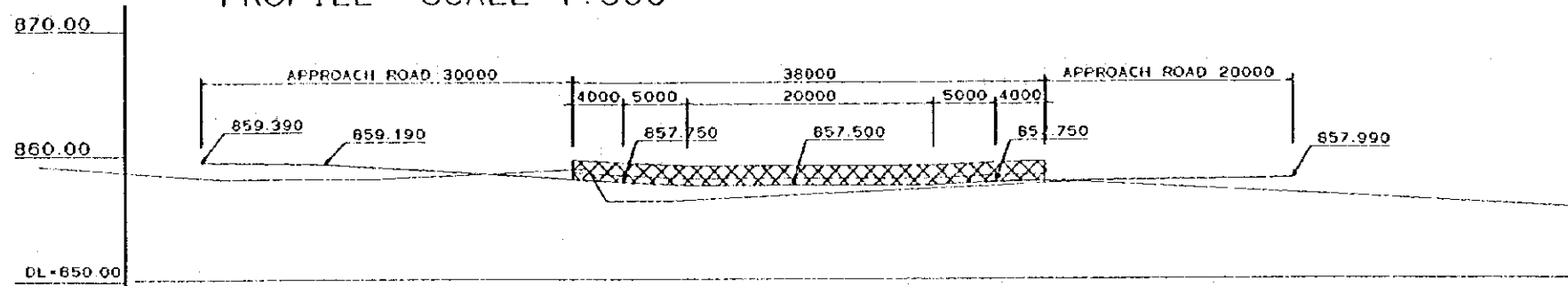


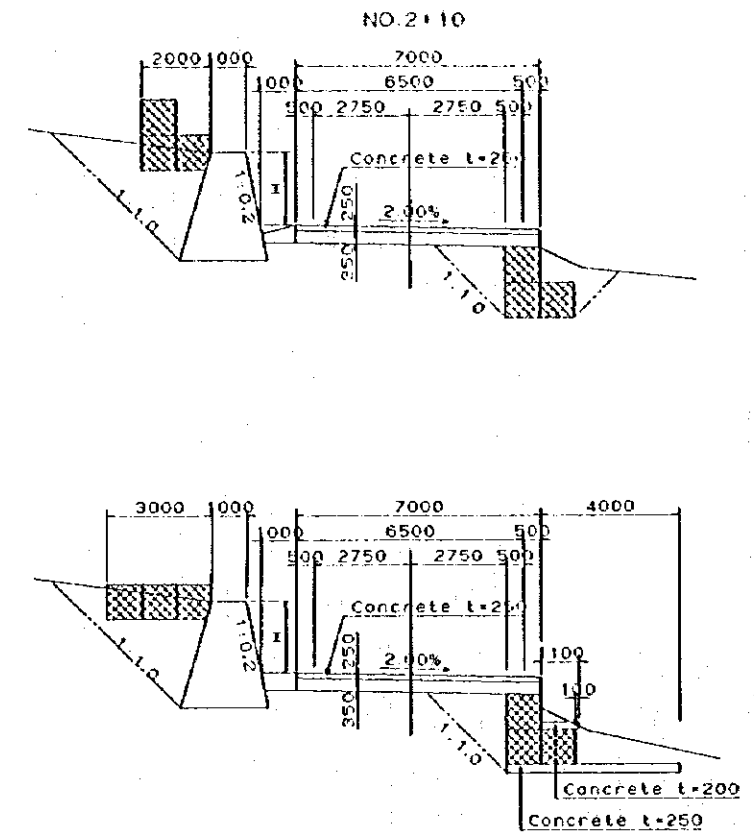
(NO.8) CAUSEWAY

PROFILE SCALE 1:500

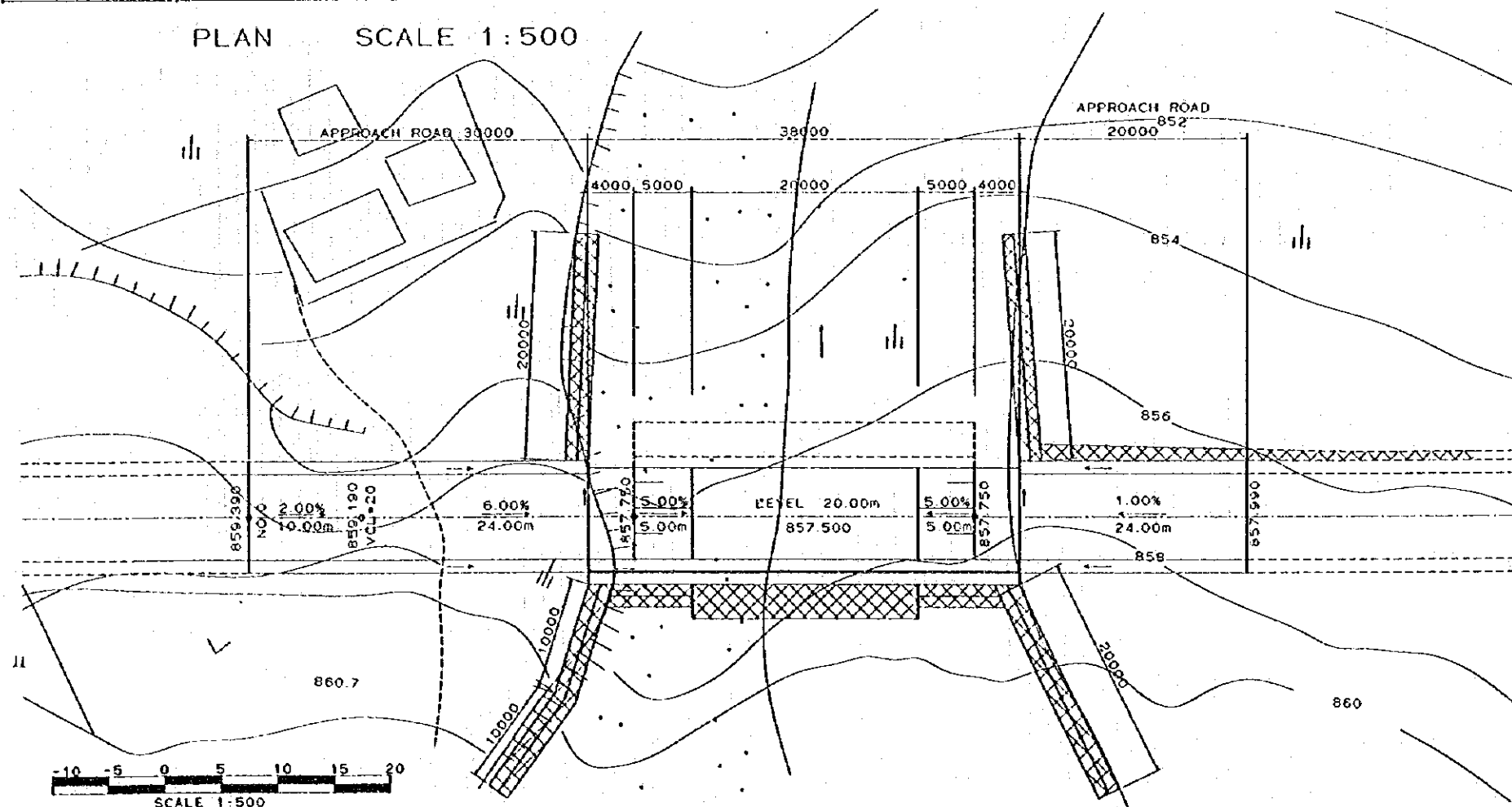


GRADIENT	1-2.000% L=10.000		1-6.000% L=24.000		LEVEL 20.000	1-3.000% L=24.000		1-1.000% L=24.000	
PROPOSED HEIGHT (PH)	859.390	859.190	857.750	857.500	857.500	857.750	857.990	857.990	857.990
GROUND ELEVATION									
ACCUMULATED DISTANCE	0.000	10.000	20.000	34.000	39.000	40.000	59.000	60.000	88.000
STATION	NO.0	NO.0+10	NO.1	NO.1+14	NO.1+19	NO.2	NO.2+19	NO.3	NO.4
CURVE ELEMENT	R=∞								

CROSS SECTION SCALE 1:200



PLAN SCALE 1:500



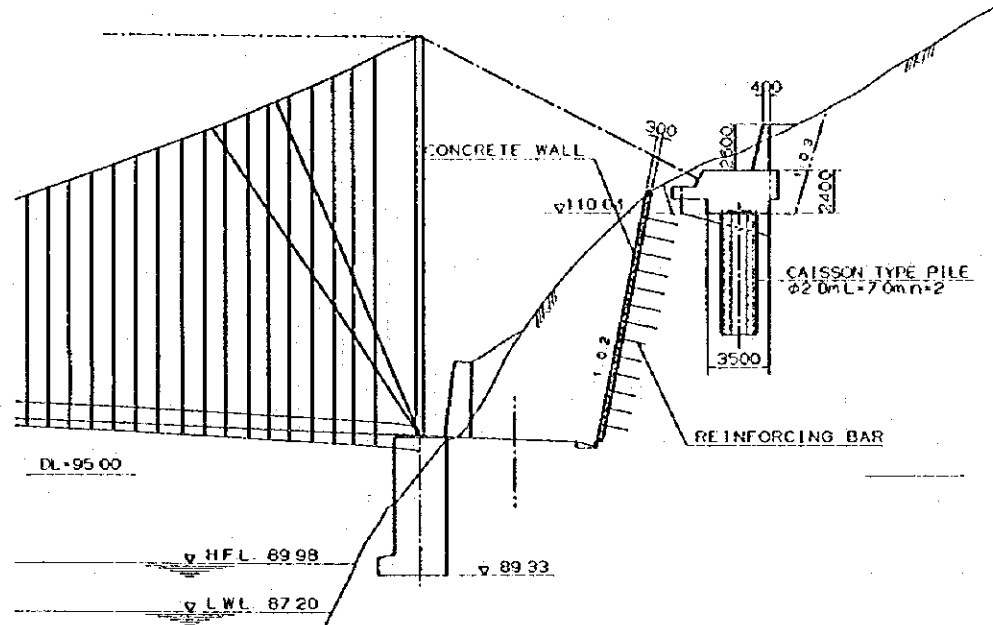
MATERIALS

ITEM	CLASS	UNIT	QUANTITY	REMARKS
EXCAVATION		m <sup>3</sup>	419.6	
BACKFILL		m <sup>3</sup>	122.4	
GRAVITY RETAINING WALL		m <sup>2</sup>	114.0	
CONCRETE WITH COBBLE		m <sup>3</sup>	148.2	
GABION	CAUSEWAY	m <sup>3</sup>	228.0	
PAVEMENT		m <sup>3</sup>	66.5	
BASE	CRUSHERRUN	m <sup>2</sup>	54.6	
SIDE DITCH		m	100.0	
REINFORCEMENT BAR		t	2.2	
GABION WALL	RIVER PROTECT	m <sup>3</sup>	360.0	

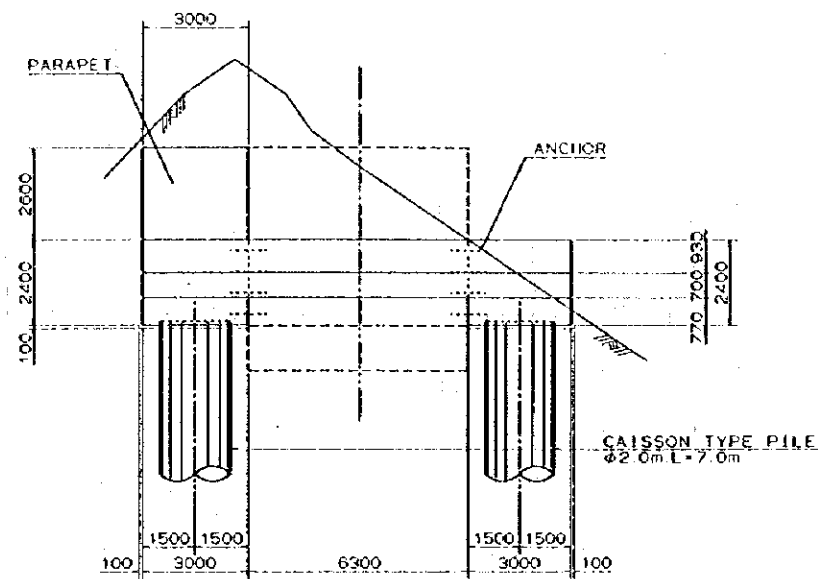
A-15 General Plan of STA.207 Causeway

# PLAN OF REINFORCING ANCHORAGE FOR NEPALTHOK BRIDGE

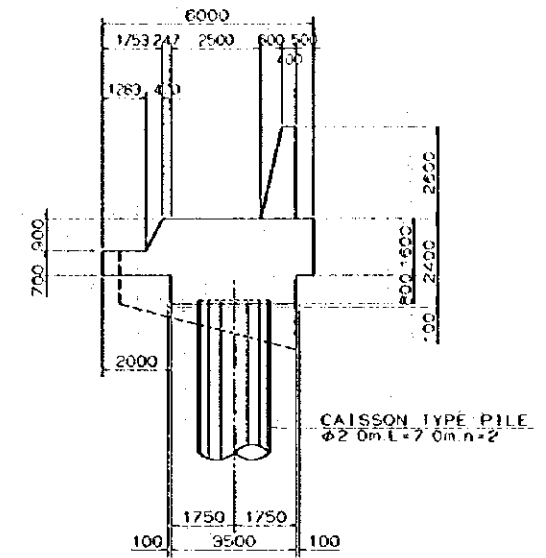
GENERAL PLAN SCALE 1:400



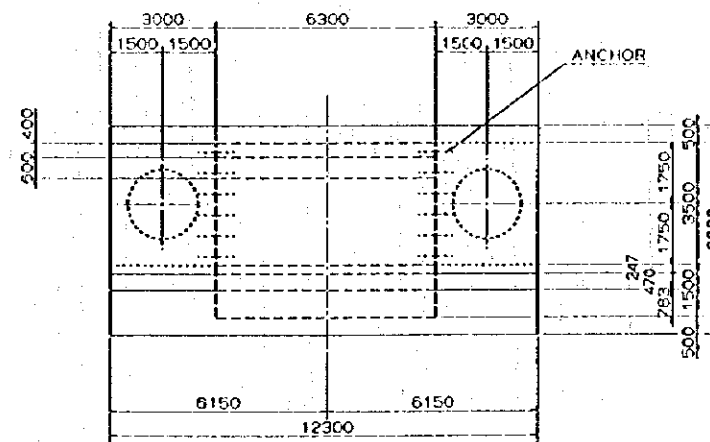
FRONT ELVATION SCALE 1:200



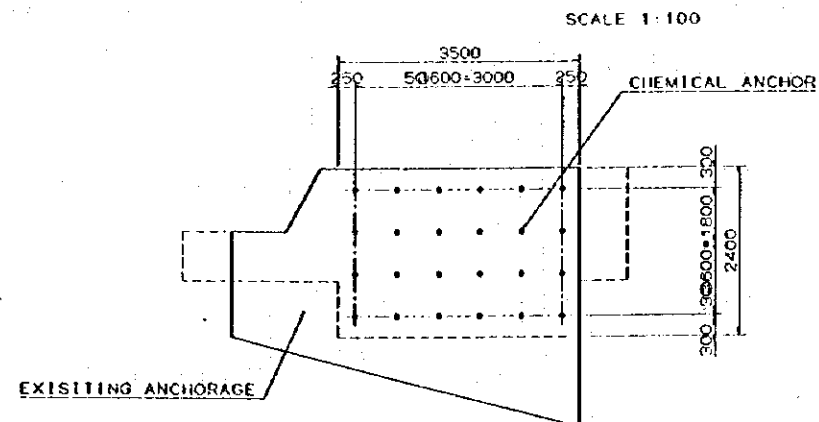
SIDE ELVATION SCALE 1:200



PLAN SCALE 1:200

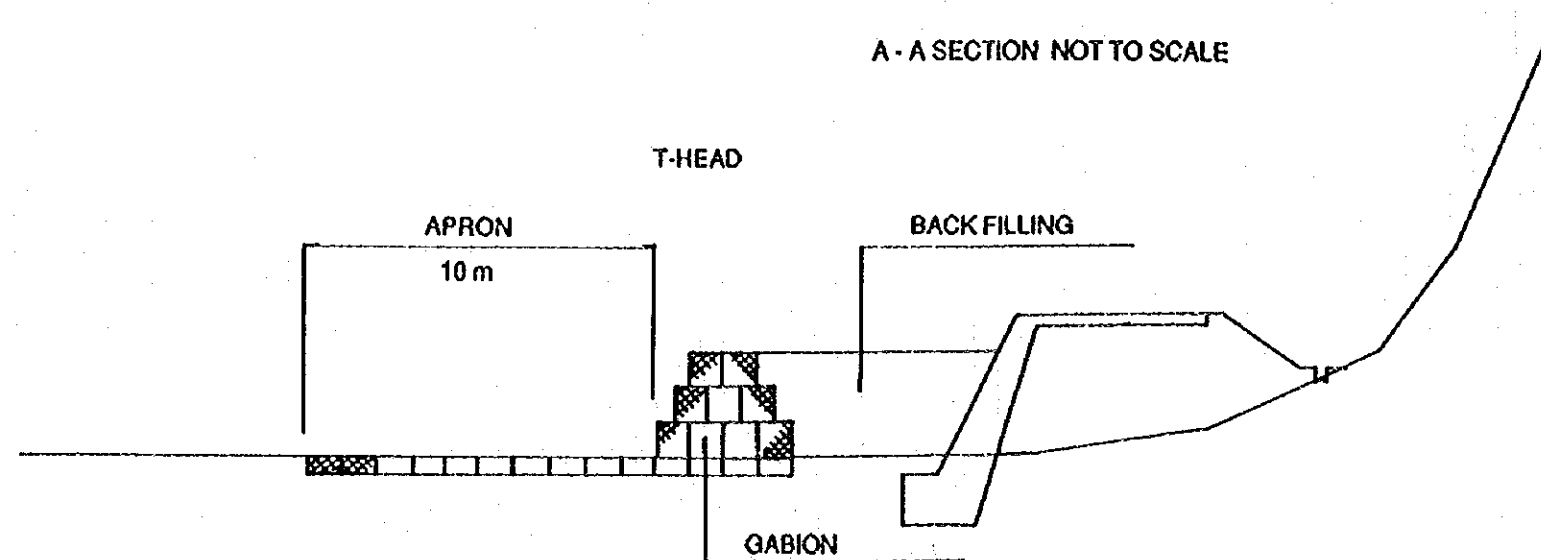
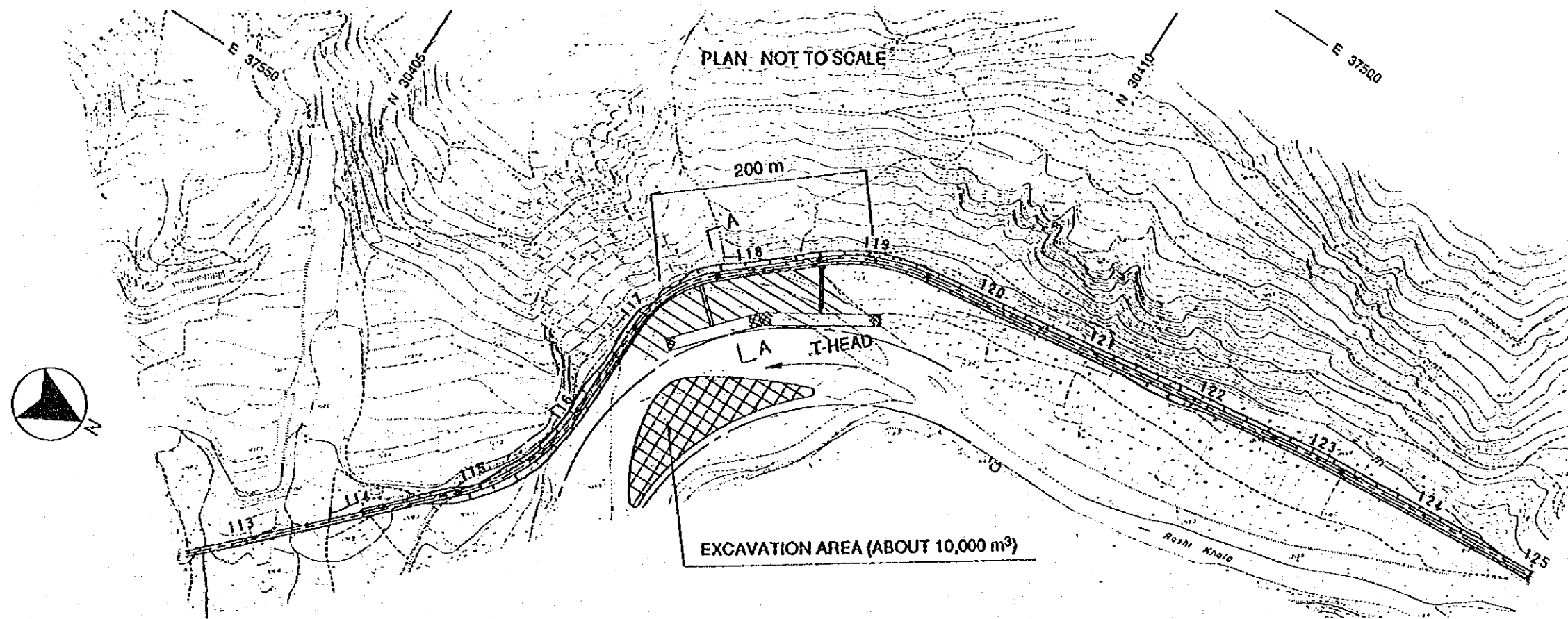


ARRANGEMENT OF REINANCHOR SCALE 1:100



ITEM	CLASS	UNIT	QUANTITY	REMARKS
EXCAVATION		m <sup>3</sup>	329	
CONCRETE	oct-240x4170x4	m <sup>3</sup>	735	
FORM		m <sup>2</sup>	81.1	
REINFORCEMENT BAR		LF	3676	
CAISSON TYPE PILE		m	140	
CHEMICAL ANCHOR		PIECE	43	
REINFORCING BAR		m	287.6	
CONCRETE WALL		m <sup>3</sup>	287.6	
PARAPET		m	30	

RIVER TRAINING WORKS BY T-HEAD SPURS

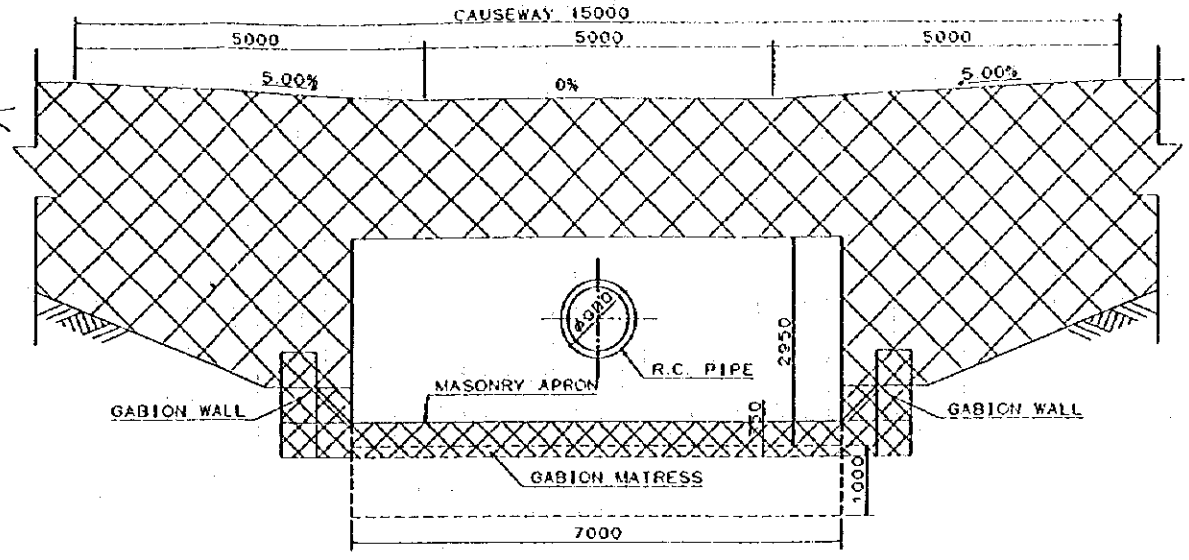
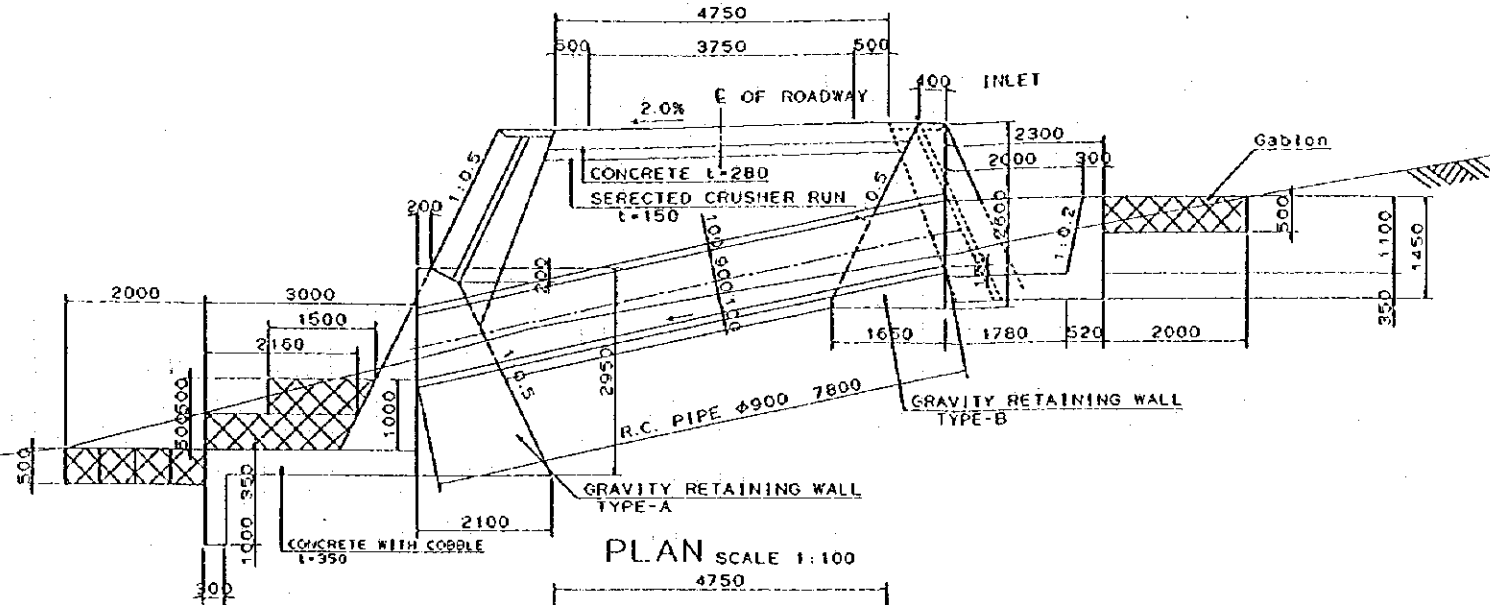


A-17 General Plan of River Training Works

PROFILE SCALE 1:100

TYPE-1 : CAUSEWAY WITH PIPE CULVERT (φ900 SINGLE)

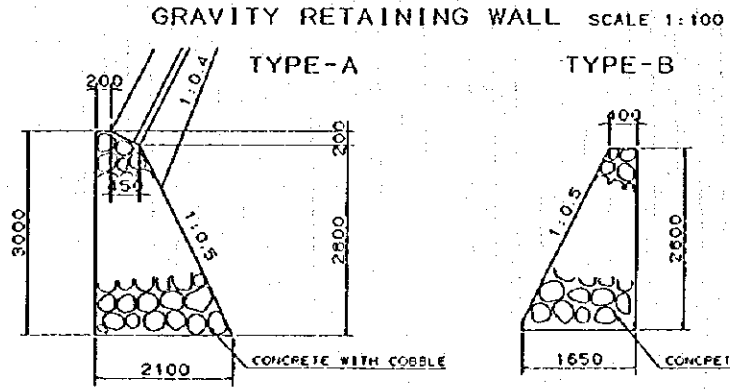
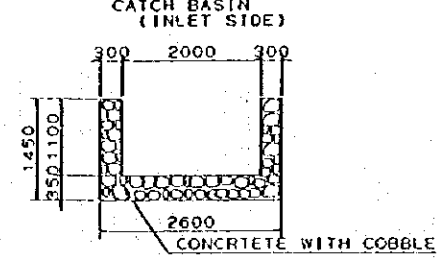
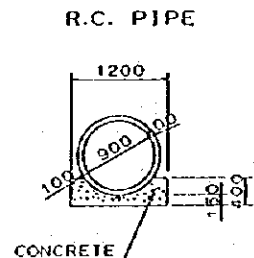
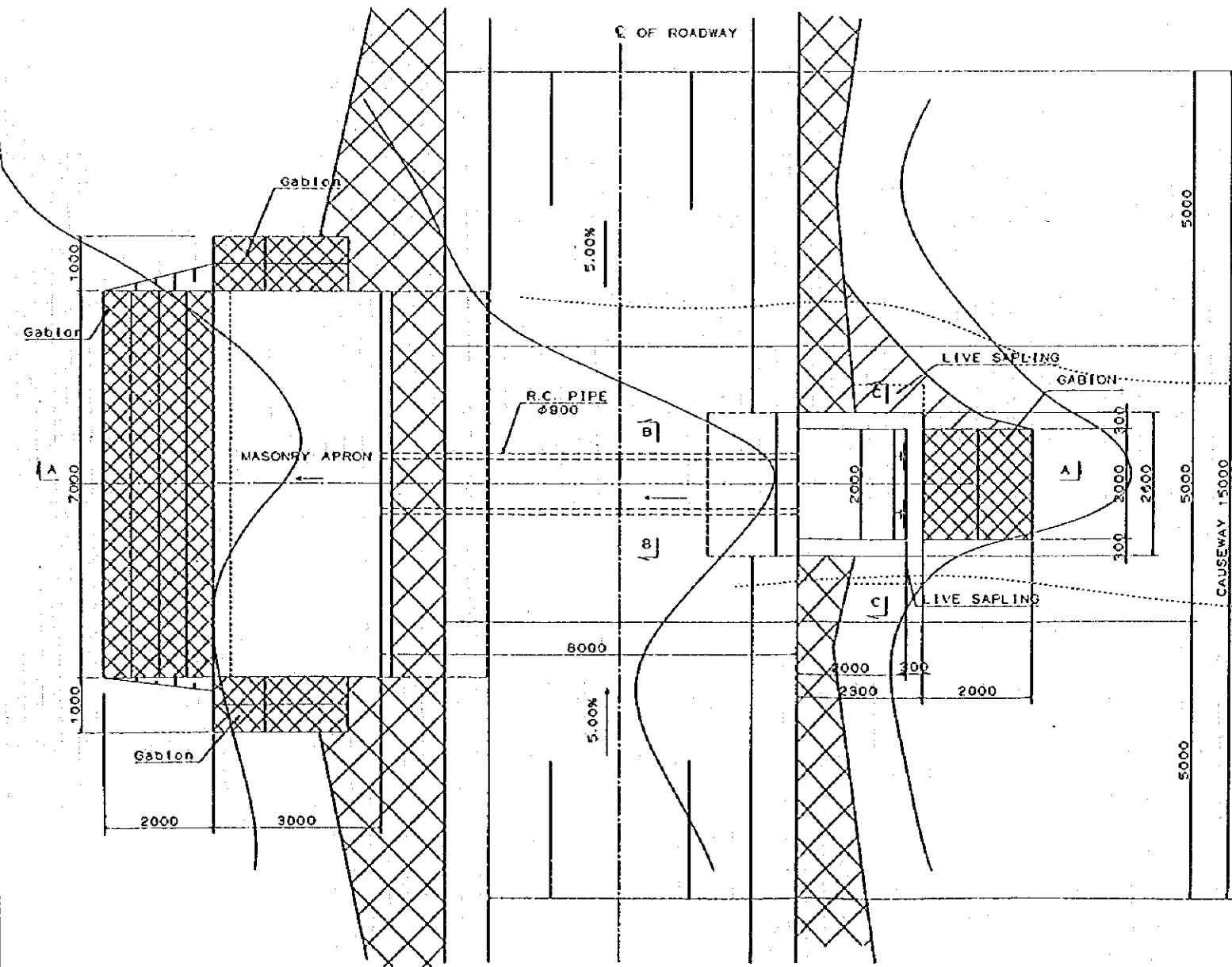
FRONT ELEVATION SCALE 1:100



PLAN SCALE 1:100

SECTION B-B SCALE 1:100

SECTION C-C SCALE 1:100

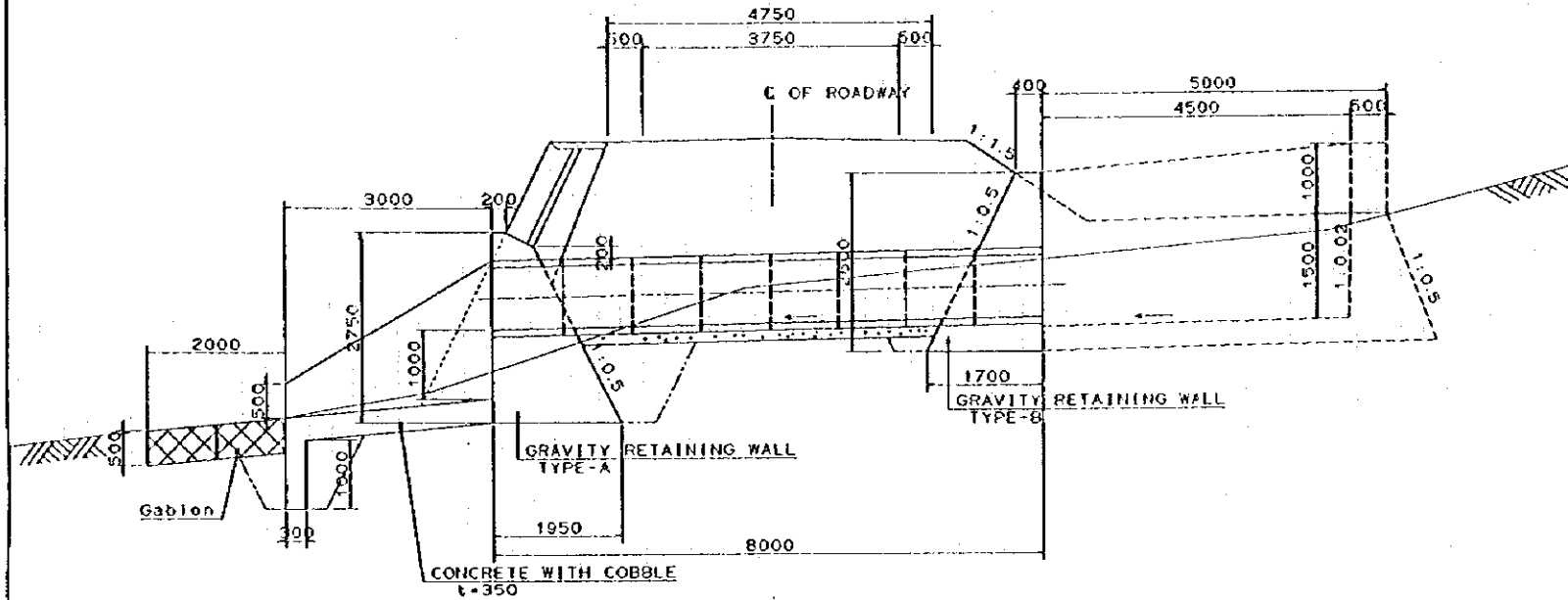


MATERIALS

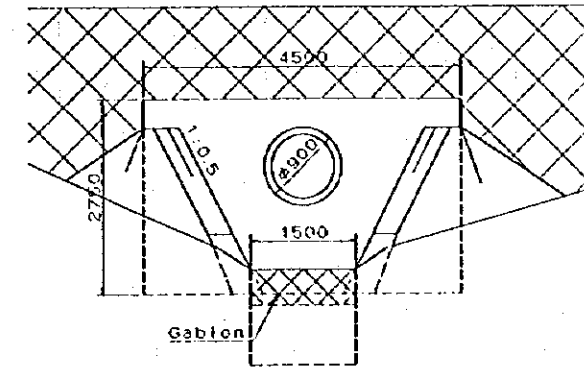
ITEM	CLASS	UNIT	QUANTITY	REMARKS
EXCAVATION		m <sup>3</sup>	67.8	
BACKFILL		m <sup>3</sup>	15.4	
R.C. PIPE	φ900	m	7.8	
G-RETAINING WALL		m <sup>3</sup>	24.5	
CONCRETE	ack-180R/m <sup>2</sup>	m <sup>3</sup>	2.3	
CONCRETE WITH COBBLE		m <sup>3</sup>	22.6	
FORM WORK		m <sup>2</sup>	3.9	
GABION		m <sup>3</sup>	12.7	

TYPE-2 : R.C. PIPE CULVERT (φ900 SINGLE)

PROFILE A-A SCALE 1:100

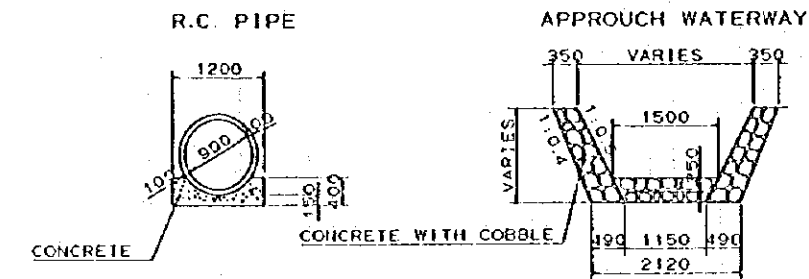


FRONT ELEVATION SCALE 1:100

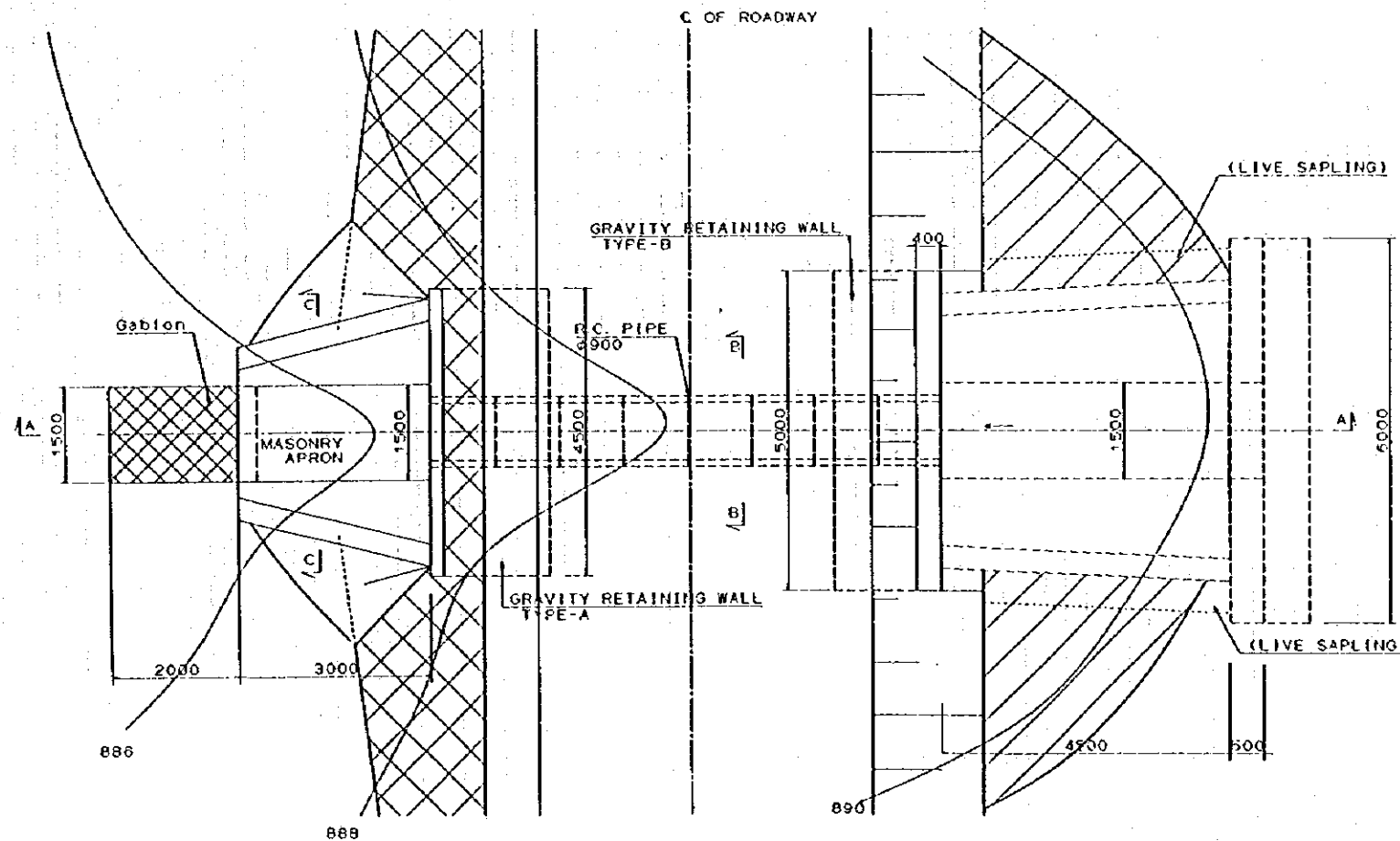


SECTION B-B SCALE 1:100

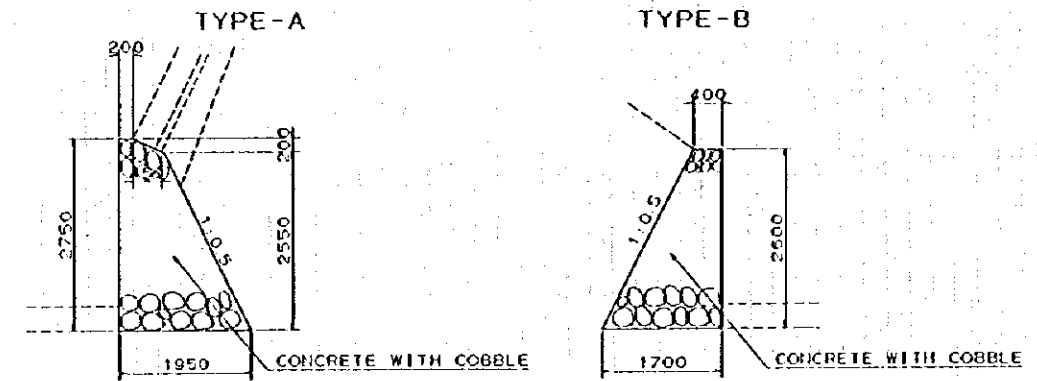
SECTION C-C SCALE 1:100



PLAN SCALE 1:100



GRAVITY RETAINING WALL SCALE 1:100

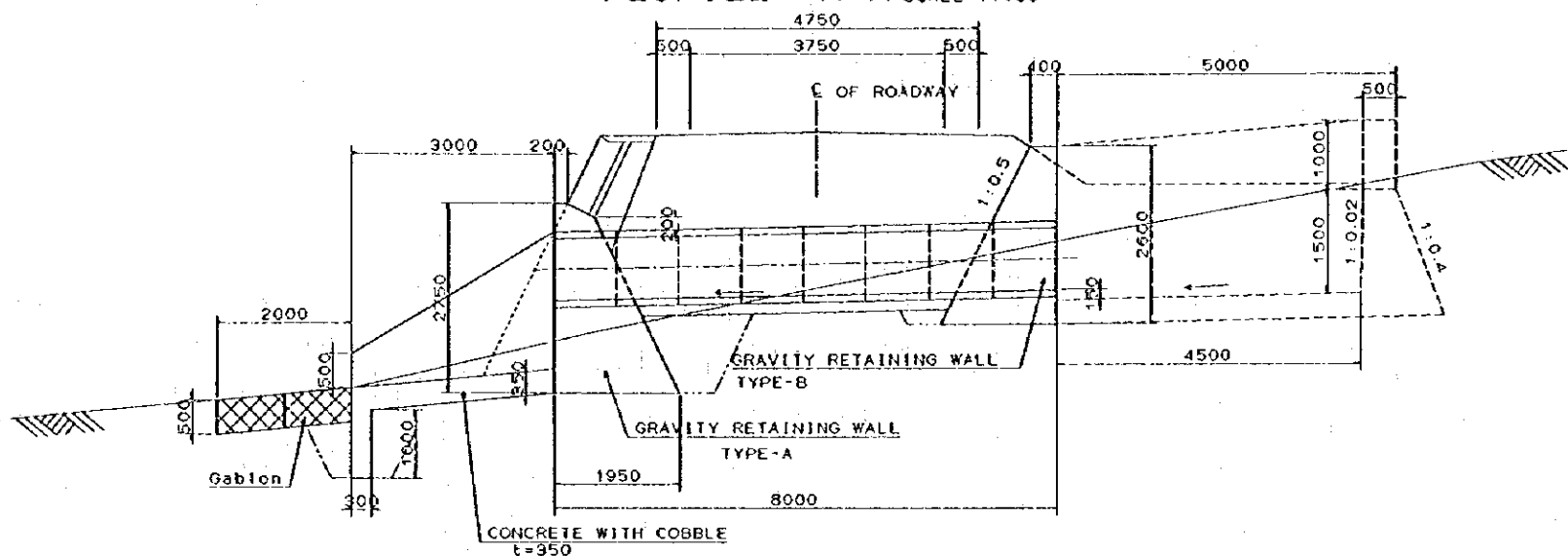


MATERIALS

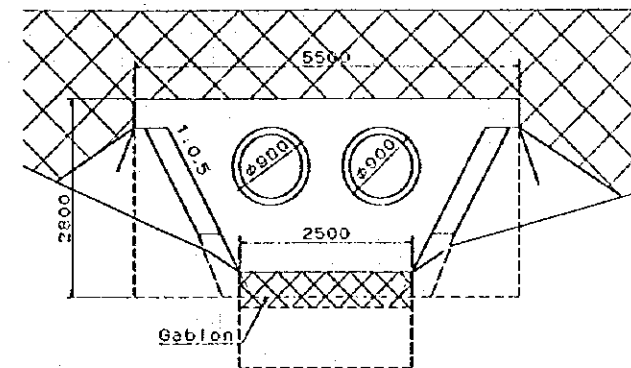
ITEM	CLASS	UNIT	QUANTITY	REMARKS
EXCAVATION		m <sup>3</sup>	38.1	
BACKFILL		m <sup>3</sup>	12.8	
R.C. PIPE	φ900	m	8.0	
SUPPORTED WALL		m <sup>2</sup>	8.4	
GRAVITY WALL		m <sup>3</sup>	28.4	
CONCRETE	ack=180kg/m <sup>2</sup>	m <sup>3</sup>	2.5	
CONCRETE WITH COBBLE		m <sup>3</sup>	1.8	
FORM WORK		m <sup>2</sup>	4.2	
GABION		m <sup>3</sup>	1.5	

TYPE-3 : R.C. PIPE CULVERT (φ900 DOUBLE)

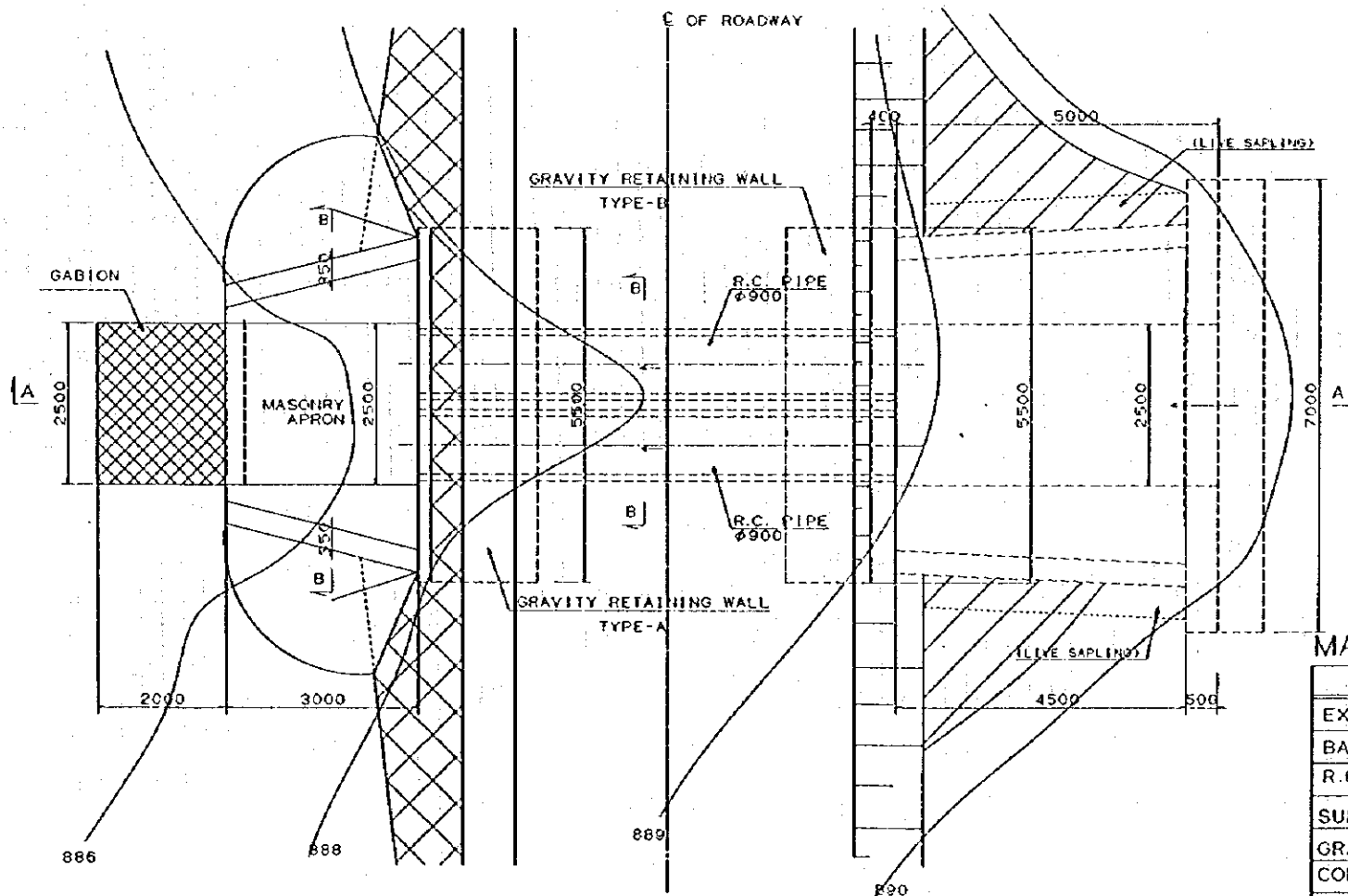
PROFILE A-A SCALE 1:100



FRONT ELEVATION SCALE 1:100

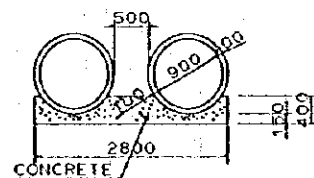


PLAN SCALE 1:100



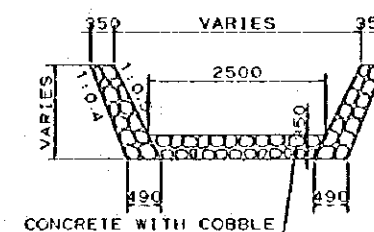
SECTION B-B SCALE 1:100

R.C. PIPE



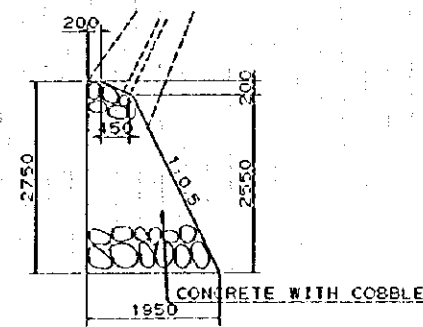
SECTION C-C SCALE 1:100

APPROACH WATERWAY

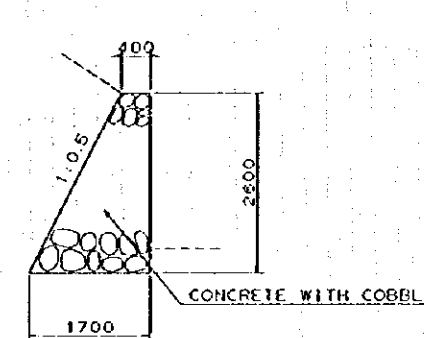


GRAVITY RETAINING WALL SCALE 1:100

TYPE-A



TYPE-B

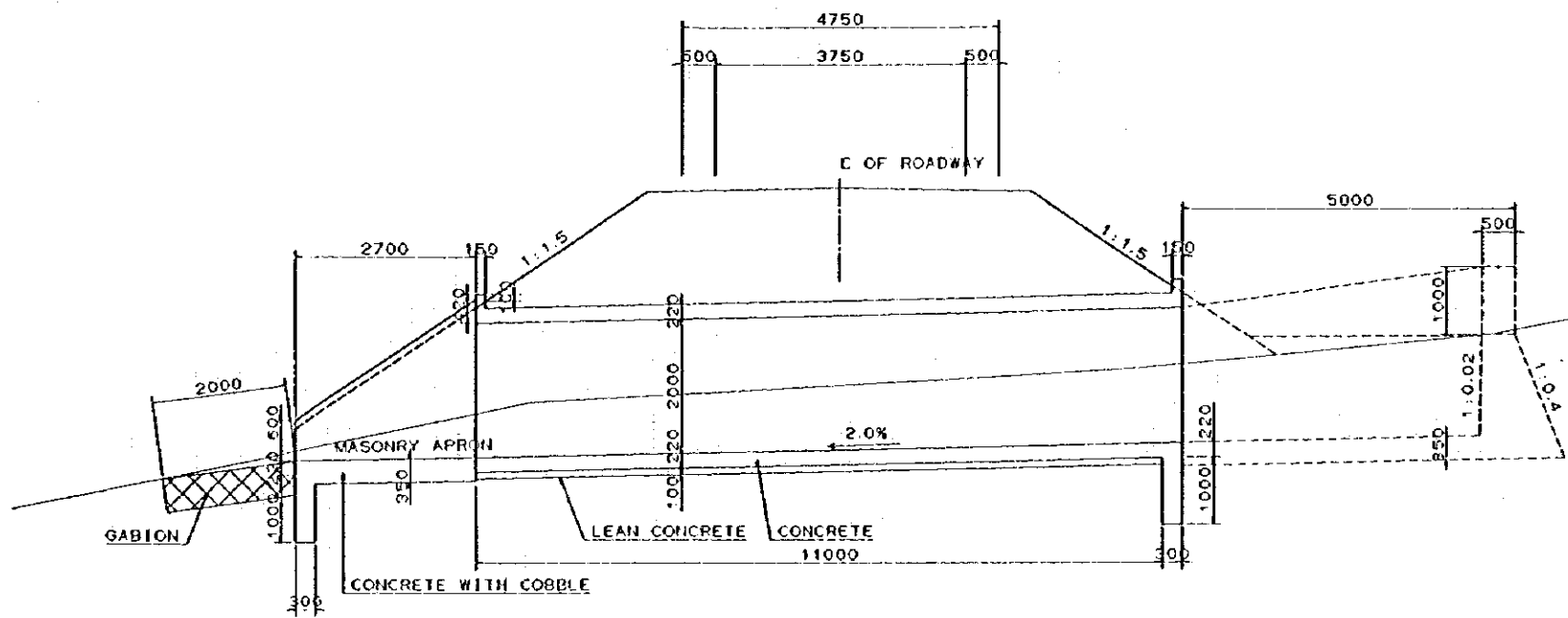


MATERIALS

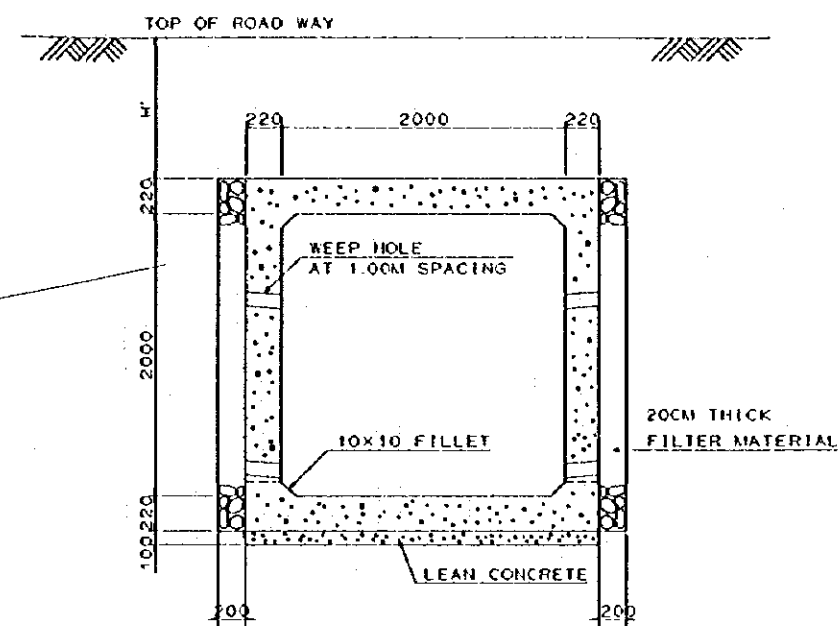
ITEM	CLASS	UNIT	QUANTITY	REMARKS
EXCAVATION		m <sup>3</sup>	49.8	
BACKFILL		m <sup>3</sup>	15.5	
R.C. PIPE	φ900	m	8.0	
SUPPORTED WALL		m <sup>2</sup>	8.4	
GRAVITY WALL		m <sup>3</sup>	33.7	
CONCRETE	ck-180kg/m <sup>2</sup>	m <sup>3</sup>	4.8	
CONCRETE WITH COBBLE		m <sup>3</sup>	3.2	
FORM WORK		m <sup>2</sup>	6.4	
GABION		m <sup>3</sup>	2.5	

TYPE-4 : BOX CULVERT (2.00m×2.00m)

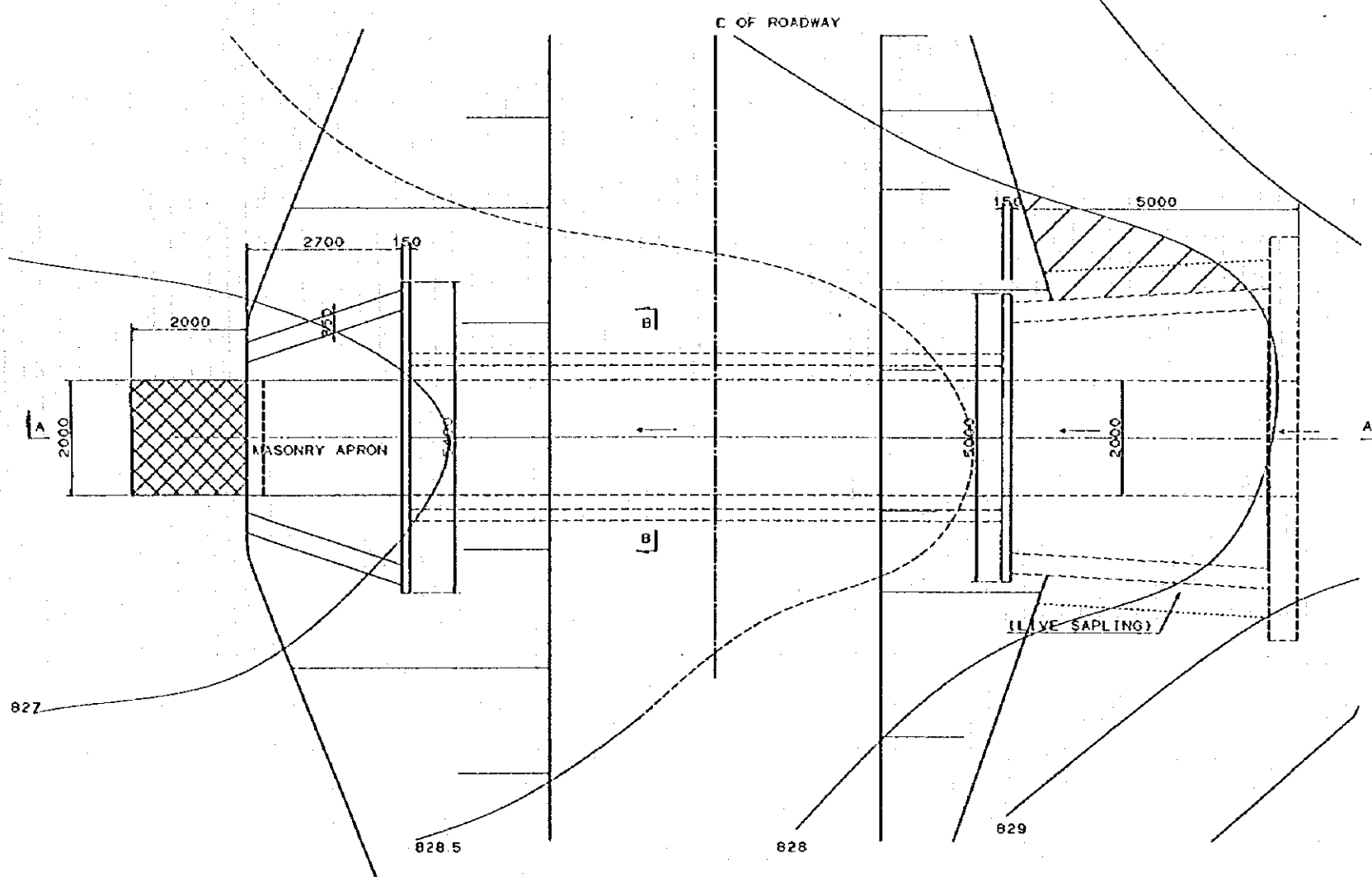
PROFILE A-A SCALE 1:100



SECTION B-B SCALE 1:50



PLAN SCALE 1:100

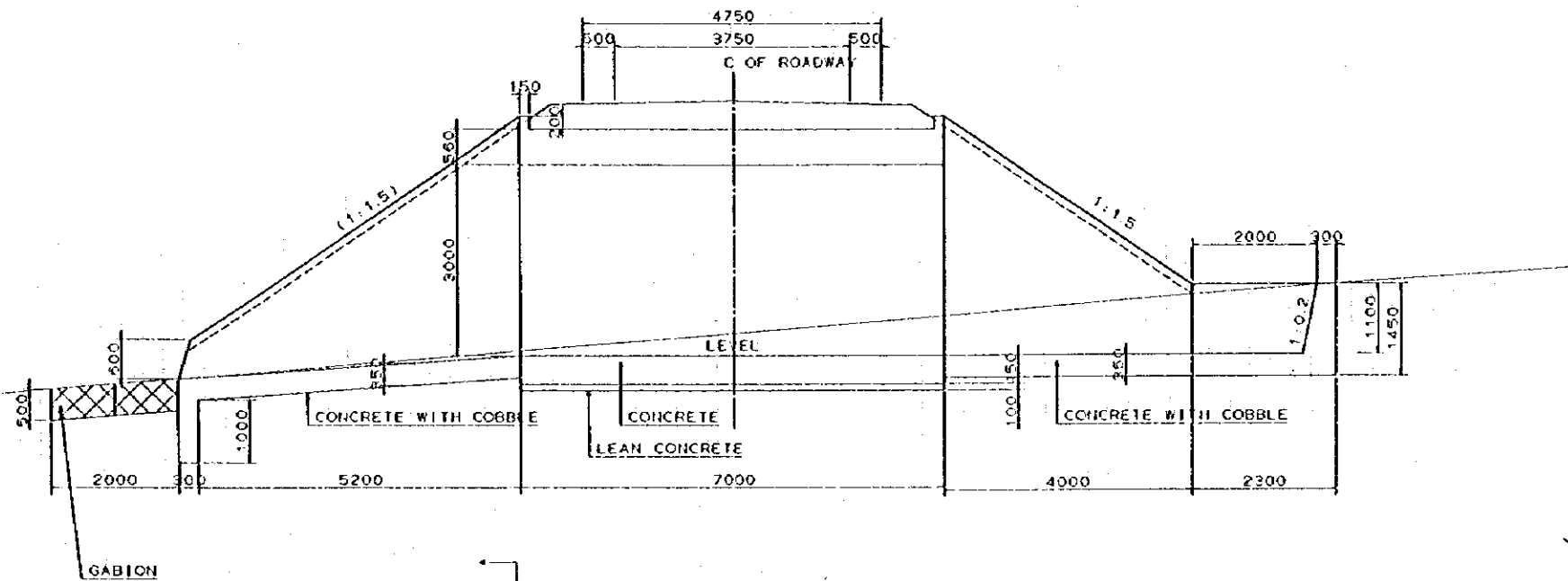


MATERIALS

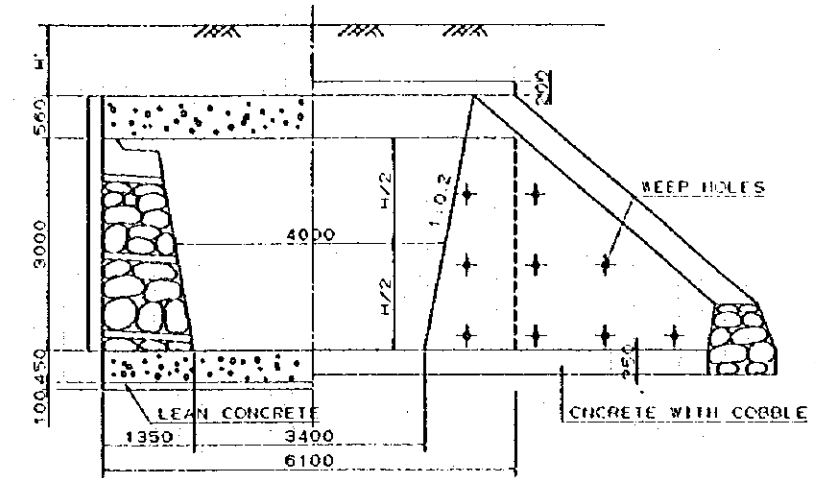
ITEM	CLASS	UNIT	QUANTITY	REMARKS
EXCAVATION		m <sup>3</sup>	117.6	
BACKFILL		m <sup>3</sup>	72.0	
SUPPORT WALL		m <sup>2</sup>	9.1	
LEAN CONCRETE	ack-180kg/m <sup>2</sup>	m <sup>3</sup>	2.7	
CONCRETE WITH COBBLE		m <sup>3</sup>	2.3	
CONCRETE	ack-240kg/m <sup>2</sup>	m <sup>3</sup>	29.1	
FORM WORK		m <sup>2</sup>	180.1	
FORM WORK	LEAN CONCRETE	m <sup>2</sup>	2.2	
REINFORCEMENT BAR	φ 10	t	3.8	
SUPPORT		m <sup>3</sup>	45.2	
GABION		m <sup>3</sup>	2.0	

TYPE-5 : SLAB CULVERT (4.00m SINGLE)

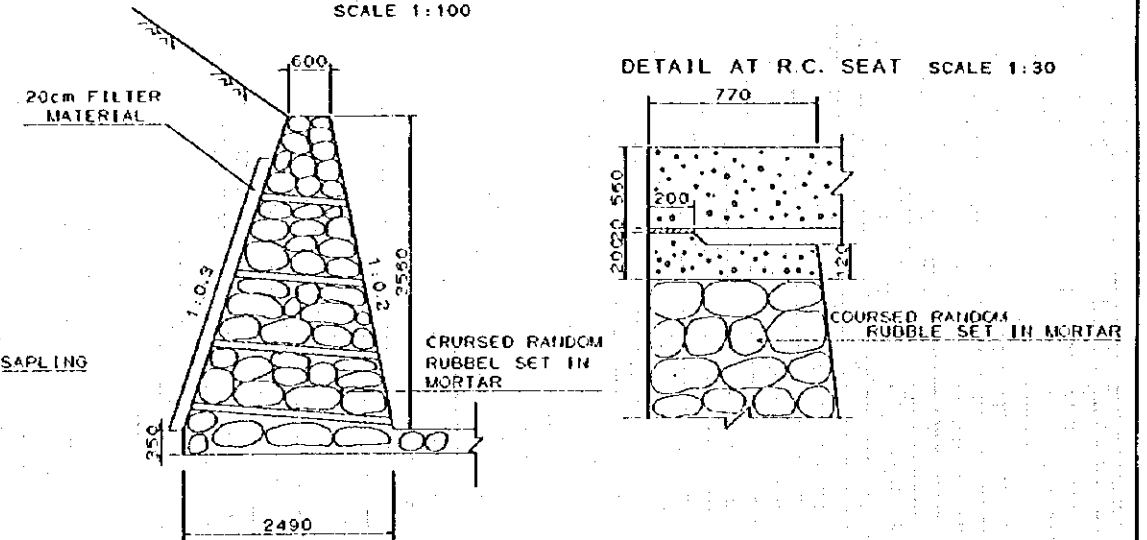
SECTION A-A SCALE 1:100



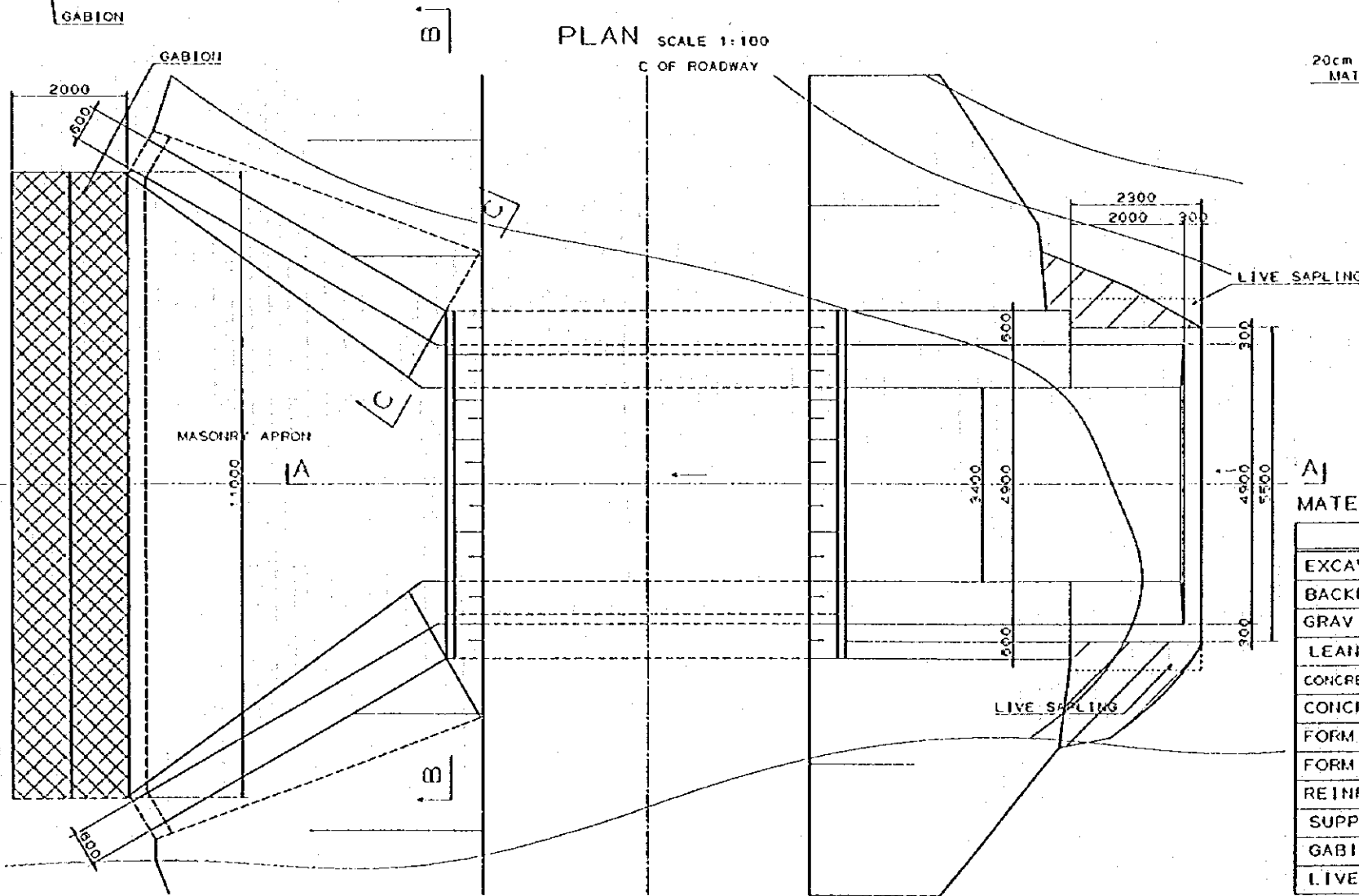
SECTION B-B SCALE 1:100



SECTION C-C SCALE 1:100



PLAN SCALE 1:100

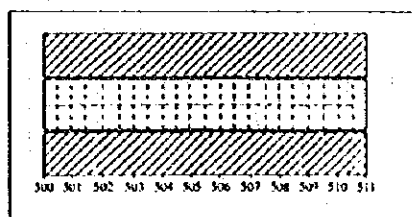
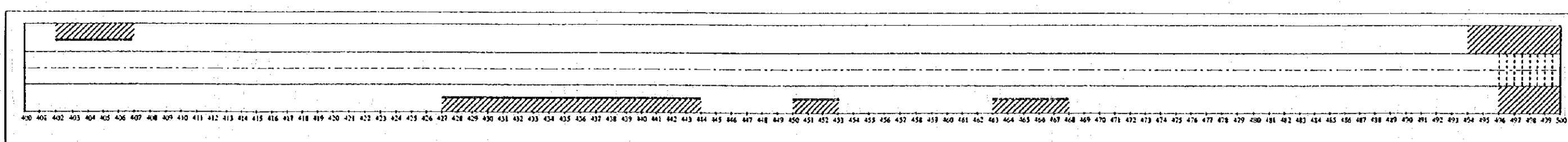
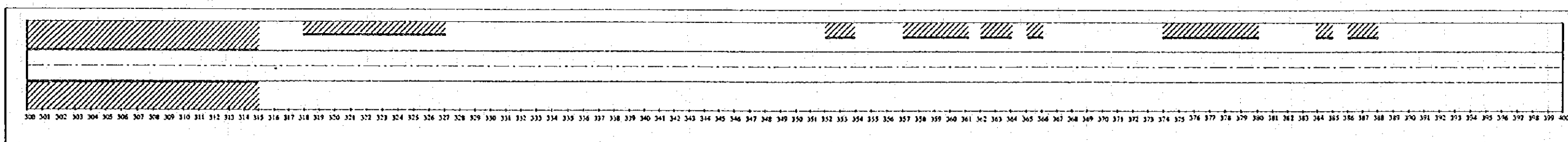
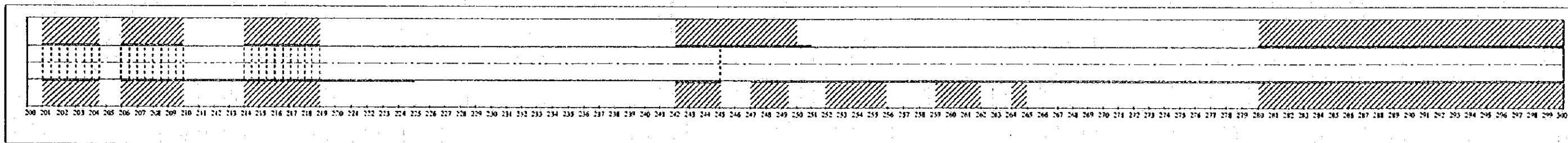
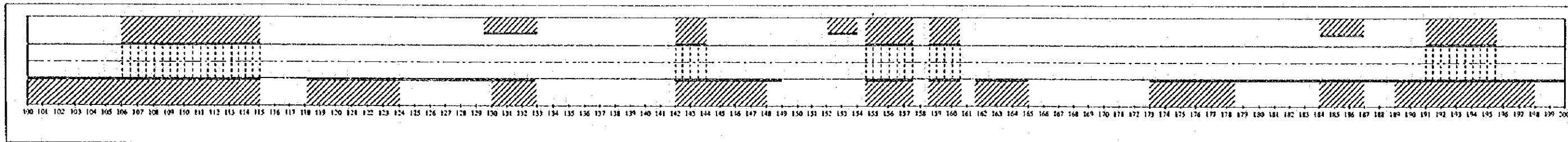
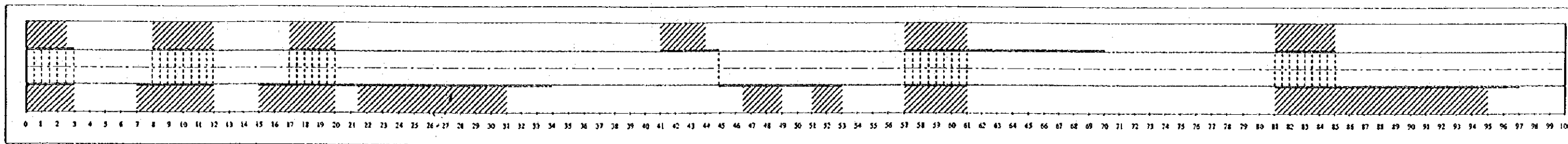


A) MATERIALS

ITEM	CLASS	UNIT	QUANTITY	REMARKS
EXCAVATION		m3	147.3	
BACKFILL		m3	81.1	
GRAVITY WALL		m3	95.1	
LEAN CONCRETE	oek-180kg/m2	m3	4.7	
CONCRETE WITH COBBLE		m3	36.1	
CONCRETE	oek-240kg/m2	m3	45.3	
FORM WORK	LEAN CONC	m2	1.4	
FORM WORK		m2	51.1	
REINFORCEMENT BAR		t	4.5	
SUPPORT		m3	84.0	
GABION		m3	11.0	
LIVE SAPLING		m2	4.1	



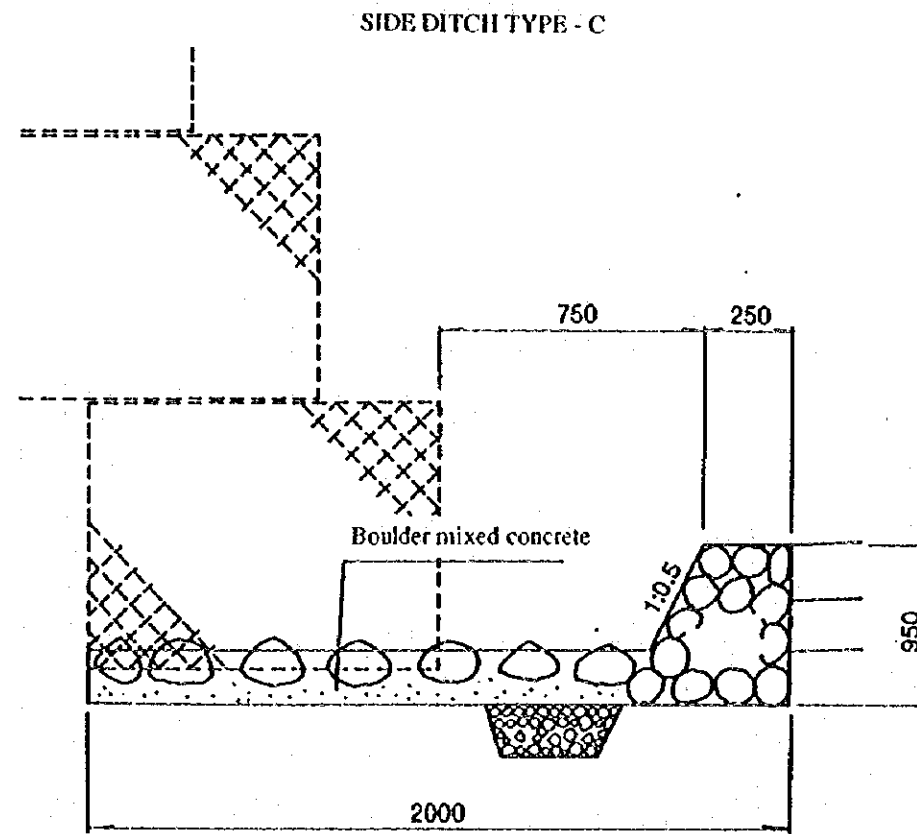
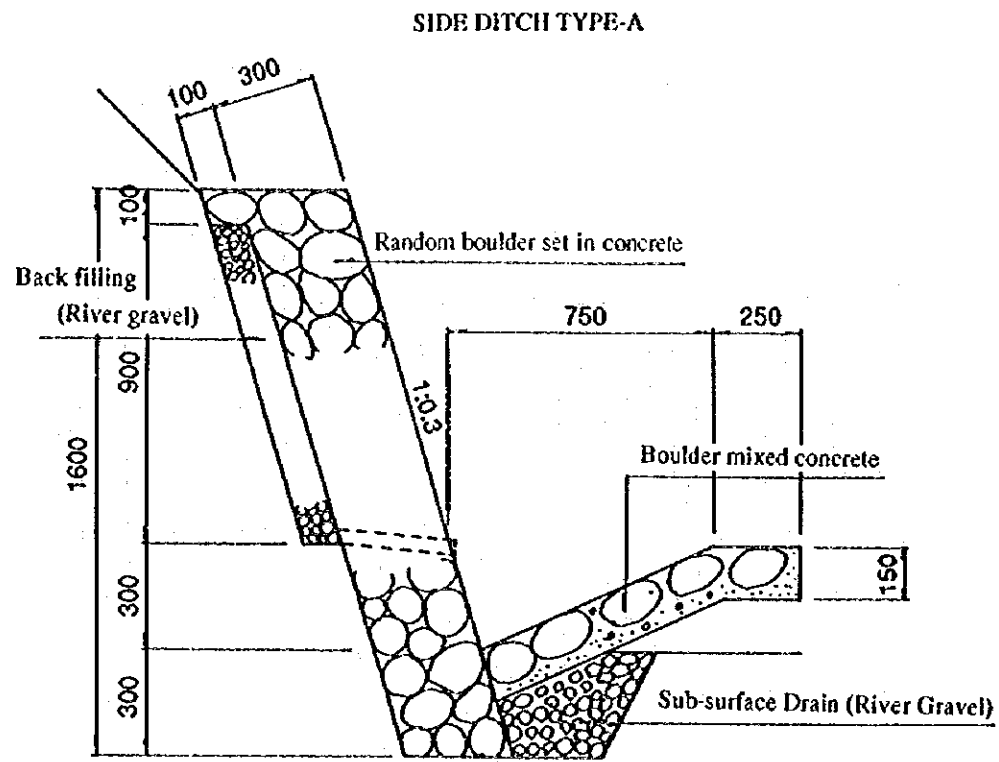
### Layout of Agricultural Drainage to be Relocated



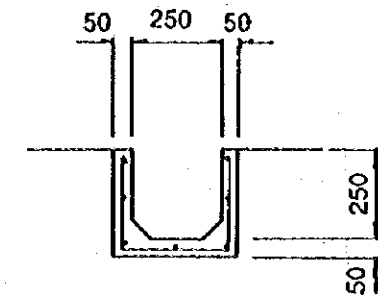
Estimated Quantities	
Agricultural Drainage	= 42600 m
Cross Drainage	= 2205 m

LEGEND	
	Paddy Field
	Field Acquired for Project Road
	Project Road
	Agricultural Drainage
	Cross Drainage

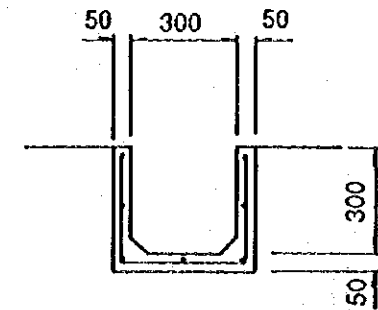
DETAILS OF SIDE DITCHES AND DRAINAGE FOR IRRIGATION Scale: 1/20



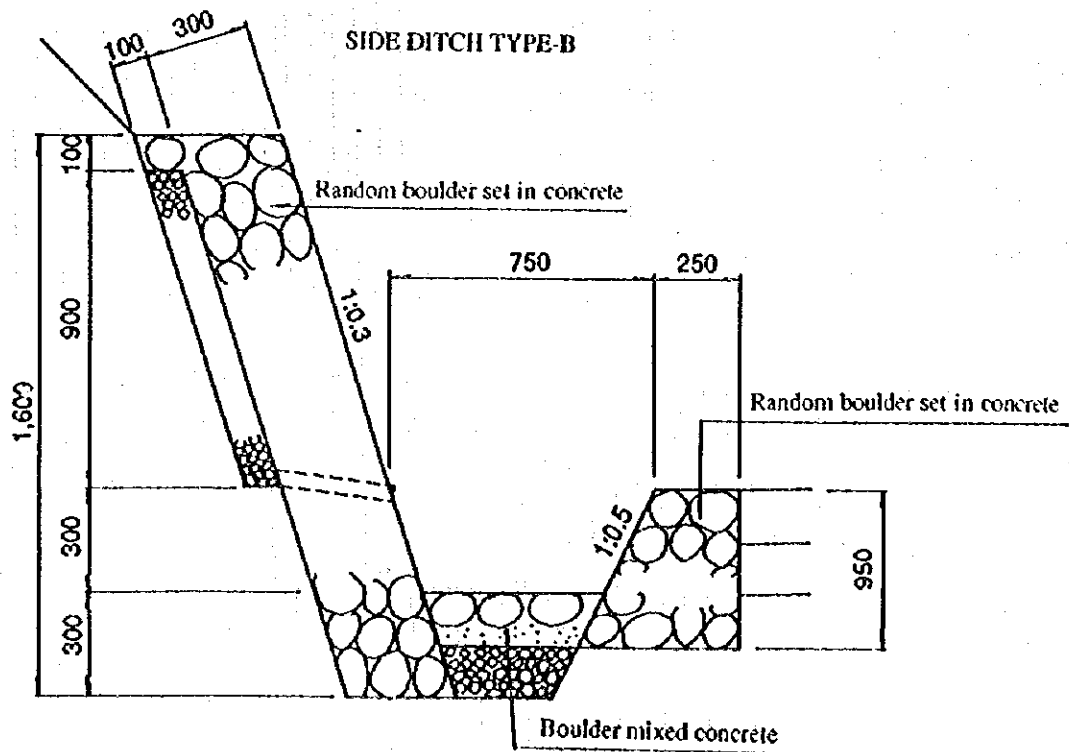
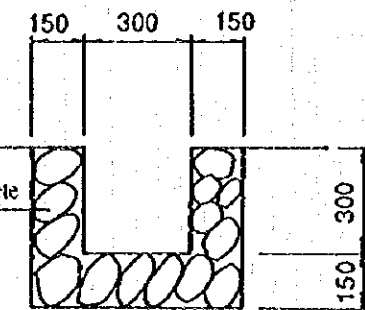
Pre-Cast U Shaped Drain (250x250)



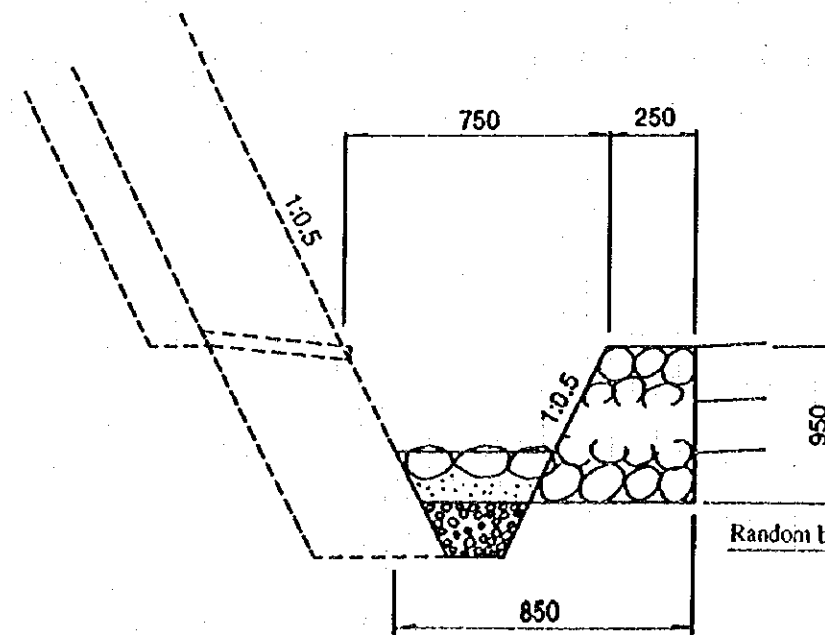
Pre-Cast U Shaped Drain (300x300)



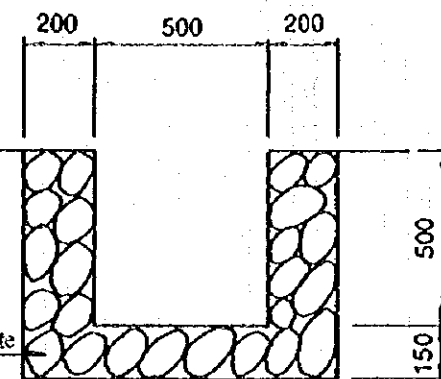
U Shaped Drain (300x300)



**SIDE DITCH TYPE - D**



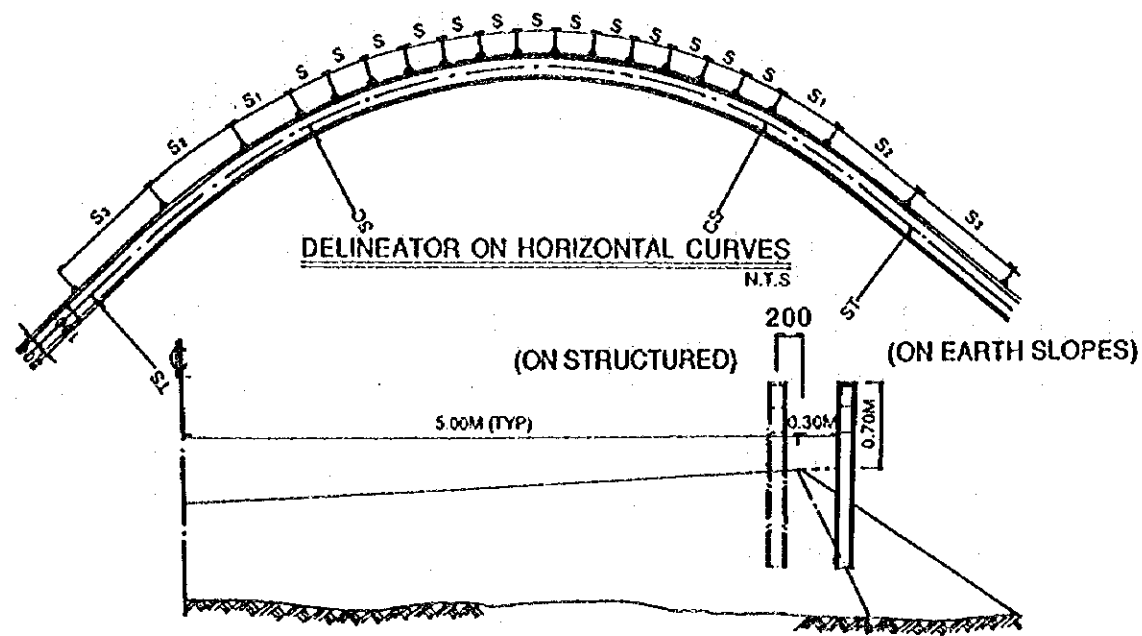
U Shaped Drain (500x500)



SIDE DITCH

DRAINAGE FOR IRRIGATION

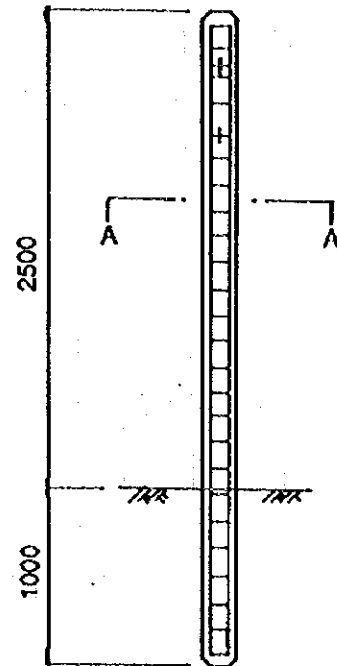
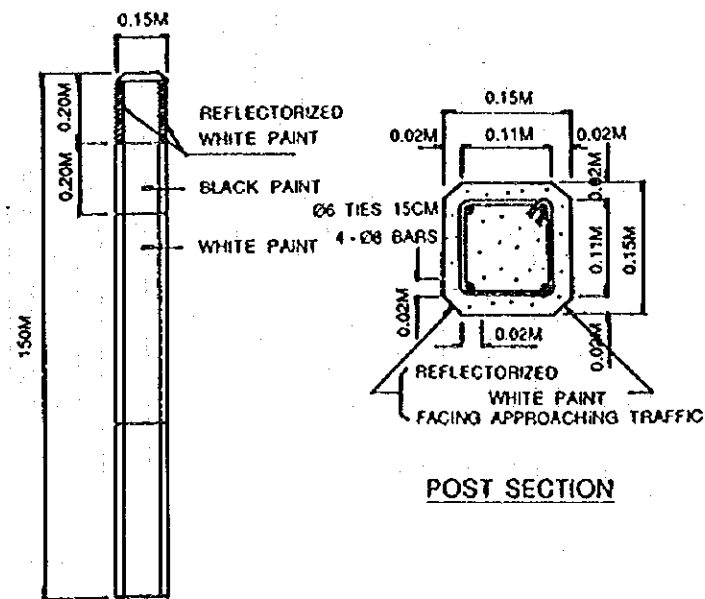
DELINEATORS NOT TO SCALE.



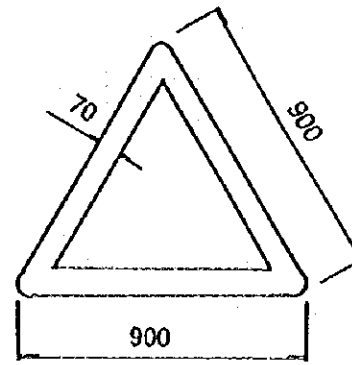
SPACING OF DELINEATORS (M)

RADIUS	S	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>
15	4	5	10	20
20	6	7	13	24
40	7	9	16	28
60	8	11	19	32
80	9	13	22	36
100	10	15	25	40
400	30	45	50	50
>400	-	-	-	50

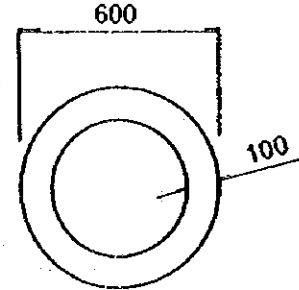
DELINEATOR INSTALLATION SECTION



ROAD TRAFFIC SIGN NOT TO SCALE

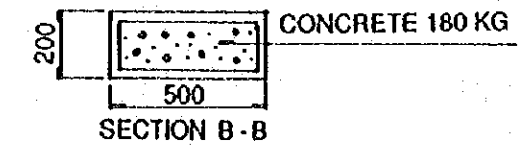
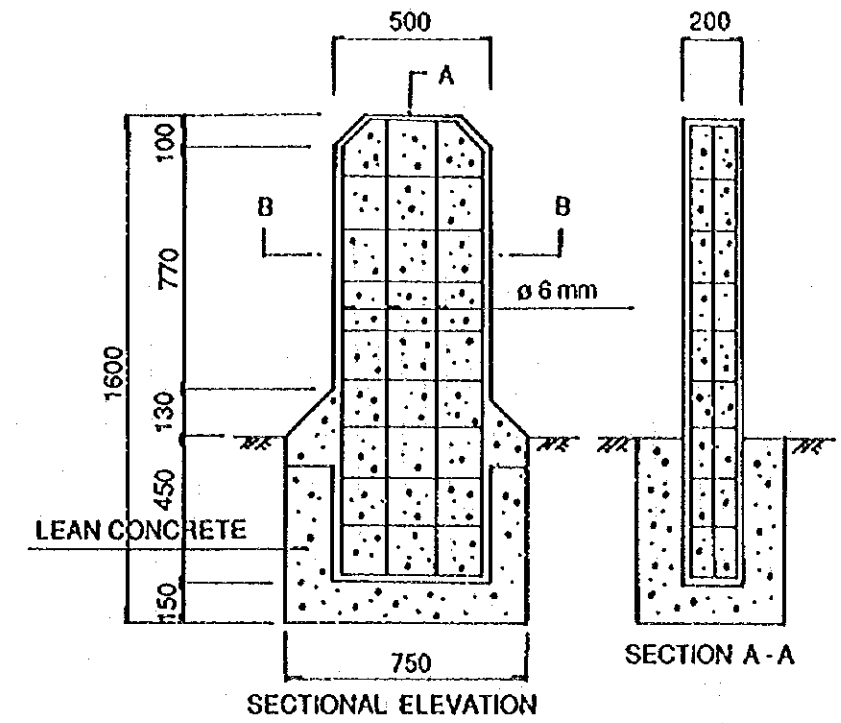


TYPE A

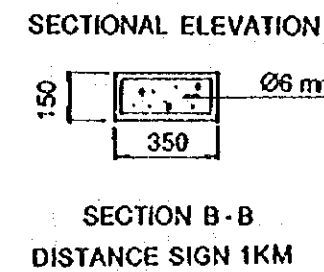
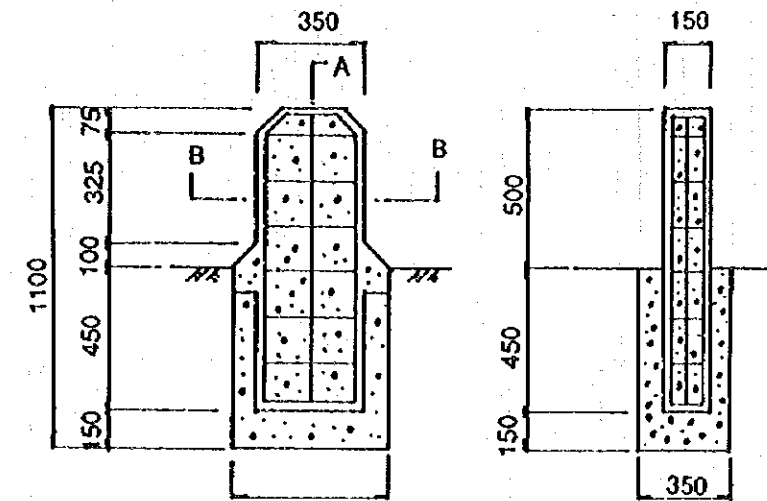


TYPE B

DISTANCE SIGN NOT TO SCALE



DISTANCE SIGN 5KM



## **APPENDIX - B**

- B.1 Member List of Survey Team**
- B.2 Survey Schedule**
- B.3 List of Party Concerned in Nepal**
- B.4 Cost Estimation Borne by HMG/N**
- B.5 Minutes of Discussion**

## B.1 Member List of Survey Team

### Inception Report Explanation and Field Survey Team

Assignment	Name	Position
1. Team Leader	: Yuji OKAZAKI	Director, Study Review & Coordination Division, Grant Aid Study & Design Department JAPAN INTERNATIONAL COOPERATION AGENCY
2. Grant Aid	: Takuya MITANI	Grant Aid Division Bureau of Economic Cooperation MINISTRY OF FOREIGN AFFAIRS
3. Chief Consultant/ Road Designer	: Hiroki SHINKAI	Nippon Koei Co., Ltd.
4. Bridge Designer	: Masaaki SHIMIZU	Nippon Koei Co., Ltd.
5. Execution Planner/ Cost Estimator	: Yoshihisa YAMASHITA	Nippon Koei Co., Ltd.
6. Natural Condition Investigator	: Akichika ISHIBASHI	Nippon Koei Co., Ltd.
7. Road Facilities Planner	: Takashi SHIMIZU	Nippon Koei Co., Ltd.

### Draft Basic Design Explanation Team

Assignment	Name	Position
1. Team Leader	: Hiroshi YONEDA	Director, Second Basic Design Study Division, Grant Aid Study & Design Department JAPAN INTERNATIONAL COOPERATION AGENCY
2. Project Coordinator	: Toshikazu MASAKI	First Project Management Division, Grant Aid Project Management Department JAPAN INTERNATIONAL COOPERATION AGENCY
3. Chief Consultant/ Road Designer	: Hiroki SHINKAI	Nippon Koei Co., Ltd.
4. Execution Planner/ Cost Estimator	: Yoshihisa YAMASHITA	Nippon Koei Co., Ltd.

## B.2 Survey Schedule

### Inception Report Explanation and Field Survey Team

Date	Movement/Place/Agencies	Station	Activities/Name of Person
Nov. 26 (Sun.)	Tokyo - Bangkok (BKK)	BKK	Mr. Mitani, Mr. Shinkai, Mr. Shimizu and Mr. Yamashita
27 (Mon.)	BKK - Kathmandu (KTM) JICA Nepal Office Embassy of Japan (EOJ)	KTM	Courtesy call
28 (Tue.)	Ministry of Finance Ministry of Works and Transport (MOWT), Department of Roads (DOR)	KTM	Courtesy call Explanation and discussion of the Inception Report
29 (Wed.)	DOR First Site Investigation	KTM Site	Courtesy call Mr. Shimizu, Mr. Yamashita
30 (Thu.)	Dacca - KTM JICA Nepal Office, EOJ First Site Investigation	KTM Site	Mr. Okazaki Courtesy call Mr. Shimizu, Mr. Yamashita
Dec. 1 (Fri.)	KTM - Nepalthok - Sindhuli Bazar	Site	Site observation
2 (Sat.)	Sindhuli Bazar - KTM	KTM	Site observation
3 (Sun.)	DOR	KTM	Discussion on the Inception Report
4 (Mon.)	DOR	KTM	Preparation of draft minutes
5 (Tue.)	DOR JICA, EOJ	KTM	Signing on the minutes Reporting the result of Minutes of Discussion
6 (Wed.)	KTM - BKK	KTM	Mr. Okazaki, Mr. Mitani
7 (Thu.)		KTM	Cost data collection & Traffic survey
8 (Fri.)		KTM	Cost data collection & Traffic survey
9 (Sat.)		KTM	Cost data collection & Traffic survey
10 - 13		KTM	Cost data collection & Traffic survey
14 (Tue.)	KTM - BKK	KTM	Mr. Shinkai
15 (Fri.)	Tokyo - BKK	KTM	Mr. Ishibashi, Mr. Shimizu
16 (Sat.)	BKK - KTM	KTM	Mr. Ishibashi, Mr. Shimizu
17 (Sun.)		KTM	Cost data collection

18 - 28		KTM	Site investigation, cost data collection
29 (Fri.)	KTM - BKK	BKK	Mr. Yamashita, Mr. Ishibashi, Mr. Shimizu
30 (Sat.)	BKK - Tokyo		Mr. Yamashita, Mr. Ishibashi, Mr. Shimizu

### Draft Basic Design Report Explanation Team

Date	Movement/Place/Agencies	Station	Activities/Name of Person
Feb. 25 (Sun.)	Tokyo - Bangkok (BKK)	BKK	Mr. Yoneda, Mr. Masaki, Mr. Shinkai, Mr. Yamashita
26 (Mon.)	BKK - Kathmandu (KTM) JICA Nepal Office Ministry of Finance Embassy of Japan (EOJ)	KTM	Courtesy call  Discussions
27 (Tue.)	Ministry of Works and Transport, Department of Road	KTM	Explanation and discussion on the Draft Report
28 (Wed.)	Department of Roads	KTM	Explanation and discussion on the Draft B/D Report
29 (Thu.)	Dapcha	KTM	Site observation
Mar. 1 (Fri.)	Department of Roads	KTM	Signing on the minutes
2 (Sat.)	KTM-BKK	KTM	Mr. Yoneda, Mr. Masaki
3 (Sun.)		KTM	Data collection
4 (Mon.)	Dhulikel	KTM	Site observation
5 (Tue.)	JICA Nepal, EOJ	KTM	Reporting the result of the Survey
6 (Wed.)	KTM - BKK	KTM	Mr. Shinkai, Mr. Yamashita
7 (Thu.)	BKK - Tokyo		Mr. Shinkai, Mr. Yamashita



### *B.3 List of Party Concerned in Nepal*

- (1) **Ministry of Works and Transport**  
Acting Secretary, Mr. Varun P. Shrestha
  
- (2) **Ministry of Finance**  
Foreign Aid Coordination Division, Joint Secretary, Mr. Madhab P. Ghimire
  
- (3) **National Planning Commission**  
Member Secretary, Mr. Rabindra K. Shakya
  
- (4) **Department of Roads**  
Director General, Department of Roads, Mr. Mohan, B. Karki  
Deputy Director General, Mr. K.P. Pokharel  
Deputy Director General (Design), Mr. Suresh K. Regmi  
Deputy Director General (Planning), Mr. Shyam P. Adhikari  
Deputy Director General (Mechanical), Mr. Hari L. Rajabahak  
Deputy Director General (Foreign Aid), Mr. Madan Gopal Malekn  
Senior Divisional engineer (Foreign Aid), Mr. Pawan M. Shrestha  
Senior Divisional engineer (MRCU), Mr. Kamal Pandey  
Engineer: Mr. Saroj K. Pradhan
  
- (6) **Water Induced Disaster Prevention Technical Centre**  
Director, Mr. Ronald, C. Mukunma

## B.4 Cost Estimation Borne by HMG/N

### Cost Estimation Borne by the HMG/N

#### 1. Land Acquisition and House Compensation Cost

	Land Acquisition		House Acquisition
Section I	(Both Land and House acquisition, estimated 50% of B/D study, considering that actual land acquisition will be don 50% of area within ROW) Total	5,500,000 NRs	
Section II-1	50% of A/C study Area (m <sup>2</sup> ) Rate (NRs) Cost Total	311287 20 6,225,740 25,820,000 NRs	Number Rate (NRs) Cost 19,600,000
Section II-2	50% of A/C study Area (m <sup>2</sup> ) Rate (NRs) Cost Total	233,328 20 4,666,550 23,170,000 NRs	Number Rate (NRs) Cost 18,500,000
Section II-3	Area (m <sup>2</sup> ) (50% of estimated area within ROW) Rate (NRs) (According to A/C study) Cost Total	587,440 35 9,333,100 20,560,000 NRs	Number (within construction width) Rate (NRs) (According to A/C study) Cost 19,800,000

#### 2. Forest

Estimation at the rate of 5 persons for each Section for 4 months a year with average salary of 6000 NRs/Month

5 persons x 4 months x 6000 Nrs/month	= 120,000 NRs/section/year
Transportation (Lumpsum)	= 300,000 NRs/section/year
Administrative	= 60,000 NRs/section/year
Total	= 480,000 NRs/section/year

#### 3. Maintenance office construction

Ref. attached layout plan. Cost of construction for Nepalthok and Khurkot offices are 20% as that of Banepa or Sindhuli Bazar office.

#### 4. Maintenance Administration

Office staff according to the attached sheet.

Average salary = 3,000 NRs/month

Allowance, office expenditure at 100 % of total salary

#### 5. Material

Average distance of cross drainage = 150 m

Gabion 1 m<sup>3</sup>/150m/year

Riprap 1 m<sup>3</sup>/150m/year

Gabion wire 32.5 kg/0.15 = 216.67 kg x 36 NRs = 7800 NRs/km/year

Cement 150 kg/0.15 = 1000 kg x 5.1 NRs = 5100 NRs/km/year

Total = 12,900 NRs/km/year

#### 6. Fuel

According to B/D study, fuel consumption is assumed to be 111 litre/hr

700 m<sup>3</sup> /km/year of deposits are cleaned at capacity of 40 m<sup>3</sup> /hr = 17.5 hr/km/year

17.5 hr/km/year x 111 litre/hr = 1942 litre/km/year x 12 NRs/litre = 23310 NRs/km/year

#### 7. Labour

2 persons/km/day x 100 NRs/day x 25day x 12 month = 60,000 NRs/km/year

#### 8. Spare

Annual spare equipment cost = 5% of equipment cost given in A/C study

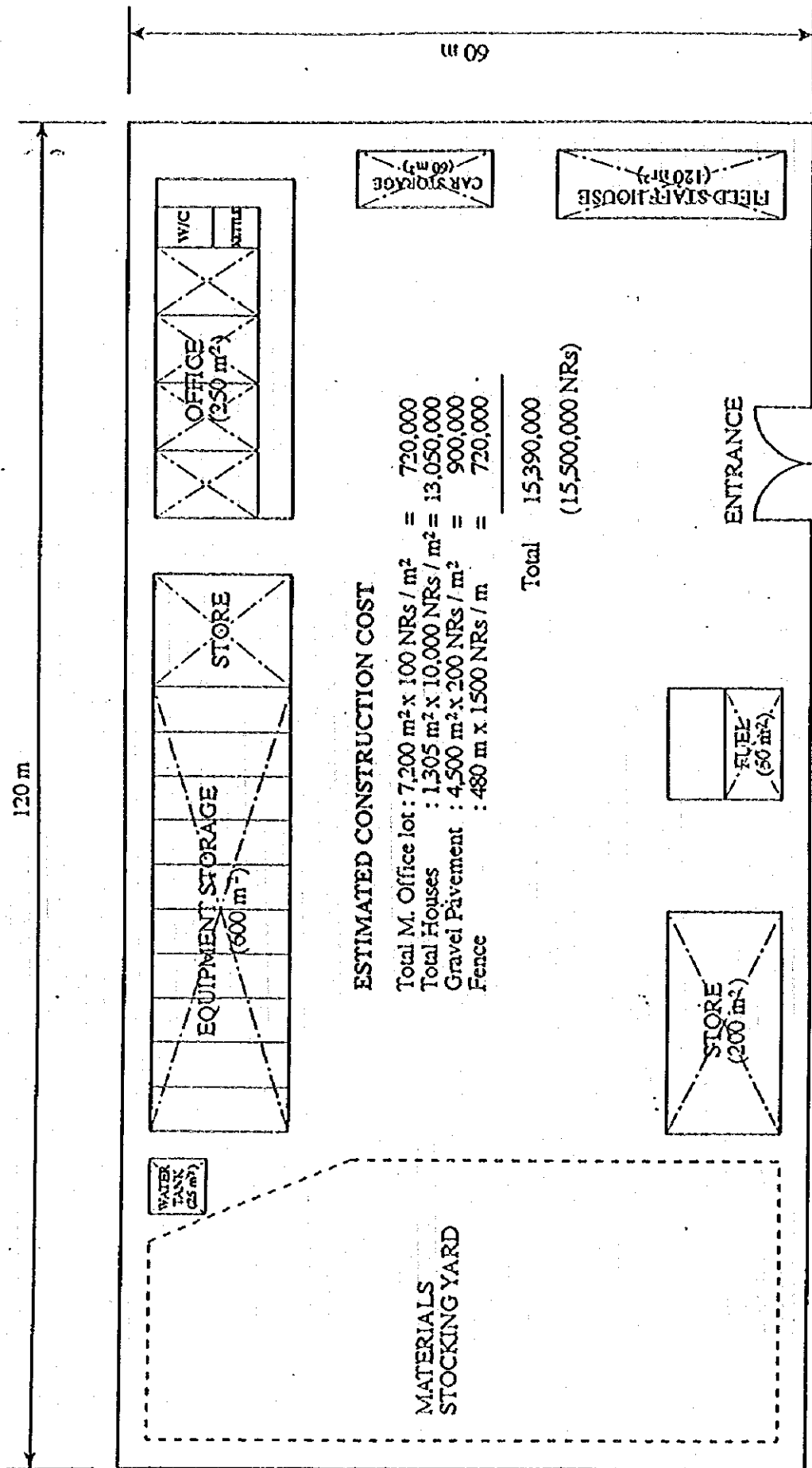
231,000,000 x 0.05 / 159 km = 72,600 NRs/km/year

Tentative Project Implementation Schedule and Budget Allocation Schedule by HMG/N

Calendar Year		1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	
Detailed Design and Construction (Grant Aid)		D/D Sec I										
			Const. Sec I									
			D/D Sec II-3									
			D/O Sec II-3 Phase 2									
			Const. Sec II-3 Phase 1									
			Const. Sec II-3 Phase 2									
			D/D Sec II-1									
			D/O Sec II-1 Phase 2									
			Const. Sec II-1 Phase 1									
			Const. Sec II-1 Phase 2									
Construction of Maintenance office & Maintenance of Section I and Handed Over Sections (HMG Force Account)			Maintenance of Sec I									
			Bio-Engineering Works (Monitoring & Rehabilitation) for Sec I Slopes									
			Const. Buxopa M. Office									
			Maintenance of Sec II-3									
			Bio-Eng. Works (Monitoring & Rehabilitation) for Sec II-3 Slopes									
			Const. Sindhu Bazar M. Office									
			Maintenance of Sec II-1									
			Bio-Eng. Works (M & R) for Sec II-1 Slopes									
			Const. Nepalkot Field Unit									
			Maintenance of Sec II-2									
		Bio-Eng. Works (M & R) for Sec II-2 Slopes										
		Const. Kharkot Field Unit										
Land Acquisition and House Compensation (HMG Force Account)		Sec I										
			Sec II-3									
			Sec II-2									
		Completion of Land Acquisition for Phase I										
		Completion of Land Acquisition for entire section										
		Total										
Land Acquisition	Sec I		5,500,000								5,500,000	
	Sec II-1			1,600,000	1,600,000	1,620,000					23,170,000	
	Sec II-2				7,720,000	7,720,000	7,720,000				23,170,000	
	Sec II-3		6,850,000	6,850,000	6,850,000						20,560,000	
Forest			240,000	480,000	480,000	480,000	240,000				1,920,000	
Maint. Office Construction					15,500,000	15,500,000		3,100,000	3,100,000		37,200,000	
Maint. Administration		36,000	180,000	2,556,000	2,556,000	2,556,000	4,716,000	5,904,000	6,984,000	8,136,000	8,172,000	41,796,000
Maint. Allowance & Expenditure		36,000	180,000	2,556,000	2,556,000	2,556,000	4,716,000	5,904,000	6,984,000	8,136,000	8,172,000	41,796,000
Material	Sec I		478,000	478,000	478,000	478,000	478,000	478,000	478,000	478,000	478,000	4,302,000
	Sec II-1					253,000	253,000	203,000	203,000	503,000	503,000	2,311,000
	Sec II-2						206,000	413,000	413,000	413,000	413,000	1,851,000
	Sec II-3				465,000	465,000	658,000	658,000	658,000	658,000	658,000	4,220,000
Fuel	Sec I		862,000	862,000	862,000	862,000	862,000	862,000	862,000	862,000	862,000	7,358,000
	Sec II-1					909,000	909,000	909,000	909,000	909,000	909,000	3,431,000
	Sec II-2					746,000	746,000	746,000	746,000	746,000	746,000	3,730,000
	Sec II-3				1,189,000	1,189,000	1,189,000	1,189,000	1,189,000	1,189,000	1,189,000	8,323,000
Labour	Sec I		2,220,000	2,220,000	2,220,000	2,220,000	2,220,000	2,220,000	2,220,000	2,220,000	2,220,000	19,980,000
	Sec II-1					2,340,000	2,340,000	2,340,000	2,340,000	2,340,000	2,340,000	14,040,000
	Sec II-2						1,920,000	1,920,000	1,920,000	1,920,000	1,920,000	8,600,000
	Sec II-3				3,060,000	3,060,000	3,060,000	3,060,000	3,060,000	3,060,000	3,060,000	21,420,000
Spair	Sec I		2,886,000	2,886,000	2,886,000	2,886,000	2,886,000	2,886,000	2,886,000	2,886,000	2,886,000	24,174,000
	Sec II-1					2,830,000	2,830,000	2,830,000	2,830,000	2,830,000	2,830,000	16,980,000
	Sec II-2						2,320,000	2,320,000	2,320,000	2,320,000	2,320,000	11,600,000
	Sec II-3				3,700,000	3,700,000	3,700,000	3,700,000	3,700,000	3,700,000	3,700,000	23,900,000
<b>Total</b>		<b>71,000</b>	<b>19,196,000</b>	<b>27,283,000</b>	<b>58,932,000</b>	<b>58,423,000</b>	<b>43,771,000</b>	<b>41,742,000</b>	<b>43,902,000</b>	<b>43,106,000</b>	<b>43,178,000</b>	<b>379,617,000</b>
Construction			Sec I	Sec II-3 Phase 1	Sec II-1 Phase 1	Sec II-3 Phase 2	Sec II-1 Phase 2	Sec II-3 Phase 2				
Handing Over			Sec I			Sec II-3 Phase 1	Sec II-1 Phase 1	Sec II-3 All	Full Section			
Maintenance			Sec I			Sec II-3 Phase 1	Sec II-1 Phase 1	Sec II-3 All	Entire Section			

Calendar Year	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	Max. No. of Position
<b>POSITION</b>											
Project Manager	1	1	1	1	1	1	1	1	1	1	1
Coordinator	1	1	1	1	1						1
Maintenance Engineer	1	1	2	2	2	2	2	2	2	2	2
Bio Engineer				1	1	2	2	2	2	2	2
Maintenance Overseer	2	2	2	2	2	4	4	4	5	5	5
Supervisor			2	2	2	4	6	7	9	10	10
<b>MECHANICAL STAFF</b>											
Mechanical Engineer			1	1	1	2	2	2	2	2	2
Senior Mechanics & Other			6	6	6	10	10	10	10	10	10
Senior Operator			5	5	5	8	11	14	17	17	17
Mechanics & Others			14	14	14	28	35	42	49	49	49
Junior Mechanics			9	9	9	16	17	18	19	19	19
Helper			6	6	6	12	17	22	27	27	27
Driver/Heavy Driver			8	8	8	16	22	26	30	30	30
<b>ADMINISTRATIVE STAFF</b>											
Nayab Subba			2	2	2	4	4	4	4	4	4
Kharidar			1	1	1	2	3	4	5	5	5
Wireless Operator			1	1	1	2	3	4	5	5	5
Low Level (Peon, Guard etc.)			10	10	10	20	27	34	41	41	41
<b>Total Man Year</b>	<b>1</b>	<b>5</b>	<b>71</b>	<b>72</b>	<b>72</b>	<b>133</b>	<b>166</b>	<b>196</b>	<b>228</b>	<b>229</b>	
<b>* 36,000</b>	<b>36,000</b>	<b>180,000</b>	<b>2,556,000</b>	<b>2,592,000</b>	<b>2,592,000</b>	<b>4,788,000</b>	<b>5,976,000</b>	<b>7,056,000</b>	<b>8,208,000</b>	<b>8,244,000</b>	

# TENTATIVE LAYOUT PLAN OF THE BANEPA MAINTENANCE OFFICE



## ESTIMATED CONSTRUCTION COST

Total M. Office lot :  $7,200 \text{ m}^2 \times 100 \text{ NRs} / \text{m}^2 = 720,000$   
 Total Houses :  $1,305 \text{ m}^2 \times 10,000 \text{ NRs} / \text{m}^2 = 13,050,000$   
 Gravel Pavement :  $4,500 \text{ m}^2 \times 200 \text{ NRs} / \text{m}^2 = 900,000$   
 Fence :  $480 \text{ m} \times 1,500 \text{ NRs} / \text{m} = 720,000$

Total 15,390,000  
 (15,500,000 NRs)

Minutes of Discussions  
on  
the Basic Design Study  
on  
The Project for Construction of Sindhuli Road  
(II-3 Section : NEPALTHOK - DHULIKHEL)  
in  
The Kingdom of Nepal

In response to a request from the Government of the Kingdom of Nepal, the Government of Japan has decided to conduct a Basic Design Study on the Project for Construction of Sindhuli Road (II-3 Section), (hereinafter referred to as "the Project"), and entrusted the study to the Japan International Cooperation Agency (JICA).


JICA sent to the Kingdom of Nepal a Basic Design Study Team headed by Mr. Yuji OKAZAKI, Director, Study Review & Coordination Division, Grant Aid Study & Design Department, JICA, which is scheduled to stay in the country from November 27 to December 29, 1995.

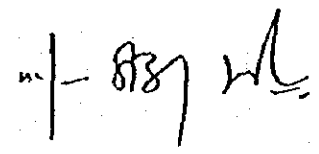
The team held a series of discussions with the concerned officials of the Kingdom of Nepal and conducted a field survey at the study area.

In the course of discussions and field survey, both parties have confirmed the main items described on the attached sheets.

The team will proceed to further works and prepare the Draft Basic Design.

Katmandu, December 5, 1995

  
Mr. Yuji Okazaki  
Leader  
Basic Design Study Team  
JICA

  
Mr. M. B. Karki  
Director General  
Department of Roads,  
Ministry of Works and Transport

## ATTACHMENT

### 1. OBJECTIVE

The objective of Project is to construct Sindhuli Road (II-3 Section: Nepalthok - Dhulikhel ) which plays an important role as a part of trunk road to mobilize transportation between Kathmandu and Terai Plain. The construction of the road will be much effective in balancing and updating the living standard and welfare of the people by ensuring smooth transportation, hence to contribute to socio-economic development of the Project area.

### 2. PROJECT IMPLEMENTING AGENCY

Department of Roads, Ministry of Works and Transport

### 3. SITE TO BE COVERED UNDER THE PROJECT

The proposed site of the Project is shown in Annex-1.

### 4. MAJOR ITEMS CONFIRMED BY BOTH PARTIES

After a result of the series of discussions, both parties have confirmed the major items listed in Annex-2. However, the contents of the Project will be decided after further study.

### 5. JAPANESE GRANT AID PROGRAM

The Nepalese side has understood the system of Japan's Grant Aid Program explained in Annex-3.

### 6. NECESSARY MEASURES TO BE TAKEN BY THE NEPALESE SIDE

The Nepalese will take necessary measures described in Annex-4 for smooth implementation of the Project on condition that the Grant Aid by the Government of Japan is extended to the Project.

### 7. PROJECT ORGANIZATION OF THE NEPALESE SIDE

Tentative organization of the maintenance unit and its contents has been proposed in Annex-5, however, concrete organization plan including staffing schedule and required maintenance equipment shall be discussed and determined by both parties based on the overall implementation during the stay of Basic Design Team in Nepal.

### 8. SCHEDULE FOR THE LAND ACQUISITION AND COMPENSATION

The tentative schedule for the land acquisition and compensation are proposed by the Nepalese side which are shown in Annex-6.



## 9. ENVIRONMENT IMPACT

Both sides recognize the affects to the environment by the civil works implemented by the Project. The team will incorporate the ways and means to protect the environment suggested in the previous study and will assess the moderate environment friendly plan of the construction suitable for the implementation of the Project as shown in Annex 7.

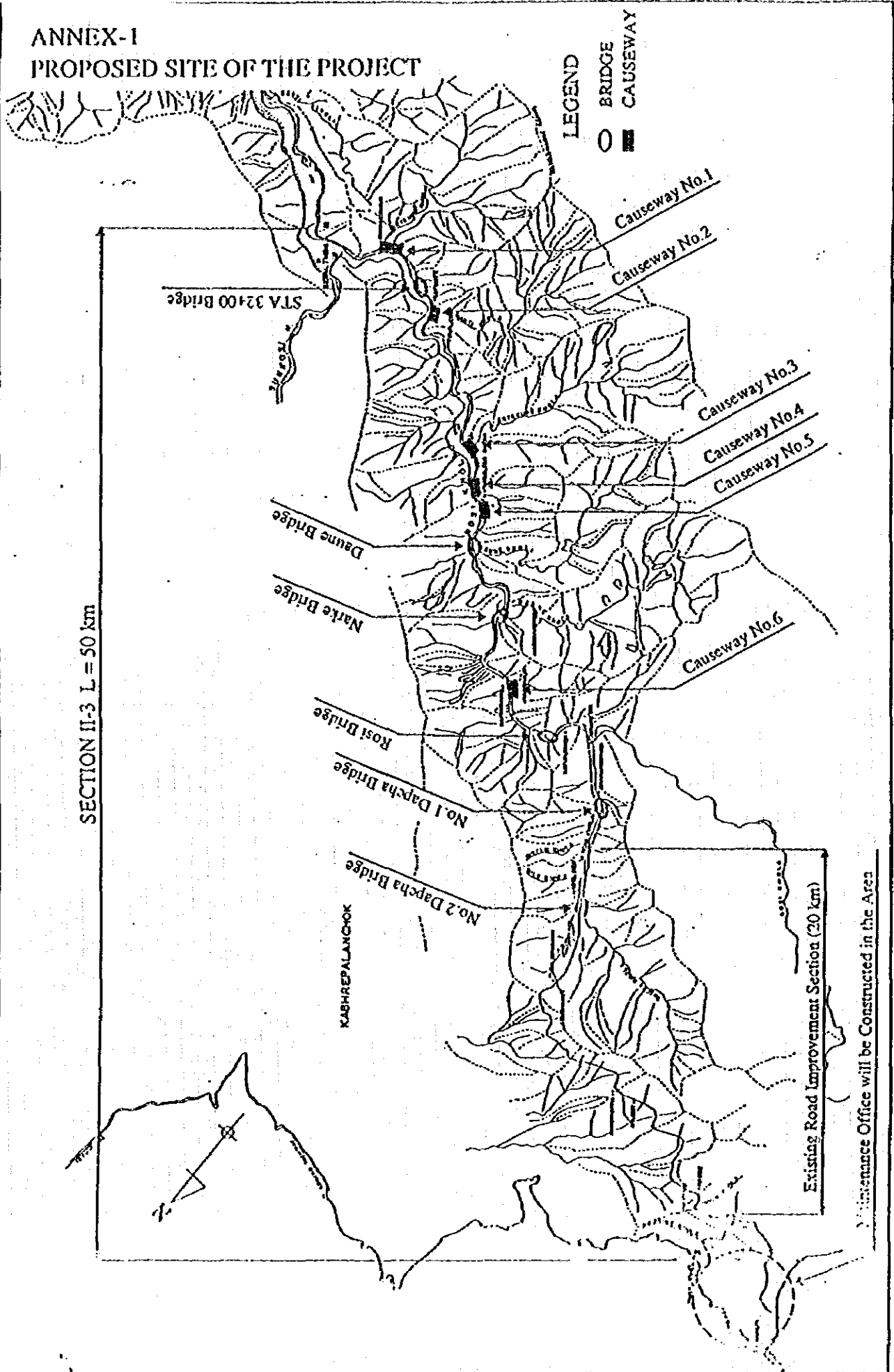
## 10. FURTHER SCHEDULE OF THE STUDY

- (1) The team will proceed to further studies in the Kingdom of Nepal until December 29, 1995.
- (2) JICA will prepared a Draft Basic Design Report and dispatch a team in February, 1996 in order to explain and to confirm on the contents of the Draft Basic Design.
- (3) In case that the Draft Basic Design is accepted by the Nepalese side, JICA will complete the Basic Design Report and send it to the Nepalese side by April 1996.

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ANNEX-1  
PROPOSED SITE OF THE PROJECT



SECTION II-3 L = 50 km

LEGEND  
○ BRIDGE  
■ CAUSEWAY

Existing Road Improvement Section (20 km)

Maintenance Office will be Constructed in the Area

## ANNEX-2

### MAJOR ITEMS CONFIRMED BY BOTH PARTIES

- (1) Design Concept for Section II-3 of Sindhuli Road  
Nepalese side agreed in principle to the design concept presented in the Inception Report with some request as follows:

(i) Lane Number : Single lane  
Nepalese side agreed to apply stage-wise construction for Section II-3 of Sindhuli Road taking into account the minimization of road disaster and environmental impact expected during and after construction of the Project, on condition that the passing bays will be provided at adequate interval for the safety of driving. Japanese side agreed their condition.

(ii) Carriageway width  
Standard sections : 4.75 m  
Steep and difficult terrain sections : 4.00 m  
Nepalese side agreed to apply the minimum carriageway width stated above for Section II-3, however, they requested to provide the adequate sight distance in the design from the view point of safe driving. Japanese side agreed to their request.

(iii) Pavement : Gravel road  
The surface treatment will be done for the sections where deem necessary from the view point of safety of the road structures as well as on traveling of traffic.  
Nepalese side agreed to the gravel surface for Section II-3 at this stage, however, they requested to implement the pavement (black topped surface) in accordance with the proposed overall implementation plan of Sindhuli Road Project in Basic Design Study Report for Section I prepared in December, 1994.

Japanese side replied that this issue shall be discussed and determined at the time the whole section of Shindhuli Road is substantially completed and connected with Dhulikhel and Bardibas, taking into account the stability of cut slope as well as the results of road maintenance of Nepalese side.

(vi) **Bridge Design** : Single lane bridge with 4.0 m carriageway width  
Nepalese side agreed to single lane bridge, however, they requested to consider the following:

- (a) Intermediate lane width of 5.5 m should be adopted for major bridges from the view point of safety of pedestrian.
- (b) Sub-structure of bridge should be designed taking into account the future widening.

Japanese side replied as follows:

- (a) There are two major bridges in Section II-3 having its bridge length more than 50 m, namely Rosi Bridge (65 m) and Narke Bridge (60 m). The adoption of intermediate width of 5.5 m will be studied for these bridges and determined based on the result of Basic Design Study.
- (b) Japanese side agreed to their request of item (b) in principle taking into account the basic concept of stage-wise construction method, however, it will apply only for the bridges where future widening is difficult due to steep topography and poor geological condition.

As for the Section II-3, there are five proposed bridges in this section, out of which, there is one bridge (Daune Bridge) of which sub-structure should be designed taking into account the future widening because of the steep terrain and poor geology, however, Japanese side recommended no future widening of this bridge since widening of bridge may cause large scaled landslides which result in critical problems on road maintenance in futur. Remaining 4 bridges are possible for constructing additional one lane in parallel or near the proposed site.

(2) **Handing-over and Maintenance Work to be done by Nepalese Side**  
Nepalese side requested, instead of the partial handing over method proposed in the Inception Report, the handing-over only after the whole section of Section II-3 is substantially completed because of the following reasons:

- Partial handing-over section will be damaged by the construction equipment of a general contractor being used for constructing other sections, which might be far beyond the ordinary maintenance level.

- Repairing and remedial work for slope failure and damaged section to be conducted by DOR maintenance team might interfere with the operation and work of a general contractor employed for constructing other sections.
- DOR has separate function for road construction and maintenance so that once the partial handing-over is made, the section will be maintained by the regional maintenance unit but not maintenance unit of the Project, which might cause coordination problems with the maintenance division of Nepalese side.

Japanese side replied that the partial-handing over method should be applied for the Project, since it is authorized in the conditions of contract of FIDIC and applied widely for the international construction contract. Instead, in order to minimize the interference to the contractor's work with the maintenance unit of DOR in handed-over section, Japanese side agreed to include the maintenance of road surface in the handed-over section as a part of contractor's responsibility on the maintenance of access road for construction of the Project until the whole section of II-3 work is finished and also to provide the maintenance equipment soon after handing-over is made. Timing and length of handing-over section shall be determined and agreed upon by both parties on the basis of construction program. Nepalese side finally agreed to the partial handing over method side taking into consideration the necessity of maximum participation of Nepalese side for this national priority project.

Nepalese side also agreed to build and organize the maintenance office at Banepa at their cost, however, requested Japanese side to submit the proposed construction plan and schedule which must be incorporated in the planning of maintenance system for Section II-3. Japanese side agreed to their request.

(3) Necessary Arrangement for Land Acquisition and Tree Cutting

Nepalese side agreed to take necessary action and arrangement on the land acquisition and compensation as well as tree cutting, which might be affected by the construction of Project, soon after the government of Japan approve the implementation of Section II-3. Both parties agreed to conduct this issue keeping close cooperation during the detailed design stage.

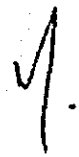
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*[Handwritten signature]*

(4) **Relocation of Water Supply System**

Nepalese side agreed to relocate the water supply system for drinking water at their cost during and after completion of the project, however, they requested to relocate the existing irrigation canal by Japanese side since the relocation of irrigation canal system will be designed as a part of road structure and constructed directly related to the road drainage system of the Project. Japanese side agreed to their request taking into account practice of construction method and sequence and to include the relocation work of irrigation system into a part of the contractor's work, but limited to the inside of right-of-way.

Nepalese side also agreed that DOR is responsible for negotiation with the people concerned and solve all the troubles and problems timely so as not hindrance the implementation of the Project.



9

## ANNEX-3 JAPAN'S GRANT AID SCHEME

### 1. Grant Aid Procedures

- 1) Japan's Grant Aid Program is executed through the following procedures.

Application	(Request made by a recipient country)
Study	(Basic Design Study conducted by JICA)
Appraisal & Approval	(Appraisal by the Government of Japan and Approval by Cabinet)
Determination of Implementation	(The Notes exchanged between the Government of Japan and recipient country)
  
- 2) Firstly, the application or request for a Grant Aid project submitted by a recipient country is examined by the Government of Japan (the Ministry of Foreign Affairs) to determine whether or not it is eligible for Grant Aid. If the request is deemed appropriate, the Government of Japan assigns JICA (Japan International Cooperation Agency) to conduct a study on the request.

Secondly, JICA conducts the study (Basic Design Study), using (a) Japanese consulting firm(s).

Thirdly, the Government of Japan appraises the project to see whether or not it is suitable for Japan's Grant Aid Program, based on the Basic Design Study report prepared by JICA, and the result are then submitted to the Cabinet for approval.


Fourthly, the project, once approved by the Cabinet, becomes official with the Exchange of Notes signed by the Governments of Japan and the recipient country.

Finally, for the implementation of the project, JICA assists the recipient country in such matters as preparing tenders, contracts and so on.

### 2. Basic Design Study

#### 1) Contents of the Study

The aim of the Basic Design Study (hereinafter referred to as "the Study"), conducted by JICA on a requested project (hereinafter referred to as "the Project") is to provide a basic document necessary for the appraisal of the Project by the Japanese Government. The contents of the Study are as follows:



- 10
- a) Confirmation of the background, objectives, and benefits of the requested project and also institutional capacity of agencies concerned of the recipient country necessary for the Project's implementation.
  - b) Evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from a technical, social and economic point of view.
  - c) Confirmation of items agreed on by both parties concerning the basic concept of the Project.
  - d) Preparation of a basic design of the Project
  - e) Estimation of costs of the Project

The contents of the original request are not necessarily approved in their initial form as the contents of the Grant Aid project. The Basic Design of the Project is confirmed considering the guidelines of Japan's Grant Aid Scheme.

The Government of Japan requests the Government of the recipient country to take whatever measures are necessary to ensure its self-reliance in the implementation of the Project. Such measures must be guaranteed even though they may fall outside of the jurisdiction of the organization in the recipient country actually implementing the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations of the recipient country through the Minutes of Discussions.

## 2) Selection of Consultants

For smooth implementation of the Study, JICA uses (a) registered consultant firm(s). JICA selects (a) firms (s) based on proposals submitted by interested firms. The Firm(s) selected carry(ies) out a Basic Design Study and write(s) a report, based upon terms of reference set by JICA.

The consulting firm(s) used for the Study is (are) recommended by JICA to the recipient country to also work on the Project's implementation after the Exchange of Notes, in order to maintain technical consistency and also to avoid any undue delay in implementation should the selection process be repeated.

## 3. Japan's Grant Aid Scheme

### 1) What is Grant Aid?

The Grant Aid Program provides a recipient country with non-reimbursable funds to procure the facilities, equipment and services (engineering services and



transportation of the products, etc.) for economic and social development of the country under principles in accordance with the relevant laws and regulations of Japan. Grant Aid is not supplied through the donation of materials as such.

2) Exchange of Notes (E/N)

Japan's Grant Aid is extended in accordance with the Notes exchanged by the two Governments concerned, in which the objectives of the Project, period of execution, conditions and amount of the Grant Aid, etc.; are confirmed.

3) "The period of the Grant Aid" means the one fiscal year which the Cabinet approves the Project for. Within the fiscal year, all procedures such as exchanging of the Notes, concluding contracts with (a) consultant firm(s) and (a) contractor(s) and final payment to them must be completed.

However in case of delays in delivery, installation or construction due to unforeseen factors such as weather, the period of the Grant Aid can be further extended for a maximum of one fiscal year at most by mutual agreement between the two Governments.

4) Under the Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased.

When the two Governments deem it necessary, the Grant Aid may be used for the purchase of the products or services of the third country.

However the prime contractors, namely, consulting, contracting and procurement firms, are limited to "Japanese nationals". (The term "Japanese nationals" means persons of Japanese nationality or Japanese corporations controlled by persons of Japanese nationality.)

5) Necessity of "Verification"

The Government of recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be verified by the Government of Japan. This "Verification" is deemed necessary to secure accountability to Japanese taxpayers.

6) Undertakings required of the Government of the Recipient Country

In the implementation of the Grant Aid project, the recipient country is required to undertake such necessary measures as the following:

- (1) To secure land necessary for the sites of the Project and to clear, level and reclaim the land prior to commencement of the construction.
  - (2) To provide facilities for the distribution of electricity, water supply and drainage and other incidental facilities in and around the sites.
  - (3) To secure buildings prior to the procurement in case the installation of the equipment.
  - (4) To ensure all the expenses and prompt execution for unloading, customs clearance at the port of disembarkation and internal transportation of the products purchased under the Grant Aid.
  - (5) To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which will be imposed in the recipient country with respect to the supply of the products and services under the Verified Contracts.
  - (6) To accord Japanese nationals whose services may be required in connection with the supply of the products and services under the Verified Contracts, such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work.
- 7) "Proper Use"
- The recipient country is required to maintain and use the facilities constructed and equipment purchased under the Grant Aid properly and effectively and to assign staff necessary for this operation and maintenance as well as to bear all the expenses other than those covered by the Grant Aid.
- 8) "Re-export"
- The products purchased under the Grant Aid should not be re-exported from the recipient country.
- 9) Banking Arrangements (B/A)
- a) The Government of the recipient country or its designated authority should open an account in the name of the Government of the recipient country in an authorized foreign exchange bank in Japan (hereinafter referred to as "the Bank"). The Government of Japan will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by the Government of the recipient country or its designated authority under the Verified Contracts.
  - b) The payments will be made when payment requests are presented by the Bank to the Government of Japan under an authorization to pay issued by the Government of the recipient country or its designated authority.

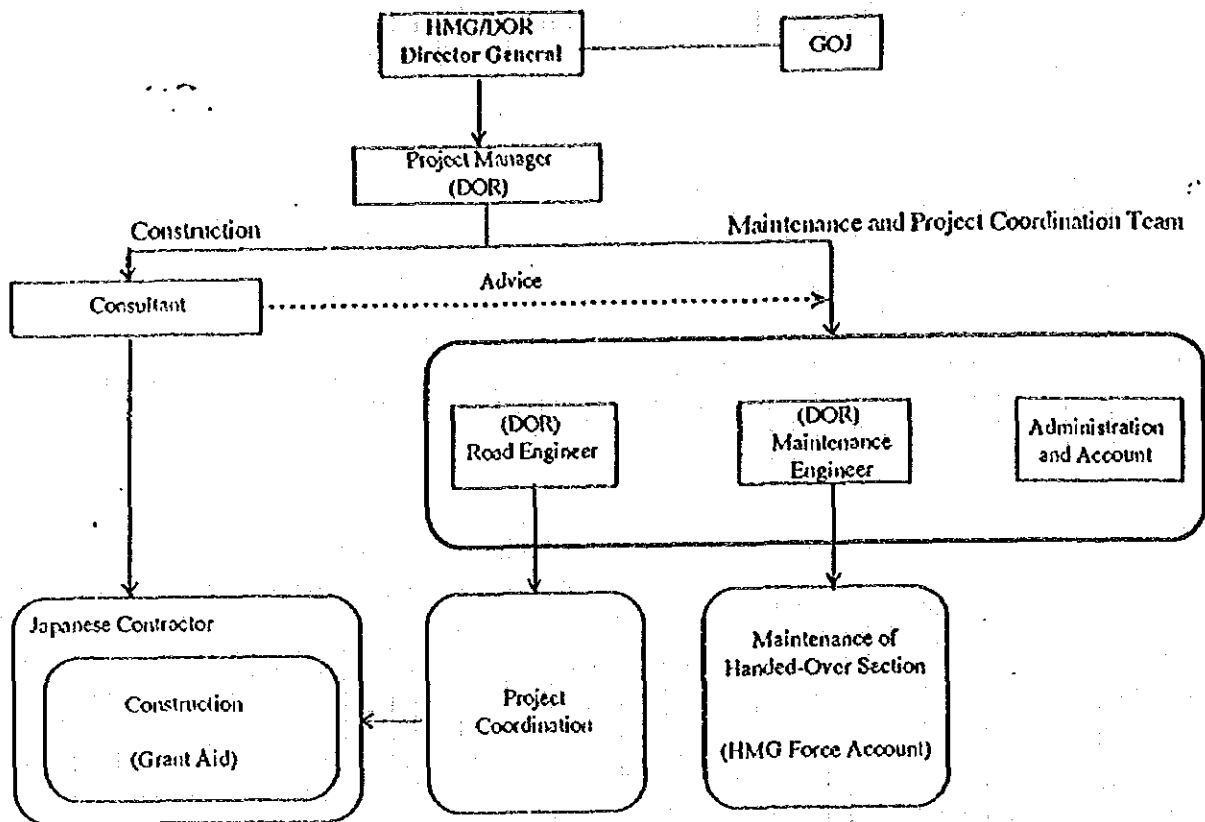
## ANNEX-4

### NECESSARY MEASURES TO BE TAKEN BY THE NEPALESE SIDE

Following necessary measures should be taken by the Nepalese side on condition that the Grant Aid by the Government of Japan is extended to the Project:

1. To provide data and information necessary for the Project
2. To secure the land for the execution of the Project, such as land for road alignment, bridge construction, working areas, storage yard and temporary contractor's camps, etc.
3. To clear the sites prior to the commencement of the construction.
4. To bear commissions to the Japanese foreign exchange bank for its banking services based upon the Banking Arrangement, namely the advising commission of the "Authorization to Pay" and payment commission.
5. To ensure prompt unloading, tax exemption, customs clearance at the port of disembarkation in Nepal and prompt internal transportation therein of the materials and equipment for the Project purchased under the Grant Aid.
6. To exempt Japanese juridical and physical nationals engaged in the Project from customs duties, internal taxes and other fiscal levies which may be imposed in the Kingdom of Nepal with respect to the supply of the products and services under the verified contracts.
7. To accord Japanese nationals whose services may be required in connection with the supply of the products and the services under the verified contact such facilities as may be necessary for their entry into Nepal and stay therein for the performance of their work.
8. To provide necessary permissions, licenses and other authorizations for implementing the Project, if necessary.
9. To assign appropriate budget and staff members for proper and effective operation and maintenance of the facilities constructed under the Project.
10. To maintain and use properly and effectively the facilities constructed and the equipment provided under the Project.
11. To bear all the expenses, other than those to be borne by the Japanese Grant Aid with the scope of the Project.
12. To coordinate and solve any issues related to the project which may be raised from third parties or inhabitants of the Project area during implementation of the Project.

ANNEX -5  
 TENTATIVE PROJECT ORGANIZATION CHART OF NEPALESE SIDE  
 AND SCHEDULE OF MAINTENANCE ( BANEPA OFFICE )



Tentative Organization Chart for the Project Implementation

Calendar Year	1	2	3	4	5	6	7	
Detailed Design	▬							
Construction		▬						
Maintenance Equipment Supply			V					
Activities of DOR	Appointment of PM and the Road Engineer							
	▬							
	Construction of the Banepa Maintenance Office							
	▬							
	Staffing of the Maintenance Team							
			Maintenance of Handing-over Sections					

Tentative Implementation Schedule

ANNEX-6

PROPOSED SCHEDULE OF LAND ACQUISITION AND COMPENSATION

Calendar Year	1	2	3	4	5	6	7
Detailed Design	▬						
Construction		▬					
Land Acquisition and Compensation		▬					

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## ANNEX 7: ENVIRONMENTAL IMPACT

Environmental impact is one of the most important subject to be considered in the planning of the Project. Nepalese side requested to study the road design paying due attention to this issues. Japanese side replied that the study will be done from all angles including road planning, slope design, construction method, maintenance, etc. to minimize an effect on natural environment as well as to reduce the possible road disasters and land slides expected during and after completion of the Project as follows:

- (a) Road Planning
  - Stage construction method (Single lane) is adopted to harmonize with natural or physical environment along the proposed route.
  - Minimum road width (4.75 m) is adopted.
  - Road alignment will be selected on valley side as much as possible to minimize the cut slope.
  - Design speed (20 km/hr - 40 km/hr) will be adopted.
  
- (b) Design for Slope Protection and Road Disaster
  - Risk map on road disasters will be prepared along the proposed route and the road alignment will be reviewed and designed so as to escape the possible land slides and failures of slope based on the risk map.
  - Appropriate slope protection measure will be provided for each place where land slide and failure is expected based on the field survey and risk map.
  
- (c) Construction Method and Maintenance
  - Manual excavation will be introduced wherever necessary to minimize an influence on field, houses and forest along the proposed route.
  - Reinforcement of maintenance capability of DOR will be planned through procurement of maintenance equipment, etc. under the Project, in order to prevent and minimize the road disasters through maximum participation of Nepalese side in the Project.



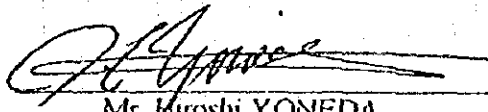
Minutes of Discussions  
on Basic Design Study  
on  
the Project for Construction of Sindhuli Road  
(Section II-3: Nepalthok~ Dhulikhel)  
in  
The Kingdom of Nepal  
(Explanation on the Draft Basic Design)

In December 1995, the Japan International Cooperation Agency (JICA) despatched the Basic Design Study Team on the Project for Construction of Sindhuli Road (Section II-3) (hereinafter referred to as "the Project") to the Kingdom of Nepal. After the assessment of the data and information through the study, JICA has prepared the Draft Basic Design of the study.

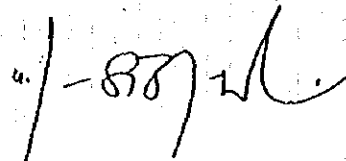
In order to explain and consult the Government of the Kingdom of Nepal, JICA sent to the Kingdom of Nepal a study team, headed by Mr. Hiroshi YONEDA, Director, Second Basic Design Study Division, Grant Aid Study & Design Department, JICA, which is scheduled to stay in the country from February 26 to March 6, 1996.

As a result of a discussions, both parties have confirmed the main items described in the attached sheets.

Kathmandu, March 1, 1996



Mr. Hiroshi YONEDA  
Leader  
Basic Design Study team  
JICA



Mr. M. B. Karki  
Director General  
Department of Roads  
Ministry of Works and Transport

## ATTACHMENT

### 1. OBJECTIVE

The objective of Project is to construct Sindhuli Road (II-3 Section: Nepalthok - Dhulikhel ) which plays an important role as a part of trunk road to mobilize transportation between Kathmandu and Terai Plain. The construction of the road will be much effective in balancing and updating the living standard and welfare of the people by ensuring smooth transportation, hence to contribute to socio-economic development of the Project area.

### 2. PROJECT IMPLEMENTING AGENCY

Department of Roads (DOR), Ministry of Works and Transport

### 3. PROJECT SITE

The site to be covered under the Project is the Section II-3 (Nepalthok - Dhulikhel ) as shown in Annex-1.

### 4. DRAFT BASIC DESIGN

The Nepalese side has in principle agreed to the components of the Draft Basic Design proposed by the Team, with some changes agreed during the meetings. These amendments are shown in Annex-2 and will be incorporated in the Basic Design.

### 5. JAPANESE GRANT AID PROGRAM

The Nepalese side has understood the system of Japan's Grant Aid Program explained in Annex-3.

### 6. NECESSARY MEASURES TO BE TAKEN BY THE NEPALESE SIDE

The Nepalese will take necessary measures described in Annex-4 for smooth implementation of the Project on condition that the Grant Aid by the Government of Japan is extended to the Project.

### 7. PROJECT ORGANIZATION OF THE NEPALESE SIDE

The organization of the maintenance unit of DOR and its staffing schedule have been proposed as shown in Annex 5-1. Nepalese side agreed to make arrangements for fund required for the maintenance work in reference to the tentative budget allocation schedule presented in Annex 5-2.



8. SCHEDULE AND PROCEDURE FOR THE LAND ACQUISITION AND COMPENSATION

Nepalese side explained to the Japanese side the procedure of land acquisition and compensation as shown in Annex 6-1 and agreed to make necessary actions during the detailed design stage in accordance with the tentative schedule of budget allocation for Section II-3 as shown in Annex 6-2.

To minimize the time required for land acquisition and compensation, Nepalese side will carry out setting of the land acquisition pegs following the center line and cross sectional survey which will be commenced if the government of Japan approves the implementation of detailed design for Section II-3.

Nepalese side also agreed that all procedure required for the above land acquisition and compensation shall be completed before the government of Japan approves the implementation of construction for Section II-3.

9. TREE CUTTING WITHIN THE RIGHT-OF-WAY OF THE PROJECT

In accordance with the guideline and procedure of the government of Nepal as shown in Annex 7, the DOR will prepare the environment impact assessment report on Section II-3 to get the approval of the Ministry of Forest for tree cutting. Japanese side agreed to assist the DOR in preparing the said report on the basis of the Basic Design.

All procedures required for tree cutting shall be completed by the DOR prior to the commencement of construction for Section II-3.

10. ENVIRONMENT IMPACT

Both sides recognized affects to the environment by the civil works implemented by the Project. The study on the environmental impact assessment for the Project was already conducted during the Feasibility Study and Aftercare Study made by JICA in 1986-1988 and 1993 respectively in which no essential environmental impacts were reported by the Project.

To minimize affects on natural environment as well as to reduce possible road disasters and land slides expected during and after construction of the Project, Japanese side will design and plan the Project from all angles including road planning, slope protection design, construction method, maintenance, etc.. Japanese side will also incorporate in the detailed design report ways and means to protect the environment as recommended by the Nepalese side and will establish an environment-friendly plan of the construction suitable for the implementation of the Project.

11. FURTHER SCHEDULE OF THE STUDY

The components of the draft basic design including the road facilities and maintenance equipment are subject to change due to the budget of Japanese Government to be allocated for the Project.

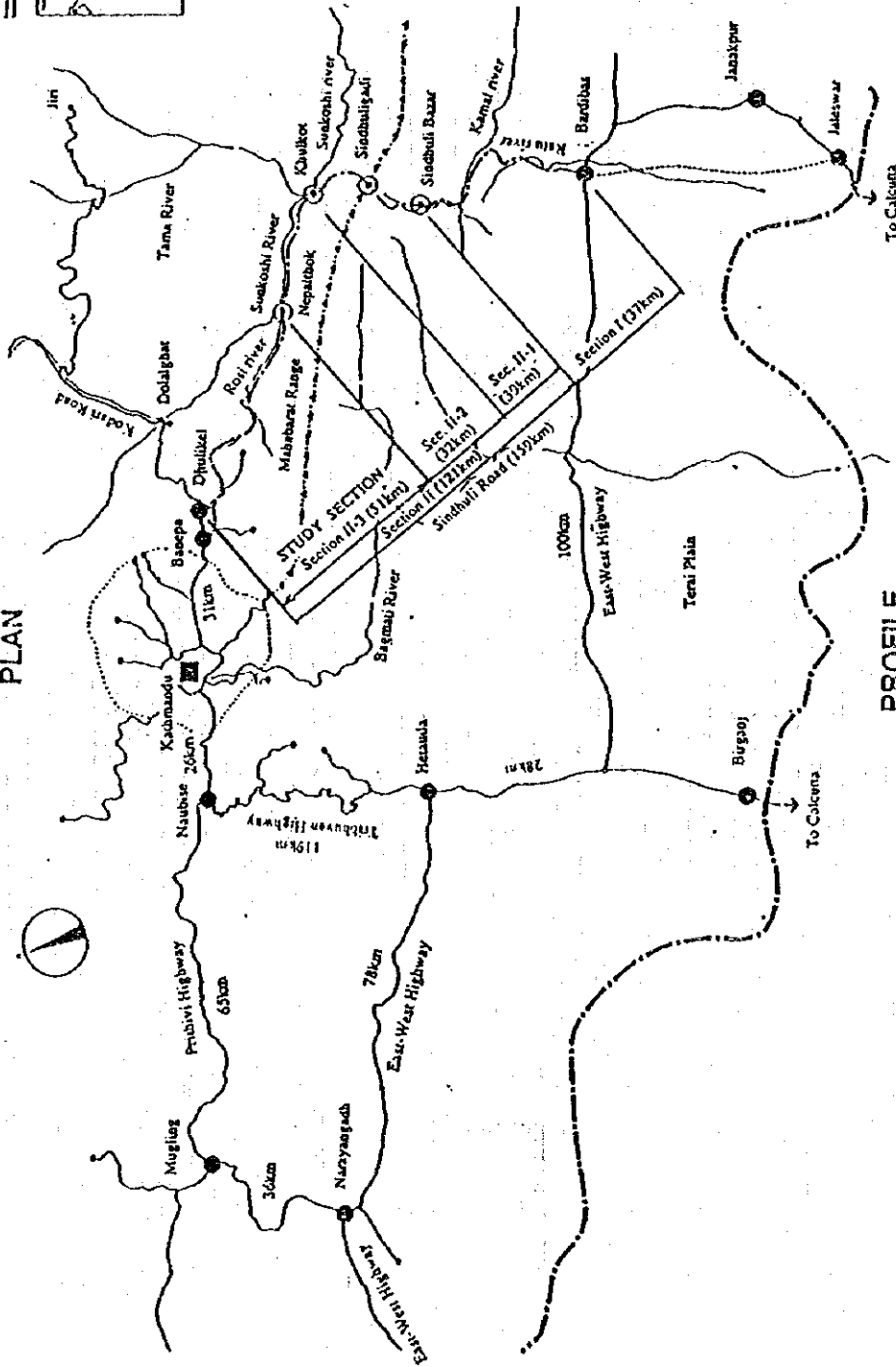
JICA will complete the Basic Design Report and send it to the Nepalese side by April 1996.

# ANNEX-I PROPOSED SITE OF THE PROJECT

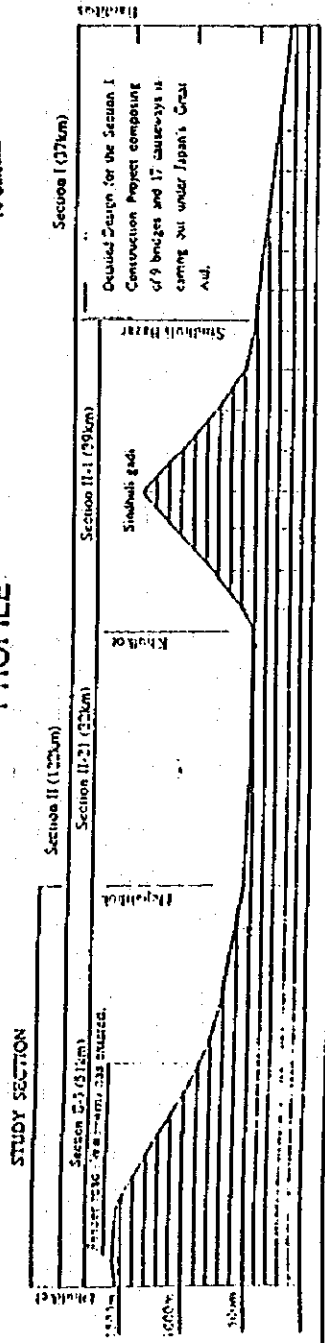
PROJECT LOCATION MAP



PLAN



PROFILE



Detailed Design for the Section I  
Construction Project comprising  
of 9 bridges and 17 culverts is  
being set under Japan's Grant  
Aid.

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## ANNEX-2

### AMENDMENTS ON THE DRAFT BASIC DESIGN AGREED BY BOTH PARTIES

#### 1. Additional River Treatment (River Training)

Nepalese side pointed out the necessity of additional river treatment at the abrupt turns in the river.

Japanese side replied that the necessary river treatment at the abrupt turns in the river have been properly designed in the basic design within the limited funds for the Project. As shown in the typical cross sections (page 1-29) and the river training works (1-33) of the draft basic design report, the curve sections have been designed with the reasonable countermeasures against the river reaction caused by abrupt change in the river flow. Therefore, no additional training will be necessary.

It is noted that Japanese side has formulated the Project so as to minimize environmental impacts and road disasters from all angles in road planning, design, construction method, maintenance, etc.. At the same time, as stated in the concept for the project implementation, the Project has been formulated with the basic concept of "the minimal development scheme" taking into account the limited funds for the Project. In line with the above concept, Japanese side has planned the Project with the basic stance that the Project is not necessarily designed to tolerate large scale land slides or disasters which would happen with the probability of 50 -100 years.

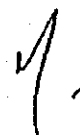
#### 2. Maintenance Equipment to be Supplied under the Project

Nepalese side requested to review the number and type of excavation and hauling equipment to be used for the maintenance work in the handed over sections, taking into consideration the existing equipment being kept by the maintenance division of DOR.

Japanese side agreed their request and review the list of maintenance equipment to be supplied under the Project, however, the modification will be made within the limit of budget of Japanese side.

#### 3. Estimated Cost of Tree Cutting to be borne by the Nepalese side

Estimated cost required for tree cutting is presented in the Table 2-3 "Estimated Expenditure for Sindhuli Road Construction Project to be Borne by DOR" of Draft Basic Design Report. The figure included only the cost to be required for administrative DOR's staff but not included the costs for compensation, cutting, stockpile and transportation. Japanese side will review and change this figure in the final report based on the cost data to be obtained from DOR before March 10, 1996.



## ANNEX-3 JAPAN'S GRANT AID SCHEME

### 1. Grant Aid Procedures

1) Japan's Grant Aid Program is executed through the following procedures.

Application	(Request made by a recipient country)
Study	(Basic Design Study conducted by JICA)
Appraisal & Approval	(Appraisal by the Government of Japan and Approval by Cabinet)
Determination of Implementation	(The Notes exchanged between the Government of Japan and recipient country)

2) Firstly, the application or request for a Grant Aid project submitted by a recipient country is examined by the Government of Japan (the Ministry of Foreign Affairs) to determine whether or not it is eligible for Grant Aid. If the request is deemed appropriate, the Government of Japan assigns JICA (Japan International Cooperation Agency) to conduct a study on the request.

Secondly, JICA conducts the study (Basic Design Study), using (a) Japanese consulting firm(s).

Thirdly, the Government of Japan appraises the project to see whether or not it is suitable for Japan's Grant Aid Program, based on the Basic Design Study report prepared by JICA, and the result are then submitted to the Cabinet for approval.

Fourthly, the project, once approved by the Cabinet, becomes official with the Exchange of Notes signed by the Governments of Japan and the recipient country.

Finally, for the implementation of the project, JICA assists the recipient country in such matters as preparing tenders, contracts and so on.

### 2. Basic Design Study

1) Contents of the Study

The aim of the Basic Design Study (hereinafter referred to as "the Study"), conducted by JICA on a requested project (hereinafter referred to as "the Project") is to provide a basic document necessary for the appraisal of the Project by the Japanese Government. The contents of the Study are as follows:

- a) Confirmation of the background, objectives, and benefits of the requested project and also institutional capacity of agencies concerned of the recipient country necessary for the Project's implementation.
- b) Evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from a technical, social and economic point of view.
- c) Confirmation of items agreed on by both parties concerning the basic concept of the Project.
- d) Preparation of a basic design of the Project.
- e) Estimation of costs of the Project.

The contents of the original request are not necessarily approved in their initial form as the contents of the Grant Aid project. The Basic Design of the Project is confirmed considering the guidelines of Japan's Grant Aid Scheme.

The Government of Japan requests the Government of the recipient country to take whatever measures are necessary to ensure its self-reliance in the implementation of the Project. Such measures must be guaranteed even though they may fall outside of the jurisdiction of the organization in the recipient country actually implementing the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations of the recipient country through the Minutes of Discussions.

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The consulting firm(s) used for the Study is (are) recommended by JICA to the recipient country to also work on the Project's implementation after the Exchange

of Notes, in order to maintain technical consistency and also to avoid any undue delay in implementation should the selection process be repeated.

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2) Exchange of Notes (E/N)

Japan's Grant Aid is extended in accordance with the Notes exchanged by the two Governments concerned, in which the objectives of the Project, period of execution, conditions and amount of the Grant Aid, etc., are confirmed.

3) "The period of the Grant Aid" means the one fiscal year which the Cabinet approves the Project for. Within the fiscal year, all procedures such as exchanging of the Notes, concluding contracts with (a) consultant firm(s) and (a) contractor(s) and final payment to them must be completed.

However in case of delays in delivery, installation or construction due to unforeseen factors such as weather, the period of the Grant Aid can be further extended for a maximum of one fiscal year at most by mutual agreement between the two Governments.

4) Under the Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased.

When the two Governments deem it necessary, the Grant Aid may be used for the purchase of the products or services of the third country.

However the prime contractors, namely, consulting, contracting and procurement firms, are limited to "Japanese nationals". (The term "Japanese nationals" means

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persons of Japanese nationality or Japanese corporations controlled by persons of Japanese nationality.)

5) Necessity of "Verification"

The Government of recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be verified by the Government of Japan. This "Verification" is deemed necessary to secure accountability to Japanese taxpayers.

6) Undertakings required of the Government of the Recipient Country

In the implementation of the Grant Aid project, the recipient country is required to undertake such necessary measures as the following:

- (1) To secure land necessary for the sites of the Project and to clear, level and reclaim the land prior to commencement of the construction.
- (2) To provide facilities for the distribution of electricity, water supply and drainage and other incidental facilities in and around the sites.
- (3) To secure buildings prior to the procurement in case the installation of the equipment.
- (4) To ensure all the expenses and prompt execution for unloading, customs clearance at the port of disembarkation and internal transportation of the products purchased under the Grant Aid.
- (5) To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which will be imposed in the recipient country with respect to the supply of the products and services under the Verified Contracts.
- (6) To accord Japanese nationals whose services may be required in connection with the supply of the products and services under the Verified Contracts, such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work.

7) "Proper Use"

The recipient country is required to maintain and use the facilities constructed and equipment purchased under the Grant Aid properly and effectively and to assign staff necessary for this operation and maintenance as well as to bear all the expenses other than those covered by the Grant Aid.

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8) "Re-export"

The products purchased under the Grant Aid should not be re-exported from the recipient country.

•9) Banking Arrangements (B/A)

- a) The Government of the recipient country or its designated authority should open an account in the name of the Government of the recipient country in an authorized foreign exchange bank in Japan (hereinafter referred to as "the Bank"). The Government of Japan will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by the Government of the recipient country or its designated authority under the Verified Contracts.
- b) The payments will be made when payment requests are presented by the Bank to the Government of Japan under an authorization to pay issued by the Government of the recipient country or its designated authority.

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## ANNEX-4

### NECESSARY MEASURES TO BE TAKEN BY THE NEPALESE SIDE

Following necessary measures should be taken by the Nepalese side on condition that the Grant Aid by the Government of Japan is extended to the Project:

1. To provide data and information necessary for the Project
2. To secure and clear the site for the project prior to the Project implementation.
3. To provide the temporary site free of charge to a general contractor for the construction of temporary bridges (two places) at Banepa as shown in the Report.
4. To allow a general contractor free of charge to collect the river gravel for road construction free of charge.
5. To replace or protect at the cost of the government of Nepal the existing utilities including local water supply system, telephone cable, power cable etc., which might be affected by the construction of the road, prior to the commencement of the work.
6. To allow a general contractor free of charge to use the maintenance equipment for road surface, trailers and wireless telephones, which will be provided to the Nepalese side under the Project as a maintenance equipment for Section II-3. Operation cost required for the above equipment shall be born by a general contractor.
7. To close the road for public traffic during the construction and to open for traffic only after handing over.
8. To maintain the road condition properly in the handing-over section in order to minimize the interference with the contractor's work for other construction section. The maintenance of road surface in the handed-over section shall be a part of contractor's responsibility as a maintenance of access road for construction of the Project until the whole section of II-3 work is finished
9. To make a proper financial arrangement on the land acquisition and compensation in accordance with the implementation schedule of the Project.
10. To bear commissions to the Japanese foreign exchange bank for its banking services based upon the Banking Arrangement, namely the advising commission of the "Authorization to Pay" and payment commission.
11. To ensure prompt unloading, tax exemption, customs clearance at the port of disembarkation in Nepal and prompt internal transportation therein of the materials and equipment for the Project purchased under the Grant Aid.
12. To exempt Japanese juridical and physical nationals engaged in the Project from customs duties, internal taxes and other fiscal levies which may be imposed in the Kingdom of Nepal with respect to the supply of the products and services under the verified contracts.

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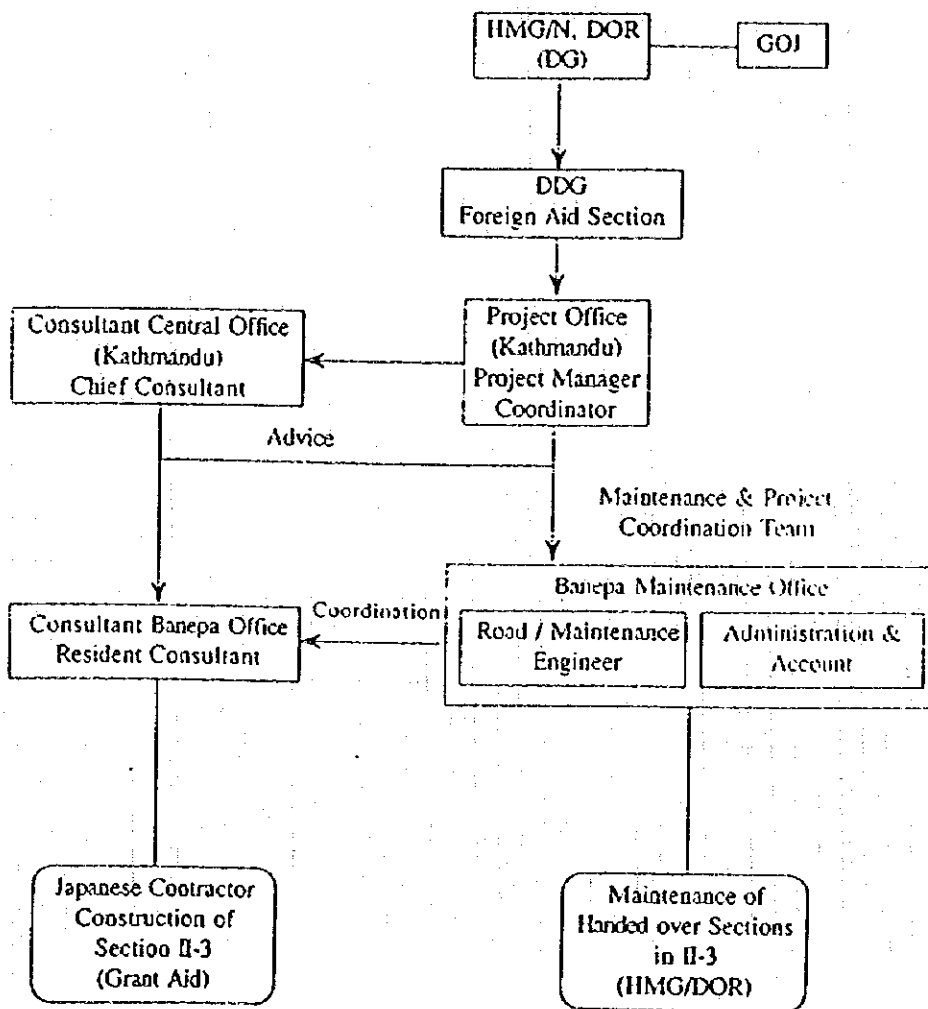
13. To accord Japanese nationals whose services may be required in connection with the supply of the products and the services under the verified contract such facilities as may be necessary for their entry into Nepal and stay therein for the performance of their work.
14. To provide necessary permissions, licenses and other authorizations for implementing the Project, if necessary.
15. To assign appropriate budget and staff members for proper and effective operation and maintenance of the facilities constructed under the Project.
16. To maintain and use properly and effectively the facilities constructed and the equipment provided under the Project.
17. To bear all the expenses, other than those to be borne by the Japanese Grant Aid with the scope of the Project.
18. To coordinate and solve any issues related to the project which may be raised from third parties or inhabitants of the Project area during implementation of the Project.

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ANNEX-5-1

PROJECT ORGANIZATION CHART OF THE NEPALESE SIDE



Organisation Chart of the Project (Section II-3) Implementation

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Recommended Staffing of the Project Office and the Maintenance/Project coordination Teams

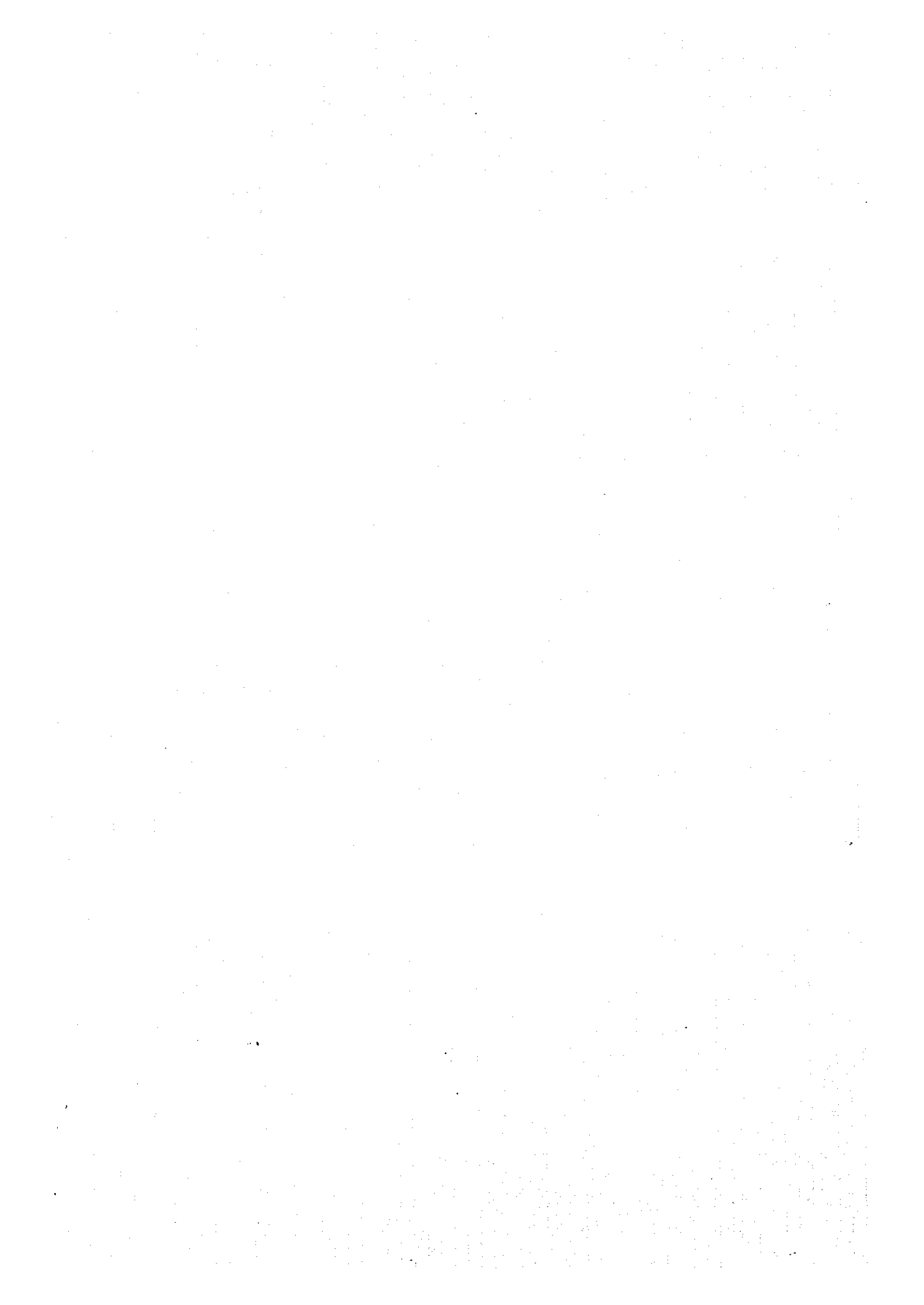
Office	Position	Main office	Maintenance/Project	Maintenance/Project coordination Team			Total (*1)
		Coordination Team (Section I) Bardibas Maintenance Office	Coordination Team (Section II-1) Sindhuli Bazar Maintenance Office	(Section II-2 and II-3)		Nepalihak Field Unit	
				Banepa Maintenance Office	Khurkot Field Unit		
	Project Manager	1					1
	Coordinator	1					1
	Maintenance engineer	1		1			2
	Maintenance Overseer	2	2	2	1	1	5
	Supervisor	2	2	2	2	2	10
<b>MECHANICAL STAFF</b>							
	Mechanical engineer	1		1			2
	Senior Mechanics & Other	6	1	6	1	1	10
	Senior Operator	5	3	3	3	3	17
	Mechanics Others	14	7	14	7	7	49
	Junior Mechanics	9	1	7	1	1	19
	Helper	6	5	6	5	5	27
	Driver/Heavy Driver	8	6	8	4	4	30
<b>ADMINISTRATIVE STAFF</b>							
	Nayab Subba	2		2			4
	Khairdar	1	1	1	1	1	5
	Wireless Operator	1	1	1	1	1	5
	Low level (Peon, Guard etc.)	10	7	10	7	7	41

(\*1) The total of member are calculated considering that the some member in Bardibas Maintenance Office will be assigned to the Sindhuli Bazar Maintenance Office during the Project (Section II-1)

Recommended Staffing on the Project Office and the  
Maintenance/Project Coordination Teams

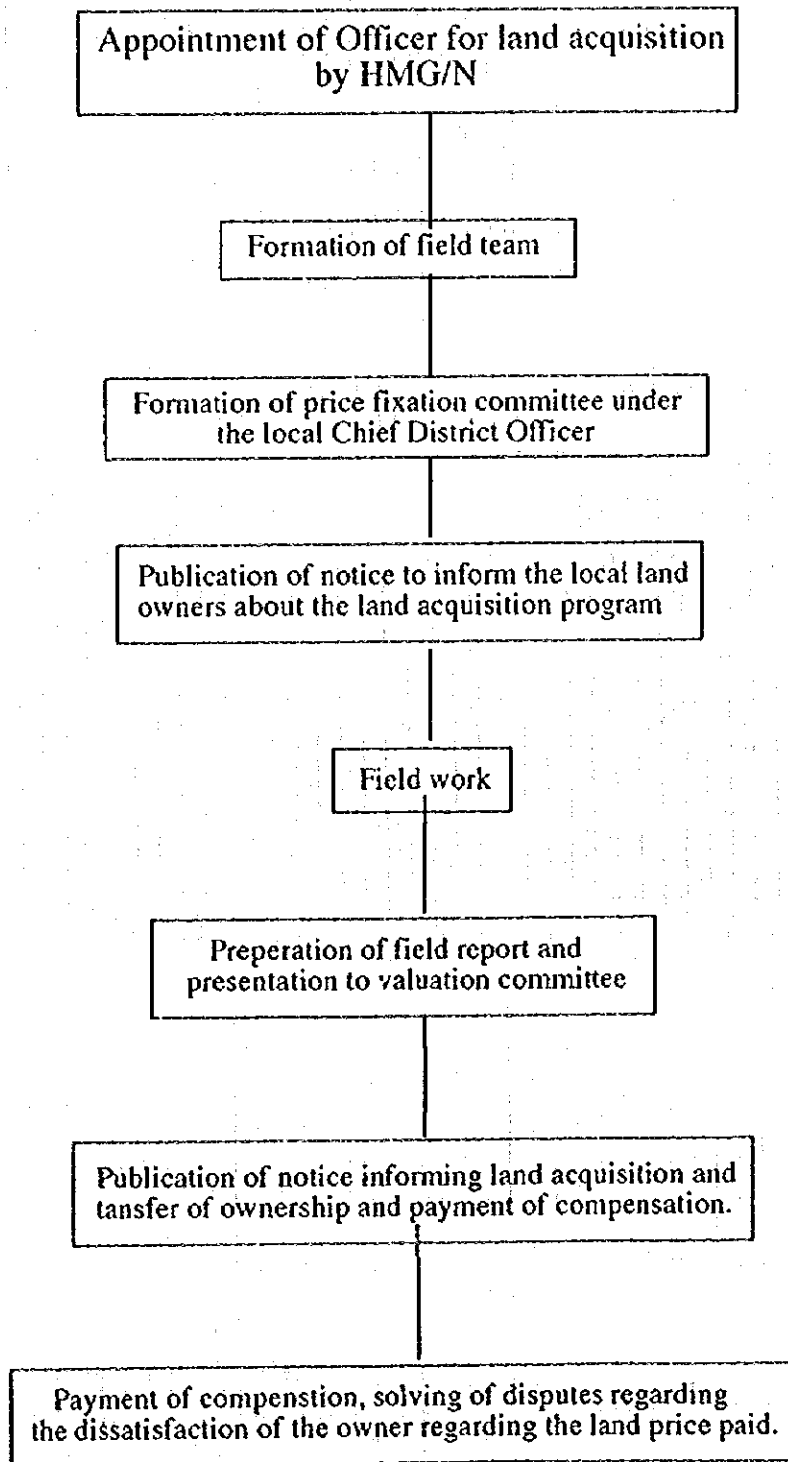






# ANNEX-6.1

## Process for land acquisition



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ANNEX- 6-2

SCHEDULE FOR LAND ACQUISITION AND COMPENSATION

Tentative Project Implementation Schedule and Budget Allocation Schedule by IIMC/N

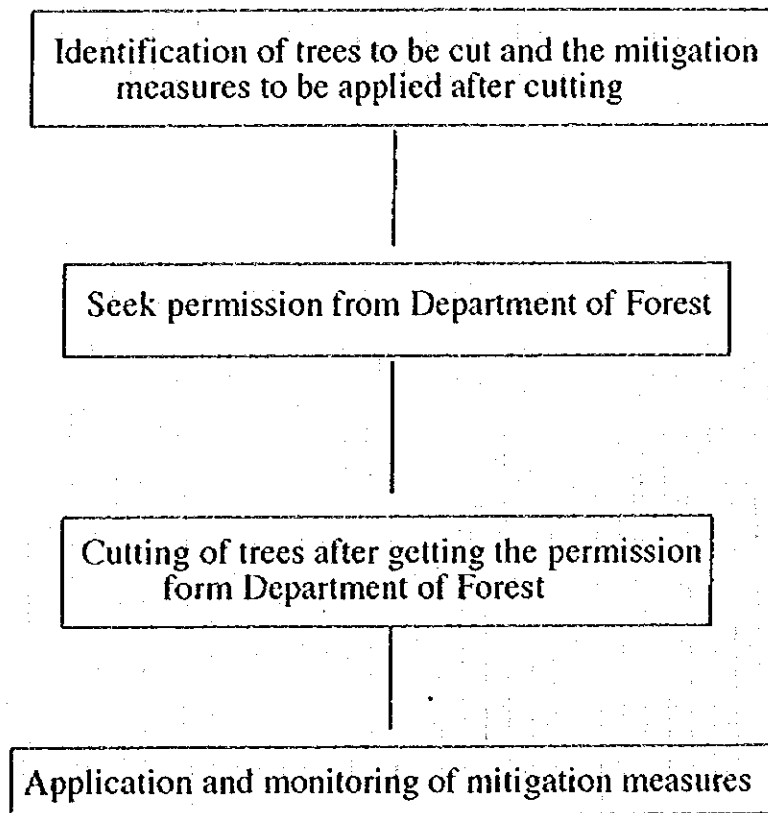
Calendar Year	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	Total		
Detailed Design and Construction	D/D Sec.1 <i>(Under Implementation)</i>	D/D Sec.1 <i>(Const. Sec.1)</i>	D/D Sec.1-1 <i>(Const. Sec.1-1 Phase 1)</i>	D/D Sec.1-2 <i>(Const. Sec.1-2 Phase 1)</i>	D/D Sec.1-3 <i>(Const. Sec.1-3 Phase 1)</i>	D/D Sec.1-1 <i>(Const. Sec.1-1 Phase 2)</i>	D/D Sec.1-2 <i>(Const. Sec.1-2 Phase 2)</i>	D/D Sec.1-3 <i>(Const. Sec.1-3 Phase 2)</i>	D/D Sec.1-1 <i>(Const. Sec.1-1 Phase 2)</i>	D/D Sec.1-2 <i>(Const. Sec.1-2 Phase 2)</i>	D/D Sec.1-3 <i>(Const. Sec.1-3 Phase 2)</i>	5,500,000	
													8,600,000
Construction of Maintenance office & Maintenance of Section I and Hand Over Sections (IIM Force Account)		Sec.1	V Sec.1-1 <i>(Const. Sandulhi Bazar M. Office)</i>	V Sec.1-2 <i>(Const. Nepalitok Field Unit)</i>	V Sec.1-3 <i>(Const. Khurkot Field Unit)</i>	V Sec.1-1 <i>(Const. Sandulhi Bazar M. Office)</i>	V Sec.1-2 <i>(Const. Nepalitok Field Unit)</i>	V Sec.1-3 <i>(Const. Khurkot Field Unit)</i>	V Sec.1-1 <i>(Const. Sandulhi Bazar M. Office)</i>	V Sec.1-2 <i>(Const. Nepalitok Field Unit)</i>	V Sec.1-3 <i>(Const. Khurkot Field Unit)</i>	6,850,000	
													8,600,000
Land Acquisition and House Compensation (IIM Force Account)				V Sec.1-1 <i>(Const. Sandulhi Bazar M. Office)</i>	V Sec.1-2 <i>(Const. Nepalitok Field Unit)</i>	V Sec.1-3 <i>(Const. Khurkot Field Unit)</i>	V Sec.1-1 <i>(Const. Sandulhi Bazar M. Office)</i>	V Sec.1-2 <i>(Const. Nepalitok Field Unit)</i>	V Sec.1-3 <i>(Const. Khurkot Field Unit)</i>	V Sec.1-1 <i>(Const. Sandulhi Bazar M. Office)</i>	V Sec.1-2 <i>(Const. Nepalitok Field Unit)</i>	V Sec.1-3 <i>(Const. Khurkot Field Unit)</i>	5,500,000
Land Acquisition	Sec.1	Sec.1-1	Sec.1-2	Sec.1-3	Sec.1-1	Sec.1-2	Sec.1-3	Sec.1-1	Sec.1-2	Sec.1-3	25,820,000		
												23,170,000	20,560,000

To be implemented under this programme

Future plans

# ANNEX -7

## Process for cutting of trees



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Mr. Mohan Bahadur Karki  
Director General  
Department of Roads  
Ministry of Works and Transport

Ref. No. BD(II-3) - 1

Date: December 12, 1994

Dear Sirs,

Re: Establishment of the Project Office and Appointment of Coordinator  
for Basic Design Study for Section II-3 of Sindhuli Road Construction Project

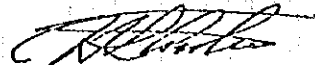
Referring to the meeting held on 5th December 1995, we would like to confirm you that the room being occupied by Mr. K. Takahashi, JICA Expert, shall be used for the Project Office for Sindhuli Road Construction Project and Mr. Saroj K. Pradhan is appointed as a coordinator for Basic Design Study on Section II-3 of the said Project.

We understand that the above Project Office shall cover its function not only for Section II-3 but also for Section I in which the detailed design is now being undertaken by Nippon Koei Co., Ltd., Consultant Engineers.

We would like to confirm, therefore, that all corresponding related to the Project shall be made through the Project Office from now on.

Your kind attention and confirmation on the above would be highly appreciated.

Yours truly,



---

Hiroki SHINKAI  
Chief Consultant for  
Basic Design Study Team for  
The Project for Construction of Sindhuli Road  
(SEC: II-3 Nepalthok - Dhulikhel)

c.c. JICA Office, Kathmandu  
Embassy of Japan  
NK Kathmandu Office  
NK Project office file

Mr. Mohan Bahadur Karki  
Director General  
Department of Roads  
Ministry of Works and Transport

Ref. No. BD(II-3) - 02

Attn: Mr. Saroj K. Pradhan  
Coordinator  
Project Office for Sindhuli Road Construction Project

Date: December 11, 1994

Dear Sirs,

Re: Proposed Organization of DOR's Maintenance Units  
Sindhuli Road Construction Project (Section II-3: Nepalthok-Dhulikhel)

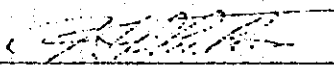
We are pleased to submit you, for your approval and confirmation, the organization chart of maintenance units including staffing schedule, required type and number of maintenance equipment, amount of fund required for construction and operation of maintenance unit as well as the maintenance work for handing-over section.

The above maintenance plan has been prepared on the basis of overall implementation plan presented in the Basic Design Report of Section I of Sindhuli Road Construction Project in November, 1994.

In connection with the above, we would like to know the present road maintenance system and organization, latest program of road maintenance or rehabilitation, the record of road maintenance in the past five years including budgetary allocation and actual expenditure, etc.. These data will be utilized for the justification of project implementation as well as for the procurement plan of maintenance equipment to be supplied under the project.

Your kind attention to this matter and early arrangement of the meeting for this issues would be highly appreciated.

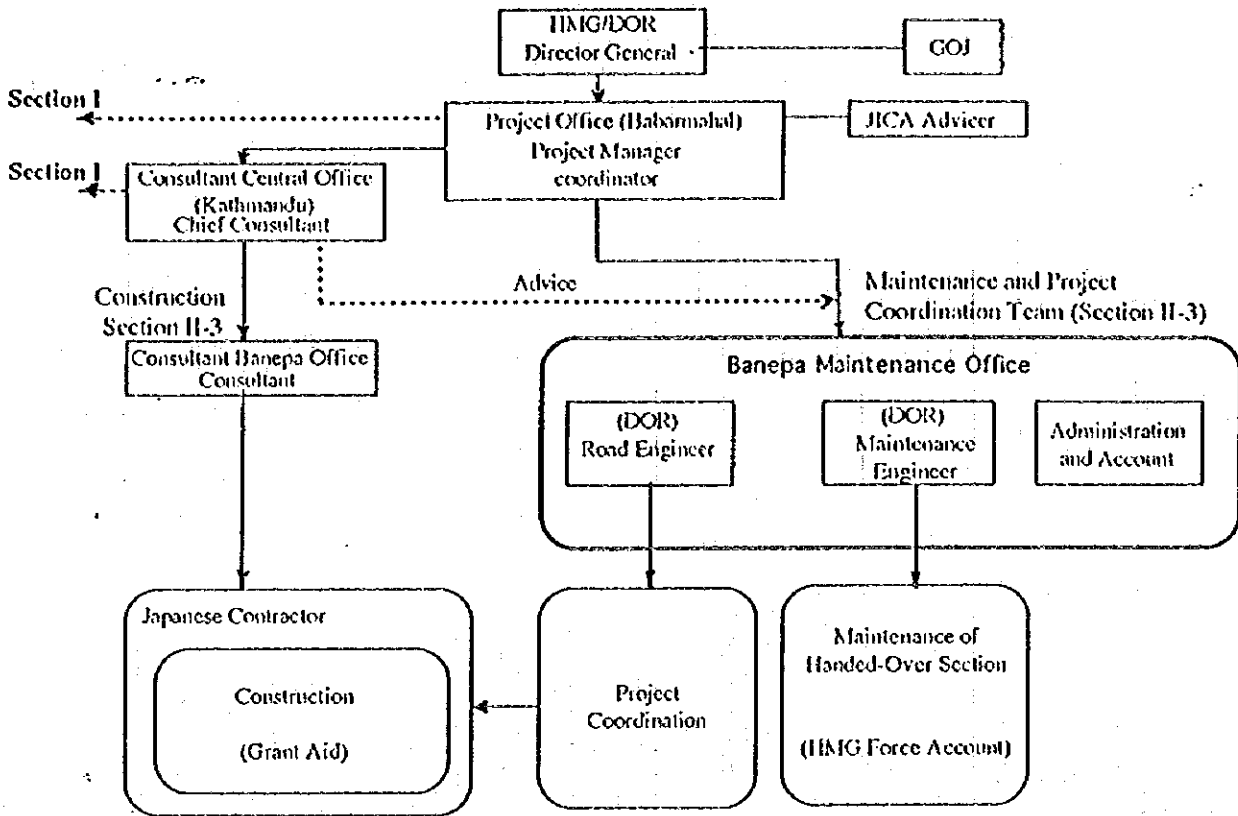
Yours truly,

  
Hiroki SHINKAI  
Chief Consultant for  
Basic Design Study Team for  
The Project for Construction of Sindhuli Road  
(SEC: II-3 Nepalthok - Dhulikhel)

- Encl.: - Tentative Organization Chart  
- Tentative Implementation Schedule  
- Tentative Layout Plan of the Banepa Maintenance Office  
- Staffing Schedule  
- Equipment list to be procured for Banepa Maintenance Office  
- List of facilities/tool for Work Shop at Banepa Maintenance Office  
- Estimated Maintenance Cost for Section II-3

c.c. JICA Office, Kathmandu  
Embassy of Japan  
Nippon Koei Kathmandu Office  
M. Project office file

# TENTATIVE PROJECT ORGANIZATION CHART OF NEPALESE SIDE AND SCHEDULE OF MAINTENANCE (SECTION II-3)

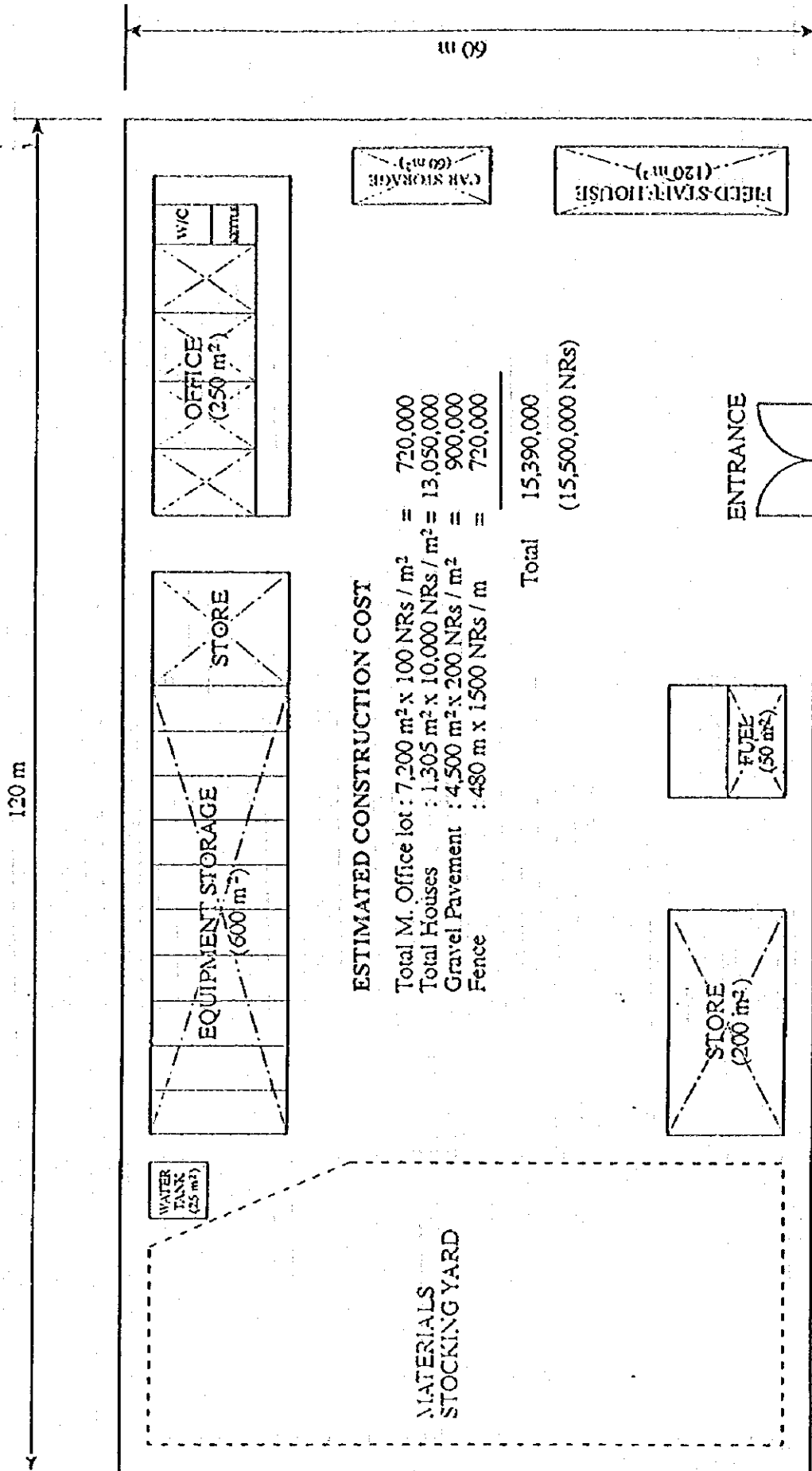


Tentative Organization Chart for the Project Implementation

Calendar Year	1	2	3	4	5	6	7
Detailed Design	▬						
Construction		▬					
Maintenance Equipment Supply			V				
Activities of DOR	Appointment of PM and the Road Engineer V						
	Construction of the Banepa Maintenance Office ▬						
	Staffing of the Maintenance Team ▬						
	Maintenance of Handing over Sections ▬						

Tentative Implementation Schedule

# TENTATIVE LAYOUT PLAN OF THE BANERA MAINTENANCE OFFICE



## ESTIMATED CONSTRUCTION COST

Total M. Office lot :	7,200 m <sup>2</sup> x 100 NRs / m <sup>2</sup>	=	720,000
Total Houses :	1,305 m <sup>2</sup> x 10,000 NRs / m <sup>2</sup>	=	13,050,000
Gravel Pavement :	4,500 m <sup>2</sup> x 200 NRs / m <sup>2</sup>	=	900,000
Fence :	480 m x 1500 NRs / m	=	720,000
<b>Total</b>			<b>15,390,000</b>
			<b>(15,500,000 NRs)</b>

### Staffing Schedule

Calendar Year	1st.	2nd.	3rd.	4th.	5th.	6th.	7th.
Project Manager							
Road Engineer							
Maintenance Engineer			1	1	1	1	1
Mechanical Engineer			1	1	1	1	1
Administration Staff			4	4	4	4	4
Chief Inspector			1	1	1	1	1
Forman			3	3	3	3	3
Mechanical Technician			3	3	3	3	3
Operator/Drivers			10	10	10	10	10
<b>Total</b>	<b>2</b>	<b>2</b>	<b>25</b>	<b>25</b>	<b>25</b>	<b>25</b>	<b>25</b>

### Equipment List to be Procured for the Banepa Maintenance Office

Equipment	Capacity	Number
Bulldozer	14ton	1
Backhoe	0.6ton	1
Wheel Loader	1.4m <sup>3</sup>	1
Crawler Loader	1.5m <sup>3</sup>	1
Dump Trucks	8ton	3
Vibratory Roller	4ton	1
Concrete Mixer	0.3m <sup>3</sup>	1
Truck Crane	5ton	1
Motor Grader	2.8m	1
Plate Compactors	80kg	3
4-Wheel Cars	2/5passenger	3
Generator	60kVA	2



**List of Facilities/Tool for the Work Shop at the Banepa Maintenance Office**

<b>Equipment/Tools</b>	<b>Number</b>
Gas welding set	1
Arc welding set	1
Gear puller	1
Drilling machine	1
Electric grinder	1
Portable air compressor	1
Vice	2
Chain block	1
Hydraulic jack	1
Compression gauge	1
Revolution indicator	1
Thickness gauge	1
Hydraulic meter	1
Current meter	1
Voltage meter	1
Tool set for vehicle repair	2
Tool set for construction Equipment repair	2
Tools set for tire repair	1
Battery charger	1

### Routine Maintenance Cost for Section II-3

(1000NRs.)

Calendar Year	1st.	2nd.	3rd.	4th.	5th.	6th.	7th.
Tentative Handing-over timing			V: 1st. 15km		V: 2nd. 15km		V: 3rd. 20km
M. Office Const. Cost		15,500					
Administration Cost	144	144	1,800	1,800	1,800	1,800	1,800
Fuel Cost			360	360	720	720	1,200
Labour Cost			900	900	1,800	1,800	3,000
Materials Cost			194	194	387	387	651
Spare Equipment Cost				2,350	2,350	2,350	2,350
<b>Total</b>	144	15,644	3,254	5,604	7,057	7,057	9,001

(\*) Final Handing-Over (Completion of the Project)

Note (\*): The Annual Routine Maintenance Cost (9,000,000 NRs.) might be required for the maintenance of the Section II-3 after completion of the Project.

## Breakdown of the Estimated Maintenance Cost for Section II-3

### 1. Administration Cost

Office Staff = 25 persons x Average salary 3,000NRs./month =	75,000
Allowances, Office expenditure (100% of total salary) =	75,000
Sub-total	150,000
	1,800,000 NRs./year

### 2. Fuel Cost

Bulldozer	104PS	0.122litre/h/PS	12.69litre/hr
Backhoe	120PS	0.129litre/h/PS	15.48litre/hr
Wheel Loader	86PS	0.119litre/h/PS	20.46litre/hr
Crawler Loader	112PS	0.104litre/h/PS	11.65litre/hr
Dump Trucks	253PS	0.039litre/h/PS	29.60litre/hr
Vibratory Roller	28PS	0.109litre/h/PS	3.05litre/hr
Truck Crane	160PS	0.034litre/h/PS	5.44litre/hr
Motor Grader	94PS	0.071litre/h/PS	6.67litre/hr
4-Wheel Cars	85PS	0.035litre/h/PS	5.95litre/hr
	Total		11litre/hr

On the assumption that the 700 cum./km/year of deposits are cleaned.

$$700 \text{ cum.} / 40 \text{ cum./hr} = 17.5 \text{ hr/year/km}$$

After 1st. handing-over (15km) (NRs./year)

$$15 \text{ km} \times 17.5 \text{ hr/km} \times 11 \text{ litre} = 30 \text{ kilolitre/year} \times 12 \text{ NRs./litre} = 360,000$$

After 2nd. handing-over (15km, total 30km)

$$30 \text{ km} \times 17.5 \text{ hr/km} \times 11 \text{ litre} = 60 \text{ kilolitre/year} \times 12 \text{ NRs./litre} = 720,000$$

After 3rd. handing-over (50km)

$$50 \text{ km} \times 17.5 \text{ hr/km} \times 11 \text{ litre} = 100 \text{ kilolitre/year} \times 12 \text{ NRs./litre} = 1,200,000$$

### 3. Labour

2 persons / km/day

After 1st. handing-over (15km) (NRs./year)

$$15 \text{ km} \times 2 \text{ personse} = 30 \times 25 \text{ day} \times 12 \text{ month} \times 100 \text{ NRs./day} = 900,000$$

After 2nd. handing-over (15km, total 30km)  
 $30\text{km} \times 2\text{personse} = 60 \times 25\text{day} \times 12\text{ month} \times 100\text{NRs./day}$  1,800,000

After 3rd. handing-over (50km)  
 $50\text{km} \times 2\text{personse} = 100 \times 25\text{day} \times 12\text{ month} \times 100\text{NRs./day}$  3,000,000

4. Materials

Gabion wire 1cum/150m(Ave.distance of cross-drainages)/year  
 Cement 150kg/150m/year

		(NRs./year)
After 1st. handing-over (15km)		
G-wire	$32.5\text{kg} \times 15\text{km}/0.15 = 3,250\text{kg}$	$\times 36\text{NRs.}$ 117,000
Cement	$150\text{kg} \times 15\text{km}/0.15 = 15,000\text{kg}$	$\times 5.1\text{NRs./kg}$ 76,500
	Total	193,500
After 2nd. handing-over (15km, total 30km)		
G-wire	$32.5\text{kg} \times 30\text{km}/0.15 = 6,500\text{kg}$	$\times 36\text{NRs.}$ 234,000
Cement	$150\text{kg} \times 30\text{km}/0.15 = 30,000\text{kg}$	$\times 5.1\text{NRs./kg}$ 153,000
	Total	387,000
After 3rd. handing-over (50km)		
G-wire	$32.5\text{kg} \times 50\text{km}/0.15 = 11,000\text{kg}$	$\times 36\text{NRs.}$ 396,000
Cement	$150\text{kg} \times 50\text{km}/0.15 = 50,000\text{kg}$	$\times 5.1\text{NRs./kg}$ 255,000
	Total	651,000

5. Spare Equipment etc.

Annual Spare equipment cost = 5% of Equipment Cost  
 $47,000,000\text{ NRs.} \times 0.05 =$  2,350,000



His Majesty's Government  
MINISTRY OF WORKS & TRANSPORT

DEPARTMENT OF ROADS

Mechanical Branch

Mechanical Section  
Babar Mahal

Tel : 231510, 211109  
211377, 213243  
213348, 215774

Tlx : 2570 Roads NP

Fax : (977) 1-225993

BABAR MAHAL  
KATHMANDU, NEPAL.

chano.660

20 December 1995

✓ The Chief Consultant  
For Basic Design Study Team  
For The Project For Construction Of Sindhuli Road.

Attn: Mr. Hiroki SHINKAI  
Chief Consultant.

Dear Sir,

With reference to your letter dated December 11, 1995 we would like to propose the attached list of equipment and tools for DOR Repair Shops, required for the maintenance of Banepa-Sindhuli Road Sector.

Yours Sincerely

H.L. Rajbahak  
Deputy Director General  
Deputy Director General

cc: JICA Office, Kathmandu  
Embassy of Japan  
Nippon Koei Kathmandu Office.

Revised List of Equipment and Tools for DOR Repair Shops

Equipment/Tools	Dardibas	Sindhuli Bazar	Danepa	Khurkot	Nepalbhok	Revised Total	Previously Proposed Total
Gas Welding Set	1	1	1	1	1	5	5
Arc welding set, 300A (40-80 Volts)	1		1			2	5
Welding Generator set, 300A (40-80 Volts)		1		1	1	3	
Battery Charger, 72V	1	1	1	1	1	5	5
Drilling Machine, Bench Type	1		1			2	
Drilling machine, Portable, 10mm	1	1	1	1	1	5	5
Electric Grinder, HD	1		1			2	
Electric Grinder, LD	1	1	1	1	1	5	5
Air Compressor, Stationery	1	1	1	1	1	5	
Air Compressor, Portable	1	1	1	1	1	5	5
Tyre Tools Set	1	1	1	1	1	5	5
Chain Block, 5t	1	1	1	1	1	5	5
Tachometer	1	1	1	1	1	5	5
Compression Gauge	1	1	1	1	1	5	5
Filler Gauge	3	1	3	1	1	9	5
Hydraulic Jack, 10t	2	2	2	2	2	10	5
Multimeter	1	1	1	1	1	5	5
Hydraulic Gauge	1	1	1	1	1	5	5
Bench Vice, 120mm	3	1	3	1	1	9	8
Torque Wrench, HD	1		1				-
Torque Wrench, LD	1	1	1	1	1	5	-
Trolley Jack, Hydraulic, 10t	2	1	2	1	1	7	-
Lathe	1			1		2	-
Lubricant Transfer Pump (from Barrel)	6	6	6	6	6	30	-
Puller Set, Mechanical	1	1	1	1	1	5	5
Puller Set, Hydraulic, 20t	1		1			2	-
Garage Crane, Hydraulic, 5t	1	1	1	1	1	5	-
Grease Gun, HD	2	1	2	1	1	7	-
Grease Gun, LD	3	3	3	3	3	15	-
Lubricant Dispensing Pump	4	4	4	4	4	20	-
High Pressure Washing Plant	1	1	1	1	1	5	-
Weighing Scale, 10Kg	1	1	1	1	1	5	-
Master Mechanic Tool set	2	1	2	1	1	7	8
Tool Set, Light duty	3	2	3	2	2	12	8
Tools Accessories for Lathe	1			1		2	-
Assorted Blacksmith Tools Set	1	1	1	1	1	5	-
Armature Growler	1		1			2	-
Winch, 50t	1	1	1	1	1	1	-
Work Bench Set	5	3	5	3	3	19	-
Spare Parts Rack							-

Revised Equipment for DOR Maintenance Offices

Equipment & Capacity	Dardibas	Sirdhuli Bazar	Danepa	Khurkot	Nepalthok	Revised Total	Previously Proposed Total
Track Dozers, 200HP		1		1		2	2
Wheel Dozers, 200HP	1		1			2	-
Backhoes, 0.1 m <sup>3</sup>	1	1	1			3	3
Wheel Loaders, 2 m <sup>3</sup>	1	1	1	1	1	5	5
Crawler Loaders, 1.5 m <sup>3</sup>						-	2
Dump Trucks, 4 m <sup>3</sup>	3	3	3	1	1	11	11
Pneumatic Rollers, 8-20t	1		1			2	-
Static 3-Wheel Rollers, 8-10t	1	1	1	1	1	5	-
Vibratory Rollers, 4.0 t						-	5
Portable Rock Crushing Plants, 10t/hr						-	2
Concrete Mixers						-	5
Flat Bed Trucks, 7t		1		1		2	-
Truck Cranes, 3 t	1		1		1	3	5
Motor Graders, 125 HP	1	1	1	1	1	5	5
Plate compactors							12
4-Wheel Drive Inspection Vehicles	2		2			4	
4-Wheel Drive Crew Cab Pickups	2	1	2	1	1	7	10
Generators, 50KVA	1		1			2	8
Generators, 10KVA		1		1	1	3	
Water Tankers, 6000 l	1	1	1	1	1	5	-
Air Compressors & 2 Set Jack Hammers	1		1		1	3	-
Tractors, 65HP	1		1			2	-
Low Bed Trailers, 20t	1					1	-
Crane Mounted Trucks, 15t	1					1	-
Mobile Workshops	1					1	-
Motor Cycles, 125 c.c. Trailer	7	5	7	5	5	29	-
Wireless Set	1	1	1	1	1	5	-
VHF Telephone set	1	1	1	1	1	5	-

He

Mr. Mohan Bahadur Karki  
Director General  
Department of Roads  
Ministry of Works and Transport

Atten: Mr. Saroj K. Pradhan  
Coordinator  
Project Office for Sindhuli Road Construction Project

Date: December 25, 1995

Dear Sirs,

Re: Proposed Organization of the Sindhuli Road Construction Project Office

In reply to your questions for the implementation of the Project (Section I and II) in the meeting held on December 11, 1995, we are pleased to submit you the Figures showing the organization, the function and the budget of the Project Office taking into account the overall implementation plan of the Sindhuli Road Construction Project (Section I and II).

The main points in the plan are as follows;

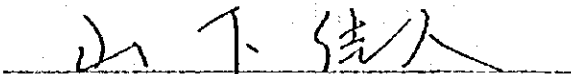
- (1) DOR establish the Project Office headed by a Project Manager under Director General and three Maintenance/Coordination Teams under the Project Office .
- (2) The Project Manager is responsible to implement the projects and maintenance of Section I and handed-over sections (Section I and II) by completion of entire Sections of the Sindhuli Road.
- (3) HMG/N allocates the budget (totaling about NRs.280 Million) for the land acquisition, the construction of maintenance offices and the maintenance of Section I and handed-over sections (Section I and Section II) with appropriate timings.
- (4) After completion of entire Sections of the Sindhuli Road, the maintenance of the Section I and II-1 shall be handed-over to A Maintenance Office, and the maintenance of Section II-2 and II-3 shall be handed-over to B Maintenance Office, and the Project Office shall be closed.



The Study Team understand that establishment of the organization and implementing the Project as shown in the Figures are the key of the successful completion, and wish to confirm you the possibility.

Your kind attentions and reply for the above would be highly appreciated.

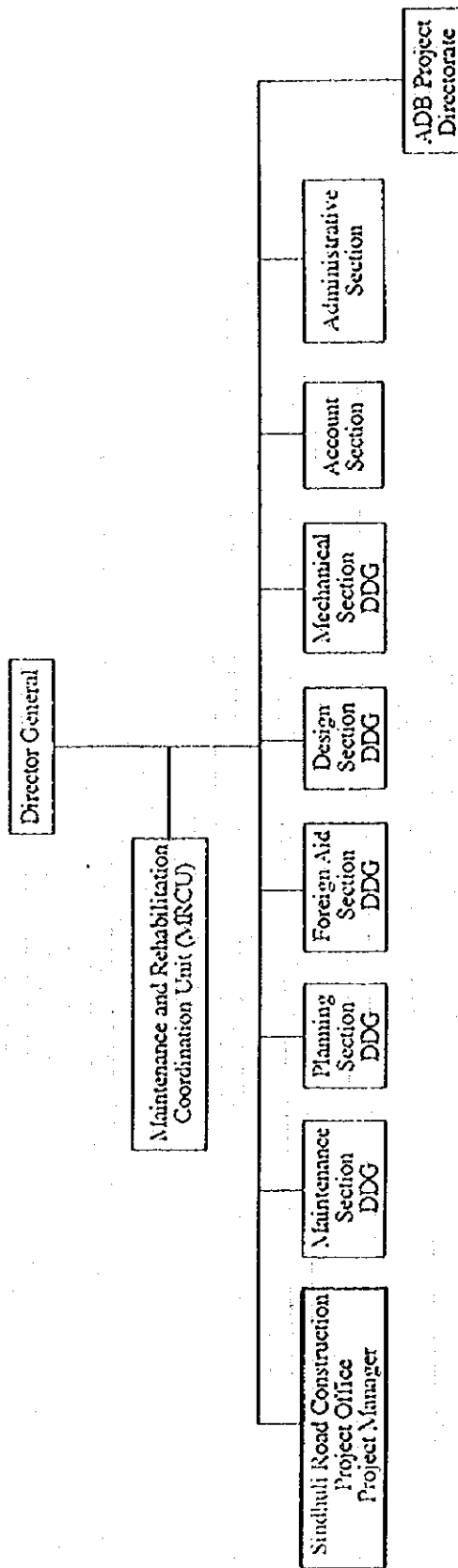
Yours truly,

  
For Hiroki SHINKAI  
Chief Consultant for  
Basic Design Study Team for  
The Project for Construction of Sindhuli Road  
(Section II-3: Nepalthok - Dhulikel)

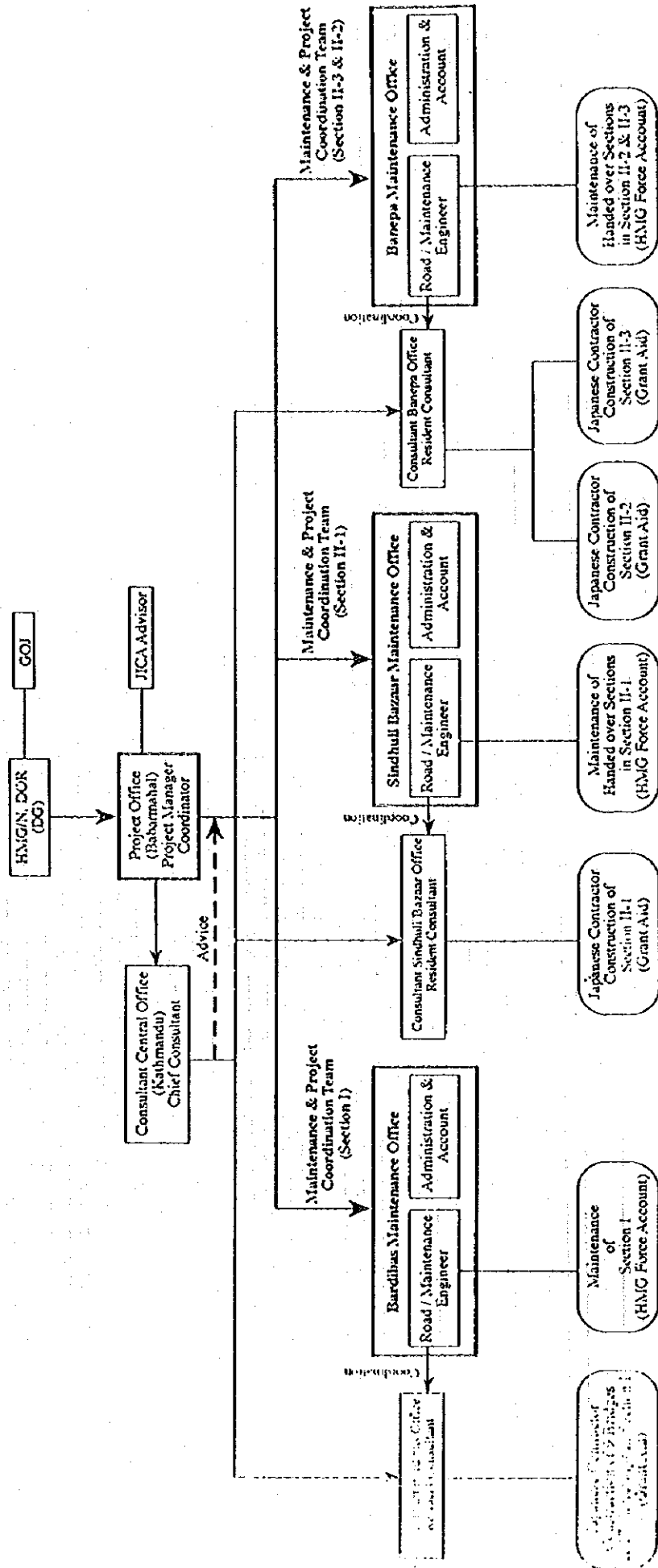
Encl:

- Proposed Organization Chart for DOR during the Implementation Period of the Sindhuli Road Construction Project (Section I and II)
- Tentative Organization Chart for the Project (Section I and II) Implementation
- Tentative Progress/Program for Sindhuli Road Construction Project (Section I and II) Showing the Construction Schedule and the Project Office Activities
- Recommended Staffing of the Maintenance/ Project Coordination Teams
- Tentative Staffing Schedule of the Project Office and the Maintenance/Project Coordination Teams
- Tentative Project Implementation Schedule and Budget Allocation Schedule by DOR

C.C. HCA Nepal Office  
Embassy of Japan  
Nippon Koei Kathamandu Office  
NK Project Office file



Proposed Organization Chart for DOR During the Implementation Period of the Sindhu Road Construction Project (Section I and II)



Tentative Organization Chart for the Project (Section I & II) Implementation

**Tentative Progress / Program of the Sindhuli Road Construction Project  
Showing the Construction Schedule and the Project Office Activities**

Calendar Year	Sindhuli Road Construction Project (158 km)			
	Section I (37 km)	Section II-1 (39 km)	Section II-2 (32 km)	Section II-3 (50 km)
1st	<p align="center">Sindhuli Bazar</p> <p align="center">Coordination/Inspection of the Project</p> <p align="center">Detailed Design (Grant Aid)</p>	<p>Khairkot</p>	<p>Nepalbhok</p>	<p>Dhauldshel</p>
2nd	<p align="center">Construction of 9 Bridges &amp; 17 Causeways in Section I (Grant Aid)</p>	<p align="center">Coordination/Inspection of the Project</p> <p align="center">Detailed Design (Grant Aid)</p> <p align="center">Construction of Section II-1 (Grant Aid)</p> <p align="center">Maintenance of Handed Over Sections of Section II-1 by Maintenance &amp; Project Coordination Team (Section II-1) (HMG Force Account)</p>	<p align="center">Coordination/Inspection of the Project</p> <p align="center">Detailed Design (Grant Aid)</p> <p align="center">Construction of Section II-2 (Grant Aid)</p> <p align="center">Maintenance of Handed Over Sections of Section II-2 by Maintenance &amp; Project Coordination Team (Section II-2 &amp; II-3) (HMG Force Account)</p>	<p align="center">Coordination/Inspection of the Project</p> <p align="center">Detailed Design (Grant Aid)</p> <p align="center">Construction of Section II-3 (Grant Aid)</p> <p align="center">Maintenance of Handed Over Sections of Section II-3 by Maintenance &amp; Project Coordination Team (Section II-2 &amp; II-3) (HMG Force Account)</p>
3rd				
4th				
5th				
6th				
7th				
8th				
9th				
10th	<p align="center">The Jurisdiction for the Sindhuli Road (Section I &amp; II-1) will be handed over from the Project Office to Maintenance Office</p> <p align="center">The Jurisdiction for the Sindhuli Road (Section II-2 &amp; II-3) will be handed over from the Project Office to Maintenance Office</p>			

**Recommended Staffing of the Project Office and the Maintenance/Project Coordination Teams**

Position	Office	Main Office Maintenance/Project Coordination Team (Section I) Bardibas Maintenance Office	Maintenance/Project Coordination Team (Section II-1) Sindhuli Bazar Maintenance Office	Maintenance/Project Coordination Team (Section II-2 and II-3)			Total
				Banepa Maintenance Office	Khurkot Field Unit	Nepalthok Field Unit	
Project Manager		1	--	--	--	1	
Coordinator		1	--	--	--	1	
Maintenance Engineer		1	1	--	--	3	
Sr. Mechanical Engineer		1	--	--	--	1	
Mechanical Engineer		1	1	--	--	3	
Chief Inspector		2	2	2	1	8	
Forman		3	3	3	2	13	
Mechanical Technician		3	3	3	2	13	
Operator/Drivers		10	10	10	4	38	
Administration Staff		6	4	4	2	18	
<b>Total</b>		<b>28</b>	<b>24</b>	<b>11</b>	<b>11</b>	<b>98</b>	

Tentative Staffing Schedule of the Project Office and the Maintenance/Coordination Teams

Calendar Year	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	Max. No. of the Position
Project Manager					1 person						1
Coordinator			1 person								1
Road/Maintenance Engineers			1	2			3 persons				3
Sr. Mechanical Engineer						1 person					1
Mechanical Engineers				1	2		3 persons				3
Chief Inspectors				2	4		6 persons	7	8		8
Formen				3	6		9 persons	11	13		13
Mechanical Technicians				3	6		9 persons	11	13		13
Operators/Drivers				10	20		30 persons	34	38		38
Administration Staffs				6	10		14 persons	16	18		18
Total M/M	3	27	273	363	639	912	912	1011	1143	588	

Tentative Project Implementation Schedule and Budget Allocation Schedule by IMG/N

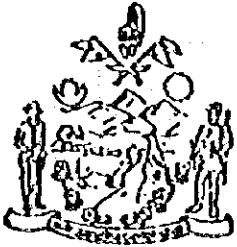
Calendar Year	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
Detailed Design and Construction (Grant Aid)										
Construction of Maintenance office & Maintenance of Section I and Handed Over Sections (IMG Force Account)										
Land Acquisition and House Compensation (IMG Force Account)										
Cost Estimation Done by IMG/N, DOR (1,000 NRs)	Total									
(1) Land Acquisition										
Sec. I		5,500								5,500
Sec. II-3			23,000	23,000						46,000
Sec. II-1				13,000	13,000					26,000
Sec. II-2					12,000	12,000				24,000
Total		5,500	23,000	36,000	25,000	12,000				101,500
(2) Maintenance Office Construction Cost			15,500	15,500			3,000	3,000		37,000
(3) Maintenance Cost (Routine)										
Sec. I	144	144	11,400	6,600	6,600	6,600	6,600	6,600	6,600	3,300
Sec. II-3			3,200	5,600	7,000	7,000	9,000	9,000	9,000	4,500
Sec. II-1					2,300	2,300	4,600	4,600	7,000	3,500
Sec. II-2								2,800	2,800	2,800
Total	144	144	14,600	12,200	15,900	15,900	20,200	23,000	25,400	14,100
Grand Total ((1)+(2)+(3))	144	5,644	53,100	63,700	40,900	27,900	23,200	26,000	25,400	14,100

Note: The Costs are subjected to change during the detailed study in Japan

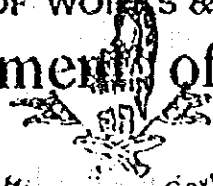
Telex: 2570 Roads NP

Fax: 977-1-225993

Phone: 221675



His Majesty's Government  
MINISTRY OF WORKS & TRANSPORT  
Department of Roads



His Majesty's Govt.  
Ministry of Works, Transport  
& Roads Department  
1994

Ref. No. Jha-4/397  
Your Ref. No.

Babar Mahal, Kathmandu.  
Date Dec 25, 1995

Sub: Proposed organisation of Sindhuli Road  
Construction Project.

→ Mr. Hiroshi Shinkai,  
Chief Consultant for the Basic Design Study Team  
For the Project for Construction of Sindhuli Road.

Dear Mr. Shinkai,

With reference to your letter of December 25, 1995, please find herewith an amended copy of the proposed organisation of Sindhuli road construction for your necessary action. The organisation and funding, however, is subject to approval from HMG/Nepal.

( M. B. Karki )  
Director General

CC.

Mr. Kimio Takahashi  
JICA Advisor  
Dept of Roads, BabarMahal

Nippon Koei Co. Ltd  
Kathmandu office

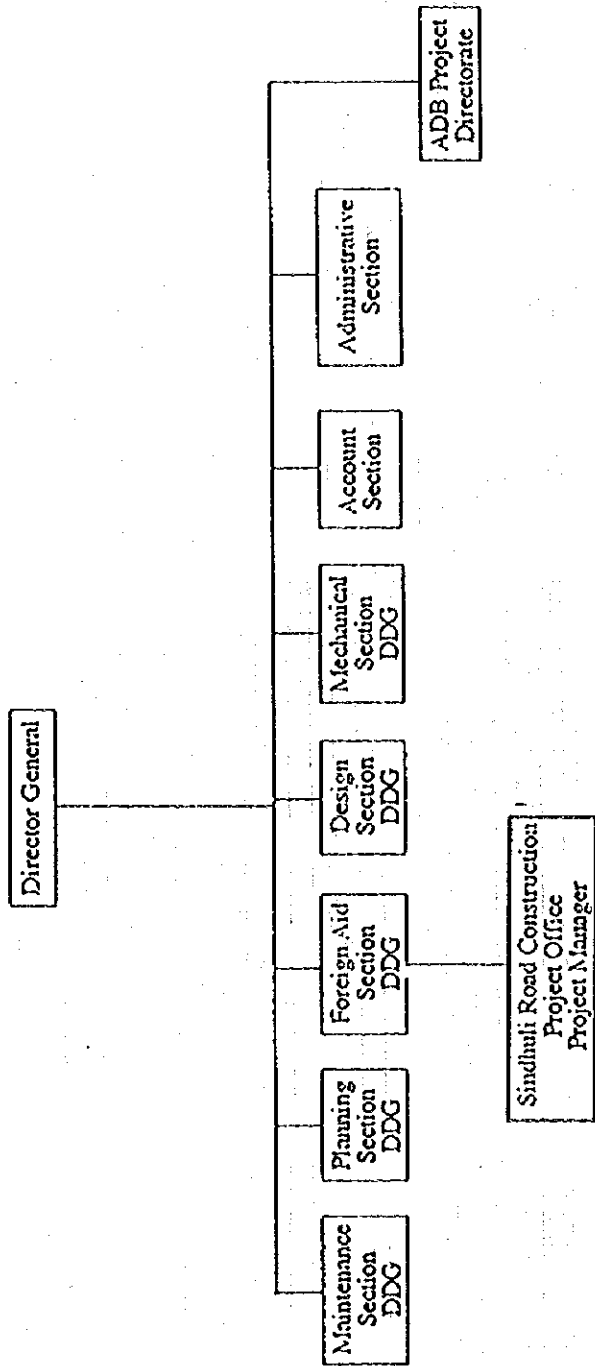


The figures showing the amended organization, function and the budget of the Project Office taking into account the overall implementation plan of the Sindhuli Road Construction Project (Section I and II) are the following. However all the proposals made are subject to the approval of the HMG/Nepal.

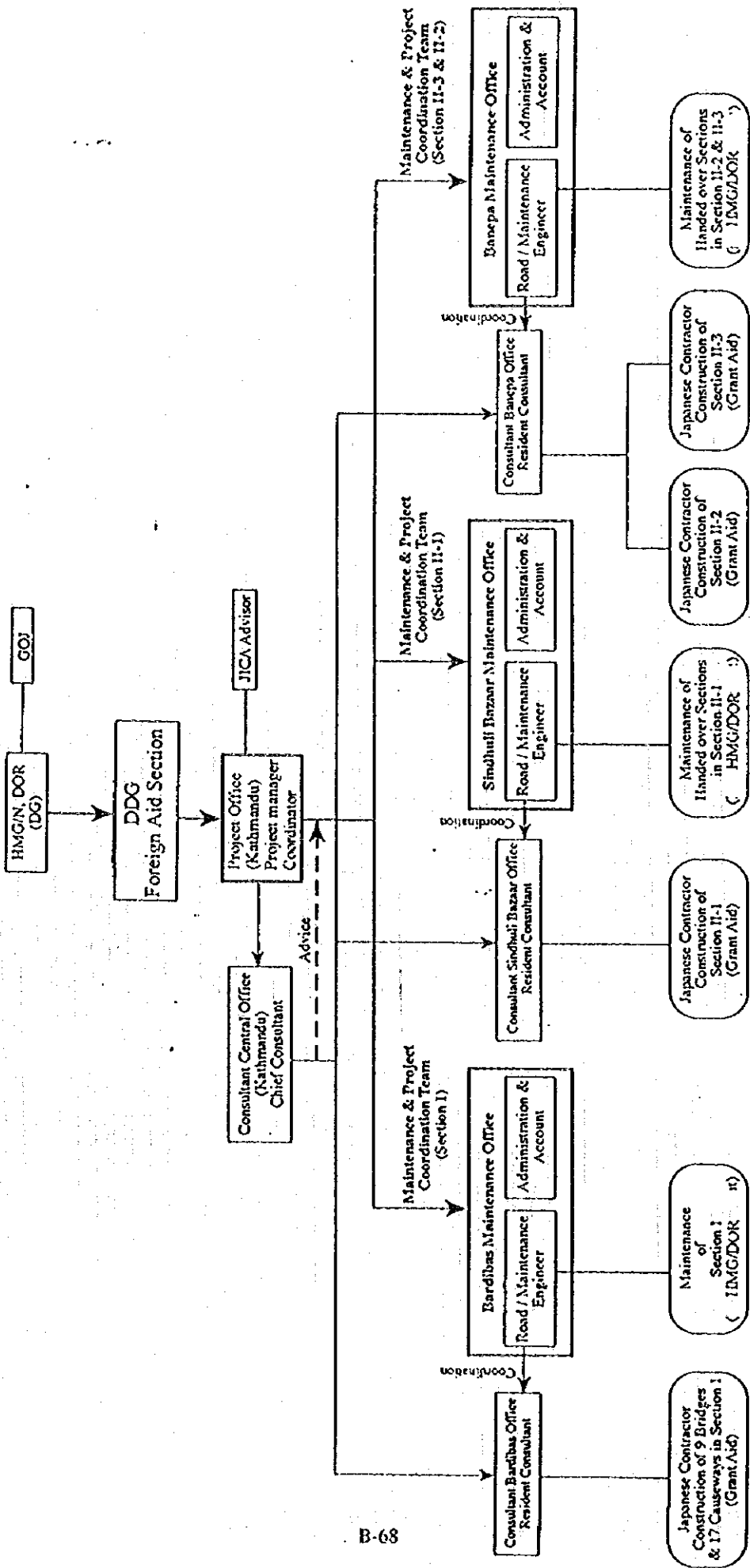
The amended main points are as follows;

- (1) DOR establish the Project office headed by a Project Manager and three Maintenance/Coordination Teams under the Project Office.
- (2) The Project Manager is responsible to implement the projects and maintenance of Section I and handed-over sections (Section I and Section II) by completion of entire Sections of the Sindhuli Road.
- (3) HMG/N allocates the required budget for the land acquisition, the construction of the maintenance offices and the maintenance of Section I and handed-over sections (Section I and Section II) with appropriate timing.
- (4) After completion of entire sections of the Sindhuli Road, the maintenance of the Section I, II-1 and II-2 shall be handed-over to the Division Road Office, Jamakpur and II-3 shall be handed-over to Division Road office, Bhaktapur and the Project Office shall be closed.

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Proposed Organization Chart for DOR During the Implementation Period of the Sindhuli Road Construction Project (Section I and II)



Tentative Organization Chart for the Project (Section I & II) Implementation

**Tentative Progress / Program of the Sindhuli Road Construction Project  
Showing the Construction Schedule and the Project Office Activities**

		Sindhuli Road Construction Project (158 km)			
Calendar Year		Section I (37 km)	Section II-1 (39 km)	Section II-2 (32 km)	Section II-3 (50 km)
1st	Barli bas	Coordination/Inspection of the Project	Khirkot	Nepalchok	Dhulikhel
2nd		Detailed Design (Grant Aid)	Coordination/Inspection of the Project	Coordination/Inspection of the Project	Coordination/Inspection of the Project
3rd		Construction of 9 Bridges & 17 Causeways in Section I (Grant Aid)	Detailed Design (Grant Aid)	Detailed Design (Grant Aid)	Detailed Design (Grant Aid)
4th			Construction of Section II-1 (Grant Aid)	Construction of Section II-2 (Grant Aid)	Construction of Section II-3 (Grant Aid)
5th		Maintenance of Section I by Maintenance & Project Coordination Team (Section I) (HMG Force Account)	Maintenance of Handed Over Sections of Section II-1 by Maintenance & Project Coordination Team (Section II-1) (HMG Force Account)	Maintenance of Handed Over Sections of Section II-2 by Maintenance & Project Coordination Team (Section II-2 & II-3) (HMG Force Account)	Maintenance of Handed Over Sections of Section II-3 by Maintenance & Project Coordination Team (Section II-2 & II-3) (HMG Force Account)
6th					
7th					
8th					
9th					
10th					

The Jurisdiction of Sindhuli Road (Section I & II-1) will be handed over from the Project office to Janakpur Division office/ DOR

The Jurisdiction for the Sindhuli Road (Section II-2 & II-3) will be handed over from the project office to Bhaktapur Division office /DOR

Recommended Staffing of the Project Office and the Maintenance/Project Coordination Teams									
Office	Main office	Maintenance/Project Coordination Team (Section II-1)		Maintenance/Project Coordination Team (Section II-2 and II-3)			Total		
		Coordination Team (Section I)	Coordination Team (Section II)	Banepa Maintenance Office	Banepa Maintenance Office	Khurkot Field Unit		Nepalchok Field Unit	
Position	Bardibas Maintenance Office	Sindhuli Bazar Maintenance Office	Maintenance Office	Maintenance Office	Field Unit	Field Unit			
Project Manager	1						1		
Coordinator	1						1		
Maintenance Engineer	1		1				2		
Maintenance Overseer	2	2		2	1	1	5		
Supervisor	2	2		2	2	2	10		
<b>MECHANICAL STAFF</b>									
Mechanical Engineer	1			1			2		
Senior Mechanics & other	6	1		6	1	1	10		
Senior Operator	5	3		3	3	3	17		
Mechanics & others	14	7		14	7	7	49		
Junior Mechanics	9	1		7	1	1	19		
Helper	6	5		6	5	5	27		
Driver/Heavy Driver	8	6		8	4	4	30		
<b>ADMINISTRATIVE STAFF</b>									
Nayab Subba	2			2			4		
Khariidar	1	1		1	1	1	5		
Wireless Operator	1	1		1	1	1	5		
Low level (Peon, Guard etc)	10	7		10	7	7	41		

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**Tentative Project Implementation Schedule and Budget Allocation Schedule by HMG/N**

Calendar Year	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
Detailed Design and Construction (Grant Aid)	D/D Sec. I		Const. Sec. I							
		D/D Sec. II-3		Const. Sec. II-3						
			D/D Sec. II-1		Const. Sec. II-1					
				D/D Sec. II-1		Const. Sec. II-2				
						Maintenance of Sec. I				
Construction of Maintenance office & Maintenance of Section I and landed Over Sections (HMG Force Account)			Const. Baeepa M. Office			Maintenance of Sec. I-3				
			Const. Sindhuji Bazar M. Office			Maintenance of Sec. II-1				
						Const. Nepalthok Field Unit		Maintenance of Sec. II-2		
								Const. Khurkot Field Unit		
Land Acquisition and House Compensation (HMG Force Account)		Sec. I		Sec. II-3						
				Sec. II-1						
					Sec. II-2					
<b>Cost Estimation Done by HMG/N, DOR (1,000 NRs)</b>										<b>Total</b>
<b>(1) Land Acquisition</b>										
Sec. I		5,500								5,500
Sec. II-3			23,000	23,000						46,000
Sec. II-1				13,000	13,000					26,000
Sec. II-2					12,000	12,000				24,000
<b>Total</b>		5,500	23,000	36,000	25,000	12,000				101,500
<b>(2) Maintenance Office</b>										
Construction Cost			15,500	15,500			3,000	3,000		37,000
<b>(3) Maintenance Cost (Routine)</b>										
Sec. I	144	144	11,400	6,600	6,600	6,600	6,600	6,600	6,600	3,300
Sec. II-3			3,200	5,600	7,000	7,000	9,000	9,000	9,000	4,500
Sec. II-1					2,300	2,300	4,600	4,600	7,000	3,500
Sec. II-2							2,800	2,800	2,800	
<b>Total</b>	144	144	14,600	12,200	15,900	15,900	20,200	23,000	25,400	14,100
<b>Grand Total (1)+(2)+(3)</b>	144	5,644	53,100	63,700	40,900	27,900	23,200	26,000	25,400	14,100

Note: The Costs are subjected to change during the detailed study in Japan

S

Mr. Mohan Bahadur Karki  
Director General  
Department of Roads  
Ministry of Works and Transport

Atten: Mr. Suresh K. Regmi  
Deputy Director General  
Department of Roads

Date: December 28, 1995

Dear Sirs,

Re: Geometric Design and Design Standard

We would like to confirm to you that the geometric design criteria and design standard applied for Section II-3 were discussed and reached on agreement as shown below.

- Geometric Design Criteria

Right of Way (m)	50
Formation width (m)	4.75
Carriageway width (m)	4.75
Camber (%) (for gravel)	4
Camber (%) (for SD)	2.5
Minimum horizontal curve radius (m)	15
Minimum vertical curve radius (m)	300
Maximum gradient (%)	9
Limitation of maximum gradient length (m)	300 : recovery section with 4% gradient 150 m length will be considered.
Passing place	by appropriate distance

- Drainage

Minimum culvert size (mm dia)	900 (pipe culvert for agricultural usage will be planned by existing conditions)
Maximum depth of side drainage (mm)	300

- Safety measure

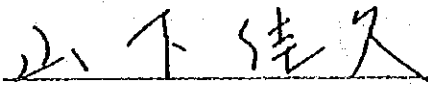
Deflector and traffic signs will be applied according to the standard drawing of DOR.

In addition, the followings are requested from DOR side,

- to consider safety of pedestrian in the Dhulikhel town area
- to consider bus stops at villages

Your kind attention for the above would be highly appreciated.

Yours truly,

  
for Hiroki SHINKAI  
Chief Consultant for  
Basic Design Study Team for  
The Project for Construction of Sindhuli Road  
(Section II-3: Nepalthok - Dhulikel)

C.C. JICA Nepal Office  
Embassy of Japan  
Mr. K. Takahashi, JICA Advisor  
Nippon Koei, Kathmandu Office  
Project file





**His Majesty's Government**  
**MINISTRY OF WORKS & TRANSPORT**  
**DEPARTMENT OF ROADS**

**Mechanical Branch**  
RDM/JICA/052/53 cl 852

Tel : 231510, 211109  
211377, 213243  
213348, 215774  
Tlx : 2570 Roads NP  
Fax : (977) 1-225993

BABAR MAHAL  
KATHMANDU, NEPAL.

✓  
The Chief Consultant  
For Basic Design Study Team  
For the Project for Construction of Sindhuli Road

Attn: Mr. Hiroki SHINKAI  
Chief Consultant

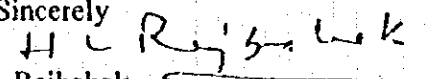
26 January 1996

Dear Sir,

As per the discussion made on 14th January the list of Equipment and tools have been sent herewith. The present list, we feel and is the minimum requirements for maintenance activities of the Sindhuli- Banepa Road sector in the view of fund constraint as conveyed to us.

We still think the number of item is undesirable to be altered as the quantity has been reduced. In connection with this, we have tried to add two more columns in the sheet to reflect the priority requirement and the minimum requirements as well.

Yours Sincerely

  
H.L. Rajbahak  
Deputy Director General

cc: Embassy of Japan  
JICA office, Kathmandu  
Nippon Koei, Kathmandu office

Revised Equipment for DOR Maintenance Offices

Equipment & Capacity	Bardibas	Sindhuli Bazar	Banepa	Khurkot	Nepalthok	Revised Total	Previously Proposed Total	Minimum required unit	Priority
Track Dozers, 200HP		1		1		2	2	1	1
Wheel Dozers, 200HP	1		1			2	-	2	1
Backhoes, 0.1 m <sup>3</sup>	1	1	1			3	3	2	1
Wheel Loaders, 2 m <sup>3</sup>	1	1	1	1	1	5	5	2	1
Crawler Loaders, 1.5 m <sup>3</sup>						-	2	-	
Dump Trucks, 4 m <sup>3</sup>	3	3	3	1	1	11	11	6	2
Pneumatic Rollers, 8-20t	1		1			2	-	1	3
Static 3-Wheel Rollers, 8-10t	1	1	1	1	1	5	-	3	2
Vibratory Rollers, 4.0 t						-	5	-	
Portable Rock Crushing Plants, 10t/hr						-	2	-	
Concrete Mixers						-	5	-	
Flat Bed Trucks, 7t		1		1		2	-	-	3
Truck Cranes, 3 t	1		1		1	3	5	1	2
Motor Graders, 125 HP	1	1	1	1	1	5	5	3	1
Plate compactors							12	-	
4-Wheel Drive Inspection Vehicles	2		2			4		4	1
4-Wheel Drive Crew Cab Pickups	2	1	2	1	1	7	10	7	1
Generators, 50KVA	1		1			2	8	2	2
Generators, 10KVA		1		1	1	3		3	2

Water Tankers, 6000 l	1	1	1	1	1	5	-	3	2
Air Compressors & 2 Set Jack Hammers	1		(1)		1	3	-	3	1
Tractors, 65HP	1		1			2	-	1	4
Low Bed Trailers, 20t	1					1	-	1	1
Crane Mounted Trucks, 15t	1					1	-	1	1
Mobile Workshops	1					1	-	-	
Motor Cycles, 125 c.c.	7	5	7	5	5	29	-	29	1
Wireless Set	1	1	1	1	1	5	-	5	1
VHF Telephone set	1	1	1	1	1	5	-	5	1

Revised List of Equipment and Tools for DOR Repair Shops

Equipment/Tools	Bardibas	Sindhuli Bazar	Banepa	Khurkot	Nepalbhok	Revised Total	Previously proposed total	Minimum required unit	Priority
Gas Welding Set	1	1	1	1	1	5	5	3	1
Arc welding set, 300A (40-80 Volts)	1		1			2	5	3	1
Welding Generator set, 300A (40-80 Volts)		1		1	1	3		2	1
Battery Charger, 72V	1	1	1	1	1	5	5	5	1
Drilling Machine, Bench Type	1		1			2		2	1
Drilling machine, Portable, 10mm	1	1	1	1	1	5	5	5	2
Electric Grinder, HD	1		1			2		2	1
Electric Grinder, LD	1	1	1	1	1	5	5	5	1
Air Compressor, Stationery	1	1	1	1	1	5		5	1
Air Compressor, Portable	1	1	1	1	1	5	5	2	2
Tyre Tools Set	1	1	1	1	1	5	5	5	1
Chain Block, 5t	1	1	1	1	1	5	5	3	3
Tachometer	1	1	1	1	1	5	5	2	1
Compression Gauge	1	1	1	1	1	5	5	2	1
Filler Gauge	3	1	3	1	1	9	5	5	1
Hydraulic Jack, 10t	2	2	2	2	2	10	5	5	1
Multimeter	1	1	1	1	1	5	5	2	1
Hydraulic Gauge	1	1	1	1	1	5	5	2	1
Bench Vice, 120mm	3	1	3	1	1	9	8	8	1
Torque Wrench, HD	1		1				-	1	2
Torque Wrench, LD	1	1	1	1	1	5	-	3	2
Trolley Jack, Hydraulic, 10t	2	1	2	1	1	7	-	5	1
Lathe	1			1		2	-	2	2
Lubricant Transfer Pump (from Barrel)	6	6	6	6	6	30	-	30	1
Puller Set, Mechanical	1	1	1	1	1	5	5	5	1

Puller Set, Hydraulic, 20t	1		1			2	-	2	1
Garage Crane, Hydraulic, 5t	1	1	1	1	1	5	-	2	2
Grease Gun, HD	2	1	2	1	1	7	-	7	1
Grease Gun, LD	3	3	3	3	3	15	-	15	1
Lubricant Dispensing Pump	4	4	4	4	4	20	-	20	1
High Pressure Washing Plant	1	1	1	1	1	5	-	3	2
Weighing Scale, 10Kg	1	1	1	1	1	5	-	5	1
Master Mechanic Tool set	2	1	2	1	1	7	8	3	1
Tool Set, Light duty	3	2	3	2	2	12	8	8	1
Tools Accessories for Lathe	1			1		2	-	2	2
Assorted Blacksmith Tools Set	1	1	1	1	1	5	-	5	1
Armature Growler	1		1			2	-	2	1
Winch, 50t	1	1	1	1	1	1	-	4	1
Work Bench Set	5	3	5	3	3	19	-	15	1
Spare Parts Rack							-	-	1

HLR 504



His Majesty's Government  
MINISTRY OF WORKS & TRANSPORT  
Department of Roads

Telex: 2570 Roads NP

Fax: 977-1-225993

Phone: 221675

Ref. No. D. 052 - 53 / S. 6  
Your Ref. No.

Minister  
Department of Roads  
Design Branch  
Babar Mahal

Babar Mahal, Kathmandu.

Date... ..  
Jan. 23, 1996

Chief Consultant  
Basic Design Study Team for the Project  
of Sindhuli Road

Dear Sir,

Please find along with this letter a copy of the typical bridge superstructure currently in practice in Department of Roads. At present we are designing the single lane bridge throughout the country with dimensions as shown in the sketch.

Your kind attention for the above would be highly appreciated.

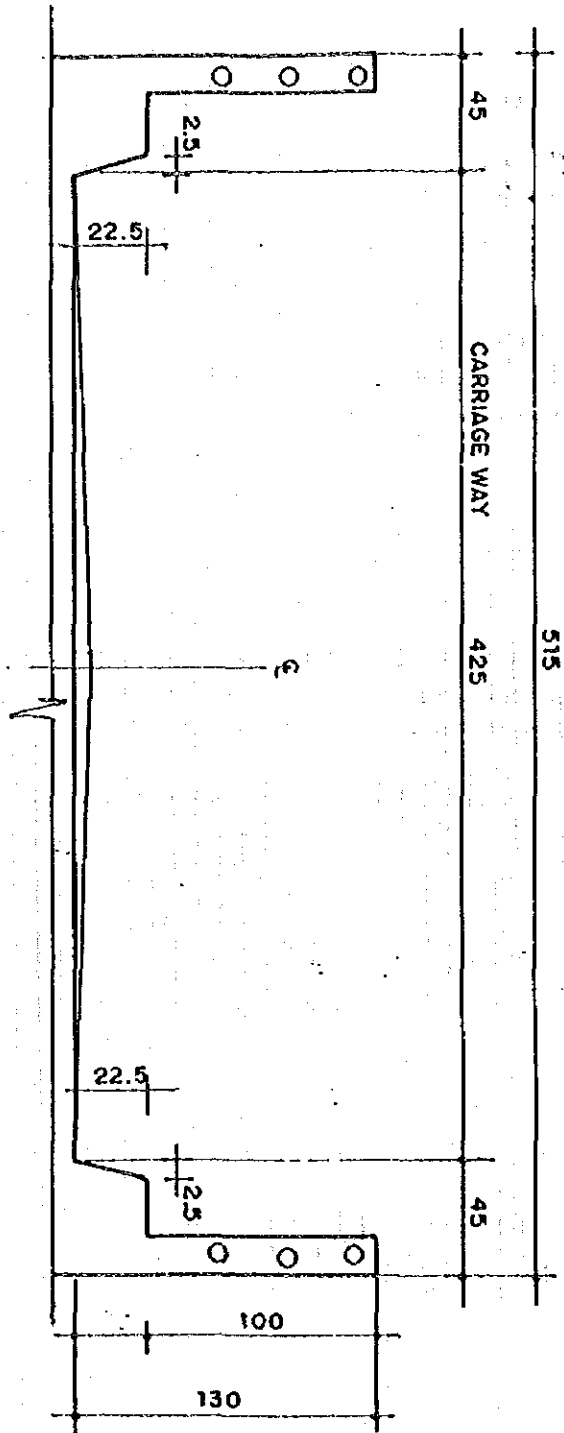
23 Jan 1996

(S.K. Regmi)  
D.D.G. Design

Deputy Director General

cc

Nippon Koei Kathmandu Office  
Mr. Takahashi, DoR, Kathmandu



Carriage way width = 4.25 m  
 Kerbs on the both sides @ 0.45 m' = 2.045 = 0.90 m  
 Total width of the bridge deck = 5.15 m

**X - SECTION FOR SINGLE LANE BRIDGE**

( NOTE : ALL DIMENSIONS ARE IN CM.)









JICA