NATIONAL HIGHWAYS AUTHORITY OF INDIA (NHAI)

Consultancy Services for Preparation of Feasibility Report of Access Controlled Delhi-Jaipur Expressway (Greenfield): Additional Works





DRAFT FEASIBILITY REPORT INCLUDING SCHEDULES TO THE CONCESSION AGREEMENT

DWARKA EXPRESSWAY (NH 248-BB)

PACKAGE -2 (Km 5+300 to Km 9+500)

Volume III : Technical Schedules

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AECOM

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SCHEDULES

SCHEDULE -A

(See Clauses 2.1 and 8.1)

SITE OF THE PROJECT

1 The Site

1.1 Site for the project highway comprises the proposed Dwarka Expressway between Design Chainage km 5+300 to 9+500 (Package-2) in the State of Delhi. The site also includes a part of Urban Extension Road (UER) - II between Bhartal Chowk to Sector 23/24 intersection on Najafgarh road near the proposed site for Diplomatic Enclave. The Site shall include the land, buildings, structures and road works as described in Annex-I of this Schedule-A.

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

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

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

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

Annex -I
(Schedule-A)

Site

1. Site

Site for the project highway comprises the proposed Dwarka Expressway between Design Chainage km 5+300 to 9+500 (Package-3) in the State of Delhi. The site also includes a part of Urban Extension Road (UER) - II between Bhartal Chowk to Sector 23/24 intersection on Najafgarh road near the proposed site for Diplomatic Enclave. The land, carriageway and structures comprising the site are described below.

2. Land

The site of the project comprises the land (Sum-total of Land already in possession & Land to be possessed) as described below:

S. No.	Chainage (km)		Existing ROW (m)	Remarks
	From	To		
1.	5+300	8+300	100	Along UER-II between existing RUB and Sector 23/24 intersection on Najafgarh road
2.	6+295	8+200	80	Along proposed Dwarka Expressway from Bhartal Chowk towards Delhi-Haryana Border
3.	8+200	9+500	0	Land Acquisition Notification 3A issued in May 2017 for 120 m RoW. Section 3C in process

3. Carriageway

3.1 Along Dwarka Expressway

Between km 6+295 to km 8+130 the existing road is 2-lane with 1.5m wide earthen shoulder.

Presently between km 8+130 to km 9+500 along the proposed Dwarka Expressway there is no existing road.

Roadside drain of width varying from 0.6m to 4.6m exists on left side of the proposed Dwarka Expressway between km 6+370 to km 7+960.

3.2 Along UER – II

The section of UER 2 between RuB and Bhartal Chowk has RoW of 100 m and has 2 major intersections of Sector 21 and Sector 23. Details of RoW and existing carriageway are described below:

Chainage		Existing RoW (m)	Carriageway	Remarks
From	To			
Dwarka Expressway Section between (5+300 to 6+300)				
5+300	6+300	100	11 m either side with 7 m service road both sides. 1.5 m wide central median and 9 m median between service road and main carriageway and service road on both sides	in addition 11 m wide airport drain top surface also used as service road towards Najafgarh along with 1 m surface drain
Link Road to Najafgarh (6+300 to 8+200)				
6+300	8+200	100	7 m carriageway from village Poachanpur	in addition 11 m wide airport drain top surface also used as service road towards Najafgarh along with 1 m surface drain
Link Road from Sector 23 (5+500 to 6+300)				
5+500	6+300	60	11 m either side with 7 m service road both sides 1.5 m wide central median and 8 m median between service road and main carriageway and service road on both sides with underground drain	Existing Sector 22-23 dividing road
Link Road from Sector 21(5+700 to 6+100)				
5+700	6+100	45	11 m either side with 7 m service road both sides 1.5 m wide central median and 4 m median between service road and main carriageway and service road on both sides with underground drain	Existing Sector 21-22 dividing road

4. Major Bridges

The site includes the following Major Bridges:

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

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

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

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

6. Grade separators

The site includes the following grade separator.

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

7. Minor bridges

The site includes the following minor bridges.

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

8. Railway level crossings

The site includes the following railway level crossings:

S. No.	Location (km)	Remarks
Nil		

9. Underpasses (vehicular, non-vehicular)

The site includes the following Underpass.

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

10. Culverts

The site has the following existing culverts:

Sl. No	Chainage (km)	Type of Culvert	Span /Opening with span length (m)	Width (m)	Remarks
1	5+950 of Link Road to Dwarka Sector 23	Slab	1 x 3.75m	75.0	Oil Pipe line Crossing

11. Bus bays

The details of bus bays on the site are as follow:

S. No	Chainage (km)	Length (m)	Left Hand Side/ Right Hand Side
Dwarka Expressway Section between (5+300 to 6+300)			
1	5+300	6	Both Sides
2	6+100	60	Both Sides (Only Bay and no shelter)

12. Truck Lay byes

The details of truck lay bye are as follow:

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

13. Road side drains

The details of roadside drains within the existing ROW are as follow:

S. No.	Existing Chainage		Approx. Length (m)	Left / Right	Width	Remarks
	Start	End				
Dwarka Expressway Section between (5+300 to 6+300)						
1	5+300	6+300	1000	Left	11 m	Storm water drain from Airport discharging into Najafgarh Drain
2	6+300	7+400	1100	Left	0.6 to 4.6 m	Sector Drain Constructed by DDA
Link Road to Najafgarh (6+300 to 8+200)						
2	6+300	8+300	2000	Left	11 m	Storm water drain from Airport discharging into Najafgarh Drain
Link Road from Sector 23 (5+500 to 6+300)						
3	5+500	6+300	800	Both	3 m	Drain below service road median
Link Road from Sector 21 (5+700 to 6+100)						
3	5+700	6+100	500	Both	2 m	Drain below service road median

14. Major junctions

The details of major junctions are as follows:

S. No.	Location	At Grade / Grade Separated	Category of Cross Road			
			NH	SH	MDR	Other
1	5+700	At Grade				Sector 21-22 dividing Road
2	6+300	At Grade				Sector 23 Intersection (Bharthal Chowk)
3	8+000	At Grade				Bamnoli Sector Road
4	8+600	At Grade				Najafgarh Bijwasan Road (UER 1)
Link Road to Najafgarh (6+300 to 8+200)						
5	7+200	At Grade				Pochanpur Village Road

6	7+600	At Grade				Sector 24 (Golf Course Road Intersection)
Link Road from Sector 23 (5+500 to 6+300)						
7	5+900	At Grade				Sector 23 Road

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

15. Minor junctions

The details of the minor junctions are as follows:

S. No.	Location	Side	Type	
			+ / T / Y Junction	Cross Road
1	7+100	LHS	T	Bharthal Village Road
2	7+300	LHS	T	Bharthal Village Road
3	7+400	RHS	T	Dhulsiras Village Road
4	7+500	LHS	T	Bharthal Village Road
5	7+700	LHS	T	Road to Police Colony
Link Road to Najafgarh (6+300 to 8+200)				
6	6+600	RHS	T	Road to Pochanpur Village
7	6+900	RHS	T	Road to Pochanpur Village
8	7+300	RHS	T	Pochanpur Village

16. Bypasses

The details of the bypass are as follows:

S. No.	Name of Bypass (town)	Chainage (km) From… to…	Length in km	Carriageway	
				Width	Type
NIL					

17. Other structures

The details of other structures are as follows:

S. No.	Chainage	Type of Structure	Remarks
NIL			

18. Referencing System

The existing road does not have any km-stone.

Existing Start Chainage in Km	Existing End Chainage in Km	Design Start Chainage in Km	Design End Chainage in Km
NIL	NIL	5+300	9+500

Annex -II
(Schedule-A)

Dates for providing Right of way

The dates on which the Authority shall provide Right of Way to the Contractor on different stretches of the site are stated as below

Sl. No.	From Km to Km	Length (km)	Width (m)	Date of Providing ROW*
1	2	3	4	5
1 Full Right of Way				
2 Part Right of Way				
3 Balance ROW				

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

Annex -III
(Schedule-A)

Alignment Plans

The existing alignment of the Project Highway shall be as modified in the following sections as per the Plan & Profile for the Project attached herewith.

Annex -IV
(Schedule-A)

Environmental Clearances

The following environment clearances have been obtained:

1. Environmental clearance approval form MoEF is not required as per clause 7(f) of EIA Notification 2006 and subsequent amendment issued from MoEF.

2. Clearance under wild life (protection) Act 1972 is not required.

3. permission for felling of trees will be required.

SCHEDULE -B

(See Clause 2.1)

Development of the Project Highway

1 Development of the Project Highway

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

2 Dwarka Expressway

Construction of Dwarka Expressway between Design Chainage 5+300 to 9+500 (Package-2) as described in Annex-I of this Schedule-B and in Schedule-C.

3 Specifications and Standards

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

Annex -I
(Schedule-B)

Description of Project Location

1. WIDENING OF THE EXISTING HIGHWAY

1.1 The Project Highway shall follow the alignment as shown in the alignment plans specified in Annex III of Schedule-A. Geometric deficiencies, if any, in the proposed horizontal and vertical profiles shall be corrected as per the prescribed standards for plain terrain to the extent land is available.

1.2 WIDTH OF CARRIAGEWAY

The width of the carriageway described below is including the paved shoulder and kerb shyness and excluding the median width.

1.2.1 DWARKA EXPRESSWAY

For Dwarka Expressway and all ramps merging to or exiting from the Expressway under this scope of work, the paved carriageway including shyness shall be as per the table below:

S. No.	Chainage of Dwarka Expressway		Design Chainage of Main Carriageway / Individual Link / Ramp		Length (m)	Width of Paved Carriageway (m)	Remarks
	From	To	From	To			
Main Carriageway							
1	5+300	8+915	5+300	6+577	1277	30	14 m wide Main Carriageway and shyness in both directions
2			6+740	8+915	2175	30	14 m wide Main Carriageway and shyness in both directions
3	8+915	9+220	8+915	9+220	305	As per the requirement of Toll Plaza	
4	9+220	9+500	9+220	9+500	280	30	14 m wide Main Carriageway and shyness in both directions
Ramp / Link exiting from Left Carriageway of Dwarka Expressway to ECC Dwarka							
1	5+719	5+931	5+730	5+936	206	0 to 11.5m	10.5 m wide main carriageway and Shyness on both sides
2	5+931	7+347	5+936	7+101	1165	11.5	10.5 m wide main carriageway and 0.5 m wide Shyness on both sides

S. No.	Chainage of Dwarka Expressway		Design Chainage of Main Carriageway / Individual Link / Ramp		Length (m)	Width of Paved Carriageway (m)	Remarks
	From	To	From	To			
Ramp from ECC Dwarka merging with Right Carriageway of Dwarka Expressway							
1	7+100	7+354	7+100	7+354	254	0 to 11.0m	10.5 m wide main carriageway and 0.25 m wide Shyness on both sides
2	7+354	7+440	7+354	7+701	347	11.0	10.5 m wide main carriageway and 0.25 m wide Shyness on both sides

1.2.2 LINK ROAD TO NAJAFGARH

For the link road coming out of Dwarka Expressway near the Sector 21 Metro Station junction (MSJ) and leading to Najafgarh and all the ramps merging to or exiting from this link road, the paved carriageway shall be as per the table below:

Sl. No.	Design Chainage of LME / RME* of Link Road to Najafgarh		Design Chainage of Individual Road / Ramp		Length (m)	Width of Paved Carriageway (m)		Remarks
	From	To	From	To		Left	Right	
Main Carriageway of the Link Road from Dwarka Sector 21 Metro Station Junction (MSJ) to Najafgarh								
1	5+755	8+300	5+755	8+300	2545	11.5		
2	5+316	5+508	5+316	5+508	192	-	11.5	
3	5+508	5+725	5+508	5+725	217	-	Varying from 11.5 to 9.25	
4	5+725	6+180	5+725	6+180	455	-	9.25	7 m wide main carriageway, 2 m wide paved shoulder and 0.25 m wide Shyness on inner side
5	6+180	6+213	6+180	6+213	33	-	Varying from 9.25 to 11.5	
6	6+213	8+300	6+213	8+300	2087	-	11.5	
Ramp from Right Carriageway from Najafgarh towards Dwarka Sector 21 MSJ								
1	5+730	5+982	5+730	6+093	363	-	7.5	7 m wide

Sl. No.	Design Chainage of LME / RME* of Link Road to Najafgarh		Design Chainage of Individual Road / Ramp		Length (m)	Width of Paved Carriageway (m)		Remarks
	From	To	From	To		Left	Right	
								main carriageway and 0.25 m wide Shyness on both sides
2	5+982	6+234	6+093	6+250	157	-	Varying 7.5 to 0	
Ramp from Dwarka Sector 23 towards RUB/Shiv Murty								
1	5+316	5+508	5+316	5+506	190	-	Varying from 0 to 7.5	
2	5+508	6+182	5+506	6+184	678	-	7.5	7 m wide main carriageway and 0.25 m wide Shyness on both sides
Ramp from Left Carriageway from Dwarka Sector 21 MSJ to ECC Dwarka								
1	6+302	6+425	6+302	6+425	123	0 to 9.25m	-	
2	6+625	6+921	6+425	6+930	505	9.25	-	
3	6+921	7+065	6+930	7+120	190	Varying from 9.25m to 11.0m	-	
4	7+065	7+100	7+120	7+317	198	11.0	-	
Ramp from ECC Dwarka merging with Right Carriageway towards Dwarka Sector 21 MSJ								
1	6+470	6+660	6+594	6+784	190	-	0 to 9.25m	
2	6+660	7+100	6+784	7+330	546	-	9.25	
Ramp from ECC Bus Drop-off merging with the Ramp from ECC Dwarka merging with Right Carriageway towards Dwarka Sector 21 MSJ								
1	6+872	7+100	7+106	7+663	557	-	9.25	
Ramp from ECC Bus Drop-off going towards Sector 24								
1	7+150	7+500	7+330	7+629	299	-	9.25	
Ramp from Left Carriageway from Dwarka Sector 21 MSJ to Golf Course Road								
1	7+000	7+650	-	-	650	9.25	-	

*LME – Left Median Edge of Link Road to Najafgarh; RME – Right Median Edge of Link Road to Najafgarh

1.2.3 LINK ROAD TO DWARKA SECTOR 21

For the link road coming out of Dwarka Expressway after the existing Road Under Bridge (RUB) and leading to Dwarka Sector 21, the paved carriageway shall be as per the table below:

Sl. No.	Design Chainage of Dwarka Expressway		Design Chainage of Link Road		Length (m)	Width of Paved Carriageway (m)	Remarks
	From	To	From	To			
1	5+300	5+700	5+300	6+150	850	11.5	

1.2.4 LINK ROAD FROM DWARKA SECTOR 23 TO KHERKI DAULA

For the link road from Dwarka Sector 23 and merging with Dwarka Expressway going towards Kherki Daula, the paved carriageway shall be as per the table below:

Sl. No.	Design Chainage of Link Road		Length (m)	Width of Paved Carriageway (m)	Remarks
	From	To			
LEFT CARRIAGEWAY					
1	5+466	7+010	1544	11.5	
2	7+010	7+185	175	Varying from 11.5m to 0	
RIGHT CARRIAGEWAY					
1	5+465	6+645	1180	11.5	
2	6+645	6+904	259	Varying from 11.5m to 0	

1.2.5 NAJAFGARH BIJWASAN CROSS ROAD

The road connecting Bijwasan and Najafgarh will have combination of underpass and flyover along the road having a carriageway width of 9 m (7 m wide main carriageway and 2 m wide paved shoulder) in each direction for a length of 1000 m. in addition a slip road will also be provided having 7.5 m width on both sides for a length of 800 m

2. GEOMETRIC DESIGN AND GENERAL FEATURES

2.1 General

Geometric design and general features of the Project Highway shall be in accordance with the manual.

2.2 Design speed

The design speed shall be the minimum 100 kmph for Dwarka Expressway. For all ramps and link roads and at the interchange location the design speed shall be 65 kmph. Design speed for all at-grade service roads shall be 40 kmph.

2.3 Improvement of existing road geometries

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

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

2.4 Right of Way

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

2.5 Type of Shoulders

Paved shoulder shall be provided in the stretches given below:

SL No.	Stretch	Side	Width (m)	Remarks
1	5+300 to 9+500	Both	nil	

2.6 Lateral and vertical clearances at Flyover/ Underpass/ Elevated structure

Lateral clearance at Flyover/ Underpass/ Elevated Structure and provision of guardrails/ crash barrier shall be as per paragraph 2.10 of the Manual. The location, width and vertical clearance of the structure shall be as per the Table below:

Details of Underpass / Flyover / Elevated Structure

S. No.	Road / Link	Design Chainage of Main Carriageway / Individual Link / Ramp		Length (m)	Proposed Structure	Width (m)	Vertical Clearance	Remarks
		From	To					
1	Dwarka Expressway	5+460	5+812	352	Elevated Structure	33.5	As per Design Profile	Ramp on Structure
		5+812	6+480	668			5.5	
		6+680	8+338	1658			5.5	
		8+338	8+560	222			As per Design Profile	Ramp on Structure
2	Ramp / Link exiting from Left Carriageway of Dwarka Expressway to ECC Dwarka	5+745	5+936	191	Elevated Structure	Varying from 0 to 12.5	5.5	Merging portion
		5+936	6+349	413		12.5	5.5	
		6+349	6+575	226		12.5	As per Design Profile	Ramp on Structure
3	Ramp from ECC Dwarka merging with Right Carriageway of Dwarka Expressway	7+300	7+360	60	Elevated Structure	Varying from 0 to 12.0	5.5	Merging portion
		7+354	7+384	30		12.0	5.5	
		7+384	7+570	186		12.0	As per Design Profile	Ramp on Structure
4	Link Road to Najafgarh *(Left Carriageway)*	6+050	6+212	162	Elevated Structure	12.5	As per Design Profile	Ramp on Structure
		6+212	6+720	508			5.5	
		6+720	7+009	289			As per Design Profile	Approach from +1 level to +2 level
		7+009	7+115	106			5.5 over and above +1	At + 2 level

S. No.	Road / Link	Design Chainage of Main Carriageway / Individual Link / Ramp		Length (m)	Proposed Structure	Width (m)	Vertical Clearance	Remarks
		From	To					
							level	
		7+115	7+458	343			As per Design Profile	Approach from +2 level to +1 level
		7+458	7+675	217			5.5	
		7+675	8+010	335			As per Design Profile	Ramp on Structure
5	Link Road to Najafgarh *(Right Carriageway)*	5+480	5+740	260	Elevated Structure	12.5	As per Design Profile	Ramp on Structure
		5+740	6+721	981			5.5	
		6+721	7+010	289			As per Design Profile	Approach from +1 level to +2 level
		7+010	7+116	106			5.5 over and above +1 level	At + 2 level
		7+116	7+459	343			As per Design Profile	Approach from +2 level to +1 level
		7+459	7+677	218			5.5	
		7+677	8+010	333			As per Design Profile	Ramp on Structure
6	Ramp from Right Carriageway from Najafgarh towards Dwarka Sector 21 MSJ	5+860	6+009	149	Elevated Structure	8.5	As per Design Profile	Ramp on Structure
		6+009	6+093	84		8.5	5.5	
		6+093	6+100	7		Varying from 8.5 to 0	5.5	Merging portion
7	Ramp from Dwarka Sector 23 towards RUB/Shiv Murty	5+491	5+506	15	Elevated Structure	Varying from 7.9 to 8.5	As per Design Profile	Merging portion Ramp on Structure
		5+506	5+635	129		8.5	As per Design Profile	Ramp on Structure
		5+635	5+718	83		8.5	5.5	
		5+668	5+885	217		8.5	As per Design Profile	Ramp on Structure
8	Ramp from Left	6+430	6+425	5	Elevated Structure	0 to 10.25m	5.5	Merging portion

S. No.	Road / Link	Design Chainage of Main Carriageway / Individual Link / Ramp		Length (m)	Proposed Structure	Width (m)	Vertical Clearance	Remarks
		From	To					
	Carriageway from Dwarka Sector 21 MSJ to ECC Dwarka	6+425	6+566	141		10.25	5.5	
		6+566	6+710	144		10.25	As per Design Profile	Ramp on Structure
9	Ramp from ECC Dwarka merging with Right Carriageway towards Dwarka Sector 21 MSJ	6+700	6+784	84	Elevated Structure	0 to9.25m	5.5	Merging portion
		6+784	7+117	333		9.25	5.5	
		7+117	7+230	113		9.25	As per Design Profile	Ramp on Structure
10	Ramp from ECC Bus Drop-off merging with the Ramp from ECC Dwarka merging with Right Carriageway towards Dwarka Sector 21 MSJ	7+110	7+402	292	Elevated Structure	10.25	5.5	
		7+402	7+520	118		10.25	As per Design Profile	Ramp on Structure
11	Ramp from ECC Bus Drop-off going towards Sector 24	7+340	7+520	180	Elevated Structure	10.25	As per Design Profile	Ramp on Structure
12	Ramp from Left Carriageway of Link Road to Najafgarh from Dwarka Sector 21 MSJ to Golf Course Road	6+910	7+050	140	Elevated Structure	0 to 10.25	On Ramp from +1 to +2 level	Merging portion
		7+050	7+120	70		10.25	5.5 over and above +1 level	
		7+120	7+455	335		10.25	As per Design Profile	Ramp on Structure
13	Link Road to Dwarka Sector 21	5+651	5+851	200	Underpass	12.5	5.5	
14	Link Road from Dwarka Sector 23 going towards Kherki	5+800	6+260	460	Elevated Structure	12.5	As per Design Profile	Ramp on Structure
		6+260	6+651	391			5.5 over and	At +2 level

S. No.	Road / Link	Design Chainage of Main Carriageway / Individual Link / Ramp		Length (m)	Proposed Structure	Width (m)	Vertical Clearance	Remarks
		From	**To**					
	Daula (*Left Carriageway)*						above +1 level	
		6+651	7+006	355			As per Design Profile	Approach from +2 level to +1 level
		7+006	7+010	4			5.5	
		7+010	7+186	176		Varying from 12.5m to 0	5,5	Merging portion
15	Link Road from Dwarka Sector 23 going towards Kherki Daula (*Right Carriageway)*	5+800	6+260	350	Elevated Structure	12.5	As per Design Profile	Ramp on Structure
		6+260	6+309	49		12.5	5.5 over and above +1 level	At +2 level
		6+309	6+645	336			As per Design Profile	Approach from +2 level to +1 level
		6+645	6+658	13		Varying from 12.5m to 11.9m	As per Design Profile	Approach from +2 level to +1 level
		6+658	6+660	2		11.9m to 0	5.5	Merging portion
16	Right turn beneath Dwarka Expressway from ECC Dwarka towards Kherki Daula	Crossing Dwarka Expressway at 7+470		120	Underpass	12.0	5.5	
17	U-turn beneath Dwarka Expressway from left Service road towards Sector 23ECC Dwarka	Crossing Dwarka Expressway at 8+009		440	Underpass	12.0	5.5	
18	Right Turn towards Najafgarh above Dwarka Expressway from left	Crossing Dwarka Expressway at 8+600		150	Elevated Structure	8.5	As per Design Profile	Ramp on Structure
				60		8.5	5.5	

S. No.	Road / Link	Design Chainage of Main Carriageway / Individual Link / Ramp		Length (m)	Proposed Structure	Width (m)	Vertical Clearance	Remarks
		From	To					
	Service Road							
19	Right Turn towards Shiv Murti from Elevated Cross-Road coming from Bijwasan	Crossing Dwarka Expressway at 8+600		60 150	Elevated Structure	8.5 8.5	5.5 As per Design Profile	 Ramp on Structure
20	Najafgarh – Bijwasan Cross Road (Left Carriageway)	Crossing Dwarka Expressway at 8+600		10.5	Depressed Cross Road through Underpass structure	130	5.5	Length and width are w.r.t. Main Carriageway; Width of main carriageway on the Underpass – 33.5m; Both side approaches of the depressed cross-road through underpass are included in the scope of work;
21	Najafgarh – Bijwasan Cross Road (Right Carriageway)	Crossing Dwarka Expressway at 8+600		10	Elevated Cross-Road	130	5.5	Length and width are w.r.t. Main Carriageway; Width of main carriageway on the Underpass – 33.5m; Both side approaches of the depressed cross-road

S. No.	Road / Link	Design Chainage of Main Carriageway / Individual Link / Ramp		Length (m)	Proposed Structure	Width (m)	Vertical Clearance	Remarks
		From	To					
								through underpass are included in the scope of work;

Note: Vertical clearance of 5.5m, wherever applicable as per the above table, shall be maintained between the at-grade service road and all the structural components of the elevated main carriageway / service.

2.7 Lateral and vertical clearances at Overpasses

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

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

Details of Overpass Structure

Sl. No.	Design Chainage	Length (m)	Proposed Structure	Width (m)	Vertical Clearance (m)	Remarks
			NIL			

2.8 Service/Slip roads

All at-grade service roads and slip roads shall be constructed as per the Plan enclosed in Annex-III and as per the table below:

Chainage		Length (m)	Number of lanes	Width (m)	LHS / RHS	Remarks
From	To					
Dwarka Expressway						
5+300	5+700	400	2	7.5	Both	
5+700	6+200	500	2	7.5	Both	
5+300	6+300	1000	3	11	LHS	
6+200	6+300	100	3	11	RHS	
6+300	7+800	1500	3	11	LHS	
7+100	7+600	500	3	11	LHS	
6+300	7+500	1200	4	14	RHS	
7+500	7+600	100	3	11	RHS	
7+500	7+970	470	2	7.5	RHS	
7+450	7+970	520	3	11	RHS	
7+800	7+950	150	5	18	LHS	
7+950	8+100	150	4	14	LHS	
8+100	8+700	600	4	14	LHS	
7+950	8+700	750	4	14	RHS	
Link Road to Sector 21						
5+700	6+100	400	3	11	Both	

Chainage		Length (m)	Number of lanes	Width (m)	LHS / RHS	Remarks
From	**To**					
Link Road from Sector 23						
5+600	6+250	650	3	11	Both	
Link Road to Najafgarh						
6+300	8+300	2000	3	11	Both	
6+300	7+030	730	3	11	LHS	Existing Slip Road above Airport Drain RCC Box, Only Overlay Required.

Where service road has been shown to be varying, it is indicative only and shall be decided as per existing road width, site requirement and detailed design duly approved by the Authority Engineer. Any change in this varying width and the length in which it is varying shall not be treated as change of scope.

Where existing road is used as part of service road, necessary repair and rehabilitation of the existing pavement shall be done as per the requirement set forth in Schedule B and the Manual.

2.9 Grade separated structures

Grade separated elevated structures and underpasses shall be provided as per particulars given below:

Sl. No.	Design Chainage	Length (m)	Proposed Structure	Remarks
1	5+460 to 8+560	3100	Elevated Structure	Dwarka Expressway
2	5+745 to 6+575	830	Elevated Structure	Ramp / Link exiting from Left Carriageway of Dwarka Expressway to ECC Dwarka
3	7+100 to 7+570	470	Elevated Structure	Ramp from ECC Dwarka merging with Right Carriageway of Dwarka Expressway
4	6+050 to 8+010	1960	Elevated Structure at +1 and +2 level	Link Road to Najafgarh *(Left Carriageway)*
5	5+480 to 8+010	2530	Elevated Structure at +1 and +2 level	Link Road to Najafgarh *(Right Carriageway)*
6	5+860 to 6+100	240	Elevated Structure	Ramp from Right Carriageway from Najafgarh towards Dwarka Sector 21 MSJ

Sl. No.	Design Chainage	Length (m)	Proposed Structure	Remarks
7	5+491 to 5+885	394	Elevated Structure	Ramp from Dwarka Sector 23 towards RUB/Shiv Murty
8	6+430to 6+710	280	Elevated Structure	Ramp from Left Carriageway from Dwarka Sector 21 MSJ to ECC Dwarka
9	6+700 to 7+230	530	Elevated Structure	Ramp from ECC Dwarka merging with Right Carriageway towards Dwarka Sector 21 MSJ
10	7+110 to 7+520	410	Elevated Structure	Ramp from ECC Bus Drop-off merging with the Ramp from ECC Dwarka merging with Right Carriageway towards Dwarka Sector 21 MSJ
11	7+340 to 7+520	180	Elevated Structure	Ramp from ECC Bus Drop-off going towards Sector 24
12	6+910 to 7+455	545	Elevated Structure	Ramp from Left Carriageway of Link Road to Najafgarh from Dwarka Sector 21 MSJ to Golf Course Road
13	5+651 to 5+851	200	Underpass	Link Road to Dwarka Sector 21
14	5+800 to 7+185	1385	Elevated Structure at +2 and +1 level	Link Road from Dwarka Sector 23 going towards Kherki Daula (*Left Carriageway)*
15	5+800 to 6+660	860	Elevated Structure at +2 and +1 level	Link Road from Dwarka Sector 23 going towards Kherki Daula (*Right Carriageway)*
16	Crossing Dwarka Expressway at 7+470	120	Underpass	Right turn beneath Dwarka Expressway from ECC Dwarka towards Kherki Daula
17	Crossing Dwarka Expressway at 8+009	440	Underpass	U-turn beneath Dwarka Expressway from left Service road towards ECC DwarkaSector 23

Sl. No.	Design Chainage	Length (m)	Proposed Structure	Remarks
18	Crossing Dwarka Expressway at 8+600	210	Elevated Structure	Right Turn towards Najafgarh above Dwarka Expressway from left Service Road
19	Crossing Dwarka Expressway at 8+600	210	Elevated Structure	Right Turn towards Shiv Murti from Elevated Cross-Road coming from Bijwasan
20	Crossing Dwarka Expressway at 8+600	9.0	Depressed Cross Road through Underpass structure	Najafgarh – Bijwasan Cross Road (Left Carriageway) Length and width are w.r.t. Main Carriageway;
21	Crossing Dwarka Expressway at 8+600	9.0	Elevated Cross-Road	Najafgarh – Bijwasan Cross Road (Right Carriageway) Length and width are w.r.t. Main Carriageway;

2.9.1 The minimum spacing between successive expansion joints shall be 200 m.

2.10 Cattle and pedestrian underpass /overpass

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

2.11 Foot Over Bridge

2.10.1 Foot Over Bridge shall be provided as per particulars given below:

NIL

2.12 Subway

2.11.1. New Pedestrian Subway is to be done as per particulars given below:

Sl. No.	Location	Type of Structure	Clear Size (Horizontal x Vertical)	Tentative Length	Remarks
1	Km 6+200 of Link Road to Najafgarh	Box	5m x 3m	70m	
2	Km 6+400 of Link Road to Najafgarh	Box	5m x 3m	80m	Subway shall be beneath the existing Drain coming from Airport to Najafgarh Drain

Sl. No.	Location	Type of Structure	Clear Size (Horizontal x Vertical)	Tentative Length	Remarks
3	Km 6+200 to Link Road from Dwarka Sector 23 to Kherki Daula	Box	5m x 3m	70m	
4	Km 6+400 to Link Road from Dwarka Sector 23 to Kherki Daula	Box	5m x 3m	85m	
5	Km 6+950 of Link Road to Najafgarh	Box	5m x 3m	90m	Subway shall be beneath the existing Drain coming from Airport to Najafgarh Drain

The subway shall have both stairways and ramps at both ends. The ramp gradient shall not exceed 1:12. As per the above particulars, subway shall be designed as per Manual and as per IRC:103-2012.

2.13 Typical Cross Sections of the Project Highway

As per drawing enclosed in Annex-II.

3. INTERSECTION AND GRADE SEPARATORS

All intersections and grade separators shall be as per Section 3 of the manual. Existing intersections which are deficient shall be improved to the prescribed standards.
Properly designed intersections shall be provided at the locations and of the types and features given in the tables below:

(a) Grade separated intersection with Ramps

SL No.	Location	Salient Features	Minimum Length of viaduct to be provided	Road to be carried under the structure	Remarks
1	5+700 of Dwarka Expressway	Elevated Dwarka Expressway; Elevated Link road to Najafgarh; Depressed link road to Dwarka Sector 21	As per Clause 2.9	Service roads	Necessary improvement of the at-grade junction with the service road is also included in the scope of work
2	6+300 of Link Road to Najafgarh	Elevated Dwarka	As per Clause 2.9	Service roads	Necessary improvement of

SL No.	Location	Salient Features	Minimum Length of viaduct to be provided	Road to be carried under the structure	Remarks
		Expressway; Elevated Link road to Najafgarh; Elevated Link road from Dwarka Sector 23 to Kherki Daula 3-lane Roundabout for all at-grade service road movements			the at-grade junction with the service road with a 3-lane roundabout is also included in the scope of work
3	8+000 of Dwarka Expressway	Elevated Dwarka Expressway	As per Clause 2.9	Cross-road	Necessary improvement of the at-grade junction with the service road is also included in the scope of work
4	8+600 of Dwarka Expressway	Service road on Elevated Structure Cross-road through underpass	As per Clause 2.9	Service roads	Necessary improvement of the at-grade junction with the service road is also included in the scope of work
5	7+600 of Link Road to Najafgarh	Elevated Link Road to Najafgarh	As per Clause 2.9	Golf Course road	Necessary improvement of the at-grade junction with the service road is also included in the scope of work

(b) Improvement of Minor Junctions with at-grade Service roads

All minor junction as provided in Clause 15 of Schedule A needs to be improved to integrate them with the at-grade service road as per the requirements of Schedule D.

4. ROAD EMBANKMENT AND CUT SECTION

4.1 Widening and improvement of the existing road embankment/cuttings and construction of new road embankment/cuttings shall conform to the Specifications and Standards given in section 4 of the

Manual and the specified cross sectional details. Deficiencies in the plan and profile of the existing road shall be corrected.

4.2 Raising of the existing road: NIL

5. PAVEMENT DESIGN

5.1 Pavement design shall be carried out in accordance with IRC : 37-2012.

5.2 Type of pavement

The approaches of the elevated corridor of Dwarka Expressway and the Service road shall be flexible pavement except the approaches of Underpasses. The cross road approaches of Underpasses and the service road approaches of the underpass shall be rigid pavement. Rigid pavement shall be provided in the toll plaza section.

5.3 Design requirements

5.3.1. *Design Period and strategy*

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

All rigid pavements shall be designed for a minimum design period of 30 years. The minimum thickness of rigid pavement shall be 300 mm of Pavement Quality Concrete (PQC) and 150 mm of de-bonded Dry Lean Concrete (DLC).

5.3.2. *Design Traffic*

Notwithstanding anything to the contrary contained in this Agreement or the Manual, the Contractor shall design the pavement for minimum Design traffic of 75 MSA for main carriageway of Dwarka Expressway (all roads except Slip/Service Road), 20 MSA for slip/service road/cross road. For new pavement following minimum thickness of the bituminous layers shall be maintained:

- BC – 40 mm
- DBM – 105 mm

5.4 Reconstruction of stretches

NIL

6. ROADSIDE DRAINAGE

Drainage system including surface and subsurface drains for the Project Highway shall be provided as per IRC-SP: 50-1999.

Construction of New RCC drains

SL No.	Stretch	Length (m)	Type	Width (m)	Remarks
Along Dwarka Expressway					
1	5+300 to 9+500	4037	Rectangular RCC covered drain	2.0m	Both sides Footpath-cum-Drain
Along Link Road to Najafgarh					
1	6+300 to 8+300	2000	Rectangular RCC covered drain	2.0m	Both sides Footpath-cum-Drain
Along Link Road to Dwarka Sector 21					

SL No.	Stretch	Length (m)	Type	Width (m)	Remarks
1	5+800 to 6+150	350	Rectangular RCC covered drain	2.0m	Both sides Footpath-cum-Drain
Along Link Road to Dwarka Sector 23					
1	5+465 to 6+300	835	Rectangular RCC covered drain	3.0m	Both sides Footpath-cum-Drain

Realignment of Existing RCC Drain

Existing drain at the following stretch needs to be realigned and reconstructed as per the design requirement.

S. No.	Existing Chainage	Approx. Length (m)	Left / Right	Width	Remarks
Dwarka Expressway section between (5+300 to 6+300)					
1	Between 5+340 to 5+800	600	Left	11 m	Existing Storm water drain from Airport discharging into Najafgarh Drain needs to be realigned

7. DESIGN OF STRUCTURES

7.1 General

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

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

7.1.3 The following structures shall be provided with footpaths: NIL

7.1.4 All bridges shall be high-level bridges. **Nil**

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

Nil

7.1.6 Cross-section of the new culverts and bridges at deck level for the Project Highway shall conform to the typical cross-sections given in section 7 of the Manual.

7.2 Culverts

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

7.2.2 Reconstruction of existing Culverts: NIL

7.2.3 Widening of existing culverts: NIL

All existing culverts which are not to be reconstructed shall be widened to the roadway width of the Project Highway as per the typical cross section given in section 7 of the Manual. Repairs and strengthening of existing structures where required shall be carried out.

SL No,	Culvert Location	Type, span, height and width of structure	Remarks
As mentioned in Annex-I (Schedule A)			

7.2.4 Additional new culverts shall be constructed as per particulars given in the table below for full width of the road : NIL

7.2.5 Repairs/replacements of railing/parapets, flooring and protection works of the existing culverts shall be undertaken for the following existing culvert as per site requirement.

Sl. No	Chainage (km)	Type of Culvert	Span /Opening with span length (m)	Width (m)	Remarks
1	5+950 of Link Road to Dwarka Sector 23	Slab	1 x 3.75m	75.0 (Skewed)	Oil Pipe line Crossing

7.2.6 Floor protection works shall be specified in the relevant IRC Codes and specifications. 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:

Nil

(ii) The following existing bridges shall be widened. NIL

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

Nil

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

Nil

7.3.4 Drainage system for bridge decks

An effective drainage system for bridge decks shall be provided as specified in paragraph 7.20 of the Manual

7.3.5 Structures in marine environment

Nil

7.3.6 New Minor Bridge is proposed at the following location:

Sl. No	**Chainage (km)**	**Type of Structure**	**Span /Opening with span length (m)**	**Width (m)**	Remarks
1	5+340 of Dwarka Expressway	Slab	1 x 11.0m	100	Crossing of Storm water drain from Airport

The location is tentative and shall be decided based on actual design. Any change in location shall not be treated as change of scope.

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. **Nil**

7.4.2 *Road over-bridges*

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

7.4.3 *Road under-bridges*

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

7.5 Grade separated structures

The grade separated structures shall be provided at the locations and of the type and length specified in paragraphs 2.6 and 2.9 of this Annex-I.

7.6 Repairs and strengthening of bridges and structures

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

Nil

7.7 List of Major Bridges and Structures

The following is the list of Structures:

Sl. No.	**Location**
1	Elevated Dwarka Expressway between 5+517 to 8+536
2	Elevated Ramp / Link exiting from Left Carriageway of Dwarka Expressway to ECC Dwarka between 5+730 to 6+515
3	Elevated Ramp from ECC Dwarka merging with Right Carriageway of Dwarka Expressway between 7+100 to 7+550
4	Elevated Left Carriageway of Link Road to Najafgarh between 6+135 to 7+933

Sl. No.	Location
5	Elevated Right Carriageway of Link Road to Najafgarh between 5+523 to 7+932
6	Elevated Ramp from Right Carriageway from Najafgarh towards Dwarka Sector 21 MSJ between 5+860 to 6+250
7	Elevated Ramp from Dwarka Sector 23 towards RUB/Shiv Murty between 5+491 to 5+840
8	Elevated Ramp from Left Carriageway from Dwarka Sector 21 MSJ to ECC Dwarka between 6+302 to 6+683
9	Elevated Ramp from ECC Dwarka merging with Right Carriageway towards Dwarka Sector 21 MSJ between 6+594 to 7+210
10	Elevated Ramp from ECC Bus Drop-off merging with the Ramp from ECC Dwarka merging with Right Carriageway towards Dwarka Sector 21 MSJ between 7+106 to 7+465
11	Elevated Ramp from ECC Bus Drop-off going towards Sector 24 between 7+330 to 7+500
12	Elevated Ramp from Left Carriageway of Link Road to Najafgarh from Dwarka Sector 21 MSJ to Golf Course Road between 6+910 to 7+455 of Link Road to Najafgarh
13	Depressed Link Road to Dwarka Sector 21 by Underpass between 5+651 to 5+851
14	Elevated left carriageway of Link Road from Dwarka Sector 23 going towards Kherki Daula between 5+840 to 7+185
15	Elevated right carriageway of Link Road from Dwarka Sector 23 going towards Kherki Daula between 5+855 to 6+905
16	Depressed Right turn beneath Dwarka Expressway from ECC Dwarka towards Kherki Daula by Underpass at 7+470 of Dwarka Expressway
17	Depressed U-turn beneath Dwarka Expressway from left Service road towards Sector 23ECC Dwarka by Underpass at 8+009 of Dwarka Expressway
18	Elevated Right Turn towards Najafgarh above Dwarka Expressway from left Service Road at 8+600 of Dwarka Expressway
19	Elevated Right Turn towards Shiv Murti above Dwarka Expressway from Elevated Cross-Road coming from Bijwasan at 8+600 of Dwarka Expressway
20	Depressed Left Carriageway of Najafgarh – Bijwasan Cross-road by Underpass at 8+600 of Dwarka Expressway
21	Elevated Right Carriageway of Najafgarh – Bijwasan Cross-road by Underpass at 8+600 of Dwarka Expressway
22	Pedestrian Subway at Km 6+200 of Link Road to Najafgarh
23	Pedestrian Subway at Km 6+400 of Link Road to Najafgarh
24	Pedestrian Subway at Km 6+200 to Link Road from Dwarka Sector 23 to Kherki Daula
25	Pedestrian Subway at Km 6+400 to Link Road from Dwarka Sector 23 to Kherki Daula
26	Pedestrian Subway at Km 6+950 of Link Road to Najafgarh

8. TRAFFIC CONTROL DEVICES AND ROAD SAFETY WORKS

8.1 Traffic control devices and road safety works shall be provided in accordance with IRC-SP-44-1996.

8.2 Specification of the reflective sheeting as per IRC: 67-2012.

9. ROADSIDE FURNITURE

9.1 Roadside furniture shall be provided in accordance with section 9 of IRC: SP: 87-2013 and as per Schedule D.

9.2 *Overhead traffic signs: location and size*

The Overhead traffic signs shall be provided as per numbers given below. The locations shall be finalized in consultation with Authority Engineer.

S. No.	Type	Nos	Remarks
1	**Cantilever**	**30**	**Location to be decided in consultation with the Authority Engineer**
2	**Full Gantry**	**20**	**Location to be decided in consultation with the Authority Engineer**

10. COMPULSORY AFFORESTATION

NIL

11. HAZARDUOS LOCATIONS

Concrete crash barrier shall be installed along both the edges of the flyover and the underpass approaches and structures.

Traffic impact attenuators shall be provided at all locations where traffic is diverging.

12. REINFORCED EARTH WALL

RE Wall shall be provided at the following locations:

Sl. No.	Road / Link	Design Chainage	Length (m)	Side	Average Height from Ground Level	Remarks
1	Dwarka Expressway	5+348 to 5+517	169	Both	4.0m (Varying from 1m to 8 m)	
		8+536 to 8+645	109	Both	3.0m (Varying from 1m to 6 m)	
2	Ramp / Link exiting from Left Carriageway of Dwarka Expressway to ECC Dwarka	6+515 to 6+678	163	Both	3.0m (Varying from 1m to 6 m)	

Sl. No.	Road / Link	Design Chainage	Length (m)	Side	Average Height from Ground Level	Remarks
3	Ramp from ECC Dwarka merging with Right Carriageway of Dwarka Expressway	7+550 to 7+651	101	Both	3.5m (Varying from 1m to 7 m)	
4	Link Road to Najafgarh *(Left Carriageway)*	5+990 to 6+135	145	Left	5.5 (Varying from 1m to 11 m)	
		7+933 to 8+180	247	Left	3.0m (Varying from 1m to 6 m)	
5	Link Road to Najafgarh *(Right Carriageway)*	5+355 to 5+523	168	Right	4.0m (Varying from 1m to 8 m)	
		7+932 to 8+143	211	Right	3.5m (Varying from 1m to 7 m)	
6	Ramp from Right Carriageway from Najafgarh towards Dwarka Sector 21 MSJ	5+760 to 5+860	100	Both	3.0m (Varying from 1m to 6 m)	
7	Ramp from Dwarka Sector 23 towards RUB/Shiv Murty	5+360 to 5+491	131	Both	3.0m (Varying from 1m to 6 m)	
		5+840 to 5+960	120	Both	4.0m (Varying from 1m to 8 m)	
8	Ramp from Left Carriageway from Dwarka Sector 21 MSJ to ECC Dwarka	6+683 to 6+763	80	Both	3.5m (Varying from 1m to 7 m)	
9	Ramp from ECC Dwarka merging with Right Carriageway towards Dwarka Sector 21 MSJ	7+210 to 7+320	110	Both	3.0m (Varying from 1m to 6 m)	
10	Ramp from ECC Bus Drop-off merging with the	7+465 to 7+545	80	Both	3.0m (Varying	

Sl. No.	Road / Link	Design Chainage	Length (m)	Side	Average Height from Ground Level	Remarks
	Ramp from ECC Dwarka merging with Right Carriageway towards Dwarka Sector 21 MSJ				from 1m to 6 m)	
11	Ramp from ECC Bus Drop-off going towards Sector 24	7+500 to 7+620	120	Both	3.5m (Varying from 1m to 7 m)	
12	Ramp from Left Carriageway of Link Road to Najafgarh from Dwarka Sector 21 MSJ to Golf Course Road	7+455 to 7+550	95	Both	3.0m (Varying from 1m to 6 m)	
13	Link Road from Dwarka Sector 23 going towards Kherki Daula (*Left Carriageway)*	5+718 to 5+840	122	Left	3.5m (Varying from 1m to 6 m)	
14	Link Road from Dwarka Sector 23 going towards Kherki Daula (*Right Carriageway)*	5+725 to 5+855	130	Right	4.0m (Varying from 1m to 8 m)	
15	Right Turn towards Najafgarh above Dwarka Expressway from left Service Road	8+235 to 8+385 *(Chainage is w.r.t. Dwarka Expressway)*	150	Both	3.0m (Varying from 1m to 6 m)	
16	Right Turn towards Shiv Murti from Elevated Cross-Road coming from Bijwasan	8+235 to 8+385 *(Chainage is w.r.t. Dwarka Expressway)*	150	Both	3.0m (Varying from 1m to 6 m)	
17	Najafgarh – Bijwasan Cross Road (Right Carriageway)	Crossing Dwarka Expressway at 8+600	2 x 150	Both	3.0m (Varying from 1m to 6 m)	

13. RETAINING WALL

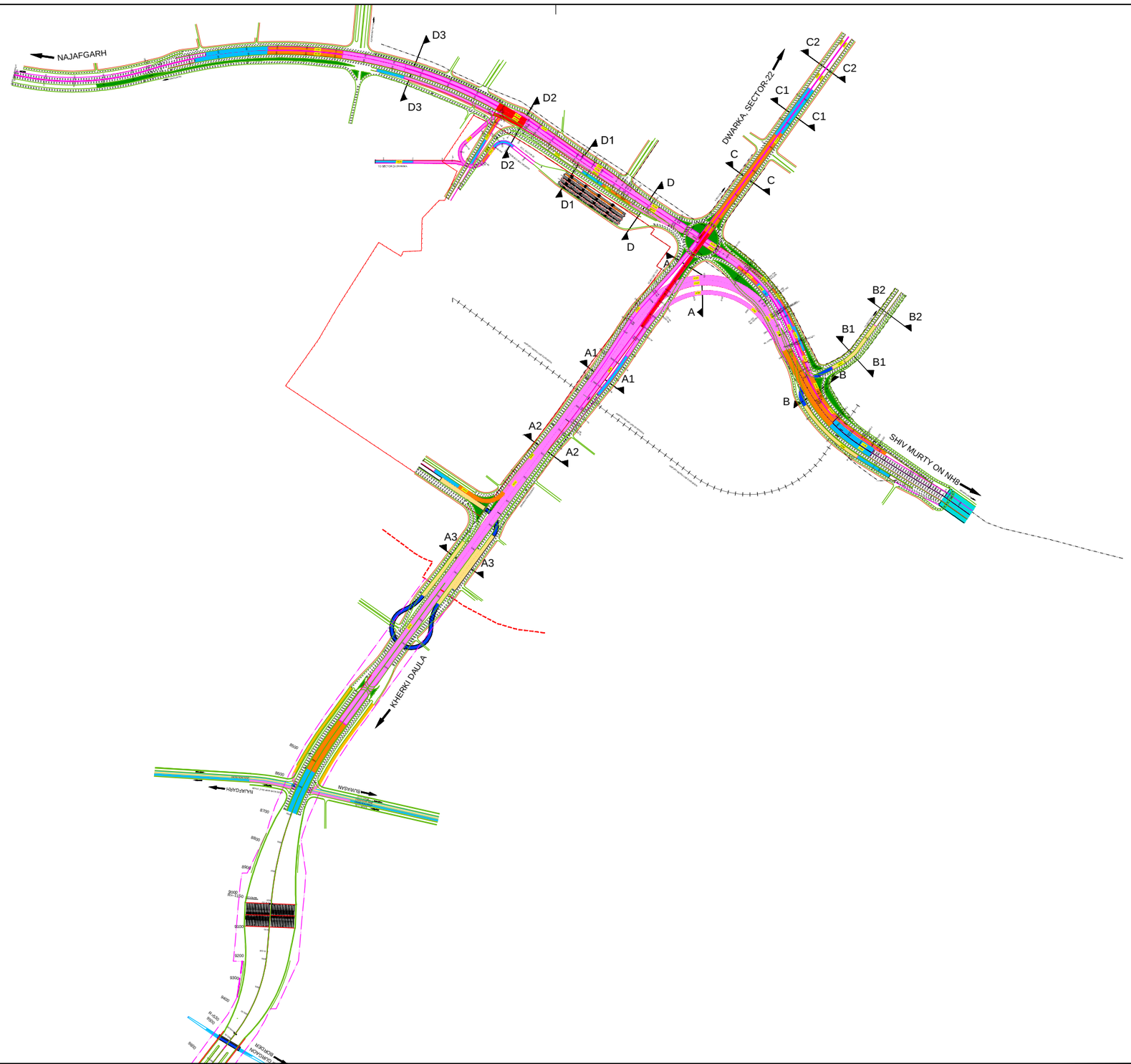
Sl. No.	Road / Link	Design Chainage	Length (m)	Side	Average Height from Ground Level	Remarks
1	Link Road to Dwarka Sector 21	5+397 to 5+651	254	Both	4.5m (Varying from 1m to 9 m)	
		5+851 to 6+051	200	Both	5.0m (Varying from 1m to 10 m)	
	Right turn beneath Dwarka Expressway from ECC Dwarka towards Kherki Daula	Crossing Dwarka Expressway at 7+470	2 x 200m	Both	4.0m (Varying from 1m to 8 m)	On both side approaches
	U-turn beneath Dwarka Expressway from left Service road towards ECC Dwarka	Crossing Dwarka Expressway at 8+009	2 x 200m	Both	4.0m (Varying from 1m to 8 m)	On both side approaches
	Najafgarh – Bijwasan Cross Road (Left Carriageway)	Crossing Dwarka Expressway at 8+600	2 x 200m	Both	4.0m (Varying from 1m to 8 m)	On both side approaches

14. RAINWATER HARVESTING

Rain water harvesting system for ground water recharge shall be provided at every 500m interval on either side of the project highway, in the landscaping areas and open areas beneath the viaducts. Suitable rain water harvesting structure shall also be provided in the Underpasses to take care of drainage & prevent flooding. Grading of the landscape and open areas shall be done to facilitate ground water recharge through the rain water harvesting system with due approval of the Authority Engineer. Rain water harvesting shall be done as per IRC: SP: 50 – 2013.

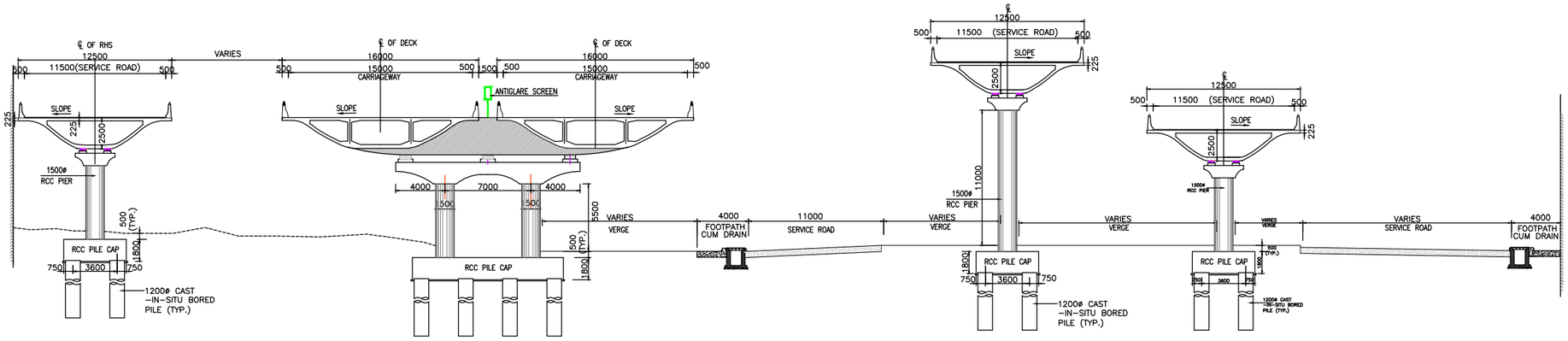
15. CHANGE OF SCOPE

Chainage of Road specified in the Schedule is tentative and approximate. The length of structures and bridges specified hereinabove shall be treated as an approximate assessment. The actual length of Approaches to structure, length of ramp, slip road, service road, RE Wall, Retaining wall and length of drains as required on the basis of detailed investigations shall be determined by the Contractor in accordance with the Specifications and Standards. Any variations in the lengths specified in this Schedule B shall not constitute a Change of Scope, save and except any variations in the length arising out of a Change of Scope expressly undertaken in accordance with the provisions of Article 13.

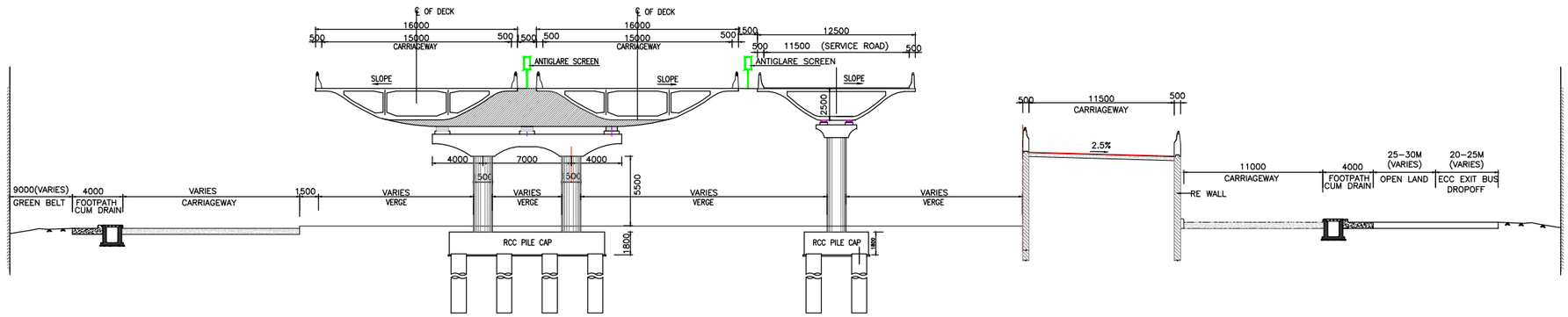


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				DRAFT FEASIBILITY REPORT (PACKAGE-2)					DATE:- AUGUST, 2017 / PAPER :- A2
			NTS	PURPOSE :- NOT FOR CONSTRUCTION	NATIONAL HIGHWAYS AUTHORITY OF INDIA (NHAI)	AECOM India Private Limited	CONSULTANCY SERVICES FOR PREPARATION OF FEASIBILITY REPORT OF ACCESS CONTROLLED DELHI-JAIPUR EXPRESSWAY (GREENFIELD): ADDITIONAL WORKS	TYPICAL CROSS SECTION	DRAWN (A): UR / DESIGN (B): DD / CHECKED (C): MSR / APPROVED (D): MSR
REV	DATE	DESCRIPTION OF REVISION							

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SECTION AT A-A



SECTION AT A1-A1

Note-

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REV	DATE	DESCRIPTION OF REVISION

SCALE : - NTS

STATUS :- DRAFT FEASIBILITY REPORT (PACKAGE-2)

PURPOSE :- NOT FOR CONSTRUCTION

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PROJECT:- CONSULTANCY SERVICES FOR PREPARATION OF FEASIBILITY REPORT OF ACCESS CONTROLLED DELHI-JAIPUR EXPRESSWAY (GREENFIELD): ADDITIONAL WORKS

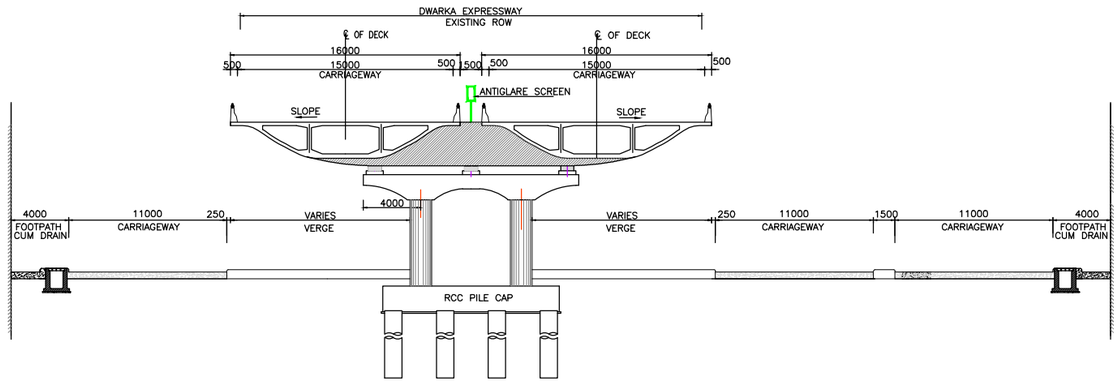
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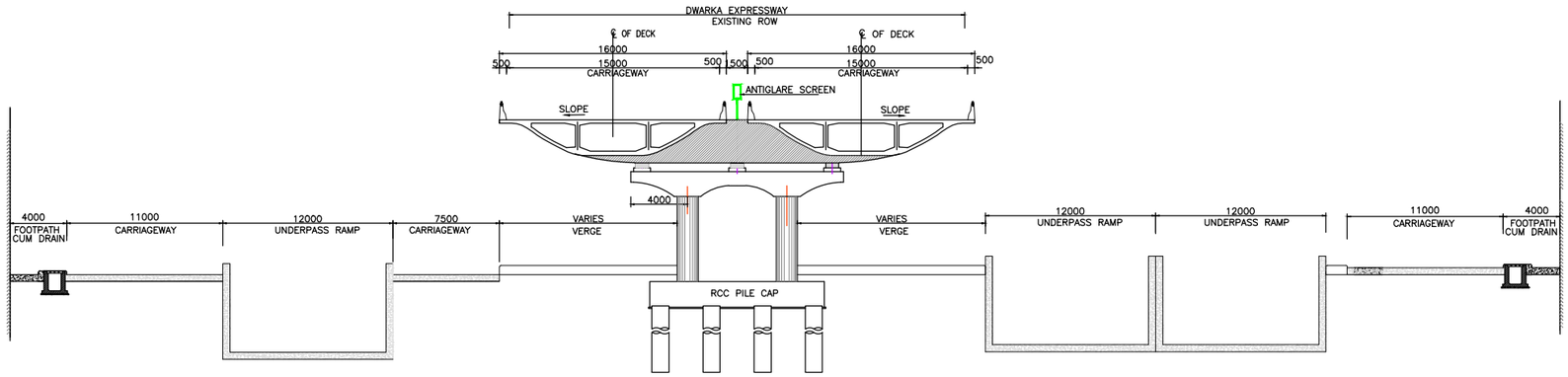
DATE:- AUGUST, 2017

PAPER :- A2

DRAWN (A)	DESIGN (B)	CHECKED (C)	APPROVED (D)
UR	DD	MSR	MSR



SECTION AT A2-A2



SECTION AT A3-A3

Note-

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REV	DATE	DESCRIPTION OF REVISION

SCALE : -
NTS

STATUS :-
DRAFT FEASIBILITY REPORT (PACKAGE-2)

PURPOSE :-
NOT FOR CONSTRUCTION

CLIENT:-
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PROJECT:-
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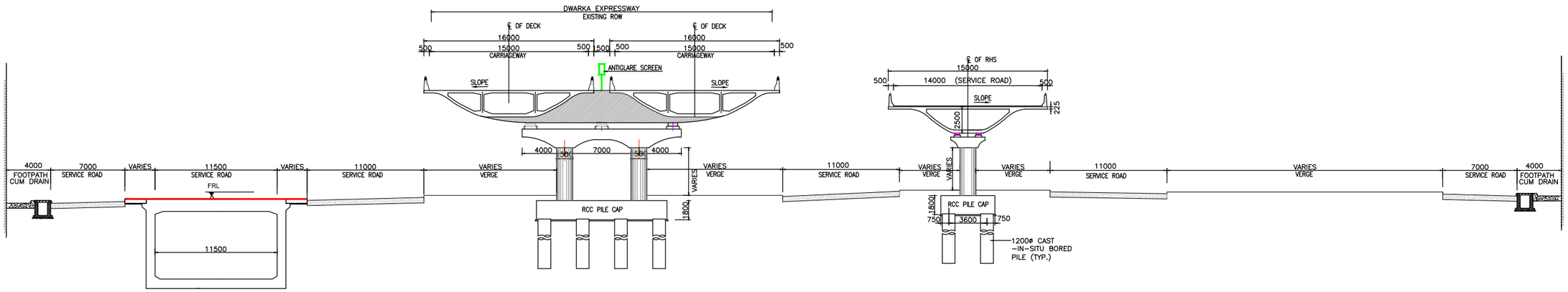
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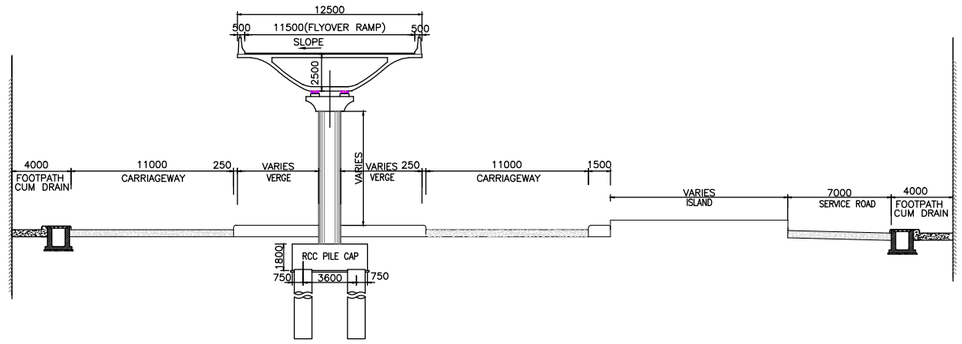
DATE:- AUGUST, 2017

PAPER :- A2

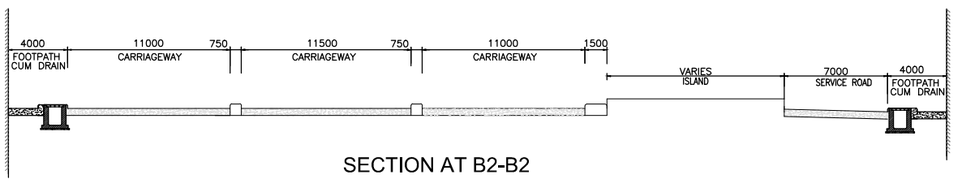
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UR	DD	MSR	MSR



SECTION AT B-B



SECTION AT B1-B1



SECTION AT B2-B2

Note-

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REV	DATE	DESCRIPTION OF REVISION

SCALE : - NTS

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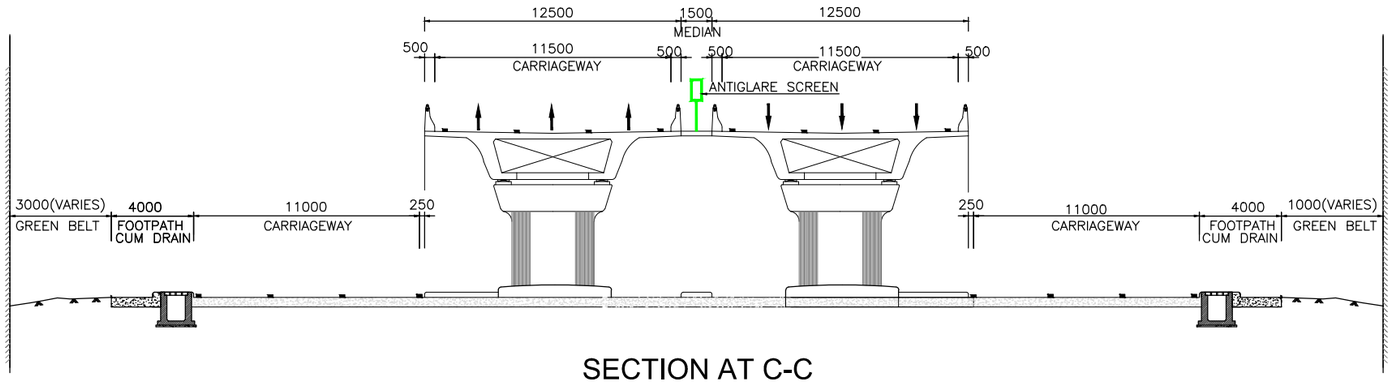
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TITLE: TYPICAL CROSS SECTION

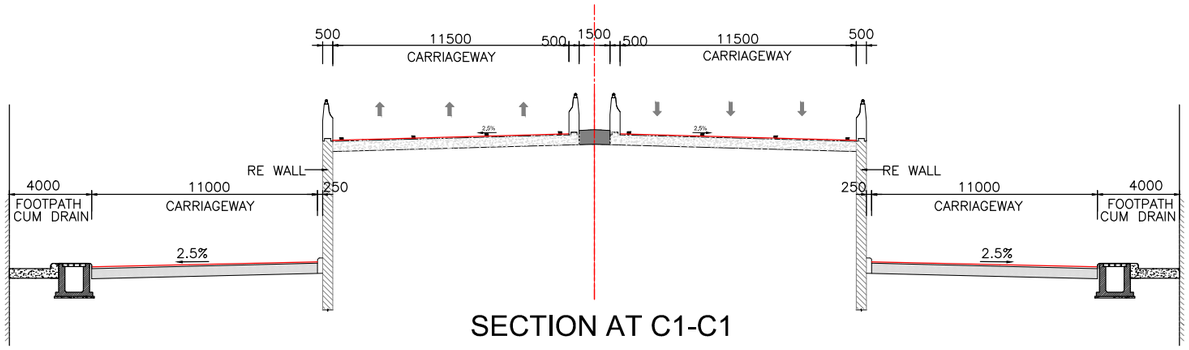
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DATE:- AUGUST, 2017 PAPER :- A2

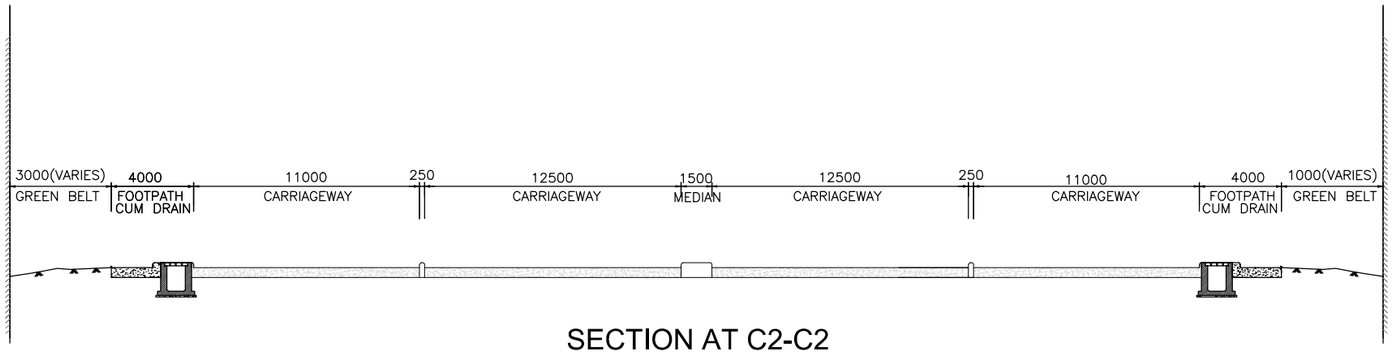
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UR	DD	MSR	MSR



SECTION AT C-C



SECTION AT C1-C1



SECTION AT C2-C2

Note-
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REV	DATE	DESCRIPTION OF REVISION

SCALE : - NTS

STATUS :- DRAFT FEASIBILITY REPORT (PACKAGE-2)

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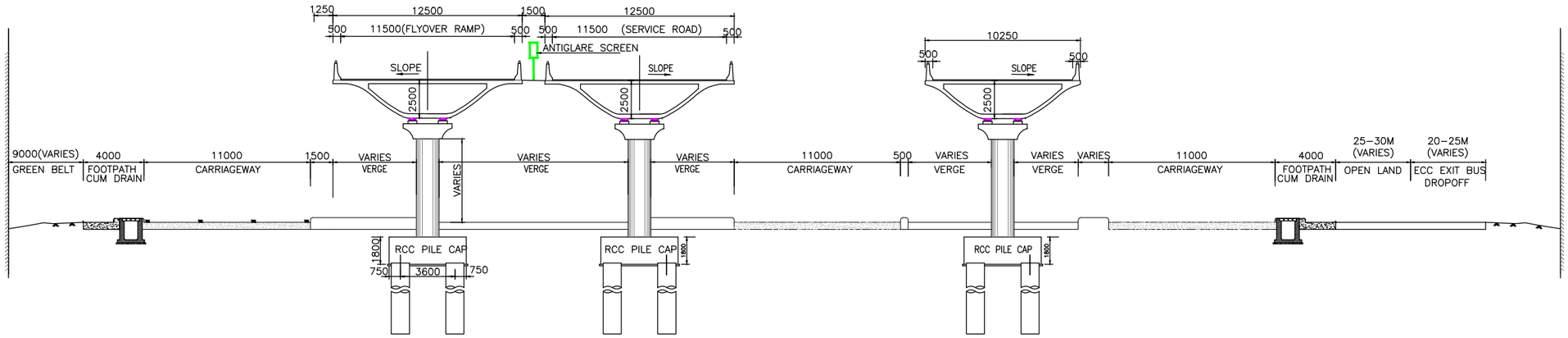
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TITLE: TYPICAL CROSS SECTION

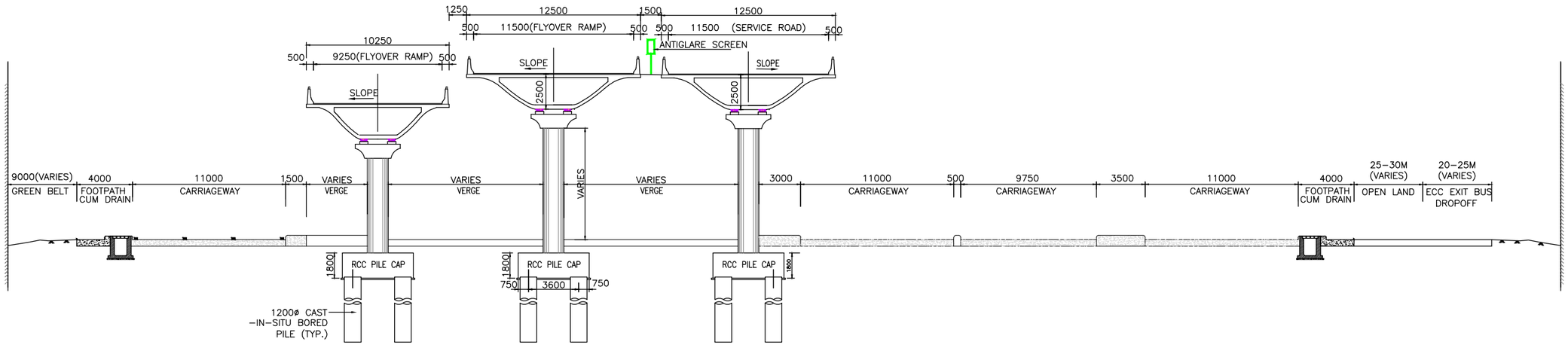
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DATE:- AUGUST, 2017 PAPER :- A2

DRAWN (A)	DESIGN (B)	CHECKED (C)	APPROVED (D)
UR	DD	MSR	MSR



SECTION AT D-D



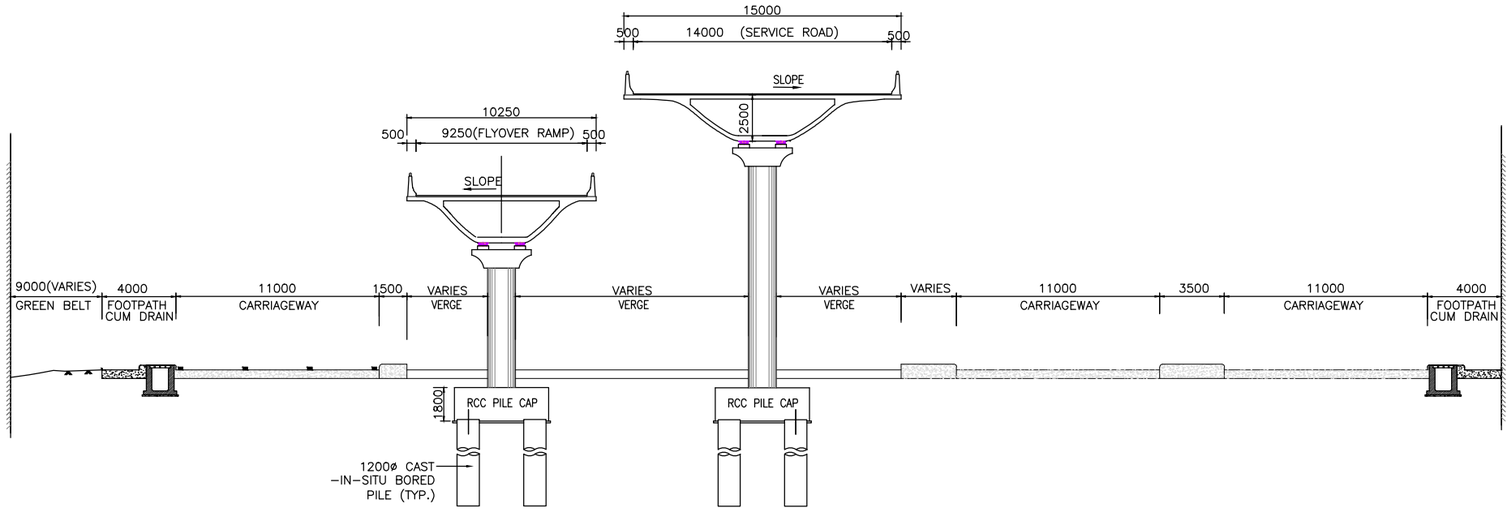
SECTION AT D1-D1

Note-

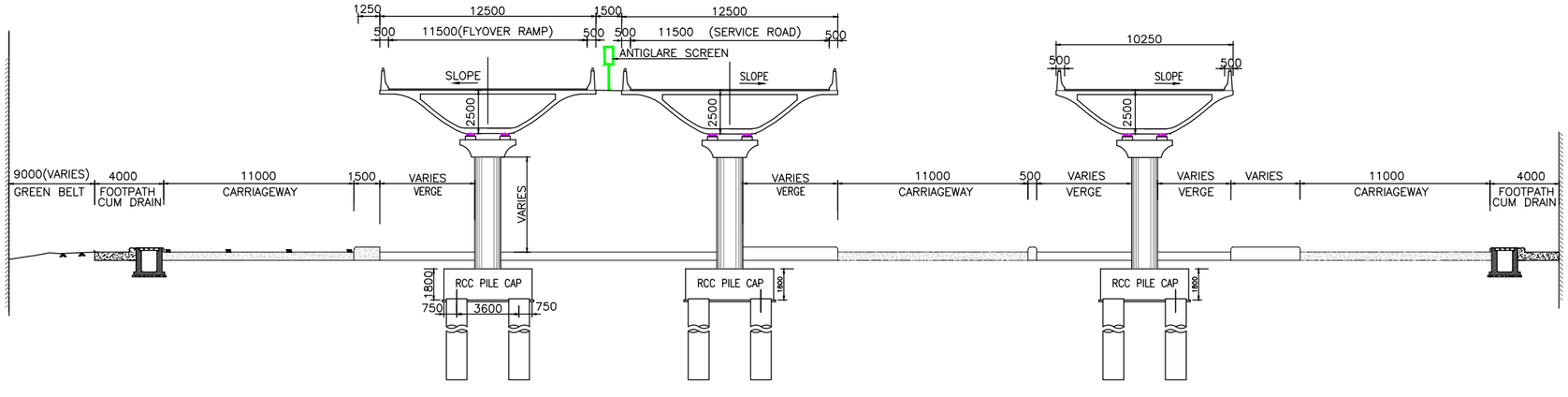
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				PURPOSE :- NOT FOR CONSTRUCTION					DRAWN (A) UR	DESIGN (B) DD	CHECKED (C) MSR	APPROVED (D) MSR

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SECTION AT D2-D2



SECTION AT D3-D3

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REV	DATE	DESCRIPTION OF REVISION

SCALE : - NTS

STATUS :- DRAFT FEASIBILITY REPORT (PACKAGE-2)

PURPOSE :- NOT FOR CONSTRUCTION

CLIENT:- NATIONAL HIGHWAYS AUTHORITY OF INDIA (NHAI)

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PROJECT:- CONSULTANCY SERVICES FOR PREPARATION OF FEASIBILITY REPORT OF ACCESS CONTROLLED DELHI-JAIPUR EXPRESSWAY (GREENFIELD): ADDITIONAL WORKS

TITLE: TYPICAL CROSS SECTION

DWG NO.:- AECOM-DELD13020-FD-DWG-CR-TCS-0307-R0

DATE:- AUGUST, 2017

PAPER :- A2

DRAWN (A)	DESIGN (B)	CHECKED (C)	APPROVED (D)
UR	DD	MSR	MSR

SCHEDULE -C

(See Clause 2.1)

PROJECT FACILITIES

1. PROJECT FACILITIES

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

(a) Toll plaza(s)

(b) Traffic Control devices/road safety/roadside furniture;

(c) Pedestrian facilities;

(d) Bus Bays and Bus Shelter

(e) Landscaping and Tree Plantation

(f) Others to be specified

2. DESCRIPTION OF PROJECT FACILITIES

Each of the Project Facilities is described below showing:

(a) **Toll Plaza**

As stipulated in Manual of Specifications and Standards for Six laning of Highways through Public Private Partnership (IRC: SP: 87), Toll Plaza shall be provided at locations given below:

Location of Toll Plaza

Sl. No.	Design Chainage (Km)	Section	No. of Lanes
1	9+045	From km 0+000 to 9+500	17 lanes on each side, including one lane for over-sized vehicles

(b) Roadside Furniture

The roadside furniture shall include the provision of;

i. Traffic Signs:

Traffic signs include roadside signs, overhead signs, minimum 20 numbers of Variable Message Signs (VMS) and Kerb mounted signs along the length of the Project Highway.

The Overhead traffic signs shall be provided as per numbers given below. The locations shall be finalized in consultation with Authority Engineer.

Sl. No.	Type	Nos	Remarks
1	**Cantilever**	**30**	**Location to be decided in consultation with the Authority Engineer**

2	**Full Gantry**	**20**	**Location to be decided in consultation with the Authority Engineer**

ii. Pavement Markings:

Pavement markings shall cover road marking for the entire Project Length.

iii. LED Traffic Blinkers: for the entire Project Length.

iv. Crash barrier

Provide W-beam crash barrier as per the drawing attached. New jersey type crash barrier shall be installed along both side of the structures including the both side of their both approaches.

v. Delineators

Delineators for the entire Project Length at the locations as suggested in Manual.

vi. Boundary stones: for the entire Project Highway.

vii. Hectometer / Kilometer stones: for the entire Project Highway.

(c) Pedestrian Facilities

The pedestrian facilities shall include the provision of 4.0m wide both sides footpath- along the entire corridor of Dwarka Expressway.

2.0m wide footpath-cum-drain is also provided along both sides of Link road to Najafgarh, 3.0 m wide footpath cum drain on Link road to Dwarka Sector 23 and 2.0m wide footpath-cum-drain on Dwarka Sector 21 for the length covered under the scope of this work.

Besides, pedestrian subways are provided at locations as tabulated in Clause 2.12 of Schedule B.

Pedestrian guardrail: Provide pedestrian guardrail at each bus stop location.

(d) Bus Bays and Bus Shelter

Bus bays with Bus shelter shall be provided at following locations:

S. No	Chainage (km)	Length* (m)	Left Hand Side/ Right Hand Side	Remarks
Dwarka Expressway Section between (5+300 to 9+500)				
1	5+300	30	Both Sides	Bus Bay with Shelter
2	6+100	30	Both Sides	Bus Bay with Shelter
3	6+900	30	LHS	Bus Bay with Shelter
4	8+500	30	Both Sides	Bus Bay with Shelter
Link Road to Najafgarh (6+300 to 8+200)				
1	6+900	30	RHS	Bus Bay with Shelter

* Length is excluding the necessary tapering. All tapering for entry and exit is included in the scope of work.

(e) Landscaping and Tree Plantation

- Landscaping & Tree Plantation shall include the provision of the landscaping on the central median / verge and as shown in the typical cross-section.
- Plantation in median/Island/open land shall be done with permitted species in consultation with Authority Engineer. The system for watering of Plantation area shall be through pipe water supply. Any pumping arrangement shall be at Ground level to ensure safety of traffic. Watering by tanker shall not be resorted to.

(f) Others

I. Highway Lighting

Lighting shall be provided at the following locations:

(i) Lighting shall be provided with a minimum illumination level of 40 lux for entire length of the project corridor, Grade Separator, Ramp, Underpass, subways and all at-grade roads including service roads being improved under the project as per Schedule D, IRC:SP:90-2010 and relevant IRC codes using solar power with full alternative power backup. For at grade pedestrian crossing locations a minimum illumination level of 50 lux to be provided and for walkways a minimum illumination level of 20 lux to be provided.

(ii) Lighting is also to be provided beneath the elevated corridor to illuminate the service road as per Schedule D. Power back generator shall be placed at Ground only. Cost of basic information for lighting and maintenance shall be borne by the Contractor. However, operation cost only to the extent of Electrical bill & fuel (Diesel only) for standby Generator shall be reimbursed by Authority.

(iii) Illumination of elevated Structures

Elevation of all the structures to be illuminated from aesthetics point of view, with adequate lighting so that the elevation may be visible during night. Design of same shall be approved by Authority Engineer.

(iv) High Mast Lighting shall be provided as per Schedule D.

II. Drainage for Underpass

Drainage for each underpass consisting of sumps and pumps for underpass shall be provided to prevent flooding. At least three pumps, including one stand-by pump, of adequate capacity shall be provided which shall be in good running condition.

III. PVC sheet covering for ramps for Underpass

Polycarbonate roof sheeting shall be provided for entire length of the ramps of Underpass to entry of water in the event of rain. The sheeting shall allow sufficient lighting.

IV. Overhead Driver Feedback System

Overhead digital speed monitoring device along with closed circuit automatic number plate recognition (ANPR) camera is to be installed at every 1km interval of Dwarka Expressway, Link Road to Najafgarh, Link Road to Dwarka Sector 23 and Link Road to Dwarka Sector 21 including the service road stretch.

V. Noise Barriers

Noise barriers to be installed both sides of elevated portion of Main Carriageway and also along the both sides of elevated portion service roads.

VI. Utility Ducts

Utility Ducts of adequate size and capacity to be provided on both sides of the project corridor for the purpose of ITS and ITMS.

VII. Coordination with Delhi Metro Rail Corporation (DMRC)

DMRC is planning to extend the Airport Metro Line from Sector 21 till Sector 25 in proposed ECC and the line will pass through Sector 26. The Airport Metro Line will cross Dwarka Expressway at 2 locations. First near Chainage Km 5+500 and second near Chainage Km 6+700. The metro line will also cross below the right turn underpass approach on the link road to Sector 21. The Metro line alignment is also below the existing Airport Drain. The Airport drain is proposed to be realigned as described in Schedule B. However, the metro extension does not warrant the drain realignment. Therefore, for construction of all the components of the project necessary coordination between DMRC, DIAL and NHAI is included in the scope of work.

VIII. Traffic Management During Construction

Traffic management during construction shall be given utmost importance. All necessary traffic diversions are included in the scope of work. Contractor shall also deploy at least 30nos. of personnel for every 8hours shift, i.e. atleast 90 persons per day, who will be responsible to manage the traffic during construction period including any extension in the period thereof. All the persons responsible for traffic management shall be "Home Guard" or equivalent and shall have experience in traffic management for atleast 2nos. of road projects in metropolitan areas. No extra payment against shall be made against the deployment of the personnel during any extension period. In case the deployment is less than the specified and the authority finds any lapse in traffic management leading to undesirable heavy traffic congestion or deadlock, Contractor shall take immediate measure to resolve the same at the full satisfaction of the Authority. Non-compliance of the same shall lead to penalty at the rate of ₹ 50,000 (Rupees fifty thousand only) per day.

SCHEDULE -D

(See Clause 2.1)

SPECIFICATIONS AND STANDARDS

1. Construction

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

2. Design Standards

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

Manual of specifications & standards for Six Laning of Highway through Public Private Partnership (IRC SP:87- 2013)

Geometric Design standards for Urban Road in Plains (IRC : 86-1983)

Guidelines for the Design of Interchanges in Urban area (IRC 092-1985)

Guidelines for Urban Drainage (IRC:SP: 50-2013)

Annex -I
(Schedule-D)

Specifications and Standards for Construction

1. Specifications and Standards

All Materials, works and construction operations shall conform to the Manual of Specifications and Standards for Six Laning of Highway through Public Private Partnership (IRC SP:87- 2013), Geometric Design Standards For Urban Roads in Plains (IRC:86-1983), Guidelines for the Design of Interchanges in Urban area (IRC: 92-1985) and latest MORTH Specifications for Road and Bridge Works. Where the specification for a work is not given, Good Industry Practice shall be adopted to the satisfaction of the Authority's Engineer.

2. Deviations from the Specifications and Standards

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

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

Sl. No.	Item	Description of Deviation	Clause reference
1	Vertical Clearance	Lateral and Vertical clearance of Underpass shall be as per Clause 2.6 of Schedule B.	2.10 and 2.11
2	Service Road	Configuration of service road shall be as per Clause 2.8 of Schedule B	2.12.1
3	Typical Cross-sections	Typical cross-section shall be as given in Annex-III of Schedule A.	2.17
4	Shoulders	Shoulder is not provided in main carriageway due to RoW constraints.	2.6
5	Width of new Structures	Width of bridge shall be as given in Schedule B and as per enclosed TCS of bridge	7.1
6	Right of Way	Proposed Right of Way shall be as per Schedule A	2.3
7	Vertical Grade	As per Profile as given in Annex – III of Schedule A.	3.3.2

SCHEDULE - H

(See Clauses10.1.4 and 19.3)

Contract Price Weightages

1.1 The Contract Price for this Agreement is Rs. (…..Crores)

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

Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
1	**2**	**3**	**4**
Road works including culverts, widening and repair of culverts	6.08%	**A- Widening and strengthening of existing road**	
		(1) Earthwork up to top of the sub-grade	0.00%
		(2) Sub base Course	0.00%
		(3) Non Bituminous base Course	
		(4) Bituminous base Course	0.00%
		(5) Wearing Coat	0.00%
		(6) Widening and repair of culverts	0.00%
		B.1- New/Approach to Structures (Flexible Pavement)	
		(1) Earthwork up to top of the sub-grade	5.93%
		(2) Sub base Course	4.98%
		(3) Non Bituminous base Course	6.68%
		(4) Bituminous base Course	7.25%
		(5) Wearing Coat	3.72%
		B.2- New/Approach to Structures (Rigid Pavement)	
		(1) Earthwork up to top of the sub-grade	0.27%
		(2) Sub base Course	0.39%
		(3) Dry Lean Concrete	0.66%

		(4) Pavement Quality Concrete	1.95%
		C.1- Reconstruction/New Service road(Flexible Pavement)	
		(1) Earthwork up to top of the sub-grade	3.90%
		(2) Sub base Course	12.79%
		(3) Non Bituminous base Course	17.52%
		(4) Bituminous base Course	13.73%
		(5) Wearing Coat	8.11%
		C.2- Reconstruction/New Service road(Rigid Pavement)	
		(1) Earthwork up to top of the sub-grade	0.55%
		(2) Sub base Course	1.13%
		(3) Dry Lean Concrete	1.36%
		(4) Pavement Quality Concrete	4.38%
		D-Re Construction and New Culverts on exiting road, realignment, bypasses	
		Culverts	4.70%
Minor Bridges/Underpasses/Overpasses	9.31%	**Minor bridges**	3.67%
		Underpass Right Turn beneath Dwarka Expressway from ECC Dwarka towards Kherki Dhaula	
		(1) Foundation +Sub structure	5.76%
		(2) Superstructure	2.01%
		(3) Approaches	6.47%
		Underpass Link Road to Dwarka Sector 21 5+651 to 5+851	
		(1) Foundation +Sub structure	9.95%
		(2) Superstructure	3.41%
		(3) Approaches	8.89%

		Underpass U-turn beneath Dwarka Expressway from left Service road towards Sector 23ECC Dwarka	
		(1) Foundation +Sub structure	24.35%
		(2) Superstructure	7.98%
		(3) Approaches	6.47%
		Underpass Najafgarh – Bijwasan Cross Road (Left Carriageway)	
		(1) Foundation +Sub structure	5.41%
		(2) Superstructure	1.83%
		(3) Approaches	6.47%
		Subway	7.32%
Elevated Structure Dwarka Expressway 5+460 to 6+480	13.03%	(1) Foundation	12.50%
		(2) Sub structure	3.79%
		(3) Super Structure including bearing	79.91%
		(4) Wearing Course including Expansion joint	1.79%
		(5) Miscellaneous items like hand rails, Crash Barrier, road marking etc.	1.15%
		(6) Approaches including (Reinforced Earth wall/Retaining wall)	0.86%
Elevated Structure Dwarka Expressway 6+680 to 8+560	23.71%	(1) Foundation	11.05%
		(2) Sub structure	3.87%
		(3) Super Structure including bearing	81.94%
		(4) Wearing Course including Expansion joint	1.73%
		(5) Miscellaneous items like hand rails, Crash Barrier, road marking etc.	1.15%
		(6) Approaches including (Reinforced Earth wall/Retaining wall)	0.26%
Elevated Structure Ramp/Link exiting from Left Carriageway of Dwarka	2.55%	(1) Foundation	26.42%
		(2) Sub structure	2.75%

Expressway to ECC Dwarka 5+745 to 6+575		(3) Super Structure including bearing	62.39%
		(4) Wearing Course including Expansion joint	2.77%
		(5) Miscellaneous items like hand rails, Crash Barrier, road marking etc.	2.21%
		(6) Approaches including (Reinforced Earth wall/Retaining wall)	3.46%
Ramp from ECC Dwarka merging with Right Carriageway of Dwarka Expressway 7+300 to 7+570	0.84%	(1) Foundation	22.22%
		(2) Sub structure	3.39%
		(3) Super Structure including bearing	63.13%
		(4) Wearing Course including Expansion joint	2.15%
		(5) Miscellaneous items like hand rails, Crash Barrier, road marking etc.	1.85%
		(6) Approaches including (Reinforced Earth wall/Retaining wall)	7.26%
Link Road to Najafgarh (Left Carriageway) 6+050 to 8+010; (Right Carriageway) 5+480 to 8+010	16.49%	(1) Foundation	10.14%
		(2) Sub structure	3.63%
		(3) Super Structure including bearing	80.19%
		(4) Wearing Course including Expansion joint	2.22%
		(5) Miscellaneous items like hand rails, Crash Barrier, road marking etc.	1.99%
		(6) Approaches including (Reinforced Earth wall/Retaining wall)	1.83%
Ramp from Right Carriageway from Najafgarh towards Dwarka Sector 21 MSJ 5+860 to 6+100	0.70%	(1) Foundation	23.13%
		(2) Sub structure	2.92%
		(3) Super Structure including bearing	61.82%
		(4) Wearing Course including Expansion joint	1.95%
		(5) Miscellaneous items like hand rails, Crash Barrier, road marking etc..	2.51%

		(6) Approaches including (Reinforced Earth wall/Retaining wall)	7.67%
Ramp from Dwarka Sector 23 towards RUB/ShivMurty 5+491 to 5+885	0.86%	(1) Foundation	21.60%
		(2) Sub structure	3.04%
		(3) Super Structure including bearing	53.96%
		(4) Wearing Course including Expansion joint	1.76%
		(5) Miscellaneous items like hand rails, Crash Barrier, road marking etc.	2.14%
		(6) Approaches including (Reinforced Earth wall/Retaining wall)	17.50%
Ramp from Left Carriageway from Dwarka Sector 21 MSJ to ECC Dwarka 6+430 to 6+710	0.87%	(1) Foundation	21.49%
		(2) Sub structure	3.16%
		(3) Super Structure including bearing	65.13%
		(4) Wearing Course including Expansion joint	2.28%
		(5) Miscellaneous items like hand rails, Crash Barrier, road marking etc.	2.38%
		(6) Approaches including (Reinforced Earth wall/Retaining wall)	5.56%
Ramp from ECC Dwarka merging with Right Carriageway towards Dwarka Sector 21 MSJ 6+700 to 7+230	1.67%	(1) Foundation	22.24%
		(2) Sub structure	3.65%
		(3) Super Structure including bearing	66.03%
		(4) Wearing Course including Expansion joint	2.21%
		(5) Miscellaneous items like hand rails, Crash Barrier, road marking etc.	2.32%
		(6) Approaches including (Reinforced Earth wall/Retaining wall)	3.55%
Ramp from ECC Bus Drop off merging with Ramp from ECC Dwarka merging with Right Carriageway towards Dwarka Sector 21 MSJ	1.41%	(1) Foundation	24.65%
		(2) Sub structure	4.03%
		(3) Super Structure including bearing	64.09%

7+110 to 7+520		(4) Wearing Course including Expansion joint	2.05%
		(5) Miscellaneous items like hand rails, Crash Barrier, road marking etc.	2.12%
		(6) Approaches including (Reinforced Earth wall/Retaining wall)	3.06%
Ramp from ECC Bus Drop off going towards Sector 24 7+340 to 7+520	0.69%	(1) Foundation	23.92%
		(2) Sub structure	3.49%
		(3) Super Structure including bearing	58.03%
		(4) Wearing Course including Expansion joint	1.99%
		(5) Miscellaneous items like hand rails, Crash Barrier, road marking etc.	1.96%
		(6) Approaches including (Reinforced Earth wall/Retaining wall)	10.61%
Ramp from Left Carriageway of Link Road to Najafgarh from Dwarka Sector 21 MSJ to Golf Course Road 6+910 to 7+455	1.36%	(1) Foundation	23.99%
		(2) Sub structure	5.66%
		(3) Super Structure including bearing	65.80%
		(4) Wearing Course including Expansion joint	2.23%
		(5) Miscellaneous items like hand rails, Crash Barrier, road marking etc.	2.32%
		(6) Approaches including (Reinforced Earth wall/Retaining wall)	0.00%
Link Road from Dwarka Sector 23 going towards Kherki Dhaula Left Carriageway 5+800 to 7+186	5.37%	(1) Foundation	18.46%
		(2) Sub structure	5.02%
		(3) Super Structure including bearing	71.78%
		(4) Wearing Course including Expansion joint	2.11%
		(5) Miscellaneous items like hand rails, Crash Barrier, road marking etc.	1.88%

		(6) Approaches including (Reinforced Earth wall/Retaining wall)	0.75%
Link Road from Dwarka Sector 25 going towards Kherki Dhaula Right Carriageway 5+800 to 6+660	2.69%	(1) Foundation	21.55%
		(2) Sub structure	4.61%
		(3) Super Structure including bearing	67.36%
		(4) Wearing Course including Expansion joint	2.66%
		(5) Miscellaneous items like hand rails, Crash Barrier, road marking etc.	2.33%
		(6) Approaches including (Reinforced Earth wall/Retaining wall)	1.49%
Right Turn towards Najafgarh above Dwarka Expressway from Left service Road Crossing Dwarka Expressway at 8+600	0.55%	(1) Foundation	31.00%
		(2) Sub structure	5.00%
		(3) Super Structure including bearing	60.00%
		(4) Wearing Course including Expansion joint	2.00%
		(5) Miscellaneous items like hand rails, Crash Barrier, road marking etc.	2.00%
		(6) Approaches including (Reinforced Earth wall/Retaining wall)	0.00%
Right Turn towards ShivMurthy from Elevated Cross Road coming from Bijwasan Crossing Dwarka Expressway at 8+600	0.55%	(1) Foundation	31.00%
		(2) Sub structure	5.00%
		(3) Super Structure including bearing	60.00%
		(4) Wearing Course including Expansion joint	2.00%
		(5) Miscellaneous items like hand rails, Crash Barrier, road marking etc.	2.00%
		(6) Approaches including (Reinforced Earth wall/Retaining wall)	0.00%
Najafgarh Bijwasan Cross Road (Right Carriageway) Crossing Dwarka Expressway at	0.36%	(1) Foundation	31.00%
		(2) Sub structure	5.00%
		(3) Super Structure including bearing	60.00%

8+600		(4) Wearing Course including Expansion joint	2.00%
		(5) Miscellaneous items like hand rails, Crash Barrier, road marking etc.	2.00%
		(6) Approaches including (Reinforced Earth wall/Retaining wall)	0.00%
Loop ramp from Right carriageway of Link Road from Sector 23 to Right Carriageway of Link Road to Najafgarh	1.11%	(1) Foundation	43.02%
		(2) Sub structure	11.18%
		(3) Super Structure including bearing	41.13%
		(4) Wearing Course including Expansion joint	2.30%
		(5) Miscellaneous items like hand rails, Crash Barrier, road marking etc.	2.37%
		(6) Approaches including (Reinforced Earth wall/Retaining wall)	0.00%
Other engineering works	9.80%	(i)Toll Plaza	40.11%
		(ii) Road side drains including dismantling of existing drain	28.69%
		(iii) Road signs, markings, km stones, safety devices, …	6.58%
		(iv) Project Facilities	
		(a) Bus bays	1.23%
		(b) Truck laybye	0.00%
		(c) Rest Area	0.00%
		(d) Others	0.00%
		(i) Pedestrian Guard Rail	0.15%
		(ii) Separator	8.50%
		(iii) PVC Sheet covering over underpass	4.20%
		(iv) Minor Junction	1.61%
		(v) Pumping Arrangement for Underpass	2.11%
		(vi) Electrical Works	3.54%
		(vii) Miscellaneous Works like rain water harvesting, submission of photo reports etc.	0.76%

		(v) Road Side Plantation/Landscaping	0.54%
		(vi) Repair of Protection works other than approaches to bridges	0.00%
		(vii) Safety and Traffic Management during construction	1.98%

1.3 Procedure of estimating the value of work done

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

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

Table 1.3.1

Stage for Payment	Percentage weightage	Payment Procedure
A- Widening and strengthening of existing road		
(1) Earthwork up to top of the sub-grade	0.00%	Unit of measurement in linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in a length of not less than 10 (ten) percent of the total length
(2) Sub base Course	0.00%	
(3) Non Bituminous base Course		
(4) Bituminous base Course	0.00%	
(5) Wearing Coat	0.00%	
(6) Widening and repair of culverts	0.00%	
B.1- New/Approach to Structures (Flexible Pavement)		

(1) Earthwork up to top of the sub-grade	5.93%	Unit of measurement in linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in a length of not less than 10 (ten) percent of the total length
(2) Sub base Course	4.98%	
(3) Non Bituminous base Course	6.68%	
(4) Bituminous base Course	7.25%	
(5) Wearing Coat	3.72%	
B.2- New/Approach to Structures (Rigid Pavement)		
(1) Earthwork up to top of the sub-grade	0.27%	Unit of measurement in linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in a length of not less than 10 (ten) percent of the total length
(2) Sub base Course	0.39%	
(3) Dry Lean Concrete	0.66%	
(4) Pavement Quality Concrete	1.95%	
C.1- Reconstruction/New Service road(Flexible Pavement)		
(1) Earthwork up to top of the sub-grade	3.90%	Unit of measurement in linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in a length of not less than 10 (ten) percent of the total length
(2) Sub base Course	12.79%	
(3) Non Bituminous base Course	17.52%	
(4) Bituminous base Course	13.73%	
(5) Wearing Coat	8.11%	
C.2- Reconstruction/New Service road(Rigid Pavement)		
(1) Earthwork up to top of the sub-grade	0.55%	Unit of measurement in linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in a length of not
(2) Sub base Course	1.13%	

(3) Dry Lean Concrete	1.36%	less than 10 (ten) percent of the total length
(4) Pavement Quality Concrete	4.38%	
D-Re Construction and New Culverts on exiting road, realignment, bypasses		
Culverts	4.70%	Cost of completed culverts shall be determined pro rate basis with respect to the total no. of culverts. The payment shall be made on completion of each culvert

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

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

Where P= Contract Price

L = Total length in km

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

1.3.2 Minor Bridges/Underpasses/Overpasses

Procedure for estimating the value of structure work shall be as stated in table 1.3.2:

Table 1.3.2

Stage for Payment	Percentage weightage	Payment Procedure
Minor bridges	3.67%	Cost of each Minor bridge shall be determined pro rate basis with respect to the total linear length of the minor bridges. Payment shall be made on completion of widening & repair works of a minor bridge.
Underpass **Right Turn beneath Dwarka Expressway from ECC Dwarka towards Kherki Dhaula**		
(1) Foundation +Sub structure	5.76%	Foundation+ Substructure:

		Cost of each Payment against foundation + sub structure shall be made on pro rata basis on completion of a stage i.e. not less than 25% of the scope of foundation + substructure.
(2) Superstructure	2.01%	Super structure: Payment shall be made on pro rata basis on completion of a stage i.e. stage i.e. not less than 25% of the scope of super structure.
(3) Approaches	6.47%	Approaches: Payment shall be made on pro rata basis on completion of a stage i.e. completion of approaches in all respect as specified.
Underpass **Link Road to Dwarka Sector 21** **5+651 to 5+851**		
(1) Foundation +Sub structure	9.95%	Foundation+ Substructure: Cost of each Payment against foundation + sub structure shall be made on pro rata basis on completion of a stage i.e. not less than 25% of the scope of foundation + substructure.
(2) Superstructure	3.41%	Super structure: Payment shall be made on pro rata basis on completion of a stage i.e. stage i.e. not less than 25% of the scope of super structure.
(3) Approaches	8.89%	Approaches: Payment shall be made on pro rata basis on completion of a stage i.e. completion of approaches in all respect as specified.
Underpass **U-turn beneath Dwarka Expressway from left Service road towards Sector 23ECC Dwarka**		
(1) Foundation +Sub structure	24.35%	Foundation+ Substructure: Cost of each Payment against foundation + sub structure shall be made on pro rata basis on completion

		of a stage i.e. not less than 25% of the scope of foundation + substructure.
(2) Superstructure	7.98%	Super structure: Payment shall be made on pro rata basis on completion of a stage i.e. stage i.e. not less than 25% of the scope of super structure.
(3) Approaches	6.47%	Approaches: Payment shall be made on pro rata basis on completion of a stage i.e. completion of approaches in all respect as specified.
Underpass Najafgarh – Bijwasan Cross Road (Left Carriageway)		
(1) Foundation +Sub structure	5.41%	Foundation+ Substructure: Cost of each Payment against foundation + sub structure shall be made on pro rata basis on completion of a stage i.e. not less than 25% of the scope of foundation + substructure.
(2) Superstructure	1.83%	Super structure: Payment shall be made on pro rata basis on completion of a stage i.e. stage i.e. not less than 25% of the scope of super structure.
(3) Approaches	6.47%	Approaches: Payment shall be made on pro rata basis on completion of a stage i.e. completion of approaches in all respect as specified.
Subway	7.32%	Cost of each Subway shall be determined pro rata basis with respect to the total linear length of the subway. Payment shall be made on completion of each subway.

1.3.3 Elevated Structure Dwarka Expressway 5+460 to 6+480

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

Table 1.3.3

Stage of payment	Weightage	Payment procedure
(1) Foundation	12.50%	(i) Foundation: Payment against foundation shall be made on pro-rata basis on completion of atleast two foundations of the structure. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(2) Sub structure	3.79%	(ii) Sub-Structure: Payment against Sub-structure shall be made on pro-rata basis on completion of atleast two sub-structures of abutments /piers upto abutment/pier cap level of the structure
(3) Super Structure including bearing	79.91%	(iii) Super-structure. Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structure including bearings of atleast one span in all respects as specified.
(4) Wearing Course including Expansion joint	1.79%	(iv) Wearing Coat: Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified
(5) Miscellaneous items like hand rails, Crash Barrier, road marking etc.	1.15%	(v) Miscellaneous: Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified
(6) Approaches including (Reinforced Earth wall/Retaining wall)	0.86%	(vi) Reinforced Earth/Retaining Wall: Payments shall be made on completion of all RE/Retaining walls complete in all respects as specified.

1.3.4 Elevated Structure Dwarka Expressway 6+680 to 8+560

Procedure for estimating the value of structure work shall be as stated in table 1.3.4:

Table 1.3.4

Stage of payment	Weightage	Payment procedure
(1) Foundation	11.05%	(i) Foundation: Payment against foundation shall be made on pro-rata basis on completion of atleast two foundations of the structure. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(2) Sub structure	3.87%	(ii) Sub-Structure: Payment against Sub-structure shall be made on pro-rata basis on completion of atleast two sub-structures of abutments /piers upto abutment/pier cap level of the structure
(3) Super Structure including bearing	81.94%	(iii) Super-structure. Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structure including bearings of atleast one span in all respects as specified.
(4) Wearing Course including Expansion joint	1.73%	(iv) Wearing Coat: Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified
(5) Miscellaneous items like hand rails, Crash Barrier, road marking etc.	1.15%	(v) Miscellaneous: Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified
(6) Approaches including (Reinforced Earth wall/Retaining wall)	0.26%	(vi) Reinforced Earth/Retaining Wall: Payments shall be made on completion of all RE/Retaining walls complete in all respects as

		specified.

1.3.5 Elevated Structure Ramp/Link exiting from Left Carriageway of Dwarka Expressway to ECC Dwarka 5+745 to 6+575

Procedure for estimating the value of structure work shall be as stated in table 1.3.5:

Table 1.3.5

Stage of payment	Weightage	Payment procedure
(1) Foundation	26.42%	(i) Foundation: Payment against foundation shall be made on pro-rata basis on completion of atleast two foundations of the structure. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(2) Sub structure	2.75%	(ii) Sub-Structure: Payment against Sub-structure shall be made on pro-rata basis on completion of atleast two sub-structures of abutments /piers upto abutment/pier cap level of the structure
(3) Super Structure including bearing	62.39%	(iii) Super-structure. Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structure including bearings of atleast one span in all respects as specified.
(4) Wearing Course including Expansion joint	2.77%	(iv) Wearing Coat: Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified

(5) Miscellaneous items like hand rails, Crash Barrier, road marking etc.	2.21%	(v) Miscellaneous: Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified
(6) Approaches including (Reinforced Earth wall/Retaining wall)	3.46%	(vi) Reinforced Earth/Retaining Wall: Payments shall be made on completion of all RE/Retaining walls complete in all respects as specified.

1.3.6 Ramp from ECC Dwarka merging with Right Carriageway of Dwarka Expressway

7+300 to 7+570

Procedure for estimating the value of structure work shall be as stated in table 1.3.6:

Table 1.3.6

Stage of payment	Weightage	Payment procedure
(1) Foundation	22.22%	(i) Foundation: Payment against foundation shall be made on pro-rata basis on completion of atleast two foundations of the structure. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(2) Sub structure	3.39%	(ii) Sub-Structure: Payment against Sub-structure shall be made on pro-rata basis on completion of atleast two sub-structures of abutments /piers upto abutment/pier cap level of the structure
(3) Super Structure including bearing	63.13%	(iii) Super-structure. Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structure including bearings of atleast one span in all respects as specified.

(4) Wearing Course including Expansion joint	2.15%	(iv) Wearing Coat: Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified
(5) Miscellaneous items like hand rails, Crash Barrier, road marking etc.	1.85%	(v) Miscellaneous: Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified
(6) Approaches including (Reinforced Earth wall/Retaining wall)	7.26%	(vi) Reinforced Earth/Retaining Wall: Payments shall be made on completion of all RE/Retaining walls complete in all respects as specified.

1.3.7 Link Road to Najafgarh (Left Carriageway) 6+050 to 8+010; (Right Carriageway) 5+480 to 8+010

Procedure for estimating the value of structure work shall be as stated in table 1.3.7:

Table 1.3.7

Stage of payment	Weightage	Payment procedure
(1) Foundation	10.14%	(i) Foundation: Payment against foundation shall be made on pro-rata basis on completion of atleast two foundations of the structure. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(2) Sub structure	3.63%	(ii) Sub-Structure: Payment against Sub-structure shall be made on pro-rata basis on completion of atleast two sub-structures of abutments /piers upto abutment/pier cap level of the structure

(3) Super Structure including bearing	80.19%	(iii) Super-structure. Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structure including bearings of atleast one span in all respects as specified.
(4) Wearing Course including Expansion joint	2.22%	(iv) Wearing Coat: Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified
(5) Miscellaneous items like hand rails, Crash Barrier, road marking etc.	1.99%	(v) Miscellaneous: Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified
(6) Approaches including (Reinforced Earth wall/Retaining wall)	1.83%	(vi) Reinforced Earth/Retaining Wall: Payments shall be made on completion of all RE/Retaining walls complete in all respects as specified.

1.3.8 Ramp from Right Carriageway from Najafgarh towards Dwarka Sector 21 MSJ

5+860 to 6+100

Procedure for estimating the value of structure work shall be as stated in table 1.3.8:

Table 1.3.8

Stage of payment	Weightage	Payment procedure
(1) Foundation	23.13%	(i) Foundation: Payment against foundation shall be made on pro-rata basis on completion of atleast two foundations of the structure. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.

(2) Sub structure	2.92%	(ii) Sub-Structure: Payment against Sub-structure shall be made on pro-rata basis on completion of atleast two sub-structures of abutments /piers upto abutment/pier cap level of the structure
(3) Super Structure including bearing	61.82%	(iii) Super-structure. Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structure including bearings of atleast one span in all respects as specified.
(4) Wearing Course including Expansion joint	1.95%	(iv) Wearing Coat: Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified
(5) Miscellaneous items like hand rails, Crash Barrier, road marking etc..	2.51%	(v) Miscellaneous: Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified
(6) Approaches including (Reinforced Earth wall/Retaining wall)	7.67%	(vi) Reinforced Earth/Retaining Wall: Payments shall be made on completion of all RE/Retaining walls complete in all respects as specified.

1.3.9 Ramp from Dwarka Sector 23 towards RUB/ShivMurty 5+491 to 5+885

Procedure for estimating the value of structure work shall be as stated in table 1.3.9:

Table 1.3.9

Stage of payment	Weightage	Payment procedure
(1) Foundation	21.60%	(i) Foundation: Payment against foundation shall be made on pro-rata basis on completion of atleast two foundations of the structure. In case where load testing is required for foundation, the trigger of first payment shall include load

		testing also where specified.
(2) Sub structure	3.04%	(ii) Sub-Structure: Payment against Sub-structure shall be made on pro-rata basis on completion of atleast two sub-structures of abutments /piers upto abutment/pier cap level of the structure
(3) Super Structure including bearing	53.96%	(iii) Super-structure. Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structure including bearings of atleast one span in all respects as specified.
(4) Wearing Course including Expansion joint	1.76%	(iv) Wearing Coat: Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified
(5) Miscellaneous items like hand rails, Crash Barrier, road marking etc.	2.14%	(v) Miscellaneous: Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified
(6) Approaches including (Reinforced Earth wall/Retaining wall)	17.50%	(vi) Reinforced Earth/Retaining Wall: Payments shall be made on completion of all RE/Retaining walls complete in all respects as specified.

1.3.10 Ramp from Left Carriageway from Dwarka Sector 21 MSJ to ECC Dwarka 6+430 to 6+710

Procedure for estimating the value of structure work shall be as stated in table 1.3.10:

Table 1.3.10

Stage of payment	Weightage	Payment procedure

(1) Foundation	21.49%	(i) Foundation: Payment against foundation shall be made on pro-rata basis on completion of atleast two foundations of the structure. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(2) Sub structure	3.16%	(ii) Sub-Structure: Payment against Sub-structure shall be made on pro-rata basis on completion of atleast two sub-structures of abutments /piers upto abutment/pier cap level of the structure
(3) Super Structure including bearing	65.13%	(iii) Super-structure. Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structure including bearings of atleast one span in all respects as specified.
(4) Wearing Course including Expansion joint	2.28%	(iv) Wearing Coat: Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified
(5) Miscellaneous items like hand rails, Crash Barrier, road marking etc.	2.38%	(v) Miscellaneous: Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified
(6) Approaches including (Reinforced Earth wall/Retaining wall)	5.56%	(vi) Reinforced Earth/Retaining Wall: Payments shall be made on completion of all RE/Retaining walls complete in all respects as specified.

1.3.11 Ramp from ECC Dwarka merging with Right Carriageway towards Dwarka Sector 21 MSJ 6+700 to 7+230

Procedure for estimating the value of structure work shall be as stated in table 1.3.11:

Table 1.3.11

Stage of payment	Weightage	Payment procedure
(1) Foundation	22.24%	(i) Foundation: Payment against foundation shall be made on pro-rata basis on completion of atleast two foundations of the structure. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(2) Sub structure	3.65%	(ii) Sub-Structure: Payment against Sub-structure shall be made on pro-rata basis on completion of atleast two sub-structures of abutments /piers upto abutment/pier cap level of the structure
(3) Super Structure including bearing	66.03%	(iii) Super-structure. Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structure including bearings of atleast one span in all respects as specified.
(4) Wearing Course including Expansion joint	2.21%	(iv) Wearing Coat: Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified
(5) Miscellaneous items like hand rails, Crash Barrier, road marking etc.	2.32%	(v) Miscellaneous: Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified
(6) Approaches including (Reinforced Earth wall/Retaining wall)	3.55%	(vi) Reinforced Earth/Retaining Wall: Payments shall be made on completion of all RE/Retaining walls complete in all respects as specified.

1.3.12 Ramp from ECC Bus Drop off merging with Ramp from ECC Dwarka merging with Right Carriageway towards Dwarka Sector 21 MSJ 7+110 to 7+520

Procedure for estimating the value of structure work shall be as stated in table 1.3.12:

Table 1.3.12

Stage of payment	Weightage	Payment procedure
(1) Foundation	24.65%	(i) Foundation: Payment against foundation shall be made on pro-rata basis on completion of atleast two foundations of the structure. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(2) Sub structure	4.03%	(ii) Sub-Structure: Payment against Sub-structure shall be made on pro-rata basis on completion of atleast two sub-structures of abutments /piers upto abutment/pier cap level of the structure
(3) Super Structure including bearing	64.09%	(iii) Super-structure. Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structure including bearings of atleast one span in all respects as specified.
(4) Wearing Course including Expansion joint	2.05%	(iv) Wearing Coat: Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified
(5) Miscellaneous items like hand rails, Crash Barrier, road marking etc.	2.12%	(v) Miscellaneous: Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified
(6) Approaches including (Reinforced Earth wall/Retaining wall)	3.06%	(vi) Reinforced Earth/Retaining Wall: Payments shall be made on completion of all RE/Retaining walls complete in all respects as specified.

1.3.13 Ramp from ECC Bus Drop off going towards Sector 24 7+340 to 7+520

Procedure for estimating the value of structure work shall be as stated in table 1.3.13:

Table 1.3.13

Stage of payment	Weightage	Payment procedure
(1) Foundation	23.92%	(i) Foundation: Payment against foundation shall be made on pro-rata basis on completion of atleast two foundations of the structure. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(2) Sub structure	3.49%	(ii) Sub-Structure: Payment against Sub-structure shall be made on pro-rata basis on completion of atleast two sub-structures of abutments /piers upto abutment/pier cap level of the structure
(3) Super Structure including bearing	58.03%	(iii) Super-structure. Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structure including bearings of atleast one span in all respects as specified.
(4) Wearing Course including Expansion joint	1.99%	(iv) Wearing Coat: Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified
(5) Miscellaneous items like hand rails, Crash Barrier, road marking etc.	1.96%	(v) Miscellaneous: Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified
(6) Approaches including (Reinforced Earth wall/Retaining wall)	10.61%	(vi) Reinforced Earth/Retaining Wall: Payments shall be made on completion of all RE/Retaining walls complete in all respects as

		specified.

1.3.14 Ramp from Left Carriageway of Link Road to Najafgarh from Dwarka Sector 21 MSJ to Golf Course Road 6+910 to 7+455

Procedure for estimating the value of structure work shall be as stated in table 1.3.14:

Table 1.3.14

Stage of payment	Weightage	Payment procedure
(1) Foundation	23.99%	(i) Foundation: Payment against foundation shall be made on pro-rata basis on completion of atleast two foundations of the structure. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(2) Sub structure	5.66%	(ii) Sub-Structure: Payment against Sub-structure shall be made on pro-rata basis on completion of atleast two sub-structures of abutments /piers upto abutment/pier cap level of the structure
(3) Super Structure including bearing	65.80%	(iii) Super-structure. Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structure including bearings of atleast one span in all respects as specified.
(4) Wearing Course including Expansion joint	2.23%	(iv) Wearing Coat: Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified

(5) Miscellaneous items like hand rails, Crash Barrier, road marking etc.	2.32%	(v) Miscellaneous: Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified
(6) Approaches including (Reinforced Earth wall/Retaining wall)	0.00%	(vi) Reinforced Earth/Retaining Wall: Payments shall be made on completion of all RE/Retaining walls complete in all respects as specified.

1.3.15 Link Road from Dwarka Sector 23 going towards Kherki Dhaula Left Carriageway

5+800 to 7+186

Procedure for estimating the value of structure work shall be as stated in table 1.3.15:

Table 1.3.15

Stage of payment	Weightage	Payment procedure
(1) Foundation	18.46%	(i) Foundation: Payment against foundation shall be made on pro-rata basis on completion of atleast two foundations of the structure. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(2) Sub structure	5.02%	(ii) Sub-Structure: Payment against Sub-structure shall be made on pro-rata basis on completion of atleast two sub-structures of abutments /piers upto abutment/pier cap level of the structure

(3) Super Structure including bearing	71.78%	(iii) Super-structure. Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structure including bearings of atleast one span in all respects as specified.
(4) Wearing Course including Expansion joint	2.11%	(iv) Wearing Coat: Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified
(5) Miscellaneous items like hand rails, Crash Barrier, road marking etc.	1.88%	(v) Miscellaneous: Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified
(6) Approaches including (Reinforced Earth wall/Retaining wall)	0.75%	(vi) Reinforced Earth/Retaining Wall: Payments shall be made on completion of all RE/Retaining walls complete in all respects as specified.

1.3.16 Link Road from Dwarka Sector 25 going towards Kherki Dhaula Right Carriageway

5+800 to 6+660

Procedure for estimating the value of structure work shall be as stated in table 1.3.16:

Table 1.3.16

Stage of payment	Weightage	Payment procedure
(1) Foundation	21.55%	(i) Foundation: Payment against foundation shall be made on pro-rata basis on completion of atleast two foundations of the structure. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.

(2) Sub structure	4.61%	(ii) Sub-Structure: Payment against Sub-structure shall be made on pro-rata basis on completion of atleast two sub-structures of abutments /piers upto abutment/pier cap level of the structure
(3) Super Structure including bearing	67.36%	(iii) Super-structure. Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structure including bearings of atleast one span in all respects as specified.
(4) Wearing Course including Expansion joint	2.66%	(iv) Wearing Coat: Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified
(5) Miscellaneous items like hand rails, Crash Barrier, road marking etc.	2.33%	(v) Miscellaneous: Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified
(6) Approaches including (Reinforced Earth wall/Retaining wall)	1.49%	(vi) Reinforced Earth/Retaining Wall: Payments shall be made on completion of all RE/Retaining walls complete in all respects as specified.

1.3.17 Right Turn towards Najafgarh above Dwarka Expressway from Left service Road Crossing Dwarka Expressway at 8+600

Procedure for estimating the value of structure work shall be as stated in table 1.3.17:

Table 1.3.17

Stage of payment	Weightage	Payment procedure
(1) Foundation	31.00%	(i) Foundation: Payment against foundation shall be made on pro-rata basis on completion of atleast two foundations of the structure. In case where load testing is required for foundation, the trigger

		of first payment shall include load testing also where specified.
(2) Sub structure	5.00%	(ii) Sub-Structure: Payment against Sub-structure shall be made on pro-rata basis on completion of atleast two sub-structures of abutments /piers upto abutment/pier cap level of the structure
(3) Super Structure including bearing	60.00%	(iii) Super-structure. Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structure including bearings of atleast one span in all respects as specified.
(4) Wearing Course including Expansion joint	2.00%	(iv) Wearing Coat: Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified
(5) Miscellaneous items like hand rails, Crash Barrier, road marking etc.	2.00%	(v) Miscellaneous: Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified
(6) Approaches including (Reinforced Earth wall/Retaining wall)	0.00%	(vi) Reinforced Earth/Retaining Wall: Payments shall be made on completion of all RE/Retaining walls complete in all respects as specified.

1.3.18 Right Turn towards ShivMurthy from Elevated Cross Road coming from Bijwasan Crossing Dwarka Expressway at 8+600

Procedure for estimating the value of structure work shall be as stated in table 1.3.18:

Table 1.3.18

Stage of payment	Weightage	Payment procedure

(1) Foundation	31.00%	(i) Foundation: Payment against foundation shall be made on pro-rata basis on completion of atleast two foundations of the structure. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(2) Sub structure	5.00%	(ii) Sub-Structure: Payment against Sub-structure shall be made on pro-rata basis on completion of atleast two sub-structures of abutments /piers upto abutment/pier cap level of the structure
(3) Super Structure including bearing	60.00%	(iii) Super-structure. Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structure including bearings of atleast one span in all respects as specified.
(4) Wearing Course including Expansion joint	2.00%	(iv) Wearing Coat: Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified
(5) Miscellaneous items like hand rails, Crash Barrier, road marking etc.	2.00%	(v) Miscellaneous: Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified
(6) Approaches including (Reinforced Earth wall/Retaining wall)	0.00%	(vi) Reinforced Earth/Retaining Wall: Payments shall be made on completion of all RE/Retaining walls complete in all respects as specified.

1.3.19 Najafgarh Bijwasan Cross Road (Right Carriageway)Crossing Dwarka Expressway at 8+600

Procedure for estimating the value of structure work shall be as stated in table 1.3.19:

Table 1.3.19

Stage of payment	Weightage	Payment procedure
(1) Foundation	31.00%	(i) Foundation: Payment against foundation shall be made on pro-rata basis on completion of atleast two foundations of the structure. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(2) Sub structure	5.00%	(ii) Sub-Structure: Payment against Sub-structure shall be made on pro-rata basis on completion of atleast two sub-structures of abutments /piers upto abutment/pier cap level of the structure
(3) Super Structure including bearing	60.00%	(iii) Super-structure. Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structure including bearings of atleast one span in all respects as specified.
(4) Wearing Course including Expansion joint	2.00%	(iv) Wearing Coat: Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified
(5) Miscellaneous items like hand rails, Crash Barrier, road marking etc.	2.00%	(v) Miscellaneous: Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified
(6) Approaches including (Reinforced Earth wall/Retaining wall)	0.00%	(vi) Reinforced Earth/Retaining Wall: Payments shall be made on completion of all RE/Retaining walls complete in all respects as specified.

1.3.20 Loop ramp from Right carriageway of Link Road from Sector 23 to Right Carriageway of Link Road to Najafgarh

Procedure for estimating the value of structure work shall be as stated in table 1.3.20:

Table 1.3.20

Stage of payment	Weightage	Payment procedure
(1) Foundation	43.02%	(i) Foundation: Payment against foundation shall be made on pro-rata basis on completion of atleast two foundations of the structure. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(2) Sub structure	11.18%	(ii) Sub-Structure: Payment against Sub-structure shall be made on pro-rata basis on completion of atleast two sub-structures of abutments /piers upto abutment/pier cap level of the structure
(3) Super Structure including bearing	41.13%	(iii) Super-structure. Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structure including bearings of atleast one span in all respects as specified.
(4) Wearing Course including Expansion joint	2.30%	(iv) Wearing Coat: Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified
(5) Miscellaneous items like hand rails, Crash Barrier, road marking etc.	2.37%	(v) Miscellaneous: Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified

(6) Approaches including (Reinforced Earth wall/Retaining wall)	0.00%	(vi) Reinforced Earth/Retaining Wall: Payments shall be made on completion of all RE/Retaining walls complete in all respects as specified.

1.3.21 Other works.

Procedure for estimating the value of other works done shall be as stated in table 1.3.21:

Table 1.3.21

Stage of Payment	**Percentage - weightage**	**Payment Procedure**
(i)Toll Plaza	40.11%	Unit of measurement is each completed toll plaza. Payment of each toll plaza shall be made on pro rata basis with respect to the total of all toll plazas
(ii) Road side drains including dismantling of existing drain	28.69%	Unit of measurement is linear length in km. Payment shall be made on pro rata basis on completion of a stage in a length of not less than 10 % (ten per cent) of the total length.
(iii) Road signs, markings, km stones, safety devices, …	6.58%	
(iv) Project Facilities		
(a) Bus bays	1.23%	Payment shall be made on pro rata basis for completed facilities.
(b) Truck laybye	0.00%	
(c) Rest Area	0.00%	
(d) Others	0.00%	
(i) Pedestrian Guard Rail	0.15%	
(ii) Separator	8.50%	
(iii) PVC Sheet covering over underpass	4.20%	
(iv) Minor Junction	1.61%	
(v) Pumping Arrangement for Underpass	2.11%	
(vi) Electrical Works	3.54%	

(vii) Miscellaneous Works like rain water harvesting, submission of photo reports etc.	0.76%	
(v) Road Side Plantation/Landscaping	0.54%	Unit of measurement is linear length in km. Payment shall be made on pro rata basis on completion of a stage in a length of not less than 10 % (ten per cent) of the total length.
(vi) Repair of Protection works other than approaches to bridges	0.00%	
(vii) Safety and Traffic Management during construction	1.98%	Payment shall be made on pro rata basis every six months.

2. Procedure for payment for Maintenance

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

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