National Highways & Infrastructure Development Corporation Limited

EPC Schedules

FOR

Construction of 2-Lane with Paved Shoulder Pynursla Bypass from existing Km 123+635 to Km 131+820 of old NH-40 on Shillong - Dawki road in the State of Meghalaya on EPC mode (Package-III), Design Km 0+000 to Km 7+760 (Length - 7.760 Km) under JICA funding.

NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD
(MINISTRY OF ROAD TRANSPORT & HIGHWAYS, GOVT. OF INDIA)

NOVEMBER 2024

NHIDCL,1st & 2nd FLOOR, TOWER-A, WORLD TRADE CENTRE, NAUROJI NAGAR, NEW DELHI – 110029, NHIDCL

SCHEDULE - A

(See Clauses 2.1 and 8.1)

SITE OF THE PROJECT

1 The Site

(i) Site of the Project Highway shall include the land, buildings, structures and road works as described in **Annex-I** of this **Schedule-A**.

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

(iii) 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 Authority Representative and the Contractor, and such inventory shall form part of the memorandum referred to in Clause 8.2 (i) of this Agreement.

(iv) 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 indicated in **Annex-III** based on site/design requirement.

(v) The status of the environment clearances obtained or awaited is given in **Annex-IV**.

Annex-I

(Schedule-A)

SITE

1. Site

The Site of the Two-Lane Project Highway comprises the section of National Highway-40 on "Shillong-Dawki" road (New NH-206) starts at near Langkyrdem village (NH-206) and terminates at end point near Saitbakon village (NH-206) in Meghalaya. The Existing Road has been followed upto 1.420 Km. The project road covers a total Design length of 7.760 km. The Project Road traverses through the East Khasi Hills District in the State of Meghalaya. The land, carriageway and structures comprising the Site are described below:

2. Land

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

S. No.	Existing Chainage		Length (m)	EROW (m)		EROW (m)	Remarks
	From (Km)	To (Km)		LHS	RHS		
1	123+635	123+800	165	7.0	7.0	14.0	Built-Up Pynursla
2	123+800	124+000	200	7.0	7.0	14.0	
3	124+000	124+070	70	7.0	7.0	14.0	
4	124+070	124+087	17	11.0	11	22.0	
5	124+087	124+145	58	7.0	7.0	14.0	
6	124+145	124+410	265	7.0	7.0	14.0	
7	124+410	124+460	50	7.75	7.75	15.5	
8	124+460	125+055	595	7.0	7.0	14.0	

The Existing Road Stretch Ends at Km 125+055. After the Ch. from Km 125+055 (After 1.420 Km), the proposed alignment is greenfield.

3. Carriageway

The present carriageway of the Project Highway consists of two lane without paved shoulder. The type of the existing pavement of the section is flexible. Details of existing carriageway are given below.

S. no	Existing Chainage From	Existing Chainage To	C/W width (m)
1	123+635	131+820	7.00

Note: The existing pavement for the project stretch is bituminous pavement. After the Ch. from Km 1+420, the proposed alignment is greenfield.

4. Major Bridges

The Site includes the following Major Bridges:

Sr. No.	Existing Chainage (km)	Type of Structure			No. of Spans with span length (m)	Width (m)
		Foundation	Sub-Structure	Super-structure		
Nil						

5. Road over-bridges (ROB)/ Road under-bridges (RUB)

The Site includes the following ROB (road over railway line)/RUB (road under railway line):

S. No.	Existing Chainage (km)	Type of Structure		No. of Spans with span length (m)	Width (m)	ROB/ RUB
		Foundation	Superstructure			
Nil						

6. Grade separators

The Site includes the following grade separators:

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

7. Minor bridges

The Site includes the following minor bridges:

Sr. No.	Existing Chainage (km)	Design Chainage (km)	Type of Structure			No. of Spans with span length (m)	Width (m)	Remarks
			Foundation	Sub-Structure	Supper-structure			
Nil								

8. Railway level crossings

The Site includes the following railway level crossings:

S. No.	Location (km)	Remarks
Nil		

9. Underpasses (vehicular, non-vehicular)

The Site includes the following underpasses:

S. No.	Existing Chainage (Km)	Type of structure	No. of span with Span Arrangement (m)	width (m)
Nil				

10. Culverts

The Site has the following culverts:

(a) HPC Culverts

Sr. No.	Existing Chainage (Km)	Type of Culvert	Span Arrangement (No. X Span Length/Dia.(m))	Overall Width (m)
1	0+070	HPC	1x1.0m	12.50
2	0+180	HPC	1x1.0m	12.50
3	0+250	HPC	1x1.0m	12.50
4	0+280	HPC	1x1.0m	12.50
5	0+490	HPC	1x1.0m	12.50
6	0+575	HPC	1x1.0m	12.50
7	0+615	HPC	1x1.0m	12.50
8	0+735	HPC	1x1.0m	12.50
9	1+035	HPC	1x1.0m	12.50
10	1+245	HPC	1x1.0m	12.50
11	1+280	HPC	1x1.0m	12.50

11. Bus shelters

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

S.N.	Existing Chainage	Side
Nil		

12. Truck Lay byes

The details of truck lay byes are as follows:

S. No.	Chainage (km)	Length (m)	Left Hand Side	Right Hand Side
Nil				

13. Roadside drains

The details of the roadside drains are as follows:

S. No.	Existing Chainage		Type & Side		Length (Km)
	From (Km.)	To (Km.)	Masonry/cc (Pucca)	Earthen (Kutcha)	
1	0+000	0+300	-	LHS	0.30
2	0+500	0+700	-	RHS	0.20
3	0+700	1+400	-	RHS	0.70

14. Major junctions

The details of major junctions are as follows:

S. No.	Location		At grade	Separated	Category of Cross Road			
	Existing Chainage	Design Chainage			NH	SH	MDR	Others
Nil								

(NH: National Highway, SH: State Highway, MDR: Major District Road)

15. Minor/ Major junctions

The details of the minor junctions/Subways (all at grade) are as follows:

S. No.	Existing Chainage (Km)	Sides	Type of junction (T/Y/X)	Cross road
1	0+160	LHS	T	To Langkyrdem
2	0+225	LHS	Y	To Langkawet
3	0+600	LHS	T	To Wahlyngkhut
4	0+660	LHS	T	To Church
5	0+800	RHS	T	To Lait Shuthim
6	0+812	LHS	T	To Wahlyngkhut
7	0+853	RHS	T	To Lait Shuthim
8	0+900	LHS	T	To Tbeh Jingshaw H.S.School
9	1+060	RHS	T	To Lait Mynreing L P S
10	1+120	LHS	T	To Seiborlang Jaktung
11	1+400	RHS	Y (Major)	To Wah Mawpun

16. Bypasses

The details of the bypasses are as follows:

S. No.	Name of bypass (town)	Existing Chainage (km) From km to km	Length (in Km)
Nil			

17. Other structures

S. No.	Type of Structure	Existing Chainage (km) From km to km	Length (in Km)
	Breast wall	0+050 to 0+100	0.05

Annex – II

(See Clauses 8.3 (i))

(Schedule-A)

Dates for providing Right of Way of Construction Zone

The dates on which the Authority shall provide Right of Way of Construction Zone to the Contractor on different stretches of the Site are stated below:

Sl. No.	From km to km	Length (km)	Width (m)	Date of providing Right of Way*
(1)	(2)	(3)	(4)	(5)
1	From Design Ch. Km. 0+000 to Km 7+760	7.760	14m to 68m (Full Right of Way)	90% on appointed date and remaining within 150 days from appointed date.

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

The Details if land are as under

S. No.	Design Chainage		Length (m)	PRoW (m)		PROW (m)	Remarks
	From (Km)	To (Km)		LHS	RHS		
1	0+000	1+420	1420	7	7	14	
2	1+420	1+560	140	12	12	24	
3	1+560	1+740	180	18	18	36	
4	1+740	1+780	40	18	21	39	
5	1+780	2+100	320	12	15	27	
6	2+100	2+120	20	12	12	24	
7	2+120	2+140	20	15	12	27	
8	2+140	2+160	20	15	15	30	
9	2+160	2+220	60	12	15	27	
10	2+220	2+240	20	12	12	24	
11	2+240	2+260	20	18	12	30	
12	2+260	2+280	20	18	21	39	
13	2+280	2+300	20	12	21	33	
14	2+300	2+320	20	12	12	24	
15	2+320	2+380	60	15	12	27	
16	2+380	2+420	40	18	12	30	
17	2+420	2+500	80	12	12	24	
18	2+500	2+520	20	15	12	27	
19	2+520	2+560	40	15	15	30	
20	2+560	2+580	20	18	15	33	
21	2+580	2+600	20	18	12	30	

S. No.	Design Chainage		Length (m)	PRoW (m)		PROW (m)	Remarks
	From (Km)	To (Km)		LHS	RHS		
22	2+600	2+620	20	12	12	24	
23	2+620	2+660	40	12	21	33	
24	2+660	2+680	20	15	12	27	
25	2+680	2+700	20	12	12	24	
26	2+700	2+760	60	15	12	27	
27	2+760	2+780	20	12	15	27	
28	2+780	2+800	20	15	12	27	
29	2+800	2+880	80	12	12	24	
30	2+880	2+900	20	18	12	30	
31	2+900	2+920	20	18	15	33	
32	2+920	2+940	20	12	12	24	
33	2+940	3+020	80	15	12	27	
34	3+020	3+060	40	12	15	27	
35	3+060	3+120	60	16	12	28	
36	3+120	3+180	60	12	12	24	
37	3+180	3+220	40	12	15	27	
38	3+220	3+240	20	15	18	33	
39	3+240	3+280	40	18	18	36	
40	3+280	3+300	20	12	12	24	
41	3+300	3+340	40	12	18	30	
42	3+340	3+380	40	12	15	27	
43	3+380	3+540	160	12	12	24	
44	3+540	3+640	100	12	15	27	
45	3+640	3+720	80	15	15	30	
46	3+720	3+760	40	12	15	27	
47	3+760	3+800	40	12	18	30	
48	3+800	3+860	60	12	15	27	
49	3+860	3+960	100	12	12	24	
50	3+960	4+000	40	12	15	27	
51	4+000	4+060	60	12	18	30	
52	4+060	4+120	60	15	18	33	
53	4+120	4+200	80	15	15	30	
54	4+200	4+320	120	18	20	38	
55	4+320	4+340	20	18	18	36	
56	4+340	4+380	40	15	18	33	
57	4+380	4+440	60	12	12	24	
58	4+440	4+460	20	12	18	30	
59	4+460	4+480	20	18	12	30	
60	4+480	4+580	100	12	12	24	
61	4+580	4+600	20	15	12	27	
62	4+600	4+620	20	15	18	33	
63	4+620	4+680	60	18	18	36	

S. No.	Design Chainage		Length (m)	PRoW (m)		PROW (m)	Remarks
	From (Km)	To (Km)		LHS	RHS		
64	4+680	4+720	40	12	18	30	
65	4+720	4+740	20	18	20	38	
66	4+740	4+760	20	21	20	41	
67	4+760	4+800	40	24	24	48	
68	4+800	4+840	40	21	30	51	
69	4+840	4+880	40	15	15	30	
70	4+880	5+100	220	12	15	27	
71	5+100	5+120	20	12	12	24	
72	5+120	5+160	40	12	15	27	
73	5+160	5+200	40	12	12	24	
74	5+200	5+300	100	12	15	27	
75	5+300	5+380	80	12	21	33	
76	5+380	5+580	200	12	15	27	
77	5+580	5+620	40	12	18	30	
78	5+620	5+640	20	12	12	24	
79	5+640	5+720	80	12	21	33	
80	5+720	5+840	120	30	30	60	
81	5+840	5+880	40	30	38	68	
82	5+880	5+920	40	30	35	65	
83	5+920	5+960	40	30	30	60	
84	5+960	6+520	560	15	15	30	
85	6+520	7+020	500	12	12	24	
86	7+020	7+060	40	12	15	27	
87	7+060	7+160	100	12	12	24	
88	7+160	7+200	40	12	15	27	
89	7+200	7+240	40	12	12	24	
90	7+240	7+280	40	12	15	27	
91	7+280	7+300	20	12	12	24	
92	7+300	7+340	40	15	12	27	
93	7+340	7+380	40	18	15	33	
94	7+380	7+400	20	12	15	27	
95	7+400	7+420	20	12	12	24	
96	7+420	7+460	40	18	12	30	
97	7+460	7+480	20	12	12	24	
98	7+480	7+500	20	12	15	27	
99	7+500	7+540	40	12	12	24	
100	7+540	7+560	20	15	12	27	
101	7+560	7+575	15	15	15	30	
102	7+575	7+590	15	12	38	50	
103	7+590	7+620	30	12	21	33	
104	7+620	7+700	80	12	12	24	
105	7+700	7+740	40	12	18	30	

S. No.	Design Chainage		Length (m)	PRoW (m)		PROW (m)	Remarks
	From (Km)	To (Km)		LHS	RHS		
106	7+740	7+760	20	12	12	24	

Annex - III

(Schedule-A)

Alignment Plans

The Existing alignment of the Project Highway shall be modified in the following sections as per the alignment plan indicated below:

(i) The alignment of the Project Highway is enclosed in alignment plan. Finished road level indicated in the alignment plan shall be followed by the contractor as minimum FRL. In any case, the finished road level of the project highway shall not be less than those indicated in the alignment plan for the filling section and not be more than those indicated in the alignment plan for the cutting section. The contractor shall, however, improve/upgrade the Road profile as indicated in Annex-III based on site/design requirement within the RoW.

(ii) Traffic Signage plan of the Project Highway showing numbers & locations of traffic signs is enclosed. The contractor shall, however, improve/upgrade upon the traffic signage plan as indicated in Annex-III based on site/design requirement as per the relevant specifications/IRC Codes/Manual.

Annex - IV

(Schedule-A)

Environment Clearances

1. **Environment Clearance**

   Not Applicable.

2. **Wildlife clearances:**

   Not Applicable.

3. **Forest Clearances**:

   Not Applicable.

4. **No Muck dumping sites will be Proposed within the Reserved Forest area. The muck dumping sites have been identified at Ch. 3+700 (LHS), Ch. 4+900 (LHS) and Ch. 7+200 (LHS). However, necessary permission for dumping of muck at the said locations needs to be obtained by the EPC contractor in consultation with the Local village head, District Administration & Forest department etc. In addition to this, the EPC Contractor may identify additional dumping locations if required, for dumping of muck and necessary clearances/NOCs/permission shall be obtained by the Contractor in addition to the applicable permissions and clearances as stated in Schedule F.**

Annex - V

(Schedule-A)

Existing Utility

(i) Electrical utilities

The site includes the following electrical utilities:

(a) Extra High-Tension Lines (EHT Lines) *

S. No	Chainage		Length (in Km)				Crossings			
	From	To	400KV	220KV	110KV	66KV	400KV	220KV	110KV	66KV
NIL										

(b) High Tension/Low Tension Lines (HT/LT Lines) *

(b) High Tension/Low Tension Lines (HT/LT Lines)											
Sr. No.	**Design Chainage (m)**		**Length (Km)**				**Crossing (m)**			**Transformer**	
	From	**To**	**11 KV (HT)**	**33 KV (HT)**	**LT**	**RHS/LHS**	**11 KV (HT)**	**33 KV (HT)**	**LT**	**Number**	**Capacity**
1	0+000	7+760	**3969**	189	**6720**	RHS/LHS	2	1	5	1	
	Total		3969	189	6720		2	1	5		
	Total length (m)		**10878**								

Description	**33 KV**	**11KV**	**LT Poles**
No. of Poles 33KV/11KV/LT	4	20	36

(ii) **Public Health utilities (Water/Sewage Pipe Lines) ***The site includes the following Public Health utilities:

(i) Public Health utilities (Water/Sewage pipe Lines)
* The site includes the following Public Health utilities:

Sr. No	Design Chainage (km)		LHS/ RHS	Length (Km)			Crossings	
				Water Supply line			Water Supply line	
	From	To		With Pumping	With Gravity flow	DIA	With Gravity flow	DIA
1	0+000 to 1+420		RHS/LHS	1417			-	-
	TOTAL LENGTH (Km)						1.417	

Schedule B

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. Construction of Two Lane with Paved Shoulder

Construction of Pynursla Bypass with Two-Lane with Paved Shoulders 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 PROJECT

Construction of 2-Lane with Paved Shoulder Pynursla Bypass from existing Km 123+635 to Km 131+820 of old NH-40 on Shillong - Dawki road in the State of Meghalaya on EPC mode (Package-III), Design Km 0+000 to Km 7+760 (Length - 7.760 Km) under JICA funding.

Note: All the chainages/ location referred to in Annex-I to Schedule-B shall be Design chainages.

1 Widening /Reconstruction of Existing Road

(i) 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 Mountainous and Steep terrain to the extent land is available.

(ii) Width of Carriageway

(a) Provided that in the built-up areas the width of the carriageway shall be as specified in the following table:

Sr. No.	Built-up stretch (Township)	Location Design Chainage (km to km)		Length (Km)	Width (m)	Typical cross section (Ref. to Manual)
1	Wahlyngkhat Village	0+280	1+420	1.140	1X7.0 m CW +2x2.5 m paved shoulder	TCS-1

(b) Provided that in open areas the width of the carriageway shall be as specified in the following table:

Sr. No.	Open area stretch	Location Design Chainage (km to km)		Length (Km)	Width (m)	Typical cross section (Ref. to Manual)
1	Wahlyngkhat Village	0+00	0+280	0.280	1X7.0 m CW +2x1.5 m paved shoulder	TCS-2

2. Geometric Design and General Features

(i) **General**

Geometric design and general features of the Project Highway shall be in accordance with Section 2 of the Manual.

(ii) **Design speed**

The design speed shall be minimum Design speed of 50 km per hr for Mountainous and Steep terrain, as per Manual of Specifications and Standards for Two Laning of Highways (IRC: 52-2019).

(iii) **Improvement of the existing road geometrics**

Ruling minimum Radius is 75m as per Manual of Specifications and Standards for Two Laning of Highways (IRC: SP: 73-2018).

In the following sections, where improvement of the existing road geometrics to the prescribed standards (Minimum Desirable Radius / Ruling Minimum Radius 75 m) 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. This Deviation has also been specified in Schedule-D if any.

S. No.	Stretch (km)		Radius (m)	Design Speed (Kmph)	Type of deficiency
	From	To			
NIL					

(a) Extra Widening on Curves

(i) On horizontal curve roadway width shall be increased to provide for extra widening of curve. The extra widening shall be provided as per Table 6.10 of IRC: 52, 2019 Guidelines for the Alignment Survey and Geometric Design of Hill Roads (Third Revision). This provision is in deviation from Manual and the Deviation is also specified in Schedule-D.

(ii) The width of carriageway at existing/ retained/ reconstructed/ additional new Minor Bridges, shall be same as specified in TCS and no extra widening shall be required.

(iii) The width of carriageway at reconstructed/additional new Culverts shall attract provision (i) above.

(b) The following bypasses/realignment/reconstruction shall be provided:

S. No.	Stretch Design Chainage (from km to km)	Length (Km)	Remarks
1	From Km 1+420 to km 7+760	6.340	Pynursla Bypass

(iv) Right of Way

The details of the ROW are given in **Annex-II of Schedule-A.**

(v) Type of shoulders

(a) In built-up sections, 2.5m paved shoulder on either side as per TCS -01 shall be provided:

Sr. No.	Design Chainage (From)	Design Chainage (To)	Length (Km)	TCS
1	0+280	1+420	1.140	1

* Other Locations of Footpath shall be as per TCS/Schedule D

(b) In open country, 1.5m Paved Shoulder on both sides and 1.0m earthen shoulders on Both sides shall be provided as per TCS Schedule (Appendix-BI). The earthen shoulder shall be covered with granular material in full depth up to GSB layer as shown in typical cross section.

(c) Design and specifications of earthen shoulders and granular material shall conform to the requirements specified in the relevant manual.

(vi) Lateral and vertical clearances at underpasses

(a) Lateral and vertical clearances at underpasses and provision of guardrails/crash barriers shall be as per paragraph 2.10 of the Manual.

(b) Lateral & Vertical clearance: The width of the opening and vertical clearances at underpasses shall be as follows:

Sl. No.	Location (Design Chainage Km)	Span/ opening (m)	Remarks
(1)	**(2)**	**(3)**	**(4)**
Nil			

Note: -

- IRC Class Special Vehicle loading shall be considered in the structural design of bridges/Flyover/VUP.

(vii) Lateral and vertical clearances at overpasses

(a) Lateral and vertical clearances at overpasses shall be as per paragraph 2.11 of the Manual.

(b) Lateral clearance: The width of the opening at the overpasses shall be as follows:

Sl. No.	Location (Design Chainage Km)	Span/ opening (m)	Width (m)	Remarks
1	2+364 (T Beam Bridge)	1x24.0m	8.4	As per attached Drawings of VOP
2	3+275 (T Beam Bridge)	1x24.0m	8.4	
3	4+693 (T Beam Bridge)	1x24.0m	8.4	

(viii) Slip Roads/Service Roads

Slip roads shall be constructed at the locations and for the lengths indicated below:

Sl. No.	Location of service road (from km to km)	Right hand side (RHS)/Left hand side (LHS)/ or Both sides	Length (km) of service road
Nil			

(ix) Grade separated structures

(a) Grade separated structures shall be provided as per the provision of the relevant Manual. The requisite particulars are given below:

SL No.	Location of Structure	Length (m)	Number and length of spans (m)	Approach gradient	Remarks, if any
Nil					

(b) In the case of grade separated structures, the type of structure and the level of the Project Highway and the cross roads shall be as follows:

Sl. No.	Location	Type of structure Length (m)	Cross Road Level*			Remarks, if any
			Existing Level	Raised Level	Lowered Level	
Nil						

(x) Cattle and pedestrian under pass / over pass

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

Sl. No.	Location	Type of crossing
NIL		

(xi) Typical cross-sections of the Project Highway

The schedule of typical cross-sections is given in the table below. Drawings of typical cross-sections are given in **Appendix B-I**.

Sr. No.	Chainage From	Chainage To	Length (Km)	TCS Type
1	0.000	0.280	0.280	2
2	0.280	1.460	1.180	1
3	1.460	1.560	0.100	4
4	1.560	1.590	0.030	9

Sr. No.	Chainage From	Chainage To	Length (Km)	TCS Type
5	1.590	1.740	0.150	Viaduct
6	1.740	1.770	0.030	9
7	1.770	1.900	0.130	10
8	1.900	2.000	0.100	5
9	2.000	2.105	0.105	7
10	2.105	2.115	0.010	4
11	2.115	2.165	0.050	10
12	2.165	2.202	0.037	9
13	2.202	2.242	0.040	MNB
14	2.242	2.275	0.033	9
15	2.275	2.290	0.015	10
16	2.290	2.357	0.067	7
17	2.357	2.372	0.015	7
18	2.372	2.410	0.038	7
19	2.410	2.445	0.035	6
20	2.445	2.475	0.030	4
21	2.475	2.590	0.115	7
22	2.590	2.613	0.023	6

Sr. No.	Chainage From	Chainage To	Length (Km)	TCS Type
23	2.613	2.618	0.005	Culvert
24	2.618	2.650	0.032	10
25	2.650	2.685	0.035	3
26	2.685	2.750	0.065	6
27	2.750	2.775	0.025	3
28	2.775	2.795	0.020	10
29	2.795	2.835	0.040	MNB
30	2.835	2.950	0.115	9
31	2.950	3.033	0.083	3
32	3.033	3.038	0.005	Culvert
33	3.038	3.118	0.080	3
34	3.118	3.123	0.005	Culvert
35	3.123	3.170	0.047	5
36	3.170	3.215	0.045	7
37	3.215	3.260	0.045	8
38	3.260	3.290	0.030	8
39	3.290	3.310	0.020	8
40	3.310	3.480	0.170	7

Sr. No.	Chainage From	Chainage To	Length (Km)	TCS Type
41	3.480	3.535	0.055	9
42	3.535	3.545	0.010	8
43	3.545	3.575	0.030	10
44	3.575	3.585	0.010	4
45	3.585	3.950	0.365	7
46	3.950	3.963	0.013	5
47	3.963	3.968	0.005	Culvert
48	3.968	4.200	0.232	3
49	4.200	4.350	0.150	10
50	4.350	4.405	0.055	3
51	4.405	4.435	0.030	4
52	4.435	4.475	0.040	9
53	4.475	4.485	0.010	Viaduct
54	4.485	4.530	0.045	5
55	4.530	4.590	0.060	7
56	4.590	4.678	0.088	8
57	4.678	4.708	0.030	8
58	4.708	4.845	0.137	8

Sr. No.	Chainage From	Chainage To	Length (Km)	TCS Type
59	4.845	4.923	0.078	9
60	4.923	4.938	0.015	MNB
61	4.938	4.993	0.055	9
62	4.993	5.003	0.010	Viaduct
63	5.003	5.055	0.052	9
64	5.055	5.075	0.020	6
65	5.075	5.090	0.015	5
66	5.090	5.110	0.020	10
67	5.110	5.120	0.010	MNB
68	5.120	5.201	0.081	10
69	5.201	5.211	0.010	MNB
70	5.211	5.245	0.034	9
71	5.245	5.260	0.015	3
72	5.260	5.280	0.020	5
73	5.280	5.405	0.125	8
74	5.405	5.433	0.028	10
75	5.433	5.438	0.005	Culvert
76	5.438	5.485	0.047	10

Sr. No.	Chainage From	Chainage To	Length (Km)	TCS Type
77	5.485	5.530	0.045	5
78	5.530	5.640	0.110	7
79	5.640	5.955	0.315	8
80	5.955	5.975	0.020	7
81	5.975	5.985	0.010	3
82	5.985	6.485	0.500	MJB+VIADUCT
83	6.485	6.590	0.105	10
84	6.590	6.605	0.015	Viaduct
85	6.605	6.653	0.048	10
86	6.653	6.658	0.005	Culvert
87	6.658	6.710	0.052	10
88	6.710	6.725	0.015	4
89	6.725	6.745	0.020	10
90	6.745	6.880	0.135	Viaduct
91	6.880	6.910	0.030	10
92	6.910	6.959	0.049	10
93	6.959	6.961	0.002	Culvert
94	6.961	7.140	0.179	7

Sr. No.	Chainage From	Chainage To	Length (Km)	TCS Type
95	7.140	7.150	0.010	4
96	7.150	7.170	0.020	10
97	7.170	7.210	0.040	6
98	7.210	7.295	0.085	7
99	7.295	7.393	0.098	10
100	7.393	7.398	0.005	Culvert
101	7.398	7.491	0.093	10
102	7.491	7.506	0.015	MNB
103	7.506	7.668	0.162	10
104	7.668	7.683	0.015	MNB
105	7.683	7.760	0.077	10
			7.760	**Km.**

(xii) Summary of TCS

Type	Road Length	
TCS 01	1.180	Reconstruction Of Existing Two - Lane Carriageway to Two - Lane with Paved Shoulder with Drain In Built-Up Area
TCS 02	0.280	Reconstruction Of Existing Two - Lane Carriageway to Two - Lane with Paved Shoulder with Drain on Hill Side
TCS 03	0.535	2 - Lane + PS (Banking Section <3m) New-construction
TCS 04	0.205	2 - Lane + PS (Cutting<1m) New-construction
TCS 05	0.285	2 - Lane + PS (Cutting< 5m) with One side Stone Breast wall- New-construction
TCS 06	0.183	2 - Lane + PS (Cutting> 5m) with One side Stone Breast wall- New-construction
TCS 07	1.359	2 - Lane + PS (Cutting> 5.0m to 15.0m) with Both side Breast wall - New-construction
TCS 08	0.740	2 - Lane + PS (Cutting> 15.0m) with Both side Breast wall - New-construction
TCS 09	0.559	2 - Lane + PS (Banking Section> 3m) with Retaining wall on Both side - New-construction
TCS 010	1.357	2 - Lane + PS (Banking Section> 3m) with Retaining wall on one side - New-construction
Structure Length	1.077	
Total (Km)	**7.760**	

Note:

1) The cross-section and Design chainages as given in above table are indicative and stretches may increase or decrease in length depending upon profile designed by contractor as per actual site condition, however, this shall not be treated as change of scope.
2) All the cross-sectional elements are to be accommodated within the proposed ROW. If required, suitable retaining structures along with drainage system shall be provided as per site condition and this will not constitute any change of scope.
3) The Contractor shall match the start and end points of Project Highway with Nearby Packages. Any increase in length due to this shall not be treated as change of scope**.**

3. Intersections and Grade Separators

All intersections and grade separators shall be as per 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 table below:

(i) At grade Intersections

All intersections as per the site requirement shall be designed and constructed in accordance with the manual. A list of intersections is given in the table below. Draft layout of major junctions is given in indicative Plan & Profile drawings for reference.

Sl. No.	Location of intersection (Design Chainage)	Type of intersection	Other features
Major Intersections			
1	1+410	Y	RHS (Existing NH-To Pynursla Town)
2	7+760	Y	RHS (Existing NH-To Pynursla Town)
Minor Intersections			
1	0+160	T	LHS –Village Road
2	0+225	Y	LHS –Village Road
3	0+610	T	LHS –Village Road
4	0+670	T	LHS –Village Road
5	0+800	T	RHS –Village Road
6	0+825	T	LHS –Village Road
7	0+865	T	LHS –Village Road
8	0+870	T	RHS –Village Road
9	0+895	T	LHS –Village Road
10	1+070	T	RHS –Village Road
11	1+130	T	LHS –Village Road
12	1+400	T	LHS –Village Road
13	1+800	Y	LHS –Village Road
14	2+090	+	LHS –Village Road, RHS –Village Road
15	4+160	+	LHS –Village Road, RHS –Village Road

(ii) Grade separated intersection with/without ramps

Sl. No.	Location	Salient features	Minimum length of viaduct to be provided	Road to be carried over/under the structures
Nil				

Note:

1) It is clarified that if any other junction is identified by the bidder before bid submission date, in addition to those mentioned above, it shall also be improved with proper drainage facilities and safety provisions as per standards. The bidders may quote the bid price as per the actual site requirement.

2) It is clarified that if any other junction is identified during development of the project highway, in addition to those mentioned above, shall also be improved with proper drainage facilities and safety provisions as per standards. They are deemed to be covered within the scope of work. The Numbers, locations & type of junctions shown in above table are minimum and may increase as per actual site conditions. Any increase in number will not constitute change of Scope.

3) The contractor shall take up 'Detailed Engineering study' to ascertain further details of all intersections and treatment of the intersections and all shall be designed in accordance with the latest guidelines mentioned in section-3 of relevant Manual as specified in Schedule-D.

The same shall not constitute a Change of Scope, save and except any variations arising out of a Change of Scope expressly undertaken in accordance with the provisions of Article 13.

4) At locations of geometric improvement, the connectivity of built-ups area, along existing road, with the proposed highway shall be provided. All such locations shall be finalized as per site requirement in consultation with the Authority Engineer and it will not be treated as change in scope of work.

4. Road Embankment and Cut Section

(i) 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 Section 4 of the Manual and the specified cross-sectional details. Deficiencies in the plan and profile of the existing road shall be corrected.

(ii) Raising of the existing road/New carriageway

The existing road shall be raised as per design requirements in accordance with the manual in conformity to the minimum FRL.

S. No.	Design Chainage (from km to km)	Length (Km)	Extent of raising [Top of finished road level]
As per Attached Plan & Profile			

The Contractor may adopt suitable slope (angle) for the embankment as per the availability of fill material/design requirements. The slopes shall be checked for safety against failure. The slopes shall be protected with turfing/geo synthetics /geo green blanket/geo cells/stone pitching or any other method as per schedule D.

Wherever required toe wall/retaining wall/Breast Wall/other protection works along with drainage system shall be provided to contain the toe of the earthwork/cut-slope, so that all the features shown in the TCS are accommodated in the ROW provided.

(iii) Cutting of the existing road/New carriageway

S. No.	Design Chainage (from km to km)	Length (Km)	Extent of raising [Top of finished road level]
As per Attached Plan & Profile			

5. Pavement Design

(i) Pavement design shall be carried out in accordance with Section 5 of the Manual.

(ii) Type of pavement

The Flexible pavement shall be provided for the entire length of Two-lane with Paved Shoulder Project Highway for Main carriageway, Service Road, Bus bays and Truck Lay-Bye etc.

(iii) Design requirements

(a) Design Period and strategy

Flexible pavement shall be designed for a minimum design period of 20 years. Stage construction shall not be permitted.

(b) Design Traffic

Notwithstanding anything to the contrary contained in this Agreement or the Manual, the Contractor shall design the pavement for design traffic of minimum 30 MSA or as per actual traffic survey, whichever is higher. The entire road section proposed for development with Flexible pavement including paved shoulders shall be constructed after scarifying /dismantling the existing bituminous layers and reconstructing with minimum crust given in table below.

For reconstruction & new construction

S.No.	Description	Minimum Crust Composition of Flexible Pavement
1	BC	40 mm
2	DBM	50 mm
3	WMM	150 mm
4	CTSB	200 mm
5	Subgrade	500 mm (min. effective CBR> 8%)

Note-

(a) The contractor shall conduct the CBR Test and shall design the pavement as per Relevant Manual. Notwithstanding anything to the contrary contained in this agreement or the manual, the contractor shall maintain minimum crust thickness as mentioned in the above table or consider a higher crust thickness as per design requirement.

(b) The Crust composition for Truck Lay Bays & Bus Bay shall be as per Flexible Pavement.

(c) Where an existing pavement is built over an untreated expansive/black cotton soil sub-grade, its improvement/strengthening shall be treated separately. Such stretches shall require reconstruction with provision of necessary measures such as replacement treatment of expansive sub-grade, drainage, etc. as per the prescribed specifications and IRC:37 and shall be designed as new pavement.

(iv) **Reconstruction of Existing Road**

The following stretches of the existing road shall be reconstructed. These shall be designed as new pavement.

Sr. No.	Stretch Design Chainage From km to km		Length (km)	Remarks
	From	To		
1	0+000	1+420	1.420	The existing 2-lane shall be reconstructed and widened to 2-lane with Paved Shoulder.
Total (Km)			**1.420**	

(v) **Strengthening & widening of existing road stretches**

The following stretches of the existing road shall be Strengthened & Widened by Contractor as per Clause 5.9 of relevant Manual as specified in Schedule-D (IRC: SP: 73, 2018) as per the Design Traffic as specified.

Sr. No.	Stretch Design Chainage From km to km		Remarks
	From	To	Length (m)
Nil			

Note:

1) Contractor shall provide 65 mm Wearing coat comprising 40 mm BC & 25 mm Mastic Asphalt on all Structures and culverts which are designed without overburden.

6 Road Side Drainage

Drainage system including surface and subsurface drains for the Project Highway shall be provided as per Section 6 of the Manual.

Open lined drain shall be provided in the following stretches:

Left			Right		
From Chainage (M)	To Chainage (M)	Length (M)	From Chainage (M)	To Chainage (M)	Length (M)
0	280	280	1900	2005	105
1460	1525	65	2015	2120	105
1905	2009	104	2295	2300	5
2012	2105	93	2300	2355	55
2290	2355	65	2375	2420	45
2375	2445	70	2465	2605	140
2447	2459	12	2685	2740	55
2461	2613	152	3155	3260	105
2618	2640	22	3295	3344	49
2685	2750	65	3346	3480	134
3155	3260	105	3570	3960	390
3295	3344	49	4410	4420	10
3346	3350	4	4520	4675	155
3355	3475	120	4710	4855	145
3580	3963	383	5025	5095	70
3968	3980	12	5150	5175	25
4400	4430	30	5255	5433	178
4510	4678	168	5438	5975	537
4708	4835	127	6515	6520	5
5055	5085	30	6670	6730	60
5265	5285	20	6895	6955	60
5295	5405	110	6975	7145	170
5490	5975	485	7155	7300	145
6910	6945	35	7420	7445	25
6970	7149	179	7525	7645	120
7170	7185	15	7715	7720	5
7220	7285	65	7730	7760	30
7545	7630	85			
7720	7745	25			
		2975	**Total**		**2928**

RCC Covered Drain in Built ups

Left			Right		
From Chainage (Km)	**To Chainage (Km)**	**Length (m)**	**From Chainage (Km)**	**To Chainage (Km)**	**Length (m)**
0+280	1+460	1180	0+280	1+460	1180
Total		**1180**	**Total**		**1180**

Note:

1) The Length of the lined drains mentioned above are indicative and minimum. The actual length of the lined drains shall be determined by the Contractor keeping in view the drainage locations and in accordance with the Manual requirements with approval from the Authority/ Authority's Engineer. Any increase in the length of drain as specified in above location shall not constitute a Change of Scope.

2) Invert levels of the longitudinal drains shall be decided as per adjoining draining area and properties. All drains should be connected to nearest natural nallah/Drainage Source.

7 Designs of Structures

(i) General

(a) All bridges, culverts and other structures shall be designed and constructed in accordance with section 7 of the Manual and shall conform the cross-sectional features and other details specified therein.

(b) Width of the carriageway of new bridges and structures shall be as follows:

Sl. No.	Design Chainage(km)	Width of carriageway and cross-sectional features*
1	1+665	1 x 13 (12.0m CW+ 2 x 0.50m RCC Crash barrier)
2	2+222	1 x 13 (12.0m CW+ 2 x 0.50m RCC Crash barrier)
3	2+815	1 x 13 (12.0m CW+ 2 x 0.50m RCC Crash barrier)
4	4+480	1 x 13 (12.0m CW+ 2 x 0.50m RCC Crash barrier)
5	4+930	1 x 13 (12.0m CW+ 2 x 0.50m RCC Crash barrier)
6	4+998	1 x 13 (12.0m CW+ 2 x 0.50m RCC Crash barrier)
7	5+115	1 x 13 (12.0m CW+ 2 x 0.50m RCC Crash barrier)
8	5+206	1 x 13 (12.0m CW+ 2 x 0.50m RCC Crash barrier)
9	6+185	1 x 21 (13.0m CW+ 2 x 0.50m Steel barrier + 2x1.5m Footpath + 2x0.5m Crash barrier + 2x1.5m Cable Stand)
10	6+435	1 x 18 (13.0m CW+ 2 x 0.50m RCC Crash barrier + 2x1.5m Footpath+ 2x0.5m RCC railing)
11	6+595	1 x 13 (12.0m CW+ 2 x 0.50m RCC Crash barrier)
12	6+812	1 x 13 (12.0m CW+ 2 x 0.50m RCC Crash barrier)
13	7+498	1 x 13 (12.0m CW+ 2 x 0.50m RCC Crash barrier)
14	7+675	1 x 13 (12.0m CW+ 2 x 0.50m RCC Crash barrier)

(b) The following structures shall be provided with footpaths:

Sl. No.	Design Chainage(km)	Width of carriageway and cross-sectional features*
1	6+185	1 x 21 (13.0m CW+ 2 x 0.50m Steel barrier + 2x1.5m Footpath + 2x0.5m Crash barrier + 2x1.5m Cable Stand)
2	6+435	1 x 18 (13.0m CW+ 2 x 0.50m RCC Crash barrier + 2x1.5m Footpath+ 2x0.5m RCC railing)

(d) All bridges shall be high level bridges.

(e) 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
All Bridges shall have the arrangement of utility services.			

(f) Cross-section of the new culverts and bridges at deck level shall conform to the typical cross-sections given in section 7 of the Manual.

(g) IRC Class Special Vehicle loading (385 T) shall be taken into account in the structural design of Elevated Viaduct, Major Bridges /Minor bridges/Flyover/VUP/ROB.

(ii) Culverts

(a) Overall minimum width of all culverts shall be more than 12.00m and transitions to be matched with the roadway width of the approaches.

(b) Reconstruction of existing culverts:

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

Sl. No.	Design Chainage (Km)	No. of Spans x Clear Span (m)/Opening (m)	Remarks (Proposed Type) *
1	0+070	1 X 2.0m	Box Culvert
2	0+180	1 X 2.0m	Box Culvert
3	0+250	1 X 2.0m	Box Culvert
4	0+280	1 X 2.0m	Box Culvert
5	0+490	1 X 2.0m	Box Culvert
6	0+575	1 X 2.0m	Box Culvert
7	0+615	1 X 2.0m	Box Culvert
8	0+735	1 X 2.0m	Box Culvert
9	1+035	1 X 2.0m	Box Culvert
10	1+245	1 X 2.0m	Box Culvert
11	1+280	1 X 2.0m	Box Culvert

* Road level shall be minimum as per Proposed FRL provided in Alignment Plan at Annexure-III Schedule-A.

Note:

1) The proposed locations are minimum in number. Any change in number/length/span/height shall not be treated as change in scope of work.

2) The culvert locations indicated as Table above shall be adjusted according to the exact location of cross-water stream or existing culvert located based on the topographic survey performed by the Contractor for the final drawings of the Detailed Design. The Contractor shall construct culvert in Skew Angle if required as per the site conditions. This shall be deemed to be included in the Scope of Work.

3) The Contractor shall carry out appropriate Ground improvement works as per the State of Art reports IRC-HRB: SR-13, SR-14 to increase the Safe Bearing Capacity of in-situ soil and reduce the settlement during the construction & post construction period.

4) The Contractor shall provide Granular Material below the foundation of Box Structure in case of presence of Clayey soils as per clause 23.3 of IRC: SP: 13, 2004.

5) The Contractor shall provide necessary Protection Works on upstream & downstream site of box structure as per Article 23 of IRC: SP: 13 and Figure 8.5 Culvert with retain wall on U/S & D/S Side, Catch pit, chute, Guide wall and Apron as per IRC: SP:48, 1998, as per the site requirement.

6) On the Culvert location at the end of roadway edges, Only RCC Crash Barriers shall be provided of minimum 1.1 m height. The crash barrier shall be extended beyond the ends of the culverts on either side to a suitable distance as a safety measures.

7) The Contractor shall provide necessary Barrel length of Box as per the extra widening, embankment Height and site requirement. This shall not constitute Change of Scope.

(c) 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.

Sl. No.	Culvert location (Design Chainage)	Type, span height and width of existing culvert(m)	Repairs to be carried out
Nil			

(d) Additional new culverts shall be constructed as per particulars given in the table below:

Sl. No.	Design Chainage (Km)	No. of Spans x Clear Span (m)/Opening (m)	Remarks (Proposed Type) *
1	1+445	1x2.0	Box Culvert
2	1+876	1x2.0	Box Culvert
3	2+010	1x3.0	Box Culvert
4	2+650	1x5.0	RCC Slab Culvert
5	2+900	1x3.0	Box Culvert
6	3+035	1x5.0	RCC Slab Culvert
7	3+120	1x5.0	RCC Slab Culvert
8	3+345	1x2.0	Box Culvert
9	3+515	1x3.0	Box Culvert
10	3+965	1x2.0	Box Culvert
11	4+260	1x2.0	Box Culvert

Sl. No.	Design Chainage (Km)	No. of Spans x Clear Span (m)/Opening (m)	Remarks (Proposed Type) *
12	5+435	1x5.0	RCC Slab Culvert
13	6+655	1x5.0	RCC Slab Culvert
14	6+960	1x2.0	Box Culvert
15	7+150	1x2.0	Box Culvert
16	7+335	1x2.0	Box Culvert
17	7+395	1x5.0	RCC Slab Culvert

****Additionally, RCC Barrel Shall be provided in all Major/minor junctions/Crossroads - 17 Nos. (RCC barrel length of min. 10m shall be provided of size 2m X 2m).**

* Road level shall be minimum as per Proposed FRL provided in Alignment Plan at Annexure-III Schedule-A.

Note:

(i) The proposed locations are minimum in number. Any change in number/length/span/height shall not be treated as change in scope of work.

(ii) The culvert location planned as Table above shall be adjusted accordingly to the exact location of cross-water stream or existing culvert located based on the topographic survey performed by the Contractor for the final drawings of the Detailed Design. The Contractor shall construct culvert in Skew Angle if required as per the site conditions. This shall be deemed to be included in the Scope of Work.

(iii) The Contractor shall carry out appropriate Ground improvement works as per the State of Art reports IRC-HRB: SR-13, SR-14 to increase the Safe Bearing Capacity of in-situ soil and reduce the settlement during the construction & post construction period.

(iv) The Contractor shall provide Granular Material below the foundation of Box Structure in case of presence of Clayey soils as per clause 23.3 of IRC: SP: 13, 2004.

(v) The Contractor shall provide necessary Protection Works on upstream & downstream site of box structure as per Article 23 of IRC: SP: 13 and Figure 8.5 Culvert with retain wall on U/S & D/S Side, Catch pit, chute, Guide wall and Apron as per IRC: SP:48, 1998, as per the site requirement.

8) On the Culvert location at the end of roadway edges, Only RCC Crash Barriers shall be provided of minimum 1.1 m height. The crash barrier shall be extended beyond the ends of the culverts on either side to a suitable distance as a safety measures.

(vi) The Contractor shall provide necessary Barrel length of Box as per the extra widening, embankment Height and site requirement. This shall not constitute Change of Scope.

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

Sl. No.	Culvert Location (Design Chainage)	Type	No. of Spans x Clear Span (m)/Opening (m)	Repairs to be carried out specify*
Nil				

Note: The existing and retained culverts shall be inspected by Contractor to check and assess the requirement of repairs and /or strengthening or reconstruction as case may be. If so, required, the repair and/or strengthening or reconstruction work shall be carried out as per the assessment. This shall not constitute Change of Scope of work

(f) Floor protection works shall be as specified in the relevant IRC Codes and Specifications.

(iii) Bridges

(a) Existing bridges to be re-constructed/widened

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

Sl. No.	Design Chainage(km)	Salient details of existing bridge	Adequacy or otherwise of the existing waterway, vertical clearance, etc*	Remarks
Nil				

(ii) The following narrow bridges shall be widened:

Sl. No.	Design Chainage(km)	Existing width (m)	Extent of widening (m)	Cross-section at deck level for widening @
Nil				

(b) **Additional New Major Bridges**

Major New bridges at the following locations on the Project Highway shall be constructed. GADs for the new bridges are attached in the drawings folder.

Sl. No.	Design Chainage (Km)	No. of Spans x Clear Span (m)	Remarks, if any (Total width in m)
1	6+185	(1*100.0m+1*200.0m+1*100.0m)	Extradosed Bridge (Width-21.00m)

(c) **Additional New Minor Bridges**

Minor New bridges at the following locations on the Project Highway shall be constructed. GADs for the new bridges are attached in the drawings folder.

Sl. No.	Design Chainage (Km)	No. of Spans x Clear Span (m)	Remarks, if any (Total width in m)
1	2+222	1x30.0m	PSC T-Beam Bridge (Width-13.00m)
2	2+815	1x30.0 m	PSC T-Beam Bridge (Width-13.00m)
3	4+930	1x15.0m	RCC T-Beam Bridge (Width-13.00m)
4	5+115	1x10.0m	RCC Slab Bridge (Width-13.00m)
5	5+206	1x10.0m	RCC Slab Bridge (Width-13.00m)
6	7+498	1x15.0m	RCC T-Beam Bridge (Width-13.00m)
7	7+675	1x15.0m	RCC T-Beam Bridge (Width-13.00m)

(d) **New Viaduct**

Sl. No.	Design Chainage (Km)	No. of Spans x Clear Span (m)	Remarks, if any (Total width in m)
1	1+665	3x50.0	PSC Box Girder, (Width-13.00m)

2	4+480	1x10.0	RCC Slab Bridge, (Width-13.00m)
3	4+998	1x10.0	RCC Slab Bridge, (Width-13.00m)
4	6+435	2x50.0	PSC Box Girder, (Width-18.00m)
5	6+595	1x10.0	RCC Slab Bridge, (Width-13.00m)
6	6+812	1x20.0+2x50.0+1x20.0	PSC Box Girder, (Width-13.00m)

Contractor shall follow the guidelines of IRC Codes & other relevant guidelines/codes.

Notes:

1) The bridge approaches, Abutments and Pier locations shall be protected as per IRC 89: 2019 River Training & control works on bridges.
2) The span and opening of these bridges as specified are indicative. The design of waterway has to be done as per hydraulic requirement at site. Any change in this configuration shall not attract any change of Scope.
3) Proposed length of bridge is minimum and any increase in length/span/height shall not be treated as change in scope of work. However, if as per site conditions, if the proposed bridge length is reduced/decreased as the case may be, the same considered as negative change of scope.
4) IRC Class Special Vehicle loading shall be considered in the structural **design of bridges/Flyover/VUP/FOB.**

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

Sl. No.	Location at Chainage	Remarks
Nil		

(b) Repairs/replacements of railing/parapets of the existing bridges shall be undertaken as follows:

The existing bridges and structures to be repaired/ strengthened, the nature and extent of repairs /strengthening required are given below.

The following Major bridges shall be retained with repairs:

Sl. No.	Location at km	Remarks
Nil		

The following Minor bridges shall be retained with repairs:

Sl. No.	Design Chainage (Km)	Remarks
Nil		

(e) Drainage system for bridge decks

An effective drainage system for bridge decks shall be provided as specified in the Manual.

(f) Structures in marine environment

Following is the list of structures to be constructed.

Sr. No.	Design Chainage (Km)	No. of Spans with Span Length (m)	Structure
NIL			

(iv) Rail-road bridges

(a) Design, construction and detailing of ROB/RUB shall be as specified in the provision of relevant Manual.

(b) Road over-bridges

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

Sl. No.	Location of Level crossing (Chainage km)	Length of Structure (m)	Remarks
NIL			

(c) Road under-bridges

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

Sl. No.	Location of Level crossing (Chainage km)	Length of Structure (m)	Remarks
NIL			

(v) **Grade separated structures**

The grade separated structures shall be provided at the locations and of the type and length specified in paragraphs 2 (x) and 3 of this Annex-I.

(vi) Repairs and strengthening of bridges and structures

The existing bridges and structures to be repaired/strengthened, and the nature and extent of repairs /strengthening required are given below:

(a) Bridges

Sl. No.	Design Chainage (Km)	Nature and extent of repairs /strengthening to be carried out
Nil		

Note: All the retained bridges are to be painted as per Manual or relevant codes.

(b) ROB / RUB

SL. No.	Location of ROB/RUB (km)	Nature and extent of repairs /strengthening to be carried out
Nil		

(c) Overpasses/Underpasses and other structures

Sl. No.	Location of Structure	Nature and extent of repairs/strengthening to be

	(Ch)	carried out
Nil		

8. Traffic Control Devices and Road Safety Works

(i) Traffic control devices and road safety works shall be provided in accordance with the provision of Section-9 of the relevant Manual as specified in Schedule-D. The Minimum number / Quantities of Traffic Control Devices and Road Safety Works are specified in Schedule-C.

(a) Traffic/ Road Signs:

Traffic signs viz roadside signages, overhead signs, kerb mounted signs etc. along the entire Project highway shall be provided in accordance with section 9 of the manual.

(b) Pavement Marking:

Pavement markings shall cover road marking for the entire Project Highway as per manual.

Specifications of the reflecting sheeting

Retro reflective sheeting should be of high intensity grade with encapsulated lens or with micro prismatic retro reflective element in accordance with ASTM Standard D 4956-04 in accordance with Clause 9.2.3 of the Manual.

Note: Above quantity of road markings are indicative and minimum specified. The actual quantity of road markings shall be determined by the Contractor in accordance with the Manual requirements with approval from the Authority's Engineer. Any increase in the length specified in this Clause of Schedule B shall not constitute a Change of Scope.

9. Roadside Furniture

(i) Roadside furniture shall be provided in accordance with the provisions of the Manual.

a) Road studs - Road studs shall be provided for the entire Project highway at median openings, bridges, VUP/Interchange/Flyover structures, approaches of bridges, VUP/Interchange/ Flyover, at curves on shoulder edge line, junctions, slip roads on both side of edge lines etc. in accordance with the manual.

b) LED traffic beacons - Shall be provided on entire project highway near pedestrian crossings, public gathering places, junctions etc. in accordance with the manual.

c) Pedestrian Guard Rail: Provide pedestrian guardrail at each bus stop location and other locations as per manual.

d) Delineators: Delineators for the entire Project Highway at the locations as suggested in relevant IRC Manual recommended in Schedule D.

e) Noise barriers: shall be provided in accordance with manual; Locations shall be decided as per site condition in consent with Authority.

f) Concrete Crash Barrier, Metal Beam Crash Barrier, Separators (MS Railings) – as per manual.

g) Traffic Safety Devices wherever required.

i) Road Boundary Stones.

j) Roadside furniture like Kilometer Stones/Hectometer Stones, Railings, Traffic Impact Attenuators, and Delineator shall be provided in accordance with the provision of section -9 of relevant Manual. The Minimum Numbers / Quantities of Roadside furniture are specified in Schedule-C.

(ii) Overhead traffic signs: -

a) Full Width Overhead signs shall be provided in accordance with section 9 of the manual.

b) Minimum number of full overhead gantry signboard – 1 No. & cantilever gantry sign – 2 Nos. shall be provided.

Note: - All Traffic Signs for Road Users would be provided as per Manual. However, the Contractor shall achieve the minimum numbers of Cautionary, Mandatory, Warning and informatory & all other Traffic Sign Boards as mentioned above. The said numbers of traffic signs are indicative and minimum specified. The actual numbers of traffic signs shall be determined by the Contractor in accordance with the Manual requirements with approval from the Authority's Engineer. Any increase in the numbers specified in this Clause and in the contract under other provisions shall not constitute a Change of Scope.

10. COMPULSORY AFFORESTATION

The trees should be planted by the Agency as compensatory afforestation according to the Forest Conservation Act, decided by the Forest Department.

11. HAZARDOUS LOCATIONS

The safety barriers shall also be provided at the following hazardous locations:

Thrie-beam crash barriers shall be installed all along the project highway on earthen shoulders on either side of main carriageway in a minimum length of **5721 m**.

Left Side			**Right Side**		
From (m.)	**To (m.)**	**Length (m)**	**From (m.)**	**To (m.)**	**Length (m)**
569	633	65	169	177	8
1138	1200	63	258	325	67
1419	1550	131	457	523	66
1560	1580	20	677	694	18
1754	1913	158	708	831	123
1775	1780	5	904	1046	143
1780	1875	95	1246	1328	82
1880	1900	20	1560	1580	20
2125	2180	55	1745	1775	30
2245	2270	25	2012	2194	182
2665	2795	130	2165	2200	35
2669	2777	108	2245	2290	45
2865	2899	34	2405	2521	117
2902	3035	133	2615	2650	35
3055	3070	15	2765	2795	30
3095	3120	25	2911	3119	207
3150	3155	5	3030	3033	3

Left Side			Right Side		
From (m.)	To (m.)	Length (m)	From (m.)	To (m.)	Length (m)
3299	3630	331	3038	3045	7
3480	3510	30	3125	3150	25
3540	3570	30	3745	3893	148
4090	4105	15	3945	3950	5
4180	4259	79	3970	4259	289
4261	4475	214	4261	4445	184
4485	4490	5	4271	4561	290
4757	4883	126	4500	4510	10
4840	4845	5	4915	4920	5
4962	5153	190	5215	5245	30
5095	5105	10	5237	5340	103
5100	5105	5	5810	5965	155
5145	5175	30	5980	5985	5
5240	5250	10	7208	7334	126
5390	5604	215	7360	7393	33
5980	5985	5	7395	7400	5
6353	6444	92	7475	7495	20
6705	6710	5	7550	7743	193
6725	6735	10	7655	7660	5
6797	7049	252	7680	7710	30
6945	6959	14			
6961	6965	4			
7150	7155	5			
7205	7210	5			
7290	7300	10			
7330	7335	5			
7350	7370	20			
7420	7430	10			
7535	7540	5			
7635	7640	5			
7700	7715	15			
Total (m)		**2843**	**Total (m)**		**2878**

Note: Above length of the Thrie-beam Crash Barriers is indicative and minimum specified. The actual length of the Thrie-beam Crash Barriers shall be determined by the Contractor in accordance with the requirements of the manual in consultation with the Authority / Authority's Engineer. Any increase in the length specified in this Clause of Schedule B shall not constitute a Change of Scope.

12. SPECIAL REQUIREMENTS FOR HILL ROADS

(a) Slope Protection Structures

As the project involve cutting of existing hill slopes, it is imperative that the cut-slopes shall be stabilized for insuring longevity of the slopes and the roads.

The contractor shall be responsible for accurate assessment of the actual requirement of slope protection structures at site & shall prepare appropriate design for slope protection & stabilization as per specification defined in Schedule D.

Structures for Slope protection and Retaining/Toe wall/ Breast Walls shall be designed and constructed as per specification in Schedule-D.

Tentative locations of structures to be constructed for slope protection are shown in the following Table:

(i) RCC Retaining wall *(Minimum Avg. height 3 m)*

Left Side			Right Side		
Ch. From	**Ch. To**	**Length (m)**	**Ch. From**	**Ch. To**	**Length (m)**
1565	1580	15	1560	1580	20
1785	1875	90	1745	1770	25
1880	1900	20	2165	2200	35
2125	2170	45	2275	2290	15
2245	2270	25	2615	2650	35
2665	2795	130	2765	2795	30
2870	2875	5	3030	3033	3
2875	2899	24	3038	3045	7
2902	2950	48	3125	3145	20
3020	3033	13	3945	3950	5
3055	3070	15	3970	4120	150
3095	3115	20	4180	4259	79
3150	3155	5	4261	4375	114
3480	3505	25	4430	4440	10
3565	3570	5	4505	4510	5
4095	4100	5	4915	4920	5
4180	4259	79	5215	5245	30
4261	4480	219	5980	5985	5
4485	4490	5	7360	7395	35
4840	4845	5	7475	7495	20
5095	5105	10	7680	7710	30
5150	5160	10			
5245	5250	5			
5980	5985	5			
6725	6735	10			
6945	6950	5			
6955	6960	5			
6961	6965	4			
7205	7210	5			
7290	7300	10			
7330	7335	5			
7355	7365	10			
7420	7430	10			
7535	7540	5			
7635	7640	5			
7705	7715	10			
		912.000			**678.000**

(ii)RCC Retaining wall *(Minimum Avg. height 6 m)*

Left Side			Right Side		
Ch. From	**Ch. To**	**Length (m)**	**Ch. From**	**Ch. To**	Length (m)
1745	1775	30	4445	4475	30
2180	2200	20	4480	4500	20
2840	2865	25			
3038	3055	17			
3510	3514	4			
3515	3535	20			
3550	3565	15			
4845	4850	5			
4850	4920	70			
4940	4945	5			
4945	4990	45			
5005	5010	5			
5010	5055	45			
5105	5110	5			
5125	5130	5			
5130	5145	15			
5175	5200	25			
5215	5240	25			
5405	5485	80			
6500	6505	5			
6505	6545	40			
6605	6655	50			
6655	6705	50			
6735	6740	5			
6895	6910	15			
7155	7170	15			
7195	7205	10			
7370	7495	125			
7515	7665	150			
7680	7700	20			
		946.000			**50.000**

- **Height of retaining wall**
  1) **Length of retaining wall of minimum Average Ht 3.0m = 1.590 Km**
  2) **Length of retaining wall of minimum Average Ht 6.0m = 0.996 Km**

Note: Above Location & length of the Retaining wall is indicative and minimum specified. The actual length of the Retaining wall shall be determined by the Contractor in accordance with the requirements of the manual in consultation with the Authority / Authority's Engineer. Any change in the length/height/location specified in this Clause of Schedule B shall not constitute a Change of Scope. Further, the protection work shall be readjusted as per actual site requirement. However, any decrease in the length as per the actual site conditions, if any shall constitute a negative change of scope.

(iii) Breast wall (Minimum Average height 2.0m)

Left Side			Right Side		
Ch. From	Ch. To	Length (m)	Ch. From	Ch. To	Length (m)
1980	1990	10	1900	1905	5
2030	2050	20	2100	2105	5
2070	2080	10	2305	2335	30
2300	2305	5	2385	2400	15
2425	2435	10	2475	2495	20
2485	2495	10	2590	2600	10
2600	2605	5	2690	2710	20
2690	2695	5	3470	3475	5
3160	3165	5	3710	3715	5
3175	3185	10	3910	3920	10
3315	3335	20	3940	3945	5
3415	3425	10	4525	4530	5
3585	3630	45	5080	5085	5
3755	3805	50	5260	5265	5
3865	3915	50	5425	5430	5
3955	3965	10	5438	5440	2
3968	3970	2	5455	5460	5
4520	4525	5	5480	5490	10
4825	4830	5	5970	5975	5
5305	5315	10	6900	6905	5
5365	5380	15	6945	6950	5
5560	5600	40	6975	6980	5
5625	5640	15	7435	7440	5
6980	7000	20	7525	7530	5
7060	7105	45	7540	7550	10
7245	7260	15	7640	7645	5
7555	7560	5	7735	7745	10
7595	7615	20			
		472.00			**222.00**

(iv) Breast wall (Minimum Average height 3.0m)

Left Side			Right Side		
Ch. From	Ch. To	Length (m)	Ch. From	Ch. To	Length (m)
2305	2355	50	1905	2000	95
2357	2372	15	2015	2100	85
2375	2425	50	2335	2355	20
2445	2447	2	2375	2385	10
2495	2600	105	2495	2500	5
2695	2745	50	2500	2590	90
3165	3260	95	3170	3260	90
3295	3315	20	3295	3344	49
3425	3470	45	3346	3470	124
3630	3780	150	3580	3940	360
3805	3865	60	4530	4675	145
4525	4675	150	4710	4850	140
4710	4825	115	5030	5080	50
5315	5365	50	5265	5425	160
5640	5970	330	5460	5465	5
7000	7060	60	5465	5480	15

Left Side			Right Side		
Ch. From	**Ch. To**	**Length (m)**	**Ch. From**	**Ch. To**	**Length (m)**
7105	7140	35	5490	5970	480
7560	7565	5	6905	6945	40
7565	7595	30	6980	7140	160
			7160	7295	135
			7430	7435	5
			7550	7640	90
		1417.00			**2353.00**

- **Height of Stone Breast wall**
  1) **Length of Breast wall of Minimum Average Ht. 2 m = 0.694 Km**
  2) **Length of Breast wall of Minimum Average Ht. 3m = 3.770 Km**

Note: Above Location & length of the Breast wall is indicative and minimum specified. The actual length of the Breast wall shall be determined by the Contractor in accordance with the requirements of the manual in consultation with the Authority/ Authority's Engineer. Any change in the length/height/location specified in this Clause of Schedule B shall not constitute a Change of Scope. Further, the protection work shall be readjusted as per actual site requirement. However, any decrease in the length as per the actual site conditions, if any shall constitute a negative change of scope.

(v) Stone Pitching

Left Side			Right Side		
Ch. From	**Ch. To**	**Length (m)**	**Ch. From**	**Ch. To**	**Length (m)**
1565	1580	15	1560	1580	20
1785	1875	90	1745	1770	25
1880	1900	20	2165	2200	35
2125	2170	45	2275	2290	15
2245	2270	25	2615	2650	35
2665	2795	130	2765	2795	30
2870	2875	5	3030	3033	3
2875	2899	24	3038	3045	7
2902	2950	48	3125	3145	20
3020	3033	13	3945	3950	5
3055	3070	15	3970	4120	150
3095	3115	20	4180	4259	79
3150	3155	5	4261	4375	114
3480	3505	25	4430	4440	10
3565	3570	5	4505	4510	5
4095	4100	5	4915	4920	5
4180	4259	79	5215	5245	30
4261	4480	219	5980	5985	5
4485	4490	5	7360	7395	35
4840	4845	5	7475	7495	20
5095	5105	10	7680	7710	30
5150	5160	10			
5245	5250	5			

Left Side			Right Side		
Ch. From	**Ch. To**	**Length (m)**	**Ch. From**	**Ch. To**	**Length (m)**
5980	5985	5			
6725	6735	10			
6945	6950	5			
6955	6960	5			
6961	6965	4			
7205	7210	5			
7290	7300	10			
7330	7335	5			
7355	7365	10			
7420	7430	10			
7535	7540	5			
7635	7640	5			
7705	7715	10			
		912.000			**678.000**

Note: Above Location & length of the Stone Pitching is indicative and minimum specified. The actual length of the Stone Pitching & Toe wall shall be determined by the Contractor in accordance with the Manual requirements in counsultation with the Authority/ Authority's Engineer. Any increase in the length/change in location/readjustment specified in this Clause of Schedule B shall not constitute a Change of Scope. However, any decrease in the length as per the actual site conditions, if any shall constitute a negative change of scope.

(iv) Coir Erosion Control (Min. Area 271160 Sqm)

Sr. No.	Design chainage (From)	Design chainage (To)	Length (m)	Side	Avg. Height(m)
1			1339.26	BS	20
		Total	**1339.26**	**2X1339.26=2678m**	

Note: Above Location & length of the Coir erosion is indicative and minimum specified. The actual length of the Coir erosion control measure shall be determined by the Contractor in accordance with the Manual requirements in consultation with the Authority/ Authority's Engineer. Any increase in the length specified in this Clause of Schedule B shall not constitute a Change of Scope.

(c) Disposal of Debris: -

5. No Muck dumping sites will be Proposed within Reserved Forest area. The muck dumping sites have been identified at Ch. 3+700 (LHS), Ch. 4+900 (LHS) and Ch. 7+200 (LHS). However, necessary permission for dumping of muck at the said locations needs to be obtained by the EPC contractor in consultation with the Local village head, District Administration & Forest department etc. In addition to this, the EPCC may identify additional dumping locations if required, for dumping of muck and necessary clearances/NOCs/permission shall be obtained by the Contractor in addition to the applicable permissions and clearances as stated in Schedule F.

13. CHANGE OF SCOPE

The length of Structures, bridges, culverts, underpasses, flyovers etc. specified hereinabove shall be treated as an approximate assessment. The actual lengths as required based on detailed site investigations shall be determined by the Contractor in accordance with the Specifications and Standards. Any variations (in case of increase only) in the lengths specified in this Schedule-B shall not constitute a Change of Scope, save and except any variations in the length arising out of a Change of Scope expressly undertaken in accordance with the provisions of Articled 13.

14. Utility Duct

The Locations of utility ducts shall be constructed for full width of cross section in consultation with Authority Engineer. The utility work proposed by the contractor will not be entitled for any other extra cost and will not amount to change of scope and shall be finalized as per site requirement in consultation with Authority Engineer.

S. No.	Utility Duct (across)	Minimum Qty.
1	Single Row for one utility services	1860.00 mtr.
2	Double Row for two utility services	-

15. Shifting of Religious Sculpture/Common property resources: Contractor has to shift all such structures falling in the PROW to an appropriate location.

.16. Utility shifting

Shifting of obstructing utilities shall be done as per Ministry's circular RW/NH-33044/29/2015-S&R(R)pt dated 11.02.2021. The Contractor shall be responsible for getting the utilities shifted as per approval of the concerned utility owning department. The assistance of the Authority is limited to giving a forwarding letter on the proposal of Contractor to the utility owning department whenever asked by the Contractor. The decision/approval of the utility owning department shall be binding on the Contractor.

17. Road safety during construction

All necessary precautions shall be taken by the contractor for the safety of road users as well as workers in the construction zone as per manual specified in the schedule D.

Appendix B-I

TYPE - 01

RECONSTRUCTION OF EXISTING TWO - LANE CARRIAGEWAY TO TWO - LANE WITH PAVED SHOULDER WITH DRAIN IN BUILT-UP AREA

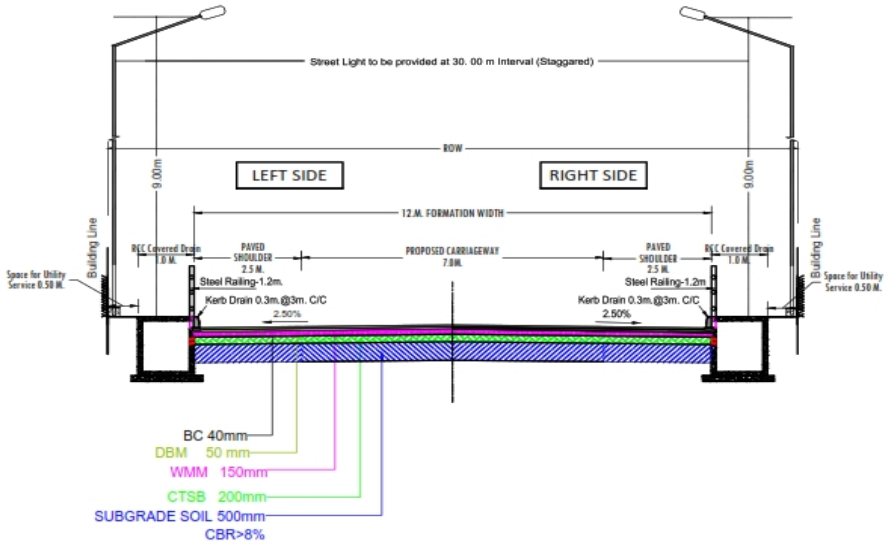

Fig. 2.6 Modified
As per IRC SP 73: 2018

Chainage From	Chainage To	Length (Km)	TCS Type	Remark
0.280	1.460	1.180	1	Reconstruction Of Existing Two - Lane Carriageway to Two - Lane with Paved Shoulder
	TOTAL	1.180	Km.	

NOTES:

1. ALL DIMENSIONS ARE IN METERS, UNLESS NOTED OTHERWISE.
2. DIMENSIONS SHALL NOT BE SCALED OFF FROM THE DRAWING. ONLY WRITTEN DIMENSION SHALL BE FOLLOWED.
3. PCC M15 50MM" PROVIDED IN LIEU OF EARTHEN SHOULDER TOWARD OFF EROSION OF SOIL NEAR DRAIN WALL.

CLIENT: NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.
1st & 2nd Floor, Tower A, World Trade Centre, Nauroji Nagar, New Delhi – 110029 Contact No : 011-26768950
Email Address : info@nhidcl.com

DESIGN CONSULTANT: Global Infra Solutions
in JV with Dhruv Consultancy Services Limited and association with Infycons Creative Software Pvt. Ltd.
F-2, E-8/11A, Sukhsagar Apartment, Trilanga, Bhopal -462039
e: globalinfrasolutions@gmail.com web: globalinfrasolutions.org

PROJECT: IMPROVEMENT TO 2-LANE WITH PAVED SHOULDER/4-LANING OF NH-40 BETWEEN SHILLONG TO DAWKI ROAD UPTO BANGLADESH BORDER INCLUDING DAWKI BRIDGE IN THE STATE OF MEGHALAYA FOR EXECUTION OF EPC MODE UNDER JICA FUNDING.(DESIGN LENGTH 7.760 KM (PACKAGE-III).

SCALE: Not to scale Dimensions as mentioned

TITLE: TYPICAL CROSS SECTION

CLIENT APPROVAL: | SIGNATURE:

DRAWN: LK | CHECKED: SJ | DESIGNED: SC | APPROVED: LA

TYPE - 02

RECONSTRUCTION OF EXISTING TWO - LANE CARRIAGEWAY TO TWO - LANE WITH PAVED SHOULDER WITH DRAIN ON HILL SIDE (OPEN COUNTRY - MOUNTAINOUS TERRAIN)

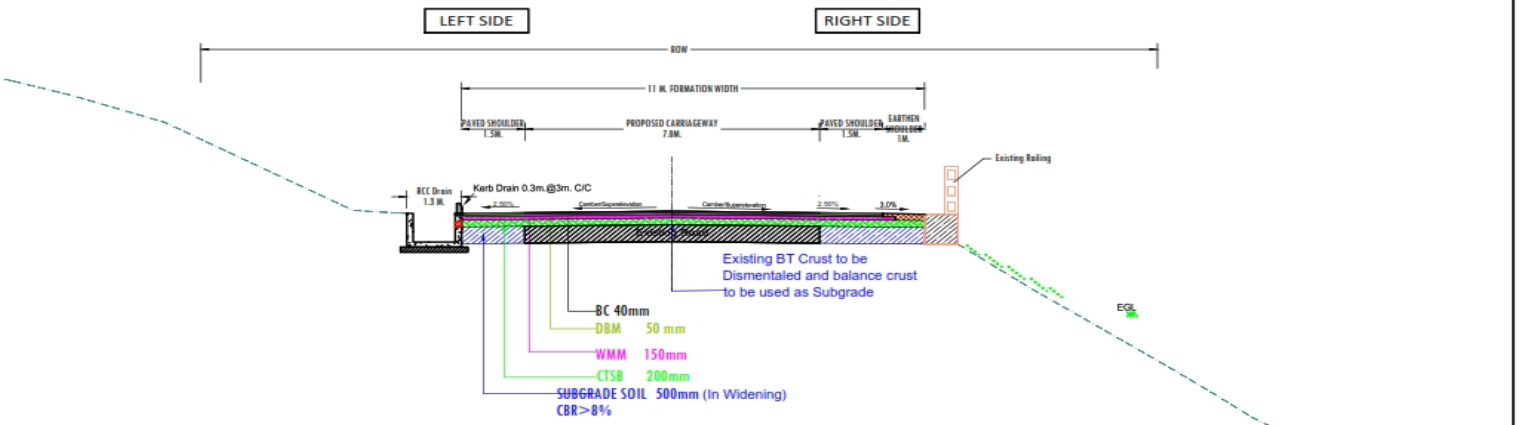

Fig. 2.9 Modified
As per IRC SP 73: 2018

Chainage From	Chainage To	Length (Km)	TCS Type	Remark
0.000	0.280	0.280	2	Reconstruction Of Existing Two - Lane Carriageway to Two - Lane with Paved Shoulder with Drain On Hill Side
	TOTAL	0.280	Km.	

NOTES:

1. ALL DIMENSIONS ARE IN METERS, UNLESS NOTED OTHERWISE.
2. DIMENSIONS SHALL NOT BE SCALED OFF FROM THE DRAWING. ONLY WRITTEN DIMENSION SHALL BE FOLLOWED.
3. 50MM PCC M15 PROVIDED IN LIEU OF EARTHEN SHOULDER TOWARD OFF EROSION OF SOIL NEAR DRAIN WALL.

CLIENT: NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.
1st & 2nd Floor, Tower A, World Trade Centre, Nauroji Nagar, New Delhi – 110029 Contact No : 011-26768950
Email Address : info@nhidcl.com

DESIGN CONSULTANT: Global Infra Solutions
in JV with Dhruv Consultancy Services Limited and association with Infycons Creative Software Pvt. Ltd.
F-2, E-8, 118, Sukhsagar Apartment, Trilanga, Bhopal - 462039
e: globalinfrasolutions2@gmail.com web: globalinfrasolutions.org

PROJECT: IMPROVEMENT TO 2-LANE WITH PAVED SHOULDER/4-LANING OF NH-40 BETWEEN SHILLONG TO DAWKI ROAD UPTO BANGLADESH BORDER INCLUDING DAWKI BRIDGE IN THE STATE OF MEGHALAYA FOR EXECUTION OF EPC MODE UNDER JICA FUNDING.(DESIGN LENGTH 7.760 KM (PACKAGE-III).

SCALE: Not to scale
Dimensions as mentioned

TITLE: TYPICAL CROSS SECTION

CLIENT APPROVAL: | SIGNATURE:

DRAWN	CHECKED	DESIGNED	APPROVED
LK	SJ	SC	LA

TYPE - 03

TYPICAL CROSS SECTION FOR 2 - LANE UNDIVIDED HIGHWAY (NEW CONSTRUCTION)
(OPEN COUNTRY -MOUNTAINOUS TERRAIN)

BANKING SECTION
HEIGHT LESS THAN 3m

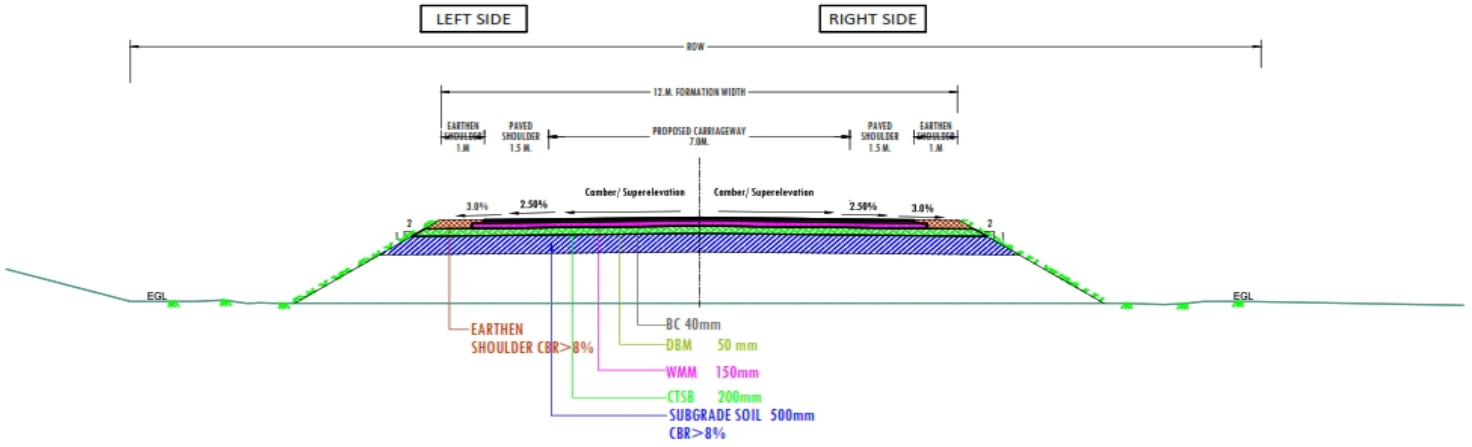

Fig. 2.9 Modified
As per IRC SP 73: 2018

Chainage From	Chainage To	Length (Km)	TCS Type	Remark
2.650	2.685	0.035	3	2 - Lane + PS (Banking Section <3m) New-construction
2.750	2.775	0.025	3	2 - Lane + PS (Banking Section <3m) New-construction
2.950	3.033	0.083	3	2 - Lane + PS (Banking Section <3m) New-construction
3.038	3.118	0.080	3	2 - Lane + PS (Banking Section <3m) New-construction
3.968	4.200	0.232	3	2 - Lane + PS (Banking Section <3m) New-construction
4.350	4.405	0.055	3	2 - Lane + PS (Banking Section <3m) New-construction
5.245	5.260	0.015	3	2 - Lane + PS (Banking Section <3m) New-construction
5.975	5.985	0.010	3	2 - Lane + PS (Banking Section <3m) New-construction
	TOTAL	0.535	Km.	

NOTES:

1. ALL DIMENSIONS ARE IN METERS, UNLESS NOTED OTHERWISE.
2. DIMENSIONS SHALL NOT BE SCALED OFF FROM THE DRAWING. ONLY WRITTEN DIMENSION SHALL BE FOLLOWED.
3. PCC M15 50MM* PROVIDED IN LIEU OF EARTHEN SHOULDER TOWARD OFF EROSION OF SOIL NEAR DRAIN WALL.

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New Delhi – 110029 Contact No : 011-26768950
Email Address : info@nhidcl.com

DESIGN CONSULTANT: Global Infra Solutions
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e: globalinfrasolutions@gmail.com web: globalinfrasolutions.org

PROJECT: IMPROVEMENT TO 2-LANE WITH PAVED SHOULDER/4-LANING OF NH-40 BETWEEN SHILLONG TO DAWKI ROAD UPTO BANGLADESH BORDER INCLUDING DAWKI BRIDGE IN THE STATE OF MEGHALAYA FOR EXECUTION OF EPC MODE UNDER JICA FUNDING.(DESIGN LENGTH 7.760 KM (PACKAGE-III).

SCALE: Not to scale Dimensions as mentioned

TITLE: TYPICAL CROSS SECTION

CLIENT APPROVAL: | SIGNATURE:

DWG NO.- 001/18/NHIDCL/PS/TCS

DRAWN:	CHECKED:	DESIGNED:	APPROVED:
LK	SJ	SC	LA

TYPE - 04

TYPICAL CROSS SECTION FOR 2 - LANE UNDIVIDED HIGHWAY(NEW CONSTRUCTION) (OPEN COUNTRY -MOUNTAINOUS TERRAIN)

CUTTING SECTION
CUTTING HEIGHT < 1m

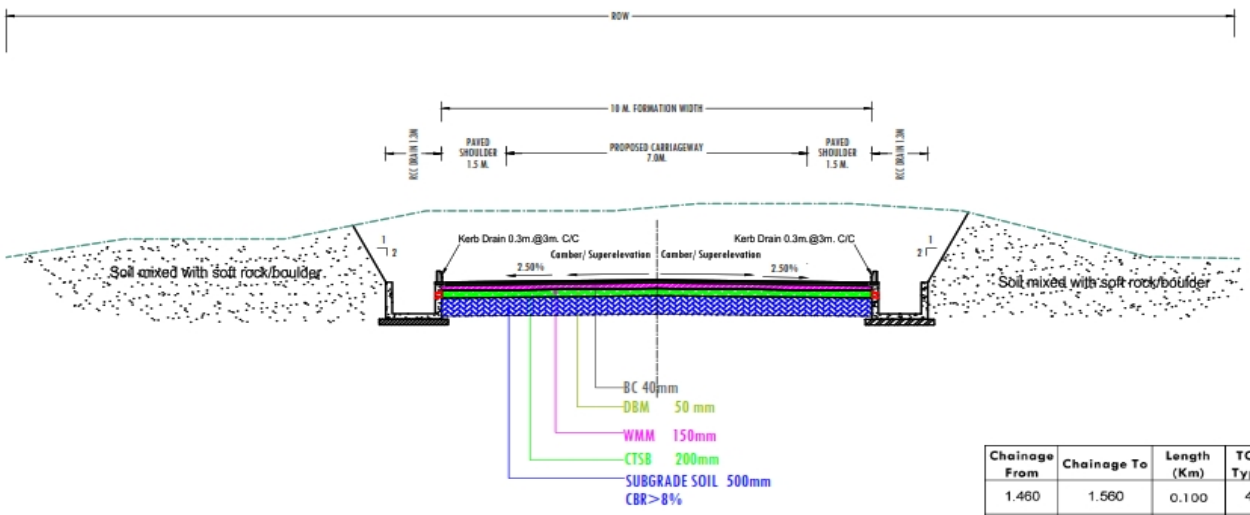

Fig. 2.9 Modified
As per IRC SP 73: 2018

Chainage From	Chainage To	Length (Km)	TCS Type	Remark
1.460	1.560	0.100	4	2 - Lane + PS (Cutting<1m) New-construction
2.105	2.115	0.010	4	2 - Lane + PS (Cutting<1m) New-construction
2.445	2.475	0.030	4	2 - Lane + PS (Cutting<1m) New-construction
3.575	3.585	0.010	4	2 - Lane + PS (Cutting<1m) New-construction
4.405	4.435	0.030	4	2 - Lane + PS (Cutting<1m) New-construction
6.710	6.725	0.015	4	2 - Lane + PS (Cutting<1m) New-construction
7.140	7.150	0.010	4	2 - Lane + PS (Cutting<1m) New-construction
	TOTAL	0.205	Km.	

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PROJECT: IMPROVEMENT TO 2-LANE WITH PAVED SHOULDER/4-LANING OF NH-40 BETWEEN SHILLONG TO DAWKI ROAD UPTO BANGLADESH BORDER INCLUDING DAWKI BRIDGE IN THE STATE OF MEGHALAYA FOR EXECUTION OF EPC MODE UNDER JICA FUNDING.(DESIGN LENGTH 7.760 KM (PACKAGE-III).

SCALE: Not to scale Dimensions as mentioned

TITLE: TYPICAL CROSS SECTION

CLIENT APPROVAL: | SIGNATURE:

DRAWN.	CHECKED.	DESIGNED.	APPROVED.
LK	SJ	SC	LA

TYPE - 05

TYPICAL CROSS SECTION FOR 2 - LANE UNDIVIDED HIGHWAY(NEW CONSTRUCTION) (OPEN COUNTRY -MOUNTAINOUS TERRAIN)

CUTTING SECTION WITH ONE SIDE BREAST WALL
CUTTING HEIGHT < 5.0m

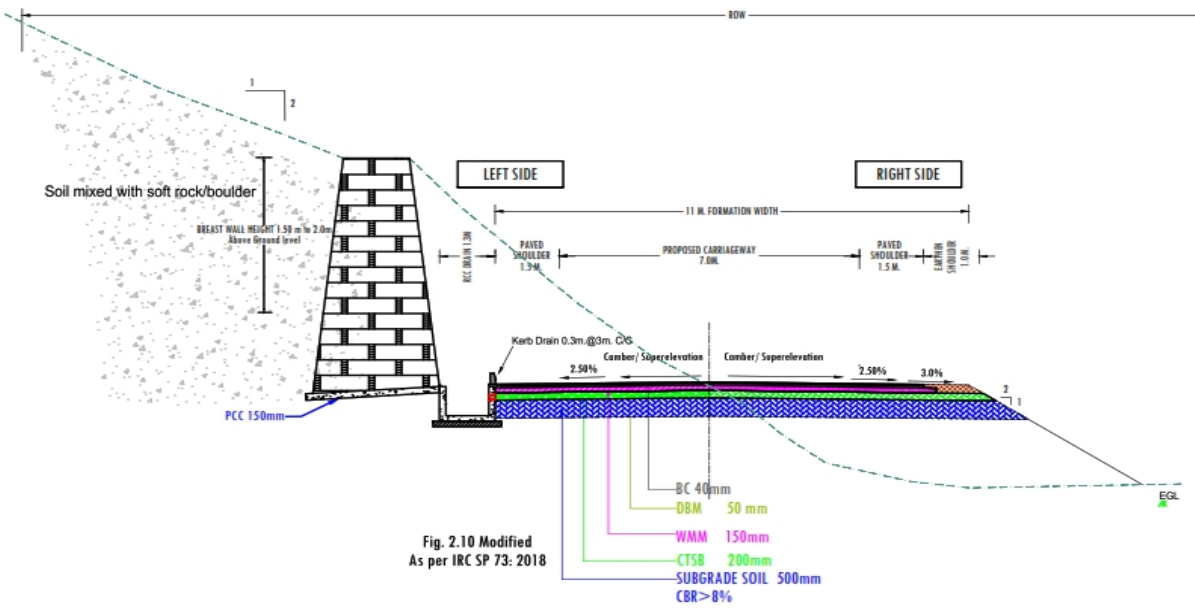

Fig. 2.10 Modified
As per IRC SP 73: 2018

1.900	2.000	0.100	5	2 - Lane + PS (Cutting< 5m) with One side Stone Breast wall- New-construction
3.123	3.170	0.047	5	2 - Lane + PS (Cutting< 5m) with One side Stone Breast wall- New-construction
3.950	3.963	0.013	5	2 - Lane + PS (Cutting< 5m) with One side Stone Breast wall- New-construction
4.485	4.530	0.045	5	2 - Lane + PS (Cutting< 5m) with One side Stone Breast wall- New-construction
5.075	5.090	0.015	5	2 - Lane + PS (Cutting< 5m) with One side Stone Breast wall- New-construction
5.260	5.280	0.020	5	2 - Lane + PS (Cutting< 5m) with One side Stone Breast wall- New-construction
5.485	5.530	0.045	5	2 - Lane + PS (Cutting< 5m) with One side Stone Breast wall- New-construction
	TOTAL	0.285	Km.	

NOTES:

1. ALL DIMENSIONS ARE IN METERS, UNLESS NOTED OTHERWISE.
2. DIMENSIONS SHALL NOT BE SCALED OFF FROM THE DRAWING. ONLY WRITTEN DIMENSION SHALL BE FOLLOWED.
3. PCC M15 50MM* PROVIDED IN LIEU OF EARTHEN SHOULDER TOWARD OFF EROSION OF SOIL NEAR DRAIN WALL.
4. BREAST WALL PROPOSED TO LIMIT THE PROPOSED ROW & SLOPE PROTECTION IN CUT SECTION.

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e: globalinfrasolutions@gmail.com web: globalinfrasolutions.org

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SCALE: Not to scale Dimensions as mentioned

TITLE: TYPICAL CROSS SECTION

CLIENT APPROVAL: SIGNATURE:

DRAWN.	CHECKED.	DESIGNED.	APPROVED.
LK	SJ	SC	LA

TYPE - 06

TYPICAL CROSS SECTION FOR 2 - LANE UNDIVIDED HIGHWAY(NEW CONSTRUCTION)
(OPEN COUNTRY -MOUNTAINOUS TERRAIN)

CUTTING SECTION WITH ONE SIDE BREAST WALL
CUTTING HEIGHT > 5.0m

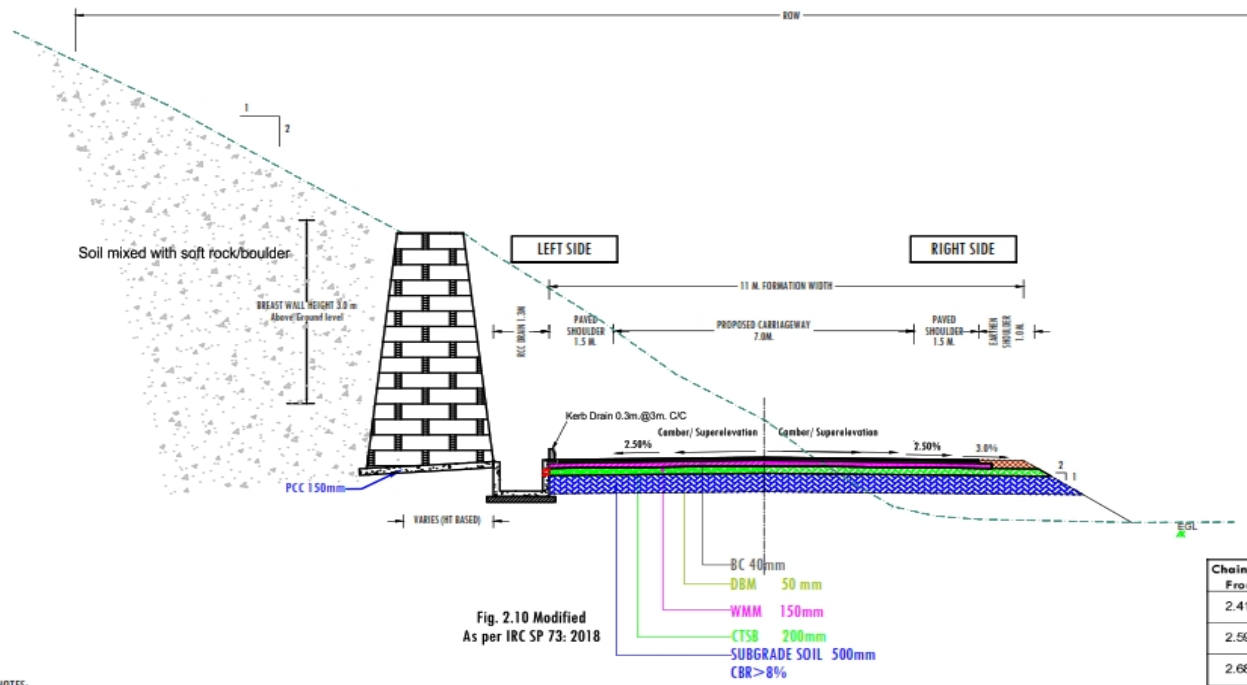

Fig. 2.10 Modified
As per IRC SP 73: 2018

Chainage From	Chainage To	Length (Km)	TCS Type	Remark
2.410	2.445	0.035	6	2 - Lane + PS (Cutting> 5m) with One side Stone Breast wall- New-construction
2.590	2.613	0.023	6	2 - Lane + PS (Cutting> 5m) with One side Stone Breast wall- New-construction
2.685	2.750	0.065	6	2 - Lane + PS (Cutting> 5m) with One side Stone Breast wall- New-construction
5.055	5.075	0.020	6	2 - Lane + PS (Cutting> 5m) with One side Stone Breast wall- New-construction
7.170	7.210	0.040	6	2 - Lane + PS (Cutting> 5m) with One side Stone Breast wall- New-construction
	TOTAL	0.183	Km.	

NOTES:

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3. PCC M15 50MM* PROVIDED IN LIEU OF EARTHEN SHOULDER TOWARD OFF EROSION OF SOIL NEAR DRAIN WALL.
4. BREAST WALL PROPOSED TO LIMIT THE PROPOSED ROW & SLOPE PROTECTION IN CUT SECTION.

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Email Address : info@nhidcl.com

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e: globalinfrasolutions@gmail.com web: globalinfrasolutions.org

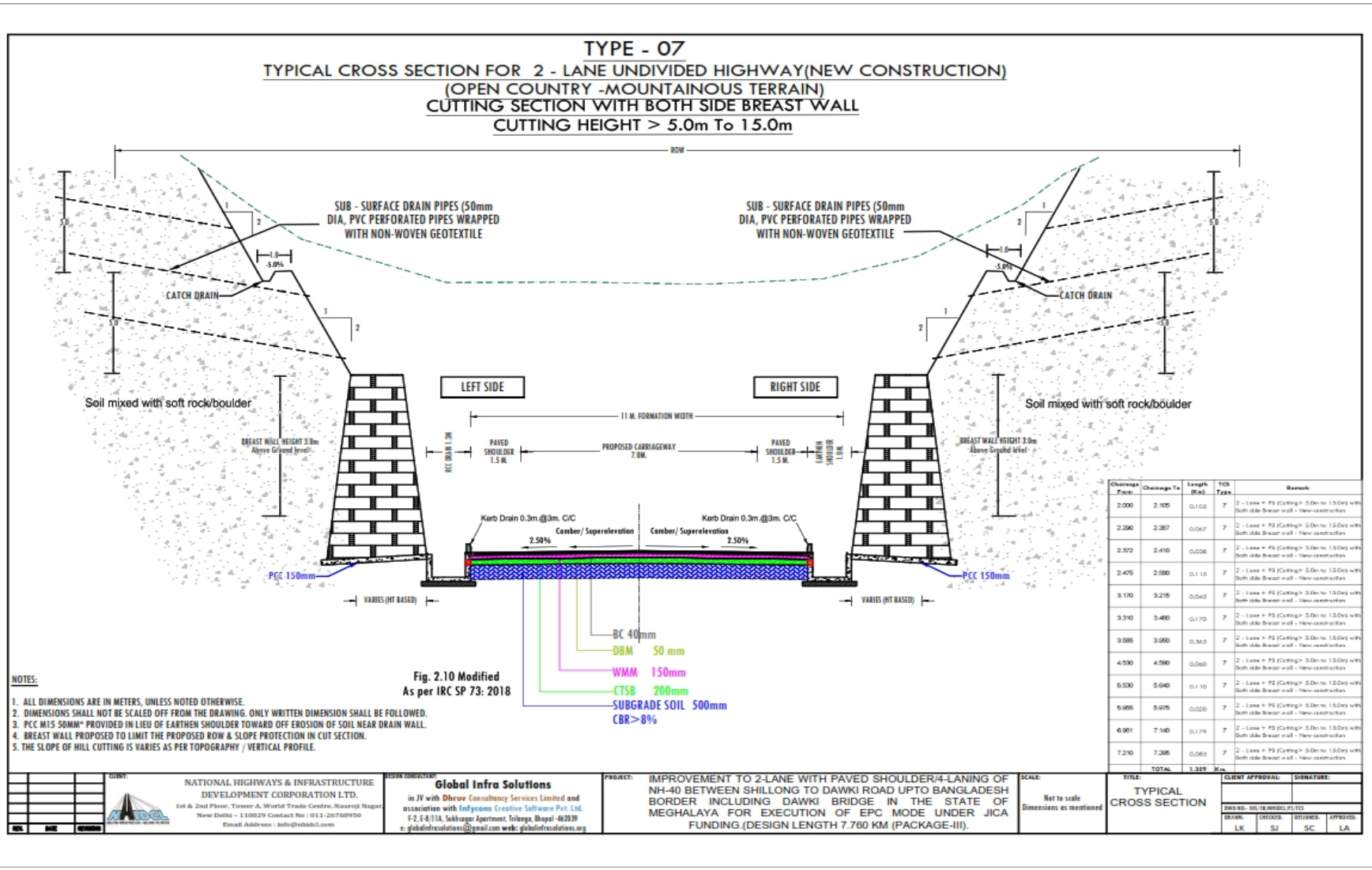
PROJECT: IMPROVEMENT TO 2-LANE WITH PAVED SHOULDER/4-LANING OF NH-40 BETWEEN SHILLONG TO DAWKI ROAD UPTO BANGLADESH BORDER INCLUDING DAWKI BRIDGE IN THE STATE OF MEGHALAYA FOR EXECUTION OF EPC MODE UNDER JICA FUNDING.(DESIGN LENGTH 7.760 KM (PACKAGE-III).

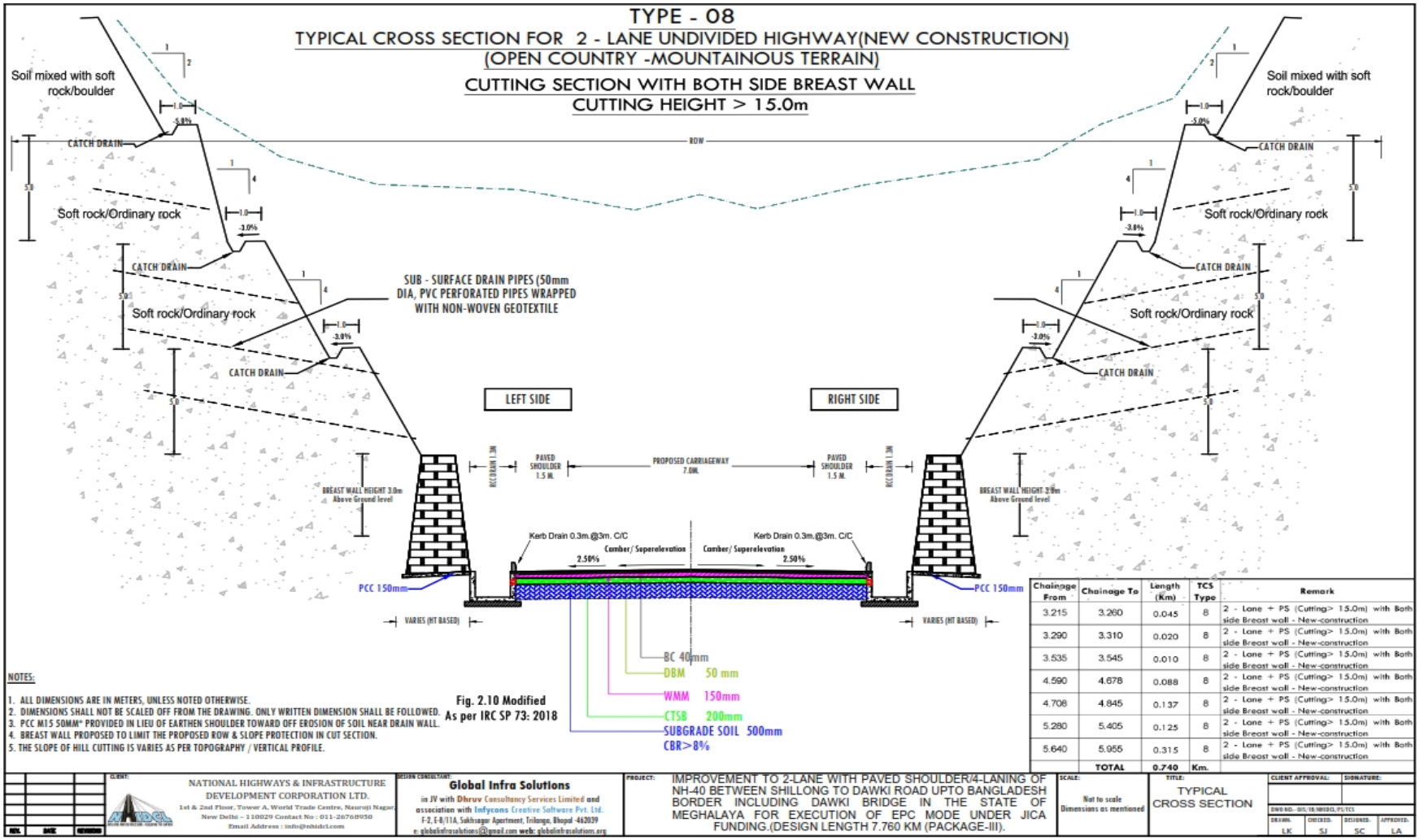
SCALE: Not to scale Dimensions as mentioned

TITLE: TYPICAL CROSS SECTION

CLIENT APPROVAL: SIGNATURE:

DRAWN: LK | CHECKED: SJ | DESIGNED: SC | APPROVED: LA


TYPE - 07
TYPICAL CROSS SECTION FOR 2 - LANE UNDIVIDED HIGHWAY(NEW CONSTRUCTION)
(OPEN COUNTRY -MOUNTAINOUS TERRAIN)
CUTTING SECTION WITH BOTH SIDE BREAST WALL
CUTTING HEIGHT > 5.0m To 15.0m
ROW
SUB - SURFACE DRAIN PIPES (50mm DIA, PVC PERFORATED PIPES WRAPPED WITH NON-WOVEN GEOTEXTILE
SUB - SURFACE DRAIN PIPES (50mm DIA, PVC PERFORATED PIPES WRAPPED WITH NON-WOVEN GEOTEXTILE
CATCH DRAIN
CATCH DRAIN
Soil mixed with soft rock/boulder
Soil mixed with soft rock/boulder
LEFT SIDE
RIGHT SIDE
11 M. FORMATION WIDTH
PAVED SHOULDER 1.5 M.
PROPOSED CARRIAGEWAY 7.0M.
PAVED SHOULDER 1.5 M.
Kerb Drain 0.3m.@3m. C/C
Kerb Drain 0.3m.@3m. C/C
Camber/ Superelevation
Camber/ Superelevation
2.50%
2.50%
PCC 150mm
PCC 150mm
VARIES (HT BASED)
VARIES (HT BASED)
BC 40mm
DBM 50 mm
WMM 150mm
CTSB 200mm
SUBGRADE SOIL 500mm
CBR>8%
NOTES:
1. ALL DIMENSIONS ARE IN METERS, UNLESS NOTED OTHERWISE.
2. DIMENSIONS SHALL NOT BE SCALED OFF FROM THE DRAWING. ONLY WRITTEN DIMENSION SHALL BE FOLLOWED.
3. PCC M15 50MM* PROVIDED IN LIEU OF EARTHEN SHOULDER TOWARD OFF EROSION OF SOIL NEAR DRAIN WALL.
4. BREAST WALL PROPOSED TO LIMIT THE PROPOSED ROW & SLOPE PROTECTION IN CUT SECTION.
5. THE SLOPE OF HILL CUTTING IS VARIES AS PER TOPOGRAPHY / VERTICAL PROFILE.
Fig. 2.10 Modified
As per IRC SP 73: 2018
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.
Global Infra Solutions
IMPROVEMENT TO 2-LANE WITH PAVED SHOULDER/4-LANING OF NH-40 BETWEEN SHILLONG TO DAWKI ROAD UPTO BANGLADESH BORDER INCLUDING DAWKI BRIDGE IN THE STATE OF MEGHALAYA FOR EXECUTION OF EPC MODE UNDER JICA FUNDING.(DESIGN LENGTH 7.760 KM (PACKAGE-III).
Not to scale
Dimensions as mentioned
TYPICAL CROSS SECTION
LK
SJ
SC
LA



Chainage From	Chainage To	Length (Km)	TCS Type	Remark
3.215	3.260	0.045	8	2 - Lane + PS (Cutting> 15.0m) with Both side Breast wall - New-construction
3.290	3.310	0.020	8	2 - Lane + PS (Cutting> 15.0m) with Both side Breast wall - New-construction
3.535	3.545	0.010	8	2 - Lane + PS (Cutting> 15.0m) with Both side Breast wall - New-construction
4.590	4.678	0.088	8	2 - Lane + PS (Cutting> 15.0m) with Both side Breast wall - New-construction
4.708	4.845	0.137	8	2 - Lane + PS (Cutting> 15.0m) with Both side Breast wall - New-construction
5.280	5.405	0.125	8	2 - Lane + PS (Cutting> 15.0m) with Both side Breast wall - New-construction
5.640	5.955	0.315	8	2 - Lane + PS (Cutting> 15.0m) with Both side Breast wall - New-construction
	TOTAL	0.740	Km.	

NOTES:

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2. DIMENSIONS SHALL NOT BE SCALED OFF FROM THE DRAWING. ONLY WRITTEN DIMENSION SHALL BE FOLLOWED.
3. PCC M15 50MM" PROVIDED IN LIEU OF EARTHEN SHOULDER TOWARD OFF EROSION OF SOIL NEAR DRAIN WALL.
4. BREAST WALL PROPOSED TO LIMIT THE PROPOSED ROW & SLOPE PROTECTION IN CUT SECTION.
5. THE SLOPE OF HILL CUTTING IS VARIES AS PER TOPOGRAPHY / VERTICAL PROFILE.

Fig. 2.10 Modified
As per IRC SP 73: 2018

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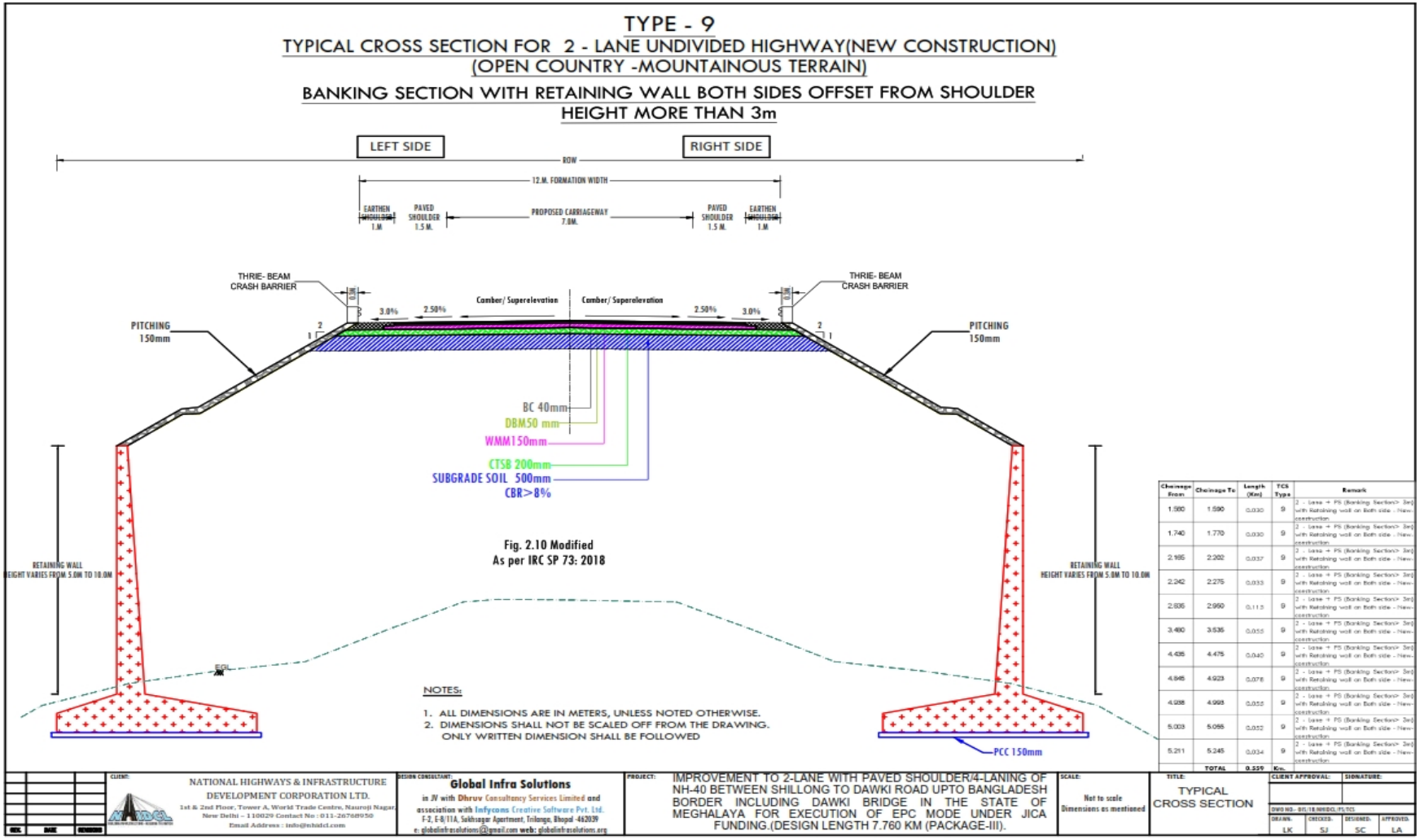
PROJECT: IMPROVEMENT TO 2-LANE WITH PAVED SHOULDER/4-LANING OF NH-40 BETWEEN SHILLONG TO DAWKI ROAD UPTO BANGLADESH BORDER INCLUDING DAWKI BRIDGE IN THE STATE OF MEGHALAYA FOR EXECUTION OF EPC MODE UNDER JICA FUNDING.(DESIGN LENGTH 7.760 KM (PACKAGE-III).

SCALE: Not to scale Dimensions as mentioned

TITLE: TYPICAL CROSS SECTION

CLIENT APPROVAL: | SIGNATURE:

DRAWN:	CHECKED:	DESIGNED:	APPROVED:
LK	SJ	SC	LA


TYPE - 9
TYPICAL CROSS SECTION FOR 2 - LANE UNDIVIDED HIGHWAY(NEW CONSTRUCTION)
(OPEN COUNTRY -MOUNTAINOUS TERRAIN)
BANKING SECTION WITH RETAINING WALL BOTH SIDES OFFSET FROM SHOULDER
HEIGHT MORE THAN 3m
LEFT SIDE
RIGHT SIDE
ROW
12.M. FORMATION WIDTH
EARTHEN SHOULDER 1.M
PAVED SHOULDER 1.5 M.
PROPOSED CARRIAGEWAY 7.0M.
PAVED SHOULDER 1.5 M.
EARTHEN SHOULDER 1.M
THRIE- BEAM CRASH BARRIER
THRIE- BEAM CRASH BARRIER
PITCHING 150mm
PITCHING 150mm
Camber/ Superelevation
Camber/ Superelevation
3.0%
2.50%
2.50%
3.0%
BC 40mm
DBM50 mm
WMM150mm
CTSB 200mm
SUBGRADE SOIL 500mm
CBR>8%
RETAINING WALL HEIGHT VARIES FROM 5.0M TO 10.0M
RETAINING WALL HEIGHT VARIES FROM 5.0M TO 10.0M
PCC 150mm
Fig. 2.10 Modified
As per IRC SP 73: 2018
NOTES:
1. ALL DIMENSIONS ARE IN METERS, UNLESS NOTED OTHERWISE.
2. DIMENSIONS SHALL NOT BE SCALED OFF FROM THE DRAWING. ONLY WRITTEN DIMENSION SHALL BE FOLLOWED
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.
Global Infra Solutions
IMPROVEMENT TO 2-LANE WITH PAVED SHOULDER/4-LANING OF NH-40 BETWEEN SHILLONG TO DAWKI ROAD UPTO BANGLADESH BORDER INCLUDING DAWKI BRIDGE IN THE STATE OF MEGHALAYA FOR EXECUTION OF EPC MODE UNDER JICA FUNDING.(DESIGN LENGTH 7.760 KM (PACKAGE-III).
Not to scale
Dimensions as mentioned
TYPICAL CROSS SECTION
LK
SJ
SC
LA

TYPE - 10

TYPICAL CROSS SECTION FOR 2 - LANE UNDIVIDED HIGHWAY(NEW CONSTRUCTION) (OPEN COUNTRY -MOUNTAINOUS TERRAIN)

BANKING SECTION WITH RETAINING WALL ONE SIDE OFFSET FROM SHOULDER HEIGHT MORE THAN 3m

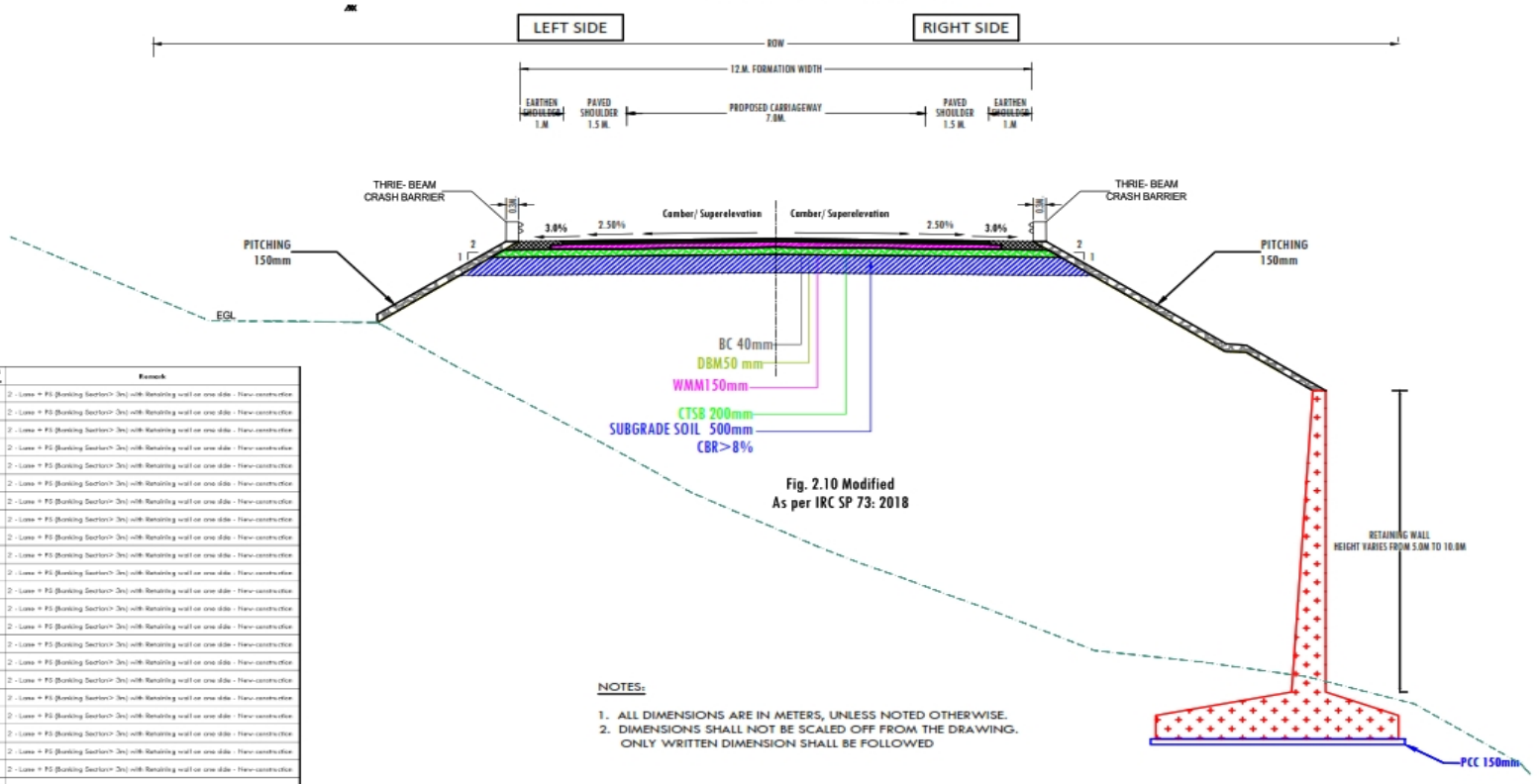


Fig. 2.10 Modified
As per IRC SP 73: 2018

Chainage From	Chainage To	Length (Km)	TCS Type	Remark
1.770	1.900	0.130	10	2 - Lane + PS (Ranking Section> 3m) with Retaining wall on one side - New construction
2.115	2.188	0.080	10	2 - Lane + PS (Ranking Section> 3m) with Retaining wall on one side - New construction
2.275	2.290	0.015	10	2 - Lane + PS (Ranking Section> 3m) with Retaining wall on one side - New construction
2.618	2.650	0.032	10	2 - Lane + PS (Ranking Section> 3m) with Retaining wall on one side - New construction
2.775	2.795	0.020	10	2 - Lane + PS (Ranking Section> 3m) with Retaining wall on one side - New construction
3.545	3.575	0.030	10	2 - Lane + PS (Ranking Section> 3m) with Retaining wall on one side - New construction
4.200	4.350	0.150	10	2 - Lane + PS (Ranking Section> 3m) with Retaining wall on one side - New construction
5.080	5.110	0.030	10	2 - Lane + PS (Ranking Section> 3m) with Retaining wall on one side - New construction
5.120	5.201	0.081	10	2 - Lane + PS (Ranking Section> 3m) with Retaining wall on one side - New construction
5.405	5.433	0.028	10	2 - Lane + PS (Ranking Section> 3m) with Retaining wall on one side - New construction
5.438	5.485	0.047	10	2 - Lane + PS (Ranking Section> 3m) with Retaining wall on one side - New construction
6.488	6.590	0.102	10	2 - Lane + PS (Ranking Section> 3m) with Retaining wall on one side - New construction
6.605	6.653	0.048	10	2 - Lane + PS (Ranking Section> 3m) with Retaining wall on one side - New construction
6.658	6.710	0.052	10	2 - Lane + PS (Ranking Section> 3m) with Retaining wall on one side - New construction
6.725	6.745	0.020	10	2 - Lane + PS (Ranking Section> 3m) with Retaining wall on one side - New construction
6.880	6.910	0.030	10	2 - Lane + PS (Ranking Section> 3m) with Retaining wall on one side - New construction
6.910	6.959	0.049	10	2 - Lane + PS (Ranking Section> 3m) with Retaining wall on one side - New construction
7.150	7.170	0.020	10	2 - Lane + PS (Ranking Section> 3m) with Retaining wall on one side - New construction
7.295	7.369	0.074	10	2 - Lane + PS (Ranking Section> 3m) with Retaining wall on one side - New construction
7.368	7.461	0.093	10	2 - Lane + PS (Ranking Section> 3m) with Retaining wall on one side - New construction
7.506	7.668	0.162	10	2 - Lane + PS (Ranking Section> 3m) with Retaining wall on one side - New construction
7.683	7.760	0.077	10	2 - Lane + PS (Ranking Section> 3m) with Retaining wall on one side - New construction
	TOTAL	1.337	Km	

NOTES:

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SCALE: Not to scale
Dimensions as mentioned

TITLE: TYPICAL CROSS SECTION

CLIENT APPROVAL: | SIGNATURE:

DRAWN:	CHECKED:	DESIGNED:	APPROVED:
LK	SJ	SC	LA

(Schedule B-1)

The shifting of utilities shall be carried out by the Contractor. The details of utilities are as follows:

Sr. No	Type of Utility	Unit	Quantity
A	Electrical Utilities		
A1	Electrical Poles	Nos.	75
A2	Electrical cables	Meters	10878
A3	Transformers/Sub-station	Nos.	01
B	Water/Sewage pipeline		
B1	Sewage	Meters	-
B2	Water supply	Meters	1680
B3	Water tank	Nos.	-
C	Trees	Nos.	All within the RoW

Schedule-C

SCHEDULE – C

(See Clause 2.1)

Project Facilities

1 Project Facilities

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

(a) Toll plazas;
(b) Roadside furniture;
(c) Pedestrian facilities;
(d) Steel railing
(e) Median Kerb
(f) Road side Plantation
(g) Land Scaping and Tree Plantation;
(h) Truck lay-byes;
(i) Way-side amenities;
(j) Bus-bays and Passenger shelters;
(k) Others;
    1. Highway Patrol Units
    2. Highway lighting
    3. Emergency Medical Services
    4. Crane Services
    5. Communication System
    6. Advance Traffic Management System (A. T. M. S.)
    7. Operation and Maintenance Center

2 Description of Project Facilities

(a) Toll Plazas

Toll Plaza shall be provided as per as stipulated in section 10 of the Manual. Canopy of Toll Plaza should be designed to withstand load of solar panels in addition to other design loads. Location of toll plaza is as per the following details.

Sl. No.	Toll Plaza ID	Design Chainage	Side	Min Number of Lanes
NIL				

Note:

- Installation of two number dedicated ETC lane (one lane in each direction) and Hybrid ETC System with provision of medium speed WIM with bending plate technology in each lane, and Static Weigh Bridge (one lane in each direction) at Toll Plaza and Configuration with Advance Traffic Management System.

- Above mentioned toll lanes are indicative. However, the actual requirement of toll lanes shall be assessed by Contractor as per actual site condition and Manual. The increase in number of toll lanes shall not be treated as change of scope.
- Solar panels shall be erected over the Toll Plaza Canopy to generate the green energy. Same shall be utilized for toll plaza lighting and other energy requirement within toll plaza area along with conventional lighting.

(b) Roadside furniture; as per **clause 9 of Annex-I Schedule B**

(c) Pedestrian facilities;

Pedestrian Guard rails shall be provided at junctions, Truck lay byes, bus bays and near schools and hospitals as per provisions in section 9.8 of the Manual

i. Pedestrian guardrail: Provide pedestrian guardrail at each bus stop location and at other locations as per manual.

ii. Pedestrian Crossings: Provide pedestrian crossing facilities on locations as recommended in Schedule D.

(d) Land Scaping and Tree Plantation.

Land Scaping and tree plantation of the highway shall be provided as per section 11 of the manual. The locations for these provisions shall be finalized in consultation with Authority Engineer. Total 415 nos. of trees (approx.) are identified to be affected in the proposed ROW, new trees to be planted by the EPC Contractor as per applicable law/guidelines. Any variation in no. of trees shall not constitute a change of scope.

(e) Truck lay-byes

Truck Lay bye shall be provided at the following locations in accordance with section 12.5 of the manual at 0 no. locations.

Sl. No.	**Design Chainage (m)**	**Side**
Nil		

(f) Way-side Amenities[1]

As stipulated in section 12.10 of the manual, Way-side Amenities shall be provided at the following locations:

S. No.	Design Chainage	Side
Nil		

(g) Bus- shelters

Bus Shelter shall be provided along the project highway. Tentative locations for Bus shelters are indicated below, however, the same shall be finalized as per suitability of

Note: The contractor shall mark the RoW with boundary stones, in accordance with the provision of manual and IRC 25, immediately as the land is handed over to the contractor by the Authority and the RoW shall be verified and cross checked by the contractor in consultation with Authority, Authority Engineer and District Administration, prior to commencement of works.

location and site requirement in consultation with the Authority's Engineer/ Authority. As stipulated in section 12.6 of the Manual, Bus- shelters shall be provided at below indicative locations.

Sr. No.	Design Chainage (m)	Side
1	1100	LHS
2	1100	RHS
3	7760	LHS

(h) Public Toilet- Nil

Note: However, the location of bus shelters & Public toilet shall be finalized as per suitability of location and site requirement in consultation with Authority. Any change in location shall not treated as change of scope.

(i) Others

1. Highway Patrol unit – as per manual
2. Highway LED Lighting: LED Lighting shall be provided at the following locations:

a. LED Traffic Beacons at Junctions (17 Nos.) & Lighting on Bridges (42 Nos.) (*minimum*) shall be provided at approach to bridges, Flyover, built up areas, bus stops, truck Lay-byes and rest areas as per manual recommended in Schedule D.

b. Apart from above locations lighting shall be provided at underpasses and ROB/RUB and as per site condition in consultation with Engineer and shall not be treated as change of scope. On all grade separated structures Lightings will be provided on Top & Underside as per clause 12.4 of IRC SP 73-2018.

Sr. No	Design Chainage		Length (km)	Spacing (m)	Height of Pole (m)	Numbers	Remark
	From	To					
1	0+280	1+420	1.180	30	9	60	Wahlyngkhat (Built-up)

c. High Mast Lighting shall be provided at all Major Junctions, or any other location as per clause 12.4.3 of IRC SP 73-2018. Minimum 4 Nos. of High Mast shall be provided.

Sr. No	Design Chainage	Location	Height of HM (m)	Qty (Nos)
1	1+410	To Pynursla Town	25	1
2	2+090	Village roads	25	1
3	4+160	Village roads	25	1
4	7+760	To Pynursla Town	25	1

3. Emergency Medical Services: Emergency medical Services shall be provided as per provisions of the manual.
4. Cranes services: One Cranes with 30 MT Capacity.

5. Communication System: Communication System shall be provided as per provisions of the manual.
6. Advance Traffic Management System (ATMS) as per technical specification: Provisions of other facilities, if required may be made in similar manner.
7. Operation and Maintenance Centre: Operation and Maintenance Centre shall be provided as per provisions of the manual.

j) **Traffic Diversion during Construction**

The traffic diversion plan during construction shall be prepared by Contractors per IRC: SP: 55 for the entire project highway. Separate traffic diversion plan shall be prepared for structures and CD works.

The Contractor shall provide necessary Men Power for guiding and regulation of Traffic during construction

(d) Median & Kerb
(e) Steel Railing

Schedule-D

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:

a) Manual of Specifications and Standards for Two Laning of Highways (IRC: SP: 73-2018), referred to herein as the Manual.

Annex - I

(Schedule-D)

Specifications and Standards for Construction

1 Specifications and Standards

All Materials, works and construction operations shall conform to the Guidelines for the Alignment Survey and Geometric Design of Hill Roads (IRC:52-2019) and Manual of Specifications and Standards for Two-Laning of Highways with Paved Shoulder (IRC: SP:73-2018, IRC:73-2023, IRC: SP:48-2023, IRC:37 2018) referred to as the Manual and Indian Road Congress (IRC) Codes and Standards and MORTH Specifications for Road and Bridge Works. Where the aforesaid Manuals, guidelines, codes, standards and specifications are silent on any aspect, 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 the aforesaid Manual, the following Specifications and Standards shall apply to the Project Highway, and for purposes of this Agreement, the aforesaid Manual shall be deemed to be amended to the extent set forth below;

1) IRC Class Special Vehicle loading shall be taken into account in the structural design of bridges/Flyover/VUP.

2) TCS of 2-Lane with paved shoulder, Width of bridges & Locations of Utility Duct

Sl. No.	Item	Clause reference of Manual	Description of Deviation
(1)	(2)	(3)	(4)
1	Design Speed	Clause 2.2.1 & Table 2.1 of IRC SP-73 2018	As per Manual
2	Extra Widening	Clause 2.7 & Table 2.4 of IRC SP-73 2018	Extra Widening may be provided at the curves for radius below 75 m, (para 6.8.5.2 of Hill Road manual may be referred for this purpose). Radius up to 20 m =extra width 1.5 m Radius 21-40m=1.5m Radius 41-60m=1.2m Radius 60-100m=0.90m Radius 101-300 m=0.60m Note: Extra Widening shall be provided at curves up to

Sl. No.	Item	Clause reference of Manual	Description of Deviation
(1)	(2)	(3)	(4)
			75m radius as per IRC SP 73 2018 & extra widening for the curves with radius below 75 m shall be provided as per Hill Road manual IRC SP 48.
3	Super elevation	Clause 2.9.3 of IRC SP-73 2018	The Super elevation shall be as per Clause 6.8.2 of IRC: 52, 2019 Guidelines for the Alignment Survey and Geometric Design of Hill Roads (Third Revision). L
4	Typical Cross-sections	Clause 2.16 of IRC SP-73 2018	Typical Cross-sections shall be as per Schedule B,
5	Flexible pavement - design period and strategy	Clause 5.4.1 of IRC: SP:73-2018	Flexible pavement shall be designed for a minimum design period of 20 years, subject to the condition that design traffic shall not be less than 30 million Standards Axles (MSA) as per Clause 5.2 of Schedule-B, Annex-I.
6	Width of the Minor Bridges & Major Bridges	Clause 7.3 iv) IRC: SP:73-2018	Width of the structures at deck Level for Minor Bridge shall be as per provided in Schedule-B.
7	Width of paved shoulder in built up area	MoRTH circular dated 04.06.2024	Width of paved shoulder has been kept as 2.5m on both sides in built up area for a stretch of 1.420km.

Schedule – E

(See Clause 2.1 and 14.2)

MAINTENANCE REQUIREMENTS

1. Maintenance Requirements

1.1. The Contractor shall, at all-time 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 "SPECIFICATIONS FOR ROAD AND BRIDGE WORKS (FIFTH REVISION, April 2013)", including latest corrections slips, issued by the Ministry of Surface Transport & Highways, Government of India and published by the Indian Roads Congress.

Where the specifications for a work are not given, Good Industry Practice shall be adopted to the satisfaction of the Authority's Engineer.

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: SP:35. 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 torrential rains, floods, earthquake or other natural disasters shall be undertaken by the Contractor at its own cost and/or out of the proceeds of insurance.

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.

Table -1: Maintenance Criteria for Pavements:

Asset Type	Performance Parameter	Level of Service (LOS)		Frequency of Inspection	Tools/Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/ Repair	Maintenance Specifications
		Desirable	Acceptable					
Flexible Pavement (Pavement of MCW, Service Road, approaches	Potholes	Nil	< 0.1 % of area and subject to limit of 10 mm in depth	Daily	Length Measurement Unit like Scale, Tape, odometer etc.	IRC 82: 2015 and Distress Identification Manual for Long Term Pavement Performance Program, FHWA 2003 (http://www.tfhrc.com/pavement/lttp/reports/03031/)	24-48 hours	MORT&H Specification 3004.2
S of Grade structure, approaches of connecting roads, slip roads, lay byes etc. as applicable)	Cracking	Nil	< 5 % subject to limit of 0.5 sqm for any 50m length	Daily			7-15 days	MORT&H Specification 3004.3
	Rutting	Nil	< 5 mm	Daily	Straight Edge		15-30 days	MORT&H Specification 3004.2
	Corrugations and Shoving	Nil	< 0.1 % of area	Daily	Length Measurement Unit like		2-7 days	IRC:82-2015

Asset Type	Performance	Level of Service (LOS)		Frequency of	Tools/Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/	Maintenance
		Desirable	Accepta					

	Parameter		ble	Inspectio n			Repair	Specificati ons
S of Grade structure, approaches of connecting roads, slip roads, lay byes etc. as applicable)	Bleeding	Nil	< 1 % area	Daily	Scale, Tape odometer etc.		3-7 days	MORT&H Specificatio n 3004.4
	Ravelling / Stripping	Nil	< 1 % area	Daily			7-15 days	IRC:82-2015 read with IRC SP 81
	Edge Deformatio n / Breaking	Nil	< 1 m for any 100m section and width < 0.1m at any location, restricted to 30cm from the edge	Daily			7-15 days	IRC:82-2015

Asset Type	Performan ce Parameter	Level of Service (LOS)		Frequen cy of Inspectio n	Tools/Equip ment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/ Repair	Maintenan ce Specificati ons
		Desirable	Accepta ble					
	Roughness	2000 mm/km	2400 mm/km	Bi-Annually	Class I Profilometer SCRIM (Sideway force Coefficient Routine Investigation	Class I Profilometer: ASTM E950 (98): 2004 – Standard Test Method for measuring Longitudinal Profile of Travelled Surfaces with Accelerometer Established Inertial Profiling Reference ASTM E1656-94:2000- Standard Guide for Classification of Automatic Pavement Condition Survey Equipment	180 days	IRC:82-2015
	Skid Number	60SN	50SN	Bi-Annually			180 days	BS: 7941-1: 2006
	Pavement Condition Index	3	2.1	Bi-Annually			180 days	IRC:82-2015

					Machine or equipment)			
	Other Pavement Distresses			Bi-Annually			2-7 days	IRC:82-2015
	Deflection /Remaining Life			Annually	Falling W eight Deflectometer	IRC 115:2014	180 days	IRC:115-2014
Rigid Pavement (Pavement of MCW, Service Road, Grade structure,	Roughness BI	2200mm/km	2400mm/ km	Bi-Annually	Class I Profilometer	ASTME950(98) :2004 and ASTM E1656-94:2000	180 days	IRC:SP:83-2008
Asset Type	**Performance Parameter**	**Level of Service (LOS)**		**Frequency of Inspection**	**Tools/Equipment**	**Standards and References for Inspection and Data Analysis**	**Time limit for Rectification/ Repair**	**Maintenance Specifications**
		Desirable	**Acceptable**					
Approaches of connecting roads, slip roads, lay byes etc. as applicable)	Skid	Skid Resistance no. at different speed of vehicles		Bi-Annually	SCRIM (Sideway-force	IRC:SP:83-2008	180 days	IRC:SP:83-2008
		Minimum SN	**Traffic Speed (Km/h)**		Coefficient Routine Investigation Machine or equivalent)			
		36	50					
		33	65					
		32	80					
		31	95					
		31	110					
	Edge drop	Nil	40mm					MORT&H

Embankment / Slopes	at shoulders			Daily	Length Measurement Unit like Scale, Tape, odometer etc.	IRC	7-15 days	Specification 408.4
	Slope of camber/cross fall	Nil	<20% variation in prescribed slope camber / cross fall	Daily			7-15 days	MORT&H Specification 408.4
	Embankment Slopes	Nil	<15% variation in prescribe	Daily			7-15 days	MORT&H Specification 408.4

Asset Type	**Performance Parameter**	**Level of Service (LOS)**		**Frequency of Inspection**	**Tools/Equipment**	**Standards and References for Inspection and Data Analysis**	**Time limit for Rectification/ Repair**	**Maintenance Specifications**
		Desirable	**Acceptable**					
			Side slope					
	Embankment Protection	Nil	Nil	Daily	NA		7-15 days	MORT&H Specification
	Rain Cuts/ Gullies in slope	Nil	Nil	Daily Specially During Rainy Season	NA		7-15 days	MORT&H Specification

In addition to the above performance criterion, the contractor shall strictly maintain the rigid pavements as per requirements in the following table

Table -2: Maintenance Criteria for Rigid Pavements:

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	For the case d > D/2
CRACKING						
1	**Single Discrete Cracks Not intersecting with any joint**	w= width of crack L= length of crack d= depth of crack D= depth of slab	0	Nil, not discernible	No Action	Not applicable
			1	w< 0.2mm.hair cracks		
			2	w= 0.2 -0.5 mm, discernible from slow-moving car	Seal without delay	Seal, and stitch if L >1m. Within 7 days
			3	w= 0.5 -1.5 mm, discernible from fast-moving car		
			4	w= 1.5-3.0 mm	Seal, and stitch if L > 1m. Within 7 days	Staple or Dowel Bar Retrofit, FDR for affected portion. Within 15 days
			5	w > 3 mm		

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	For the case d > D/2
2	**Single Transverse (or Diagonal) Crack intersecting with one or more joints**	w= width of crack L= length of crack d= depth of crack D= depth of slab	0	Nil, not discernible	No Action	
			1	w< 0.2mm.hair cracks	Route and seal with epoxy Within 7 days	Staple or Dowel Bar Retrofit. Within 15 days
			2	w= 0.2 -0.5 mm, discernible from slow-moving car		
			3	w= 0.5 - 3.0 mm, discernible from fast-moving car	Route and seal and stitch, if L >1m. Within 7 days	
			4	w= 3.0 - 6.0 mm	Dowel Bar Retrofit. Within 15 days	Full Depth Repair Dismantle and reconstruct affected. Portion with norms and specifications – See Para 5.5 &9.2 Within 15 days
			5	w > 6 mm, usually associated with spalling, and/or slab rocking under traffic	Not Applicable, as it may be full depth	
3	**Single Longitudinal Crack intersecting with one or more joints**	w= width of crack L= length of crack d= depth of crack D= depth of slab	0	Nil, Not discernible	No, Action	
			1	w= 0.5 mm, discernible from slow-moving vehicle	Seal with epoxy, if L > 1m. Within 7 days	Staple or Dowel Bar Retrofit. Within 15 days
			2	w= 0.5 - 3.0 mm, discernible from fast vehicle	Route seal and stitch, if L > 1m. Within 15 days	-

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d <	For the case d >

					D/2	**D/2**
			3	w= 3.0 - 6.0 mm	Staple, if L> 1m. Within 15 days	Partial Depth Repair with stapling. Within15 days
			4	w= 6.0 - 12.0 mm, usually associated with spalling	Not Applicable, as it may be full depth	
			5	w > 12 mm, usually associated with spalling, and/or slab rocking under traffic		Full depth Repair Dismantle and reconstruct affected portion as per norms and specifications See Para 5.6.4 Within 15 days
4	**Multiple Crack intersecting with one or more joints**	w= width of crack	0	Nil, Not discernible	No, Action	-
			1	w < 0.2 mm, hair cracks	Seal and stitch if L > 1m. Within 15 days	
			2	w= 0.2 - 0.5 mm, discernible from slow vehicle		
			3	w= 0.5 - 3.0 mm, discernible from fast vehicle	Full depth repair within 15 days	Dismantle, Reinstate subbase, Reconstruct whole slab as per specifications within 30 days
			4	w= 3.0 - 6.0 mm panel broken into 2 or 3 pieces		
			5	w > 6 mm and /or panel broken into more than 4 pieces		

S.No.	**Type of Distress**	**Measured Parameter**	**Degree of Severity**	**Assessment Rating**	**Repair Action**	
					For the case d < D/2	**For the case d > D/2**
5	**Corner Break**	w= width of crack L= length of crack	0	Nil, not discernible	No Action	-
			1	w < 0.5mm, only 1 corner broken	Seal with low viscosity epoxy to secure broken parts Within 7 days	Seal with epoxy seal with epoxy Within 7 days
			2	w < 1.5mm, L < 0.6m, only		

				one corner broken		
			3	w < 1.5mm, L < 0.6m, two corners broken	Partial Depth (Refer Figure 8.3 of IRC:83-2008) Within 15 days	Full depth repair
			4	w > 1.5mm, L > 0.6m or three corners broken		
			5	Three or four corners broken		Reinstate sub-base and reconstruct the slab as per norms and specifications Within 30 days
6	**Punchout (Applicable to Continuous Reinforced Concrete Pavement (CRCP) only)**	w= width of crack L= length (m/m2)	0	Nil, Not discernible		No, Action
			1	w < 0.5 mm, L< 3m / m^2	Not Applicable, as it may be full depth	Seal with low viscosity epoxy to secure broken parts.
			2	either w > 0.5 mm or L < 3m /m^2		
			3	w > 1.5mm and L < 3m /m^2		
			4	w > 3mm, L < 3m /m^2 and deformation		Full depth repair Cutout and replace damaged area taking care not to damage reinforcement. Within 30 days
			5	w > 3mm, L < 3m /m^2 and deformation		

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	For the case d > D/2
Surface Defects						
7	**Ravelling or Honeycomb type surface**	r= area damaged surface / total surface of slab (%) h = maximum depth of damage	0	Nil, not discernible	**Short Term** No action.	**Long Term** Not Applicable
			1	r < 2 %	Local repair of area damaged and liable to be damaged. Within 15 days	
			2	r = 2 - 10 %		
			3	r = 10 - 25 %	Bonded Inlay, 2 or 3 slabs if affecting. Within 30 days	
			4	r = 25 - 50 %		
			5	r > 50% and h > 25mm	Reconstruct slabs, 4 or more slabs if affecting. Within 30 days	

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	For the case d > D/2
Surface Defects						
8	**Scalling**	r= damaged surface / total surface of slab (%) h = maximum depth of damage	0	Nil, not discernible	**Short Term** No action.	**Long Term** Not Applicable
			1	r < 2 %	Local repair of area damaged and liable to be damaged. Within 7 days	
			2	r = 2 - 10 %		
			3	r = 10 - 20 %	Bonded Inlay Within 15 days	
			4	r = 20 - 30 %		
			5	r > 30% and h > 25mm	Reconstruct slabs Within 30 days	

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	**For the case d > D/2**
9	**Polished Surface /Glazing**	t = texture depth, sand patch test	0			
			1	t >1 mm	No action.	
			2	t = 1 - 0.6 mm	Monitor rate of deterioration	
			3	t = 0.6 - 0.3 mm	Diamond Grinding if affecting	
			4	t = 0.3 - 0.1 mm	50% or more slabs in a continuous stretch of minimum 5 km.	
			5	t < 0.1 mm	Within 30 days	Not Applicable
10	**Popout (Small Hole), Pothole Refer Para 8.4**	n = number/m^2 d = diameter h = maximum depth	0	d < 50 mm; h < 25 mm ; n < 1 per 5 m^2	No action	
			1	d = 50 – 100 mm; h < 50 mm; n < 1 per 5 m^2	Partial depth repair 65 mm deep. Within 15 days	
			2	d = 50 – 100 mm; h > 50 mm; n < 1 per 5 m^2		
			3	d = 100 – 300 mm; h < 100 mm; n < 1 per 5 m^2	Partial depth repair 110 mm i.e. 10mm more that the depth of the hole. Within 30 days	Not Applicable
			4	d = 10 – 300 mm; h > 100 mm; n < 1 per 5 m^2		
			5	d > 300 mm; h > 100 mm ; n > 1 per 5 m^2	Full depth repair. Within 30 days	

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	For the case d > D/2
Joints Defects						
11	**Joint Seal Defects**	loss or damage L = Length as % total joint length			**Short Term**	**Long Term**
			0	Difficult to discern	No action	Not Applicable
			1	Discernible, L < 25% but of little immediate consequence with regard to ingress of water or trapping incompressible material.	Clean joint, inspect later.	
			3	Notable. L > 25%insufficient protection against ingress of water and trapping incompressible material.	Clean and reapply sealant in selected locations. Within 7 days	
			5	Severe; w > 3 mm negligible protection against ingress of water and trapping incompressible material.	Clean, widen and reseal the joint. Within 7 days	
12	**Spalling of Joints**	w = width on either side of the joint L = length of spalled portion (as % joint length)	0	Nil, not discernible	No action.	Not Applicable
			1	w < 10 mm	Apply low viscosity epoxy resin / mortar in cracked portion. Within 7 days	
			2	w = 10 - 20 mm, L < 25%		

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	**For the case d > D/2**
Joints Defects						
			3	w = 20 – 40 mm, L > 25%	Partial Depth Repair. Within 15 days	Not Applicable
			4	w = 40 – 80 mm, L > 25%	30 – 50 mm deep, h = w + 20 % of w, within 30 days	
			5	w > 80 mm, and L > 25%	50 – 100 mm deep repair. H = w + 20% of w. Within 30 days	
13	**Faulting (or Stepping) in Cracks or Joints**	f = difference of level	0	not discernible, < 1 mm	No action.	No action
			1	f < 3 mm		
			2	f = 3 – 6 mm	Determine cause and observe, take action for diamond grinding	Replace the slab as appropriate. Within 30 days
			3	f = 6 – 12 mm	Diamond Grinding	
			4	f = 12 – 18 mm	Raise sunken slab	Replace the slab as appropriate. Within 30 days
			5	f > 18 mm	Strengthen subgrade and sub – base by grouting and raising sunken slab	

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	**For the case d > D/2**
Joints Defects						
14	**Blowup or Buckling**	h = vertical displacement from normal profile			**Short Term**	**Long Term**
			0	Nil, not discernible	No action	
			1	h < 6 mm		
			2	h = 6 – 12 mm	Install Signs to Warn Traffic Within 7 days	
			3	h = 12 – 25 mm		
			4	h > 25 mm	Full Depth Repair. Within 30 days	
			5	shattered slab, ie 4 or more pieces	Replace broken slabs. Within 30 days	
15	**Depression**	h = negative vertical displacement from normal profile L = length	0	Not discernible, h < 5 mm	No action.	Not applicable
			1	h = 5 – 15 mm		
			2	h = 15 -30 mm, Nos < 20% joints	Install Signs to Warn Traffic Within 7 days	
			3	h = 30 – 50 mm		
			4	h > 50 mm or > 20 % joints	Strengthen subgrade. Reinstate pavement at normal level if L < 20 m. Within 30 days	
			5	h > 100 mm		

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	**For the case d > D/2**
Joints Defects						
					Short Term	**Long Term**
16	**Heave**	h = positive vertical displacement from normal profile. L = length	0	Not discernible, h < 5 mm	No action	
			1	h = 5 – 15 mm	Follow up	scrabble
			2	h = 15 – 30 mm, Nos < 20% joints	Install Signs to Warn Traffic Within 7 days	
			3	h = 30 – 50 mm		
			4	h > 50 mm or > 20% joints	Stabilise subgrade. Reinstate pavement at normal level if length < 20 m. Within 30 days	
			5	h > 100 mm		
			5	f > 18 mm	Strengthen subgrade and sub – base by grouting and raising sunken slab	
17	**Bump**	h = vertical displacement from normal profile.	0	h < 4 mm	No action	
			1	h = 4 – 7 mm	Grind, in case of new construction Within 7 days	Construction Limit for new Construction
			3	h = 7 – 15 mm	Grind, in case of on going maintenance Within 15 days	Replace in case of new construction. Within 30 days.
			5	h > 15 mm	Full Depth Repair. Within 30 days	Full Depth Repair. Within 30 days

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	**For the case d > D/2**
Joints Defects						
					Short Term	**Long Term**
18	**Lane to Shoulder Dropoff**	f = difference of level	0	Nil, Not discernible, < 3 mm	No action	
			1	f = 3 – 10 mm	Spot repair of shoulder Within 7 days	
			2	f = 10 – 25 mm		
			3	f = 25 – 50 mm	Fill up shoulder Within 7 days	For any 100 m stretch Reconstruct shoulder, if affecting 25% or more of stretch. Within 30 days
			4	f = 50 – 75 mm		
			5	f > 75 mm		
Drainage						
19	**Pumping**	quantity of fines and water expelled through open joints and cracks Nos	0	not discernible	No Action	
			1 to 2	slight/ occasional Nos < 10%	Repair cracks and joints without delay.	Inspect and repair sub-drainage at distressed sections and upstream.
			3 to 4	Appreciable/ Frequent 10-25%	Lift or jack slab within 30 days	
		Nos/100m stretch	5	abundant, crack development > 25%	Repair distressed pavement sections. Strengthen subgrade and subbase. Replace slab. Within 30 days	

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	**For the case d > D/2**
20	**Ponding**	Ponding on slabs due to blockage of drains	0-2	not discernible problem	No Action	
			3 to 4	Blockage observed in drains, but water flowing	Clean drains etc within 7days follow up	Action required to stop water damaging foundation within 30 days
			5	Ponding, accumulation of water observed	-do-	

Table -3: Maintenance Criteria for Safety Related Items and Other Furniture Items:

Asset Type	Performance Parameter	Level of Service (LOS)			Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
Highway	Availability of Safe Sight Distance	As per IRC SP :84-2014, a minimum of safe stopping sight distance shall be available throughout.			Monthly	Manual Measurements with Odometer along with video/ image backup	Removal of obstruction within 24 hours, in case of sight line affected by temporary objects such as trees, temporary encroachments. In case of permanent structure or design deficiency: Removal of obstruction/improvement of deficiency at the earliest Speed Restriction boards and suitable traffic calming measures such as transverse bar marking,		IRC:SP 84-2014
		Design Speed, kmph	Desirable Minimum Sight Distance (m)	Safe Stopping Sight Distance (m)					
		100	360	180					

		80	260	130			blinkers, etc. shall be applied during the period of rectification.	
Pavement Marking	Wear	<70% of marking remaining			Bi- Annually	Visual Assessment as per Annexure-F of IRC:35-2015	Re - painting	Cat-1 Defect – within 24 hours Cat-2 Defect - within 2 months	IRC:35-2015

Asset Type	**Performance Parameter**	**Level of Service (LOS)**			**Frequency of Measurement**	**Testing Method**	**Recommended Remedial measures**	**Time limit for Rectification**	**Specifications and Standards**
	Day time Visibility	During expected life Service Time Cement Road - 130mcd/m^2/lux Bituminous Road - 100mcd/m^2/lux			Monthly	As per Annexure-D of IRC:35-2015	Re - painting	Cat-1 Defect – within 24 hours Cat-2 Defect – within 2 months	IRC:35-2015
	Night Time Visibility	Initial and Minimum Performance for Dry Retro reflectivity during night time:			Bi-Annually	As per Annexure-E of IRC:35-2015	Re - painting	Cat-1 Defect – within 24 hours Cat-2 Defect – within 2 months	IRC:35-2015
		Design Speed	(RL) Retro Reflectivity (mcd/m^2/lux)						
			Initial (7 days)	Minimum Threshold level (TL) & warranty period required up to 2 years					

		Up to 65	200	80				
		65 - 100	250	120				
		Above 100	350	150				
		Initial and Minimum Performance for Night Visibility under wet condition (Retro reflectivity):						
Asset Type	**Performance Parameter**	**Level of Service (LOS)**			**Frequency of Measurement**	**Testing Method**	**Recommended Remedial measures**	**Time limit for Rectification**	**Specifications and Standards**
		Initial 7 days Retro reflectivity: 100 mcd/m^2/lux Minimum Threshold Level: 50 mcd/m^2/lux							
	Skid Resistance	Initial and Minimum performance for Skid Resistance: Initial (7days): 55BPN Min. Threshold: 44BPN *Note: shall be considered under urban/city traffic condition encompassing the locations like pedestrian crossings, bus bay, bus stop, cycle track intersection delineation, transverse bar markings etc			Bi-Annually	As per Annexure-G of IRC:35-2015		Within 24 hours	IRC:35-2015

Road Signs	Shape and Position	Shape and Position as per IRC:67-2012. Signboard should be clearly visible for the design speed of the section.	Daily	Visual with video/image backup	Improvement of shape, in case if shape is damaged. Relocation as per requirement	48 hours in case of Mandatory Signs, Cautionary and Informatory Signs (Single and Dual post signs) 15 Days in case of Gantry/Cantilever r Sign boards	IRC:67-2012

Asset Type	**Performance Parameter**	**Level of Service (LOS)**	**Frequency of Measurement**	**Testing Method**	**Recommended Remedial measures**	**Time limit for Rectification**	**Specifications and Standards**
	Retro reflectivity	As per specification in IRC:67-2012	Bi-Annually	Testing of each signboard using Retro Reflectivity Measuring Device. In accordance with A S T M D 4956-09.	Change of signboard	48 hours in case of Mandatory Signs, Cautionary and Informatory Signs (Single and Dual post signs) 1 Month in case of Gantry/Cantilever er Sign boards	IRC:67-2012
	Kerb Height	As per IRC 86:1983 depending upon type of Kerb	Bi-Annually	Use of distance easuring tape	Raising Kerb eight	Within 1 Month	RC 86:1983

Kerb	Kerb Painting	Functionality: Functioning of Kerb painting as intended	Daily	Visual with video/image backup	Kerb Repainting	Within 7-days	RC 35:2015
Other Road Furniture	Reflective Pavement Markers (Road Studs)	Numbers and Functionality as per specifications in IRC:SP:84-2014 and IRC:35-2015, unless specified in Schedule-B.	Daily	Counting	New Installation	Within 2 months	IRC: SP:84-2014, IRC:35-2015
	Pedestrian Guardrail	Functionality: Functioning of guardrail as intended	Daily	Visual with video/image backup	Rectification	Within 15 days	IRC: SP:84-2014
	Traffic Safety Barriers	Functionality: Functioning of Safety Barriers as intended	Daily	Visual with video/image backup	Rectification	Within 7 days	IRC: SP:84-2014, IRC:119-2015
Asset Type	**Performance Parameter**	**Level of Service (LOS)**	**Frequency of Measurement**	**Testing Method**	**Recommended Remedial measures**	**Time limit for Rectification**	**Specifications and Standards**
	End Treatment of	Functionality: Functioning of End Treatment as intended	Daily	Visual with video/image	Rectification	Within 7 days	IRC:SP:84-2014,
	Traffic Safety Barriers			backup			IRC:119-2015
	Attenuators	Functionality: Functioning of Attenuators as intended	Daily	Visual with video/image backup	Rectification	Within 7 days	IRC:SP-2014, IRC:119-2015
	Guard Posts and Delineators	Functionality: Functioning of Guard Posts and Delineators as intended	Daily	Visual with video/image backup	Rectification	Within 15 days	IRC: 79 - 1981

	Overhead Sign Structure	Overhead sign structure shall be structurally adequate	Daily	Visual with video/image backup	Rectification	Within 15 days	IRC:67-2012
	Traffic Blinkers	Functionality: Functioning of Traffic Blinkers as intended	Daily	Visual with video/image backup	Rectification	Within 7 days	IRC:SP:84-2014
Highway Lighting System	Highway Lights	Illumination: Minimum 40 Lux illumination on the road surface	Daily	The illumination level shall be measured with luxmeter	Improvement in Lighting System	24 hours	IRC:SP:84-2014
		No major failure in the lighting system	Daily	-	Rectification of failure	24 hours	IRC:SP:84-2014
		No minor failure in the lighting system	Monthly	-	Rectification of failure	8 hours	IRC:SP:84-2014

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement t	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
	Toll Plaza Canopy Lights	Minimum 40 Lux illumination on the road surface	Daily	The illumination level shall be measured with luxmeter	Improvement in Lighting System	24 hours	IRC:SP:84-2014
		No major/minor failure in the lighting system	Daily	-	Rectification failure	8 hours	IRC:SP:84-2014
Trees and Plantation including median plantation	Obstruction in a minimum head-room of 5.5 m above carriageway or obstruction in visibility of road signs	No obstruction due to trees	Monthly	Visual with video/image backup	Removal of trees	Immediate	IRC:SP:84-2014
	Deterioration in health of trees and bushes	Health of plantation shall be as per requirement of specifications & instructions issued by Authority from time to time	Daily	Visual with video/image backup	Timely watering and treatment. Or Replacement of Trees and Bushes.	Within 90 days	IRC:SP:84-2014
	Vegetation affecting sight line and road structures	Sight line shall be free from obstruction by vegetation	Daily	Visual with video/image backup	Removal of Trees	Immediate	IRC:SP 84-2014

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
Rest Areas	Cleaning of toilets	-	Daily	-	-	Every 4 hours	
	Defects in electrical, water and sanitary installations	-	Daily	-	Rectification	24 hours	
Other Project Facilities and Approach roads	Damage or deterioration in Approach Roads, pedestrian facilities, truck lay- bys, bus-bays, bus- shelters, cattle crossings, Traffic Aid Posts, Medical Aid Posts and other works		Daily	-	Rectification	15days	IRC:SP 84-2014

Asset Type	Performance Paramet	Level of Service (LOS)	Frequency of Measuremen t	Testing Method	Recommended Remedial measures	Time limit for Rectificatio	Specification s and Standards
Pipe/Box/ slab culverts	Free waterway/ unobstructe d flow section	85% of culvert normal flow area to available.	2 times in a year (before and after rainy season)	Inspection by Bridge Engineer as per IRC SP: 35-1990 and recording of depth of silting and area of vegetation.	Cleaning silt up soils and debris in culvert barrel after rainy season, removal of bushes and vegetation, U/s of barrel, under barrel and D/s of barrel before rainy season.	15 days before onset of monsoon and within 30 days after end of rainy season.	IRC 5-2015, IRC SP:40-1993 and IRC SP:13-2004
	Leak-proof expansion joints if any	No leakage through expansion joints	Bi-Annually	Physical inspection of expansion joints as per IRC SP: 35-1990 if any, for leakage strains on walls at joints.	Fixing with sealant suitably	30 days or before onset of rains whichever comes earlier	IRC SP:40-1993 and IRC SP:69-2011
	Structurally sound	Spalling of concrete not more than 0.25 sqm Delamination of concrete not more than 0.25 sq.m.	Bi-Annually	Detailed inspection of all components of culvert as per IRC SP:35-1990 and recording the defects	Repairs to spalling, cracking, delamination, rusting shall be followed as per IRC:SP:40-1993	15 days	IRC SP:40-1993 and MORTH Specificatio ns clause 2800

		Cracks wider than 0.3 mm not more than 1m aggregate length					
Asset Type	**Performance Parameter**	**Level of Service (LOS)**	**Frequency of Measurement**	**Testing Method**	**Recommended Remedial measures**	**Time limit for Rectification**	**Specifications and Standards**
	Protection work in good condition	Damaged of rough stone apron or bank revetment not more than 3 sqm, damage to solid apron (concrete apron) not more than 1 sqm	2 times in a year (before and after rainy season)	Condition survey as per IRC SP:35-1990	Repairs to damaged aprons and pitching	30 days after defect observation or 2 weeks before onset of rainy season whichever is earlier	IRC: SP 40-1993 and IRC:SP: 13-2004.
Bridges including ROBS Flyover etc. as applicable	Riding quality or user comfort	No pothole in wearing coat on bridge deck	Daily	Visual inspections per IRCSP:35-1990	Repairs to BC or wearing coat	15 days	MORTH Specification 2811
Bridge – Super Structure	Bumps	No bump at expansion joint	Daily	Visual inspections per IRCSP:35-1990	Repairs to BC or either side of expansion joints, profile correction course on approach slab in case of settlement to approach embankment	15 days	MORTH Specification 3004.2 & 2811
	User safety (condition of crash barrier	No damaged or missing stretch of crash barrier	Daily	Visual inspections and detailed condition survey as	Repairs and replacement of safety barriers as the case may be	3 days	IRC: 5-1998 IRC:SP: 84-2004.

	and guard rail)	or pedestrian hand railing		per IRC SP:35-1990			And IRC SP: 40-1993

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
	Rusted reinforcement	Not more than 0.25 sq.m.	Bi- Annually	Detailed condition survey as per IRC SP: 35-1990 Using Mobile Bridge Inspection Unit	All the corroded reinforcement shall need to be thoroughly cleaned from rusting and applied with anti- corrosive coating before carrying out the repair to affected concrete portion with epoxy mortar / concrete.	15 days	IRC:SP: 40-1993. And MORTH Specification 1600.
	Spalling of concrete	Not more than 0.50 sq.m.					
	Delamination	Not more than 0.50 sq.m.					
	Cracks wider than 0.30 mm	Not more than 1m total length.	Bi- Annually	Detailed condition survey as per IRC SP: 35-1990 Using Mobile Bridge Inspection Unit	Grouting with epoxy mortar, investigation causes for cracks development and carry out necessary rehabilitation.	48 hours	IRC:SP: 40-1993. And MORTH Specification 2800.
	Rain seepage through deck slab	Leakage- nil	Quarterly	Detailed condition survey as per IRC SP: 35-1990 Using Mobile Bridge Inspection Unit	Grouting with slab at leakage areas, waterproofing, repairs to drainage spouts.	1months	MORTH Specification 2600 & 2700.
	Deflection due to permanent loads and live loads	Within design limits.	Once in every 10 years for spans more than 40 m	Load test method	Carry out major rehabilitation works on bridge to retain original design loads capacity.	6months	IRC:SP: 51-1999.

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
	Vibrations in bridge deck due to moving trucks	Frequency of vibrations shall not be more than 5 Hz.	Once in every 5 years for spans more than 30m and every 10 years for spans between 15 to 30m.	Laser displacement sensors or laser vibro-meters	Strengthening of super structure	4 months	AASHTOLRFD Specification
	Leakage in Expansion Joints	No damage to elastomeric sealant compound in strip expansion joint, no leakage of rain water through expansion joint in case of buried and asphalt plug and copper strip joint.	Bi- Annually	Detailed condition survey as per IRC SP: 35-1990 Using Mobile Bridge Inspection Unit	Replace of seal in expansion joint	15 days	MORTH Specification 2600 and IRC SP: 40-1993.
	Debris and dust in strip seal expansion joint	No dust or debris in expansion joint gap.	Monthly	Detailed condition survey as per IRC SP: 35-1990 Using Mobile Bridge Inspection Unit	Cleaning of expansion joint gaps thoroughly	3 days	MORTH Specification 2600 and IRC SP: 40-1993.

Asset Type	Performance	Level of Service (LOS)	Frequency of measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards

	Parameter						
	Drainage spouts	No down take pipe missing/broken below soffit of the deck slab. No silt, debris, clogging of drainage spout collection chamber.	Monthly	Detailed condition survey as per IRC SP: 35-1990 Using Mobile Bridge Inspection Unit	Cleaning of drainage spouts thoroughly. Replacement of missing/broken down take pipes with a minimum pipe extension of 500mm below soffit of slab. Providing sealant around the drainage spout if any leakages observed.	3 days	MORTH Specification 2700
Bridge sub structure	Cracks/spalling of concrete /rusted steel	No cracks spalling of concrete and rusted steel	Bi-Annually	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit	All the corroded reinforcement shall need to be thoroughly cleaned from rusting and applied with anti-corrosive coating before carrying out repairs to substructure by grouting/guniting and micro concreting depending on type of defect noticed.	30 days	IRC:SP: 40-1993. And MORTH Specification 2800.
	Bearings	Delamination of bearing reinforcement not more than 5%, cracking or tearing of rubber not more	Bi-Annually	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit	In case of failure of even one bearing on any pier/ abutment, all the bearings on that pier/ abutment shall be replaced, in order to get uniform load transfer on to bearings.	3 months	MORTH Specification 2810 and IRC SP: 40-199.
Asset Type	**Performance Parameter**	**Level of Service (LOS)**	**Frequency of measurement**	**Testing Method**	**Recommended Remedial measures**	**Time limit for Rectification**	**Specifications and Standards**
		than 2 locations per side, no rupture of					

		reinforcement or rubber.					
Bridge Foundations	Scouring around foundations	Scouring shall not be lower than maximum scour level form the bridge	Bi-Annually	Condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit. In case of doubt, use Underwater camera for inspection of deep wells in major Rivers.	Suitable protection works around pier/ abutment	1 months	IRC:SP: 40-1993. IRC: 83-2014 MORTH Specification 2500.
	Protection works in good condition	Damaged of rough stone apron or bank revetment not more than 3 sq.m. damage to apron (concrete apron) not more than 1 sq.m.	2 times in a year (before and after rainy season)	Condition survey as per IRC SP: 35-1990	Repairs to damaged aprons and pitching.	30 days after defect observation or 2 weeks before onset of rainy season whichever is earlier	MORTH Specification 2810 and IRC SP: 40-199.

Note: Any Structure during the entire contract period which is found that does not complies with all requirements of this Table will be prepared, rehabilitated or even reconstructed under the scope of the contractor.

Table 4: Maintenance Criteria for Structures and Culverts:

Table 5: Maintenance Criteria for Hill Roads

In addition to above, for hill roads the following provision for maintenance is also to done.

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: For all tables 1 to 5 above, latest BIS & IRC standard (even those not indicated herewith)along with MoRTH specifications shall be binding for all maintenance activities.

A. Flexible Pavement

	Nature of Defect or deficiency	**Time limit for repair/ rectification**
(b)	**Granular earth shoulders, sides lopes, drains and culvert**	
(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)	Desilting of drains in urban/semi-urban areas	24 (Twenty-Four) days
(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 (forty-eight) hours
(ii)	Painting of km stone, railing, parapets, crash barriers	As and when required /Once every year
(iii)	Damaged/missing signs road requiring replacement	7 (Seven) days

(iv)	Damaged to road mark ups	7 (Seven) days
(d)	Road lighting	
(i)	Any major failure of the system	24 (Twenty-Four) days
(ii)	Faults and minor failures	8 (eight) hours
(e)	**Trees and plantation**	

	Nature of Defect or deficiency	**Time limit for repair/ rectification**
(i)	Obstruction in a minimum head- room of 5 m above carriageway or obstruction in visibility of road signs	24 (Twenty-Four) days
(ii)	Removal of fallen trees from carriageway	4 (Four) 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 (four) hours
(ii)	Defects in electrical, water and sanitary installations	24 (Twenty-Four) days
(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 crossing,[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 (forty-eight) hours Within 15 (fifteen) days or as specified by the Authority's Engineer
(b)	**Foundations**	

	Nature of Defect or deficiency	Time limit for repair/ rectification
(i)	Scouring and / or cavitation	15 (fifteen) days
(c) Pipers, abutment, return walls and wing walls		
(i)	Cracks and damages including settlement and tilting, spalling, 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)	Damaged 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

	Nature of Defect or deficiency	Time limit for repair/ rectification
(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 3.1.5(a))

APPLICABLE PERMITS

1. **Applicable Permits**

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 Panchayat and Pollution Control Board for installation of crushers;

(c) License for use of explosives;

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

(e) License 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, clearances or approvals required under Applicable Laws.

(j) Trade license as per the norms of the State Govt.

(k) Labour license to be obtained from the Autonomous District Council and from Centre Labour department.

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

Schedule-G
(See Clause 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,
NHIDCL,
1st & 2nd Floor, Tower A, World Trade Centre, Nauroji Nagar, New Delhi- 110029

WHEREAS:

(A)_____ [name and address of contractor] (hereinafter called "the Contractor") and [**NHIDCL**], (**"the Authority"**) have entered into an agreement (the **"Agreement"**) for "Construction of 2-Lane with Paved Shoulder Pynursla Bypass from existing Km 123+635 to Km 131+820 of old NH-40 on Shillong - Dawki road in the State of Meghalaya on EPC mode (Package-III), Design Km 0+000 to Km 7+760 (Length - 7.760 Km) under JICA funding, 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 and Defects Liability Period (as defined in the Agreement) in a sum of Rs. …. Crore (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 Construction Period and Defects Liability 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 NHIDCL 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 difference 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, fulfillment 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 fulfillment, 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 ****[$2]. 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 authorized 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.

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

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

12. This guarantee shall also be operable at our…… Branch at New Delhi, from whom, confirmation regarding the issue of this guarantee or extension/ renewal thereof shall be made available on demand. In the contingency of this guarantee being invoked and payment thereunder claimed, the said branch shall accept such invocation letter and make payment of amounts so demanded under the said invocation.

13. Information regarding issuance of this Bank Guarantee hall be sent to Authority's Bank through SFMS Gateway as per the details below :

S. No.	Particulars	Details
1	Name of Beneficiary	National Highways & Infrastructure Development Corporation Limited
2	Beneficiary Bank Account Number	90621010002659
3	Beneficiary Bank IFSC Code	CNRB0019062
4	Beneficiary Bank Branch	Transport Bhawan, New Delhi
5	Beneficiary Bank Address	Canara Bank, Transport Bhawan, No. 1 Parliament Street, New Delhi - 110001

14. This Guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revision, ICC Publication no. 758, except that the supporting statement under Article 15 (a) is hereby excluded.

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

Form for Guarantee for Withdrawal of Retention Money

The Managing Director,
NHIDCL,
Corporate Office: 1st & 2nd Floor, Tower A, World Trade Centre, Nauroji Nagar, New Delhi- 110029

WHEREAS:

[Name and address of contractor] (hereinafter called "**the Contractor**") has executed an agreement (hereinafter called the "Agreement") with the [NHIDCL], (hereinafter called "the Authority") for the **"**Construction of 2-Lane with Paved Shoulder Pynursla Bypass from existing Km 123+635 to Km 131+820 of old NH-40 on Shillong - Dawki road in the State of Meghalaya on EPC mode (Package-III), Design Km 0+000 to Km 7+760 (Length - 7.760 Km) under JICA funding**".** subject to and in accordance with the provisions of the Agreement.

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

(B) 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……. in words) (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 NHIDCL 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 difference 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 Retention Money and 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 Certificate 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 authorized 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 para 8 above or until it is released earlier by the Authority pursuant to the provisions of the Agreement.

12. This guarantee shall also be operable at our…… Branch at New Delhi, from whom, confirmation regarding the issue of this guarantee or extension/ renewal thereof shall be made available on demand. In the contingency of this guarantee being invoked and payment there under claimed, the said branch shall accept such invocation letter and make payment of amounts so demanded under the said invocation.

13. Information regarding issuance of this Bank Guarantee hall be sent to Authority's Bank through SFMS Gateway as per the details below :

S. No.	Particulars	Details
1	Name of Beneficiary	National Highways & Infrastructure Development Corporation Limited
2	Beneficiary Bank Account Number	90621010002659
3	Beneficiary Bank IFSC Code	CNRB0019062
4	Beneficiary Bank Branch	Transport Bhawan, New Delhi
5	Beneficiary Bank Address	Canara Bank, Transport Bhawan, No. 1 Parliament Street, New Delhi - 110001

14. This Guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revision, ICC Publication no. 758, except that the supporting statement under Article 15 (a) is hereby excluded.

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,
NHIDCL,
Corporate Office: 1st & 2nd Floor, Tower A, World Trade Centre, Nauroji Nagar, New Delhi- 110029

WHEREAS:

[name and address of contractor] (hereinafter called "**the Contractor**") has executed an agreement (hereinafter called the "Agreement") with the [**NHIDCL**], (hereinafter called "**the Authority**") for the **"**Construction of 2-Lane with Paved Shoulder Pynursla Bypass from existing Km 123+635 to Km 131+820 of old NH-40 on Shillong - Dawki road in the State of Meghalaya on EPC mode (Package-III), Design Km 0+000 to Km 7+760 (Length - 7.760 Km) under JICA funding**"** subject to and in accordance with the provisions of the Agreement.

(A) In accordance with the Clause 19.2 of the Agreement, the Authority shall make to the Contractor an interest bearing (@ Bank Rate) advance payment (hereinafter called "**Advance Payment**") equal to 10% (ten per cent) of the contract price; and that the Advance Payment shall be made in two 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} installment of the Advance Payment is Rs. ------ cr. (Rupees ------ crore) and the amount of this Guarantee is Rs. ------- cr. (Rupees ------ crore) (the **"Guarantee Amount")** [$3]**.**

(B) 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 irrevoc**ably, guarantee**s and affirms as follows:

1. The Bank hereby unconditionally and irrevocably guarantees the due and faithful repayment on time of the aforesaid installment 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 NHIDCL, that the Contractor has committed 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

[$]The Guarantee Amount should be equivalent to 110% of the value of the applicable installment.

default shall be final, and binding on the Bank, notwithstanding any difference 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 ****.[$4] 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 authorized 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.

[$]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).

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

12. This guarantee shall also be operable at our…… Branch at New Delhi, from whom, confirmation regarding the issue of this guarantee or extension/ renewal thereof shall be made available on demand. In the contingency of this guarantee being invoked and payment thereunder claimed, the said branch shall accept such invocation letter and make payment of amounts so demanded under the said invocation.
13. Information regarding issuance of this Bank Guarantee hall be sent to Authority's Bank through SFMS Gateway as per the details below :

S. No.	Particulars	Details
1	Name of Beneficiary	National Highways & Infrastructure Development Corporation Limited
2	Beneficiary Bank Account Number	90621010002659
3	Beneficiary Bank IFSC Code	CNRB0019062
4	Beneficiary Bank Branch	Transport Bhawan, New Delhi
5	Beneficiary Bank Address	Canara Bank, Transport Bhawan, No. 1 Parliament Street, New Delhi - 110001

14. This Guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revision, ICC Publication no. 758, except that the supporting statement under Article 15 (a) is hereby excluded.

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)

Schedule-H

(See Clauses10.1 (iv) and 19.3)

1 Contract Price Weightages

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

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

S. No.	Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
1	2	3	4	5
1	Road works including culverts, widening and repair of culverts.	17.08%	**A - Widening and strengthening of existing road/ Reconstruction of Existing Road**	
			(1) Earthwork up to top of the Embankment	0.27%
			(2) Subgrade	0.89%
			(3) Sub base course	2.75%
			(4) Non-bituminous Base course	1.75%
			(5) Bituminous Base Course	2.15%
			(6) Wearing coat	2.07%
			(7) Widening and repair of culverts	0.00%
			B.1 – Reconstruction/realignment/ bypass (Flexible pavement)	
			(1) Earthwork up to top of the Embankment	31.88%
			(2) Subgrade	3.21%
			(3) Sub base course	10.17 %
			(4) Non-bituminous Base course	6.47 %
			(5) Bituminous Base Course	7.96 %
			(6) Wearing coat	7.67 %
			B.2 - Reconstruction realignment / bypass (Rigid Pavement)	
			(1) Earthwork up to top of the Embankment	0.00%
			(2) Subgrade	0.00%
			(3) Sub base course	0.00%
			(4) Dry lean concrete (DLC)	0.00%
			(5) Pavement quality concrete (PQC) course	0.00%
			C.1 - Reconstruction/ New Service road (flexible Pavement)	
			(1) Earthwork up to top of the	0.00%

S. No.	Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
			Embankment	
			(2) Subgrade	0.00%
			(3) Sub base course	0.00%
			(4) Non-bituminous Base course	0.00%
			(5) Bituminous Base Course	0.00%
			(6) Wearing coat	0.00%
			C.2 - Reconstruction/ New Service road (Rigid Pavement)	
			(1) Earthwork up to top of the Embankment	0.00%
			(2) Subgrade	0.00%
			(3) Sub base course	0.00%
			(4) Dry lean concrete (DLC)	0.00%
			(5) Pavement quality concrete (PQC) course	0.00%
			D. - Reconstruction/ New culverts on existing road, realignment, bypasses	
			Culverts (length < 6 m)	22.76%
2	Minor Bridges/ Underpasses/ Overpasses	13.33%	**A.1- Widening and Repair of Minor bridges (length > 6 m and < 60 m)**	
			Minor bridges	
			(1) Foundation: On completion of the foundation work of abutments and piers	0.00%
			(2) Sub-structure: On completion of abutments and piers with abutment/ pier cap.	0.00%
			(3) Super-structure: On completion of the super-structure in all respects including wearing coat, bearings, expansion joints, handrails, crash barriers, road signs and markings, tests on completion etc. complete in all respect.	0.00%
			(4) Approaches: On completion of approaches including wing walls/ return walls, Retaining walls, stone pitching, protection works for floor, embankment slope, etc. complete in all respect and fit for use.	0.00%
			A.2- New Minor bridges (length >6 and <60m.)	

S. No.	Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
			(1) Foundation: On completion of the foundation work of abutments and piers.	20.93%
			(2) Sub–structure: On completion of abutments and piers with abutment/ pier cap.	26.55%
			(3) Super-structure: On completion of the super-structure upto deck slab including bearings.	9.02%
			(4) Miscellaneous Works : On completion of wearing coat, expansion joint, crash barrier, railings, protection works and any remaining work associated to bridge including tests on bridge.	3.61%
			(5) Approaches: On completion of approaches including wing walls/ return walls, Retaining walls, stone pitching, protection works for floor, embankment slope etc. complete in all respect and fit for use.	15.35%
			(6) Guide Bunds and River Training Works: On completion of Guide Bunds and river Training Works complete in all respects.	0.00%
			B.1 - Widening and repairs of Underpasses/Overpasses	
			Underpasses/ Overpasses	0.00%
			B.2 - New Underpasses/Overpasses	
			(1) Foundation: On completion of the foundation work of abutments and piers.	1.54%
			(2) Sub–structure: On completion of abutments and piers with abutment/ pier cap.	3.14%
			(3) Super-structure: On completion of the super-structure upto deck slab including bearings.	8.21%
			(4) Miscellaneous Works : On completion of wearing coat, expansion joint, crash barrier, railings, protection works and any remaining work associated to bridge including tests on bridge.	1.90%

S. No.	Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
			(5) Approaches: On completion of approaches including wing walls/ return walls, Retaining walls, stone pitching, protection works for floor, embankment slope etc. complete in all respect and fit for use.	9.76%
3	Major Bridge works and ROB/RUB/elevated sections/flyovers including viaducts, if any	41.55%	**A.1 - Widening and repairs of Major Bridges**	
			(1) Foundation	
			i) Pile Foundation	0.00%
			ii) Open Foundation	0.00%
			(2) Sub-structure	0.00%
			(3) Super-structure (including bearings)	0.00%
			(4) Wearing Coat including expansion joints	0.00%
			(5) Miscellaneous Items like hand rails, crash barriers, road markings etc.)	0.00%
			(6) Wing walls/return walls	0.00%
			(7) Guide Bunds, River Training works etc.	0.00%
			(8) Approaches (including Retaining walls, stone pitching and protection works for floor, embankment slope etc.)	0.00%
			A.2 - New Major Bridges	
			(1) Foundation	
			i) Well Foundation	0.00%
			ii) Pile Foundation	10.91%
			iii) Open Foundation	0.00%
			(2) Sub-structure	9.96%
			(3) Super-structure (including bearings)	37.91%
			(4) Wearing Coat including expansion joints	0.69%
			(5) Miscellaneous Items like hand rails, crash barriers, road markings etc.)	1.34%
			(6) Wing walls/return walls	0.00%
			(7) Guide Bunds, River Training works etc.	0.00%
			(8) Approaches (including Retaining walls, stone pitching and protection works for floor, embankment slope etc.)	0.97%
			B.1- Widening and repair of (a) ROB (b) RUB	

S. No.	Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
			(1) Foundation	
			i) Pile Foundation	0.00%
			ii) Open Foundation	0.00%
			(2) Sub-structure	0.00%
			(3) Super-structure (including bearings)	0.00%
			(4) Wearing Coat: (a) in case of ROB- wearing coatincluding expansion joints complete in all respects as specified and (b) in case of RUB- rigid pavement under RUB including drainage facility complete in all respects as specified.	0.00%
			(5) Miscellaneous Items like hand rails, crash barriers, road markings etc.)	0.00%
			(6) Wing walls/return walls	0.00%
			(7) Approaches (including Retaining walls, stone pitching and protection works)	0.00%
			B.2 - New ROB / RUB	
			(1) Foundation	
			i) Well Foundation	0.00%
			ii) Pile Foundation	0.00%
			iii) Open Foundation	0.00%
			(2) Sub-structure	0.00%
			(3) Super-structure (including bearings)	0.00%
			(4) Wearing Coat: (a) in case of ROB- wearing coat including expansion joints complete in all respects as specified and (b) in case of RUB- rigid pavement under RUB including drainage facility complete in all respects as specified.	0.00%
			(5) Miscellaneous Items like hand rails, crash barriers, road markings etc.)	0.00%
			(6) Wing walls/return walls	0.00%
			(7) Approaches (including Retaining walls, stone pitching and protection works)	0.00%
			C.1 - Widening and repairs of Elevated section/Flyover/Grade Separators	
			(1) Foundation	
			i) Pile Foundation	0.00%
			ii) Open Foundation	0.00%
			(2) Sub-structure	0.00%
			(3) Super-structure (including bearings)	0.00%

S. No.	Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
			(4) Wearing Coat including expansion joints	0.00%
			(5) Miscellaneous Items like hand rails, crash barriers, road markings etc.)	0.00%
			(6) Wing walls/return walls	0.00%
			(7) Approaches (including Retaining walls, stone pitching and protection works)	0.00%
			C.2 - New Elevated section/Flyover/Grade Separators/Viaduct	
			(1) Foundation	0.00%
			i) Well Foundation	0.00%
			ii) Pile Foundation	4.80%
			iii) Open Foundation	1.09%
			(2) Sub-structure	13.52%
			(3) Super-structure (including bearings)	11.78%
			(4) Wearing Coat including expansion joints	0.70%
			(5) Miscellaneous Items like hand rails, crash barriers, road markings etc.)	1.14%
			(6) Wing walls/return walls	0.00%
			(7) Approaches (including Retaining walls, stone pitching and protection works)	5.17%
4	Other works	28.04%	**(i) Toll Plaza**	0.00%
			(ii) Road side Drains	
			(a) Drain	8.64%
			(b) Cover Slab	0.37%
			(iii) Road signs, markings, km stones safety Devices etc.	1.62%
			(iv) Overhead gantry mounted signs	0.20%
			(v) Project facilities	
			(a) Bus Bay	0.12%
			(b) Truck lay-byes	0.00%
			(c) Rest areas	0.00%
			(d) Median & Kerb	0.61%
			(e) Steel Railing	0.64%
			(f) Others (Street Lighting/High mast/Utility Ducts)	2.76%
			(vi) Road Side Plantation	0.00%

S. No.	Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
			(vii) Protection works# other than approaches to the bridges, elevated sections/ flyovers/grade separators and ROBs/RUBs.	
			(a) Crash Barrier	2.95%
			(b) Retaining Wall	30.71%
			(c) Breast Wall	37.98%
			(d) Stone Pitching	1.60%
			(e) Coir Soil Erosion blanket	2.04%
			(viii) Safety and traffic management during construction.	0.00%
			(ix) Site Clearance	0.56%
			(x) Junction improvement works including Connecting Road & Junction under Grade separator	6.10%
			(xi) Utility Shifting PHE	2.23%
			(xii) Utility Shifting MECL	0.86%
		100.00%	**Total**	

1.3 Procedure of estimating the value of work done.

1.3.1 Road works

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

Table 1.3.1

Stage of Payment	Percentage weightage	Payment Procedure
1	**2**	**3**
A-Widening and strengthening of existing road		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 or 500m whichever is less.
(1) Earthwork up to top of the embankment	0.27%	
(2) Sub-Grade	0.89 %	
(3) Sub-Base Course	2.75 %	
(4) Non Bituminous Base Course*	1.75 %	
(5) Bituminous Base Course	2.15 %	
(6) Wearing Coat	2.07 %	

Stage of Payment	Percentage weightage	Payment Procedure
1	2	3
(7) Widening and repair of culverts	0.00%	Cost of completed culverts shall be determined pro rata basis with respect to the total no. of culverts. The payment shall be made on the completion of atleast one culvert. 75% of the cost will be payable on completion of box/ abutments and slab/ pipe and head wall. Remaining 25% will become payable on completion of protection works including return/ wing walls and any other work associated with culverts.
B.1- **Reconstruction/New realignment/bypass (Flexible pavement)**		Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in full length or 500 m length, whichever is less.
(1) Earthwork up to top of the embankment	31.88%	
(2) Sub-Grade	3.21 %	
(3) Sub Base Course	10.17 %	
(4) Non-Bituminous Base Course*	6.47 %	
(5) Bituminous Base Course	7.96 %	
(6) Wearing Coat	7.67 %	
B.2- Reconstruction/New realignment/bypass (Rigid pavement)		Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in full length or 500 m length, whichever is less.
(1) Earthwork up to top of the embankment	0.00%	
(2) Sub-Grade	0.00%	
(3) Sub Base Course	0.00%	
(4) Dry Lean Concrete (DLC) Course	0.00%	
(5) Pavement Quality Control (PQC) Course	0.00%	
C.1- Reconstruction/ New service road (Flexible pavement)		Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in full length or 500 m length, whichever is less.
(1) Earthwork up to top of the embankment	0.00%	
(2) Sub-Grade	0.00%	
(3) Sub Base Course	0.00%	
(4) Non-Bituminous Base Course*	0.00%	

Stage of Payment	Percentage weightage	Payment Procedure
1	**2**	**3**
(5) Bituminous Base Course	0.00%	
(6) Wearing Coat	0.00%	
C.2- Reconstruction/ New service road (Rigid pavement)		Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in full length or 500 m
(1) Earthwork up to top of the embankment.	0.00%	
(2) Sub-Grade	0.00%	
(3) Sub Base Course	0.00%	
(4) Dry Lean Concrete (DLC) Course	0.00%	
(5) Pavement Quality Control (PQC) Course	0.00%	
D- Re-Construction and New culverts on existing road, realignments, bypasses:		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 atleast one culvert. 75% of the cost will be payable on completion of box/ abutments and slab/ pipe and head wall. Remaining 25% will become payable on completion of protection works including return/ wing walls and any other work associated with culverts.
Culverts (length < 6m)	22.76%	
Total =	**100.00%**	

@ 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 weightage for road work x weightage for bituminous work x (1/L)

Where,

P = Contract Price

L = Total length in km Similarly, the rates per km for other stages shall be worked out accordingly.

Note: The length affected due to law-and-order problems or litigation during execution due to which the Contractor is unable to execute the work, may be deducted from the total project length for payment purposes. The total length calculated here is only for payment purposes and will not affect and referred in other clauses of the Contract Agreement.

1.3.2 Minor Bridges and Underpasses/Overpasses.

Procedure for estimating the value of Minor Bridge and underpasses/Overpasses shall be as stated in table 1.3.2:

Table 1.3.2

Stage of Payment	Weightage	Payment Procedure
1	2	3
A.1-Widening and repair of minor bridges (length > 6m and < 60m)		Cost of each minor bridge shall be determined on pro rata basis with respect to the total linear length (m) of the minor bridges.
(i) **Foundation:** On completion of the foundation work of abutments and piers	0.00%	(i) **Foundation:** Payment against foundation shall be made on pro-rata basis on completion of a stage i.e completion of atleast two foundations of each bridge. In case where load testing is specified for foundation, the trigger of first payment shall include load testing also.
(ii) Sub – structure:	0.00%	**(ii) Sub - structure** – Payment shall be made on pro-rata basis on completion of stage i.e. completion of atleast one sub-structure upto abutment/ pier cap level of each bridge.
(iii) Super-structure: On completion of the super-structure in all respects including wearing coat, bearings, expansion joints, hand rails, crash barriers, road signs & markings, tests on completion etc. complete in all respect.	0.00%	(iii) **Super-structure:** Payment shall be made on pro-rata basis on completion of a stage i.e., completion of super-structure of at least one span in all respects as specified in the column of "Stage of Payment" in this sub-clause.
(iv) Approaches: On completion of approaches including Retaining walls, stone pitching, protection works for floor, embankment slope etc. complete in all respect and fit for use.	0.00%	(iv) **Approaches:** Payment shall be made on pro-rata basis on completion of a stage i.e. completion of approaches including wing walls/ return walls, retaining walls, stone pitching in all respect as specified in the column of "Stage of Payment" in this sub-clause for each bridge.
A.2- New minor bridges		Cost of each minor bridge shall be determined on pro rata basis with respect to the total linear length (m) of the minor bridges.
(i) Foundation: On completion of the foundation work of abutments and piers.	20.93%	(i) **Foundation:** Payment against foundation shall be made on pro-rata basis on completion of a stage completion of atleast two foundations of each bridge. In case where load testing is specified for foundation, the trigger of first payment shall include load testing also.

Stage of Payment	Weightage	Payment Procedure
(ii) Sub – structure:	26.55%	(ii) Sub - structure – Payment shall be made on pro-rata basis on completion of stage i.e. completion of atleast one sub-structure upto abutment/ pier cap level of each bridge.
(iii) **Super-structure:** On completion of the super-structure upto deck slab including bearings.	9.02%	(iii) **Super-structure:** Payment shall be made on pro-rata basis on completion of a stage i.e., completion of super-structure of at least one span upto deck slab including bearing as specified in the column of "Stage of Payment" in this sub- clause. If pre-cast girders/ segments are used, interim payments shall be made at 75% of the cost of that element, as derived from MoRTH Data Book, applicable SOR of State PWD on Base Date with tender discount/premium applied thereon.
(iv) **Miscellaneous Works:**	3.61%	(iv) **Miscellaneous Works**: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of wearing coat, expansion joint, crash barrier, railing, protection works, drainage and any other remaining work associated to bridge including tests on bridge for each bridge.
v) **Approaches**: On completion of approaches including Retaining walls, stone pitching, protection works for floor, embankment slope etc. complete in all respect and fit for use.	15.35%	(v) **Approaches:** Payment shall be made on pro-rata basis on completion of a stage i.e. completion of approaches including wing walls/ return walls, retaining walls, stone pitching in all respect as specified in the column of "Stage of Payment" in this sub-clause for each bridge.
(vi) **Guide Bunds and River Training Works:** On completion of Guide Bunds and river Training Works complete in all respects	0.00%	(vi) **Guide Bunds and River Training Works:** Payment shall be made on pro-rata basis on completion of a stage i.e. completion of Guide Bunds and River training Works in all respects as specified for each bridge.
B.1-Widening and repair of underpasses/ overpasses	0.00%	Cost of each underpass/overpass shall be determined on pro rata basis with respect to the total linear length of the underpasses/overpasses. Payment shall be made on the completion of widening & repair works of a underpass/overpass.
B.2- New Underpasses/Overpasses:		Cost of each Underpass/Overpass shall be determined on pro rata basis with respect to the total linear length (m) of the Underpasses/Overpasses.

Stage of Payment	Weightage	Payment Procedure
(i) Foundation: On completion of the foundation work including foundations, of abutments and piers	1.54%	(i) **Foundation:** Payment against foundation shall be made on pro-rata basis on completion of a stage i.e. completion of foundation(s) of each underpass/overpass. In case where load testing is specified for foundation, the trigger of first payment shall include load testing also.
(ii) Sub-structure :	3.14%	(ii) **Sub-structure:** Payment shall be made on pro-rata basis on completion of stage i.e. completion of atleast one sub-structure upto abutment/ pier cap level of each bridge.
(iii) Super-structure: On completion of the super-structure upto deck slab,	8.21%	(iii) **Super-structure:** Payment shall be made on pro-rata basis on completion of a stage 'i.e. completion of super-structure of at least one span upto deck slab including bearing as specified in the column of "Stage of Payment" in this sub- clause: If pre-cast girders/ segments are used, interim payments shall be made at 75% of the cost of that element, as derived from MoRTH Data Book, applicable SOR of State PWD on Base Date with tender discount/premium applied thereon.
(iv) Miscellaneous Works:	1.90%	(iv) Miscellaneous Works: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of wearing coat, expansion joint, crash barrier, railing, protection works and any other remaining work associated to bridge including tests on bridge for each bridge.
(v) Approaches: On completion of approaches including wing wall/ return wall, Retaining walls/ Reinforced Earth walls, stone pitching, protection works complete in all respect and fit for use.	9.76%	(v) **Approaches:** Payment shall be made on pro-rata basis on completion of a stage i.e. completion of approaches including wing wall/ return wall, retaining walls, Reinforced Earth walls, stone pitching, protection works complete in all respect for each bridge.
Total =	**100.00%**	

1.3.3 Major Bridge works, ROB/RUB and Structures

Procedure for estimating the value of major Bridge works, ROB/RUB and structure work shall be as stated in table 1.3.3:

Table 1.3.3

Stage of Payment	Weightage	Payment Procedure
1	**2**	**3**
A.1- Widening and repairs of Major Bridges		Cost of each Major Bridge shall be determined on pro rata basis with respect to the total linear length (m) of the Major Bridges.
(1) Foundation		(1) **Foundation:** Payment against foundation shall be made on pro-rata basis on completion of a stage i.e. completion of atleast one foundation of each of the major Bridge as specified hereinunder.
(i) Pile Foundation	0.00%	(i) Pile Foundation
(a) Piling – On completion of pile upto bottom of pile cap		(a) Piling : Payment of 70% shall be made on completion of piling upto bottom of pile cap for each pile on prorate basis.
(b) Pile Cap : On completion of pile cap		(b) Pile Cap : Payment of 30% on pro- rata basis shall be made on completion of pile cap.
		In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(ii) Open Foundation	0.00%	(ii) Open Foundation: Payment shall be made on completion of a stage
		i.e. on completion of atleast one foundation.
(2) Sub-structure	0.00%	**(2) Sub-Structure:** Payment against Sub-structure shall be made on pro- rata basis on completion of a stage i.e. completion of atleast one sub- structure of abutments/piers upto abutment/pier cap level of each of the major bridge.
(3) Super-structure (including bearings)	0.00%	(3) **Super-structure:**
		Payment shall be made on prorata basis on completion of a stage i.e. completion of superstructure upto deck slab including bearings of at least one span as specified here in under :
		If pre-cast RCC/PSC/Steel girders/ segments are used, interim payments shall be made at 75% of the cost of that element, as derived from MoRTH Data Book, applicable SOR of State PWD on Base Date with tender discount/premium applied thereon.
(4) Wearing Coat including expansion joints	0.00%	**(4) Wearing Coat:** Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified for each major bridge.

Stage of Payment	Weightage	Payment Procedure
(5) Miscellaneous Items like hand rails, crash barriers, road markings etc.	0.00%	(5) **Miscellaneous:** Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified for each major bridge.
(6) Wing walls/return walls	0.00%	(6) **Wing walls/return walls:** Payments shall be made on completion of all wing walls/return walls complete in all respects as specified for each major bridge.
(7) Guide Bunds, River Training works etc.	0.00%	(7) **Guide Bunds, River Training works:** Payments shall be made on completion of all guide bunds/river training works etc. complete in all respects as specified for each major bridge.
(8) Approaches (including Retaining walls, stone Retaining walls, stone pitching and protection works)	0.00%	**(8) Approaches**: Payments shall be made on completion of both approaches including stone pitching, protection works, etc. complete in all respects as specified for each major bridge.
A.2- New Major Bridges		Cost of each Major Bridge shall be determined on pro rata basis with respect to the total linear length (m) of the Major Bridge.
(1) Foundation		(1) **Foundation:** Payment against foundation shall be made on pro-rata basis on completion of a stage i.e. completion of atleast one foundation of each of the major Bridge as specified here in under:
(i) Well Foundation	0.00%	(i) Well Foundation
(a) On completion of Cutting Edge + Well Curb		(a) Cutting Edge + Well Curb: Payment of 10% shall be made on completion of a stage i.e. completion of cutting edge + well curb.
(b) Wellsteining : On completion of well steining upto bottom of well cap.		(b) Well steining : Payment of 65% shall be made on completion of well steining upto bottom of well cap. The payment stage shall be further sub-divided on pro-rata basis i.e. (i) on completion upto 10 m and (ii) on completion of each subsequent 5 m or part thereof.
(c) On completion of bottom plug + top plug (if provisioned as per design) + well cap		(c) Bottom plug + top plug (if provisioned as per design) + well cap: Payment of 25% shall be made on completion of a stage i.e. completion of bottom plug, back fill, top plug and well cap.
(ii) Pile Foundation	10.91%	(ii) Pile Foundation
(a) Piling – On completion of pile upto bottom of pile cap		(a) Piling : Payment of 70% shall be made on completion of piling upto bottom of pile cap for each pile on prorota basis.
(b) Pile Cap : On completion of pile cap		(b) Pile Cap : Payment of 30% shall be made on completion of pile cap.

Stage of Payment	Weightage	Payment Procedure
		In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(iii) Open Foundation	0.00%	(iii) Open Foundation: Payment shall be made on completion of a stage
		i.e. on completion of atleast one foundation.
(2) Sub-structure	9.96%	**(ii) Sub-Structure:**. Payment against Sub-structure shall be made on pro- rata basis on completion of a stage
		i.e. completion of atleast one sub- structure of abutments/piers upto abutment/pier cap level of each of the major bridge.
(3) Super-structure (including bearings)	37.91%	(3) **Super-structure:**
		Payment shall be made on prorata basis on completion of a stage i.e. completion of superstructure upto deck slab including bearings of at least one span as specified here in under:
		If pre-cast girders/ segments are used, interim payments shall be made at 75% of the cost of that element, as derived from MoRTH Data Book, applicable SOR of State PWD on Base Date with tender discount/premium applied thereon.
		(For cable stayed bridge and suspension cable bridge, detailed payment stage may be included on case to case basis)
(4) Wearing Coat including expansion joints	0.69%	**(4) Wearing Coat:** Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified for each major bridge.
(5) Miscellaneous Items like hand rails, crash barriers, road markings etc.	1.34%	(5) **Miscellaneous:** Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified for each major bridge.
(6) Wing walls/return walls	0.00%	(6) **Wing walls/return walls:** Payments shall be made on completion of all wing walls/return walls complete in all respects as specified for each major bridge.
(7) Guide Bunds, River Training works etc.	0.00%	(7) **Guide Bunds, River Training works:** Payments shall be made on completion of all guide bunds/river training works etc. complete in all respects as specified for each major bridge.

Stage of Payment	Weightage	Payment Procedure
(8) Approaches (including Retaining walls, stone pitching and protection works for floor, embankment slope etc.)	0.97%	**(8) Approaches**: Payments shall be made on completion of both approaches including stone pitching, protection works, etc. complete in all respects as specified for each major bridge.
B.1 -Widening and repairs of		Cost of each ROB/RUB shall be determined on pro rata basis with respect to the total linear length (m) of the ROBs/RUBs.
(a) ROB		
(b) RUB		
(1) Foundation		(1) **Foundation:** Payment against foundation shall be made on pro-rata basis on completion of a stage i.e. completion of atleast one foundation of each of the ROB/RUB as specified here in under.
(i) Pile Foundation	0.00%	(i) Pile Foundation
(a) Piling – On completion of pile upto bottom of pile cap		(a) Piling : Payment of 70% shall be made on completion of piling upto bottom of pile cap for each pile on prorata basis.
(b) Pile Cap : On completion of pile cap		(b) Pile Cap : Payment of 30% on pro- rata basis shall be made on completion of pile cap.
		In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(ii) Open Foundation	0.00%	(ii) Open Foundation: Payment shall be made on completion of a stage i.e. on completion of atleast one foundation.
(2) Sub-structure	0.00%	**(2) Sub-Structure:**. Payment against Sub-structure shall be made on pro-rata basis on completion of a stage i.e. completion of atleast one sub- structure of abutments/piers upto abutment/pier cap level of each of the ROB/RUB.
(3) Super-structure (including bearings)	0.00%	(3) **Super-structure:** Payment shall be made on pro-rata basis on completion of a stage i.e. completion of superstructure upto deck slab including bearings of at least one span as specified here in under :
		If pre-cast girders/ segments are used, interim payments shall be made at 75% of the cost of that element, as derived from MoRTH Data Book, applicable SOR of State PWD on Base Date with tender discount/premium applied thereon.

Stage of Payment	Weightage	Payment Procedure
(4) Wearing Coat including expansion joints in case of ROB. In case of RUB, rigid pavement under RUB including drainage facility as specified.	0.00%	**(4) Wearing Coat:** Payment shall be made on completion of (a) in case of ROB- wearing coat including expansion joints complete in all respects as specified for each of the ROB and (b) in case of RUB- rigid pavement under RUB including drainage facility complete in all respects as specified for each of the RUB.
(5) Miscellaneous Items like hand rails, crash barriers, road markings etc.	0.00%	(5) **Miscellaneous:** Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified for each of the ROB/ RUB.
(6) Wing walls/return walls	0.00%	(6) **Wing walls/return walls:** Payments shall be made on completion of all wing walls/return walls complete in all respects as specified for each of the ROB/ RUB.
(7) Approaches (including Retaining walls, stone pitching and protection works)	0.00%	**(7) Approaches**: Payments shall be made on completion of both approaches including stone pitching, protection works, etc. complete in all respects as specified for each of the ROB/ RUB.
B.2- New		Cost of each ROB/RUB shall be determined on pro rata basis with respect to the total linear length (m) of the ROBs/RUBs.
(a) ROB		
(b) RUB		
(1) Foundation		(1) **Foundation:** Payment against foundation shall be made on pro-rata basis on completion of a stage i.e. completion of atleast one foundation of each of the ROB/RUB as specified here in under:
(i) Well Foundation	0.00%	(i) Well Foundation
(a) On completion of Cutting Edge + Well Curb		(a) Cutting Edge + Well Curb: Payment of 10% shall be made on completion of a stage i.e. completion of cutting edge + well curb.
(b) Well staining: On completion of well steining upto bottom of well cap.		(b) Well steining : Payment of 65% shall be made on completion of well steining upto bottom of well cap. The payment stage shall be further sub-divided on pro-rata basis i.e. (i) on completion upto 10 m and (ii) on completion of each subsequent 5 m or part thereof.
(c) On completion of bottom plug + top plug (if provisioned as per design) + well cap		(c) Bottom plug + top plug (if provisioned as per design) + well cap: Payment of 25% shall be made on completion of a stage i.e. completion of bottom plug, back fill, top plug and well cap.
(ii) Pile Foundation	0.00%	(ii) Pile Foundation

Stage of Payment	Weightage	Payment Procedure
(a) Piling – On completion of pile upto bottom of pile cap		(a) Piling : Payment of 70% shall be made on completion of piling upto bottom of pile cap for each pile on prorota basis.
(b) Pile Cap : On completion of pile cap		(b) Pile Cap : Payment of 30% shall be made on completion of pile cap.
		In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(iii) Open Foundation	0.00%	(iii) Open Foundation: Payment shall be made on completion of a stage i.e. on completion of atleast one foundation.
2) Sub-structure	0.00%	**(2) Sub-Structure:** Payment against Sub-structure shall be made on pro- rata basis on completion of a stage i.e. completion of atleast one sub- structure of abutments/piers upto abutment/pier cap level of each of the ROB/RUB.
(3) Super-structure (including bearings)	0.00%	(3) **Super-structure:**
		Payment shall be made on prorata basis on completion of a stage i.e. completion of superstructure upto deck slab including bearings of at least one span as specified here in under :
		If pre-cast girders/ segments are used, interim payments shall be made at 75% of the cost of that element, as derived from MoRTH Data Book. Applicable SOR of State PWD on Base Date with tender discount/premium applied thereon.
(4) Wearing Coat including expansion joints in case of ROB. In case of RUB, rigid pavement under RUB including drainage facility as specified.	0.00%	**(4) Wearing Coat:** Payment shall be made on completion of (a) in case of ROB- wearing coat including expansion joints complete in all respects as specified for each of the ROB and (b) in case of RUB- rigid pavement under RUB including drainage facility complete in all respects as specified for each of the RUB.
(5) Miscellaneous Items like hand rails, crash barriers, road markings etc.	0.00%	(5) **Miscellaneous:** Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified for each of the ROB/RUB.
(6) Wing walls/return walls	0.00%	(6) **Wing walls/return walls:** Payments shall be made on completion of all wing walls/return walls complete in all respects as specified for each of the ROB/RUB.

Stage of Payment	Weightage	Payment Procedure
(7) Approaches (including Retaining walls/Reinforced Earth wall, stone pitching and protection works)	0.00%	**(7) Approaches**: Payments shall be made on completion of both approaches of each ROB including stone pitching, protection works, etc. complete in all respects as specified here in under :
		If reinforced soil wall is used with facia panel/blocks, interim payment shall be made @75% of the Cost of that element as derived from MoRTH data Book. Applicable SOR of State PWD on Base Date with tender discount/premium applied thereon.
C.1- Widening and repairs of Elevated Section/Flyovers/ Grade Separators		Cost of each structure shall be determined on pro rata basis with respect to the total linear length (m) of the structures.
(i) Foundation		(1) Foundation : Payment against foundation shall be made on pro-rata basis on completion of a stage i.e. completion of atleast one foundation of each of the structure as specified here in under :
(i) Pile Foundation	0.00%	(i) Pile Foundation
(a) Piling – On completion of pile upto bottom of pile cap		(a) Piling : Payment of 70% shall be made on completion of piling upto bottom of pile cap for each pile on prorate basis.
(b) Pile Cap : On completion of pile cap		(b) Pile Cap : Payment of 30% on pro-rata basis shall be made on completion of pile cap.
		In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(ii) Open Foundation	0.00%	(ii) Open Foundation: Payment shall be made on completion of a stage i.e. on completion of atleast one foundation.
(2) Sub-structure	0.00%	**(2) Sub-Structure:**. Payment against Sub-structure shall be made on pro- rata basis on completion of a stage i.e. completion of atleast one sub- structure of abutments/piers upto abutment/pier cap level of each of the structure.
(3) Super-structure (including bearings)	0.00%	(3) **Super-structure:**
		Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structure upto deck slab including bearings of at least one span as specified here in under :

Stage of Payment	Weightage	Payment Procedure
		If pre-cast girders/ segments are used, interim payments shall be made at 75% of the cost of that element, as derived from MoRTH Data Book, applicable SOR of State PWD on Base Date with tender discount/premium applied thereon.
(4) Wearing Coat including expansion joints	0.00%	**(4) Wearing Coat:** Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified for each of the structure.
(5) Miscellaneous Items like hand rails, crash barriers, road markings etc.	0.00%	(5) **Miscellaneous:** Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc.
		complete in all respects as specified for each of the structure.
(6) Wing walls/return walls	0.00%	(6) **Wing walls/return walls:** Payments shall be made on completion of all wing walls/return walls complete in all respects as specified for each of the structure.
(7) Approaches (including Retaining walls/Reinforced Earth wall, stone pitching and protection works)	0.00%	**(7) Approaches**: Payments shall be made on completion of both approaches including stone pitching, protection works, etc. complete in all respects of each structure.
C.2 -New Elevated Section/Flyovers/ Grade Separators/Viaduct		Cost of each structure shall be determined on pro rata basis with respect to the total linear length (m) of the structures.
(1) Foundation		(1) **Foundation:** Payment against foundation shall be made on pro-rata basis on completion of a stage i.e. completion of atleast one foundation of each of the structure as specified here in under:
(i) Well Foundation	0.00%	(i) Well Foundation
(a) On completion of Cutting Edge + Well Curb		(a) Cutting Edge + Well Curb: Payment of 10% shall be made on completion of a stage i.e. completion of cutting edge + well curb.
(b) Wellsteining : On completion of well steining upto bottom of well cap.		(b) Well steining : Payment of 65% shall be made on completion of well steining upto bottom of well cap. The payment stage shall be further sub-divided on pro-rata basis i.e. (i) on completion upto 10 m and (ii) on completion of each subsequent 5 m or part thereof.
(c) On completion of bottom plug + top plug (if provisioned as per design) + well cap		(c) Bottom plug + top plug (if provisioned as per design) + well cap: Payment of 25% shall be made on completion of a stage i.e. completion of bottom plug, back fill, top plug and well cap.

Stage of Payment	Weightage	Payment Procedure
(ii) Pile Foundation		(ii) Pile Foundation
(a) Piling – On completion of pile upto bottom of pile cap	4.80%	(a) Piling : Payment of 70% shall be made on completion of piling upto bottom of pile cap for each pile on pro-rata basis.
(b) Pile Cap : On completion of pile cap		(b) Pile Cap : Payment of 30% shall be made on completion of pile cap.
		In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(iii) Open Foundation	1.09%	(iii) Open Foundation: Payment shall be made on completion of a stage i.e. on completion of atleast one foundation.
(2) Sub-structure	13.52%	**(2) Sub-Structure:**. Payment against Sub-structure shall be made on pro- rata basis on completion of a stage i.e. completion of atleast one sub- structure of abutments/piers upto abutment/pier cap level of each of the structure.
(3) Super-structure (including bearings)	11.78%	(3) **Super-structure:**
		Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structure upto deck slab including bearings of at least one span as specified here in under:
		If pre-cast girders/ segments are used, interim payments shall be made at 75% of the cost of that element, as derived from MoRTH Data Book, applicable SOR of State PWD on Base Date with tender discount/premium applied thereon.
(4) Wearing Coat including expansion joints	0.70%	**(4) Wearing Coat:** Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified for each of the structure.
(5) Miscellaneous Items like hand rails, crash barriers, road markings etc.	1.14%	(5) **Miscellaneous:** Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified for each of the structure.
(6) Wing walls/return walls	0.00%	(6) **Wing walls/return walls:** Payments shall be made on completion of all wing walls/return walls complete in all respects as specified for each of the structure.
(7) Approaches (including Retaining walls/Reinforced Earth wall, stone pitching and protection works)	5.17%	**(7) Approaches**:
		Payments shall be made on completion of both approaches including stone pitching, protection works, etc. complete in all respects as specified here in under :

Stage of Payment	Weightage	Payment Procedure
		If reinforced soil wall is used with facia panel/blocks, interim payment shall be made @75% of the Cost of that element as derived from MoRTH data Book. Applicable SOR of State PWD on Base Date with tender discount/premium applied thereon.

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
1	**2**	**3**
(i) Toll plaza	0.00%	Unit of measurement is each completed toll plaza. Payment for each toll plaza shall be made on pro rata basis with respect to the total of all toll plazas as specified here in under :
(a) DLC(LHS)		(a) DLC (LHS) : Payment of 12.5% on pro-rata basis shall be made on completion of a stage i.e. completion of DLC on LHS.
(b) DLC (RHS)		(b) DLC (RHS) : Payment of 12.5% on pro-rata basis shall be made on completion of a stage i.e. completion of DLC on LHS.
(c) PQC(LHS)		(c) PQC(LHS): Payment of 25% on pro-rata basis shall be made on completion of a stage i.e. completion of PQC on LHS.
(d) PQC(RHS)		(d) PQC(RHS): Payment of 25% on pro-rata basis shall be made on completion of a stage i.e. completion of PQC on RHS.
(e) Admin Building		(e) Admin Building: Payment of 10% on pro-rata basis shall be made on completion of a stage i.e. completion of Admin Building and miscellaneous works.
(f) Toll Booth, canopy, safety items and all other associated works		(f) Toll Booth, canopy, safety items and all other associated works: Payment of 15% on pro-rata basis shall be made on completion of a stage i.e. completion of Toll Booth, canopy, safety items and all other associated works.
(ii) Road side drains		

Stage of Payment	Weightage	Payment Procedure
(a) Drains	8.64%	a) Drains: Unit of measurement is linear length in metre. Payment shall be made on pro rata basis on completion of a stage in a length of not less than 100 m on one side.
(b) Cover Slabs	0.37%	(b) Cover slabs: Unit of measurement is linear length in metre. Payment shall be made on pro rata basis on completion of a stage in a length of not less than 100 m on one side.
(iii) Road signs, markings, km stones, safety devices, …	1.62%	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 one Km on both sides.
(iv) **Overhead gantry mounted signs**	0.20%	Unit of measurement is each number. Payment shall be made on pro-rata basis on completion of each overhead gantry mounted sign
(v) Project Facilities		Unit of measurement is each number.
(a) Bus bays	0.12%	Payment shall be made on pro rata basis for completed facilities.
(b) Truck lay-byes	0.00%	Pavement shall be made on pro rata basis for completed facilities.
(c) Rest areas	0.00%	Pavement shall be made on pro rata basis for completed facilities.
(d) Median & Kerb	0.61%	Pavement shall be made on pro rata basis for completed facilities.
(e) Steel Railing	0.64%	Pavement shall be made on pro rata basis for completed facilities.
(f) others	2.76%	Pavement shall be made on pro rata basis for completed facilities.
(vi) Roadside plantation	0.00%	Unit of measurement is linear length in Km. Payment shall be made on pro rata basis on completion of one Km.
(vii) Protection works other than approaches to the bridges, elevated sections/ flyovers/grade separators and ROBs/ RUBs		Unit of measurement is linear length.
(a) Crash Barrier	2.95%	Payment against items (a), (b) & (c) 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 and 100 m whichever is less.
(b) Retaining Wall	30.71%	
(c) Breast Wall	37.98%	
(d) Stone Pitching	1.60%	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 and 100 m whichever is less.

Stage of Payment	Weightage	Payment Procedure
(e) Coir Soil Erosion blanket	2.04%	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 and 100 m whichever is less.
(viii) Safety and traffic management during construction	0.00%	Payment shall be made on pro rata basis every six months.
(ix) Site Clearance	0.56%	Pavement shall be made on pro rata basis for completed facilities.
(x) Junction improvement works including Connecting Road & Junction under Grade separator	6.10%	Pavement shall be made on pro rata basis for completed facilities.
(xi) Utility Shifting PHE	2.23%	Unit of measurement is as per completed activities. Cost per activity shall be determined on pro-rata basis as per its weightage with reference to total cost of pipe line. Payment shall be made for the completed activity. (The average weightage of major activities (only for payment purpose) in shifting work is laying of pipe-50%, Charging of line including all miscellaneous works and dismantling and site clearance-50%) Cost of each crossing shall be determined on pro-rata basis with reference to total no. of crossings. Payment shall be made for not less than 25% of the crossings subject to a minimum of 8 crossings.] Unit of measurement is as per completed activities. Cost per activity shall be determined on pro-rata basis as per its weightage with reference to total cost of pipe line. Payment shall be made for completed activity. (The average weightage of major activities (only for payment purpose) in shifting work is laying of pipe-50%, Charging of line including all miscellaneous works and dismantling and site clearance- 50% Cost of each crossing shall be determined on pro-rata basis with reference to total no. of crossings. Payment shall be made for completed activity. (The average weightage of major activities in shifting work is laying pipe-50%, Charging of line including all miscellaneous works and dismantling and site clearance-50%).

Stage of Payment	Weightage	Payment Procedure
(xii) Utility Shifting MECL	0.86%	1. Unit of measurement is as per completed activities. Cost per activity shall be determined on pro-rate basis as per its weightage with reference to total cost of EHT line. Payment shall be made for completed activity. (The average weightage of major activities (only for payment purpose) in shifting work is (i) Erection of Poles-20%, (ii) Conductor stringing including laying of cable 30%, (iii) DTR erection (if involved)-15% and (iv) Charging of line including dismantling and site clearance-35% (with DTR) and 50%without DTR 2. Cost of each crossing shall be determined on pro-rata basis with reference to total no. of crossings. Payment shall be made for not less than 25% of the crossings subject to a minimum of 4 crossings. 3. Unit of measurement is as per completed activities. Cost per activity shall be determined on pro-rata basis as per its weightage with reference to total cost of LTI HT line. Payment shall be made for completed activity. (The average weightage of major activities (only for payment purpose) in shifting work is (i) Erection of Poles-20%(tt) Conductor stringing including laying of cable 30%, (iii) DTR erection (if involved)-10% and (iv) Charging of line including dismantling and site clearance-40% (with DTR) and 50%without DTR 4. Cost of each crossing shall be determined on pro-rata basis with reference to total no. of crossings. Payment shall be made for not less than 25% of the crossings subject to a minimum of 10 crossings.

2. Procedure for payment for Maintenance.

2.1 The cost for maintenance shall be as stated in Clause 14.1.(i)

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

Schedule - I

(See Clause 10.2 (iv))

1. Drawings

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

1. A minimum list of the drawings of the various components/elements of the project highway and project facility required to be submitted by the Contractor is given below:

(a) Drawing of horizontal alignment, vertical profile and detailed cross sections;

(b) Drawings of cross drainage works, i.e. Bridges/Culverts/Flyovers and Other Structures;

(c) Drawings for River Training works;

(d) Drawings of interchanges, major intersections and underpasses;

(e) Drawing of control centre;

(f) Drawings of road furniture items including traffic signage, marking, safety barriers, etc;

(g) Drawings of traffic diversions plans and traffic control measures;

(h) Drawings of road drainage measures;

(i) Drawings of typical details slope protection measures;

(j) Drawings of landscaping and horticulture;

(k) Drawings of pedestrian crossing;

(l) Drawings of street lighting;

(m) General Arrangement showing Base Camp and Administrative Block;

(n) Any other drawings as per instruction of Authority Engineer.

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[$]

(i) Project Milestone-I shall occur on the date falling on the 274th (Two Hundred and Seventy-Four) day from the Appointed Date (the "**Project Milestone-I**").

(ii) 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[$]

(i) Project Milestone-II shall occur on the date falling on the 548th (Five hundred and forty eight) day from the Appointed Date (the "**Project Milestone-II**").

(ii) 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 35% (thirty five per cent) of the Contract Price and **should have started have started with the construction of all bridges and** should have completed the construction of project highway between **Design Chainage Km 0+000 to Km 7+760.**

4. Project Milestone-III[$]

(i) Project Milestone-III shall occur on the date falling on the 821st (Eight hundred and Twenty One) day from the Appointed Date (the "**Project Milestone-III**").

(ii) 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 70% (Seventy per cent) of the Contract Price and should have started construction of all project facilities.

5 Schedule Completion Date

[$] If total project length is say **'L' km** and the unencumbered length along existing road as handed over on the appointed date is **'L_1' km** (including bypasses, re-alignment, structure etc.) and balance length i.e. **'L2' km (L-L1)** is to be handed over on a later date as per the memorandum signed under provision of Clause 8.2.1 of the Contract Document, then the Project Milestone-I, II and III shall be linked to stage payment statement for amount in percentage of the contract price worked out on prorata basis for the **'L_1' km** length handed over of balance length, the subsequent Project Milestone shall be linked to stage payment statement for amount in percentage of the total contract price.

For example:

If the date for Milestone-I and Milestone-II is 438th and 621st day from appointed date and balance **'L_2' km** length is handed over after 621stsday from appointed date, then the stage payment statement required for achieving Milestone-I and Milestone-II should be linked to Contract Price worked out on prorata basis for the **L_1 km length** [**i.e. for Contract Price x L_1/L**]. Subsequent Milestone i.e. Milestone-III will be linked to stage payment statement for amount in percentage of the total contract price. **In no case, there shall be any change in the schedule completion date unless extension of time has been granted by the Authority under Clause 10.3 and 10.5 of the contract agreement.**

In order for the above dispensation to come into operation, it is necessary that a suitable mechanism (like escrow account) is evolved between the parties to the effect that the payments released to the contractor under the above dispensation would be used for completion of the project in the first instance and shall be available to the Contractor only after meeting his project related commitments.

(i) The Scheduled Completion Date shall occur on the 1095th (One Thousand Ninety Five) day from the Appointed Date.

(ii) 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

1. **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 all the tests specified in IRC code, manual and MORTH specifications for the road and Bridge works, 5th revision, 2013.

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) meters 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 carried 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

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 2-Lane with Paved Shoulder Pynursla Bypass from existing Km 123+635 to Km 131+820 of old NH-40 on Shillong - Dawki road in the State of Meghalaya on EPC mode (Package-III), Design Km 0+000 to Km 7+760 (Length - 7.760 Km) under JICA funding**"** 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.

1. 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.

2. In view of the foregoing, I am satisfied that that Project **Construction of 2-Lane with Paved Shoulder Pynursla Bypass from existing Km 123+635 to Km 131+820 of old NH-40 on Shillong - Dawki road in the State of Meghalaya on EPC mode (Package-III), Design Km 0+000 to Km 7+760 (Length - 7.760 Km) under JICA funding** can be safety 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 AND DELIVERED For and on behalf of CONTRACTOR by	SIGNED, SEALED AND DELIVERED For and on behalf of AUTHORITY's ENGINEER by:
(Signature)	(Signature)

Schedule-L
COMPLETION CERTIFICATE

1. I, …….(Name of the Authority's Engineer), acting as Authority's Engineer, under and in accordance with the Agreement dated …….(the "**Agreement**"), for "Construction of 2-Lane with Paved Shoulder Pynursla Bypass from existing Km 123+635 to Km 131+820 of old NH-40 on Shillong - Dawki road in the State of Meghalaya on EPC mode (Package-III), Design Km 0+000 to Km 7+760 (Length - 7.760 Km) under JICA funding**"** 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 safety 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 deduction 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 weightage 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 crossfall, undulations, settlement, potholes, ponding, obstructions	10%
(ii)	Deficient slopes, raincuts, disturbed pitching, vegetation growth, pruning of trees	5%
(c)	**Bridges and Culverts**	
(i)	Desilting, 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 Items**	
(i)	Removal of dead animals, broken down/accidented 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/100 x M xL1/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 noncompliance 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 or 'Guidelines for Employment of Consultants under Japanese ODA Loans' or a combination of certain provisions thereof shall apply for selection of an experienced firm to discharge the functions and duties of an Authority's Engineer.

1.2 The Authority shall invite Expression of Interest from Consulting Engineering firms or bodies corporate to undertake and perform the duties and functions set forth in Annexure-I of Schedule-N and thereupon shortlist qualified firms in accordance with pre-determined criteria.

1.3 The Authority shall invite the aforesaid shortlisted firms to submit their respective technical and financial offers, each in separate sealed cover and/or upload online. All the technical bids so received shall be opened and pursuant to the evaluation thereof, the Authority shall open the financial bids in respect of each shortlisted firm and the order of priority as among these firms shall be determined on the basis of a weighted evaluation where technical and financial score shall be assigned respective weights of 80:20.

1.4 In the event of termination of the Technical Consultants appointed in accordance with the provisions of above Paragraphs 1.1 to 1.3, 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 Ministry of Road Transport and Highways (the "**Authority**") and ..... (the "**Contractor**") for **"Construction of 2-Lane with Paved Shoulder Pynursla Bypass from existing Km 123+635 to Km 131+820 of old NH-40 on Shillong - Dawki road in the State of Meghalaya on EPC mode (Package-III), Design Km 0+000 to Km 7+760 (Length - 7.760 Km) under JICA funding"**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 0.2% of Contract Price.

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 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)

Forms 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 upto 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.

Monthly Maintenance Payment Statement

The monthly Statement for Maintenance Payment shall state:

(f) the monthly payment admissible in accordance with the provisions of the agreement;

(g) the deductions for maintenance work not done;

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

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

(j) amount towards deduction of taxes

4. 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 last 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 whatsoever 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 arises from a cause occurring prior to the issue of 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 each Party's liability for any loss, damage, death or bodily injury which may occur to any physical property (except things insured under Paragraph 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 and 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.

SCHEDULE-Q
(See Clause 14.10)

Tests on Completion of Maintenance Period

1. Riding Quality test:
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 2,500 (two thousand five hundred) mm for each kilometer.
2. 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 measurement of cracking, rutting, stripping and potholes and the permissible values are given below: • Area of cracking not more than 2 % area
• Area of rutting with rut depth more than 10 mm - not more than 1 …. % area
• Area of stripping: not more than 2 % area
• Area of potholes: Nil
• Edge drop – Shall not be more than 15 mm

SCHEDULE-R
(See Clause 14.10)

Taking Over Certificate

I, ……. (Name and designation of the Authority's representative) under and in accordance with the Agreement dated …… (the "Agreement"), for **"Construction of 2-Lane with Paved Shoulder Pynursla Bypass from existing Km 123+635 to Km 131+820 of old NH-40 on Shillong - Dawki road in the State of Meghalaya on EPC mode (Package-III), Design Km 0+000 to Km 7+760 (Length - 7.760 Km) under JICA funding"** ……. (Name of Contractor), hereby certify that the Tests on completion of Maintenance Period in accordance with Article 14 of the Agreement have been successfully undertaken to determine compliance of the Project Highway with the provisions of the Agreement and I hereby certify that the Authority has Taken over the Project Highway from the Contractor on this day .....

SIGNED, SEALED AND DELIVERED

(Signature)
(Name of Authority's Engineer)
(Address)

SCHEDULE-S
(See Clause 17.7.2)

Performance Certificate

I, ……. (Name and designation of the Authority's representative) under and in accordance with the Agreement dated …… (the "Agreement"), for [construction and maintenance of the **"Construction of 2-Lane with Paved Shoulder Pynursla Bypass from existing Km 123+635 to Km 131+820 of old NH-40 on Shillong - Dawki road in the State of Meghalaya on EPC mode (Package-III), Design Km 0+000 to Km 7+760 (Length - 7.760 Km) under JICA funding"** ……. (Name of Contractor), hereby certify that the Contractor has discharged all its obligations under the Agreement and in accordance with Article 17 of the Agreement I hereby issue Performance Certificate to the Contractor on this day.....

SIGNED, SEALED AND DELIVERED

(Signature)
(Name of Authority's Engineer)
(Address)

SCHEDULE-T
(See Clause 19.1.6)

Name of Currency	**A Amount of Currency**	**B Rate of Exchange* (Local Currency per Unit of Foreign Currency)**	**C Local Currency Equivalent**	**D Percentage of Net Bid Price (NTP) (100 x C) / NTP**
Local Currency (Indian Rupees)				
Foreign Currency 1 (Japanese Yen)				
Foreign Currency 2 (US Dollar)				
Net Bid Price				100.00

* The fixed rates of exchange shall be the selling rates 28 days prior to the deadline for submission of bids published by the **Reserve Bank of India**.

1. Change in scope would require agreement between parties on currency.
2. Regarding damages by the Authority, financing charges for a payment delay will be in corresponding currency amounts.
3. Delay damages will be recovered in currencies in proportion which in which contract price is payable.