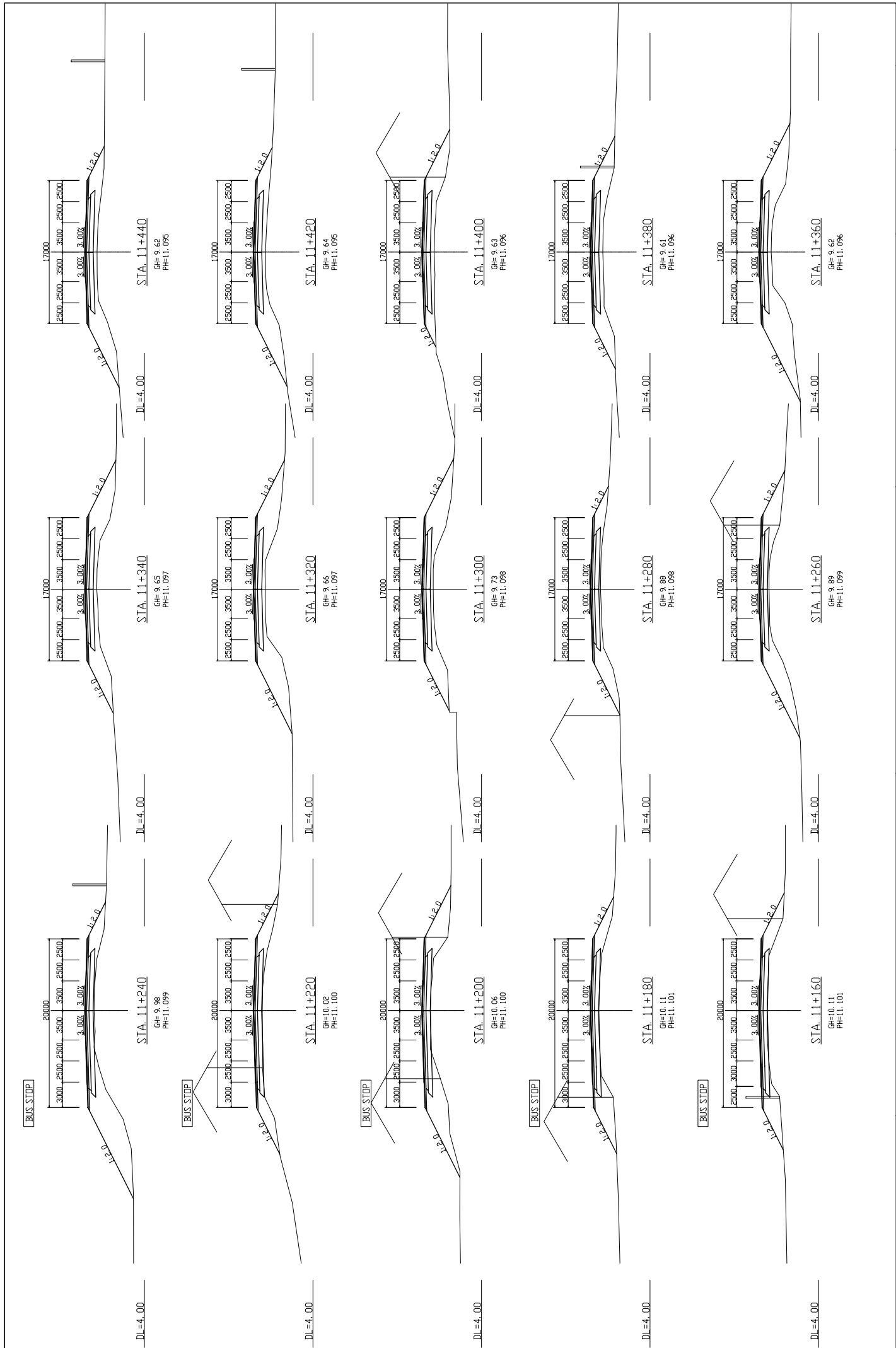
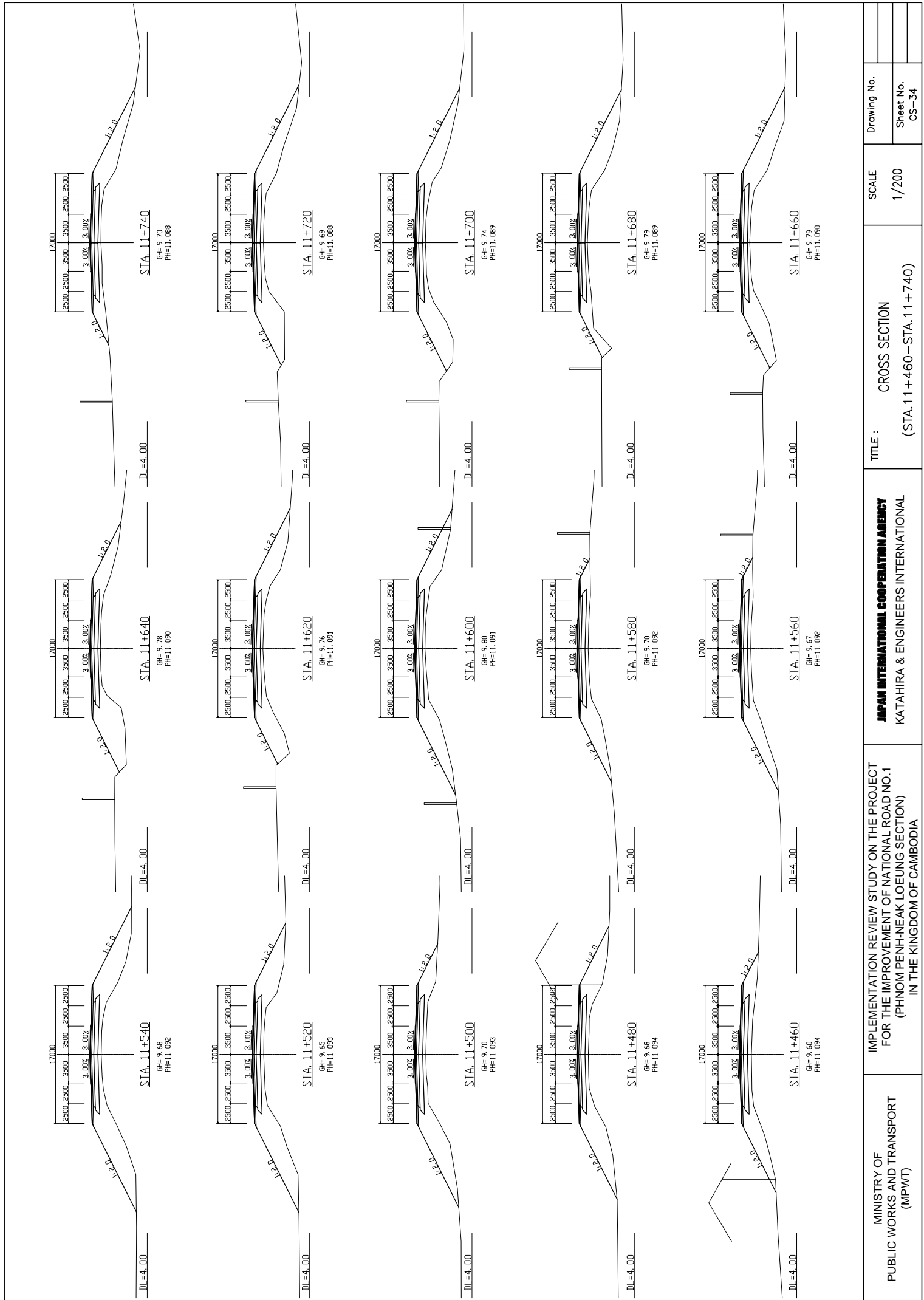


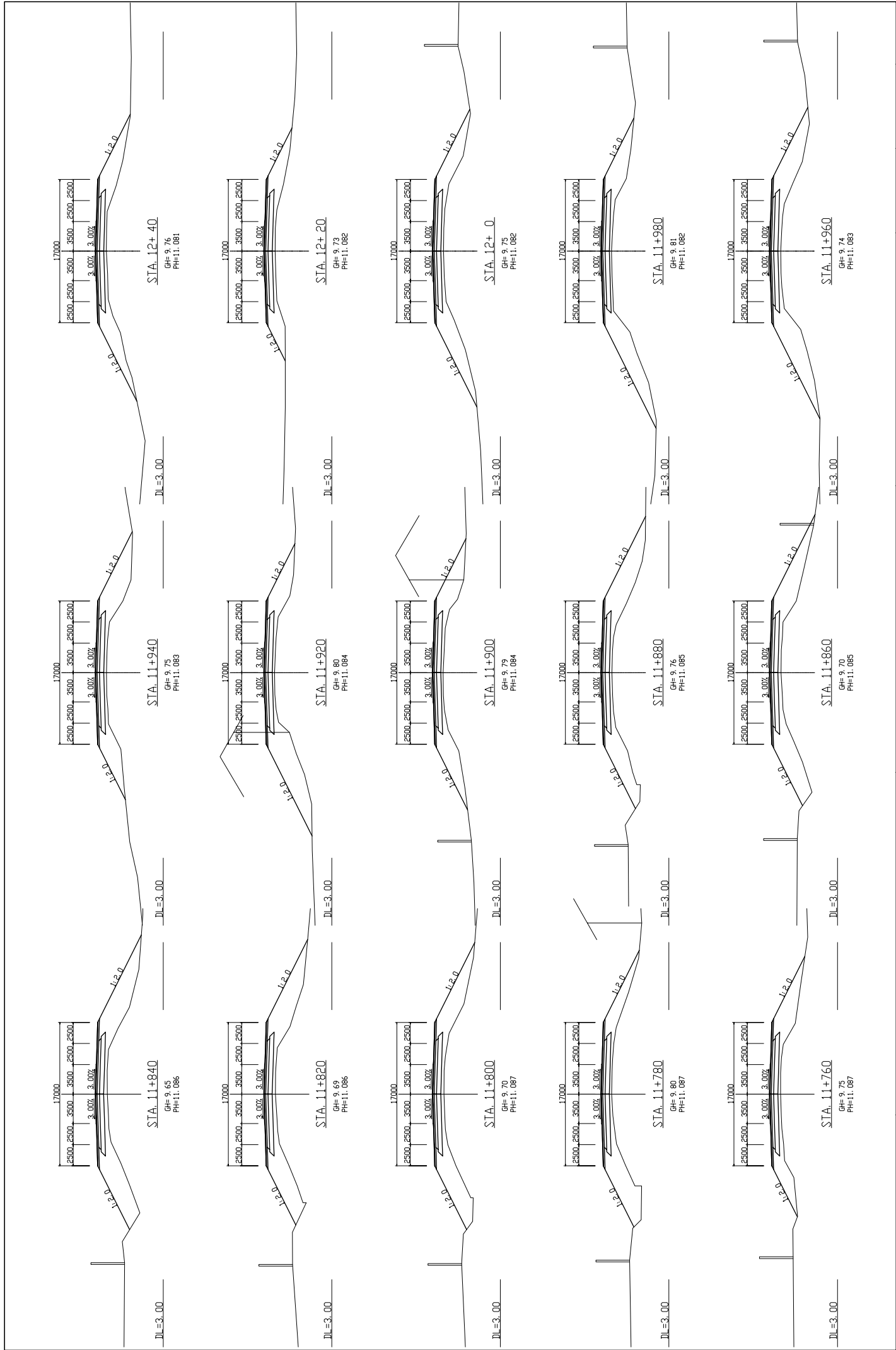
MINISTRY OF PUBLIC WORKS AND TRANSPORT (MPWT)	IMPLEMENTATION REVIEW STUDY ON THE PROJECT FOR THE IMPROVEMENT OF NATIONAL ROAD NO.1 (PHNOM PENH-NEAK LOEUNG SECTION) IN THE KINGDOM OF CAMBODIA	JAPAN INTERNATIONAL COOPERATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL	TITLE : CROSS SECTION (STA. 10+860—STA. 11+140)	SCALE 1/200	Drawing No.
					Sheet No. CS-32



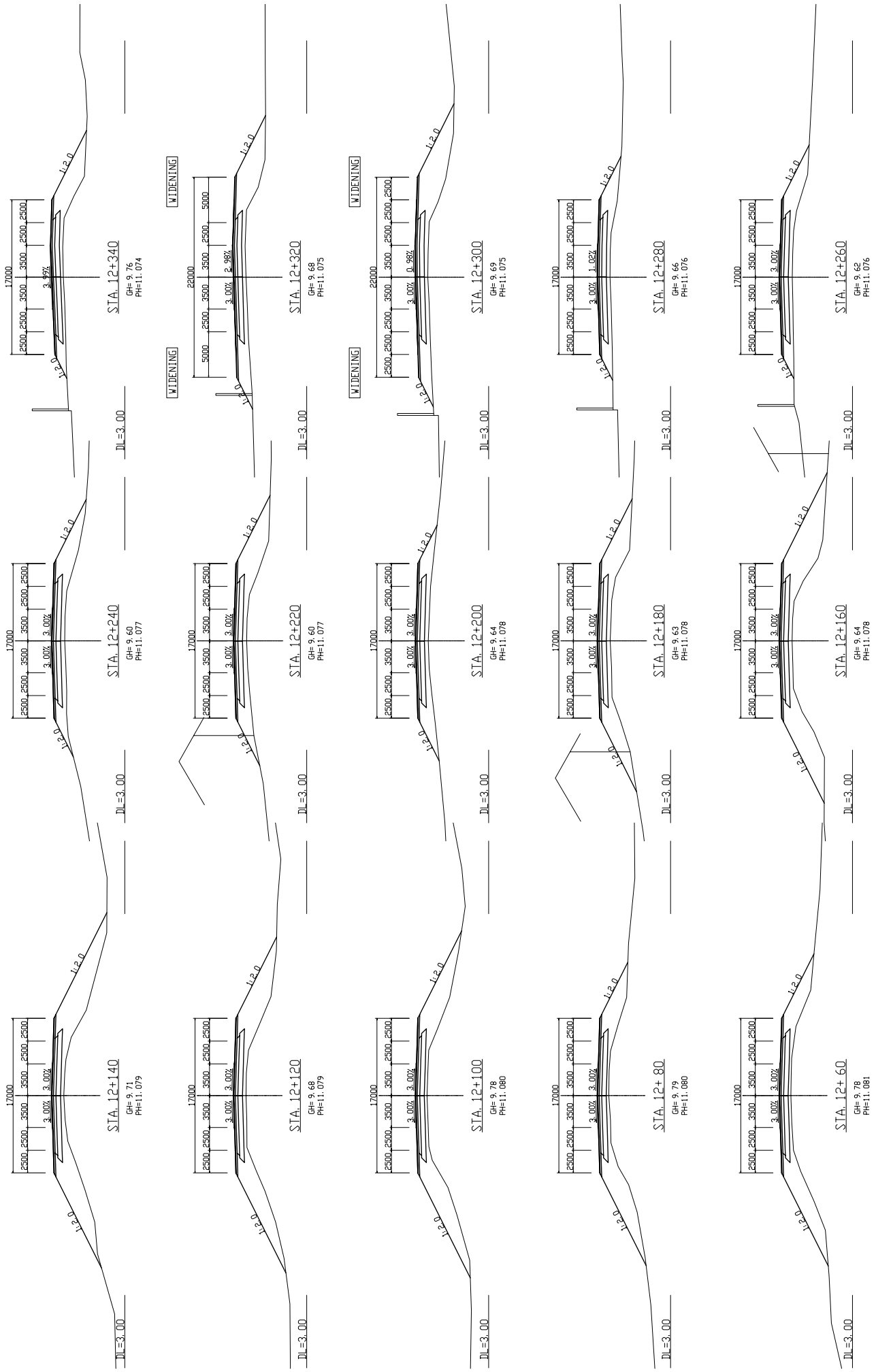
MINISTRY OF PUBLIC WORKS AND TRANSPORT (MPWT)	IMPLEMENTATION REVIEW STUDY ON THE PROJECT FOR THE IMPROVEMENT OF NATIONAL ROAD NO.1 (PHNOM PENH-NEAK LOEUNG SECTION) IN THE KINGDOM OF CAMBODIA	JAPAN INTERNATIONAL COOPERATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL	TITLE : CROSS SECTION (STA. 11 + 160 – STA. 11 + 440)	SCALE	Drawing No.
				1/200	



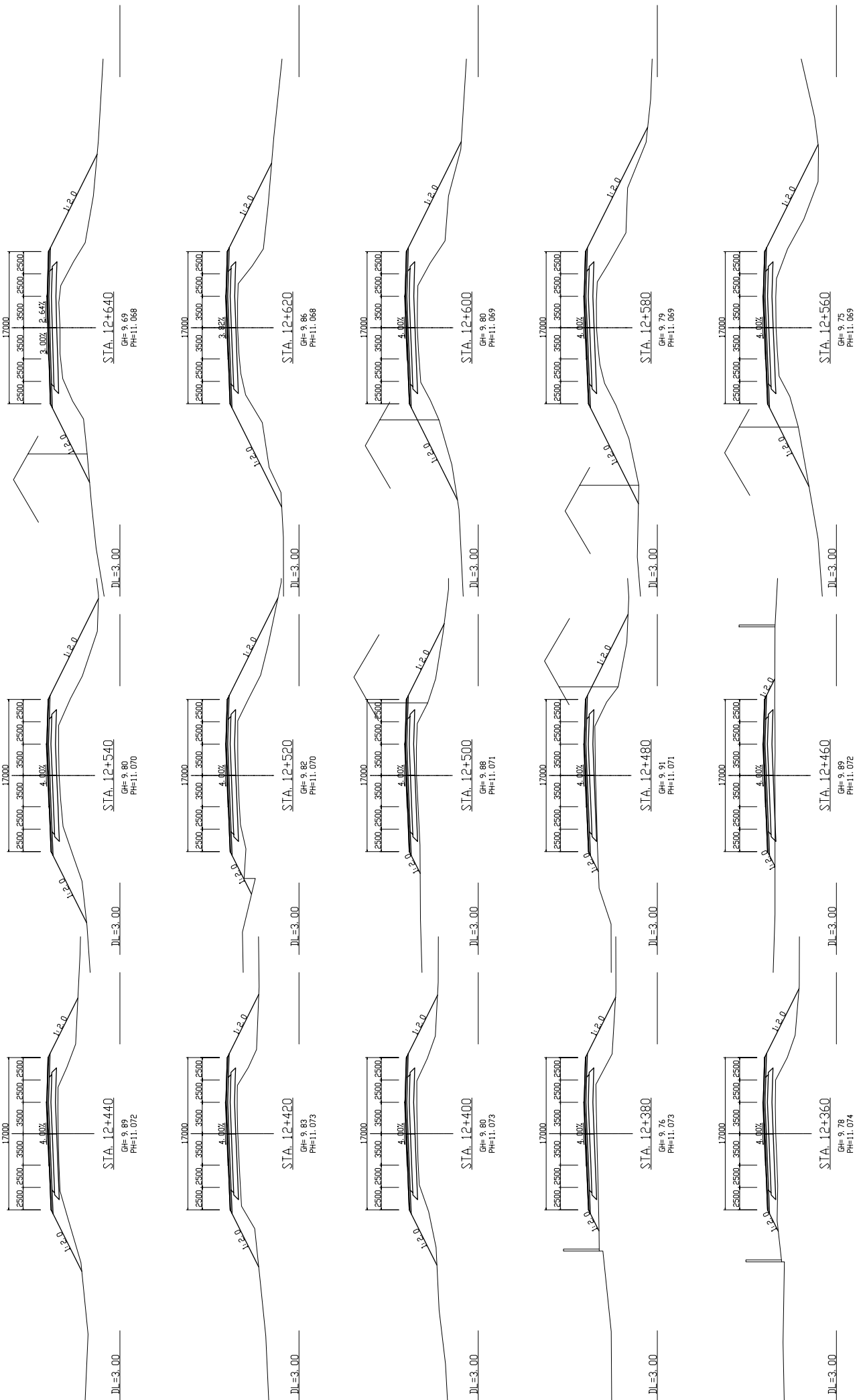
MINISTRY OF PUBLIC WORKS AND TRANSPORT (MPWT)	IMPLEMENTATION REVIEW STUDY ON THE PROJECT FOR THE IMPROVEMENT OF NATIONAL ROAD NO.1 (PHNOM PENH-NEAK LOEUNG SECTION) IN THE KINGDOM OF CAMBODIA	JAPAN INTERNATIONAL COOPERATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL	TITLE : CROSS SECTION (STA. 11+460 – STA. 11+740)	SCALE	Drawing No.
				1/200	Sheet No. CS-34



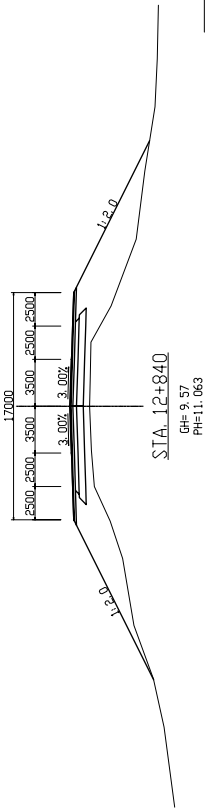
MINISTRY OF PUBLIC WORKS AND TRANSPORT (MPWT)	IMPLEMENTATION REVIEW STUDY ON THE PROJECT FOR THE IMPROVEMENT OF NATIONAL ROAD NO.1 (PHNOM PENH-NEAK LOEUNG SECTION) IN THE KINGDOM OF CAMBODIA	JAPAN INTERNATIONAL COOPERATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL	TITLE : CROSS SECTION (STA. 11 + 760 – STA. 12 + 040)	SCALE	Drawing No.
				1/200	



MINISTRY OF PUBLIC WORKS AND TRANSPORT (MPWT)	IMPLEMENTATION REVIEW STUDY ON THE PROJECT FOR THE IMPROVEMENT OF NATIONAL ROAD NO.1 (PHNOM PENH-NEAK LOEUNG SECTION) IN THE KINGDOM OF CAMBODIA	JAPAN INTERNATIONAL COOPERATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL	TITLE :	CROSS SECTION (STA. 12+060 – STA. 12+340)	SCALE 1/200	Drawing No.

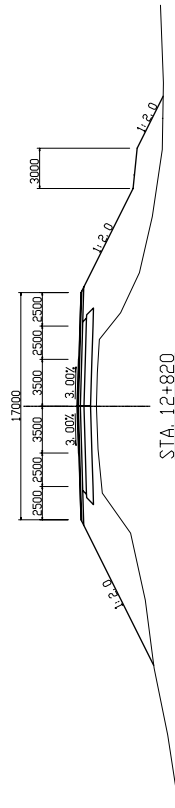


MINISTRY OF PUBLIC WORKS AND TRANSPORT (MPWT)	IMPLEMENTATION REVIEW STUDY ON THE PROJECT FOR THE IMPROVEMENT OF NATIONAL ROAD NO.1 (PHNOM PENH-NEAK LOEUNG SECTION) IN THE KINGDOM OF CAMBODIA	JAPAN INTERNATIONAL COOPERATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL	TITLE : CROSS SECTION (STA. 12+360 – STA. 12+640)	SCALE	Drawing No.
				1/200	



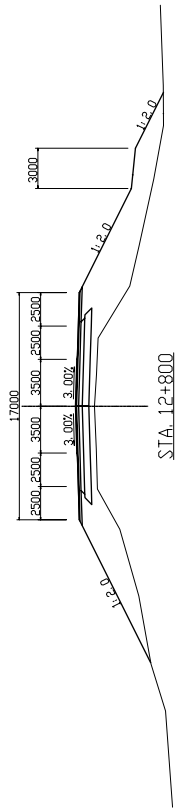
STA. 12+740
GH= 9.59
PH=11.065

DL=1.00



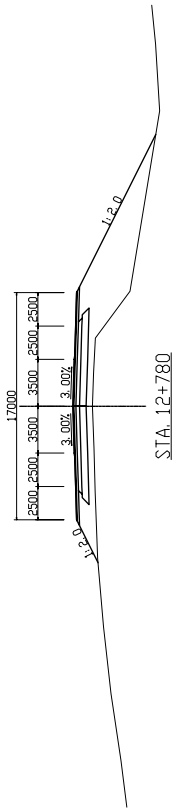
STA. 12+720
GH= 9.66
PH=11.066

DL=1.00



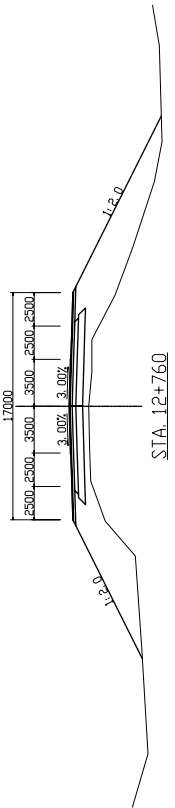
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GH= 9.66
PH=11.066

DL=1.00



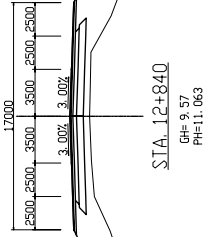
STA. 12+680
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PH=11.067

DL=1.00



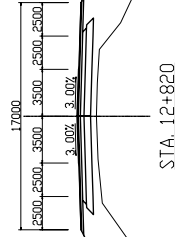
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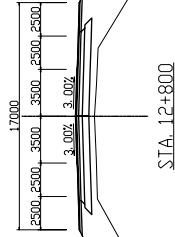
STA. 12+840
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PH=11.063

DL=1.00



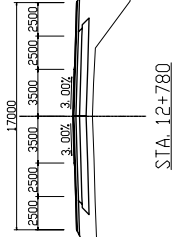
STA. 12+820
GH= 9.61
PH=11.064

DL=1.00



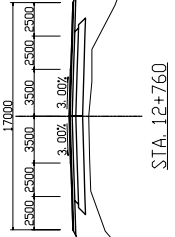
STA. 12+800
GH= 9.64
PH=11.064

DL=1.00



STA. 12+780
GH= 9.59
PH=11.064

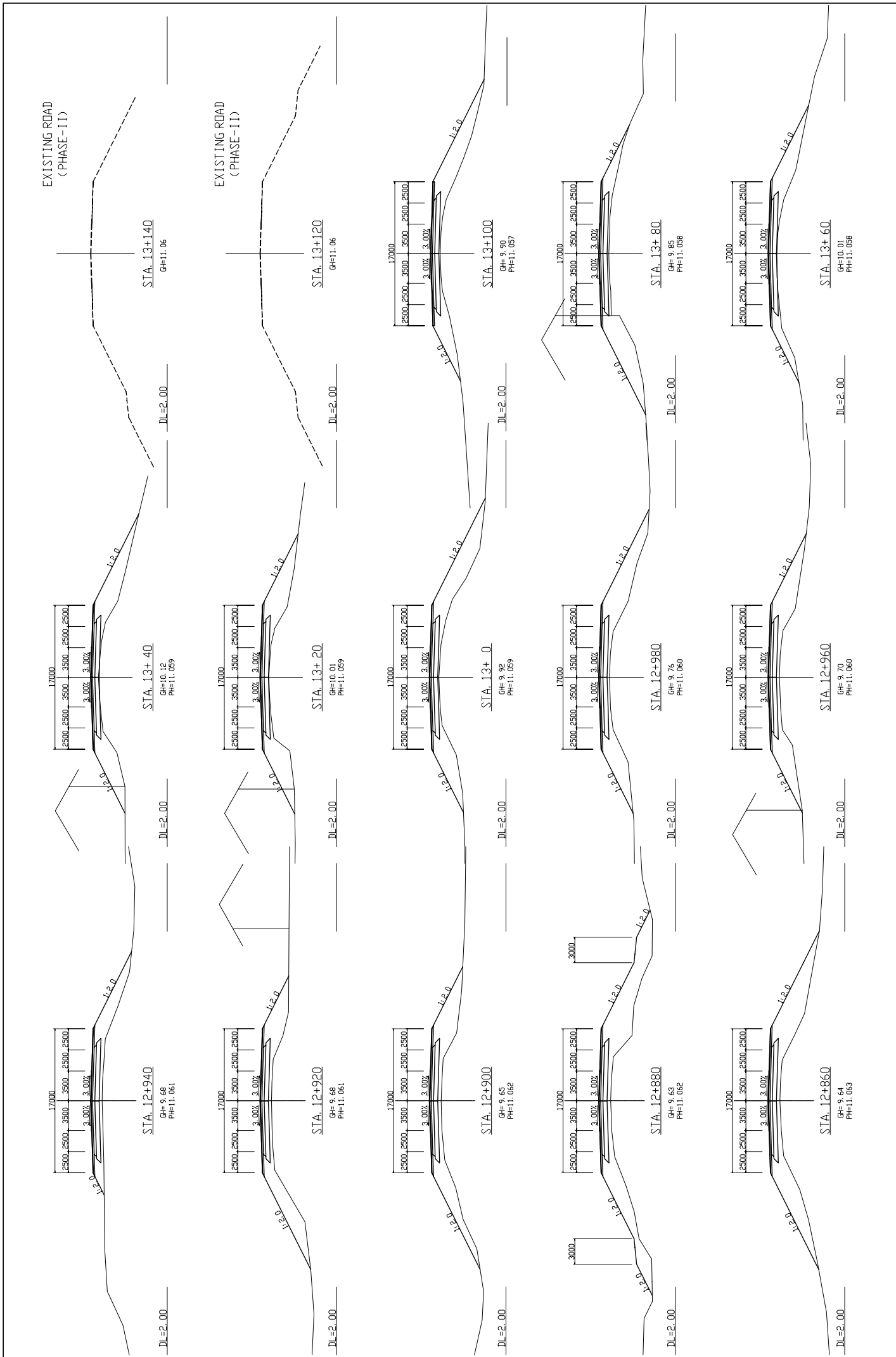
DL=1.00



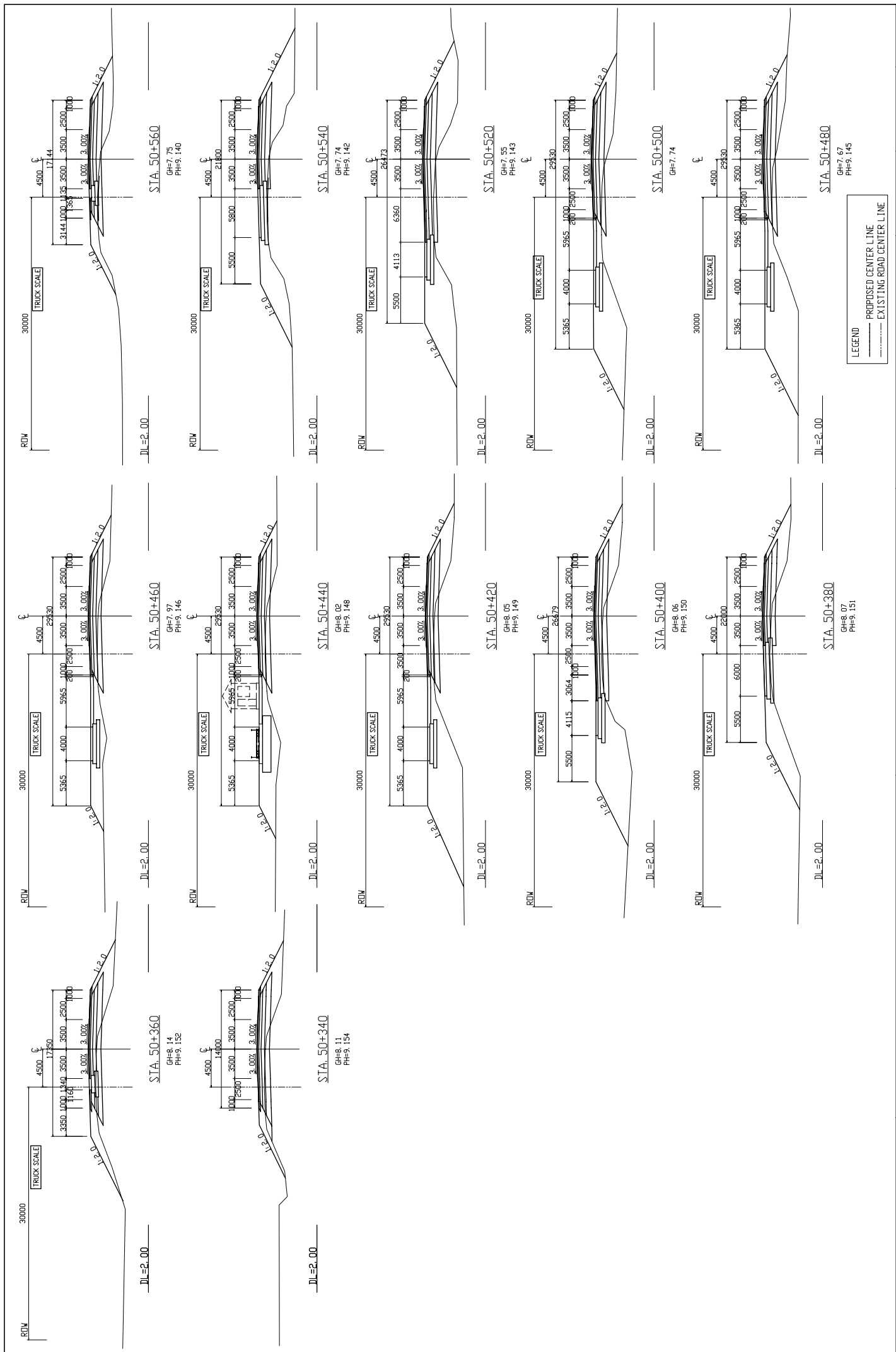
STA. 12+760
GH= 9.59
PH=11.065

DL=1.00

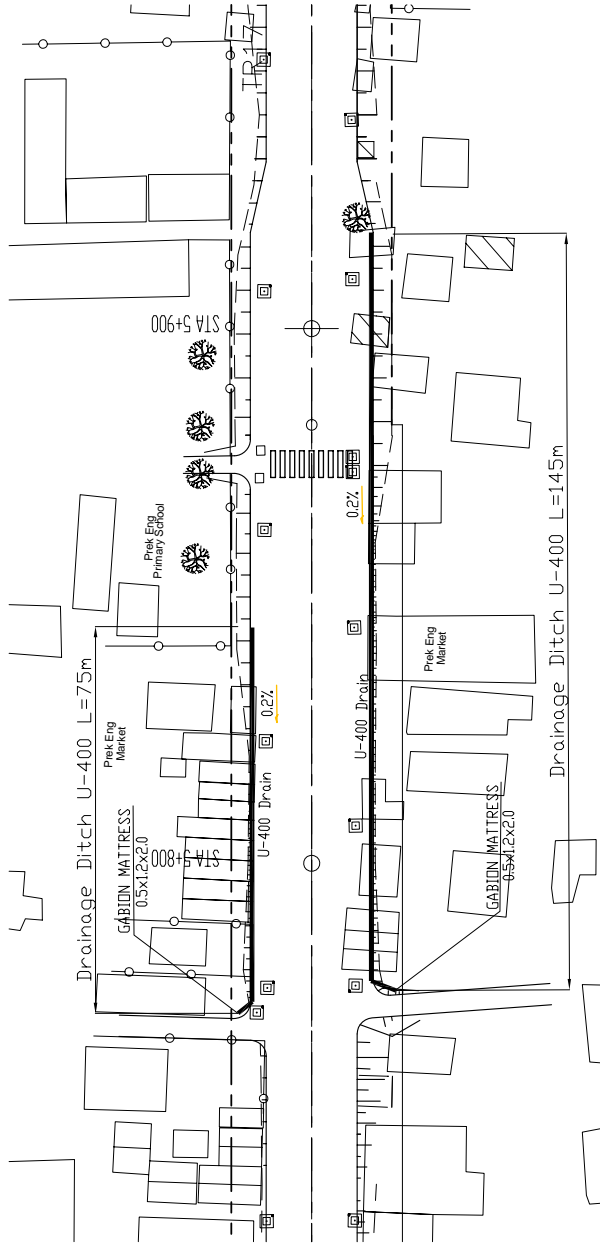
MINISTRY OF PUBLIC WORKS AND TRANSPORT (MPWT)	IMPLEMENTATION REVIEW STUDY ON THE PROJECT FOR THE IMPROVEMENT OF NATIONAL ROAD NO.1 (PHNOM PENH-NEAK LOEUNG SECTION) IN THE KINGDOM OF CAMBODIA	JAPAN INTERNATIONAL COOPERATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL	TITLE :	SCALE	Drawing No.
			CROSS SECTION (STA. 12+660—STA. 12+840)	1/200	Sheet No. CS-38



MINISTRY OF PUBLIC WORKS AND TRANSPORT (MPWT)	IMPLEMENTATION REVIEW STUDY ON THE PROJECT FOR THE IMPROVEMENT OF NATIONAL ROAD NO.1 (PHNOM PENH-NEAK LOEUNG SECTION) IN THE KINGDOM OF CAMBODIA	JAPAN INTERNATIONAL COOPERATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL	TITLE : CROSS SECTION (STA. 12+860—STA. 13+080)	SCALE	Drawing No.
				1/200	Sheet No. CS-39



MINISTRY OF PUBLIC WORKS AND TRANSPORT (MPWT)	IMPLEMENTATION REVIEW STUDY ON THE PROJECT FOR THE IMPROVEMENT OF NATIONAL ROAD NO.1 (PHNOM PENH-NEAK LOENG SECTION) IN THE KINGDOM OF CAMBODIA	JAPAN INTERNATIONAL COOPERATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL	TITLE : CROSS SECTION (STA.50+360—STA.50+560)	SCALE 1/200	Drawing No.

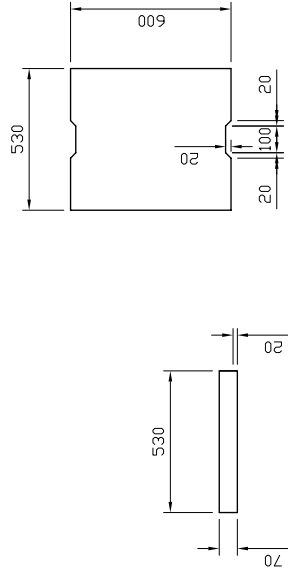


Plan of Road Side Drainage Scale : 1:500

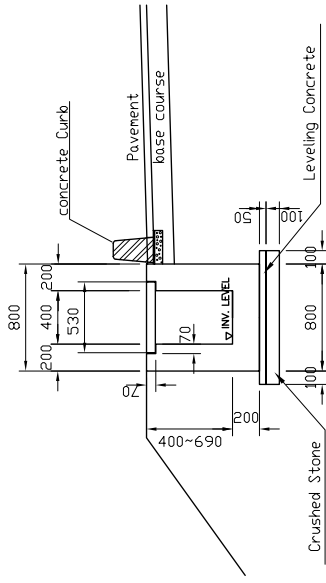
Chainage	Road Elevation	Road Edge Elevation	Drainage Depth
10.171	(10.319) (0.542)	(10.185) (0.676)	(10.341) (0.528)
SkM+773m	11.222	10.861	(10.341) (0.528)
(SkM+769m)	11.222	10.861	(10.341) (0.528)
SkM+800m	11.222	10.861	10.225 0.636 (10.381) (0.488)
SkM+820m	11.221	10.860	10.264 0.596 (10.420) (0.449)
SkM+840m	11.221	10.860	(10.460) (0.408) (10.460) (0.400)
SkM+860m	11.221	10.860	10.344 0.516
SkM+880m	11.220	10.859	10.383 0.476
SkM+900m	11.220	10.859	10.423 0.436
SkM+918m	11.219	10.858	10.458 0.400

Note: Numbers inside brackets represent values for ditches at the left side.

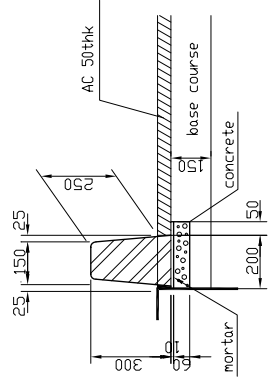
Drainage Profile None Scale



Detail of Ditch Cover Scale : 1:20



Detail of U-Ditch Scale : 1:40

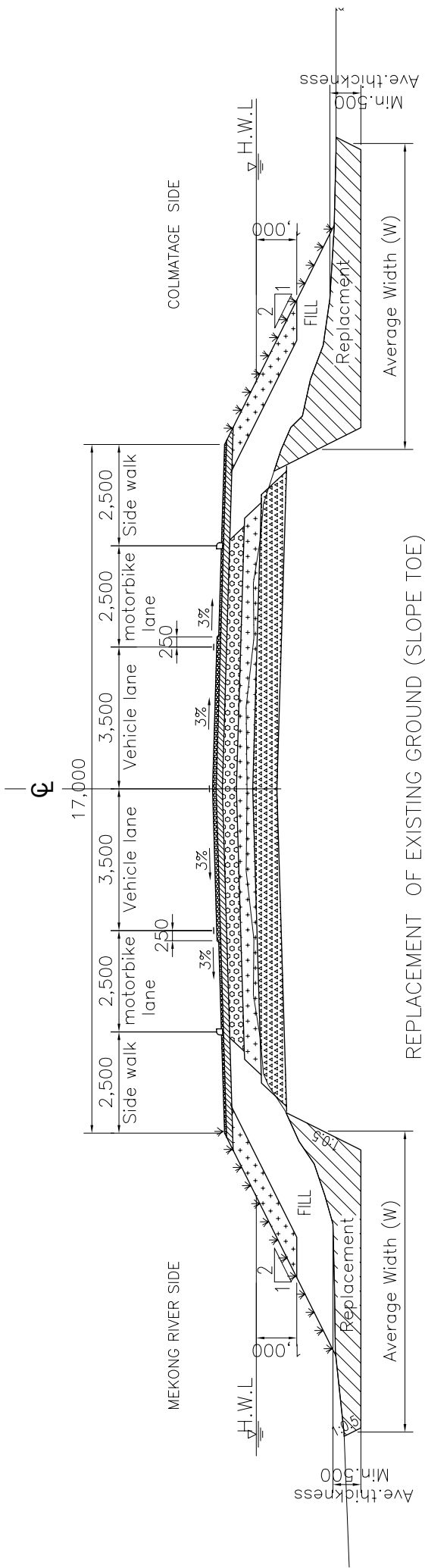


SECTION Scale:20

PLAN Scale:10

Detail of Concrete Curb

MINISTRY OF PUBLIC WORKS AND TRANSPORT (MPWT)	IMPLEMENTATION REVIEW STUDY ON THE PROJECT FOR THE IMPROVEMENT OF NATIONAL ROAD NO.1 (PHNOM PENH-NEAK LOEUNG SECTION) IN THE KINGDOM OF CAMBODIA	JAPAN INTERNATIONAL COOPERATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL	TITLE : DRAINAGE SYSTEM PLAN AT PREK ENG MARKET AREA STA.5+773-5+918	
			SCALE As Shown	Drawing No. Sheet No. DR-1



SCHEDULE LIST OF REPLACEMENT

Station	Replacement by Soil						
	Mekong side			Colmatage side			
	Replacement Section	Ave. Thickness; t	Ave. Width; W	Replacement Section	Ave. Thickness; t	Ave. Width; W	
1.9km - 2.0km	100m	0.50	6.60	3.30	100m	1.40	7.82
2.0km - 3.0km	1,000m	0.68	6.96	4.70	963m	0.50	5.48
3.0km - 4.0km	1,000m	0.75	5.50	4.13	100m	1.22	6.49
4.0km - 5.0km	1,000m	1.02	4.22	4.30	900m	0.65	4.32
5.0km - 6.0km	1,000m	0.50	5.60	2.80	1,000m	0.50	5.42
6.0km - 7.0km	1,000m	0.81	4.42	3.60	1,000m	0.50	4.38
7.0km - 8.0km	1,000m	0.83	5.06	4.20	1,000m	0.50	4.92
8.0km - 9.0km	850m	0.50	4.40	2.20	1,000m	0.50	6.64
9.0km - 10.0km	900m	0.50	4.82	2.41	1,000m	0.50	6.37
10.0km - 11.0km	1,000m	0.72	5.80	4.20	1,000m	0.57	4.58
11.0km - 12.0km	400m	0.70	4.57	3.20	700m	0.96	5.03
12.0km - 13.0km	800m	1.39	4.63	6.42	1,000m	1.91	7.54
13.0km - 13.1km	100m	0.54	4.63	2.50	1,00m	1.07	4.28

SCHEDULE LIST OF REPLACEMENT

Station	Replacement by Sand					
	Mekong side			Colmatage side		
	Replacement Section	Ave. Thickness; t	Ave. Width; W	Replacement Section	Ave. Thickness; t	Ave. Width; W
2.0km - 3.0km				37m	1.00	7.84
3.0km - 4.0km				900m	1.40	4.79
4.0km - 5.0km	150m	1.00	5.58	100m	1.50	5.24
8.0km - 9.0km	100m	1.00	5.27			
9.0km - 10.0km	600m	1.50	6.68	300m	1.50	6.68
11.0km - 12.0km	200m	1.50	7.13	10.69		
12.0km - 13.0km						10.02

MINISTRY OF PUBLIC WORKS AND TRANSPORT (MPWT)

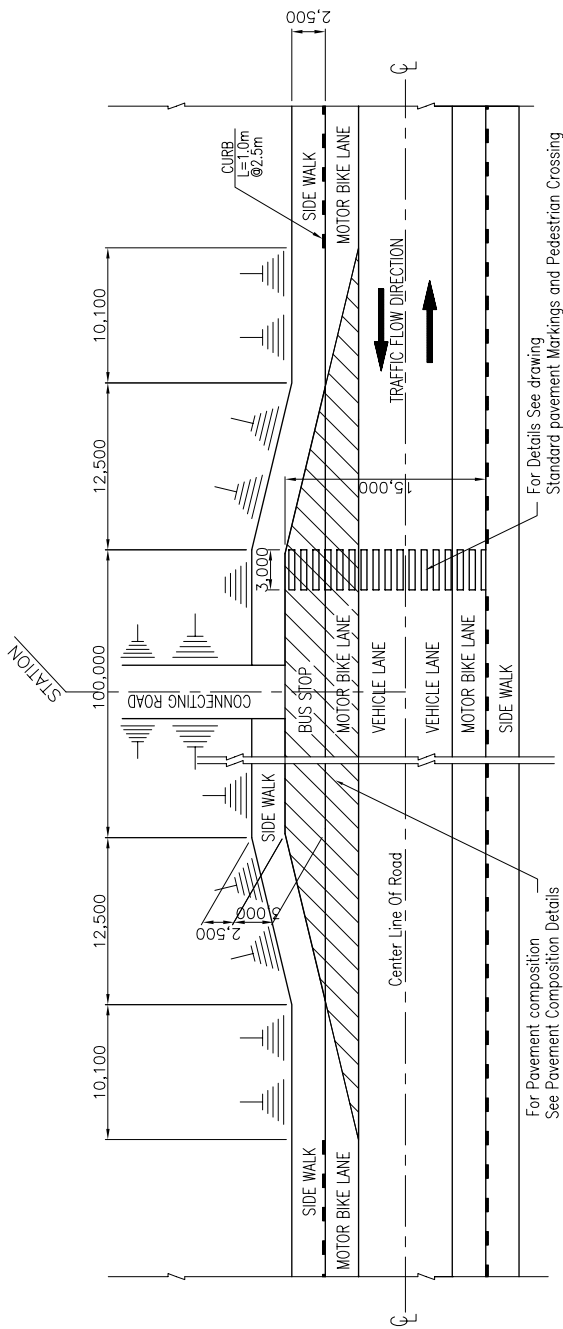
IMPLEMENTATION REVIEW STUDY ON THE PROJECT FOR THE IMPROVEMENT OF NATIONAL ROAD NO.1 (PHNOM PENH-NEAK LOEUNG SECTION) IN THE KINGDOM OF CAMBODIA

JAPAN INTERNATIONAL COOPERATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL

TITLE : REPLACEMENT OF EXISTING GROUND (SLOPE TOE)

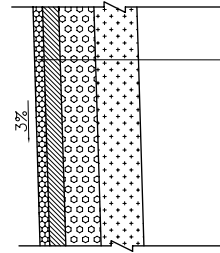
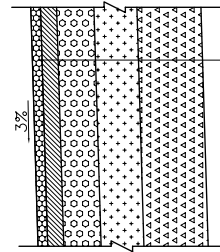
SCALE 1:50

Drawing No. Sheet No. M - 1



SCHEDULE OF BUS STOPS

No.	STATION (km)	WIDENING SIDE	PAVEMENT TYPE
1	3+326	Left Side	TYPE-1
2	6+940	Left Side	TYPE-2
3	8+102	Left Side	TYPE-2
4	9+527	Right Side	TYPE-2
5	11+202	Left Side	TYPE-2
TOTAL			5



TYPE-1

TYPE-2

PAVEMENT COMPOSITION DETAILS SCALE 1:25

MINISTRY OF PUBLIC WORKS AND TRANSPORT (MPWT)

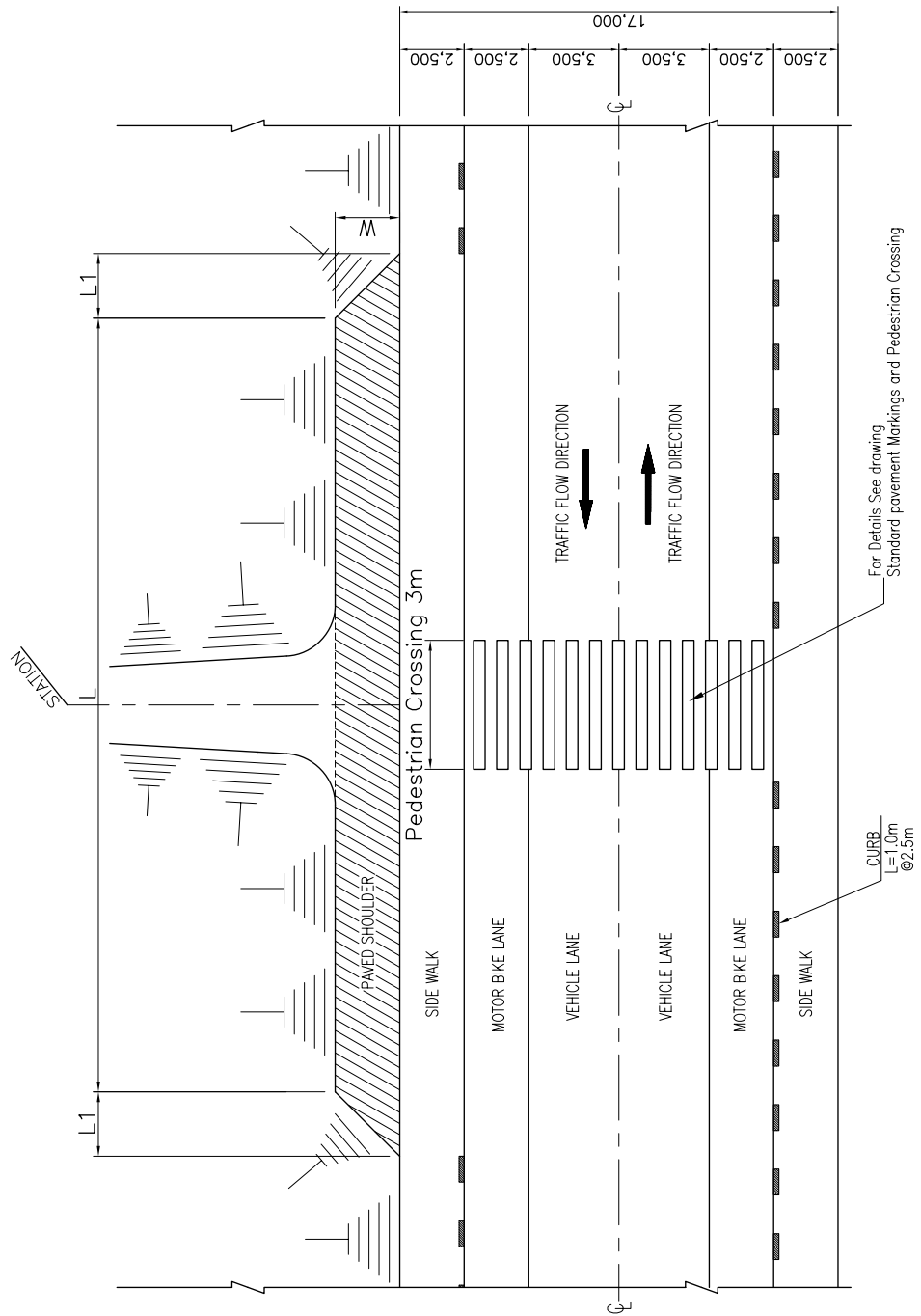
IMPLEMENTATION REVIEW STUDY ON THE PROJECT FOR THE IMPROVEMENT OF NATIONAL ROAD NO.1 (PHNOM PENH-NEAK LOEUNG SECTION) IN THE KINGDOM OF CAMBODIA

JAPAN INTERNATIONAL COOPERATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL

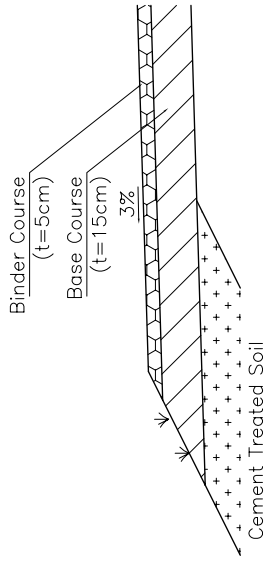
TITLE : DETAILS OF BUS BAY

SCALE As Shown

Drawing No. Sheet No. M - 2



PLAN SCALE 1:100



PAVEMENT COMPOSITION SCALE 1:10

SCHEDULE OF WIDENING

No.	STATION (km)	WIDENING SIDE	PURPOSE	WIDENING DIMENSIONS		
				L (m)	L1 (m)	W (m)
1	3+918	Both Sides	School	30.0	2.5	2.5
2	4+984	Both Sides	School	30.0	2.5	2.5
3	5+800	Both Sides	Market	140.0	12.5	3.0
4	6+300	Left Side	Health Center	30.0	2.5	2.5
5	9+000	Both Sides	School	30.0	2.5	2.5
6	9+966	Right Side	Health Center	30.0	2.5	2.5
7	10+325	Both Sides	School	30.0	2.5	2.5
8	12+310	Both Sides	School	30.0	2.5	2.5
TOTAL		14				

MINISTRY OF PUBLIC WORKS AND TRANSPORT (MPWT)

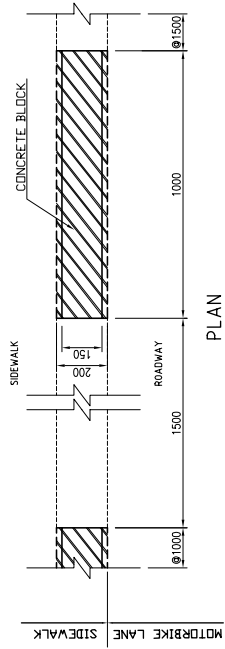
IMPLEMENTATION REVIEW STUDY ON THE PROJECT FOR THE IMPROVEMENT OF NATIONAL ROAD NO.1 (PHNOM PENH-NEAK LOEUNG SECTION) IN THE KINGDOM OF CAMBODIA

JAPAN INTERNATIONAL COOPERATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL

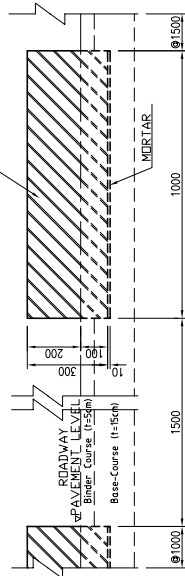
TITLE : WIDENING OF SIDEWALK (SHOULDER) (MARKET, SCHOOL & HEALTH CENTER)

SCALE As Shown

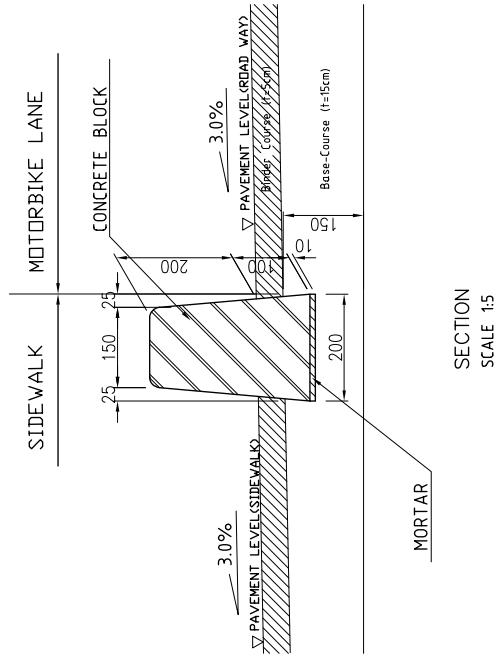
Drawing No. Sheet No. M - 3



PLAN
SCALE 1:10



FRONT VIEW
SCALE 1:10



SECTION
SCALE 1:5

DETAILS OF CURB (LOCALATIONAL)

MINISTRY OF
PUBLIC WORKS AND TRANSPORT
(MPWT)

IMPLEMENTATION REVIEW STUDY ON THE PROJECT
FOR THE IMPROVEMENT OF NATIONAL ROAD NO.1
(PHNOM PENH-NEAK LOEUNG SECTION)
IN THE KINGDOM OF CAMBODIA

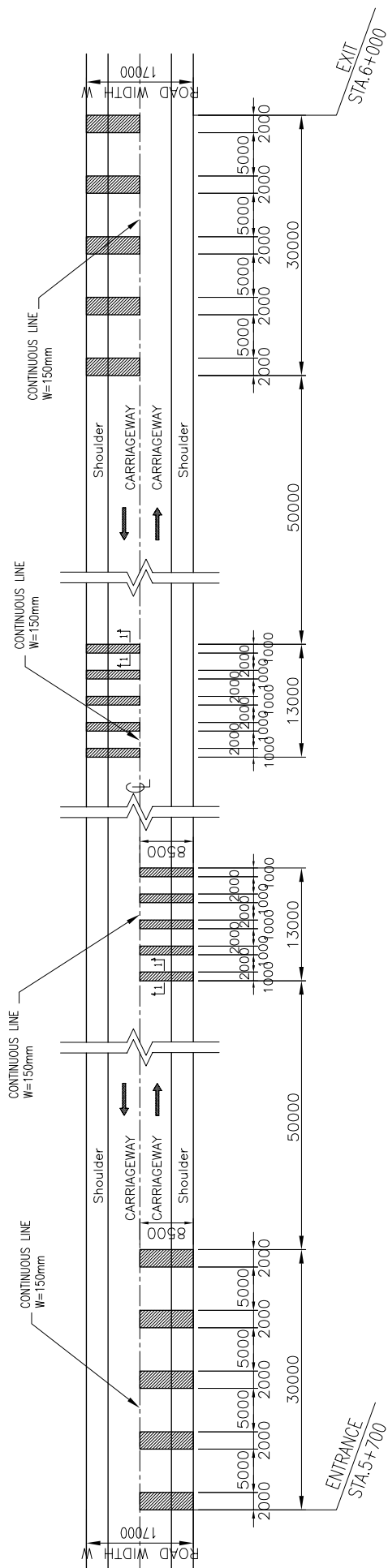
JAPAN INTERNATIONAL COOPERATION AGENCY
KATAHIRA & ENGINEERS INTERNATIONAL

TITLE :
DETAILS OF CURB (LOCALATIONAL)

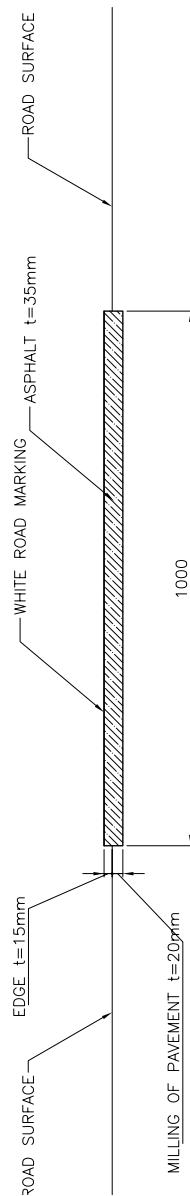
SCALE
As Shown

Drawing No.

Sheet No.
M - 4

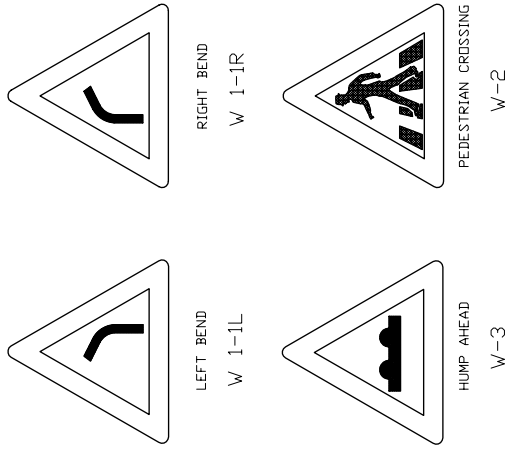


RUMBLE STRIP SCALE 1/250

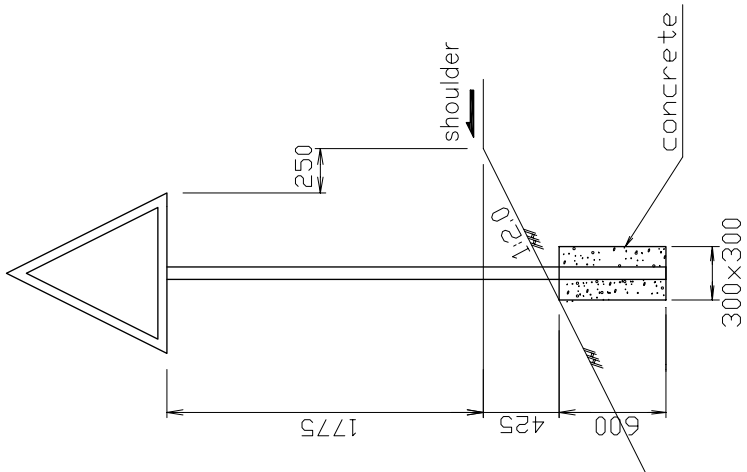


SECTION 1-1 SCALE 1/5

MINISTRY OF PUBLIC WORKS AND TRANSPORT (MPWT)	IMPLEMENTATION REVIEW STUDY ON THE PROJECT FOR THE IMPROVEMENT OF NATIONAL ROAD NO.1 (PHNOM PENH-NEAK LOEUNG SECTION) IN THE KINGDOM OF CAMBODIA	JAPAN INTERNATIONAL COOPERATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL	TITLE :	SCALE	Drawing No.
			DETAILS OF RUMBLE STRIPS	As Shown	Sheet No.
					M - 5



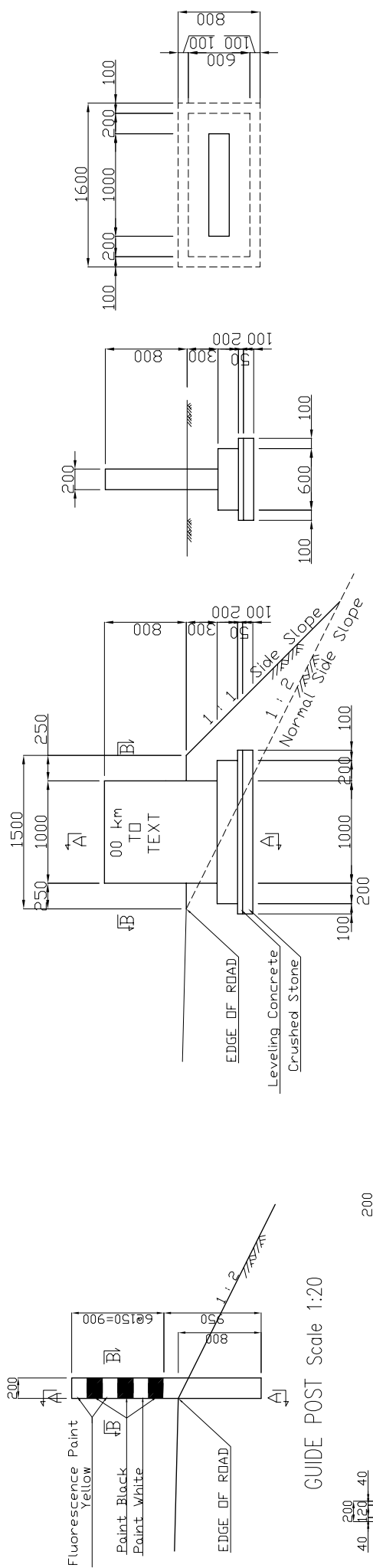
WARNING SIGNS SCALE 1:15



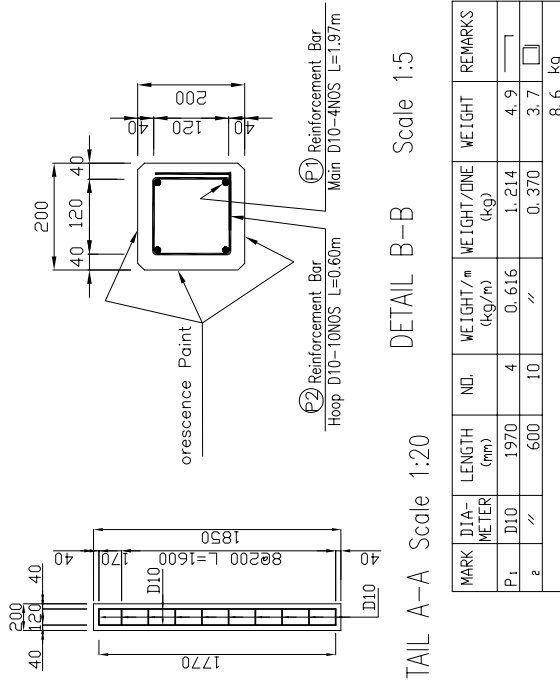
SIGN POST DETAILS SCALE 1:15

SCHEDULE OF TRAFFIC POSTS

No.	LEFT SIDE			RIGHT SIDE		
	STATION	TYPE	No.	STATION	TYPE	No.
1	3+376	W-2	1	3+100	W1-1R	1
2	3+795	W1-1L	2	3+276	W-2	2
3	3+968	W-2	3	3+868	W-2	3
4	5+034	W-2	4	4+934	W-2	4
5	6+050	W-3	5	5+650	W-3	5
6	6+350	W-2	6	6+250	W-2	6
7	9+050	W-2	7	8+950	W-2	7
8	10+016	W-2	8	9+916	W-2	8
9	10+375	W-2	9	10+275	W-2	9
10	12+360	W-2	10	12+260	W-2	10
11	12+695	W1-1L	11	12+260	W1-1R	11



GUIDE POST Scale 1:20

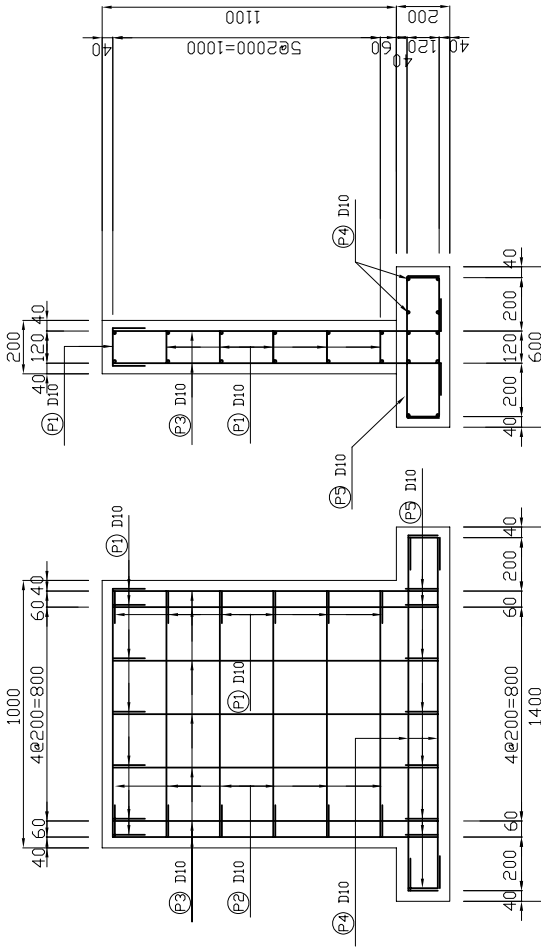


KILOMETER POST Scale 1:20

DETAIL A-A Scale 1:20

DETAIL B-B Scale 1:5

MARK	DIA-METER	LENGTH (mm)	NO.	WEIGHT/m (kg)	WEIGHT/DNE (kg)	REMARKS
P1	D10	1970	4	0.616	1.214	4.9
2	"	600	10	"	0.370	3.7
						8.6 kg



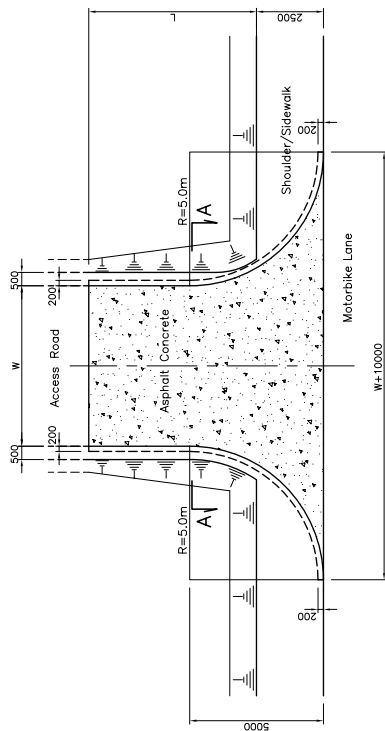
Scale 1:10

SCHEDULE LIST FOR GUIDE POST

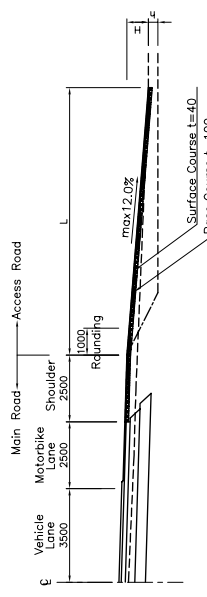
NO.	LEFT SIDE			RIGHT SIDE			Remarks
	START STATION	END L(+)m	LENGTH L(+)m	START STATION	END L(+)m	LENGTH L(+)m	
1	1+955	1+965	10.0	2+955	2+965	10.0	Embankment
2	2+050	2+070	20.0	12+320	12+340	20.0	Embankment
3	2+125	2+160	35.0	12+720	12+755	35.0	Embankment
4	2+320	2+330	10.0	12+800	12+825	25.0	Embankment
5	2+950	2+985	35.0	12+875	12+885	10.0	Embankment
6	3+182	3+713	531.0				Acute Curve
7	12+715	12+750	35.0				Embankment
8	12+870	12+890	20.0				Embankment
9	13+015	13+100	85.0				Embankment
TOTAL			781.0m	TOTAL		100.0m	25

MARK	DIA-METER	LENGTH (mm)	NO.	WEIGHT/m (kg)	WEIGHT/DNE (kg)	REMARKS
P1	D10	360	7	0.616	0.222	1.6
2	"	920	12	"	0.567	6.8
3	"	1140	14	"	0.702	9.8
4	"	1320	10	"	0.813	8.1
5	"	1400	9	"	0.862	7.8
						34.1 kg

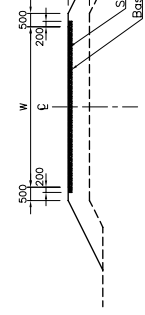
NOTE: Kilometer Stones are to be installed at both sides of the Road at 5 Kilometers Interval



PLAN

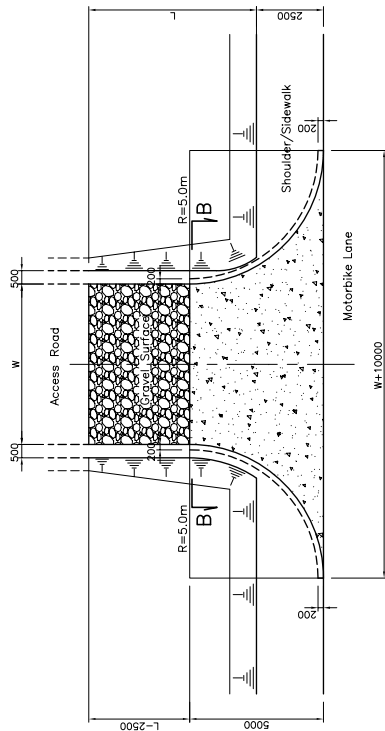


PROFILE

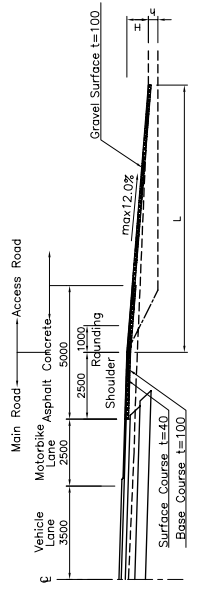


A-A SECTION

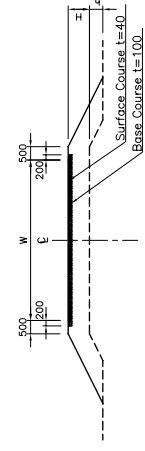
RANK-A JUNCTION



PLAN



PROFILE



B-B SECTION

RANK-B JUNCTION

LIST OF RANK-A CONNECTING ROAD

No.	L/R	Station	Reach	V(m)	L(m)	H(m)	P(m)
1	R	4+098	A	4.0	20.0	1.0	0.9
2	R	6+954	A	7.0	29.0	1.0	0.4
3	R	Total		16.0	67.0	3.3	2.3
	Average			5.3	22.3	1.1	0.8

LIST OF RANK-B CONNECTING ROAD

No.	L/R	Station	Reach	V(m)	L(m)	H(m)	P(m)
1	L	2+287	B	7.0	42.0	0.6	1.1
2	L	4+852	B	3.0	13.0	1.3	0.6
3	L	4+920	B	4.5	22.0	0.9	0.2
4	L	5+381	B	4.0	13.0	1.6	1.0
5	L	5+770	B	5.0	9.0	0.9	0.5
6	L	6+368	B	5.0	14.0	1.2	0.8
7	L	6+459	B	5.0	18.5	1.4	1.1
8	L	7+495	B	7.0	24.0	1.1	0.0
9	L	9+327	B	4.0	17.0	0.8	0.8
10	L	10+290	B	2.0	15.0	0.8	0.2
11	L	10+523	B	4.0	14.0	1.0	1.1
12	L	10+820	B	4.0	17.0	1.5	1.1
13	L	10+953	B	3.0	10.0	1.6	1.1
14	L	12+240	B	6.0	11.0	1.5	0.1
15	L	13+048	B	5.0	15.0	1.0	3.0
16	L	4+785	B	5.0	22.0	2.4	1.7
17	R	4+927	B	5.0	18.0	1.6	1.3
18	R	5+024	B	5.0	16.0	2.1	1.8
19	R	5+340	B	6.0	22.0	2.8	1.5
20	R	5+419	B	6.0	19.0	2.0	1.3
21	R	5+419	B	6.0	19.0	2.0	1.3
22	R	5+558	B	5.0	10.0	1.5	0.9
23	R	6+478	B	5.0	15.0	1.4	1.3
24	R	8+125	B	7.0	16.0	1.4	1.1
25	R	10+519	B	4.0	17.0	1.1	0.6
26	R	12+200	B	7.0	15.0	2.6	1.4
27	R	12+200	B	4.0	20.0	2.7	3.0
28	R	12+500	B	14.15	47.85	41.3	31.1
	Average			5.1	17.1	1.5	1.1

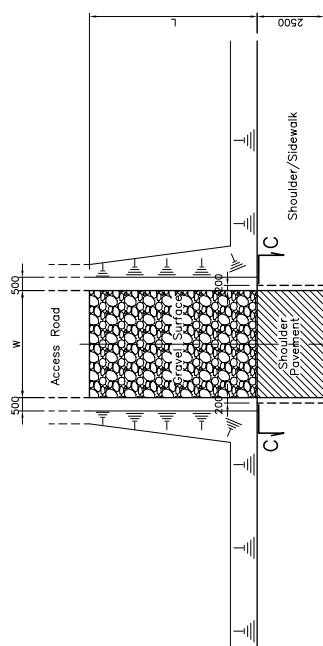
MINISTRY OF PUBLIC WORKS AND TRANSPORT (MPWT)

IMPLEMENTATION REVIEW STUDY ON THE PROJECT FOR THE IMPROVEMENT OF NATIONAL ROAD NO.1 (PHNOM PENH-NEAK LOEUNG SECTION) IN THE KINGDOM OF CAMBODIA

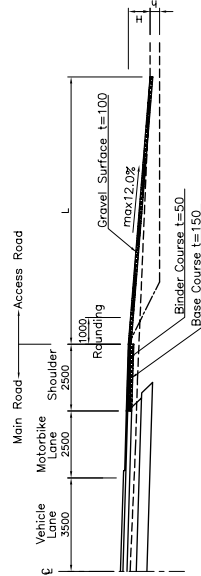
JAPAN INTERNATIONAL COOPERATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL

TITLE : DETAILS OF CONNECTING ROADS

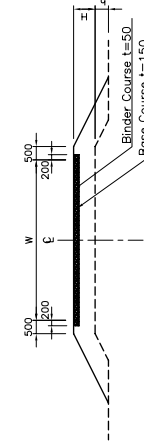
SCALE 1:100
Drawing No.
Sheet No.
M - 8



PLAN

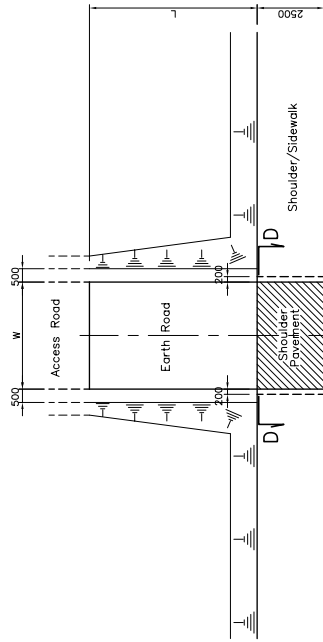


PROFILE

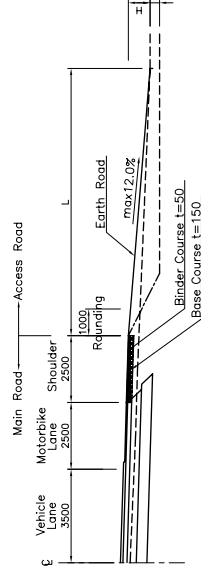


C-C SECTION

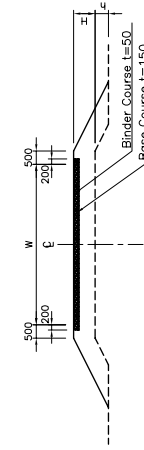
RANK-C JUNCTION



PLAN



PROFILE



D-D SECTION

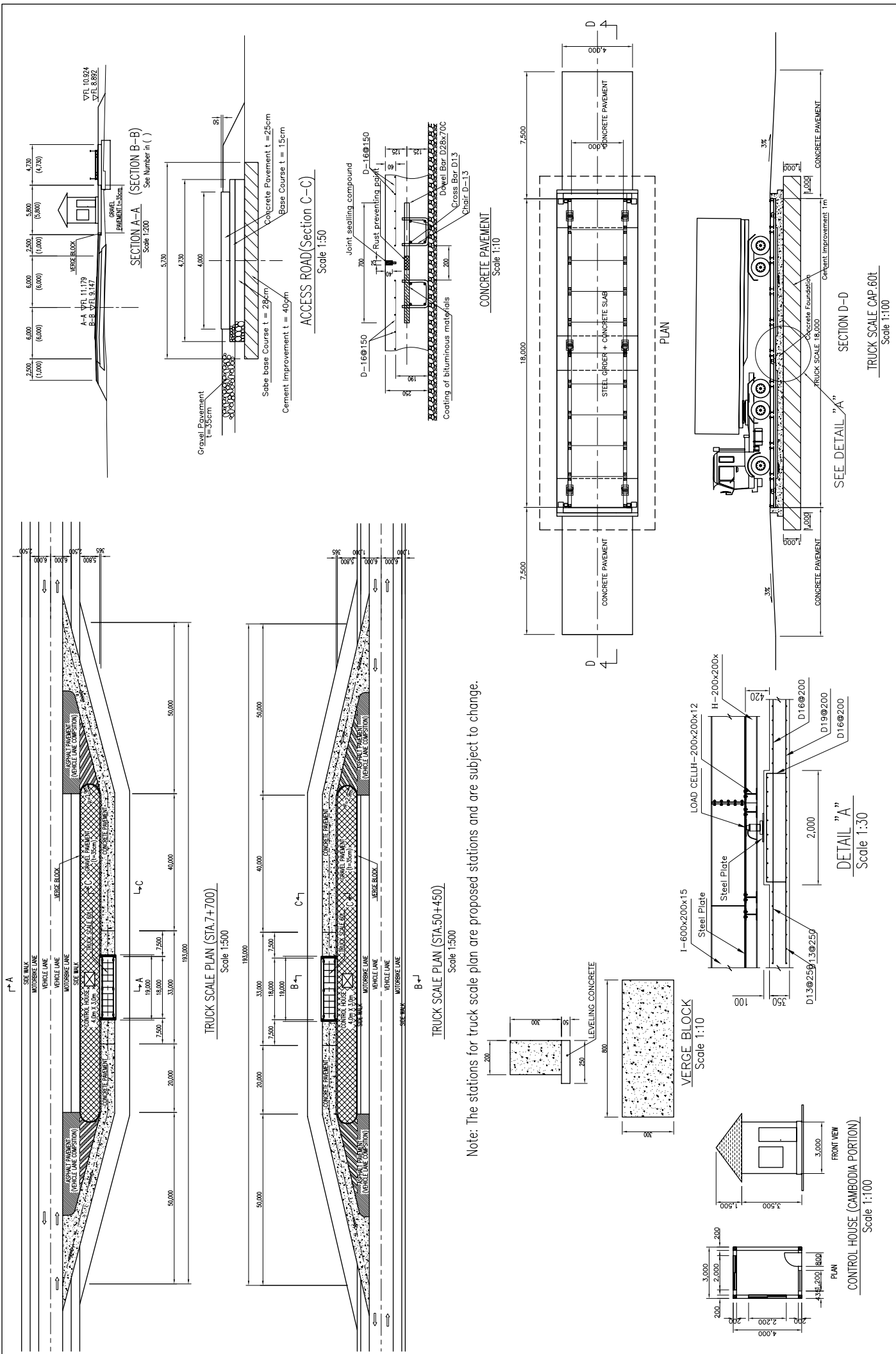
RANK-D JUNCTION

LIST OF RANK-C CONNECTING ROAD

No.	L/R	Station	Rank	V(m)	L(m)	H(m)	K(m)
1	L	3+326	C	4.0	26.0	1.8	1.3
2	L	3+940	C	5.0	18.0	0.7	0.7
3	L	4+418	C	4.0	9.0	1.5	0.8
4	L	4+618	C	4.0	20.0	2.7	2.2
5	L	4+964	C	4.0	18.0	1.5	0.7
6	L	5+640	C	4.0	7.5	1.3	1.0
7	L	5+874	C	4.0	10.0	1.6	1.2
8	L	6+06	C	4.0	15.0	1.3	1.1
9	L	6+113	C	4.0	14.0	1.5	0.6
10	L	7+013	C	3.0	14.0	1.5	0.6
11	L	8+102	C	5.0	14.0	0.3	0.3
12	L	8+565	C	4.0	18.0	1.4	0.7
13	L	8+830	C	3.0	16.0	1.6	1.2
14	L	9+000	C	5.0	9.0	1.0	0.7
15	L	11+202	C	6.0	11.0	1.2	0.1
16	L	12+310	C	4.0	8.0	2.0	0.8
17	R	3+918	C	5.0	17.5	1.5	1.3
18	R	5+715	C	5.0	19.0	1.6	1.5
19	R	6+040	C	4.0	9.0	1.6	0.8
20	R	6+863	C	3.0	16.0	2.2	2.2
21	R	9+583	C	3.0	16.0	2.2	2.2
22	R	9+527	C	4.0	17.0	1.7	1.2
23	R	9+966	C	4.0	16.0	1.9	0.9
24	R	10+103	C	3.0	18.0	2.8	2.1
25	R	10+194	C	2.5	16.0	2.4	1.8
26	R	10+325	C	3.0	14.0	2.3	1.4
27	R	10+820	C	2.5	14.0	2.2	1.8
28	R	11+173	C	3.0	19.0	2.7	2.0
29	R	11+266	C	4.0	16.0	2.9	2.0
30	R	12+300	C	3.0	24.0	3.7	2.9
31	R	12+440	C	3.0	24.0	3.7	2.9
		Total			130.0	467.0	374.6
		Average			3.9	15.1	1.9

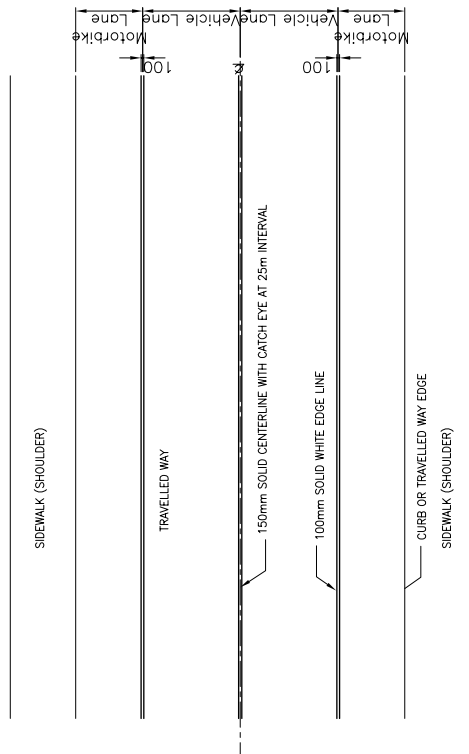
LIST OF RANK-D CONNECTING ROAD

No.	L/R	Station	Rank	V(m)	L(m)	H(m)	K(m)
1	L	4+921	D	2.0	12.0	1.7	2.8
2	L	5+921	D	2.0	12.0	1.7	2.8
3	L	8+253	D	1.5	40.0	4.6	4.0
4	L	9+172	D	2.0	12.0	1.2	1.0
5	L	9+763	D	2.5	18.0	2.2	2.0
6	R	3+789	D	2.5	19.0	3.8	3.4
7	R	4+100	D	2.0	18.0	2.9	2.7
8	R	4+297	D	2.0	15.5	2.6	2.1
9	R	11+035	D	2.0	13.0	2.7	2.2
		Total			18.5	160.5	25.2
		Average			2.1	17.8	2.8

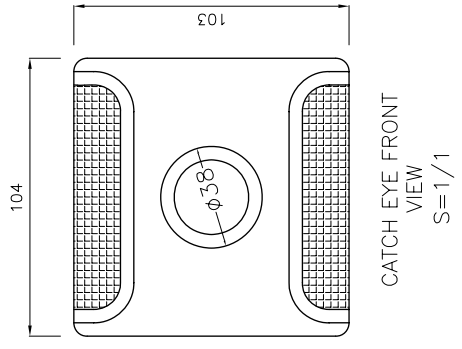


Note: The stations for truck scale plan are proposed stations and are subject to change.

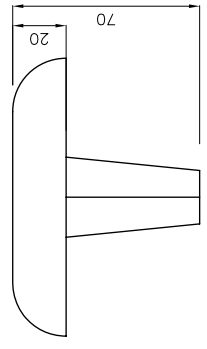
MINISTRY OF PUBLIC WORKS AND TRANSPORT (MPWT)	IMPLEMENTATION REVIEW STUDY ON THE PROJECT FOR THE IMPROVEMENT OF NATIONAL ROAD NO.1 (PHNOM PENH-NEAK LOEUNG SECTION) IN THE KINGDOM OF CAMBODIA	TITLE :	DETAILS OF TRUCK SCALE	SCALE	As Shown	Drawing No.
		JAPAN INTERNATIONAL COOPERATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL				Sheet No. M - 10



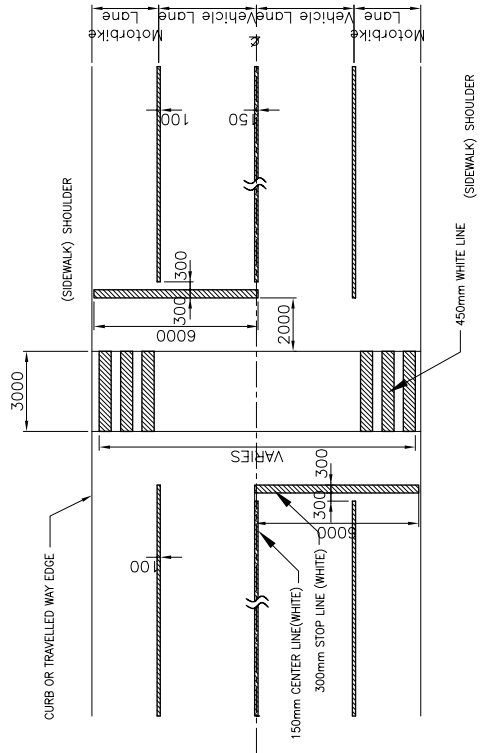
CENTER & EDGE LINE MARKINGS
RURAL HIGHWAY, TWO LANE
S=1/100



CATCH EYE FRONT VIEW
S=1/1



CATCH EYE LATERAL VIEW
S=1/1



PEDESTRIAN CROSSING(ZEBRA TYPE)
S=1/100

NOTES :
PAVEMENT MARKINGS SHALL BE PLACED IN ACCORDANCE WITH THE LATEST CAMBODIA ROAD DESIGN GUIDE O
PAVEMENT MARKINGS.

Note: To be installed at every 25 meters from Sta. 1+900 to Sta. 13+100

MINISTRY OF PUBLIC WORKS AND TRANSPORT (MPWT)	IMPLEMENTATION REVIEW STUDY ON THE PROJECT FOR THE IMPROVEMENT OF NATIONAL ROAD NO.1 (PHNOM PENH-NEAK LOEUNG SECTION) IN THE KINGDOM OF CAMBODIA	JAPAN INTERNATIONAL COOPERATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL	TITLE : STANDARD PAVEMENT AND PEDESTRIAN CROSSING	SCALE	Drawing No.
				As Shown	Sheet No. M - 11

2.2.4 Implementation Plan

2.2.4.1 Implementation Policy

The basic conditions for implementing the Project are as follows:

- This Project, if approved, will be implemented in accordance with the guidelines of Japan's Grant Aid after the signing of the Exchange of Notes between the Governments of Japan (GOJ) and the Kingdom of Cambodia.
- The Ministry of Public Works and Transport (MPWT) is responsible for implementing the Project.
- The detail design, assistance in tendering, and construction supervision of the Project will be undertaken by a Japanese consulting firm in accordance with a contract between the MPWT and the consultant.
- The construction will be undertaken by the successful Japanese tenderer in awarding the contract with the MPWT.

The basic concepts in the implementation plan and procurement plan are as follows:

- Materials and equipments and labors necessary for the Project will be procured in Cambodia as far as available. Items unavailable locally will be procured from Japan or third countries, which will be selected on the basis of cost, on condition that the quality and supplying capacity meet the requirements.
- Imported materials which are constantly available in the local market will be procured and regarded as local materials.
- Common equipment owned by local contractors will be leased from them.
- The construction method and schedule will be planned reflecting local conditions of climate, topography, geology etc.
- Easy and common construction methods which do not require the use of special equipment or new technology will be adopted as much as available.
- Organizations for construction management by the contractor and construction supervision by the consultant will be established meeting the standardized construction management requirements.
- The traffic shall be maintained during construction period and necessary measures for safety shall be taken.
- Full attention shall be paid to the environmental preservation, preventing the washing away of soil in the rainy season, pollution of river, minimizing the noise/vibration, impact against traffic in urbanized areas etc.

The Project is implemented under three (3) stages, taking into consideration the environmental and social aspects.

Stage-1 : Bridge No.2 and No.3

Stage-2 : Sta.13+100 ~ Neak Loueng

Stage-3 : Sta.1+900 ~ 13+100

2.2.4.2 Implementation Conditions

(1) Securing of safety for the road users and construction

1) During Road Construction

A space of at least one lane shall be opened to traffic which is controlled by alternate passing. Necessary safety facilities such as notice signs, detour signs, safety cones safety light and traffic control men shall be properly placed.

2) During Structure Construction

- The detour shall be provided for the existing traffic.
- The workers engaging in works at high place shall be prevented from falling down by putting proper equipment/facilities for going up and down, downfall prevention facilities etc.

(2) Environmental Considerations

- Measures to prevent the dust pollution during road construction shall be undertaken by sprinkling water etc.
- Proper maintenance shall be carried out for the existing road utilized in transporting the materials and equipment.
- The construction methods minimizing the noise/vibration are adopted in the populated areas: Sta.1+900 - Sta.13+100.

(3) Considerations on Natural Condition

It shall be difficult to carry out the embankment, substructure, revetment and riverbed protection in the rainy season because the Mekong River covers the bed of road embankment from July to November. Therefore, those works shall be carried out in the dry season or when the Mekong River does not affect them from December to June.

2.2.4.3 Scope of Works

The undertakings of both governments of Japan and Cambodia are listed in Table 2.2.4.3-1.

Table 2.2.4.3-1 Undertakings of Both Governments

Items	Contents	Undertaking by		Remarks
		Japan	Cambodia	
Procurement of materials and equipment	Procurement & delivery	○		
	Tax exemption and customs clearance		○	
	Maintenance/improvement of delivery route		○	
Preparatory Works	Acquisition of lots for construction	○		Site office, stock yard, plant yard, working area, etc.
	Other preparatory works	○		
Removal/relocation of obstructions	Removal of ground obstructions		○	Electric posts and wire, etc.
	Removal of underground obstructions		○	Optical cables, water pipes etc.
Construction works	Road improvement	○		

2.2.4.4 Consultant Supervision

A Japanese consultant will carry out the detailed design, assistance in tendering and construction supervision in accordance with the contract between the MPWT and the Consultant.

(1) Detailed Design

Major works in the detailed design to be carried out by the consultant are as follows:

- Review of road design, opening design, revetment design, and drawings prepared during the Basic Design Study;
- Review of the construction plan and materials/equipment procurement plan prepared during the Basic Design Study; and
- Review of the cost estimation prepared during the Basic Design Study.

The necessary time for the Detailed Design is two (2) months for Stage-3.

(2) Assistance in Tendering

Major items of the services in the assistance in tendering are as follows:

- Preparation of tender documents (conducted simultaneously with the Detailed Design);
- Tender publication;
- Pre-qualification;
- Assistance in tendering;
- Tender evaluation; and
- Contract facilitation

The necessary time for the assistance in tendering is 3 months for Stage-3.

(3) Construction Supervision

The Consultant will carry out the supervision of the construction works executed by the contractor. Major items of the construction supervision are as follows:

- Inspection and approval of site survey;
- Inspection and approval of construction plan;
- Quality control;
- Progress control;
- Measurement of work;
- Inspection of safety aspects; and

- Final inspection and turnover

The necessary construction periods are 16 months for Stage-3 (from Sta. 1+900 to Sta.13+100).

The improvement length is 11.2 km in Stage-3, this section is located on the soft soil layer which requires the same monitoring procedure for Stage-2. Many involuntary resettlements would be occurred due to the nature of this area is populous. A lot of close meetings with client and close attention to PAPs are required.

Therefore one (1) resident engineer and one (1) more engineer are stationed for Stage-3 as well.

2.2.4.5 Quality Control Plan

The quality control plan for concrete work is shown in the Table 2.2.4.5-1 and the quality control plan for earthwork and pavement work is shown in Table 2.2.4.5-2.

Table 2.2.4.5-1 Quality Control Plan for Concrete Work

Item	Test	Test Method (Specification)	Frequency of Test
Cement	Physical property test	JIS R 5201 - 3	Once before trial mix. Thereafter, once a month or when the material brand is changed.
Fine Aggregate	Physical property test	JIS A 1103	Once before trial mix. Thereafter, once a month or when the material source is changed.
	Sieve analysis	JIS A 1102	Once a month
Coarse Aggregate	Physical property test	JIS A 1110, 1121	Once before trial mix. Thereafter, once in every 1,500 m ³ or when the material resource is changed.
	Sieve analysis	JIS A 1102	Once a month
Water	Quality test	pH, Cl ⁺	Once before trial mix
Concrete	Slump test	JIS A 1101	Once in every 50m ³ for each category
	Moisture content test	JIS A 1111	Once a day
	Compressive strength test	JIS A 1108	6 specimens per 100 m ³ in each category (3 specimens for 7 days strength test and 3 specimens for 28 days strength test)

Table 2.2.4.5-2 Quality Control Plan for Earthwork and Pavement Work

Work Item	Test	Test Method (Specification)	Frequency of Test
Embankment	Density in-situ	JIS A 1214	Once in every 5,000m ³ , 500 m ³ in subgrade.
Base course / subbase course	Sieve analysis	JIS A 1102	Once before placement and when the material source is changed.
	CBR	<i>Hosou-shiken hou 2-3-1</i>	Once before placement and when the material source is changed.
	Moisture-density relation	JIS A 1210	Once before placement and when the material source is changed.
	Density in-situ	<i>Hosou-shiken hou 2-5-3</i>	Once in every 1,000m ²
Asphalt concrete surface course	Temperature of asphalt mixture	-	As required
	Bulk specific gravity	<i>Hosou-shiken hou 2-5-3</i>	Once every 1,500 m ²

2.2.4.6 Procurement Plan

(1) Construction Materials

The construction materials available in Cambodia are sand, crashed stone, aggregate, asphalt concrete, ready mixed concrete (only in and around Phnom Penh), prefabricated concrete products and timbers. All others are imported.

Procurement plan of the major materials is shown in Table 2.2.4.6-1.

Table 2.2.4.6-1 Material Procurement Plan

Item	Procurement Source			Remarks
	Cambodia	Japan	Third Country	
<u>Construction Materials</u>				
Crusher-run (Foundation, roadbed)	○			
Cement	○			
Sand	○			
Crusher-run (Coarse Aggregate)	○			
Reinforcing Bar : D6 - D32	○			
Concrete Admixture		○		Japan
Boulder (Wet Stone Masonry)	○			
Reinforced Concrete Pipe	○			
Straight Asphalt			○	Singapore
Mattress Gabion		○	○	Japan, Thailand
Concrete Curb Block	○			
Verge Block	○			
Interlocking Block	○			
Timber	○			

(2) Equipment

There is no equipment lease company in Cambodia while equipments owned by local contractors are possible to be leased. The common equipments owned by local contractors are of old model and quantity is not enough for this Project. Special equipments such as large crane, reverse circulation drill, vibration hammer, erection girder facilities, etc. are not locally available and to be procured from the third countries or Japan. Procurement plan of the major equipment is shown in Table 2.2.4.6-2.

Table 2.2.4.6-2 Procurement Plan of Major Equipment

Item	Type	Procurement Source				Remarks
		Cambodia		Third Country	Japan	
		Lease from Local Contractor	Lease near NR1			
Backhoe	0.27m ³				○	
Backhoe	0.5m ³	○		○		Thailand
Backhoe	0.8m ³	○				
Backhoe	1.4m ³				○	
Bulldozer	3 t			○		Thailand
Bulldozer	15 t	○		○		Thailand
Bulldozer	21 t				○	
Motor Grader	3.1m	○		○		Thailand
Road Roller	10~12 t	○				
Pneumatic Tire Roller	8-20t	○			○	Left-hand-drive
Vibration Roller	0.8~1.1 t	○				
Vibration Roller	3~4 t	○				
Vibration Roller	15~18 t				○	
Road Stabilizer	1.2m				○	
Road Stabilizer	2.0m				○	
Water Tanker	6m ³	○				
Dump Truck	10 t	○			○	Left-hand-drive
Agitator Truck	4.5m ³				○	Left-hand-drive
Asphalt Finisher		○				
Asphalt Distributor		○				
Truck	2t, 4t	○				
Concrete Mixing Plant				○		Thailand
Sub-base Mixing Plant	105m ³ /h				○	
Portable Impact Crusher	53t/h				○	
Truck Crane	20t			○		Thailand
Trailer	20~40t	○				

2.2.4.7 Implementation Schedule

The implementation schedule of the project is as shown in Table 2.2.4.7-1. The construction schedule is as follows:

Stage-1: Construction of Bridge No. 2 and 3: November 2005 to January 2007.

Stage-2: Sta. 13+1000 – Sta. 55+ 980 (Neak Loueng): November 2006 to March 2009

Stage-3: Sta. 1+900 – Sta. 13+100: November 2008 to February 2010

Table 2.2.4.7-1 Implementation Schedule

Stage	Work Item	Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32					
Stage 1	Rehabilitation of 2 Bridges	Site Survey	█																																				
		Work in Japan	█																																				
		Finalization	█																																				
		Preparatory Work	█																																				
		Bridge	█																																				
		Approach Road	█																																				
		Road Facility																		█																			
Stage 2	Sta.13+100 ~ Sta.55+980 Rehabilitation of 1 Bridge, 9 Culverts and Road Improvement (L=42.88km)	Site Survey	█																																				
		Work in Japan	█																																				
		Finalization	█																																				
		Preparatory Work	█																																				
		Bridge	█																																				
		Culvert																																					
		Road																																					
Stage 3	Sta.0+000 ~ Sta.13+100 Road Improvement (L=13.1km)	Road Facility																																					
		Site Survey	█																																				
		Work in Japan	█																																				
		Finalization	█																																				
		Road																																					
		Road Facility																																					
		Demobilization																																					

2.3 Obligations of the Government of Cambodia

The following measures should be undertaken by the Government of Cambodia on condition that the Grant Aid by the Government of Japan is extended to the Project.

- To provide data and information necessary for the Project.
- To relocate existing utilities such as power poles, power cable, optical cable and water pipes, etc.
- To bear commissions to the bank in Japan for its banking services based upon the Banking Arrangement, namely the advising commission of the “Authorization to Pay” and payment commission.
- To ensure prompt unloading, tax exemption, customs clearance at the port of disembarkation in Cambodia and prompt internal transportation of the materials and equipment for the Project.
- To exempt Japanese nationals engaged in the Project from customs duties, internal taxes and other fiscal levies, which may be imposed in Cambodia with respect to the supply of the products and services under the verified contracts.
- 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 Cambodia and stay therein for the performance of their work.
- To provide necessary permission, licenses and other authorizations for implementing the Project.
- To maintain and use properly and effectively the facilities constructed under the Project.
- To coordinate and solve any issues related to the Project which may be raised from third parties or inhabitants in the Project area during implementation of the Project.
- To bear all the expenses, other than those covered by the Japan’s Grant Aid, necessary for the Project.

The Government of Cambodia should execute the resettlement of the Project affected people (PAPs) including the followings.

- Agreement on compensation consent from PAPs;
- Confirmation to budgetary arrangement for resettlement compensation
- Compensation payment to PAPs; and
- Rehabilitation of life on PAPs

2.4 Project Operation Plan

(1) Operation and Maintenance System

Maintenance of the Project road after completion will be undertaken by MPWT and Departments of Public Works and Transport of the Municipality/Provinces and those obliged to maintain the Project road. The demarcation of maintaining the Project road is as follows:

Sta.1+900 - Sta.5+000 : Phnom Penh Municipality

Sta.5+000 - Sta.13+100 : Kandal Province

Jurisdictionally, Departments of Public Works and Transport of Municipality/Provinces belong to both MPWT and Municipal/Provincial governments. Demarcation of tasks related to maintenance of roads between the Municipal/Provincial Departments and the MPWT is as follows:

- Daily maintenance works such as cleaning of road surface ditch and culverts, slope vegetation management, maintenance of lighting, etc. are executed by the Municipal/Provincial Departments using the maintenance budgets of Municipal/Provincial governments.
- Repair/rehabilitation works such as crack sealing and pothole patching of pavement, repair of bridge revetment and riverbed protection, etc. are executed by the Municipal/Provincial Departments in some cases and by the MPWT in other cases.

In the former case, the necessary budget for specific tasks is requested to the MPWT and the work is executed using the budget when approved. The inspection to assess the necessity of the works, decide the scope of works and estimate the budget is usually conducted jointly with the MPWT and the Ministry of Economy and Finance.

In the latter case, the Maintenance Management Office set up in the General Directorate of Public Works is in charge.

(2) Maintenance Works to be Done

Necessary maintenance works for the Project road are as follows:

- Daily Maintenance : Routine inspection, cleaning of road surface ditch/culverts, maintenance of slope planting, cleaning of bridge ancillary facilities and maintenance of lighting, etc.
- Repair/Rehabilitation : Sealing of pavement crack, repair of pothole, repair of guidepost, repair of wet masonry (revetment, retaining wall), repair of slope damage, patching of

bridge surface pavement, reconstruction of bridge surface pavement, repair of hand rail, repair of revetment/riverbed protection, repair of older damages, etc.

The daily maintenance and the repair will be done by the Municipal/Provincial Departments of Public Works and Transport and by the MPWT respectively.

Although the road, bridges and culverts to be improved/constructed in this Project have high durability and weather resistance, the repair works of riverbed protection may possibly be necessary after the floods. Since the repair works of riverbed protection and revetment have been carried out frequently in Cambodia, no technical difficulty is expected in executing those repair works. Extensive repairs will not be required for a fairly long time for other structures. No technical difficulty is expected in executing daily maintenance works as well. It is considered possible for the road to be properly operated and maintained under the present system.

2.5 Rough Project Cost

2.5.1 Rough Estimate of Project Cost

The total project cost necessary to implement this Project is estimated at 8,194 Million Yen. The costs to be borne by both governments, Japan and Cambodia based on the scope of works for both governments as previously stated and respective details are estimated as follows on the conditions shown in (3) below.

This cost estimate is provisional and would be further examined by the Government of Japan for the approval of the Grant.

(1) Cost Borne by the Government of Japan

The project cost will be implemented in accordance with the Japan's Grant Aid scheme and the cost will be determined before concluding the Exchange of Note for the Project.

(2) Cost Borne by the Government of Cambodia

Total Cost approximately 23,160 Million Riel (equivalent to 632 Million Yen)

Item	Roughly Estimated Cost	
	Riel in Million	Equivalent JPN Yen in Million
Compensation to PAPs	2,844	78
Relocation of Power Line	4,919	134
Relocation of Fiber Optical Cable	7,392	202
Relocation of Water Pipe	672	18
Total	15,827	432

(3) Conditions in Cost Estimate

- Time of Cost Estimate: June 2004
- Exchange Rate : 1US Dollar =109.17 Yen
1,000 Riel = 27.293 Yen
- Construction Period : as shown in the Implementation Schedule
- Others : This Project is implemented in accordance with the system of Japan's Grant Aid.

2.5.2 Estimated Maintenance Cost

The annual costs of the maintenance works are roughly estimated at US\$ 21,970 as detailed in Table 2.5.2-1.

When the Project is completed, both routine inspection and daily maintenance work are undertaken by the Department of Public Works and Transport those belong to Municipality and Province. And repair and rehabilitation are undertaken by MPWT.

Table 2.5.2-1 Maintenance Plan and Cost Estimate

1. Routine Inspection (Undertaken by the Departments of Public Works and Transport of Municipality/Province)										
Facility	Inspection Item	Frequency	Number of Staff	Equipment	Quantity	Cost (US\$/year)				
Road		12 times a year (4 days/time)	2 persons	scoop, hammer, sickle, barricade, pick-up truck	Worker:	480				
Pavement	crack, deformation, pothole, etc.				96 man-day					
Sholder/slope	erosion, collapse, etc.				/year					
Pavement marking	injury, deformation, stain, splitting									
Guide post	damage				Pick-up:					
Revetment	crack, damage, collapse, etc.				48 veh-day					
Bridge					/year					
Pavement	crack, deformation, pothole, etc.									
Drainage	existence of soil, obstacles									
Pavement marking	injury, deformation, stain, splitting									
Structure	damage on bridge surface/ abutment/ pier									
Revetment/ Riverbed protection	crack, damage, collapse, etc.									
Ancillary facilities	damage of lighting, apparatus to attach utilities, handrail etc.									
Culvert										
Structure	displacement, damage									
Revetment/ Riverbed protection	crack, damage, collapse, etc.									
					Subtotal	2,160				
2. Daily maintenance work (Undertaken by the Departments of Public Works and Transport of Municipality/Province)										
Facility	Work Item	Frequency	Number of Staff	Equipment/ Materials	Quantity	Cost (US\$/year)				
Road		12 times a year (4 days/time)	5 persons	scoop, barricade, mowing machine, broom, tools, pick-up truck, bulb	Worker:	2,880				
Pavement	cleaning				240 man-day					
Sholder/slope	cleaning, cutting grass				/year					
Pavement marking	cleaning				Pick-up:					
Bridge					48 veh-day					
Pavement	cleaning				/year					
Drainage	clearance of soil, obstacles									
Pavement marking	cleaning									
Lighting	cleaning, replacement of bulb									
									Subtotal	2,880
Subtotal of routine inspection and daily maintenance							5,040			
3. Repair/Rehabilitation (Undertaken by the MPWT)										
Facility	Work Item				Frequency		Number of Staff	Equipment/ Materials	Quantity	Cost (US\$/year)
Road					2 times a year (20 days/time)		8 persons		Worker:	16,930
Pavement	crack sealing, patching of potholes,	320 man-day								
Sholder/slope	repair of damages	/year								
Pavement marking	re-marking	Plate tamper								
Guide post	repair of damages, replacement	40 unit-day								
Revetment	repair of damages	/year								
Bridge		Pick-up truck								
Pavement	crack sealing, patching of potholes,	80 veh-day								
Drainage	repair of damages	/year								
Pavement marking	re-marking	Base course								
Structure	repair of damages	100 m ³ /year								
Revetment/ Riverbed protection	repair of damages	Asphalt concrete								
Ancillary facilities	repair of damages, repainting	10 t/year								
Culvert		Cement								
Structure	repair of damages	100 bags/year								
Revetment/ Riverbed protection	repair of damages	Boulder								
		50 m ³ /year								
		Road marking paint								
		1,000 m/year								
		Subtotal	16,930							
Total						21,970				

The total budgets appropriated for the road maintenance by office in charge in the last three years are shown in Table 2.5.2-2.

Table 2.5.2-2 Total Maintenance Budgets in the Last Three Years (Unit : US\$)

Year	2001	2002	2003
MPWT	2,134,000	1,116,800	1,997,200
Phnom Penh Mun.	715,500	2,027,200	1,052,200
Kandal Province	—	143,000	28,000
Total	2,849,500	3,287,000	3,077,400

The required costs for the routine inspection and daily maintenance of the Project road are 5,040 US\$/yr accounting for about 0.4% of the total budgets of the two (2) concerned Municipal/Provincial DPWTs in 2004 appropriated for the road maintenance and the required costs for repair works of the Project road is 16,930 US\$/yr accounting for about 0.8% to 1.5% of the budget of the MPWT for the road maintenance. No financial problem in budgets is expected.