

COMPUTATION OF GRASSING AREA
KIKUYU JUNCTION : A Slip Road

[illegible]

COMPUTATION OF VOLUMES
KIKUYU JUNCTION: B Slip Road

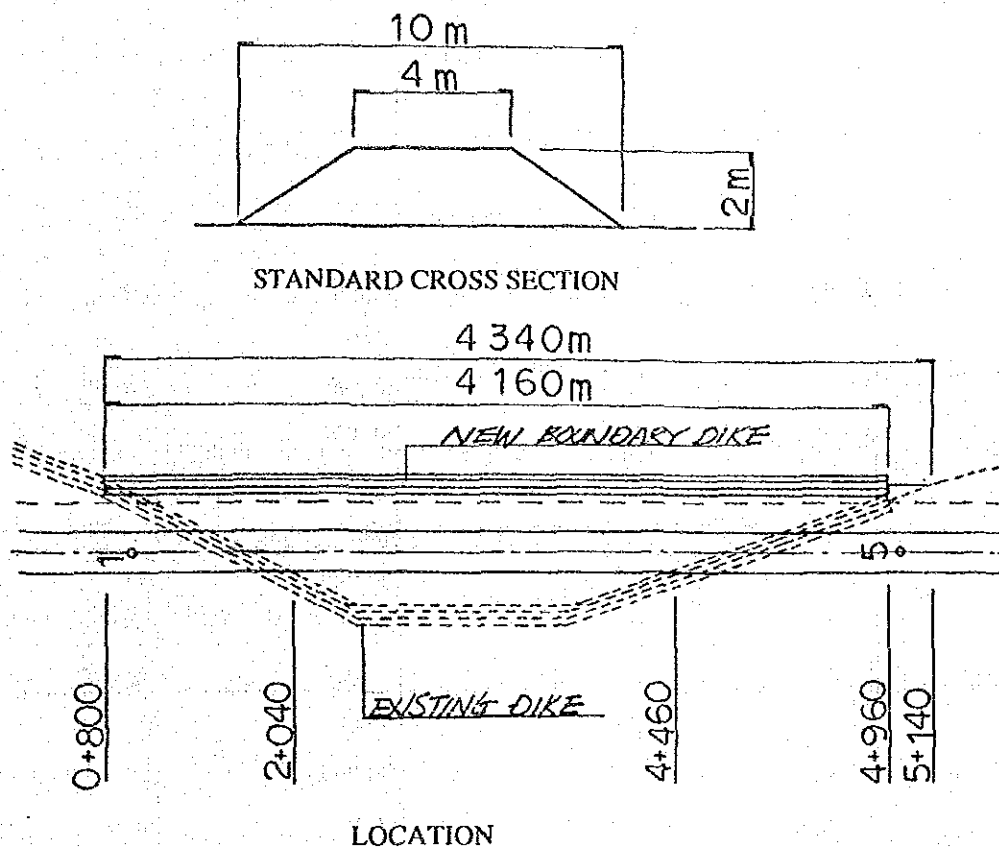
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COMPUTATION OF VOLUMES
KIKUYU JUNCTION: C Slip Road

[illegible]

2.7 New National Park Boundary Dike

QUANTITIES OF NEW NATINAL PARK BOUNDARY DIKE



1. SITE CLEARING

(New dike) $14\text{m}(\text{width}) \times 4160\text{m}(\text{length}) = 58,240\text{m}^2$
 (Existing dike) $14\text{m}(\text{width}) \times 2420\text{m}(\text{length}) = 33,880\text{m}^2$ Total 92,120m²

2. REMOVAL OF BLACK COTTON SOIL

$10\text{m}(\text{width}) \times 4160\text{m}(\text{length}) \times 0.6\text{m}(\text{Ave. depth}) = 24,960\text{m}^3$

3. GRASSING

$11.21\text{m}(\text{width}) \times 4160\text{m}(\text{length}) = 46,633.6\text{m}^2$

4. FILLING

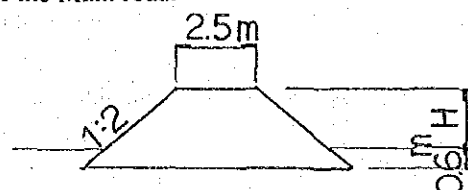
$(4 + 10)\text{m} \times 1/2 \times 2\text{m}(\text{height}) \times 4160\text{m}(\text{length}) = 58,240\text{m}^3$

COMPUTATION OF EXISTING NATIONAL PARK BOUNDARY DIKE VOLUME

STATION	DISTANCE	HIGHT OF EXISTING EMBANKMENT	SECTION (*)	VOLUME
	(m)	(m)	(m2)	(m3)
0 + 700.00		1.60	12.43	
0 + 800.00		1.60	12.43	
1 + 0.00	200.00	1.00	7.12	1,424.00
1 + 100.00	100.00	1.80	14.52	1,452.00
1 + 180.00	80.00	0.60	4.38	350.40
1 + 740.00	560.00	1.60	12.43	6,960.80
1 + 880.00	140.00	1.00	7.12	996.80
1 + 960.00	80.00	1.20	8.73	698.40
2 + 40.00	80.00	1.20	8.73	698.40
2 + 60.00	20.00	1.20	8.73	174.60
2 + 580.00	520.00	1.40	10.50	5,460.00
2 + 700.00	120.00	1.20	8.73	1,047.60
2 + 860.00	160.00	1.30	9.60	1,535.20
3 + 0.00	140.00	1.00	7.12	996.80
3 + 140.00	140.00	0.80	5.67	793.80
3 + 200.00	60.00	2.00	16.77	1,006.20
3 + 660.00	460.00	1.20	8.73	4,015.80
3 + 740.00	80.00	1.20	8.73	698.40
3 + 920.00	180.00	1.00	7.12	1,281.60
4 + 160.00	240.00	0.70	5.01	1,201.20
4 + 200.00	40.00	1.40	10.50	420.00
4 + 460.00	260.00	1.30	9.60	2,494.70
4 + 500.00	40.00	1.20	8.73	349.20
4 + 560.00	60.00	1.50	11.45	686.70
4 + 660.00	100.00	0.80	5.67	567.00
4 + 760.00	100.00	1.00	7.12	712.00
4 + 800.00	40.00	1.60	12.43	497.20
4 + 960.00	160.00	1.00	7.12	1,139.20
TOTAL				37,658.00
			(**)	(19,026.8m3)

(*) The sections were calculated using the estimated standard section as shown .

(**) The Volume is to be included in black cotton soil volume of the Main road.



2.8 Railway Embankment

SCHEDULE OF QUANTITIES FOR RAILWAY EMBANKMENT

ITEM	UNIT	QUANTITY	REMARKS
SITE CLEARING	m2	5,349.6	IN OPEN COUNTRY
REMOVAL OF TOPSOIL	m2	4,560.7	(456.1m3)
FILLING	m3	6,930.4	
GRASSING (IN FILL AREA)	m2	3,362.8	

COMPUTATION OF RAILWAY EMBANKMENT REMOVAL OF TOPSOIL

STATION	DISTANCE	LENGTH	AVERAGE	AREA
	(m)	(m2)	(m2)	(m3)
0 + 0.00				
0 + 20.00	20.0	0.0	0.0	0.0
0 + 40.00	20.0	6.0	3.0	60.0
0 + 60.00	20.0	8.0	7.0	140.0
0 + 80.00	20.0	10.5	9.3	185.0
0 + 100.00	20.0	11.0	10.8	215.0
0 + 120.00	20.0	12.5	11.8	235.0
0 + 140.00	20.0	15.5	14.0	280.0
0 + 160.00	20.0	15.5	15.5	310.0
0 + 180.00	20.0	15.5	15.5	310.0
0 + 200.00	20.0	15.5	15.5	310.0
0 + 203.96	4.0	15.5	15.5	61.4
0 + 220.00	16.0	0.0	7.8	124.3
0 + 240.00	20.0	0.0	0.0	0.0
0 + 260.00	20.0	25.5	12.8	255.0
0 + 280.00	20.0	17.5	21.5	430.0
0 + 300.00	20.0	16.0	16.8	335.0
0 + 320.00	20.0	14.5	15.3	305.0
0 + 340.00	20.0	12.5	13.5	270.0
0 + 360.00	20.0	12.5	12.5	250.0
0 + 380.00	20.0	9.5	11.0	220.0
0 + 400.00	20.0	8.5	9.0	180.0
0 + 420.00	20.0	0.0	4.3	85.0
TOTAL	(IN FILL VOLUME 456.1m3)			4,560.7

COMPUTATION OF RAILWAY EMBANKMENT VOLUME

STATION	DISTANCE (m)	SECTION (m ²)	AVERAGE SECTION (m ²)	VOLUME (m ³)
0 + 0.00				
0 + 20.00	20.0	0.0	0.0	0.0
0 + 40.00	20.0	3.6	1.8	36.0
0 + 60.00	20.0	4.8	4.2	84.0
0 + 80.00	20.0	8.8	6.8	136.0
0 + 100.00	20.0	11.3	10.1	201.0
0 + 120.00	20.0	15.8	13.6	271.0
0 + 140.00	20.0	24.4	20.1	402.0
0 + 160.00	20.0	27.0	25.7	514.0
0 + 180.00	20.0	29.5	28.3	565.0
0 + 200.00	20.0	29.5	29.5	590.0
0 + 203.96	4.0	29.5	29.5	116.8
0 + 220.00	16.0	0.0	14.8	236.6
0 + 240.00	20.0	0.0	0.0	0.0
0 + 260.00	20.0	43.5	21.8	435.0
0 + 280.00	20.0	33.0	38.3	765.0
0 + 300.00	20.0	28.0	30.5	610.0
0 + 320.00	20.0	26.0	27.0	540.0
0 + 340.00	20.0	21.0	23.5	470.0
0 + 360.00	20.0	17.9	19.5	389.0
0 + 380.00	20.0	12.0	15.0	299.0
0 + 400.00	20.0	7.5	9.8	195.0
0 + 420.00	20.0	0.0	3.8	75.0
TOTAL				6,930.4

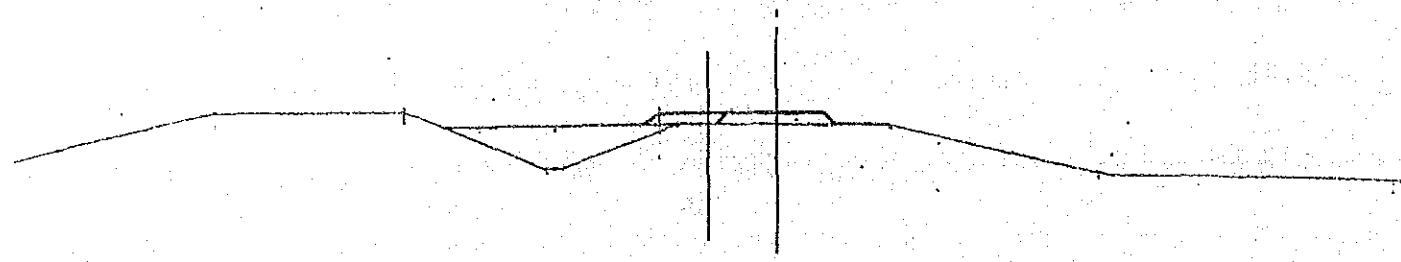
COMPUTATION OF RAILWAY EMBANKMENT GRASSING AREA

STATION	DISTANCE	LENGTH	AVERAGE	AREA
	(m)	(m ²)	(m ²)	(m ³)
0 + 0.00				
0 + 20.00	20.0	0.0	0.0	0.0
0 + 40.00	20.0	5.0	2.5	50.0
0 + 60.00	20.0	8.0	6.5	130.0
0 + 80.00	20.0	7.0	7.5	150.0
0 + 100.00	20.0	7.0	7.0	140.0
0 + 120.00	20.0	8.0	7.5	150.0
0 + 140.00	20.0	13.0	10.5	210.0
0 + 160.00	20.0	11.5	12.3	245.0
0 + 180.00	20.0	11.5	11.5	230.0
0 + 200.00	20.0	11.5	11.5	230.0
0 + 203.96	4.0	15.5	13.5	53.5
0 + 220.00	16.0	0.0	7.8	124.3
0 + 240.00	20.0	0.0	0.0	0.0
0 + 260.00	20.0	15.0	7.5	150.0
0 + 280.00	20.0	13.0	14.0	280.0
0 + 300.00	20.0	12.0	12.5	250.0
0 + 320.00	20.0	10.0	11.0	220.0
0 + 340.00	20.0	8.0	9.0	180.0
0 + 360.00	20.0	9.0	8.5	170.0
0 + 380.00	20.0	8.0	8.5	170.0
0 + 400.00	20.0	7.5	7.8	155.0
0 + 420.00	20.0	0.0	3.8	75.0
TOTAL				3,362.8

D+ 40.000

PH = 2035.744

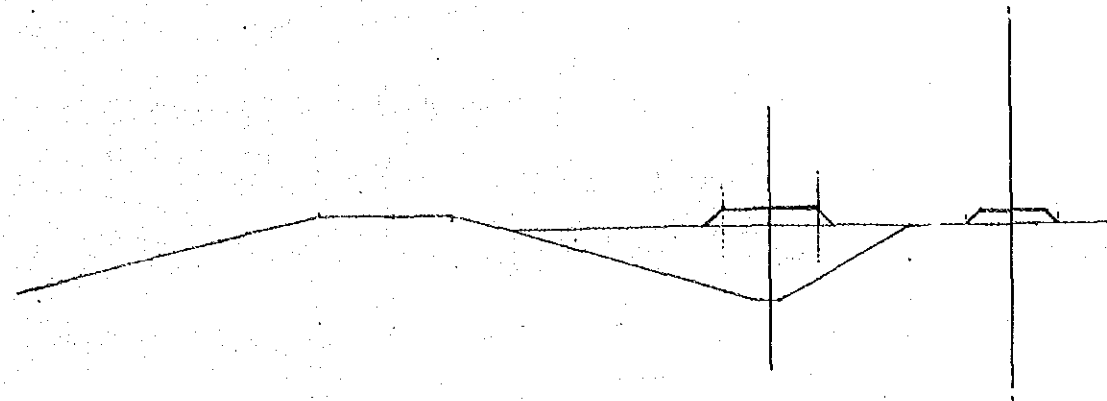
GH = 2035.400



D+ 100.000

PH = 2034.973

GH = 2032.600

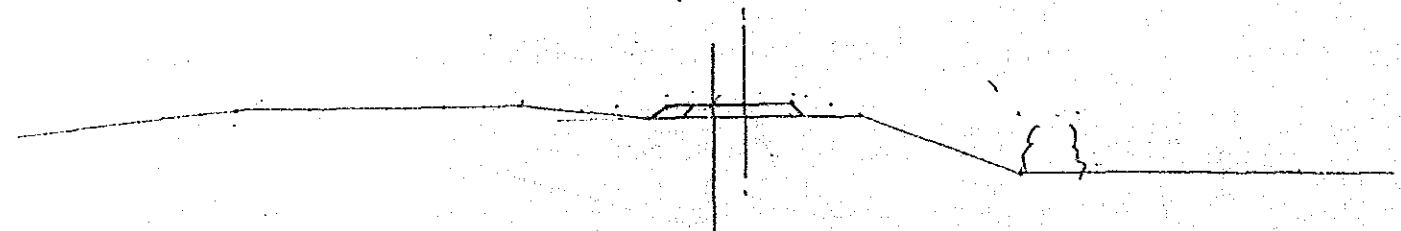


2030.

D+ 20.000

PH = 2035.561

GH = 2035.500

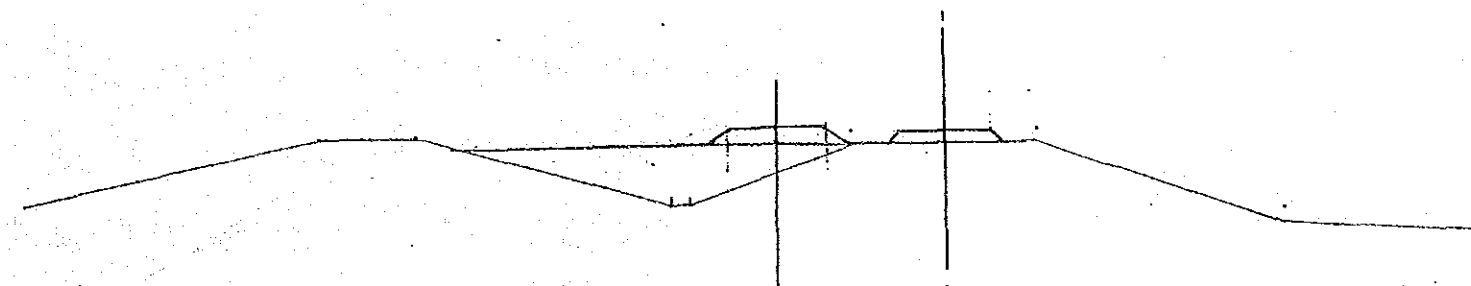


2030.

D+ 80

PH = 2035.120

GH = 2033.900

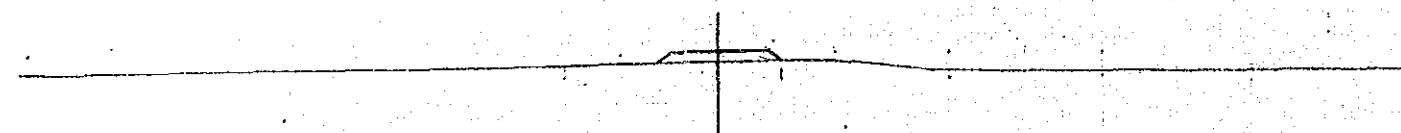


2030.

D+ 0.000

PH = 2035.708

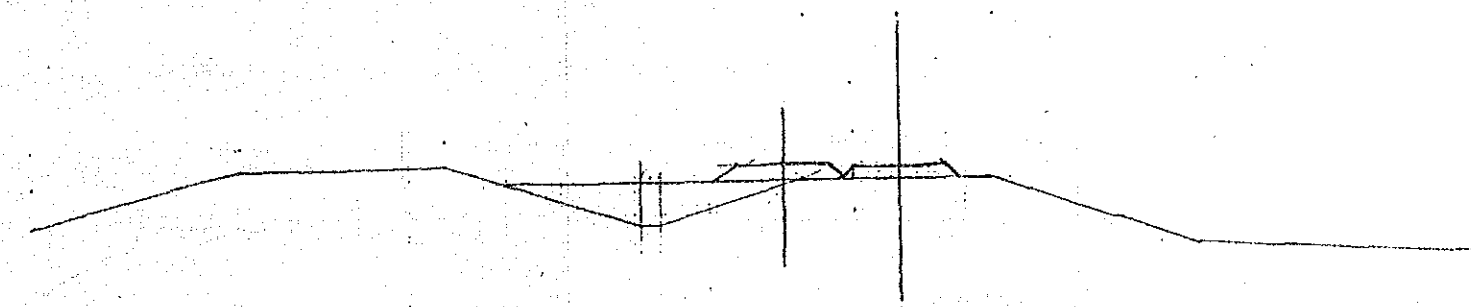
GH = 2035.700



D+ 60.0

PH = 2035.267

GH = 2034.750



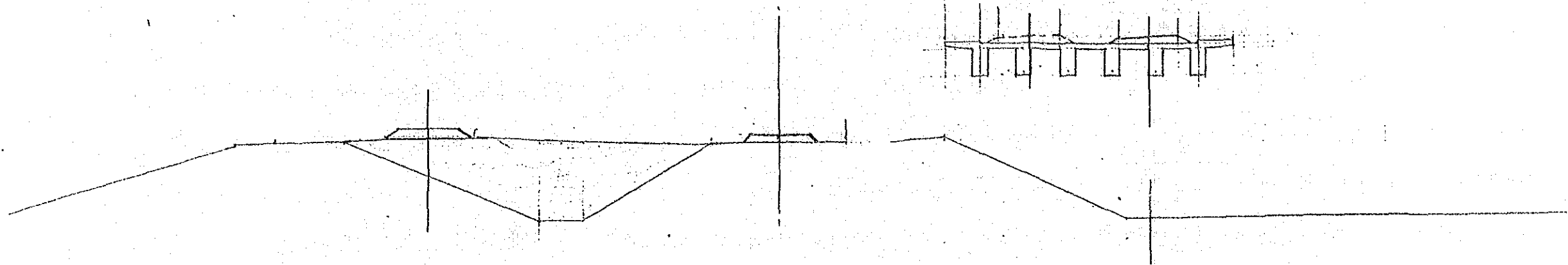
2030.

0 + 160.0

PH = 2034.532
GH = 2032.700

0 + 220.000

PH = 2034.091
GH = 2028.500



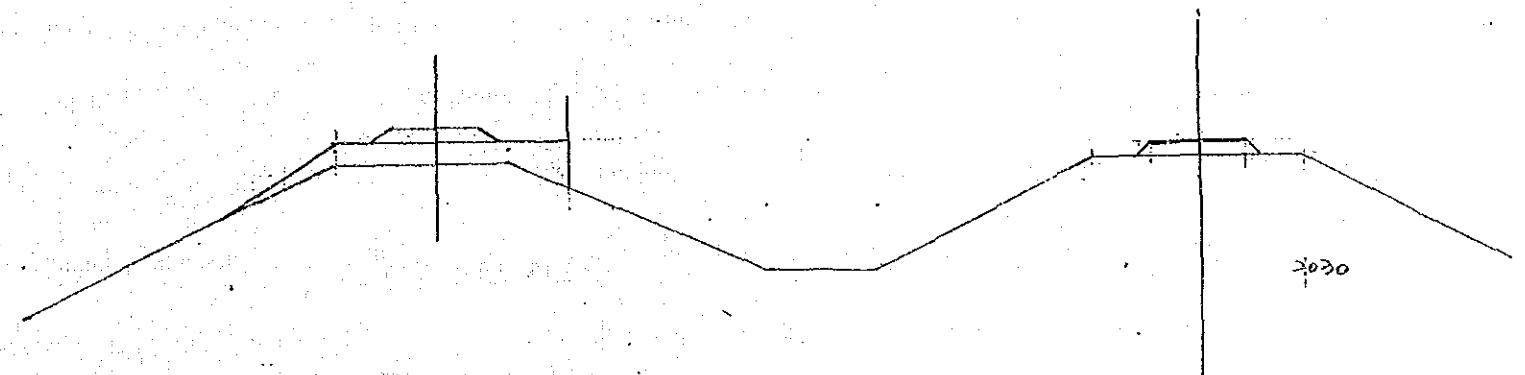
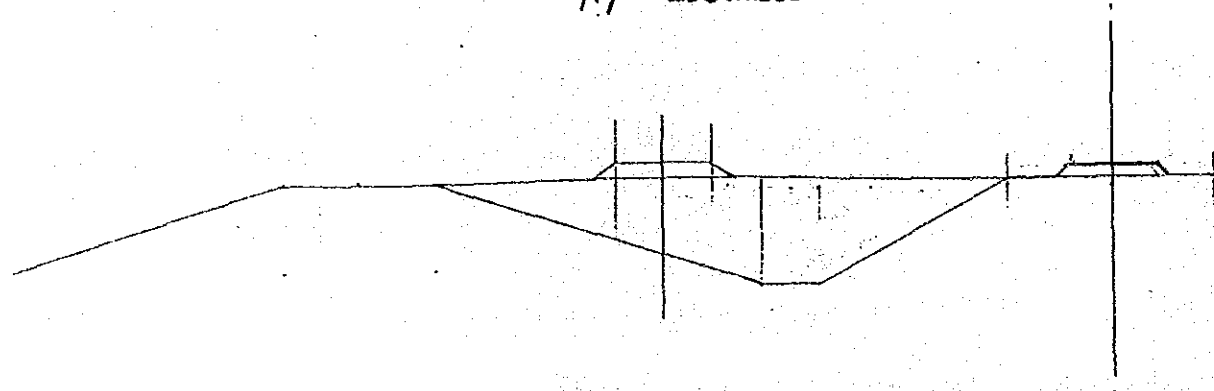
2030.

0 + 140.000

PH = 2034.679
GH = 2032.300

0 + 200.000

PH = 2034.238
GH = 2033.100



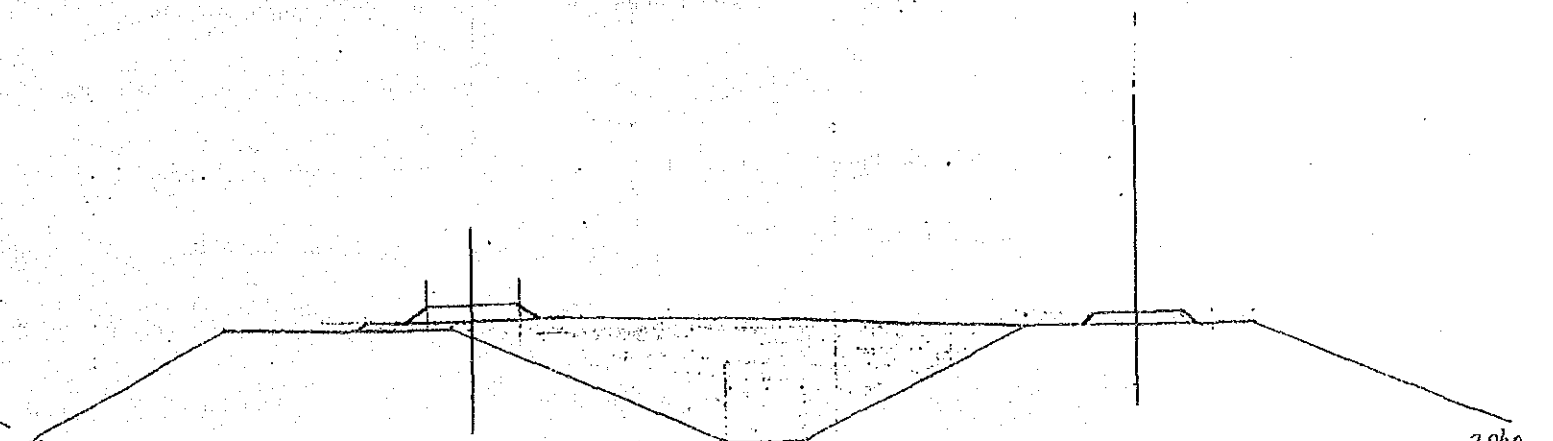
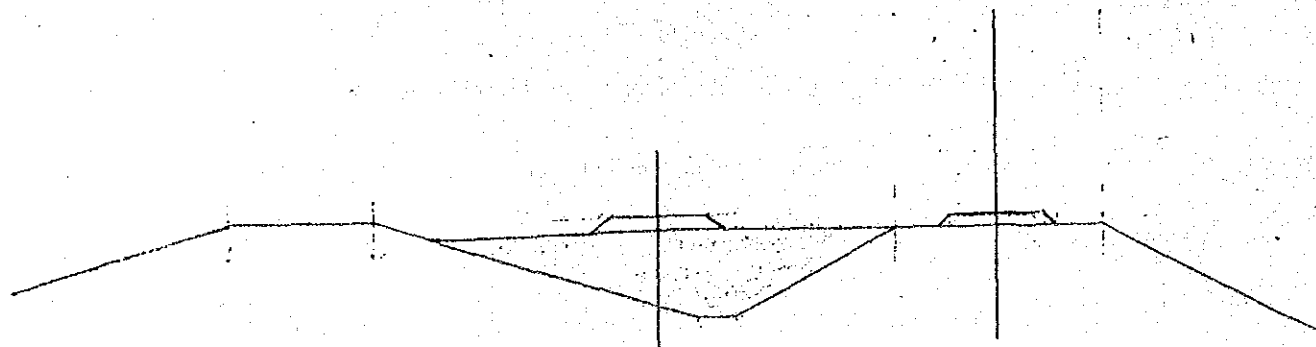
2030

0 + 120.000

PH = 2034.826
GH = 2032.400

0 + 180.000

PH = 2034.385
GH = 2033.600



2030.

D + 300.000

PH = 2033.270
GH = 2029.600

D + 260.000

PH = 2033.797
GH = 2032.300

D + 280.000

PH = 2033.650
GH = 2030.800

D + 240.000

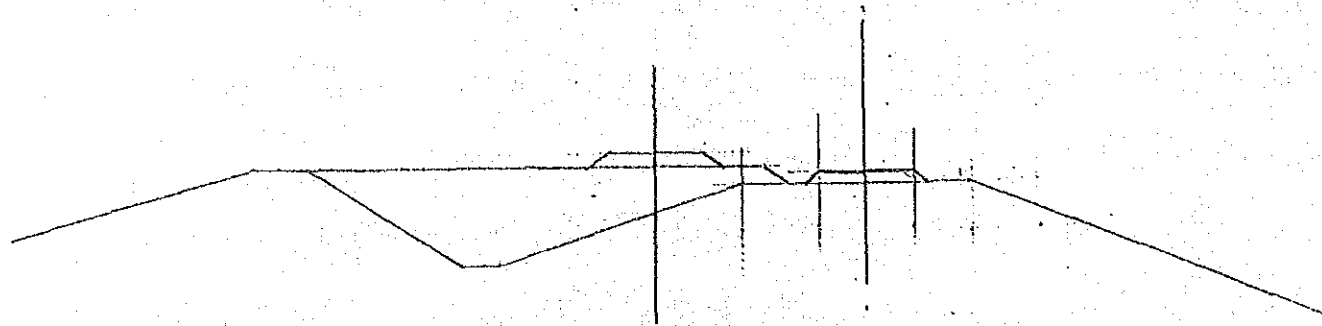
PH = 2033.944
GH = 2026.800

2030

2030

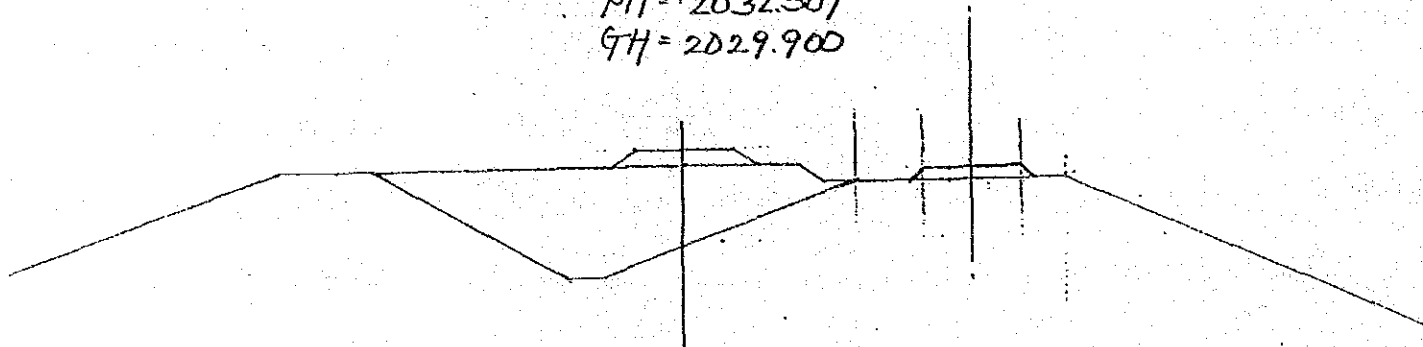
D + 360.000

PH = 2032.129
GH = 2030.500



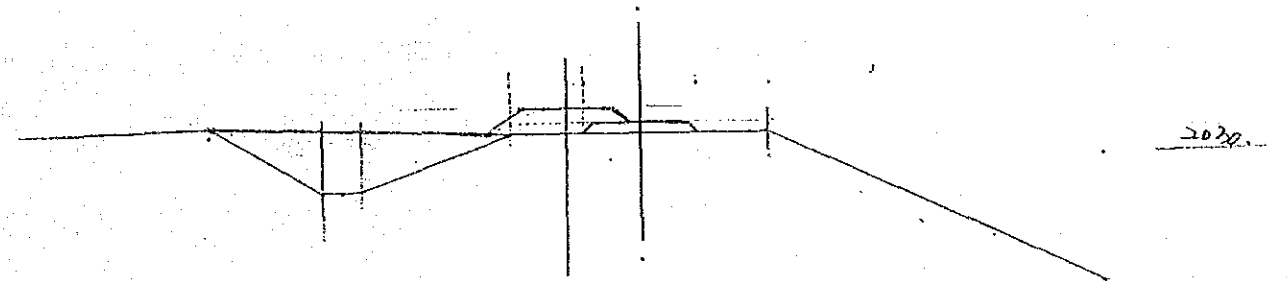
D + 340.000

PH = 2032.509
GH = 2029.900



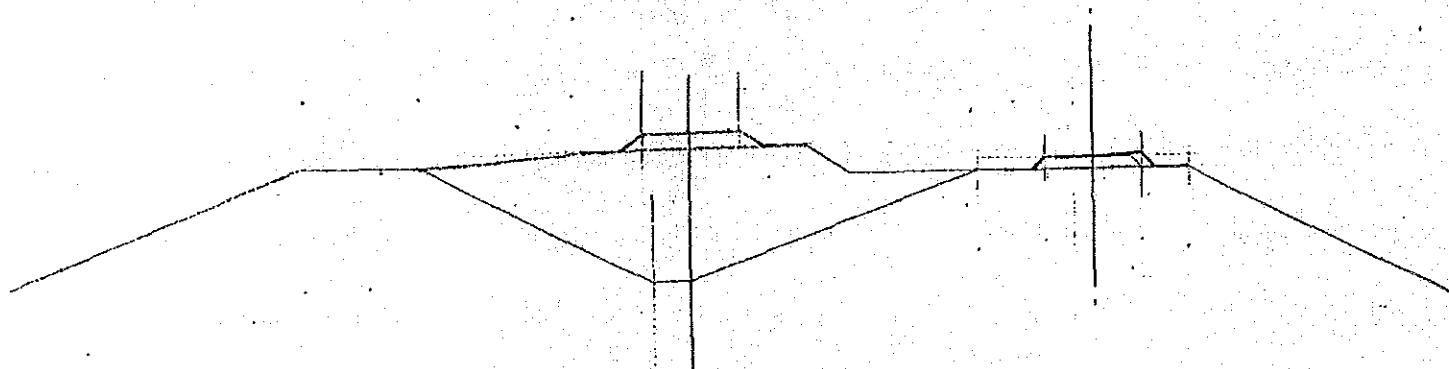
D + 400.000

PH = 2031.369
GH = 2030.700



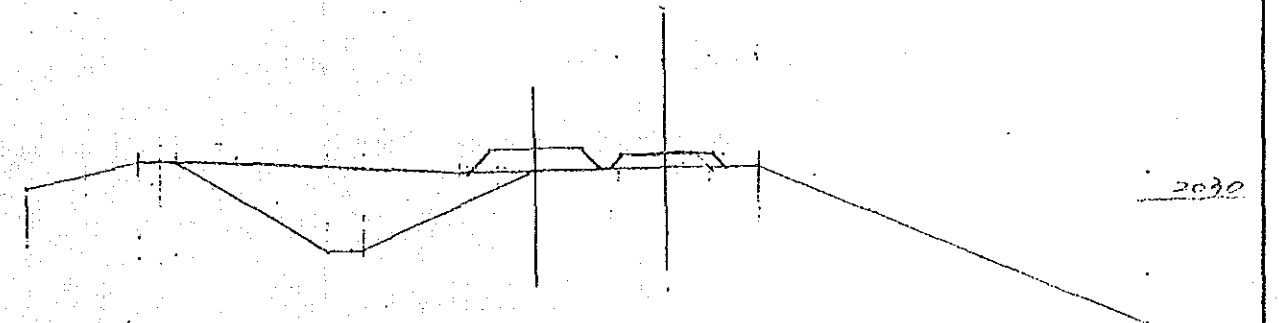
D + 320.000

PH = 2032.890
GH = 2029.100



D + 380.000

PH = 2031.749
GH = 2031.200



D + 432.556

PH = 2030.750

GH = 2030.750

2030.0

D + 420.000

PH = 2030.989

GH = 2030.500

2030.0

2.9 Spoil Bank Volume at Mombasa Road Junction

SCHEDULE OF SPOIL BANK VOLUMES

LOCATION	VOLUME (m3)	REMARKS
THE BANK BETWEEN A SLIP AND B SLIP ROAD	22,479.0	
THE BANK BETWEEN B SLIP AND MAIN ROAD	51,200.8	
THE BANK BETWEEN C SLIP AND D SLIP ROAD	12,849.0	
THE BANK BETWEEN D SLIP AND MAIN ROAD	37,401.0	
THE BANK BETWEEN E SLIP AND F SLIP ROAD	4,488.0	
THE BANK BETWEEN F SLIP AND MAIN ROAD	29,333.1	
THE BANK BETWEEN G SLIP AND MAIN ROAD	8,170.8	
TOTAL	165,921.7	

THE AREA BETWEEN A SLIP AND B SLIP

2.9. 3.

THE AREA BETWEEN B SLIP AND MAIN ROAD

2.9. 4

THE AREA BETWEEN C SLIP AND D SLIP

2.9. 5

THE AREA BETWEEN D SLIP AND MAIN ROAD

2.9. 6

THE AREA BETWEEN E SLIP AND F SLIP

2.9. 7

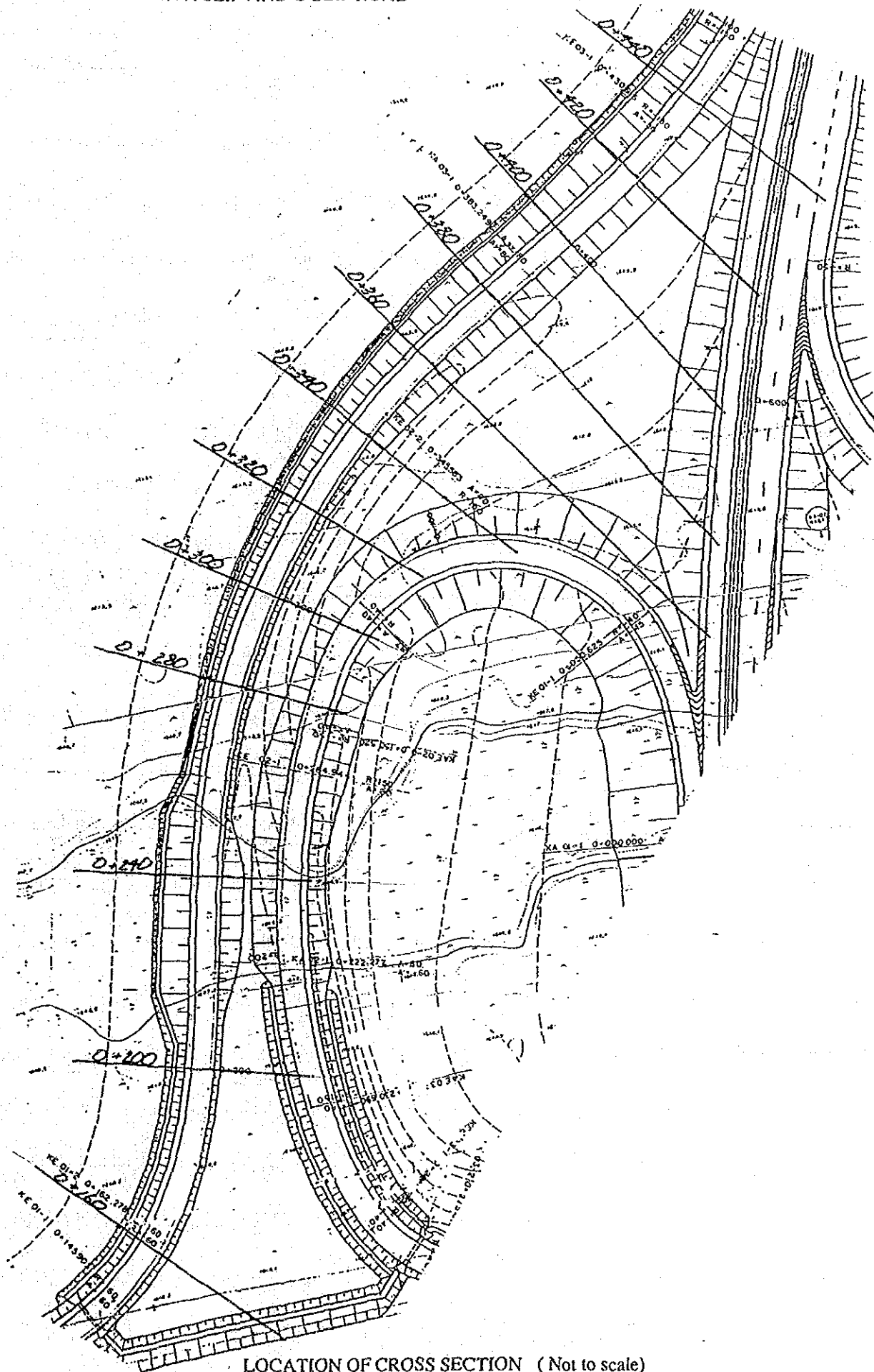
THE AREA BETWEEN F SLIP AND MAIN ROAD

2.9. 8

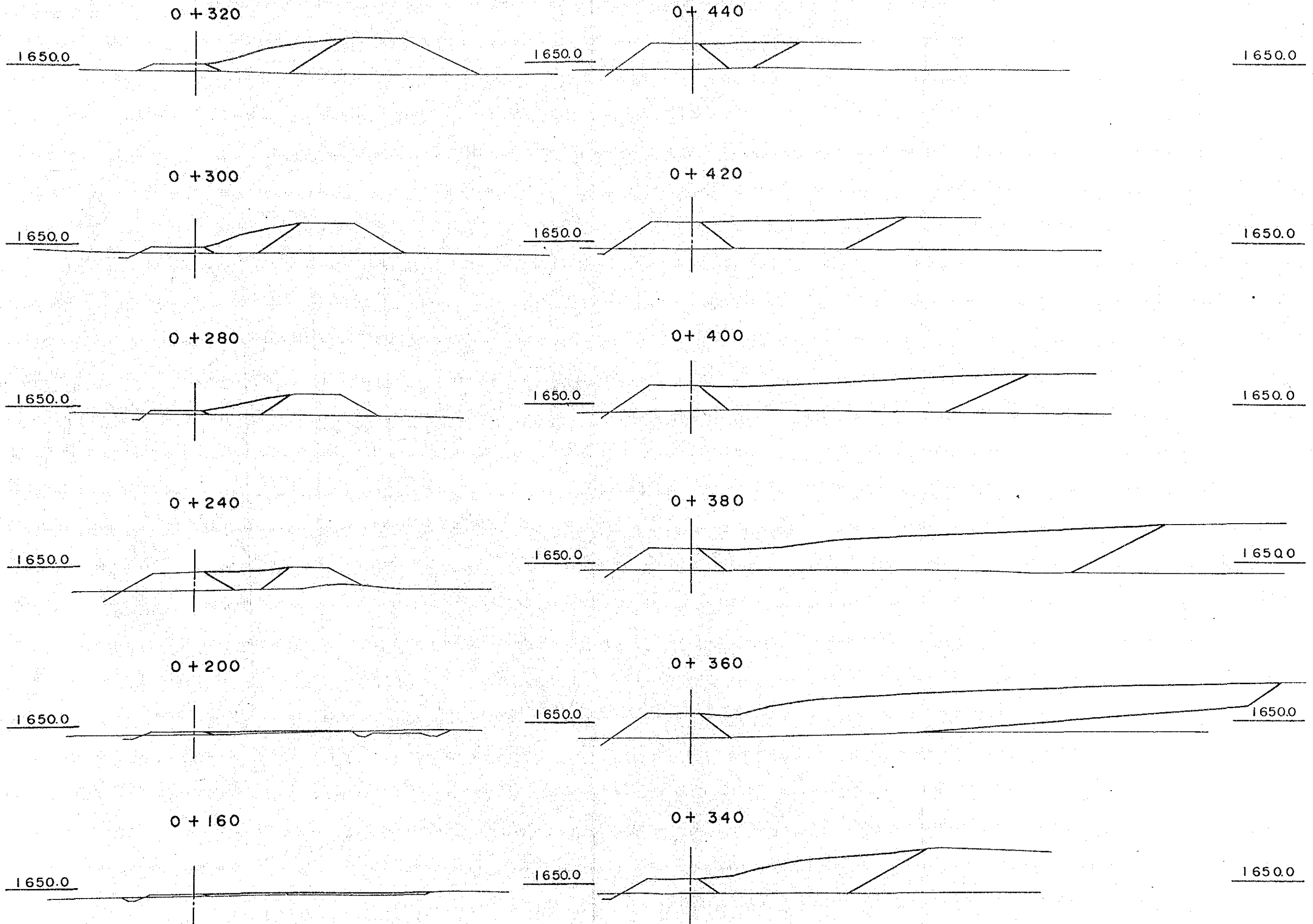
THE AREA BETWEEN G SLIP AND MAIN ROAD

2.9. 9

THE BANK BETWEEN A SLIP AND B SLIP ROAD



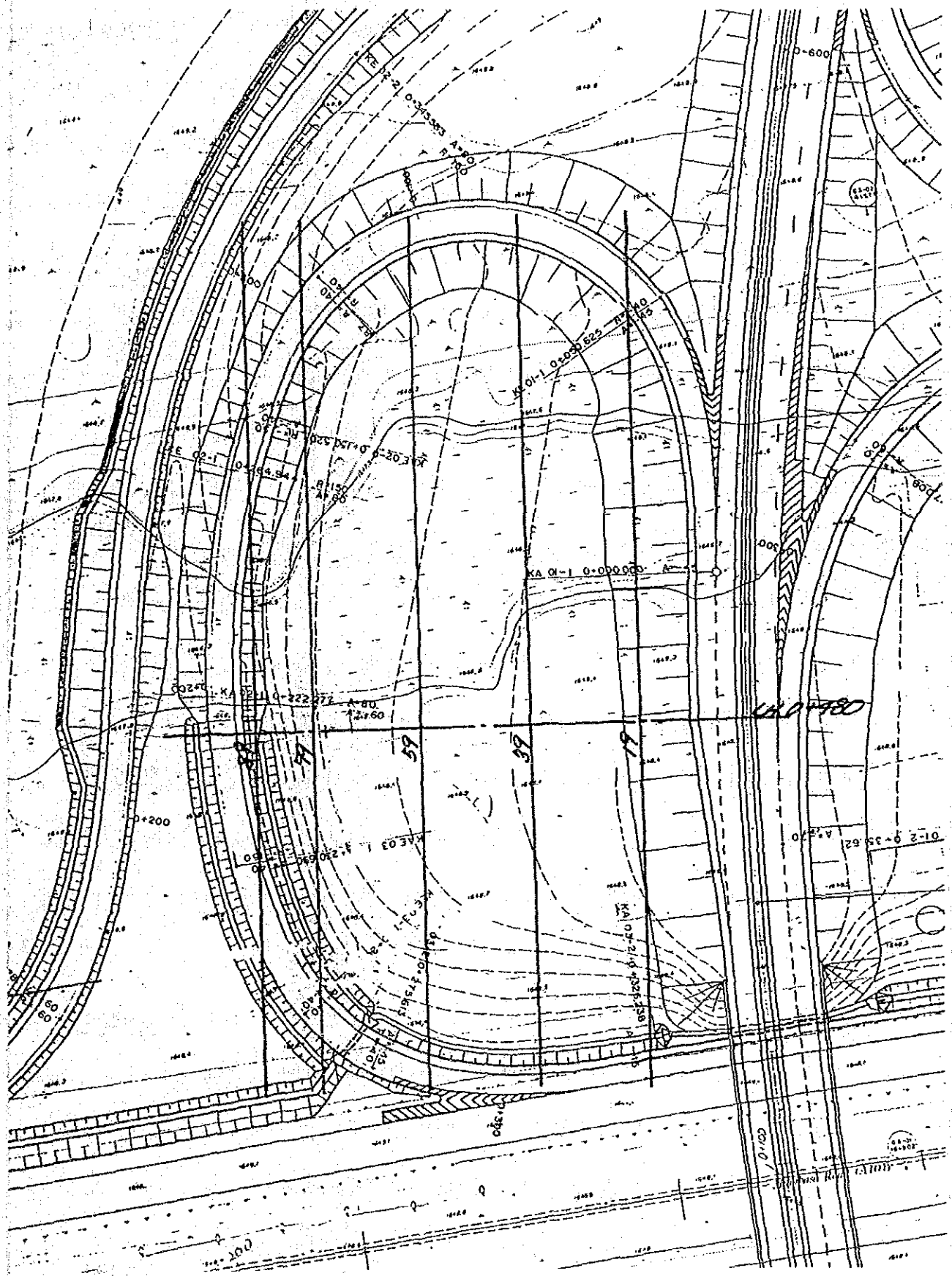
LOCATION OF CROSS SECTION (Not to scale)



THE BANK BETWEEN A SLIP AND B SLIP ROAD

CROSS SECTION Scale 1:500

THE BANK BETWEEN B SLIP AND MAIN ROAD



LOCATION OF CROSS SECTION (Not to scale)

0 + 480

120

1650.0

1650.0

100

1650.0

1650.0

80

1650.0

1650.0

60

1650.0

1650.0

40

1650.0

1650.0

20

1650.0

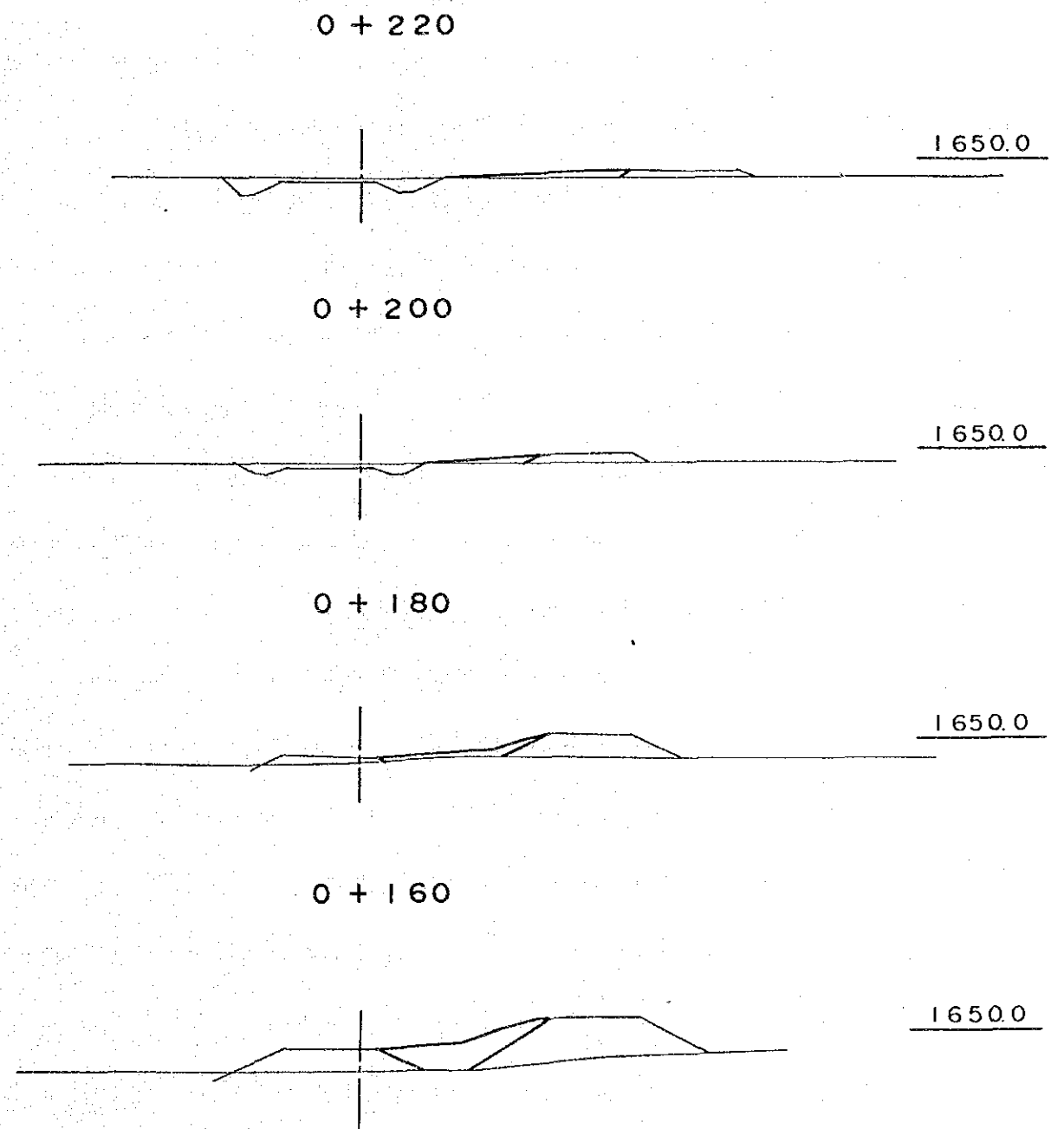
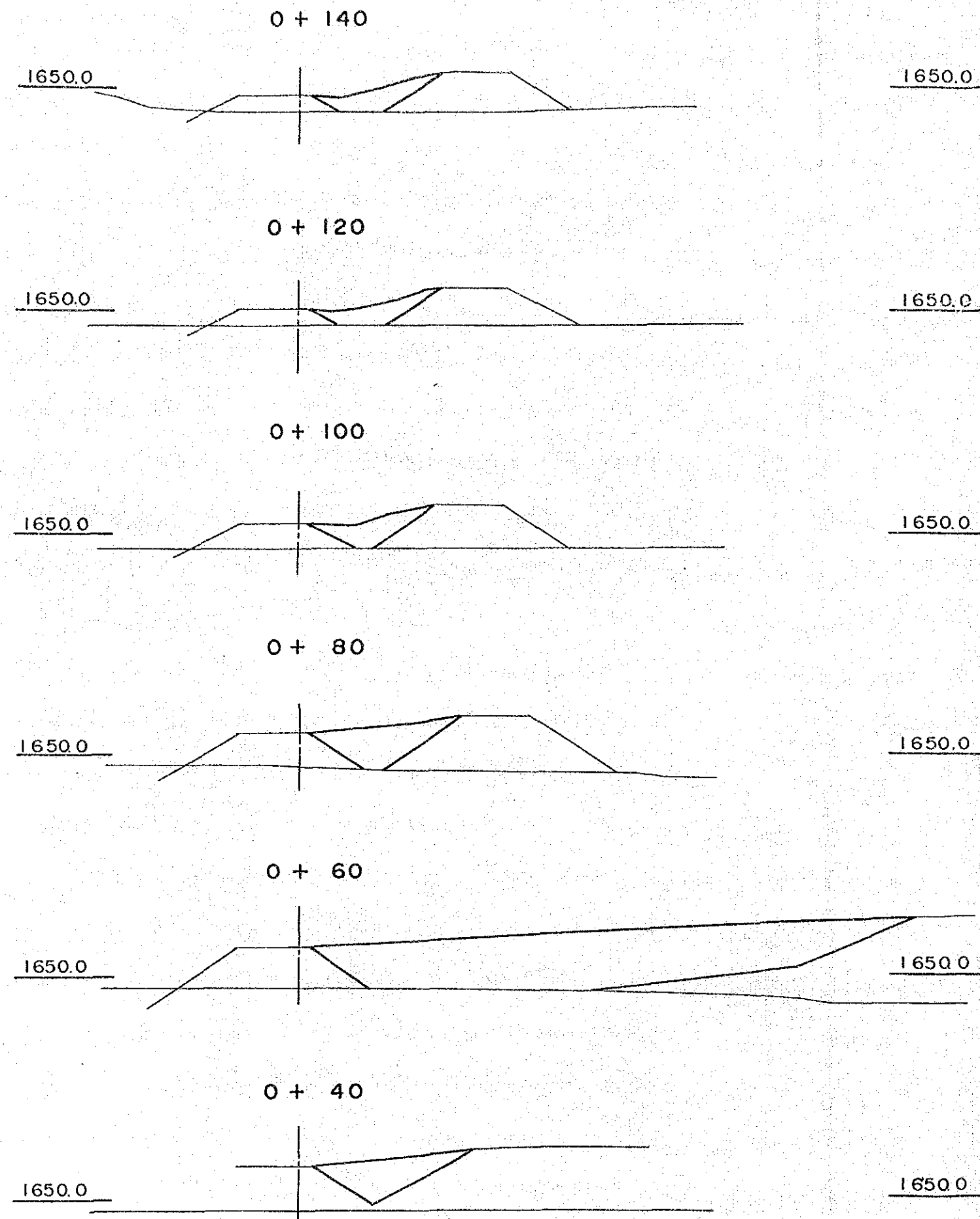
1650.0

THE BANK BETWEEN B SLIP AND MAIN ROAD

CROSS SECTION Scale 1:500

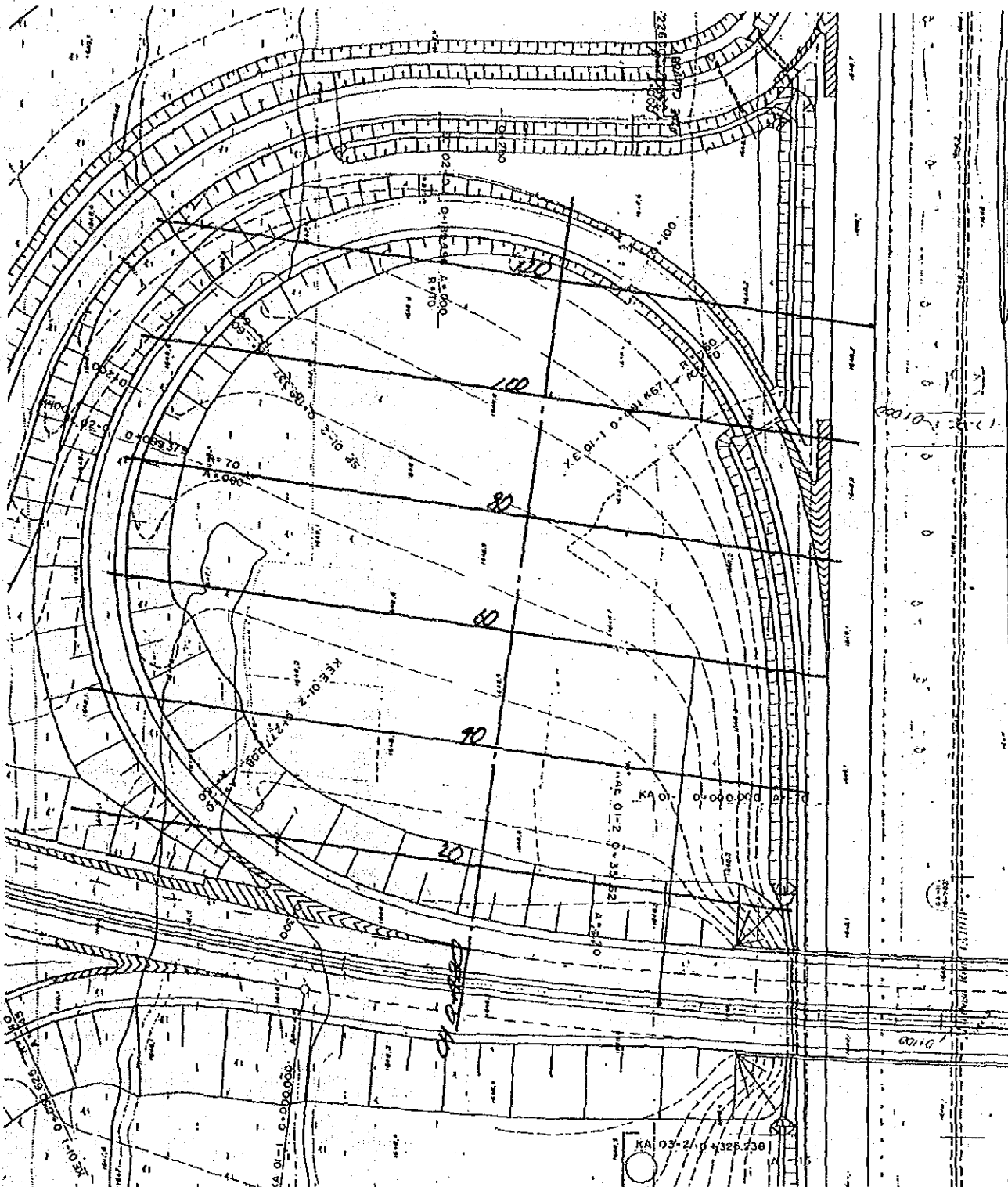
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2.9. 14

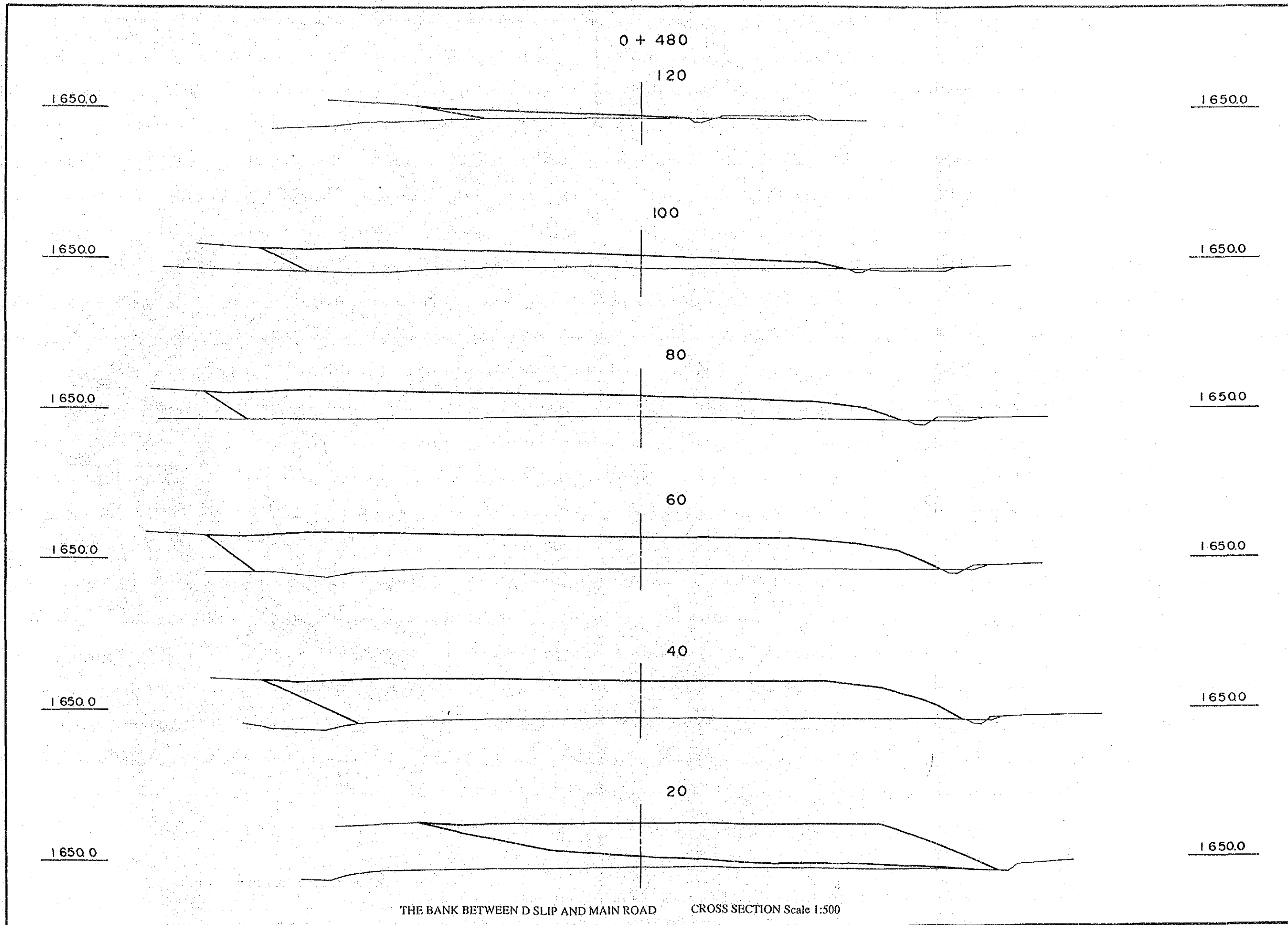


THE BANK BETWEEN C SLIP AND D SLIP ROAD CROSS SECTION Scale 1:500

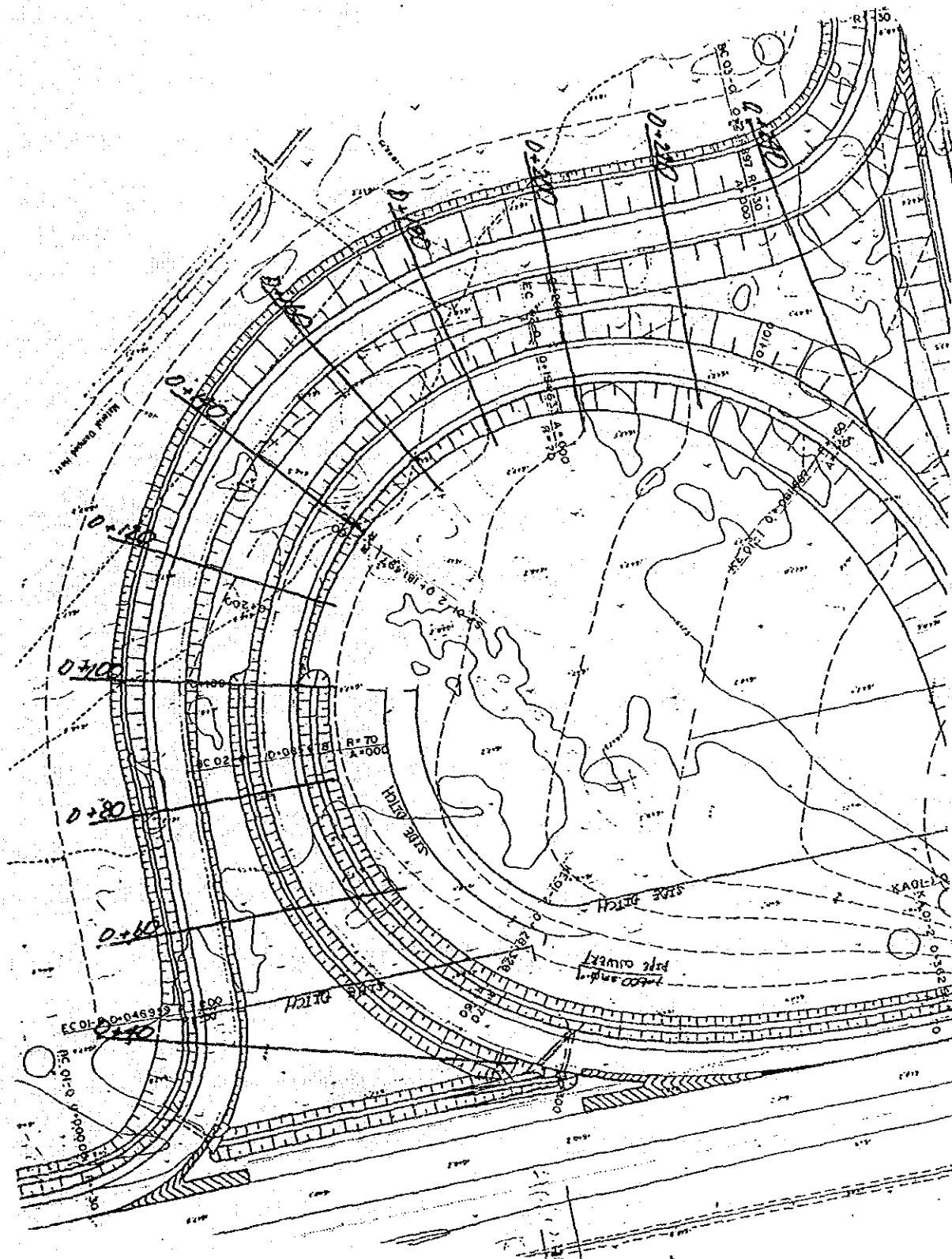
THE BANK BETWEEN D SLIP AND MAIN ROAD



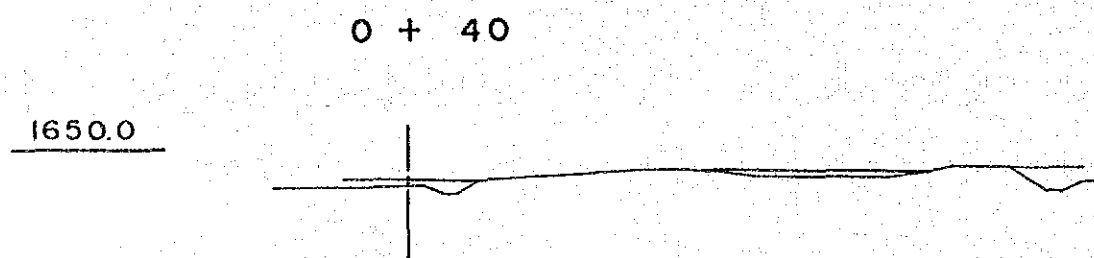
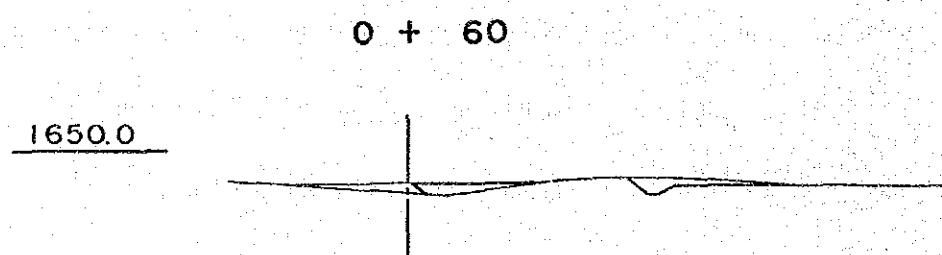
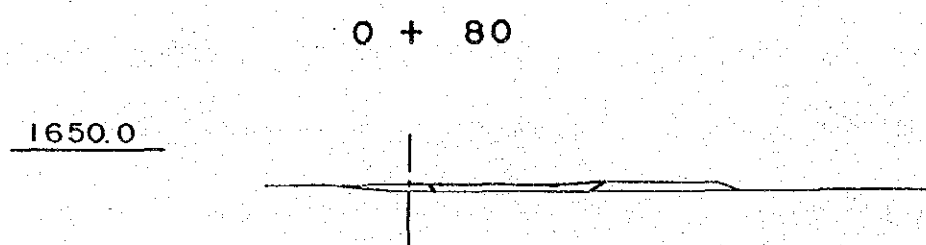
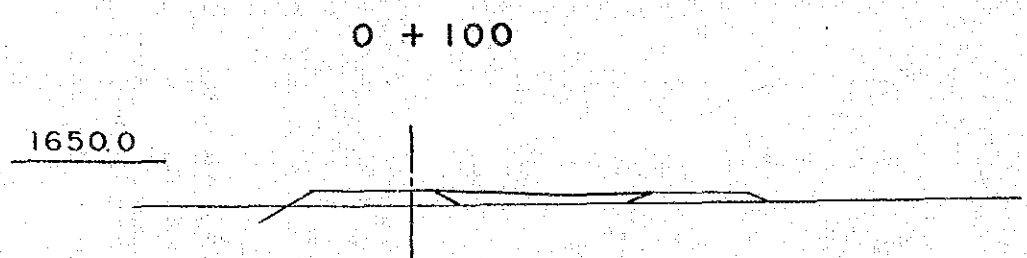
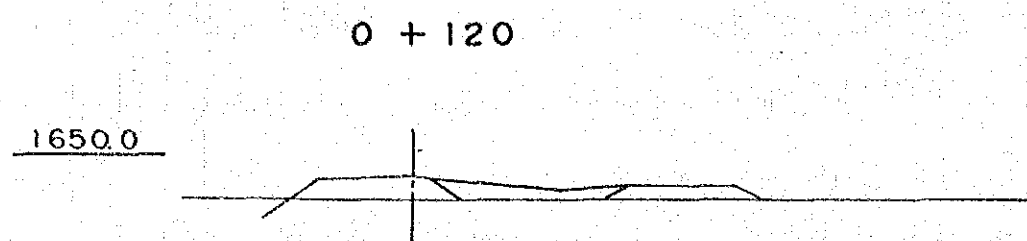
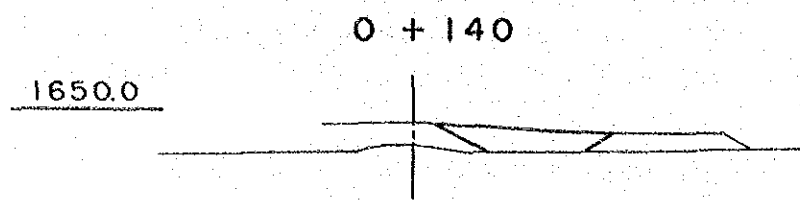
LOCATION OF CROSS SECTION (Not to scale)



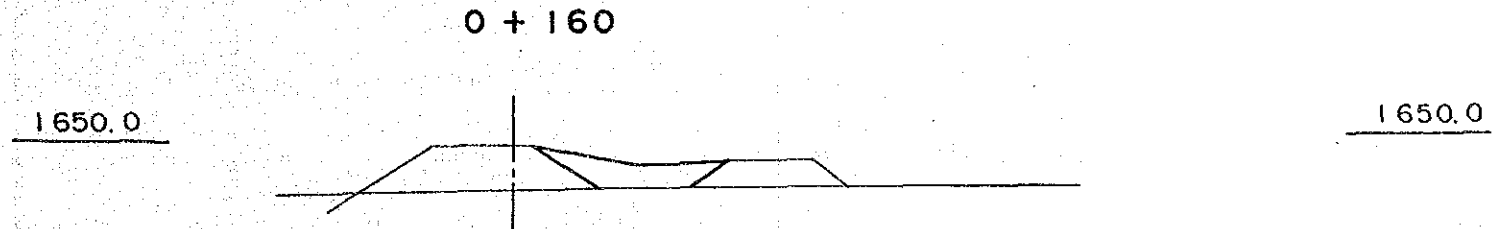
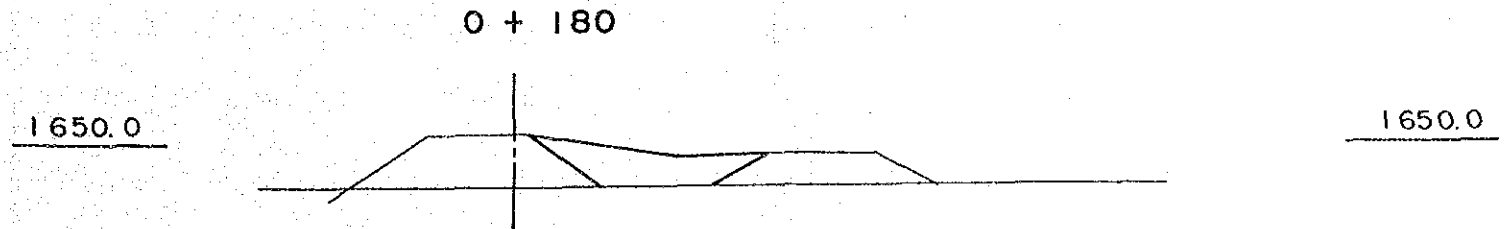
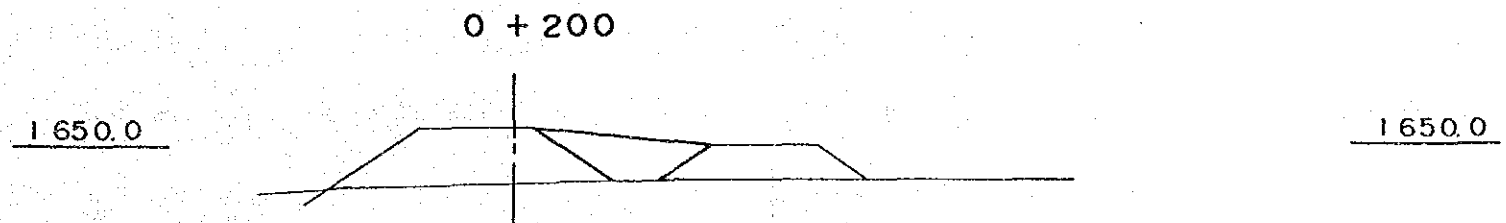
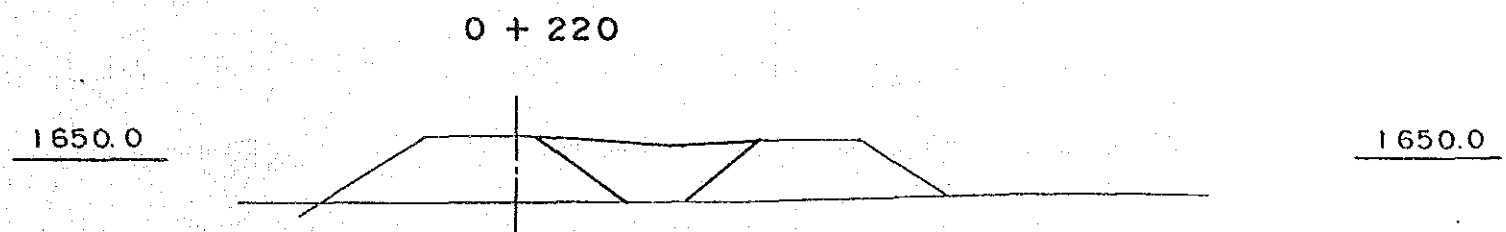
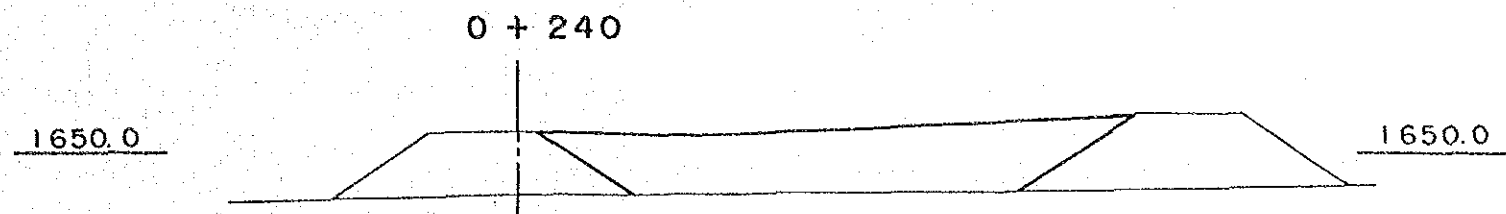
THE BANK BETWEEN E SLIP AND F SLIP ROAD



LOCATION OF CROSS SECTION (Not to scale)



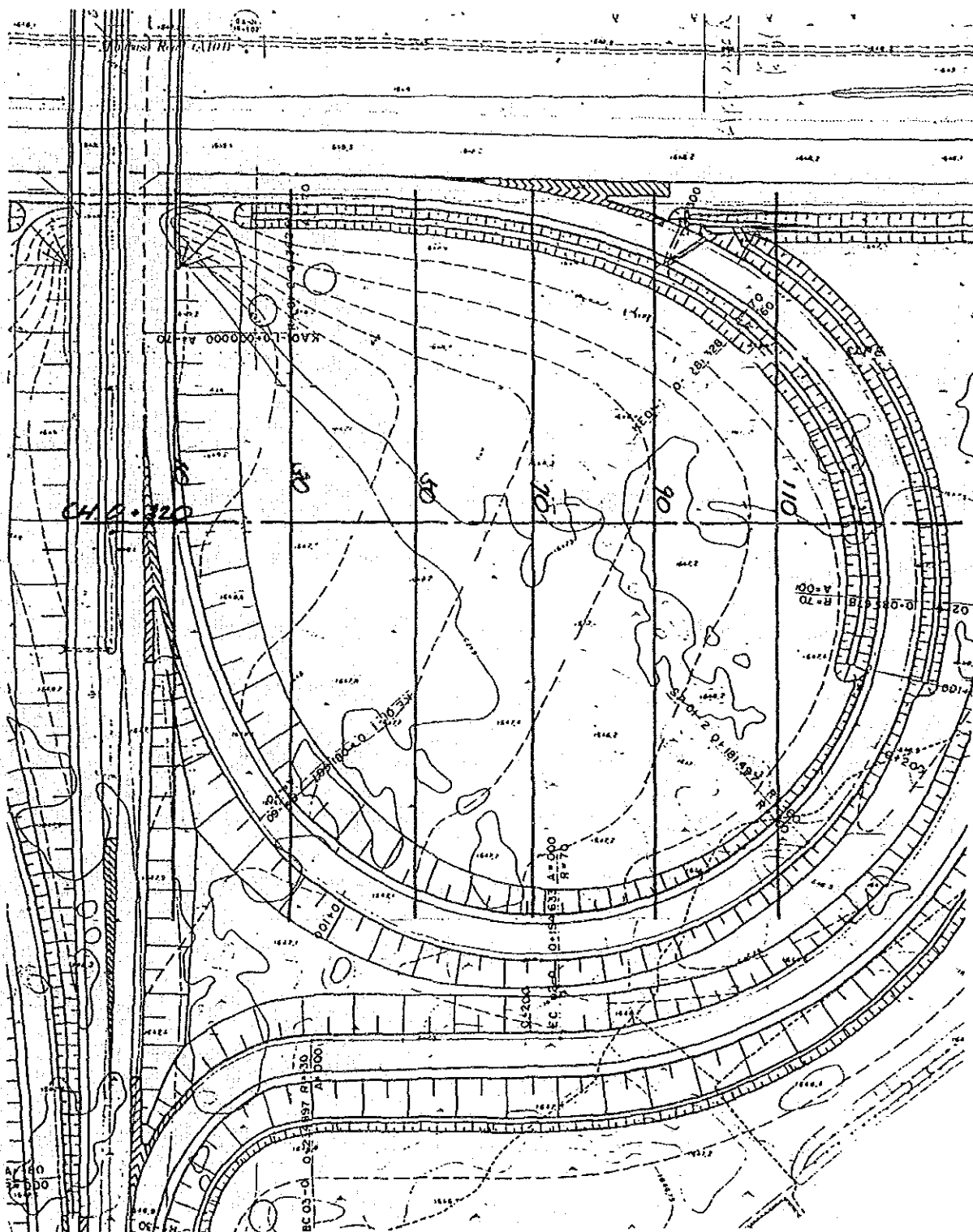
1650.0



THE BANK BETWEEN E SLIP AND F SLIP ROAD

CROSS SECTION Scale 1:500

THE BANK BETWEEN F SLIP AND MAIN ROAD



LOCATION OF CROSS SECTION (Not to scale)

0 + 320

110

1650.0

1650.0

90

1650.0

1650.0

70

1650.0

1650.0

50

1650.0

1650.0

30

1650.0

1650.0

10

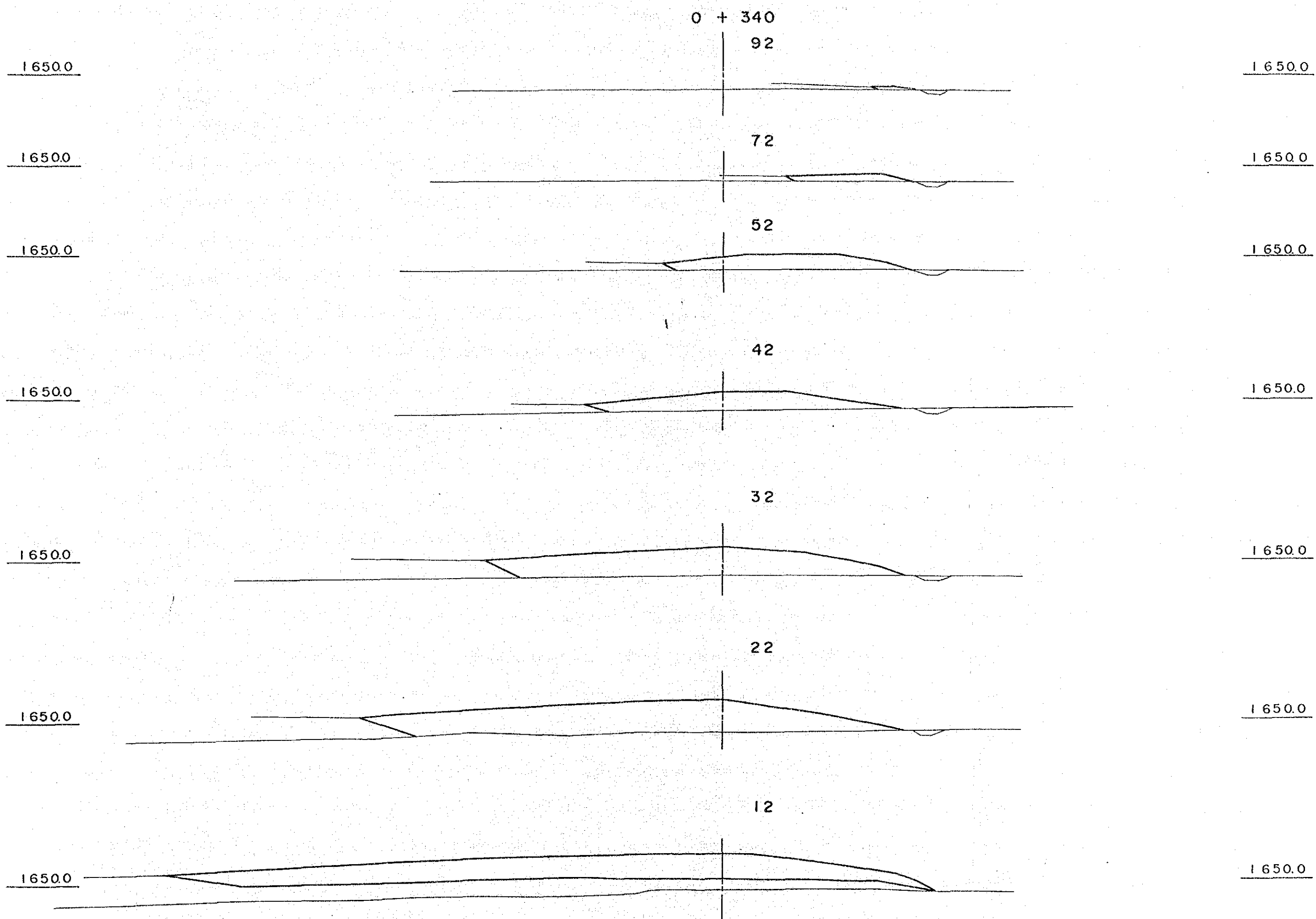
1650.0

1650.0

THE BANK BETWEEN F SLIP AND MAIN ROAD

CROSS SECTION Scale 1:500

2.9. 22



THE BANK BETWEEN G SLIP AND MAIN ROAD

CROSS SECTION Scale 1:500

