Technical Schedule

Schedules - A

Schedule-A

(See Clauses 2.1 and 8.1)

Site of the Project

1 The Site

(i) Site of the Two-lane with paved shoulders 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 Highways shall be followed by the contractor with minimum FRL as indicated in the alignment plan. The Contractor, however, improve/upgrade the Road Profile as indicated 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

[All the chainages/location referred to in Annex-Ito Schedule-A are existingchainages.]

1.0 Site

The site of the Two-lane with paved shoulder Project Highway comprises the section of National Highway NH-717A commencing from km 96+254 (Reshi) to km 101+554 (Rhenock)in the State of Sikkim. The land, carriageway and structures comprising the site are described below.

2.0 Land

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

Sr. No.	Chainage		ROW (m)	Remarks
	From	To		
1	96+254	101+554	Varies from 24 to 30 m	Refer Annex-II of this Schedule-A

3.0 Carriageway

The present carriageway of the Project Highway is a two-lane road. The type of the existing pavement is flexible.

Sr. No	Existing Chainage (Km)		Length (km)	Existing Carriageway Width (m)	Type of Pavement	Remarks
	From	To				
1.	96+254	101+554	5.3	7	Flexible	Except Sinking Zone (4m-5m)

4.0 Major Bridges

The Site includes the following Major Bridge:

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

5.0 Road over-bridges (ROB)/ Road under-bridges (RUB)

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

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

6.0 Grade Separators

The Site includes the following grade separators:

Sr.No.	Chainage (km)	Type of Structure		No. of Spans with span length (m)	Width (m)
		Foundation	Superstructure		
Nil					

7.0 Minor bridges

The Site includes the following minor bridges:

Sr.No.	Chainage (km)		Type of Structure			No of Spans with span length (m)	Width (m)
	Existing	Design	Foundation	Sub Structure	Super Structure		
1	96+228	96+200	Open	Abutment	PSC I-Girder	1x52	7

8.0 Railway level crossings

The Site includes the following railway level crossings:

Sr. No.	Location (km)	Remarks
Nil		

9.Underpasses (vehicular, non-vehicular)

The Site includes the following underpasses:

Sr. No.	Chainage (km)	Type of Structure	No. of Spans with span length (m)	Width (m)
Nil				

10. Culverts

The Site has the following culverts:

S.No.	Chainage (km)	Type of Culvert	Span/Opening with span length (m)	Width(m)
1	96+400	BOX	1x1.5	10.50
2	96+440	BOX	1x1.5	10.50
3	96+825	BOX	1x1.5	10.50
4	96+885	BOX	1x1.5	12.20
5	97+125	BOX	1x3	12.00
6	97+420	BOX	1x1.5	7.00
7	97+765	BOX	1x1.5	12.00
8	98+130	BOX	1x1.5	11.80
9	98+360	BOX	1x1.5	11.80
10	98+615	BOX	1x2	11.80
11	98+790	BOX	1x1.5	12.00
12	98+875	BOX	1x1.5	12.00
13	99+140	BOX	1x1.5	12.00
14	99+490	BOX	1x2	12.00

S.No.	Chainage (km)	Type of Culvert	Span/Opening with span length (m)	Width(m)
15	99+540	BOX	1x2	12.00
16	99+640	BOX	1x1.5	12.00
17	100+025	BOX	1x1.5	12.00
18	100+185	BOX	1x1.5	12.10
19	100+270	BOX (with Catchpit)	1x1.5	12.00
20	100+350	BOX	1x1.5	12.00
21	100+590	BOX	1x1.5	12.00
22	100+705	BOX	1x1.5	11.00
23	101+255	BOX	1x1.5	8.60

11. Bus bays

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

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

12. Truck Lay byes

The details of truck lay byes are as follows:

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

13. Road side drains

The details of the roadside drains are as follows

Sr. No.	Location		Type	
	From km	To km	Masonry/CC (Pucca)	Earthen (Kutcha)
1	96+254	96+854		✓
2	96+854	97+104	✓	
3	97+104	97+254		✓
4	97+254	97+404		✓
5	97+404	97+850		✓
6	97+850	98+050	✓	
7	98+050	98+150		✓
8	98+150	98+300	✓	
9	98+300	98+850	✓	
10	98+850	98+950		✓
11	98+950	99+050	✓	
12	99+050	99+450	✓	
13	99+450	99+750		✓

Sr. No.	Location		Type	
	From km	To km	Masonry/CC (Pucca)	Earthen (Kutcha)
14	99+750	99+950	✓	
15	99+950	100+100		✓
16	100+100	100+650	✓	
17	100+650	101+400		✓
18	101+400	101+550	✓	

14.0 Major junctions

The details of major junctions are as follows:

Sr. No.	Location at	At grade	Separated	Category of Cross Road			
				NH	SH	MDR	Others
1	101+500	✓	-	✓	-	-	✓

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

15.0 Minor junctions

The details of the minor junctions are as follows:

Sr. No.	Location at	Type	
		Y- junction	Cross road
1	97+170	✓	-
2	98+060	✓	-
3	100+620	✓	-

16. Bypasses

The details of the existing road sections proposed to be bypassed are as follows:

Sr. No.	Name of bypass (town)	Chainage		Length (in Km)
		From km	To km	
NIL				

17. Other structure:

(i) Retaining wall

The details of the retaining wall are as follows:

Sr. No.	Existing Chainage (Km)		Length (m)
	From km	To km	
1	97+105	97+120	15m
2	98+350	98+365	15m
3	98+370	98+390	20m

Sr. No.	Existing Chainage (Km)		Length (m)
	From km	To km	
4	98+780	98+800	20m
5	99+575	99+590	15m
6	99+650	99+680	30m
7	99+710	99+740	30m
8	99+760	99+810	50m
9	101+250	101+265	15m
10	101+285	101+310	25m

(ii) Breast wall

The details of the Breast wall are as follows:

Sr. No.	Existing Chainage (Km)		Length (m)
	From km	To km	
1	96+445	96+460	15m
2	96+845	96+880	35m
3	96+890	97+090	200m
4	97+870	97+950	80m
5	97+985	98+030	45m
6	98+080	98+105	25m
7	98+110	98+230	120m
8	98+310	98+360	50m
9	98+390	98+415	25m
10	98+455	98+480	25m
11	98+500	98+530	30m
12	98+565	98+635	70m
13	99+760	99+800	40m
14	99+850	99+860	10m
15	100+060	100+100	40m
16	101+380	101+450	70m

18. Details of Existing Utilities: The details of existing utilities are given in Sheet-I.

(i) ELECTRICAL UTILITIES

The site includes the following electrical utilities: -

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

Sr. No	Chainage		Length along NH (in Km)				ROW Crossings (in km)			
	From km	To km	400KV	220KV	110KV	66KV	400KV	220KV	110KV	66KV
Nil										

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

Sr. No	Chainage		Length (in Km)				Crossings (no's)				Transformer	
	From	To	33 KV	22 KV	11 KV	LT/ HT	33KV	22KV	11KV	LT/HT	No	Capacity
1	96+378	98+085	-	-	1.707	LT	-	-	-	-	2	25KVA &315 KVA
2	98+608	99+448	-	-	0.840	LT	-	-	-	-	-	-
3	99+670	100+236	-	-	0.566	LT	-	-	-	-	-	-
4	100+100	101+200	-	-	1.1	LT (UC)	-	-	-	-	-	-
5	100+566	100+856	-	-	0.290	LT	-	-	-	-	-	-
6	101+285	101+290	-	-	0.005	LT	-	-	-	-	-	-

(c) Public Health Utilities (Water Pipelines)

The site includes the following public health utilities: -

(c) Public Health Utilities (Water Pipelines)

(a) The site includes the following public health utilities: -

Sr. No	Chainage(km)		Type	Length (in Km)				Crossings				Remarks
	From	To		Water Supply line		Sewage line		Water Supply line		Sewage line		
				With Pumping	With Gravity	With Pumping	With Gravity	With Pumping	With Gravity	With Pumping	With Gravity	
1	96+254	96+540	DN-15mm (GI)		0.286							

Sr. No	Chainage(km)		Type	Length (in Km)				Crossings				Remarks
	From	To		Water Supply line		Sewage line		Water Supply line		Sewage line		
				With Pumping	With Gravity	With Pumping	With Gravity	With Pumping	With Gravity	With Pumping	With Gravity	
2	96+540	97+040	DN-15mm (GI)		0.500							
3	97+050	97+100	DN-32mm		0.050				1 no			
4	97+100	97+540	Nil		0.000							
5	97+540	97+750	Nil		0.000							
6	97+750	98+040	DN-20mm		0x0.290							
			both side		0.580							
7	98+040	98+540	DN-20mm		2x0.500							
			both side		1.000							
8	98+540	98+680	DN-20mm		2x0.140							
			both side		0.280							
9	98+680	98+750	Nil		0.000							
10	98+750	99+040	DN-15mm		2x0.290							
			both side		0.580							
11	99+040	99+200	Nil		0.000							
12	99+200	99+390	DN-15mm		2x0.190							
			both side		0.380							
13	99+390	99+450	DN-15mm		0.060							
14	99+450	99+540	Nil		0.000							
15	99+540	99+600	Nil		0.000							
16	99+600	99+650	DN-15mm		0.050							
17	99+650	99+800	DN-20mm (GI)		0.150							
18	99+800	99+900	DN-20mm (GI)		0.100							
19	99+900	100+000	Nil		0.000							
20	100+000	100+050	DN-15mm		0.050							
21	100+050	100+100	DN-15mm		2x0.050							
			both side		0.100							
22	100+100	100+150	Nil		0.000							
23	100+150	100+250	DN-15mm		2x0.100				1 no			
			both side		0.200							
24	100+250	100+440	Nil		0.000							
25	100+440	100+540	DN-15mm		2x0.100							
			both side		0.200							
26	100+540	101+070	DN-15mm		2x0.530							
			both side		1.060							
			DN-20mm		2x0.530							
			both side		1.060							

Sr. No	Chainage(km)		Type	Length (in Km)				Crossings				Remarks
	From	To		Water Supply line		Sewage line		Water Supply line		Sewage line		
				With Pumping	With Gravity	With Pumping	With Gravity	With Pumping	With Gravity	With Pumping	With Gravity	
27	101+070	101+367	DN-15mm both side		2x0.297 0.594							
			DN-20mm both side		2x0.297 0.594							

(ii) **Any Other Line:** OFC cable line (BSNL) – 5.020 Km

Annex – II

(As per Clause 8.3 (i))

(Schedule-A)

Annex-II 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)
(i) Full Right of Way (full width)					
(a)	Stretch-I	Km 96+070 to 101+367	5.297	Varies between 19 m to 30 m	On Appointed Date
(ii) Part Right of Way (part width) : NIL					
(iii) Balance Right of Way (width) : NIL					

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

Annex - III
(Schedule-A)
Alignment Plans

The existingalignment 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. The contractor shall, however, improve/upgrade the Road profile as indicated in Annex-III based on site/design requirement.

(ii) Traffic Signage plan of the Project Highway showing numbers & location of traffic signs are enclosed. The contractor 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, in addition to MoRTH Circular no. RT-25035/07/2023-RS (Part) (221534), dated 20.07.2023.

i.

Annex – IV

(Schedule-A)

Annex-IV **Environment Clearances**

Sr.No.	Clearances	Present Status
1	Environment clearance	Not Applicable

Schedule - B

Schedule - B

(See Clause2.1)

Development of Project Highway

1 Development of the Project Highway

Developmentof the ProjectHighwayshallinclude designandconstruction of the projecthighway as describedinthis Schedule-BandinSchedule-C.

2 Widening &Up-gradation of Project Highway

Widening & upgradation of Project Highway shall include two laning with paved shoulders ofthe Project Highway as described in Annex-I of this Schedule B and Schedule-C

3 Specifications and Standards

TheProject Highwayshall be designed and constructed inconformitywith theSpecificationsandStandardsspecifiedin Annex-Iof Schedule-D.

Annex –I

(Schedule-B)

Description of Two-Laning with Paved Shoulders

1. Widening of the Existing Highway

(i) The ProjectHighway shall follow the existing alignmentunless otherwise specifiedbytheAuthorityandshowninthealignmentplansSpecified in Annex-IIIofSchedule-A. Geometricdeficiencies, if any, inthe existinghorizontaland vertical profilesshallbecorrectedasperttheprescribedstandards forsteep terrain to the extentlandis available.

(ii) Width ofCarriageway

(a) TwoLaningwithpavedshouldershallbeundertaken.Thepaved carriageway shall be 7.0m wide in accordance with the typical cross section drawings shown/attached.

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		Width (m)	Typical cross section
		From	To		
Nil					

(b) ExceptasotherwiseprovidedinthisAgreement,thewidthofthepavedcarriageway andcross-sectionalfeatures shallconformto paragraph1(i) above.

2. Geometric Designand General Features

(i) General

Geometricdesignand generalfeaturesof theProjectHighway shallbein accordancewithSection2of theManual, referred to as the Manual in Sch-Doranother relevant IRC codes.

(ii) Design Speed

The design speed shall be the minimum design speed of 40kmper hour for steep terrain, except at hair pin bends.

(iii) Improvement of the Existing Road Geometrics

Inthefollowingsections, whereimprovementoftheexistingroad geometricsto theprescribedstandardsisnotpossible,theexisting roadgeometricsshallbe improvedtotheextentpossible within thegivenrightofwayandproperroad signs andsafetymeasures shallbeprovided:

Sl.No	Stretch (from km to km)	Type of deficiency	Remarks
NIL			

(iv) ***Details of Bypasses are specified as under:***

Sl.No.	Name of Bypass	Existing Chainage (km)		Design Chainage (km)		Design Length (km)
		From	To	From	To	
Nil						

(v) Details of Realignment:

Sl. No.	Chainage (Design)		Length	Remarks
	From km	To km		
1	96+160	96+240	80.00	Realignment for design speed of 40-50kmph
2	99+000	99+020	20.00	Realignment for design speed of 40-50kmph
3	99+020	99+040	20.00	Realignment for design speed of 40-50kmph
4	99+040	99+060	20.00	Realignment for design speed of 40-50kmph
5	99+060	99+120	60.00	Realignment for design speed of 40-50kmph
6	99+450	99+500	50.00	Realignment for design speed of 40-50kmph

(vi) Right of Way

Details of the Right of Way are given in Annexure-II of Schedule-A.

(vii) Type of Shoulders

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

Sr. No.	Design Chainage Stretch (in km)		Length (m)	Fully paved shoulders	Footpaths	Reference to cross section
	Start	End				
Nil						

b) In open country, paved shoulders of 1.0m width shall be provided on both hill and valley side. The Earthen shoulder, as given below, at valley side shall be covered with 150mm thick compacted layer of granular material:

b) Description	c) Width of Earthen Shoulder (m)
d) Open Country normal section	e) 2.50 m f) (0.50 m ES + 1.00 m for Thrie beam installation + 1.00 m for Utility Corridor)

c) Design and specifications of paved shoulders and granular material shall conform to the requirements specified in the relevant Manual.

(viii) Lateral and vertical clearances at underpasses

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

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

Sr. No.	Design Chainage (km)	Silent features	Minimum length of Viaduct to be provided	Road to be carried over/under the structure	Type of Structure	Location	Remarks
Nil							

(ix) Lateral and vertical clearances at overpasses

a) Lateral and vertical clearances at overpasses shall be as per the provision of relevantManual.

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

Sr. No.	Location (Chainage) (from km to km)	Span/ opening (m)	Remarks
Nil			

(x) Service Roads

Serviceroadswidth shallbeconstructed as per relevant manual atthelocationsandforthelengthsindicated below:

Sl. No	Design Chainage (Km)		Bridge Length (m)	Length (km)	Side
	From	To			
Nil					

(xi) Grade Separated Structures

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

Sr. No.	Locations	Length	Number of Span	Approach		Remarks, if any
				A1	A2	
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: [Refer to the 156 provision of relevant Manual and specify the type of vehicular under pass/ overpass structure and whether the cross road is to be carried at the existing level, raised or lowered]

Sr. No.	Location	Type of	Cross road at	Remarks,

		structure Length (m)	Existing Level	Raised Level	Lowered Level	if any
Nil						

(xii) Cattle and pedestrian underpass/overpass:

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

Sr. No.	Location	Type of crossing
Nil		

(xiii) Typical Cross section of the Project Highway

TCS of Type	Description	Length (km)	Remarks
TCS-1	Typical Cross Section -1, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Hill Side Slope (LHS) And Valley Side Slope (RHS)	0.220	Refer Chainage-wise details for respective typical cross section, as furnished in the table below.
TCS-1A	Typical Cross Section -1A, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Slope (LHS) And Hill Side Slope (RHS)	0.620	
TCS-1B	Typical Cross Section -1B, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Hill Side Slope (LHS) And Valley Side Slope (RHS) (New Construction)	0.040	
TCS-2	Typical Cross Section -2, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Hill Side Slope (LHS) And Valley Side Retaining Wall (RHS)	0.230	
TCS-2A	Typical Cross Section -2A, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Retaining Wall (LHS) And Hill Side Slope (RHS)	0.320	
TCS-3	Typical Cross Section -3, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Hill Side Breast Wall (LHS) And Valley Side Retaining Wall (RHS)	0.090	
TCS-3A	Typical Cross Section -3A, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Retaining Wall (LHS) And Hill Side Breast Wall (RHS)	0.220	

TCS of Type	Description	Length (km)	Remarks
TCS-4	Typical Cross Section -4, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Hill Side Breast Wall (LHS) And Valley Side Slope (RHS)	0.960	
TCS-4A	Typical Cross Section -4A, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Slope (LHS) And Hill Side Breast Wall (RHS)	2.050	
TCS-4B	Typical Cross Section -4B, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Hill Side Breast Wall (LHS) And Valley Side Slope (RHS) (New Construction)	0.080	
TCS-5	Typical Cross Section -5, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Retaining Wall (LHS) And Hill Side Breast Wall (RHS)	0.337	
MJB	New Construction (Realignment)	0.080	
MNB	New Construction (Realignment)	0.050	
	Total Proposed length of project road	**5.297**	

(xiv) Typical Cross section of the Project Highway with chainage:

S. No.	Chainage (Km)		Length (m)	Type of TCS
	From	To		
1	96+070	96+160	90	TCS-3
2	96+160	96+240	80	**MJB**
3	96+240	96+400	160	TCS-4A
4	96+400	96+420	20	TCS-3A
5	96+420	96+520	100	TCS-4A
6	96+520	96+540	20	TCS-3A
7	96+540	96+680	140	TCS-4A
8	96+680	96+760	80	TCS-3A
9	96+760	96+800	40	TCS-4A
10	96+800	96+820	20	TCS-1A
11	96+820	96+840	20	TCS-4A
12	96+840	96+900	60	TCS-1A
13	96+900	96+960	60	TCS-4A
14	96+960	97+040	80	TCS-2A
15	97+040	97+070	30	TCS-1A
16	97+070	97+100	30	TCS-2A
17	97+100	97+120	20	TCS-1A
18	97+120	97+250	130	TCS-4A
19	97+250	97+420	170	TCS-5
21	97+420	97+500	80	TCS-4A

S. No.	Chainage (Km)		Length (m)	Type of TCS
	From	To		
22	97+500	97+670	170	TCS-1A
23	97+670	97+840	170	TCS-4A
24	97+840	97+860	20	TCS-1A
25	97+860	97+900	40	TCS-4A
26	97+900	97+940	40	TCS-2A
27	97+940	98+120	180	TCS-4A
28	98+120	98+140	20	TCS-1A
29	98+140	98+160	20	TCS-4A
30	98+160	98+200	40	TCS-1A
31	98+200	98+250	50	TCS-2A
32	98+250	98+540	290	TCS-4
33	98+540	98+560	20	TCS-1
34	98+560	98+640	80	TCS-4
35	98+640	98+660	20	TCS-1
36	98+660	98+800	140	TCS-4
37	98+800	98+860	60	TCS-2
38	98+860	98+900	40	TCS-4
39	98+900	98+920	20	TCS-1
40	98+920	99+000	80	TCS-4
41	99+000	99+020	20	TCS-1B
42	99+020	99+040	20	TCS-4B
43	99+040	99+060	20	TCS-1B
44	99+060	99+120	60	TCS-4B
45	99+120	99+160	40	TCS-1
46	99+160	99+200	40	TCS-4
47	99+200	99+240	40	TCS-1
48	99+240	99+300	60	TCS-4
49	99+300	99+320	20	TCS-1
50	99+320	99+400	80	TCS-4
51	99+400	99+420	20	TCS-1
52	99+420	99+450	30	TCS-4
53	99+450	99+500	50	**MNB**
54	99+500	99+520	20	TCS-1
55	99+520	99+640	120	TCS-4
56	99+640	99+660	20	TCS-1
57	99+660	99+830	170	TCS-2
58	99+830	99+980	150	TCS-4A
59	99+980	100+040	60	TCS-2A
60	100+040	100+080	40	TCS-1A
61	100+080	100+140	60	TCS-4A
62	100+140	100+160	20	TCS-1A
63	100+160	100+180	20	TCS-4A
64	100+180	100+200	20	TCS-1A
65	100+200	100+220	20	TCS-2A
66	100+220	100+260	40	TCS-4A

S. No.	Chainage (Km)		Length (m)	Type of TCS
	From	To		
67	100+260	100+280	20	TCS-1A
68	100+280	100+300	20	TCS-2A
69	100+300	100+400	100	TCS-4A
70	100+400	100+420	20	TCS-1A
71	100+420	100+500	80	TCS-4A
72	100+500	100+540	40	TCS-1A
73	100+540	100+900	360	TCS-4A
74	100+900	100+940	40	TCS-1A
75	100+940	100+960	20	TCS-4A
76	100+960	101+000	40	TCS-1A
77	101+000	101+100	100	TCS-3A
78	101+100	101+180	80	TCS-4A
79	101+180	101+200	20	TCS-2A
80	101+200	101+367	167	TCS-5
	Total Length (m)		**5297**	

3. Intersections and GradeSeparators:

All intersections and grade separators shall be as per the provision of relevantManual.

Existing intersections which are deficient shall be improved to the prescribed standards.

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

(i) At-grade intersections

(a) Major Junctions

At grade major junctions shall be improved at intersecting roads with the Project highway is given below:

Sl. No	Location of intersection (Design Chainage)	Type of intersection	Other features
1	Km 101+360	Cross Road Intersection	Intersecting road to be developed/Constructed for at least 120 m length.

(b) Minor Junctions

At grade minor junctions shall be improved at intersecting roads with the Project highway is given below:

Sl. No	Location of intersection (Design Chainage)	Type of intersection	Other features
1	Km 97+140	Y- Junction	Intersecting road to be developed/Constructed for atleast 60 m length.
2	Km 97+990	Y- Junction	
3	Km 100+540	Y- Junction	

(ii) Grade Separated intersections with/ without ramps:

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

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**: The existing road shall be raised as per given Plan & Profile.

5. PAVEMENT DESIGN

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

(ii) **Type of pavement:**

Flexible pavement shall be adopted. The contractor shall accordingly carry out pavement design after conducting requisite tests as per standard and specifications. In case of use of any alternate or new technology other than conventional design (i.e. GSB/WMM/DBM/BC), the design is to be approved by the Competent Authority of NHIDCL.

(iii) Design requirements:

Design requirement for the flexible pavement shall be in accordance with section 5 of the IRC: SP-73-2018 and IRC:37-2018.

(a) Design Period and Strategy

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

(b) DesignTraffic

Notwithstanding anything to the contrary contained in this Agreement or the Manual, the Contractor shall design the pavement for design traffic of 25 million standard axles.

(iv) Reconstruction ofStretches

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

S.No	Chainage		Length(m)	Type of TCS	DESCRIPTION
	From	To			
1	96+070	96+160	90.00	TCS-3	Typical Cross Section -3, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Hill Side Breast Wall (LHS) And Valley Side Retaining Wall (RHS)
2	96+240	96+400	160.00	TCS-4A	Typical Cross Section -4A, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Slope (LHS) And Hill Side Breast Wall (RHS)
3	96+400	96+420	20.00	TCS-3A	Typical Cross Section -3A, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Retaining Wall (LHS) And Hill Side Breast Wall (RHS)
4	96+420	96+520	100.00	TCS-4A	Typical Cross Section -4A, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Slope (LHS) And Hill Side Breast Wall (RHS)
5	96+520	96+540	20.00	TCS-3A	Typical Cross Section -3A, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Retaining Wall (LHS) And Hill Side Breast Wall (RHS)
6	96+540	96+680	140.00	TCS-4A	Typical Cross Section -4A, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Slope (LHS) And Hill Side Breast Wall (RHS)
7	96+680	96+760	80.00	TCS-3A	Typical Cross Section -3A, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Retaining Wall (LHS) And Hill Side Breast Wall (RHS)

S.No	Chainage		Length(m)	Type of TCS	DESCRIPTION
	From	To			
8	96+760	96+800	40.00	TCS-4A	Typical Cross Section -4A, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Slope (LHS) And Hill Side Breast Wall (RHS)
9	96+800	96+820	20.00	TCS-1A	Typical Cross Section -1A, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Slope (LHS) And Hill Side Slope (RHS)
10	96+820	96+840	20.00	TCS-4A	Typical Cross Section -4A, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Slope (LHS) And Hill Side Breast Wall (RHS)
11	96+840	96+900	60.00	TCS-1A	Typical Cross Section -1A, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Slope (LHS) And Hill Side Slope (RHS)
12	96+900	96+960	60.00	TCS-4A	Typical Cross Section -4A, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Slope (LHS) And Hill Side Breast Wall (RHS)
13	96+960	97+040	80.00	TCS-2A	Typical Cross Section -2A, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Retaining Wall (LHS) And Hill Side Slope (RHS)
14	97+040	97+070	30.00	TCS-1A	Typical Cross Section -1A, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Slope (LHS) And Hill Side Slope (RHS)
15	97+070	97+100	30.00	TCS-2A	Typical Cross Section -2A, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Retaining Wall (LHS) And Hill Side Slope (RHS)
16	97+100	97+120	20.00	TCS-1A	Typical Cross Section -1A, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Slope (LHS) And Hill Side Slope (RHS)
17	97+120	97+250	130.00	TCS-4A	Typical Cross Section -4A, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Slope (LHS) And Hill Side Breast Wall (RHS)
18	97+250	97+420	170.00	TCS-5	Typical Cross Section -5, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Retaining Wall (LHS) And Hill

S.No	Chainage		Length(m)	Type of TCS	DESCRIPTION
	From	To			
					Side Breast Wall (RHS)
19	97+420	97+500	80.00	TCS-4A	Typical Cross Section -4A, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Slope (LHS) And Hill Side Breast Wall (RHS)
20	97+500	97+670	170.00	TCS-1A	Typical Cross Section -1A, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Slope (LHS) And Hill Side Slope (RHS)
21	97+670	97+840	170.00	TCS-4A	Typical Cross Section -4A, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Slope (LHS) And Hill Side Breast Wall (RHS)
22	97+840	97+860	20.00	TCS-1A	Typical Cross Section -1A, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Slope (LHS) And Hill Side Slope (RHS)
23	97+860	97+900	40.00	TCS-4A	Typical Cross Section -4A, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Slope (LHS) And Hill Side Breast Wall (RHS)
24	97+900	97+940	40.00	TCS-2A	Typical Cross Section -2A, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Retaining Wall (LHS) And Hill Side Slope (RHS)
25	97+940	98+120	180.00	TCS-4A	Typical Cross Section -4A, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Slope (LHS) And Hill Side Breast Wall (RHS)
26	98+120	98+140	20.00	TCS-1A	Typical Cross Section -1A, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Slope (LHS) And Hill Side Slope (RHS)
27	98+140	98+160	20.00	TCS-4A	Typical Cross Section -4A, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Slope (LHS) And Hill Side Breast Wall (RHS)
28	98+160	98+200	40.00	TCS-1A	Typical Cross Section -1A, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Slope (LHS) And Hill Side Slope (RHS)

S.No	Chainage		Length(m)	Type of TCS	DESCRIPTION
	From	To			
29	98+200	98+250	50.00	TCS-2A	Typical Cross Section -2A, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Retaining Wall (LHS) And Hill Side Slope (RHS)
30	98+250	98+540	290.00	TCS-4	Typical Cross Section -4, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Hill Side Breast Wall (LHS) And Valley Side Slope (RHS)
31	98+540	98+560	20.00	TCS-1	Typical Cross Section -1, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Hill Side Slope (LHS) And Valley Side Slope (RHS)
32	98+560	98+640	80.00	TCS-4	Typical Cross Section -4, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Hill Side Breast Wall (LHS) And Valley Side Slope (RHS)
33	98+640	98+660	20.00	TCS-1	Typical Cross Section -1, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Hill Side Slope (LHS) And Valley Side Slope (RHS)
34	98+660	98+800	140.00	TCS-4	Typical Cross Section -4, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Hill Side Breast Wall (LHS) And Valley Side Slope (RHS)
35	98+800	98+860	60.00	TCS-2	Typical Cross Section -2, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Hill Side Slope (LHS) And Valley Side Retaining Wall (RHS)
36	98+860	98+900	40.00	TCS-4	Typical Cross Section -4, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Hill Side Breast Wall (LHS) And Valley Side Slope (RHS)
37	98+900	98+920	20.00	TCS-1	Typical Cross Section -1, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Hill Side Slope (LHS) And Valley Side Slope (RHS)
38	98+920	99+000	80.00	TCS-4	Typical Cross Section -4, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Hill Side Breast Wall (LHS) And Valley Side Slope (RHS)
39	99+120	99+160	40.00	TCS-1	Typical Cross Section -1, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Hill Side Slope (LHS) And Valley Side Slope

S.No	Chainage		Length(m)	Type of TCS	DESCRIPTION
	From	To			
					(RHS)
40	99+160	99+200	40.00	TCS-4	Typical Cross Section -4, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Hill Side Breast Wall (LHS) And Valley Side Slope (RHS)
41	99+200	99+240	40.00	TCS-1	Typical Cross Section -1, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Hill Side Slope (LHS) And Valley Side Slope (RHS)
42	99+240	99+300	60.00	TCS-4	Typical Cross Section -4, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Hill Side Breast Wall (LHS) And Valley Side Slope (RHS)
43	99+300	99+320	20.00	TCS-1	Typical Cross Section -1, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Hill Side Slope (LHS) And Valley Side Slope (RHS)
44	99+320	99+400	80.00	TCS-4	Typical Cross Section -4, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Hill Side Breast Wall (LHS) And Valley Side Slope (RHS)
45	99+400	99+420	20.00	TCS-1	Typical Cross Section -1, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Hill Side Slope (LHS) And Valley Side Slope (RHS)
46	99+420	99+450	30.00	TCS-4	Typical Cross Section -4, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Hill Side Breast Wall (LHS) And Valley Side Slope (RHS)
47	99+500	99+520	20.00	TCS-1	Typical Cross Section -1, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Hill Side Slope (LHS) And Valley Side Slope (RHS)
48	99+520	99+640	120.00	TCS-4	Typical Cross Section -4, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Hill Side Breast Wall (LHS) And Valley Side Slope (RHS)
49	99+640	99+660	20.00	TCS-1	Typical Cross Section -1, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Hill Side Slope (LHS) And Valley Side Slope (RHS)

S.No	Chainage		Length(m)	Type of TCS	DESCRIPTION
	From	To			
50	99+660	99+830	170.00	TCS-2	Typical Cross Section -2, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Hill Side Slope (LHS) And Valley Side Retaining Wall (RHS)
51	99+830	99+980	150.00	TCS-4A	Typical Cross Section -4A, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Slope (LHS) And Hill Side Breast Wall (RHS)
52	99+980	100+040	60.00	TCS-2A	Typical Cross Section -2A, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Retaining Wall (LHS) And Hill Side Slope (RHS)
53	100+040	100+080	40.00	TCS-1A	Typical Cross Section -1A, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Slope (LHS) And Hill Side Slope (RHS)
54	100+080	100+140	60.00	TCS-4A	Typical Cross Section -4A, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Slope (LHS) And Hill Side Breast Wall (RHS)
55	100+140	100+160	20.00	TCS-1A	Typical Cross Section -1A, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Slope (LHS) And Hill Side Slope (RHS)
56	100+160	100+180	20.00	TCS-4A	Typical Cross Section -4A, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Slope (LHS) And Hill Side Breast Wall (RHS)
57	100+180	100+200	20.00	TCS-1A	Typical Cross Section -1A, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Slope (LHS) And Hill Side Slope (RHS)
58	100+200	100+220	20.00	TCS-2A	Typical Cross Section -2A, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Retaining Wall (LHS) And Hill Side Slope (RHS)
59	100+220	100+260	40.00	TCS-4A	Typical Cross Section -4A, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Slope (LHS) And Hill Side Breast Wall (RHS)
60	100+260	100+280	20.00	TCS-1A	Typical Cross Section -1A, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Slope (LHS) And Hill Side Slope

S.No	Chainage		Length(m)	Type of TCS	DESCRIPTION
	From	To			
					(RHS)
61	100+280	100+300	20.00	TCS-2A	Typical Cross Section -2A, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Retaining Wall (LHS) And Hill Side Slope (RHS)
62	100+300	100+400	100.00	TCS-4A	Typical Cross Section -4A, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Slope (LHS) And Hill Side Breast Wall (RHS)
63	100+400	100+420	20.00	TCS-1A	Typical Cross Section -1A, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Slope (LHS) And Hill Side Slope (RHS)
64	100+420	100+500	80.00	TCS-4A	Typical Cross Section -4A, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Slope (LHS) And Hill Side Breast Wall (RHS)
65	100+500	100+540	40.00	TCS-1A	Typical Cross Section -1A, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Slope (LHS) And Hill Side Slope (RHS)
66	100+540	100+900	360.00	TCS-4A	Typical Cross Section -4A, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Slope (LHS) And Hill Side Breast Wall (RHS)
67	100+900	100+940	40.00	TCS-1A	Typical Cross Section -1A, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Slope (LHS) And Hill Side Slope (RHS)
68	100+940	100+960	20.00	TCS-4A	Typical Cross Section -4A, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Slope (LHS) And Hill Side Breast Wall (RHS)
69	100+960	101+000	40.00	TCS-1A	Typical Cross Section -1A, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Slope (LHS) And Hill Side Slope (RHS)
70	101+000	101+100	100.00	TCS-3A	Typical Cross Section -3A, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Retaining Wall (LHS) And Hill Side Breast Wall (RHS)

S.No	Chainage		Length(m)	Type of TCS	DESCRIPTION
	From	To			
71	101+100	101+180	80.00	TCS-4A	Typical Cross Section -4A, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Slope (LHS) And Hill Side Breast Wall (RHS)
72	101+180	101+200	20.00	TCS-2A	Typical Cross Section -2A, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Retaining Wall (LHS) And Hill Side Slope (RHS)
73	101+200	101+367	167.00	TCS-5	Typical Cross Section -5, 2 Lane Highway (Open Country Mountainous/Steep Terrain) Valley Side Retaining Wall (LHS) And Hill Side Breast Wall (RHS)

6. ROADSIDE DRAINAGE

Drainage system including surface and subsurfacedrains fortheProject Highway shallbe providedas per the provision of relevantManual.

Cement Concrete Lined Drain of trapezoidal shape as shown in the different typical cross sections in length to be constructed= 5167 m

7.DESIGN OF STRUCTURES

(i) General

a. All bridges, culverts and structures shall be designed and constructed in accordance with the provision of relevant Manual and shall conform to the cross-sectional features and other details specifiedtherein.

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

Sl. No.	MNB/MJB at km	Width of carriageway and cross-sectional features
1	96+200	Total Deck Width = 13.1 m (Typical Cross Section attached)
2	99+475	

c. The following structures shall be provided with footpath, as per provisions of IRC:

Sl. No.	Location at km	Remarks
1	96+200	MJB
2	99+475	MNB

d. All bridges shall be high-level bridges.

e. The following structures shall be designed to carry utility services as per site requirement.

Sr. No.	Bridgeat km	Utility service to be carried	Remarks
Nil			

f. Cross-section of the new culverts and Bridges at deck level for the Project Highway shall conform to the typical cross-sections given.

(ii) <u>Culverts</u>

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

b. Reconstruction of existing culverts:

Theexistingculvertsatthefollowinglocationsshallbere-constructedasnew culverts:

Sl.No.	Culvert location	Span/Opening (m)	Remarks
1	96+440	1x2x2	RCC BOX
2	96+670	1x2x2	RCC BOX
3	96+865	1x2x2	RCC BOX
4	97+095	1x5x3	RCC BOX
5	97+390	1x3x3	RCC BOX
6	97+740	1x2x2	RCC BOX
7	98+098	1x2x2	RCC BOX
8	98+412	1x2x2	RCC BOX
9	98+660	1x2x2	RCC BOX
10	98+823	1x2x2	RCC BOX
11	98+913	1x3x3	RCC BOX
12	99+112	1x3x3	RCC BOX
13	99+632	1x3x3	RCC BOX
14	100+050	1x3x3	RCC BOX
15	100+205	1x2x2	RCC BOX
16	100+288	1x2x2	RCC BOX
17	100+572	1x2x2	RCC BOX
18	100+684	1x2x2	RCC BOX

Sl.No.	Culvert location	Span/Opening (m)	Remarks
19	101+217	1x2x2	RCC BOX

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 details below. Repairs and strengthening of existing structures where required shall be carried out.

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

d. Additional **New culverts (RCC Box type)**shall be constructed as per particulars given in the table below:

Sl. No	Culvert location	Span/Opening (m)
1	97+620	1x2x2
2	98+286	1x2x2
3	99+870	1x2x2

e. Repair/Replacement of railing/Parapets, flooring and protection works of the existing culverts shall be undertaken as follows:

Sr. No.	Location at km	Type of repair required
NIL		

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 Structures:

Sr.No.	Bridge location (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:

Sr. No.	Location (Km)	Existing Width (m)	Extent of Widening (m)	Cross-section at deck level for widening
NIL				

(b) Additional New Bridges

New Bridges at the following locations on the Project Highway shall be constructed of minimum length as under:

Sr. No.	Location	Total length (m)	Remarks
1	96+200	80 m (25 m x 2 + 30 m x 1)	New MJB
2	99+475	50 x 1 = 50 m	New MNB

Note: In case, the Span arrangement is modified by the EPC Contractor as per site requirement, the same shall be done with the approval of the Competent Authority and without any additional financial implication. Notwithstanding, the span length shall be treated as minimum.

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

Sr. No.	Location (km)	Remarks
Nil		

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

Sr. No.	Location (km)	Remarks
Nil		

(e) Drainage System for BridgeDecks: Aneffectivedrainagesystemforbridgedecksshallbeprovidedasspecifiedin the provision of relevant Manual.

(f) Structures inMarineEnvironment:Nil

(iv) Rail-Road Bridges

(a) Design, Construction and detailing of ROB/RUB shall be 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 bridge (m)
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:

Sr. No.	Location of Level crossing (Chainage km)	Number and length of span (m)
NIL		

(v) Grade Separated Structures

The grade separated structures shall be provided at the locations and of the type and length specified in paragraphs2 (ix) 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.	Location of Bridge (km)	Nature of extent of repairs/strengthening to be carried out
Nil		

(b) ROB/RUB

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

(c) Overpasses/Underpassesand otherstructures

Sl. No.	Location of Structure (km)	Nature of extent of repairs/strengthening to be carried out
Nil		

(vii) List of Bridges andStructures

The following is list of Bridges and Structures

Sl. No.	Location	Type of Structures
1	96+200	Major Bridge
2	99+475	Minor Bridge

8. Traffic Control Devices and Road Safety Works:

(i) Traffic control devices and road safety works shall be provided in accordance with the provisions of the relevant Manual.

(ii) Specifications of the reflective sheeting shall be Class C sheeting described in IRC:67 and type VIII/IX/XI as per ASTM D 4956-09 fixed over Aluminium or Aluminium Composite Material.

The minimum nos. of traffic sign boards are as hereunder-

Sl. No.	Item	Total Nos
(i)	90 cm equilateral triangle	195
(ii)	60 cm equilateral triangle	18
(iii)	90 cm high octagon	103
(iv)	60 cm circular	14
(v)	Hazard Marker Sign Boards	51
(vi)	Village Name Boards of size 900x600	6
(vii)	Place Identification Boards of size 1200x900	4
(viii)	Advance Direction Sign Boards of 1800x1200	7
(ix)	Chevron boards of size 600x450	392

(iii) **Road Marking:** The road markings with hot applied thermoplastic paint consisting of different lane markings, directional arrows, chevron marking, letterings, transverse bar marking (speed calming measure) etc. shall cover the entire Project Highway and at all junctions/intersections as per relevant code, manual and relevant MoRT&H circular.

(iv) **Road studs:** The Reflective Pavement Markers (RRPM) i.e. road studs of prismatic retroreflective type conforming to ASTM D 4280, Table 9.1 of Manual to be provided following placement details as per IRC:35. The colour pattern of road studs for edge line and center line with respect traffic movement is to be adopted as per Manual and as per relevant MoRT&H Circular.

Minimum number of road studs of different colours: 2080 no.

(v) **Road Delineators:** Minimum 51 no. of road delineators to be provided as per Manual and relevant IRC code.

9. Roadside Furniture

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

(ii) Overhead Traffic Signs: Location and Size

The location & size of overhead traffic signsshall be as hereunder:

Location	Size	Remarks
96+300 (1 no.)	12.0 m x 2.0 m	Clear height of gantry = 6.0 m
101+367 (3 no.)		

10. Compulsory Afforestation: NIL

11. Hazardous Locations

The safety barriers (Thrie Beam Crash Barriersalong with reflectors) shall be provided at the following hazardous locations:

Sl.No.	Location stretches from (km) to (km)	LHS/RHS	Remarks
1	km 96+070 to km 96+163	At Valley side	Except at culvertlocations.
2	km 96+243 to km 99+447		
3	km 99+503 to km 101+367		

12. Special Requirement for Hill Roads

a) Retaining Wall:

The minimum requirement of Retaining wall is as follows. The Contractor is required to conduct detail investigation to assess the work based on site survey,

investigations and assessment before commencement of work.Any increase in length within 10% of total scope mentioned herein shall not constitute a Change of Scope.

Retaining Walls Locations LHS:

Sr. No	Chainage From	Chainage To	Length(m)	Minimum Height(m)	Type
1	96+400	96+420	20	RW 4m	Plum
2	96+520	96+540	20	RW 4m	Plum
3	96+680	96+760	80	RW 5m	Plum
4	96+960	97+040	80	RW 4m	Plum
5	97+070	97+100	30	RW 5m	Plum
6	97+250	97+420	170	10m RCC RW	RCC (Counter fort)
7	97+900	97+940	40	RW 5m	Plum
8	98+200	98+250	50	RW 5m	Plum
9	99+980	100+040	60	RW 4m	Plum
10	100+200	100+220	20	RW 4m	Plum
11	100+280	100+300	20	RW 4m	Plum
12	101+000	101+100	100	RW 4m	Plum
13	101+180	101+200	20	RW 4m	Plum
14	101+200	101+367	167	10m RCC RW	RCC (Counter fort)
15	101+240	101+260	20	RW 4m	Plum
16	101+260	101+280	20	RW 4m	Plum
17	101+280	101+300	20	RW 6m	Plum
18	101+300	101+320	20	9m RCC RW	RCC
19	101+320	101+340	20	8m RCC RW	RCC
Total			**977 m**		

Retaining Walls Locations RHS:

Sr. No	Chainage From	Chainage To	Length(m)	Minimum Height(m)	Type
1	96+070	96+140	70	RW 4m	Plum
2	98+800	98+860	60	RW 6m	Plum
3	99+660	99+830	170	RW 4m	Plum
Total			**300 m**		

Total proposed minimum length of Retaining wall:1277m

b) BREAST WALL

The minimum requirement of Breast wall is as follows. The Contractor is required to conduct detail investigation to assess the work based on site survey, investigations and assessment before commencement of work. Any increase in

length within 10% of total scope mentioned herein shall not constitute a Change of Scope.

Breast Walls Locations LHS:

Sr. No	Chainage From	Chainage To	Length(m)	Minimum Height(m)	Type
1	96+070	96+140	70	BW 4m	Plum
2	97+360	97+420	60	BW 4m	Plum
3	98+250	98+540	290	BW 3m	Plum
4	98+560	98+580	20	BW 4m	Plum
5	98+580	98+600	20	BW 3m	Plum
6	98+600	98+640	40	BW 3m	Plum
7	98+660	98+700	40	BW 3m	Plum
8	98+700	98+740	40	BW 3m	Plum
9	98+740	98+800	60	BW 4m	Plum
10	98+860	98+900	40	BW 3m	Plum
11	98+920	99+000	80	BW 4m	Plum
12	99+060	99+120	60	BW 4m	Plum
13	99+160	99+200	40	BW 4m	Plum
14	99+240	99+300	60	BW 4m	Plum
15	99+320	99+400	80	BW 3m	Plum
16	99+420	99+450	30	BW 4m	Plum
17	99+520	99+640	120	BW 3m	Plum
Total			**1150 m**		

Breast Walls Locations RHS:

Sr. No	Chainage From	Chainage To	Length(m)	Minimum Height(m)	Type
1	96+250	96+260	10	BW 4m	Plum
2	96+260	96+280	20	BW 3m	Plum
3	96+300	96+360	60	BW 3m	Plum
4	96+360	96+400	40	BW 4m	Plum
5	96+400	96+420	20	BW 3m	Plum
6	96+420	96+480	60	BW 4m	Plum
7	96+480	96+520	40	BW 3m	Plum
8	96+520	96+540	20	BW 3m	Plum
9	96+540	96+680	140	BW 3m	Plum
10	96+680	96+760	80	BW 4m	Plum
11	96+760	96+800	40	BW 4m	Plum
12	96+820	96+840	20	BW 3m	Plum
13	96+900	96+960	60	BW 3m	Plum
14	97+120	97+340	220	BW 3m	Plum
15	97+420	97+440	20	BW 4m	Plum
16	97+440	97+480	40	BW 3m	Plum

Sr. No	Chainage From	Chainage To	Length(m)	Minimum Height(m)	Type
17	97+670	97+680	10	BW 3m	Plum
18	97+680	97+700	20	BW 3m	Plum
19	97+700	97+840	140	BW 4m	Plum
20	97+860	97+900	40	BW 3m	Plum
21	97+940	98+120	180	BW 4m	Plum
22	98+140	98+160	20	BW 3m	Plum
23	99+830	99+980	150	BW 3m	Plum
24	100+080	100+140	60	BW 4m	Plum
25	100+160	100+180	20	BW 3m	Plum
26	100+220	100+260	40	BW 3m	Plum
27	100+300	100+400	100	BW 4m	Plum
28	100+420	100+500	80	BW 3m	Plum
29	100+540	100+900	360	BW 3m	Plum
30	100+940	100+960	20	BW 3m	Plum
31	101+000	101+100	100	BW 4m	Plum
32	101+100	101+180	80	BW 4m	Plum
33	101+200	101+220	20	BW 4m	Plum
Total			**2330 m**		

Total proposed minimum length of Breast wall: 3480m.

c) Special Slope Protection

The minimum requirement for Special Slope Protection work is as follows. The Contractor is required to conduct detail investigation to assess the work based on site survey, investigations and assessment before commencement of work. Any increase in area within 10% of total scope mentioned herein shall not constitute a Change of Scope.

The Special Slope protection works shall comprise of the following:

(i) Excavation in rock in accordance with the requirements of lines, grades and cross sections

(ii) Supply and Installation of Self Drilling hollow soil/rock anchor of different diameter (horizontal and vertical) in soil /overburden /rock suitable for, drilling placing and cement grouting. Installations with all accessories.

(iii) Providing & installing Gabion box for retaining structure with Mechanically Woven Double Twisted Hexagonal Shaped Wire mesh Gabion Boxes

(iv) Supply and fixing of Double Twisted Mesh over the geo-jute layer.

(v) Coir mat (450GSM) applied on slope surface for erosion control.

(vi) Structural steel work, fixed with or without connecting plate, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete

(vii) Details of specification and standard has been specified in Schedule-D

Slope protection in LHS side

Sr. No	Chainage From	Chainage To	Length(m)
1	98+580	98+600	20
2	98+600	98+640	40
3	98+700	98+740	40
4	98+860	98+900	40

Slope protection work RHS Side

Sr. No	Chainage From	Chainage To	Length(m)
1	96+260	96+280	20
2	96+300	96+360	60
3	96+400	96+420	20
4	96+480	96+520	40
5	96+520	96+540	20
6	96+540	96+680	140
7	97+120	97+340	220
8	97+440	97+480	40
9	97+670	97+680	10
10	97+680	97+700	20

Note: The minimum area of special slope protection work is **5,840 sqm**. The height of special protection work should be assessed and approved by the Authority's Engineer, as per site requirement.

13. CHANGE OF SCOPE

The length of Viaducts, Culverts, Retaining Walls, Breast Walls, Bridges etc. specified here in above shall be treated as an approximate assessment. The actual lengths as required on the basis of detailed investigations shall be determined by the Contractor in accordance with the Specifications and Standards. Any variations in the lengths 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 Article 13.

14. UTILITY SHIFTING:

Details are given in Sheet-II (Annex-I to Schedule-B)

Sheet-II (Annex-I to Schedule-B)

Utility Shifting

Shifting of obstructing existing utilities as indicated in Schedule A to an appropriate location in accordance with the standards and specifications of concerned Utility Owing Department is part of the scope of work of the Contractor. The bidders may visit the site and assess the quantum of shifting of utilities for the project before submission of their bid. Copy of utility relocation plan is enclosed. The specifications of concerned Utility Owning Department shall be applicable and followed.

Notes:

a) The type/spacing/size/specifications of poles/towers/lines/cables to be used in shifting work shall be as per the guidelines of Utility Owing Department and it is to be agreed solely between the Contractor and the Utility Owing Department. No change of scope shall be admissible, and no cost shall be paid for using different type/spacing/size/specifications in shifted work in comparison to those in the existing work or for making any overhead crossings to underground as per requirement of Utility Owing Department and/or/construction of project highway. The Contractor shall carry out joint inspection with Utility Owing Department and get the estimates from Utility Owing Department. The assistance of the Authority is limited to giving forwarding letter on the proposal of Contractor to Utility Owing Department whenever asked by the Contractor. The decision/approval of Utility Owing Department shall be binding on the Contractor.

b) The supervision charges at the rates/charges applicable of the Utility Owing Department shall be paid directly by the Authority to the Utility Owing Department as and when Contractor* furnishes demand of Utility Owning Department along with a copy of estimated cost given by the latter.

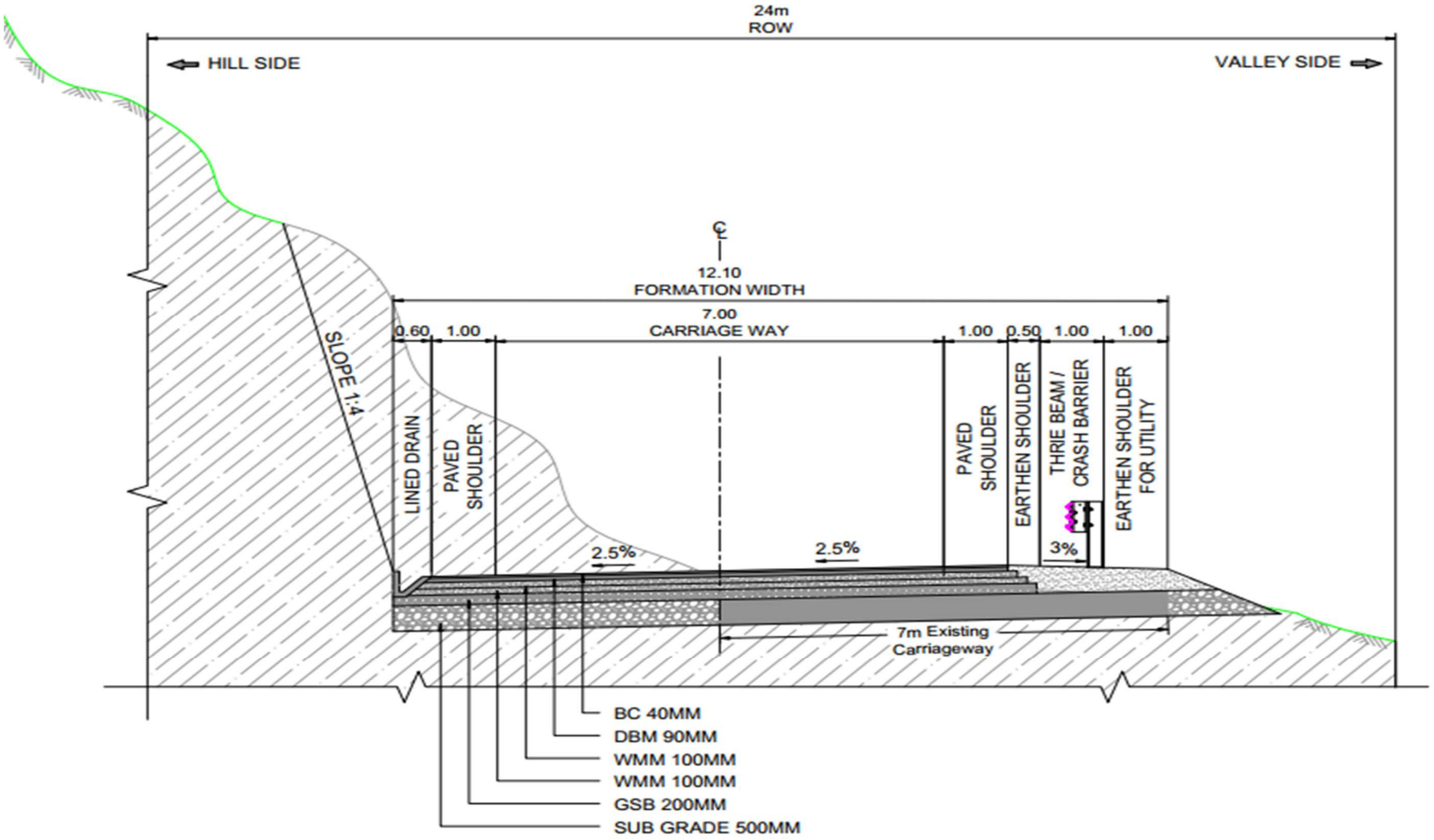
c) The dismantled materials/scrap of existing Utility to be shifted/dismantled shall belong to the Contractor who would be free to dispose-off the dismantled material as deemed fit by them unless the Contractor* is required to deposit the dismantled material to Utility Owing Department as per the norms and practice and, in that case the amount of credit for dismantled material may be availed by the Contractor as per the estimate agreed between them.

d) The utilities shall be handed over after shifting work is completed to Utility Owning Department up to their entire satisfaction. The

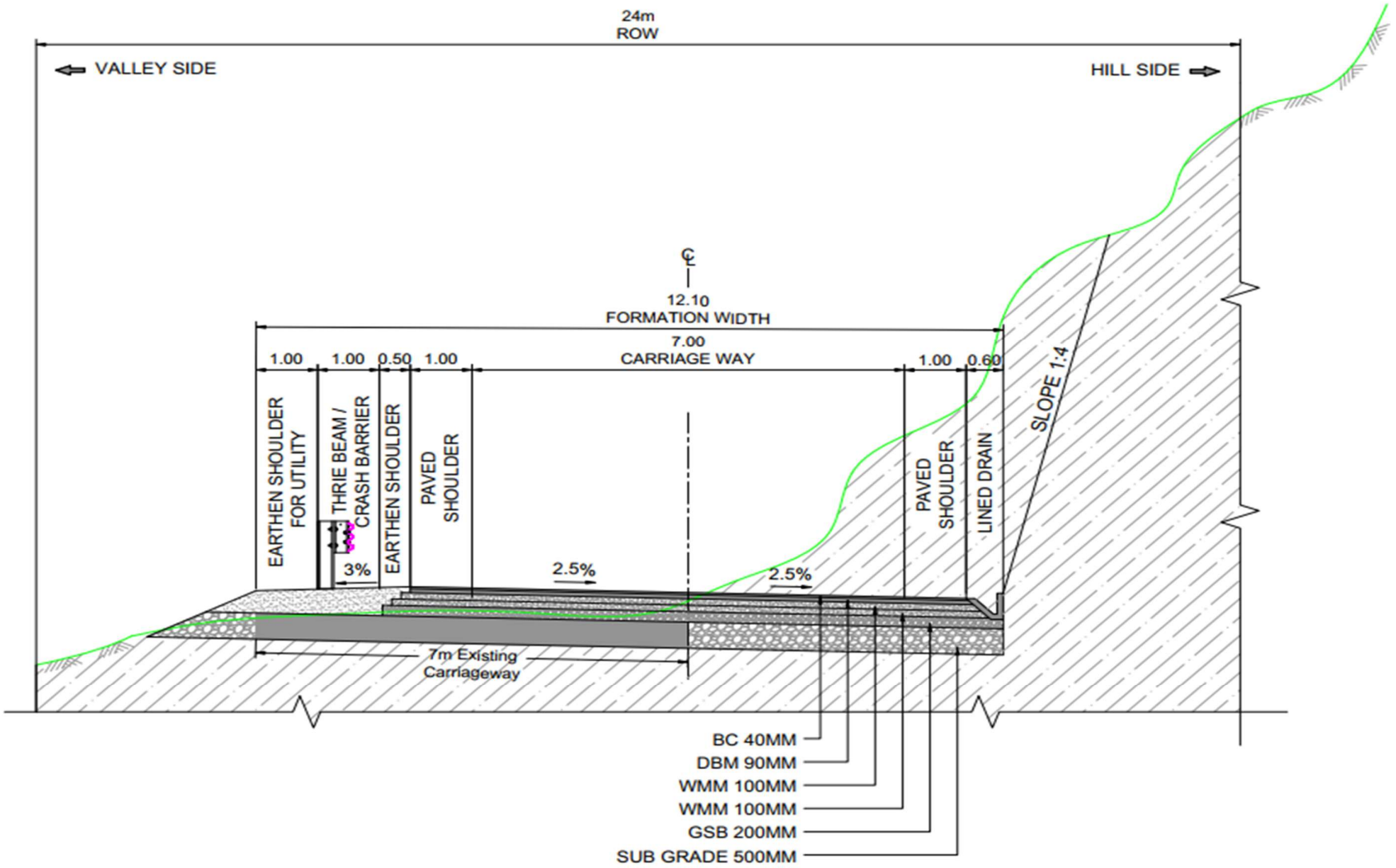
maintenance liability shall rest with the Utility Owning Department after handing over process is complete as far as utility shifting works are concerned.

Note -II Copy of utility shifting plans enclosed as Annexure-II to Schedule B1.

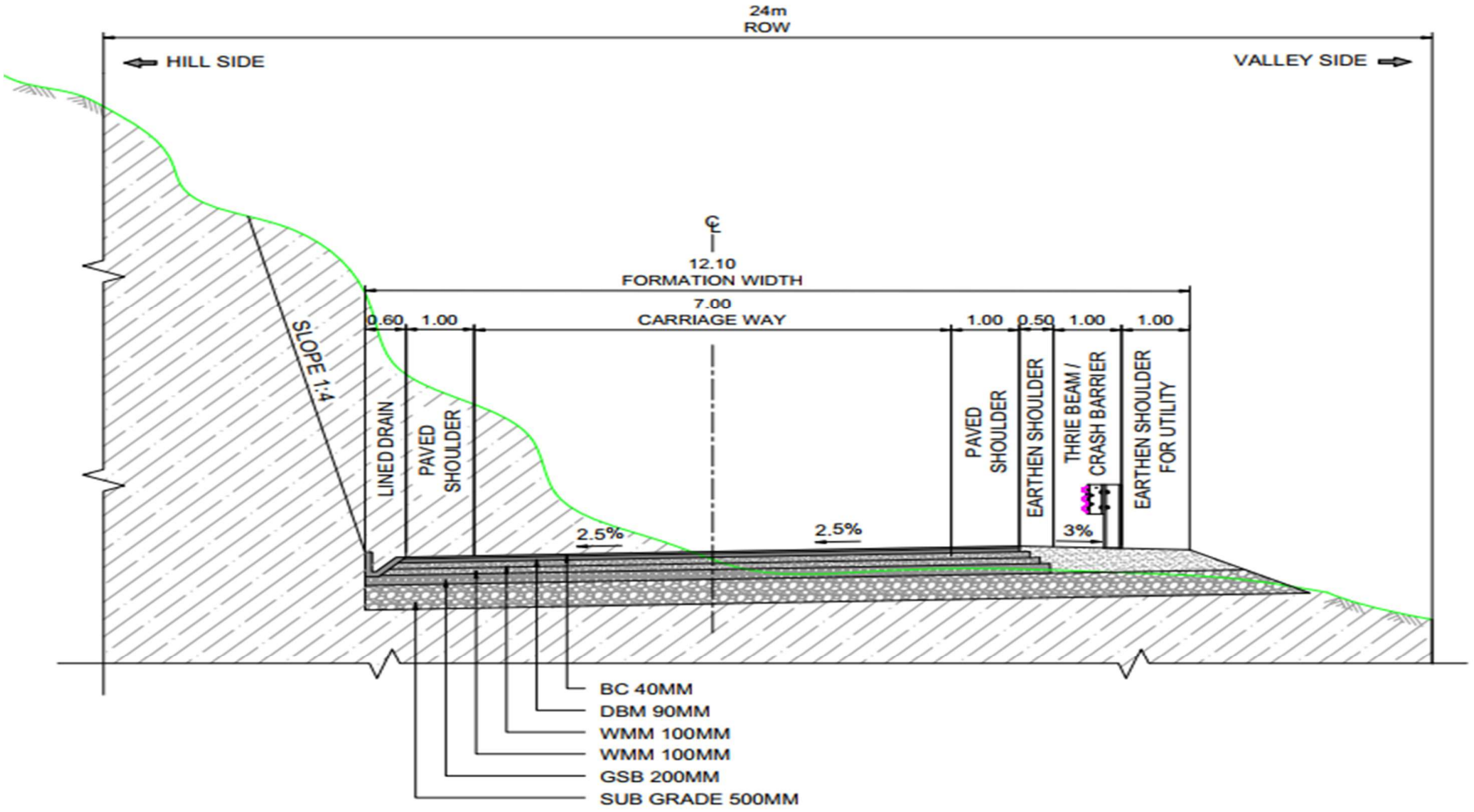
Typical Cross Section



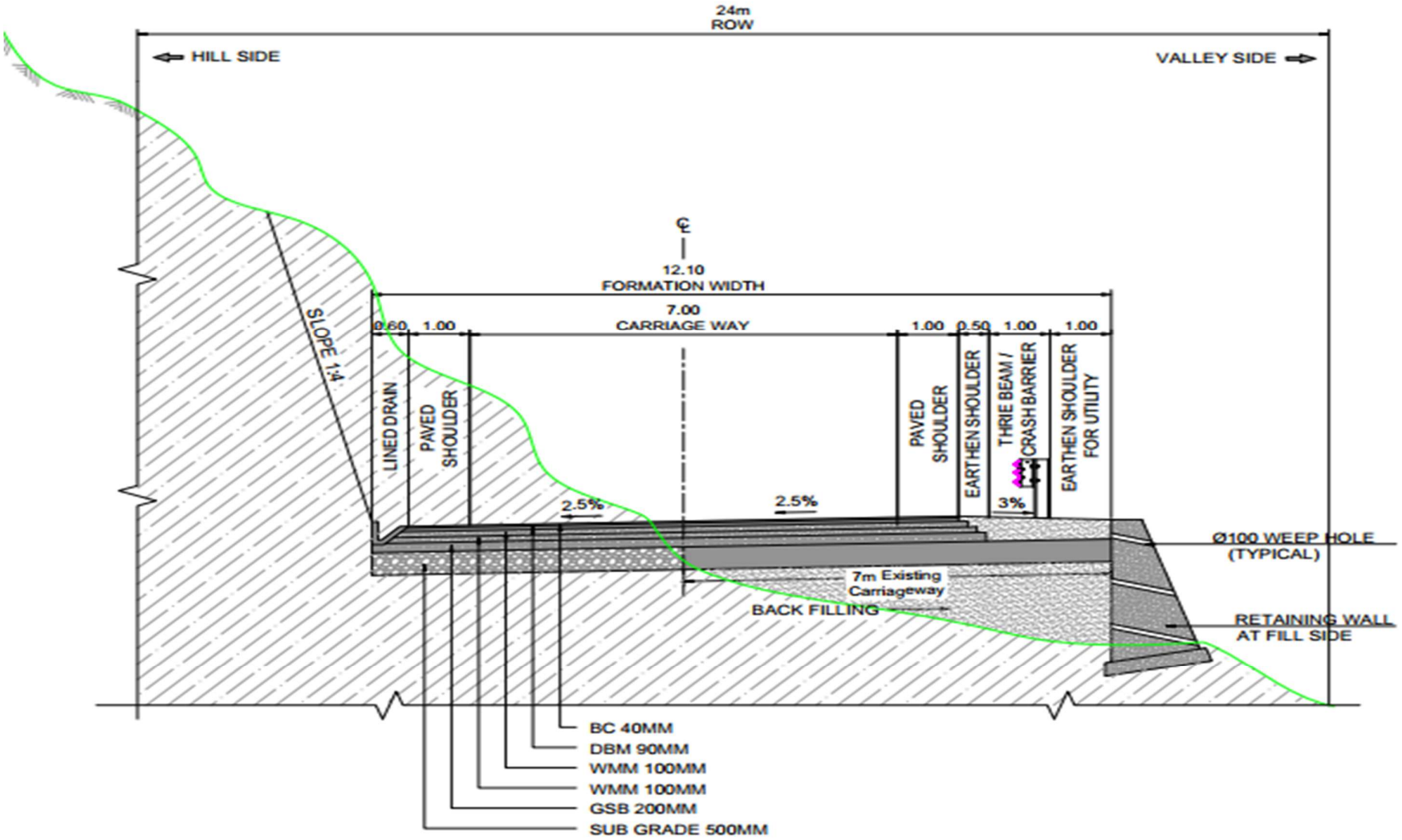
TYPICAL CROSS SECTION-1
2 LANE HIGHWAY (OPEN COUNTRY MOUNTAINOUS/ STEEP TERRAIN) HILL SIDE SLOPE(LHS) AND VALLEY SIDE SLOPE(RHS)



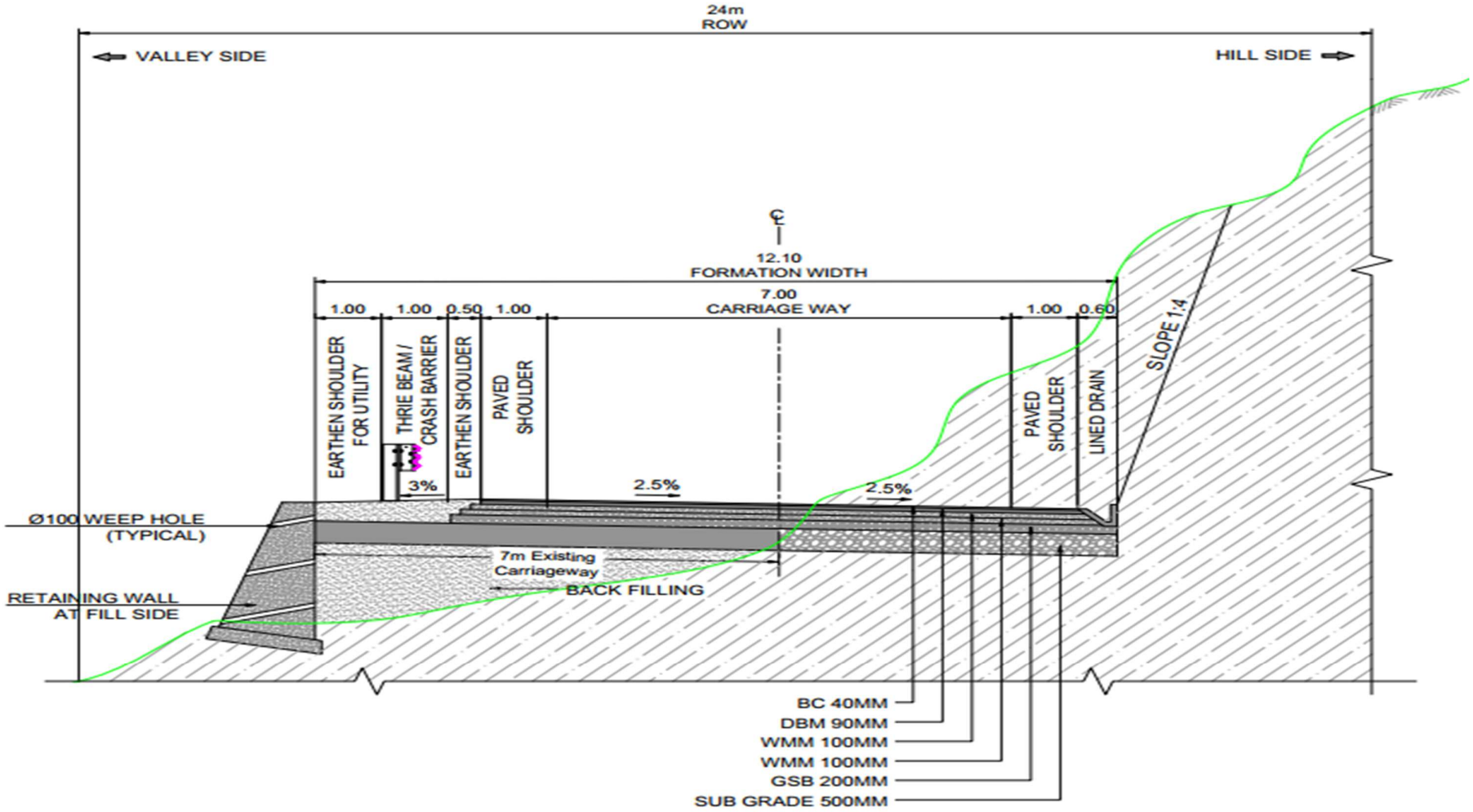
TYPICAL CROSS SECTION-1A
2 LANE HIGHWAY (OPEN COUNTRY MOUNTAINOUS/ STEEP TERRAIN) VALLEY SIDE SLOPE(LHS) AND HILL SIDE SLOPE(RHS)



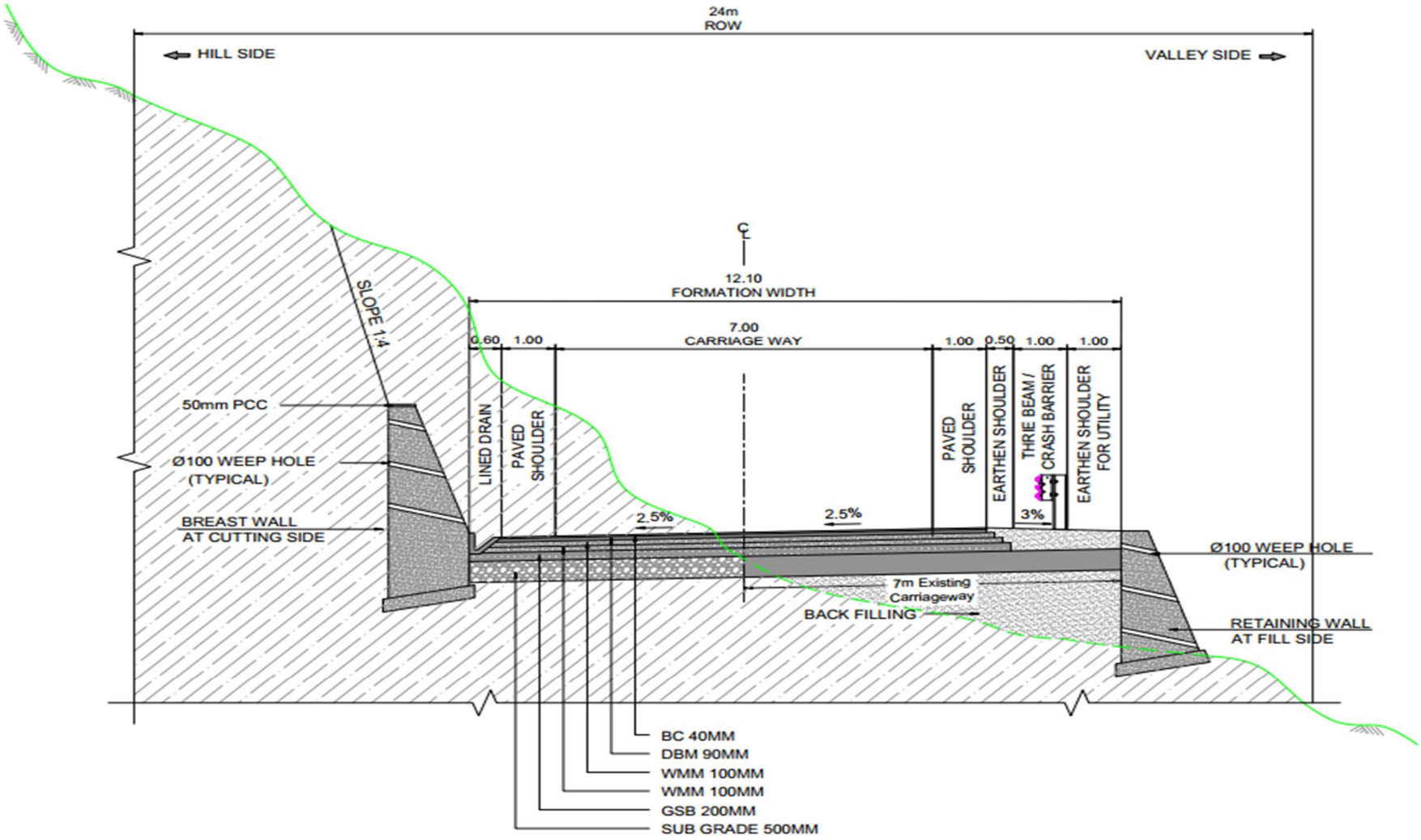
TYPICAL CROSS SECTION-1B
2 LANE HIGHWAY (OPEN COUNTRY MOUNTAINOUS/ STEEP TERRAIN) HILL SIDE SLOPE(LHS) AND VALLEY SIDE SLOPE(RHS) NEW CONSTRUCTION



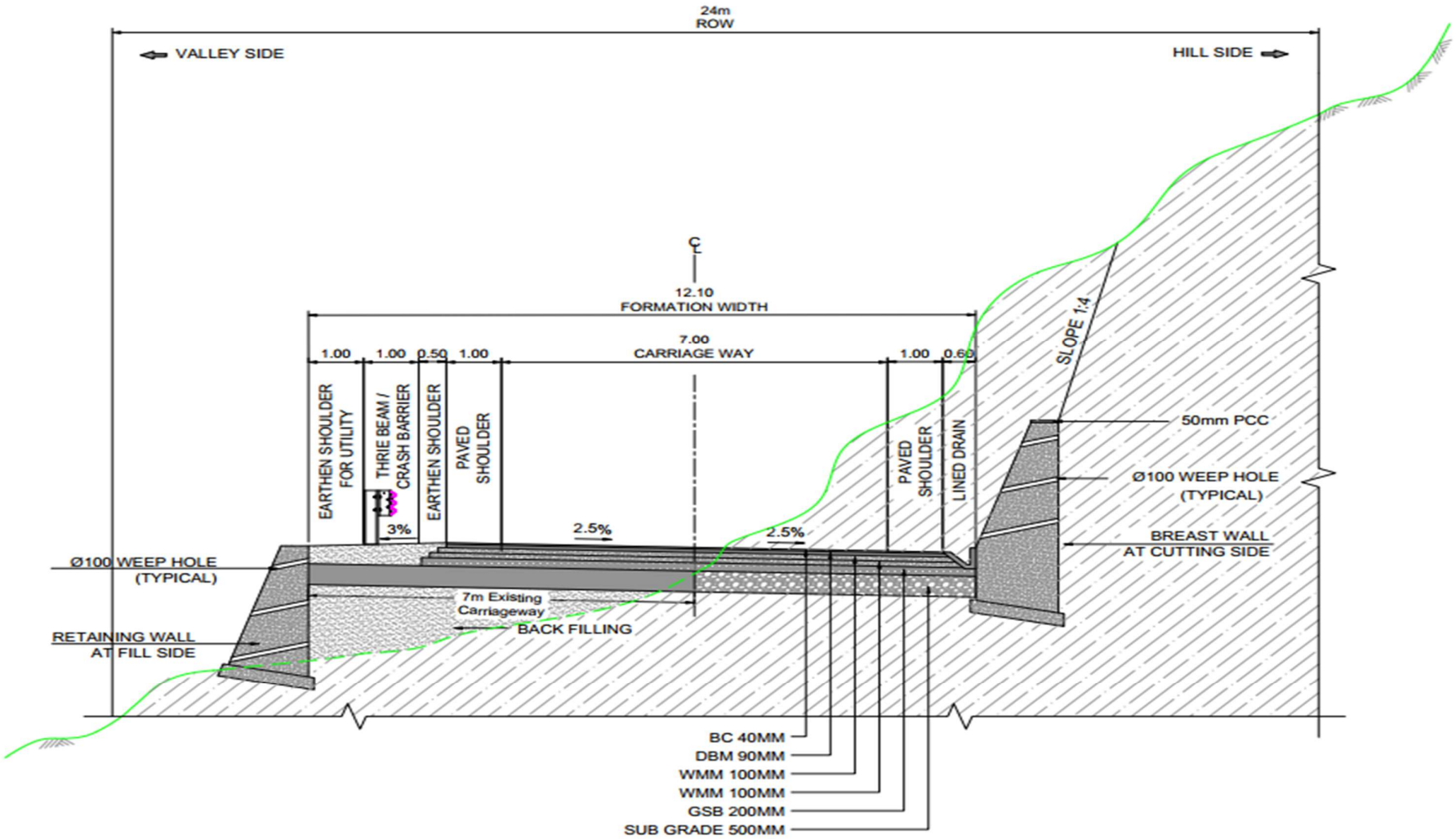
TYPICAL CROSS SECTION-2
2 LANE HIGHWAY (OPEN COUNTRY MOUNTAINOUS/ STEEP TERRAIN) HILL SIDE SLOPE(LHS) AND VALLEY SIDE RETAINING WALL(RHS)



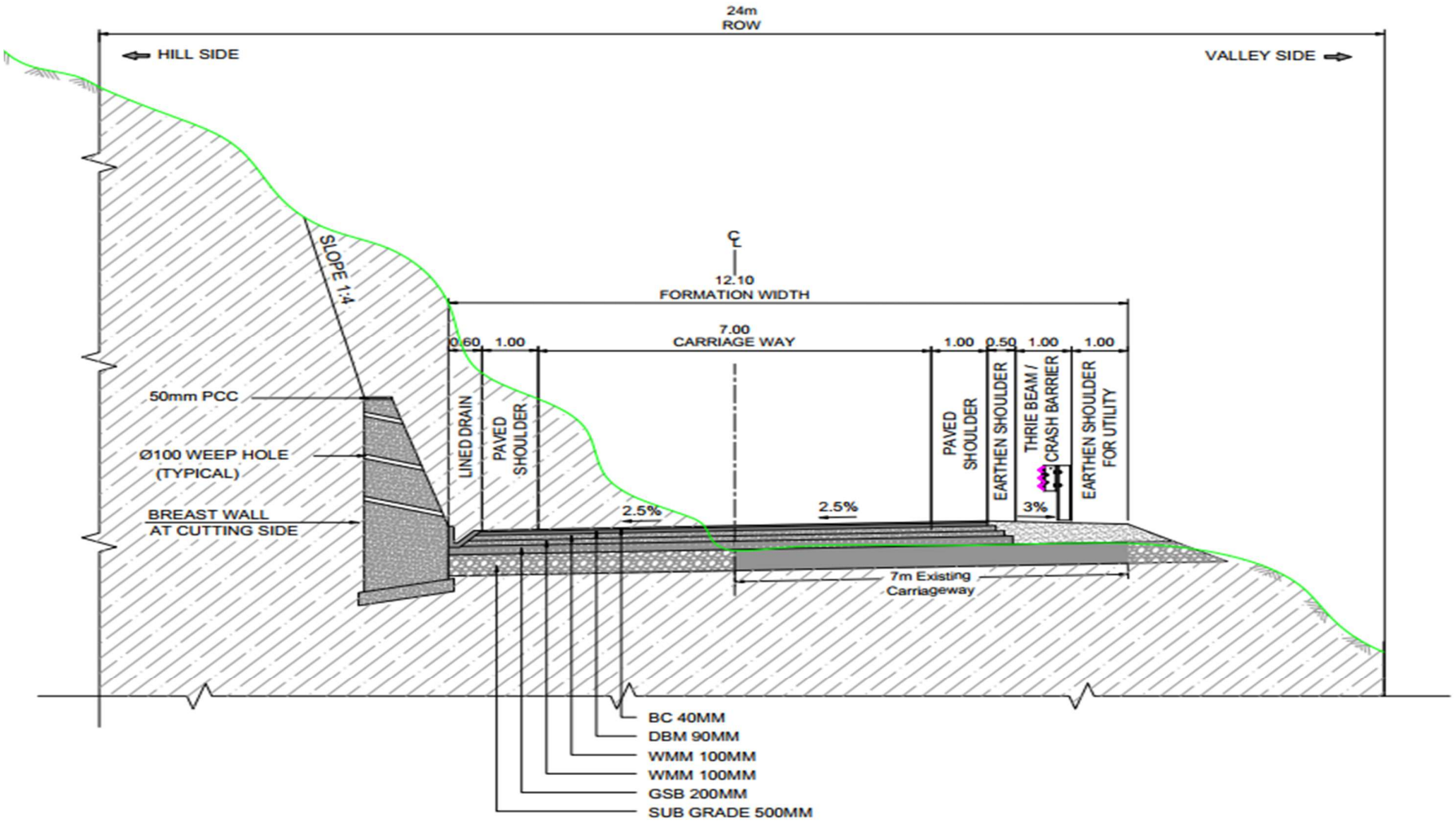
TYPICAL CROSS SECTION-2A
2 LANE HIGHWAY (OPEN COUNTRY MOUNTAINOUS/ STEEP TERRAIN) VALLEY SIDE RETAINING WALL(LHS) AND HILL SIDE SLOPE(RHS)



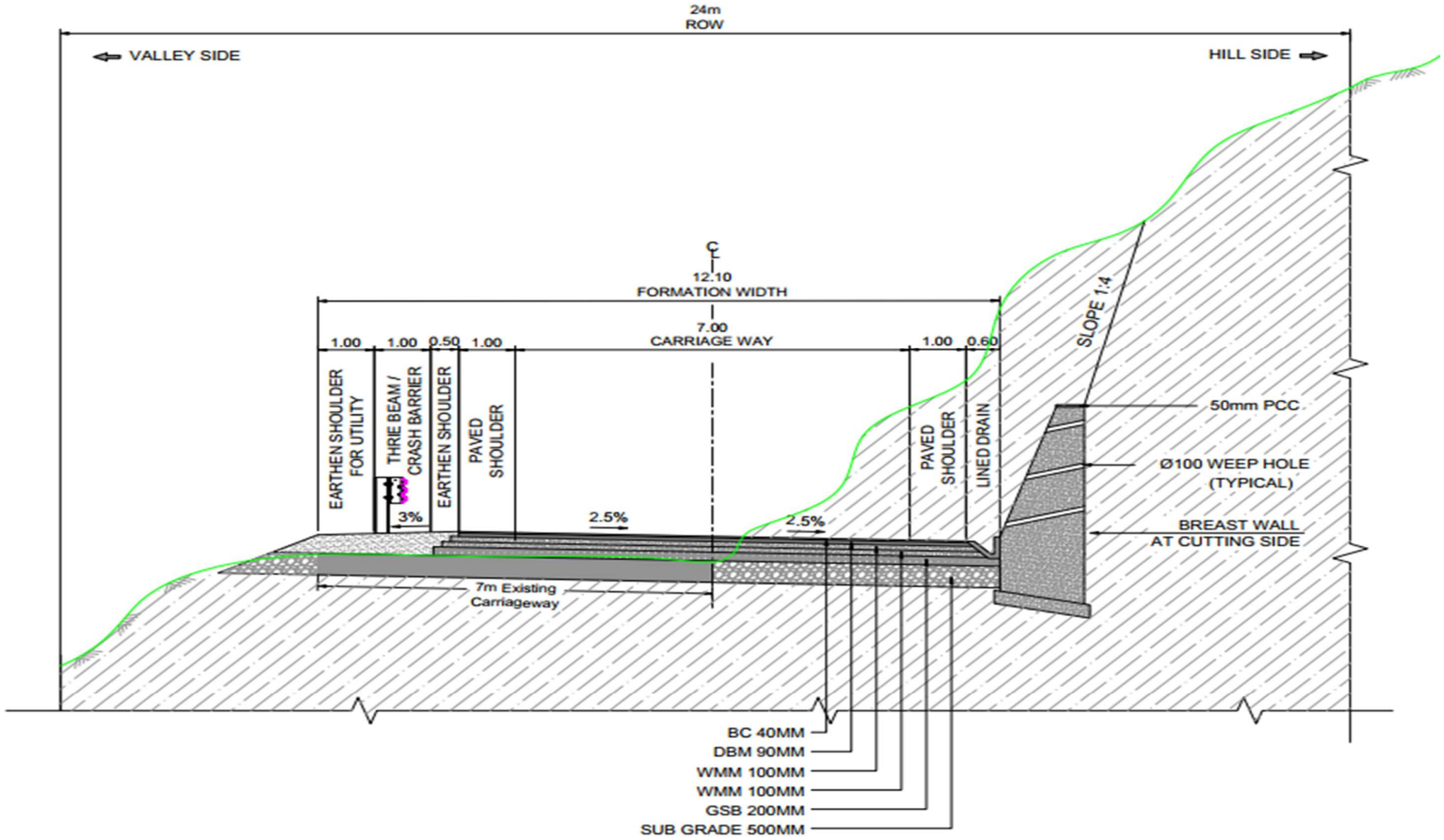
TYPICAL CROSS SECTION-3
2 LANE HIGHWAY (OPEN COUNTRY MOUNTAINOUS/ STEEP TERRAIN) HILL SIDE BREAST WALL(LHS) AND VALLEY SIDE RETAINING WALL(RHS)



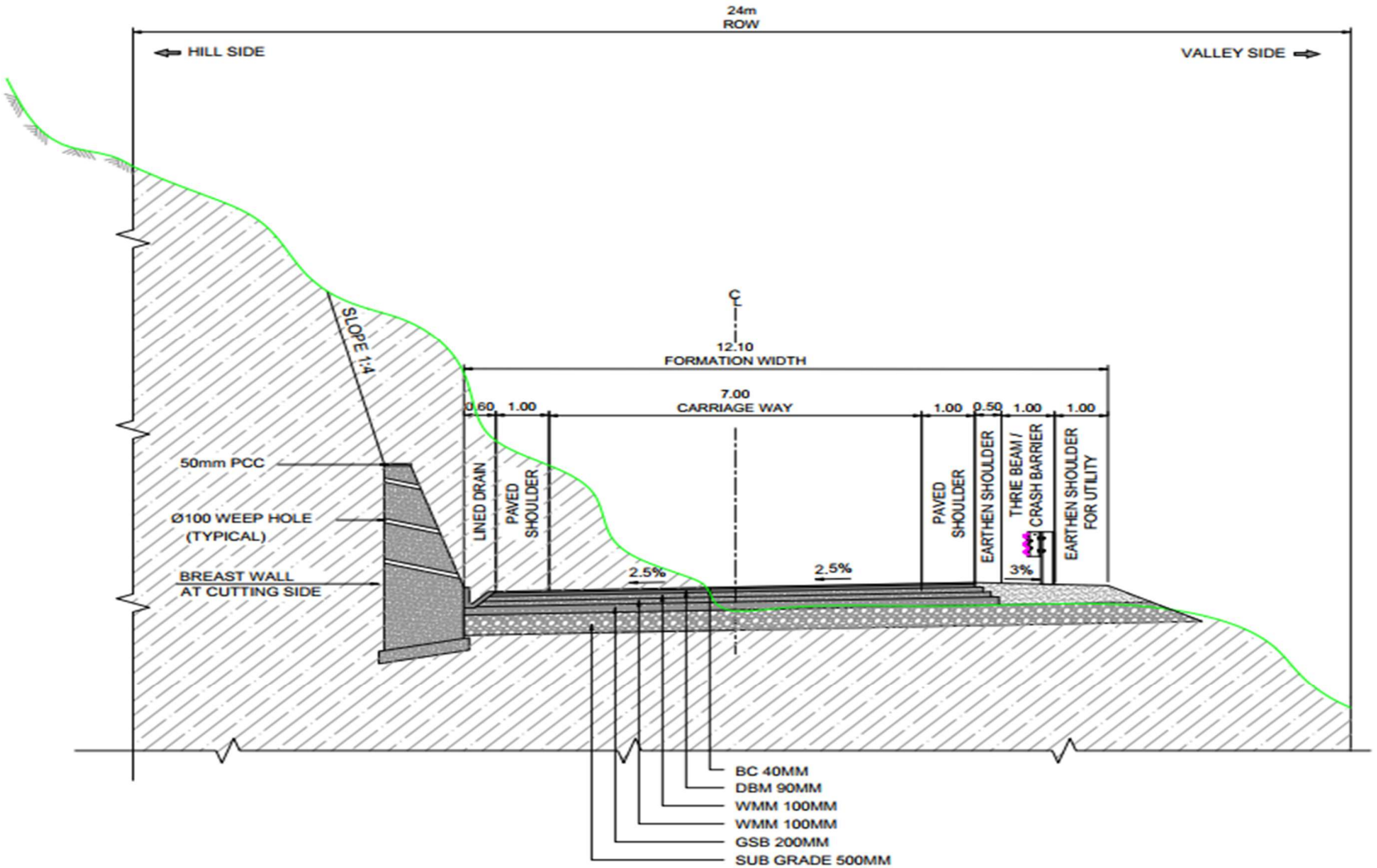
TYPICAL CROSS SECTION-3A
2 LANE HIGHWAY (OPEN COUNTRY MOUNTAINOUS/ STEEP TERRAIN) VALLEY SIDE RETAINING WALL(LHS) AND HILL SIDE BREAST WALL(RHS)



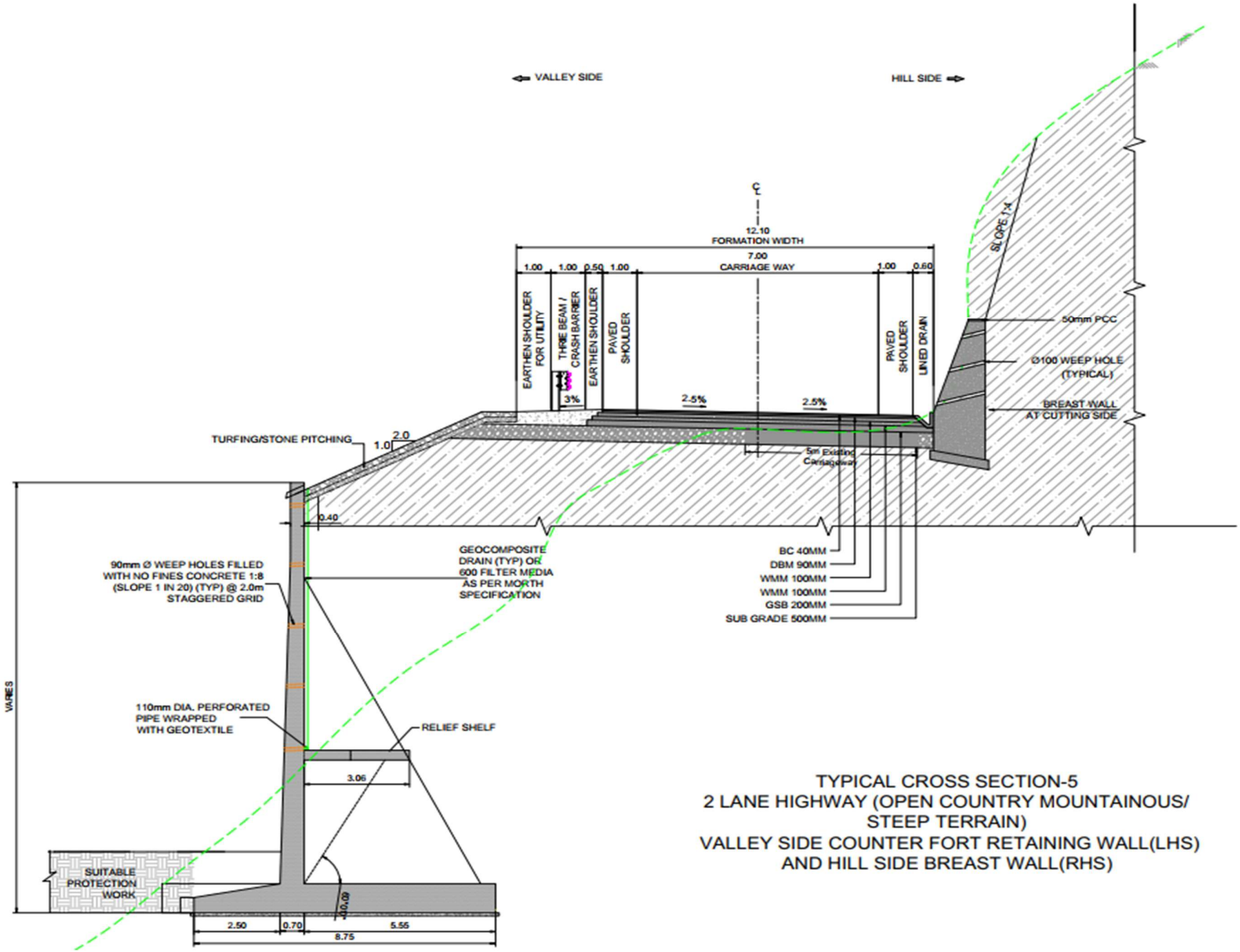
TYPICAL CROSS SECTION-4
2 LANE HIGHWAY (OPEN COUNTRY MOUNTAINOUS/ STEEP TERRAIN) HILL SIDE BREAST WALL(LHS) AND VALLEY SIDE SLOPE(RHS)



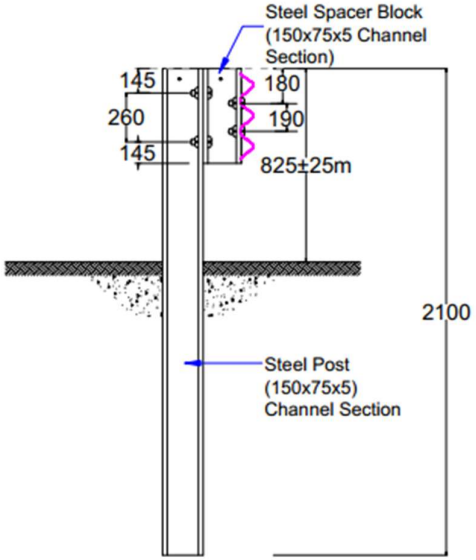
TYPICAL CROSS SECTION-4A
2 LANE HIGHWAY (OPEN COUNTRY MOUNTAINOUS/ STEEP TERRAIN) VALLEY SIDE SLOPE(LHS) AND HILL SIDE BREAST WALL(RHS)



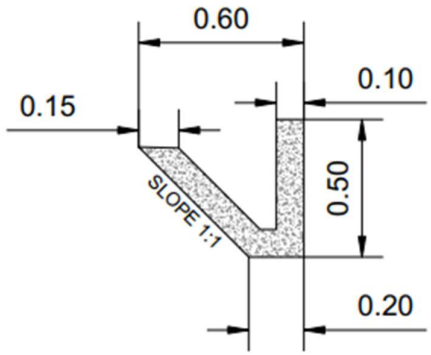
TYPICAL CROSS SECTION-4B
2 LANE HIGHWAY (OPEN COUNTRY MOUNTAINOUS/ STEEP TERRAIN) HILL SIDE BREAST WALL(LHS) AND VALLEY SIDE SLOPE(RHS)
NEW CONSTRUCTION



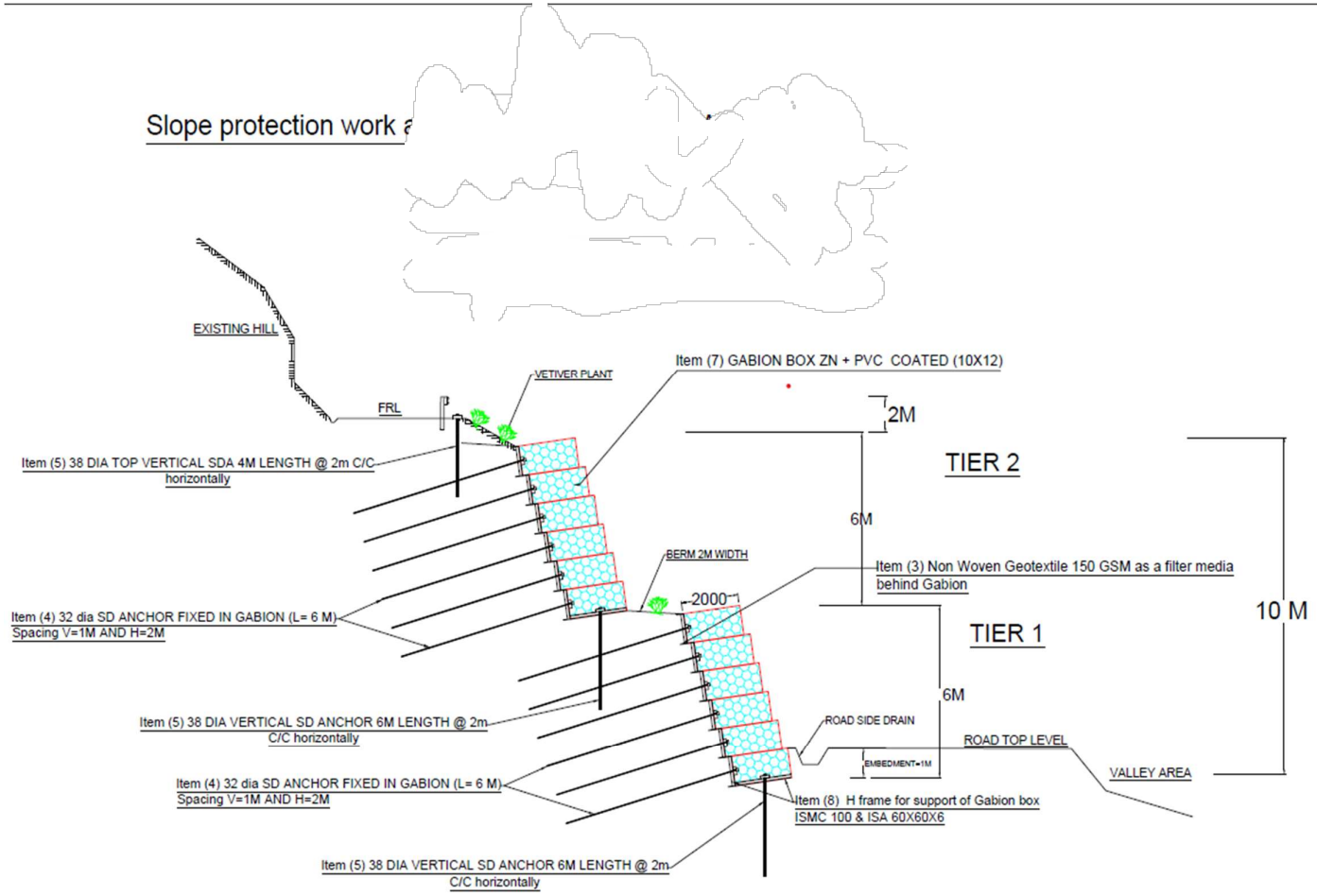
TYPICAL CROSS SECTION-5
2 LANE HIGHWAY (OPEN COUNTRY MOUNTAINOUS/ STEEP TERRAIN)
VALLEY SIDE COUNTER FORT RETAINING WALL(LHS) AND HILL SIDE BREAST WALL(RHS)



THRIE BEAM/
CRASH BARRIER



LINED DRAIN



SECTION 'A-A'

PROTECTION LENGTH=70M

SPECIFICATIONS:

1). Needle Punched and mechanically bonded non-woven Geotextile indigenously manufactured from high quality fibers on the prepared subgrade for Seperation 150 gsm

2). Self Drilling hollow soil/rock anchor of outer dia of 32 mm and inner dia of 18.5mm, yield load carrying capacity of minimum 230 kN in soil /overburden /rock suitable for, drilling placing and cement grouting

3). Gabion box for retaining structure with Mechanically Woven Double Twisted Hexagonal Shaped Wire mesh Gabion Boxes as per IS 16014:2012,MORTH Clause 2500, of required size, MeshType 10x12 (D=100 mm with tolerance of ± 2%) Zinc + PVC coated, DT Mesh wire diameter 2.7/3.7 mm, mechanically edged/selvedged with partitions at every 1m interval and shall have minimum 10 numbers of openings per meter of mesh perpendicular to twist, tying with lacing wire of diameter 2.2mm, supplied @ 3% by weight of Gabion boxes, filled with boulders with least dimension of 200 mm

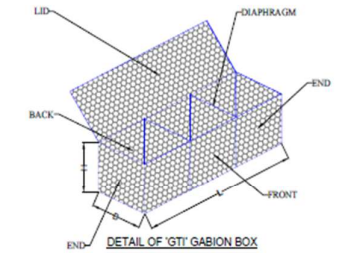
4). Self drilling Hollow soil / rock anchor of outer dia of 38 mm and Inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accesses such as 76 mm dia drill bit, couplers, 8mm thick base plate and nut and bolt complete in all. respect.

5). Structural steel work in single section, fixed with or without connecting plate, including cutting, hoisting, fixing in position and applyinga priming coat of approved steel primer all complete.

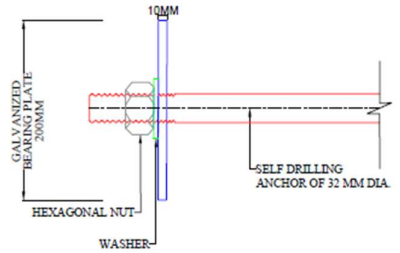
*Note :

1). As per site observations; the most critical section is 20m from OGL & **Average Inclination of slope = 700**

2). The given proposal in on site observations basis as suggested by an expert.



DETAIL OF 'GTI' GABION BOX



Detail of Item-(4)

Schedule - C

Schedule - C
(SeeClause2.1)

PROJECT FACILITIES

1. Project Facilities

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

~~(a) toll plaza;~~

(b) road side furniture;

~~(c) pedestrian facilities;~~

~~(d) tree plantation;~~

(e) truck lay-byes;

(f) bus bays and bus shelters;

~~(g) rest areas;~~

(h) Others to be specified: street lighting

2. Description of Project Facilities

Each of the project facilities is described below:

2.1 **Toll Plaza**

Toll plaza shall be designed as per the guidelines of manual and it is provided at following locations:

Sl.No.	Toll Plaza Location (Design Chainage in Km)
NIL	

2.2 Road side furniture

As described in Annex-I of Schedule-B, including the below mentioned facility:

2.2.1 Identification & boundary stones:

Sl. No.	Project facility	Location	Design requirements	Other essential details
1	5th Kilometer stones	Km 96+070 to 101+367	As per Manual and relevant IRC code.	-
2	Kilometer stones			
3	Hectometer stones			
4	Boundary stones			

2.3 Pedestrian facilities : Nil

2.4 Tree plantation : Nil

2.5 Truck lay-byes :

Sl.No.	Location	Design requirements	Other essential details
1	km 99+020 (RHS)	As per Manual and relevant IRC code.	-

2.6 Bus bays and bus shelters:

S.No.	Location	Design requirements	Other essential details
1	km 98+330 (RHS)	As per Manual and relevant IRC code.	-
2	km 100+350 (LHS)		

2.7 Rest areas : NIL

2.8 Others:

2.8.1 Street lightening:

S. No.	Location	Design requirements	Other essential details
1	At Junctions/Intersections, MJB, MNB and it's approaches, Bus Bay and Bus shelters, Truck Lay byes etc.	As per Manual and relevant IRC code.	Minimum 30 nos.

Schedule- D

Schedule - D

(See Clause2.1)

Specifications and Standards

1. **1. Construction:** The Contractor shall comply with the Specifications and Standards set forth in Annex-I of this Schedule-D for construction of the Project Highway.

2. **Design Standards:**

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

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

IRC-37: 2018 Guidelines for the design of flexible pavements

Code for Practice of Road Signs IRC- 67: 2022.

The Hill Road Manual IRC SP:48: 2023 should be referred.

The NGT Order dated 01.11.2018 should be followed for disposal of muck.

3. As regards, the work of utility shifting, the relevant specification, relevant rules, regulations and acts of Utility Owning Department/ Agencies shall be applicable.

Annex – I

(Schedule-D)

Annex-I Specifications and Standards for Construction

1. Specifications and Standards

All Materials, works and construction operations shall conform to the Manual of Specifications and Standards for Two-Lanning of Highways (IRC: SP:73), referred to as the Manual and MORTH Specifications for Road and Bridge Works. In addition, provisions of relevant Codes, Standards, Specifications, Guidelines etc. of IRC, MoRTH, AASHTO, ASTM, Euro Codes and British Codes shall also be referred. Where the specification for a work is not given, Good Industry Practice shall be adopted to the satisfaction of the Authority's Engineer.

1.1 Design Standards for special slope protection works

(i) Hill Road Manual IRC SP:48:2023

(ii) MoRT&HOM no. RW/NH-33044/55/2021-S&R (P&B)pt./Hill Slope Monitoring (Computer No. 219394), dated 28.11.2024

(iii) IRC- HRB- Special Report-23 -State of the Art: Design and Construction of Rock fall Mitigation systems.

(iv) IRC: SP: 42 – 2014, Guidelines of Road Drainage.

(v) IRC SP: 116-2018 – Guidelines for Design and Installation of Gabion Structures.

(vi) BS 8006-1:2010+A1:2016–Code of Practice for Strengthened /Reinforced Soil& other fills.

(vii) BS 8081:2015+A2:2018 – Code of Practice for Grouted Anchors.

(viii) FHWA-NHI-14-007 – Soil Nail Walls Reference Manual (FHWA GEC 007), 2015.

(ix) FHWA-IF-99-015 – Ground Anchors and Anchored System (GEC No. 4), 1999.

(x) IS 16014:2018, Mechanically Woven, Double-Twisted, Hexagonal Wire Mesh Gabions, Rivet Mattresses, Rock Fall Nettingand Other Products for Civil Engineering Purposes (Galvanized Steel Wire or Galvanized Steel Wire with Polymer Coating) — Specification.

(xi) IS 14268: 2017 - Uncoated Stress Relieved Low Relaxation Seven-Wire (Ply) Strand for Prestressed Concrete— Specification.

(xii) IS: 1893-1 (2016), —Criteria for Earthquake Resistant Design of Structure, Bureau of Indian Standards, and New Delhi.

(xiii) Ministry of Road Transport and Highways (MORTH), —Specifications for Road and Bridges Works – Fifth Revision.

(xiv) Geological, geotechnical& Geophysical investigations as per IRC: 78, Specifications for drilling, coring testing etc. issued by ISI. BIS, MoRT&H and other relevant codes are applicable.

(xv) Other Indian / International Standards applicable as per Good Industry Practice.

2. Deviations from the Specifications and Standards

(i) 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.

(ii) Notwithstanding anythingtothecontrarycontainedinParagraph1above, the following Specifications and Standards shall apply to the Project Highway, and for purposes of this Agreement, the aforesaid Specifications and Standards shall be deemed to be amended to the extent set for the below:

Clause Referred in Manual	Item	Provision as per Manual	Modified Provision	Remarks
2.2.1	Minimum design speed in hilly terrain.	40 kmph	At some locations listed below, where the horizontal curve radius is not meeting the criteria as per manual	Speed is restricted for Curve having radius less 50m.
2.6.1	Width of shoulders in mountainous and steep terrain (Hilly Area)	Paved shoulder (open country) = 1.50 m (each side) Earthen shoulder (open country) = 1.00 m (valley side)	As defined in clause 2 (vii) (b) of Annex-I of Sch-B	

The following Policy circulars of MoRTH shall be also complied:

Sl. No.	Policy circular No.	Dated	Subject
1	Efile No. RW/NH-33044/55/2021-S&R(P&B)Pt./ Hill slope monitoring (Computer No. 219394)	28th November 2024	Expert Committee Report on Cost Effective Long Term Remedial Measures for landslide prone areas in hilly regions.
2	Efile No. RW/NH-34066/09/2017/S&R(B) (Computer no. 185417)	12th February 2021	Reinforcing Steel Bars (Clause 1000.9.3.1 of Ministry's specification for Roads and Bridge Works).
3	E-file No. RW/NH-33044/22/2020-S&R (P&B) (Computer No. 186381)	4th June 2024	Width of shoulder (Paved earthen) for National Highways
4	Efile no. RW/NH-35072/05/2018-S&R(P&B) (Computer No. 165688)	19th April 2024	Recommended Bitumen type & grade for different climate &traffic loading for National Highway and Expressway works in India
5	Efile No. RW/NH-35072/05/2018-S&R(P&B) (E165688)	23rd August 2023	Use of Bitumen: Demand Supply, Type & grade, specifications, source of procurement and quality in construction of National Highway Projects
6	Efile No. RW/NH-36098/25/2022-S&R (P&)/Pt.	16th March 2023	Safety in road construction zone in National Highway Projects – effective and adequate measures to be taken
7	Efile No. RW/NH-36098/17/2022/S&R(B)	2nd January 2023	Provisions of crash barriers in existing bridge.

CURVE *DETAILS:*

Curve details where speed limit is restricted are given in the table below:

Sr. No.	HIP Chainage	Radius	Transition Length	SPEED (V) in KMPH	Super elevation e (%)	Extra Widening	Direction of curve
1	96152.446	30	0	20	5.93	1.500	Right
2	96256.933	60	15	30	6.67	1.200	Left
3	96350.031	100	35	40	7.11	0.900	Left
4	96503.121	70	20	35	7.78	0.900	Right
5	96658.857	60	25	35	9.07	1.200	Left
6	96790.887	40	15	20	4.44	1.500	Left

7	96871.379	80	15	30	5.00	0.900	Right
8	96956.396	45	20	30	8.89	1.200	Right
9	97084.985	35	20	25	7.94	1.500	Left
10	97176.397	80	25	35	6.81	0.900	Right
11	97389.817	150	15	40	4.74	0.600	Left
12	97464.372	250	15	50	4.44	0.600	Right
13	97591.742	300	15	50	3.70	0.600	Left
14	97732.834	60	15	30	6.67	1.200	Left
15	97828.773	60	15	30	6.67	1.200	Right
16	97916.292	120	25	40	5.926	0.600	Left
17	98103.936	140	25	40	5.079	0.600	Left
18	98230.473	26	15	20	6.838	1.500	Right
19	98270.572	26	0	20	6.838	1.500	Right
20	98357.919	80	15	30	5.000	0.900	Left
21	98437.140	90	25	40	7.901	0.900	Right
22	98598.176	60	25	35	9.074	1.200	Left
23	98688.815	250	15	50	4.444	0.600	Right
24	98789.891	250	15	50	4.444	0.600	Left
25	98932.578	70	25	35	7.778	0.900	Right
26	99046.912	120	15	40	5.926	0.600	Left
27	99184.459	80	15	30	5.000	0.900	Right
28	99244.516	50	20	30	8.000	1.200	Left
29	99300.659	120	15	40	5.926	0.600	Right
30	99369.721	80	15	30	5.000	0.900	Left
31	99470.255	75	15	30	5.333	0.900	Right
32	99562.867	120	15	40	5.926	0.600	Left
33	99687.305	80	15	30	5.000	0.900	Right
34	99801.120	30	15	20	5.926	1.500	Left
35	99847.880	30	0	20	5.926	1.500	Left
36	99985.199	150	15	40	4.741	0.600	Left
37	100131.816	80	15	30	5.000	0.900	Right
38	100210.285	80	15	30	5.000	0.900	Left
39	100378.903	100	15	35	5.444	0.900	Right
40	100536.225	150	15	40	4.741	0.600	Right
41	100587.090	120	25	40	5.926	0.600	Left
42	100684.453	55	15	25	5.051	1.200	Left
43	100787.554	60	15	30	6.667	1.200	Right
44	100866.796	80	15	30	5.000	0.900	Left
45	100985.367	120	15	40	5.926	0.600	Left
46	101103.005	30	15	20	5.926	1.500	Right
47	101195.384	150	15	40	4.741	0.600	Left
48	101292.982	90	15	35	6.049	0.900	Right
49	101353.634	60	0	30	6.667	1.200	Left

3. ***Technical Specification:***

- ***Counter-fort Retaining wall***

  - **Design Standards**

I. **Codes and Standards:** Design should comply with relevant codes like ACI 318 (for concrete), BS 8110, Eurocode 2, or IS 456 for design and construction.

II. **Load Considerations:** Consider lateral earth pressure, surcharge loads, seismic forces, and other environmental factors.

III. **Safety Factors:** Apply appropriate safety factors as per the design code.

  - **Materials**

I. **Concrete Grade:** Minimum M25 or C30 for reinforced concrete.

II. **Reinforcement Steel:** High-yield strength deformed bars conforming to ASTM A615, IS 1786, or equivalent.

III. **Cement:** OPC 43/53 grade or equivalent.

IV. **Aggregate:** Clean, well-graded aggregate conforming to IS 383 or equivalent.

  - **Structural Details**

I. **Reinforcement:**

Vertical bars: Main reinforcement to resist bending moments.
Horizontal and inclined bars: Ties and distribution steel to control shrinkage and temperature effects.
Adequate anchorage and lap lengths as per design standards.

II. **Concrete Cover:** Minimum 40 mm for reinforcement to protect against corrosion.

III. **Footing Design**: Base slab must be designed to distribute loads from the counterforts uniformly to the foundation soil.

- **Construction Considerations**

I. **Formwork:** Ensure smooth, properly aligned formwork to achieve desired dimensions and prevent honeycombing.

II. **Curing:** Proper curing for a minimum of 7-14 days to achieve adequate strength.

III. **Construction Joints:** Located at points of minimum shear, with shear keys or dowels for continuity.

IV. **Quality Control:** Test concrete and steel samples for strength and quality compliance.

- **Drainage and Waterproofing**

I. Provide weep holes or drainage pipes at regular intervals to prevent hydrostatic pressure buildup behind the wall.

II. Use waterproofing membranes or coatings to protect the wall from seepage.

- **Maintenance**

I. Regular inspections for cracks, spalling, and water seepage.

II. Apply protective coatings periodically to reduce corrosion risks.

➢ ***Slope protection (Self Drilling Anchoring Work):***

ISO certified SDA shall be arranged as specified in the drawings in order to stabilize in-situ strata. The grout shall be made of OPC grade 53 with suitable admixtures. The SDA, nuts, bearing plates and couplers shall be epoxy coated. In-house testing facility of the manufacturer shall have NABL, GAI-LAP certifications.

Drilling shall be carried out by suitable equipment. Diameter of SDA shall be 32 (inner dia-18.5mm)& 38 mm (inner dia-19.0mm) as specified. The SDA shall be made of tensile strength of min. 400 kN. The SDA rod shall be continuously threaded. For convenience of installation, appropriate arrangement (coupler) shall be made to connect two smaller lengths of SDA to achieve the required length.

Installation guideline

a. **Scaling works**: All the loose debris & unwanted materials are to be properly removed from the surface of slope and in the location of SDA applications.

b. The SDA is driven in the required position with help of sacrificial drill bit at the bottom of the anchor bar which facilitates in drilling the hole. The minimum diameter, minimum length and minimum spacing of SDA shall be as specified or site requirement. Additional length and/or spacing of anchoring/nailing shall be carried out as per site condition and as directed by Authority/Authority's Engineer.
c. The grout is pumped through the hollow bar during the drilling process. Grouting shall be done by using OPC grade 53 along with addition of suitable admixture. Mixing shall be done along with potable water so as to form the cementitious paste.
d. The base plates of size 200mm x 200mm x 10 mm shall be placed at interface for tightening the nuts.
e. The fascia (if applicable) shall be installed in front and connected to the steel rods with base plate and nuts.

Following equipment deployed on site
1) Grout agitator
2) Compressor – 450 to 600CFM
3) Drilling equipment percussion/rotary type
4) Any other required equipment.

Expansive plasticizing agent for cement grouts shall be used, typical brand name DR. FIXIT PIDICRETE AM is a shrinkage compensating grout admixture for pressure grouting or similar brand with same properties.

Technical Specification of Mechanically Woven Double Twisted Hexagonal Shaped Wire Mesh netting roll, Mesh Type 10x12, Zn + PVC coated Mesh Wire dia. 2.7/3.7mm (ID/OD), end of roll mechanically edged / selvedged, with galvanization as per IS 16014:2012 and MoRTH (Fifth Revision) 2013, Clause 2500.

Scope:

This specification covers the use of mechanically woven hexagonal shaped double twisted (DT) wire mesh rock fall netting for surface rock fall protection including the scope of furnishing and installation as per the special provisions mentioned in the specifications, instructions from the manufacturer/supplier of the rock fall protection system and as directed by the Engineer- In-Charge.

General Requirements:

The DT wire mesh rock fall netting shall meet the minimum requirements of mechanically woven DT hexagonal shaped zinc and PVC coated wire mesh mainly mesh wire diameter, mesh type, zinc coating, PVC coating, wire tensile strength and mesh panel tensile strength as specified in this document.

System Technology:

The DT wire mesh rock fall netting shall be made up of mechanically woven hexagonal DT wire mesh. The steel wire shall be heavily zinc coated soft temper steel. PVC coating shall be applied for added protection, to use in corrosive environment. Nominal PVC thickness of 0.50mm shall be applied. The hexagonal shape of the mesh provides a better distribution of the working tensions along the wires that form the mesh.

Zn + PVC Coated
Hexagonal wire mesh

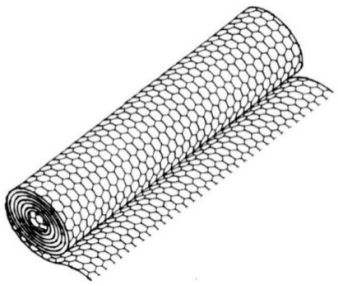


Figure 1 Typical Wire Mesh Rock fall Netting

Material Specifications:

Mechanically Woven Double Twisted Hexagonal shaped Zn + PVC coated wire mesh: All steel wires used in the manufacturing of wire mesh rock fall netting shall conform to IS 16014:2012. The wire used for the manufacture of mesh shall have a tensile strength between 350-550N/mm2 and elongation shall not be less than 10%. Test shall be carried out on a sample of at least 20 cm length. All tests on the mesh wire, selvedging wire & lacing wire shall be performed prior to manufacturing the mesh. The DT wire mesh shall have peak tensile strength of 40 kN/m tested as per procedure outlined in clause 6 of this specification.

Selvedge wire: The diameter of the selvedging shall be bigger than the wires in the mesh. The diameter of selvedge wire shall be 3.4mm and shall have same characteristics as the mesh wire.

Lacing wire: The diameter of the lacing wire shall be 2.2 mm and shall have same characteristics as the mesh wire and shall have same characteristics as the mesh wire.

Zinc coating

Zinc coating: Minimum quantities of Zinc shown at Table 1 shall meet the requirements of IS 4826:1979.

Adhesion of zinc coating: The adhesion of the zinc coating to the wire shall be such that, when the wire is wrapped ten turns around a mandrel having four times the diameter of the wire, it does not flake or crack when rubbing it with the bare fingers in accordance with IS 4826:1979.

PVC (Polyvinyl Chloride) coating

a. PVC coating thickness: Nominal – 0.5 mm, Minimum – 0.4 mm;
b. Specific weight: 1.3 kg/dm3 – 1.35 kg/dm3 in accordance with IS 13360, Part3, section 1.
c. Hardness: between 50 and 60 Shore D, according to IS 13360, Part5, section 11
d. Tensile strength: Higher than 20.6 MPa, according to IS 13360, Part5, section 1
e. Elongation at break: not less than 200% in accordance with IS 13360, Part5, section 1.5.
f. Colour: Grey - RAL 7037.

Wire diameter, tolerances, zinc coating shall conform to values indicated in Table 1:

Table 1 Characteristics of Mesh wire, Selvedge wire and Lacing wire

Characteristicsof 10x12mesh	Mesh wire	Selvedge wire	Lacing wire
MeshWireDiamm	2.7	3.4	2.2
Tolerance(+/-)mm	0.07	0.09	0.06
ZnCoatingMin (gm/sq.m)	260	270	240

The wire mesh shall have nominal opening of 100mm as shown in Figure 2. The mesh opening tolerances are indicated in Table 2.

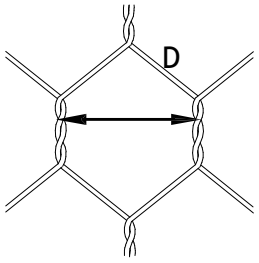


Figure 2 Mesh Details

Tolerances in Mesh Opening size: - 2% to +2%

DT mesh shall have minimum 10 numbers of mesh openings per meter of mesh perpendicular to twist of mesh.

Procedure for verification of mesh opening.

Rockfall netting shall be unfolded on the plain ground.
Any shrink in the unfolded netting shall be removed, by stretching the Mesh panel.
Marking on the ground shall be made from the Centre of the twist of one mesh and the second.
Marking shall be done at 1 m distance.
The number of mesh Openings in the 1 m shall be counted & verified.

Table 2 Standard Mesh

Mesh type	"D" (mm)	Tolerance	MeshPanelStrength (paralleltotwist)	Zinc+PVCcoated Diameterof wire(Inner/Outer wire)		
				Mesh wire(mm)	Selvedgewir (mm)	Lacing wire(mm)
10X12	100mm	- 2%to +2%	40kN /m	2.7/3.7	3.4/4.4	2.2/3.2

Dimensions of DT wire mesh

DT wire mesh shall be manufactured in a standard width of 4m and length of 25 or 50m with tolerance of ±5%.Table 3 indicates standard sizes of DT wire mesh rock fall netting other roll sizes may be required as per site conditions subject to the Engineer's approval. For non-standard roll lengths there may be some variation outside the tolerance limit from the nominal size shown in the contract drawings.
Table 3 Standard sizes of DT wire mesh rock fall netting

Type	Length (m)	Width (m)
DT wiremesh(Mesh10x12)	25	4
	50	4
	100	4

Installation:

Vegetation, debris and loose soils and other deleterious matter shall be cleared to the satisfaction of Authority Engineer. Reference benchmarks, line and levels shall be marked at site. The materials, tools and tackles shall be shifted to site without damaging system.

The rolls of DT wire mesh rock fall netting should be rolled down the surface from top anchoring system as per the contract drawings. New roll shall be placed in the same manner directly overlapping the adjacent roll such that longitudinal ropes of both the rolls can be laced together by hand. Lacing shall commence by twisting end of the lacing wire tightly to the wire mesh. It shall then pass round the two edges being joined using alternate single and double loops at approximately 100mm intervals. The lacing wire shall be securely tied off at the bottom of the roll. The bottom anchoring shall be done as per the drawings.

Manufacturer's installation guideline shall be referred for details.

Testing and Acceptance criteria:

Testing shall be done on raw material as per codes specified in Table 4. Approval for the material shall be obtained in the writing from the Engineer before actual start of supply. The manufacturer of the DT wire mesh rock fall netting shall provide manufacturers test certificate for the material with every lot/shipment. The manufacturers test certificate for DT wire mesh rock fall netting shall be provided for certifying that rock fall protection system conforms to all the technical and special requirements.

The punch strength test results shall be 19kN in accordance with MoRTH section 2500 and test specified therein.

DT wire mesh tensile strength test procedure

A tensile test on DT wire mesh sample shall be carried out in order to estimate tensile strength parallel to twist. The test shall be carried out as per procedure outlined below. The DT wire mesh tensile strength shall be minimum 40 kN/m.

a. Take a DT wire mesh of approximately 1.0 m width. The sample shall have edge wire on both the sides.

b. The height of the sample shall be such that after selvedging on both the sides, effective height of the sample shall be more than 300 mm. Sample shall be loaded on the UTM in a direction parallel to twist, with the samples being gripped as shown in the figure 3.

c. The effective height of sample (gauge length) shall be the distance measured between the two rows of inner gripping pins on two grips.

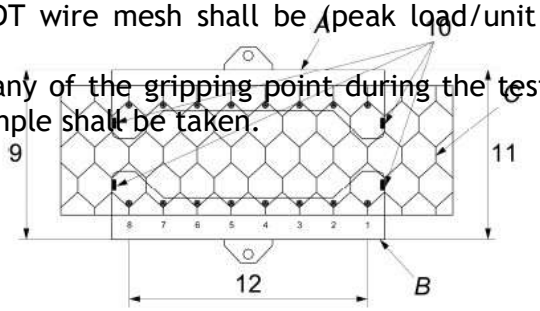
d. Distance between the two end gripping points (pins) along the width of the sample shall be recorded as the unit width under test. The width shall be at least 700 mm.

e. The load shall be applied gradually to the sample and the test be continued till the break point.

f. The peak load and the % elongation shall be recorded.

g. The strength of the DT wire mesh shall be (peak load/unit width under test) expressed in kN/m.

NB. If the sample slips at any of the gripping point during the test, such a test shall be discarded and a new sample shall be taken.



Key

1 to 8	Steel hooks	12	Effective width
9	Left reading	*A*	Upper steel plate
10	Lateral hooks	*B*	Underneath steel plate
11	Right reading	*C*	Mesh sample

Figure 4 Tensile strength of mesh panel

PVC coating thickness test procedure:

The thickness of the PVC coating shall be determined on a randomly chosen individual piece of wire removed from the coil at 3 places 1 metre apart.

Measure with a micrometre the diameter of the galvanized steel wire with PVC coating. Determine the thickness of the PVC coating by stripping the PVC coating from the wire and measure the reduced diameter with a micrometre. The thickness

of the coating is the difference between the diameter of the galvanized steel wire with PVC coating and the measured diameter of the galvanized steel wire divided by two. The thickness values should be as per clause 3.e. While removing the PVC coating by stripping, take care not to remove any of the metallic surfaces.

Table 4 Testing Plan

Sr.No	Test	Reference	Frequency of Testing	Sample size	Remarks
	MESHWIRE				
1	Tensile strength &Elongation%	IS 16014:2012	Once	Three	
2	MassofZinc& adhesion	IS4826:1979	Once	Three	
3	DT wiremeshpanel strength	Clause1.6	Once	Three	
4	Physicaldimensionof Wire meshrockfallnetting	TDS,Visual checking			
5	PVCcoatingthickness	Clause1.3.5	Once	Three	
Note:	Testingofwireshallbedoneon samplesfromrawmaterial				

Schedule - E

(See Clauses 2.1 and 14.2)

Maintenance Requirements

1. Maintenance Requirements

i. The Contractor shall, at all times maintain the Project Highway inaccordance with the provisions of this Agreement, Applicable Laws andApplicable Permits.

ii. The Contractor shall repair or rectify any Defect or deficiency set forth in Paragraph2ofthisSchedule-Ewithinthetimelimitspecifiedthereinandany failure in this behalf shall constitute non-fulfilment 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 Terminationthereof.

iii. All Materials, works and construction operations shall conform to the MORTH Specifications for Road and Bridge Works, and the relevant IRC publications.Wherethespecificationsforaworkarenotgiven,GoodIndustry Practice shall beadopted.

2. Repair/rectification of Defects and deficiencies

iv. 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

v. 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

vi. 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

vii. 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

viii. 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

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

8. Repairs on account of natural calamities

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

Annex – I

(Schedule-E)

Annex-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 of Grade structure, approaches of connecting roads, slip roads, lay byes etc. as applicable)	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
	Cracking	Nil	< 5 % subject to limit of 0.5 sqm for any 50 m 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 Scale, Tape, odometer etc.		2-7 days	IRC:82-2015
	Bleeding	Nil	< 1 % of area	Daily			3-7 days	MORT&H Specification 3004.4
	Ravelling/ Stripping	Nil	< 1 % of area	Daily			7-15 days	IRC:82-2015 read with IRC SP 81
	Edge Deformation / Breaking	Nil	< 1 m for any 100 m section and width < 0.1 m at any location, restricted to 30 cm from the edge	Daily			7- 15 days	IRC:82-2015
	Roughness BI	2000 mm/km	2400 mm/km	Bi-Annually	Class I Profilometer SCRIM (Sideway-force	Class I Profilometer : ASTM E950 (98) :2004 –Standard Test Method for measuring Longitudinal Profile of Travelled	180 days	IRC:82-2015
	Skid Number	60SN	50SN	Bi-Annually			180 days	BS: 7941-1: 2006

<table>
<tr><th rowspan="2">Asset Type</th><th rowspan="2">Performance Parameter</th><th colspan="2">Level of Service (LOS)</th><th>Frequency of Inspection</th><th>Tools/Equipment</th><th>Standards and References for Inspection and Data Analysis</th><th>Time limit for Rectification/Repair</th><th>Maintenance Specifications</th></tr>
<tr><th>Desirable</th><th>Acceptable</th><th></th><th></th><th></th><th></th><th></th></tr>
<tr><td rowspan="3"></td><td>Pavement Condition Index</td><td>3</td><td>2.1</td><td>Bi-Annually</td><td rowspan="2">Coefficient Routine Investigation Machine or equivalent)</td><td rowspan="2">Surfaces with Accelerometer Established Inertial Profiling Reference
ASTM E1656 -94: 2000- Standard Guide for Classification of Automatic Pavement Condition Survey Equipment</td><td>180 days</td><td>IRC:82-2015</td></tr>
<tr><td>Other Pavement Distresses</td><td></td><td></td><td>Bi-Annually</td><td>2-7 days</td><td>IRC:82-2015</td></tr>
<tr><td>Deflection/ Remaining Life</td><td></td><td></td><td>Annually</td><td>Falling Weight Deflecto meter</td><td>IRC 115: 2014</td><td>180 days</td><td>IRC:115-2014</td></tr>
<tr><td rowspan="2">Rigid Pavement (Pavement of MCW, Service Road, Grade structure, approaches of connecting roads, slip roads, lay byes etc. as applicable)</td><td>Roughness BI</td><td>2200mm/km</td><td>2400mm/km</td><td>Bi-Annually</td><td>Class I Profilometer</td><td>ASTM E950 (98) :2004 and ASTM E1656 -94: 2000</td><td>180 days</td><td>IRC:SP:83-2008</td></tr>
<tr><td>Skid</td><td colspan="2">Skid Resistance no. at different speed of vehicles
<table><tr><th>Minimum SN</th><th>Traffic Speed (Km/h)</th></tr><tr><td>36</td><td>50</td></tr><tr><td>33</td><td>65</td></tr><tr><td>32</td><td>80</td></tr><tr><td>31</td><td>95</td></tr><tr><td>31</td><td>110</td></tr></table></td><td>Bi-Annually</td><td>SCRIM (Sideway-force Coefficient Routine Investigation Machine or equivalent)</td><td>IRC:SP:83-2008</td><td>180 days</td><td>IRC:SP:83-2008</td></tr>
<tr><td rowspan="3">Embankment/ Slope</td><td>Edge drop at shoulders</td><td>Nil</td><td>40mm</td><td>Daily</td><td rowspan="3">Length Measurement Unit like Scale, Tape, odometer etc.</td><td rowspan="3">IRC SP:73-2018, IRC 36-2010 & IRC 56-2011</td><td>7-15 days</td><td>MORT&H Specification 408.4</td></tr>
<tr><td>Slope of camber/cross fall</td><td>Nil</td><td><2% variation in prescribed slope of camber /cross fall</td><td>Daily</td><td>7-15 days</td><td>MORT&H Specification 408.4</td></tr>
<tr><td>Embankment Slopes</td><td>Nil</td><td><15 % variation in prescribe side slope</td><td>Daily</td><td>7-15 days</td><td>MORT&H Specification 408.4</td></tr>
</table>

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					
	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 < 0.2 mm. hair cracks		
			2	w = 0.2 - 0.5 mm, discernible from slow-moving car	Seal without delay	Seal, and stitch if L >lm. Within 7days
			3	w = 0.5 - 1.5 mm, discernible from fast-moving car		
			4	w = 1.5 - 3.0 mm	Seal, and stitch if L > l m. Within 7 days	Staple or Dowel Bar Retrofit, FDR for affected portion. Within 15days
			5	w > 3 mm.		
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 < 0.2 mm, hair cracks	Route and seal with epoxy. Within 7 days	Staple or Dowel Bar Retrofit. Within 15days
			2	w = 0.2 - 0.5 mm, discernible from slow vehicle		
			3	w = 0.5 - 3.0 mm, discernible from fast vehicle	Route, seal and stitch, if L > 1 m. Within 7 days	
			4	w = 3.0 - 6.0 mm	Dowel Bar Retrofit. Within 15 days	Full Depth Repair Dismantle and reconstruct affected.
			5	w > 6 mm, usually associated with	Not Applicable, as it may	

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
				spalling, and/or slab rocking under traffic	be full depth	Portion with norms and specifications - See Para 5.5 & 9.2 Within 15days
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, discernable from slow moving vehicle	Seal with epoxy, if L > 1 m. Within 7 days	Staple or dowel bar retrofit. Within 15days
			2	w = 0.5 - 3.0 mm, discernible from fast vehicle	Route seal and stitch, if L > l m. Within 15 days	-
			3	w = 3.0 - 6.0 mm	Staple, if L > 1 m. Within 15 days	Partial Depth Repair with stapling. Within 15 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 Cracks 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 > l m. 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		
5	**Corner Break**	w = width of crack L = length of crack	0	Nil, not discernible	No Action	-
			1	w < 0.5 mm; only 1 corner broken	Seal with low viscosity epoxy to	Seal with epoxy seal with epoxy
			2	w < 1.5 mm; L < 0.6 m, only one corner		

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**
				broken	secure broken parts Within 7 days	Within 7days
			3	w < 1.5 mm; L < 0.6 m, two corners broken	Partial Depth (Refer Figure 8.3 of IRC:SP: 83-2008) Within 15 days	Full depth repair
			4	w > 1.5 mm; L > 0.6 m or three corners broken		
			5	three or four corners broken		Reinstate sub-base, and reconstruct the slab as per norms and specifications within 30days
6	**Punch-out (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 < 3 m/m^2	Not Applicable, as it may be full depth	Seal with low viscosity epoxy to secure broken parts. Within 15days
			2	either w > 0.5 mm or L < 3 m/m^2		
			3	w > 1.5 mm and L < 3 m/m^2		
			4	w > 3 mm, L < 3 m/m^2 and deformation		Full depth repair - Cut out and replace damaged area taking care not to damage reinforcement. Within 30days
			5	w > 3 mm, L > 3 m/m^2 and deformation		
Surface Defects						
			0	Nil, not discernible	**Short Term**	**Long Term**
					No action.	Not Applicable
			1	r < 2 %	Local repair of areas damaged and liable to be damaged. Within 15 days	
7	Ravelling or Honeycomb type surface	r = area damaged surface/total surface of slab (%) h = maximum depth of damage	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 > 25 mm	Reconstruct slabs, 4 or more slabs if affecting. Within 30 days	
8	**Scaling**	r = damaged	0	Nil, not discernible	**Short Term**	**Long Term**

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/total surface of slab (%) h = maximum depth of damage			No action.	Not Applicable
			1	r <2 %	Local repair of areas damaged and liable to be damaged. Within 7days	
			2	r = 2 - 10 %		
			3	r = 10 - 20%	Bonded Inlay within 15 days	
			4	r = 20 - 30 %		
			5	r > 30 % and h > 25 mm	Reconstruct slab within 30 days	
9	**Polished Surface/Glazing**	t = texture depth, sand patch test	0		No action.	Not Applicable
			1	t > 1 mm		
			2 '	t = 1 - 0.6 mm	Monitor rate of deterioration	
			3	t = 0.6 - 0.3 mm		
			4	t = 0.3 - 0.1 mm		
			5	t < 0.1 mm	Diamond Grinding if affecting 50% or more slabs in a continuous stretch of minimum 5 km. Within 30 days	
10	**Pop out (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.	Not Applicable
			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 110mm i.e.10 mm more than the depth of the hole. Within 30 days	
			4	d = 100 - 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	

Joint Defects						
11	**Joint Seal Defects**	loss or damage L = Length as % total joint length	0	Difficult to discern.	**Short Term** No action.	**Long Term** 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%		
			3	w = 20 - 40 mm, L > 25%	Partial Depth Repair. Within 15 days	
			4	w = 40 - 80 mm, L > 25%	30 - 50 mm deep, h = w + 20% of w, within 30 days	

Joint Defects						
			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 30days
			3	f = 6 - 12 mm	Diamond Grinding	
			4	f= 12 - 18 mm	Raise sunken slab.	Replace the slab as appropriate. Within 30days
			5	f> 18 mm	Strengthen subgrade and sub-base by grouting and raising sunken slab	
14	**Blow-up or Buckling**	h = vertical displacement from normal profile	0	Nil, not discernible	**Short Term**	**Long Term**
					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 slabs, ie 4 or more pieces	Replace broken slabs. Within 30 days	

Joint Defects						
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		
16	**Heave**	h = positive vertical displacement from normal profile. L = length	0	Not discernible. h < 5 mm	**Short Term**	**Long Term**
					No action.	Scrabble
			1	h = 5 - 15 mm	Follow up.	
			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		
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.

Joint Defects						
			3	h = 7 - 15 mm	Grind, in case of ongoing Maintenance within 15 days	Replace in case of new construction. Within 30days
			5	h > 15 mm	Full Depth Repair. Within 30 days	Full Depth Repair. Within 30days
18	**Lane to Shoulder Drop-off**	f = difference of level	0	Nil, not discernible < 3mm	**Short Term** No action.	**Long Term**
			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 dayss	
			4	f = 50 - 75 mm		For any 100 m stretch Reconstruct shoulder, if affecting 25% or more of stretch. Within 30days
			5	f > 75 mm		
Drainage						
19	**Pumping**	quantity of fines and water expelled through open joints and cracks Nos	0	not discernible	No Action	Inspect and repair sub-drainage at distressed sections and upstream.
			1 to 2	slight/ occasional Nos < 10%	Repair cracks and joints Without delay.	
			3 to 4	appreciable/ Frequent 10 - 25%	Lift or jack slab within 30 days.	

Joint Defects						
		Nos/100 m stretch	5	abundant, crack development > 25%	Repair distressed pavement sections. Strengthen subgrade and subbase. Replace slab. Within 30 days	
20	**Ponding**	Ponding on slabs due to blockage of drains	0-2	No discernible problem	No action.	
			3 to 4	Blockages observed in drains, but water flowing	Clean drains etc within 7 days, 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:

<table>
<tr><th>Asset Type</th><th>Performance Parameter</th><th>Level of Service (LOS)</th><th>Frequency of Measurement</th><th>Testing Method</th><th>Recommended Remedial measures</th><th>Time limit for Rectification</th><th>Specifications and Standards</th></tr>
<tr><td>Highway</td><td>Availability of Safe Sight Distance</td><td>As per IRC: 52-2019, a minimum of safe stopping sight distance shall be available throughout.
<table><tr><th>Design Speed, kmph</th><th>Desirable Minimum Sight Distance (m)</th><th>Safe Stopping Sight Distance (m)</th></tr><tr><td>50</td><td>120</td><td>60</td></tr><tr><td>40</td><td>90</td><td>45</td></tr></table></td><td>Monthly</td><td>Manual Measurements with Odometer along with video/ image backup</td><td colspan="2">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, blinkers, etc. shall be applied during the period of rectification.</td><td>IRC : 52-2019</td></tr>
<tr><td rowspan="3">Pavement Marking</td><td>Wear</td><td><70% of marking remaining</td><td>Bi-Annually</td><td>Visual Assessment as per Annexure-F of IRC:35-2015</td><td>Re - painting</td><td>Cat-1 Defect – within 24 hours
Cat-2 Defect - within 2 months</td><td>IRC:35-2015</td></tr>
<tr><td>Day time Visibility</td><td>During expected life Service Time
Cement Road - 130mcd/m^2/lux
Bituminous Road - 100mcd/m^2/lux</td><td>Monthly</td><td>As per Annexure-D of IRC:35-2015</td><td>Re - painting</td><td>Cat-1 Defect – within 24 hours
Cat-2 Defect – within 2 months</td><td>IRC:35-2015</td></tr>
<tr><td>Night Time Visibility</td><td><u>Initial and Minimum Performance for Dry Retro reflectivity during night time:</u>
<table><tr><td>Design Speed</td><td>(RL) Retro Reflectivity</td></tr></table></td><td>Bi-Annually</td><td>As per Annexure-E of IRC:35-2015</td><td>Re - painting</td><td>Cat-1 Defect – within 24 hours
Cat-2 Defect – within 2 months</td><td>IRC:35-2015</td></tr>
</table>

<table>
<tr><th>Asset Type</th><th>Performance Parameter</th><th>Level of Service (LOS)</th><th>Frequency of Measurement</th><th>Testing Method</th><th>Recommended Remedial measures</th><th>Time limit for Rectification</th><th>Specifications and Standards</th></tr>
<tr><td rowspan="2"></td><td></td><td>(mcd/m²/lux)
<table><tr><th></th><th>Initial (7 days)</th><th>Minimum Threshold level (TL) & warranty period required up to 2 years</th></tr><tr><td>Up to 65</td><td>200</td><td>80</td></tr><tr><td>65 - 100</td><td>250</td><td>120</td></tr><tr><td>Above 100</td><td>350</td><td>150</td></tr></table><u>Initial and Minimum Performance for Night Visibility under wet condition (Retro reflectivity):</u>
Initial 7 days Retro reflectivity: 100 mcd/m²/lux
Minimum Threshold Level: 50 mcd/m²/lux</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Skid Resistance</td><td>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</td><td>Bi-Annually</td><td>As per Annexure-G of IRC:35-2015</td><td></td><td>Within 24 hours</td><td>IRC:35-2015</td></tr>
<tr><td>Road Signs</td><td>Shape and Position</td><td>Shape and Position as per IRC:67-2022. Signboard should be clearly visible for the design speed of the section.</td><td>Daily</td><td>Visual with video/image backup</td><td>Improvement of shape, in case if shape is damaged.

Relocation as per requirement</td><td>48 hours in case of Mandatory Signs, Cautionary and Informatory Signs (Single and Dual post signs)</td><td>IRC:67-2022</td></tr>
</table>

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
						15 Days in case of Gantry/Cantilever Sign boards	
	Retro reflectivity	As per specifications in IRC:67-2022	Bi-Annually	Testing of each signboard using Retro Reflectivity Measuring Device. In accordance with ASTM 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 Sign boards	IRC:67-2022
Kerb	Kerb Height	As per IRC 86:1983 depending upon type of Kerb	Bi-Annually	Use of distance measuring tape	Raising Kerb Height	Within 1 Month	RC 86:1983
	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 73-2018 and IRC:35-2015, unless specified in Schedule-B.	Daily	Counting	New Installation	Within 2 months	IRC:SP:73-2018, IRC:35-2022
	Pedestrian Guardrail	Functionality: Functioning of guardrail as intended	Daily	Visual with video/image backup	Rectification	Within 15 days	IRC:SP:73-2018,
	Traffic Safety Barriers	Functionality: Functioning of Safety Barriers as intended	Daily	Visual with video/image backup	Rectification	Within 7 days	IRC:SP:73-2018, IRC:119-2015
	End Treatment of Traffic Safety Barriers	Functionality: Functioning of End Treatment as intended	Daily	Visual with video/image backup	Rectification	Within 7 days	IRC:SP:73-2018, 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
	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 – 2019
	Overhead Sign Structure	Overhead sign structure shall be structurally adequate	Daily	Visual with video/image backup	Rectification	Within 15 days	IRC:67-2022
	Traffic Blinkers	Functionality: Functioning of Traffic Blinkers as intended	Daily	Visual with video/image backup	Rectification	Within 7 days	IRC:SP:73-2018,
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:73-2018
		No major failure in the lighting system	Daily	-	Rectification of failure	24 hours	IRC:SP:73-2018,
		No minor failure in the lighting system	Monthly	-	Rectification of failure	8 hours	IRC:SP:73-2018,
	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:73-2018,
		No major/minor failure in the lighting system	Daily	-	Rectification of failure	8 hours	IRC:SP:73-2018,

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
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:73-2018,
	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:73-2018,
	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:73-2018,
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	15 days	IRC:SP:73-2018,

Table 4: Maintenance Criteria for Structures and Culverts:

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
Pipe/box/slab culverts	Free waterway/unobstructed 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:40-2019 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:40-2019 and IRC SP:69-2011
	Structurally sound	Spalling of concrete not more than 0.25 sqm Delamination of concrete not more than 0.25 Sqm. Cracks wider than 0.3 mm not more than 1m aggregate length	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:40-2019.	15 days	IRC SP 40-2019 and MORTH Specifications clause 2800
	Protection works in good condition	Damaged of rough stone apron or bank revetment not more than 3 sqm, damage to solid apron (concrete apron) not	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 40-2019 and IRC: SP:13-2004.

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
		more than 1 sqm					
Bridges including ROBs Flyover etc. as applicable	Riding quality or user comfort	No pothole in wearing coat on bridge deck	Daily	Visual inspection as per IRC SP:35-1990	Repairs to BC or wearing coat	15 days	MORT&H Specification 2811
Bridge -Super Structure	Bumps	No bump at expansion joint	Daily	Visual inspection as per IRC SP:35-1990	Repairs to BC on either side of expansion joints, profile correction course on approach slab in case of settlement to approach embankment	15 days	MORT&H Specification 3004.2 & 2811.
	User safety (condition of crash barrier and guard rail)	No damaged or missing stretch of crash barrier or pedestrian hand railing	Daily	Visual inspection and detailed condition survey as per IRC SP: 35-1990.	Repairs and replacement of safety barriers as the case may be	3days	IRC: 5-2015, IRC SP: 73-2018 and IRC SP: 40-2019.
	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 repairs to affected concrete portion with epoxy mortar / concrete.	15 days	IRC SP: 40-2019 and MORTH Specification 1600.
	Spalling of concrete	Not more than 0.50 sq.m					
	Delamination	Not more than 0.50 sq.m					

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
	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, investigating causes for cracks development and carry out necessary rehabilitation.	48 Hours	IRC SP: 40-2019 and MORTH Specification 2800.
	Rainwater seepage through deck slab	Leakage – nil	Quarterly	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit	Grouting of deck slab at leakage areas, waterproofing, repairs to drainage spouts	1 months	MORTH specifications 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	6 months	IRC SP: 51-2015.
	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 30 m	Laser displacement sensors or laser vibro-meters	Strengthening of super structure	4 months	AASHTO LRFD specifications
	Leakage in Expansion joints	No damage to elastomeric sealant compound in strip seal expansion joint, no leakage of rain water through	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 specifications 2600 and IRC SP: 40-2019.

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
		expansion joint in case of buried and asphalt plug and copper strip joint.					
	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 specifications 2600 and IRC SP: 40-2019.
	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-substructure	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: 40-2019 and MORTH specification 2800.

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
	Bearings	Delamination of bearing reinforcement not more than 5%, cracking or tearing of rubber not more than 2 locations per side, no rupture of reinforcement or rubber	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, IRC 83 and IRC SP: 40-2019.
Bridge Foundation	Scouring around foundations	Scouring shall not be lower than maximum scour level for the bridge	Bi-Annually	Condition survey and visual inspection 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 month	IRC SP: 40-2019, MORTH specification 2500
	Protection works in good condition	Damaged of rough stone apron or bank revetment not more than 3 sq.m, damage to solid 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.	IRC: SP 40-2019 and IRC: SP:13-2022.

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
Slope Protection (Landslide & Sinking)	Movement & deformation in landslide & sinking zones	Movement & deformation beyond permissible limit should be made good to the design standard	14 Days	Once in month/ as when noticed	Standard method as approved by the Authority QA/QC plan of the contractor	30 days after defect observation or 2 weeks before onset of rainy season whichever is earlier	Refer the Schedule B and Schedule D
	Any material or defect development in workmanship used in protection work	The material and workmanship specification should be in accordance with Schedule B and Schedule D	14 Days	Once in month/ as when noticed	Standard method as approved by the Authority QA/QC plan of the contractor	30 days after defect observation or 2 weeks before onset of rainy season whichever is earlier.	Refer the Schedule B and Schedule D
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 5: Maintenance Criteria for Hill Roads

In addition to above, for hill roads the following provisions 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 standards (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, side slopes, drains and culverts**	
(i)	Variation by more than 1 % inthe prescribed slope of camber/cross fall (shall not be less than the camber on the maincarriageway)	7 (seven) days
(ii)	Edge drop at shoulders exceeding 40 mm	7 (seven) days
(iii)	Variationbymorethan15%inthe 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) hours
(vii)	Railing, parapets, crash barriers	7 (seven) days (Restore immediately if causing safety hazard)
(c)	**Road side furniture including road sign and pavement marking**	
(i)	Damagetoshapeorposition,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 everyyear
(iii)	Damaged/missing signs road requiringreplacement	7 (seven) days
(iv)	Damage to road mark ups	7 (seven) days
(d)	**Road lighting**	
(i)	Any major failure of the system	24 (twenty-four) hours
(ii)	Faults and minor failures	8 (eight) hours
(e)	**Trees and plantation**	
(i)	Obstruction in a minimum head- room of 5 m above carriagewayor obstruction in visibility of road signs	24 (twenty four)hours
(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

Nature of Defect or deficiency		Time limit for repair/ rectification
(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) hours
(g)	**[Toll Plaza]**	
(h)	**Other Project Facilities and Approachroads**	
(i)	Damage in approach roads, pedestrian facilities, truck lay- byes, bus-bays, bus-shelters,cattle crossings, [Traffic Aid Posts, Medical Aid Posts], Rain water harvesting/Artificial Recharge Unit 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 within15(fifteen)daysor as specified by the Authority'sEngineer
(b)	**Foundations**	
(i)	Scouring and/or cavitation	15 (fifteen) days
(c)	**Piers, abutments, return walls and wing walls**	
(i)	Cracks and damagesincluding 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**	

Nature of Defect or deficiency		Time limit for repair/ rectification
(i)	Deforming of pads in elastomeric bearings	7 (seven) days
(ii)	Gathering of dirt in bearings and joints; or clogging of spouts,weep holes andvent-holes	3 (three) days
(iii)	Damage or deterioration in kerbs, parapets, handrails andcrash barriers	3 (three) days (immediately within 24 hours if posing danger to safety)
(iv)	Rain-cuts or erosion of banks of the side slopes of approaches	7 (seven) days
(v)	Damage to wearing coat	15 (fifteen) days
(vi)	Damage or deterioration in approach slabs, pitching, apron, toes, floor or guide bunds	30 (thirty) days
(vii)	Growth of vegetation affectingthe structure or obstructingthe waterway	15 (fifteen) days
(g)	**Slope Protection (Landslide & Sinking)**	
	Any damage, Temporary measures Permanent measures	within 48 (forty eight) hours within15(fifteen)daysor as specified by the Authority'sEngineer
(g)	**Hill Roads**	
(i)	Damage to retaining wall/breast wall	7 (seven) days
(ii)	Landslides requiring clearance	12 (twelve) hours
(iii)	Snow requiring clearance	24 (twenty four) hours

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

Schedule - F

(See Clause 4.1 (vii)(a))
ApplicablePermits

1. Applicable Permits

xi. The Contractor shall obtain, as required under the Applicable Laws, the following ApplicablePermits:

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

b. Permission of Village Panchayats and Pollution Control Board for installation ofcrushers;

c. Licence for use ofexplosives;

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

e. Licence from inspector of factories or other competent Authority for setting up batchingplant;

f. Clearance of Pollution Control Board for setting up batchingplant;

g. Clearance of Village Panchayats and Pollution Control Boardfor setting up asphaltplant;

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

i. Any other permits or clearances required under ApplicableLaws.

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

Schedule – G

(See Clauses 7.1 and 19.2)

Form of Bank Guarantee

Annex-I

(See Clause 7.1)

[Performance Security/Additional Performance Security]

To

The Managing Director,
National Highway & Highway Development Corporation Ltd.
1st Floor, Tower-A, World Trade Centre, Nauroji Nagar
New Delhi- 110029

WHEREAS_____[name and address of Contractor] (hereafter called the "Contractor") has undertaken, in pursuance of Letter of Acceptance (LOA) No. _____Dated_____ for construction of "**Widening and Up-gradation of existing carriageway into 2-lane with paved shoulder configuration from Reshi to Rhenock from Ch. 96.254 to Ch. 101.554 along NH-717A in the State of Sikkim on EPC mode"** (hereinafter called the "Contract").

AND WHEREAS the Contract requires the Contractor to furnish an {Performance Security/ Additional Performance Security} for due and faithful performance of its obligations, under and in accordance with the Contract, during the {Construction Period/ Defects Liability Period and Maintenance Period} in a sum of Rs….. cr. (Rupees ……..….. crore) (the "**Guarantee Amount**"[1]).

1. AND WHEREAS we, …….. through our branch at ……. (the "Bank") have agreed to furnish this Bank Guarantee (hereinafter called the "Guarantee") by way of Performance Security.

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

3. The Bank hereby unconditionally and irrevocably guarantees the due and faithful performance of the Contractor's obligations during the {Construction Period/ Defects Liability Period and Maintenance Period} under and in accordance with the Contract, 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.

[1] Guarantee Amount for Performance Security and Additional Performance Security shall be calculated as per Contract.

4. A letter from the Authority, under the hand of an officer not below the rank of [Superintending Engineer of Ministry of Road Transport & Highways], 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 Contract 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 Contract and its decision that the Contractor is in default shall be final and binding on the Bank, notwithstanding any differences between the Authority and the Contractor, or any dispute between them pending before any court, tribunal, arbitrators or any other authority or body, or by the discharge of the Contractor for any reason whatsoever.

5. 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.

6. 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.

7. 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 Contract 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 Contract 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 Contract 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.

8. 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 Contract or for the fulfillment, compliance and/or performance of all or any of the obligations of the Contractor under the Contract.

9. 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.

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

11. 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.

12. 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.

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

12. 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.

13. This guarantee shall also be operatable 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.

14. The guarantor/bank hereby confirms that it is on the SFMS (Structural Finance Messaging System) platform & shall invariably send an advice of this Bank Guarantee to the designated bank of NHIDCL, detail of which is as under:

S. No.	Particulars	Details
1.	Name of Beneficiary	National Highways & Infrastructure Development Corporation Ltd. (NHIDCL)
2.	Name of Bank	Canara Bank
3.	Account No.	8598201005819
4.	IFSC Code	CNRB0008598

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

SIGNED, SEALED AND DELIVERED

For and on behalf of the Bank by:

[$]Insert date atleast 2 (two) years from the date of issuance of this Guarantee (in accordance with Clause 2.21 of the RFP). The Contractors can submit the BG for periods of two years at one time and keep on renewing the same till the DLP is over if they have problems in getting the BG in one go for the entire DLP.

(Signature)

(Name)

(Designation)

(Code Number)

(Address)

NOTES:

(i) Thebankguaranteeshouldcontainthename,designationandcodenumberof the officer(s) signing theguarantee.

(ii) Theaddress,telephonenumberandotherdetailsoftheheadofficeoftheBank as well as of issuing branch should be mentioned on the covering letter of issuingbranch.

Format of Insurance Surety Bond
[Performance Security/Additional Performance Security]

To

The Managing Director,
National Highway & Highway Development Corporation Ltd.
1st Floor, Tower-A, World Trade Centre, Nauroji Nagar
New Delhi- 110029

WHEREAS_____[name and address of Contractor] (hereafter called the "Contractor") has undertaken, in pursuance of Letter of Acceptance (LOA) No. _____Dated_____ for construction of "**Widening and Up-gradation of existing carriageway into 2-lane with paved shoulder configuration from Reshi to Rhenock from Ch. 96.254 to Ch. 101.554 along NH-717A in the State of Sikkim on EPC mode"** (hereinafter called the "Contract").

AND WHEREAS the Contract requires the Contractor to furnish an [Performance Security/Additional Performance Security] for due and faithful performance of its obligations, under and in accordance with the Contract, during the [Construction Period/ Defects Liability Period and Maintenance Period) in a sum of Rs …….. cr. (Rupees .... crore) (the "Surety Bond amount").

AND WHEREAS we, through our branch at …… (the "Surety Insurer") have agreed to furnish this Surety Bond by way of Performance security.

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

1. The Surety Insurer herby unconditionally and irrevocably guarantees the due and faithful performance of the Contractor's obligations during the (Construction Period/ Defects Liability Period and Maintenance Period' under and in accordance with the Contract, 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 Surety Bond 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 [Superintending Engineer of Ministry of Road Transport Et Highways], 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 Contract shall be conclusive, final and binding on the Surety Insurer. The Surety Insurer 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 Contract and its decision that the Contractor is in default shall be final and binding on the Surety Insurer, notwithstanding any differences between the Authority and the Contractor, or any dispute between them pending before any court, tribunal, arbitrators or any other authority or body, or by the discharge of the Contractor for any reason whatsoever.

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

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

5. The Authority shall have the liberty, without affecting in any manner the liability of the Surety Insurer under this Surety Bond, to vary at any time, the terms and conditions of the Contract 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 Contract 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 Contract and/or the securities available to the Authority, and the Surety Insurer 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 Surety Insurer from its liability and obligation under this Surety Bond and the Surety Insurer hereby waives all of its rights under any such law

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

7. Notwithstanding anything contained hereinbefore, the liability of the Surety Insurer under this Surety Bond is restricted to the Surety Bond Amount and this Surety Bond 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 Surety Insurer under this Surety Bond all rights of the Authority under this Surety Bond shall be forfeited and the Surety Insurer shall be relieved from its liabilities hereunder

8. The Surety Bond shall cease to be in force and effect on ****[$]. Unless3 a demand or claim under this Surety Bond is made in writing before expiry of the Surety Bond, the Surety Insurer shall be discharged from its liabilities hereunder.

[$]Insert date atleast 2 (two) years from the date of issuance of this Surety Bond (in accordance with Clause 2.21 of the RFP). The Contractors can submit the BG for periods of two years at one time and keep on renewing the same till the DLP is over if they have problems in getting the BG in one go for the entire DLP.

9. The Surety Insurer undertakes not to revoke this Surety Bond 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 Surety Bond and the undersigned has full powers to do so on behalf of the Surety Insurer.

10. Any notice by way of request, demand or otherwise hereunder may be sent by post addressed to the Surety Insurer 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 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 Surety Bond shall come into force with immediate effect and shall remain in force and effect for up to the date specified in paragraph 8 above or until it is released earlier by the Authority pursuant to the provisions of the Contract.

12. 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)

Annex – II

(Schedule - G)

(See Clause 19.2)

Annexure-II: Form for Insurance Surety Bond for Advance Payment

To,
The Managing Director,
National Highways and Infrastructure Development Corporation of India Limited, 1St & 2nd Floor, Tower A, World Trade Centre, Nauroji Nagar, New Delhi-110029

WHEREAS:

(A) [Name and address of contractor] (hereinafter called the "Contractor") has executed an agreement (hereinafter called the "Agreement") with the [name and address of the authority], (hereinafter called the "Authority") for the construction of the ***** section of [National Highway No. **] on Engineering, Procurement and Construction (the "EPC") basis, subject to and in accordance with the provisions of the Agreement.

(B) In accordance with Clause 19.2 of the Agreement, the Authority shall make to the Contractor an interest bearing @Bank Rate + 3% 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 Insurance Surety Bond by Insurance Company 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

(C) Insurance Surety Bond is Rs. ..... cr. (Rupees - crore) (the "Guarantee Amount")$.

(D) We, ... through our branch at ... (the "Insurance Company" have agreed to furnish this Insurance Surety Bond (hereinafter called the "Guarantee") for the Guarantee Amount.

NOW, THEREFORE, the Insurance Company hereby, unconditionally and irrevocably,

guarantees and affirms as follows:

1. The Insurance Company hereby unconditionally and irrevocably guarantees the due and faithful repayment on time of the aforesaid instalment of the Advance Payment under and in accordance with the Agreement, and agrees and undertakes to pay to the authority, upon its mere first written demand, and without any demur, reservation, recourse, contest or protest, and without any reference to the Contractor, such sum or sums up to an aggregate sum of the Guarantee Amount as the Authority shall claim, without the Authority being required to prove or to show grounds or reasons for its demand and/or for the sum specified therein. A letter from the Authority, under the hand of an officer not below the rank of General Manager in the National Highways and Infrastructure Development Corporation of India Limited that the Contractor has committed default in the due and faithful performance of all or any of its obligations for the repayment of the instalment of the Advance Payment under and in accordance with the Agreement shall be conclusive, final and binding on the Insurance Company.

$ The guarantee amount should be equivalent to 110% of the value of the applicable installment.

The Insurance Company 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 Insurance Company, notwithstanding any differences between the Authority and the Contractor, or any dispute between them pending before any court, tribunal, arbitrators or any other authority or body, or by the discharge of the Contractor for any reason whatsoever.

2. In order to give effect to this Insurance Surety Bond, the Authority shall be entitled to act as if the Insurance Company were the principal debtor and any change in the constitution of the Contractor and/or the Insurance Company, 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 Insurance Company under this Guarantee.

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

4. The Authority shall have the liberty, without affecting in any manner the liability of the Insurance Company 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 Insurance Company 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 Insurance Surety Bond from its liability and obligation under this Guarantee and the Insurance Company hereby waives all of its right under any such law.

5. This Insurance Surety Bond 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.

6. Notwithstanding anything contained herein before, the liability of Insurance Company 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 Insurance Company under this Guarantee all rights of the Authority under this Insurance Surety Bond shall be forfeited and the Insurance Company shall be relieved from its liabilities hereunder.

7. The Insurance Surety Bond shall cease to be in force and effect on [$]****. Unless a demand or claim under this Guarantee is made in writing on or before the aforesaid date, the Insurance Company shall be discharged from its liabilities hereunder.

8. The Insurance Company 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 Insurance Company.

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

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

Signed and sealed this day of 20 at

[$] 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)

SIGNED, SEALED AND DELIVERED

For and on behalf of the Insurance Company

by: (Signature)

(Name)

(Designation)

(Code Number)

(Address)

11. NOTES:

(1) The Insurance Surety Bond should contain the name, designation and code number of the officer(s) signing the Insurance Surety Bond.

(ii) The address, telephone number and other detail of the head of the Insurance Company as well as issuing branch should be

Schedule - H

(SeeClauses10.1(iv)and19.3)

Contract Price Weightages

1.1 The Contract Price for this Agreement is Rs……

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

Item	Weightage in percentage to the Contract	Stage for Payment	Percentage weightage
1	2	3	4
I. Road works including culverts, widening and repair of culverts.	**23.75%**	**B.1- Reconstruction/ New realignment/ bypass (Flexible pavement)**	
		(1) Earthwork up to top of subgrade	22.93%
		(3) Granular Sub-Base (GSB)	16.81%
		(4) Wet mix macadam (WMM)	12.85%
		(5) Dense Graded Bituminous Macadam (DBM)	23.82%
		(6) Bituminous Concrete	10.97%
		D- Re-Construction and New culverts on existing road, realignments, bypasses :	
		Culverts (length < 6 m)	12.62%
II. Minor Bridges/ Underpasses/ Overpasses	**5.62%**	**A.2- New Minor bridges (length >6 and <60 m.)**	
		(1) Foundation: On completion of the foundation work of abutments and piers	7.74%
		2) Sub-structure: On completion of abutments and piers with abutment/ pier cap.	34.92%
		(3) Super-structure: On completion of the super-structure upto deck slab including bearings, structural steel etc.	50.79%
		(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.	5.16%

		(5) Approaches: On completion of approaches including wing walls/ return walls, Retaining walls, crash barrier, stone pitching, protection works for floor, embankment slope etc. complete in all respect and fit for use.	1.39%
		(6) Guide Bunds and River Training Works: On completion of Guide Bunds and river Training Works complete in all respects	0.00%
III. Major Bridge(length > 60 m.) works and ROB/RUB/ elevated sections/flyovers including viaducts, if any	**9.96%**	**A.2- New Major Bridges**	
		(1) Foundation	10.21%
		(2) Sub-structure	29.41%
		(3) Super-structure (including bearings)	54.66%
		(4) Wearing Coat including expansion joints	4.04%
		(5) Miscellaneous Items like hand rails, crash barriers, road markings etc.)	0.90%
		(6) Wing walls/return walls	0.00%
		(7) Guide Bunds, River Training works etc.	0.00%
		(8) Approaches (including Crash Barriers, Retainingwalls/Reinforced Earth wall, stone pitching and protection works)	0.78%
IV. Other works	**58.58%**	(i) Toll Plaza	0.00%
		(ii) Road side drains	
		(a) CC Lined Drain	1.91%
		(b) Cover slab	0.00%
		(iii) Road signs, markings, km stones, safety devices etc.	3.26%
		(iv) Overhead gantry mounted signs	0.27%
		(v) Project facilities (a) Bus Bays (b) Truck lay-byes (c) Rest areas (d) others	1.62%
		(vi) Road side plantation	0.00%
		(vii) Protection works# other than approaches to	0.00%
		(a) Thrie Beam Crash Barrier	6.95%
		(b) Retaining Wall	33.54%
		(c) Breast Wall	24.68%

		(d) Special Slope Protection	20.90%
		(viii) Safety and traffic management during construction	0.00%
		(ix) Junction Development	6.87%
V. Utility shifting	**2.09%**	**Electrical utilities and Public Health Utilities (Water pipelines and sewage lines)**	
		(i) EHT line	0.00%
		(ii) EHT crossings	
		(iii) HT/LT line	59.89%
		(iv) HT/LT crossings	
		(v) Water pipeline	40.11%
		(vi) Water pipeline crossing	
		(vii) Sewage lines	0.00%
		(viiii) Sewage line crossings.	0.00%

1.3 Procedure of estimating the value of work done.

1.3.1 Road works.

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

Table 1.3.1

Stage of for Payment	**Percentage Weight in particular Item**	**Payment Procedure**
1	**2**	**3**
B.1- Reconstruction/ New realignment/ bypass (Flexible pavement)		
(1) Earthwork up to top of subgrade	22.93%	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.
(3) Granular Sub-Base (GSB)	16.81%	
(4) Wet mix macadam (WMM)	12.85%	
(5) Dense Graded Bituminous Macadam (DBM)	23.82%	
D- Re-Construction and New culverts on existing road, realignments, bypasses :		
Culverts (length < 6 m)	10.97%	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%

Stage of for Payment	Percentage Weight in particular Item	Payment Procedure
		will become payable on completion of protection works including return/wing walls and any other work associated with culverts.

@. 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)

WhereP = 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 including the length not handed over to the Contractor under clause 8.3 of this Contract Agreement 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 Bridges and Underpasses/Overpasses shall be as stated in table 1.3.2:

Table 1.3.2

Stage of for Payment	Percentage Weight in particular Item	Payment Procedure
1	**2**	**3**
A.2- New minor bridges		
(1) Foundation: On completion of the foundation work of abutments and piers	**7.74%**	Cost of each minor bridge shall be determined on pro rata basis with respect to the total linear length (m) of the minor bridges. **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.

Stage of for Payment	Percentage Weight in particular Item	Payment Procedure
		In case where load testing is specified for foundation, the trigger of first payment shall include load testing also.
2) Sub–structure	**34.92%**	Payment shall be made on pro-rata basis on completion of a stage i.e. completion of atleast one sub-structure upto abutments/piers cap level of each bridge.
(3) Super-structure: On completion of the super-structure upto deck slab including bearings, structural steel etc.	**50.79%**	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.
(4) Miscellaneous Works	**5.16%**	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.
(5) Approaches: On completion of approaches including wing walls/ return walls, retaining walls, crash barrier, stone pitching, protection works for floor, embankment slope etc. complete in all respect and fit for use.	**1.39%**	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.
(6) Guide Bunds and River Training Works: On completion of Guide Bunds and river Training Works complete in all respects	**0.00%**	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.

1.3.3 Major Bridge works, ROB/RUB and Structures.

Procedure for estimating the value of MajorBridge works, ROB/RUB and Structures shall be as stated in table 1.3.3:

Table 1.3.3

Stage of for Payment	Percentage Weight in particular Item	Payment Procedure
1	2	3
A.2- New Major Bridges		
(1) Foundation	**10.21%**	Cost of each Major Bridge shall be determined on pro rata basis with respect to the total linear length (m) of the Major Bridge. 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.
Open Foundation		Payment shall be made on completion of a stage i.e. on completion of atleast one foundation.
(2) Sub-structure	**29.41%**	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)	**54.66%**	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	**4.04%**	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.)	**0.90%**	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%**	Payments shall be made on completion of all wing walls/return walls complete in all respects as specified for each of the structure.
(7) Guide Bunds, River Training works etc.	**0.00%**	Payments shall be made on completion of all guide bunds/river training works etc. complete in all respects as

Stage of for Payment	Percentage Weight in particular Item	Payment Procedure
		specified for each of the structure.
(8) Approaches (including Crash Barriers, Retaining walls/Reinforced Earth wall, stonepitching and protection works)	**0.78%**	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.

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 for Payment	Percentage Weight in particular Item	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
(ii) Road side drains		
(a) CC Lined Drain	1.91%	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 slab	0.00%	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 etc.	3.26%	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	0.27%	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 (a) Bus Bays (b) Truck lay-byes (c) Rest areas (d) others	1.62%	Unit of measurement is each number. Payment shall be made on pro rata basis for completed facilities.
(vi) Road side plantation	0.00%	Unit of measurement is linear length in Km. Payment shall be made on pro rata basis on completion of one Km.

Stage of for Payment	Percentage Weight in particular Item	Payment Procedure
(vii) Protection works# other than approaches to the bridges, elevated sections/ flyovers/grade separators and ROBs/ RUBs		
(a) Thrie Beam Crash Barrier	6.95%	Unit of measurement is linear length. 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	33.54%	
(c) Breast Wall	24.68%	
(d) Special Slope Protection works	20.90%	Unit of measurement is area in sqm. Payment shall be made on pro rata basis on completion of each stage in an area of not less than 10% of the total area.
(viii) Safety and traffic management during construction	0.00%	Payment shall be made on prorata basis every six months.
(ix) Junction Development	6.87%	Unit of measurement is each number. Payment shall be made on pro rata basis on completion of development of each junction.
(x) Utility shifting : Electrical utilities and Public Health Utilities (Water pipelines and sewage lines)		
(g) EHT line	0.00%	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 cable30%, (iii) OTR erection (if involved)-15% and (iv) Charging of line including dismantling and site clearance-35% (with OTR) and 50%without OTR)
(h) EHT crossings	0.00%	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 (iii) HTI LT line [**] (including transformers if any) (iv) HTI LT crossings [**] (v) Water pipeline [**] (vi) water pipeline [**] crossings crossings subject to a minimum of 4 crossings

Stage of for Payment	Percentage Weight in particular Item	Payment Procedure
(i) HT/LT line	59.89%	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%(ii) Conductor stringing including laying of cable30%, (iii) OTR erection (if involved)-10% and (iv) Charging of line including dismantling and site clearance-40% (with OTR) and 50%without OTR
(j) HT/LT crossings		
(k) Water pipeline	40.11%	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%)
(l) Water pipeline crossing		
(m) Sewage lines	0.00%	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%)
(n) Sewage line crossings.	0.00%	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%)

2. Procedure for payment for Maintenance

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

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

Schedule - I

(See Clause 10.2 (iv))
Drawings

1. Drawings

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

2. Additional Drawings

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

Annex – I

(Schedule - I)

List of Drawings

A minimum list of the drawings of the various components / elements of the Project Highway and project facilities required to be submitted by the Contractor is given below:

a) Detailed Drawings of Plan & Profile with Horizontal intersection Point, Vertical Intersection Points, elements of curves, and sight distances etc.

b) Detailed Drawings of Cross-section at 50.0m interval along the alignment.

c) Typical Cross-section with details of pavement thickness.

d) Detailed Drawings of all Junctions/intersections.

e) Detailed drawing for culverts.

f) Detailed Drawings of road drainage measures and drainage Plan.

g) Detailed Drawings of slope protection measures like Secured Drapery in Hill Side and RCC and Plum concrete retaining wall in Valley Side.

h) Drawings of road furniture items including traffic signage, markings, safety barriers (Thrie beam) etc.

i) Detailed Utility Shifting Drawings (Electrical, HT/EHT Line and Water Supply line etc.)

j) Detailed Drawings of Major & Minor Bridges.

k) Any other drawing relevant to the Project Highway as desired by Authority/Client.

Schedule - J

(See Clause 10.3 (ii))

Project Completion Schedule

1. **Project Completion Schedule**

During Construction period, the Contractor shall comply with the requirementssetforthinthisSchedule-JforeachoftheProjectMilestonesand the **Scheduled Completion Date**. Within 15 (fifteen) days of the date ofeach Project Milestone, the Contractor shall notify the Authority of such compliance along with necessary particularsthereof.

2. **Project Milestone-I**

(ii) Project Milestone-I shall occur on the date falling on the **256th (Two Hundred Fifty Six)** day from the Appointed Date (the "**Project Milestone-I**").

(iii) 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 anamount not less than 10% (ten per cent) of the ContractPrice.

3. **Project Milestone-II**

(i) Project Milestone-II shall occur on the date falling on the **438th (Four Hundred and Thirty 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 anamount notlessthan35%(thirty-five percent)oftheContractPrice**andshouldhave started construction of all structures**

4. **Project Milestone-III**

(i) Project Milestone-III shall occur on the date falling on the **621th(Six 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 anamount notlessthan70%(seventypercent)oftheContractPriceand**shouldhave**started construction of all project facilities.

5. Scheduled Completion Date

(i) TheScheduledCompletionDateshalloccuronthe**730th(Seven Hundred thirty)**day from the AppointedDate.

(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 ScheduledCompletionDate,asthecasemaybe,underandinaccordancewith the provisions of this Agreement, the Project Completion Schedule shall be deemed to have been amended accordingly.

Schedule - K

(See Clause 12.1 (ii))
Tests on Completion

1. Schedule for Tests

(i) The Contractor shall, no later than 30 (thirty) days prior to the likely completion of construction, notify the Authority's Engineer and theAuthority 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 ofWorks.

(ii) TheContractorshallnotifytheAuthority'sEngineerofitsreadinesstosubject 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 witnesstheTests.TheAuthority'sEngineershallthereuponconductthe Tests itself or cause any of the Tests to be conducted in accordance with Article 12 and thisSchedule-K.

2. Tests

xiii. **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 required are to be decided by theAuthority/Authority's Engineer at the time of physical tests as per standard.

xiv. **Riding quality test:** Riding quality of each lane of the carriageway shall be checked with the help of a Network Survey Vehicle (NSV) fitted with latest equipment's and the maximum permissible roughness for purposes of this Test shall be 2,000 (two thousand) mm for each kilometre.

xv. **Tests for bridges/viaducts:** All major and minor bridges/viaducts 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 Non-destructive Testing Techniques, at two spots in every span, to be chosen at random by the Authority's Engineer. Bridges/viaducts with a span of 15 (fifteen) metres or more shall also be subjected to load testing.

xvi. **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, except tests as specified in clause 5, but shall include measuring the reflectivity of road markings and road signs; and measuring the illumination level (lux) of lighting using requisite testing equipment.

xvii. **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.

xviii. **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.

5. The Authority Engineer will carry out tests with following equipment at his own cost in the presence of contractor'srepresentative.

Sr. No.	Key metrics of Asset	Equipment to be used	Frequency of condition survey
1	Surface defectsof pavement	Network Survey Vehicle(NSV)	At least twice a year (As per survey months defined for the state basis rainy season)
2	Roughness of pavement	Network Survey Vehicle(NSV)	At least twice a year (As per survey months defined for the state basis rainy season)
3	Strength of pavement	Falling Weight Deflectometer (FWD)	At least once a year
4	Bridges	Mobile Bridge Inspection Unit (MBU)	At least twice a year (As per survey months defined for the state basis rainy season)
5	Road signs	Retro-reflectometer	At least twice a year (As per survey months defined for the

Sr. No.	Key metrics of Asset	Equipment to be used	Frequency of condition survey
			state basis rainy season)

The first testing with the help of NSV shall be conducted at the time of issue of Completion Certificate.

Schedule - L

(See Clause 12.2)

1 I, …… (Name of the Authority's Engineer), actingasthe Authority'sEngineer,underandinaccordancewiththeAgreementdated …… (the "**Agreement**"), for **Widening and Up-gradation of existing carriageway into 2-lane with paved shoulder configuration from Reshi (Design Km 96.070) to Rhenock (Design Km 101.367) along NH-717A in the State of Sikkim** on Engineering, Procurement and Construction (the "EPC") basis through …… (Name of Contractor), hereby certify that the Tests in accordance with Article 12 of the Agreement have been successfully undertaken to determine compliance of the Project Highway with the provisions of the Agreement, and I am satisfied that the Project Highway can be safely and reliably placed in service of the Users thereof.

2 Itiscertifiedthat,intermsoftheaforesaidAgreement,allworksformingpart of Project Highway have been completed, and the Project Highway is hereby declared fit for entry into operation on this the …… day of …… 20….. , Scheduled Completed Date for which was 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

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

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

(iii) 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 on monthly basis

(i) The following percentages shall govern the paymentreduction:

S. No.	Item/Defect/Deficiency	Percentage
(a)	**Carriageway/Pavement**	
(i)	Potholes, cracks, other surface defects	15%
(ii)	Repairs of Edges, Rutting	5%
(b)	**Road, Embankment, Cuttings, Shoulders**	
(i)	Edge drop, inadequate cross fall, undulations, settlement, potholes, ponding, obstructions	10%
(ii)	Deficient slopes, 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%

S. No.	Item/Defect/Deficiency	Percentage
(iii)	Painting, repairs/replacement kerbs, railings, parapets, guideposts/crash barriers	5%
(iv)	Any Defects in Special slope protection works	10%
(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%

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

$$R = {}^{P}/_{100} \times (M1 \; or \; M2) \times {}^{L1}/_{L}$$

Where,

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

M1= Monthly lump-sum payment in accordance para 1.2 above of this Schedule

M2= Monthly lump-sum payment in accordance para 1.2 above of this Schedule

L1= non-complying length L = Total length of the road,

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

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

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

Schedule - N
(See Clause 18.1 (i))
Selection of Authority's Engineer

1. Selection of Authority's Engineer

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

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

2. Terms of Reference

xxii. 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

xxiii. 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-ownedentitywhichisownedorcontrolledbytheAuthorityshall not be eligible for appointment as Authority'sEngineer.

Annex – I

(Schedule - N)

Annex-IAnnex-I: Terms of Reference for Authority's Engineer

1. Scope

xxiv. TheseTermsofReference(the**"TOR"**)fortheAuthority'sEngineerarebeing specified pursuant to the EPC Agreement dated ..... (the **"Agreement**), which has been entered into National Highways & Infrastructure Development Corporation, 1st Floor, Tower A, World Trade Centre, Nauroji Nagar,New Delhi – 110029 (the **"Authority"**) and ..... (the **"Contractor"**)#**Widening and Up-gradation of existing carriageway into 2-lane with paved shoulder configuration from Reshi to Rhenock from Ch. 96.254 to Ch. 101.554 along NH-717A in the State of Sikkim on EPC mode**on EPC mode, and a copy of which is annexed hereto and marked as Annex-A to form part of thisTOR.

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

2. Definitions and interpretation

xxvi. 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.

xxvii. 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.

xxviii. The rules of interpretation stated in Article 1 of the Agreement shall apply, mutatis mutandis, to this TOR.

3. General

xxix. 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 IndustryPractice.

xxx. 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 beforedetermining:

a). any Time Extension;

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

c). the Termination Payment; or

d). issuance of Completion Certificate or

e). Any other matter which is not specified in (a), (b), (c) or (d) above and which creates a financial liability on either Party.

xxxi. 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.

xxxii. 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.

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

xxxiv. 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

xxxv. During the Construction Period, the Authority's Engineer shall review and approve 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 (vi). The Authority's Engineer shall complete such review and approval 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 beextended 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 andStandards.

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

xxxvii. The Authority's Engineer shall review and approve 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.

xxxviii. The Authority's Engineer shall complete the review and approve of the methodology proposedtobeadoptedbytheContractorforexecutingtheWorks,andconvey its comments to the Contractor within a period of 10 (ten) days from the date of receipt of the proposed methodology from theContractor.

xxxix. TheAuthority'sEngineershallgrantwrittenapprovaltotheContractor,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 Clause10.4.

xl. 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 suchreport.

xli. TheAuthority'sEngineershallinspecttheConstructionWorksandtheProject HighwayandshallsubmitamonthlyInspectionReportbringingouttheresults of inspections and the remedial action taken by the Contractor in respect of Defectsordeficiencies.Inparticular,theAuthority'sEngineershallincludein its Inspection Report, the compliance of the recommendations made by the SafetyConsultant.

xlii. 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 mayrequire.

xliii. 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 management. For purpose of this paragraph 4(ix), the tests specified in the MoRTH Specifications for Road and Bridge works and respective Indian Roads Congress Standards/ Guidelines/ Manuals, together with any other Indian/ International Standards mentioned therein including any modifications/ substitutions thereof shall be deemed to be tests confirming to Good Industry Practice for quality management.

xliv. The Authority's Engineer shall witness all the quality control tests carried out by the Contractor at its site laboratory/ main laboratory/ field/ plants. These include tests for all materials, mixes, products etc. Authority's

Engineer shall also witness all tests of finished products like bearing in the manufacturer's laboratory as mandated in respective standards. Authority's Engineer will also conduct review of quality control documents in respect of factory manufactured materials/ finished products, etc. as per IRC:SP:112.

xlv. Thetimingoftestsreferredtoin Paragraph 4 (ix),andthecriteriaforacceptance/ rejection of their results shall be determined by the Authority's Engineer in accordance with the MoRTH specifications for Road & Bridge works and respective Indian Roads Congress Standards/ Guidelines/ Manuals together with any other Indian/ International standards referred thereto. 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.

xlvi. 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 remedialmeasures.

xlvii. The Authority's Engineer may instruct the Contractor to execute any work which is urgently required for the safety of the Project Highway, whether becauseofanaccident,unforeseeableeventorotherwise;providedthatincase of any work required on account of a Force Majeure Event, the provisions of Clause 21.6 shallapply.

xlviii. 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.

xlix. 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 Clause12.2.

l. 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'sEngineershallinspectsuchremedialmeasuresforthwithandmake a report to the Authority recommending whether or not the suspension hereunder may berevoked.

li. 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 Engineertoinspectsuchworks,theAuthority'sEngineershallinspectthe 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.

lii. 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,asthecasemaybe.Forcarryingoutitsfunctionsunder thisParagraph4 (xviii)andallmattersincidentalthereto,theAuthority'sEngineer shall act under and in accordance with the provisions of Article 12 and Schedule-K.

5. Maintenance Period

liii. TheAuthority'sEngineershallaidandadvisetheContractorintheprepara tion of its monthly Maintenance Programme and for this purpose carry out a joint monthly inspection with theContractor.

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

lv. 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 thisbehalf.

lvi. 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, specifythepermissiblelimitofdeviationordeteriorationwithreferencetothe Specifications and Standards and shall also specify the time limit for repairor rectification of any deviation or deterioration beyond the permissiblelimit.

lvii. 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 Clause14.5.

6. Determination of costs and time

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

lix. TheAuthority'sEngineershalldeterminetheperiodofTimeExtensiontha tis required to be determined by it under theAgreement.

lx. The Authority's Engineer shall consult each Party in every case of determination in accordance with the provisions of Clause18.5.

7. Payments

lxi. 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 (iv)(d).

lxii. Authority's Engineer shall -

g) 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

h) 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.

i. 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.

ii. 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

iii. A copy of all communications, comments, instructions, Drawings or DocumentssentbytheAuthority'sEngineertotheContractorpursuanttothis 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 tothe Authority forthwith.

iv. 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 safecustody.

v. 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, engineeredandconstructed,includinganas-builtsurveyillustratingthelayout ofheProjectHighwayandsetbacklines,ifany,ofthebuildingsandstructures forming part of Project Facilities; and shall hand them over to the Authority against receiptthereof.

vi. TheAuthority'sEngineer,ifcalleduponbytheAuthorityortheContractor or both, shall mediate and assist the Parties in arriving at an amicable settlement of any Dispute between theParties.

vii. TheAuthority'sEngineershallinformtheAuthorityandtheContractorofa ny event of Contractor's Default within one week of itsoccurrence.

Schedule - O

(See Clauses 19.4 (i), 19.6 (i), and 19.8 (i))

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 (i) subsequent to the lastclaim;

b) amounts reflecting adjustments in price for the aforesaidclaim;

c) the estimated amount of each Change of Scope Order executed subsequent to the lastclaim;

d) amounts reflecting adjustment in price, if any, for (c) abovein accordance with the provisions of Clause 13.2 (iii)(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:

a. For the Works executed (excluding Change of Scope orders);

b. For Change of Scope Orders, and

c. 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 theAgreement;

b) The deductions for maintenance work notdone;

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

d) Amounts reflecting adjustments in price under Clause 19.12;and

e) Amount towards deduction oftaxes

3. Contractor's claim for Damages

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

Schedule - P
(See Clause 20.1)
Insurance

1. Insurance during Construction Period

i. The Contractor shall effect and maintain at its own cost, from the Appointed Date till the date of issue of the Completion Certificate, the following insurancesforanylossordamageoccurringonaccountofNonPoliticalEvent 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) percent 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). InsurancefortheContractor'sequipmentandDocumentsbroughtonto the Site by the Contractor, for a sum sufficient to provide for their replacement at theSite.

ii. Theinsuranceunder sub para (a)and(b) ofparagraph 1(i)aboveshallcovertheAuthority and the Contractor against all loss or damage from any cause arising under paragraph 1.1 other than risks which are not insurable at commercialterms.

2. Insurance for Contractor's Defects Liability

iii. The Contractor shall effect and maintain insurance cover of not less than 15% of the Contract Price for the Works from the date of issue of the Completion Certificate until the end of the Defects Liability Period for any loss or damage for which the Contractor is liable and which arises from a cause occurring prior to the issue of the Completion Certificate. The Contractor shall also maintain other insurances for maximum sums as may be required under the Applicable Laws and in accordance with Good Industry Practice.

3. Insurance against injury to persons and damage to property

iv. The Contractor shall insure against its liability for any loss, damage, death or bodily injury, or damage to any property (except things insured under Paragraphs 1 and 2 of this Schedule or to any person (except persons insured under Clause 20.9), which may arise out of the Contractor's performance of this Agreement. This insurance shall be for a limit per

occurrence of not less than the amount stated below with no limit on the number ofoccurrences.

v. The insurance cover shall be not less than: Rs. 2,00,00,000/- (Rupees Two Crore only), and it shall contractor's responsibility for any liability beyond the amousnt specified in the agreement. .

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

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

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

4. Insurance to be in joint names

vii. 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 2,200 (two thousand and two hundred only) mm for each kilometre.

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 shall be as per the requirement of maintenance mentioned in Schedule-E.

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 **Widening and Up-gradation of existing carriageway into 2-lane with paved shoulder configuration from Reshi to Rhenock from Ch. 96.254 to Ch. 101.554 along NH-717A in the State of Sikkim on EPC mode**on Engineering, Procurement and Construction (the "EPC") basis through …… (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 ANDDELIVERED

(Signature)

(Name and designation of Authority'sRepresentative)

(Address)

SCHEDULE - S

Procedure for Dispute Resolution Board

The parties to the Contract Agreement mutually agree as follows:

1. The Board shall comprise of three Members having experience in the field of construction or have been involved in the Works related to construction and with the interpretation of contractual documents. One Member shall be selected by each of the Authority and the Contractor from the list maintained by NHIDCL hosted on its website website (https://nhidcl.com/). In the event the parties fail to select the member within 28 days of the date of the signing of Contract agreement, in that eventuality, upon the request of either or both parties such Member shall be selected by SAROD within 14 days. The third Member shall be selected by the other two members from the same list. If the two Members selected by or on behalf of the parties fail to select the third Member within 14 days after the later of their selections, then upon the request of either or both parties such third Member shall be selected by SAROD within 14 days. The third Member shall serve as DG (Road & Development) of the Board.

2. The Board shall be constituted when each of the three Board Members has signed a Board Member's declaration of Acceptance as required by the DRB's rules and procedures (which, along with the declaration of acceptance form, are attached as Annexure herewith).

3. In the event of death, disability, or resignation of any Member, such Member shall be replaced in the same manner as the Member being replaced was selected. If for any other reason, a Member fails or is unable to serve, the Managing Director, NHIDCL (or failing the action of the Managing Director then either of the other Members) shall inform the Parties and such non-serving Member shall be replaced in the same manner as the Member being replaced was selected. Any replacement made by the parties shall be completed within 28 days after the event giving rise to the vacancy on the Board, failing which the replacement shall be made by SAROD in the same manner as described above. Replacement shall be considered complete when the new Member signs the Board Member's Declaration of Acceptance. Throughout any replacement process, the Members not being replaced shall continue to serve and the Board shall continue to function and its activities shall have the same force and effect as if the vacancy had not occurred, provided, however that the Board shall not conduct a hearing nor issue a decision until the replacement is completed.

4. If either the Authority or the Contractor is dissatisfied with any decision of the Board, and/or if the Board fails to issue its decision within 56 days after receipt of all the pleadings (along with the supporting documents) of the parties by the DG (Road & Development) of the Board or any extension mutually agreed upon by the Authority and the Contractor, in such a case, either the Authority or the Contractor may, within 28 days after his receipt of the decision, or within 28 days after the expiry of the said period, as the case may be, give notice to the other party, with a copy for information to the Authority's Engineer, of his intention to refer the matter to the Conciliation

Committee of Independent Experts (CCIE) of the Authority for Conciliation/amicable settlement.

5. It is mandatory to refer all the disputes to DRB before issuance of completion certificate and satisfactory completion of punch list items. No dispute shall be entertained after completion of aforementioned date.

6. If the Board has issued a decision to the Authority and the Contractor within the said 56 days or any extension mutually agreed upon by the Authority and the Contractor and no notice of intention to commence Conciliation by the Conciliation Committee of Independent Experts (CCIE) of the Authority for Conciliation/amicable settlement as to such dispute has been given by either the Authority or the Contractor within 28 days after the parties received such decision from the Board, the decision shall become final and binding upon the Authority and Contractor.

7. Whether or not it has become final and binding upon the Authority and the Contractor, a decision shall be admissible as evidence in any subsequent dispute resolution procedure, including any arbitration or litigation having any relation to the dispute to which the decision relates.

8. All decision of DRB which have become final and binding or till they have been reversed in subsequent conciliation/Arbitration process shall be implemented by the parties forthwith. Such implementation shall also include any relevant action of the Authority's Engineer.

9. If during the Contract Period, the Authority and the Contractor are of the opinion that the Disputes Resolution Board is not performing its functions properly, the Authority and the Contractor may together disband the Disputes Resolution Board and reconstitute it. In that case, a new board shall be selected in accordance with the provisions applying to the selection of the original Board as specified above, except that words "within 28 days after the signing of this Contract agreement" shall be replaced by the words "within 28 days after the date on which the notice disbanding the original Board became effective".
10. The Authority and the Contractor shall jointly signed a notice specifying that the Board shall stand disbanded with effect from the date specified in the notice. The notice shall be posted by the email to each member of the Board. A Member shall be deemed to have received the email even if he refuses to have received the same.
11. All other terms and conditions of the original Contract Agreement shall remain unaltered/unaffected and the parties shall remain bound by terms and conditions as contained therein.

Annexure to Schedule [S]

Disputes Resolution Board's Rules and Procedures

1. Except for providing the services required hereunder, the Board Members shall not give any advice to either party or to the Authority's Engineer concerning conduct of the Works. The Board Members:

   a. Shall have no financial interest in any party to the Contract, or the Authority's Engineer, or a financial interest in the contract, except for payment for services on the Board.

   b. Shall have had no previous employment by, or financial ties to, any party to the Contract Agreement, or the Authority's Engineer, except for fee based consulting services/advisers on other projects, and/or be Retired Government Officers (not connected in whole or part with the project), all of which must be disclosed in writing to both parties prior to appointment to the Board.

   c. Shall have disclosed in writing to both parties prior to appointment to the Board any and all recent or close professional or personal relationships with any director, officer, or employee of any party to the Contract, or the Authority's Engineer, and any and all prior involvement in the project to which the Contract relates:

   d. Shall not, while Board member, be employed whether as a consultant or adviser or otherwise by either party to the Contract, or the Authority's Engineer, except as a Board Member, without the prior consent of the parties and the other Board Members;

   e. Shall not, while a Board Member, engage in discussion or make any agreement with any party to the Contract, or with the Authority's Engineer, regarding employment whether as a consultant or otherwise whether after the Contract is completed or after service as a Board Member is completed.

   f. Shall remain and be impartial and independent of the parties and shall disclose in writing to the Authority, the Contractor and one another any fact or circumstance which might be such as to cause either the Authority or the Contractor to question the continued existence of the impartiality and independence required of Board Members, and

   g. Shall be fluent in the language of the Contract.

2. Except for its participation in the Board's activities as provided in the Contract Agreement and in this Agreement none of the Authority, the Contractor, and or the Authority's Engineer shall solicit advice or consultation from the Board or the Board Members on matters dealing with the conduct of the Works.

3. The Contractor shall:

a. Furnish to each Board member one copy of all documents which the Board may request including Contract Agreement, progress reports and other documents pertinent to the performance of the Contract Agreement.

b. In cooperation with the Authority, coordinate the site visits of the Board, including conference facilities, and secretarial and copying service.

4. The Board shall begin its activities following the signing of a Board Member's Declaration of Acceptance by all three Board Members, and it shall terminate these activities as set forth below:

   a. The Board shall terminate its regular activities when either (i) issuance of completion certificate and completion of punch list items or (ii) the parties have terminated the contract and when, in either case, the Board has communicated to the parties and the Authority's Engineer its decision on all disputes previously referred to it.

   b. Once the Board has terminated its regular activities as provided by the previous paragraph, the Board shall remain available to process any dispute referred to it by either party. In case of such a referral, Board Members shall receive payments as provided in paragraphs 7(a) (ii), (iii) and (iv).

5. Board Members shall not assign or subcontract any of their work under these Rules and Procedures.

6. The Board Members are Independent and not employees or agents of either the Authority or the Contractor.

7. Payments to the Board Members for their services shall be governed by the following provisions.

   a. Each Board Member will receive payments as follows:

      i. A retainer fee per calendar month as specified in the schedule of fee made part of this Schedule and its revision from time to time. This retainer fee shall be considered as payment in full for:

   A. Being available, on 7 days' notice, for all hearings, Site Visits, and other meetings of the Board.

   B. Being conversant with all project developments and maintaining relevant files.

   C. All offices and overhead expenses such as secretarial services, photocopying and office supplies (but not include telephone calls, faxes and telexes) incurred in connection with the duties as a Board Member.

ii. A daily fee as specified in the schedule of fee in respect of fee for site visit & meeting, fee for meeting/ hearing not at site and extra charges for days max. of 02 days for travel on each occasion) other than hearing / meeting days.

iii. Expenses, in addition to the above, all reasonable and necessary travel expenses (including economy class air fare, subsistence, and other direct travel expenses). Receipts for all expenses in excess of Rs. 2000/- (Rupees Two Thousand only) shall be provided.

iv. Reimbursement of any taxes that may be levied on payments made to the Board Member pursuant to this paragraph 7.

b. The retainer fee and other fees shall remain fixed for the period of each Board Member's term until revised by NHIDCL.

c. Phasing out of monthly retainer fee. Beginning with the next month after the completion certificate (or, if there are more than one, the one issued last) has been issued, the Board members shall receive only one-third of the monthly retainer fee till next one year. Beginning with the next month after the Board has terminated its regular activities pursuant to paragraph 4(a) above, the Board members shall no longer receive any monthly retainer fee.

d. Payments to the Board Members shall be shared equally by the Authority and the Contractor. The concerned Project Implementation Unit (PIU) of Authority shall pay members' invoices within 30 calendar days after receipt of such invoices and shall invoice the Contractor for one-half of the amounts of such invoices. The Contractor shall pay such invoices within 30 days' time period after receipt of such invoices.

8. Board Site Visits:

a. The Board shall visit the Site and meet the representatives of the Authority, the Contractor and the Authority's Engineer at regular intervals, at times of critical construction events, at the written request of either party, and in any case not less than 6 times in any period or 12 months. The timing of Site visits shall be as agreed among the Authority, the Contractor and the Board, but failing agreement shall be fixed by the Board.

b. Site visits shall include an informal discussion of the status of the construction of the Works. Site visits shall be attended by personnel from the Authority, the Contractor and the Authority's Engineer.

c. At the conclusion of each Site visit, the Board shall prepare a report covering its activities during the visit and shall send copies to the parties and to the Authority's Engineer.

9. Procedure for Dispute Referral to the Board

a. lf either party objects to any action or inaction of the other party or the Authority's Engineer, the objecting party may file a written Notice of Dispute to the other party with a copy to the Authority's Engineer stating that it is given pursuant to the Agreement and state clearly and in details the basis of the dispute.

b. The party receiving the Notice of Dispute will consider it and respond to it in writing within 14 days after receipt.

c. This response shall be final and conclusive on the subject, unless a written appeal to the response is filed with the responding party within 10 days after receiving the response and call upon Authority's Engineer to mediate and assist the parties in arriving an amicable settlement thereof. Both parties are encouraged to pursue the matter further to attempt to settle the dispute.

d. If the Authority's Engineer receiving the Notice of Dispute fails to provide a written response within 14 days after receipt of such Notice or failing mediation by Authority's Engineer, either party may require such dispute to be referred to the Board, either party may refer the dispute to the Board by written Request to the Board. The Request for decision shall state clearly and in full detail the specific issues of the dispute (s) to be considered by Board and shall be addressed to the DG (Road & Development) of the Board, with copies to the other Board Members, the other party, and the Authority Engineer, and it shall state that it is made pursuant to this Agreement.

e. When a dispute is referred to the Board, and the Board is satisfied that the dispute requires the Board's assistance, the Board decide when to conduct a hearing on the dispute. The Board may request that written documentation and arguments from both parties be submitted to each Board Member before the hearing begins. The parties shall submit insofar as possible agreed statements of the relevant facts.

f. During the hearing, the Contractor, the Authority, and the Authority's Engineer shall each have ample opportunity to be heard and to offer evidence. The Board's decision for resolution of the dispute will be given in writing to the Authority, the Contractor and the Authority's Engineer as soon as possible, and in any event not more than 56 days or any mutually extended period between the Authority and the Contractor. The time period of 56 days of issuance of DRB decision will reckon/start from the day of first hearing that begins after submission of complete pleadings (including supporting documents, if any) by the parties.

10. Conduct of Hearings:

a. Normally hearings will be conducted at the Site, but any location that would be more convenient and still provide all required facilities and access to necessary documentation may be utilized by the Board. Private session of the Board may be held at any cost-effective location convenient to the Board. Video recordings of all hearings shall invariably be made.

b. The Authority, the Authority's Engineer and the Contractor shall be given opportunity to have representatives at all hearings. Parties should restrain to bring any Advocate/Law Firm during DRB hearings.

c. During the hearings, no Board Member shall express any opinion concerning the merit of the respective arguments of the parties.

d. After the hearings are concluded, the Board shall meet privately to formulate its decision. The private meeting (s) of the Board shall not exceed 3 sittings. All Board deliberations shall be conducted in private, with all Members' individual views kept strictly confidential. The Board's decisions, together with an explanation of its reasoning shall be submitted in writing to both parties and to the Authority's Engineer. The decision shall be based on the pertinent contract provisions, applicable laws and regulations and the facts and circumstances involved in the dispute.

e. The Board shall make every effort to reach a unanimous decision. If this proves impossible the majority shall decide and the dissenting Member may prepare a

written minority report together with an explanation of its reasoning for submission to both parties and to the Authority's Engineer

11. In all procedural matters, including the furnishing of written documents and arguments relating to disputes, site visits and conduct of hearings, the Board shall have full and the final authority. If a unanimous decision on any such matter proves impossible, the majority shall prevail.
12. After having been selected and where necessary approved each Board Member shall sign two copies of the following declaration and make one copy available each to the Authority and to the Contractor.

BOARD MEMBER'S DECLARATION OF ACCEPTANCE

WHEREAS

a. A Contract Agreement (the Contract) for the_____ project [fill in the name of project] has been signed on _____ [fill in date] between_____ [name of Authority] and _____name of Contractor] (the Contractor).;

b. The provisions of Agreement and Dispute Resolution Board's rules and procedure provided for establishment and operation of Dispute Resolution Board (DRB).

c. The undersigned has been selected to serve as a Board Member on said Board;

NOW THEREFORE, the undersigned Board Member hereby declares as follows

1. I accept the selection as a Board Member and agree to serve on the Board and to be bound by the provisions of Contract Agreement and rules and procedure provided for establishment and operation of Dispute Resolution Board DRB).

2. With respect to paragraph 1 of Dispute Resolution Board's Rules and Procedure. said Annex A, I declare

   a. that I have no financial interest of the kind referred to in subparagraph (a):

   b. that I have had no previous employment nor financial ties of the kind referred to in subparagraph (b); and

   c. that I have made to both parties any disclosures that may be required by sub-paragraphs (b) and (c).

3. I declare that I have _____no. of Arbitrations (list enclosed) and _____ no. of DRBs (list enclosed) in progress and that I will give sufficient time for the current assignment.

BOARD MEMBER

_____

_____ [insert name of Board Member)
Date: _____

Schedule of expenses and fees payable to the Member(s) of Dispute Resolution Board (DRB)

The fee and other expenses payable to the Members of DRB shall be as under

S. No.	Particular	Amount Payable
1	Retainer-ship fee, secretarial assistance and incidental charges (telephone, fax, postage etc)	Rs. 50,000/- per month for one package and maximum of Rs. 75,000/- per month for 2 or more packages
2(i)	Fee for site visit or meetings at site	Rs. 25,000/- per day
(ii)	Fee for meetings/hearings not at site	Rs. 10,000/- per day
3	Traveling expenses	Economy class by air, AC first class by train and AC taxi by road
4	Lodging & Boarding	Rs. 15,000/- per day (Metro Cities): or Rs. 10,000/- per day (in other cities); or Rs. 5,000/- per day (own arrangement)
5	Extra charges for days other than hearing/meeting days (travel days maximum of 2 days on each occasion)	Rs. 5,000/-
6	Local conveyance	Rs. 2,000/-

Notes:

i. Lodging, boarding and travelling expenses will be allowed only for those members who are residing 100 kms away from the place of meeting.

ii. Delhi, Mumbai, Chennai, Kolkata, Bangalore and Hyderabad shall be considered as Metro Cites.

iii. The above schedule of fee and expenses shall be applicable on or after the date of issue of this circular.

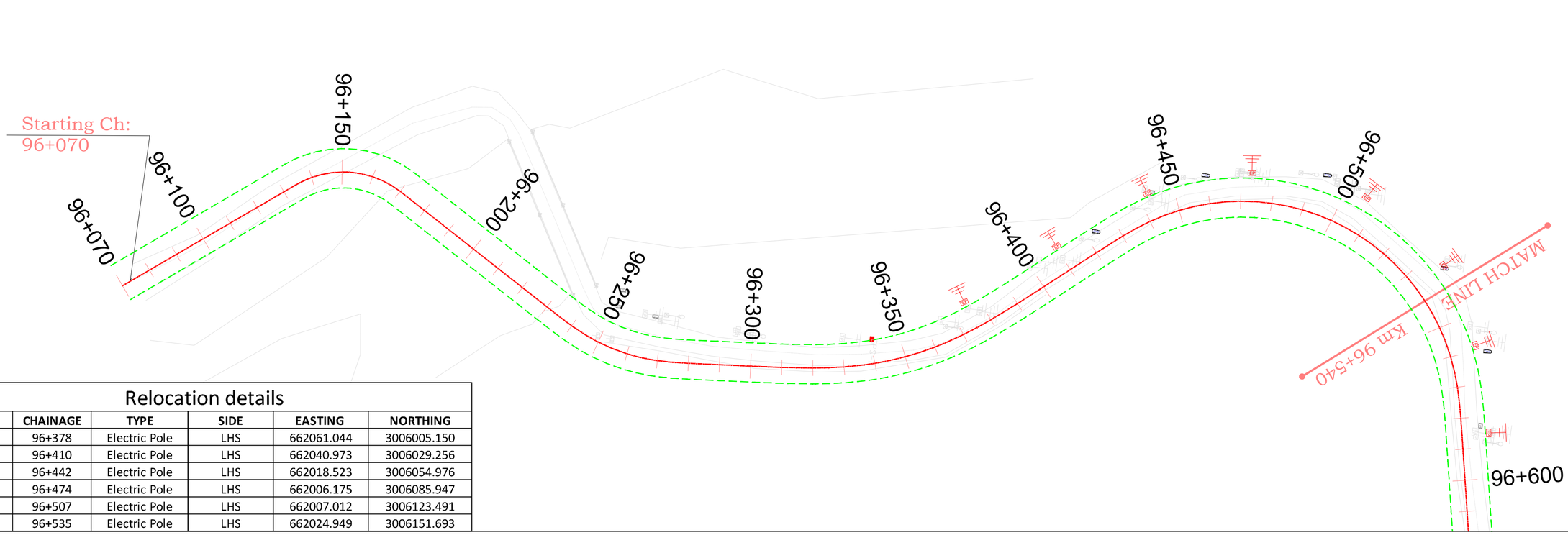
iv. The expenses are to be shared equally by the parties i.e. Authority and Contractor.

Utility Relocation Plan

Electric Poles

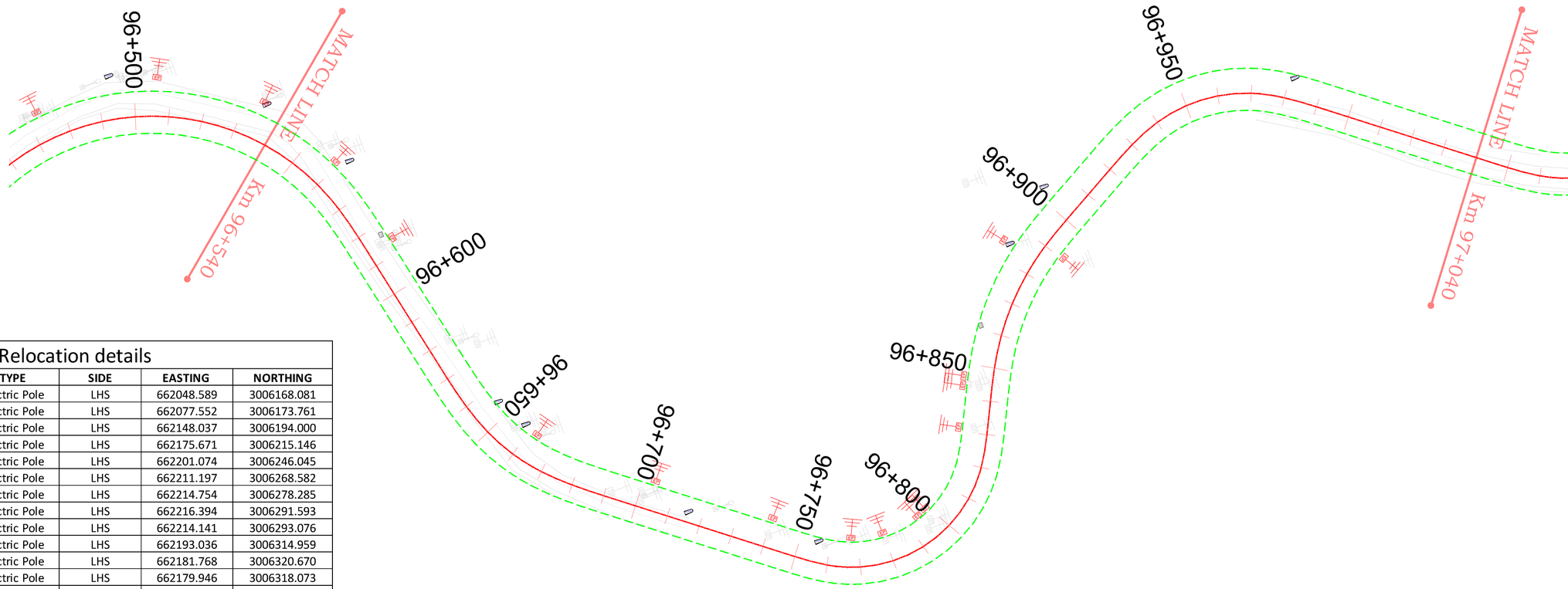
TO RESHI (NH-717A)

TO RHENOCK (NH-717A)



Relocation details

SL. NO	CHAINAGE	TYPE	SIDE	EASTING	NORTHING
1	96+378	Electric Pole	LHS	662061.044	3006005.150
2	96+410	Electric Pole	LHS	662040.973	3006029.256
3	96+442	Electric Pole	LHS	662018.523	3006054.976
4	96+474	Electric Pole	LHS	662006.175	3006085.947
5	96+507	Electric Pole	LHS	662007.012	3006123.491
6	96+535	Electric Pole	LHS	662024.949	3006151.693



Relocation details

SL. NO	CHAINAGE	TYPE	SIDE	EASTING	NORTHING
7	96+560	Electric Pole	LHS	662048.589	3006168.081
8	96+585	Electric Pole	LHS	662077.552	3006173.761
9	96+660	Electric Pole	LHS	662148.037	3006194.000
10	96+700	Electric Pole	LHS	662175.671	3006215.146
11	96+740	Electric Pole	LHS	662201.074	3006246.045
12	96+767	Electric Pole	LHS	662211.197	3006268.582
13	96+780	Electric Pole	LHS	662214.754	3006278.285
14	96+795	Electric Pole	LHS	662216.394	3006291.593
15	96+798	Electric Pole	LHS	662214.141	3006293.076
16	96+830	Electric Pole	LHS	662193.036	3006314.959
17	96+843	Electric Pole	LHS	662181.768	3006320.670
18	96+843	Electric Pole	LHS	662179.946	3006318.073
19	96+882	Electric Pole	LHS	662145.763	3006344.667
20	96+890	Electric Pole	RHS	662157.942	3006359.941

Legends: Existing

- Electrical Pole
- Light Pole
- Telephone Pole
- Transformer
- Water Pipe Line

Legends: Proposed

- Electrical Pole
- Light Pole
- Telephone Pole
- Transformer
- Water Pipe Line

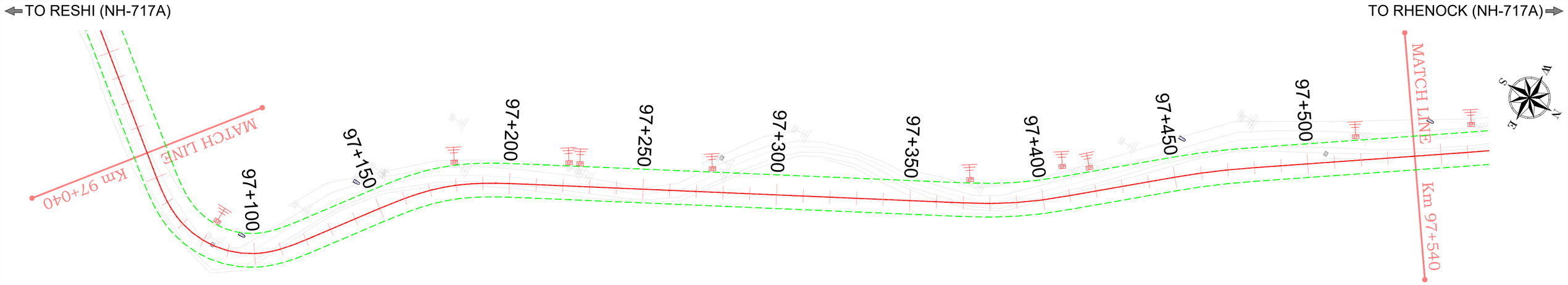
Rev. No	Date	Checked By.	Revision Details	Color Code.	Description
					Center Line
					PROW

Client:
National Highway & Infrastructure Development Corp. Ltd. (NHIDCL)
1st & 2nd Floor, Tower A, World Trade Centre, Nauroji Nagar, New Delhi – 110029

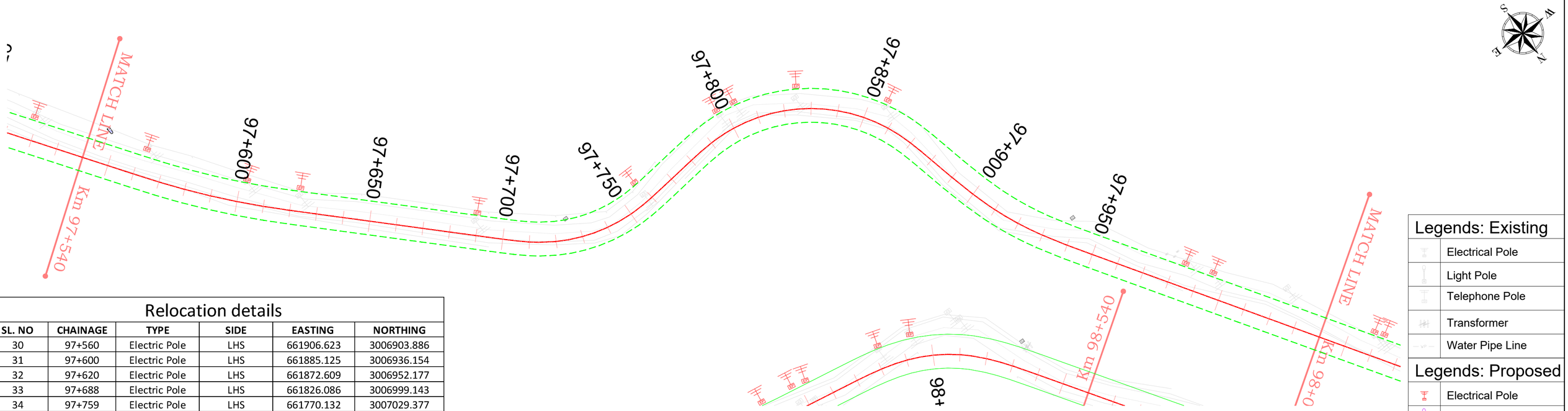
Design Consultant:
Xplorer Consultancy Services Pvt. Ltd. in joint venture Dsd Infratech Management Pvt. Ltd, in Association With Maverick Mernok & Construction
511, Tower b, ithum, plot-A40
Sector-62, Noida
Uttar Pradesh – 201301

Project :
Consultancy Services For Preparation Of DPR And Providing Services For Pre-Construction Activities In Respect of"Widening And Up-Gradation Of Existing Carriageway into 2L+PS Configuration From Reshi(Km 96.254) .To Rhenock (Km 101.554) Along NH-717A & From Rhenock (Km 0.00) To Rongli Bazaar (Km 15.300) Along NH-717B in the States Of Sikkim ".
(Reshi 96+070 To Rhenock 101+367)

Design By : RK	Title: Utilities Shifting For Electrical Poles (Km 96+070 to Km 97+040)
Drawn By : MK	
Checked By : AH	
Approved By : VY	Dwg No: XPL/DSD/SK/UTILITIES/EP/01
Scale : 1/1000	Sheet: 01 OF 06 — Date : Oct-2024



Relocation details					
SL. NO	CHAINAGE	TYPE	SIDE	EASTING	NORTHING
21	97+080	Electric Pole	LHS	662185.178	3006519.676
22	97+180	Electric Pole	LHS	662115.143	3006585.126
23	97+220	Electric Pole	LHS	662094.083	3006622.685
24	97+223	Electric Pole	LHS	662093.687	3006626.183
25	97+275	Electric Pole	LHS	662067.043	3006669.217
26	97+372	Electric Pole	LHS	662021.645	3006754.209
27	97+408	Electric Pole	LHS	661999.009	3006784.669
28	97+418	Electric Pole	LHS	661992.737	3006792.664
29	97+517	Electric Pole	LHS	661931.888	3006868.591



Relocation details					
SL. NO	CHAINAGE	TYPE	SIDE	EASTING	NORTHING
30	97+560	Electric Pole	LHS	661906.623	3006903.886
31	97+600	Electric Pole	LHS	661885.125	3006936.154
32	97+620	Electric Pole	LHS	661872.609	3006952.177
33	97+688	Electric Pole	LHS	661826.086	3006999.143
34	97+759	Electric Pole	LHS	661770.132	3007029.377
35	97+798	Electric Pole	LHS	661729.712	3007026.752
36	97+802	Electric Pole	LHS	661723.011	3007022.907
37	97+824	Electric Pole	LHS	661703.555	3007034.732
38	97+855	Electric Pole	LHS	661678.727	3007057.673
39	97+982	Electric Pole	LHS	661623.110	3007171.206
40	97+994	Electric Pole	LHS	661619.038	3007180.970

Legends: Existing

- Electrical Pole
- Light Pole
- Telephone Pole
- Transformer
- Water Pipe Line

Legends: Proposed

- Electrical Pole
- Light Pole
- Telephone Pole
- Transformer
- Water Pipe Line

Rev. No	Date	Checked By.	Revision Details	Color Code.	Description
					Center Line
					PROW

Client:
National Highway & Infrastructure Development Corp. Ltd. (NHIDCL)
1st & 2nd Floor, Tower A,
World Trade Centre,
Nauroji Nagar,
New Delhi – 110029

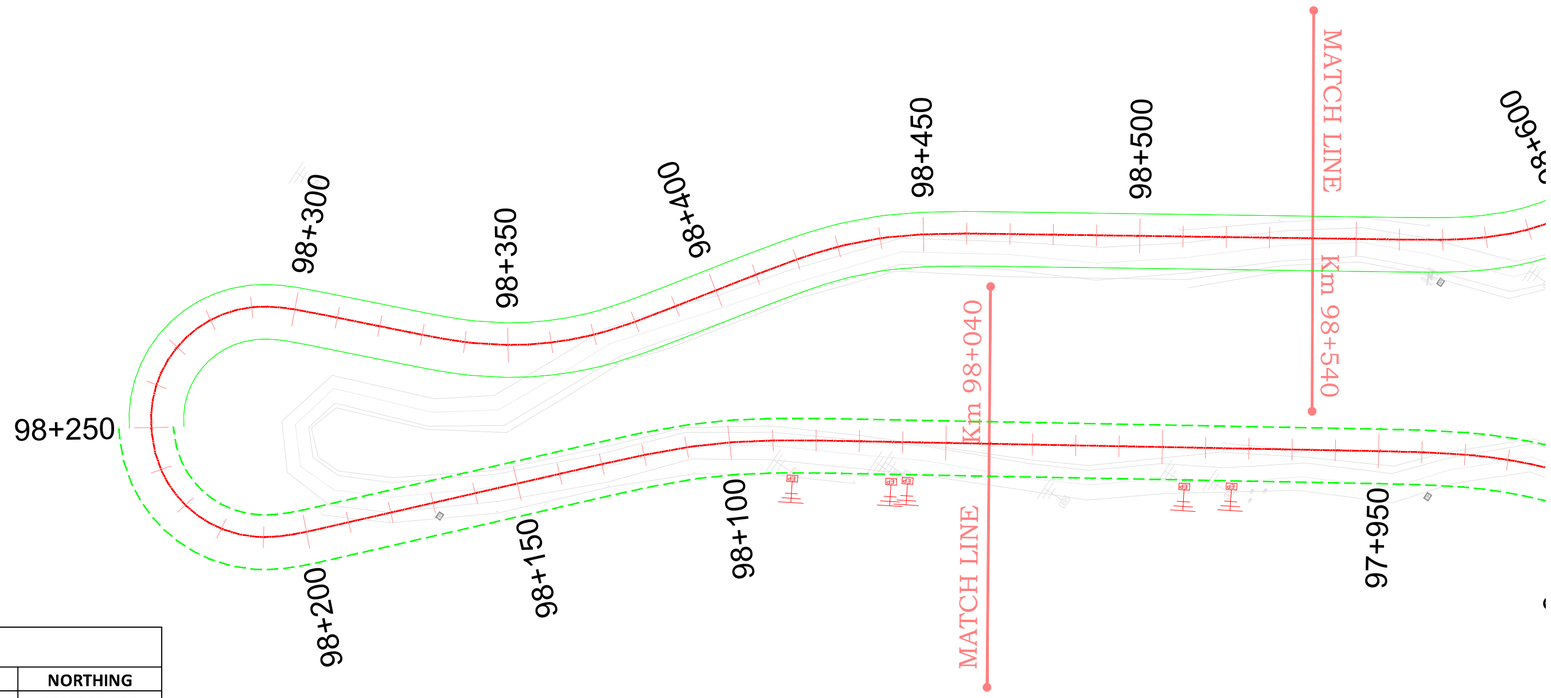
Design Consultant:
Xplorer Consultancy Services Pvt. Ltd.
in joint venture Dsd Infratech Management Pvt. Ltd, in Association With Maverick Mernok & Construction
511, Tower b, ithum, plot-A40
Sector-62, Noida
Uttar Pradesh – 201301

Project :
Consultancy Services For Preparation Of DPR And Providing Services For Pre-Construction Activities in Respect of"Widening And Up-Gradation Of Existing Carriageway into 2L+PS Configuration From Reshi(Km 96.254) .To Rhenock (Km 101.554) Along NH-717A & From Rhenock (Km 0.00) To Rongli Bazaar (Km 15.300) Along NH-717B in the States Of Sikkim ".
(Reshi 96+070 To Rhenock 101+367)

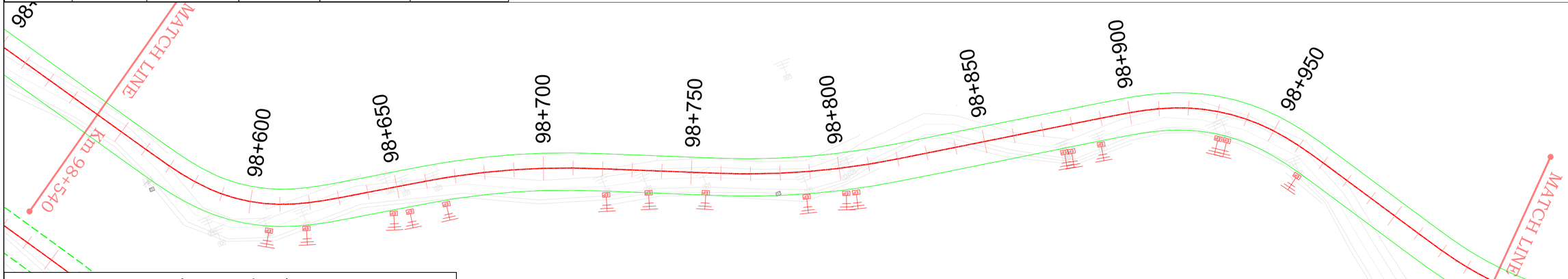
Design By : RK	Title: Utilities Shifting For Electrical Poles (Km 97+040 to Km 98+040)
Drawn By : MK	
Checked By : AH	
Approved By : VY	Dwg No: XPL/DSD/SK/UTILITIES/EP/02
Scale : 1/1000	Sheet: 02 OF 06 — Date : Oct-2024

TO RESHI (NH-717A)

TO RHENOCK (NH-717A)



Relocation details					
SL. NO	CHAINAGE	TYPE	SIDE	EASTING	NORTHING
41	98+058	Electric Pole	LHS	661584.519	3007235.725
42	95+060	Electric Pole	LHS	661583.266	3007237.645
43	98+085	Electric Pole	LHS	661570.531	3007257.311



Relocation details					
SL. NO	CHAINAGE	TYPE	SIDE	EASTING	NORTHING
44	98+608	Electric Pole	RHS	661722.460	3007129.806
45	98+620	Electric Pole	RHS	661735.373	3007128.122
46	98+648	Electric Pole	RHS	661765.577	3007128.541
47	98+652	Electric Pole	RHS	661770.442	3007125.970
48	98+665	Electric Pole	RHS	661781.136	3007123.611
49	98+722	Electric Pole	RHS	661833.796	3007101.982
50	98+736	Electric Pole	RHS	661847.168	3007097.875
51	98+756	Electric Pole	RHS	661866.046	3007091.456
52	98+790	Electric Pole	RHS	661897.572	3007077.736
53	98+802	Electric Pole	RHS	661910.929	3007077.476
54	98+805	Electric Pole	RHS	661913.416	3007078.135
55	99+868	Electric Pole	RHS	661982.689	3007060.547
56	99+869	Electric Pole	RHS	661983.939	3007060.343
57	99+880	Electric Pole	RHS	661995.425	3007058.191
58	98+934	Electric Pole	RHS	662033.306	3007044.101
59	98+935	Electric Pole	RHS	662036.261	3007044.348
60	98+965	Electric Pole	RHS	662054.368	3007023.303

Legends: Existing

- Electrical Pole
- Light Pole
- Telephone Pole
- Transformer
- Water Pipe Line

Legends: Proposed

- Electrical Pole
- Light Pole
- Telephone Pole
- Transformer
- Water Pipe Line

Rev. No	Date	Checked By.	Revision Details	Color Code.	Description
					Center Line
					PROW

Client:
National Highway & Infrastructure Development Corp. Ltd. (NHIDCL)
1st & 2nd Floor, Tower A, World Trade Centre, Nauroji Nagar, New Delhi – 110029

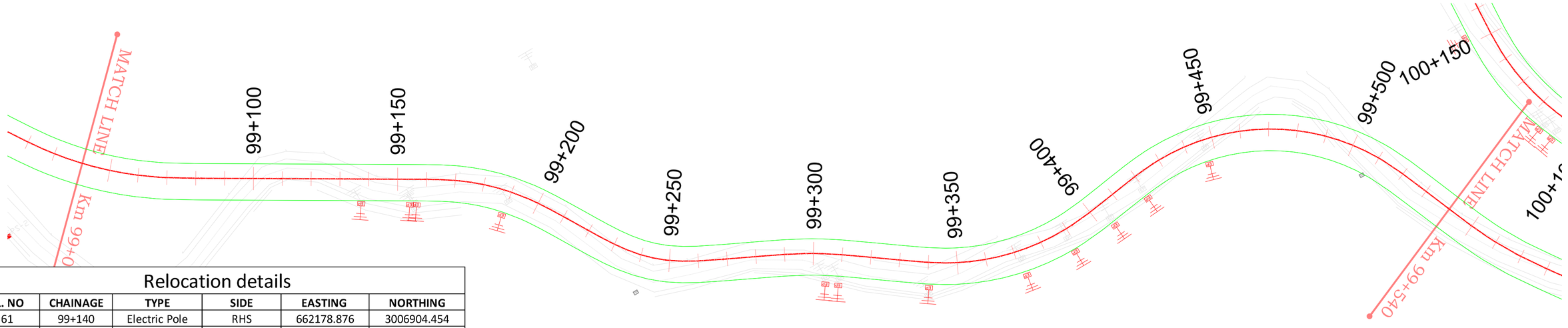
Design Consultant:
Xplorer Consultancy Services Pvt. Ltd. in joint venture Dsd Infratech Management Pvt. Ltd, in Association With Maverick Mernok & Construction
511, Tower b, ithum, plot-A40 Sector-62, Noida Uttar Pradesh – 201301

Project :
Consultancy Services For Preparation Of DPR And Providing Services For Pre-Construction Activities in Respect of"Widening And Up-Gradation Of Existing Carriageway into 2L+PS Configuration From Reshi(Km 96.254) .To Rhenock (Km 101.554) Along NH-717A & From Rhenock (Km 0.00) To Rongli Bazaar (Km 15.300) Along NH-717B in the States Of Sikkim ".
(Reshi 96+070 To Rhenock 101+367)

Design By : RK	Title: Utilities Shifting For Electrical Poles (Km 98+040 to Km 99+040)
Drawn By : MK	
Checked By : AH	
Approved By : VY	Dwg No: XPL/DSD/SK/UTILITIES/EP/03
Scale : 1/1000	Sheet: 03 OF 06 — Date : Oct-2024

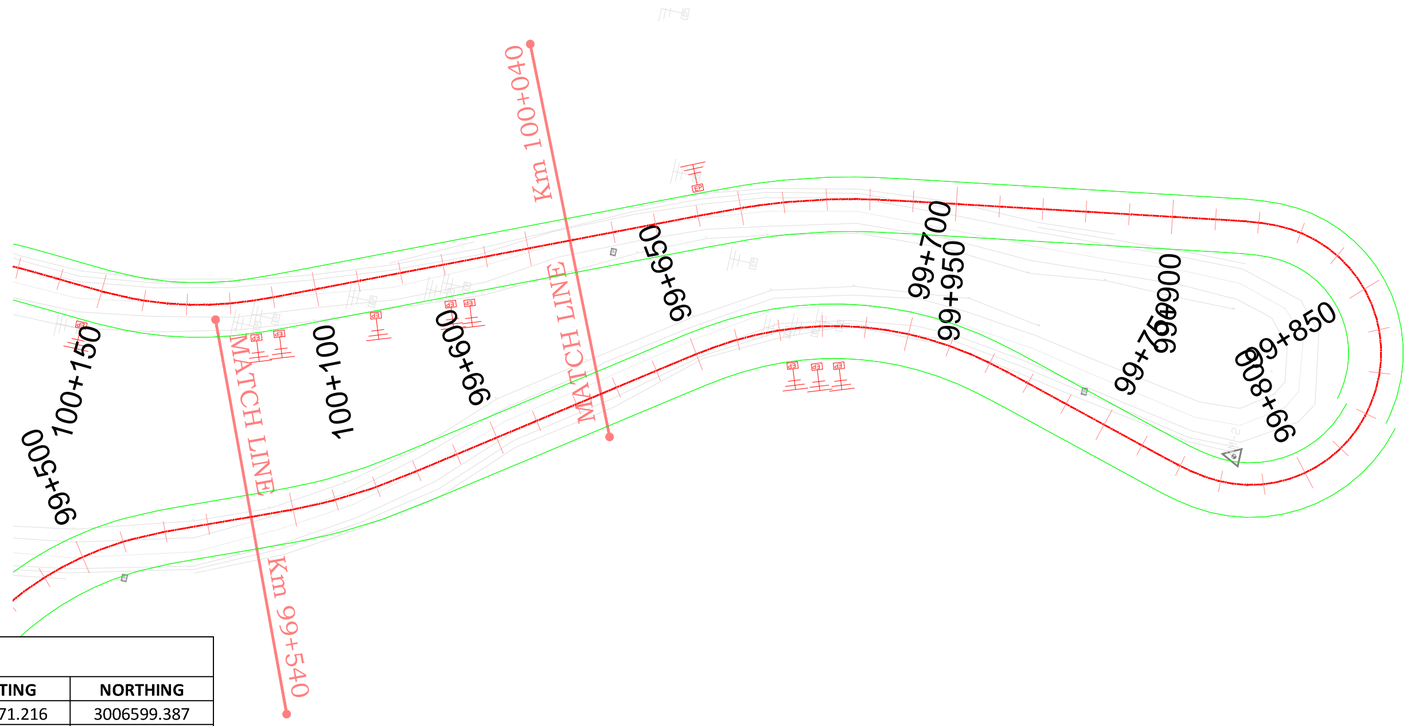
TO RESHI (NH-717A)

TO RHENOCK (NH-717A)



Relocation details

SL. NO	CHAINAGE	TYPE	SIDE	EASTING	NORTHING
61	99+140	Electric Pole	RHS	662178.876	3006904.454
62	99+155	Electric Pole	RHS	662194.625	3006895.102
63	99+155	Electric Pole	RHS	662193.811	3006897.180
64	99+190	Electric Pole	RHS	662222.886	3006879.267
65	99+305	Electric Pole	RHS	662304.207	3006800.596
66	99+310	Electric Pole	RHS	662308.320	3006797.843
67	99+340	Electric Pole	RHS	662332.091	3006781.312
68	99+372	Electric Pole	RHS	662366.249	3006771.622
69	99+389	Electric Pole	RHS	662383.515	3006769.773
70	99+405	Electric Pole	RHS	662399.734	3006768.364
71	99+420	Electric Pole	RHS	662414.330	3006771.043
72	99+448	Electric Pole	RHS	662440.548	3006772.605



Relocation details

SL. NO	CHAINAGE	TYPE	SIDE	EASTING	NORTHING
73	99+670	Electric Pole	RHS	662571.216	3006599.387
74	99+679	Electric Pole	RHS	662572.831	3006593.246
75	99+685	Electric Pole	RHS	662575.289	3006588.015
76	100+010	Electric Pole	RHS	662601.730	3006627.737

Legends: Existing

- Electrical Pole
- Light Pole
- Telephone Pole
- Transformer
- Water Pipe Line

Legends: Proposed

- Electrical Pole
- Light Pole
- Telephone Pole
- Transformer
- Water Pipe Line

Rev. No	Date	Checked By.	Revision Details	Color Code.	Description
					Center Line
					PROW

Client:
National Highway & Infrastructure Development Corp. Ltd. (NHIDCL)
1st & 2nd Floor, Tower A, World Trade Centre, Nauroji Nagar, New Delhi – 110029

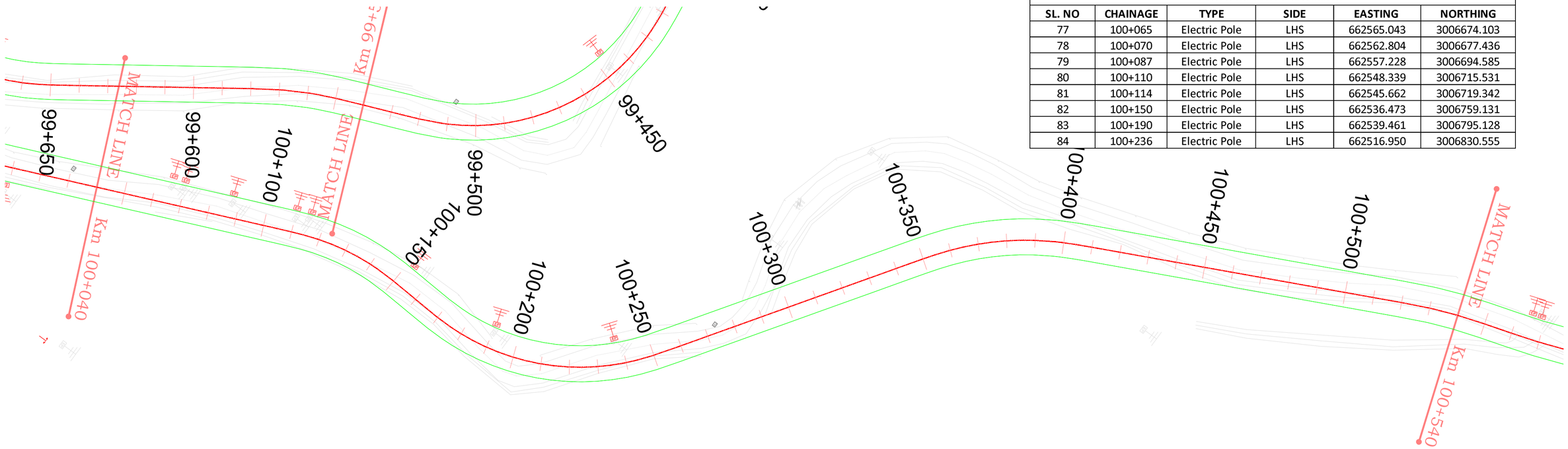
Design Consultant:
Xplorer Consultancy Services Pvt. Ltd. in joint venture Dsd Infratech Management Pvt. Ltd, in Association With Maverick Mernok & Construction
511, Tower b, ithum, plot-A40 Sector-62, Noida Uttar Pradesh – 201301

Project :
Consultancy Services For Preparation Of DPR And Providing Services For Pre-Construction Activities in Respect of"Widening And Up-Gradation Of Existing Carriageway into 2L+PS Configuration From Reshi(Km 96.254) .To Rhenock (Km 101.554) Along NH-717A & From Rhenock (Km 0.00) To Rongli Bazaar (Km 15.300) Along NH-717B in the States Of Sikkim ".
(Reshi 96+070 To Rhenock 101+367)

Design By : RK	Title: Utilities Shifting For Electrical Poles (Km 99+040 to Km 100+040)
Drawn By : MK	
Checked By : AH	
Approved By : VY	Dwg No: XPL/DSD/SK/UTILITIES/EP/04
Scale : 1/1000	Sheet: 04 OF 06 — Date : Oct-2024

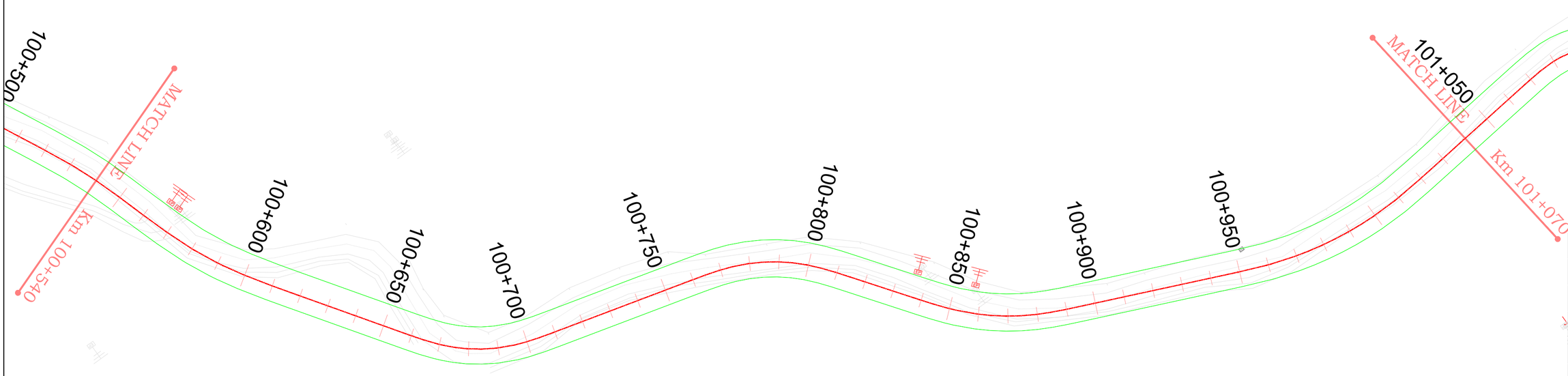
TO RESHI (NH-717A)

TO RHENOCK (NH-717A)



Relocation details

SL. NO	CHAINAGE	TYPE	SIDE	EASTING	NORTHING
77	100+065	Electric Pole	LHS	662565.043	3006674.103
78	100+070	Electric Pole	LHS	662562.804	3006677.436
79	100+087	Electric Pole	LHS	662557.228	3006694.585
80	100+110	Electric Pole	LHS	662548.339	3006715.531
81	100+114	Electric Pole	LHS	662545.662	3006719.342
82	100+150	Electric Pole	LHS	662536.473	3006759.131
83	100+190	Electric Pole	LHS	662539.461	3006795.128
84	100+236	Electric Pole	LHS	662516.950	3006830.555



Relocation details

SL. NO	CHAINAGE	TYPE	SIDE	EASTING	NORTHING
85	100+566	Electric Pole	LHS	662319.243	3007085.121
86	100+568	Electric Pole	LHS	662317.134	3007086.079
87	100+836	Electric Pole	LHS	662125.273	3007250.463
88	100+856	Electric Pole	LHS	662115.296	3007267.358

Legends: Existing

- Electrical Pole
- Light Pole
- Telephone Pole
- Transformer
- Water Pipe Line

Legends: Proposed

- Electrical Pole
- Light Pole
- Telephone Pole
- Transformer
- Water Pipe Line

Rev. No	Date	Checked By.	Revision Details	Color Code.	Description
					Center Line
					PROW

Client:
National Highway & Infrastructure Development Corp. Ltd. (NHIDCL)
1st & 2nd Floor, Tower A,
World Trade Centre,
Nauroji Nagar,
New Delhi – 110029

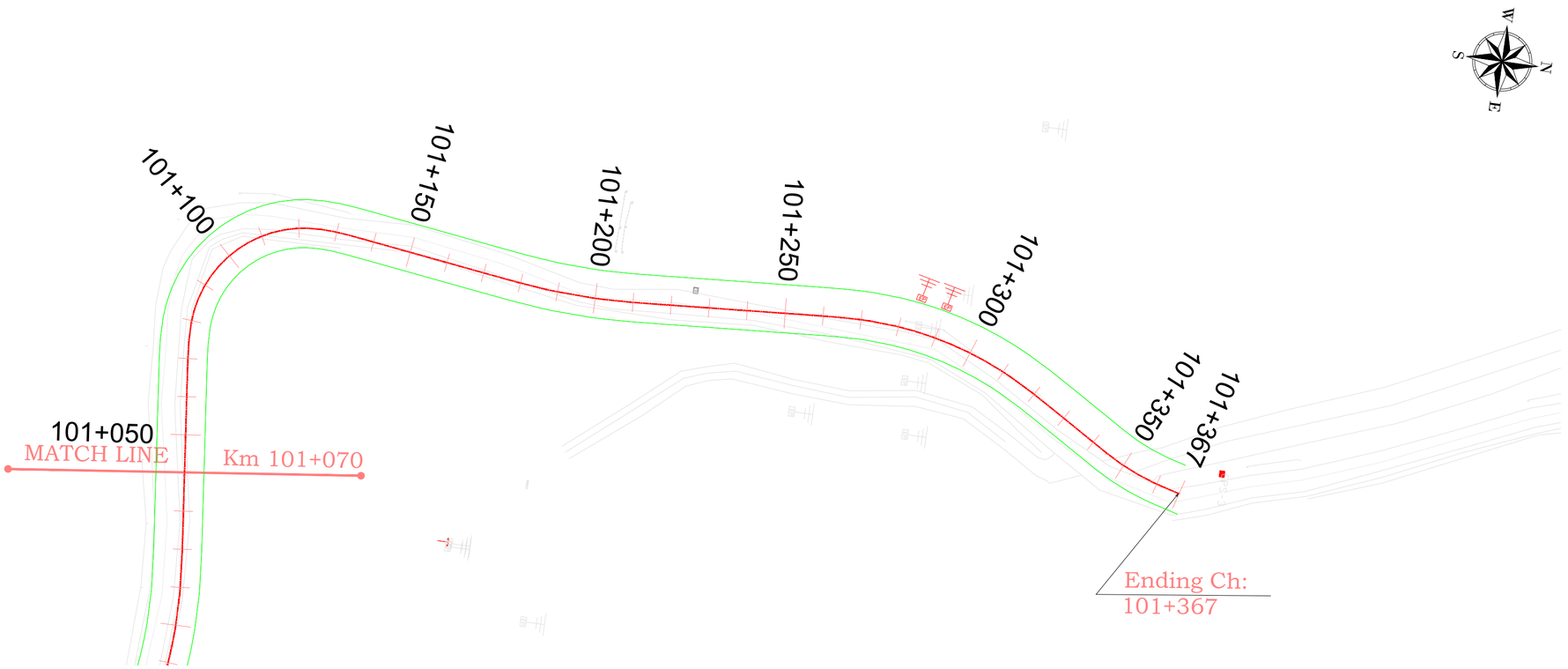
Design Consultant:
Xplorer Consultancy Services Pvt. Ltd.
in joint venture Dsd Infratech Management Pvt. Ltd, in Association With Maverick Mernok & Construction
511, Tower b, ithum, plot-A40
Sector-62, Noida
Uttar Pradesh – 201301

Project :
Consultancy Services For Preparation Of DPR And Providing Services For Pre-Construction Activities in Respect of"Widening And Up-Gradation Of Existing Carriageway into 2L+PS Configuration From Reshi(Km 96.254) .To Rhenock (Km 101.554) Along NH-717A & From Rhenock (Km 0.00) To Rongli Bazaar (Km 15.300) Along NH-717B in the States Of Sikkim ".
(Reshi 96+070 To Rhenock 101+367)

Design By : RK	Title: Utilities Shifting For Electrical Poles (Km 100+040 to Km 101+040)
Drawn By : MK	
Checked By : AH	
Approved By : VY	Dwg No: XPL/DSD/SK/UTILITIES/EP/05
Scale : 1/1000	Sheet: 05 OF 06 — Date : Oct-2024

TO RESHI (NH-717A)

TO RHENOCK (NH-717A)



Relocation details

SL. NO	CHAINAGE	TYPE	SIDE	EASTING	NORTHING
89	101+285	Electric Pole	LHS	661886.636	3007508.374
90	101+290	Electric Pole	LHS	661877.108	3007518.368

Legends: Existing

	Electrical Pole
	Light Pole
	Telephone Pole
	Transformer
WP	Water Pipe Line

Legends: Proposed

	Electrical Pole
	Light Pole
	Telephone Pole
	Transformer
WP	Water Pipe Line

Rev. No	Date	Checked By.	Revision Details	Color Code.	Description
					Center Line
					PROW

Client:
National Highway & Infrastructure Development Corp. Ltd.
(NHIDCL)
1st & 2nd Floor, Tower A,
World Trade Centre,
Nauroji Nagar,
New Delhi – 110029

Design Consultant:
Xplorer Consultancy Services Pvt. Ltd.
in joint venture Dsd Infratech Management Pvt. Ltd, in Association With Maverick Mernok & Construction
511, Tower b, ithum, plot-A40
Sector-62, Noida
Uttar Pradesh – 201301

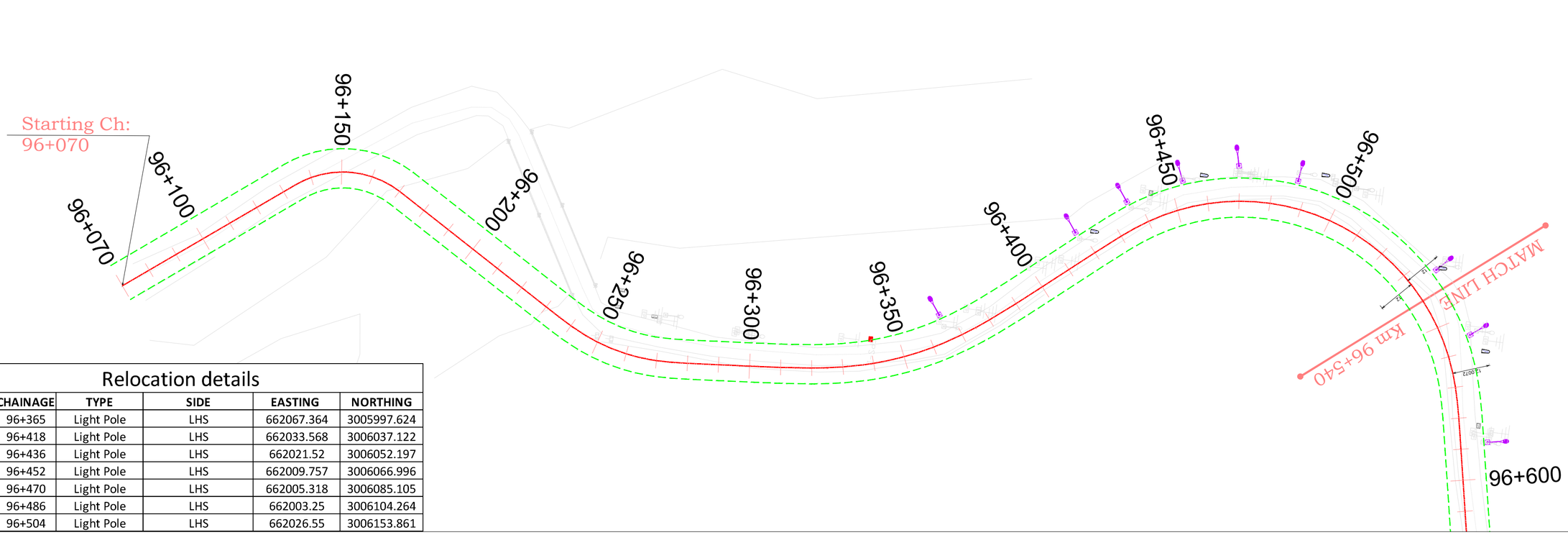
Project :
Consultancy Services For Preparation Of DPR And Providing Services For Pre-Construction Activities in Respect of"Widening And Up-Gradation Of Existing Carriageway into 2L+PS Configuration From Reshi(Km 96.254) .To Rhenock (Km 101.554) Along NH-717A & From Rhenock (Km 0.00) To Rongli Bazaar (Km 15.300) Along NH-717B in the States Of Sikkim ".
(Reshi 96+070 To Rhenock 101+367)

Design By : RK	Title: Utilities Shifting For Electrical Poles (Km 101+040 to Km 101+367)
Drawn By : MK	
Checked By : AH	
Approved By : VY	Dwg No: XPL/DSD/SK/UTILITIES/EP/06
Scale : 1/1000	Sheet: 06 OF 06 — Date : Oct-2024

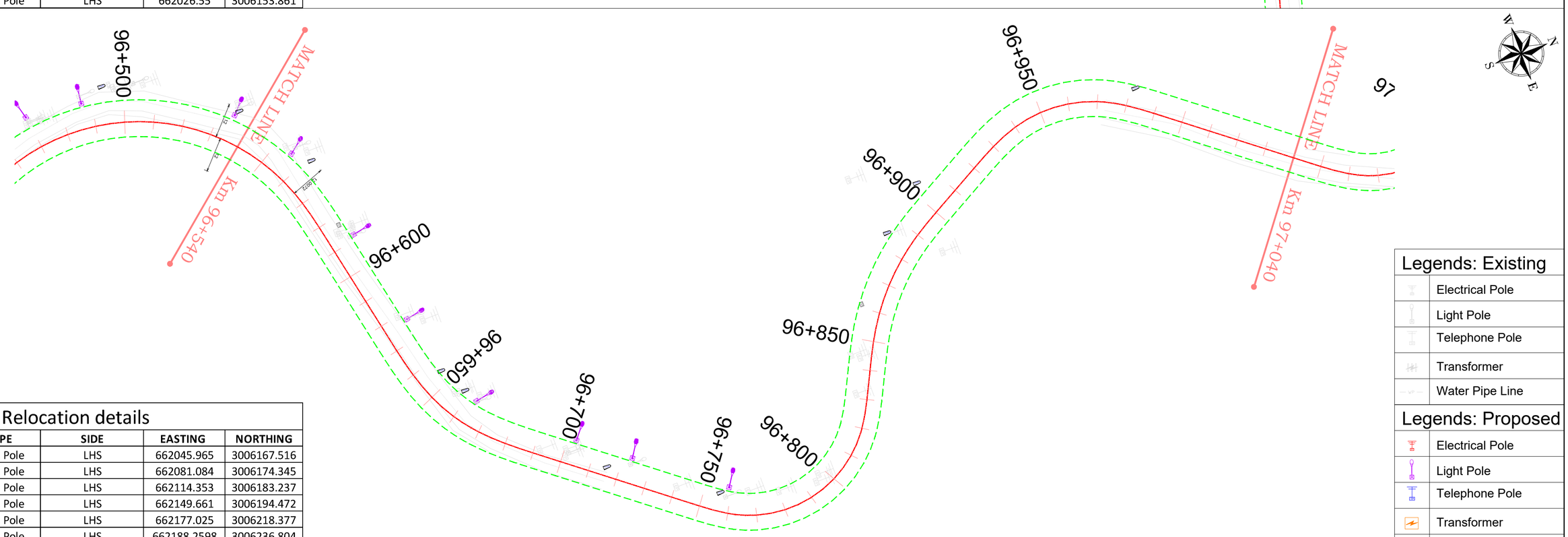
Light Poles

TO RESHI (NH-717A)

TO RHENOCK (NH-717A)



Relocation details					
SL. NO	CHAINAGE	TYPE	SIDE	EASTING	NORTHING
1	96+365	Light Pole	LHS	662067.364	3005997.624
2	96+418	Light Pole	LHS	662033.568	3006037.122
3	96+436	Light Pole	LHS	662021.52	3006052.197
4	96+452	Light Pole	LHS	662009.757	3006066.996
5	96+470	Light Pole	LHS	662005.318	3006085.105
6	96+486	Light Pole	LHS	662003.25	3006104.264
7	96+504	Light Pole	LHS	662026.55	3006153.861



Relocation details					
SL. NO	CHAINAGE	TYPE	SIDE	EASTING	NORTHING
8	96+556	Light Pole	LHS	662045.965	3006167.516
9	96+590	Light Pole	LHS	662081.084	3006174.345
10	96+622	Light Pole	LHS	662114.353	3006183.237
11	96+665	Light Pole	LHS	662149.661	3006194.472
12	96+701	Light Pole	LHS	662177.025	3006218.377
13	96+724	Light Pole	LHS	662188.2598	3006236.804
14	96+758	Light Pole	LHS	662210.2239	3006263.375

Legends: Existing

- Electrical Pole
- Light Pole
- Telephone Pole
- Transformer
- Water Pipe Line

Legends: Proposed

- Electrical Pole
- Light Pole
- Telephone Pole
- Transformer
- Water Pipe Line

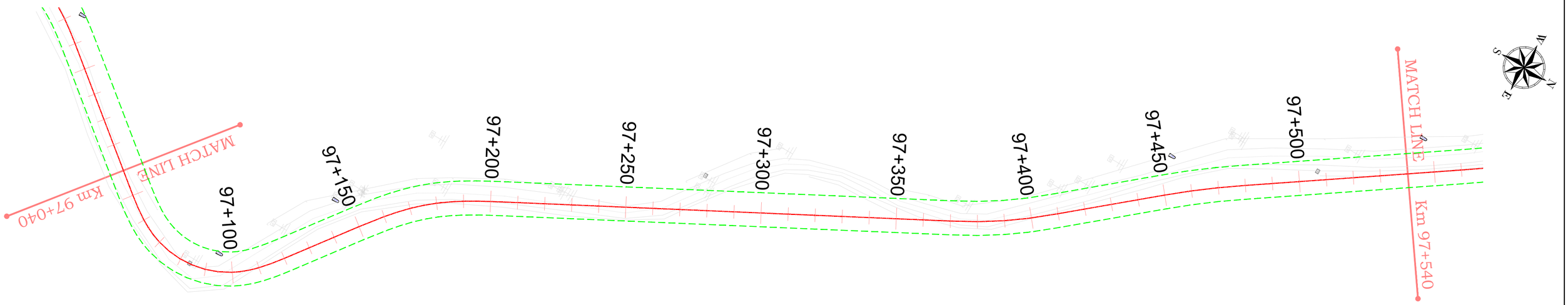
Rev. No	Date	Checked By.	Revision Details	Color Code.	Description
					Center Line
					Formation Width

Client:
National Highway & Infrastructure Development Corp. Ltd. (NHIDCL)
1st & 2nd Floor, Tower A, World Trade Centre, Nauroji Nagar, New Delhi – 110029

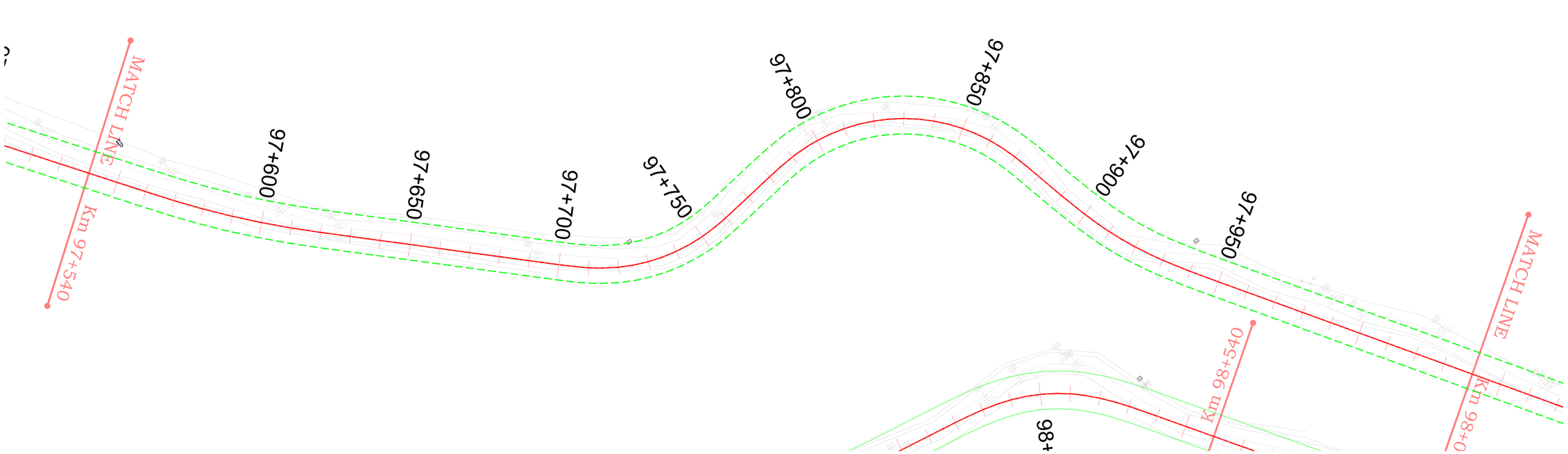
Design Consultant:
Xplorer Consultancy Services Pvt. Ltd. in joint venture Dsd Infratech Management Pvt. Ltd, in Association With Maverick Mernok & Construction
511, Tower b, ithum, plot-A40 Sector-62, Noida Uttar Pradesh – 201301

Project :
Consultancy Services For Preparation Of DPR And Providing Services For Pre-Construction Activities In Respect of"Widening And Up-Gradation Of Existing Carriageway into 2L+PS Configuration From Reshi(Km 96.254) .To Rhenock (Km 101.554) Along NH-717A & From Rhenock (Km 0.00) To Rongli Bazaar (Km 15.300) Along NH-717B in the States Of Sikkim ".
(Reshi 96+070 To Rhenock 101+367)

Design By : RK	Title: Utilities Shifting For Light Poles (Km 96+070 to Km 97+040)
Drawn By : MK	
Checked By : AH	
Approved By : VY	Dwg No: XPL/DSD/SK/UTILITIES/LP/01
Scale : 1/1000	Sheet: 01 OF 06 — Date : Nov-2024



Relocation details					
SL. NO	CHAINAGE	TYPE	SIDE	EASTING	NORTHING
	97+040	Light Pole	NIL		
	97+540				



Relocation details					
SL. NO	CHAINAGE	TYPE	SIDE	EASTING	NORTHING
	97+540	Light Pole	NIL		
	98+040				

Legends: Existing

- Electrical Pole
- Light Pole
- Telephone Pole
- Transformer
- Water Pipe Line

Legends: Proposed

- Electrical Pole
- Light Pole
- Telephone Pole
- Transformer
- Water Pipe Line

Rev. No	Date	Checked By.	Revision Details	Color Code.	Description
					Center Line
					Formation Width

Client:
National Highway & Infrastructure Development Corp. Ltd. (NHIDCL)
1st & 2nd Floor, Tower A, World Trade Centre, Nauroji Nagar, New Delhi – 110029

Design Consultant:
Xplorer Consultancy Services Pvt. Ltd. in joint venture Dsd Infratech Management Pvt. Ltd, in Association With Maverick Mernok & Construction
511, Tower b, ithum, plot-A40 Sector-62, Noida Uttar Pradesh – 201301

Project :
Consultancy Services For Preparation Of DPR And Providing Services For Pre-Construction Activities in Respect of"Widening And Up-Gradation Of Existing Carriageway into 2L+PS Configuration From Reshi(Km 96.254) .To Rhenock (Km 101.554) Along NH-717A & From Rhenock (Km 0.00) To Rongli Bazaar (Km 15.300) Along NH-717B in the States Of Sikkim ".
(Reshi 96+070 To Rhenock 101+367)

Design By	: RK
Drawn By	: MK
Checked By	: AH
Approved By	: VY
Scale	: 1/1000

Title:
Utilities Shifting For Light Poles (Km 97+040 to Km 98+040)

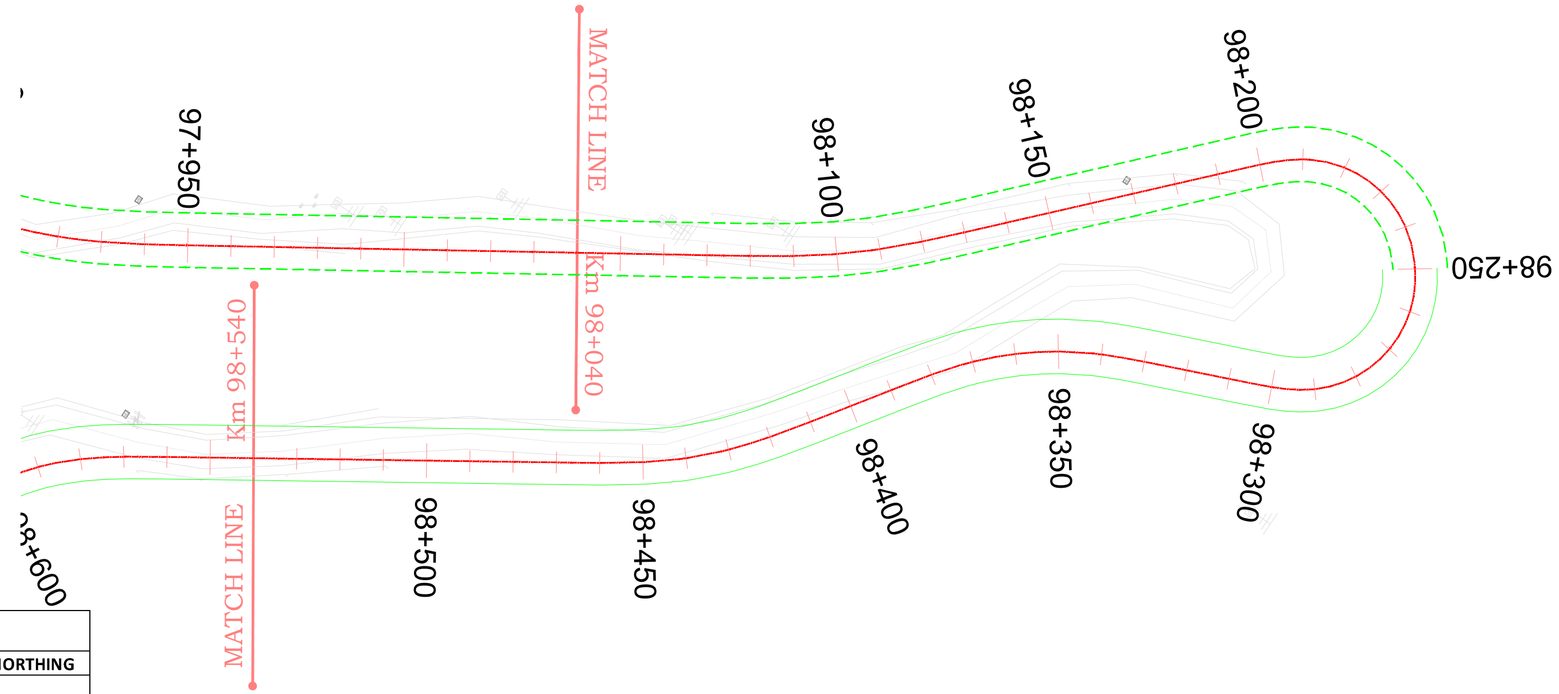
Dwg No: XPL/DSD/SK/UTILITIES/LP/02

Sheet: 02 OF 06

Date : Nov-2024

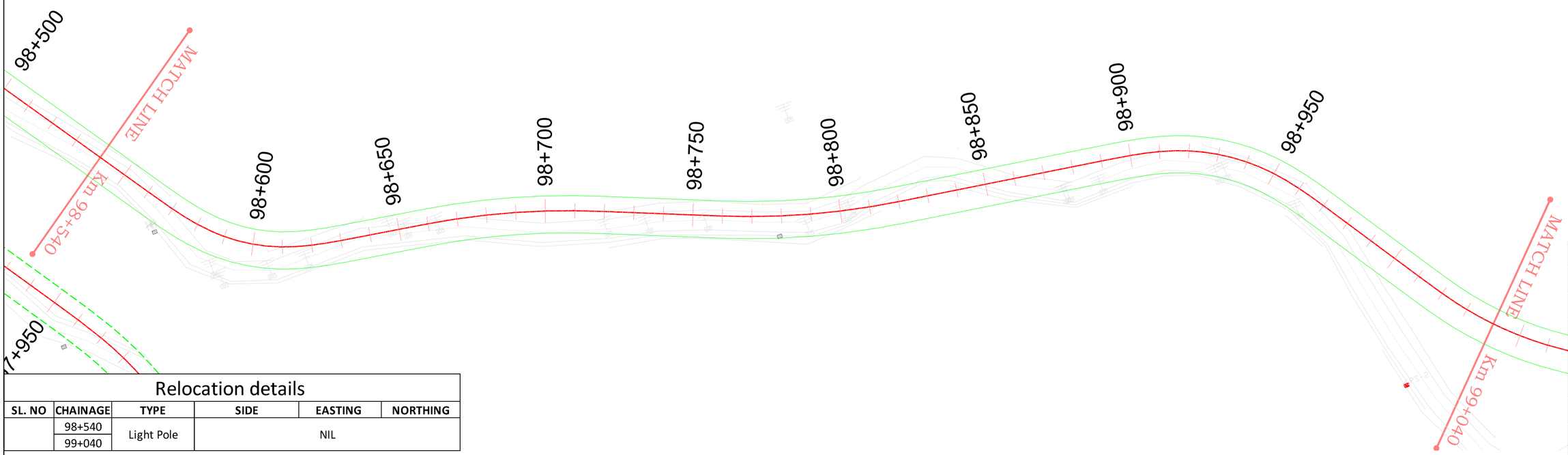
TO RESHI (NH-717A)

TO RHENOCK (NH-717A)



Relocation details

SL. NO	CHAINAGE	TYPE	SIDE	EASTING	NORTHING
	98+040	Light Pole	NIL		
	98+540				



Relocation details

SL. NO	CHAINAGE	TYPE	SIDE	EASTING	NORTHING
	98+540	Light Pole	NIL		
	99+040				

Legends: Existing

	Electrical Pole
	Light Pole
	Telephone Pole
	Transformer
	Water Pipe Line

Legends: Proposed

	Electrical Pole
	Light Pole
	Telephone Pole
	Transformer
	Water Pipe Line

Rev. No	Date	Checked By.	Revision Details	Color Code.	Description
					Center Line
					Formation Width

Client:
National Highway & Infrastructure Development Corp. Ltd. (NHIDCL)
1st & 2nd Floor, Tower A, World Trade Centre, Nauroji Nagar, New Delhi – 110029

Design Consultant:
Xplorer Consultancy Services Pvt. Ltd. in joint venture Dsd Infratech Management Pvt. Ltd, in Association With Maverick Mernok & Construction
511, Tower b, ithum, plot-A40 Sector-62, Noida Uttar Pradesh – 201301

Project :
Consultancy Services For Preparation Of DPR And Providing Services For Pre-Construction Activities in Respect of"Widening And Up-Gradation Of Existing Carriageway into 2L+PS Configuration From Reshi(Km 96.254) .To Rhenock (Km 101.554) Along NH-717A & From Rhenock (Km 0.00) To Rongli Bazaar (Km 15.300) Along NH-717B in the States Of Sikkim ".
(Reshi 96+070 To Rhenock 101+367)

Design By	: RK
Drawn By	: MK
Checked By	: AH
Approved By	: VY
Scale	: 1/1000

Title:
Utilities Shifting For Light Poles (Km 98+040 to Km 99+040)

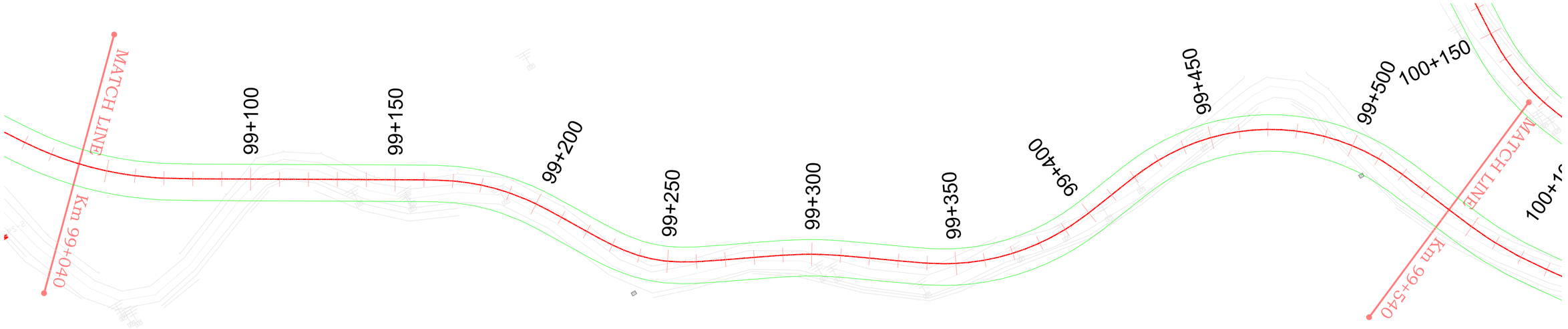
Dwg No: XPL/DSD/SK/UTILITIES/LP/03

Sheet: 03 OF 06

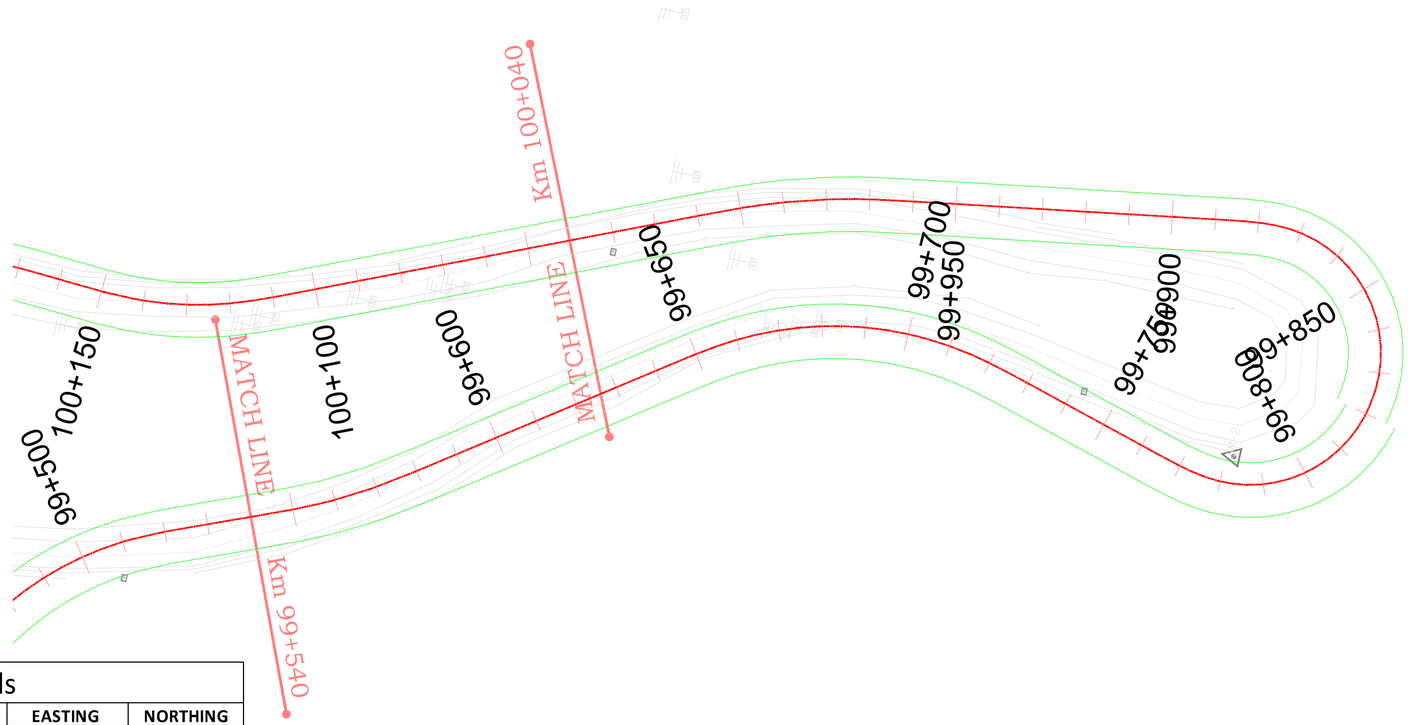
Date : Nov-2024

TO RESHI (NH-717A)

TO RHENOCK (NH-717A)



Relocation details					
SL. NO	CHAINAGE	TYPE	SIDE	EASTING	NORTHING
	99+040	Light Pole	NIL		
	99+540				



Relocation details					
SL. NO	CHAINAGE	TYPE	SIDE	EASTING	NORTHING
	99+540	Light Pole	NIL		
	100+040				

Legends: Existing

	Electrical Pole
	Light Pole
	Telephone Pole
	Transformer
— WP —	Water Pipe Line

Legends: Proposed

	Electrical Pole
	Light Pole
	Telephone Pole
	Transformer
— WP —	Water Pipe Line

Rev. No	Date	Checked By.	Revision Details	Color Code.	Description
					Center Line
					Formation Width

Client:
National Highway & Infrastructure Development Corp. Ltd.
(NHIDCL)
1st & 2nd Floor, Tower A,
World Trade Centre,
Nauroji Nagar,
New Delhi – 110029

Design Consultant:
Xplorer Consultancy Services Pvt. Ltd.
in joint venture Dsd Infratech Management Pvt. Ltd, in Association With Maverick Mernok & Construction
511, Tower b, ithum, plot-A40
Sector-62, Noida
Uttar Pradesh – 201301

Project :
Consultancy Services For Preparation Of DPR And Providing Services For Pre-Construction Activities in Respect of"Widening And Up-Gradation Of Existing Carriageway into 2L+PS Configuration From Reshi(Km 96.254) .To Rhenock (Km 101.554) Along NH-717A & From Rhenock (Km 0.00) To Rongli Bazaar (Km 15.300) Along NH-717B in the States Of Sikkim ".
(Reshi 96+070 To Rhenock 101+367)

Design By	: RK
Drawn By	: MK
Checked By	: AH
Approved By	: VY
Scale	: 1/1000

Title:
Utilities Shifting
For Light Poles
(Km 99+040 to Km 100+040)

Dwg No: XPL/DSD/SK/UTILITIES/LP/04

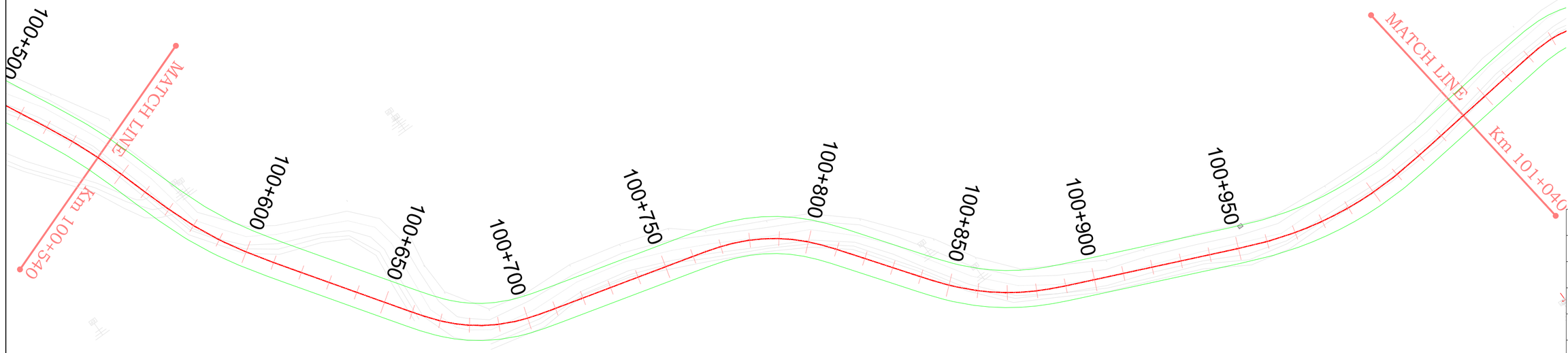
Sheet: 04 OF 06

Date : Nov-2024

TO RESHI (NH-717A)

TO RHENOCK (NH-717A)

Relocation details					
SL. NO	CHAINAGE	TYPE	SIDE	EASTING	NORTHING
	100+040	Light Pole	NIL		
	100+540				



Relocation details					
SL. NO	CHAINAGE	TYPE	SIDE	EASTING	NORTHING
	100+540	Light Pole	NIL		
	101+040				

Legends: Existing

- Electrical Pole
- Light Pole
- Telephone Pole
- Transformer
- Water Pipe Line

Legends: Proposed

- Electrical Pole
- Light Pole
- Telephone Pole
- Transformer
- Water Pipe Line

Rev. No	Date	Checked By.	Revision Details	Color Code.	Description
					Center Line
					Formation Width

Client:
National Highway & Infrastructure Development Corp. Ltd. (NHIDCL)
1st & 2nd Floor, Tower A, World Trade Centre, Nauroji Nagar, New Delhi – 110029

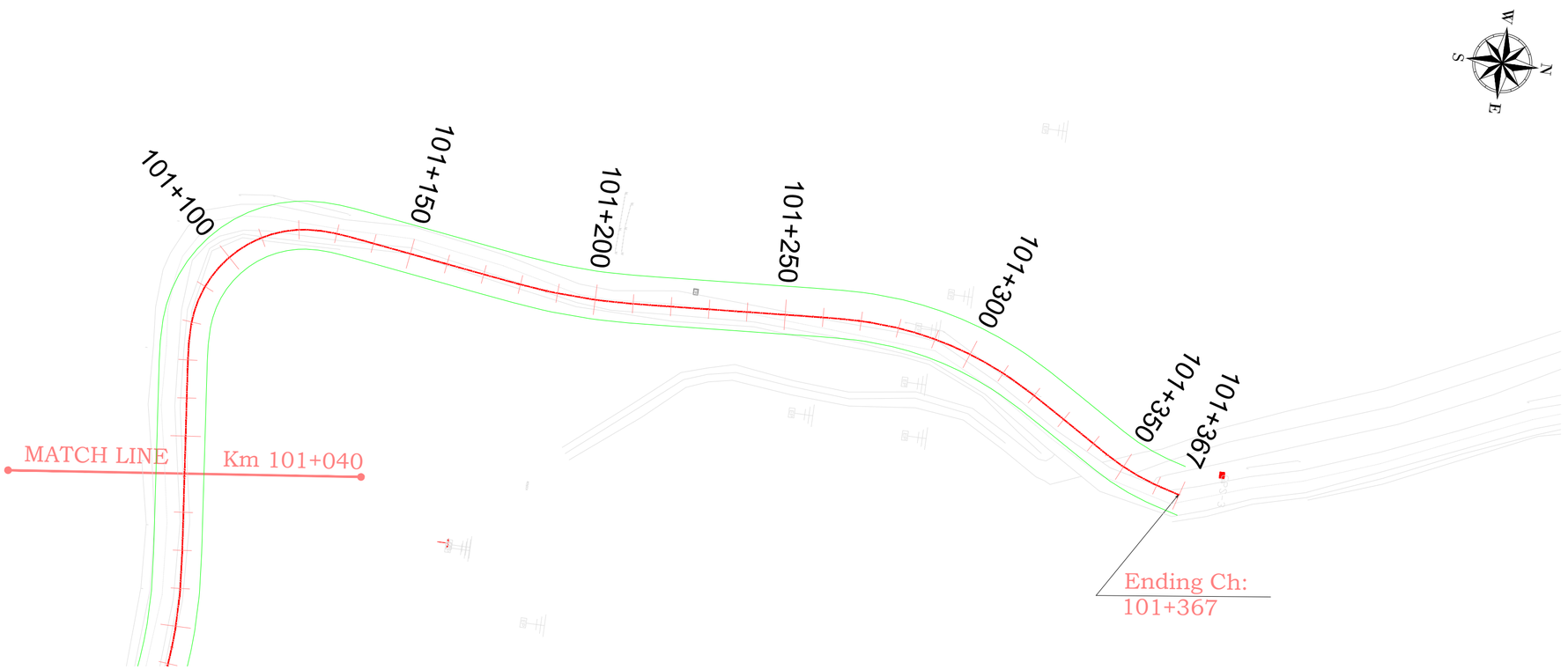
Design Consultant:
Xplorer Consultancy Services Pvt. Ltd. in joint venture Dsd Infratech Management Pvt. Ltd, in Association With Maverick Mernok & Construction
511, Tower b, ithum, plot-A40 Sector-62, Noida Uttar Pradesh – 201301

Project :
Consultancy Services For Preparation Of DPR And Providing Services For Pre-Construction Activities in Respect of"Widening And Up-Gradation Of Existing Carriageway into 2L+PS Configuration From Reshi(Km 96.254) .To Rhenock (Km 101.554) Along NH-717A & From Rhenock (Km 0.00) To Rongli Bazaar (Km 15.300) Along NH-717B in the States Of Sikkim ".
(Reshi 96+070 To Rhenock 101+367)

Design By : RK	Title: Utilities Shifting For Light Poles (Km 100+040 to Km 101+040)
Drawn By : MK	
Checked By : AH	
Approved By : VY	Dwg No: XPL/DSD/SK/UTILITIES/LP/05
Scale : 1/1000	Sheet: 05 OF 06 — Date : Nov-2024

TO RESHI (NH-717A)

TO RHENOCK (NH-717A)



Relocation details

SL. NO	CHAINAGE	TYPE	SIDE	EASTING	NORTHING
	101+040	Light Pole	NIL		
	101+367				

Legends: Existing

	Electrical Pole
	Light Pole
	Telephone Pole
	Transformer
WP	Water Pipe Line

Legends: Proposed

	Electrical Pole
	Light Pole
	Telephone Pole
	Transformer
WP	Water Pipe Line

Rev. No	Date	Checked By.	Revision Details	Color Code.	Description
					Center Line
					Formation Width

Client:
National Highway & Infrastructure Development Corp. Ltd.
(NHIDCL)
1st & 2nd Floor, Tower A,
World Trade Centre,
Nauroji Nagar,
New Delhi – 110029

Design Consultant:
Xplorer Consultancy Services Pvt. Ltd.
in joint venture Dsd Infratech Management Pvt. Ltd, in Association With Maverick Mernok & Construction
511, Tower b, ithum, plot-A40
Sector-62, Noida
Uttar Pradesh – 201301

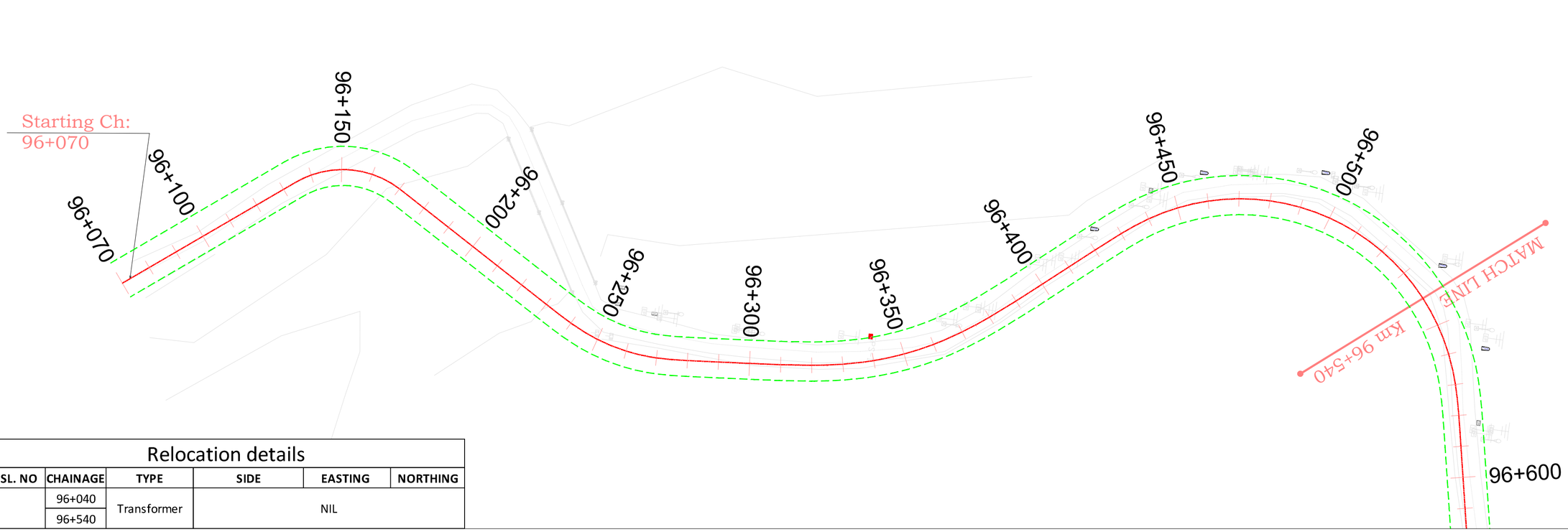
Project :
Consultancy Services For Preparation Of DPR And Providing Services For Pre-Construction Activities in Respect of"Widening And Up-Gradation Of Existing Carriageway into 2L+PS Configuration From Reshi(Km 96.254) .To Rhenock (Km 101.554) Along NH-717A & From Rhenock (Km 0.00) To Rongli Bazaar (Km 15.300) Along NH-717B in the States Of Sikkim ".
(Reshi 96+070 To Rhenock 101+367)

Design By : RK	Title: Utilities Shifting For Light Poles (Km 101+040 to Km 101+367)
Drawn By : MK	
Checked By : AH	
Approved By : VY	Dwg No: XPL/DSD/SK/UTILITIES/LP/06
Scale : 1/1000	Sheet: 06 OF 06 — Date : Nov-2024

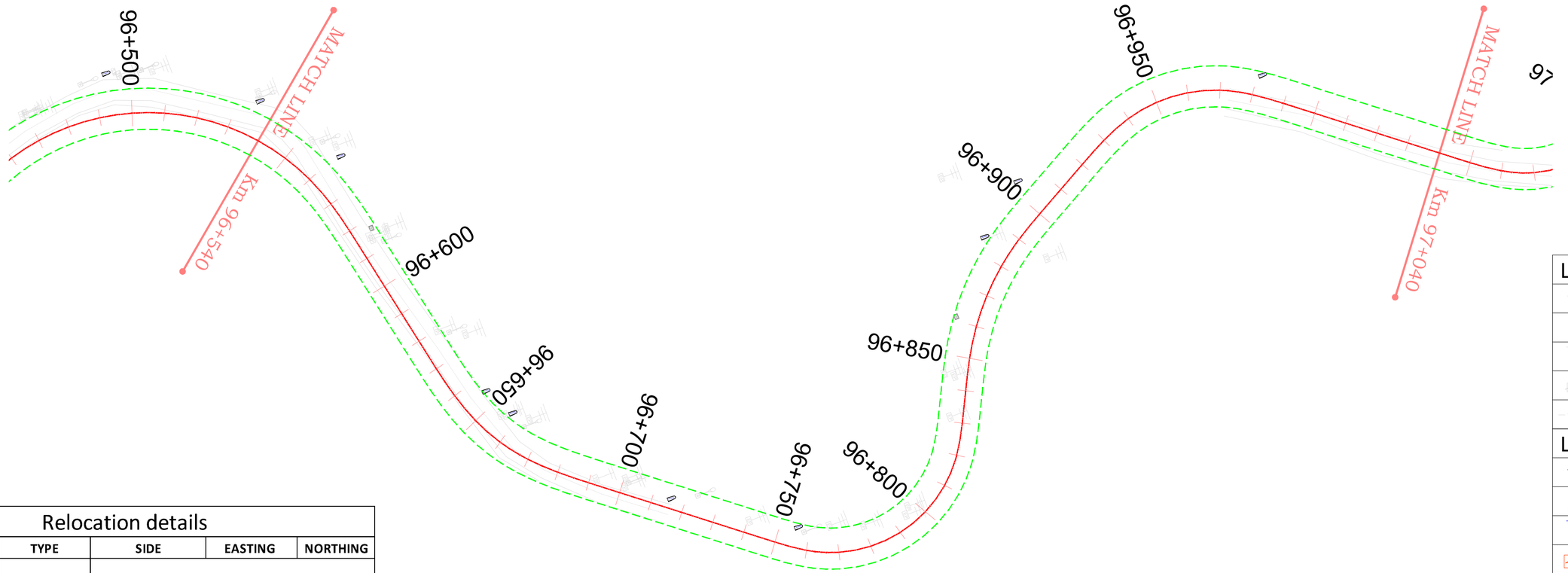
Transformer

TO RESHI (NH-717A)

TO RHENOCK (NH-717A)



Relocation details					
SL. NO	CHAINAGE	TYPE	SIDE	EASTING	NORTHING
	96+040	Transformer	NIL		
	96+540				



Relocation details					
SL. NO	CHAINAGE	TYPE	SIDE	EASTING	NORTHING
	96+540	Transformer	NIL		
	97+040				

Legends: Existing

- Electrical Pole
- Light Pole
- Telephone Pole
- Transformer
- Water Pipe Line

Legends: Proposed

- Electrical Pole
- Light Pole
- Telephone Pole
- Transformer
- Water Pipe Line

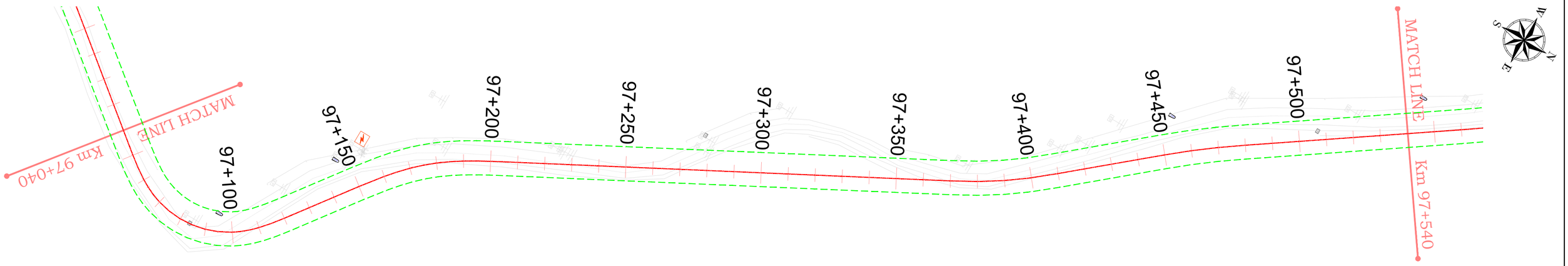
Rev. No	Date	Checked By.	Revision Details	Color Code.	Description
					Center Line
					Formation Width

Client:
National Highway & Infrastructure Development Corp. Ltd. (NHIDCL)
1st & 2nd Floor, Tower A,
World Trade Centre,
Nauroji Nagar,
New Delhi – 110029

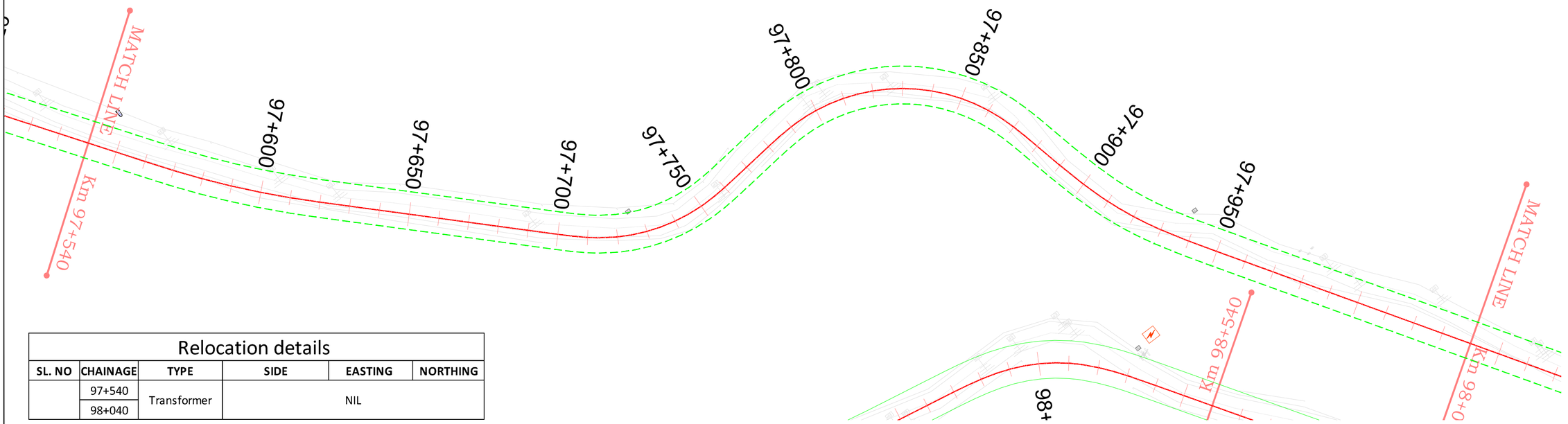
Design Consultant:
Xplorer Consultancy Services Pvt. Ltd.
in joint venture Dsd Infratech Management Pvt. Ltd, in Association With Maverick Mernok & Construction
511, Tower b, ithum, plot-A40
Sector-62, Noida
Uttar Pradesh – 201301

Project :
Consultancy Services For Preparation Of DPR And Providing Services For Pre-Construction Activities in Respect of"Widening And Up-Gradation Of Existing Carriageway into 2L+PS Configuration From Reshi(Km 96.254) .To Rhenock (Km 101.554) Along NH-717A & From Rhenock (Km 0.00) To Rongli Bazaar (Km 15.300) Along NH-717B in the States Of Sikkim ".
(Reshi 96+070 To Rhenock 101+367)

Design By : RK	Title: Utilities Shifting For Transformer (Km 96+040 to Km 97+040)
Drawn By : MK	
Checked By : AH	
Approved By : VY	Dwg No: XPL/DSD/SK/UTILITIES/TF/01
Scale : 1/1000	Sheet: 01 OF 06 — Date : Nov-2024



Relocation details					
SL. NO	CHAINAGE	TYPE	SIDE	EASTING	NORTHING
1	97+153	Transformer	LHS	662131.8914	3006566.52



Relocation details					
SL. NO	CHAINAGE	TYPE	SIDE	EASTING	NORTHING
	97+540	Transformer	NIL		
	98+040				

Legends: Existing

	Electrical Pole
	Light Pole
	Telephone Pole
	Transformer
VP	Water Pipe Line

Legends: Proposed

	Electrical Pole
	Light Pole
	Telephone Pole
	Transformer
VP	Water Pipe Line

Rev. No	Date	Checked By.	Revision Details	Color Code.	Description
					Center Line
					Formation Width

Client:
National Highway & Infrastructure Development Corp. Ltd. (NHIDCL)
1st & 2nd Floor, Tower A,
World Trade Centre,
Nauroji Nagar,
New Delhi – 110029

Design Consultant:
Xplorer Consultancy Services Pvt. Ltd. in joint venture Dsd Infratech Management Pvt. Ltd, in Association With Maverick Mernok & Construction
511, Tower b, ithum, plot-A40
Sector-62, Noida
Uttar Pradesh – 201301

Project :
Consultancy Services For Preparation Of DPR And Providing Services For Pre-Construction Activities in Respect of"Widening And Up-Gradation Of Existing Carriageway into 2L+PS Configuration From Reshi(Km 96.254) .To Rhenock (Km 101.554) Along NH-717A & From Rhenock (Km 0.00) To Rongli Bazaar (Km 15.300) Along NH-717B in the States Of Sikkim ".
(Reshi 96+070 To Rhenock 101+367)

Design By	: RK
Drawn By	: MK
Checked By	: AH
Approved By	: VY
Scale	: 1/1000

Title:
Utilities Shifting
For Transformer
(Km 97+040 to Km 98+040)

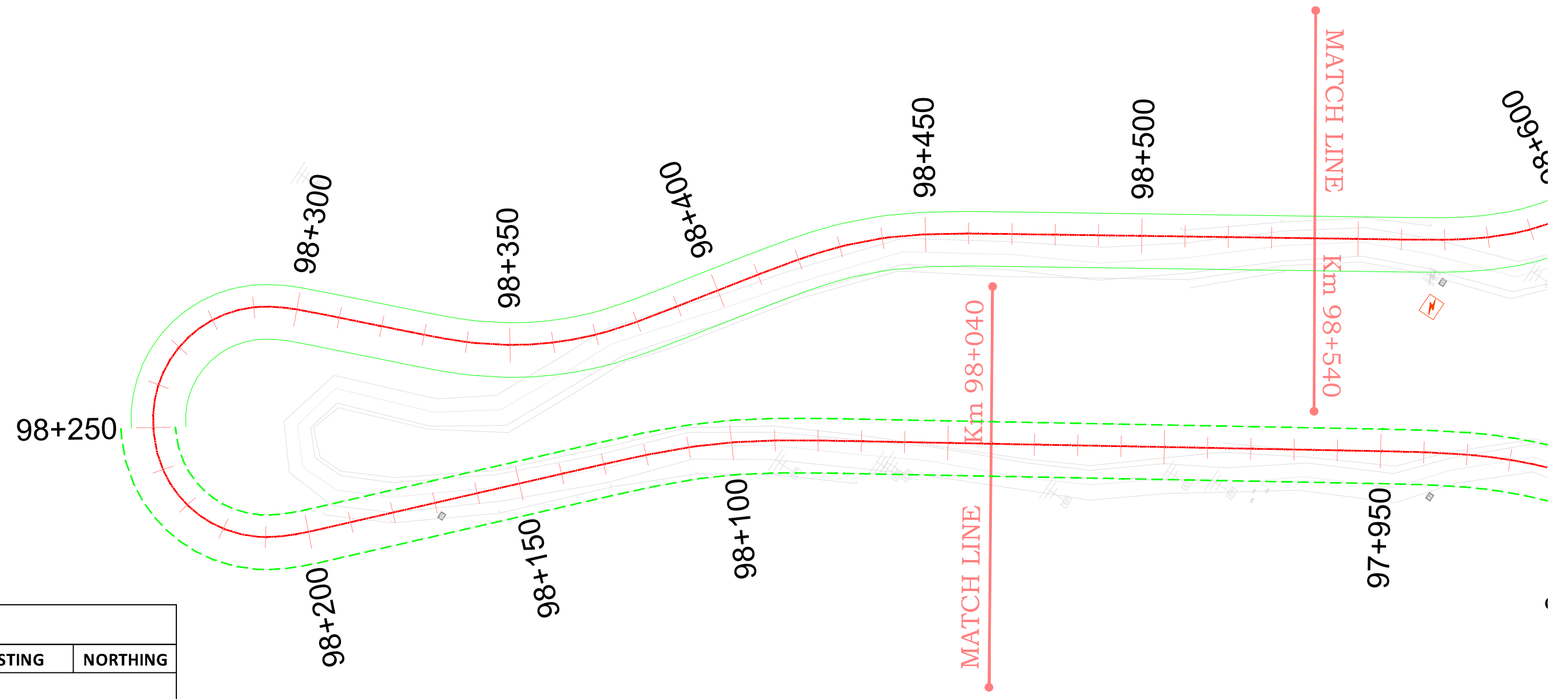
Dwg No: XPL/DSD/SK/UTILITIES/TF/02

Sheet: 02 OF 06

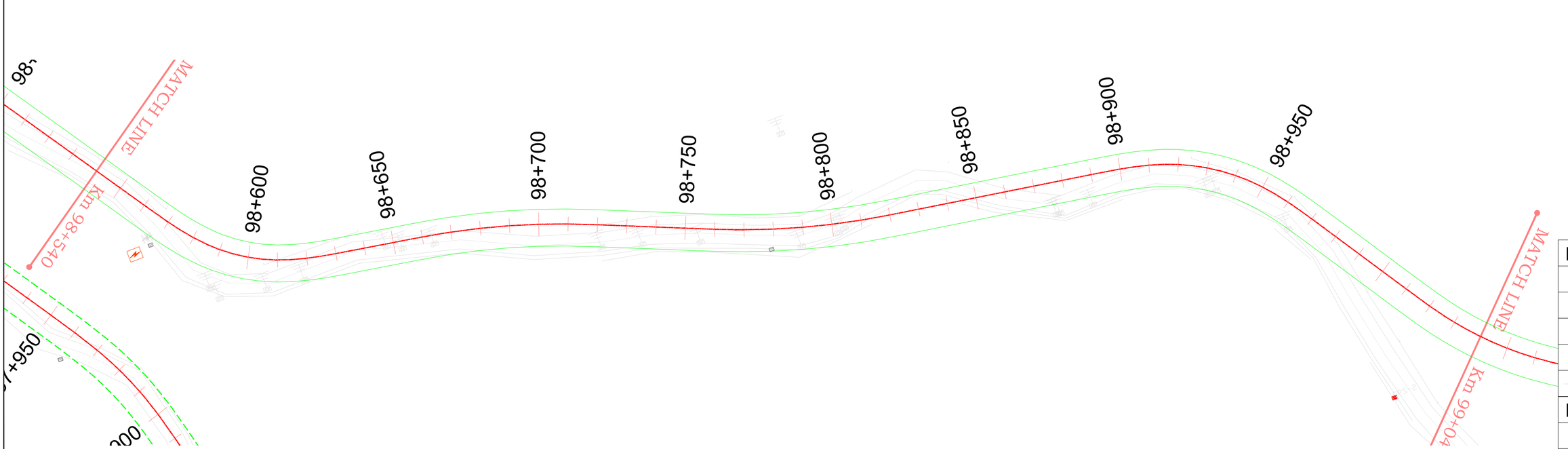
Date : Nov-2024

TO RESHI (NH-717A)

TO RHENOCK (NH-717A)



Relocation details					
SL. NO	CHAINAGE	TYPE	SIDE	EASTING	NORTHING
	98+040	Transformer	NIL		
	98+540				



Relocation details					
SL. NO	CHAINAGE	TYPE	SIDE	EASTING	NORTHING
2	98+568	Transformer	RHS	661690.5259	3007163.14

Legends: Existing

- Electrical Pole
- Light Pole
- Telephone Pole
- Transformer
- Water Pipe Line

Legends: Proposed

- Electrical Pole
- Light Pole
- Telephone Pole
- Transformer
- Water Pipe Line

Rev. No	Date	Checked By.	Revision Details	Color Code.	Description
					Center Line
					Formation Width

Client:
National Highway & Infrastructure Development Corp. Ltd. (NHIDCL)
1st & 2nd Floor, Tower A, World Trade Centre, Nauroji Nagar, New Delhi – 110029

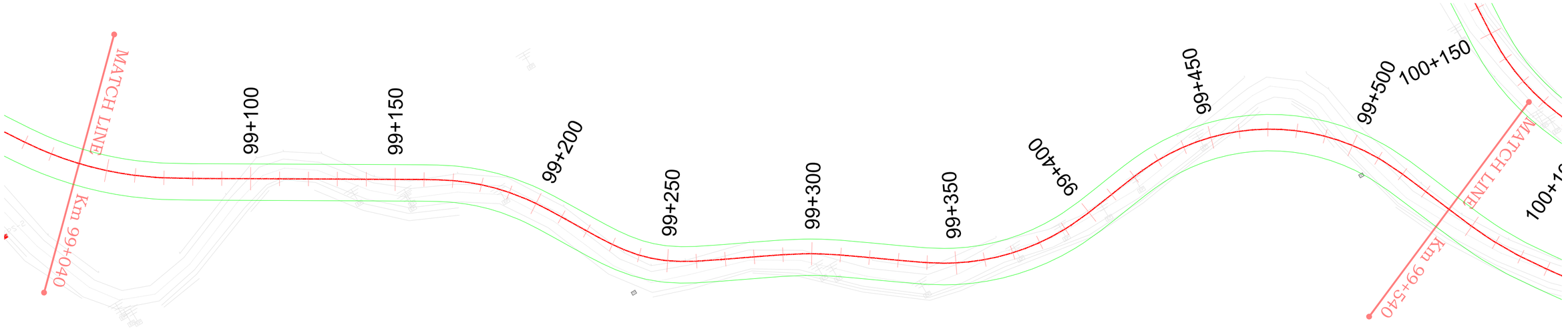
Design Consultant:
Xplorer Consultancy Services Pvt. Ltd. in joint venture Dsd Infratech Management Pvt. Ltd, in Association With Maverick Mernok & Construction
511, Tower b, ithum, plot-A40 Sector-62, Noida Uttar Pradesh – 201301

Project :
Consultancy Services For Preparation Of DPR And Providing Services For Pre-Construction Activities in Respect of"Widening And Up-Gradation Of Existing Carriageway into 2L+PS Configuration From Reshi(Km 96.254) .To Rhenock (Km 101.554) Along NH-717A & From Rhenock (Km 0.00) To Rongli Bazaar (Km 15.300) Along NH-717B in the States Of Sikkim ".
(Reshi 96+070 To Rhenock 101+367)

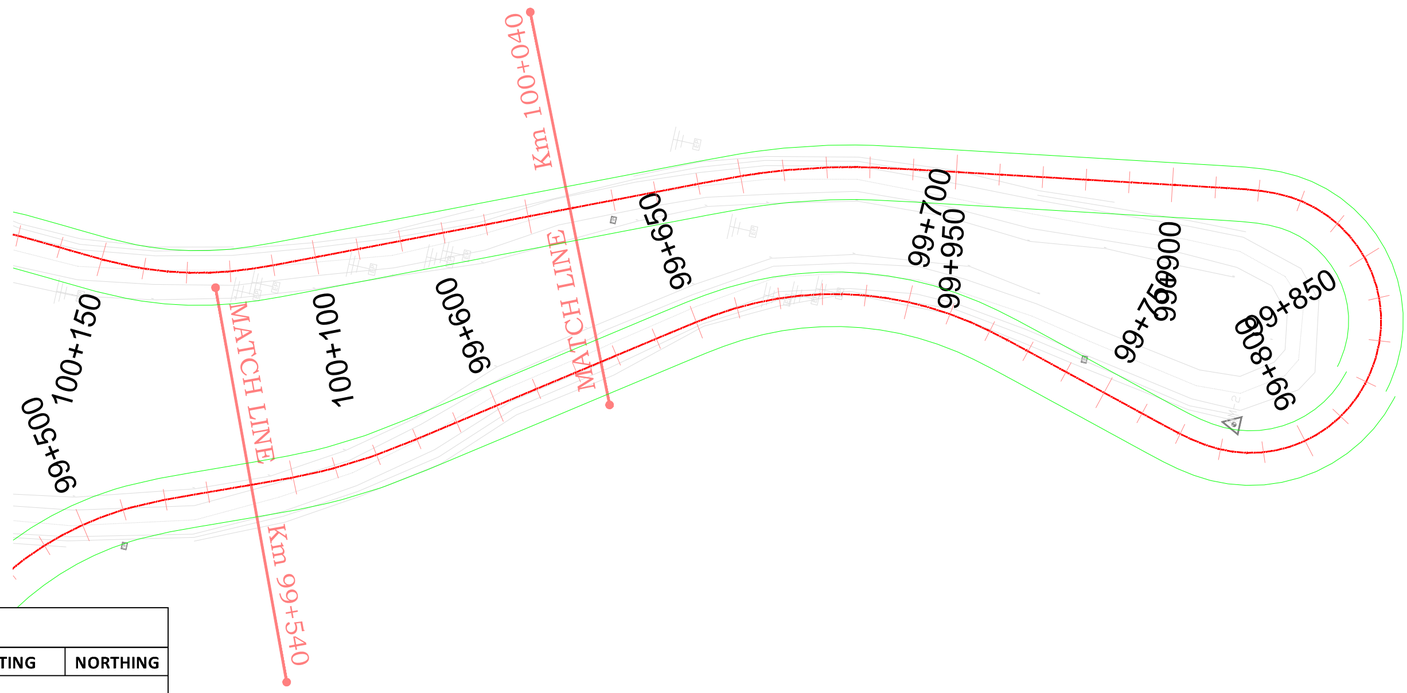
Design By : RK	Title: Utilities Shifting For Transformer (Km 98+040 to Km 99+040)
Drawn By : MK	
Checked By : AH	
Approved By : VY	Dwg No: XPL/DSD/SK/UTILITIES/TF/03
Scale : 1/1000	Sheet: 03 OF 06 — Date : Nov-2024

TO RESHI (NH-717A)

TO RHENOCK (NH-717A)



Relocation details					
SL. NO	CHAINAGE	TYPE	SIDE	EASTING	NORTHING
	99+040	Transformer	NIL		
	99+540				



Relocation details					
SL. NO	CHAINAGE	TYPE	SIDE	EASTING	NORTHING
	99+540	Transformer	NIL		
	100+040				

Legends: Existing

- Electrical Pole
- Light Pole
- Telephone Pole
- Transformer
- Water Pipe Line

Legends: Proposed

- Electrical Pole
- Light Pole
- Telephone Pole
- Transformer
- Water Pipe Line

Rev. No	Date	Checked By.	Revision Details	Color Code.	Description
					Center Line
					Formation Width

Client:
National Highway & Infrastructure Development Corp. Ltd. (NHIDCL)
1st & 2nd Floor, Tower A, World Trade Centre, Nauroji Nagar, New Delhi – 110029

Design Consultant:
Xplorer Consultancy Services Pvt. Ltd. in joint venture Dsd Infratech Management Pvt. Ltd, in Association With Maverick Mernok & Construction
511, Tower b, ithum, plot-A40 Sector-62, Noida Uttar Pradesh – 201301

Project :
Consultancy Services For Preparation Of DPR And Providing Services For Pre-Construction Activities in Respect of"Widening And Up-Gradation Of Existing Carriageway into 2L+PS Configuration From Reshi(Km 96.254) .To Rhenock (Km 101.554) Along NH-717A & From Rhenock (Km 0.00) To Rongli Bazaar (Km 15.300) Along NH-717B in the States Of Sikkim ".
(Reshi 96+070 To Rhenock 101+367)

Design By	: RK
Drawn By	: MK
Checked By	: AH
Approved By	: VY
Scale	: 1/1000

Title:
Utilities Shifting
For Transformer
(Km 99+040 to Km 100+040)

Dwg No: XPL/DSD/SK/UTILITIES/TF/04

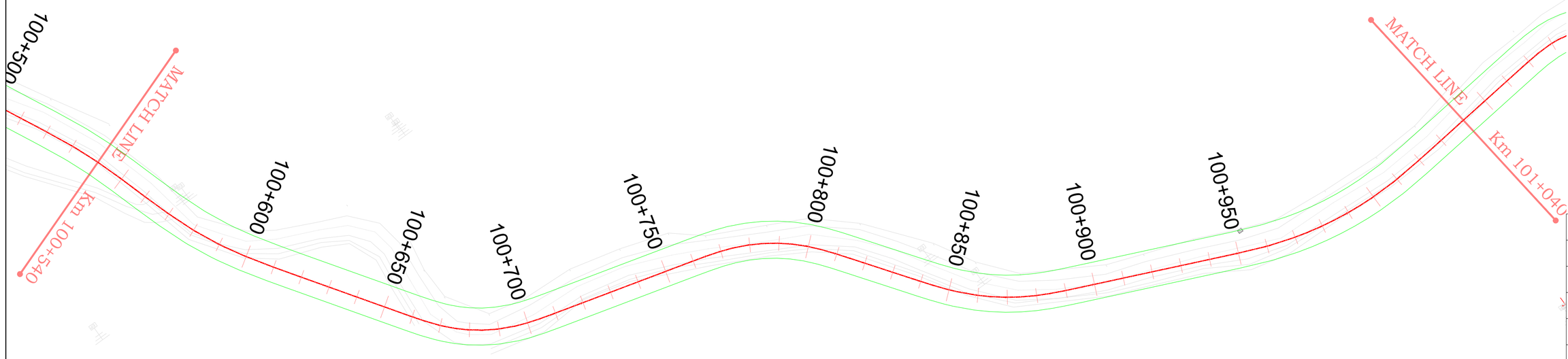
Sheet: 04 OF 06

Date : Nov-2024

TO RESHI (NH-717A)

TO RHENOCK (NH-717A)

Relocation details					
SL. NO	CHAINAGE	TYPE	SIDE	EASTING	NORTHING
	100+040	Transformer	NIL		
	100+540				



Relocation details					
SL. NO	CHAINAGE	TYPE	SIDE	EASTING	NORTHING
	100+540	Transformer	NIL		
	101+040				

Legends: Existing

- Electrical Pole
- Light Pole
- Telephone Pole
- Transformer
- Water Pipe Line

Legends: Proposed

- Electrical Pole
- Light Pole
- Telephone Pole
- Transformer
- Water Pipe Line

Rev. No	Date	Checked By.	Revision Details	Color Code.	Description
					Center Line
					Formation Width

Client:
National Highway & Infrastructure Development Corp. Ltd. (NHIDCL)
1st & 2nd Floor, Tower A, World Trade Centre, Nauroji Nagar, New Delhi – 110029

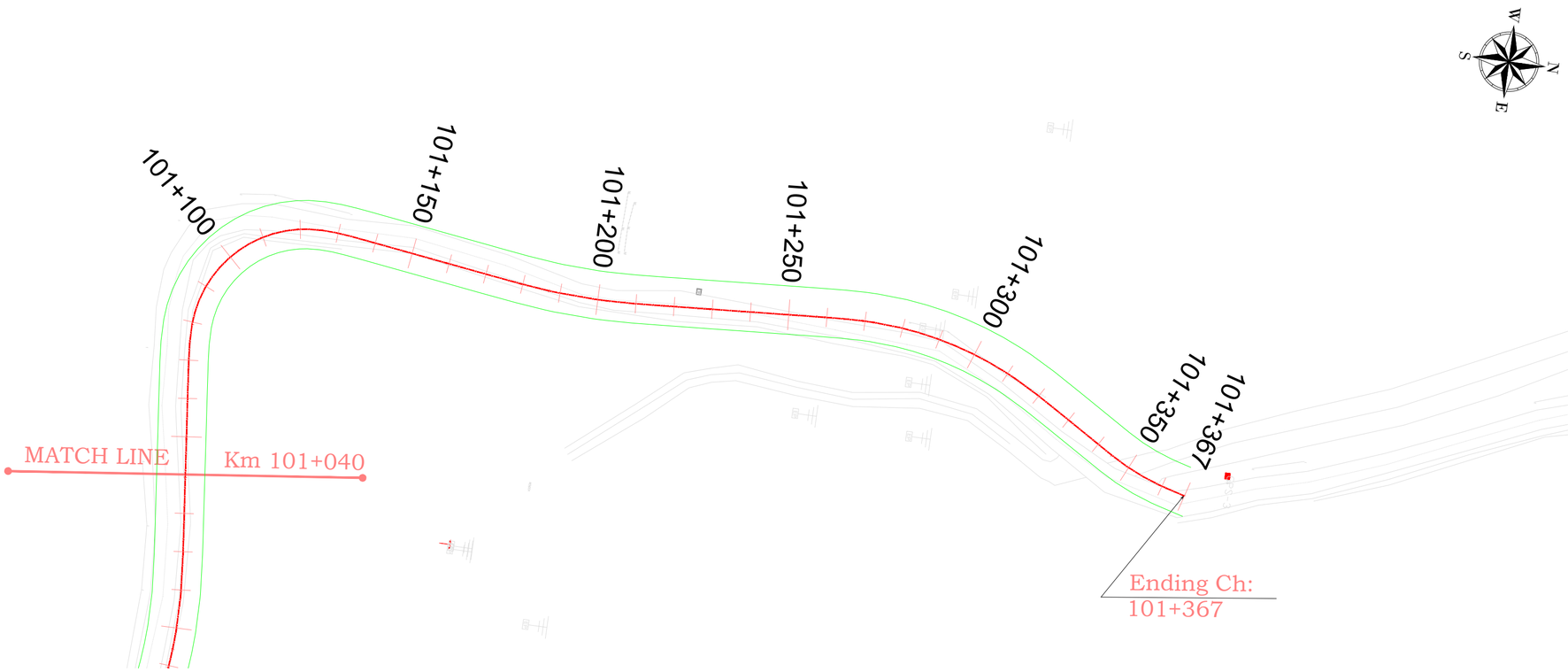
Design Consultant:
Xplorer Consultancy Services Pvt. Ltd. in joint venture Dsd Infratech Management Pvt. Ltd, in Association With Maverick Mernok & Construction
511, Tower b, ithum, plot-A40 Sector-62, Noida Uttar Pradesh – 201301

Project :
Consultancy Services For Preparation Of DPR And Providing Services For Pre-Construction Activities in Respect of"Widening And Up-Gradation Of Existing Carriageway into 2L+PS Configuration From Reshi(Km 96.254) .To Rhenock (Km 101.554) Along NH-717A & From Rhenock (Km 0.00) To Rongli Bazaar (Km 15.300) Along NH-717B in the States Of Sikkim ".
(Reshi 96+070 To Rhenock 101+367)

Design By : RK	Title: Utilities Shifting For Transformer (Km 100+040 to Km 101+040)
Drawn By : MK	
Checked By : AH	
Approved By : VY	Dwg No: XPL/DSD/SK/UTILITIES/TF/05
Scale : 1/1000	Sheet: 05 OF 06 — Date : Nov-2024

TO RESHI (NH-717A)

TO RHENOCK (NH-717A)



Relocation details

SL. NO	CHAINAGE	TYPE	SIDE	EASTING	NORTHING
	101+040	Transformer	NIL		
	101+367				

Legends: Existing

	Electrical Pole
	Light Pole
	Telephone Pole
	Transformer
WP	Water Pipe Line

Legends: Proposed

	Electrical Pole
	Light Pole
	Telephone Pole
	Transformer
WP	Water Pipe Line

Rev. No	Date	Checked By.	Revision Details	Color Code.	Description
					Center Line
					Formation Width

Client:
National Highway & Infrastructure Development Corp. Ltd.
(NHIDCL)
1st & 2nd Floor, Tower A,
World Trade Centre,
Nauroji Nagar,
New Delhi – 110029

Design Consultant:
Xplorer Consultancy Services Pvt. Ltd.
in joint venture Dsd Infratech Management Pvt. Ltd, in Association With Maverick Mernok & Construction
511, Tower b, ithum, plot-A40
Sector-62, Noida
Uttar Pradesh – 201301

Project :
Consultancy Services For Preparation Of DPR And Providing Services For Pre-Construction Activities in Respect of"Widening And Up-Gradation Of Existing Carriageway into 2L+PS Configuration From Reshi(Km 96.254) .To Rhenock (Km 101.554) Along NH-717A & From Rhenock (Km 0.00) To Rongli Bazaar (Km 15.300) Along NH-717B in the States Of Sikkim ".
(Reshi 96+070 To Rhenock 101+367)

Design By	: RK
Drawn By	: MK
Checked By	: AH
Approved By	: VY
Scale	: 1/1000

Title:
Utilities Shifting
For Transformer
(Km 101+040 to Km 101+367)

Dwg No: XPL/DSD/SK/UTILITIES/TF/06

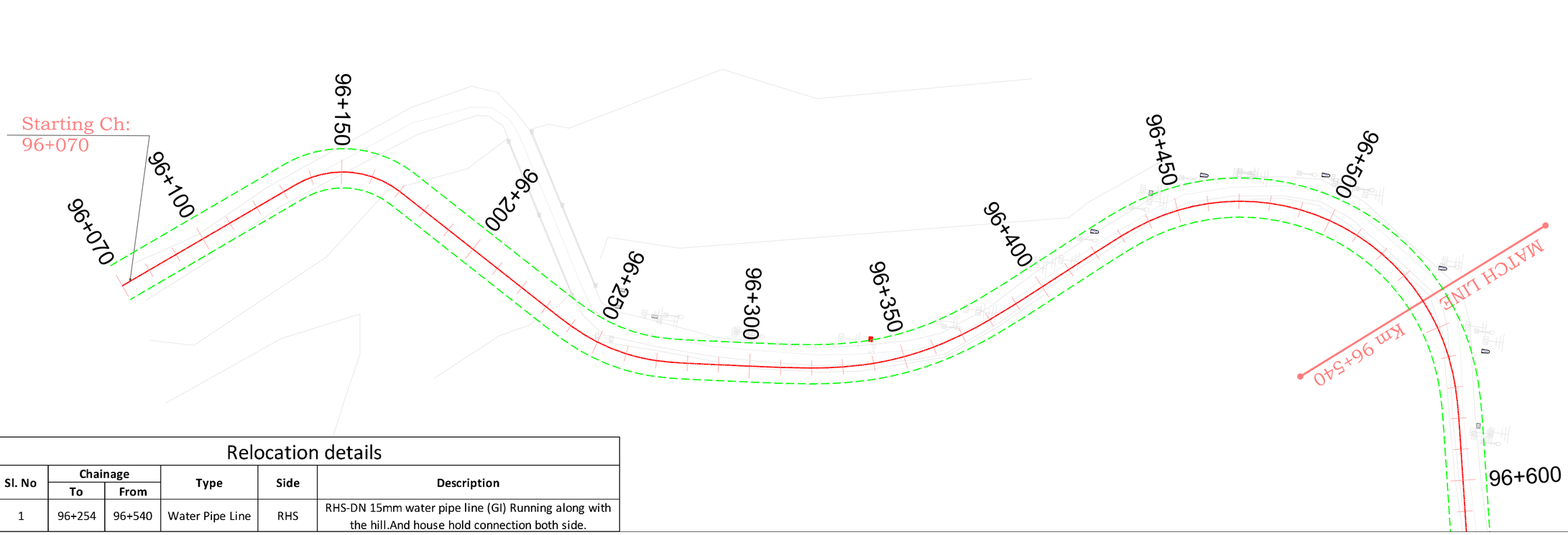
Sheet: 06 OF 06

Date : Nov-2024

Water Pipe Line

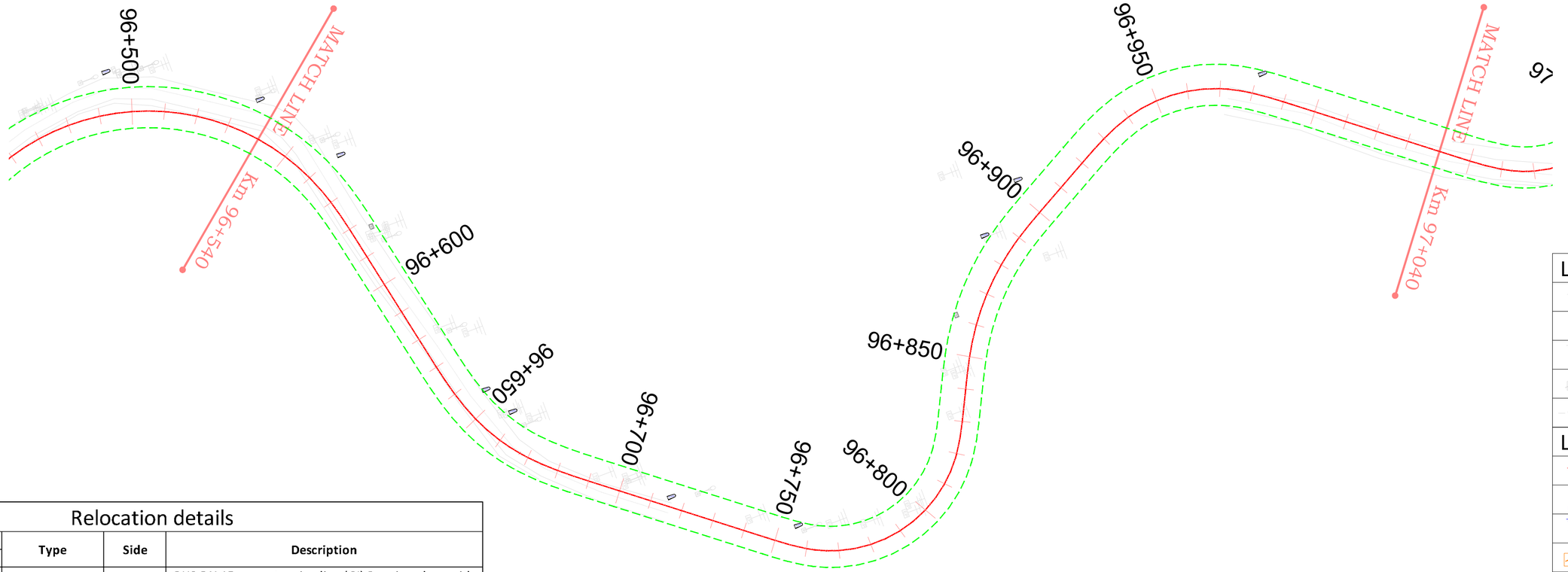
TO RESHI (NH-717A)

TO RHENOCK (NH-717A)



Relocation details

Sl. No	Chainage		Type	Side	Description
	To	From			
1	96+254	96+540	Water Pipe Line	RHS	RHS-DN 15mm water pipe line (GI) Running along with the hill.And house hold connection both side.



Relocation details

Sl. No	Chainage		Type	Side	Description
	To	From			
2	96+540	97+040	Water Pipe Line	RHS	RHS-DN 15mm water pipe line (GI) Running along with the hill.And house hold connection both side.

Legends: Existing

- Electrical Pole
- Light Pole
- Telephone Pole
- Transformer
- Water Pipe Line

Legends: Proposed

- Electrical Pole
- Light Pole
- Telephone Pole
- Transformer
- Water Pipe Line

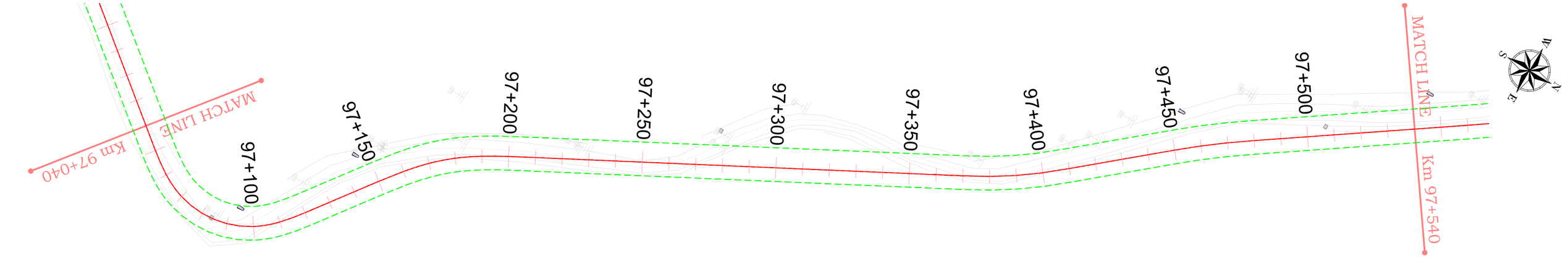
Rev. No	Date	Checked By.	Revision Details	Color Code.	Description
					Center Line
					Formation Width

Client:
National Highway & Infrastructure Development Corp. Ltd. (NHIDCL)
1st & 2nd Floor, Tower A, World Trade Centre, Nauroji Nagar, New Delhi – 110029

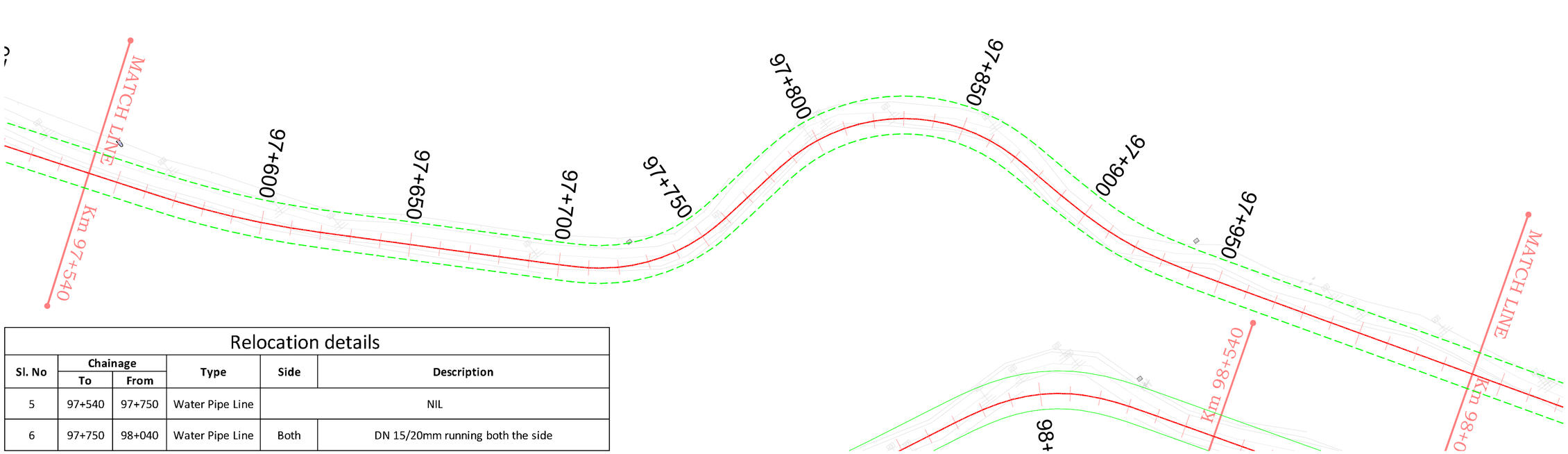
Design Consultant:
Xplorer Consultancy Services Pvt. Ltd. in joint venture Dsd Infratech Management Pvt. Ltd, in Association With Maverick Mernok & Construction
511, Tower b, ithum, plot-A40 Sector-62, Noida Uttar Pradesh – 201301

Project :
Consultancy Services For Preparation Of DPR And Providing Services For Pre-Construction Activities in Respect of"Widening And Up-Gradation Of Existing Carriageway into 2L+PS Configuration From Reshi(Km 96.254) .To Rhenock (Km 101.554) Along NH-717A & From Rhenock (Km 0.00) To Rongli Bazaar (Km 15.300) Along NH-717B in the States Of Sikkim ".
(Reshi 96+070 To Rhenock 101+367)

Design By : RK	Title: Utilities Shifting For Water Pipe Line (Km 96+070 to Km 97+040)
Drawn By : MK	
Checked By : AH	
Approved By : VY	Dwg No: XPL/DSD/SK/UTILITIES/WPL/01
Scale : 1/1000	Sheet: 01 OF 06 — Date : Nov-2024



Relocation details					
Sl. No	Chainage		Type	Side	Description
	To	From			
3	97+050	97+100	Water Pipe Line	RHS	Road crossing (DN-32mm) mane corning from hill side road crossing at 97+100 through box
4	97+100	97+540	Water Pipe Line	NIL	



Relocation details					
Sl. No	Chainage		Type	Side	Description
	To	From			
5	97+540	97+750	Water Pipe Line	NIL	
6	97+750	98+040	Water Pipe Line	Both	DN 15/20mm running both the side

Legends: Existing

- Electrical Pole
- Light Pole
- Telephone Pole
- Transformer
- Water Pipe Line

Legends: Proposed

- Electrical Pole
- Light Pole
- Telephone Pole
- Transformer
- Water Pipe Line

Rev. No	Date	Checked By.	Revision Details	Color Code.	Description
					Center Line
					Formation Width

Client:
National Highway & Infrastructure Development Corp. Ltd. (NHIDCL)
1st & 2nd Floor, Tower A, World Trade Centre, Nauroji Nagar, New Delhi – 110029

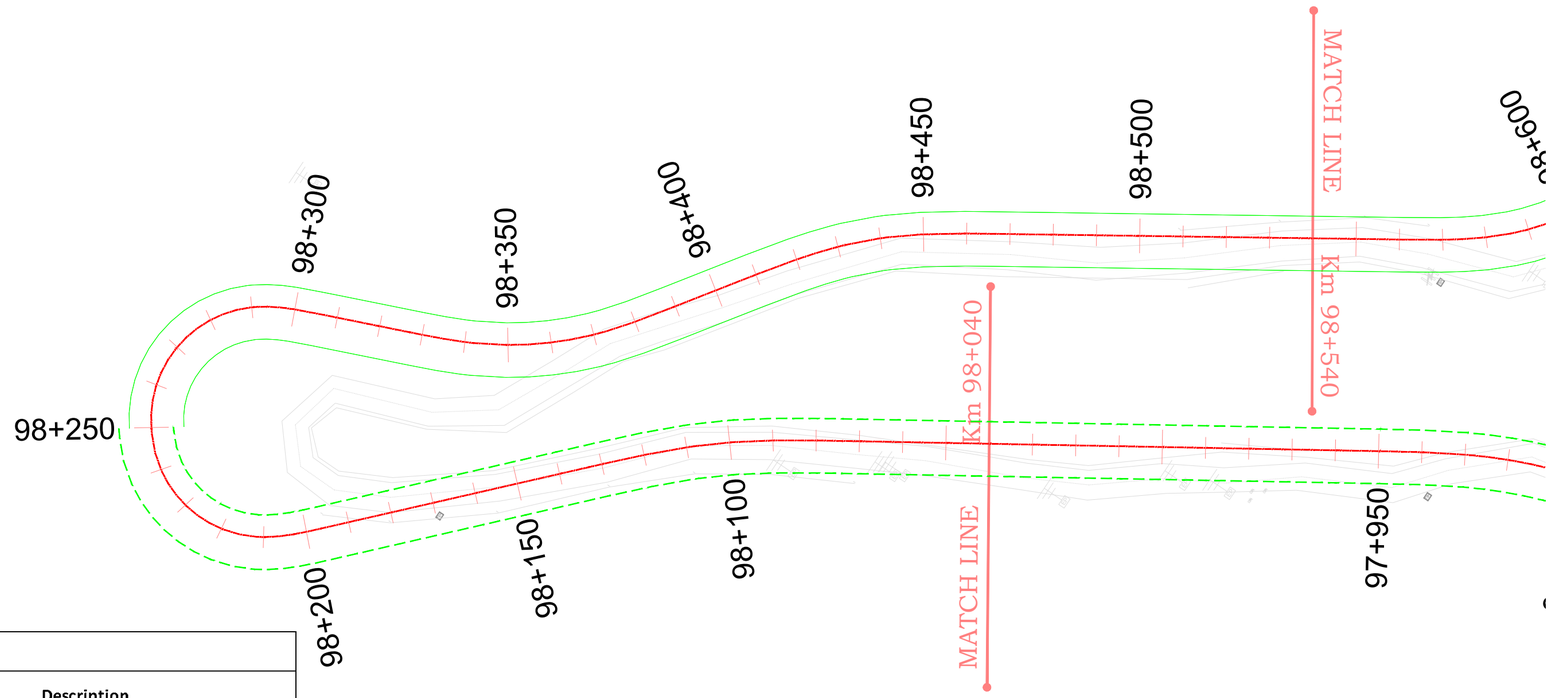
Design Consultant:
Xplorer Consultancy Services Pvt. Ltd. in joint venture Dsd Infratech Management Pvt. Ltd, in Association With Maverick Mernok & Construction
511, Tower b, ithum, plot-A40 Sector-62, Noida Uttar Pradesh – 201301

Project :
Consultancy Services For Preparation Of DPR And Providing Services For Pre-Construction Activities in Respect of"Widening And Up-Gradation Of Existing Carriageway into 2L+PS Configuration From Reshi(Km 96.254) .To Rhenock (Km 101.554) Along NH-717A & From Rhenock (Km 0.00) To Rongli Bazaar (Km 15.300) Along NH-717B in the States Of Sikkim ".
(Reshi 96+070 To Rhenock 101+367)

Design By : RK	Title: Utilities Shifting For Water Pipe Line (Km 97+040 to Km 98+040)
Drawn By : MK	
Checked By : AH	
Approved By : VY	Dwg No: XPL/DSD/SK/UTILITIES/WPL/02
Scale : 1/1000	Sheet: 02 OF 06 — Date : Nov-2024

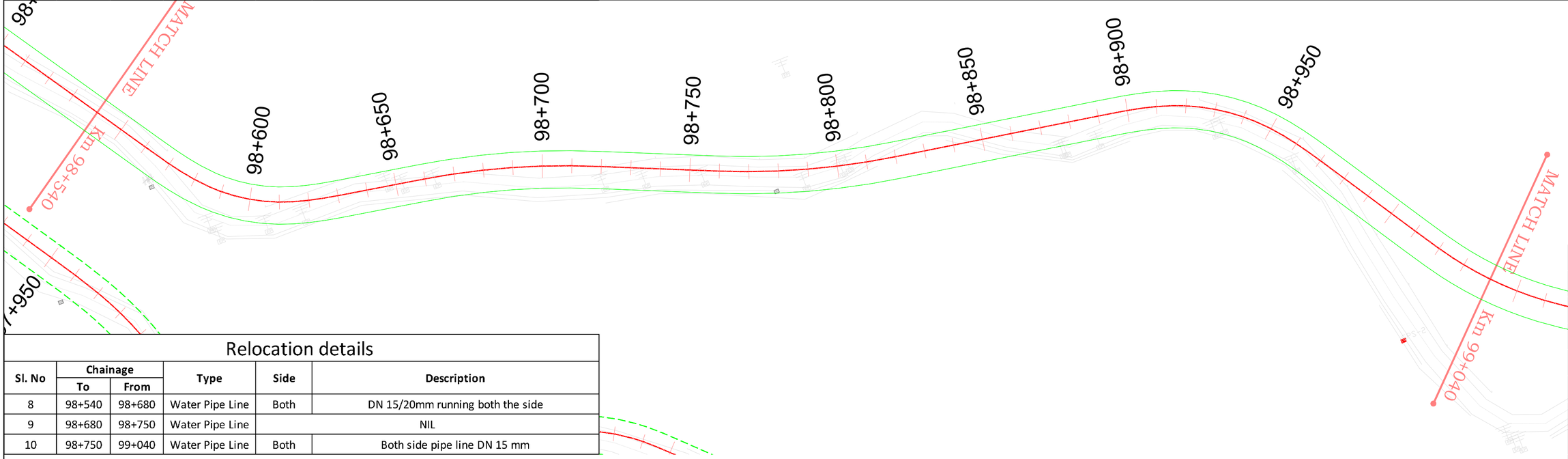
TO RESHI (NH-717A)

TO RHENOCK (NH-717A)



Relocation details

Sl. No	Chainage		Type	Side	Description
	To	From			
7	98+040	98+540	Water Pipe Line	Both	DN 15/20mm running both the side



Relocation details

Sl. No	Chainage		Type	Side	Description
	To	From			
8	98+540	98+680	Water Pipe Line	Both	DN 15/20mm running both the side
9	98+680	98+750	Water Pipe Line	NIL	
10	98+750	99+040	Water Pipe Line	Both	Both side pipe line DN 15 mm

Legends: Existing

- Electrical Pole
- Light Pole
- Telephone Pole
- Transformer
- Water Pipe Line

Legends: Proposed

- Electrical Pole
- Light Pole
- Telephone Pole
- Transformer
- Water Pipe Line

Rev. No	Date	Checked By.	Revision Details	Color Code.	Description
					Center Line
					Formation Width

Client:
National Highway & Infrastructure Development Corp. Ltd. (NHIDCL)
1st & 2nd Floor, Tower A, World Trade Centre, Nauroji Nagar, New Delhi – 110029

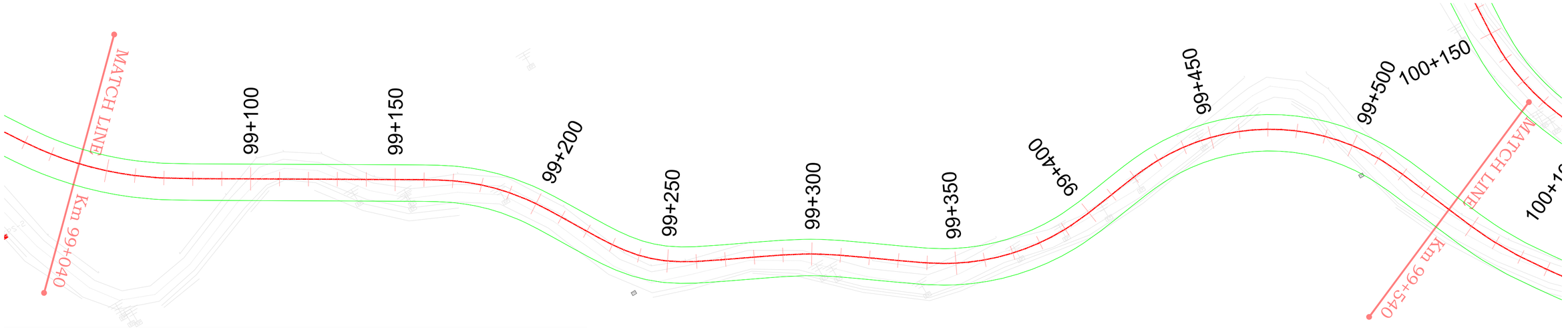
Design Consultant:
Xplorer Consultancy Services Pvt. Ltd. in joint venture Dsd Infratech Management Pvt. Ltd, in Association With Maverick Mernok & Construction
511, Tower b, ithum, plot-A40 Sector-62, Noida Uttar Pradesh – 201301

Project :
Consultancy Services For Preparation Of DPR And Providing Services For Pre-Construction Activities in Respect of"Widening And Up-Gradation Of Existing Carriageway into 2L+PS Configuration From Reshi(Km 96.254) .To Rhenock (Km 101.554) Along NH-717A & From Rhenock (Km 0.00) To Rongli Bazaar (Km 15.300) Along NH-717B in the States Of Sikkim ".
(Reshi 96+070 To Rhenock 101+367)

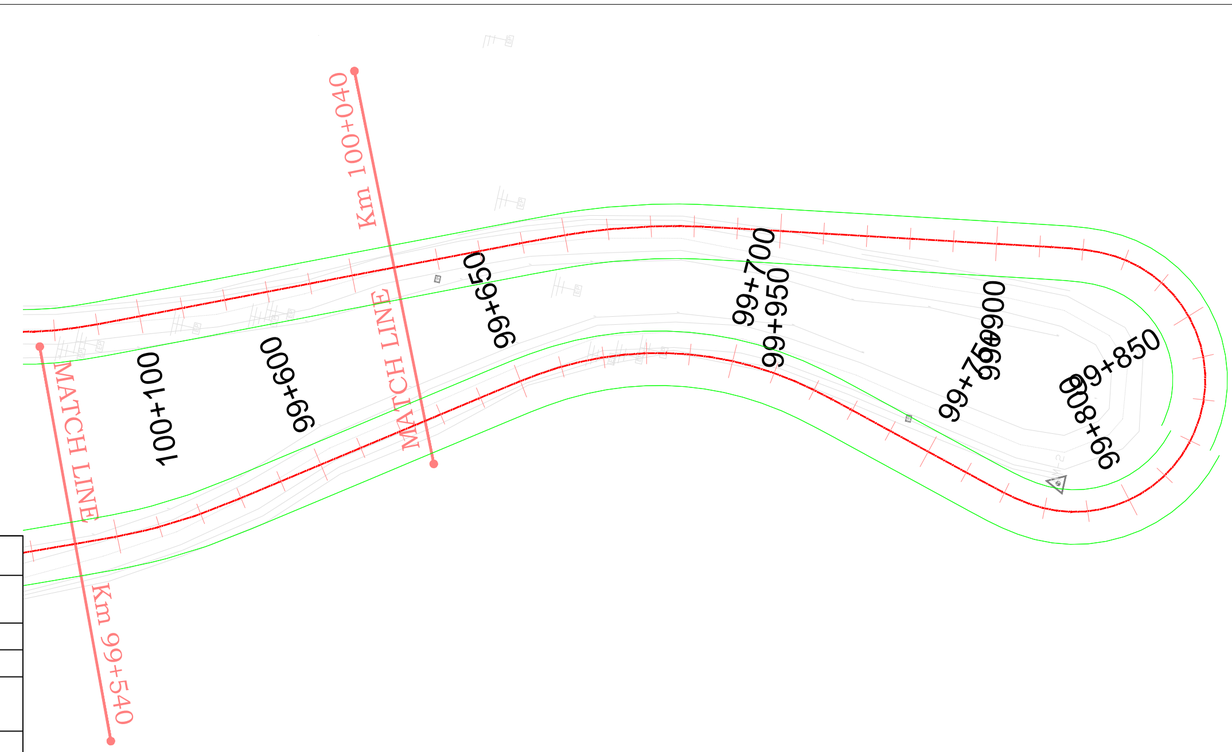
Design By : RK	Title: Utilities Shifting For Water Pipe Line (Km 98+040 to Km 99+040)
Drawn By : MK	
Checked By : AH	
Approved By : VY	Dwg No: XPL/DSD/SK/UTILITIES/WPL/03
Scale : 1/1000	Sheet: 03 OF 06 — Date : Nov-2024

TO RESHI (NH-717A)

TO RHENOCK (NH-717A)



Relocation details					
Sl. No	Chainage		Type	Side	Description
	To	From			
11	99+040	99+200	Water Pipe Line	NIL	
12	99+200	99+390	Water Pipe Line	Both	Both Side
13	99+390	99+450	Water Pipe Line	LHS	DN 15 hill side
14	99+450	99+540	Water Pipe Line	NIL	



Relocation details					
Sl. No	Chainage		Type	Side	Description
	To	From			
15	99+540	99+600	Water Pipe Line	NIL	
16	99+600	99+650	Water Pipe Line	RHS	valley side house hold connection
17	99+650	99+800	Water Pipe Line	RHS	valley side DN 20/15mm (GI) pipe
18	99+800	99+900		LHS	
19	99+900	100+000	Water Pipe Line	NIL	
20	100+000	100+040	Water Pipe Line	LHS	DN 15 mm valley side

Legends: Existing	
	Electrical Pole
	Light Pole
	Telephone Pole
	Transformer
	Water Pipe Line

Legends: Proposed	
	Electrical Pole
	Light Pole
	Telephone Pole
	Transformer
	Water Pipe Line

Rev. No	Date	Checked By.	Revision Details	Color Code.	Description
					Center Line
					Formation Width

Client:
National Highway & Infrastructure Development Corp. Ltd. (NHIDCL)
1st & 2nd Floor, Tower A, World Trade Centre, Nauroji Nagar, New Delhi – 110029

Design Consultant:
Xplorer Consultancy Services Pvt. Ltd. in joint venture Dsd Infratech Management Pvt. Ltd, in Association With Maverick Mernok & Construction
511, Tower b, ithum, plot-A40 Sector-62, Noida Uttar Pradesh – 201301

Project :
Consultancy Services For Preparation Of DPR And Providing Services For Pre-Construction Activities in Respect of"Widening And Up-Gradation Of Existing Carriageway into 2L+PS Configuration From Reshi(Km 96.254) .To Rhenock (Km 101.554) Along NH-717A & From Rhenock (Km 0.00) To Rongli Bazaar (Km 15.300) Along NH-717B in the States Of Sikkim ".
(Reshi 96+070 To Rhenock 101+367)

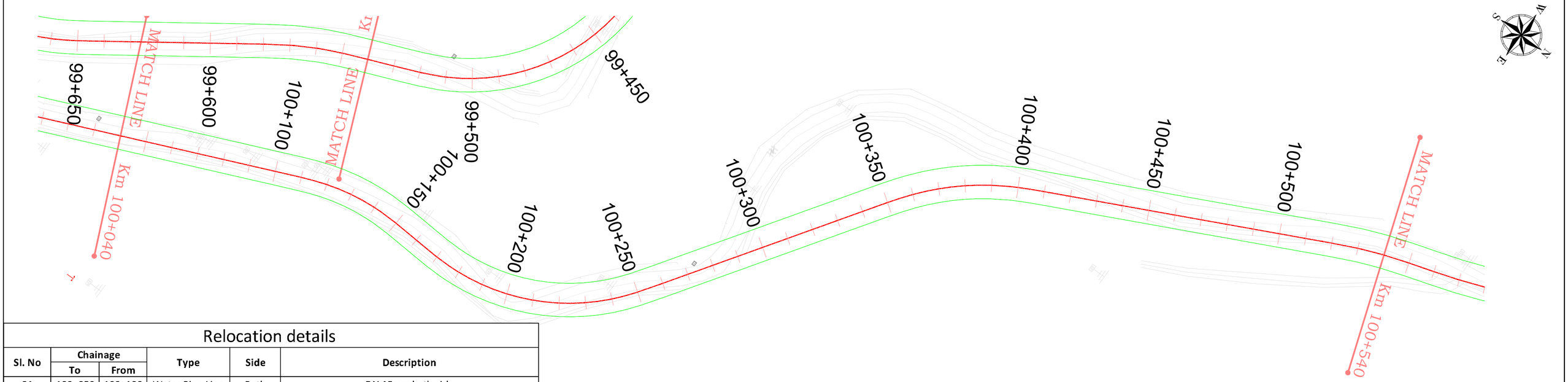
Design By	: RK
Drawn By	: MK
Checked By	: AH
Approved By	: VY
Scale	: 1/1000

Title:
Utilities Shifting
For Water Pipe Line
(Km 99+040 to Km 100+040)

Dwg No: XPL/DSD/SK/UTILITIES/WPL/04

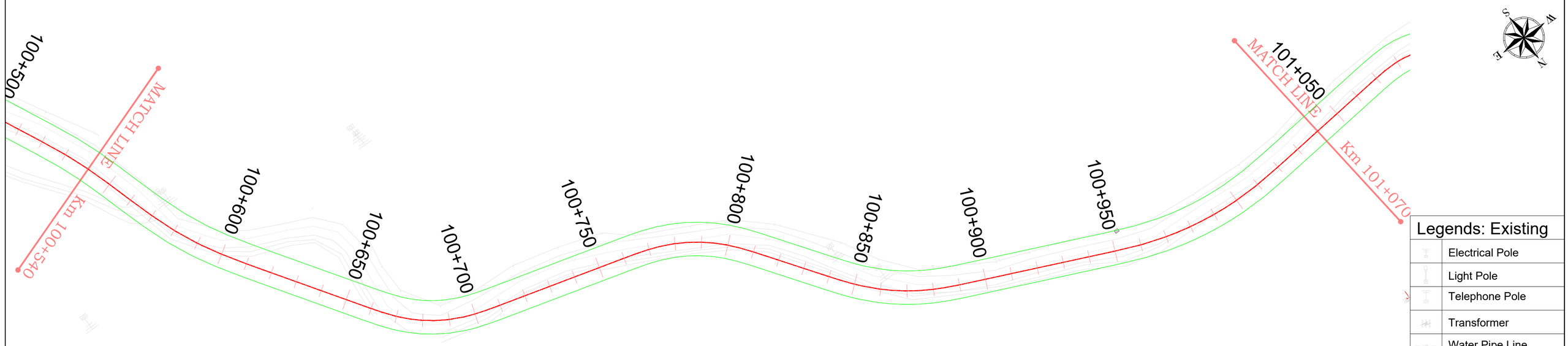
Sheet: 04 OF 06

Date : Nov-2024



Relocation details

Sl. No	Chainage		Type	Side	Description
	To	From			
21	100+050	100+100	Water Pipe Line	Both	DN 15mm both side
22	100+100	100+150	Water Pipe Line	NIL	
23	100+150	100+250	Water Pipe Line	Both	DN 15mm both side and road crossing
24	100+250	100+440	Water Pipe Line	NIL	
25	100+440	100+540	Water Pipe Line	Both	20mm and 15mm pipes on both valley side and hill side



Relocation details

Sl. No	Chainage		Type	Side	Description
	To	From			
26	100+540	101+070	Water Pipe Line	Both	20mm and 15mm pipes on both valley side and hill side

Legends: Existing

	Electrical Pole
	Light Pole
	Telephone Pole
	Transformer
WP	Water Pipe Line

Legends: Proposed

	Electrical Pole
	Light Pole
	Telephone Pole
	Transformer
WP	Water Pipe Line

Rev. No	Date	Checked By.	Revision Details	Color Code.	Description
					Center Line
					Formation Width

Client:
National Highway & Infrastructure Development Corp. Ltd. (NHIDCL)
1st & 2nd Floor, Tower A,
World Trade Centre,
Nauroji Nagar,
New Delhi – 110029

Design Consultant:
Xplorer Consultancy Services Pvt. Ltd. in joint venture Dsd Infratech Management Pvt. Ltd, in Association With Maverick Mernok & Construction
511, Tower b, ithum, plot-A40
Sector-62, Noida
Uttar Pradesh – 201301

Project :
Consultancy Services For Preparation Of DPR And Providing Services For Pre-Construction Activities in Respect of"Widening And Up-Gradation Of Existing Carriageway into 2L+PS Configuration From Reshi(Km 96.254) .To Rhenock (Km 101.554) Along NH-717A & From Rhenock (Km 0.00) To Rongli Bazaar (Km 15.300) Along NH-717B in the States Of Sikkim ".
(Reshi 96+070 To Rhenock 101+367)

Design By	: RK
Drawn By	: MK
Checked By	: AH
Approved By	: VY
Scale	: 1/1000

Title:
Utilities Shifting
For Water Pipe Line
(Km 100+040 to Km 101+040)

Dwg No: XPL/DSD/SK/UTILITIES/WPL/05

Sheet: 05 OF 06

Date : Nov-2024

TO RESHI (NH-717A)

TO RHENOCK (NH-717A)

Relocation details

Sl. No	Chainage		Type	Side	Description
	To	From			
27	101+070	101+367	Water Pipe Line	Both	20mm and 15mm pipes on both valley side and hill side

Legends: Existing

	Electrical Pole
	Light Pole
	Telephone Pole
	Transformer
VP	Water Pipe Line

Legends: Proposed

	Electrical Pole
	Light Pole
	Telephone Pole
	Transformer
VP	Water Pipe Line

Rev. No	Date	Checked By.	Revision Details	Color Code.	Description
					Center Line
					Formation Width

Client:
National Highway & Infrastructure Development Corp. Ltd.
(NHIDCL)
1st & 2nd Floor, Tower A,
World Trade Centre,
Nauroji Nagar,
New Delhi – 110029

Design Consultant:
Xplorer Consultancy Services Pvt. Ltd.
in joint venture Dsd Infratech Management Pvt. Ltd, in Association With Maverick Mernok & Construction
511, Tower b, ithum, plot-A40
Sector-62, Noida
Uttar Pradesh – 201301

Project :
Consultancy Services For Preparation Of DPR And Providing Services For Pre-Construction Activities in Respect of"Widening And Up-Gradation Of Existing Carriageway into 2L+PS Configuration From Reshi(Km 96.254) .To Rhenock (Km 101.554) Along NH-717A & From Rhenock (Km 0.00) To Rongli Bazaar (Km 15.300) Along NH-717B in the States Of Sikkim ".
(Reshi 96+070 To Rhenock 101+367)

Design By	: RK
Drawn By	: MK
Checked By	: AH
Approved By	: VY
Scale	: 1/1000

Title:
Utilities Shifting
For Water Pipe Line
(Km 101+040 to Km 101+367)

Dwg No: XPL/DSD/SK/UTILITIES/WPL/06

Sheet: 06 OF 06

Date : Nov-2024