RECORD OF WATER PRESSURE TEST

HOLE NO 3 GROUND WATER LEVEL 19.45 m SHEET NO 8

STAGE NO	DATE	DEPTH m- m	SECTION LENGTH L cm	HOLE RADIUS r cm	PRESSURE kg/cm^3	GUAGE HEIGHT Hg cm	WATER LEAKAGE Q l/min	PERMEABILITY k cm/sec	LUGEON UNIT Lu l/min/m
					4		6.29	1.52×10^{-4}	
					1		0.08	4.51×10^{-6}	
4	7/May	12.0- 12.5	50.0	5.0	0	25	0	-	
					1		0	-	
					4		11.11	2.58×10^{-4}	
					7		25.92	3.83×10^{-4}	
					10		37.79	4.10×10^{-4}	75.6
					7		25.32	3.74×10^{-4}	
					4		13.64	3.17×10^{-4}	
					1		0.15	8.30×10^{-6}	
5	8/May	17.0- 17.5	50.0	5.0	0	25	3.34	2.33×10^{-4}	
					1		3.15	1.39×10^{-4}	
					4		22.61	4.79×10^{-4}	
					7		19.90	2.77×10^{-4}	
					10		41.39	4.29×10^{-4}	82.8
					7		28.43	3.97×10^{-4}	
					4		13.80	2.93×10^{-4}	
					1		2.73	1.21×10^{-4}	

TABLE C-1-3 (8)

RECORD OF WATER PRESSURE TEST

HOLE NO 3 GROUND WATER LEVEL 19.45 m SHEET NO 9

STAGE NO	DATE	DEPTH m- m	SECTION LENGTH L cm	HOLE RADIUS r cm	PRESSURE kg/cm^3	GUAGE HEIGHT Hg cm	WATER LEAKAGE Q l/min	PERMEABILITY k cm/sec	LUGEON UNIT Lu l/min/m
6	10/May	22.0- 22.5	50.0	5.0	0	25.0	0	-	
					1		0	-	
					4		0.27	4.88×10^{-6}	
					7		1.90	2.56×10^{-5}	
					10		3.49	3.54×10^{-5}	7.0
					7		2.05	2.81×10^{-5}	
					4		0.83	7.32×10^{-6}	
					1		0.15	6.10×10^{-6}	

TABLE C-1-3 (9)

RECORD OF WATER PRESSURE TEST

HOLE NO 4 GROUND WATER LEVEL 17.35 m SHEET NO 10

STAGE NO	DATE	DEPTH m- m	SECTION LENGTH L cm	HOLE RADIUS r cm	PRESSURE kg/cm^3	GUAGE HEIGHT Hg cm	WATER LEAKAGE Q l/min	PERMEABILITY k cm/sec	LUGEON UNIT Lu l/min/m
1	14/May	4.5- 5.0	50.0	4.25	0	25.0	0	-	
					1		0	-	
					4		20.43	5.95×10^{-4}	
					7		36.08	6.30×10^{-4}	
					10		44.76	5.58×10^{-4}	89.5
					7		35.25	6.16×10^{-4}	
					4		23.65	6.89×10^{-4}	
					1		13.49	1.18×10^{-4}	
2	15/May	9.25- 9.75	50.0	4.25	0	25.0	4.36	5.86×10^{-4}	
					1		6.48	4.30×10^{-4}	
					4		46.39	1.22×10^{-3}	
					7		64.66	1.06×10^{-3}	162.1
					4		39.72	1.05×10^{-3}	
					1		41.39	2.75×10^{-3}	

TABLE C-1-3 (1)

RECORD OF WATER PRESSURE TEST

HOLE NO 4　　GROUND WATER LEVEL 17.35 m　　SHEET NO 11

STAGE NO	DATE	DEPTH m- m	SECTION LENGTH L cm	HOLE RADIUS r cm	PRESSURE kg/cm^3	GUAGE HEIGHT Hg cm	WATER LEAKAGE Q l/min	PERMEABILITY k cm/sec	LUGEON UNIT Lu l/min/m
3	16/May	11.5- 12.0	50.0	4.25	0	25.0	3.41	3.72×10^{-4}	
					1		6.75	4.02×10^{-4}	
					4		34.64	8.72×10^{-4}	
					7		44.80	7.15×10^{-4}	109.3
					4		26.61	6.70×10^{-4}	
					1		8.72	5.18×10^{-4}	
4	17/May	13.5- 14.0	50.0	4.25	0	25.0	12.73	1.19×10^{-3}	
					1		17.62	9.62×10^{-4}	
					4		39.38	9.55×10^{-4}	
					7		56.81	8.66×10^{-4}	135.3
					4		46.69	1.13×10^{-3}	
					1		19.03	1.04×10^{-3}	

TABLE C-1-3 (11)

RECORD OF WATER PRESSURE TEST

HOLE NO 4 GROUND WATER LEVEL 17.35 m SHEET NO 12

STAGE NO	DATE	DEPTH m- m	SECTION LENGTH L cm	HOLE RADIUS r cm	PRESSURE kg/cm^3	GUAGE HEIGHT Hg cm	WATER LEAKAGE Q l/min	PERMEABILITY k cm/sec	LUGEON UNIT Lu l/min/m
5	19/May	18.0- 19.0	100.0	4.25	0	25.0	0	-	
					1		0	-	
					4		0.11	1.67×10^{-6}	
					7		0.46	4.19×10^{-6}	
					10		0.95	6.70×10^{-6}	1.0
					7		0.46	4.19×10^{-6}	
					4		0.08	8.37×10^{-7}	
					1		0	-	
6	19/May	23.4- 24.4	100.0	3.75	0	25.0	1.14	5.66×10^{-5}	
					1		1.97	6.26×10^{-5}	
					4		29.45	4.46×10^{-4}	
					7		70.57	7.02×10^{-4}	80.7
					4		46.92	7.11×10^{-4}	
					1		34.94	1.11×10^{-3}	

TABLE C-1-3 (12)

RECORD OF WATER PRESSURE TEST

HOLE NO 4 GROUND WATER LEVEL 17.35 m SHEET NO 13

STAGE NO	DATE	DEPTH m- m	SECTION LENGTH L cm	HOLE RADIUS r cm	PRESSURE kg/cm^3	GUAGE HEIGHT Hg cm	WATER LEAKAGE Q l/min	PERMEABILITY k cm/sec	LUGEON UNIT Lu·l/min/m
7	20/May	27.0- 30.0	300.0	3.75	0	25.0	2.12	4.72×10^{-5}	
					1		3.41	4.80×10^{-5}	
					4		7.24	4.88×10^{-5}	
					7		14.14	6.27×10^{-5}	
					10		19.37	6.39×10^{-5}	6.5
					7		18.19	8.05×10^{-5}	
					4		12.05	8.13×10^{-5}	
					1		6.60	9.29×10^{-5}	

TABLE C-1-3 (3)

RECORD OF WATER PRESSURE TEST

HOLE NO 5 GROUND WATER LEVEL 28.10 m SHEET NO 14

STAGE NO	DATE	DEPTH m- m	SECTION LENGTH L cm	HOLE RADIUS r cm	PRESSURE kg/cm^3	GUAGE HEIGHT Hg cm	WATER LEAKAGE Q l/min	PERMEABILITY k cm/sec	LUGEON UNIT Lu l/min/m
1	8/May	4.5-	Bottom	6.40	H= 468 cm		124.8 cm^3	5.53×10^{-5}	Hole Bottom Method Constant Head.
2	9/May	8.0- 8.5	50.0	5.0	0	0	0	-	
					1		0	-	
					4		0.23	5.73×10^{-6}	
					7		0.53	8.30×10^{-6}	
					10		3.87	4.36×10^{-6}	7.7
					7		3.26	5.08×10^{-5}	
					4		1.59	4.03×10^{-5}	
					1		0.25	1.67×10^{-5}	
3	10/May	13.0- 13.5	50.0	5.0	0	0	0	-	
					1		0	-	
					4		0.64	1.48×10^{-5}	
					7		3.56	5.22×10^{-5}	
					10		6.90	7.43×10^{-5}	13.8
					7		5.46	8.00×10^{-5}	
					4		3.49	7.99×10^{-5}	
					1		0.23	1.20×10^{-5}	

TABLE C-1-3 (4)

RECORD OF WATER PRESSURE TEST

HOLE NO 5 GROUND WATER LEVEL 28.10 m SHEET NO 15

STAGE NO	DATE	DEPTH m- m	SECTION LENGTH L cm	HOLE RADIUS r cm	PRESSURE kg/cm^3	GUAGE HEIGHT Hg cm	WATER LEAKAGE Q l/min	PERMEABILITY k cm/sec	LUGEON UNIT Lu l/min/m
4	11/May	18.0- 18.8	80.0	5.0	0	25.0	0	-	
					1		0	-	
					4		1.90	2.97×10^{-5}	
					7		4.13	4.28×10^{-5}	
					10		6.48	5.30×10^{-5}	8.1
					7		5.23	5.41×10^{-5}	
					4		3.41	5.34×10^{-5}	
					1		0.46	1.46×10^{-5}	
5	14/May	22.15- 23.15	100.0	5.0	0	25.0	0	-	
					1		0.04	4.40×10^{-7}	
					4		0.27	1.54×10^{-6}	
					7		0.57	2.24×10^{-6}	
					10		2.50	7.45×10^{-6}	2.5
					7		1.21	4.81×10^{-6}	
					4		0.60	3.52×10^{-6}	
					1		0.08	8.44×10^{-6}	

TABLE C-1-3 (15)

RECORD OF WATER PRESSURE TEST

HOLE NO 5 GROUND WATER LEVEL 28.10 m SHEET NO 16

STAGE NO	DATE	DEPTH m- m	SECTION LENGTH L cm	HOLE RADIUS r cm	PRESSURE kg/cm^3	GUAGE HEIGHT Hg cm	WATER LEAKAGE Q l/min	PERMEABILITY k cm/sec	LUGEON UNIT Lu l/min/m
6	15/May	27.0- 28.0	100.0	5.0	0	25.0	0	-	
					1		0	-	
					4		0.08	4.04×10^{-6}	
					7		0.09	3.30×10^{-7}	
					10		0.11	3.30×10^{-7}	0.1
					7		0.10	3.67×10^{-7}	
					4		0.10	5.14×10^{-7}	
					1		0	-	
7	17/May	32.0- 33.0	100.0	5.0	0	0	0	-	
					1		0	-	
					4		0	-	
					7		0.11	4.40×10^{-7}	
					10		1.63	4.70×10^{-6}	1.6
					7		0.30	1.14×10^{-6}	
					4		0.15	8.07×10^{-7}	
					1		0.08	7.34×10^{-7}	

RECORD OF WATER PRESSURE TEST

HOLE NO 6 GROUND WATER LEVEL 19.45 m SHEET NO 17

STAGE NO	DATE	DEPTH m- m	SECTION LENGTH L cm	HOLE RADIUS r cm	PRESSURE kg/cm^3	GUAGE HEIGHT Hg cm	WATER LEAKAGE Q l/min	PERMEABILITY k cm/sec	LUGEON UNIT Lu l/min/m
1	20/May	4.85- 5.35	50.0	5.0	0	0	0	-	
					1		0	-	
					4		0	-	
					7		0.83	1.34×10^{-5}	
					10		2.50	2.93×10^{-5}	5.0
					7		1.52	2.44×10^{-5}	
					4		0.53	1.46×10^{-5}	
					1		0.08	6.10×10^{-6}	
2	20/May	6.10- 6.60	50.0	5.0	0	0	0	-	
					1		0	-	
					4		0	-	
					7		0.38	6.10×10^{-6}	
					10		0.95	1.10×10^{-5}	1.9
					7		0.38	6.10×10^{-6}	
					4		0.23	6.10×10^{-6}	
					1		0	-	

TABLE C-1-3 (2)

TABLE RECORD OF WATER PRESSURE TEST

HOLE NO 6 GROUND WATER LEVEL 19.45 m SHEET NO 18

STAGE NO	DATE	DEPTH m- m	SECTION LENGTH L cm	HOLE RADIUS r cm	PRESSURE kg/cm^3	GUAGE HEIGHT Hg cm	WATER LEAKAGE Q l/min	PERMEABILITY k cm/sec	LUGEON UNIT Lu l/min/m
3	20/May	8.10- 8.16	50.0	5.0	0	0	0	-	
					1		0	-	
					4		0.30	7.32×10^{-6}	
					7		0.87	1.34×10^{-5}	
					10		2.12	2.44×10^{-5}	4.2
					7		1.36	2.07×10^{-5}	
					4		0.23	6.10×10^{-6}	
					1		0	-	
4	21/May	10.1- 10.6	50.0	5.0	0	0	0	-	
					1		0	-	
					4		0.27	6.10×10^{-6}	
					7		1.10	1.71×10^{-5}	
					10		1.52	1.71×10^{-5}	3.0
					7		1.52	2.32×10^{-5}	
					4		0.53	1.34×10^{-5}	
					1		0	-	

RECORD OF WATER PRESSURE TEST

HOLE NO 6 GROUND WATER LEVEL 19.45 m SHEET NO 19

STAGE NO	DATE	DEPTH m- m	SECTION LENGTH L cm	HOLE RADIUS r cm	PRESSURE kg/cm^3	GUAGE HEIGHT Hg cm	WATER LEAKAGE Q l/min	PERMEABILITY k cm/sec	LUGEON UNIT Lu l/min/m
5	22/May	12.2- 12.7	50.0	5.0	0	0	0	-	
					1		0	-	
					4		0.26	6.10×10^{-6}	
					7		1.29	1.95×10^{-5}	
					10		3.11	3.42×10^{-5}	6.2
					7		1.67	2.44×10^{-5}	
					4		0.30	7.32×10^{-6}	
					1		0	-	
6	23/May	17.05- 18.05	100.0	5.0	0	0	0	-	
					1		0	-	
					4		0	-	
					7		0.30	2.78×10^{-6}	
					10		0.95	6.43×10^{-6}	1.0
					7		0.53	4.84×10^{-6}	
					4		0.08	1.03×10^{-6}	
					1		0	-	

RECORD OF WATER PRESSURE TEST

HOLE NO 6 GROUND WATER LEVEL 19.45 m SHEET NO 20

STAGE NO	DATE	DEPTH m- m	SECTION LENGTH L cm	HOLE RADIUS r cm	PRESSURE kg/cm^3	GUAGE HEIGHT Hg cm	WATER LEAKAGE Q l/min	PERMEABILITY k cm/sec	LUGEON UNIT Lu l/min/m
7	24/May	21.0- 24.0	300.0	5.0	0	0	0	-	
					1		0	-	
					4		0	-	
					7		0.38	1.52×10^{-6}	
					10		0.76	2.28×10^{-6}	0.3
					7		0.38	1.52×10^{-6}	
					4		0	-	
					1		0	-	
8	25/May	30.55- 33.55	300.0	4.3	0	0	0	-	
					1		0.04	4.88×10^{-7}	
					4		0.08	4.88×10^{-7}	
					7		0.27	1.13×10^{-6}	
					10		0.87	2.74×10^{-6}	0.3
					7		0.46	1.91×10^{-6}	
					4		0.15	9.75×10^{-6}	
					1		0	-	

TABLE C-1-3 (2)

FIGURE C-1-1 GEOLOGICAL PLAN

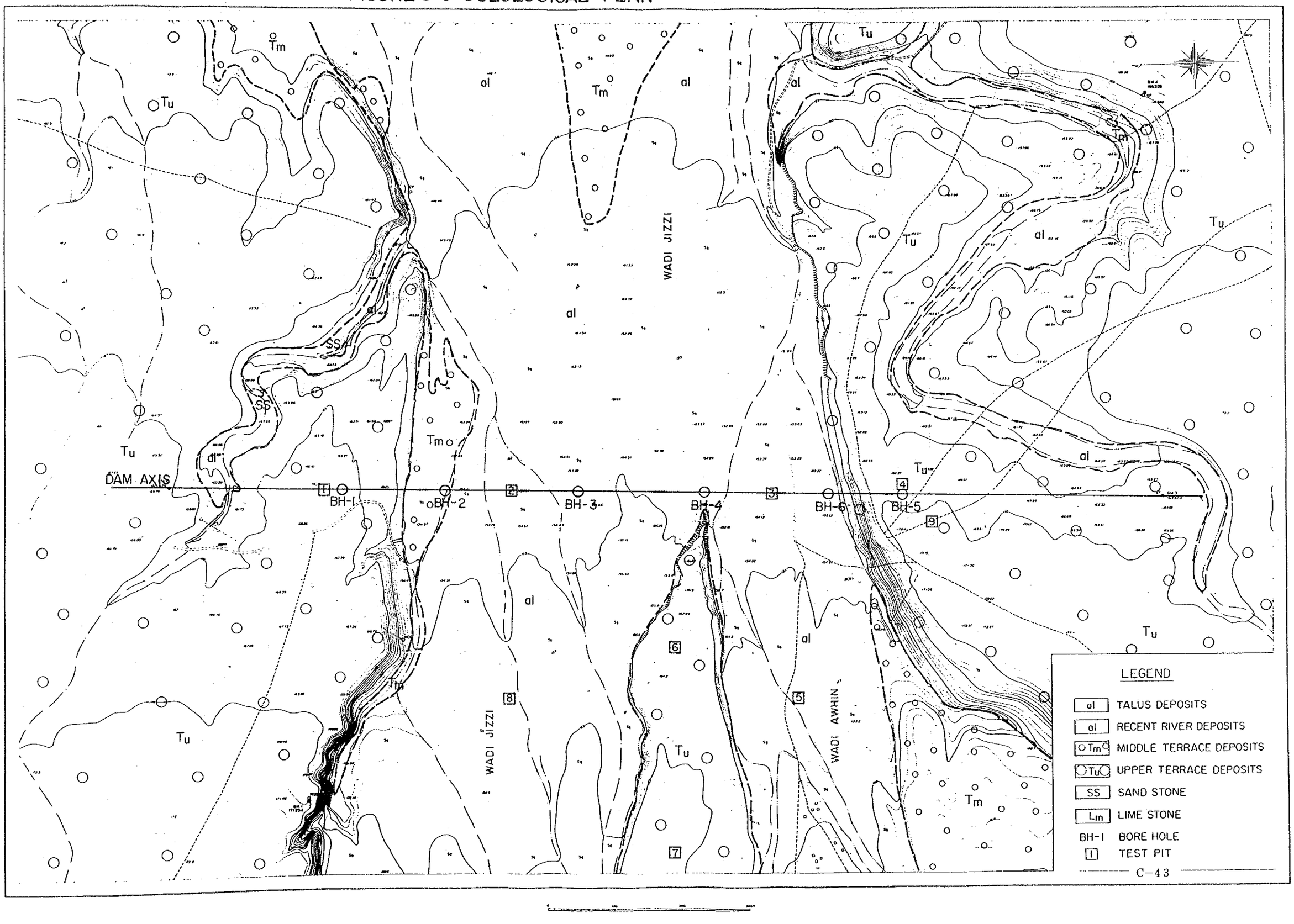

Figure C-1-2

DRILL LOG (1)

HOLE NO. 1 SHEET NO. 1 OF 2

PROJECT	THE WADI JIZZI AGRICULTURAL DEVELOPMENT PROJECT			DEPTH	40.0m	ELEVATION	166.3m
SITE	LEFT BANK	COORDINATE	: :	INCLINATION		DRILL RIG	
AVERAGE CORE RECOVERY		DATE	FROM TO	DRILLED		LOGGED	

DATE	DEPTH	ELEVATION	ROCK TYPE OR FORMATION	COLUMN SECTION	DESCRIPTION	BIT & DIAMETER	GROUNDWATER LEVEL
	0.6		SURFACE SOIL		GRAVELY SILT		
9			UPPER TERRACE DEPOSITS		SANDS AND GRAVELS light brownish grey 0.6-5.0m dense to very dense weakly cemented 5.0-14.0m dense well cemented gravels, granule to cobble and occasionally including boulders consists of basic to ultrabasic rock and chert etc. sands, fine to coarse occasionally including thin silt bed	66 mm METAL	
11	14.0		SERPENTINE		light greenish grey to dark grey 14.0-17.2m moderately strong to strong weathered jointed and broken especially 14.0-15.0m, 16.0-17.2m joints, opened and weathered 17.2-40.0m strong weakly weathered, opened joints are sparse	100 mm METAL	25.85
	30.0						

CORE RECOVERY %	CORE RECOVERY cm	R. Q. D 50 %	WATER PRESSURE TEST LUGEON VALUE 10 20 30 40 50	DEPTH
			36 (K=2.58x10⁻⁴)	
			2 (K=1.27 x 10⁻⁵)	
			1	
			1	
			2	

HOLE NO. ( )

LOG FORM-B

C-45

※R.Q.D is Rock Quality Designation, R.Q.D=(Total length of cylindric cores longer than 10 cm)/(Total core length) x 100%
※LUGEON VALUE is l/min/m under injection water pressure of 10kg/cm²
※DEPTH and ELEVATION are in meter

DRILL LOG (2)

HOLE NO. 1 SHEET NO. 2 OF 2

PROJECT			DEPTH		ELEVATION	
SITE		COORDINATE : :	INCLINATION		DRILL RIG	
AVERAGE CORE RECOVERY		DATE FROM TO	DRILLED		LOGGED	

DATE	DEPTH	ELEVATION	ROCK TYPE OR FORMATION	COLUMN SECTION	DESCRIPTION	BIT & DIAMETER	GROUNDWATER LEVEL	CORE RECOVERY %	CORE RECOVERY cm	R. Q. D	WATER PRESSURE TEST LUGEON VALUE	DEPTH
			SERPENTINE			85m METAL				0.4 0.2		
	40.0											

HOLE NO. ( )

LOG FORM-B

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*R.Q.D is Rock Quality Designation, R.Q.D=(Total length of cylindric cores longer than 10 cm)/(Total core length) × 100%

*LUGEON VALUE is l/min/m under injection water pressure of 10kg/cm²

*DEPTH and ELEVATION are in meter

DRILL LOG (3)

HOLE NO. 2 SHEET NO. 1 OF 1

PROJECT	THE WADE JIZZI AGRICULTURAL DEVELOPMENT PROJECT			DEPTH	30.0m	ELEVATION	153.0m
SITE	RIVER FLOOR	COORDINATE	: :	INCLINATION		DRILL RIG	
AVERAGE CORE RECOVERY		DATE	FROM TO	DRILLED		LOGGED	

DEPTH	ELEVATION	ROCK TYPE OR FORMATION	DESCRIPTION
0			sands and gravels light brownish grey dense to very dense weakly cemented gravels, granule to cobble and occasional including boulders matrix, fine to coarse sand occasional including silt
7.50		MIDDLE TERRACE DEPOSITS	
			light brownish grey to dark grey porosity, weakly cemented gravels, granule to cobble and occasional boulders
12.6			
			sand and gravels browish grey to dark grey strong, well cemented gravels, granule to cobble and weakly weathered consist of basic to ultra basic rock and Hawasina sediments
19.5			
			gravely silt strong greyish brown well consolidated gravels, rubble
22.0			
		SERPENTINE	light yellowish brown to light greenish grey moderately strong to strong strong weathered, joints, spended and decontaminated
30.0			

BIT & DIAMETER: 100 mm METAL; 85 mm METAL

GROUNDWATER LEVEL: ▽ 18.80

CORE RECOVERY (%, cm)

R. Q. D (50 %)

WATER PRESSURE TEST LUGEON VALUE (10 20 30 40 50)

3 (K=1.95x10^{-5})

62 (K=4.61x10^{-4})

11 (K=5.75x10^{-5})

24 (K=1.34x10^{-5})

2.50

0.5

DEPTH

HOLE NO. ( )

LOG FORM-B

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*R.Q.D is Rock Quality Designation, R.Q.D=(Total length of cylindric cores longer than 10 cm)/(Total core length) x 100%

*LUGEON VALUE is l/min/m under injection water pressure of 10kg/cm^2

*DEPTH and ELEVATION are in meter

DRILL LOG(4)

HOLE NO. 3 SHEET NO. 1 OF 2

PROJECT	THE WADI JIZZI AGRICULTURAL DEVELOPMENT PROJECT			DEPTH	32.0m	ELEVATION	154.5m
SITE	RIVER FLOOR	COORDINATE	: :	INCLINATION		DRILL RIG	
AVERAGE CORE RECOVERY		DATE	FROM TO	DRILLED		LOGGED	

DATE	DEPTH	ELEVATION	ROCK TYPE OR FORMATION	COLUMN SECTION	DESCRIPTION	BIT & DIAMETER	GROUNDWATER LEVEL
		2.90	RECENT RIVER DEPOSITE		sand and gravels light grey to grey very loose gravels, granule to cobble		
	4 5 5 6				sands and gravels light grey to dark grey dense to very dense seakly to well cemented gravels, granule to cobble and occasional including silt	100 mm METAL	
	7	10.5	MIDDLE TERRACE DEPOSITS		sands and gravels same as above, but porosity, and fine grain size lacking		
	8 9	21.5				85 mm METAL	▽ 19.45
	10	25.6	UPPER TERRACE DEPOSITS		gravely silt light yellowish grey very dense and well consolidated	85 mm DIA-MOND	
	11	30.0	SERPENTINE		dark greenish grey weak highly weathered joints opened and contaminated	85 mm METAL	

CORE RECOVERY %	CORE RECOVERY cm	R. Q. D % (50)	WATER PRESSURE TEST LUGEON VALUE (10 20 30 40 50)	DEPTH
			Lu = 208 (K=6.59x10⁻³)	
			Lu = 118 (K=2.45x10⁻³)	
			Lu = 42 (K=2.31x10⁻⁴)	
			Lu = 76 (K=4.10x10⁻⁴)	
			Lu=83 (K=4.29x10⁻⁴)	
			Lu=7 (K=3.54x10⁻⁵)	

HOLE NO. ( )

LOG FORM-B

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※R.Q.D is Rock Quality Designation, R.Q.D=(Total length of cylindric cores longer than 10 cm)/(Total core length) × 100%
※LUGEON VALUE is l/min/m under injection water pressure of 10kg/cm²
※DEPTH and ELEVATION are in meter

DRILL LOG (5)

HOLE NO. 3 SHEET NO. 2 OF 2

PROJECT				DEPTH		ELEVATION	
SITE		COORDINATE	: :	INCLINATION		DRILL RIG	
AVERAGE CORE RECOVERY		DATE	FROM TO	DRILLED		LOGGED	

DATE	DEPTH	ELEVATION	ROCK TYPE OR FORMATION	COLUMN SECTION	DESCRIPTION	BIT & DIAMETER	GROUNDWATER LEVEL	CORE RECOVERY %	CORE RECOVERY cm	R. Q. D %	WATER PRESSURE TEST LUGEON VALUE	DEPTH
12	32.00		SURPENTINE	V V V V V V							10 20 30 40 50	

HOLE NO. ( )

※R.Q.D is Rock Quality Designation, R.Q.D=(Total length of cylindric cores longer than 10 cm)/(Total core length) × 100%.
※LUGEON VALUE is l/min/m under injection water pressure of 10kg/cm²
※DEPTH and ELEVATION are in meter

LOG FORM—B

DRILL LOG (6)

HOLE NO. 4 SHEET NO. 1 OF 1

PROJECT	THE WADI JIZZI AGRICULTURAL DEVELOPMENT			DEPTH	30.0m	ELEVATION	154.0m
SITE	RIVER FLOOR	COORDINATE	: :	INCLINATION		DRILL RIG	
AVERAGE CORE RECOVERY		DATE	FROM TO	DRILLED		LOGGED	

DATE	DEPTH	ELEVATION	ROCK TYPE OR FORMATION	COLUMN SECTION	DESCRIPTION	BIT & DIAMETER	GROUNDWATER LEVEL
13/4	2.90		RECENT RIVER DEPOSITS		sands and gravels light grey to grey very loose gravels, granule to cobble		
14			MIDDLE TERRACE DEPOSITS		sands and gravels brownish grey to greyish brown weakly to well cemented gravels, granule to cobble and occassional including boulders	100 mm METAL	
15	9.75				matrix, medium to coarse sand at places with silt thin beds complete water loss from 8.6m	85 mm METAL	
16					sands and gravels same as above, but porosity, and fine grein size lacking		
17	16.7						
18					sands and gravels lights yellowish to browish grey very dense and strongly consolidated slightly weathered		▽ 17.35
19	22.0		UPPER TERRACE DEPOSITS		22.0 - 23.0m sandy silt		
	23.0				23.0 - 30.0m porosity, and strong weathered	75 mm METAL	
20	30.0						

CORE RECOVERY (%, cm) | R. Q. D (50 %) | WATER PRESSURE TEST LUGEON VALUE (10 20 30 40 50) | DEPTH

Lu = 90 (K=5.58x10^{-4})

Lu = 108 (K=1.06x10^{-3})

Lu=109 (K=7.15x10^{-4})

Lu=152 (K=8.86x10^{-4})

Lu=1 (K=6.70x10^{-6})

Lu = 54 (K=7.02x10^{-4})

Lu = 7 (K=6.39x10^{-5})

HOLE NO. ( )

LOG FORM-B

C-55

*R.Q.D is Rock Quality Designation, R.Q.D=(Total length of cylindric cores longer than 10 cm)/(Total core length) × 100%

*LUGEON VALUE is l/min/m under injection water pressure of 10kg/cm²

*DEPTH and ELEVATION are in meter

DRILL LOG (7)

HOLE NO. 5 SHEET NO. 1 OF 2

PROJECT	THE WADI JIZZI AGRICULTURAL DEVELOPMENT			DEPTH	40.7m	ELEVATION	169.8m
SITE	RIGHT BANK	COORDINATE	: :	INCLINATION		DRILL RIG	
AVERAGE CORE RECOVERY		DATE	FROM TO	DRILLED		LOGGED	

DATE	DEPTH	ELEVATION	ROCK TYPE OR FORMATION	COLUMN SECTION	DESCRIPTION
6/5	0.6		SURFACE SOIL		gravely silt, loose
7					sands and gravels brownish grey - greyish brown weakly to well cemented gravels, granule to cobble and occasional including boulder matrix, fine to coarse sand slightly weathered
8					
9					
10	12.8		UPPER TERRACE DEPOSITS		sands and gravels lightyellowish to greyish brown very dense and consolidated slightly weathered gravels and sands as above
11					
12					
14	21.3				sands and gravels same as above, but strong consolidated
15					
16	30.0				

BIT & DIAMETER: 100 mm METAL; 100 mm DIA-MOND

GROUNDWATER LEVEL: ▽ 28.10

CORE RECOVERY (% / cm)

R. Q. D (50 %)

WATER PRESSURE TEST LUGEON VALUE (10 20 30 40 50)

- 5.59x10⁻³
- Lu=8 (K=4.36x10⁻⁶)
- Lu=14 (K=7.43x10⁻⁵)
- Lu=8 (K=5.30x10⁻⁵)
- Lu=3 (K=7.45x10⁻⁶)
- Lu=0.1 (K=3.80x10⁻⁷)

DEPTH

HOLE NO. ( )

C-57 LOG FORM-B

*R.Q.D is Rock Quality Designation. R.Q.D=(Total length of cylindric cores longer than 10 cm)/(Total core length) x 100%
*LUGEON VALUE is l/min/m under injection water pressure of 10kg/cm²
*DEPTH and ELEVATION are in meter

DRILL LOG (8)

HOLE NO. 5 SHEET NO. 2 OF 2

PROJECT	THE WADI JIZZI AGRICULTURAL DEVELOPMENT			DEPTH		ELEVATION	
SITE		COORDINATE	: :	INCLINATION		DRILL RIG	
AVERAGE CORE RECOVERY		DATE	FROM TO	DRILLED		LOGGED	

DATE	DEPTH	ELEVATION	ROCK TYPE OR FORMATION	COLUMN SECTION	DESCRIPTION	BIT & DIAMETER	GROUNDWATER LEVEL	CORE RECOVERY %	CORE RECOVERY cm	R. Q. D	WATER PRESSURE TEST LUGEON VALUE	DEPTH
16	33.0				33.0-34.0m cemented medium sand	100 mm DIA-MOND				50	10 20 30 40 50	
	34.0										Lu=2 (K=1.14x10⁻⁶)	
17	38.1				38.10-40.70m silty sand brownish grey strong consolidated							
18	40.7											

HOLE NO. ( )

※R.Q.D is Rock Quality Designation, R.Q.D=(Total length of cylindric cores longer than 10 cm)/(Total core length) × 100%
※LUGEON VALUE is l/min/m under injection water pressure of 10kg/cm²
※DEPTH and ELEVATION are in meter

LOG FORM—B

DRILL LOG (9)

HOLE NO. 6 SHEET NO. 1 OF 2

PROJECT	THE WADI JIZZI AGRICULTURAL DEVELOPMENT PROJECT			DEPTH	33.55m	ELEVATION	153.7m
SITE	RIVER FLOOR	COORDINATE	: :	INCLINATION		DRILL RIG	
AVERAGE CORE RECOVERY		DATE	FROM TO	DRILLED		LOGGED	

DATE	DEPTH	ELEVATION	ROCK TYPE OR FORMATION	COLUMN SECTION	DESCRIPTION	BIT & DIAMETER	GROUNDWATER LEVEL
	2.30		RECENT RIVER DEPOSITS		sands and gravels lights grey to grey very loose		
19/5	3.65		MIDDLE TERRACE DEPOSITS		sands and gravels greyish brown weakly		
20			UPPER TERRACE DEPOSITS		sands and gravels light yellowish to greyish brown strong consolidated and very dense moderately strong to strong at places weakly weathered gravels, granule to cobble matrix, fine to coarse sand, at places with silt thin beds	100 mm METAL	
21							
22	17.40					100 mm DIA-MOND	
23	17.50				17.40 - 17.50m coarse sand		▽ 19.45
	23.40				23.40 - 23.60m coarsesand		
24	23.60						
	25.70						
	26.10						
	26.60				26.60-27.75m silty sand with gravel	85 mm DIA-MOND	
	27.75						
25	30.0						

CORE RECOVERY (%, cm) | R. Q. D (50) | WATER PRESSURE TEST LUGEON VALUE (10 20 30 40 50) | DEPTH

Lu=5 ($K=2.93\times10^{-5}$)
Lu=5 ($K=2.10\times10^{-5}$)
Lu=4 ($K=2.44\times10^{-5}$)
Lu=3 ($K=1.71\times10^{-5}$)
Lu=6 ($K=3.42\times10^{-5}$)
Lu=1 ($K=6.43\times10^{-6}$)
Lu=0.5 ($K=2.28\times10^{-6}$)

HOLE NO. ( )

C-61 LOG FORM-B

*R.Q.D is Rock Quality Designation, R.Q.D=(Total length of cylindric cores longer than 10 cm)/(Total core length) × 100%
*LUGEON VALUE is l/min/m under injection water pressure of 10kg/cm²
*DEPTH and ELEVATION are in meter

DRILL LOG (10)

HOLE NO. 6 SHEET NO. 2 OF 2

PROJECT	THE WADI JIZZI AGRICULTURAL DEVELOPMENT PROJECT		DEPTH		ELEVATION	
SITE		COORDINATE : :	INCLINATION		DRILL RIG	
AVERAGE CORE RECOVERY		DATE FROM TO	DRILLED		LOGGED	

DATE	DEPTH	ELEVATION	ROCK TYPE OR FORMATION	COLUMN SECTION	DESCRIPTION	BIT & DIAMETER	GROUNDWATER LEVEL	CORE RECOVERY %	CORE RECOVERY cm	R. Q. D	WATER PRESSURE TEST LUGEON VALUE	DEPTH
26	33.25 33.55				33.25-33.55 Lime stone white, very hard, fresh siliceous.	85 mm DIA-MOND				50 %	10 20 30 40 50 LU=0.3 (K=2.74×10⁻⁶)	

※R.Q.D is Rock Quality Designation, R.Q.D=(Total length of cylindric cores longer than 10 cm)/(Total core length) × 100%
※LUGEON VALUE is l/min/m under injection water pressure of 10kg/cm²
※DEPTH and ELEVATION are in meter

HOLE NO. ( )

LOG FORM-B

Fig. C-1-3 TEST PIT LOG

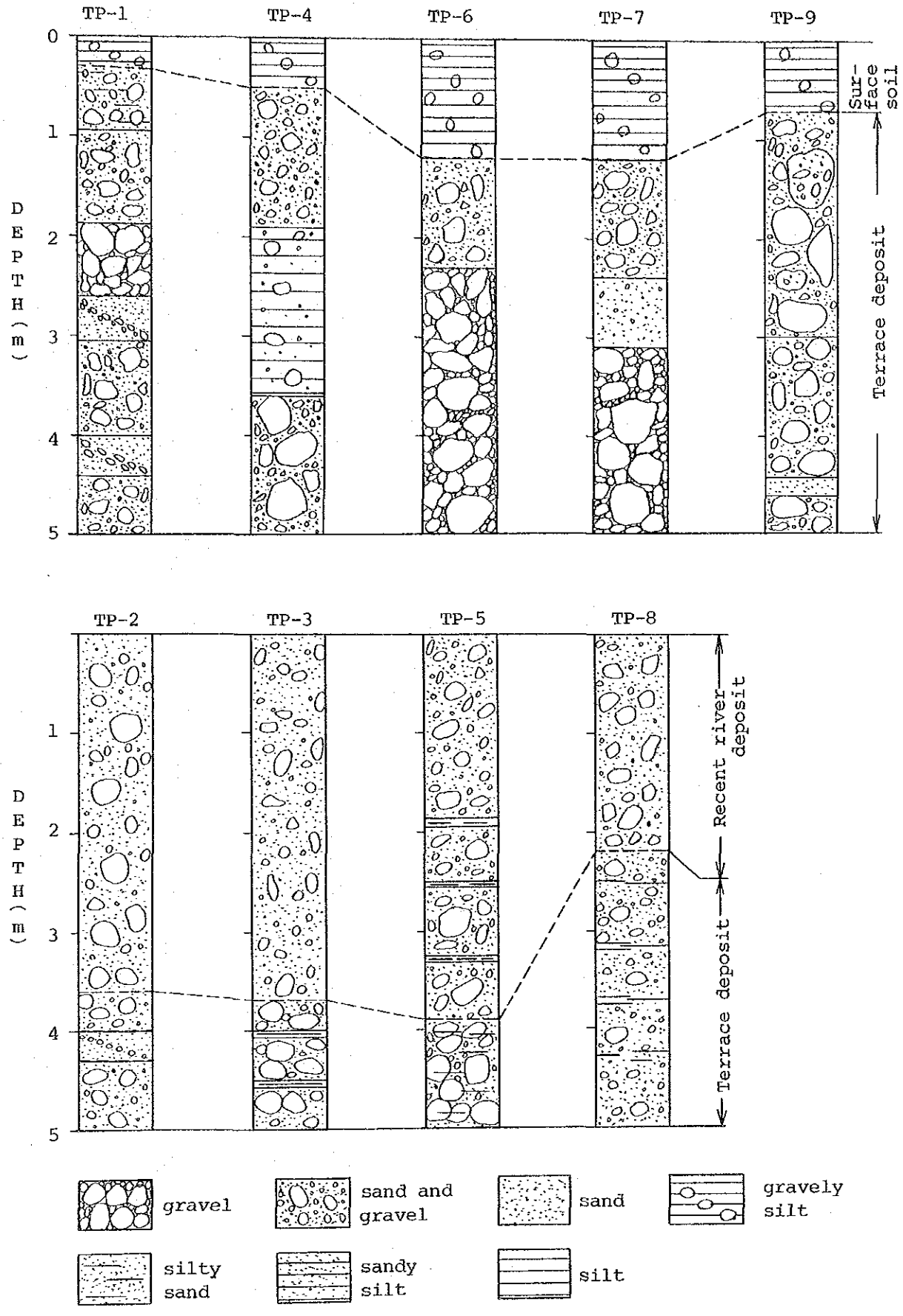


Fig. C-1-4 P ~ Q CURVE BH-1

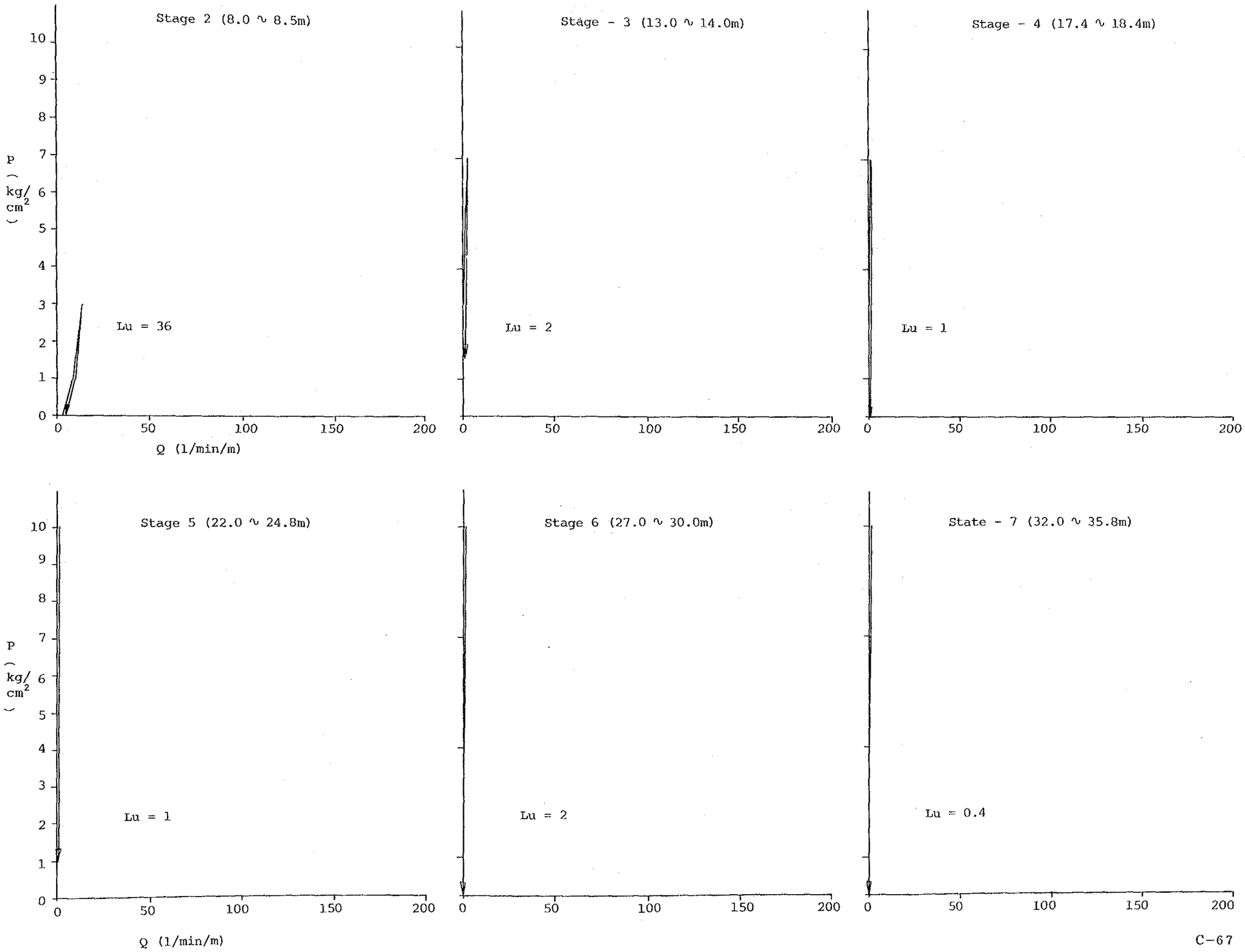


Fig.C-1-4 P - Q CURVE BH-2

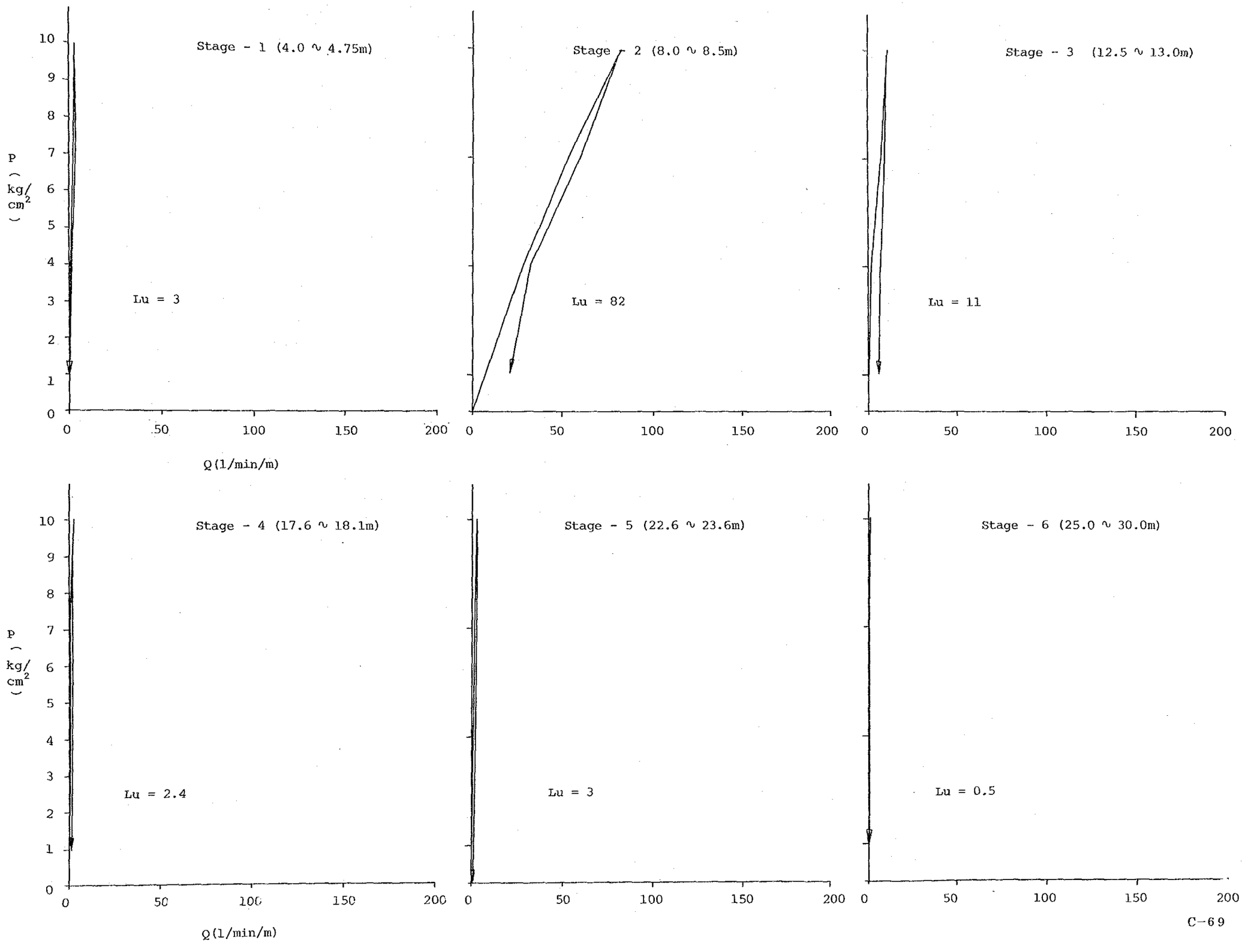


Fig.C-1-4 P - Q CURVE

BH-3

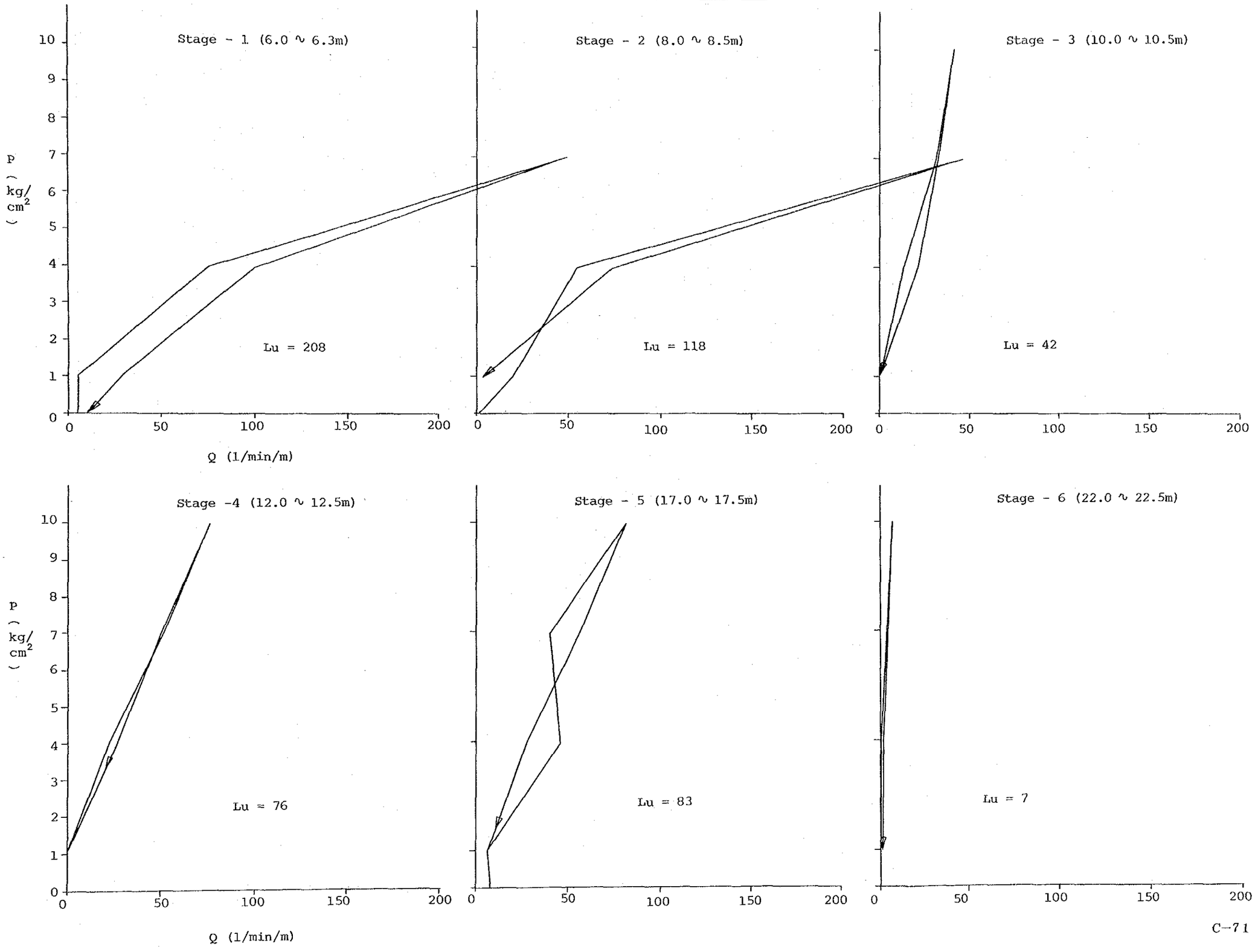


Fig. C-1-4 P - Q CURVE

BH-4

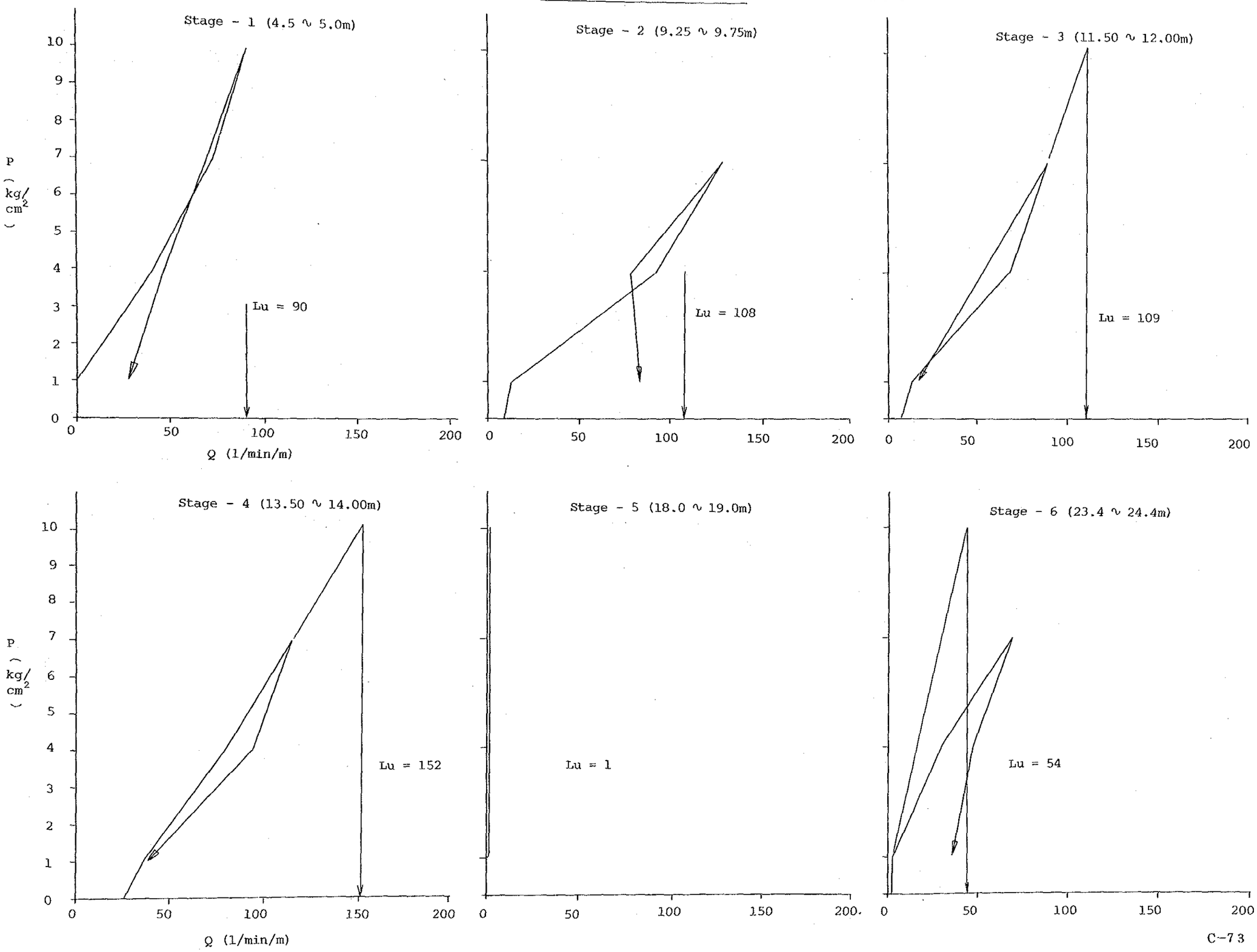


Fig.C-1-4 P - Q CURVE BH-5

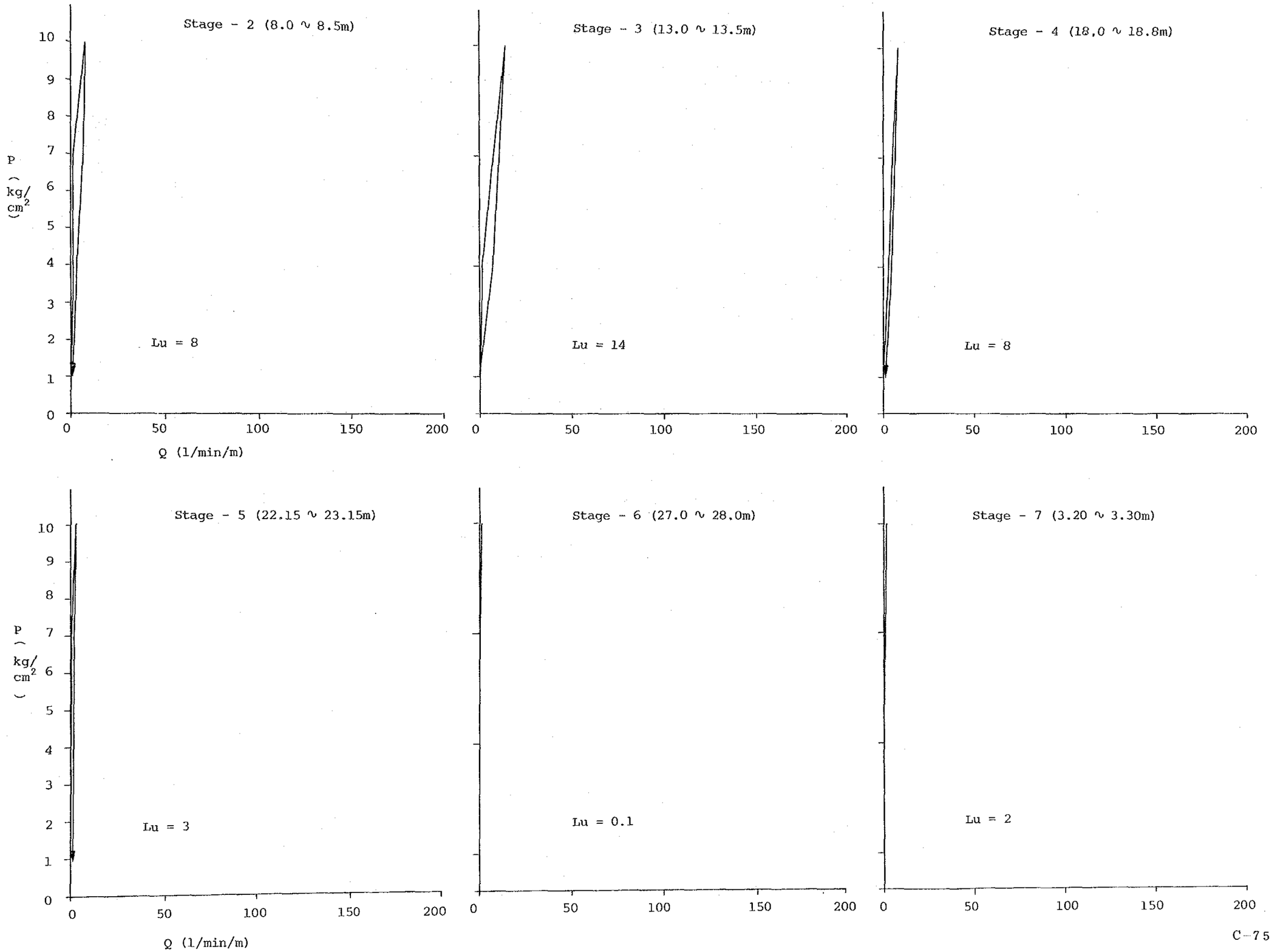
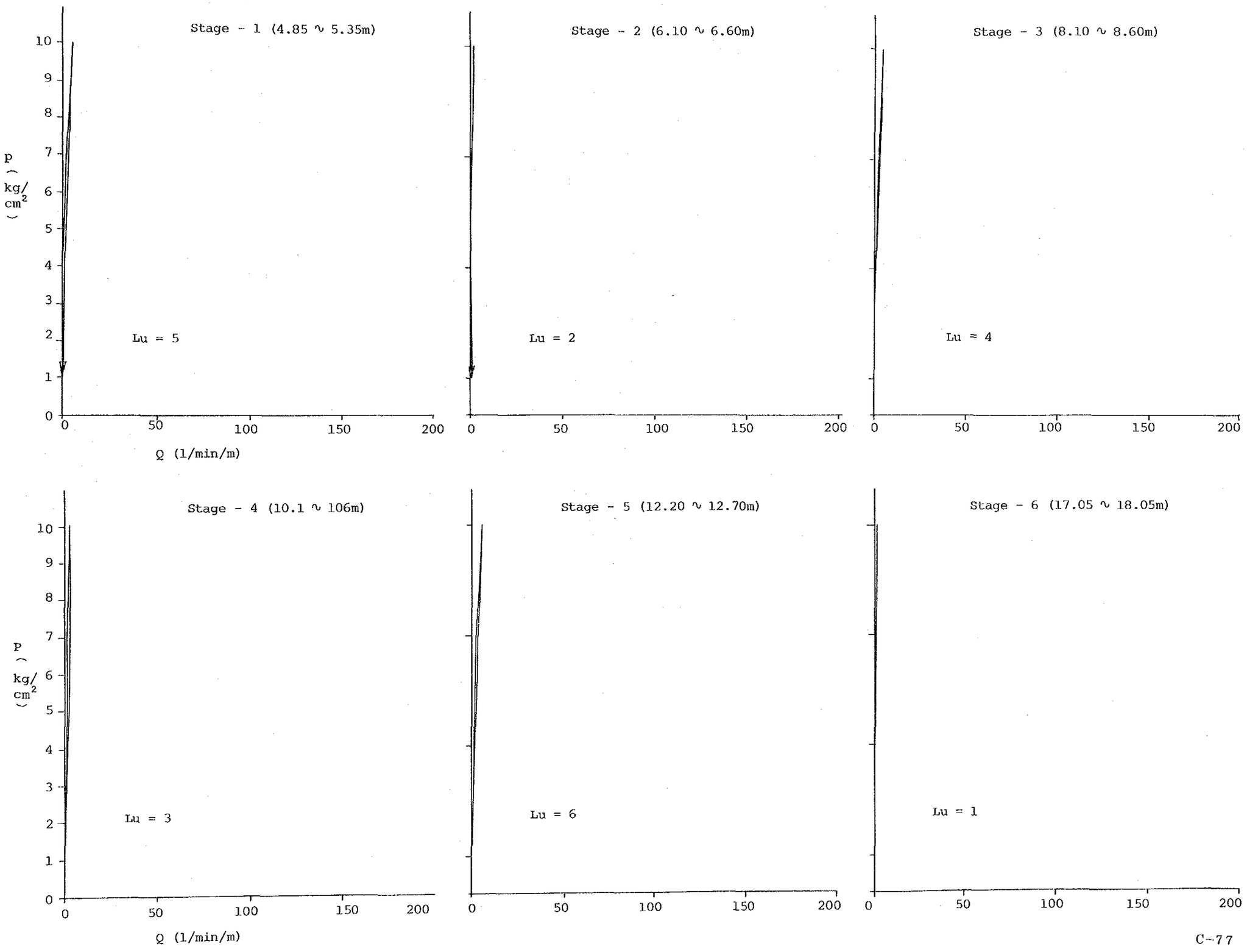
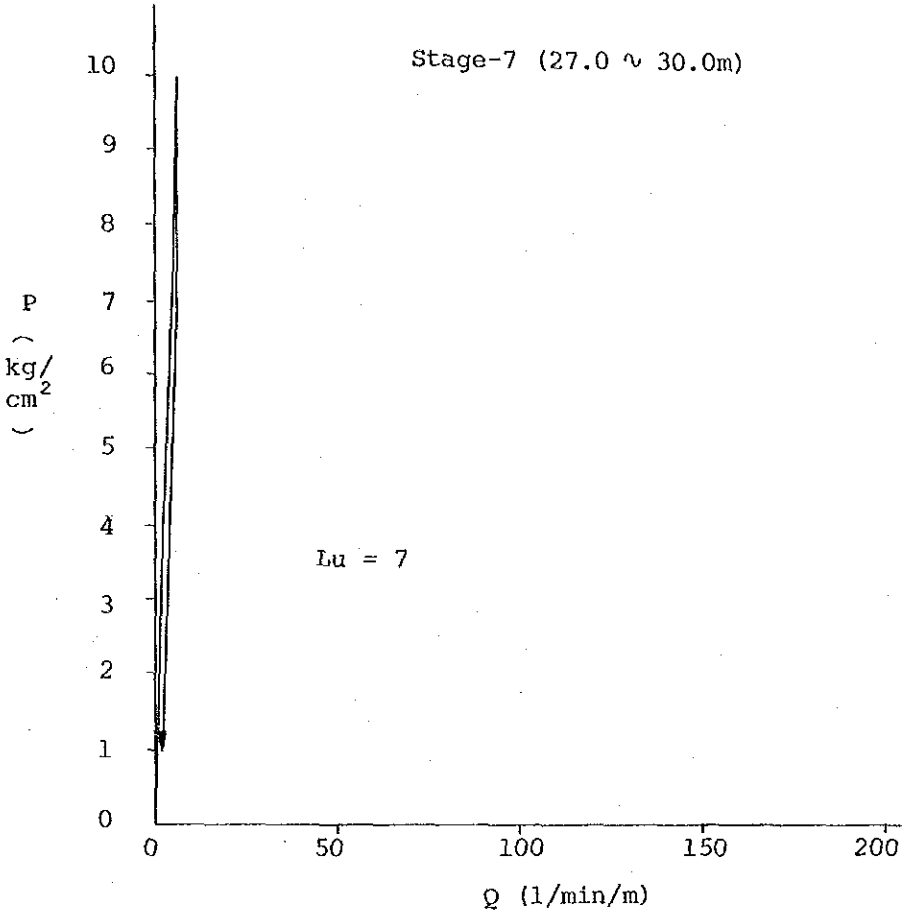
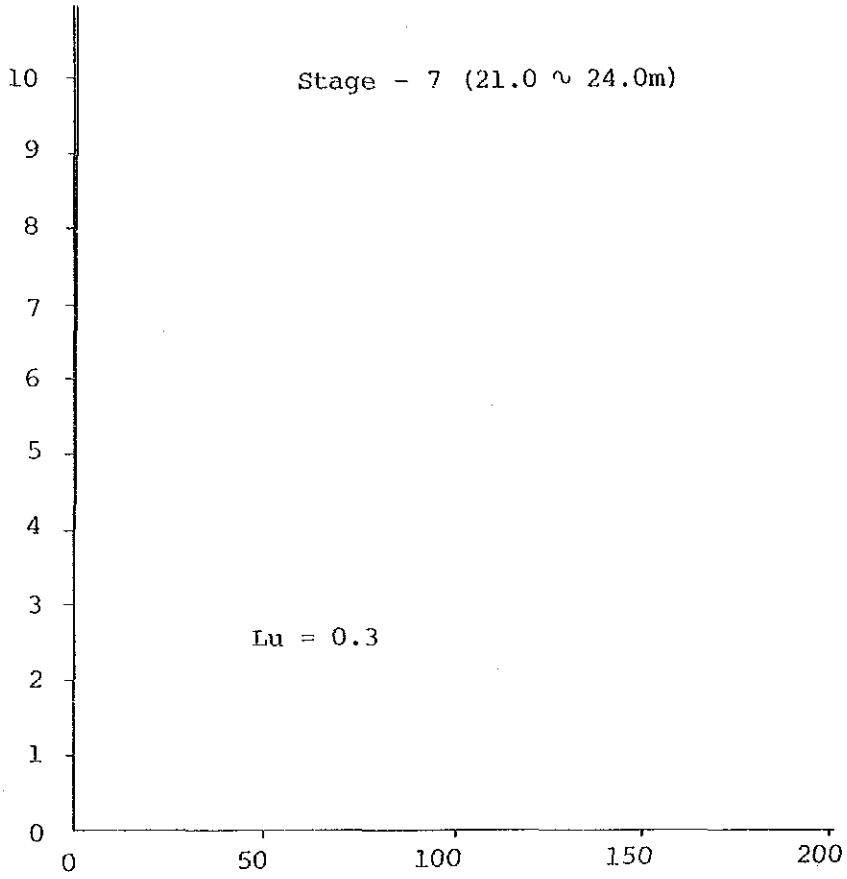
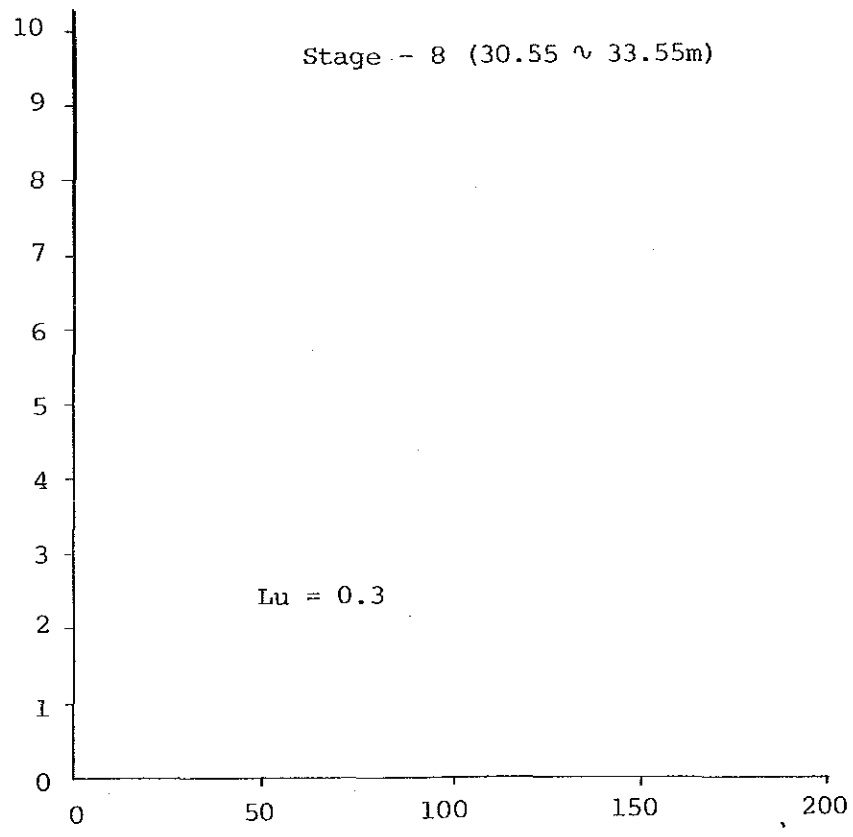


Fig.C-1-4 P - Q CURVE BH-6




Stage-7 (27.0 ∿ 30.0m)
P
(kg/cm²)
10
9
8
7
6
5
4
3
2
1
0
Lu = 7
0
50
100
150
200
Q (l/min/m)


Stage - 7 (21.0 ∿ 24.0m)
Lu = 0.3
10
9
8
7
6
5
4
3
2
1
0
0
50
100
150
200


Stage - 8 (30.55 ∿ 33.55m)
Lu = 0.3
10
9
8
7
6
5
4
3
2
1
0
0
50
100
150
200

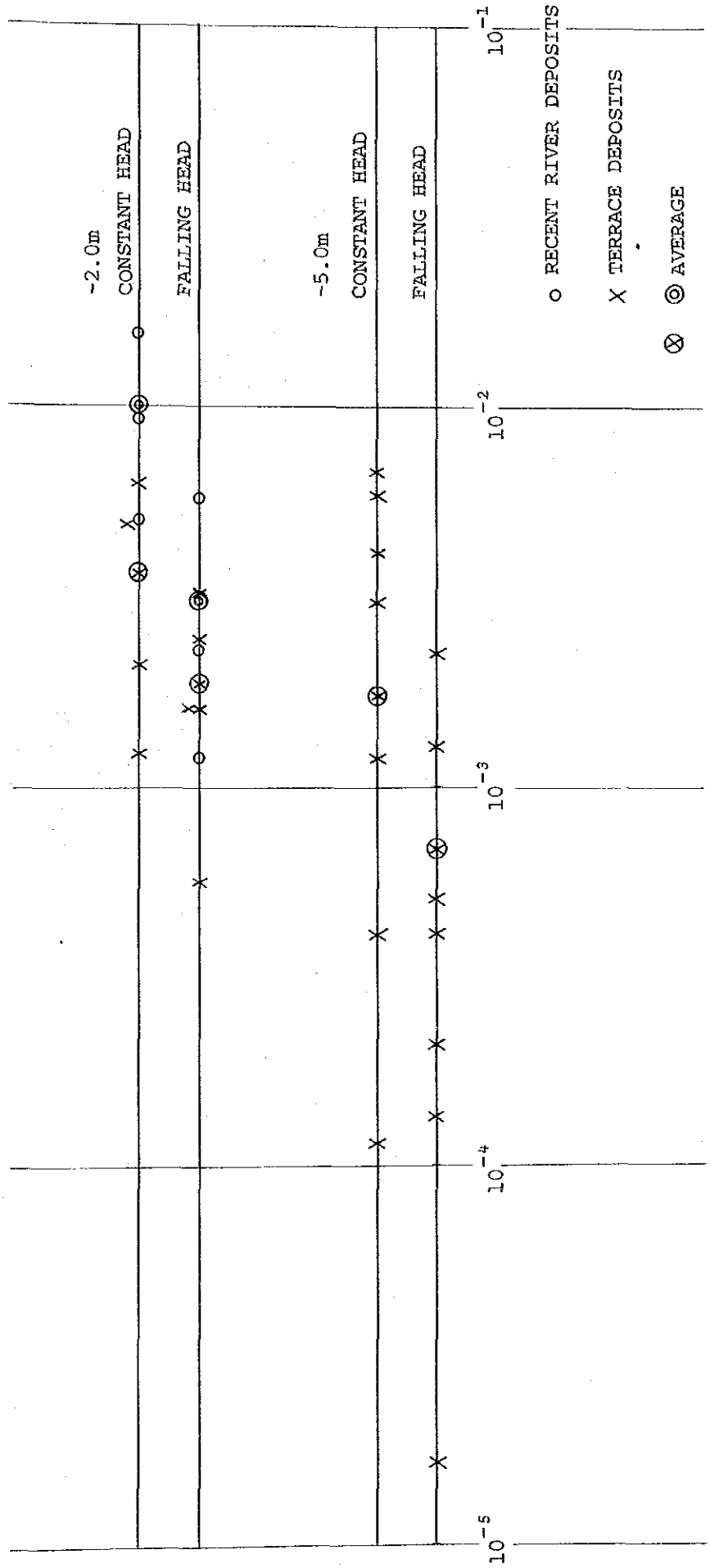


FIG. C-5 SUMMARY OF THE PERMEABILITY TEST IN THE TEST PITS

FIG C-1-6 SUMMARY OF CONE PENETRATION TEST

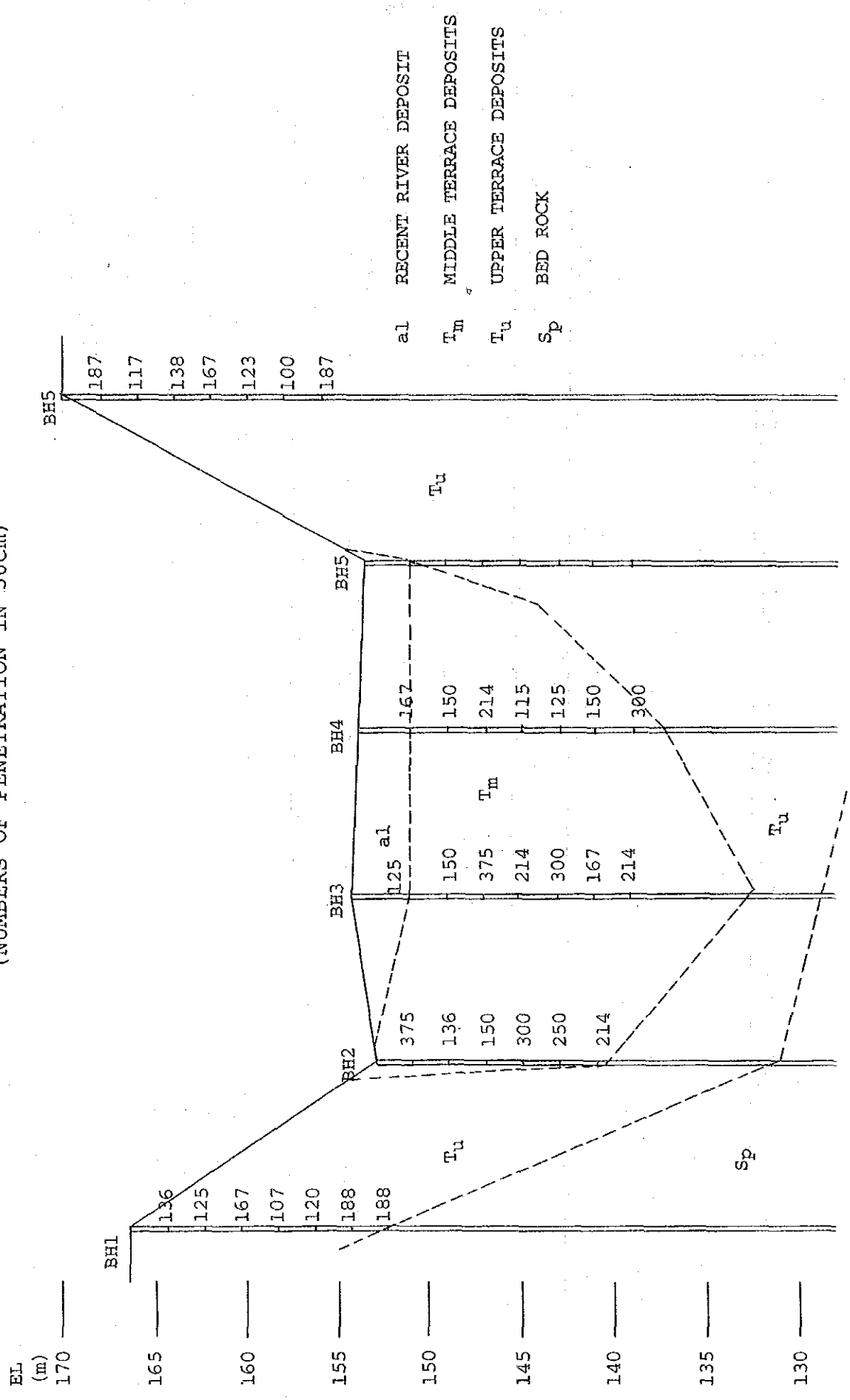


FIGURE C-6 SUMMARY OF CONE PENETRATION TEST
(NUMBERS OF PENETRATION IN 30cm)

FIGURE C-1-7 GEOLOGICAL SECTION

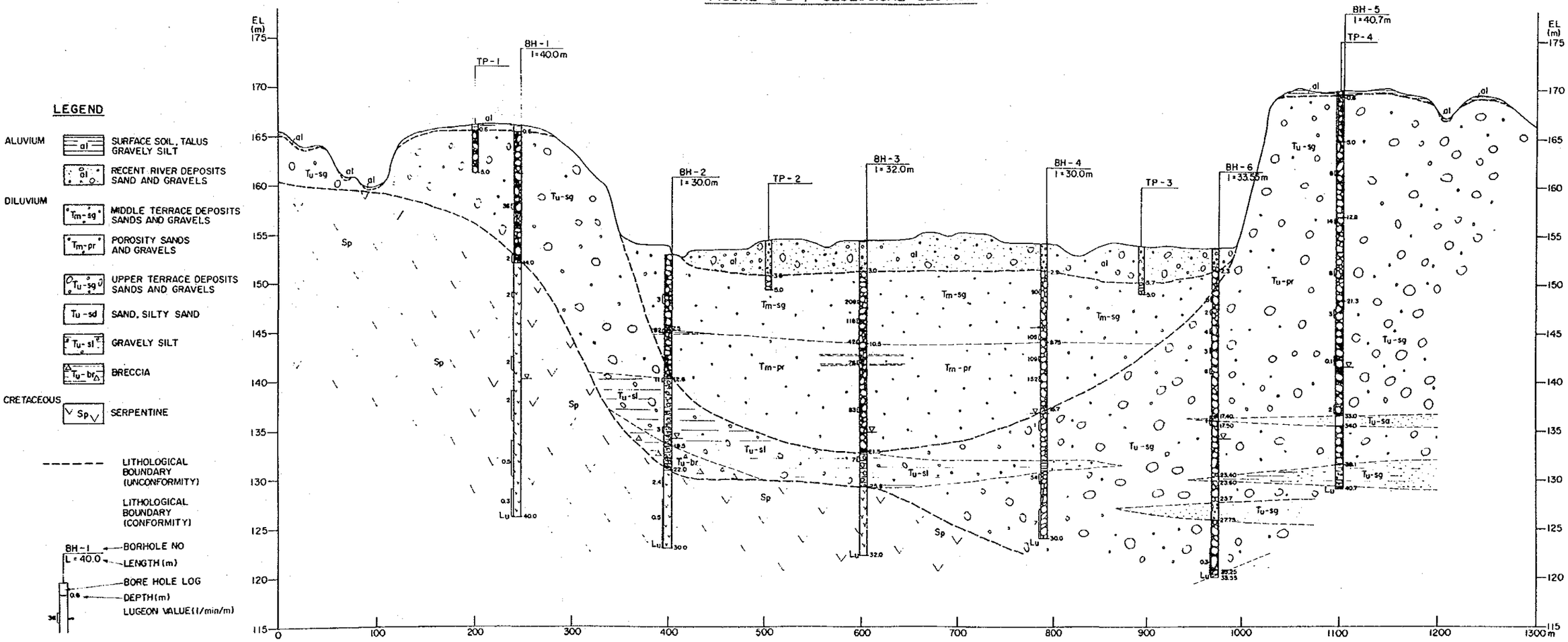


FIGURE C-1-8 LUGEON MAP

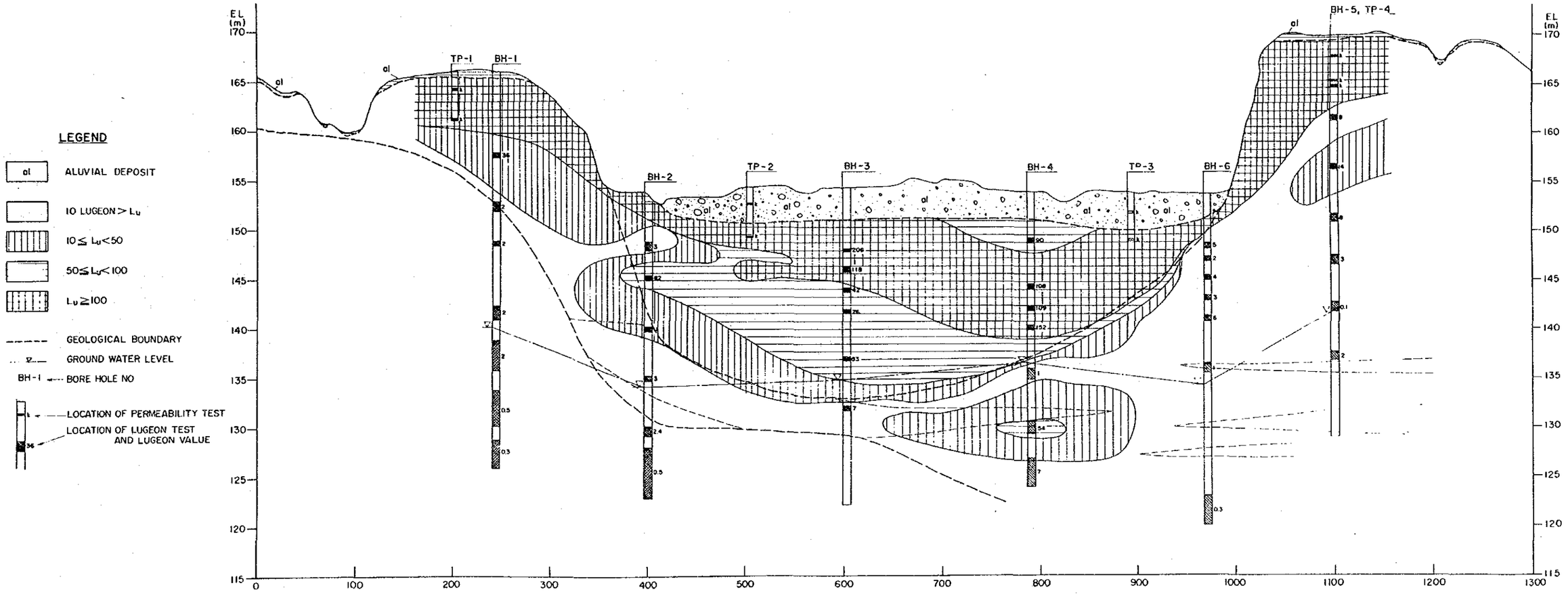
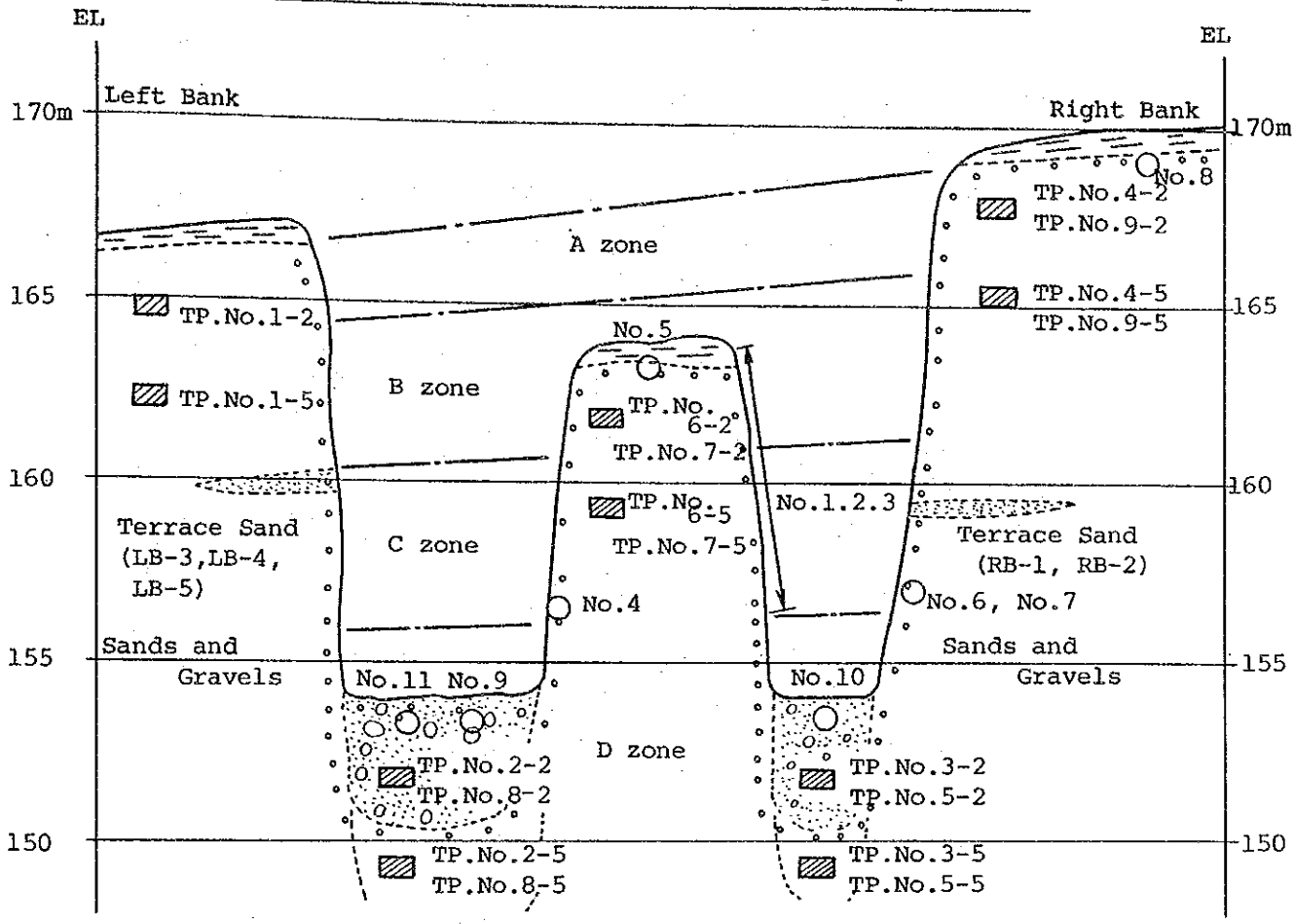


Figure C-1-9 Profile of Sampling Point



Sampling ▨ (1985) TP.No.1 ∿ TP.No.9

○ (1983) No.1 ∿ No.11

A zone: Terrace Deposits (Upper part). Consolidated weathered.
Sample No. TP. No.1-2, TP. No. 4-2, TP. No. 9-2.

B zone; Terrace Deposits. (Middle part). Consolidated, little weathered
Sample No. TP. No. 1-5, TP. No. 4-5, TP. No. 6-2, TP. No. 7-2, TP. No.9-5

C zone; Terrace Deposits. (Lower part). Well consolidated.
Sample No. TP. No. 6-5, TP. No. 7-5

D zone; Middle Terrace Deposits. Well consolidated. Fresh.
Sample No. TP. No. 2-5, TP. No. 3-5, TP. No. 5-5, TP. No. 8-5

River Deposits; (F)
Sample No. TP. No. 2-2, TP. No. 3-2, TP. No. 5-2, TP. No. 8-2

E ; Mean Value (A∿D, Grain Size)

G ; Mean Value (1983)

C-2 EMBANKMENT MATERIALS

C-2-1 Terrace Deposits

C-2-2 River Deposits

C-2-3 Talus Deposits (Limestone)

C-2 EMBANKMENT MATETRIALS

The material test has been carried out for samples of 11 numbers in order to conform physical quality of terrace and river deposits and availability of use for embankment materials of dam body and concrete aggregate was cleared.
Sampling points and profile of material tests are shown in Fig. -1 and Fig. -2. The items of material test and quantity collected are shown in Table -4.

An outline of mechanical properties of the each materials is shown in Table __ (1985 Data), A-6 (1983 Data), and mean values including 1983 Data are shown in Table A-1 - A-3 and data sheets of each tests.

C-2-1 Terrace Deposits

Grading analysis tests for the terrace deposits were carried out by using sieving and from results of the test, it was cleared that the grading curve lie within a relative narrow range and classified into GW-GC under the Unified Soil Classifications. In addition, since the material are including fine grain of 7.1 percent in average value, they can use as semiprevious materials of the dam body.

The in-situ moisture contents of the terrace deposits are ranging within the limits of 1.3 to 5.4 percent except smaple NO T.P. 3-5. Mean values of their densities, specific gravities and water absorptions are shown in Table -1.

. Compaction Tests

Large scale compaction test (mold diameter 30 cm, height 35 cm) has been carried out for 3 samples of terrace and river deposits in order to confirm their maximum dry density and optimum moisture content. The result is shown in Fig. -4.

Relationship between moisture content and maximum dry density could not indicate clearly from view point of enough time sand satisfied apparatus for the test. However, it is assumed that maximum dry density are within the limits of 1.83 to 2.07 for per cu.m and optimum moisture content will be proposed within 4 to 7 percent.

. Permeabiilty Coefficient

Permeability tests have been conducted for 5 samples by falling water method in the laboratory using compacted samples. Permeability coefficents are within the limits of $k=3.8 \times 10^{-4}$ to 4.5×10^{-5} cm per sec under 5.6 kg.cm per cu.cm energy condition.

. Shearing Strength

Shear box tests by quick undrained method on effective basis have been conducted at the field laboratory and the result is shown in Fig. -6. Obtained friction angles are within the limits of 38° to 40° and no choesion has been recorded for the same sampler.

Table C-2-1 Test Results of Terrace Deposits (Mean Value. 1983, 1985)

Guain Size Analysis

Maximum size	-74 μ	mm -4.76	mm -50.8	D10	D60	Uc	Uc'
mm	%	%	%	mm	mm		
270	7.1	39.2	82.9	0.31	13.0	46.3	1.6

Physical Property

Specific gravity	Bulk density	Water absorption	In-situ moisture content	Consistency		
				Liquid limit	Plastic limit	Plasticity index
	* t/m^3	%	%			
2.7	2.2	1.8	2.5	180	NP	NP

Dynamic Property

Maximum dry density	Optimum moisture content	Permeability coefficient	Shear strength	
			Cohesion	Friction angle
*	* %	*	*	*
1.8	5.3	1.95×10^{-4}	c = 0	ϕ = 39°

* 1985 Data

C-2-2 River Deposits

The same tests as the samples of terrace deposits have been conducted at field laboratory and satisfied values as the filter materials of dam body and concrete aggregate were obtained by screening. The result is shown in Table -2.

Table C-2-2 Test Results of River Deposits

Guain Size Analysis

Maximum size	-74 μ	mm -4.76	mm -50.8	D10	D60	Uc	Uc'
mm	%	%	%	mm	mm		
230	1.5	37.1	84.3	0.4	28.6	41.7	1.4

Physical Property

Specific gravity	Bulk density	Water absorption	In-situ moisture content	Soundness
	* t/m^3	%	* %	*
2.9	1.75	0.7	7.2	0.08

Dynamic Property

Maximum dry density	Optimum moisture content	Permeability coefficient	Shear strength	
			Cohesion	Friction angle
*	* %	*	*	*
1.9	2.5	8.4×10^{-4}	c = 0	$\phi = 40°$

* 1985 Data

C-3-3 Talus Deposits (Limestone)

The toughness and durability tests of limestone have been conducted in the field laboratory and from the result, it was cleared that the limestone is available to use as riprap materials and masonry. A mean value of the test result is shown in Table -3.

Table C-2-3 Test Result of Rock Sample

Specific gravity	Bulk density	Water absorption	Moisture content	Soundness	Compressive strength
			* %	* %	kg/cm^2
2.73	2.70	0.23	0.2	0.4	724

* 1985 Data

LIST OF TABLES AND FIGURES

C-2 EMBANKMENT MATETRIALS

TEST ITEM AND QUANTITY (1985 Data)

SAMPLING POINT \ TEST ITEM	GRAIN SIZE ANALYSIS	BULK DENSITY	SPECIFIC GRAVITY	MOISUTURE CONTENT	SOUNDNESS	WATER ABSORPTION	COMPACTION	PERMEABILITY	COMPRESSIVE STRENGTH	SHEAR BOX	DESCRIPTION
TP.NO-1	2	2	2	2		2				1 (GL-2.00m)	TERRACE LEFT BANK
TP.NO-2	2	2	4	2	1 (GL-2.00m)	2	1 (GL-2.00m)	1 (GL-2.00m)		1 (GL-2.00m)	RIVER BED
TP.NO-3	2	2	4	2	1 (GL-2.00m)	2	1 (GL-2.00m)	1 (GL-2.00m)		1 (GL-2.00m)	RIVER BED
TP.NO-4	2	2	6	2		2	1 (GL-2.00m) 1 (GL-5.00m)	1 (GL-2.00m) 1 (GL-5.00m)		1 (GL-2.00m)	TERRACE RIGHT BANK
TP.NO-5	2	2	2	2		2					RIVER BED
TP.NO-6	2	2	2	2		2				1 (GL-2.00m)	TERRACE DELTA AREA
TP.NO-7	3	3	6	2		2	1 (GL-2.00m)	1 (GL-2.00m)			TERRACE DELTA AREA
TP.NO-8	2	2	3	2	1 (GL-2.00m)	2					RIVER BED
TP.NO-9	2	2	2	2		2					TERRACE RIGHT BANK
TERRACE DEPOSIT (RIGHT BANK)	2	2	2 (SILT) 2 (SAND)								
TERRACE DEPOSIT (LEFT BANK)	3	3	3 (SILT) 3 (SAND)								
QUARRY SITE		5	6	5	6	6			5		ROCK SAMPLE
RIVER DEPOSIT (UP, MIDDLE, DOWN)	3										
TOTAL	27	28	40	23	9	24	5	5	5	5	

# RIVER DEPOSITS SAMPLING POINT. UPSTREAM(NEAR WADI GUAGE NO.-1). MIDDLESTREAM(10km DOWNSTREAM FROM DAMSITE)
DOWNSTREAM(NEAR WADI BRIDGE)

Table C-2-4 Test Item and Quantity (1985 Data)

Table C-2-5 Summary of Soil Tests (1985 Data)

Group Symbols		Sample Number	Soil Classification	Grain Size Distribution −0.074 mm	−4.76 mm	−50.8 mm	Uc	Uc'	Moisture content %	Bulk Density t/m³	Specific Gravity	Water absorption %	Soundness %	Compaction γd t/m³ / Wopt %	Permeability	Compressive strength Kg/cm²	Shear Box
Terrace Deposits	A	TP No. 1-2	GW-GC	6.68	33.33	75.22	54.76	1.20	1.28	2.16	2.77	1.18					C=0 φ=40°
		4-2	〃	7.63	41.74	98.81	52.50	2.74	3.27	2.24	2.67	2.78		γd=1.83 Wopt=5.0	4.5×10^{-5}		C=0 φ=48°
		9-2	〃	7.76	41.54	85.73	46.43	1.65	2.69	2.11	2.59	2.13					
				(7.36)	(38.87)	(84.25)	(51.23)	(1.86)	(2.58)	(2.17)	(2.68)	(2.03)		(1.83 5.0)			(C=0 φ=39°)
	B	TP No. 1-5	GW-GC	7.77	30.18	84.92	47.00	1.80	1.60	2.19	2.74	1.10					
		4-5 6-2	〃	7.12 7.33	33.75 47.85	92.67 79.43	37.50 39.52	2.29 0.44	5.87 1.55	2.14 2.13	2.77 2.81	1.08 1.69		1.89 2.0	1.6×10^{-4}		C=0 φ=32
		7-2 9-5	〃	7.12 7.28	13.75 51.06	87.31 92.04	26.92 26.67	1.35 1.07	2.69 2.92	2.05 2.27	2.75 2.63	1.41 3.01		2.07 4.0	1.8×10^{-4}		
				(7.32)	(41.42)	(87.28)	(34.42)	(1.39)	(2.81)	(2.16)	(2.74)	(1.66)		(1.98 4.5)	(1.95×10^{-4})		(C=0 φ=39°)
	C	TP No. 6-5	GW-GC	6.88	30.43	80.73	44.74	0.84	1.91	2.29	2.82	2.49					
		7-5	〃	7.30	34.89	80.24	37.70	0.73	1.91	2.21	2.72	1.10					
				(7.09)	(32.68)	(80.49)	(41.22)	(0.79)	(1.91)	(2.25)	(2.77)	(1.80)					
	D	TP No. 2-5	GW-GC	7.28	41.61	93.28	40.38	1.12	1.93	2.07	2.75	2.88					
		3-5 5-5	〃	7.09 6.88	45.07 38.75	68.78 64.76	28.71 63.38	0.79 1.30	10.58 4.61	1.96 2.19	2.45 2.73	1.91 1.82					
		8-5	〃	6.39	31.64	89.38	40.00	2.36	1.92	2.07	2.78	1.22					
				(6.91)	(36.52)	(84.06)	(44.12)	(1.44)	(4.46)	(2.07)	(2.75)	(1.48)					
	Terrace Sand	R II - 1, 2	SW-SP							2.035 1.743	Sa=2.57 2.58 Si=2.64 2.66						
		L H - 3, 4	SP, SP							2.130 2.200	Sa=2.61 2.55 Si=2.66 2.61						
		5	SP							2.176	Sa=2.59 Si=2.70						
										2.096	Sa= 2.58 Si= 2.65						
River Deposits	Damsite	TP No. 2-2	GW	0.67	37.93	88.30	64.00	1.63	7.48	1.89	2.97	0.925	0.10	2.25 2.5	1.4×10^{-3}	〃	C=0 φ=38°
		3-2 5-2	SW, GW	1.47 1.11	65.13 35.70	96.15 82.04	11.54 37.50	0.37 1.29	4.49 3.53	1.511 1.76	2.83 2.82	0.57 0.81	0.09	2.02 2.5	2.8×10^{-4}	〃	C=0 φ=42°
		8-2	GW	0.90	28.39	75.66	44.35	1.69	13.43	1.84	2.87	0.49	0.06				
				(1.04)	(41.79)	(84.59)	(49.35)	(1.21)	(7.28)	(1.75)	(2.87)	(0.70)	(0.08)	(2.10 2.50)	(8.4×10^{-4})		(C=0 φ=40°)
	Upstream		GW	0.46	19.19	52.89	61.90	3.52									
	Damsite		GW	0.79	38.16	81.98	36.87	0.89									
	Middle St		GP	1.56	22.48	80.55	44.29	1.61									
	Down St		SW	1.21	57.50	0	15.59	0.35									
Quarry	Rock	R - 1, 2	Rock						0.11 0.05	2.68 2.70	2.70 2.73	0.16 0.06	0.25 0.55			240 816	
		3, 4							0.25 0.16	2.71 2.71	2.75 2.70	0.09 0.04	0.32 0.36			765 431	
		5, 6							0.21	2.72	2.73 2.77	0.07 0.14	0.25 0.44			187	
									(0.16)	(2.70)	(2.73)	(0.09)	(0.36)			(552)	

- Soil Classification
  - GW ; Well graded gravels sandy gravels
  - GC ; Clayey sandy gravels
  - GP ; Sandy gravels
  - GW-GC ; Mixed GW,GC
  - SW ; Gravelly sand
  - SP ; Uniform sand, gravelly sands
- Grain Size Distribution
  - Uc=Uniformity Cofficient
  - Uc'=Curvature Cofficient
- Specific Gravity
  - Apparent specific gravity
  - grain size 10 ~50mm
  - Si ; silt Sa ; sand
- Soundness
  - Durability by magnesium sulfate
- Compaction
  - γd_{max} ; Maximum dry unit weight(Ec=5.6kg·cm/cm³)
  - Wopt ; Optimum moisture content
- Permeability
  - Same condition as Compaction test
- Shear Box
  - Quick Undrained
  - C ; Apparent cohesion
  - φ ; Angle of internal friction

( ) Mean Values

Table C-2-6 Summary of Soil Tests (1983 Data)

Group Symbols	Geological Formation & Lithology	Unified Soil Classification System	Apparent Specific Gravity (+4.76mm)	Water absorption (%)	Grain Size Distribution mm -0.074 (%)	mm -4.76 (%)	mm -50.8 (%)	Uc	Uc'	Classification
Tm - u	Upper part of middle terrace deposit Gravel and sand. Well consolidated. Gravel partially weathered. Assumed thickness 4.0 m.	GW	2.80 2.90 (2.85)	2.4 (2.4)	0.5 4.0 (1.5)	20.2 36.9 (28.0)	47.3 73.9 (62.6)	57.1 87.2 (78.2)	1.35 3.84 (1.52)	Semi-pervious
Tm - m	Middle part of middle terrace deposit Gravel and sand. Consolidated. Assumed thickness 3.0 m.	GW - GM	2.74 2.91 (2.92)	1.4 3.1 (2.2)	6.9 7.4 (7.1)	30.1 49.5 (36.6)	67.8 90.2 (80.1)	42.5 53.3 (56.7)	0.69 3.53 (1.04)	- do -
Tm - l	Lower part of middle terrace deposit Gravel and sand. Consolidated. Assumed thickness 1.0 m and lenticular.	SW - SM	2.44 (2.44)	7.3 (7.3)	8.1 10.1 (9.1)	52.1 73.0 (62.6)	100.0 (100.0)	30.0 78.6 (50.0)	3.0 6.6 (4.8)	- do -
Tu - 1.2	Upper terrace deposit Gravel and sand. Well consolidated. Gravel partially weathered. Assumed thickness 20.0 m.	GW - GM	2.54 2.61 (2.58)	5.0 5.7 (5.4)	5.8 5.9 (5.9)	31.9 40.2 (36.1)	79.1 92.6 (85.9)	26.6 50.0 (29.2)	1.2 3.4 (1.3)	- do -
Rm	Recent wadi bed deposit of main stream Gravel and sand. Loose. Grain size distribution poorly sorted.	GP	2.79 3.00 (2.92)	-	1.8 2.1 (2.0)	17.1 47.6 (32.4)	66.0 100.0 (83.0)	19.0 136.7 (44.0)	1.0 18.3 (1.5)	- do -
Rt	Recent wadi bed deposit of tributary stream Gravel and sand. Loose. Grain size distribution poorly sorted.	SP	2.69 3.00 (2.85)	-	1.0 2.1 (1.6)	44.1 67.1 (55.6)	94.2 98.8 (96.5)	17.6 73.7 (29.5)	0.34 0.40 (0.25)	- do -
Lm	Talus deposit Gravel with sand and clay. Subangular to angular. Limestone.	GW	2.72 2.74 (2.73)	0	-	-	-	-	-	Rock Rip-rap
Fine Grained Soil	Talus and recent wadi bed deposit Sand, silt and clay. Distributed in small area and then deposit.	CL	-	-	60<	-	-	-	-	

Uc : Coefficient of Uniformity

Uc': Coefficient of Curvature

Figures in parentheses show an average value.

Table C-2-7 DATA SHEET FOR GRAIN SIZE ANALYSIS (1)

SAMPLE NO. _____

SAMPLE NO.	NO. Terrace A		NO. Terrace B		NO. Terrace C		NO. Terrace D	
SIEVE ANALYSIS	GRAIN SIZE (mm)	PERCENT PASSING(%)	GRAIN SIZE (mm)	PERCENT PASSING(%)	GRAIN SIZE (mm)	PERCENT PASSING(%)	GRAIN SIZE (mm)	PERCENT PASSING(%)
	50.8	83.25	50.8	87.27	50.8	80.49	50.8	84.05
	38.1	78.84	38.1	80.46	38.1	74.87	38.1	79.29
	25.4	70.69	25.4	72.54	25.4	60.72	25.4	70.64
	19.1	65.44	19.1	66.67	19.1	55.45	19.1	64.05
	9.52	57.45	9.52	53.32	9.52	42.94	9.52	49.87
	4.76	38.87	4.76	41.32	4.76	32.63	4.76	36.52
	2.00	21.65	2.00	27.78	2.00	21.59	2.00	25.61
	0.84	18.44	0.84	17.08	0.84	12.10	0.84	17.25
	0.42	11.96	0.42	10.88	0.42	9.62	0.42	11.54
	0.25	9.85	0.25	9.15	0.25	8.71	0.25	8.87
	0.105	8.13	0.105	8.07	0.105	7.65	0.105	7.85
	0.074	7.36	0.074	7.32	0.074	7.09	0.074	6.91
		0		0		0		0

SANPLE NO.		NO.Terrace A	NO.Terrace B	NO.Terrace C	NO.Terrace D
MAXIMUM GRAIN SIZE	mm	180	270	230	260
60% GRAIN SIZE	mm	14.50	13.30	24.50	15.50
30% GRAIN SIZE	mm	2.60	2.30	3.80	2.80
10% GRAIN SIZE	mm	0.30	0.37	0.64	0.37
COEFFICIENT OF UNIFORMITY	Uc	48.33	35.95	38.28	41.89
CIEFFICIENT OF CURVATURE	Uc'	1.55	1.07	0.92	1.37
APPARENT SPECIFIC GRAVITY OF GRAVEL	Gs				
PERCENT SUCTION OF GRAVEL	%				

Table C-2-7 DATA SHEET FOR GRAIN SIZE ANALYSIS (2)

SAMPLE NO. _____

SAMPLE NO.	NO. Terrace E		NO. River Bed		NO.		NO.	
SIEVE ANALYSIS	GRAIN SIZE (mm)	PERCENT PASSING(%)	GRAIN SIZE (mm)	PERCENT PASSING(%)	GRAIN SIZE (mm)	PERCENT PASSING(%)	GRAIN SIZE (mm)	PERCENT PASSING(%)
	50.8	83.77	50.8	86.54	50.8		50.8	
	38.1	77.56	38.1	79.58	38.1		38.1	
	25.4	69.09	25.4	71.86	25.4		25.4	
	19.1	63.04	19.1	65.78	19.1		19.1	
	9.52	49.50	9.52	52.02	9.52		9.52	
	4.76	38.14	4.76	41.79	4.76		4.76	
	2.00	24.80	2.00	31.82	2.00		2.00	
	0.84	17.87	0.84	22.51	0.84		0.84	
	0.42	11.00	0.42	16.15	0.42		0.42	
	0.25	9.15	0.25	5.11	0.25		0.25	
	0.105	7.93	0.105	2.32	0.105		0.105	
	0.074	7.17	0.074	1.04	0.074		0.074	

SANPLE NO.		NOTerrace E	NO.River Bed	NO.	NO.
MAXIMUM GRAIN SIZE	mm	270	230		
60% GRAIN SIZE	mm	16.40	14.10		
30% GRAIN SIZE	mm	2.55	1.68		
10% GRAIN SIZE	mm	0.42	0.37		
COEFFICIENT OF UNIFORMITY	Uc	39.05	38.11		
CIEFFICIENT OF CURVATURE	Uc′	0.94	0.54		
APPARENT SPECIFIC GRAVITY OF GRAVEL	Gs				
PERCENT SUCTION OF GRAVEL	%				

Table C-2-7 DATA SHEET FOR GRAIN SIZE ANALYSIS (3)

SAMPLE NO. _____

SAMPLE NO.	NO. TP No.1-2		NO. TP No.1-5		NO. TP No.2-2		NO. TP No.2-5	
SIEVE ANALYSIS	GRAIN SIZE (mm)	PERCENT PASSING(%)	GRAIN SIZE (mm)	PERCENT PASSING(%)	GRAIN SIZE (mm)	PERCENT PASSING(%)	GRAIN SIZE (mm)	PERCENT PASSING(%)
	50.8	75.22	50.8	84.92	50.8	88.30	50.8	93.28
	38.1	69.94	38.1	75.00	38.1	79.71	38.1	89.55
	25.4	61.78	25.4	62.38	25.4	71.27	25.4	80.26
	19.1	55.64	19.1	52.84	19.1	64.64	19.1	72.75
	9.52	43.12	9.52	38.41	9.52	47.26	9.52	56.98
	4.76	38.33	4.76	30.18	4.76	37.93	4.76	41.61
	2.00	24.05	2.00	21.26	2.00	26.67	2.00	31.06
	0.84	17.82	0.84	13.44	0.84	14.29	0.84	21.54
	0.42	10.01	0.42	9.76	0.42	5.13	0.42	13.79
	0.25	8.58	0.25	8.99	0.25	2.70	0.25	9.79
	0.105	7.20	0.105	8.26	0.105	1.43	0.105	8.37
	0.074	6.68	0.074	7.77	0.074	0.67	0.074	7.28
		0		0		0		0

SANPLE NO.		NO. TPNo.1-2	NO. TP.No.1-5	NO. TP.No.2-2	NO. TP.No.2-5
MAXIMUM GRAIN SIZE	mm	160	170	170	140
60% GRAIN SIZE	mm	23.00	23.50	16.00	10.50
30% GRAIN SIZE	mm	3.40	4.60	2.55	1.75
10% GRAIN SIZE	mm	0.42	0.50	0.25	0.26
COEFFICIENT OF UNIFORMITY	Uc	54.76	47.00	64.00	40.38
CIEFFICIENT OF CURVATURE	Uc'	1.20	1.80	1.63	1.12
APPARENT SPECIFIC GRAVITY OF GRAVEL	Gs	2.77	2.74	2.97	2.75
PERCENT SUCTION OF GRAVEL	%	1.18	1.10	0.925	2.88

Table C-2-7 DATA SHEET FOR GRAIN SIZE ANALYSIS (4)

SAMPLE NO. _____

SAMPLE NO.	NO. Tr. No.3-2		NO. TP No.3-5		NO. TP No.4-2		NO. TP No.4-5	
SIEVE ANALYSIS	GRAIN SIZE (mm)	PERCENT PASSING(%)	GRAIN SIZE (mm)	PERCENT PASSING(%)	GRAIN SIZE (mm)	PERCENT PASSING(%)	GRAIN SIZE (mm)	PERCENT PASSING(%)
	50.8	96.15	50.8	68.78	50.8	88.81	50.8	92.62
	38.1	94.02	38.1	65.36	38.1	84.74	38.1	85.27
	25.4	88.03	25.4	60.84	25.4	79.06	25.4	75.96
	19.1	84.47	19.1	56.69	19.1	73.55	19.1	68.29
	9.52	74.68	9.52	45.67	9.52	57.16	9.52	48.34
	4.76	65.13	4.76	34.07	4.76	41.74	4.76	30.75
	2.00	55.88	2.00	21.93	2.00	26.74	2.00	18.62
	0.84	46.76	0.84	12.99	0.84	19.16	0.84	13.89
	0.42	19.76	0.42	9.25	0.42	14.01	0.42	9.52
	0.25	9.39	0.25	8.49	0.25	10.87	0.25	8.60
	0.105	2.95	0.105	7.88	0.105	8.84	0.105	7.97
	0.074	1.47	0.074	7.09	0.074	7.63	0.074	7.12
		0		0		0		0

SANPLE NO.		NO.TP No.3-2	NO.TP No.3-5	NO.TP No.4-2	NO.TP No.4-5
MAXIMUM GRAIN SIZE	mm	120	260	180	110
60% GRAIN SIZE	mm	3.00	24.00	10.50	14.30
30% GRAIN SIZE	mm	0.54	3.40	2.40	3.80
10% GRAIN SIZE	mm	0.26	0.62	0.20	0.44
COEFFICIENT OF UNIFORMITY	Uc	11.54	38.71	52.50	32.50
CIEFFICIENT OF CURVATURE	Uc'	0.37	0.78	2.74	2.29
APPARENT SPECIFIC GRAVITY OF GRAVEL	Gs	2.83	2.75	2.67	2.77
PERCENT SUCTION OF GRAVEL	%	0.57	1.91	2.78	1.08

Table C-2-7 DATA SHEET FOR GRAIN SIZE ANALYSIS (5)

SAMPLE NO. _____

SAMPLE NO.	NO. TP No.5-2		NO. TP No.5-5		NO. TP No.6-2		NO. TP No.6-5	
SIEVE ANALYSIS	GRAIN SIZE (mm)	PERCENT PASSING(%)	GRAIN SIZE (mm)	PERCENT PASSING(%)	GRAIN SIZE (mm)	PERCENT PASSING(%)	GRAIN SIZE (mm)	PERCENT PASSING(%)
	50.8	82.04	50.8	84.76	50.8	78.44	50.8	80.73
	38.1	72.00	38.1	77.78	38.1	71.00	38.1	71.78
	25.4	70.33	25.4	67.81	25.4	66.80	25.4	59.60
	19.1	63.02	19.1	61.87	19.1	64.44	19.1	54.55
	9.52	48.41	9.52	51.07	9.52	55.58	9.52	41.13
	4.76	35.70	4.76	38.75	4.76	47.85	4.76	30.43
	2.00	24.85	2.00	27.81	2.00	36.19	2.00	20.12
	0.84	16.62	0.84	19.13	0.84	19.44	0.84	11.90
	0.42	9.09	0.42	12.70	0.42	11.30	0.42	9.86
	0.25	4.48	0.25	9.52	0.25	9.93	0.25	8.77
	0.105	2.32	0.105	8.24	0.105	7.88	0.105	7.66
	0.074	1.11	0.074	6.88	0.074	7.33	0.074	6.88
		0		0		0		0

SAMPLE NO.		NO.TP No.5-2	NO.TP No.5-5	NO.TP No.6-2	NO.TP No.6-5
MAXIMUM GRAIN SIZE	mm	210	190	210	150
60% GRAIN SIZE	mm	16.50	17.00	13.50	25.50
30% GRAIN SIZE	mm	3.00	2.40	1.45	3.50
10% GRAIN SIZE	mm	0.44	0.26	0.35	0.57
COEFFICIENT OF UNIFORMITY	Uc	37.50	65.38	38.57	44.74
CIEFFICIENT OF CURVATURE	Uc'	1.24	1.30	0.44	0.84
APPARENT SPECIFIC GRAVITY OF GRAVEL	Gs	2.82	2.73	2.81	2.82
PERCENT SUCTION OF GRAVEL	%	0.81	1.52	1.69	2.49

Table C-2-7 DATA SHEET FOR GRAIN SIZE ANALYSIS (6)

SAMPLE NO. _____

SAMPLE NO.	NO. TP No. 7-2		NO. TP No. 7-5		NO. TP No. 7-2 Ec=200%		NO.	
SIEVE ANALYSIS	GRAIN SIZE (mm)	PERCENT PASSING(%)	GRAIN SIZE (mm)	PERCENT PASSING(%)	GRAIN SIZE (mm)	PERCENT PASSING(%)	GRAIN SIZE (mm)	PERCENT PASSING(%)
	50.8	87.31	50.8	80.24	50.8	0	50.8	
	38.1	81.82	38.1	70.95	38.1	98.16	38.1	
	25.4	75.42	25.4	61.83	25.4	94.18	25.4	
	19.1	70.46	19.1	56.57	19.1	91.28	19.1	
	9.52	57.39	9.52	44.74	9.52	76.88	9.52	
	4.76	43.75	4.76	34.83	4.76	58.63	4.76	
	2.00	26.64	2.00	23.06	2.00	36.48	2.00	
	0.84	16.10	0.84	12.90	0.84	22.23	0.84	
	0.42	10.19	0.42	9.38	0.42	14.96	0.42	
	0.25	8.28	0.25	8.64	0.25	9.56	0.25	
	0.105	7.58	0.105	7.63	0.105	8.87	0.105	
	0.074	7.12	0.074	7.30	0.074	7.11	0.074	
		0		0		0		

SANPLE NO.		NO. TP No. 7-2	NO. TP No. 7-5	NO. TP No. 7-2 Ec=200%	NO.
MAXIMUM GRAIN SIZE	mm	160	230	37	
60% GRAIN SIZE	mm	10.50	23.00	5.10	
30% GRAIN SIZE	mm	2.35	3.20	1.32	
10% GRAIN SIZE	mm	0.39	0.61	0.25	
COEFFICIENT OF UNIFORMITY	Uc	26.92	37.70	20.40	
CIEFFICIENT OF CURVATURE	Uc'	1.35	0.73	1.37	
APPARENT SPECIFIC GRAVITY OF GRAVEL	Gs	2.75	2.72		
PERCENT SUCTION OF GRAVEL	%	1.41	1.10		

Table C-2-7 DATA SHEET FOR GRAIN SIZE ANALYSIS (7)

SAMPLE NO. _____

SAMPLE NO.	NO. TP No. 8-2		NO. TP No. 8-5		NO. TP No. 9-2		NO. TP No. 9-5	
SIEVE ANALYSIS	GRAIN SIZE (mm)	PERCENT PASSING(%)	GRAIN SIZE (mm)	PERCENT PASSING(%)	GRAIN SIZE (mm)	PERCENT PASSING(%)	GRAIN SIZE (mm)	PERCENT PASSING(%)
	50.8	75.66	50.8	89.38	50.8	85.73	50.8	92.04
	38.1	67.59	38.1	84.43	38.1	81.83	38.1	89.23
	25.4	57.80	25.4	73.65	25.4	71.28	25.4	83.14
	19.1	50.97	19.1	64.81	19.1	67.13	19.1	77.35
	9.52	37.73	9.52	45.75	9.52	54.07	9.52	65.88
	4.76	28.39	4.76	31.64	4.76	41.54	4.76	51.08
	2.00	19.89	2.00	21.63	2.00	26.16	2.00	34.89
	0.84	12.35	0.84	15.27	0.84	18.55	0.84	22.34
	0.42	6.69	0.42	10.42	0.42	11.86	0.42	13.61
	0.25	3.91	0.25	7.69	0.25	10.10	0.25	9.97
	0.105	2.14	0.105	6.92	0.105	8.35	0.105	8.65
	0.074	0.90	0.074	6.39	0.074	7.76	0.074	7.28
		0		0		0		0

SAMPLE NO.		NO.TP No.8-2	NO.TP No.8-5	NO.TP No.9-2	NO.TP No.9-5
MAXIMUM GRAIN SIZE	mm	230	110	160	270
60% GRAIN SIZE	mm	27.50	16.00	13.00	7.20
30% GRAIN SIZE	mm	5.20	4.05	2.45	1.44
10% GRAIN SIZE	mm	0.62	0.40	0.28	0.27
COEFFICIENT OF UNIFORMITY	Uc	44.35	40.00	46.43	26.67
CIEFFICIENT OF CURVATURE	Uc'	1.59	2.56	1.65	1.07
APPARENT SPECIFIC GRAVITY OF GRAVEL	Gs	2.87	2.78	2.59	2.63
PERCENT SUCTION OF GRAVEL	%	0.49	1.22	2.13	3.01

Table C-2-7 DATA SHEET FOR GRAIN SIZE ANALYSIS (8)

SAMPLE NO. _____

SAMPLE NO.	NO. Upstream		NO. Middle stream		NO. Down stream		NO. Dam site	
SIEVE ANALYSIS	GRAIN SIZE (mm)	PERCENT PASSING(%)	GRAIN SIZE (mm)	PERCENT PASSING(%)	GRAIN SIZE (mm)	PERCENT PASSING(%)	GRAIN SIZE (mm)	PERCENT PASSING(%)
	50.8	52.88	50.8	80.55	50.8	0	50.8	81.98
	38.1	45.96	38.1	66.17	38.1	99.60	38.1	73.65
	25.4	37.57	25.4	53.49	25.4	93.58	25.4	64.54
	19.1	32.98	19.1	43.88	19.1	87.10	19.1	52.31
	9.52	24.14	9.52	28.93	9.52	72.13	9.52	42.60
	4.76	19.19	4.76	22.48	4.76	57.50	4.76	33.16
	2.00	13.71	2.00	16.24	2.00	44.43	2.00	25.29
	0.84	8.64	0.84	11.16	0.84	31.49	0.84	15.52
	0.42	4.19	0.42	7.03	0.42	18.52	0.42	8.93
	0.25	2.36	0.25	5.09	0.25	4.83	0.25	3.31
	0.105	1.07	0.105	3.24	0.105	2.65	0.105	1.82
	0.074	0.16	0.074	1.56	0.074	1.21	0.074	0.99
		0		0		0		

SANPLE NO.		NO.UP ST.	NO.MIDDLE ST.	NO. DOWN ST.	NO. Dam site
MAXIMUM GRAIN SIZE	mm	270	90	40	230
60% GRAIN SIZE	mm	65.00	31.00	5.30	22.50
30% GRAIN SIZE	mm	15.00	10.00	0.79	3.50
10% GRAIN SIZE	mm	1.05	0.70	0.34	0.61
COEFFICIENT OF UNIFORMITY	Uc	61.90	44.29	15.59	36.87
CIEFFICIENT OF CURVATURE	Uc'	3.52	4.61	0.35	0.89
APPARENT SPECIFIC GRAVITY OF GRAVEL	Gs				
PERCENT SUCTION OF GRAVEL	%				

FIGURE C-2-1 LOCATION MAP OF SAMPLING POINT

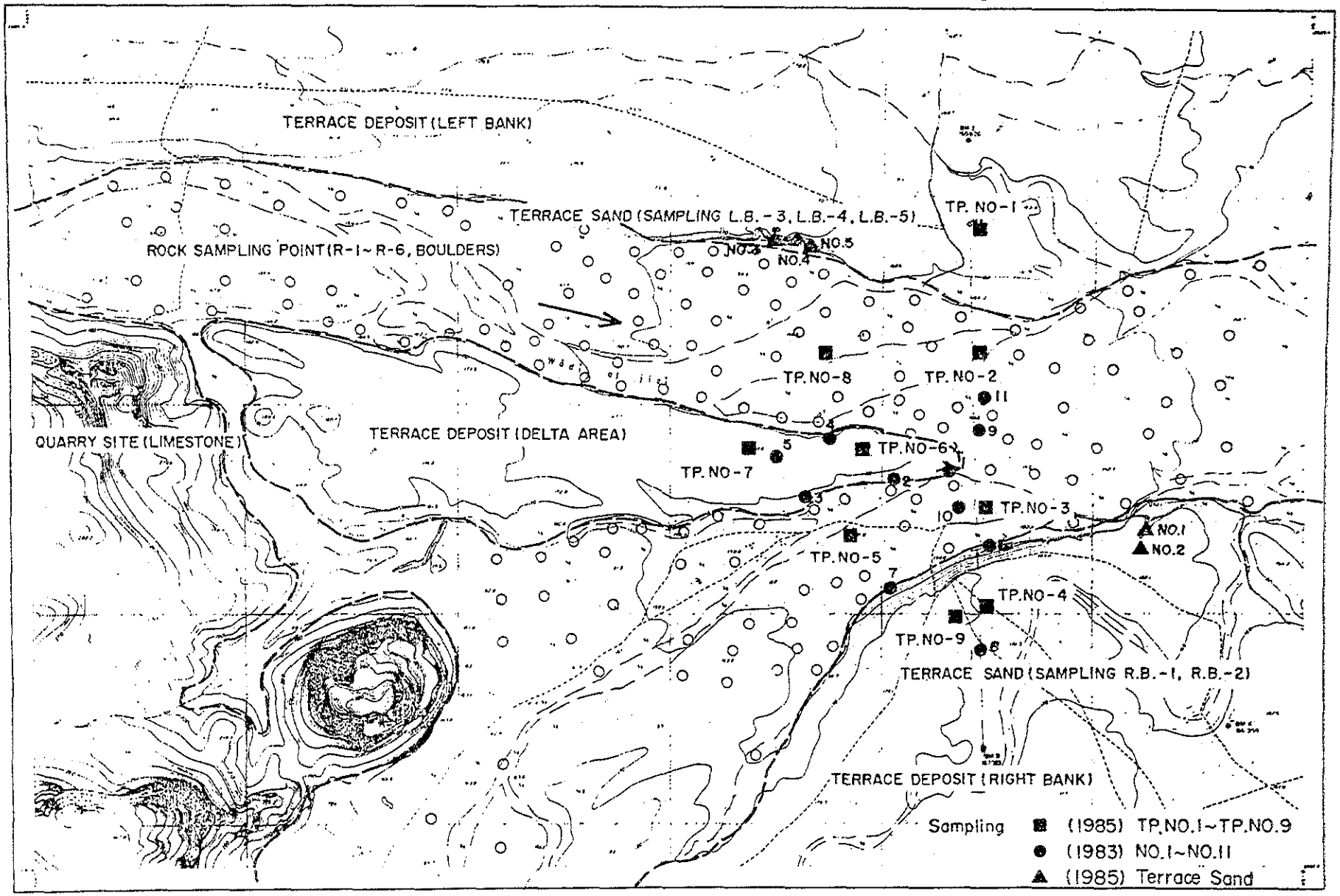
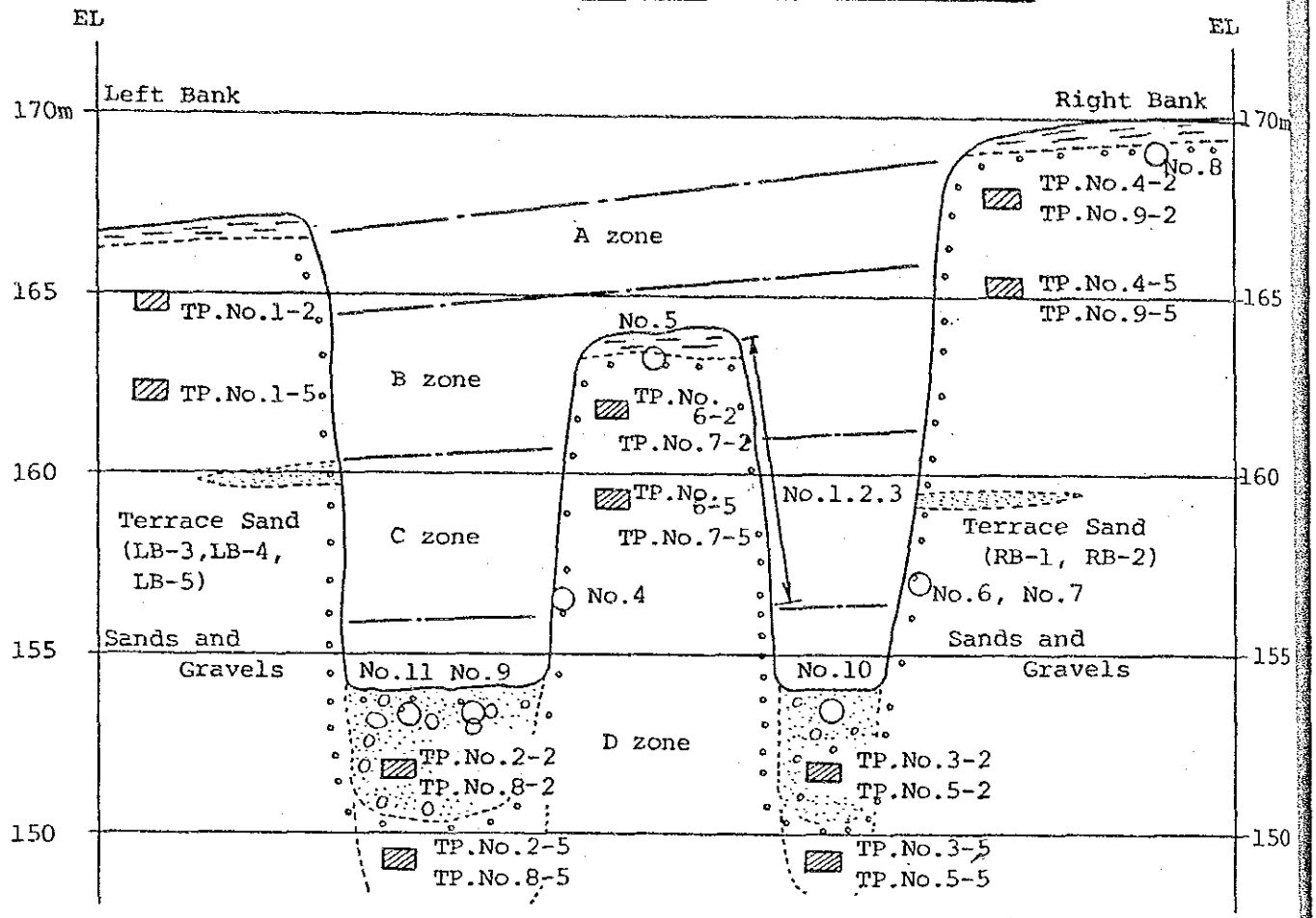


Figure C-2-2 Profile of Sampling Point



Sampling ▨ (1985) TP.No.1 ∿ TP.No.9

○ (1983) No.1 ∿ No.11

A zone; Terrace Deposits (Upper part). Consolidated weathered.
Sample No. TP. No.1-2, TP. No. 4-2, TP. No. 9-2.

B zone; Terrace Deposits. (Middle part). Consolidated, little weathered
Sample No. TP. No. 1-5, TP. No. 4-5, TP. No. 6-2, TP. No. 7-2, TP. No.9-5

C zone; Terrace Deposits. (Lower part). Well consolidated.
Sample No. TP. No. 6-5, TP. No. 7-5

D zone; Middle Terrace Deposits. Well consolidated. Fresh.
Sample No. TP. No. 2-5, TP. No. 3-5, TP. No. 5-5, TP. No. 8-5

River Deposits; (F)
Sample No. TP. No. 2-2, TP. No. 3-2, TP. No. 5-2, TP. No. 8-2

FIGURE C-2-3 GRAIN SIZE ANALYSIS OF TERRACE DEPOSITS (1)

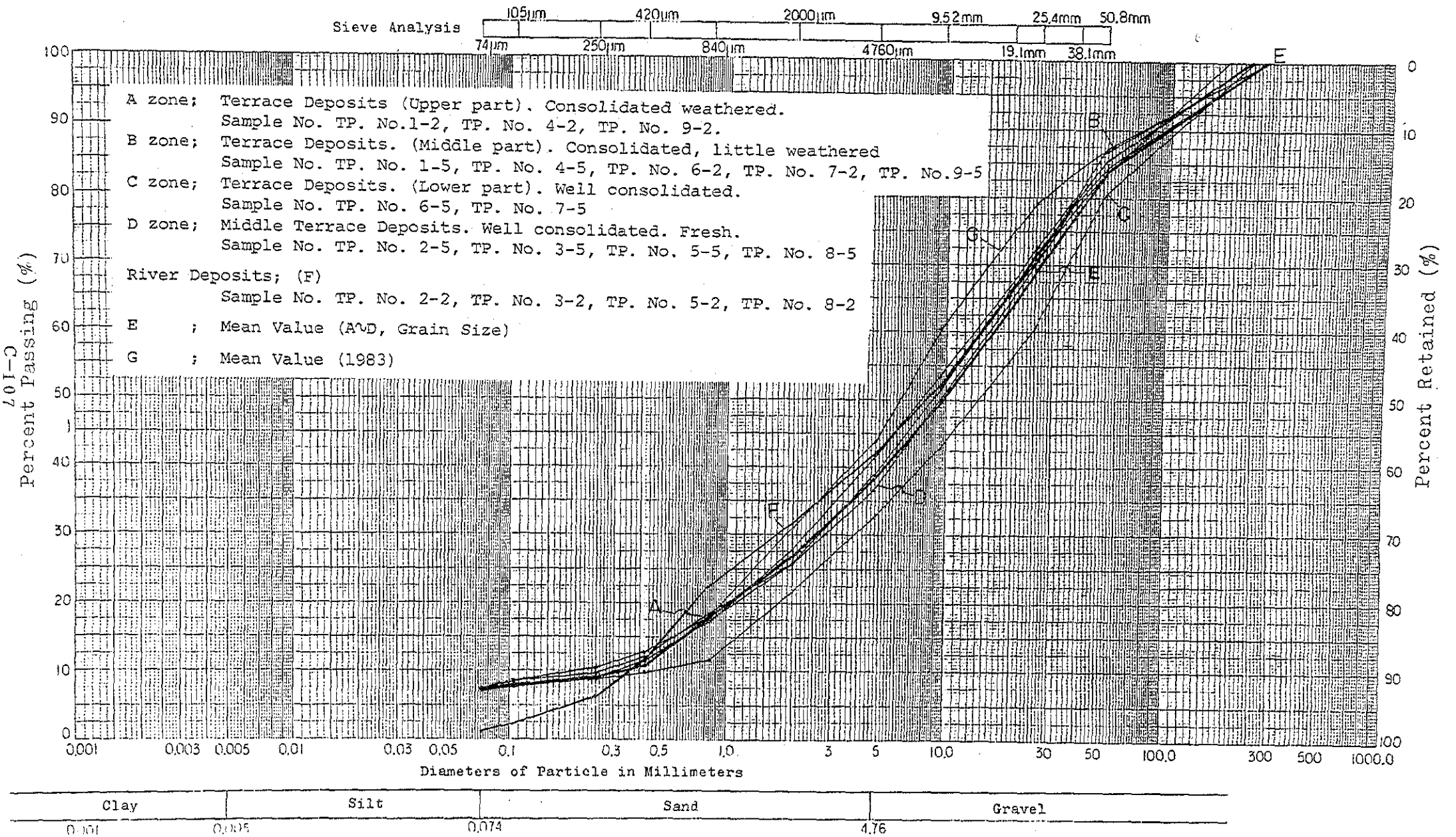


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FIGURE C-2-3 GRAIN-SIZE ANALYSIS OF TERRACE DEPOSITS (2)

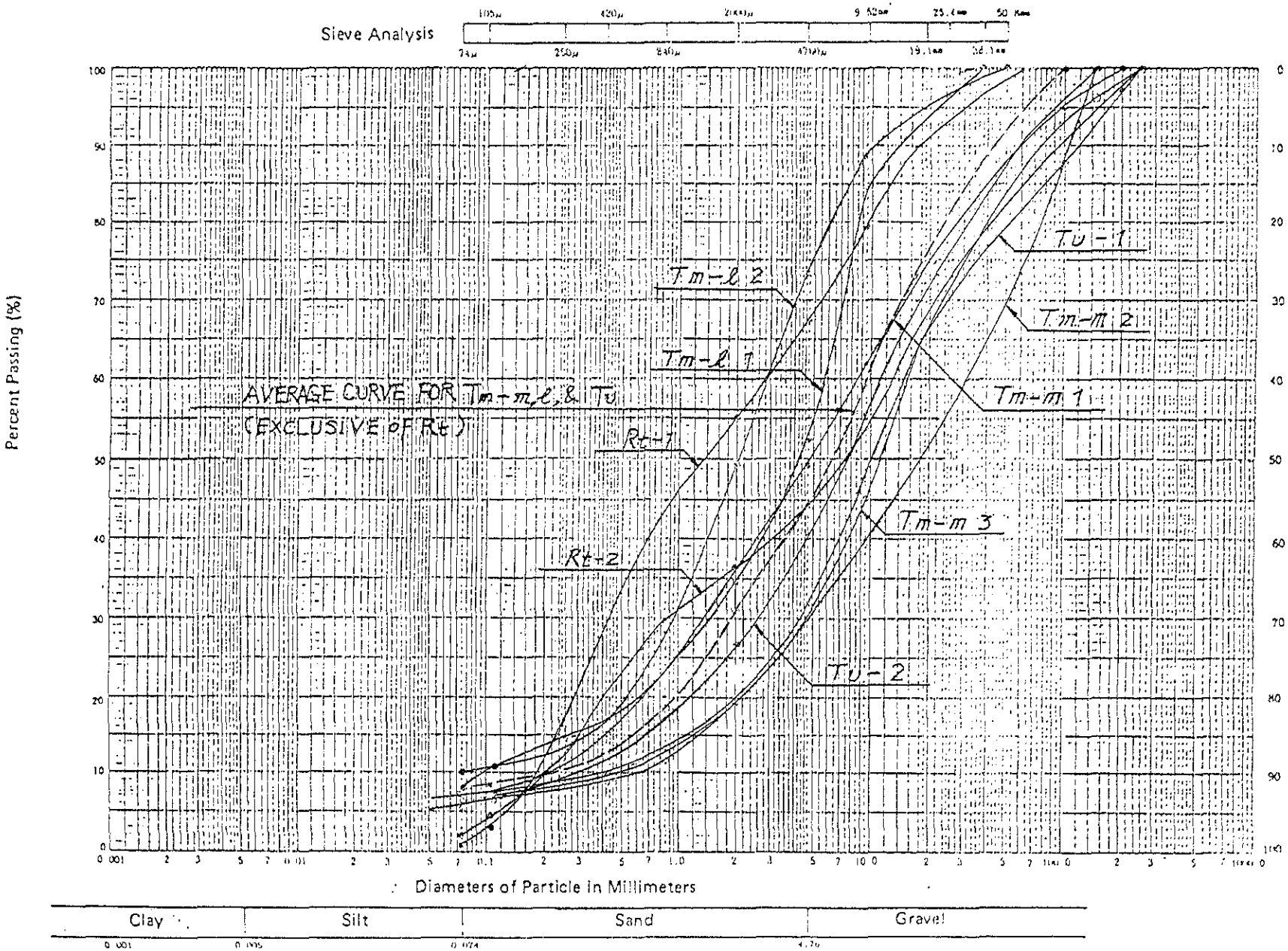

FIGURE C-2-3 GRAIN-SIZE ANALYSIS (3)

Project _____ Date of Testing _____

Location of Project _____ Remarks ;

Sample NO. Terrace A

HYDROMETER ANALYSIS	SIEVE ANALYSIS	
READING IN MINUTES	U.S. STANDARD SIEVE NUMBERS	CLEAR SQUARE OPENINGS IN INCHES

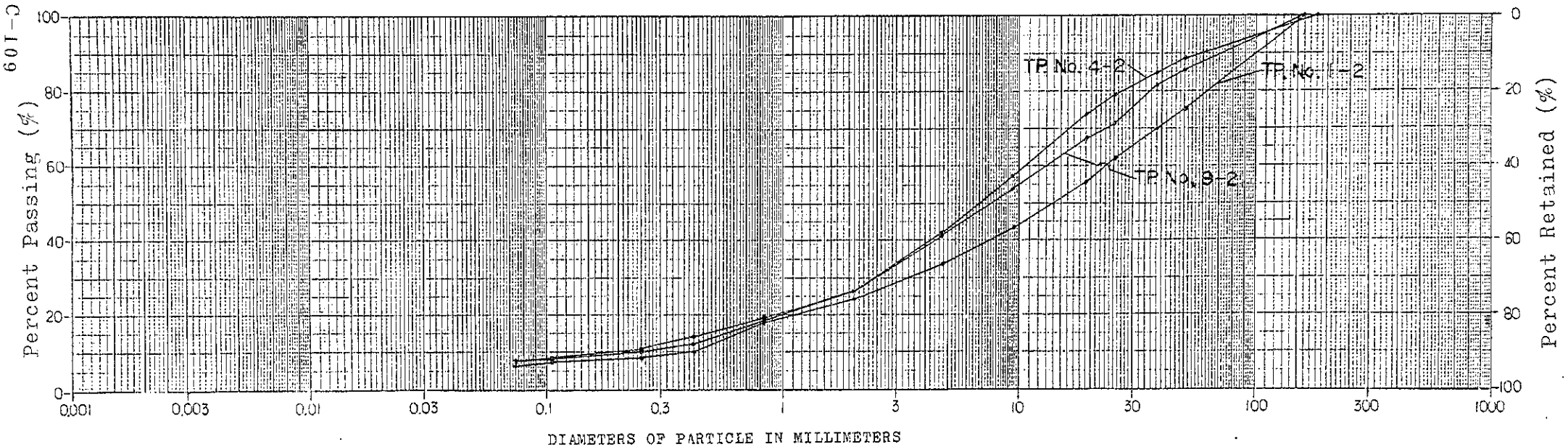

FIGURE C-2-3 GRAIN-SIZE ANALYSIS (4)

Project _____ Date of Testing _____

Location of Project _____ Remarks ;

Sample NO. Terrace B

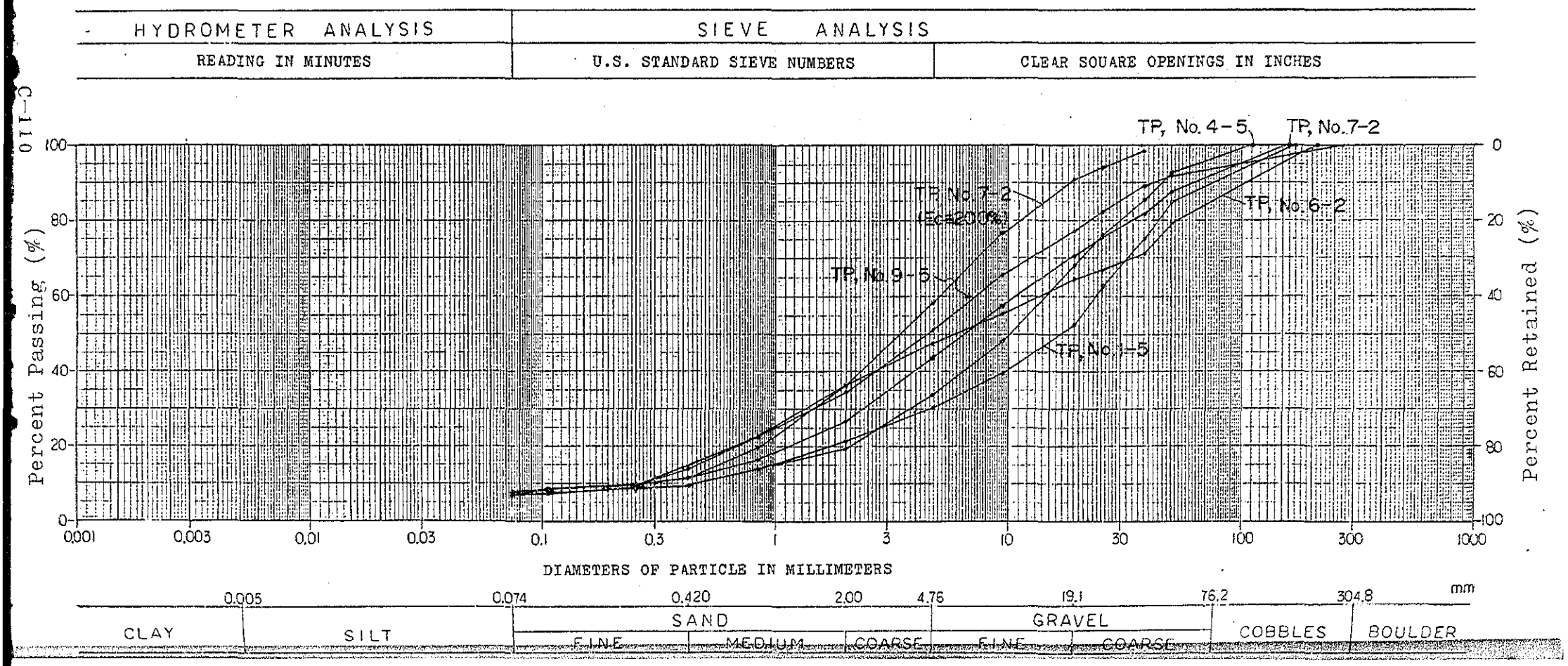

FIGURE C-2-3 GRAIN-SIZE ANALYSIS (5)

Project _____ Date of Testing _____

Location of Project _____ Remarks ;

Sample NO. Terrace C