4. BOA VIAGEM

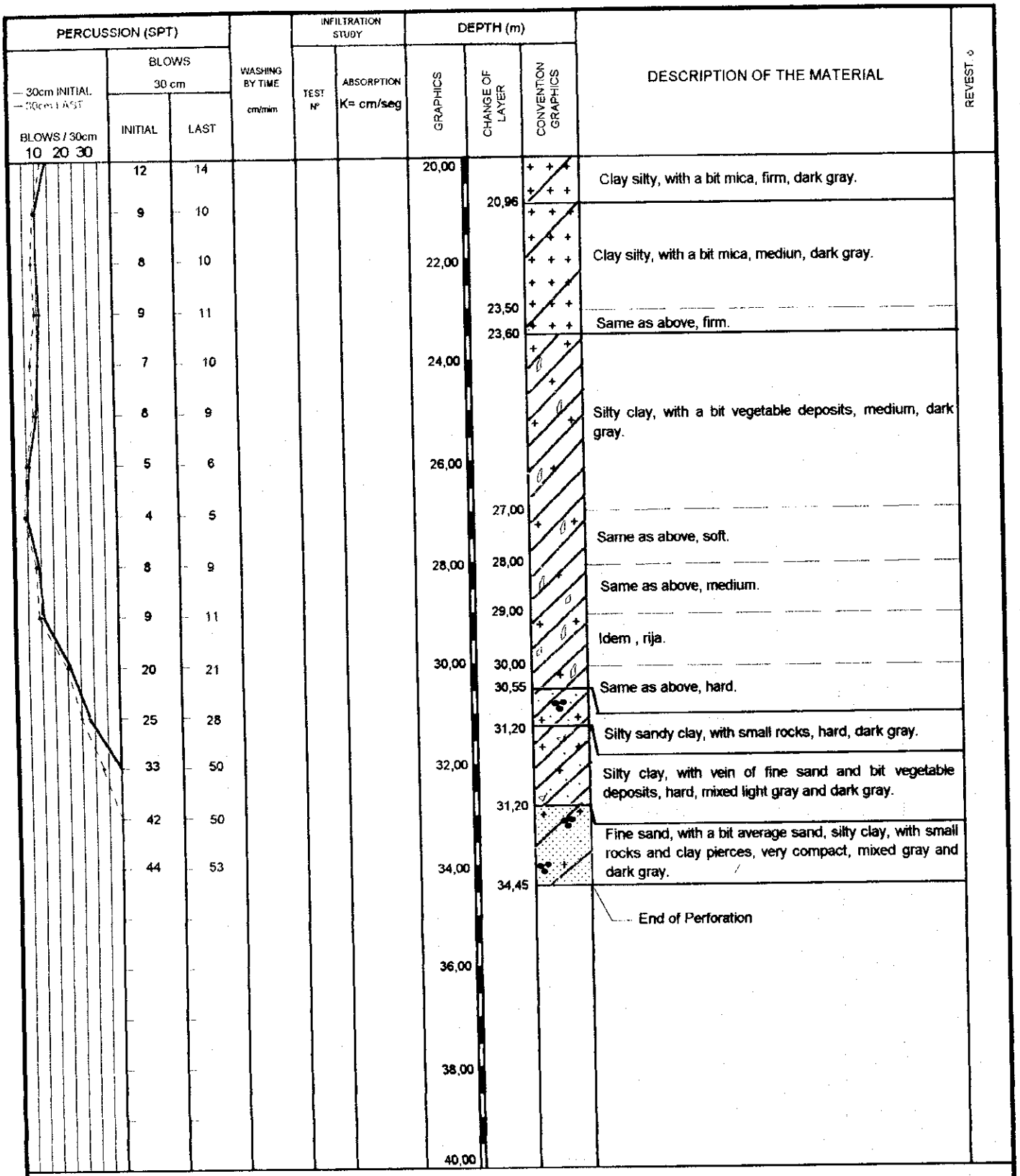
PERCUSSION (SPT)			WASHING BY TIME	INFILTRATION STUDY		DEPTH (m)			DESCRIPTION OF THE MATERIAL	REVEST.
— 30cm INITIAL — Worst Last BLOWS / 30cm 10 20 30	BLOWS 30 cm INITIAL	 LAST	cm/mm	TEST Nº	ABSORPTION K= cm/seg	GRAPHICS	CHANGE OF LAYER	CONVENTION GRAPHICS		
	2/32	2				0,00	0,10		Fine sand silty, soft, motley yellowish gray.	ϕ = 100mm
	1/45						0,65		Silty clay, with a bit of fine sand, very soft, dark yellow and greenish gray.	
	1/45					2,00				
	4	5/31					2,98		Silty clay, soft, greenish gray and dark yellow.	
	8	11/31				4,00	4,00		Same as above, firm.	
	11	14					4,65		Silty sandy clay, with rare small rocks, firm, greenish gray and dark yellow.	
	11	13				6,00	5,46		Average and fine sand, silty clay, with small rocks, averagely compact, greenish gray and dark yellow.	
	7	8					6,92		Fine sand and thicks and, silty, with a bit of small stons, not too compact, motley greenish gray.	
	6	7				8,00				
	6	6								
	6	6				10,00				
	6	7					10,47		Fine and average sand, silty clay, with a bit of small rocks, not too compact motley, greenish.	
	6	6				12,00				
	7	9					13,00		Same as above, averagely compact.	
	7	10				14,00	13,58		Silty sandy clay, mediun, greenish and reddish brown.	
	10	13					14,60		Clay silty, firm, greenish gray and dark yellow.	
	9	12				16,00	15,25		Silty clay, firm, greenish gray.	
	9	13					16,90		Silty clay, a bit sandy, firm, dark gray.	
	10	12				18,00	17,80		Clay silty, with a bit mica, firm, dark gray.	
	13	15								
	12	14				20,00				

OBSERVATION: Taken from a SHELBY sample

LOCALIZATION:

COORDINATES	QUOTA:	OPERATOR:	DATE	VERIFIED BY:
N= E=		JOSÉ DANTAS	I = 03/08/00 F= 07/08/00	

JICA	WORK: STUDY ON STORMWATER DRAINAGE AND SEWERAGE MANAGEMENT PLAN FOR RECIFE METROPOLITON AREA	PESQUISE	PROFILE OF SOIL INVESTIGATION
	LOCATE: BOA VIAGEM SUB - SYSTEM RECIFE		SOUNDING Nº SP-12


PERCUSSION (SPT)
— 30cm INITIAL
— 30cm LAST
BLOWS / 30cm
10 20 30
BLOWS
30 cm
INITIAL
LAST
WASHING BY TIME
cm/min
INFILTRATION STUDY
TEST Nº
ABSORPTION
K= cm/seg
DEPTH (m)
GRAPHICS
CHANGE OF LAYER
CONVENTION GRAPHICS
DESCRIPTION OF THE MATERIAL
REVEST. ◊
12 14
9 10
8 10
9 11
7 10
8 9
5 6
4 5
8 9
9 11
20 21
25 28
33 50
42 50
44 53
20,00
22,00
24,00
26,00
28,00
30,00
32,00
34,00
36,00
38,00
40,00
20,96
23,50
23,60
27,00
28,00
29,00
30,00
30,55
31,20
31,20
34,45
Clay silty, with a bit mica, firm, dark gray.
Clay silty, with a bit mica, mediun, dark gray.
Same as above, firm.
Silty clay, with a bit vegetable deposits, medium, dark gray.
Same as above, soft.
Same as above, medium.
Idem , rija.
Same as above, hard.
Silty sandy clay, with small rocks, hard, dark gray.
Silty clay, with vein of fine sand and bit vegetable deposits, hard, mixed light gray and dark gray.
Fine sand, with a bit average sand, silty clay, with small rocks and clay pierces, very compact, mixed gray and dark gray.
End of Perforation
OBSERVATION:
LOCALIZATION:
COORDINATES
N=
E=
QUOTA:
OPERATOR:
JOSÉ DANTAS
DATE
I = 03/08/00
F= 07/08/00
VERIFIELD BY:
JICA
WORK:
STUDY ON STORNWATER DRAINAGE AND SEWERAGE MANAGEMENT PLAN FOR RECIFE METROPOLITON AREA
LOCATE:
BOA VIAGEM SUB - SYSTEM
RECIFE
PESQUISE
PROFILE OF SOIL INVESTIGATION
SOUNDING Nº
SP-12

PERCUSSION (SPT)			WASHING FOR TIME	INFILTRATION - ESSAY -		DEPTH (m)			DESCRIPTION OF THE MATERIAL	REVEST. ◇
-- 30cm INITIAL -- 30cm LAST BLOWS / 30cm 10 20 30	BLOWS 30 cm INITIAL	 LAST	cm/min	TEST Nº	ABSORPTION K= cm/seg	GRAPHICS	CHANGE OF LAYER	CONVENTION GRAPHICS		
	4	5				0,00	0,63		Fine sand, not very silty, a bit compact, greyish brown.	◇ = 100mm
	6	7								
	7	8				2,00			Clay silty with fine sand, medium, motley light yellow.	
	6	7					2,91	WL		
	5	5				4,00	4,00		Same as above, soft.	
	5	6					4,52		Fine sand, not very silty, not too compact, light gray.	
	6	7				6,00				
	9	11					6,75		Silt clay, firm, dark yellow and bluish gray.	
	10	11				8,00				
	10	12					8,61		Average and thick sand, with a bit fine sand, with small rocks, averagely compact, light yellow.	
	7	9				10,00	9,78		Average and fine sand, silty, averagely compact, motley light yellow.	
	8	9								
	11	13				12,00	11,83		Average and thick sand, with a small rocks, averagely compact, yellowish gray.	
	9	13					12,95		Silty clay, hard, dark yellow and greenish gray.	
	17	20				14,00				
	17	21								
	16	22				16,00				
	11	14					16,88		Fine sand, with a bit average sand, a bit silty, averagely compact, motley light gray.	
	10	12				18,00				
	10	11								
	11	13				20,00				

OBSERVATION: Taken from a SHELBY sample

LOCALIZATION:

COORDINATES	QUOTA:	OPERATOR:	DATE	VERIFIED BY:
N= E=		ABDIAS	I = 31/08/00 F= 01/09/00	

JICA	WORK: STUDY ON STORMWATER DRAINAGE AND SEWERAGE MANAGEMENT PLAN FOR RECIFE METROPOLITON AREA	PESQUISE	PROFILE OF SOIL INVESTIGATION
	LOCATE: BOA VIAGEM SUB - SYSTEM RECIFE		SOUNDING Nº SP-15

PERCUSSION (SPT)			WASHING BY TIME cm/min	INFILTRATION STUDY		DEPTH (m)			DESCRIPTION OF THE MATERIAL	REVEST. ○
--- 30cm INITIAL — 30cm LAST BLOWS / 30cm 10 20 30	BLOWS 30 cm INITIAL	LAST		TEST Nº	ABSORPTION K= cm/seg	GRAPHICS	CHANGE OF LAYER	CONVENTION GRAPHICS		
	11	13				20,00			Fine sand, with a bit average sand, a bit silty, averagely compact, motley light gray.	
	23	31					20,95			
	26	30				22,00			Gravels with fine and average sand, silty, compact, motley light gray.	
	26	32								
	29	38				24,00				
	29	39								
	32	42				26,00	26,00		Same as above, very compact. - Rock alteration	
							26,45		End of Perforation	
						28,00				
						30,00				
						32,00				
						34,00				
						36,00				
						38,00				
						40,00				

OBSERVATION:

LOCALIZATION:

COORDINATES	QUOTA:	OPERATOR:	DATE	VERIFIED BY:
N= E=		ABDIAS	I = 31/08/00 F= 01/09/00	

JICA	WORK: STUDY ON STORMWATER DRAINAGE AND SEWERAGE MANAGEMENT PLAN FOR RECIFE METROPOLITON AREA	PESQUISE	PROFILE OF SOIL INVESTIGATION
	LOCATE: BOA VIAGEM SUB - SYSTEM RECIFE		SOUNDING Nº SP-15

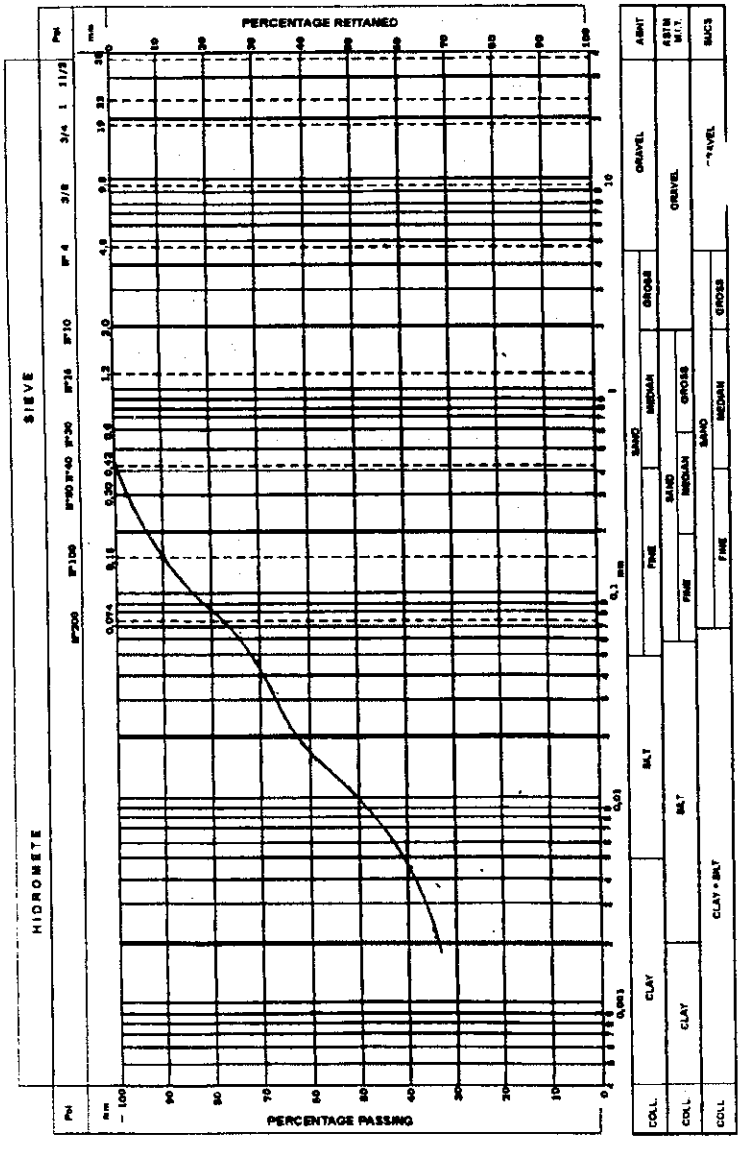
Identification	Hole		SP-12	SP-12	SP-15	SP-15							
	Sample Depth	from	200	340	200	700							
		to	260	400	260	760							
	Register N°		5317	5318	5319	5320							
Gradation Analysis	Sieve - % Total Passing	2"											
		1"											
		3/8											
		N° 4											
		N° 8											
		N° 10											
		N° 16				100							
		N° 30			100	99							
		N° 40	100	100	99	96							
		N° 50	98	95	99	94							
		N° 100	90	87	90	87							
		N° 200	78	79	80	17							
	Hidron. %	Silt	31	35	15	21							
		Clay	41	40	62	49							
Liquid limit			61	54	57	35							
Plasticity index			30	25	32	18							
Degree of contraction													
Specific graerty of soil particles			2,56	2,57	2,56	2,59							
Unifed classification			MH	MH	CH	CL							
Uniconfined Compression Test	Water content		20,7	22,8	28,1	23,2							
	Compressive Strength (kgf / cm^2)		0,28	0,18	1,27	1,43							
	Cohesion (kgf / cm^2)		0,14	0,09	0,63	0,71							
Direct Shear	Cohesion (kgf / cm^2)												
	Angle of internal friction (°)												
Free Expanding (%)	Water content												
	Degree of saturation												
	Expanding												
Field	Natural water content		20,5	21,8	27,4	22,2							
	Wet density		1,826	1,986	2,061	1,968							
	Dryness density												

Observation:

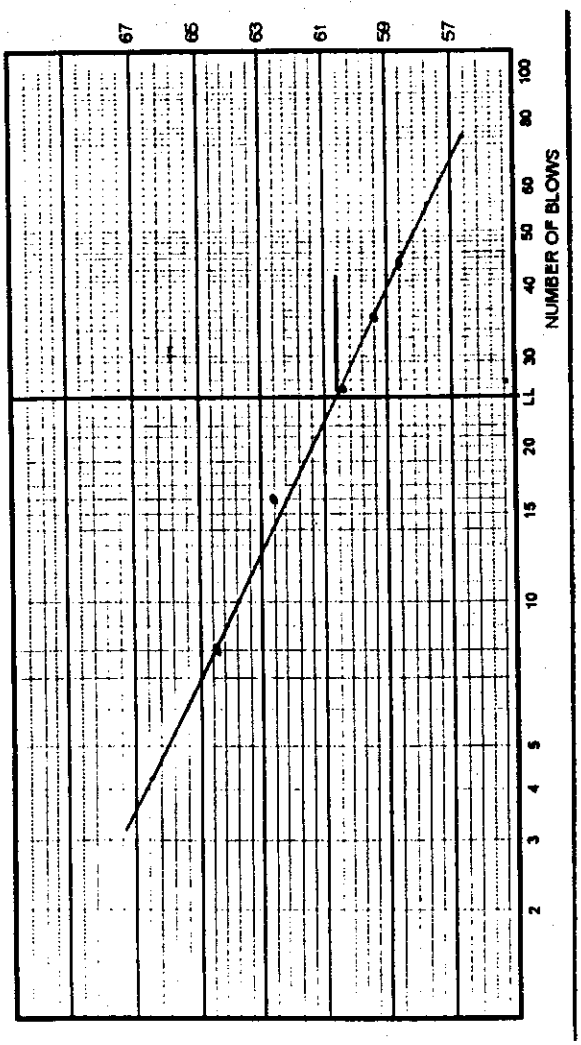
JICA	Work: STUDY ON STORNWATER DRAINAGE AND SEWERAGE MANAGEMENT PLAN FOR RECIFE METROPOLITON AREA	PESQUISE	SUMARY OF SOIL TEST
	Locate: BOA VIAGEM SUB - SYSTEM RECIFE		PAGE N° :

PHYSICS AND MECHANICS CHARACTERISTICS	RESULT
NATURAL WATER CONTENT - %	20,5
WET DENSITY - g / cm³	1,826
DRYNESS DENSITY - g / cm³	
GRAVEL	
GROSS	-
MEDIAN	-
FINE	28
SILT	31
CLAY	41
LIQUID LIMIT	61
PLASTICITY INDEX	30
DEGREE OF CONTRACTION	
SPECIFIC GRAVITY OF SOIL PARTICLES - (g / cm³)	2,56
Kgf / cm²	
WATER CONTENT - (%)	20,7
COMPRESSIVE STRENGTH	0,28
COHESION	0,14
COHESION	
ANGLE OF INTERNAL FRICTION	
WATER CONTENT	
DEGREE OF SATURATION	
EXPANDING	-
UNIFED CLASSFICATION	MH
OBSERVATION	

FIELD | GRADATION ANALYSIS % | SOIL CONSISTENCY TEST | UNICONFINED COMPRESSION TEST | DIRECT SHEAR | FREE EXPANDING - %



GRADATION ANALYSIS

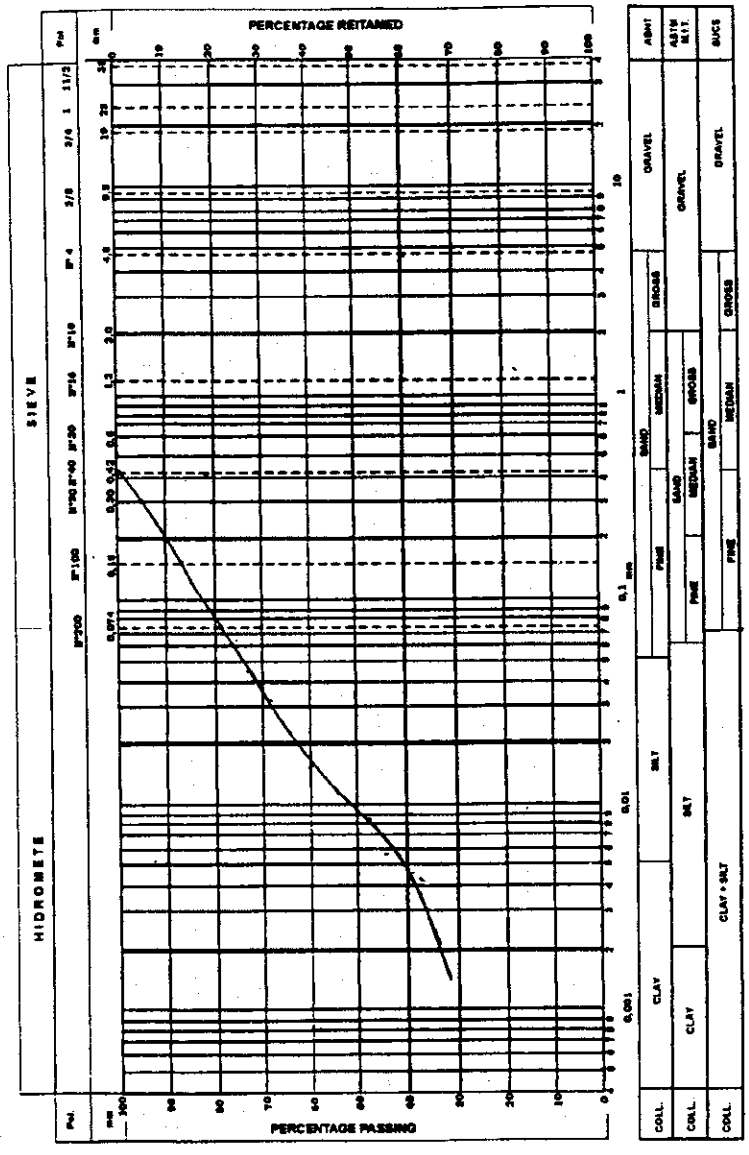


LIQUID LIMIT

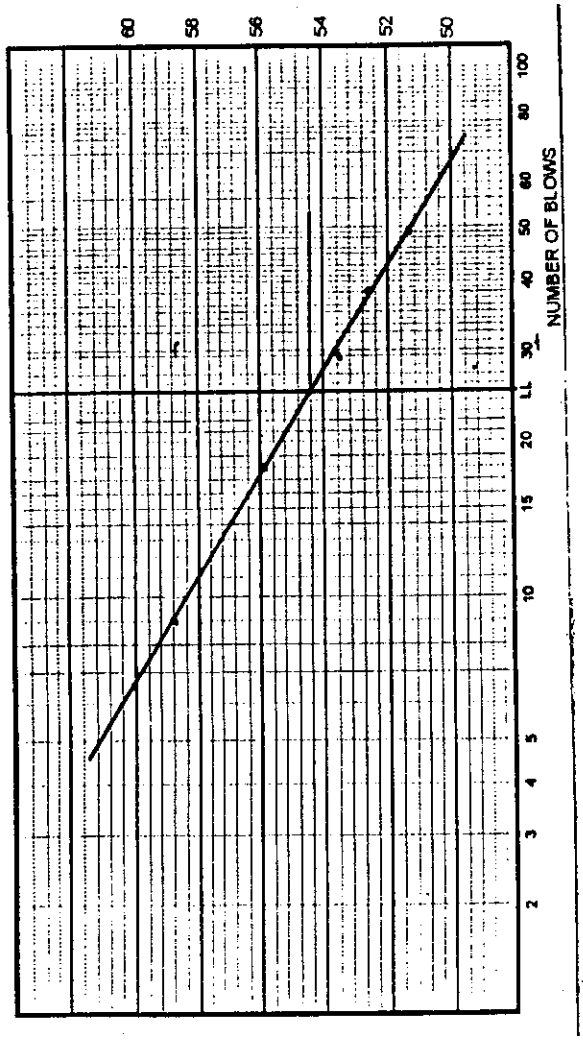
ORIGIN	HOLE: SP-12	STAKE:	SAMPLES:	POSITION:	SAMPLE DEPTH: 200 - 260	DATE:

JICA	WORK: STUDY ON STORMWATER DRAINAGE AND SEWERAGE MANAGEMENT PLAN FOR RECIFE METROPOLITON AREA	PESQUISE	ESSAY GRÁPHIC
	LCOATE: BOA VIAGEM SUB - SYSTEM RECIFE		REGISTER Nº: 5317

PHYSICS AND MECHANICS CHARACTERISTICS	RESULT
NATURAL WATER CONTENT - %	21,8
WET DENSITY - g / cm	1,986
DRYNESS DENSITY - g / cm	
GRAVEL	
SAND — GROSS	
SAND — MEDIAN	
SAND — FINE	25
SILT	35
CLAY	40
LIQUID LIMIT	54
PLASTICITY INDEX	25
DEGREE OF CONTRACTION	
SPECIFIC GRAVITY OF SOIL PARTICLES - (g / cm)	2,57
UNICONFINED COMPRESSION TEST — WATER CONTENT - (%)	22,8
UNICONFINED COMPRESSION TEST — COMPRESSIVE STRENGTH - Kgf / cm²	0,18
DIRECT SHEAR — COHESION	0,09
DIRECT SHEAR — COHESION	
DIRECT SHEAR — ANGLE OF INTERNAL FRICTION	
FREE EXPANDING - % — WATER CONTENT	
FREE EXPANDING - % — DEGREE OF SATURATION	
FREE EXPANDING - % — EXPANDING	
UNIFIED CLASSFICATION	MH
OBSERVATION:	



GRADATION ANALYSIS



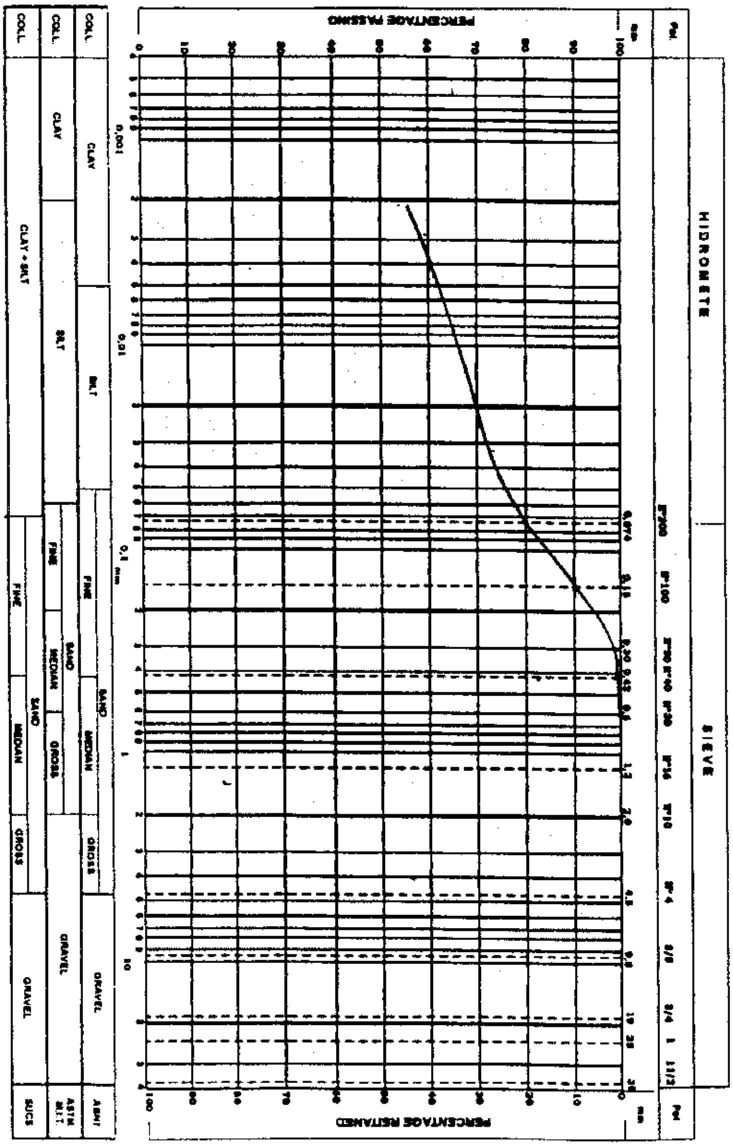
LIQUID LIMIT

ORIGIN	HOLE	STAKE	SAMPLES	POSITION	SAMPLE DEPTH	DATE
	SP-12				340 - 400	

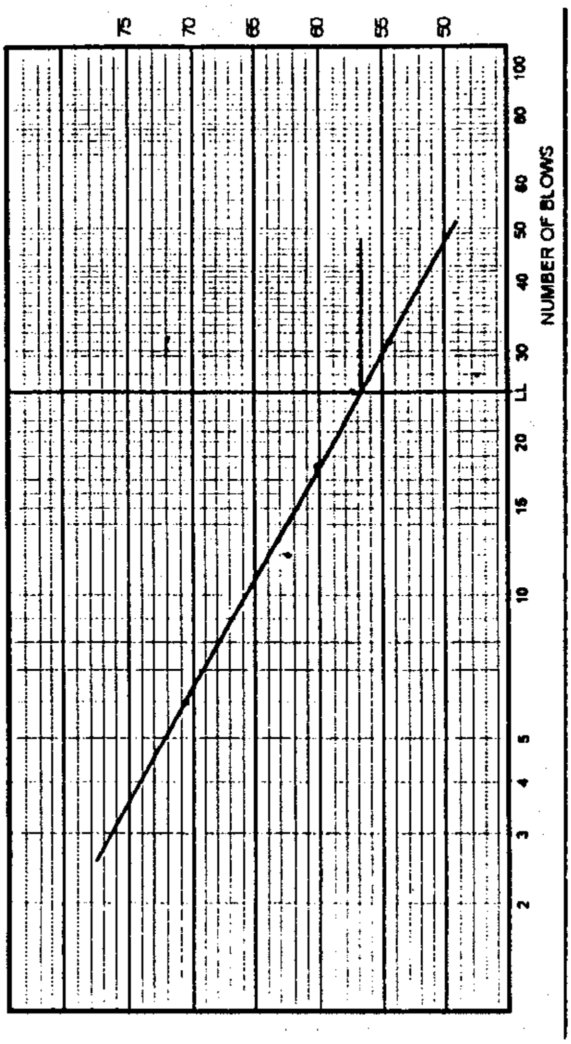
JICA	WORK: STUDY ON STORMWATER DRAINAGE AND SEWERAGE MANAGEMENT PLAN FOR RECIFE METROPOLITON AREA	PESQUISE	ESSAY GRÁPHIC
	LCOATE: BOA VIAGEM SUB - SYSTEM RECIFE		REGISTER Nº: 5318

PHYSICS AND MECHANICS CHARACTERISTICS

TEST OR DETERMINATION			RESULT
FIELD		NATURAL WATER CONTENT - %	27,4
		WET DENSITY - g / cm	2,061
		DRYNESS DENSITY - g / cm	
GRADATION ANALYSIS %		GRAVEL	
	SAND	GROSS	
		MEDIAN	
		FINE	23
		SILT	15
		CLAY	62
SOIL CONSISTENCY TEST		LIQUID LIMIT	57
		PLASTICITY INDEX	32
		DEGREE OF CONTRACTION	
SPECIFIC GRAVITY OF SOIL PARTICLES - (g / cm³)			2,56
UNICONFINED COMPRESSION TEST		WATER CONTENT - (%)	28,1
	Kgf / cm²	COMPRESSIVE STRENGTH	1,27
		COHESION	0,63
DIRECT SHEAR		COHESION	
		ANGLE OF INTERNAL FRICTION	
FREE EXPANDING - %		WATER CONTENT	
		DEGREE OF SATURATION	
		EXPANDING	
UNIFED CLASSIFICATION			CH
OBSERVATION			



GRADATION ANALYSIS

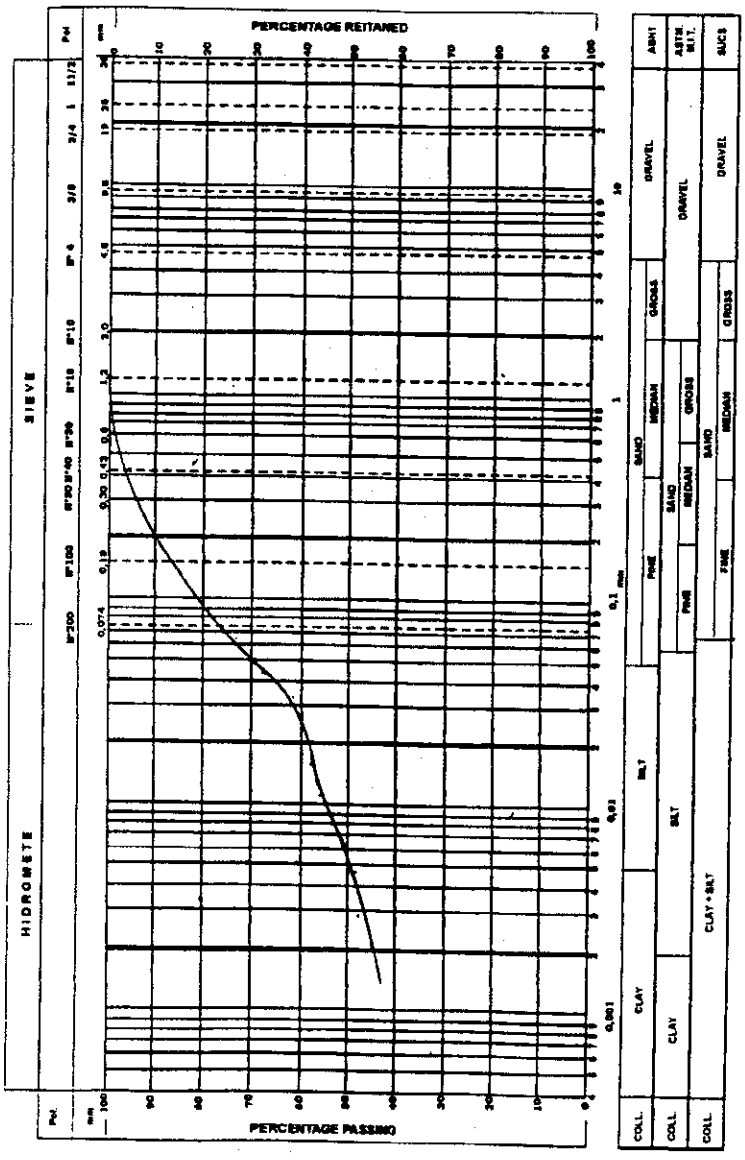


LIQUID LIMIT

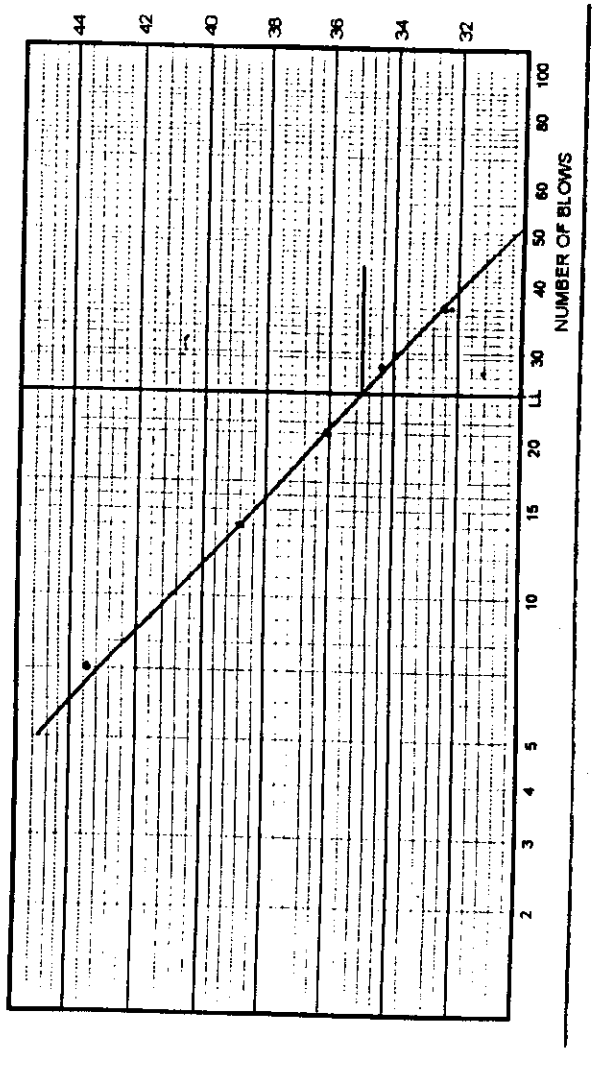
ORIGIN	HOLE: SP-15	STAKE:	SAMPLES:	POSITION:	SAMPLE DEPTH: 200 - 260	DATE:

JICA	WORK: STUDY ON STORNWATER DRAINAGE AND SEWERAGE MANAGEMENT PLAN FOR RECIFE METROPOLITON AREA	PESQUISE	ESSAY GRÁPHIC
	LCOATE: BOA VIAGEM SUB - SYSTEM RECIFE		REGISTER Nº: 5319

PHYSICS AND MECHANICS CHARACTERISTICS																				
TEST OR DETERMINATION	RESULT																			
NATURAL WATER CONTENT - %	22,2																			
WET DENSITY - g / cm	1,968																			
DRYNESS DENSITY - g / cm																				
GRAVEL																				
GROSS																				
MEDIAN	4																			
FINE	26																			
SAND																				
SILT	21																			
CLAY	49																			
LIQUID LIMIT	35																			
PLASTICITY INDEX	18																			
DEGREE OF CONTRACTION																				
SPECIFIC GRAVITY OF SOIL PARTICLES - (g / cm³)	2,59																			
Kgf / cm																				
WATER CONTENT - (%)	23,2																			
COMPRESSIVE STRENGTH	1,43																			
COHESION	0,71																			
COHESION																				
ANGLE OF INTERNAL FRICTION																				
WATER CONTENT																				
DEGREE OF SATURATION																				
EXPANDING	A-6 (11)																			
UNIFED CLASSFICATION	CL																			
OBSERVATION																				
FIELD	GRADATION ANALYSIS %							SOIL CONSISTENCY TEST			SPECIFIC GRAVITY OF SOIL PARTICLES - (g / cm³)	UNICONFINED COMPRESSION TEST			DIRECT SHEAR	FREE EXPANDING - %				



GRADATION ANALYSIS



LIQUID LIMIT

ORIGIN:	HOLE: SP-15	STAKE:	SAMPLES:	POSITION	SAMPLE DEPTH: 700 - 760	DATE:
JICA	WORK: STUDY ON STORNWATER DRAINAGE AND SEWERAGE MANAGEMENT PLAN FOR RECIFE METROPOLITON AREA			PESQUISE	ESSAY GRÁPHIC	
	LCOATE: BOA VIAGEM SUB - SYSTEM RECIFE				REGISTER Nº: 5320	

5. CORDEIRO

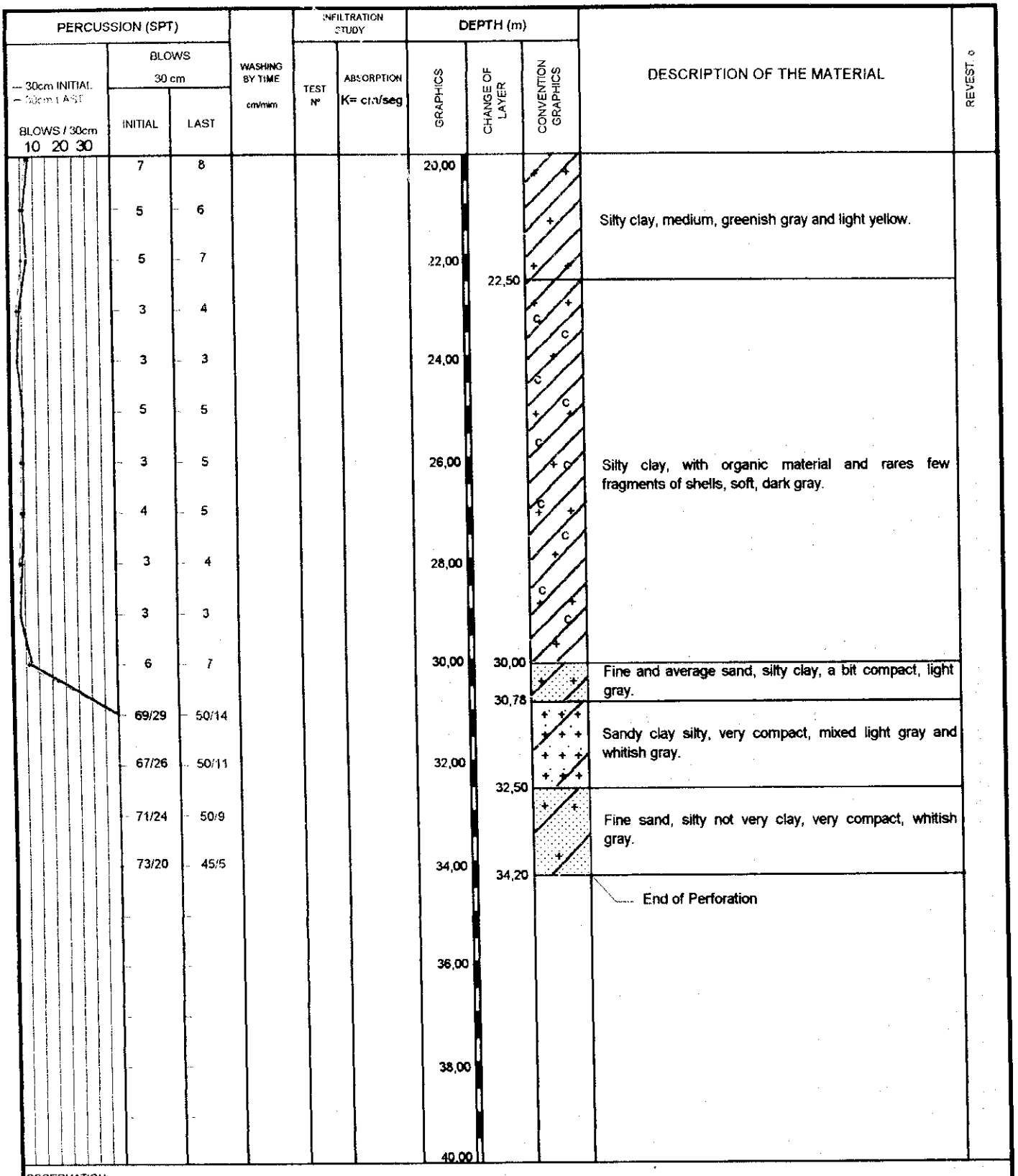
PERCUSSION (SPT)			WASHING BY TIME	INFILTRATION STUDY		DEPTH (m)			DESCRIPTION OF THE MATERIAL	REVEST. ϕ
— 30cm INITIAL BLOWS / 30cm 10 20 30	BLOWS 30 cm INITIAL	LAST	cm/min	TEST N°	ABSORPTION K= cm/seg	GRAPHICS	CHANGE OF LAYER	CONVENTION GRAPHICS		ϕ = 100 mm
	6	8				0,00			Silty sandy clay, medium motley, dark red.	
	6	7					0,50		Average and fine sand, silty, not too compact, light yellow.	
	3	4				2,00	1,55	WL	Silty sandy clay, soft, greenish gray and dark yellow.	
	1/59						2,85		Silty clay, with traces of organic material, very soft, dark gray.	
	1/55					4,00				
	1/48						5,68		Organic clay, soft, black.	
	2	3/31				6,00				
	2	2/36					6,60		Organic clay with peat, soft, dark brown and black.	
	2	2/42				8,00	7,85		Organic clay with few fragments of shells, very soft black.	
	2	2/39								
	1/61					10,00				
	1/56									
	1/48					12,00				
	1/52									
	1/49					14,00				
	5	6					14,85		Medium and thick sand, with a bit of fine sand with few fragments of shells, a bit compact, mixed light gray colors.	
	5	5				16,00				
	4	5					17,53		Silty clay, mediun, greenish gray and light yellow.	
	7	8				18,00				
	7	9								
	7	8				20,00				

OBSERVATION: Taken from a SHELBY sample

LOCALIZATION:

COORDINATES		QUOTA:	OPERATOR:	DATE		VERIFIED BY:
N=	E=		HERONIDES	I = 26/06/00	F= 28/06/00	

JICA	WORK: STUDY ON STORMWATER DRAINAGE AND SEWERAGE MANAGEMENT PLAN FOR RECIFE METROPOLITON AREA	PESQUISE	PROFILE OF SOIL INVESTIGATION
	LOCATE: CORDEIRO SUB - SYSTEM RECIFE		SOUNDING N° SP.08


PERCUSSION (SPT)
BLOWS
30 cm
INITIAL
LAST
— 30cm INITIAL
— 30cm LAST
BLOWS / 30cm
10 20 30
WASHING BY TIME
cm/min
INFILTRATION STUDY
TEST Nº
ABSORPTION
K= cm/seg
DEPTH (m)
GRAPHICS
CHANGE OF LAYER
CONVENTION GRAPHICS
DESCRIPTION OF THE MATERIAL
REVEST. o
7 8
5 6
5 7
3 4
3 3
5 5
3 5
4 5
3 4
3 3
6 7
69/29 50/14
67/26 50/11
71/24 50/9
73/20 45/5
20,00
22,00
24,00
26,00
28,00
30,00
32,00
34,00
36,00
38,00
40,00
22,50
30,00
30,78
32,50
34,20
Silty clay, medium, greenish gray and light yellow.
Silty clay, with organic material and rares few fragments of shells, soft, dark gray.
Fine and average sand, silty clay, a bit compact, light gray.
Sandy clay silty, very compact, mixed light gray and whitish gray.
Fine sand, silty not very clay, very compact, whitish gray.
End of Perforation
OBSERVATION:
LOCALIZATION:
COORDINATES
N=
E=
QUOTA:
OPERATOR:
HERONIDES
DATE
I = 26/06/00
F= 26/06/00
VERIFIED BY:
JICA
WORK:
STUDY ON STORNWATER DRAINAGE AND SEWERAGE MANAGEMENT PLAN FOR RECIFE METROPOLITON AREA
LOCATE:
CORDEIRO SUB - SYSTEM
RECIFE
PESQUISE
PROFILE OF SOIL INVESTIGATION
SOUNDING Nº
SP.08

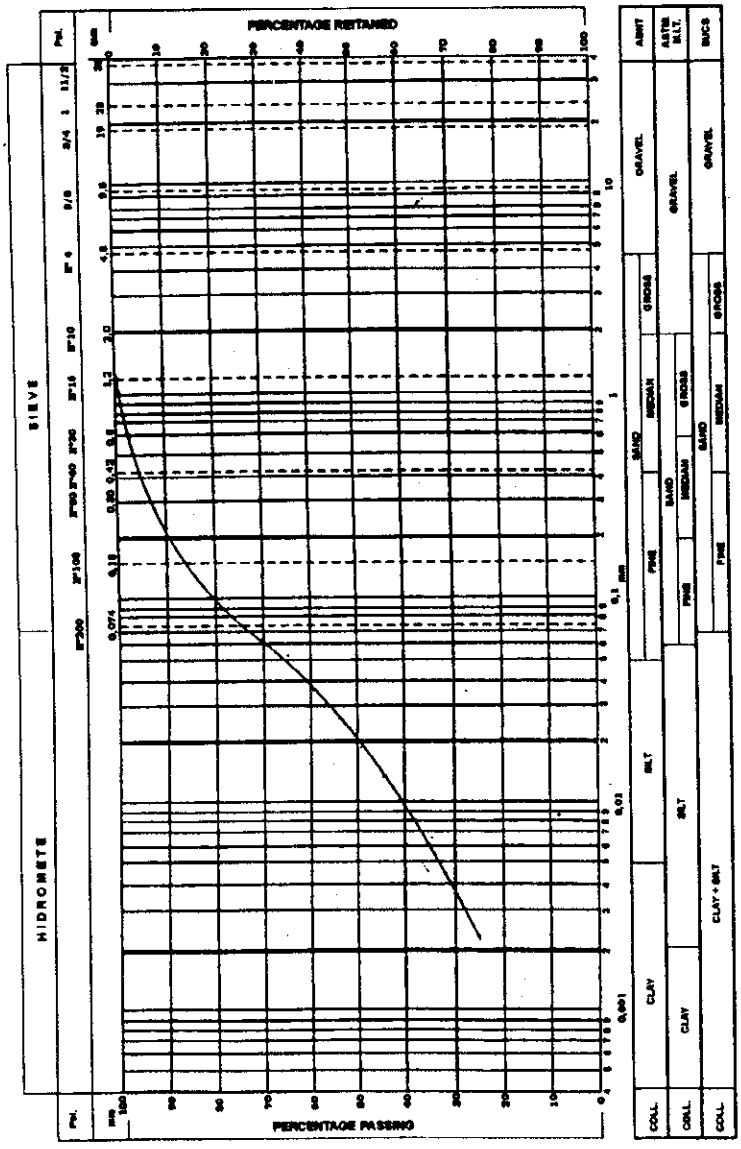
Identification	Hole			SP-08	SP-08	SP-08	SP-08						
	Sample Depth		from	400	700	830	1000						
			to	460	760	890	1060						
	Register Nº			5279	5280	5283	5281						
Gradation Analysis	Sieve - % Total Passing		2"										
			1"		100								
			3/8		99								
			Nº 4		94		100						
			Nº 8		87	100	98						
			Nº 10		86	99	97						
			Nº 16	100	84	98	93						
			Nº 30	98	79	96	90						
			Nº 40	96	75	93	88						
			Nº 50	93	73	91	87						
			Nº 100	90	69	86	82						
			Nº 200	75	67	78	76						
	Hidron. %		Silt	42	22	46	44						
			Clay	33	45	32	32						
Liquid limit				60	71	69	64						
Plasticity index				35	35	35	33						
Degree of contraction				-	-	-	-						
Specific graerty of soil particles				2,25	2,39	2,38	2,41						
Unifed classification				CH	OH	OH	OH						
Unicontined Compression Test	Water content			33,0	57,9	199,6	73,9						
	Compressive Strength (kgf / cm²)			0,08	0,06	0,88	0,15						
	Cohesion (kgf / cm²)			0,04	0,03	0,44	0,08						
Direct Shear	Cohesion (kgf / cm²)			-	-	-	-						
	Angle of internal friction (°)			-	-	-	-						
Free Expanding (%)	Water content			-	-	-	-						
	Degree of saturation			-	-	-	-						
	Expanding			-	-	-	-						
Field	Natural water content			32,9	49,4	123,6	70,8						
	Wet density			1,333	1,740	1,333	1,453						
	Dryness density			1,003	1,165	0,596	0,851						

Observation:

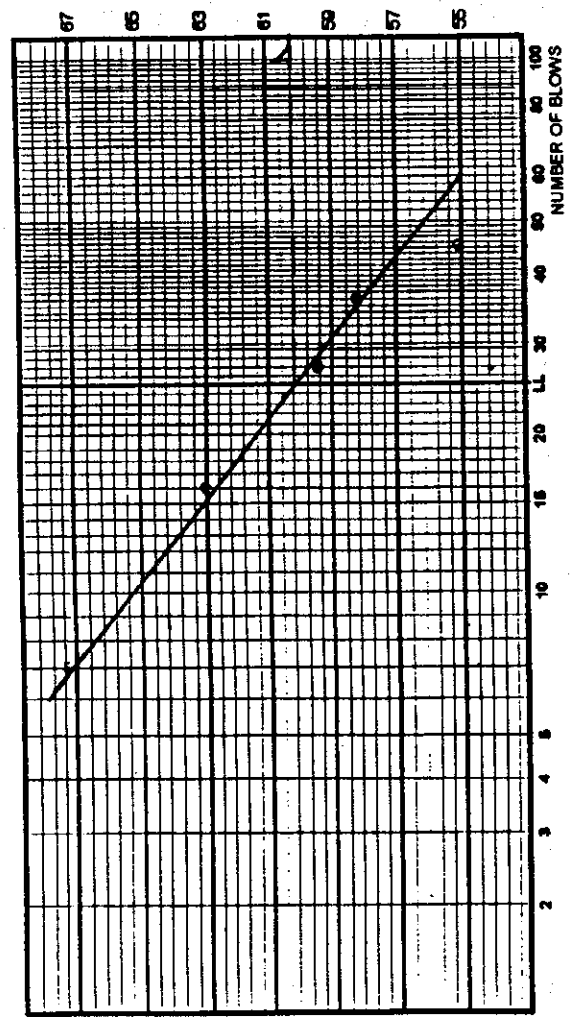
JICA	Work: STUDY ON STORNWATER DRAINAGE AND SEWERAGE MANAGEMENT PLAN FOR RECIFE METROPOLITON AREA	PESQUISE	SUMARY OF SOIL TEST
	Locate: CORDEIRO SUB - SYSTEM RECIFE		PAGE Nº :

PHYSICS AND MECNANICS CHARACTERISTICS																				
TEST OR DETERMINATION	RESULT	NATURAL WATER CONTENT - %	WET DENSITY - g / cm³	DRYNESS DENSITY - g / cm³	GRAVEL	SAND: GROSS	SAND: MEDIAN	SAND: FINE	SILT	CLAY	LIQUID LIMIT	PLASTICITY INDEX	DEGREE OF CONTRACTION	SPECIFIC GRAVITY OF SOIL PARTICLES - (g / cm³)	Kgf / cm²: WATER CONTENT - (%)	Kgf / cm²: COMPRESSIVE STRENGTH	Kgf / cm²: COHESION	DIRECT SHEAR: COHESION	ANGLE OF INTERNAL FRICTION	WATER CONTENT
		32,9	1,333	1,003	-	-	4	21	42	33	60	35	-	2,25	33	0,08	0,04	-	-	-
FIELD		GRADATION ANALYSIS %									SOIL CONSISTENCY TEST			SPECIFIC GRAVITY OF SOIL PARTICLES - (g / cm³)	UNICONFINED COMPRESSION TEST			DIRECT SHEAR		FREE EXPANDING - %

DEGREE OF SATURATION	EXPANDING	UNIFED CLASSFICATION	OBSERVATION:
-	-	CH	
FREE EXPANDING - %		UNIFED CLASSFICATION	



GRADATION ANALYSIS



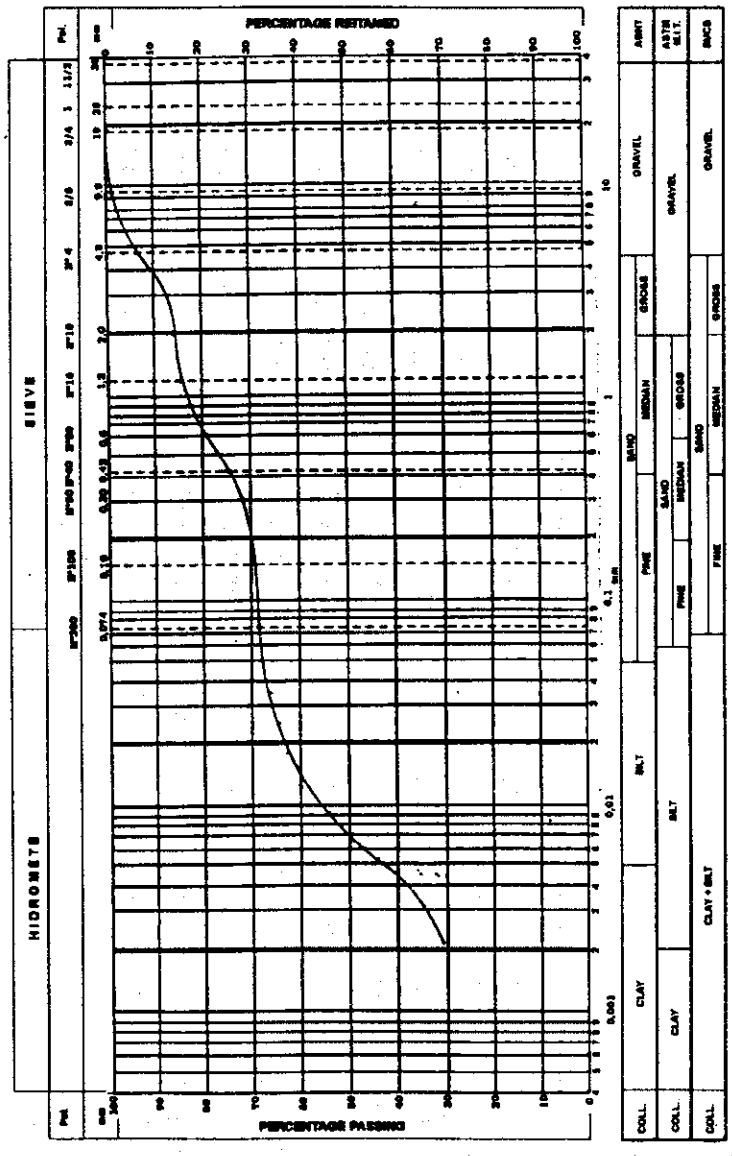
LIQUID LIMIT

ORIGIN:	HOLE: SP-08	STAKE:	SAMPLES:	POSITION:	SAMPLE DEPTH: 400 - 460	DATE:

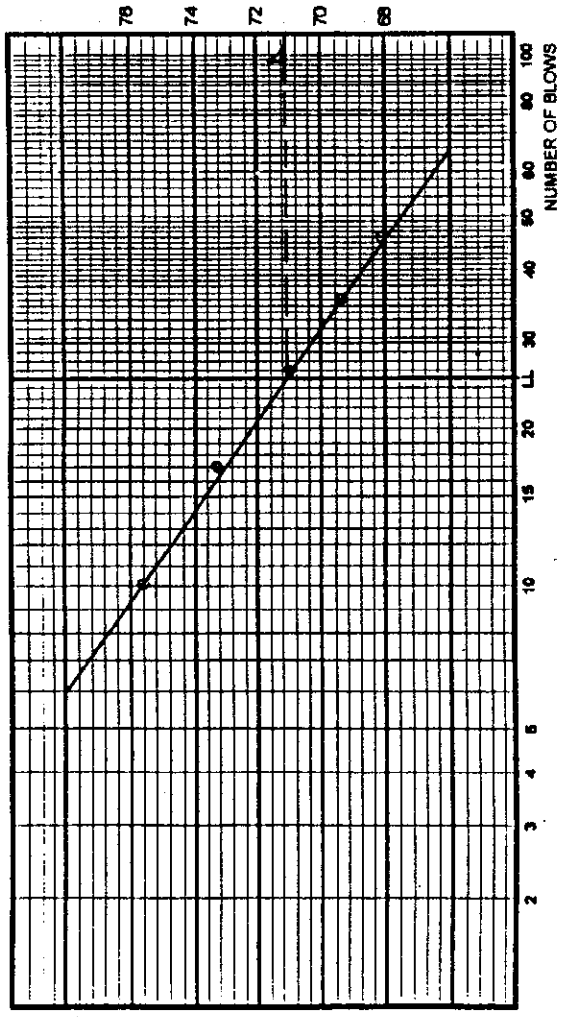
JICA	WORK: STUDY ON STORMWATER DRAINAGE AND SEWERAGE MANAGEMENT PLAN FOR RECIFE METROPOLITON AREA	PESQUISE	ESSAY GRÁPHIC
	LCOATE: CORDEIRO SUB - SYSTEM RECIFE		REGISTER Nº: 5279

PHYSICS AND MECHANICS CHARACTERISTICS	RESULT
NATURAL WATER CONTENT - %	49,4
WET DENSITY - g / cm³	1,740
DRYNESS DENSITY - g / cm³	1,165
GRAVEL	6
SAND — GROSS	8
SAND — MEDIAN	11
SAND — FINE	8
SILT	22
CLAY	45
LIQUID LIMIT	71
PLASTICITY INDEX	35
DEGREE OF CONTRACTION	-
SPECIFIC GRAVITY OF SOIL PARTICLES - (g / cm³)	2,39
WATER CONTENT - (%)	57,9
COMPRESSIVE STRENGTH - Kgf / cm²	0,06
COHESION	0,03
COHESION	-
ANGLE OF INTERNAL FRICTION	-
WATER CONTENT	-
DEGREE OF SATURATION	-
EXPANDING	-
UNIFIED CLASSIFICATION	OH
OBSERVATION:	

TEST OR DETERMINATION	FIELD	GRADATION ANALYSIS %	SOIL CONSISTENCY TEST	SPECIFIC GRAVITY OF SOIL PARTICLES - (g / cm³)	UNICONFINED COMPRESSION TEST	DIRECT SHEAR	FREE EXPANDING - %	UNIFIED CLASSIFICATION	OBSERVATION:



GRADATION ANALYSIS

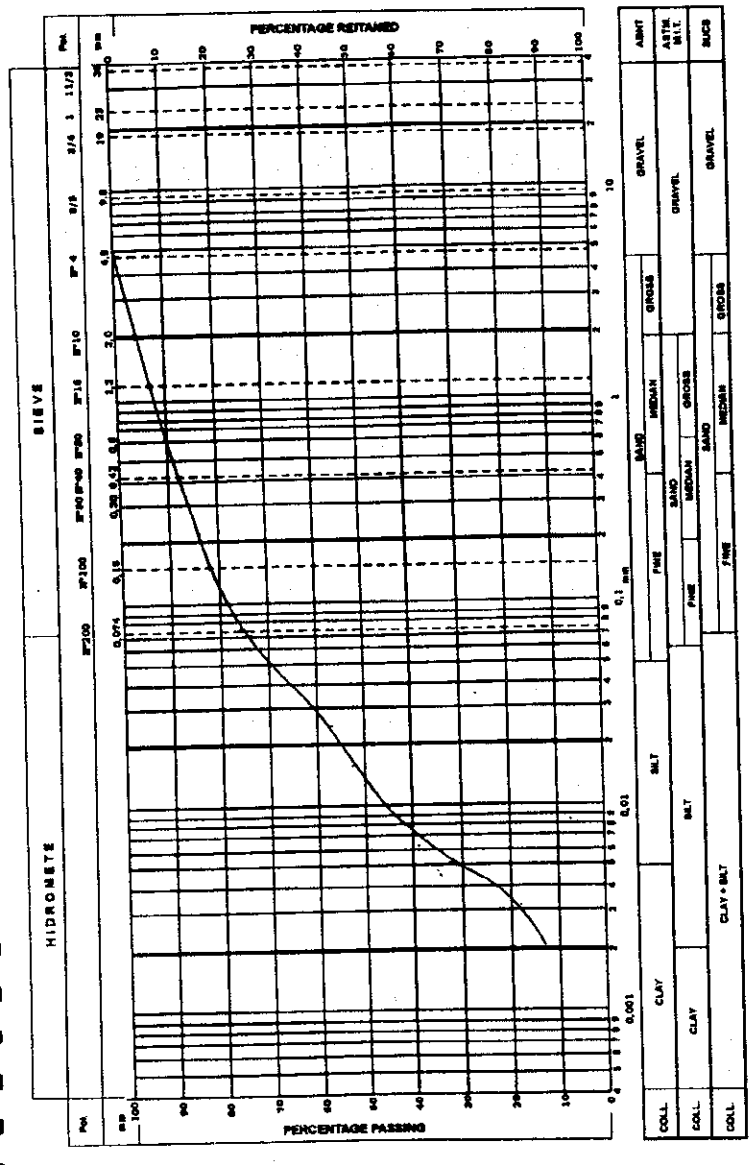


LIQUID LIMIT

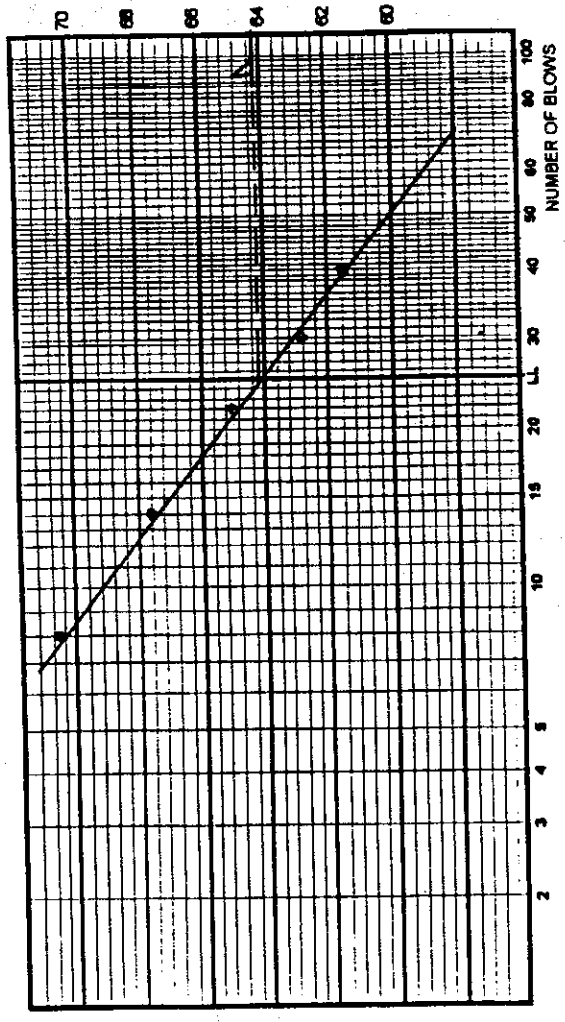
ORIGIN:	HOLE: SP-08	STAKE:	SAMPLES:	POSITION:	SAMPLE DEPTH: 700 - 760	DATE:

JICA	WORK: STUDY ON STORMWATER DRAINAGE AND SEWERAGE MANAGEMENT PLAN FOR RECIFE METROPOLITON AREA	PESQUISE	ESSAY GRÁPHIC
	LOCATE: CORDEIRO SUB - SYSTEM RECIFE		REGISTER Nº: 5280

PHYSICS AND MECHANICS CHARACTERISTICS		RESULT
FIELD	NATURAL WATER CONTENT - %	70,8
	WET DENSITY - g / cm³	1,453
	DRYNESS DENSITY - g / cm³	0,851
GRADATION ANALYSIS %	GRAVEL	-
	SAND — GROSS	3
	SAND — MEDIAN	9
	SAND — FINE	12
	SILT	44
	CLAY	32
SOIL CONSISTENCY TEST	LIQUID LIMIT	64
	PLASTICITY INDEX	33
	DEGREE OF CONTRACTION	-
SPECIFIC GRAVITY OF SOIL PARTICLES - (g / cm³)		2,41
UNICONFINED COMPRESSION TEST	WATER CONTENT - (%)	73,9
	COMPRESSIVE STRENGTH Kgf / cm²	0,15
	COHESION	0,08
DIRECT SHEAR	COHESION	-
	ANGLE OF INTERNAL FRICTION	-
FREE EXPANDING - %	WATER CONTENT	-
	DEGREE OF SATURATION	-
	EXPANDING	-
UNIFED CLASSFICATION		OH
OBSERVATION:		



GRADATION ANALYSIS

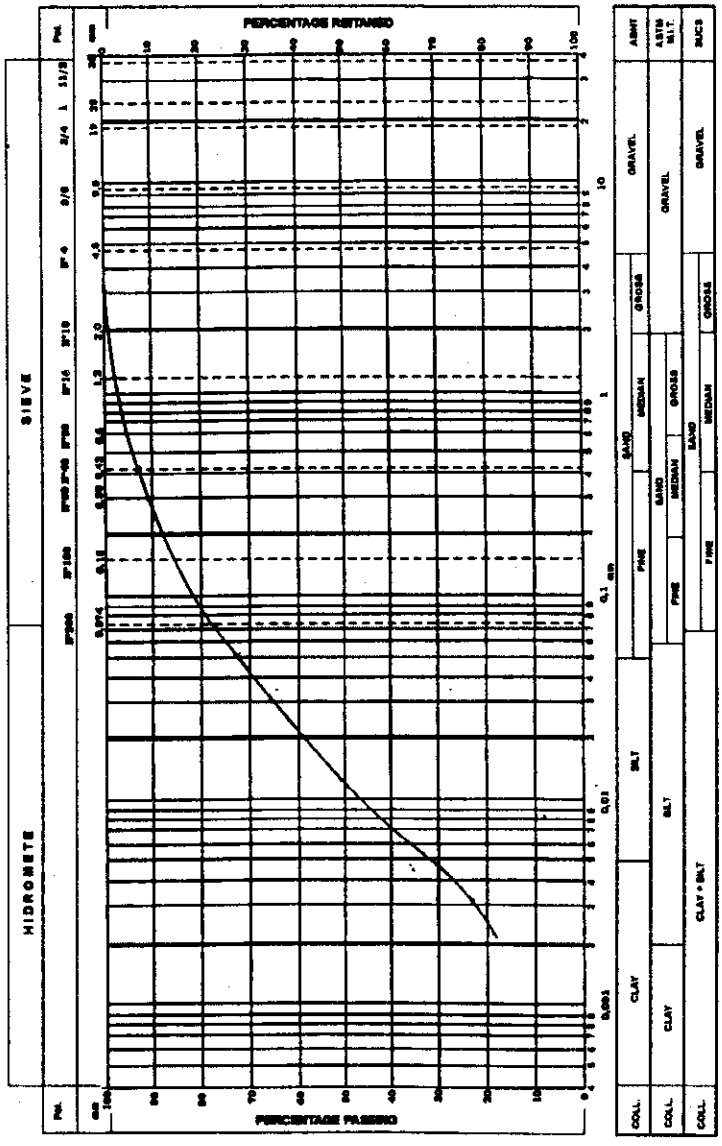


LIQUID LIMIT

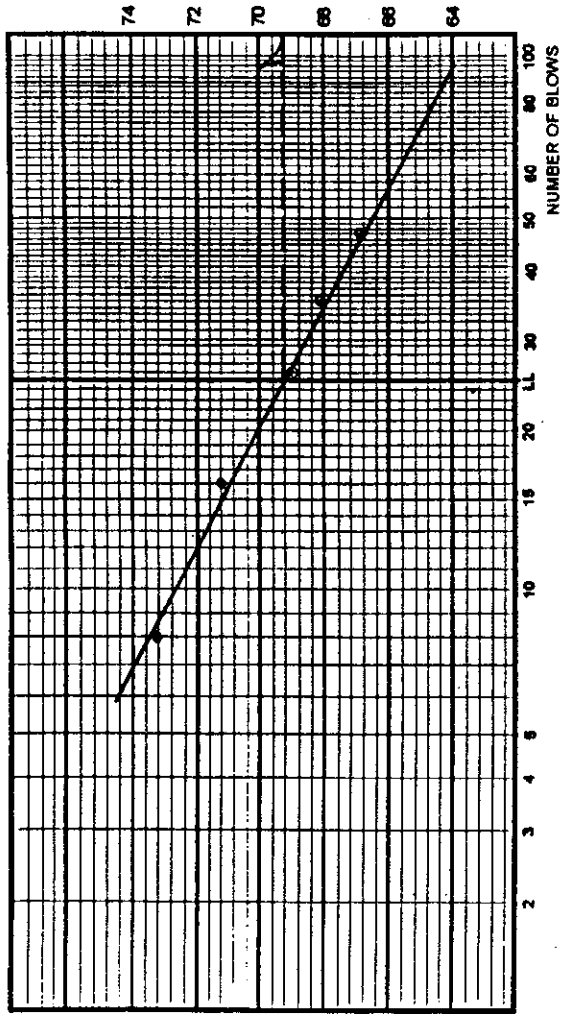
ORIGIN:	HOLE: SP-06	STAKE:	SAMPLES:	POSITION:	SAMPLE DEPTH: 1000 - 1060	DATE:

JICA	WORK: STUDY ON STORNWATER DRAINAGE AND SEWERAGE MANAGEMENT PLAN FOR RECIFE METROPOLITON AREA	PESQUISE	ESSAY GRÁPHIC
	LCOATE: CORDEIRO SUB - SYSTEM RECIFE		REGISTER Nº: 5281

PHYSICS AND MECHANICS CHARACTERISTICS																						
TEST OR DETERMINATION	RESULT	FIELD			GRADATION ANALYSIS %						SOIL CONSISTENCY TEST			SPECIFIC GRAVITY OF SOIL PARTICLES - (g / cm³)	UNICONFINED COMPRESSION TEST			DIRECT SHEAR		FREE EXPANDING - %			OBSERVATION:
															Kgf / cm²								
NATURAL WATER CONTENT - %	123,6														WATER CONTENT - (%)								
WET DENSITY - g / cm³	1,333															COMPRESSIVE STRENGTH							
DRYNESS DENSITY - g / cm³	0,596																COHESION						
				GRAVEL				SILT	CLAY						199,6	0,88	0,44	-	-	-	-	-	-
					GROSS	MEDIAN	FINE			LIQUID LIMIT	PLASTICITY INDEX	DEGREE OF CONTRACTION						COHESION	ANGLE OF INTERNAL FRICTION	WATER CONTENT	DEGREE OF SATURATION	EXPANDING	UNIFIED CLASSFICATION	
					SAND																		



GRADATION ANALYSIS



LIQUID LIMIT

ORIGIN:	HOLE: SP-08	STAKE:	SAMPLES:	POSITION:	SAMPLE DEPTH: 830 - 890	DATE:

JICA	WORK: STUDY ON STORNWATER DRAINAGE AND SEWERAGE MANAGEMENT PLAN FOR RECIFE METROPOLITON AREA	PESQUISE	ESSAY GRÁPHIC
	LCOATE: CORDEIRO SUB - SYSTEM RECIFE		REGISTER Nº: 5283

6. PRAZERES

PERCUSSION (SPT)			WASHING BY TIME	INFILTRATION STUDY		DEPTH (m)			DESCRIPTION OF THE MATERIAL	REVEST ○
— 30cm INITIAL BLOWS / 30cm 10 20 30	BLOWS 30 cm INITIAL	LAST	cm/min	TEST N°	ABSORPTION K= cm/seg	GRAPHICS	CHANGE OF LAYER	CONVENTION GRAPHICS		○ = 100 mm
	4	5				0,00			Average and fine sand, silty, with organic material, not too compact, black.	
	3	4					0,85		Average and fine sand, not very silty, with organic material, soft, dark gray.	
	15	19					1,65		Average and sand, silty, with traces of organic material, compact, dark brown. - Incoherent sandston	
	25	28				2,00	2,80		Average sand with a bit of fine sand, clay silty, compact, yellowish brown. - Incoherent sandston	
	13	16					3,55		Average sand with a bit of fine and a bit of thick sand, silty, averagely compact, dark brown. - Incoherent sandston.	
	15	18				4,00	4,90		Fine and average sand, silty, averagely compact, dark brown.	
	22	27					6,00		Same as above, compact. - Incoherent sandston	
	26	30				6,00				
	30	37								
	25	29				8,00				
	25	31								
	25	28				10,00				
	26	30								
	24	29				12,00				
	24	27								
	2	3				14,00				
	3	4					14,85		Silty clay, soft, greenish gray and dark yellow.	
	2	3				16,00	16,64		Clay silty, with a bit of fine sand, soft, greenish gray.	
	4	5								
	3	4				18,00				
	1/53					20,00	19,78		Silty sandy clay, with traces of organic material, very soft, dark gray.	

OBSERVATION: Taken from a SHELBY sample

LOCALIZATION:

COORDINATES		QUOTA:	OPERATOR:	DATE		VERIFIED BY:
N=	E=		HERONIDES	I = 29/06/00	F= 30/06/00	

JICA	WORK: STUDY ON STORMWATER DRAINAGE AND SEWERAGE MANAGEMENT PLAN FOR RECIFE METROPOLITON AREA	PESQUISE	PROFILE OF SOIL INVESTIGATION
	LOCATE: PRAZERES SUB - SYSTEM JABOATÃO DOS GUARARAPES		SOUNDING N° SP.09

PERCUSSION (SPT)			WASHING BY TIME	INFILTRATION STUDY		DEPTH (m)			DESCRIPTION OF THE MATERIAL	REVEST. e
— 30cm INITIAL — 30cm LAST BLOWS / 30cm 10 20 30	BLOWS 30 cm INITIAL	LAST	cm/min	TEST N°	ABSORPTION K= cm/seg	GRAPHICS	CHANGE OF LAYER	CONVENTION GRAPHICS		
	1/53					20,00				
	1/61								Silty sandy clay, with traces of organic material, very soft, dark gray.	
	7	9				22,00	21,97			
	10	11								
	9	10				24,00			Average and fine sand, not very silty, averagely compact, light gray.	
	13	14								
	11	12				26,00				
	13	13								
	21	26				28,00	27,68		Average and thick sand with small rocks silty, compact, light gray.	
	34	69/25					28,73			
	71	50/15				30,00			Fine and average sand, not very silty, very compact, light gray.	
	53/27	50/12								
	72/25	50/10				32,00	32,25		End of Perforation	
						34,00				
						36,00				
						38,00				
						40,00				

OBSERVATION:

LOCALIZATION:

COORDINATES	QUOTA:	OPERATOR:	DATE	VERIFIED BY:
N= E=		HERONIDES	I = 26/06/00 F= 28/06/00	

JICA	WORK: STUDY ON STORNWATER DRAINAGE AND SEWERAGE MANAGEMENT PLAN FOR RECIFE METROPOLITON AREA	PESQUISE	PROFILE OF SOIL INVESTIGATION
	LOCATE: PRAZERES SUB - SYSTEM JABOATÃO DOS GUARARAPES		SOUNDING N° SP.09

PERCUSSION (SPT)			WASHING BY TIME	INFILTRATION STUDY		DEPTH (m)			DESCRIPTION OF THE MATERIAL	REVEST. ø
— 30cm INITIAL — 30cm LAST BLOWS / 30cm 10 20 30	BLOWS 30 cm INITIAL	LAST	cm/min	TEST Nº	ABSORPTION K= cm/seg	GRAPHICS	CHANGE OF LAYER	CONVENTION GRAPHICS		ø = 100 mm
	2	3				0,00	0,23		Average and fine sand, a bit silty, with fraces of organic material, soft, dark gray.	
	3	4								
	17	21				2,00	1,68		Average and fine sand, silty with organic material, compact and black. - Non-coherent sandstone	
	11	14					2,75		Average sand with a bit of fine sand anda bit of thick sand,silty, averagely compact, dark brown.	
	15	17				4,00	3,87		Thick sand with and fine sand, silty, with small rocks, averagely compact, dark brows. - Non-coherent sandstone	
	23	30					4,53		Fine sand with a bit of average sand, silty, with traces of organic material, compact, black and dark brown. - Non-coherent sandstone	
	14	19				6,00				
	16	23					6,76		Fine and average sand, silty, compact, dark brown. - Non-coherent sandstone	
	17	25				8,00				
	13	20					8,65		Medium sand with a bit of fine sand, compact, dark brown. - Non-coherent sandstone	
	13	17				10,00	10,00		Same as above, averagely compact.	
	15	16								
	13	14				12,00	11,57		Sandy-clay-silty, averagely compact, light gray.	
	11	13					12,55		Fine sand, average, compact, light gray.	
	9	11				14,00	13,85		Fine and average sand, silty with rare ond small rocks and dried sandy clay pieces, compact, grayish-yellow.	
	11	11								
	13	14				16,00				
	9	11					16,64		Fine and thick sand, silty with small stones, averagely compact, grayish and gray yellow.	
	3	4				18,00	17,95		Silty clay, with traces of organic material, soft, dark gray.	
	7	7					18,72		Fine sand with a bit of average sand, silty, a bit compact, whitish and yellowish gray.	
	7	8				20,00	19,87		Silty-sandy clay, medium, light gray.	

OBSERVATION:

LOCALIZATION:

COORDINATES	QUOTA:	OPERATOR:	DATE	VERIFIED BY:
N= E=			I = 04/07/00 F= 05/07/00	

JIC	WORK: STUDY ON STORNWATER DRAINAGE AND SEWERAGE MANAGEMENT PLAN FOR RECIFE METROPOLITON AREA	PESQUISE	PROFILE OF SOIL INVESTIGATION
	LOCATE: PRAZERES SUB - SYSTEM JABOATÃO DOS GUARARAPES		SOUNDING Nº SP.10

PERCUSSION (SPT)			WASHING BY TIME	INFILTRATION STUDY		DEPTH (m)			DESCRIPTION OF THE MATERIAL	REVEST. e
— 30cm INITIAL — 30cm LAST BLOWS / 30cm 10 20 30	BLOWS 30 cm INITIAL	LAST	cm/min	TEST Nº	ABSORPTION K= cm/seg	GRAPHICS	CHANGE OF LAYER	CONVENTION GRAPHICS		
	7	8				20,00			Silty sandy day, medium, light gray.	
	5	7								
	10	12				22,00	21,53		Average and fine sand, silty, not very clay, averagely compact, whitish gray and yellowish.	
	12	13								
	11	13				24,00				
	26	35					24,68		Average and fine sand, silty compact, light yellow and whitish gray.	
	30	41				26,00	26,00		Same as above, very compact.	
	36	46								
	38	60				28,00	27,84		Fine and average sand, clay silty, very compact, whitish gray and yellowsish.	
	43	58								
	38	58				30,00				
	43	58					31,45		End of Perforation	
						32,00				
						34,00				
						36,00				
						38,00				
						40,00				

OBSERVATION:

LOCALIZATION:

COORDINATES	QUOTA:	OPERATOR:	DATE	VERIFIED BY:
N= E=			I = 04/07/00 F= 05/07/00	

JICA	WORK: STUDY ON STORNWATER DRAINAGE AND SEWERAGE MANAGEMENT PLAN FOR RECIFE METROPOLITON AREA	PESQUISE	PROFILE OF SOIL INVESTIGATION
	LOCATE: PRAZERES SUB - SYSTEM JABOATÃO DOS GUARARAPES		SOUNDING Nº SP.10

Identification	Hole		SP-09	SP-10									
	Sample Depth	from	1500	453									
		to	1560	676									
	Register N°		5282	5285									
Gradation Analysis	Sieve - % Total Passing	2"											
		1"											
		3/8											
		N° 4											
		N° 8											
		N° 10		100									
		N° 16		96									
		N° 30		73									
		N° 40		40									
		N° 50	100	27									
		N° 100	95	11									
		N° 200	75	7									
	Hidron. %	Silt	35	3									
		Clay	40	4									
Liquid limit			41	NL									
Plasticity index			21	NP									
Degree of contraction			-	-									
Specific graerty of soil particles			2,55	2,60									
Unifed classification			CL	SM									
Uniconfined Compression Test	Water content		28,2	-									
	Compressive Strength (kgf / cm²)		0,32	-									
	Cohesion (kgf / cm²)		0,16	-									
Direct Shear	Cohesion (kgf / cm²)		-	-									
	Angle of internal friction (°)		-	-									
Free Expanding (%)	Water content		-	-									
	Degree of saturation		-	-									
	Expanding		-	-									
Field	Natural water content		31,7	19,3									
	Wet density		1,888	-									
	Dryness density		1,433	-									

Observation:

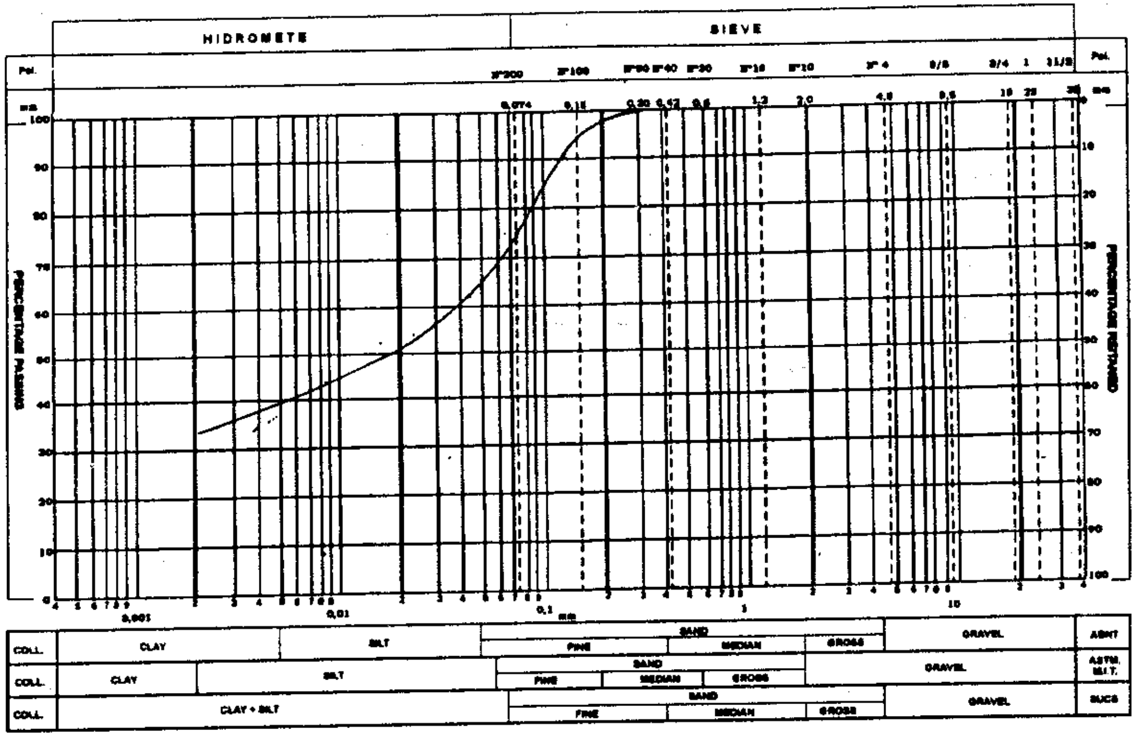
JICA	Work: STUDY ON STORMWATER DRAINAGE AND SEWERAGE MANAGEMENT PLAN FOR RECIFE METROPOLITON AREA	PESQUISE	SUMARY OF SOIL TEST
	Locate: PRAZERES SUB - SYSTEM JABOATÃO DOS GUARARAPES		PAGE N°

PHYSICS AND MECHANICS CHARACTERISTICS

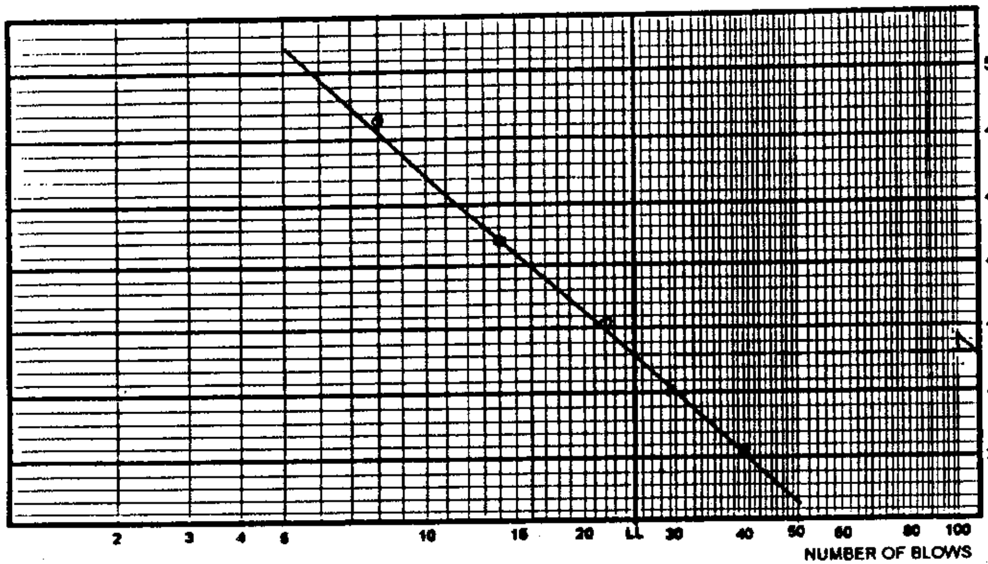
TEST OR DETERMINATION			RESULT
FIELD	NATURAL WATER CONTENT - %		-
	WET DENSITY - g / cm		-
	DRYNESS DENSITY - g / cm³		-
GRADATION ANALYSIS %	GRAVEL		-
	SAND	GROSS	-
		MEDIAN	-
		FINE	25
	SILT		35
	CLAY		40
SOIL CONSISTENCY TEST	LIQUID LIMIT		41
	PLASTICITY INDEX		21
	DEGREE OF CONTRACTION		-
SPECIFIC GRAVITY OF SOIL PARTICLES - (g / cm³)			2,55
UNICONFINED COMPRESSION TEST	WATER CONTENT - (%)		28,2
	COMPRESSIVE STRENGTH	Kgf / cm²	0,32
	COHESION	Kgf / cm²	0,16
DIRECT SHEAR	COHESION	Kgf / cm²	-
	ANGLE OF INTERNAL FRICTION		-
FREE EXPANDING - %	WATER CONTENT		-
	DEGREE OF SATURATION		-
	EXPANDING		-
UNIFED CLASSFICATION			CL

OBSERVATION:

GRADATION ANALYSIS



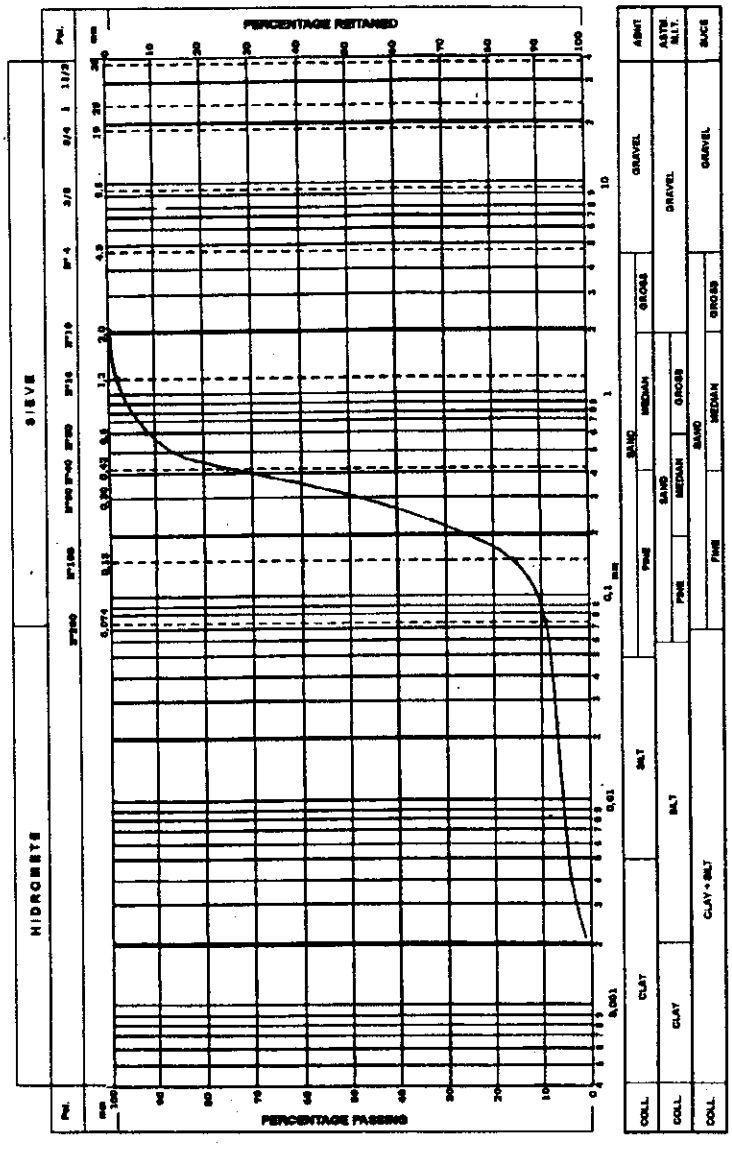
LIQUID LIMIT



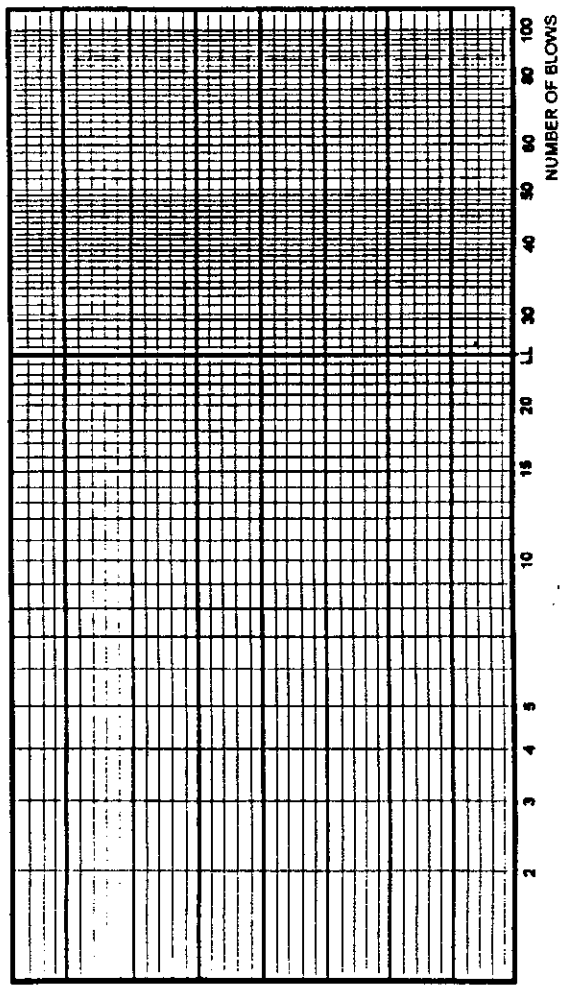
ORIGIN:	HOLE: SP-09	STAKE:	SAMPLES:	POSITION:	SAMPLE DEPTH: 1500 - 1560	DATE:

JICA	WORK: STUDY ON STORNWATER DRAINAGE AND SEWERAGE MANAGEMENT PLAN FOR RECIFE METROPOLITON AREA	PESQUISE	ESSAY GRÁPHIC
	LCOATE: PRAZERES SUB - SYSTEM RECIFE		REGISTER Nº: 5282

PHYSICS AND MECHANICS CHARACTERISTICS																				
RESULT	19,3	-	-	-	-	25	66	5	4	NL	NP	-	2,6	-	-	-	-	-	-	-	-
TEST OR DETERMINATION	NATURAL WATER CONTENT - %	WET DENSITY - g / cm	DRYNESS DENSITY - g / cm	GRAVEL	GROSS	MEDIAN	FINE	SILT	CLAY	LIQUID LIMIT	PLASTICITY INDEX	DEGREE OF CONTRACTION	SPECIFIC GRAVITY OF SOIL PARTICLES - (g / cm ³)	WATER CONTENT - (%)	COMPRESSIVE STRENGTH	COHESION	COHESION	ANGLE OF INTERNAL FRICTION	WATER CONTENT	DEGREE OF SATURATION	EXPANDING	UNIFED CLASSFICATION	OBSERVATION
	FIELD	GRADATION ANALYSIS %								SOIL CONSISTENCY TEST				UNICONFINED COMPRESSION TEST			DIRECT SHEAR		FREE EXPANDING - %				
					SAND									Kgf / cm²									



GRADATION ANALYSIS



LIQUID LIMIT

ORIGIN	HOLE: SP-10	STAKE:	SAMPLES:	POSITION:	SAMPLE DEPTH: 453 - 676	DATE:

JICA	WORK: STUDY ON STORNWATER DRAINAGE AND SEWERAGE MANAGEMENT PLAN FOR RECIFE METROPOLITON AREA	PESQUISE	ESSAY GRÁPHIC
	LCOATE: PRAZERES SUB - SYSTEM RECIFE		REGISTER Nº 5285

7. CURCURANA

PERCUSSION (SPT)			WASHING BY TIME (cm/min)	INFILTRATION STUDY		DEPTH (m)			DESCRIPTION OF THE MATERIAL	REVEST ϕ
— 30cm INITIAL -- 30cm LAST BLOWS / 30cm 10 20 30	BLOWS 30 cm INITIAL	BLOWS 30 cm LAST		TEST Nº	ABSORPTION K= cm/seg	GRAPHICS	CHANGE OF LAYER	CONVENTION GRAPHICS		

BLOWS INITIAL	BLOWS LAST
4	4
5	6
6	6
20	35
29	33
31	32
1	3/45
9	10
10	18
15	23
12	31
29	43
27	43
28	44
30	52
39	60
58	55/19
43	57
27	50
35	53
33	53

Graphics depth marks: 0,00; 2,00; 4,00; 6,00; 8,00; 10,00; 12,00; 14,00; 16,00; 18,00; 20,00

CHANGE OF LAYER	DESCRIPTION OF THE MATERIAL
0,20	Fine sand, not very silty, with vegetable plant roots, soft brownish gray.
1,00	Same as above, not too compact.
1,35	Fine sand, not too compact, light gray.
3,15	Fine sand silty, with traces of organic material, compact, dark brown and black. - Incoherent sandstone
3,97	Fine sand silty, compact, dark brown. - Incoherent sandstone
5,78	Silty sandy clay, soft, light gray.
6,97	Clay sandy silt medium greenish gray.
7,89	Fine and average sand, silty, not very clay, averagely compact, whitish gray.
9,17	Sandy clay silt, compact, light gray and greenish.
11,00	Same as above, very compact.
11,85	Clay sandy silty, hard, greenish gray.
16,93	Clay silty, hard, greenish gray.
18,34	Silty clay with shell fragments, hard, greenish gray.

REVEST: ϕ = 100mm

OBSERVATION: Taken from a SHELBY sample; Sample taken from the DENISON method

LOCALIZATION:

COORDINATES		QUOTA:	OPERATOR:	DATE		VERIFIED BY:
N=	E=		ABDIAS	I = 19/07/00	F= 21/07/00	

JICA	WORK: STUDY ON STORNWATER DRAINAGE AND SEWERAGE MANAGEMENT PLAN FOR RECIFE METROPOLITON AREA	PESQUISE	PROFILE OF SOIL INVESTIGATION
	LOCATE: CURCURANA SUB - SYSTEM JABOATÃO DOS GUARARAPES		SOUNDING Nº SP-11

PERCUSSION (SPT)			WASHING BY TIME	INFILTRATION STUDY		DEPTH (m)			DESCRIPTION OF THE MATERIAL	REVEST.
— 30cm INITIAL — 30cm LAST BLOWS / 30cm 10 20 30	BLOWS 30 cm INITIAL	LAST	cm/min	TEST Nº	ABSORPTION K= cm/seg	GRAPHICS	CHANGE OF LAYER	CONVENTION GRAPHICS		
	33	53				20,00			Silty clay with shell fragments, hard, greenish gray.	
	45	59/20					20,96			
	58	60/19				22,00			Clay silty, hard, grayish brown and greenish gray.	
	58	60/20					23,35			
						24,00			End of Perforation	
						26,00				
						28,00				
						30,00				
						32,00				
						34,00				
						36,00				
						38,00				
						40,00				

OBSERVATION:

LOCALIZATION:

COORDINATES	QUOTA:	OPERATOR:	DATE	VERIFIED BY:
N= E=		ABDIAS	I = 19/07/00 F= 21/07/00	

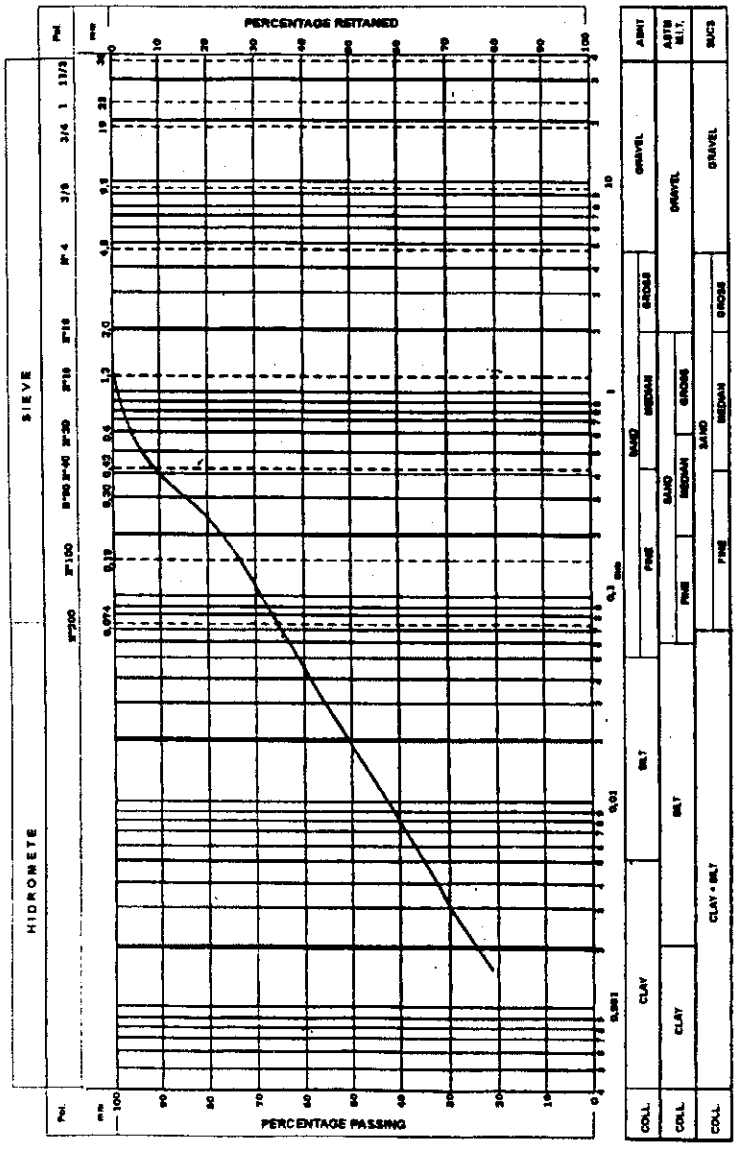
JICA	WORK: STUDY ON STORMWATER DRAINAGE AND SEWERAGE MANAGEMENT PLAN FOR RECIFE METROPOLITON AREA	PESQUISE	PROFILE OF SOIL INVESTIGATION
	LOCATE: CURCURANA SUB - SYSTEM JABOATÃO DOS GUARARAPES		SOUNDING Nº SP-11

Identification	Hole		SP-11	SP-11	SP-11								
	Sample Depth	from	600	1000	1200								
		to	660	1060	1260								
	Register Nº		5314	5315	5316								
Gradation Analysis	Sieve - % Total Passing	2"											
		1"											
		3/8											
		Nº 4											
		Nº 8											
		Nº 10		100	100								
		Nº 16	100	98	99								
		Nº 30	97	94	98								
		Nº 40	92	90	97								
		Nº 50	85	87	95								
		Nº 100	73	78	86								
		Nº 200	66	68	76								
	Hidron. %	Silt	26	44	36								
		Clay	35	18	36								
Liquid limit			41	39	42								
Plasticity index			23	18	20								
Degree of contraction													
Specific graerty of soil particles			2,54	2,56	2,55								
Unifed classification			CL	CL	CL								
Unicontined Compression Test	Water content		35,5	30,2	28,8								
	Compressive Strength (kgf / cm²)		0,51	1,61	1,88								
	Cohesion (kgf / cm²)		0,25	0,80	0,94								
Direct Shear	Cohesion (kgf / cm²)												
	Angle of internal friction (°)												
Free Expanding (%)	Water content												
	Degree of saturation												
	Expanding												
Field	Natural water content		34,1	30,4	29,6								
	Wet density		1,956	2,023	2,640								
	Dryness density												

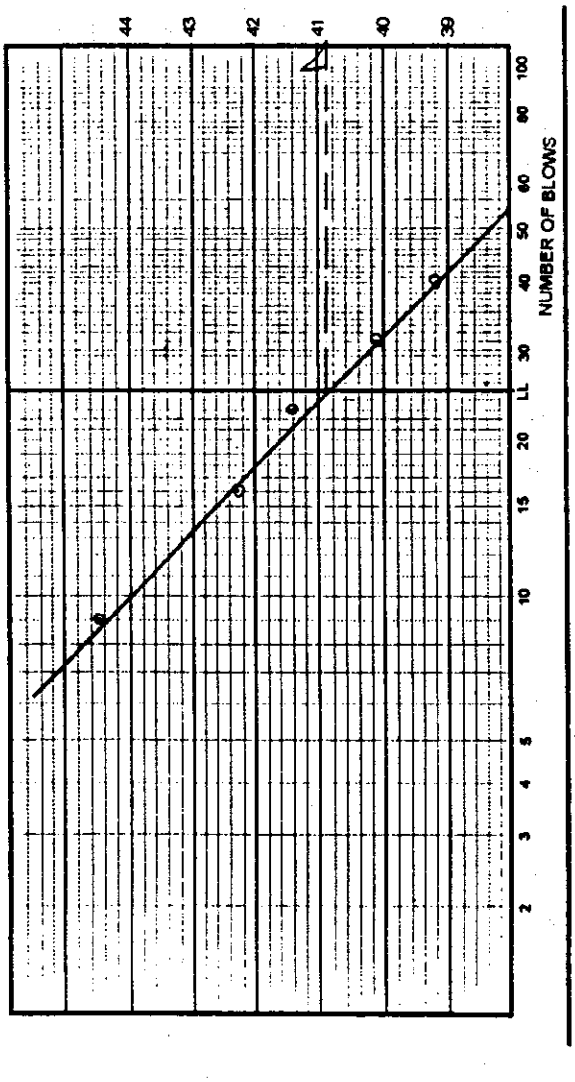
Observation:

JICA	Work: STUDY ON STORNWATER DRAINAGE AND SEWERAGE MANAGEMENT PLAN FOR RECIFE METROPOLITON AREA	PESQUISE	SUMARY OF SOIL TEST
	Locate: CURCURANA SUB - SYSTEM JABOATÃO DOS GUARARAPES		PAGE Nº:

PHYSICS AND MECHANICS CHARACTERISTICS																				
TEST OR DETERMINATION	RESULT																			
NATURAL WATER CONTENT - %	34,1																			
WET DENSITY - g / cm³	1,956																			
DRYNESS DENSITY - g / cm³	-																			
GRAVEL	-																			
SAND	GROSS	-																		
	MEDIAN	8																		
	FINE	31																		
SILT		26																		
CLAY		35																		
LIQUID LIMIT		-																		
PLASTICITY INDEX		-																		
DEGREE OF CONTRACTION		-																		
SPECIFIC GRAVITY OF SOIL PARTICLES - (g / cm³)		2,54																		
WATER CONTENT - (%)		35,5																		
COMPRESSIVE STRENGTH - Kgf / cm²		0,51																		
COHESION		0,25																		
COHESION		-																		
ANGLE OF INTERNAL FRICTION		-																		
WATER CONTENT		-																		
DEGREE OF SATURATION		-																		
EXPANDING		-																		
UNIFED CLASSFICATION		CL																		
OBSERVATION:																				
FIELD		GRADATION ANALYSIS %								SOIL CONSISTENCY TEST			UNICONFINED COMPRESSION TEST			DIRECT SHEAR		FREE EXPANDING - %		



GRADATION ANALYSIS



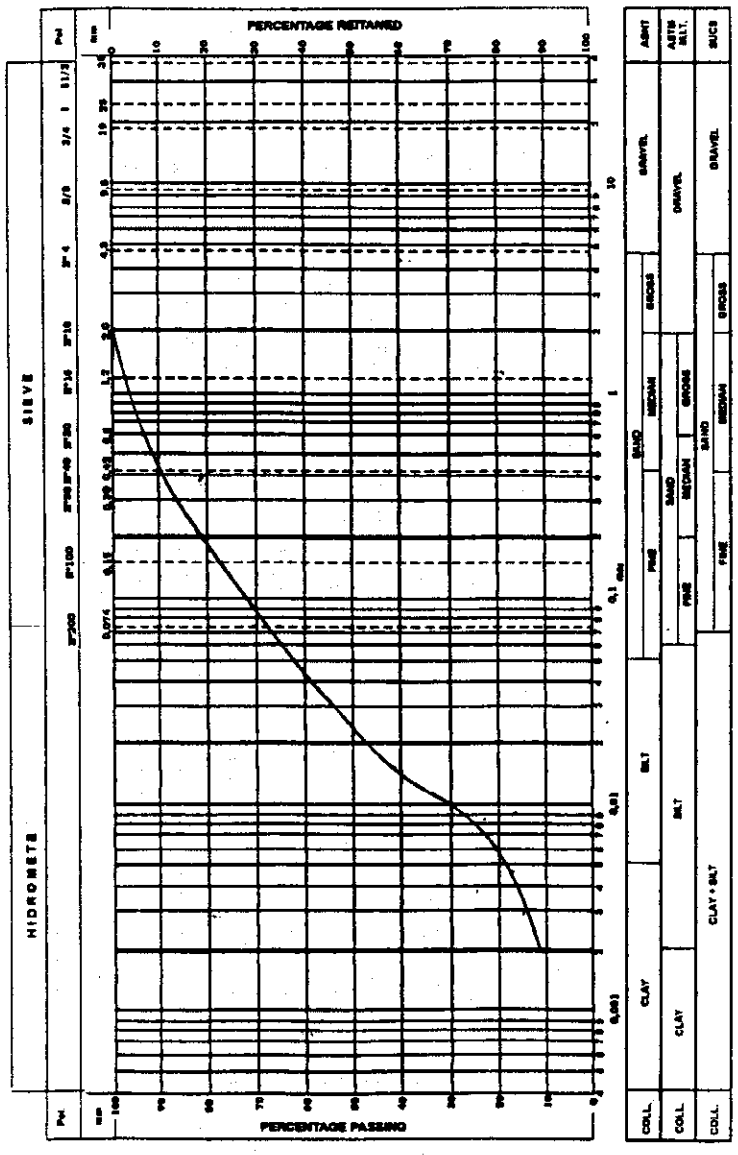
LIQUID LIMIT

ORIGIN	HOLE	STAKE	SAMPLES	POSITION	SAMPLE DEPTH	DATE
	SP-11				600 - 660	

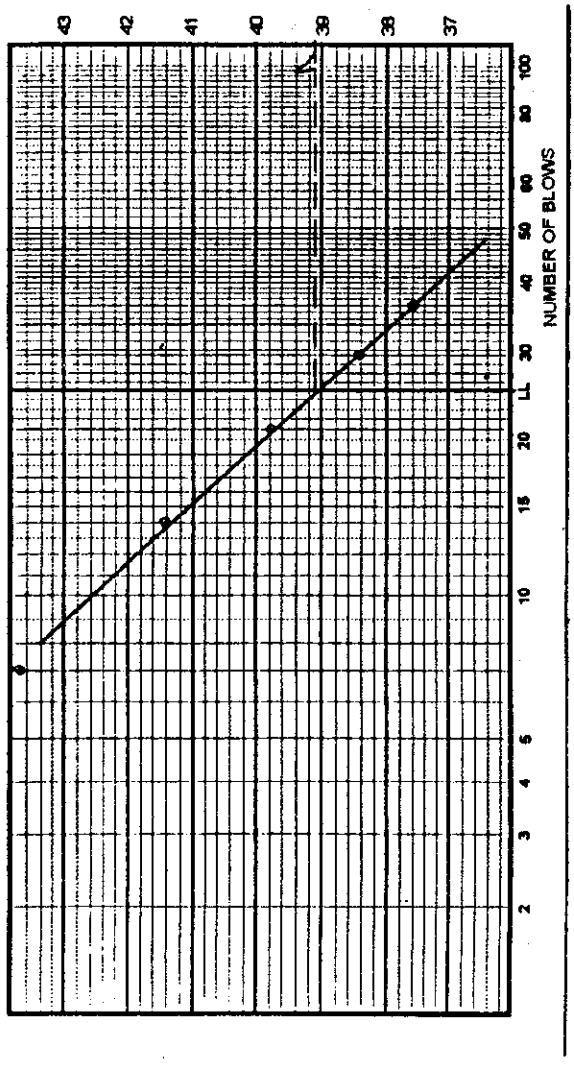
JICA	WORK: STUDY ON STORMWATER DRAINAGE AND SEWERAGE MANAGEMENT PLAN FOR RECIFE METROPOLITON AREA	PESQUISE	ESSAY GRÁPHIC
	LCOATE: CURCURANA SUB - SYSTEM JABOATÃO DOS GUARARAPES		REGISTER Nº: 5314

PHYSICS AND MECHANICS CHARACTERISTICS	RESULT
NATURAL WATER CONTENT - %	30,4
WET DENSITY - g / cm	2,023
DRYNESS DENSITY - g / cm	-
GRAVEL	-
SAND — GROSS	-
SAND — MEDIAN	10
SAND — FINE	28
SILT	44
CLAY	18
LIQUID LIMIT	39
PLASTICITY INDEX	21
DEGREE OF CONTRACTION	-
SPECIFIC GRAVITY OF SOIL PARTICLES - (g / cm³)	2,56
WATER CONTENT - (%)	30,2
COMPRESSIVE STRENGTH (Kgf / cm²)	1,61
COHESION	0,80
COHESION	-
ANGLE OF INTERNAL FRICTION	-
WATER CONTENT	-
DEGREE OF SATURATION	-
EXPANDING	-
UNIFIED CLASSFICATION	CL
OBSERVATION	

TEST OR DETERMINATION	FIELD	GRADATION ANALYSIS %	SOIL CONSISTENCY TEST	SPECIFIC GRAVITY OF SOIL PARTICLES	UNICONFINED COMPRESSION TEST	DIRECT SHEAR	FREE EXPANDING - %	UNIFIED CLASSFICATION	OBSERVATION



GRADATION ANALYSIS

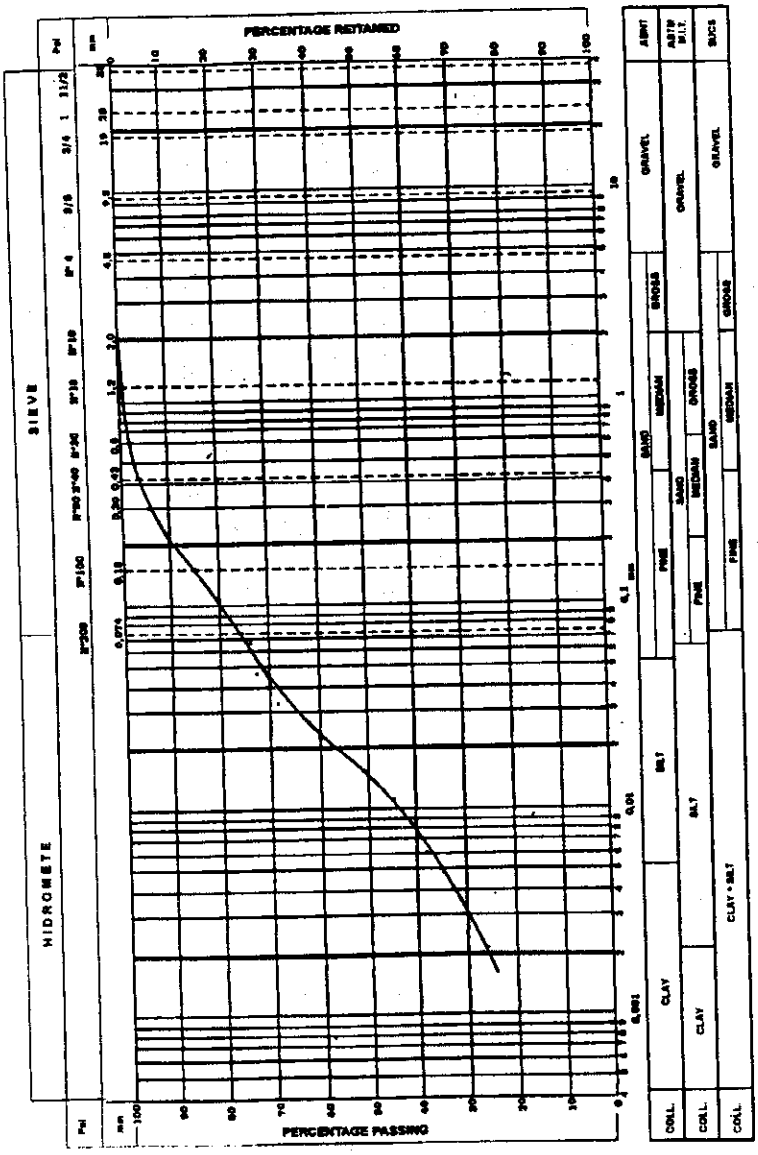


LIQUID LIMIT

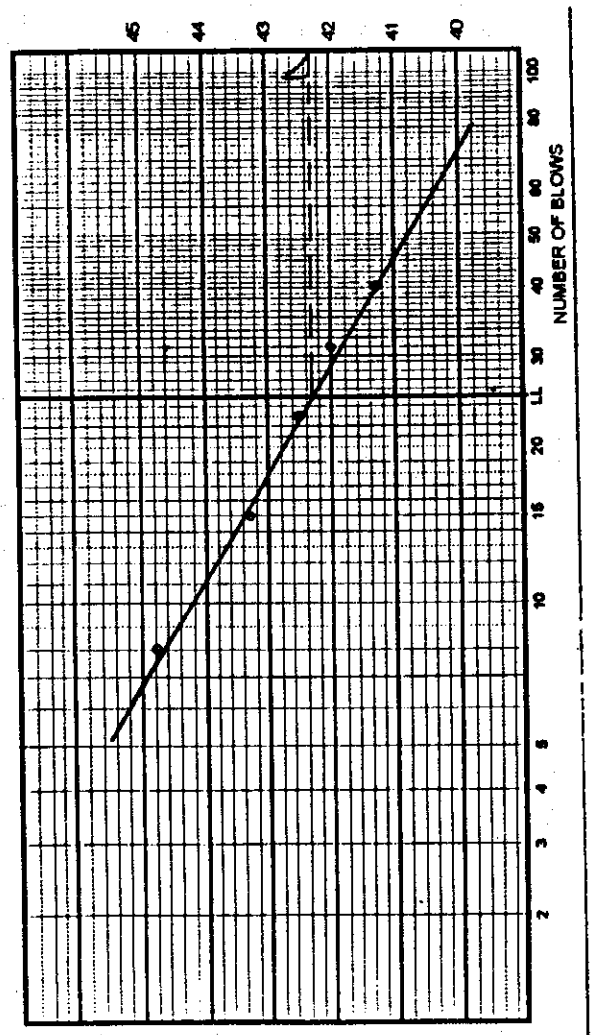
ORIGIN	HOLE: SP-11	STAKE	SAMPLES	POSITION	SAMPLE DEPTH: 1000 - 1060	DATE

JICA	WORK: STUDY ON STORMWATER DRAINAGE AND SEWERAGE MANAGEMENT PLAN FOR RECIFE METROPOLITON AREA	PESQUISE	ESSAY GRÁPHIC
	LOCATE: CURCURANA SUB - SYSTEM JABOATÃO DOS GUARARAPES		REGISTER Nº: 5315

PHYSICS AND MECHANICS CHARACTERISTICS																				
TEST OR DETERMINATION	RESULT	NATURAL WATER CONTENT - %	WET DENSITY - g / cm³	DRYNESS DENSITY - g / cm³	GRAVEL	GROSS	MEDIAN	FINE	SAND	SILT	CLAY	LIQUID LIMIT	PLASTICITY INDEX	DEGREE OF CONTRACTION	SPECIFIC GRAVITY OF SOIL PARTICLES - (g / cm³)	WATER CONTENT - (%)	COMPRESSIVE STRENGTH	COHESION	COHESION	ANGLE OF INTERNAL FRICTION	WATER CONTENT	DEGREE OF SATURATION	EXPANDING	UNIFED CLASSFICATION	OBSERVATION.
		29,6	2,640	-	-	-	3	25	36	36	-	-	-	2,55	28,8	1,88	0,94	-	-	-	-	-	CL	
															Kgf / cm²									
FIELD		GRADATION ANALYSIS %										SOIL CONSISTENCY TEST			SPECIFIC GRAVITY OF SOIL PARTICLES - (g / cm³)	UNICONFINED COMPRESSION TEST			DIRECT SHEAR		FREE EXPANDING - %				



GRADATION ANALYSIS



LIQUID LIMIT

ORIGIN	HOLE: SP-11	STAKE	SAMPLES:	POSITION	SAMPLE DEPTH: 1200 - 1260	DATE
JICA	WORK: STUDY ON STORMWATER DRAINAGE AND SEWERAGE MANAGEMENT PLAN FOR RECIFE METROPOLITON AREA			PESQUISE	ESSAY GRÁPHIC	
	LCOATE: CURCURANA SUB - SYSTEM JABOATÃO DOS GUARARAPES				REGISTER Nº: 5316	

8. RESULTS OF LABORATORY TEST

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TABLE I

RESULTS OF THE STUDIES ON SIMPLE COMPRESSION

Location	Probing n^0	Depth (m)	CP	Initial Humidity (%)	Resistance to compression (kgf/cm^2)	Resistance to medium compression (kgf/cm^2)	Cohesion (kgf/cm^2)
CABANGA SUB - SYSTEM	SP-01	3,00 – 3,60	01 02 03	**52,9** **53,3** **57,9**	0,49 0,48 0,42	0,46	0,23
CABANGA SUB - SYSTEM	SP-02	5,00 – 5,60	01 02 03	**71,1** **75,7** **73,5**	0,29 0,24 0,21	0,25	0,12
CABANGA SUB - SYSTEM	SP-02	10,00 –10,60	01 02 03	**15,9** **23,7** **17,1**	0,51 0,24 0,30	0,35	0,18
JANGA SUB - SYSTEM	SM-03	2,00 – 2,50	01 02 03	**24,7** **24,2** **37,2**	2,09 1,35 0,54	1,99	0,99
JANGA SUB - SYSTEM	SM-03	5,00 – 5,50	01 02 03	**38,8** **34,3** **37,2**	1,30 0,66 0,85	0,94	0,47
CORDEIRO SUB - SYSTEM	SP-08	3,40 – 4,00	01 02 03	**35,2** **31,4** **32,5**	0,10 0,09 0,06	0,08	0,04
CORDEIRO SUB - SYSTEM	SP-08	8,30 – 8,90	01 02 03	**165,3** **226,8** **206,6**	1,39 1,03 0,21	0,88	0,44
CORDEIRO SUB - SYSTEM	SP-08	7,00 – 7,60	01 02 03	**57,0** **58,8** **57,9**	0,08 0,06 0,05	0,06	0,03
CORDEIRO SUB - SYSTEM	SP-08	10,00 – 10,60	01 02 03	**76,2** **71,6** **73,8**	0,07 0,20 0,18	0,15	0,08
PRAZERES SUB - SYSTEM	SP-09	15,00 – 15,60	01 02 03	**28,1** **28,5** **27,9**	0,32 0,36 0,29	0,32	0,16

* Notice that there many humidity variables of up to 61% in the same Shelby. In these cases the "Average" cohesion needs attention whem interpreting and using.

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TABLE I

RESULTS OF THE STUDIES ON SIMPLE COMPRESSION

Location	Probing n^0	Depth (m)	CP	Initial Humidity! (%)	Resistance to compression (kgf/cm^2)	Resistance to medium compression (kgf/cm^2)	Cohesion (kgf/cm^2)
BOA VIAGEM SUB - SYSTEM	SP-12	2,00 - 2,60	01 02 03	**20,6** **20,7** **20,9**	0,28 0,30 0,27	**0,28**	0,14
BOA VIAGEM SUB - SYSTEM	SP-12	3,40 – 4,00	01 02 03	**22,5** **22,3** **23,5**	0,18 0,17 0,18	**0,18**	0,09
BOA VIAGEM SUB - SYSTEM	SP-15	2,00 – 2,60	01 02 03	**28,7** **27,3** **28,3**	1,38 1,17 1,26	**1,27**	0,63
BOA VIAGEM SUB - SYSTEM	SP-15	7,00 – 7,60	01 02 03	**23,4** **24,1** **22,2**	1,55 1,22 1,51	**1,43**	0,71
CURCURANA SUB - SYSTEM	SP-11	6,00 - 6,60	01 02 03	**36,1** **33,2** **37,2**	0,48 0,53 0,54	**0,51**	0,25
CURCURANA SUB - SYSTEM	SP-11	10,00 - 10,60	01 02 03	**30,2** **29,6** **30,9**	1,49 1,58 1,76	**1,61**	0,80
CURCURANA SUB - SYSTEM	SP-11	12,00 - 12,60	01 02 03	**28,3** **27,9** **30,2**	1,98 2,01 1,65	**1,88**	0,94
CONCEIÇÃO SUB - SYSTEM	SP-13	12,00 - 12,60	01 02 03	**29,2** **26,7** **30,1**	2,31 2,63 1,98	**2,30**	1,15
CONCEIÇÃO SUB - SYSTEM	SP-14	12,50 - 13,10	01 02 03	**25,2** **26,3** **25,8**	1,67 1,50 1,86	**1,67**	0,83
CONCEIÇÃO SUB - SYSTEM	SP-14	14,50 – 15,10	01 02 03	**26,1** **24,3** **24,8**	1,93 1,88 2,07	**1,96**	0,98

* Notice that there many humidity variables of up to 61% in the same Shelby. In these cases the "Average" cohesion needs attention whem interpreting and using.

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TABLE II

RESULT OF THE DIRECT SHEAR

Location	Sample N°	Depth (m)	TEST N°	Natural Humidity (%)	Cohesion (kgf/cm^2)	Angle of internal friction (^{0})
JANGA SUB - SYSTEM	BLOCK SM-04	2,50 - 2,80	01	25,44	0,10	25
			02	26,65		
			03	26,37		
			04	26,13		

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TABLE III

RESULTS OF THE STUDIES AND SAMPLES ON SPECIFIC MASS OF APPARENT HUMIDITY AND HUMIDITY IN THE NATURAL STATE AS FOUND IN SOIL

Location	Probing N°	Depth (m)	Natural Humidity of soil (%)	Specific and apparent humidity mass (g/cm^3)
CABANGA SUB - SYSTEM	**SP 01**	3,00 - 3,60	40,9	1,857
CABANGA SUB - SYTEM	**SP 02**	5,00 - 5,60	80,4	1,550
CABANGA SUB - SYSTEM	**SP 02**	10,00 - 10,60	44,3	1,871
JANGA SUB - SYSTEM	**SM 03**	2,00 - 2,50	26,4	1,928
JANGA SUB - SYSTEM	**SM 03**	5,00 - 5,50	37,9	1,940
JANGA SUB - SYSTEM	**SM 04 *(BL)**	2,50 - 2,80	29,0	1,873
CORDEIRO SUB - SYSTEM	**SP 08**	3,40 - 4,00	32,9	1,333
CORDEIRO SUB - SYSTEM	**SP 08**	8,30 - 8,90	123,6	1,333
CORDEIRO SUB - SYSTEM	**SP 08**	7,00 - 7,60	49,4	1,740
CORDEIRO SUB - SYSTEM	**SP 08**	10,00 - 10,60	70,8	1,453
PRAZERES - SUB - SYSTEM	**SP 09**	15,00 - 15,60	31,7	1,888

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TABLE III

RESULTS OF THE STUDIES AND SAMPLES ON SPECIFIC MASS OF APPARENT HUMIDITY AND HUMIDITY IN THE NATURAL STATE AS FOUND IN SOIL

Location	Probing Nº	Depth (m)	Natural Humidity of soil (%)	Specific and apparent humidity mass (g/cm^3)
BOA VIAGEM SUB - SYSTEM	**SP 12**	2,00 - 2,60	20,5	1,826
BOA VIAGEM SUB - SYSTEM	**SP 12**	3,40 - 4,00	21,8	1,986
BOA VIAGEM SUB - SYSTEM	**SP 15**	2,00 - 2,60	27,4	2,061
BOA VIAGEM SUB - SYSTEM	**SP 15**	7,00 - 7,60	22,2	1,968
CURCURANA SUB - SYSTEM	**SM 11**	6,00 - 6,60	34,1	1,956
CURCURANA SUB - SYSTEM	**SP 11**	10,00 - 10,60	30,4	2,023
CURCURANA SUB - SYSTEM	**SP 11**	12,00 - 12,60	29,6	2,064
CONCEIÇÃO SUB - SYSTEM	**SP 13**	12,00 - 12,60	27,5	2,014
CONCEIÇÃO SUB -SYSTEM	**SP 14**	12,50 - 13,10	24,6	1,932
CONCEIÇÃO SUB - SYSTEM	**SP 14**	14,50 - 15,10	24,1	1,947

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TABLE IV

RESULT OF THE FREE EXPANSION HIDRAULIC TEST

Location	Sample Nº	Depth (m)	Humidity (%)	Saturation Level (%)	Expansion (%)
JANGA SUB - SYSTEM	SM 04 * BLOCK	2,50 - 2,80	8,69	37	29

DATA BOOK C

DRAWINGS

DATA BOOK OF DRAWINGS

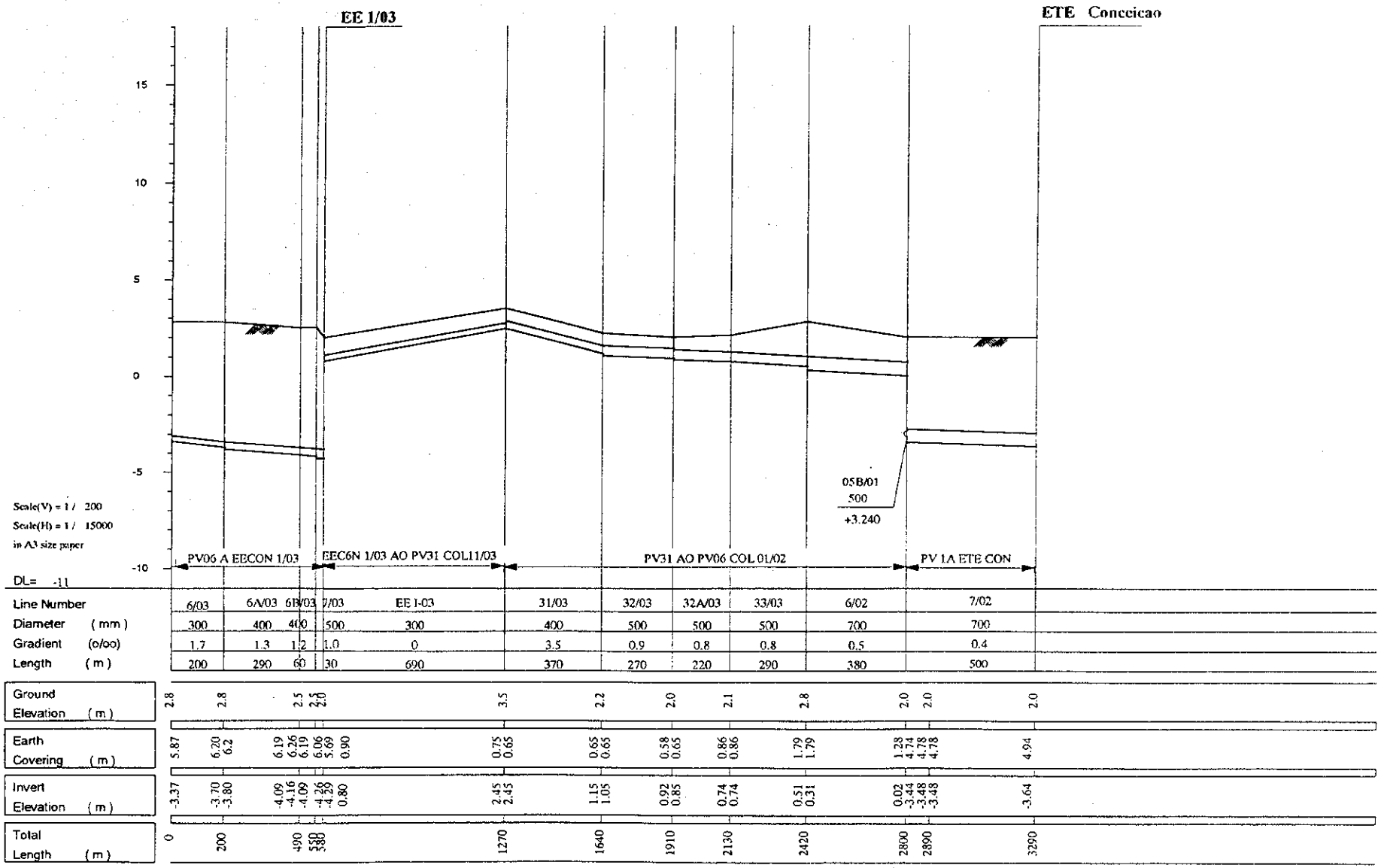


Fig.C-1 Longitudinal Profile of Proposed Sewer to Conceicao-1

THE STUDY ON STORM WATER DRAINAGE AND SEWERAGE MANEGEMENT PLAN FOR RMR

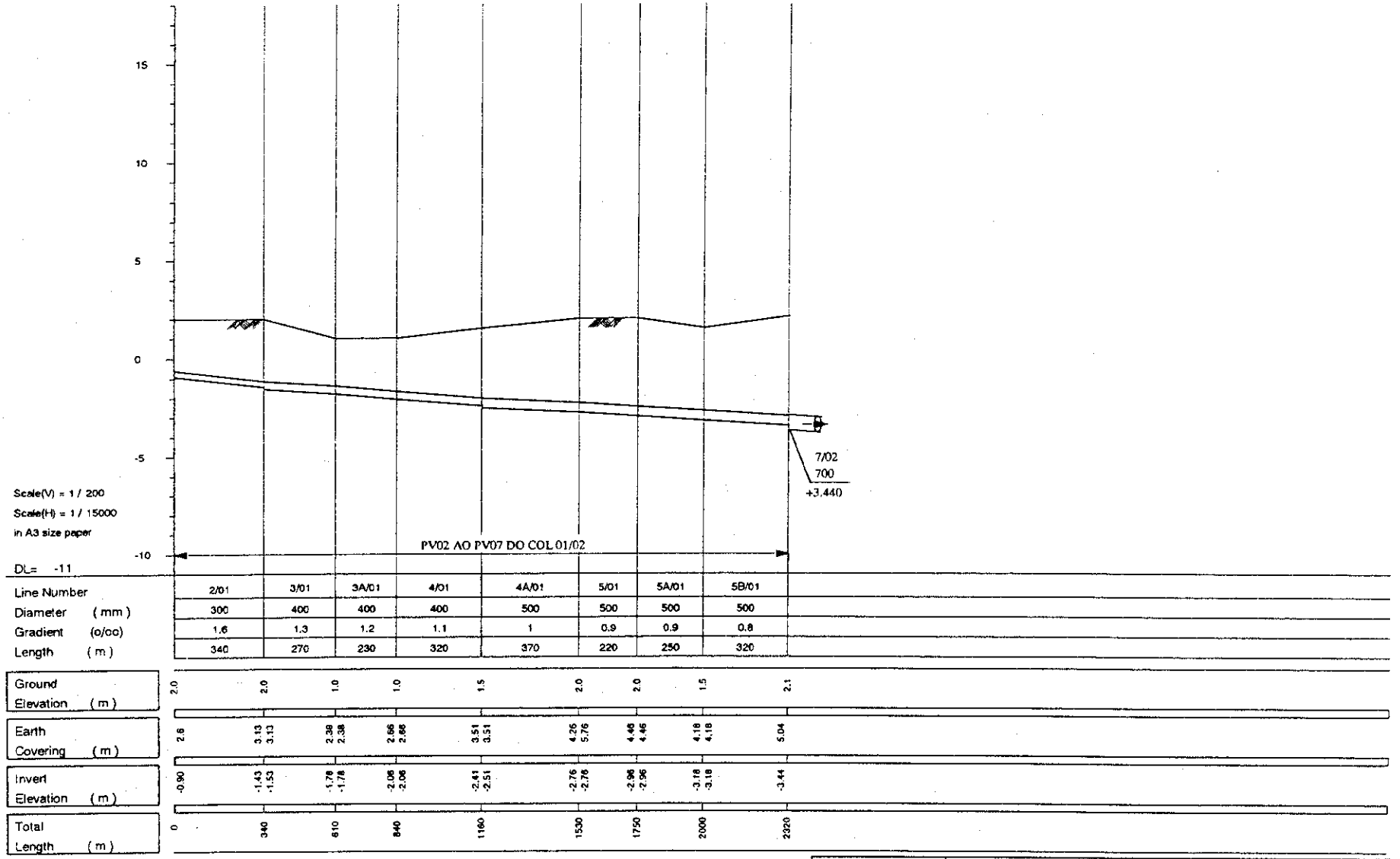
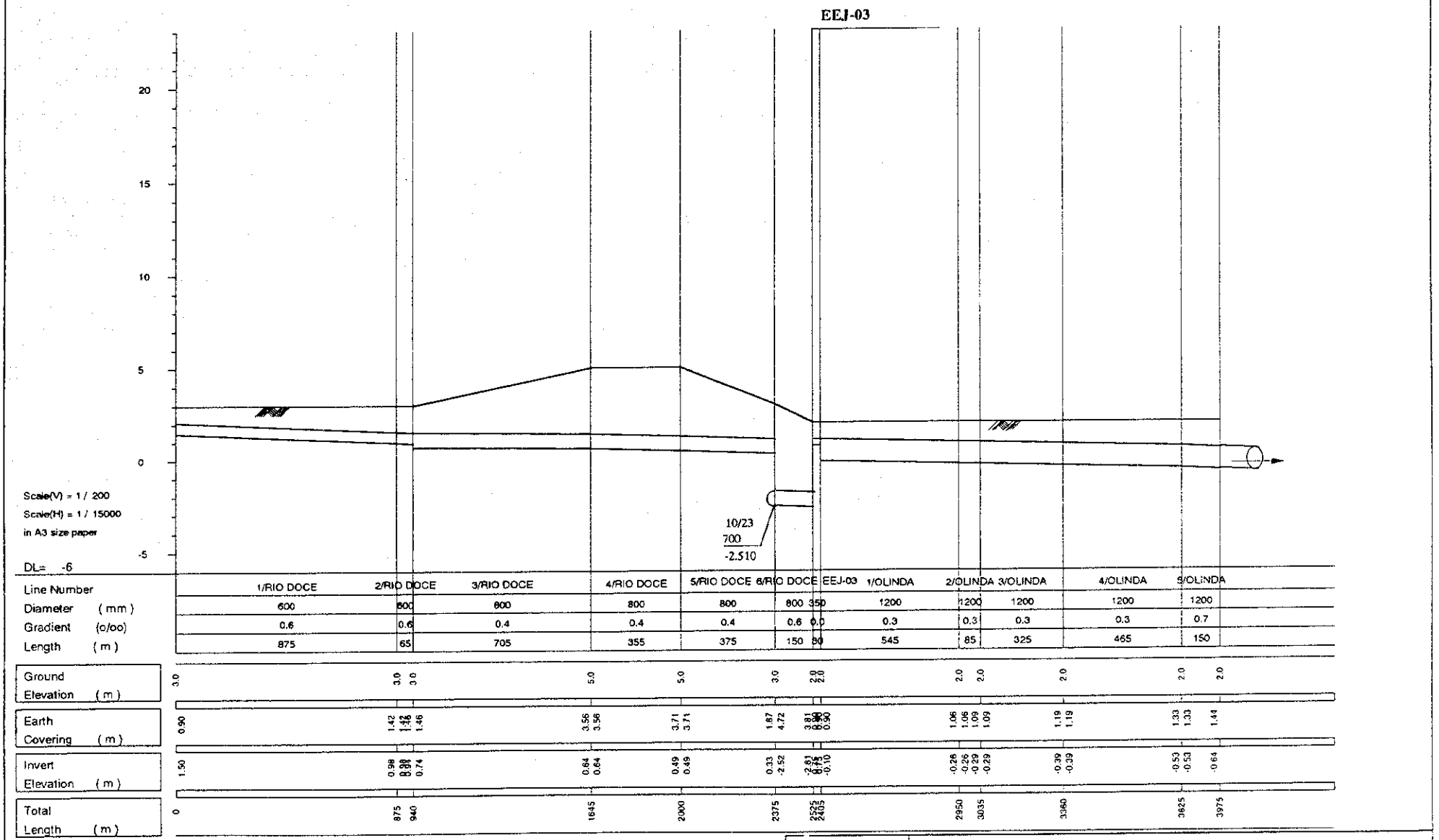


Fig.C-2 Longitudinal Profile of Proposed Sewer to Conceicao-2

THE STUDY ON STORM WATER DRAINAGE AND SEWERAGE MANEGEMENT PLAN FOR RMR



Line Number	1/RIO DOCE	2/RIO DOCE	3/RIO DOCE	4/RIO DOCE	5/RIO DOCE	6/RIO DOCE	EEJ-03	1/OLINDA	2/OLINDA	3/OLINDA	4/OLINDA	5/OLINDA
Diameter (mm)	600	600	600	800	800	800	350	1200	1200	1200	1200	1200
Gradient (o/oo)	0.6	0.6	0.4	0.4	0.4	0.6	0.0	0.3	0.3	0.3	0.3	0.7
Length (m)	875	65	705	355	375	150	30	545	85	325	465	150
Ground Elevation (m)	3.0	3.0	3.0	5.0	5.0	3.0	2.0	2.0	2.0	2.0	2.0	2.0
Earth Covering (m)	0.90	1.42	1.46	3.56	3.71	1.87	4.72	1.06	1.09	1.19	1.33	1.44
Invert Elevation (m)	1.50	0.98	0.74	0.64	0.49	0.33	-2.52	-0.26	-0.29	-0.39	-0.53	-0.64
Total Length (m)	0	875	940	1645	2000	2375	2525	2950	3035	3360	3825	3975

Fig.C-3 Longitudinal Profile of Proposed Sewer to Janga 1-1

THE STUDY ON STORM WATER DRAINAGE AND SEWERAGE MANEGEMENT PLAN FOR RMR

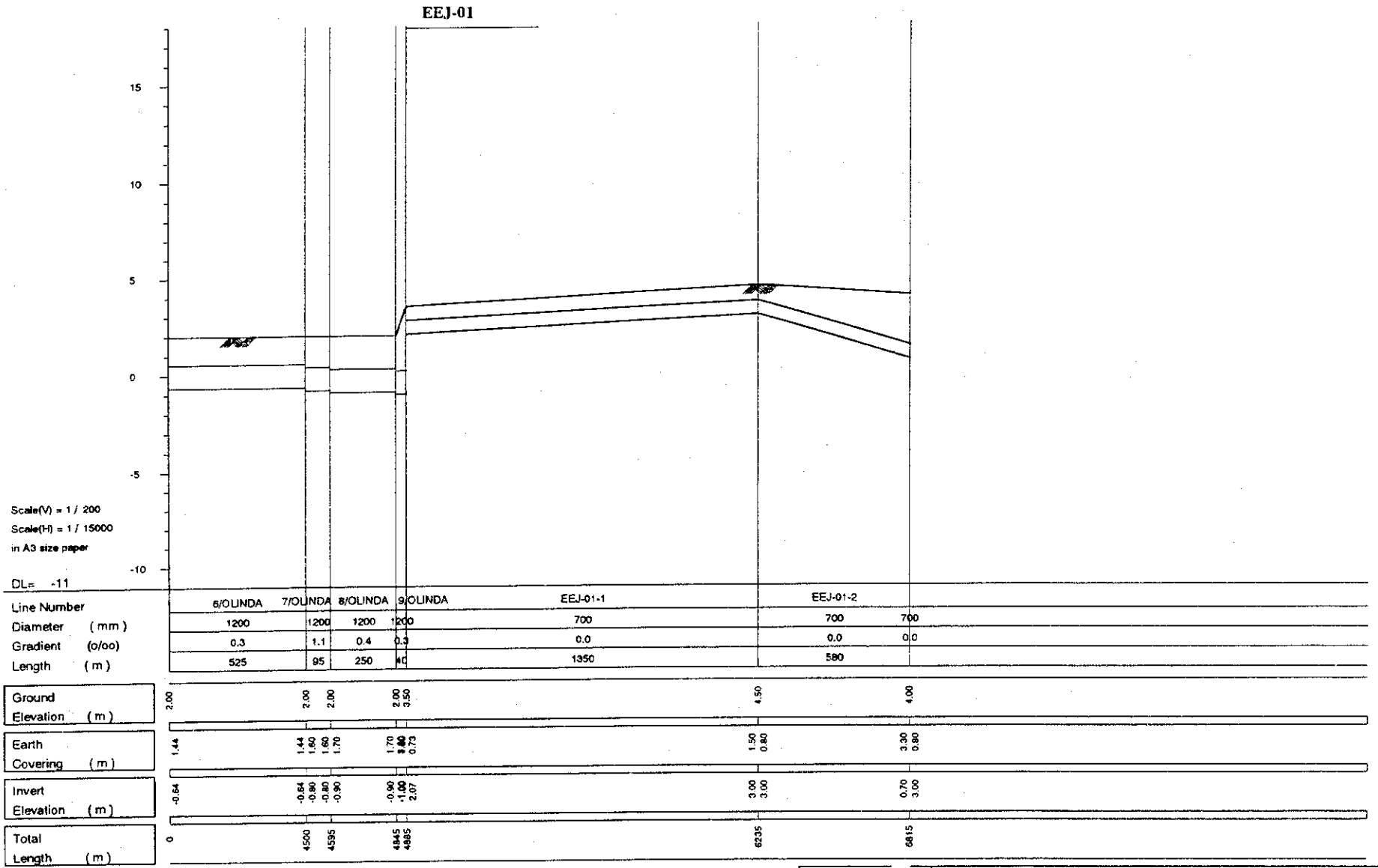


Fig.C-4 Longitudinal Profile of Proposed Sewer to Janga 1-2

THE STUDY ON STORM WATER DRAINAGE AND SEWERAGE MANEGEMENT PLAN FOR RMR

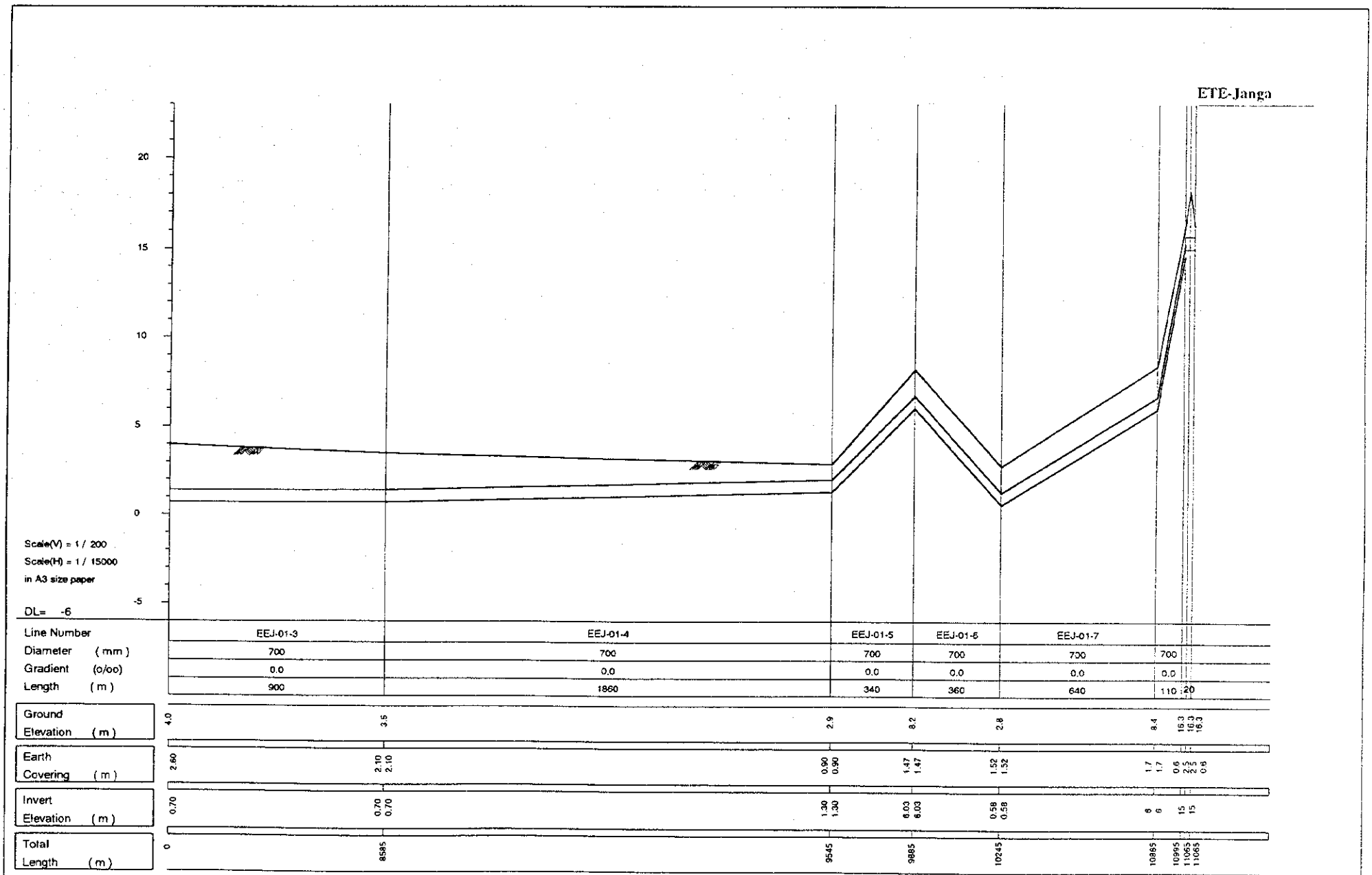


Fig.C-5 Longitudinal Profile of Proposed Sewer to Janga 1-3

THE STUDY ON STORM WATER DRAINAGE AND SEWERAGE MANEGEMENT PLAN FOR RMR

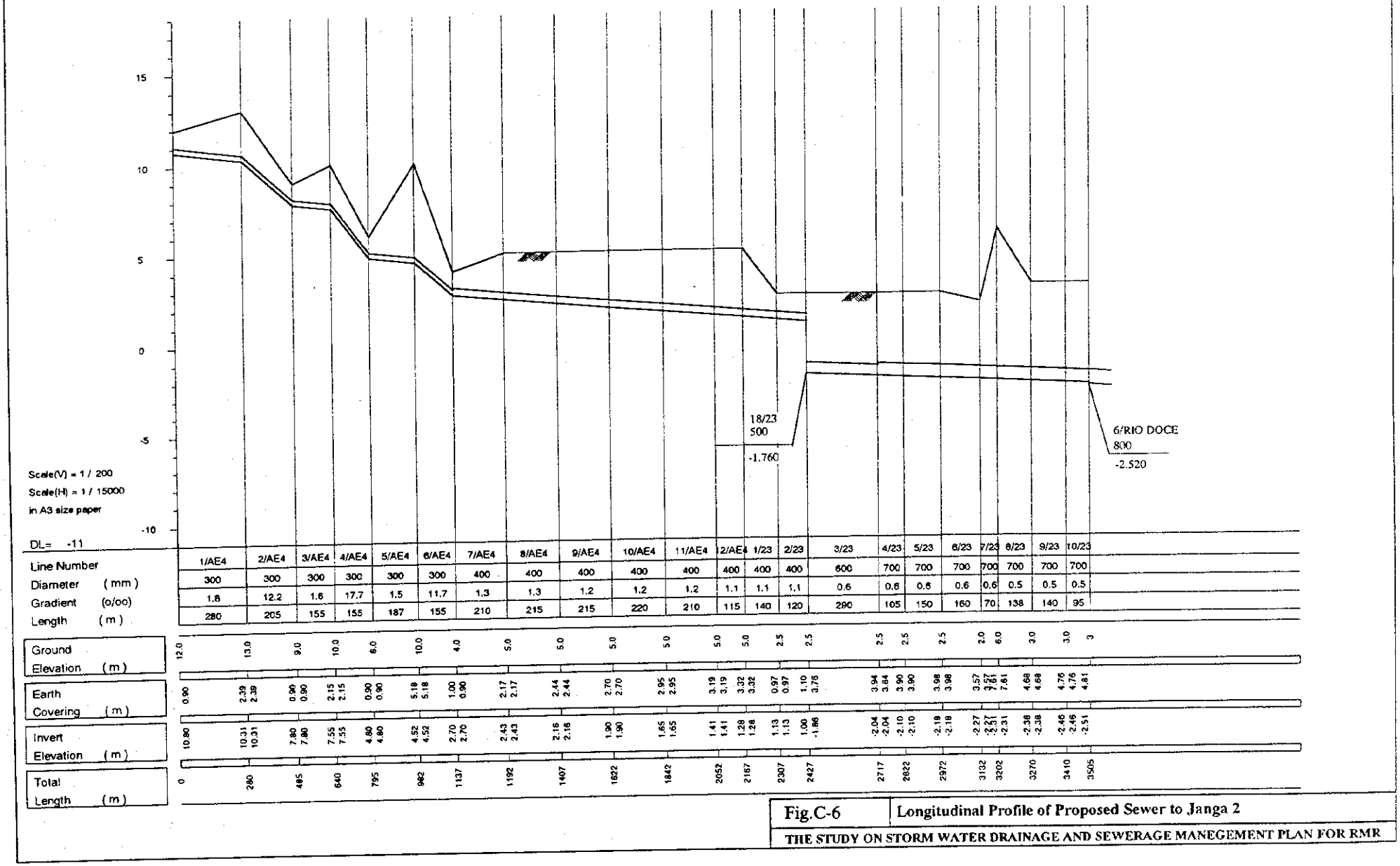


Fig.C-6 Longitudinal Profile of Proposed Sewer to Janga 2

THE STUDY ON STORM WATER DRAINAGE AND SEWERAGE MANEGEMENT PLAN FOR RMR

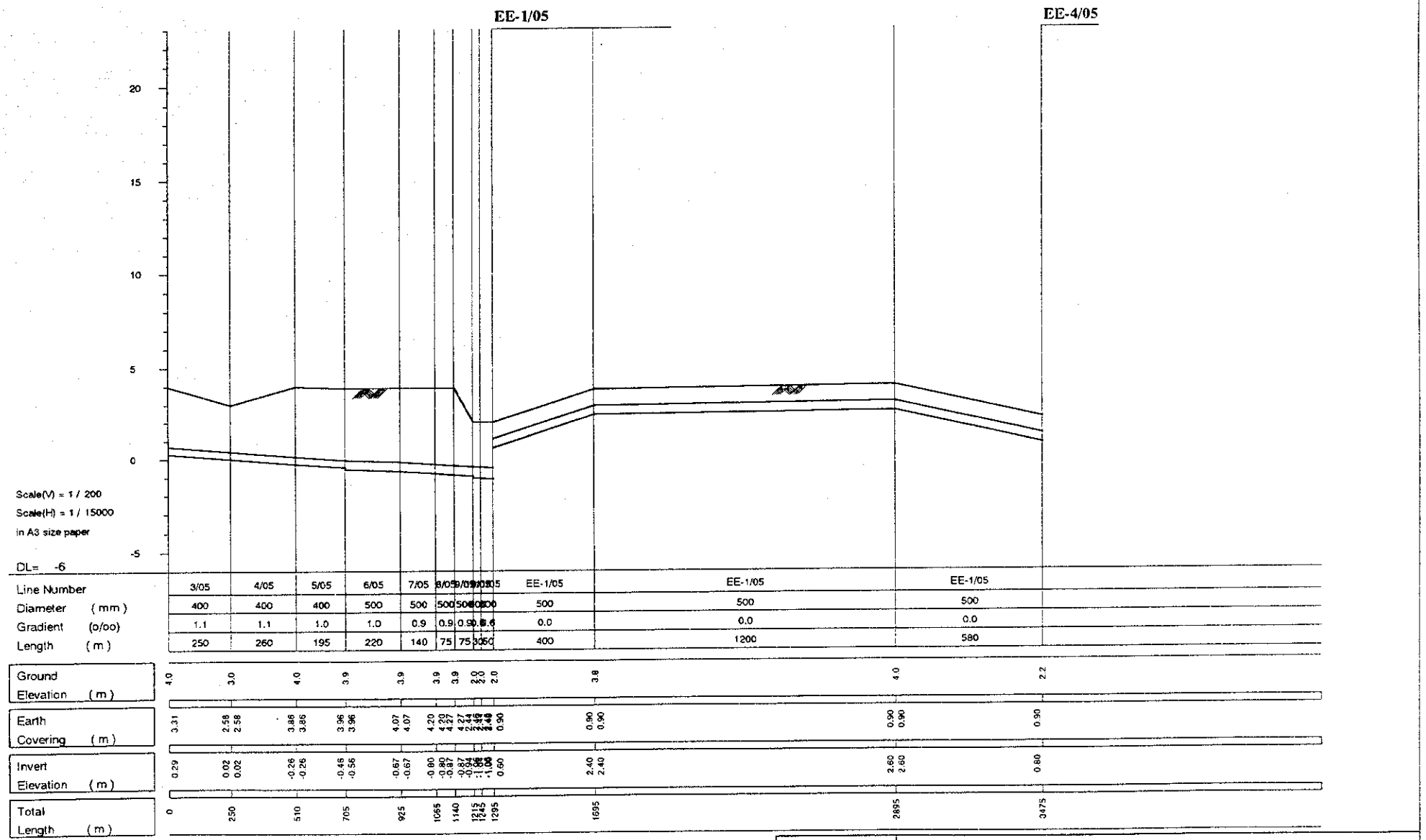


Fig.C-7 **Longitudinal Profile of Proposed Sewer to Janga 3**

THE STUDY ON STORM WATER DRAINAGE AND SEWERAGE MANEGEMENT PLAN FOR RMR

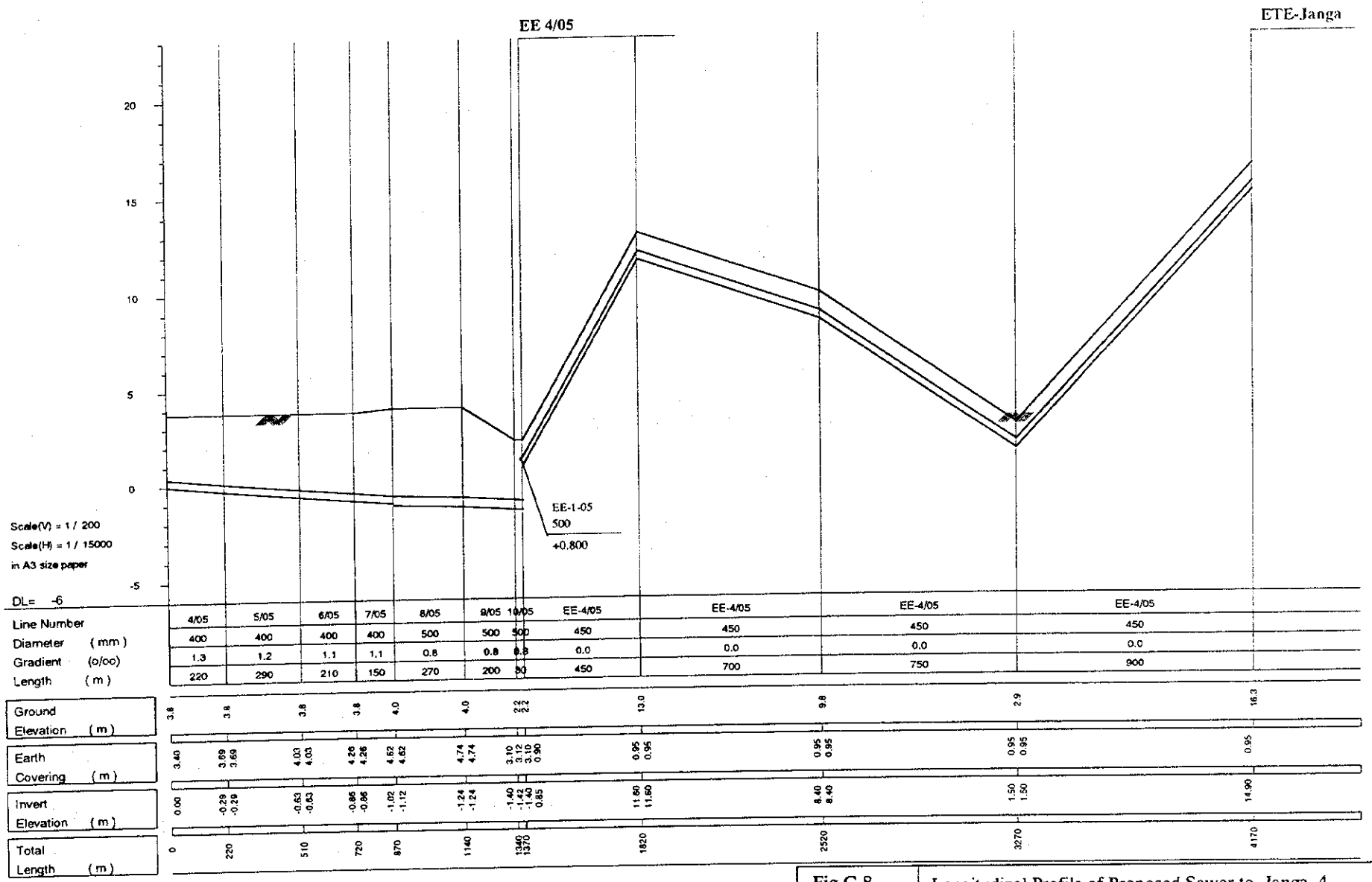
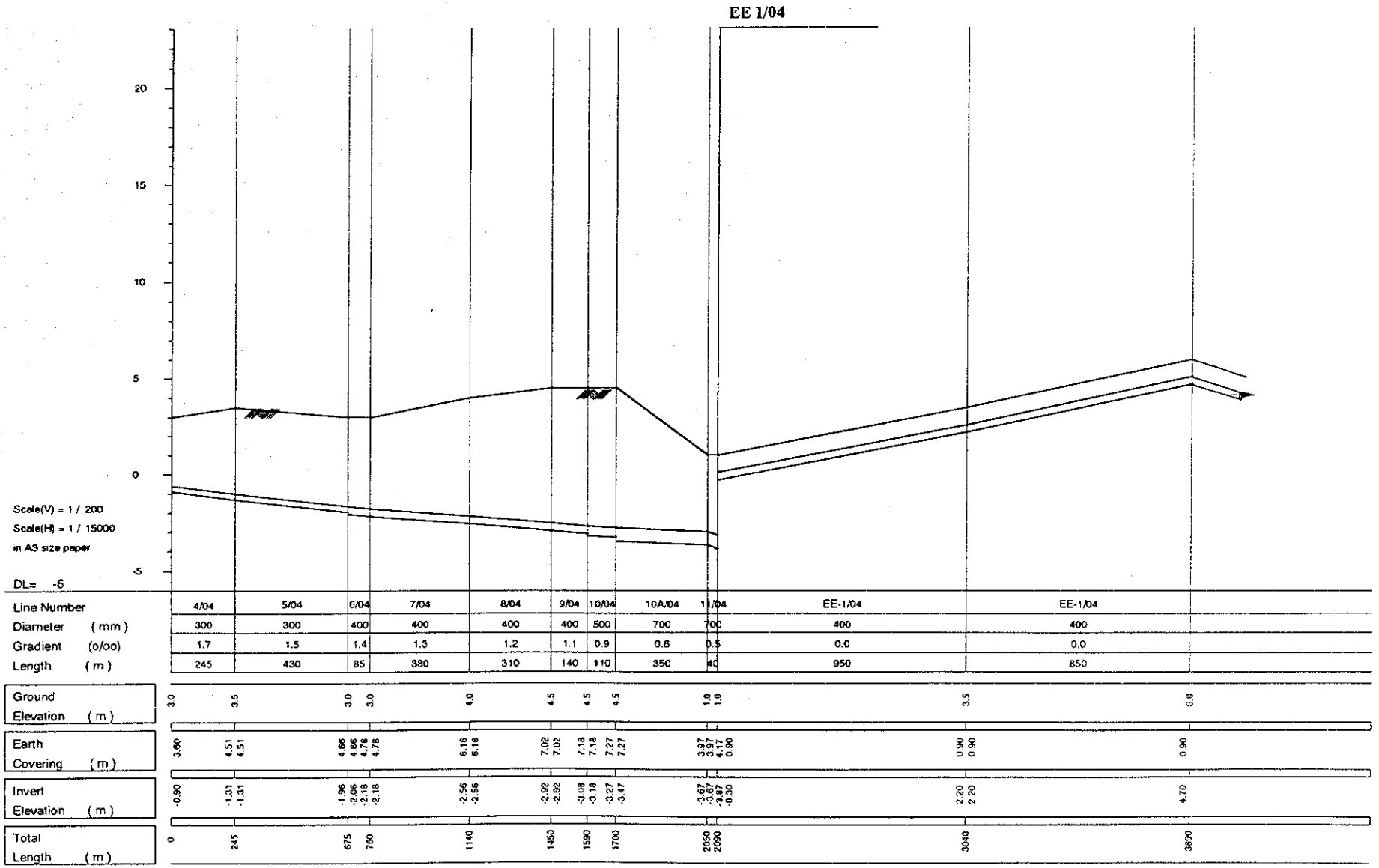


Fig.C-8 Longitudinal Profile of Proposed Sewer to Janga 4

THE STUDY ON STORM WATER DRAINAGE AND SEWERAGE MANEGEMENT PLAN FOR RMR



Line Number	4/04	5/04	6/04	7/04	8/04	9/04	10/04	10A/04	11/04	EE-1/04	EE-1/04
Diameter (mm)	300	300	400	400	400	400	500	700	700	400	400
Gradient (o/oo)	1.7	1.5	1.4	1.3	1.2	1.1	0.9	0.6	0.5	0.0	0.0
Length (m)	245	430	85	380	310	140	110	350	40	950	850
Ground Elevation (m)	3.0	3.5	3.0	3.0	4.0	4.5	4.5	4.5	1.0	3.5	6.0
Earth Covering (m)	3.60	4.51	4.51	4.66	4.66	4.78	4.78	6.16	6.16	7.02	7.02	7.18	7.18	7.27	7.27	3.97	3.97	4.17	0.90	0.90	0.90
Invert Elevation (m)	-0.90	-1.31	-1.31	-1.96	-2.06	-2.18	-2.18	-2.56	-2.56	-2.92	-2.92	-3.08	-3.18	-3.27	-3.47	-3.67	-3.67	-3.87	-0.30	2.20	2.20	4.70
Total Length (m)	0	245		675	760	1140		1450	1590	1700	2050	2090								3040		3890

Fig.C-9 Longitudinal Profile of Proposed Sewer to Janga 5-1

THE STUDY ON STORM WATER DRAINAGE AND SEWERAGE MANEGEMENT PLAN FOR RMR

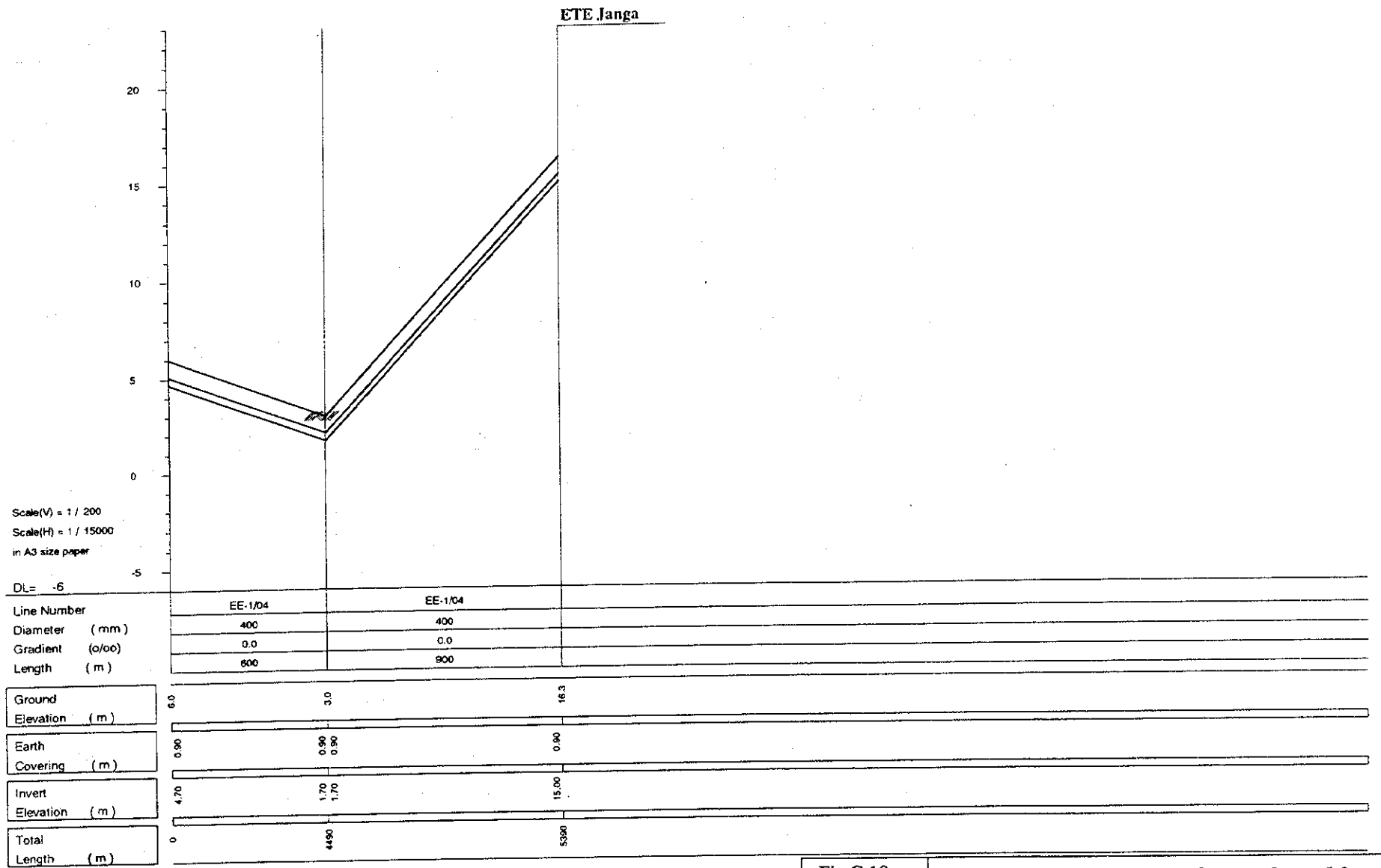
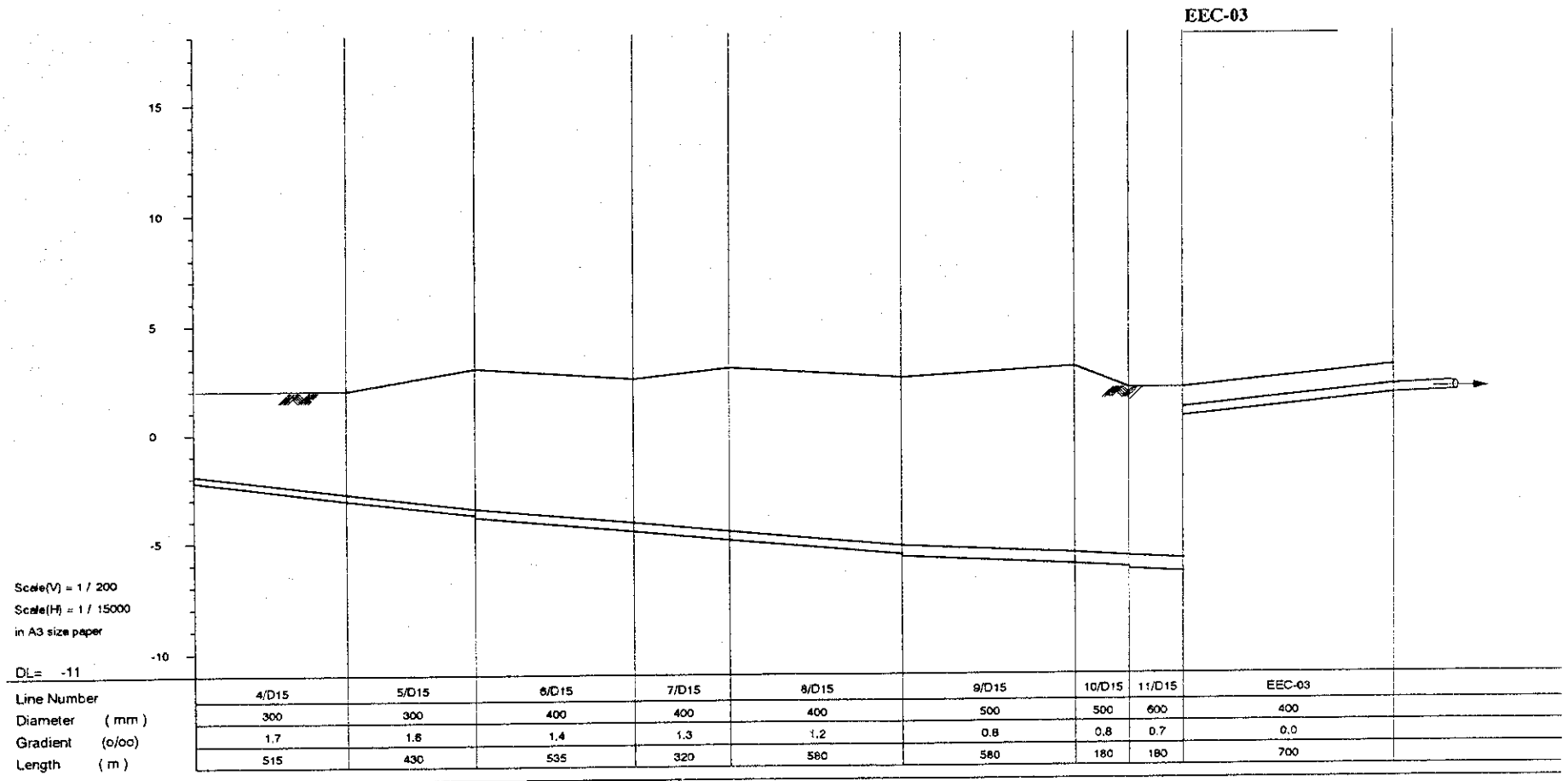


Fig.C-10 Longitudinal Profile of Proposed Sewer to Janga 5-2

THE STUDY ON STORM WATER DRAINAGE AND SEWERAGE MANEGEMENT PLAN FOR RMR



Line Number	4/D15	5/D15	6/D15	7/D15	8/D15	9/D15	10/D15	11/D15	EEC-03
Diameter (mm)	300	300	400	400	400	500	500	600	400
Gradient (o/oo)	1.7	1.6	1.4	1.3	1.2	0.8	0.8	0.7	0.0
Length (m)	515	430	535	320	580	580	180	180	700
Ground Elevation (m)	2.0	2.0	3.0	2.5	3.0	2.5	3.0	2.0	2.0	3.0
Earth Covering (m)	3.89	4.76 / 4.76	6.45 / 6.45	6.60 / 6.60	7.52 / 7.52	7.71 / 7.71	8.58 / 8.58	7.72 / 7.72	7.84 / 0.90	0.90
Invert Elevation (m)	-2.19	-3.06 / -3.06	-3.75 / -3.85	-4.50 / -4.50	-4.92 / -4.92	-5.61 / -5.71	-6.08 / -6.08	-6.22 / -6.32	-6.44 / 0.70	1.70
Total Length (m)	0	515	945	1480	1800	2380	2960	2560	2740	3440

Fig.C-11 Longitudinal Profile of Proposed Sewer to Cabanga 1-1

THE STUDY ON STORM WATER DRAINAGE AND SEWERAGE MANEGEMENT PLAN FOR RMR

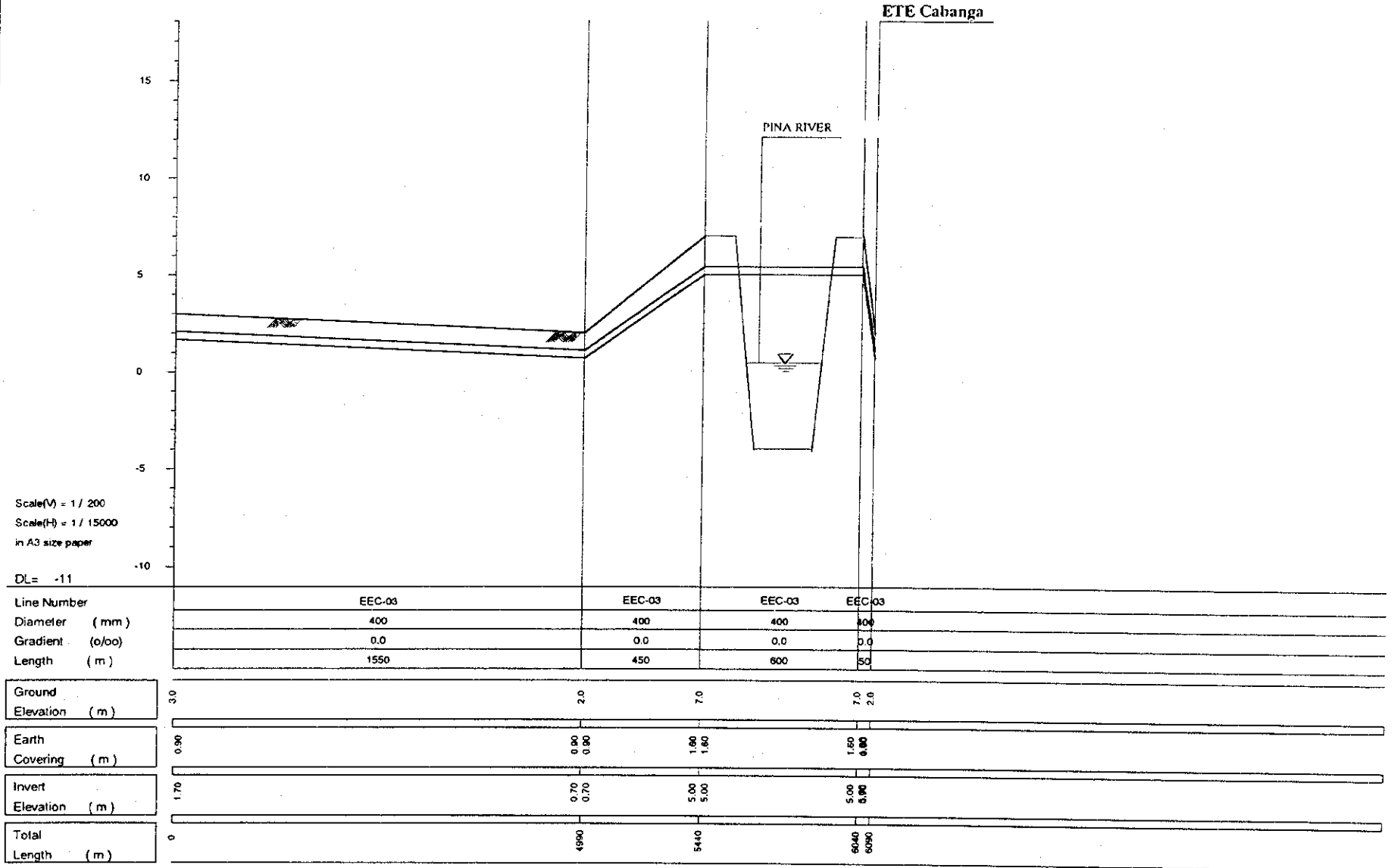
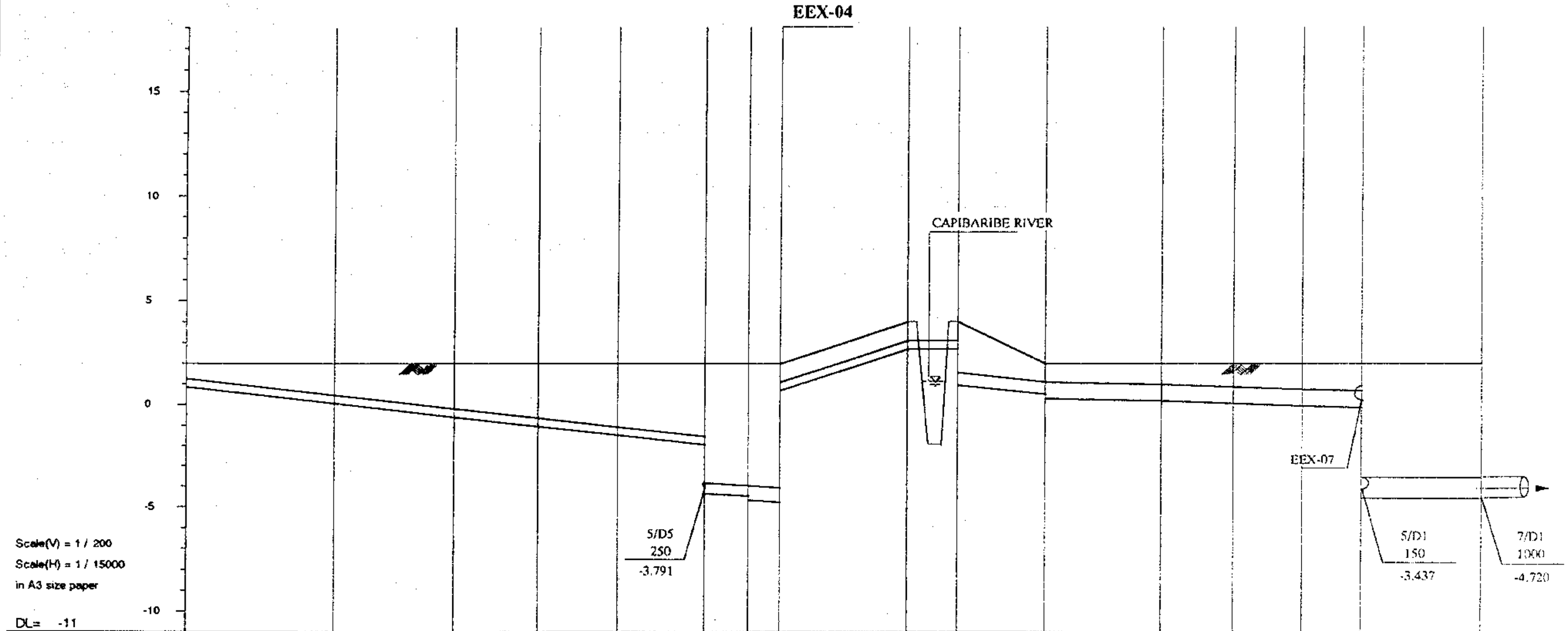


Fig.C-12 Longitudinal Profile of Proposed Sewer to Cabanga 1-2

THE STUDY ON STORM WATER DRAINAGE AND SEWERAGE MANEGEMENT PLAN FOR RMR



Line Number	3/D5	4/D5	5/D5	6/D5	7/D5	8/D5	9/D5	EEX-04	EEX-04	1/D1	2/D1	3/D1	4/D1	5/D1	6/D1
Diameter (mm)	400	400	400	400	400	500	700	400	400	600	800	800	800	800	1000
Gradient (o/oo)	1,5	1,5	1,5	1,5	1,5	0,8	0,8	0,0	0,0	1,5	0,5	0,5	0,5	0,4	0,4
Length (m)	530	425	300	285	310	155	115	450	180	310	410	255	240	210	420

Total Length (m)	Ground Elevation (m)	Earth Covering (m)	Invert Elevation (m)
0	2,00	0,75	0,85
530	2,00	1,55 / 1,54	0,06 / 0,06
955	2,00	2,19 / 2,19	-0,59 / -0,59
1255	2,00	2,63 / 2,63	-1,03 / -1,03
1540	2,00	3,06 / 3,06	-1,46 / -1,46
1850	2,00	3,53 / 5,83	-1,93 / -4,33
2005	2,00	5,96 / 5,96	-4,46 / -4,66
1965	2,00	6,06 / 0,90	-4,76 / 0,70
2415	4,00	0,90 / 0,90	2,70 / 2,70
2595	4,00	0,90 / 2,45	2,70 / 0,95
2905	2,00	0,90 / 0,90	0,50 / 0,30
3315	2,00	1,02 / 1,02	0,18 / 0,18
3570	2,00	1,13 / 1,13	0,07 / 0,07
3810	2,00	1,25 / 1,25	-0,05 / -0,05
4020	2,00	1,33 / 5,55	-0,13 / -4,55
4440	2,00	5,55	-4,55

Fig.C-13 | Longitudinal Profile of Proposed Sewer to Cabanga 2-1

THE STUDY ON STORM WATER DRAINAGE AND SEWERAGE MANEGEMENT PLAN FOR RMR

ETE Cabanga

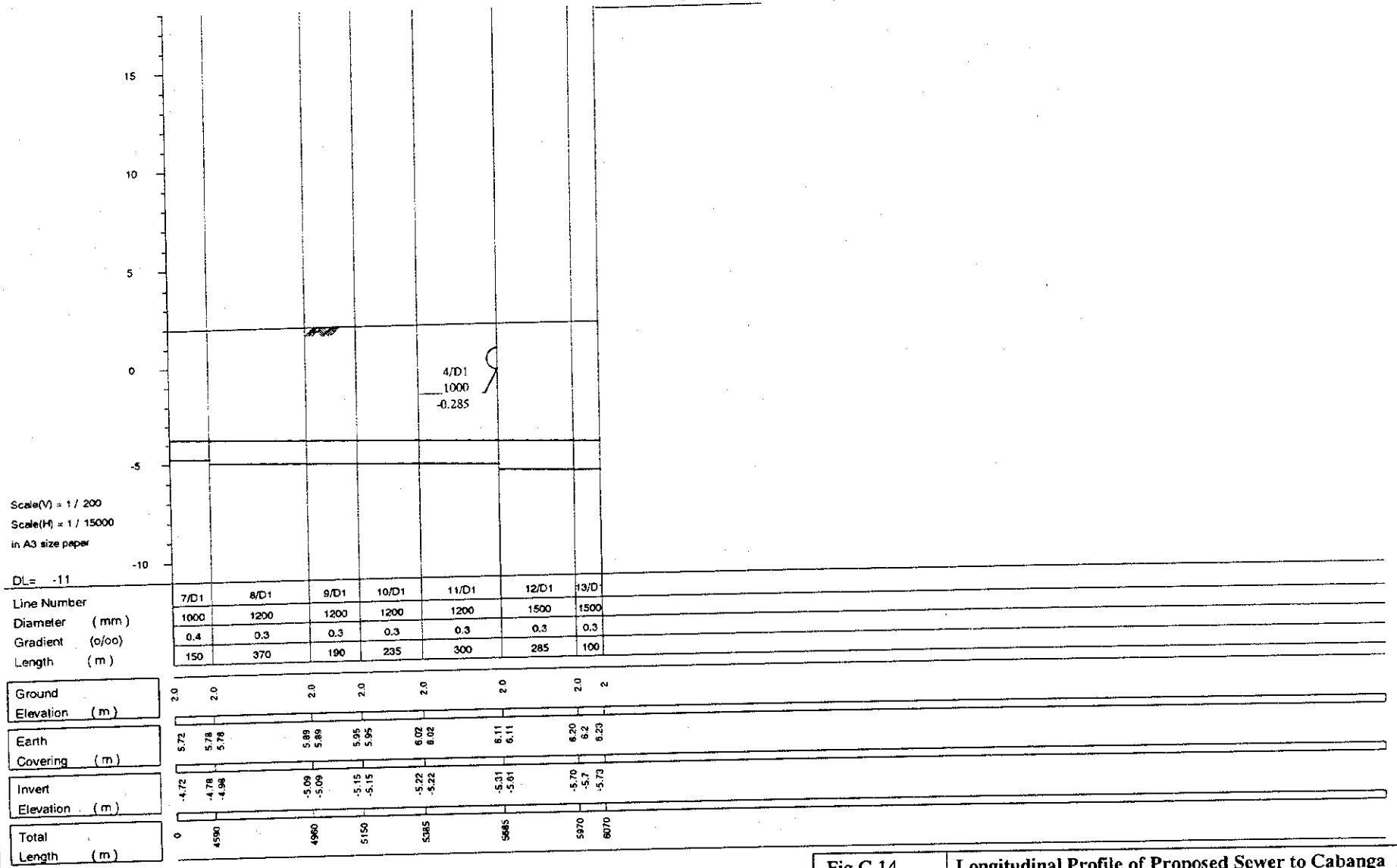
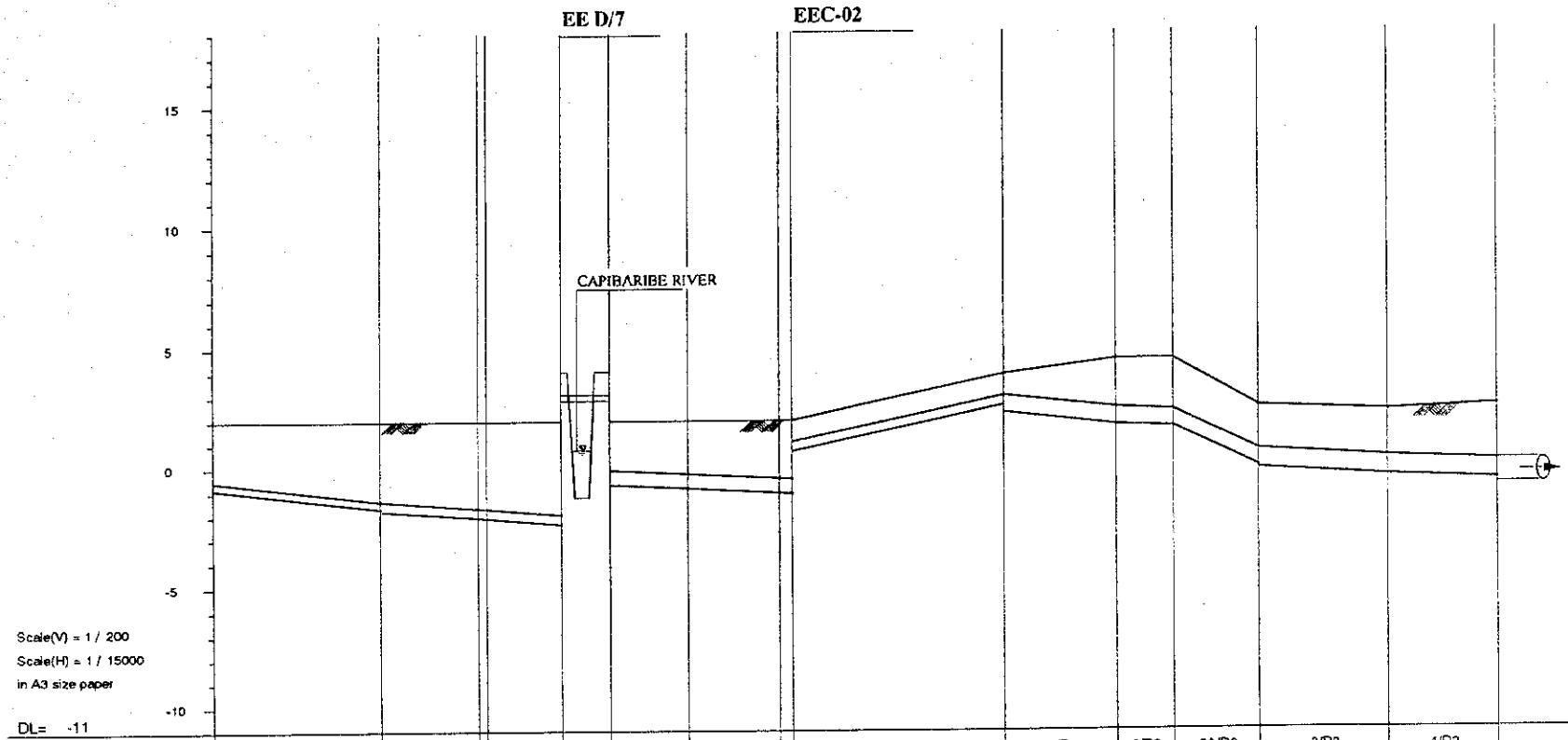


Fig.C-14 Longitudinal Profile of Proposed Sewer to Cabanga 2-2

THE STUDY ON STORM WATER DRAINAGE AND SEWERAGE MANEGEMENT PLAN FOR RMR



Line Number	3/D7	4/D7	5/D7	6/D7	EE-D7	6/D7	7/D7	8/D7	EEC-02	1/D2	2/D2	2A/D2	3/D2	4/D2
Diameter (mm)	300	400	400	400	250	600	600	600	400	700	700	700	800	800
Gradient (o/oo)	1.6	1.3	1.3	1.2	0.0	0.7	0.7	0.7	0.0	1.5	0.5	6.5	0.8	0.5
Length (m)	515	300	25	230	150	240	280	40	650	345	175	260	395	330
Ground Elevation (m)	2.0	2.0	2.0	2.0	2.0	4.0	2.0	2.0	2.0	3.9	4.5	4.5	2.5	2.3	2.5
Earth Covering (m)	2.53	3.33	3.33	3.62	3.85	3.92	0.90	2.07	2.23	2.23	2.43	2.48	0.90	0.90	2.02	2.02	2.11	2.11	1.80	1.80	1.92	1.92	2.29
Invert Elevation (m)	-0.83	-1.63	-1.73	-2.02	-2.05	-2.32	2.85	-0.67	-0.83	-0.83	-1.03	-1.08	0.70	2.50	2.30	1.78	1.79	1.69	1.69	0.00	-0.10	-0.42	-0.42	-0.59
Total Length (m)	0	515	815	840	1070	1220	1460	1500	1540	2190	2535	2710	2970	3365	3695

Fig.C-15 **Longitudinal Profile of Proposed Sewer to Cabanga 3-1**

THE STUDY ON STORM WATER DRAINAGE AND SEWERAGE MANEGEMENT PLAN FOR RMR

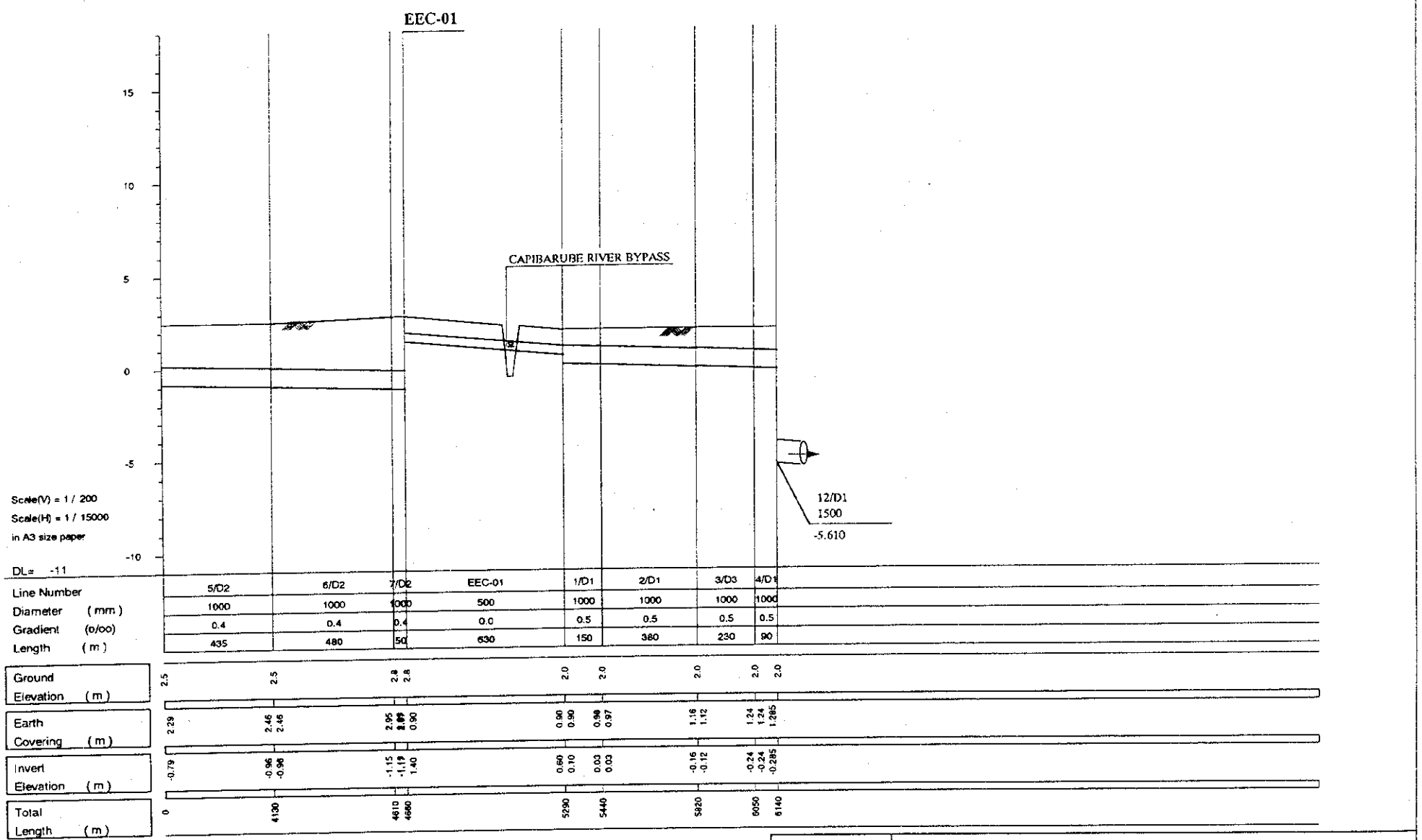
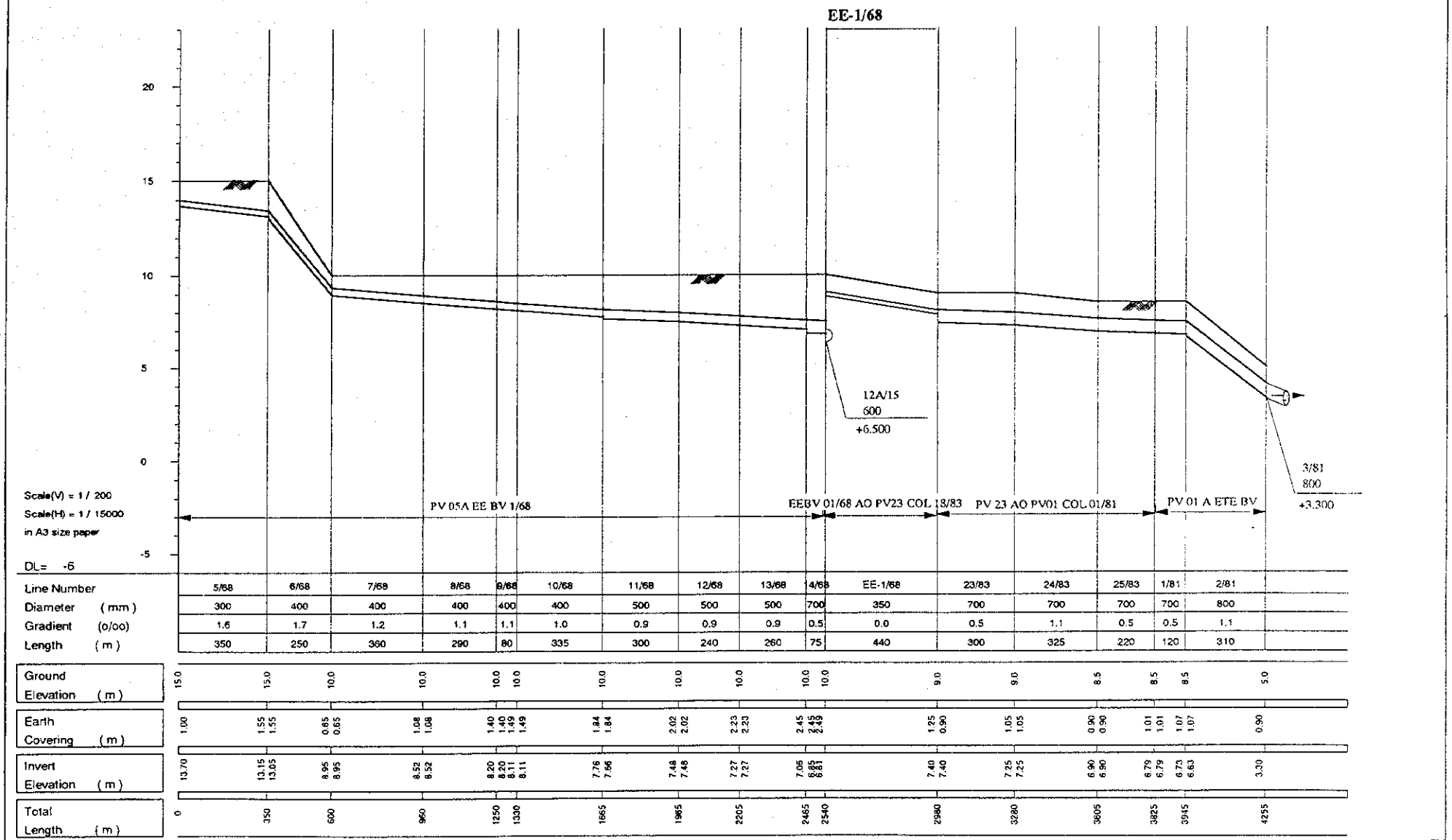


Fig.C-16 Longitudinal Profile of Proposed Sewer to Cabanga 3-2

THE STUDY ON STORM WATER DRAINAGE AND SEWERAGE MANEGEMENT PLAN FOR RMR



Line Number	5/68	6/68	7/68	8/68	9/68	10/68	11/68	12/68	13/68	4/68	EE-1/68	23/83	24/83	25/83	1/81	2/81
Diameter (mm)	300	400	400	400	400	400	500	500	500	700	350	700	700	700	700	800
Gradient (o/oo)	1.6	1.7	1.2	1.1	1.1	1.0	0.9	0.9	0.9	0.5	0.0	0.5	1.1	0.5	0.5	1.1
Length (m)	350	250	360	290	80	335	300	240	260	75	440	300	325	220	120	310
Ground Elevation (m)	15.0	15.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	9.0	9.0	8.5	8.5	8.5	5.0
Earth Covering (m)	1.00	1.55	1.55	0.85	0.85	1.08	1.08	1.40	1.40	1.49	1.49	1.84	1.84	2.02	2.02	2.23	2.23	2.45	2.45	2.49	1.25	0.90	1.05	1.05	0.90	0.90	1.01	1.01	1.07	1.07	0.90
Invert Elevation (m)	13.70	13.15	13.05	8.95	8.95	8.52	8.52	8.20	8.20	8.11	8.11	7.76	7.66	7.48	7.48	7.27	7.27	7.05	6.85	6.81	7.40	7.40	7.25	7.25	6.90	6.90	6.79	6.79	6.73	6.63	3.30
Total Length (m)	0	350	600	960	1250	1330	1665	1965	2205	2465	2540	2980	3280	3505	3625	3745	4255

Fig.C-17 **Longitudinal Profile of Proposed Sewer to Boa Viagem 1-1**

THE STUDY ON STORM WATER DRAINAGE AND SEWERAGE MANEGEMENT PLAN FOR RMR

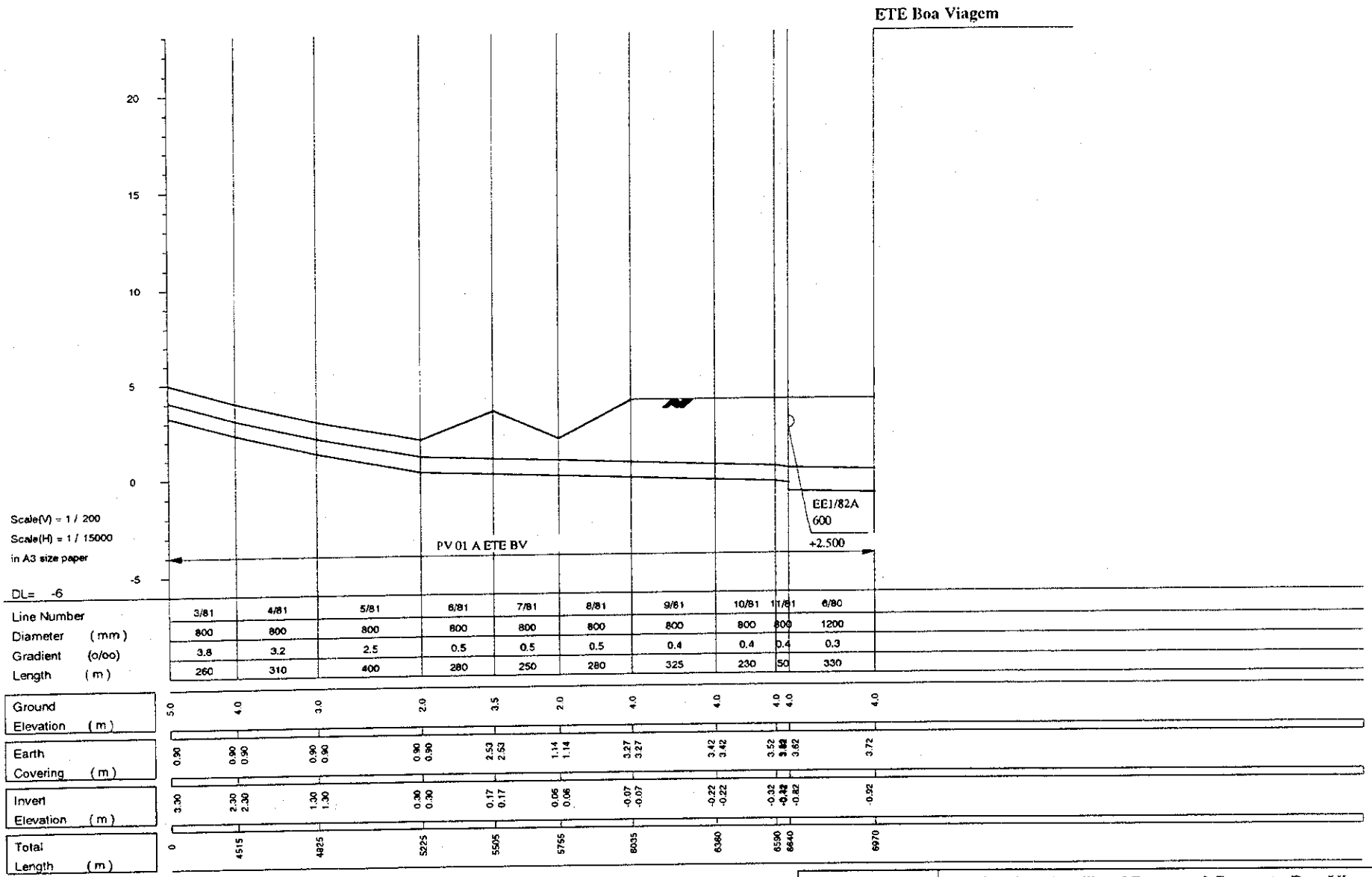
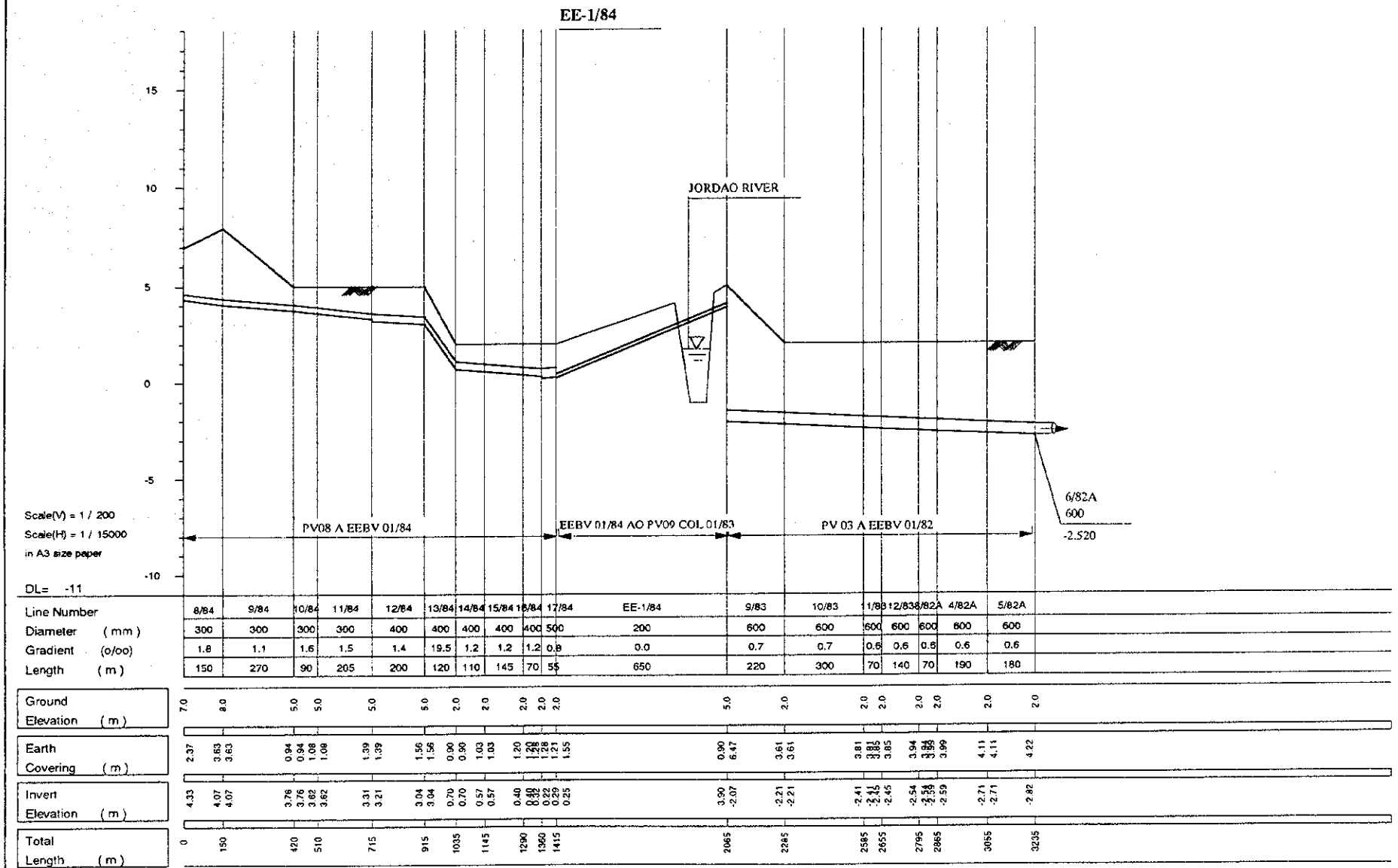


Fig.C-18 Longitudinal Profile of Proposed Sewer to Boa Viagem 1-2

THE STUDY ON STORM WATER DRAINAGE AND SEWERAGE MANEGEMENT PLAN FOR RMR



Line Number	8/84	9/84	10/84	11/84	12/84	13/84	14/84	15/84	16/84	17/84	EE-1/84	9/83	10/83	11/83	12/83	8/82A	4/82A	5/82A
Diameter (mm)	300	300	300	300	400	400	400	400	400	500	200	600	600	600	600	600	600	600
Gradient (o/oo)	1.8	1.1	1.6	1.5	1.4	19.5	1.2	1.2	1.2	0.8	0.0	0.7	0.7	0.6	0.6	0.6	0.6	0.6
Length (m)	150	270	90	205	200	120	110	145	70	55	650	220	300	70	140	70	190	180
Ground Elevation (m)	7.0	8.0	5.0	5.0	5.0	5.0	2.0	2.0	2.0	2.0	2.0	5.0	2.0	2.0	2.0	2.0	2.0	2.0
Earth Covering (m)	2.37	3.63	0.94	1.08	1.39	1.56	0.90	1.03	1.20	1.21	1.55	0.90	3.61	3.81	3.85	3.94	3.99	4.11	4.22
Invert Elevation (m)	4.33	4.07	3.76	3.62	3.31	3.04	0.70	0.57	0.40	0.29	0.25	3.90	-2.21	-2.41	-2.45	-2.54	-2.59	-2.71	-2.82
Total Length (m)	0	150	420	510	715	915	1035	1145	1290	1360	1415	2065	2285	2585	2655	2795	2865	3055	3235

Fig.C-19 Longitudinal Profile of Proposed Sewer to Boa Viagem 2-1

THE STUDY ON STORM WATER DRAINAGE AND SEWERAGE MANEGEMENT PLAN FOR RMR

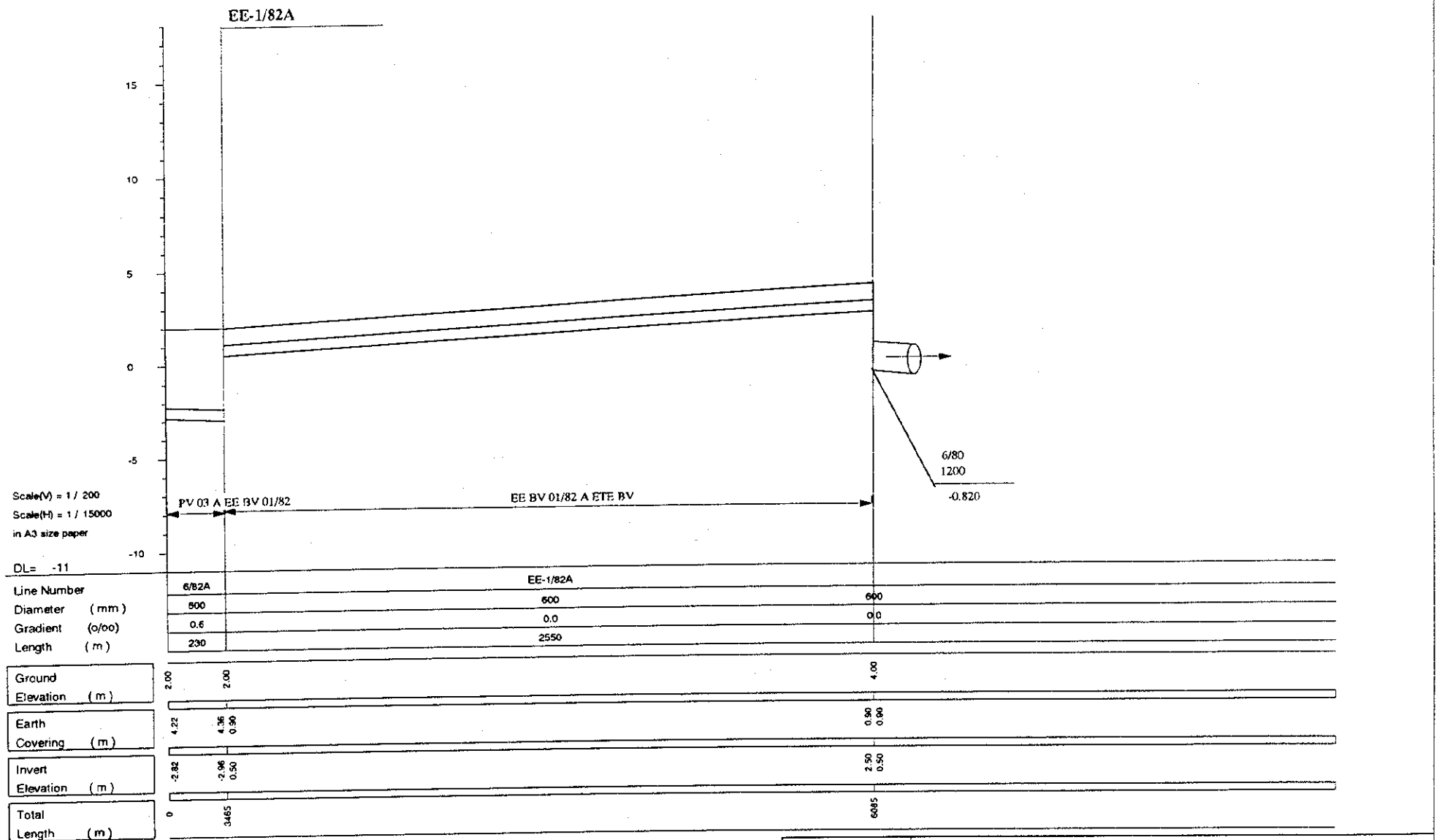
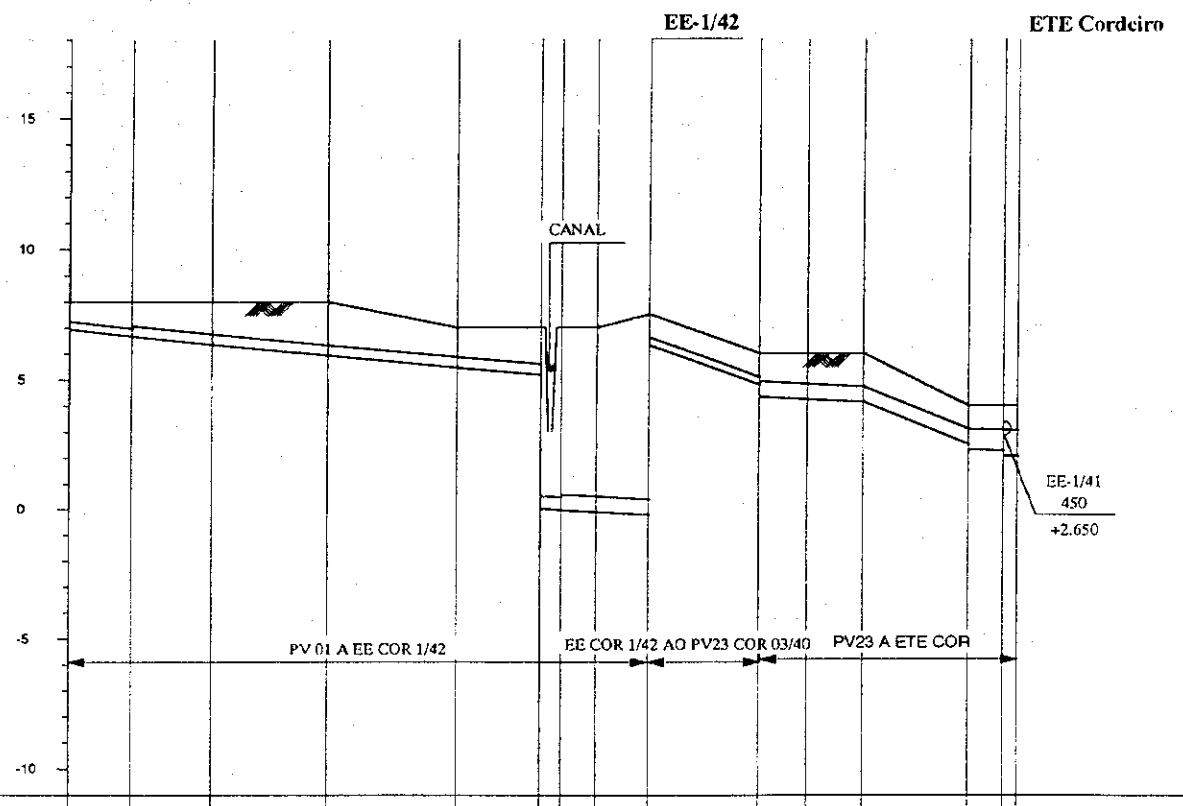


Fig.C-20 Longitudinal Profile of Proposed Sewer to Boa Viagem 2-2

THE STUDY ON STORM WATER DRAINAGE AND SEWERAGE MANEGEMENT PLAN FOR RMR



Line Number	1/42	2/42	3/42	4/42	5/42	6/42	7/42	8/42	EE-1/42	23/40	24/40	25/40	26/40	27/40
Diameter (mm)	300	400	400	400	400	500	600	600	300	600	500	600	800	1000
Gradient (o/oo)	1.6	1.4	1.3	1.3	1.2	1.0	0.7	0.7	0.0	0.7	0.7	10.4	0.4	0.3
Length (m)	180	230	330	370	240	60	100	150	315	140	160	300	100	40
Ground Elevation (m)	8.00	8.00	8.00	8.00	7.00	7.00	7.00	7.00	7.50	6.00	6.00	6.00	4.00	4.00	4.00
Earth Covering (m)	0.75	1.03	0.93	1.25	1.25	1.68	1.68	1.14	1.14	1.47	0.47	6.53	6.43	6.50	6.50	7.11	0.90	0.90	1.05	1.15	1.15	1.26	1.26	0.90	0.90	0.94	0.94	0.96
Invert Elevation (m)	6.95	6.67	6.67	6.35	6.35	5.92	5.92	5.46	5.46	5.18	6.03	-0.03	-0.03	-0.10	-0.10	-0.21	6.30	4.80	4.35	4.25	4.25	4.14	4.14	2.50	2.30	2.28	2.08	2.04
Total Length (m)	0	180	410	740	1,110	1,350	1,410	1,510	1,660	1,975	2,115	2,275	2,575	2,675	2,715

Fig.C-21 Longitudinal Profile of Proposed Sewer to Cordeiro 1

THE STUDY ON STORM WATER DRAINAGE AND SEWERAGE MANEGEMENT PLAN FOR RMR

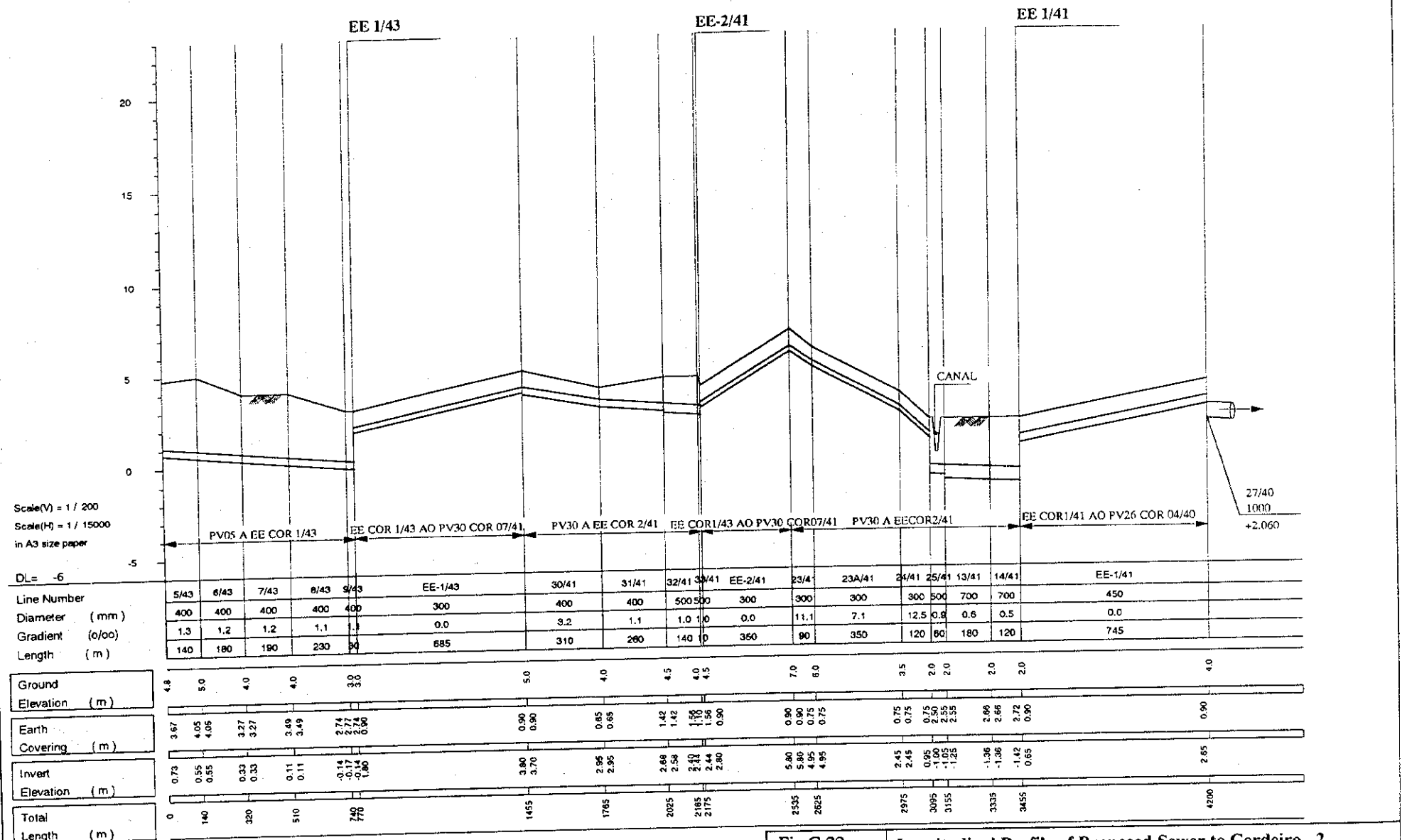


Fig.C-22 **Longitudinal Profile of Proposed Sewer to Cordeiro 2**

THE STUDY ON STORM WATER DRAINAGE AND SEWERAGE MANEGEMENT PLAN FOR RMR

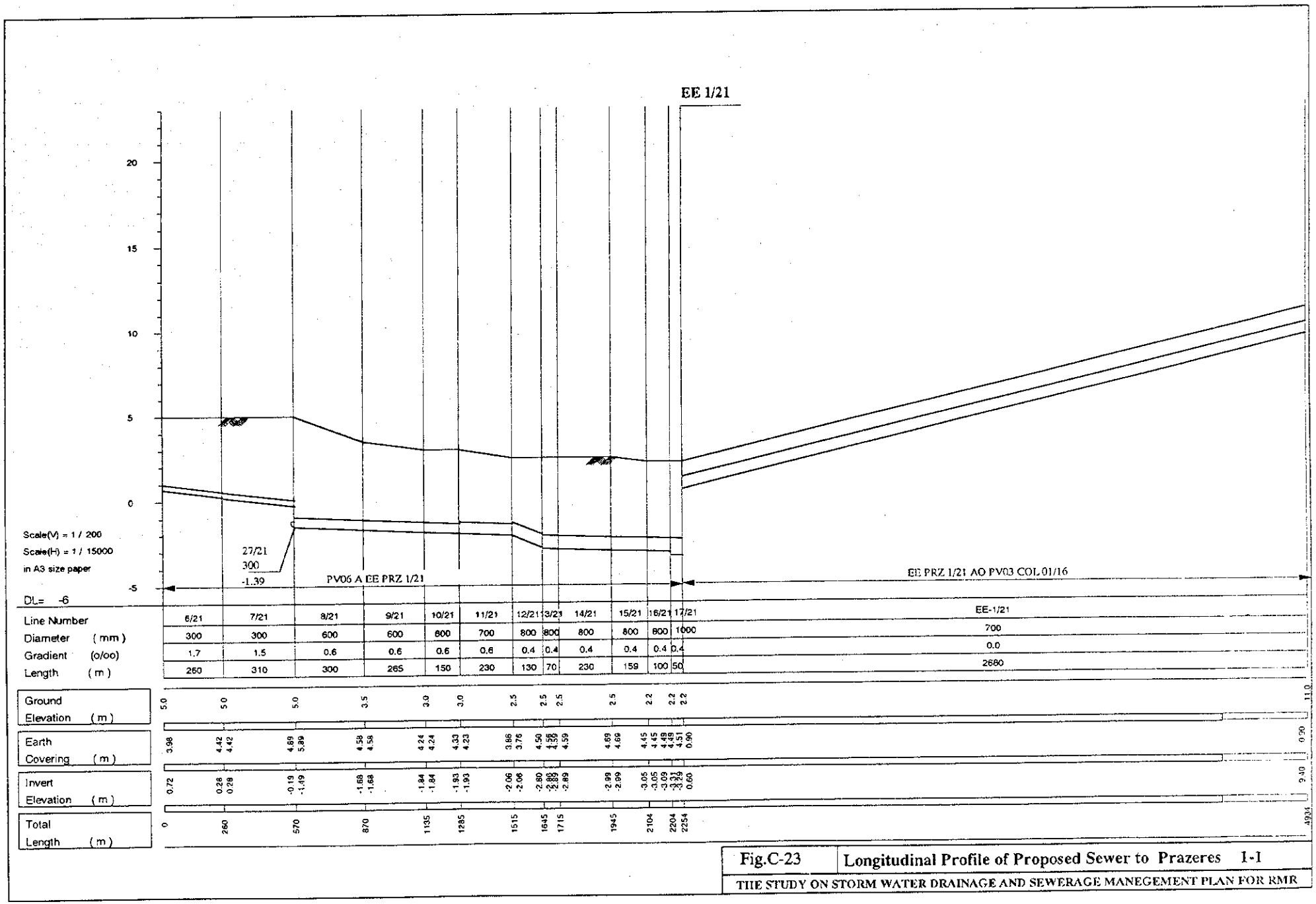
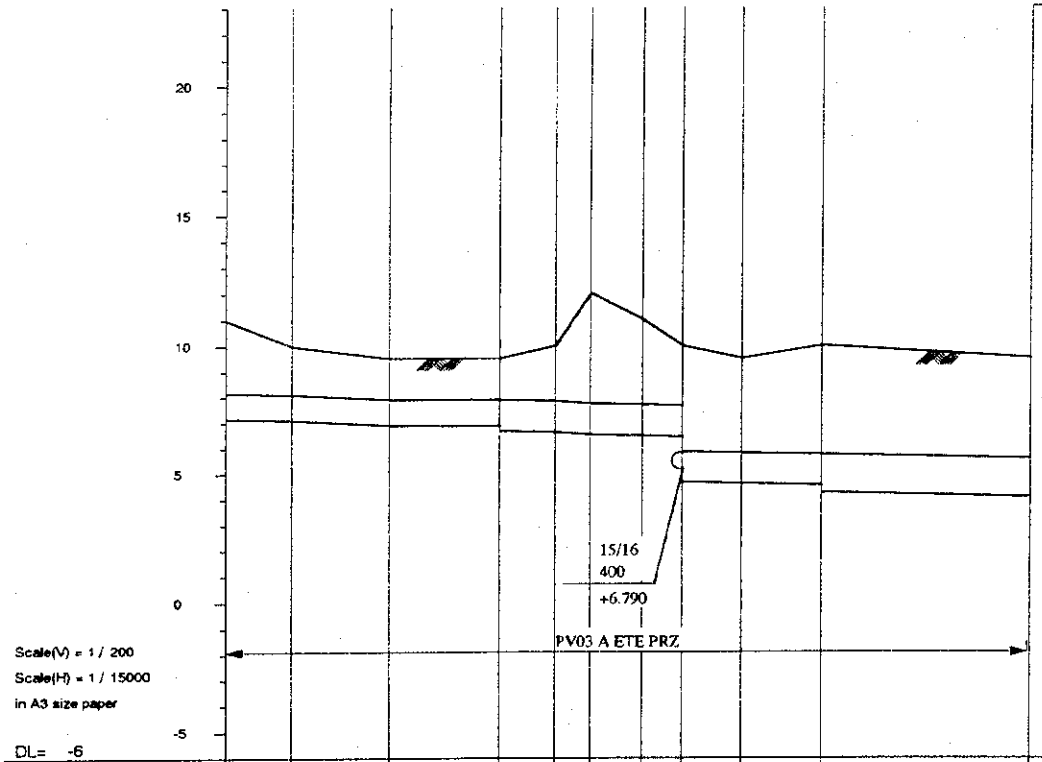


Fig.C-23 Longitudinal Profile of Proposed Sewer to Prazeres 1-1

THE STUDY ON STORM WATER DRAINAGE AND SEWERAGE MANEGEMENT PLAN FOR RMR

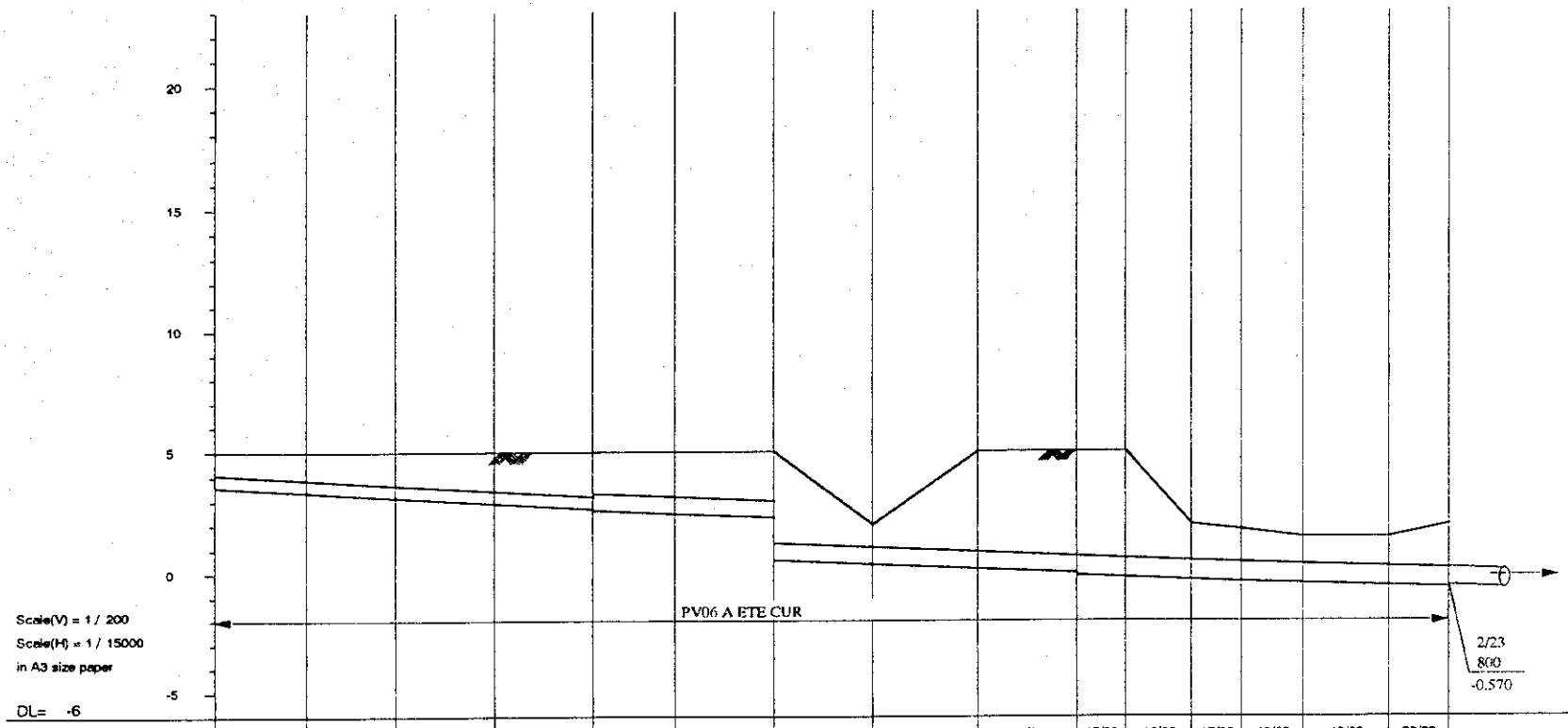
EET Prazeres



Line Number	3/16	4/16	5/16	5/16	7/16	8/16	8A/16	9/16	10/16	11/16
Diameter (mm)	1000	1000	1000	1200	1200	1200	1200	1200	1200	1500
Gradient (o/oo)	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Length (m)	190	280	315	160	100	150	115	170	230	600
Ground Elevation (m)	11.0	10.0	9.5	9.5	10.0	12.0	11.0	10.0	9.5	10	9.5
Earth Covering (m)	2.83	1.90 / 1.90	1.60 / 1.60	1.63 / 1.63	2.18 / 2.18	4.28 / 4.28	3.31 / 3.31	2.38 / 4.13	3.68 / 3.68	4.25 / 4.25	3.93
Invert Elevation (m)	7.17	7.10 / 7.10	6.90 / 6.90	6.87 / 6.87	6.62 / 6.62	6.52 / 6.52	6.49 / 6.49	6.44 / 4.67	4.62 / 4.62	4.55 / 4.25	4.07
Total Length (m)	0	5124	5404	5719	5879	5979	6129	6244	6414	6644	7244

Fig.C-24 **Longitudinal Profile of Proposed Sewer to Prazeres 1-2**

THE STUDY ON STORM WATER DRAINAGE AND SEWERAGE MANEGEMENT PLAN FOR RMR



Line Number	6/23	7/23	8/23	9/23	10/23	11/23	12/23	13/23	14/23	15/23	16/23	17/23	18/23	19/23	20/23
Diameter (mm)	500	500	500	500	700	700	700	700	700	800	800	800	800	800	800
Gradient (o/oo)	0.8	0.8	0.8	0.8	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.4	0.4	0.4
Length (m)	280	270	300	300	250	300	300	320	300	150	200	150	185	260	180
Ground Elevation (m)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	2.0	5.0	5.0	5.0	2.0	1.8	1.5	1.5	2.0
Earth Covering (m)	0.90	1.12 / 1.12	1.34 / 1.34	1.58 / 1.58	1.82 / 1.87	1.82 / 1.82	2.00 / 3.72	0.90 / 0.90	4.09 / 4.09	4.27 / 4.27	4.35 / 4.35	1.45 / 1.45	1.33 / 1.33	1.10 / 1.10	1.20 / 1.20	1.77
Invert Elevation (m)	3.60	3.38 / 3.38	3.16 / 3.16	2.92 / 2.92	2.68 / 2.63	2.48 / 2.48	2.30 / 0.58	0.40 / 0.40	0.21 / 0.21	0.03 / -0.07	-0.15 / -0.15	-0.25 / -0.25	-0.33 / -0.33	-0.40 / -0.40	-0.50 / -0.50	-0.57
Total Length (m)	0	280	550	850	1150	1400	1700	2000	2320	2620	2770	2970	3120	3305	3565	3745

Fig.C-25 Longitudinal Profile of Proposed Sewer to Curcurana 1-1

THE STUDY ON STORM WATER DRAINAGE AND SEWERAGE MANEGEMENT PLAN FOR RMR

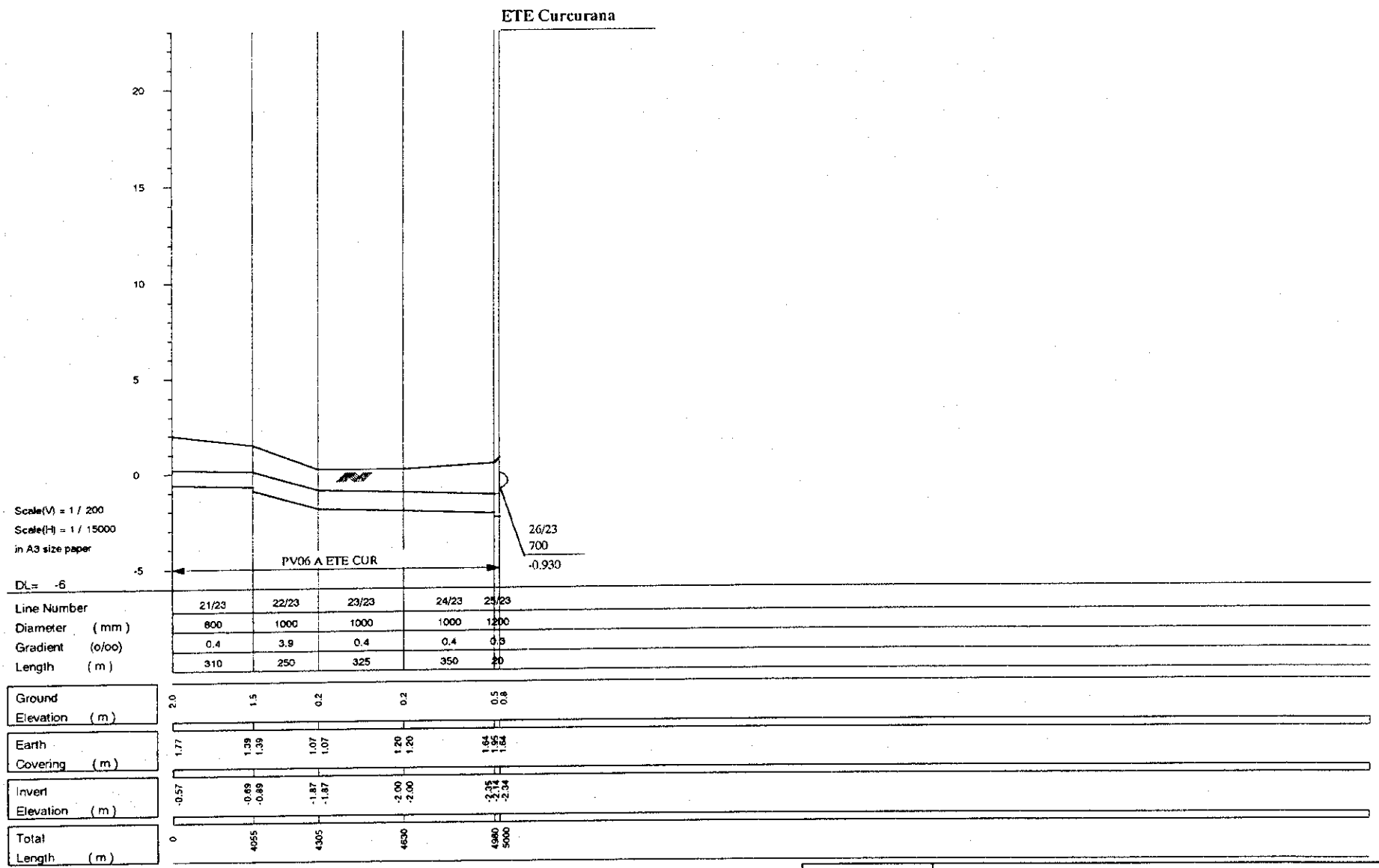


Fig.C-26	Longitudinal Profile of Proposed Sewer to Curcurana 1-2

THE STUDY ON STORM WATER DRAINAGE AND SEWERAGE MANEGEMENT PLAN FOR RMR

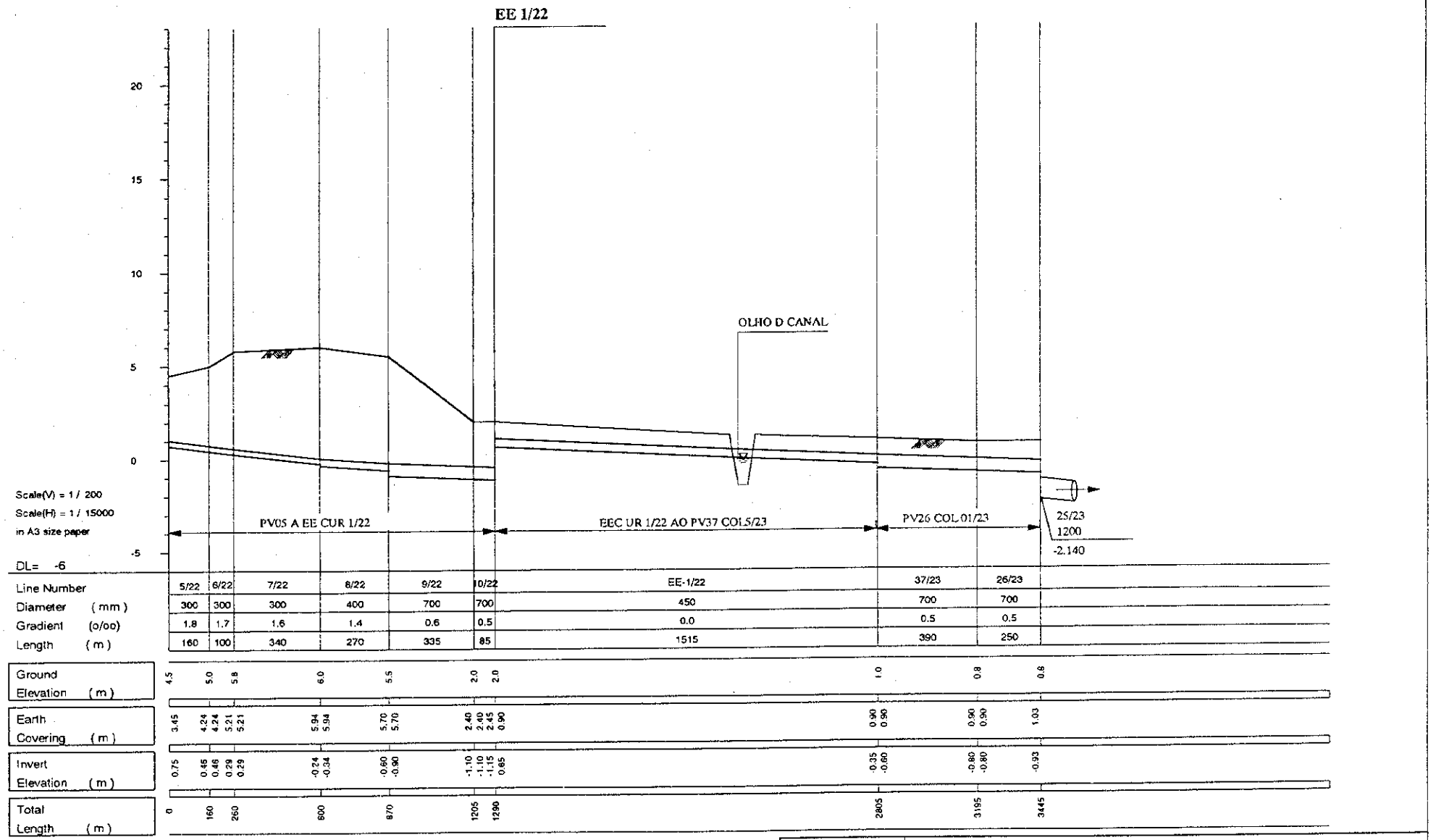


Fig.C-27 Longitudinal Profile of Proposed Sewer to Curcurana 2

THE STUDY ON STORM WATER DRAINAGE AND SEWERAGE MANEGEMENT PLAN FOR RMR