

# ネパール王国

## シンズリ道路建設計画 (第二-3工区)

### 基本設計調査報告書

#### 資 料 編

- C: 技 術 資 料
- D: 土地取得範囲, 補償家屋位置図
- E: 横 断 図
- F: ハザードマップ
- G: 横断水路概略計画図

平成 8 年 3 月



国際協力事業団  
日本工営株式会社

無 調 二
C R ( 4 )
96 - 095



ネパール王国

シンズリ道路建設計画（第二-3工区）

# 基本設計調査報告書

平成 8 年 3 月

国際協力事業団  
日本工営株式会社



1132040 [5]

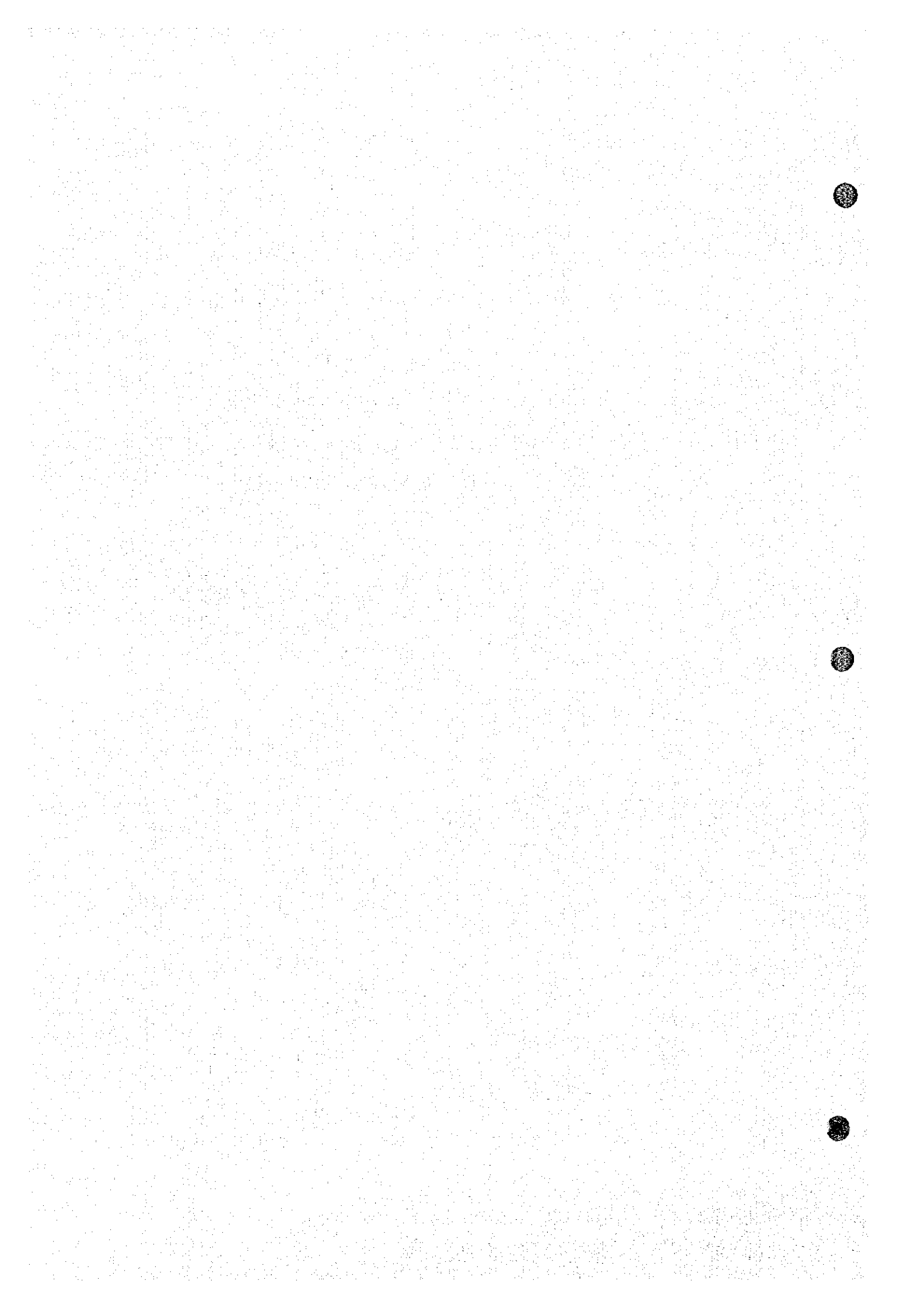
## 資料編 C

### 技術資料

C.1 交通量調査結果

C.2 地質調査結果

C.3 既存基準点現況調査結果



## TRAFFIC SURVEY

### Objective of the Survey

Roadside traffic counts have been carried out to review and update the future traffic demand on the Project Road.

The survey was done during December 10 (Monday) to 14 (Friday), 1995. As in the previous studies, 8 types of vehicles were categorized. Location of traffic counts and the total number of survey hours have been shown in Figure 1. The counting sites are at the same locations as in the previous studies, but only four sites were included in this study.

### Results of the Survey

Results of traffic counts are shown in Figure 1 and in the Appendix. Daily traffic volumes in the surveyed highways were found to increase at average rates of 12%-18% annually since 1993.

## TRAFFIC DEMAND FORECAST

### Future Traffic Volume

The main objective of this study is to update the forecasted traffic volume in the project road from previous studies, mainly the study in 1993.

In the 1993 study, the then 'present' OD matrices were estimated based on available OD matrices in 1986 study, applying expansion factor as the ratio of observed traffic volume in 1993 to the observed traffic volume in 1986. In the present study, that ratio has been used to forecast possible observed traffic volume in 1995 ( $V_{f,1995}$ ). A factor  $\alpha$ , was calculated as the ratio of the present observed traffic volume in 1995 ( $V_{p,1995}$ ) to  $V_{f,1995}$  such that,

$$\alpha = \frac{V_{p,1995}}{V_{f,1995}}$$

The assigned traffic volumes from 1993 study were modified by applying this factor. The traffic volume for the target year 2003 and also for the years 2008 and 2013 were estimated by linear extrapolation. These updated estimated traffic volumes are given in Figures 2, 3 and 4 for respective years.

The estimated volumes for Section II for different years have been given in Table 1 and also Figure 5. The average percentage of peak hour flow as a percentage of daily traffic volume has been calculated from the present data and also referring to the data from previous studies. The PCE (passenger car equivalent) values for respective vehicle types are same as in the previous studies.

Estimated Traffic Volume Based on 1995 Survey

Year	Site 3 (Pathlaiya - Hetauda side) 12 Hrs				Site 6 (Pathlaiya - Bardibas side) 12 Hrs					
	PC	Bus	Truck	MCycle	Total	PC	Bus	Truck	MCycle	Total
Surveyed 1986	86	66	326	40	518	55	60	239	28	382
Surveyed 1993	153	105	701	106	1065	92	80	425	49	646
Forecasted (F) 1995	172	116	808	125	1221	103	86	478	55	721
Surveyed (S) 1995	180	124	883	157	1344	133	90	510	75	808
Ratio S/F	1.05	1.07	1.09	1.26	1.10	1.30	1.05	1.07	1.36	1.12
Avg. of 3&6 (K)	1.17	1.06	1.08	1.31						

Forecasted Result in 1993 A/C Study

Section I (24 Hrs)	Year	PC	Bus	Truck	MCycle	Total
Forecasted	1999	221	371	500	26	1118
Forecasted	2010	463	918	1087	83	2551
Interpolated (X1)	2003	309	570	713	47	1639
Interpolated (X2)	2008	419	819	980	73	2290
Extrapolated (X3)	2013	529	1067	1247	99	2942
Section II (24 Hrs)	Year	PC	Bus	Truck	MCycle	Total
Forecasted	1999	186	368	478	26	1058
Forecasted	2010	452	963	1063	83	2561
Interpolated (Y1)	2003	283	584	691	47	1605
Interpolated (Y2)	2008	404	855	957	73	2288
Extrapolated (Y3)	2013	525	1125	1223	99	2971

Estimated Result Based on 1995 Survey

Section I (24 Hrs)	Year	PC	Bus	Truck	MCycle	Total
Estimated (K * X1)	2003	362	603	770	61	1797
Estimated (K * X2)	2008	491	867	1058	95	2511
Estimated (K * X3)	2013	620	1130	1346	129	3225
Section II (24 Hrs)	Year	PC	Bus	Truck	MCycle	Total
Estimated (K * Y1)	2003	331	619	746	61	1757
Estimated (K * Y2)	2008	473	905	1033	95	2506
Estimated (K * Y3)	2013	614	1191	1320	129	3255



Station: NAUBISE (24 Hrs. Total)

Direction		Bus	Mini Bus	Light Truck	Medium & Heavy Truck	Car, Van, Jeep, Pick-up	Tractor	Motor-cycle	Others
Kathmandu	Kathmandu-Mugling	248	54	82	782	190	0	108	0
	Kathmandu-Hetauda	4	3	3	43	8	0	10	0
	Mugling-Kathmandu	233	65	108	707	171	0	102	0
	Hetauda-Kathmandu	4	1	5	21	7	0	20	0
	Kathmandu Total	489	123	198	1553	376	0	240	0
Mugling	Mugling-Kathmandu	233	65	108	707	171	0	102	0
	Mugling-Hetauda	1	0	1	4	0	0	0	0
	Kathmandu-Mugling	248	54	82	782	190	0	108	0
	Hetauda-Mugling	1	0	0	5	0	0	1	0
	Mugling Total	483	119	191	1498	361	0	211	0
Hetauda	Hetauda-Kathmandu	4	1	5	21	7	0	20	0
	Hetauda-Mugling	1	0	0	5	0	0	1	0
	Kathmandu-Hetauda	4	3	3	43	8	0	10	0
	Mugling-Hetauda	1	0	1	4	0	0	0	0
	Hetauda Total	10	4	9	73	15	0	31	0

Station: NARAYANGHAT (12 Hrs. Total)

Direction		Bus	Mini Bus	Light Truck	Medium & Heavy Truck	Car, Van, Jeep, Pick-up	Tractor	Motor-cycle	Others
Hetauda	Hetauda-Butwal	23	12	18	167	95	39	129	3
	Hetauda-Mugling	60	22	14	184	97	6	56	1
	Butwal-Hetauda	19	8	8	139	91	43	62	2
	Mugling-Hetauda	68	19	39	203	126	12	75	1
	Hetauda Total	170	61	79	693	409	100	322	7
Butwal	Butwal-Hetauda	19	8	8	139	91	43	62	2
	Butwal-Mugling	45	5	20	105	57	4	48	0
	Hetauda-Butwal	23	12	18	167	95	39	129	3
	Mugling-Butwal	38	7	12	93	63	4	66	0
	Butwal Total	125	32	58	504	306	90	305	5
Mugling	Mugling-Butwal	38	7	12	93	63	4	66	0
	Mugling-Hetauda	68	19	39	203	126	12	75	1
	Butwal-Mugling	45	5	20	105	57	4	48	0
	Hetauda-Mugling	60	22	14	184	97	6	56	1
	Mugling Total	211	53	85	585	343	26	245	2

Station: PATHLAIYA (12 Hrs. Total)

Direction		Bus	Mini Bus	Light Truck	Medium & Heavy Truck	Car, Van, Jeep, Pick-up	Tractor	Motor-cycle	Others
Hetauda	Hetauda-Birgunj	43	4	21	359	30	9	68	0
	Hetauda-Bardibas	10	1	0	128	59	2	12	0
	Birgunj-Hetauda	49	2	6	192	58	10	66	0
	Bardibas-Hetauda	12	3	1	155	33	0	11	0
	Hetauda Total	114	10	28	834	180	21	157	0
Birgunj	Birgunj-Hetauda	49	2	6	192	58	10	66	0
	Birgunj-Bardibas	31	0	2	101	18	8	26	2
	Hetauda-Birgunj	43	4	21	359	30	9	68	0
	Bardibas-Birgunj	33	0	2	98	23	9	26	2
	Birgunj Total	156	6	31	750	129	36	186	4
Bardibas	Bardibas-Birgunj	33	0	2	98	23	9	26	2
	Bardibas-Hetauda	12	3	1	155	33	0	11	0
	Birgunj-Bardibas	31	0	2	101	18	8	26	2
	Hetauda-Bardibas	10	1	0	128	59	2	12	0
	Bardibas Total	86	4	5	482	133	19	75	4

Name of Station: Naubise				Direction: Kathmandu to Mugling		Date: Dec. 14, 1995		Weather: Clear	
Time	Bus	Mini Bus	Light Truck	Medium & Heavy Truck	Car, Van, Jeep, Pick-up	Tractor	Motor-cycle	Others	Total
06:00-07:00	0	0	1	14	0	0	4	0	19
07:00-08:00	13	0	6	88	12	0	7	0	126
08:00-09:00	21	13	5	42	21	0	5	0	107
09:00-10:00	10	11	8	24	11	0	6	0	70
10:00-11:00	9	7	3	26	11	0	4	0	60
11:00-12:00	6	5	1	35	18	0	7	0	72
12:00-13:00	2	4	1	53	14	0	16	0	90
13:00-14:00	6	2	12	42	10	0	14	0	86
14:00-15:00	4	2	1	50	16	0	14	0	87
15:00-16:00	8	2	14	52	18	0	12	0	106
16:00-17:00	16	1	3	60	10	0	10	0	100
17:00-18:00	32	1	6	61	17	0	3	0	120
18:00-19:00	31	1	1	54	10	0	1	0	98
19:00-20:00	32	1	7	43	14	0	0	0	97
20:00-21:00	42	2	1	42	3	0	2	0	92
21:00-22:00	16	2	2	21	1	0	0	0	42
22:00-23:00	0	0	3	23	1	0	0	0	27
23:00-24:00	0	0	2	12	1	0	0	0	15
00:00-01:00	0	0	1	11	0	0	0	0	12
01:00-02:00	0	0	1	2	0	0	0	0	3
02:00-03:00	0	0	0	2	0	0	0	0	2
03:00-04:00	0	0	0	4	0	0	0	0	4
04:00-05:00	0	0	1	3	2	0	0	0	6
05:00-06:00	0	0	2	18	0	0	3	0	23
<b>Total</b>	<b>248</b>	<b>54</b>	<b>82</b>	<b>782</b>	<b>190</b>	<b>0</b>	<b>108</b>	<b>0</b>	<b>1464</b>

Name of Station: Naubise				Direction: Mugling to Kathmandu		Date: Dec. 14, 1995		Weather: Clear	
Time	Bus	Mini Bus	Light Truck	Medium & Heavy Truck	Car, Van, Jeep, Pick-up	Tractor	Motor-cycle	Others	Total
06:00-07:00	25	0	5	40	0	0	0	0	70
07:00-08:00	3	1	2	52	1	0	3	0	62
08:00-09:00	6	0	3	83	1	0	5	0	98
09:00-10:00	7	2	6	53	10	0	6	0	84
10:00-11:00	3	1	9	48	3	0	4	0	68
11:00-12:00	3	5	7	62	17	0	6	0	100
12:00-13:00	5	10	7	44	16	0	9	0	91
13:00-14:00	7	7	6	43	16	0	10	0	89
14:00-15:00	17	11	4	25	19	0	14	0	90
15:00-16:00	7	5	12	31	11	0	16	0	82
16:00-17:00	7	7	7	31	24	0	9	0	85
17:00-18:00	7	4	15	25	7	0	9	0	67
18:00-19:00	5	4	9	15	12	0	4	0	49
19:00-20:00	1	6	2	14	11	0	3	0	37
20:00-21:00	1	0	2	9	5	0	2	0	19
21:00-22:00	0	0	1	20	5	0	0	0	26
22:00-23:00	0	0	0	12	1	0	2	0	15
23:00-24:00	2	1	1	4	2	0	0	0	10
00:00-01:00	1	0	0	12	5	0	0	0	18
01:00-02:00	2	0	2	16	1	0	0	0	21
02:00-03:00	16	0	0	9	1	0	0	0	26
03:00-04:00	34	0	1	17	2	0	0	0	54
04:00-05:00	38	1	2	14	0	0	0	0	55
05:00-06:00	36	0	5	28	1	0	0	0	70
<b>Total</b>	<b>233</b>	<b>65</b>	<b>108</b>	<b>707</b>	<b>171</b>	<b>0</b>	<b>102</b>	<b>0</b>	<b>1386</b>

Name of Station: Naubise				Direction: Kathmandu to Hetauda		Date: Dec. 14, 1996,		Weather: Clear	
Time	Bus	Mini Bus	Light Truck	Medium & Heavy Truck	Car, Van, Jeep, Pick-up	Tractor	Motor-cycle	Others	Total
06:00-07:00	0	0	0	3	0	0	0	0	3
07:00-08:00	0	0	0	3	0	0	0	0	3
08:00-09:00	2	1	0	0	0	0	2	0	5
09:00-10:00	0	1	1	4	2	0	1	0	9
10:00-11:00	0	0	0	3	0	0	1	0	4
11:00-12:00	0	0	1	1	1	0	0	0	3
12:00-13:00	0	0	0	4	1	0	2	0	7
13:00-14:00	0	0	0	5	1	0	2	0	8
14:00-15:00	2	0	0	3	0	0	0	0	5
15:00-16:00	0	0	1	8	1	0	1	0	11
16:00-17:00	0	1	0	4	1	0	1	0	7
17:00-18:00	0	0	0	1	0	0	0	0	1
18:00-19:00	0	0	0	2	0	0	0	0	2
19:00-20:00	0	0	0	0	0	0	0	0	0
20:00-21:00	0	0	0	0	0	0	0	0	0
21:00-22:00	0	0	0	0	0	0	0	0	0
22:00-23:00	0	0	0	0	0	0	0	0	0
23:00-24:00	0	0	0	0	0	0	0	0	0
00:00-01:00	0	0	0	0	0	0	0	0	0
01:00-02:00	0	0	0	0	0	0	0	0	0
02:00-03:00	0	0	0	0	0	0	0	0	0
03:00-04:00	0	0	0	0	0	0	0	0	0
04:00-05:00	0	0	0	0	1	0	0	0	1
05:00-06:00	0	0	0	2	0	0	0	0	2
<b>Total</b>	<b>4</b>	<b>3</b>	<b>3</b>	<b>43</b>	<b>8</b>	<b>0</b>	<b>10</b>	<b>0</b>	<b>71</b>

Name of Station: Naubise				Direction: Hetauda to Kathmandu		Date: Dec. 14, 1995,		Weather: Clear	
Time	Bus	Mini Bus	Light Truck	Medium & Heavy Truck	Car, Van, Jeep, Pick-up	Tractor	Motor-cycle	Others	Total
06:00-07:00	0	0	0	0	0	0	2	0	2
07:00-08:00	0	0	0	1	0	0	2	0	3
08:00-09:00	0	0	0	3	0	0	1	0	4
09:00-10:00	0	0	0	3	1	0	1	0	5
10:00-11:00	0	0	1	0	1	0	1	0	3
11:00-12:00	1	0	0	1	1	0	2	0	5
12:00-13:00	1	0	0	2	0	0	3	0	6
13:00-14:00	0	1	0	1	0	0	2	0	4
14:00-15:00	0	0	0	0	0	0	2	0	2
15:00-16:00	0	0	0	2	0	0	4	0	6
16:00-17:00	2	0	0	2	1	0	0	0	5
17:00-18:00	0	0	2	0	1	0	0	0	3
18:00-19:00	0	0	0	1	0	0	0	0	1
19:00-20:00	0	0	0	0	1	0	0	0	1
20:00-21:00	0	0	0	0	0	0	0	0	0
21:00-22:00	0	0	0	1	1	0	0	0	2
22:00-23:00	0	0	0	0	0	0	0	0	0
23:00-24:00	0	0	1	0	0	0	0	0	1
00:00-01:00	0	0	0	0	0	0	0	0	0
01:00-02:00	0	0	1	1	0	0	0	0	2
02:00-03:00	0	0	0	0	0	0	0	0	0
03:00-04:00	0	0	0	0	0	0	0	0	0
04:00-05:00	0	0	0	3	0	0	0	0	3
05:00-06:00	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>4</b>	<b>1</b>	<b>5</b>	<b>21</b>	<b>7</b>	<b>0</b>	<b>20</b>	<b>0</b>	<b>58</b>

Name of Station: Naubise				Direction: Hetauda-Mugling		Date: Dec. 14,1995		Weather: Clear	
Time	Bus	Mini Bus	Light Truck	Medium & Heavy Truck	Car, Van, Jeep, Pick-up	Tractor	Motor-cycle	Others	Total
06:00-07:00	0	0	0	1	0	0	0	0	1
07:00-08:00	0	0	0	1	0	0	0	0	1
08:00-09:00	0	0	0	0	0	0	0	0	0
09:00-10:00	0	0	0	0	0	0	0	0	0
10:00-11:00	0	0	0	0	0	0	0	0	0
11:00-12:00	0	0	0	0	0	0	0	0	0
12:00-13:00	0	0	0	0	0	0	0	0	0
13:00-14:00	0	0	0	0	0	0	0	0	0
14:00-15:00	0	0	0	0	0	0	0	0	0
15:00-16:00	1	0	0	3	0	0	1	0	5
16:00-17:00	0	0	0	0	0	0	0	0	0
17:00-18:00	0	0	0	0	0	0	0	0	0
18:00-19:00	0	0	0	0	0	0	0	0	0
19:00-20:00	0	0	0	0	0	0	0	0	0
20:00-21:00	0	0	0	0	0	0	0	0	0
21:00-22:00	0	0	0	0	0	0	0	0	0
22:00-23:00	0	0	0	0	0	0	0	0	0
23:00-24:00	0	0	0	0	0	0	0	0	0
00:00-01:00	0	0	0	0	0	0	0	0	0
01:00-02:00	0	0	0	0	0	0	0	0	0
02:00-03:00	0	0	0	0	0	0	0	0	0
03:00-04:00	0	0	0	0	0	0	0	0	0
04:00-05:00	0	0	0	0	0	0	0	0	0
05:00-06:00	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>7</b>

Name of Station: Naubise				Direction: Mugling-Hetauda		Date: Dec. 14,1995		Weather: Clear	
Time	Bus	Mini Bus	Light Truck	Medium & Heavy Truck	Car, Van, Jeep, Pick-up	Tractor	Motor-cycle	Others	Total
06:00-07:00	0	0	0	0	0	0	0	0	0
07:00-08:00	0	0	0	0	0	0	0	0	0
08:00-09:00	0	0	0	0	0	0	0	0	0
09:00-10:00	0	0	0	0	0	0	0	0	0
10:00-11:00	0	0	0	0	0	0	0	0	0
11:00-12:00	0	0	0	1	0	0	0	0	1
12:00-13:00	0	0	0	0	0	0	0	0	0
13:00-14:00	0	0	0	2	0	0	0	0	2
14:00-15:00	1	0	1	0	0	0	0	0	2
15:00-16:00	0	0	0	0	0	0	0	0	0
16:00-17:00	0	0	0	0	0	0	0	0	0
17:00-18:00	0	0	0	1	0	0	0	0	1
18:00-19:00	0	0	0	0	0	0	0	0	0
19:00-20:00	0	0	0	0	0	0	0	0	0
20:00-21:00	0	0	0	0	0	0	0	0	0
21:00-22:00	0	0	0	0	0	0	0	0	0
22:00-23:00	0	0	0	0	0	0	0	0	0
23:00-24:00	0	0	0	0	0	0	0	0	0
00:00-01:00	0	0	0	0	0	0	0	0	0
01:00-02:00	0	0	0	0	0	0	0	0	0
02:00-03:00	0	0	0	0	0	0	0	0	0
03:00-04:00	0	0	0	0	0	0	0	0	0
04:00-05:00	0	0	0	0	0	0	0	0	0
05:00-06:00	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6</b>

Name of Station: Narayanghat				Direction: Mugling to Hetauda		Date: Dec. 12, 1995		Weather: Clear	
Time	Bus	Mini Bus	Light Truck	Medium & Heavy Truck	Car, Van, Jeep, Pick-up	Tractor	Motor-cycle	Others	Total
06:00-07:00	2	1	5	25	2	1	0	0	36
07:00-08:00	4	0	4	24	6	0	2	0	40
08:00-09:00	1	2	4	33	4	0	4	0	48
09:00-10:00	9	0	3	22	17	1	12	0	64
10:00-11:00	10	1	2	14	16	2	6	0	51
11:00-12:00	7	1	5	10	22	0	6	0	51
12:00-13:00	9	5	5	12	13	0	7	0	51
13:00-14:00	6	3	3	10	10	2	6	0	40
14:00-15:00	4	3	2	11	9	3	5	0	37
15:00-16:00	7	1	2	14	8	2	8	0	42
16:00-17:00	4	0	1	12	11	1	8	0	37
17:00-18:00	5	2	3	16	8	0	11	1	46
<b>Total:</b>	<b>68</b>	<b>19</b>	<b>39</b>	<b>203</b>	<b>126</b>	<b>12</b>	<b>75</b>	<b>1</b>	<b>543</b>

Name of Station: Narayanghat				Direction: Hetauda to Mugling		Date: Dec. 12, 1995		Weather: Clear	
Time	Bus	Mini Bus	Light Truck	Medium & Heavy Truck	Car, Van, Jeep, Pick-up	Tractor	Motor-cycle	Others	Total
06:00-07:00	3	0	2	17	4	0	0	0	26
07:00-08:00	4	0	1	15	1	0	0	0	21
08:00-09:00	5	7	1	16	5	0	2	0	36
09:00-10:00	4	2	0	16	9	0	3	0	34
10:00-11:00	7	2	0	17	17	1	5	1	50
11:00-12:00	8	5	0	11	7	1	10	0	42
12:00-13:00	10	2	1	14	11	0	9	0	47
13:00-14:00	5	2	3	17	10	0	8	0	45
14:00-15:00	3	1	2	9	6	3	4	0	28
15:00-16:00	3	1	1	10	13	0	6	0	34
16:00-17:00	5	0	2	23	10	1	5	0	46
17:00-18:00	3	0	1	19	4	0	4	0	31
<b>Total:</b>	<b>60</b>	<b>22</b>	<b>14</b>	<b>184</b>	<b>97</b>	<b>6</b>	<b>56</b>	<b>1</b>	<b>440</b>

Name of Station: Narayanghat			Direction: Butwal to Hetauda			Date: Dec. 12, 1995		Weather: Clear	
Time	Bus	Mini Bus	Light Truck	Medium & Heavy Truck	Car, Van, Jeep, Pick-up	Tractor	Motor-cycle	Others	Total
06:00-07:00	1	0	0	9	4	0	0	0	14
07:00-08:00	0	1	0	21	6	2	5	1	36
08:00-09:00	3	0	0	13	8	7	4	0	35
09:00-10:00	1	4	0	30	6	5	4	0	50
10:00-11:00	1	0	0	5	11	4	3	0	24
11:00-12:00	3	1	1	9	8	3	9	1	35
12:00-13:00	6	0	0	13	10	3	7	0	39
13:00-14:00	1	0	0	8	4	0	3	0	16
14:00-15:00	3	0	3	8	9	6	8	0	37
15:00-16:00	0	1	2	7	16	6	7	0	39
16:00-17:00	0	1	1	4	5	4	7	0	22
17:00-18:00	0	0	1	12	4	3	5	0	25
<b>Total:</b>	<b>19</b>	<b>8</b>	<b>8</b>	<b>139</b>	<b>91</b>	<b>43</b>	<b>62</b>	<b>2</b>	<b>372</b>

Name of Station: Narayanghat			Direction: Hetauda to Butwal			Date: Dec. 12, 1995		Weather: Clear	
Time	Bus	Mini Bus	Light Truck	Medium & Heavy Truck	Car, Van, Jeep, Pick-up	Tractor	Motor-cycle	Others	Total
06:00-07:00	3	0	2	6	4	0	2	1	18
07:00-08:00	1	0	0	22	10	4	4	0	41
08:00-09:00	3	3	2	18	7	3	12	0	48
09:00-10:00	4	2	2	26	6	4	14	0	58
10:00-11:00	1	1	0	18	8	2	10	1	41
11:00-12:00	5	0	2	14	12	2	14	0	49
12:00-13:00	0	0	0	15	7	2	13	1	38
13:00-14:00	1	4	2	9	8	2	14	0	40
14:00-15:00	2	1	1	8	14	7	15	0	48
15:00-16:00	0	0	4	10	4	7	11	0	36
16:00-17:00	2	0	1	11	8	3	10	0	35
17:00-18:00	1	1	2	10	7	3	10	0	34
<b>Total:</b>	<b>23</b>	<b>12</b>	<b>18</b>	<b>167</b>	<b>95</b>	<b>39</b>	<b>129</b>	<b>3</b>	<b>486</b>

Name of Station: Narayanghat				Direction: Butwal to Mugling		Date: Dec. 12, 1995		Weather: Clear	
Time	Bus	Mini Bus	Light Truck	Medium & Heavy Truck	Car, Van, Jeep, Pick-up	Tractor	Motor-cycle	Others	Total
06:00-07:00	0	0	0	15	2	0	1	0	18
07:00-08:00	2	1	2	18	4	0	0	0	27
08:00-09:00	2	0	1	8	5	0	5	0	21
09:00-10:00	9	1	1	7	4	3	6	0	31
10:00-11:00	8	0	2	12	2	0	2	0	26
11:00-12:00	7	0	2	6	8	0	5	0	28
12:00-13:00	1	1	2	5	8	0	10	0	27
13:00-14:00	5	0	1	4	8	1	5	0	24
14:00-15:00	5	1	2	5	4	0	2	0	19
15:00-16:00	1	1	3	7	4	0	3	0	19
16:00-17:00	5	0	2	9	4	0	2	0	22
17:00-18:00	0	0	2	9	4	0	7	0	22
<b>Total:</b>	<b>45</b>	<b>5</b>	<b>20</b>	<b>105</b>	<b>57</b>	<b>4</b>	<b>48</b>	<b>0</b>	<b>284</b>

Name of Station: Narayanghat				Direction: Mugling to Butwal		Date: Dec. 12, 1995		Weather: Clear	
Time	Bus	Mini Bus	Light Truck	Medium & Heavy Truck	Car, Van, Jeep, Pick-up	Tractor	Motor-cycle	Others	Total
06:00-07:00	0	1	3	8	2	0	2	0	16
07:00-08:00	1	0	2	12	1	0	5	0	21
08:00-09:00	1	0	0	5	4	0	5	0	15
09:00-10:00	1	1	0	15	9	1	6	0	33
10:00-11:00	4	0	0	6	7	0	4	0	21
11:00-12:00	5	1	2	3	7	0	11	0	29
12:00-13:00	5	1	2	5	3	0	11	0	27
13:00-14:00	6	0	0	6	4	1	5	0	22
14:00-15:00	3	2	0	9	8	0	7	0	29
15:00-16:00	3	1	0	10	9	2	5	0	30
16:00-17:00	4	0	2	10	5	0	3	0	24
17:00-18:00	5	0	1	4	4	0	2	0	16
<b>Total:</b>	<b>38</b>	<b>7</b>	<b>12</b>	<b>93</b>	<b>63</b>	<b>4</b>	<b>66</b>	<b>0</b>	<b>283</b>

Name of Station: Pathlaiya			Direction: Birgunj to Hetauda			Date: Dec. 11, 1996		Weather: Clear	
Time	Bus	Mini Bus	Light Truck	Medium & Heavy Truck	Car, Van, Jeep, Pick-up	Tractor	Motor-cycle	Others	Total
06:00-07:00	4	0	1	7	0	0	0	0	12
07:00-08:00	3	0	0	2	1	1	0	0	7
08:00-09:00	5	1	0	7	12	1	1	0	27
09:00-10:00	2	1	0	6	11	3	3	0	26
10:00-11:00	5	0	0	12	3	0	6	0	26
11:00-12:00	3	0	0	9	4	1	6	0	23
12:00-13:00	4	0	1	12	7	0	6	0	30
13:00-14:00	5	0	2	20	4	0	2	0	33
14:00-15:00	5	0	0	24	2	2	5	0	38
15:00-16:00	8	0	0	25	4	0	13	0	50
16:00-17:00	4	0	1	34	6	2	18	0	65
17:00-18:00	1	0	1	34	4	0	6	0	46
<b>Total:</b>	<b>49</b>	<b>2</b>	<b>6</b>	<b>192</b>	<b>58</b>	<b>10</b>	<b>66</b>	<b>0</b>	<b>383</b>

Name of Station: Pathlaiya			Direction: Hetauda to Birgunj			Date: Dec. 11, 1996		Weather: Clear	
Time	Bus	Mini Bus	Light Truck	Medium & Heavy Truck	Car, Van, Jeep, Pick-up	Tractor	Motor-cycle	Others	Total
06:00-07:00	5	0	1	15	0	0	0	0	21
07:00-08:00	3	0	1	41	1	0	0	0	46
08:00-09:00	6	0	5	36	2	0	3	0	52
09:00-10:00	4	0	0	59	4	3	8	0	78
10:00-11:00	3	0	4	31	3	1	17	0	59
11:00-12:00	1	0	0	44	2	0	5	0	52
12:00-13:00	2	0	4	24	2	0	9	0	41
13:00-14:00	3	0	0	28	4	2	7	0	44
14:00-15:00	5	3	3	29	1	0	2	0	43
15:00-16:00	5	0	1	24	4	2	3	0	39
16:00-17:00	3	1	1	21	5	1	7	0	39
17:00-18:00	3	0	1	7	2	0	7	0	20
<b>Total:</b>	<b>43</b>	<b>4</b>	<b>21</b>	<b>359</b>	<b>30</b>	<b>9</b>	<b>68</b>	<b>0</b>	<b>534</b>



Name of Station: Pathlaiya				Direction: Bardibas to Birgunj		Date: Dec. 11, 1995		Weather: Clear	
Time	Bus	Mini Bus	Light Truck	Medium & Heavy Truck	Car, Van, Jeep, Pick-up	Tractor	Motor-cycle	Others	Total
06:00-07:00	2	0	0	5	0	0	0	0	7
07:00-08:00	3	0	0	5	1	0	0	0	9
08:00-09:00	2	0	0	13	1	0	2	0	18
09:00-10:00	5	0	0	7	2	2	0	0	16
10:00-11:00	4	0	0	14	2	1	1	0	22
11:00-12:00	1	0	2	7	2	2	4	0	18
12:00-13:00	2	0	0	4	3	1	4	1	15
13:00-14:00	0	0	0	6	2	0	4	0	12
14:00-15:00	2	0	0	9	3	1	5	0	20
15:00-16:00	5	0	0	13	2	1	4	1	26
16:00-17:00	3	0	0	10	3	1	1	0	18
17:00-18:00	4	0	0	5	2	0	1	0	12
<b>Total:</b>	<b>33</b>	<b>0</b>	<b>2</b>	<b>98</b>	<b>23</b>	<b>9</b>	<b>26</b>	<b>2</b>	<b>193</b>

Name of Station: Pathlaiya				Direction: Birgunj to Bardibas		Date: Dec. 11, 1995		Weather: Clear	
Time	Bus	Mini Bus	Light Truck	Medium & Heavy Truck	Car, Van, Jeep, Pick-up	Tractor	Motor-cycle	Others	Total
05:00-07:00	4	0	0	7	0	1	0	0	12
07:00-08:00	4	0	1	10	0	0	0	0	15
08:00-09:00	2	0	0	4	2	1	0	0	9
09:00-10:00	2	0	0	5	2	1	3	0	13
10:00-11:00	2	0	0	7	1	1	0	0	11
11:00-12:00	2	0	1	3	2	1	1	0	10
12:00-13:00	2	0	0	13	1	0	5	0	21
13:00-14:00	4	0	0	6	2	1	2	0	15
14:00-15:00	0	0	0	10	2	1	5	0	18
15:00-16:00	5	0	0	16	2	0	3	2	28
16:00-17:00	1	0	0	5	3	1	4	0	14
17:00-18:00	3	0	0	15	1	0	3	0	22
<b>Total:</b>	<b>31</b>	<b>0</b>	<b>2</b>	<b>101</b>	<b>18</b>	<b>8</b>	<b>26</b>	<b>2</b>	<b>188</b>

Name of Station: Pathlaiya			Direction: Bardibas to Hetauda			Date: Dec. 11, 1995		Weather: Clear	
Time	Bus	Mini Bus	Light Truck	Medium & Heavy Truck	Car, Van, Jeep, Pick-up	Tractor	Motor-cycle	Others	Total
06:00-07:00	0	0	0	13	0	0	0	0	13
07:00-08:00	1	0	0	12	0	0	0	0	13
08:00-09:00	2	0	0	17	2	0	0	0	21
09:00-10:00	2	1	0	20	6	0	1	0	30
10:00-11:00	3	0	0	14	5	0	0	0	22
11:00-12:00	1	0	0	12	1	0	0	0	14
12:00-13:00	1	1	1	6	2	0	3	0	14
13:00-14:00	0	0	0	9	2	0	4	0	15
14:00-15:00	1	1	0	18	4	0	0	0	24
15:00-16:00	0	0	0	15	3	0	2	0	20
16:00-17:00	1	0	0	11	5	0	1	0	18
17:00-18:00	0	0	0	8	3	0	0	0	11
<b>Total:</b>	<b>12</b>	<b>3</b>	<b>1</b>	<b>155</b>	<b>33</b>	<b>0</b>	<b>11</b>	<b>0</b>	<b>215</b>

Name of Station: Pathlaiya			Direction: Hetauda to Bardibas			Date: Dec. 11, 1995		Weather: Clear	
Time	Bus	Mini Bus	Light Truck	Medium & Heavy Truck	Car, Van, Jeep, Pick-up	Tractor	Motor-cycle	Others	Total
06:00-07:00	0	0	0	6	3	0	0	0	9
07:00-08:00	0	0	0	10	3	0	0	0	13
08:00-09:00	0	1	0	12	9	0	1	0	23
09:00-10:00	0	0	0	15	5	0	2	0	22
10:00-11:00	0	0	0	14	2	0	2	0	18
11:00-12:00	0	0	0	15	5	0	0	0	20
12:00-13:00	1	0	0	14	3	0	1	0	19
13:00-14:00	4	0	0	9	3	2	2	0	20
14:00-15:00	3	0	0	9	8	0	0	0	20
15:00-16:00	1	0	0	6	6	0	0	0	13
16:00-17:00	1	0	0	10	4	0	2	0	17
17:00-18:00	0	0	0	8	8	0	2	0	18
<b>Total:</b>	<b>10</b>	<b>1</b>	<b>0</b>	<b>128</b>	<b>59</b>	<b>2</b>	<b>12</b>	<b>0</b>	<b>212</b>

REPORT ON

GEOTECHNICAL SURVEY FOR THE BASIC DESIGN STUDY

ON

THE PROJECT FOR CONSTRUCTION OF  
SINDHULI ROAD

(SECTION II-3 : NEPALTHOK - DHULIKHEL)

Submitted to:

NIPPON KOEI CO., LTD.  
4, KOJIMACHI 5-CHOME CHIYODA-KU  
TOKYO, JAPAN

JANUARY 1996

---

Submitted by:

**SILT** Consultants (P) Ltd.

Baneshwor (Battisputali)

Kathmandu, Nepal

P.O. Box 2724

Tel : 473573, 470866

Telex: 2314 RAITRA NP

Fax : 977-1-473573

January, 1996

**Report on Geotechnical Survey for  
Basic Design Study on  
Project for Construction of  
Sindhuli Road (Section III-3 : Nepalthok - Dhulikhel)**

**TABLE OF CONTENTS**

<b>1</b>	<b>INTRODUCTION</b> .....	<b>1</b>
1.1	General .....	1
1.2	Objective .....	1
1.3	Scope and Extent of Works .....	1
	1.3.1 Boring .....	1
	1.3.2 In - Situ Testing .....	2
	1.3.3 Ground Water Observation .....	2
	1.3.4 Bore Hole Logging .....	2
	1.3.5 Sampling and Laboratory Testing Construction Materials .....	3
<b>2</b>	<b>RESULTS</b> .....	<b>3</b>
<b>Annex 1</b>	<b>Bore Hole Logs</b>	
<b>Annex 2</b>	<b>CBR Test Results</b>	

# 1 INTRODUCTION

## 1.1 General

This report has been prepared as per the Agreement made on December 5, 1995 between Nippon Koei Co. Ltd, 4, Kojimachi 5-chome Chiyoda-ku, Tokyo, Japan and SILT Consultants (P.) Ltd, Battisputali, Kathmandu, Nepal for undertaking by the latter a Geotechnical Survey for the Basic Design Study on the Project for Construction of Sindhuli Road (Section III-3 : Nepalthok - Dhulikhel).

This report describes the methodology and scope of sub-surface drilling, in - situ testing, and observation in the bore holes.

The investigation works were carried out during December 10, 1995 to January 12, 1996.

## 1.2 Objective

The objective of the geotechnical investigation was to establish the sub-surface geological condition at the sites of the proposed 4 bridges along the (Section III-3 : Nepalthok - Dhulikhel) of the Bardibas - Sindhuli Road, and to obtain the classification as well as design soil parameters for the design of the bridge foundations by undertaking in-situ testing in the bore holes.

## 1.3 Scope and Extent of Works

The geotechnical investigation carried out under the present contract consisted mainly of drilling of four bore holes, one each at the four points of the bridges; in - situ testing in the bore holes by Standard Penetration test at 1 m interval; ground water observation, bore hole logging; and conduction of CBR tests on three soil samples collected from 3 test pits. Aspects of these are described in brief below.

### 1.3.1 Boring

No. of Bore Holes : Altogether 4 bore holes were drilled, one each at the site of the four bridges, namely, at Charange Khola (BH1), Naubise Khola (BH2), Roshi Khola (BH3) and Daunne Khola (BH4)

Method of Boring : All of the bore holes were drilled by rotary core drilling method using diamond core bits. Water was used as the drilling fluid. Diameter of the boreholes was 76 mm.

The holes were cased up to the required depths for preventing the wall collapse.

Location of Boreholes : The bore holes drilled were located as per the advise of the Client. The following list provides the details.

Name of the River	Bore Hole Number	Drilled Depth, m	Location of the Bore Hole
Charange Khola	BH1	15	Left bank about 8m high
Naubise Khola	BH2	15	Right bank of River, about 3m away
Roshi Khola	BH3	15	Left bank, about 15m from the stream bed
Daunne Khola	BH4	15	On a hill at the confluence of Roshi Khola and Daunne Khola

Date of Boring : The drilling machine together with the mud pump and other accessories were mobilized to the site of BH - 1 on December 10, 1995. The first boring was started on 13th December 1995. Since then the drilling operation went on smoothly with interruptions only for shifting the machines.

### 1.3.2 In - Situ Testing

Standard Penetration Test (SPT) was tried carried out at every one meter depth interval in all the bore holes. However, in most of the holes rock was encountered so not SPT could be conducted 8 depths. Similarly, due preserve of boulders refusal of the debt was seen in many sections tested.

### 1.3.3 Ground Water Observation

The level of ground water was monitored in each of the drilled holes every day morning at the start of the drilling operation when the water is least disturbed.

### 1.3.4 Bore Hole Logging

All the drilled bore holes were logged as the drilling progressed.

### **1.3.5 Sampling and Laboratory Testing Construction Materials**

Three test pits were dug so as to collect soil samples for the conduction of CBR test. The samples were transported to Kathmandu and were tested in the Soil and Materials Testing Laboratory of SILT Consultants (P.) Ltd. at Baneshwor, Kathmandu.

## **2 RESULTS**

The bore hole logs have been presented in Annex 1. The results of laboratory test (CBR test) are provided in Annex 2.

**Annex 1**

**Bore Hole Logs**



# SILT Consultants (P.) Ltd.

Baneswor, Kathmandu

## FIELD BORING LOG

Project: <u>Banepa Shindhuli Road</u>		Location: <u>Charange Khola 1st bridge</u>	
B.H. <u>1</u>	Elev. of Ground _____ m	Date Commenced <u>19 Dec 1995</u>	Finished <u>24 Dec 1995</u>
Drilling Crews <u>Rohini UPadhaya</u>		Field Engineer: _____	
_____		Weather <u>Cloudy</u>	

WATER LEVEL RECORD				
Date	Time	Borehole Depth, m	Casing Depth, m	Water Level from Ground, m
			6 m	9.00
Ground Water Table				
(from Observation Well)				

Type of Sample: _____
Thin Wall Tube: _____
Drill Rod <u>42 mm Casing NX</u>
Casing <u>SPT</u>
Drive Weight, kg. <u>64.50</u>
Drop Weight, cm <u>76.00</u>

Depth, m From	Method	Recovery, cm	Sample No	Standard Penetration Test			Strata Change Level, m	Soil Description
				Blows 0-15	Blows 15-30	N blows 30-45		
0	1	DB		Refusal		> 50		Loose alluvial sandy gravel with
1	2	"		SPT test could not be carried out because of the pressure of boulders			2.00	occasional boulders
2	3	"		refusal in SPT test. No penetration				Heavily fractured weathered fine to medium grained dark coloured schist. No water return during drilling
3	4	"						
4	5	"						
5	6	"					6.00	
6	7	"		SPT not carried out.				Fine to medium grained, moderately calcareous biolite schist the light and dark alternating bands are 1-2 cm. thick.
7	8	"						
8	9	"						
9	10	"						
10	11	"						
11	12	"						
12	13	"						
13	14	"						
14	15	"					15.00	
								Bottom of hole

METHOD	PA - Power Auger    ST - Shelby Tube HA - Hand Auger    SS - Split Spoon WO - Wash Out    DB - Diamond Bit	REMARKS
		_____
		_____
		_____







## Annex 2 CBR Test Results

SOIL AND MATERIAL TESTING LABORATORY  
CBR TEST RESULT SHEET

Project: Bardibas Sindhuli Road	Sample No.: Pit-1	Mould No.: 8
Client:	Depth, m:	Mould Wt., gm: 4395.00
Location: Kavre Danda, Dapcha mod	Blows/Layer: 56.00	Mould Volume, cm <sup>3</sup> : 2359.00
B.H. No.:	No. of Layer: 5.00	Date: 19-01-1996
LRC, kg/div.: 42.35	Area of Piston, cm <sup>2</sup> : 19.45	Tested by: S.N.Singh

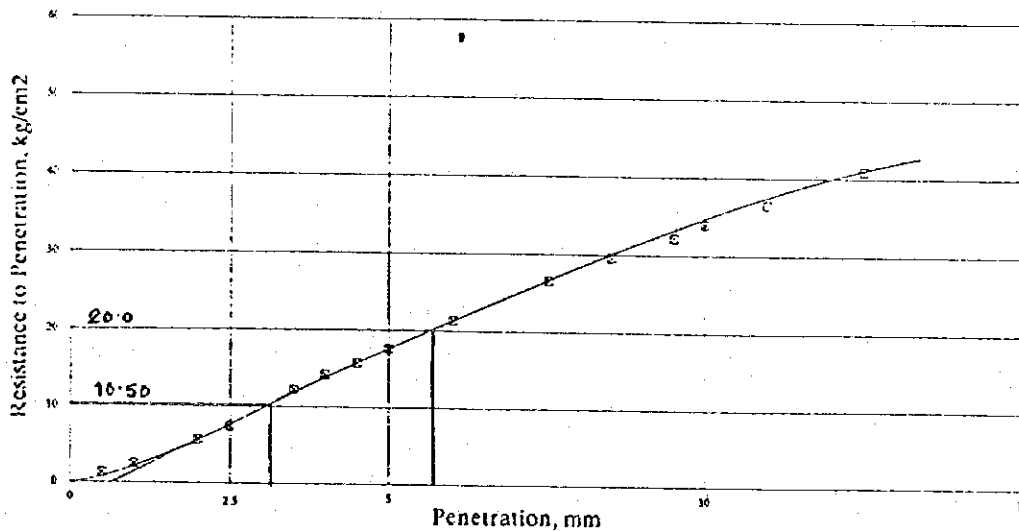
Penetration mm	Piston Load Dial Reading	Load kg/cm <sup>2</sup>
0.50	0.60	1.31
1.00	1.10	2.40
2.00	2.60	5.66
2.50	3.40	7.40
3.50	5.60	12.19
4.00	6.50	14.15
4.50	7.20	15.68
5.00	8.10	17.64
6.00	9.80	21.34
7.50	12.20	26.56
8.50	13.60	29.61
9.50	14.80	32.23
10.00	15.60	33.97
11.00	16.80	36.58
12.50	18.80	40.93

Condition	Initial (Before Soaked)	Final (Soaked)
Can No.	A90	125
Wt. of Can+Wet Soil, gm	127.10	132.45
Wt. of Can+Dry Soil, gm	109.50	113.50
Wt. of Can, gm	23.70	27.30
Moisture Content, %	16.07	16.70

Mould No.	8
Wt. of Mould+Soil, gm	9390.00
Wt. of Soil, mg	4995.00
Wet Density, gm/cc	2.12
Dry Density, gm/cc	1.82
Wt. of Soil after Soaked, gm	5085.00
Water Absorbed, %	1.80
CBR Value of, %	
CBR of 2.5mm Penetration	15.00

Initial Dial Reading	Div.
(0hrs.) 15-01-1996	6.21
Dial Reading (24hrs.)	
Dial Reading (48hrs.)	
Dial Reading (72hrs.)	
Final Dial Reading	
(96hrs.) 19-01-1996	6.55
Swell, %	0.26
CBR of 5mm Penetration	19.05

STRESS STRAIN CURVE



Note: CBR =  $\frac{\text{Corrected Load Value} \times 100}{\text{Standard Load}}$

**SILT Consultants (P) Ltd.**  
 Battispatali, Kathmandu  
**SOIL AND MATERIAL TESTING LABORATORY**  
**CBR TEST RESULT SHEET**

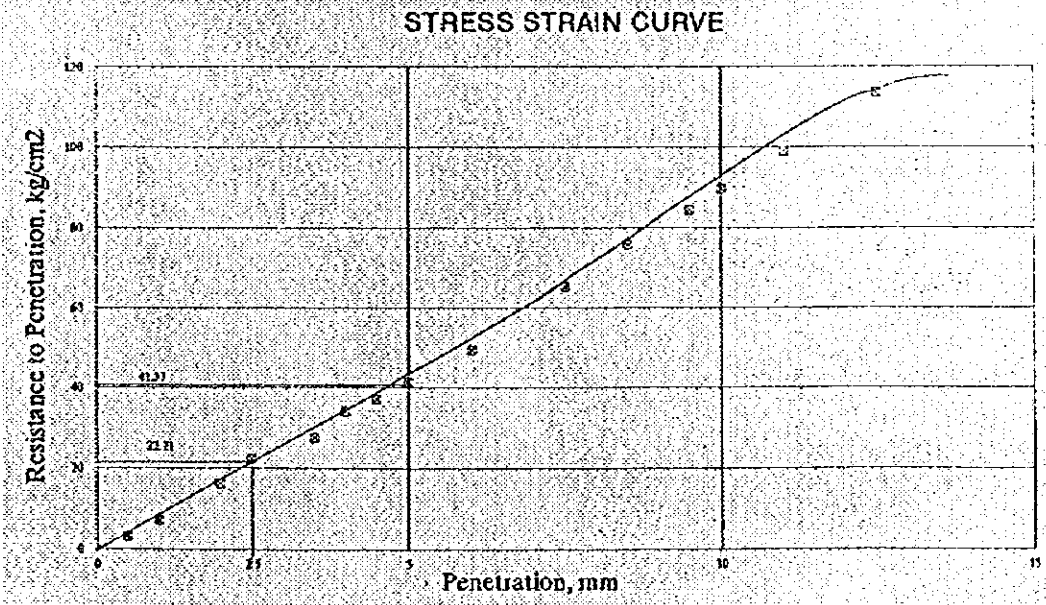
Project: Bardibas Sindhuli Road	Sample No.: Pit-2	Mould No.: 16
Client:	Depth, m:	Mould Wt., gm: 4420.00
Location: Charange Khola	Blows/Layer: 56.00	Mould Volume, cm <sup>3</sup> : 2359.00
B.H. No.:	No. of Layer: 5.00	Date: 19-01-1996
LRC, kg/dry.:	Area of Piston, cm <sup>2</sup> : 19.45	Tested by: S.N. Singh

Penetration mm	Piston Load Dial Reading	Load kg/cm <sup>2</sup>
0.50	1.40	3.05
1.00	3.20	6.97
2.00	7.40	16.11
2.50	10.20	22.21
3.50	12.60	27.43
4.00	15.60	33.97
4.50	17.00	37.02
5.00	19.00	41.37
6.00	22.60	49.21
7.50	30.00	65.32
8.50	34.80	75.77
9.50	38.80	84.48
10.00	41.20	89.71
11.00	45.50	99.07
12.50	52.20	113.66

Condition	Initial (Before Soaked)	Final (Soaked)
Can No.	217	205
Wt. of Can+Wet Soil, gm	117.50	105.00
Wt. of Can+Dry Soil, gm	114.25	102.45
Wt. of Can, gm	30.00	27.50
Moisture Content, %	2.84	2.49

Mould No.	16
Wt. of Mould+Soil, gm	9800.00
Wt. of Soil, mg	5380.00
Wet Density, gm/cc	2.28
Dry Density, gm/cc	2.22
Wt. of Soil after Soaked, gm	9950.00
Water Absorbed, %	2.78
CBR Value of, %	
CBR of 2.5mm Penetration	31.73

Initial Dial Reading	Div.
(0hrs.) 15-01-1996	5.92
Dial Reading (24hrs.)	
Dial Reading (48hrs.)	
Dial Reading (72hrs.)	
Final Dial Reading (96hrs.) 19-01-1996	5.95
Swell, %	0.02
CBR of 5mm Penetration	39.40



Note:  $CBR = \frac{\text{Corrected Load Value} \times 100}{\text{Standard Load}}$

**SILT Consultants (P) Ltd.**  
**Battispurahi, Kathmandu**  
**SOIL AND MATERIAL TESTING LABORATORY**  
**CBR TEST RESULT SHEET**

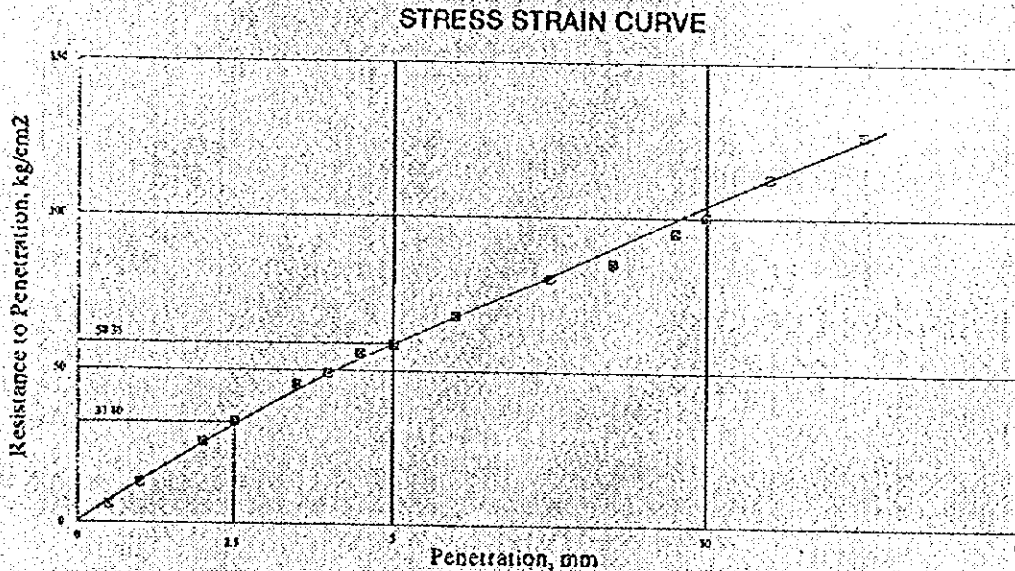
Project: Bardibas Sindhuli Road	Sample No.: Pit-3	Mould No.: C3
Client:	Depth, m:	Mould Wt., gm: 3960.00
Location: Daunne, Roshi Khola	Blows/Layer: 56.00	Mould Volume, cm <sup>3</sup> : 2244.27
B.H. No.:	No. of Layer: 5.00	Date: 19-01-1996
LRC, kg/div.: 42.35	Area of Piston, cm <sup>2</sup> : 19.45	Tested by: S.N. Singh

Penetration mm	Piston Load Dial Reading	Load kg/cm <sup>2</sup>
0.50	2.80	6.10
1.00	6.00	13.06
2.00	12.20	26.56
2.50	15.20	33.10
3.50	20.80	45.29
4.00	22.50	48.99
4.50	25.60	55.74
5.00	26.80	58.35
6.00	31.20	67.93
7.50	36.80	80.13
8.50	39.00	84.92
9.50	43.60	94.93
10.00	46.00	100.16
11.00	51.80	112.79
12.50	56.20	126.72

Condition	Initial (Before Soaked)		Final (Soaked)
	CN28	A98	
Wt. of Can + Wet Soil, gm	140.85	123.15	
Wt. of Can + Dry Soil, gm	136.90	119.50	
Wt. of Can, gm	36.30	32.30	
Moisture Content, %	2.69	3.05	

Mould No.	C3
Wt. of Mould + Soil, gm	9050.0
Wt. of Soil, mg	5150.00
Wet Density, gm/cc	2.29
Dry Density, gm/cc	2.22
Wt. of Soil after Soaked, gm	5295.00
Water Absorbed, %	2.81
CBR Value of, %	
CBR of 2.5mm Penetration	47.29

Initial Dial Reading	Div.
(0hrs.) 15-01-1996	6.80
Dial Reading (24hrs.)	
Dial Reading (48hrs.)	
Dial Reading (72hrs.)	
Final Dial Reading (96hrs.) 19-01-1996	6.84
Swell, %	0.03
CBR of 5mm Penetration	55.57



Note:  $CBR = \frac{\text{Corrected Load Value} \times 100}{\text{Standard Load}}$



**THE PROJECT FOR CONSTRUCTION OF SINDHULI ROAD  
(SECTION II - 3 : NEPALTHOK - DHULIKHEL)**

**CONDITION SURVEY  
BENCHMARKS AND CONTROL POINTS**

*Submitted To:*

**NIPPON KOEI Co. Ltd.**

*December, 1995*

---

**GEOCE Consultants (P) Ltd.**

**CONSULTING ENGINEERS**

GPO Box 4266, KATHMANDU, NEPAL, TEL : 415144 FAX : 977-1-415401 TLEX : 2322 BLUSTR NP

Station No	: BK - 9	District	: Kavre Palanchok
VDC	: Subhagau	Ward	: Village : Subhagau
Location	: Banepa	Located	: Lost : <input checked="" type="checkbox"/>
Condition	: Lost	Damaged	: Not damaged :
Centre Peg	: Did not exist <input type="checkbox"/>	Damage	: <input type="checkbox"/> Lost <input checked="" type="checkbox"/>

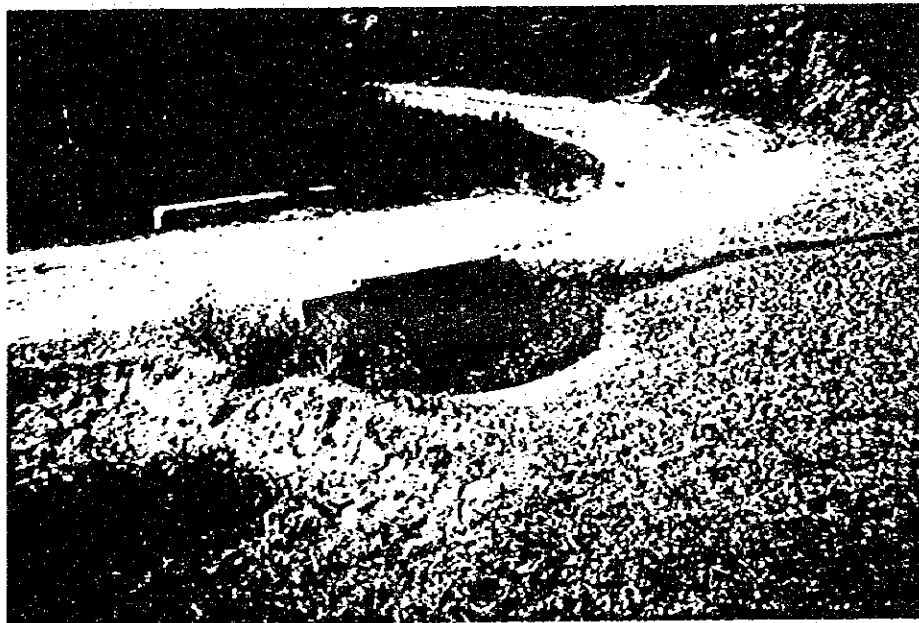
Photographs

Remarks

Lost could not find

Station No	: BK - 10	District	: Kavre Palanchok
VDC	: Subhugau	Ward	: 8 Village : Mahatgaun
Location	: Banepa	Located	: Lost : ✓
Condition	:	Damaged	: ✓ Not damaged :
Centre Peg	: Did not exist <input type="checkbox"/>	Damage	<input type="checkbox"/> Lost <input type="checkbox"/> ✓

Photographs



Remarks

Reported to be around the above area.

Project for Construction of Sindhuli Road

Station No	: BK - 11	District	: Kavre Palanchok
VDC	: Sharada	Ward	: 7 Village : Balase
Location	: Banepa	Located	: Lost : ✓
Condition	: Lost	Damaged	: ✓ Not damaged :
Centre Peg	: Did not exist <input type="checkbox"/>	Damage	<input type="checkbox"/> Lost <input type="checkbox"/> ✓ <input type="checkbox"/>

Photographs

Remarks

Lost could not find.

Station No	: TS - 100	District	: Kavre Palanchok
VDC	: Dhulikhel	Ward	: 6 Village : Dhulikhel
Location	: Dhulikhel	Located	: Lost : ✓
Condition	: Lost	Damaged	: ✓ Not damaged :
Centre Peg	: Did not exist <input type="checkbox"/>	Damage	: <input type="checkbox"/> Lost <input type="checkbox"/> ✓ <input type="checkbox"/>

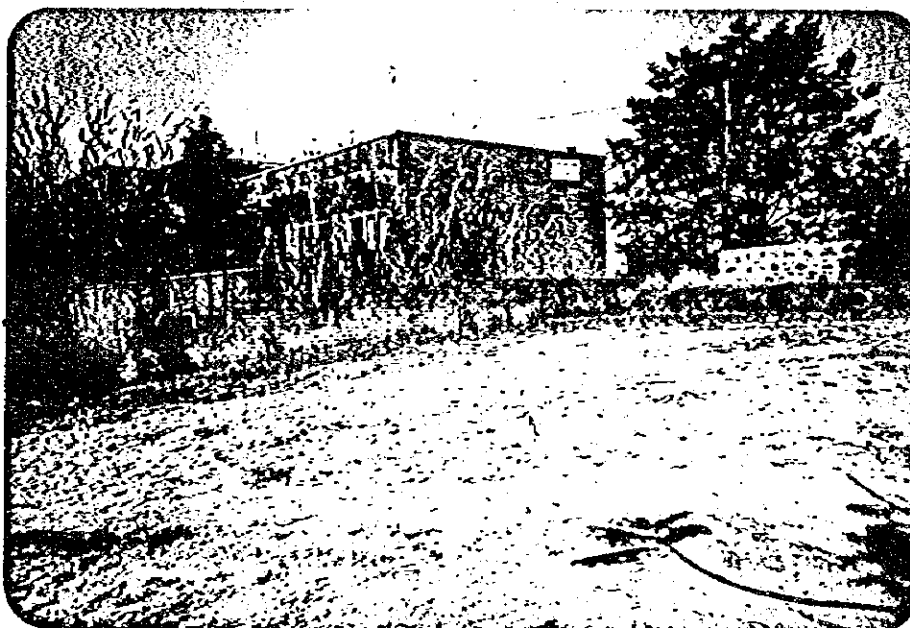
Photographs

Remarks

Lost could not find.

Station No	: <u>TS - 101</u>	District	: <u>Kavre Palanchok</u>
VDC	: <u>Dhulikhel</u>	Ward	: <u>2</u> Village : <u>Dhulikhel</u>
Location	: <u>Dhulikhel</u>	Located	: <u>      </u> Lost : <u>√</u>
Condition	: <u>Lost</u>	Damaged	: <u>√</u> Not damaged : <u>      </u>
Centre Peg	: <u>Did not exist</u> <input type="checkbox"/>	Damage	<input type="checkbox"/> Lost <input type="checkbox"/> <u>√</u>

Photographs



Remarks

The point was disturbed during the construction of the forestry office building above.

Station No	: TK-2-1	District	: Kavre Palanchok
VDC	: Banepa	Ward	: 6 Village : Banepa
Location	: Banepa	Located	: Lost : <input checked="" type="checkbox"/>
Condition	: Lost	Damaged	: <input checked="" type="checkbox"/> Not damaged : <input type="checkbox"/>
Centre Peg	: Did not exist <input type="checkbox"/>	Damage	<input type="checkbox"/> Lost <input checked="" type="checkbox"/>

Photographs

Remarks

Lost could not find.

Station No	: TK-2	District	: Kavre Palanchok
VDC	: Subhugau	Ward	: 2 Village : Dhaneshor
Location	: Dhulikhel	Located	: <input checked="" type="checkbox"/> Lost : <input type="checkbox"/>
Condition	: All Good	Damaged	: <input type="checkbox"/> Not damaged : <input checked="" type="checkbox"/>
Centre Peg	: Did not exist <input type="checkbox"/>	Damage	: <input type="checkbox"/> A01 Lost <input type="checkbox"/>

Photographs



Remarks

- Near the house of Surya Bahadur Thapa
- Could be used
- Even centre peg existed



Station No	: TK - 2- 2	District	: Kavre Palanchok
VDC	: Shrikhandpur	Ward	: 7 Village : Shrikhandpur
Location	: Banepa	Located	: Lost : ✓
Condition	: Lost	Damaged	: Not damaged :
Centre Peg	: Did not exist <input type="checkbox"/>	Damage	<input type="checkbox"/> Lost <input checked="" type="checkbox"/>

Photographs



Remarks

Reported to be around the above area

Station No	: TS - 22	District	: Kavre Palanchok
VDC	: Shubhugau	Ward	: 8 Village : Mahatgau
Location	: Banepa	Located	: <input checked="" type="checkbox"/> Lost : <input type="checkbox"/>
Condition	: All Good	Damaged	: <input type="checkbox"/> Not damaged : <input checked="" type="checkbox"/>
Centre Peg	: Did not exist <input type="checkbox"/>	Damage	<input type="checkbox"/> Lost <input type="checkbox"/>

Photographs



Remarks

- Near the land of Naw Raj Mahat
- Could be used
- Even centre peg existed

Station No	: <u>TS - 22 - 1</u>	District	: <u>Kavre Palanchok</u>
VDC	: <u>Shubhugau</u>	Ward	: <u>5</u> Village : <u>Gairigau</u>
Location	: <u>Banepa</u>	Located	: <input checked="" type="checkbox"/> Lost : <input type="checkbox"/>
Condition	: <u>Good</u>	Damaged	: <input type="checkbox"/> Not damaged : <input checked="" type="checkbox"/>
Centre Peg	: <input type="checkbox"/> Did not exist	<input type="checkbox"/> Damage	<input type="checkbox"/> Lost <input type="checkbox"/>

Photographs



Remarks

- The point is known to Mr. Hari Bahadur K. C.
- Could be used
- Even centre peg existed

Station No	: TS - 23	District	: Kavre Palanchok
VDC	: Sharada	Ward	: 7 Village : Batase
Location	: Banepa	Located	: Lost : <input checked="" type="checkbox"/>
Condition	: Can't be used	Damaged	: <input checked="" type="checkbox"/> Not damaged : <input type="checkbox"/>
Centre Peg	: Did not exist <input type="checkbox"/>	Damage	<input type="checkbox"/> Lost <input checked="" type="checkbox"/>

**Photographs**

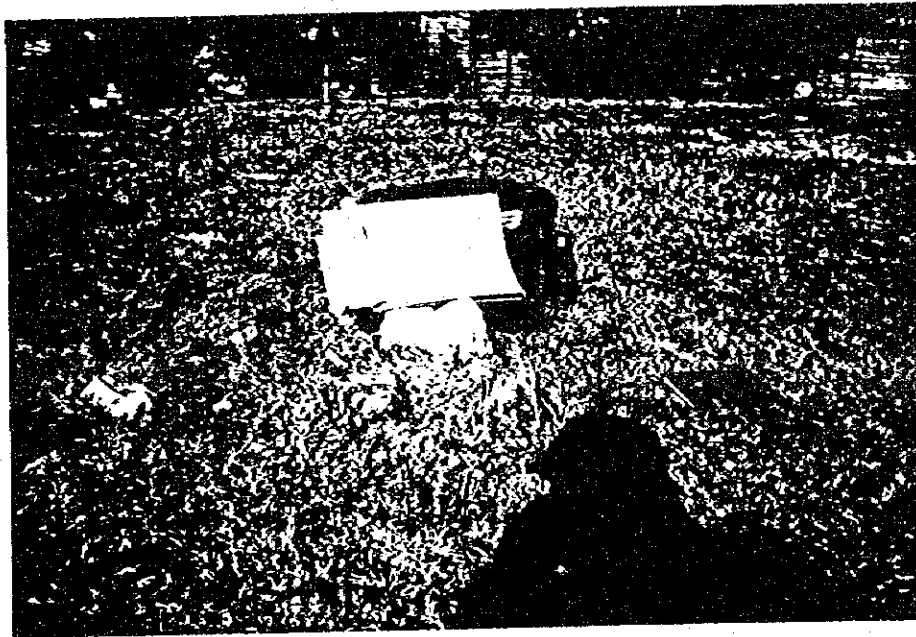


**Remarks**

- Totally damaged condition located at Sanu Babu's Land

Station No	: TS - 24-1	District	: Kavre Palanchok
VDC	: Sharada	Ward	: 8 Village : Batase
Location	: Banepa	Located	: <input checked="" type="checkbox"/> Lost : <input type="checkbox"/>
Condition	: All Good	Damaged	: <input type="checkbox"/> Not damaged : <input checked="" type="checkbox"/>
Centre Peg	: Did not exist <input type="checkbox"/>	Damage	<input type="checkbox"/> Lost <input type="checkbox"/>

Photographs

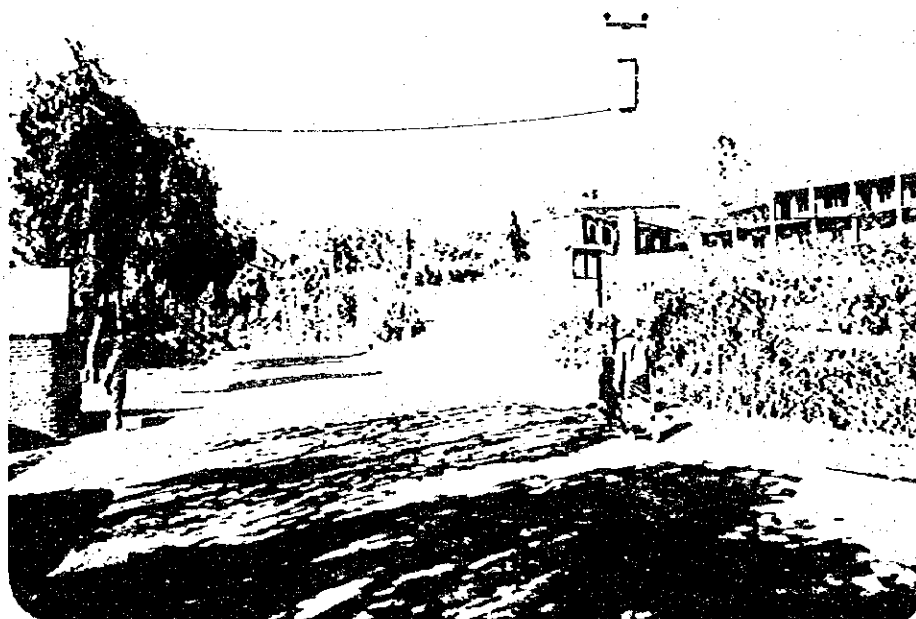


Remarks

- The point is known to Mr. Bhisnu Bahadur Lama of ward no. 8
- Even centre peg existed could be used

Station No	: BS - 100	District	: Kavre Palanchok
VDC	: Dhulikhel	Ward	: 7 Village : Bhulikhel Basaghari
Location	: Dhulikhel	Located	: Lost : ✓
Condition	: Damaged	: ✓	Not damaged :
Centre Peg	: Did not exist <input type="checkbox"/>	Damage <input type="checkbox"/>	Lost <input checked="" type="checkbox"/>

Photographs



Remarks

- B. M. is damaged during the extension of road to Hotel Himalayan Horizon

Project for Construction of Sindhuli Road

Station No	: TS - 24	District	: Kavre Palanchok
VDC	: Nitry Chandya Sheri	Ward	: 2 Village : Kabre
Location	: Banepa	Located	: <input checked="" type="checkbox"/> Lost : <input type="checkbox"/>
Condition	: <input type="checkbox"/>	Damaged	: <input type="checkbox"/> Not damaged : <input checked="" type="checkbox"/>
Centre Peg	: Did not exist <input type="checkbox"/>	Damage	: <input checked="" type="checkbox"/> Lost <input type="checkbox"/>

Photographs



Remarks

- B. M. is near the house of Arjun and Electrical Pole

Station No	: TS - 25	District	: Kavre Palanchok
VDC	: Pathe Kheet	Ward	: 9 Village : Phaskot
Location	: Banépa	Located	: <input checked="" type="checkbox"/> Lost : <input type="checkbox"/>
Condition	: <input type="checkbox"/>	Damaged	: <input type="checkbox"/> Not damaged : <input checked="" type="checkbox"/>
Centre Peg	: Did not exist <input type="checkbox"/>	Damage	: <input checked="" type="checkbox"/> Lost <input type="checkbox"/>

**Photographs**



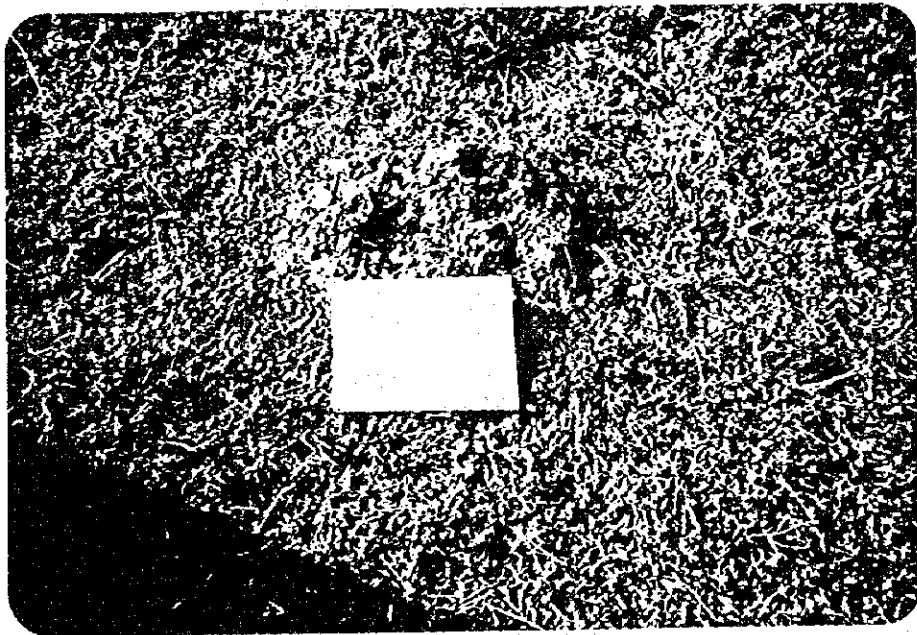
**Remarks**

- This B. M. is known Krishna Bahadur Shigdel



Station No	: TS - 26	District	: Kavre Palanchok
VDC	: Pathe Kheet	Ward	: 7 Village : Danda gau
Location	: Banepa	Located	: <input checked="" type="checkbox"/> Lost : <input type="checkbox"/>
Condition	: Can be used	Damaged	: <input type="checkbox"/> Not damaged : <input checked="" type="checkbox"/>
Centre Peg	: Did not exist <input type="checkbox"/>	Damage	: <input checked="" type="checkbox"/> Lost <input type="checkbox"/>

**Photographs**



**Remarks**

- B. M. is near the house of Neupane

Station No	: TS - 27	District	: Kavre Palanchok
VDC	: Mathura pati	Ward	: 8 Village : Bachakot
Location	: Banepa	Located	: <input checked="" type="checkbox"/> Lost : <input type="checkbox"/>
Condition	: <input type="checkbox"/>	Damaged	: <input type="checkbox"/> Not damaged : <input checked="" type="checkbox"/>
Centre Peg	: Did not exist <input type="checkbox"/>	Damage	: <input checked="" type="checkbox"/> Lost <input type="checkbox"/>

Photographs

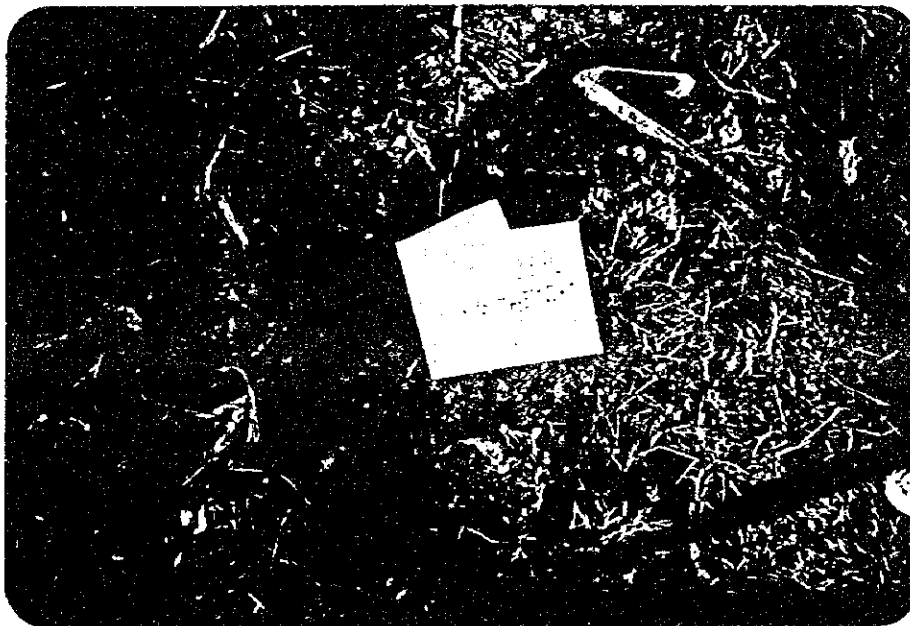


Remarks

- The points is located at Mathura Pati, Rata Mate

Station No	: TS - 28 - 1	District	: Kavre Palanchok
VDC	: Metaenikot	Ward	: 2 Village : Metaenikot
Location	: Banepa	Located	: <input checked="" type="checkbox"/> Lost : <input type="checkbox"/>
Condition	: Can be used	Damaged	: <input type="checkbox"/> Not damaged : <input checked="" type="checkbox"/>
Centre Peg	: Did not exist <input type="checkbox"/>	Damage	: <input checked="" type="checkbox"/> Lost <input type="checkbox"/>

Photographs

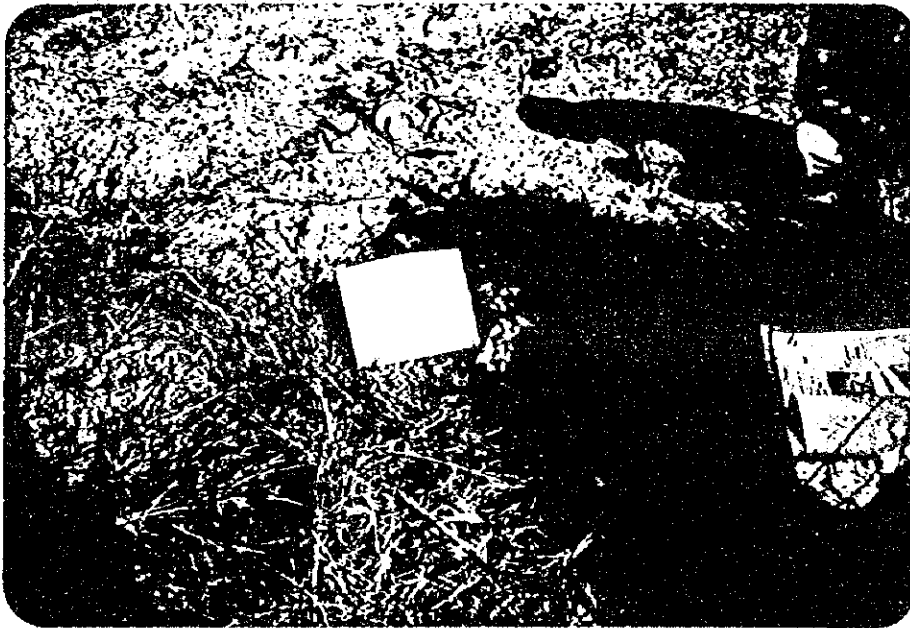


Remarks

- The points is located at Krishna Silwal's land

Station No	: <u>TS - 28</u>	District	: <u>Kavre Palanchok</u>
VDC	: <u>Mathur Pati</u>	Ward	: <u>6</u> Village : <u>Buchakot</u>
Location	: <u>Banepa</u>	Located	: <input checked="" type="checkbox"/> Lost : <input type="checkbox"/>
Condition	: <u>Can be used</u>	Damaged	: <input type="checkbox"/> Not damaged : <input checked="" type="checkbox"/>
Centre Peg	: <input type="checkbox"/> Did not exist	<input checked="" type="checkbox"/> Damage	<input type="checkbox"/> Lost <input type="checkbox"/>

Photographs



Remarks

- The points is located on hillock at Thule Pokhari in the forest. The point is known to Mr. Dhruba Adhikari of Khanba

Station No	: TS - 29	District	: Kavre Palanchok
VDC	: Methenikot	Ward	: 2 Village : Methenikot Besi
Location	: Banepa	Located	: <input checked="" type="checkbox"/> Lost : <input type="checkbox"/>
Condition	: Can be used	Damaged	: <input type="checkbox"/> Not damaged : <input checked="" type="checkbox"/>
Centre Peg	: Did not exist <input type="checkbox"/>	Damage	: <input checked="" type="checkbox"/> Lost <input type="checkbox"/>

Photographs



Remarks

- The points is located in the open field near a Simal tree. The point is known to Mr. Jagat Nath Timilsena

Station No	: <u>TS - 30</u>	District	: <u>Kavre Palanchok</u>
VDC	: <u>Methenikot</u>	Ward	: <u>8</u> Village : <u>Kafle Thok</u>
Location	: <u>Banepa</u>	Located	: <input checked="" type="checkbox"/> Lost : <input type="checkbox"/>
Condition	: <u>Can be used</u>	Damaged	: <input checked="" type="checkbox"/> Not damaged : <input type="checkbox"/>
Centre Peg	: <input type="checkbox"/> Did not exist	<input type="checkbox"/> Damage	: <input checked="" type="checkbox"/> Lost <input type="checkbox"/>

Photographs



Remarks

- Near the house of Ram Bahadur Karki

Station No	: <u>TS - 30 - 1</u>	District	: <u>Kavre Palanchok</u>
VDC	: <u>Khanal Thok</u>	Ward	: <u>1</u> Village : <u>Kakre Besi</u>
Location	: <u>Banepa</u>	Located	: <u>          </u> Lost : <u>√</u>
Condition	: <u>          </u>	Damaged	: <u>√</u> Not damaged : <u>          </u>
Centre Peg	: <u>Did not exist</u> <input type="checkbox"/>	Damage	<input type="checkbox"/> Lost <input checked="" type="checkbox"/>

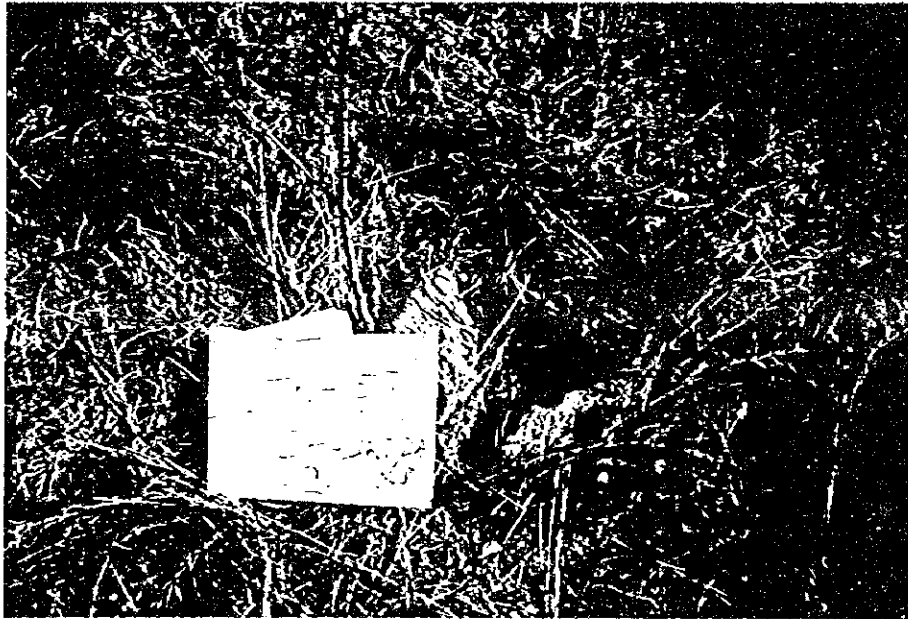
Photographs

Remarks

Lost could not find.

Station No	: TK - 57	District	: Kavre Palanchok
VDC	: Khanal Thok	Ward	: 2 Village : Chauki Dhunga
Location	: Rosi Kholu	Located	: <input checked="" type="checkbox"/> Lost : <input type="checkbox"/>
Condition	: Can be used	Damaged	: <input type="checkbox"/> Not damaged : <input checked="" type="checkbox"/>
Centre Peg	: Did not exist <input type="checkbox"/>	Damage	<input type="checkbox"/> Lost <input checked="" type="checkbox"/>

Photographs



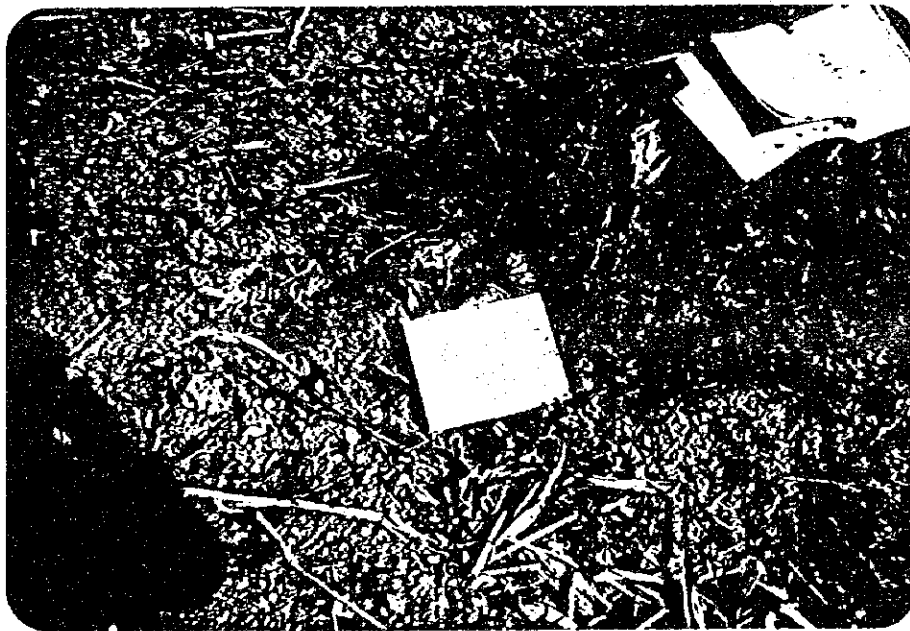
Remarks

This point is located about 200 m height from road and placed ar slide area, meet with Krishna Bahadur Shrestha or Gopal Shrestha



Station No	: TK - 58	District	: Kavre Palanchok
VDC	: Khanal Thok	Ward	: 2 Village : Charangefedi
Location	: Banepa	Located	: <input checked="" type="checkbox"/> Lost : <input type="checkbox"/>
Condition	: Can be used	Damaged	: <input type="checkbox"/> Not damaged : <input checked="" type="checkbox"/>
Centre Peg	: Did not exist <input type="checkbox"/>	Damage	: <input checked="" type="checkbox"/> Lost <input type="checkbox"/>

Photographs



Remarks

This point is placed at cultivate lands of Sanno K. C. above the path.

Station No	: TK - 48 - 1	District	: Sindhuli
VDC	: Dumsa	Ward	: Village : Dumsa Besi
Location	: Rosi Khola	Located	: Lost : <input checked="" type="checkbox"/>
Condition	: Can be used	Damaged	: <input checked="" type="checkbox"/> Not damaged : <input type="checkbox"/>
Centre Peg	: Did not exist <input type="checkbox"/>	Damage	<input type="checkbox"/> Lost <input checked="" type="checkbox"/>

Photographs



Remarks

Washed out by the river

Station No	: TK - 49 - 1	District	: Kavrepalanchok
VDC	: Bhimkhori	Ward	: 5 Village : Aapghari
Location	: Rosi Khola	Located	: <input checked="" type="checkbox"/> Lost : <input type="checkbox"/>
Condition	: Could be useful	Damaged	: <input type="checkbox"/> Not damaged : <input checked="" type="checkbox"/>
Centre Peg	: Did not exist <input type="checkbox"/>	Damage	: <input checked="" type="checkbox"/> Lost <input type="checkbox"/>

Photographs

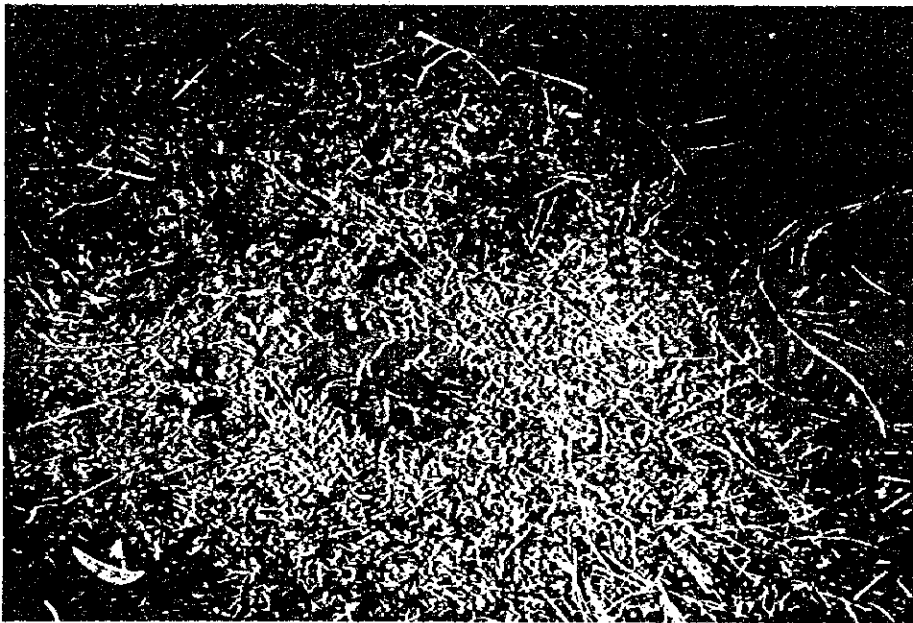


Remarks

- Near Bhim Bahadur's house

Station No	: TK - 49	District	: Kavrepalanchok
VDC	: Bhimkhori	Ward	: 9 Village : Mamti Ratamata
Location	: Rosi Khola	Located	: <input checked="" type="checkbox"/> Lost : <input type="checkbox"/>
Condition	: <input type="checkbox"/>	Damaged	: <input checked="" type="checkbox"/> Not damaged : <input type="checkbox"/>
Centre Peg	: Did not exist <input type="checkbox"/>	Damage	: <input type="checkbox"/> Lost <input checked="" type="checkbox"/>

Photographs

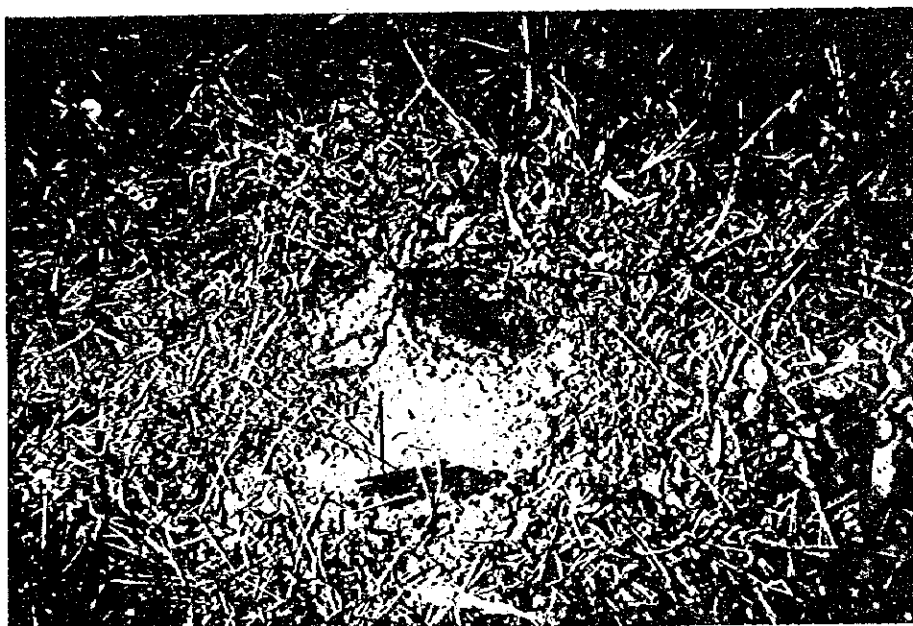


Remarks

Near the house of Krishna

Station No	: TK - 50	District	: Kavrepalanchok
VDC	: (Pipe) Bhimkhori	Ward	: 5 Village : Pipe
Location	: Rosi Khola	Located	: Lost
Condition	: Can be use	Damaged	: Not damaged : ✓
Centre Peg	: Did not exist <input checked="" type="checkbox"/>	Damage	<input type="checkbox"/> Lost <input type="checkbox"/>

Photographs



Remarks

Station No	: TK - 51	District	: Kavrepalanchok
VDC	: Bhimkhori	Ward	: 2 Village : Buda Dhunga
Location	: Rosi Khola	Located	: <input checked="" type="checkbox"/> Lost : <input type="checkbox"/>
Condition	: Can be use	Damaged	: <input type="checkbox"/> Not damaged : <input checked="" type="checkbox"/>
Centre Peg	: Did not exist <input type="checkbox"/>	Damage	<input type="checkbox"/> Lost <input checked="" type="checkbox"/>

Photographs



Remarks

- B. M. is 1 feet down from ground level
- Land owner is Man Bahadur Tamang Wrad No. 2

Station No	: TK - 52	District	: Kavrepalanchok
VDC	: Bhimkhori	Ward	: 2 Village : Karma village
Location	: Rosi Khola	Located	: <input checked="" type="checkbox"/> Lost : <input type="checkbox"/>
Condition	: Can be use	Damaged	: <input type="checkbox"/> Not damaged : <input checked="" type="checkbox"/>
Centre Peg	: Did not exist <input type="checkbox"/>	Damage	<input type="checkbox"/> Lost <input checked="" type="checkbox"/>

Photographs

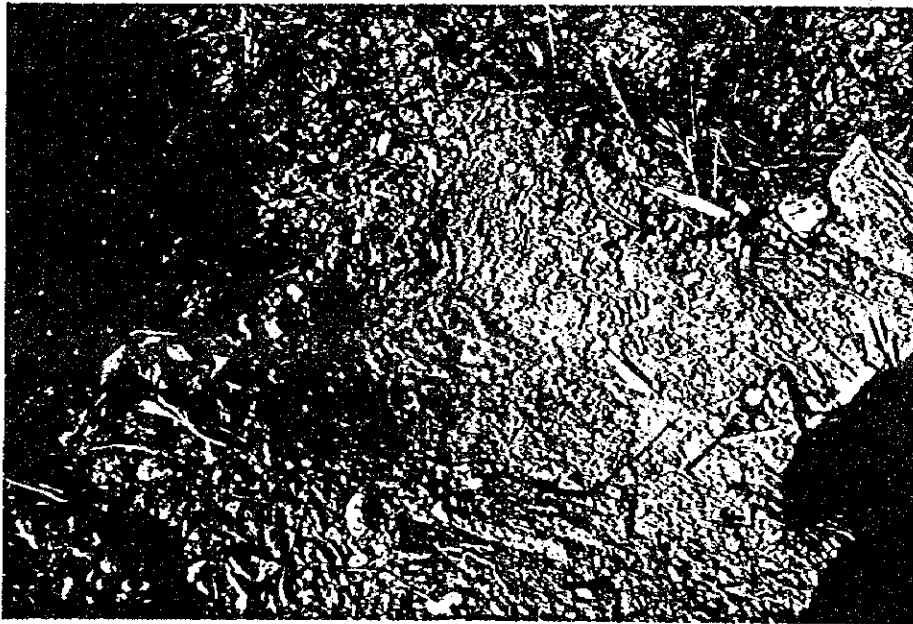


Remarks

- B. M. is 1/2 feet down from ground level
- Land owner is Gajabir Lama

Station No	: TK - 53	District	: Kavrepalanchok
VDC	: Mangal Tar	Ward	: 5 Village : Bohore
Location	: Rosi Khola	Located	: <input checked="" type="checkbox"/> Lost : <input type="checkbox"/>
Condition	: Can be use	Damaged	: <input type="checkbox"/> Not damaged : <input checked="" type="checkbox"/>
Centre Peg	: Did not exist <input type="checkbox"/>	Damage	<input type="checkbox"/> Lost <input checked="" type="checkbox"/>

Photographs



Remarks

- Land owner is Gobind Prashad Khatiwada

Project for Construction of Sindhuli Road



Station No	: TK - 54	District	: Kavrepalanchok
VDC	: Mangal Tar	Ward	: 9 Village : Pingthali
Location	: Rosi Khola	Located	: Lost : <input checked="" type="checkbox"/>
Condition	: Can be use	Damaged	: <input checked="" type="checkbox"/> Not damaged : <input type="checkbox"/>
Centre Peg	: Did not exist <input type="checkbox"/>	Damage	<input type="checkbox"/> Lost <input checked="" type="checkbox"/>

Photographs

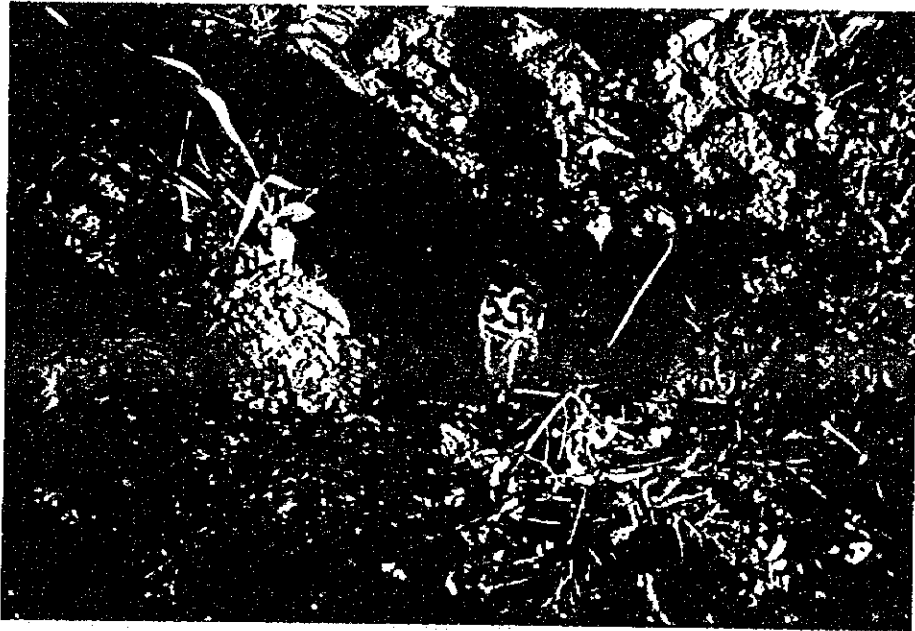


Remarks

Totally damaged

Station No	: TK - 55 - 1	District	: Kavrepalanchok
VDC	: Kharpachok	Ward	: Village : Phuldum
Location	: Rosi Khoja	Located	: <input checked="" type="checkbox"/> Lost : <input type="checkbox"/>
Condition	: Can be use	Damaged	: <input type="checkbox"/> Not damaged : <input checked="" type="checkbox"/>
Centre Peg	: Did not exist <input type="checkbox"/>	Damage	<input type="checkbox"/> Lost <input checked="" type="checkbox"/>

Photographs



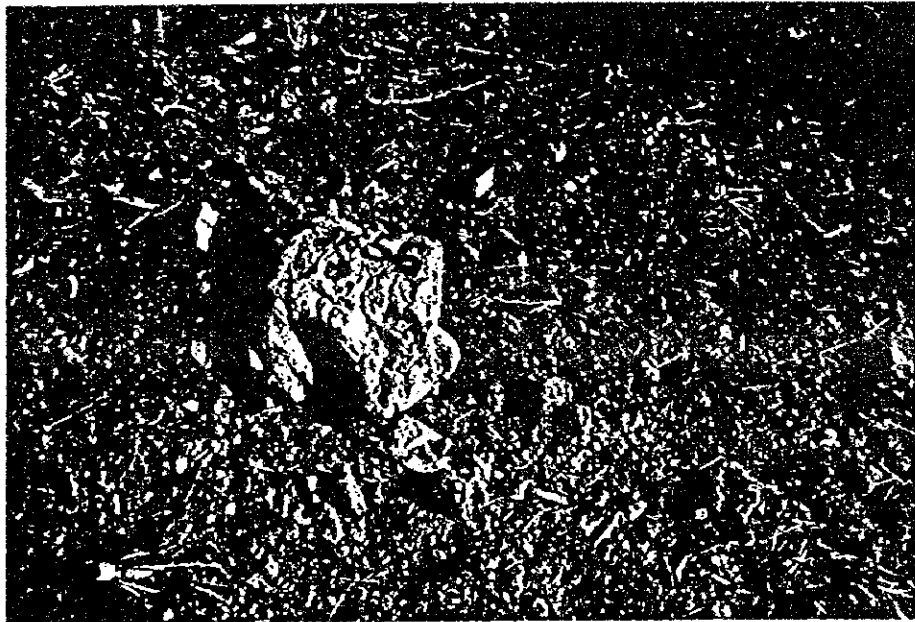
Remarks

Near the house of Bhuddi Man Tamang

Project for Construction of Sindhuli Road

Station No	: TK - 55	District	: Kavrepalanchok
VDC	: Kharpachok	Ward	: 4 Village : Kharpachok
Location	: Rosi Khola	Located	: Lost
Condition	: Can be use	Damaged	: <input checked="" type="checkbox"/> Not damaged : <input type="checkbox"/>
Centre Peg	: Did not exist <input type="checkbox"/>	Damage	: <input type="checkbox"/> Lost <input checked="" type="checkbox"/>

Photographs



Remarks

Land owner and near the house Ram Bahadur Tamang

Station No	: TK - 56 - 1	District	: Kavrepalanchok
VDC	: Kharpachok	Ward	: Village : Nangsal
Location	: Resi Khola	Located	: <input checked="" type="checkbox"/> Lost : <input type="checkbox"/>
Condition	: Can be use	Damaged	: <input type="checkbox"/> Not damaged : <input checked="" type="checkbox"/>
Centre Peg	: Did not exist <input type="checkbox"/>	Damage	<input type="checkbox"/> Lost <input checked="" type="checkbox"/>

Photographs



Remarks

Land owner is Saifa Tamang

Station No	: TK - 56	District	: Kavrepalanchok
VDC	: Catunse	Ward	: 5 Village : Puranodanda
Location	: Rosi Khola	Located	: <input checked="" type="checkbox"/> Lost : <input type="checkbox"/>
Condition	: Can be use	Damaged	: <input type="checkbox"/> Not damaged : <input checked="" type="checkbox"/>
Centre Peg	: Did not exist <input type="checkbox"/>	Damage	<input type="checkbox"/> Lost <input checked="" type="checkbox"/>

Photographs

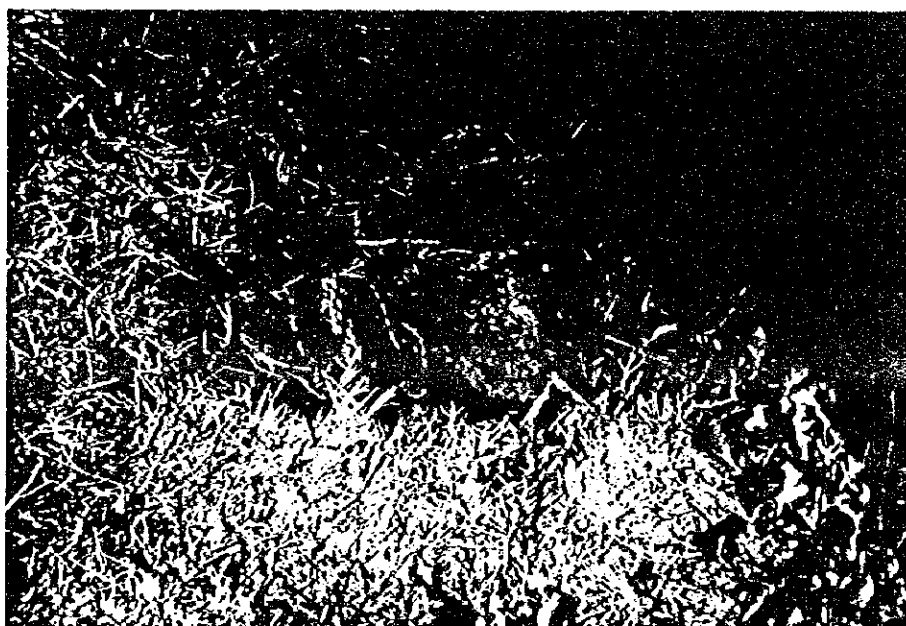


Remarks

Land owner is Sanu Tamang

Station No	: TK - 56 - 2	District	: Kavrepalanchok
VDC	: Catunse	Ward	: 4 Village : Aghuchor
Location	: Rosi Khola	Located	: Lost : <input checked="" type="checkbox"/>
Condition	: Can be use	Damaged	: Not damaged : <input checked="" type="checkbox"/>
Centre Peg	: Did not exist <input type="checkbox"/>	Damage	<input type="checkbox"/> Lost <input checked="" type="checkbox"/>

Photographs



Remarks

Village name is Raghuchour  
Near the V. D. C. Office building

Project for Construction of Sindhuli Road