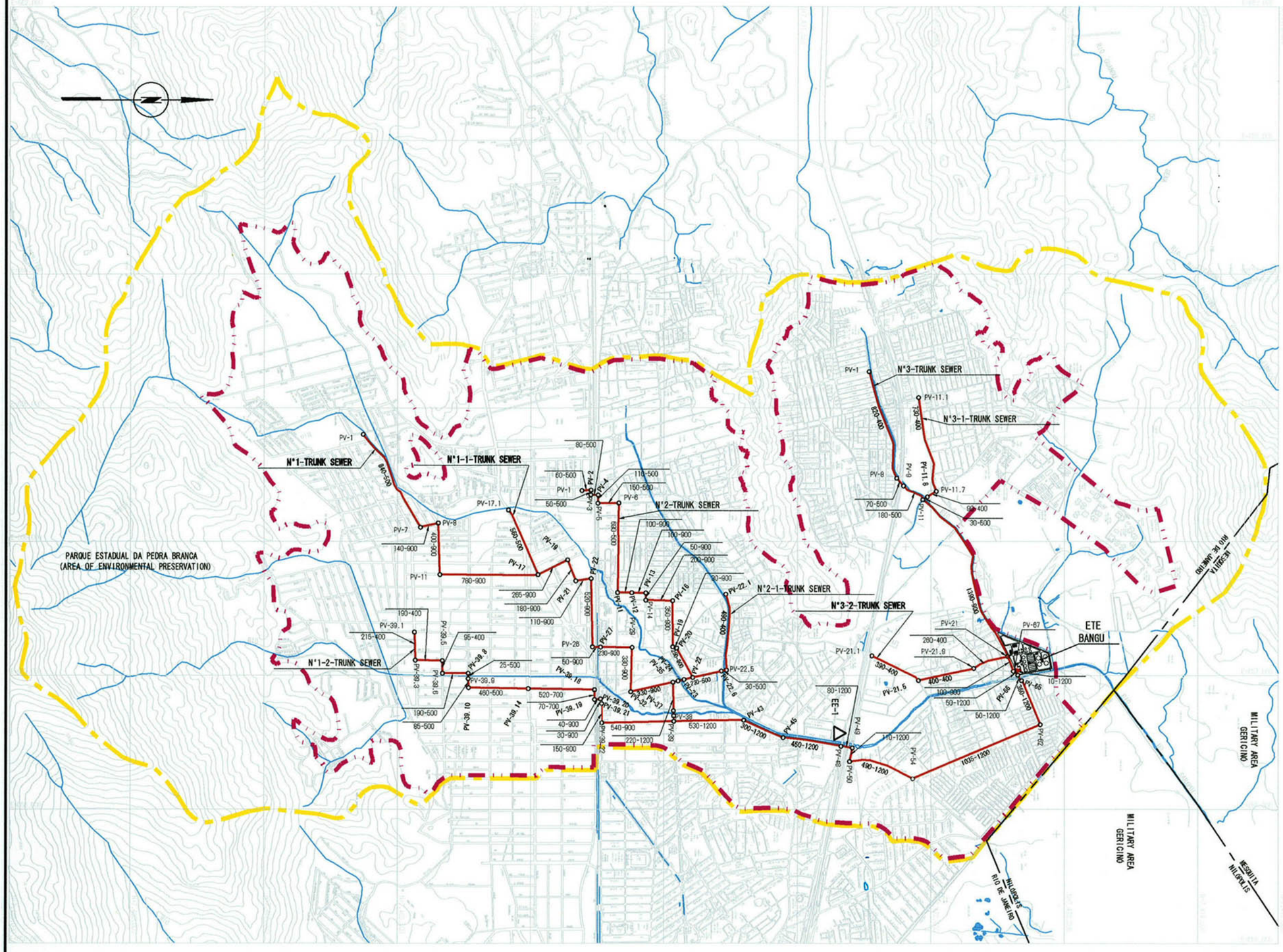


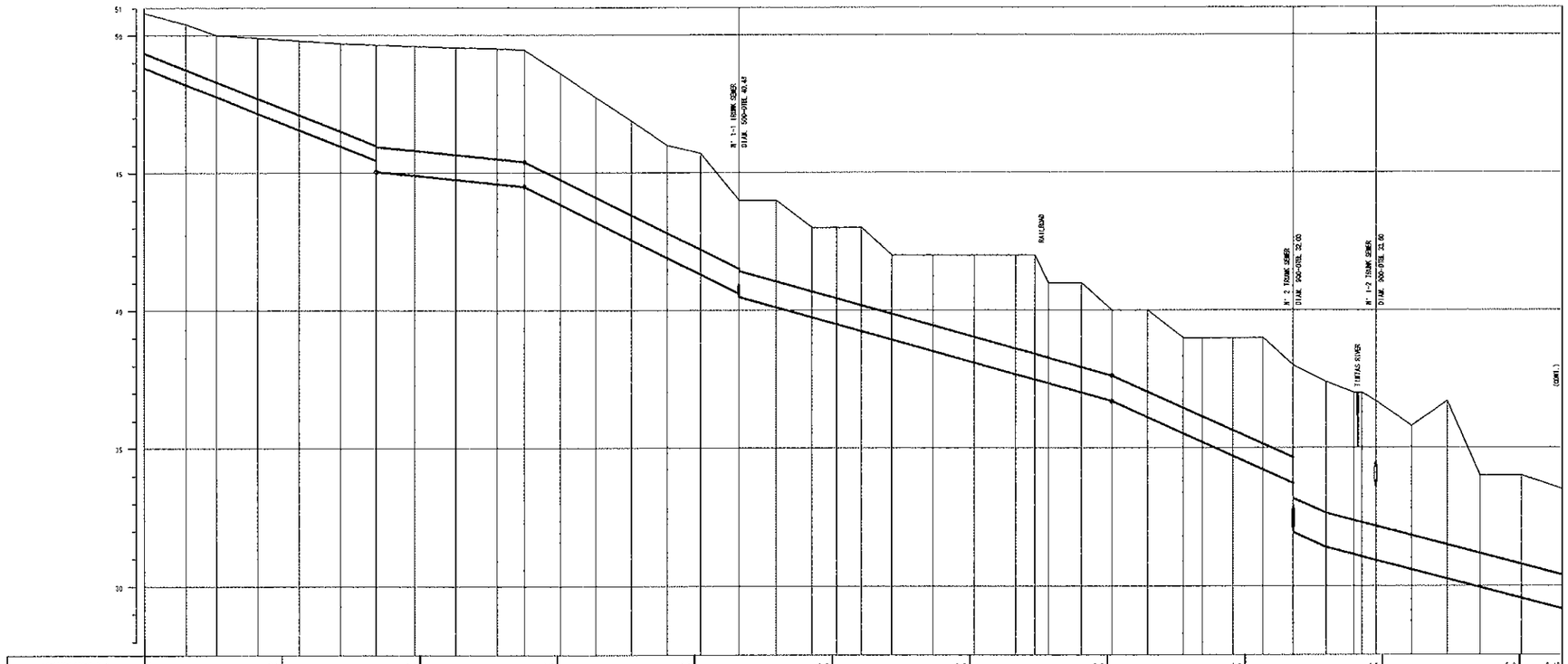
LEGEND

- MUNICIPALITY BOUNDARY
- SUB-BASIN BOUNDARY
- URBAN AREA BOUNDARY
- TRUNK SEWER (BY GRAVITY FLOW)
- TRUNK SEWER EXISTENT BY GRAVITY FLOW)
- TRUNK SEWER (BY PRESSURE FLOW)
- 100-400 — DIAMETER (mm) / LENGTH (m)
- PV — MANHOLE
- EE — PUMP STATION
- ETE — TREATMENT FACILITY
- PLANNED TREATMENT FACILITY
- PLANNED PUMP STATION
- EXISTING PUMP STATION

SCALE 1:15,000

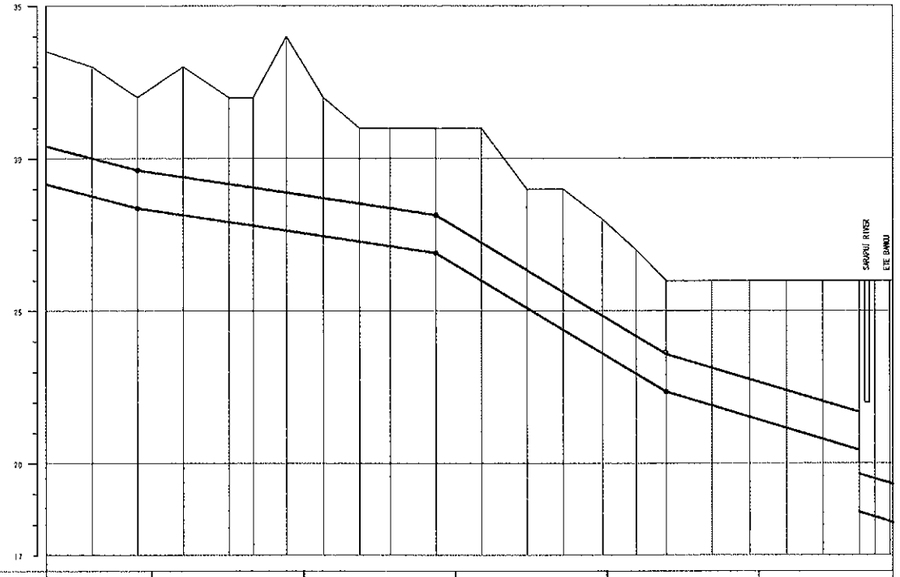
0 500 1000 1500 2000

DRAW.	THE STUDY ON MANAGEMENT AND IMPROVEMENT OF THE ENVIROMENTAL CONDITIONS OF GUANABARA BAY IN RIO DE JANEIRO	TITLE
5.1		LAYOUT PLAN OF BANGU SEWER DISTRICT
	JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	



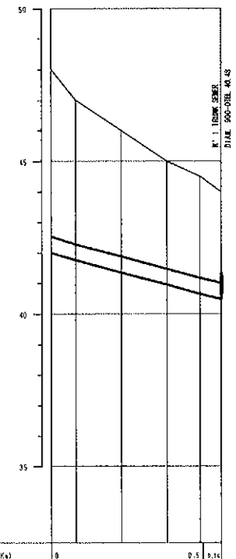
LOCATION STAKE (Km)		0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.15
N° OF SEWER		1 2 3 4 5 6	7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34	35 36 37 38 39 40 41 42 43									
UMH	DMH	1	2	35 44									
UGL	DGL	50.00 49.65	49.65 39.00	38.00 33.50									
UTEL	DTEL	49.00 45.44	45.04 33.72	31.93 29.15									
UTD	DTD	2.09 4.21	4.61 4.28	6.07 4.35									
LENGHT-DIAMETER		840-500	3335-900	980-1200									
SLOPE		0.0040	0.0030	0.0350	0.0028	0.0045	0.0045	0.0045	0.0045	0.0045	0.0045	0.0026	0.0026
FLOW		153.39 153.39	208.96 333.55	735.77 1051.37									

N°1 - TRUNK SEWER



LOCATION STAKE (Km)		5.15	5.5	6.0	6.5	7.0	7.5	7.94	
N° OF SEWER		44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64	65 66	MANHOLE OF ETE					
UMH	DMH	44	ETE						
UGL	DGL	33.50	28.00						
UTEL	DTEL	29.15	18.07						
UTD	DTD	4.35	7.93						
LENGHT-DIAMETER		2385-1200							
SLOPE		0.0020	0.0015	0.0060	0.0030				
FLOW		1051.37	1748.74						

N°1 - TRUNK SEWER (CONT.)



LOCATION STAKE (Km)		0	0.5	0.94
N° OF SEWER		17.1 17.2 17.3 17.4 17.5		
UMH	DMH	17.1	17	
UGL	DGL	48.09	44.00	
UTEL	DTEL	42.09	40.43	
UTD	DTD	6.00	3.57	
LENGHT-DIAMETER		500-500		
SLOPE		0.0027		
FLOW		29.49	29.49	

N°1-1 - TRUNK SEWER

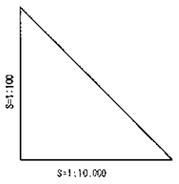
NOTE:

1- DIAMETERS IN MILIMETERS, SLOPES IN METER PER METER. LEVELS AND LENGHTS IN METERS.

LEGEND:

UMH	- UPSTREAM MANHOLE
UGL	- UPSTREAM GROUND LEVEL
UTEL	- UPSTREAM TRUNK SEWER BOTTOM LEVEL
UTD	- UPSTREAM TRUNK SEWER DEPTH
DMH	- DOWNSTREAM MANHOLE
DGL	- DOWNSTREAM GROUND LEVEL
DTEL	- DOWNSTREAM TRUNK SEWER BOTTOM LEVEL
DTD	- DOWNSTREAM TRUNK SEWER DEPTH
———	- GROUND
═══	- TRUNK SEWER
|	- MANHOLE

SCALE



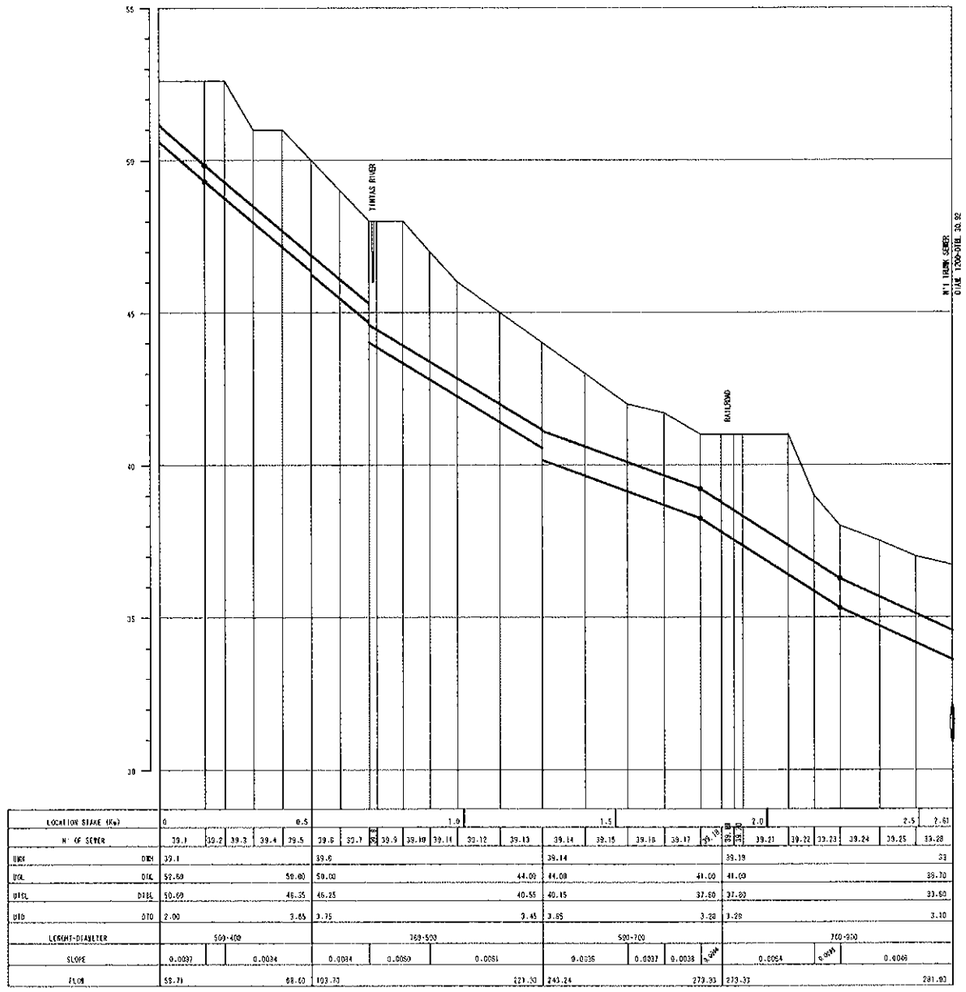
HORIZONTAL=1:10.000

0m 200 400 600 800 1000m

VERTICAL=1:100

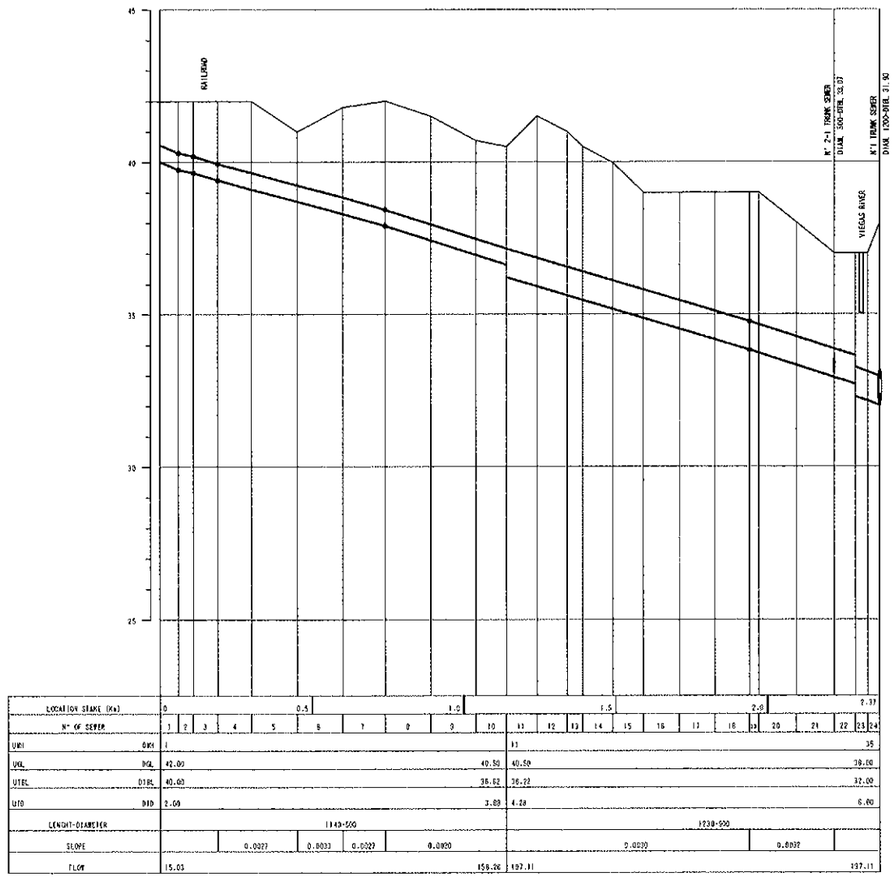
0m 2 4 6 8 10m

DRAW.	THE STUDY ON MANAGEMENT AND IMPROVEMENT OF THE ENVIROMENTAL CONDITIONS OF GUANABARA BAY IN RIO DE JANEIRO	TITLE
5.2		TRUNK SEWER PROFILE (1/3) BANGU SEWER DISTRICT
	JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	



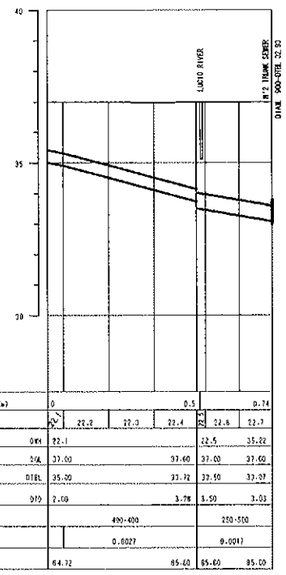
LOCATION STAKE (Km)		0			0.5				1.0				1.5				2.0				2.5	2.81
N° OF SEWER		39.1	39.2	39.3	39.4	39.5	39.6	39.7	39.8	39.9	39.10	39.11	39.12	39.13	39.14	39.15	39.16	39.17	39.18	39.19	39.20	39.21	39.22	39.23	39.24	39.25	39.26
UMH	DMH	39.1					39.6								39.14					39.19							33
UGL	DGL	52.60				50.80	50.00							44.00	44.00				41.00	41.00							39.70
UTEL	DTEL	50.60				46.35	46.25							40.55	40.15				37.60	37.80							33.60
UTD	DTD	2.00				3.65	3.75							3.45	3.85				3.38	3.20							3.10
LENGHT-DIAMETER		500-400					300-500								500-700					700-900							
SLOPE		0.0037			0.0034		0.0034		0.0059		0.0081				0.0035		0.0037	0.0038	0.0054	0.0049		0.0049					
FLOW		59.79			68.60		103.70				229.53				243.24			279.93	279.32			281.80					

N°1-2 - TRUNK SEWER



LOCATION STAKE (Km)		0			0.5			1.0				1.5				2.0				2.37
N° OF SEWER		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
UMH	DMH	1																		31					35
UGL	DGL	42.00									40.50									40.50					38.00
UTEL	DTEL	40.00									38.62									36.22					32.00
UTD	DTD	2.00									3.88									4.28					6.00
LENGHT-DIAMETER		1143-500																		1239-500					
SLOPE			0.0027		0.0033		0.0027			0.0020										0.0030			0.0032		
FLOW		15.03									158.26									197.81					197.11

N°2 - TRUNK SEWER



LOCATION STAKE (Km)		0			0.5		0.74
N° OF SEWER		22.2	22.3	22.4	22.5	22.6	22.7
UMH	DMH	22.1				22.5	35.22
UGL	DGL	37.00			37.60	37.00	37.60
UTEL	DTEL	35.00			33.72	33.50	33.07
UTD	DTD	2.00			3.78	3.50	3.03
LENGHT-DIAMETER		400-400				250-500	
SLOPE			0.0027			0.0047	
FLOW		64.72			65.60	65.60	85.00

N°2-1 - TRUNK SEWER

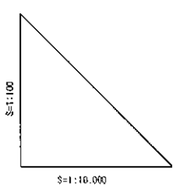
NOTE:

1- DIAMETERS IN MILIMETERS, SLOPES IN METER PER METER, LEVELS AND LENGHTS IN METERS.

LEGEND:

UMH	- UPSTREAM MANHOLE
UGL	- UPSTREAM GROUND LEVEL
UTEL	- UPSTREAM TRUNK SEWER BOTTOM LEVEL
UTD	- UPSTREAM TRUNK SEWER DEPTH
DMH	- DOWNSTREAM MANHOLE
DGL	- DOWNSTREAM GROUND LEVEL
DTEL	- DOWNSTREAM TRUNK SEWER BOTTOM LEVEL
DTD	- DOWNSTREAM TRUNK SEWER DEPTH
	- GROUND
	- TRUNK SEWER
	- MANHOLE

SCALE



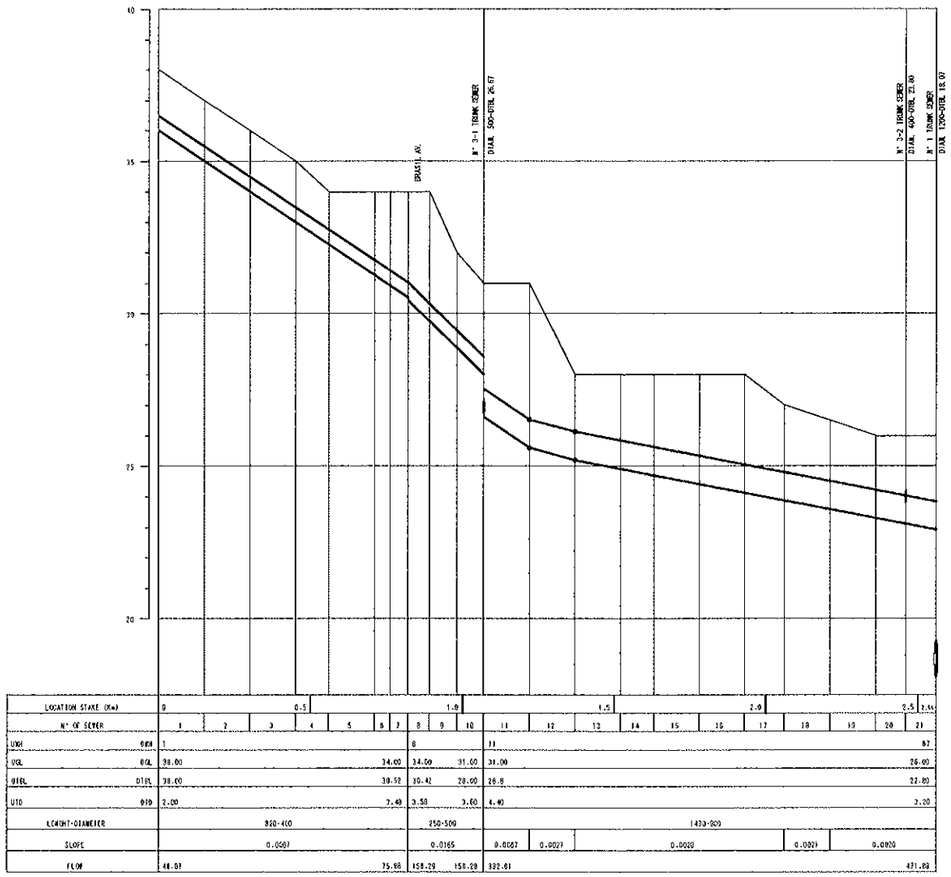
HORIZONTAL=1:10.000

0m 200 400 600 800 1000m

VERTICAL=1:100

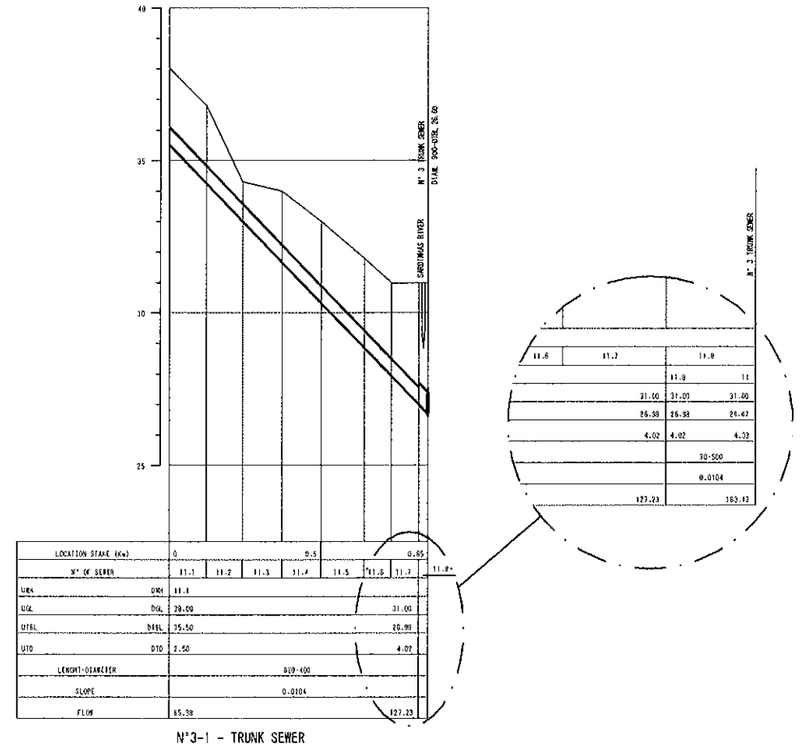
0m 2 4 6 8 10m

DRAW.	THE STUDY ON MANAGEMENT AND IMPROVEMENT OF THE ENVIROMENTAL CONDITIONS OF GUANABARA BAY IN RIO DE JANEIRO	TITLE
5.3		TRUNK SEWER PROFILE (2/3) BANGU SEWER DISTRICT
	JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	



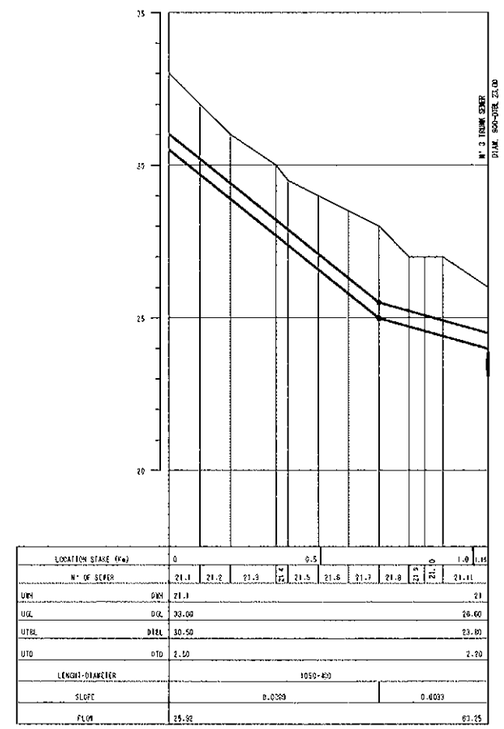
LOCATION STAKE (Km)		0				0.5				1.0				1.5				2.0				2.5	2.54
N° OF SEWER		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	
UMH	UMH	1							8			11											87
UGL	UGL	38.00					34.00		34.00		31.00	31.00											26.00
UTBL	UTBL	38.00					30.52		30.42		28.00	28.8											22.80
UTO	UTO	2.00					3.48		3.58		3.00	4.40											3.20
LENGHT-DIAMETER		800-400							250-500			1400-900											
SLOPE		0.0067							0.0165			0.0082	0.0027			0.0020				0.0024	0.0020		
FLOW		48.87					75.98		158.29		158.29	332.61											471.83

N°3 - TRUNK SEWER



LOCATION STAKE (Km)		0				0.5			0.85	
N° OF SEWER		11.1	11.2	11.3	11.4	11.5	11.6	11.7	11.8	
UMH	UMH	11.1								
UGL	UGL	29.00							31.00	
UTBL	UTBL	25.50							28.98	
UTO	UTO	2.50							4.02	
LENGHT-DIAMETER		800-400								
SLOPE		0.0104								
FLOW		85.98							127.23	

N°3-1 - TRUNK SEWER



LOCATION STAKE (Km)		0				0.5				1.0	1.35
N° OF SEWER		21.1	21.2	21.3	21.4	21.5	21.6	21.7	21.8	21.9	21.91
UMH	UMH	21.1									21
UGL	UGL	33.00									28.00
UTBL	UTBL	30.50									23.80
UTO	UTO	2.50									2.20
LENGHT-DIAMETER		1050-800									
SLOPE		0.0039								0.0039	
FLOW		85.98									83.25

N°3-2 - TRUNK SEWER

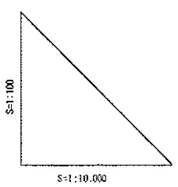
NOTE:

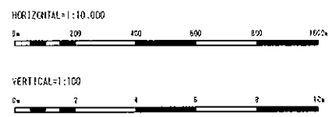
1- DIAMETERS IN MILIMETERS, SLOPES IN METER PER METER, LEVELS AND LENGTHS IN METERS.

LEGEND:

UMH	- UPSTREAM MANHOLE
UGL	- UPSTREAM GROUND LEVEL
UTBL	- UPSTREAM TRUNK SEWER BOTTOM LEVEL
UTO	- UPSTREAM TRUNK SEWER DEPTH
DMH	- DOWNSTREAM MANHOLE
DGL	- DOWNSTREAM GROUND LEVEL
DTBL	- DOWNSTREAM TRUNK SEWER BOTTOM LEVEL
DTO	- DOWNSTREAM TRUNK SEWER DEPTH
———	- GROUND
═══	- TRUNK SEWER
|	- MANHOLE

SCALE





DRAW.	THE STUDY ON MANAGEMENT AND IMPROVEMENT OF THE ENVIROMENTAL CONDITIONS OF GUANABARA BAY IN RIO DE JANEIRO	TITLE
5.4		TRUNK SEWER PROFILE (3/3) BANGU SEWER DISTRICT
	JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	

LEGEND:

1. INFLUENT PUMPING STATION
2. FINE SCREEN CHANNEL
3. GRIT CHAMBER
4. PRIMARY CLARIFIER
5. GRAVITY THICKENING
6. DIGESTERS
7. AERATION TANK
8. SECUNDARY CLARIFIER
9. RETURN PUMPING STATION
10. BLOWERS
11. ADMINISTRATION BUILDING
12. SLUDGE BUILDING
13. WORKSHOP
14. SUBSTATION SE-1
15. SUBSTATION SE-2

N=7472400 N=7472500 N=7472600 N=7472700 N=7472800 N=7472900 N=7473000

E=656700 E=656800 E=656900 E=657000

V.E.D.

EL. 25m

SARDINHAS RIVER

CABRAL RIVER

SARAPUI RIVER

TINTAS RIVER

OUTLET

INLET

ENTRANCE

RUA 3 MARIAS

RUA FLOR

TRAV. VIOLETA

TRAV. ROSAS

RUA CAPÃO BONITO

N° 3-TRUNK SEWER
DIAM. 900-DTBL 22.80

RUA BG. DE MAIO FLOR DE MAIO

RUA DA SAUDADE

TRAV. GIRASSOL

N° 1-TRUNK SEWER
DIAM. 1200-DTBL 18.07

SCALE 1:750

0 25 50 75 100

NOTE:
1 - ELEVATION E DIMENSION IN METER.

DRAW. 5.5	THE STUDY ON MANAGEMENT AND IMPROVEMENT OF THE ENVIROMENTAL CONDITIONS OF GUANABARA BAY IN RIO DE JANEIRO	TITLE: BANGU - WWTP LAYOUT PLAN
	JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	