

LEVELLING ROUTE

ΔZS124-#6-#5

1328 31

124723

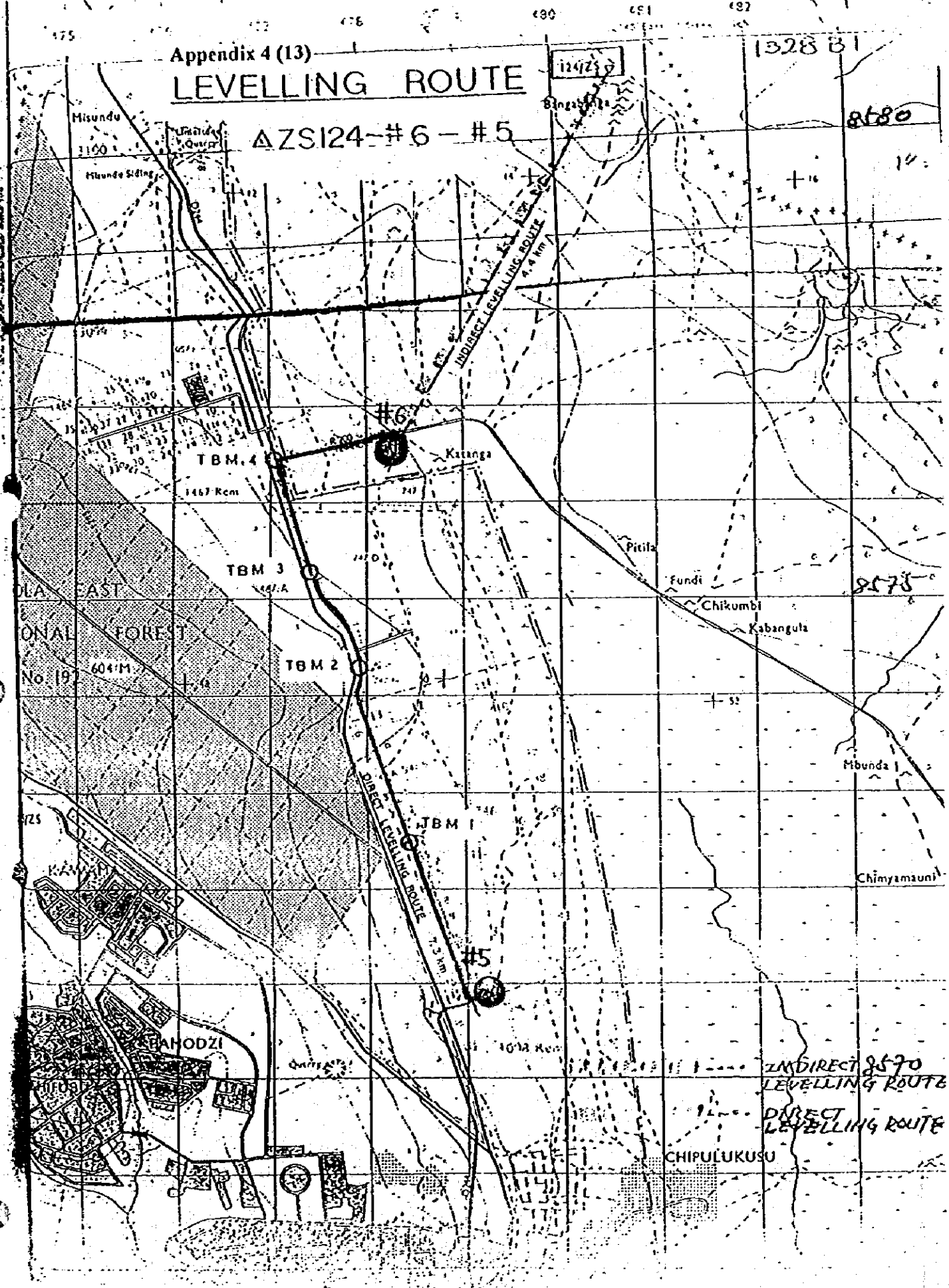
8580

8575

INDIRECT 8570
LEVELLING ROUTE

DIRECT
LEVELLING ROUTE

CHIPULUKUSU



Appendix 4 (14)

FILE:NV

DESCRIPTION

date: 22 JULY, 1994 weather: FINE			
STATION	Δ ZS 124	1/50,000	1228 D3
		1/250,000	SD - 35 - 4
HEIGHT	H= 1,328.740	surveyor	/
		instrument	
CO-ORDINATE	E= 680,628.330 N= 8580,706.680	surveyor	
		instrument	

Sketch.

Name of Village.

FILE:NV

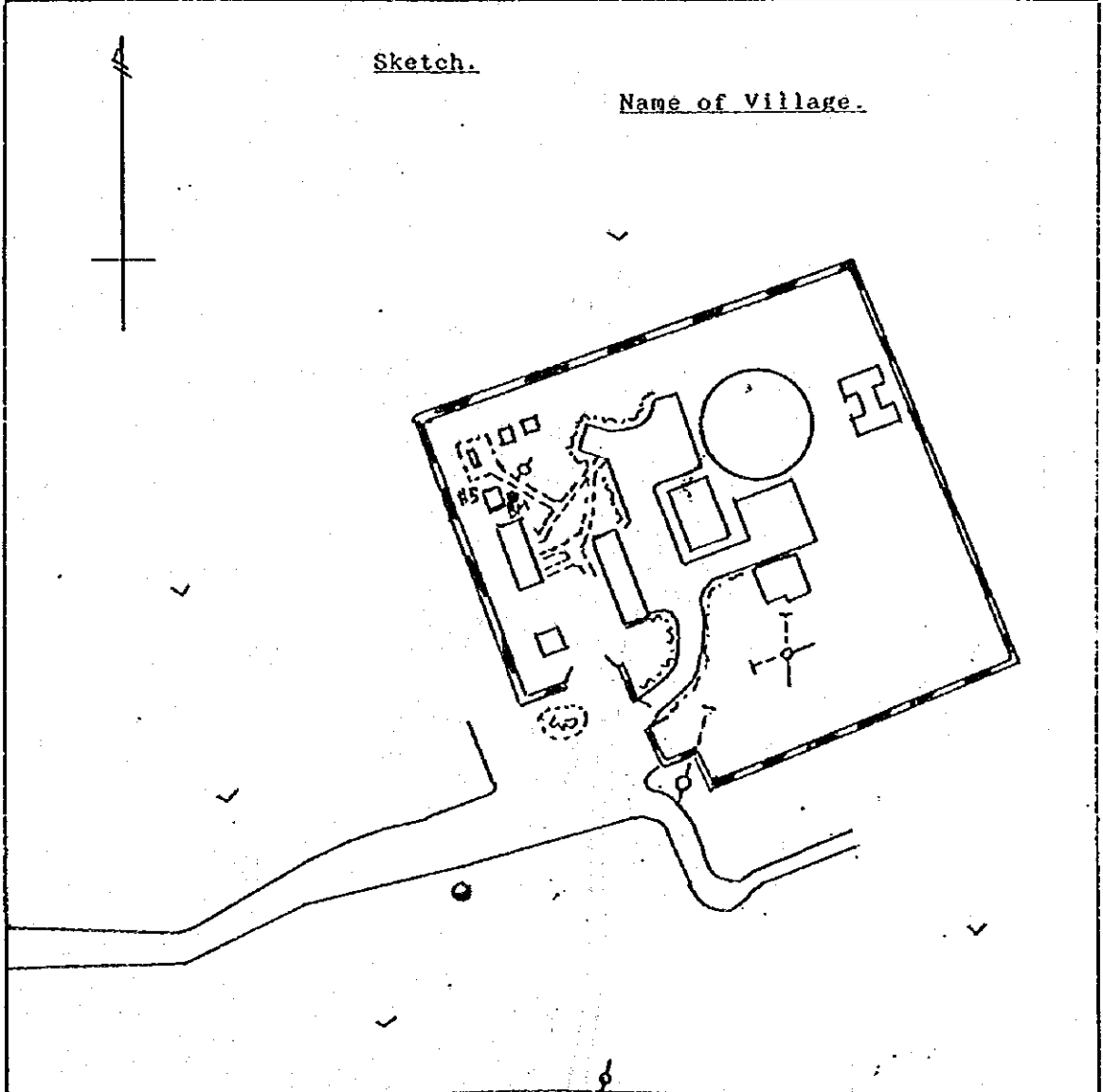
JICA STUDY TEAM.

Appendix 4 (15)

FILE:NV

DESCRIPTION

date: 22 JUL 1994 weather:			
STATION	# 5 BM	1/50,000	1228 D3
		1/250,000	SD - 35 - 4
HEIGHT	H= 1252. ⁸⁰⁹ 899 ✓	surveyor	KODY - A.W.
		instrument	NA 2
CO-ORDINATE	E= 609,057 N= 8570,930	surveyor	
		instrument	ENSIGN GPS



FILE:NV

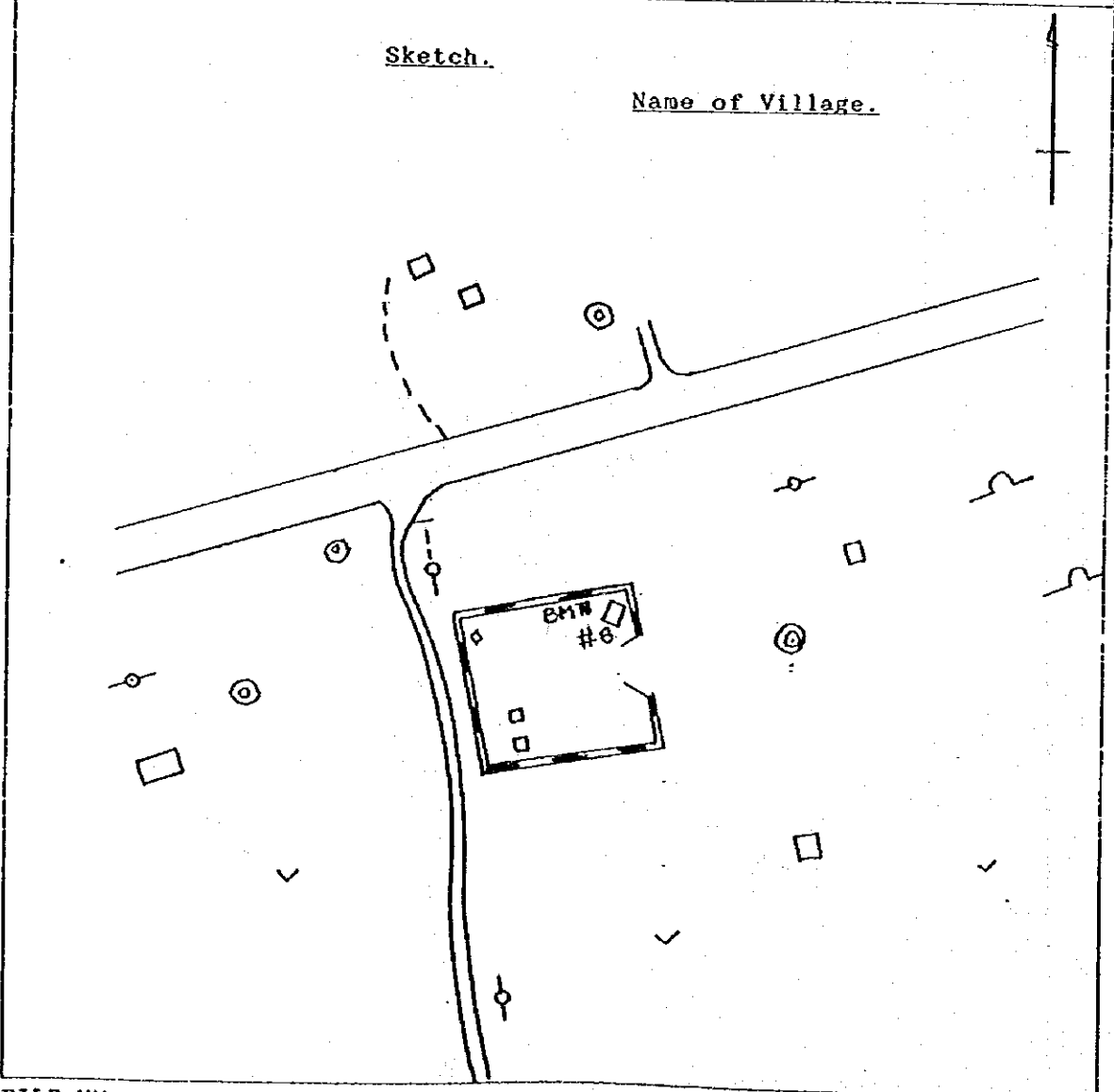
JICA STUDY TEAM.

Appendix 4 (16)

FILE:NV

DESCRIPTION

date: 22 JULY 1994 weather: FINE			
STATION	# 6 BM	1/50,000	1228 D3
		1/250,000	SD - 35 - 4
HEIGHT	H= 1,246.99	surveyor	KODY . A . W.
		instrument	BAROMETER
CO-ORDINATE	E= 678,057 N= 8576,721	surveyor	
		instrument	ENSIGN GPS



FILE:NV

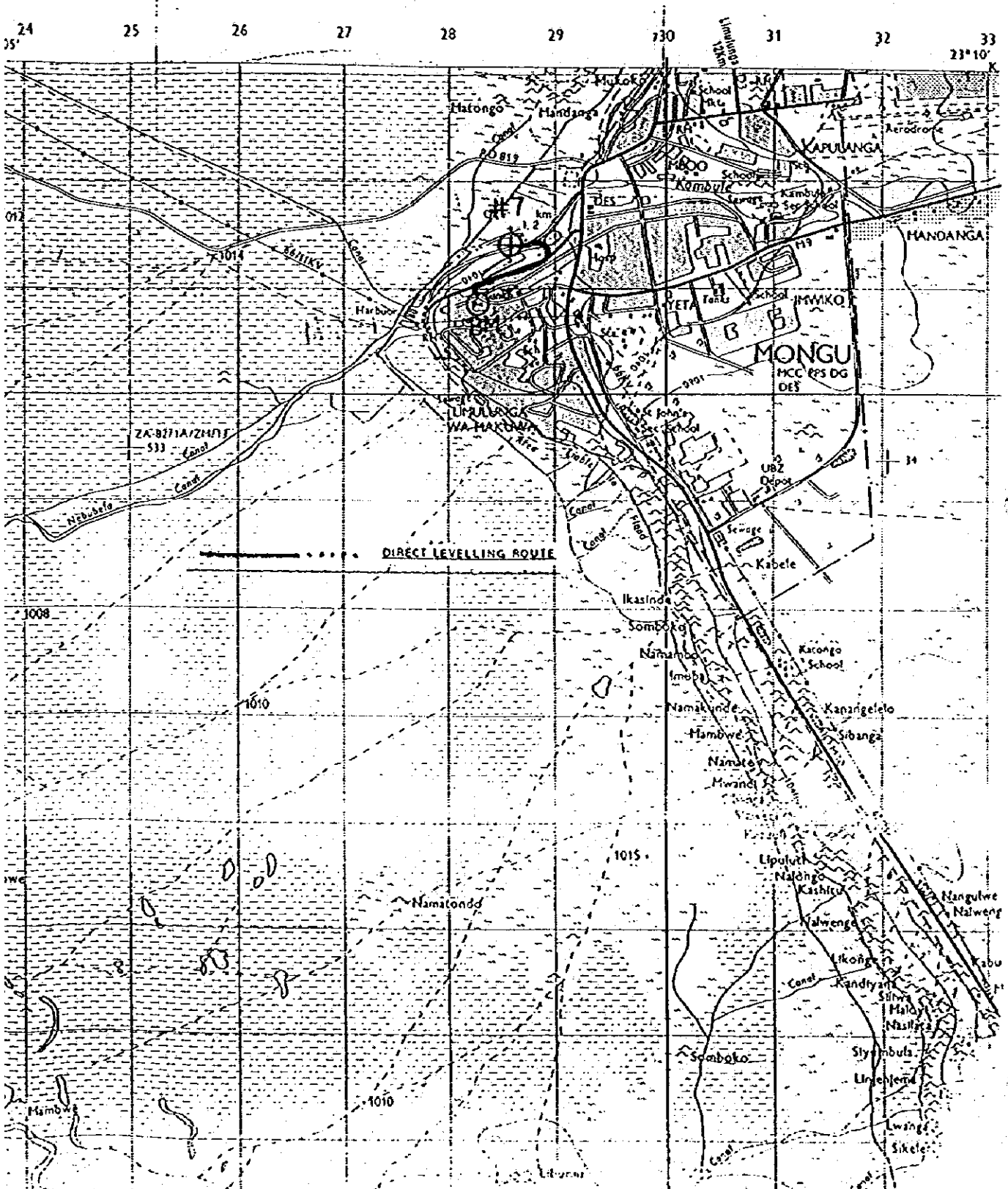
JICA STUDY TEAM.

Appendix 4 (17)

- #7 IN MONGU

LEVELLING ROUTE

REPUBLIC OF AMBIA # 44FI - # 7

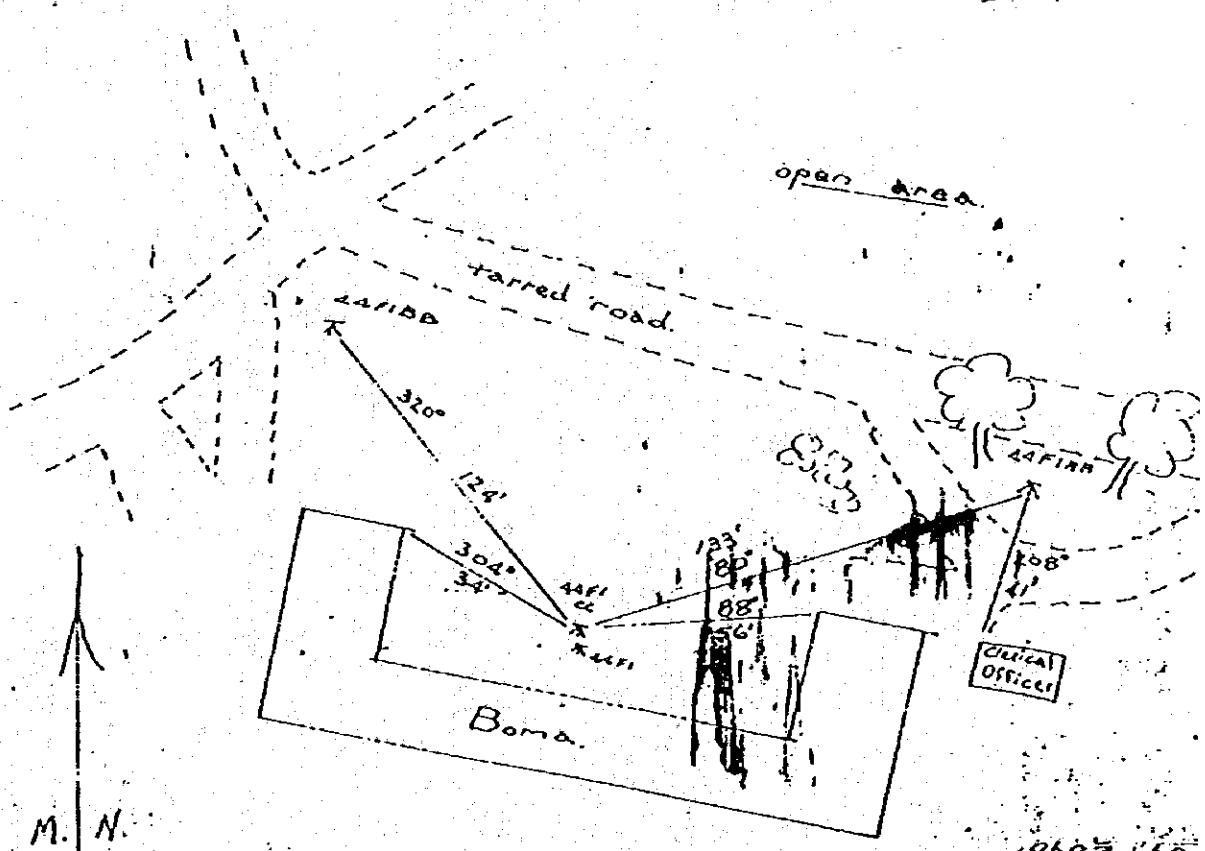


FUNDAMENTAL / MAIN BENCH MARK LOCALITY SKETCHES

Route Number 44 Locality Barotseland Monga
 Bench mark No. 44 F1 CC consists of a brass plug set in conc. foundation 4' deep x 2' x 2' below ground level, enclosed in a cast iron box and surmounted by a 2ft. high cairn.
 Bench mark No. 44 F1 CC consists of a brass plug set in conc. foundation 2'6" deep x 4' x 4' below ground level enclosed in a cast iron box and surmounted by a 2ft. high cairn.
 Bench mark No. 44 F1 consists of a brass plug set in conc. pillar 18" high x 12" diameter painted white on a concrete foundation 3' deep x 2' x 2'.

650

E = 728,189
 N = 8310,882

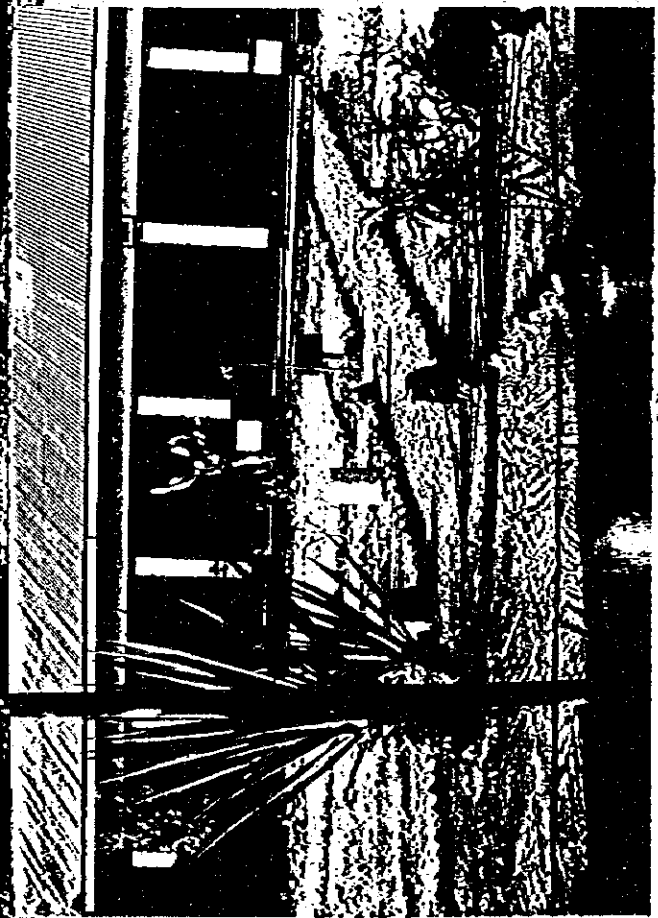


H = 1053.676 /

23.10.66

1958年 5月
 68
 78
 92
 大水
 1958年 10月
 10月 12日
 1958年 10月
 1958年 10月

BENCH MARK T-App-23	U.T.M. GRID 21 840 000	10000	10000
------------------------	---------------------------	-------	-------



T-App.-24

44 F 1

Appendix 4 (21)

FILE:NV

DESCRIPTION

date: 9 AUG. 1994 weather: FINE			
STATION	# 7 BM	1/50,000	1523 A 1
		1/250,000	SD-34-16
HEIGHT	H= 1,022.116	surveyor	KODY A.W.
		instrument	NA 2
CO-ORDINATE	E= 728.583 N= 8311 399	surveyor	
		instrument	ENSIGN GPS
<p>Sketch.</p> <p style="text-align: right;">Name of Village.</p>			

FILE:NV

JICA STUDY TEAM.

Appendix 5 (1)

WATER LEVEL GAUGING STATION

- **MFUWE G.S.**
 - Levelling Route Map
 - BM Description
 - Stuff gauge check data
 - River cross Section data
 - River cross section

- **CHAMBESHI G.S.**
 - Levelling Route Map
 - BM Description
 - Stuff gauge check data
 - River cross Section data
 - River cross section

- **CHEMBE FERRY G.S.**
 - Levelling Route Map (NEW, OLD STATION)
 - BM Description (NEW, OLD STATION)
 - Stuff gauge check data (NEW, OLD STATION)
 - River cross Section data (NEW, OLD STATION)
 - River cross section (NEW, OLD STATION)

Appendix 5 (2)

MFUWE G. S.

Appendix 5 (4)

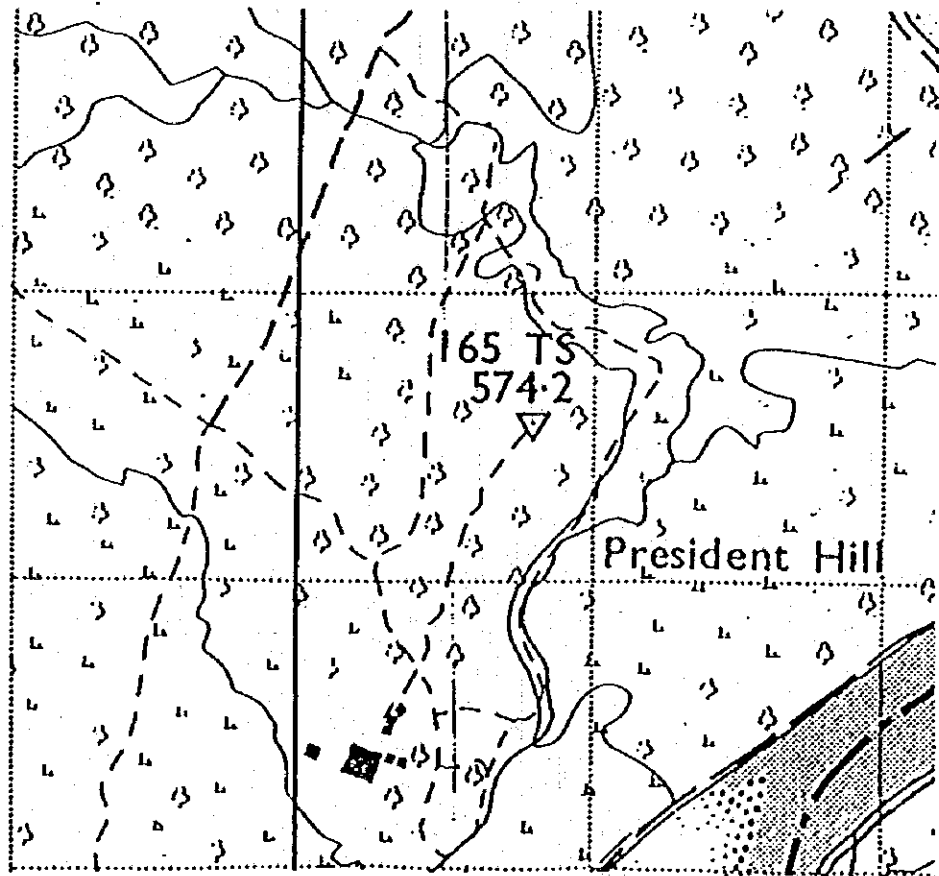
FILE:NV

DESCRIPTION

date: 21. 6. 19,94 weather:			
STATION	△ TS 165	1/50,000	1331 B 1
		1/250,000	SD-36-6
HEIGHT	H= 574.2	surveyor	/
		instrument	
CO-ORDINATE	E= 360,801.708	surveyor	
	N= 8545,548.360	instrument	

Sketch.

Name of Village.



FILE:NV

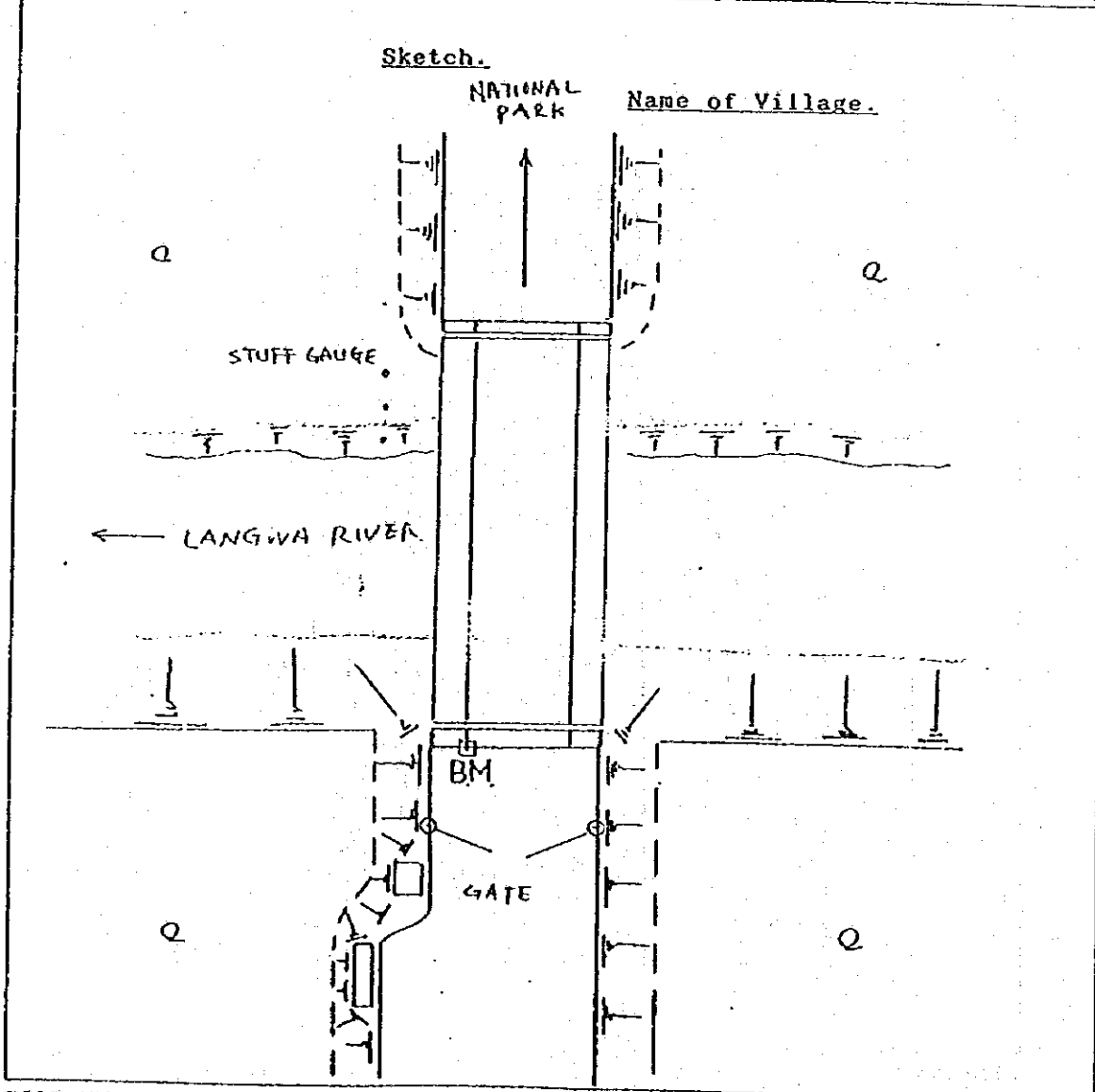
JICA STUDY TEAM.

Appendix 5 (5)

FILE:NV

DESCRIPTION

		date: 21.6.1994	weather:
STATION	MFUWE G.S. B.M.	1/50,000	1331 B 2
		1/250,000	SD-36-6
HEIGHT	H= 528.80	surveyor	KODY. A.W.
		instrument	BAROMETER
CO-ORDINATE	E= 368,310	surveyor	
	N= 8551,970	instrument	ENSIGN G.P.S.

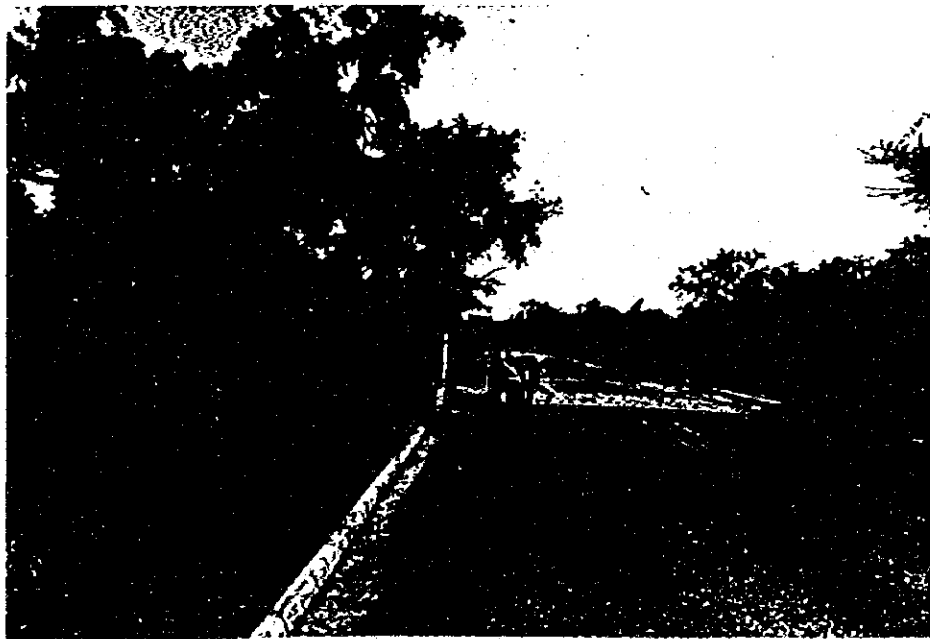
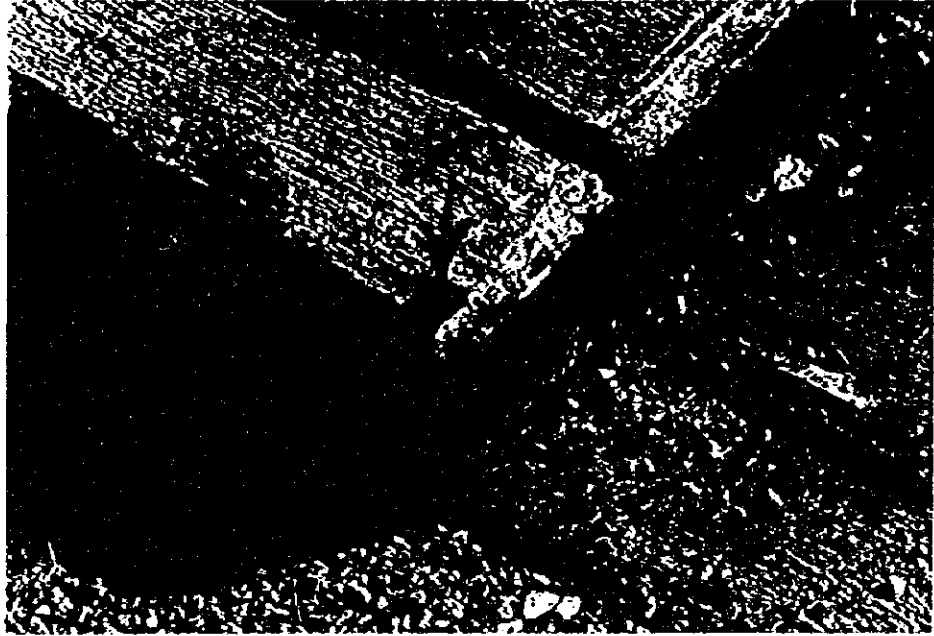


FILE:NV

JICA STUDY TEAM.

Appendix 5 (6)

MFUWE G.S. B.M.

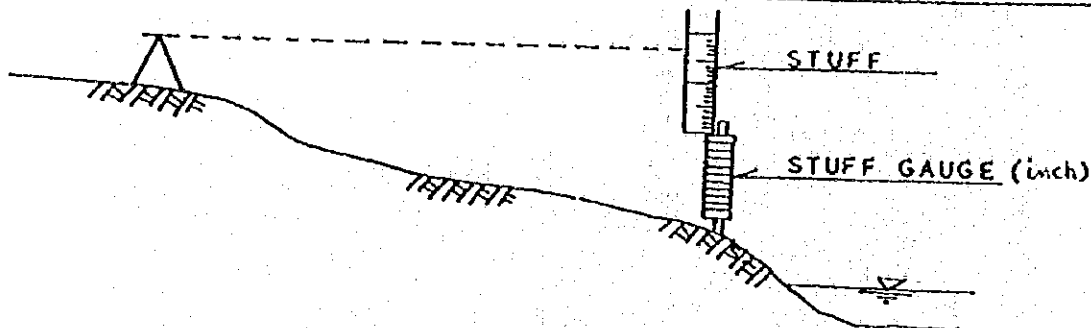
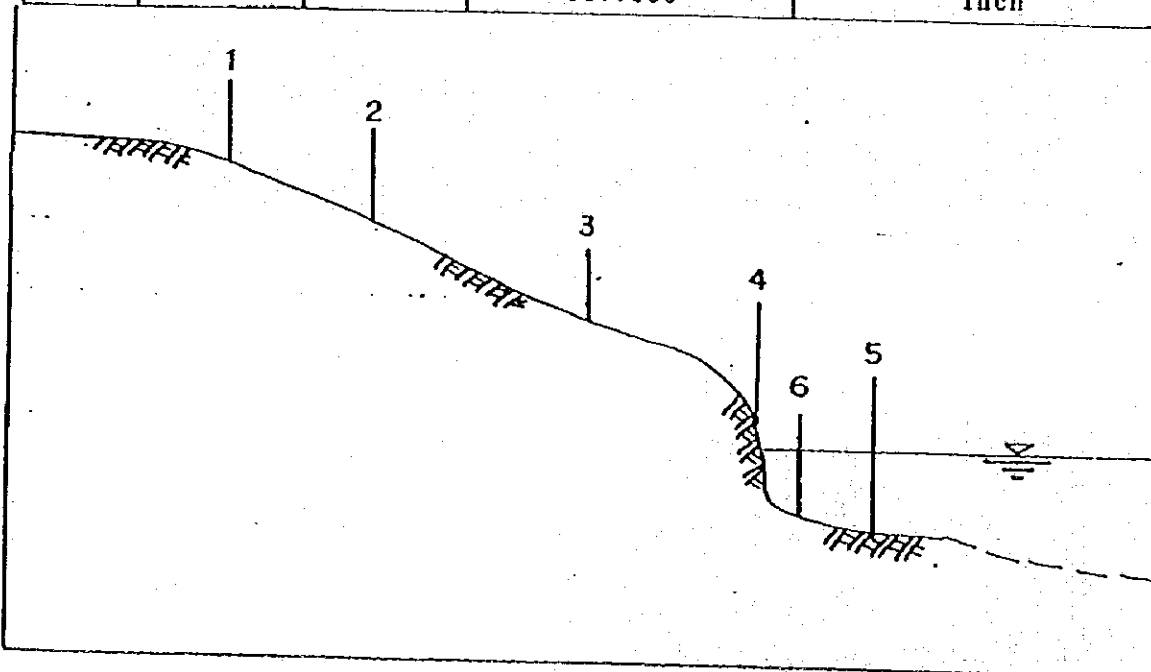


Appendix 5 (7)

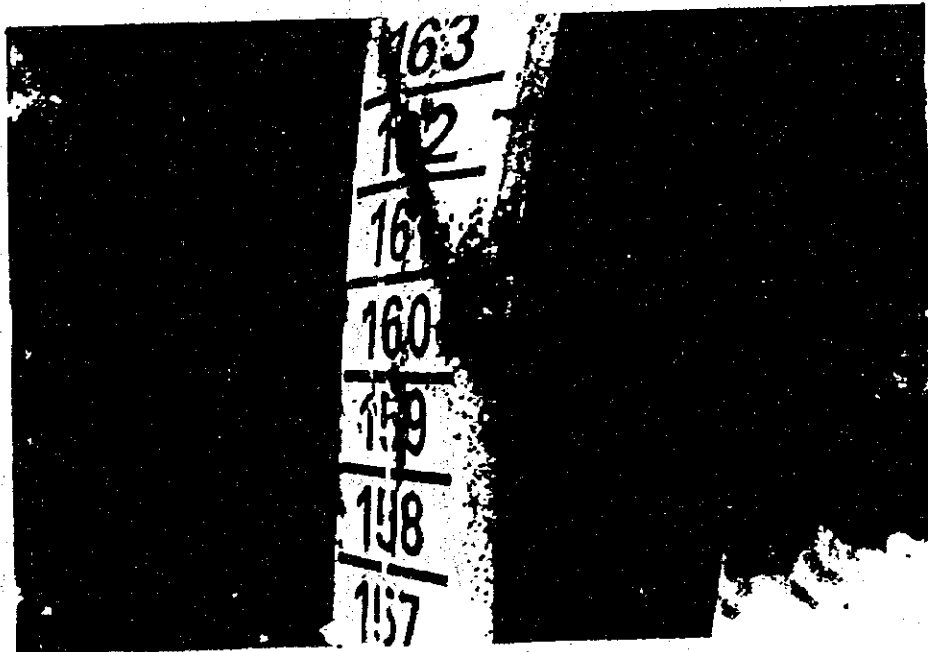
STUFF GAUGE CHECK DATA.

MPOWE GUADGING STATION.

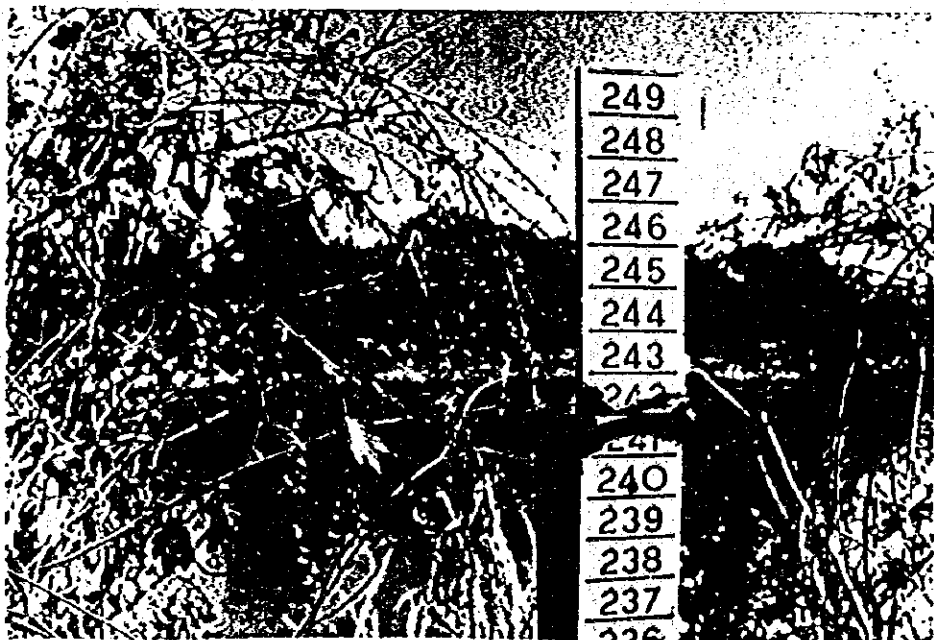
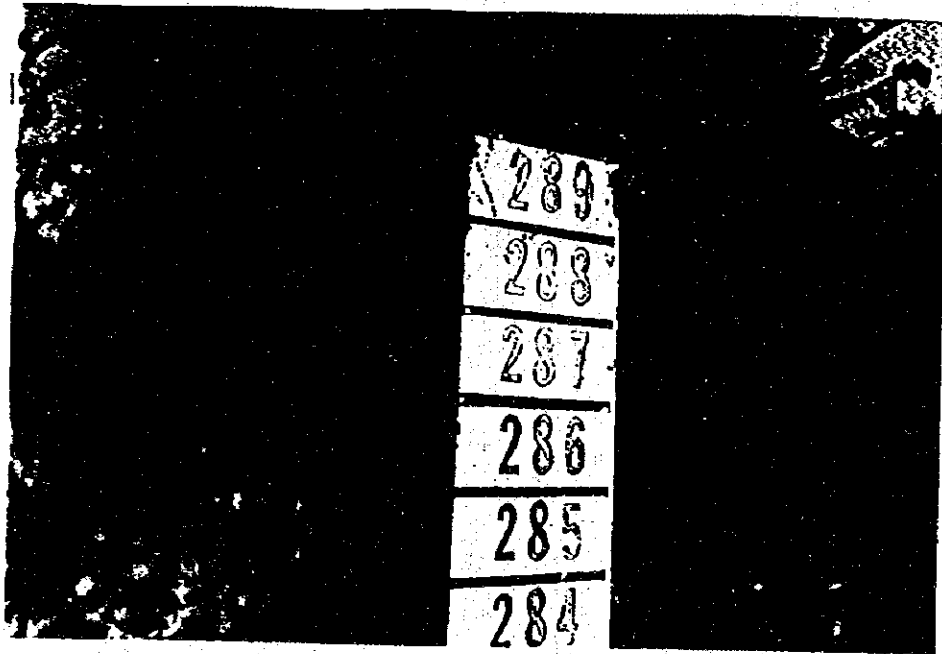
NO.	Reading		Levelling Data	Remark.
	Top	Low		
1	290	240	523.747	inch
2	250	224	522.467	inch
3	210	181	521.324	inch
4	170	130	520.068	inch
5	130	80	518.698	inch
6	85	129	517.633	inch



Appendix 5 (8)



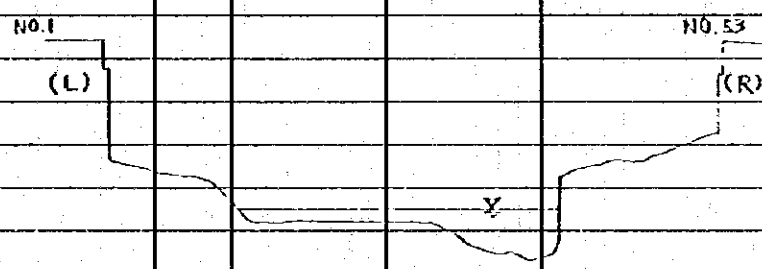
Appendix 5 (9)



Appendix 5 (10)

RIVER CROSS SECTION DATA.

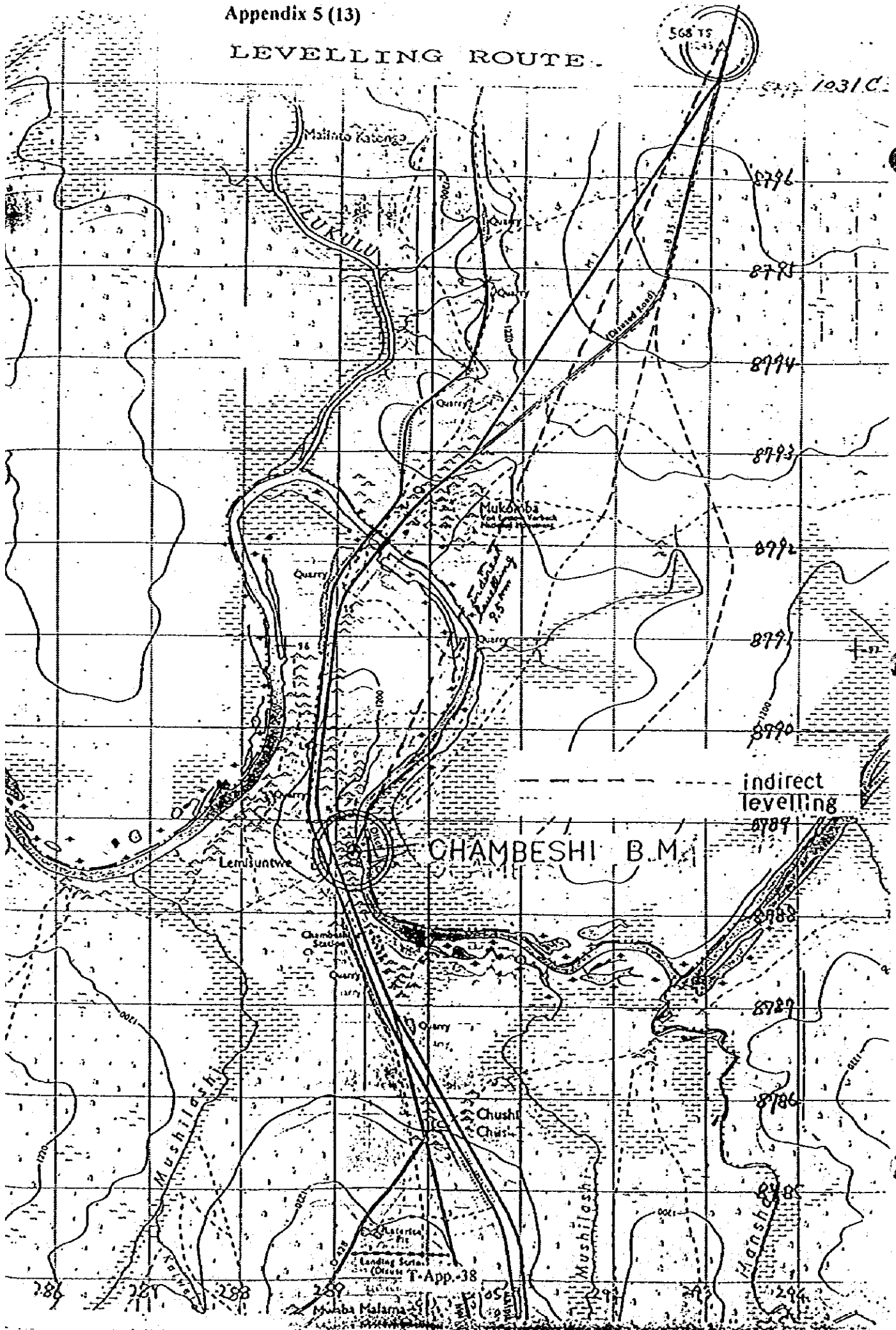
STATION : MFUWE WATER LEVEL GAUGING STATION				(RIGHT)			
No.	D	H	Remark	No.	D	H	Remark
1	-10.00	528.56		37	140.00	514.91	
2	-0.3	528.66	ABATT	38	145.00	514.08	
3	0	528.66	ABATT	39	150.00	513.75	
4	0	527.21	ABATT	40	155.00	513.32	
5	0.54	527.21		41	156.80	513.58	
6	0.54	523.48	TBM.	42	160.00	513.58	
7	12.54	522.70		43	160.00	518.82	
8	22.04	522.31		44	163.50	521.00	
9	23.71	521.92		45	169.00	522.50	
10	24.41	521.93		46	175.00	523.00	
11	24.41	521.08		47	185.00	523.50	
12	25.62	521.03		48	195.00	523.90	
13	27.32	520.60		49	207.35	524.45	ABATT
14	33.52	517.90		50	207.35	526.90	ABATT
15	36.52	516.63	Water Surface.	51	207.80	526.90	ABATT
16	40.00	516.22		52	207.80	528.35	ABATT
17	45.00	516.20		53	220.00	528.25	
18	50.00	516.16					
19	55.00	516.12					
20	60.00	516.03					
21	65.00	516.09			TS 165	574.20	
22	70.00	516.18				-45.40	BAROMETER.
23	75.00	516.26			B.M.	528.80	
24	80.00	516.27					
25	85.00	516.23					
26	90.00	516.28					
27	95.00	516.22					
28	100.00	516.30					
29	105.00	516.32					
30	110.00	516.32					
31	113.00	516.08					
32	115.00	515.28					
33	120.00	514.41					
34	125.00	515.62					
35	130.00	515.88					
36	135.00	515.67					



Appendix 5 (12)

CHAMBESHI G. S.

LEVELLING ROUTE.



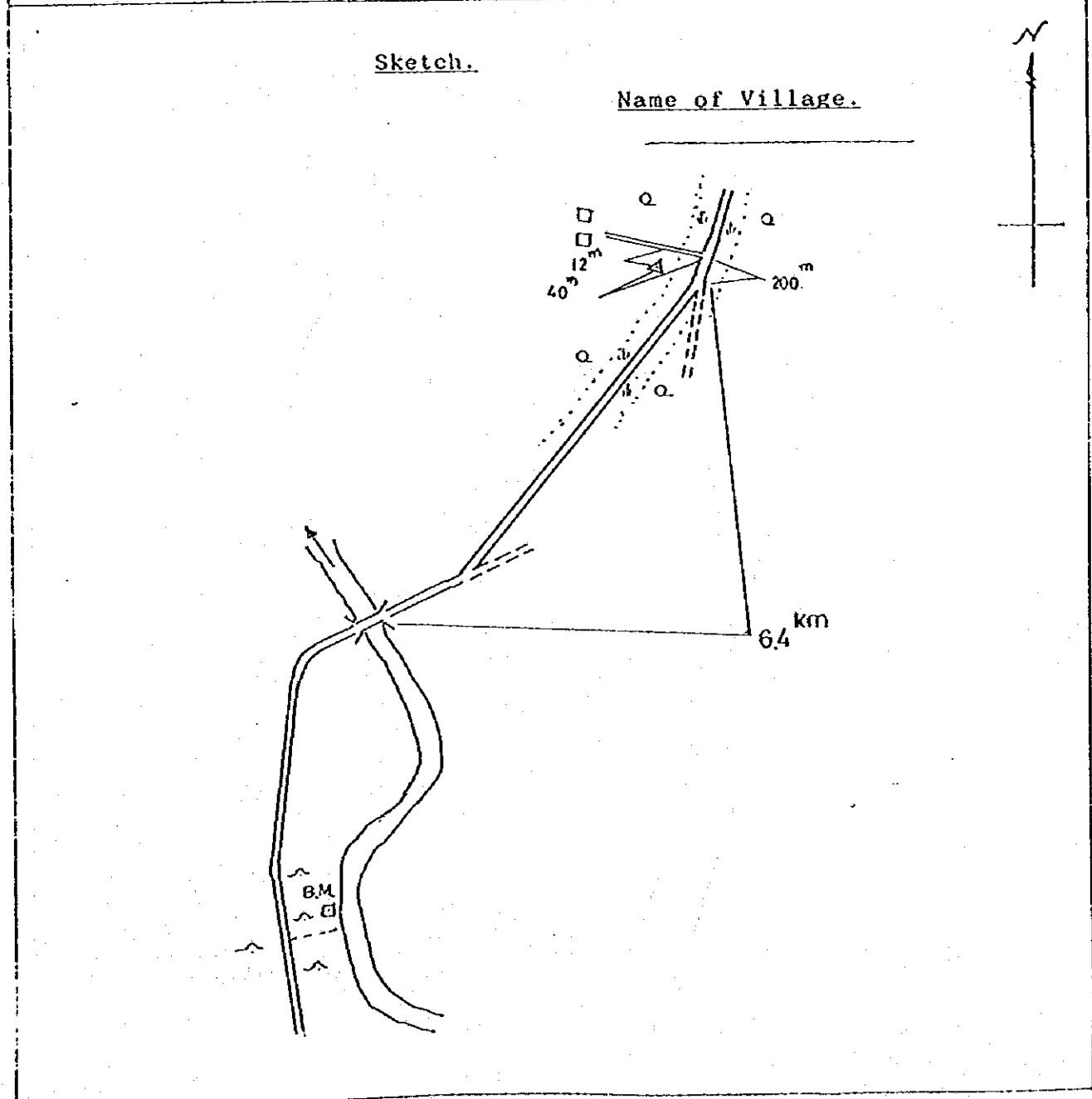
Appendix 5 (14)

FILE:NV

DESCRIPTION

10/7/94
 10:30 AM
 10/7/94

		date: 10 7 1994	weather:
STATION	△ TS 568	1/50,000	103IC3
		1/250,000	SC-36-9
HEIGHT	H= 1,246.00	surveyor	KODY - A.W.
		instrument	
CO-ORDINATE	E= 293098.00 N= 8797410.00	surveyor	
		instrument	



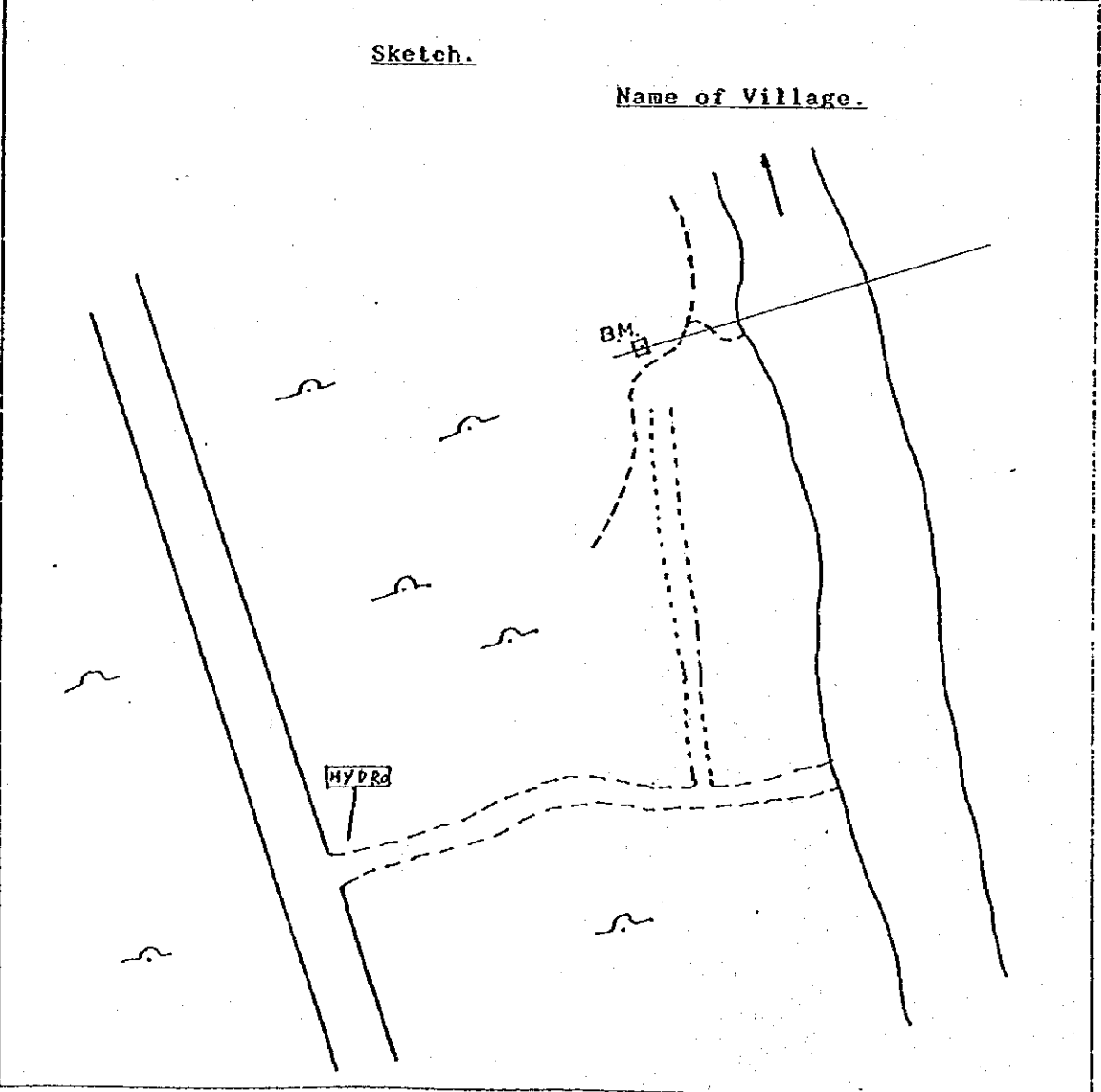
FILE:NV

Appendix 5 (15)

FILE:NV

DESCRIPTION

date: 10 JULY 1994 weather: FINE			
STATION	CHAMBESIB.M.	1/50,000	1128 D3
		1/250,000	SC-35-16
HEIGHT	H= 1,187.28	surveyor	KODY - A-W.
	E= 289,196	instrument	BAROMETER
CO-ORDINATE	N= 8788,642	surveyor	
		instrument	ENSIGN G.P.S.



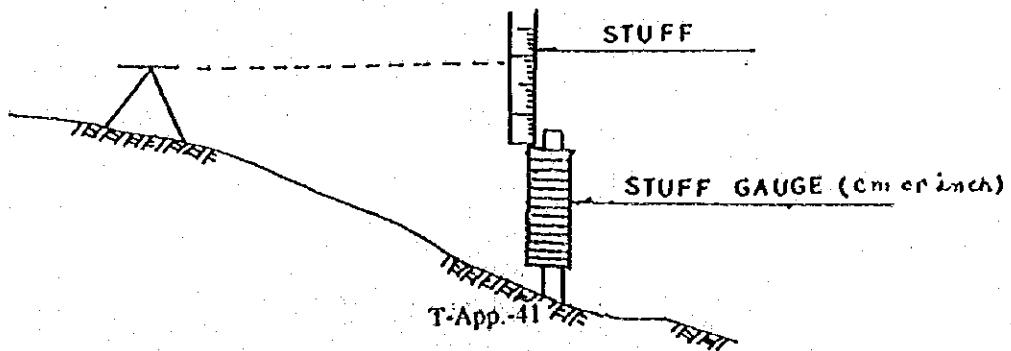
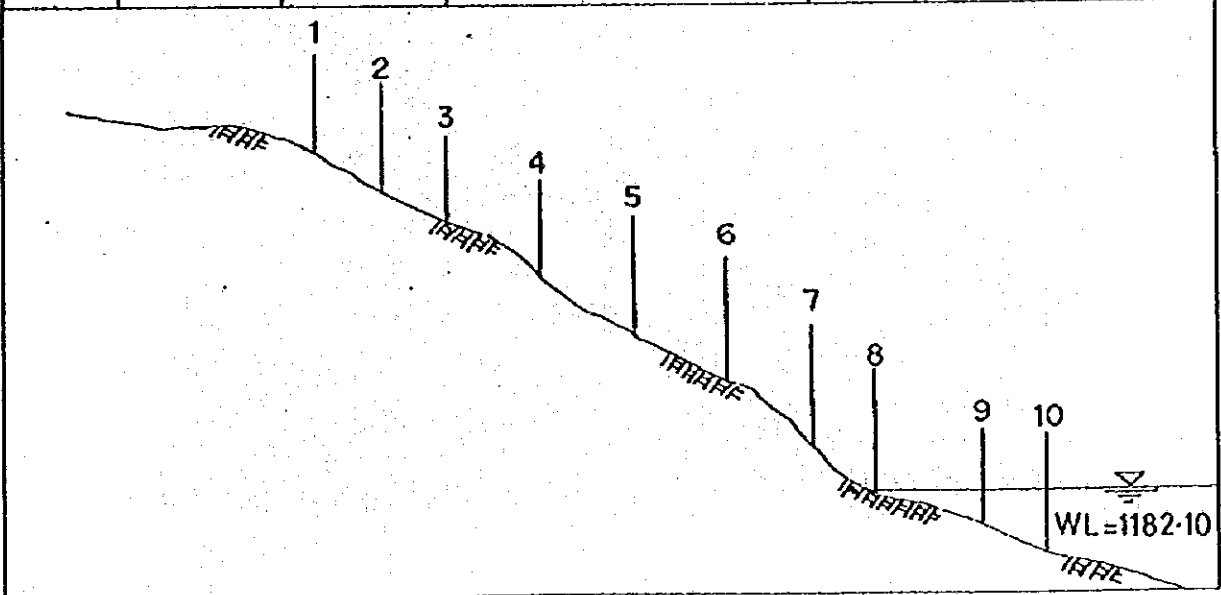
FILE:NV

JICA STUDY TEAM.

Appendix 5 (16)

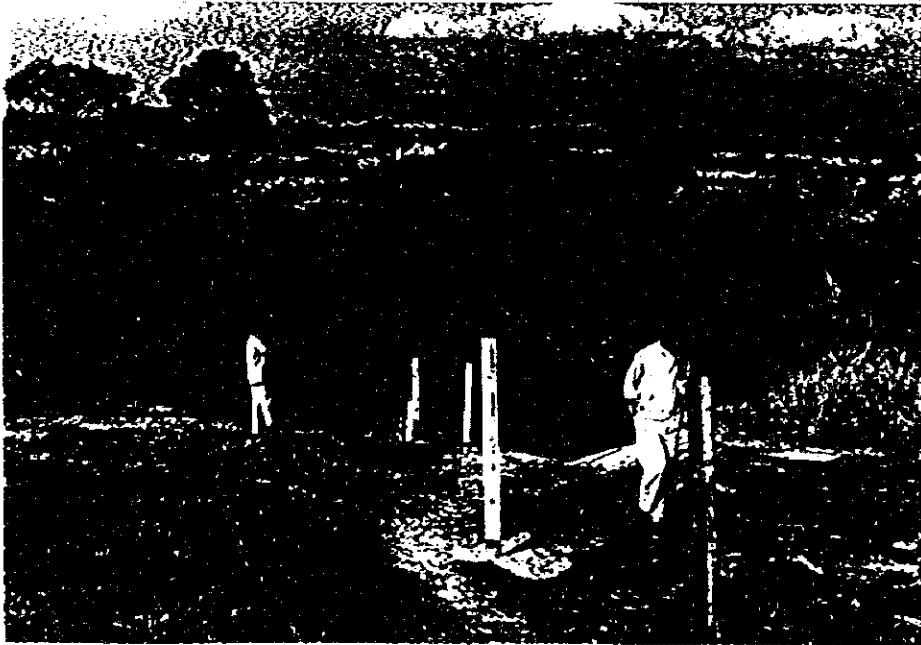
STUFF GAUGE CHECK DATA.

CHAMBESHI GUADGING STATION.				
NO.	Reading		Levelling Data(H)	Remark.
	Top	Low		
1	280	240	1188.913	inch
2	750	604	1187.871	cm
3	250	200	1187.983	inch
4	710	630	1187.462	cm
5	193	160	1186.245	inch
6	Cannot	See.	1186.063	cm
7	160	128	1185.249	inch
8	430	290	1184.669	cm
9	130	83	1184.331	inch
10	90	65	1183.109	inch



Appendix 5 (17)

CHAMBESHI G.S.



Appendix 5 (18)

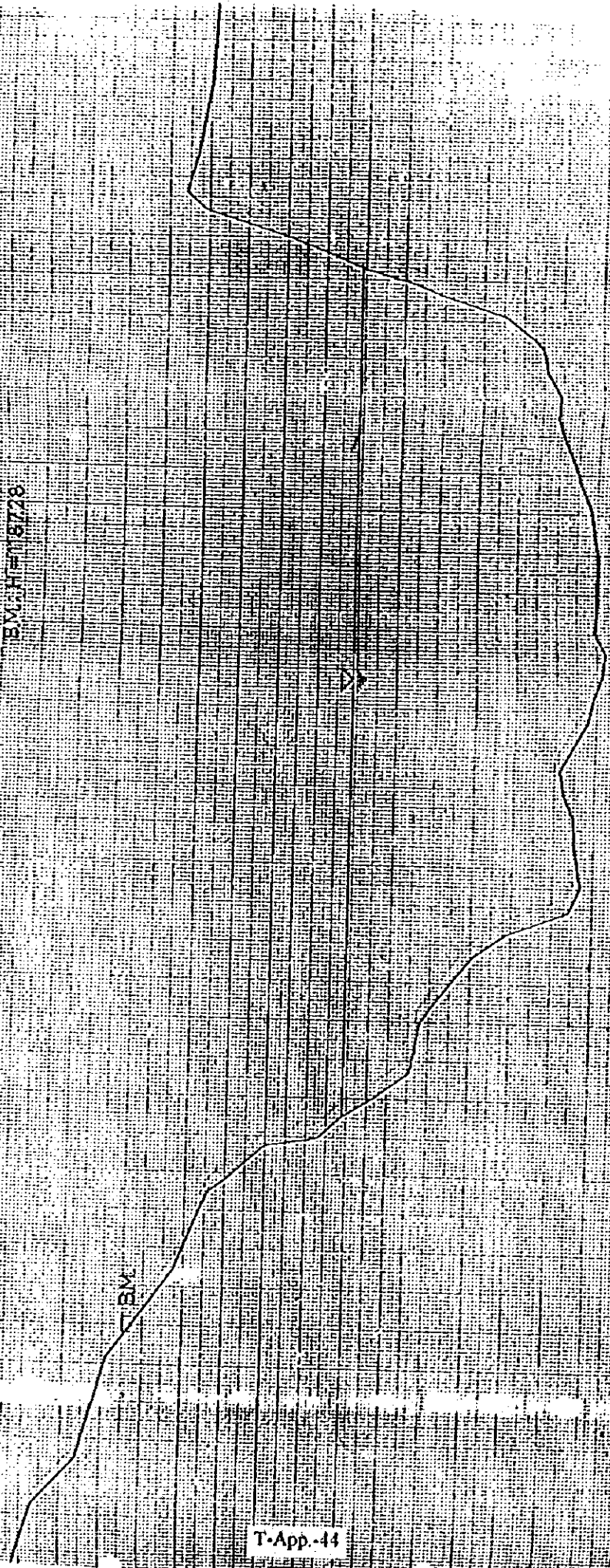
RIVER CROSS SECTION

STATION : CHAMBESHI WATER LEVEL GUADGING STATION.							
(RIGHT)				(RIGHT)			
No.	D	H	Remark	No.	D	H	Remark
BM.	0	1187.28		36	111.40	1176.64	
1	7.87	1186.18		37	114.40	1176.94	
2	13.26	1185.69		38	117.40	1177.14	
3	17.98	1185.36		39	120.40	1177.11	
4	19.92	1185.05		40	123.40	1177.39	
5	23.18	1184.01		41	126.40	1177.54	
6	24.30	1183.31		42	127.40	1177.69	
7	24.82	1182.75		43	130.80	1178.46	
8	27.40	1182.10	Water Surface.	44	133.39	1180.18	
9	30.40	1181.28		45	134.67	1180.74	
10	33.40	1180.47		46	136.30	1182.10	Water Surface.
11	36.40	1180.32		47	138.18	1183.13	
12	39.40	1180.24		48	140.00	1183.94	
13	42.40	1179.85		49	143.13	1186.13	
14	45.40	1179.39		50	145.32	1186.54	
15	48.40	1178.93		51	150.10	1186.34	
16	51.40	1178.09		52	159.49	1185.91	
17	54.40	1176.55		53	173.11	1185.84	
18	57.40	1176.34					
19	60.40	1176.41					
20	63.40	1176.54					
					(LEFT)		
21	66.40	1176.54		No.	D	H	
22	69.40	1176.74		BM.	0	1087.28	
23	72.40	1176.84		1	4.15	1087.85	
24	75.40	1176.54		2	11.95	1089.15	
25	78.40	1176.21		3	17.98	1089.16	
26	81.40	1176.01		4	23.36	1090.24	
27	84.40	1175.89		5	31.77	1090.79	
28	87.40	1175.79		6	45.50	1092.28	
29	90.40	1176.09		7	54.07	1093.69	
30	93.40	1175.99					
31	96.40	1175.99			TS.568	1246.000	
32	99.40	1175.99				-58.875	BAROMETER
33	102.40	1176.14			T.P.	1187.125	
34	105.40	1176.19				+0.160	Levelling
35	108.40	1176.44			BM.	1187.28	

Appendix 5 (9)

CAMBESHJ GAUGING STATION

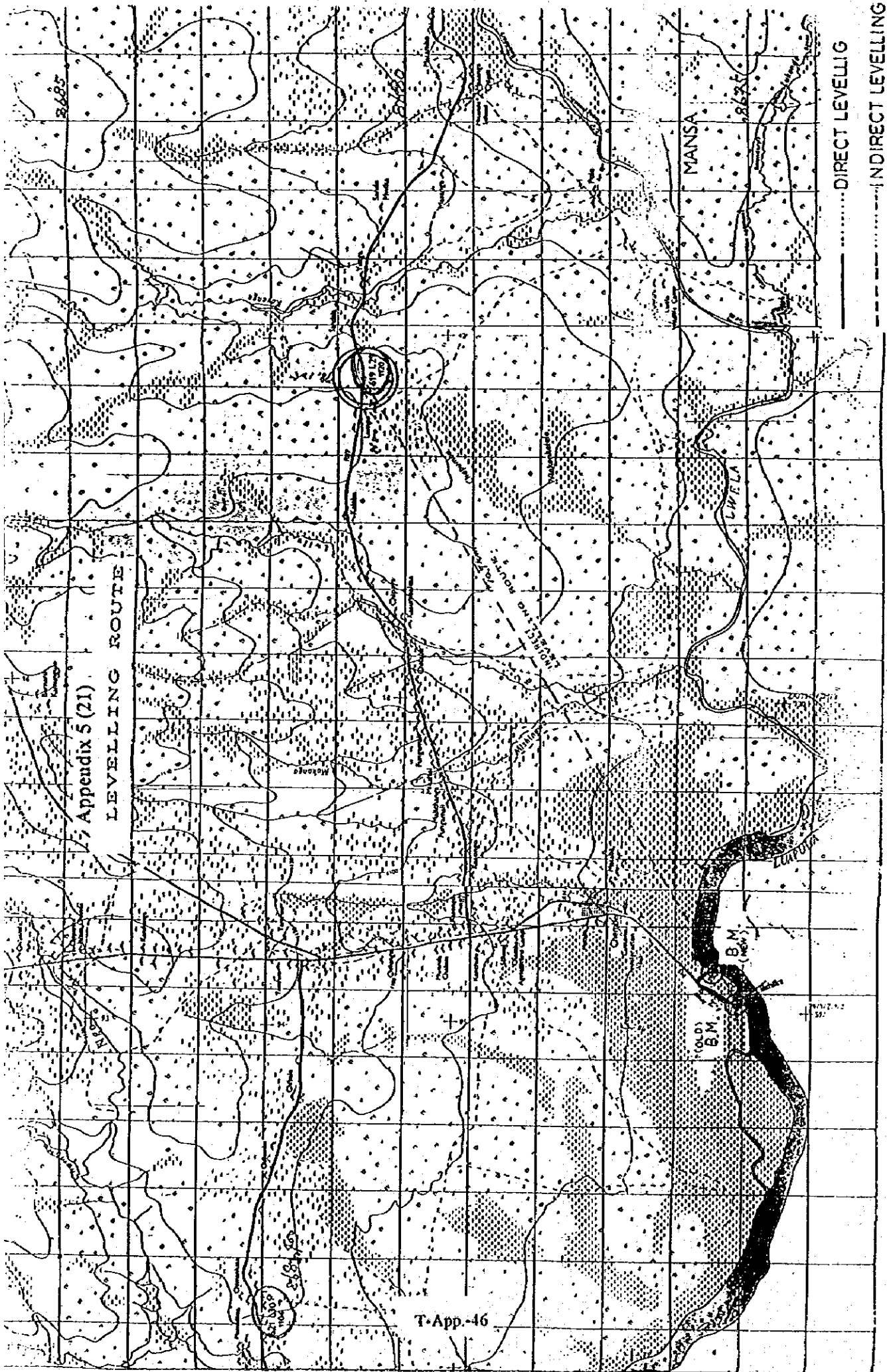
S.M. H. = 1500
V = 1/100
B.M. H. = 15728



TBM

Appendix 5 (20)

CHEMBE FERRY G. S.



Appendix 5 (21)

LEVELLING ROUTE

MANSALA

OLD B.M.

DIRECT LEVELLING

INDIRECT LEVELLING

T-App-46

Appendix 5 (22)

FILE:NV

DESCRIPTION

.. date: 15 8 1994 weather:			
STATION	619 L 29	1/50,000	1128 D4
		1/250,000	SC-35-16
HSIGHT	H= 1119.528	surveyor	KODY A.W.
		instrument	
CO-ORDINATE	E=	surveyor	
	N=	instrument	

Sketch.

Name of Village.
LUMPA

FILE:NV

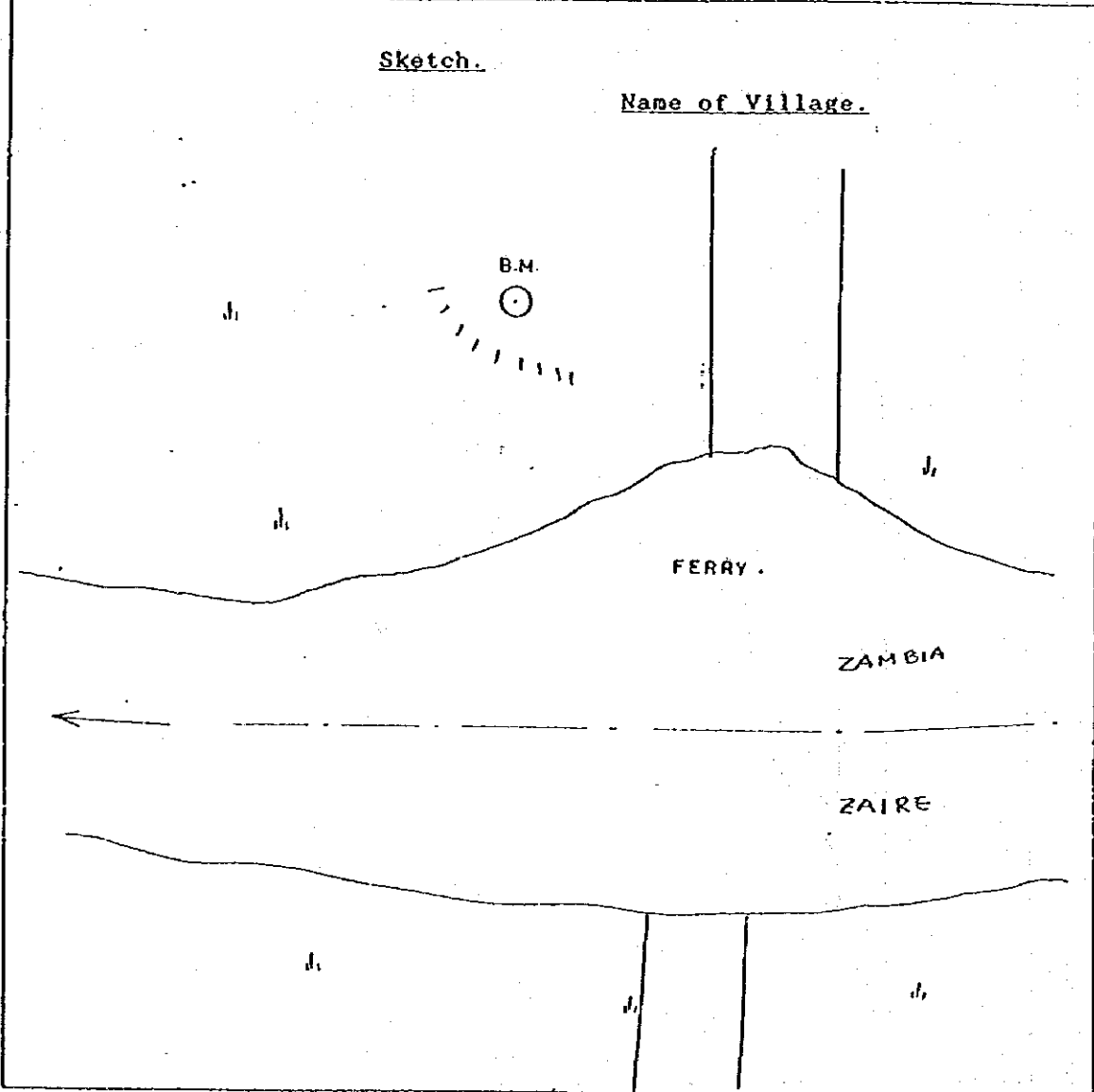
JICA STUDY TEAM.

Appendix 5 (23)

FILE:NV

DESCRIPTION

date: 15 8 1994 weather:			
STATION	CHEMBE FERRY OLD SECTION	1/50,000	1128 D4
		1/250,000	SC-35-16
HEIGHT	H= 1057.53	surveyor	KODY-A-W.
		instrument	BAROMETER
CO-ORDINATE	E= N=	surveyor	KODY-A-W.
		instrument	



FILE:NV

JICA STUDY TEAM.

689 320
8675 450

Appendix 5 (24)

FILE:NV

DESCRIPTION

date: 17 . 7 . 1994 weather:			
STATION	DWA		1/50,000
	CHEMBE FERRY B.M.		1/250,000
HEIGHT	H=	1058.030	surveyor KODY-A-W.
	E=	689,320	instrument NA 2
CO-ORDINATE	E=	689,320	surveyor KODY-A-W.
	N=	8675,450	instrument ENSIGN GPS

Sketch.

Name of Village.

FILE:NV

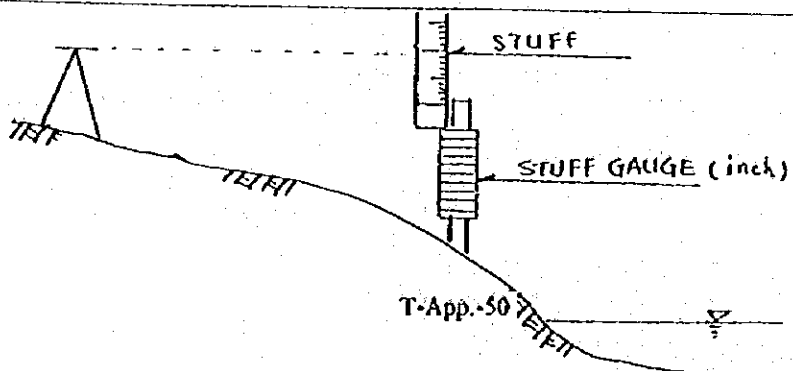
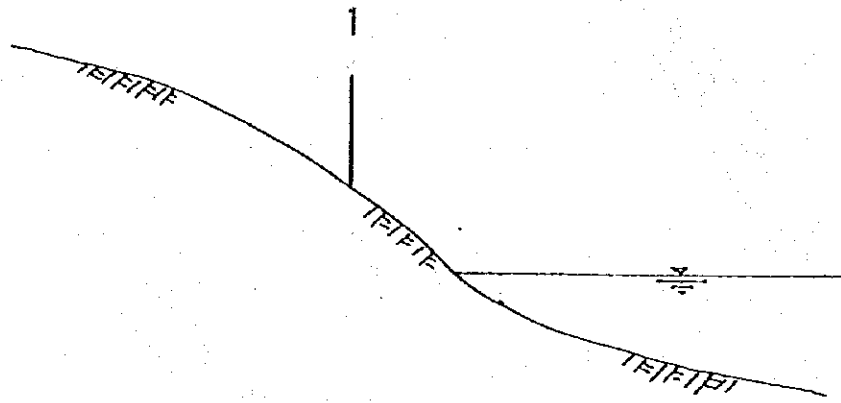
JICA STUDY TEAM.

Appendix 5 (25)

STUFF GAUGE CHECK DATA.

CHEMBE FERRY OLD STATION.

No.	Reading		Levelling Data	Remarks.
	Top	Low		
1	148		1055.970	inch



Appendix 5 (26)

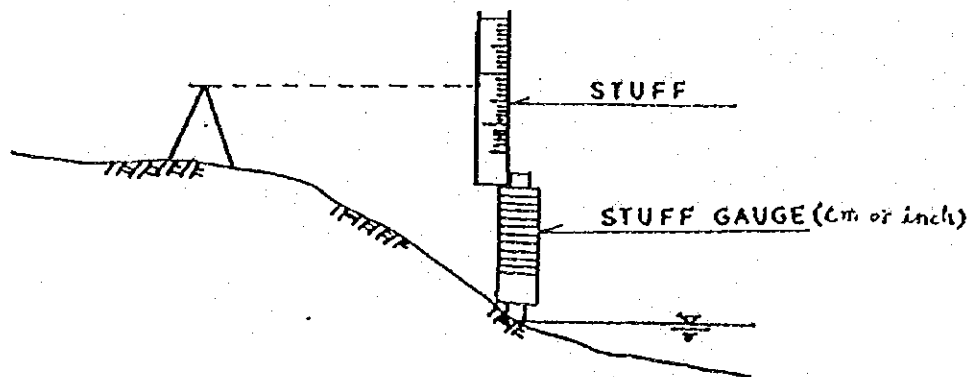
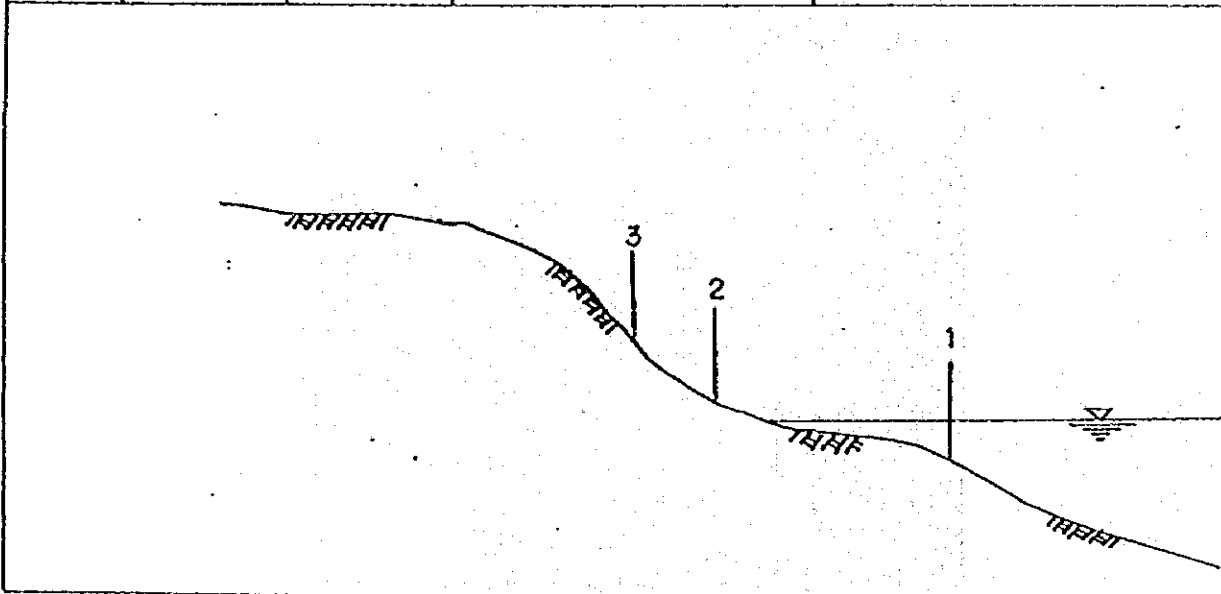
OLD STATION
STUFF GAUGE



Appendix 5 (27)

STUFF GAUGE CHECK DATA.

CHEMBE FERRY NEW STATION				
NO.	Reading		Levelling Data(B)	Remark.
	Top	Low		
1	710	140	1057.924	cm
2	210	160	1057.224	inch
3	170		1055.986	inch



Appendix 5 (28)

CHEMBE FERRY
NEW STATION



3

2



1

Appendix 5 (29)

RIVER CROSS SECTION SURVEY DATA

STATION : CHEMBE FERRY OLD WATER LEVEL GAUGING STATION							
(LEFT)				(RIGHT)			
No.	D	H	Remark	No.	D	H	Remark
BM.	0	1057.53		BM.	0	1057.53	
1	12.82	1055.83		1	17.26	1057.14	
2	27.65	1053.61		2	35.41	1056.85	
3	35.67	1053.71		3	53.20	1057.09	
4	49.79	1053.26		4	70.75	1057.95	
5	68.26	1053.26		5	88.89	1057.94	
6	84.72	1052.41		6	105.62	1058.43	
7	105.45	1051.91		7	122.86	1058.50	
8	116.87	1051.91					
9	129.67	1051.91					
10	143.47	1052.01					
11	159.07	1051.81					
12	175.19	1051.26					
13	194.86	1050.41					
14	211.56	1050.36					
15	225.58	1050.31					
16	241.51	1050.66					
17	264.74	1051.26		WL=	1054.10		
18	282.08	1050.81					
19	297.11	1051.41					
20	308.34	1051.11					
21	318.63	1050.91					
22	333.85	1050.71					
23	347.63	1051.21					
24	358.73	1051.91					
25	375.81	1054.99					
26	375.99	1055.98					
27	381.90	1057.92					
28	400.02	1058.23					
29	417.08	1057.82					
30	435.68	1057.23					
31	448.22	1057.02					

Appendix S (30)

CHEMBE FERRY OUT SECTION

SCALE

1" = 100'

1" = 100'

EX-108183

Appendix 5 (30)

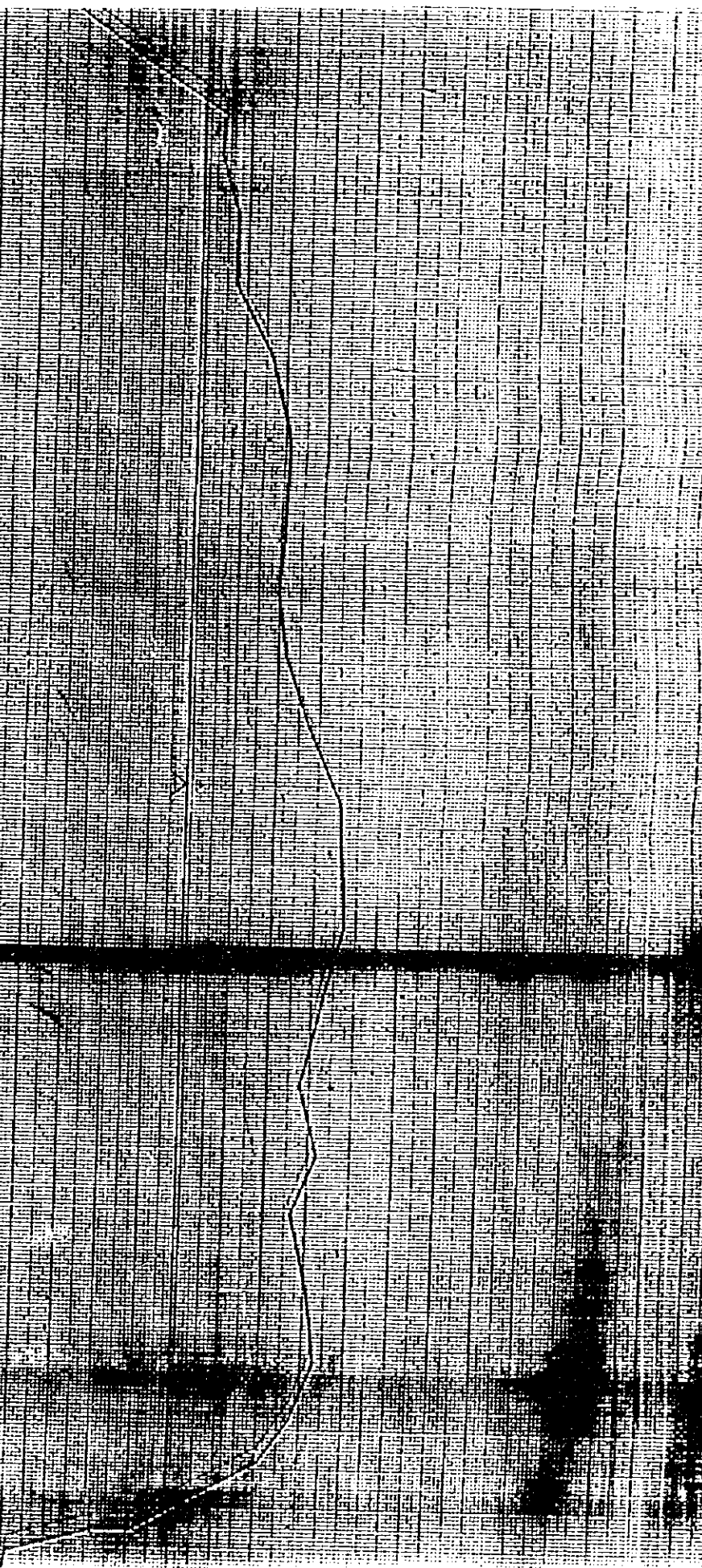
CHEMBE FERRY QUIN SECTION

SCALE

VF = 100'

LF = 100'

BY = 108753



Appendix 5 (32)

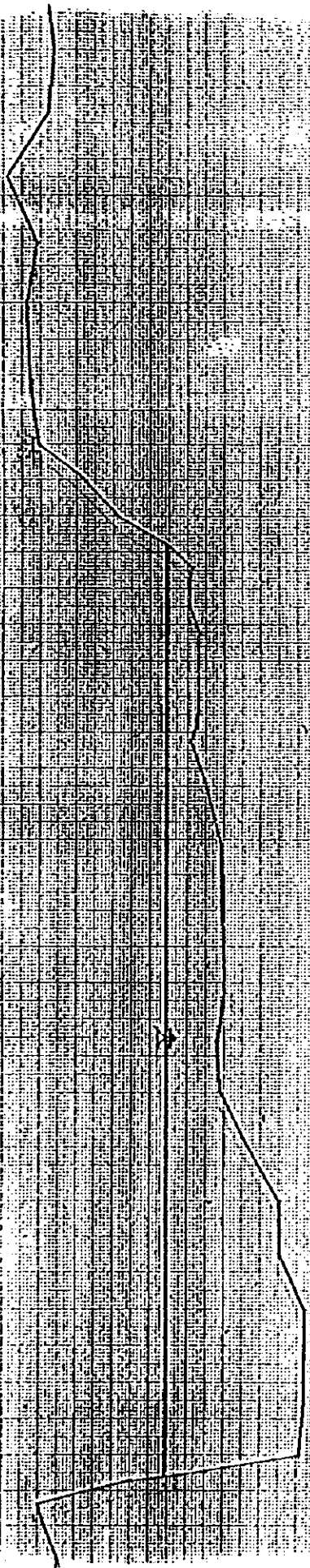
CHEMBE FERRY NEW STATION

SCALE

V = 1:100

H = 1:1000

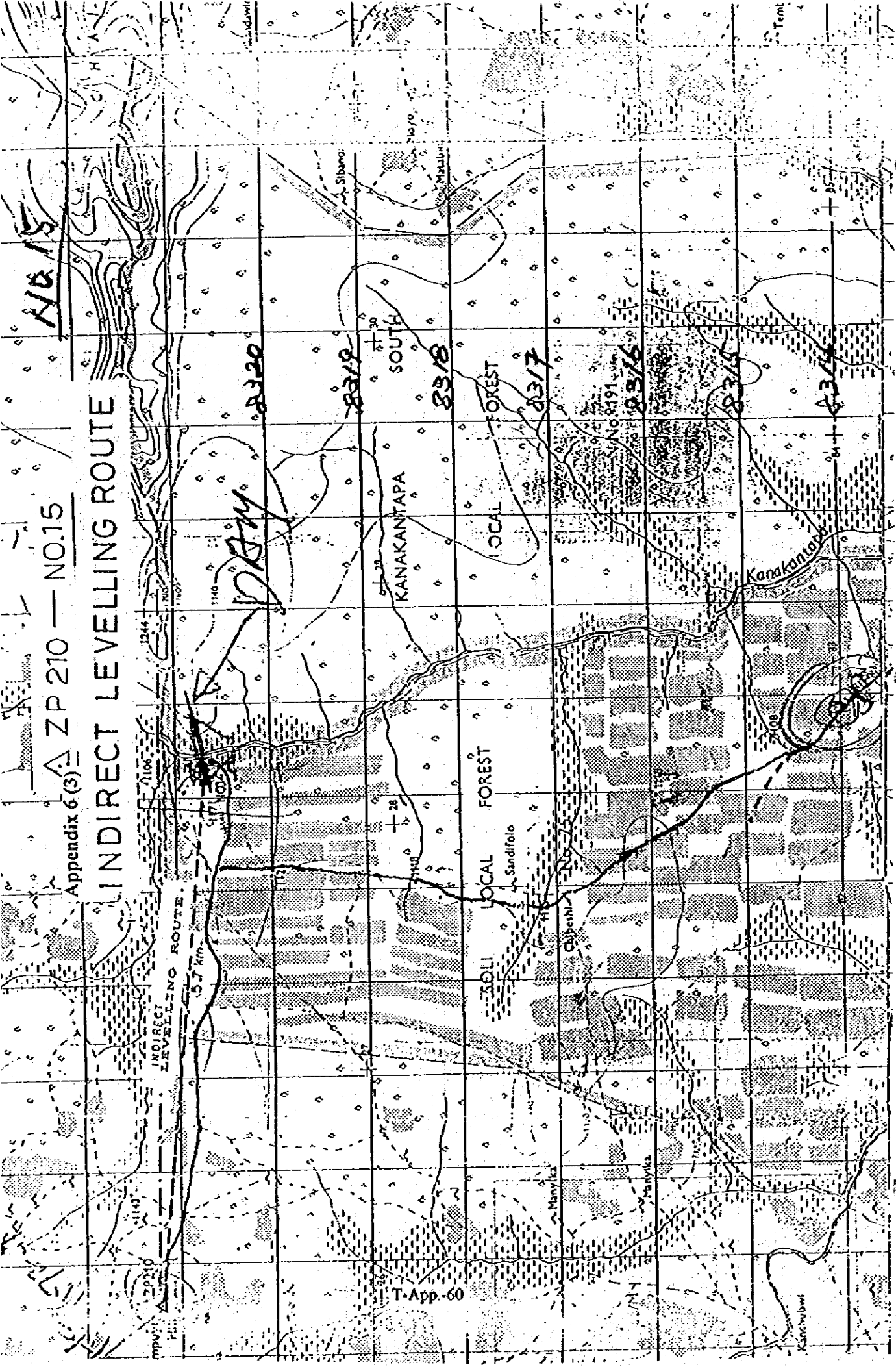
BM = 1059.03



Appendix 6 (1)

PLANNING DAM AXIS PROFILE

- Levelling Route
- Description
- Profile data, Profile, Location



Appendix 6(3) ZP 210 - NO.15

INDIRECT LEVELLING ROUTE

INDIRECT LEVELLING ROUTE

5.7 km

T-App-60

AB 15

D 314

8319

8318

8317

8316

8315

8314

SOUTH

KANAKANTAPA

LOCAL FOREST

LOCAL FOREST

Sandifalo

MANYIKA

MANYIKA

SIBANO

MASUBU

Kanakantapa

Kanchudani

28° 30' East of Greenwich

68

45' 69

70

15° South 834

833

832

15°

831

830

829

30'

Appendix 6 (4)

INDIRECT LEVELLING ROUTE

JICA BM — NO 16

TRUST

LAND

LOCAL FOREST No. 400 (N.D.)

CHIPILEPIL LOCAL FOREST No. 315

KAKAKATAPA SOUTH LOCAL FOREST No. 191

SOLI LOCAL FOREST No. 75

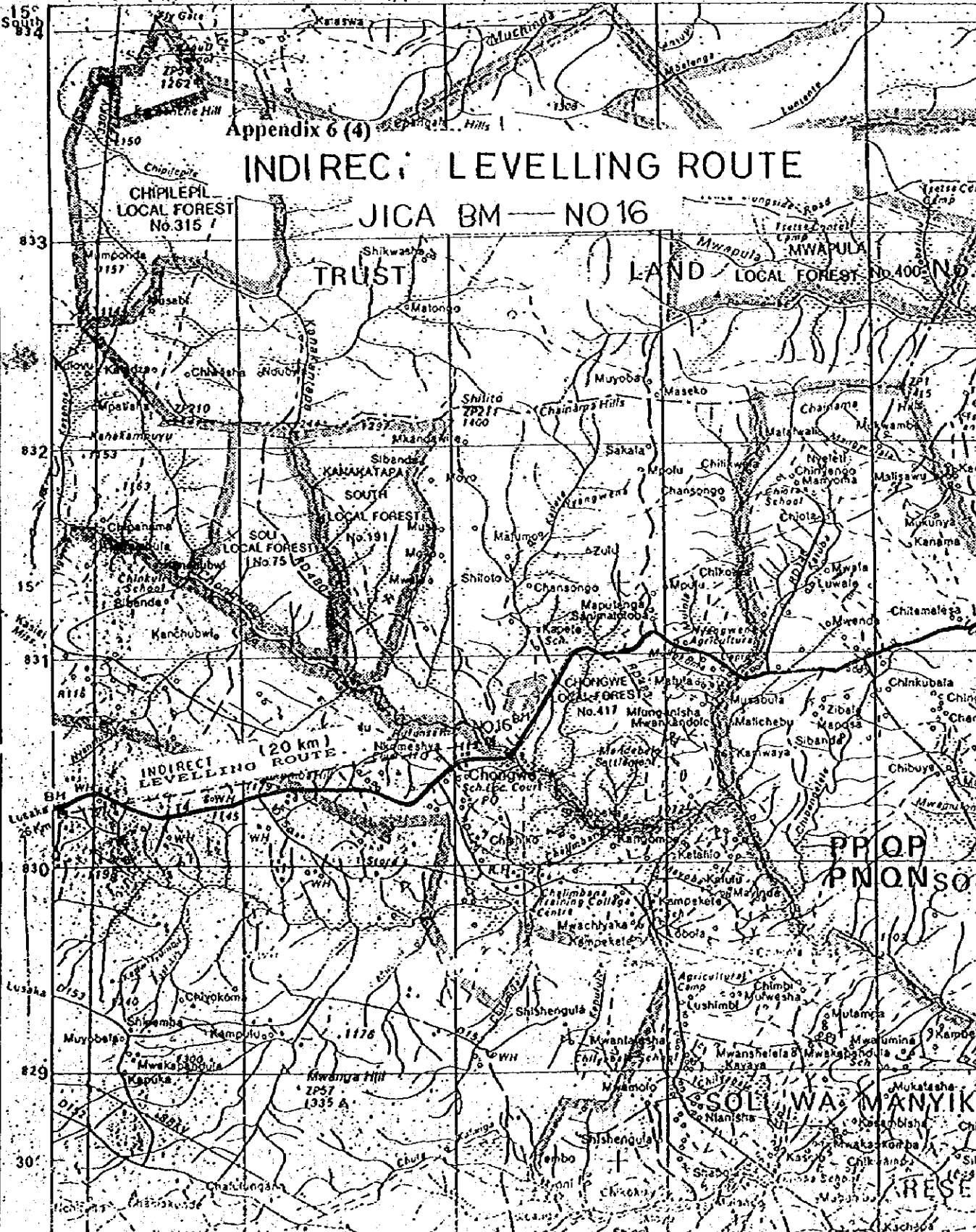
CHONGWE LOCAL FOREST No. 417

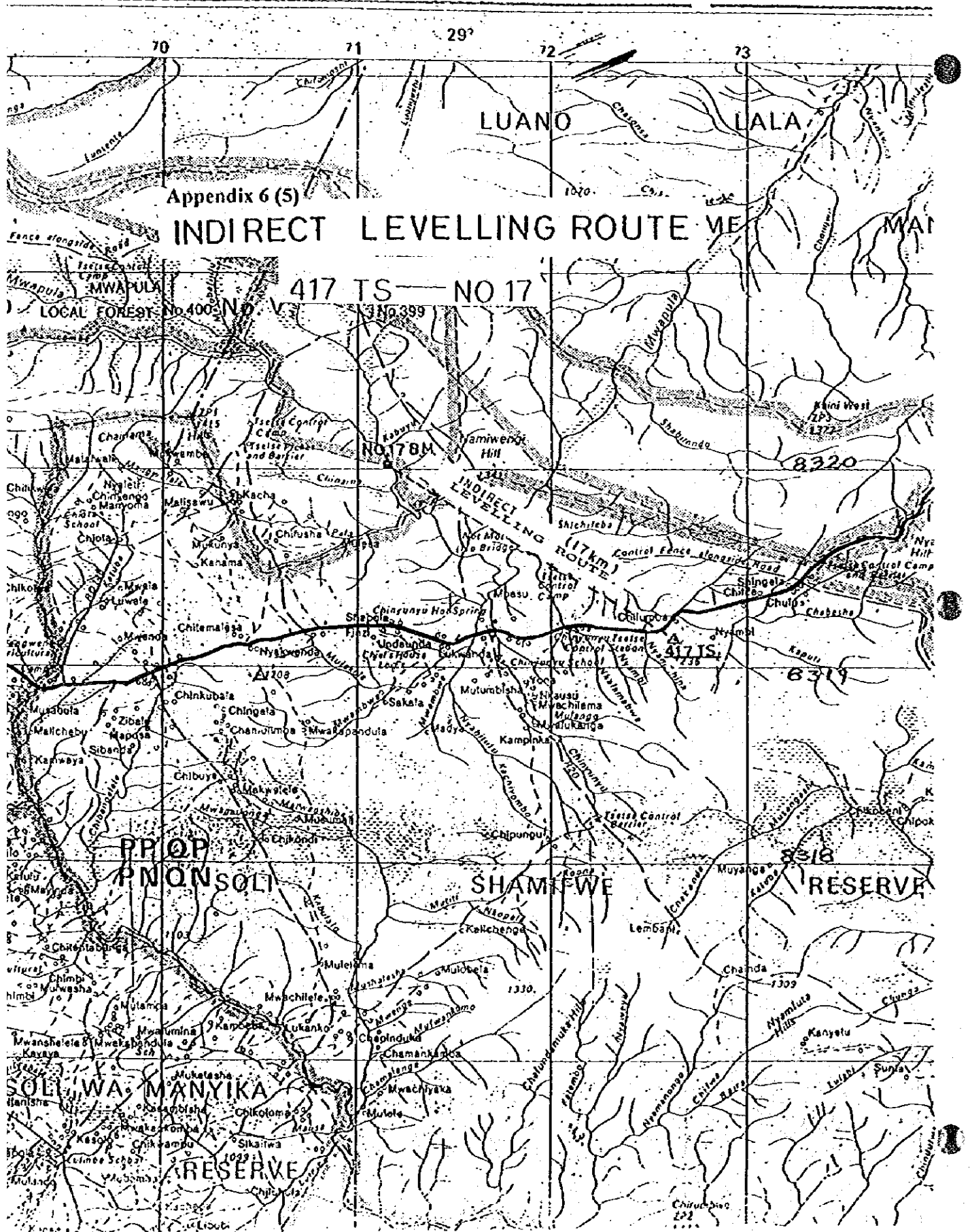
INDIRECT LEVELLING ROUTE (20 km)

PROVINCE

SOLUWA MANYIKI

RESERVE





Appendix 6 (5)

INDIRECT LEVELLING ROUTE

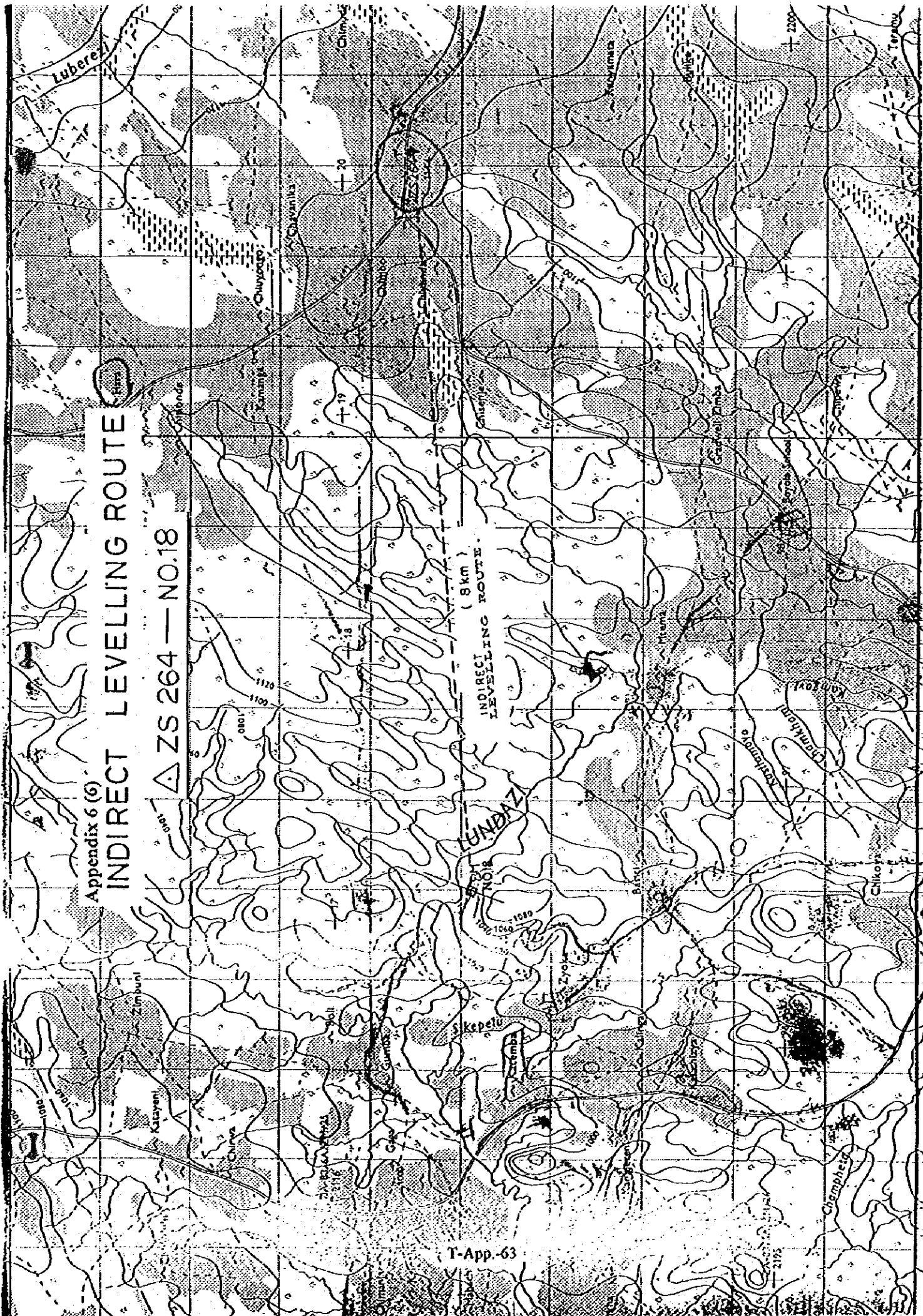
417 TS — NO 17

Appendix 6 (6)
INDIRECT LEVELLING ROUTE

△ ZS 264 — NO.18

INDIRECT LEVELLING ROUTE (8 km)

LUNDAZI



397

398

399

UV 400 W

401
32°05'

402

403

Madagascar
Channel

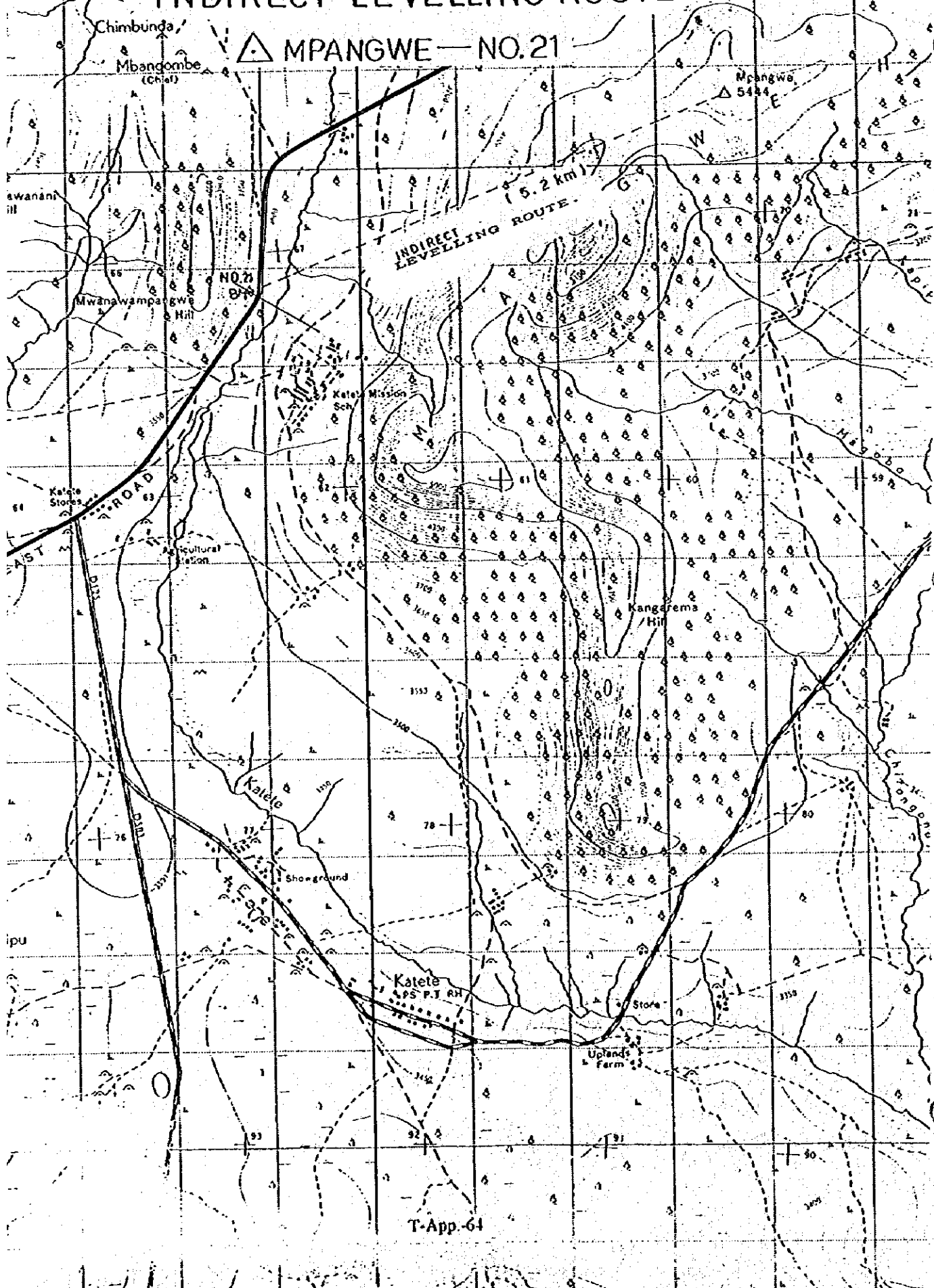
404

405

Appendix 6 (7)

INDIRECT LEVELLING ROUTE

△ MPANGWE — NO. 21

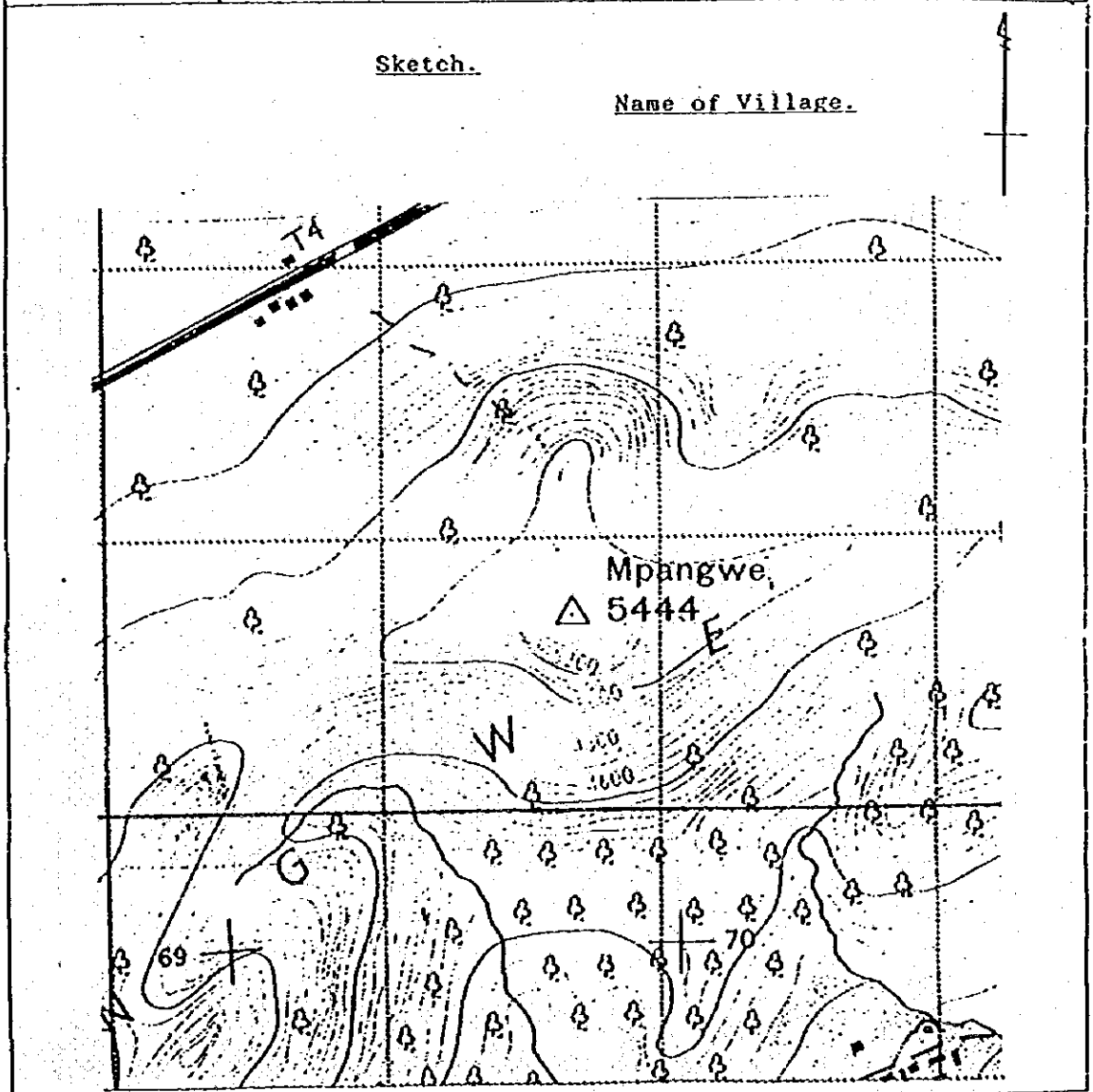


Appendix 6 (8)

FILE:NV

DESCRIPTION

	date:		weather:
	(ZP.14)	1/50,000	1432 A1
STATION	△ MPANGWE	1/250,000	SD-36-10
		surveyor	KODY-A-W
HEIGHT	H= 1660.800	instrument	
	E= 403,675.310	surveyor	
CO-ORDINATE	N= 8450,704.709	instrument	



FILE:NV

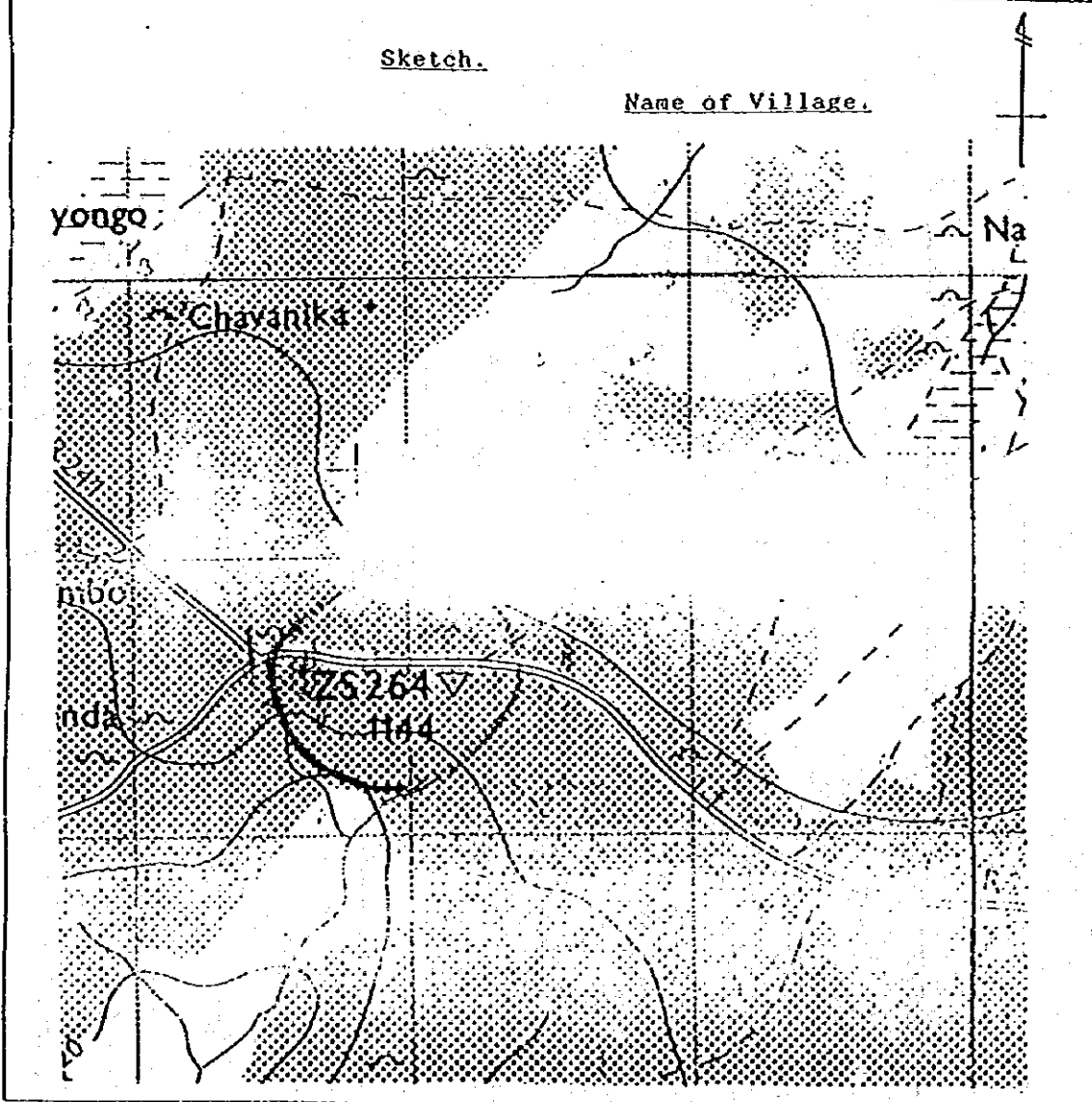
JICA STUDY TEAM.

Appendix 6 (9)

FILE:NV

DESCRIPTION

	date:		weather:
STATION	△ ZS.264	1/50,000	1233 A 1
		1/250,000	SD-36-3
HEIGHT	H= 1,144.800	surveyor	KODY-A-W
	E= 513,167.966	instrument	
CO-ORDINATE	N=8665,545.360	surveyor	
		instrument:	



FILE:NV

JICA STUDY TEAM.

Appendix 6 (10)

FILE:NV

DESCRIPTION

		date:	weather:	
STATION	△ 417 TS	1/50,000	1529'A3	
		1/250,000	SD-35-16	
HEIGHT	H= 1237.700	surveyor	KODY - A-W.	
	E= 726196.030	instrument		
CO-ORDINATE	N= 8311349.290	surveyor		
		instrument		
<p>Sketch.</p> <p>Name of Village.</p>				

FILE:NV

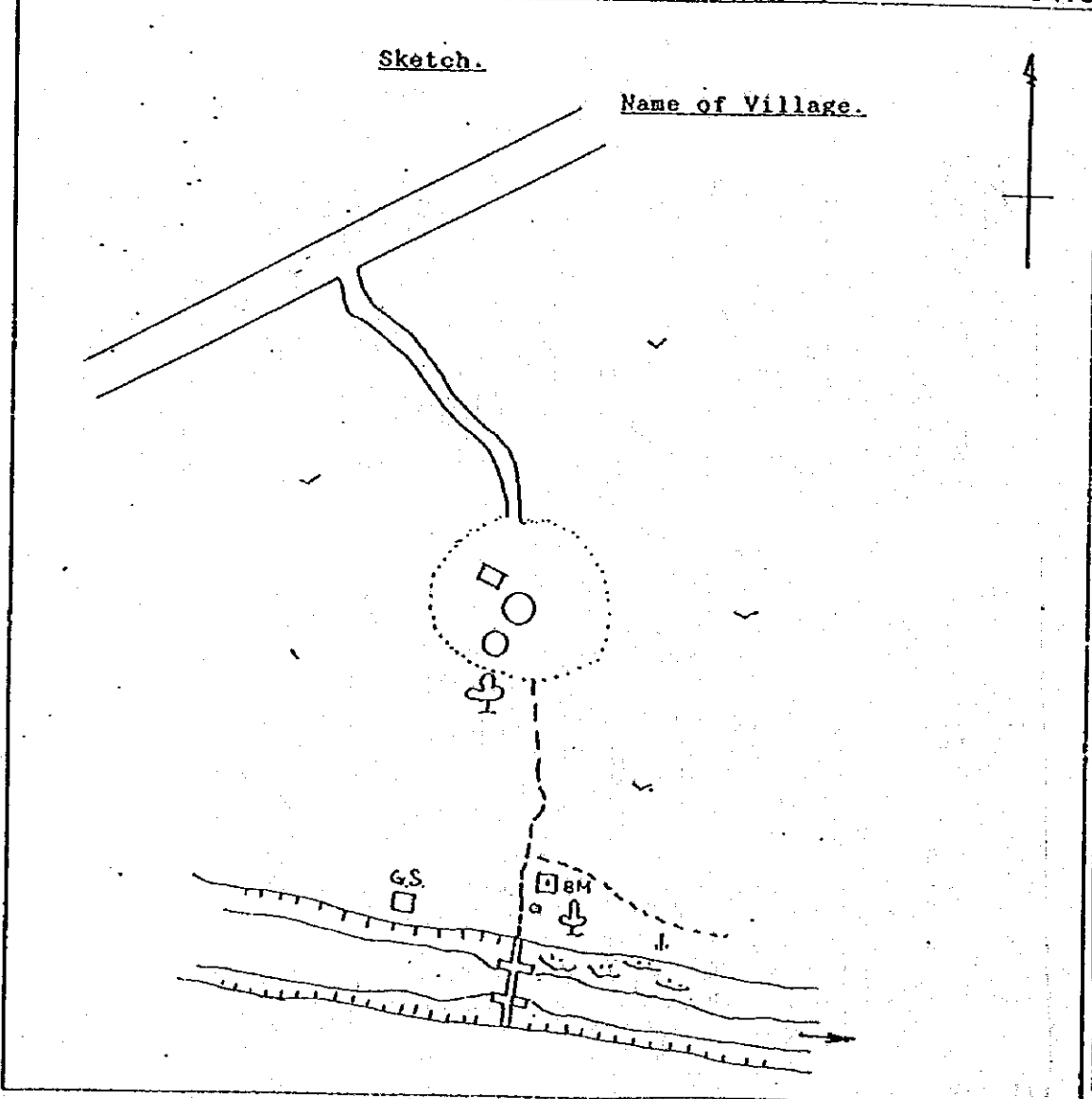
JICA STUDY TEAM.

Appendix 6 (11)

FILE:NV

DESCRIPTION

date: 6 . 6 . 1994 weather:			
STATION	J.I.C.A. B.M.	1/50,000	1528 B3
		1/250,000	SD-35-16
HEIGHT	H= 1118.198	surveyor	KODY A-W.
		instrument	
CO-ORDINATE	E= 661,285 N= 8302,730	surveyor	
		instrument	ENSIGN GPS



FILE:NV

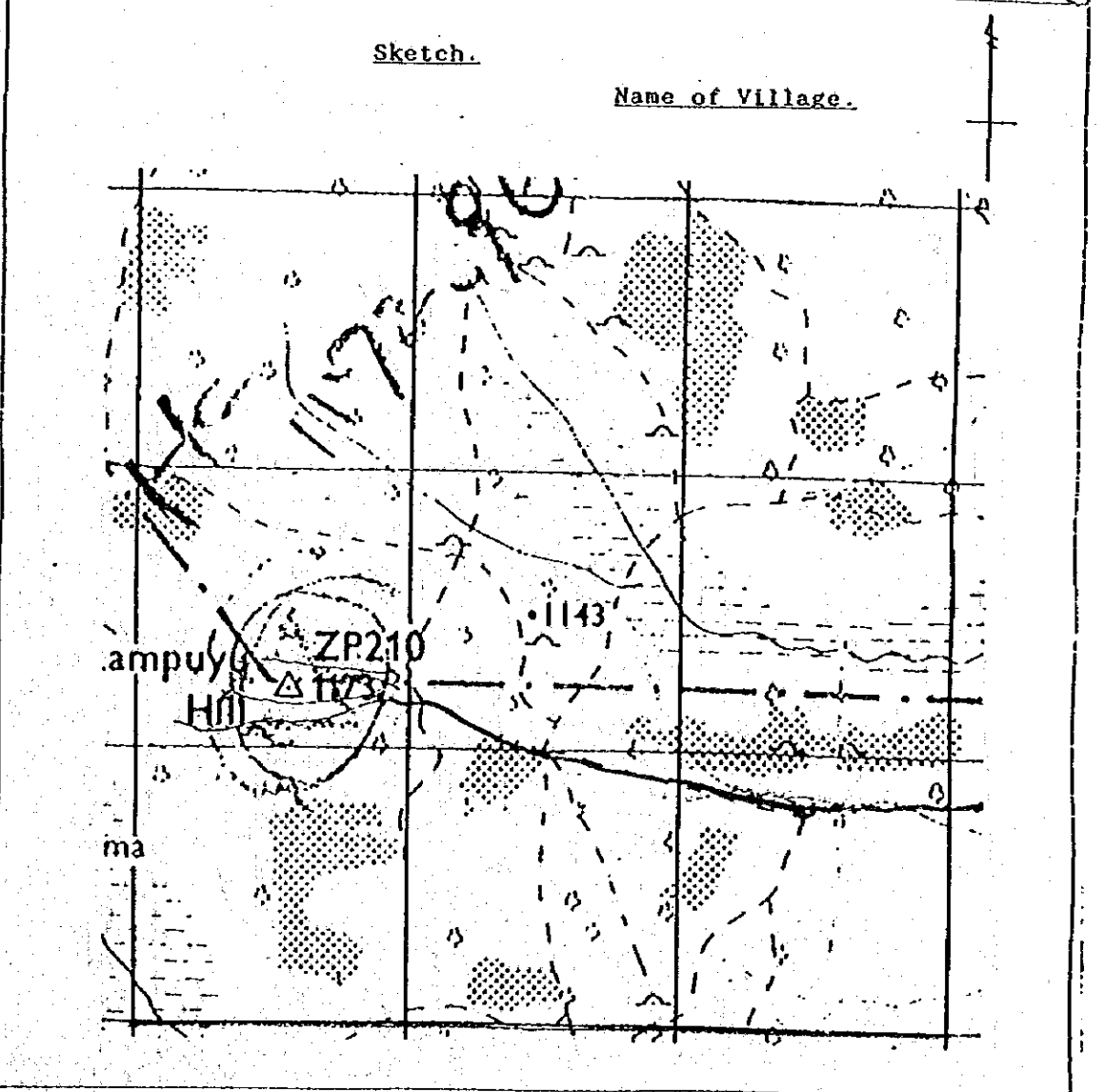
JICA STUDY TEAM.

Appendix 6 (12)

FIGURE

DATE: 1971.11.15

		date:	weather:	
STATION	△ ZP. 210	1/50,000	1528 B 1	
		1/250,000	SD-35-16	
HEIGHT	H= 1,172.960	surveyor	KODY-A-W.	
	E= 666.441.551	instrument		
CO-ORDINATE	N= 8321.244.129	surveyor		
		instrument		



FILE:NV

JICA STUDY TEAM.