REPUBLIC OF KENYA

MINISTRY OF PUBLIC WORKS

THE NAIROBI BYPASS PROJECT

DETAILED DESIGN STUDY

FINAL REPORT

PART II

VOLUME 2

(DRAWINGS)

SEPTEMBER 1992

JAPAN INTERNATIONAL COOPERATION AGENCY

24896

REPUBLIC OF KENYA

MINISTRY OF PUBLIC WORKS

THE NAIROBI BYPASS PROJECT
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FINAL REPORT
PART II
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JAPAN INTERNATIONAL COOPERATION AGENCY

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AERIAL PHOTO BY
MAPPING BY
LOCATION BY
SURVEYED BY
TRACED BY
CHECKED BY
M.O.P.W ROADS DEPT. DRG NO.

REVISIONS DESCRIPTION	DATE		

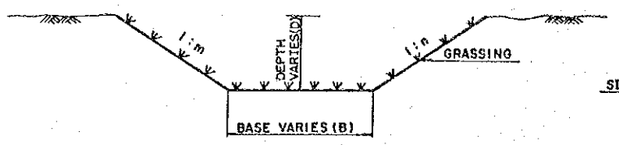
JAPAN INTERNATIONAL COOPERATION AGENCY

CHIEF ENGINEER (ROADS)
CHIEF SUPT. ENG (DESIGN)
SEN. SUPT. ENG (DESIGN)
SUPT. ENGINEER (DESIGN)
PROJECT ENGINEER

SCALES

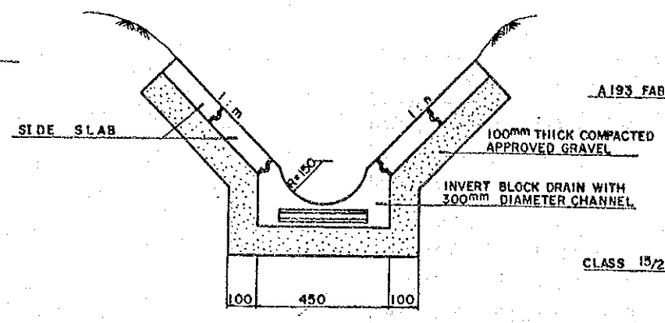
NAIROBI BYPASS

SHEET OF



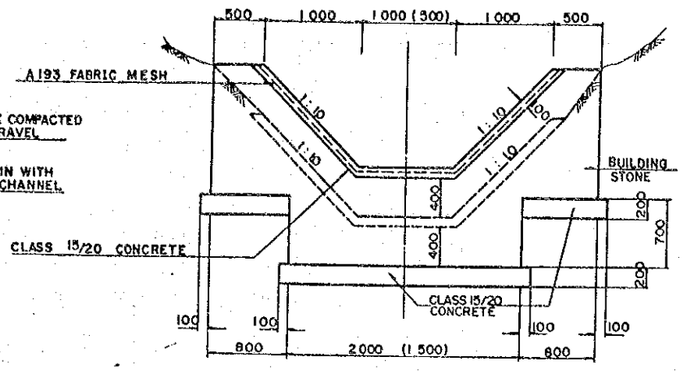
TYPICAL CROSS-SECTION OF DRAIN TYPE-I

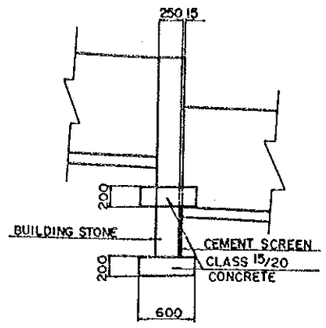
SCALE 1:20



TYPICAL CROSS-SECTION OF DRAIN TYPE-V
(450x225 INVERT BLOCK DRAIN AND SIDE SLAB)

SCALE 1:10





TYPICAL CROSS-SECTION OF DRAIN TYPE VI
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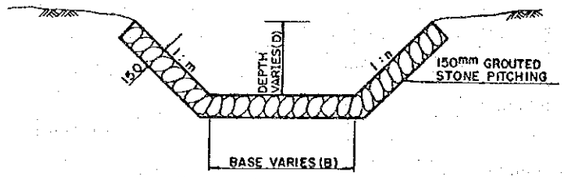
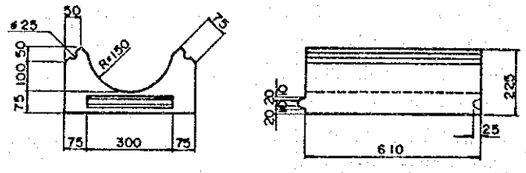
SCALE 1:30



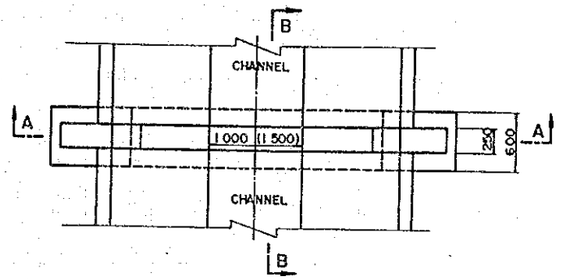
TYPICAL CROSS-SECTION OF DRAIN TYPE-II
(STONE PITCHING CHANNEL)

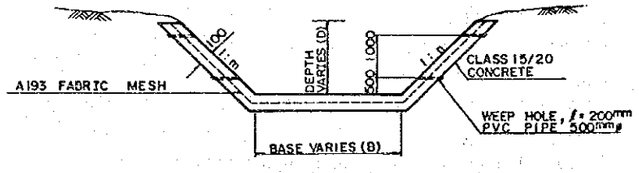
SCALE 1:20



450x225mm INVERT BLOCK DRAIN

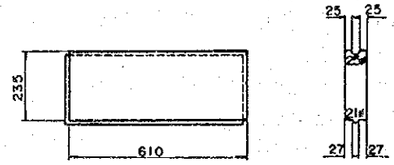
SCALE 1:10





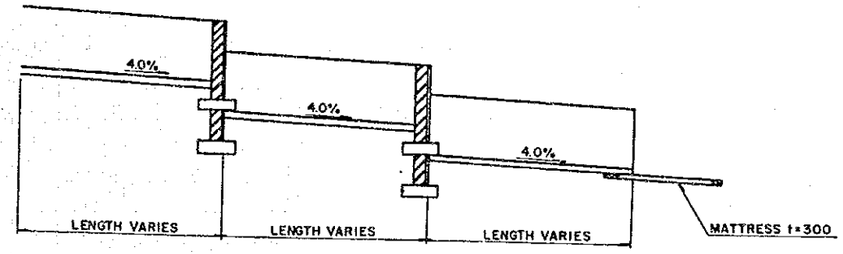
TYPICAL CROSS-SECTION OF DRAIN TYPE-III
(CONCRETE CHANNEL)

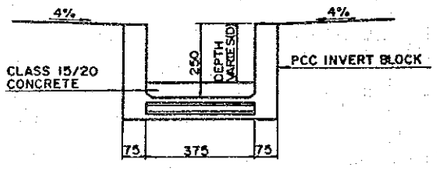
SCALE 1:20



SIDE SLAB FOR INVERT BLOCK DRAIN

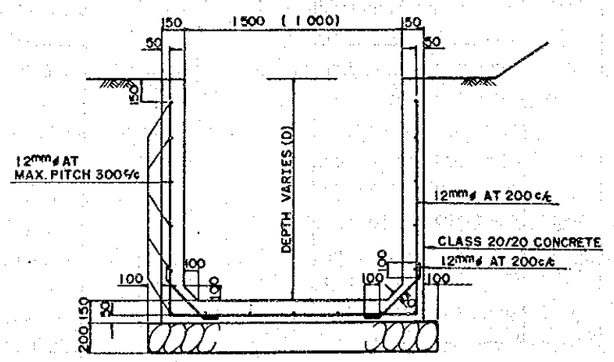
SCALE 1:10





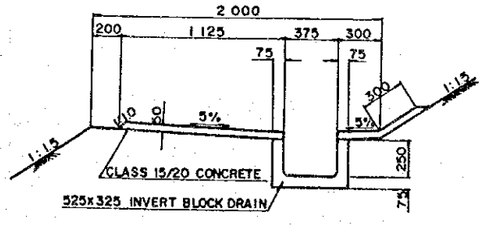
TYPICAL CROSS-SECTION OF DRAIN TYPE-IV
(525x325 INVERT BLOCK DRAIN)

SCALE 1:10



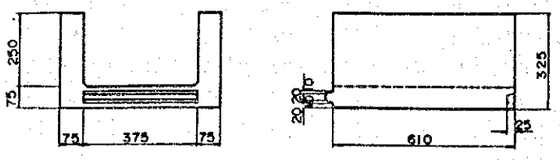
TYPICAL CROSS-SECTION OF DRAIN TYPE-VI
CONCRETE DITCH

SCALE 1:20



TYPICAL CROSS-SECTION TYPE-VII
(DRAIN DITCH ON BERM)

SCALE 1:20



525x325mm INVERT BLOCK DRAIN

SCALE 1:10

NOTE:
1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. A193 FABRIC MESH REINFORCEMENT TO BE PLACED AS SHOWN.
3. THE WEEP HOLE (ø=200mm,50mmdia) IS INSTRUCTED BY THE ENGINEER.

SURVEYED BY			
TRACED BY			
CHECKED BY			
AERIAL PHOTO BY			
MAPPING BY			
LOCATION BY			

M.O.P.W ROADS DEPT DRG NO.

REVISIONS			
DESCRIPTION	DATE		

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CHIEF ENGINEER (ROADS)		SEN. SUPT. ENG. (DESIGN)	
CHIEF SUPT. ENG. (DESIGN)		SUPT. ENGINEER (DESIGN)	
		PROJECT ENGINEER	

SCALES
AS SHOWN

NAIROBI BYPASS
DRAINAGE DETAILS

E
SHEET 1 OF 11

DRAINAGE SCHEDULE (1/3)

CHAINAGE	LOCATION	SIZE DEPTH (m)	SIZE BASE (m)	TYPE	LENGTH (m)	REMARKS
NAIROBI BYPASS						
CH.0+ 0.000 ~ CH.0+ 201.588	LEFT	0.500	1.000	I	201.588	
CH.0+ 692.078 ~ CH.5+ 160.000	LEFT	0.500	1.000	I	4,467.922	
CH.5+ 280.000 ~ CH.6+ 429.957	LEFT	0.500	1.000	I	1,149.957	
CH.6+ 480.000 ~ CH.6+ 540.000	LEFT	0.500	0.500 ~ 1.000	II	60.000	
CH.6+ 540.000 ~ CH.6+ 683.000	LEFT	0.500	1.000	I	143.000	
CH.6+ 720.000 ~ CH.6+ 840.000	LEFT	0.500	1.000	I	120.000	
CH.6+ 840.000 ~ CH.6+ 900.000	LEFT	0.500	0.500 ~ 1.000	II	60.000	
CH.6+ 969.957 ~ CH.7+ 25.000	LEFT	1.000 ~ 1.500	1.500	VI	55.043	
CH.7+ 25.000 ~ CH.7+ 30.000	LEFT	0.500	1.000	II	5.000	
CH.7+ 30.000 ~ CH.7+ 600.000	LEFT	0.500	1.000	I	570.000	
CH.7+ 600.000 ~ CH.7+ 760.000	LEFT	0.500	1.000	II	160.000	
CH.7+ 760.000 ~ CH.8+ 860.000	LEFT	0.500	1.000	I	1,100.000	
CH.8+ 860.000 ~ CH.9+ 60.000	LEFT	0.500	1.000	II	200.000	
CH.9+ 60.000 ~ CH.9+ 440.000	LEFT	0.500	1.000	I	380.000	
CH.9+ 440.000 ~ CH.10+ 100.000	LEFT	0.500	1.000	II	660.000	
CH.10+ 100.000 ~ CH.15+ 424.000	LEFT	0.500	1.000	I	5,508.875	
CH.15+ 456.000 ~ CH.15+ 517.000	LEFT	0.500	1.000	II	61.000	
CH.15+ 530.000 ~ CH.15+ 700.000	LEFT	1.000	1.000	VII	170.000	
CH.15+ 700.000 ~ CH.15+ 880.000	LEFT	1.000	1.000	I	180.000	
CH.15+ 880.000 ~ CH.15+ 885.000	LEFT	1.000	1.000	II	5.000	
CH.15+ 885.000 ~ CH.15+ 895.000	LEFT	1.000	1.000	III	10.000	
CH.15+ 895.000 ~ CH.15+ 990.000	LEFT	1.000	1.000	II	95.000	
CH.15+ 990.000 ~ CH.16+ 980.000	LEFT	1.000	1.000	I	990.000	
CH.16+ 980.000 ~ CH.17+ 20.000	LEFT	0.500	1.000	II	40.000	
CH.17+ 20.000 ~ CH.17+ 280.000	LEFT	0.500	1.000	I	260.000	
CH.17+ 360.000	LEFT	0.500	1.000	VII	100.000	OUTFALL CHANNEL
CH.17+ 360.000 ~ CH.17+ 440.000	LEFT	0.500	1.000	I	80.000	
CH.17+ 440.000 ~ CH.17+ 620.000	LEFT	0.500	1.000	II	180.000	
CH.17+ 620.000 ~ CH.17+ 780.000	LEFT	0.500	1.000	I	160.000	
CH.18+ 160.000	LEFT	0.500	1.000	VII	113.000	OUTFALL CHANNEL
CH.18+ 360.000	LEFT	0.500	1.000	VII	123.000	OUTFALL CHANNEL
CH.18+ 700.000 ~ CH.18+ 960.000	LEFT	0.500	1.000	I	260.000	
CH.18+ 960.000 ~ CH.19+ 20.000	LEFT	0.500	1.000	II	60.000	
CH.19+ 20.000 ~ CH.19+ 100.000	LEFT	0.500	1.000	I	80.000	
CH.19+ 60.000	LEFT	1.000	1.000	III	185.000	OUTFALL CHANNEL
CH.19+ 520.000	LEFT	0.500	1.000	VII	73.000	OUTFALL CHANNEL
CH.19+ 520.000 ~ CH.19+ 660.000	LEFT	0.500	1.000	I	140.000	
CH.19+ 660.000 ~ CH.19+ 760.000	LEFT	0.500	1.000	II	100.000	
CH.19+ 760.000 ~ CH.20+ 220.000	LEFT	0.500	1.000	I	460.000	
CH.20+ 220.000	LEFT	1.000	1.000	III	162.000	OUTFALL CHANNEL
CH.20+ 220.000 ~ CH.20+ 624.000	LEFT	1.000	1.000	I	404.000	
CH.20+ 920.000 ~ CH.21+ 60.000	LEFT	1.000	1.000	VII	140.000	
CH.21+ 60.000 ~ CH.21+ 640.000	LEFT	1.000	1.000	I	580.000	
CH.21+ 600.000 ~ CH.21+ 640.000	LEFT	1.000	1.000	I	40.000	CUT-OFF DITCH
CH.21+ 640.000 ~ CH.22+ 20.000	LEFT	0.500	1.000	II	380.000	
CH.22+ 20.000 ~ CH.22+ 380.000	LEFT	0.500	1.000	I	360.000	
CH.22+ 340.000 ~ CH.22+ 380.000	LEFT	0.500	1.000	I	40.000	CUT-OFF DITCH
CH.22+ 380.000 ~ CH.22+ 600.000	LEFT	1.000	1.000	I	220.000	
CH.22+ 600.000 ~ CH.22+ 800.000	LEFT	1.000	1.000	II	200.000	
CH.22+ 800.000 ~ CH.23+ 160.000	LEFT	1.000	1.000	I	360.000	
CH.23+ 175.000 ~ CH.23+ 404.000	LEFT	0.500	1.000	I	229.000	
CH.23+ 436.000 ~ CH.23+ 640.000	LEFT	0.500	1.000	I	204.000	
CH.23+ 640.000 ~ CH.23+ 920.000	LEFT			IV	280.000	
CH.23+ 920.000 ~ CH.24+ 740.000	LEFT	0.500	1.000	I	820.000	
CH.25+ 200.000 ~ CH.26+ 200.000	LEFT	0.500	1.000	I	1,000.000	
CH.26+ 220.000 ~ CH.26+ 365.000	LEFT	0.500	1.000	II	145.000	
CH.26+ 250.000 ~ CH.26+ 470.000	LEFT			VIII	220.000	DRAIN DITCH ON BERM
CH.26+ 295.000 ~ CH.26+ 430.000	LEFT			VIII	135.000	DRAIN DITCH ON BERM
CH.26+ 360.000 ~ CH.26+ 400.000	LEFT			VIII	40.000	DRAIN DITCH ON BERM
CH.26+ 295.000 ~ CH.26+ 430.000	LEFT	1.000	1.000	VII	135.000	
CH.26+ 430.000 ~ CH.26+ 990.000	LEFT	1.000	1.000	I	560.000	
CH.26+ 990.000 ~ CH.27+ 0.000	LEFT	1.000	1.000 ~ 1.500	III	10.000	
CH.27+ 0.000 ~ CH.27+ 20.000	LEFT	1.000	1.500	VI	20.000	
CH.27+ 20.000 ~ CH.27+ 30.000	LEFT	1.000	1.500 ~ 1.000	III	10.000	
CH.27+ 30.000 ~ CH.27+ 210.000	LEFT	1.000	1.000	I	180.000	
CH.27+ 210.000 ~ CH.27+ 215.000	LEFT	1.000	1.000	II	5.000	
CH.27+ 215.000 ~ CH.27+ 225.000	LEFT	1.000	1.000	III	10.000	
CH.27+ 225.000 ~ CH.27+ 230.000	LEFT	1.000	1.000	II	5.000	
CH.27+ 230.000 ~ CH.27+ 286.000	LEFT	1.000	1.000	I	56.000	
CH.27+ 286.000 ~ CH.27+ 540.000	LEFT	0.500	1.000	I	254.000	
CH.27+ 540.000 ~ CH.27+ 780.000	LEFT	0.500	0.500 ~ 1.000	II	240.000	
CH.27+ 905.000 ~ CH.27+ 910.000	LEFT	1.000	1.000	II	5.000	
CH.27+ 910.000 ~ CH.27+ 930.000	LEFT	1.000	1.000	III	20.000	
CH.27+ 930.000 ~ CH.27+ 935.000	LEFT	1.000	1.000	II	5.000	
CH.27+ 935.000 ~ CH.28+ 244.064	LEFT	0.500	1.000	I	464.064	
CH.0+ 0.000 ~ CH.0+ 210.000	RIGHT	0.500	1.000	I	210.000	
CH.0+ 611.720 ~ CH.0+ 760.000	RIGHT	1.000	1.000	I	148.280	
CH.0+ 760.000 ~ CH.5+ 160.000	RIGHT	0.500	1.000	I	4,400.000	
CH.5+ 300.000 ~ CH.5+ 960.000	RIGHT	0.500	1.000	I	660.000	
CH.6+ 540.000 ~ CH.6+ 580.000	RIGHT	0.500	0.500 ~ 1.000	II	40.000	
CH.6+ 580.000 ~ CH.6+ 665.000	RIGHT	0.500	1.000	I	85.000	
CH.6+ 705.000 ~ CH.6+ 880.000	RIGHT	0.500	0.500 ~ 1.000	II	175.000	
CH.7+ 15.000 ~ CH.7+ 25.000	RIGHT	1.500	1.500	VI	10.000	
CH.7+ 20.000	RIGHT	1.000	1.000	VII	473.000	OUTFALL CHANNEL
CH.7+ 25.000 ~ CH.7+ 30.000	RIGHT	0.500	0.500 ~ 1.000	II	5.000	
CH.7+ 30.000 ~ CH.7+ 360.000	RIGHT	0.500	1.000	I	330.000	
CH.7+ 700.000 ~ CH.7+ 780.000	RIGHT	0.500	1.000	II	80.000	
CH.7+ 780.000 ~ CH.8+ 0.000	RIGHT	0.500	1.000	I	220.000	
CH.8+ 180.000 ~ CH.8+ 250.000	RIGHT	0.500	1.000	I	70.000	
CH.8+ 250.000	RIGHT	1.000	1.000	VII	115.000	OUTFALL CHANNEL
CH.8+ 940.000	RIGHT	1.000	1.000	III	251.000	OUTFALL CHANNEL

NOTES:

1.LOCATION
THE DRAINAGE LOCATION IS INDICATED FOR THE CHAINAGE DIRECTION.

2.TYPE
DRAINAGE TYPES ARE SHOWN ON THE STANDARD DRAWING DETAILS. (DRAWING NO. E 1)

AERIAL PHOTO BY | SURVEYED BY
MAPPING BY | TRACED BY
LOCATION BY | CHECKED BY

M.O.P.W. ROADS DEPT. DRG NO.

REVISIONS DESCRIPTION	DATE		

JAPAN INTERNATIONAL COOPERATION AGENCY

CHIEF ENGINEER (ROADS)
CHIEF SUPT. ENG. (DESIGN)
SEN. SUPT. ENG (DESIGN)
SUPT. ENGINEER (DESIGN)
PROJECT ENGINEER

SCALES

NAIROBI BYPASS
DRAINAGE SCHEDULE (1)

E
SHEET 2 OF 11

DRAINAGE SCHEDULE (2/3)

CHAINAGE	LOCATION	SIZE DEPTH (m)	SIZE BASE (m)	TYPE	LENGTH (m)	REMARKS
CH.9+ 80.000 ~ CH.9+ 100.000	RIGHT	0.500	1.000	I	20.000	
CH.9+ 760.000 ~ CH.9+ 783.600	RIGHT	0.500	1.000	I	23.600	
CH.9+ 783.600	RIGHT	1.000	1.000	VII	110.000	OUTFALL CHANNEL
CH.9+ 783.600 ~ CH.10+ 100.000	RIGHT	0.500	1.000	II	316.400	
CH.10+ 100.000 ~ CH.12+ 820.000	RIGHT	0.500	1.000	I	2,720.000	
CH.11+ 240.000	RIGHT	1.000	1.000	I	71.000	OUTFALL CHANNEL
CH.12+ 400.000	RIGHT	0.500	1.000	VII	200.000	OUTFALL CHANNEL
CH.13+ 60.000 ~ CH.13+ 680.000	RIGHT	0.500	1.000	I	620.000	
CH.13+ 400.000	RIGHT	1.000	1.000	I	80.000	OUTFALL CHANNEL
CH.13+ 950.000 ~ CH.14+ 40.000	RIGHT	0.500	1.000	I	90.000	
CH.14+ 40.000 ~ CH.14+ 140.000	RIGHT	0.500	1.000	II	100.000	
CH.14+ 140.000 ~ CH.14+ 860.000	RIGHT	0.500	1.000	I	720.000	
CH.14+ 860.000 ~ CH.14+ 900.000	RIGHT	0.500	1.000	II	40.000	
CH.14+ 900.000 ~ CH.15+ 384.000	RIGHT	0.500	1.000	I	484.000	
CH.15+ 520.000 ~ CH.15+ 660.000	RIGHT	1.000	1.000	VII	140.000	
CH.15+ 660.000 ~ CH.16+ 980.000	RIGHT	1.000	1.000	I	1,320.000	
CH.16+ 980.000 ~ CH.17+ 340.000	RIGHT	0.500	1.000	I	360.000	
CH.17+ 340.000 ~ CH.17+ 380.000	RIGHT	0.500	1.000	II	40.000	
CH.17+ 380.000 ~ CH.18+ 280.000	RIGHT	0.500	1.000	I	900.000	
CH.18+ 280.000 ~ CH.18+ 380.000	RIGHT	0.500	1.000	II	100.000	
CH.18+ 380.000 ~ CH.19+ 0.000	RIGHT	0.500	1.000	I	620.000	
CH.19+ 0.000 ~ CH.19+ 80.000	RIGHT	0.500	1.000	II	80.000	
CH.19+ 80.000 ~ CH.19+ 160.000	RIGHT	0.500	1.000	I	80.000	
CH.19+ 160.000 ~ CH.19+ 220.000	RIGHT	0.500	1.000	II	60.000	
CH.19+ 220.000 ~ CH.20+ 240.000	RIGHT	0.500	1.000	I	1,020.000	
CH.20+ 240.000 ~ CH.20+ 744.000	RIGHT	0.500	1.000	II	504.000	
CH.20+ 776.000 ~ CH.20+ 945.000	RIGHT	0.500	1.000	I	169.000	
CH.22+ 0.000 ~ CH.22+ 380.000	RIGHT	0.500	1.000	I	380.000	
CH.22+ 380.000	RIGHT	1.000	1.000	III	732.000	OUTFALL CHANNEL
CH.22+ 380.000 ~ CH.22+ 600.000	RIGHT	0.500	1.000	I	220.000	
CH.22+ 600.000 ~ CH.22+ 780.000	RIGHT	0.500	1.000	II	180.000	
CH.22+ 780.000 ~ CH.23+ 20.000	RIGHT	0.500	1.000	I	240.000	
CH.23+ 20.000 ~ CH.23+ 60.000	RIGHT	0.500	1.000	II	40.000	
CH.23+ 60.000 ~ CH.23+ 160.000	RIGHT	0.500	1.000	I	100.000	
CH.23+ 175.000 ~ CH.23+ 404.000	RIGHT	0.500	1.000	I	229.000	
CH.23+ 436.000 ~ CH.23+ 640.000	RIGHT	0.500	1.000	I	204.000	
CH.23+ 640.000 ~ CH.23+ 940.000	RIGHT			IV	300.000	
CH.23+ 940.000 ~ CH.24+ 440.000	RIGHT	0.500	1.000	I	500.000	
CH.24+ 380.000	RIGHT	1.000	1.000	I	260.000	OUTFALL CHANNEL
CH.24+ 440.000 ~ CH.24+ 520.000	RIGHT	0.500	1.000	II	80.000	
CH.24+ 520.000 ~ CH.24+ 880.000	RIGHT	0.500	1.000	I	360.000	
CH.25+ 200.000 ~ CH.25+ 420.000	RIGHT	0.500	1.000	I	220.000	
CH.25+ 420.000	RIGHT	1.000	1.000	I	258.000	OUTFALL CHANNEL
CH.25+ 420.000 ~ CH.25+ 480.000	RIGHT	0.500	1.000	II	60.000	

CHAINAGE	LOCATION	SIZE DEPTH (m)	SIZE BASE (m)	TYPE	LENGTH (m)	REMARKS
CH.25+ 480.000 ~ CH.26+ 200.000	RIGHT	0.500	1.000	I	720.000	
CH.26+ 220.000 ~ CH.26+ 280.000	RIGHT	0.500	1.000	II	60.000	
CH.26+ 233.000 ~ CH.26+ 425.000	RIGHT			VIII	192.000	DRAIN DITCH ON BERM
CH.26+ 280.000 ~ CH.26+ 365.000	RIGHT			VIII	85.000	DRAIN DITCH ON BERM
CH.26+ 277.000 ~ CH.26+ 315.000	RIGHT			VIII	38.000	DRAIN DITCH ON BERM
CH.26+ 325.000 ~ CH.26+ 417.000	RIGHT	0.500	0.500 ~ 1.000	II	92.000	
CH.26+ 417.000 ~ CH.26+ 584.000	RIGHT	0.500	1.000	I	167.000	
CH.26+ 616.000 ~ CH.26+ 960.000	RIGHT	0.500	1.000	I	344.000	
CH.26+ 960.000 ~ CH.27+ 25.000	RIGHT	0.500	1.000	I	65.000	
CH.27+ 25.000 ~ CH.27+ 35.000	RIGHT	0.500	1.000	II	10.000	
CH.27+ 35.000 ~ CH.27+ 55.000	RIGHT	0.500	1.000	VI	20.000	
CH.27+ 55.000 ~ CH.27+ 65.000	RIGHT	0.500	1.000	II	10.000	
CH.27+ 65.000 ~ CH.27+ 210.000	RIGHT	0.500	1.000	I	145.000	
CH.27+ 210.000 ~ CH.27+ 215.000	RIGHT	0.500	1.000	II	5.000	
CH.27+ 215.000 ~ CH.27+ 225.000	RIGHT	0.500	1.000	III	10.000	
CH.27+ 225.000 ~ CH.27+ 230.000	RIGHT	0.500	1.000	II	5.000	
CH.27+ 230.000 ~ CH.27+ 640.000	RIGHT	0.500	1.000	I	410.000	
CH.27+ 580.000		0.500	1.000	III	76.000	OUTFALL CHANNEL
CH.27+ 640.000 ~ CH.27+ 730.000	RIGHT	1.000	1.000	II	90.000	
CH.27+ 730.000 ~ CH.27+ 880.000	RIGHT	0.500	1.000	II	150.000	
CH.27+ 880.000 ~ CH.27+ 905.000	RIGHT	1.000	1.000	I	25.000	
CH.27+ 905.000 ~ CH.27+ 910.000	RIGHT	1.000	1.000	II	5.000	
CH.27+ 910.000 ~ CH.27+ 930.000	RIGHT	1.000	1.000	III	20.000	
CH.27+ 930.000 ~ CH.27+ 935.000	RIGHT	1.000	1.000	II	5.000	
CH.27+ 935.000 ~ CH.28+ 40.000	RIGHT	0.500	1.000	I	105.000	
CH.28+ 40.000		0.500	1.000	III	260.000	OUTFALL CHANNEL
CH.0+ 300.000 ~ CH.0+ 368.800	MEDIAN	0.250	0.375	IV	68.800	
CH.0+ 426.400 ~ CH.0+ 920.000	MEDIAN	0.000 ~ 0.250	0.375	IV	493.600	
CH.0+ 920.000 ~ CH.1+ 0.000	MEDIAN	0.500	0.500	II	80.000	
CH.1+ 0.000 ~ CH.5+ 275.000	MEDIAN	0.500	1.000	I	4,275.000	
CH.5+ 280.000 ~ CH.5+ 305.000	MEDIAN	0.500	1.000	II	25.000	
CH.5+ 305.000 ~ CH.6+ 40.000	MEDIAN	0.500	1.000	I	735.000	
CH.6+ 40.000 ~ CH.6+ 200.000	MEDIAN	0.500	0.500 ~ 1.000	II	160.000	
CH.6+ 200.000 ~ CH.6+ 675.890	MEDIAN	0.250	0.375	IV	475.890	
CH.6+ 714.490 ~ CH.7+ 28.438	MEDIAN	0.000 ~ 0.250	0.375	IV	313.948	
CH.7+ 450.000 ~ CH.11+ 572.939	MEDIAN	0.250	0.375	IV	4,122.939	
CH.12+ 555.272 ~ CH.13+ 45.000	MEDIAN	0.250	0.375	IV	489.728	
CH.13+ 484.164 ~ CH.14+ 46.897	MEDIAN	0.250	0.375	IV	562.733	
CH.14+ 595.083 ~ CH.16+ 723.371	MEDIAN	0.250	0.375	IV	2,313.163	
CH.17+ 717.493 ~ CH.19+ 501.992	MEDIAN	0.250	0.375	IV	1,784.499	
CH.19+ 665.156 ~ CH.22+ 263.231	MEDIAN	0.250	0.375	IV	2,598.075	
CH.24+ 83.917 ~ CH.25+ 248.062	MEDIAN	0.250	0.375	IV	1,164.145	
CH.27+ 670.000 ~ CH.28+ 380.000	MEDIAN	0.250	0.375	IV	710.000	

NOTES:

1.LOCATION
THE DRAINAGE LOCATION IS INDICATED FOR THE CHAINAGE DIRECTION.

2.TYPE
DRAINAGE TYPES ARE SHOWN ON THE STANDARD DRAWING DETAILS. (DRAWING NO. E 1)

AERIAL PHOTO BY
MAPPING BY
LOCATION BY
SURVEYED BY
TRACED BY
CHECKED BY
M.O.P.W. ROADS DEPT. DRG NO.

REVISIONS DESCRIPTION	DATE			JAPAN INTERNATIONAL COOPERATION AGENCY	CHIEF ENGINEER (ROADS)	SEN. SUPT. ENG. (DESIGN)		SCALES	NAIROBI BYPASS DRAINAGE SCHEDULE (2)	E
					CHIEF SUPT. ENG. (DESIGN)	SUPT. ENGINEER (DESIGN)				SHEET 3 OF 11
						PROJECT ENGINEER				

DRAINAGE SCHEDULE (3/3)

CHAINAGE	LOCATION	SIZE DEPTH (m)	SIZE BASE (m)	TYPE	LENGTH (m)	REMARKS
MOMBASA ROAD JUNCTION						
A SLIP ROAD CH.0+ 140.000 ~ CH.0+ 196.000	LEFT	0.500	1.000	I	69.000	
B SLIP ROAD CH.0+ 209.000 ~ CH.0+ 288.168	LEFT	0.500	1.000	I	75.000	
CH.0+ 209.000 ~ CH.0+ 288.168	RIGHT	0.500	1.000	I	68.000	
C SLIP ROAD CH.0+ 19.523 ~ CH.0+ 120.000	LEFT	1.000	1.000	I	72.000	
CH.0+ 120.000 ~ CH.0+ 170.000	LEFT	1.000	1.000	III	55.000	
CH.0+ 170.000 ~ CH.0+ 257.054	LEFT	1.000	1.000	I	85.000	
CH.0+ 172.000 ~ CH.0+ 240.000	RIGHT	0.500	1.000	I	68.000	
D SLIP ROAD CH.0+ 51.041 ~ CH.0+ 65.000	LEFT	0.500	1.000	I	10.000	
E SLIP ROAD CH.0+ 16.644 ~ CH.0+ 263.960	LEFT	0.500	1.000	I	260.000	
F SLIP ROAD CH.0+ 212.000 ~ CH.0+ 311.954	LEFT	0.500	1.000	I	100.000	
CH.0+ 212.000 ~ CH.0+ 289.000	RIGHT	0.500	1.000	I	82.000	
G SLIP ROAD CH.0+ 100.245 ~ CH.0+ 325.775	LEFT	0.500	1.000	I	223.000	
CH.0+ 248.000 ~ CH.0+ 301.000	RIGHT	0.500	1.000	I	54.000	
APPROACH ROAD (A104) CH.0- 150.000 ~ CH.0+ 80.000	LEFT	0.500	1.000	I	230.000	
CH.0+ 117.000 ~ CH.0+ 459.000	LEFT	0.500	1.000	I	342.000	
CH.0- 796.000 ~ CH.0- 64.811	RIGHT	0.500	2.000	I	732.000	
CH.0+ 13.237 ~ CH.0+ 80.000	RIGHT	0.500	1.000	I	67.000	
CH.0+ 117.000 ~ CH.0+ 220.000	RIGHT	0.500	1.000	I	103.000	
CH.0- 117.000	MEDIAN & LEFT	1.000	3.500	III	22.000	OUTFALL CHANNEL
UHURU MONUMENT JUNCTION						
A SLIP ROAD CH.0+ 130.218 ~ CH.0+ 390.000	LEFT	0.500	1.000	I	260.000	
C SLIP ROAD CH.0+ 20.000 ~ CH.0+ 100.000	LEFT	0.500	1.000	I	80.000	
CH.0+ 100.000 ~ CH.0+ 140.000	LEFT	0.500	1.000	II	40.000	
CH.0+ 140.000 ~ CH.0+ 215.000	LEFT	0.500	1.000	I	75.000	
CH.0+ 215.000 ~ CH.0+ 220.000	LEFT	0.500	0.500 ~ 1.000	II	5.000	
CH.0+ 220.000 ~ CH.0+ 269.112	LEFT	1.000 ~ 1.500	1.500	VI	50.000	
APPROACH ROAD (C58) CH.0+ 100.000 ~ CH.0+ 360.000	RIGHT			IV	260.000	
CH.0+ 0.000 ~ CH.0+ 103.000	LEFT	0.500	1.000	I	103.000	
CH.0+ 113.000 ~ CH.0+ 360.000	LEFT			V	247.000	
CH.0+ 360.000 ~ CH.0+ 468.000	LEFT	0.500	1.000	I	128.000	
NGONG ROAD JUNCTION						
A SLIP ROAD CH.0+ 10.000 ~ CH.0+ 285.000	LEFT	0.500	1.000	I	290.000	
CH.0+ 10.000 ~ CH.0+ 285.000	RIGHT	0.500	1.000	I	280.000	
B SLIP ROAD CH.0+ 10.000 ~ CH.0+ 268.000	LEFT	0.500	1.000	I	236.000	
CH.0+ 10.000 ~ CH.0+ 268.000	RIGHT	0.500	1.000	I	262.000	
APPROACH ROAD (C60) CH.0+ 0.000 ~ CH.0+ 65.000	LEFT	0.500	1.000	I	65.000	
CH.0+ 123.000 ~ CH.0+ 367.000	LEFT	0.500	1.000	I	244.000	
CH.0+ 437.000 ~ CH.0+ 562.000	LEFT	0.500	1.000	I	125.000	
CH.0+ 622.000 ~ CH.0+ 800.000	LEFT	0.500	1.000	I	178.000	
CH.0+ 0.000 ~ CH.0+ 367.000	RIGHT	0.500	1.000	I	367.000	
CH.0+ 437.000 ~ CH.0+ 800.000	RIGHT	0.500	1.000	I	363.000	
OUTFALL CHANNEL CH.0+ 260.000		0.500	1.000	I	40.000	

CHAINAGE	LOCATION	SIZE DEPTH (m)	SIZE BASE (m)	TYPE	LENGTH (m)	REMARKS
DAGORETTI FOREST JUNCTION						
A SLIP ROAD CH.0+ 10.000 ~ CH.0+ 314.000	LEFT	1.000	1.000	I	330.000	
B SLIP ROAD CH.0+ 10.000 ~ CH.0+ 277.000	RIGHT	0.500	1.000	I	280.000	
CH.0+ 10.000 ~ CH.0+ 80.000	LEFT	0.500	1.000	I	70.000	
APPROACH ROAD (C63) CH.0+ 335.000 ~ CH.0+ 340.000	LEFT	1.000	1.000	I	5.000	
CH.0+ 0.000 ~ CH.0+ 160.000	RIGHT	0.500	1.000	I	160.000	
CH.0+ 240.000 ~ CH.0+ 340.000	RIGHT	1.000	1.000	I	100.000	
CH.0+ 340.000 ~ CH.0+ 480.000	RIGHT	0.500	1.000	I	140.000	
THOGOTO JUNCTION						
A SLIP ROAD CH.0+ 10.000 ~ CH.0+ 406.000	LEFT	0.500	1.000	I	400.000	
CH.0+ 10.000 ~ CH.0+ 457.500	RIGHT	0.500	1.000	I	450.000	
B SLIP ROAD CH.0+ 10.000 ~ CH.0+ 40.000	LEFT	0.500	1.000	I	30.000	
CH.0+ 215.000 ~ CH.0+ 327.000	LEFT	0.500	1.000	I	120.000	
CH.0+ 215.000 ~ CH.0+ 327.000	RIGHT	0.500	1.000	I	120.000	
APPROACH ROAD (D411) CH.0+ 0.000 ~ CH.0+ 227.000	LEFT	0.500	1.000	I	230.000	
CH.0+ 290.000 ~ CH.0+ 500.000	LEFT	0.500	1.000	I	210.000	
CH.0+ 0.000 ~ CH.0+ 147.000	RIGHT	0.500	1.000	I	147.000	
CH.0+ 200.000 ~ CH.0+ 227.000	RIGHT	0.500	1.000	I	27.000	
CH.0+ 290.000 ~ CH.0+ 406.000	RIGHT	0.500	1.000	I	116.000	
CH.0+ 457.500 ~ CH.0+ 500.000	RIGHT	0.500	1.000	I	42.500	
KIRUYU TOWN JUNCTION						
A SLIP ROAD CH.0+ 25.000 ~ CH.0+ 220.000	LEFT	0.500	1.000	I	195.000	
CH.0+ 0.000 ~ CH.0+ 860.000	RIGHT	0.500	1.000	I	860.000	
CH.0+ 860.000 ~ CH.0+ 960.000	RIGHT	0.500	1.000	II	100.000	
CH.1+ 60.000 ~ CH.1+ 275.000	RIGHT	0.500	1.000	II	215.000	
B SLIP ROAD CH.0+ 10.000 ~ CH.0+ 54.000	LEFT	0.500	1.000	I	44.000	
CH.0+ 10.000 ~ CH.0+ 54.000	RIGHT	0.500	1.000	I	44.000	
C SLIP ROAD CH.0+ 10.000 ~ CH.0+ 170.000	LEFT	0.500	1.000	II	160.000	
CH.0+ 10.000 ~ CH.0+ 170.000	RIGHT	0.500	1.000	II	160.000	
D SLIP ROAD CH.0- 20.000 ~ CH.0+ 180.000	LEFT	0.500	1.000	I	200.000	
CH.0+ 180.000 ~ CH.0+ 768.529	LEFT	0.500	1.000	II	590.000	
CH.0+ 20.000 ~ CH.0+ 200.000	RIGHT	0.500	1.000	I	180.000	
KIKUYU JUNCTION						
A SLIP ROAD CH.0+ 83.958 ~ CH.0+ 140.000	LEFT	0.500	1.000	I	58.000	
CH.0+ 140.000 ~ CH.0+ 240.000	LEFT	0.500	1.000	II	100.000	
CH.0+ 240.000 ~ CH.0+ 550.147	LEFT	0.500	1.000	I	310.000	
CH.0+ 195.000 ~ CH.0+ 460.000	RIGHT	0.500	1.000	II	265.000	
B SLIP ROAD CH.0+ 35.000 ~ CH.0+ 120.000	LEFT	0.500	1.000	I	85.000	
CH.0+ 120.000 ~ CH.0+ 172.320	RIGHT	0.500	1.000	I	53.000	
C SLIP ROAD CH.0+ 3.500 ~ CH.0+ 120.000	LEFT	0.500	1.000	I	116.500	
CH.0+ 3.500 ~ CH.0+ 120.000	RIGHT	0.500	1.000	I	116.500	
APPROACH ROAD (A104) CH.5+ 960.000 ~ CH.6+ 140.000	LEFT	0.500	1.000	I	180.000	

NOTES:

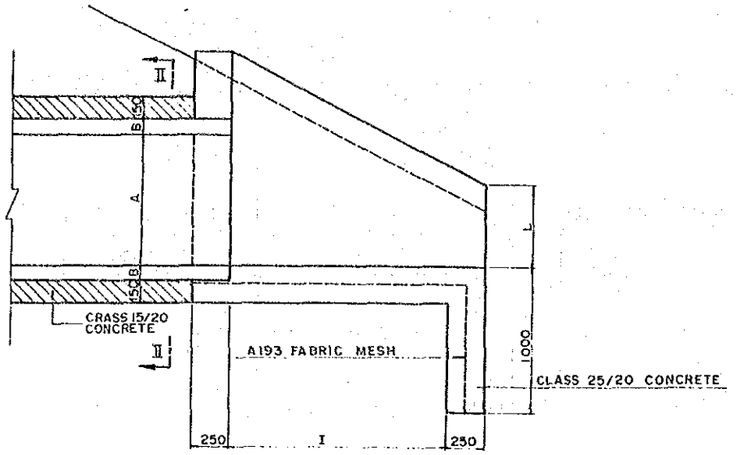
1.LOCATION
THE DRAINAGE LOCATION IS INDICATED FOR THE CHAINAGE DIRECTION.

2.TYPE
DRAINAGE TYPES ARE SHOWN ON THE STANDARD DRAWING DETAILS. (DRAWING NO. E 1)

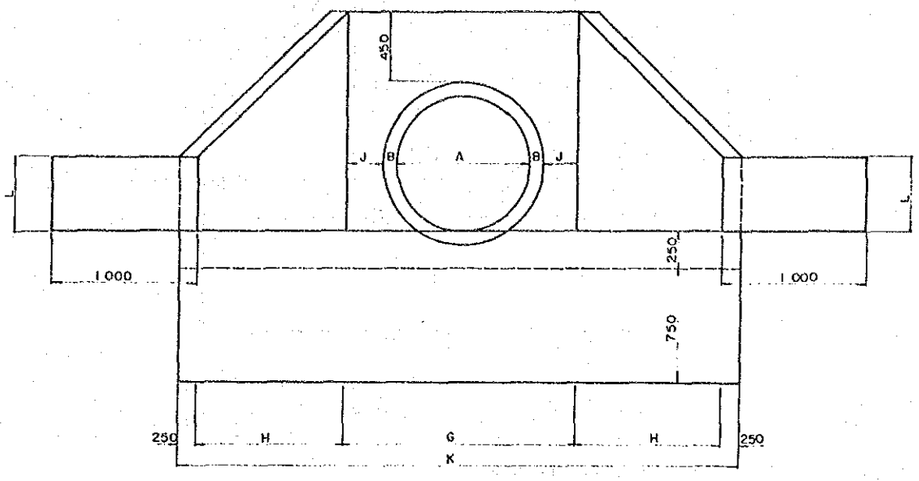
AERIAL PHOTO BY
MAPPING BY
LOCATION BY
SURVEYED BY
TRACED BY
CHECKED BY

M.O.P.W. ROADS DEPT. DRG. NO.

REVISIONS DESCRIPTION	DATE				JAPAN INTERNATIONAL COOPERATION AGENCY	CHIEF ENGINEER (ROADS)	SEN. SUPT. ENG. (DESIGN)			SCALES	NAIROBI BYPASS DRAINAGE SCHEDULE (3)	E SHEET 4 OF 11
						CHIEF SUPT. ENG. (DESIGN)	SUPT. ENGINEER (DESIGN)					
							PROJECT ENGINEER					



SECTION I – I



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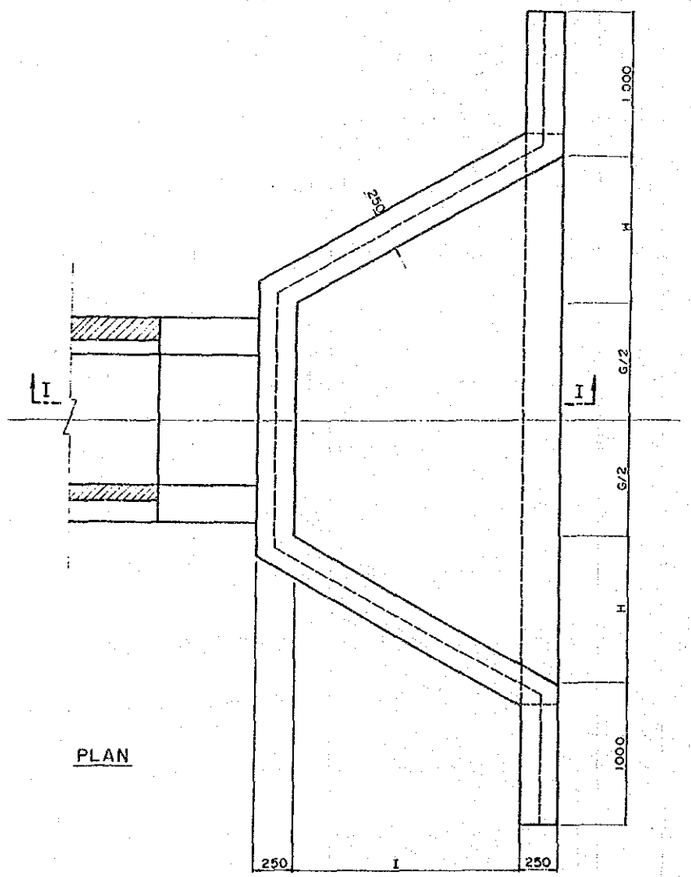

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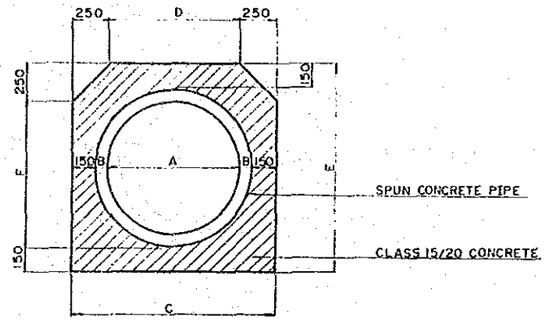


SECTION II – II

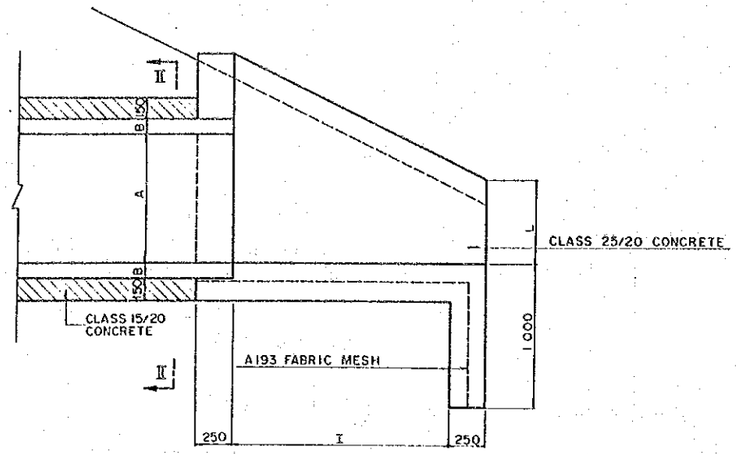
CULVERT	A (m)	B (m)	C (m)	D (m)	E (m)	F (m)	G (m)	H (m)	I (m)	J (m)	K (m)	L (m)
0.60m DIAMETER	0.60	0.050	0.85	0.35	1.00	0.60	1.30	0.90	1.20	0.30	3.60	0.50
0.75m DIAMETER	0.75	0.060	1.02	0.52	1.17	0.77	1.45	0.95	1.35	0.29	3.85	0.50
0.90m DIAMETER	0.90	0.064	1.18	0.68	1.33	0.93	1.61	1.00	1.50	0.29	4.11	1.00
1.20m DIAMETER	1.20	0.075	1.50	1.00	1.85	1.25	1.91	1.10	1.80	0.28	4.61	1.00

NOTES:

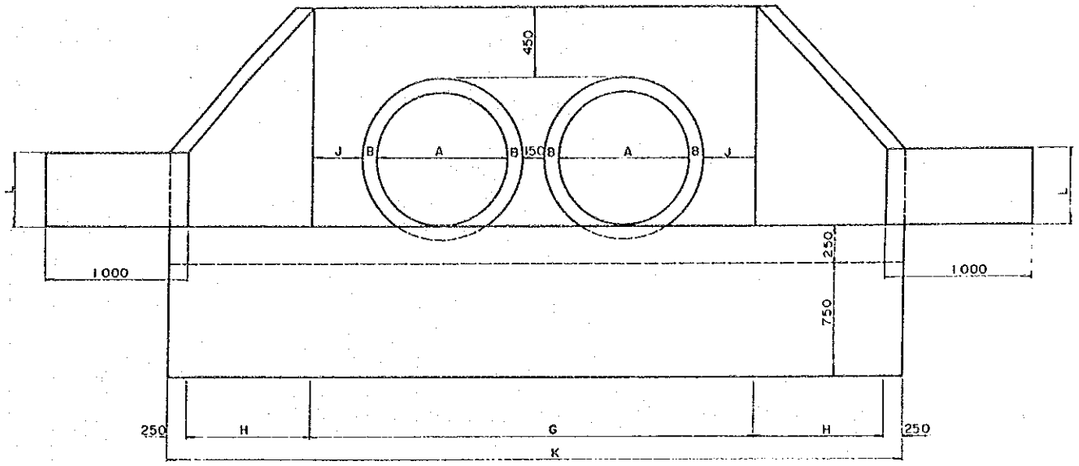
1. A193 FABRIC MESH REINFORCEMENT TO BE PLACED AS SHOWN.
2. THE SLOPE OF THE PIPE SHALL BE AS DIRECTED BY THE ENGINEER.
3. ALL DIMENSIONS ARE IN MILLIMETRES.

SURVEYED BY
TRACED BY
CHECKED BY
AERIAL PHOTO BY
MAPPING BY
LOCATION BY
M.O.P.W. ROADS DEPT. DRG NO

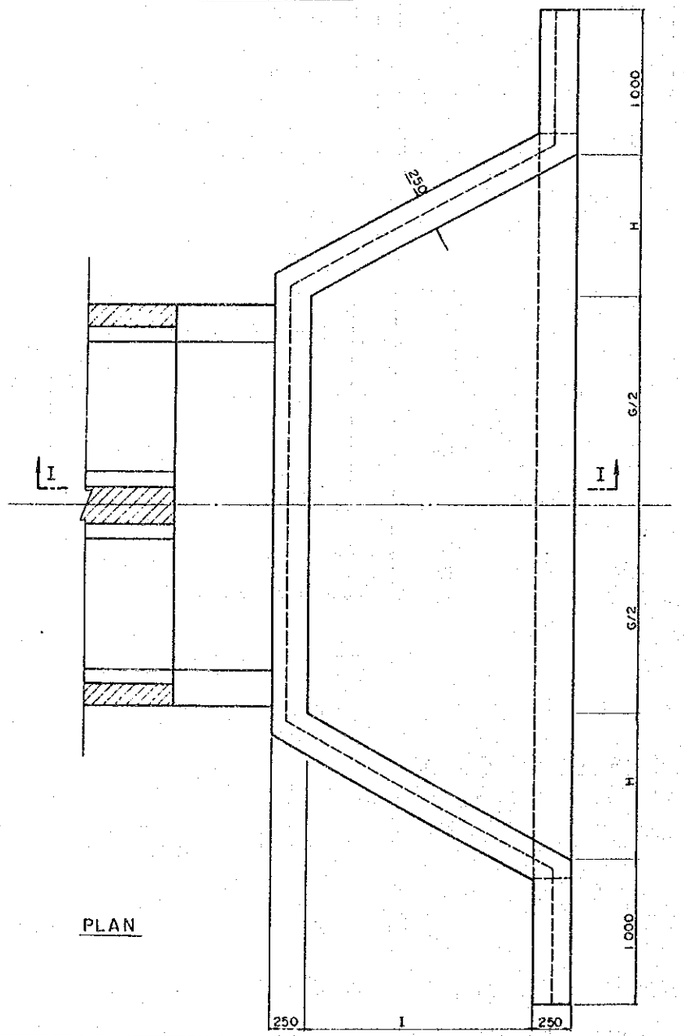
REVISIONS				JAPAN INTERNATIONAL COOPERATION AGENCY	CHIEF ENGINEER (ROADS)	SEN. SUPT. ENG (DESIGN)		SCALES	NAIROBI BYPASS	E
DESCRIPTION	DATE				CHIEF SUPT. ENG (DESIGN)	SUPT. ENGINEER (DESIGN)		AS SHOWN	STANDARD PIPE CULVERT	SHEET 5 OF 11
						PROJECT ENGINEER				



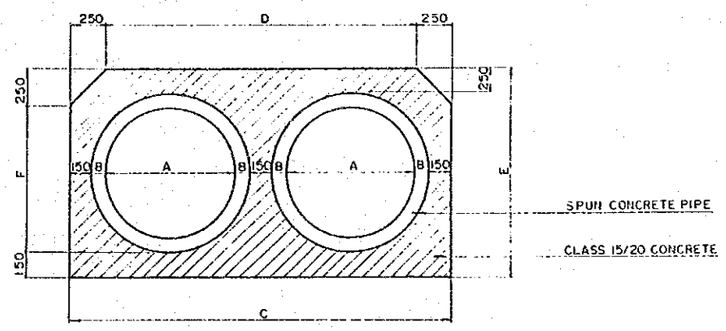
SECTION I-I



FRONT ELEVATION



PLAN



SECTION II - II

CULVERT	A (m)	B (m)	C (m)	D (m)	E (m)	F (m)	G (m)	H (m)	I (m)	J (m)	K (m)	L (m)
2×0.90m DIAMETER	0.90	0.07	2.53	2.03	1.34	0.94	2.85	1.00	1.50	0.31	5.35	1.00
2×1.20m DIAMETER	1.20	0.08	3.17	2.67	1.66	1.26	3.45	1.10	1.80	0.23	6.15	1.00

NOTES:

1. A193 FABRIC MESH REINFORCEMENT TO BE PLACED AS SHOWN.
2. THE SLOPE OF THE PIPE SHALL BE AS DIRECTED BY THE ENGINEER.
3. ALL DIMENSIONS ARE IN MILLIMETRES.

SURVEYED BY
TRACED BY
CHECKED BY
AERIAL PHOTO BY
MAPPING BY
LOCATION BY
M.O.P.W. ROADS DEPT. DRG NO

REVISIONS			
DESCRIPTION	DATE		

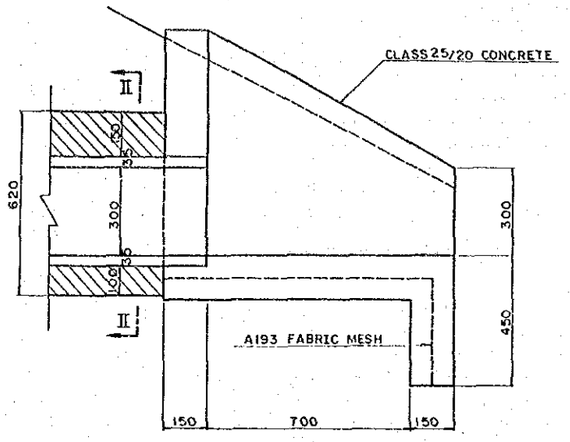
JAPAN INTERNATIONAL COOPERATION AGENCY

CHIEF ENGINEER (ROADS)
CHIEF SUPT ENG (DESIGN)
SEN SUPT ENG (DESIGN)
SUPT ENGINEER (DESIGN)
PROJECT ENGINEER

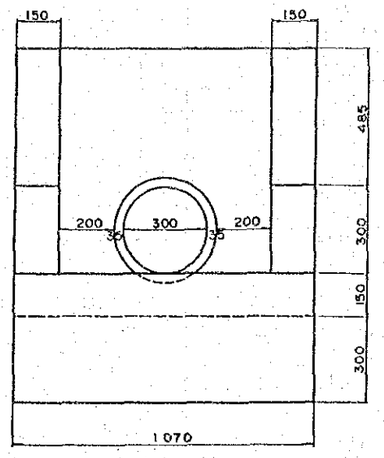
SCALES
AS SHOWN

NAIROBI BYPASS
STANDARD TWIN PIPE CULVERT

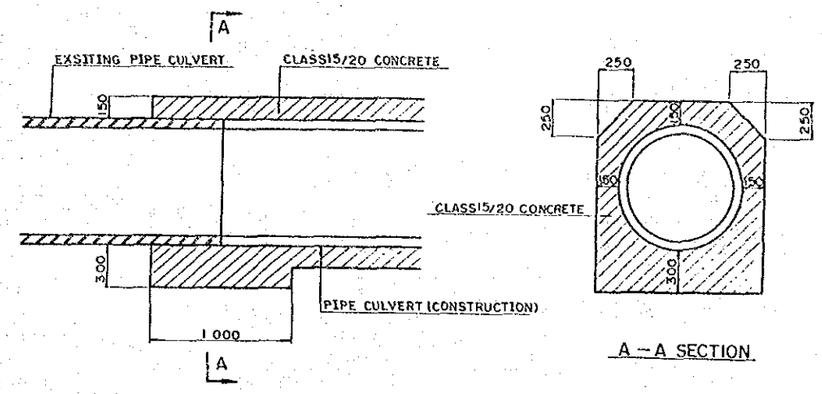
E
SHEET 6 OF 11



SECTION I – I

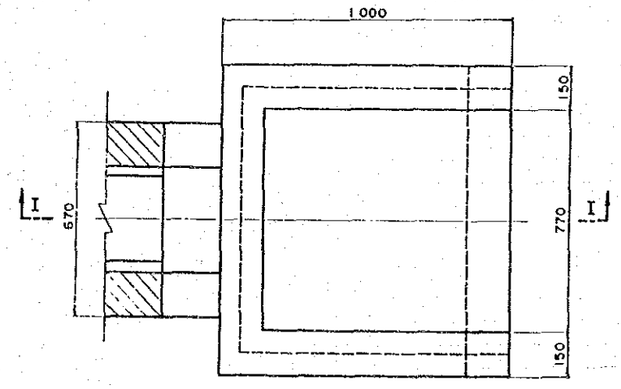


FRONT ELEVATION

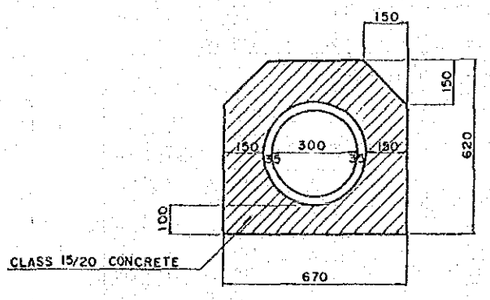


A – A SECTION

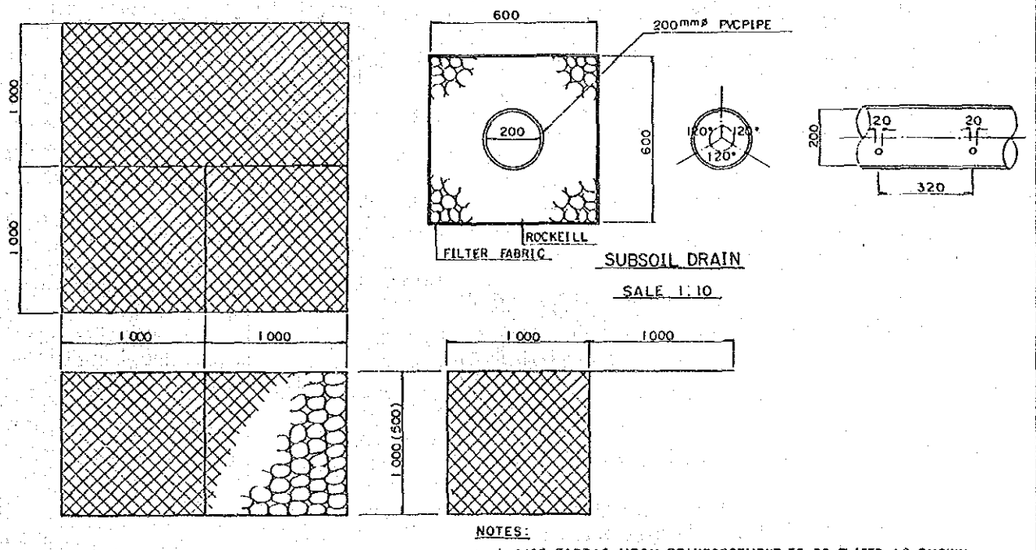
JOINT DETAIL OF PIPE CULVERT WITH EXISTING PIPE



PLAN



SECTION II – II



SUBSOIL DRAIN

SCALE 1:10

GABION

STANDARD 300mmø PIPE CULVERT

SCALE 1:100

NOTES:

1. A193 FABRIC MESH REINFORCEMENT TO BE PLACED AS SHOWN
2. THE SLOPE OF THE PIPE SHALL BE AS DIRECTION BY THE ENGINEER
3. ALL DIMENSIONS ARE IN MILLIMETRES.
4. GABION SHALL BE MADE OF A GALVANIZED STEEL WELDMESH WITH WIRE DIAMETER OF AT LEAST 3.4mm AND A MESH SIZE OF MAXIMUM 100 x 120
   THE GALVANIZING SHALL COMPLY WITH BS 443

SURVEYED BY
TRACED BY
CHECKED BY
AERIAL PHOTO BY
MAPPING BY
LOCATION BY
M.O.P.W. ROADS DEPT. DRG NO

REVISIONS					
DESCRIPTION	DATE				

JAPAN INTERNATIONAL COOPERATION AGENCY

CHIEF ENGINEER (ROADS)	SEN. SUPT. ENG. (DESIGN)
CHIEF SUPT. ENG. (DESIGN)	SUPT. ENGINEER (DESIGN)
	PROJECT ENGINEER

SCALES
AS SHOWN

NAIROBI BYPASS
STANDARD 300mmø PIPE CULVERT, GABION AND SUBSOIL DRAIN JOINT DETAIL OF PIPE CULVERT WITH EXISTING PIPE

E

PIPE CULVERT SCHEDULE

REF. NO.	CHAINAGE	NO. OF PIPES	DIAMETER (mm)	LENGTH (m)	REMARKS
1	CH.0 +300.000 (G)	1	600	14.280	
2	CH.0 +760.000	2	900	24.644	
3	CH.0 +820.000 (G)	1	600	11.668	
4	CH.1 +000.000	1	900	11.766	
5	CH.5 +280.000	2	900	15.126	
6	CH.5 +300.000	2	900	13.668	
7	CH.6 +200.000 (G)	1	600	14.817	
8	CH.7 +020.000	2	900	46.136	
9	CH.7 +028.438 (G)	1	600	19.198	
10	CH.7 +450.000 (G)	1	600	11.990	
11	CH.7 +700.000	1	900	25.390	
12	CH.8 +000.000 (G)	1	600	11.036	
13	CH.8 +180.000 (G)	1	600	14.546	
14	CH.8 +250.000	1	1200	31.172	
15	CH.8 +400.000 (G)	1	600	11.282	
16	CH.8 +880.000 (G)	1	600	11.350	
17	CH.8 +940.000	1	900	61.840	SKEW ANGLE +25°
18	CH.9 +340.000 (G)	1	600	10.916	
19	CH.9 +783.604	1	900	28.470	
20	CH.9 +800.000 (G)	1	600	14.328	
21	CH.11 +100.000 (G)	1	600	11.092	
22	CH.11 +240.000	1	1200	26.749	
23	CH.12 +400.000	2	900	22.935	
24	CH.12 +555.218 (G)	1	600	10.996	
25	CH.12 +900.000 (G)	1	600	13.308	
26	CH.13 +400.000	1	1200	29.942	
27	CH.13 +484.164 (G)	1	600	10.927	
28	CH.13 +760.000 (G)	1	600	11.474	
29	CH.14 +595.083 (G)	1	600	10.910	
30	CH.14 +865.086 (G)	1	600	11.496	
31	CH.15 +160.000 (G)	1	600	11.084	
32	CH.15 +400.000 (G)	1	600	11.100	
33	CH.15 +440.000 (G)	1	600	15.434	
34	CH.15 +700.000 (G)	1	600	11.406	
35	CH.16 +100.000 (G)	1	600	10.960	
36	CH.16 +400.000 (G)	1	600	10.962	
37	CH.17 +360.000	1	900	34.539	
38	CH.17 +717.493 (G)	1	600	10.931	
39	CH.18 +160.000	1	900	38.119	
40	CH.18 +360.000	1	900	46.924	
41	CH.18 +580.000 (G)	1	600	11.290	
42	CH.18 +820.000 (G)	1	600	10.924	
43	CH.19 +020.000 (G)	1	600	12.354	
44	CH.19 +100.000	1	900	37.128	
45	CH.19 +520.000	1	900	47.209	
46	CH.19 +665.167 (G)	1	600	13.740	
47	CH.19 +900.000 (G)	1	600	10.910	
48	CH.20 +120.000 (G)	1	600	11.330	
49	CH.20 +240.000	2	900	32.559	
50	CH.20 +340.000 (G)	1	600	16.132	
51	CH.20 +600.000 (G)	1	600	20.830	
52	CH.21 +010.000	1	750	76.590	
53	CH.21 +060.000 (G)	1	600	16.930	
54	CH.21 +600.000 (G)	1	600	11.283	
55	CH.22 +380.000	2	1200	22.480	
56	CH.22 +400.000	2	1200	3.472	
57	CH.22 +400.000	2	1200	8.121	
58	CH.23 +560.000	1	900	27.146	
59	CH.23 +780.000	1	900	41.546	
60	CH.24 +280.000 (G)	1	600	11.049	
61	CH.24 +360.000	2	1200	29.124	
62	CH.24 +700.000 (G)	1	600	11.001	
63	CH.25 +248.062 (G)	1	600	10.987	
64	CH.25 +420.000	2	1200	28.934	
65	CH.27 +800.000 (G)	1	600	10.913	
66	CH.28 +040.000 (G)	1	600	10.911	
67	CH.28 +240.000	1	750	13.336	
68	CH.28 +260.000 (G)	1	600	22.680	
69	CH.28 +380.000 (G)	1	600	8.000	
70	CH.0 +140.000	1	600	9.289	MOMBASA ROAD J/C A-SLIP ROAD
71	CH.0 +275.614	1	600	10.448	MOMBASA ROAD J/C B-SLIP ROAD
72	CH.0 +240.000	1	600	10.144	MOMBASA ROAD J/C C-SLIP ROAD
73	CH.0 +065.000	1	600	9.308	MOMBASA ROAD J/C D-SLIP ROAD
74	CH.0 +025.000	1	600	10.136	MOMBASA ROAD J/C E-SLIP ROAD
75	CH.0 +300.000	1	600	9.247	MOMBASA ROAD J/C F-SLIP ROAD
76	CH.0 +300.000	1	600	8.802	MOMBASA ROAD J/C G-SLIP ROAD
77	CH.0 -800.000 L	2	1200	13.004	MOMBASA ROAD (A104)
78	CH.0 -800.000 R	2	1200	12.884	MOMBASA ROAD (A104)
79	CH.0 -650.000	2	900	8.544	MOMBASA ROAD (A104)
80	CH.0 -260.000	2	900	5.844	MOMBASA ROAD (A104)
81	CH.0 +950.000	2	600	11.475	MOMBASA ROAD (A104)
82	CH.1 +220.000 R	1	900	9.844	SERVICE ROAD
83	CH.6 +520.000 (G)	1	600	9.404	UHURU MONUMENT J/C A-SLIP ROAD
84	CH.0 +110.000 L	1	600	8.882	LANGATA ROAD (C58)
85	CH.0 +140.000 L	1	600	16.112	LANGATA ROAD (C58)
86	CH.0 +165.000 R	1	600	12.798	LANGATA ROAD (C58)
87	CH.0 +177.000 L	1	300	3.887	LANGATA ROAD (C58)
88	CH.0 +220.000 L	1	300	3.563	LANGATA ROAD (C58)
89	CH.0 +235.000 L	1	600	13.300	LANGATA ROAD (C58)
90	CH.0 +240.000 R	1	300	3.324	LANGATA ROAD (C58)
91	CH.0 +260.000 R	1	600	14.800	LANGATA ROAD (C58)
92	CH.0 +220.000	1	900	4.354	UHURU MONUMENT J/C C-SLIP ROAD
93	CH.7 +340.000 L	1	900	7.282	SERVICE ROAD
94	CH.0 +040.000	1	600	15.364	NGONG ROAD J/C A-SLIP ROAD
95	CH.0 +260.000	1	600	11.574	APPROACH ROAD (C60)
96	CH.0 +440.000	1	600	14.300	APPROACH ROAD (C60)
97	CH.0 +620.000	1	600	15.084	APPROACH ROAD (C60)
98	CH.0 +740.000 L	1	300	8.338	APPROACH ROAD (C60)
99	CH.18 +400.000 R	1	600	5.340	SERVICE ROAD
100	CH.18 +480.000 R	1	600	6.242	SERVICE ROAD
101	CH.19 +060.000 L	1	900	7.358	SERVICE ROAD
102	CH.19 +520.000 L	1	900	7.583	SERVICE ROAD
103	CH.20 +200.000 L	1	300	5.430	SERVICE ROAD
104	CH.20 +200.000 R	1	300	5.376	SERVICE ROAD
105	CH.20 +220.000 L	2	900	31.426	SERVICE ROAD
106	CH.0 +040.000	1	600	24.923	DAGORETTI FOREST J/C A-SLIP ROAD
107	CH.0 +260.000	1	600	12.420	DAGORETTI FOREST J/C A-SLIP ROAD
108	CH.0 +080.000	1	600	31.793	DAGORETTI FOREST J/C A-SLIP ROAD
109	CH.0 +040.000	1	600	14.529	APPROACH ROAD (C63)
110	CH.0 +160.000	1	900	12.670	APPROACH ROAD (C63)
111	CH.0 +340.000	1	1200	14.890	APPROACH ROAD (C63)
112	CH.21 +000.000 L	2	900	7.424	SERVICE ROAD
113	CH.21 +000.000 R	1	900	7.964	SERVICE ROAD
114	CH.22 +380.000 L	1	600	8.950	SERVICE ROAD
115	CH.22 +380.000 R	2	1200	7.000	SERVICE ROAD
116	CH.22 +880.000 L	1	900	5.074	SERVICE ROAD
117	CH.22 +880.000 R	1	900	5.964	SERVICE ROAD
118	CH.23 +100.000 R	1	900	5.160	SERVICE ROAD
119	CH.23 +240.000 L	1	900	9.648	SERVICE ROAD
120	CH.0 +010.000 L	1	300	6.446	APPROACH ROAD (D411)
121	CH.0 +080.000 L	1	300	6.930	APPROACH ROAD (D411)
122	CH.0 +140.000 L	1	300	7.550	APPROACH ROAD (D411)
123	CH.0 +230.000	1	900	9.654	APPROACH ROAD (D411)
124	CH.0 +280.000	1	900	9.901	APPROACH ROAD (D411)
125	CH.0 +285.000 L	1	300	8.080	APPROACH ROAD (D411)
126	CH.0 +320.000 R	1	600	5.376	APPROACH ROAD (D411)
127	CH.0 +325.000 L	1	300	5.420	APPROACH ROAD (D411)
128	CH.0 +340.000 L	1	300	9.368	APPROACH ROAD (D411)
129	CH.0 +040.000	1	900	14.126	THOGOTO J/C A-SLIP ROAD
130	CH.0 +040.000	1	900	30.141	THOGOTO J/C B-SLIP ROAD
131	CH.0 +280.000	1	600	13.474	THOGOTO J/C B-SLIP ROAD
132	CH.25 +420.000 L	2	900	7.208	SERVICE ROAD
133	CH.26 +420.000 R	1	600	10.360	ONDORI SWAMP
134	CH.26 +490.000 L	1	900	9.544	ONDORI SWAMP
135	CH.0 +020.000	1	600	12.822	KIKUYU TOWN J/C A-SLIP ROAD
136	CH.0 +540.000	1	300	12.124	KIKUYU TOWN J/C A-SLIP ROAD
137	CH.0 +640.000 R	1	600	20.350	KIKUYU TOWN J/C A-SLIP ROAD
138	CH.1 +060.000	1	900	12.552	KIKUYU TOWN J/C A-SLIP ROAD
139	CH.1 +105.000 R	1	300	8.362	KIKUYU TOWN J/C A-SLIP ROAD
140	CH.1 +165.000 R	1	300	8.521	KIKUYU TOWN J/C A-SLIP ROAD
141	CH.1 +265.000 R	1	300	8.003	KIKUYU TOWN J/C A-SLIP ROAD
142	CH.1 +440.000	1	600	17.565	KIKUYU TOWN J/C A-SLIP ROAD
143	CH.0 +040.000	1	600	16.041	KIKUYU TOWN J/C C-SLIP ROAD
144	CH.0 +060.000 L	1	600	15.206	KIKUYU TOWN J/C C-SLIP ROAD
145	CH.0 +030.000 L	1	300	11.783	KIKUYU TOWN J/C D-SLIP ROAD
146	CH.0 +040.000	1	600	11.612	KIKUYU TOWN J/C D-SLIP ROAD
147	CH.0 +050.000 R	1	300	6.218	KIKUYU TOWN J/C D-SLIP ROAD
148	CH.0 +090.000 L	1	300	7.027	KIKUYU TOWN J/C D-SLIP ROAD
149	CH.0 +120.000 R	1	300	5.539	KIKUYU TOWN J/C D-SLIP ROAD
150	CH.0 +135.000 L	1	300	4.102	KIKUYU TOWN J/C D-SLIP ROAD
151	CH.0 +150.000 R	1	300	4.216	KIKUYU TOWN J/C D-SLIP ROAD
152	CH.0 +160.000 L	1	300	5.500	KIKUYU TOWN J/C D-SLIP ROAD
153	CH.0 +260.000 L	1	600	9.869	KIKUYU TOWN J/C D-SLIP ROAD
154	CH.0 +420.000 L	1	900	8.359	KIKUYU TOWN J/C D-SLIP ROAD
155	CH.0 +444.278 (G)	1	900	13.356	KIKUYU TOWN J/C D-SLIP ROAD
156	CH.27 +095.000 L	1	900	5.881	SERVICE ROAD
157	CH.28 +050.000 L	1	600	9.470	
158	CH.0 +460.000	1	900	13.430	KIKUYU J/C A-SLIP SLIP ROAD
159	CH.0 +120.000	1	600	10.924	KIKUYU J/C B-SLIP SLIP ROAD
160	CH.0 +020.000	1	600	21.884	KIKUYU J/C C-SLIP SLIP ROAD
161	CH.0 +380.000	1	600	10.540	KIKUYU J/C ROAD 3.1

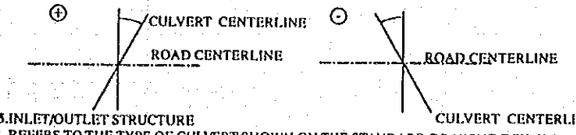
NOTES:

1.GENERAL
THE CULVERT SCHEDULE CONTAINS ALL OF PIPE CULVERT TO BE INSTALLED IN ACCORDANCE WITH THE STANDARD DRAWING DETAILS (DRAWING No.)

2.CHAINAGE
CHAINAGE IS GIVEN FOR EACH CULVERT AT THE INTERSECTION OF THE CULVERT CENTERLINE WITH THE DESIGNED ROAD CENTERLINE. WHERE MULTIPLE CULVERTS OCCUR, THE GIVEN CHAINAGE REFERS TO THE INTERSECTION BETWEEN THE DESIGNED ROAD CENTERLINE WITH THE CENTERLINE OF THE MULTIPLE SYSTEM.
REFERS TO THE ABBREVIATION IN THIS COLUMN:
L:LEFT
R:RIGHT
(G):GULLEY POT

3.DIAMETER
INDICATES THE DIAMETER OF PROPOSED CULVERTS

4.SKEW ANGLE IN DEGREES
THE ANGLE OF SKEW SHOULD BE DETERMINED AS FOLLOWS:



5.INLET/OUTLET STRUCTURE
REFERS TO THE TYPE OF CULVERT SHOWN ON THE STANDARD DRAWING DETAILS.
(DRAWING No. E 5 - E 7)

6.REMARKS
INDICATES THE SPOT OF EACH CULVERT

SURVEYED BY | AERIAL PHOTO BY
TRACED BY | MAPPING BY
CHECKED BY | LOCATION BY
M.O.P.W. ROADS DEPT. DRG NO.

REVISIONS			
DESCRIPTION	DATE		

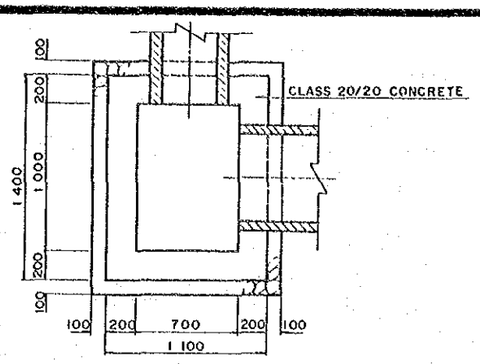
JAPAN INTERNATIONAL COOPERATION AGENCY

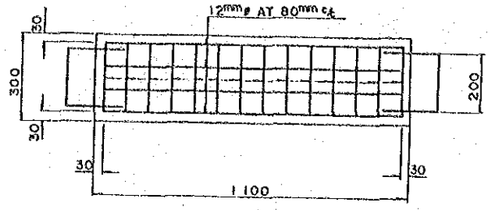
CHIEF ENGINEER (ROADS)
CHIEF SUPT. ENG. (DESIGN)
SEN. SUPT. ENG. (DESIGN)
SUPT. ENGINEER (DESIGN)
PROJECT ENGINEER

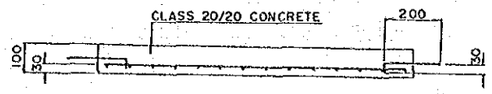
SCALES

NAIROBI BYPASS
PIPE CULVERT SCHEDULE

E
SHEET 8 OF 11

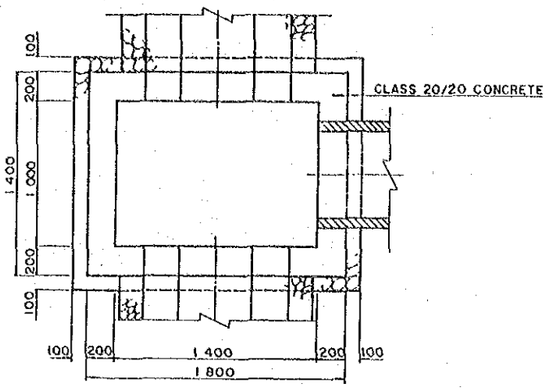






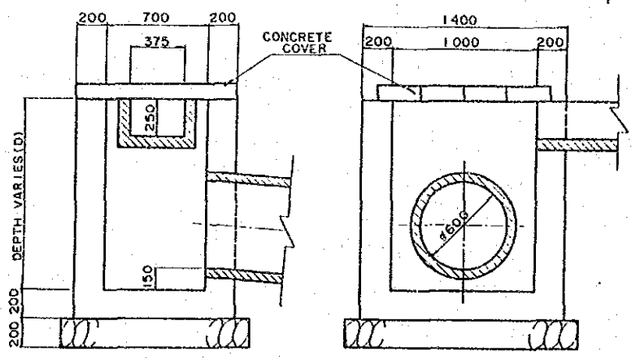
CONCRETE COVER

SCALE 1 : 10



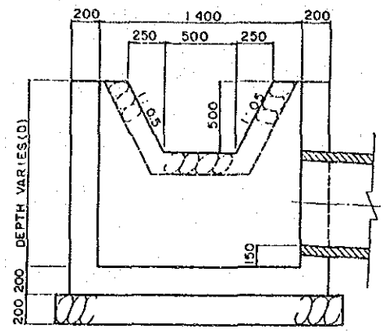
NOTE :

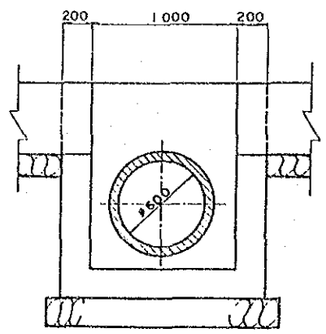
1 ALL DIMENSIONS ARE IN MILLIMETRES



GULLEY POT TYPE - I

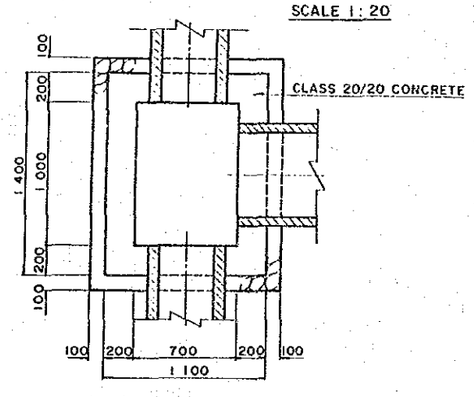
SCALE 1 : 20

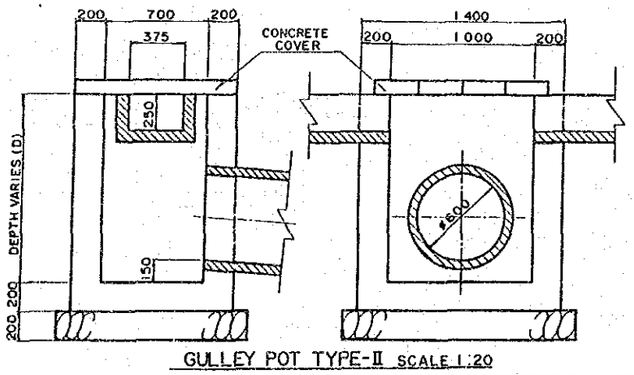




GULLEY POT TYPE - III

SCALE 1:20





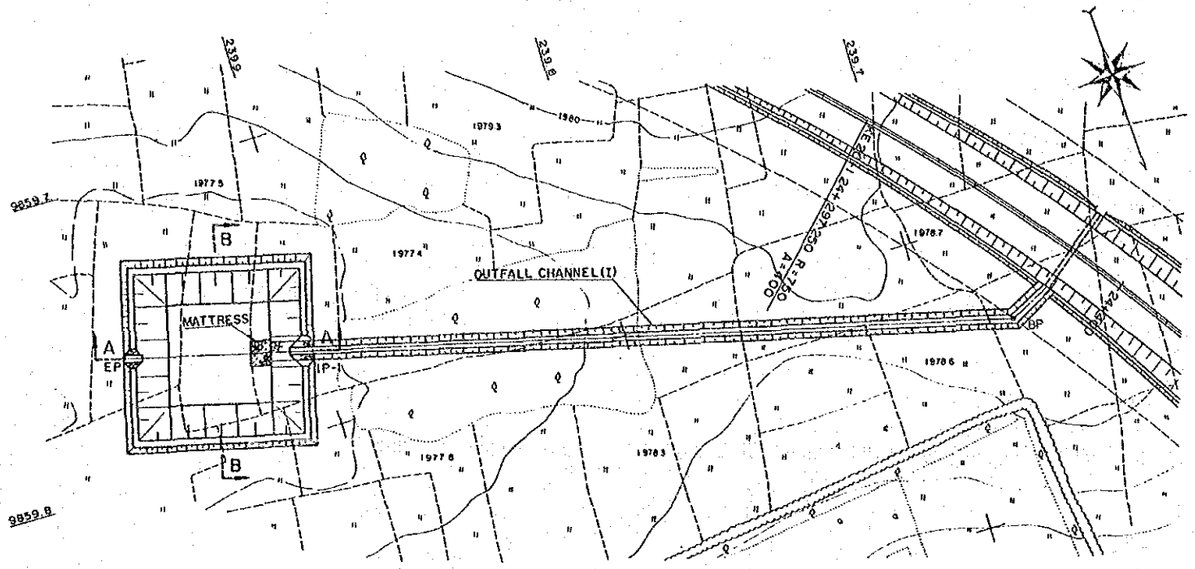
GULLEY POT TYPE-II SCALE 1:20

GULLEY POT SCHEDULE

REF. NO.	CHAINAGE	TYPE	DEPTH (m)	DIRECTION	REMARKS	REF. NO.	CHAINAGE	TYPE	DEPTH (m)	DIRECTION	REMARKS
1	0+380	I	1.653	LEFT		23	15+700	I	1.550	RIGHT	
2	0+820	II	1.650	RIGHT		24	16+100	I	1.615	LEFT	
3	8+200	I	2.078	LEFT		25	16+400	I	1.618	LEFT	
4	8+520	III	1.253	LEFT	UHURU MONUMENT J/C A SLIP ROAD CH.0+221.233	26	17+717.493	I	1.650	LEFT	
5	7+028.438	I	2.062	LEFT		27	18+580	I	1.559	RIGHT	
6	7+450	I	1.930	LEFT		28	18+820	I	1.690	LEFT	
7	8+000	I	1.844	LEFT		29	19+020	I	1.650	RIGHT	
8	8+180	I	2.288	RIGHT		30	19+865.167	I	1.935	RIGHT	
9	8+400	I	1.650	RIGHT		31	19+900	I	1.710	LEFT	
10	8+850	I	1.650	LEFT		32	20+120	I	1.550	LEFT	
11	9+340	I	1.856	LEFT		33	20+340	I	2.201	LEFT	
12	9+800	I	2.294	RIGHT		34	20+600	I	2.350	LEFT	
13	11+100	II	1.550	RIGHT		35	21+060	I	1.550	RIHGT	
14	12+655.218	I	1.589	LEFT		36	21+500	I	1.550	RIHGT	
15	12+960	I	2.416	LEFT		37	24+280	II	1.650	RIHGT	
16	13+464.164	I	1.710	RIGHT		38	24+700	I	1.650	RIHGT	
17	13+760	I	1.687	LEFT		39	25+248.062	I	1.650	RIHGT	
18	14+595.083	I	1.708	RIGHT		40	27+740	III	1.200	LEFT	KIKUYU TOWN D-SLIP 0+444.278
19	14+865.068	I	1.550	RIGHT		41	27+800	I	1.748	RIGHT	
20	15+160	I	1.652	LEFT		42	28+040	I	1.760	RIGHT	
21	15+400	I	1.651	LEFT		43	28+260	I	2.160	LEFT	KIKUYU J/C A-SLIP 0+105
22	15+440	I	1.650	RIGHT		44	28+380	I	1.550	LEFT	

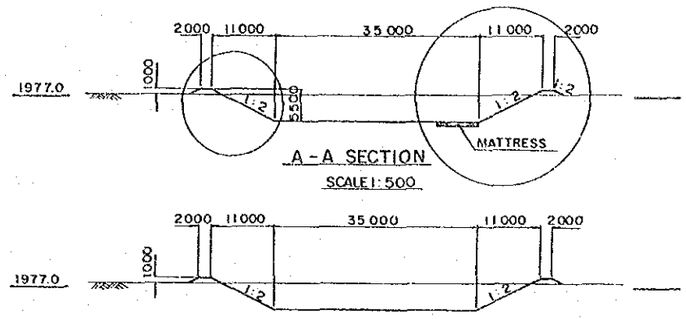
SURVEYED BY
TRACED BY
CHECKED BY
AERIAL PHOTO BY
MAPPING BY
LOCATION BY
M.O.P.W. ROADS DEPT DRG NO

REVISIONS				JAPAN INTERNATIONAL COOPERATION AGENCY	CHIEF ENGINEER (ROADS)	SEN. SUPT. ENG (DESIGN)		SCALES AS SHOWN	NAIROBI BYPASS GULLEY POT AND GULLEY POT SCHEDULE	E
DESCRIPTION	DATE				CHIEF SUPT. ENG (DESIGN)	SUPT. ENGINEER (DESIGN)				SHEET 9 OF 11
						PROJECT ENGINEER				



DRAINAGE POND PLAN

SCALE 1:1000

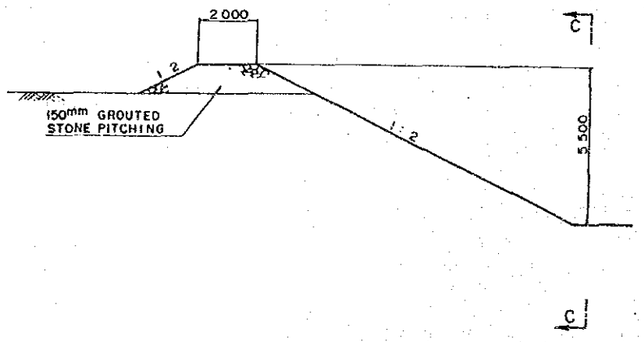


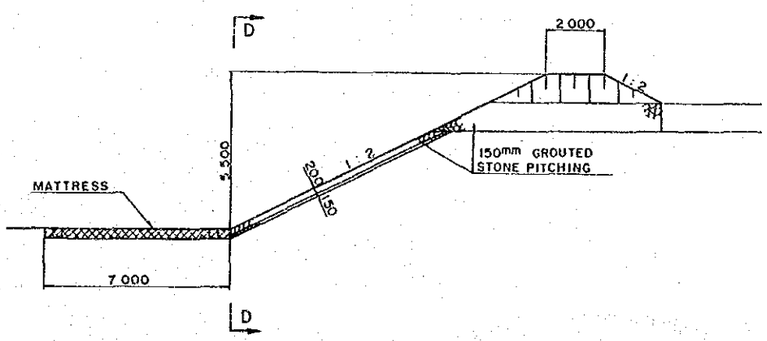
A-A SECTION

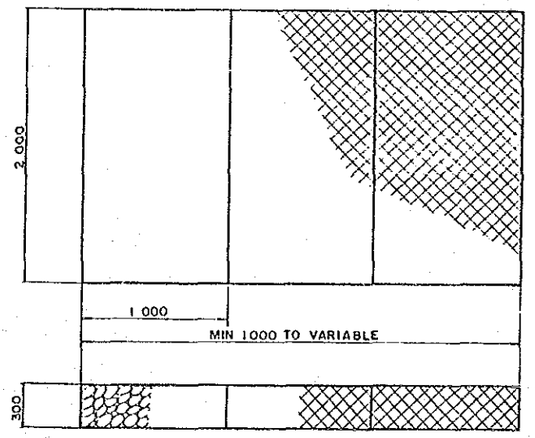
SCALE 1:500

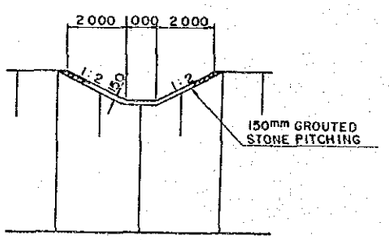
B-B SECTION

SCALE 1:500









ELEVATION C-C

SCALE 1:100

ELEVATION D-D

SCALE 1:100

MATTRESS

SCALE 1:200

NOTES:

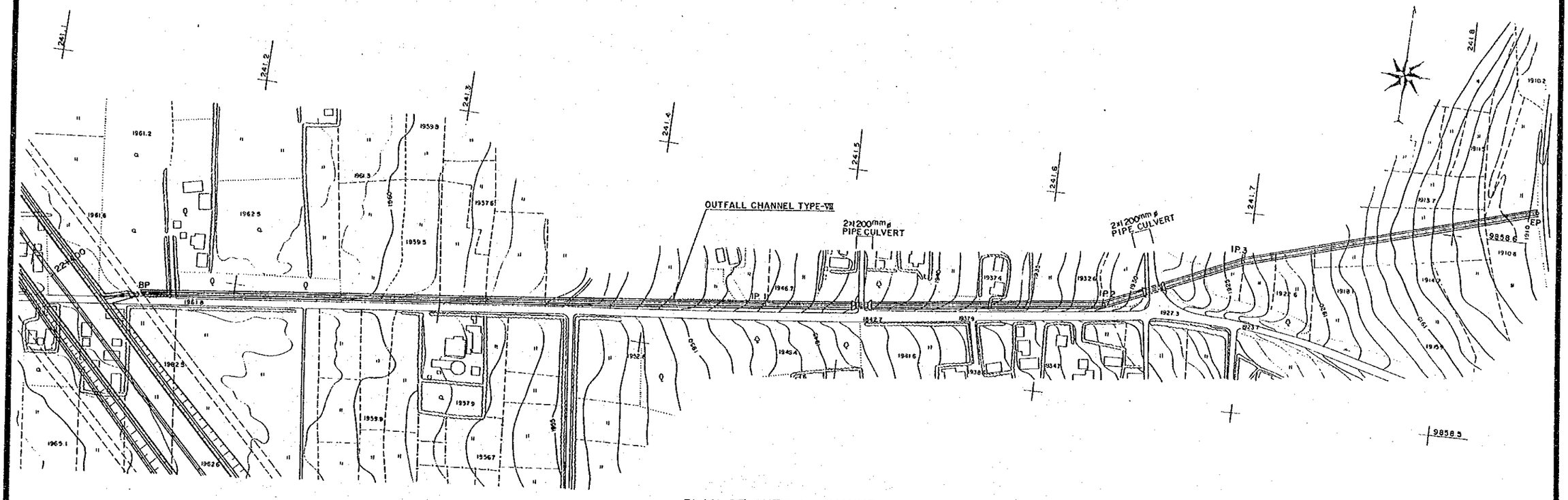
1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. MATTRESS SHALL BE MADE OF A GALVANIZED STEEL WELDMESH WITH WIRE DIAMETER OF AT LEAST 2.7mm AND A MESH SIZE OF MAXIMUM 100×120.
   THE GALVANIZING SHALL COMPLY WITH B.S 443

SURVEYED BY			
AERIAL PHOTO BY	TRACED BY	CHECKED BY	
MAPPING BY	LOCATION BY		

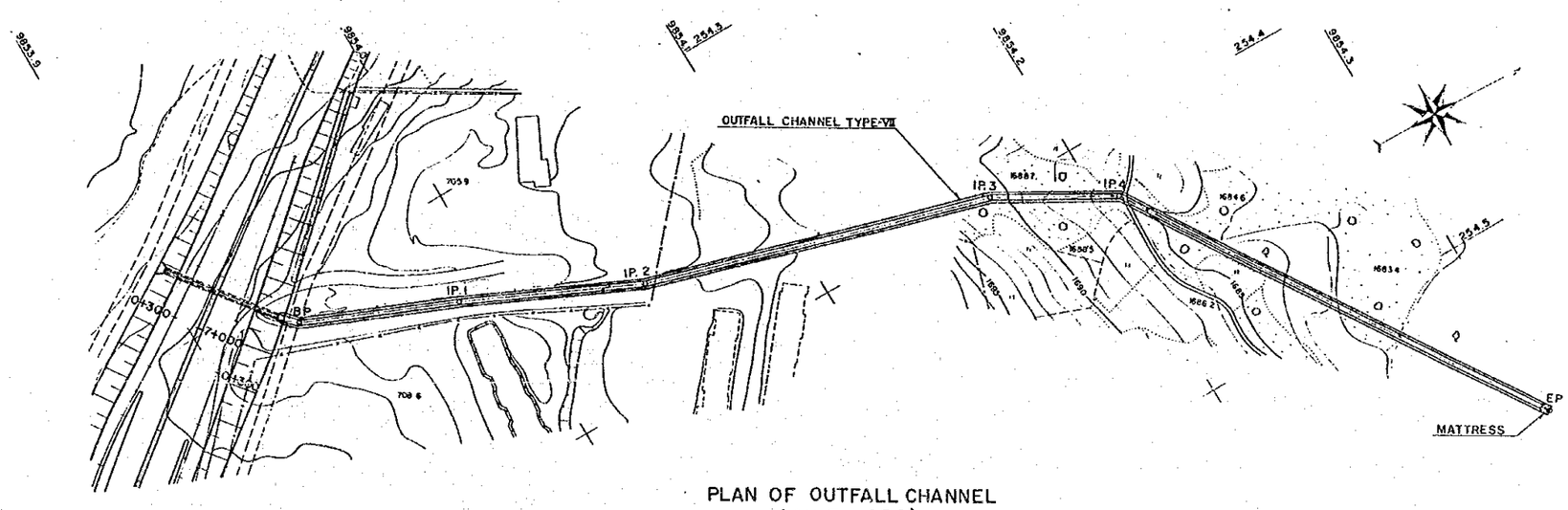
M.O.P.W. ROADS DEPT DRG NO.

REVISIONS									
DESCRIPTION	DATE								

JAPAN INTERNATIONAL COOPERATION AGENCY	CHIEF ENGINEER (ROADS)	SEN. SUPT. ENG. (DESIGN)			SCALES AS SHOWN	NAIROBI BYPASS DRAINAGE POND AND MATTRESS	E SHEET 10 OF 11
	CHIEF SUPT. ENG. (DESIGN)	SUPT. ENGINEER (DESIGN)					
		PROJECT ENGINEER					



PLAN OF OUTFALL CHANNEL
(CH.22+400)



PLAN OF OUTFALL CHANNEL
(CH.7+020)

NOTE:
LOCATION OF OUTFALL CHNNELS TO BE DETERMINED ON SITE DURING CONSTRUCTION.

AERIAL PHOTO BY	SURVEYED BY	REVISIONS		JAPAN INTERNATIONAL COOPERATION AGENCY	CHIEF ENGINEER (ROADS)	SEN. SUPT. ENG (DESIGN)		SCALES	NAIROBI BYPASS
MAPPING BY	TRACED BY	DESCRIPTION	DATE		CHIEF SUPT. ENG. (DESIGN)	SUPT. ENGINEER (DESIGN)		1 : 1000	PLAN OF OUTFALL CHANNEL
LOCATION BY	CHECKED BY					PROJECT ENGINEER			E
MOPW ROADS DEPT DRG NO									SHEET 11 OF 11