NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.

(Ministry of Road, Transport & Highways)

Government of India

Schedules

FOR

Two Laning of Imphal – Moreh Section of NH 39 (Package II) from Km 350.000 to Km 395.680 in the State of Manipur on

Engineering, Procurement & Construction (EPC) Mode

BID DOCUMENT

Aug-2017

BUILDING INFRASTRUCTURE - BUILDING THE NATION

National Highways & Infrastructure Development Corporation Ltd
3rd Floor, PTI Building, 4-Parliament Street, New Delhi-110001

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SCHEDULE – A
(See Clause 8.1)

SITE OF THE PROJECT

1 **The Site**

1.1 Site of the Two-Lane Project Highway shall include the land, buildings, structures and road works as described in Annex-I of this Schedule-A.

1.2 The dates of handing over the Right of Way to the Contractor are specified in Annex-II of this Schedule-A.

1.3 An inventory of the Site including the land, buildings, structures, road works, trees and any other immovable property on, or attached to, the Site shall be prepared jointly by the Executing Agency Representative and the EPC Contractor, and such inventory shall form part of the memorandum referred to in Clause 8.2.1 of the Agreement.

1.4 The alignment plans of the Project Highway are specified in Annex-III. In the case of sections where no modification in the existing alignment of the Project Highway is contemplated, the alignment plan has not been provided. Alignment plans have only been given for sections where the existing alignment is proposed to be upgraded. The proposed profile of the Project Highway shall be followed by the contractor with minimum FRL as indicated in the alignment plan. The contractor, however, improve/upgrade the Road Profile as indicated m Annexure-III based on site/design requirement.

1.5 The status of the environment clearances obtained or awaited is given in Annex IV of Schedule A.

1.6 Additional land required for construction of works specified in the Change of Scope Order issued under Clause 13.2 of this Agreement shall be acquired. Upon acquisition, such land shall form part of the Site and vest in the Executing Agency.


Project Road Starts
From Km 350+000
Kakching
Project Road Ends
From Km 395+680

Annex - I
(Schedule-A)

Site for Two-Laning

1.0 The Site

The Road start in Imphal city, first 10 km section has already been undertaken by MoRTH for upgrading to 4 lane carriageway and 6 km from start is already upgraded and remaining 4 km section has been sanctioned for upgradation to 4-lane and is in advance stage of Implementation. Hence the project start has been considered as km 330+000. The project concerns upgrading about 95.411 kilometers of existing National Highway 39 in the State of Manipur and ends at Moreh (Myanmar Border) at its km 430+400. The road run through plain terrain up to Pallel (36Kms) and remaining road section passes through hilly/rolling terrain (from Pallel to Moreh). **This project section road (Package-II) starts from Km 350+000 (near Wangjing Village) to Km 395+680 (near Khonckhang Village)**.

The topography falls under the plain terrain of IRC classification and traverse generally through rural area with semi-urban areas in some places.

Majority of the land use along the project road is for agriculture in rural areas and commercial, residential, educational institutions, petrol stations and religious centers etc in built-up sections.

Traffic on this stretch of project road is of mixed type mostly with small passenger's vehicles and two wheelers. The number of commercial vehicles & passenger vehicles are very much less.

1.1 Referencing System

Kilometer stones are existing in some of the locations of the project highway. It is called the "Existing Chainage". During topographical survey with Total Station, observations made are referred to "Design Chainage". The relationship between the "Existing Chainage" and the "Design Chainage" as per field surveys of the location of existing Km stones using the total station for the "Project Highway" is given below:

Design Chainage corresponding to Existing Chainage

Design Chainage (Km)		**Existing Chainage (Km)**		**Remarks**
From	**To**	**From**	**To**	
Wangjing - Khonckhang				
350+000	395+680	350.000	395.680	NH-39

2.0 Land

The Site of the Project Highway comprises the land described below:

Chainage		**ROW (m)**
From	**To**	
350+000	395+680	15

3.0 Carriageway

The present carriageway width is approximately 7.00 m. The type of the existing pavement is flexible.

4.0 Major Bridges

The Site includes the following Major Bridges:

S. No	Name of Bridge	Type	Existing Chainage (km)	Width (m)	Span Arrangement (m)	Type of Structure		
						Foundation	Sub-structure	Super-structure
1	Pallel	Major	365+550	6.0	6x10.0	Well	RCC Abutment, pier	RCC solid slab

5.0 Railway Over Bridges (ROB)/ Railway under Bridges (RUB) – Nil

6.0 Grade separators - Nil

7.0 Minor Bridges

The site includes the following Minor Bridges:

S. No	Name of Bridge	Type	Existing Chainage (km)	Width (m)	Span Arrangement (m)	Type of Structure		
						Foundation	Sub-structure	Super-structure
1.	Khongjom	Minor	352+800	8.5	2 x 5.8	Open	RCC Abutment, pier	RCC solid slab

8.0 Railway level crossings - NIL

9.0 Underpasses (vehicular) – NIL

S. No.	Location	Type	Existing Chainage (Km)	Width (m)	Span Arrangement (m)	Type of Structure		
						Foundation	Sub-structure	Super-structure
Nil								

10.0 Culverts

(i) The site includes the following Pipe Culverts:

S. No	CD No	Existing Chainage (km)	Type of Structure Arch/ Box/Slab	Type of Structure			Carriage way Width (m)	Width of Culvert (m)
				No of Spans	Clear Span (m)	Clear Height (m)		
1	-	350+980	Pipe	1	0.90	-	7.00	14.80
2	-	353+580	Pipe	1	0.90	-	6.50	14.00

S. No	CD No	Existing Chainage (km)	Type of Structure Arch/ Box/Slab	Type of Structure			Carriage way Width (m)	Width of Culvert (m)
				No of Spans	Clear Span (m)	Clear Height (m)		
3	-	361+540	Pipe	NV	NV	-	7.00	14.00
4	-	365+640	Pipe	1	0.90	-	7.00	18.00
5	-	368+020	Pipe	1	0.60	-	7.00	9.00
6	-	368+250	Pipe	1	0.90	-	7.00	11.00
7	-	368+488	Pipe	1	NV	-	7.00	11.00
8	-	369+684	Pipe	1	NV	-	7.00	8.00
9	-	369+989	Pipe	1	NV	-	7.00	10.00
10	-	370+100	Pipe	1	1.20	-	7.00	9.00
11	-	370+200	Pipe	1	NV	-	7.00	10.00
12	-	370+290	Pipe	1	NV	-	7.00	13.00
13	-	370+600	Pipe	1	0.9	-	7.00	11.0
14	-	371+235	Pipe	1	0.9	-	7.00	10.0
15	-	373+280	Pipe	1	0.9	-	7.00	12.0
16	-	378+240	Pipe	1	1.00	-	11.20	12.00
17	-	378+730	Pipe	1	0.90	-	11.20	12.00
18	-	380+870	Pipe	1	0.90	-	12.00	12.00
19	-	381+150	Pipe	1	0.60	-	12.00	12.00
20	-	381+240	Pipe	1	0.90	-	12.00	12.00
21	-	381+720	Pipe	1	0.90	-	12.00	12.00
22	-	381+980	Pipe	1	0.90	-	12.00	12.00
23	-	382+280	Pipe	1	0.90	-	12.00	12.00
24	-	382+950	Pipe	1	0.60	-	12.00	12.00
25	-	383+070	Pipe	1	0.60	-	12.00	12.00
26	-	383+110	Pipe	1	0.90	-	12.00	12.00
27	-	383+200	Pipe	1	0.90	-	12.00	12.00
28	-	383+720	Pipe	1	0.90	-	12.00	12.00
29	-	383+900	Pipe	1	1.20	-	14.00	14.00
30	-	383+980	Pipe	1	1.20	-	12.00	12.00
31	-	384+150	Pipe	1	1.20	-	14.00	14.00
32	-	384+350	Pipe	1	0.90	-	12.00	12.00
33	-	384+800	Pipe	1	0.90	-	12.00	12.00
34	-	384+950	Pipe	1	1.20	-	12.00	12.00
35	-	385+190	Pipe	1	0.90	-	12.00	12.00
36	-	385+480	Pipe	1	0.60	-	14.00	14.00
37	-	385+800	Pipe	1	0.60	-	12.00	12.00

S. No	CD No	Existing Chainage (km)	Type of Structure Arch/ Box/Slab	Type of Structure			Carriage way Width (m)	Width of Culvert (m)
				No of Spans	Clear Span (m)	Clear Height (m)		
38	-	386+016	Pipe	1	0.60	-	12.00	12.00
39	-	386+560	Pipe	1	0.90	-	12.00	12.00
40	-	386+840	Pipe	1	0.60	-	12.00	12.00
41	-	387+165	Pipe	1	0.90	-	11.40	12.00
42	-	387+600	Pipe	1	0.90	-	12.00	12.00
43	-	387+900	Pipe	1	0.90	-	10.60	11.20
44	-	388+015	Pipe	1	0.90	-	12.00	12.00
45	-	388+030	Pipe	1	0.60	-	12.00	12.00
46	-	388+340	Pipe	1	NV	-	12.00	12.00
47	-	388+700	Pipe	1	0.90	-	12.00	12.00
48	-	389+180	Pipe	1	0.90	-	12.00	12.00
49	-	389+500	Pipe	1	0.90	-	12.00	12.00
50	-	390+900	Pipe	1	NV	-	12.00	12.00
51	-	391+420	Pipe	1	0.60	-	12.00	12.00
52	-	393+040	Pipe	1	0.90	-	12.00	12.00
53	-	393+390	Pipe	1	NV	-	14.00	14.00
54	-	393+530	Pipe	1	NV	-	11.40	12.00
55	-	394+320	Pipe	1	0.90	-	11.20	12.00
56	-	394+810	Pipe	1	0.90	-	11.20	12.00
57	-	395+150	Pipe	1	0.90	-	11.20	12.00
58	-	395+350	Pipe	1	0.90	-	11.20	12.00
59	-	395+500	Pipe	1	1.20	-	11.00	12.00

(ii) The site includes the following Slab Culverts:

S. No	CD No	Existing Chainage (km)	Type of Structure Arch/ Box/Slab	Type of Structure			Carriage way Width (m)	Width of Culvert (m)
				No of Spans	Clear Span (m)	Clear Height (m)		
1	-	350+453	Slab	1	1.0	1.2	7.0	11.2
2	-	350+990	Slab	1	1.5	1.5	7.0	12
3	-	351+250	Slab	1	1.0	1.0	7.0	11.2
4	-	351+582	Slab	1	1.0	NV	7.0	11.2
5	-	351+725	Slab	1	2.0	1.5	7.0	11.2
6	-	352+050	Slab	1	2.0	1.0	7.0	11.4
7	-	352+450	Slab	1	1.5	1.5	7.0	11.4
8	-	352+600	Slab	1	1.0	NV	7.0	10.2

S. No	CD No	Existing Chainage (km)	Type of Structure Arch/ Box/Slab	Type of Structure			Carriage way Width (m)	Width of Culvert (m)
				No of Spans	Clear Span (m)	Clear Height (m)		
9	-	352+723	Slab	1	2.0	1.5	7.0	13.2
10	-	353+600	Slab	1	2.0	1.5	7.0	11.2
11	-	354+380	Slab	1	4.0	2.5	7.0	11.4
12	-	354+900	Slab	1	5.1	1.8	11.0	11.4
13	-	355+940	Slab	1	2.0	2.0	7.2	11.8
14	-	356+670	Slab	1	4.5	2.5	7.0	10
15	-	357+350	Slab	1	1.8	1.5	7.0	11.2
16	-	358+150	Slab	1	1.8	1.5	7.0	11.2
17	-	360+240	Slab	1	1.0	1.5	7.0	11.2
18	-	360+250	Slab	1	2.0	1.0	7.2	11.2
19	-	360+800	Slab	1	1.0	2.0	6.8	11.2
20	-	362+700	Slab	1	3.0	1.0	7.0	12
21	-	363+300	Slab	1	2.0	1.2	7.0	11.5
22	-	363+900	Slab	1	NV	NV	7.0	11.2
23	-	364+890	Slab	1	1.5	1.5	7.0	11.2
24	-	365+350	Slab	1	5.0	NV	7.0	9.4
25	-	365+370	Slab	1	NV	NV	7.0	14
26	-	365+890	Slab	1	1	0.8	7.0	12
27	-	366+300	Slab	1	2	1	7.0	11.3
28	-	366+380	Slab	1	1.5	3.0	7.0	11.3
29	-	368+445	Slab	1	1.5	NV	7.0	11.3
30	-	368+900	Slab	1	2	1.8	7.0	11.4
31	-	369+013	Slab	1	NV	NV	7.0	11.3
32	-	369+250	Slab	1	2	2	7.0	11.4
33	-	370+400	Slab	1	1.5	1.0	7.0	11.2
34	-	371+625	Slab	1	1.5	2.0	7.0	11.2
35	-	374+200	Slab	1	1.5	2.0	7.0	11.2
36	-	375+270	Slab	1	1.2	1.0	7.0	11.2
37	-	376+550	Slab	1	2.0	1.0	7	11.3
38	-	377+050	Slab	1	2.0	1.5	8	9.2
39	-	377+250	Slab	1	1.5	1.0	7	9.4
40	-	378+500	Slab	1	1.8	1.1	7	11.2
41	-	379+350	Slab	1	1.0	1.0	7	10.8
42	-	379+375	Slab	1	1.0	NV	7	10.9
43	-	380+330	Slab	1	2.0	1.5	7	10.4

S. No	CD No	Existing Chainage (km)	Type of Structure Arch/ Box/Slab	Type of Structure			Carriage way Width (m)	Width of Culvert (m)
				No of Spans	Clear Span (m)	Clear Height (m)		
44	-	380+560	Slab	1	1.5	1.5	7	10.4
45	-	382+160	Slab	1	2.0	1.0	7	9.6
46	-	383+220	Slab	1	2.0	1.5	8	12.4
47	-	386+230	Slab	1	1.5	1.5	7	11.4
48	-	388+900	Slab	1	2.0	1.5	7	11.4
49	-	390+000	Slab	1	2.0	2.0	7	10.5
50	-	390+630	Slab	1	1.5	1.5	8	13.4
51	-	392+100	Slab	1	1.5	0.8	7	11.4
52	-	393+280	Slab	1	1.8	4.0	7	11.4
53	-	393+530	Slab	1	1.0	3.0	7	11.4
54	-	394+050	Slab	1	1.0	2.1	7	11.4
55	-	394+210	Slab	1	2.2	1.8	7	11.4
56	-	394+380	Slab	1	1.2	2.0	7	11.4
57	-	394+444	Slab	1	1.2	1.8	7	11.4

11.0 Bus bays

The details of bus stops on the Site are as follows:

S. No	Existing Chainage	Side
1	355+150	RHS
2	360+100	LHS
3	362+000	LHS

12.0 Truck Lay byes

The details of truck lay byes are as follows:

S. No	Design Chainage (km)	Existing Chainage (km)	Side
Nil			

13.0 Roadside drains

The details of the roadside drains are as follows:

From	To	Side	Type

Nil

14.0 Major Junctions

The details of major junctions are as follows:

S. No	Existing Chainage	Type	Type of junction
Nil			

15.0 Minor Junctions

The details of minor junctions are as follows:

S. No	Existing Chainage	Type	Type of junction
1	351+700	At-Grade	T
2	352+550	At-Grade	T
3	352+600	At-Grade	T
4	353+050	At-Grade	T
5	353+650	At-Grade	T
6	353+100	At-Grade	T
7	354+400	At-Grade	T
8	357+550	At-Grade	T
9	357+750	At-Grade	T
10	360+150	At-Grade	T
11	365+850	At-Grade	T

16.0 Bypasses

Nil

17.0 Total number of structures on the Site

Total number of structures on the Site is noted below:

a)	Total No. of Major Bridges	-	1
b)	Total No. of Railway Over/Under Bridges	-	Nil
c)	Total No. of Minor Bridges	-	1
d)	Total No. of Pipe Culverts	-	59
e)	Total No. of Slab Culverts	-	57
f)	Total No. of Box Culverts	-	Nil
g)	Total No. of Flyovers	-	Nil
h)	Level Crossings	-	Nil

18.0 Built Up Locations

The following are the Built-up locations on the Project Road.

S. No	Existing Chainage (Km)		Length (m)	Name of the Village/Town
	Start	End		
1	351+500	353+100	1600	Khongjom
2	357+300	358+200	900	Sora
3	359+900	360+300	400	Kakching Lamkhai
4	362+900	363+200	300	Bijoypur
5	365+100	366+300	1200	Pallel
6	373+700	374+200	500	Bangjing
7	377+400	377+700	300	Senam
8	382+800	383+000	200	Saivom
9	389+600	390+600	1000	Tengnoupal
10	392+800	393+200	400	Chahmol

Annex -II

(Schedule-A)

Dates for providing Right of Way

The dates on which the Authority shall provide Right of Way to the Contractor on different stretches of the Site are stated below: To be filled by NHIDCL

S. No	From	To	Length	Total ROW Width (m)	Date of Providing ROW*
1	350+000	352+300	2300	45	To be filled by NHIDCL
2	352+300	353+300	1000	41.5	To be filled by NHIDCL
3	353+300	357+600	4300	45	To be filled by NHIDCL
4	357+600	358+100	500	41.5	To be filled by NHIDCL
5	358+100	364+600	6500	45	To be filled by NHIDCL
8	364+600	366+200	1600	41.5	To be filled by NHIDCL
9	366+200	373+730	7530	24	To be filled by NHIDCL
10	373+730	374+020	290	16	To be filled by NHIDCL
11	374+020	375+000	980	24	To be filled by NHIDCL
12	375+000	395+680	20680	24	To be filled by NHIDCL

* The dates specified herein shall in no case be beyond 150 (one hundred and fifty) days after the Appointed Date.

Annex - III
(Schedule - A)

Alignment Plans

The existing alignment plan of the Project Highway is enclosed in digital form.

Annex - IV
(Schedule - A)

Environment Clearances

To be filled by the Environment Consultant Appointed by ADB.

SCHEDULE - B
(See Clause 2.1)

DEVELOPMENT OF THE PROJECT HIGHWAY

1 Development of the Project Highway

Development of the Project Highway shall include design and construction of the Project Highway as described in this Schedule-B and in Schedule-C.

2 Rehabilitation and augmentation

Rehabilitation and augmentation shall include Two-Laning with Paved Shoulder and strengthening of the Project Highway as described in Annex-I of this Schedule-B and in Schedule-C.

3 Specifications and Standards

The Project Highway shall be designed and constructed in conformity with the Specifications and Standards specified in Annex-I of Schedule-D.

Annex – I

(Schedule – B)

Description of Two – Laning

1 WIDENING OF THE EXISTING HIGHWAY

1.1 The Project Highway shall follow the existing alignment unless otherwise specified by the Authority and shown in the alignment plans specified in Annex III of Schedule-A. Geometric deficiencies, if any, in the existing horizontal and vertical profiles shall be corrected as per the prescribed standards for [plain /rolling /Hilly] terrain to the extent land is available. The horizontal alignment provided in the plan and profile shall remain unchanged in realignment locations where if any issue arises the same shall be finalized in consultation with Authority /Authority Engineer.

1.2 Width of Carriageway

1.2.1 The paved carriageway shall be 10.0 meters (2x3.5m + 2x1.5m paved shoulder) for 2-Lane in accordance with typical cross section drawings, except in the areas mentioned in the table below where paved carriageway shall be 11.0 meters (2x3.5m + 2x2.0m paved shoulder).

S. No	Built-up Town	Design Chainage (Km)		Length (m)	TCS Type
		From	To		
Nil					

2. GEOMETRIC DESIGN AND GENERAL FEATURES

2.1 General

Geometric design and general features of the Project Highway shall be in accordance with the relevant Sections of the Manuals for two laning.

2.2 Design speed

The design speed shall be as per the alignment plan enclosed in Annexure II of Schedule -A.

2.3 Improvement of the existing road geometrics

In the following sections, where improvement of the existing road geometrics to the prescribed standards is not possible, the existing road geometrics shall be improved to the extent possible within the given right of way and proper road signs and safety measures shall be provided:

S. No.	From (Km)	To (Km)	Type of Deficiency	Remarks
1	363+080	363+410	Sharp Existing Curvature	Adopted Design Speed of 80 Kmph
2	363+410	363+590	Sharp Existing Curvature	Adopted Design Speed of 80 Kmph
3	364+000	364+050	Sharp Existing Curvature	Adopted Design Speed of 80 Kmph

S. No.	From (Km)	To (Km)	Type of Deficiency	Remarks
4	364+600	364+680	Sharp Existing Curvature	Adopted Design Speed of 65 Kmph
5	364+680	364+880	Sharp Existing Curvature	Adopted Design Speed of 65 Kmph
6	365+130	365+250	Sharp Existing Curvature	Adopted Design Speed of 65 Kmph
7	365+440	365+930	Sharp Existing Curvature	Adopted Design Speed of 65 Kmph
8	366+110	366+130	Sharp Existing Curvature	Adopted Design Speed of 65 Kmph
9	366+260	366+470	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
10	366+470	366+640	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
11	366+640	366+710	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
12	366+710	366+790	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
13	366+790	366+840	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
14	366+900	366+990	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
15	366+990	367+190	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
16	367+190	367+240	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
17	367+240	367+450	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
18	367+450	367+520	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
19	367+520	367+650	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
20	367+650	367+830	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
21	367+830	367+910	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
22	367+910	367+970	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
23	367+970	368+070	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
24	368+070	368+160	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
25	368+230	368+450	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
26	368+450	368+550	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
27	368+550	368+610	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
28	368+610	368+660	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
29	368+710	368+840	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
30	368+840	369+020	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
31	369+020	369+110	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
32	369+110	369+170	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
33	369+170	369+240	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
34	369+240	369+360	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph

S. No.	From (Km)	To (Km)	Type of Deficiency	Remarks
35	369+360	369+420	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
36	369+550	369+630	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
37	369+630	369+720	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
38	369+800	369+860	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
39	369+920	370+000	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
40	370+080	370+270	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
41	370+270	370+360	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
42	370+400	370+480	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
43	370+480	370+560	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
44	370+560	370+650	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
45	370+650	370+680	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
46	370+800	370+960	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
47	370+960	371+090	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
48	371+110	371+200	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
49	371+200	371+290	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
50	371+290	371+380	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
51	371+380	371+480	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
52	371+480	371+550	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
53	371+550	371+610	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
54	371+610	371+710	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
55	371+710	371+790	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
56	371+870	371+940	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
57	371+940	372+090	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
58	372+090	372+160	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
59	372+260	372+330	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
60	372+330	372+390	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
61	372+390	372+450	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
62	372+550	372+620	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
63	372+690	372+750	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
64	372+750	372+910	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
65	372+910	373+070	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph

S. No.	From (Km)	To (Km)	Type of Deficiency	Remarks
66	373+070	373+170	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
67	373+170	373+380	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
68	373+380	373+490	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
69	373+490	373+540	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
70	373+540	373+900	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
71	373+900	373+970	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
72	373+970	374+010	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
73	374+010	374+070	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
74	374+070	374+150	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
75	374+150	374+260	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
76	374+260	374+350	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
77	374+350	374+380	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
78	374+380	374+560	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
79	374+560	374+670	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
80	374+670	374+760	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
81	374+760	374+790	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
82	374+790	374+870	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
83	374+870	374+950	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
84	374+950	375+010	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
85	375+010	375+080	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
86	375+080	375+150	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
87	375+150	375+240	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
88	375+330	375+360	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
89	375+360	375+410	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
90	375+510	375+590	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
91	375+590	375+630	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
92	375+630	375+680	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
93	375+810	375+980	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
94	375+980	376+100	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
95	376+100	376+140	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
96	376+140	376+330	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph

S. No.	From (Km)	To (Km)	Type of Deficiency	Remarks
97	376+330	376+440	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
98	376+460	376+570	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
99	376+660	376+710	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
100	376+710	376+830	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
101	376+830	376+870	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
102	376+870	376+940	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
103	376+940	377+080	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
104	377+230	377+290	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
105	377+290	377+360	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
106	377+360	377+490	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
107	377+490	377+560	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
108	377+560	377+730	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
109	377+720	377+810	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
110	377+930	378+010	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
111	378+010	378+090	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
112	378+130	378+210	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
113	378+210	378+330	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
114	378+370	378+470	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
115	378+500	378+590	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
116	378+660	378+710	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
117	378+710	378+790	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
118	378+790	378+840	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
119	378+840	378+920	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
120	379+000	379+090	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
121	379+110	379+190	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
122	379+210	379+290	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
123	379+310	379+390	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
124	379+390	379+480	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
125	379+480	379+570	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
126	379+570	379+640	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
127	379+640	379+780	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph

S. No.	From (Km)	To (Km)	Type of Deficiency	Remarks
128	379+780	379+840	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
129	379+840	379+900	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
130	379+960	380+040	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
131	380+040	380+080	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
132	380+080	380+150	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
133	380+170	380+290	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
134	380+290	380+350	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
135	380+380	380+460	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
136	380+460	380+550	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
137	380+550	380+590	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
138	380+590	380+670	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
139	380+720	380+770	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
140	380+770	380+820	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
141	380+820	380+930	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
142	380+980	381+030	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
143	381+030	381+090	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
144	381+190	381+450	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
145	381+490	381+570	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
146	381+570	381+610	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
147	381+610	381+700	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
148	381+700	381+770	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
149	381+770	381+840	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
150	381+840	381+910	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
151	381+910	381+960	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
152	381+960	382+000	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
153	382+000	382+060	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
154	382+060	382+100	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
155	382+100	382+130	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
156	382+130	382+190	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
157	382+190	382+250	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
158	382+290	382+330	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph

S. No.	From (Km)	To (Km)	Type of Deficiency	Remarks
159	382+330	382+400	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
160	382+400	382+470	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
161	382+470	382+530	Sharp Existing Curvature	Adopted Design Speed of 20 Kmph
162	382+530	382+580	Sharp Existing Curvature	Adopted Design Speed of 20 Kmph
163	382+580	382+640	Sharp Existing Curvature	Adopted Design Speed of 25 Kmph
164	382+640	382+720	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
165	382+720	382+770	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
166	382+770	382+840	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
167	382+840	382+930	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
168	382+930	382+960	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
169	382+960	383+110	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
170	383+110	383+200	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
171	383+200	383+290	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
172	383+290	383+380	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
173	383+380	383+430	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
174	383+430	383+520	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
175	383+520	383+680	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
176	383+680	383+770	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
177	383+770	383+930	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
178	383+930	384+070	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
179	384+070	384+150	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
180	384+150	384+240	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
181	384+240	384+310	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
182	384+310	384+370	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
183	384+370	384+430	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
184	384+430	384+510	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
185	384+510	384+740	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
186	384+740	384+810	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
187	384+810	384+870	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
188	384+870	384+940	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
189	384+940	385+010	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph

S. No.	From (Km)	To (Km)	Type of Deficiency	Remarks
190	385+010	385+090	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
191	385+150	385+250	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
192	385+250	385+310	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
193	385+310	385+380	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
194	385+380	385+460	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
195	385+460	385+520	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
196	385+520	385+600	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
197	385+600	385+680	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
198	385+680	385+800	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
199	385+800	385+920	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
200	385+920	385+970	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
201	385+970	386+030	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
202	386+030	386+100	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
203	386+100	386+220	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
204	386+300	386+400	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
205	386+400	386+500	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
206	386+500	386+760	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
207	386+760	386+970	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
208	386+970	387+060	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
209	387+060	387+180	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
210	387+180	387+310	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
211	387+310	387+380	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
212	387+380	387+570	Sharp Existing Curvature	Adopted Design Speed of 20 Kmph
213	387+570	387+630	Sharp Existing Curvature	Adopted Design Speed of 20 Kmph
214	387+680	387+760	Sharp Existing Curvature	Adopted Design Speed of 20 Kmph
215	387+770	387+800	Sharp Existing Curvature	Adopted Design Speed of 20 Kmph
216	387+840	387+870	Sharp Existing Curvature	Adopted Design Speed of 20 Kmph
217	388+050	388+140	Sharp Existing Curvature	Adopted Design Speed of 20 Kmph
218	388+140	388+180	Sharp Existing Curvature	Adopted Design Speed of 20 Kmph
219	388+170	388+250	Sharp Existing Curvature	Adopted Design Speed of 20 Kmph
220	388+230	388+290	Sharp Existing Curvature	Adopted Design Speed of 20 Kmph

S. No.	From (Km)	To (Km)	Type of Deficiency	Remarks
221	388+270	388+380	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
222	388+360	388+410	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
223	388+410	388+460	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
224	388+500	388+570	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
225	388+620	388+780	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
226	388+780	388+870	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
227	388+870	388+900	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
228	388+960	389+060	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
229	389+060	389+160	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
230	389+160	389+210	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
231	389+210	389+310	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
232	389+310	389+390	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
233	389+390	389+460	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
234	389+460	389+550	Sharp Existing Curvature	Adopted Design Speed of 20 Kmph
235	389+640	389+760	Sharp Existing Curvature	Adopted Design Speed of 20 Kmph
236	389+800	389+880	Sharp Existing Curvature	Adopted Design Speed of 20 Kmph
237	389+880	389+900	Sharp Existing Curvature	Adopted Design Speed of 20 Kmph
238	389+900	389+990	Sharp Existing Curvature	Adopted Design Speed of 20 Kmph
239	390+060	390+110	Sharp Existing Curvature	Adopted Design Speed of 20 Kmph
240	390+110	390+160	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
241	390+160	390+280	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
242	390+370	390+430	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
243	390+480	390+570	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
244	390+690	390+760	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
245	390+760	390+830	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
246	390+830	390+880	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
247	390+880	390+970	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
248	390+970	391+040	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
249	391+100	391+190	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
250	391+280	391+460	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
251	391+460	391+520	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph

S. No.	From (Km)	To (Km)	Type of Deficiency	Remarks
252	391+560	391+630	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
253	391+630	391+670	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
254	391+670	391+740	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
255	391+740	391+840	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
256	391+920	392+020	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
257	392+020	392+080	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
258	392+170	392+250	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
259	392+280	392+520	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
260	392+710	392+780	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
261	392+780	392+820	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
262	392+820	392+900	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
263	392+900	392+950	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
264	392+950	393+030	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
265	393+030	393+150	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
266	393+150	393+170	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
267	393+170	393+250	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
268	393+250	393+340	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
269	393+360	393+440	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
270	393+440	393+520	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
271	393+520	393+640	Sharp Existing Curvature	Adopted Design Speed of 20 Kmph
272	393+640	393+710	Sharp Existing Curvature	Adopted Design Speed of 20 Kmph
273	393+710	393+780	Sharp Existing Curvature	Adopted Design Speed of 20 Kmph
274	393+780	393+840	Sharp Existing Curvature	Adopted Design Speed of 20 Kmph
275	393+840	393+880	Sharp Existing Curvature	Adopted Design Speed of 20 Kmph
276	393+930	394+010	Sharp Existing Curvature	Adopted Design Speed of 20 Kmph
277	394+010	394+040	Sharp Existing Curvature	Adopted Design Speed of 20 Kmph
278	394+040	394+220	Sharp Existing Curvature	Adopted Design Speed of 20 Kmph
279	394+220	394+300	Sharp Existing Curvature	Adopted Design Speed of 20 Kmph
280	394+330	394+400	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
281	394+400	394+470	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
282	394+550	394+630	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph

S. No.	From (Km)	To (Km)	Type of Deficiency	Remarks
283	394+630	394+790	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
284	394+790	394+920	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
285	394+920	395+000	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
286	395+000	395+060	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
287	395+060	395+110	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
288	395+110	395+180	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
289	395+180	395+280	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
290	395+280	395+380	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
291	395+380	395+460	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
292	395+460	395+510	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
293	395+510	395+590	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
294	395+590	395+670	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
295	395+710	395+770	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
296	395+770	395+840	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph
297	395+970	395+680	Sharp Existing Curvature	Adopted Design Speed of 30 Kmph

S. No	From (Km)	To (Km)	Type of Deficiency	Gradient (%)
1	375+120	375+240	Sharp Existing Profile	7.00%
2	375+610	375+800	Sharp Existing Profile	5.00%
3	375+870	375+990	Sharp Existing Profile	5.00%
4	376+320	376+370	Sharp Existing Profile	6.00%
5	376+460	376+500	Sharp Existing Profile	8.00%
6	376+610	376+690	Sharp Existing Profile	8.00%
7	376+750	376+780	Sharp Existing Profile	7.00%
8	376+930	377+350	Sharp Existing Profile	6.00%
9	377+490	377+600	Sharp Existing Profile	6.00%
10	377+820	378+100	Sharp Existing Profile	5.00%
11	378+310	378+460	Sharp Existing Profile	7.00%
12	378+490	378+580	Sharp Existing Profile	8.00%
13	378+630	378+810	Sharp Existing Profile	6.00%
14	378+850	379+010	Sharp Existing Profile	8.00%
15	379+180	379+200	Sharp Existing Profile	8.00%

S. No	From (Km)	To (Km)	Type of Deficiency	Gradient (%)
16	379+340	379+440	Sharp Existing Profile	8.00%
17	379+550	380+170	Sharp Existing Profile	6.00%
18	380+290	380+450	Sharp Existing Profile	7.00%
19	380+710	380+890	Sharp Existing Profile	5.00%
20	381+090	381+270	Sharp Existing Profile	7.00%
21	381+460	381+630	Sharp Existing Profile	8.00%
22	381+740	381+780	Sharp Existing Profile	6.00%
23	382+160	383+030	Sharp Existing Profile	8.00%
24	383+410	383+450	Sharp Existing Profile	6.00%
25	383+680	383+730	Sharp Existing Profile	6.00%
26	385+930	385+970	Sharp Existing Profile	6.00%
27	386+140	386+300	Sharp Existing Profile	7.00%
28	386+390	386+570	Sharp Existing Profile	8.00%
29	386+640	387+260	Sharp Existing Profile	8.00%
30	387+560	387+590	Sharp Existing Profile	6.00%
31	387+750	387+930	Sharp Existing Profile	7.00%
32	387+970	390+080	Sharp Existing Profile	8.00%
33	390+110	390+340	Sharp Existing Profile	5.00%
34	390+380	390+830	Sharp Existing Profile	8.00%
35	391+040	391+160	Sharp Existing Profile	8.00%
36	391+340	391+590	Sharp Existing Profile	5.00%
37	391+750	391+970	Sharp Existing Profile	5.00%
38	392+010	392+110	Sharp Existing Profile	8.00%
39	392+450	395+680	Sharp Existing Profile	8.00%

The proposed horizontal and vertical alignment is available in digital format and this is for information and authority shall not be held responsible for any implications of the contract. EPC contractor shall carry out his own survey and investigations and due diligence both during bidding and during design and construction.

2.4 Right of Way

Details of Proposed ROW

As described in Annex-II of Schedule-A.

2.5 Type of shoulders

(a) In built-up sections, footpaths/fully paved shoulders shall be provided in the following stretches:

S. No	Built-up Town	Design Chainage (m)		Length (m)	TCS Type
		From	To		
Nil					

(b) In open country, paved shoulders of 1.5 m width shall be provided and balance 1.0m width shall be covered with 150 mm thick compacted layer of granular material. On Hilly sections, granular shoulder of 1.0m width on Hill side and 2.0m width on Valley side will be provided as shown in TCS drawings.

2.6 Lateral and vertical clearances at underpasses

2.6.1 Lateral and vertical clearances at underpasses and provision of guardrails/crash barriers shall be as per paragraph 2.11 of the Manual.

2.6.2 Lateral clearance: The width of the opening at the underpasses shall be as follows:

S. No	Design Chainage (Km)	Name of Intersecting Roads	Width of Opening (m)	Remarks
1	360+132	-	1x20	-

2.7 Lateral and vertical clearances at overpasses

2.7.1 Lateral and vertical clearances at overpasses shall be as per paragraph 2.12 of the Manual.

2.7.2 Lateral clearance: The width of the opening at the overpasses shall be as follows:

S. No	Design Chainage (Km)	Name of Intersecting Roads	Width of Opening (m)	Remarks
Nil				

2.8 Service roads

Service roads of 5.5 each side shall be constructed at the locations and for the lengths indicated below:

S. No	Built-up Town	Design Chainage (Km)		Side	Length (m)	TCS Type
		From	To			
1	VUP Approach	359+610	360+530	Both Side	1000	TCS-8

2.9 Grade separated structures

2.9.1 Grade separated structures shall be provided as per paragraph 2.14 of the Manual. The requisite particulars are given below:

S. No.	Design Chainage (Km)	Name of Intersecting Roads	Proposed Span Arrangement (m)	Remarks
1	360+132	-	1x20	-

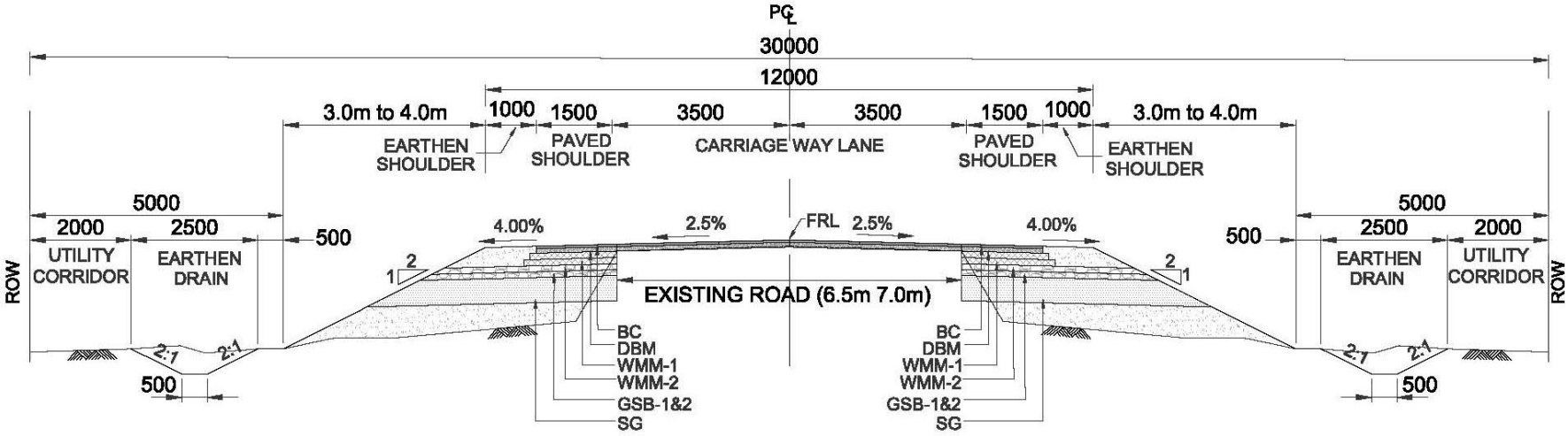
2.10 Cattle and Pedestrian Underpass /Overpass

Cattle and pedestrian underpass/ overpass shall be constructed as follows:

S. No.	Location	Type of crossing
Nil		

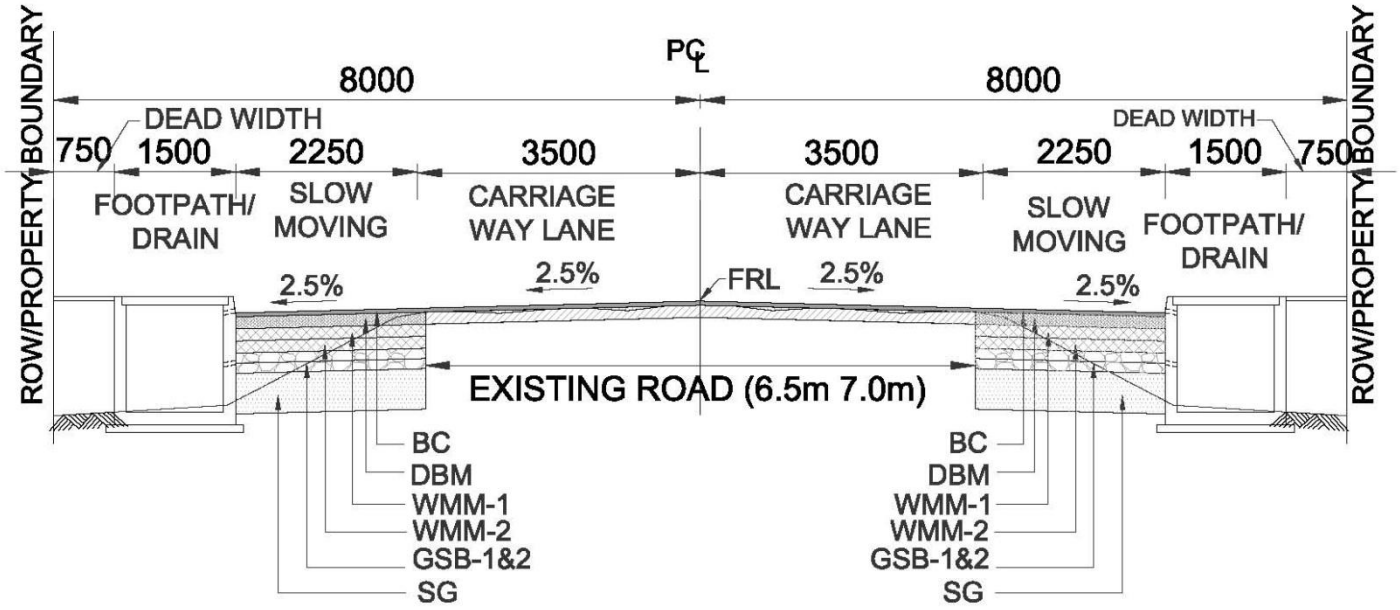
2.11 Typical cross-sections of the Project Highway

Approximate cross section type (tentative) suitable at various chainages of project highway is as shown below:

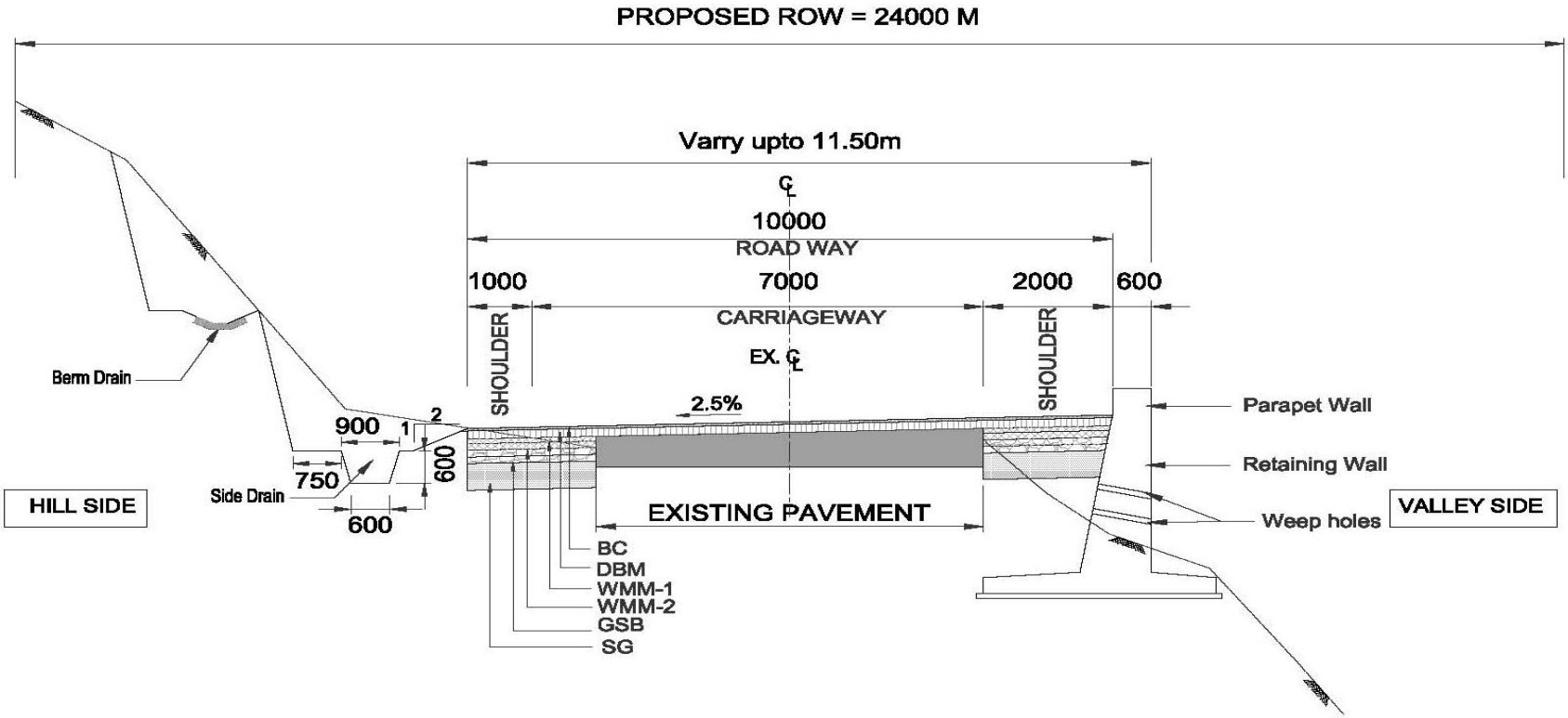


TCS - 1

CONCENTRIC WIDENING IN RURAL AREAS - TWO LANE CARRIAGEWAY



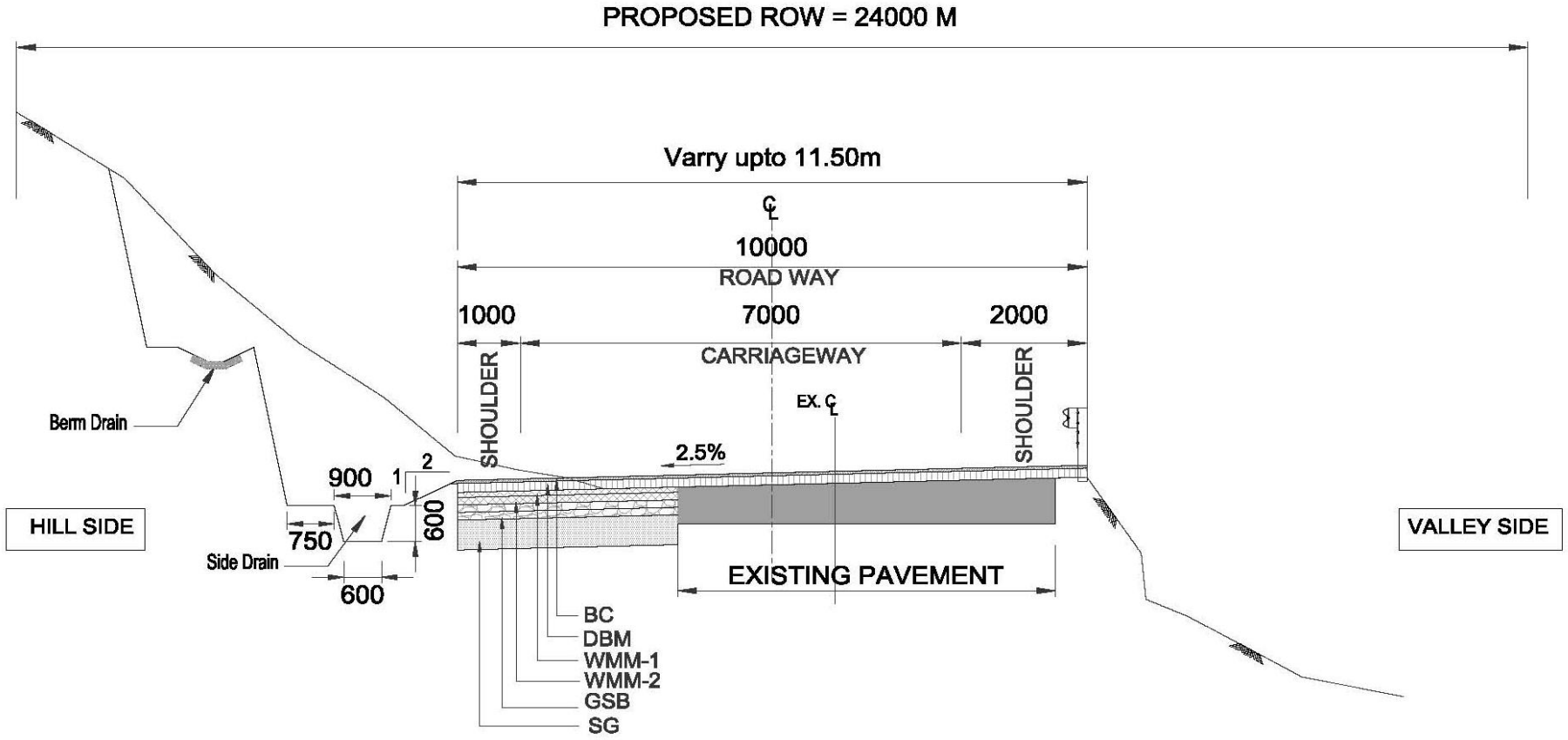
TCS - 2
CONCENTRIC WIDENING IN URBAN AREAS - TWO LANE CARRIAGEWAY



TCS - 3

BOTH HILL & VALLEY SIDE WIDENING IN HILL AREAS - TWO LANE CARRIAGEWAY

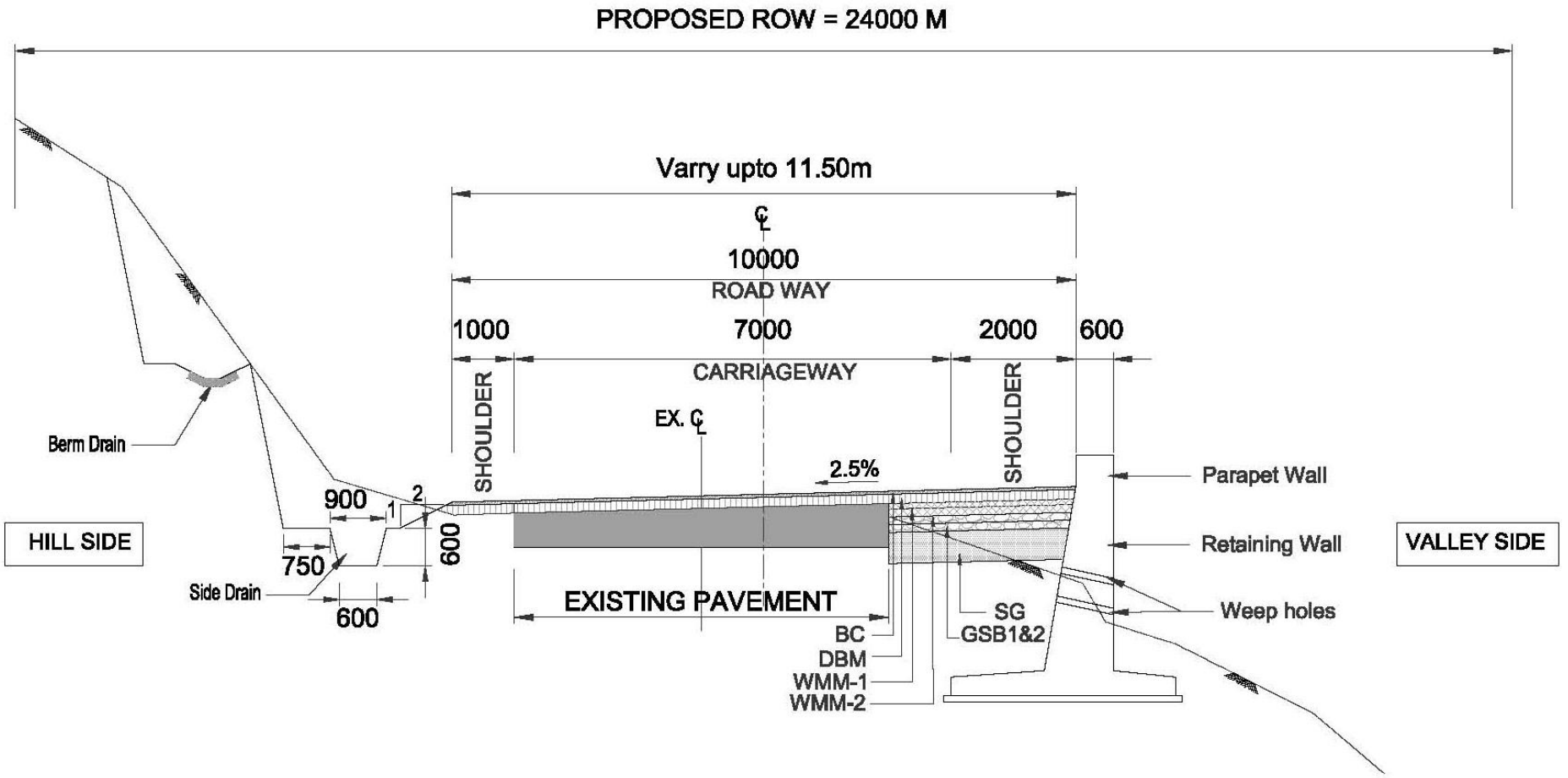
*Note :- Extra Widening as per Cuvature



TCS - 4

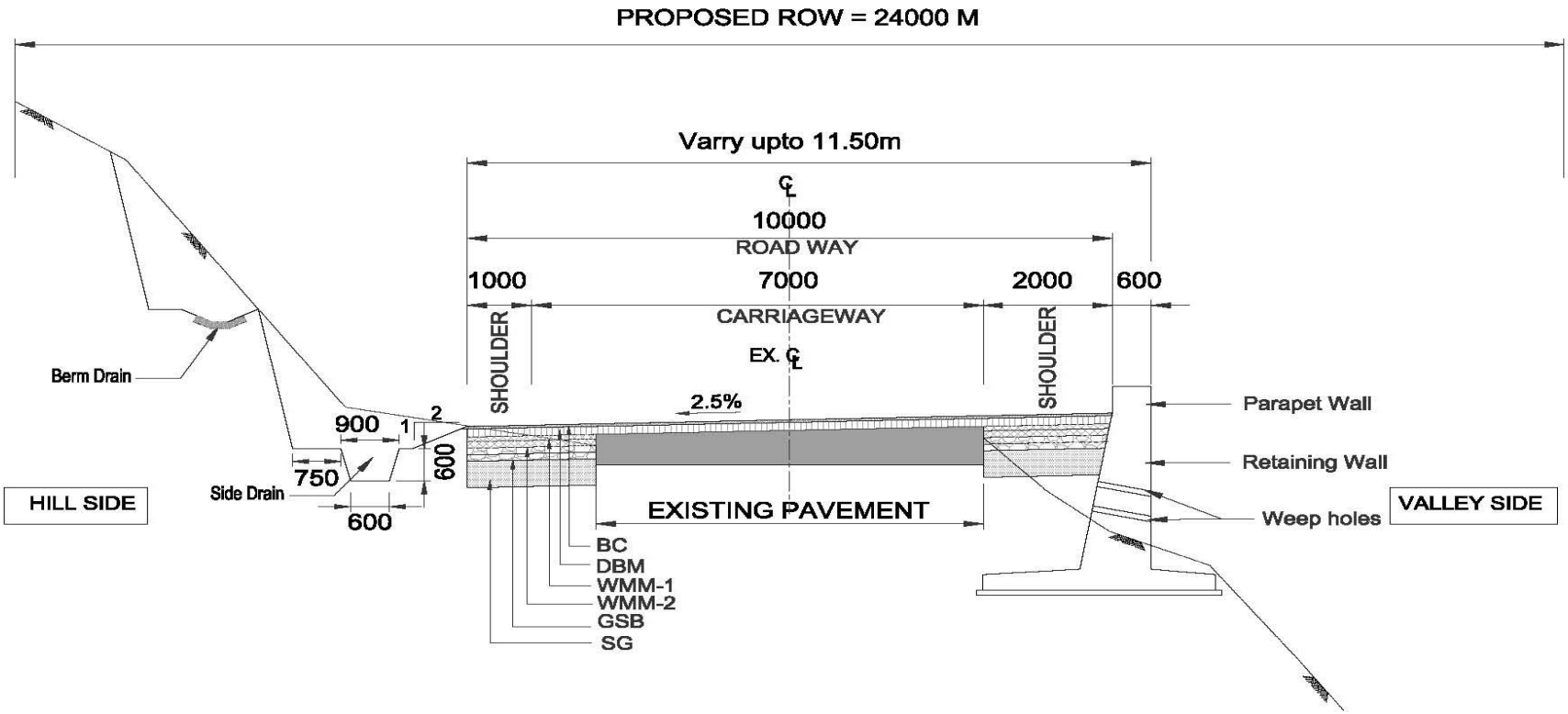
HILL SIDE WIDENING IN HILL AREAS - TWO LANE CARRIAGEWAY

*Note :- Extra Widening as per Cuvature



TCS - 5

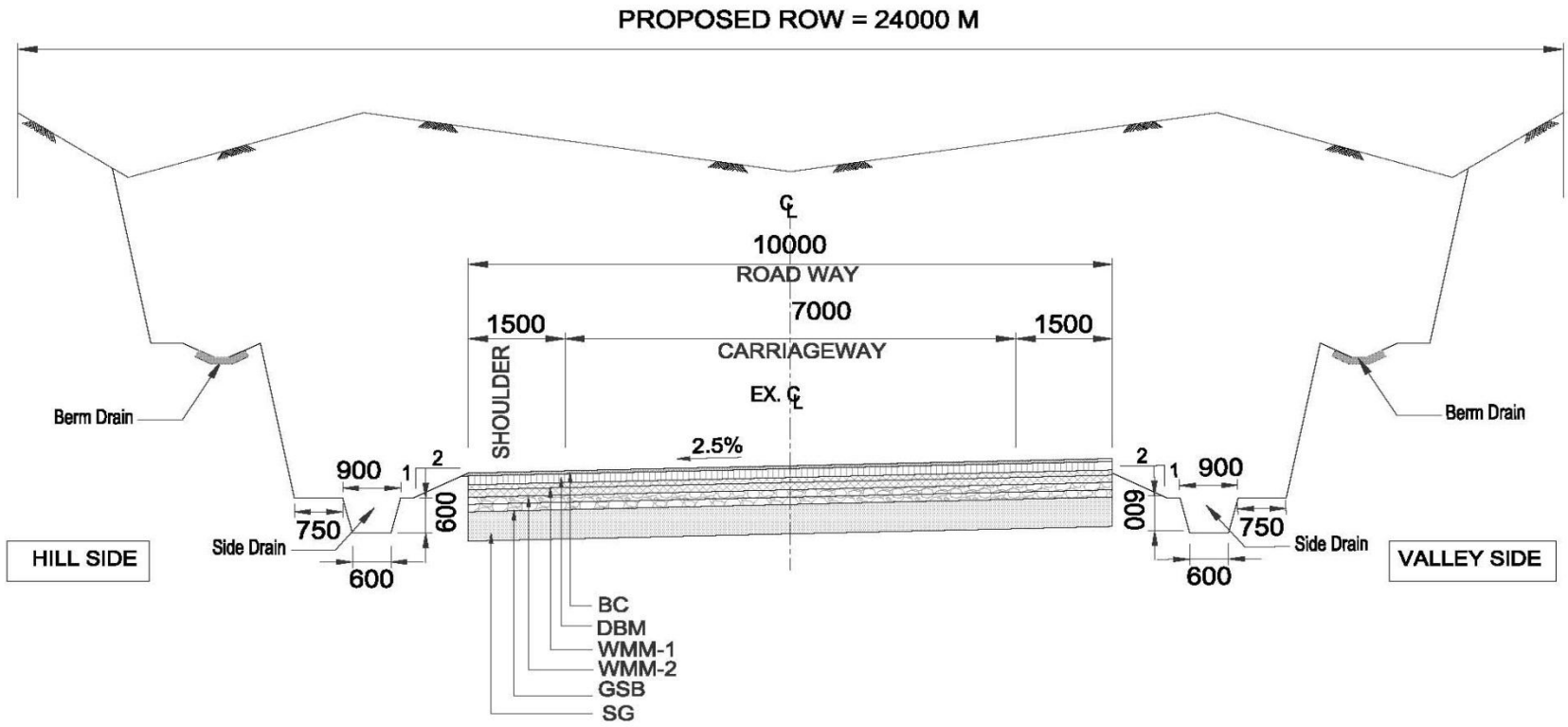
VALLEY SIDE WIDENING IN HILL AREAS - TWO LANE CARRIAGEWAY



TCS - 6

LEFT/RIGHT ECENTRIC - TWO LANE CARRIAGEWAY

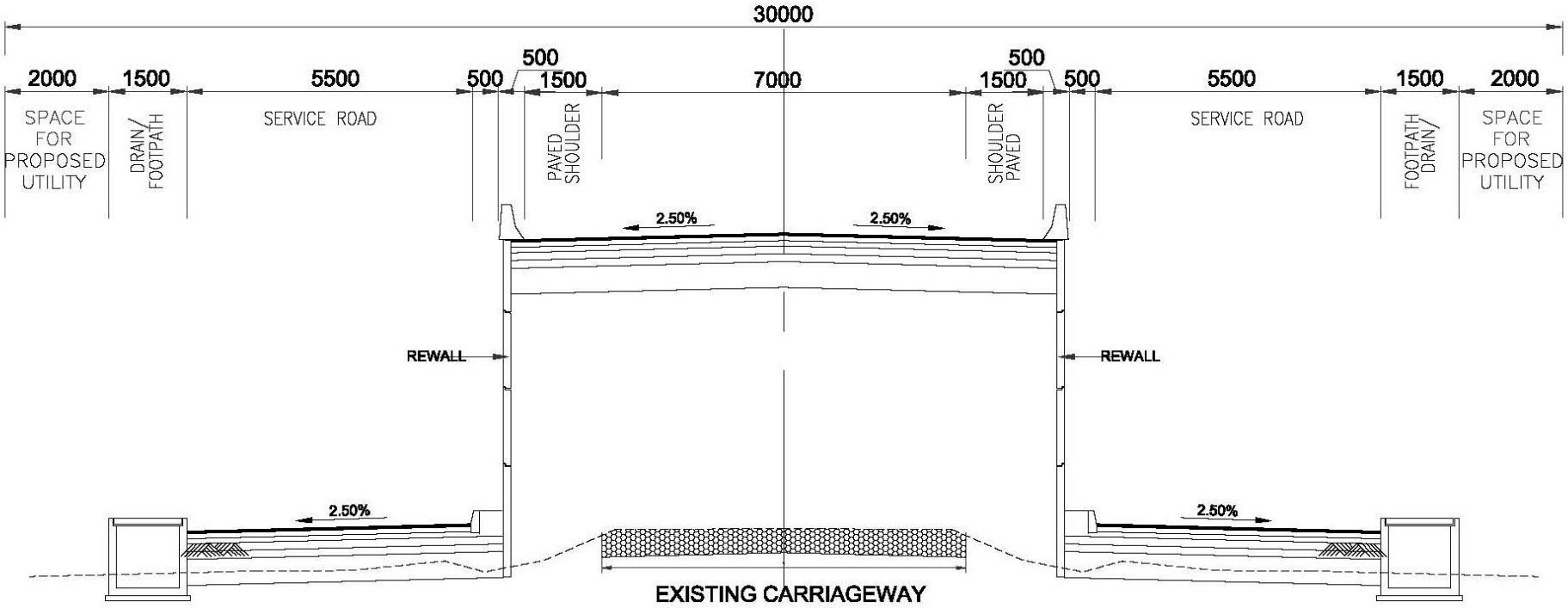
*Note :- Extra Widening as per Cuvature



TCS - 7

BOTH SIDE HILL - TWO LANE CARRIAGEWAY

*Note :- Extra Widening as per Cuvature



TCS - 8

TYPICAL CROSS SECTION FOR TWO LANE VUP APPROACH WITH SERVICE ROAD

2.12 Cross Section Type along the Project Corridor

Approximate cross section type (tentative) suitable at various chainages of project highway is shown in Table below:

S. No	Design Chainage (Km)		Length (m)	TCS Type	Type of Widening
	From	To			
1	350+000	359+610	9610	TCS-1	Concentric Widening
2	359+610	360+530	920	TCS-8	VUP Approach
3	360+530	366+200	5670	TCS-1	Concentric Widening
4	366+200	368+200	2000	TCS-4	Left Side Widening
5	368+200	368+400	200	TCS-7	New Construction
6	368+400	370+050	1650	TCS-4	Left Side Widening
7	370+050	370+150	100	TCS-7	New Construction
8	370+150	372+500	2450	TCS-4	Left Side Widening
9	372+500	373+100	600	TCS-4	Right Side Widening
10	373+100	374+250	1150	TCS-3	Concentric Widening
11	374+250	375+000	750	TCS-4	Right Side Widening
12	375+000	375+400	400	TCS-7	New Construction
13	375+400	382+000	6600	TCS-4	Right Side Widening
14	382+000	383+000	1000	TCS-7	New Construction
15	383+000	386+500	3500	TCS-4	Left Side Widening
16	386+500	386+650	150	TCS-7	New Construction
17	386+650	387+080	430	TCS-4	Left Side Widening
18	387+080	387+340	260	TCS-7	New Construction
19	387+340	387+800	460	TCS-4	Left Side Widening
20	387+800	387+900	100	TCS-7	New Construction
21	387+900	388+100	200	TCS-4	Left Side Widening
22	388+100	388+620	520	TCS-4	Right Side Widening
23	388+620	391+300	2680	TCS-7	New Construction
24	391+300	392+000	700	TCS-4	Right Side Widening
25	392+000	392+700	700	TCS-7	New Construction
26	392+700	395+680	3300	TCS-4	Right Side Widening

3 INTERSECTIONS AND GRADE SEPARATORS

All intersections and grade separators shall be as per relevant Section 3 of the Manual. Existing intersections which are deficient shall be improved to the prescribed standards.

Properly designed intersections shall be provided at the locations and of the types and features given in the tables below:

(a) At-grade Major intersections

S. No	Existing Chainage (Km)	Design Chainage (Km)	Location	Proposed Structure	Remarks
Nil					

(b) Grade separated intersection with/without ramps

S. No.	Design Chainage (Km)	Road Leads To	Junction Type	Proposed Improvements
Nil				

(c) Minor Intersections

S. No	Existing Chainage (Km)	Type	Type of junction
1	351+700	At-Grade	T
2	352+550	At-Grade	T
3	352+600	At-Grade	T
4	353+050	At-Grade	T
5	353+650	At-Grade	T
6	353+100	At-Grade	T
7	354+400	At-Grade	T
8	357+550	At-Grade	T
9	357+750	At-Grade	T
10	360+150	At-Grade	T
11	365+850	At-Grade	T

4.0 ROAD EMBANKMENT AND CUT SECTION

4.1 Widening and improvement of the existing road embankment/cuttings and construction of new road embankment/ cuttings shall conform to the Specifications and Standards given in relevant sections of the Manuals and the specified cross sectional details. Deficiencies in the plan and profile of the existing road shall be corrected.

4.2 Raising of the existing road shall be carried out for entire length except bridge locations and the built

up areas.

5.0 PAVEMENT DESIGN

5.1 Pavement design shall be carried out in accordance with relevant Sections of the Manuals.

5.2 Type of pavement

Flexible Pavement with Bituminous Concrete (BC), Dense Bituminous Macadam (DBM), Wet Mix Macadam (WMM), Granular Sub-base (GSB) & Subgrade layers shall be designed as per IRC-37:2012 guidelines.

5.3 Design requirements

5.3.1 ***Design Period and strategy***

Flexible pavement shall be designed for a minimum design period of 15 years as per IRC-37:2012. Stage construction shall not be permitted.

5.3.2 ***Design Traffic***

Notwithstanding anything to the contrary contained in this Agreement or the Manual, the Contractor shall design the pavement for design traffic of **20** Million Standard Axles.

5.4 Reconstruction of stretches

Total Project Road shall be considered as full reconstruction as per IRC-37-2012 and Manual & Specifications.

6 ROADSIDE DRAINAGE

Drainage system including surface and subsurface drains for the Project Highway shall be provided as per Section 6 of the Manual. RCC covered drain shall be provided at the following stretches of built up areas:

S. No	Built-up Town	Design Chainage (m)		RCC with Cover Slab Side	Length (m)	TCS Type
		From	To			
Nil						

7.0 DESIGN OF STRUCTURES

7.1 General

7.1.1 All bridges and structures shall be designed and constructed in accordance with section 7 of the Manual and shall conform to the cross sectional features and other details specified in MoRTH circular No: RW/NH/33044/2/88-S&R dated 24.03.2009 (for 2 lane structures as 12.9m / 14.8m without and with footpath). The culverts shall be designed and constructed in accordance with section 7 of the Manuals.

7.1.2 Width of the carriageway of new bridges and structures shall be as follows:

Sl. No	Bridges at km	Width of carriageway and cross sectional features
Nil		

7.1.3 The following structures shall be provided with footpaths:

S. No	Location at Km
Nil	

7.1.4 All bridges shall be high-level bridges.

7.1.5 The following structures shall be designed to carry utility services specified in table below:

Sl. No	Bridge at km	Utility service to be carried	Remarks
Nil			

7.2 Culverts

7.2.1 Overall width of all culverts shall be equal to the roadway width of the approaches.

7.2.2 ***Reconstruction of existing culverts:***

The existing culverts at the following locations shall be re-constructed as new culverts:

(i) Reconstruction of Pipe to Box Culverts

S. No	Existing Chainage (km)	Design Chainage (km)	Existing		Recommendation	Proposed	
			Type	Dia. (m)		Type	Size. (m)
1	350+980	351+190	Pipe	1 X 0.9	Reconstruction	Box	1 x 1.5 x 1.5
2	353+580	354+345	Pipe	1 X 0.9	Reconstruction	Box	1 x 1.5 x 1.5
3	361+540	362+684	Pipe	NV	Reconstruction	Box	1 x 1.5 x 1.5
4	365+640	366+097	Pipe	1 X 0.9	Reconstruction	Box	1 x 1.5 x 1.5
5	368+020	367+694	Pipe	1 X 0.6	Reconstruction	Box	1 x 1.5 x 1.5
6	368+250	367+873	Pipe	1 X 0.9	Reconstruction	Box	1 x 1.5 x 1.5
7	368+488	368+111	Pipe	1 X NV	Reconstruction	Box	1 x 1.5 x 1.5
8	369+684	369+269	Pipe	1 X NV	Reconstruction	Box	1 x 1.5 x 1.5
9	369+989	369+480	Pipe	1 X NV	Reconstruction	Box	1 x 1.5 x 1.5
10	370+100	369+591	Pipe	1 X 1.2	Reconstruction	Box	1 x 1.5 x 1.5

11	370+200	369+695	Pipe	1 X NV	Reconstruction	Box	1 x 1.5 x 1.5
12	370+290	369+798	Pipe	1 X NV	Reconstruction	Box	1 x 1.5 x 1.5
13	370+600	370+131	Pipe	1 X 0.9	Reconstruction	Box	1 x 1.5 x 1.5
14	371+235	370+854	Pipe	1 X 0.9	Reconstruction	Box	1 x 1.5 x 1.5
15	373+280	372+632	Pipe	1 X NV	Reconstruction	Box	1 x 1.5 x 1.5
16	378+240	377+587	Pipe	1 x 1.0	Reconstruction	Box	1 x 1.5 x 1.5
17	378+730	378+143	Pipe	1 x 0.9	Reconstruction	Box	1 x 1.5 x 1.5
18	380+870	379+935	Pipe	1 x 0.9	Reconstruction	Box	1 x 1.5 x 1.5
19	381+150	380+074	Pipe	1 x 0.6	Reconstruction	Box	1 x 1.5 x 1.5
20	381+240	380+177	Pipe	1 x 0.9	Reconstruction	Box	1 x 1.5 x 1.5
21	381+720	380+572	Pipe	1 x 0.9	Reconstruction	Box	1 x 1.5 x 1.5
22	381+980	380+773	Pipe	1 x 0.9	Reconstruction	Box	1 x 1.5 x 1.5
23	382+280	381+010	Pipe	1 x 0.9	Reconstruction	Box	1 x 1.5 x 1.5
24	383+070	381+621	Pipe	1 x 0.6	Reconstruction	Box	1 x 1.5 x 1.5
25	383+110	381+736	Pipe	1 x 0.9	Reconstruction	Box	1 x 1.5 x 1.5
26	383+200	381+911	Pipe	1 x 0.9	Reconstruction	Box	1 x 1.5 x 1.5
27	383+720	382+174	Pipe	1 x 0.9	Reconstruction	Box	1 x 1.5 x 1.5
28	383+980	382+497	Pipe	1 x 1.2	Reconstruction	Box	1 x 1.5 x 1.5
29	384+800	383+250	Pipe	1 x 0.9	Reconstruction	Box	1 x 1.5 x 1.5
30	384+950	383+401	Pipe	1 x 1.2	Reconstruction	Box	1 x 1.5 x 1.5
31	385+190	383+596	Pipe	1 x 0.9	Reconstruction	Box	1 x 1.5 x 1.5
32	385+480	383+981	Pipe	1 x 0.6	Reconstruction	Box	1 x 1.5 x 1.5
33	385+800	384+272	Pipe	1 x 0.6	Reconstruction	Box	1 x 1.5 x 1.5
34	386+016	384+415	Pipe	1 x 0.6	Reconstruction	Box	1 x 1.5 x 1.5
35	386+560	385+059	Pipe	1 x 0.9	Reconstruction	Box	1 x 1.5 x 1.5
36	386+840	385+292	Pipe	1 x 0.6	Reconstruction	Box	1 x 1.5 x 1.5
37	387+165	385+529	Pipe	1 x 0.9	Reconstruction	Box	1 x 1.5 x 1.5
38	387+600	385+928	Pipe	1 x 0.9	Reconstruction	Box	1 x 1.5 x 1.5
39	387+900	386+245	Pipe	1 x 0.9	Reconstruction	Box	1 x 1.5 x 1.5
40	388+015	386+348	Pipe	1 x 0.9	Reconstruction	Box	1 x 1.5 x 1.5
41	388+030	386+377	Pipe	1 x 0.6	Reconstruction	Box	1 x 1.5 x 1.5

42	388+700	386+893	Pipe	1 x 0.9	Reconstruction	Box	1 x 1.5 x 1.5
43	389+180	387+374	Pipe	1 x 0.9	Reconstruction	Box	1 x 1.5 x 1.5
44	389+500	387+680	Pipe	1 x 0.9	Reconstruction	Box	1 x 1.5 x 1.5
45	390+900	389+119	Pipe	NV	Reconstruction	Box	1 x 1.5 x 1.5
46	391+420	389+639	Pipe	1 x 0.6	Reconstruction	Box	1 x 1.5 x 1.5
47	393+040	391+167	Pipe	1 x 0.9	Reconstruction	Box	1 x 1.5 x 1.5
48	393+390	391+566	Pipe	NV	Reconstruction	Box	1 x 1.5 x 1.5
49	394+320	392+510	Pipe	1 x 0.9	Reconstruction	Box	1 x 1.5 x 1.5
50	394+810	393+058	Pipe	1 x 0.9	Reconstruction	Box	1 x 1.5 x 1.5
51	395+150	393+337	Pipe	1 x 0.9	Reconstruction	Box	1 x 1.5 x 1.5
52	395+350	393+580	Pipe	1 x 0.9	Reconstruction	Box	1 x 1.5 x 1.5
53	396+160	394+108	Pipe	1 x 0.9	Reconstruction	Box	1 x 1.5 x 1.5
54	396+400	394+306	Pipe	1 x 0.9	Reconstruction	Box	1 x 1.5 x 1.5
55	397+350	395+031	Pipe	1 x 0.9	Reconstruction	Box	1 x 1.5 x 1.5
56	397+650	395+486	Pipe	1 x 0.9	Reconstruction	Box	1 x 1.5 x 1.5
57	398+016	395+672	Pipe	NV	Reconstruction	Box	1 x 1.5 x 1.5

(ii) Reconstruction of Slab Culverts to Box Culverts

S. No	Existing Chainage (km)	Design Chainage (km)	Existing		Recommendation	Proposed	
			Type	Span (m)		Type	Span (m)
1	350+453	350+371	Slab	1 x 1.0 x1.2	Reconstruction	Box	1 x 1.5 x 1.5
2	350+990	351+194	Slab	1 x 1.5 x 1.5	Reconstruction	Box	1 x 1.5 x 2.0
3	351+250	351+742	Slab	1 x 1.0 x 1.0	Reconstruction	Box	1 x 1.5 x 2.5
4	351+582	352+135	Slab	1 x 1 x NV	Reconstruction	Box	1 x 1.5 x 2.5
5	351+725	352+622	Slab	1 x 2.0 x 1.5	Reconstruction	Box	1 x 2.0 x 2.0
6	352+050	352+681	Slab	1 x 2.0 x 1.0	Reconstruction	Box	1 x 2.0 x 1.5
7	352+450	352+831	Slab	1 x 1.5 x 1.5	Reconstruction	Box	1 x 1.5 x 2.0
8	352+600	353+511	Slab	1 x 1 x NV	Reconstruction	Box	1 x 1.5 x 1.5
9	352+723	353+715	Slab	1 x 2.0 x 1.5	Reconstruction	Box	1 x 2.0 x 3.5
10	353+600	354+365	Slab	1 x 2.0 x 1.5	Reconstruction	Box	1 x 2.0 x 2.5
11	354+380	355+145	Slab	1 x 4.0 x 2.5	Reconstruction	Box	1 x 4.0 x 3.0

S. No	Existing Chainage (km)	Design Chainage (km)	Existing		Recommendation	Proposed	
			Type	Span (m)		Type	Span (m)
12	354+900	355+983	Slab	1 x 5.1 x 1.8	Reconstruction	Box	1 x 5.5 x 3.5
13	355+940	357+023	Slab	1 x 2.0 x 2.0	Reconstruction	Box	1 x 2.0 x 2.5
14	356+670	357+808	Slab	1 x 4.5 x 2.5	Reconstruction	Box	1 x 4.5 x 3.0
15	357+350	358+548	Slab	1 x 1.8 x 1.5	Reconstruction	Box	1 x 2.0 x 3.5
16	358+150	359+290	Slab	1 x 1.8 x 1.5	Reconstruction	Box	1 x 2.0 x 2.5
17	360+240	360+357	Slab	1 x 1.0 x 1.5	Reconstruction	Box	1 x 1.5 x 2.0
18	360+250	361+465	Slab	1 x 2.0 x 1.0	Reconstruction	Box	1 x 2.0 x 1.5
19	360+800	362+015	Slab	1 x 2.0 x 1.0	Reconstruction	Box	1 x 2.0 x 1.5
20	362+700	363+297	Slab	1 x 3.0 x 1.0	Reconstruction	Box	1 x 3.0 x 2.5
21	363+300	363+962	Slab	1 x 2.0 x 1.2	Reconstruction	Box	1 x 2.0 x 2.0
22	363+900	364+925	Slab	1xNVxNV	Reconstruction	Box	1 x 3.0 x 3.0
23	365+370	365+840	Slab	1xNVxNV	Reconstruction	Box	1 x 3.0 x 3.0
24	365+890	366+254	Slab	1 x 1.0 x 0.8	Reconstruction	Box	1 x 1.5 x 1.5
25	366+300	366+605	Slab	1 x 2.0 x 1.0	Reconstruction	Box	1 x 2.0 x 1.5
26	366+380	366+685	Slab	1 x 1.5 x 3.0	Reconstruction	Box	1 x 2.0 x 3.5
27	368+445	368+068	Slab	1 x 1.5 x 1.2	Reconstruction	Box	1 x 1.5 x 1.5
28	368+900	368+520	Slab	1 x 2.0 x 1.8	Reconstruction	Box	1 x 2.0 x 2.0
29	369+013	368+860	Slab	1 x 2.0 x 1.6	Reconstruction	Box	1 x 3.0 x 3.0
30	369+250	368+872	Slab	1 x 2.0 x 2.0	Reconstruction	Box	1 x 2.0 x 2.5
31	370+400	369+960	Slab	1 x 1.5 x 1.0	Reconstruction	Box	1 x 1.5 x 1.5
32	371+625	371+238	Slab	1 x 1.5 x 2.0	Reconstruction	Box	1 x 1.5 x 2.5
33	374+200	373+552	Slab	1 x 1.5 x 2.0	Reconstruction	Box	1 x 1.5 x 2.5
34	375+270	374+617	Slab	1 x 1.2 x 1.0	Reconstruction	Box	1 x 1.5 x 1.5
35	376+550	375+896	Slab	1 x 2.0 x 1.0	Reconstruction	Box	1 x 2.0 x 1.5
36	377+050	376+396	Slab	1 x 2.0 x 1.5	Reconstruction	Box	1 x 2.0 x 2.0
37	377+250	376+597	Slab	1 x 1.5 x 1.0	Reconstruction	Box	1 x 1.5 x 1.5
38	378+500	377+784	Slab	1 x 1.8 x 1.0	Reconstruction	Box	1 x 2.0 x 1.5
39	379+350	378+741	Slab	1 x 1.0 x 1.0	Reconstruction	Box	1 x 1.5 x 1.5
40	380+330	379+543	Slab	1 x 2.0 x 1.5	Reconstruction	Box	1 x 2.0 x 2.0

S. No	Existing Chainage (km)	Design Chainage (km)	Existing		Recommendation	Proposed	
			Type	Span (m)		Type	Span (m)
41	380+560	379+804	Slab	1 x 1.5 x 1.5	Reconstruction	Box	1 x 2.0 x 2.0
42	382+160	380+903	Slab	1 x 2.0 x 1.0	Reconstruction	Box	1 x 2.0 x 1.5
43	383+220	381+931	Slab	1 x 2.0 x 1.5	Reconstruction	Box	1 x 2.0 x 2.0
44	386+230	384+631	Slab	1 x 1.5 x 1.5	Reconstruction	Box	1 x 1.5 x 2.0
45	388+900	387+046	Slab	1 x 2.0 x 1.5	Reconstruction	Box	1 x 2.0 x 2.0
46	390+000	388+218	Slab	1 x 2.0 x 2.0	Reconstruction	Box	1 x 2.0 x 2.5
47	392+100	390+240	Slab	1 x 1.5 x 0.8	Reconstruction	Box	1 x 1.5 x 1.5
48	393+280	391+456	Slab	1 x 1.8 x 4.0	Reconstruction	Box	1 x 2.0 x 4.5
49	393+530	391+782	Slab	1 x 1.0 x 3.0	Reconstruction	Box	1 x 2.0 x 3.5
50	394+050	392+191	Slab	1 x 1.0 x 2.1	Reconstruction	Box	1 x 1.5 x 2.5
51	394+380	392+568	Slab	1 x 1.2 x 2.0	Reconstruction	Box	1 x 1.5 x 2.5
52	394+444	392+692	Slab	1 x 1.2 x 1.8	Reconstruction	Box	1 x 1.5 x 2.0
53	396+280	394+228	Slab	1 x 1.8 x 1.0	Reconstruction	Box	1 x 2.0 x 1.5

(iii) New Construction of Box Culverts

S. No	Existing Chainage (km)	Design Chainage (km)	Existing		Recommendation	Proposed	
			Type	Span (m)		Type	Span (m)
1	-	365+263	-	-	New construction	Box	1 x 1.5 x 4.0
2	-	365+302	-	-	New construction	Box	1 x 5.0 x 3.5
3	-	386+493	-	-	New Construction	Box	1 x 1.5 x 1.5
4	-	392+329	-	-	New Construction	Box	1 x 2.5 x 2.0
5	-	394+509	-	-	New Construction	Box	1 x 1.5 x 1.5
6	-	395+315	-	-	New Construction	Box	1 x 1.5 x 1.5
7	-	395+403	-	-	New Construction	Box	1 x 1.5 x 1.5

Note: Additional culverts to an extent of 20 Box shall be considered to be constructed as per site condition and as decided by Authority / Authority Engineer.

7.2.3 Widening of existing culverts

All existing culverts which are not to be reconstructed shall be widened to the roadway width of the

Project Highway as per the typical cross section given in Section 7 of the Manual. Repairs and strengthening of existing structures where required shall be carried out.

(i) Widening of Slab Culverts

S. No	Existing Chainage (km)	Design Chainage (km)	Existing		Recommendation	Proposed Top Width (m)
			Type	Span (m)		
Nil						

7.2.4 Repairs/replacements of railing/parapets, flooring and protection works of the existing culverts shall be undertaken as follows:

S. No	Location at km	Type of repair required
As per above Table		

7.2.5 Floor protection works shall be as specified in the relevant IRC Codes and Specifications.

7.3 Bridges (Major & Minor)

7.3.1 Existing bridges to be Re-constructed

(i) The bridges at the following locations shall be re-constructed as new Structures:

S. No	Name of Existing Bridge	Bridge Type	Existing Chainage (km)	Design Chainage (km)	Proposed Structure Type	Proposed Span Arrangement No x Span (m)	Width of Structure (m)	Remarks
Nil								

(ii) The following narrow bridges shall be widened:

S. No	Location (km)	Existing width (m)	Extent of widening (m)	Cross-section at deck level for widening @
1	352+800	10.3	2.6m	0.45+0.75+10.5+0.75+0.45 = 12.9m

7.3.2 Additional *new bridges*

New bridges at the following locations on the Project Highway shall be constructed.

S. No	Name of Existing Bridge	Bridge Type	Existing Chainage (km)	Design Chainage (km)	Proposed Structure Type	Proposed Span Arrangement No x Span (m)	Width of Structure (m)	Remarks
Nil								

7.3.3 The railings of existing bridges shall be replaced by crash barriers at the following locations:

S. No.	Location at Km	Remarks
Given in Table under 7.7		

7.3.4 Repairs/replacements of railing/parapets of the existing bridges shall be undertaken as follows:

S. No.	Location at Km	Remarks
Given in Table under 7.7		

7.3.5 Drainage system for bridge decks

An effective drainage system for bridge decks shall be provided as specified in paragraph 7.21 of the Manual

7.3.6 Structures in marine environment - Nil

7.4. Rail-road bridges

7.4.1 Design, construction and detailing of ROB/RUB shall be as specified in section 7 of the Manual.

7.4.2 *Road over-bridges*

Road over-bridges (road over rail) shall be provided at the following level crossings, as per GAD drawings attached:

S. No	Location	Existing Chainage (km)	Design Chainage (km)	Name of Crossing	Proposed Structural Configuration	Proposed Structure Type	Proposed Span Arrangement No x Span (m)	Total Width of Structure (m)
Nil								

7.4.3 Road under-bridges:

Road under-bridges (road under railway line) shall be provided at the following level crossings, as per GAD drawings attached:

S. No.	Location of Level crossing (chainage km)	Number and Length of Span (m)
Nil		

7.5 Grade separated structures

The grade separated structures shall be provided at the locations given below:

S. No	Design Chainage (Km)	Name of Intersecting Roads	Proposed Structural Configuration	Proposed Structure Type	Proposed Span Arrangement (m)	Total Width of Structure (m)
Nil						

7.6 Vehicular Underpass

The Vehicular Underpass structure shall be provided at the locations given below:

S. No	Design Chainage (Km)	Name of Intersecting Roads	Proposed Structural Configuration	Proposed Structure Type	Proposed Span Arrangement (m)	Total Width of Structure (m)
1	360+132	-	New 2 Lane	RCC T Girder Pile Foundation	1 x 20m	1 x 12.0

Note: Extra widening shall be provided for structures falling on curves with radius less than 300m.

7.7 Repairs and Rehabilitation of bridges and structures:

The existing bridges and structures to be repaired & rehabilitated as per details given below:

A. Major Bridges

S. No	Name of Existing Bridge	Existing Chainage (km)	Design Chainage (km)	Span Arrangement No x Span (m)	Type of Structure			Details of Rehabilitation
					Foundation	Sub-structure	Super-structure	
1	Pallel	365+550	365+365	3x 24.0m (Bridge under construction along the realignment)	well	RCC Abutment & pier	RCC T-Girder	• Wearing course shall be replaced after the construction of project stretch • Expansion joints shall be cleaned and damaged joints shall be replaced.

B. Minor Bridges

S. No	Name of Existing Bridge	Existing Chainage (Km)	Design Chainage (km)	Span Arrangement No x Span (m)	Type of Structure			Details of Rehabilitation
					Founda-tion	Sub-structure	Super-structure	
1	Khongjom	352+800	352+863	2x 5.8	open	RCC Abutment, pier	RCC solid slab	• Wearing course, Crash barrier / Kerb + Railing, Expansion joints and Drainage spouts with gratings & down-take pipe shall be newly constructed after constructing the widened portion of the of bridge. • Spalling of concrete shall be repaired with epoxy grouting

Note: Repair and Rehabilitation Measures to be carried out for bridges:

A schedule for repair and rehabilitation of bridges to be prepared based on detailed inspection and got to be approved from Engineer before taking up this work subjected to minimum rehabilitation measures that are mentioned in table.

Widening of the bridge shall include widening of deck slab, abutment, pier, return / retaining wall, approach slab (dismantling of existing return wall if necessary) along with associated works including quadrant embankment slopes with stone pitching.

8 TRAFFIC CONTROL DEVICES AND ROAD SAFETY WORKS

8.1 Traffic control devices and road safety works shall be provided in accordance with relevant Sections of the Manuals.

8.1 Specifications of the reflective sheeting. Type VIII/Type IX micro prismatic retro-reflective sheeting conforming to ASTM-D-4956

9 ROADSIDE FURNITURE

9.1 Roadside furniture shall be provided in accordance with the provisions of Section 11 of the Manual.

9.2 *Overhead traffic signs: location and size*

10 COMPULSORY AFFORESTATION

Nil

11 HAZARDOUS LOCATIONS

(i) Breast Wall Locations:

Breast walls are provided at the locations given below:

S. No	Chainage (Km)		Length (m)	S. No	Chainage (Km)		Length (m)
	From	To			From	To	
Left Hand Side (LHS)							
1	366+210	366+780	570	28	383+850	383+880	30
2	366+800	367+350	550	29	383+960	383+990	30
3	367+440	367+490	50	30	384+070	384+090	20
4	367+740	367+760	20	31	384+200	384+250	50
5	367+990	368+120	130	32	384+300	384+360	60
6	368+160	368+220	60	33	384+430	384+540	110
7	368+390	370+060	1670	34	384+700	384+780	80
8	370+130	370+170	40	35	384+870	384+970	100
9	370+240	370+300	60	36	385+010	385+050	40
10	370+710	370+870	160	37	385+160	385+260	100
11	370+960	370+990	30	38	385+330	385+370	40
12	371+140	371+220	80	39	385+480	385+730	250
13	371+290	371+440	150	40	385+780	385+980	200
14	371+460	371+530	70	41	386+050	386+330	280
15	371+580	371+630	50	42	386+360	386+410	50
16	371+660	371+710	50	43	386+470	386+540	70
17	371+780	372+620	840	44	386+640	386+930	290
18	373+100	374+260	1160	45	387+020	387+080	60

S. No	Chainage (Km)		Length (m)	S. No	Chainage (Km)		Length (m)
	From	To			From	To	
19	377+040	377+320	280	46	387+130	387+170	40
20	377+340	377+570	230	47	387+380	387+690	310
21	377+750	377+990	240	48	387+770	387+910	140
22	378+480	378+500	20	49	387+980	388+030	50
23	382+980	383+260	280	50	389+170	389+290	120
24	383+280	383+300	20	51	390+480	390+530	50
25	383+510	383+600	90	52	394+600	394+650	50
26	383+660	383+710	50	53	395+240	395+270	30
27	383+760	383+790	30				
Right Hand Side (RHS)							
1	370+320	370+660	340	38	388+370	388+470	100
2	372+640	372+860	220	39	388+530	388+800	270
3	372+500	373+100	600	40	382+150	382+250	100
4	374+290	374+370	80	41	382+360	382+390	30
5	374+450	374+520	70	42	382+720	382+740	20
6	374+620	374+640	20	43	387+130	387+170	40
7	374+660	374+770	110	44	388+090	388+160	70
8	374+990	375+000	10	45	388+180	388+350	170
9	375+000	375+040	40	46	388+370	388+470	100
10	375+130	375+400	270	47	388+530	388+800	270
11	375+430	375+450	20	48	389+970	390+020	50
12	375+560	375+730	170	49	390+070	390+340	270
13	375+800	375+840	40	50	390+480	390+530	50
14	375+910	375+980	70	51	390+670	391+040	370
15	376+050	376+100	50	52	391+140	391+330	190
16	376+160	376+240	80	53	391+420	391+600	180
17	376+330	376+370	40	54	391+630	391+730	100
18	376+410	376+560	150	55	391+800	391+880	80
19	376+650	376+930	280	56	391+930	391+970	40
20	378+380	378+400	20	57	392+140	392+180	40
21	378+550	378+630	80	58	392+230	392+260	30
22	378+700	378+780	80	59	392+320	392+350	30
23	378+830	378+860	30	60	392+540	392+560	20
24	378+920	379+020	100	61	392+670	392+750	80
25	379+140	379+170	30	62	392+790	392+810	20
26	379+200	379+240	40	63	392+830	393+140	310

S. No	Chainage (Km)		Length (m)	S. No	Chainage (Km)		Length (m)
	From	To			From	To	
27	379+340	379+600	260	64	393+210	393+390	180
28	379+620	379+680	60	65	393+140	393+490	80
29	379+760	379+840	80	66	393+780	393+800	20
30	379+870	379+910	40	67	393+830	394+120	290
31	379+930	380+080	150	68	394+170	394+210	40
32	380+120	380+180	60	69	394+280	394+350	70
33	380+220	380+460	240	70	394+450	394+530	80
34	380+540	381+510	970	71	394+600	394+650	50
35	381+580	381+620	40	72	395+240	392+270	30
36	388+090	388+160	70	73	395+650	395+700	50
37	388+180	388+350	170	74	395+790	395+860	70
				75	395+930	395+960	30

Side of the Breast wall shall be based on the Cross Section Schedule Clause as per B Clause 2.12

(ii) Median Guard Rail Details

Nil

(iii) Details of Gabion Wall Locations

Nil

(iv) Details of Toe Wall Locations

Nil

(v) Details of Retaining Wall Locations

The following are the Retaining Wall locations**:**

S. No	Design Chainage (km)		Length (m)	Side
	From	To		
1	378+080	378+120	40	LHS
2	379+620	379+660	40	LHS
3	382+950	383+050	100	LHS
4	388+120	388+150	30	LHS
5	389+970	390+010	40	LHS
6	390+420	390+460	40	LHS
7	390+910	390+940	30	LHS
8	391+440	391+460	20	LHS
9	394+000	394+050	50	LHS
10	367+930	367+960	30	RHS
11	369+460	369+530	70	RHS

12	382+950	383+050	100	RHS
13	386+480	386+510	30	RHS
14	386+770	386+800	30	RHS
15	387+860	387+890	30	RHS
16	390+920	390+940	20	RHS

Note: The retaining wall length is indicative and shall be estimated by the EPC contractor.

(vi) Details of Reinforced Earth Wall locations:

Design Chainage (Km)		Length (m)	Remarks
From	To		
359+610	360+530	920	VUP

(vii) Landscaping / Hydro seeding on the Hill cutting side:

Landscaping / Hydro seeding on the Hill cut side shall be done as per the specifications and Standards and as directed by Engineer in Charge. The total surface area for the same is about 317650 Sq.m. The locations shall be finalized during the execution of work as directed by Engineer in Charge.

(viii) Treatment for the Landslides locations:

The treatment for the landslides locations shall be done as per the specifications and Standards and as directed by Engineer in Charge. The locations shall be finalized during the execution of work as directed by Engineer in Charge.

(ix) Details of Metal Beam Crash Barrier Locations

The following are the Metal Beam Crash Barrier locations**:**

S. No	Design Chainage (km)		Length (m)	Side
	From	To		
1	370+400	370+550	150	RHS
2	372+500	373+100	600	RHS
3	374+250	375+000	750	RHS

12 SPECIAL REQUIREMENT FOR HILL ROADS

In accordance with section 13 of the manual (from IRC : SP : 84-2014), IRC :SP-1998 and Recommended practices for Treatment of Embankment and Roadside slopes for Erosion control (First Revision), IRC :56-2011 and relevant IRC codes.

12.1 Slope Protection

As the project involves cutting of existing hill slopes, it is imperative that slopes are stabilized for ensuring longevity of the slope and the road. Slope stability,

erosion control and landslide correction shall be accomplished in accordance with IRC : SP: 48-1998. Reference may be drawn from IRC: 56-2011.

(i) The **minimum quantity** of protection work may be taken as below:

Type of Protection Work		
Protection Work	**Unit**	**Quantity**
1. Parapet Wall/ Toe Wall	Rm	
2.Breast wall with PCC	Rm	
3. Breast wall sausage type by gabion/ Specialized treatment for slide protection as specified above-	Rm	
4. Retaining Wall with PCC	Rm	
5. Catch water drain	Rm	
6. Vetiver Plantation, Hydro Seeding and Hydro Mulching etc. including nets if required or similar works are to be done for slope protection and site mitigation measure upto a height of 12-15 m all along the slopes in each cutting locations except hard rock location which needs to be protected with appropriate applicable technologies, if required.		

(ii) Location of existing Slide prone zones-

Sl No.	**Design Chainage**		**ngth (m)**	**Remarks**
	From	**To**		
	NIL			

Note-*The Contractor shall be responsible for accurate assessment of the actual requirement as per site situation & prepare designs for slope protection & stabilization as per the specifications & standards stipulated in schedule 'D' and submit the same to the AE for review through the proof consultant and implement it accordingly thereafter.*

Any increase in quantity over and above the tentative qty. ***as mentioned in above table or through change in specifications will not be considered as change of scope****. Therefore contractor shall make thorough investigation at site and assess the requirement of slope protection and slide prone zone and other safety features at his own before submission of bid.*

12.2 ROAD LAND BOUNDARY (As per Clause 9.8 of IRC:84:2014)

Road land (ROW) boundary shall be demarcated by putting RCC boundary pillars of size 60cm x 15cm x 15 cm embedded in concrete (as per IRC:25) along the Project Highway at 200 m interval on both sides. All the components used in delineating road land boundary shall be aesthetically pleasing, sturdy and vandal proof. The road land boundary shall be demarcated in consultation with NHIDCL.

12.3 Disposal of Debris: - As per Manual

13 CHANGE OF SCOPE

The length of Structures, bridges and slope protection works whatsoever in terms of retaining wall, breast wall, gabion wall or under special requirement of hill slope specified hereinabove shall be treated as an approximate assessment. The actual lengths as required on the basis of detailed investigations shall be determined by the Contractor in accordance with the Specifications and Standards. Any variations in the lengths and specifications in this Schedule-B shall not constitute a Change of Scope.

14 BYPASSES

Nil

15 REALIGNMENTS

S. No	Design Chainage (Km)		Length (m)	TCS Type
	From	To		
Nil				

SCHEDULE – C

(See Clause 2.1)

PROJECT FACILITIES

1 Project Facilities

The EPC Contractor shall construct the Project Facilities in accordance with the provisions of this Agreement. Such Project Facilities shall include:

(a) Toll plazas;

(b) Roadside furniture;

(c) Street lighting;

(d) Pedestrian facilities;

(e) Landscaping and tree plantation;

(f) Truck lay-byes;

(g) Bus-bays and bus shelters;

(h) Traffic aid posts;

(i) Medical aid posts;

(j) Vehicle rescue posts; and

(k) Others

Annex - I
(Schedule - C)

Project Facilities

1 Project Facilities

The EPC Contractor shall construct the Project Facilities described in this Annex-I to form part of the Two-Lane Project Highway. The Project Facilities shall include:

(a) Toll plazas;

(b) Roadside furniture;

(c) Pedestrian facilities;

(d) Landscaping and tree plantation;

(e) Truck lay-byes;

(f) Bus-bays and bus shelters;

(g) Highway Patrol Unit;

(h) Emergency Medical Services;

(i) Crane Services; and

(j) Others

2 Description of Project Facilities

Each of the Project Facilities is briefly described below:

(a) Toll Plazas

Nil

(b) Road side Furniture

Road side furniture shall be provided in accordance with Section 9.0 of the Manual of Standards and Specifications

(c) Pedestrian Facilities

Pedestrian crossing Facilities shall be provided in accordance with Clause 9.8 of the Manual of Standards and Specifications and Typical Cross Section Details provided in Appendix BI

(d) Landscaping and Tree Plantation

Highway landscaping and tree plantation shall be provided in accordance with Section 11 of the Manual of Standards and Specifications.

(e) Truck Lay-byes

Nil

(f) Bus-bays and Bus Shelter

Bus-bays and shelters shall be provided in accordance with Clause 12.6 of the Manual of Standards and Specifications at following locations.

S. No	Design Chainage (Km)	Village	Side
1	357+750	Sona Village	Both Sides
2	363+550	Kackching Lamkhai Village	Both Sides
3	365+950	Pallel Town	Both Sides
4	373+350	Bangjing Village	Both Sides

(g) Highway Patrol Unit

Nil

(h) Emergency Medical Services

Nil

(i) Crane Services

Nil

(j) Others

Highway Lighting

Lighting shall be provided at the following locations:

(i) Lighting shall be provided at Toll Plaza, Truck lay byes and Bus stops as per Schedule D

(ii) High Mast Lighting shall be provided at all Major Junctions, Toll plaza, Truck lay byes and Grade Separation structures.

SCHEDULE – D

(See Clause 2.1)

SPECIFICATIONS AND STANDARDS

1. Construction

The Contractor shall comply with the Specifications and Standards set forth in Annex – I of this Schedule – D for construction of the Project Highway.

2. Design Standards

The Project Highway including Project Facilities shall conform to design requirements set out in the following documents:

Manual of Standards & Specification for Four Laning of Highways (IRC: SP-84-2014) referred to herein as the Manual]

[Note: Specify the relevant Manual, Specifications and Standards]

Annex – I

(Schedule – D)

Specifications and Standards for Construction

1 Specifications and Standards

All Materials, works and construction operations shall conform to the Manual of Standards & Specification for Four laning of Highways (IRC: SP-84-2014), referred to as the Manual, and MORTH Specifications for Road and Bridge Works, IRC: SP: 48-1998 and IRC 56-2011. Where the specification for a work is not given, Good Industry Practice shall be adopted to the satisfaction of the Authority's Engineer.

2 Deviations from the Specifications and Standards

2.1 The terms "Concessionaire", "Independent Engineer" and "Concession Agreement" used in the Manual shall be deemed to be substituted by the terms "Contractor", "Authority's Engineer" and "Agreement" respectively.

2.2 [Notwithstanding anything to the contrary contained in Paragraph 1 above, the following Specifications and Standards shall apply to the Project Highway, and for purposes of this Agreement, the aforesaid Specifications and Standards shall be deemed to be amended to the extent set forth below:]

[Note 1: Deviations from the aforesaid Specifications and Standards shall be listed out here. Such deviations shall be specified only if they are considered essential in view of project-specific requirements.]

Sl. No.	Clause No.	Description	Deviation
1	Clause 2.1	General: Provision of Four lane divided carriageway through built-up areas	Lane configuration and width of carriageway shall be provided as per the Typical cross sections given in **Schedule B.**
2	Clause 2.2	Design Speed: Ruling or minimum Design speed shall be followed	Design speed shall be adopted as mentioned in the Plan & Profile drawings given in **Schedule B and clause 2.2 & 2.3.**
3	Clause 2.6	Type and width of Shoulders	Type and Width of shoulders shall be as per the **Typical cross sections given in Schedule B.**
4	Clause 2.9.3	Super-elevation Shall be limited to 7 Percent	Super-elevation shall be limited to **5% (five Percent).**
5	Clause 2.9.4	Radius of Horizontal Curves	Radius of Horizontal curves shall be as per the alignment plan shown in Plan & Profile drawings given in **Schedule B.**
6	Clause 2.9.5	Sight Distance: On two-lane roads, normally intermediate sight distance should be available throughout.	Stopping sight distance shall be provided as a minimum, where ever possible intermediate and over taking sight distance shall be provided.
9	Clause 5.1 &	Provision of Flexible or Rigid pavement	The type of Pavement shall be as per **Clause 5.2 of Schedule B.**

Sl. No.	Clause No.	Description	Deviation
	5.1.1		
10	Clause 5.9	Widening and strengthening	The project road is recommended for full reconstruction based on the schemes and the designed profiles and as per clause **given in Schedule B.**
11	Clause 6.3.2	Median Drainage: In super-elevated sections, combination of covered longitudinal and cross drains shall be provided	Median cuts shall be provided at the location of super-elevated sections to allow the water to flow from one side carriageway to other side.
12	Fig 7.2, 7.3 & 7.4	Deck Width of bridges	Deck width of Structures and bridges shall be **as per clause 7.0 of Schedule B.**

2.2 Notwithstanding anything to the contrary contained in Paragraph 1 above, the MORTH Specifications for Road and Bridge Works 5th Revision 2013 shall be amended to the extent given in Appendix D-1 to this Schedule D.

SCHEDULE - E

(See Clauses 2.1 and 14.2)

MAINTENANCE REQUIREMENTS

1 Maintenance Requirements

1.1 The Contractor shall, at all times maintain the Project Highway in accordance with the provisions of this Agreement, Applicable Laws and Applicable Permits.

1.2 The Contractor shall repair or rectify any Defect or deficiency set forth in Paragraph 2 of this Schedule-E within the time limit specified therein and any failure in this behalf shall constitute non-fulfillment of the Maintenance obligations by the Contractor. Upon occurrence of any breach hereunder, the Authority shall be entitled to effect reduction in monthly lump sum payment as set forth in Clause 14.6 of this Agreement, without prejudice to the rights of the Authority under this Agreement, including Termination thereof.

1.3 All Materials, works and construction operations shall conform to the MORTH Specifications for Road and Bridge Works, and the relevant IRC publications. Where the specifications for a work are not given, Good Industry Practice shall be adopted.

[Specify all the relevant documents]

2 Repair/rectification of Defects and deficiencies

The obligations of the Contractor in respect of Maintenance Requirements shall include repair and rectification of the Defects and deficiencies specified in Annex -I of this Schedule-E within the time limit set forth therein.

3 Other Defects and deficiencies

In respect of any Defect or deficiency not specified in Annex -I of this Schedule-E, the Authority's Engineer may, in conformity with Good Industry Practice, specify the permissible limit of deviation or deterioration with reference to the Specifications and Standards, and any deviation or deterioration beyond the permissible limit shall be repaired or rectified by the Contractor within the time limit specified by the Authority's Engineer.

4 Extension of time limit

Notwithstanding anything to the contrary specified in this Schedule-E, if the nature and extent of any Defect or deficiency justifies more time for its repair or rectification than the time specified herein, the Contractor shall be entitled to additional time in conformity with Good Industry Practice. Such additional time shall be determined by the Authority's Engineer and conveyed to the Contractor and the Authority with reasons thereof.

5 Emergency repairs/restoration

Notwithstanding anything to the contrary contained in this Schedule-E, if any Defect, deficiency or deterioration in the Project Highway poses a hazard to safety or risk of damage to property, the Contractor shall promptly take all reasonable measures for eliminating or

minimizing such danger.

6 Daily inspection by the Contractor

The Contractor shall, through its engineer, undertake a daily visual inspection of the Project Highway and maintain a record thereof in a register to be kept in such form and manner as the Authority's Engineer may specify. Such record shall be kept in safe custody of the Contractor and shall be open to inspection by the Authority and the Authority's Engineer at any time during office hours.

7. Pre-monsoon inspection / Post-monsoon inspection

The Contractor shall carry out a detailed pre-monsoon inspection of all bridges, culverts and drainage system before [1st June] every year in accordance with the guidelines contained in IRC: SP35. Report of this inspection together with details of proposed maintenance works as required on the basis of this inspection shall be sent to the Authority's Engineer before the [10th June] every year. The Contractor shall complete the required repairs before the onset of the monsoon and send to the Authority's Engineer a compliance report. Post monsoon inspection shall be done by the [30th September] and the inspection report together with details of any damages observed and proposed action to remedy the same shall be sent to the Authority's Engineer.

8. Repairs on account of natural calamities

All damages occurring to the Project Highway on account of a Force Majeure Event or default or neglect of the Authority shall be undertaken by the Authority at its own cost. The Authority may instruct the Contractor to undertake the repairs at the rates agreed between the Parties.

Annex -I
(Schedule-E)

REPAIR / RECTIFICATION OF DEFECTS AND DEFICIENCIES

The Contractor shall repair and rectify the Defects and deficiencies specified in this Annex-I of Schedule-E within the time limit set forth in the table below.

Nature of Defect or Deficiency		Time limit for repair/rectification
Roads		
(a)	**Carriageway and Paved Shoulder**	
(i)	Breach or blockade	Temporary restoration of traffic within 24 hours; permanent restoration within 15 (fifteen) days
(ii)	Roughness value exceeding 2,200 mm in a stretch of 1 km (as measured by a calibrated bump integrator)	120 (one hundred and twenty) days
(iii)	Pot Holes	24 Hours
(iv)	Any cracks in road surface	15 (fifteen days)
(v)	Any depressions, rutting exceeding 10mm in road surface	30 (thirty days)
(vi)	Bleeding/skidding	7 (seven) days
(vii)	Any other defect/distress on the Road	15 (fifteen) days
(viii)	Damage to pavement edges	15 (fifteen) days
(ix)	Removal of debris, dead animals	6 hours
(b)	**Granular Earth shoulder, side slopes, drain and culverts**	
(i)	Variation by more than 1 % in the prescribed slope of camber/cross fall (shall not be less than the camber on the main carriageway)	7 (seven) days
(ii)	Edge drop at shoulders exceeding 40 mm	7 (seven) days
(iii)	Variation by more than 15% in the prescribed side (embankment) slopes	30 (thirty) days
(iv)	Rain cuts/gullies in slope	7 (seven) days
(v)	Damage to or silting of culverts and side drains	7 (seven) days
(vi)	De-silting of drains in urban/semi urban Areas	24 hours
(vii)	Railing, parapets, crash barriers	7 (seven) days (Restore immediately if causing safety hazard)

(c)	**Road side furniture including road sign and pavement marking**	
(i)	Damage to shape or position, poor visibility or loss of retro reflectivity	48 hours
(ii)	Painting of km stone, railing, parapets, crash barriers	As and when required/Once every year
(iii)	Damaged/missing road signs requiring replacement	7 (seven) days
(iv)	Damage to road mark ups	7 (seven) days
(d)	**Road lighting**	
(i)	Any major failure of the system	24 hours
(ii)	Faults and minor failures	8 hours
(e)	**Trees and plantation**	
(i)	Obstruction in a minimum headroom of 5 m above carriageway or obstruction in visibility of road signs	24 hours
(ii)	Removal of fallen trees from Carriageway	4 hours
(iii)	Deterioration in health of trees and Bushes	Timely watering and treatment
(iv)	Trees and bushes requiring Replacement	30 (thirty) days
(v)	Removal of vegetation affecting sight line and road structures	15 (fifteen) days
(f)	**Rest Area**	
(i)	Cleaning of toilets	Every 4 hours
(ii)	Defects in electrical, water and sanitary installations	24 hours
(g)	**[Toll Plaza]**	
(h)	**Other Project Facilities and Approach roads**	
(i)	Damage in approach roads, pedestrian facilities, truck lay byes, bus-bays, bus-shelters, cattle crossings, [Traffic Aid Posts, Medical Aid Posts] and service Roads	15 (fifteen) days
(ii)	Damaged vehicles or debris on the Road	4 (four) hours
(iii)	Malfunctioning of the mobile Crane	4 (four) hours
Bridges		
(a)	**Superstructure**	

(i)	Any damage, cracks, spalling/ scaling Temporary measures Permanent measures	within 48 hours within 15 (fifteen) days or as specified by the Authority's Engineer
(b)	**Foundations**	
(i)	Scouring and/or cavitations	15 (fifteen) days
(c)	**Piers, abutments, return walls and wing walls**	
(i)	Cracks and damages including settlement and tilting, spalling and scaling	30 (thirty) days
(d)	**Bearings (metallic) of bridges**	
(i)	Deformation, damages, tilting or shifting of bearings	15 (fifteen) days Greasing of metallic bearings once in a year
(e)	**Joints**	
(i)	Malfunctioning of joints	15 (fifteen) days
(f)	**Other items**	
(i)	Deforming of pads in elastomeric bearings	7 (seven) days
(ii)	Gathering of dirt in bearings and joints; or clogging of spouts, weep holes and vent-holes	3 (three) days
(iii)	Damage or deterioration in kerbs, parapets, handrails and crash barriers	3 (three) days (immediately within 24 hours if posing danger to safety)
(iv)	Rain-cuts or erosion of banks of the side slopes of approaches	7 (seven) days
(v)	Damage to wearing coat	15 (fifteen) days
(vi)	Damage or deterioration in approach slabs, pitching, apron, toes, floor or guide bunds	30 (thirty) days
(vii)	Growth of vegetation affecting the structure or obstructing the waterway	15 (fifteen) days
(g)	**Hill Roads**	
(i)	Damage to retaining wall/breast wall	7 (seven) days
(ii)	Landslides requiring clearance	12 (twelve) hours
(iii)	Snow requiring clearance	24 (twenty four) hours

[Note: Where necessary, the Authority may modify the time limit for repair/rectification, or add to the nature of Defect or deficiency before issuing the bidding document, with the approval of the competent authority.]

SCHEDULE - F

(See Clause 3.1.7(a))

APPLICABLE PERMITS

1 Applicable Permits

1.1 The Contractor shall obtain, as required under the Applicable Laws, the following Applicable Permits:

(a) Permission of the State Government for extraction of boulders from quarry;

(b) Permission of Village Panchayats and Pollution Control Board for installation of crushers;

(c) Licence for use of explosives;

(d) Permission of the State Government for drawing water from river/reservoir;

(e) Licence from inspector of factories or other competent Authority for setting up batching plant;

(f) Clearance of Pollution Control Board for setting up batching plant;

(g) Clearance of Village Panchayats and Pollution Control Board for setting up asphalt plant;

(h) Permission of Village Panchayats and State Government for borrow earth; and

(i) Any other permits or clearances required under Applicable Laws.

1.2 Applicable Permits, as required, relating to environmental protection and conservation shall have been procured by the Authority in accordance with the provisions of this Agreement.

SCHEDULE - G

(See Clauses 7.1.1, 7.5.3 and 19.2)

FORM OF BANK GUARANTEE

Annex-I

(See Clause 7.1.1)

Performance Security

[The Managing Director,

National Highways & Infrastructure Development Corporation Limited

New Delhi]

WHEREAS:

(A) _____ [name and address of contractor] (hereinafter called the "**Contractor**") and [name and address of the authority], (hereinafter called the **"Authority"**) have entered into an agreement (hereinafter called the "**Agreement**") for the construction of the Imphal to Moreh section of [National Highway No. 39] from Km. 350+000 to 395+680 on Engineering, Procurement and Construction (the "**EPC**") basis, subject to and in accordance with the provisions of the Agreement

(B) The Agreement requires the Contractor to furnish a Performance Security for due and faithful performance of its obligations, under and in accordance with the Agreement, during the {Construction Period/ Defects Liability Period and Maintenance Period} (as defined in the Agreement) in a sum of Rs….. cr. (Rupees ……..….. crore) (the "**Guarantee Amount**").

(C) We, …….. through our branch at ……. (the "**Bank**") have agreed to furnish this bank guarantee (*hereinafter called the* **"Guarantee**") by way of Performance Security.

NOW, THEREFORE, the Bank hereby, unconditionally and irrevocably, guarantees and affirms as follows:

1. The Bank hereby unconditionally and irrevocably guarantees the due and faithful performance of the Contractor's obligations during the {Construction Period/ Defects Liability Period and Maintenance Period} under and in accordance with the Agreement, and agrees and undertakes to pay to the Authority, upon its mere first written demand, and without any demur, reservation, recourse, contest or protest, and without any reference to the Contractor, such sum or sums up to an aggregate sum of the Guarantee Amount as the Authority shall claim, without the Authority being required to prove or to show grounds or reasons for its demand and/or for the sum specified therein.
2. A letter from the Authority, under the hand of an officer not below the rank of [General Manager in the National Highways & Infrastructure Development Corporation Limited], that the Contractor has committed default in the due and faithful performance of all or any of its obligations under and in accordance with the Agreement shall be conclusive, final and binding

on the Bank. The Bank further agrees that the Authority shall be the sole judge as to whether the Contractor is in default in due and faithful performance of its obligations during and under the Agreement and its decision that the Contractor is in default shall be final and binding on the Bank, notwithstanding any differences between the Authority and the Contractor, or any dispute between them pending before any court, tribunal, arbitrators or any other authority or body, or by the discharge of the Contractor for any reason whatsoever.

3. In order to give effect to this Guarantee, the Authority shall be entitled to act as if the Bank were the principal debtor and any change in the constitution of the Contractor and/or the Bank, whether by their absorption with any other body or corporation or otherwise, shall not in any way or manner affect the liability or obligation of the Bank under this Guarantee.

4. It shall not be necessary, and the Bank hereby waives any necessity, for the Authority to proceed against the Contractor before presenting to the Bank its demand under this Guarantee.

5. The Authority shall have the liberty, without affecting in any manner the liability of the Bank under this Guarantee, to vary at any time, the terms and conditions of the Agreement or to extend the time or period for the compliance with, fulfilment and/ or performance of all or any of the obligations of the Contractor contained in the Agreement or to postpone for any time, and from time to time, any of the rights and powers exercisable by the Authority against the Contractor, and either to enforce or forbear from enforcing any of the terms and conditions contained in the Agreement and/or the securities available to the Authority, and the Bank shall not be released from its liability and obligation under these presents by any exercise by the Authority of the liberty with reference to the matters aforesaid or by reason of time being given to the Contractor or any other forbearance, indulgence, act or omission on the part of the Authority or of any other matter or thing whatsoever which under any law relating to sureties and guarantors would but for this provision have the effect of releasing the Bank from its liability and obligation under this Guarantee and the Bank hereby waives all of its rights under any such law.

6. This Guarantee is in addition to and not in substitution of any other guarantee or security now or which may hereafter be held by the Authority in respect of or relating to the Agreement or for the fulfilment, compliance and/or performance of all or any of the obligations of the Contractor under the Agreement.

7. Notwithstanding anything contained hereinbefore, the liability of the Bank under this Guarantee is restricted to the Guarantee Amount and this Guarantee will remain in force for the period specified in paragraph 8 below and unless a demand or claim in writing is made by the Authority on the Bank under this Guarantee all rights of the Authority under this Guarantee shall be forfeited and the Bank shall be relieved from its liabilities hereunder.

8. The Guarantee shall cease to be in force and effect on ****[$]. Unless a demand or claim under this Guarantee is made in writing before expiry of the Guarantee, the Bank shall be discharged from its liabilities hereunder.

9. The Bank undertakes not to revoke this Guarantee during its currency, except with the previous express consent of the Authority in writing, and declares and warrants that it has the power to issue this Guarantee and the undersigned has full powers to do so on behalf of the Bank.

10. Any notice by way of request, demand or otherwise hereunder may be sent by post addressed to the Bank at its above referred branch, which shall be deemed to have been duly authorised to receive such notice and to effect payment thereof forthwith, and if sent by post it shall be deemed to have been given at the time when it ought to have been delivered in due course of post and in proving such notice, when given by post, it shall be sufficient to prove that the envelope containing the notice was posted and a certificate signed by an officer of the Authority that the envelope was so posted shall be conclusive.

11. This Guarantee shall come into force with immediate effect and shall remain in force and effect for up to the date specified in paragraph 8 above or until it is released earlier by the Authority pursuant to the provisions of the Agreement.

Signed and sealed this ……. day of ……., 20…… at ……..

SIGNED, SEALED AND DELIVERED

For and on behalf of the Bank by:

(Signature)

(Name)

(Designation)

(Code Number) (Address)

NOTES:

(i) The bank guarantee should contain the name, designation and code number of the officer(s) signing the guarantee.

(ii) The address, telephone number and other details of the head office of the Bank as well as of issuing branch should be mentioned on the covering letter of issuing branch.

[$] Insert date being 2 (two) years from the date of issuance of this Guarantee (in accordance with Clause 7.2 of the Agreement).

Annex – II
(Schedule -G)
(See Clause 7.5.3)

FORM FOR GUARANTEE FOR WITHDRAWL OF RETENTION MONEY

[The Managing Director,

National Highways & Infrastructure Development Corporation Limited

New Delhi]

WHEREAS:

(A) [name and address of contractor] (hereinafter called the "**Contractor**") has executed an agreement (hereinafter called the "Agreement") with the [name and address of the authority], (hereinafter called the "**Authority**") for the construction of the Imphal to Moreh section of [National Highway No. 39] from Km. 350+000 to 395+680 on Engineering, Procurement and Construction (the "**EPC**") basis, subject to and in accordance with the provisions of the Agreement.

(B) In accordance with Clause 7.5.3 of the Agreement, the Contractor may withdraw the retention money (hereinafter called the "**Retention Money**") after furnishing to the Authority a bank guarantee for an amount equal to the proposed withdrawal.

(C) We, …….. through our branch at ……. (the "**Bank**") have agreed to furnish this bank guarantee (hereinafter called the "**Guarantee**") for the amount of Rs. ---------cr. (Rs.----------crore) (the "**Guarantee Amount**").

NOW, THEREFORE, the Bank hereby unconditionally and irrevocably guarantees and affirms as follows:

1 The Bank hereby unconditionally and irrevocably undertakes to pay to the Authority, upon its mere first written demand, and without any demur, reservation, recourse, contest or protest, and without any reference to the Contractor, such sum or sums up to an aggregate sum of the Guarantee Amount as the Authority shall claim, without the Authority being required to prove or to show grounds or reasons for its demand and/or for the sum specified therein.

2 A letter from the Authority, under the hand of an officer not below the rank of [General Manager in the National Highways & Infrastructure Development Corporation Limited], that the Contractor has committed default in the due and faithful performance of all or any of its obligations for under and in accordance with the Agreement shall be conclusive, final and binding on the Bank. The Bank further agrees that the Authority shall be the sole judge as to whether the Contractor is in default in due and faithful performance of its obligations during and under the Agreement and its decision that the Contractor is in default shall be final, and binding on the Bank, not withstanding any differences between the Authority and the Contractor, or any dispute between them pending before any court, tribunal, arbitrators or any other authority or body, or by the discharge of the Contractor for any reason whatsoever

3. In order to give effect to this Guarantee, the Authority shall be entitled to act as if the Bank were the principal debtor and any change in the constitution of the Contractor and/or the

Bank, whether by their absorption with any other body or corporation or otherwise, shall not in any way or manner affect the liability or obligation of the Bank under this Guarantee.

4. It shall not be necessary, and the Bank hereby waives any necessity, for the Authority to proceed against the Contractor before presenting to the Bank its demand under this Guarantee.

5. The Authority shall have the liberty, without affecting in any manner the liability of the Bank under this Guarantee, to vary at any time, the terms and conditions of the Advance Payment or to extend the time or period of its repayment or to postpone for any time, and from time to time, any of the rights and powers exercisable by the Authority against the Contractor, and either to enforce or forbear from enforcing any of the terms and conditions contained in the Agreement and/or the securities available to the Authority, and the Bank shall not be released from its liability and obligation under these presents by any exercise by the Authority of the liberty with reference to the matters aforesaid or by reason of time being given to the Contractor or any other forbearance, indulgence, act or omission on the part of the Authority or of any other matter or thing whatsoever which under any law relating to sureties and guarantors would but for this provision have the effect of releasing the Bank from its liability and obligation under this Guarantee and the Bank hereby waives all of its rights under any such law.

6. This Guarantee is in addition to and not in substitution of any other guarantee or security now or which may hereafter be held by the Authority in respect of or relating to the Retention Money.

7. Notwithstanding anything contained hereinbefore, the liability of the Bank under this Guarantee is restricted to the Guarantee Amount and this Guarantee will remain in force for the period specified in paragraph 8 below and unless a demand or claim in writing is made by the Authority on the Bank under this Guarantee all rights of the Authority under this Guarantee shall be forfeited and the Bank shall be relieved from its liabilities hereunder.

8. The Guarantee shall cease to be in force and effect 90 (ninety) days after the date of the Completion specified in Clause 12.4 of the Agreement.

9. The Bank undertakes not to revoke this Guarantee during its currency, except with the previous express consent of the Authority in writing, and declares and warrants that it has the power to issue this Guarantee and the undersigned has full powers to do so on behalf of the Bank.

10. Any notice by way of request, demand or otherwise hereunder may be sent by post addressed to the Bank at its above referred branch, which shall be deemed to have been duly authorised to receive such notice and to effect payment thereof forthwith, and if sent by post it shall be deemed to have been given at the time when it ought to have been delivered in due course of post and in proving such notice, when given by post, it shall be sufficient to prove that the envelope containing the notice was posted and a certificate signed by an officer of the Authority that the envelope was so posted shall be conclusive.

11. This Guarantee shall come into force with immediate effect and shall remain in force and effect up to the date specified in paragraph 8 above or until it is released earlier by the Authority pursuant to the provisions of the Agreement.

Signed and sealed this ……. day of ……., 20…… at ……..

SIGNED, SEALED AND DELIVERED

For and on behalf of the Bank by:

(Signature)

(Name)

(Designation)

(Code Number)

(Address)

NOTES:

(i) The bank guarantee should contain the name, designation and code number of the officer(s) signing the guarantee.

(ii) The address, telephone number and other details of the head office of the Bank as well as of issuing branch should be mentioned on the covering letter of issuing branch.

Annex – III
(Schedule - G)
(See Clause 19.2)

FORM FOR GUARANTEE FOR ADVANCE PAYMENT

[The Managing Director,

National Highways & Infrastructure Development Corporation Limited

New Delhi]

WHEREAS:

(A) [name and address of contractor] (hereinafter called the "**Contractor**") has executed an agreement (hereinafter called the "**Agreement**") with the [name and address of the authority], (hereinafter called the "**Authority**") for the construction of the Imphal to Moreh section of [National Highway No. 39] from Km. 350+000 to 395+680 on Engineering, Procurement and Construction (the "**EPC**") basis, subject to and in accordance with the provisions of the Agreement

(B) In accordance with Clause 19.2 of the Agreement, the Authority shall make to the Contractor an interest free advance payment (herein after called "**Advance Payment**") equal to 10% (ten per cent) of the Contract Price; and that the Advance Payment shall be made in three installments subject to the Contractor furnishing an irrevocable and unconditional guarantee by a scheduled bank for an amount equivalent to 110% (one hundred and ten percent) of such installment to remain effective till the complete and full repayment of the installment of the Advance Payment as security for compliance with its obligations in accordance with the Agreement. The amount of {first/second/third} installment of the Advance Payment is Rs. ------ cr. (Rupees ------ crore) and the amount of this Guarantee is Rs. ------- cr. (Rupees ------ crore) (the **"Guarantee Amount")$.**

(D) We, …….. through our branch at ……. (the "**Bank"**) have agreed to furnish this bank guarantee (*hereinafter called the* **"Guarantee"**) for the Guarantee Amount.

NOW, THEREFORE, the Bank hereby, unconditionally and irrevocably, guarantees and affirms as follows:

1 The Bank hereby unconditionally and irrevocably guarantees the due and faithful repayment on time of the aforesaid instalment of the Advance Payment under and in accordance with the Agreement, and agrees and undertakes to pay to the Authority, upon its mere first written demand, and without any demur, reservation, recourse, contest or protest, and without any reference to the Contractor, such sum or sums up to an aggregate sum of the Guarantee Amount as the Authority shall claim, without the Authority being required to prove or to show grounds or reasons for its demand and/or for the sum specified therein.

2. A letter from the Authority, under the hand of an officer not below the rank of [General Manager in the National Highways & Infrastructure Development Corporation Limited], that the Contractor has committed

$ The Guarantee Amount should be equivalent to 110% of the value of the applicable instalment.

default in the due and faithful performance of all or any of its obligations for the repayment of the installment of the Advance Payment under and in accordance with the Agreement shall be conclusive, final and binding on the Bank. The Bank further agrees that the Authority shall be the sole judge as to whether the Contractor is in default in due and faithful performance of its obligations during and under the Agreement and its decision that the Contractor is in default shall be final and binding on the Bank, notwithstanding any differences between the Authority and the Contractor, or any dispute between them pending before any court, tribunal, arbitrators or any other authority or body, or by the discharge of the Contractor for any reason whatsoever.

3. In order to give effect to this Guarantee, the Authority shall be entitled to act as if the Bank were the principal debtor and any change in the constitution of the Contractor and/or the Bank, whether by their absorption with any other body or corporation or otherwise, shall not in any way or manner affect the liability or obligation of the Bank under this Guarantee.

4. It shall not be necessary, and the Bank hereby waives any necessity, for the Authority to proceed against the Contractor before presenting to the Bank its demand under this Guarantee.

5. The Authority shall have the liberty, without affecting in any manner the liability of the Bank under this Guarantee, to vary at any time, the terms and conditions of the Advance Payment or to extend the time or period of its repayment or to postpone for any time, and from time to time, any of the rights and powers exercisable by the Authority against the Contractor, and either to enforce or forbear from enforcing any of the terms and conditions contained in the Agreement and/or the securities available to the Authority, and the Bank shall not be released from its liability and obligation under these presents by any exercise by the Authority of the liberty with reference to the matters aforesaid or by reason of time being given to the Contractor or any other forbearance, indulgence, act or omission on the part of the Authority or of any other matter or thing whatsoever which under any law relating to sureties and guarantors would but for this provision have the effect of releasing the Bank from its liability and obligation under this Guarantee and the Bank hereby waives all of its rights under any such law.

6. This Guarantee is in addition to and not in substitution of any other guarantee or security now or which may hereafter be held by the Authority in respect of or relating to the Advance Payment.

7. Notwithstanding anything contained hereinbefore, the liability of the Bank under this Guarantee is restricted to the Guarantee Amount and this Guarantee will remain in force for the period specified in paragraph 8 below and unless a demand or claim in writing is made by the Authority on the Bank under this Guarantee all rights of the Authority under this Guarantee shall be forfeited and the Bank shall be relieved from its liabilities hereunder.

8. The Guarantee shall cease to be in force and effect on ****.$ Unless a demand or claim under this Guarantee is made in writing on or before the aforesaid date, the Bank shall be discharged from its liabilities hereunder.

9. The Bank undertakes not to revoke this Guarantee during its currency, except with the previous express consent of the Authority in writing, and declares and warrants that it has the power to issue this Guarantee and the undersigned has full powers to do so on behalf of the

Bank.

10. Any notice by way of request, demand or otherwise hereunder may be sent by post addressed to the Bank at its above referred branch, which shall be deemed to have been duly authorised to receive such notice and to effect payment thereof forthwith, and if sent by post it shall be deemed to have been given at the time when it ought to have been delivered in due course of post and in proving such notice, when given by post, it shall be sufficient to prove that the envelope containing the notice was posted and a certificate signed by an officer of the Authority that the envelope was so posted shall be conclusive.

11. This Guarantee shall come into force with immediate effect and shall remain in force and effect up to the date specified in paragraph 8 above or until it is released earlier by the Authority pursuant to the provisions of the Agreement.

Signed and sealed this ……. day of ……., 20…… at ……..

SIGNED, SEALED AND DELIVERED

For and on behalf of the Bank by:

(Signature)

(Name)

(Designation)

(Code Number)

(Address)

NOTES:

(i) The bank guarantee should contain the name, designation and code number of the officer(s) signing the guarantee.

(ii) The address, telephone number and other details of the head office of the Bank as well as of issuing branch should be mentioned on the covering letter of issuing branch.

$ Insert a date being 90 (ninety) days after the end of one year from the date of payment of the Advance payment to the Contractor (in accordance with Clause 19.2 of the Agreement). (Code Number)

SCHEDULE - H
(See Clauses10.1.4 and 19.3)

CONTRACT PRICE WEIGHTAGES

1.1 The Contract Price for this Agreement is Rs. ******

1.2 Proportions of the Contract Price for different stages of Construction of the Project Highway shall be as specified below:

Item	Weightage in Percentage to the Contract Price	Stage for Payment	Percentage Weightage
1	**2**	**3**	**4**
Road works including Culverts, Minor Bridges, approaches to ROB / RUB / Major Bridges/ Structures (but excluding service roads)	73.50	**A- Widening and strengthening of existing road**	
		(1) Earthwork up to top of the sub-grade	37.79
		(2) Granular work (Sub base, Base, Shoulders)	24.88
		(3) Bituminous work	25.28
		(4) CC Pavement	0.00
		(5) Widening and repair of culverts	0.00
		(6) Widening and repair of Minor bridges	0.13
		B- New 2-lane realignment / bypass	
		(1) Earthwork up to top of the sub-grade	0.00
		(2) Granular work (Sub base, Base, Shoulders)	0.00
		(3) Bituminous work	0.00
		(4) CC Pavement	0.00
		C- New Culverts, Minor Bridges, Underpasses, Overpasses on Existing Road, Realignments, Bypasses:	
		(1) Culverts	11.92
		(2) Minor bridges	0.00

Major Bridge works, Underpasses, Overpasses and ROB / RUB	0.50	**A- Widening and repairs of Major Bridges**	
		(1) Foundation	0.00
		(2) Sub-structure	0.00
		(3) Super-structure (including crash barriers etc. complete)	0.00
		(4) Protection works	0.00
		B- Widening and repair of	
		(a) ROB	0.00
		(b) RUB	0.00
		C- New Major Bridges	
		(1) Foundation	0.00
		(2) Sub-structure	0.00
		(3) Super-structure (including crash barriers etc. complete)	0.00
		(4) Protection works	0.00
		D- New rail-road bridges	
		(a) ROB	0.00
		(b) RUB	0.00
		E- Cattle / Pedestrian Underpasses	0.00
		F- Vehicular Underpasses	100.00
		G- Overpasses	0.00
Structures (Elevated Sections, Reinforced Earth)	1.20	(1) Foundation	0.00
		(2) Sub-structure	0.00
		(3) Super-structure (including crash barriers etc. complete)	0.00
		(4) Reinforced Earth	100.00
Other works	24.80	(i) Service roads	2.51
		(ii) Toll Plaza	0.00
		(iii) Road side drains	5.53
		(iv) Road signs, markings, km stones, safety devices,	13.19
		(v) Project facilities	
		a) Bus Bay	1.19
		b) Bus Shelter	0.16
		c) Truck Lay Bye	0.00

		d) Others	0.47
		(vi) Repairs to bridges/structures	
		a) Providing wearing coat	0.29
		b) Replacement of bearings, joints	0.34
		c) Providing crash barriers	0.15
		d) Other items	0.19
		(vii) Road side plantation	0.00
		(viii) Repair of protection works	0.00
		(ix) Safety & traffic management during construction *	2.32
		(x) Junctions	0.28
		(xi) Retaining wall	65.41
		(xii) Miscellaneous	7.97

* The above list is illustrative and may require modification as per the scope of the work.

1.3 Procedure of estimating the value of work done

1.3.1 Road works including approaches to minor bridges, Major Bridges and Structures (excluding service roads).

Procedure for estimating the value of road work done shall be as follows:

Table 1.3.1

Stage of Payment	Percentage Weightage	Payment Procedure
A Widening & Strengthening		Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in a length of not less than 10 (ten) percent of the total length. @
(1) Earthwork up to top of the sub-grade	37.79	
(2) Granular work (subbase, base, shoulders)	24.88	
(3) Bituminous work	25.28	
(4) CC Pavement	0.00	
(5) Widening and repair of culverts	0.00	Cost of ten completed culverts shall be determined pro rata with respect to the total number of culverts. Payment shall be made on the completion of ten culverts.
(6) Widening and repair of minor bridges	0.13	Cost of each minor bridge shall be determined on pro rata basis with respect to the total linear length of the minor bridges. Payment shall be made on the completion of a minor bridge.
B New 2-lane realignment, bypass		Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a

(1) Earthwork up to top of the sub-grade	0.00	stage in full length or 5 (five) km length.
(2) Granular work (subbase, base, shoulders)	0.00	
(3) Bituminous work	0.00	
(4) CC Pavement	0.00	
C New culverts, minor bridges on existing road, realignments, bypasses:		
(1) Culverts	11.92	Cost of each culvert shall be determined on pro rata basis with respect to the total number of culverts. Payment shall be made on the completion of five culverts.
(2) Minor bridges	0.00	Cost of each minor bridge shall be determined on pro rata basis with respect to the total linear length of the minor bridges. Payment shall be made on the completion of a minor bridge

@. For example, if the total length of bituminous work to be done is 100 km, the cost per km of bituminous work shall be determined as follows:

Cost per km = P x weight age for road work x weight age for bituminous work x (1/L)

Where P= Contract Price

L = Total length in km

Similarly, the rates per km for stages (1), (2) and (4) above shall be worked out.

1.3.2 Major Bridge works and ROB/RUB.

Procedure for estimating the value of Major Bridge works and of ROB/RUB shall be as stated in table 1.3.2:

Table 1.3.2

Stage of Payment	Weightage	Payment Procedure

A Widening and repairs of Major Bridges Foundation: On completion of the foundation work including foundations for wing and return walls	0.00	Cost of each Major Bridge (Widening and repairs) shall be determined on pro-rata basis with respect to the total linear length (m) of the Major Bridges (widening and repairs). Payment shall be made on completion of each stage of a Major Bridge as per the weight age given in this table.
Sub-structure: On completion of abutments, piers up to the abutment/pier cap	0.00	
Super-structure: On completion of the super structure in all respects including hand rails/crash barriers, wing walls, return walls, guide bunds, if any, tests on completion etc., bridge complete in all respects and fit for use.	0.00	
B Widening and repairs of (a) ROB	0.00	Cost of each ROB/RUB (widening and repairs) shall be determined on prorate basis with respect to the total linear length (m) of the ROB/RUB (widening and repairs). Payment shall be made on completion of an ROB/RUB
(b) RUB	0.00	
C New Major Bridges (1) Foundation: On completion of the foundation work including foundations for wing and return walls	0.00	Cost of each Major Bridge shall be determined on pro rata basis with respect to the total linear length (m) of the Major Bridges. Payment shall be made on completion of each stage of a Major Bridge as per the weight age given in this table
(2) Sub-structure: On completion of abutments, piers up to the abutment/pier cap	0.00	
(3) Super-structure: On completion of the super structure in all respects including hand rails/crash barriers, wing walls, return walls, guide bunds, if any, tests on completion etc., complete in all respects and fit for use	0.00	
(4) Protection works	0.00	
D New Rail-road bridges		Cost of each ROB/RUB shall be

(a) ROB (b) RUB	0.00 0.00	determined on pro-rata basis with respect to the total linear length (m) of the ROB/RUB. Payment shall be made on completion of an ROB/RUB
E Cattle / Pedestrian Underpasses **F Pedestrian Overpasses**	0.00 0.00	Cost of each Cattle / Pedestrian Underpass or Overpasses shall be determined on pro rata basis with respect to the total number of Cattle / Pedestrian Underpasses or Overpasses. Payment shall be made on the completion of the number of Cattle/Pedestrian Underpasses or Overpasses specified below: Total No: Stage for Payment: (i) 1 to 5 - on completion of all, (ii) 6 or more - on completion of five
G Grade Separated Structures (a) Underpasses (b) Overpasses	 100.00 0.00	 Same as for (E) above

1.3.3 Structures

Procedure for estimating the value of structure work shall be as stated in 1.3.3:

Table 1.3.3

Stage of payment	Weightage	Payment procedure
(1) Foundation: On completion of the foundation works including foundations for wing and return walls	0.00	Cost of each structure shall be determined on pro rata basis in respect to the total linear length (m) of all the structures. Payment shall be made on completion of each stage of a structure as per the weight age given in this table.
(2) Sub-structure: On completion of abutments, piers up to the abutment/pier cap	0.00	
(3) Super-structure: On completion of the Structure along with super structure, including hand rails/crash barriers, wing walls, return walls, tests on completion etc., elevated structure complete in all respects and fit for use.	0.00	
(4) Reinforced Earth work	100.00	Payment shall be made on pro rata

		basis on completion of 25 (twenty five) percent of total area.

1.3.4 Other works.

Procedure for estimating the value of other works done shall be as stated in table 1.3.4.

Table 1.3.4

Stage of Payment	Weightage	Payment Procedure
(i) Service roads	2.51	Unit of measurement is linear length in km. Cost per km shall be determined on pro rata basis with respect to the total length of the service roads. Payment shall be made for completed service road in a length of not less than 20 (twenty) percent of the total length of service roads.
(ii) Toll plaza	0.00	Unit of measurement is each completed toll plaza. Payment of each toll plaza shall be made on pro rata basis with respect to the total of all toll plazas.
(iii) Road side drains	5.52	Unit of measurement is linear length in km. Payment shall be made on pro rata basis on completion of a stage in a length of not less than 10 % (ten per cent) of the total length.
(iv) Road signs, markings, km stones, safety devices,	13.19	
(v) Project Facilities		Payment shall be made on pro rata basis for completed facilities.
a) Bus bays	1.19	
b) Bus Shelter	0.16	
c) Truck lay-byes	0.00	
d) Rest areas	0.00	
e) Others	0.47	

(vi) Repairs to existing bridges/structures a) Providing wearing coat b) Replacement of bearing, joints c) Providing crash barriers d) Other items	 0.29 0.34 0.15 0.19	Payment shall be made for completed items.
(vii) Roadside plantation	0.00	Unit of measurement is linear length. Payment shall be made on pro rata basis on completion of a stage in a length of not less than 10% (ten per cent) of the total length.
(viii) Protection works	0.00	
(ix) Safety and traffic management during construction	2.32	Payment shall be made on pro-rata basis every six months
(x) Junctions	0.28	Payment shall be made on pro rata basis for completed facilities.
(xi) Retaining wall	65.41	Unit of measurement is linear length. Payment shall be made on pro rata basis on completion of a stage in a length of not less than 10% (ten per cent) of the total length.
(xii) Miscellaneous	7.97	

2. Procedure for payment for Maintenance

2.1 The cost for maintenance shall be as stated in Clause 14.1.1.

2.2 Payment for Maintenance shall be made in quarterly installments in accordance with the provisions of Clause 19.7.

SCHEDULE - I

(See Clause 10.2.4)

DRAWINGS

1 Drawings

In compliance of the obligations set forth in Clause 10.2 of this Agreement, the Contractor shall furnish to the Authority's Engineer, free of cost, all Drawings listed in Annex-I of this Schedule-I.

2 Additional Drawings

If the Authority's Engineer determines that for discharging its duties and functions under this Agreement, it requires any drawings other than those listed in Annex-I, it may by notice require the Contractor to prepare and furnish such drawings forthwith. Upon receiving a requisition to this effect, the Contractor shall promptly prepare and furnish such drawings to the Authority's Engineer, as if such drawings formed part of Annex-I of this Schedule-I.

Annex - I
(Schedule - I)

LIST OF DRAWINGS

[**Note**: The Authority shall describe in this Annex-I, all the Drawings that the Contractor is required to furnish under Clause 10.2.]

SCHEDULE - J

(See Clause 10.3.2)

PROJECT COMPLETION SCHEDULE

1 Project Completion Schedule

During Construction period, the Contractor shall comply with the requirements set forth in this Schedule-J for each of the Project Milestones and the **Scheduled Completion Date**. Within 15 (fifteen) days of the date of each Project Milestone, the Contractor shall notify the Authority of such compliance along with necessary particulars thereof.

2 Project Milestone-I

2.1 Project Milestone-I shall occur on the date falling on the 365th (three hundred and sixty fifth) day from the Appointed Date (the "**Project Milestone-I**").

2.2 Prior to the occurrence of Project Milestone-I, the Contractor shall have commenced construction of the Project Highway and submitted to the Authority duly and validly prepared Stage Payment Statements for an amount not less than 10% (ten per cent) of the Contract Price.

3 Project Milestone-II

3.1 Project Milestone-II shall occur on the date falling on the 730th (seven hundred and thirtieth) day from the Appointed Date (the "**Project Milestone-II**").

3.2 Prior to the occurrence of Project Milestone-II, the Contractor shall have continued with construction of the Project Highway and submitted to the Authority duly and validly prepared Stage Payment Statements for an amount not less than 30% (thirty per cent) of the Contract Price.

4 Project Milestone-III

4.1 Project Milestone-III shall occur on the date falling on the [1095th (One thousand and ninety fifth)] day from the Appointed Date (the "**Project Milestone-III**").

4.2 Prior to the occurrence of Project Milestone-III, the Contractor shall have continued with construction of the Project Highway and submitted to the Authority duly and validly prepared Stage Payment Statements for an amount not less than 60% (sixty per cent) of the Contract Price.

5 Scheduled Completion Date

5.1 The Scheduled Completion Date shall occur on the [1460th (One thousand four hundred and sixtieth day)] day from the Appointed Date.

5.2 On or before the Scheduled Completion Date, the Contractor shall have completed construction in accordance with this Agreement.

6 Extension of time

Upon extension of any or all of the aforesaid Project Milestones or the Scheduled Completion Date, as the case may be, under and in accordance with the provisions of this Agreement, the Project Completion Schedule shall be deemed to have been amended accordingly.

SCHEDULE - K

(See Clause 12.1.2)

TESTS ON COMPLETION

Schedule for Tests

1.1 The Contractor shall, no later than 30 (thirty) days prior to the likely completion of construction, notify the Authority's Engineer and the Authority of its intent to subject the Project Highway to Tests, and no later than 10 (ten) days prior to the actual date of Tests, furnish to the Authority's Engineer and the Authority detailed inventory and particulars of all works and equipment forming part of Works.

1.2 The Contractor shall notify the Authority's Engineer of its readiness to subject the Project Highway to Tests at any time after 10 (ten) days from the date of such notice, and upon receipt of such notice, the Authority's Engineer shall, in consultation with the Contractor, determine the date and time for each Test and notify the same to the Authority who may designate its representative to witness the Tests. The Authority's Engineer shall thereupon conduct the Tests itself or cause any of the Tests to be conducted in accordance with Article 12 and this Schedule-K.

2 Tests

2.1 Visual and physical test: The Authority's Engineer shall conduct a visual and physical check of construction to determine that all works and equipment forming part thereof conform to the provisions of this Agreement. The physical tests shall include [***].

2.2 Riding quality test: Riding quality of each lane of the carriageway shall be checked with the help of a calibrated bump integrator and the maximum permissible roughness for purposes of this Test shall be [2,000 (two thousand)] mm for each kilometer.

2.3 Tests for bridges: All major and minor bridges shall be subjected to the rebound hammer and ultrasonic pulse velocity tests, to be conducted in accordance with the procedure described in Special Report No. 17: 1996 of the IRC Highway Research Board on Nondestructive Testing Techniques, at two spots in every span, to be chosen at random by the Authority's Engineer. Bridges with a span of 15 (fifteen) metres or more shall also be subjected to load testing.

2.4 Other tests: The Authority's Engineer may require the Contractor to carry out or cause to be Carrie d additional tests, in accordance with Good Industry Practice, for determining the compliance of the Project Highway with Specifications and Standards.

2.5 Environmental audit: The Authority's Engineer shall carry out a check to determine conformity of the Project Highway with the environmental requirements set forth in Applicable Laws and Applicable Permits.

2.6 Safety Audit: The Authority's Engineer shall carry out, or cause to be carried out, a safety audit to determine conformity of the Project Highway with the safety requirements and Good Industry Practice.

3 Agency for conducting Tests

All Tests set forth in this Schedule-K shall be conducted by the Authority's Engineer or such other agency or person as it may specify in consultation with the Authority.

4 Completion Certificate

Upon successful completion of Tests, the Authority's Engineer shall issue the Completion Certificate in accordance with the provisions of Article 12.

SCHEDULE - L

(See Clause 12.2 and 12.4)

PROVISIONAL CERTIFICATE

1 I, ……. (Name of the Authority's Engineer), acting as the Authority's Engineer, under and in accordance with the Agreement dated ……. (the **"Agreement"**), for construction of the Imphal to Moreh section of [National Highway No. 39] from Km. 350+000 to 395+680 (the **"Project Highway"**) on Engineering, Procurement and Construction (EPC) basis through …… (Name of Contractor), hereby certify that the Tests in accordance with Article 12 of the Agreement have been undertaken to determine compliance of the Project Highway with the provisions of the Agreement.

2 Works that are incomplete on account of Time Extension have been specified in the Punch List appended hereto, and the Contractor has agreed and accepted that it shall complete all such works in the time and manner set forth in the Agreement. In addition, certain minor works are incomplete and these are not likely to cause material inconvenience to the Users of the Project Highway or affect their safety. The Contractor has agreed and accepted that as a condition of this Provisional Certificate, it shall complete such minor works within 30 (thirty) days hereof. These minor works have also been specified in the aforesaid Punch List.

3 In view of the foregoing, I am satisfied that the Project Highway from km ** to km ** can be safely and reliably placed in service of the Users thereof, and in terms of the Agreement, the Project Highway is hereby provisionally declared fit for entry into operation on this the …… day of …….. 20…...

ACCEPTED, SIGNED, SEALED	SIGNED, SEALED AND
AND DELIVERED	DELIVERED
For and on behalf of	For and on behalf of
CONTRACTOR by:	AUTHORITY's ENGINEER by:
(Signature)	(Signature)

COMPLETION CERTIFICATE

1 I, ……. (Name of the Authority's Engineer), acting as the Authority's Engineer, under and in accordance with the Agreement dated …… (the "**Agreement**"), for [construction of the Imphal to Moreh section of [National Highway No. 39] from Km. 350+000 to 395+680 (the "**Project Highway**") on Engineering, Procurement and Construction (EPC) basis through ……. (Name of Contractor), hereby certify that the Tests in accordance with Article 12 of the Agreement have been successfully undertaken to determine compliance of the Project Highway with the provisions of the Agreement, and I am satisfied that the Project Highway can be safely and reliably placed in service of the Users thereof.

2 It is certified that, in terms of the aforesaid Agreement, all works forming part of Project Highway have been completed, and the Project Highway is hereby declared fit for entry into operation on this the …… day of …… 20…..

SIGNED, SEALED AND DELIVERED

For and on behalf of

the Authority's Engineer by:

(Signature)

(Name)

(Designation)

(Address)

SCHEDULE - M

(See Clauses 14.6, 15.2 and 19.7)

PAYMENT REDUCTION FOR NON-COMPLIANCE

1. Payment reduction for non-compliance with the Maintenance Requirements

1.1 Monthly lump sum payments for maintenance shall be reduced in the case of non-compliance with the Maintenance Requirements set forth in Schedule-E.

1.2 Any deduction made on account of non-compliance with the Maintenance Requirements shall not be paid even after compliance subsequently. The deductions shall continue to be made every month until compliance is done.

1.3 The Authority's Engineer shall calculate the amount of payment reduction on the basis of weight age in percentage assigned to non-conforming items as given in Paragraph 2.

2 Percentage reductions in lump sum payments

2.1 The following percentages shall govern the payment reduction:

S. No.	Item/Defect/Deficiency	Percentage
(a)	**Carriageway/Pavement**	
(i)	Potholes, cracks, other surface Defects	15%
(ii)	Repairs of Edges, Rutting	5%
(b)	**Road, Embankment, Cuttings, Shoulders**	
(i)	Edge drop, inadequate cross fall, undulations, settlement, potholes, ponding, obstructions	10%
(ii)	Deficient slopes, rain cuts, disturbed pitching, vegetation growth, pruning of trees	5%
(c)	**Bridges and Culverts**	
(i)	De-silting, cleaning. Vegetation growth, damaged pitching, flooring, parapets, wearing course, footpaths, any damage to foundations	20%
(ii)	Any Defects in superstructures, bearings and sub-structures	10%
(iii)	Painting, repairs/replacement, kerbs, railings, parapets, guideposts/crash barriers	5%
(d)	**Roadside Drains**	
(i)	Cleaning and repair of drains	5%
(e)	**Road Furniture**	
(i)	Cleaning, painting, replacement of road signs, delineators, road markings, 200 m/km/5th km stones	5%
(f)	**Miscellaneous**	

(i)	Removal of dead animals, broken down/accidental vehicles, fallen trees, road blockades or malfunctioning of mobile crane	10%
(ii)	Any other Defects in accordance with paragraph 1.	5%
(g)	**Defects in Other Project Facilities**	**5%**

2.2 The amount to be deducted from monthly lump-sum payment for non compliance of particular item shall be calculated as under:

R=P/IOO x M x L1/L

Where P = Percentage of particular item/Defect/deficiency for deduction

M = Monthly lump-sum payment in accordance with the Bid

L1 = Non-complying length

L = Total length of the road,

R = Reduction (the amount to be deducted for non compliance for a particular item/Defect/deficiency

The total amount of reduction shall be arrived at by summation of reductions for such items/Defects/deficiency or non compliance.

For any Defect in a part of one kilometer, the non-conforming length shall be taken as one kilometer.

SCHEDULE - N

(See Clause 18.1.1)

SELECTION OF AUTHORITY'S ENGINEER

1 Selection of Authority's Engineer

1.1 The provisions of the Model Request for Proposal for Selection of Technical Consultants, issued by the Ministry of Finance in May 2009, or any substitute thereof shall apply for selection of an experienced firm to discharge the functions and duties of an Authority's Engineer.

1.2 In the event of termination of the Technical Consultants appointed in accordance with the provisions of Paragraph 1.1, the Authority shall appoint another firm of Technical Consultants forthwith and may engage a government-owned entity in accordance with the provisions of Paragraph 3 of this Schedule-N.

2 Terms of Reference

The Terms of Reference for the Authority's Engineer (the "**TOR**") shall substantially conform with Annex 1 to this Schedule N.

3 Appointment of Government entity as Authority's Engineer

Notwithstanding anything to the contrary contained in this Schedule, the Authority may in its discretion appoint a government-owned entity as the Authority's Engineer; provided that such entity shall be a body corporate having as one of its primary functions the provision of consulting, advisory and supervisory services for engineering projects; provided further that a government-owned entity which is owned or controlled by the Authority shall not be eligible for appointment as Authority's Engineer.

Annex – I
(Schedule - N)

TERMS OF REFERENCE FOR AUTHORITY'S ENGINEER

1. Scope

1.1 These Terms of Reference (the "**TOR**") for the Authority's Engineer are being specified pursuant to the EPC Agreement dated ..... (the "**Agreement**), which has been entered into between the [name and address of the Authority] (the "**Authority**") and ..... (the "**Contractor**") for [Two-Laning] of the Imphal to Moreh section of [National Highway No. 39] from Km. 350+000 to 395+680 on Engineering, Procurement, Construction (EPC) basis, and a copy of which is annexed hereto and marked as Annex-A to form part of this TOR.

1.2 The TOR shall apply to construction and maintenance of the Project Highway.

2. Definitions and interpretation

2.1 The words and expressions beginning with or in capital letters and not defined herein but defined in the Agreement shall have, unless repugnant to the context, the meaning respectively assigned to them in the Agreement.

2.2 References to Articles, Clauses and Schedules in this TOR shall, except where the context otherwise requires, be deemed to be references to the Articles, Clauses and Schedules of the Agreement, and references to Paragraphs shall be deemed to be references to Paragraphs of this TOR.

2.3 The rules of interpretation stated in Clauses 1.2, 1.3 and 1.4 of the Agreement shall apply, *mutatis mutandis*, to this TOR.

3. General

3.1 The Authority's Engineer shall discharge its duties in a fair, impartial and efficient manner, consistent with the highest standards of professional integrity and Good Industry Practice.

3.2 The Authority's Engineer shall perform the duties and exercise the authority in accordance with the provisions of this Agreement, but subject to obtaining prior written approval of the Authority before determining:

(a) any Time Extension;

(b) any additional cost to be paid by the Authority to the Contractor;

(c) the Termination Payment; or

(d) any other matter which is not specified in (a), (b) or (c) above and which creates an obligation or liability on either Party for a sum exceeding Rs. 5,000,000 (Rs. fifty lakh).

3.3 The Authority's Engineer shall submit regular periodic reports, at least once every month, to the Authority in respect of its duties and functions under this Agreement. Such reports shall be submitted by the Authority's Engineer within 10 (ten) days of the beginning of every month.

3.4 The Authority's Engineer shall inform the Contractor of any delegation of its duties and responsibilities to its suitably qualified and experienced personnel; provided, however, that it shall not delegate the authority to refer any matter for the Authority's prior approval in accordance with the provisions of Clause 18.2.

3.5 The Authority's Engineer shall aid and advise the Authority on any proposal for Change of Scope under Article 13.

3.6 In the event of any disagreement between the Parties regarding the meaning, scope and nature of Good Industry Practice, as set forth in any provision of the Agreement, the Authority's Engineer shall specify such meaning, scope and nature by issuing a reasoned written statement relying on good industry practice and authentic literature.

4. Construction Period

4.1 During the Construction Period, the Authority's Engineer shall review the Drawings furnished by the Contractor along with supporting data, including the geo-technical and hydrological investigations, characteristics of materials from borrow areas and quarry sites, topographical surveys, and the recommendations of the Safety Consultant in accordance with the provisions of Clause 10.1.6. The Authority's Engineer shall complete such review and send its observations to the Authority and the Contractor within 15 (fifteen) days of receipt of such Drawings; provided, however that in case of a Major Bridge or Structure, the aforesaid period of 15 (fifteen) days may be extended upto 30 (thirty) days. In particular, such comments shall specify the conformity or otherwise of such Drawings with the Scope of the Project and Specifications and Standards.

4.2 The Authority's Engineer shall review any revised Drawings sent to it by the Contractor and furnish its comments within 10 (ten) days of receiving such Drawings.

4.3 The Authority's Engineer shall review the Quality Assurance Plan submitted by the Contractor and shall convey its comments to the Contractor within a period of 21 (twenty-one) days stating the modifications, if any, required thereto.

4.4 The Authority's Engineer shall complete the review of the methodology proposed to be adopted by the Contractor for executing the Works, and convey its comments to the Contractor within a period of 10 (ten) days from the date of receipt of the proposed methodology from the Contractor.

4.5 The Authority's Engineer shall grant written approval to the Contractor, where necessary, for interruption and diversion of the flow of traffic in the existing lane(s) of the Project Highway for purposes of maintenance during the Construction Period in accordance with the provisions of Clause 10.4.

4.6 The Authority's Engineer shall review the monthly progress report furnished by the Contractor and send its comments thereon to the Authority and the Contractor within 7

(seven) days of receipt of such report.

4.7 The Authority's Engineer shall inspect the Construction Works and the Project Highway and shall submit a monthly Inspection Report bringing out the results of inspections and the remedial action taken by the Contractor in respect of Defects or deficiencies. In particular, the Authority's Engineer shall include in its Inspection Report, the compliance of the recommendations made by the Safety Consultant.

4.8 The Authority's Engineer shall conduct the pre-construction review of manufacturer's test reports and standard samples of manufactured Materials, and such other Materials as the Authority's Engineer may require.

4.9 For determining that the Works conform to Specifications and Standards, the Authority's Engineer shall require the Contractor to carry out, or cause to be carried out, tests at such time and frequency and in such manner as specified in the Agreement and in accordance with Good Industry Practice for quality assurance. For purposes of this Paragraph 4.9, the tests specified in the IRC Special Publication-11 (Handbook of Quality Control for Construction of Roads and Runways) and the Specifications for Road and Bridge Works issued by MORTH (the "Quality Control Manuals") or any modification/substitution thereof shall be deemed to be tests conforming to Good Industry Practice for quality assurance.

4.10 The Authority's Engineer shall test check at least 20 (twenty) percent of the quantity or number of tests prescribed for each category or type of test for quality control by the Contractor.

4.11 The timing of tests referred to in Paragraph 4.9, and the criteria for acceptance/ rejection of their results shall be determined by the Authority's Engineer in accordance with the Quality Control Manuals. The tests shall be undertaken on a random sample basis and shall be in addition to, and independent of, the tests that may be carried out by the Contractor for its own quality assurance in accordance with Good Industry Practice.

4.12 In the event that results of any tests conducted under Clause 11.10 establish any Defects or deficiencies in the Works, the Authority's Engineer shall require the Contractor to carry out remedial measures.

4.13 The Authority's Engineer may instruct the Contractor to execute any work which is urgently required for the safety of the Project Highway, whether because of an accident, unforeseeable event or otherwise; provided that in case of any work required on account of a Force Majeure Event, the provisions of Clause 21.6 shall apply.

4.14 In the event that the Contractor fails to achieve any of the Project Milestones, the Authority's Engineer shall undertake a review of the progress of construction and identify potential delays, if any. If the Authority's Engineer shall determine that completion of the Project Highway is not feasible within the time specified in the Agreement, it shall require the Contractor to indicate within 15 (fifteen) days the steps proposed to be taken to expedite progress, and the period within which the Project Completion Date shall be achieved. Upon receipt of a report from the Contractor, the Authority's Engineer shall review the same and send its comments to the Authority and the Contractor forthwith.

4.15 The Authority's Engineer shall obtain from the Contractor a copy of all the Contractor's quality control records and documents before the Completion Certificate is issued pursuant to Clause 12.4.

4.16 Authority's Engineer may recommend to the Authority suspension of the whole or part of the Works if the work threatens the safety of the Users and pedestrians. After the Contractor has carried out remedial measure, the Authority's Engineer shall inspect such remedial measures forthwith and make a report to the Authority recommending whether or not the suspension hereunder may be revoked.

4.17 In the event that the Contractor carries out any remedial measures to secure the safety of suspended works and Users, and requires the Authority's Engineer to inspect such works, the Authority's Engineer shall inspect the suspended works within 3 (three) days of receiving such notice, and make a report to the Authority forthwith, recommending whether or not such suspension may be revoked by the Authority.

4.18 The Authority's Engineer shall carry out, or cause to be carried out, all the Tests specified in Schedule-K and issue a Completion Certificate or Provisional Certificate, as the case may be. For carrying out its functions under this Paragraph 4.18 and all matters incidental thereto, the Authority's Engineer shall act under and in accordance with the provisions of Article 12 and Schedule-K.

5. Maintenance Period

5.1 The Authority's Engineer shall aid and advise the Contractor in the preparation of its monthly Maintenance Programme and for this purpose carry out a joint monthly inspection with the Contractor.

5.2 The Authority's Engineer shall undertake regular inspections, at least once every month, to evaluate compliance with the Maintenance Requirements and submit a Maintenance Inspection Report to the Authority and the Contractor.

5.3 The Authority's Engineer shall specify the tests, if any, that the Contractor shall carry out, or cause to be carried out, for the purpose of determining that the Project Highway is in conformity with the Maintenance Requirements. It shall monitor and review the results of such tests and the remedial measures, if any, taken by the Contractor in this behalf.

5.4 In respect of any defect or deficiency referred to in Paragraph 3 of Schedule-E, the Authority's Engineer shall, in conformity with Good Industry Practice, specify the permissible limit of deviation or deterioration with reference to the Specifications and Standards and shall also specify the time limit for repair or rectification of any deviation or deterioration beyond the permissible limit.

5.5 The Authority's Engineer shall examine the request of the Contractor for closure of any lane(s) of the Project Highway for undertaking maintenance/repair thereof, and shall grant permission with such modifications, as it may deem necessary, within 5 (five) days of receiving a request from the Contractor. Upon expiry of the permitted period of closure, the Authority's Engineer shall monitor the reopening of such lane(s), and in case of delay,

determine the Damages payable by the Contractor to the Authority under Clause 14.5.

6. Determination of costs and time

6.1 The Authority's Engineer shall determine the costs, and/or their reasonableness, that are required to be determined by it under the Agreement.

6.2 The Authority's Engineer shall determine the period of Time Extension that is required to be determined by it under the Agreement.

6.3 The Authority's Engineer shall consult each Party in every case of determination in accordance with the provisions of Clause 18.5.

7. Payments

7.1 The Authority's Engineer shall withhold payments for the affected works for which the Contractor fails to revise and resubmit the Drawings to the Authority's Engineer in accordance with the provisions of Clause 10.2.4 (d).

7.2 Authority's Engineer shall

(a) within 10 (ten) days of receipt of the Stage Payment Statement from the Contractor pursuant to Clause 19.4, determine the amount due to the Contractor and recommend the release of 90 (ninety) percent of the amount so determined as part payment, pending issue of the Interim Payment Certificate; and

(b) within 15 (fifteen) days of the receipt of the Stage Payment Statement referred to in Clause 19.4, deliver to the Authority and the Contractor an Interim Payment Certificate certifying the amount due and payable to the Contractor, after adjustments in accordance with the provisions of Clause 19.10.

7.3 The Authority's Engineer shall, within 15 (fifteen) days of receipt of the Monthly Maintenance Statement from the Contractor pursuant to Clause 19.6, verify the Contractor's monthly statement and certify the amount to be paid to the Contractor in accordance with the provisions of the Agreement.

7.4.1 The Authority's Engineer shall certify final payment within 30 (thirty) days of the receipt of the final payment statement of Maintenance in accordance with the provisions of Clause 19.16.

8. Other duties and functions

The Authority's Engineer shall perform all other duties and functions as specified in the Agreement.

9. Miscellaneous

9.1 A copy of all communications, comments, instructions, Drawings or Documents sent by the

Authority's Engineer to the Contractor pursuant to this TOR, and a copy of all the test results with comments of the Authority's Engineer thereon, shall be furnished by the Authority's Engineer to the Authority forthwith.

9.2 The Authority's Engineer shall retain at least one copy each of all Drawings and Documents received by it, including 'as-built' Drawings, and keep them in its safe custody.

9.3 Within 90 (ninety) days of the Project Completion Date, the Authority's Engineer shall obtain a complete set of as-built Drawings, in 2 (two) hard copies and in micro film form or in such other medium as may be acceptable to the Authority, reflecting the Project Highway as actually designed, engineered and constructed, including an as-built survey illustrating the layout of the Project Highway and setback lines, if any, of the buildings and structures forming part of Project Facilities; and shall hand them over to the Authority against receipt thereof.

9.4 The Authority's Engineer, if called upon by the Authority or the Contractor or both, shall mediate and assist the Parties in arriving at an amicable settlement of any Dispute between the Parties.

9.5 The Authority's Engineer shall inform the Authority and the Contractor of any event of Contractor's Default within one week of its occurrence.

SCHEDULE - O

(See Clauses 19.4.1, 19.6.1, and 19.8.1)

FOEMS OF PAYMENT STATEMENTS

1. Stage Payment Statement for Works

The Stage Payment Statement for Works shall state:

(a) the estimated amount for the Works executed in accordance with Clause 19.3.1 subsequent to the last claim;

(b) amounts reflecting adjustments in price for the aforesaid claim;

(c) the estimated amount of each Change of Scope Order executed subsequent to the last claim;

(d) amounts reflecting adjustment in price, if any, for (c) above in accordance with the provisions of Clause 13.2.3 (a);

(e) total of (a), (b), (c) and (d) above;

(f) Deductions:
  (i) Any amount to be deducted in accordance with the provisions of the Agreement except taxes;
  (ii) Any amount towards deduction of taxes; and
  (iii) Total of (i) and (ii) above.

(g) Net claim: (e) – (f) (iii);

(h) The amounts received by the Contractor up to the last claim:
  (i) For the Works executed (excluding Change of Scope orders);
  (ii) For Change of Scope Orders, and
  (iii) Taxes deducted

2. Monthly Maintenance Payment Statement

The monthly Statement for Maintenance Payment shall state:

(a) the monthly payment admissible in accordance with the provisions of the Agreement;

(b) the deductions for maintenance work not done;

(c) net payment for maintenance due, (a) minus (b);

(d) amounts reflecting adjustments in price under Clause 19.12; and

(e) amount towards deduction of taxes

3. Contractor's claim for Damages

Note: The Contractor shall submit its claims in a form acceptable to the Authority.

SCHEDULE -P

(See Clause 20.1)

INSURANCE

1 Insurance during Construction Period

1.1 The Contractor shall effect and maintain at its own cost, from the Appointed Date till the date of issue of the Completion Certificate, the following insurances for any loss or damage occurring on account of Non Political Event of Force Majeure, malicious act, accidental damage, explosion, fire and terrorism:

(a) insurance of Works, Plant and Materials and an additional sum of [15 (fifteen)] per cent of such replacement cost to cover any additional costs of and incidental to the rectification of loss or damage including professional fees and the cost of demolishing and removing any part of the Works and of removing debris of whatsoever nature; and

(b) Insurance for the Contractor's equipment and Documents brought onto the Site by the Contractor, for a sum sufficient to provide for their replacement at the Site.

1.2 The insurance under paragraph 1.1 (a) and (b) above shall cover the Authority and the Contractor against all loss or damage from any cause arising under paragraph 1.1 other than risks which are not insurable at commercial terms.

2 Insurance for Contractor's Defects Liability

The Contractor shall effect and maintain insurance cover for the Works from the date of issue of the Completion Certificate until the end of the Defects Liability Period for any loss or damage for which the Contractor is liable and which arises from a cause occurring prior to the issue of the Completion Certificate. The Contractor shall also maintain other insurances for maximum sums as may be required under the Applicable Laws and in accordance with Good Industry Practice.

3 Insurance against injury to persons and damage to property

3.1 The Contractor shall insure against its liability for any loss, damage, death or bodily injury, or damage to any property (except things insured under Paragraphs 1 and 2 of this Schedule or to any person (except persons insured under Clause 20.9), which may arise out of the Contractor's performance of this Agreement. This insurance shall be for a limit per occurrence of not less than the amount stated below with no limit on the number of occurrences.

The insurance cover shall be not less than: Rs. [*****]

3.2 The insurance shall be extended to cover liability for all loss and damage to the Authority's property arising out of the Contractor's performance of this Agreement excluding:

(a) the Authority's right to have the construction works executed on, over, under, in or through any land, and to occupy this land for the Works; and

(b) damage which is an unavoidable result of the Contractor's obligations to execute the Works.

4 Insurance to be in joint names

The insurance under paragraphs 1 to 3 above shall be in the joint names of the Contractor and the Authority.

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