

ボリビア共和国  
ボリビア国有鉄道

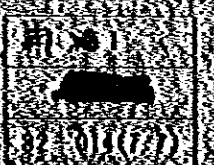
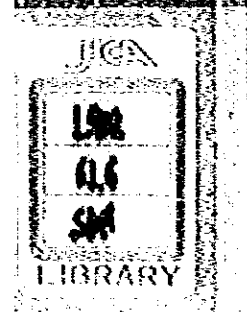
# 東部路線イピアス～ロボレ間鉄道災害復旧工事

- 第 1 卷 入札心得
- 第 2 卷 契約条件書
- 第 3 卷 一般仕様書
- 第 4 卷 技術仕様書
- 第 5 卷 数量明細書
- 第 6 卷 基本設計図

第 6 卷  
基本設計図 (1)

昭和57年1月

国際協力事業団



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## 第 6 卷 基本設計図

昭和57年1月

国際協力事業団

国際協力事業団		
受入 期	'84.8.31	L702
登録No.	14571	61.6 SDP

# RAILWAY REHABILITATION PROJECT, EASTERN LINE

(IPIAS - ROBORE)

## INDEX OF DRAWINGS

BASIC DRAWING

NO.	TITLE	NO.	TITLE
1	QUANTITY TABLE (Sheet 1 OF 4)	26	ROADWAY DIMENSION FOR BOX CULVERTS
2	— DO — (Sheet 2 OF 4)	27	TYPICAL EARTH WORK FOR CLEARING AND GRUBBING OF RIVER-BED
3	— DO — (Sheet 3 OF 4)	28	RE-ROUTING OF RIVER CHANNEL 353 <sup>K</sup> +100 <sup>M</sup>
4	— DO — (Sheet 4 OF 4)	29	346 <sup>K</sup> +211 <sup>M</sup> OPEN DRAINAGE (D <sub>o3</sub> ) GENERAL VIEW
5	LOCATION MAP	30	348 <sup>K</sup> +330 <sup>M</sup> BOX CULVERT (Cb) GENERAL VIEW
6	ROADWAY PLAN (Sheet 1 OF 9)	31	351 <sup>K</sup> +100 <sup>M</sup> BOX CULVERT (Cb) GENERAL VIEW
7	— DO — (Sheet 2 OF 9)	32	351 <sup>K</sup> +419 <sup>M</sup> BOX CULVERT (Cb) GENERAL VIEW
8	— DO — (Sheet 3 OF 9)	33	— DO — BAR ARRANGEMENT
9	— DO — (Sheet 4 OF 9)	34	352 <sup>K</sup> +284 <sup>M</sup> BOX CULVERT (Cb) GENERAL VIEW
10	— DO — (Sheet 5 OF 9)	35	— DO — BAR ARRANGEMENT
11	— DO — (Sheet 6 OF 9)	36	353 <sup>K</sup> +020 <sup>M</sup> BOX CULVERT (Cb) GENERAL VIEW (Sheet 1 OF 2)
12	— DO — (Sheet 7 OF 9)	37	— DO — (Sheet 2 OF 2)
13	— DO — (Sheet 8 OF 9)	38	— DO — BAR ARRANGEMENT
14	— DO — (Sheet 9 OF 9)	39	353 <sup>K</sup> +160 <sup>M</sup> BOX CULVERT (Cb) GENERAL VIEW
15	PROFILE	40	— DO — BAR ARRANGEMENT
16	TEMPORARY TRACK PROFILE AND PLAN 347 <sup>K</sup> +317 <sup>M</sup> ~347 <sup>K</sup> +540 <sup>M</sup>	41	353 <sup>K</sup> +328 <sup>M</sup> OPEN DRAINAGE (D <sub>o</sub> ) GENERAL VIEW
17	— DO — 352 <sup>K</sup> +189 <sup>M</sup> ~352 <sup>K</sup> +375 <sup>M</sup>	42	353 <sup>K</sup> +930 <sup>M</sup> BOX CULVERT (Cb) GENERAL VIEW
18	— DO — 354 <sup>K</sup> +816 <sup>M</sup> ~355 <sup>K</sup> +571 <sup>M</sup>	43	354 <sup>K</sup> +430 <sup>M</sup> BOX CULVERT (Cb) GENERAL VIEW
19	— DO — 357 <sup>K</sup> +975 <sup>M</sup> ~358 <sup>K</sup> +300 <sup>M</sup>	44	355 <sup>K</sup> +165 <sup>M</sup> BOX CULVERT (Cb) GENERAL VIEW
20	— DO — 359 <sup>K</sup> +056 <sup>M</sup> ~359 <sup>K</sup> +300 <sup>M</sup>	45	355 <sup>K</sup> +793 <sup>M</sup> OPEN DRAINAGE (D <sub>o</sub> ) GENERAL VIEW
21	— DO — 361 <sup>K</sup> +577 <sup>M</sup> ~361 <sup>K</sup> +920 <sup>M</sup>	46	356 <sup>K</sup> +907 <sup>M</sup> BOX CULVERT (Cb) GENERAL VIEW
22	— DO — 364 <sup>K</sup> +540 <sup>M</sup> ~365 <sup>K</sup> +000 <sup>M</sup>	47	357 <sup>K</sup> +032 <sup>M</sup> BOX CULVERT (Cb) GENERAL VIEW
23	— DO — 367 <sup>K</sup> +090 <sup>M</sup> ~367 <sup>K</sup> +454 <sup>M</sup>	48	357 <sup>K</sup> +536 <sup>M</sup> BOX CULVERT (Cb) GENERAL VIEW
24	ROADWAY DIMENSION FOR NEW LINE	49	358 <sup>K</sup> +700 <sup>M</sup> BOX CULVERT (Cb) GENERAL VIEW
25	ROADWAY DIMENSION FOR TEMPORARY TRACK	50	358 <sup>K</sup> +869 <sup>M</sup> BOX CULVERT (Cb) GENERAL VIEW

# RAILWAY REHABILITATION PROJECT, EASTERN LINE

(IPIAS - ROBORE)

## INDEX OF DRAWINGS

BASIC DRAWING

NO.	TITLE	NO.	TITLE
51	358 <sup>K</sup> +980 <sup>M</sup> BOX CULVERT (Cb) GENERAL VIEW	76	359 <sup>K</sup> +186 <sup>M</sup> BRIDGE GENERAL VIEW
52	359 <sup>K</sup> +300 <sup>M</sup> OPEN DRAINAGE (Do) GENERAL VIEW	77	—DO— BAR ARRANGEMENT
53	360 <sup>K</sup> +925 <sup>M</sup> BOX CULVERT (Cb) GENERAL VIEW	78	360 <sup>K</sup> +364 <sup>M</sup> 5 BRIDGE GENERAL VIEW
54	360 <sup>K</sup> +986 <sup>M</sup> BOX CULVERT (Cb) GENERAL VIEW	79	—DO— BAR ARRANGEMENT
55	361 <sup>K</sup> +130 <sup>M</sup> BOX CULVERT (Cb) GENERAL VIEW	80	361 <sup>K</sup> +725 <sup>M</sup> BRIDGE GENERAL VIEW
56	362 <sup>K</sup> +127 <sup>M</sup> 5 OPEN DRAINAGE (Do) GENERAL VIEW	81	—DO— BAR ARRANGEMENT (Sheet 1 OF 2)
57	364 <sup>K</sup> +778 <sup>M</sup> BOX CULVERT (Cb) GENERAL VIEW (Sheet 1 OF 2)	82	—DO— (Sheet 2 OF 2)
58	—DO— (Sheet 2 OF 2)	83	363 <sup>K</sup> +575 <sup>M</sup> BRIDGE GENERAL VIEW
59	—DO— BAR ARRANGEMENT	84	—DO— BAR ARRANGEMENT
60	367 <sup>K</sup> +273 <sup>M</sup> BOX CULVERT (Cb) GENERAL VIEW	85	386 <sup>K</sup> +780 <sup>M</sup> BRIDGE GENERAL VIEW
61	—DO— BAR ARRANGEMENT	86	—DO— BAR ARRANGEMENT (Sheet 1 OF 2)
62	387 <sup>K</sup> +050 <sup>M</sup> BOX CULVERT (Cb) GENERAL VIEW	87	—DO— (Sheet 2 OF 2)
63	347 <sup>K</sup> +428 <sup>M</sup> BRIDGE GENERAL VIEW	88	APRON FOR BOX CULVERT
64	—DO— BAR ARRANGEMENT	89	SKELTON OF DECK GIRDER SPAN = 15 <sup>M</sup>
65	354 <sup>K</sup> +940 <sup>M</sup> BRIDGE GENERAL VIEW	90	SKELTON OF THROUGH GIRDER SPAN = 15 <sup>M</sup>
66	—DO— BAR ARRANGEMENT	91	SKELTON OF THROUGH GIRDER SPAN = 20 <sup>M</sup>
67	355 <sup>K</sup> +208 <sup>M</sup> BRIDGE GENERAL VIEW	92	SKELTON OF DECK GIRDER SPAN = 40 <sup>M</sup>
68	—DO— BAR ARRANGEMENT	93	SKELTON OF DECK TRUSS SPAN = 40 <sup>M</sup>
69	355 <sup>K</sup> +448 <sup>M</sup> BRIDGE GENERAL VIEW	94	SKELTON OF THROUGH TRUSS SPAN = 65 <sup>M</sup>
70	—DO— BAR ARRANGEMENT	95	TYPICAL TRACK MATERIALS, RAIL, DRIVE SPIKE, JOINT BAR, BOLT, NUT, WASHER
71	356 <sup>K</sup> +307 <sup>M</sup> BRIDGE GENERAL VIEW		
72	—DO— BAR ARRANGEMENT (Sheet 1 OF 2)		
73	—DO— (Sheet 2 OF 2)		
74	358 <sup>K</sup> +155 <sup>M</sup> BRIDGE GENERAL VIEW		
75	—DO— BAR ARRANGEMENT		

SUM TOTAL QUANTITIES OF WORKS

Qty. item No.	Description of work item	Unit	Sum Total quantity	Surveying	Geological survey	Detailed design	Earth work	Roadbed facilities	Box culvert	Bridge	Pipe culvert	Track materials	Track motor trolley	Administration building	Communication facilities	Remarks
1	Surveying	Lump sum	/	/	/	/	/	/	/	/	/	/	/	/	/	/
2	Geological survey	Lump sum	/	/	/	/	/	/	/	/	/	/	/	/	/	/
3	Detailed design	Lump sum	/	/	/	/	/	/	/	/	/	/	/	/	/	/
4	Main line cuttings (up to 1000 sqm)	m <sup>3</sup>	16,000	/	/	/	16,000	/	/	/	/	/	/	/	/	/
5	Main line cuttings (over 1000 sqm)	m <sup>3</sup>	1,000	/	/	/	1,000	/	/	/	/	/	/	/	/	/
6	Temporary line cuttings (up to 1000 sqm)	m <sup>3</sup>	18,000	/	/	/	18,000	/	/	/	/	/	/	/	/	/
7	Temporary line cuttings (over 1000 sqm)	m <sup>3</sup>	2,000	/	/	/	2,000	/	/	/	/	/	/	/	/	/
8	Main line embankments	m <sup>3</sup>	190,000	/	/	/	190,000	/	/	/	/	/	/	/	/	/
9	Temporary line embankments	m <sup>3</sup>	31,000	/	/	/	31,000	/	/	/	/	/	/	/	/	/
10	Grading and grading (up to 1000 sqm)	m <sup>3</sup>	100,000	/	/	/	100,000	/	/	/	/	/	/	/	/	/
11	Excavation (up to 1000 sqm)	m <sup>3</sup>	13,100	/	/	/	13,100	/	/	/	/	/	/	/	/	/
12	Excavation (over 1000 sqm)	m <sup>3</sup>	1,100	/	/	/	1,100	/	/	/	/	/	/	/	/	/
13	Roadbed	m <sup>3</sup>	150	/	/	/	150	/	/	/	/	/	/	/	/	/
14	Leveling concrete	m <sup>3</sup>	270	/	/	/	270	/	/	/	/	/	/	/	/	/
15	Reinforcing wall concrete	m <sup>3</sup>	370	/	/	/	370	/	/	/	/	/	/	/	/	/
16	Open drainage concrete	m <sup>3</sup>	110	/	/	/	110	/	/	/	/	/	/	/	/	/
17	Miscellaneous concrete	m <sup>3</sup>	70	/	/	/	70	/	/	/	/	/	/	/	/	/
18	Un-traced retaining wall concrete	m <sup>3</sup>	1,230	/	/	/	1,230	/	/	/	/	/	/	/	/	/
19	Structure-dismantling	m <sup>3</sup>	1,030	/	/	/	1,030	/	/	/	/	/	/	/	/	/
20	Bridge abutment concrete	m <sup>3</sup>	5,300	/	/	/	5,300	/	/	/	/	/	/	/	/	/
21	Bridge abutment foundation concrete	m <sup>3</sup>	2,000	/	/	/	2,000	/	/	/	/	/	/	/	/	/
22	Bridge pier concrete	m <sup>3</sup>	200	/	/	/	200	/	/	/	/	/	/	/	/	/
23	Bridge pier foundation concrete	m <sup>3</sup>	110	/	/	/	110	/	/	/	/	/	/	/	/	/
24	Box culvert concrete	m <sup>3</sup>	3,100	/	/	/	3,100	/	/	/	/	/	/	/	/	/
25	Reinforcing bar	kg	371,000	/	/	/	371,000	/	/	/	/	/	/	/	/	/
26	Reinforcing bar (for bridge abutment)	kg	371,000	/	/	/	371,000	/	/	/	/	/	/	/	/	/
27	Reinforcing bar (for bridge pier)	kg	/	/	/	/	/	/	/	/	/	/	/	/	/	/
28	Painting (Do - Do)	Each	/	/	/	/	/	/	/	/	/	/	/	/	/	/
29	Painting (Do - Do)	Each	/	/	/	/	/	/	/	/	/	/	/	/	/	/
30	Painting (Do - Do)	Each	/	/	/	/	/	/	/	/	/	/	/	/	/	/
31	Electricity (Do - Do)	Each	/	/	/	/	/	/	/	/	/	/	/	/	/	/
32	Painting (Do - Do)	Each	/	/	/	/	/	/	/	/	/	/	/	/	/	/
33	Painting (Do - Do)	Each	/	/	/	/	/	/	/	/	/	/	/	/	/	/
34	Electricity (Do - Do)	Each	/	/	/	/	/	/	/	/	/	/	/	/	/	/
35	Painting (Do - Do)	Each	/	/	/	/	/	/	/	/	/	/	/	/	/	/
36	Painting (Do - Do)	Each	/	/	/	/	/	/	/	/	/	/	/	/	/	/
37	Electricity (Do - Do)	Each	/	/	/	/	/	/	/	/	/	/	/	/	/	/
38	Painting (Do - Do)	Each	/	/	/	/	/	/	/	/	/	/	/	/	/	/
39	Painting (Do - Do)	Each	/	/	/	/	/	/	/	/	/	/	/	/	/	/
40	Electricity (Do - Do)	Each	/	/	/	/	/	/	/	/	/	/	/	/	/	/
41	Painting (Do - Do)	Each	/	/	/	/	/	/	/	/	/	/	/	/	/	/
42	Painting (Do - Do)	Each	/	/	/	/	/	/	/	/	/	/	/	/	/	/
43	Electricity (Do - Do)	Each	/	/	/	/	/	/	/	/	/	/	/	/	/	/
44	Painting (Do - Do)	Each	/	/	/	/	/	/	/	/	/	/	/	/	/	/
45	Painting (Do - Do)	Each	/	/	/	/	/	/	/	/	/	/	/	/	/	/
46	Electricity (Do - Do)	Each	/	/	/	/	/	/	/	/	/	/	/	/	/	/
47	Painting (Do - Do)	Each	/	/	/	/	/	/	/	/	/	/	/	/	/	/
48	Painting (Do - Do)	Each	550	/	/	/	550	/	/	/	/	550	/	/	/	/
49	Painting (Do - Do)	Each	600	/	/	/	600	/	/	/	/	600	/	/	/	/
50	Painting (Do - Do)	Each	1,200	/	/	/	1,200	/	/	/	/	1,200	/	/	/	/
51	Painting (Do - Do)	Each	33,000	/	/	/	33,000	/	/	/	/	33,000	/	/	/	/
52	Painting (Do - Do)	Unit	/	/	/	/	/	/	/	/	/	/	/	/	/	/
53	Painting (Do - Do)	Unit	/	/	/	/	/	/	/	/	/	/	/	/	/	/
54	Painting (Do - Do)	Unit	/	/	/	/	/	/	/	/	/	/	/	/	/	/
55	Painting (Do - Do)	Unit	/	/	/	/	/	/	/	/	/	/	/	/	/	/
56	Painting (Do - Do)	Unit	/	/	/	/	/	/	/	/	/	/	/	/	/	/
57	Painting (Do - Do)	Unit	/	/	/	/	/	/	/	/	/	/	/	/	/	/
58	New construction of engineer's office	m <sup>2</sup>	110	/	/	/	/	/	/	/	/	/	/	/	/	/
59	New construction of engineer's loggins	m <sup>2</sup>	830	/	/	/	/	/	/	/	/	/	/	/	/	/
60	Communication facilities	Lump sum	/	/	/	/	/	/	/	/	/	/	/	/	/	/

ENTRESA NACIONAL DE FERROCARRILES  
 ECUADOR (EXAMINATION PROJECT (LINES ROAD))

**QUANTITY TABLE**  
 (Sheet 1 OF 4)

Executing Enterprise

Drawn by Date	Checked by	Approved by Date

Contracting Enterprise

Checked by Date	Approved by Date	No
		1

ALL PROJECT

EARTH WORK

Section		Extension of diversion		Main line Embankments		Main line cuttings (soil mixed sand)		Main line cuttings (loose rock)	Temporary line Embankments	Temporary line cuttings (soil mixed sand)	Temporary line cuttings (loose rock)	Remarks
From	To	New line	Temporary line	New line	Existing line	New line	Existing line	New line	Existing line	Existing line	Existing line	
K M	K M	M	M	M <sup>3</sup>	M <sup>3</sup>	M <sup>3</sup>	M <sup>3</sup>	M <sup>3</sup>	M <sup>3</sup>	M <sup>3</sup>	M <sup>3</sup>	
347 317	347 540		2292						7300			
347 325	347 500				1700							
351 rear					1800							
352 159	352 375 5		188.7						2100	100		
352 rear					950							
352 845	353 300	455 0		32 740		1500						
354 8:6	355 571		76 5						1230	9900		
354 8:6	355 571				100		5770					
355 900	356 534 45	631 45		22 700		2600						
357 975	358 300		339 9						9100	200		
358 003	358 250				100		110					
359 056	359 300		248 5						1300	100		
359 150	359 300				370		120					
359 831	361 407 27	1,576 27		91 750		2250						
361 577	361 920		359 2						1600	300		
361 577	361 920				570		650					
363 307 5	363 734 66	437 16		5500		2200						
364 540	365 000		456 2						5300	700		
364 rear					1000		100					
367 090	367 454		383 8						5900	11500	2000	
367 rear					1260							
365 650	367 602	1,752 0		23 650		10 740		1000				
Total		4,904 58	3,000 5	140000	21450	19290	6750	1000	31000	18000	2000	

BOX CULVERT

Kilometrage	Clearing and grubbing of river-bed (soil mixed sand)	Remarks
K M rear	M <sup>3</sup>	
347 428	2600	
353 020	15000	
353 160		
354 940	3300	
355 208	2600	
355 413	2600	
356 307	17600	
358 155	15600	
359 185	5100	
360 364 5	5100	
361 725	19800	
363 575	7700	
364 778	2900	
367 273	1100	
366 780	10300	
Total	159000	

Kilometrage	Inside dimension clear span x height	Slope	Excavation	Excavation		V-sections - bus concrete	U-shaped retaining wall concrete	Leveling concrete	Box culvert concrete	Reinforcing bar	Fabrication and placement of reinforcement for box culvert	Remarks
				Soil mixed sand	Loose rock							
K M	M M		Excavation	M <sup>3</sup>	M <sup>3</sup>	M <sup>3</sup>	M <sup>3</sup>	M <sup>3</sup>	M <sup>3</sup>	M <sup>3</sup>	M <sup>3</sup>	
349 330	20x15	Right angle	Live tree				9	9	14	2780	2750	
351 300	25x20	-Do-	-Do-				17	8	26	8370	8370	
351 419	25x20	-Do-	-Do-	710			22	18	155	23600	23400	
352 284	50x40	-Do-	Temporary live tree		290		12	117	23	123	26550	26850
353 020	70x50	45° right hand	Live tree	820			375	76	1033	158000	158000	
353 160	70x50	75° left hand	-Do-	480	350		208	91	336	65500	65500	
353 930	20x20	Right angle	Live tree				13	6	38	6560	6560	
354 430	15x15	-Do-	-Do-				6	13	7	5070	5070	
355 165	20x15	-Do-	Temporary live tree	130			10	5	21	9380	9380	
356 907	15x10	-Do-	Live tree				7	17	10	6910	6910	
357 032	10x10	-Do-	-Do-				5	9	17	3010	3010	
357 526	15x10	-Do-	-Do-				5	9	6	4230	4230	
358 700	15x10	-Do-	-Do-				5	3	10	1750	1750	
358 869	15x15	-Do-	-Do-				5	12	5	3860	3860	
358 930	15x15	-Do-	-Do-				5	11	6	4590	4590	
360 925	25x20	-Do-	New tree	70			27	11	57	19330	19330	
360 996	25x20	-Do-	-Do-	60			23	13	71	17260	17260	
361 130	25x20	-Do-	-Do-	50			13	5	36	7900	7900	
364 778	450x45	60° right hand	Temporary live tree	1760			255	68	702	95550	95550	
367 273	50x50	Right angle	-Do-	1500			176	33	270	48700	48700	
387 050	35x30	-Do-	New tree	60	40		35	11	56	19100	19100	
Total	21 place		Live tree 11 place Temporary live tree 4 place New tree 6 place	8860	830	40	1430	248	3100	523000	523000	

EMPRESA NACIONAL DE FERROCARRILES RAILWAY REHABILITATION PROJECT (I PLUS BOX)			
<b>QUANTITY TABLE</b> (Sheet 2 OF 4)			
Executing Enterprise			
Drawn by E. ...	Checked by ...	Approved by ...	Date
		2	





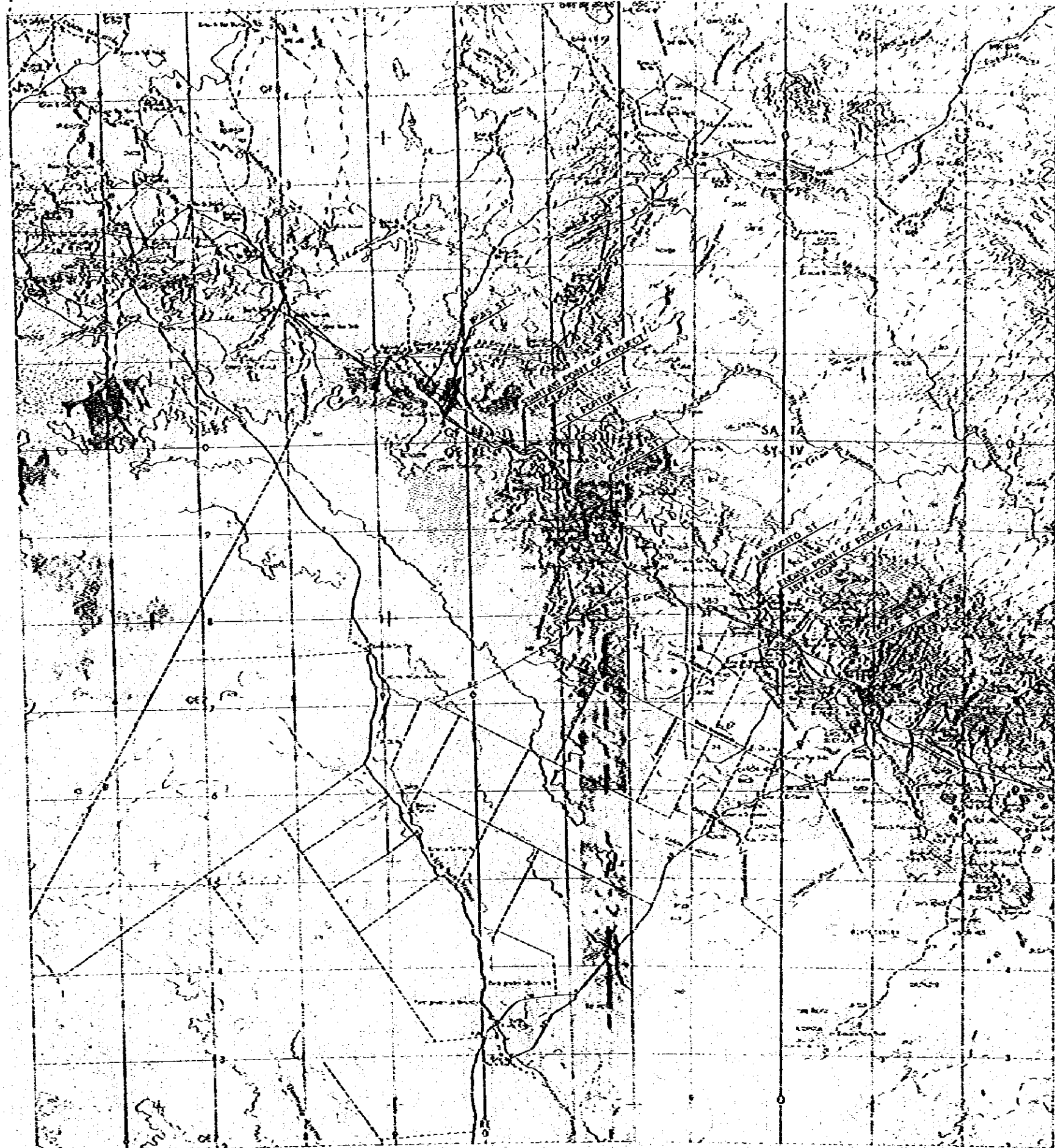
# WORK DESCRIPTION AND MATERIAL SUPPLY CONSTRUCTED BY ENFE

Description of work		Station	Meters												Total			
			340	350	360	370	380	390	400	410	420	430	440	450				
X Temporary Line	Laying																	
	Removal																	
	Rail (8 meters length per track)																	
	Joint bar																	
	Bolt, Nut, Washer for joint bar																	
	Drive spike																	
	Regular tie																	
	Divergence																	
	Temporary line laying and removal																	
	Removal and restoration (for temporary line)																	
C Existing Line	Rail beam construction and dismantling																	
	Laying (for New Line)																	
	Rail (8 meters length per track)																	
	Welding of rail																	
	Joint bar																	
	Bolt, Nut, Washer for joint bar																	
	Drive spike																	
	Regular tie																	
	Bridge tie																	
	Ballast																	
A New Line	Divergence temporary line																	
	Removal and restoration (for temporary line)																	
	Rail beam construction and dismantling																	
	Laying																	
	Rail (8 meters length per track)																	
	Welding of rail																	
	Joint bar																	
	Bolt, Nut, Washer for joint bar																	
	Drive spike																	
	Regular tie																	
R Materials	Bridge tie																	
	Ballast																	
	Divergence temporary line																	
	Temporary line laying																	
	Removal and restoration																	
	Turnout 100																	
	Laying and removal																	
	Turnout 80																	
	Laying and removal																	
	Laying and removal																	
T Materials	Rail (8 meters length per track)																	
	Joint bar																	
	Bolt, Nut, Washer for joint bar																	
	Drive spike																	
	Regular tie																	
	Excavation																	
	Refilling																	
	Embankment																	
	Relocation																	
	Relocation																	

### LEGEND

- T Temporary line section
  - N New Line portion
  - CR Box culvert
  - DO Open drainage
  - Temporary line laying and removal
  - Existing line removal and restoration
  - Temporary line removal (not included)
  - New Line laying
- Figures in boxes are net values of materials which the contractor will furnish and hand over to ENFE.

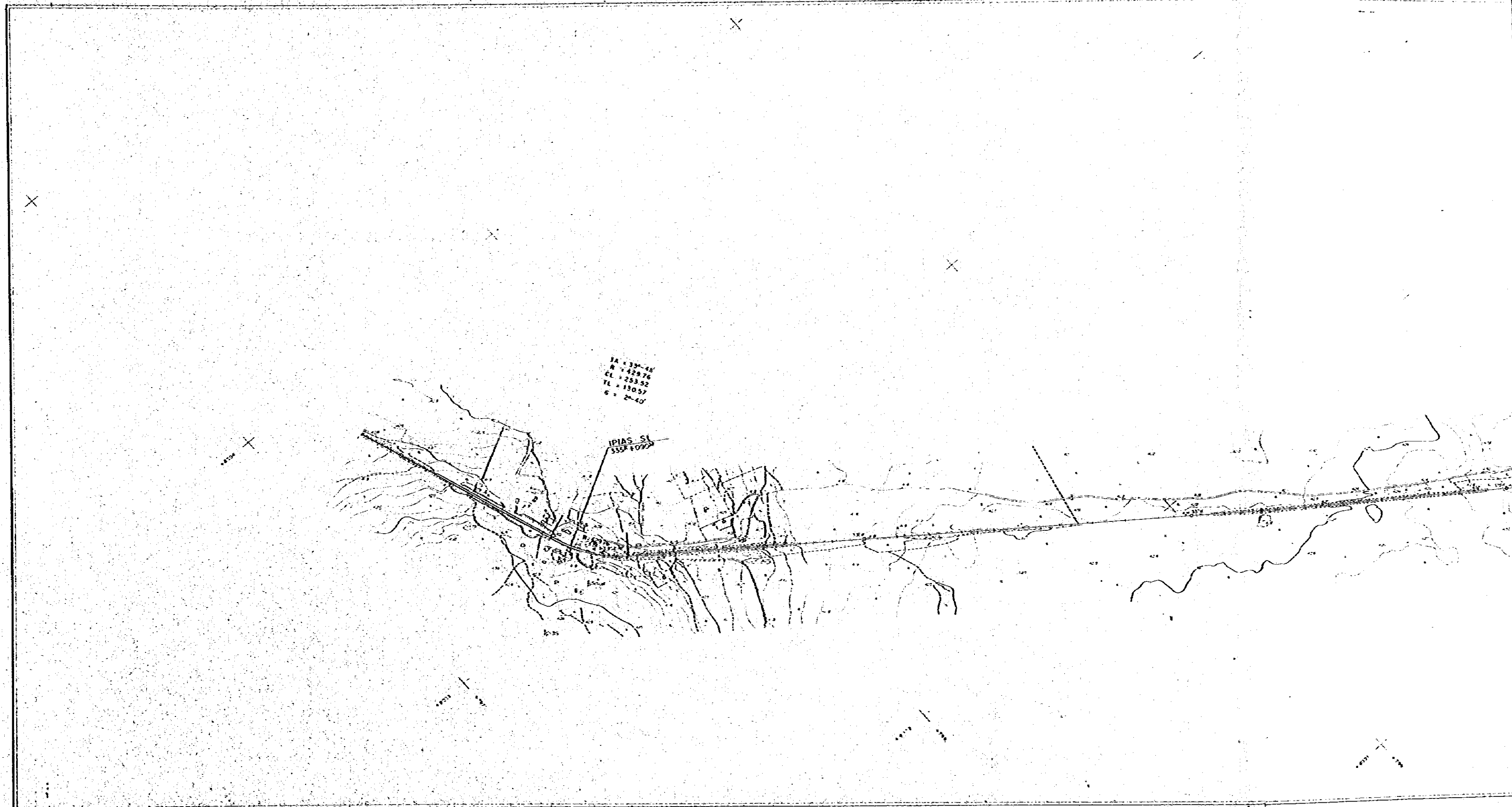
<b>EMPRESA NACIONAL DE FERROCARRILES</b> RAILWAY RECONSTRUCTION PROJECT (1974-2000)		
<b>QUANTITY TABLE</b> (Sheet 4 of 4)		
Executing Enterprise		
Drawn by Date	Checked by Date	Approved by Date
Contracting Enterprise		
Checked by Date	Approved by Date	No. 4

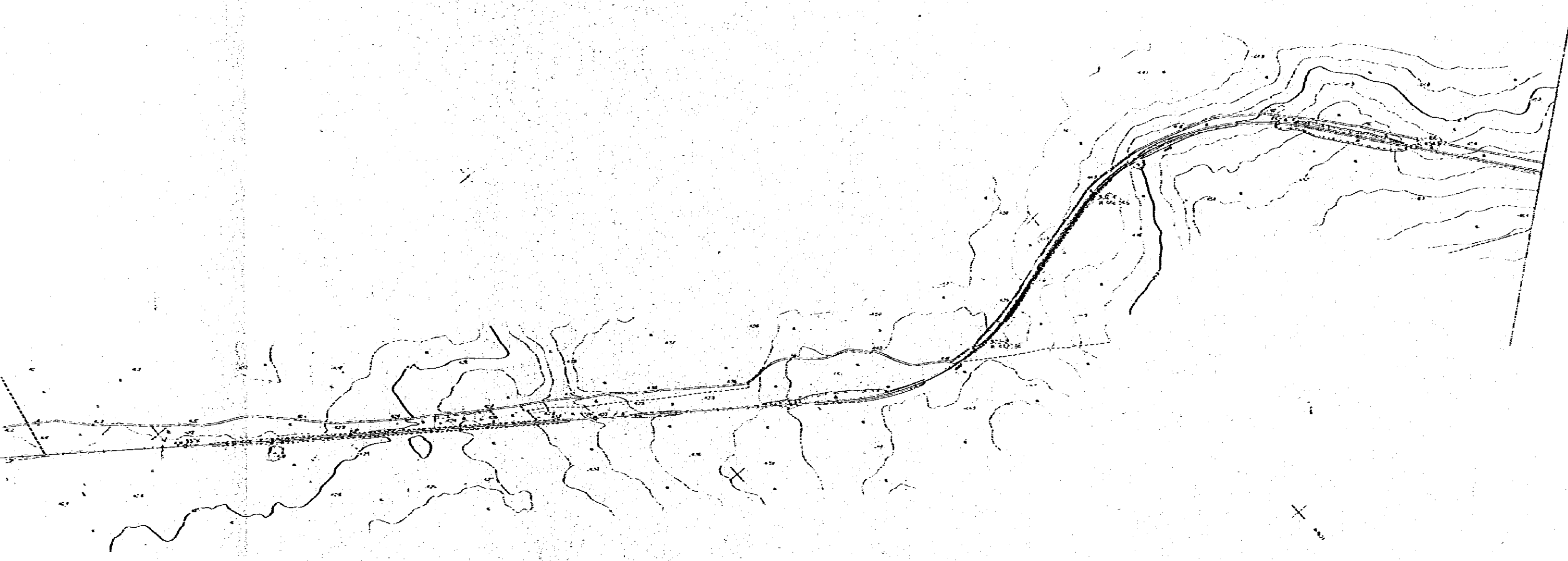


EMPRESA NACIONAL DE FERROCARRILES RAILWAY REHABILITATION PROJECT (IPAS-ROBOS)		
<b>LOCATION MAP</b> S=1:250,000		
Executing Enterprise		
Drawn by Date	Checked by Date	Approved by Date
Contracting Enterprise		
Checked by Date	Approved by Date	5

1 : 5000  
BOLIVIA

# RAILWAY REHABILITATION PROJECT (IPIAS-ROB)





EMPRESA NACIONAL DE FERROCARRILES  
 RAILWAY REHABILITATION PROJECT (IPIAS-ROBORE)

**ROADWAY PLAN**  
 (Sheet 1 of 9)  
 S=1:5,000

Executing Enterprise

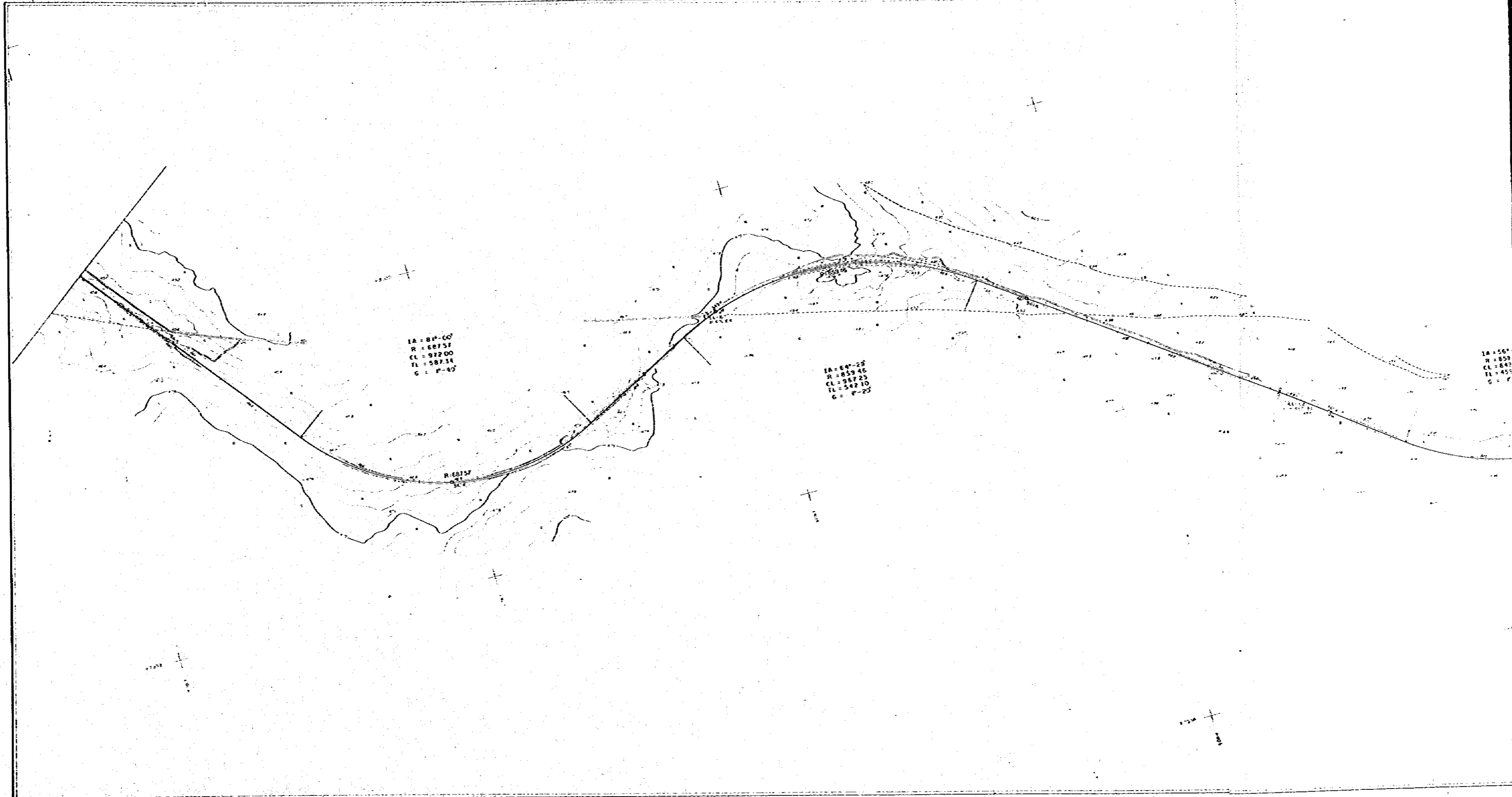
Drawn by Date	Checked by Date	Approved by Date
Contracting Enterprise		
Checked by Date	Approved by Date	No. 6

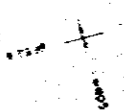
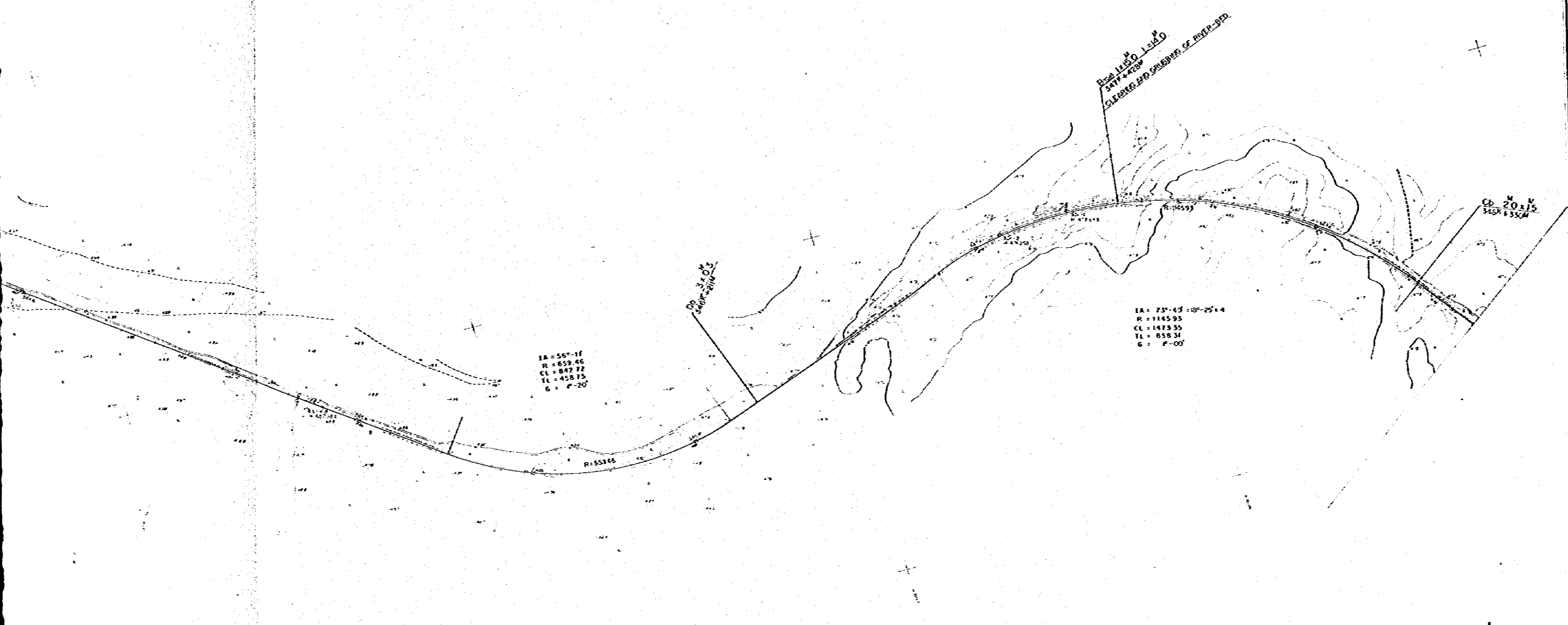
SCALE 1:5,000 METERS

- 1. Photography ..... July 1979
- 2. Restitution ..... September 1981
- 3. Ground control survey ..... June 1981
- 4. Field identification ..... June 1981

1 : 5000  
BOLIVIA

# RAILWAY REHABILITATION PROJECT (IPIAS-ROB)





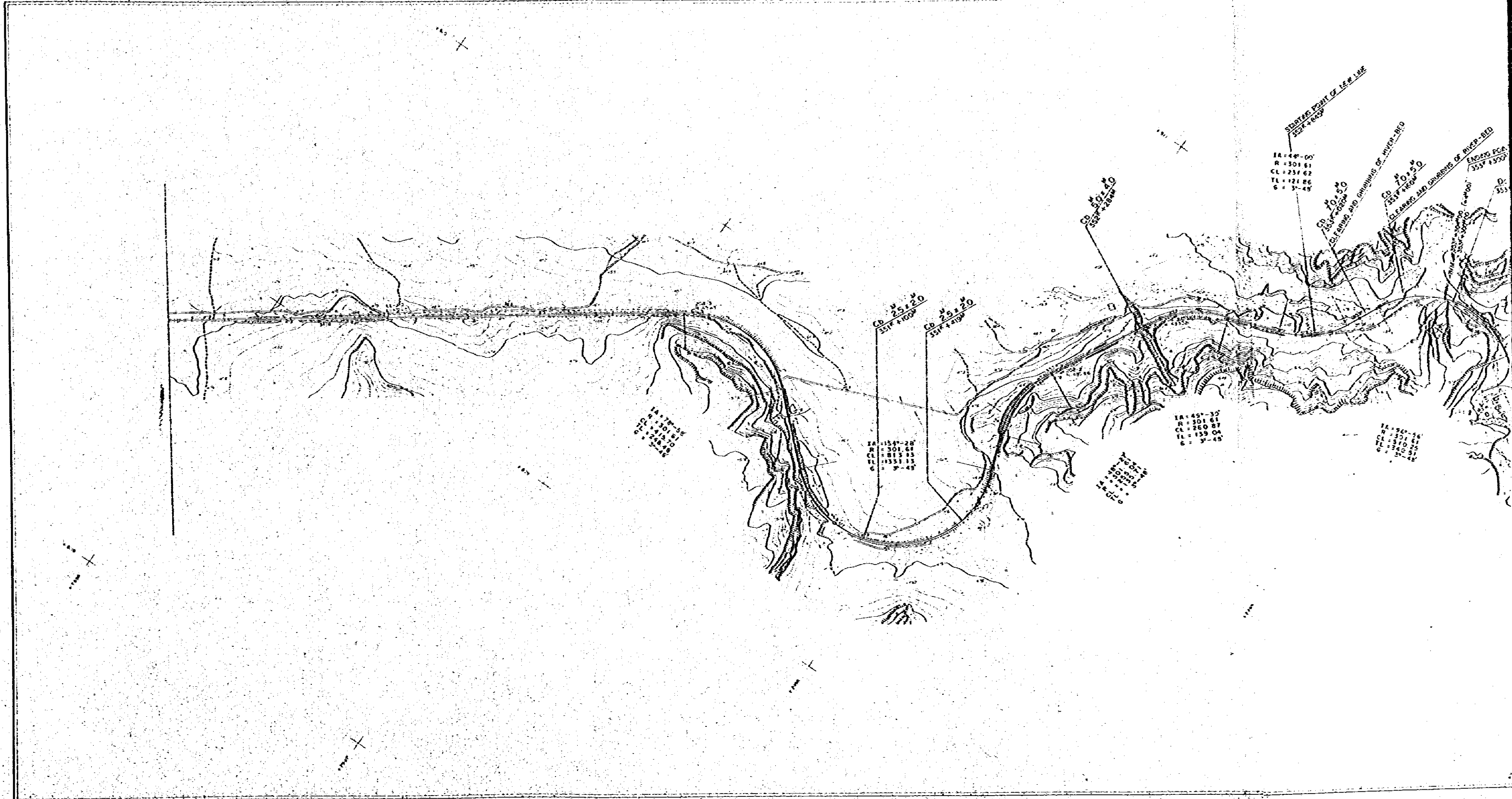
SCALE 1:5,000 METERS

EMPRESA NACIONAL DE FERROCARRILES RAILWAY REHABILITATION PROJECT (IPIAS-ROBORE)		
ROADWAY PLAN (Sheet 2 of 9) S=1:5000		
Executing Enterprise		
Drawn by Date	Checked by Date	Approved by Date
Contracting Enterprise		
Checked Date	Approved by Date	7

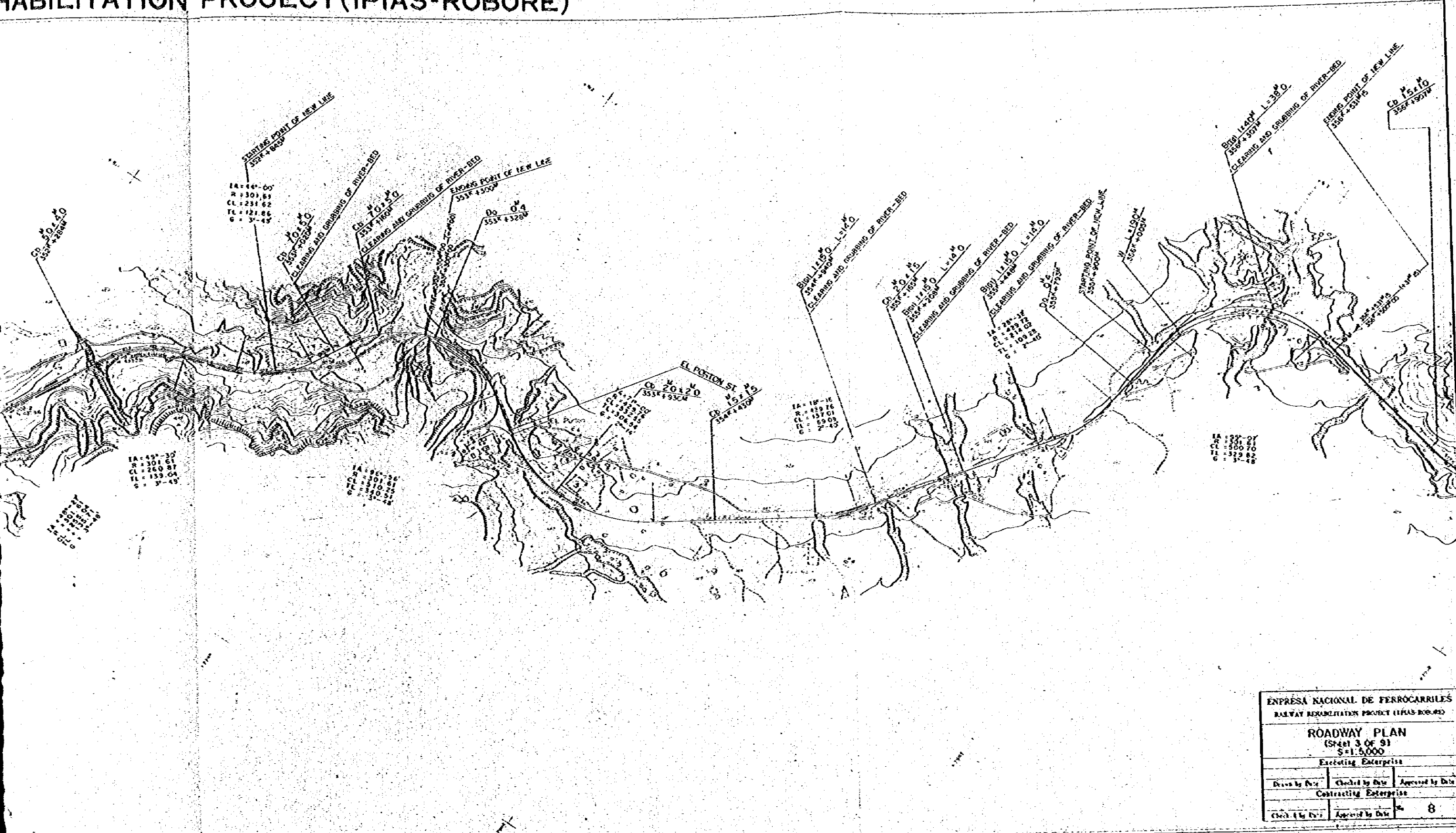
- 1 Photography ..... July 1981
- 2 Restoration ..... September 1981
- 3 Ground control survey ..... June 1981
- 4 Field description ..... June 1981

1 : 5000  
BOLIVIA

# RAILWAY REHABILITATION PROJECT (IPIAS-ROE)



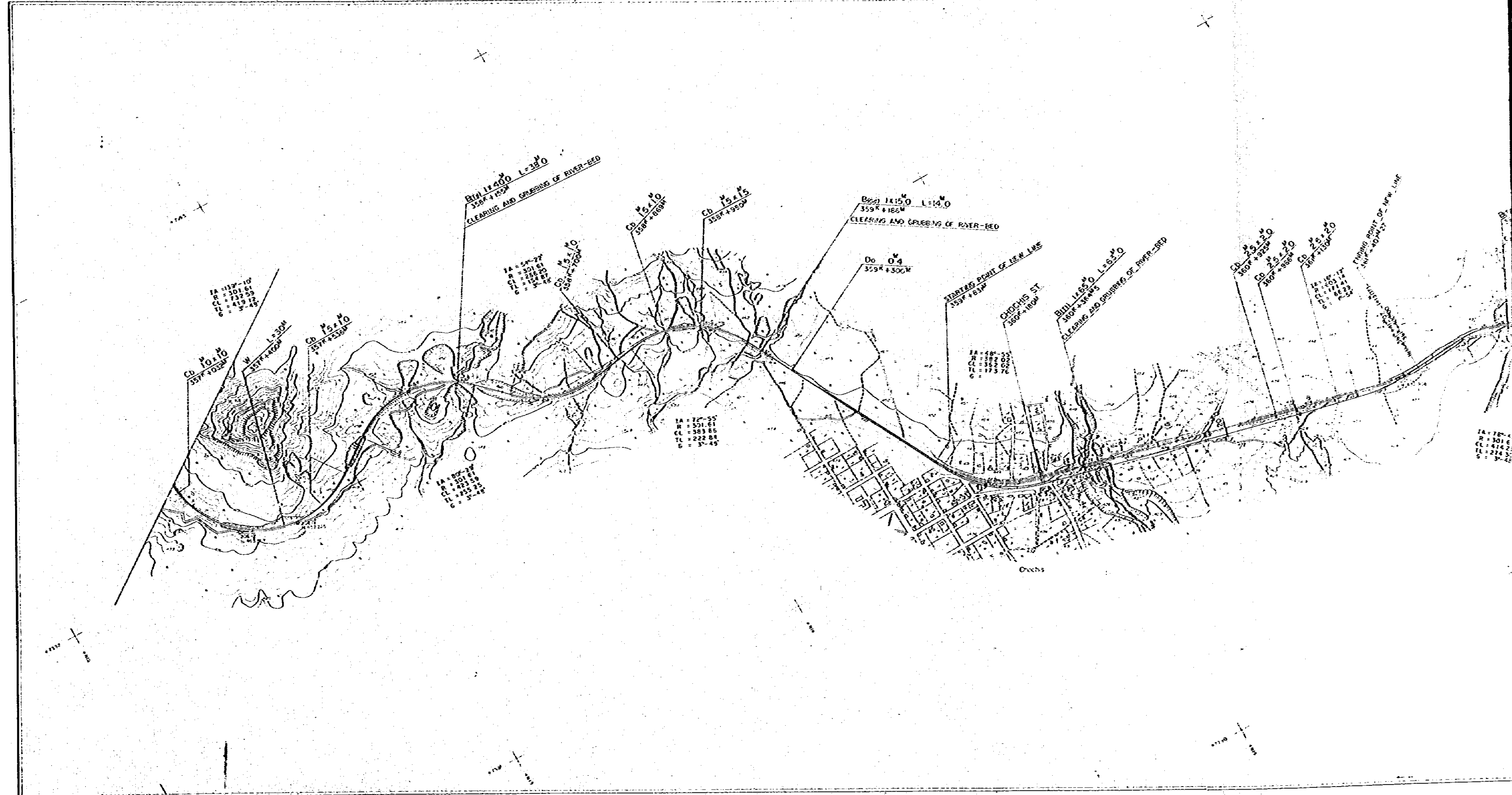




**EMPRESA NACIONAL DE FERROCARRILES**  
 RAILWAY REHABILITATION PROJECT (IPIAS-ROBORE)  
**ROADWAY PLAN**  
 (Sheet 3 of 9)  
 S=1:5000  
 Executing Enterprise  
 Drawn by Date Checked by Date Approved by Date  
 Contracting Enterprise  
 Checked by Date Approved by Date 8

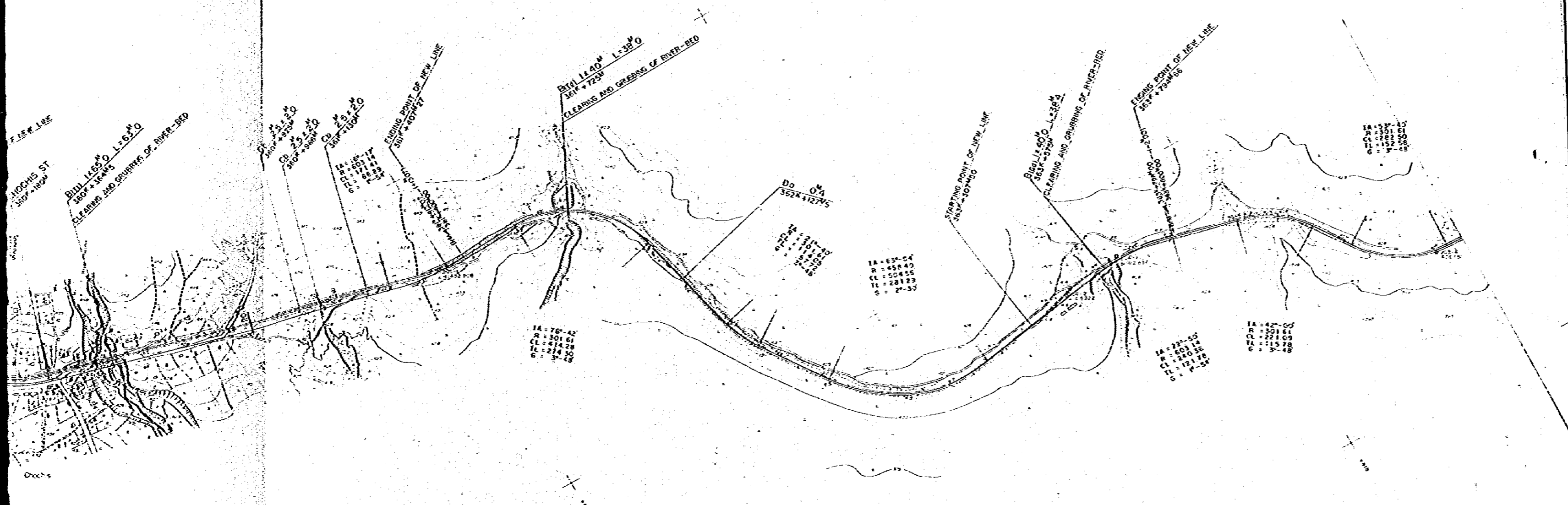
- 1. Photography ..... July 1979
- 2. Restitution ..... September 1981
- 3. Ground control survey ..... June 1981
- 4. Field observations ..... June 1981

SCALE: 1:5,000 METERS



# REHABILITATION PROJECT (IPIAS-ROBORE)

NO. 4

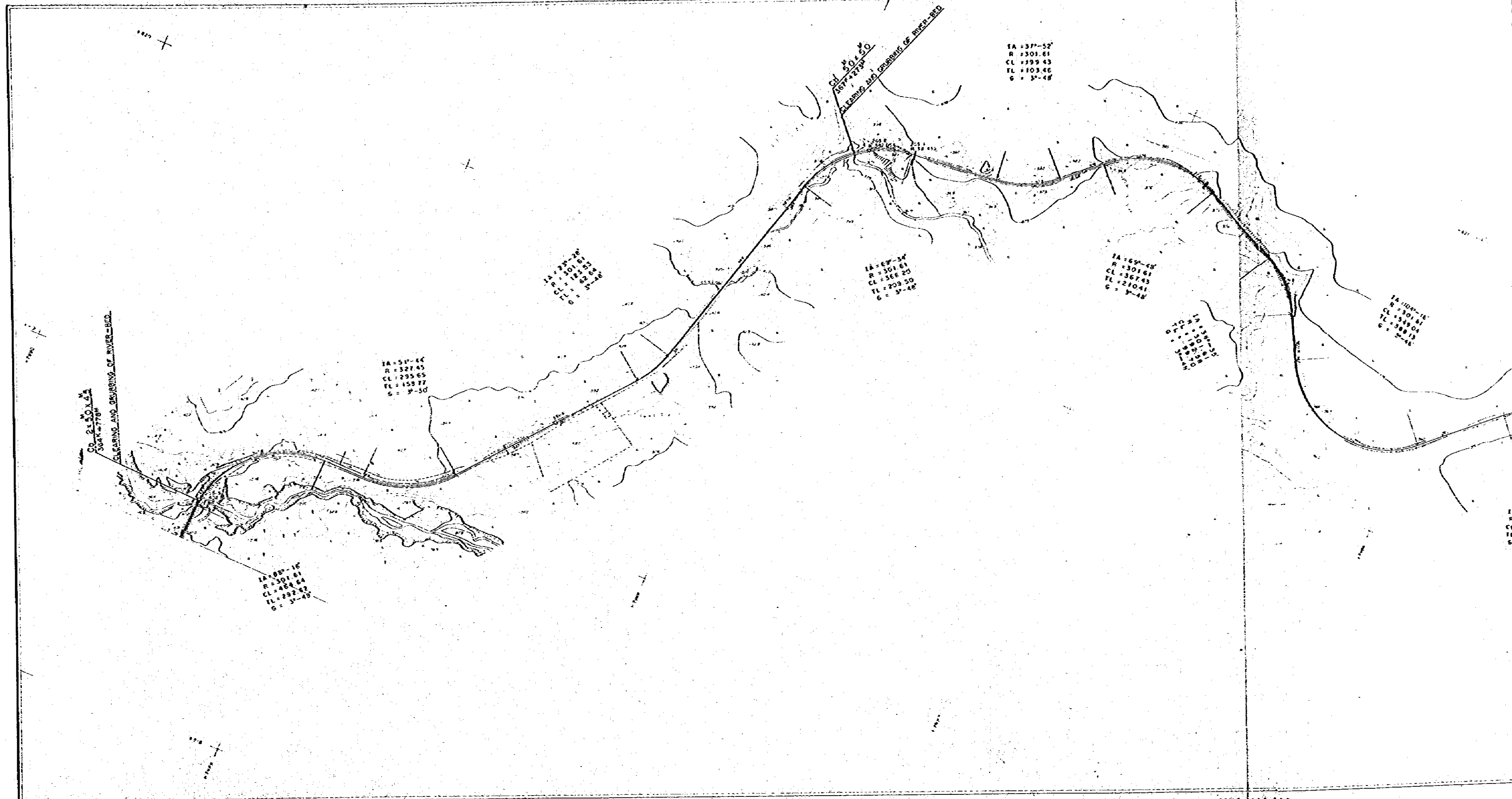


EMPRESA NACIONAL DE FERROCARRILES RAILWAY REHABILITATION PROJECT (IPIAS-ROBORE)		
<b>ROADWAY PLAN</b> (Sheet 4 of 9) S=1:5,000		
Executing Enterprise		
Drawn by Date	Checked by Date	Approved by Date
Contracting Enterprise		
Checked by Date	Approved by Date	9

1. Photography ..... July 1979
2. Restitution ..... September 1981
3. Ground control survey ..... June 1981
4. Field identification ..... June 1981

1 : 5000  
BOLIVIA

# RAILWAY REHABILITATION PROJECT (IPIAS-ROB)



# REHABILITATION PROJECT (IPIAS-ROBORE)

NO. 5

EA = 37°-52'  
R = 301.61  
CL = 199.43  
TL = 103.46  
G = 3°-48'

EA = 69°-48'  
R = 301.61  
CL = 367.43  
TL = 210.41  
G = 3°-48'

EA = 105°-18'  
R = 301.61  
CL = 549.04  
TL = 388.13  
G = 3°-48'

EA = 26°-40'  
R = 301.61  
CL = 140.37  
TL = 71.48  
G = 3°-48'

EA = 11°-36'  
R = 301.61  
CL = 613.78  
TL = 488.35  
G = 3°-48'

EA = 60°-12'  
R = 301.61  
CL = 211.61  
TL = 110.37  
G = 3°-48'

EA = 83°-32'  
R = 301.61  
CL = 439.72  
TL = 262.38  
G = 3°-48'

EA = 33°-00'  
R = 301.61  
CL = 173.71  
TL = 89.34  
G = 3°-48'

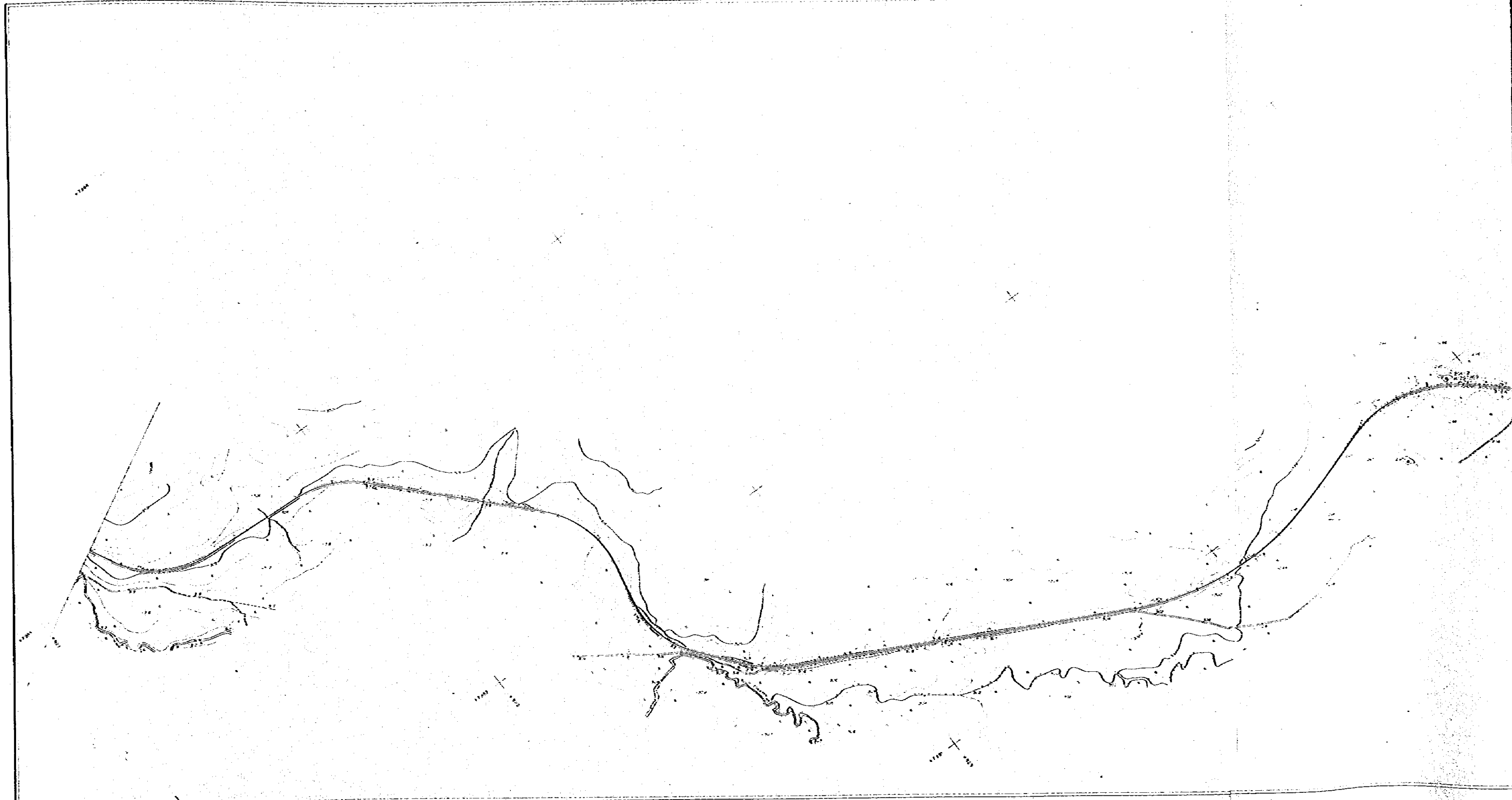
EMPRESA NACIONAL DE FERROCARRILES RAILWAY REHABILITATION PROJECT (IPIAS-ROBORE)		
<b>ROADWAY PLAN</b> (Sheet 5 of 9) Set: 5000		
Executing Enterprise		
Drawn by Date	Checked by Date	Approved by Date
Contracting Enterprise		
Checked by Date	Approved by Date	10

- 1. Photography ..... July 1979
- 2. Planimetry ..... September 1981
- 3. Ground control survey ..... June 1981
- 4. Field verification ..... June 1981

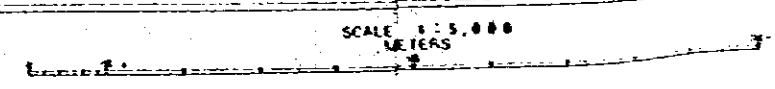
SCALE 1:5000

1 : 5000  
BOLIVIA

# RAILWAY REHABILITATION PROJECT (IPIAS-ROB)

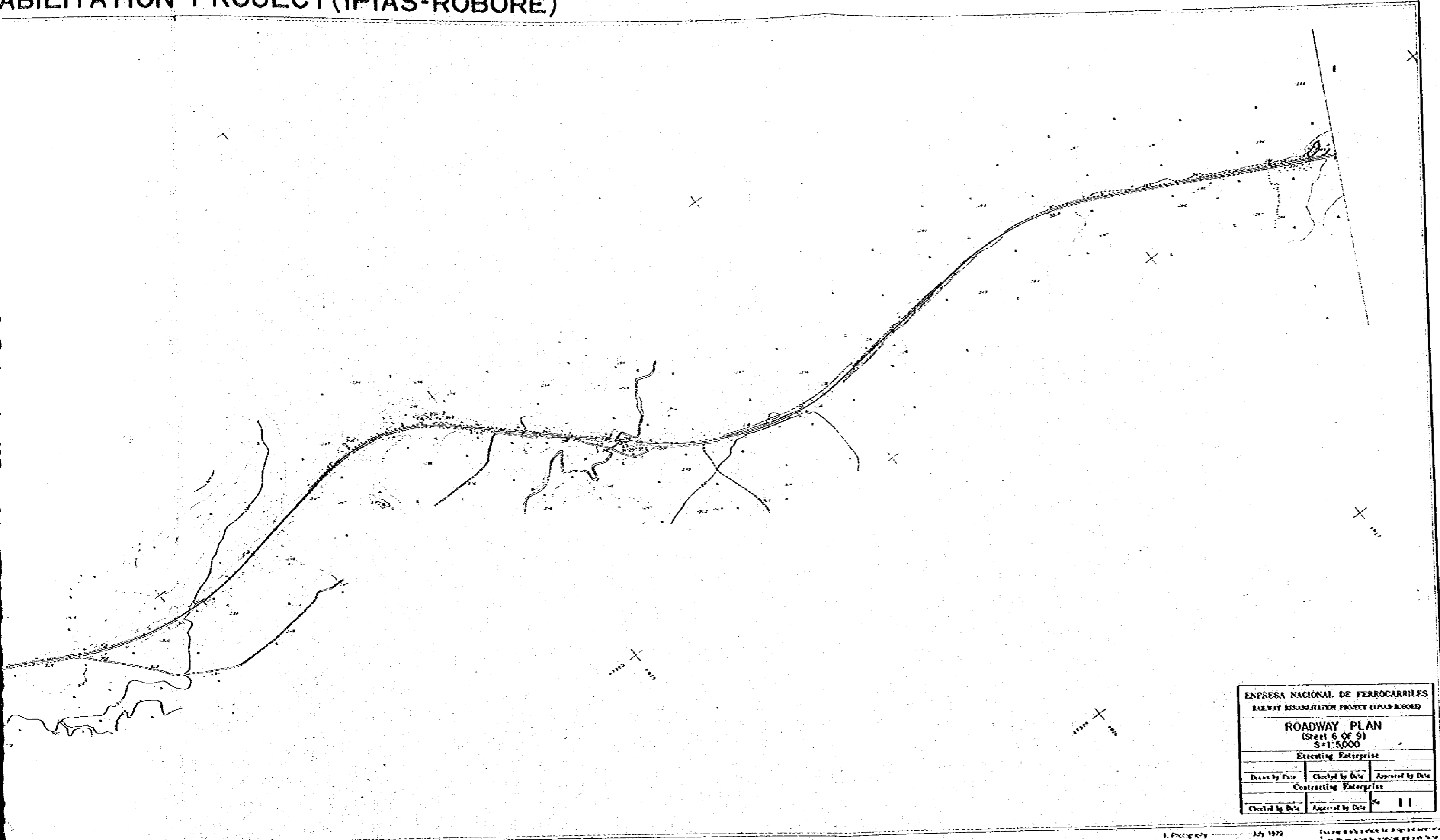


NO.6 JAPAN INTERNATIONAL COOPERATION AGENCY



# REHABILITATION PROJECT (IPIAS-ROBORE)

NO. 6



**EMPRESA NACIONAL DE FERROCARRILES**  
**RAILWAY REHABILITATION PROJECT (IPIAS-ROBORE)**  
**ROADWAY PLAN**  
 (Sheet 6 OF 9)  
 S=1:5,000

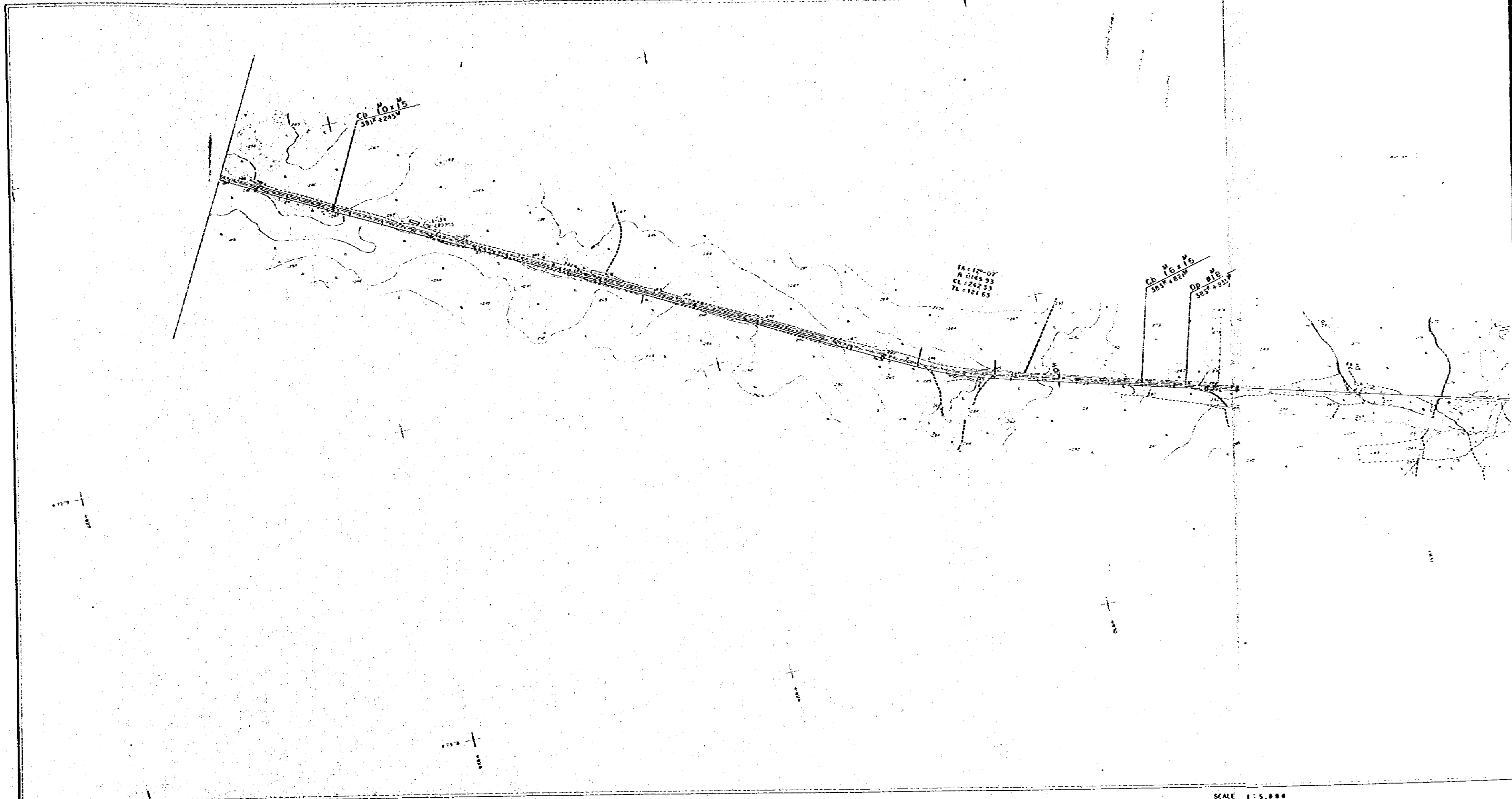
Executing Enterprise		
Drawn by Date	Checked by Date	Approved by Date
Contracting Enterprise		
Checked by Date	Approved by Date	No. 11

SCALE 1:5,000 METERS

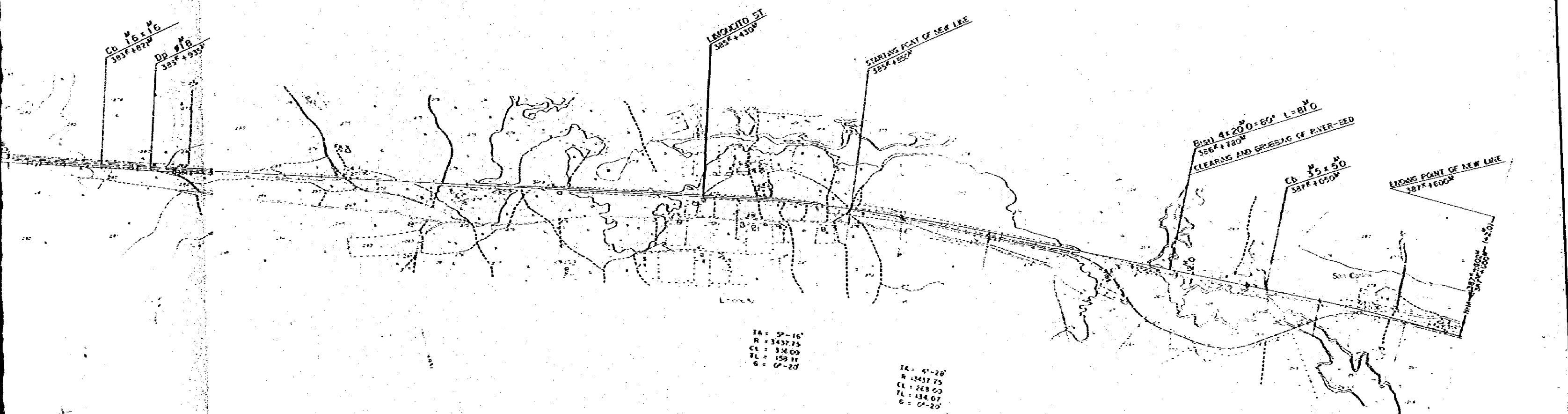
- 1. Photography ..... July 1951
- 2. Reconnaissance ..... September 1951
- 3. Ground control survey ..... June 1951
- 4. Field distribution ..... June 1951

1 : 5000  
BOLIVIA

# RAILWAY REHABILITATION PROJECT (IPIAS-ROBO)







TA = 5°-16'  
 R = 3437.75  
 CL = 336.00  
 TL = 158.11  
 G = 0°-20'

TA = 4°-28'  
 R = 3437.75  
 CL = 288.00  
 TL = 134.07  
 G = 0°-20'

TA = 4°-02'  
 R = 3437.75  
 CL = 242.00  
 TL = 121.00  
 G = 0°-20'

EMPRESA NACIONAL DE FERROCARRILES  
 RAILWAY REHABILITATION PROJECT (IPIAS-ROBORE)

**ROADWAY PLAN**  
 (Sheet 7 of 9)  
 S=1:5,000

Executing Enterprise

Drawn by Date	Checked by Date	Approved by Date
Controlling Enterprise		
Checked by Date	Approved by Date	No. 12

SCALE 1:5,000  
 METERS

- 1. Planning July 1979
- 2. Restoration September 1981
- 3. Ground control survey June 1981
- 4. Field identification June 1981

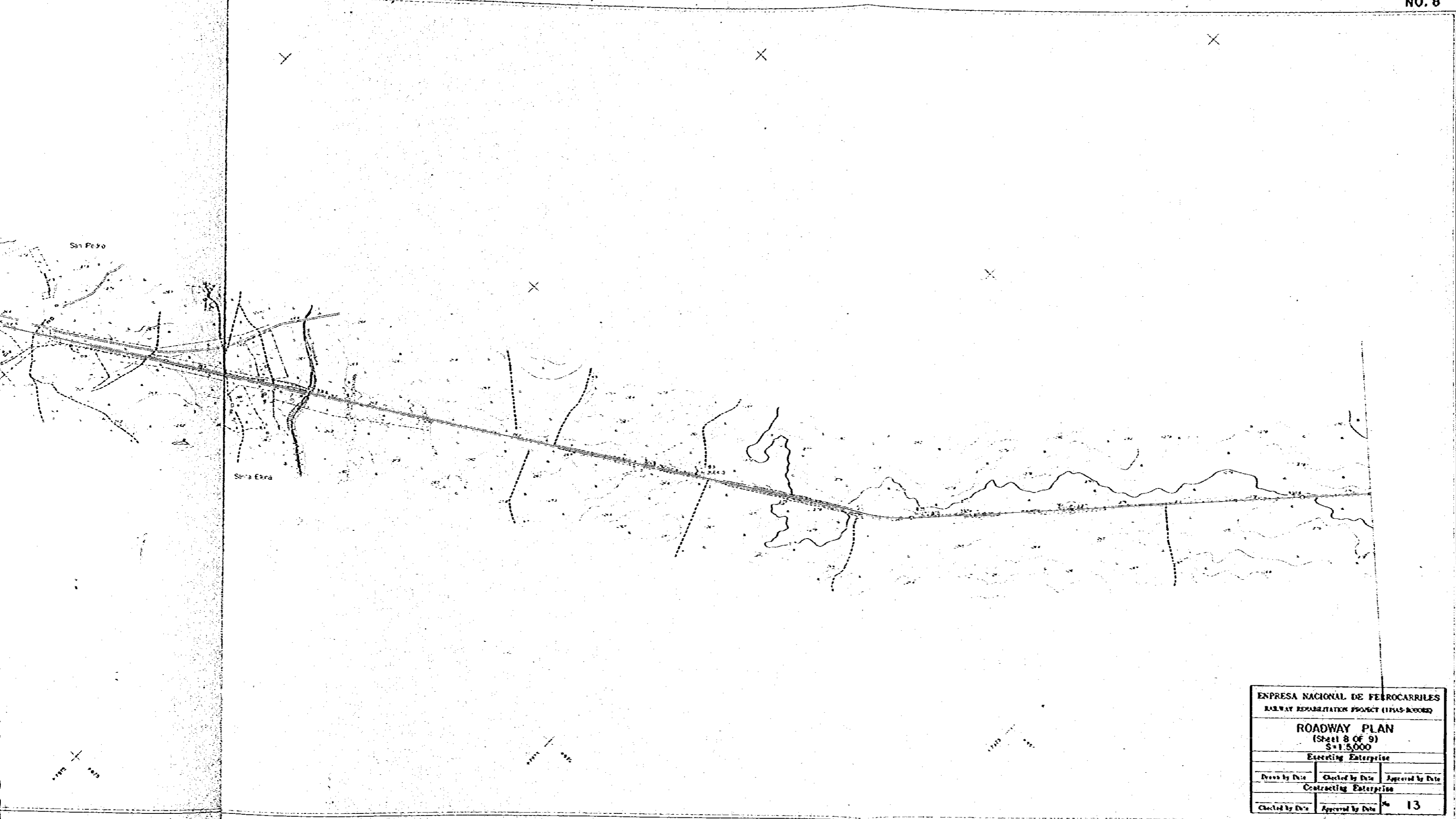
: 5000  
BOLIVIA

# RAILWAY REHABILITATION PROJECT (IPIAS-ROE)



# REHABILITATION PROJECT (IPIAS-ROBORE)

NO. 8



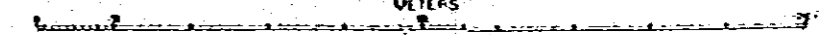
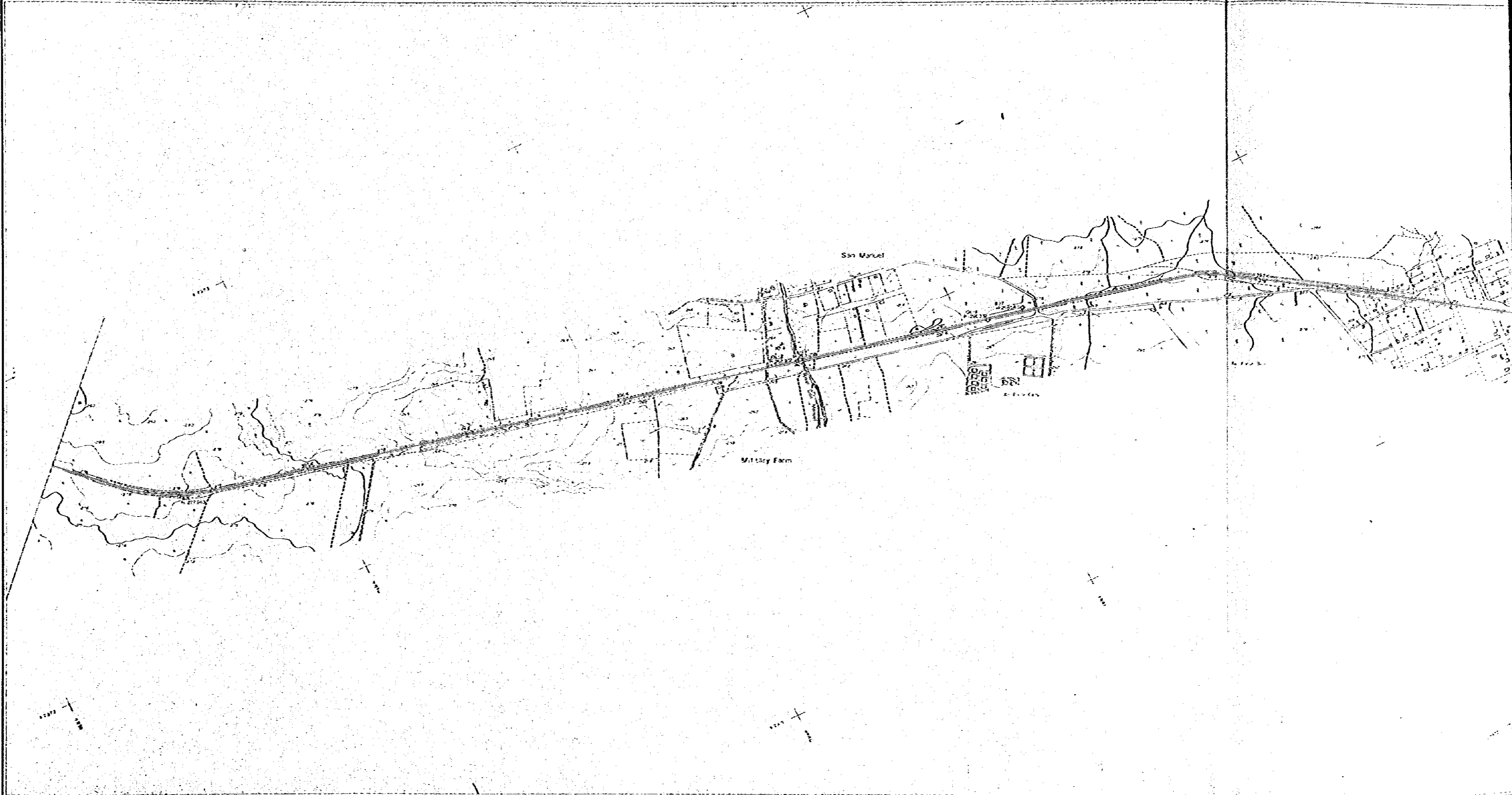
SCALE 1:5,000  
METERS

<b>EMPRESA NACIONAL DE FERROCARRILES</b> RAILWAY REHABILITATION PROJECT (IPIAS-ROBORE)		
<b>ROADWAY PLAN</b> (Sheet 8 of 9) S=1:5,000		
Executing Enterprise		
Drawn by Date	Checked by Date	Approved by Date
Contracting Enterprise		
Checked by Date	Approved by Date	13

- 1. Photography ..... July 1979
- 2. Reconnaissance ..... September 1981
- 3. Ground control survey ..... June 1981
- 4. Field identification ..... June 1981

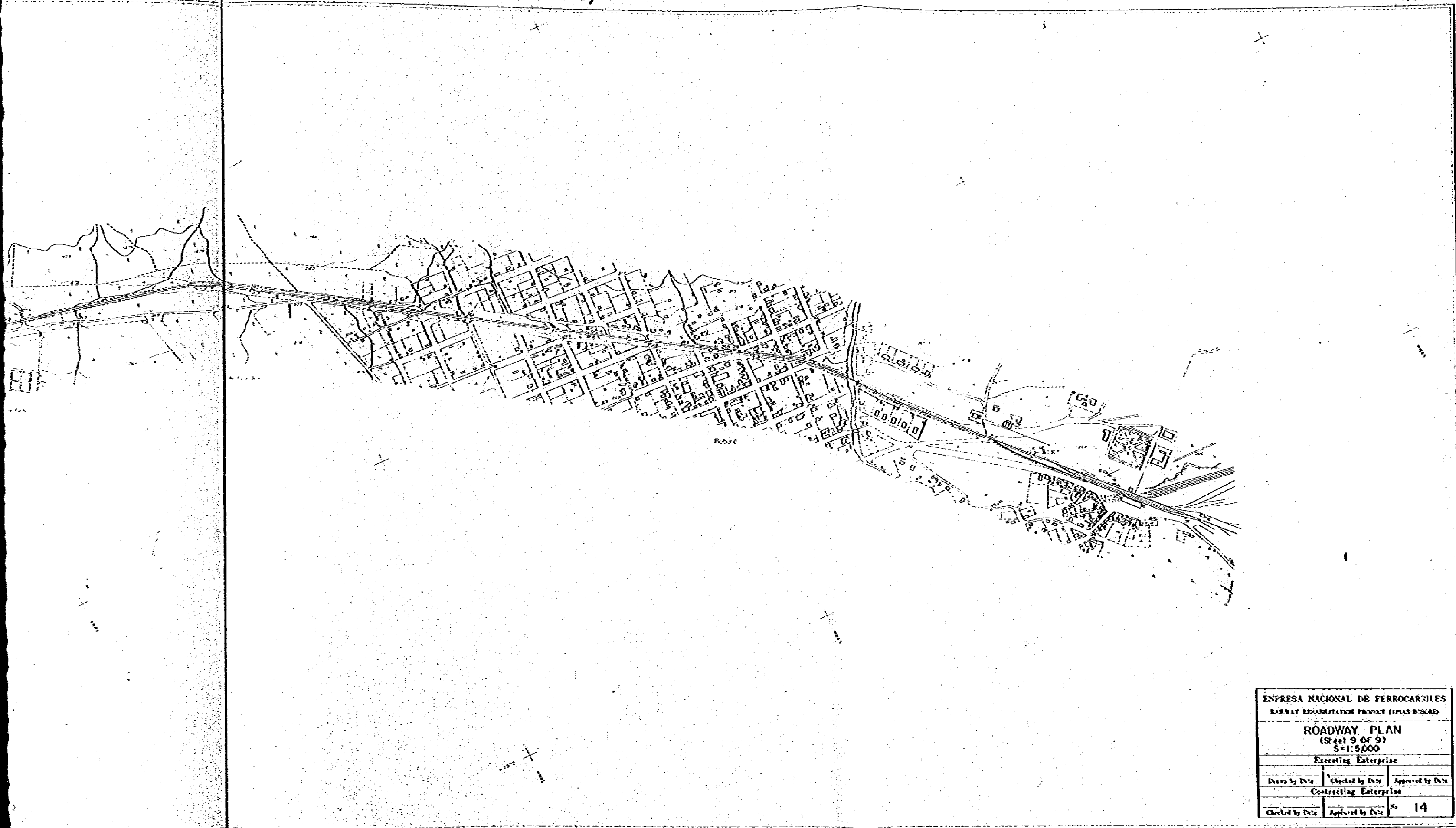
1 : 5000  
BOLIVIA

# RAILWAY REHABILITATION PROJECT (IPIAS-ROB)



# REHABILITATION PROJECT (IPIAS-ROBORE)

NO. 9



<b>EMPRESA NACIONAL DE FERROCARRILES</b> RAILWAY REHABILITATION PROJECT (IPIAS-ROBORE)		
<b>ROADWAY PLAN</b> (Sheet 9 of 9) S=1:5,000		
Executing Enterprise		
Drawn by Date	Checked by Date	Approved by Date
Contracting Enterprise		
Checked by Date	Approved by Date	No. 14

- 1. Photography ..... July 1979
- 2. Position ..... September 1981
- 3. Ground control survey ..... June 1981
- 4. Field verification ..... June 1981

SCALE 1:5,000