

THE REPUBLIC OF COLOMBIA  
THE BOGOTA-BUENAVENTURA ROAD PROJECT  
FEASIBILITY SURVEY  
DRAWING FOR NEW ROAD CONSTRUCTION  
FINAL REPORT  
MARCH 1982

JAPAN INTERNATIONAL COOPERATION AGENCY

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THE REPUBLIC OF COLOMBIA

THE BOGOTA-BUENAVENTURA ROAD PROJECT

FEASIBILITY SURVEY

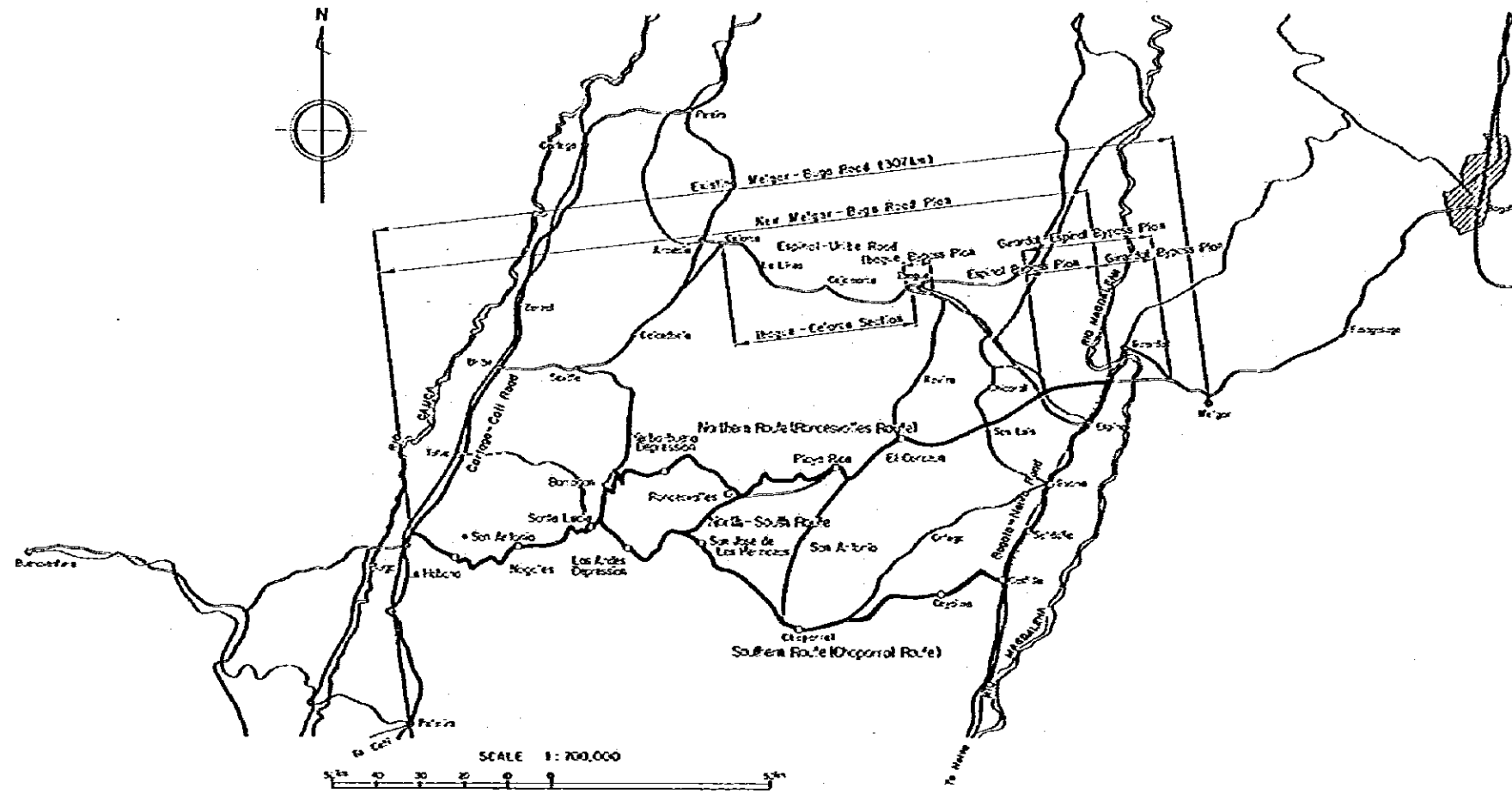
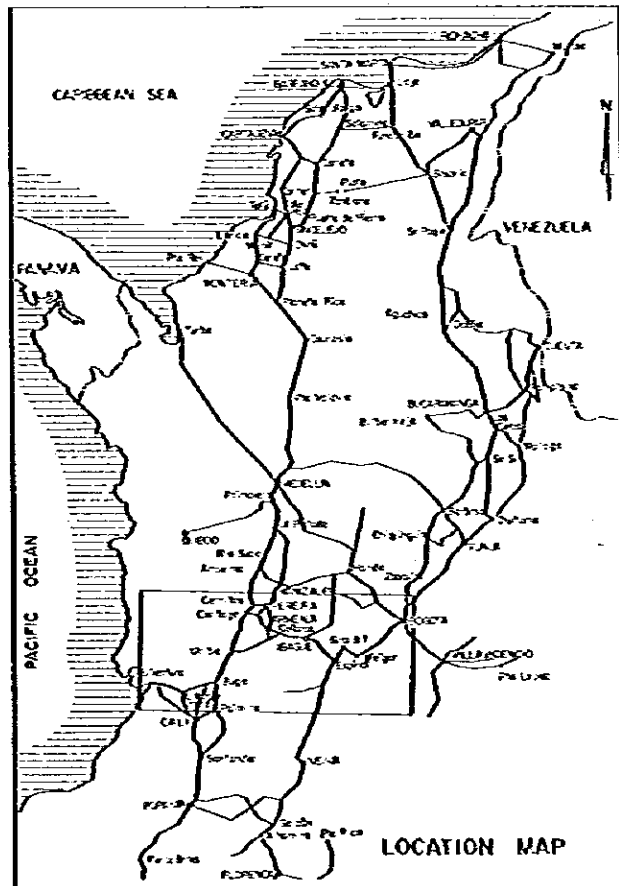
DRAWING FOR NEW ROAD CONSTRUCTION

FINAL REPORT

MARCH 1982

JAPAN INTERNATIONAL COOPERATION AGENCY

国際協力事業団	
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**LEGEND**

- Alternative Route
- - - Gravel Road
- Paved Road
- Railways
- LS-1 Landslide Area Number
- ⊖ Landslide

**INDEX OF SHEETS**

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**REDUCED PLAN**  
 SCALES SHOWN HEREON APPLY TO ORIGINAL SIZE PLANS ONLY  
 SCALES ARE SHOWN IN THE SIZE OF 1/2 OF THE ORIGINAL ONE

M O P T

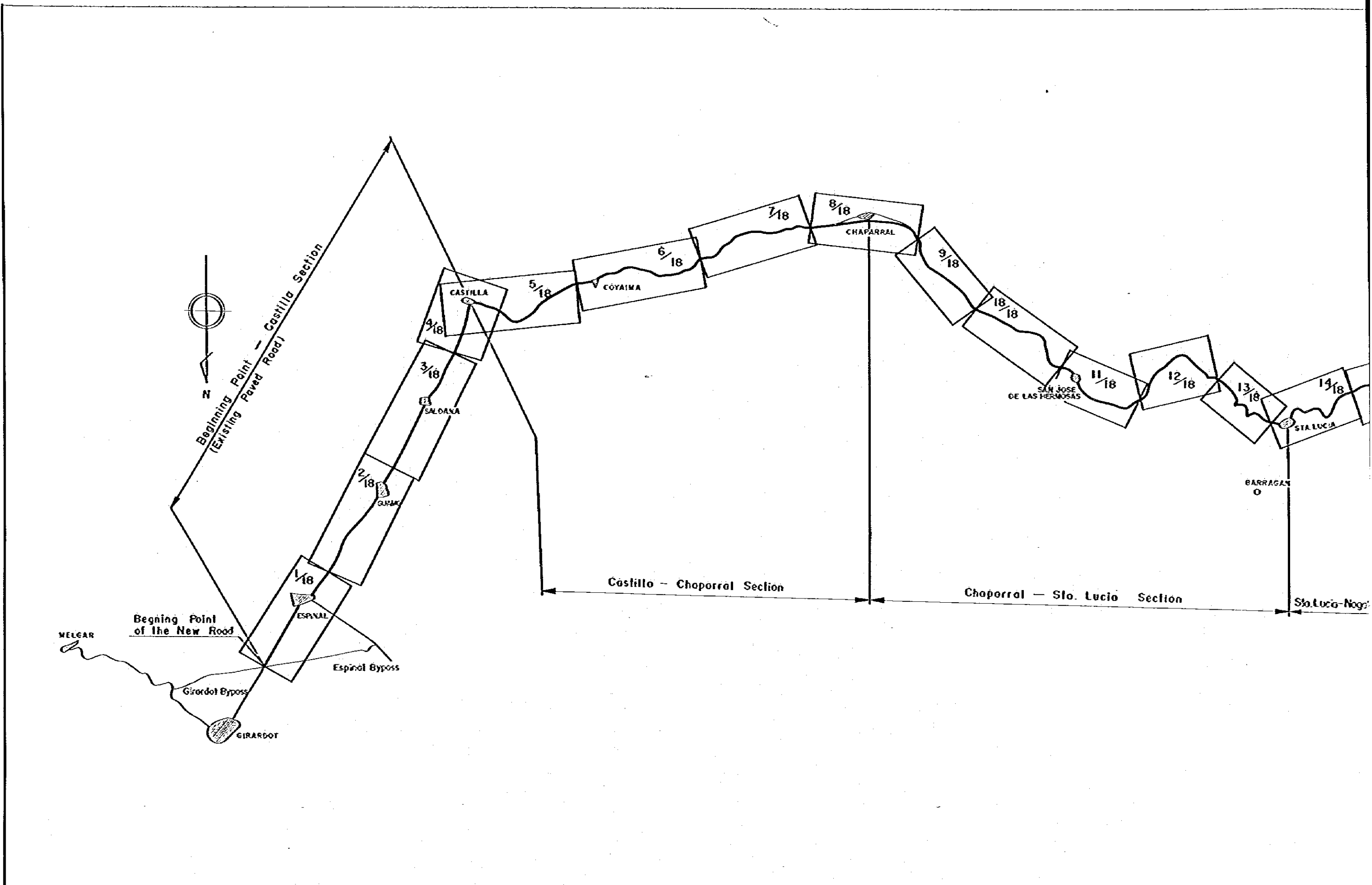
BOGOTA — BUENAVENTURA  
 ROAD PROJECT

LOCATION MAP

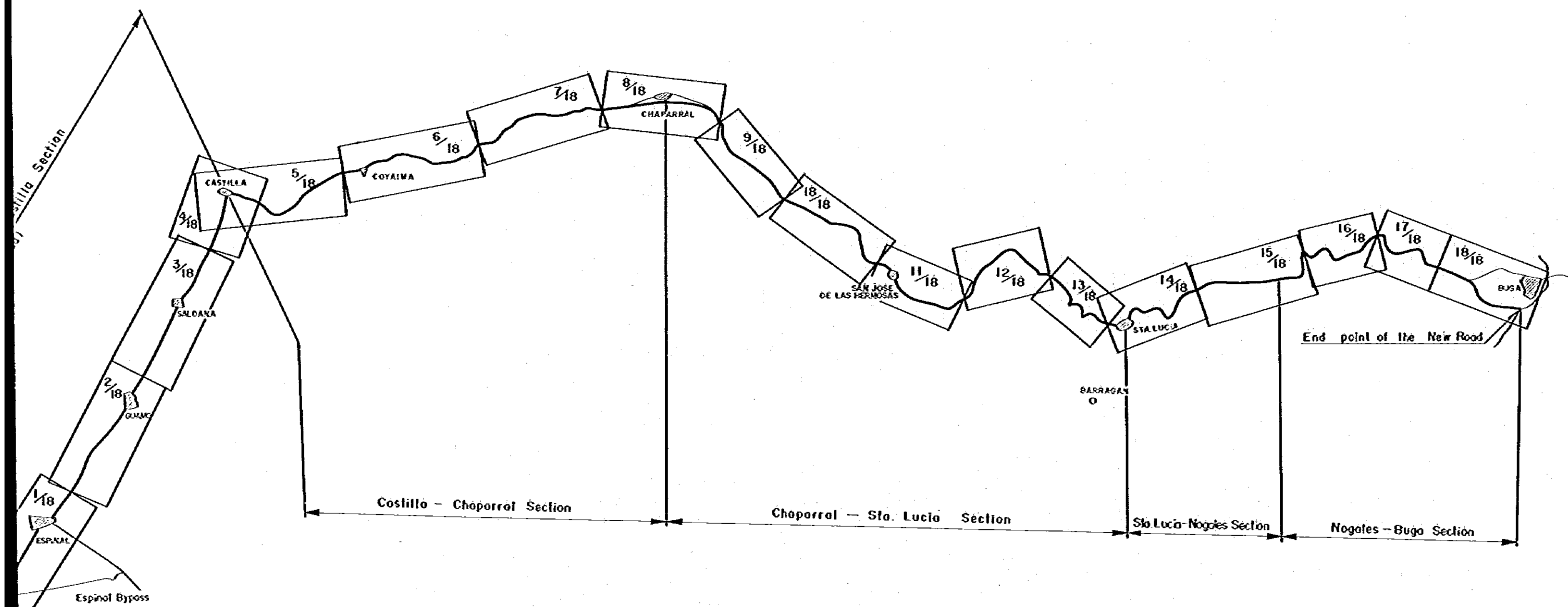
SCALE

DATE MARCH 1982

SHEET No. 1 OF 32



M O P T	BOGOTA - BUENAVENTURA ROAD PROJECT	KEY MAP	SCALE
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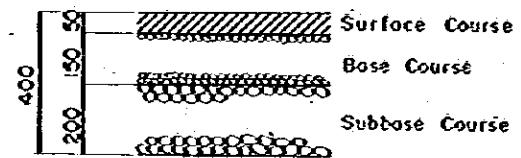
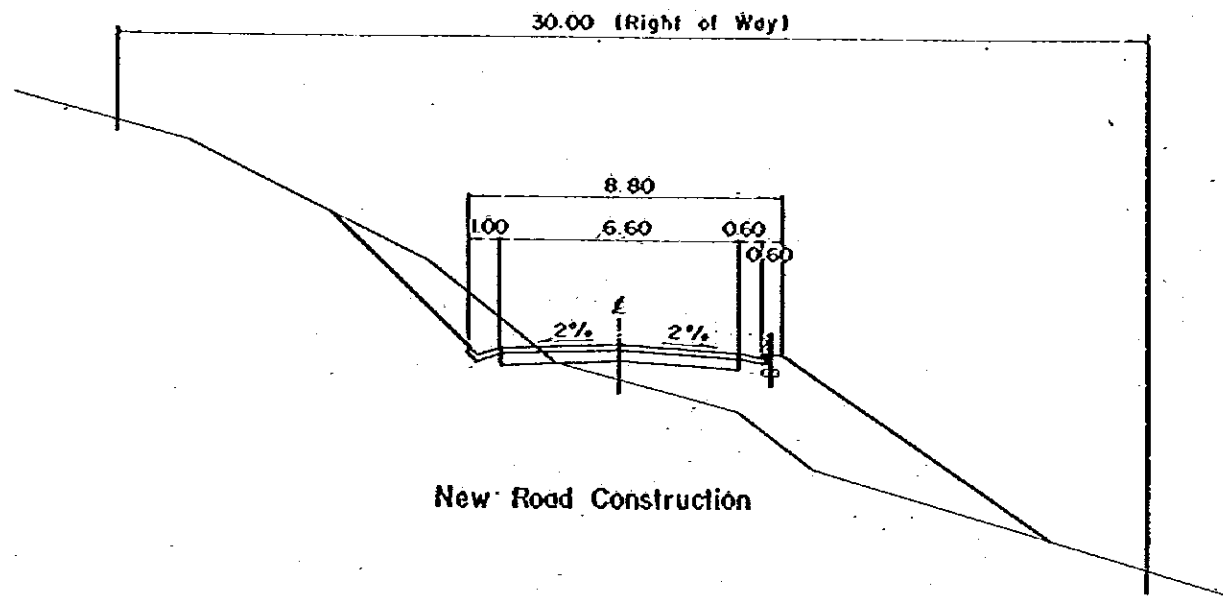


BOGOTA - BUENAVENTURA  
ROAD PROJECT

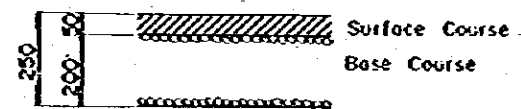
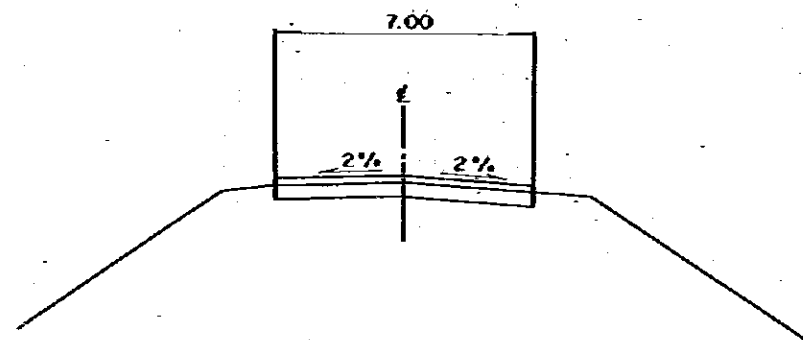
KEY MAP

SCALE

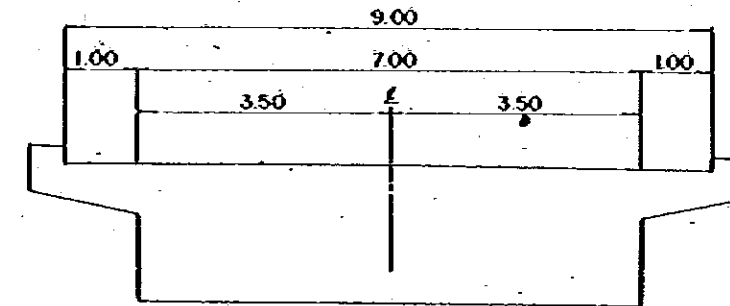
DATE	MARCH 1982
SHEET	No. 2 OF 32



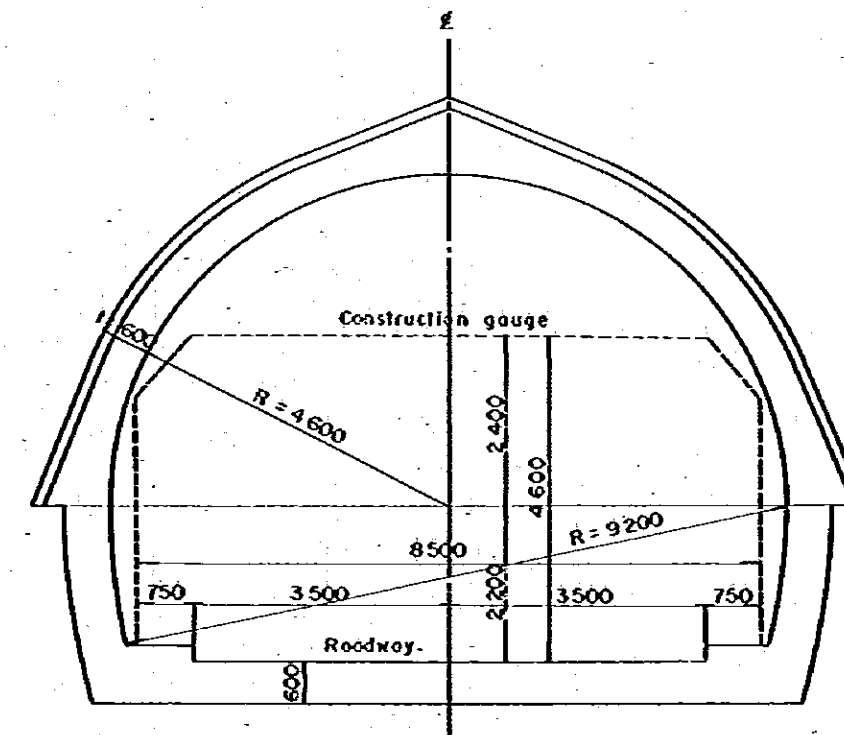
Pavement Structure of Roadway  
Scale 1:20



Pavement Structure of Roadway  
Scale 1:20

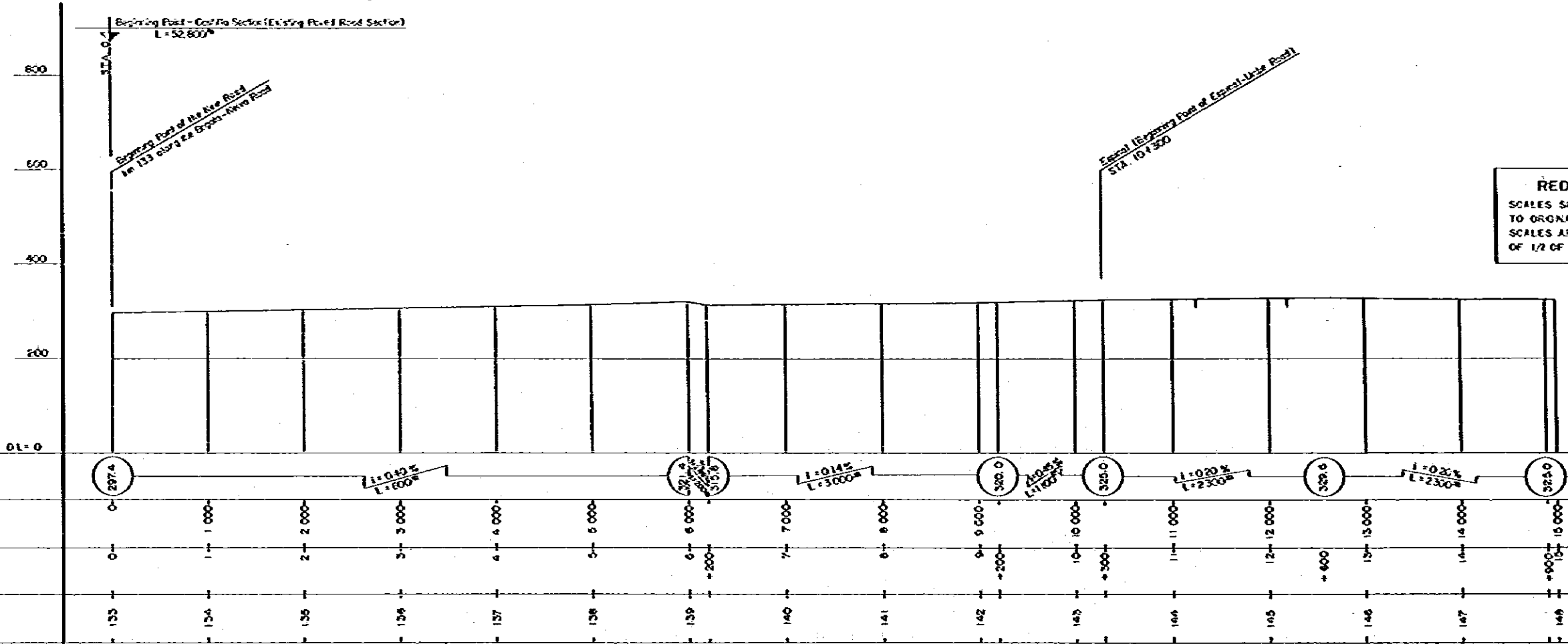
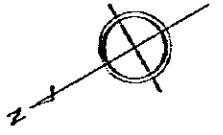
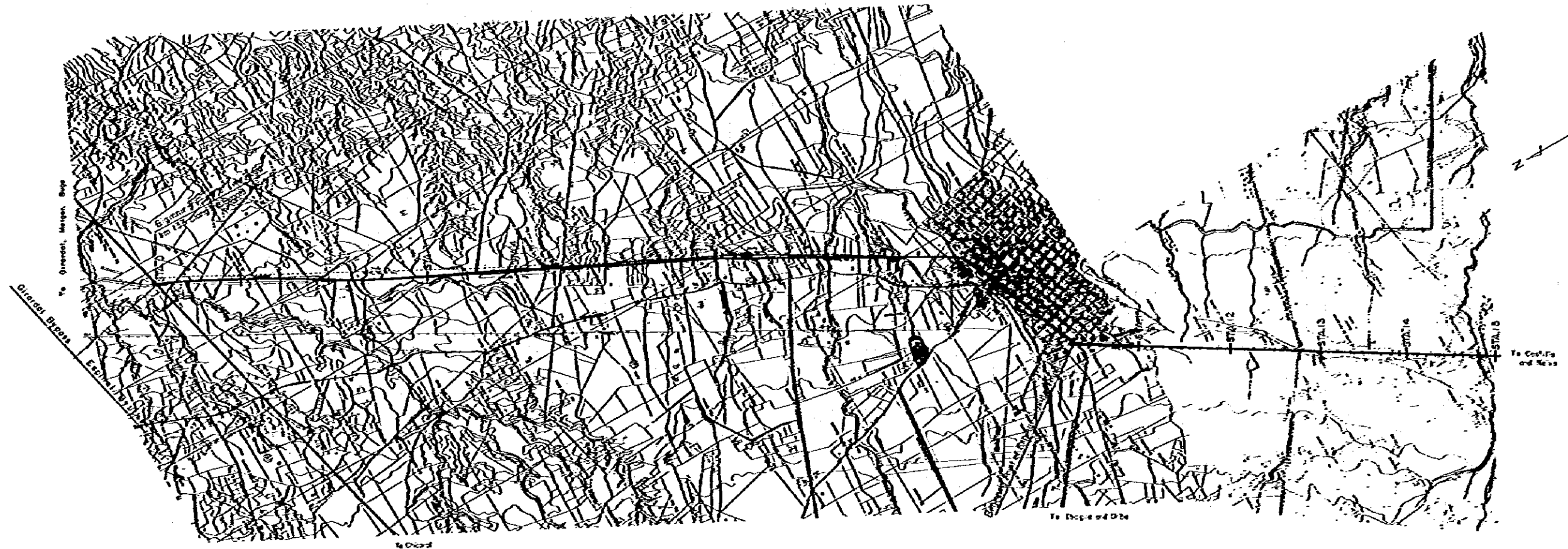


Scale 1:100



Scale 1:100

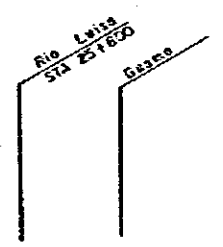
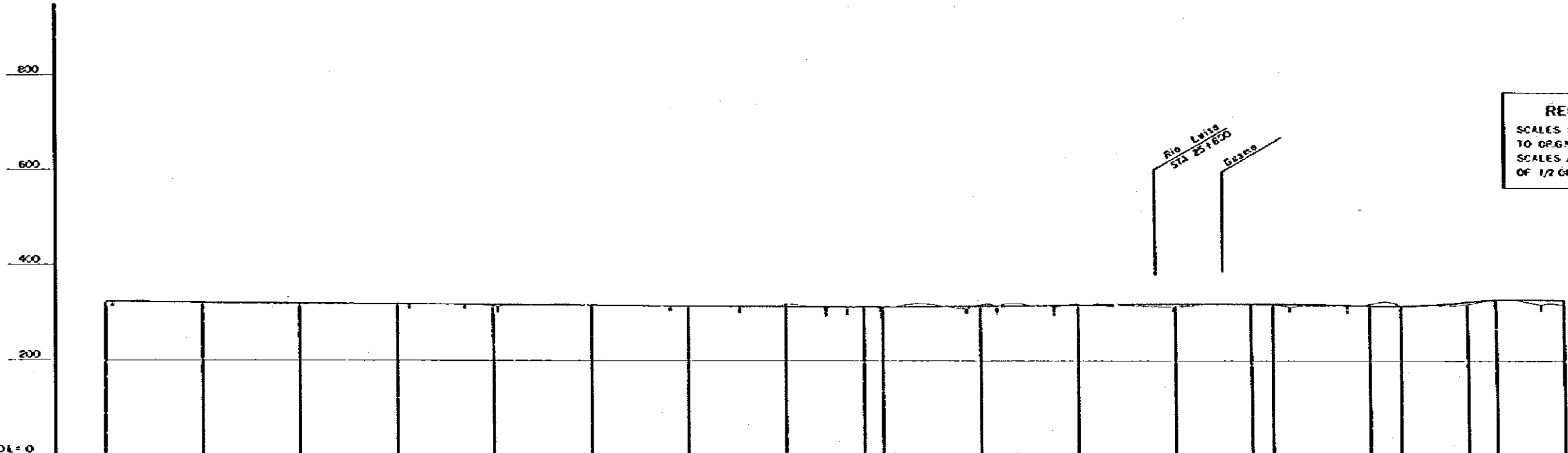




**REDUCED PLAN**  
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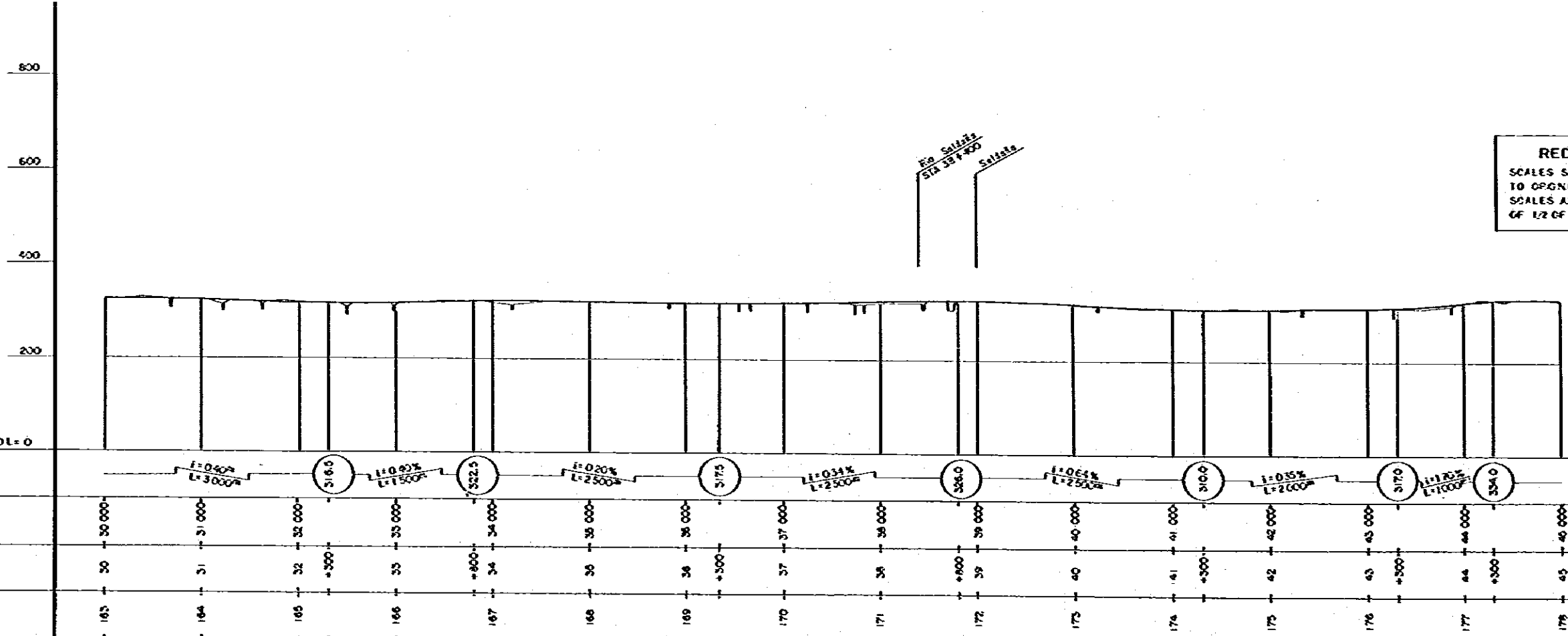


DATUM LINE	DL = 0															
VERTICAL GRADIENT	$1:020\%$ $L=7900'$ $309.2$ $1:020\%$ $L=4000'$ $317.2$ $1:032\%$ $L=1500'$ $312.7$ $1:158\%$ $L=1000'$ $328.9$															
ACCUMULATIVE DISTANCE	15 000	16 000	17 000	18 000	19 000	20 000	21 000	22 000	23 000	24 000	25 000	26 000	27 000	28 000	29 000	30 000
STATION	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
IN-SITU KM POST	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163



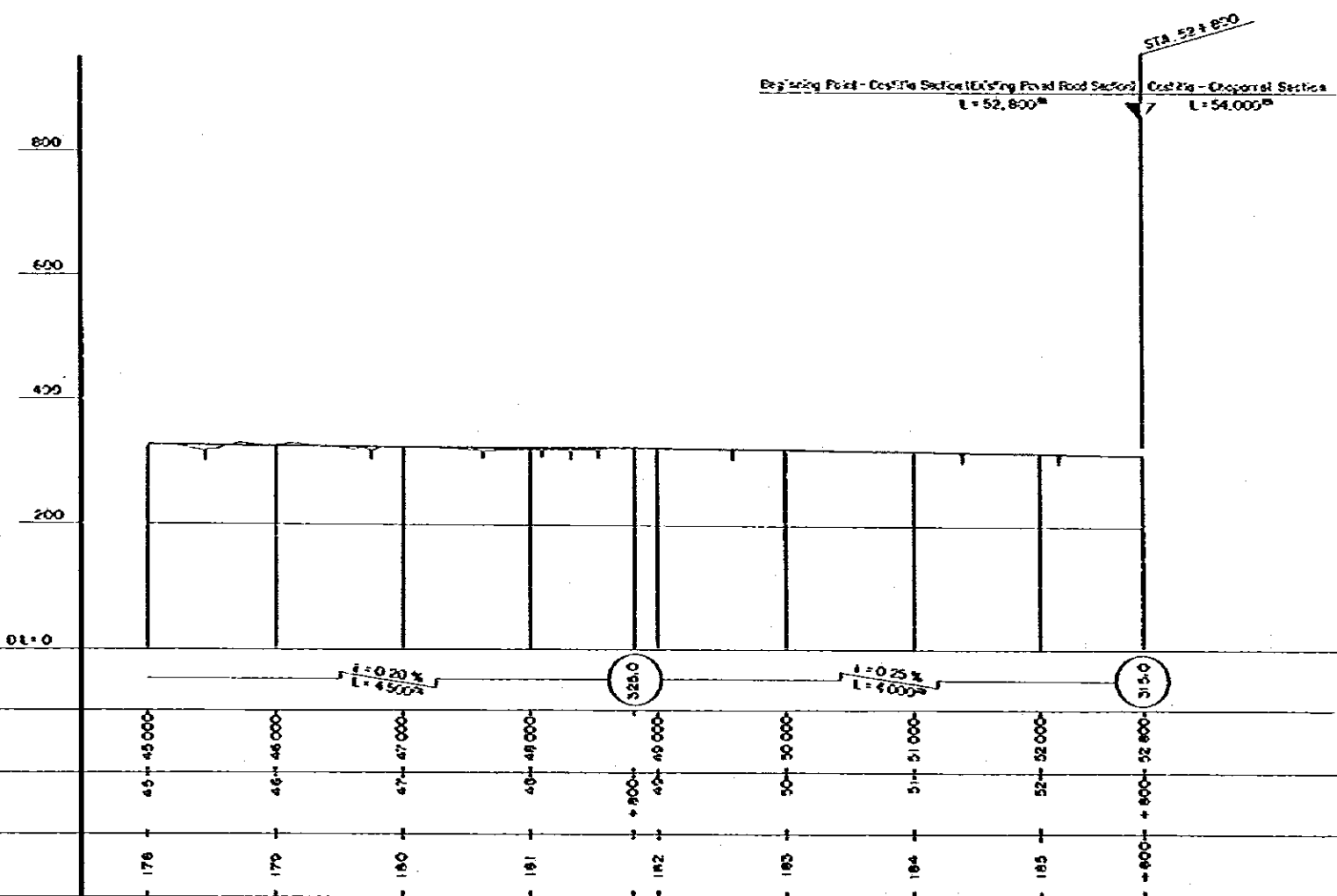
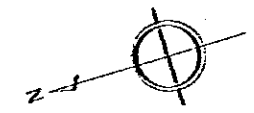
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Fin Salinas  
 STA 38+400  
 Salinas



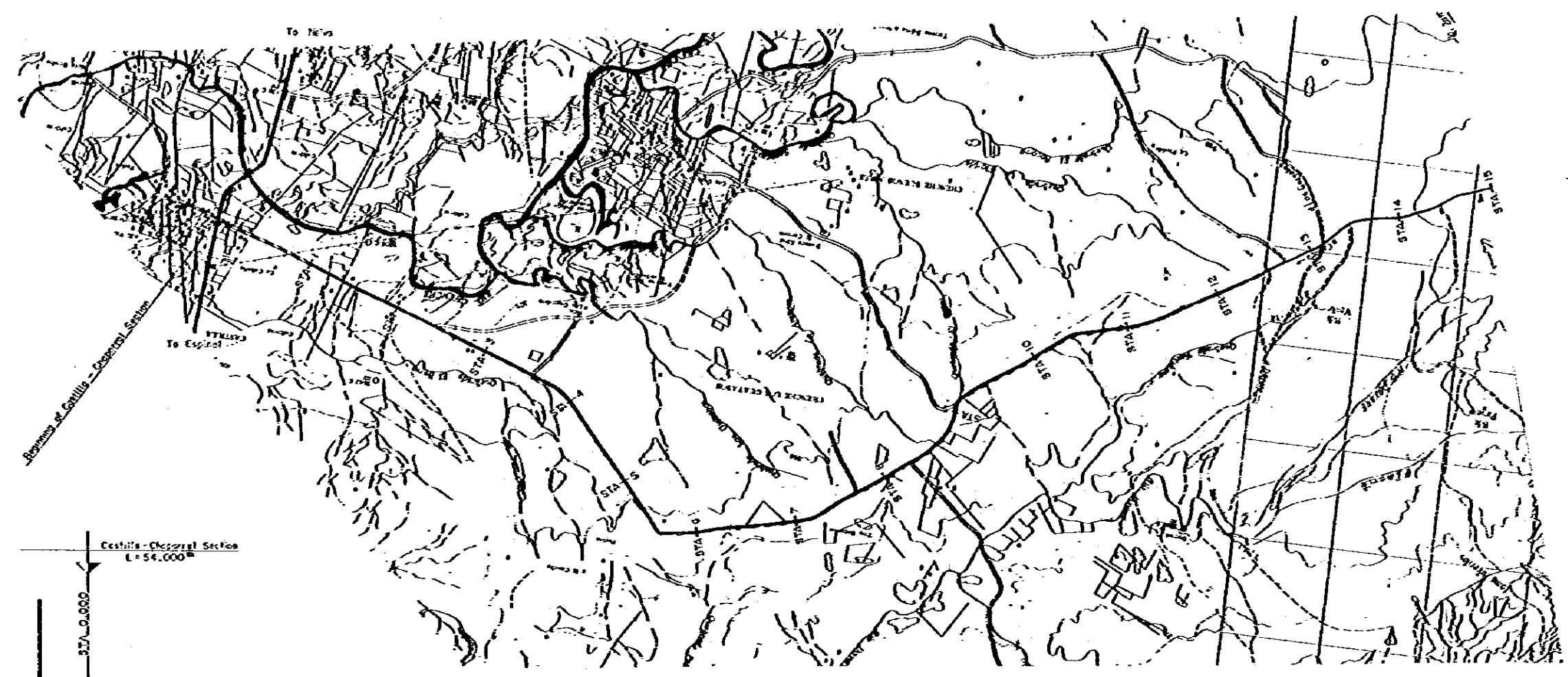
DATUM LINE DL=0  
 VERTICAL GRADIENT  
 ACCUMULATIVE DISTANCE  
 STATION  
 IN-SITU KM POST

M O P T	BOGOTA — BUENAVENTURA ROAD PROJECT	PLAN AND PROFILE (BEGINNING POINT — CASTILLA) STATION 30 — STATION 45		SCALE H = 1 : 25,000 V = 1 : 2,500	DATE	MARCH 1982
					SHEET No. 6 OF 32	

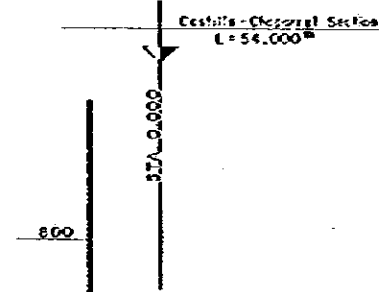


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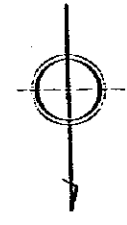
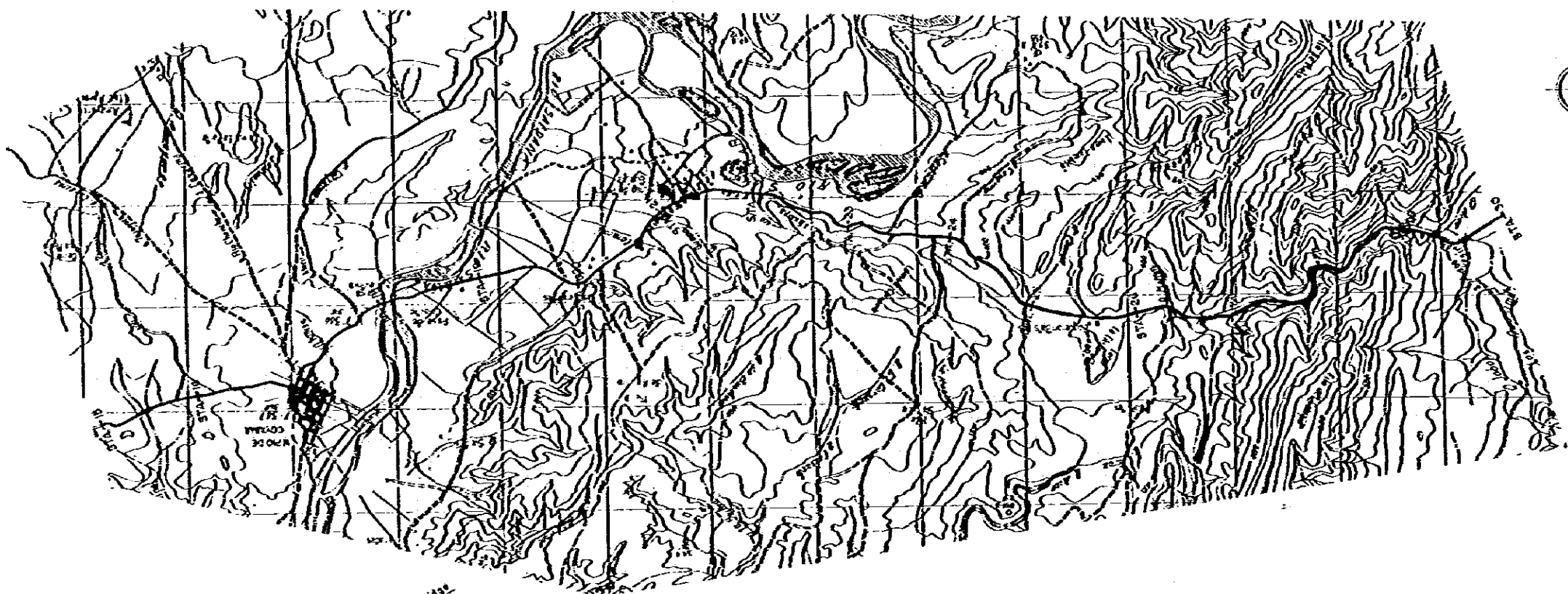
DATUM LINE	0L+0									
VERTICAL GRADIENT		-0.20% L=4500m				325.0	-0.25% L=4000m			315.0
ACCUMULATIVE DISTANCE		45+000	46+000	47+000	48+000	49+000	50+000	51+000	52+000	52+800
STATION		45+000	46+000	47+000	48+000	49+000	50+000	51+000	52+000	52+800
IN-SITU KM POST		176	179	180	181	182	183	184	185	186
<b>M O P T</b>	<b>BOGOTÁ — BUENAVENTURA ROAD PROJECT</b>	<b>PLAN AND PROFILE (BEGINNING POINT — CASTILLA)</b>					<b>SCALE</b>		<b>DATE</b>	
		<b>STATION 45 — STATION 52+800</b>					H : 1 : 25,000 V : 1 : 2,500		MARCH 1982	
									SHEET No. 7 OF 32	



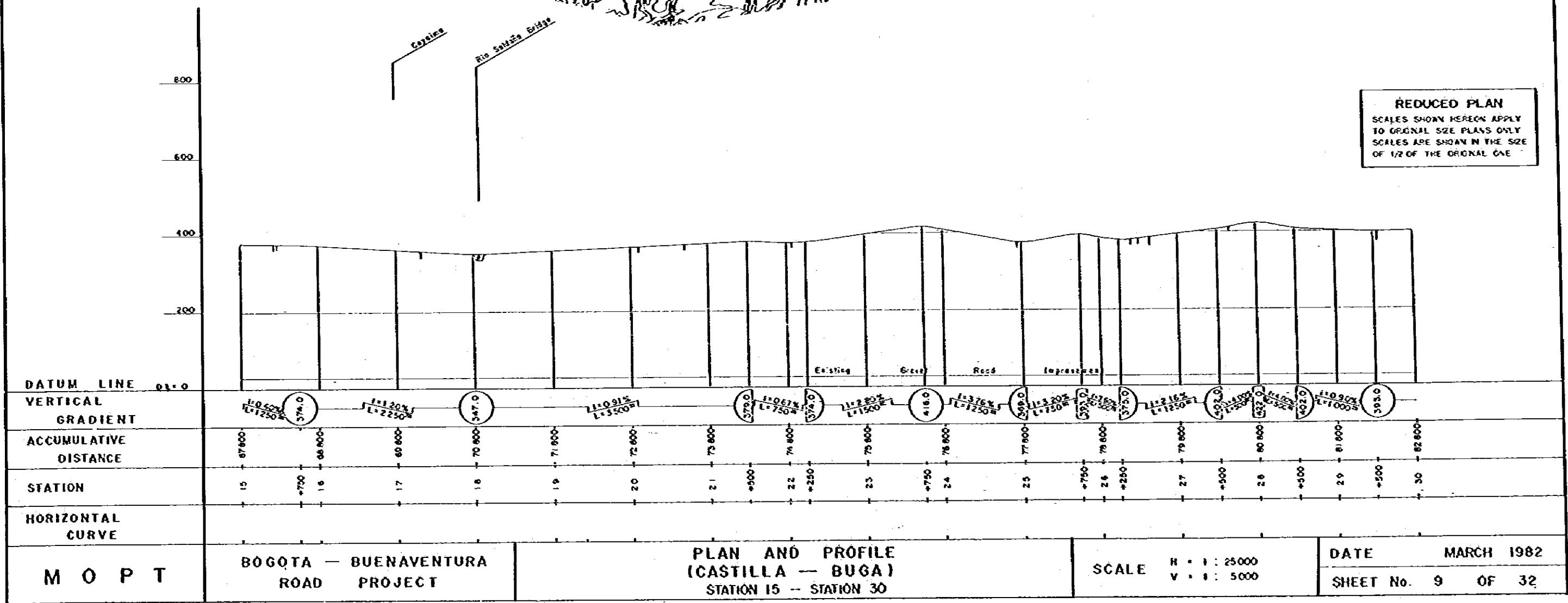
**REDUCED PLAN**  
 SCALES SHOWN HEREON APPLY TO ORIGINAL SIZE PLANS ONLY  
 SCALES ARE SHOWN IN THE SIZE OF 1/2 OF THE ORIGINAL CASE

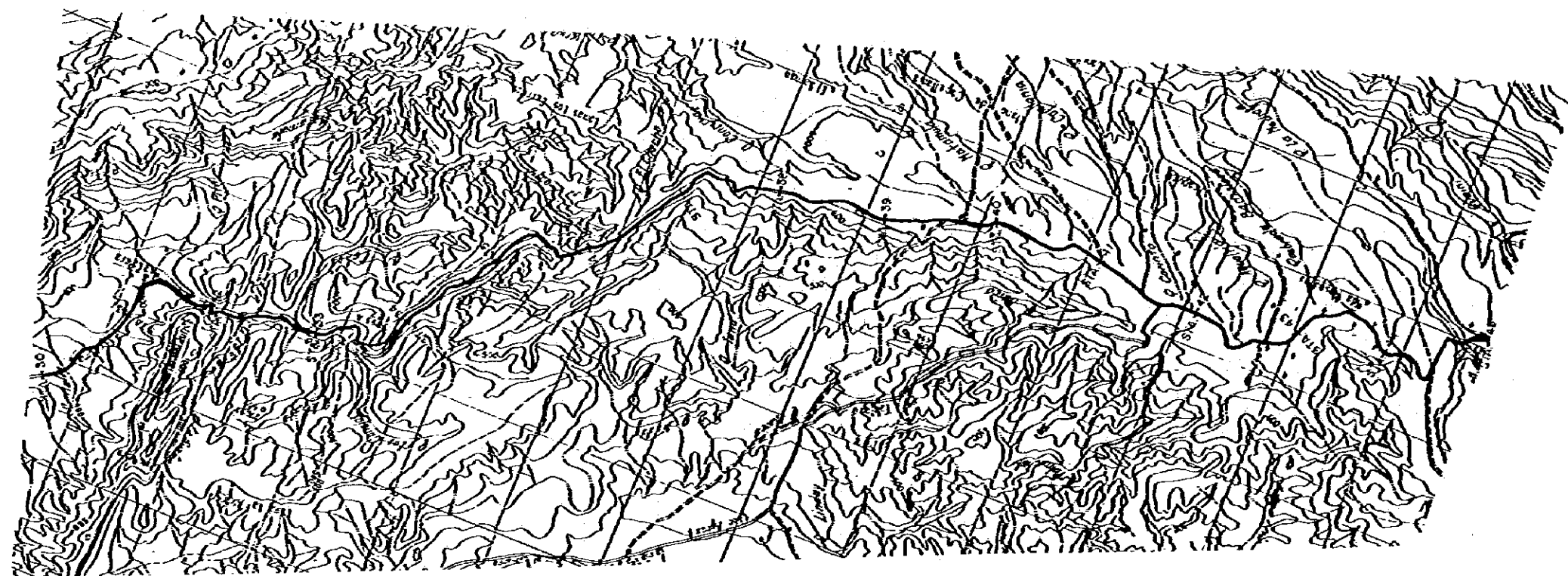


	<div style="display: flex; justify-content: space-between;"> <span>Existing</span> <span>Gravel</span> <span>Paved</span> <span>Improvement</span> </div>															
<b>DATUM LINE</b> DL=0	[Profile line with vertical curve data]															
<b>VERTICAL GRADIENT</b>	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
<b>ACCUMULATIVE DISTANCE</b>	0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	11000	12000	13000	14000	15000
<b>STATION</b>	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
<b>HORIZONTAL CURVE</b>	[Curve data table]															

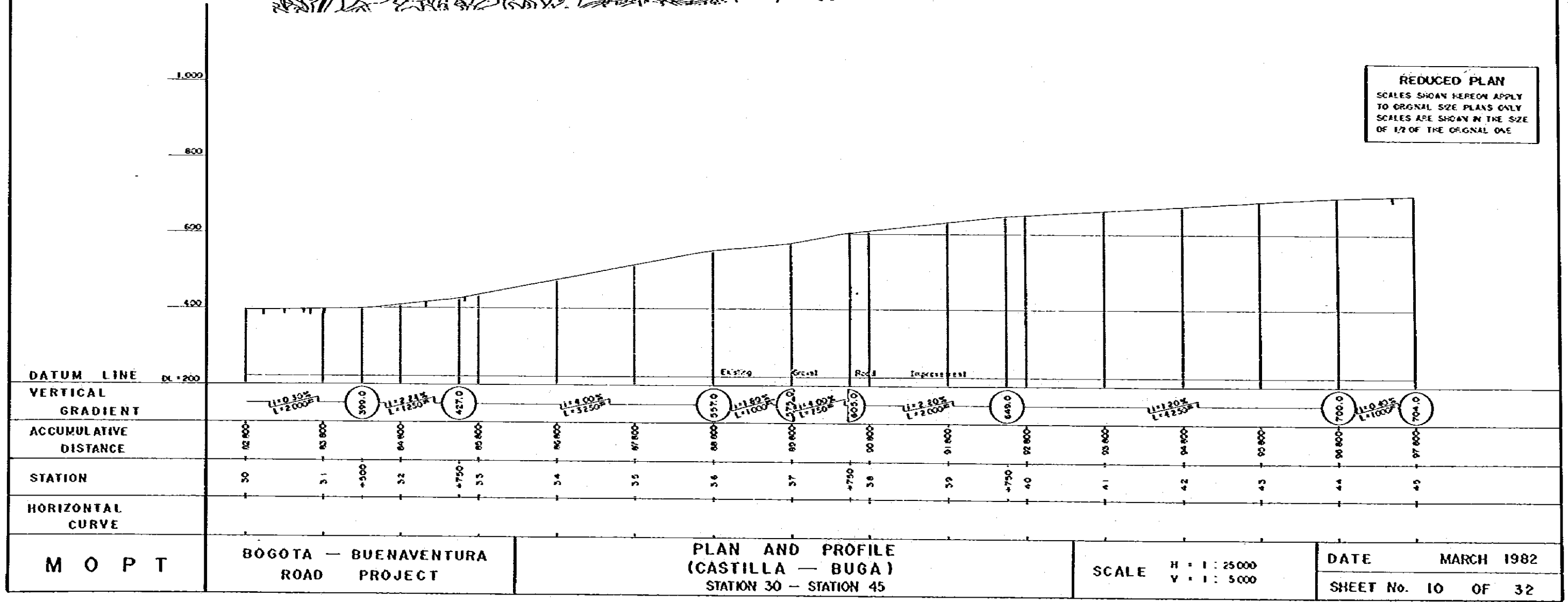


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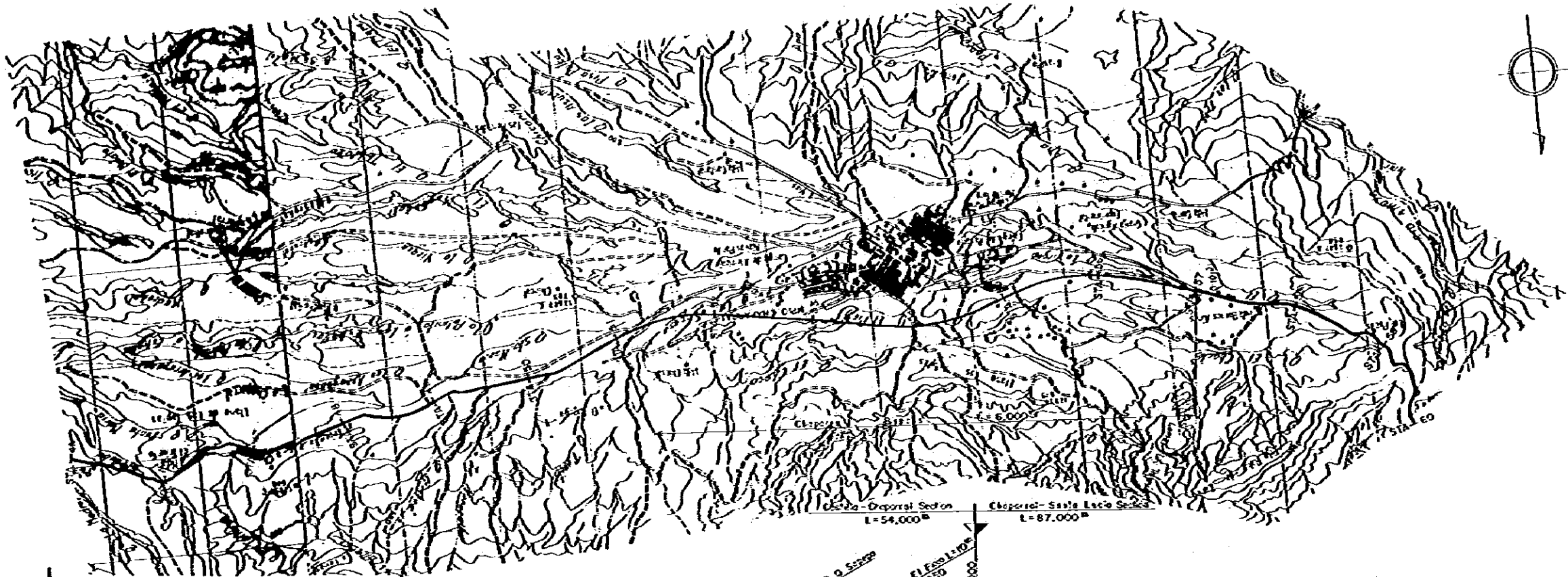
M O P T

BOGOTA — BUENAVENTURA  
 ROAD PROJECT

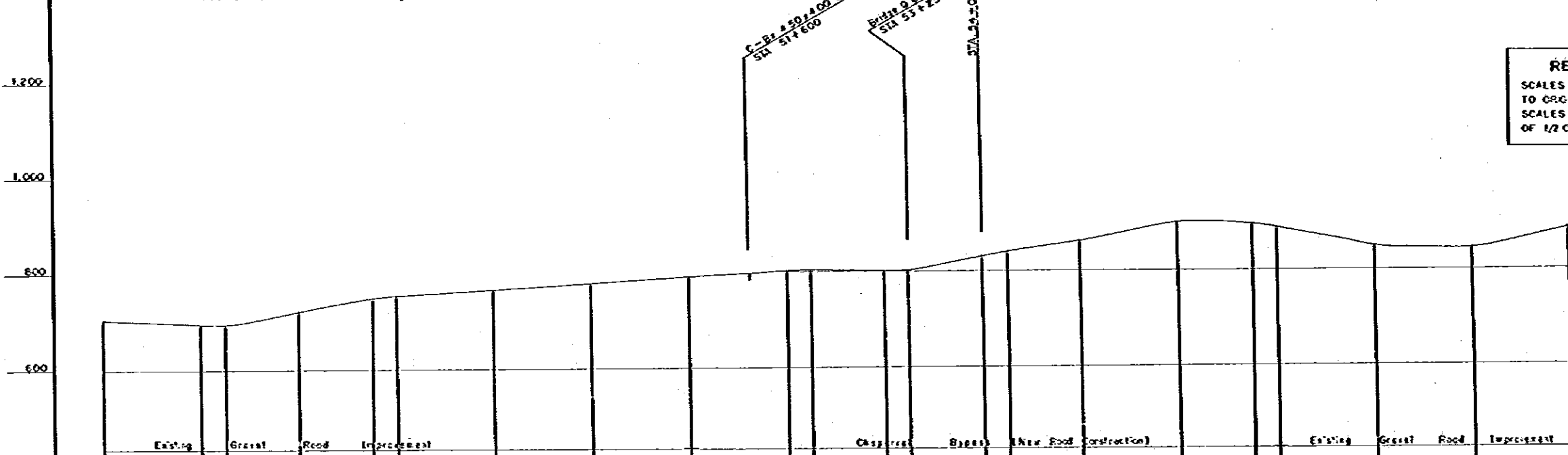
PLAN AND PROFILE  
 (CASTILLA — BUGA)  
 STATION 30 — STATION 45

SCALE H : 1 : 25000  
 V : 1 : 5000

DATE MARCH 1982  
 SHEET No. 10 OF 32

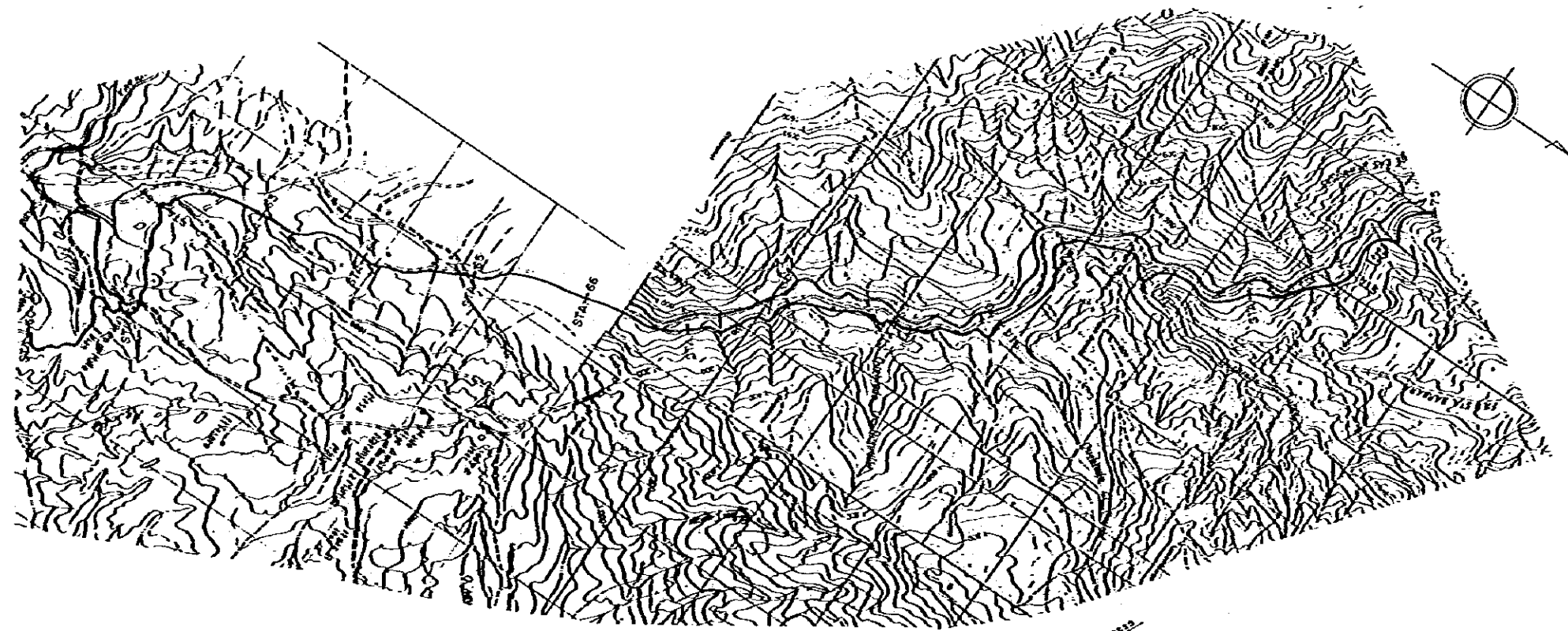


**REDUCED PLAN**  
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 SCALES ARE SHOWN IN THE SIZE OF 1/2 OF THE ORIGINAL CASE

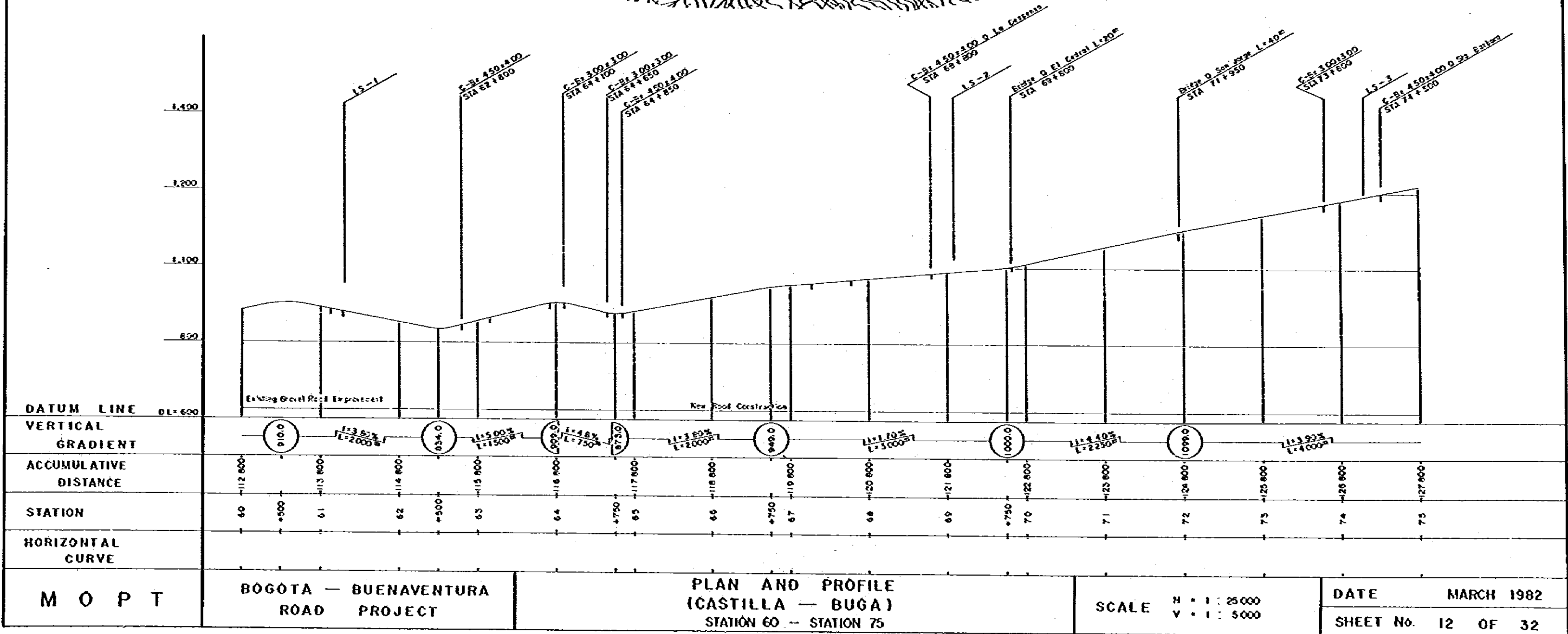


DATUM LINE	D.L. = 600															
VERTICAL GRADIENT	704.0	691.0	750.0	604.0	601.0	651.0	660.0	697.0	670.0	644.0	644.0	644.0	644.0	644.0	644.0	
ACCUMULATIVE DISTANCE	97 800	98 800	100 800	101 800	102 800	103 800	104 800	105 800	106 800	107 800	108 800	109 800	110 800	111 800	112 800	
STATION	45	46 +250	47	48 +750	49	50	51	52 +250	53 +250	54 +250	55	56	57 +750	58	59	60
HORIZONTAL CURVE	L=1.06% L=1250' L=1.33% L=1500' L=1.22% L=4500' L=0.30% L=1000' L=1.40% L=1000' L=2.53% L=750' L=1.40% L=1000' L=0.40% L=750' L=4.00% L=1250' L=0.30% L=1000' L=1.40% L=1500'															





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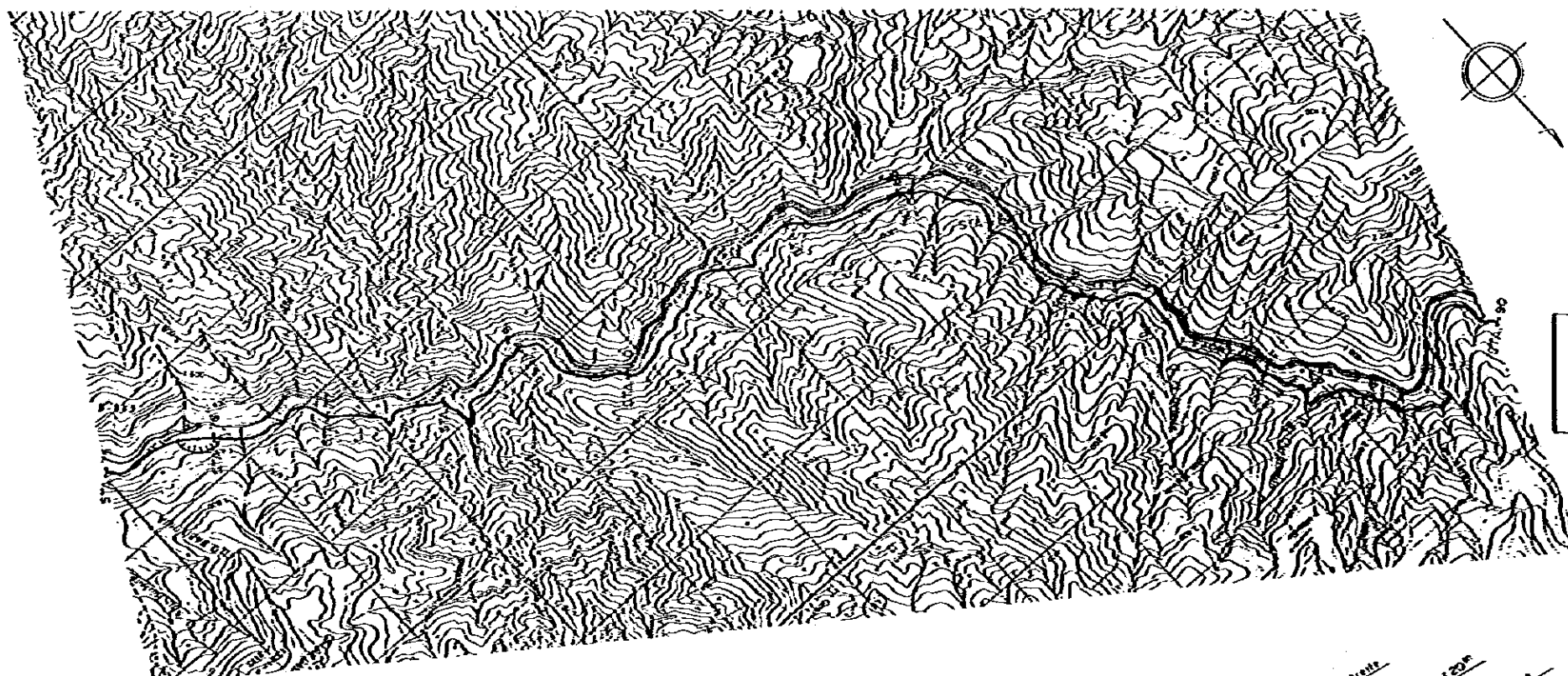
M O P T

BOGOTA — BUENAVENTURA  
 ROAD PROJECT

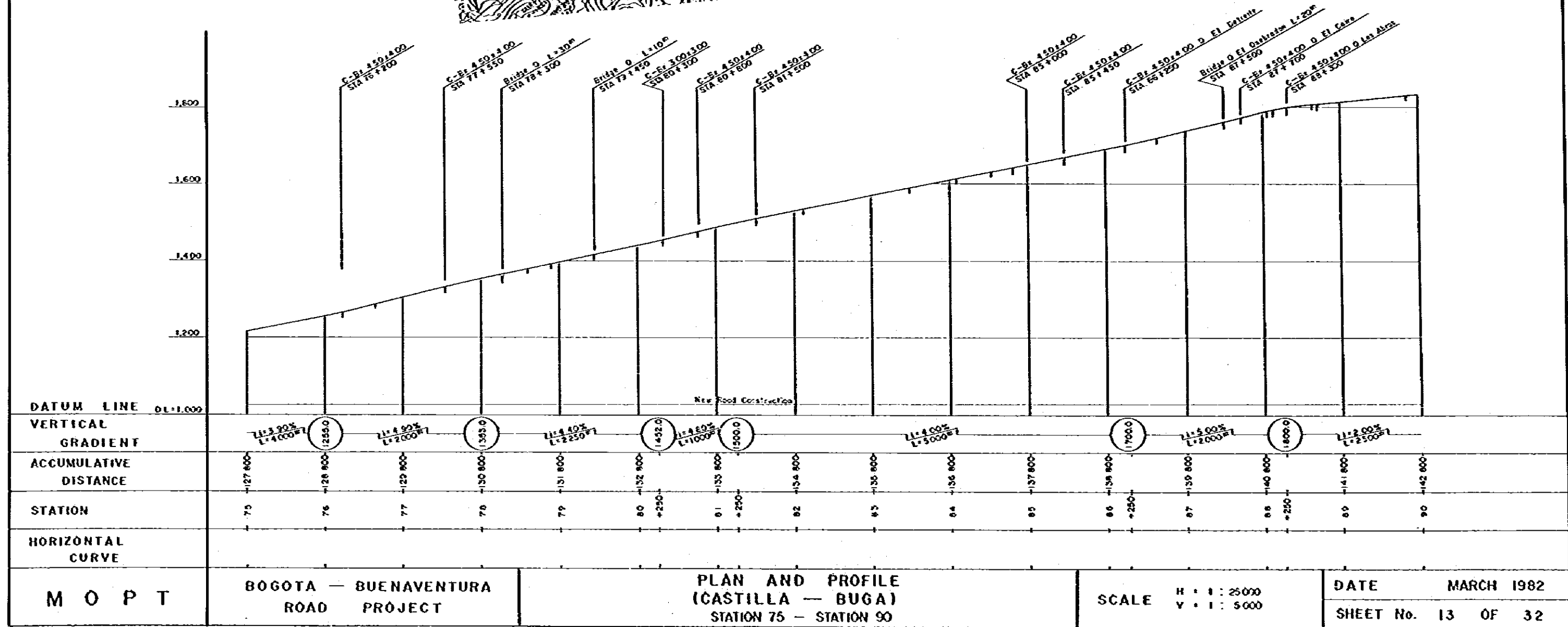
PLAN AND PROFILE  
 (CASTILLA — BUGA)  
 STATION 60 — STATION 75

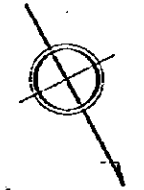
SCALE H = 1 : 25000  
 V = 1 : 5000

DATE MARCH 1982  
 SHEET No. 12 OF 32

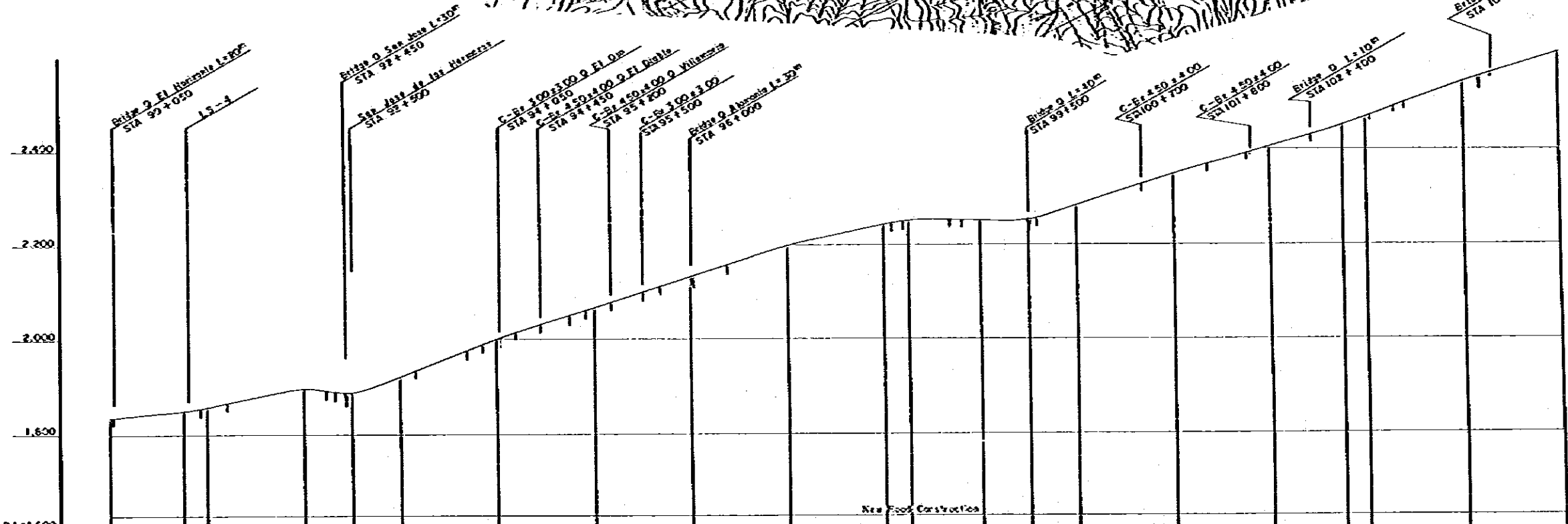
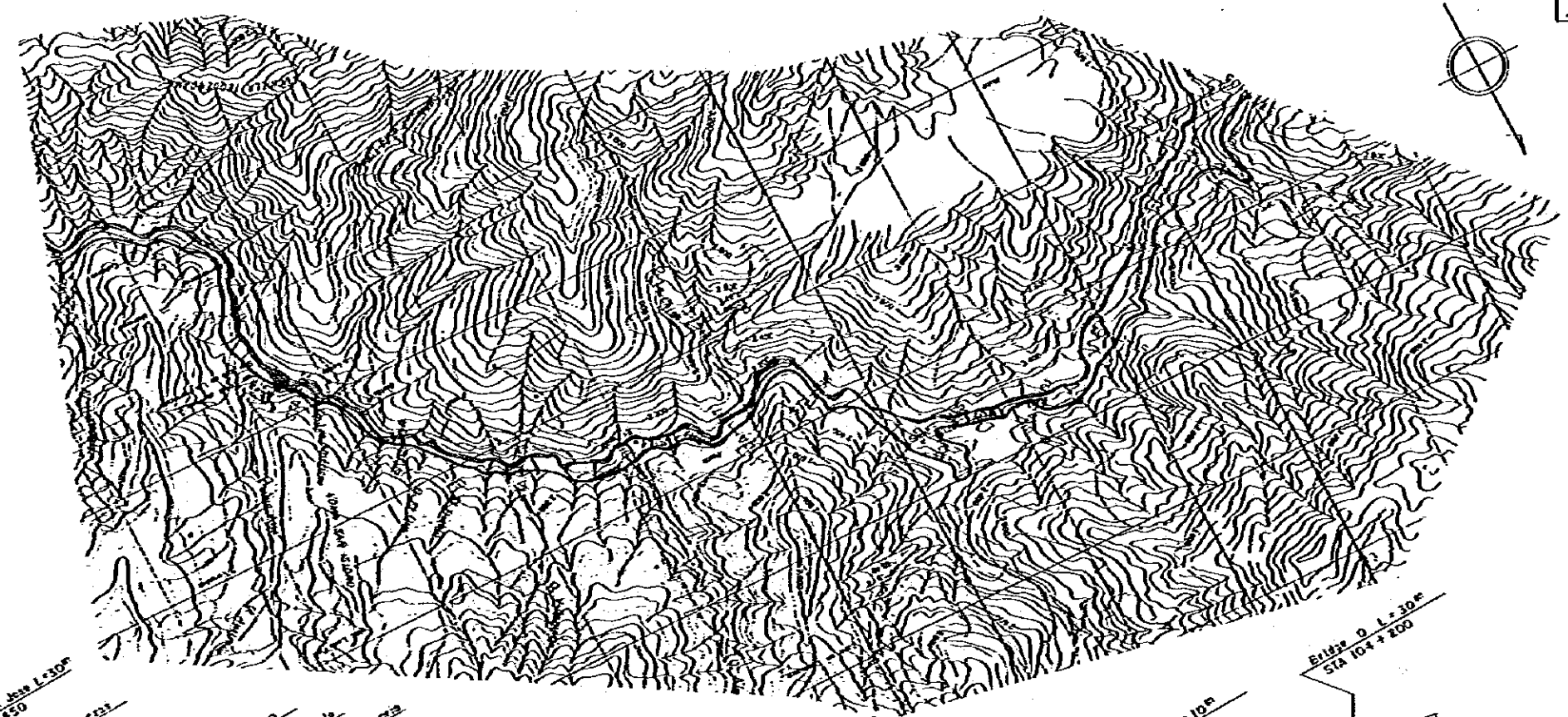


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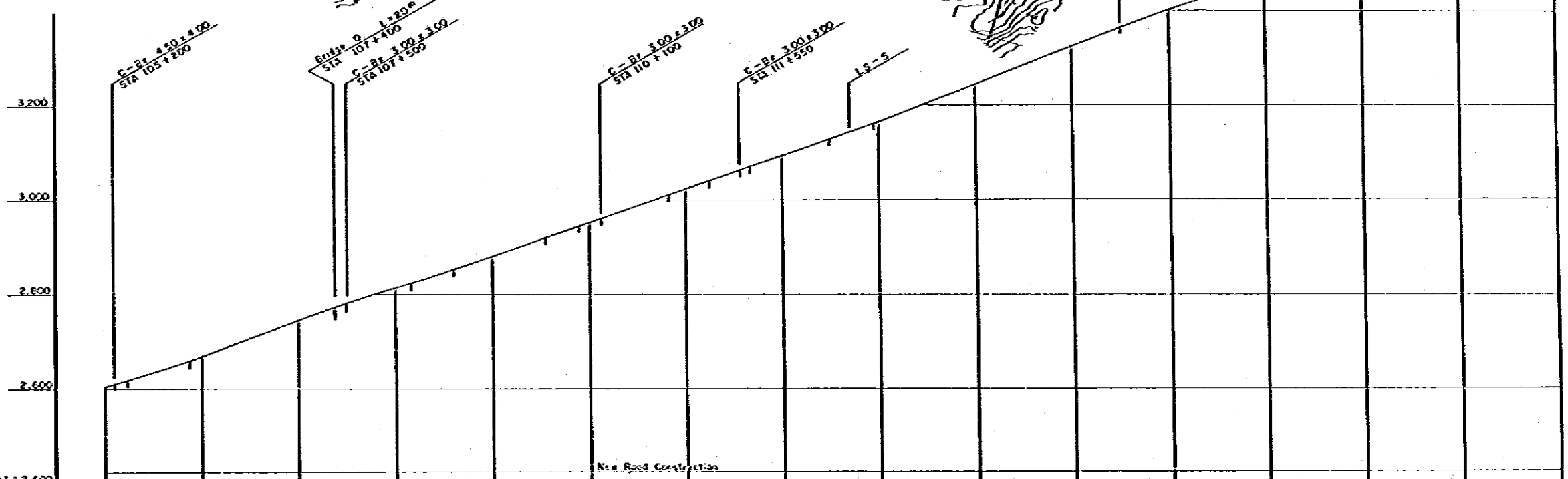
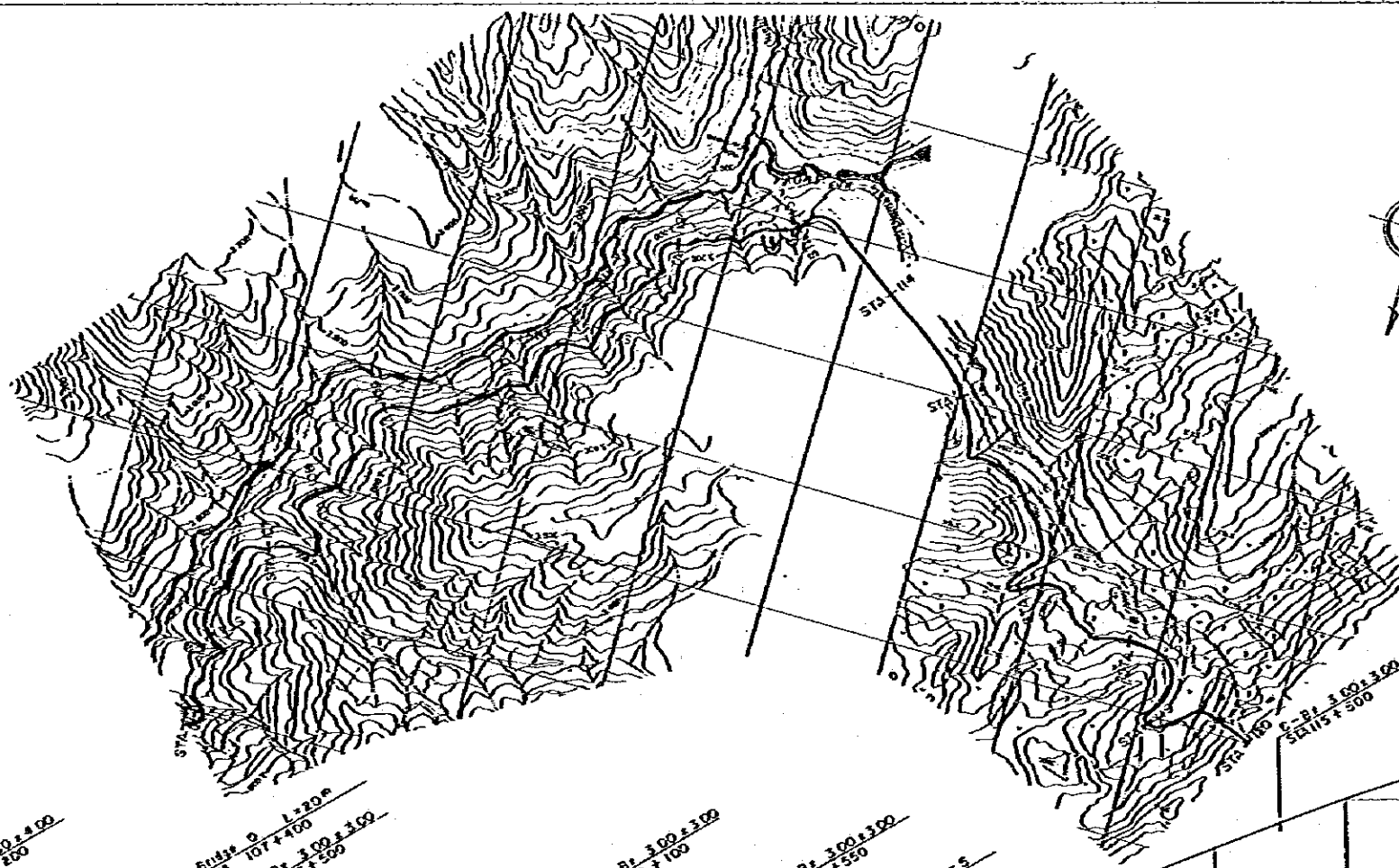
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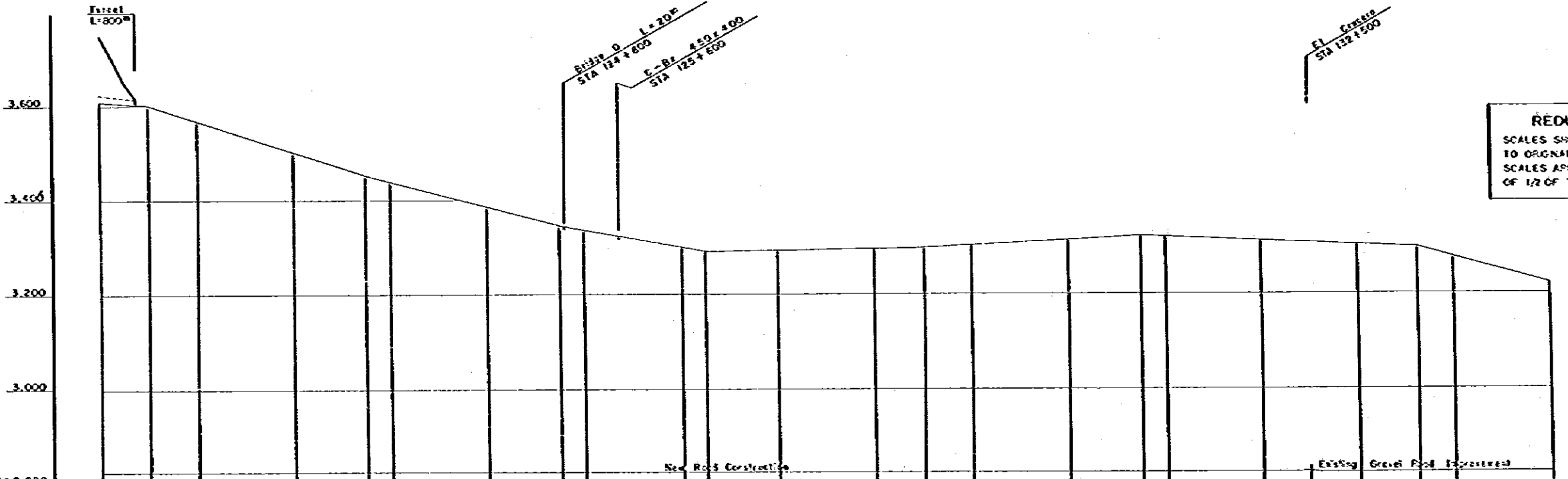
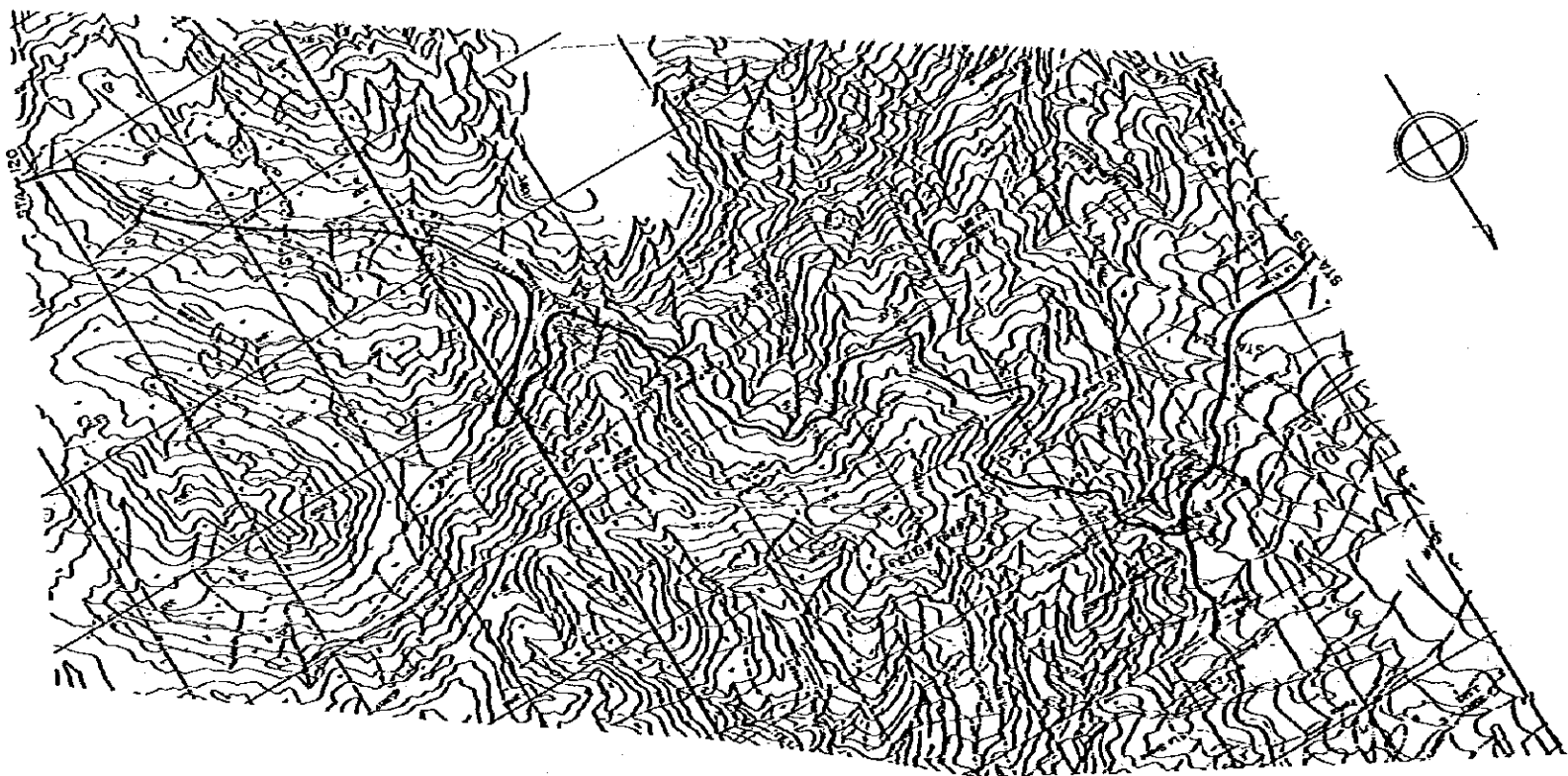
DATUM LINE	DL = 1,600
VERTICAL GRADIENT	$L=2,000$ $L=2,500$ (1950) $L=1,400$ $L=1,250$ (1900) $L=3,000$ $L=3,500$ (1950) $L=7,800$ $L=1,500$ (2000) $L=6,600$ $L=3,000$ (2200) $L=4,400$ $L=1,250$ (2250) $L=0,400$ $L=1,250$ (2300) $L=6,600$ $L=1,500$ (2340) $L=5,775$ $L=1,750$ (2400) $L=7,445$ $L=1,250$ (2500) $L=6,235$ $L=1,750$ (2550)
ACCUMULATIVE DISTANCE	142 800 143 800 144 800 145 800 146 800 147 800 148 800 149 800 150 800 151 800 152 800 153 800 154 800 155 800 156 800 157 800
STATION	90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105
HORIZONTAL CURVE	

New Road Construction

**REDUCED PLAN**  
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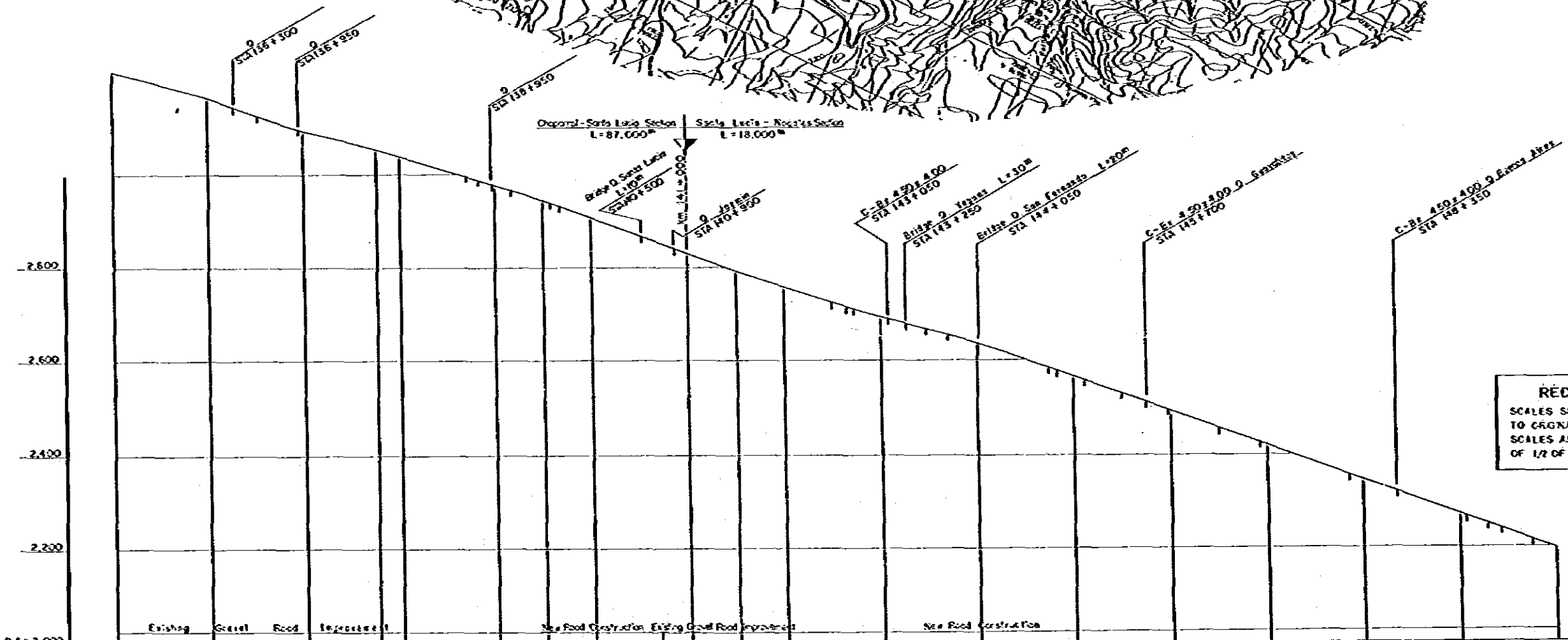
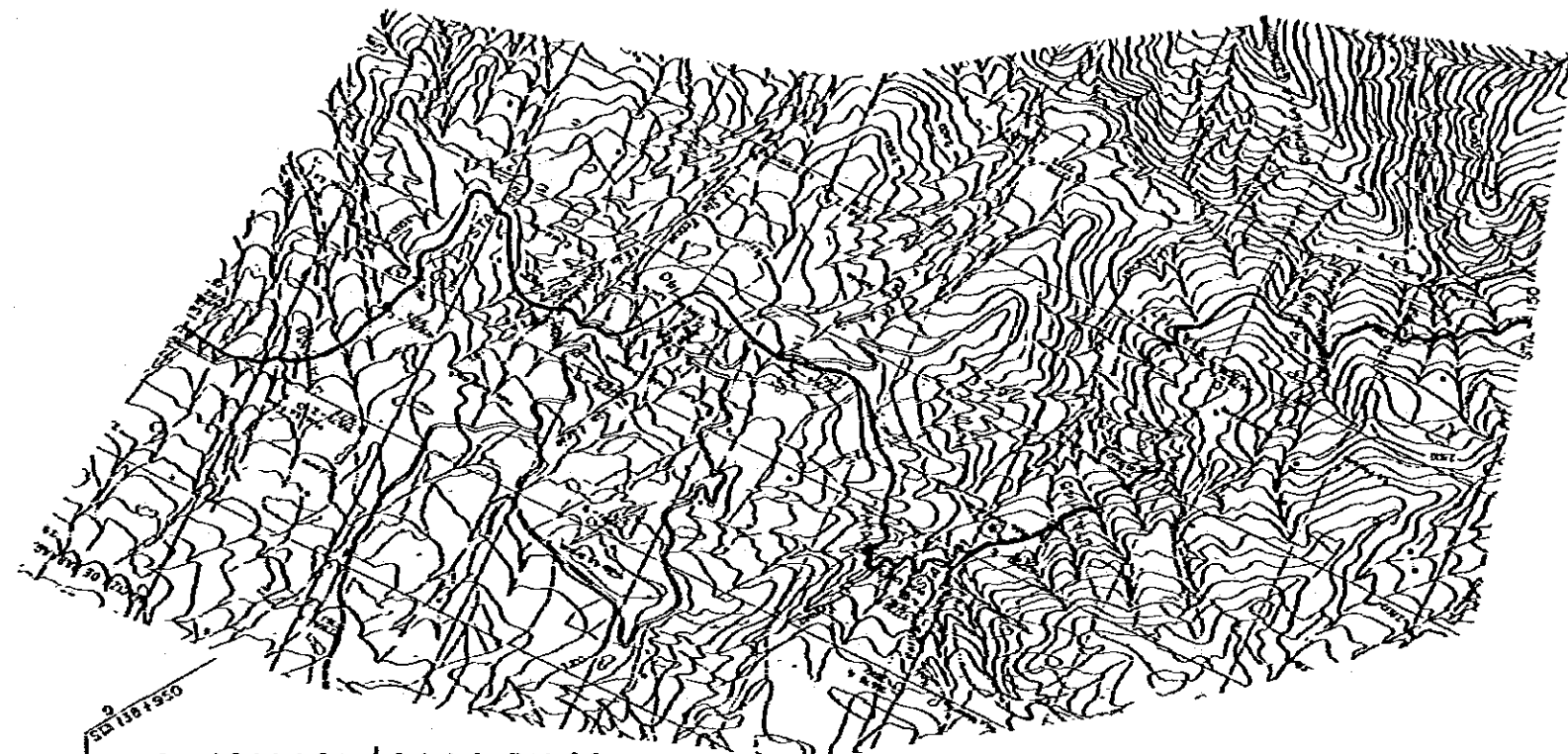


DATUM LINE	OL = 2,400
VERTICAL GRADIENT	$11.621\%$ L=1750 $11.731\%$ L=1750 $11.650\%$ L=1000 $11.781\%$ L=3000 $11.650\%$ L=3000
ACCUMULATIVE DISTANCE	105 - 157 800 + 700 - 158 500 106 - 159 200 + 500 - 160 700 107 - 161 200 + 500 - 162 700 108 - 164 200 + 500 - 165 700 109 - 166 200 + 500 - 167 700 110 - 168 200 + 500 - 169 700 111 - 170 200 + 500 - 171 700 112 - 172 200 + 500 - 173 700 113 - 174 200 + 500 - 175 700 114 - 176 200 + 500 - 177 700 115 - 178 200 + 500 - 179 700 116 - 180 200 + 500 - 181 700 117 - 182 200 + 500 - 183 700 118 - 184 200 + 500 - 185 700 119 - 186 200 + 500 - 187 700 120 - 188 200
STATION	105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120
HORIZONTAL CURVE	

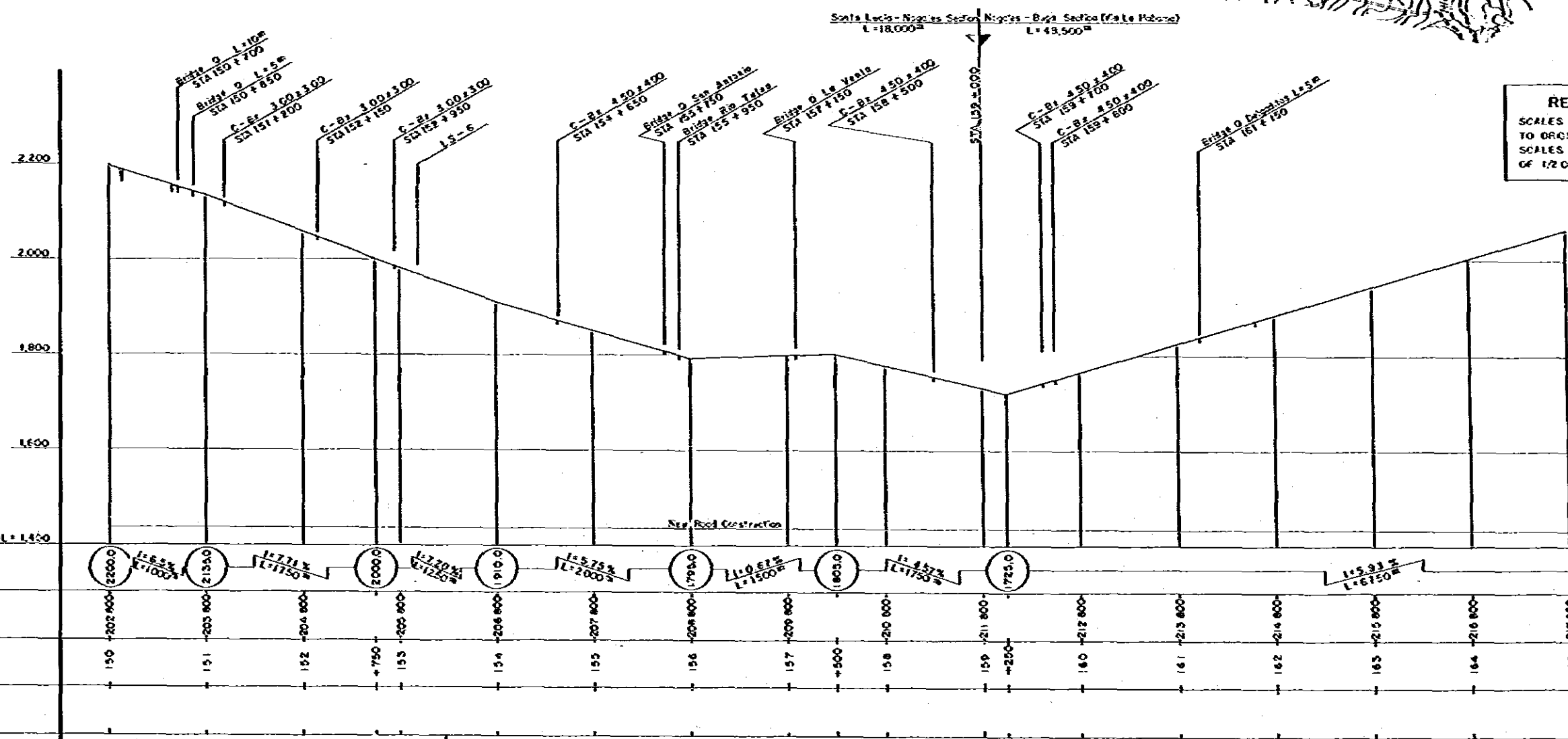


**REDUCED PLAN**  
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DATUM LINE	DL = 2.800	
VERTICAL GRADIENT	$1:6.57\%$ L=2250m $1:5.00\%$ L=2000m $1:3.67\%$ L=1500m $1:0.22\%$ L=2250m $1:1.11\%$ L=2250m $1:0.67\%$ L=2675m $1:5.60\%$ L=1675m	
ACCUMULATIVE DISTANCE	120+172 800 121+173 800 122+174 800 123+175 800 124+176 900 125+177 800 126+179 800 127+179 800 128+190 800 129+181 800 130+182 800 131+183 800 132+184 800 133+185 800 134+186 800 135+187 800	
STATION	120+000 121+000 122+000 123+000 124+000 125+000 126+000 127+000 128+000 129+000 130+000 131+000 132+000 133+000 134+000 135+000	
HORIZONTAL CURVE		
M O P T	BOGOTA — BUENAVENTURA ROAD PROJECT	PLAN AND PROFILE (CASTILLA — BUGA) STATION 120 — STATION 135
	SCALE	H · 1 : 25000 V · 1 : 5000
	DATE	MARCH 1982
	SHEET No.	16 OF 32

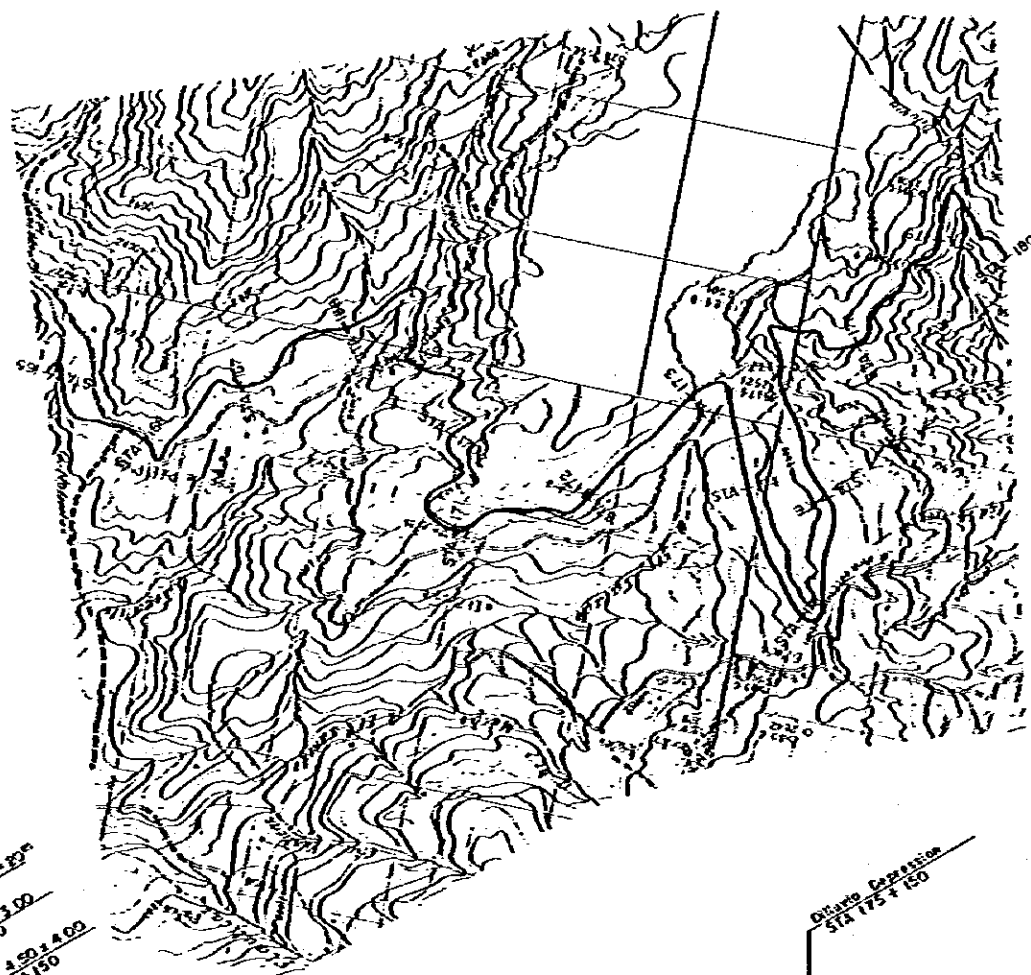


DATUM LINE	D.L. = 2,000															
VERTICAL GRADIENT																
ACCUMULATIVE DISTANCE	187 800	188 800	189 800	190 800	191 800	192 800	193 800	194 800	195 800	196 800	197 800	198 800	199 800	200 800	201 800	202 800
STATION	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150
HORIZONTAL CURVE																

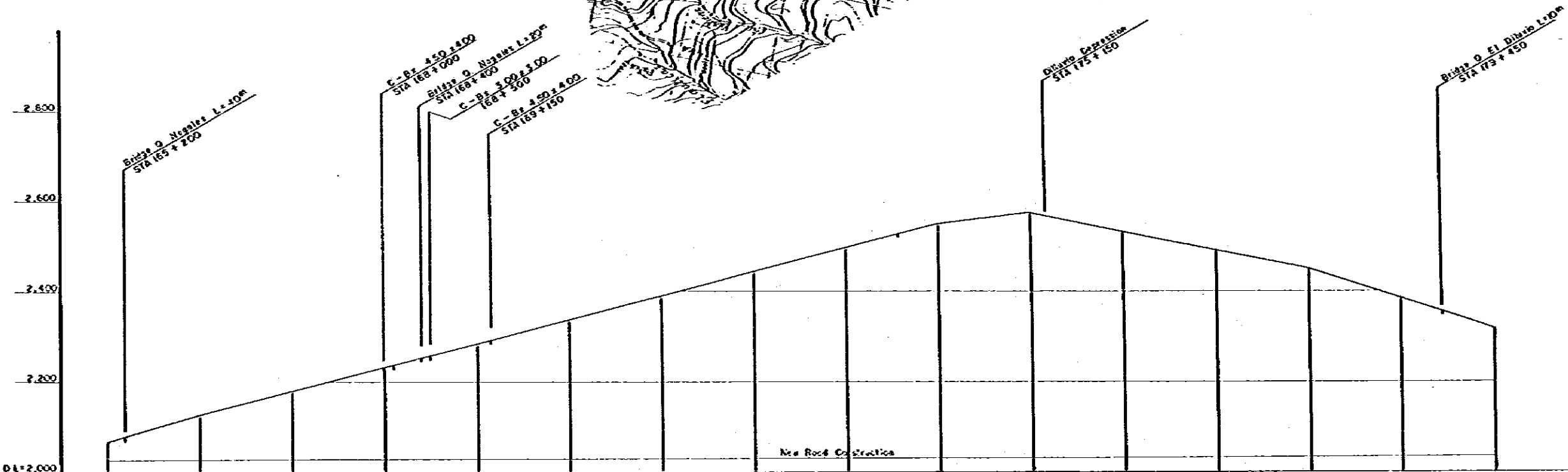


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DATUM LINE	DL = 1400
VERTICAL GRADIENT	$\frac{1.62\%}{L=1000}$ $\frac{1.771\%}{L=1150}$ $\frac{1.220\%}{L=1250}$ $\frac{1.575\%}{L=2000}$ $\frac{1.061\%}{L=1500}$ $\frac{1.487\%}{L=1750}$ $\frac{1.593\%}{L=6750}$
ACCUMULATIVE DISTANCE	202 800    203 800    204 800    205 800    206 800    207 800    208 800    209 800    210 800    211 800    212 800    213 800    214 800    215 800    216 800    217 800
STATION	150    151    152    +750    153    154    155    156    157    +900    158    159    +250    160    161    162    163    164    165
HORIZONTAL CURVE	



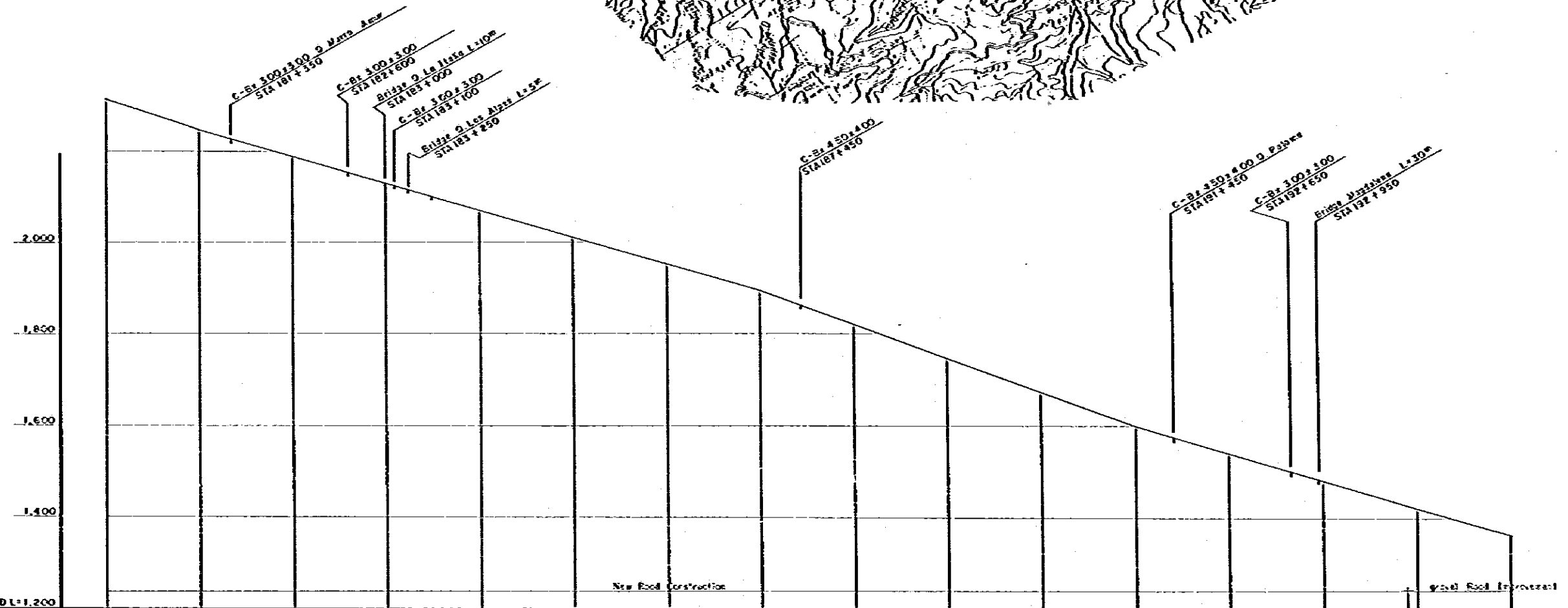
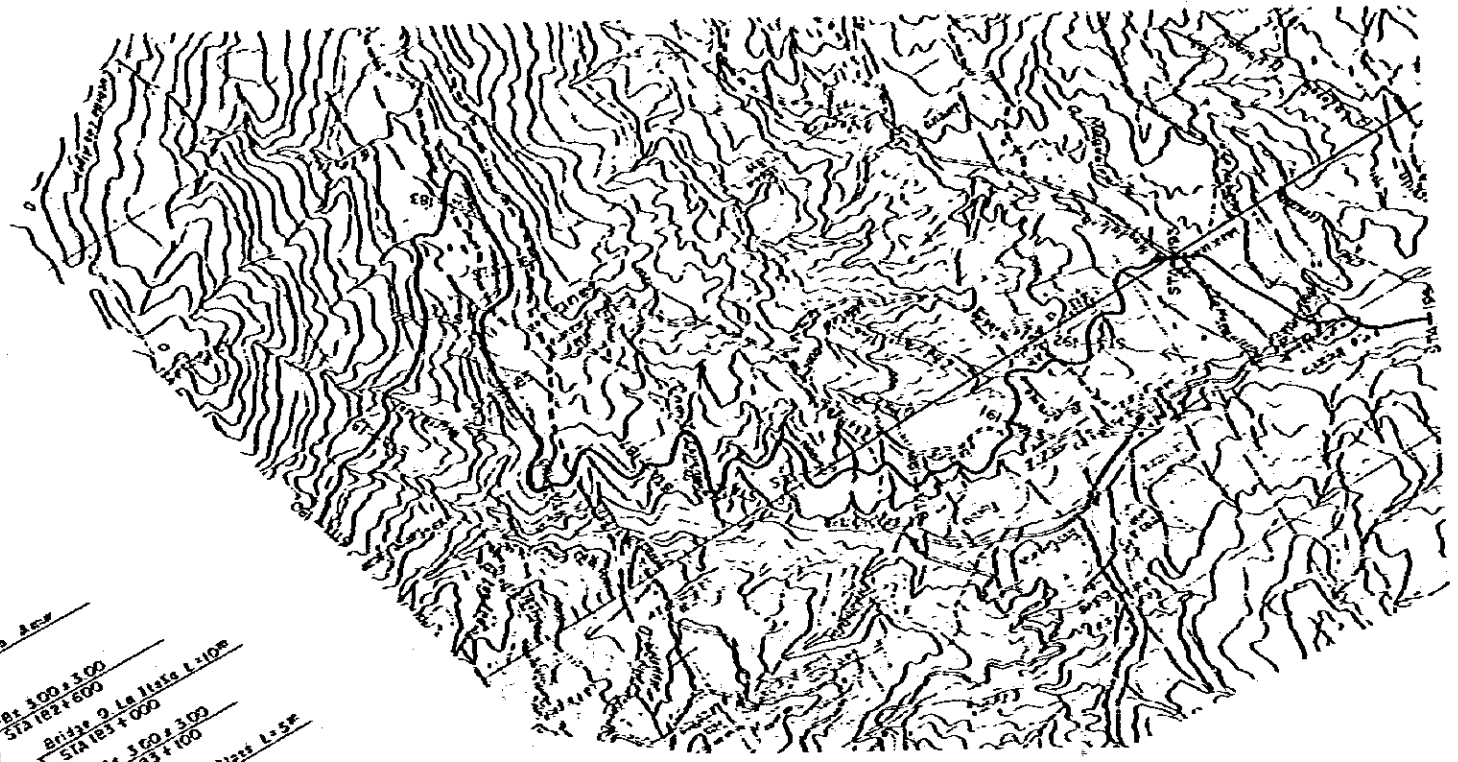
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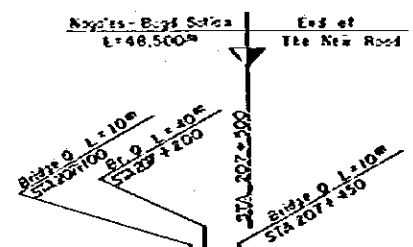
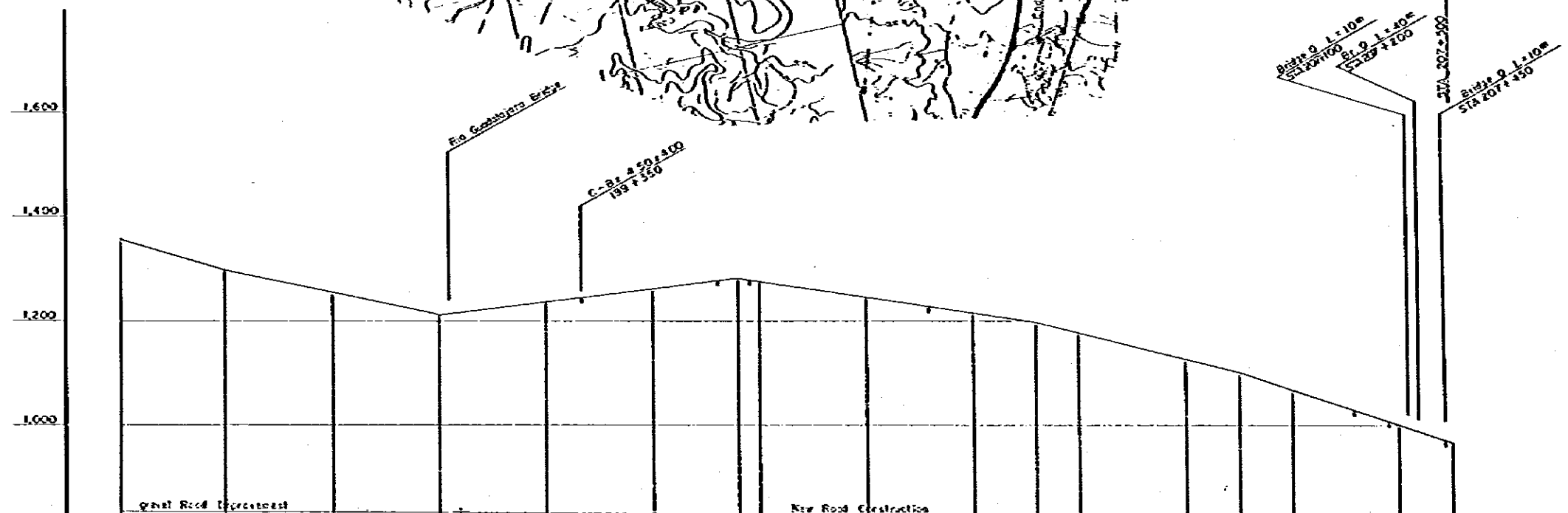
DATUM LINE	DA = 2,000															
VERTICAL GRADIENT	<div style="display: flex; justify-content: space-between;"> <span>2.25%</span> <span>1.531%</span> <span>2.35%</span> <span>1.417%</span> <span>1.667%</span> </div>															
ACCUMULATIVE DISTANCE	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
STATION	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
HORIZONTAL CURVE																



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 TO ORIGINAL SIZE PLANS ONLY  
 SCALES ARE SHOWN IN THE SIZE  
 OF 1/2 OF THE ORIGINAL ONE



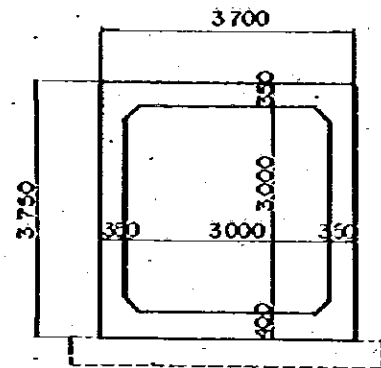
VERTICAL GRADIENT																
ACCUMULATIVE DISTANCE	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195
STATION	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195
HORIZONTAL CURVE																



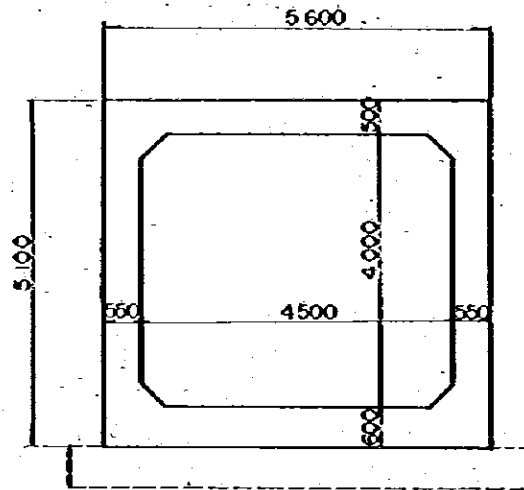
**REDUCED PLAN**  
 SCALES SHOWN HEREON APPLY TO ORIGINAL SIZE PLANS ONLY  
 SCALES ARE SHOWN IN THE SIZE OF 1/2 OF THE ORIGINAL ONE

DATUM LINE	DL = 600
VERTICAL GRADIENT	
ACCUMULATIVE DISTANCE	195 - 207 800, 196 - 204 800, 197 - 210 800, 198 - 250 800, 199 - 231 800, 200 - 232 800, 201 - 233 800, 202 - 234 800, 203 - 235 800, 204 - 236 800, 205 - 237 800, 206 - 238 800, 207 - 239 800, 200 - 240 500
STATION	195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 200
HORIZONTAL CURVE	

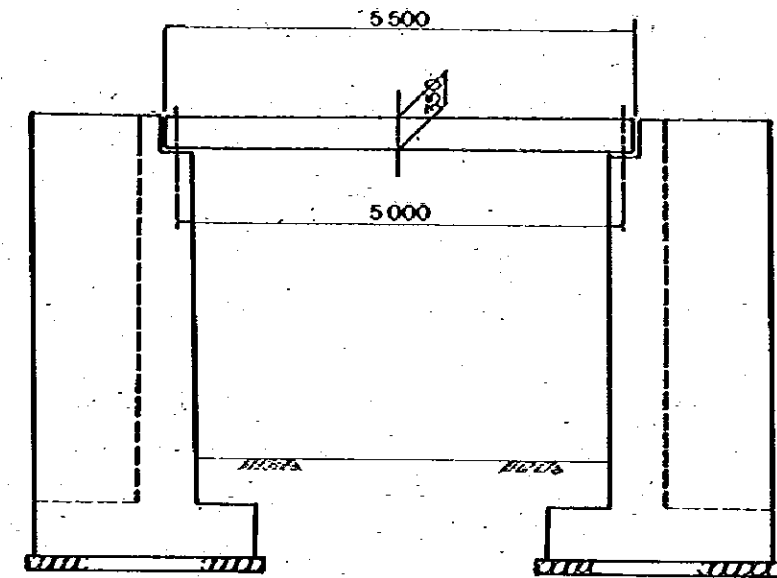
BOX CULVERT 3.00x3.00<sup>m</sup> s=1:50



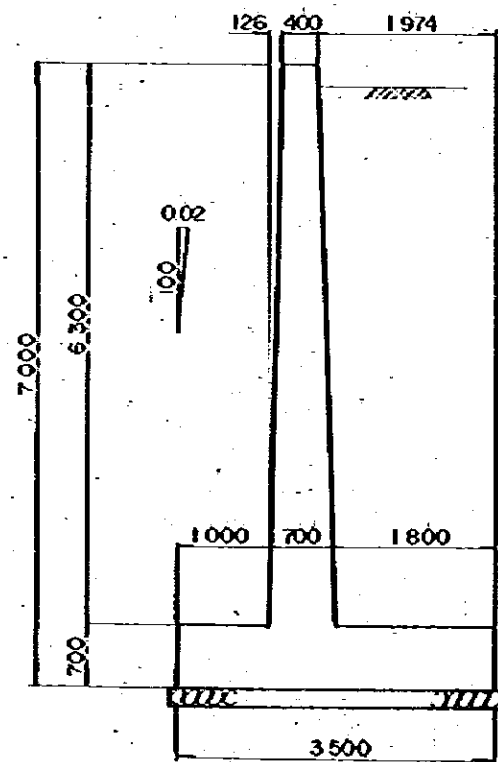
BOX CULVERT 4.50x4.00<sup>m</sup> s=1:50



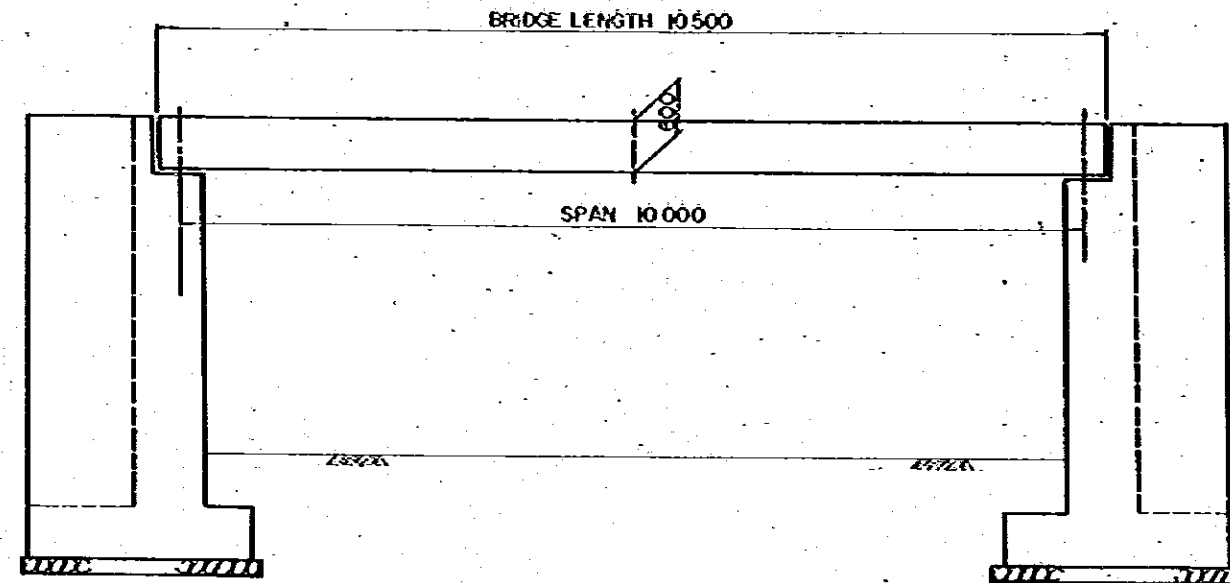
R.C SLAB BRIDGE (L=5.0M) s=1:40  
ELEVATION



REINFORCED CONCRETE RETAINING WALL  
(H=7.0M)

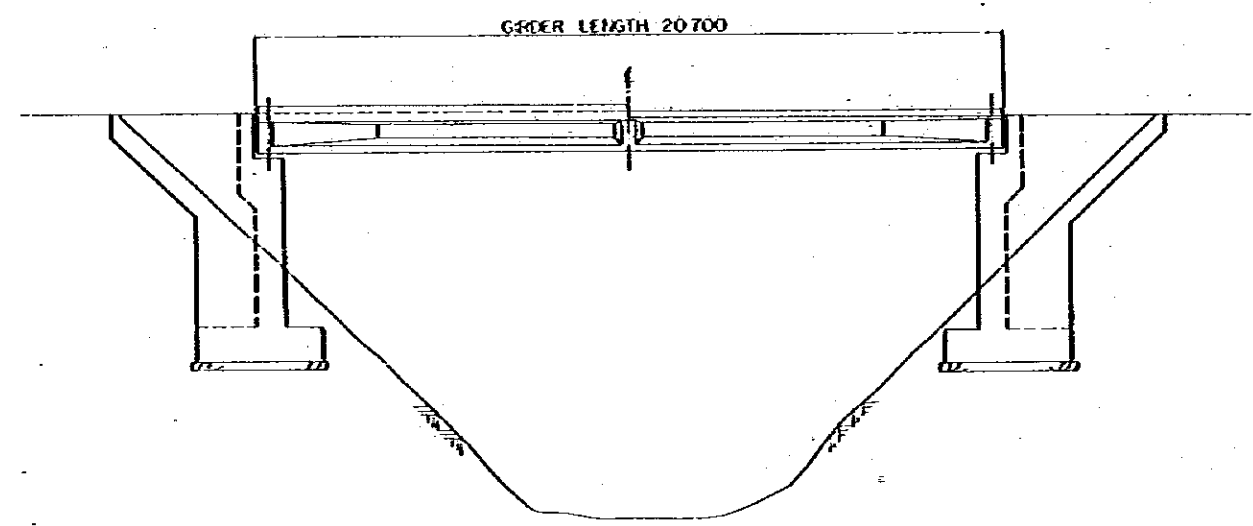


R.C SLAB BRIDGE (L=10.0M) s=1:40  
ELEVATION

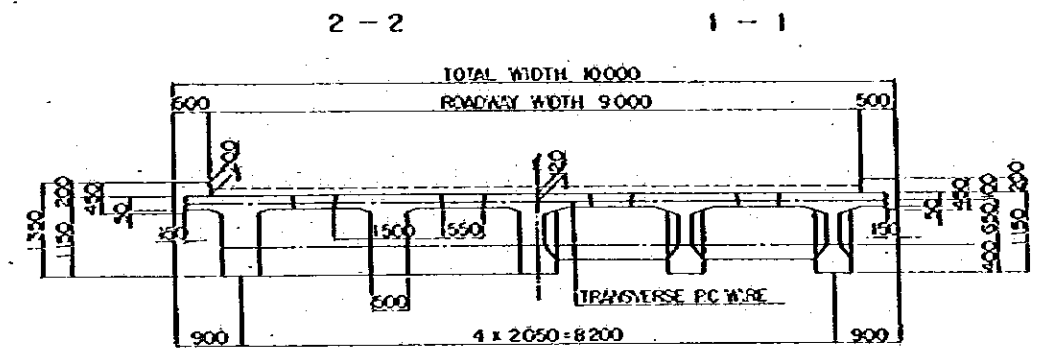


TYPICAL P.C BRIDGE (L=200M)

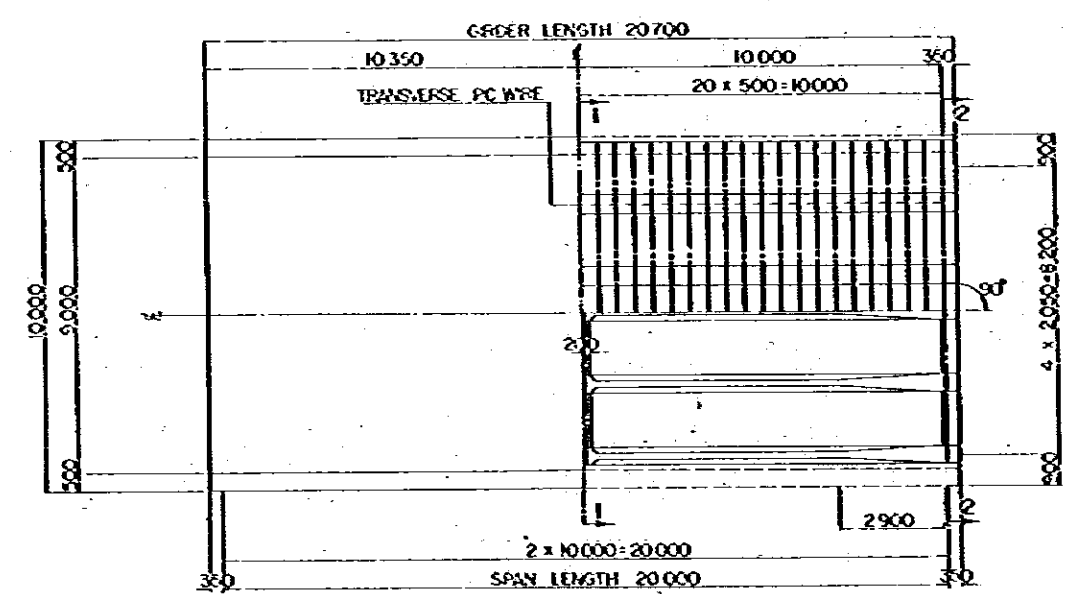
ELEVATION S=1:100



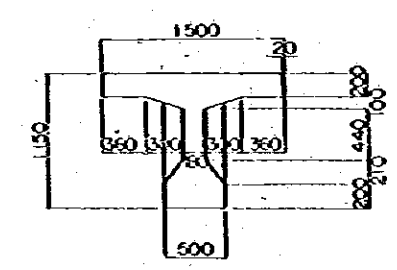
CROSS SECTION S=1:60



GENERAL PLAN S=1:100



GIRDER SECTION S=1:30



DESIGN CRITERIA

1. JRA STANDARD SPECIFICATION FOR HIGHWAY BRIDGES, 1973 EDITIONS.
  2. CONCRETE MINIMUM COMPRESSIVE STRENGTH  
SUPER STRUCTURE 350<sup>kg/cm<sup>2</sup></sup> AT 28 DAYS.  
SUB STRUCTURE 210<sup>kg/cm<sup>2</sup></sup> AT 28 DAYS.
  3. PRESTRESSING TENSION TO HAVE A YIELD POINT STRESS OF  
 $F_y = 8000^{kg/cm^2}$  ( $F_y = 13500^{kg/cm^2}$ )
  4. ALL REINFORCING BAR TO HAVE A YIELD POINT STRESS OF  
 $F_y = 3000^{kg/cm^2}$
  5. LIVE LOAD TL-20
- # JRA: JAPAN ROAD ASSOCIATION

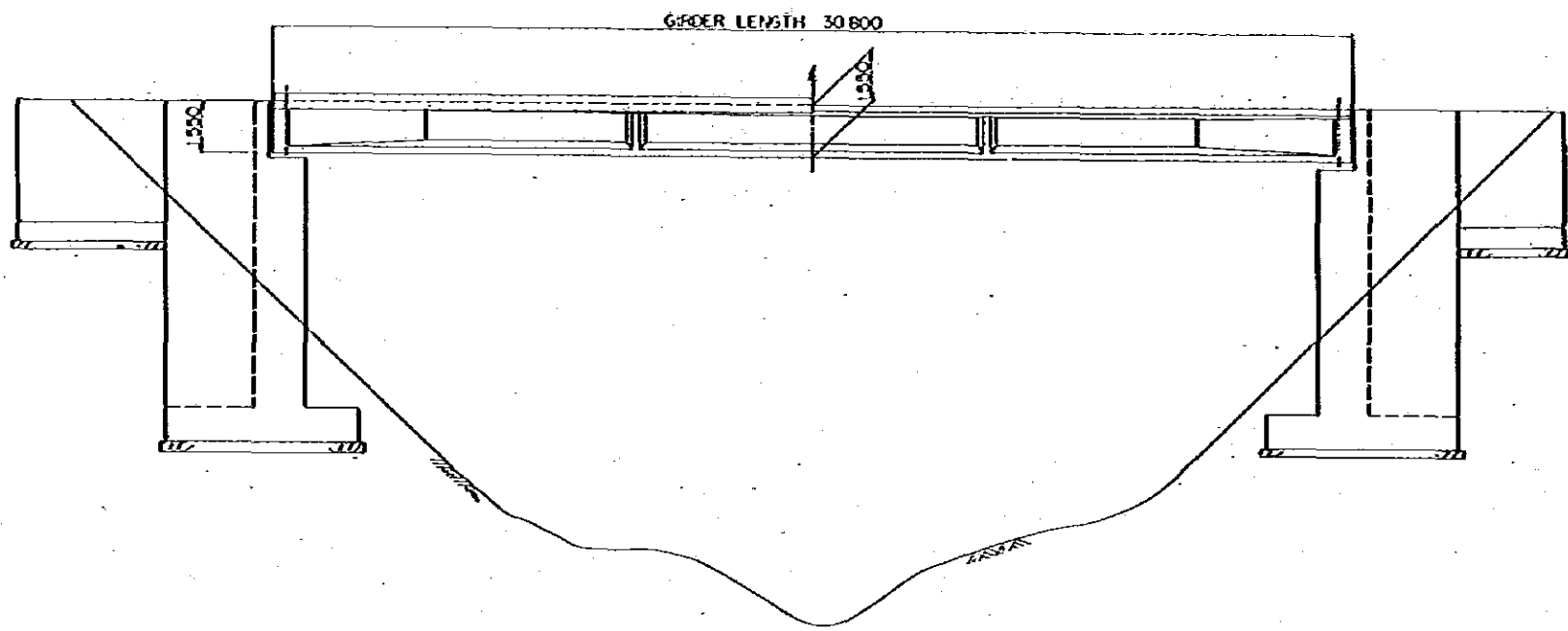
GENERAL NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.

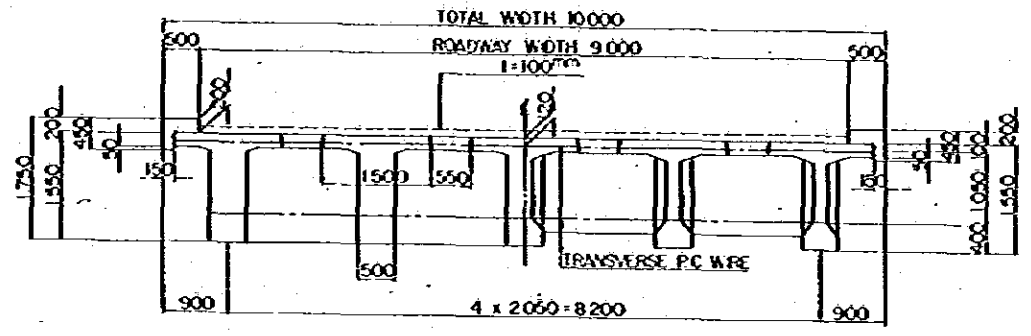
M O P T	BOGOTA — BUENAVENTURA ROAD PROJECT	BRIDGES AND STRUCTURES TYPICAL P.C BRIDGE (L=200M)	SCALE 1:30, 1:60, 1:100	DATE MARCH 1982 SHEET No. 23 OF 32
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TYPICAL P.C BRIDGE (L=30.0M)

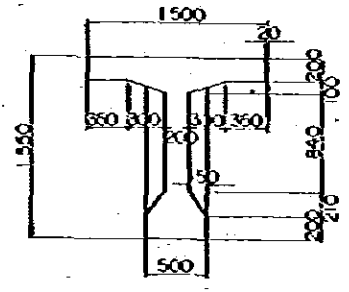
ELEVATION S=1:100



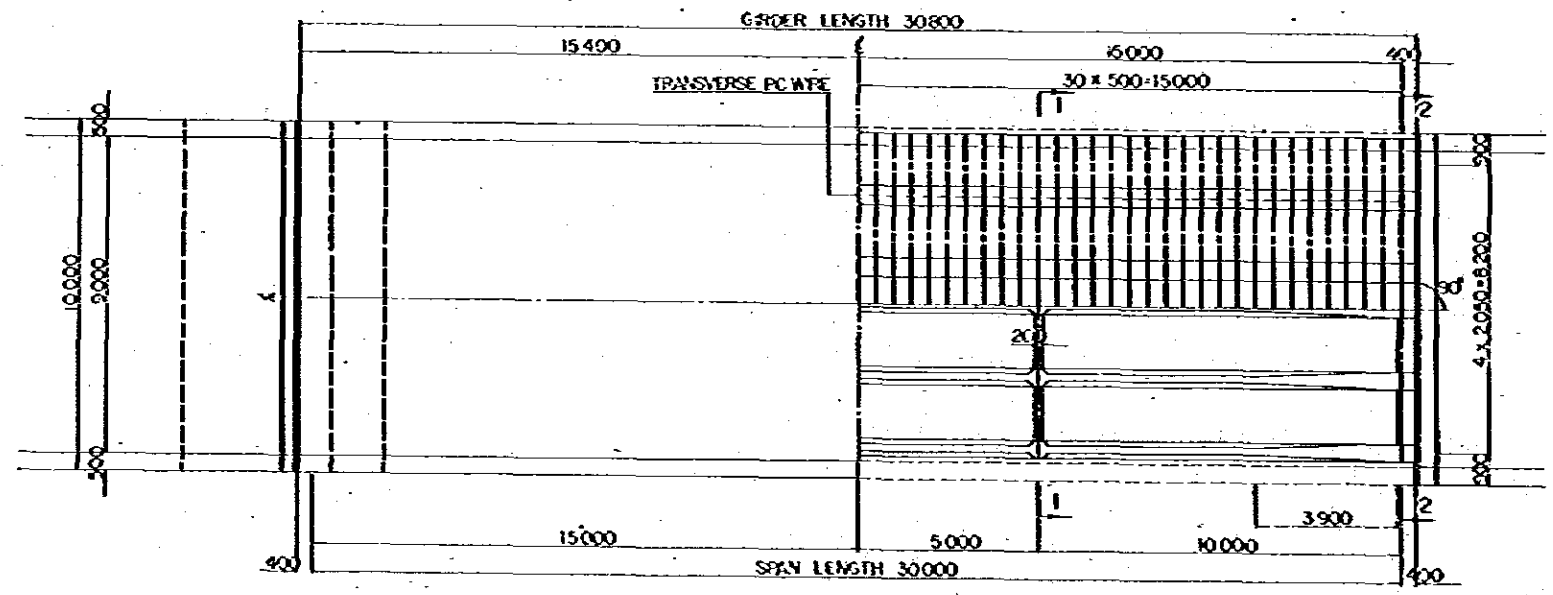
CROSS SECTION S=1:50



GIRDER SECTION S=1:30



GENERAL PLAN S=1:100



DESIGN CRITERIA

- JRA STANDARD SPECIFICATION FOR HIGHWAY BRIDGES, 1979 EDITIONS.
- CONCRETE MINIMUM COMPRESSIVE STRENGTH  
SUPER STRUCTURE 350<sup>kg/cm<sup>2</sup></sup> AT 28 DAYS.  
SUB STRUCTURE 210<sup>kg/cm<sup>2</sup></sup> AT 28 DAYS.
- PRESTRESSING TENDON TO HAVE A YIELD POINT STRESS OF  
 $F_y = 8000^{kg/cm^2}$  ( $F_y = 13500^{kg/cm^2}$ )
- ALL REINFORCING BAR TO HAVE A YIELD POINT STRESS OF  
 $F_y = 3000^{kg/cm^2}$
- LIVE LOAD TL-20

JRA: JAPAN ROAD ASSOCIATION

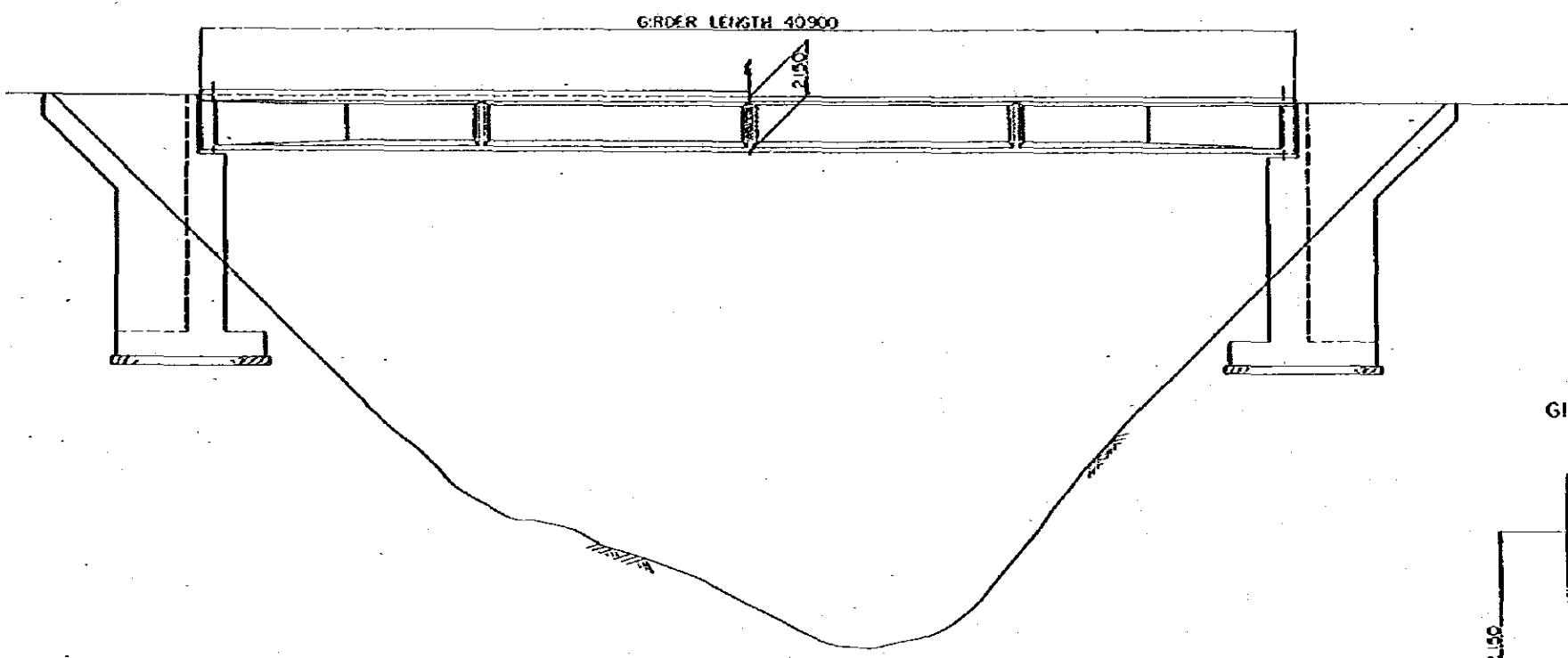
GENERAL NOTES

- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.

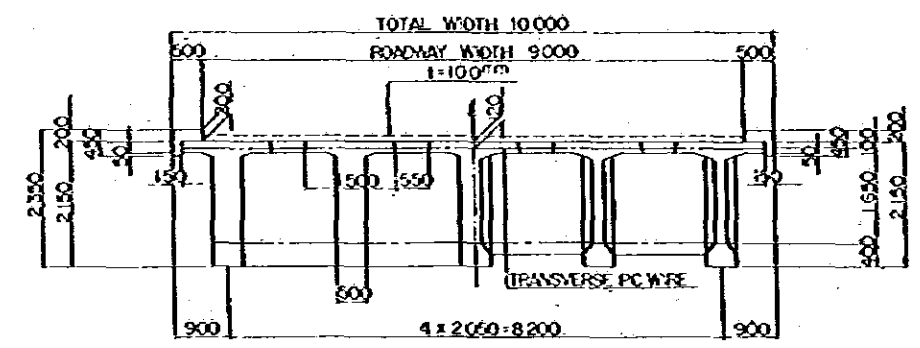
M O P T	BOGOTA — BUENAVENTURA ROAD PROJECT	BRIDGES AND STRUCTURES TYPICAL P.C BRIDGE (L=30.0M)	SCALE 1:50, 1:100	DATE MARCH 1982 SHEET No. 24 OF 32
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TYPICAL P.C BRIDGE (L=40.0M)

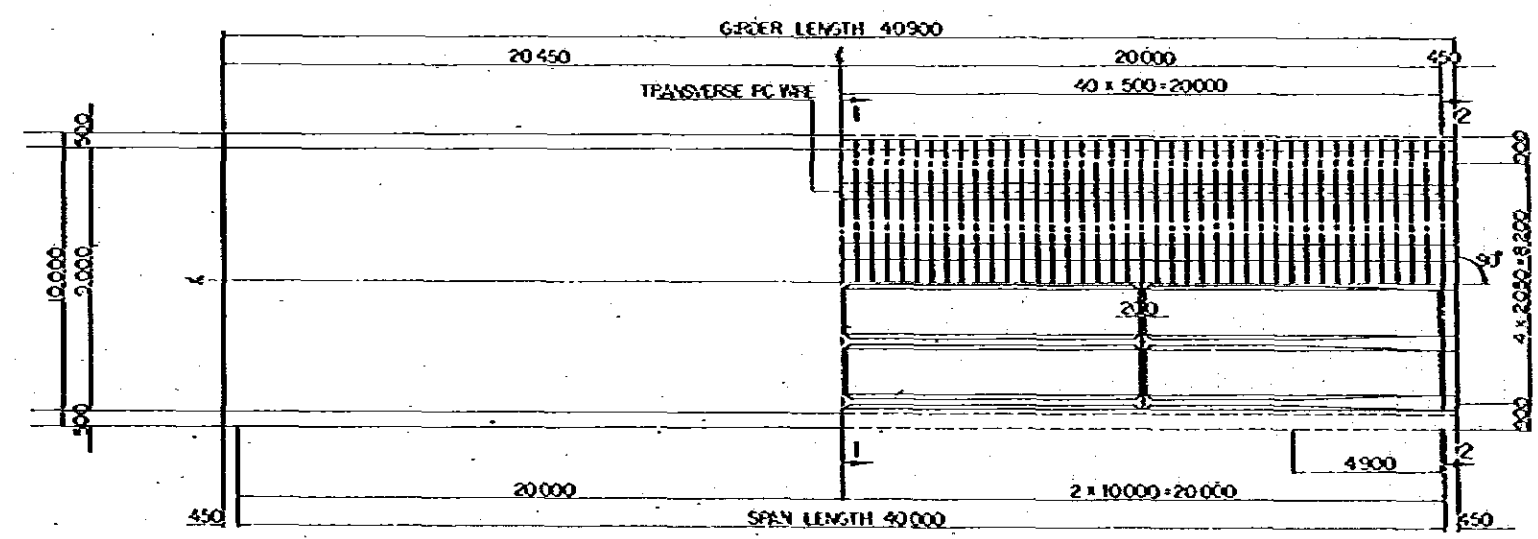
ELEVATION S=1:120



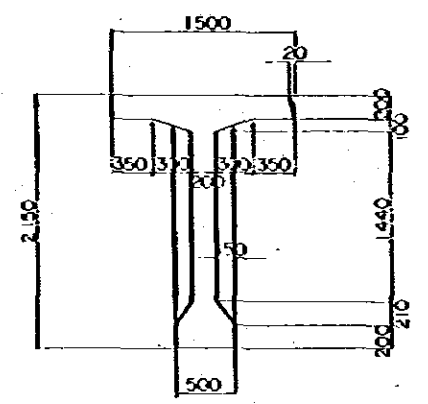
CROSS SECTION S=1:60



GENERAL PLAN S=1:120



GIRDER SECTION S=1:30



DESIGN CRITERIA

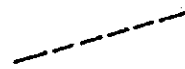
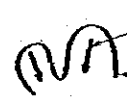
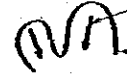

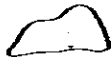




1. JRA STANDARD SPECIFICATION FOR HIGHWAY BRIDGES 1973 EDITIONS.
2. CONCRETE MINIMUM COMPRESSIVE STRENGTH  
 SUPER STRUCTURE :  $350^{kg/cm^2}$  AT 28 DAYS.  
 SUB STRUCTURE :  $210^{kg/cm^2}$  AT 28 DAYS.
3. PRESTRESSING TENDON TO HAVE A YIELD POINT STRESS OF  $F_y = 8000^{kg/cm^2}$  ( $F_y = 13500^{kg/cm^2}$ )
4. ALL REINFORCING BAR TO HAVE A YIELD POINT STRESS OF  $F_y = 3000^{kg/cm^2}$
5. LIVE LOAD TL-20

J.R.A. : JAPAN ROAD ASSOCIATION

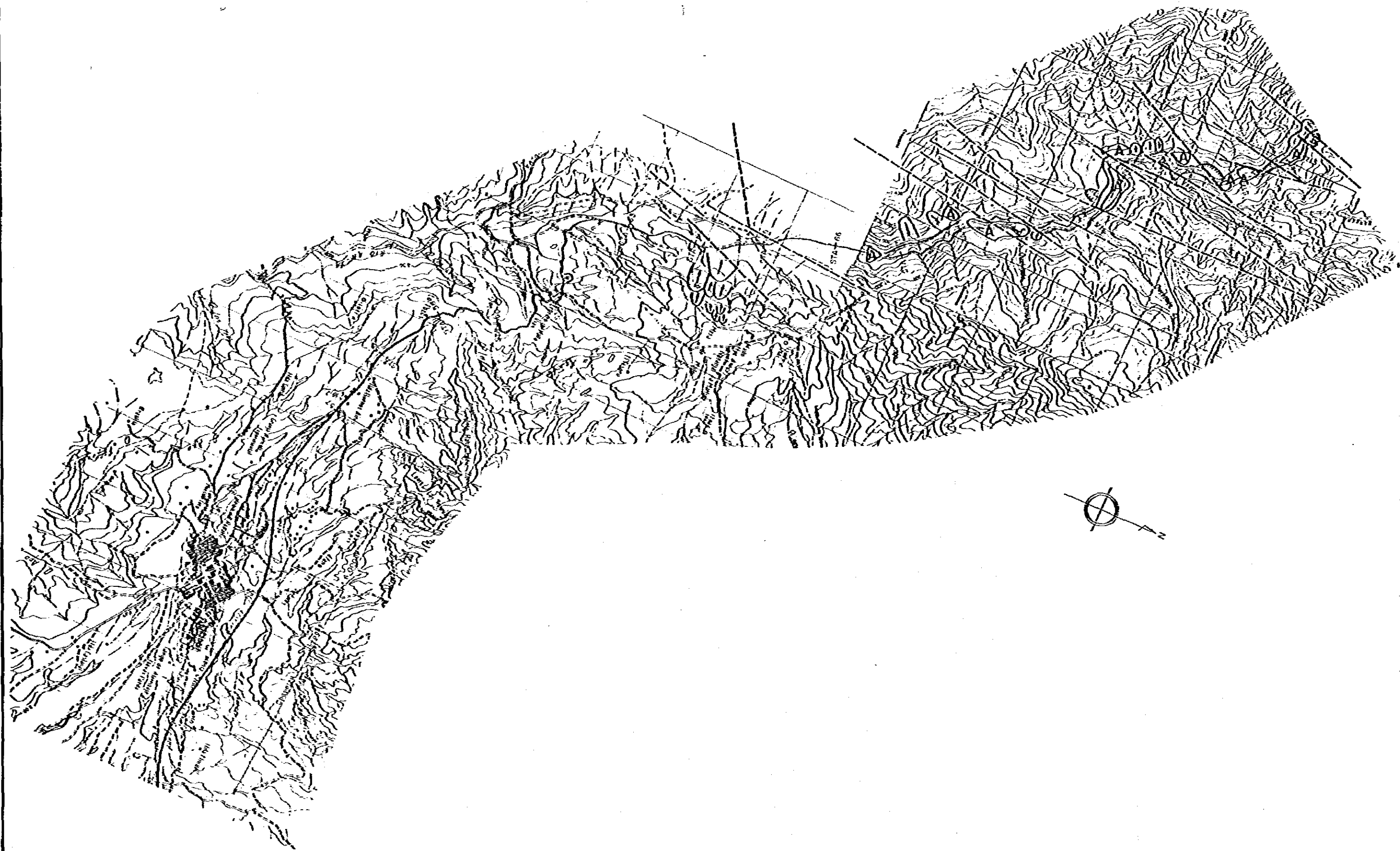
GENERAL NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.

M O P T	BOGOTA — BUENAVENTURA ROAD PROJECT	BRIDGES AND STRUCTURES TYPICAL P.C BRIDGE (L=40.0M)	SCALE 1:30, 1:60, 1:120	DATE MARCH 1982 SHEET No. 25 OF 32
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-  lineation
-  direction of slide
-  landslide
-  collapse
-  talus deposit / debris flow deposit (A)
-  terrace deposit (B)
-  glacial landform
-  mor (soft ground) (C)
-  moraine (D)

M O P T	BOGÓTA — BUENAVENTURA ROAD PROJECT	GEOLOGICAL MAP (LEGEND)	SCALE	DATE MARCH 1982 SHEET No. 26 OF 32
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M O P T

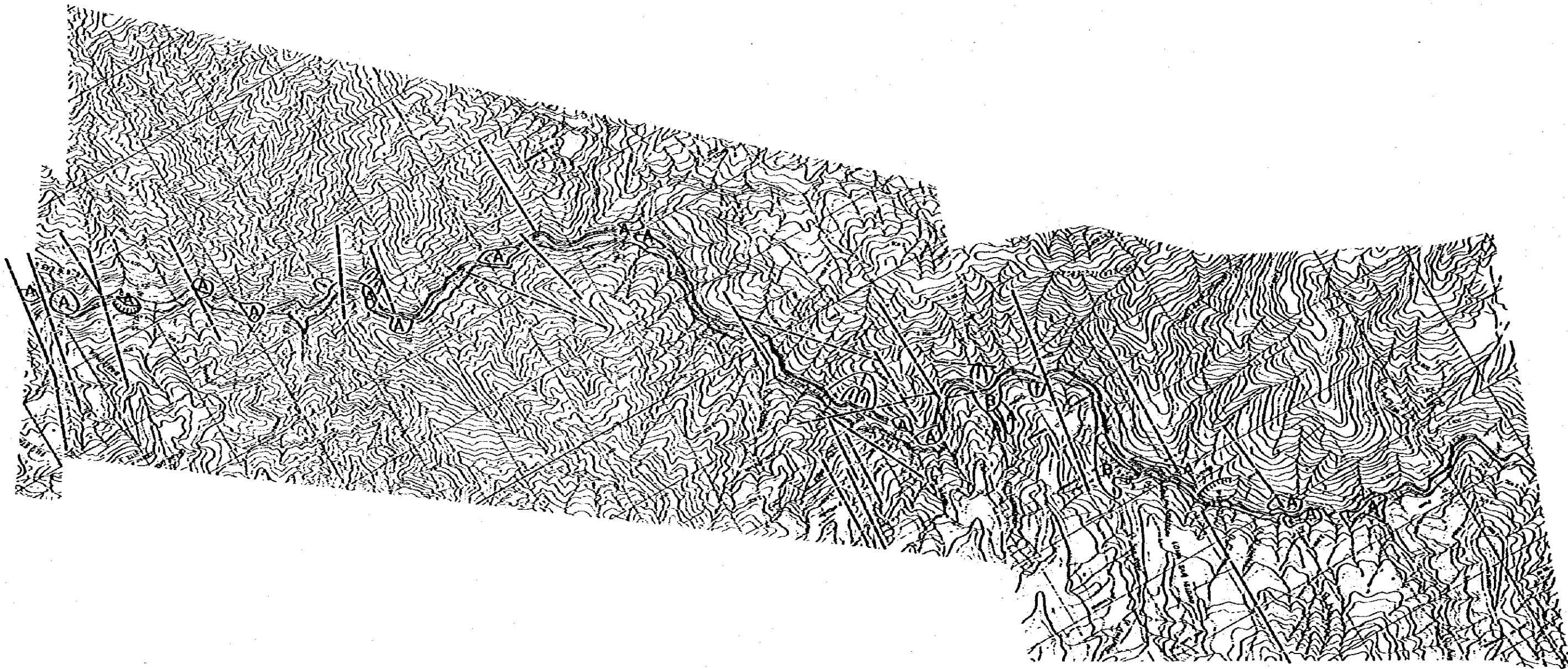
BOGOTA — BUENAVENTURA  
ROAD PROJECT

GEOLOGICAL MAP

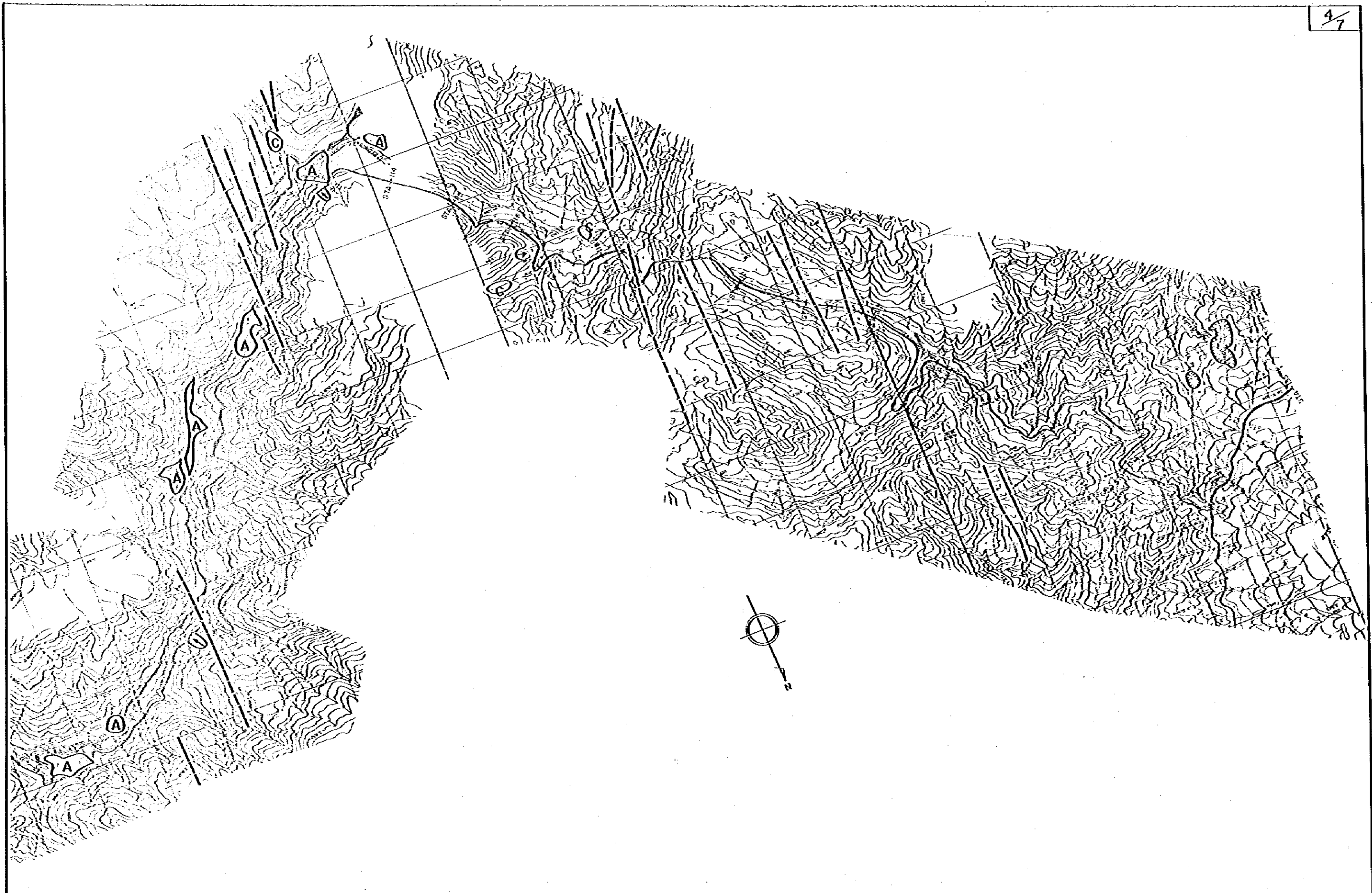
SCALE 1: 50,000

DATE	MARCH 1982
SHEET No.	27 OF 32

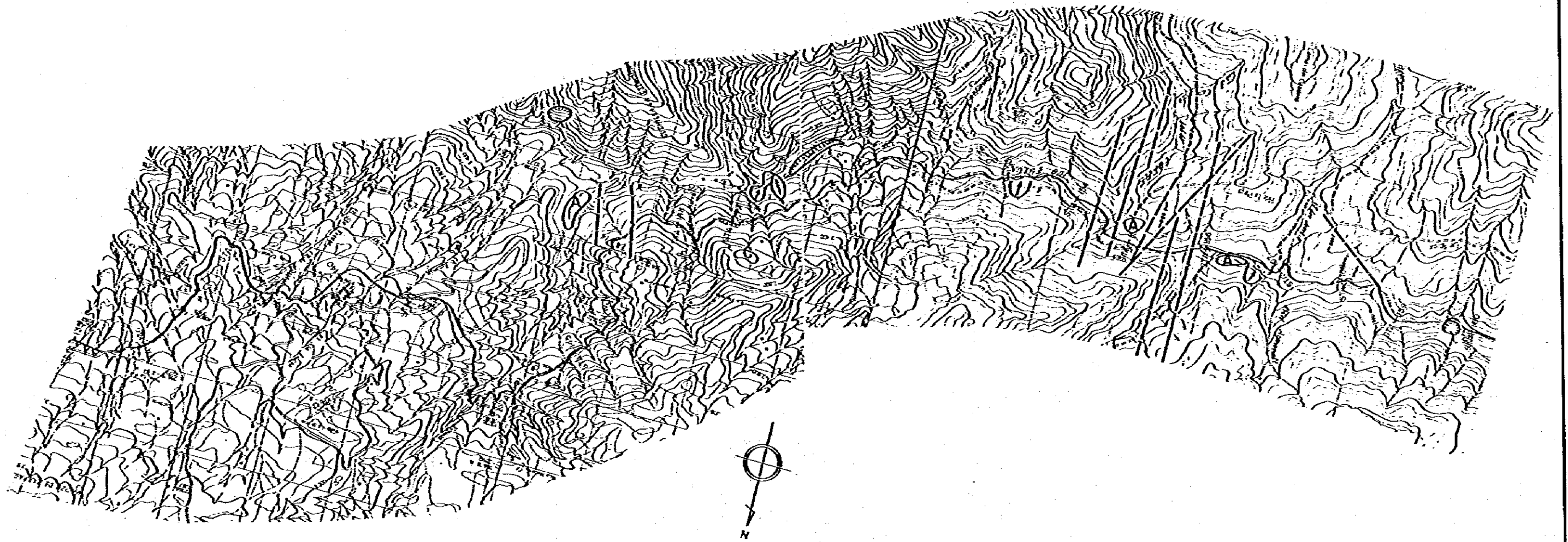




M O P T	BOGOTA — BUENAVENTURA ROAD PROJECT	GEOLOGICAL MAP	SCALE 1: 50,000	DATE MARCH 1982 SHEET No. 28 OF 32
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M O P T	BOGOTA — BUENAVENTURA ROAD PROJECT	GEOLOGICAL MAP	SCALE 1 : 50,000	DATE MARCH 1982 SHEET No. 29 OF 32
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M O P T

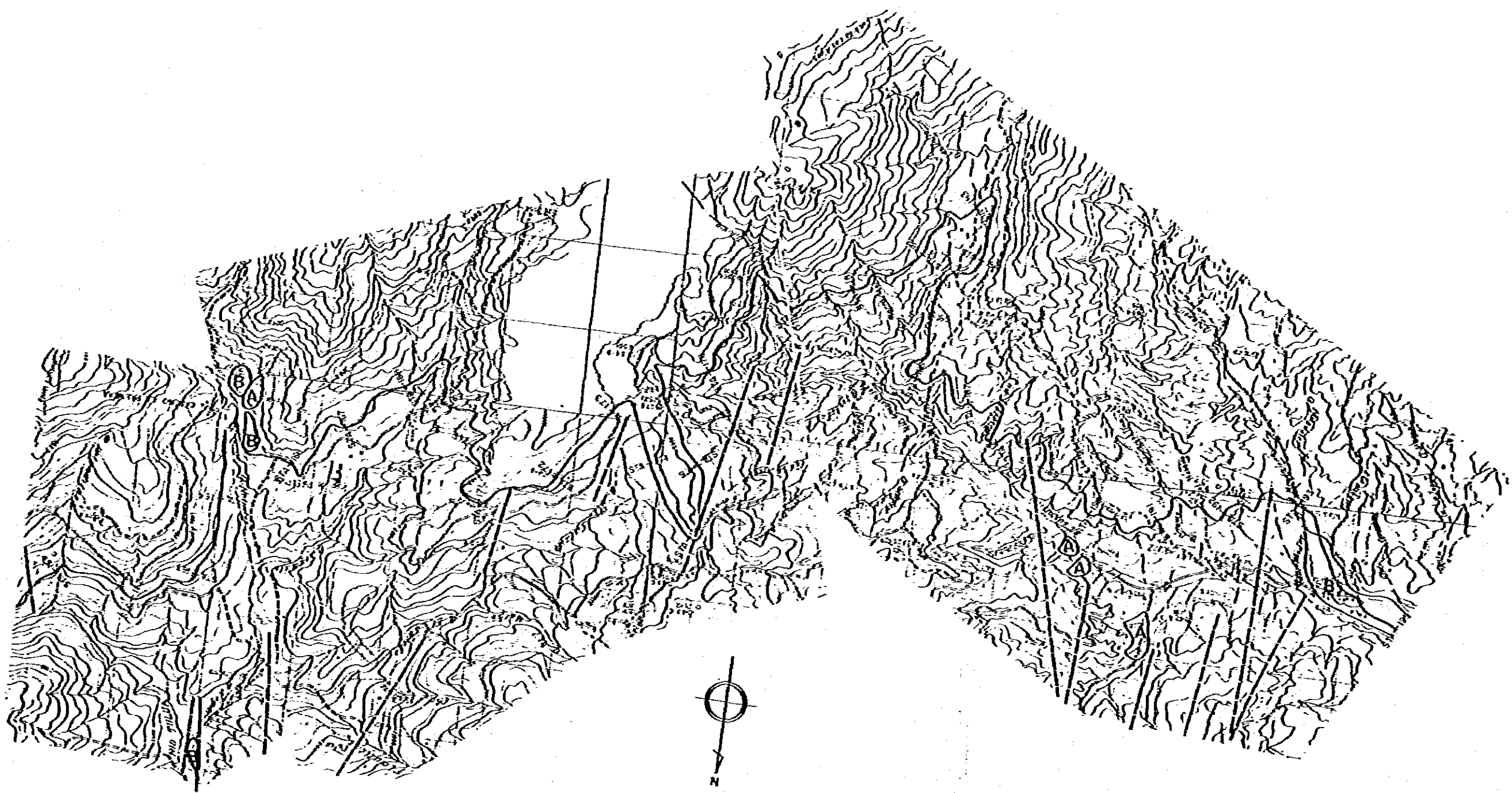
BOGOTA — BUENAVENTURA  
ROAD PROJECT

GEOLOGICAL MAP

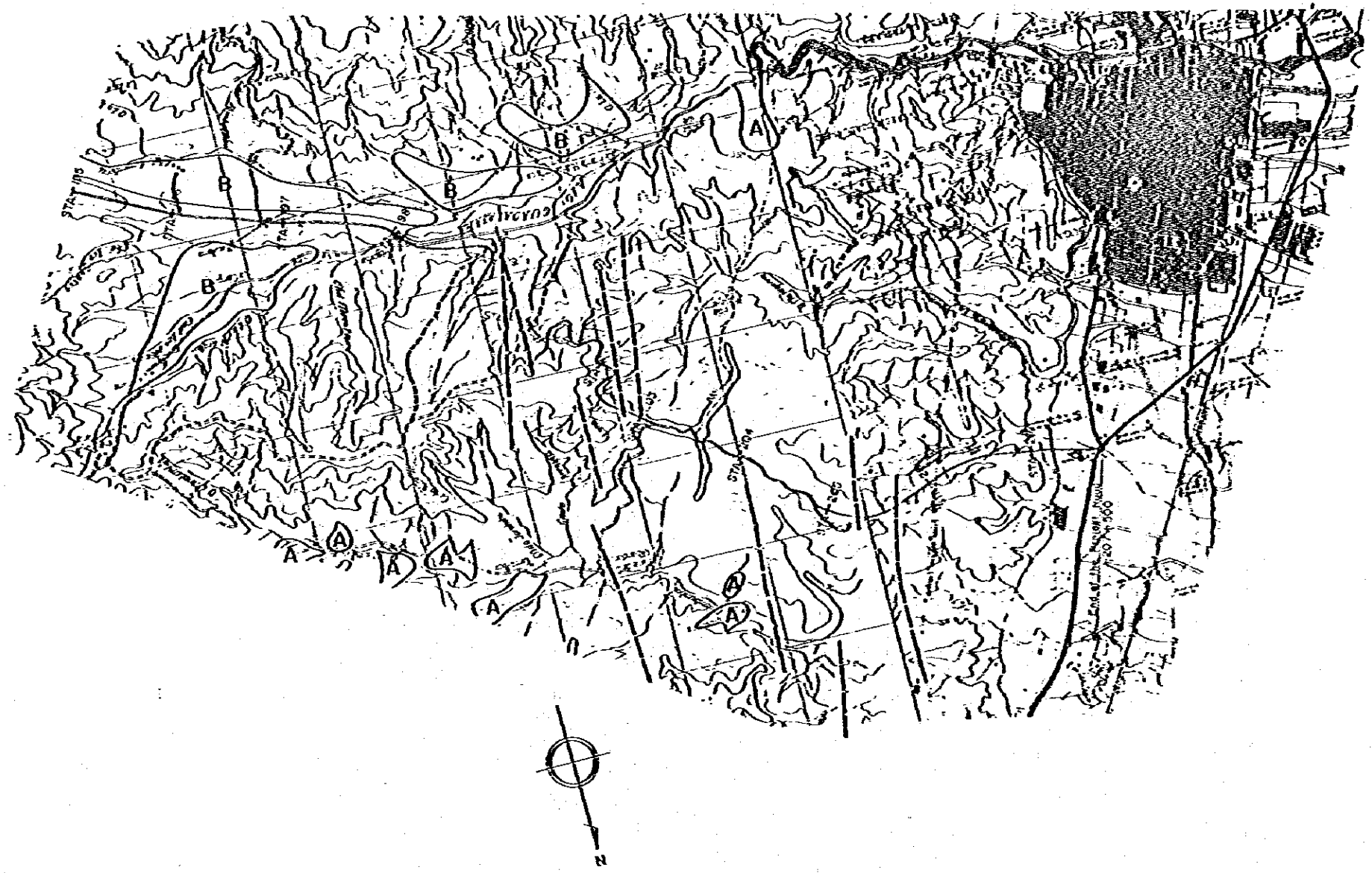
SCALE 1 : 50,000

DATE MARCH 1982

SHEET No. 30 OF 32



M O P T	BOGOTA — BUENAVENTURA ROAD PROJECT	GEOLOGICAL MAP	SCALE 1 : 50,000	DATE MARCH 1982 SHEET No. 31 OF 32
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M O P T	BOGOTA — BUENAVENTURA ROAD PROJECT	GEOLOGICAL MAP	SCALE 1 : 50,000	DATE MARCH 1982 SHEET No. 32 OF 32
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JICA