



Technical Schedules

Upgradation to Four lane with paved shoulder of Kalavad-Jamnagar section (Package-II) of NH-927D from Design km 0+000 (Ex. Km 50+925) to Design km 47+572 (Ex. Km 3+720) in the state of Gujarat

Ministry of Road Transport & Highways (MoRT&H)

Sept 2025

Schedule-A (Site of the project)

(See Clause 10.1)

1. The Site

- 1.1 Site of the Project highway shall include the land, buildings, structures, and road works as described in **Annexure-I** of this Schedule-A.
- 1.2 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 Concessionaire, and such inventory shall form part of the memorandum referred to in Clause 10.3.1 of the Agreement.
- 1.3 Additional land required for construction of works specified in the Change of Scope Order issued under Clause 16.2.3 of this Agreement shall be acquired in accordance with the provisions of Clause 10.3.6 of this Agreement. Upon acquisition, such land shall form part of the Site and vest in the Authority.

Annex - I: Site (Schedule-A)

1. Site

The Site of the Project Highway comprises the section of National Highway 927-D commencing from km 50+925 to km 3+720 i.e. the Kalavad to Jamnagar section in the State of Gujarat. The land, carriageway and structures comprising the Site are described below. The index plan and location plan of the project highway is given in appendix A-1.

2. Land

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

Sr. No.	Existing Chainage (km)		Ex Length (Km)	Existing ROW (m)
	From	To		
1	50+925	3+720	47.205	24.00

3. Carriageway

The present carriageway of the Project Highway is intermediate to lane two lane in general except 4-lane in Kalavad town. The types of the existing pavements are flexible pavement.

4. Major Bridges

The Site includes the following Major Bridges:

Sr. No.	Existing Chainage (km)	Type of Structure			No. of Spans with span length (m)	Width (m)
		Foundati on	Sub-structure	Super-structure		
1	46+270	-	Stone Masonry	RCC Solid Slab Type	9 x 7.0	8.20
2	35+625 (Moti Phuljar River)	Not Visible	Stone Masonry	RCC Solid Slab Type	12 x 6.80	6.70

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

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

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

6. Grade Separators

The Site includes the following grade separators:

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

7. Minor bridges

The Site includes the following minor bridges:

S. No.	Existing km	Type of Structure			No. of Spans with span length (m)	Width (m)
		Foundation	Sub-structure	Super-structure		
1	45+730	Not Visible	SM & PCC	RCC Slab	1 x 9.10 (Skew)	20.2
2	44+990	Open	Stone Masonry	RCC Slab	2x 3.00 (Clear)	7.3
3	44+570	Open	Stone Masonry	RCC Slab	2x 3.00 (Clear)	7.2
4	40+365	Open	Stone Masonry	RCC Slab	2x 3.00 (Clear)	6.5
5	39+990	Open	Stone Masonry	RCC Slab	2x 3.00 (Clear) (Skew)	7.5
6	39+520	Open	Stone Masonry	RCC Slab	4x 1.50 (Clear)	7
7	38+580	Not Visible	Stone Masonry	RCC Slab	5 x 6.50	7
8	37+955	Open	Stone Masonry	RCC Slab	2x 3.00 (Clear)	7.6
9	36+880	Not Visible	Stone Masonry	RCC Slab	5 x 7.00	7.2
10	28+800	Not Visible	Stone Masonry	RCC Slab	3 x 6.80	7.7
11	28+600	Open	Stone Masonry	RCC Slab	5 x 6.80	6.5
12	21+730	Not Visible	Stone Masonry	RCC Slab	4 x 6.00	7.8
13	20+275	Not Visible	Stone Masonry	RCC Slab	2 x 6.00 (Skew)	7.8 (Skew)
14	17+835	Open	Stone Masonry	RCC Slab	7 x 6.00	7.3
15	9+050	Not Visible	Stone Masonry	RCC Slab	2 x 5.40	8.1
16	6+480	Not Visible	Stone Masonry	RCC Slab	6 x 3.70	8.15

8. Railway level crossings

The Site includes the following railway level crossings:

S. No.	Existing Chainage (km)	LC No.	Remarks
Nil			

9. Underpasses (vehicular, non-vehicular)

The Site includes the following underpasses:

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

10. Culverts

The Site has the following culverts:

S. No.	Km	Type of Culvert	Span (m)	Width (m)
1	48+775	Pipe	2 x 1.20	11.10
2	48+266	Pipe	1 x 0.90	21.70
3	47+330	Pipe	2 x 1.20	21.70
4	47+130	Pipe	3 x 0.90	21.70
5	47+000	Pipe	2 x 1.20	21.20
6	46+893	Pipe	1 x 0.90	21.10
7	46+660	Pipe	1 x 0.90	17.10
8	46+000	Slab	1 x 5.00	22.40
9	44+790	Slab	2 x 1.50	7.25
10	44+080	Slab	2 x 0.90	9.65
11	43+265	Slab	2 x 1.20	7.20
12	42+320	Slab	2 x 2.25	7.35
13	41+670	Slab	2 x 1.50	7.05
14	40+790	Slab	2 x 2.50	7.65
15	39+235	Slab	2 x 1.20	7.50
16	37+330	Slab	3 x 1.50	7.20
17	36+340	Pipe	1 x 1.20	12.00
18	35+180	Slab	1 x 2.30	7.15
19	34+700	Slab	2 x 1.60	7.25
20	34+430	Pipe (Canal)	1 x 0.30	17.80
21	33+316	Pipe (Canal)	1 x 0.90	24.50
22	33+300	Pipe	2 x 0.75	11.50
23	33+220	Pipe	1 x 0.90	11.50
24	32+325	Slab	2 x 2.50	6.60
25	32+050	Slab	2 x 1.20	7.25
26	31+910	Pipe	2 x 0.60	7.10
27	31+770	Slab	2 x 1.80	6.70
28	31+530	Slab	3 x 1.80	7.05
29	31+325	Slab	2 x 1.80	10.90
30	31+085	Pipe	2 x 0.75	6.80
31	30+915	Pipe	2 x 0.75	6.45
32	30+625	Pipe	1 x 0.90	9.80
33	30+180	Pipe	2 x 0.90	10.10

S. No.	Km	Type of Culvert	Span (m)	Width (m)
34	28+275	Slab	2 x 2.50	7.70
35	27+160	Pipe	1 x 1.20	9.70
36	27+005	Pipe	1 x 0.90	12.30
37	26+532	Pipe	1 x 0.90	12.40
38	25+625	Pipe	1 x 0.90	12.40
39	25+320	Pipe	4 x 0.75	9.70
40	24+995	Pipe	2 x 0.90	11.90
41	24+890	Pipe	4 x 1.20	9.80
42	24+630	Pipe	4 x 1.20	9.50
43	24+340	Pipe	1 x 1.20	9.95
44	24+160	Pipe	2 x 1.20	9.50
45	23+510	Pipe	2 x 0.90	9.70
46	23+260	Slab	1 x 4.30	9.50
47	22+650	Pipe	1 x 0.90	9.70
48	22+460	Pipe	3 x 0.90	9.70
49	21+220	Pipe	2 x 0.90	12.00
50	19+510	Pipe	1x0.9+1x0.6	12.40
51	18+620	Pipe	1 x 0.75	8.30
52	18+085	Pipe	2 x 0.90	12.90
53	17+450	Pipe (Canal)	1 x 0.90	9.30
54	17+325	Pipe	1 x 0.90	8.60
55	16+140	Pipe	1 x 0.90	9.70
56	15+900	Pipe	2 x 0.90	9.74
57	14+950	Pipe	3 x 0.90	9.10
58	12+955	Slab (Canal)	1 x 2.10	9.30
59	12+500	Vented Causeway (Pipe)	6 x 0.90	8.65
60	11+670	Slab	1 x 1.60	9.70
61	11+490	Slab	1 x 3.50	9.70
62	11+100	Slab	1 x 3.80	9.70
63	10+800	Slab	1 x 3.80	9.70
64	10+390	Slab	1 x 1.50	10.00
65	9+800	Pipe	1 x 1.20	10.10
66	9+515	Slab	1 x 1.50	10.10
67	9+380	Pipe	1 x 0.90	10.10

S. No.	Km	Type of Culvert	Span (m)	Width (m)
68	8+730	Slab	3 x 1.50	10.95
69	7+145	Pipe	2 x 0.90	10.56
70	6+915	Pipe	1 x 0.90	9.90
71	6+180	Slab	1 x 2.50	10.90
72	5+565	Slab	3 x 0.90	10.90
73	3+795	Slab	1 x 5.0	10.10

11. Bus bays

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

S. No.	Existing Chainage (km)	Length (m)	Left Hand Side	Right Hand Side
1	48+455		-	RHS
2	44+280		LHS	-
3	41+440		-	RHS
4	40+745		LHS	-
5	38+720		LHS	-
6	31+040		-	RHS
7	28+675		LHS	-
8	22+215		-	RHS
9	22+080		LHS	-
10	19+860		LHS	-
11	18+645		-	RHS
12	17+950		-	RHS
13	13+885		-	RHS
14	12+100		LHS	-
15	11+210		LHS	-
16	10+345		-	RHS

12. Truck Lay byes

The details of truck lay byes are as follows:

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

13. Road side drains

There is no line drain along project highway. The existing earthen drainage has been found at following location along project road. The details of the roadside drains are as follows:

S. No.	Location		Length	Type	
	From km	to km		Masonry/cc (Pucca)	Earthen (Kutcha)
1	40+375	39+980	395	-	LHS
2	38+050	36+860	1910	-	LHS
3	28+000	27+960	40	-	LHS
4	17+295	16+600	695	-	LHS
5	40+100	40+000	100	-	RHS
6	38+165	37+050	1115	-	RHS
7	27+100	27+000	100	-	RHS
8	5+540	5+340	200	-	RHS
Total			4555		

14. Major junctions

The details of major junctions are as follows:

Sr. No.	Existing Chainage (Km)	Type of Junction	Crossing Side (LHS/RHS)		Carriageway Width (m)	Category of Road
1	46+500	3-Legged		Rajkot	4 lane (7+7)	SH-23
2	45+760	3-Legged		Phalla	7.0	SH-94
3	11+210	3-Legged		Aliyapada	7.0	SH
4	4+630	4-Legged	Dwarka	Morbi	4 lane (7+7)	NH-151A

15. Minor junctions

The details of the minor junctions are as follows:

Sr. No.	Existing Chainage (km)	Type of Junction	Side	Cross Road
1	47+500	T	RHS	Mota Bhadukiya
2	47+300	X	Both	Pipaliya (LHS) Sardarbag (RHS)
3	45+515	Y	LHS	Wavadi
4	44+615	T	LHS	Wavadi
5	38+710	Y	RHS	Ranuja
6	31+030	T	RHS	Varudi Temple
7	28+600	Y	LHS	Khankotda
8	22+235	Y	RHS	Nani Matli
9	19+850	T	RHS	Pasaya
10	18+000	T	RHS	Beraja
11	17+465	Y	RHS	Aliya
12	12+200	Y	LHS	Miyathara
13	11+980	T	RHS	Vijrakhi

Sr. No.	Existing Chainage (km)	Type of Junction	Side	Cross Road
14	10+345	X	Both	Suwarada (LHS) (RHS)
15	8+700	T	RHS	I.O.C. Ltd
16	6+245	X	Both	Theba (LHS) (RHS)
17	4+630	X	Both	Khambhaliya (LHS) & Dhrol (RHS)

16. Bypasses

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

Sr. No.	Name of bypass	Existing Chainage (km)		Length (m)
		From	To	
1	Kalavad	50+925	42+930	9430

17. Other structures

S. No.	Existing Chainage (Km)	Type of Structure	No. of Spans with Span Length (m)	Width (m)
Nil				

18. Utilities

(i) Electrical Utilities

The site includes the following electrical utilities:

(a) High-Tension Lines (HT Lines)

Sr. No.	Chainage	Location	Capacity	HT Tower Height (Mtr)	FRL	Ground Level
1	46+875	Sikka-Jamnagar line	132 KVA	11.5	27.241	18.211
2	47+020	Jamnagar-Nagdi line	132 KVA	11.5	24.839	17.717

(b) Low Tension Lines

Low tension Lines (LT Lines)- Jamnagar Section Details

CIN : U40102GJ2003SGC042908
(LEADING ELECTRICITY DISTRIBUTOR IN WESTERN REGION OF GUJARAT IN INDIA)

Pachim Gujarat Vij Company Ltd. Gujarat.
Quantity Sheet of Electrical Utility Shifting Work of NH 927D

Package : V
Road Location : JAMNAGAR TO KALAWAD
Project Name : FOUR LANE NH-927D JAMNAGAR-KALAWAD
Name Of Applicant : DY.EX.ENG, NH SUB DIVISION, MORBI

Ch. No : 4.0KM TO 22.0KM
Sub - Division : HAPA
Division : CITY-1, JAMNAGAR
Catagary : D

Page No.	Ch. No.		LT Line Pole		11 KV Line Pole		11 KV Line in KM (Length)		11 KV Total Length		11 KV Tapping		11 KV DP Without A.B.		11 KV DP With A.B.		New DTC		Shifting DTC		Road Crossing	
	From	To	LHS	RHS	LHS	RHS	LHS	RHS	LHS + RHS	LHS	RHS	LHS	RHS	LHS	RHS	LHS	RHS	LHS	RHS	45 Mtr	60 Mtr	
1	4.00+000	5.55+000			31	57	1.24	2.28	3.52	3	1	0	0	0	1			2	4	3		
2	5.55+000	7.30+000			35	59	1.4	2.36	3.76	2	4	0	2		2			2	7	5		
3	7.30+000	9.3+000			18	53	0.72	2.12	2.84	3	4	0	2	0	0			2	2	3		
4	9.3+000	11.9+000			53	37	2.12	1.48	3.6	2	3	0	0	0	0			6	2	7		
5	11.9+000	17.3+000			115	46	4.6	1.84	6.44	9	3	1	3	0	0			2	0	0		
6	17.3+000	20.5+000			65	35	2.6	1.4	4	3	2	0	0	0	0			2	0	0		
7	20.5+000	22.00+000			35	51	1.4	2.04	3.44	1	4	0	0	0	1			2	0	1		
Total Quantity of Ch. No : 4.00+000 To 22.0+000			0	0	352	338	14.08	13.52	27.6	23	21	1	7	0	4	0	0	18	17	24	0	

Total Quantity of Ch. No : 4.00+000 To 22.0+000	LT Line Pole	11 KV Line Pole	11 KV Line in KM (Length)	11 KV Tapping	11 KV DP Without A.B.	11 KV DP With A.B.	New DTC	Shifting DTC	Road Crossing
	0	690	27.6	44	8	4	0	35	24


 Deputy Engineer
 HAPA Subdivision
 PGVCL, Jamnagar

Executive Eng
city-1 division
PGVCL, Jamnaga

Low tension Lines (LT Lines)- Kalawad Section Details

Electric Line Shifting Detail Doraji - Jamnagar Package - 2											
S.No.	Existing Km.		Electric Pole		Total No. Of Poles	Wire Length (meter)		Cross/Under Ground	Transformer		Remark
	From	To	Left	Right		Left	Right		Left	Right	
1	50+925	43+000	48	24	72	1375	490	19	4	1	Electrical line Crossing, shifting the electrical pole & Transformer shifting
2	43+000	42+000	21	5	26	430	215	2			Electrical line Crossing, shifting the electrical pole
3	42+000	41+000	10	25	35	279	993	2			Electrical line Crossing, shifting the electrical pole
4	41+000	40+000	2	22	24		1024	2			Electrical line Crossing & shifting the electrical pole
5	40+000	39+000	11	13	24	185	773	3	2		Electrical line Crossing, shifting the electrical pole & Transformer shifting
6	39+000	38+000	8	11	19	134	324		1		Electrical line Crossing, shifting the electrical pole & Transformer shifting
7	38+000	37+000	10	21	31	356	986	3	1		Electrical line Crossing, shifting the electrical pole & Transformer shifting
8	37+000	36+000									
9	36+000	35+000	11	13	24	548	642	4	5	1	Electrical line Crossing, shifting the electrical pole & Transformer shifting
10	35+000	34+000									
11	34+000	33+000	9	4	13	254	68	1	1		Electrical line Crossing, shifting the electrical pole & Transformer shifting
12	33+000	32+000	3	4	7		207	2	1		Electrical line Crossing, shifting the electrical pole & Transformer shifting
13	32+000	31+000	0	0	0	0	0	0	0	0	
14	31+000	30+000	5	3	8	160	93	1	1	0	Electrical line Crossing & shifting the electrical pole
15	30+000	29+000	15	4	19	536	90	1	1	0	Electrical line Crossing, shifting the electrical pole & Transformer shifting
16	29+000	28+000	16	10	26	562	560	4			Electrical line Crossing & shifting the electrical pole
17	28+000	27+000	20	9	29	1017	286	1		1	Electrical line Crossing, shifting the electrical pole & Transformer shifting
18	27+000	26+000	27	4	31	1110	48	2			Electrical line Crossing & shifting the electrical pole
19	26+000	25+000	22	13	35	772	671	1			Electrical line Crossing & shifting the electrical pole
20	25+000	24+000	11	5	16	413	88	1			Electrical line Crossing & shifting the electrical pole
21	24+000	23+000	16	13	29	427	678	1		1	Electrical pole shifting & Transformer shifting
22	23+000	22+000	29	7	36	1292	723	2			Electrical line Crossing & shifting the electrical pole
			294	210	504	9850	8959	52	17	4	

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

The site includes following Public Health Utilities:

Jamnagar Section: -

Water Pipe Line Shifting Details _Jamnagar							
S.No.	Existing Km.		Line Length (meter)		Diameter (mm)	Cross/Under Ground	Remarks
	From	To	Left	Right			
1	4+000	5+000			2000	1	Water Pipe Line Crossing
2	5+000	6+000			250	1	Water Pipe Line Crossing
3	6+000	7+000			90	1	Water Pipe Line Crossing
4	10+000	11+000			200	1	Water Pipe Line Crossing
5	13+000	14+000			200	1	Water Pipe Line Crossing
6	14+000	15+000	237		200		Water Pipe Line Shifting
7	15+000	16+000	1005		200		Water Pipe Line Shifting
8	16+000	17+000	924		200		Water Pipe Line Shifting
9	17+000	18+000	950		200		Water Pipe Line Shifting
Total =			3116	0			

Kalavad Section:

Water Pipe Line Shifting Details_ Kalavad							
S.No.	Existing Km.		Line Length (meter)		Diameter (mm)	Cross/Under Ground	Remark
	From	To	Left	Right			
1			365				Municipal Corporation Line (Design Start Point Chainage 0+000
2					1500	1	Crossing for Water pipe line Bypass Design Chainage (4+900 to 5+000)
3	42+000	41+000	980		200		Water Pipe Line Shifting
4	41+000	40+000	1020		200		Water Pipe Line Shifting
5	40+000	39+000	974		200		Water Pipe Line Shifting
6	39+000	38+000		594	180	2	Water Pipe Line Shifting & Crossing
7	38+000	37+000		1008	180		Water Pipe Line Shifting
8	37+000	36+000		637	180		Water Pipe Line Shifting
9	35+000	34+000		487	180		Water Pipe Line Shifting
10	34+000	29+000		6481	180	1	Water Pipe Line Shifting & Crossing
11	30+000	32+000	163		200	1	Water Pipe Line Shifting & Crossing
12	29+000	23+000		6625	180		Water Pipe Line Shifting
Total =			3502	15832			

Annex - II: Dates for Providing Right of Way of Construction Zone

(Schedule-A)

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

S. No.	Existing Km		Design Chainage		Length (km)	Width (m)	Date of providing ROW*
	From	To	From	To			
1	2		3		4	5	6
Full Right of Way (Full Width)							
Nil							On appointed Date
Partial Right of Way (part width)							
1	42.930	41.940	9.430	10.422	0.992	24	On appointed Date
2	41.940	41.752	10.422	10.613	0.191	24	
3	41.752	39.080	10.613	13.280	2.667	24	
4	38.810	38.520	13.550	13.850	0.300	24	
5	37.854	36.340	14.280	16.020	1.740	24	
6	34.460	29.000	17.340	22.800	5.460	24	
7	28.600	17.835	23.145	33.735	10.590	24	
8	17.450	16.550	34.145	35.000	0.855	24	
9	16.140	14.430	35.410	37.120	1.710	24	
10	12.215	12.175	39.110	39.150	0.040	24	
11	11.875	10.700	39.450	40.600	1.150	24	
12	10.700	9.750	40.600	41.600	1.000	24	
13	9.750	9.300	41.600	42.050	0.450	24	
14	9.300	7.336	42.050	43.886	1.836	24	
15	7.336	7.145	43.886	44.077	0.191	24	
16	7.145	6.380	44.077	44.950	0.873	24	
17	6.380	3.720	44.950	47.572	2.622	24	
Total					32.667		

Balance Right of Way								
Sr. No.	Existing Km		Design Chainage (Km)		Length (m)	Balance ROW	Remarks	Date of Providing ROW
	From	To	From	To				
1	50+925	42+930	0+000	9+430	9430	45.00	Bypass	After 5 months of appointed date
2	42+930	42+860	9+430	9+500	70	10.36	Widening	
3	42+860	42+760	9+500	9+600	100	8.49	Widening	
4	42+760	42+660	9+600	9+700	100	8.40	Widening	
5	42+660	42+560	9+700	9+800	100	6.99	Widening	

Balance Right of Way								
Sr. No.	Existing Km		Design Chainage (Km)		Length (m)	Balance ROW	Remarks	Date of Providing ROW
	From	To	From	To				
6	42+560	42+460	9+800	9+900	100	8.75	Widening	
7	42+460	42+360	9+900	10+000	100	7.83	Widening	
8	42+360	42+260	10+000	10+100	100	7.93	Widening	
9	42+260	42+160	10+100	10+200	100	8.54	Widening	
10	42+160	42+060	10+200	10+300	100	8.04	Widening	
11	42+060	41+960	10+300	10+400	100	8.08	Widening	
12	41+960	41+860	10+400	10+500	100	18.08	Widening	
13	41+860	41+760	10+500	10+600	100	18.20	Widening	
14	41+760	41+660	10+600	10+700	100	7.27	Widening	
15	41+660	41+560	10+700	10+800	100	8.59	Widening	
16	41+560	41+460	10+800	10+900	100	16.00	Widening	
17	41+460	41+360	10+900	11+000	100	16.00	Widening	
18	41+360	41+260	11+000	11+100	100	8.19	Widening	
19	41+260	41+160	11+100	11+200	100	6.00	Widening	
20	41+160	41+060	11+200	11+300	100	8.00	Widening	
21	41+060	40+960	11+300	11+400	100	8.15	Widening	
22	40+960	40+860	11+400	11+500	100	8.20	Widening	
23	40+860	40+760	11+500	11+600	100	8.02	Widening	
24	40+760	40+660	11+600	11+700	100	6.00	Widening	
25	40+660	40+560	11+700	11+800	100	19.65	Widening	
26	40+560	40+460	11+800	11+900	100	17.98	Widening	
27	40+460	40+360	11+900	12+000	100	7.94	Widening	
28	40+360	40+260	12+000	12+100	100	8.43	Widening	
29	40+260	40+160	12+100	12+200	100	8.29	Widening	
30	40+160	40+060	12+200	12+300	100	8.00	Widening	
31	40+060	39+960	12+300	12+400	100	8.23	Widening	
32	39+960	39+860	12+400	12+500	100	8.07	Widening	
33	39+860	39+760	12+500	12+600	100	8.06	Widening	
34	39+760	39+660	12+600	12+700	100	8.13	Widening	
35	39+660	39+560	12+700	12+800	100	7.93	Widening	
36	39+560	39+460	12+800	12+900	100	7.83	Widening	
37	39+460	39+360	12+900	13+000	100	8.27	Widening	
38	39+360	39+260	13+000	13+100	100	16.00	Widening	
39	39+260	39+160	13+100	13+200	100	26.00	Widening	
40	39+160	39+060	13+200	13+300	100	23.50	Widening	
41	39+060	38+960	13+300	13+400	100	36.70	Widening	
42	38+960	38+860	13+400	13+500	100	40.35	Widening	

Balance Right of Way								
Sr. No.	Existing Km		Design Chainage (Km)		Length (m)	Balance ROW	Remarks	Date of Providing ROW
	From	To	From	To				
43	38+860	38+760	13+500	13+800	300	21.00	Widening	
44	38+760	37+895	13+800	14+450	650	45.00	Realignment	
45	37+895	37+845	14+450	14+500	50	11.51	Widening	
46	37+845	37+745	14+500	14+600	100	6.00	Widening	
47	37+745	37+645	14+600	14+700	100	7.65	Widening	
48	37+645	37+545	14+700	14+800	100	7.76	Widening	
49	37+545	37+445	14+800	14+900	100	8.19	Widening	
50	37+445	37+345	14+900	15+000	100	9.16	Widening	
51	37+345	37+245	15+000	15+100	100	7.88	Widening	
52	37+245	37+145	15+100	15+200	100	8.08	Widening	
53	37+145	37+045	15+200	15+300	100	8.18	Widening	
54	37+045	36+945	15+300	15+400	100	8.47	Widening	
55	36+945	36+845	15+400	15+500	100	8.16	Widening	
56	36+845	36+745	15+500	15+600	100	8.96	Widening	
57	36+745	36+645	15+600	15+700	100	8.53	Widening	
58	36+645	36+545	15+700	15+800	100	8.04	Widening	
59	36+545	36+445	15+800	15+900	100	7.94	Widening	
60	36+445	36+345	15+900	16+000	100	7.60	Widening	
61	36+345	36+295	16+000	16+050	50	21.00	Widening	
62	36+295	34+480	16+050	17+300	1250	45.00	Realignment	
63	34+480	34+380	17+300	17+400	100	21.00	Widening	
64	34+380	34+280	17+400	17+500	100	8.16	Widening	
65	34+280	34+180	17+500	17+600	100	8.09	Widening	
66	34+180	34+080	17+600	17+700	100	7.92	Widening	
67	34+080	33+980	17+700	17+800	100	8.29	Widening	
68	33+980	33+880	17+800	17+900	100	8.17	Widening	
69	33+880	33+780	17+900	18+000	100	7.80	Widening	
70	33+780	33+680	18+000	18+100	100	7.88	Widening	
71	33+680	33+580	18+100	18+200	100	7.79	Widening	
72	33+580	33+480	18+200	18+300	100	8.33	Widening	
73	33+480	33+380	18+300	18+400	100	8.13	Widening	
74	33+380	33+280	18+400	18+500	100	8.31	Widening	
75	33+280	33+180	18+500	18+600	100	8.00	Widening	
76	33+180	33+080	18+600	18+700	100	7.60	Widening	
77	33+080	32+980	18+700	18+800	100	8.17	Widening	
78	32+980	32+880	18+800	18+900	100	8.06	Widening	

Balance Right of Way								
Sr. No.	Existing Km		Design Chainage (Km)		Length (m)	Balance ROW	Remarks	Date of Providing ROW
	From	To	From	To				
79	32+880	32+780	18+900	19+000	100	7.94	Widening	
80	32+780	32+680	19+000	19+100	100	13.50	Widening	
81	32+680	32+580	19+100	19+200	100	19.18	Widening	
82	32+580	32+480	19+200	19+300	100	13.50	Widening	
83	32+480	32+380	19+300	19+400	100	8.03	Widening	
84	32+380	32+280	19+400	19+500	100	7.98	Widening	
85	32+280	32+180	19+500	19+600	100	8.15	Widening	
86	32+180	32+080	19+600	19+700	100	7.85	Widening	
87	32+080	31+980	19+700	19+800	100	7.85	Widening	
88	31+980	31+880	19+800	19+900	100	8.81	Widening	
89	31+880	31+780	19+900	20+000	100	8.53	Widening	
90	31+780	31+680	20+000	20+100	100	8.31	Widening	
91	31+680	31+580	20+100	20+200	100	27.43	Widening	
92	31+580	31+480	20+200	20+300	100	28.51	Widening	
93	31+480	31+380	20+300	20+400	100	21.00	Widening	
94	31+380	31+280	20+400	20+500	100	8.27	Widening	
95	31+280	31+180	20+500	20+600	100	7.92	Widening	
96	31+180	31+080	20+600	20+700	100	21.90	Widening	
97	31+080	30+980	20+700	20+800	100	7.97	Widening	
98	30+980	30+880	20+800	20+900	100	8.13	Widening	
99	30+880	30+780	20+900	21+000	100	7.82	Widening	
100	30+780	30+680	21+000	21+100	100	8.09	Widening	
101	30+680	30+580	21+100	21+200	100	8.02	Widening	
102	30+580	30+480	21+200	21+300	100	8.36	Widening	
103	30+480	30+380	21+300	21+400	100	7.44	Widening	
104	30+380	30+280	21+400	21+500	100	7.71	Widening	
105	30+280	30+180	21+500	21+600	100	8.02	Widening	
106	30+180	30+080	21+600	21+700	100	7.91	Widening	
107	30+080	29+980	21+700	21+800	100	7.96	Widening	
108	29+980	29+880	21+800	21+900	100	7.91	Widening	
109	29+880	29+780	21+900	22+000	100	8.02	Widening	
110	29+780	29+680	22+000	22+100	100	7.81	Widening	
111	29+680	29+580	22+100	22+200	100	7.99	Widening	
112	29+580	29+480	22+200	22+300	100	7.65	Widening	
113	29+480	29+380	22+300	22+400	100	6.65	Widening	
114	29+380	29+280	22+400	22+500	100	16.71	Widening	
115	29+280	29+170	22+500	22+600	100	19.30	Widening	

Balance Right of Way								
Sr. No.	Existing Km		Design Chainage (Km)		Length (m)	Balance ROW	Remarks	Date of Providing ROW
	From	To	From	To				
116	29+170	29+070	22+600	22+700	100	18.36	Widening	
117	29+070	28+970	22+700	22+800	100	18.17	Widening	
118	28+970	28+870	22+800	22+900	100	17.90	Widening	
119	28+870	28+760	22+900	23+000	100	40.41	Widening	
120	28+760	28+650	23+000	23+100	100	47.15	Widening	
121	28+650	28+530	23+100	23+200	100	31.73	Widening	
122	28+530	28+430	23+200	23+300	100	7.40	Widening	
123	28+430	28+330	23+300	23+400	100	8.08	Widening	
124	28+330	28+230	23+400	23+500	100	6.04	Widening	
125	28+230	28+130	23+500	23+600	100	17.93	Widening	
126	28+130	28+030	23+600	23+700	100	18.02	Widening	
127	28+030	27+930	23+700	23+800	100	18.96	Widening	
128	27+930	27+830	23+800	23+900	100	8.21	Widening	
129	27+830	27+730	23+900	24+000	100	7.91	Widening	
130	27+730	27+630	24+000	24+100	100	7.97	Widening	
131	27+630	27+530	24+100	24+200	100	7.90	Widening	
132	27+530	27+430	24+200	24+300	100	6.27	Widening	
133	27+430	27+330	24+300	24+400	100	7.18	Widening	
134	27+330	27+230	24+400	24+500	100	8.05	Widening	
135	27+230	27+130	24+500	24+600	100	7.96	Widening	
136	27+130	27+030	24+600	24+700	100	7.67	Widening	
137	27+030	26+930	24+700	24+800	100	7.78	Widening	
138	26+930	26+830	24+800	24+900	100	7.81	Widening	
139	26+830	26+730	24+900	25+000	100	7.36	Widening	
140	26+730	26+630	25+000	25+100	100	7.88	Widening	
141	26+630	26+530	25+100	25+200	100	8.13	Widening	
142	26+530	26+470	25+200	25+300	100	15.87	Widening	
143	26+470	26+370	25+300	25+400	100	27.19	Widening	
144	26+370	26+270	25+400	25+500	100	34.92	Widening	
145	26+270	26+170	25+500	25+600	100	13.38	Widening	
146	26+170	26+070	25+600	25+700	100	8.11	Widening	
147	26+070	25+970	25+700	25+800	100	7.97	Widening	
148	25+970	25+870	25+800	25+900	100	8.22	Widening	
149	25+870	25+770	25+900	26+000	100	9.28	Widening	
150	25+770	25+670	26+000	26+100	100	8.57	Widening	
151	25+670	25+570	26+100	26+200	100	8.15	Widening	
152	25+570	25+470	26+200	26+300	100	8.14	Widening	

Balance Right of Way								
Sr. No.	Existing Km		Design Chainage (Km)		Length (m)	Balance ROW	Remarks	Date of Providing ROW
	From	To	From	To				
153	25+470	25+370	26+300	26+400	100	8.08	Widening	
154	25+370	25+270	26+400	26+500	100	6.85	Widening	
155	25+270	25+170	26+500	26+600	100	7.55	Widening	
156	25+170	24+935	26+600	26+700	100	7.91	Widening	
157	24+935	24+835	26+700	26+800	100	7.98	Widening	
158	24+835	24+735	26+800	26+900	100	8.07	Widening	
159	24+735	24+635	26+900	27+000	100	8.12	Widening	
160	24+635	24+535	27+000	27+100	100	8.37	Widening	
161	24+535	24+435	27+100	27+200	100	7.83	Widening	
162	24+435	24+335	27+200	27+300	100	7.36	Widening	
163	24+335	24+235	27+300	27+400	100	7.73	Widening	
164	24+235	24+135	27+400	27+500	100	8.29	Widening	
165	24+135	24+035	27+500	27+600	100	8.27	Widening	
166	24+035	23+935	27+600	27+700	100	7.95	Widening	
167	23+935	23+835	27+700	27+800	100	7.74	Widening	
168	23+835	23+735	27+800	27+900	100	7.94	Widening	
169	23+735	23+635	27+900	28+000	100	7.13	Widening	
170	23+635	23+535	28+000	28+100	100	8.03	Widening	
171	23+535	23+435	28+100	28+200	100	8.16	Widening	
172	23+435	23+235	28+200	28+400	200	21.00	Widening	
173	23+235	23+135	28+400	28+500	100	7.98	Widening	
174	23+135	23+035	28+500	28+600	100	7.77	Widening	
175	23+035	22+935	28+600	28+700	100	7.91	Widening	
176	22+935	22+835	28+700	28+800	100	7.91	Widening	
177	22+835	22+735	28+800	28+900	100	9.03	Widening	
178	22+735	22+635	28+900	29+000	100	21.95	Widening	
179	22+635	22+535	29+000	29+100	100	8.91	Widening	
180	22+535	22+335	29+100	29+300	200	16.00	Widening	
181	22+335	22+235	29+300	29+400	100	8.84	Widening	
182	22+235	22+135	29+400	29+500	100	10.65	Widening	
183	22+135	22+035	29+500	29+600	100	18.26	Widening	
184	22+035	21+955	29+600	29+700	100	18.03	Widening	
185	21+955	21+855	29+700	29+800	100	17.85	Widening	
186	21+855	21+755	29+800	29+900	100	7.67	Widening	
187	21+755	21+655	29+900	30+000	100	7.94	Widening	
188	21+655	21+555	30+000	30+100	100	7.87	Widening	
189	21+555	21+255	30+100	30+400	300	21.00	Widening	

Balance Right of Way								
Sr. No.	Existing Km		Design Chainage (Km)		Length (m)	Balance ROW	Remarks	Date of Providing ROW
	From	To	From	To				
190	21+255	21+155	30+400	30+500	100	8.16	Widening	
191	21+155	21+045	30+500	30+600	100	9.08	Widening	
192	21+045	20+930	30+600	30+700	100	26.43	Widening	
193	20+930	20+830	30+700	30+800	100	34.66	Widening	
194	20+830	20+530	30+800	31+100	300	21.00	Widening	
195	20+530	20+430	31+100	31+200	100	7.62	Widening	
196	20+430	20+330	31+200	31+300	100	8.12	Widening	
197	20+330	20+230	31+300	31+400	100	7.95	Widening	
198	20+230	20+130	31+400	31+500	100	7.90	Widening	
199	20+130	19+780	31+500	31+800	300	16.00	Widening	
200	19+780	19+680	31+800	31+900	100	7.90	Widening	
201	19+680	19+580	31+900	32+000	100	18.30	Widening	
202	19+580	19+480	32+000	32+100	100	18.58	Widening	
203	19+480	19+380	32+100	32+200	100	8.12	Widening	
204	19+380	19+280	32+200	32+300	100	7.98	Widening	
205	19+280	19+180	32+300	32+400	100	7.52	Widening	
206	19+180	19+080	32+400	32+500	100	7.48	Widening	
207	19+080	18+980	32+500	32+600	100	7.67	Widening	
208	18+980	18+880	32+600	32+700	100	8.03	Widening	
209	18+880	18+780	32+700	32+800	100	7.86	Widening	
210	18+780	18+680	32+800	32+900	100	7.75	Widening	
211	18+680	18+580	32+900	33+000	100	6.00	Widening	
212	18+580	18+280	33+000	33+300	300	21.00	Widening	
213	18+280	18+180	33+300	33+400	100	24.05	Widening	
214	18+180	18+080	33+400	33+500	100	16.00	Widening	
215	18+080	17+980	33+500	33+600	100	6.65	Widening	
216	17+980	17+870	33+600	33+700	100	21.10	Widening	
217	17+870	17+790	33+700	33+800	100	21.00	Widening	
218	17+790	17+510	33+800	34+100	300	45.00	Curve Improvem ent	
219	17+510	17+410	34+100	34+200	100	37.61	Widening	
220	17+410	17+310	34+200	34+300	100	21.00	Widening	
221	17+310	17+210	34+300	34+400	100	23.50	Widening	
222	17+210	17+110	34+400	34+500	100	23.50	Widening	
223	17+110	17+010	34+500	34+600	100	16.00	Widening	
224	17+010	16+910	34+600	34+700	100	7.36	Widening	
225	16+910	16+810	34+700	34+800	100	7.52	Widening	

Balance Right of Way								
Sr. No.	Existing Km		Design Chainage (Km)		Length (m)	Balance ROW	Remarks	Date of Providing ROW
	From	To	From	To				
226	16+810	16+690	34+800	34+900	100	7.81	Widening	
227	16+690	16+590	34+900	35+000	100	7.75	Widening	
228	16+590	16+490	35+000	35+100	100	21.00	Widening	
229	16+490	16+390	35+100	35+200	100	45.00	Widening	
230	16+390	16+290	35+200	35+300	100	44.27	Widening	
231	16+290	16+190	35+300	35+400	100	43.80	Widening	
232	16+190	16+055	35+400	35+500	100	21.00	Widening	
233	16+055	15+955	35+500	35+600	100	8.29	Widening	
234	15+955	15+855	35+600	35+700	100	7.36	Widening	
235	15+855	15+755	35+700	35+800	100	6.97	Widening	
236	15+755	15+655	35+800	35+900	100	7.72	Widening	
237	15+655	15+555	35+900	36+000	100	21.00	Widening	
238	15+555	15+455	36+000	36+100	100	21.01	Widening	
239	15+455	15+355	36+100	36+200	100	9.30	Widening	
240	15+355	15+255	36+200	36+300	100	8.14	Widening	
241	15+255	15+155	36+300	36+400	100	8.15	Widening	
242	15+155	15+055	36+400	36+500	100	7.16	Widening	
243	15+055	14+955	36+500	36+600	100	7.38	Widening	
244	14+955	14+855	36+600	36+700	100	7.00	Widening	
245	14+855	14+755	36+700	36+800	100	8.41	Widening	
246	14+755	14+655	36+800	36+900	100	9.04	Widening	
247	14+655	14+555	36+900	37+000	100	8.94	Widening	
248	14+555	14+455	37+000	37+100	100	8.77	Widening	
249	14+455	13+955	37+100	37+150	50	6.00	Widening	
250	13+955	12+370	37+150	38+950	1800	45.00	Realignme nt	
251	12+370	12+275	38+950	39+050	100	25.30	Widening	
252	12+275	12+175	39+050	39+150	100	21.00	Widening	
253	12+175	12+075	39+150	39+250	100	31.62	Widening	
254	12+075	11+975	39+250	39+350	100	45.00	Widening	
255	11+975	11+875	39+350	39+450	100	36.41	Widening	
256	11+875	11+775	39+450	39+550	100	16.14	Widening	
257	11+775	11+675	39+550	39+650	100	16.00	Widening	
258	11+675	11+575	39+650	39+750	100	16.01	Widening	
259	11+575	11+475	39+750	39+850	100	7.98	Widening	
260	11+475	11+375	39+850	39+950	100	7.71	Widening	
261	11+375	11+275	39+950	40+050	100	8.20	Widening	

Balance Right of Way								
Sr. No.	Existing Km		Design Chainage (Km)		Length (m)	Balance ROW	Remarks	Date of Providing ROW
	From	To	From	To				
262	11+275	11+175	40+050	40+150	100	8.20	Widening	
263	11+175	11+075	40+150	40+250	100	8.39	Widening	
264	11+075	10+975	40+250	40+350	100	10.14	Widening	
265	10+975	10+875	40+350	40+450	100	8.21	Widening	
266	10+875	9+655	40+450	41+610	1160	21.00	Widening	
267	9+655	9+205	41+610	42+060	450	46.00	Toll Plaza	
268	9+205	9+115	42+060	42+150	90	6.00	Widening	
269	9+115	9+015	42+150	42+250	100	5.21	Widening	
270	9+015	8+915	42+250	42+350	100	7.83	Widening	
271	8+915	8+815	42+350	42+450	100	8.05	Widening	
272	8+815	8+715	42+450	42+550	100	8.39	Widening	
273	8+715	8+615	42+550	42+650	100	7.99	Widening	
274	8+615	8+515	42+650	42+750	100	8.08	Widening	
275	8+515	8+415	42+750	42+850	100	8.03	Widening	
276	8+415	8+315	42+850	42+950	100	8.27	Widening	
277	8+315	8+215	42+950	43+050	100	8.28	Widening	
278	8+215	8+115	43+050	43+150	100	8.14	Widening	
279	8+115	8+015	43+150	43+250	100	7.62	Widening	
280	8+015	7+915	43+250	43+350	100	8.20	Widening	
281	7+915	7+815	43+350	43+450	100	8.38	Widening	
282	7+815	7+715	43+450	43+550	100	8.23	Widening	
283	7+715	7+615	43+550	43+650	100	8.19	Widening	
284	7+615	7+515	43+650	43+750	100	8.44	Widening	
285	7+515	7+415	43+750	43+850	100	8.20	Widening	
286	7+415	7+315	43+850	43+950	100	7.88	Widening	
287	7+315	7+215	43+950	44+050	100	18.05	Widening	
288	7+215	7+115	44+050	44+150	100	18.14	Widening	
289	7+115	7+015	44+150	44+250	100	7.93	Widening	
290	7+015	6+915	44+250	44+350	100	7.92	Widening	
291	6+915	6+815	44+350	44+450	100	6.20	Widening	
292	6+815	6+715	44+450	44+550	100	6.44	Widening	
293	6+715	6+615	44+550	44+650	100	8.03	Widening	
294	6+615	6+515	44+650	44+750	100	8.25	Widening	
295	6+515	5+115	44+750	46+150	1400	21.00	Widening	
296	5+115	5+015	46+150	46+250	100	16.81	Widening	
297	5+015	4+915	46+250	46+350	100	16.00	Widening	
298	4+915	4+815	46+350	46+450	100	15.62	Widening	

Balance Right of Way								
Sr. No.	Existing Km		Design Chainage (Km)		Length (m)	Balance ROW	Remarks	Date of Providing ROW
	From	To	From	To				
299	4+815	4+715	46+450	46+550	100	14.05	Widening	
300	4+715	4+615	46+550	46+650	100	14.20	Widening	
301	4+615	4+565	46+650	46+700	50	34.62	Widening	
302	4+565	3+720	46+700	47+572	872	21.00	Widening	

Annex - III: Alignment Plans
(Schedule-A)

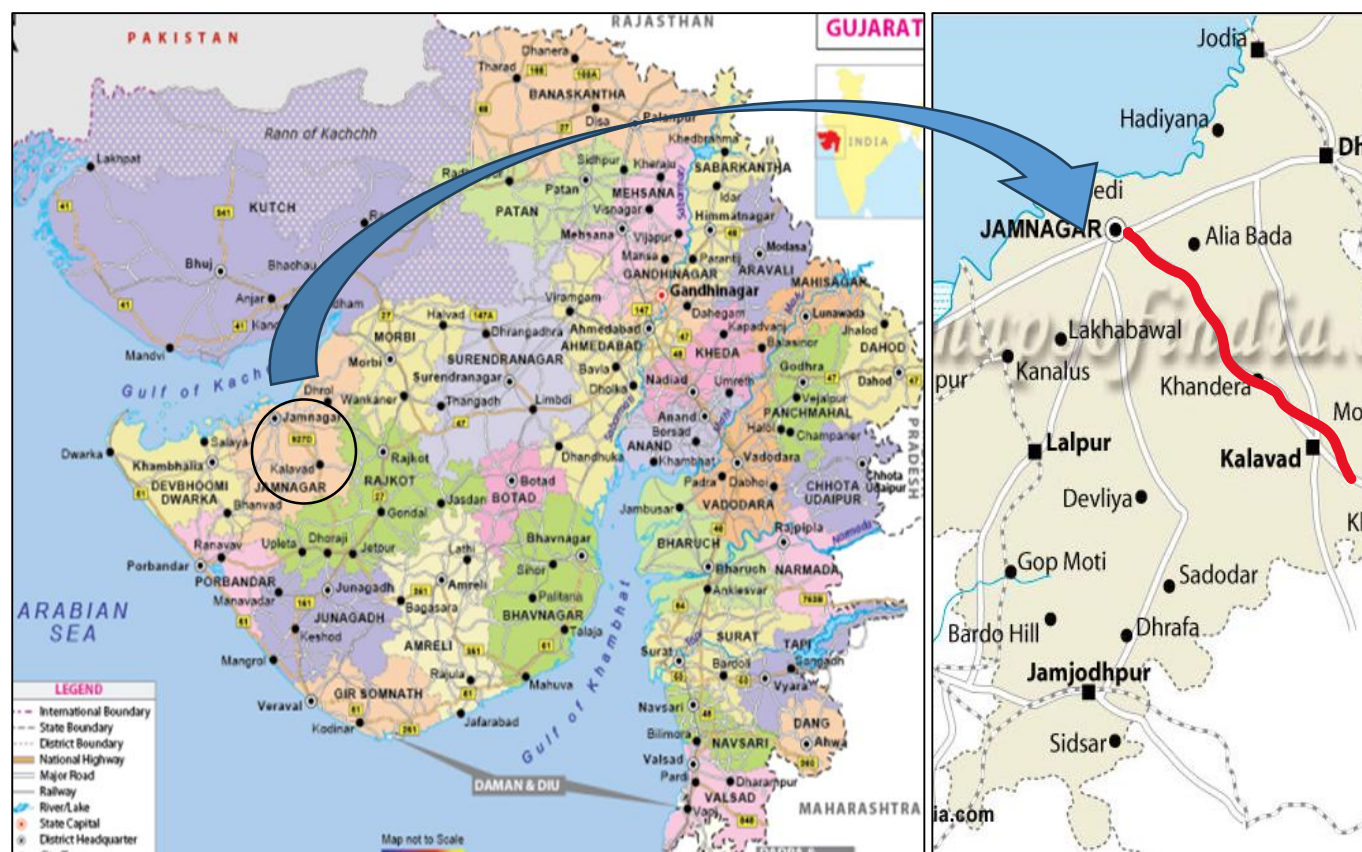
The existing alignment of the Project Highway shall be modified in the following sections as per the alignment plan indicated below:

- (i) The alignment of the Project Highway is enclosed in alignment plan. Finished road level indicated in the alignment plan shall be followed by the Concessionaire 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 Concessionaire shall, however, improve/upgrade the Road profile as indicated in **Annexure-III** based on site/design requirement.
- (ii) Traffic Signage plan of the Project Highway showing numbers & location of traffic signs is enclosed. The Concessionaire shall, however, improve/upgrade upon the traffic signage plan as indicated in **Annexure-III** based on site/design requirement as per the relevant specifications/IRC Codes/Manual.

**Annex - IV: Environment Clearance
(Schedule-A)**

There is no need of environment clearances.

Appendix A-I: Index map of Project Highway



Appendix A-II: Existing Carriageway Width

S. No.	Existing Location (Km)		Length (Km)	Carriageway width (m)	Remarks
	From	To			
1	50+925	48+800	2.125	6 m to 6.5 m	-
2	48+800	45+200	3.600	14 m	Kalavad Town
3	45+200	4+720	40.480	6 m to 6.5 m	-
4	4+720	3+720	1.00	7+7 m	Near Jamnagar Ring Road

Appendix A-III: Chainage Correlation

S.No.	Design Chainage	Existing Km	S.No.	Design Chainage	Existing Km
1	0+000	Kalawad Bypass Start	33	32+000	19+612
2	1+000	Kalawad Bypass	34	33+000	18+589
3	2+000	Kalawad Bypass	35	34+000	17+583
4	3+000	Kalawad Bypass	36	35+000	16+601
5	4+000	Kalawad Bypass	37	36+000	15+552
6	5+000	Kalawad Bypass	38	37+000	14+551
7	6+000	Kalawad Bypass	39	38+000	13+537
8	7+000	Kalawad Bypass	40	39+000	12+334
9	8+000	Kalawad Bypass	41	40+000	11+316
10	9+430	Kalawad Bypass End	42	41+000	10+311
11	10+000	42+362	43	42+000	9+261
12	11+000	41+361	44	43+000	8+292
13	12+000	40+341	45	44+000	7+264
14	13+000	39+358	46	45+000	6+295
15	14+000	38+364	47	46+000	5+295
16	15+000	37+351	48	47+000	4+293
17	16+000	36+341	49	47+572 (Project end)	3+720
18	17+000	35+430			
19	18+000	33+783			
20	19+000	32+807			
21	20+000	31+799			
22	21+000	30+786			
23	22+000	29+788			
24	23+000	28+764			
25	24+000	27+730			
26	25+000	26+758			
27	26+000	25+770			
28	27+000	24+635			
29	28+000	23+640			
30	29+000	22+630			
31	30+000	21+655			
32	31+000	20+622			

Schedule-B (Development of the Project Highway)

(See Clause 2.1)

1. Development of the Project Highway

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

2. Four Lanning with Paved Shoulders

2.1 Four-Lanning shall include the four Lane Project as described in **Annexure-I** of this Schedule-B and **Annexure-I** of Schedule-C.

2.2 Four-Lanning shall be completed by the Concessionaire in conformity with the Specifications and Standards set forth in **Annexure-I** of Schedule-D.

Annexure-I: Description of Four Laning with Paved Shoulder (Schedule-B)

Description of the Project

1. Development of Project Highway

The Project Highway shall generally follow the horizontal alignment shown in the plan specified in **Annexure- III** of Schedule-A, unless otherwise specified by the Authority. Notwithstanding anything to the contrary contained in this Agreement or IRC:SP:84, the proposed plan & profile, locations of different structures/drains/service & slip road/RE walls, chainages of different structures/drains/service & slip road/RE walls, length of different structures/drains/service & slip road/RE walls etc. of the project highway as indicated in the Schedule A, Schedule B, Schedule C and their Annexures shall be treated as minimum requirement. Based on site/design requirement, the Concessionaire shall finalize their Detailed Designs (Development Stage) including plan & profile of the project highway and submit the same to Authority & its Independent Engineer for its Consent/Approval and Safety Audit by Safety Auditor before the start of the execution of project. The designs so approved shall not be in contradiction with the scope of project. For avoidance of doubt, the provisions mentioned in Schedule-B & Schedule-C cannot be changed, only the design of the components is to be submitted for consent/ approval.

1.1 Width of Carriageway

- 1.1.1 Four-Laning with paved shoulder from Design Ch. 0+000 to Ch. 47+572 (Design Chainage) shall be undertaken. The paved carriageway shall be 18.0 metres for four Lanning (including Paved Shoulder & kerb shyness). The earthen shoulder shall be 1 metre on either side. The earthen shoulder shall be 2 metres if metal beam crash barrier provided.
- 1.1.2 In Built-up sections/areas the width of paved carriageway shall be 20 metres (including paved shoulders & kerb shyness).
- 1.1.3 Except as otherwise provided in this Agreement, the width shall be adjusted to fit into appropriate plans and cross sections developed in accordance with TCS enclosed.
- 1.1.4 The entire cross-sectional elements shall be accommodated in the available/proposed ROW. If required, suitable retaining structures shall be provided to accommodate the highway cross section within the available/proposed ROW. The details of such sections are mentioned in Schedule-B. In case of any other section not included in Schedule-B, where retaining structures are to be provided, shall constitute a Change of Scope.

1.2 Width of Median

1.2.1 The width of median including kerb shyness shall be 2.5 metre including kerb shyness for raised median. In built up section the width of median shall be 2.5 metre including kerb shyness.

1.2.2 Suitable anti-glare measures shall be provided at the following locations.

S. No.	Design Chainage (Km)		Length (m)	Remarks
	From	To		
1	40+658	41+367	709	Built-up
2	44+942	46+157	1215	Built-up
3	46+157	47+307	1150	Flyover Reach

1.3 The Project Highway shall follow the existing alignment unless otherwise specified by the Authority and shown in the alignment plans specified in **Annexure-III** of Schedule-A. Geometric deficiencies, if any, in the existing horizontal and vertical profiles shall be corrected as per the prescribed standards for [plain/rolling] terrain to the extent land is available.

Following table shows a terrain classification considered for project highway:

S. No.	Design Chainage (Km)		Length (Km)	Terrain Classification
	From	To		
1	00+000	47+572	47.572	Plain and rolling

The horizontal alignment provided in the plan profile drawings shall remain unchanged except locations where if any issues arise, the same shall be finalized in consultation with Independent Engineer and Authority. The minimum Finished Road Level (FRL), Gradient and Sight Distance provided in the plan profile drawings (**Annexure-III** of Schedule A) shall have to be achieved. The vertical profile shall be designed with design speed as given in para 2.2 of this **Annexure**.

1.4 Built-up Area

The following stretches of the Highway shall be treated as Built up area.

S. No.	Design Chainage (Km)		Length (m)	Remark
	From	To		
1	40+658	41+367	709.00	Sapada
2	44+942	46+157	1215.00	Theba
Total			1924 m	

2. Geometric Design and General Features

2.1 General

Geometric design and general features of the Project Highway shall be in accordance with Section 2 of the Manual IRC: SP:84. Intermediate Sight distance (Desirable minimum sight distance) shall be followed for design of all vertical curves including structures as well as highways.

2.2 Design Speed

The design speed shall be minimum as per alignment plan enclosed. The project road shall be designed for 100Kmph in Plain /Rolling terrain. However, minimum design speed should be followed as per alignment plan **Annexure-III** of Schedule-A.

2.3 Improvement of the existing road geometrics

2.3.1 The existing road geometrics shall be improved as per the codal provisions. In the sections, where improvement of the existing road geometrics to the prescribed standards is not possible, the existing road geometrics shall be improved to the extent possible within the given right of way and appropriate road signs, Pavement markings and safety measures shall be provided.

2.3.2 The entire cross-sectional elements shall be accommodated in the proposed ROW. If required, suitable height retaining structures shall be provided to accommodate the highway cross sections within the proposed ROW.

2.3.3 Realignments

The existing road shall be improved to the standards specified in the manual at the following locations:

Sr. No.	Existing Chainage (km)		Design Chainage (km)		Length (m)	Location/Village
	From	To	From	To		
1	39+197	37+800	13+160	14+560	1400	Haripar Village
2	36+400	34+460	15+930	17+303	1373	Khandera Village
3	14+430	12+235	37+120	39+090	1970	Vijayrakhi Village

2.3.4 Bypass

Sr. No.	Name of bypass	Existing Chainage (km)		Design Chainage (km)		Length (m)
		From	To	From	To	
1	Kalavad	50+925	42+930	0+000	9+430	9430

2.4 Right of Way

Details of Right of Way along Project Highway and side roads are given in Annexure-II of Schedule-A.

2.5 Type of Shoulders

2.5.1 The Design Specification of paved shoulder shall conform to the requirements specified in paragraph 5.10 of the manual.

2.5.2 Paved shoulder shall be of same specification and pavement composition as of main carriageway. (Clause No. 5.10 IRC: SP:84)

2.5.3 The overlay on the main carriageway pavement and on the paved shoulders shall be uniform thickness and composition. (Clause No. 5.9 IRC: SP:84)

2.5.4 In Built-up sections, footpath-cum-drain of width 1.50m and fully paved shoulders of width 2.5m shall be provided. (Ministry's Circular No. RW/NH-33044/22/2022-S&R(P&B), dated 04/06/2024).

2.5.5 In open country, paved shoulders of 1.5 m width shall be provided. (Ministry's Circular No. RW/NH-33044/22/2022-S&R(P&B), dated 04/06/2024).

2.5.6 Deleted.

2.5.7 Deleted.

2.5.8 The earthen shoulders, as specified in typical cross sections attached as **Appendix B-I** of this Schedule, shall be provided with top 150mm well graded naturals and moorum, gravel, crust stones or combination thereof, conforming the Clause 401 of MoRT&H Specification (Clause No. 5.11 IRC: SP:84).

2.5.9 Deleted.

2.6 Lateral and Vertical Clearances at Underpasses/Flyovers/ROBs

2.6.1 In case of VUP/LVUP/SVUP, the proposed structure, the finished road level in VUP/LVUP/SVUP shall be kept 150 mm above ground level/service road/cross road (whichever is higher) to ensure that these VUP/LVUP/SVUP don't become water accumulation points. (Clause No. 2.10 IRC: SP:84).

2.6.2 The vertical and horizontal clearances for underpasses shall be as per Clause 2.10.2 of the manual.

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

S. No.	Existing Km	Design Ch.	Span/opening (m)	Remarks
1	Bypass	1+216	2x10.0x5.5 clear	VUP
2	Bypass	4+600	2x12x5.5 clear	VUP
3	Bypass	8+255	2x12x5.5 clear	VUP

S. No.	Existing Km	Design Ch.	Span/opening (m)	Remarks
4	4+700	46+670	2x30m x 5.5 clear	Flyover

2.7 Lateral and Vertical Clearances at Overpass

2.7.1 Lateral and vertical clearances for overpasses shall be as per paragraph 2.11 of the Manual.

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

S. No.	Design Chainage (Km)	Type of Structure	Lateral Clearance i.e. Span Arrangement c/c of expansion joint (m)	Vertical Clearance (m)	Remark
Nil					

2.8 Service Roads/Slip Roads/Connecting Roads:

2.8.1 Service Road: The height of embankment of service road shall conform to clause 4.2.1 of the manual.

2.8.2 The Service Roads shall be constructed at the locations and for the lengths indicated below:

Sr. No.	Design Chainage (km)		Design Length (km)		Width (m)	Total (km)	Remark
	From	To	LHS	RHS			
1	1+700	4+130	2.430	-	7.5	2.430	TCS-7A
2	5+200	5+790	0.590	-	7.5	0.590	TCS-7A
3	6+410	7+450	1.040	-	7.5	1.040	TCS-7A
4	40+658	41+367	0.709	0.709	7.5	1.418	TCS-2
5	44+942	46+117	1.175	1.175	7.5	2.350	TCS-2
6	46+117	46+157	0.040	0.040	5.5-7.5	0.080	Merging Portion
Total						7.908	

2.8.3 Deleted.

2.8.4 Slip Road: The height of the embankment of the slip road shall confirm to clause 4.2.1 of the Manual. The Slip roads shall be constructed at the locations and for the lengths indicated below:

Sr. No.	Design Chainage		Design Length (km)		Width (m)	Total (km)	Remark
	From	To	LHS	RHS			
1	0+805	1+700	0.895	0.895	7.5	1.790	TCS-4 and TCS-4A
2	4+130	5+200	1.070	1.070	7.5	2.140	TCS-4 and TCS-4A
3	7+450	8+680	1.230	1.230	7.5	2.460	TCS-4 and TCS-4A
4	46+157	47+307	1.150	1.150	5.5	2.300	TCS-3 and TCS-3A
Total						8.690	

2.8.5 Separator between Main Carriageway and Service/Slip Road (Clause No. 2.15.1 IRC: SP:84-2019)

A separator between main carriageway and service/slip road shall be provided, as specified in typical cross sections attached as **Appendix B-I** of this Schedule, to prevent the pedestrians, local vehicle and animals entering the highway.

Note:

(i) Above length of the service/ slip/ connecting roads/ is indicative and minimum specified. The actual length of the service/ slip/ connecting roads shall be determined by the Concessionaire in accordance with the IRC: SP: 84 requirements with approval from the Independent Engineer. Any increase in the length specified in this Clause of 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 16.

(ii) The Acceleration, deceleration lane, right turning storage lane, entry/exit lanes shall be constructed in addition to length given in above table and shall be deemed to be part of the scope and no Change of Scope shall be considered for the same. (Clause No. 2.12.2 IRC: SP:84-2019)

2.9 Grade Separated Structures (Clause No. 3.4 IRC: SP:84-2019): Grade separated structures shall be constructed as per Clause 2.13 of the Manual. Proposed levels at structure locations as shown in plan & profile specified in **Annexure-III** of Schedule-A are minimum requirement and only for guidance and any increase in levels shall not constitute any change of scope. Entry/Exit arrangement from main carriageway shall be 50m before/after the start/end of approach road to grade separator i.e. start/end of valley curve. RCC barrier shall start from start of valley curve and end after grade separator at end of valley curve.

Where crash barrier on the median side is not continuous along the project highway, 50m long MBCB Safety barriers on median side shall be provided on both sides approaches of the structures. MBCB provided towards median side of each of the structure with corresponding end treatment. (Clause No. 4.3.5 and 4.9, IRC 119).

Where crash barrier on the shoulder sides is not continuous along the project highway, 50m long MCB Safety barriers on shoulder side shall be provided on both sides approaches of the bridge/ structures or till 3m embankment height whichever is more.

50 m long Thrie Beam safety barriers on structure approaches shall be provided on all four faces of each structure. (Clause No. 4.3.5 and 4.9, IRC:119)

The requisite particulars are given below:

2.9.1 Vehicle Overpass (VOP)

S. No.	Design Chainage (Km)	Type of Structure	Span Arrangement (m)	Total Width (m)	Remark / Crossing Type
Nil					

2.9.2 Flyover

Sr. No.	Design Chainage (Km)	LHS Roadway Width (m)	RHS Roadway Width (m)	Super Structure Provision in Median	Span Arrangement (m)	Minimum Vertical Clearance (m)	Skew Angle	Remarks
1	46+670	9.5	9.5	NJB	2X30	5.5	0°	NH-151A

Note: Junction between the Service Road and Cross-road below the fly-overs shall be improved as per IRC:SP:84.

2.9.3 Vehicular Underpass (VUP)

Sr. No.	Design Chainage (Km)	LHS Roadway Width (m)	RHS Roadway Width (m)	Super Structure Provision in Median	Span Arrangement (m)	Minimum Vertical Clearance (m)	Skew Angle	Remarks
1	1+216	10	10	Open to Sky	2x10.0	5.5	0°	Mota Bhadukiya road
2	4+600	10	10	Open to Sky	2x12.0	5.5	0°	SH-23
3	8+255	10	10	Open to Sky	2x12.0	5.5	35°	SH-94

Note: Junction between the Service Road and Cross-road below the VUP shall be improved as per IRC:SP:84.

2.9.4 Light Vehicular Underpass (LVUP)

S. No.	Design Chainage (Km)	Type of Structure	Span Arrangement (m)	Total Width (m)	Remark / Crossing Type
Nil					

2.9.5 Small Vehicular Underpass (SVUP)

S. No.	Design Chainage (Km)	Type of Structure	Span Arrangement (m)	Total Width (m)	Remark / Crossing Type
Nil					

2.9.6 Cattle and Pedestrian underpass (CUP / PUP)

S. No.	Design Chainage (Km)	Type of Structure	Span Arrangement (m)	Total Width (m)	Remark / Crossing Type
Nil					

2.9.7 Interchanges (IC) (Clause No. 3.4 IRC: SP:84-2019)

S. No.	Design Chainage (Km)	Type of Structure	Span Arrangement (m)	Total Width (m)	Remark / Crossing Type
Nil					

2.9.8 Details of Ramps, Cross Roads and Connecting Roads at Interchanges (IC)

S. No.	Carriageway Widths including Kerb Shyness	Length (m)	Description of Ramps, Crossroads and Connecting Roads	Remarks
Nil				

Note: However, additional SVUP/LVUP/VUP at cross-road locations not provided for in the Schedule B but required during the execution of work will be dealt under the provisions of Article 16.

2.10 Typical Cross Section (TCS) of Project Highway (Clause No. 2.17 IRC: SP:84-2019)

The Project Highway shall be constructed to 4-Lane with Paved Shoulders configuration. Typical cross sections along with different types of cross-sections required to be developed in different segments of the project highway are indicated in **Appendix B-I & Appendix B-II** of this Schedule respectively.

Note:

1. Lengths mentioned in the above-mentioned list for cross section types concerned to structures are inclusive of structure length.
2. RE wall shall be provided for full height on all structures. (Clause No. 7.1 (iv) IRC: SP:84-2019).
3. Toe wall (0.6m ht) to be provided where water bodies along the proposed highway on the sections.

4. Chainages may be adjusted according to location of structures as per drawings.
5. Intermediate Sight Distance (Desirable Minimum Sight Distance) shall be followed for design of all vertical curves (Summit Curves) including structures as well as highways. (Clause No. 2.9.6 IRC: SP:84-2019)

3. Intersections and Grade separated Intersections (Section 3, IRC: SP:84-2019)

All at-grade intersections and grade separated intersections shall be as per Section-3 of the Manual IRC: SP:84. Existing at-grade intersections shall be improved to the prescribed standards.

The service road pavement composition shall be continued on cross roads of the intersections for the length specified for at-grade and grade separated intersections.

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

3.1 At Grade Intersections (Clause No. 3.2 IRC: SP:84-2019)

(a) Major Intersections

The intersections with NH, SH road and MDR roads are listed below:

Sr. No.	Design Chainage	Type	Side	Leads to (LHS/RHS)	Category of Cross Road	Median Opening (m)	Carriageway Width of Cross Road (m)	Length of intersecting road to be developed (m)
1	0+115	3-Legged	LHS	Kalavad	Existing NH-927D	20.0	5.5+5.5	140.00
2	9+190	3-Legged	LHS	Kalavad	Existing NH-927D	-	7+7	110.00
3	16+068	3-Legged	LHS	Khandhera	Existing NH-927D	20.0	5.5+5.5	100.00
4	17+273	3-Legged	LHS	Khandhera	Existing NH-927D	20.0	5.5+5.5	120.00
5	40+104	3-Legged	RHS	Aliyapada	SH	20.0	7+7	100.00

Note: Design of Major Junctions shall be as per the drawings attached in Annexure-III of Schedule-A and as per IRC: SP:84-2019 and as per MoRTH type design for intersection on national highways.

(b) Minor Intersections

The intersections with ODR, village road and other minor roads are listed below:

Sr. No.	Design Chainage	Type	Side	Leads to	Category of Cross Road	Median Opening (m)	Carriageway Width of Cross Road (m)	Length of cross road to be developed (m)
1	2+170	Y	RHS	Balambadh	VR		7	70
2	2+200	Y	LHS	Kalavad	VR		11	75
3	4+070	x	BHS	Kalavad & Dhedh Khijadiya	VR		11 LHS & 8 RHS	70
4	5+885	x	BHS	Kalavad & Jivapar	VR	20	11	70
5	10+390	Y	LHS	Vavdi	VR		8	70
6	13+613	Y	RHS	Ranuja	VR		8	70
7	18+495	X	BHS	Field & Dhudasiya	VR	20	11	80
8	20+737	T	RHS	Varudi Temple	VR		8	70
9	22+260	T	RHS	Dhutarpur	VR		8	70
10	23+047	Y	LHS	Khankotda	VR		7	70
11	29+390	Staggered	RHS	Nani Matli	VR	20	7	70
12	29+460		LHS	Modpar	VR	20	7	70
13	31+740	T	RHS	Pasaya	VR		7	70
14	33+621	T	RHS	Beraja	VR		11	70
15	34+145	Y	RHS	Sapda	VR		9	70
16	39+087	Y	LHS	Miyathara	SH		7	70
17	39+359	T	RHS	Vijrakhi	VR		7	70
18	40+940	X	Both	Suwarada (LHS) (RHS)	VR		7	70
19	43+195	T	RHS	I.O.C. Ltd.	ODR		11	70
20	45+040	X	Both	Theba (LHS) (RHS)	VR		7	70

Note:

1. Type of Junction to be improved as per manual. (Clause No. 3.2.5 IRC: SP:84-2019)

2. The Concessionaire shall take up 'Detailed Engineering study' to ascertain further details of all intersections and treatment of the intersections shall be designed in accordance with the latest guidelines mentioned out in Section-3 of the Manual. Auxiliary lanes including storage, acceleration and deceleration lane along with physical islands to be provided.
3. The cross road at the junctions which are having a level difference from the main carriageway, are to be improved at the level of main carriageway for the length of 30 metre and then to be merged with the cross road at the gradient not more than 1:50. (Clause No. 3.2.1 IRC: SP:84-2019)
4. For minor/major layout for left-in/left-out arrangement with physical islands with hazard marking. Where there is space constraint to provide physical islands, the effect of junction kept wide opened can be avoided by ghost island with marking. (Fig. 3.5 IRC: SP:84-2019)
5. All Junction Roads below the category of National Highway shall be provided with Rumble Strips before junction as per IRC:99.

3.2 At-grade Intersections below Grade Separators/Interchanges

These shall be provided as per the details given below in accordance with para 3.4.7 of Manual IRC: SP:84 and Ministry's Type design for intersection:

Sr. No.	Design Chainage (Km)	Junction Type	Leads to		U-Turn provision in Viaduct Spans	Category of Cross Road	Carriageway width of cross road	Length of cross road to be developed	
			Left	Right				LHS	RHS
1	1+216	VUP	Kalavad	Balambhadi	No	Mota bhadukiya road	3.75 m	75	60
2	4+600	VUP	Kalavad	Rajkot	No	SH-23	7.0 m	100	90
3	8+255	VUP	Kalavad	Falla	No	SH-94	7.0 m	120	40
4	46+670	Flyover	Khambhalia	Dhrol	No	NH-947 (SH-25)	7+7 m	200	200

Note:

1. The Contractor shall take up 'Detailed Engineering study' to ascertain further details of all intersections and treatment of the intersections shall be designed in accordance with the latest guidelines mentioned out in Section-3 of the Manual.

2. Junction improvement under grade separators shall be carried out as per manual with proper entry/exit to cross roads and slip/service roads, etc. Auxiliary lanes including storage, accelerations and deceleration lane along with physical islands to be provided.
3. Location of grade-separated structures are indicative. Exact location should be decided in consultation with Independent Engineer.
4. Intersection Layout & Entry/Exit shall be provided as per schedule-D and alignment plan attached with Annex-III of schedule-A .

4. Road Embankment and Cut Section

Construction of road embankment / cuttings shall conform to the specifications and standards in Section 4 of the Manual. Notwithstanding anything to the contrary contained in this Agreement or manual, the proposed profile of the project highway as indicated in the **Annexure-III** of Schedule A shall be treated as minimum requirement.

The Concessionaire shall design the alignment plans and profiles of the project highway based on site/design requirement mentioned in this Schedule-B with approval from the Independent Engineer within the available Right of Way. However, it is clarified that bottom of subgrade level shall be at-least 1000 mm above HFL/Existing ground level for a greenfield/bypass stretch.

The side slopes shall not be steeper than 2H:1V. In case, there is a ROW constraint than, suitable soil retaining structures shall be provided. (Clause No. 4.2 IRC: SP:84-2019)

For stability of slope upto 3 metre height the turfing can be adapted. For the slope from 3-6 metre suitable, geocell, geo-grid, geo-green, etc. can be provided with suitable drainage chutes as per IRC:56. For the slope more than 6 metre height, a complete slope stability analysis as per IRC:75 shall be done and the slopes shall be compulsory protected with stone pitching within stone masonry grid structure of 4x4 metre and suitable drains/chutes etc. shall be provided for effective drainage of the water.

Cut formations shall be constructed either as Box cutting or Partial Cutting and Filling as per Alignment plan given in **Annexure-III** of Schedule A. Concessionaire shall provide suitable slope protection to the cut formation to keep it safe, durable and stable.

Raising of the existing road

The existing road shall be raised in the following sections and as per profile enclosed:

S. No.	Existing Km		Design Chainage		Length (m)	Raising at Existing Bridge Location (m)	Remarks
	From	To	From	To			
1	40+213	39+087	12+140	13+160	1020	1.180	Submersible Bridge
2	37+784	37+558	14+560	14+790	230	1.120	Submersible Bridge
3	37+152	36+662	15+215	15+770	555	1.454	Submersible Bridge
4	28+585	28+423	23+164	23+325	161	3.505	Submersible Bridge
5	21+975	21+486	29+773	30+070	297	1.462	Submersible Bridge
6	21+302	21+136	30+330	30+520	190	3.313	Geometric Improvement
7	20+580	20+102	31+030	31+540	510	3.771	Submersible Bridge
8	18+280	17+805	33+303	33+560	257	4.151	Submersible Bridge
9	9+012	8+792	42+178	42+468	290	0.429	Submersible Bridge
10	6+853	6+023	44+444	44+942	498	1.609	Submersible Bridge

5. Pavement Design

5.1 Pavement design shall be carried out in accordance with Section 5 of the Manual.

5.2 Type of Pavement and Design Requirement (Clause No. 5.4 IRC: SP:84-2019)

The pavement shall be flexible throughout project stretch except at toll plaza location where rigid pavement shall be provided.

For connecting road/Service Road/Slip Road and truck lay bye, flexible pavement shall be proposed.

5.2.1 Design period & Strategy

Flexible pavement shall be constructed for the entire length of Project Highway including paved shoulders. Flexible pavement shall be designed for a minimum design period of 20 years and minimum subgrade CBR of 8%. Whereas rigid pavement shall be designed for a minimum design period of 30 years. **Stage construction shall not be permitted.**

5.2.2 Design Traffic

Notwithstanding anything to the contrary contained in this Agreement or the

Manual, the Concessionaire shall design the flexible pavement for minimum design traffic in million standard axles as tabulated below:

S. No.	Homogenous Section Design Chainage (Km)		Minimum Design Traffic Loading in 20 years Design Period (MSA)		Remark
	From	To	Main Carriageway	Service Road	
1	0+000	47+572	44	20	Flexible Pavement

Notwithstanding anything to the contrary contained in this Agreement or the Manual, the Concessionaire shall design the rigid pavement for Total Two-way Commercial Traffic (CVPD) in the year of completion of construction as tabulated below:

S. No.	Design Chainage (Km)		Total Two-way Commercial Traffic (CVPD) in the year of completion of construction	Remark
	From	To	Toll plaza	
1	41+666	42+000	1034	-

5.3 The pavement layers and their thicknesses given below is minimum to follow.

5.3.1 Main carriageway including paved shoulders:

S. No.	Pavement Layer	Effective CBR	Minimum Crust Layer thickness (mm)
1	Bituminous Concrete (BC)	8.00%	40
2	Dense Bituminous Concrete (DBM)		60
3	Aggregate Interlayer (AIL)		100
4	Cement Treated Base (CTB)		165
5	Granular Sub-Base (GSB)		200
6	Subgrade		500

5.3.2 Connecting/Service/slip road including paved shoulders

S. No.	Pavement Layer	Effective CBR	Minimum Crust Layer thickness (mm)
1	Bituminous Concrete (BC)	8.00%	30
2	Dense Bituminous Concrete (DBM)		55
3	Aggregate Interlayer (AIL)		100
4	Cement Treated Base (CTB)		170
5	Granular Sub-Base (GSB)		200
6	Subgrade		500

5.3.3 Toll Plaza

S. No.	Pavement Layer	Effective CBR	Minimum Crust Layer thickness (mm)
1	Pavement Quantity Concrete (PQC)	8.00%	280

2	Dry Lean Concrete (DLC)		150
3	Granular Sub-base (GSB)		150
4	Subgrade		500

5.4 Reconstruction of stretches with new pavement (Clause No. 5.9.4 IRC: SP:84-2019)

The following stretches of the existing road shall be dismantled/milled and reconstructed. These shall be designed as per new pavement.

S. No.	Design Chainage		Pavement Composition	Remark
	From	To		
As per location of TCS mentioned in clause 2.10 above and Alignment plan attached in Annexure-III of Schedule-A				

5.5 Bituminous Mix for Overlay (Clause No. 5.9.8 IRC: SP:84-2019)

The following stretches of the existing road shall be provided bituminous overlay as follows:

S. No.	Design Chainage		Overlay Pavement Composition	Remark
	From	To		
As per location of TCS mentioned in clause 2.10 above and Alignment plan attached in Annexure-III of Schedule-A				

Note: The concessionaire shall design the pavement including overlay as per design requirements subject to minimum thickness and design requirement as indicated above.

5.6 One time improvement for existing roads in bypass/Realignment

S. No.	Pavement Layer	Minimum Crust Layer thickness (mm)
1	Bituminous Concrete (BC)	40
2	Dense Bituminous Concrete (DBM)	50

Note: The concessionaire shall design the pavement including overlay as per design requirements subject to minimum thickness and design requirement as indicated above.

6. Roadside Drainage

6.1 Drainage system including surface and subsurface drains for the Project Highway including crossroads shall be provided as per Section-6 of the Manual. RCC Drain cum footpaths shall conform to the cross-sectional features and other details as given in Annexures to Schedule-B and shall be provided as under:

Details of RCC Lined Drain

Sr. No.	Design Chainage (Km)		Both Side Drain (m)	Design Chainage (Km)		One Side Drain (m)	Width of Drain (m)
	From	To		From	To		
1	0+805	1+700	895	1+700	4+130	2430	1.5
2	4+130	5+200	1070	5+200	5+790	590	1.5
3	7+450	8+680	1230	6+410	7+450	1040	
3	40+658	41+367	709	Total		4060	1.5
4	44+942	47+307	2365				1.5
Total			2 x 6269 = 12538				
Total Length of Drain				12538+4060 = 16598m			

Details of CC Lined Drain (Trapezoidal)

Sr. No.	Design Chainage (Km)		Length (m)		Top Width of Drain (m)	Total Length (m)	Remarks
	From	To	LHS	RHS			
1.	20520	20660	140	140	3.5	280	TCS-6
2.	28150	28300	150	150	3.5	300	TCS-6
3.	30070	30330	260	260	3.5	520	TCS-6
4.	30680	31030	350	350	3.5	700	TCS-6
5.	32999	33303	304	304	3.5	608	TCS-6
6.	34170	34240	70	70	3.5	140	TCS-6
7.	34303	34420	117	117	3.5	234	TCS-6
8.	35020	35230	210	210	3.5	420	TCS-6
9.	37430	37656	226	226	3.5	452	TCS-6
10.	39090	39448	358	358	3.5	716	TCS-6
Total						4370	

6.2 **Unlined Drains** other than above mentioned locations shall be provided in the entire project length which gets terminated at all crossroad locations. In case, the definite outfall is not available, a rainwater harvesting system shall be provided at the deepest location for dispersal of water.

6.3 **Median Drain**

Nil

6.4 **Drainage arrangement between Main Carriageway and Service/Slip Roads (Clause No. 2.15 IRC: SP:84-2019)**

A suitable drainage arrangement for draining storm water of main carriageway shall be provided.

6.5 Drainage where embankment height is more than 3 m. (Clause No. 6.4 IRC: SP:84-2019)

Drainage chutes shall be provided at suitable interval on embankment slopes. The drainage arrangement shall include kerb, cement concrete drainage channel at the edge of roadway, cement concrete chutes, CC bedding, energy dissipation basin, etc. Mountable kerb shall be provided beyond the post of MBCB to channelize storm water into chute.

6.6 Drainage for Structures (Clause No. 6.8 IRC: SP:84-2019)

A suitable drainage arrangement for draining storm water from deck slab shall be provided. Water shall not fall on any surface of the structures or remain standing or flowing over the road below structure.

6.7 Drainage for Underpass and Subways Structures (Clause No. 6.8.3 IRC: SP:84-2019)

A suitable drainage arrangement for draining storm water from Underpass and Subways shall be provided.

6.8 Drainage arrangement of Retaining Structures

Vertical drop-down drainage pipes with suitable cleaning provision shall be provided at suitable interval. Drainage fixtures and drop-down pipes shall be of rigid, corrosion resistant material not less than 100mm diameter. The storm water of main carriageway draining on service road is not permitted.

6.9 Drainage arrangement of Box Cut Formation and cutting sections

Concessionaire shall provide suitable drainage arrangement for efficient drainage of the Box cut sections and cutting sections by providing longitudinal lined drains and catch water drains on hill side of the carriageway.

7. Design of Structures

7.1 General

Project Highway is proposed to be constructed to 4-Lane with Paved Shoulder configuration. Special vehicle loading is to be considered in design of all bridges, culverts and structures.

All structures except wherever expansion joints have been provided, the pavement layers CTB, AIL, DBM & BC shall be continued over the structures for smooth riding quality of the project highway. These structures shall be designed considering the dead load of pavement wherever applicable (CTB, AIL, DBM, BC, etc.) layers.

All major structures shall be designed preferably as continuous slab to reduce the number of expansion joints on the MJB/ ROB/ flyover/ Interchange etc.

7.1.1 All bridges, culverts and structures shall be designed for IRC class Special Vehicle (SV) loading as per IRC:6 and constructed in accordance with Section-7 of the

Manual and shall conform to the cross-sectional features and other details specified therein.

- 7.1.2** Overall width of Major Bridges and ROB structures shall be as given below in accordance with Ministry's Circular No. RW/NH-33044/22/2020-S&R (P&B) (Computer No. 186381) dated 04.06.2024:

S. No.	Design Chainage	Type of proposed Structure	Existing Span	Existing Width	Proposed Span	Proposed Width of Carriageway	Proposed total width (m)
1	0+376	Major bridge	New	-	7 x 40.00 (Skew)	2 x 10.0	2 x 13.10
2	6+111	Major bridge	New	-	3 x 25m	2 x 10.0	2 x 13.10
3	13+785	Major bridge	5 x 6.5m	7.0m	3 x 20m	2 x 10.0	2 x 13.10
4	16+354	Major bridge	New	-	5 x 40m	2 x 10.0	2 x 13.10
5	33+740	Major bridge	7 x 6.0m	7.30m	3 x 21.890 (Skew)	2 x 10.0	2 x 13.10

- 7.1.3** Overall width of Minor Bridge structures shall be as given below in accordance with Ministry's Circular No. RW/NH-33044/22/2020-S&R (P&B) (Computer No. 186381) dated 04.06.2024:

S. No.	Design Chainage	Type of proposed Structure	Existing Span	Existing Width	Proposed Span	Proposed Width of Carriageway	Proposed Total Width (m)
1	1+186	Minor Bridge	New	-	1 x 20m	2 x 10.0m(MCW) + 2 X 7.5(SR)	2 x 11.0(MCW) + 2 X 9.5(SR)
2	8+659	Minor Bridge	New	-	2 x 10m	2 x 10.0m(MCW) + 2 X 7.5(SR)	2 x 11.0(MCW) + 2 X 9.5(SR)
3	11+987	Minor Bridge	2 x 3.0 (Clear)	6.5	1 x 8m (Skew)	2 x 10.0m	2 x 13.10
4	12+364	Minor Bridge	2 x 3.0 (Clear) (Skew)	7.5	1 x 8m	2 x 10.0m	2 x 13.10
5	12+838	Minor Bridge	4 x 1.50 (Clear)	7.0	1 x 8m	2 x 10.0m	2 x 13.10
6	14+361	Minor Bridge	New	-	1 x 8m (Skew)	2 x 10.0m	2 x 13.10
7	15+461	Minor	5 x 7.0	7.2	3 x 15m	2 x 10.0m	2 x 13.10

S. No.	Design Chainage	Type of proposed Structure	Existing Span	Existing Width	Proposed Span	Proposed Width of Carriageway	Proposed Total Width (m)
		Bridge					
8	22+977	Minor Bridge	New	-	3 x 10m (Skew)	2 x 10.0m	2 x 13.10
9	23+145	Minor Bridge	5 x 6.8	6.5	4 x 10m	2 x 10.0m	2 x 13.10
10	29+915	Minor Bridge	4 x 6.0	7.8	3 x 10m	2 x 10.0m	2 x 13.10
11	31+337	Minor Bridge	2 x 6.0 (Skew)	7.8 (Skew)	3 x 8m (Skew)	2 x 10.0m	2 x 13.10
12	38+764	Minor Bridge	New	-	5 x 10m (Skew)	2 x 10.0m	2 x 13.10
13	42+216	Minor Bridge	2 x 5.4	8.1	2 x 10m	2 x 10.0m	2 x 13.10
14	44+812	Minor Bridge	6 x 3.7	8.15	3 x 7m (Skew)	2 x 10.0m	2 x 13.10

7.1.4 The following existing bridges shall be repaired, retained and widened with combined superstructure:

S. No.	Structure / Bridge Design Chainage (Km)	Width of Carriageway & Cross-Sectional Features	Remark
Nil			

7.1.5 Deleted.

7.1.6 The following structures shall be provided with footpaths.

S. No.	Design Chainage (Km)	Remark
At all structures as specified under Para 7.1.2 & 7.1.3 of Annexure-I of this Schedule-B		

7.1.7 All bridges shall be designed and constructed as high-level bridges.

7.1.8 All structures shall be designed to carry utility services on outer side of RCC barrier/Railing as per site requirement.

7.1.9 Cross-section of the bridges at deck level for the Project Highway shall conform to the typical cross-sections given in Annexure-II of Schedule-B.

7.2 Culverts

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

The overall width of culverts shall be including width of main carriageway and slip/service roads/Entry Ramps/Exit Ramps/Acceleration/ Deceleration lanes, etc. All culverts shall also be continued in Median and in gap between main carriageway and service road. The slope and floor protection for the culverts shall be strictly in accordance with provisions of IRC:SP:13 (Latest Edition). The skew angle mentioned in the table shall be reconfirmed at site before construction.

7.2.2 Reconstruction of Existing Culverts:

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

S. No.	Existing Km.	Design Chainage	Type of Structure		Span Arrangement (m)	
			Existing	Proposed	Existing	Proposed
1	42+320	10+044	Slab	Box	2 x 2.25	1 x 5.00
2	41+670	10+697	Slab	Box	2 x 1.50	1 x 4.00
3	40+790	11+551	Slab	Box	2 x 2.50	1 x 5.00
4	39+235	13+123	Slab	Box	2 x 1.20	1 x 3.00
5	37+330	15+018	Slab	Box	3 x 1.50	1 x 5.00
6	36+340	16+014	Pipe	Pipe	1 x 1.20	1 x 1.20
7	34+430	17+340	Pipe	Pipe	1 x 0.30	1 x 1.20
8	33+316	18+486	Pipe	Pipe	1 x 0.90	3 x 1.20
9	33+300	18+503	Pipe	Pipe	2 x 0.75	2 x 1.20
10	33+220	18+593	Pipe	Pipe	1 x 1.20	1 x 1.20
11	32+325	19+481	Slab	Box	2 x 2.50	1 x 5.00
12	32+050	19+740	Slab	Box	2 x 1.20	1 x 3.00
13	31+910	19+889	Pipe	Pipe	2 x 0.60	2 x 1.20
14	31+770	20+032	Slab	Box	2 x 1.80	1 x 4.00
15	31+530	20+261	Slab	Box	3 x 1.80	1 x 6.00
16	31+325	20+473	Slab	Box	2 x 1.80	1 x 4.00
17	31+085	20+703	Pipe	Pipe	2 x 0.75	2 x 1.20
18	30+915	20+872	Pipe	Pipe	2 x 0.75	2 x 1.20
19	30+625	21+170	Pipe	Pipe	1 x 0.90	1 x 1.20
20	30+180	21+605	Pipe	Pipe	2 x 0.90	2 x 1.20
21	28+275	23+454	Slab	Box	2 x 2.50	1 x 5.00
22	27+160	24+596	Pipe	Pipe	1 x 1.20	1 x 1.20
23	27+005	24+751	Pipe	Pipe	1 x 1.20	1 x 1.20
24	26+532	25+254	Pipe	Pipe	1 x 1.20	1 x 1.20
25	25+625	26+006	Pipe	Pipe	1 x 1.20	1 x 1.20
26	25+320	26+319	Pipe	Pipe	4 x 0.75	4 x 1.20
27	24+995	26+640	Pipe	Pipe	2 x 1.20	2 x 1.20

S. No.	Existing Km.	Design Chainage	Type of Structure		Span Arrangement (m)	
			Existing	Proposed	Existing	Proposed
28	24+890	26+753	Pipe	Pipe	4 x 1.20	4 x 1.20
29	24+630	27+006	Pipe	Pipe	4 x 1.20	4 x 1.20
30	24+340	27+300	Pipe	Pipe	1 x 1.20	1 x 1.20
31	24+160	27+481	Pipe	Pipe	2 x 1.20	2 x 1.20
32	23+510	28+124	Pipe	Pipe	2 x 1.20	2 x 1.20
33	23+260	28+374	Slab	Box	1 x 4.30	1 x 5.0
34	22+650	28+999	Pipe	Pipe	1 x 1.20	1 x 1.20
35	22+460	29+191	Pipe	Pipe	3 x 1.20	3 x 1.20
36	21+220	30+417	Pipe	Pipe	2 x 1.20	2 x 1.20
37	19+510	32+075	Pipe	Pipe	1x0.9+1x0.6	2 x 1.20
38	18+620	32+976	Pipe	Pipe	1 x 0.75	1 x 1.20
39	18+085	33+501	Pipe	Pipe	2 x 1.20	2 x 1.20
40	17+450	34+147	Pipe	Pipe	1 x 1.20	1 x 1.20
41	17+325	34+264	Pipe	Pipe	1 x 1.20	1 x 1.20
42	16+140	35+411	Pipe	Pipe	1 x 1.20	1 x 1.20
43	15+900	35+660	Pipe	Pipe	2 x 1.20	2 x 1.20
44	14+950	36+603	Pipe	Pipe	3 x 1.20	3 x 1.20
45	11+670	39+666	Slab	Box	1 x 1.60	1 x 2.00
46	11+490	39+843	Slab	Box	1 x 3.50	1 x 3.50
47	11+100	40+225	Slab	Box	1 x 4.0	1 x 4.0
48	10+800	40+494	Slab	Box	1 x 3.80	1 x 4.0
49	10+390	40+902	Slab	Box	1 x 1.50	1 x 2.00
50	9+800	41+459	Pipe	Pipe	1 x 1.20	1 x 1.20
51	9+515	41+745	Slab	Box	1 x 1.50	1 x 2.00
52	9+380	41+884	Pipe	Pipe	1 x 1.20	1 x 1.20
53	8+730	42+529	Slab	Box	3 x 1.50	1 x 5.00
54	7+145	44+148	Pipe	Pipe	2 x 1.20	2 x 1.20
55	6+915	44+381	Pipe	Pipe	1 x 1.20	1 x 1.20
56	6+180	45+116	Slab	Box	1 x 2.50	1 x 2.50
57	5+565	45+728	Slab	Box	3 x 0.90	1 x 3.00
58	3+795	47+496	Slab	Box	1 x 5.0	1 x 5.0

7.2.3 Widening of Existing Culverts

All existing culverts which are to be retained shall be widened to the proposed roadway width of the Project Highway as per the typical cross section given in section 7 of the Manual. Repairs and strengthening of existing structures where

required shall be carried out.

S. No.	Existing Structure Chainage (Km)	Existing Structure Type	Proposed Structure Chainage (Km)	Number and Length of Spans (m)	Remark /Repairs to be carried out
Nil					

7.2.4 Additional New Culverts

New Culverts (given in the table below) shall be constructed for width equal to the proposed roadway width of the Project Highway & as per typical cross-section given in Schedule-B. The details are given as under:

S. No.	Existing Km	Design Chainage	Proposed type	Span/ Opening (m)
1	Bypass	1+813	Pipe	1 x 1.20
2	Bypass	2+323	Box	1 x 5.00
3	Bypass	2+703	Pipe	2 x 1.20
4	Bypass	3+653	Box	1 x 2.00
5	Bypass	4+393	Pipe	1 x 1.20
6	Bypass	4+880	Pipe	3 x 1.20
7	Bypass	4+994	Pipe	1 x 1.20
8	Bypass	5+335	Pipe	1 x 1.20
9	Bypass	5+518	Pipe	2 x 1.20
10	Bypass	6+962	Pipe	1 x 1.20
11	Bypass	7+454	Pipe	2 x 1.20
12	Bypass	7+685	Pipe	2 x 1.20
13	Bypass	8+305	Pipe	1 x 1.20
14	Bypass	8+976	Box	1 x 3.00
15	Bypass	9+122	Box	1 x 5.00
16	35+180	16+654	Box	1 x 3.00
17	34+700	16+875	Box	1 x 4.00
18	-	38+012	Pipe	1 x 1.20
19	12+955	38+495	Box	1 x 3.00

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

S. No.	Design Chainage (Km)	Structure Type	Type of Repair required
Nil			

7.3 Bridges

7.3.1 Existing bridges to be re-constructed/widened:

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

S. No.	Design Chainage	Type of proposed Structure	Existing Span	Existing Width	Proposed Span	Proposed Width of Carriageway	Proposed Total Width (m)	Skew Angle
1	11+987	Minor Bridge	2 x 3.0	6.5	1 x 8m	2 x 10.0m	2 x 13.10	0°
2	12+364	Minor Bridge	2 x 3.0	7.5	1 x 8m (Skew)	2 x 10.0m	2 x 13.10	29°
3	12+838	Minor Bridge	4x 1.50	7	1 x 8m	2 x 10.0m	2 x 13.10	0°
4	13+785	Major bridge	5 x 6.5	7.0	3 x 20m	2 x 10.0	2 x 13.10	0°
5	15+461	Minor Bridge	5 x 7.0	7.2	3 x 15m	2 x 10.0m	2 x 13.10	0°
6	23+145	Minor Bridge	5 x 6.8	6.5	4 x 10m	2 x 10.0m	2 x 13.10	0°
7	29+915	Minor Bridge	4 x 6.0	7.8	3 x 10m	2 x 10.0m	2 x 13.10	0°
8	31+337	Minor Bridge	2 x 6.0	7.8	3 x 8m (Skew)	2 x 10.0m	2 x 13.10	29°
9	33+740	Major bridge	7 x 6.0	7.30	3 x 21.890m (Skew)	2 x 10.0	2 x 13.10	24°
10	42+216	Minor Bridge	2 x 5.4	8.1	2 x 10m	2 x 10.0m	2 x 13.10	0°
11	44+812	Minor Bridge	6 x 3.7	8.15	3 x 7m (Skew)	2 x 10.0m	2 x 13.10	37°

Note: The span arrangement of structures is indicative. The Concessionaire shall design the structure as per the site requirement, subject to the condition that the structure is provided over entire linear waterway.

- (ii) The following narrow bridges shall be widened:

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

Note: The span arrangement of structures is indicative. The Concessionaire shall design the structure as per the site requirement, subject to the condition that the structure is provided over entire linear waterway.

7.3.2 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 Volume in Annexure-III of Schedule-A.

(i) Major Bridges

Sr. No	Design Chainage (Km)	Skew Span Arrangement (m)	Type of Crossing	Total Proposed width (m)		Typical Cross Section	Skew Angle
				MCW	SR		
1	0+376	7 x 40.00 (Skew)	Stream	2x13.1	-	7.2A of Manual	48°
2	6+111	3 x 25m	Canal	2x13.1	-	7.2A of Manual	0°
3	16+354	5 x 40m	Stream	2x13.1	-	7.2A of Manual	0°

Note: The span arrangement of structures is indicative. The Concessionaire shall design the structure as per the site requirement, subject to the condition that the structure is provided over entire linear waterway.

(ii) Minor Bridges

Sr. No	Design Chainage (Km)	Skew Span Arrangement (m)	Type of Crossing	Total Proposed width (m)		Typical Cross Section	Skew Angle
				MCW	SR		
1	1+186	1 x 20m	Nalla	2 x 11.0	2 x 9.5	TCS-4 for MCW & Fig.7.2B of Manual for SR.	0°
2	8+659	2 x 10m		2 x 11.0	2 x 9.5		0°
3	14+361	1 x 8m (Skew)		2 x 13.10	-	MoRTH circular no. RW/NH-33044/22/2020-S&R(P&B)/dated 4 th June 2024	35°
4	22+977	3 x 10m (Skew)		2 x 13.10	-		20°
5	38+764	5 x 10m (Skew)		2 x 13.10	-		37°

Note: The span arrangement of structures is indicative. The Concessionaire shall design the structure as per the site requirement, subject to the condition that the structure is provided over entire linear waterway.

7.3.3 The railings of existing bridges shall be replaced by crash barriers at the following locations (Clause No. 7.17 iv IRC: SP:84-2019):

S. No.	Design Chainage (Km)	Remark
Nil		

7.3.4 The existing bridges/ROB/Grade Separators/RUB retained on the project highway shall be upgraded and rehabilitation measures/proposals shall be specified as follows: (Clause No. 7.3 IV (b) IRC: SP:84-2019)

S. No.	Design Chainage (Km)	Remark
Nil		

7.3.5 Structures in Marine Environment

S. No.	Design Chainage (Km)	Remark
Nil		

7.4 Rail-road bridges

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

7.4.2 Road Over Bridges

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

Sr. No.	Design Chainage (Km)	Proposed Span Arrangement (m)	Type of super-structure	Name of Crossing	Remarks
Nil					

Note:

1. ROB shall be designed, constructed and maintained as per the requirements of Railway Authorities. The construction plan shall be prepared in consultation with the concerned railway authority.
2. The ROB shall be constructed and maintained by the Concessionaire under supervision of the Railways.
3. All charges payable to the railways like D&G, Capitalized maintenance, signaling, cabling, OHE modification, earthing, etc. except P&E charges shall be borne by the Concessionaire.

7.4.3 Road Under Bridges

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

S. No.	Location of Level Crossing / Design Chainage (Km)	Number and Length of Spans (m)
Nil		

7.5 Grade Separated Structures (Clause 7.19 IRC: SP:84-2019)

The grade separated structures shall be provided at the locations and of the type and length specified in paragraphs 2.9, 2.10 and 3 of this Annexure-I of Schedule-

B.

7.6 FOB/Skywalks (Clause No. 10 IRC:103 and Clause No. 9.8.5 IRC: SP:84-2019)

FOB/Skywalks shall be provided in built-up areas/near schools.

S. No.	Location / Design Chainage (Km)	FOB Type	Remarks
Nil			

7.7 List of Bridges and Structures

Sr. No.	Type of Structure	Total Nos.	Remarks
1	ROB	Nil	
2	Major Bridge	5	
3	Minor Bridge	14	
4	VUP/Flyover	4	
5	Culverts	77	

8. Traffic Control Devices and Road Safety Works

8.1 Traffic control devices and road safety works shall be provided in accordance with Section 9 of the Manual.

- Traffic Signs: Traffic signs include roadside signs, overhead signs and curb mounted signs along the entire Project Highway as per IRC:67-2022 and Ministry's Circular No. RT-25035/07/2023-RS (Part) (221534) dated 24.12.2024 as mentioned in Schedule-C.
- Pavement Marking: Pavement markings shall cover road marking for the entire Project Highway as per IRC:35-2015 as mentioned in Schedule-C.
- Safety Barrier:

1. **Thrie Beam Crash Barrier:** Provide Thrie metal beam crash barrier along the project highway at the locations as suggested in Manual. However, the minimum location shall be as follows:

Locations where embankment height is more than 3.0m:

LHS				RHS		
S. No.	Design Chainage		Length (m)	Design Chainage		Length (m)
	From	To		From	To	
1	0+570	0+710	140	0+570	0+740	170
2	16+120	16+200	80	11+983	11+991	8
3	30+520	30+580	60	13+160	13+290	130
4	31+325	31+349	24	16+140	16+200	60

LHS				RHS		
S. No.	Design Chainage		Length (m)	Design Chainage		Length (m)
	From	To		From	To	
5	37+750	38+150	400	16+670	16+750	80
6	38+620	38+990	370	29+900	29+930	30
7	44+801	44+823	22	31+325	31+349	24
8				33+990	34+090	100
9				35+190	35+240	50
10				37+660	38+180	520
11				38+330	38+430	100
12				38+660	38+910	250
Total length			1096	Total length		1522

Locations where radius of curve is less than 450m:

S. No.	Design Chainage (Km)		Length (m)	Side
	From	To		
1	13+290	13+712	422	On Outer Side and Median
2	13+870	14+192	322	On Outer Side and Median
3	16+450	16+670	220	On Outer Side and Median
4	17+001	17+323	322	On Outer Side and Median
5	19+055	19+131	76	On Outer Side and Median
6	20+027	20+216	189	On Outer Side and Median
7	20+520	20+660	140	On Outer Side and Median
8	22+296	22+519	223	On Outer Side and Median
9	22+853	22+940	87	On Outer Side and Median
10	22+990	23+090	100	On Outer Side and Median
12	25+232	25+496	264	On Outer Side and Median
13	28+807	28+945	138	On Outer Side and Median
14	30+070	30+330	260	On Outer Side and Median
15	30+520	30+927	407	On Outer Side and Median
16	32+999	33+137	138	On Outer Side and Median
17	34+928	35+374	446	On Outer Side and Median
18	35+873	35+970	97	On Outer Side and Median
19	39+428	39+448	20	On Outer Side and Median
20	44+801	44+823	22	On Outer Side and Median
Total Length			3893m	

2. RCC Crash Barrier: Provide rigid type (Concrete) crash barrier along the project highway at the locations as shown in the applicable Typical Cross Section. However, the minimum location (excluding structures) shall be as follows:

Sr. No.	From	To	Length (m)	Side
1	46+157	46+630	473	In Median
2	46+700	47+307	607	In Median
		Total:	1080	

3. **RCC Crash Barrier with Friction Slab:** Provide rigid type (Concrete) crash barrier with friction slab at RE Wall Locations. However, the minimum length shall be as follows:

Sr. No.	From	To	Length (m)	Side
1	0+805	1+206	401	Both side
2	1+226	1+700	474	Both side
3	4+130	4+588	458	Both side
4	4+612	5+200	588	Both side
5	7+450	8+243	793	Both side
6	8+267	8+680	413	Both side
7	46+157	46+630	473	Both side
8	46+700	47+307	607	Both side
		Total:	2*4207= 8414m	

4. **Additional crash barrier requirement (Thrie beam):**

Thrie Beam at the Outer Edge of the Carriageway				
Sr. No.	From	To	Length (m)	
			LHS	RHS
1	9430	11983	2553	2553
2	11991	12360	369	369
3	12368	12834	466	466
4	12842	13160	318	318
5	14560	15438	878	878
6	15484	15949	465	465
7	17323	19055	1732	1732
8	19248	20027	779	779
9	20321	20520	199	199
10	20660	22296	1636	1636
11	22574	22780	206	206
12	23165	23325	160	160
13	23395	24197	802	802
14	24266	25232	966	966
15	25496	28150	2654	2654
16	28300	28807	507	507
17	28972	29900	928	928

Thrie Beam at the Outer Edge of the Carriageway				
Sr. No.	From	To	Length (m)	
			LHS	RHS
18	29930	30070	140	140
19	30330	30520	190	190
20	31030	31325	295	295
21	31349	32999	1650	1650
22	33303	33560	257	257
23	34240	34303	63	63
24	34420	34928	508	508
25	35455	35873	418	418
26	36031	37065	1034	1034
27	39520	40433	913	913
28	41592	41655	63	63
29	42015	42206	191	191
30	42226	44801	2575	2575
31	44823	44942	119	119
Total			2*24034=48068	

Thrie Beam on the Median Side				
Sr. No.	From	To	Length (m)	
			LHS	RHS
1	0	236	236	236
2	516	1206	690	690
3	1226	4588	3362	3362
4	4612	6073	1461	1461
5	6149	8243	2094	2094
6	8267	11983	3716	3716
7	11991	12360	369	369
8	12368	12834	466	466
9	12842	13755	913	913
10	13815	14357	542	542
11	14365	15438	1073	1073
12	15484	16254	770	770
13	16454	22962	6508	6508
14	22992	23125	133	133
15	23165	29900	6735	6735
16	29930	31325	1395	1395
17	31349	33703	2354	2354
18	33767	38739	4972	4972

Thrie Beam on the Median Side				
Sr. No.	From	To	Length (m)	
			LHS	RHS
19	38789	41655	2866	2866
20	42015	42206	191	191
21	42226	44801	2575	2575
22	44823	46157	1334	1334
Total			2*44755= 89510	

In addition to above locations thrie beam crash barrier shall be provided in approaches to all bridges in length of 50 m on median and shoulder side. **(Total length =1600m).**

The safety barriers shall be provided in accordance with Section-9 of the Clause 9.7 of the Manual and MoRTH circular no RW/NH-2923/02/2019-S&R (P&B) dated 01.01.2020.

End Treatment of Steel barriers/Rope Barrier shall be specified i.e. MELT or P-4 confirming to EN 1317-4, TT, MBCB barrier to Concrete Barrier (Clause No. 9.7.2 (b) IRC: SP:84-2019/ IRC: SP:87-2019).

End Treatment to Concrete barrier shall be done as specified in Clause No. 9.7.3 (b) IRC: SP:84- 2019.

In addition to above locations, metal beam crash barrier & Concrete crash barrier shall be provided if any requirement arises as per manual and as shown in GAD of the Bridges & Structures in the drawings Volume.

8.2 Specifications of the Reflecting Sheeting

Retro reflective sheeting shall be of micro prismatic grade Type-XI in accordance with ASTM Standard D 4956.

9. Roadside Furniture

9.1 Roadside furniture shall be provided in accordance with the provisions of Section 9 of the Manual

9.2 Overhead traffic signs: location and size

1. Full width Overhead signs: 10 Nos.
2. Cantilever Overhead signs: 20 Nos.

Note:

1. The numbers and location of Traffic Signages shown in Traffic Signage plan as indicated in **Annexure-III** of Schedule-A are tentative and minimum specified. The actual numbers and location of Traffic Signages shall be determined by the Concessionaire in accordance with relevant manual

requirements with approval from the Independent Engineer. Any increase in the number and type of road sign boards specified in this Clause of 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 16.

2. Full width overhead sign shall be provided with retro reflective sheeting on both sides.

10. Hazardous Locations

Provide safety barrier along the project highway at hazardous locations as suggested in Manual. However, the minimum location shall be as follows:

S. No.	Stretches (Km)-Left Side			Stretches (Km)-Right Side		
	From	To	Length (Km)	From	To	Length (Km)
As per Clause 8.1 (c) of this schedule						

11. Special Requirements for Hill Roads- Deleted

12. Protection Works

12.1 RCC Retaining Wall/Toe Walls

LHS				RHS		
S.no.	From	To	Length(m)	From	To	Length (m)
1	200	240	40	150	240	90
2	6010	6080	70	2160	2230	70
3	6150	6240	90	5990	6070	80
4	13740	13760	20	6150	6260	110
5	16130	16260	130	13750	13760	10
6	22940	22970	30	16150	16260	110
7	23120	23130	10	23120	23130	10
8	33770	33780	10	33770	33790	20
9	37750	38090	340	37700	38150	450
10	38130	38140	10	38670	38740	70
11	38640	38740	100	38790	38920	130
12	38790	38990	200			
Total LHS			1050 m	Total RHS		1150 m
Total Length (LHS+RHS)			2200 m			

12.2 RCC Retaining Wall/Toe Wall with RCC Lined Drain

Sr. No.	From	To	Length (m)	
			LHS	RHS
1	9430	11983	2553	2553

Sr. No.	From	To	Length (m)	
			LHS	RHS
2	11991	12360	369	369
3	12368	12834	466	466
4	12842	13160	318	318
5	14560	15438	878	878
6	15484	15949	465	465
7	17323	18960	1637	1637
8	19248	20027	779	779
9	20321	20520	199	199
10	20660	22296	1636	1636
11	22574	22780	206	206
12	23165	25232	2067	2067
13	25496	28150	2654	2654
14	28300	28807	507	507
15	28972	29900	928	928
16	29930	30070	140	140
17	30330	30520	190	190
18	31030	31325	295	295
19	31349	32999	1650	1650
20	33303	33560	257	257
21	34240	34303	63	63
22	34420	34928	508	508
23	35455	35873	418	418
24	36031	37065	1034	1034
25	39520	40433	913	913
26	41592	41655	63	63
27	42015	42206	191	191
28	42226	44801	2575	2575
29	44823	44942	119	119
Total			24078	24078
Total (LHS+RHS)			2*24078=48156m	

Note: The entire cross-sectional elements shall be accommodated in the proposed ROW. If required, suitable height retaining structures shall be provided to accommodate the highway cross sections within the proposed ROW. Any increase in the length to and height specified or referred in this Clause of Schedule -B shall not constitute a Change of Scope.

12.3 Breast Wall and Slope Protection on Hill Side

Sr. No.	From	To	Length (m)	Height (m)	Side
1	37+510	37+550	40.0	4 m	LHS
2	37+470	37+590	120.0	4 m	RHS
3	39+160	39+260	100.0	4 m	LHS
Total			260.0 m		

Note: The entire cross-sectional elements shall be accommodated in the proposed ROW. If required, suitable height slope protection measures including PCC Breast Wall but not limited to it shall be provided to accommodate the highway cross sections within the proposed ROW as well to keep the cut formation and slope stable, durable and safe for the users. Any increase in the length to and height specified or referred in this Clause of Schedule-B shall not constitute a Change of Scope.

12.4 RE Wall

Sr. No.	From	To	Length (m)	TCS Type	Side
1	805	1206	401	TCS-4A	Both Side
2	1226	1700	474	TCS-4A	Both Side
3	4130	4588	458	TCS-4A	Both Side
4	4612	5200	588	TCS-4A	Both Side
5	7450	8243	793	TCS-4A	Both Side
6	8267	8680	413	TCS-4A	Both Side
7	46157	46630	473	TCS-3A	Both Side
8	46700	47307	607	TCS-3A	Both Side
Total			2*4207= 8414		

Note: Any increase in the length and height specified in this Clause of Schedule-B shall not constitute a Change of Scope.

13. Utility Shifting

Shifting of obstructing existing utilities indicated in Schedule A to an appropriate location in accordance with the standards and specifications of concerned Utility Owning Department is part of the scope of work of the Concessionaire. Copy of utility relocation plan is enclosed. The specifications of concerned Utility Owning Department shall be applicable and followed. (NHAI/Policy Guidelines/Utility Shifting/2021 Policy Circular No.7.2.12/2021 dated 15th January, 2021)

Note I:

a. A The type/spacing/size/specifications of poles/towers/lines/cables to be used in shifting work shall be as per the guidelines of Utility Owning Department and it is to be agreed solely between the Concessionaire and the Utility Owning Department. No change of scope shall be admissible and no cost shall be paid for

using different type/ spacing/ size/ specifications in shifted work in comparison to those in the existing work or for making any overhead crossings to underground as per requirement of Utility Owning Department and/or construction of project highway. The Concessionaire shall carry out joint inspection with Utility Owning Department and get the estimates from Utility Owning Department. The assistance of the Authority is limited to giving forwarding letter on the proposal of Concessionaire to Utility Owning Department whenever asked by the Concessionaire". The decision/approval of Utility owning Department shall be binding on the Concessionaire".

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

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

d. The utilities shall be handed over after shifting work is completed to Utility Owning Department to their entire satisfaction. The maintenance liability shall rest with the Utility Owning Department after handing over process is complete as far as utility shifting works are concerned.

Note II: Utility shifting shall be done as per clause 18 of Schedule A

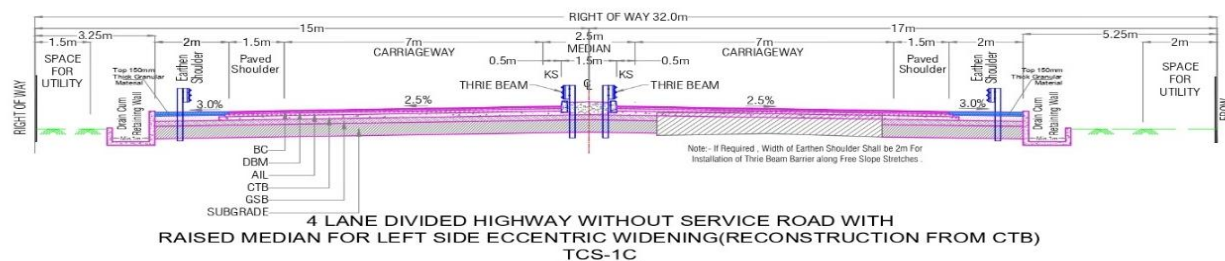
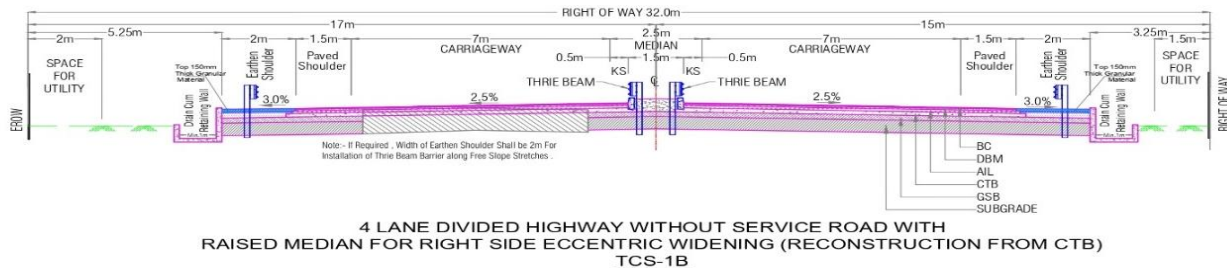
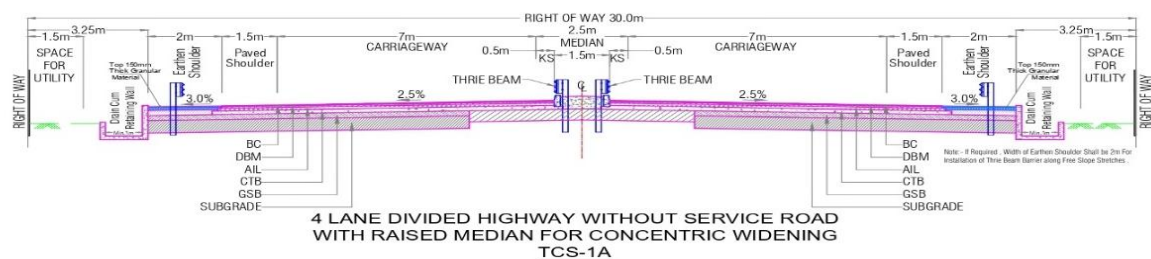
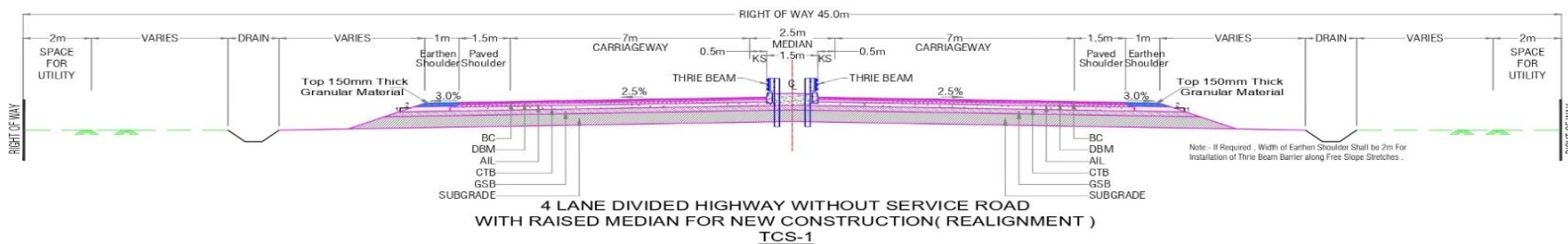
14. Change of Scope

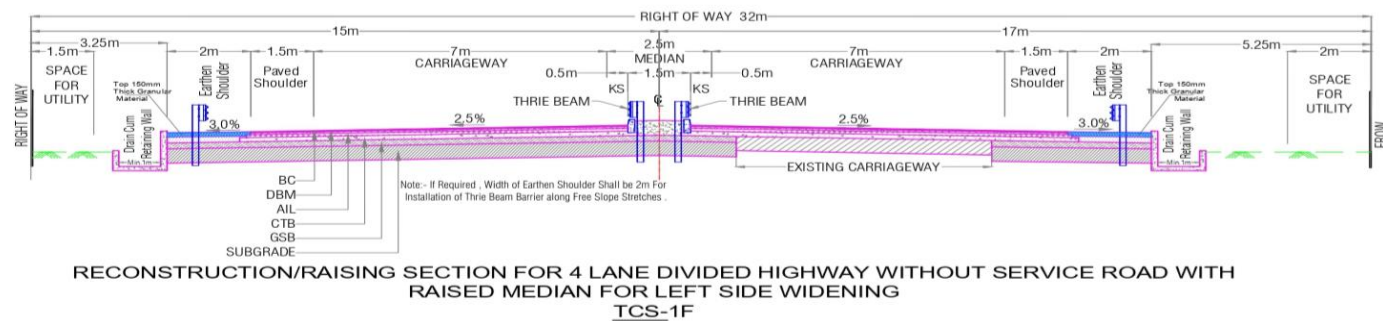
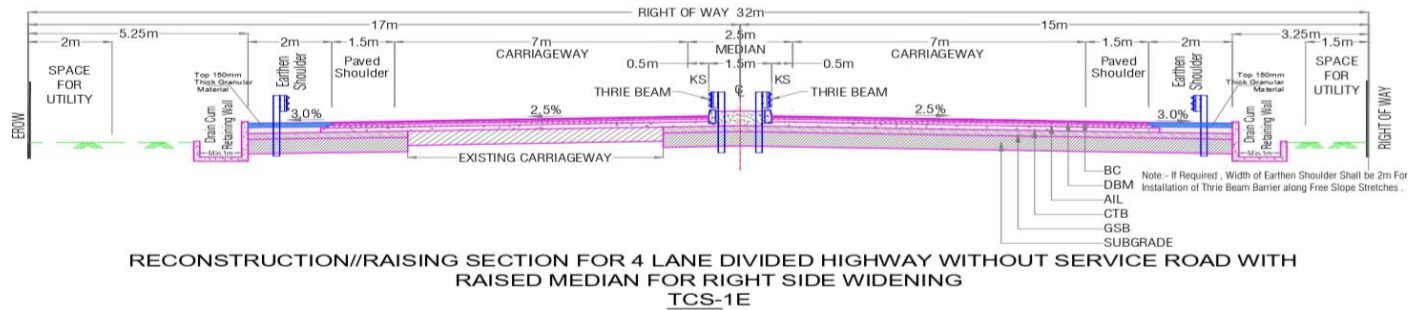
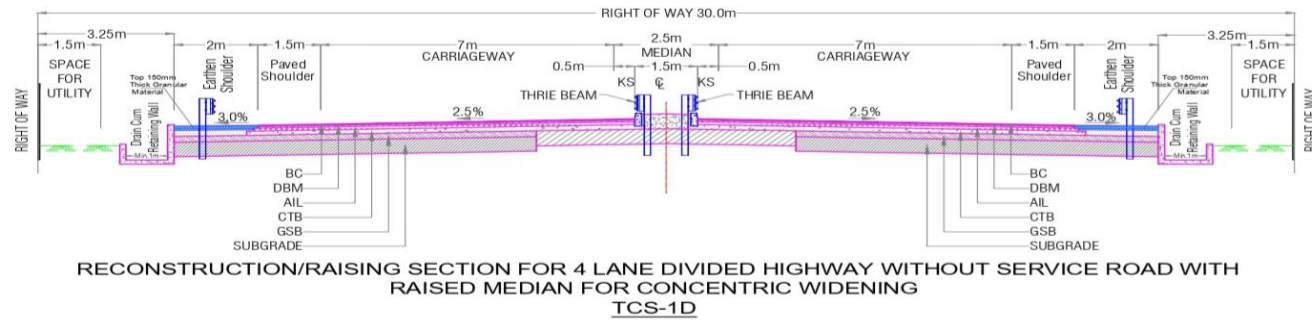
The length of Structures and bridges specified hereinabove shall be treated as an approximate assessment. The proposed span arrangement of above structures may be changed based on innovative design of structure, latest construction techniques and aesthetics of structures and the actual lengths of Structures and bridges as required on the basis of detailed investigations shall be determined by the Concessionaire 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 16.

15. Work Zone Traffic Management Plans (Clause No. 9.9 IRC: SP:84-2019)

The traffic diversion plans shall be prepared as per IRC: SP:55 for smooth flow of traffic and safety. A diversion plan shall be proposed for construction of Culvert, Grade Separated Structures, Bridges, ROB/RUB, etc. and traffic management plan for widening/reconstruction of carriageway. Tentative traffic diversion plans are attached with **Annexure-III** of Schedule-A.

Appendix B-I: Typical Cross Sections





RIGHT OF WAY 45.0m

1m 1.5m 7.5m SERVICE ROAD 1.75m 2.5m Paved Shoulder 7m CARRIAGEWAY 0.5m 1.5m KS 0.5m 2.5m MEDIAN 7m CARRIAGEWAY 2.5m Paved Shoulder 1.75m 7.5m SERVICE ROAD 1.5m 1m

FOOTPATH DRAIN

SEPARATOR

Pedestrian Rolling Shell 1m height

2.5%

THRIE BEAM

Antiglare Screen

THRIE BEAM

EXISTING CARRIAGEWAY

BC

DBM

AIL

CTB

GSB

SUBGRADE

4 LANE DIVIDED HIGHWAY WITH SERVICE ROAD
WITH RAISED MEDIAN FOR CONCENTRIC WIDENING (OVERLAY & PCC)
TCS-2

50mm 115mm 200mm 2.5% 60mm 165mm 170mm

BC

DBM

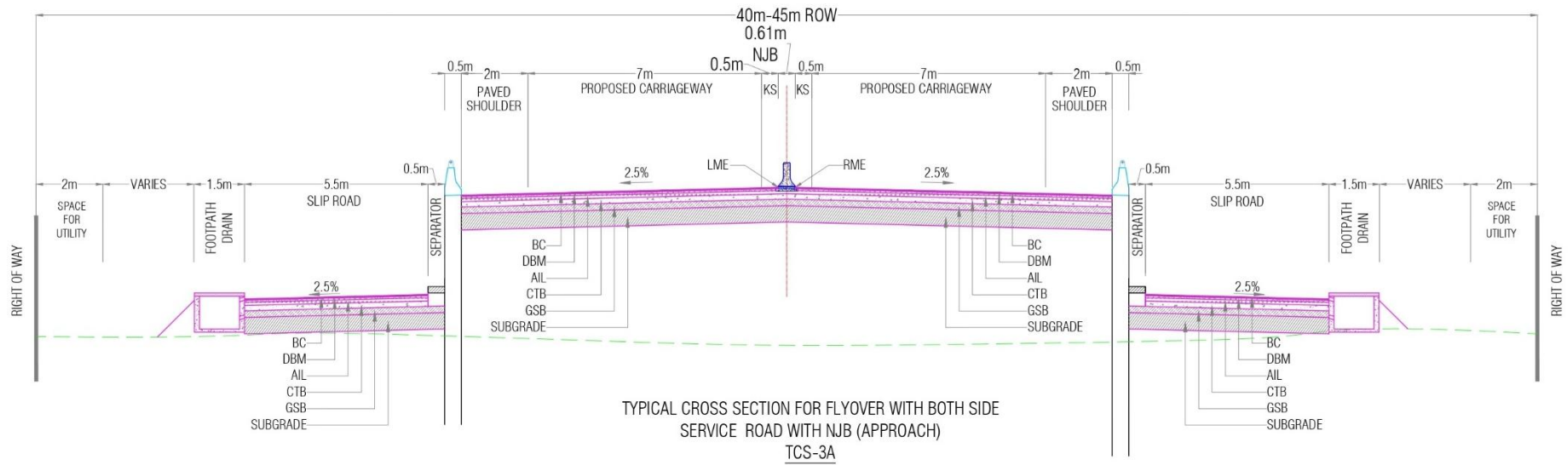
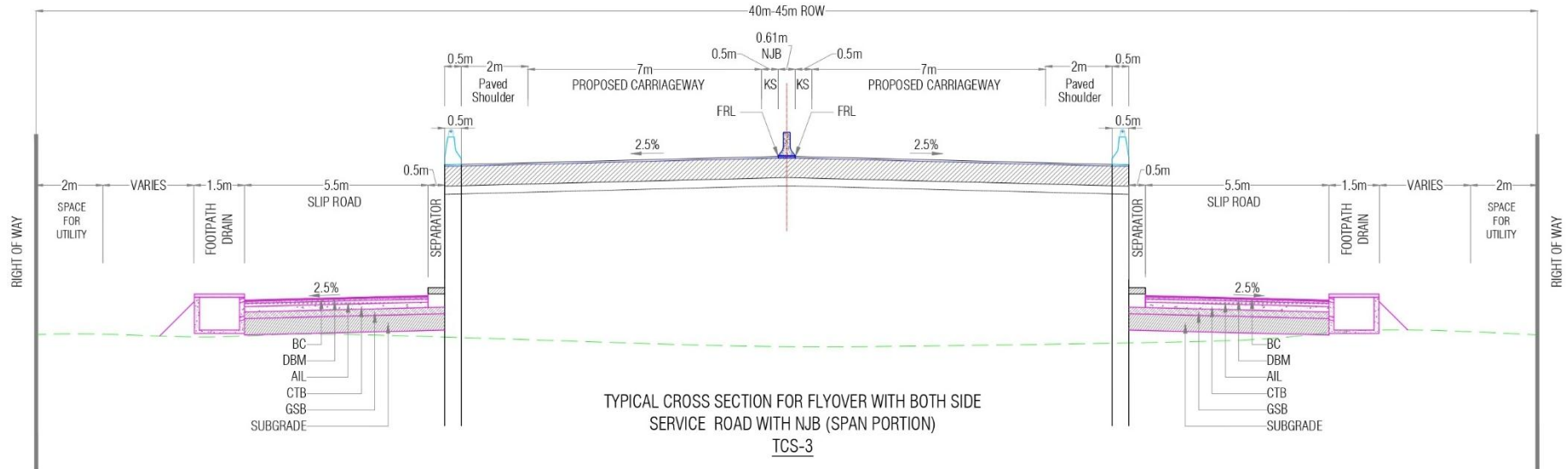
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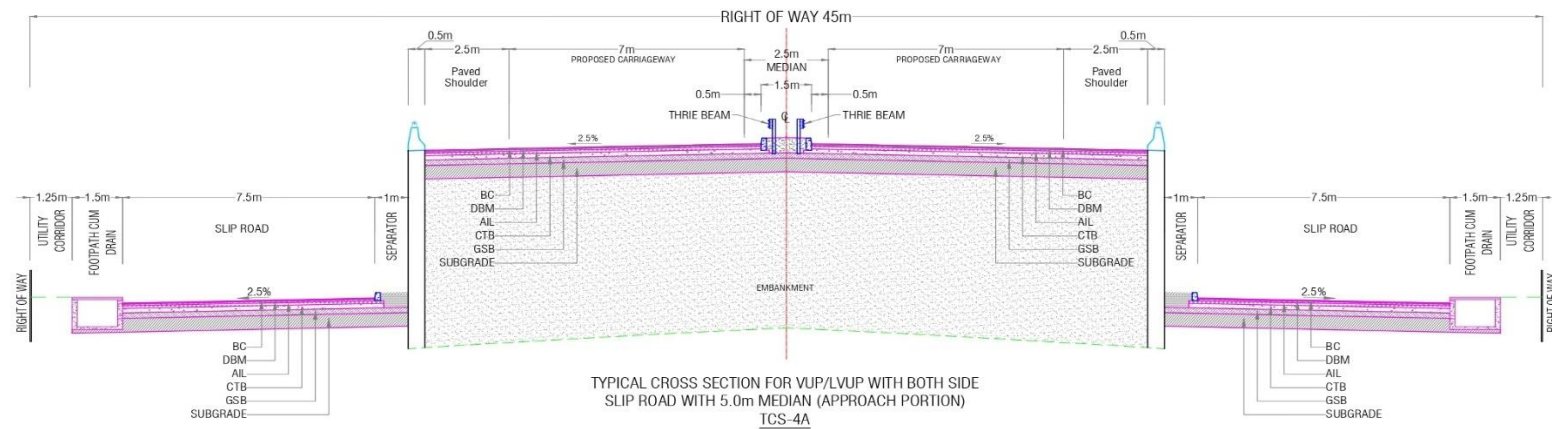
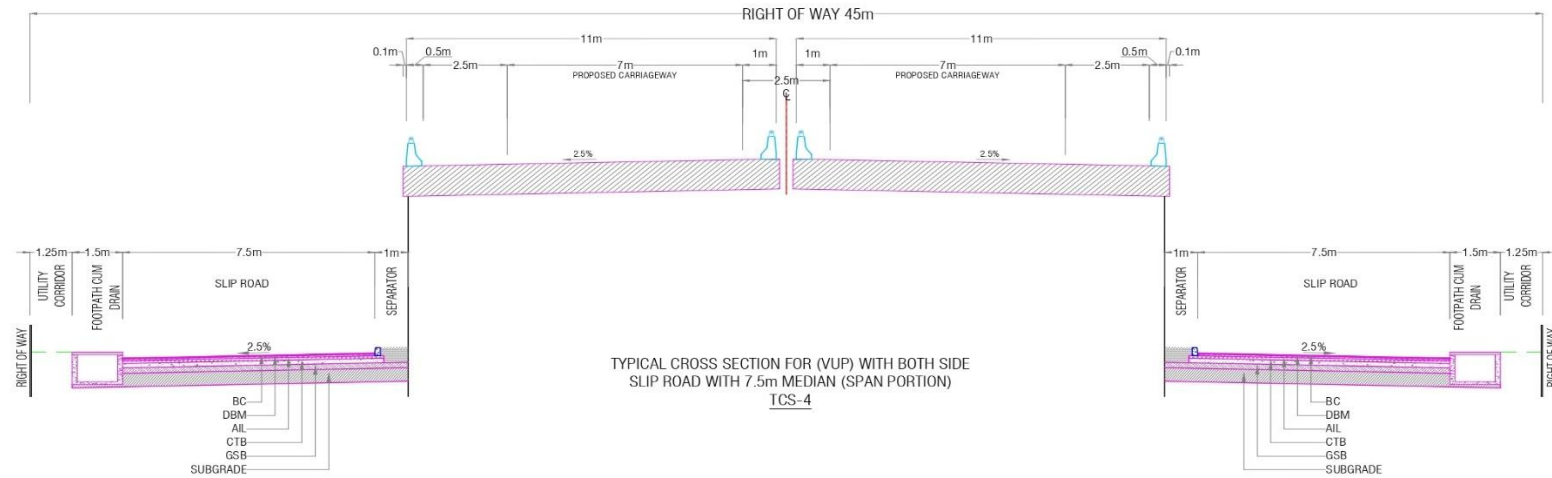
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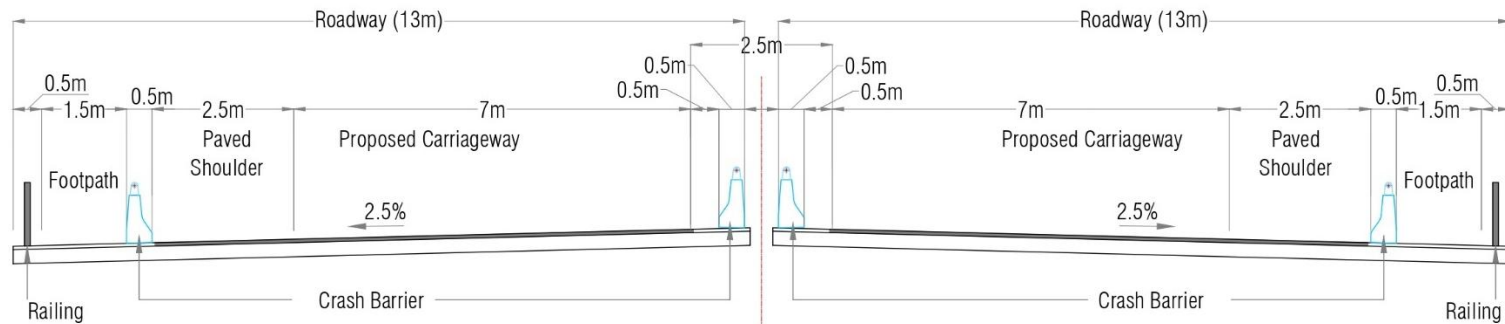
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SUBGRADE

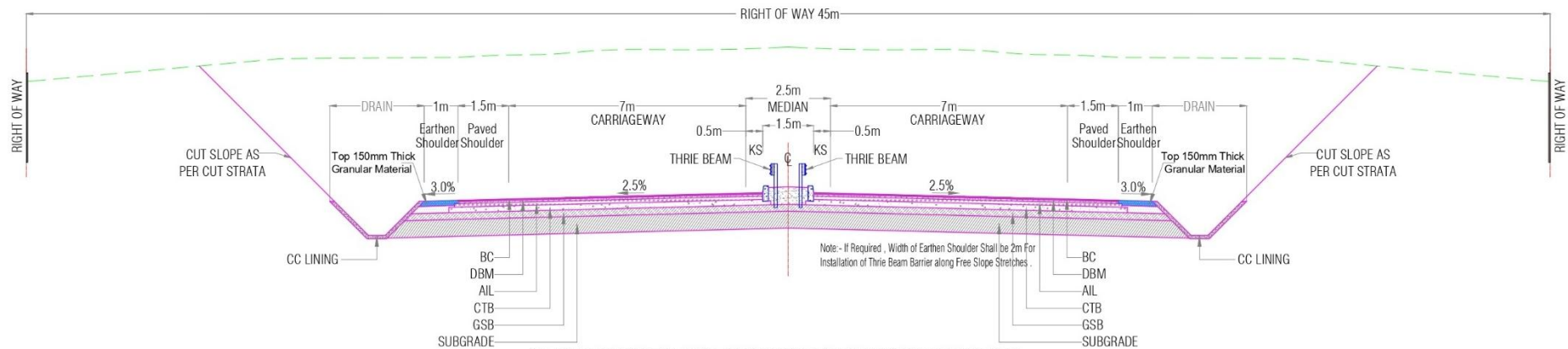
DETAILS OF I KERB IN PROPOSED ROAD
DETAIL - B



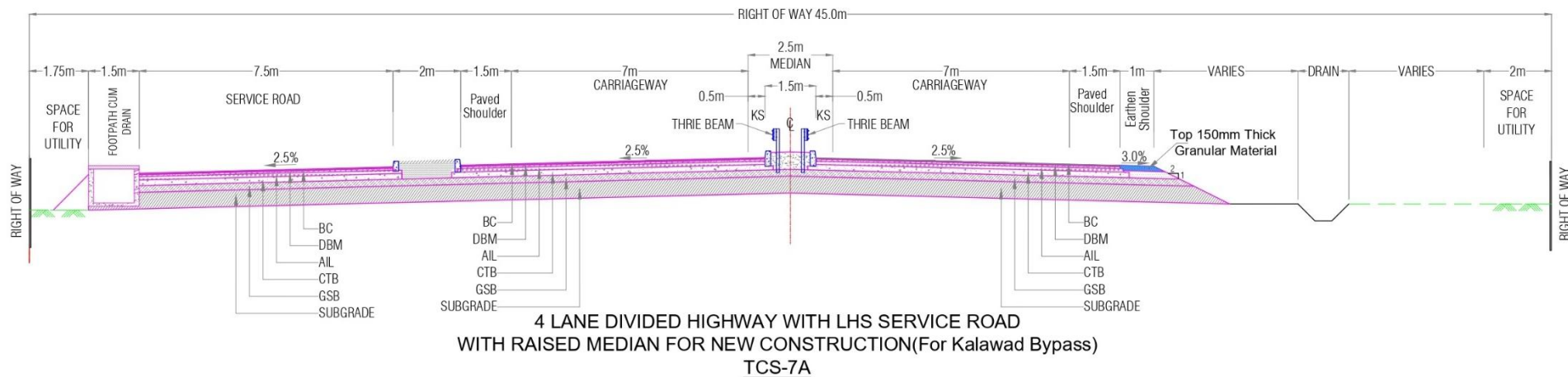
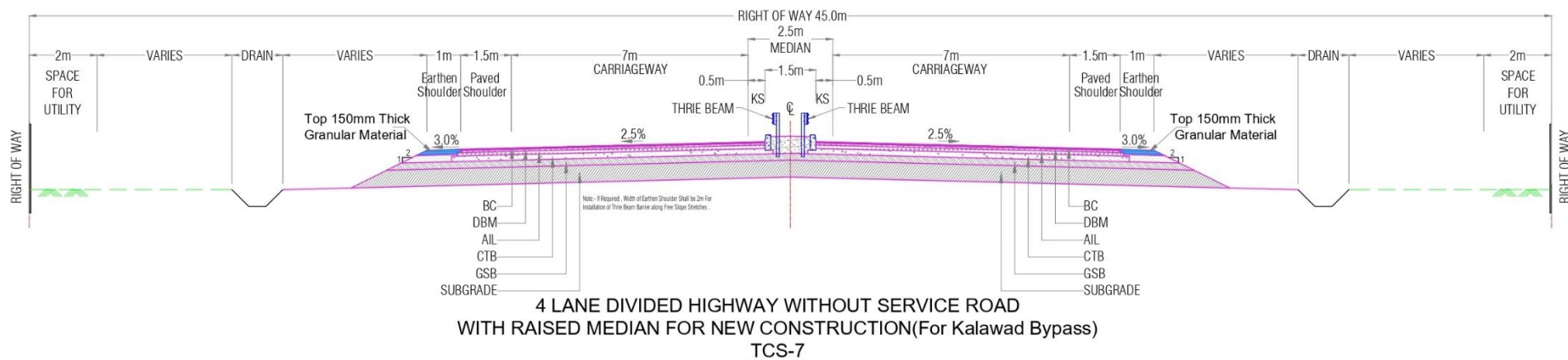




TYPICAL CROSS SECTION FOR BRIDGE AND DECK LEVEL - WITH FOOTPATH
4 LANE DIVIDED HIGHWAY
TCS - 5



4 LANE DIVIDED HIGHWAY FOR NEW CONSTRUCTION
IN HILL SECTION (BOTH SIDE CUTTING)
TCS-6



Appendix B-II: Applicable Stretches of Typical Cross Sections

S.No	Design Chainage		Length(m)	TCS Type
	From	To		
1	0	236	236	TCS-7
2	236	516	280	TCS-5
3	516	805	289	TCS-5 to TCS-4A
4	805	1206	401	TCS-4A
5	1206	1226	20	TCS-4
6	1226	1700	474	TCS-4A
7	1700	1970	270	TCS-4A to TCS-7A
8	1970	3845	1875	TCS-7A
9	3845	4130	285	TCS-7A to TCS-4A
10	4130	4588	458	TCS-4A
11	4588	4612	24	TCS-4
12	4612	5200	588	TCS-4A
13	5200	5470	270	TCS-4A to TCS-7A
14	5470	5790	320	TCS-7A
15	5790	6015	225	TCS-7A to TCS-7
16	6015	6073	58	TCS-7
17	6073	6149	76	TCS-5
18	6149	6200	51	TCS-7
19	6200	6410	210	TCS-7 to TCS-7A
20	6410	7165	755	TCS-7A
21	7165	7450	285	TCS-7A to TCS-4A
22	7450	8243	793	TCS-4A
23	8243	8267	24	TCS-4
24	8267	8680	413	TCS-4A
25	8680	8965	285	TCS-4A to TCS-7
26	8965	9340	375	TCS-7
27	9340	9430	90	TCS-7 to TCS-1B
28	9430	11119	1689	TCS-1B
29	11119	11185	66	TCS-1B to TCS-1C
30	11185	11625	440	TCS-1C
31	11625	11683	58	TCS-1C to TCS-1B
32	11683	11983	300	TCS-1B
33	11983	11991	8	TCS-5
34	11991	12140	149	TCS-1B
35	12140	12360	220	TCS-1E
36	12360	12368	8	TCS-5
37	12368	12834	466	TCS-1E

S.No	Design Chainage		Length(m)	TCS Type
	From	To		
38	12834	12842	8	TCS-5
39	12842	13160	318	TCS-1E
40	13160	13755	595	TCS-1
41	13755	13815	60	TCS-5
42	13815	14357	542	TCS-1
43	14357	14365	8	TCS-5
44	14365	14560	195	TCS-1
45	14560	14790	230	TCS-1E
46	14790	15215	425	TCS-1B
47	15215	15438	223	TCS-1E
48	15438	15484	46	TCS-5
49	15484	15770	286	TCS-1E
50	15770	15949	179	TCS-1B
51	15949	16254	305	TCS-1
52	16254	16454	200	TCS-5
53	16454	17323	869	TCS-1
54	17323	18960	1637	TCS-1B
55	18960	19055	95	TCS-1B to TCS-1
56	19055	19131	76	TCS-1
57	19131	19248	117	TCS-1 to TCS-1C
58	19248	20027	779	TCS-1C
59	20027	20080	53	TCS-1C to TCS-1
60	20080	20216	136	TCS-1
61	20216	20321	105	TCS-1 to TCS-1B
62	20321	20520	199	TCS-1B
63	20520	20660	140	TCS-6
64	20660	22296	1636	TCS-1B
65	22296	22396	100	TCS-1B to TCS-1
66	22396	22519	123	TCS-1
67	22519	22574	55	TCS-1 to TCS-1C
68	22574	22780	206	TCS-1C
69	22780	22822	42	TCS-1C to TCS-1
70	22822	22962	140	TCS-1
71	22962	22992	30	TCS-5
72	22992	23125	133	TCS-1
73	23125	23165	40	TCS-5
74	23165	23395	230	TCS-1E
75	23395	25232	1837	TCS-1B

S.No	Design Chainage		Length(m)	TCS Type
	From	To		
76	25232	25280	48	TCS-1B to TCS-1
77	25280	25445	165	TCS-1
78	25445	25496	51	TCS-1 to TCS-1B
79	25496	28150	2654	TCS-1B
80	28150	28300	150	TCS-6
81	28300	28807	507	TCS-1B
82	28807	28830	23	TCS-1B to TCS-1
83	28830	28945	115	TCS-1
84	28945	28972	27	TCS-1 to TCS-1B
85	28972	29773	801	TCS-1B
86	29773	29900	127	TCS-1E
87	29900	29930	30	TCS-5
88	29930	30070	140	TCS-1E
89	30070	30330	260	TCS-6
90	30330	30520	190	TCS-1E
91	30520	30590	70	TCS-1E to TCS-1
92	30590	30680	90	TCS-1
93	30680	31030	350	TCS-6
94	31030	31325	295	TCS-1E
95	31325	31349	24	TCS-5
96	31349	31540	191	TCS-1E
97	31540	32880	1340	TCS-1B
98	32880	32999	119	TCS-1A
99	32999	33303	304	TCS-6
100	33303	33560	257	TCS-1E
101	33560	33703	143	TCS-1
102	33703	33767	64	TCS-5
103	33767	34170	403	TCS-1
104	34170	34240	70	TCS-6
105	34240	34303	63	TCS-1B
106	34303	34420	117	TCS-6
107	34420	34928	508	TCS-1B
108	34928	35020	92	TCS-1B to TCS-6
109	35020	35230	210	TCS-6
110	35230	35374	144	TCS-1
111	35374	35455	81	TCS-1 to TCS-1C
112	35455	35873	418	TCS-1C
113	35873	35929	56	TCS-1C to TCS-1

S.No	Design Chainage		Length(m)	TCS Type
	From	To		
114	35929	35970	41	TCS-1
115	35970	36031	61	TCS-1 to TCS-1C
116	36031	37065	1034	TCS-1C
117	37065	37120	55	TCS-1C to TCS-1
118	37120	37430	310	TCS-1
119	37430	37656	226	TCS-6
120	37656	38739	1083	TCS-1
121	38739	38789	50	TCS-5
122	38789	39090	301	TCS-1
123	39090	39448	358	TCS-6
124	39448	39520	72	TCS-6 to TCS-1C
125	39520	40433	913	TCS-1C
126	40433	40658	225	TCS-1C to TCS-2
127	40658	41367	709	TCS-2
128	41367	41592	225	TCS-2 to TCS-1A
129	41592	41655	63	TCS-1A
130	41655	41810	155	Toll Plaza Tapering
131	41810	41860	50	Toll plaza
132	41860	42015	155	Toll Plaza Tapering
133	42015	42083	68	TCS-1A
134	42083	42178	95	TCS-1A to TCS-1F
135	42178	42206	28	TCS-1F
136	42206	42226	20	TCS-5
137	42226	42468	242	TCS-1F
138	42468	44352	1884	TCS-1C
139	44352	44444	92	TCS-1A
140	44444	44780	336	TCS-1F
141	44780	44801	21	TCS-1D
142	44801	44823	22	TCS-5
143	44823	44942	119	TCS-1D
144	44942	46117	1175	TCS -2
145	46117	46157	40	TCS-2 to TCS-3A
146	46157	46630	473	TCS-3A
147	46630	46700	70	TCS-3
148	46700	47307	607	TCS-3A
149	47307	47572	265	TCS-3A to Existing 2 Lane
Total			47572	

Schedule-C (Project Facilities)

(See Clause 2.1)

1. Project Facilities

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

- a) Toll plaza;
- b) Roadside furniture;
 - i. Kilometre and Hectometer Stones
 - ii. Traffic Signs
 - iii. Overhead Signs
 - iv. Road Marking
 - v. Road Delineators
 - vi. Reflective Pavement Markers & Solar Studs
- c) Operation and Maintenance Centers;
- d) Viewpoint;
- e) Truck lay-bay;
- f) Bus-bays and bus shelters;
- g) Pedestrian Facilities;
- h) Highway Lighting;
- i) Rainwater Harvesting;
- j) Environment Management Plan;
- k) Landscaping and Tree Plantation;
- l) Advanced Traffic Management System (ATMS);
- m) Highway Patrol Units;
- n) Emergency Medical Services;
- o) Crane Service;

- 1.1 Project Facilities to be completed on or before the Project Completion Date have been described in **Annexure-I** of this Schedule-C.

**Annex - I: Project Facilities for Four Lanning with Paved Shoulder
(Schedule-C)**

1. Project Facilities

The Concessionaire shall construct the Project Facilities described in this **Annexure-I** to form part of the Project Highway. The Project Facilities shall include:

- a) Toll plaza;
- b) Roadside furniture;
 - i. Kilometre and Hectometer Stones
 - ii. Traffic Signs
 - iii. Overhead Signs
 - iv. Road Marking
 - v. Road Delineators
 - vi. Reflective Pavement Markers & Solar Studs
 - vii. Boundary wall and fencing
- c) Operation and Maintenance Centers;
- d) Viewpoint;
- e) Truck lay-bay;
- f) Bus-bays and bus shelters;
- g) Pedestrian Facilities;
- h) Highway Lighting;
- i) Rainwater Harvesting;
- j) Environment Management Plan;
- k) Landscaping and Tree Plantation;
- l) Advanced Traffic Management System (ATMS);
- m) Highway Patrol Units;
- n) Emergency Medical Services;
- o) Crane Service;

2. Description of Project Facilities

2.1 Toll Plaza

Tolling system shall be provided in entire length of the project and the same is integrated with the adjoining packages. The Toll Plazas shall be provided as per NHA circular No. 17.5.82 dated 24/5/2021 and Schedule-D. Minimum Lane requirement in the opening year are as follows.

Toll Plaza Shall be provided confirming to Clause 10.2 IRC: SP:84-2019 at the following locations:

Toll Plaza at Main carriageway

Sr. No.	Location of Toll Plaza (Km)	Min. No. of toll lanes (5+5)									
		Kalavad-Jamnagar (LHS)					Jamnagar- Kalavad (RHS)				
		No. of Regular Lane	Lane Width (m)	No of Extra Wide Lane	Extra Wide Lane Width (m)	Two-Wheeler Lane Width (m)	No. of Regular Lane	Lane Width (m)	No of Extra Wide Lane	Extra Wide Lane Width (m)	Two-Wheeler Lane Width (m)
1	41+833	4	3.2	1	4.5	1.2	4	3.2	1	4.5	1.2

The Sub Items of toll Plaza are as follows.

Sr. No.	Item	Number	Remarks
1	No. of Toll Lanes	10	As per Above Table
2	Admin Building, Toll Booth Complex & traffic and medical aid post	1	Minimum as per circular No. 17.5.82 dated 24/5/2021
3	Weigh Bridges	2	One number each on either side of Toll Plaza
4	Electrical Systems	It shall be provided as per standard specifications and as per Approved drawing.	
5	Highway Nest with Toilet Facility	2	One number Each direction after crossing the toll booth
6	Internet Facility	2	Internet facility with 2 different telecom operators

Note:

1. The Toll Plaza shall be constructed as per Manual (Schedule-D) considering the modification as per NHAI Circular NHAI/Policy Guidelines/Management of Toll Plaza/2021 Policy Circular No. 17.5.82 dated 24th May 2021.
2. Based on the toll lanes as given above, toll Booth complex, weigh bridges, electrical systems, O&M Centre and all other facilities required/ mentioned in manual shall be provided as per specification mentioned in Schedule D.
3. No. of toll lane specified above are minimum to be provided. The Concessionaire shall design and provide toll lane as per NHAI Circular NHAI/Policy Guidelines/Management of Toll Plaza/2021 Policy Circular No.17.5.82 dated 24th May 2021 subject to as specified above.
4. All Toll Lanes to be equipped with Hybrid ETC equipment as per NHAI/Policy Guidelines/Management of Toll Plaza/2021 Policy Circular No. 17.5.82 dated 24th May 2021. Concessionaire shall provide all Software, Hardware, equipment and tools required as per Clause No. 10 of IRC: SP:84-2019.
5. Toilet facility for road users shall be provided near toll plaza location along with parking facility. One toilet block on each direction shall be provided. These toilet facilities shall follow CPWD specifications for sanitary ware items and fittings such as WC, wash basin, Wash basin-Under counter, Urinal flat back, PVC Cistern, IWC Orissa Pan, Flush Valve -CP, Wash Basin pillar cock-CP, Bib Cock-CP, Health Faucet, W/c Bib cock, Wash Basin angle cock. One WC shall be provided for specially challenged persons.
6. Point of Sale (POS) with card swapping machines shall be provided.
7. Provide Lane markings and Traffic Signs as per IRC 35 and IRC 67 (**Clause No. 10.9 of IRC: SP:84-2019**)
8. Solar panels shall be erected over the either on FOB or over Toll Plaza / Admin building to generate the green energy. Same shall be utilized for toll plaza lighting and other energy requirement within toll plaza area along with conventional lighting.
9. Medium speed Weigh in Motion (MSWIM) devices shall be provided in all toll lanes at Toll Plaza Location. In addition to MSWIM, Static weigh Bridge (SWBs) shall be provided on each direction as per manual. (**Clause No. 10.5, IRC: SP:84-2019**)
10. Provide Impact Attenuators on Toll Plaza islands in the direction of traffic. Impact attenuators shall be self-restoring conforming to Section 10.6 of IRC SP 99 i.e., Manual of Specifications and Standards for Expressways. (**Clause No. 9.6, IRC: SP:84-2019**)
11. The Concessionaire shall bear all costs of procurement, installation, running and operation cost of all lighting, including cost of energy consumption specified in Clause 12.5 of IRC: SP:84-2019.

12. The concessionaire shall provide 1.5m wide road side drainage cum footpath along the Full length of Toll Plaza including Tapper length.

3. Roadside Furniture

The roadside furniture shall be provided accordance to Manual and MoRTH circular no. RT25035/07/2023-RS (Part) (221534) "Guidelines for provision of signages on Expressway and National Highways dated 24.12.2024". The signage type and quantity of roadside furniture mentioned below shall be treated as tentative and minimum requirement, concessionaire shall prepare the traffic signage plan in consultation with road safety expert of Independent Engineer and Road Safety Consultant appointed by the Authority.

3.1 Kilometer and Hectometre Stones (Clause No. 12.3 IRC: SP:84-2019)

Kilometre/Hectometre stones shall be provided for the entire Project Highway and specification as per schedule D.

Sr. No.	Item	Number	Remarks
1	5 th Kilometre Stone/Marker	10+10 (LHS & RHS)	The 5 th KM/KM/Hectometre stones can be Concrete/Stones and shall be placed on outer of both side of the earthen shoulder. In case 5 th KM/KM/ Hectometre marker are to be fixed on separator between Main Carriageway & Service Road then these should be fixed as reflective signs.
2	Kilometres Stone/Marker	38+38 (LHS & RHS)	
3	Hectometre Stone/Marker	190+190 (LHS & RHS)	

3.2 Traffic Signs (Clause No. 9.2 IRC: SP:84-2019 & latest circular)

Traffic Signs include roadside signs, overhead signs and kerb mounted signs etc. shall be provided along the entire Project Highway and on all Side, Roads joining the main carriageway/service road. A QR code shall be marked on back of each sign as per IRC:67 and Ministry's Circular No. RT-25035/07/2023-RS (Part) (221534) dated 24.12.2024.

All signs shall be of Micro Prismatic Grade Sheeting Corresponding to Class C sheeting as per ASTM D 4956 Type XI. (Clause No. 9.2.3 IRC: SP:84-2019 and IRC:67,2022)

All shoulder mounted signs shall be supported on GI Pipes. Overhead Signs shall be placed on a structurally sound gantry or cantilever structure made of GI pipes. (Clause No. 9.2.4 IRC: SP:84-2019)

The siting of signs shall conform to Table 4.1 and Fig 4.1 of IRC:67. (Clause No. 4.7 IRC:67-2022). The two successive signs shall be placed at a minimum distance of 0.6 x V meter (V is design speed in Km/h). (Clause No. 4.8 IRC 67 2022).

The overhead gantry signs shall be placed as given below: (Clause No. 16.3.2 of IRC 67 2022)

Sr. No.	Item	Carriageway (Left, Right, Both)
1	Overhead Gantry signs	
a	Start of Project	2
b	For grade separated intersection (VUP/Flyover)	8
2	Overhead Cantilever Gantry signs	
a	Variable Message signs at Midblock Locations	-
b	At roads leading to religious places, Polo Forest, Heritage sites or any other important location	-
c	For grade separated intersection (VUP/Flyover) & Toll Plaza	20

The detailed minimum number of signages indicating places, direction, distances, and other features shall be marked on the alignment plan and submitted which are as mentioned below:

S. No.	Road Signs	Number	Remarks
I	Mandatory/Regulatory		
1	Stop signs	24	
2	Give Way Signs	19	
3	Prohibitory signs	-	
4	No Parking signs	-	
5	No Stopping signs	-	
6	Speed Limit signs (Circular)	11	
7	Speed Limit signs (Vehicle Type)	20	
8	Vehicle Control signs	-	
9	Restriction Ends sign	-	
10	Compulsory Direction Control and other signs	-	
II	Cautionary/Warning		
1	Left/Right Curve	-	
2	Left / Right Curve with side road	-	
2	Right/Left Hairpin Bend	-	
3	Right/Left Reverse Bend	-	
4	Series of Bends	-	
5	270 Degree Loop	-	
6	Side Road	-	
7	Y-intersection	3	
8	Cross Road	-	
9	Roundabout	-	
10	Traffic Signals	7	
11	T-Intersection	39	
12	Major Road Ahead	-	
13	Staggered Inter-section	-	
14	Merging Traffic Ahead	10	
15	Narrow Road Ahead	-	

S. No.	Road Signs	Number	Remarks
16	Road Widens	-	
17	Narrow Bridge Ahead	-	
18	Steep Ascend/Descend	-	
20	Reduced Carriageway	-	
21	Start /End of Dual Carriageway	-	
23	Gap in Median	14	
24	Pedestrian Crossing	27	
25	Pedestrian crossing with backing board	-	
26	School Ahead	-	
27	Built Up Area	4	
28	Two Way Operation (on main carriage way /service road	-	
29	Two Way Traffic on Cross Road Ahead	13	
30	Danger Warning Sign	-	
31	Deaf or Blind Persons Likely on Road Ahead	-	
32	Cycle Crossing	-	
33	Cycle Route Ahead (Warning for Cycles on road ahead)	-	
34	Dangerous Dip	-	
35	Speed Breaker	38	
36	Rumble Strip	-	
37	Rough Road	-	
38	Dangerous Ditch	-	
39	Slippery Road	-	
40	Slippery Road because of Ice	-	
41	Opening or Swing Bridge	-	
42	Overhead Cable	-	
43	Play Ground Ahead	-	
44	Quay Side or River Bank	-	
45	Sudden Side Winds	-	
46	Tunnel Ahead Warning	-	
47	Falling Rocks	-	
48	Cattle Crossing	-	
49	Wild Animals likely to be on Road Ahead	-	
50	Queues Likely Ahead	-	
51	Low flying Air Craft	-	
52	Unguarded Railway Crossing	-	
53	Guarded Railway Crossing	-	
54	Crash prone area ahead	-	
55	U- Turn	-	
III	Chevron Signs		
1	Single Chevron	410	
2	Double Chevron	-	
3	Triple Chevron	-	

S. No.	Road Signs	Number	Remarks
IV	Object Hazard Marker Sign		
1	Left /Right side Object Hazard Marker	118	
2	Two-way Object Hazard Marker	10	
V	Informatory/Guide		
1	Direction and Place Identification signs	-	
2	Stack Type Advance Direction Sign (Shoulder Mounted)	56	
3	Stack Type Advance Direction Sign with cautionary / regulatory signs (Shoulder Mounted)	-	
4	Map Type Advance Direction Sign (Shoulder Mounted)	-	
5	Map Type Advance Direction Sign for roundabout (Shoulder Mounted)	-	
6	Flag Type Direction Sign	22	
7	Reassurance Sign	-	
8	Place Identification Sign	-	
9	Truck Lay -By	6	
10	Toll Booth Ahead	4	
11	Weigh Bridge Ahead	-	
12	Shoulder Mounted Sign in Advance of a Grade Separated Junction/ Interchange	12	
13	Expressway Sign	-	
14	Gantry Mounted advance Direction Sign Ahead of a Flyover in Urban/City Roads	-	Instead of continuous sign board, Separate Signs shall be provided for each information
15	Gantry Mounted advance Direction Sign Ahead of a Grade Separated Junction	-	
16	Gantry Mounted advance Direction Sign Ahead of a At Grade Intersection	-	
17	Gantry Mounted Advance Direction Sign for Interchange	-	
18	Cantilever Gantry Mounted Advance Direction Sign	7	
19	Lane Dedicated Gantry Sign	-	
20	Definition/Supplementary Plates	-	
21	Tourism Related Sign	-	
22	Tourist Destination Direction Information Signs Without Photograph	-	
23	Tourist Destination Direction	-	

S. No.	Road Signs	Number	Remarks
	Information Signs with Photograph		
24	Finger Destination direction Information Sign for Pedestrians	-	
25	Tourist Map Information Sign	-	
26	Boundary Sign at Entrance to a City/Place	-	
27	Boundary Sign at Entrance to a Tourist Destination	-	
28	User Fees At toll Plaza	8	
29	Service Road Start/End	-	
VI	Facility Information signs		
1	Eating Place	-	
2	Light Refreshment	-	
3	Resting Place	-	
4	First Aid Post	-	
5	Toilet	-	
6	Filling Station (Fuel Pump)	-	
7	Hospital	-	
9	U-Turn Ahead	-	
10	Pedestrian Subway	-	
11	Police Station	-	
12	Picnic Site	-	
13	Repair Facility	-	
14	Railway Station/Metro Station/Monorail Station	-	
15	Industrial Area	-	
16	Cycle Rickshaw Stand	-	
17	Taxi Stand	-	
18	Auto Rickshaw Stand	-	
19	Home Zone	-	
20	Camp Site	-	
21	Airport	-	
22	Golf Course	-	
23	National Heritage	-	
24	No Through Road	-	
25	No Through Side Road	-	
26	Toll Road Ahead	-	
27	Guide Sign on Toll Lane Portal	-	
28	Country Border	-	
29	Entry Ramp for Expressway	-	
30	Exit Ramp for Expressway	-	
31	Expressway Symbol	-	
32	End of Expressway	-	
33	Bus Stop	12	
34	Bus Lane	-	
35	Contra Flow Bus Lane	-	
36	Cycle Lane	-	

S. No.	Road Signs	Number	Remarks
37	Contra Flow Cycle Lane	-	
38	Holiday Chalets	-	
39	Emergency Exit	-	
VII	Other Useful Information Signs		
1	Signs For Persons with Disabilities	-	
2	International symbol of Accessibility	-	
3	Parking Information	-	
4	Parking Areas	-	
5	Ramped Entrance to Subway/Over Bridge	-	
6	Telephone Facilities	-	
7	Toilet Facilities	-	
8	Way Finding	-	
9	Parking Signs	-	
10	Auto Rickshaw Parking	-	
11	Cycle Parking	-	
12	Cycle Rickshaw Parking	-	
13	Scooter and Motorcycle Parking	-	
14	Taxi Parking	-	
15	Park and Ride	-	
16	Parking Restrictions Signs for Traffic Management	-	
17	Flood Gauge Sign	-	
VIII	Route Maker Signs		
1	State Highway Route Marker Sign	-	
2	National Highway Route Marker Sign	10	
3	Asian Highway Route Marker Sign	-	
4	Expressway Route Marker Sign	-	

Note: The locations of the placement of signages shall be finalized in consultation with Independent Engineer/ MoRT&H, as per site requirement.

Note:

- (i) The type and numbers of Traffic Signs shown in above are tentative and minimum specified. The actual numbers and location of Traffic Signs shall be determined by the Concessionaire in accordance with the Manual specified in Schedule-D and shall obtain the approval from Independent Engineer. Any increase in the number and type of road signs shall not constitute any Change of Scope.
- (ii) All traffic sign support shall be of Galvanized Iron (GI) sections.
- (iii) The horizontal and vertical clearances of all traffic signs with respect to

carriageway shall be as per Table 4.1 of IRC:67-2022.

- (iv) Facility information signs at toll plaza and other service units to be provided in accordance to the Manual in consultation with Independent Engineer.

In addition to the above provisions, the Concessionaire should ensure the following:

1. Advance direction signs (Cantilever gantry) should be placed at 0.75 Km and 1.5 Km on the major intersecting road i.e., NH/SH in advance of the intersection with the project road.
2. Speed limit sign shall be placed at an interval of 5 km (maximum) on both sides of the project road.
3. The font size of the exit boards shall be increased by 20% as per Note 3 of Table 12.1 of IRC:67-2022.
4. Police Station sign shall be placed at the boundary of police station limits in consultation with Police Department/District Administration.

3.3 Road Marking (Clause no. 9.3 of IRC: SP:84-2019 & as per latest circular)

Road Markings shall be Hot applied thermoplastic materials with reflectorized beads to achieve visibility confirming to clause 2.7.2 of IRC 35. (Clause No. 2.2 IRC: 35)

The cold applied plastics pavement markings shall be used for School Zone Markings, Audible Raised Profile Edge Lines and Block Markings (BM 01/02/03). (Clause No. 2.4 of IRC: 35)

Sr. No.	Item	Unit		Remarks
		Length (m)	Number	
1	Longitudinal Marking			
	Traffic Lane Lines	69512		LM01 on MCW
	Warning Lines	9781		LM04 on MCW
	Center Line	13767		LM07 on SR
	Warning Lines	298		LM09 on SR
	Warning Lines VUP& LVUP Approach	1800		LM11 on MCW
	Warning Lines	730		LM18 on Median Opening
	Bus bay & Truck Lay-by Marking	2448		LM19 on MCW
	Warning Lines	4082		LM22 on MCW Junction
	No Overtaking Lines	15221		LM 23on MCW
	Border or Edge Lines	211595		LM24 on MCW, SR & Median
	Merging/Diverging Markings	777		LM28 on MCW
	Merging/Diverging Markings	912		LM29 on MCW

Sr. No.	Item	Unit		Remarks
		Length (m)	Number	
2	Transverse Marking			
3	Hazard Marking			
4	Block Marking			
5	Arrow Marking		1006	
6	Directional Marking			
7	Facility Marking			
8	Centre Line			Entire Length excluding No overtaking Sections
9	Traffic Lane Lines			
10	No Overtaking Lines			On all curves in mountainous terrain
11	Warning Lines			On transition of all curves
12	Border or Edge Lines			For Service Roads
13	Longitudinal Markings for Undivided Roads			
14	Longitudinal Markings for Divided Roads			
15	Longitudinal Markings for Ramps/Slip Roads/ One Way Streets			
16	Stop Line			On all Minor Junctions
17	Give Way Lines			On all Major Junctions
18	Diagonal Markings	213		
19	Chevron Markings	5497		On Entry Exit
20	Continuity Line			
21	Word Messages			
22	Lane Change			
23	Merging/Diverging Markings			Entry & Exit of Service Roads
24	Hatch Markings			
25	Raised Profile Edge Lines			Both side for entire length on MCW
26	Lane Reduction / Narrowing Situations and Transitions (lane Balancing)			
27	Directional Arrows		988	
28	Mandatory Turn Arrows			
29	Guidance Arrows			
30	Deflection Arrows			
31	Bifurcation Arrows		18	
32	Arrows on side road approaches			
33	Arrows on Main Road			Before all Junctions

Sr. No.	Item	Unit		Remarks
		Length (m)	Number	
	Approaches			
34	Word Messages			
35	Yellow Box Markings			
36	Ghost Island	944		On Junction
37	Marking for Speed Breakers		38	On junction road at minor intersections
38	Pedestrian Crossing		108	On all Junctions (MCW), Bus Bays & Built-up Areas (3 Nos.) and 10 Nos. Intermediate locations
39	Markings when highway passes through settlement (Fig. 9.4 of IRC: SP:84-2019)			
40	Transverse Bar Marking		5 sets of TBM at approaching side of traffic at all median openings and built-up sections. (Total- 80 Sets)	Before Major Junctions, Built-up Area, Bus Bays, ROB, Speed Restrictions, Schools, Animal Crossing locations, Toll Plaza and Midblock Pedestrian Crossings.
41	Bus Bay Marking			Each Bus Bay
42	Truck Lay-Bye Markings			
43	Toll Plaza Marking			All markings of Toll Plaza as per IRC:35
44	School Zone Markings			
45	Object Markings within Carriageway			
46	Object Markings Adjacent to Carriageway			
47	i. Subway Piers, Abutments, Culverts Head Walls, Concrete Barrier			
48	ii. Electrical Poles			
49	iii. Guard Rails			
50	iv. Trees			
51	v. Kerbs			
52	Directional Markings as per Annexure: A 6 IRC 35			

Sr. No.	Item	Unit		Remarks
		Length (m)	Number	
53	Facility Markings as per Annexure A.7 of IRC 35			

Note: The locations of the marking shall be finalized in consultation with Independent Engineer/MoRT&H, as per site requirement.

3.4 Road Delineators (Clause No. 9.4 IRC: SP:84-2019)

Delineators/road studs shall be provided for entire Project highway as per Manual. Delineators shall be made of Mild Steel with pure polyester powder coating with the minimum thickness of powder coating of not less than 40 microns for protection against corrosion. Road studs shall be provided at locations and spacing as specified in IRC: SP:84- 2019. However, at approaches to gore areas i.e., entry and exit, round shaped solar powered road studs shall be provided.

Sr. No.	Item	Number/ Length (m)	Remarks
1	Roadway Indicators	56	
2	Median Marker on Median/RCC Barrier (Clause 4 of IRC 79 2019)	20116	
3	Object Markers		
4	Flexible Object Markers (Clause 6 of IRC 79 2019) i. On Thrie Metal Beam Barrier ii. On Toll Booth/Toll Island iii. On Entry/Exit of Tunnel iv. On Exit from Main carriageway	In Full length of Safety Barriers and toll islands	
5	Solar Blinkers on traffic islands of Major intersections	14 Nos.	

Note: The locations of the marking shall be finalized in consultation with Independent Engineer/Authority, as per site requirement.

Solar Blinkers shall be provided as per Manual and relevant specifications at the entry/exit and intersections/interchanges with connecting roads in consultation with AE/IE/Authority.

3.5 Reflective Pavement Markers & Solar Studs

The Prismatic Retro-Reflective type confirming to ASTM D-4280 Pavement Markers & Solar Power Studs on Highway shall be provided in accordance with Schedule - D. (Clause No. 9.5 IRC: SP:84-2019)

Sr. No.	Item	Number	Location	Remarks
1	White Colour Two coloured		Traffic lane line & center of	Bi-

Sr. No.	Item	Number	Location	Remarks
	face Road Studs		carriageway	directional carriageway
2	Red Colour Two coloured face Road Studs	5193	Left hand edge of the carriageway, entry to truck lay bye / bus bay, start of service road, chevron/diagonal markings on gorge	
3	Green Colour Two coloured face Road Studs	300	Lay byes, left hand side of the carriageway in case of multi-lane divided carriageways, crossable continuous line like in acceleration/ deceleration lanes involving lane changing	
4	Amber Colour Two coloured face Road Studs	5193		
5	Solar Studs on Major/Minor bridge, RoB, and all structures (Interchange/Flyover/VUP) and built-up areas, In storage lane of median opening and Exit/Entry from main carriageway	-	At ROB and Major Bridges	

3.6 Traffic Impact Attenuators (Clause No. 9.6 IRC: SP:84-2019)

3.6.1 Provide Impact Attenuators in Gore Areas

Traffic Impact attenuators composed of W-beam steel fender panels supported by diaphragms with a trigger mechanism at nose (NCHRP 350 test level 3 EN 1317-3 type/mash) shall be placed in front of gore areas formed at exits, beginning of a grade separator and any other locations in accordance with Schedule-D. Traffic impact attenuators shall be provided at the Gore Areas of Grade Separated Junctions (where traffic diverges) and at any other locations not mentioned here is critical as per Schedule-D and the same shall not constitute a Change of Scope.

Sr. No.	Item	Chainage / Number	Remarks
1	Impact Attenuators	0+800	LHS
2	Impact Attenuators	1+700	RHS
3	Impact Attenuators	5+200	LHS
4	Impact Attenuators	6+410	LHS
5	Impact Attenuators	8+680	LHS
6	Impact Attenuators	40+660	LHS
7	Impact Attenuators	41+370	RHS
8	Impact Attenuators	44+940	LHS
9	Impact Attenuators	47+300	RHS

3.6.2 Providing End Terminals (Clause No. 9.7.2, IRC: SP:84-2019)

Provide End Terminals P-4 type confirming to EN 1317-2 to Parapet Walls of Culverts, Structures ends for the safety of approaching traffic etc.

Sr. No.	Item	Chainage / Number	Remarks
1	Culvert Ends	All Culvert Locations	
2	Structures Ends	All Major Bridge & Minor Bridge Locations	
3	Any other location which Safety Hazard	-	-

3.7 Deleted

4. Operation and Maintenance centers (Clause No. 12.15 IRC: SP:84-2019)

There shall be operation and maintenance center(s) as per Clause 12.15 of IRC: SP:84-2019 and Schedule-D, either near the toll plaza location or at any other location along the Project Highway, as identified by the Concessionaire. Dedicated operation and maintenance center shall be provided in accordance with Manual.

5. Viewpoint

Sr. No.	Item	Design Chainage (Km)	Side	Remarks
		Nil		

The site needs to be levelled/graded for the whole of viewpoint and boundary wall of the height of 1.5m shall be constructed along the periphery of the area.

Note:

1. The viewpoint shall be provided with guard rails and adequate safety measures on the periphery on reservoir side.
2. Landscaping and tree plantation shall be provided in consultation with the

Independent Engineer / Authority.

3. There shall be adequate provision of Parking Space with paved surface within the viewpoint area mentioned above.
4. Entry/Exit Ramps to the Viewpoint shall be constructed as Two-Lane Road.
5. Lighting shall be provided to sufficiently illuminate the entire viewpoint at night.
6. The viewpoint shall include a highway nest and sanitation facilities (Toilet Block).

6. Truck Lay-bay

The truck lay-bye shall be provided at below given location and as per the design mentioned in Schedule-D.

Sr. No.	Design Chainage	Side	Remarks
1	10+517	RHS	
2	43+982	LHS	

Truck lay by pavement shall be same as of main carriageway

The following minimum facilities (On both side of Truck lay-byes) shall be provided.

- Room/Hall (Minimum 6m x 4m in area), Toilets (separate for ladies and gents) For gent's toilet (WC - 3 nos. (With minimum 1.2x1.5 in sqm area each); Urinals - 3 nos., Wash Basin-2 nos., Bath-1 nos. (With minimum 1.2x1.5 in sqm area each); For ladies' toilet (WC - 1 nos. With minimum 1.2x1.5 sqm in area); Wash Basin-1 nos., Bath-1 nos. (With minimum 1.2x1.5 sqm in area)), drinking water facility; STD/ISD Telephone Facility & First Aid facilities.

7. Bus Bay and Bus Shelter (Clause No. 12.7 IRC: SP:84-2019)

Provision of Bus Bay and Bus Shelter on highways as per IRC:80-2022 including paving of layby, signs, markings, speed calming measures, drainage, lighting, etc. in built-up areas, intersections of NH/SH/MDR and roads leading to large settlements is as follows:

7.1 Bus Bays and Shelters

Bus bays with tapers shall be provided along with passenger's shelters shall be constructed at the following locations:

S.n.	Description	Ex. Km	Design Ch	Side	Location	Remark
1	Bus Bay	41+405	10+940	Left	Cross Road to Nana Badanpar	As per Attached Drawing
2	Bus Bay	40+515	11+830	Right	Cross Road to Nana Badanpar	As per Attached Drawing
3	Bus Bay	39+285	13+074	Left	Haripar Village	As per Attached

S.n.	Description	Ex. Km	Design Ch	Side	Location	Remark
						Drawing
4	Bus Bay	39+168	13+189	Right	Haripar Village	As per Attached Drawing
5	Bus Bay	29+101	22+669	Left	Motimatli Village	As per Attached Drawing
6	Bus Bay	28+134	23+593	Right	Motimatli Village	As per Attached Drawing
7	Bus Bay	22+515	29+135	Left	Matwa Village	As per Attached Drawing
8	Bus Bay	22+047	29+607	Right	Matwa Village	As per Attached Drawing
9	Bus Bay	20+005	31+605	Left	Cross Road to Pasaya	As per Attached Drawing
10	Bus Bay	19+672	31+917	Right	Cross Road to Pasaya	As per Attached Drawing
11	Bus Bay	18+225	33+350	Left	Sapda Village	As per Attached Drawing
12	Bus Bay	17+192	34+407	Right	Sapda Village	As per Attached Drawing
13	Bus Bay	12+065	39+250	Left	Vijarkhi Village	As per Attached Drawing
14	Bus Bay	11+955	39+552	Right	Vijarkhi Village	As per Attached Drawing

7.2 Kerb Side Bus Stop with Pedestrian Shelter

Kerb Side Bus Stop with Pedestrian Shelter shall be provided at the following locations:

S.n.	Description	Ex. Km	Design Ch	Side	Location	Remark
1	Bus Shelter	Bypass	1+148	Left	On the Slip Road of VUP	As per Attached Drawing
2	Bus Shelter	Bypass	1+310	Right	On the Slip Road of VUP	As per Attached Drawing
3	Bus Shelter	Bypass	4+520	Left	On the Slip Road of VUP	As per Attached Drawing
4	Bus Shelter	Bypass	4+687	Right	On the Slip Road of VUP	As per Attached Drawing
5	Bus Shelter	Bypass	8+127	Left	On the Slip Road of VUP	As per Attached Drawing
6	Bus Shelter	Bypass	8+338	Right	On the Slip Road of VUP	As per Attached Drawing
7	Bus Shelter	10+468	40+822	Left	Mota Thavaria Village	As per Attached Drawing
8	Bus Shelter	10+285	41+005	Right	Mota Thavaria	As per Attached

S.n.	Description	Ex. Km	Design Ch	Side	Location	Remark
					Village	Drawing
9	Bus Shelter	6+225	45+100	Left	For Cross road to Theba Road	As per Attached Drawing
10	Bus Shelter	6+000	45+295	Right	For Cross road to Theba Road	As per Attached Drawing
11	Bus Shelter	4+872	46+418	Left	NH-947 (SH-25)/ major intersection/ Lumbini nagar	As per Attached Drawing
12	Bus Shelter	4+453	46+836	Right	NH-947 (SH-25) /major intersection/ Lumb ininagar	As per Attached Drawing

7.3 Bus Bays pavement shall be same as the Main Carriageway.

8. Pedestrian Facilities (Clause No. 9.8 IRC: SP:84-2019)

Pedestrian Facilities shall be provided in accordance with the Manual of Specifications and Standards as referred in Clause 9.8 of IRC: SP:84-2019 and IRC:103-2022. This shall consist of footpath (sidewalks), pedestrian guard rails and pedestrian crossing as per TCSs and GADs.

The details are as mentioned below:

Sr. No.	Pedestrian facilities	Chainage		Total Length (m)	Side	Remarks
		From	To			
1	Pedestrian guardrails shall be 150 mm from Carriageway/Paved Shoulder					
	i. Hazardous Locations on Straight Stretches					
	ii. At Junctions/Intersections					
	iii. Schools					
	iv. Bus Stop/Railway Stations	At all Bus Shelters for the total length of passenger shelters- 590m (Minimum)				
	v. Overpass, Subway					
	vi. Central Reserve					
	vii. Built Up Sections	40+658	41+367	1418m	BHS	Built-Up area
		44+942	46+117	2350m	BHS	
2	Footpath paving including fixing of Tactile pavers					

Sr. No.	Pedestrian facilities	Chainage		Total Length (m)	Side	Remarks
		From	To			
3	Pedestrian Crossing i. With Zebra Marking ii. At Intersections iii. At Schools	At all Bus Bays, Built-up areas and junctions and 10 Midblock Locations.				

9. Highway Lighting

The street light poles shall be 1 piece, continuous-tapered, octagonal poles and shall be manufactured from one length of steel sheet, formed in continuous tapered tube, with one continuous arc-welded vertical seam. The minimum wall thickness for lighting poles shall not be less than 4 mm. The Bottom Diameter shall be minimum 175 mm. The Top Diameter shall be minimum 75 mm. The door on window of pole shall be antitheft. All electrical cable should be concealed. All electrical lighting fixers shall be LED. The fixtures shall be concealed except on poles. Lighting poles shall be fixed on outer side of steel/concrete barrier. The lighting shall be providing at the following locations: (Clause No. 12.4 IRC: SP:84-2019)

Sr. No.	Lighting facilities	Chainage		Side	Lighting Source: Electricity Board/ Generator/ Solar
		From	To		
1	Toll Plaza area: The lighting in and around toll plaza, toll booths, office building, on the approach road, etc. shall be as per Section 12 of the Manual. In addition to at least two high mast light shall be provided on either side of toll plaza.	41+665	42+000	BHS	
2	Viewpoint: The entire Viewpoint shall be provided with lighting with average illumination to 40 Lux	-			
3	Bus Bay & bus shelter locations: The entire bus bay & bus shelter area shall be provided with Lighting (Average illumination of 40Lux.).	All Locations of Bus Bays & shelter shall be provided with sufficient lighting. (Mention in 7.2 of schedule C)			
4	Truck lay-bay: The entire Truck lay-bay area shall be provided with Lighting (Average illumination of 40Lux.).	All Locations truck lay-bay shall be provided with sufficient lighting. (Mention in 6 of schedule C)			

Sr. No.	Lighting facilities	Chainage		Side	Lighting Source: Electricity Board/ Generator/ Solar
		From	To		
4	Grade Separated Structures, interchanges, flyovers, underpasses (Vehicle/Pedestrian), and Vehicle Overpasses: Lighting requirement shall be as per Section-12 of the Manual. The top and underside of the Grade Separated Structures including service road/slip road, Interchange area at ground level up to 50m beyond the point from where flaring of main carriageway takes place shall be provided with lighting. Also, on all legs of at grade intersection/ crossings the lighting shall be provided 50m beyond the point from which the change in cross section is to be done in all legs. The minimum illumination shall be 40 Lux., at the extreme edge of the Highway	0+805	1+700	Both	
		4+130	5+200		
		7+450	8+680		
		46+157	47+307		
5	Built-up Sections: Built-up sections on the project highway both in the median of main carriageway and on the service roads on both sides	40+658 44+942	41+367 46+117	Both	
6	On Major Bridges and its approaches higher than 3m	On all Major Bridges			
7	Major Junctions: On all legs of at grade intersection, the lighting shall be provided 50m beyond the point from which the change in cross section is to be done in all legs. The minimum illumination shall be 40 Lux., at the extreme edge of the Highway	High Mast Light on all Major Junctions.			

In general, 'code of practice for lighting of public thoroughfare IS 1944 shall be followed. All facility buildings shall be illuminated adequately.

Interior Lighting: The toll booths and facility building office shall be illuminated adequately. Indoor lighting shall be with fluorescent lamps. Lighting should be provided in such a manner that glare is avoided or minimized.

Exterior Lighting: Lighting of the Toll Plaza is important for enhancing the night visibility. The lighting system shall consist of the following major components.

- (i) High mast lighting
- (ii) Lighting on both side approaches to the Toll Plaza

The lighting fittings (with LED features) shall be powered by solar system with back up facilities (power and battery both) at all locations.

10. Rainwater Harvesting

The provision of rainwater harvesting shall be provided at every 500m staggered in the entire project length and shall be executed as per requirement of IRC SP: 42-2014 and IRC SP: 50-2013. Additionally, wherever urban drains are provided, which do not have a definite outfall for discharge of water, at such location one pit for rain water harvesting shall be provided along the side drains at the lowest point/ where the water stagnates.

11. Environmental Management Plan

The Concessionaire shall implement the mitigation measures of the approved Environmental Management Plan (EMP) based on Environment Impact Assessment (EIA) and conditions of the Environmental Clearance accorded by the Ministry of Environment, Forests and Climate Change. All the conditions and directions stipulated by the MoEF&CC shall be complied by the Concessionaire.

The Concessionaire also shall implement the approved mitigation measures including Wildlife Mitigation measures and conditions as per Forest and Wildlife Clearance accorded by the Ministry of Environment, Forests and Climate Change. All the conditions and directions stipulated by the MoEF&CC shall be complied by the Contractor/ Concessionaire.

The Concessionaire shall also implement the approved mitigation measures of the Environmental Management Plan (EMP) for the project.

12. Landscaping & Tree Plantation

The Concessionaire shall plant trees and shrubs of required numbers and types at the appropriate locations within Right of Way and in the land earmarked by the Authority for afforestation as per Schedule D at the following areas.

Sl. No.	Types of Plantations	Location (Km)	Number of trees to be planted	Remarks
1	Shrubs	In median except Structures+ Frist row from side of drain	1 row of 167 plants for the median at every km.	Ornamental type plantation shall be provided
2	Landscaping	O & M Centers, Vacant land parcels, lend within loops of	Landscaping plans will be submitted by the Concessionaire/Contractor which shall include	The number of Ornamental type plantation and other things shall

Sl. No.	Types of Plantations	Location (Km)	Number of trees to be planted	Remarks
		flyovers, Toll Plaza building and surroundings Vacant space below the flyovers	ornamental trees, decorative statues and landscaping	be decided on the basis availability of land.
3	Plantations	Available open land within ROW	1 row of plants (Small trees) at 3 m interval on each side 2nd & 3rd row of plants (Medium & large Size) at 6-12m interval on each side at every km in project stretch.	Trees of native species (Preferably local varieties like mango, neem, sheesham) & as per Schedule D.

13. Advanced Traffic Management System (ATMS): Deleted

14. Highway Patrol Units

Highway Patrol units shall be established and operate at toll plaza location as per Schedule-D Clause 12.11 (strictly as per details mentioned in Annexure-C), which shall continuously patrol the project stretch. The vehicle shall be brand new with fuel, driver, and insurance all-inclusive for the entire contract period. Highway Patrol units shall be fitted with GPS and GSM based vehicle tracker system. Highway Patrol Vehicles shall be stationed on Toll Plaza. (Clause No. 12.10 IRC: SP:84-2019)

15. Emergency medical services

The Concessionaire shall, at its own cost, construct a medical aid post at each toll plaza with a minimum size of 5 x 5 sq. m with a toilet (to be used for the patients of minimum size of 3 x3 sq. m) and hand it over to the Authority, no later than 30 (thirty) days prior to PCOD/COD. The Medical Aid Post(s) shall be deemed to be part of the project and shall vest in the Authority. Medical Aid Post shall be set up at Administrative Block with round-the-clock services for victims of accidents on the Project Highway.

One number Ambulance shall be provided for the project stretch. The Ambulance shall be brand new with fuel, driver, medical staff and insurance all-inclusive for the entire contract period. Ambulance fitted with GPS and GSM based vehicle tracker system shall be provided, as per Schedule-D, Clause 12.12 (strictly as per details mentioned in Schedule-D), along with all necessary manpower (including paramedical staff), medicines, equipment's etc. and shall be maintained in an effective manner throughout the contract period starting from the appointed date. Ambulance shall be stationed at Toll Plaza. (Clause No. 12.11 IRC: SP:84-2019)

15.1 Buildings for Traffic Aid Posts

The Concessionaire shall, in accordance with the type designs prescribed for such police outpost buildings by the State Government or a substitute thereof, construct buildings not exceeding 25 (twenty-five) square meters of plinth area, for each of the Traffic Aid Posts, and hand them over to the Authority no later than 30 (thirty) days prior to the Scheduled Completion Date. The Traffic Aid Post(s) shall be deemed to be part of the Site and shall vest in the Authority. Traffic Aid Posts shall be provided at each toll plaza and rest area location.

15.2 Building for Medical Aid Post

The Concessionaire shall, at its cost and in accordance with the type designs prescribed for such buildings by the State Medical Department (or a substitute thereof to be designated by the Authority), construct an aid post building and hand it over to the Authority, no later than 30 (thirty) days prior to COD. The Medical Aid Post(s) shall be deemed to be part of the Site and shall vest in the Authority. Medical Aid Post shall be provided at each toll plaza and rest area location.

16. Crane Service

Crane Service shall be provided on project highway, as specified in the manual Clause 12.12. One number crane shall be provided for the project stretch. Crane having capacity of minimum 20 MT shall be made available. The crane shall be brand new with fuel, driver, and insurance all-inclusive for the entire contract period. Cranes shall be stationed at Toll Plaza. (Clause No. 12.12 IRC: SP:84-2019)

Schedule-D (Specifications & Standards)

(See Clauses 2.1)

1. Construction

The Concessionaire shall comply with the Specifications and Standards set forth in **Annexure-I** of this Schedule-D for construction of the Project Highway

2. Design Standards

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

Manual of Specification & Standards for Four Laning of Highways (Second Revision)
published by the Indian Roads Congress - IRC: SP: 84-2019

Annex - I: Specifications & Standards for Four Lanning of Highways (Schedule-D)

1. Manual of Specifications and Standards to apply

Subject to the provisions of Paragraph 2 of this Annexure-I, Four Laning with Paved Shoulder of the project highway shall conform to the Manual of Specification and Standards for Four-Laning of Highways (Second Revision) published by IRC: SP:84-2019 (referred to as “Manuals” in this Schedule) and MORTH Specifications for Road and Bridge Works (5th revision). Where the specification for a work is not given, Good Industry Practice shall be adopted to the satisfaction of the Independent Engineer.

2. Deviations from the Specifications and Standards

2.1 Notwithstanding anything to the contrary contained in the aforesaid Manual, the following Specifications and Standards shall apply to the Project Highway, and for purposes of this Agreement, aforesaid Manual shall be deemed to be amended to the extent set forth below:

Deviations from the Manual

S. No.	Clause No	Clause Title	Deviation to Clause
1	2.6.1 of IRC: SP:84-2019	Width of shoulder	Width of earthen & paved shoulder shall be provided as per TCS given in Schedule-B & MoRTH circular no. RW/NH-33044/22/2020-S&R(P&B)/dated 4 th June 2024
2	2.10.2 of IRC: SP:84-2019	Vertical & horizontal clearance of underpasses	Vertical & horizontal clearance for VUP to be provided as 2 x 10 x 5.5 at Ch 1+216 & 2 x 12 x 5.5 at Ch 4+600 & 8+255
3	2.12.2 of IRC: SP:84-2019	Service road	Width of the service road in approaches to flyover as per TCS-3 & 3A.
4	7.3 (ii)/ Fig 7.2A of IRC: SP: 84-2019	Width of Structures	Width of Structures shall be as per Schedule-B & MoRTH circular no. RW/NH-33044/22/2020-S&R(P&B)/dated 4 th June 2024.
5	7.19/ Fig 7.8 of IRC: SP: 84-2019	Width of Grade separated structures	Width of Flyover & VUP shall be as per Schedule-B & MoRTH circular no. RW/NH-33044/22/2020-S&R(P&B)/dated 4 th June 2024.
6	Clause 3.2.2 of IRC: SP:84-2019	Taper Length for Junction at Ch 0+128	Due to constraint of Major Bridge at Ch 0.390 a tapering of the carriageway shall be achieved in the length available between bridge and Junction as shown in the junction layout.

S. No.	Clause No	Clause Title	Deviation to Clause
7	Clause 3.2.2 of IRC: SP:84-2019	Taper Length for Junction at Ch 16+068	Due to constraint of Major Bridge at Ch 16.354 a tapering of the carriageway shall be achieved in the length available between bridge and Junction as shown in the junction layout. 16.068
8	Clause 12.2 of IRC: SP:84-2019	Boundary Wall	Road Boundary stones shall be provided at the boundary on both sides of the right of way available under the control of the Authority, except at ingress and egress points.
9	Clause 2.5.1 of IRC: SP:84-2019	Median width	Median width shall be provided 2.5m as per typical cross sections attached as Appendix B-I of this Schedule-B.
10	Clause No. 2.15.1 IRC: SP:84-2019	Separator between Main Carriageway and Service/Slip Road	A separator between main carriageway and service/slip road shall be provided, as specified in typical cross sections attached as Appendix B-I of this Schedule-B.
11	Clause No. 6.3 of IRC: SP:84-2019	Median Drain	Water will be diverted from one carriageway to other by having an opening/channel in the median at 10m interval.
12	Fig 7.2B of IRC: SP: 84-2019	Width of Structure	Width of structure for Main carriageway and Service Road of Bridge, Grade Separated Structures shall be provided as per Schedule B & in line with MoRTH circular RW/NH-33044/22/2020-S&R(P&B) dated 04.07.2024.

2.2 Following Circulars forms part of specifications and Manual:

S. No.	Policy Circular No.	Dated	Subject
1	Efile No. RW/NH-33044/55/2021-S&R (P&B) Pt./Hill Slope Monitoring (Computer No. 219394)	28.11.2024	Expert committee Report on Cost Effective long-term Remedial Measures for Landslide Prone Areas in Hilly Region
2	Efile No. RW/NH-33044/27/2024/S&R (P&B) (Computer No. 243038)	23.09.2024	Policy Guidelines on use of Inert Material in construction of National Highways

S. No.	Policy Circular No.	Dated	Subject
3	Efile No. RW/NH-34066/09/2017/S&R(B) (Computer No. 185417)	12.02.2021	Reinforcing Steel Bars (Clause 1000.9.3.1 of Ministry's Specifications for Road and Bridge Works)
4	Efile No. RW/NH-34066/09/2017/S&R (B) (Computer No. 185417)	22.01.2021	Use of Stainless Steel Reinforcing Steel Bars in Bridges on National Highways and other Centrally sponsored projects to be Constructed in Marine Environment susceptible to Severe Corrosion
5	Efile No. RW/NH-34049/01/2020-S&R (P&B)pt. (Computer No. 207229)	20.09.2024	Use of New/Alternative Material and Technology in Construction and Maintenance of National Highways projects and adoption of Value Engineering practices therein
6	Efile No. RW/NH-35083/02/2024-S&R (Computer No. 238879)	26.11.2024	Use of Waste Plastic in Bituminous Concrete Wearing Course Mix in National Highways Construction & Maintenance Works.
7.	Efile No. RW/NH-33044/22/2020-S&R (P&B) (Computer No. 186381)	04.06.2024	Width of Shoulder (Paved & Earthen Shoulder) for National Highways
8	Efile No. RW/NH-35072/05/2018-S&R (P&B) (Computer No. 165688)	19.04.2024	Recommended Bitumen Type & Grade for Different Climate & Traffic Loading for National Highways and Expressways Works in India
9	Efile No. RW/NH-35072/05/2018-S&R (P&B) (E 165688)	23.08.2023	Use of Bitumen: Demand Supply, Type & Grade, Specifications, Source of Procurement and Quality in Construction of National Highway Projects.
10	Efile No. RW/NH-36098/25/2022-S&R (P&B)/pt.	16.03.2023	Safety in Road Construction Zones in National Highway Projects- effective and adequate measures to be taken
11	Efile No. RW/NH-33044/10/2021-S&R (P&B) (Computer No. 171909)	15.03.2023	Reuse of Material reclaimed from existing pavement layers.
12	Efile No. RW/NH-36098/17/2022/S&R (B)	02.01.2023	Provisions of Crash Barriers in existing Bridges
13	Efile No. RW/NH-33049/01/2020-S&R	22.02.2022	Use of Ultra High Performance Fiber Reinforced Concrete (UHPFRC) in Design & Construction of

Upgradation of Junction with NH-27 near Kalavad - Jamnagar Section (Package-2) of NH-927D from Km. 50+925 (Ch 0.000) of SH-26 (Old) to Km. 3+720 (Ch 47.572) of SH-26 in the State of Gujarat to Four lane with paved shoulder configuration (Package No- NH/IAHE/18) in the state of Gujrat on Hybrid Annuity Mode (HAM)

S. No.	Policy Circular No.	Dated	Subject
	(B) Pt.		Structures/Bridges of National Highways
14	Efile No. RW/NH-33044/04/2022-S&R (P&B)	15.02.2022	Use of dynamite on hills/mountains for the construction of roads
15	Efile No. RW/NH-34049/01/2020-S&R (B) (Computer No. 182692)	24.06.2025	Mandatory Use of Precast Concrete Components in National Highways Projects-Reg.

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