

# SCHEDULE - A

**SCHEDULE – A***(See Clause 10.1)***SITE OF THE PROJECT****1 The Site**

- 1.1 Site of the Project Highway shall include the land, buildings, structures and road works as described in Annex-I of this Schedule-A.
- 1.2 An inventory of the Site including the land, buildings, structures, road works, trees and any other immovable property on, or attached to, the Site shall be prepared jointly by the Authority Representative and the Concessionaire, and such inventory shall form part of the memorandum referred to in Clause 10.3.1 of the Agreement.
- 1.3 Additional land required for Toll Plazas, Traffic Aid Posts, Medical Aid Posts and vehicle rescue posts or for construction of works specified in the Change of Scope Order issued under Clause 16.2.3 of this Agreement shall be acquired in accordance with the provisions of Clause 10.3.6 of this Agreement. Upon acquisition, such land shall form part of the Site and vest in the Authority.

**Annex - I**  
(Schedule-A)  
**SITE FOR THE PROJECT**

**1. The Site**

**1.1 Project Highway**

The proposed four Laning of the Project Highway comprise the section of National Highway - 21A commencing from Km.4+200 to 34+500 (design Chainage) i.e the End of Pinjore Bypass– Baddi – Nalagarh section in the State of Haryana and Himachal Pradesh. The land, carriageway and structures comprising the Site are described below.

Chainage (Km)			State
Start	End	Length (Km)	
4+200	17+800	13.00	Haryana
17+800	34+500	16.700	Himachal Pradesh

**1.2 Description of the Project Highway**

The project highway is a Greenfield alignment passing through Gariran, Majri Jatta, Kiratpur, Charaniya, Johluwal, Nanakpur, Kalyanpur, Sandoli, Malpur, Nalka, Krupalpur, Rakhram Singh in the State of Haryana and Himachal Pradesh. The Latitude and longitude of the project road lies between 30° 49'19.16"N, 76°52'57.39"E and 31°2'23.70"N, 76°42'49.95"E respectively.

**2. Land**

The Site of the Project Highway comprises the Land described below:

SL. No	Chainage (km)		Length (m)	Existing ROW Average (m)	Average Proposed ROW (m)
	From	To			
1	4+200	17+030	1283	39	39
2	17+030	17+260	230	45	45
3	17+255	34+500	17245	39	39

### 3. Carriageway

The present carriageway of the Project Highway is a Two-Lane with paved shoulder. The type of the existing pavement is flexible.

### 4. Major Bridges

The Site includes the following Major Bridges:

#### 1. Major Bridge at Km 7+689

Ch.	7+689	Status at site		
Structure	Major Bridge	BHS		
Span	2 x 37.5	A1	P1	A2
Sr No.	Activity			
1	Piles	Done	Done	Done
2	Pile Cap			
3	Pier/Abut Shaft			
4	Pier/Abut Cap			
5	Pedestal			
6	Arrester	NR	Done	Done
7	Girder PSC Casted	NR	8	8
8	Stressing/Grouting	NR	8/8	8/8
9	Girder Launching	NR	A1-P1 Done	P1-A2 Done
10	End Cross Girder	Done	Done	Done
11	Mid Cross Girder	Done	Done	Done
12	Slab	NR	A1-P1 Done	P1-A2 Done
13	Drainage Spout	Done	Done	Done
15	Link Slab	NR	Done	NR
16	Expansion Joint	LHS Done RHS Pending	NR	LHS Done RHS Pending
17	Dirt Wall	Done	NR	Done
18	Dep. Retaining Wall	A1 LHS Done	NR	A1 RHS Done
		A2 LHS Done	NR	A2 RHS Done
19	Ind. Retaining Wall	A1 LHS Done	NR	A1 LHS Done
		A2 LHS Done	NR	A2 LHS Done
20	Approach Slab	A1 Done (LHS) A1 Pending (RHS)	NR	A2 Done (LHS) A2 Pending (RHS)
21	Crash Barrier	Done	Done	Done (RHS)
22	Footpath	Done	Done	Done

**2. Major Bridge at Km 14+021**

Ch.	14+021	Status at site									
Structure	Major Bridge	LHS					RHS				
Span	4 x 27.535	A1	P1	P2	P3	A2	A1	P1	P2	P3	A2
Sr No.	Activity										
1	Piles	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done
2	Pile Cap										
3	Pier/Abut Shaft										
4	Pier/Abut Cap										
5	Pedestal										
6	Arrester										
7	Girder PSC Casted No.	NR	4	4	4	4					
8	Stressing/ Grouting	NR	4/4	4/4	4/4	4/4					
9	Girder Launching	NR	A1-P1 Done	P1-P2 Done	P2-P3 Done	P3-A2 Done					
10	End Cross Girder	Done	Done	Done	Done	Done					
11	Mid Cross Girder	Done	Done	Done	Done	Done					
12	Slab	NR	A1-P1 Done	P1-P2 Done	P2-P3 Done	P3-A2 Done					
13	Drainage Spout	Done	Done	Done	Done	Pending	Done	Done	Done	Done	Done
14	Painting Work	Pending	Pending	Pending	Pending	Pending					
15	Link Slab	NR	Done	NR	Done	Pending					
16	Expansion Joint	Done	NR	Done	NR	Done	Done	Done	Done	Done	Done
17	Dirt Wall	Done	NR	NR	NR	Done		NR	NR	NR	

18	Dep. Retaining Wall	A1 Median Done	A2 Median Done	A1 Footpath Done	A2 Footpath Done	A1 Median	A2 Median	A1 Footpath	A2 Footpath
19	Ind. Retaining Wall	A1 Median Done	A2 Median Done	A1 Footpath Done	A2 Footpath Done	A1 Median	A2 Median	A1 Footpath	A2 Footpath
20	Approach Slab	A1	Pending	A2	Done	Done			
21	Crash Barrier	Done in Footpath & median side, Pending on Approach Slab							
22	Footpath	Railing & Finishing Pending							
23	Stone Pitching	Pending							
24	Launching Apron	NR							
25	Floor Protection	Pending							

### 3. Major Bridge at km 17+630

Ch.	17+630	Status at site															
Structure	Major Bridge	LHS								RHS							
Span	7 x 37.600	A1	P1	P2	P3	P4	P5	P6	A2	A1	P1	P2	P3	P4	P5	P6	A2
Sr No.	Activity																
1	Arrester	Pending								Done							
2	Girder PSC Casted	NR	4	4	4	4	4	4	4	NR	4	4	4	4	4	4	4
3	Stressing/Grouting	NR	4/4	4/4	4/4	4/4	4/4	4/4	4/4	NR	4/4	4/4	4/4	4/4	4/4	4/4	4/4

4	Girder Launching	Pending								NR	A1-P1 Done	P1-P2 Done	P2-P3 Done	P3- P4 Don e	P4- P5 Don e	P5- P6 Don e	P6-A2 Done			
5	End Cross Girder									DONE	Done	Done	Done	Don e	Don e	Don e	Done			
6	Mid Cross Girder									DONE	Done	Done	Done	Don e	Don e	Don e	Done			
7	Slab									-	A1-P1 Done	P1-P2 Done	P2-P3 Done	P3- P4 Don e	P4- P5 Don e	P5- P6 Don e	P6-A2 Done			
8	Drainage Spout									Done										
9	Painting Work									Pending										
10	Link Slab	NR	Pend ing	NR	Pendin g	Pendin g	NR	Pendin g	NR	NR	Done	NR	Done	Don e	NR	Don e	NR			
11	Expansion Joint	Pen din g	NR	Pendin g	NR	NR	Pendin g	NR	Pendin g	Done	NR	Done	NR	NR	Don e	NR	Done			
12	Dirt Wall	Pen din g	NR	NR	NR	NR	NR	NR	Pendin g	Done	NR	NR	NR	NR	NR	NR	Done			
13	Dep. Retaining Wall	A1	LHS	Pending			RCC Wall Median A1		Done			A1						RHS	Done	
		A2	LHS	Pending								A2						RHS	Done	
14	Ind. Retaining Wall	A1	LHS	Pending			RCC Wall Median A2		Done			A1						RHS	Done	
		A2	LHS	Pending								A2						RHS	Done	
15	Approach Slab	A1	Pending			A2		Pending		A1		Pending			A2		Pending			

16	Crash Barrier	Pending				Done in Footpath & median side, Pending on Approach Slab							
17	Footpath	Pending				Railing & Finishing Pending							
18	Launching Apron	NR				NR							
19	Stone Pitching	Pen din g	NR			Pendin g	NR					Pendin g	
20	Pile Protection	Pending				Pendin g	Pendin g	Pendin g	Pendin g	Don e	Don e	Don e	Pendin g
21	Floor Protection	Pending				pending							

#### 4. Major Bridge at Km 26+536

Ch.	26+536	Status at site											
Structure	Major Bridge	LHS						RHS					
Span	2 x 39.5	A1	P1	A2	A1	P1	A2	A1	P1	A2	A1	P1	A2
Sr. No.	Activity												
1	Piles	Done	Done	Done	Pending	Pending	Pending	Pending	Pending	Pending	Pending	Pending	Pending
2	Pile Cap												
3	Pier/Abut Shaft												
4	Pier/Abut Cap												
5	Pedestal												
6	Arrester												
7	Girder PSC Casted	NR	4	4	NR	4	4	NR	4	4	NR	4	4
8	Stressing/Grouting	NR	4/4	4/4	Pending	Pending	Pending	Pending	Pending	Pending	Pending	Pending	Pending
9	Girder Launching	NR	A1-P1 Done	P1-A2 Done									
10	End Cross Girder	Done	Done	Done									



11	Mid Cross Girder	Done	Done	Done			
12	Slab	NR	A1-P1 Done	P1-A2 Done			
13	Drainage Spout	Pending					
14	Painting Work	Pending	Pending	Pending			
15	Link Slab	NR	Done	NR			
16	Expansion Joint	Done	NR	Done			
17	Dirt Wall	Done	NR	Done	Pending	NR	Pending
18	Dep. Retaining Wall	A1 LHS	Done	RCC Wall Median A1	Done	A1 RHS	Pending
		A2 LHS	Done		Done	A2 RHS	Pending
19	Ind. Retaining Wall	A1 LHS	Done	RCC Wall Median A2	Done	A1 RHS	Pending
		A2 LHS	Done		Done	A2 RHS	Pending
20	Approach Slab	A1 Done	NR	A2 Done	A1 Pending	NR	A2 Pending
21	Crash Barrier	Done in Footpath & median side, Pending on Approach Slab			Pending		
22	Footpath	Railing & Finishing Pending			Pending		
23	Stone Pitching	Pending			Pending		
24	Launching Apron	NR			NR		
25	Floor Protection	Pending			Pending		

**Minor Bridge**

The Site includes the following Minor Bridges:

**1. Minor Bridge at Km 6+078**

Ch.	6+078	Status at site					
Structure	Minor Bridge	LHS			RHS		
Span	2 x 30	A1	P1	A2	A1	P1	A2
Sl. No.	Activity						
1	Piles	5/10	Done	Pending	Done	Done	Done
2	Pile Cap	Pending	Pending	Pending	Done	Done	Done
3	Pier/Abut Shaft				Done	Done	Done
4	Pier/Abut Cap				Done	Done	Done
5	Pedestal				Done	Done	Done
6	Arrester				Done	Done	Done
7	Girder PSC/RCC Casted	NR	4	4	NR	4	4
8	Stressing/Grouting	NR	Pending	Pending	NR	4/4	4/4
9	Girder Launching	NR	Pending	Pending	NR	A1-P1 Done	P1-A2 Done
10	End Cross Girder	Pending	Pending	Pending	Done	Done	Done
11	Mid Cross Girder	Pending	Pending	Pending	Done	Done	Done
12	Slab	NR	Pending	Pending	NR	A1-P1 Done	P1-A2 Done
13	Drainage Spout	Pending	Pending	Pending	Done	Done	Done
14	Painting Work	Pending	Pending	Pending	Pending	Pending	Pending
15	Link Slab	NR	Pending	NR	NR	Done	NR
16	Expansion Joint	Pending	NR	Pending	Done	NR	Done

17	Dirt Wall	Pending	NR	Pending	Done	NR	Done
18	Dep. Retaining Wall	A1 LHS	Pending	RCC Wall Median A1	Done	A1 RHS	Done
		A2 LHS	Pending			A2 RHS	Done
19	Ind. Retaining Wall	A1 LHS	Pending	RCC Wall Median A2	Done	A1 RHS	Done
		A2 LHS	Pending			A2 RHS	Done
20	Approach Slab	A1	NR	A2	A1	NR	A2
21	Crash Barrier	Pending			Done in Footpath & median side, Pending on Approach Slab		
22	Footpath	Pending			Railing & Finishing Pending		
23	Stone Pitching	Pending	NR	Pending	Pending	NR	Pending
24	Launching Apron	Pending	NR	Pending	Pending	NR	Pending
25	Floor Protection	NR			NR		

## 2. Minor Bridge at Km 7+540

Ch.	7+540	Status at site					
Structure	Minor Bridge	LHS			RHS		
Span	1 x 37.0	A1	A2		A1	A2	
Sr No.	Activity						
1	Piles	Done	Done		Pending	Pending	
2	Pile Cap						
3	Pier/Abut Shaft						
4	Pier/Abut Cap						
5	Pedestal						
6	Arrester						
7	Girder PSC Casted	NR	4		NR	Pending	
8	Stressing/Grouting	NR	4/4		NR		
9	Girder Launching	NR	A1-A2 Done		NR		
10	End Cross Girder	Done	Done		Pending		

11	Mid Cross Girder	Done	Done	Pending	
12	Slab	NR	A1-A2 Done	NR	
13	Drainage Spout	Done	Done	Pending	
14	Painting Work	Pending	Pending	Pending	
15	Link Slab	NR	NR	NR	NR
16	Expansion Joint	Done	Done	Pending	Pending
17	Dirt Wall	Done	Done	Pending	
18	Dep. Retaining Wall	A1 LHS Done	RCC Wall Median A1	A2 LHS	
		A1 RHS Done	Done	A2 RHS	
19	Ind. Retaining Wall	A1 LHS Done	RCC Wall median A2	A2 LHS	
		A1 RHS Done	Done	A2 RHS	
20	Approach Slab	A1 Done	A2 Done	A1 Pending	A2 Pending
21	Crash Barrier	Done in Footpath & median side, Pending on Approach Slab		Pending	
22	Footpath	Railing & Finishing Pending		Pending	
23	Stone Pitching	Pending		Pending	
24	Launching Apron	Pending	Pending	Pending	Pending
25	Floor Protection	NR		NR	

### 3. Minor Bridge at Km 8+642

Ch.	8+642	Status at site					
Structure	Minor Bridge	LHS			RHS		
Span	2 x 29.0	A1	P1	A2	A1	P1	A2
Sr No.	Activity						
1	Piles	Done	Done	Done	Done	Done	Done
2	Pile Cap						
3	Pier/Abut Shaft						
4	Pier/Abut Cap						

5	Pedestal						
6	Arrester	Done	1/2 Done	1/2 Done	Pending	Pending	Pending
7	Girder PSC Casted	NR	4	4	NR	4	4
8	Stressing/Grouting	NR	4/4	4/4	NR	4/4	4/4
9	Girder Launching	NR	A1-P1 Done	P1-A2 Done	NR	A1-P1 Done	P1-A2 Done
10	End Cross Girder	Done	Done	Done	Pending	Pending	Pending
11	Mid Cross Girder	Done	Done	Done	Pending	Pending	
12	Slab	NR	A1-P1 Done	P1-A2 Done	NR	Pending	
13	Drainage Spout	Done	Done	Done	Pending	Pending	
14	Painting Work	Pending	Pending	Pending	Pending	Pending	
15	Link Slab	NR	Done	NR	NR	Pending	NR
16	Expansion Joint	Done	NR	Done	Pending	NR	Pending
17	Dirt Wall	Done	NR	Done	Pending	NR	
18	Dep. Retaining Wall	A1 LHS	Done	RCC Wall Median A1	Done	A1 RHS	
		A2 LHS	Done			A2 RHS	
19	Ind. Retaining Wall	A1 LHS	Done	RCC Wall Median A2	Done	A1 RHS	
		A2 LHS	Done			A2 RHS	
20	Approach Slab	Done	NR	Done	Pending	NR	
21	Crash Barrier	Done in Footpath & median side, Pending on Approach Slab			Pending		
22	Footpath	Railing & Finishing Pending			Pending		
23	Stone Pitching	Done	NR	Done	Pending	NR	Pending
24	Launching Apron	Pending	NR	Pending	Pending	NR	Pending
25	Floor Protection	NR			NR		

**4. Minor Bridge at Km 9+262**

Ch.	9+262	Status at site					
Structure	Minor Bridge	LHS			RHS		
Span	2 x 24	A1	P1	A2	A1	P1	A2
Sr No.	Activity						
1	Piles	Done	Done	Done	Done	Done	Done
2	Pile Cap						
3	Pier/Abut Shaft						
4	Pier/Abut Cap						
5	Pedestal	Pending	Pending	Pending	Done	Done	Done
6	Arrester	Pending	Pending	Pending	Pending	Pending	Pending
7	Girder RCC Casted	NR	4	4	NR	4	4
8	Stressing/Grouting	NR	NR	NR	NR	NR	NR
9	Girder Launching	NR	Pending	Pending	NR	A1-P1 Done	P1-A2 Done
10	End Cross Girder	Pending	Pending	Pending	Done	Done	Done
11	Mid Cross Girder	Pending	Pending	Pending	Done	Done	Done
12	Slab	NR			NR	A1-P1 Done	P1-A2 Done
13	Drainage Spout	Pending	Pending	Pending	Done	Done	Done
14	Painting Work	Pending	Pending	Pending	Pending	Pending	Pending
15	Link Slab	NR		NR	NR	Done	NR
16	Expansion Joint	Pending	NR	Pending	Done	NR	Done
17	Dirt Wall	Pending	NR	Pending	Done	NR	Done
18	Dep. Retaining Wall	A1 LHS	Pending	RCC Wall Median A1	Done	A1 RHS	Done
		A2 LHS	Pending			A2 RHS	Done
19	Ind. Retaining Wall	A1 LHS	Pending		Done	A1 RHS	Done

		A2 LHS	Pending	RCC Wall Median A2		A2 RHS	Done
20	Approach Slab	Pending	NR	Pending	Done	NR	Done
21	Crash Barrier	Pending			Done in Footpath & median side, Pending on Approach Slab		
22	Footpath	Pending			Railing & Finishing Pending		
23	Stone Pitching	Pending	NR	Pending	Done	NR	Done
24	Launching Apron	Pending	NR	Pending	Pending	NR	Pending
25	Floor Protection	NR			NR		

### 5. Minor Bridge at Km 9+949

Ch.	9+949	Status at site					
Structure	Minor Bridge	LHS			RHS		
Span	2 x 24.0	A1	P1	A2	A1	P1	A2
Sr No.	Activity						
1	Piles	Done	Done	Done	Done	Done	Done
2	Pile Cap				Pending	Pending	Pending
3	Pier/Abut Shaft						
4	Pier/Abut Cap						
5	Pedestal						
6	Arrester						
7	Girder RCC Casted	NR	4	4	NR	4	4
8	Stressing/Grouting	NR	NR	NR	NR	NR	NR
9	Girder Launching	NR	A1-P1 Done	P1-A2 Done	NR	Pending	Pending
10	End Cross Girder	Done	Done	Done	Pending		
11	Mid Cross Girder	Done	Done	Done	Pending		

12	Slab	NR	A1-P1 Done	P1-A2 Done	NR		
13	Drainage Spout	Done	Done	Done	Pending		
14	Painting Work	Pending	Pending	Pending	Pending		
15	Link Slab	NR	Done	NR	NR	Pending	NR
16	Expansion Joint	Done	NR	Done	Pending	NR	Pending
17	Dirt Wall	Done	NR	Done	Pending	NR	Pending
18	Dep. Retaining Wall	A1 LHS Done	NR	RCC Wall Median A1	Done	NR	A1 RHS Pending
		A2 LHS Done	NR			NR	A2 RHS Pending
19	Ind. Retaining Wall	A1 LHS Done	NR	RCC Wall Median A2	Done	NR	A1 RHS Pending
		A2 LHS Done	NR			NR	A2 RHS Pending
20	Approach Slab	Pending	NR	Pending	Pending	NR	Pending
21	Crash Barrier	Done in Footpath & median side, Pending on Approach Slab			Pending		
22	Footpath	Railing & Finishing Pending			Pending		
23	Stone Pitching	Pending	NR	Pending	Pending	NR	Pending
24	Launching Apron	Pending	NR	Pending	Pending	NR	Pending
25	Floor Protection	NR			NR		

## 6. Minor Bridge at Km 10+175

Ch.	10+175	Status at site						
Structure	Minor Bridge	LHS			RHS			
Span	2 x 31	A1	P1	A2	A1	P1	A2	
Sr No.	Activity							
1	Piles	Done	Done	Done	Done	Done	Done	
2	Pile Cap							
3	Pier/Abut Shaft					Pending		
4	Pier/Abut Cap							



5	Pedestal				Pending		Pending
6	Arrester						
7	Girder PSC/RCC Casted	NR	4	4	NR	4	Pending
8	Stressing/Grouting	NR	4/4	4/4	NR	Pending	Pending
9	Girder Launching	NR	A1-P1 Done	P1-A2 Done	NR		
10	End Cross Girder	Done	Done	Done	Pending		
11	Mid Cross Girder	Done	Done	Done	Pending		
12	Slab	NR	A1-P1 Done	P1-A2 Done	NR		
13	Drainage Spout	Pending	Pending	Pending	Pending		
14	Painting Work	Pending	Pending	Pending	Pending		
15	Link Slab	NR	Done	NR	NR	Pending	NR
16	Expansion Joint	Done	NR	Done	Pending	NR	Pending
17	Dirt Wall	Done	NR	Done	Pending	NR	Pending
18	Dep. Retaining Wall	A1 LHS Done	NR	RCC Wall Median A1	Done	NR	A1 RHS Pending
		A2 LHS Done	NR			NR	A2 RHS Pending
19	Ind. Retaining Wall	A1 LHS Done	NR	RCC Wall Median A2	Done	NR	A1 RHS Pending
		A2 LHS Done	NR			NR	A2 RHS Pending
20	Approach Slab	Done	NR	Done	Pending	NR	Pending
21	Crash Barrier	Done in Footpath & median side, Pending on Approach Slab			Pending		
22	Footpath	Railing & Finishing Pending			Pending		
23	Stone Pitching	Pending	NR	Pending	Pending	NR	Pending
24	Launching Apron	Pending	NR	Pending	Pending	NR	Pending
25	Floor Protection	NR			NR		

**7. Minor Bridge at Km 12+042**

Ch.	12+042	Status at site			
Structure	Minor Bridge	LHS		RHS	
Span	1 x 32	A1	A2	A1	A2
Sr No.	Activity				
1	Piles	Done	Done	Pending	Pending
2	Pile Cap				
3	Pier/Abut Shaft				
4	Pier/Abut Cap				
5	Pedestal				
6	Arrester	Done	Done	Pending	Pending
7	Girder PSC Casted	NR	4	NR	Pending
8	Stressing/Grouting	NR	4/4		
9	Girder Launching	NR	A1-A2 Done		
10	End Cross Girder	Done	Done	Pending	Pending
11	Mid Cross Girder	Done	Done		
12	Slab	NR	A1-A2 Done		
13	Drainage Spout	Done	Done		
14	Painting Work	Pending	Pending		
15	Link Slab	NR	NR	NR	NR
16	Expansion Joint	Done	Done	Pending	Pending
17	Dirt Wall	Done	Done	Pending	Pending
18	Dep. Retaining Wall	A1 LHS Done	RCC Wall median A1	A1 LHS	Pending
		A2 LHS Done	Done	A2 LHS	
19	Ind. Retaining Wall	A1 LHS Done	RCC Wall median A2	A1 LHS	
		A2 LHS Done	Done	A2 LHS	
20	Approach Slab	Pending	Pending	Pending	Pending

21	Crash Barrier	Done in Footpath & median side, Pending on Approach Slab		Pending	
22	Footpath	Railing & Finishing Pending		Pending	
23	Stone Pitching	Pending	Pending	Pending	Pending
24	Launching Apron	Pending	Pending	Pending	Pending
25	Floor Protection	NR		NR	

### 8. Minor Bridge at Km 19+366

Ch.	19+366	Status at site					
Structure	Minor Bridge S/R	LHS			RHS		
Span	2 x 15	A1	P1	A2	A1	P1	A2
Sr No.	Activity						
1	Piles	Done	Done	Done	Done	Done	Done
2	Pile Cap						
3	Pier/Abut Shaft						
4	Pier/Abut Cap						
5	Pedestal						
6	Arrester	Done	Done	Pending	Done	Done	Done
7	Girder RCC Casted	NR	3	3	NR	3	3
8	Stressing/Grouting	NR	NR	NR	NR	NR	NR
9	Girder Launching	NR	A1-P1 Done	Pending	NR	Done	Done
10	End Cross Girder	Done	Done	Pending	Done	Done	Done
11	Mid Cross Girder	NR	NR	NR	NR	NR	NR
12	Slab	NR	A1-P1 Done	Pending	NR	A1-P1 Done	P1-A2 Done
13	Drainage Spout	Pending	Pending	Pending	Pending	Pending	Pending
14	Painting Work						
15	Link Slab						
16	Expansion Joint						

17	Dirt Wall	Pending	NR	Pending	Pending	NR	Pending
18	Dep. Retaining Wall	A1 LHS Pending	NR	A1 RHS	A1 LHS Done	NR	A1 RHS Done
		A1 LHS Pending	NR	A2 RHS	A2 LHS Done	NR	A2 RHS Done
19	Ind. Retaining Wall	A1 LHS Done	NR	A1 RHS Done	A1 LHS Done	NR	A1 RHS Done
		A2 LHS Done	NR	A2 RHS Done	A2 LHS Done	NR	A2 RHS Done
20	Approach Slab	Pending	NR	Pending	Pending	NR	Pending
21	Crash Barrier	Pending			Pending		
22	Footpath	Railing & Finishing Pending			Railing & Finishing Pending		
23	Stone Pitching	Pending	NR	Pending	Pending	NR	Pending
24	Launching Apron	NR			NR		
25	Floor Protection	NR			NR		

### 9. Minor Bridge at Km 21+161

Ch.	21+161	Status at site					
Structure	Minor Bridge	LHS			RHS		
Span	2 x 29	A1	P1	A2	A1	P1	A2
Sr No.	Activity	Not Started					
1	Piles	Done	Done	Done	Pending	Pending	Pending
2	Pile Cap						
3	Pier/Abut Shaft						
4	Pier/Abut Cap						
5	Pedestal						
6	Arrester						
7	Girder PSC Casted	NR	4	4	NR	4	4
8	Stressing/Grouting	NR	4/4	4/4	NR	Pending	Pending
9	Girder Launching	NR	A1-P1 Done	P1-A2 Done	NR		
10	End Cross Girder	Done	Done	Done	Pending		

11	Mid Cross Girder	Done	Done	Done	Pending		
12	Slab	NR	A1-P1 Done	P1-A2 Done	NR		
13	Drainage Spout	Pending	Pending	Pending	Pending		
14	Painting Work	Pending	Pending	Pending	Pending		
15	Link Slab	NR	Done	NR	NR	Pending	NR
16	Expansion Joint	Done	NR	Done	Pending	NR	Pending
17	Dirt Wall	Done	NR	Done	Pending	NR	Pending
18	Dep. Retaining Wall	A1 LHS Done	NR	RCC Wall Median A1	Done	NR	A1 RHS Pending
		A2 LHS Done	NR			NR	A2 RHS Pending
19	Ind. Retaining Wall	A1 LHS Done	NR	RCC Wall Median A2	Done	NR	A1 RHS Pending
		A2 LHS Done	NR			NR	A2 RHS Pending
20	Approach Slab		NR			NR	
21	Crash Barrier	Done in Footpath & median side, Pending on Approach Slab			Pending		
22	Footpath	Railing & Finishing Pending			Pending		
23	Stone Pitching	Pending	NR	Pending	Pending	NR	Pending
24	Launching Apron		NR			NR	
25	Floor Protection	NR			NR		

### 10. Minor Bridge at Km 21+596

Ch.	21+596	Status at site			
Structure	Minor Bridge	LHS		RHS	
Span	1 x 15	A1	A2	A1	A2
Sr No.	Activity				
Sr No.	Activity				
1	Piles	NR	NR	NR	NR
2	Open Raft	Done	Done	Pending	Pending
3	Pier/Abut Shaft				

4	Pier/Abut Cap				
5	Pedestal				
6	Arrester				
7	Girder RCC Casted	NR	4	NR	4
8	Stressing/Grouting	NR	NR	NR	NR
9	Girder Launching	NR	A1-A2 Done	NR	Pending
10	End Cross Girder	Done	Done	Pending	Pending
11	Mid Cross Girder	Done	Done	Pending	Pending
12	Slab	NR	A1-A2 Done	NR	Pending
13	Drainage Spout	Pending	Pending	Pending	Pending
14	Painting Work				
15	Link Slab				
16	Expansion Joint	Done	Done	Pending	Pending
17	Dirt Wall	Done	Done		
18	Dep. Retaining Wall	A1 LHS Done	RCC Wall median A1	A1 LHS	Pending
		A2 LHS Done	Done	A2 LHS	
19	Ind. Retaining Wall	A1 LHS Done	RCC Wall median A2	A1 LHS	
		A2 LHS Done	Done	A2 LHS	
20	Approach Slab	Done	Done	Pending	Pending
21	Crash Barrier	Done in Footpath & median side, Pending on Approach Slab		Pending	
22	Footpath	Railing & Finishing Pending		Pending	
23	Stone Pitching	Pending		Pending	
24	Launching Apron	Pending	Pending	Pending	Pending
25	Floor Protection	NR		NR	

**11. Minor Bridge at Km 22+124**

Ch.	22+124	Status at site			
Structure	Minor Bridge	LHS		RHS	
Span	1 x 32.5	A1	A2	A1	A2
Sr No.	Activity				
1	Piles	Done	Done	Pending	Pending
2	Pile Cap				
3	Pier/Abut Shaft				
4	Pier/Abut Cap				
5	Pedestal				
6	Arrester				
7	Girder PSC Casted	NR	4	NR	Pending
8	Stressing/Grouting	NR	4/4	NR	Pending
9	Girder Launching	NR	A1-A2 Done	NR	Pending
10	End Cross Girder	Done	Done	Pending	Pending
11	Mid Cross Girder	Done	Done	Pending	Pending
12	Slab	NR	A1-A2 Done	NR	Pending
13	Drainage Spout	Pending	Pending	Pending	Pending
14	Painting Work	Pending	Pending	Pending	Pending
15	Link Slab	NR	NR	NR	NR
16	Expansion Joint	Done	Done	Pending	Pending
17	Dirt Wall	Done	Done	Pending	Pending
18	Dep. Retaining Wall	A1 LHS Done	RCC Wall median A1	A1 LHS	Pending
		A2 LHS Done	Done	A2 LHS	Pending
19	Ind. Retaining Wall	A1 LHS Done	RCC Wall median A2	A1 LHS	Pending
		A2 LHS Done	Done	A2 LHS	Pending
20	Approach Slab	Done	Done	Pending	Pending

21	Crash Barrier	Done in Footpath & median side, Pending on Approach Slab		Pending	
22	Footpath	Railing & Finishing Pending		Pending	
23	Stone Pitching	Pending	Done	Pending	Pending
24	Launching Apron	Pending	Pending	Pending	Pending
25	Floor Protection	NR		NR	

**12. Minor Bridge at Km 27+639**

Ch.	27+639	Status at site			
Structure	Minor Bridge	LHS		RHS	
Span	1 x 17	A1	A2	A1	A2
Sr No.	Activity				
1	Piles	NR	NR	NR	NR
2	Open Raft	Done	Done	Done	Done
3	Pier/Abut Shaft				
4	Pier/Abut Cap			Pending	Pending
5	Pedestal				
6	Arrester				
7	Girder RCC Casted	NR	4	NR	4
8	Stressing/Grouting	NR	NR	NR	NR
9	Girder Launching	NR	A1-A2 Done	NR	A1-A2 Done
10	End Cross Girder	Done	Done	Done	Done
11	Mid Cross Girder	Done	Done	Pending	Pending
12	Slab	NR	A1-A2 Done		
13	Drainage Spout	Pending	Pending		
14	Painting Work	Pending	Pending		
15	Link Slab	NR	NR	NR	NR
16	Expansion Joint	Done	Done	Pending	Pending



17	Dirt Wall	Done	Done	Pending	Pending
18	Dep. Retaining Wall	A1 LHS	RCC Wall Median A1	A1 LHS	Pending
		A2 LHS	Done	A2 LHS	Pending
19	Ind. Retaining Wall	A1 LHS	RCC Wall median A2	A1 LHS	Pending
		A2 LHS	Done	A2 LHS	Pending
20	Approach Slab	Done	Done	Pending	Pending
21	Crash Barrier	Pending		Pending	
22	Footpath	Railing & Finishing Pending		Pending	
23	Stone Pitching	NR		NR	
24	Launching Apron	NR		NR	
25	Floor Protection	NR		NR	

**13. Minor Bridge at Km 28+786**

Ch.	28+786	Status at site					
Structure	Minor Bridge	LHS			RHS		
Span	2 x 30	A1	P1	A2	A1	P1	A2
Sr No.	Activity						
1	Piles	Pending	Pending	Pending	Done	Pending	Done
2	Pile Cap						
3	Pier/Abut Shaft						
4	Pier/Abut Cap						
5	Pedestal	Pending	Pending	Pending	Pending	Pending	Pending
6	Arrester	Pending	Pending	Pending	Pending	Pending	Pending
7	Girder PSC Casted	NR	Pending	Pending	NR	4	4
8	Stressing/Grouting	NR	Pending	Pending	NR	4/4	4/4
9	Girder Launching	NR	Pending	Pending	NR	Pending	Pending
10	End Cross Girder	Pending	Pending	Pending	Pending	Pending	Pending

11	Mid Cross Girder	Pending	Pending	Pending	Pending	Pending	Pending
12	Slab	NR	Pending	Pending	NR	Pending	Pending
13	Drainage Spout	Pending	Pending	Pending	Pending	Pending	Pending
14	Painting Work	Pending	Pending	Pending	Pending	Pending	Pending
15	Link Slab	NR	Pending	NR	NR	Pending	NR
16	Expansion Joint	Pending	NR	Pending	Pending	NR	Pending
17	Dirt Wall	Pending	NR	Pending	Pending	NR	Pending
18	Dep. Retaining Wall	A1 LHS	Pending	RCC Wall Median A1		A1 RHS	Pending
		A2 LHS	Pending			A2 RHS	Pending
19	Ind. Retaining Wall	A1 LHS	Pending	RCC Wall Median A2		A1 RHS	Pending
		A2 LHS	Pending			A2 RHS	Pending
20	Approach Slab	Pending	NR	Pending	Pending	NR	Pending
21	Crash Carrier	Pending			Pending		
22	Footpath	Pending			Pending		
23	Stone Pitching	Pending	NR	Pending	Pending	NR	Pending
24	Launching Apron	Pending	NR	Pending	Pending	NR	Pending
25	Floor Protection	NR			NR		

**14. Minor Bridge at km 31+425**

Ch.	31+425	Status at site					
Structure	Minor Bridge	LHS			RHS		
Span	2 x 30	A1	P1	A2	A1	P1	A2
Sr No.	Activity						
1	Piles	Pending	Pending	Pending	Done	Done	Done
2	Pile Cap						
3	Pier/Abut Shaft						
4	Pier/Abut Cap						

5	Pedestal	Pending	Pending	Pending	Done	Done	Done
6	Arrester	Pending	Pending	Pending	Done	Done	Done
7	Girder PSC Casted	NR	Pending	Pending	NR	4	4
8	Stressing/Grouting	NR	Pending	Pending	NR	4/4	4/4
9	Girder Launching	NR	Pending	Pending	NR	A1-P1 Done	P1-A2 Done
10	End Cross Girder	Pending	Pending	Pending	Done	Done	Done
11	Mid Cross Girder	Pending	Pending	Pending	Done	Done	Done
12	Slab	NR			NR	A1-P1 Done	P1-A2 Done
13	Drainage Spout	Pending	Pending	Pending	Pending	Pending	Pending
14	Painting Work	Pending	Pending	Pending	Pending	Pending	Pending
15	Link Slab	NR	Pending	NR	NR	Done	NR
16	Expansion Joint	Pending	NR	Pending	Done	NR	Done
17	Dirt Wall	Pending	NR	Pending	Done	NR	Done
18	Dep. Retaining Wall	A1 LHS	Pending	RCC Wall Median A1	Done	A1 RHS	Done
		A2 LHS	Pending			A2 RHS	Done
19	Ind. Retaining Wall	A1 LHS	Pending	RCC Wall Median A2	Done	A1 RHS	Done
		A2 LHS	Pending			A2 RHS	Done
20	Approach Slab	Pending	NR	Pending	Done	NR	Done
21	Crash Barrier	Pending			Done		
22	Footpath	Pending			Railing & Finishing Pending		
23	Stone Pitching	Pending	NR	Pending	Pending	NR	Pending
24	Launching Apron	Pending	NR	Pending	Pending	NR	Pending
25	Floor Protection	NR			NR		

**6. 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 Structure		No. of Spans with span length (m)	Width (m)	ROB/ RUB
		Foundation	Superstructure			
Nil						

**7. Railway Level Crossings/ Railway line crossing**

The project highway is not crossing with any level crossing. It crosses the railway line at one location. The details of railway line crossings are tabulated below:

S. No.	Design Chainage (km)	Nearest Railway station	Remarks
NIL			

**8. Grade Separators**

The Site includes the following grade separators:

**Vehicular Underpass (VUP)****VUP at Km 25+650**

Ch.	25+650	Status at site	
Structure	Vehicular underpass	BHS	
Span	1 x 20 (5.5)	A1	A2
Sr No.	Activity		
1	Piles	Done	Done
2	Pile Cap	Done	Done
3	Pier/Abut Shaft	Done	Done
4	Pier/Abut Cap	Done	Done
5	Pedestal	Done	Done
6	Arrester	Pending	Pending
7	Girder RCC Casted	7	
8	Stressing/Grouting	NR	NR
9	Girder Launching	A1-A2 Done	
10	End Cross Girder	Done	Done
11	Mid Cross Girder	NR	NR
12	Slab	Pending	
13	Drainage Spout	Pending	Pending
14	Painting Work	Pending	Pending
15	Link Slab	NR	NR
16	Expansion Joint	Pending	Pending

17	Dirt Wall	Pending	Pending
18	Approach Slab	Pending	Pending
19	Crash Carrier	Pending	Pending
20	Footpath	NR	NR
21	Stone Pitching	Pending	Pending
22	Launching Apron	NR	NR
23	Floor Protection	NR	

### 9. Culvert (A) RCC SLAB CULVERT

Sr No.	Chainage As per Design	Status of work	No. of cells	Span Length (axb)	LHS			Median	RHS			BHS	% of length completed
					Length	Retaining Wall	Connection with Drain	NJCB	Length	Retaining Wall	Connection with Drain	Total Length	
1	05+081	Scope	1	1.7 X 2.4	5.210	5.774	Yes	Yes	16.250	4.536	Yes	<b>21.460</b>	
		Status							16.250			16.250	75.72%
2	06+563	Scope	1	3.8 X 2.8	3.570	5.188	Yes	Yes	17.730	6.143	Yes	<b>21.300</b>	
		Status			3.570				17.730			21.300	100.00%
3	10+524	Scope	1	1.7 X 1.2	10.500	2.272	No	Yes	1.880	2.272	No	<b>12.380</b>	
		Status			10.500	2.272			1.880	2.272		12.380	100.00%
4	12+352	Scope	1	2.4 X 1.3	6.920	3.535	No	Yes	7.486	4.862	No	<b>14.406</b>	
		Status			6.920	3.535						6.920	48.04%
5	12+559	Scope	1	3.7 X 2.8	6.580	5.611	No	Yes	6.320	6.026	No	<b>12.900</b>	
		Status			6.580	5.611			6.320	6.026		12.900	100.00%
6	12+854	Scope	1	1.6 X 2.1	9.650	4.441	No	Yes	10.640	4.638	No	<b>20.290</b>	
		Status			9.650	4.441			10.640	4.638		20.290	100.00%
7	12+983	Scope	1	2.4 X 1.9	6.010	4.732	No	Yes	15.770	7.063	No	<b>21.780</b>	
		Status			6.010	4.732			15.770	7.063		21.780	100.00%
8	13+170	Scope	1	1.6 X 1.9	6.580	3.306	Yes	Yes	16.050	3.479	Yes	<b>22.630</b>	
		Status			6.580				16.050			22.630	100.00%
9	14+590	Scope	1	2.5 X 1.9	7.740	3.642	Yes	Yes	14.550	3.708	Yes	<b>22.290</b>	
		Status			7.650				14.500			22.150	99.37%

Sr No.	Chainage As per Design	Status of work	No. of cells	Span Length (axb)	LHS			Media n	RHS			BHS	% of length completed
					Length	Retaining Wall	Connection with Drain	NJCB	Length	Retaining Wall	Connection with Drain	Total Length	
10	18+033	Scope	1	1.3 X 1.2	13.070	2.182	Yes	Yes	9.630	2.291	Yes	<b>22.700</b>	
		Status			13.070				9.630			22.700	100.00%
11	20+813	Scope	1	3 X 2.2	18.790	4.760	Yes	Yes	2.910	4.081	Yes	<b>21.700</b>	
		Status			18.790	4.760						18.790	86.59%
12	22+372	Scope	1	1.5 X 1.0	18.340	1.800	No	Yes	3.130	1.800	No	<b>21.470</b>	
		Status			18.340							18.340	85.42%
13	23+029	Scope	1	2.4 X 1.4	19.880	3.464	Yes	Yes	2.310	3.536	Yes	<b>22.190</b>	
		Status			19.880							19.880	89.59%
14	23+185	Scope	1	1.6 X 1.2	14.000	2.256	Yes	Yes	8.470	3.024	Yes	<b>22.470</b>	
		Status			14.000				8.470			22.470	100.00%
15	23+227	Scope	1	1.4 X 1	13.950	1.928	Yes	Yes	8.560	3.071	Yes	<b>22.510</b>	
		Status			13.950	1.928			8.560	3.071		22.510	100.00%
16	23+391	Scope	1	2.5 X 1.5	23.900	3.460	Yes	Yes		4.029	Yes	<b>23.900</b>	
		Status			23.900	3.000						23.900	100.00%
17	23+827	Scope	1	1.9 X 1.3	16.300	3.131	Yes	Yes	5.810	2.405	Yes	<b>22.110</b>	
		Status			16.300	3.131						16.300	73.72%
18	24+979	Scope	1	1.3 X 0.9	17.000	1.650	No	Yes	-	1.650	No	<b>17.000</b>	
		Status			17.000	1.650						17.000	100.00%

Sr No.	Chainage As per Design	Status of work	No. of cells	Span Length (axb)	LHS			Median	RHS			BHS	% of length completed
					Length	Retaining Wall	Connection with Drain		Length	Retaining Wall	Connection with Drain	Total Length	
19	25+222	Scope	1	4.5 X 3	18.120	5.416	Yes	Yes	1.600	5.472	Yes	19.720	
		Status			18.120							18.120	91.89%

**(B) RCC BOX CULVERT**

Sr No.	Structure	Chainage As per Design	Status of work	No. of cells	Span Length (axb)	LHS			Median	RHS			BHS	% of length completed
						Length	Retaining Wall	Connection with Drain		Length	Retaining Wall	Connection with Drain	Total Length	
1	Box Culvert	05+749	Scope	1	2.5 X 2.5	15.250	6.180	No	Yes	15.250	6.180	No	30.500	
			Status							10.700			10.700	35.08%
2	Box Culvert	05+883	Scope	1	2 X 2	15.210	7.085	No	Yes	15.210	7.085	No	30.420	
			Status							13.000			13.000	42.74%
3	Box Culvert	09+520	Scope	1	2 X 2	11.750	7.085	No	Yes	11.750	7.085	No	23.500	
			Status			11.750	7.085			11.750	7.085		23.500	100.00%
4	Box Culvert Pre Cast	11+083	Scope	1	2 X 2	13.000	7.085	No	Yes	13.000	7.085	No	26.000	
			Status			13.000	4.300			13.000	7.085 *		26.000	100.00%
5	Box Culvert Pre Cast	11+326	Scope	1	2 X 2	13.000	7.085	No	Yes	13.000	7.085	No	26.000	
			Status			13.000	7.085			13.000	7.085 *		26.000	100.00%



Sr No.	Structure	Chainage As per Design	Status of work	No. of cells	Span Length (axb)	LHS			Median  NJCB	RHS			BHS  Total Length	% of length completed
						Length	Retaining Wall	Connection with Drain		Length	Retaining Wall	Connection with Drain		
6	Box Culvert	11+469	Scope	1	2 X 2	13.000	7.085	No	Yes	13.000	7.085	No	<b>26.000</b>	
			Status			13.000				13.000	7.085		26.000	100.00%
7	Box Culvert	11+616	Scope	1	2 X 2	13.000	3.844	No	Yes	13.000	3.844	No	<b>26.000</b>	
			Status			13.000	3.844*			13.000			26.000	100.00%
8	Box Culvert	11+771	Scope	1	2 X 2	13.000	7.085	No	Yes	13.000	7.085	No	<b>26.000</b>	
			Status			13.000	7.085						13.000	50.00%
9	Box Culvert	11+836	Scope	1	2 X 2	13.000	7.085	No	Yes	13.000	7.085	No	<b>26.000</b>	
			Status			13.000	7.085						13.000	50.00%
10	Box Culvert	12+203	Scope		2.5 X 2.5	13.000	4.032	No	Yes	13.000	4.032	No	<b>26.000</b>	
			Status			13.000	4.032			13.000			26.000	100.00%
11	Box Culvert	13+442	Scope	1	2 X 2	17.500	7.085	Yes	Yes	17.500	7.085	Yes	<b>35.000</b>	
			Status			9.200							9.200	26.29%
12	Box Culvert	13+790	Scope	1	2 X 2	15.250	7.085	No	Yes	15.250	7.085	No	<b>30.500</b>	
			Status			15.250				15.250			30.500	100.00%
13	Box Culvert	14+827	Scope	1	2 X 2	17.500	3.837	Yes	Yes	17.500	3.841	Yes	<b>35.000</b>	
			Status			14.800							14.800	42.29%
14	Box Culvert	15+509	Scope	1	5 X 4	17.500	4.500	Yes	Yes	17.500	4.500	Yes	<b>35.000</b>	
			Status			16.050	5.000						16.050	45.86%

Sr No.	Structure	Chainage As per Design	Status of work	No. of cells	Span Length (axb)	LHS			Median  NJCB	RHS			BHS  Total Length	% of length completed
						Length	Retaining Wall	Connection with Drain		Length	Retaining Wall	Connection with Drain		
15	Box Culvert	16+004	Scope	1	3 X 3.5	17.500	9.417	Yes	Yes	17.500	9.417	Yes	<b>35.000</b>	
			Status			17.500	9.417	NS	NS	NS	NS	NS	17.500	50.00%
16	Box Culvert	16+939	Scope	1	2 X 2	17.823	7.625	Yes	Yes	16.830	6.602	yes	<b>34.653</b>	
			Status	1						16.800	6.500		16.800	48.48%
17	Box Culvert	17+239	Scope	1	3 X 3	14.570	no	yes	no	13.500	9.237	yrs	<b>28.070</b>	
			Status	1		5.700				9.400			15.100	53.79%
18	Box Culvert	18+462	Scope	1	2 X 1.5	18.250	0.000	Yes	Yes	18.250	0.000	Yes	<b>36.500</b>	
			Status			10.500							10.500	28.77%
19	Box Culvert	19+580	Scope	1	1.5 X 1.5	18.250	0.000	Yes	Yes	18.250	0.000	Yes	<b>36.500</b>	
			Status			10.500				6.600			17.100	46.85%
20	Box Culvert	19+869	Scope	1	1.5 X 1.5	18.250	0.000	Yes	Yes	18.250	0.000	Yes	<b>36.500</b>	
			Status			8.500				9.200			17.700	48.49%
21	Box Culvert	20+031	Scope	1	3 X 2	18.250	0.000	Yes	Yes	18.250	0.000	Yes	<b>36.500</b>	
			Status			7.400				14.500			21.900	60.00%
22	Box Culvert	20+152	Scope	1	2.5 X 2	18.250	0.000	Yes	Yes	18.250	0.000	Yes	<b>36.500</b>	
			Status			8.500				15.400			23.900	65.48%
23	Box Culvert	21+703	Scope	1	2 X 2	13.430	7.085	No	Yes	13.430	7.085	No	<b>26.860</b>	
			Status			8.500	4.500						8.500	31.65%

Sr No.	Structure	Chainage As per Design	Status of work	No. of cells	Span Length (axb)	LHS			Median  NJCB	RHS			BHS  Total Length	% of length completed
						Length	Retaining Wall	Connection with Drain		Length	Retaining Wall	Connection with Drain		
24	Box Culvert	22+620	Scope	1	2.5 X 1.5	17.500	2.762	Yes	Yes	17.500	3.873	Yes	<b>35.000</b>	
			Status			17.500				17.500			35.000	100.00%
25	Box Culvert	23+438	Scope	1	2 X 1.5	17.500	2.745	Yes	Yes	17.500	2.722	Yes	<b>35.000</b>	
			Status			17.500	2.745						17.500	50.00%
26	Box Culvert	24+836	Scope	1	2 X 2	13.000	5.225	No	Yes	13.000	5.225	No	<b>26.000</b>	
			Status			17.500							17.500	67.31%
27	Box Culvert	25+421	Scope	1	2 X 1.5	18.250	0.000	Yes	Yes	18.250	0.000	Yes	<b>36.500</b>	
			Status			17.000							17.000	46.58%
28	Box Culvert	25+607	Scope	1	3 X 3	18.250	0.000	Yes	Yes	18.250	0.000	Yes	<b>36.500</b>	
			Status			21.200							21.200	58.08%
29	Box Culvert	25+904	Scope	1	1.5 X 1.5	18.250	0.000	Yes	Yes	18.250	0.000	Yes	<b>36.500</b>	
			Status			11.400							11.400	31.23%
30	Box Culvert	26+045	Scope	1	1.5 X 1.5	18.250	0.000	Yes	Yes	18.250	0.000	Yes	<b>36.500</b>	
			Status			14.700							14.700	40.27%
31	Box Culvert	26+403	Scope	1	2 X 2	15.250	7.085	No	Yes	15.250	7.085	No	<b>30.500</b>	
			Status			13.300	3.300						13.300	43.61%
32	Box Culvert	26+591	Scope	1	2 X 2	14.460	7.085	No	Yes	14.460	7.085	No	<b>28.920</b>	
			Status			17.000	4.000						17.000	58.78%

Sr No.	Structure	Chainage As per Design	Status of work	No. of cells	Span Length (axb)	LHS			Median  NJCB	RHS			BHS  Total Length	% of length completed
						Length	Retaining Wall	Connection with Drain		Length	Retaining Wall	Connection with Drain		
33	Box Culvert	26+641	Scope	1	2 X 2	14.750	7.085	No	Yes	14.750	7.085	No	<b>29.500</b>	
			Status			16.400	4.000						16.400	55.59%
34	Box Culvert	26+731	Scope	1	2 X 2	15.250	7.085	No	Yes	15.250	7.085	No	<b>30.500</b>	
			Status			17.700							17.700	58.03%
35	Box Culvert	26+788	Scope	1	2 X 2	15.548	7.085	No	Yes	15.548	7.085	No	<b>31.096</b>	
			Status			16.200	3.000						16.200	52.10%
36	Box Culvert Pre Cast	28+375	Scope	1	1.5 X 1.5	17.500	2.728	Yes	Yes	17.500	2.630	Yes	<b>35.000</b>	
			Status							16.300			16.300	46.57%
37	Box Culvert	28+629	Scope	1	6 X 2	15.250		No	Yes	15.250		No	<b>30.500</b>	
			Status							12.500			12.500	40.98%
38	Box Culvert	28+863	Scope	1	2 X 2	15.375	7.374	No	Yes	15.375	7.374	No	<b>30.750</b>	
			Status							16.400			16.400	53.33%
39	Box Culvert	29+097	Scope	1	1.5 X 1.5	17.500	2.900	Yes	Yes	17.500	4.383	Yes	<b>35.000</b>	
			Status			18.500							18.500	52.86%
40	Box Culvert	31+297	Scope	1	3 X 3	11.750	7.085	No	Yes	11.750	7.085	No	<b>23.500</b>	
			Status							13.750			13.750	58.51%
41	Box Culvert	31+584	Scope	1	3 X 3	11.750	7.085	No	Yes	11.750	7.085	No	<b>23.500</b>	
			Status							11.750	7.085		11.750	50.00%

**9. Total Number of Structures**

The total number of structures on the Site is noted below:

Sl. No.	Name of Structure	Total Numbers
1	Major Bridge	04
2	Minor Bridge	14
3	Flyover	01
4	VUP	01
5	Culvert	60

**10. Bus Bays and Truck Lay Bys**

The total number of bus bays and truck lay bies on the Project is noted below:

(a)	No. of Bus bays on LHS	- Nil
(b)	No. of Bus bays on RHS	- Nil
(c)	No. of Truck lay-bies on LHS	- Nil
(d)	No. of Truck lay-bies on RHS	- Nil

**11. Wayside Amenities / Truck Parking**

The Site includes the parcels of land for provision of wayside Amenities / truck parking as given in Schedule C.

**12. Existing utility**

The details of existing utility services are given in Annex IV.

**13. Details of RE block already casted**

Total 279747 nos. of RE blocks have already been casted and are placed on site at chainage 18+700. However, Contractor has to assess the exact number of RE Blocks on his own after detail inventory study.

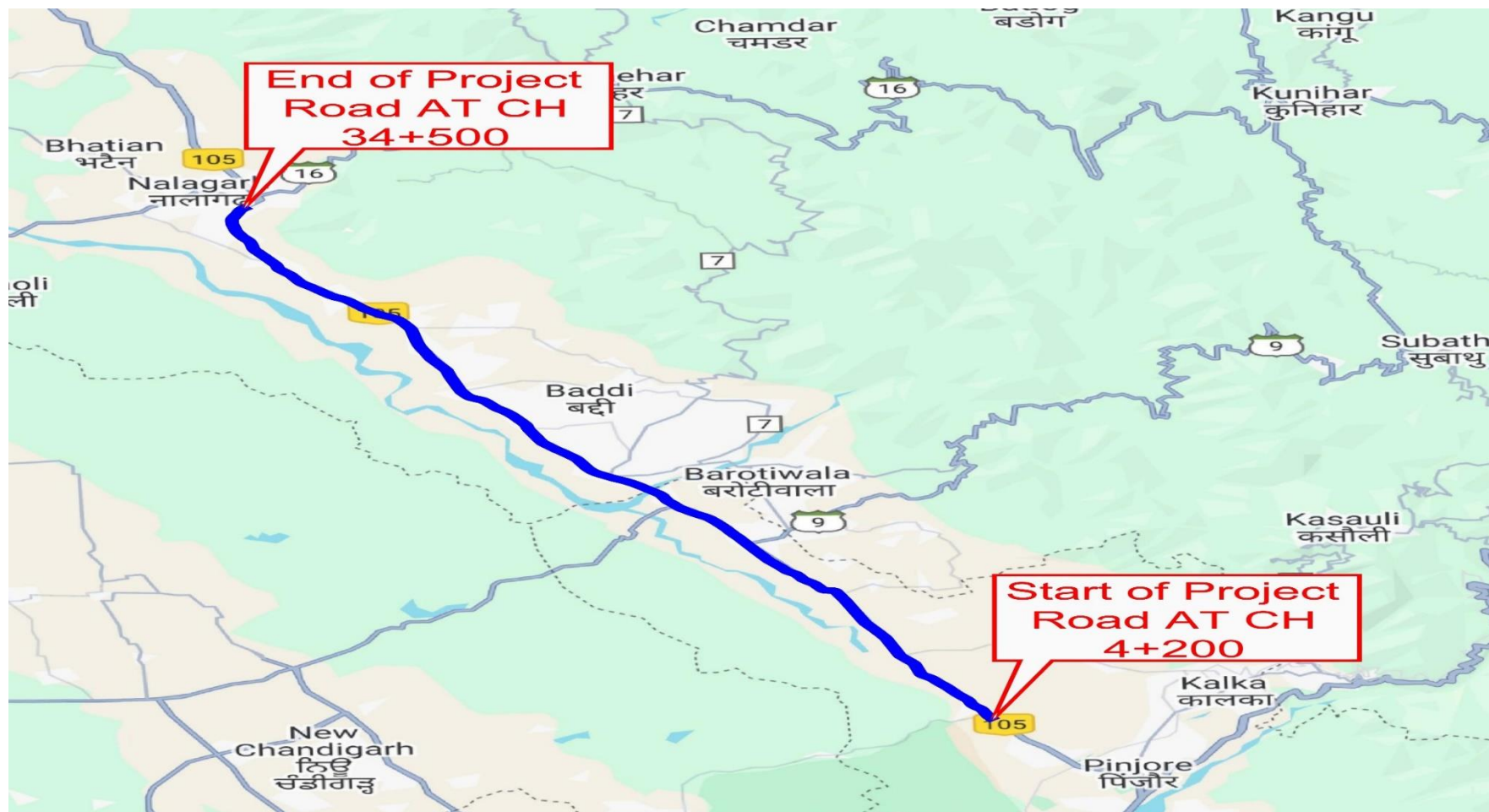
**14. Detail Summary of Girder Casted at Pinjore to Nalagarh Site (RCC & PSC)**

<b>Detail Summary of Girder Casted at Pinjore to Nalagarh Site (RCC &amp; PSC)</b>														
S.No	Chainage	Type of Structure	Latitude	Longitude	Village	RCC	PSC Stressed	PSC Unstressed	Dimension			Total No	Casting side	Remarks
									Length	Width (Bottom/Top flange)	Height			
1	28+788	MNB	30.99706325	76.73939124	Bagrbani a			8	29.2	0.750/0.750	2	8	28+600	
2	26+535	MJB	30.98265599	76.7518588	Maanpur a			8	38.7	0.750/1.100	2.6	8	26+500	
3	21+172	MNB	30.943738	76.777975	Maalpur		8		28.2	0.750/0.750	2	8	21+172 (A2side)	
4	21+606	MNB	30.94547907	76.77711304	Maalpur	4			14.2	0.600/0.600	1.2	4	21+606 (A2 side)	
5	19+400	MNB	30.927355	76.792185	Baddi	3			14.2	0.600/0.600	1.2	3	19+340	
6	19+000	Flyover	30.91954911	76.80481453	Baddi		4	59	29.2	0.750/0.850	2	63	17+600(A2 side)	1 girder fell in river (unstressed)
7	19+000	Flyover	30.91954911	76.80481453	Baddi			21	34.2	0.750/1.1	2.3	21	17+600(A2 side)	
8	19+000	Flyover	30.91954911	76.80481453	Baddi			2	34.2	0.750/1.1	2.3	2	17+600(A1 side)	1 girder rejected due to cone breakdown

9	19+000	Flyover	30.9195491 1	76.8048145 3	Baddi		2		34.2	0.750/1.1	2.3	2	17+600(A1 side)	2 girder fell in River
10	17+634	MJB	30.9195491 1	76.8048145 3	Baddi		4		36.8	0.750/1.1	2.3	4	17+600(A1 side)	1 girder fell on Ground
11	19+000	Flyover	30.9195491 1	76.8048145 3	Baddi		14		29.2	0.750/0.850	2	14	17+600(A1 side)	
12	19+000	Flyover	30.9195491 1	76.8048145 3	Baddi		10		34.2	0.750/1.1	2.3	10	17+600(A1 side)	5 girder fell on Ground and 1 girder fell in river
13	17+634	MJB	30.9195491 1	76.8048145 3	Baddi		24		36.8	0.750/1.1	2.3	24	17+600(A1 side)	
14	19+000	Flyover	30.9219387 6	76.8102552 2	Baddi		7		29.2	0.750/0.850	2	7	Km18 stock yard	
15	10+175 RHS	MNB	30.8679591 3	76.8512244 3	Nanakpu r			4	30.2	0.750/0.850	2	4	10+175 RHS	
16	9+941 RHS	MNB	30.8656606 2	76.8521968 8	Jholuwal a	8			23.2	0.750/0.750	1.6	8	Km 9+480 RHS	
17	9+271 LHS	MNB	30.8607097 5	76.8553725 7	Jholuwal a	8			23.2	0.750/0.750	1.6	8	Km 9+450 LHS	
18	6+078 LHS	MNB	30.8357839 6	76.8720937 3	Basola			8	29.2	0.750/0.750	2	8	Km 6+300 LHS	
<b>TOTAL</b>							<b>23</b>	<b>73</b>	<b>110</b>			<b>206</b>	Km 6+300 LHS	



**Annex A-I**



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**Annex - II**  
(Schedule-A)

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

Sl. No	Design Chainage (Km)		Length (km)	Width (m)	Date of providing ROW*
	From	To			
1	2	3	4	5	6
Right of Way (full width)	4+200	34+500	30.3	39	On appointment date.

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**Annex – III**  
*(Schedule-A)*  
**Alignment Plans**

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

- (i) The alignment of the Project Highway is enclosed in alignment plan. Finished road level indicated in the alignment plan and Profile shall be followed by the contractor. In any case FRL of the Project highway shall not be less than that indicated in the Plan and Profile.
- (ii) Traffic signs is enclosed in the drawings folder. The contractor shall, however, improve/upgrade upon the traffic signage based on site/design requirement as per the relevant specifications/IRC Codes/Manual.

**Annex - IV***(Schedule-A)***a. Existing Cross Roads**

S. No.	Design Chainage (Km)	Junction Type	Leads to		Category of cross road
			Left	Right	
1	7+920	T	-	Charnia	VR
2	14+300	T	-	Madawala	SH-9
3	17+780	T	-	Suncity Road	MDR
4	23+970	X (Staggered)	Malku Majra	Bhud Barrier	ODR
5	24+260	T	Truck Union	-	VR
6	27+150	T	-	Manpura	SH
7	4+530	T	Khera	-	VR
8	5+040	X	Basolan	Basolan	VR
9	6+240	T	-	Garidan	VR
10	7+320	T	-	Kiratpur	VR
11	8+010	T	Charnia	-	VR
12	8+760	T	-	Johluwal	VR
13	9+160	T	Johluwal	-	VR
14	9+640	T	-	Karanpur	VR
15	10+250	T	-	Ramnagar	VR
16	10+540	T	-	Khol Albela	VR
17	11+070	X	Nanakpur	Nanakpur	VR
18	11+670	T	Nanakpur	-	VR
19	12+000	T	-	Nanakpur	VR
20	12+520	T	-	Rampur Jungi	VR
21	12+710	T	Jhunga	-	VR
22	13+260	T	-	Kona	VR
23	13+460	T	Kona	-	VR
24	14+650	T	-	Madawala	VR
25	15+220	T	-	Madawala	VR
26	15+750	T	-	Gorakhnath Temple	VR
27	17+210	T	-	Khokra	VR
28	17+460	T	-	Khokra	VR
29	20+640	T	-	Sandoli	VR
30	21+220	T	-	CPET	VR
31	21+320	T	CETP		VR
32	21+500	Y	-	Malpur	VR
33	21+600	Y	Malpur	-	VR
34	22+090	T	Malpur	-	VR
35	22+150	T	-	Baddi University	VR
36	22+350	T	Bhud	-	VR

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

S. No.	Design Chainage (Km)	Junction Type	Leads to		Category of cross road
			Left	Right	
37	22+540	T	-	Bhud	VR
38	23+000	T	Daso Majra	-	VR
39	23+040	T	-	Daso Majra	VR
40	23+160	T	Daso Majra	-	VR
41	23+310	T	-	Dr. Reddy	VR
42	23+580	T	-	Malku Majra	VR
43	23+640	T	Malku Majra	-	VR
44	24+560	T	-	Harraipur	VR
45	24+630	Y	Harraipur	-	VR
46	24+660	T	-	Harraipur	VR
47	24+920	Y	-	Guru Majra	VR
48	25+110	X	Kishanpura	Guru Majra	VR
49	25+400	T	-	Kishanpura	VR
50	25+470	T	Kishanpura	-	VR
51	25+850	X	Kishanpura	Kishanpura	VR
52	26+040	T	-	Kishanpura	VR
53	26+580	X	Manpura	Manpura	VR
54	27+600	T	Manpura	-	VR
55	27+930	X	Kharuni	Kharuni	VR
56	28+020	T	Kharuni	-	VR
57	28+550	X	Tahliwal	Tahliwal	VR
58	28+580	T	Tahliwal	-	VR
59	28+830	T	Bagbania	-	VR
60	29+120	X (Staggered)	Nalka	Dhana	VR
61	29+730	T	Bele Deyodh	-	VR
62	30+130	T	Bele Deyodh	-	VR
63	30+300	T	-	Bele Deyodh	VR
64	30+610	T	-	Khera Chak	VR
65	30+820	X	Khera Chak	Khera Chak	VR
66	31+120	T	-	Khera Chak	VR
67	31+390	X	Khera Chak	Khera Chak	VR
68	31+450	X	Khera Chak	Khera Chak	VR
69	31+700	T	Khera Chak	-	VR
70	32+150	T	-	Dadi Kaniya	VR
71	32+340	T	Dadi Kaniya	-	VR
72	32+900	X	Peersthan	Peersthan	VR
73	33+100	T	Kirpalpur	-	VR
74	33+310	Y	Kirpalpur	-	VR
75	33+510	T	Rakhram singh	-	VR
76	33+910	Y	Rakhram singh	-	VR

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

S. No.	Design Chainage (Km)	Junction Type	Leads to		Category of cross road
			Left	Right	
77	34+050	T	Rakhram singh	-	VR
78	34+390	Y	-	Mini Secretariat	VR
79	34+500	T	Mini Secretariat	-	VR
80	16+660	T	Chandigarh	-	ODR
81	18+415	T	-	Baddi Civil Hospital	VR
82	18+760	X (Staggered)	Industrial Area	Baddi-Sai Raod	ODR
83	18+970	T	Sheetalpur Road	-	VR
84	19+130	T	-	Baddi Civil Hospital	VR
85	19+310	T	Sheetalpur Road	-	VR
86	19+400	X	Truck Union	Baddi Market	ODR
87	19+680	T	-	Women Police Station	VR
88	19+900	T	-	Bilanwali Gujran	VR
89	20+040	T	-	Haripur Sandoli	VR
90	25+650	T	-	Glenmark Road	ODR

**b. Electrical Utilities**

The site includes the following electrical utilities

sl no	Chainage		HT/LT Crossing	HT/LT Crossing	33KV crossing	Remark for crossings	LT along line length mtr	11 KV along line length in mtr	33 KV along line length in mtr	T/F	Location
	From	To									
1	6+636		1			Under Ground					
2	6+790		1			Under Ground					
3	6+985		1			Under Ground					
4	7+165		1			Under Ground					
5	7+350		1			Under Ground					
6	7+500		1			Under Ground					
7	8+152		1			Under Ground					
8	8+540		1			Under Ground					
9	8+900		1			Under Ground					
10	10+652		1			Under Ground					
11	11+650		1			Under Ground					
12	11+860		1			Under Ground					
13	11+948		1			Under Ground					
14	13+663		1			Under Ground					
15	14+230		1			Under Ground					
16	14+430		1			Under Ground					
17	14+350					Under Ground				1	

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

sl no	Chainage		HT/LT Crossing	HT/LT Crossing	33KV crossing	Remark for crossings	LT along line length mtr	11 KV along line length in mtr	33 KV along line length in mtr	T/F	Location
	From	To									
18	14+352		1			Under Ground					
19	14+430		1			Under Ground					
20	14+710		1			Under Ground					
21	15+440		1			Under Ground					
22	16+200		1			Under Ground					
23	16+350		1			Under Ground					
24	15+740		1			Under Ground					
25	16+600		1			Under Ground					
26	16+970		1			Under Ground					
27	16+980		1			Under Ground					
28	17+000		1			Under Ground					
29	17+190					Under Ground				1	RHS
30	17+285		1			Under Ground					
31	17+380		1			Under Ground					
32	17+800		1			Under Ground					
33	17+920		1			Under Ground					
34	17+920		1			Under Ground					
35						Under Ground					
36	17760	18400				Under Ground		640			RHS
37	18+600		1			Under Ground					
38	18+961		1			Under Ground					
39	18+150		1			Under Ground					
40	18+190		1			Under Ground					
41	18+330		1			Under Ground					
42	18+450		1			Under Ground					
43	18+600		1			Under Ground					
44	18+720		1			Under Ground					
45	18800	18830				Under Ground	30				RHS
46	19130	19400				Under Ground		270			RHS
47	19+230		1			Under Ground					
48	19+390		1			Under Ground					
49	19+520		1			Under Ground					
50	19+650		1			Under Ground					
51	19+720		1			Under Ground					
52	19+920		1			Under Ground				2	LHS
53	20+177		1	1		Under Ground					
54	20177	20300				Under Ground		123			LHS
55	20400	20550				Under Ground	150				RHS
56	20+400			1		Under Ground					
57	20+470		1			Under Ground					

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

sl no	Chainage		HT/LT Crossing	HT/LT Crossing	33KV crossing	Remark for crossings	LT along line length mtr	11 KV along line length in mtr	33 KV along line length in mtr	T/F	Location
	From	To									
58	20890	21100				Under Ground		210			RHS
59	21+200				8	Under Ground				1	LHS
60	21+745		1			Under Ground					HDD
61	21+850		1			Under Ground					
62	22+320					Under Ground				1	LHS
63	23+450					Under Ground				1	LHS
64	23500	23730				Under Ground	230	230			RHS
65	23+700					Under Ground				1	RHS
66	23+990		1	1		Under Ground					
67	24+000				1	Under Ground					
68	24+250			1		Under Ground					
69	24+560			2		Under Ground					
70	24560	24720				Under Ground		160			LHS
71	24+870					Under Ground				1	Centre
72	25+100					Under Ground				1	LHS
73	25+100			1		Under Ground				1	LHS
74	25+150					Under Ground					
75	25+170					Under Ground				1	LHS
76	25+300					Under Ground				1	LHS
77	25350	25400				Under Ground		50			LHS
78	25+500					Under Ground				1	LHS
79	25+620		1			Under Ground					
80	25750	26050				Under Ground	300	300			
81	25+850					Under Ground				1	
82	25+900			1		Under Ground					
83	25+920		1			Under Ground					
84	26+030		1			Under Ground				1	
85	26+140		1			Under Ground					
86	26860	27200				Under Ground		340			LHS
87	27+060		1			Under Ground					
88	27000	27300				Under Ground		300			RHS
89	27+300		1	1		Under Ground					
90	27950	28050				Under Ground	100	100			RHS
91	28+490			1		Under Ground				1	LHS
92	28490	28550				Under Ground	60				LHS
93	28550		1			Under Ground					
94	28630		1			Under Ground					
95	28830	28850				Under Ground	20				LHS
96	28840	28890				Under Ground	50				RHS
97	29+020		1			Under Ground				1	RHS

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.



sl no	Chainage		HT/LT Crossing	HT/LT Crossing	33KV crossing	Remark for crossings	LT along line length mtr	11 KV along line length in mtr	33 KV along line length in mtr	T/F	Location
	From	To									
98	29+200		1			Under Ground				2	LHS+RHS
99	29+300		1			Under Ground					
100	29+350		1			Under Ground					
101	29+400		1			Under Ground					
102	29400	29550				Under Ground	150				LHS
103	29400	29550				Under Ground	150				RHS
104	29+580		1			Under Ground					
105	29+480					Under Ground				1	RHS
106	29+560					Under Ground				1	RHS
107	29+630					Under Ground				1	LHS
108	29+980					Under Ground				1	RHS
109	30+480		1			Under Ground				1	centre
110	30+560		1			Under Ground					
111	31640	32000				Under Ground	360	360			LHS
112	31+900		1			Under Ground				1	LHS
113	32+000		1			Under Ground					
114	32+930					Under Ground				1	LHS
115	32+200		1			Under Ground					
116	32000	32200				Under Ground	200	200			LHS
117	32000	32300				Under Ground		300			RHS
118	32300	32500				Under Ground	200				LHS
119	32420	32560				Under Ground	140	140			LHS
120	32780	32950				Under Ground		170			RHS
121	32+900		2			Under Ground					
122	33420	33660				Under Ground	240				LHS
123	33+560		2			Under Ground				2	
124	33700	33800				Under Ground			100		RHS
125	33+750		1			Under Ground					
126	33850	34050				Under Ground			200		LHS
127	33+910		1			Under Ground					
128	33+950		1			Under Ground					
129	34+060				1	Under Ground					
130	34+100			1		Under Ground					
131	34100	34500				Under Ground		400			LHS
132	34+200		1			Under Ground					
133	34+400			1		Under Ground					
	<b>Total</b>		<b>78</b>	<b>12</b>	<b>10</b>		<b>2380</b>	<b>4293</b>	<b>300</b>	<b>29</b>	

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

sl no	Chainage		HT/LT Crossing	HT/LT Crossing	33KV crossing	Remark for crossings	LT along line length mtr	11 KV along line length in mtr	33 KV along line length in mtr	T/F	Location
	From	To									
<p>20% extra of the calculated crossings and along line is taken as Utility owning department may be erect new line / crossing/ or Transformer along the project alignment till finalization of the EPC Contractor. The Estimate taken on the basis of future consideration. However, if the No of crossing /along line / Transformer decreases at the time of shifting negative change of scope may be implicated. If any increase in the number of crossing /along line / Transformer positive change of scope will not be given. EPC Contractor may verify the quantum of utility before bidding process. If any change in Specification, line rating, crossing rating no change of scope will be imposed. All the material specification is as per Utility owning department specification. If the utility owning department does not allow Underground crossing, Negative change of scope will be applicable for shifting of Underground to overhead crossing</p>											
	Total		94	15	12		2856	5152	360	35	

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

**c. Public Health Utilities (Water/Sewage pipe Lines)**

Sl.No	Design Chainage		Length (m)				Crossing				Remarks
	From	To	Water Supply Line		Sewage Line		Water Supply Line		Sewage Line		
			With Pumping	With Gravity Flow	With Pumping	With Gravity Flow	With Pumping	With Gravity Flow	With Pumping	With Gravity Flow	
1	21+196	21+589		393							Multiple lines
2	23+090	23+530		440							
3	24+320	24+650		330							
4	24+650	25+150		500							
5	25+150	25+640		490							
6	25+660	26+200		540							
7	29+050	30+000		950							
8	29+150							140			Bagwania crossing (Multiple lines)
9	31+898	33+368		1470							Multiple lines
10	31+900							340			Near shimla sweet crossing (Multiple lines)
11	32+600							1870			Doon Colony crossing (Multiple lines)
12	32+600							900			Doon Colony crossing (Multiple lines)
13	32+900							150			Peersthan crossing (Multiple lines)
14	32+900							400			Peersthan crossing (Multiple lines)
15	33+090							250			Akash hotel crossing (Multiple lines)
16	33+090							180			Akash hotel crossing (Multiple lines)
17	33+400							1500			Kirpalpur crossing (Multiple lines)
18	33+471	33+737		266.8							Multiple lines

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

Sl.No	Design Chainage		Length (m)				Crossing				Remarks
	From	To	Water Supply Line		Sewage Line		Water Supply Line		Sewage Line		
			With Pumping	With Gravity Flow	With Pumping	With Gravity Flow	With Pumping	With Gravity Flow	With Pumping	With Gravity Flow	
19	33+871	34+500		629							Multiple lines
20	33+880	34+130		250							IPH Tank to IPH rest house (1.25") (Multiple lines)
21	33+880	33+980		100							IPH Tank to PG College (2") (Multiple lines)
22	34+000	34+450				450					IPH Rest House to Aakash Hospital (150 mm Φ) (Multiple lines)
23	34+320	34+420		100							IPH Tank to Anganwadi (2") (Multiple lines)
24	34+550	35+050				500					Police station to Shagun hotel(150mmΦ) (Multiple lines)
25	34+550	34+900		350							Pawan restaurant to police station(3") (Multiple lines)
26	34+600	35+050		450							Govt colony (2.25") (Multiple lines)
27	34+800	35+000		100							Ropar chowk(4") (Multiple lines)
28	34+800	35+000		100							Ropar chowk(1.25") (Multiple lines)
29	34+900	35+060		160							Ayurvedic hospital (2") (Multiple lines)

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4200 to 35395) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

# SCHEDULE - B

## Schedule-B

### 1. Development of the Project Highway

The Project Highway shall generally follow the horizontal alignment shown in the plan specified in Annexure-III of Schedule-A, unless otherwise specified by the Authority. Notwithstanding anything to the contrary contained in this Agreement or IRC SP 84-2019, the proposed plan & profile locations of different structures/drains/service & slip road RE walls, chainages of different structures/drains/service & slip road/RE walls, length of different structures/drains/service & slip road/RE walls etc. of the project highway as indicated in the Schedule A, Schedule B. Schedule C and their Annexures shall be treated as minimum requirement. Based on site/design requirement the Concessionaire shall finalise their Detailed Designs (Development Stage) including plan & profile of the project highway and submit the same to Authority & its Engineer for its Consent/Approval and Safety Audit by Safety Auditor, before the start of the execution of project. The designs so approved shall not be in contradiction with the scope of project. For avoidance of doubt, the provisions mentioned in Schedule B & C cannot be changed. only the design of the components is to be submitted for consent approval.

'NHAI reserves the right to Check/Verify Design Calculations and Drawings of all components of the Stretch of National Highway including the Structures Falling within the Scope of Work. The Concessionaire shall be required to furnish all Data pertaining to detailed Designs, Drawings, Calculations, Design Basis Report, Input Files of Design Software used in the Project, etc. to the Authority and/or the Independent Engineer Free of Cost within a time as specified by the Authority and/or the Independent Engineer'. (as per the new circular 11.66/2025 8th April).

'The Concessionaire shall deploy at its own Cost and Expenses, the Grading/Paving/Compaction Equipment fitted with System of **Automated & Intelligent Machine-aided Construction (AI-MC)** for finishing of all Grades including Embankment, Subgrade, GSB, WMM. The System of **Automated & Intelligent Machine-aided Construction (AI-MC)** used by the Concessionaire shall be capable of delivering accuracy as per the applicable IRC specifications. During the Construction Period, the Concessionaire shall furnish all the Physical Progress Data (All desired type of Surface Grading Data, Compaction and Temperature Data etc.) obtained through System of **Automated & Intelligent Machine-aided Construction (AI-MC)/CMS** to Authority for monitoring of Construction on Daily Basis. These Digital Data and desired output shall be made available at the Location (Server/Cloud) finalised by Authority'.

#### 1.1. Width of Carriageway

**1.1.1** Four lane with paved shoulders shall be undertaken. The paved carriageway shall be 18 to 20 meter for four laning (including paved shoulder). Paved carriageway shall be 18 m for four laning (including paved shoulder and kerb shyness), Paved carriageway shall be 11m for high embankment with one side Retaining Earth Wall, Paved carriageway 12m for approaches to underpass/ structures. The earthen shoulder shall be 1/2 meter on either sides. Earthen shoulder of 1m for embankment up to 3m. Earthen shoulder of 2m for embankment (Circular: MORTH circular, E File No.RW/NH-33044/22/2020-S&R (P&B) dated 04.06.2024).

**1.1.2.** In built - up areas, the width of paved carriageway shall be 18m (including paved shoulder and kerb shyness/edge strip).

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

- 1.1.3.** Except as otherwise provided in this Agreement, the width shall be adjusted to fit into appropriate plans and cross sections developed in accordance with TCS enclosed.
- 1.1.4.** The entire cross-sectional elements shall be accommodated in the available/proposed ROW. If required, suitable retaining structures shall be provided to accommodate the highway cross section within available/ proposed ROW. The details of such sections are mentioned in Schedule-B. In of any other section not included in Schedule-B, where retaining structures are to be provided, shall constitute a Change of Scope.

**1.2. Width of Median**

- 1.2.1** The width of median including kerb shyness shall be 2.5 meter for raised median in built up section and 5 meter in open section.

**2. Geometric Design and General Features**

- 2.1. General:** Geometric design and general features of the Project Highway shall be in accordance with Section 2 of the manual. Intermediate Sight distance (Desirable Minimum Sight Distance) shall be followed for design of all vertical curves including structures as well as highways. (clause no 2.9.5 of IRC SP 84:2019)

- 2.2. Design Speed:** The project road shall be designed for minimum speed of 50 Kmph for plain and rolling terrain. (clause no. 2.2 IRC SP 84: 2019).

**2.3. Improvement of the existing road geometrics**

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

S.No.	Design Chainage		Length (m)	Type of deficiency Design Speed (kmph)
	From	To		
1	4+700	5+500	800	65
2	6+800	7+100	300	65
3	7+300	7+550	250	65
4	11+100	11+700	600	50
5	31+000	31+500	500	65
6	32+500	32+800	300	65
7	33+600	34+400	800	65

- 2.3.2** The entire cross-sectional elements shall be accommodated in the available/proposed ROW. If required, suitable full height retaining structures shall be provided to accommodate the highway cross section within the available/proposed ROW. The details of such sections are mentioned in Schedule-B. In case of any other section not included in



Schedule-B, where retaining structure are to be provided, shall constitute a change of scope.

- 2.3.3. Realignments:** The existing road shall be improved to the standards as specified in the manual at the following locations:

S.No.	Design Chainage		Length (m)
	From	To	
Nil			

- 2.3.4. Bypass:** The existing road shall be bypassed to the standards as specified in the manual at the following locations:

S.No.	Name of bypass	Existing Chainage (Km)		Design chainage (Km)		Length (Km)
		From	To	From	To	
Nil						

## 2.4. Right of Way

Details of the Right of Way along Project Highways and Side Roads are given in Annexure-I of Schedule-A.

## 2.5. Type of shoulders

- 2.5.1** The Design Specification of paved shoulder shall conform to the requirements specified in paragraph 5.10 of the manual and schedule D.

- 2.5.2** Paved shoulders and strip on median side shall be of same specification and pavement composition as of main carriageway (Clause No. 5.10 IRC: SP:84-2019).

- 2.5.3** The overlay on the main carriageway pavement and on the paved shoulders shall be uniform in thickness and composition, (Clause No. 5.10 IRC: SP:84-2019).

- 2.5.4** In Built-up sections, footpaths fully paved shoulder shall be provided with width 2.5m (Clause No. 2.6 IRC: SP 84-2019).

- 2.5.5** In open country, paved shoulders of 1.5m width shall be provided. (Clause No. 2.6 IRC SP 84-2019).

- 2.5.7** The Design Specification of Earthen paved shoulder shall conform to the requirements specified in paragraph 5.11 of the manual.

- 2.5.8** The earthen shoulder of 2 m width on shoulder side shall be provided with top 150 mm on earthen shoulder with well graded naturals and moorum gravel crust stones or combination thereof, confirming to Clause 401 of MORTH specification (Clause No. 5.11 IRC: SP:84-2019).

## 2.6 Lateral and Vertical Clearance at Underpasses

- 2.6.1.** In Case of VUP/LVUP/SVUP, the proposed structure, the finish road level in VUP/LVUP/SVUP shall be kept 150 mm above the ground level/service road/ cross road

(Whichever is Higher) to ensure that these VUP/LVUP/SVUP don't become water accumulation points (Clause No. 2.10 IRC: SP:84-2019).

**2.6.2.** The minimum vertical and horizontal clearance at the underpasses shall be as per Clause 2.10.2 of the manual.

**2.7. Lateral and vertical clearances at Overpasses**

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

**2.7.2.** Lateral clearance: The Width of the opening at the overpasses shall be as follow:

S.No.	Location Chainage (KM)	Span/opening (m)	Remarks
Nil			

(MCW – Main Carriageway, LHS - Left Hand Side and RHS – Right Hand Side)

**2.8. Services roads/Slip roads/Connecting Roads:**

**2.8.1 Services Road:** The height of embankment of service road shall confirm to Clause 4.2.1.

**2.8.2** The service roads shall be constructed at the locations and for the lengths indicated below:

**A) BALANCE WORK FOR FLEXIBLE PAVEMENT**

**FOR LHS**

**1. EARTHWORK (Embankment with Subgrade)**

Sr No.	From	To	Side	Paved Carriageway width including Shyness (m)	Length (m)
1	05+200	05+400	LHS	7.0	200.00
2	05+635	05+670	LHS	7.0	35.00
3	06+535	06+680	LHS	7.0	145.00
4	06+770	06+900	LHS	7.0	130.00
5	07+170	07+275	LHS	7.0	105.00
6	13+240	13+290	LHS	7.0	50.00
7	13+435	13+466	LHS	7.0	30.50
8	14+400	14+670	LHS	7.0	270.00
9	14+785	14+839	LHS	7.0	54.00
10	14+930	15+078	LHS	7.0	148.00
11	15+424	15+539	LHS	7.0	114.50
12	15+603	16+154	LHS	7.0	551.50
13	16+197	16+330	LHS	7.0	133.10
14	16+430	16+480	LHS	7.0	50.00
15	20+425	20+611	LHS	7.0	186.00
16	20+737	20+765	LHS	7.0	28.00
17	20+800	20+824	LHS	7.0	23.50
18	20+886	20+890	LHS	7.0	4.10
19	22+400	22+400	LHS	7.0	0.00
20	22+600	22+642	LHS	7.0	41.50
21	22+675	22+705	LHS	7.0	30.50

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

Sr No.	From	To	Side	Paved Carriageway width including Shyness (m)	Length (m)
22	22+965	23+075	LHS	7.0	110.00
23	23+140	23+244	LHS	7.0	103.50
24	23+375	23+395	LHS	7.0	20.00
25	23+431	23+530	LHS	7.0	99.50
26	23+630	23+810	LHS	7.0	180.20
27	23+859	23+870	LHS	7.0	11.20
28	24+650	24+682	LHS	7.0	32.20
29	24+827	24+891	LHS	7.0	64.00
30	24+976	24+994	LHS	7.0	17.50
31	25+088	25+150	LHS	7.0	62.00
32	30+000	30+020	LHS	7.0	20.00
33	30+024	30+030	LHS	7.0	6.00
34	30+141	30+150	LHS	7.0	9.00
35	31+845	32+000	LHS	7.0	155.00
36	34+000	34+500	LHS	7.0	500.00
37	20+300	20+309	LHS	6.0	9.00
38	20+350	20+425	LHS	6.0	75.00
<b>Total Length = 3804.30</b>					

## 2. GSB (minimum 200 mm thick)

Sr No.	From	To	Side	Paved Carriageway width including Shyness (m)	Length (m)
1	05+200	05+400	LHS	7.0	200.00
2	05+635	05+670	LHS	7.0	35.00
3	06+535	06+680	LHS	7.0	145.00
4	06+770	06+900	LHS	7.0	130.00
5	07+170	07+275	LHS	7.0	105.00
6	13+240	13+290	LHS	7.0	50.00
7	13+435	13+466	LHS	7.0	30.50
8	14+400	14+670	LHS	7.0	270.00
9	14+785	14+839	LHS	7.0	54.00
10	14+930	15+078	LHS	7.0	148.00
11	15+424	15+539	LHS	7.0	114.50
12	15+603	16+154	LHS	7.0	551.50
13	16+197	16+330	LHS	7.0	133.10
14	16+430	16+480	LHS	7.0	50.00
15	20+425	20+620	LHS	7.0	195.00
16	20+737	20+765	LHS	7.0	28.00
17	20+800	20+824	LHS	7.0	23.50

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

Sr No.	From	To	Side	Paved Carriageway width including Shyness (m)	Length (m)
18	20+886	20+890	LHS	7.0	4.10
19	22+600	22+642	LHS	7.0	41.50
20	22+675	22+705	LHS	7.0	30.50
21	22+965	23+075	LHS	7.0	110.00
22	23+140	23+244	LHS	7.0	103.50
23	23+371	23+399	LHS	7.0	27.70
24	23+431	23+530	LHS	7.0	99.50
25	23+630	23+810	LHS	7.0	180.20
26	23+859	23+870	LHS	7.0	11.20
27	24+650	24+682	LHS	7.0	32.20
28	24+827	24+891	LHS	7.0	64.00
29	24+976	24+994	LHS	7.0	17.50
30	25+088	25+150	LHS	7.0	62.00
31	30+000	30+020	LHS	7.0	20.00
32	30+024	30+030	LHS	7.0	6.00
33	30+141	30+150	LHS	7.0	9.00
34	31+845	32+000	LHS	7.0	155.00
35	34+000	34+500	LHS	7.0	500.00
36	20+300	20+309	LHS	6.0	9.00
37	20+350	20+425	LHS	6.0	75.00
<b>Total Length = 3821.00</b>					

### 3. WMM reinforced with Strata Grid SGB 80 Grid (minimum 170mm thick)

Sr No.	From	To	Paved Carriageway width including Shyness (m)	Side	Length (m)
1	05+200	05+400	7.0	LHS	200.00
2	05+635	05+670	7.0	LHS	35.00
3	06+535	06+680	7.0	LHS	145.00
4	06+770	06+900	7.0	LHS	130.00
5	07+170	07+275	7.0	LHS	105.00
6	13+240	13+290	7.0	LHS	50.00
7	13+435	13+466	7.0	LHS	30.50
8	14+400	14+670	7.0	LHS	270.00
9	14+785	14+839	7.0	LHS	54.00
10	14+930	15+320	7.0	LHS	390.00
11	15+421	15+539	7.0	LHS	117.50
12	15+603	16+154	7.0	LHS	551.50
13	16+197	16+330	7.0	LHS	133.10

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

Sr No.	From	To	Paved Carriageway width including Shyness (m)	Side	Length (m)
14	16+430	16+480	7.0	LHS	50.00
15	18+000	18+100	7.0	LHS	100.00
16	20+425	20+620	7.0	LHS	195.00
17	20+737	20+765	7.0	LHS	28.00
18	20+800	20+824	7.0	LHS	23.50
19	20+886	20+890	7.0	LHS	4.10
20	22+600	22+642	7.0	LHS	41.50
21	22+675	22+705	7.0	LHS	30.50
22	22+960	23+075	7.0	LHS	115.00
23	23+140	23+244	7.0	LHS	103.50
24	23+371	23+399	7.0	LHS	27.70
25	23+431	23+530	7.0	LHS	99.50
26	23+630	23+810	7.0	LHS	180.20
27	23+859	23+870	7.0	LHS	11.20
28	24+650	24+682	7.0	LHS	32.20
29	24+827	24+891	7.0	LHS	64.00
30	24+976	24+995	7.0	LHS	19.00
31	25+088	25+150	7.0	LHS	62.00
32	30+000	30+020	7.0	LHS	20.00
33	30+024	30+030	7.0	LHS	6.00
34	30+141	30+150	7.0	LHS	9.00
35	31+845	32+000	7.0	LHS	155.00
36	34+000	34+500	7.0	LHS	500.00
37	20+300	20+309	6.0	LHS	9.00
38	20+350	20+425	6.0	LHS	75.00
<b>Total Length = 4172.50</b>					

**4. DBM to be laid (minimum 50 mm thick) above Prime Coat**

Sr No.	From	To	Side	Paved Carriageway width including Shyness (m)	Length (m)
1	05+200	05+400	LHS	7.0	200.00
2	05+635	05+670	LHS	7.0	35.00
3	06+535	07+275	LHS	7.0	740.00
4	13+000	13+710	LHS	7.0	710.00
5	14+400	15+541	LHS	7.0	1141.00
6	15+603	16+480	LHS	7.0	877.50
7	18+000	18+100	LHS	7.0	100.00
8	20+425	20+890	LHS	7.0	465.00
9	22+590	22+705	LHS	7.0	115.00

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

Sr No.	From	To	Side	Paved Carriageway width including Shyness (m)	Length (m)
10	22+830	23+283	LHS	7.0	453.20
11	23+368	23+530	LHS	7.0	162.10
12	23+630	23+870	LHS	7.0	240.00
13	24+650	25+150	LHS	7.0	500.00
14	30+000	30+150	LHS	7.0	150.00
15	31+845	32+000	LHS	7.0	155.00
16	34+000	34+500	LHS	7.0	500.00
17	20+300	20+425	LHS	6.0	125.00
<b>Total Length = 6668.80</b>					

**5. BC to be laid (minimum 30 mm thick) above Tack Coat**

Sr No.	From	To	Side		Length (m)
1	05+200	05+670	LHS	7.0	470.00
2	06+350	07+275	LHS	7.0	925.00
3	13+000	13+710	LHS	7.0	710.00
4	14+400	16+300	LHS	7.0	1900.00
5	16+300	16+480	LHS	7.0	180.00
6	18+000	18+100	LHS	7.0	100.00
7	20+425	20+890	LHS	7.0	465.00
8	22+400	23+870	LHS	7.0	1470.00
9	24+650	25+150	LHS	7.0	500.00
10	30+000	30+150	LHS	7.0	150.00
11	31+845	32+000	LHS	7.0	155.00
12	34+000	34+500	LHS	7.0	500.00
13	20+300	20+425	LHS	6.0	125.00
<b>Total Length = 7650.00</b>					

**FOR RHS****1. EARTHWORK (Embankment with Subgrade)**

Sr No.	From	To	Side	Paved Carriageway width including Shyness (m)	Length (m)
1	05+200	05+350	RHS	7.0	150.00
2	05+540	05+670	RHS	7.0	130.00
3	06+538	06+730	RHS	7.0	192.00
4	06+770	06+780	RHS	7.0	10.00
5	06+860	06+980	RHS	7.0	120.00
6	07+069	07+275	RHS	7.0	206.00
7	13+070	13+090	RHS	7.0	20.00
8	13+160	13+170	RHS	7.0	10.00

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

Sr No.	From	To	Side	Paved Carriageway width including Shyness (m)	Length (m)
9	15+100	15+801	RHS	7.0	701.00
10	15+930	16+480	RHS	7.0	550.00
11	16+480	16+830	RHS	7.0	350.00
12	16+918	16+920	RHS	7.0	2.00
13	20+880	20+890	RHS	7.0	10.00
14	25+248	25+250	RHS	7.0	2.00
15	30+024	30+030	RHS	7.0	6.00
16	30+148	30+150	RHS	7.0	2.00
17	31+845	32+000	RHS	7.0	155.00
18	34+000	34+500	RHS	7.0	500.00
<b>Total Length = 3116.00</b>					

## 2. GSB (minimum 200 mm thick)

Sr No.	From	To	Side	Paved Carriageway width including Shyness (m)	Length
1	05+200	05+350	RHS	7.0	150.00
2	05+540	05+670	RHS	7.0	130.00
3	06+538	06+730	RHS	7.0	192.00
4	06+770	06+780	RHS	7.0	10.00
5	06+860	06+980	RHS	7.0	120.00
6	07+069	07+275	RHS	7.0	206.00
7	13+070	13+090	RHS	7.0	20.00
8	13+160	13+170	RHS	7.0	10.00
9	15+100	15+801	RHS	7.0	125.00
10	15+930	16+480	RHS	7.0	701.00
11	20+880	20+890	RHS	7.0	550.00
12	30+024	30+030	RHS	7.0	10.00
13	30+148	30+150	RHS	7.0	6.00
14	31+845	32+000	RHS	7.0	2.00
15	34+000	34+500	RHS	7.0	155.00
16	25+248	25+250	RHS	6.0	500.00
17	16+480	16+830	RHS	6.0	2.00
18	16+918	16+920	RHS	6.0	350.00
<b>Total Length = 3116.00</b>					

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

**3. WMM reinforced with Strata Grid SGB 80 Grid (minimum 170mm thick)**

Sr No.	From	To	Side	Paved Carriageway width including Shyness (m)	Length (m)
1	05+200	05+350	RHS	7.0	150.00
2	05+540	05+670	RHS	7.0	130.00
3	06+350	06+400	RHS	7.0	50.00
4	06+538	06+730	RHS	7.0	192.00
5	06+770	06+780	RHS	7.0	10.00
6	06+860	06+980	RHS	7.0	120.00
7	07+069	07+275	RHS	7.0	206.00
8	13+070	13+090	RHS	7.0	20.00
9	13+160	13+170	RHS	7.0	10.00
10	15+100	15+801	RHS	7.0	125.00
11	15+930	16+480	RHS	7.0	701.00
12	20+880	20+890	RHS	7.0	550.00
13	30+024	30+030	RHS	7.0	10.00
14	30+148	30+150	RHS	7.0	6.00
15	31+845	32+000	RHS	7.0	2.00
16	34+000	34+500	RHS	7.0	155.00
17	25+248	25+250	RHS	6.0	500.00
18	16+480	16+830	RHS	6.0	2.00
19	16+918	16+920	RHS	6.0	350.00
<b>Total Length = 3116.00</b>					

**4. DBM to be laid (minimum 50 mm thick) above Prime Coat**

Sr No.	From	To	Side	Paved Carriageway width including Shyness (m)	Length (m)
1	05+200	05+670	RHS	7.0	470.00
2	06+350	07+275	RHS	7.0	925.00
3	13+070	13+090	RHS	7.0	20.00
4	13+160	13+170	RHS	7.0	10.00
5	15+100	16+300	RHS	7.0	125.00
6	16+300	16+480	RHS	7.0	1200.00
7	20+880	20+890	RHS	7.0	180.00
8	22+400	22+410	RHS	7.0	10.00
9	22+520	22+540	RHS	7.0	10.00
10	30+000	30+150	RHS	7.0	20.00
11	31+845	32+000	RHS	7.0	150.00
12	34+000	34+500	RHS	7.0	155.00
13	25+248	25+249	RHS	6.0	500.00

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.



Sr No.	From	To	Side	Paved Carriageway width including Shyness (m)	Length (m)
14	16+480	16+920	RHS	6.0	0.50
<b>Total Length = 4090.50</b>					

**5. BC to be laid (minimum 30 mm thick) above Tack Coat**

Sr No.	From	To	Side	Paved Carriageway width including Shyness (m)	Length (m)
1	05+200	05+670	RHS	7.0	470.00
2	06+350	07+275	RHS	7.0	925.00
3	13+000	13+170	RHS	7.0	170.00
4	15+100	16+300	RHS	7.0	125.00
5	16+300	16+480	RHS	7.0	1200.00
6	20+880	20+890	RHS	7.0	180.00
7	22+400	22+540	RHS	7.0	10.00
8	30+000	30+150	RHS	7.0	140.00
9	31+845	32+000	RHS	7.0	150.00
10	34+000	34+500	RHS	7.0	155.00
11	16+480	16+920	RHS	6.0	500.00
<b>Total Length = 4340.00</b>					

**B) Proposal of service road to be reconstructed with Rigid Pavement (minimum 300mm PQC, 150 mm DLC, 150 mm GSB)**

Sr.No.	Chainage		Side	Length(m)
	From	To		
1	13170	13710	RHS	540
2	14325	14400	RHS	75
3	14400	15100	RHS	700
4	18000	18470	RHS	470
5	18470	18620	RHS	150
6	18620	20070	RHS	1450
7	20070	20265	RHS	195
8	20265	20600	RHS	335
9	20600	20880	RHS	280
10	18100	19500	LHS	1400
11	22540	22730	RHS	190
12	22730	23870	RHS	1140
13	24650	25248	RHS	598
14	25441	25922	RHS	481
15	26019	26050	RHS	31

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

Sr.No.	Chainage		Side	Length(m)
	From	To		
16	26050	26140	RHS	90
17	26140	26200	RHS	60
18	26850	26960	RHS	110
19	26960	27050	RHS	90
20	27050	27200	RHS	150
21	27880	28080	RHS	200
22	28080	28110	RHS	30
23	28110	28180	RHS	70
24	28180	28220	RHS	40
25	28220	28385	RHS	165
26	28385	28440	RHS	55
27	28440	28520	RHS	80
28	29050	29810	RHS	760
29	29810	29960	RHS	150
30	29960	29985	RHS	25
31	29985	30000	RHS	15
32	32000	33060	RHS	1060
33	33060	33240	RHS	180
34	33240	33365	RHS	125
35	33365	33450	RHS	85
36	33450	33740	RHS	290
37	33740	33770	RHS	30
38	33770	33840	RHS	70
39	33840	33875	RHS	35
40	33875	34000	RHS	125
41	16480	16920	LHS	440
42	19500	20300	LHS	800
43	25150	26200	LHS	1050
44	26850	27200	LHS	350
45	27880	28520	LHS	640
46	29050	30000	LHS	950
47	32000	32190	LHS	190
48	32190	32300	LHS	110
49	32300	32580	LHS	280
50	32580	32710	LHS	130
51	32710	32730	LHS	20
52	32730	32850	LHS	120
53	32850	34000	LHS	1150
Total length				<b>18355</b>

**2.8.3.** The parking bays shall be provided along service road.

2.10.1. The parking bays shall be provided along service road.			
S.No.	Design Chainage of Parking Bay		Remarks
	LHS Service Road	RHS Service Road	
Nil			

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

**2.8.4. Separator Between Main Carriageway and Service/Slip Road** A separator with Crash Barrier/ pedestrian guard Rail between main carriageway and service/slip road shall be provided to prevent the pedestrians, local vehicles and animals entering the highway.

**Note:**

- i. Above length of the service/slip roads is minimum specified. The actual length of the service connecting roads shall be determined by the Concessionaire in accordance with the approved plan & profile and design approved from the Authority Engineer. Any increase/decrease up to 5 percent length from the length specified in this Clause of Schedule-B shall not constitute a Change of Scope. Any additional length shall be dealt in Change of Scope.
- ii. The Acceleration, deceleration lane, right turning storage lane, entry/exit lanes shall be constructed in addition to length given in above table and shall be deemed to be part of the scope and no Change of Scope shall be considered for the same.
- iii. Any structure falling within acceleration/deceleration lane/taper shall be constructed to the required width. This increase in width shall not be treated as change of Scope.

**2.9. Grade Separated Structures (Clause No. 3 IRC SP 84-2019)**

Grade separated structures shall be constructed as per paragraph 2.13 of the Manual. Proposed levels at structure locations as shown in plan & profile specified in Annexure-III of Schedule A are minimum requirement and only for guidance and any increase in levels shall not constitute any change of scope. Entry/Exit arrangement from main carriageway shall be 50m before/after the start end of approach road to grade separator i.e. start/end of valley curve. RCC barrier shall start from start of valley curve and end after grade separator at end of valley curve.

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

1.5m wide footpaths shall be provided at grade intersection below structures for each direction of pedestrian movement.

The requisite particulars are given below:

**2.9.1. Vehicle Overpass (VOP)**

S. No.	Design Chainage (KM)	LHS Roadway Width (m)	RHS Roadway Width (m)	Super Structure Provision in Median	Span Arrangement (m)	Minimum Vertical Clearance (m)	Skew Angle (to be specified)	Remarks
Nil								

**2.9.2 Vehicle Underpasses (VUP)**

Sl.No	Design Chainage (km)	LHS Roadway Width (m)	RHS Roadway Width (m)	Super Structure Provision in Median	Span Arrangement (m)	Minimum Vertical Clearance (m)	Skew Angle (to be specified)	Remarks
1	16+662	10.9	-	No	1x23.66	5.5	0°	Unidirectional VUP
2	19+680	10.25	10.25	No	1x20.0	5.5	0°	Additional Structure Proposed.
3	19+900	10.25	10.25	No	1x20.0	5.5	0°	Additional Structure Proposed.
4	20+040	10.25	10.25	No	1x20.0	5.5	0°	Additional Structure Proposed.
5	25+650	10.25	10.25	No	1x23.66	5.5	0°	<b>Balance work to be done</b> (Arrester, Slab Drainage Spout, Painting Work, Expansion Joint, Dirt Wall, Approach Slab, Crash Barrier, Footpath, Stone Pitching)

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

**2.9.3. Light Vehicle Underpasses (LVUP)**

S.No	Design Chainage (km)	LHS Roadway Width (m)	RHS Roadway Width (m)	Super Structure Provision in Median	Span Arrangement (m)	Minimum Vertical Clearance (m)	Skew Angle (to be specified)	Remarks
1	18+415	10.25	10.25	No	1x12.0	4.0	0°	Additional Structure proposed.

**2.9.4. Small Vehicle Underpasses (SVUP)**

S.No	Design Chainage (km)	LHS Roadway Width (m)	RHS Roadway Width (m)	Super Structure Provision in Median	Span Arrangement (m)	Minimum Vertical Clearance (m)	Skew Angle (to be specified)	Remarks
NIL								

**New Viaducts:** New viaducts at the following locations on the Project Highway shall be constructed. GADs for the new viaducts are attached in the drawings folder. **(Clause No. 7.3 ii IRC: SP:84-2019).**

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

S. No.	Design Chainage (Km)	Name of Structure	Span Arrangement (m)	Total width (m)	Typical Cross Section	Remarks
NIL						

**Note:**

- Layout, Geometric Design and Typical Cross Sections are included in Annexure to Schedule-B.
- Inspection steps shall be provided on both the sides of carriageways in underpasses without service/slip roads.
- Height barriers on either sides of the underpasses for height less than 5.5m to be provided.
- 

**2.9.7. Details of Ramps, Cross Roads and Connecting Roads at Interchanges (IC)**

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

**Note:** Layout Geometric Design and Typical Cross Sections are included in Annexure to Schedule-B.

**2.9.8 Flyover**

Sl.No	Design Chainage (km)	LHS Roadway Width (m)	RHS Roadway Width (m)	Super Structure Provision in Median	Span Arrangement (m)	Minimum Vertical Clearance (m)	Skew Angle (to be specified)	Remarks
1	19+085	10.755	10.755	No	18X30.0+5X35.0+2X40.0	5.5	0°	

**Balance work for flyover to be done is tabulated as below:**

Ch.	19+085	Status at site															
Structure	Flyover	BHS															
Span	18x30.0+5x35.0+2x40	A1	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15
Sr No.	Activity																
1	Piles	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done
2	Pile Cap	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Pending
3	Pier/Abut Shaft	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Pending
4	Pier/Abut Cap	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Pending
5	Pedestal	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Pending
6	Arrester	Pending	Pending	Pending	Pending	Pending	Pending	Done	Done	Pending	Pending	Pending	Pending	Pending	Pending	Pending	Pending
7	Girder PSC Casted	NR	7	7	7	7	7	7	7	7	7	7	7	7	7	7	Pending
8	Stressing/GROUTING	NR	Pending	Pending	Pending	7/7	7/7	7/7	7/7	7/7	7/7	Pending	Pending	Pending	Pending	Pending	Pending
9	Girder Launching	NR	Pending	Pending	Pending	P3-P4 Done	P4-P5 Done	P5-P6 Done	P6-P7 Done	P7-P8 Done	P8-P9 Done	Pending	Pending	Pending	Pending	Pending	Pending
10	End Cross Girder	Pending	Pending	Pending	Pending	Done	Done	Done	Done	Done	Done	Pending	Pending	Pending	Pending	Pending	Pending
11	Mid Cross Girder	Pending	Pending	Pending	Pending	Done	Done	Done	Done	Done	Done	Pending	Pending	Pending	Pending	Pending	Pending

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

12	Slab	NR	Pend ing	Pend ing	Pend ing	P3- P4 Done	P4- P5 Done	P5- P6 Done	P6- P7 Done	P7- P8 Done	Pend ing	Pend ing	Pend ing	Pend ing	Pend ing	Pend ing	Pend ing
13	Drainage Spout	Pend ing	Pend ing	Pend ing	Pend ing	Pend ing	Pend ing	Pend ing	Pend ing	Pend ing	Pend ing	Pend ing	Pend ing	Pend ing	Pend ing	Pend ing	Pend ing
14	Painting Work	Pend ing	Pend ing	Pend ing	Pend ing	Pend ing	Pend ing	Pend ing	Pend ing	Pend ing	Pend ing	Pend ing	Pend ing	Pend ing	Pend ing	Pend ing	Pend ing
15	Link Slab	NR	Pend ing	Pend ing	Pend ing	NR	Done	Done	Done	NR	Pend ing	Pend ing	Pend ing	NR	Pend ing	Pend ing	Pend ing
16	Expansion Joint	Pend ing	NR	NR	NR	Pend ing	NR	NR	NR	Pend ing	NR	NR	NR	Pend ing	NR	NR	NR
17	Crash Carrier	Pend ing	Pend ing	Pend ing	Pend ing	Pend ing	Pend ing	Pend ing	Pend ing	Pend ing	Pend ing	Pend ing	Pend ing	Pend ing	Pend ing	Pend ing	Pend ing
18	Footpath	NR															
19	Floor Protection	NR															
20	Dirt Wall	A1 Pending			A2 Pending			Approach Slab Pending			A1 Pending			A2 Pending			
21	Dep. Retaining Wall	A1 LHS		Pending		A1 RHS		Pending		A2 LHS		Pending		A2 RHS		Pending	
22	Ind. Retaining Wall	A1 LHS		Pending		A1 RHS		Pending		A2 LHS		Pending		A2 RHS		Pending	
23	Launching Apron	NR															
24	Stone Pitching	A1			Pending			A2			Pending						

Span	25 x 30 + 1 x 45	P16	P17	P18	P19	P20	P21	P22	P23	P24	A2
Sr No.	Activity										
1	Piles	Done	Done	Done	Done	Done	Pending	Pending	Done	Done	Done

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.



2	Pile Cap	Done	Done	Done	Done	Done	Pending	Pending	Done	Done	Done
3	Pier/Abut Shaft	Done	Done	Done	Done	Done	Pending	Pending	Done	Done	Done
4	Pier/Abut Cap	Done	Done	Done	Done	Pending	Pending	Pending	Done	Done	Done
5	Pedestal	Done	Done	Done	Done	Pending	Pending	Pending	Done	Done	Done
6	Arrester	Pending	Pending	Pending	Pending	Pending	Pending	Pending	Pending	Pending	Pending
7	Girder PSC Casted	7	7	7	7	7	7	7		7	7
8	Stressing/Grouting	Pending	Pending	Pending	Pending	Pending	Pending	Pending	Pending	Pending	Pending
9	Girder Launching	Pending	Pending	Pending	Pending	Pending	Pending	Pending	Pending	Pending	Pending
10	End Cross Girder	Pending	Pending	Pending	Pending	Pending	Pending	Pending	Pending	Pending	Pending
11	Mid Cross Girder	Pending	Pending	Pending	Pending	Pending	Pending	Pending	Pending	Pending	Pending
12	Slab	Pending	Pending	Pending	Pending	Pending	Pending	Pending	Pending	Pending	Pending
13	Drainage Spout	Pending	Pending	Pending	Pending	Pending	Pending	Pending	Pending	Pending	Pending
14	Painting Work	Pending	Pending	Pending	Pending	Pending	Pending	Pending	Pending	Pending	Pending
15	Link Slab	NR	Pending	Pending	Pending	NR	Pending	NR	Pending	Pending	NR
16	Expansion Joint	Pending	NR	NR	NR	Pending	NR	Pending	NR	NR	Pending
17	Crash Barrier	Pending								Pending	
18	Footpath	NR								NR	
19	Floor Protection	NR								NR	
20	Launching Apron	NR								NR	

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

**2.10. Typical Cross section (TCS) of the Project Highway (Clause No. 2.17 IRC: SP:84 2019)**

The Project Highway shall be constructed to Two lane configuration. Typical cross sections required to be developed in different sections of the Project Highway are given below.

<b>FOR LEFT HAND SIDE (LHS) CARRIAGEWAY</b>					
<b>S. No</b>	<b>Chainage</b>		<b>Description</b>	<b>TCS</b>	<b>Length m</b>
	<b>From</b>	<b>To</b>			
1	04+200.0 0	04+800.0 0	TYPICAL CROSS SECTION OPEN AREA	TCS 3	600.00
2	04+800.0 0	04+990.0 0	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT) (RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)	TCS 2	190.00
3	04+990.0 0	05+125.0 0	TYPICAL CROSS SECTION FOR RAISING SECTION (HAVING MERGING /DIVERSING LANE)	TCS 2A	135.00
4	05+125.0 0	05+200.0 0	TYPICAL CROSS SECTION HAVING VARYING PORTION OF ACCESS ROAD (CONNECTING SERVICE ROAD WITH MAIN ALIGNMENT)	TCS 2B	75.00
5	05+200.0 0	05+670.0 0	WIDENING IN BUILD UP AREA WITH SERVICE ROAD	TCS 1	470.00
6	05+670.0 0	05+745.0 0	TYPICAL CROSS SECTION HAVING VARYING PORTION OF ACCESS ROAD (CONNECTING SERVICE ROAD WITH MAIN ALIGNMENT)	TCS 2B	75.00
7	05+745.0 0	05+895.0 0	TYPICAL CROSS SECTION FOR RAISING SECTION (HAVING MERGING /DIVERSING LANE)	TCS 2A	150.00
8	05+895.0 0	06+048.0 0	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT) (RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)	TCS 2	153.00
9	06+048.0 0	06+108.0 0	TYPICAL CROSS SECTION FOR MAJOR AND MINOR BRIDGE	TCS 6	60.00
10	06+108.0 0	06+140.0 0	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT) (RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)	TCS 2	32.00

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

11	06+140.0 0	06+275.0 0	TYPICAL CROSS SECTION FOR RAISING SECTION (HAVING MERGING /DIVERSING LANE)	TCS 2A	135.00
12	06+275.0 0	06+350.0 0	TYPICAL CROSS SECTION HAVING VARYING PORTION OF ACCESS ROAD (CONNECTING SERVICE ROAD WITH MAIN ALIGNMENT)	TCS 2B	75.00
13	06+350.0 0	07+275.0 0	WIDENING IN BUILD UP AREA WITH SERVICE ROAD	TCS 1	925.00
14	07+275.0 0	07+350.0 0	TYPICAL CROSS SECTION HAVING VARYING PORTION OF ACCESS ROAD (CONNECTING SERVICE ROAD WITH MAIN ALIGNMENT)	TCS 2B	75.00
15	07+350.0 0	07+500.0 0	TYPICAL CROSS SECTION FOR RAISING SECTION (HAVING MERGING /DIVERSING LANE)	TCS 2A	150.00
16	07+500.0 0	07+521.5 0	(HAVING MERGING /DIVERSING LANE)	TCS 2	21.50
17	07+521.5 0	07+558.5 0	TYPICAL CROSS SECTION FOR MAJOR AND MINOR BRIDGE	TCS 6	37.00
18	07+558.5 0	07+661.5 0	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT) (RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)	TCS 2	103.00
19	07+661.5 0	07+716.5 0	TYPICAL CROSS SECTION FOR MAJOR AND MINOR BRIDGE	TCS 6	55.00
20	07+716.5 0	07+900.0 0	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT) (RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)	TCS 2	183.50
21	07+900.0 0	08+200.0 0	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT) (RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)	TCS 2	300.00
22	08+200.0 0	08+613.0 0	TYPICAL CROSS SECTION OPEN AREA	TCS 3	413.00
23	08+613.0 0	08+671.0 0	TYPICAL CROSS SECTION FOR MAJOR AND MINOR BRIDGE	TCS 6	58.00

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

24	08+671.0 0	08+800.0 0	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT) (RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)	TCS 2	129.00
25	08+800.0 0	09+238.0 0	TYPICAL CROSS SECTION OPEN AREA	TCS 3	438.00
26	09+238.0 0	09+286.0 0	TYPICAL CROSS SECTION FOR MAJOR AND MINOR BRIDGE	TCS 6	48.00
27	09+286.0 0	09+925.0 0	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT) (RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)	TCS 2	639.00
28	09+925.0 0	09+973.0 0	TYPICAL CROSS SECTION FOR MAJOR AND MINOR BRIDGE	TCS 6	48.00
29	09+973.0 0	10+145.0 0	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT) (RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)	TCS 2	172.00
30	10+145.0 0	10+207.0 0	TYPICAL CROSS SECTION FOR MAJOR AND MINOR BRIDGE	TCS 6	62.00
31	10+207.0 0	10+400.0 0	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT) (RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)	TCS 2	193.00
32	10+400.0 0	11+900.0 0	TYPICAL CROSS SECTION OPEN AREA	TCS 3	1500.00
33	11+900.0 0	12+026.0 0	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT) (RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)	TCS 2	126.00
34	12+026.0 0	12+058.0 0	TYPICAL CROSS SECTION FOR MAJOR AND MINOR BRIDGE	TCS 6	32.00
35	12+058.0 0	12+200.0 0	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT) (RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)	TCS 2	142.00
36	12+200.0 0	12+320.0 0	TYPICAL CROSS SECTION OPEN AREA	TCS 3	120.00
37	12+320.0 0	12+580.0 0	TYPICAL CROSS SECTION OPEN AREA	TCS 3	260.00

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

38	12+580.0 0	12+790.0 0	TYPICAL CROSS SECTION OPEN AREA	TCS 3	210.00
39	12+580.0 0	12+925.0 0	TYPICAL CROSS SECTION OPEN AREA (HAVING MERGING /DIVERGING LANE)	TCS 3A	345.00
40	12+925.0 0	13+000.0 0	TYPICAL CROSS SECTION HAVING VARYING PORTION OF ACCESS ROAD (CONNECTING SERVICE ROAD WITH MAIN ALIGNMENT)	TCS 3B	75.00
41	13+000.0 0	13+450.0 0	WIDENING IN BUILD UP AREA WITH SERVICE ROAD	TCS 1 A	450.00
42	13+450.0 0	13+710.0 0	WIDENING IN BUILD UP AREA WITH SERVICE ROAD	TCS 1	260.00
43	13+710.0 0	13+785.0 0	TYPICAL CROSS SECTION HAVING VARYING PORTION OF ACCESS ROAD (CONNECTING SERVICE ROAD WITH MAIN ALIGNMENT)	TCS 2B	75.00
44	13+785.0 0	13+967.4 5	TYPICAL CROSS SECTION FOR RAISING SECTION (HAVING LEFT MEDIAN & RIGHT MEDIAN EDGE DIFFERENCE LEVEL)	TCS 2C	182.45
45	13+967.4 5	14+074.5 5	TYPICAL CROSS SECTION FOR MAJOR AND MINOR BRIDGE	TCS 6	107.10
46	14+074.5 5	14+325.0 0	TYPICAL CROSS SECTION FOR RAISING SECTION (HAVING LEFT MEDIAN & RIGHT MEDIAN EDGE DIFFERENCE LEVEL)	TCS 2C	250.45
47	14+325.0 0	14+400.0 0	TYPICAL CROSS SECTION HAVING VARYING PORTION OF ACCESS ROAD (CONNECTING SERVICE ROAD WITH MAIN ALIGNMENT)	TCS 2B	75.00
48	14+400.0 0	16+480.0 0	WIDENING IN BUILD UP AREA WITH SERVICE ROAD	TCS 1	2080.00
49	16+480.0 0	16+652.0 0	TYPICAL CROSS SECTION FOR APPROACH OF ONE SIDE VEHICULAR UNDERPASS	TCS 5	172.00
50	16+652.0 0	16+672.0 0	TYPICAL CROSS SECTION FOR STRUCTURE OF ONE SIDE VEHICULAR UNDERPASS	TCS 5A	20.00
51	16+672.0 0	16+920.0 0	TYPICAL CROSS SECTION FOR APPROACH OF ONE SIDE VEHICULAR UNDERPASS	TCS 5	248.00
52	16+920.0 0	17+350.0 0	TOLL PLAZA	TOLL PLAZA	430.00
53	17+350.0 0	17+502.0 0	TYPICAL CROSS SECTION OPEN AREA	TCS 3	152.00

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

54	17+502.0 0	17+766.0 0	TYPICAL CROSS SECTION FOR MAJOR AND MINOR BRIDGE	TCS 6	264.00
55	17+766.0 0	17+790.0 0	TYPICAL CROSS SECTION OPEN AREA WITH BOTH SIDE RCC COVERED DRAIN	TCS 3D	24.00
56	17+790.0 0	17+925.0 0	TYPICAL CROSS SECTION OPEN AREA (HAVING MERGING /DIVERGING LANE)	TCS 3E	135.00
57	17+925.0 0	18+000.0 0	TAPERING SECTION	TCS 3F	75.00
58	18+000.0 0	18+230.0 0	WIDENING IN BUILD UP AREA WITH SERVICE ROAD	TCS 1 A	230.00
59	18+230.0 0	18+686.2 3	TYPICAL CROSS SECTION FOR APPROACH FOR FLYOVER/UNDERPASS WITH HPC IN RHS	TCS 4B	456.23
60	18+686.2 3	18+900.0 0	TYPICAL CROSS SECTION FOR STRUCTURE OF FLYOVER/UNDERPASS WITH HPC IN RHS	TCS 4 C	213.77
61	18+900.0 0	18+960.0 0	TYPICAL CROSS SECTION FOR STRUCTURE OF FLYOVER/UNDERPASS WITH NAILING & SHOT CRETING ON HILL SIDE	TCS 4D	60.00
62	18+960.0 0	19+481.0 0	TYPICAL CROSS SECTION FOR STRUCTURE OF FLYOVER/UNDERPASS WITH HPC IN RHS	TCS 4 C	521.00
63	19+481.0 0	20+425.0 0	TYPICAL CROSS SECTION FOR APPROACH FOR FLYOVER/UNDERPASS WITH LOAD BEARING DRAIN IN RHS	TCS 4E	944.00
64	20+425.0 0	20+890.0 0	WIDENING IN BUILD UP AREA WITH SERVICE ROAD	TCS 1 A	465.00
65	20+890.0 0	20+965.0 0	TYPICAL CROSS SECTION HAVING VARYING PORTION OF ACCESS ROAD (CONNECTING SERVICE ROAD WITH MAIN ALIGNMENT)	TCS 2B	75.00
66	20+965.0 0	21+115.0 0	TYPICAL CROSS SECTION FOR RAISING SECTION (HAVING MERGING /DIVERSING LANE)	TCS 2A	150.00

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

67	21+115.0 0	21+138.0 0	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT) (RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)	TCS 2	23.00
68	21+138.0 0	21+196.0 0	TYPICAL CROSS SECTION FOR MAJOR AND MINOR BRIDGE	TCS 6	58.00
69	21+196.0 0	21+330.0 0	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT) (RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)	TCS 2	134.00
70	21+330.0 0	21+588.5 0	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT) (RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)	TCS 2	258.50
71	21+588.5 0	21+603.5 0	TYPICAL CROSS SECTION FOR MAJOR AND MINOR BRIDGE	TCS 6	15.00
72	21+603.5 0	21+730.0 0	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT) (RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)	TCS 2	126.50
73	21+730.0 0	21+950.0 0	TYPICAL CROSS SECTION OPEN AREA	TCS 3	220.00
74	21+950.0 0	22+114.7 5	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT) (RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)	TCS 2	164.75
75	22+114.7 5	22+147.2 5	TYPICAL CROSS SECTION FOR MAJOR AND MINOR BRIDGE	TCS 6	32.50
76	22+147.2 5	22+190.0 0	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT) (RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)	TCS 2	42.75
77	22+190.0 0	22+325.0 0	TYPICAL CROSS SECTION FOR RAISING SECTION (HAVING MERGING /DIVERSING LANE)	TCS 2A	135.00
78	22+325.0 0	22+400.0 0	TYPICAL CROSS SECTION HAVING VARYING PORTION OF ACCESS ROAD (CONNECTING SERVICE ROAD WITH MAIN ALIGNMENT)	TCS 2B	75.00

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

79	22+400.0 0	23+870.0 0	WIDENING IN BUILD UP AREA WITH SERVICE ROAD	TCS 1 A	1470.00
80	23+870.0 0	23+945.0 0	TYPICAL CROSS SECTION HAVING VARYING PORTION OF ACCESS ROAD (CONNECTING SERVICE ROAD WITH MAIN ALIGNMENT)	TCS 2B	75.00
81	23+945.0 0	24+095.0 0	TYPICAL CROSS SECTION FOR RAISING SECTION (HAVING MERGING /DIVERSING LANE)	TCS 2A	150.00
82	24+095.0 0	24+104.0 0	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT) (RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)	TCS 2	9.00
83	24+104.0 0	24+228.0 0	TYPICAL CROSS SECTION FOR MAJOR AND MINOR BRIDGE	TCS 6	124.00
84	24+228.0 0	24+320.0 0	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT) (RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)	TCS 2	92.00
85	24+320.0 0	24+650.0 0	TYPICAL CROSS SECTION FOR CUTTING SECTION FOR CUTTING UPTO 5m	TCS 7	330.00
86	24+650.0 0	25+150.0 0	WIDENING IN BUILD UP AREA WITH SERVICE ROAD	TCS 1	500.00
87	25+150.0 0	25+640.0 0	TYPICAL CROSS SECTION FOR APPROACH FOR FLYOVER/UNDERPASS	TCS 4	490.00
88	25+640.0 0	25+660.0 0	TYPICAL CROSS SECTION FOR STRUCTURE OF FLYOVER/UNDERPASS	TCS 4A	20.00
89	25+660.0 0	26+200.0 0	TYPICAL CROSS SECTION FOR APPROACH FOR FLYOVER/UNDERPASS	TCS 4	540.00
90	26+200.0 0	26+275.0 0	TYPICAL CROSS SECTION HAVING VARYING PORTION OF ACCESS ROAD (CONNECTING SERVICE ROAD WITH MAIN ALIGNMENT)	TCS 2B	75.00
91	26+275.0 0	26+425.0 0	TYPICAL CROSS SECTION FOR RAISING SECTION (HAVING MERGING /DIVERSING LANE)	TCS 2A	150.00

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.



92	26+425.0 0	26+492.7 1	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT) (RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)	TCS 2	67.71
93	26+492.7 1	26+571.2 9	TYPICAL CROSS SECTION FOR MAJOR AND MINOR BRIDGE	TCS 6	78.58
94	26+571.2 9	26+640.0 0	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT) (RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)	TCS 2	68.71
95	26+640.0 0	26+775.0 0	TYPICAL CROSS SECTION FOR RAISING SECTION (HAVING MERGING /DIVERSING LANE)	TCS 2A	135.00
96	26+775.0 0	26+850.0 0	TYPICAL CROSS SECTION HAVING VARYING PORTION OF ACCESS ROAD (CONNECTING SERVICE ROAD WITH MAIN ALIGNMENT)	TCS 2B	75.00
97	26+850.0 0	27+200.0 0	WIDENING IN BUILD UP AREA WITH SERVICE ROAD	TCS 1	350.00
98	27+200.0 0	27+275.0 0	TYPICAL CROSS SECTION HAVING VARYING PORTION OF ACCESS ROAD (CONNECTING SERVICE ROAD WITH MAIN ALIGNMENT)	TCS 2B	75.00
99	27+275.0 0	27+425.0 0	TYPICAL CROSS SECTION FOR RAISING SECTION (HAVING MERGING /DIVERSING LANE)	TCS 2A	150.00
100	27+425.0 0	27+630.6 4	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT) (RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)	TCS 2	205.64
101	27+630.6 4	27+647.6 4	TYPICAL CROSS SECTION FOR MAJOR AND MINOR BRIDGE	TCS 6	17.00
102	27+647.6 4	27+670.0 0	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT) (RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)	TCS 2	22.36
103	27+670.0 0	27+805.0 0	TYPICAL CROSS SECTION FOR RAISING SECTION (HAVING MERGING /DIVERSING LANE)	TCS 2A	135.00

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

104	27+805.0 0	27+880.0 0	TYPICAL CROSS SECTION HAVING VARYING PORTION OF ACCESS ROAD (CONNECTING SERVICE ROAD WITH MAIN ALIGNMENT)	TCS 2B	75.00
105	27+880.0 0	28+520.0 0	WIDENING IN BUILD UP AREA WITH SERVICE ROAD	TCS 1 A	640.00
106	28+520.0 0	28+595.0 0	TYPICAL CROSS SECTION HAVING VARYING PORTION OF ACCESS ROAD (CONNECTING SERVICE ROAD WITH MAIN ALIGNMENT)	TCS 2B	75.00
107	28+595.0 0	28+745.0 0	TYPICAL CROSS SECTION FOR RAISING SECTION (HAVING MERGING /DIVERGING LANE)	TCS 2A	150.00
108	28+745.0 0	28+756.0 0	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT) (RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)	TCS 2	11.00
109	28+756.0 0	28+816.0 0	TYPICAL CROSS SECTION FOR MAJOR AND MINOR BRIDGE	TCS 6	60.00
110	28+816.0 0	28+840.0 0	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT) (RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)	TCS 2	24.00
111	28+840.0 0	28+975.0 0	TYPICAL CROSS SECTION FOR RAISING SECTION (HAVING MERGING /DIVERGING LANE)	TCS 2A	135.00
112	28+975.0 0	29+050.0 0	TYPICAL CROSS SECTION HAVING VARYING PORTION OF ACCESS ROAD (CONNECTING SERVICE ROAD WITH MAIN ALIGNMENT)	TCS 2B	75.00
113	29+050.0 0	30+150.0 0	WIDENING IN BUILD UP AREA WITH SERVICE ROAD	TCS 1	1100.00
114	30+150.0 0	30+225.0 0	TYPICAL CROSS SECTION HAVING VARYING PORTION OF ACCESS ROAD (CONNECTING SERVICE ROAD WITH MAIN ALIGNMENT)	TCS 3B	75.00
115	30+225.0 0	30+375.0 0	TYPICAL CROSS SECTION OPEN AREA (HAVING MERGING /DIVERGING LANE)	TCS 3A	150.00
116	30+375.0 0	31+000.0 0	TYPICAL CROSS SECTION OPEN AREA	TCS 3	625.00

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

117	31+000.0 0	31+100.0 0	TYPICAL CROSS SECTION OPEN AREA WITH BREAST WALL ON RHS	TCS 3 C	
118	31+100.0 0	31+395.0 0	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT) (RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)	TCS 2	295.00
119	31+395.0 0	31+455.0 0	TYPICAL CROSS SECTION FOR MAJOR AND MINOR BRIDGE	TCS 6	60.00
120	31+455.0 0	31+635.0 0	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT) (RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)	TCS 2	180.00
121	31+635.0 0	31+770.0 0	TYPICAL CROSS SECTION FOR RAISING SECTION (HAVING MERGING /DIVERSING LANE)	TCS 2A	135.00
122	31+770.0 0	31+845.0 0	TYPICAL CROSS SECTION HAVING VARYING PORTION OF ACCESS ROAD (CONNECTING SERVICE ROAD WITH MAIN ALIGNMENT)	TCS 2B	75.00
123	31+845.0 0	32+360.0 0	WIDENING IN BUILD UP AREA WITH SERVICE ROAD	TCS 1 A	515.00
124	32+360.0 0	33+940.0 0	WIDENING IN BUILD UP AREA WITH SERVICE ROAD	TCS 1	1580.00
125	33+940.0 0	33+980.0 0	WIDENING IN BUILD UP AREA WITH SERVICE ROAD WITH 2 HPC IN RHS	TCS 1 B	40.00
126	33+980.0 0	34+080.0 0	WIDENING IN BUILD UP AREA WITH SERVICE ROAD WITH 2 HPC IN RHS	TCS 1 B	100.00
127	34+080.0 0	34+160.0 0	WIDENING IN BUILD UP AREA WITH SERVICE ROAD ON LHS NEAR NALA	TCS 1 C	80.00
128	34+160.0 0	34+330.0 0	WIDENING IN BUILD UP AREA WITH SERVICE ROAD	TCS 1	170.00
129	34+330.0 0	34+370.0 0	WIDENING IN BUILD UP AREA WITH SERVICE ROAD AND RHS BREAST WALL	TCS 1 D	40.00
130	34+370.0 0	34+450.0 0	WIDENING IN BUILD UP AREA WITH SERVICE ROAD	TCS 1	80.00
131	34+450.0 0	34+500.0 0	WIDENING IN BUILD UP AREA WITH SERVICE ROAD AND BREAST WALL BHS	TCS 1 E	50.00

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

For RIGHT HAND SIDE (RHS) CARRIAGEWAY					
S. No	Chainage		Description	TCS	Length m
	From	To			
1	04+200.0 0	04+800.0 0	TYPICAL CROSS SECTION OPEN AREA	TCS 3	600.00
2	04+800.0 0	04+975.0 0	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT) (RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)	TCS 2	175.00
3	04+975.0 0	05+125.0 0	TYPICAL CROSS SECTION FOR RAISING SECTION (HAVING MERGING /DIVERSING LANE)	TCS 2A	150.00
4	05+125.0 0	05+200.0 0	TYPICAL CROSS SECTION HAVING VARYING PORTION OF ACCESS ROAD (CONNECTING SERVICE ROAD WITH MAIN ALIGNMENT)	TCS 2B	75.00
5	05+200.0 0	05+670.0 0	WIDENING IN BUILD UP AREA WITH SERVICE ROAD	TCS 1	470.00
6	05+670.0 0	05+745.0 0	TYPICAL CROSS SECTION HAVING VARYING PORTION OF ACCESS ROAD (CONNECTING SERVICE ROAD WITH MAIN ALIGNMENT)	TCS 2B	75.00
7	05+745.0 0	05+880.0 0	TYPICAL CROSS SECTION FOR RAISING SECTION (HAVING MERGING /DIVERSING LANE)	TCS 2A	135.00
8	05+880.0 0	06+048.0 0	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT) (RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)	TCS 2	168.00
9	06+048.0 0	06+108.0 0	TYPICAL CROSS SECTION FOR MAJOR AND MINOR BRIDGE	TCS 6	60.00
10	06+108.0 0	06+125.0 0	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT) (RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)	TCS 2	17.00
11	06+125.0 0	06+275.0 0	TYPICAL CROSS SECTION FOR RAISING SECTION (HAVING MERGING /DIVERSING LANE)	TCS 2A	150.00
12	06+275.0 0	06+350.0 0	TYPICAL CROSS SECTION HAVING VARYING PORTION OF ACCESS ROAD (CONNECTING SERVICE ROAD WITH MAIN ALIGNMENT)	TCS 2B	75.00

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

13	06+350.0 0	07+275.0 0	WIDENING IN BUILD UP AREA WITH SERVICE ROAD	TCS 1	925.00
14	07+275.0 0	07+350.0 0	TYPICAL CROSS SECTION HAVING VARYING PORTION OF ACCESS ROAD (CONNECTING SERVICE ROAD WITH MAIN ALIGNMENT)	TCS 2B	75.00
15	07+350.0 0	07+485.0 0	TYPICAL CROSS SECTION FOR RAISING SECTION (HAVING MERGING /DIVERSING LANE)	TCS 2A	135.00
16	07+485.0 0	07+521.5 0	(HAVING MERGING /DIVERSING LANE)	TCS 2	36.50
17	07+521.5 0	07+558.5 0	TYPICAL CROSS SECTION FOR MAJOR AND MINOR BRIDGE	TCS 6	37.00
18	07+558.5 0	07+661.5 0	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT) (RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)	TCS 2	103.00
19	07+661.5 0	07+716.5 0	TYPICAL CROSS SECTION FOR MAJOR AND MINOR BRIDGE	TCS 6	55.00
20	07+716.5 0	07+900.0 0	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT) (RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)	TCS 2	183.50
21	07+900.0 0	08+200.0 0	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT) (RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)	TCS 2	300.00
22	08+200.0 0	08+613.0 0	TYPICAL CROSS SECTION OPEN AREA	TCS 3	413.00
23	08+613.0 0	08+671.0 0	TYPICAL CROSS SECTION FOR MAJOR AND MINOR BRIDGE	TCS 6	58.00
24	08+671.0 0	08+800.0 0	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT) (RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)	TCS 2	129.00
25	08+800.0 0	09+238.0 0	TYPICAL CROSS SECTION OPEN AREA	TCS 3	438.00
26	09+238.0 0	09+286.0 0	TYPICAL CROSS SECTION FOR MAJOR AND MINOR BRIDGE	TCS 6	48.00

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

27	09+286.0 0	09+925.0 0	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT) (RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)	TCS 2	639.00
28	09+925.0 0	09+973.0 0	TYPICAL CROSS SECTION FOR MAJOR AND MINOR BRIDGE	TCS 6	48.00
29	09+973.0 0	10+145.0 0	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT) (RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)	TCS 2	172.00
30	10+145.0 0	10+207.0 0	TYPICAL CROSS SECTION FOR MAJOR AND MINOR BRIDGE	TCS 6	62.00
31	10+207.0 0	10+400.0 0	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT) (RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)	TCS 2	193.00
32	10+400.0 0	11+900.0 0	TYPICAL CROSS SECTION OPEN AREA	TCS 3	1500.00
33	11+900.0 0	12+026.0 0	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT) (RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)	TCS 2	126.00
34	12+026.0 0	12+058.0 0	TYPICAL CROSS SECTION FOR MAJOR AND MINOR BRIDGE	TCS 6	32.00
35	12+058.0 0	12+200.0 0	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT) (RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)	TCS 2	142.00
36	12+200.0 0	12+320.0 0	TYPICAL CROSS SECTION OPEN AREA	TCS 3	120.00
37	12+320.0 0	12+580.0 0	TYPICAL CROSS SECTION OPEN AREA	TCS 3	260.00
38	12+580.0 0	12+775.0 0	TYPICAL CROSS SECTION OPEN AREA	TCS 3	195.00
39	12+775.0 0	12+925.0 0	TYPICAL CROSS SECTION OPEN AREA (HAVING MERGING /DIVERGING LANE)	TCS 3A	150.00
40	12+925.0 0	13+000.0 0	TYPICAL CROSS SECTION HAVING VARYING PORTION OF ACCESS ROAD (CONNECTING SERVICE ROAD WITH MAIN ALIGNMENT)	TCS 3B	75.00

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

41	13+000.0 0	13+450.0 0	WIDENING IN BUILD UP AREA WITH SERVICE ROAD	TCS 1 A	450.00
42	13+450.0 0	13+710.0 0	WIDENING IN BUILD UP AREA WITH SERVICE ROAD	TCS 1	260.00
43	13+710.0 0	13+785.0 0	TYPICAL CROSS SECTION HAVING VARYING PORTION OF ACCESS ROAD (CONNECTING SERVICE ROAD WITH MAIN ALIGNMENT)	TCS 2B	75.00
44	13+785.0 0	13+967.4 5	TYPICAL CROSS SECTION FOR RAISING SECTION (HAVING LEFT MEDIAN & RIGHT MEDIAN EDGE DIFFERENCE LEVEL)	TCS 2C	182.45
45	13+967.4 5	14+074.5 5	TYPICAL CROSS SECTION FOR MAJOR AND MINOR BRIDGE	TCS 6	107.10
46	14+074.5 5	14+325.0 0	TYPICAL CROSS SECTION FOR RAISING SECTION (HAVING LEFT MEDIAN & RIGHT MEDIAN EDGE DIFFERENCE LEVEL)	TCS 2C	250.45
47	14+325.0 0	14+400.0 0	TYPICAL CROSS SECTION HAVING VARYING PORTION OF ACCESS ROAD (CONNECTING SERVICE ROAD WITH MAIN ALIGNMENT)	TCS 2B	75.00
48	14+400.0 0	16+480.0 0	WIDENING IN BUILD UP AREA WITH SERVICE ROAD	TCS 1	2080.00
49	16+480.0 0	16+652.0 0	TYPICAL CROSS SECTION FOR APPROACH OF ONE SIDE VEHICULAR UNDERPASS	TCS 5	172.00
50	16+652.0 0	16+672.0 0	TYPICAL CROSS SECTION FOR STRUCTURE OF ONE SIDE VEHICULAR UNDERPASS	TCS 5A	20.00
51	16+672.0 0	16+920.0 0	TYPICAL CROSS SECTION FOR APPROACH OF ONE SIDE VEHICULAR UNDERPASS	TCS 5	248.00
52	16+920.0 0	17+350.0 0	TOLL PLAZA	TOLL PLAZA	430.00
53	17+350.0 0	17+502.0 0	TYPICAL CROSS SECTION OPEN AREA	TCS 3	152.00
54	17+502.0 0	17+766.0 0	TYPICAL CROSS SECTION FOR MAJOR AND MINOR BRIDGE	TCS 6	264.00
55	17+766.0 0	17+775.0 0	TYPICAL CROSS SECTION OPEN AREA WITH BOTH SIDE RCC COVERED DRAIN	TCS 3D	9.00
56	17+775.0 0	17+925.0 0	TYPICAL CROSS SECTION OPEN AREA (HAVING MERGING /DIVERGING LANE)	TCS 3E	150.00
57	17+925.0 0	18+000.0 0	TAPERING SECTION	TCS 3F	75.00
58	18+000.0 0	18+230.0 0	WIDENING IN BUILD UP AREA WITH SERVICE ROAD	TCS 1 A	230.00

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

59	18+230.0 0	18+686.2 3	TYPICAL CROSS SECTION FOR APPROACH FOR FLYOVER/UNDERPASS WITH HPC IN RHS	TCS 4B	456.23
60	18+686.2 3	18+900.0 0	TYPICAL CROSS SECTION FOR STRUCTURE OF FLYOVER/UNDERPASS WITH HPC IN RHS	TCS 4 C	213.77
61	18+900.0 0	18+960.0 0	TYPICAL CROSS SECTION FOR STRUCTURE OF FLYOVER/UNDERPASS WITH NAILING & SHOT CRETING ON HILL SIDE	TCS 4D	60.00
62	18+960.0 0	19+481.0 0	TYPICAL CROSS SECTION FOR STRUCTURE OF FLYOVER/UNDERPASS WITH HPC IN RHS	TCS 4 C	521.00
63	19+481.0 0	20+425.0 0	TYPICAL CROSS SECTION FOR APPROACH FOR FLYOVER/UNDERPASS WITH LOAD BEARING DRAIN IN RHS	TCS 4E	944.00
64	20+425.0 0	20+890.0 0	WIDENING IN BUILD UP AREA WITH SERVICE ROAD	TCS 1 A	465.00
65	20+890.0 0	20+965.0 0	TYPICAL CROSS SECTION HAVING VARYING PORTION OF ACCESS ROAD (CONNECTING SERVICE ROAD WITH MAIN ALIGNMENT)	TCS 2B	75.00
66	20+965.0 0	21+100.0 0	TYPICAL CROSS SECTION FOR RAISING SECTION (HAVING MERGING /DIVERSING LANE)	TCS 2A	135.00
67	21+100.0 0	21+138.0 0	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT) (RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)	TCS 2	38.00
68	21+138.0 0	21+196.0 0	TYPICAL CROSS SECTION FOR MAJOR AND MINOR BRIDGE	TCS 6	58.00
69	21+196.0 0	21+330.0 0	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT) (RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)	TCS 2	134.00
70	21+330.0 0	21+588.5 0	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT) (RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)	TCS 2	258.50
71	21+588.5 0	21+603.5 0	TYPICAL CROSS SECTION FOR MAJOR AND MINOR BRIDGE	TCS 6	15.00

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.



72	21+603.5 0	21+730.0 0	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT) (RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)	TCS 2	126.50
73	21+730.0 0	21+950.0 0	TYPICAL CROSS SECTION OPEN AREA	TCS 3	220.00
74	21+950.0 0	22+114.7 5	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT) (RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)	TCS 2	164.75
75	22+114.7 5	22+147.2 5	TYPICAL CROSS SECTION FOR MAJOR AND MINOR BRIDGE	TCS 6	32.50
76	22+147.2 5	22+175.0 0	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT) (RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)	TCS 2	27.75
77	22+175.0 0	22+325.0 0	TYPICAL CROSS SECTION FOR RAISING SECTION (HAVING MERGING /DIVERSING LANE)	TCS 2A	150.00
78	22+325.0 0	22+400.0 0	TYPICAL CROSS SECTION HAVING VARYING PORTION OF ACCESS ROAD (CONNECTING SERVICE ROAD WITH MAIN ALIGNMENT)	TCS 2B	75.00
79	22+400.0 0	23+870.0 0	WIDENING IN BUILD UP AREA WITH SERVICE ROAD	TCS 1 A	1470.00
80	23+870.0 0	23+945.0 0	TYPICAL CROSS SECTION HAVING VARYING PORTION OF ACCESS ROAD (CONNECTING SERVICE ROAD WITH MAIN ALIGNMENT)	TCS 2B	75.00
81	23+945.0 0	24+080.0 0	TYPICAL CROSS SECTION FOR RAISING SECTION (HAVING MERGING /DIVERSING LANE)	TCS 2A	135.00
82	24+080.0 0	24+104.0 0	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT) (RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)	TCS 2	24.00
83	24+104.0 0	24+228.0 0	TYPICAL CROSS SECTION FOR MAJOR AND MINOR BRIDGE	TCS 6	124.00
84	24+228.0 0	24+320.0 0	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT)	TCS 2	92.00

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

			(RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)		
85	24+320.0 0	24+650.0 0	TYPICAL CROSS SECTION FOR CUTTING SECTION FOR CUTTING UPTO 5m	TCS 7	330.00
86	24+650.0 0	25+150.0 0	WIDENING IN BUILD UP AREA WITH SERVICE ROAD	TCS 1	500.00
87	25+150.0 0	25+640.0 0	TYPICAL CROSS SECTION FOR APPROACH FOR FLYOVER/UNDERPASS	TCS 4	490.00
88	25+640.0 0	25+660.0 0	TYPICAL CROSS SECTION FOR STRUCTURE OF FLYOVER/UNDERPASS	TCS 4A	20.00
89	25+660.0 0	26+200.0 0	TYPICAL CROSS SECTION FOR APPROACH FOR FLYOVER/UNDERPASS	TCS 4	540.00
90	26+200.0 0	26+275.0 0	TYPICAL CROSS SECTION HAVING VARYING PORTION OF ACCESS ROAD (CONNECTING SERVICE ROAD WITH MAIN ALIGNMENT)	TCS 2B	75.00
91	26+275.0 0	26+410.0 0	TYPICAL CROSS SECTION FOR RAISING SECTION (HAVING MERGING /DIVERSING LANE)	TCS 2A	135.00
92	26+410.0 0	26+492.7 1	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT) (RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)	TCS 2	82.71
93	26+492.7 1	26+571.2 9	TYPICAL CROSS SECTION FOR MAJOR AND MINOR BRIDGE	TCS 6	78.58
94	26+571.2 9	26+625.0 0	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT) (RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)	TCS 2	53.71
95	26+625.0 0	26+775.0 0	TYPICAL CROSS SECTION FOR RAISING SECTION (HAVING MERGING /DIVERSING LANE)	TCS 2A	150.00
96	26+775.0 0	26+850.0 0	TYPICAL CROSS SECTION HAVING VARYING PORTION OF ACCESS ROAD (CONNECTING SERVICE ROAD WITH MAIN ALIGNMENT)	TCS 2B	75.00
97	26+850.0 0	27+200.0 0	WIDENING IN BUILD UP AREA WITH SERVICE ROAD	TCS 1	350.00
98	27+200.0 0	27+275.0 0	TYPICAL CROSS SECTION HAVING VARYING PORTION OF ACCESS ROAD	TCS 2B	75.00

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

			(CONNECTING SERVICE ROAD WITH MAIN ALIGNMENT)		
99	27+275.0 0	27+410.0 0	TYPICAL CROSS SECTION FOR RAISING SECTION (HAVING MERGING /DIVERSING LANE)	TCS 2A	135.00
100	27+410.0 0	27+630.6 4	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT) (RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)	TCS 2	220.64
101	27+630.6 4	27+647.6 4	TYPICAL CROSS SECTION FOR MAJOR AND MINOR BRIDGE	TCS 6	17.00
102	27+647.6 4	27+655.0 0	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT) (RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)	TCS 2	7.36
103	27+655.0 0	27+805.0 0	TYPICAL CROSS SECTION FOR RAISING SECTION (HAVING MERGING /DIVERSING LANE)	TCS 2A	150.00
104	27+805.0 0	27+880.0 0	TYPICAL CROSS SECTION HAVING VARYING PORTION OF ACCESS ROAD (CONNECTING SERVICE ROAD WITH MAIN ALIGNMENT)	TCS 2B	75.00
105	27+880.0 0	28+520.0 0	WIDENING IN BUILD UP AREA WITH SERVICE ROAD	TCS 1 A	640.00
106	28+520.0 0	28+595.0 0	TYPICAL CROSS SECTION HAVING VARYING PORTION OF ACCESS ROAD (CONNECTING SERVICE ROAD WITH MAIN ALIGNMENT)	TCS 2B	75.00
107	28+595.0 0	28+730.0 0	TYPICAL CROSS SECTION FOR RAISING SECTION (HAVING MERGING /DIVERSING LANE)	TCS 2A	135.00
108	28+730.0 0	28+756.0 0	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT) (RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)	TCS 2	26.00
109	28+756.0 0	28+816.0 0	TYPICAL CROSS SECTION FOR MAJOR AND MINOR BRIDGE	TCS 6	60.00
110	28+816.0 0	28+825.0 0	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT) (RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)	TCS 2	9.00

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

111	28+825.0 0	28+975.0 0	TYPICAL CROSS SECTION FOR RAISING SECTION (HAVING MERGING /DIVERSING LANE)	TCS 2A	150.00
112	28+975.0 0	29+050.0 0	TYPICAL CROSS SECTION HAVING VARYING PORTION OF ACCESS ROAD (CONNECTING SERVICE ROAD WITH MAIN ALIGNMENT)	TCS 2B	75.00
113	29+050.0 0	30+150.0 0	WIDENING IN BUILD UP AREA WITH SERVICE ROAD	TCS 1	1100.00
114	30+150.0 0	30+225.0 0	TYPICAL CROSS SECTION HAVING VARYING PORTION OF ACCESS ROAD (CONNECTING SERVICE ROAD WITH MAIN ALIGNMENT)	TCS 3B	75.00
115	30+225.0 0	30+360.0 0	TYPICAL CROSS SECTION OPEN AREA (HAVING MERGING /DIVERGING LANE)	TCS 3A	135.00
116	30+360.0 0	31+000.0 0	TYPICAL CROSS SECTION OPEN AREA	TCS 3	640.00
117	31+000.0 0	31+100.0 0	TYPICAL CROSS SECTION OPEN AREA WITH BREAST WALL ON RHS	TCS 3 C	100.00
118	31+100.0 0	31+395.0 0	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT) (RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)	TCS 2	295.00
119	31+395.0 0	31+455.0 0	TYPICAL CROSS SECTION FOR MAJOR AND MINOR BRIDGE	TCS 6	60.00
120	31+455.0 0	31+620.0 0	TYPICAL CROSS SECTION FOR RAISING/BRIDGE APPROACHES (FREE SLOPE, BELOW 2.1M HEIGHT) (RCC TOE/RETAINING WALL, ABOVE 2.1M HEIGHT)	TCS 2	165.00
121	31+620.0 0	31+770.0 0	TYPICAL CROSS SECTION FOR RAISING SECTION (HAVING MERGING /DIVERSING LANE)	TCS 2A	150.00
122	31+770.0 0	31+845.0 0	TYPICAL CROSS SECTION HAVING VARYING PORTION OF ACCESS ROAD (CONNECTING SERVICE ROAD WITH MAIN ALIGNMENT)	TCS 2B	75.00
123	31+845.0 0	32+360.0 0	WIDENING IN BUILD UP AREA WITH SERVICE ROAD	TCS 1 A	515.00
124	32+360.0 0	33+940.0 0	WIDENING IN BUILD UP AREA WITH SERVICE ROAD	TCS 1	1580.00
125	33+940.0 0	33+980.0 0	WIDENING IN BUILD UP AREA WITH SERVICE ROAD WITH 2 HPC IN RHS	TCS 1 B	40.00

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

126	33+980.0 0	34+080.0 0	WIDENING IN BUILD UP AREA WITH SERVICE ROAD WITH 2 HPC IN RHS	TCS 1 B	100.00
127	34+080.0 0	34+160.0 0	WIDENING IN BUILD UP AREA WITH SERVICE ROAD ON LHS NEAR NALA	TCS 1 C	80.00
128	34+160.0 0	34+330.0 0	WIDENING IN BUILD UP AREA WITH SERVICE ROAD	TCS 1	170.00
129	34+330.0 0	34+370.0 0	WIDENING IN BUILD UP AREA WITH SERVICE ROAD AND RHS BREAST WALL	TCS 1 D	40.00
130	34+370.0 0	34+450.0 0	WIDENING IN BUILD UP AREA WITH SERVICE ROAD	TCS 1	80.00
131	34+450.0 0	34+500.0 0	WIDENING IN BUILD UP AREA WITH SERVICE ROAD AND BREAST WALL BHS	TCS 1 E	50.00

**Note:**

The Design Consultant shall take full care in designing the cross section confirming to the details given above.

1. Any variations in the lengths specified in the above table shall not constitute a change of Scope
2. Lengths mentioned in the above list for cross section types concerned to structures are inclusive of structure length.
3. Retaining wall Re wall shall be provided for full height on all structure (Clause No.7.1. iv) IRC SP-84-2019).
4. Toe wall (0.6m ht) to be provided where ROW is restricted and water bodies along the proposed highway on the sections specified in Schedule-B.
5. Chainages may be adjusted according to location of structures as per drawings.
6. For example, (The design Consultant has to mentioned clearly the changes from the cross section shown in the manual).
7. Carriageway width tapering shall be provided 1 in 50 as per manual Clause no 2.5.4.

Intermediate Sight Distance (Desirable Minimum Sight Distance) shall be followed for design of all vertical curves (Summit and Valley Curves) including structures as well as highways (Clause No 2.9.5 IRC SP 84-2019)

8. Provide detailing of placement and specification of Railing, Fencing and electric poles, etc. (Clause No. 2.17 IRC SP 84-2019)

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

All at-grade intersections and grade separated intersections shall be as per Section 3 of the manual. Existing at-grade intersections shall be improved to the prescribed standards  
The service road pavement composition shall be continued on cross roads of the intersections for the length specified for at-grade and grade separated intersections.

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

### 3.1. At-grade intersections (Clause No. 3.2 IRC SP 84-2019):

#### (a) Major Junctions:

S. No.	Design Chainage (Km)	Junction Type	Leads to		Median Opening	Category of cross road	Carriageway Width of cross road	Length of cross road to be developed	
			Left	Right				LHS	RHS
1	7+920	T	-	Charnia	No	VR	6.0	-	200
2	14+300	T	-	Madawala	No	SH-9	6.0	-	200
3	17+780	T	-	Suncity Road	No	MDR	2X7.5	-	200
4	23+970	X (Staggered)	Malku Majra	Bhud Barrier	No	ODR	6.0	200	200
5	24+260	T	Truck Union	-	No	VR	6.0	200	-
6	27+150	T	-	Manpura	No	SH	7.0	-	200

**Note:** Layout, Geometric Design and Typical Cross Sections of Major Junction shall be included in Annexure to Schedule-B.

#### (b) Minor Intersections:

S. No.	Design Chainage (Km)	Junction Type	Leads to		Median Opening	Category of	Carriageway Width of cross	Length of cross road to be developed	
			Left	Right				LHS	RHS
1	4+530	T	Khera	-	No	VR	3.75	90	-
2	5+040	X	Basolan	Basolan	No	VR	6.0	90	90
3	6+240	T	-	Garidan	No	VR	5.0	-	90
4	7+320	T	-	Kiratpur	No	VR	5.0	-	90
5	8+010	T	Charnia	-	No	VR	3.75	90	-
6	8+760	T	-	Johluwal	No	VR	5.0	-	90
7	9+160	T	Johluwal	-	No	VR	4.5	90	-
8	9+640	T	-	Karanpur	No	VR	5.0	-	90
9	10+250	T	-	Ramnagar	No	VR	5.5	-	90
10	10+540	T	-	Khol Albela	No	VR	5.5	-	90
11	11+070	X	Nanakpur	Nanakpur	No	VR	5.5	90	90
12	11+670	T	Nanakpur	-	No	VR	7.0	90	-
13	12+000	T	-	Nanakpur	No	VR	5.5	-	90
14	12+520	T	-	Rampur Jungi	No	VR	7.0	-	90
15	12+710	T	Jhunga	-	No	VR	3.75	90	-
16	13+260	T	-	Kona	No	VR	3.75	-	90

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

S. No.	Design Chainage (Km)	Junction Type	Leads to		Median Opening	Category of	Carriageway Width of cross	Length of cross road to be developed	
			Left	Right				LHS	RHS
17	13+460	T	Kona	-	No	VR	3.75	90	-
18	14+650	T	-	Madawala	No	VR	5.5	-	90
19	15+220	T	-	Madawala	No	VR	3.75	-	90
20	15+750	T	-	Gorakhnath Temple	No	VR	5.5	90	90
21	17+210	X	Khokra	Khokra	No	VR	3.75	-	90
22	17+460	T	-	Khokra	No	VR	3.75	-	90
23	20+640	T	-	Sandoli	No	VR	5.5	-	90
24	21+220	T	-	CPET	No	VR	9.0	-	90
25	21+320	T	CETP		No	VR	3.75	90	-
26	21+500	Y	-	Malpur	No	VR	7.0	-	90
27	21+600	Y	Malpur	-	No	VR	3.75	90	-
28	22+090	T	Malpur	-	No	VR	3.75	90	-
29	22+150	T	-	Baddi University	No	VR	7.0	-	90
30	22+350	T	Bhud	-	No	VR	3.75	90	-
31	22+540	T	-	Bhud	No	VR	5.5	-	90
32	23+000	T	Daso Majra	-	No	VR	3.75	90	-
33	23+040	T	-	Daso Majra	No	VR	3.75	-	90
34	23+160	T	Daso Majra	-	No	VR	3.75	90	-
35	23+310	T	-	Dr. Reddy	No	VR	5.5	-	90
36	23+580	T	-	Malku Majra	No	VR	3.75	-	90
37	23+640	T	Malku Majra	-	No	VR	3.75	90	-
38	24+560	T	-	Harraipur	No	VR	3.75	-	90
39	24+630	Y	Harraipur	-	No	VR	5.5	90	-
40	24+660	T	-	Harraipur	No	VR	3.75	-	90
41	24+920	Y	-	Guru Majra	No	VR	5.5	-	90
42	25+110	X	Kishanpura	Guru Majra	No	VR	3.75	90	90
43	25+400	T	-	Kishanpura	No	VR	5.5	-	90
44	25+470	T	Kishanpura	-	No	VR	3.75	90	-
45	25+850	X	Kishanpura	Kishanpura	No	VR	5.5	90	90
46	26+040	T	-	Kishanpura	No	VR	3.75	-	90
47	26+580	X	Manpura	Manpura	No	VR	3.75	90	90
48	27+600	T	Manpura	-	No	VR	5.5	90	-
49	27+930	X	Kharuni	Kharuni	No	VR	5.5	90	90
50	28+020	T	Kharuni	-	No	VR	3.75	90	-
51	28+550	X	Tahliwal	Tahliwal	No	VR	5.5	90	90
52	28+580	T	Tahliwal	-	No	VR	5.5	90	-

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S. No.	Design Chainage (Km)	Junction Type	Leads to		Median Opening	Category of	Carriageway Width of cross	Length of cross road to be developed	
			Left	Right				LHS	RHS
53	28+830	T	Bagbania	-	No	VR	3.75	90	-
54	29+120	X (Staggered)	Nalka	Dhana	No	VR	3.75	90	90
55	29+730	T	Bele Deyodh	-	No	VR	3.75	90	-
56	30+130	T	Bele Deyodh	-	No	VR	3.75	90	-
57	30+300	T	-	Bele Deyodh	No	VR	3.75	-	90
58	30+610	T	-	Khera Chak	No	VR	3.75	-	90
59	30+820	X	Khera Chak	Khera Chak	No	VR	5.5	90	90
60	31+120	T	-	Khera Chak	No	VR	3.75	-	90
61	31+390	X	Khera Chak	Khera Chak	No	VR	5.5	90	90
62	31+450	X	Khera Chak	Khera Chak	No	VR	3.75	90	90
63	31+700	T	Khera Chak	-	No	VR	5.5	90	-
64	32+150	T	-	Dadi Kaniya	No	VR	3.75	-	90
65	32+340	T	Dadi Kaniya	-	No	VR	3.75	90	-
66	32+900	X	Peersthan	Peersthan	No	VR	5.5	90	90
67	33+100	T	Kirpalpur	-	No	VR	3.75	90	-
68	33+310	Y	Kirpalpur	-	No	VR	3.75	90	-
69	33+510	T	Rakhram singh	-	No	VR	5.5	90	-
70	33+910	Y	Rakhram singh	-	No	VR	5.5	90	-
71	34+050	T	Rakhram singh	-	No	VR	3.75	90	-
72	34+390	Y	-	Mini Secretariat	No	VR	3.75	-	90
73	34+500	T	Mini Secretariat	-	No	VR	5.5	90	-

**Note:** Typical layout Geometric Design and typical Cross Typical Cross Sections of Major Junction included in Annexure of Schedule-B

**Note:**

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

1. The Concessionaire shall take up 'Detailed Engineering study' to ascertain further details of all intersections and treatment of the intersections shall be designed in accordance with the latest guidelines mentioned out in section-3 of the manual. Auxiliary lanes including storage, acceleration and deceleration lane along with physical islands to be provided.

The cross road at the junctions which are having a level difference from the main carriageway, are to be improved at the level of main carriageway for the length of 30 metre and then to be merged with the cross road to the gradient not more than 1:50. (Clause No.3.2.2 IRC: SP:84-2019/IRC: SP:87-2019).

2. From Minor / Major layout for left-in / left out arrangement with physical islands with hazard marking. Where there is space constraint to provide physical islands, the effect of junction

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kept wide opened can be avoided by ghost island with marking. (Fig 3.7, IRC: SP:84-2019/IRC: SP:87-2019).

3. For U-turn, Self-Regulated U-turn facility shall be created. (Fig 3.6, IRC: SP:84-2019/IRC: SP:87-2019) as per fig 3.6 of manual (IRC SP 84).

### 3.2. At-Grade Intersections below grade Separators/ Interchanges:

These shall be provided as given at para ---- of this Annexure-I of the Schedule B. (Clause No. 3.4.7 of IRC: SP: 84-2019/Clause No. 3.2.4 of IRC: SP:87-2019)

S.	Design Ch.	Junction Type	Leads to		U- turn provision	Category of Cross Road	Carriageway width of cross road	Length of crossroad to be developed	
					Viaduct Spans				
			Left	Right				LHS	RHS
1	16+660	T	Chandigarh	-	No	O DR	7.5	200	-
2	18+415	T	-	Baddi Civil Hospital	Yes	VR	5.5	-	90
3	18+760	X (Staggered)	Industrial Area	Baddi-Sai Raod	Yes	O DR	7.5	200	200
4	18+970	T	Sheetalpur Road	-	Yes	VR	7.0	90	-
5	19+130	T	-	Baddi Civil Hospital	Yes	VR	3.75		90
6	19+310	T	Sheetalpur Road	-	Yes	VR	5.5	90	-
7	19+400	X	Truck Union	Baddi Market	Yes	O DR	7.5	200	200
8	19+680	T	-	Women Police Station	Yes	VR	5.5	-	90
9	19+900	T	-	Bilanwali Gujran	Yes	VR	5.5	-	90
10	20+040	T	-	Haripur Sandoli	Yes	VR	10.0	-	90
11	25+650	T	-	Glenmark Road	Yes	O DR	5.5	-	200

#### **Note:**

1. The Concessionaire shall take up 'Detailed Engineering Study' to ascertain further details of all intersections and treatment of the intersections shall be designed in accordance with the latest guidelines mentioned out in section-3 of manual.
2. Junction improvement under grade separators shall be carried out as per manual with proper entry/exit to cross roads and slip/service roads, etc. Auxiliary lanes including storage, acceleration and deceleration lane along with physical islands to be provided.
3. Location of grade-separated structures are indicative. Exact location should be decided in consultation with Authority Engineer.
4. Intersection Layout, Entry/Exit, Right Turning Lane, U-Turns, Geometric Design and Typical Cross Sections of Interchange shall be included in Annexure to Schedule-B.

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5. Only Entry or Exit shall be designed at any location (provision of entry/exit by ghost island not permitted) **(Clause No. 2.13.1 of IRC: SP: 84-2019/ IRC: SP:87-2019).**

#### 4.0 Road Embankment and Cut Section S

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

Based on site/design requirement, the Concessionaire shall design the alignment plans and profiles of the project highway based on site/Design requirement mentioned in Schedule B with approval from the Independent Engineer/Authority Engineer within the available Right of way. However, it is clarified that bottom of subgrade level shall be at-least 1500 mm above HFL/Existing ground level for a greenfield/bypass stretch.

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

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

**Use of Pond Ash and Design of Pond Ash embankment shall be specified (Clause No.4.2.4 & 4.4.1.i (d) IRC: SP:84-2019)**

The Concessionaire shall deploy Grading, Paving and Compaction Equipment equipped with System of **Automated & Intelligent Machine-aided Construction (AI-MC)** for finishing of all Grades including Embankment, and Subgrade. The System of **Automated & Intelligent Machine-aided Construction (AI-MC)** for Motor Graders/ Paver and the same in Compactors and Dozers shall be done with help of 3D Digital Model generated from Design to ensure Quality Standards as per IRC Specifications and Productivity improvement.

Further, Contractor shall ensure the Generation of measurable Digital Records that can be shared on a Digital Drive or can viewed in real time. The Hardware and Software used by the Contractor shall have Features and Specifications mentioned at Schedule D.

#### 5.0 Pavement design

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

- 5.1.1 Concessionaire shall develop 3D Digital Models and use suitable system of **Automated & Intelligent Machine-aided Construction (AI-MC)** for Motor Graders and Paver and the same in Compactors and Dozers to ensure Quality Standards as per IRC Specifications and Productivity improvement. Further, Contractor shall generate measurable Digital Records that can be shared on a Digital Drive or can viewed in real time. The Hardware and software used by Contractor shall have features and specification mentioned at schedule D.

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

The Pavement shall be flexible type for entire length of project highway except for the toll plaza location where rigid pavement shall be provided.

**(The design consultant will carry out life cycle cost analysis for flexible and as well as rigid pavement. The cost-effective solution shall be proposed for the project.)**

- 5.2.1.** Design Period and Strategy Pavement shall be constructed for the entire length of Project Highway including paved shoulders. Flexible Pavement shall be designed for a minimum design period of 20 years and minimum sub grade CBR of 8% and maximum subgrade CBR of 10%. Whereas Rigid pavement shall be designed for a minimum design period of 30 years. Stage construction shall not be permitted.
- 5.2.2.** Recommended Pavement Design Notwithstanding anything to the contrary contained in this Agreement or the manual, the Concessionaire shall design the pavement of main carriageway for minimum design traffic of 175 MSA.
- 5.2.3.** The Pavement for service road/slip roads shall be designed and projected traffic subject to minimum as follows: **(Clause No. 5.5.4 IRC: SP: 84-2019/ IRC : SP: 87-2019)**
- Main Carriageway s for minimum 175 MSA
  - Slip Roads/ Service Roads for minimum 30 MSA
- 5.3** In order to meet the intended functional requirement of respective pavement layers on main carriageway, the minimum thickness of respective pavement layers for main carriageway and connecting cross roads/service roads/slip roads/entry/exit locations, acceleration/deceleration lane, right turning lanes shall, shall be same as main carriageway.
- 5.3.1 Main carriageway, paved shoulder, median side paved strip, entry/exit locations, acceleration/deceleration lane, right turning lanes (flexible) with GSB/WMM**

**(A)** The following stretches shall be treated as new construction as tabulated below:

Sr.No.	Chainage		Side	Length
	From	To		
1	05+620	05+670	LHS	50
2	05+670	05+745	LHS	75
3	05+745	05+782	LHS	37
4	05+875	05+885	LHS	10
5	06+020	06+048	LHS	28
6	06+108	06+125	LHS	17
7	06+535	07+275	LHS	740
8	07+275	07+350	LHS	75
9	07+500	07+522	LHS	22
10	07+559	07+652	LHS	93
11	08+850	09+060	LHS	210
12	09+200	09+238	LHS	38
13	09+286	09+320	LHS	34
14	09+827	09+925	LHS	98
15	10+899	10+905	LHS	6
16	13+170	13+520	LHS	350
17	13+785	13+795	LHS	10
18	14+076	14+325	LHS	249
19	14+325	14+400	LHS	75

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Sr.No.	Chainage		Side	Length
	From	To		
20	14+400	14+841	LHS	441
21	14+932	15+320	LHS	388
22	15+420	15+538	LHS	118
23	15+620	15+941	LHS	320.7
24	15+998	16+014	LHS	16
25	16+195	16+340	LHS	144.6
26	16+428	16+430	LHS	1.7
27	16+431	16+480	LHS	49
28	16+480	16+652	LHS	172
29	16+705	16+920	LHS	215
30	17+350	17+502	LHS	152
31	17+766	17+790	LHS	24
32	17+790	17+925	LHS	135
33	17+925	18+000	LHS	75
34	18+000	18+230	LHS	230
35	18+230	18+686	LHS	456
36	19+481	20+425	LHS	944
37	20+425	20+500	LHS	75
38	21+201	21+235	LHS	34
39	21+295	21+340	LHS	45
40	23+440	23+450	LHS	10
41	23+710	23+720	LHS	10
42	23+932	23+945	LHS	13.2
43	23+945	24+104	LHS	159
44	24+228	24+320	LHS	92
45	24+320	24+650	LHS	330
46	24+650	24+682	LHS	32.2
47	24+827	24+894	LHS	67
48	24+972	25+001	LHS	29.2
49	25+088	25+150	LHS	62
50	25+150	25+630	LHS	480
51	25+670	26+200	LHS	530
52	26+200	26+275	LHS	75
53	26+275	26+350	LHS	75
54	26+840	26+850	LHS	10
55	26+850	27+200	LHS	350
56	27+200	27+275	LHS	75
57	27+275	27+425	LHS	150
58	27+425	27+551	LHS	126
59	28+039	28+125	LHS	86
60	28+366	28+382	LHS	16
61	28+440	28+520	LHS	80
62	28+520	28+595	LHS	75

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

Sr.No.	Chainage		Side	Length
	From	To		
63	28+595	28+728	LHS	133
64	28+848	28+975	LHS	127
65	28+975	29+050	LHS	75
66	29+050	29+990	LHS	940
67	30+024	30+030	LHS	6
68	30+363	30+375	LHS	11.7
69	30+375	30+880	LHS	505
70	31+010	31+100	LHS	90
71	31+100	31+395	LHS	295
72	31+463	31+635	LHS	172
73	31+635	31+770	LHS	135
74	31+770	31+845	LHS	75
75	31+845	32+198	LHS	352.5
76	32+299	32+629	LHS	330
77	32+721	32+740	LHS	19.3
78	32+820	34+500	LHS	1680.3

Sr.No.	Chainage		Side	Length
	From	To		
1	05+615	05+670	RHS	55
2	05+670	05+745	RHS	75
3	05+745	05+770	RHS	25
4	05+875	05+880	RHS	5
5	05+880	05+885	RHS	5
6	06+535	07+275	RHS	740
7	07+275	07+350	RHS	75
8	07+350	07+485	RHS	135
9	07+485	07+522	RHS	37
10	07+559	07+662	RHS	103
11	07+717	08+030	RHS	313
12	08+570	08+613	RHS	43
13	08+671	08+682	RHS	11
14	09+890	09+925	RHS	35
15	09+973	09+990	RHS	17
16	10+130	10+145	RHS	15
17	10+207	10+250	RHS	43
18	11+597	11+626	RHS	29
19	11+766	11+776	RHS	10
20	11+831	11+841	RHS	10
21	12+006	12+026	RHS	20

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Sr.No.	Chainage		Side	Length
	From	To		
22	12+058	12+075	RHS	17
23	12+200	12+210	RHS	10
24	13+160	13+510	RHS	350
25	13+570	13+580	RHS	10
26	13+778	13+785	RHS	7
27	13+785	13+800	RHS	15
28	13+947	13+967	RHS	20
29	14+075	14+325	RHS	250
30	14+325	14+400	RHS	75
31	14+400	16+480	RHS	2080
32	16+480	16+652	RHS	172
33	16+652	16+672	RHS	20
34	16+672	16+920	RHS	248
36	17+350	17+502	RHS	152
37	17+768	17+775	RHS	7
38	17+775	17+925	RHS	150
39	17+925	18+000	RHS	75
40	18+000	18+230	RHS	230
41	18+230	18+686	RHS	456
42	19+481	20+425	RHS	944
43	20+425	20+500	RHS	75
44	21+000	21+100	RHS	100
45	21+100	21+138	RHS	38
46	21+196	21+589	RHS	393
47	21+604	21+645	RHS	41
48	21+920	21+950	RHS	30
49	21+950	22+115	RHS	165
50	22+147	22+175	RHS	28
51	22+175	22+300	RHS	125
52	23+090	23+530	RHS	440
53	23+942	23+945	RHS	3.4
54	23+945	24+080	RHS	135
55	24+080	24+104	RHS	24
56	24+228	24+320	RHS	92
57	24+320	24+650	RHS	330
58	24+650	25+150	RHS	500
59	25+150	25+640	RHS	490
60	25+660	26+200	RHS	540
61	26+200	26+275	RHS	75
62	26+275	26+410	RHS	135

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

Sr.No.	Chainage		Side	Length
	From	To		
63	26+410	26+493	RHS	83
64	26+571	26+625	RHS	54
65	26+625	26+775	RHS	150
66	26+775	26+850	RHS	75
67	26+850	26+959	RHS	109
68	27+050	27+200	RHS	150.3
69	27+200	27+275	RHS	75
70	27+275	27+410	RHS	135
71	27+410	27+510	RHS	100.4
72	27+610	27+631	RHS	21
73	27+648	27+655	RHS	7
74	27+655	27+658	RHS	3
75	28+039	28+130	RHS	91.5
76	28+440	28+520	RHS	80
77	28+520	28+595	RHS	75
78	28+595	28+730	RHS	135
79	28+730	28756	RHS	26
80	28+816	28+825	RHS	9
81	28+825	28+975	RHS	150
82	28+975	29+050	RHS	75
83	29+050	30+000	RHS	950
84	30+024	30+030	RHS	6
85	30+161	30+171	RHS	10
86	30+480	30+500	RHS	20
87	30+550	30+557	RHS	6.5
88	30+607	30+630	RHS	23
89	30+799	30+823	RHS	24.5
90	31+898	33+368	RHS	1470
91	33+471	33+737	RHS	266.8
92	33+871	34+500	RHS	629

**(B) Balance BC work for Main Carriageway**

Sr.No.	Chainage		Side	Length
	From	To		
1	04+790	04+990	LHS	200.00
2	04+990	05+125	LHS	135.00
3	05+125	05+200	LHS	75.00
4	05+200	05+670	LHS	470.00
5	05+670	05+745	LHS	75.00

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Sr.No.	Chainage		Side	Length
	From	To		
6	05+745	05+895	LHS	150.00
7	05+895	06+048	LHS	153.00
8	06+108	06+140	LHS	32.00
9	06+140	06+275	LHS	135.00
10	06+275	06+350	LHS	75.00
11	06+350	07+275	LHS	925.00
12	07+275	07+350	LHS	75.00
13	07+350	07+500	LHS	150.00
14	07+500	07+522	LHS	22.00
15	07+559	07+662	LHS	103.00
16	07+717	08+200	LHS	483.00
17	08+200	08+613	LHS	413.00
18	08+671	08+800	LHS	129.00
19	08+800	09+238	LHS	438.00
20	09+286	09+925	LHS	639.00
21	09+973	10+145	LHS	172.00
22	10+207	10+400	LHS	193.00
23	10+400	10+553	LHS	153.00
24	11+040	11+900	LHS	860.00
25	11+900	12+026	LHS	126.00
26	12+058	12+197	LHS	139.00
27	13+060	13+710	LHS	650.00
28	13+710	13+785	LHS	75.00
29	13+785	13+967	LHS	182.00
30	14+075	14+325	LHS	250.00
31	14+325	14+400	LHS	75.00
32	14+400	16+480	LHS	2080.00
33	16+480	16+652	LHS	172.00
34	16+672	16+920	LHS	248.00
35	17+350	17+502	LHS	152.00
36	17+766	17+790	LHS	24.00
37	17+790	17+925	LHS	135.00
38	17+925	18+000	LHS	75.00
39	18+000	18+230	LHS	230.00
40	18+230	18+686	LHS	456.00
41	19+481	20+425	LHS	944.00
42	20+425	20+890	LHS	465.00
43	20+890	20+965	LHS	75.00
44	20+965	21+115	LHS	150.00
45	21+115	21+138	LHS	23.00
46	21+196	21+589	LHS	393.00
47	21+604	21+730	LHS	126.00

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.



Sr.No.	Chainage		Side	Length
	From	To		
48	21+730	21+950	LHS	220.00
49	21+950	22+115	LHS	165.00
50	22+147	22+190	LHS	43.00
51	22+190	22+325	LHS	135.00
52	22+325	22+400	LHS	75.00
53	22+400	23+870	LHS	1470.00
54	23+870	23+945	LHS	75.00
55	23+945	24+095	LHS	150.00
56	24+095	24+104	LHS	9.00
57	24+228	24+320	LHS	92.00
58	24+320	24+650	LHS	330.00
59	24+650	25+150	LHS	500.00
60	25+150	25+640	LHS	490.00
61	25+660	26+200	LHS	540.00
62	26+200	26+275	LHS	75.00
63	26+275	26+425	LHS	150.00
64	26+425	26+493	LHS	68.00
65	26+571	26+640	LHS	69.00
66	26+640	26+775	LHS	135.00
67	26+775	26+850	LHS	75.00
68	26+850	27+200	LHS	350.00
69	27+200	27+275	LHS	75.00
70	27+275	27+425	LHS	150.00
71	27+425	27+631	LHS	206.00
72	27+648	27+670	LHS	22.00
73	27+670	27+805	LHS	135.00
74	27+805	27+880	LHS	75.00
75	27+880	28+520	LHS	640.00
76	28+520	28+595	LHS	75.00
77	28+595	28+745	LHS	150.00
78	28+745	28+756	LHS	11.00
79	28+816	28+840	LHS	24.00
80	28+840	28+975	LHS	135.00
81	28+975	29+050	LHS	75.00
82	29+050	30+150	LHS	1100.00
83	30+150	30+225	LHS	75.00
84	30+225	30+375	LHS	150.00
85	30+375	31+100	LHS	725.00
86	31+100	31+395	LHS	295.00
87	31+455	31+635	LHS	180.00
88	31+635	31+770	LHS	135.00
89	31+770	31+845	LHS	75.00

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

Sr.No.	Chainage		Side	Length
	From	To		
90	31+845	34+500	LHS	2655.00

Sr.No.	Chainage		Side	Length
	From	To		
1	04+800	04+975	RHS	175
2	04+975	05+125	RHS	150
3	05+125	05+200	RHS	75
4	05+200	05+670	RHS	470
5	05+670	05+745	RHS	75
6	05+745	05+880	RHS	135
7	05+880	06+048	RHS	168
8	06+108	06+125	RHS	17
9	06+125	06+275	RHS	150
10	06+275	06+350	RHS	75
11	06+350	07+275	RHS	925
12	07+275	07+350	RHS	75
13	07+350	07+485	RHS	135
14	07+485	07+522	RHS	36.5
15	07+559	07+662	RHS	103
16	07+717	08+030	RHS	313.5
17	08+567	08+613	RHS	46
18	08+671	08+800	RHS	129
19	08+800	09+238	RHS	438
20	09+286	09+925	RHS	639
21	09+973	10+145	RHS	172
22	10+207	10+400	RHS	193
23	10+400	10+578	RHS	178
24	11+440	11+900	RHS	460
25	11+900	12+026	RHS	126
26	12+058	12+200	RHS	142
27	12+200	12+775	RHS	575
28	12+775	12+925	RHS	150
29	12+925	13+000	RHS	75
30	13+000	13+710	RHS	710
31	13+710	13+785	RHS	75
32	13+785	13+967	RHS	182.45
33	14+075	14+325	RHS	250.45
34	14+325	14+400	RHS	75
35	14+400	16+480	RHS	2080
36	16+480	16+652	RHS	172
37	16+652	16+672	RHS	20
38	16+672	16+920	RHS	248

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

Sr.No.	Chainage		Side	Length
	From	To		
39	17+350	17+502	RHS	152
40	17+766	17+775	RHS	9
41	17+775	17+925	RHS	150
42	17+925	18+000	RHS	75
43	18+000	18+230	RHS	230
44	18+230	18+686	RHS	456.228
45	19+481	20+425	RHS	943.772
46	20+425	20+890	RHS	465
47	20+890	20+965	RHS	75
48	20+965	21+100	RHS	135
49	21+100	21+138	RHS	38
50	21+196	21+589	RHS	392.5
51	21+604	21+730	RHS	126.5
52	21+730	21+950	RHS	220
53	21+950	22+115	RHS	164.75
54	22+147	22+175	RHS	27.75
55	22+175	22+325	RHS	150
56	22+325	22+400	RHS	75
57	22+400	23+870	RHS	1470
58	23+870	23+945	RHS	75
59	23+945	24+080	RHS	135
60	24+080	24+104	RHS	24
61	24+228	24+320	RHS	92
62	24+320	24+650	RHS	330
63	24+650	25+150	RHS	500
64	25+150	25+640	RHS	490
65	25+660	26+200	RHS	540
66	26+200	26+275	RHS	75
67	26+275	26+410	RHS	135
68	26+410	26+493	RHS	82.71
69	26+571	26+625	RHS	53.71
70	26+625	26+775	RHS	150
71	26+775	26+850	RHS	75
72	26+850	27+200	RHS	350
73	27+200	27+275	RHS	75
74	27+275	27+410	RHS	135
75	27+410	27+631	RHS	220.644
76	27+648	27+655	RHS	7.356
77	27+655	27+805	RHS	150
78	27+805	27+880	RHS	75
79	27+880	28+130	RHS	250
80	28+440	28+520	RHS	80

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

Sr.No.	Chainage		Side	Length
	From	To		
81	28+520	28+595	RHS	75
82	28+595	28+730	RHS	135
83	28+730	28+756	RHS	26
84	28+816	28+825	RHS	9
85	28+825	28+975	RHS	150
86	28+975	29+050	RHS	75
87	29+050	30+150	RHS	1100
88	30+150	30+225	RHS	75
89	30+225	30+360	RHS	135
90	30+360	31+100	RHS	740
91	31+100	31+395	RHS	295
92	31+455	31+620	RHS	165
93	31+620	31+770	RHS	150
94	31+770	31+845	RHS	75
95	31+845	34+500	RHS	2655

BC works as mentioned in 5.3.1 (A) of Schedule-B should not be considered as mentioned in clause 5.3.1 (B).

**5.3.2. Main carriageway, paved shoulder, median side paved strip, entry/exit locations, acceleration/deceleration lane, right turning lanes (Rigid) -for Toll Plaza location.**

Pavement Composition	Minimum Crust Thickness (mm)
Subgrade	500
GSB	150
DLC	150
PQC	300

**5.3.3. Crossroads/ Services roads/ slip roads**

Pavement Composition	Minimum Crust Thickness (mm)
Subgrade	500
GSB	200
WMM reinforced with strata grid SGB 80 grid	170
DBM	50
BC	30

**Note:** The design Consultant shall mention the crust thickness based on the design traffic assessed during traffic survey and CBR.

Without the traffic plying on the slip roads no construction of any underpasses for clauses 1 & 2 should be undertaken.

Drainage plan should be approved prior to start of slip road planning on the project.

**5.4 Reconstruction of Stretches with New pavement**

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

S. No.	Design chainage		Length	Pavement Composition	Remarks
	From	To			
Nil					

**5.5 Bituminous Mix for Overlay**

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

Sl.No.	Chainage		Overlay Pavement Composition	Length (m)	Remarks
	From	To			
1	4+200	4+790	BC- 40 mm	590	LHS
2	4+200	4+800		600	RHS
3	8+030	8+567		537	RHS
4	10+553	11+040		487	LHS
5	10+578	11+440		862	RHS
6	12+197	13+060		863	LHS
7	28+130	28+440		310	RHS
8	34+500	35+395	BC- 40 mm + DBM- 50mm	895	This stretch shall be handed over to PWD.

**6 Roadside Drainage**

- 6.1.** Drainage system including surface and subsurface drains for the Project Highway including crossroads shall be provided as per section 6 of the manual. RCC Drain cum footpaths shall conform to the cross-sectional features and other details as given in Annexures to Schedule-B and shall be provided as under: **Details of lined Drain (Clause No. 2.13 & 6.2.6 IRC: SP:84-2019)**

**Footpath cum Drain**

SR.NO.	Chainage		Side	Width of Drain (m)	Total Length (m)
	From	To			
1	16480	16690	LHS	1.5	210
2	16918	16920	LHS	1.5	2
3	17175	17270	LHS	1.5	95
4	17766	17790	LHS	1.5	24
5	18458	18468	LHS	1.5	10
6	18623	19550	LHS	1.5	927
7	19578	19582	LHS	1.5	4
8	19714	19720	LHS	1.5	6
9	19774	19798	LHS	1.5	24
10	19857	19870	LHS	1.5	13
11	20015	20030	LHS	1.5	15

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

12	20146	20152	LHS	1.5	6
13	20281	20304	LHS	1.5	23
14	20354	20425	LHS	1.5	71
15	25175	25240	LHS	1.5	65
16	25280	25296	LHS	1.5	16
17	25334	25343	LHS	1.5	9
18	25370	25377	LHS	1.5	7
19	25447	25480	LHS	1.5	33
20	25525	25915	LHS	1.5	390
21	25962	26055	LHS	1.5	93
22	26197	26200	LHS	1.5	3
<b>Total</b>					<b>2046</b>

SR.NO.	Chainage		Side	Width of Drain (m)	Length (m)
	From	To			
1	16480	16631	RHS	1.5	151
2	16918	16920	RHS	1.5	2
3	17185	17239	RHS	1.5	54
4	17766	17775	RHS	1.5	9
5	18436	18438	RHS	1.5	2
6	18453	18464	RHS	1.5	11
7	18665	18982	RHS	1.5	317
8	19089	19153	RHS	1.5	64
9	19168	19171	RHS	1.5	3
10	19248	19255	RHS	1.5	7
11	19337	19599	RHS	1.5	262
12	19619	19625	RHS	1.5	6
13	19765	19774	RHS	1.5	9
14	19864	19869	RHS	1.5	5
15	19996	20063	RHS	1.5	67
16	20146	20158	RHS	1.5	12
17	20364	20379	RHS	1.5	15
18	20382	20425	RHS	1.5	43
19	25217	25249	RHS	1.5	32
20	25450	25801	RHS	1.5	351
21	25897	25921	RHS	1.5	24
22	26023	26055	RHS	1.5	32
23	26141	26159	RHS	1.5	18
24	26193	26200	RHS	1.5	7
<b>Total</b>					<b>1503</b>

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

**Load Bearing Drain**

Sr .No.	Chainage		Side	Width of Drain (m)	Length (m)	Remarks
	From	To				
1	5200	5310	LHS	1	110	
2	5640	5670	LHS	1	30	
3	6548.5	6580	LHS	1	31.5	
4	6851.7	6900	LHS	1	48.3	
5	7172	7275	LHS	1	103	
6	13161	13176	LHS	1	15	
7	13271	13288	LHS	1	17	
8	13434.5	13465.5	LHS	1	31	
9	13680	13685	LHS	1	5	
10	14400	14410	LHS	1	10	
11	14430	14538	LHS	1	108	
12	14578	14601	LHS	1	23	
13	14800	14841	LHS	1	41	
14	14943	14960	LHS	1	17	
15	15020	15050	LHS	1	30	
16	15199	15210	LHS	1	11	
17	15431	15530	LHS	1	99	
18	15608	15840	LHS	1	232	
19	15930	16072	LHS	1	142	
20	16103	16154	LHS	1	51	
21	16199	16218	LHS	1	19	
22	16232	16330	LHS	1	98	
23	16430	16480	LHS	1	50	
24	17790	17925	LHS	1	135	Additional Single cell (1x1)
25	17925	18000	LHS	1	75	Additional Single cell (1x1)
26	18034	18036	LHS	1	2	
27	18110	18190	LHS	1	80	
28	20425	20609	LHS	1	184	
29	20740	20763	LHS	1	23	
30	20797	20823	LHS	1	26	
31	20887	20890	LHS	1	3	
32	22622	22641	LHS	1	19	
33	22674	22693	LHS	1	19	
34	23027	23030	LHS	1	3	
35	23059	23074	LHS	1	15	
36	23162	23167	LHS	1	5	
37	23184	23194	LHS	1	10	

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

Sr .No.	Chainage		Side	Width of Drain (m)	Length (m)	Remarks
	From	To				
38	23228	23232	LHS	1	4	
39	23386	23394	LHS	1	8	
40	23429	23510	LHS	1	81	
41	23714	23810	LHS	1	96	
42	23859	23870	LHS	1	11	
43	24650	24674	LHS	1	24	
44	24828	24849	LHS	1	21	
45	24977	24993	LHS	1	16	
46	25105	25110	LHS	1	5	
47	26850	26861	LHS	1	11	
48	26940	27200	LHS	1	260	
49	27900	27940	LHS	1	40	
50	28071	28109	LHS	1	38	
51	28365	28378	LHS	1	13	
52	28489	28511	LHS	1	22	
53	29050	29071	LHS	1	21	
54	29097	29121	LHS	1	24	
55	29175	29180	LHS	1	5	
56	29503	29517	LHS	1	14	
57	29640	29646	LHS	1	6	
58	29766	29770	LHS	1	4	
59	30015	30030	LHS	1	15	
60	30141	30150	LHS	1	9	
61	31845	31900	LHS	1	55	
62	31932	31940	LHS	1	8	
63	32000	32010	LHS	1	10	
64	32500	32548	LHS	1	48	
65	32729	32740	LHS	1	11	
66	32857	32912	LHS	1	55	
67	33017	33056	LHS	1	39	
68	33246	33267	LHS	1	21	
69	33640	33655	LHS	1	15	
70	33890	34169	LHS	1	279	
71	34263	34500	LHS	1	237	
<b>Total</b>					<b>3446.8</b>	

SR.NO.	Chainage		Side	Width of Drain (m)	Length	Remarks
	From	To				
1	5200	5330	RHS	1	130	
2	6550	6580	RHS	1	30	
3	6670	6730	RHS	1	60	
4	6780	6790	RHS	1	10	

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.



SR.NO.	Chainage		Side	Width of Drain (m)	Length	Remarks
	From	To				
5	6856	6984	RHS	1	128	
6	7069	7275	RHS	1	206	
7	13000	13160	RHS	1	160	Additional Single Cell (1x1)
8	13160	13179	RHS	1	19	Double cell (2x1)
9	13179	13200	RHS	1	21	Additional Single Cell (1x1)
10	13200	13380	RHS	1	180	Double cell (2x1)
11	13380	13430	RHS	1	50	Additional Single Cell (1x1)
12	13430	13450	RHS	1	20	Double cell (2x1)
13	13430	13478	RHS	1	48	
14	13567	13580	RHS	1	13	
15	14510	14518	RHS	1	8	
16	14585	14599	RHS	1	14	
17	14639	14670	RHS	1	31	
18	14729	14760	RHS	1	31	
19	14811	14835	RHS	1	24	
20	14845	14856	RHS	1	11	
21	14865	14893	RHS	1	28	
22	14900	14909	RHS	1	9	
23	14930	14960	RHS	1	30	
24	15210	15230	RHS	1	20	
25	15332	15337	RHS	1	5	
26	15402	15642	RHS	1	240	
27	15680	15772	RHS	1	92	
28	15969	16020	RHS	1	51	
29	16410	16480	RHS	1	70	
30	17775	17925	RHS	1	150	Additional Single Cell (1x1)
31	17925	18000	RHS	1	75	Additional Single Cell (1x1)
32	18000	18032.5	RHS	1	32.5	Additional Single Cell (1x1)
33	18032.5	18037	RHS	1	4.5	Double cell (2x1)
34	18037	18048	RHS	1	11	Additional Single Cell (1x1)
35	18048	18088	RHS	1	40	Double cell (2x1)
36	18088	18263	RHS	1	175	Additional Single Cell (1x1)
37	19481	20425	RHS	1	944	Additional Single Cell (1x1)
38	20425	20558	RHS	1	133	Double cell (2x1)
39	20558	20801	RHS	1	243	Additional Single Cell (1x1)
40	20801	20821.6	RHS	1	20.6	Additional Single Cell (1x1)
41	20821.6	20886	RHS	1	64.4	Additional Single Cell (1x1)
42	20886	20890	RHS	1	4	Double cell (2x1)
43	22400	22622.6	RHS	1	222.6	Additional Single Cell (1x1)
44	22622.6	22629.2	RHS	1	6.6	Double cell (2x1)
45	22629.2	23027	RHS	1	397.8	Additional Single Cell (1x1)
46	23027	23035	RHS	1	8	Double cell (2x1)

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

SR.NO.	Chainage		Side	Width of Drain (m)	Length	Remarks
	From	To				
47	23035	23184.5	RHS	1	149.5	Additional Single Cell (1x1)
48	23184.5	23186	RHS	1	1.5	Double cell (2x1)
49	23186	23220.5	RHS	1	34.5	Additional Single Cell (1x1)
50	23220.5	23227	RHS	1	6.5	Double cell (2x1)
51	23227	23386.6	RHS	1	159.6	Additional Single Cell (1x1)
52	23386.6	23396	RHS	1	9.4	Double cell (2x1)
53	23396	23437	RHS	1	41	Additional Single Cell (1x1)
54	23437	23443.5	RHS	1	6.5	Double cell (2x1)
55	23443.5	23616	RHS	1	172.5	Additional Single Cell (1x1)
56	23616	23620	RHS	1	4	Double cell (2x1)
57	23620	23635	RHS	1	15	Additional Single Cell (1x1)
58	23635	23643	RHS	1	8	Double cell (2x1)
59	23643	23823	RHS	1	180	Additional Single Cell (1x1)
60	23823	23841	RHS	1	18	Double cell (2x1)
61	23841	23870	RHS	1	29	Additional Single Cell (1x1)
62	24650	24682	RHS	1	32	
63	24820	24840	RHS	1	20	
64	24971	24991	RHS	1	20	
65	25030	25041	RHS	1	11	
66	25109	25150	RHS	1	41	
67	26906	26958	RHS	1	52	
68	27007	27015	RHS	1	8	
69	27060	27200	RHS	1	140	
70	27878.5	27896.5	RHS	1	18	Additional Single Cell (1x1)
71	27896.5	27945	RHS	1	48.5	Double cell (2x1)
72	27945	27986	RHS	1	41	Additional Single Cell (1x1)
73	27986	27990	RHS	1	4	Double cell (2x1)
74	27990	28054	RHS	1	64	Additional Single Cell (1x1)
75	28054	28062	RHS	1	8	Double cell (2x1)
76	28062	28069	RHS	1	7	Additional Single Cell (1x1)
77	28069	28074	RHS	1	5	Double cell (2x1)
78	28074	28278	RHS	1	204	Additional Single Cell (1x1)
79	28278	28287	RHS	1	9	Double cell (2x1)
80	28287	28316	RHS	1	29	Additional Single Cell (1x1)
81	28316	28318	RHS	1	2	Double cell (2x1)
82	28318	28370	RHS	1	52	Additional Single Cell (1x1)
83	28370	28377	RHS	1	7	Double cell (2x1)
84	28377	28521	RHS	1	144	Additional Single Cell (1x1)
85	29050	29080	RHS	1	30	
86	29090	29110	RHS	1	20	
87	29150	29337	RHS	1	187	
88	29560	29567	RHS	1	7	

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SR.NO.	Chainage		Side	Width of Drain (m)	Length	Remarks
	From	To				
89	29738	29759	RHS	1	21	
90	30148	30150	RHS	1	2	
91	31840	31999	RHS	1	159	Additional Single Cell (1x1)
92	31999	32029	RHS	1	30	Double cell (2x1)
93	32029	32117.2	RHS	1	88.2	Additional Single Cell (1x1)
94	32117.2	32285	RHS	1	167.8	Double cell (2x1)
95	32285	32360	RHS	1	75	Additional Single Cell (1x1)
96	32477	32530	RHS	1	53	
97	32728	32751	RHS	1	23	
98	32790	32800	RHS	1	10	
99	32880	32920	RHS	1	40	
100	33027	33060	RHS	1	33	
101	33233	33364	RHS	1	131	
102	33408	33413	RHS	1	5	
103	33641	33655	RHS	1	14	
104	33880	34060	RHS	1	180	
105	34210	34232	RHS	1	22	
106	34238	34240	RHS	1	2	
107	34371	34500	RHS	1	129	
Total Length = 7501.5						

**Hume Pipe culvert 1.2 m dia.**

HUME PIPE CULVERT (LHS)				
SR.NO.	Chainage		Length (m)	Type of drain
	From	To		
1	17766	17790	24	HPC
2	17790	17925	135	HPC
3	17925	18000	75	HPC

HUME PIPE CULVERT (RHS)				
SR.NO.	Chainage		Length (m)	Type of drain
	From	To		
1	17766	17775	9	HPC
2	17775	17925	150	HPC
3	17925	18000	75	HPC
4	18230	19481	1251	HPC
5	18686	19481	795	HPC
6	33940	34080	140	HPC

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**Note:****RCC Chutes Drain & Channel Kerbs**

RCC Chutes at designed interval with energy dissipation basin shall be provided both side of the main carriageway where height is more than 3m and Berm Shall be provided at locations having Height Greater than 6.0 m and shall be properly connected to the channel kerb provided on shoulder.

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

- 6.3. Median Drain (Clause No. 6.3 IRC: SP:84-2019)**  
NIL

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

**A Suitable Drainage arrangement for draining storm water of main carriageway shall be provided. Storm water of main carriageway to service road is not permitted.**

- 6.5. Drainage where Embankment Height is more than 3m (Clause No. 6.4 IRC: SP: 84-2019)**  
Drainage chutes shall be provided at suitable interval on embankment slopes. The drainage arrangement shall include kerb, cement concrete drainage channel at the edge roadway. Cement Concrete Chutes, CC bedding, energy dissipation basin, etc. Mountable Kerb shall be provided beyond the post of MBCB to channelize storm water into chute. **(Clause No. 6.8.2.4 Of IRC: SP:84-2019).**

- 6.6 Drainage for Structures (Clause No. 6.8 IRC: SP: 84-2019)**  
A Suitable drainage arrangement for draining storm water from deck slab shall be provided. Water shall not fall on any surface of the structures, or remain standing or flowing over the road below structure.

- 6.7 Drainage for Underpass and Subways Structures (Clause No. 6.8.3 IRC: SP: 84-2019)**  
A suitable drainage arrangement for draining storm water from Underpass and Subways shall be provided.

- 6.8 Drainage arrangement of Retaining Structures (No Clause in IRC: SP: 84-2019)**  
Vertical Drop-down drainage pipes with suitable cleaning provision shall be provided at suitable interval. Drainage fixtures and dropdown pipes shall be of rigid, corrosion resistant material not less than 100mm dia. The Storm water of main carriageway draining on service road is not permitted.

**7. Design of Structures**

**7.1 General**

Project highway is proposed to be constructed to a four-lane configuration. As such, superstructure of all bridges, culverts and structures is to be designed for edge movement of the vehicle considering stitching of new superstructure in future due to widening for additional lane.

**Special vehicle loading is to be considered in design of all bridges, culverts and structures. All Structures except wherever expansion joints have been provided, the pavement layers WMM, DBM& BC shall be continued over the structures for smooth riding quality of the**

**project highway.** These structures shall be designed considering the dead load of pavement (WMM, DBM, BC etc.) layers.

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

**7.1.1.** All Bridges, culverts and structures shall be designed for IRC class Special Vehicle (SV) loading as per IRC: 6 and constructed in accordance with section-7 of the manual and shall conform to the cross-sectional features and other details specified therein.

**7.1.2.** The overall width of the structures shall be as given in Para 7.3 of Annex-I of Schedule-B. **(Clause No. 7.3 IRC: SP:84-2019).**

**7.1.3.** The Safety Barrier and Footpath on Bridges shall continue on approaches. The footpath shall be provided with paved surface & railing till the embankment height is more than 3m. **(Clause No. 7.17 IRC: SP:84-2019)**

(Details of structures with footpaths **Clause No. 7.2 ii IRC: SP:84-2019)**

S.No.	Location at km	Skew Angle	Footpath Width (m)		Remarks
			Left	Right	
1	14+021	0°	1.5m	1.5m	Major Bridge (LHS- Railing & Finishing work pending)
2	17+630	0°	1.5m	1.5m	Major Bridge (LHS-Footpath pending, RHS- Railing & Finishing pending)
3	24+166	0°	1.5m	1.5m	Major Bridge (Footpath pending for both side)
4	26+536	0°	1.5m	1.5m	Major Bridge (LHS- Railing & Finishing pending, RHS- Footpath Pending)
5	06+078	0°	1.5m	1.5m	Minor Bridge (LHS- Footpath pending, RHS- Railing & Finishing pending)
6	07+540	0°	1.5m	1.5m	Minor Bridge (LHS- Railing & Finishing pending, RHS- Footpath Pending)
7	08+642	0°	1.5m	1.5m	Major Bridge Bridge (LHS- Railing & Finishing pending, RHS- Footpath Pending)
8	09+262	0°	1.5m	1.5m	Minor Bridge (LHS- Footpath pending, RHS- Railing & Finishing pending)
9	09+949	0°	1.5m	1.5m	Minor Bridge (LHS- Railing & Finishing pending, RHS- Footpath Pending)
10	10+175	0°	1.5m	1.5m	Minor Bridge (LHS- Railing & Finishing pending, RHS- Footpath Pending)

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S.No.	Location at km	Skew Angle	Footpath Width (m)		Remarks
			Left	Right	
11	12+042	0°	1.5m	1.5m	Minor Bridge (LHS- Railing & Finishing pending, RHS- Footpath Pending)
12	19+366	0°	1.5m	1.5m	Minor Bridge (LHS- Footpath pending, RHS- Railing & Finishing pending)
13	21+161	0°	1.5m	1.5m	Minor Bridge (LHS- Railing & Finishing pending, RHS- Footpath Pending)
14	21+596	0°	1.5m	1.5m	Minor Bridge (LHS- Railing & Finishing pending, RHS- Footpath Pending)
15	22+124	0°	1.5m	1.5m	Minor Bridge (LHS- Railing & Finishing pending, RHS- Footpath Pending)
16	27+639	0°	1.5m	1.5m	Minor Bridge (LHS- Railing & Finishing pending, RHS- Footpath Pending)
17	28+786	0°	1.5m	1.5m	Minor Bridge (Footpath pending for both side)
18	31+425	0°	1.5m	1.5m	Minor Bridge (LHS-Footpath pending, RHS- Railing & Finishing pending)

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

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

**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 Annexure-1 of the Schedule-B.

## **7.2 Culverts (Clause No. 7.3 i IRC: SP: 84-2019)**

**7.2.1** Overall width of all culverts shall be equal to the roadway width of the approaches. The overall width of culverts shall be including width of main carriageway and slip/service roads/Entry ramps/Exit Ramps/Acceleration/Deceleration lanes, etc. All culverts shall also be continued in median and in gap between main carriageway and service road.

**7.2.2** Construction of balance work of existing RCC Slab culverts: The balance work of existing slab culverts at the following locations shall be constructed as tabulated below:

Sr No.	Structure	Chainage	Stat us of wor k	No . of cell s	Span Leng th (axb)	LHS			Medi an NJCB	RHS			BHS	% of length complet ed
		As per Design				Leng th	Retaini ng Wall	Connecti on with Drain		Leng th	Retaini ng Wall	Connecti on with Drain	Total Leng th	
1	RCC Slab	05+081	Scop e	1	1.7 X 2.4	5.210	5.774	Yes	Yes	16.250	4.536	Yes	21.460	75.72%
			Stat us							16.250			16.250	
2	RCC Slab	12+352	Scop e	1	2.4 X 1.3	6.920	3.535	No	Yes	7.486	4.862	No	14.406	48.04%
			Stat us			6.920	3.535						6.920	
3	RCC Slab	14+590	Scop e	1	2.5 X 1.9	7.740	3.642	Yes	Yes	14.550	3.708	Yes	22.290	99.37%
			Stat us			7.650				14.500			22.150	
4	RCC Slab	20+813	Scop e	1	3 X 2.2	18.790	4.760	Yes	Yes	2.910	4.081	Yes	21.700	86.59%
			Stat us			18.790	4.760						18.790	
5	RCC Slab	22+372	Scop e	1	1.5 X 1.0	18.340	1.800	No	Yes	3.130	1.800	No	21.470	85.42%
			Stat us			18.340							18.340	
6	RCC Slab	23+029	Scop e	1	2.4 X 1.4	19.880	3.464	Yes	Yes	2.310	3.536	Yes	22.190	89.59%
			Stat us			19.880							19.880	

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7	RCC Slab	23+827	Scope	1	1.9 X 1.3	16.300	3.131	Yes	Yes	5.810	2.405	Yes	22.110	
			Status			16.300	3.131						16.300	73.72%
8	RCC Slab	25+222	Scope	1	4.5 X 3	18.120	5.416	Yes	Yes	1.600	5.472	Yes	19.720	
			Status			18.120							18.120	91.89%
<b>Note</b>		<b>All the miscellaneous items like Toe wall, Certain wall, Floor apron, Flexible Apron are pending in all the Slab culvert.</b>												
	<b>Pending on all Slab Culvert</b>													
	1	Stone pitching												
	2	Toe Wall												
	3	Certain Wall-Type-I												
	4	Certain Wall-Type-II												
	5	Floor Apron												
	6	Flexible Apron												

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**7.2.3 Widening of existing RCC Pipe culverts (Clauses No. 7.3 iii IRC: SP:84-2019)**

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

S. No.	Design Chainage	Culvert Type	Skew Angle	Span/ Opening (m)	Repairs Rehabilitation Proposals	Culvert Crossing Type (Balancing/Stream etc.)	Remarks
NIL							

**7.2.4 Construction of Box Culverts:**

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

**Box Culverts (Clause No. 7.3 i IRC: SP 84-2019)**

S.NO.	Design Chainage	Span Arrangement	Skew Angle	Culvert crossing type
1	06+866	4.0x2.5	0°	Stream
2	07+185	2.0x1.5	1.2°	Stream
3	10+884	2.0x1.5	0°	Stream
4	13+279	3.0x2.0	0°	Stream
5	14+217	2.0x2.0	0°	Stream
6	14+953	2.0x1.5	0°	Stream
7	15+509	5.0x4.0	0°	Stream
8	17+877	3.0x3.0	0°	Stream
9	18+685	2.0x1.5	0°	Stream
10	18+882	3.0x1.5	0°	Stream
11	19+067	2.0x2.0	0°	Stream
12	19+126	2.0x2.0	0°	Stream
13	19+931	5.0x2.0	0°	Stream
14	22+711	3.0x2.0	0°	Stream
15	24+669	3.0x1.5	0°	Stream
16	26+946	3.0x2.0	0°	Stream
17	27+923	3.0x1.5	0°	Stream
18	28+068	2.0x1.5	0°	Stream
19	28+559	2.0x1.5	0°	Stream
20	29+752	6.0x1.5	0°	Stream
21	30+028	3.0x1.5	11°	Stream
22	30+165	6.0x2.0	40°	Stream
23	30+250	2.0x1.5	0°	Stream
24	30+414	2.0x1.5	0°	Stream
25	30+616	2.0x1.0	0°	Stream
26	30+817	2.5x1.5	0°	Stream
27	31+173	3.0x2.5	0°	Stream

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S.NO.	Design Chainage	Span Arrangement	Skew Angle	Culvert crossing type
28	32+005	5.0x2.5	0°	Stream
29	32+506	5.0x3.5	0°	Stream
30	32+734	4.0x2.0	0°	Stream
31	33+041	4.0x3.0	6°	Stream
32	33+257	5.0x2.5	0°	Stream
33	33+621	3.0x3.0	0°	Stream
34	33+936	4.0x2.0	0°	Stream
35	34+240	2.0x2.0	0°	Stream

**Note:**

1. Location of the above culverts are indicative and span arrangement is minimum specified. Exact location of these culverts shall be decided in consultation with Authority Engineer. The actual vent way/span arrangements of culverts shall be determined on the basis of detailed investigations by the Contractor in accordance with the Specifications and Standards. Any variations in vent way/span arrangements 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.

**7.2.6 Construction of balance work of existing Box culverts**

All existing culverts which are not completely constructed, balance work of these culverts shall be constructed to the proposed roadway width of the Project Highway as per the typical cross section given in Schedule-B Repairs and strengthening of existing structures where required shall be carried out.

**(Clause No. 7.3 iii IRC: SP:84-2019)**

Sr No.	Structure	Chainage	Stat us of wor k	No . of cell s	Span Lengt h (axb)	LHS			Medi an NJCB	RHS			BHS	% of length complet ed
		As per Design				Leng th	Retaini ng Wall	Connecti on with Drain		Leng th	Retaini ng Wall	Connecti on with Drain	Total Leng th	
1	Box Culvert	05+749	Scop e	1	2.5 X 2.5	15.250	6.180	No	Yes	15.250	6.180	No	30.500	35.08%
			Stat us							10.700			10.700	
2	Box Culvert	05+883	Scop e	1	2 X 2	15.210	7.085	No	Yes	15.210	7.085	No	30.420	42.74%
			Stat us							13.000			13.000	
3	Box Culvert	11+771	Scop e	1	2 X 2	13.000	7.085	No	Yes	13.000	7.085	No	26.000	50.00%
			Stat us			13.000	7.085						13.000	
4	Box Culvert	11+836	Scop e	1	2 X 2	13.000	7.085	No	Yes	13.000	7.085	No	26.000	50.00%
			Stat us			13.000	7.085						13.000	
5	Box Culvert	13+442	Scop e	1	2 X 2	17.500	7.085	Yes	Yes	17.500	7.085	Yes	35.000	26.29%
			Stat us			9.200							9.200	
6	Box Culvert	14+827	Scop e	1	2 X 2	17.500	3.837	Yes	Yes	17.500	3.841	Yes	35.000	42.29%
			Stat us			14.800							14.800	

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7	Box Culvert	15+509	Scop e	1	5 X 4	17.500	4.500	Yes	Yes	17.500	4.500	Yes	35.000	
			Stat us			16.050	5.000						16.050	45.86%
8	Box Culvert	16+004	Scop e	1	3 X 3.5	17.500	9.417	Yes	Yes	17.500	9.417	Yes	35.000	
			Stat us			17.500	9.417	No	No	No	No	No	17.500	50.00%
9	Box Culvert	16+939	Scop e		2 X 2	17.823	7.625	Yes	Yes	16.830	6.602	yes	34.653	
			Stat us							16.800	6.500		16.800	48.48%
10	Box Culvert	17+239	Scop e		3 X 3	14.570	no	yes	no	13.500	9.237	yrs	28.070	
			Stat us			5.700				9.400			15.100	53.79%
11	Box Culvert	18+462	Scop e	1	2 X 1.5	18.250	0.000	Yes	Yes	18.250	0.000	Yes	36.500	
			Stat us			10.500							10.500	28.77%
12	Box Culvert	19+580	Scop e	1	1.5 X 1.5	18.250	0.000	Yes	Yes	18.250	0.000	Yes	36.500	
			Stat us			10.500				6.600			17.100	46.85%
13	Box Culvert	19+869	Scop e	1	1.5 X 1.5	18.250	0.000	Yes	Yes	18.250	0.000	Yes	36.500	
			Stat us			8.500				9.200			17.700	48.49%

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14	Box Culvert	20+031	Scope	1	3 X 2	18.250	0.000	Yes	Yes	18.250	0.000	Yes	<b>36.500</b>	
			Status			7.400				14.500			21.900	60.00%
15	Box Culvert	20+152	Scope	1	2.5 X 2	18.250	0.000	Yes	Yes	18.250	0.000	Yes	<b>36.500</b>	
			Status			8.500				15.400			23.900	65.48%
16	Box Culvert	21+703	Scope	1	2 X 2	13.430	7.085	No	Yes	13.430	7.085	No	<b>26.860</b>	
			Status			8.500	4.500						8.500	31.65%
17	Box Culvert	23+438	Scope	1	2 X 1.5	17.500	2.745	Yes	Yes	17.500	2.722	Yes	<b>35.000</b>	
			Status			17.500	2.745						17.500	50.00%
18	Box Culvert	24+836	Scope	1	2 X 2	13.000	5.225	No	Yes	13.000	5.225	No	<b>26.000</b>	
			Status			17.500							17.500	67.31%
19	Box Culvert	25+421	Scope	1	2 X 1.5	18.250	0.000	Yes	Yes	18.250	0.000	Yes	<b>36.500</b>	
			Status			17.000							17.000	46.58%
20	Box Culvert	25+607	Scope	1	3 X 3	18.250	0.000	Yes	Yes	18.250	0.000	Yes	<b>36.500</b>	
			Status			21.200							21.200	58.08%

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21	Box Culvert	25+904	Scope	1	1.5 X 1.5	18.250	0.000	Yes	Yes	18.250	0.000	Yes	<b>36.500</b>	
			Status			11.400							11.400	31.23%
22	Box Culvert	26+045	Scope	1	1.5 X 1.5	18.250	0.000	Yes	Yes	18.250	0.000	Yes	<b>36.500</b>	
			Status			14.700							14.700	40.27%
23	Box Culvert	26+403	Scope	1	2 X 2	15.250	7.085	No	Yes	15.250	7.085	No	<b>30.500</b>	
			Status			13.300	3.300						13.300	43.61%
24	Box Culvert	26+591	Scope	1	2 X 2	14.460	7.085	No	Yes	14.460	7.085	No	<b>28.920</b>	
			Status			17.000	4.000						17.000	58.78%
25	Box Culvert	26+641	Scope	1	2 X 2	14.750	7.085	No	Yes	14.750	7.085	No	<b>29.500</b>	
			Status			16.400	4.000						16.400	55.59%
26	Box Culvert	26+731	Scope	1	2 X 2	15.250	7.085	No	Yes	15.250	7.085	No	<b>30.500</b>	
			Status			17.700							17.700	58.03%
27	Box Culvert	26+788	Scope	1	2 X 2	15.548	7.085	No	Yes	15.548	7.085	No	<b>31.096</b>	
			Status			16.200	3.000						16.200	52.10%

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28	Box Culvert Pre Cast	28+375	Scop e	1	1.5 X 1.5	17.5 00	2.728	Yes	Yes	17.5 00	2.630	Yes	35.0 00	
			Stat us							16.3 00			16.3 00	46.57%
29	Box Culvert	28+629	Scop e	1	6 X 2	15.2 50		No	Yes	15.2 50		No	30.5 00	
			Stat us							12.5 00			12.5 00	40.98%
30	Box Culvert	28+863	Scop e	1	2 X 2	15.3 75	7.374	No	Yes	15.3 75	7.374	No	30.7 50	
			Stat us							16.4 00			16.4 00	53.33%
31	Box Culvert	29+097	Scop e	1	1.5 X 1.5	17.5 00	2.900	Yes	Yes	17.5 00	4.383	Yes	35.0 00	
			Stat us										18.5 00	52.86%
32	Box Culvert	31+297	Scop e	1	3 X 3	11.7 50	7.085	No	Yes	11.7 50	7.085	No	23.5 00	
			Stat us							13.7 50			13.7 50	58.51%
33	Box Culvert	31+584	Scop e	1	3 X 3	11.7 50	7.085	No	Yes	11.7 50	7.085	No	23.5 00	
			Stat us							11.7 50	7.085		11.7 50	50.00%
Note		All the miscellaneous items like Toe wall, Certain wall, Floor apron, Flexible Apron are pending in all the box culvert.												
	Pending on all Box Culvert													
	1	Stone pitching												
	2	Toe Wall												

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	3	Certain Wall- Type-I	
	4	Certain Wall- Type-II	
	5	Floor Apron	
	6	Flexible Apron	

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.



**7.2.7 Culverts on Crossroads:**

S.NO.	Design Chainage	Span Arrangement	Skew Angle	Culvert crossing type
NIL				

**7.2.8** Utility ducts (Greenfield as well as Brownfield which is being upgraded) in form of NP-4 RCC Pipe dia. 600 mm shall be provided across the Project Highway @ 0.50 km c/c and along with inspection chamber where directed for crossing of utilities anywhere as per manual (clause 2.16)

**7.3 Bridges****7.3.1 Balance work for Existing bridges to be constructed:**

Balance work for existing bridges to be constructed:

**(A) Major Bridge****1. Major Bridge at Km 7+689**

Ch.	7+689	Status at site				
Structure	Major Bridge	BHS				
Span	2 x 37.5	A1		P1	A2	
Sr No.	Activity					
1	Drainage Spout	Done		Done	Done	
2	Painting Work	Pending		Pending	Pending	
3	Link Slab	NR		Done	NR	
4	Expansion Joint	LHS Done RHS Pending		NR	LHS Done RHS Pending	
5	Dirt Wall	Done		NR	Done	
6	Dependent Retaining Wall	A1 LHS	Done	NR	A1 RHS	Done
		A2 LHS	Done	NR	A2 RHS	Done
7	Independent Retaining Wall	A1 LHS	Done	NR	A1 LHS	Done
		A2 LHS	Done	NR	A2 LHS	Done
8	Approach Slab	A1 Done (LHS) A1 Pending (RHS)		NR	A2 Done (LHS) A2 Pending (RHS)	
9	Crash Barrier	Done		Done	Done (RHS)	
10	Footpath	Done		Done	Done	
11	Stone Pitching	Pending		Pending	Pending	
12	Launching Apron	Pending		300 MM THICK PCC	Pending	
13	Floor Protection	Pending				

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

**2. Major Bridge at Km 14+021**

Ch.	14+021	Status at site									
Structure	Major Bridge	LHS					RHS				
Span	4 x 27.535	A1	P1	P2	P3	A2	A1	P1	P2	P3	A2
Sr No.	Activity	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done
1	Piles										
2	Pile Cap										
3	Pier/Abut Shaft										
4	Pier/Abut Cap										
5	Pedestal										
6	Arrester										
7	Girder PSC Casted No.	NR	4	4	4	4	Done	Done	Done	Done	Done
8	Stressing/ Grouting	NR	4/4	4/4	4/4	4/4					
9	Girder Launching	NR	A1-P1 Done	P1-P2 Done	P2-P3 Done	P3-A2 Done					
10	End Cross Girder	Done	Done	Done	Done	Done					
11	Mid Cross Girder	Done	Done	Done	Done	Done					
12	Slab	NR	A1-P1 Done	P1-P2 Done	P2-P3 Done	P3-A2 Done	Done	Done	Done	Done	Done
13	Drainage Spout	Done	Done	Done	Done	Pending					
14	Painting Work	Pending	Pending	Pending	Pending	Pending					
15	Link Slab	NR	Done	NR	Done	Pending					

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

16	Expansion Joint	Done	NR	Done	NR	Done	Done	Done	Done	Done	Done
17	Dirt Wall	Done	NR	NR	NR	Done		NR	NR	NR	
18	Dep. Retaining Wall	A1 Median Done	A2 Median Done	A1 Footpath Done	A2 Footpath Done		A1 Median	A2 Median	A1 Footpath	A2 Footpath	
19	Ind. Retaining Wall	A1 Median Done	A2 Median Done	A1 Footpath Done	A2 Footpath Done		A1 Median	A2 Median	A1 Footpath	A2 Footpath	
20	Approach Slab	A1	Pending	A2	Done		Done				
21	Crash Barrier	Done in Footpath & median side, Pending on Approach Slab									
22	Footpath	Railing & Finishing Pending									
23	Stone Pitching	Pending									
24	Launching Apron	NR									
25	Floor Protection	Pending									

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

**3. Major Bridge at km 17+630**

Ch.	17+630	Status at site															
Structure	Major Bridge	LHS								RHS							
Span	7 x 37.600	A1	P1	P2	P3	P4	P5	P6	A2	A1	P1	P2	P3	P4	P5	P6	A2
Sr No.	Activity																
1	Arrester	Pending								Done							
2	Girder PSC Casted	NR	4	4	4	4	4	4	4	NR	4	4	4	4	4	4	4
3	Stressing/Grouting	NR	4/4	4/4	4/4	4/4	4/4	4/4	4/4	NR	4/4	4/4	4/4	4/4	4/4	4/4	4/4
4	Girder Launching	Pending								NR	A1-P1 Done	P1-P2 Done	P2-P3 Done	P3-P4 Done	P4-P5 Done	P5-P6 Done	P6-A2 Done
5	End Cross Girder									DONE	Done	Done	Done	Done	Done	Done	
6	Mid Cross Girder									DONE	Done	Done	Done	Done	Done	Done	
7	Slab									-	A1-P1 Done	P1-P2 Done	P2-P3 Done	P3-P4 Done	P4-P5 Done	P5-P6 Done	P6-A2 Done

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

8	Drainage Spout									Done							
9	Painting Work									Pending							
10	Link Slab	NR	Pend ing	NR	Pend ing	Pend ing	NR	Pend ing	NR	NR	Done	NR	Done	Do ne	NR	Do ne	NR
11	Expansion Joint	Pend ing	NR	Pend ing	NR	NR	Pend ing	NR	Pend ing	Done	NR	Done	NR	NR	Do ne	NR	Done
12	Dirt Wall	Pend ing	NR	NR	NR	NR	NR	NR	Pend ing	Done	NR	NR	NR	NR	NR	NR	Done
13	Dep. Retaining Wall	A1 LHS		Pending			RCC Wall Median A1		Done				A1 RHS		Done		
		A2 LHS		Pending									A2 RHS		Done		
14	Ind. Retaining Wall	A1 LHS		Pending			RCC Wall Median A2		Done				A1 RHS		Done		
		A2 LHS		Pending									A2 RHS		Done		
15	Approach Slab	A1	Pending			A2	Pending			A1	Pending			A2	Pending		
16	Crash Barrier	Pending								Done in Footpath & median side, Pending on Approach Slab							
17	Footpath	Pending								Railing & Finishing Pending							
18	Launching Apron	NR								NR							
19	Stone Pitching	Pend ing	NR					Pend ing	Pend ing	NR					Pend ing		
20	Pile Protection	Pending								Pend ing	Pend ing	Pend ing	Pend ing	Do ne	Do ne	Do ne	Pend ing

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

21	Floor Protection	Pending	pending
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#### 4. Major Bridge at Km 24+166

Ch.	24+166	Status at site															
Structure	Major Bridge	LHS				RHS											
Span	3 x 40.44	A1	P1	P2	A2	A1	P1	P2	A2								
Sr No.	Activity	Not Started				Not Started											
1	Piles	Pending	Pending	Pending	Pending	Pending	Pending	Pending	Pending								
2	Pile Cap																
3	Pier/Abut Shaft																
4	Pier/Abut Cap																
5	Pedestal																
6	Arrester																
7	Composite Steel Girder																
8	Girder Launching	Pending	Pending	Pending	Pending	Pending	Pending	Pending	Pending								
9	End Cross Girder (Steel)																
10	Mid Cross Girder (Steel)																
11	Slab																
12	Drainage Spout																
13	Painting Work																
14	Link Slab																
15	Expansion Joint	Pending	Pending	Pending	Pending	Pending	Pending	Pending	Pending								
16	Dirt Wall									Pending				Pending			
17										A1 LHS	Pending		Pending	A2 LHS		Pending	

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

	Dep. Retaining Wall	A1 RHS	Pending	RCC Wall Median A1	Pending	A2 RHS		Pending	
18	Ind. Retaining Wall	A1 LHS	Pending	RCC Wall median A2	Pending	A2 LHS		Pending	
		A1 RHS	Pending		Pending	A2 RHS		Pending	
19	Approach Slab	A1	Pending	A2	Pending	A1	Pending	A2	Pending
20	Crash Barrier	Pending				Pending			
21	Footpath	Pending				Pending			
22	Stone Pitching	Pending				Pending			
23	Launching Apron	NR				NR			
24	Floor Protection	Pending				Pending			

### 5. Major Bridge at Km 26+536

Ch.	26+536	Status at site					
Structure	Major Bridge	LHS			RHS		
Span	2 x 39.5	A1	P1	A2	A1	P1	A2
Sr. No.	Activity						
1	Piles	Done	Done	Done	Pending	Pending	Pending
2	Pile Cap						
3	Pier/Abut Shaft						
4	Pier/Abut Cap						
5	Pedestal						
6	Arrester						
7	Girder PSC Casted	NR	4	4	NR	4	4
8	Stressing/Grouting	NR	4/4	4/4	Pending	Pending	Pending
9	Girder Launching	NR	A1-P1 Done	P1-A2 Done			
10	End Cross Girder	Done	Done	Done			
11	Mid Cross Girder	Done	Done	Done			

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

12	Slab	NR	A1-P1 Done	P1-A2 Done			
13	Drainage Spout	Pending					
14	Painting Work	Pending	Pending	Pending			
15	Link Slab	NR	Done	NR			
16	Expansion Joint	Done	NR	Done			
17	Dirt Wall	Done	NR	Done	Pending	NR	Pending
18	Dep. Retaining Wall	A1 LHS	Done	RCC Wall Median A1	Done	A1 RHS	Pending
		A2 LHS	Done		Done	A2 RHS	Pending
19	Ind. Retaining Wall	A1 LHS	Done	RCC Wall Median A2	Done	A1 RHS	Pending
		A2 LHS	Done		Done	A2 RHS	Pending
20	Approach Slab	A1 Done	NR	A2 Done	A1 Pending	NR	A2 Pending
21	Crash Barrier	Done in Footpath & median side, Pending on Approach Slab			Pending		
22	Footpath	Railing & Finishing Pending			Pending		
23	Stone Pitching	Pending			Pending		
24	Launching Apron	NR			NR		
25	Floor Protection	Pending			Pending		

**(B) Minor Bridge****1. Minor Bridge at Km 6+078**

Ch.	6+078	Status at site					
Structure	Minor Bridge	LHS			RHS		
Span	2 x 30	A1	P1	A2	A1	P1	A2
Sl. No.	Activity						
1	Piles	5/10	Done	Pending	Done	Done	Done
2	Pile Cap	Pending	Pending	Pending	Done	Done	Done
3	Pier/Abut Shaft				Done	Done	Done
4	Pier/Abut Cap				Done	Done	Done

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.



5	Pedestal				Done	Done	Done
6	Arrester				Done	Done	Done
7	Girder PSC/RCC Casted	NR	4	4	NR	4	4
8	Stressing/Grouting	NR	Pending	Pending	NR	4/4	4/4
9	Girder Launching	NR	Pending	Pending	NR	A1-P1 Done	P1-A2 Done
10	End Cross Girder	Pending	Pending	Pending	Done	Done	Done
11	Mid Cross Girder	Pending	Pending	Pending	Done	Done	Done
12	Slab	NR	Pending	Pending	NR	A1-P1 Done	P1-A2 Done
13	Drainage Spout	Pending	Pending	Pending	Done	Done	Done
14	Painting Work	Pending	Pending	Pending	Pending	Pending	Pending
15	Link Slab	NR	Pending	NR	NR	Done	NR
16	Expansion Joint	Pending	NR	Pending	Done	NR	Done
17	Dirt Wall	Pending	NR	Pending	Done	NR	Done
18	Dep. Retaining Wall	A1 LHS	Pending	RCC Wall Median A1	Done	A1 RHS	Done
		A2 LHS	Pending			A2 RHS	Done
19	Ind. Retaining Wall	A1 LHS	Pending	RCC Wall Median A2	Done	A1 RHS	Done
		A2 LHS	Pending			A2 RHS	Done
20	Approach Slab	A1	NR	A2	A1	NR	A2
21	Crash Barrier	Pending			Done in Footpath & median side, Pending on Approach Slab		
22	Footpath	Pending			Railing & Finishing Pending		
23	Stone Pitching	Pending	NR	Pending	Pending	NR	Pending
24	Launching Apron	Pending	NR	Pending	Pending	NR	Pending
25	Floor Protection	NR			NR		

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

**2. Minor Bridge at Km 7+540**

Ch.	7+540	Status at site			
Structure	Minor Bridge	LHS		RHS	
Span	1 x 37	A1	A2	A1	A2
Sr No.	Activity				
1	Piles	Done	Done	Pending	Pending
2	Pile Cap				
3	Pier/Abut Shaft				
4	Pier/Abut Cap				
5	Pedestal				
6	Arrester				
7	Girder PSC Casted	NR	4	NR	Pending
8	Stressing/Grouting	NR	4/4	NR	
9	Girder Launching	NR	A1-A2 Done	NR	
10	End Cross Girder	Done	Done	Pending	
11	Mid Cross Girder	Done	Done	Pending	
12	Slab	NR	A1-A2 Done	NR	
13	Drainage Spout	Done	Done	Pending	
14	Painting Work	Pending	Pending	Pending	
15	Link Slab	NR	NR	NR	NR
16	Expansion Joint	Done	Done	Pending	Pending
17	Dirt Wall	Done	Done	Pending	
18	Dep. Retaining Wall	A1 LHS Done	RCC Wall median A1	A2 LHS	
		A1 RHS Done	Done	A2 RHS	
19	Ind. Retaining Wall	A1 LHS Done	RCC Wall median A2	A2 LHS	
		A1 RHS Done	Done	A2 RHS	
20	Approach Slab	A1 Done	A2 Done	A1 Pending	A2 Pending

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

21	Crash Barrier	Done in Footpath & median side, Pending on Approach Slab		Pending	
22	Footpath	Railing & Finishing Pending		Pending	
23	Stone Pitching	Pending		Pending	
24	Launching Apron	Pending	Pending	Pending	Pending
25	Floor Protection	NR		NR	

### 3. Minor Bridge at Km 8+642

Ch.	8+642	Status at site					
Structure	Minor Bridge	LHS			RHS		
Span	2 x 29.0	A1	P1	A2	A1	P1	A2
Sr No.	Activity						
1	Piles	Done	Done	Done	Done	Done	Done
2	Pile Cap						
3	Pier/Abut Shaft						
4	Pier/Abut Cap						
5	Pedestal						
6	Arrester	Done	1/2 Done	1/2 Done	Pending	Pending	Pending
7	Girder PSC Casted	NR	4	4	NR	4	4
8	Stressing/Grouting	NR	4/4	4/4	NR	4/4	4/4
9	Girder Launching	NR	A1-P1 Done	P1-A2 Done	NR	A1-P1 Done	P1-A2 Done
10	End Cross Girder	Done	Done	Done	Pending	Pending	Pending
11	Mid Cross Girder	Done	Done	Done	Pending	Pending	
12	Slab	NR	A1-P1 Done	P1-A2 Done	NR	Pending	
13	Drainage Spout	Done	Done	Done	Pending	Pending	

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

14	Painting Work	Pending	Pending	Pending	Pending	Pending	
15	Link Slab	NR	Done	NR	NR	Pending	NR
16	Expansion Joint	Done	NR	Done	Pending	NR	Pending
17	Dirt Wall	Done	NR	Done	Pending	NR	
18	Dep. Retaining Wall	A1 LHS	Done	RCC Wall Median A1	Done	A1 RHS	
		A2 LHS	Done			A2 RHS	
19	Ind. Retaining Wall	A1 LHS	Done	RCC Wall Median A2	Done	A1 RHS	
		A2 LHS	Done			A2 RHS	
20	Approach Slab	Done	NR	Done	Pending	NR	
21	Crash Barrier	Done in Footpath & median side, Pending on Approach Slab			Pending		
22	Footpath	Railing & Finishing Pending			Pending		
23	Stone Pitching	Done	NR	Done	Pending	NR	Pending
24	Launching Apron	Pending	NR	Pending	Pending	NR	Pending
25	Floor Protection	NR			NR		

#### 4. Minor Bridge at Km 9+262

Ch.	9+262	Status at site					
Structure	Minor Bridge	LHS			RHS		
Span	2 x 24	A1	P1	A2	A1	P1	A2
Sr No.	Activity						
1	Piles	Done	Done	Done	Done	Done	Done
2	Pile Cap						
3	Pier/Abut Shaft						
4	Pier/Abut Cap						
5	Pedestal	Pending	Pending	Pending	Done	Done	Done
6	Arrester	Pending	Pending	Pending	Pending	Pending	Pending

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

7	Girder RCC Casted	NR	4	4	NR	4	4
8	Stressing/Grouting	NR	NR	NR	NR	NR	NR
9	Girder Launching	NR	Pending	Pending	NR	A1-P1 Done	P1-A2 Done
10	End Cross Girder	Pending	Pending	Pending	Done	Done	Done
11	Mid Cross Girder	Pending	Pending	Pending	Done	Done	Done
12	Slab	NR			NR	A1-P1 Done	P1-A2 Done
13	Drainage Spout	Pending	Pending	Pending	Done	Done	Done
14	Painting Work	Pending	Pending	Pending	Pending	Pending	Pending
15	Link Slab	NR		NR	NR	Done	NR
16	Expansion Joint	Pending	NR	Pending	Done	NR	Done
17	Dirt Wall	Pending	NR	Pending	Done	NR	Done
18	Dep. Retaining Wall	A1 LHS	Pending	RCC Wall Median A1	Done	A1 RHS	Done
		A2 LHS	Pending			A2 RHS	Done
19	Ind. Retaining Wall	A1 LHS	Pending	RCC Wall Median A2	Done	A1 RHS	Done
		A2 LHS	Pending			A2 RHS	Done
20	Approach Slab	Pending	NR	Pending	Done	NR	Done
21	Crash Barrier	Pending			Done in Footpath & median side, Pending on Approach Slab		
22	Footpath	Pending			Railing & Finishing Pending		
23	Stone Pitching	Pending	NR	Pending	Done	NR	Done
24	Launching Apron	Pending	NR	Pending	Pending	NR	Pending
25	Floor Protection	NR			NR		

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

**5. Minor Bridge at Km 9+949**

Ch.	9+949	Status at site					
Structure	Minor Bridge	LHS			RHS		
Span	2 x 24.0	A1	P1	A2	A1	P1	A2
Sr No.	Activity						
1	Piles	Done	Done	Done	Done	Done	Done
2	Pile Cap				Pending	Pending	Pending
3	Pier/Abut Shaft						
4	Pier/Abut Cap						
5	Pedestal						
6	Arrester						
7	Girder RCC Casted	NR	4	4	NR	4	4
8	Stressing/Grouting	NR	NR	NR	NR	NR	NR
9	Girder Launching	NR	A1-P1 Done	P1-A2 Done	NR	Pending	Pending
10	End Cross Girder	Done	Done	Done	Pending		
11	Mid Cross Girder	Done	Done	Done	Pending		
12	Slab	NR	A1-P1 Done	P1-A2 Done	NR		
13	Drainage Spout	Done	Done	Done	Pending		
14	Painting Work	Pending	Pending	Pending	Pending		
15	Link Slab	NR	Done	NR	NR	Pending	NR
16	Expansion Joint	Done	NR	Done	Pending	NR	Pending
17	Dirt Wall	Done	NR	Done	Pending	NR	Pending
18	Dep. Retaining Wall	A1 LHS Done	NR	RCC Wall Median A1	Done	NR	A1 RHS Pending
		A2 LHS Done	NR			NR	A2 RHS Pending
19		A1 LHS Done	NR		Done	NR	A1 RHS Pending

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

	Ind. Retaining Wall	A2 LHS Done	NR	RCC Wall Median A2		NR	A2 RHS Pending
20	Approach Slab	Pending	NR	Pending	Pending	NR	Pending
21	Crash Barrier	Done in Footpath & median side, Pending on Approach Slab			Pending		
22	Footpath	Railing & Finishing Pending			Pending		
23	Stone Pitching	Pending	NR	Pending	Pending	NR	Pending
24	Launching Apron	Pending	NR	Pending	Pending	NR	Pending
25	Floor Protection	NR			NR		

#### 6. Minor Bridge at Km 10+175

Ch.	10+175	Status at site					
Structure	Minor Bridge	LHS			RHS		
Span	2 x 31	A1	P1	A2	A1	P1	A2
Sr No.	Activity						
1	Piles	Done	Done	Done	Done	Done	Done
2	Pile Cap						
3	Pier/Abut Shaft						
4	Pier/Abut Cap				Pending	Pending	Pending
5	Pedestal						
6	Arrester						
7	Girder PSC/RCC Casted	NR	4	4	NR	4	Pending
8	Stressing/Grouting	NR	4/4	4/4	NR	Pending	Pending
9	Girder Launching	NR	A1-P1 Done	P1-A2 Done	NR		
10	End Cross Girder	Done	Done	Done	Pending		
11	Mid Cross Girder	Done	Done	Done	Pending		

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

12	Slab	NR	A1-P1 Done	P1-A2 Done	NR		
13	Drainage Spout	Pending	Pending	Pending	Pending		
14	Painting Work	Pending	Pending	Pending	Pending		
15	Link Slab	NR	Done	NR	NR	Pending	NR
16	Expansion Joint	Done	NR	Done	Pending	NR	Pending
17	Dirt Wall	Done	NR	Done	Pending	NR	Pending
18	Dep. Retaining Wall	A1 LHS Done	NR	RCC Wall Median A1	Done	NR	A1 RHS Pending
		A2 LHS Done	NR			NR	A2 RHS Pending
19	Ind. Retaining Wall	A1 LHS Done	NR	RCC Wall Median A2	Done	NR	A1 RHS Pending
		A2 LHS Done	NR			NR	A2 RHS Pending
20	Approach Slab	Done	NR	Done	Pending	NR	Pending
21	Crash Barrier	Done in Footpath & median side, Pending on Approach Slab			Pending		
22	Footpath	Railing & Finishing Pending			Pending		
23	Stone Pitching	Pending	NR	Pending	Pending	NR	Pending
24	Launching Apron	Pending	NR	Pending	Pending	NR	Pending
25	Floor Protection	NR			NR		

### 7. Minor Bridge at Km 12+042

Ch.	12+042	Status at site			
Structure	Minor Bridge	LHS		RHS	
Span	1 x 32	A1	A2	A1	A2
Sr No.	Activity				
1	Piles	Done	Done	Pending	Pending
2	Pile Cap				
3	Pier/Abut Shaft				

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4	Pier/Abut Cap				
5	Pedestal				
6	Arrester	Done	Done	Pending	Pending
7	Girder PSC Casted	NR	4	NR	Pending
8	Stressing/Grouting	NR	4/4		
9	Girder Launching	NR	A1-A2 Done		
10	End Cross Girder	Done	Done	Pending	Pending
11	Mid Cross Girder	Done	Done		
12	Slab	NR	A1-A2 Done		
13	Drainage Spout	Done	Done		
14	Painting Work	Pending	Pending		
15	Link Slab	NR	NR	NR	NR
16	Expansion Joint	Done	Done	Pending	Pending
17	Dirt Wall	Done	Done	Pending	Pending
18	Dep. Retaining Wall	A1 LHS Done	RCC Wall median A1	A1 LHS	Pending
		A2 LHS Done	Done	A2 LHS	
19	Ind. Retaining Wall	A1 LHS Done	RCC Wall median A2	A1 LHS	
		A2 LHS Done	Done	A2 LHS	
20	Approach Slab	Pending	Pending	Pending	Pending
21	Crash Barrier	Done in Footpath & median side, Pending on Approach Slab		Pending	
22	Footpath	Railing & Finishing Pending		Pending	
23	Stone Pitching	Pending	Pending	Pending	Pending
24	Launching Apron	Pending	Pending	Pending	Pending
25	Floor Protection	NR		NR	

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

**8. Minor Bridge at Km 19+366**

Ch.	19+366	Status at site					
Structure	Minor Bridge S/R	LHS			RHS		
Span	2 x 15	A1	P1	A2	A1	P1	A2
Sr No.	Activity						
1	Piles	Done	Done	Done	Done	Done	Done
2	Pile Cap						
3	Pier/Abut Shaft						
4	Pier/Abut Cap						
5	Pedestal						
6	Arrester	Done	Done	Pending	Done	Done	Done
7	Girder RCC Casted	NR	3	3	NR	3	3
8	Stressing/Grouting	NR	NR	NR	NR	NR	NR
9	Girder Launching	NR	A1-P1 Done	Pending	NR	Done	Done
10	End Cross Girder	Done	Done	Pending	Done	Done	Done
11	Mid Cross Girder	NR	NR	NR	NR	NR	NR
12	Slab	NR	A1-P1 Done	Pending	NR	A1-P1 Done	P1-A2 Done
13	Drainage Spout	Pending	Pending	Pending	Pending	Pending	Pending
14	Painting Work						
15	Link Slab						
16	Expansion Joint						
17	Dirt Wall	Pending	NR	Pending	Pending	NR	Pending
18	Dep. Retaining Wall	A1 LHS Pending	NR	A1 RHS	A1 LHS Done	NR	A1 RHS Done
		A1 LHS Pending	NR	A2 RHS	A2 LHS Done	NR	A2 RHS Done
19	Ind. Retaining Wall	A1 LHS Done	NR	A1 RHS Done	A1 LHS Done	NR	A1 RHS Done
		A2 LHS Done	NR	A2 RHS Done	A2 LHS Done	NR	A2 RHS Done
20	Approach Slab	Pending	NR	Pending	Pending	NR	Pending

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

21	Crash Barrier	Pending			Pending		
22	Footpath	Railing & Finishing Pending			Railing & Finishing Pending		
23	Stone Pitching	Pending	NR	Pending	Pending	NR	Pending
24	Launching Apron	NR			NR		
25	Floor Protection	NR			NR		

### 9. Minor Bridge at Km 21+161

Ch.	21+161	Status at site					
Structure	Minor Bridge	LHS			RHS		
Span	2 x 29	A1	P1	A2	A1	P1	A2
Sr No.	Activity				Not Started		
1	Piles	Done	Done	Done	Pending	Pending	Pending
2	Pile Cap						
3	Pier/Abut Shaft						
4	Pier/Abut Cap						
5	Pedestal						
6	Arrester						
7	Girder PSC Casted	NR	4	4	NR	4	4
8	Stressing/Grouting	NR	4/4	4/4	NR	Pending	Pending
9	Girder Launching	NR	A1-P1 Done	P1-A2 Done	NR		
10	End Cross Girder	Done	Done	Done	Pending		
11	Mid Cross Girder	Done	Done	Done	Pending		
12	Slab	NR	A1-P1 Done	P1-A2 Done	NR		
13	Drainage Spout	Pending	Pending	Pending	Pending		
14	Painting Work	Pending	Pending	Pending	Pending		
15	Link Slab	NR	Done	NR	NR	Pending	NR
16	Expansion Joint	Done	NR	Done	Pending	NR	Pending

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17	Dirt Wall	Done	NR	Done	Pending	NR	Pending
18	Dep. Retaining Wall	A1 LHS Done	NR	RCC Wall Median A1	Done	NR	A1 RHS Pending
		A2 LHS Done	NR			NR	A2 RHS Pending
19	Ind. Retaining Wall	A1 LHS Done	NR	RCC Wall Median A2	Done	NR	A1 RHS Pending
		A2 LHS Done	NR			NR	A2 RHS Pending
20	Approach Slab		NR			NR	
21	Crash Barrier	Done in Footpath & median side, Pending on Approach Slab			Pending		
22	Footpath	Railing & Finishing Pending			Pending		
23	Stone Pitching	Pending	NR	Pending	Pending	NR	Pending
24	Launching Apron		NR			NR	
25	Floor Protection	NR			NR		

**10. Minor Bridge at Km 21+596**

Ch.	21+596	Status at site			
Structure	Minor Bridge	LHS		RHS	
Span	1 x 15	A1	A2	A1	A2
Sr No.	Activity				
Sr No.	Activity				
1	Piles	NR	NR	NR	NR
2	Open Raft	Done	Done	Pending	Pending
3	Pier/Abut Shaft				
4	Pier/Abut Cap				
5	Pedestal				
6	Arrester				
7	Girder RCC Casted	NR	4	NR	4
8	Stressing/Grouting	NR	NR	NR	NR

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9	Girder Launching	NR	A1-A2 Done	NR	Pending
10	End Cross Girder	Done	Done	Pending	Pending
11	Mid Cross Girder	Done	Done	Pending	Pending
12	Slab	NR	A1-A2 Done	NR	Pending
13	Drainage Spout	Pending	Pending	Pending	Pending
14	Painting Work				
15	Link Slab				
16	Expansion Joint	Done	Done	Pending	Pending
17	Dirt Wall	Done	Done		
18	Dep. Retaining Wall	A1 LHS Done	RCC Wall median A1	A1 LHS	Pending
		A2 LHS Done	Done	A2 LHS	
19	Ind. Retaining Wall	A1 LHS Done	RCC Wall median A2	A1 LHS	
		A2 LHS Done	Done	A2 LHS	
20	Approach Slab	Done	Done	Pending	Pending
21	Crash Barrier	Done in Footpath & median side, Pending on Approach Slab		Pending	
22	Footpath	Railing & Finishing Pending		Pending	
23	Stone Pitching	Pending		Pending	
24	Launching Apron	Pending	Pending	Pending	Pending
25	Floor Protection	NR		NR	

**11. Minor Bridge at Km 22+124**

Ch.	22+124	Status at site			
Structure	Minor Bridge	LHS		RHS	
Span	1 x 32.5	A1	A2	A1	A2
Sr No.	Activity				
1	Piles	Done	Done	Pending	Pending
2	Pile Cap				

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3	Pier/Abut Shaft				
4	Pier/Abut Cap				
5	Pedestal				
6	Arrester				
7	Girder PSC Casted	NR	4	NR	Pending
8	Stressing/Grouting	NR	4/4	NR	Pending
9	Girder Launching	NR	A1-A2 Done	NR	Pending
10	End Cross Girder	Done	Done	Pending	Pending
11	Mid Cross Girder	Done	Done	Pending	Pending
12	Slab	NR	A1-A2 Done	NR	Pending
13	Drainage Spout	Pending	Pending	Pending	Pending
14	Painting Work	Pending	Pending	Pending	Pending
15	Link Slab	NR	NR	NR	NR
16	Expansion Joint	Done	Done	Pending	Pending
17	Dirt Wall	Done	Done	Pending	Pending
18	Dep. Retaining Wall	A1 LHS Done	RCC Wall median A1	A1 LHS	Pending
		A2 LHS Done	Done	A2 LHS	Pending
19	Ind. Retaining Wall	A1 LHS Done	RCC Wall median A2	A1 LHS	Pending
		A2 LHS Done	Done	A2 LHS	Pending
20	Approach Slab	Done	Done	Pending	Pending
21	Crash Barrier	Done in Footpath & median side, Pending on Approach Slab		Pending	
22	Footpath	Railing & Finishing Pending		Pending	
23	Stone Pitching	Pending	Done	Pending	Pending
24	Launching Apron	Pending	Pending	Pending	Pending
25	Floor Protection	NR		NR	

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**12. Minor Bridge at Km 27+639**

Ch.	27+639	Status at site			
Structure	Minor Bridge	LHS		RHS	
Span	1 x 17	A1	A2	A1	A2
Sr No.	Activity				
1	Piles	NR	NR	NR	NR
2	Open Raft	Done	Done	Done	Done
3	Pier/Abut Shaft				
4	Pier/Abut Cap			Pending	Pending
5	Pedestal				
6	Arrester				
7	Girder RCC Casted	NR	4	NR	4
8	Stressing/Grouting	NR	NR	NR	NR
9	Girder Launching	NR	A1-A2 Done	NR	A1-A2 Done
10	End Cross Girder	Done	Done	Done	Done
11	Mid Cross Girder	Done	Done	Pending	Pending
12	Slab	NR	A1-A2 Done		
13	Drainage Spout	Pending	Pending		
14	Painting Work	Pending	Pending		
15	Link Slab	NR	NR	NR	NR
16	Expansion Joint	Done	Done	Pending	Pending
17	Dirt Wall	Done	Done	Pending	Pending
18	Dep. Retaining Wall	A1 LHS	RCC Wall median A1	A1 LHS	Pending
		A2 LHS	Done	A2 LHS	Pending
19	Ind. Retaining Wall	A1 LHS	RCC Wall median A2	A1 LHS	Pending
		A2 LHS	Done	A2 LHS	Pending
20	Approach Slab	Done	Done	Pending	Pending

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21	Crash Barrier	Pending	Pending
22	Footpath	Railing & Finishing Pending	Pending
23	Stone Pitching	NR	NR
24	Launching Apron	NR	NR
25	Floor Protection	NR	NR

**13. Minor Bridge at Km 28+786**

Ch.	28+786	Status at site					
Structure	Minor Bridge	LHS			RHS		
Span	2 x 30	A1	P1	A2	A1	P1	A2
Sr No.	Activity						
1	Piles	Pending	Pending	Pending	Done	Pending	Done
2	Pile Cap						
3	Pier/Abut Shaft						
4	Pier/Abut Cap						
5	Pedestal	Pending	Pending	Pending	Pending	Pending	Pending
6	Arrester	Pending	Pending	Pending	Pending	Pending	Pending
7	Girder PSC Casted	NR	Pending	Pending	NR	4	4
8	Stressing/Grouting	NR	Pending	Pending	NR	4/4	4/4
9	Girder Launching	NR	Pending	Pending	NR	Pending	Pending
10	End Cross Girder	Pending	Pending	Pending	Pending	Pending	Pending
11	Mid Cross Girder	Pending	Pending	Pending	Pending	Pending	Pending
12	Slab	NR	Pending	Pending	NR	Pending	Pending
13	Drainage Spout	Pending	Pending	Pending	Pending	Pending	Pending
14	Painting Work	Pending	Pending	Pending	Pending	Pending	Pending
15	Link Slab	NR	Pending	NR	NR	Pending	NR
16	Expansion Joint	Pending	NR	Pending	Pending	NR	Pending

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17	Dirt Wall	Pending	NR	Pending	Pending	NR	Pending
18	Dep. Retaining Wall	A1 LHS	Pending	RCC Wall Median A1		A1 RHS	Pending
		A2 LHS	Pending			A2 RHS	Pending
19	Ind. Retaining Wall	A1 LHS	Pending	RCC Wall Median A2		A1 RHS	Pending
		A2 LHS	Pending			A2 RHS	Pending
20	Approach Slab	Pending	NR	Pending	Pending	NR	Pending
21	Crash Carrier	Pending			Pending		
22	Footpath	Pending			Pending		
23	Stone Pitching	Pending	NR	Pending	Pending	NR	Pending
24	Launching Apron	Pending	NR	Pending	Pending	NR	Pending
25	Floor Protection	NR			NR		

**14. Minor Bridge at km 31+425**

Ch.	31+425	Status at site					
Structure	Minor Bridge	LHS			RHS		
Span	2 x 30	A1	P1	A2	A1	P1	A2
Sr No.	Activity						
1	Piles	Pending	Pending	Pending	Done	Done	Done
2	Pile Cap						
3	Pier/Abut Shaft						
4	Pier/Abut Cap						
5	Pedestal	Pending	Pending	Pending	Done	Done	Done
6	Arrester	Pending	Pending	Pending	Done	Done	Done
7	Girder PSC Casted	NR	Pending	Pending	NR	4	4
8	Stressing/Grouting	NR	Pending	Pending	NR	4/4	4/4
9	Girder Launching	NR	Pending	Pending	NR	A1-P1 Done	P1-A2 Done
10	End Cross Girder	Pending	Pending	Pending	Done	Done	Done

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11	Mid Cross Girder	Pending	Pending	Pending	Done	Done	Done
12	Slab	NR			NR	A1-P1 Done	P1-A2 Done
13	Drainage Spout	Pending	Pending	Pending	Pending	Pending	Pending
14	Painting Work	Pending	Pending	Pending	Pending	Pending	Pending
15	Link Slab	NR	Pending	NR	NR	Done	NR
16	Expansion Joint	Pending	NR	Pending	Done	NR	Done
17	Dirt Wall	Pending	NR	Pending	Done	NR	Done
18	Dep. Retaining Wall	A1 LHS	Pending	RCC Wall Median A1	Done	A1 RHS	Done
		A2 LHS	Pending			A2 RHS	Done
19	Ind. Retaining Wall	A1 LHS	Pending	RCC Wall Median A2	Done	A1 RHS	Done
		A2 LHS	Pending			A2 RHS	Done
20	Approach Slab	Pending	NR	Pending	Done	NR	Done
21	Crash Barrier	Pending			Done		
22	Footpath	Pending			Railing & Finishing Pending		
23	Stone Pitching	Pending	NR	Pending	Pending	NR	Pending
24	Launching Apron	Pending	NR	Pending	Pending	NR	Pending
25	Floor Protection	NR			NR		

**Note: -**

A total of 195 girders and 279747 nos. of RE blocks have already been casted and are placed on site. However, Contractor has to assess the exact number of RE Blocks. Contractor has to assess the utility of Girders & RE Blocks on his own after detail inventory study.

**The details of the above mentioned items has been provided in clause no. 13 & 14 of Schedule-A of this document.**

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**7.3.2. Additional New Bridges:** New bridges at the following locations on the Project Highway shall be constructed. GADs for the new bridges are attached in the drawings folder. **(Clause No. 7.3 ii IRC: SP:84-2019)**

**Major Bridges**

S.No.	Design Chainage (Km)	Total Proposed Length (m)	Type of Crossing	Total Proposed Width (m)		Typical Cross Section of manual	Remarks	Skew
				MCW	SR			
NIL								

**Minor Bridges**

S.No.	Design Chainage (Km)	Total Proposed Length (m)	Type of Crossing	Total Proposed Width (m)		Typical Cross Section of manual	Remarks	Skew
				MCW	SR			
NIL								

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

S. No.	Design Chainage		Length (Km)	Remarks
	From	To		
NIL				

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

S.No.	Location at Km.	Rehabilitation Proposals	Remarks
NIL			

**7.3.5.** Structures in marine environment: - the specific locations are to be mentioned.

**7.4. Railroad Bridges (ROB/RUB) (Clause No. 7.18 IRC: SP: 84-2019)**

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

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

S. No.	Design Chainage (km)	Proposed Span Arrangements (m)	Type of Super Structure (i.e) bow String, Simply Supported Composite Structure etc.	Name of Crossing	Total Width (m)	Skew Angle	Remarks
NIL							

**Note:**

The Details of span and type of super-Structure have to be mentioned as per approved GAD by the railways. If the length/width of the span/type of super-structure is changed due to any reason the COS shall be considered.

3. ROB shall be designed, constructed and maintained as per the requirements of Railway authorities. The construction plan shall be prepared in consultation with the concerned railway authority.

4. The ROB shall be constructed and maintained by the concessionaire under supervision of the Railways

5. All charges payable to the Railway like D&G, Capitalized maintenance, signalling. Cabling, OHE modification, earthing etc. except P&E charges shall be borne by the Concessionaire.

**7.4.3** Road under Bridges (road under railway line) shall be provided at the following level crossings, as per GAD Drawings attached:

S.No.	Design Chainage	Proposed Span Arrangement (m)	Name of Crossing	Total Width (m)	Skew Angle	Remarks
NIL						

Caution wherever the ROB is being provided in lieu of existing level crossing, the RUB must be proposed so that the existing railway crossing must be closed.

**7.5 Grade Separated Structures (Clause No. 7.19 IRC: SP: 84-2019)**

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

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

FoB/ skywalks shall be provided in built up areas/ near schools.

S.No.	Location at Km	FoB Type	Remarks
Total 8 nos. of FOB shall be provided; location shall be finalised in consultation with Authority.			

**7.7 A summary of Culverts, Bridges and Structures shall be presented as follows:**

S.No.	Name of the Structure	Total Numbers
1.	Major Bridge	05
2.	Minor Bridge	14
3.	VUP	05
4.	LVUP	01
5.	SVUP	0
6.	Flyover	01
7.	Culverts	76

**8 Traffic Control Devices and Road Safety Works**

**8.1** Traffic control devices and road safety works shall be provided in accordance with Section 9 of the IRC: SP: 84 2019

**8.2** Traffic Signs:

Traffic signs shall be provided as per IRC 67 as mentioned in Schedule-C

**8.3** Pavement Marking:

Pavement markings shall be completed as per IRC 35 as mentioned in Scheduled-C

**8.4** Safety Barrier:

The Safety barriers shall be provided in accordance with Section-9 of the Clause 9.7 of the manual.

**The Safety Barrier length proposed are excluding the safety barrier already proposed on Culverts, Grade Separated Structures, Interchange, Bridges, RoB and RUB as applicable cross sections respectively.**

End treatment of Steel barriers/Rope Barrier shall be specified i.e. **MELT or P-4 confirming to EN 1317-4**, TT, MBCB barrier to Concrete Barrier (**Clause No. 9.7.2 (b) IRC: SP:84-2019**)  
End Treatment to Concrete barrier shall be done as specified in **Clause No. 9.7.3 (b) IRC: SP: 84-2019**)

**Thrie Beam Crash Barrier locations mentioned below:**

Sr.no	Chainage		Side	Length	Total Length
	From	To			
1	04+762	05+050	BHS	288.00	576
2	05+060	05+150	RHS	90.00	90
3	05+061	05+345	LHS	284.00	284
4	06+000	06+130	BHS	130.00	260
5	07+240	07+260	LHS	20.00	20
6	07+280	07+520	LHS	240.00	240
7	07+560	07+650	BHS	90.00	180
8	07+730	08+000	BHS	270.00	540
9	08+550	08+600	BHS	50.00	100
10	08+610	08+670	BHS	60.00	120
11	08+670	08+720	BHS	50.00	100
12	09+185	09+235	BHS	50.00	100
13	09+290	09+390	RHS	100.00	100
14	09+290	09+940	LHS	650.00	650
15	09+975	10+145	BHS	170.00	340
16	10+207	10+450	BHS	243.00	486
17	10+970	11+090	BHS	120.00	240
18	11+200	11+650	BHS	450.00	900
19	11+970	12+025	BHS	55.00	110
20	12+060	12+600	RHS	540.00	540
21	12+600	12+940	LHS	340.00	340
22	12+060	13+830	LHS	1770.00	1770
23	13+670	13+965	BHS	295.00	590
24	14+075	14+125	RHS	50.00	50
25	14+075	14+150	LHS	75.00	75
26	15+410	15+600	BHS	190.00	380
27	15+410	15+600	BHS	190.00	380
28	15+950	16+060	BHS	110.00	220
29	16+580	16+960	BHS	380.00	760
30	17+180	17+790	BHS	610.00	1220
31	18+320	20+330	BHS	2010.00	4020
32	20+867	21+135	BHS	268.00	536
33	21+200	21+585	BHS	385.00	770
34	21+605	22+115	BHS	510.00	1020
35	22+000	22+325	BHS	325.00	650
36	23+870	24+100	LHS	230.00	230.00
37	23+870	23+960	RHS	90.00	90.00
38	24+020	24+260	BHS	240.00	480.00
39	25+220	26+110	BHS	890.00	1780.00
40	26+425	26+490	BHS	65.00	130
41	26+570	26+850	BHS	280.00	560

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42	27+400	27+630	BHS	230.00	460
43	27+650	27+800	BHS	150.00	300
44	28+620	28+970	BHS	350.00	700
45	28+815	29+000	BHS	185.00	370
46	30+150	31+395	LHS	1245.00	1245.00
47	31+150	31+395	RHS	245.00	245.00
48	31+455	31+800	BHS	345.00	690
49	31+510	31+640	BHS	130.00	260
<b>Total</b>					<b>26297.00</b>

**New jersey Crash Barrier locations mentioned below:**

Sr.no.	Chainage		Side	Length
	From	To		
1	04+800	05+418	Median	618.00
2	05+600	05+810	Median	209.50
3	05+869	05+895	Median	25.60
4	05+985	06+048	Median	63.00
5	06+108	06+170	Median	62.00
6	06+350	07+522	Median	1172.00
7	07+559	07+662	Median	103.00
8	07+717	08+050	Median	333.00
9	08+671	08+800	Median	129.00
10	09+286	09+378	Median	92.00
11	09+609	09+925	Median	316.50
12	09+973	10+145	Median	172.00
13	10+207	10+400	Median	193.00
14	11+900	12+026	Median	126.00
15	12+058	12+200	Median	142.00
16	12+925	13+010	Median	85.00
17	13+160	13+599	Median	439.00
18	13+780	13+785	Median	5.00
19	14+325	16+480	Median	2155.00
20	17+925	18+686	Median	761.00
21	19+481	20+500	Median	1019.00
22	20+801	21+138	Median	337.00
23	21+196	21+589	Median	393.00
24	21+604	21+730	Median	126.00
25	21+950	22+115	Median	165.00
26	22+147	22+410	Median	263.00
27	22+590	22+720	Median	130.00
28	22+990	23+530	Median	540.00
29	23+760	23+785	Median	25.20
30	23+935	24+104	Median	169.00
31	24+228	25+640	Median	1412.00

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode

32	25+660	26+493	Median	833.00
33	26+571	27+567	Median	996.00
34	27+627	27+631	Median	4.00
35	27+648	27+652	Median	4.00
36	27+891	27+940	Median	49.50
37	28+030	28+130	Median	100.00
38	28+370	28+380	Median	10.00
39	29+440	30+034	Median	594.40
40	30+123	30+225	Median	101.70
41	31+100	31+395	Median	295.00
42	31+455	35+395	Median	3940.00
<b>Total length (mtr)</b>				<b>18708.40</b>

**NJCB below flyover for pier protection as mentioned below:**

Sr.no.	Chainage		Side	Length(mtr)
	From	To		
1	18686	19481	BHS	795

**Note:** Deduct Length for opening/crossing (4 nos.) =  $130 \times 2 = (260 \text{ m})$

**9 Roadside furniture**

9.1 It shall be provided as per the details mentioned in Schedule-C

**10. Hazardous Locations**

The safety barriers shall be provided at the following hazardous location such as ponds, well, electric sub-station, Electric Tower, spilt carriageway, etc.

S.No.	Location stretch		Type of Safety Barrier	LHS/RHS
	From (Km)	To (Km)		
	NIL			

**11. Special requirement:**

Retaining Structure and protection works shall be provided at locations as indicated below and as provided in TCS Schedule in cl. 2.11 of Schedule-B.

**RE WALL:**

Sr.no.	Chainage		Side	Total Length (m)
	From	To		
1	16480	16920	LHS	440
2	16480	16920	LHS Inner	440
3	18230	20425	LHS	2195
4	18230	20425	RHS	2195
5	25150	26200	LHS	1050
6	25150	26200	RHS	1050
<b>Total length = 7370</b>				

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode



**RETAINING WALL:**

Retaining Wall- LHS			
From	To	Side	Total Length
6010	6040	LHS	30
9850	9870	LHS	20
9890	9900	LHS	10
17470	17490	LHS	20
17770	17790	LHS	20
21310	21335	LHS	25
24228	24320	LHS	92
24240	24290	LHS	50
24320	24650	LHS	330
26200	26260	LHS	60
28600	28660	LHS	60
28850	28880	LHS	30
28950	28980	LHS	30
31090	31190	LHS	100
31250	31305	LHS	55
31488	31593	LHS	105
Total Length = 1037 m			

Retaining Wall- RHS			
From	To	Side	Total Length
6030	6040	RHS	10
7570	7650	RHS	80
7730	7940	RHS	210
12000	12020	RHS	20
12200	12320	RHS	120
12580	12775	RHS	195
17350	17480	RHS	130
22160	22200	RHS	40
22200	22290	RHS	90
22290	22350	RHS	60
24228	24320	RHS	92
24240	24250	RHS	10
24320	24650	RHS	330
26200	26230	RHS	30
26580	26590	RHS	10
26660	26740	RHS	80
26830	26850	RHS	20
28560	28630	RHS	70
28630	28750	RHS	120
28830	28870	RHS	40
Total Length = 1757 m			

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode

**Breast Wall:**

Breast Wall- LHS			
From	To	Side	Total Length
34080	34160	LHS	80
34450	34500	LHS	50
Total Length = 130 m			

Breast Wall- RHS			
From	To	Side	Total Length
31000	31100	RHS	100
34330	34370	RHS	40
34450	34500	RHS	50
Total Length = 190 m			

**Toe wall:**

Toe Wall- LHS			
From	To	Side	Total Length
17900	17970	LHS	70
23980	24090	LHS	110
27530	27570	LHS	40
Total Length = 220 m			

Toe Wall- RHS			
From	To	Side	Total Length
12910	12920	RHS	10
21000	21610	RHS	610
26340	26390	RHS	50
Total Length = 670 m			

**River Protection Works:**

Rigid flooring (70 m U/S & 120 m D/S), flexible apron, curtain wall and river bank slope protection in form of cement concrete blocks (50 m on both side) as per guidelines of IRC 89-2019 and IRC SP 116 shall be provided in following locations: -

Sl. No.	Chainage	Type of Structure
1.	7+689	Major Bridge
2.	14+021	Major Bridge
3.	17+630	Major Bridge
4.	24+166	Major Bridge
5.	26+536	Major Bridge
6.	21+161	Minor Bridge
7.	28+786	Minor Bridge
8.	12+042	Minor Bridge

**Ramps**

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode

Two Ramps have been proposed for Traffic coming from cross roads and going towards Baddi. The locations are as mentioned below:

Sl. No.	Chainage	Remarks
1	17+780	Major Bridge
2	31+460	Minor Bridge

## 12. Open well with in ROW

The Open well shall be identified and appropriate treatment shall be provided.

S.No.	Design Chainage	Dimension	Depth`	Filling Material	Slab on Top of well Yes/No	Remarks
NIL						

## 13. Shifting of utilities

The Contractor shall undertake the work of shifting of any utility (including electric lines, water pipes, gas pipelines and telephone cables etc.) to an appropriate location or alignment, in accordance with the provisions of the Contract Agreement. No change of scope shall be made for all over ground utilities. However, for any underground utilities not mentioned in schedule -B, shall form change of scope which shall worked out as per the estimation of concerned utility owing department, and shall be payable.

Shifting of obstructing existing utilities indicated in Schedule A to an appropriate location in accordance with the standards and Specification of concern Utility Owning Departments as per new CEA guidelines 8 June 2023 is a part of scope of work for the Contractor. The bidder may visit the site and assess the quantum of shifting of utilities for the project before submission of the bid. The specifications of concerned Utility Owning Department shall be applicable and followed.

Note: -

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

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode

and when Contractor furnishes demand of Utility Owning Department along with a copy of estimated cost given by the letter.

- (c) The dismantled material /scrap of existing Utility to be shifted/dismantled shall belong to the Contractor who would be free to dispose-off the dismantled material as deemed fit by them unless the Contractor is required to deposit the dismantled material to utility owning department as per the norms and practice and, in that case the amount of credit for dismantled material may be availed by the Contractor as per the estimate agreed between them.
- (d) The utilities shall be handed over after shifting work is completed to the Utility Owning Department to their entire satisfaction. The maintenance liability shall rest with the Utility Owning Department after the handing over process is complete as far as utility shifting works are concerned. Agreement.
- (e) Existing lights, Junction boxes, connection to individual properties along the affected section shall be disconnected and reconnect as part of utility relocation and same shall be in scope of the concessionaire.
- (f) For all 33KV/11KV/LT crossing need to be shifted underground with double cable facility. No of crossings may vary as per site condition; however, no positive change of scope is applicable for increasing no of crossings. EPC contractor have to follow the specifications, shifting procedure of utility owning department. If the shifting of crossing is changed from underground to overhead as per direction of utility owning department negative change of scope will be imposed as per CA. Length of along line may also vary, no positive change of scope will be imposed with increased length of along line. All the crossings and along line mentioned in Schedule-A are the obstructing utilities. EPC contractor need to be shift all the obstructing utilities as mentioned in Schedule-A.

#### 14. Work Zone Traffic Management Plans (Clause No. 7.19. IRC: SP: 84-2019)

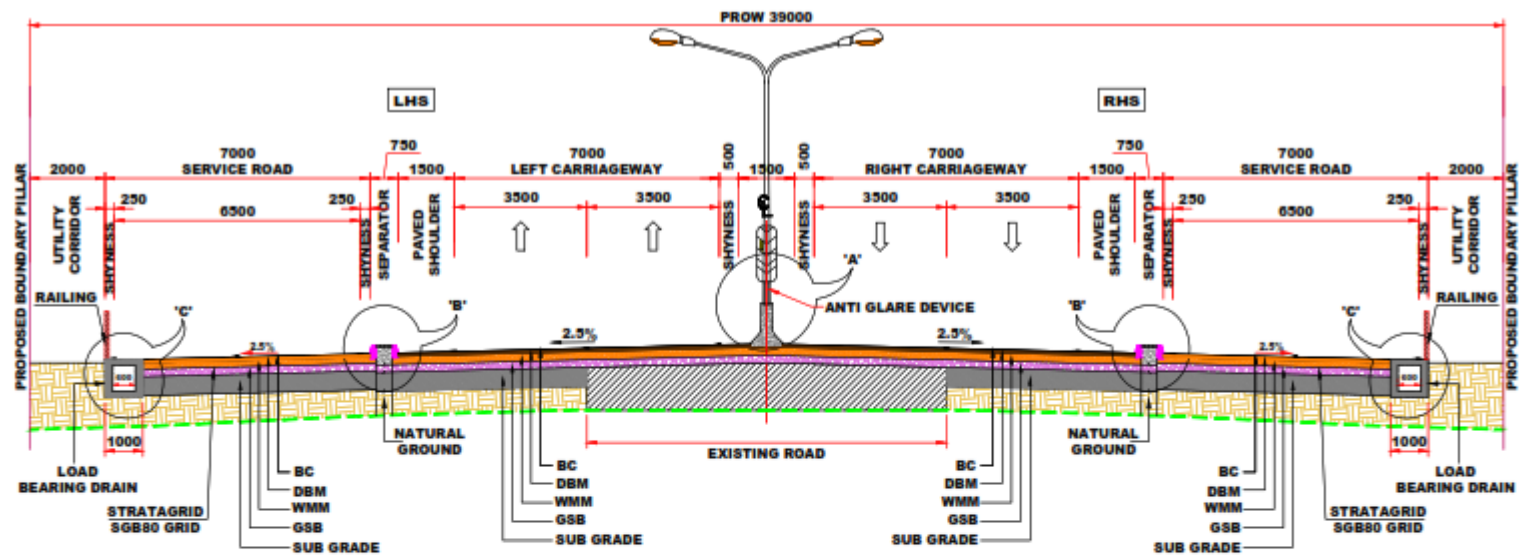
Annexure-ii Schedule B- Typical Cross Sections

The traffic diversion plans shall be prepared as per IRC SP 55 for smooth flow of traffic and safety. A diversion plan shall be proposed for construction of Culvert, Grade Separated Structures, Bridges, RoB/RUB, etc. and traffic management plan for widening/reconstruction of carriageway.

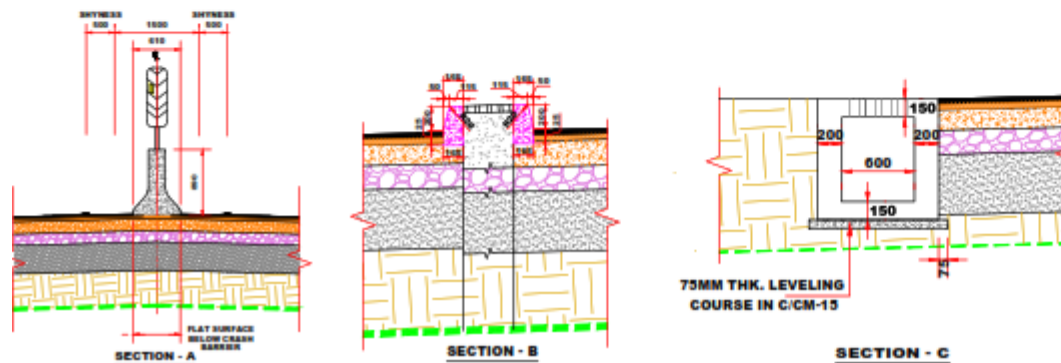
S. No.	Design Chainage (km)		Construction Activity	Diversion	Traffic management Plan	Barricading Type III/IV/CC	Deployment of flagman In Habitation/School/Hospital Etc.	Remarks
	From	To				Barrier with Lighting along Barrier		
---								

Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode

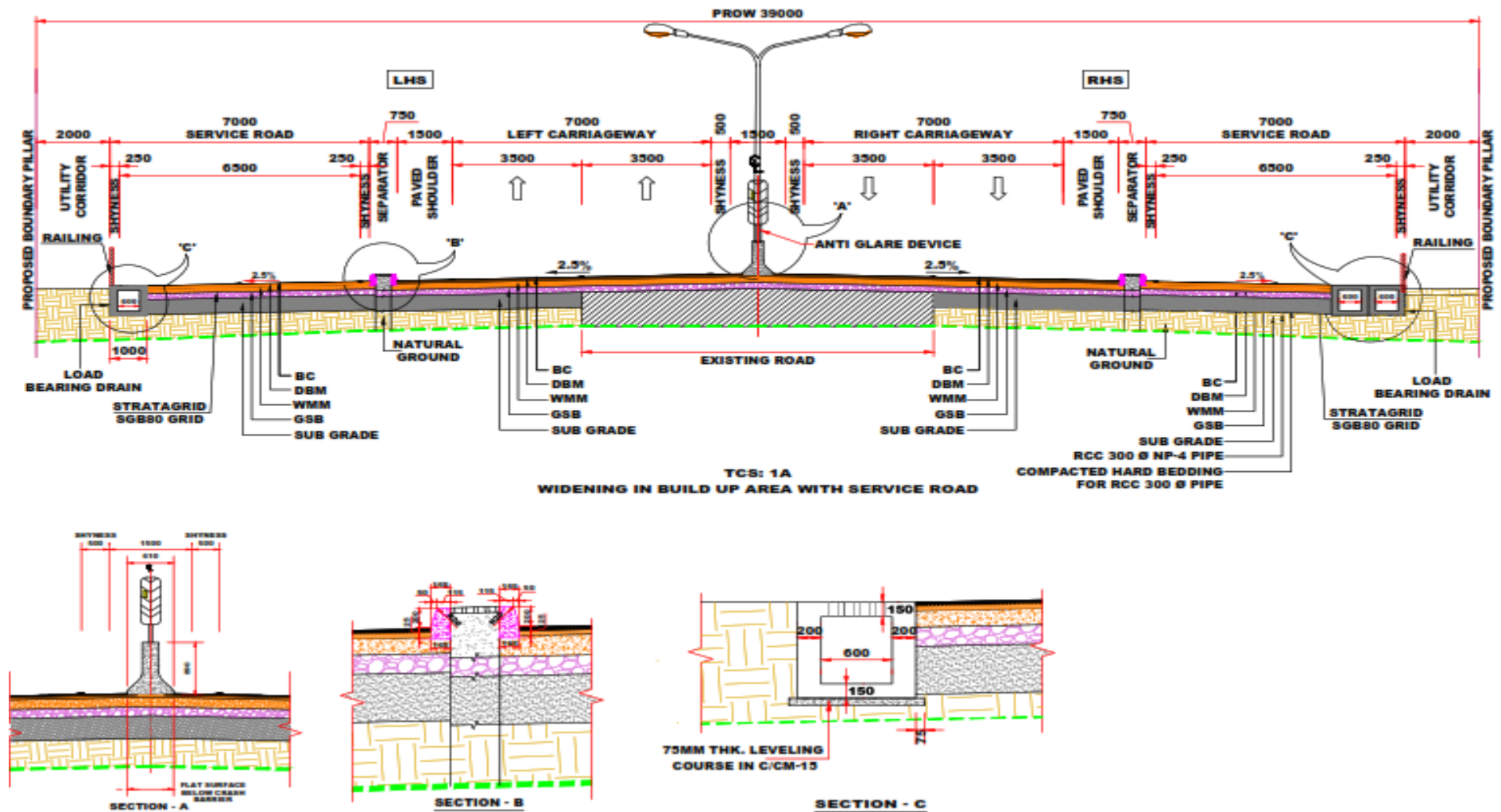
### Proposed Typical Cross Section



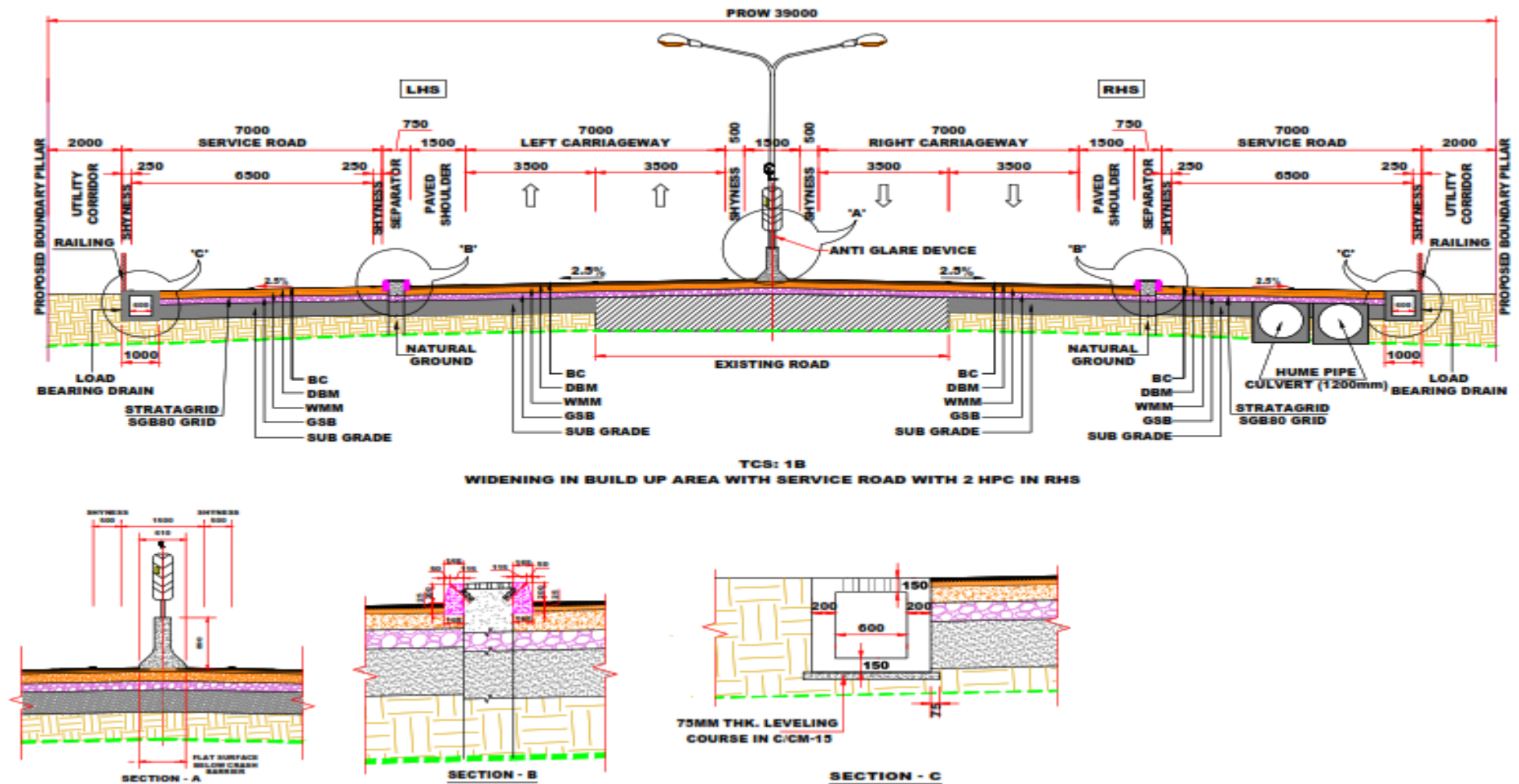
TCS: 1  
WIDENING IN BUILD UP AREA WITH SERVICE ROAD



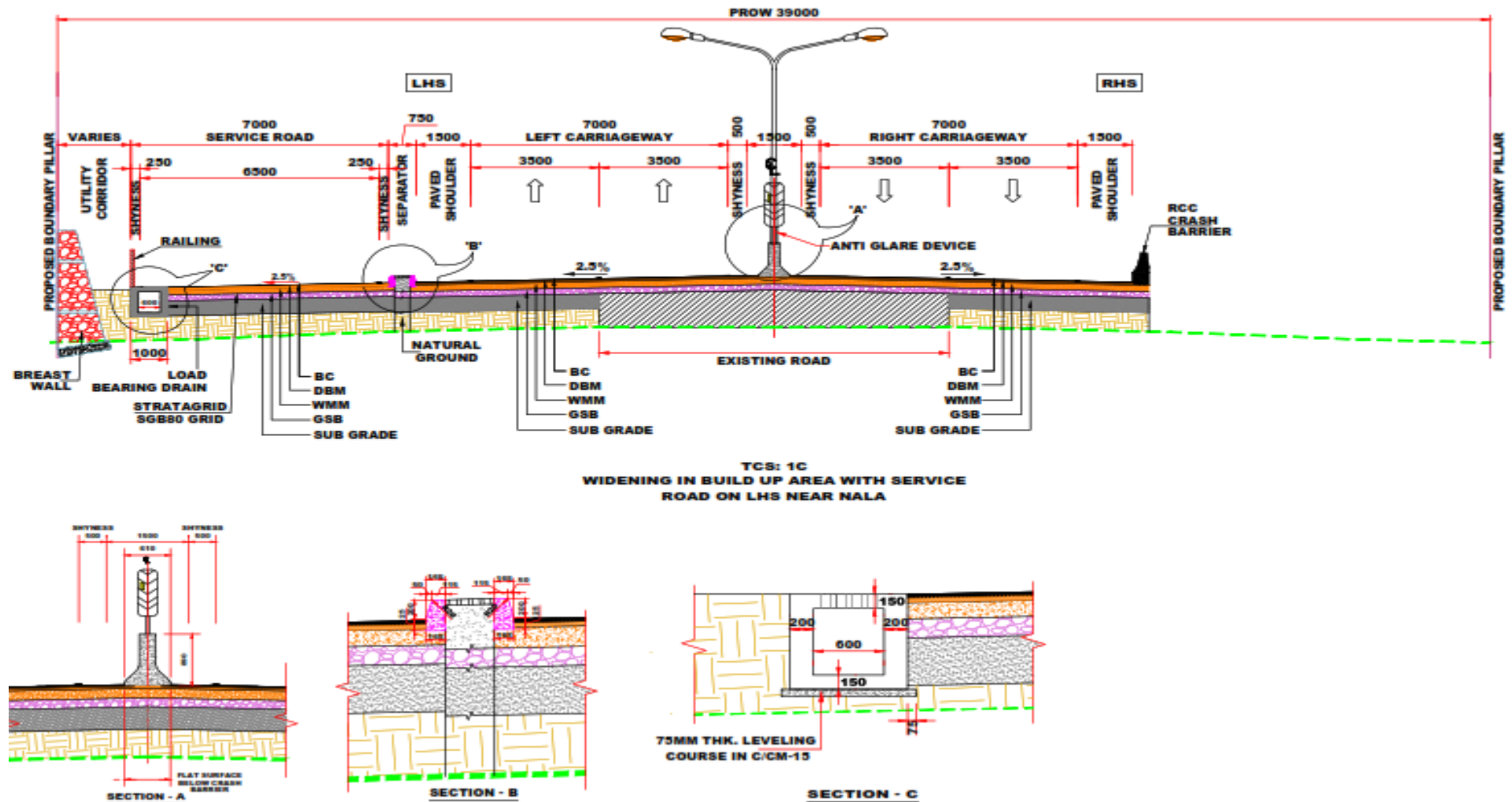
Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode



Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode

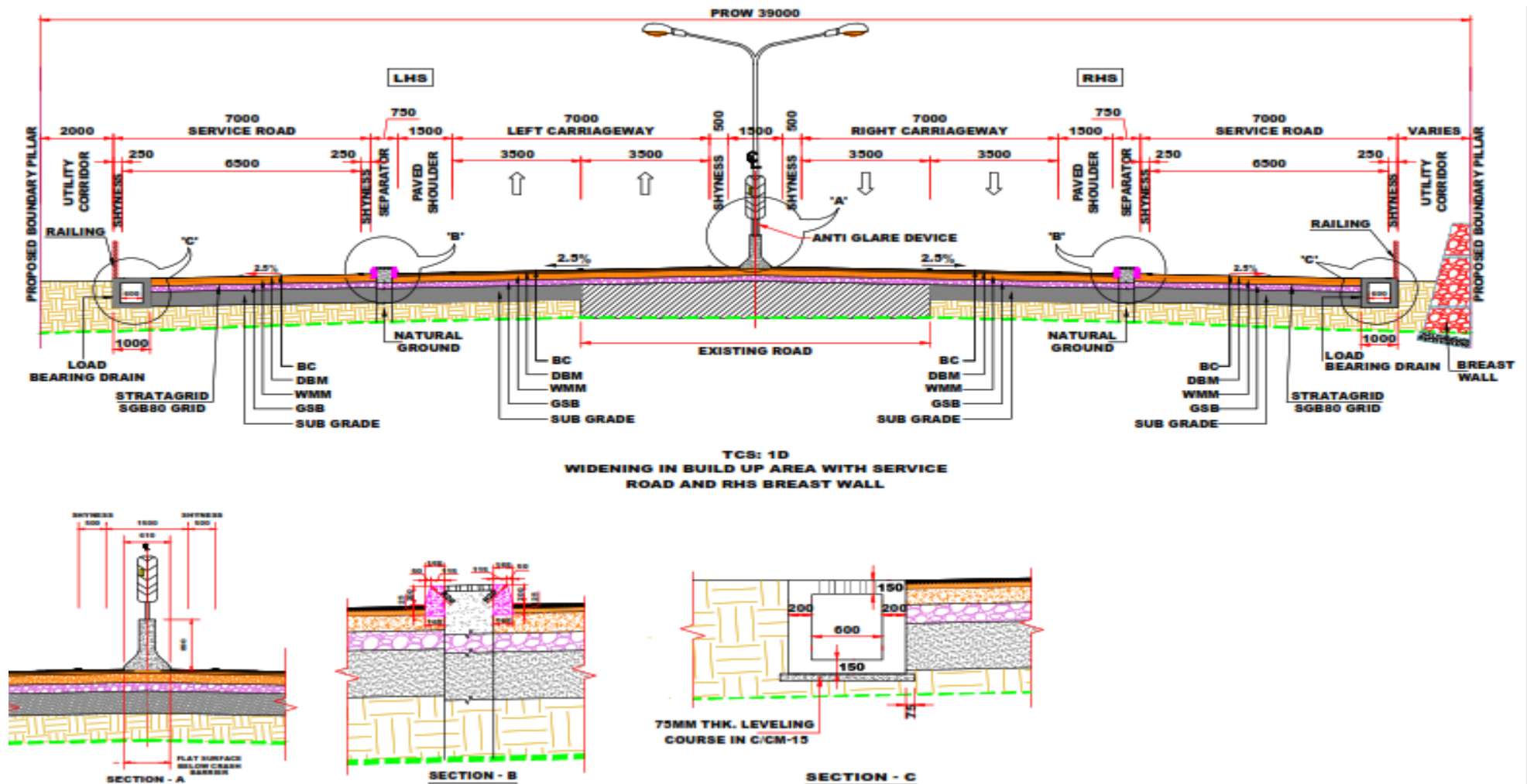


Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode

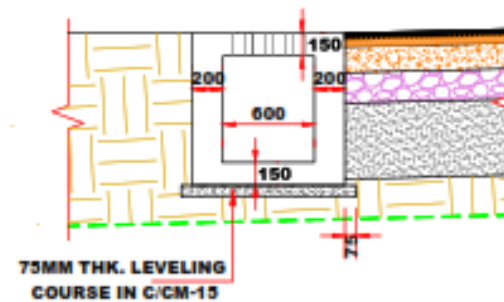
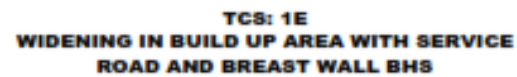


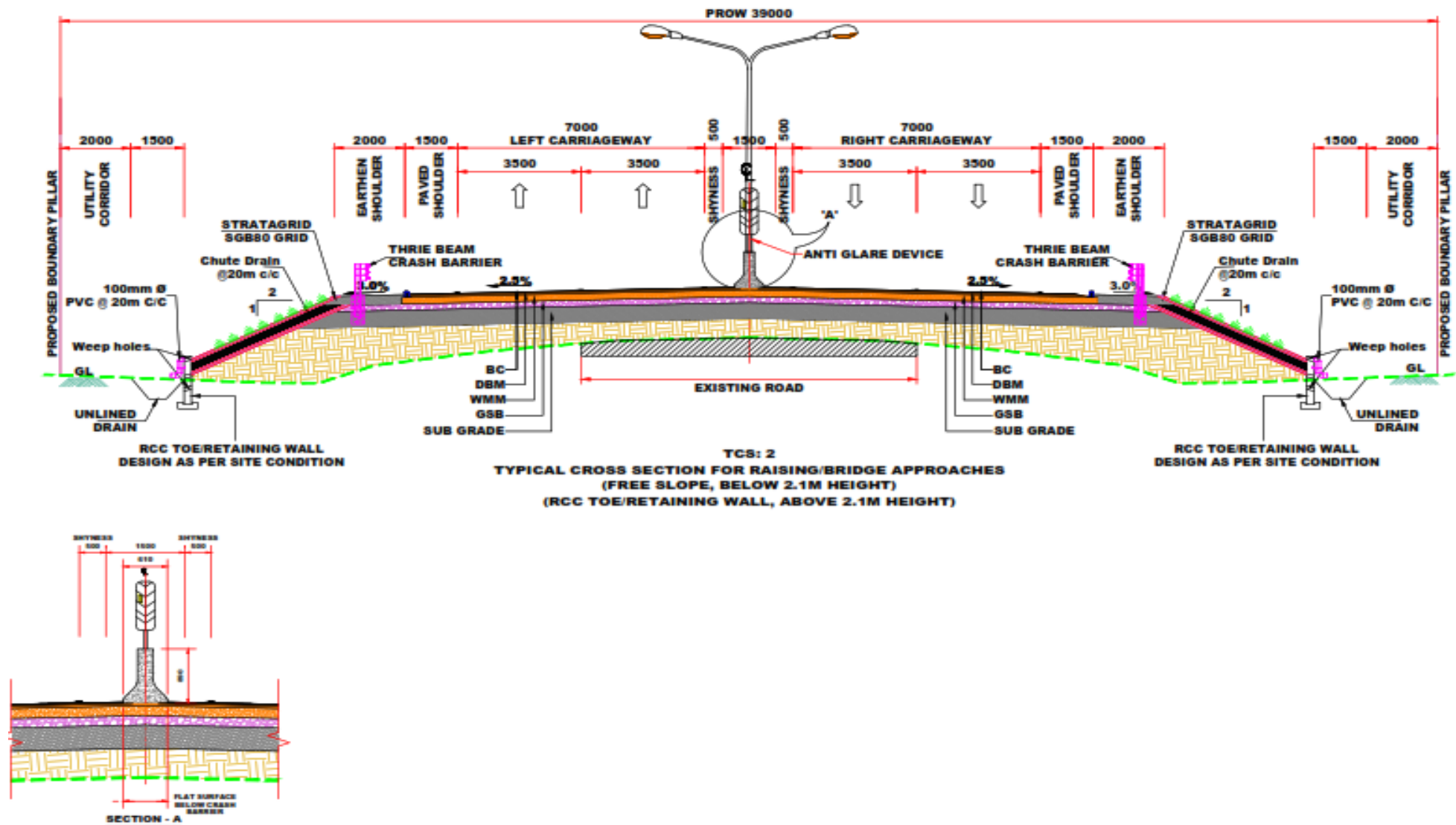
Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode



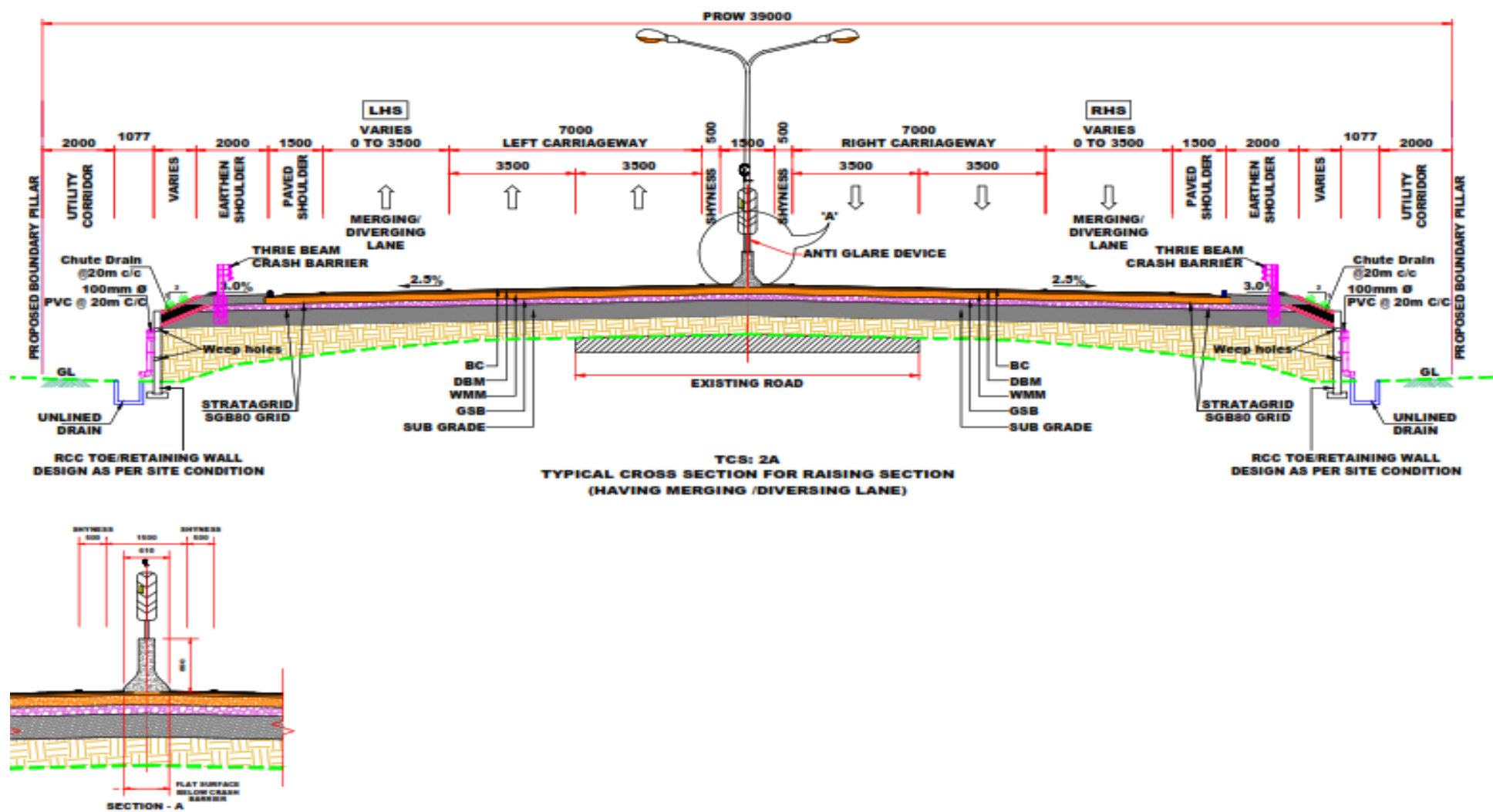


Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode

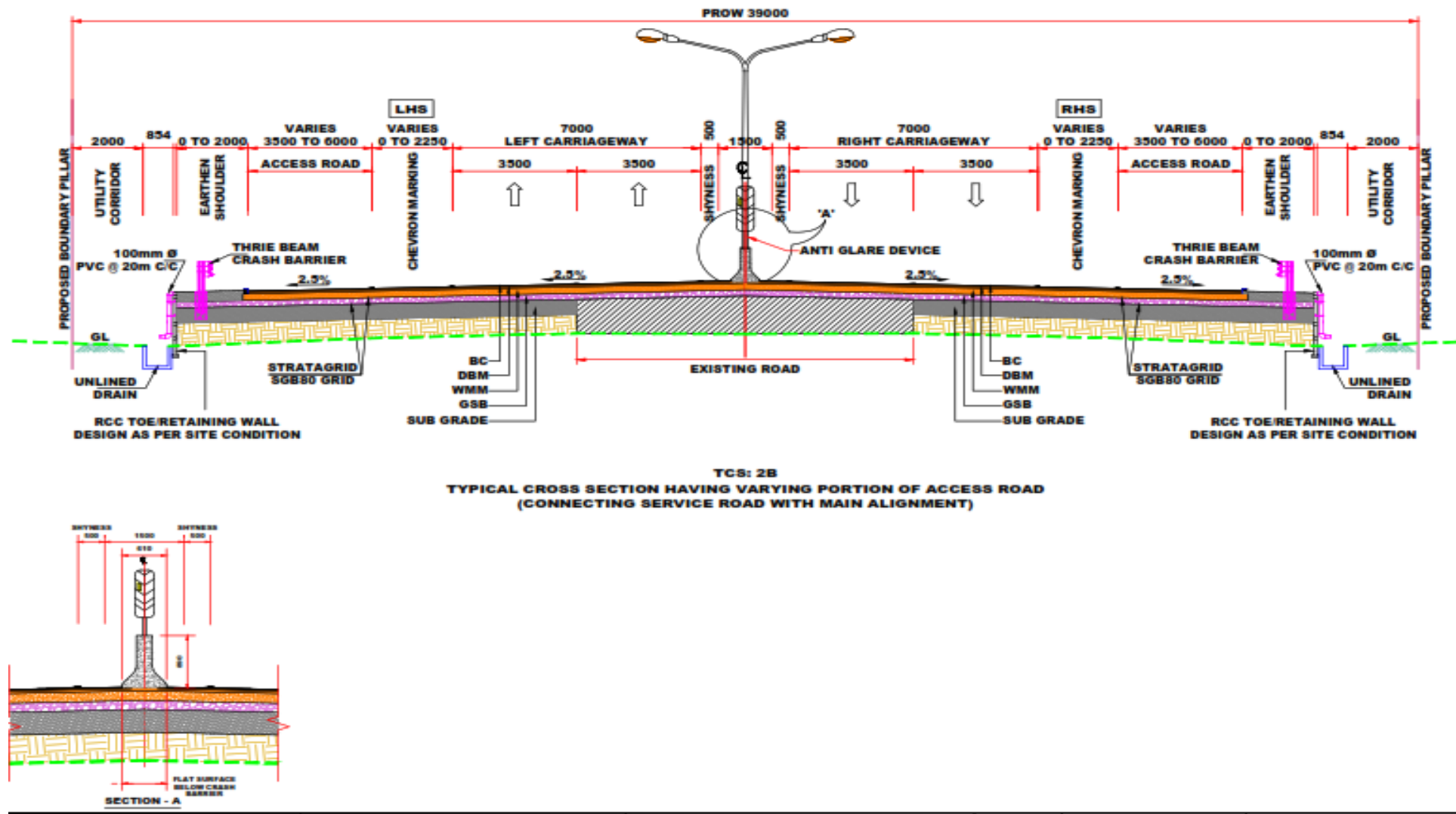




Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode

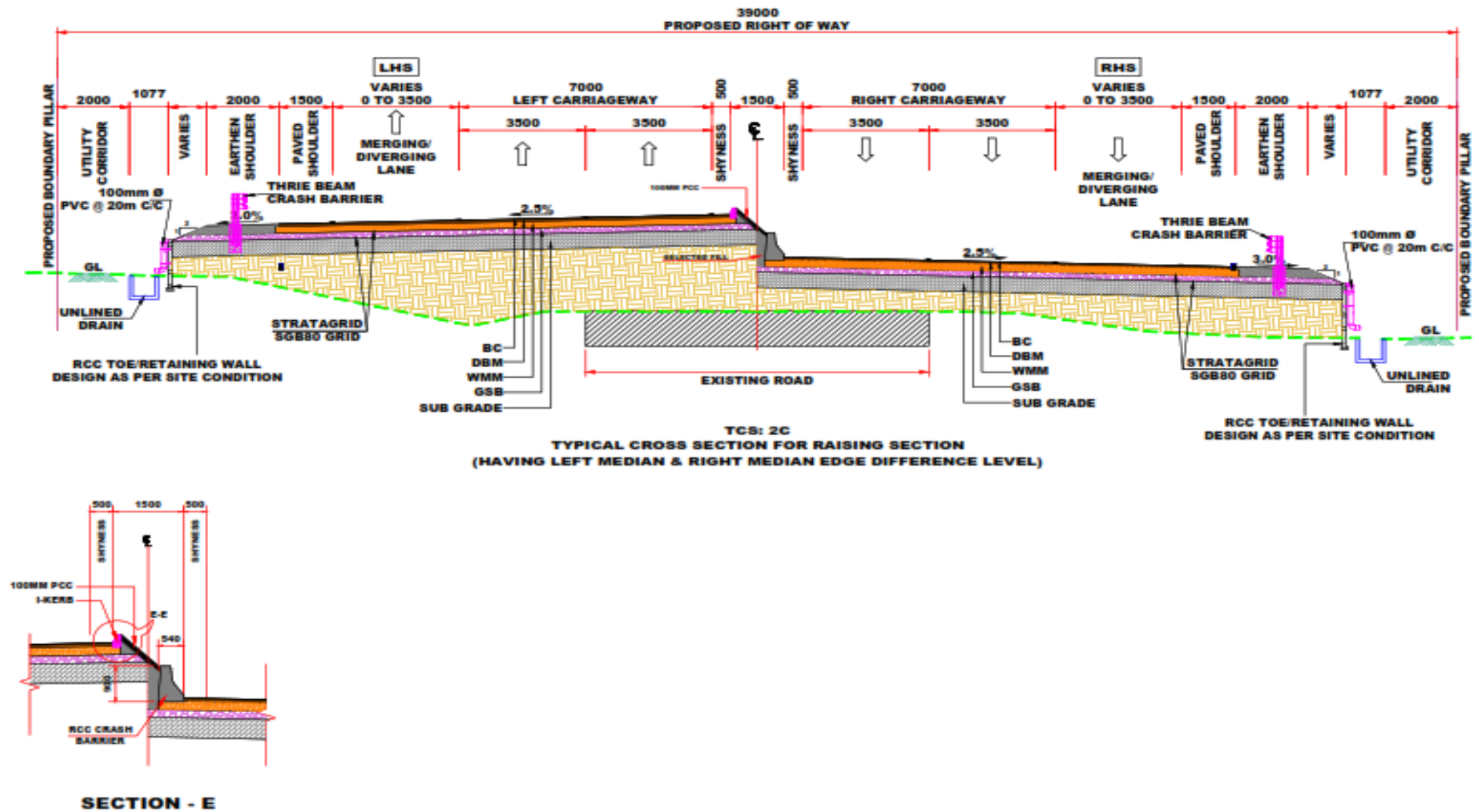


Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode

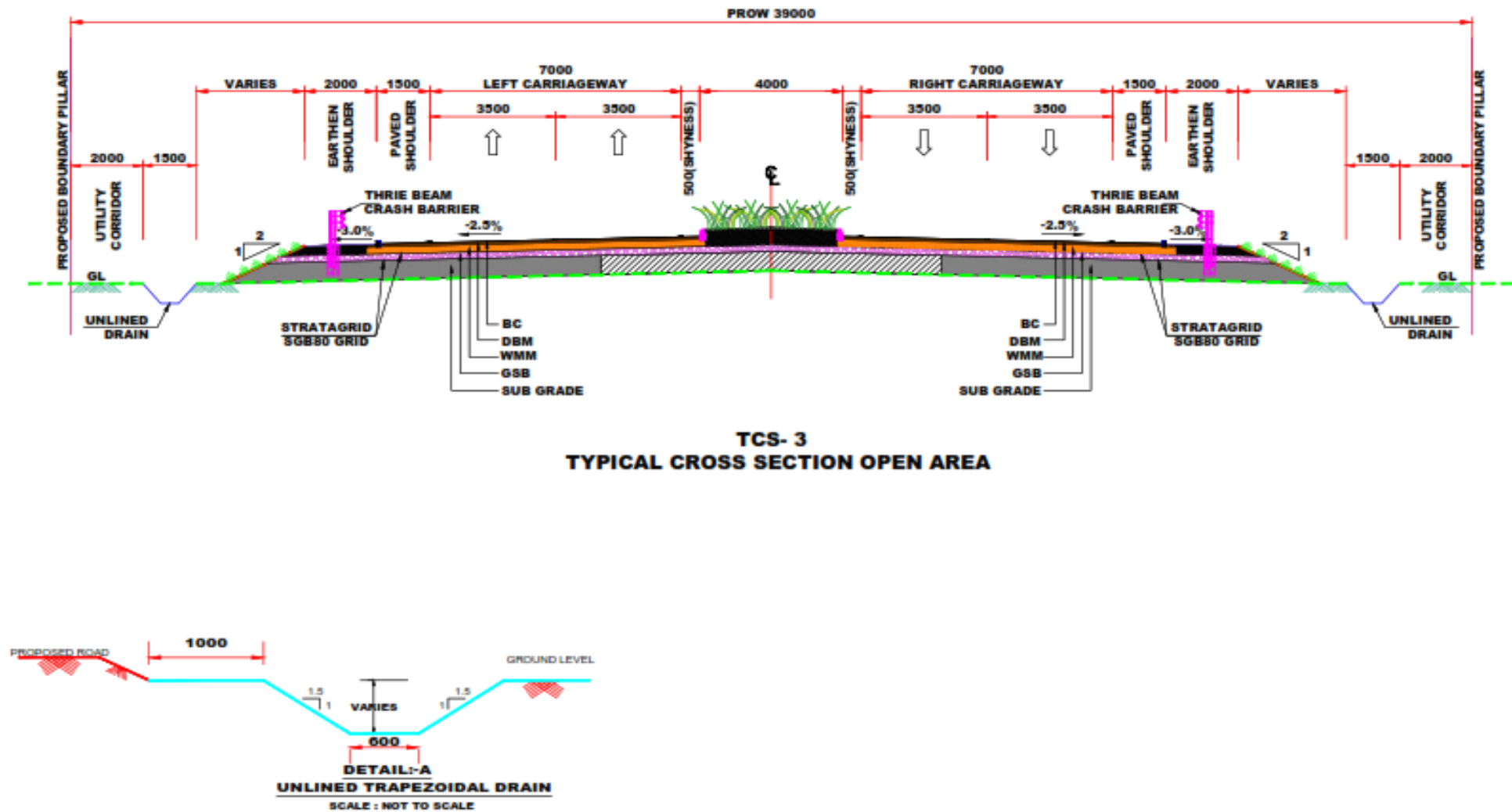


Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode

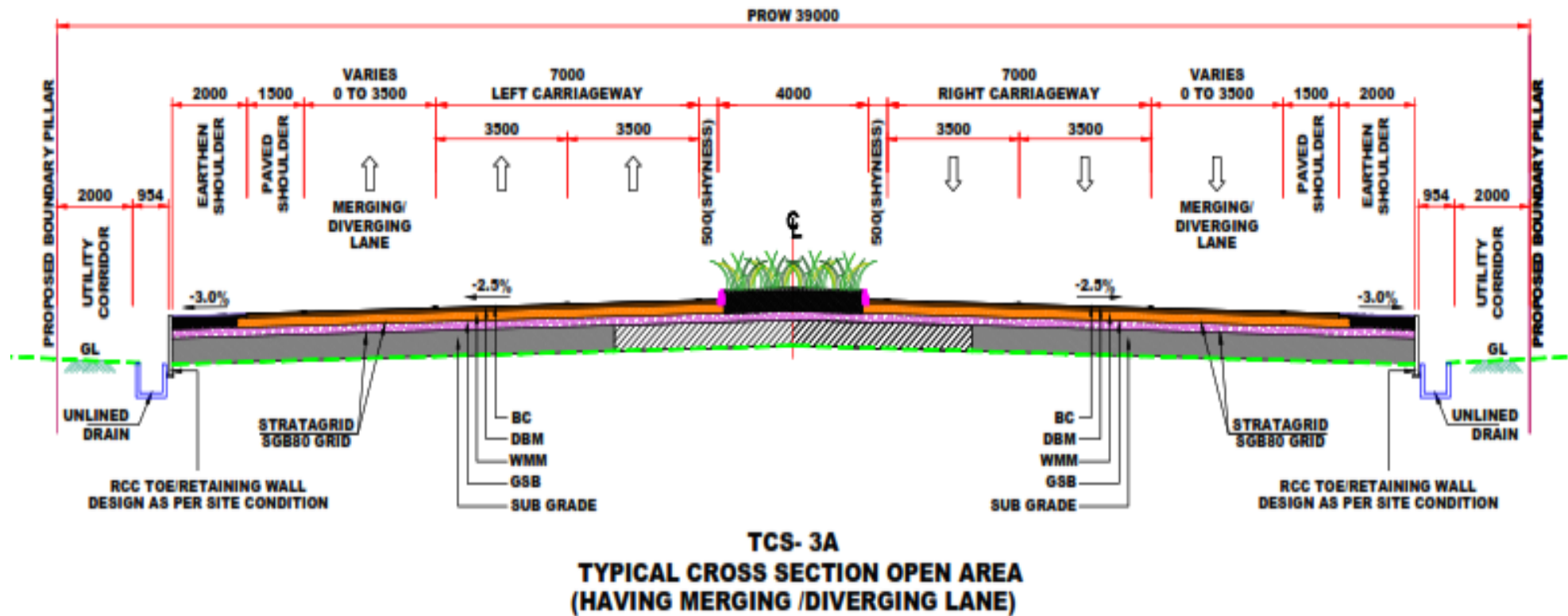




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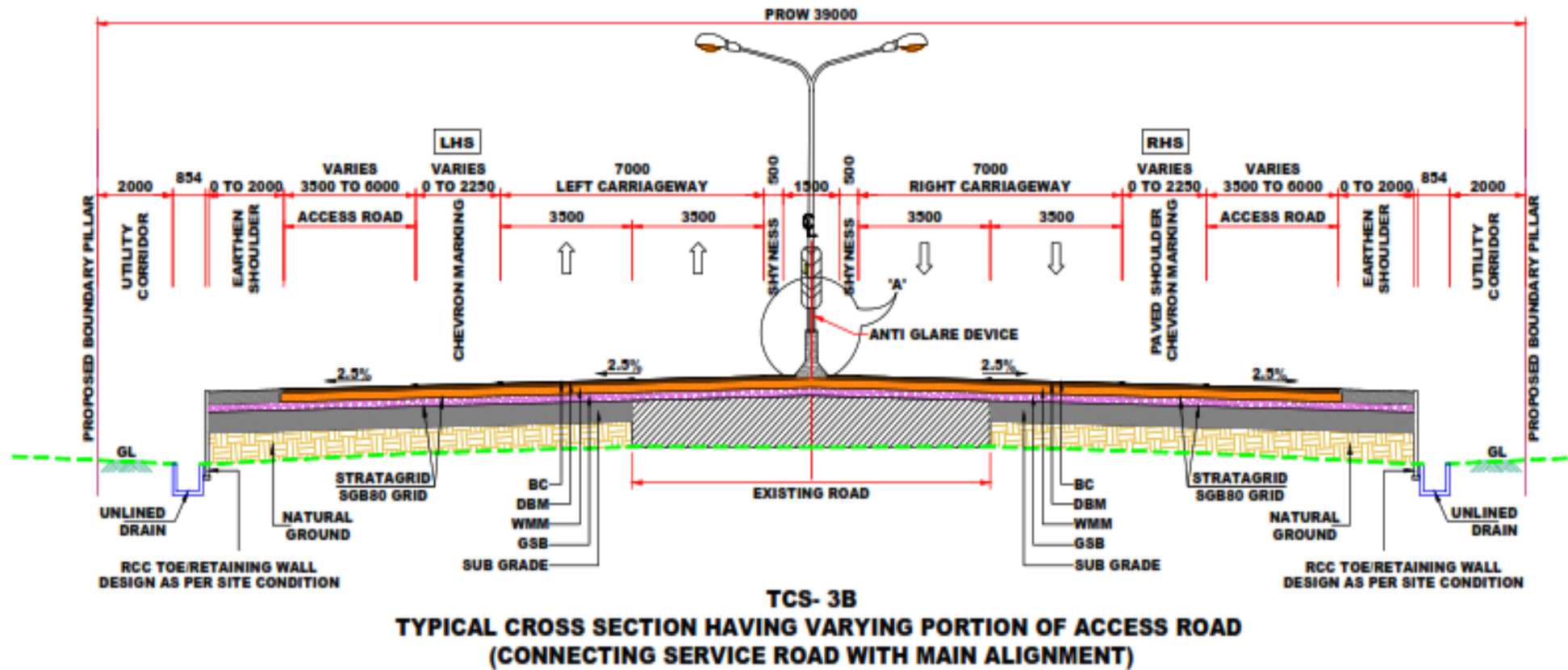


Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode

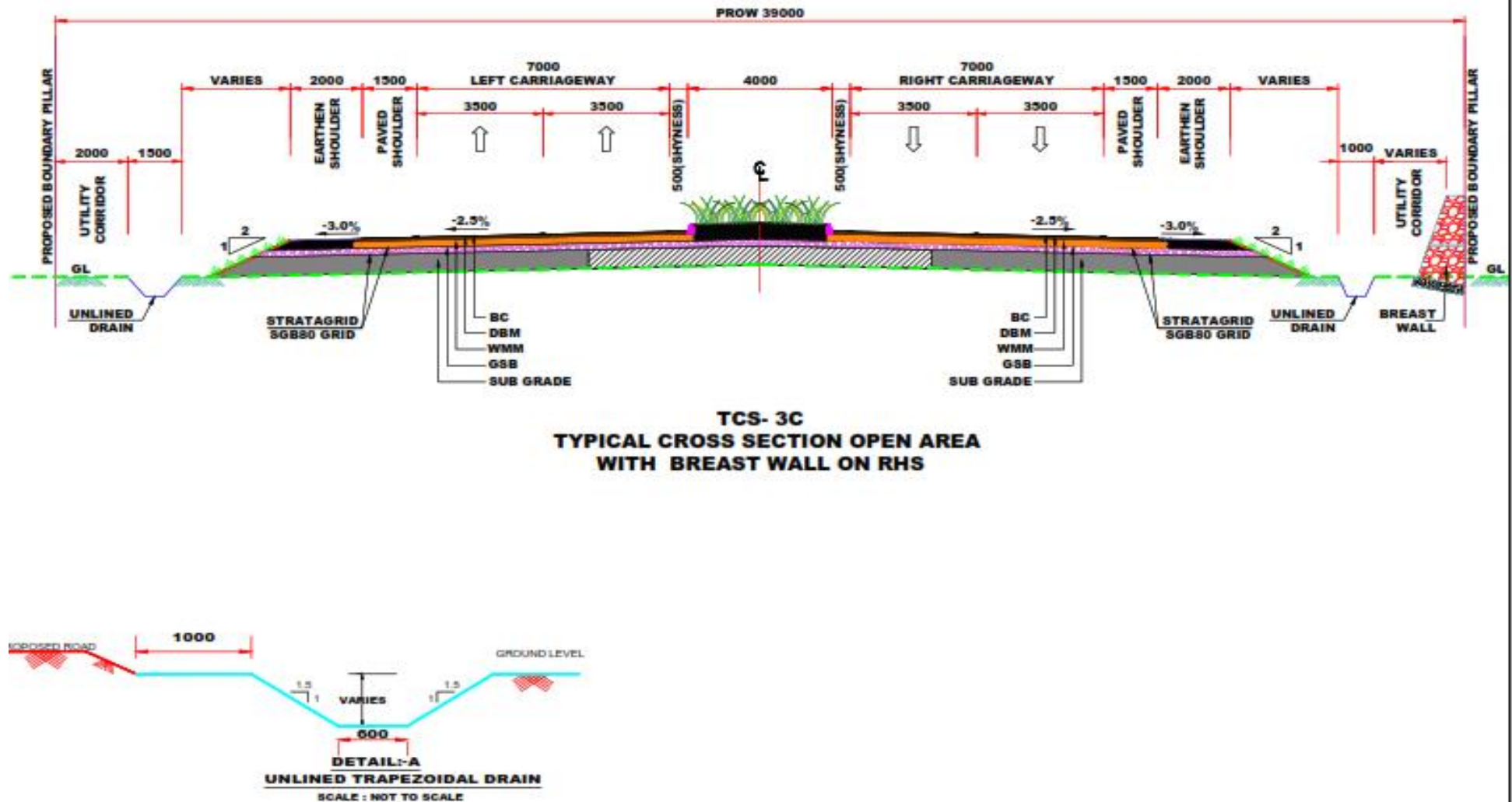


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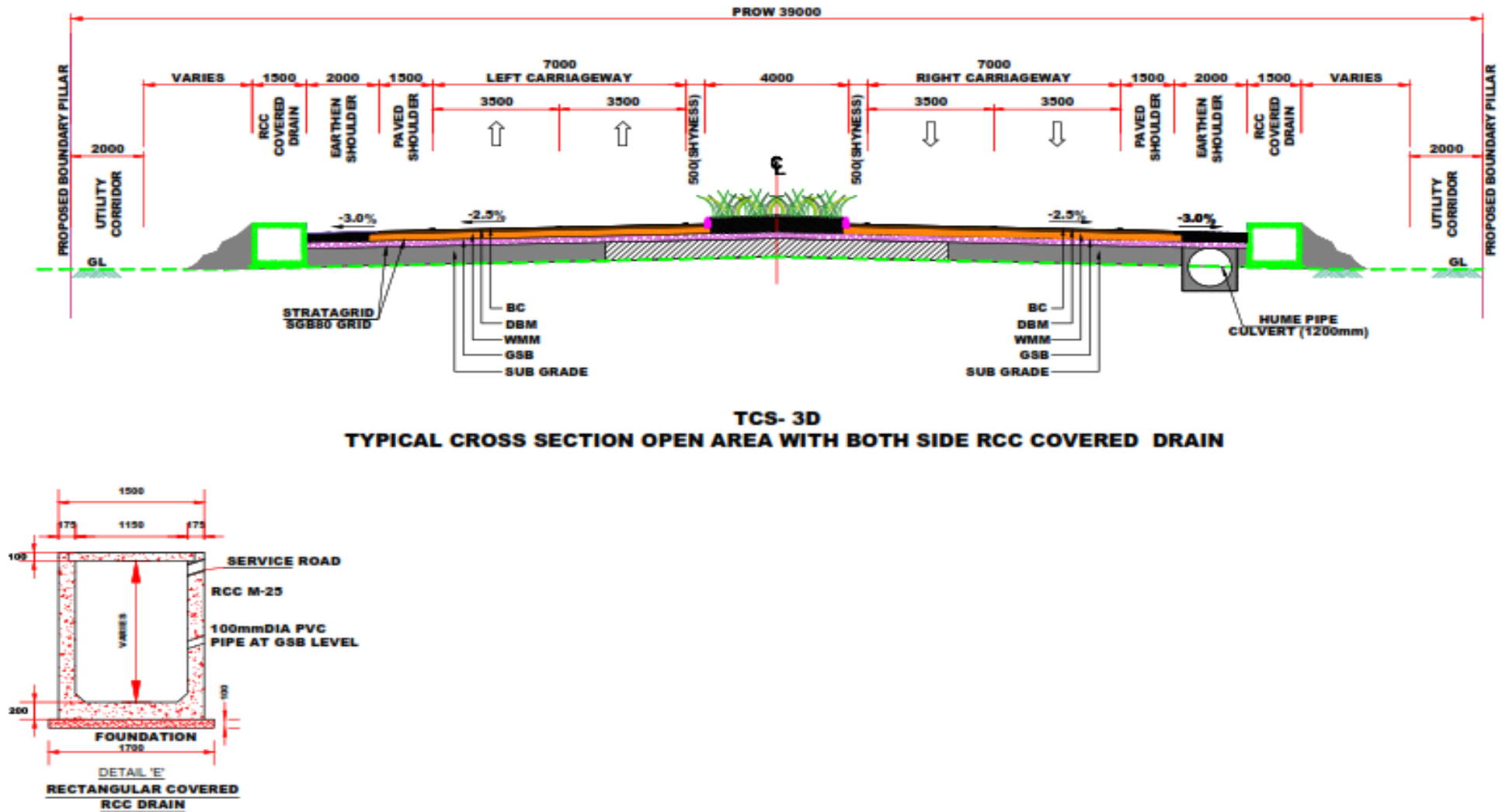




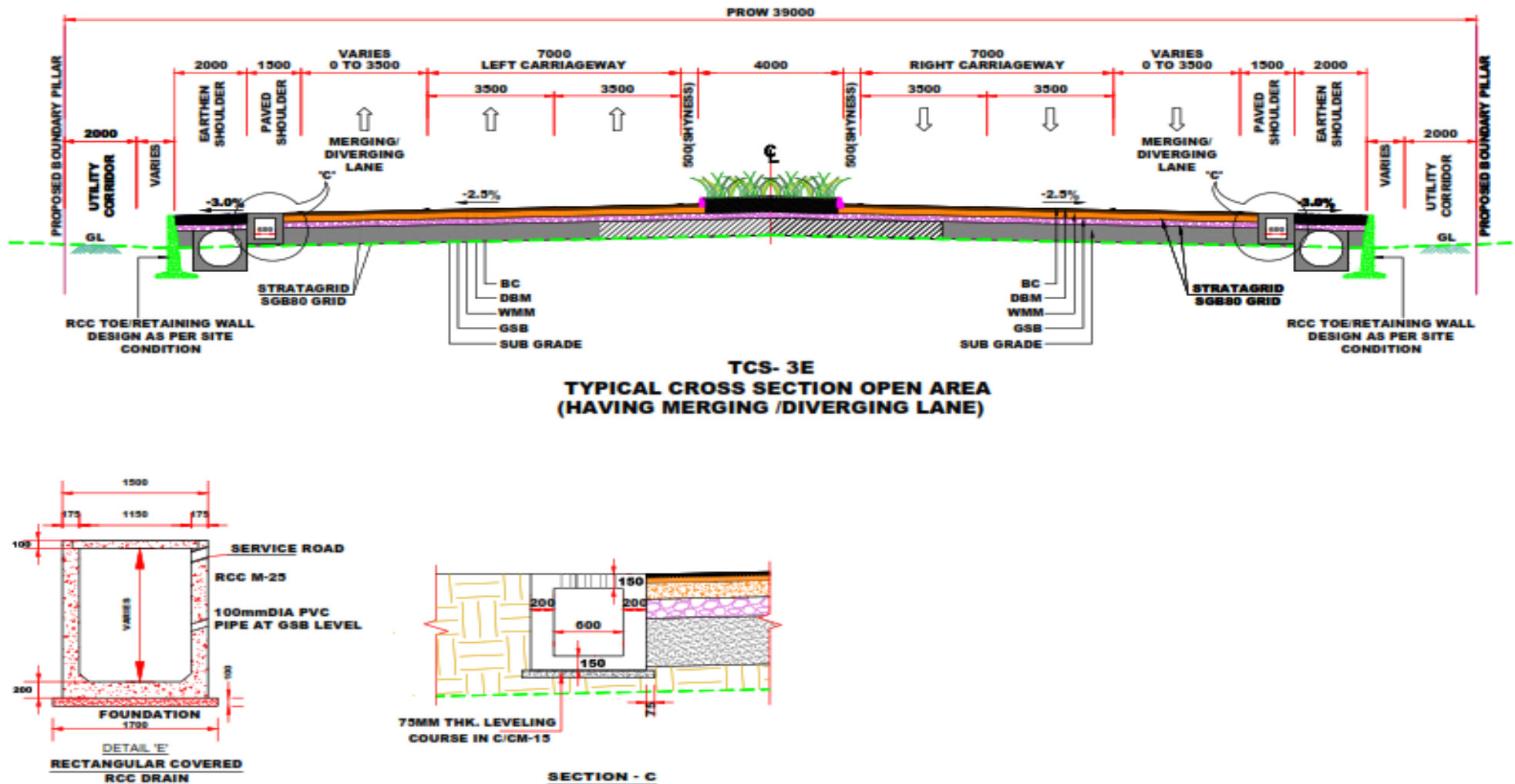
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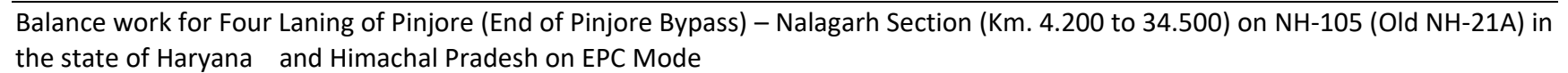
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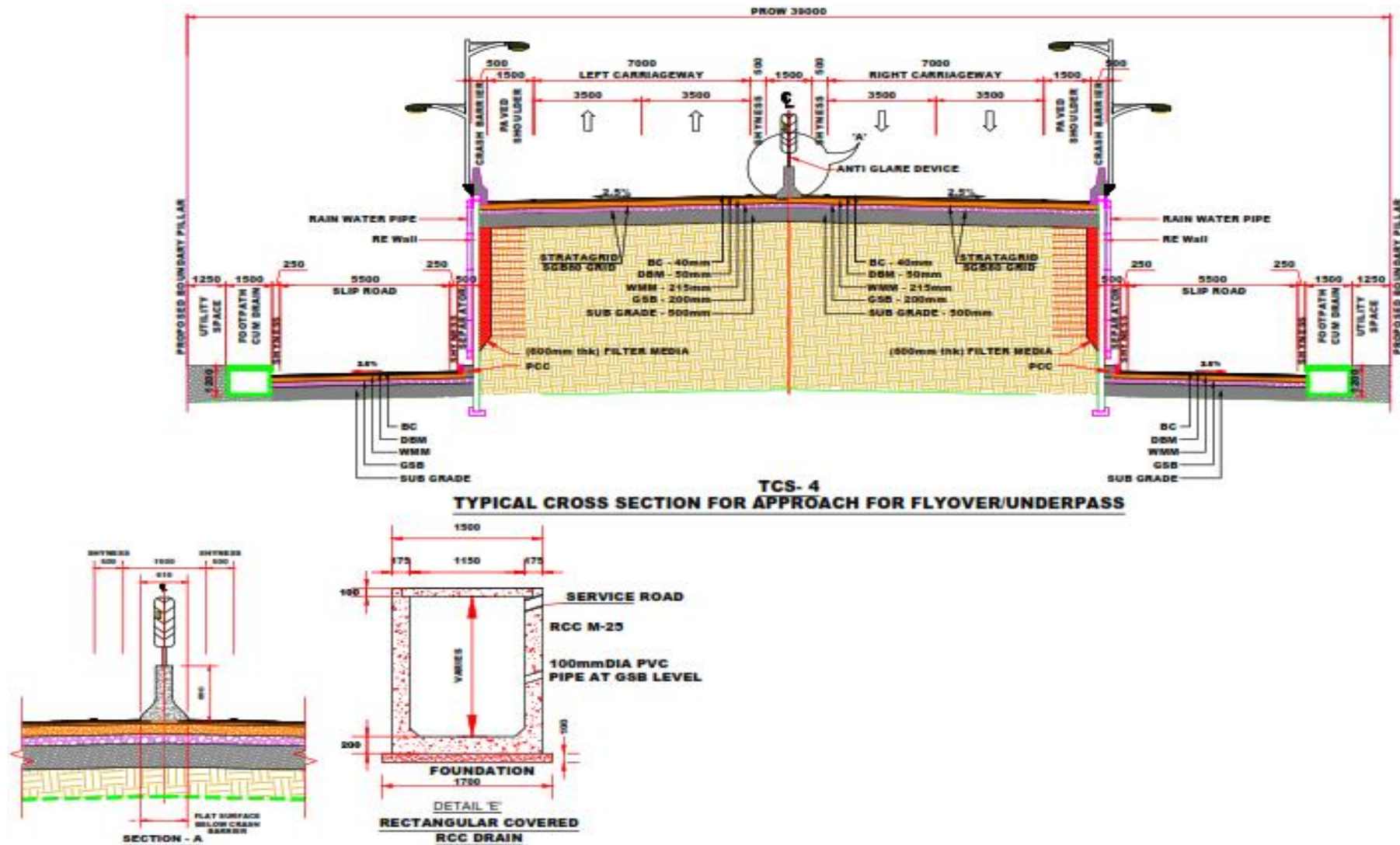
Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode



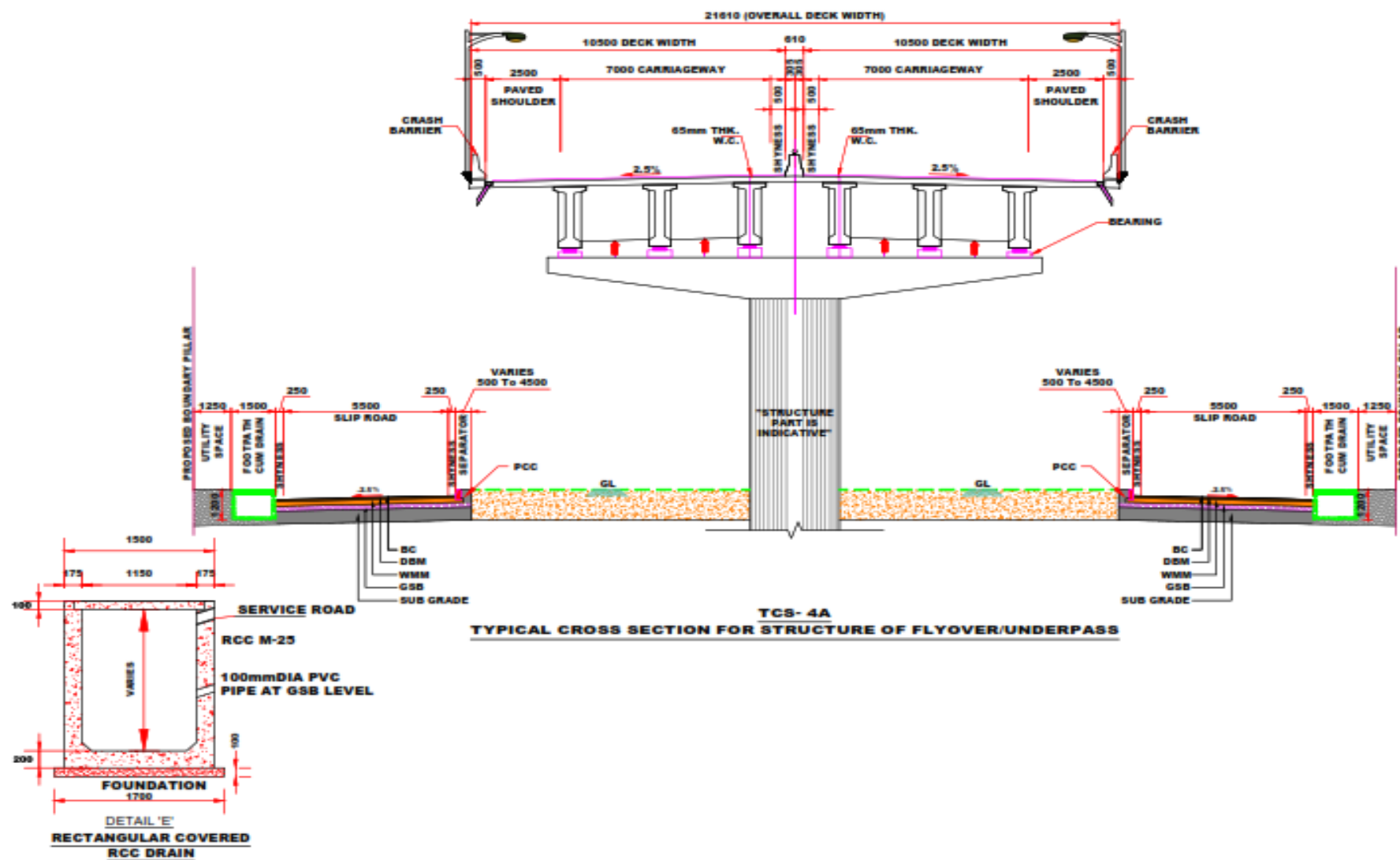
Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode



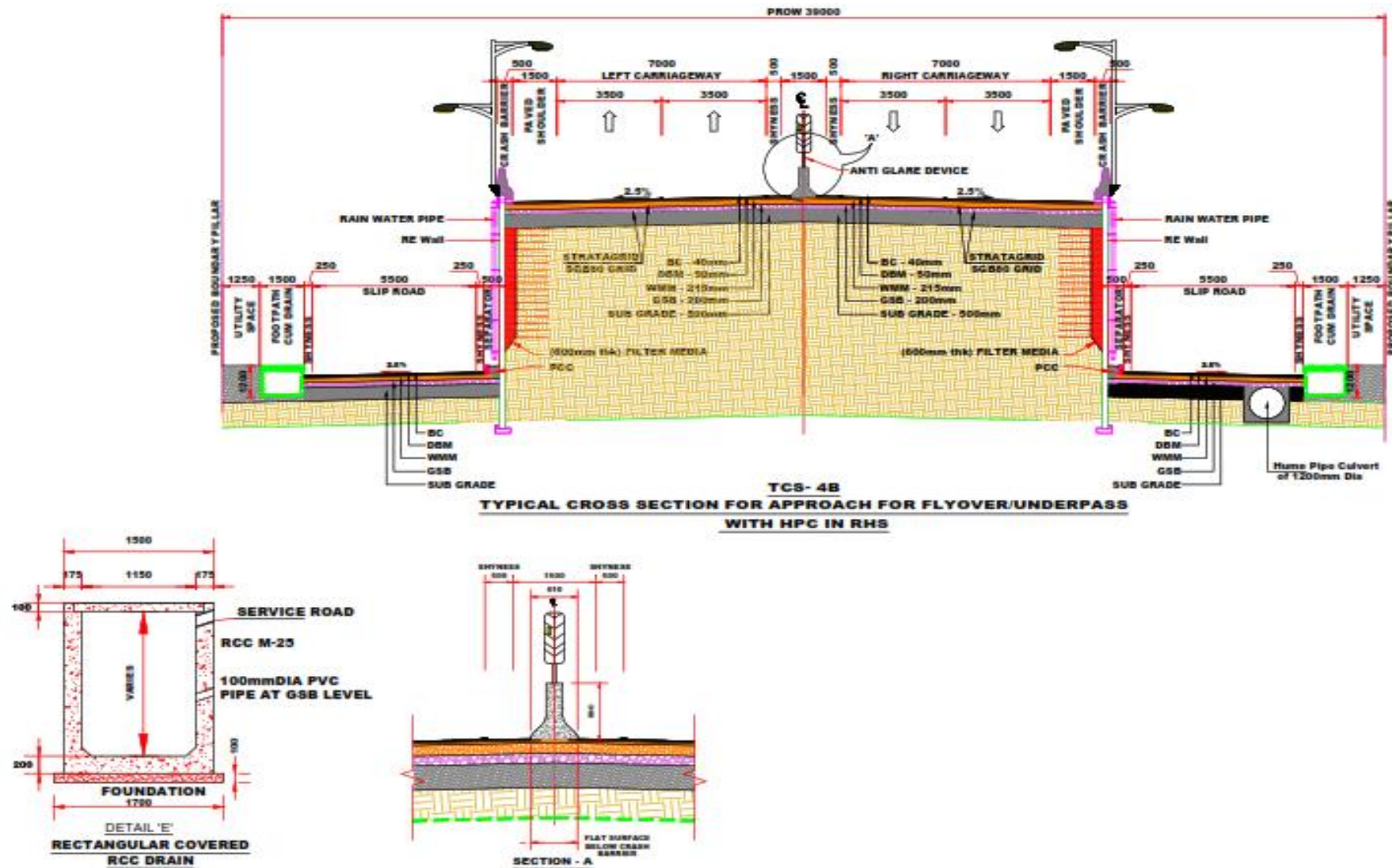




Balance work for Four Lining of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode

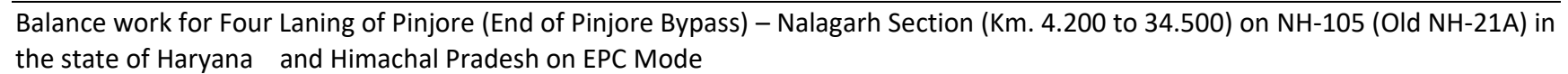


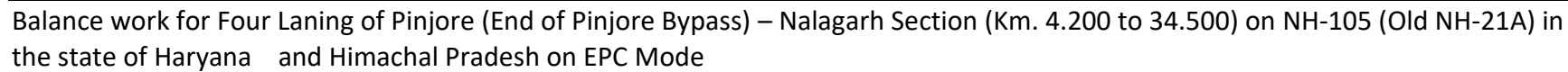
Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode

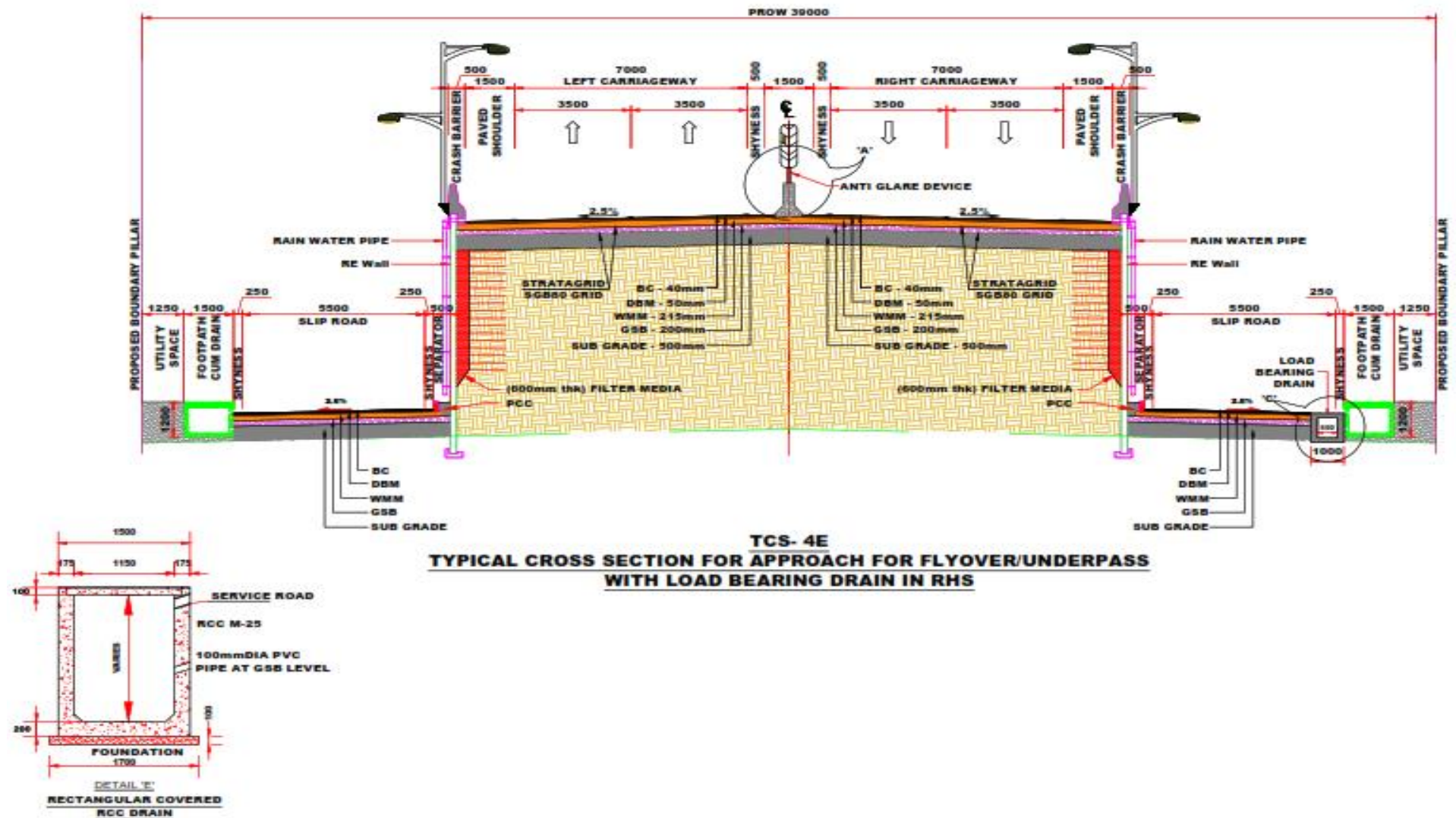


Balance work for Four Lining of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode

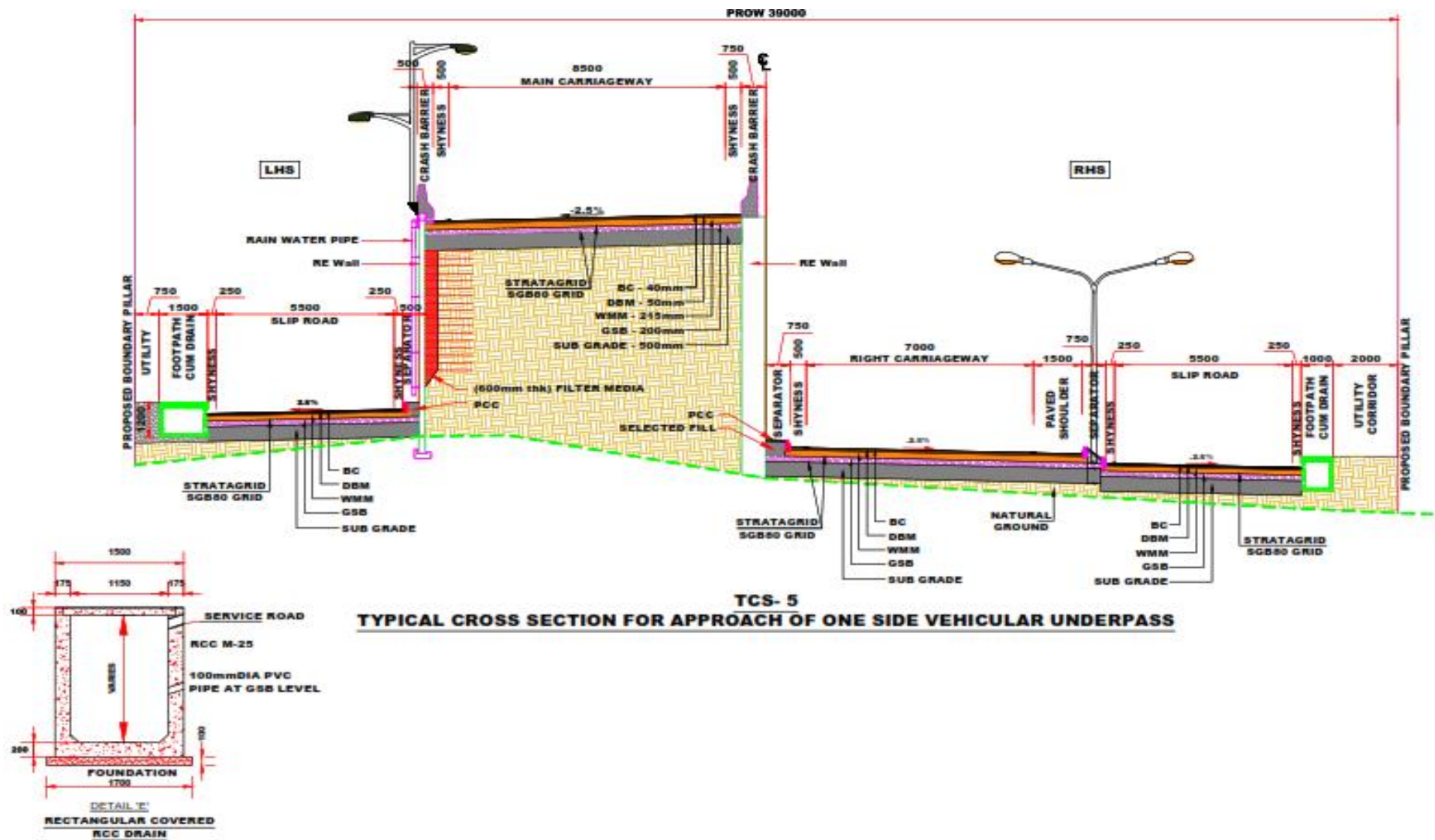






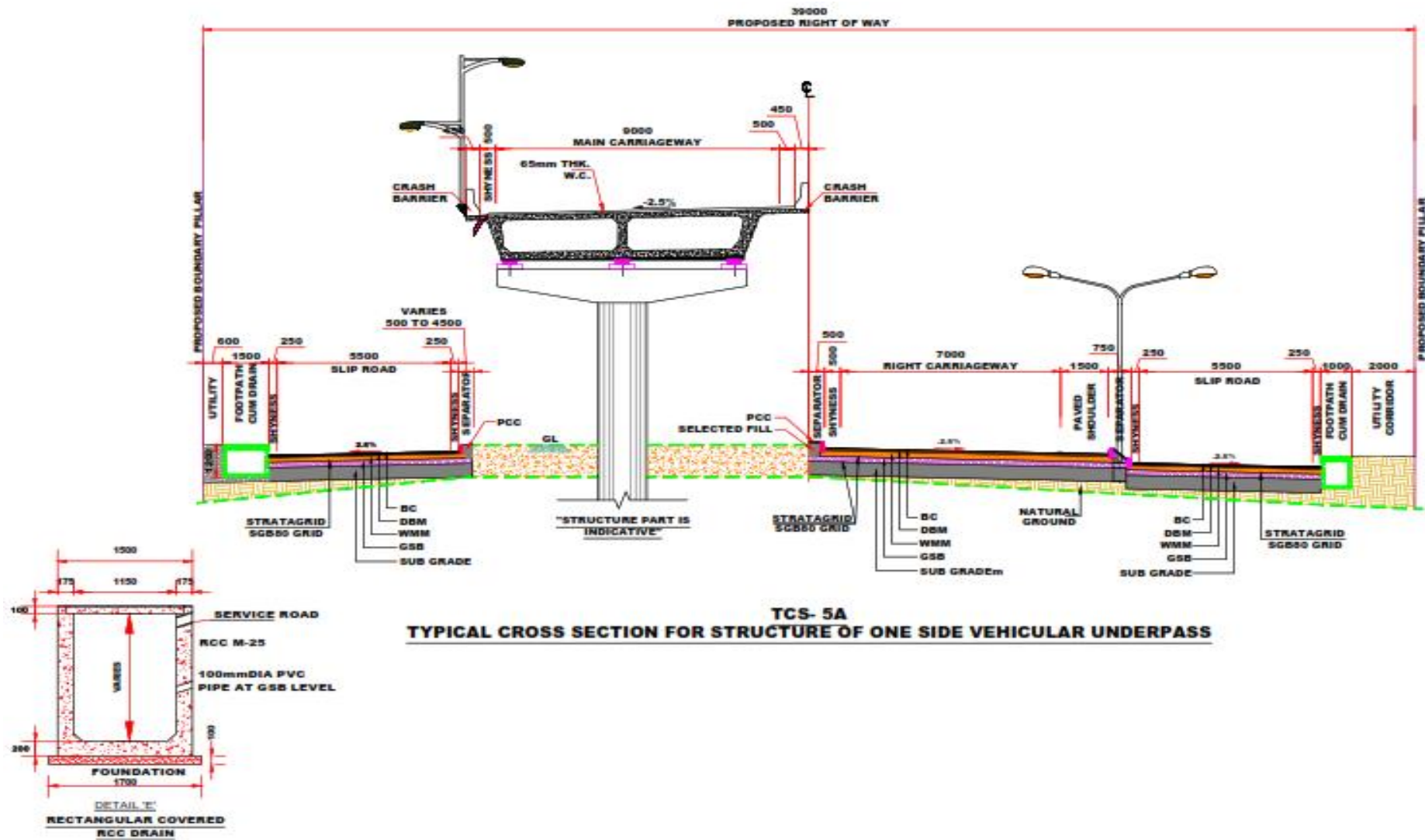


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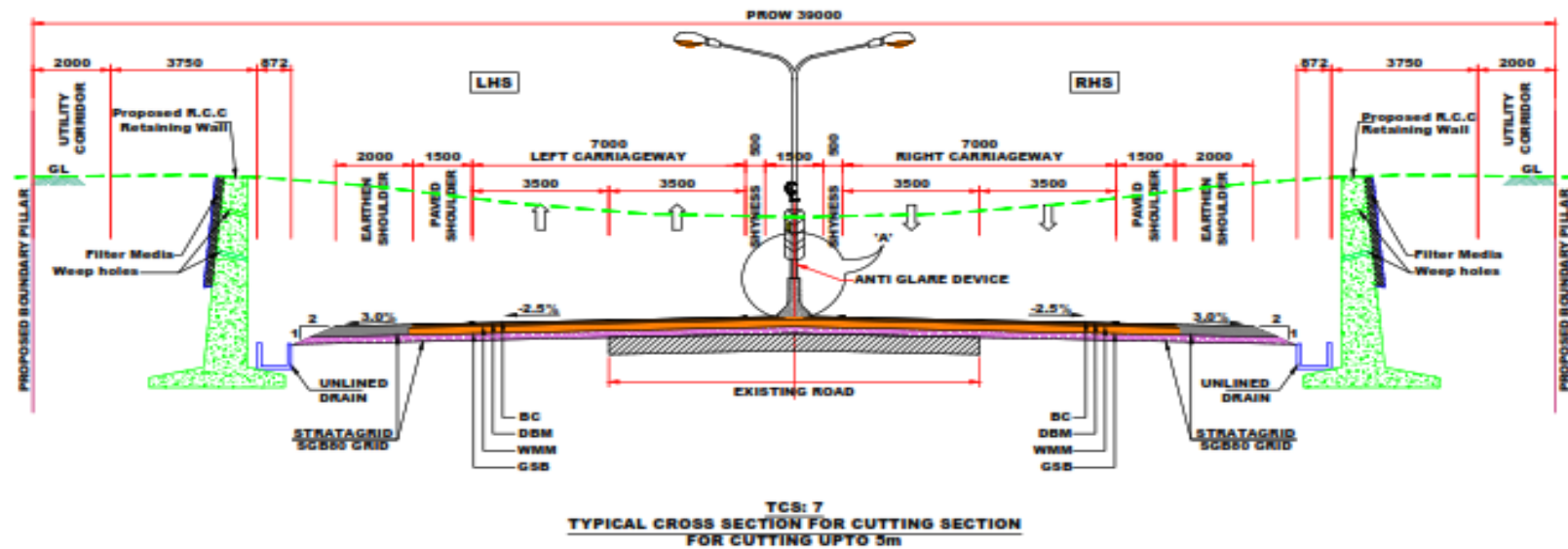
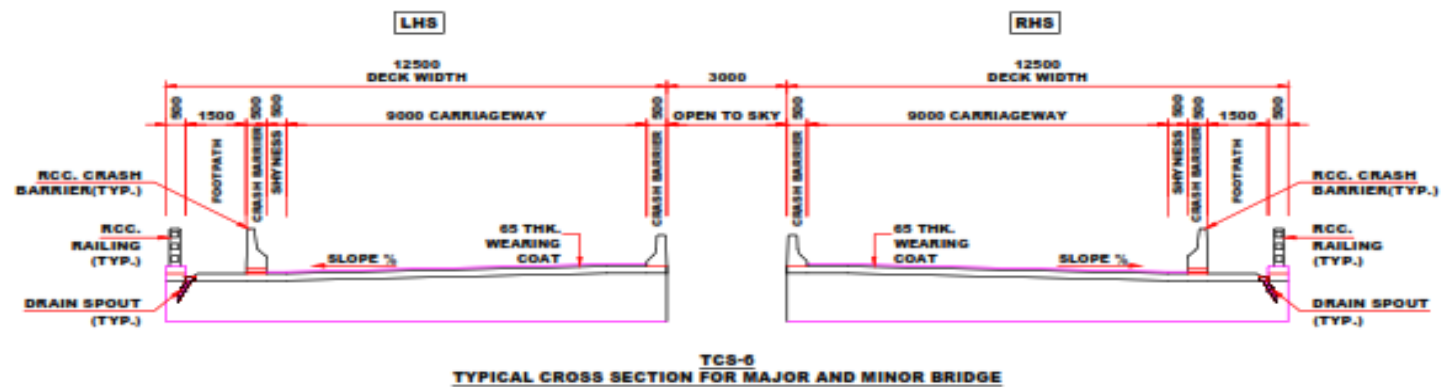


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Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode



Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode

# SCHEDULE - C

**(Schedule-C)**  
**PROJECT FACILITIES**

**1. Project Facilities**

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

- a) Toll Plaza
- b) Roadside furniture
  - i. Kilometer and Hectometer Stones
  - ii. Traffic Signs
  - iii. Overhead Signs
  - iv. Road Marking
  - v. Road Delineators
  - vi. Reflective Pavement Markers & Solar Studs
  - vii. Traffic Impact Attenuators
  - viii. Boundary wall and Fencing
- c) Operation and Maintenance centers
- d) Way side Amenities / Service Areas
- e) Truck lay-byes
- f) Bus Bay and Bus shelter
- g) Pedestrian Facilities
- h) Highway Lighting
- i) Rainwater Harvesting
- j) Environmental Management Plan
- k) Land Scaping and Tree Plantation
- l) Advanced Traffic Management System (ATMS)
- m) Highway Patrol Units
- n) Emergency Medical Services
- o) Crane Service

**Description of Project Facilities**

Each of the Project facilities is briefly described below:

**1. Toll Plaza**

Toll Plaza Tolling system shall be provided in entire length of the project and the same is integrated with the adjoining packages. The Toll Plazas shall be provided as per NHAI Circular No. 17.5.82 dated 24.05.2021 and Schedule D. Minimum Lane requirement in the opening year are as follows:

Toll plaza shall be provided confirming to **(Clause No. 10.2 IRC: SP:84-2019/IRC: SP:87-2019)** at the following locations:

Balance work for four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.



S. No.	Location of Toll Plaza		Direction (Entry: to highway, Exit: from Highway)	Minimum number of Toll Lanes	
	Existing Chainages	Design Chainages		Entry	Exit
1		17+150		3+1	3+1

The Sub items of toll plaza are as follows:

S.No.	Item	Number	Remarks
1	No. of Toll lane	3+1 BHS	
2	Toll Booth complex	Yes	
3	Weigh bridges	Nil	
4	Electrical systems	Yes	
5	Highway Nest with toilet facility	Nil	
6	Internet facility	Yes	

**Note:**

1. The Toll Plaza shall be constructed as per Manual (Schedule D) considering the modification as per NHAI Circular NHAI/Policy Guidelines/Management of Toll Plaza/2021 Policy Circular No. 17.5.82 dated 24th May, 2021. However, layout as mentioned in Schedule-C shall be followed.
2. Based on the toll lanes as given above, toll Booth complex, weigh bridges, electrical systems, and all other facilities required/ mentioned in manual shall be provided as per specification mentioned in Schedule D
3. No. of toll lane specified above are to be provided. The Concessionaire shall design and provide toll lane as per Manual (Schedule D) & NHAI Circular NHAI/Policy Guidelines/Management of Toll Plaza/2021 Policy Circular No.17.5.82 dated 24th May, 2021 subject to as specified above.
4. All Toll Lanes to be equipped with Hybrid ETC equipment's as per NHAI/Policy Guidelines/Management of Toll Plaza/2021 Policy Circular No. 17.5.82 dated 24th May, 2021. DPR consultant to specify details of equipment's with their numbers. **(Clause No. 10.5 IRC: SP:84-2019)**
5. A separate Highway Nest with toilet facility for road users shall be provided near toll plaza location along with parking facility. One toilet block on each direction shall be provided. These toilet facilities shall follow CPWD specifications for sanitary ware items and fittings such as WC. wash basin. Wash basin-Under counter, Urinal flat back, PVC Cistern, IWC Orissa Pan, Flush Value-CP. Wash Basin pillar cock-CP. Bb Cock-CP. Health Faucet Wic Bib cock Wash Basin angle cock. One WC shall be provided for specially challenged persons.
6. Point of Sale (POS) with card swapping machines shall be provided.

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7. Provide Lane markings and Traffic Signs as per IRC: SP: 84-2019. IRC 35 and IRC 67 **(Clause No. 10.8 & 10.9 of IRC: SP:84-2019)**
8. Solar panels shall be erected over the either on FOB or over Toll plaza / Admin building to generate the green energy. Same shall be utilized for toll plaza lighting and other energy requirement within toll plaza area along with conventional lighting.
9. Medium speed Weigh in Motion (MSWIM) devices shall be provided in all toll lanes at Toll Plaza Location. In addition to MSWIM, Static weigh Bridge (SWBs) shall be provided on each direction as per manual. (Clause No. 10.6, IRC: SP:84-2019)
10. Provide Impact Attenuators on Toll Plaza islands in the direction of traffic. Impact attenuators shall be self-restoring confirm to section 10.6 of IRC SP 99 i.e. Manual of Specifications and Standards for Expressways. (Clause No.9.6, IRC: SP:84-2019)
11. Provide Staircase on either side of the FoB at Median Island location by widening the island appropriately

## 2. Roadside furniture

### 2.1. Kilometer and Hectometer Stones (Clause No. 12.3 IRC: SP:84-2019)

S.No.	Item	Number	Remarks
1	Kilometer Marker/stones	62	The KM/ Hectometer stones/ marker can be Concrete/ Stones and shall be placed on both outer side of the earthen shoulder.  In case KM/ Hectometer marker are to be fixed on separator between Main Carriageway & Service Road then these should be fixed as reflective signs.  Km/ Hectometer stones are required to provide on main carriageway and Service Road, both if continuous service road is provided throughout project length (Service Road length is more than 1 Km).
2	Hectometer Marker/stones	248	

### 2.2. Traffic Signs (Clause No. 9.2 IRC: SP:84-2019)

Traffic Signs include roadside signs, overhead signs and korts mounted signs to shall be provided along the entire Project Highway and on all Side, Roads joining this main carriageway/service road. A QR code shall be marked on back of each sign as per IRC 67.

All sign shall be of Micro Prismatic Grade Sheeting Corresponding to Class C shooting as per ASTM D 4556 Type VIII, IX and XI **(Clause No. 9.2.3 IRC: SP:84-2019)**

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

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On multi lane roads (6 lanes or above), signs shall be mounted overhead **(Clause No. 4.6 of IRC: 67 2022)**

The siting of signs shall confirm to Table 4.1 and Fig 4.1 of IRC 67 **(Clause No. 4.7 IRC: SP:84-2019/ IRC: SP:87-2019)**. The two successive signs shall be placed at a minimum distance of  $0.6 \times V$  metre (V is design speed in Kmph). **(Clause No. 4.8 IRC 67 2022)**.

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

S.No.	Item	Carriageway (Left, Right, Both)
1	Overhead Gantry signs	
a	Start of Project	Both side
b	End of Project	Both side
c	Toll plaza location on both side	-
2	Overhead Cantilever Gantry signs	
a	At all major locations of Crossroads i.e NH, SH, MDR (start of grade separated structure/at grade interchange)	6 Nos.
b	At major trauma center, roads leading to religious places or any other important location	
3	Double/Butterfly Cantilever	Nil

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

S.No.	Road Signs	Number (DPR Consultant has to give the number required for each sign)	Remarks
I	<b>Mandatory/Regulatory</b>		
1	Stop signs	90	At cross roads
2	Give way Signs	0	At cross roads
3	Prohibitory signs	0	
4	No parking signs	0	
5	No Stopping signs	13	
6	Speed Limit signs (Circular)	49	
7	Speed Limit signs (Vehicle Type)	24	
8	Vehicle Control signs	0	
9	Restriction Ends signs	0	
10	Compulsory Direction Control and other signs	86 (Compulsory Keep Left)	
II	<b>Cautionary/warning</b>		

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S.No.	Road Signs	Number (DPR Consultant has to give the number required for each sign)	Remarks
1	Left/Right Curve	43	
2	Left/Right Curve with side road	0	
3	Right/Left Hairpin Bend	0	
4	Series of Bends	0	
5	270 Degree Loop	0	
6	Side Road	0	
7	Y-intersection	5	
8	Cross Road	90	
9	Roundabout	0	
10	Traffic Signals	0	
11	T-Intersection	0	
12	Side Road Ahead	74	
13	Staggered Inter-section	0	
14	Merging Traffic Ahead	21	
15	Narrow Road Ahead	0	
16	Road Widens	0	
17	Narrow Bridge Ahead	0	
18	Steep Ascent/Descent	0	
19	Reduced Carriageway	0	
20	Star/End of Dual Carriageway	0	
21	Gap in Median	0	
22	Pedestrian Crossing	25	
23	Pedestrian crossing with backing board	0	
24	School Ahead	0	
25	Built up Area	0	
26	Two Way Operation (on main carriage way/service road	0	
27	Two Way Traffic on Cross Road Ahead	0	
28	Danger Warning Sign	0	
29	Deaf or Blind Persons Likely on Road Ahead	0	
30	Cycle Crossing	0	
31	Cycle Route Ahead (Warning for Cycles on road ahead)	0	
32	Dangerous Dip	0	
33	Speed Breaker	86	
34	Rumble Strip	35	
35	Rough Road	0	
36	Dangerous Ditch	0	
37	Slippery Road	0	

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S.No.	Road Signs	Number (DPR Consultant has to give the number required for each sign)	Remarks
38	Slippery Road because of Ice	0	
39	Opening or Swing Bridge	0	
40	Overhead Cable	0	
41	Play Ground Ahead	0	
42	Quay Side or River Bank	0	
43	Sudden Side winds	0	
44	<b>Tunnel Ahead Warning</b>	0	
45	Falling Rocks	0	
46	Cattle Crossing	0	
47	Wild Animals likely to be on Road Ahead	0	
48	Queues Likely Ahead	0	
49	Low Flying Air Craft	0	
50	Unguarded Railway Crossing	0	
51	Guarded Railway Crossing	0	
52	Crash Prone area ahead	0	
53	U-Turn	4	
III	<b>Chevron Signs</b>		
1	Single Chevron	650	
IV	<b>Object Hazard marker Sign</b>		
1	Left/Right side Object Hazard Marker	177	
2	Two way Object Hazard Marker	33	
V	<b>Informatory/Guide</b>		
1	Direction and Place Identification signs		
2	Stack Type Advance Direction Sign (Shoulder Mounted)	89	
3	Stack Type Advance Direction Signs with cautionary / regulatory signs (Shoulder Mounted)	0	
4	Map Type Advance Direction Sign (Shoulder Mounted)	0	
5	Map type Advance Direction Sign for roundabout (Shoulder Mounted)	0	
6	Flag Type Direction Sign	81	
7	Reassurance Sign	10	
8	Place Identification Sign	15	
9	Truck Lay -By	0	
10	Toll Booth Ahead	0	
11	Weigh Bridge Ahead	0	

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S.No.	Road Signs	Number (DPR Consultant has to give the number required for each sign)	Remarks
12	Shoulder Mounted Sign in Advance of a Grade Separated Junction/Interchange	20	
13	Expressway Sign	0	
14	Gantry	20	
15	Lane Dedicated Gantry Sign	0	
16	Definition/Supplementary Plates	0	
17	Tourism Related Sign	0	
18	Tourist Destination Direction Information Signs Without Photograph	0	
19	Tourist Destination Direction Information Signs With Photograph	0	
20	Finger Destination direction information Sign for Pedestrians	0	
21	Tourist Map Information Sign	0	
22	Boundary sign at Entrance to a city/Place	0	
23	Boundary Sign at Entrance to a Tourist Destination	0	
<b>VI</b>	<b>Facility Information signs</b>		
1	Eating Place	0	
2	Light Refreshment	0	
3	Resting Place	0	
4	First Aid Post	0	
5	Toilet	0	
6	Filling Station (Fuel Pump)	17	
7	Hospital	4	
8	U-Turn Ahead	4	
9	Pedestrian Subway	25	
10	Police Station	0	
11	Picnic Site	0	
12	Repair Facility	0	
13	Railway Station/Metro Station/Monorail Station	0	
14	Industrial Area	0	
15	Cycle Rickshaw Stand	0	
16	Taxi Stand	0	
17	Auto Rickshaw Stand	0	
18	Home Zone	0	
19	Camp Site	0	

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S.No.	Road Signs	Number (DPR Consultant has to give the number required for each sign)	Remarks
20	Airport	0	
21	Golf Course	0	
22	National Heritage	0	
23	No Through side Road	0	
24	No Through Side Road	0	
25	Toll Road Ahead	0	
26	Guide Sign on Toll Lane Portal	0	
27	Country Border	0	
28	Entry Ramp for Expressway	0	
29	Exit Ramp for Expressway	0	
30	Expressway Symbol	0	
31	End of Expressway	0	
32	Bus Stop	27	
33	Bus Lane	0	
34	Contra Flow Bus Lane	0	
35	Cycle Lane	0	
36	Contra Flow Cycle	0	
37	Contra Flow Cycle Lane	0	
38	Holiday Chalets	0	
39	Emergency Exit	0	
<b>VII</b>	<b>Other Useful Information Signs</b>		
1	Signs For Persons With Disabilities	0	
2	International Symbol of Accessibility	0	
3	Parking Information	0	
4	Parking Areas	0	
5	Ramped entrance to Subway/Over Bridge	0	
6	Telephone Facilities	0	
7	Toilet Facilities	0	
8	Way Finding	0	
9	Parking Signs	0	
10	Auto Rickshaw Parking	0	
11	Cycle Parking	0	
12	Cycle Rickshaw Parking	0	
13	Scooter and Motorcycle Parking	0	
14	Taxi Parking	0	
15	Park and Ride	0	
16	Parking Restriction Signs for Traffic Management	0	
17	Flood Gauge Sign	0	

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S.No.	Road Signs	Number (DPR Consultant has to give the number required for each sign)	Remarks
<b>VIII</b>	<b>Route Marker Signs</b>	0	
1	State Highway Route Marker Sign	0	
2	National Highway Route Marker Sign	16	
3	Asian Highway Route Marker Sign	0	
4	Expressway Route Marker Sign	0	

**Note:** The locations of the placement of signage's shall be finalized in consultation with Independent Engineer/NHA, as per the site requirement.

### 2.3. Road Marking (Clause No. 9.2 IRC: SP:84-2019)

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

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

S. No.	Item	Unit		Remarks
		Length (m)	Number	
1	Longitudinal Marking	31000 (MCW) 18000 (SR)	6 2	Table A.1 & 4.4 of IRC 35 :2015
2	Transverse Marking	0	0	Cross Road Stop line
3	Hazard Marking	-	0	Table A.3 of IRC 35 :2015
4	Block Marking	-	-	
5	Arrow Marking	8 8	87	Entry/Exit
6	Directional Marking	-	-	
7	Facility Marking	-	27	
8	Center Line	-	-	
9	Traffic Lane Lines	-	87	
10	No Overtaking Lines	-	On no. of curves	
11	Warning Lines	-	-	
12	Border or Edge Lines	0	0	
13	Longitudinal Markings for Undivided Roads	0	0	
14	Longitudinal Markings for divided Roads	0	0	
15	Longitudinal Markings for Ramps/Slip Roads/One Way Streets	0	0	

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16	Stop Line	10	87	
17	Give Way Lines	0	0	
18	Diagonal Markings	10	87	
19	Chevron Markings	20*2	7	Refer Sr No.3
20	Continuity Line	0	0	
21	Word Messages	0	0	
22	Lane Change	0	0	
23	Merging/Diverging Markings	0	0	Refer Sr No.3
24	Hatch Markings	0	0	
25	Raised profile Edge Lines	0	0	
26	Lane Reduction / Narrowing Situations and Transition (lane Balancing)	0	0	Vice versa locations
27	Directional Arrows	0	0	Ref Sr No.5
28	Mandatory Turn Arrows	0	0	
29	Guidance Arrows	0	0	
30	Deflection Arrows	0	0	
31	Bifurcation Arrows	0	0	Ref Sr No.5
32	Arrows on side Road Approaches	0	0	
33	Arrows on Main Road Approaches	0	0	
34	Word Messages	0	0	
35	Yellow Box Markings	0	0	
36	Ghost Island	0	0	
37	Marking for Speed Breakers	0	87	87 in cross roads
38	Pedestrian Crossing	0	40	
39	Markings when highway passes through settlement fig 9.4 of IRC SP 84/87	0	0	
40	Transverse Bar Markings	-	10	
41	Busbay Marking	-	27	Ref fig 12.3 irc-35
42	Truck Lay-BY Markings	-	0	
43	Toll Plaza Marking	0	1	
44	School Zone Markings	0	0	
45	Objects Markings Adjacent to Carriageway	0	0	
46	Objects Markings Adjacent to Carriageway	0	0	
47	i. Subway Piers, Abutments, Culverts head Walls, Concrete barrier	0	0	
48	ii. Electrical Poles	0	0	
49	iii. Guard Rails	0	0	

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50	iv. Trees	0	0	
51	v. Kerbs	0	0	Painting to be done
52	Directional Markings as per Annexure: A6	0	0	
53	Facility markings as per Annexure A.7 of IRC 35	0	0	

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

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

S.No.	Item	Number / Length (m)	Remarks
1	Roadway Indicators		
2	Median Marker on Median/RCC Barrier (Clause 4 of IRC 79 2019)	0	
3	Object Markers	0	
4	Flexible Object Markers (Clause 6 of IRC 79 2019) i. On Metal Beam Barrier ii. On Toll Booth/ Toll Island iii. On Entry/Exit of Tunnel iv. On Exit from Main Carriageway	0	
5	Solar Blinkers on Median Opening on exit from main carriageway and traffic islands of grade separated intersections	10*2	

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

#### 2.5. Reflective Pavement Markers & Solar Studs (Clause No. 9.5 IRC: SP:84-2019/ IRC: SP:87-2019)

The Prismatic Retro-Reflective type conforming to ASTM D-4280 Pavement Markers & Solar Power Studs on Highway shall be provided in accordance with Schedule-D

S.No.	Item	Number	Location	Remarks
1	White Colour one coloured face Studs	222/KM	Center of Main carriageway	Clause No. 9.5 IRC: SP:84-2019
2	Red Colour one coloured face Road studs	222/KM	Shoulder side of MCW and edge lines of service road	Clause No. 9.5 IRC: SP:84-2019
3	Yellow/ Amber Colour one coloured face Road Studs	222/KM	Median line of MCW and at zebra crossing (0.5 m spacing)	Clause No. 9.5 IRC: SP:84-2019

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4	Green Colour one coloured face Road Studs	27 at Bus bays	Crossable continuous line like in acceleration/deceleration lanes involving lane Changing	<b>Clause No. 9.5 IRC: SP:84-2019</b>
<b>B- For 2 Lane PS Projects</b>				
5	White Colour Two coloured face Road Studs	-	-	-
6	Red Colour Two coloured Face Road Studs	-	-	-
7	Green Colour Two Coloured face Road Studs	-	-	-
8	Solar Studs on Major/Minor Bridge, RoB and all structures (Interchange/Flyover/VUP) and Builtup areas, In storage lane of Median opening and Exit/Entry from main Carriageway	-	-	-

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

**2.6.1 Provide Impact Attenuators in Gore Areas, it shall be self-restoring confirming to section 10.6 of IRC SP 99 i.e. Manual of Specifications and Standards for Expressways at following locations**

S.No.	Item	Chainage / Number	Remarks
1	On Flyover/grade separated structure at exit from main carriageway	6 Nos.	Traffic Impact Attenuators on project highway shall be provided at approaches of Vehicular Under passes /Interchanges in Gore Area
2	On Island of Toll Plaza	NIL	
3	Any other location which Safety Hazard	-	-

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

## 2.6.2 Providing End Terminals (Clause No. \_\_\_\_\_, IRC SP 99)

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

S.No.	Item	Chainage / Number	Remarks
1	Culvert Ends	76	

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2	Structures Ends	25	
3	Any other Location Which Safety Hazard	05	Additional

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

### **2.7. Boundary Wall and Fencing (Clause No. 12.2 IRC: SP:84-2019/IRC: SP:87-2019)**

Boundary wall shall be provided along the entire length on either side (including transverse requirements at structure locations) as per the detail given below in accordance with IRC: SP:84/87 Road boundary walls shall be provided at the boundary on both sides of the right of way available under the control of the Authority, except at ingress and egress points. The boundary walls shall be of reinforced cement concrete as per figure enclosed as Annexure A.

At all CD structure locations, the boundary wall shall be discontinued by turning and joining it with the wing/return wall to allow crossing through these structures during dry seasons.

In case of Pre cast panel fencing, provide cast in situ coping beam on top of fencing. provide detailed drawings as Annexure A.

### **3. Operation and Maintenance centers (Clause No. 12.15 IRC: SP:84-2019/ IRC: SP:87-2019)**

There shall be operation and maintenance center(s) as per Clause 12.15 of Schedule-D, wither near the toll plaza location or at any other location along the Project Highway, as identified by the Concessionaire. The minimum land for O&M center shall be 2000 sqm and shall be acquired by the Concessionaire at his own cost and risk. Dedicated operation and maintenance center shall be provided in accordance to Schedule D.

### **4. Way side Amenities / Service Areas/Rest Area (Clause No. 12.6 IRC: SP:84-2019/ IRC: SP:87-2019)**

S.No.	Item	Existing Chainage (Km.)	Side	Remarks
Nil				

The Site needs to levelled/ graded for the whole of Way Side Amenities area and boundary wall of the height of 1.5m shall be constructed along the periphery of the area.

### **5. Truck lay-byes: (Clause No. 12.6 IRC: SP:84-2019/ IRC: SP:87-2019)**

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

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S.No.	Design Chainage	Side	Remarks
Nil			

5.2 Toilet block along with Janitor room on each Truck Lay bye shall be provided. The toilet block shall consist of at least 1 block for bathing, atleast 2 fixtures each for urinals, WC and wash basin. There shall be 24-hour lighting facility in toilet block. These toilets facilities must be functional round the clock including proper maintenance. For arrangement of water, 1 no. of boring along with water pump shall be provided to keep the toilet clean. For upkeep and maintenance of Toilet, 3 Safai wale (1 in each 8-hour shift) shall be engaged and is in the scope throughout contract period.

5.3 Truck Lay Bye Pavement: Provide pavement composition (Flexible/Rigid/ Paver Blocks) as follows:

Pavement Composition (Flexible/Rigid/ Paver Blocks)
Nil

## 6. Bus Bay and Bus Shelter: (Clause No. 12.7 IRC: SP:84-2019/IRC: SP:87-2019)

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

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

S.No.	Chainage Km	SIDE
1	5+220	RHS
2	5+000	LHS
3	7+965	RHS
4	7+900	LHS
5	8+750	RHS
6	8+820	LHS
7	9+635	LHS
8	9+690	RHS
9	11+125	LHS
10	10+950	RHS
11	19+045	RHS
12	19+150	LHS
13	21+440	RHS
14	21+530	LHS
15	22+600	LHS
16	22+550	RHS
17	23+200	BHS
18	24+300	BHS

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S.No.	Chainage Km	SIDE
19	25+800	RHS
20	25+900	LHS
21	26+100	BHS
22	27+090	RHS
23	27+150	LHS
24	28+000	BHS
25	29+100	BHS
26	30+000	BHS
27	34+000	BHS

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

**6.3 Bus Bay Pavement:** Provide pavement composition (Flexible/Rigid/Paver Blocks) as follows:

Pavement Composition (Flexible/Rigid/Paver Blocks)
NA

## 7. Pedestrian Facilities (Clause No. 12.7 IRC: SP:84-2019/IRC: SP:87-2019)

Pedestrian Facilities shall be provided in accordance with the Manual of Specifications and Standards referred in Clause 9.8 of Schedule D and IRC 103 2022. This shall consist of footpath (sidewalk), pedestrian guard rails and pedestrian crossing.

Refer Clause 2.3 of Schedule C

The details are as mentioned below:

S.No.	Pedestrian facilities	Chainage		Side	Remarks
		From	To		
1	Pedestrian Guardrails shall be 150 mm from Carriageway/Paved Shoulder i. Hazardous Locations on Straight Stretches ii. At Junction/Intersections iii. Schools iv. Bus Stop/Railway stations v. Overpass, Subway vi. Central Reserve	-	-	-	-
2	Footpath paving including fixing of Tactile pavers	-	-	-	-
3	Pedestrian Crossing i With Zebra Marking ii With Tabletop Crossing	-	-	-	-

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	iii At Intersections				
	iv At Schools				

## 8. Highway Lighting (Clause No. 12.5 IRC: SP:84-2019)

The street light poles shall be 1 piece, continuous-tapered, Octagonal poles and shall be manufactured from one length of steel sheet, formed in continuous tapered tube, with one continuous arc-welded vertical seam. The minimum wall thickness for lighting poles shall not be less than 4 mm. The Bottom Diameter shall be minimum 175 mm. The Top Diameter shall be minimum 75 mm. The door on window of pole shall be antitheft. All electrical cable should be concealed. All electrical lighting fixers shall be LED. The fixtures shall be concealed except on poles. Lighting poles shall be fixed on outer side of steel/concrete barrier.

Offgrid hybrid solar lighting system should be installed with both power and battery backup system. Battery Backup must be with 12 hrs backup, specifications of light minimum 165 Watt, 185 Lumen/Watt. Diesel generator needs to be installed at toll plaza to cater the load for toll building and toll booth. Another DG will be required for ATMS & highway Lighting. 30 m high mast need to be installed at major junction and toll plaza. Minimum lux level at all location should be 40 Lux. Brand of the light make must be of Havells, Bajaj, Crompton, GBH, & Panasonic.

Brand of the cable must be of Polycab, Havells & KEI.

The lighting shall be providing at the following locations:

1. LVUP/VUP/Underpass with Underdeck Lighting.
2. Major Bridge & Minor Bridge.
3. Toll Plaza.
4. Interchanges.
5. Built-up area with Footpath
6. Truck Lay Bys/ Bus Bays
7. Minor Junction (with adjoining roads upto 75 m)
8. Major Junction (Street light with 30 m high mast)
9. Flyover & ROB.
10. Service & Slip Roads.

### Note:

- (i) EPC Contractor need to be lightened all above mentioned locations and follow IRC: SP 84-2019
- (ii) The locations of the marking shall be finalized in consultation with Authority Engineer/NHAI, as per the site requirement.

## 9. Rainwater Harvesting

The provision of rainwater harvesting shall be provided at every 500m staggered in the entire project length and shall be executed as per requirement of IRC SP: 42-2014 and IRC SP: 50-2013. Additionally, wherever urban drains are provided, which do not have a definite outfall

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for discharge of water, at such location one pit for rain water harvesting shall be provided along the side drains at the lowest point/where the water stagnates.

S.No.	Rain water Harvesting Type	Chainage	Side	Depth of Recharge Structure
1	Type 1 confirming to clause 10.7.2 of IRC SP 42	-	-	-
2	Type 2 confirming to clause 10.7.3 of IRC SP 42	-		
3	Type 3 confirming to clause 10.7.4 of IRC SP 42	-	-	-
4	Type 4 confirming to clause 10.7.5 of IRC SP 42	-	-	-

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

#### 10. Environmental Management Plan (Attach MOEF Mitigation Report in Schedule D)

The Concessionaire shall implement the Environmental Management plan and action Plan for undertaking possible mitigation measures in accordance with environmental clearance accorded by Ministry of Environment and Forests and climate change. The conditions & directions stipulated by the MOEF shall be complied by the contractor/concessionaire.

#### 11. Land Scaping and Tree Plantation (Section 11 of IRC SP 84 2019)

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

Drip Irrigation system for median plantation by gravity/pressure sources with all necessary components/systems and emitting devices at plants shall be provided

The Concessionaire shall maintain the trees and shrubs in good condition during concession period as per the concession agreement.

S.No.	Types of Plantation	Location (Km.)	Number of trees to be planted	Remarks
1	Shrubs	Nil		
2	Land Scaping	O&M Centres, Vacant land parcels, lend within loops of flyovers, Toll Plaza building and surroundings Vacant space below the flyovers	Landscaping plans will be submitted by the Concessionaire/Contractor which shall include ornamental trees, decorative statues and landscaping.	

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3	Plantation	Available open land within ROW	-	
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## 12. Advanced Traffic Management System (ATMS)

Nil.

## 13. Highway Patrol Units (Clause No. 12.10 IRC: SP:84-2019)

Highway Patrol units shall be established and operate at toll plaza location as per Schedule-D Clause 12.10 (strictly as per details mentioned in Annexure-C), which shall continuously patrol the highway in a stretch not exceeding 50 km (if the stretch is more than 50 Km. additional 1 number of patrol vehicle per 50 km or less shall be provided). The vehicle shall be brand new with fuel, driver, and insurance all-inclusive for the entire contract period. Highway Patrol units shall be fitted with GPS and GSM based vehicle tracker system. Highway Patrol Vehicles shall be stationed on layby constructed on Project Highway @ every 20 km of each Toll Plaza.

## 14. Emergency medical services (Clause No. 12.11 IRC: SP:84-2019)

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

One number Ambulance shall be provided in a stretch not exceeding 50 km (if the stretch is more than 50 km additional 1 number of ambulances per 50 km or less shall be provided). The Ambulance shall be brand new with fuel, driver, medical staff and insurance all-inclusive for the entire contract period. Ambulance fitted with GPS and GSM based vehicle tracker system shall be provided to be integrated with the Video Incident Detection System with ATMS, as per Schedule- D. Clause 12.11 (strictly as per details mentioned in Annexure-D), along with all necessary manpower (including paramedical staff), medicines, equipment's etc. and shall be maintained in an effective manner throughout the contract period starting from the appointed date. Ambulance shall be stationed on layby constructed on Project Highway @ every 20 Km. of each Toll Plaza

## 15. Crane Service: (Clause No. 12.12 IRC: SP:84-2019)

Crane Service shall be provided on project highway, as specified in the manual Clause 12.12. One number crane shall be provided in a stretch not exceeding 50 km (if the stretch is more than 50 km additional 1 number of crane per 50 km or less shall be provided). Crane having capacity of minimum 201 shall be made available. The crane shall be brand new with fuel, driver and insurance all-inclusive for the entire contract period, Cranes shall be stationed on layby constructed on Project Highway @every 20 km of each Toll Plaza.

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# SCHEDULE - D

## **SCHEDULE - D**

**(See Clause 2.1)**

### **SPECIFICATIONS AND STANDARDS**

**1. Construction**

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

## **Annex - I**

### **(Schedule-D)**

### **Specifications and Standards for the Project**

#### **1 Manual of Specifications and Standards to apply**

Four laning of the Project Highway shall conform to the 'Manual of Specifications and Standards for four laning of Highway' published as IRC: SP: 84:2019 with all amendments and addition till date. (An authenticated copy of the Manual has been provided to the Concessionaire as part of the bid documents, (Referred to as "Manuals" in this Schedule) and MoRTH Specifications for Road and Bridge Works (5<sup>th</sup> Revision) where the specification for a work is not given, Good Industry Practice shall be adopted to the satisfaction of the Authority & Independent Engineer.

All Materials, works and construction operations shall conform to the following documents:

- a) The Manual of Specifications and Standards for Four Laning of Highways (IRC: SP:84-2019), referred to as Manual.
- b) NHAI Circular (Policy Matter – 10.1.16/2017) No. 11014/11/2016-HR-I dated 12.06.2017;
- c) NHAI Circular RW/NH-33044/22/2020-S&R(P&B), Dated 04/06/2024.
- d) MORTH Specifications for Road and Bridge Works (5th Revision).

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

#### **2 Deviations from the Manual**

- (i) The term "concessionaire", "Independent Engineer" and "Concession Agreement" used in the manual shall be deemed to be substituted by the term "Contractor", "Authority's Engineer" and Agreement" respectively.
- (ii) Design, fabrication/casting and launching/installation of factory manufactured pre-cast concrete elements will be done as per relevant IRC/BIS standards/guidelines/ codes duly considering expected handling/ lifting stresses. Any international guidelines such as ASHTO, FHWA (Accelerated Bridge Construction. Guidelines), Japan & Eurocodes, may be followed in case of any gaps in IRC/BIS standards/ guidelines/codes. The pre-cast factory shall have minimum facility of fully automatic RMC plant, arrangement for steam curing, mechanical handling of concrete and pre-cast components, bar bending machines, stacking yard, in-house design team and NABL accredited quality control laboratory, RO plant for water purification, etc. The precast factory shall be certified by Quality Council of India if it is so mandated by MoRTH.

Notwithstanding anything to the contrary contained in the aforesaid Manual, the

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following Specifications and Standards shall apply to the Project highway, and for purposes of this Agreement, the aforesaid Manual shall be deemed to be amended to the extent set forth below:

Sr. No.	Clause No.	Details of Item	Description of Deviation			
1.	2.2	(Design Speed) For Plain and Rolling Terrain Ruling/Min Design Speed 100/80 Kmph respectively.	Design speed of 100 kmph followed at entire alignment from km (4+200 to 34+500) except location specified in deviation table.			
			Design Chainage		Design speed (Kmph)	Remarks
			From (Km)	To (Km)		
			4+700	5+400	65	Restriction of ROW
			6+000	6+220	80	
			6+500	6+710	80	
			6+800	7+050	65	
			7+300	7+600	65	
			7+800	8+100	80	
			11+000	11+700	50	
			11+700	12+840	80	
			16+870	17+500	80	
			21+700	22+000	80	
			22+750	23+780	80	
			24+850	25+200	80	
			27+500	28+700	80	
			31+000	31+500	65	
			32+000	32+580	80	
			32+580	32+780	65	
			32+780	33+350	80	
			33+700	33+900	65	
			34+180	34+380	65	

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Sr. No.	Clause No.	Details of Item	Description of Deviation																																																													
2.	2.9.6.2	<p style="text-align: center;"><b>(Gradients)</b> For Pain &amp; Rolling terrain Ruling and limiting gradients are 2.5% and 3.3% respectively.</p>	The vertical curve design accounts for Plain & rolling terrain, with ruling and limiting gradient are 2.5% and 3.3% respectively, with providing ISD (Intermediate sight distance) at speed of 100 Kmph from Km (20+600 to 59+459).																																																													
			Chainages where gradient exceeding than ruling gradient		Gradient (%)	From (Km)	To (Km)	5+400	5+547	-4.70%	5+645.993	5+764.075	-4.70%	6+161.108	6+408.608	-3.30%	7+717.120	7+960	-3.30%	7+979.414	8+050.814	-3.30%	8+158.561	8+420.641	-3.68%	8+460.697	8+613.417	-3.68%	8+696.075	9+101.075	-3%	9+109.508	9+235.508	-3%	14+812	15+257.500	-3%	15+261.615	15+375.015	-3%	16+503.462	16+855.962	-5%	16+895.032	17+042.032	-5%	27+070.396	27+430.727	-3.30%	27+482.657	27+621.442	-3.30%	31+502.092	31+665.851	3.30%	31+681.064	32+086.064	3.30%	33+949.238	34+048.778	4.67%	34+516.836	34+500	4.67%
			Chainages where gradient exceeding than ruling gradient			Gradient (%)																																																										
			From (Km)	To (Km)																																																												
			5+400	5+547	-4.70%																																																											
			5+645.993	5+764.075	-4.70%																																																											
			6+161.108	6+408.608	-3.30%																																																											
			7+717.120	7+960	-3.30%																																																											
			7+979.414	8+050.814	-3.30%																																																											
			8+158.561	8+420.641	-3.68%																																																											
			8+460.697	8+613.417	-3.68%																																																											
			8+696.075	9+101.075	-3%																																																											
			9+109.508	9+235.508	-3%																																																											
			14+812	15+257.500	-3%																																																											
			15+261.615	15+375.015	-3%																																																											
			16+503.462	16+855.962	-5%																																																											
			16+895.032	17+042.032	-5%																																																											
			27+070.396	27+430.727	-3.30%																																																											
			27+482.657	27+621.442	-3.30%																																																											
			31+502.092	31+665.851	3.30%																																																											
			31+681.064	32+086.064	3.30%																																																											
			33+949.238	34+048.778	4.67%																																																											
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Balance work for Four Laning of Pinjore (End of Pinjore Bypass) – Nalagarh Section (Km. 4.200 to 34.500) on NH-105 (Old NH-21A) in the state of Haryana and Himachal Pradesh on EPC Mode.

Sr. No.	Clause No.	Details of Item	Description of Deviation																												
3.	2.6	<b>(Shoulders)</b> Width of Shoulders	Shoulder width shall as be specified in Schedule B in accordance with NHAI circular RW/NH-33044/22/2020-S&R(P&B), Dated 04/06/2024.																												
			<table><tr><th rowspan="2">S.No.</th><th rowspan="2">Type of Section</th><th colspan="3">Width of shoulder (m)</th></tr><tr><th>Paved</th><th>Earthen</th><th>Total</th></tr><tr><td>1</td><td>Open country with isolated built-up</td><td>1.5</td><td>2.0</td><td>3.5</td></tr><tr><td>2</td><td>Built-up area</td><td>1.5</td><td>-</td><td>1.5</td></tr><tr><td>3</td><td>Approaches to grade separated structure/bridges/ROB with full height RS wall/ Retaining wall</td><td>1.5</td><td>2</td><td>3.5</td></tr><tr><td>4</td><td>Approaches to bridges/ grade separated structure/ROB with free slope</td><td>1.5</td><td>2.0</td><td>3.5</td></tr></table>	S.No.	Type of Section	Width of shoulder (m)			Paved	Earthen	Total	1	Open country with isolated built-up	1.5	2.0	3.5	2	Built-up area	1.5	-	1.5	3	Approaches to grade separated structure/bridges/ROB with full height RS wall/ Retaining wall	1.5	2	3.5	4	Approaches to bridges/ grade separated structure/ROB with free slope	1.5	2.0	3.5
			S.No.			Type of Section	Width of shoulder (m)																								
				Paved	Earthen		Total																								
			1	Open country with isolated built-up	1.5	2.0	3.5																								
			2	Built-up area	1.5	-	1.5																								
			3	Approaches to grade separated structure/bridges/ROB with full height RS wall/ Retaining wall	1.5	2	3.5																								
4	Approaches to bridges/ grade separated structure/ROB with free slope	1.5	2.0	3.5																											
4.	Table 3.1	<b>(Taper Rate)</b> Desirable Taper and Absolute Minimum Taper for 100kmph is 1:50 and 1:40 respectively.	Taper rate of minimum (1:20) followed at Bridge structures.																												
5.	2.3	<b>(Right-of-Way)</b> A minimum ROW of 60m should be available for the development of highway.	The width of proposed right-of-way (PROW) shall be as per Schedule-A and Schedule-B.																												
6.	2.12.2	Service/Slip Roads	Width of Service/Slip Road shall as be specified in Schedule B.																												
7.	2.17	Typical Cross Section	The typical cross section shall be as given in Schedule B.																												
8.	5.2	Type of Pavement	The type of pavement shall be as specified in Schedule B.																												
9.	7.3	Overall width of structures	The Overall Deck Configuration of all structures shall be as per Schedule B.																												
10.	6.2	Surface Drainage	Lined/unlined Side Drains shall be provided throughout the Project as per typical cross section except cross drainage (River, nala, canal etc.)																												

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Sr. No.	Clause No.	Details of Item	Description of Deviation
11.	2.10	Vertical and Horizontal Clearance at Underpasses/Overpasses	The lateral and vertical clearance of all underpasses/Overpasses shall be as given in Schedule B.
12.	2.9.6	Sight Distance	The Vertical Profile design shall be done using Intermediate Sight distance.
13.	9.7	Roadside safety barriers	Three beam metal crash barriers / RCC barrier shall be provided as per TCS and as mentioned in Schedule B on main carriageway, service, slip, loop road excluding stretches covered by bridges and RE wall structures.
14.	12.15	Traffic Management System	Additional specifications for Advanced Traffic Management System (ATMS) shall be as given in Annex II of Schedule D and as per functional and technical requirements of Specifications for Road & Bridgeworks of MoRT&H (Fifth Revision).
15.	12.5	Street lighting	The street light poles shall be 1 piece, continuous-tapered, Octagonal poles and shall be manufactured from one length of steel sheet, formed in continuous tapered tube, with one continuous arc-welded vertical seam. The minimum wall thickness for lighting poles shall not be less than 4 mm. The Bottom Diameter shall be minimum 175 mm. The Top Diameter shall be minimum 75 mm. The door on window of pole shall be antitheft. Offgrid hybrid solar lighting system should be installed with both power and battery backup system. Battery Backup must be with 12 hrs backup, specifications of light minimum 165 Watt, 185 Lumen/Watt.

### 3. Adoption of Automated & Intelligent Machine-aided Construction (AI-MC)

#### 3.1 Definition of Automated & Intelligent Machine-aided Construction (AI-MC)

**Automated & Intelligent Machine-aided Construction (AI-MC)** has been adopted to Highway Construction Projects to achieve better Construction Quality with respect to compaction in confirmation with IRC: SP:97-2013, in a Safer Environment. Construction Efficiency of Construction Machineries are being enhanced through Location referencing. **Automated & Intelligent Machine-aided Construction (AI-MC)** involves using Construction Equipment mounted with on-board Computers, using a combination of 3D Modelling Data along with Global Navigation Satellite System(GNSS)/ Universal Robotic Total Station (UTS) Technology and Intelligent Guidance to control the manoeuvring of Construction Equipment. AI-MC provides Horizontal and Vertical Guidance in real time to Construction Equipment Operators. AI-MC Equipment has the potential to achieve designed Grades on the First Pass, without assistance of traditional staking.

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### 3.2 Obligations of the Concessionaire

The concessionaire/contractor shall deploy at its own cost and expense, deploy Grading/Paving/Compaction equipment fitted with system of Automated & Intelligent Machine-aided Construction (AI-MC) for finishing of all grades including Embankment, Subgrade, GSB, WMM. The system of Automated & Intelligent Machine-aided Construction (AI-MC) used by the concessionaire/contractor shall be capable of delivering accuracy as per the applicable IRC specifications. During the construction period, the concessionaire/consultant shall furnish all the physical Progress Data (All desired type of Surface Grading Data, Compaction/Temperature Data etc.) obtained through system of Automated & Intelligent Machine-aided Construction (AI-MC)/CMS to Authority for monitoring of construction on daily basis. These Digital Data and desired output shall be made available at the Location (Server/ Cloud) finalized by Authority. Detailed specifications of this technology is elaborated in subsequent paras.

### 3.3 Construction of the Project (detailed specification)

Contractor/concessionaire shall use 3D digital models and **Automated & Intelligent Machine-aided Construction (AI-MC)** for Motor Graders, Paver, Compactors and Dozers to ensure Quality Standards as per IRC Specifications and Productivity Improvement. Further, Contractor shall generate measurable Digital Records that can be shared on a Digital Drive or can viewed in real time. The Hardware and Software used by the contractor shall have following features and specifications:

#### (i) Centralized Monitoring Software (CMS) for Preparing design data for Field Systems and Processing Results:

A contractor/concessionaire shall use appropriate (Design/working) Software for 3D constructible model out of approved design that can be carried in 'Construction Grade Survey Instruments and 3D Machine control tools for construction purpose. The software shall be able to generate Triangulated Surface models, 3D line works and should have ability to Guide Machines, based on Design Data and also generate the Reports. There shall be provision to feed tolerance limits or desired passes for comparing with Final Results. The cloud based Software shall be capable of Records Creation, Compilation, Exporting, presenting in Graphical Format with Color Coding showing different activity and generate Report showing Location/Stretches where the work done is not confirming to limits/tolerances prescribed in Specification. The Nonconformity Report should be generatable for any selected stretch in Tabular Format. Some of the Non-conformity/Conformity to be displayed includes:

- Location where the thickness of each layer Embankment/Subgrade is more than specified limit from prevailing finalized layer with its clear location, to meet the requirements as per clause 305.3.5.1 of MoRT&H Specification.
- Number of passes made with respect to Target number of passes for the compactors to achieve the compaction requirement of respective layers as per section 305 & 903.2 of MoRT&H (Table 300-1 and 300-2).

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- Weak spot w.r.t Intelligent Compaction Measurement Value (ICMV, in conformity with clause 4.3.3.2 of IRC: SP:97-2013 page 23). To bring the conformity as per section 305 & 903.2 of MoRT&H (Table 300-1 and 300-2).
- Granular/Bituminous layer surface level beyond the tolerance limits, as specified in clause 902 (Table 900-1) of MoRT&H Specification.
- Laying and Rolling Temperature achieved by Asphalt Paver/Compactor/Pneumatic Rollers, with respect to specified minimum Target temperature as per IRC guidelines (like clause-507 of MoRT&H Specification; clause 4.4.3 of IRC 27-2009 for BM; clause 5.2, ii of IRC: SP:97-2013).

**(ii) Automated & Intelligent Machine-aided Construction (AI-MC) System for Motor Grader for Accurate Grading to Design.**

A Contractor/Concessionaire shall utilize motor grader controlled with GNSS Machine control system in the construction of Embankment, Subgrade & GSB Surface Grades. The requirement includes the finishing of final surface level of Embankment, Subgrade & GSB as per Clause 902 of MoRT&H Specification.

In respect of Embankment layers, the Motor Grader shall be equipped with requisite instrumentation to set the desired level and inclination of blade of grader to achieve desired profile.

The Contractor may use any type of GNSS/GPS/Universal Robotic Total Station Type Machine Control System that Results in achieving the finished grading requirements of each layer. The 3D Machine guidance and control System shall be able to control the depth and slope of the Motor Grader Blade in relation to the 3D Model during the Grading Process. The 3D Machine Control System shall have requisite instrumentation to execute Earthworks Driven from Design Data. Machine Guidance & Control System shall have provision to show and send required Fields Coverage Data Point for all Passes in Dashboard/Office Monitoring Software. Data shall have at-least following information: Date & Time Stamp, Longitude/Latitude, Easting/Northing, Local Easting/Local Northing, Height on the Ground above WGS84 Geoid/Elevation/local elevation, GNSS Mode, Motor Grader Pass Numbers, Auto/Manual.

**(iii) Automated & Intelligent Machine-aided Construction (AI-MC) System for Pavers**

A Contractor/Concessionaire shall utilize Paving equipment controlled by Universal Robotic Total Station and Machine Control System in the Construction of roadway pavement for Automatic Control of Elevation and Slope. The requirement includes the finishing of final pavement surface as per the MoRTH Specification Clause 902.

Machine Guidance & Control System shall have provision to show and send required fields coverage data for each data point in dashboard/office Monitoring Software. Data shall have at-least like this information: Date & Time Stamp, Easting, Northing and Elevation.

**(iv) Automated & Intelligent Machine-aided Construction (AI-MC) System for Compactors**

The **Automated & Intelligent Machine** Guidance System on Compactor shall allow Operator to monitor the number of Passes completed in real time for every layer of Embankment, Subgrade, GSB or asphalt- based items, against a Target Pass Count. It should have provision to send required Fields Coverage Data for each Data Point for all passes and provision to show in Dashboard and send the Data to CMS. Data shall have at least following information: Date & Time Stamp, Longitude/Latitude, Easting/Northing, Local Easting/Local Northing, Height on the Ground above WGS84 Geoid/Elevation/Local Elevation, GNSS Mode, Compactor Pass Numbers, Compactor Direction(Forward/Reverse), Compactor Speed, Vibration On (Yes/no, On/Off), Frequency, Amplitude, ICMV (Required for roller instrumented with Accelerometer).

**(v) Automated & Intelligent Machine-aided Construction (AI-MC) System for Capturing Temperature (T)**

There shall be an equipment to capture the temperature of the asphalt-based items during the Laying and Rolling process. The same should be reflected and captured in Machine Guidance System of the Paver and rollers and shall be sent to Monitoring Software for further reporting and analysis in the following information: Date & Time Stamp, Longitude/Latitude, Easting/Northing, Local Easting/Local Northing, Surface Temperature (Required for Tandem Roller instrument with Temperature Sensor).

**(vi) Data/File transfer from CMS from Automated & Intelligent Machine-aided Construction (AI-MC) System**

CMS should have the ability to send design updates to all the equipment's in the field ensuring that same design data is used by all equipment's. It should accept field data for validation and demonstration process. It shall be capable for exporting the data to the any Highway Modelling Platform for demonstrating the progress of construction on real time basis by exposing the requested data through API for further use like Scheduling, Billing, and Progress etc.

# SCHEDULE - H

<b>SCHEDULE - H</b>			
(See Clause 10.1.4 and 19.3)			
<b>Contract Price Weightages</b>			
1.1 The Contract Price for this Agreement is Rs.			
1.2 Proportions of the Contract Price for different stages of Construction of the Project Highway shall be as specified			
<b>Item</b>	<b>Weightage in percentage to the Contract Price</b>	<b>Stage for Payment</b>	<b>Percentage weightage</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Road works including culverts, widening and repair of culverts.	<b>39.31%</b>	<b>A- Widening and strengthening of existing road</b>	
		(1) Earthwork up to top of the sub-grade	0.00%
		(2) Sub-Base course	0.00%
		(3) Non Bituminous Base Course	0.00%
		(4) Bituminous Base Course	0.28%
		(5) Wearing Coat	0.27%
		(6) Widening and repair of culverts	0.00%
		<b>B-1 Reconstruction/New 4-lane realignment/bypass (Flexible pavement)</b>	
		(1) Earthwork up to top of the sub-grade	18.27%
		(2) Sub-base Course	9.39%
		(3) Non Bituminous Base Course	9.32%
		(4) Bituminous Base Course	7.60%
		(5) Wearing Coat	10.60%
		<b>B-2 Reconstruction/New 2-lane realignment/bypass (Rigid pavement)</b>	
		(1) Earthwork up to top of the sub-grade	0.00%
		(2) Sub-base Course	0.00%
		(3) Dry Lean Concrete (DLC) Course	0.00%
		(4) Pavement Quality Control (PQC) Course	0.00%
		<b>C-1 Reconstruction/New service road (Flexible pavement)</b>	
		(1) Earthwork up to top of the sub-grade	1.01%
		(2) Sub-base Course	1.19%
		(3) Non Bituminous Base Course	1.05%
		(4) Bituminous Base Course	1.88%
		(5) Wearing Coat	1.32%
		<b>C-2 Reconstruction/New service road (Rigid pavement)</b>	
		(1) Earthwork up to top of the sub-grade	1.83%
		(2) Sub-base Course	2.89%
		(3) Dry Lean Concrete (DLC) Course	3.19%
		(4) Pavement Quality Control (PQC) Course	13.61%
		<b>D- Re-construction and New culverts on existing road, realignments, bypasses:</b>	
		Culverts (Length < 6 m)	16.28%
		<b>A-1 Widening and repairs of Minor Bridges (Length &gt; 6 m and &lt; 60 m)</b>	
		Minor Bridges	0.00%

Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
Minor Bridges/Underpasses /Overpasses	6.96%	<b>A-2 New Minor Bridges (Length &gt; 6 m and &lt; 60 m)</b>	
		<b>(1) Foundation + Sub-structure:</b> On completion of the foundation work including foundations for wing and return walls, abutments, piers upto the abutment/pier cap.	22.27%
		<b>(2) Super-structure:</b> On completion of the super-structure in all respects including wearing coat, bearings, expansion joints, hand rails, crash barriers, road signs & markings, tests on completion etc. complete in all respect.	17.70%
		<b>(3) Approaches:</b> On completion of approaches including retaining walls, stone pitching, protection works complete in all respect and fit for use.	8.03%
		<b>(4) Guide Bunds and River Training Works:</b> On completion of Guide Bunds and river training works complete in all respects	30.30%
		<b>B.1- Widening and repair of underpasses/overpasses</b>	
		Underpasses/Overpasses	0.00%
		<b>B.2- New underpasses/overpasses</b>	
		<b>(1) Foundation + Sub-structure:</b> On completion of the foundation work including foundations for wing and return walls, abutments, piers upto the abutment/pier cap.	10.35%
		<b>(2) Super-structure:</b> On completion of the super-structure in all respects including wearing coat, bearings, expansion joints, hand rails, crash barriers, road signs & markings, tests on completion etc. complete in all respect.	6.10%
		Wearing coat (a) in case of Overpass-wearing coat including expansionjoints complete in all reaspects as specified and (b) in case of underpass- rigid pavement including drainage facility complete in all respects as specified.	
		<b>(3) Approaches:</b> On completion of approaches including retaining walls/Reinforced Earth Walls, stone pitching, protection works complete in all respect and fit for use.	5.24%
Major Bridge (length>60 m) works and ROB/RUB/elevated sections/flyovers including viaducts, if any	11.21%	<b>A.1- Widening and repairs of Major Bridges</b>	
		(1) Foundation	0.00%
		(2) Sub-structure	0.00%
		(3) Super-Structure (Including Bearings)	0.00%
		(4) Wearing Coat including expansion joints	0.00%
		(5) Miscellaneous Items like hand rails, Crash barriers, road markings etc.)	0.00%
		(6) Wing walls/return walls	0.00%
		(7) Guide Bunds, River Training Works etc.	0.00%
		(8) Approaches (including retaining walls, stone pitching, protection works)	0.00%
		<b>A.2- New Major Bridges</b>	
		(1) Foundation	1.40%
		(2) Sub-structure	0.48%
		(3) Super-Structure (Including Bearings)	4.44%

Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
		(4) Wearing Coat including expansion joints	0.00%
		(5) Miscellaneous Items like hand rails, Crash barriers, road markings etc.)	1.93%
		(6) Wing walls/return walls	0.00%
		(7) Guide Bunds, River Training Works etc.	0.00%
		(8) Approaches (including retaining walls, stone pitching, protection works)	51.48%
		<b>B.1- Widening and repair of</b>	
		<b>(a) ROB</b>	
		<b>(b) RUB</b>	
		(1) Foundation	0.00%
		(2) Sub-structure	0.00%
		(3) Super-Structure (Including Bearings)	0.00%
		(4) Wearing Coat (a) in case of ROB- wearing coat including expansion joints complete in all respects as specified and (b) in case of RUB-rigid pavement under RUB including drainage facility complete in all respects as specified	0.00%
		(5) Miscellaneous Items like hand rails, Crash barriers, road markings etc.)	0.00%
		(6) Wing walls/return walls	0.00%
		(7) Approaches (including retaining walls, stone pitching, protection works)	0.00%
		<b>B.2- New ROB/RUB</b>	
		<b>(a) ROB</b>	
		<b>(b) RUB</b>	
		(1) Foundation	0.00%
		(2) Sub-structure	0.00%
		(3) Super-Structure (Including Bearings)	0.00%
		(4) Wearing Coat (a) in case of ROB- wearing coat including expansion joints complete in all respects as specified and (b) in case of RUB-rigid pavement under RUB including drainage facility complete in all respects as specified	0.00%
		(5) Miscellaneous Items like hand rails, Crash barriers, road markings etc.)	0.00%
		(6) Wing walls/return walls	0.00%
		(7) Approaches (including retaining walls, stone pitching, protection works)	0.00%
		<b>C.1- Widening and repair of Elevated Sections/Flyover/Grade Separators</b>	
		(1) Foundation	0.00%
		(2) Sub-structure	0.00%
		(3) Super-Structure (Including Bearings)	0.00%
		(4) Wearing Coat including expansion joints	0.00%
		(5) Miscellaneous Items like hand rails, Crash barriers, road markings etc.)	0.00%
		(6) Wing walls/return walls	0.00%
		(7) Approaches (including retaining walls/Reinforced Earth Wall, stone pitching, protection works)	0.00%

Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
		<b>C.2- New Elevated Sections/Flyover/Grade Seperators</b>	
		(1) Foundation	0.95%
		(2) Sub-structure	1.96%
		(3) Super-Structure (Including Bearings)	20.66%
		(4) Wearing Coat including expansion joints	0.00%
		(5) Miscellaneous Items like hand rails, Crash barriers, road markings etc.)	5.47%
		(6) Wing walls/return walls	0.00%
		(7) Approaches (including retaining walls/Reinforced Earth Wall, stone pitching, protection works)	11.24%



Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
Other Works	<b>42.51%</b>	(i) Toll Plaza	3.22%
		(ii) Road side drains	10.14%
		(iii) Road signs, markings, km stones, safety devices, ....	14.87%
		(iv) Protection works (incl. Metal Beam Crash Barrier & RCC Crash Barrier, RE Walls, Retaining Wall	0.24
		(v) Project facilities	
		(a) Bus Bays	0.30%
		(b) Truck lay-byes	0.00%
		(c) Rest areas	0.00%
		(d) Others	15.38%
		(vi) Road side plantation	0.00%
		(vii) Repair of protection works other than approaches to the bridges, elevated sections/ flyovers/grade separators and ROB/RUBs.	24.76%
		(viii) Safety and traffic management during construction	7.37%