Technical Schedules

FOR

"Widening & Upgradation to 2-lane with paved shoulder of balance work of NH-301 Kargil Zanskar Road from Design km 6.000 to km 30.040 of 24.040 Km length in the Union Territory of Ladakh on EPC mode"

NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. (NHIDCL)

"Widening & Upgradation to 2-lane with paved shoulder of Balance Work of NH-301 Kargil Zanskar Road from Design km 6.000 to km 30.040 of 24.040 Km length in the Union Territory of Ladakh on EPC mode"

SCHEDULES

"Widening & Upgradation to 2-lane with paved shoulder of Balance Work of NH-301 Kargil Zanskar Road from Design km 6.000 to km 30.040 of 24.040 Km length in the Union Territory of Ladakh on EPC mode"

Schedule-A

(See Clauses 2.1 and 8.1)

Site of the Project

1. The Site

(i) Site of the 2-lane project highway shall include land, buildings, structures and roadworks 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.** The proposed profile of the Project Highways shall be followed by the contractor with a 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.**

"Widening & Upgradation to 2-lane with paved shoulder of Balance Work of NH-301 Kargil Zanskar Road from Design km 6.000 to km 30.040 of 24.040 Km length in the Union Territory of Ladakh on EPC mode"

Annex-I
Schedule-A (Site)

The site of the 2-lane project highway comprises section of National Highway-301 Kargil to Zanskar commencing from km 6+000 to km 30+040 of length 24.040 km of Kargil –Zanskar Section in the UnionTerritoryof Ladakh.The land, carriageway and structures comprising the Site are described below.

1. Land

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

Sr. No.	Design Chainage in km		Length in m	E ROW in m
	From	To		
1	6+000	30+040	24040	7m-12 m

2. Carriageway

The existing carriageway of the Project Highway is Intermediate Lane & 2 L+PS with 5.5 m - 10 m carriageway. The type of the existing pavement is flexible. The following chainages have been completed in 2l+PS

Sr. No.	Design Chainage in km		
	From	To	Length in m
1	6+410	6+900	490
2.	13+300	16+330	3030
3.	16+500	16+670	170
4.	16+720	17+540	820
5.	17+590	17+660	70
6.	22+190	22+550	360
7.	22+580	22+760	180
8.	22+820	26+660	3840
9.	26+740	26+770	30
10.	26+800	26+840	40
11.	26+860	27+640	780
12.	27+880	27+960	80
13.	28+000	28+330	330
14.	28+360	28+740	380
15.	28+790	29+770	980
16.	29+810	30+040	230

3. Major Bridges

"Widening & Upgradation to 2-lane with paved shoulder of Balance Work of NH-301 Kargil Zanskar Road from Design km 6.000 to km 30.040 of 24.040 Km length in the Union Territory of Ladakh on EPC mode"

The Site includes the following Major Bridges:

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

4. **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						

5. **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					

6. **Minor bridges**

The Site includes the following minor bridges:

Sr. No.	Ex Chainage (km)	Type of Structure			No. of Spans with span length(m)	Overall Width (m)
		Foundation	Sub-structure	Super-structure		
01	10+680	Completed	Completed	Completed	2x6 m	12

7. **Railway level crossings**

The Site includes the following railway level crossings:

Sr. No.	Location(km)	Remarks
Nil		

8. **Under passes (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				

"Widening & Upgradation to 2-lane with paved shoulder of Balance Work of NH-301 Kargil Zanskar Road from Design km 6.000 to km 30.040 of 24.040 Km length in the Union Territory of Ladakh on EPC mode"

9. Culverts

The Site has the following culverts:

Sr.no	Ch. as per Site	Span
1	6+600	2x2
2	8+020	1x1
3	8+040	2x2
4	8+220	1x1
5	8+550	2x2
7	9+080	1x1
6	6+750	1x1
8	9+450	1x1
9	9+500	2x2
10	9+800	1x1
11	9+890	2x2
12	10+140	1x1
13	13+300	1x1
14	14+330	2x2
15	14+540	2x2
16	15+070	1x1
17	15+690	2x2
18	16+110	1x1
19	16+450	1x1
20	16+700	2x2
21	16+845	1x1
22	16+900	1x1
23	17+190	1x1
24	17+560	2x2
25	18+400	2x2
26	18+850	1x1
27	19+000	2x2
28	19+940	2x2
29	20+008	2x2
30	20+128	2x2
31	21+250	2x2
32	22+340	2x2
33	23+187	2x2
34	24+200	2x2
35	24+400	2x2
36	24+704	2x2
37	25+004	2x2
38	27+200	1x1
39	27+860	2x2
40	28+056	1x1
41	28+280	1x1
42	28+430	2x2

43	28+806	2x2

10. Busbay/Shelters

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

Sr. No.	Chainage(km)	Left Hand Side
1	15+165	LHS
2	23+980	RHS
3	24+000	RHS
4	29+320	LHS

11. Truck Lay byes

The details of truck lay byes are as follows:

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

12. Roadside drains

The details of the roadside drain are as follows:

Sr. No.	Location		Length	
	From km	To km	(m)	Masonry/cc (Pucca)
1	12.530	14.160	830	(Pucca)
2	14.160	14.330	145	(Pucca)
3	14.330	17.350	2504	(Pucca)
4	17.350	17.600	390	(Pucca)
5	17.600	17.660	60	(Pucca)
6	22.180	24.390	1782	(Pucca)
7	24.390	25.280	1645	(Pucca)
8	25.280	26.560	1135	(Pucca)
9	26.560	26.710	280	(Pucca)
10	26.710	26.930	210	(Pucca)
11	26.930	27.230	486	(Pucca)
12	27.230	27.480	171	(Pucca)
13	27.480	27.630	240	(Pucca)
14	27.630	27.750	15	(Pucca)
15	27.750	29.130	958	(Pucca)
16	29.130	29.830	560	(Pucca)
17	29.830	30.040	153	(Pucca)

13. Major junctions

The details of major junctions' areas follow:

Sr. No.	Location		At grade	Separated	Category of Cross Road			
	From km	To km			NH	SH	MDR	Others
Nil								

"Widening & Upgradation to 2-lane with paved shoulder of Balance Work of NH-301 Kargil Zanskar Road from Design km 6.000 to km 30.040 of 24.040 Km length in the Union Territory of Ladakh on EPC mode"

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

14. Minor junctions

The details of the minor junctions are as follows:

SI .No.	Location of intersection	Type of intersection	Other features	Remarks
1	17+540	T	LHS	Minor Junctions
2	22+400	T	LHS	Minor Junctions
3	23+180	T	RHS	Minor Junctions
4	23+400	T	RHS	Minor Junctions
5	23+400	T	LHS	Minor Junctions
6	24+470	Y	RHS	Minor Junctions
7	24+700	T	LHS	Minor Junctions
8	26+520	Y	LHS	Minor Junctions
9	26+770	Y	LHS	Minor Junctions

15. Bypasses

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

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

16. Others

The project where stretch of road work has been completed, Traffic signs, Road markings and other road appurtenances has been installed in all respects.

Annex-II

(As per Clause 8.3(i))

(Schedule-A)

Dates for providing Right of Way of Construction Zone

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

Sl. No.	From (Km)	To (Km)	Length (Km)	Width(m)	Date of providing Right of Way*
1	2		3	4	5
(i)Full Right of Way (Full Width)					
1	6+000	30+040	12.4	12.0	150 (One hundred and fifty) days after the Appointed Date

The details of stretches in above length for which LA is being carried out and to be handed over is as under:

	Design Chainage in Km		
Sr. No.	From	To	Length in m
1	6.000	6.410	410
2	6.900	13.300	6450
3	16.330	16.500	170
4	16.670	16.720	50
5	17.540	17.590	50
6	17.660	22.190	4580
7	22.550	22.580	30
8	22.760	22.820	60
9	26.660	26.740	80
10	26.770	26.800	30
11	26.840	26.860	20
12	27.640	27.880	250
13	27.960	28.000	50
14	28.330	28.360	30
15	28.740	28.790	50
16	29.770	29.810	40
Total length			12400

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

Annex-III

(Schedule-A)

Alignment Plans

The existing alignment 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 and indicated below. 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 is enclosed. The contractor shall, however, improve/upgrade upon the traffic signage plan as indicated in Annex-III based on site/design requirement as per the relevant specifications/IRC Codes/Manual.

Environment Clearances

Not Applicable

Annex–V

(Schedule-A)

Existing Utility

a) PDD Kargil:

The site includes the following electrical utilities:

S. No	Chainage		Length in (Km)				Crossings		Transformers	
	From Km	To Km	11 KV HT	33 HT	11 KV LT	33 LT	11 KV LT	33 LT	Nos.	Remarks
01	6.000	30.040	5.670	Nil	8.085	Nil	10	8	10	

Description	33 KV	11KV	LT Poles
No. of Poles 33KV/11KV/LT	Nil	162	231

b) 8 Mountain Division Khumbathang, Station HQ (Indian Army)

The site includes the following electrical utilities:

S. No	Chainage		Length in (Km)					Crossings		
	From	To	11 KV HT	33 HT	11 KV LT	33 LT		11 KV LT	33 LT	If any, please mention
01	10+680	24+600	12.45	Nil	Nil	Nil		Nil	Nil	Nil

Description	33 KV	11lv	LT Poles
No. of Poles 33KV/11KV/LT	Nil	349 Nos.	Nil

c) Public Health utilities (Water/Sewage Pipe Lines)

The site includes the following Public Health utilities:

Sl. No	KM From	KM To	Length of Water Supply line (RM)	No. of Hand Pumps (Nos.)	If any, please mention
01	6.000	30.020	5061	16	Nil

Annex–V

(Schedule-A)

d) Irrigation & Flood Control utilities (Irrigation Khuls)

The site includes the following Irrigation Khuls:

Sl. No	KM From	KM To	Length of Irrigation Khul (M)	If any Please mention
01	6.000	30.040	5910	Nil

Development of the Project Highway

1. Development of the Project Highway

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

2. Rehabilitation and augmentation

Rehabilitation and augmentation shall include Two-Laning and Strengthening of the Highway as described in Annex-I of this Schedule-B and in Schedule-C.

3. Specifications and Standards

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

Schedule-B

(SeeClause2.1)

(Schedule-B)

Description of the Project

"Widening & Upgradation to 2-lane with paved shoulder of balance work of NH-301 Kargil Zanskar Road from Design km 6.000 to km 30.040 of 24.040 Km length in the Union Territory of Ladakh on EPC mode"

1. Balance work for Widening of Existing Highway

i. The Project Highway shall follow the existing alignment unless otherwise specified by the Authority and shown in the alignment plans specified in Annex-III of Schedule-A. Geometric deficiencies, if any, in the existing horizontal and vertical profiles shall be corrected as per already completed work as per previous contractor & as per the prescribed standards for hill/mountainous terrain to the extent land is available.

S.No.	Chainage		Design Length (Km)	Balance work Length (m)	TCS No.	Proposed TCS in Balance Work
	From	To				
1	6.000	6.070	0.070	70	3A	2 Lane + PS "Reconstruction in Rural Area"
2	6.070	6.490	0.420	400	2B	2 Lane + PS "Reconstruction in Built-up Area with Side Drain Cum Footpath"
3	6.490	6.910	0.420	280	3A	2 Lane + PS "Reconstruction in Rural Area"
4	6.910	9.030	2.120	2120	2	2 Lane in Built-up Area with Footpath "
5	9.030	9.500	0.470	470	3A	2 Lane + PS "Reconstruction in Rural Area"
6	9.500	9.830	0.330	330	2	2 Lane in Built-up Area with Footpath "
7	9.830	10.020	0.190	190	3A	2 Lane + PS "Reconstruction in Rural Area"
8	10.020	11.550	1.530	1530	2	2 Lane in Built-up Area with Footpath "
9	11.550	12.200	0.650	650	3A	2 Lane + PS "Reconstruction in Rural Area"
10	12.200	12.530	0.330	330	2B	2 Lane + PS "Reconstruction in Built-up Area with Side Drain Cum Footpath"
11	12.530	14.160	1.630	765	3A	2 Lane + PS "Reconstruction in Rural Area"
12	14.160	14.330	0.170	0	2B	2 Lane + PS "Reconstruction in Built-up Area with Side Drain Cum Footpath"
13	14.330	17.350	3.020	180	3A	2 Lane + PS "Reconstruction in Rural Area"
14	17.350	17.600	0.250	0	2B	2 Lane + PS "Reconstruction in Built-up Area with Side Drain Cum Footpath"
15	17.600	17.660	0.060	0	3A	2 Lane + PS "Reconstruction in Rural Area"
16	17.660	20.000	2.340	2340	2	2 Lane in Built-up Area with Footpath "
17	20.000	20.310	0.310	310	3A	2 Lane + PS "Reconstruction in Rural Area"
18	20.310	22.180	1.870	1870	2	2 Lane in Built-up Area with Footpath "

Schedule-B

(SeeClause2.1)

19	22.180	24.390	2.210	710	3A	2 Lane + PS "Reconstruction in Rural Area"
20	24.390	25.280	0.890	0	2B	2 Lane + PS "Reconstruction in Builtup Area with Side Drain Cum Footpath"
21	25.280	26.560	1.280	0	3A	2 Lane + PS "Reconstruction in Rural Area"
22	26.560	26.710	0.150	10	2B	2 Lane + PS "Reconstruction in Builtup Area with Side Drain Cum Footpath"
23	26.710	26.930	0.220	40	3A	2 Lane + PS "Reconstruction in Rural Area"
24	26.930	27.230	0.300	180	2B	2 Lane + PS "Reconstruction in Builtup Area with Side Drain Cum Footpath"
25	27.230	27.480	0.250	120	3A	2 Lane + PS "Reconstruction in Rural Area"
26	27.480	27.630	0.150	50	2B	2 Lane + PS "Reconstruction in Builtup Area with Side Drain Cum Footpath"
27	27.630	27.750	0.120	110	3A	2 Lane + PS "Reconstruction in Rural Area"
28	27.750	29.130	1.380	260	3A	2 Lane + PS "Reconstruction in Rural Area"
29	29.130	29.830	0.700	30	2B	2 Lane + PS "Reconstruction in Built-up Area with Side Drain Cum Footpath"
30	29.830	30.040	0.210	300	3A	2 Lane + PS "Reconstruction in Rural Area"
Total length in Km			**24.040 Km**	**12.400 Km**		

ii. **Width of Carriageway**

(a) 2-Laning with paved shoulders shall be undertaken for main road. The paved carriageway shall be 10m wide accordance with the typical cross section's drawings attached along with Schedule-B.

(b) Except as otherwise provided in this agreement, the width of the paved carriageway and cross-sectional features shall confirm to paragraph 1.1 above.

(c) The details of the balance Road works are as under:

Balance Work Chainages			
Sr. No.	**Design Chainage in Km**		**Length in m**
	From	**To**	
1	6.000	6.410	410
2	6.900	13.300	6450
3	16.330	16.500	170
4	16.670	16.720	50
5	17.540	17.590	50
6	17.660	22.190	4580
7	22.550	22.580	30
8	22.760	22.820	60

Schedule-B

(SeeClause2.1)

9	26.660	26.740	80
10	26.770	26.800	30
11	26.840	26.860	20
12	27.640	27.880	250
13	27.960	28.000	50
14	28.330	28.360	30
15	28.740	28.790	50
16	29.770	29.810	40
Total length			12400

(d) The details of balance work to be carried out is detailed as per TCS given below:

(A)TCS-IIB (2 Lane + PS "Reconstruction in Built up Area with Side Drain Cum Footpath")

(i) Balance Road Works of Subgrade, Granular Sub-Base, Wet Mix Macadam, Dense Bituminous Macadam & Bituminous Concrete in full width **(reconstruction in flexible pavement)** is tabulated below:

Balance Work				Length (m)	Width (m)
From	**To**	**Side**	**Mtr**		
6070	6400	B/s	Mtr	330	Full width as per 2L+PS
12200	12530	B/s	Mtr	330	
26700	26710	B/s	Mtr	10	
29780	29820	B/s	Mtr	40	
Total length in mtr.				**710**	

(ii) Balance work of paved shoulder to be constructed as per 2L+PS for the following stretches as tabulated below:

Balance Work				Length (m)	Width (m)
From	**To**	**Side**	**Mtr**		
6400	6410	B/s	Mtr	10	1.5 m Paved shoulder on either side.
6410	6420	B/s	Mtr	10	
6420	6430	B/s	Mtr	10	
27080	27090	B/s	Mtr	10	
27090	27100	B/s	Mtr	10	
27100	27110	B/s	Mtr	10	
27110	27120	B/s	Mtr	10	
27120	27130	B/s	Mtr	10	
27480	27490	B/s	Mtr	10	
27490	27500	B/s	Mtr	10	
27500	27510	B/s	Mtr	10	

Schedule-B

(SeeClause2.1)

27510	27520	B/s	Mtr	10	
Total length in mtr				**120 m**	

(B) TCS-IIIA (2 Lane + PS "Reconstruction in Rural Area)

(i) Balance work of Subgrade, Granular Sub-Base, Wet Mix Macadam, Dense Bituminous Macadam & Bituminous Concrete in full width **(reconstruction in flexible pavement)** as per 2L+PS as tabulated below:

Balance Work -LHS				Length (m)	Width (m)
From	To	Side	Mtr		
6000	6070	B/s	Mtr	70	Full width as per 2L+PS
9030	9500	B/s	Mtr	470	
9830	10020	B/s	Mtr	190	
11550	12200	B/s	Mtr	650	
12530	13295	B/s	Mtr	765	
20000	20310	B/s	Mtr	310	
22550	22560	B/s	Mtr	10	
22560	22570	B/s	Mtr	10	
22570	22580	B/s	Mtr	10	
22770	22780	B/s	Mtr	10	
22780	22790	B/s	Mtr	10	
22790	22800	B/s	Mtr	10	
22800	22810	B/s	Mtr	10	
23130	23140	B/s	Mtr	10	
26710	26720	B/s	Mtr	10	
26720	26730	B/s	Mtr	10	
27640	27750	B/s	Mtr	110	
27750	27890	B/s	Mtr	140	
29780	29820	B/s	Mtr	40	
Total length in mtr				**2845**	

(ii) Balance work of paved shoulder to be constructed as per 2L+PS for the following stretches as tabulated below:

Balance Work -LHS				Length (m)	Width (m)
From	To	Side	Mtr		
6600	6610	B/s	Mtr	10	

Schedule-B

(SeeClause2.1)

6610	6620	B/s	Mtr	10	1.5 m Paved shoulder on either side.
6620	6630	B/s	Mtr	10	
6670	6680	B/s	Mtr	10	
6680	6690	B/s	Mtr	10	
6690	6700	B/s	Mtr	10	
6860	6870	B/s	Mtr	10	
6870	6880	B/s	Mtr	10	
6880	6890	B/s	Mtr	10	
6890	6900	B/s	Mtr	10	
6900	6910	B/s	Mtr	10	1.5 m Paved shoulder on either side.
16570	16580	B/s	Mtr	10	
16580	16590	B/s	Mtr	10	
16590	16600	B/s	Mtr	10	
16600	16610	B/s	Mtr	10	
16610	16620	B/s	Mtr	10	
16620	16630	B/s	Mtr	10	
16650	16660	B/s	Mtr	10	
16660	16670	B/s	Mtr	10	
22180	22190	B/s	Mtr	10	
22190	22200	B/s	Mtr	10	
22200	22210	B/s	Mtr	10	
22210	22220	B/s	Mtr	10	
22220	22230	B/s	Mtr	10	
22230	22240	B/s	Mtr	10	
22240	22250	B/s	Mtr	10	
22250	22260	B/s	Mtr	10	
22260	22270	B/s	Mtr	10	
22270	22280	B/s	Mtr	10	
22280	22290	B/s	Mtr	10	
22290	22300	B/s	Mtr	10	
22300	22310	B/s	Mtr	10	
22310	22320	B/s	Mtr	10	
22320	22330	B/s	Mtr	10	
22330	22340	B/s	Mtr	10	
22370	22380	B/s	Mtr	10	
22380	22390	B/s	Mtr	10	
22390	22400	B/s	Mtr	10	
22400	22410	B/s	Mtr	10	
22410	22420	B/s	Mtr	10	
22420	22430	B/s	Mtr	10	
22430	22440	B/s	Mtr	10	

Schedule-B

(SeeClause2.1)

22440	22450	B/s	Mtr	10	
22450	22460	B/s	Mtr	10	
22510	22520	B/s	Mtr	10	
22520	22530	B/s	Mtr	10	
22530	22540	B/s	Mtr	10	
22540	22550	B/s	Mtr	10	
22880	22890	B/s	Mtr	10	
22890	22900	B/s	Mtr	10	
22900	22910	B/s	Mtr	10	
22910	22920	B/s	Mtr	10	
22920	22930	B/s	Mtr	10	
22930	22940	B/s	Mtr	10	
22940	22950	B/s	Mtr	10	
22950	22960	B/s	Mtr	10	
23110	23120	B/s	Mtr	10	
23120	23130	B/s	Mtr	10	1.5 m Paved shoulder on either side.
23140	23300	B/s	Mtr	160	
26770	26780	B/s	Mtr	10	
26780	26790	B/s	Mtr	10	
27410	27420	B/s	Mtr	10	
27420	27430	B/s	Mtr	10	
27460	27470	B/s	Mtr	10	
27470	27480	B/s	Mtr	10	
28270	28300	B/s	Mtr	30	
28410	28450	B/s	Mtr	40	
28810	28850	B/s	Mtr	40	
29820	29910	B/s	Mtr	90	
29910	29940	B/s	Mtr	30	1.5 m Paved shoulder on either side.
29940	29970	B/s	Mtr	30	
29970	30010	B/s	Mtr	40	
30010	30040	B/s	Mtr	30	
Total length in mtr				**1130 m**	

(C) TCS-II (2 Lane in Built up Area with Footpath)

(i) Balance work of Subgrade & Granular subbase in the following stretches of widening in 2 lane width in built-up areas:

Balance work-LHS				Length (m)	Balance work-RHS				Length (m)	Width (m)
From	To	Side	Mtr		From	To	Side	Mtr		
6910	6980	LHS	Mtr	70	6910	6980	RHS	Mtr	70	2 lane
7010	7160	LHS	Mtr	150	7140	7160	RHS	Mtr	20	2 lane

Schedule-B

(SeeClause2.1)

7260	7350	LHS	Mtr	90	7250	7300	RHS	Mtr	50	2 lane
7370	8000	LHS	Mtr	630	7350	7360	RHS	Mtr	10	2 lane
8480	9030	LHS	Mtr	550	7420	7640	RHS	Mtr	220	2 lane
9500	9560	LHS	Mtr	60	7700	7780	RHS	Mtr	80	2 lane
10200	10340	LHS	Mtr	140	7800	7830	RHS	Mtr	30	2 lane
10830	11030	LHS	Mtr	200	8480	9030	RHS	Mtr	550	2 lane
11200	11390	LHS	Mtr	190	10020	10130	RHS	Mtr	110	2 lane
11450	11550	LHS	Mtr	100	10330	10550	RHS	Mtr	220	2 lane
17780	18300	LHS	Mtr	520	10716	10740	RHS	Mtr	24	2 lane
18400	18410	LHS	Mtr	10	10830	10910	RHS	Mtr	80	2 lane
18560	18640	LHS	Mtr	80	10960	11100	RHS	Mtr	140	2 lane
18730	18760	LHS	Mtr	30	11200	11300	RHS	Mtr	100	2 lane
19120	19670	LHS	Mtr	550	11380	11550	RHS	Mtr	170	2 lane
19850	20000	LHS	Mtr	150	17880	18010	RHS	Mtr	130	2 lane
20310	20370	LHS	Mtr	60	18260	18416	RHS	Mtr	156	2 lane
20540	20620	LHS	Mtr	80	18520	18620	RHS	Mtr	100	2 lane
20790	20870	LHS	Mtr	80	18730	18850	RHS	Mtr	120	2 lane
20980	21290	LHS	Mtr	310	19000	19140	RHS	Mtr	140	2 lane
21620	21640	LHS	Mtr	20	19240	19280	RHS	Mtr	40	2 lane
21820	21960	LHS	Mtr	140	19460	19820	RHS	Mtr	360	2 lane
					20310	20430	RHS	Mtr	120	2 lane
					20540	20660	RHS	Mtr	120	2 lane
					20790	20870	RHS	Mtr	80	2 lane
					21120	21160	RHS	Mtr	40	2 lane
					21620	22180	RHS	Mtr	560	2 lane
Total				**4210**	**Mtr**				**3840**	

(iii) Balance work of WMM, DBM & BC in the following stretches of widening in 2 lane width in built-up areas:

S. No.	From	To	Length	Specifications
1	6910	9030	2120	Widening to 2 lanes
2	9500	9830	330	Widening to 2 lanes
3	10020	11550	1530	Widening to 2 lanes
4	17660	20000	2340	Widening to 2 lanes
5	20310	22180	1870	Widening to 2 lanes
Total length in mtr			**8120**	

"Widening & Upgradation to 2-lane with paved shoulder of Balance Work of NH-301 Kargil Zanskar Road from Design km 6.000 to km 30.040 of 24.040 Km length in the Union Territory of Ladakh on EPC mode"

Schedule-B

(SeeClause2.1)

2. Geometric Design and General Features

(i) General

Geometric design and general features of the Project Highway shall be in accordance with Section 2 of the Manual of 2L+PS & plan & profile already approved in the previous agreement.

(ii) Design speed

The design speed shall be the maximum design speed of 50Km/hr. and minimum design speed of 30 km/hr. for mountainous/hilly terrain.

(iii) Improvement of the existing road geometrics

In the following sections, where improvement of the existing road geometrics to the prescribed standards.

Sl. No.	Stretch (from km to km)	Type of deficiency	Remarks
1	Km 11+000 to Km 11+500	Sharp curve	

(iv) Right of Way

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

(v) Type of shoulders

(a) In built-up sections, footpaths/fully paved shoulders shall be provided as shown in corresponding typical cross sections given at para (xii) of Annexure I of Schedule B.

(b) In open country/hilly areas, paved shoulders of 1.5m width shall be provided on either side.

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

(vi) Lateral and vertical clearances at underpasses

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

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

Sl. No.	Location (Chainage) (from km to km)	Span/opening (m)	Remarks
NIL			

(vii) Lateral and vertical clearances at overpasses

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

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

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

Schedule-B

(SeeClause2.1)

(viii) Service roads

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

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

(ix) Grade separated structures/Viaduct

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

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

In the case of grade separated structures, the type of structure and the level of the Project Highway and the crossroads shall be as follows:

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

(x) Cattle and pedestrian underpass/overpass

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

Sl. No.	Location	Type of crossing
Nil		

(xi) Viaduct

Viaduct shall be constructed as follows:

Sl. No.	Design Chainage Km	Span Arrangement (No. x length) in m	Width (m)	Remarks
Nil				

(xii) **Typical cross-sections of the Project Highway**

Following typical cross sections shall be provided for the Project Highway. However, project to be designed as per manual

S.No.	Chainage	Design Length		TCS No.	Proposed TCS in Balance Work

Schedule-B

(SeeClause2.1)

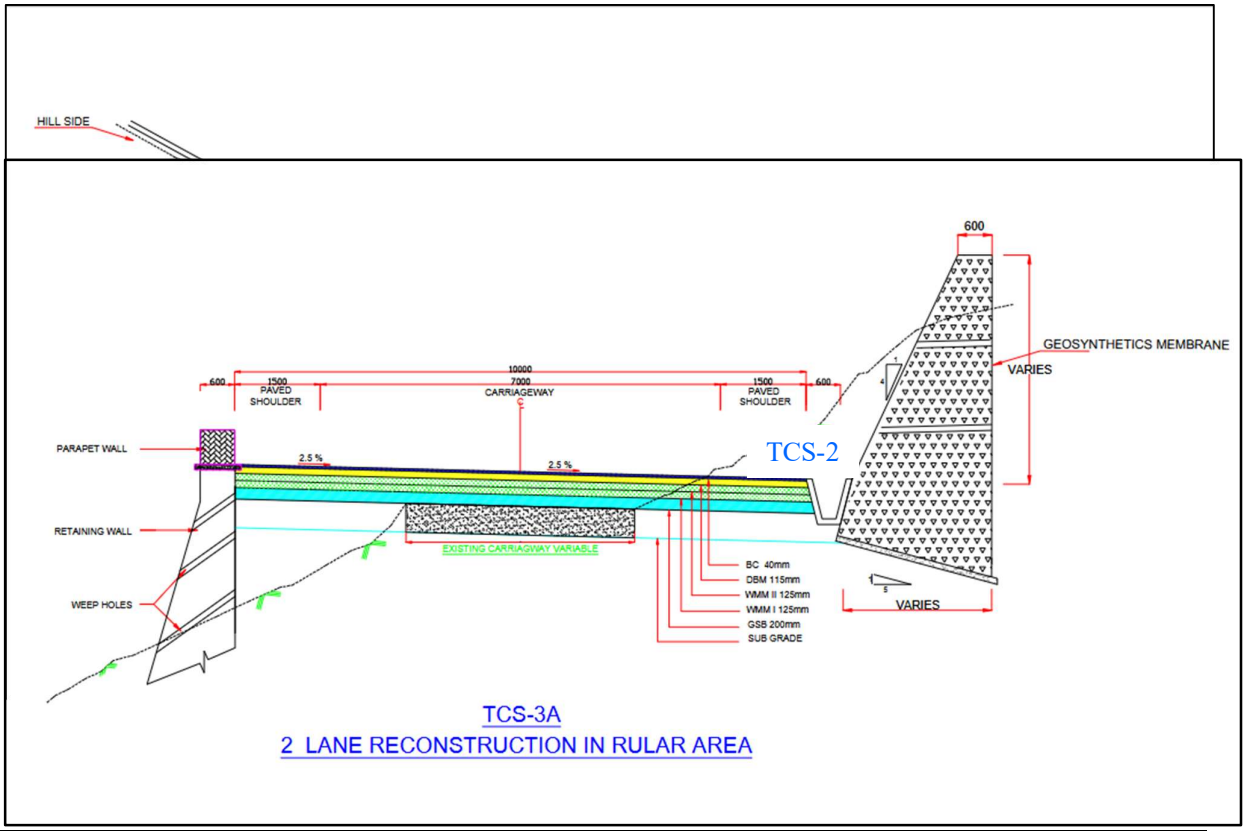
	From	To	(Km)	Balance work Length (m)		
1	6.000	6.070	0.070	70	3A	2 Lane + PS "Reconstruction in Rural Area"
2	6.070	6.490	0.420	400	2B	2 Lane + PS "Reconstruction in Builtup Area with Side Drain Cum Footpath"
3	6.490	6.910	0.420	280	3A	2 Lane + PS "Reconstruction in Rural Area"
4	6.910	9.030	2.120	2120	2	2 Lane in Builtup Area with Footpath "
5	9.030	9.500	0.470	470	3A	2 Lane + PS "Reconstruction in Rural Area"
6	9.500	9.830	0.330	330	2	2 Lane in Builtup Area with Footpath "
7	9.830	10.020	0.190	190	3A	2 Lane + PS "Reconstruction in Rural Area"
8	10.020	11.550	1.530	1530	2	2 Lane in Builtup Area with Footpath "
9	11.550	12.200	0.650	650	3A	2 Lane + PS "Reconstruction in Rural Area"
10	12.200	12.530	0.330	330	2B	2 Lane + PS "Reconstruction in Builtup Area with Side Drain Cum Footpath"
11	12.530	14.160	1.630	765	3A	2 Lane + PS "Reconstruction in Rural Area"
12	14.160	14.330	0.170	0	2B	2 Lane + PS "Reconstruction in Builtup Area with Side Drain Cum Footpath"
13	14.330	17.350	3.020	180	3A	2 Lane + PS "Reconstruction in Rural Area"
14	17.350	17.600	0.250	0	2B	2 Lane + PS "Reconstruction in Builtup Area with Side Drain Cum Footpath"
15	17.600	17.660	0.060	0	3A	2 Lane + PS "Reconstruction in Rural Area"
16	17.660	20.000	2.340	2340	2	2 Lane in Builtup Area with Footpath "
17	20.000	20.310	0.310	310	3A	2 Lane + PS "Reconstruction in Rural Area"
18	20.310	22.180	1.870	1870	2	2 Lane in Builtup Area with Footpath "
19	22.180	24.390	2.210	710	3A	2 Lane + PS "Reconstruction in Rural Area"
20	24.390	25.280	0.890	0	2B	2 Lane + PS "Reconstruction in Builtup Area with Side Drain Cum Footpath"
21	25.280	26.560	1.280	0	3A	2 Lane + PS "Reconstruction in Rural Area"
22	26.560	26.710	0.150	10	2B	2 Lane + PS "Reconstruction in Builtup Area with Side Drain Cum Footpath"
23	26.710	26.930	0.220	40	3A	2 Lane + PS "Reconstruction in Rural Area"
24	26.930	27.230	0.300	180	2B	2 Lane + PS "Reconstruction in Builtup Area with Side Drain Cum Footpath"
25	27.230	27.480	0.250	120	3A	2 Lane + PS "Reconstruction in Rural Area"
26	27.480	27.630	0.150	50	2B	2 Lane + PS "Reconstruction in Builtup Area with Side Drain Cum Footpath"

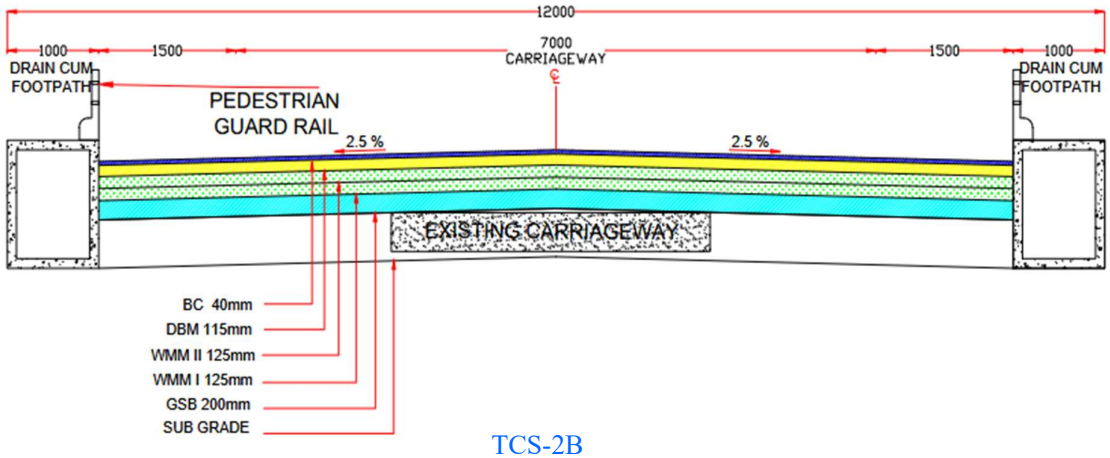
Schedule-B

(SeeClause2.1)

27	27.630	27.750	0.120	110	3A	2 Lane + PS "Reconstruction in Rural Area"
28	27.750	29.130	1.380	260	3A	2 Lane + PS "Reconstruction in Rural Area"
29	29.130	29.830	0.700	30	2B	2 Lane + PS "Reconstruction in Builtup Area with Side Drain Cum Footpath"
30	29.830	30.040	0.210	300	3A	2 Lane + PS "Reconstruction in Rural Area"
Total length in Km			**24.040 Km**	**12.400 Km**		

As per drawing enclosed below:





TCS-2B

2 LANE RECONSTRUCTION IN BUILTUP AREA WITH SIDE DRAIN CUM FOOTHPATH

3. Intersections and Grade Separators

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

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

(i) At-grade intersections

Sl. No.	Location of intersection	Type of intersection	Other features	Remarks
1	7+600	T	LHS	Minor Junctions
2	8+500	Y	LHS	Minor Junctions
3	9+720	Y	LHS	Minor Junctions
4	9+900	Y	RHS	Minor Junctions
5	10+740	T	RHS	Minor Junctions
6	17+525	T	LHS	Minor Junctions
7	21+280	T	LHS	Minor Junctions

(ii) Grade separated intersection with/without ramps

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

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 of the existing road shall be corrected as per already approved P&P.

Recommended overlay thickness(mm)		
BC	**DBM**	**WMM**
40	115	Correction required as per approved P&P

(ii) Raising of the existing road.

The existing road shall be raised in the following sections:

Sl. No.	Section (from km to km)	Length	Extent of raising [Top of finished road level]
Nil			

5. Pavement Design

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

(ii) Type of pavement

Main carriageway of entire length of project highway including bypasses, realignment, reconstruction, Truck Lay Byes, Rest Area and Bus Bays shall be constructed with Flexible pavement as per IRC:37-2018.

(iii) Design requirements

(a) Design Period and strategy

Flexible pavement for new pavement or for widening & strengthening of the existing pavement shall be designed for a minimum period of 20 years and rigid pavement shall be designed for a minimum design period of 30 years. Stage construction shall not be permitted.

(b) Design Traffic

Not withstanding anything to the contrary contained in this Agreement or the Manual, the Contractor shall design the pavement for minimum design traffic of 20 (MSA) million standard axles.

Proposed FlexiblePavementThickness(mm)				Total(mm)
BC	**DBM**	**WMM**	**GSB**	
40	115	250	200	605*

*TCS-3A & TCS-2B

The minimum thickness is to be provided at strengthening/widening sections is given below.

"Widening & Upgradation to 2-lane with paved shoulder of Balance Work of NH-301 Kargil Zanskar Road from Design km 6.000 to km 30.040 of 24.040 Km length in the Union Territory of Ladakh on EPC mode"

6. Roadside Drainage

Drainage system including surface and sub surface drains for the Project Highway shall be provided as per the provision of relevant Manual.

Sr. No.	Design Chainage in km		Road side Drain Length (m)
	From	To	
1	6000	12530	6530
2	12530	14160	800
3	14160	17660	401
4	17660	22180	4520
5	22180	24390	428
7	24390	25280	135
8	25280	26560	145
9	26560	26710	20
10	26930	27230	114
11	27230	27480	79
12	27480	27630	60
13	27630	27750	105
14	27750	29130	422
15	29130	29830	140
16	29830	30040	57
Total length in mtr.			**13956 m**

Catch Water Drainage List					
Sr. No.	Design Chainage in km		Length (m)	Side	Roadside Drain Length (m)
	From	To			
nil					

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 specified therein.

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

Sr. No.	Design Chainage in km	Width of carriageway and cross-sectional features*	Remarks
Nil			

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

Sl. No.	Location at km	Span Arrangement No.xLength(m)	Remarks
Nil			

(d) All bridges shall be high-level bridges.

Refer to the provision of relevant Manual and state if there is any exception.

(e) The following structures shall be designed to carry utility services specified in table below:

Sl. No.	Bridge at km	Utility service to be carried	Remarks
		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 in the provision of relevant Manual.

(ii) Culverts

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

(b) Reconstruction of existing culverts:

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

Reconstruction of Existing Culverts:

Sl. No.	Design Chainage (Ch.)	Proposed Span Arrangements/opening
01	7+472	1x2x2
02	7+852	1x2x2
03	8+961	1x2x2
04	11+460	1x2x2
05	12+185	1x2x2
06	12+704	1x2x2
07	17+930	1x1x1
08	18+140	1x1x1
09	19+770	1x1x1
10	20+660	1x2x2
11	20+840	1x2x2
12	20+980	1x2x2
13	22+195	1x2x2
14	21+280	1x1x1
15	21+680	1x1x1
16	22+801	1x2x2
17	29+882	1x2x2

*Specify modifications, if any, required in the road level, etc.

(c) Widening of existing culverts:

All existing culverts which are not to be reconstructed shall be widened to the roadway width of the Project Highway as per the typical cross section given in the provision of relevant Manual. 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 shall be constructed as per particulars given in the table below: Box Culverts:

S.No.	Design Chainage (Ch.)	Proposed Span arrangement/ opening	Remarks
1	6+081	1x1.0x1.0	RCC Box
2	10+681	1x1.0x1.0	RCC Box
3	11+073	1x1.0x1.0	RCC Box
4	11+082	1x1.0x1.0	RCC Box
5	11+090	1x1.0x1.0	RCC Box
6	11+606	1x1.0x1.0	RCC Box
7	11+843	1x1.0x1.0	RCC Box
8	11+936	1x1.0x1.0	RCC Box
9	11+987	1x1.0x1.0	RCC Box
10	12+096	1x1.0x1.0	RCC Box
11	22+685	1x1.0x1.0	RCC Box
12	29+766	1x1.0x1.0	RCC Box

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

Sl. No.	Location at km	Type of repair required
Nil		

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

(iii) Bridges

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

(i) Theexistingbridgesatthefollowinglocationsshallbere-constructedasnewStructures

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

*Attach GAD

(ii) The following narrow bridges shall be widened:

Sl. No.	Location(km)	Existing width (m)	Extent of widening (m)	Cross section at deck level for

				widening@
Nil				

@Attach cross-section

(b) Additional New bridges

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

Major Bridge: -

Sr. No.	Design Chainage In km	Span arrangement (No. x Length)	Total length in m	Overall Width in m	Remarks
Nil					

Minor Bridge: -

Sr. No.	Design Chainage In km	Span arrangement (No. x Length)	Total length in m	Overall Width in m	Remarks
Nil					

Viaduct: -

Sr. No.	Design Chainage in km	Span arrangement (NoxLength)	Totallength in m	Overall Width in m	Type of Superstructure
Nil					

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

Sl. No.	Location at km	Remarks
Nil		

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

Sl.No.	Location at km	Remarks
Nil		

(e) Drainage system for bridge decks

An effective drainage system for bridge decks shallbe provided as specified in the provision of relevant Manual

(f) Structures in marine environment

Refer to the provision of relevant Manual and specify the necessary measures/ treatments for protecting structures in marine environment, where applicable.

(iv) Rail-roadbridges

(a) Design, construction and detailing of ROB/RUB shall be as specified in the provision of relevant Manual. [Refer to the provision of relevant Manual and specify modification, if any]

(b) Roadover-bridges

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

	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:

Sl.No.	**Location of Level crossing (Chainage km)**	**Number and lengthof 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 paragraphs 2 (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 and extent of repairs / Strengthening to be carried out**
Nil		

(b) ROB/RUB

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

(c) Overpasses/Underpasses and other structures

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

(vii) List of Bridges and Structures

The following is the list of the Bridges and Structures:

Sl. No.	**Design Chainage in km**	**Type of Structure**

"Widening & Upgradation to 2-lane with paved shoulder of Balance Work of NH-301 Kargil Zanskar Road from Design km 6.000 to km 30.040 of 24.040 Km length in the Union Territory of Ladakh on EPC mode"

Nil.

(viii) List of Foot Over Bridges:

Sl. No.	Location of Foot over Bridges (km)
01	Km 23+950 (Ladakh University)
02	Km 25+400 (Army Garrison Khumbathang)

8. Traffic Control Devices and Road Safety Works

(i) Traffic control devices and road safety works shall be provided in accordance with the section 9 of the manual referred to in Schedule D.

(ii) Specifications of the reflective sheeting as per IRC:67-2012 has been provided.

Crash Barrier

(a) Thrie Metal beam crashbarrier shall be provided along the project highway as per section 9 of the manual. It shall be provided at Culvert/ bridge approaches on both sides and at location of embankment with height greater than or equal to 3m.

(b) The concrete crash barrier/ railing of bridge and culvert shall be painted in black and white stripes in general.

Transverse Rumble strip

Transverse rumble strips in the form of thermoplastic bar marking shall be provided to warn the drivers to reduce the speed for safety. Stripes shall be in full width of pavement. The stripes shall be provided at sharp curves, village approaches, location approaching access road, intersections and any other hazardous locations on the project highway. Guidelines of IRC-35 shall be followed.

9. Roadside Furniture

(i) Road side furniture shall be provided in accordance with the provision of relevant Manual.

(ii) Over head traffic sign: Full Gantry with 1 Nos.

(iii) Road Marking and Signage

The following road marking, signage and safety devise shall be used on the project which is minimum. Further if any shall be in accordance with the section 9 of the manual referred to in Schedule D.

The minimum quantity of Traffic signages and pavement marking as per IRC:35-2015 are tabulated:

Sl. No.	Traffic Signages, Road Marking and other appurtenances	unit	Quantity
1	Road Marking: -Lines, dashes, arrows	RM	11015
2	900mm triangular	Nos.	16
3	600mm circular	Nos.	8
4	Rectangular 900X300 mm	Nos.	2
5	Rectangular 600x500 mm	Nos.	2

6	Rectangular 800x600 mm	Nos.	2
7	5th Km Stone	Nos.	3
8	Ordinary Km Stone	Nos.	5
9	Hectometer Stone	Nos.	56
10	Raised Road Marker (Studs)	Nos.	2500
11	Boundary pillars	Nos.	1202
Sl. No.	**Traffic Signages, Road Marking and other appurtenances**	**unit**	**Quantity**
12	Delineators	Nos.	450
13.1	UtilityDucts	Lm	Every 500m

10. Compulsory Afforestation

Nil

11. Hazardous Locations

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

Sl. No.	Location stretches from (km) to (km)	LHS/RHS
Nil		

13. Special Requirement for Hill Road

This shall be provided accordance with section 1 3of the Manual.

The side slope shall be protected by using suitable slope protection measures all along the highway on Hill side and valley side. The retaining wall, gabion wall and Soil nailing or Rock Bolting shall be constructed as per requirement of site condition in accordance with manual requirement. However, minimum length of protection works shall be construction as per details given below and the typical section of protection work are given in below.

a) Retaining wall shall be constructed with minimum length is 6923 m with following & as per site condition of stone masonry in cement mortar 1:3 or any other better material acceptable to the Authority Engineer. Contractors need to access the same and bid accordingly.

Retaining on Hill and Valley Side

Design Chainage in Km		Length in m	Height in m
From	To		
6000	6070	140	1 m
6490	6910	65	1 m
9160	9500	340	1 m
9500	9809	309	3 m
9809	9830	21	1 m
10200	11550	1530	1 m
11550	12530	980	1 m

12530	13300	770	1 m
16300	16647	347	2 m
16647	16700	53	1 m
20000	20370	285	2 m
22180	23270	990	2 m
26710	27200	140	4 m
27230	27550	153	4 m
27630	27699	69	3 m
27699	29130	581	2 m
29480	29597	117	4 m
29597	30040	33	3 m
Total Length in m		**6923**	

b) Breast wall shall be constructed with minimum length is 2941 m on main road with with following height, as per site condition of stone masonry in cement mortar or any other better material acceptable to the Authority Engineer. Contractor needs to access the same and bid accordingly.

BREAST WALLL Hill Side

Design Chainage in km		**Length in m**	**Height in m**
From	**To**		
6490	6703	212	4 m
6703	6910	69	1 m
9 230	9500	300	2 m
9500	9830	330	2 m
9830	9923	93	2 m
9923	11550	277	1 m
11550	12200	650	1 m
12530	14160	770	1 m
17600	17632	32	1 m
17632	17660	28	3 m
20000	20310	180	3 m
Total Length		**2941**	

c) Gabion wall shall be in wire crates in accordance with applicable clause of section 2500 of MoRTH specification for road and bridge works (fifth revision) and accordance with IRC: SP: 48-1998 and IRC: 56-2011. Minimum length is 0 m on Main. Contractor need to access the same and bid accordingly.

Gabion Wall on Hill Side

Design Chainage in km		**Length in m**
From	**To**	
Nil		

d) **Road side Foot Path**

Road side Foot Path with min. width 1.5 mtr and max. as per site condition due to

constraint RoW must be provided as per site condition as per design and specification, relevant IRC 103 or MoRT&H Specifications. Contractors need to access the same and bid accordingly.

Design Chainage in km		Stretch Length (m)	TCS
From	To		
6910	9030	4240	TCS-2
9500	9830	660	TCS-2
10020	11550	3060	TCS-2
17660	20000	4680	TCS-2
20310	22180	3740	TCS-2
Total		16380 m	

14. **SAFETY AND TRAFFIC MANAGEMENT DURING CONSTRUCTION & MAINTENANCE PERIOD: -**

1) Rock fall protection during construction period (Providing and fixing 2.5 metres high fencing with vertical angle iron posts 150 mm x 150 mm x 10 mm placed & every 0.5 metres center to center founded in M15 grade cement concrete, 0.6 metre below ground level and three horizontal iron angle 50mm x 50mm x6mm for connecting vertical post.

2) Diversion road at bridge locations & main road

3) Portable Type Barricadein Construction Zone -350 Nos.

4) Traffic Signs & making for Diversion- Road Work ahead, Man at work, Hazard Marker, Traffic Diversion, Chevron, Speed Limit, Restriction Ends, Flag Man, Overtaking Prohibited, Work Traffic Exit, Drum Delineator

5) Temporary shed for Landslide–1 Nos. (if required)

6) Maintenance of existing road in traffic worthy condition (filling potholes, patches etc). This shall include snow clearance and land slide clearance of already completed stretches mentioned under Para- 03 of schedule-A.

7) Snow Clearance [construction period+ maintenance period]: 24.040 Km during Construction + Maintenance Period from October to March or Nov- April for a year, whenever snow clearance required as per condition.

7.1 <u>Snow Clearance during Construction Period and Maintenance Period has to be carried which shall inter-alia include the following activities:</u>

a. Stocking of Moorum to be used for 6-month sand sprinkling shall be done after every clearance of snow

b. Necessary chaining on tyre shall be done wherever and whenever as per requirement.

c. Day and Night shift drivers shall be made available all time at site with active Contact no.

d. During any condition of break down of any Machinery, the same shall be replaced immediately,

e. The site supervisors with minimum 3years of snow clearance experience shall be available at site for supervision of this work along with one vehicle.

f. The contractor shall provide all the safety equipment's like helmets, PPE jackets, snowshoes etc with winter clothes.

g. Camp arrangement for operators, machinery and material shall be made by the contractor.

h. Snow clearance is to be carried out immediately within 12 hours of snowfall. If it is observed that the snow clearance has not be carried out within 12 hours or more than 2 (two) instances in a month, damages shall be recovered based on the rates per hour derived from schedule-H or the cost incurred by Authority on Snow Clearance, whichever is maximum.

i. Pre-snow and post snow clearance ideography/geo-tagged photography shall be made for reference and record each work done claim shall be supported with the photographs indicating date of snowfall, date of clearance and depth of snow, area/Locality/Lane/road ED-wise landmarks.

j. The snow clearance hours start from deployment of machineries at site on directions of Engineer in charge during the winter season.

7.2 Inspections

a. The Contractor shall be required to perform all road maintenance activities along the project roads. The Contractor shall be required to submit Maintenance Report for each component of the works.

b. The Contractor shall be required to utilize mechanized equipment and methods to perform these obligations.

c. All maintenance activities shall be carried out in accordance with relevant specifications and IRC codes prescribed in the contract. The requisite quality control tests as per specifications and codes are to be carried out by the Contractor at his cost as per directions of the Engineer.

d. Routine road maintenance means planned works and activities required to ensure public safety,

e. Repair small defects and to maintain the road in the required condition. Adhoc maintenance means carrying out of unscheduled maintenance occasioned by irregular events such as accidents, natural calamities, abnormal weather conditions and the like.

7.3 Maintenance obligation of already completed following stretches of road from Km 6.000 to Km 30.040 are as under:

7.3.1 The contractor is obligated to routine maintenance including Snow clearance of the already completed stretch by previous contractor as per Article 14. Contractor needs to assess the same and bid accordingly. the details of chainage are as under:

Sl.No.	Design Chainage in km		
	From	To	Length in m (11810m)

1	6+410	6+900	490
2.	13+300	16+330	3030
3.	16+500	16+670	170
4.	16+720	17+540	820
5.	17+590	17+660	70
6.	22+190	22+550	360
7.	22+580	22+760	180
8.	22+820	26+660	3840
9.	26+740	26+770	30
10.	26+800	26+840	40
11.	26+860	27+640	780
12.	27+880	27+960	80
13.	28+000	28+330	330
14.	28+360	28+740	380
15.	28+790	29+770	980
16.	29+810	30+040	230

Note: Contractor must use Standard Specification/ in accordance with IRC &MoRT&H Specification

15. Muck Disposal land management:

The muck to be generated shall be appropriately dumped in tips at various suitable locations so that it does not degrade the various elements of the natural environment. For final disposal of the material convenient locations have been identified viz-a-viz to environmental aspects. The most suitable locations for dumping of the muck that would be generated from the Kargil– Zanskar road package under this agreement

Location specified in the Schedule is tentative and approximate assessment. The actual 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 specified in this Schedule –B shall not constitute a Change of Scope.

Details of Environment Management and Muck Disposal Management are as under:

Sl. No.	Location in km	Muck Dumping no.	Coordinates	Remarks
1	Km 13+350	P1	34°27'41.77"N 76°04'25.54"E	Location may be changed in pursuance to Schedule-F

"Widening & Upgradation to 2-lane with paved shoulder of Balance Work of NH-301 Kargil Zanskar Road from Design km 6.000 to km 30.040 of 24.040 Km length in the Union Territory of Ladakh on EPC mode"

16. Change of Scope

The length of Structures and bridges, muck disposal sites specified here in above shall be treated as an approximate assessment. The actual lengths as required based on 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.

17. Chainages wise indicative widening scheme with applicable typical Cross section

S.No.	Chainage		Design Length (Km)	Balance work Length (m)	TCS No.	Proposed TCS in Balance Work
	From	To				
1	6.000	6.070	0.070	70	3A	2 Lane + PS "Reconstruction in Rural Area"
2	6.070	6.490	0.420	400	2B	2 Lane + PS "Reconstruction in Builtup Area with Side Drain Cum Footpath"
3	6.490	6.910	0.420	280	3A	2 Lane + PS "Reconstruction in Rural Area"
4	6.910	9.030	2.120	2120	2	2 Lane in Builtup Area with Footpath "
5	9.030	9.500	0.470	470	3A	2 Lane + PS "Reconstruction in Rural Area"
6	9.500	9.830	0.330	330	2	2 Lane in Builtup Area with Footpath "
7	9.830	10.020	0.190	190	3A	2 Lane + PS "Reconstruction in Rural Area"
8	10.020	11.550	1.530	1530	2	2 Lane in Builtup Area with Footpath "
9	11.550	12.200	0.650	650	3A	2 Lane + PS "Reconstruction in Rural Area"
10	12.200	12.530	0.330	330	2B	2 Lane + PS "Reconstruction in Builtup Area with Side Drain Cum Footpath"
11	12.530	14.160	1.630	765	3A	2 Lane + PS "Reconstruction in Rural Area"
12	14.160	14.330	0.170	0	2B	2 Lane + PS "Reconstruction in Builtup Area with Side Drain Cum Footpath"
13	14.330	17.350	3.020	180	3A	2 Lane + PS "Reconstruction in Rural Area"
14	17.350	17.600	0.250	0	2B	2 Lane + PS "Reconstruction in Builtup Area with Side Drain Cum Footpath"
15	17.600	17.660	0.060	0	3A	2 Lane + PS "Reconstruction in Rural Area"
16	17.660	20.000	2.340	2340	2	2 Lane in Builtup Area with Footpath "
17	20.000	20.310	0.310	310	3A	2 Lane + PS "Reconstruction in Rural Area"
18	20.310	22.180	1.870	1870	2	2 Lane in Builtup Area with Footpath "
19	22.180	24.390	2.210	710	3A	2 Lane + PS "Reconstruction in Rural Area"
20	24.390	25.280	0.890	0	2B	2 Lane + PS "Reconstruction in Builtup Area with Side Drain Cum Footpath"
21	25.280	26.560	1.280	0	3A	2 Lane + PS "Reconstruction in Rural Area"
22	26.560	26.710	0.150	10	2B	2 Lane + PS "Reconstruction in Builtup Area with Side Drain Cum Footpath"
23	26.710	26.930	0.220	40	3A	2 Lane + PS "Reconstruction in Rural Area"
24	26.930	27.230	0.300	180	2B	2 Lane + PS "Reconstruction in Builtup Area with Side Drain Cum Footpath"
25	27.230	27.480	0.250	120	3A	2 Lane + PS "Reconstruction in Rural Area"
26	27.480	27.630	0.150	50	2B	2 Lane + PS "Reconstruction in Builtup Area with Side Drain Cum Footpath"

27	27.630	27.750	0.120	110	3A	2 Lane + PS "Reconstruction in Rural Area"
28	27.750	29.130	1.380	260	3A	2 Lane + PS "Reconstruction in Rural Area"
29	29.130	29.830	0.700	30	2B	2 Lane + PS "Reconstruction in Builtup Area with Side Drain Cum Footpath"
30	29.830	30.040	0.210	300	3A	2 Lane + PS "Reconstruction in Rural Area"
Total length in Km			**24.040 Km**	**12.400 Km**		

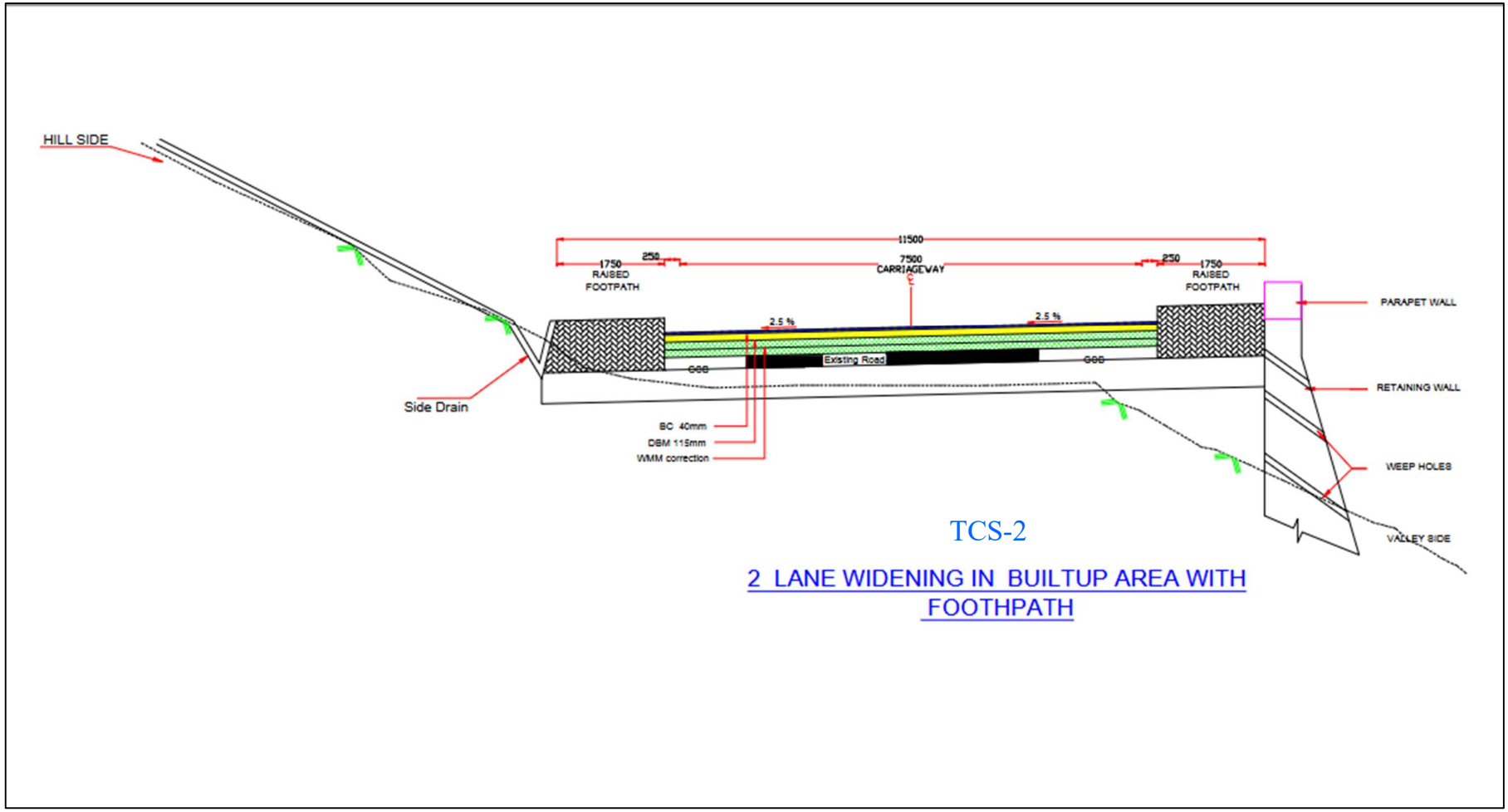
18. Shifting of obstructing utilities:

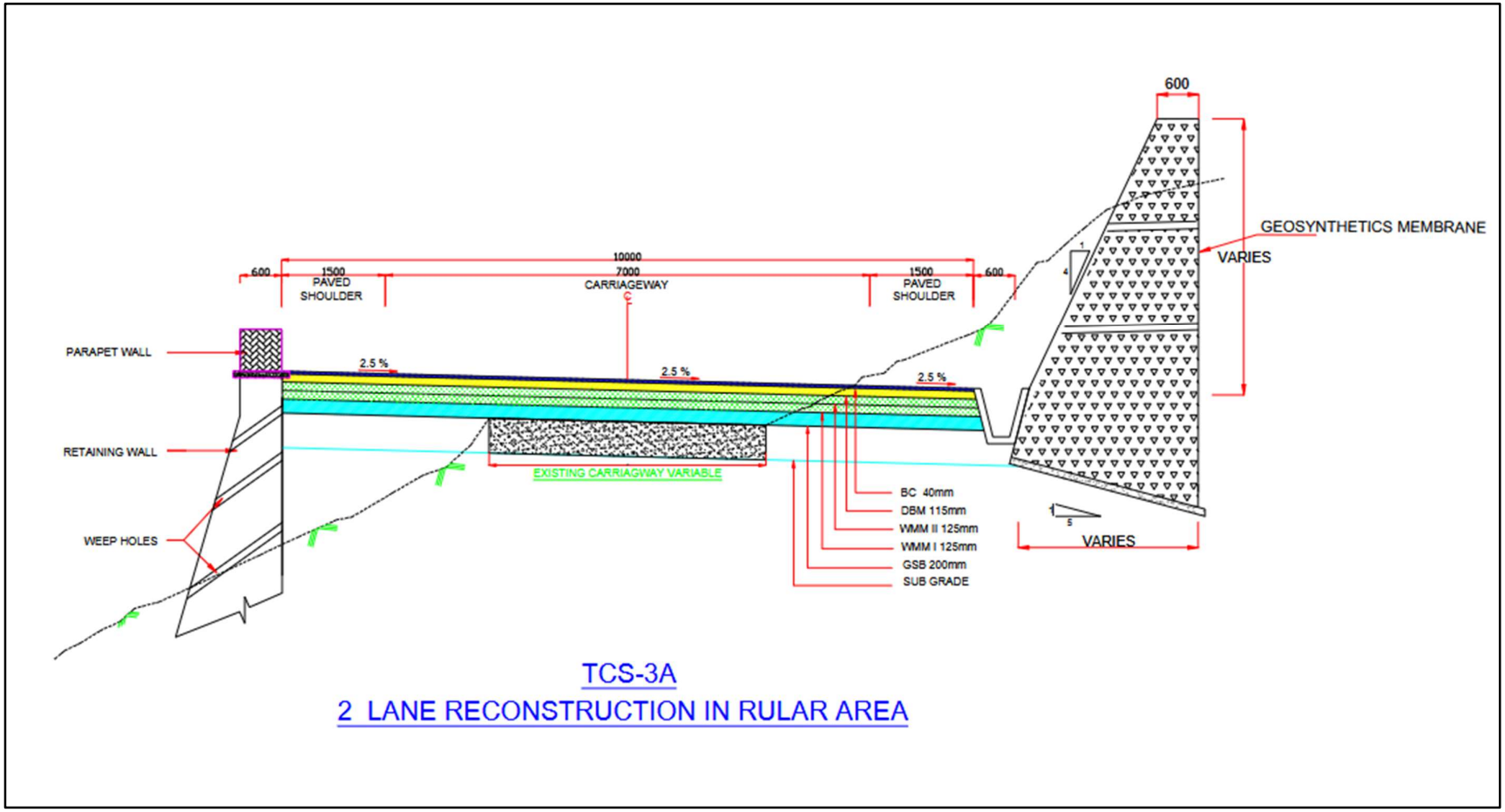
Shifting of obstructing utilities shall be done as per Ministry's circular RW/NH33044/29/2015-S&R(R)pt dated 11.02.2021 as mentioned under schedule-B1. The Contractor shall be responsible for getting the utilities shifted as per approval of the concerned utility owning department. The assistance of the Authority is limited to giving a forwarding letter on the proposal of Contractor to the utility owning department whenever asked by the Contractor. The decision/approval of the utility owning department shall be binding on the Contractor.

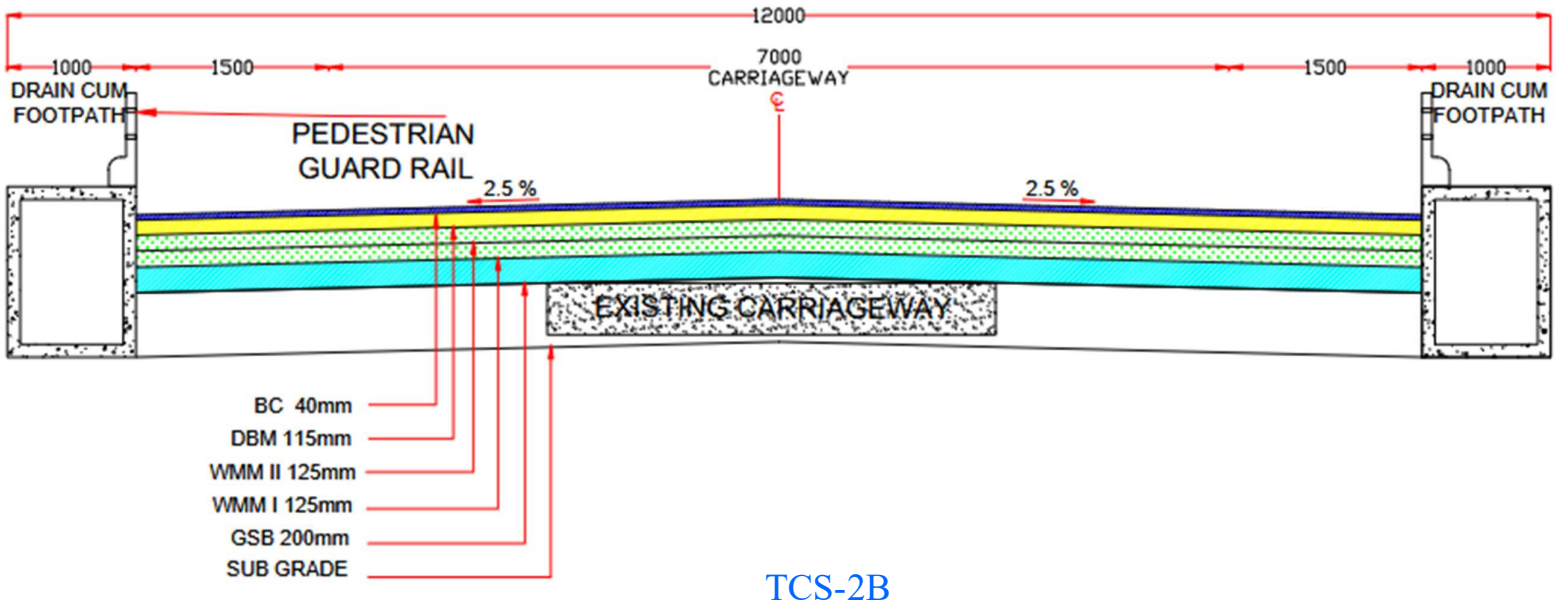
Note: Utility duct shall be laid with 300mm dia. HDPE pipe all along the project length @ 500mand cross sectional in accordance with IS: 4984/14333 or any other relevant code with inspection chambers at acceptable interval as approved by Authority Engineer/ Employer.

"Widening & Upgradation to 2-lane with paved shoulder of Balance Work of NH-301 Kargil Zanskar Road from Design km 6.000 to km 30.040 of 24.040 Km length in the Union Territory of Ladakh on EPC mode"

TCSs given below

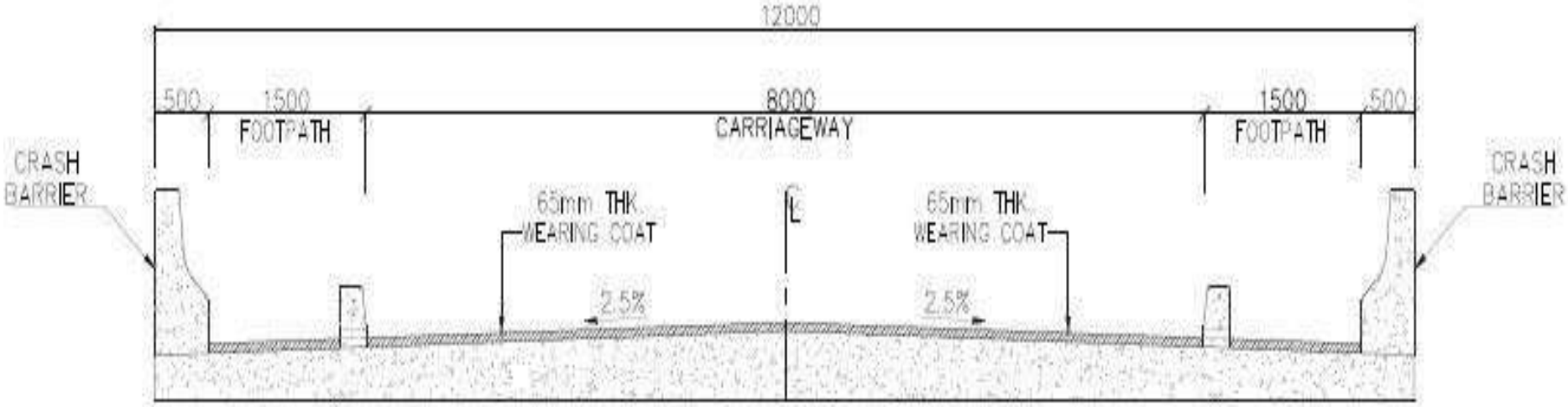

HILL SIDE
11500
250
1750
RAISED
FOOTPATH
7500
CARRIAGEWAY
250
1750
RAISED
FOOTPATH
PARAPET WALL
2.5 %
2.5 %
Existing Road
RETAINING WALL
Side Drain
BC 40mm
DBM 115mm
WMM correction
WEEP HOLES
VALLEY SIDE
TCS-2
2 LANE WIDENING IN BUILTUP AREA WITH FOOTHPATH


600
GEOSYNTHETICS MEMBRANE
VARIES
10000
600
1500
PAVED
SHOULDER
7000
CARRIAGEWAY
1500
PAVED
SHOULDER
600
PARAPET WALL
2.5 %
2.5 %
2.5 %
RETAINING WALL
EXISTING CARRIAGWAY VARIABLE
WEEP HOLES
BC 40mm
DBM 115mm
WMM II 125mm
WMM I 125mm
GSB 200mm
SUB GRADE
VARIES
TCS-3A
2 LANE RECONSTRUCTION IN RULAR AREA



TCS-2B

2 LANE RECONSTRUCTION IN BUILTUP AREA WITH SIDE DRAIN CUM FOOTHPATH



TCS -IV
MAJOR/MINOR BRIDGE LOCATION

"Widening & Upgradation to 2-lane with paved shoulder of Balance Work of NH-301 Kargil Zanskar Road from Design km 6.000 to km 30.040 of 24.040 Km length in the Union Territory of Ladakh on EPC mode"

Schedule-B-1

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

S.NO	Type of utilty	Unit	Quantity
A	**Electrical Utilities. PDD**		
A1	Electrical Poles Nos (LT)	No.	231
A2	Electrical Poles Nos (HT)	No.	162
A3	Electrical cables A1	M	8085
A4	Electrical cables A1	M	5670
A5	Transformers/Sub-station	No	10
B	**Electrical Utilities. Army**		
B1	Electrical Poles Nos	No.	249
B2	Electrical cables A1	M	12445
B3	Transformers/Sub-station	No.	Nil
C	**Water pipeline**	M	5061
D	**Hand Pumps**	No.	16
E	**Irrigation Khuls**	M	2620 m

Schedule - C

(See Clause 2.1)

Project

1. Project Facilities **Facilities**

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

(a) tollplaza[s];

(b) roadside furniture;

(c) pedestrian facilities;

(d) tree plantation;

(e) trucklay-byes;

(f) bus-bays/busshelters/bus stop;

(g) restareas

(h) rainwater harvesting; and

(i) others to be specified

2. Description of Project Facilities

Each of the Project Facilities is described below:

(a) Toll Plaza: - Toll plaza to be designed as per latest available MoRT&H/NHAI guidelines. All the lanes of toll plaza shall be designed as Hybrid ETC System (HES) in all lane.

Location of Toll Plaza

Sr. No	Design Chainage	Length in m	No. of Lanes
Nil			

(b) Roadside furniture: - all roadside furniture like road marking, placing of signages to be design and proposed as per IRC:35-2015 and IRC:67-2012.

(c) Bus Stops: In order to promote the use of public transport and facilitate the travel for passengers 14 nos. of bus stops have been proposed at 16 locations along the project road.

Sl. No.	Design Chainage	Side (LHS/RHS)	Remarks
1	7+000	LHS	Bus Shelter
2	7+850	LHS	Bus Shelter
3	7+900	RHS	Bus Shelter

4	8+840	LHS	Bus Shelter
5	8+870	RHS	Bus Shelter
6	10+950	LHS	Bus Shelter
7	11+000	RHS	Bus Shelter
8	18+150	LHS	Bus Shelter
9	18+200	RHS	Bus Shelter
10	20+200	LHS	Bus Shelter
11	20+220	RHS	Bus Shelter
12	22+000	LHS	Bus Shelter
13	25+150	LHS	Bus Shelter
14	25+220	RHS	Bus Shelter

(d) Rest Area: Rest are at obede signed as per latest available MoRT&H/NHAI/NHIDCL guidelines.

RestArea-Nil

(e) High Mast Lighting & Electric Pole:

Provision of Electric Pole (Street Lighting) as per specification or as per the instruction of the Authority

"Widening & Upgradation to 2-lane with paved shoulder of Balance Work of NH-301 Kargil Zanskar Road from Design km 6.000 to km 30.040 of 24.040 Km length in the Union Territory of Ladakh on EPC mode"

Schedule-D

(See Clause2.1)

Specifications and Standards

1. Construction

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

2. Design Standards

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

Annex-I

(Schedule-D)

[Refer Annex-II for brief of specifications]

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-Laning of Highways IRC: SP:73-2018, Hill Road Manual (IRC: SP: 48- 1998) Guidelines referred toas the Manual, and MORTH Specifications for Road and Bridge Works. Where the specification for a work is not given, Good Industry Practice shall beadopted to the satisfaction of the Authority's Engineer.

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

Sr.No.	Item	Clause referred in Manual	Provisionasper Manual	Modified Provision
1	Typical Cross section	2.16		These clauses are deemed to be amended as shown in the typical cross section (refer Schedule B).
2	Typical Cross Section	2.6.1, 2.7 and 2.16		
3	Radii of Horizontal Curves	2.9.4	Mountainous and steep terrain, desirable minimum radii and absolute minimum shall be 150 m and 75 m, respectively.	Mountainous and steep terrain, desirable minimum radii and absolute minimum shall be 75 m and 30 m, respectively except at the location given in alignment drawing
4	Width of New Bridge	7.3		To be amended as shown in the typical Cross section (refer Schedule B)
5	Utility Duct	2.15	UtilityDuctwith600 mm dia….	Utility duct shall be laid in accordance with IS: 4984/14333 or any other relevant code with inspection chambers at acceptable interval as approved by Authority Engineer/ Employer.

ATTACHMENT-DI

TECHNICAL SPECIFICATIONS FOR ROAD & BRIDGE

"Widening & Upgradation to 2-lane with paved shoulder of Balance Work of NH-301 Kargil Zanskar Road from Design km 6.000 to km 30.040 of 24.040 Km length in the Union Territory of Ladakh on EPC mode"

Table of Contents

CLAUSE202 DISMANTLING CULVERTS, BRIDGES AND OTHER STRUCTURES/PAVEMENTS

SECTION300 Earthwork, Erosion Control and Drainage

CLAUSE301 EXCAVATION FOR ROADWAY AND DRAINS

CLAUSE304 EXCAVATION FOR STRUCTURES

CLAUSE305 EMBANKMENT CONSTRUCTION

Sub-Clause305.2.2.2 Borrow Materials

Sub-Clause305.2.2.4 Compaction

Requirements Sub-Clause 305.3 Construction

Operations

Sub-Clause305.8 Measurement for Payment

CLAUSE306 SOIL EROSION AND SEDIMENTATION CONTROL

SECTION400 Sub-Bases, Bases (Non-Bituminous) and Shoulders

CLAUSE401 GRANULAR SUB-BASE

Sub-Clause401.2.2 Physical Requirements

CLAUSE406 WET MIX MACADAM SUB-BASE/BASE

Sub-Clause406.4 Opening to Traffic

SECTION500 Base and Surface Courses (Bituminous)

Sub-Clause501.2 Materials

Sub clause 501.2.1 Binder

Binder of VG-10 grade shall be used or if available viscosity grade of bitumen shall be used in accordance with IS: 73

CLAUSE505 DENSE BITUMINOUS MACADAM

CLAUSE 507 BITUMINOUS CONCRETE

Binder of CRMB-60 grade shall be used.

SECTION800 Traffic Signs, Marking sand Other Road Appurtenances

CLAUSE 803 ROAD MARKINGS

CLAUSE806 ROAD DELINATORS

"Widening & Upgradation to 2-lane with paved shoulder of Balance Work of NH-301 Kargil Zanskar Road from Design km 6.000 to km 30.040 of 24.040 Km length in the Union Territory of Ladakh on EPC mode"

TECHNICAL SPECIFICATIONS

1 The Technical Specifications contained herein shall be read in conjunction with the other Bidding Documents as specified in Volume-IX.

Site Information General

The information given hereunder and provided elsewhere in these documents is given in good faith by the Employer, but the Contractor shall satisfy himself regarding all aspects of site conditions and no claim will be entertained on the plea that the information supplied by the Employer is erroneous or insufficient.

The area in which the works are located is in hilly/mountainous terrain,

Climatic Conditions

The temperature in this region is as under:

i) During summer months, the average maximum temperature recorded is 20°C

ii) During winter months, the minimum average temperature is-20°C.

Seismic Zone

The stretch lies in Seismic Zone-Vas defined in Fig.18 of IRC:6-2017.

2 **GENERAL REQUIREMENTS**

The Technical Specifications in accordance with which the entire work described hereinafter shall be constructed and completed by the Contractor shall comprise of the following:

Part-I: General Technical Specifications

The General Technical Specifications shall be the "SPECIFICATIONSFOR ROAD AND BRIDGE WORKS" (Fifth Revision, April 2013), IRCs & Circulars issued by the Ministry of Road Transport and Highways, Government of India and published by the Indian Roads Congress, henceforth called MORT&H Specifications, and deemed to be bound into this document.

Part-II: Supplementary Technical Specifications

The Supplementary Technical Specifications shall comprise of various Amendments/Modifications/ Additions to the "SPECIFICATIONS FOR ROAD AND BRIDGE WORKS" referred to in Part-I above and Additional Specifications for item of works which are not covered in Part-I.

A clause or a part thereof in "SPECIFICATIONS FOR ROAD AND BRIDGE WORKS (Fifth Revision April 2013",), referred in Part-I above, where Amended/Modified/Added upon, and incorporated in Part-II, referred to above, such Amendment/Modification/ Addition supersedes the relevant Clause or part of the Clause.

The Additional Specifications shall comprise of specifications for item of works which not covered in Part-I.

When an Amended/Modified/Added Clause supersedes a Clause or part thereof in the said Specifications, then any reference to the superseded Clause shall be deemed to refer to the Amended/Modified/Added Clause or part thereof.

In so far as Amended/Modified/Added Clause may come in conflict or be in consistent with any of the provisions of the said MORT&H Specifications under reference; the Amended/Modified/Added Clause shall always prevail.

The following Clauses in the "SPECIFICATIONS FOR ROAD AND BRIDGE WORKS (Fifth Revision April 2013",) have been Amended/Modified/Added upon

Sr. No.	Section No.	Section Title	Clause No.
1.	100	General	102,106,108,109, 111,112,114,115and121
2.	200	Site Clearance	201and202
3.	300	Earthwork, Erosion Control and Drainage	301,304,305and306
4.	400	Sub-base, Bases (Non-Bituminous) and Shoulders	401 and406
4.	500	Bases and Surface Courses (Bituminous)	501,505 and 507
5.	800	Traffic signs, Markings and Other Road Appurtenances	803,806and811
6.	2100	Open Foundations	2104

PART-III Specifications for Miscellaneous Works

Technical Specifications for Miscellaneous works shall be the latest "Specifications volume I to VI, 1996 for Civil Works and General Specifications for Electrical Works PART I – INTERNAL, PART – II, EXTERNAL for electric work 1994 as published by the Central Public Works Department (CPWD), Government of India" and deemed to be bound into this document.

The latest edition till 60 days before the final date of submission of the bid of all specifications / standard shall be applicable.

"Widening & Upgradation to 2-lane with paved shoulder of Balance Work of NH-301 Kargil Zanskar Road from Design km 6.000 to km 30.040 of 24.040 Km length in the Union Territory of Ladakh on EPC mode"

SCOPE OF WORKS

Road Works

Site clearance; setting-out and layout; widening of existing carriageway and strengthening including camber corrections; construction of new road/ parallel service road; bituminous pavements remodelling/construction of junctions, intersections, bus bays, lay byes; supplying and placing of drainage channels, flumes, guard posts, guard rails and other related items; construction/extension of cross drainage works, bridges, approaches and other related works; road markings, road signs and kilometer/ hectometre stones; protective works for roads/ bridges; all aspects of quality assurance of various components of works; rectification of the defects in the completed works during the Defect Liability Period for already executed works by previous contractor and instant tender work; submission of "As built" drawings and any other related documents; and other items of work as may be required to be carried out for completing the works in accordance with the drawings and provisions of the Contract to insure safety.

Other Items

Execution of any other items of work for the construction and completion of the Works in accordance with the provisions of the Contract including all incidental items as well as preparation and submittal of reports, plans as may be required.

During the period of the Contract the right of way and all existing roads shall be kept open for traffic and maintained in a safe and usable condition. Residents along and adjacent to the works are always to be provided with safe and convenient access to their properties. Traffic control and traffic diversions shall be used as necessary to protect the works and maintenance will be carried out as directed by the Engineer and provided in the Contract.

Any other items as required to fulfil all contractual obligations as per the Bid Documents.

"Widening & Upgradation to 2-lane with paved shoulder of Balance Work of NH-301 Kargil Zanskar Road from Design km 6.000 to km 30.040 of 24.040 Km length in the Union Territory of Ladakh on EPC mode"

PART II

SUPPLEMENTARY TECHNICAL SPECIFICATION

AMENDMENTS/MODIFICATIONS/ADDITIONS TO EXISTING CLAUSES OF GENERAL TECHNICAL SPECIFICATIONS

SECTION100 General

CLAUSE102 DEFINITIONS

The following abbreviations shall be added in this Clause:"MORT&H" : Ministry of Road Transport & Highways

(Previously known as 'MOST', Ministry of Surface Transport)

"NHAI": National Highways Authority of India

CLAUSE106 CONSTRUCTION EQUIPMENT

Add the following sub para(g) and (h) after sub para (f)

- Adequate stand by equipment including spare parts shall be available.
- All measuring devices and gauges shall be in good working condition. Measuring devices that can affect product quality shall be calibrated prior to use and at prescribed intervals against certified equipment. Calibration procedures shall be established, maintained, and documented and corrective actions taken when results are unsatisfactory. Accuracy and fitness of measuring devices shall be ensured by proper maintenance.

CLAUSE108 SITEINFORMATION

Sub-Clause108.4 This clause shall be as follows:

"Identification of quarry sites and borrow areas shall be the responsibility of the Contractor. Materials procured from quarry sites and borrow areas identified by Contractor and to be used in Works must comply with the requirements of quality as stipulated in the Technical Specification for particular items of work."

CLAUSE109 SETTINGOUT

Sub-Clause109.8 Delete the 2nd and 3rd sentences in Clause 109.8 and substitute the following: "Setting out of the road alignment and measurement of angles shall be done by using Total Station."

CLAUSE111 PRECAUTIONS FOR SAFE GUARDING THE ENVIRONMENT

Sub-Clause111.1 General

Delete the text of Clause111.1 initsentirety and substitute the following:

"The Contractor shall take all necessary measures and precautions and otherwise ensure that the execution of the Works and all associated operations on site or off-site are carried out in conformity with statutory and regulatory requirements including those prescribed elsewhere in this document.

The Contractor shall take all measures and precautions to avoid any nuisance or disturbance arising for the execution of the Works. This shall wherever possible be achieved by suppression of the nuisance at source rather than abatement of the nuisance once generated. All vehicles deployed for material haulage shall be spillage proof.

Haul roads shall be inspected at least once daily to clear any accidental spillage. In the event of any spoil, debris, wastes or any deleterious substance from the Site being deposited on any adjacent land, the Contractor shall immediately remove all such material at no cost to the Contract and restore the affected area to its original state to the satisfaction of the Engineer."

Sub-Clause111.2 Borrow Pits for Embankment Construction

Delete the text of Clause-111.2 and substitute the following:

"Prior approval shall be sought from the concerned State Authorities, and the Contractor shall comply with all local environmental regulations. For all borrow areas, the actual extent of area/zones to be excavated shall be demarcated with the signboards and the operational areas shall be access controlled.

In the case of borrow from tank beds, a regrade/improvement of the inlet channels (at least upto 100m stretch) shall be undertaken in consultation with the concerned state government departments (the Minor Irrigation department of the State PWD) and local bodies. The Contractor shall ensure that excavation of tank beds is uniform over the entire area and that the finished profile of the bed is smooth.

In the case of borrow from the dry highlands, all borrow areas shall be reinstated by the formation gentle side slopes, re-vegetated and connected to the nearest drainage channel to avoid the formation of pools during/after the rainy seasons.

Plant and machinery used in the borrow areas shall conform to State noise emission regulations. All operation areas shall be water sprinkled to contain dust levels to the National Ambient Air Quality Standards."

Sub-Clause111.3 Quarry Operations

Delete the text of Clause-111.3 and substitute the following:

"Aggregates shall be sourced only from quarry sites that comply with the local/state environmental and other applicable regulations. Occupational safety procedures/practices for the work force in all quarries shall be in accordance with applicable laws. Quarry and crushing units shall have adequate dust suppression measures, such as sprinklers, in work areas and along all approach roads to the quarry sites. These shall preferable be located on the upwind side."

Sub-Clause111.5 Pollution from Hot-Mix Plant and Batching Plants

Delete the 1st sentence of Clause 111.5 and substitute the following:

"Bituminous hot mix plant and concrete batching plants shall be located at least one (1) km away from the sensitive receptors (schools, hospitals, etc.) and atleast 500m from urban settlements, unless otherwise required by the statutory requirements."

Sub-Clause111.8.1 Environmental Protection:

Add the following sentences in the first paragraph of Sub-Clause 111.8.1:

Water tankers with suitable sprinkling system shall be deployed along the haulage roads and in the work sites. Water shall be sprinkled regularly all along the routes to suppress airborne dusts from truck/dumper movements particularly on unpaved roads. Actual frequency will be agreed with the Engineer to suit site conditions."

Sub-Clause111.8.2 Air Quality

The Contractor shall device and implement methods of working to minimize dust, gaseous and other air-borne emissions and carry out the Works in such a manner as to minimize adverse impacts on the air quality. Construction camps shall have facilities for LPG fuel. The use of firewood shall not be permitted.

The Contractor shall utilize effective water sprays during delivery, manufacture, processing and handling of materials when dust is likely to be created, and to dampen stored materials during dry and windy weather. Stockpiles of friable materials shall be covered with clean tarpaulins, with applications of sprayed water during dry and windy weather. Stockpiles of materials or debris shall be dampened prior to their movement, except where this is contrary to the Specification.

Any vehicle with an open load-carrying area used for transporting potentially dust- producing material shall have properly fitting side and tail boards. Materials having the potential to produce dust shall not be loaded to a level higher than the side and tail boards and shall be covered with clean tarpaulins in good condition. The tarpaulin shall be properly secured and extend at least 300mm over the edges of the side of the side and tailboards.

The Contractor shall monitor air-quality once weekly in all operational areas under the project and take the necessary steps to comply with the specified requirements. Air quality parameters will include SPM, RPM, SO_2, NO_X, HC and CO. operational areas include work sites, haulage roads, hot mix plants, quarries, crushing plants, stockpiles, borrow sites and spoil disposal sites.

Sub-Clause111.8.3 Water Sources and Water Quality

The Contractor shall provide independent sources of water supply, such asbore wells, for use in the Works and for associated storage, workshop and work force compounds. Prior approval shall be obtained from the relevant State Authorities and all installations shall follow local regulations. Bore wells installed and used for the project shall be left in good operating condition for the use of NHAI and local communities. The Contractor shall prevent any interference with the supply to or abstraction from and prevent any pollution of wate r
Resources (including underground percolating water) as a result of the execution of the Works.

Areas where water is regularly or repetitively used for dust suppression purposes shall be laid to fall to specially constructed settlement tanks to permit sedimentation of particulate matter. After settlement, the water may be re-used for dust suppression and rinsing. The Contractor shall protect all watercourses, waterways, ditches, canals, drains, lakes and the likes from pollution as a result of the execution of the Works.

All water and other liquid waste products arising on the Site shall be collected and disposed of at a location on or off the Site and in a manner that shall not cause either nuisance or pollution.

The Contractor shall at all times ensure that all existing stream courses and drains within, and adjacent to, the Site are kept safe and free from any debris and any materials arising from the Works. The Contractor shall not discharge or deposit any matter arising from the execution of the Works into any water except with the permission of the Engineer and the regulatory

authority concerned.

Work force camps shall have septic tank and soak away pits. Operational areas like POL storage areas/hot mix plant areas shall comply with local/state environmental regulations and safety procedures. Storage and handling areas shall be impervious and surrounded by an impervious lined drain to catch any accidental spills. Storm water shall be stored in lined holding tanks with oil, grease-tapping facility prior to disposal in to near by water courses. The trappings and sludge of holding tanks shall be disposed off in accordance with the procedures approved by the local regulatory authority.

Sub-Clause111.20 Control and Disposal of Wastes

The Contractor shall control the disposal of all forms of waste generated by the construction operations and in all associated activities. No uncontrolled deposition or dumping shall be permitted. Wastes to be so controlled shall include, but shall not be limited to, all forms of fuel sand engine oils, all types of bitumen, cement, and surplus aggregates, gravels, bituminous mixtures etc. The Contractor shall make specific provision for the proper disposal of these and any other waste products, conforming to local regulations and acceptable to the Engineer.

Spilling of oil and bituminous products during construction and transport shall be avoided to reduce the chances of contamination of surface as well as ground water.

Degraded materials shall be disposed of in a manner as approved by the Engineer and wastewater shall be disposed into septic tanks and soak pits etc. The Contractor shall make arrangements to clean-up spoil as soon as the work finishes in a stretch. If such sites are located outside the ROW, restoration of the site to a level acceptable to the land owner(s) will be carried out within a time period agreed between landowner(s) and the Contractor. Separators shall be used to separate POL materials from wastewater prior to discharging to the watercourses or as approved by the Engineer in conformance with directives and guidelines.

Disposal of solid waste materials shall be outlined in a plan for which environmental clearances shall be obtained from State environmental regulatory authorities. Potential locations for solid waste disposal are the natural depressions and borrow areas. The area used for dumping of uncontaminated debris shall be covered with **300mm soil and shall be planted.** Contaminated debris shall be dumped in depressions whose bed must be impervious e.g., stone quarry sites or depressions made impervious with 450mm thick imperviousfloor apron as per MORT&H Technical Specifications. Each successive layers shall be covered with 500mm thick soil layer, and the area will be covered with 300mm thick layer and planted.

After Clause 111.12 add the following new Clauses 111.13

to111.17 Sub-Clause 111.13 Haulage Roads

Existing roads used for hauling shall be strengthened and/ or widened by the Contractor in accordance with the requirements for normal and construction traffic.

Where such roads are not existing, the Contactor shall construct project specific single lane paved roads in settlement areas and gravel roads in open areas conforming to the Ministry of Road Transport and Highways (MORT&H)

specifications.

The alignment of the haulage roads shall be fixed to avoid agricultural land to the extent possible. In unavoidable circumstances, suitable compensation shall be paid to the people whose land will be temporarily acquired for the duration of the operations. The compensation shall cover for loss of income for the duration of temporary acquisition and land restoration. Prior to the construction of the haul roads, topsoil shall be stripped and stockpiled for re- use.

Material dumping sites shall be access controlled to prevent the unauthorized entry of the people, grazing cattle, and stray animals.

Haulage road shall be reinstated upon completion of hauling for the use of local communities."

Sub-Clause111.14 Equipment and Vehicles used for the Works

Equipments and vehicles deployed for the construction activities shall not be older than 5 years. Equipments used for road and bridge works shall be based on new technology and shall generate noise and pollutants not exceeding the limits specified by the relevant State Authorities. Vehicles and machineries used for road and bridge works are to be regularly maintained to conform to the National Air Quality Standards. Blasting, if any, will be carried out using small charges.

Sub-Clause111.15 Noise Control

The Contractor shall consider noise as an environmental constrain in the planning and execution of the Works.

The Contractor shall take all necessary measures so that the operation of all mechanical equipment and construction processes on and off the site shall not cause any unnecessary or excessive noise, taking in to account applicable environmental requirements. The Contractor shall use all necessary measures and shall maintains all plant and silencing equipment in good conditions so as to minimize the noise emission during construction works.

Any member of the work force likely to be exposed to beyond their threshold noise levels shall be provided with protective equipment, such asearplugs, and shall be rotated every four hours.

Construction operations shall be limited to daytime hours only, particularly in the settlement areas.

Sub-Clause111.16 Vibration Control

The Contractor shall take measures during construction activities to controlthe movement of the work force and construction machinery/equipment, and to avoid/ minimize activities, which produce vibrations.

Sub-Clause111.17 Measurement

Monitoringof Air/Water/NoiseandSoilqualityshall bepaidas pernumbersof samples tested. For Compliance of all other provisions made in this Clause 111, it shall be deemed to be incidental to the work and no separate measurement shall be made. The Contractor shall be deemed to have made allowance for such compliance with these provisions in the preparations of his prices for items of work included in the Bills of Quantities and full compensation for such compliance shall be deemed to be covered by them."

CLAUSE112 ARRANGEMENT FOR TRAFFIC DURING CONSTRUCTION

Sub-Clause112.4 Traffic Safety and Control

Last line of Para5 shall be read as under:

"Thesignsshallbeofapproveddesignandofreflectortype." **Add the following paragraph at the end of the clause:**

"Before commencement of any construction, the Contractor shall prepare and submit details of the arrangements for passing traffic during construction, design of barricades, signs, markings, lights, flags etc. conforming and satisfying the requirements of the "Guidelines on Safety in Road Construction Zones" of IRC: SP 55-2001 and get the same approved by the Engineer.

Sub-Clause112.6 Measurement for Payment and Rates

a) The provision of treated shoulder including construction of temporarycross drainage structures, if required, as described in Clause 112.2 including their maintenance, dismantling and clearing debris, where necessary, shall be considered as incidental to the works and shall be Contractor's responsibility.

b) The Construction of temporary diversion including temporary cross drainage structures asdescribedinsubclause112.3, shall be measured inlinearmeter and the unit contract rate shall be inclusive of full compensation for construction (including supply of material, labor, tools, etc.), maintenance as per sub clause 112.5, final dismantling, and disposal.

c) All Traffic safety and control devices during construction as per sub clause 112.4including providing, erecting and maintaining barrier, signs, markings, flags, lights and providing flag men etc. is included in item rate.

CLAUSE114 SCOPEOFRATESFORDIFFERENTITEMSOFWORK

Sub-Clause114.2 Item(ii) of Clause114.2 shall read as follows:

A detailed resource-based construction programme including resources planning using computerized critical path network method/PERT in a form, which facilitates control of the progress of the works and consequences of any changes in terms of time. The programme shall also include detailed network, activities for the submission and approval of materials, procurement of critical materials and equipment, fabrication ofspecial products/ equipment and their installation and testing and for all activities of the Contractor that are likely to affect the progress of work etc. including updating all such activities on the basis of decisions taken at the periodic site review meetings or as directed by the Engineer. The Contractor shall submit data via electronic media to the Engineer in a form readily compatible with Engineer's planning system.

The first issue of the detailed construction programme including the detailed description of the system and the procedures shall be submitted to the Engineer for acceptance not later than 28 days after the date of receipt of the letter of acceptance.

The contractor shall submit to the Engineer for approval & consent, theupdated & revised programme at every three months interval or as such as directed by the Engineer. The updated & revised programme shall besubmitted showing the actual progress achieved (physical & financial) and the effects of the progress achieved on the timing of the remaining work

including any change to the sequence of the activities

CLAUSE115 METHODOLOGY AND SEQUENCE OF WORK

The Clause shall be substituted as

follows: Sub-Clause115.1 Submission of Method Statement

The Contractor shall submit methods statement within 28 days after the dateof letter of acceptance. The methods statement shall be submittedin two parts.

The General part of the methods statement shall describe the Contractor's proposals regarding preliminary works, common facilities, and items that

require consideration at the early stage of the Contract. The General part shall be furnished along with the first issue of the construction programme (refer clause 114.2) and shall include information on:

a) Sources of materials like coarse aggregate and fine aggregate, quantity and quality of materials available in different sources;

b) Sources of manufactured materials like cement, steel, bitumen reinforcement, prestressing strands and bearings. Wherever possible the Contractor shall identify at least two sources for each of the items; he shall also submit test certificates of recently manufactured materials for the consideration of the Engineer.

c) Locations of site facilities like batching plant, hot mix plant, aggregate processing plant, crushing plant etc.

d) Detailsof facilities/approaches for transportation of men, equipment and materials for construction ofpavements, foundations andsubstructure in riverbed, and plan for free traffic flow and safe drainage.

e) Information on procedures to be adopted by the Contractor for prevention and mitigation of negative environmental impact due to construction activities.

f) Any other information required by the Engineer subsequent to the scrutiny of method statement

The General part of the Q.A. Programme shall accompany the methodstatement under sub-clause 105.3.

The Special part of the methods statement shall be submitted to the Engineer by the Contractor for each important item of work like construction of embankments and subgrade, pavements, pile/well foundations, concreting, prestressing, repair and rehabilitation of existing structures, concrete superstructure, dismantling of structures and pavement and for any otheritem as directed by the Engineer.

Thesestatementsshallgiveinformationon

i) Details of personnel both for execution and quality control of the work.

ii) Equipment deployment with details of number of units, capacity, stand by arrangements

iii) Sequence of construction, details of temporary or enabling works like, diversions, cofferdams, formwork including specialized formwork for superstructure, details of borrow areas, method of construction of embankment and subgrade, pavements, piles, wells, concreting procedures, details of proprietary process and products (e.g. details

of prestressing systems, proprietary piling systems, bearings, expansion joints etc.) and details of equipment to be deployed. Wherever necessary, technical literature, design calculations and drawings shallbe included in the method statement.

iv) Testingandacceptanceproceduresincludingdocumentation.

v) Special part of the Q.A. Programme referred in clause 105.3 for the particular item of work shall be submitted along with the methods statement for the concerned activity.

vi) Engineer shall examine and approve the methods statement or directthe Contractor to resubmit the statement with required modifications. The modified statement shall be submitted within 14 days of receipt of Engineer'scomments.

The sole responsibility for the safety and adequacy of the methods adopted by the Contractor shall rest on the Contractor irrespective of any approval given by the Engineer.

Sub-Clause115.2 ApprovalofProprietaryProduct/Process/System

Only proprietary products proven by International usage in comparable projects shall be permitted to be used. Fully authenticated details of licensing and collaboration arrangement shall be submitted by the manufacturer, where relevant.

Within 90 days of award of work the Contractor shall submit the following information for all proprietary products for approval by the Engineer.

i) Nameofmanufacturerandnameofproduct/process/system.

Complete details of the manufacturer of the product/ process/ system shall be furnished. Details of projects where similar product/process/system has been successfully used shall be furnished. Authenticated copies of license/collaboration agreement shall be furnished.

ii) Generalfeaturesoftheproduct/productprocess/system.

Detailed write up with methods statements shall be furnished for eachproduct/ process/ system. This shall include complete working drawings & installation drawings, technical specifications covering fabrication, materials, system of corrosion protection etc.

i) Detailsofproductdevelopmentanddevelopmenttesting.

ii) Acceptancetestandcriteria.

Manufacturer shall submit a quality assurance system document. Details of acceptance test and criteria of acceptance shall be furnished in this document.

i) Installationprocedure.

ii) Maintenanceprocedureandschedule.

iii) Warrantyproposal.

The Engineer may instruct anyadditional tests for the purposeof accepting the product. The charges of these additional tests shall be borne by the Employer only in case the product satisfies the specifications.

CLAUSE120 FIELDLABORATORY

Sub-Clause120.2 Description

Replace the words "indicated in the drawings" in the first sentence of

second paragraph of this Clause with the words "per provisions indicated in this Clause and at a location approved by the Engineer."

Replace "electric supply etc."to these cond sentence of first paragraph by"including uninterrupted power supply etc."

Delete the first sentence of second paragraph "The floor space in the drawing"and substitute the following:

"The floor space required for the field laboratory shall be not less than 200 sq.m.

"The fourth sentenceofsecond paragraphs "The furnishing in Table100-2" shall read as under.

"A good semi furnished office accommodation shall be provided to the Material Engineers of the Supervision Team as per the direction of the Engineer."

Add the following at the end of this Clause:

"There shall also be provided a concrete paved area, for storing samples adjacent to the laboratory, of about 100sq.m and another 75 sq.m shall be suitably roofed with open sides giving protection against sunan drain.

Within14(fourteen)daysof the commencement date, the Contractor shall prepare and submit a layout plan and details of the laboratory building and make/supplier of the equipment to the Engineer for his approval.

ThefieldlaboratoryTo beprovidedundertheContractshallbehandedovertothe Engineerinfinished and fullyequippedconditionnotlater than 2monthsafter the receipt of Notice to Commence Work, and the field laboratory with all equipment/ instrument shall be to the entire satisfaction of the Engineer. During the 2- monthperiod starting from the Notice to Commence work, the laboratory tests shall be performed in another laboratory proposed by the Contractor and approved by the Engineer.

Laboratory Equipment

General

The items of laboratory equipment shall be provided in the field laboratory depending upon the items to be executed as per Table mentioned below instead of Table 100-2 shown in MORTH:

The following items of laboratory equipment shall be provided in the field laboratory:

The equipment and instruments shall be new and shall be quality certified by Bureau of Indian Standards(BIS).

Sr. No.	Sub No.	Item, Specifications	Nos. required
		A: General	
(i)		**Balance**	
	(a)	7kg to 10kg capacity semi-self indicating Electronic Type–Accuracy 1 gm	2
	(b)	500 gm capacity semi-self-indicating Electronic Type–Accuracy 0.01gm	2
	(c)	Chemical balance 100gm capacity-Accuracy 0.0001gm	1
	(d)	Pan balance 5kg capacity-Accuracy 0.5gm	2
	(e)	Platform Scale–300kg capacity	1

	(f)	Triple Beam balance-25kg capacity Accuracy 1gm	2
(ii)	**Ovens-Electrically operated, thermostatically controlled**		
	(a)	From 100ºC to 220ºC–Sensitivity	2
(iii)	**Sieves, as per IS460-1962**		
	(a)	IS Sieves 450 mm internal dia. Of sieve sets as per BIS Of required sieve sizes complete with lidandpan	2set
	(b)	IS sieve 200mm internal dia. (brass frame and steel or brass wire cloth mesh) consisting of sieve sets of required sieve sizes complete with lid and pan	2set
(iv)	Sieve shaker capable of taking 200mm and 450mm dia. Sieves electrically Operated with times with assembly (As per BIS)		1
(v)	200tonescompressiontestingmachine		1
(vi)	Stopwatches1/5sec. Accuracy		2
(vii)	Glassware comprising of Beakers, Pipettes, dishes, measuring cylinders (100 to 1000		1 dozen
	Cc capacity) glass rods and funnels, glass thermometers range 0ºC to 100ºC and Metallic thermometers range 300ºC.		each
(viii)	Hotplates 200mm dia (1500 watt)		6
(ix)	**Enamel trays**		
	(a)	600mmx450mmx50mm	10
	(b)	450mmx300mmx40mm	10
	(c)	300mmx250mmx40mm	6
	(d)	Circularplatesof250mmdia.	6
(x)	WaterTesting Kit		1
(xi)	First Aid Box		1
(xii)	Spatula Set of 100 and 200 long		3
(xiii)	DiggingTools (pixels, shovel, fork etc.)		As reqd.
(xiv)	Miscellaneous tools (sledge hammer, lump hammer, wooden peg setc.)		As reqd.
(xv)	Maximum and MinimumThermometer		2 Set
(xvi)	Rain Gauge		1 Set
(xvii)	Timer 0-60minutes with alarm &1/5 sec accuracy.		3 Sets

B: For Soils and Aggregates		
(i)	Water still,3litre/hr with fittings and accessories	1
(ii)	Liquid limit device with Casagrande and ASTM grooving tools as per IS: 2720	1
(iii)	Samplingpipettesfittedwithpressureandsuctioninlets,10mlCapacity	2set
(iv)	Compaction apparatus (Proctor) as per IS: 2720 (Part 8) complete with collar, base plate and hammer	1set
(v)	ModifiedAASHTOcompactionapparatusas perIS.2720(Part7)1980orHeavy CompactionApparatusasperIScompletewithcollar,baseplateandhammer	1set
(vi)	Sandpouringcylinderwithconicalfunnelandtapandcompleteas perIS2720 (Part28)1980includingmodifiedequipment	4
(vii)	Samplingtinswithlids100mmdiax75mmht½kgcapacityandmiscellaneous items like moisture,tins withlid(50grams)etc.	12

(viii)	Lab CBRtestingequipmentforconductingCBRtesting,loadframe with 5Ton capacity,electricallyoperatedwithspeedcontrolasperIS:2720(Part16),and consistingoffollowing:		**1set**
	(a)	CBRmoulds150-mmdia-175-mmhtcompletewithcollar,baseplateetc.	**24**
	(b)	Tripodstandsforholdingdialgaugeholder	**24**
	(c)	CBRplungerwithsettlementdialgaugeholder	**1**
	(d)	Surchargeweight147-mmdia2.5kgweight withcentralhole	48
	(e)	Spacerdisc148-mmdia,47.7-mmht.Withhandle	3
	(f)	Perforatedplate(Brass)	24
	(g)	Soakingtankforaccommodating24CBRmoulds	
	(h)	Provingringsof1000kg,2500kgand5000kgcapacity	1 each
	(i)	Dialgauges,25mmtravel-0.01mm/division	10
	(j)	**AluminiumTis**	
	50x30m		36 nos
	55x35m		36 nos
	70x45m		36 nos
	70x50m		36 nos
	80x50m		36 nos
(ix)	StandardPenetrationtestequipment		1
(x)	NuclearMoistureDensityMeterorequivalent		2
(xi)	Speedymoisturemetercompletewithchemicals		2
(xii)	Unconfinedcompressiontestapparatus		1set
(xiii)	AggregateImpactTestApparatus		1
(xiv)	AggregateImpactTestApparatusasperIS2386(Part4)1963		1
(xv)	LosAngelesabrasionTestApparatus asperIS2386(Part4)1963		1
(xvi)	RiffleBoxofSlotsizeof50mmasperASTMC-136		1

C: For Bitumen and BituminousMixes		
(i)	Constanttemperaturebathforaccommodatingbitumen	2
	Testspecimenelectricallyoperatedandthermostaticallycontrolled,50-litercapacity temp.rangeambient80oC	
(ii)	Penetrometerautomatictype,adjustableweightarrangementandneedlesasperIS. 1203-1978	2
(iii)	Solventextractionorcentrifugetypeapparatuscomplete(AASHTO,T-164)with extractionthimbleswithstocksofsolventandfilterpaper	1
(iv)	Laboratorymixerincludingrequiredaccessoriesabout.02cumcapacityelectrically operatedfittedwithheatingjacket	1
(v)	MarshallcompactionapparatusautomaticallyoperatedasperASTM1559-62Tand complete with electrically operated loading unit, compaction pedestal heating head assembly,dialmicrometre and bracketforflowmeasurement,loadtransferbar, specimenmould100mmdia.(4in)withbaseplate,collars,specimenextractor, compactionhammer4.53kg(10lb.)x457mm(18in)fall	1set
(vi)	DistantReadingDigitalThermometerforMeasuringTemperaturesinAsphalticMixes	As required
(vii)	RiffleBox	1
(viii)	AutomaticAsphaltContentGauge[Nuclearareequivalent]	1
(ix)	ThinfilmOventestapparatustotherequirementofAASHTOT179,including accessories	1

(x)	RingBallApparatusasperIS1205-1978	1
(xi)	AsphaltInstituteVacuumViscometerasperIS 1206(partII)-1978	1
(xii)	BSU-TubeModifiedReverseFloroViscometerIS1206(PartIII)-1978	1
(xiii)	ApparatusforDeterminationofDuctilityTestasper IS1208-1978	1
(xiv)	PenSky-MartarsclosedTesterfortestingflashandfirepointasperIS1209-1978.	1
(xv)	ApparatusforFloatTest-IS-1210-1978	1
(xvi)	ApparatusforDeterminationofwatercontent(DeanandSharkMethod)IS-1211 -1978	1
(xvii)	ApparatusforDeterminationofLossonHeadingIS-1212-1978.	1
(xviii)	ApparatusofDeterminationofspecifiedGravityIS-1202-1978	1
(xix)	Corecuttingmachinewith100mmdia.Diamondcutting Edge	1
(xx)	ApparatusforElasticRecoverytestforModifiedBitumen	1
(xxi)	ApparatusforStorageStabilitytestforModifiedBitumen	1
(xxii)	ApparatusforSeparationtestformodifiedbitumen	1

D: For Cement, Cement Concrete and Materials			
(i)	Water still		1
(ii)	Vicat needle apparatus for setting time with plungers, as per IS.269-1967		1
(iii)	Moulds		
	(a)	150mmx300mmhtcylinderwithcappingcomponent	As required
	(b)	150mmx150mmx150mmcubicalforcompressivestrength	As required
	(c)	150mmx100mmx600mmbeamforflexuralstrength	As required
(iv)	Concrete permeability apparatus		1
(v)	High frequency mortar cube vibrator for cement testing		1
(vi)	Concrete mixer power driven,1 cuft. capacity		1
(vii)	Variable frequency and amplitude vibrating table size 1metre x 1 metre, as per the Relevant British Standard		1
(viii)	Flakiness & Elongation test apparatus		2each
(ix)	Aggregate impact test apparatus as per IS2386 (Part4) 1963		2
(x)	Los Angeles abrasion apparatus as per IS.2386(Part4)1963		1
(xi)	Flow table as per IS712-1973		1
(xii)	(a)	Equipment for slump test	2
	(b)	Compaction factor test equipment	1
(xiii)	Equipment for determination of specific gravity for fine and coarse aggregate as per IS2386 (Part3)1963		2
(xiv)	Flexural attachment to compression testingmachine		1
(xv)	Corecutting machine with 150mmdia. Diamond cutting edge		1
(xvi)	Needle vibrator		1
(xvii)	Vibrating hammer as per BS specification		1
(xviii)	Air entrainment meter ASTMC-231		1
(xix)	0.5Cft,1Cft cylinder for checking bulkdensity of aggregate with tamping rod		1

(xx)	Soundness testing apparatus for cement	1
(xxi)	Flexural Beam testing machine with accessories	1
(xxii)	Chemicals solution sand consumable	As reqd.
(xxiii)	ChlorideTesting kit for chemical analysis of chloride content.	1
(xxiv)	ION Exchange kit for rapid determination of sulphate content.	1

E: For Control of Profile and Surface Evenness			
(i)	Digital Level complete with all accessories		2 sets
(ii)	Distomat or equivalent		2 Nos.
(iii)	Theodolite –Electronically operated with computerized output attachment		2 sets
(iv)	Total Station with all accessories		2 sets
(v)	Towed Fifth Wheel Bump Indicator		1set
(vi)	3-meter straight edge and measuring wedge		2 sets
	Camber templates 2 lane		
(vii)	Stringline Arrangement with paver and sensor powers		1
	(a)	Crown type cross-section	2 sets
	(b)	Straight run cross-section	2 sets
(viii)	Steel tape		
	(a)	5m long	As reqd
	(b)	10 m long	As reqd
	(c)	20 m long	As reqd
	(d)	30 m long	As reqd
	(e)	50 m long	As reqd
	(e)	50 m long	As reqd
(ix)	Precision Staff		3 Sets

Note: The laboratory set-up must be complete including as etof reference standards, adequately staffed and operational to the satisfaction of the Engineer not later than 2 months from the date of receipt of Notice to commence the works.

Sub-Clause120.3 Ownership

This Clause shall read as under:

"Land for the laboratory shall be provided by the Contractor. "

Sub-Clause 120.4 Maintenance

This Clause shall read as under:

"TheContractorshallarrangetomaintainthefieldlaboratoryincludingsample store yards in a satisfactory manner until the issue of Taking over Certificate for the whole work. Maintenance includes all activities described in Clause120.4and maintenance of equipment and running of the same including chemicals and consumables."

Sub-Clause120.5 Rate

The construction, supply, installation, maintenance, and operation including all consumables like chemicals & reagents etc., and all other expenses involved in connection there to for the field laboratory shall be incidental to the work, and shall not be paid for separately.

SECTION200	Site Clearance
CLAUSE201	CLEARING AND GRUBBING
Sub-Clause201.1	Scope
	Replace with following Para:
	This work shall consist of cutting, excavating, removing, and disposing of all materials such as trees of girth up to 300 mm, bushes, shrubs, stumps, roots, grass weeds, rubbish etc. and top soil up to 150 mm, which in the opinion of Engineer is unsuitable for incorporation in the work including draining out stagnant water if any from the area of road land, drain, cross drainage structure and other area as specified in the drawing or instructed by Engineer. It shall include necessary excavation by harrow discs or any other suitable equipment, backfilling of the pits by suitable soil, resulting from uprooting of trees & stumps and making the surface in proper grade by suitable equipment and compacted by power roller to required compaction as per Clause 305.3.4. The work also includes handling, salvaging and disposal of cleared material. Clearing and grubbing shall be performed less than one month in advance of earthwork operation and in accordance with requirement of these specifications.
CLAUSE202	DISMANTLING CULVERTS, BRIDGES AND OTHER STRUCTURES/PAVEMENTS
Sub-Clause202.5	Disposal of Materials
	The first paragraph of the subclause shall read as below:
	All materials obtained of dismantling/milling shall be the property of the Contractor for which he shall quote a rate for rebate in BOQ Bill No. 1, and the Contractor shall be free to use this material in work, or he may sell/dispose the material to as desired / deemed fit by him.
	The existing pavement crust shall be reused as indicated below:
	Contractor shall be free to use dismantled / milled material, as is where basisis, or by suitably modifying the material, or by crushing the material, or by breaking the material, and screening the same, provided it meets the specifications and is approved by the Engineer.
SECTION 300	Earthwork, Erosion Control and Drainage
CLAUSE301	EXCAVATIONFORROADWAYANDDRAINS
Sub-Clause301.1	Scope
	Add the following as second para graph under this clause:
	"Theworkshallalsoincludeexcavationforchanneltrainingatculverts/bridges, excavation of existing shoulders and medians for purposes of widening the pavement and excavation of existing embankment for reconstruction to specification."
CLAUSE304	EXCAVATIONFORSTRUCTURES
Sub-Clause304.3.2Excavation	
	At the end of 1^{s} ^{t}paragraph of Clause304.3.2 inserts the following additional sentences:
	"The Contractor shall ensure the stability and structural integrity of adjacent existing foundations and structures and if necessary shall, at his own expense, install temporary or permanent sheet piles, cofferdams, shoring or similar as support or protection to the satisfaction of the Engineer."

"Widening & Upgradation to 2-lane with paved shoulder of Balance Work of NH-301 Kargil Zanskar Road from Design km 6.000 to km 30.040 of 24.040 Km length in the Union Territory of Ladakh on EPC mode"

CLAUSE305 EMBANKMENT CONSTRUCTION

Sub-Clause 305.2 Material and General Requirements Sub-Clause 305.2.1

Physical Requirements:

Sub-Clause305.2.1.2Addthefollowingaftersecondparagraph:

"SoilshavingmediumandhighswellingpotentialshallbedefinedbasedonLiquid Limit, Plastic Limit, Shrinkage Limit, Gradation, Free swelling Index, Field dry DensityandFieldMoistureContentandtypesofClaymineralspresentinthesoil and as directed by the Engineer. The location and the extent of these soils with mediumtohighswellingpotentialshouldbedefinedasdirectedbytheEngineer."

Sub-Clause 305.2.2.2 Borrow Materials

Para1 of this Clause shall read as under:

" No borrow area shall be made available by the Employer for this work. The arrangement for the source of supply of the material for embankment and sub-gradeaswellascompliancetothedifferentenvironmentalrequirementsinrespect of excavation and borrow areas asstipulated, from time to time,bytheMinistryof Environmental and Forest,Government of India and the local bodies,as applicable, shallbethesoleresponsibilityoftheContractor."

Sub-Clause305.2.2.4CompactionRequirements

In Clause305.2.2.4deleteTable300-2andsubstitutethefollowing:

Table300-2

Compaction Requirements of Embankment and Subgrade

Sr.No.	Typeof Work/Material	Relative Compaction as %age of maximum Laboratory dry density as per IS 2720 (Part 8)
1	Subgrade and earthen shoulders	Notlessthan97%
2	Embankment	Notlessthan95%
3	Expansiveclays	Notallowed
4	Design CBR of Subgrade & Shoulder has been taken5.The borrow earth used for subgrade material must satisfied the requirement of the design CBR of 5 %	

Para 2 of this Clause given below Table300-2 shall read as under:

The contractor shall at least 21 working days before commencement of construction of embankment and the subgrade; submit the following to the Engineer for approval:

(i) ThevaluesofmaximumdrydensityandoptimummoisturecontentobtainedinaccordancewithIS:2720(Part8)for eachfill materialproposedtobeusedintheconstructionofembankmentandsubgrade.

(ii) ThegraphsofDensityplottedagainstmoisturecontentfromwhicheachof thevaluesin(i)aboveofmaximumdrydensityandoptimummoisture content were determined.

(iii) Thedrydensity-moisturecontent-CBRrelationships,heavycompactiveefforts conformingtotheIS2770(part 8)foreachofthefillmaterialproposedtobeused in thesubgrade.

	Theaboveinformationshallformthebasisforcompactiononlyuponits approval by the Engineer."
Sub-Clause305.3	Construction Operations
Sub-Clause 305.3.4	Compacting Ground Supporting Embankment/Subgrade Para 1 of this clause shall be read as "Wherenecessarytheoriginalgroundshallbelevelled, scarified, mixed with water and then compacted by rolling to facilitate placement of first layer of embankment so as to achieve minimum dry density as given in Table300-2.
Sub-Clause305.8	Measurement for Payment Substitute Clause 305.8.1 shall be read as "Earth embankment/sub-grade construction shall be measured separately by taking cross sections at intervals after clearing and grubbing and if necessary compactionoforiginalgroundbeforetheembankmentworkstartsandafterits completion and computing the volumes of earthwork in cubic metres by the method of average and areas."
CLAUSE306	SOIL EROSION AND SEDIMENTATION CONTROL
Sub-Clause306.4	MeasurementsforPayment SubstituteClause306.4asfollows: "All temporary sedimentation and pollution control works shall be deemed as incidental to the earthwork and other items of work and as such no separate paymentshall be made for thesame."
SECTION400	Sub-Bases,Bases(Non-Bituminous)and Shoulders
CLAUSE401	GRANULAR SUB BASE
Sub-Clause401.1	Scope Addthefollowingattheendofthis Clause: "AsitetrialshallbeperformedinaccordancewithClause901.16."
Sub-Clause 401.2.2	Physical Requirements Addattheendofthisclauseasunder: The Contractor shall,at least21 workingdays beforethe commencementof the construction of the sub-base course, submit to the Engineer, the results for approval of the laboratory testing on the physical properties defined above.The construction of the sub-base course shall be taken up only upon the Engineer's approval of the material. Grading-I of table 400-1 shall be adopted at site.
CLAUSE406	WET MIX MACADAM SUBBASE/BASE
Sub-Clause406.4	OpeningtoTraffic TheClauseshallbereadasfollows: Novehiculartrafficofanykindshallbeallowedonthefinishedwetmix macadam surface.
SECTION 500	Base and Surface Courses (Bituminous)
Sub-Clause 501.2	Materials
Subclause501.2.1	Binder

	Binder of VG-10 grade shall be used or if available viscosity grade of bitumenshall be used in accordance with IS: 73
Sub-Clause 501.2.2	Delete"Crushed gravel or other hard
	smaterial"fromfirstLineofPara1." Para 3 isdeleted.
CLAUSE 505	DENSE BITUMINOUS MACADAM
Sub-Clause505.2.1	Bitumen
	Binder of VG-10 grade shall be used or if available viscosity grade of bitumenshall be used in accordance with IS: 73.
CLAUSE 507	BITUMINOUS CONCRETE
Sub-Clause507.2.1	Bitumen
	BinderofCRMB-60gradeshallbeused.
SECTION 800	Traffic Signs, Markings and Other Road Appurtenances
CLAUSE 803	ROAD MARKINGS
Sub-Clause803.2	Materials
	Thisclauseshallreadasunder:
	"Roadmarkingsshallbehotappliedthermoplasticcompoundandthematerials shallmeettherequirementsasspecifiedinClause803.4.
	The road markings shall be laid in one layer with appropriate road marking machineapprovedbytheEngineer.Beforetheroad-markingmachineisusedon the permanent works, the satisfactory working of the machine shall be demonstrated on a suitable site, which is not part of the permanent works. The rate of application shallbe checkedand adjustedas necessarybefore application on a large scale is commenced, and thereafter daily."
CLAUSE806	ROAD DELINATORS
Sub-Clause806.2	Thisclauseshallreadasfollows:

a) Triangular Object Marker shall be 300mm side with four red reflectors, made out of 2mm thick aluminium sheet, face to be fully covered by high intensitygradewhiteretro reflectivesheetingofencapsulatedlens typeas per clause 801. The background/border/symbolsshall bemadebyscreen- printingof desiredcolouras per sign details. The sign plate shall be fixed with 6mm dia. aluminium rivets on MS angle iron frame. The angle iron frame shall be made with angle of size 40mmx40mmx5mm. Thesign shall be fixed with nut-bolts & welding on MS pipe 50mm dia (NB-MW) and 500mmhigh.

b) Rectangular hazard marker 600mm x 300mm made out of2mm thick aluminium sheet, face to be fully covered by high intensity grade white retro reflective sheeting of encapsulated lens type. The background/ border/ symbols shall bemade byscreen-printingof desired colour as per sign details. The sign plate shall be fixed with 6mm dia aluminium rivetson MS angle iron frame. The angle iron frame shall be made with angle of size 40mmx40mmx5mm. The sign shall be fixed to 80mm dia (NB-MW) MSpipe.

c) Roadway Indicators shall be 1000mm high made with 100 mm dia. NB medium weight MS pipe. One reflector of high intensity grade retro reflective sheeting with encapsulated lens shall be provided on top of the reflector. The white & red reflector shall be provided alternatively of 40mm width, sothat total width of reflector shall be 120mm. A wire

mesh cover of 150mm height shall be provided ontop.

d) All components of signs & supports shall be thoroughly descaled, cleaned, primed and painted with two coats of epoxy paint. Thesign backside shall bewithgreycolourandpostshallbewhitecolour/alternatewhite&black bands. Thepostbelow ground shall bepainted with three coats ofredlead.

Clause2100 OpenFoundation

Sub-Clause2104.1Preparationof Foundation

Pleaseaddthefollowingasalast para-

Considering the soil SBC as per Geotechnical report, 1 m of depth below the founding level of bridges shall be removed and replaced with granular sand. The cost of the excavation and sand shall be made from respective items.

Schedule-E

(See Clauses 2.1and 14.2)

Maintenance Requirements

1. Maintenance Requirements

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

(ii) The Contractor shall repair or rectify any Defect or deficiency set forth in Paragraph 2 of this Schedule-E within the time limit specified therein and any failure in this behalf shall constitute non-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 Termination thereof.

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

[Specify all the relevant documents]

2. Repair/rectification of Defects and deficiencies

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

3. Other Defects and deficiencies

In respect of any Defect or deficiency not specified in Annex - I of this Schedule-E, the Authority's Engineer may, inconformity 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 with in the time limit specified by the Authority's Engineer.

4. Extension of time limit

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

5. Emergency repairs/restoration

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

6. Daily inspection by the Contractor

The Contractor shall, through its engineer, undertake a daily visual inspection of the Project Highwayand maintaina record thereof ina registerto be keptinsuch form and manner as the Authority'sEngineermayspecify.Suchrecordshallbekeptin 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.

"Widening & Upgradation to 2-lane with paved shoulder of Balance Work of NH-301 Kargil Zanskar Road from Design km 6.000 to km 30.040 of 24.040 Km length in the Union Territory of Ladakh on EPC mode"

7. Pre-monsoon inspection/post-monsoon inspection

TheContractorshallcarryoutadetailedpre-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

(a) All damages occurring to the Project Highway on account of a Force Majeure Event orwilful 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 ratesagreed between the Parties

9. Routine Maintenance of already completed stretch: The following stretches have been completed in all respects under the previous agreement which has been terminated. In the following stretches, EPC contractor under this agreement is obligated to maintain the road as per Maintenance Requirements mentioned under the Schedule-E, Annex-I of this Agreement. DLP period shall start from June 2025 to July 2030 or date of commencement of this work [Apointed Date] whichever is earlier.

Sr.No.	Design Chainage in km		
	From	To	Length in m (11810 m)
1	6+410	6+900	490
2.	13+300	16+330	3030
3.	16+500	16+670	170
4.	16+720	17+540	820
5.	17+590	17+660	70
6.	22+190	22+550	360
7.	22+580	22+760	180
8.	22+820	26+660	3840
9.	26+740	26+770	30
10.	26+800	26+840	40
11.	26+860	27+640	780
12.	27+880	27+960	80
13.	28+000	28+330	330
14.	28+360	28+740	380
15.	28+790	29+770	980
16.	29+810	30+040	230
Total (m)			11810

Annex-I

(Schedule-E)

Repair/rectification of Defects and deficiencies

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

Table-1: Maintenance CriteriaforPavements:

AssetType	Performance Parameter	Level of Service (LOS)		Frequencyof Inspection	Tools/Equipment	StandardsandReferencesforInspectionand Data Analysis	Timelimit for Rectification/ Repair	Maintenanc Specificatior
		Desirable	Acceptable					
FlexiblePavement(Pavement ofMCW,Service Road,Approachesof Gradestructure,approaches ofconnectingroads,sliproads,layb yesetc.asapplicable)	Potholes	Nil	<0.1%ofareaand subject tolimitof10mm in depth	Daily	LengthMeasurementUnit like Scale, Tape,odometeretc.	IRC 82: 2015 and Distress IdentificationManual for Long Term Pavement PerformanceProgram,FHWA2003(http://www.tfhrc.com/pavement/lttp/reports/03031/)	24-48hours	MORT&H Specification .2
	Cracking	Nil	<5%subjecttolimitof0.5 sq.mfor any 50 mlength	Daily			7-15days	MORT&H Specification .3
	Rutting	Nil	< 5mm	Daily	StraightEdge		15-30days	MORT&H Specification .2
	CorrugationsandShoving	Nil	<0.1% ofarea	Daily	LengthMeasurementUnitlike		2-7days	IRC:82- 20
	Bleeding	Nil	< 1%ofarea	Daily	Scale,Tape,odometeretc.		3-7days	MORT&H Specification .4
	Ravelling/Stripping	Nil	< 1%ofarea	Daily			7-15days	IRC:82-2015readwi IRCSP81
	Edge Deformation/ Breaking	Nil	< 1 m for any100msection and width<0.1matanylocation,restricted to 30cm from theedge	Daily			7-15days	IRC:82-201
	RoughnessBI	2000mm/km	2400mm/km	Bi-Annually	Class I ProfilometerSCRIM(Sideway-forceCoefficientRoutine InvestigationMachineor equivalent)	ClassIProfilometer:ASTME950(98) :2004 –Standard Test Method for measuringLongitudinalProfileofTravelledSurfaceswithAccelerometer Established Inertial Profiling	180 days	IRC:82-201
	SkidNumber	60SN	50SN	Bi-Annually			180 days	BS:7941-1 2006
	Pavement Condition Index	3	2.1	Bi-Annually		Reference ASTM E1656 -94: 2000-StandardGuideforClassificationofAutomaticPavement	180 days	IRC:82-20

AssetType	PerformanceParameter	Level of Service (LOS)		FrequencyofInspection	Tools/Equipment	StandardsandReferencesforInspectionand Data Analysis	TimelimitforRectification/ Repair	MaintenanceSpecifications
		Desirable	Acceptable			ConditionSurveyEquipment		
	Other Pavement Distresses			Bi-Annually			2-7days	IRC:82- 2015
	Deflection/ Remaining Life			Annually	FallingWeight Deflectometer	IRC115: 2014	180 days	IRC:115-2014
Rigid Pavement (Pavement of MCW, Service Road, Grade structure, approaches of connecting road, slip roads, lay byes etc.as applicable)	Roughness BI	2200mm/km	2400mm/km	Bi-Annually	ClassI Profilometer	ASTME950(98):2004andASTME1656-94: 2000	180 days	IRC:SP:83-2018
	Skid	Skid Resistance no. at Different speed of vehicles		Bi-Annually	SCRIM (Sideway-force	IRC:SP:83-2018	180 days	IRC:SP:83-2018
		MinimumSN 36 33 32 31 31		**Traffic Speed (Km/h)** 50 65 80 95 110	Coefficient RoutineInvestigation Machineor equivalent)			
Embankment /Slope	Edge drop at shoulders	Nil	40mm	Daily	Length MeasurementUnit like Scale, Tape, odometeretc.	IRC	7-15days	MORT&H Specification 408.4
	Slope of camber/crossfall	Nil	<2%variation inprescribed slope of camber/crossfall	Daily			7-15days	MORT&H Specification 408.4
	Embankment Slopes	Nil	<15%variation inprescribesi	Daily			7-15days	MORT&H Specification 408.4

			deslope					
	Embankment Protection	Nil	Nil	Daily	NA		7-15days	MORT&H Specification
	Rain Cuts/ Gullies inslope	Nil	Nil	DailySpecially During RainySeason	NA		7-15days	MORT&H Specification
	Drainage & Snow clearance.							
19	**Pumping**	quantity of fines andwater expelled throughopen joints and cracksNos Nos/100 m stretch	0	not discernible	No Action			
			1 to2	slight/occasionalNos< 10%	Repaircracksandjoints Withoutdelay.	Inspect and repair sub-drainage at distressedsections and upstream.		
			3 to4	appreciable/ Frequent10-25%	Lift or jackslabwithin30days.			
			5	abundant, crackdevelopment> 25%	Repair distressed pavement			
20	**Snow Clearance during maintenance Period**	Road shall be clean and no slip/skid shall occured	NA	Snowy: Roads have a COF of 0.2 to 0.3 Icy: Roads have a COF of 0.1 to 0.212	Spreading of moorum & dust to avoid slip/skid	Not Applicablle		

Table-2: Maintenance Criteria for RigidPavements:

[deleted]

Table-3: Maintenance Criteria for Safety Related Items and OtherFurniture Items:

<table>
<tr><th>AssetType</th><th>Performance Parameter</th><th>Level of Service (LOS)</th><th>Frequencyof Measurement</th><th>TestingMethod</th><th>RecommendedRemedial measures</th><th>Time limit for Rectification</th><th>Specifications and Standards</th></tr>
<tr><td rowspan="2">Highway</td><td rowspan="2">Availability of Safe Sight Distance</td><td>AsperIRCSP:84-2019, a minimum of safe stopping sight distance shall be availablethroughout.
<table>
<tr><th>DesignSpeed, kmph</th><th>DesirableMinimum Sight Distance (m)</th><th>Safe Stopping Sight Distance (m)</th></tr>
<tr><td>100</td><td>360</td><td>180</td></tr>
<tr><td>80</td><td>260</td><td>130</td></tr>
</table></td><td rowspan="2">Monthly</td><td rowspan="2">Manual Measurements with Odometer along with video/imagebackup</td><td colspan="2" rowspan="2">Removal of obstruction within 24 hours, in caseofsightlineaffectedbytemporaryobjects such as trees, temporary encroachments.
Incaseofpermanentstructureordesign deficiency:
Removalofobstruction/improvementofdeficiencyattheearliestSpeedRestrictionboardsand suitabletrafficcalmingmeasuressuchas transverse barmarking, blinkers, etc. shall be applied during the period of rectification.</td><td rowspan="2">IRC:SP84-2019</td></tr>
<tr><td></td></tr>
<tr><td>Pavement Marking</td><td>Wear</td><td><70%ofmarkingremaining</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 - within24hours
Cat-2Defectwithin 2months-</td><td>IRC:35-2015</td></tr>
<tr><td></td><td>Day time Visibility</td><td>DuringexpectedlifeService Time Cement - Road 130mcd/m^2/lux BituminousRoad-100mcd/m^2/lux</td><td>Monthly</td><td>AsperAnnexure-DofIRC: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>AssetType</th><th>Performance Parameter</th><th>Level of Service (LOS)</th><th>Frequency of Measurement</th><th>TestingMethod</th><th>RecommendedRemedial measures</th><th>Time limit for Rectification</th><th>Specifications and Standards</th></tr>
<tr><td></td><td>Night Time Visibility</td><td>
<table>
<tr><td colspan="3">Initial and Minimum Performance for Dry Retro (RL)RetroReflectivity (mcd/m2/lux)</td></tr>
<tr><td>Design Speed</td><td>Initial(7days)</td><td>Minimum Threshold level (TL) &warranty period required upto2 years</td></tr>
<tr><td>Upto 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>
<tr><td colspan="3">Initial and Minimum</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>

		Performancefor NightVisibilityunderwet Condition (Retroreflectivity):					
		Initial 7 days Retro reflectivity: 100 mcd/m^2/lux MinimumThresholdLevel: 50mcd/m^2/lux					
	Skid Resistance	Initial and Minimum performance for SkidResistance:	Bi-Annually	As per Annexure-GofIRC:35-2015		Within24hours	IRC:35-2015
AssetType	**Performance Parameter**	**Level of Service (LOS)**	**Frequencyof Measurement**	**TestingMethod**	**RecommendedRemedial measures**	**Time limit for Rectification**	**Specifications and Standards**
		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, transversebar markingsetc.					
	ShapePosition and	Shape and Position as per IRC: 67- 2012. Signboard should be clearly Visible for the design speed of the section.	Daily	Visual with video/image backup		48 hours in case of Mandatory Signs, Cautionary and Informatory	IRC:67-2012

RoadSigns	Retro reflectivity	As per specifications in IRC:67-2012	Bi-Annually	Testingof each Signboard usingRetroReflectivityMeasuri ngDevice.Inaccordancewit h ASTM D 4956-09.	Improvement of shape, in case ifshapeisDamaged. Relocation aspe r requirement change of signboard	Signs (Single and Dual post signs) 15DaysincaseofG antry/Cantilever Sign boards 48hoursincaseof Mandator y Signs, Cautionar y an d Informator ySigns (Single and Dual postsigns) 1Monthincase of Gantry/Cantileve r Sign boards	RC:67-2012
Kerb	KerbHeight	As per IRC 86:2018 dependingupontypeof Kerb	Bi-Annually	Useofdistancemeasuringtap e	Raising KerbHeight	Within1 Month	IRC86:2018
	KerbPainting	Functionality: Functionin g of Kerb painting as intended	Daily	Visualwithvideo/image backup	KerbRepainting	Within7-days	IRC35:2015
Other Road Furniture	Reflective Pavement	NumbersandFunctionality as per specifications in	Daily	Counting	NewInstallation	Within2 months	IRC:SP:84-2019,IRC:35-
AssetType	**Performance Parameter**	**Level of Service (LOS)**	**Frequencyo f Measureme n t**	**TestingMethod**	**RecommendedRemedi al measures**	**Time limit for Rectification**	**Specificatio n s an d Standards**
	Markers(Roa d Studs)	IRC:SP:84-2019and IRC: 35-2015, unless specified in Schedule-B.					2015

	Pedestrian Guardrail	Functionality: Functioning ofguardrail asintended	Daily	Visual withvideo/image backup	Rectification	Within15 days	IRC:SP:84-2019
	Traffic Safety Barriers	Functionality: Functioningof Safety Barriers as intended	Daily	Visual with video/image backup	Rectification	Within7days	IRC:SP:84- 2014, IRC:119-2015
	End Treatment of	Functionality: Functioning ofEnd Treatment asintended	Daily	Visual withvideo/image	Rectification	Within7days	IRC:SP:84-2019,
	Traffic Safety Barriers			backup			IRC:119 - 2015
	Attenuators	Functionality: Functioning of Attenuatorsasintended	Daily	Visual with video/imageback up	Rectification	Within7days	IRC:SP-2014, IRC:119-2015
	GuardPosts and Delineators	Functionality: Functioning of Guard Posts and Delineators as intended	Daily	Visual with video/imageback up	Rectification	Within15 days	IRC:79-2019
	OverheadSign Structure	Overhead sign structure shall be structurally adequate	Daily	Visual with video/image backup	Rectification	Within15 days	IRC:67-2012
	Traffic Blinkers	Functionality: Functioning of Traffic Blinkers as intended	Daily	Visual withvideo/image backup	Rectification	Within7days	IRC:SP:84-2019

Highway Lighting System	Highway Lights	Illumination: Minimum 40 Lux illuminationontheroad surface	Daily	Theilluminationlevelshallbe measured with luxmeter	ImprovementinLighting System	24 hours	IRC:SP:84-2019
		Nomajorfailureinthe lighting system	Daily	-	Rectification offailure	24 hours	IRC:SP:84-2019
AssetType	**Performance Parameter**	**Level of Service(LOS)**	**Frequencyof Measurement**	**TestingMethod**	**RecommendedRemedial measures**	**Time limit for Rectification**	**Specifications and Standards**
		Nominorfailureinthe lighting system	Monthly	-	Rectification offailure	8hours	IRC:SP:84-2019
	Toll Plaza Canopy Lights	Minimum 40 Lux illuminationontheroad surface	Daily	Theilluminationlevelshallbe measured with luxmeter	ImprovementinLighting System	24 hours	IRC:SP:84-2019
		Nomajor/minorfailureinthe lighting system	Daily	-	Rectification of failure	8hours	IRC:SP:84-2019
Trees and Plantation	Obstruction in a minimum head-room of 5.5 m above carriageway orobstruction in visibility of roadsigns	Noobstructionduetotrees	Monthly	Visual with video/imagebackup	Removaloftrees	Immediate	IRC:SP:84-2019

including median plantation	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/imageback up	Timely watering and treatment. Or Replacement ofTreesandBushes.	Within90 days	IRC:SP:84-2019
	Vegetation affectingsight line and road structures	Sight line shall be	Daily	Visual with video/imageback up	RemovalofTrees	Immediate	IRC:SP:84-2019
Rest Areas	Cleaning of toilets	-	Daily	-	-	Every4hours	
	Defects in electrical, water and d sanitary installations	-	Daily	-	Rectification	24 hours	
Other				-	Rectification	15 days	IRC:SP:84-2019
Asset Type	**Performance Parameter**	**Level of Service (LOS)**	**Frequency of Measurement**	**TestingMethod**	**RecommendedRemedial measures**	**Time limit for Rectification**	**Specifications and Standards**
Project	DamageordeteriorationinApproach Roads, Pedestrian facilities, trucklay-bys, bus- bays,bus-		Daily				

Facilities and Approach roads	shelters, cattle crossings, Traffic Aid Posts, Medical Aid Posts and otherworks						
Pipe/box/ slab culverts	Free waterway/ unobstructed flowsection	85%ofculvertnormalflow area to available.	2 times in a year (beforeand afterrainy season)	InspectionbyBridgeEngineer as per IRC SP: 35-1990 and recordingofdepthofsilting 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 barrelbefore rainyseason.	15 days before onset of monsoon and within 30 days after end ofrainy season.	IRC:5-2015, IRC:SP:40-2019 and IRC:SP:13-2004
	Leak-proof expansion joints if any	No leakage through expansionjoints	Bi-Annually	Physical inspection of expansion joints as per IRC SP: 35- 1990 if any, for leakage strains on wallsatjoints.	Fixing with sealant suitably	30daysorbefore onset of rains whichever comes earlier	IRC:SP:40-2019andIRCSP:69-2011
	Structurally sound	Spalling of concrete not more than 0.25 sqm	Bi-Annually	Detailed inspection of all components of culvert as per IRC SP:35-1990 and recording thedefects	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
		Delamination of concrete not more than 0.25 sq.m.					
		Crackswiderthan0.3mm not more than 1m aggregatelength					

	Protection works in goodcondition	Damagedofroughstone apronorbankrevetment not more than 3 sqm, damage to solidapron (concreteapron)notmore than 1 sqm	2 times in a year (before and After rainy season)	ConditionsurveyasperIRC SP:35-1990	Repairs todamaged aprons andpitching	30 days after defect observationor2 weeks before onset ofrainy seasonwhichever isearlier.	IRC:SP 40-2019and IRC:SP:13- 2004.
Asset Type	**Performance Parameter**	**Level of Service (LOS)**	**Frequency of Measurement**	**TestingMethod**	**RecommendedRemedial measures**	**Time limit for Rectification**	**Specifications and Standards**
Bridges including ROBs Flyover etc. as applicable	Ridingquality or usercomfort	Nopotholeinwearingcoat on bridge deck	Daily	VisualinspectionasperIRC SP:35-1990	RepairstoBCorwearing coat	15 days	MORT&H Specification 2811
	Bumps	No bump at expansionjoint	Daily	VisualinspectionasperIRC SP:35- 1990	Repairs to BC on either side of expansion joints, profile correction course onapproachslabincaseof settlementtoapproach embankment	15 days	MORT&H Specification 3004 & 2811.
	User safety (condition of crash barrier andguardrail)	No damaged or missing stretch of crash barrier or pedestrian hand railing	Daily	Visual inspection anddetailed conditionsurvey asperIRC SP: 35- 1990.	Repairs and replacementof safety barriers as the case may be	3days	IRC:5-2015, IRCSP:84-2019and IRCSP:40-2019.

Bridge - Super Structure	Rusted reinforcement Spalling of concrete Delamination	Not more than 0.25 sq.m Not more than 0.50 sq.m Not more than 0.50 sq.m	Bi-Annually	Detailedconditionsurveyas perIRCSP:35-1990using Mobile Bridge InspectionUnit	All the corroded reinforcementshallneed tobethoroughlycleaned fromrustingandapplied with anti-corrosive coating before carrying outtherepairstoaffected concrete portionwith epoxymortar/concrete.	15 days	IRCSP:40-2019 and dMORTH Specification 1600.
	Cracks wider than 0.30mm	Not more than 1m total length	Bi-Annually	Detailedconditionsurveyas perIRCSP:35-1990using Mobile Bridge InspectionUnit	Grouting with epoxy mortar, investigating causes for cracks developmentandcarryout necessary rehabilitation.	48 Hours	IRCSP:40-2019 and dMORTH Specification 2800.
	Rainwater seepage	Leakage- nil	Quarterly	Detailedconditionsurveyas perIRCSP:35-1990using Mobile Bridge InspectionUnit	Groutingofdeckslabat Leakage areas, waterproofing, repairs to drainage	1months	MoRTH specifications

Asset Type	**Performance Parameter**	**Level of Service (LOS)**	**Frequency of Measurement**	**TestingMethod**	**Recommended Remedial measures**	**Time limit for Rectification**	**Specifications and**

							Standards
	throughdeck slab				spouts		2600&2700.
	Deflectiondue to permanent loads and liveloads	Within design limits.	Once in Every 10 Years for spansmore than40m	Loadtestmethod	Carry outmajor rehabilitationworks on bridgetoretainoriginal designloadscapacity	6months	IRCSP:51-2015.
	Vibrations in bridge deck due to moving trucks	Frequency of vibrations shall not be more than 5 Hz	Onceinevery 5 years for spans more than 30m and Every 10 Years for spansbetween 15 to30m	Laserdisplacementsensorsor laservibro-meters	Strengtheningstructure of super	4months	AASHTO LRFD specifications
	Leakagein Expansion joints	No damage to elastomeric sealant compound in strip seal expansion joint, no leakage of rain water through expansion joint in case of buried and asphaltplugand copperstripjoint.	Bi-Annually	Detailedconditionsurveyas per IRC SP:35-1990 using Mobile Bridge InspectionUnit	Replaceofexpansionjoint seal in	15 days	MORTH specifications 2600andIRC SP:40-2019.

	Debris and dust in strip seal expansion joint	No dust debris expansion orinjoint gap.	Monthly	Detailed condition survey as per IRC SP:35-1990 using Mobile Bridge InspectionUnit	Cleaning ofexpansion joint gapsthoroughly	3days	MORTH specifications 2600 and IRCSP:40-2019.
	Drainage spouts	No downtake pipe missing/brokenbelowsoffit of the deckslab. No silt, debris, clogging of drainage	Monthly	Detailedconditionsurveyas perIRCSP:35-1990using Mobile Bridge InspectionUnit	Cleaning of drainage spouts thoroughly. Replacement of missing/brokendowntake		MORTH
Asset Type	**Performance Parameter**	**Level of Service (LOS)**	**Frequency of Measurement**	**TestingMethod**	**RecommendedRemedial measures**	**Time limit for Rectification**	**Specifications and Standards**
		spoutcollectionchamber.			pipes with a minimumpipe extension of 500mm below soffit of slab. Providing sealant around thedrainagespoutifany leakagesobserved.	3days	specification 2700.

Bridge-substructure	Cracks/spalling of concrete/ rustedsteel	No cracks, spalling of concrete and rusted steel	Bi-Annually	Detailedconditionsurveyas perIRCSP:35-1990using Mobile Bridge InspectionUnit	All thecorroded reinforcementshallneed tobethoroughlycleaned fromrustingandapplied with anti-corrosivecoatingbefore carrying out repairs tosubstructureby grouting/guniting and micro concretingexpen dingontypeof defectnoticed	30 days	IRCSP:40-2019 and MORTH specification 2800.
	Bearings	Delamination of bearing reinforcement notmore than 5%, crackingortearingofrubber notmorethan2locations perside, no rupture Of reinforcement or rubber	Bi-Annually	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge InspectionUnit	In case of failure of even one bearing on any pier/abutment, all the bearings on that pier/abutment shall be replaced, in order toget uniformloadtransferon tobearings.	3months	MORTH specification 2810andIRC SP:40-2019.
Bridge Foundations	Scouring around foundations	Scouring shall not be lower than maximum scour level for the bridge	Bi-Annually	Condition survey and visualinspection as per IRC SP:35-1990 UsingMobileBridgeInspection Unit. In case of doubt, use Underwatercamera for inspection of deep	Suitableprotectionworks aroundpier/abutment	1month	IRCSP:40-2019,IRC 83-2014, MORTH specification 2500

				wells inmajor			
AssetType	**Performance Parameter**	**Level of Service (LOS)**	**Frequency of Measurement**	**TestingMethod**	**RecommendedRemedial measures**	**Time limit for Rectification**	**Specifications and Standards**
				Rivers.			
	Protection works in good condition	Damaged of rough stone apron or bank revetmentnot more than 3	2timesinayear (before and after rainy season)	ConditionsurveyasperIRC SP:35- 1990	Repairs todamaged aprons andpitching.	30 daysafter defectobservation or2	IRC:SP 40-2019 and IRC:SP:13-2004.
		sq.m, damage to solidapron (concrete apron) not morethan1sq.m				weeks before onset of rainy season whicheveris earlier.	
Note: Any Structure during the entire contract period which is found that does not comply with all requirements of this Table will be prepared, rehabilitated or even Reconstructed under the scope of the contractor.							

Table 4: Maintenance Criteria for Hill Roads

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

a) HillRoads		
(i)	Damage to Retainingwall/Breast wall	7(Seven) days
(ii)	Landslides requiring clearance	12(Twelve) hours
(iii)	Snow requiring clearance	24(Twenty-Four) hours

Note: For all tables 1to5 above, latest BIS & IRC standards (even those not indicated herewith) along with MoRT&H 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, sideslopes, drains and culverts**	
(i)	Variation by more than 1% in the prescribed slope of camber/crossfall (shall not be less than the camber on the main carriageway)	7(seven) days
(ii)	Edge drop at shoulders exceeding 40mm	7(seven) days
(iii)	Variation by more than 15% in the prescribed side (embankment) slopes	30(thirty) days
(iv)	Raincuts/gulliesinslope	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, crashbarriers	7 (seven) days (Restore immediately if causing safety hazard)
(c)	**Roadside furniture including road sign and pavement marking**	
(i)	Damage to shape or position, poor visibility or loss of retro-reflectivity	48(forty-eight) hours
(ii)	Painting of km stone, railing, parapets, crashbarriers	As and when required/Once every year
(iii)	Damaged/missing signs road requiring replacement	7(seven)days
(iv)	Damagetoroadmarkups	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 5m above carriageway or obstruction in visibility of road signs	24(twenty-four) hours
(ii)	Removal of fall entrees from carriageway	4 (four) hours
(iii)	Deterioration in health of trees and bushes	Timely watering and treatment
(iv)	Trees and bushes requiring replacement	30(thirty) days
(v)	Removal of vegetation affecting sight line and road structures	15(fifteen) days
(f)	**Rest area**	
(i)	Cleaning of toilets	Every4 (four) hours
(ii)	Defects in electrical, water and sanitary installations	24(twenty-four) hours

(g)	**[Toll Plaza]**	
(h)	**Other Project Facilities and Approach roads**	
(i)	Damage in approach roads, pedestrian facilities, trucklay-byes, bus-bays, bus-shelters, cattle crossings, [Traffic Aid Posts, Medical Aid Posts] and service roads	15(fifteen)days
(ii)	Damaged vehicles or debris on the road	4(four) hours
(iii)	Malfunctioning of the Mobile crane	4(four) hours
Bridges		
(a)	**Superstructure**	
(i)	Any damage, cracks, spalling/scaling Temporary measures Permanent measures	within 48 (forty-eight) hours within 15 (fifteen)days or as specified by the Authority's Engineer
(b)	**Foundations**	
(i)	Scouring and/or cavitation	15(fifteen) days
(c)	**Piers, abutments, return walls and wingwalls**	
(i)	Cracks and damages including settlement and tilting, spalling, scaling	30(thirty)days
(d)	**Bearings(metallic)of bridges**	
(i)	Deformation, damages, tilting or shifting of bearings	15(fifteen)days Greasing of metallic bearings once in a year
(e)	**Joints**	
(i)	Malfunctioning of joints	15(fifteen)days
(f)	**Other items**	
(i)	Deforming of pads in elastomeric bearings	7(seven)days
(ii)	Gathering of dirt in bearings and joints; or clogging of spouts, weep holes and vent-holes	3(three) days
(iii)	Damage or deterioration in kerbs, parapets, handrails and crash barriers	3 (three) days (immediately within 24 hours if posing danger to safety)
(iv)	Rain-cuts or erosion of banks of the side slopes of approaches	7(seven)days
(v)	Damage to wearing coat	15(fifteen)days
(vi)	Damage or deterioration in approach slabs, pitching, apron, toes, floor or guide bunds	30(thirty)days
(vii)	Growth of vegetation affecting the structure or obstructing the waterway	15(fifteen)days
(g)	**Hill Roads**	
(i)	Damage to retaining wall/breast wall	7(seven)days
(ii)	Landslides requiring clearance	12(twelve)hours
(iii)	Snow requiring clearance	24(twenty-four) hours
(iv)	Spreading of Dust/moorum on Road Surface after snow clearance to avoid Slip & Skid to vehicles ply.	24 (twenty-four) hours

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

"Widening & Upgradation to 2-lane with paved shoulder of Balance Work of NH-301 Kargil Zanskar Road from Design km 6.000 to km 30.040 of 24.040 Km length in the Union Territory of Ladakh on EPC mode"

10. **Routine Maintenance of already completed stretch:** The following stretches have been completed in all respects under the previous agreement which has been terminated**.** In the following stretches, EPC contractor under this agreement is obligated to maintain the road as per Maintenance Requirements mentioned under the Schedule-E, Annex-I of this Agreement.

Sr.No.	Design Chainage in km		
	From	To	Length in m (11810 m)
1	6+410	6+900	490
2.	13+300	16+330	3030
3.	16+500	16+670	170
4.	16+720	17+540	820
5.	17+590	17+660	70
6.	22+190	22+550	360
7.	22+580	22+760	180
8.	22+820	26+660	3840
9.	26+740	26+770	30
10.	26+800	26+840	40
11.	26+860	27+640	780
12.	27+880	27+960	80
13.	28+000	28+330	330
14.	28+360	28+740	380
15.	28+790	29+770	980
16.	29+810	30+040	230
Total (m)			11810

Schedule-F

(See Clause 4.1(vii)(a))

Applicable Permits

1. Applicable Permits

(i) The Contractor shall obtain, as required under the Applicable Laws, the following Applicable Permits:

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

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

(c) License for use of explosives;

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

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

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

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

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

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

(ii) 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 Clauses7.1 and 19.2)

Annex-I

(See Clause7.1)

Form of Bank Guarantee

[Performance Security/Additional Performance Security]

[MD, National Highways & Infrastructure Development Corporation Limited, New Delhi] WHEREAS:

(A) [name and address of contractor](Herein after called the "**Contractor**")and[name and address of the authority], (hereinafter called the **"Authority"**) have entered into an agreement (hereinafter called the "**Agreement**") for the Widening & Upgradation to 2 lane with paved shoulder of NH-301 Kargil Zanskar Road from Design km 0.000 (Ex. km 0.000) to km 30.040 (Ex. km 30.000) of 30.040 Km length in the Union Territory of Ladakh on EPC mode (Pkg–I), subject to and in accordance with the provisions of the Agreement

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

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

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

1. The Bank hereby unconditionally and irrevocably guarantees the due and faithful performance of the Contractor's obligations during the {Construction Period/ Defects Liability Period and Maintenance Period} under and in accordance with the Agreement, and agrees and undertakes to pay to the Authority, upon its mere first written demand, and without any demur, reservation, recourse, contest or protest, and without any reference to the Contractor, such sum or sums up to an aggregate sum of the Guarantee Amount as the Authority shall claim, without the Authority being required to prove or to show grounds or reasons for its demand and/or for the sum specified therein.

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

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

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

Widening & Up-Gradation to 2 Lane with Paved shoulder of NH-301 Kargil Zanskar Road from Design Km 0.000 (Ex. Km. 0.000) to Km 30.040 (Ex. Km 30.000) of 30.040 km length in the Union Territory of Ladakh on EPC mode (Pkg-I).

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

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

7. Not with standing anything contained herein before, the liability of the Bank under this Guarantee is restricted to the Guarantee Amount and this Guarantee will remain in force for the period specified in paragraph 8 below and unless a demand or claim in writing is made by the Authority on the Bank under this Guarantee all rights of the Authority under this Guarantee shall be forfeited and the Bank shall be relieved from its liabilities hereunder.

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

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

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

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

12. 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, details of which is as under:

S. No	Particulars	Details
1	Name of Beneficiary	National Highways & Infrastructure Development Corporation Limited
2	Beneficiary Bank Account No.	90621010002610
3	Beneficiary Bank Branch	IFSC SYNB0009062
4	Beneficiary Bank Branch Name	Transport Bhawan, New Delhi

5	Beneficiary Bank Address	Canara Bank (erstwhile Syndicate Bank) transport Bhawan,1st Parliament Street, New Delhi-110001

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

SIGNED, SEALED AND DELIVERED

For and on behalf of the Bank by:

(Signature) (Name)(Designation)(Code Number) (Address)

NOTES:

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

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

Annex – II
(Schedule - G)
(SeeClause19.2)
Form for Guarantee for Advance Payment

[MD, National Highways & Infrastructure Development Corporation Limited, New Delhi] WHEREAS:

(A) [name and address of contractor] (hereinafter called the "**Contractor**") has executed an agreement (hereinafter called the "**Agreement**") with the [name and address of the authority], (hereinafter called the "**Authority**") for the "Balance work of Widening & Upgradation to 2 lane with paved shoulder of NH-301 Kargil Zanskar Road from Design km 6.000 to km 30.040 of 30.040 Km length in the Union Territory of Ladakh on EPC mode (Pkg–I),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 (herein after called "**Advance Payment**") equal to 10% (ten percent) of the Contract Price; and that the Advance Payment shall be made in two instalments subject to the Contractor furnishing an irrevocable and unconditional guarantee by a scheduled bank for an amount equivalent to 110% (one hundred and ten percent) of such instalment to remain effective till the complete and full repayment of the instalment of the Advance Payment as security for compliance with its obligations in accordance with the Agreement. The amount of {first/second} instalment of the Advance Payment is Rs. ------ cr.(Rupees crore) and the amount of this Guarantee is Rs.------- cr.(Rupees------crore) (the "Guarantee Amount")[$].

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

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

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

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

2. 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.

"Widening & Upgradation to 2-lane with paved shoulder of Balance Work of NH-301 Kargil Zanskar Road from Design km 6.000 to km 30.040 of 24.040 Km length in the Union Territory of Ladakh on EPC mode"

3. 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.

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

---

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

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

6. Not withstanding anything contained herein before, 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.

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

8. 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.

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

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

11. 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, details of which is as under:

"Widening & Upgradation to 2-lane with paved shoulder of Balance Work of NH-301 Kargil Zanskar Road from Design km 6.000 to km 30.040 of 24.040 Km length in the Union Territory of Ladakh on EPC mode"

S. No	Particulars	Details
1	Name of Beneficiary	National Highways & Infrastructure Development Corporation Limited
2	Beneficiary Bank Account No.	90621010002610
3	Beneficiary Bank Branch	IFSC SYNB0009062
4	Beneficiary Bank Branch Name	Transport Bhawan, New Delhi
5	Beneficiary Bank Address	Canara Bank (erstwhile Syndicate Bank) transport Bhawan,1st Parliament Street, NewDelhi-110001

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

SIGNED, SEALED AND DELIVERED

For and on behalf of the Bank by:

(Signature)(Name)(Designation)(Code Number)(Address)

NOTES:

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

$Insertadatebeing90(ninety)daysaftertheendofoneyearfromthedateofpaymentoftheAdvancepayment totheContractor (in accordance with Clause 19.2 of the Agreement).

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

Annex-III

(Schedule - G)
(SeeClause7.5.v)
Form for Guarantee for Withdrawal of Retention Money

The Managing Director,
National Highways & Infrastructure Development Corporation Limited
New Delhi

WHEREAS:

(A) [name and address of contractor] (hereinafter called the "**Contractor**") has executed an agreement (hereinafter called the "Agreement") with the [name and address of the authority],(hereinaftercalledthe"**Authority**")fortheconstructionofthe*****sectionof [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 7.5.3 of the Agreement, the Contractor may withdraw the retention money (hereinafter called the "**Retention Money**") after furnishing to the Authority a bank guarantee for an amount equal to the proposed withdrawal.

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

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

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

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

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

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

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

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

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

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

9. The Bank undertakes not to revoke this Guarantee during its currency, except with the previous express consent of the Authority in writing and declares and warrants that it hasthepowertoissuethisGuaranteeandtheundersignedhasfullpowerstodosoon behalf of the Bank.

10. Any notice by way of request, demand or otherwise hereunder may be sent by post addressed to the Bank at its above referred branch, which shall be deemed to have been duly authorized to receive such notice and to effect payment there of 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.

"Widening & Upgradation to 2-lane with paved shoulder of Balance Work of NH-301 Kargil Zanskar Road from Design km 6.000 to km 30.040 of 24.040 Km length in the Union Territory of Ladakh on EPC mode"

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

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

13. 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, details of which is as under:

S. No	Particulars	Details
1	Name of Beneficiary	National Highways & Infrastructure Development Corporation Limited
2	Beneficiary Bank Account No.	90621010002610
3	Beneficiary Bank Branch	IFSC SYNB0009062
4	Beneficiary Bank Branch Name	Transport Bhawan, New Delhi
5	Beneficiary Bank Address	Canara Bank (erstwhile Syndicate Bank) transport Bhawan,1st Parliament Street, NewDelhi-110001

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

SIGNED, SEALED AND DELIVERED For and on
Behalf of the Bank by:

(Signature)
(Name)

(Designation) (Code
Number) (Address)NOTES:

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

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

Schedule-H

See Clauses10.1(iv) and 19.3

Contract Price Weightages

The Contract Price for this Agreement is _____ **Crores (excl. GST)**

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

Item	Weightage in Percentage to the Contract Price	Stage for Payment	Percentage Weightage
1	2	3	4
I. Road Works Including Culverts, Widening and repair of culverts	**43.92%**	**A-Widening and Strengthening of existing road**	
		(1) Earthwork upto top of the sub-grade	6.07%
		(2) Sub-base Course	3.40%
		(3) Non-Bituminous Base course	12.45%
		(4) Bituminous Base course	26.46%
		(5) Wearing Coat	10.61%
		(6) Widening and repair of culverts	0.00%
		B.1- Reconstruction/New Intermediate-Lane Realignment/ Bypass (Flexible Pavement)	
		(1) Earthwork upto top of the sub-grade	4.89%
		(2) Sub-base Course	2.54%
		(3) Non bituminous Base course	4.99%
		(4) Bituminous Base course	11.14%
		(5) Wearing Coat	4.19%
		B.3- Balance work of Paved Shoulder in reconstruction (Flexible Pavement)	2.33 %
		D- Reconstruction and New Culverts on existing road, realignments , bypasses	
		Culverts (length<6m)	10.93%
II. Minor Bridges/ Underpasses / Overpasses/ Foot over Bridge	**2.10%**	**A.2- New Minor bridges/Foot Over Bridge (length >6 and <60 m.)**	
		(1) **Foundation:** On completion of the foundation work of abutments and piers	1.24%
		(2) **Sub-structure:** On completion of abutments and piers with abutment/ pier cap.	36.27%
		(3) **Super-structure:** On	62.49%

		completion of the super-structure upto deck slab including bearings.	
		(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.	0.00%
		(5) **Approaches:** On completion of approaches including wing walls/ return walls, retaining walls, stone pitching, protection works for floor, embankment slope etc. complete in all respect and fit for use.	0.00%
		(6) **Guide Bunds and River Training Works:** Completion of Guide Bunds and river Training Works complete in all respects	0.00%
III. Other Works	**53.98 %**	(i)Toll Plaza	0.00%
		(ii)Roadside drains	11.28%
		(iii) Road signs, markings, km stones, safety devices, Metal Beam Crash Barriers	6.55%
		(iv)Project facilities	0.00%
		a) Bus Bays/Shelter	1.45%
		b) Truck Lay-Byes	0.00%
		c) Rest Area	0.00%
		d) Others (Passing Lane)	0.00%
		(v) Roadside Plantation	0.00%
		(vi) Protection works other than approaches to the bridges, elevated sections/ flyovers/grade separators and ROBs/RUBs.	
		(a)Retaining Wall	26.61%
		(b)Gabion Wall	0.00 %
		(c)Breast Wall	9.62%
		(vii)Safety and traffic management during construction	
		a) Rock Netting in Avalanche Zone	0.00%
		b) Temporary diversion	0.39%
		(viii) Other miscellaneous works including Connecting Road & Junction under Grade separator	0.49%
		(ix)Pedestrian Footpath	8.69%
		(x)Utility Shifting	

		a) Electrical Utility-PDD	6.90%
		b) Irrigation & Flood Control	10.06%
		c) Public Health Engineering-Pipe laying	4.46%
		d) Electrical Utility -Army	13.50%

1.3 Procedure of estimating the value of work done

1.31 Road works

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

Table 1.3.1

Stage of Payment	Percentage Weightage	Payment Procedure
1	**2**	**3**
A1-Widening & Strengthening of road		
(1) Earthwork upto top of the sub-grade	2.67%	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
(2) Sub-base Course	1.49%	
(3) Non bituminous Base course	5.47%	
(4) Bituminous Base course	11.62%	
(5) Wearing Coat	4.66%	
(7) Widening and Repair of culverts	0.00%	
B.1-Reconstruction/New Intermediate-Lane Realignment/ Bypass (Flexible Pavement)		
(1) Earthwork upto top of the sub-grade	2.15%	Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in full length or 500 m length, whichever is less.
(2) Sub-base Course	1.11%	
(2) Non bituminous Basecourse-WMM	2.19%	
(4) Bituminous Base course	4.89%	
(5) Wearing Coat	1.84%	
B.3- Balance work of Paved Shoulder in reconstruction (Flexible Pavement)		
Balance Work Paved Shoulder	1.02%	Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion each stretch of balance work.
D-Reconstruction & New Culverts on existing road, realignments, bypasses		
Culverts(length<6m)	4.80%	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 at least one culvert. 75% of the cost will be payable on completion of box/

		abutments and slab/ pipe and head wall. Remaining 25% will become payable on completion of protection works including return/ wing walls and any other work associated with culverts.

***Note:** In case of CTB and AIL layer, this stage may be modified suitably to permit separate weightages for each of these layers.

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

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

Where P= Contract Price

L=Total length in km

Similarly, the rates per km for other stages shall be worked out accordingly.

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

1.3.2 Minor Bridges and Underpasses/Overpasses.

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

Table1.3.2

Stage of Payment	Weightage	Payment Procedure
1	2	3
A.2-New minor bridges/Foot over bridges		Cost of each minor bridge shall be determined on pro rata basis with respect to the total linear length (m) of the minor bridges.
(i) Foundation: On completion of the foundation work of abutments and piers	0.03%	(i) Foundation: Payment against foundation shall be made on pro-rata basis on completion of a stage i.e. completion of at least two foundations of each bridge. In case where load testing is specified for foundation, the trigger of first payment shall include load testing also.
(ii) Sub – structure:	**0.76%**	(ii) Sub - structure – Payment shall be made on pro-rata basis on completion of stage i.e. completion of at least one sub-structure upto abutment/ pier cap level of each bridge.

(iii) Super-structure: On completion of the superstructure in all respects including wearing coat, bearings, expansion joints, handrails, crash barriers, road signs & markings, tests on completion etc. complete in all respect.	1.32%	(iii) Super-structure: Payment shall be made on pro-rata basis on completion of a stage i.e., completion of super-structure of at least one span in all respects as specified in the column of "Stage of Payment" in this sub-clause.
(iv) Approaches: On completion of approaches including Retaining walls, stone pitching, protection works for floor, embankment slope etc. complete in all respect and fit for use.	0.00%	(iv) Approaches: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of approaches including wing walls/ return walls, retaining walls, stone pitching in all respect as specified in the column of "Stage of Payment" in this sub clause for each bridge.
(4) Guide Bunds, gabion Protection and River Training Works: On completion of Guide Bunds and river training works complete in all respects	0.00%	**Guide Bunds and River Training Works**: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of Guide Bunds and River training Works in all respects as specified

Major Bridgeworks, ROB/RUB and Structures.

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

Table1.3.3 Deleted

1.3.4 Other works.

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

Table1.3.4

Stage of Payment	Weightage	Payment Procedure
1	2	3
(i)Toll Plaza	0.00%	Unit of measurement is each completed toll plaza. Payment of each toll plaza shall be made on pro rata basis with respect to the total of all toll plazas.
(ii) Road side drains	6.09%	a) Drains: Unit of measurement is linear length in metre. Payment shall be made on pro rata basis on completion of a stage in a length of not less than 100 m on one side. Unit of measurement is linear length
(iii)Road signs, markings, km stones, safety devices,	3.53%	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)Project Facilities	0.00%	Unit of measurement is each number. Payment shall be made on pro rata basis for completed facilities.
a) Bus Bays/Shelters	0.78%	
b) Truck Lay-Byes	0.00%	
c) Rest Areas	0.00%	
d) Others (To be specified)	0.00%	
(v)Roadside Plantation	0.00%	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.
(vi) Protection Works other than approaches to the bridges, elevated sections/ flyover/ grade separators and ROBs/ RUBs	0.00%	
(a)Retaining Wall	14.11%	
(b)Gabion Wall	0.00%	
(c)Breast Wall	5.45%	
(vii)Safety and traffic management during construction	0.00%	Payment shall be made on prorate basis every six months.
a) Rock Netting in Avalanche Zone	0.00%	
b) Temporary diversion	0.22%	
(viii) Other miscellaneous works including Connecting road Junction under Grade separator	0.26%	Payment should be made on pro rata basis on completion of each stage
(ix) Pedestrian Footpath	4.69%	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.
(x) Utility Shifting		Cost of each Hand Pump shall be determined on pro rata basis with respect to the total number of Hand Pumps. Payment shall be made on the completion of atleast one Hand pump.
a) Electrical Utility-PDD	3.72%	Payment shall be made only upon erection of minimum 10 Nos. of Poles on pro-rata basis with respect to the total number of poles - 40% Payment shall be made only upon stringing of cable conductor & other accessories in all respects on pro-rata basis with respect to the total length of conductor - 40% Payment shall be made on commissioning of utility on pro-rata basis- 20%

b) Irrigation & Flood Control	5.42%	Payment shall be made on Running Metre on completion of a stage in a length of not less than 100 m in all respects.
c) Public Health Engineering-Pipe laying	0.87%	Payment shall be made on Running Metre on completion of a stage in a length of not less than 100 m in all respects.
d) Public Health Engineering-Hand Pump	1.54%	
e) Electrical Utility -Army	7.29%	Payment shall be made only upon erection of minimum 10 Nos. of Poles on pro-rata basis with respect to the total number of poles - 40% Payment shall be made only upon stringing of cable conductor & other accessories in all respects on pro-rata basis with respect to the total length of conductor - 40% Payment shall be made on commissioning of utility on pro-rata basis- 20%

"Widening & Upgradation to 2-lane with paved shoulder of Balance Work of NH-301 Kargil Zanskar Road from Design km 6.000 to km 30.040 of 24.040 Km length in the Union Territory of Ladakh on EPC mode"

2. Procedure for payment for Maintenance

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

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

Schedule-I

(See Clause 10.2(iv))

Drawings

1. Drawings

In compliance of the obligations set forth in Clause10.2 of this Agreement, the Contractor shall furnish to the Authority's Engineer, free of cost, all Drawings listed in Annex-I of this Schedule- I.

2. Additional Drawings

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

Annex – I (Schedule I)

List of Drawings

1. The Project drawings, as defined in Clause1.1, Definitions, Article1, Definitions and Interpretation, Part-I: Preliminary, of the Contract Agreement shall consist:

   (a) Working Drawings of all the components/elements of the Project as determined by Authority Engineer/Authority, and

   (b) As-built drawings for the Project components/elements as determined by AE/Authority. As-built drawings shall be duly certified by Authority Engineer.

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

A. BRIDGE

[deleted]

B. ROAD (PLAN&PROFILE)

Plan & Profile
Cross Sections
Drawings of horizontal alignment, vertical profile and cross sections
Drawings of cross drainage works
Drawings of traffic diversion plans and traffic control measures
Drawings of road drainage measures
Drawings of typical details slope protection measures
Drawings of landscaping and horticulture
Drawings of street lighting

C. STANDARD DRAWINGS

Detail of Mandatory Regulatory Signs
Detail of Mandatory Regulatory Signs & Compulsory Direction Control and Other Signs
Detail of Informatory Signs
Detail of Cautionary Signs-TS
Detail of cautionary warning signs
Detail of cautionary warning signs
Details of route marking (chevron marking)
Details of road marking
Details of directional signs
Details Toe drain
Details of pitching, filter material, chute drain and energy dissipation basin-std
Details of double head metal beam crash barrier
Details for 200-meter 1 km & km post
Detail for boundary stone & guard post
Drain retaining wall & kerb

Schedule-J

(SeeClause10.3(ii))

Project Completion Schedule

1. Project Completion Schedule [731 days]

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

2. Project Milestone-I

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

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

3. Project Milestone-II

(i) Project Milestone-II shall occur on the date falling on the 437th (Four Hundred and Thirty seven) day from the Appointed Date (the "Project Milestone-II").

(ii) Prior to the occurrence of Project Milestone-II, the Contractor shall have continued with construction of the Project Highway and submitted to the Authority duly and validly prepared Stage Payment Statements for an amount not less than 35% (thirty-five per cent) of the Contract Price and should have started construction of all bridges.

4. Project Milestone-III

(i) Project Milestone-III shall occur on the date falling on the 621st (Six Hundred & Twenty one) day from the Appointed Date (the "Project Milestone-III").

(ii) Prior to the occurrence of Project Milestone-III, the Contractor shall have continued with construction of the Project Highway and submitted to the Authority duly and validly prepared Stage Payment Statements for an amount not less than 70% (seventy per cent) of the Contract Price and should have started construction of all project facilities.

5. Scheduled Completion Date

(i) The Scheduled Completion Date shall occur on the **731st** (Seven Hundred and Thirty-One) day from the Appointed Date.

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

6. Extension of time

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

Schedule – K

(See Clause 12.1 (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 the Authority of its intent to subject the Project Highway to Tests, and no later than 10(ten) days prior to the actual date of Tests, furnish to the Authority's Engineer and the Authority detailed inventory and particulars of all works and equipment forming part of Works.

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

2. Tests

A. Road and Bridge

(i) 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 [***].

(ii) 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 equipments and the maximum permissible roughness for purposes of this Test shall be [2,000 (two thousand)] mm for each kilometre.

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

(iv) Other tests: The Authority's Engineer may require the Contractor to carryout 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.

B. Other Tests

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

(ii) Safety Audit: The Authority's Engineer shall carry out, or cause to be carried out,

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's representative.

Sr. No.	Key metrics of Asset	Equipment to be used	Frequency of condition survey
1	Surface of defects pavement	Network Survey Vehicl e (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 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

(SeeClause12.2)

Completion Certificate

1 I, …… (Name of the Authority's Engineer), acting as the Authority's Engineer, under and in accordance with the Agreement dated.....(the**"Agreement"**), the Widening & Upgradation to 2 lane with paved shoulder of NH-301 Kargil Zanskar Road from Design km 0.000 (Ex. km 0.000) to km 30.040 (Ex. km 30.000) of 30.040 Km length in the Union Territory of Ladakh on EPC mode(Pkg–I),(the **"Project Highway"**)on Engineering, Procurement and Construction (EPC) basis through.....(Name of Contractor),hereby certify that the Tests in accordance with Article-12 of the Agreement have been successfully undertaken to determine compliance of the Project Highway with the provisions of the Agreement, and I am satisfied that the Project Highway can be safely and reliably placed in service of the Users thereof.

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

(SeeClauses14.6,15.2and19.7)

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 Paragraph2.

2. Percentage reductions in lump sum payments on monthly basis

(i) The following percentages shall govern the payment reduction:

S.No.	Item/Defect/Deficiency	Percentage
(a)	**Carriageway/Pavement**	
(i)	Potholes, cracks, other surface defects	15%
(ii)	Repairs of Edges, Rutting	5%
(b)	**Road, Embankment, Cuttings, Shoulders**	
(i)	Edge drop, inadequate crossfall, undulations, settlement, potholes, ponding, obstructions	10%
(ii)	Deficient slopes, rain cuts, disturbed pitching, vegetation growth, pruning of trees	5%
(c)	**Bridges and Culverts**	
(i)	Desilting, cleaning. Vegetation growth, damaged pitching, flooring, parapets, Wearing course, footpaths, any damage to foundations	20%
(ii)	Any Defects in superstructures, bearings and sub-structures	10%
(iii)	Painting, repairs/replacement kerb, railings, parapets, guideposts/crash barriers	5%
(d)	**Road side 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/accidental vehicles, fallen trees, road blockades or malfunctioning of mobile crane	10%
(ii)	Any other Defects in accordance with paragraph1.	5%
(g)	**Defects in Other Project Facilities**	5%
(h)	**Deduction on account of non-compliance for Snow Clearance**	The deduction shall be made on per hour basis

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

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

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 para1.2 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 Clause18.1 (i))

Selection of Authority's Engineer

1. Selection of Authority's Engineer

(i) 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.

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

2. Terms of Reference

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

3. Appointment of Government entity as Authority's Engineer

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

Annex-I

(Schedule-N)

Terms of Reference for Authority's Engineer

1. Scope

(i) These Terms of Reference(the"**TOR**")for the Authority's Engineer are being specified pursuant to the EPC Agreement dated ..... (the "**Agreement**), which has been enteredintobetweenthe[nameandaddressoftheAuthority](the"**Authority**")and .....(the "**Contractor**")# Widening & Upgradation to 2 lane with paved shoulder of NH-301 Kargil ZanskarRoadfromDesignkm0.000(Ex.km0.000) to km30.040(Ex.km30.000) of 30.040 Km length in the Union Territory of Ladakh on EPC mode (Pkg–I),and a copy of which is annexed hereto and marked as Annex-A to form part of this TOR.

#-IncasethebidofAuthority'sEngineerisinvitedsimultaneouslywiththebidofEPCproject, then the status of bidding of EPC project only to be indicated

(ii) The TOR shall apply to construction and maintenance of the Project Highway.

2. Definitions and interpretation

(i) 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.

(ii) 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.

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

3. General

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

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

(a) any Time Extension;

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

(c) the Termination Payment; or

(d) 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.

(iii) 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.

(iv) 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.

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

(vi) 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

(i) 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 be extended upto 30 (thirty) days. In particular, such comments shall specify the conformity or otherwise of such Drawings with the Scope of the Project and Specifications and Standards.

(ii) 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.

(iii) TheAuthority'sEngineershallreviewandapprovetheQualityAssurancePlansubmitted 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.

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

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

(vi) The Authority's Engineer shall review the monthly progress report furnished by the Contractor and send its comments thereon to the Authority and the Contractor within 7 (seven) days of receipt of such report.

(vii) TheAuthority'sEngineershallinspecttheConstructionWorksandtheProjectHighway and shall submit a monthly Inspection Report bringing out the results of inspections and the remedial action taken by the Contractor in respect of Defects or deficiencies. In particular, the Authority's Engineer shall include in its Inspection Report, the compliance of the recommendations made by the Safety Consultant.

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

(ix) For determining that the Works conform to Specifications and Standards, the Authority's Engineer shall require the Contractor to carry out, or cause to be carried out, tests at such time and frequency and in such manner as specified in the Agreement and in accordance with Good Industry Practice for quality assurance. For purposes of this Paragraph 4 (ix), the tests specified in the IRC Special Publication-11 (Handbook of Quality Control for Construction of Roads and Runways) and the Specifications for Road and Bridge Works issued by MORTH (the "Quality Control Manuals") or any modification/substitution thereof shall be deemed to be tests conforming to Good Industry Practice for quality assurance.

(x) The Authority's Engineer shall test check at least 50 (fifty) percent of the quantity or number of tests prescribed for each category or type of test for quality control by the Contractor.

(xi) The timing of tests referred to in Paragraph 4 (ix), and the criteria for acceptance/ rejection of their results shall be determined by the Authority's Engineer in accordance with the Quality Control Manuals. The tests shall be undertaken on a random sample basis and shall be in addition to, and independent of, the tests that may be carried out by the Contractor for its own quality assurance in accordance with Good Industry Practice.

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

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

(xiv) 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.

(xv) TheAuthority'sEngineershallobtainfromtheContractoracopyofalltheContractor's quality control records and documents before the Completion Certificate is issued pursuant to Clause 12.2.

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

(xvii) In the event that the Contractor carries out any remedial measures to secure the safety of suspended works and Users, and requires the Authority's Engineer to inspect such works, the Authority's Engineer shall inspect the suspended works within3(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.

(xviii) 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, as the case may be. For carrying out its functions under this Paragraph 4 (xviii) and all matters incidental thereto, the Authority's Engineer shall act under and in accordance with the provisions of Article 12 and Schedule-K.

5. Maintenance Period

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

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

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

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

(v) 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

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

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

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

7. Payments

(i) 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).

(ii) Authority's Engineer shall-

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

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

(iii) 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.

(iv) TheAuthority'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

Clause19.16.

8. Other duties and functions

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

9. Miscellaneous

(i) A copy of all communications, comments, instructions, Drawings or Documents sent by the Authority's Engineer to the Contractor pursuant to this TOR, and a copy of all the test results with comments of the Authority's Engineer thereon, shall be furnished by the Authority's Engineer to the Authority forthwith.

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

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

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

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

Schedule-O

(SeeClauses19.4(i),19.6(i),and19.8(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 Clause19.3

(i) subsequent to the last claim;

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

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

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

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

ii. For Change of Scope Orders, and

iii. Taxes deducted

2. Monthly Maintenance Payment Statement

The monthly Statement for Maintenance Payment shall state:

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

(b) The deductions for maintenance work not done;

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

(d) Amounts reflecting adjustments in price under Clause19.12;and

(e) Amount towards deduction of taxes

3. Contractor's claim for Damages

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

Schedule - P

(See

Clause20.1)

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 insurances for any loss or damage occurring on account of Non Political Event of Force Majeure, malicious act, accidental damage, explosion, fire and terrorism:

(a) insurance of Works, Plant and Materials and an additional sum of [15 (fifteen)] 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) insurance for the Contractor's equipment and Documents brought onto the Site by the Contractor, for a sum sufficient to provide for their replacement at the Site.

(ii) The insurance under subpara(a) and (b) of paragraph 1(i)above shall cover the Authority and the Contractor against all loss or damage from any cause arising under paragraph 1.1 other than risks which are not insurable at commercial terms.

2. Insurance for Contractor's Defects Liability

The Contractor shall effect and maintain insurance cover 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

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

The insurance cover shall be not less than: *******

(ii) The insurance shall be extended to cover liability for all loss and damage to the Authority's propertyarisingoutoftheContractor'sperformanceofthisAgreementexcluding:

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

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

4. Insurance to be in joint names

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

Schedule-Q

(SeeClause14.10)

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 kilometer.

2. Visual and physical test

The Authority's Engineer shall conduct a visual and physical check of construction to determine that all works and equipment forming part there of 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

(SeeClause14.10)

Taking Over Certificate

I,.....(Name and designation of the Authority's Representative) under and inaccordance with the Agreement dated …… (the **"Agreement"**), Widening & Upgradation to 2 lane with paved shoulder of NH-301 Kargil Zanskar Road from Design km 0.000 (Ex. km 0.000) to km 30.040 (Ex. km 30.000) of 30.040 Km length in the Union Territory of Ladakh on EPC mode (Pkg-I)(the **"Project Highway"**) on Engineering, Procurement and Construction (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,SEALEDANDDELIVERED

(Signature)

(Name and designation of Authority's Representative)

(Address)

******* End of the Document*******