राष्ट्रीय राजमार्ग एवं अवसंरचना विकास निगम लिमिटेड
सड़क परिवहन और राजमार्ग मंत्रालय, भारत सरकार
तीसरी मंजिल, पीटीआई बिल्डिंग, 4–संसद मार्ग, नई दिल्ली–110001

National Highways & Infrastructure Development Corporation Limited
Ministry of Road Transport & Highways, Govt. of India
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BHARATMALA
ROAD TO PROSPERITY

BUILDING INFRASTRUCTURE - BUILDING THE NATION
CIN: U45400DL2014GOI269062

(भारत सरकार का उद्यम) (A Government of India Enterprise)

CORIGENDUM-6

NHIDCL/Nagaland/D-K/BW/PKG3/2021 **Dated: 24.03.2021**

To,

All Prospective Bidders

Subject: Balance work for Four-laning of NH-39 Dimapur- Kohima Road from Design Km 152.490 to Km 166.700 (Existing Km 156.000 to Km 172.900), in the state of Nagaland.

Sir,

1. The bid for the subject work was invited on 27.01.2021 with bid due date being 31.03.2021 (1500 Hours).

2. In this regard the changes made in the bidding documents are as follows:

S. No	Clause	As Existing	As Modified (To be read as)
1	Schedules A, B, C &H	As Attached with NIT dated 27.01.2021	As per Modified Schedule A, Modified Schedule B, Modified Schedule C & Modified Schedule H
2.	Article 2.21.1 of the RFP	As per RFP dated 27.01.2021	As per Annexure-1
3.	Article 2.2.3 of the RFP	As per RFP dated 27.01.2021	As per Annexure-1

3. All bidders are requested to follow Corrigendum -6 for the subject project.

(AK Jha)
General Manager (Tech)

Annexure-1

2.21.1(a)

Within 15 (Fifteen) days of receipt of Letter of Acceptance, the selected Bidder shall furnish to the Authority an irrevocable and unconditional guarantee issued by the Public Sector Banks or Scheduled Private Banks having the Net Worth of Rs 1,000/- crores or more as per the latest annual report of the bank, in favour of the Authority. The list of such banks is mentioned below. The Authority reserves the right to add or remove any of names bank on which BG shall be accepted based on advisories from the Govt./RBI. The BGs issued by 'Foreign Banks' and Banks not mentioned in the given list shall not be accepted.

List of Scheduled Public Sector Banks	List of Private Sector Banks
1. Bank of Baroda	1. Axis Bank Ltd.
2. Bank of India	2. Bandhan Bank Ltd.
3. Bank of Maharashtra	3. CSB Bank Ltd.
4. Canara Bank	4. City Union Bank Ltd.
5. Central Bank of India	5. DCB Bank Ltd.
6. Indian Bank	6. Federal Bank Ltd.
7. Indian Overseas Bank	7. HDFC Bank Ltd.
8. Punjab National Bank	8. ICICI Bank Ltd.
9. Punjab & Sind Bank	9. Indusind Bank Ltd.
10. State Bank of India	10. IDFC First Bank Ltd.
11. UCO Bank	11. Jammu & Kashmir Bank Ltd.
12. Union Bank of India	12. Karnataka Bank Ltd.
	13. Karur Vysya Bank Ltd.
	14. Kotak Mahindra Bank Ltd.
	15. RBL Bank Ltd.
	16. South Indian Bank Ltd.
	17. Tamilnadu Mercantile Bank Ltd.
	18. IDBI Bank Ltd

2.21.3

The Selected Bidder has the option to provide 50% of the Performance Security and 50% of the Additional Performance Security, if any, within 15 (Fifteen) days of receipt of Letter of Acceptance, in any case before signing of the Contract Agreement and the remaining Performance Security and Additional Performance Security, if any, shall be submitted within 30 days of signing of the agreement.

Modified Schedule :A

MODIFIED SCHEDULE -A

(See Clauses 2.1 and 8.1)

SITE OF THE PROJECT

1. The Site

1.1 Site of the Four Laning divided Project Highway of Existing Dimapur- Kohima Road on EPC basis starts from design km. 152.490 to km 166.700 (Design Length 14.21 Kms) (Existing km. 156.000 to km. 172.900, Length 16.900 Kms) of NH 39 (New No. is NH-29) in the state of Nagaland. Project Highway shall include the land, buildings, structures and road works as described in Annex-1 of this Schedule-A.

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

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

1.4 The proposed alignment plans of the Project Highway are specified in Annex-III which has to be followed by the Contractor as a minimum. The Contractor may, however, improve upon the alignment plans and profile and raise the finished roadway level (FRL) with approval from the Authority's Engineer within the available Right of Way.

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

Annex-1
(Schedule-A)

Note: Through suitable drawings and description in words, the land, buildings, structures and road works comprising the Site shall be specified briefly but precisely in this Annex-1. All the chainages/location referred to in Annex- I to Schedule-A shall be Designchainages.

1. Site

The site of the four lane Project Highway comprises the section of Dimapur- Kohima road commencing from Km 156.000 to Km 172.900 (Existing, Length= 16.90 Kms) and from Design Km 152.490 to Km 166.700 (Design, Length = 14.21 Kms) i.e. Dimapur – Kohima Section in the State of Nagaland. The land, carriageway and structures comprising the Site are described below.

2. Current Status of Project Chainages: The following work has been completed.

Sl. No.	Activity	Chainage		Side	Length (M)	Remarks
		From	To			
1	Earthwork	152+490	155+450	LHS	2960	
		155+540	155+840	LHS	300	
		156+100	157+250	LHS	1150	
		157+450	166+700	LHS	9250	
		152+490	153+180	RHS	690	
		153+250	154+960	RHS	1710	
		155+000	155+200	RHS	200	
		155+200	155+690	RHS	490	
		155+710	155+840	RHS	130	
		156+200	156+300	RHS	100	
		156+400	157+250	RHS	850	
		157+450	161+300	RHS	3850	
		161+420	162+900	RHS	1480	
		162+960	165+180	RHS	2220	
		165+220	166+450	RHS	1230	
		166+540	166+600	RHS	60	
		166+640	166+670	RHS	30	
		Total			**26700**	
Sl. No.	**Activity**	**Chainage**		**Side**	**Length (M)**	**Remarks**
		From	**To**			
2	Earthwork upto Subgrade Top	152+490	153+070	LHS	580	
		153+450	154+890	LHS	1440	
		156+420	157+130	LHS	710	
		158+240	158+400	LHS	160	
		158+610	160+640	LHS	2030	
		160+660	161+170	LHS	510	
		161+300	162+540	LHS	1240	
		162+980	164+000	LHS	1020	
		164+300	165+100	LHS	800	

		166+230	166+590	LHS	360	
		152+490	154+770	RHS	2280	
		156+400	156+850	RHS	450	
		158+240	158+390	RHS	150	
		158+610	158+820	RHS	210	
		158+900	159+140	RHS	240	
		159+370	161+195	RHS	1825	
		161+470	162+530	RHS	1060	
		163+000	165+100	RHS	2100	
		165+630	166+090	RHS	460	
		166+290	166+380	RHS	90	
		Total			**17715**	

Sl. No.	**Activity**	**Chainage**		**Side**	**Length (M)**	**Remarks**
		From	**To**			
3	GSB	152+490	153+070	LHS	580	
		153+450	154+890	LHS	1440	
		156+420	157+130	LHS	710	
		158+240	158+400	LHS	160	
		158+610	160+640	LHS	2030	
		160+660	161+170	LHS	510	
		161+300	162+540	LHS	1240	
		162+980	164+000	LHS	1020	
		164+300	165+100	LHS	800	
		166+230	166+590	LHS	360	
		152+490	154+770	RHS	2280	
		156+400	156+850	RHS	450	
		158+240	158+390	RHS	150	
		158+610	158+820	RHS	210	
		158+900	159+140	RHS	240	
		159+370	161+195	RHS	1825	
		161+470	162+530	RHS	1060	
		163+000	165+100	RHS	2100	
		165+630	166+090	RHS	460	
		166+290	166+380	RHS	90	
		Total			**17715**	

Sl. No.	**Activity**	**Chainage**		**Side**	**Length (M)**	**Remarks**
		From	**To**			
4	WMM	152+490	152+830	LHS	340	
		152+990	153+070	LHS	80	
		153+500	154+800	LHS	1300	
		156+420	157+100	LHS	680	
		158+660	159+430	LHS	770	
		160+030	160+540	LHS	510	
		160+660	161+170	LHS	510	
		161+530	162+540	LHS	1010	

		162+980	164+000	LHS	1020	
		164+315	165+100	LHS	785	
		166+265	166+550	LHS	285	
		152+490	153+065	RHS	575	
		153+500	153+780	RHS	280	
		153+980	154+760	RHS	780	
		156+610	156+850	RHS	240	
		158+900	159+100	RHS	200	
		159+430	160+690	RHS	1260	
		160+825	161+195	RHS	370	
		161+550	162+100	RHS	550	
		162+190	162+501	RHS	311	
		163+100	163+340	RHS	240	
		165+650	166+090	RHS	440	
		Total			**12536**	

Sl. No.	**Activity**	**Chainage**		**Side**	**Length (M)**	**Remarks**
		From	**To**			
5	DBM	152+490	152+830	LHS	340	
		152+990	153+050	LHS	60	
		153+550	154+770	LHS	1220	
		156+420	156+950	LHS	530	
		158+660	159+445	LHS	785	
		160+040	160+510	LHS	470	
		160+665	161+160	LHS	495	
		161+560	162+540	LHS	980	
		163+080	164+000	LHS	920	
		164+320	165+100	LHS	780	
		166+265	166+560	LHS	295	
		152+490	153+065	RHS	575	
		154+010	154+760	RHS	750	
		156+610	156+830	RHS	220	
		159+440	160+690	RHS	1250	
		160+820	161+200	RHS	380	
		161+715	162+030	RHS	315	
		165+640	166+090	RHS	450	
		Total			**10815**	

The new Contractor shall be fully responsible for the rectification of defects and maintenance for such works including the portion or part of the work done earlier by M/s Gayatri Projects Ltd.

3. A) Rectification / Reconstruction of Damaged DBM stretch :

SL. NO.	**CHAINAGE**			**LENGTH IN Mtrs**
	From	**To**	**Side**	
1	152+490	152+830	LHS	340

2	152+990	153+050	LHS	60
3	153+550	154+770	LHS	1220
4	156+610	156+950	LHS	340
5	158+900	159+420	LHS	520
6	161+820	162+000	LHS	180
7	162+150	162+400	LHS	250
8	163+200	164+000	LHS	800
9	152+850	152+965	RHS	115
10	159+430	159+800	RHS	370
11	161+820	162+000	RHS	180
12	165+640	165+910	RHS	270
	Total Length (2 Lane)			**4645**
	Total Length (4 Lane)			**2322.5**

B) Rectification / Reconstruction of WMM stretch:

Sl No	Chainage		Length	Side
	From	To		
1	153500	153550	50	LHS
2	160500	160540	40	LHS
3	161530	161570	40	LHS
4	158900	159100	200	RHS
	Total Length(2 Lane)		**330**	
	Total Length(4 Lane)		**165**	

C) Rectification / Reconstruction of GSB stretch:

Sl No	Chainage		Length	Side
	From	To		
1	157+100	157+130	30	LHS
2	159+430	160+030	600	LHS
3	160+540	160+640	100	LHS
4	161+300	161+530	230	LHS
5	158+240	158+390	150	RHS
6	158+610	158+820	210	RHS
7	159+100	159+140	40	RHS
8	163+340	165+100	1760	RHs
9	166+290	166+380	90	RHS
	Total Length(2 Lane)		**3210**	
	Total Length(4 Lane)		**1605**	

Bidders are requested to visit the site/stretch to understand the requirement of rectification as per their own assessment. The locations and length given above are tentative. The distressed

locations should be identified with their exact chainages. The distresses should then be marked up in a grid pattern covering the distressed portion and also beyond the distressed portion. Then the entire DBM layer within the identified grid must be scrapped off thoroughly. After scrapping of DBM layer, the top WMM surface must be thoroughly checked with respect to degree of compaction and plasticity (within the grid) randomly by doing the test pits at few locations. Further it should be extended for GSB and subgrade layer with extraction of layer material to observe CBR value. If result does not comply in any of the layers then in that grid all the material including subgrade should be excavated and reconstructed freshly.

If subgrade soil is complying with the physical properties while GSB does not, then excavation should be made upto GSB layer and reconstruction should be done from GSB layer. The same should be done for WMM also.

4. Land

The Site of the Project Highway as described below:

Sl. No.	Existing Chainage		Design Chainage		Length (m)	Available ROW (m)	Remarks
	From	To	From	To			
1	156.000	172.900	152.490	166.700	14210	45	

5. Carriageway

The Proposed Project section is completed partly 4-lane and partly 2-Lane bituminous carriageway with variable width of Earthen Shoulders as per proposed cross section. The Project stretch runs through hilly terrain.

6. Major Bridge -The Site includes the following Major Bridges:

Sl. No.	Design (Km)	Type of Structure			Span Length (m)	HFL (m)	Width (m)	Remarks (River/Nala Name)
		Foundation	Sub-Structure	Super Structure				
1	155.245	Steel Girder			1 x 81.0	-	7.80 m Carriage plus 1.5 footpath on either side	Dzozaru constructed in year 2013 (LHS)
2	155.245	Steel Girder			1 x 81.0	-	7.80 m Carriage plus 1.5 footpath on either side	Upto Sub-Structure completed. (RHS)

Balance Bridge work also shall be fully undertaken for completion in all respects by the new Contractor.

7. Road over-bridges (ROB)

The Site includes the following ROB (road over railway line)

Sl. No.	Chainage (km)	Type of Structure		No. of Spans with span length (m)	Width (m)	ROB
		Foundation	Superstructure			
NIL						

8. Grade separators

The Site includes the following grade separators:

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

9. Minor bridges

The Site includes the following minor bridges:

Sl. No	Design (Km)	Type of Structure			Span Length (m)	HFL (m)	Width (m)	Remarks (River/Nala Name)
		Foundation	Sub-Structure	Super Structure				
1	158.817	RCCSlab			1 x 9.80	967.980	7.9	Diaru, Completed
2	161.255	RCC T-Beam			1 x 14.50	961.440	8.4	Kharu, LHS, Existing
2A	161.255	RCC T-Beam			1 x 14.50	961.440	8.4	Kharu, RHS, Sub-Structure Completed. Superstructure is in progress
3	165.158	RCC T-Beam			1 x 24.5	981.146	8.6	Dzuza, LHS, Existing
3A	165.158	RCC T-Beam			1 x 24.5	981.146	8.6	Dzuza, RHS, To be constructed
4	165.585	RCC Box			1 x 9.80	967.980	7.9	Dzuza, LHS, Completed and RHS is in progress

Balance Bridge work also shall be fully undertaken for completion in all respects by the new Contractor.

10. Railway level crossings/Railway Track

The Site includes the following railway level crossings/Track:

Sl. No.	Location (km)	Remarks
NIL		

11. Underpasses (Vehicular, Non Vehicular)

The Site includes the following underpasses:

Sl. No.	Chainage (km)	Type of Structure	No. of Spans with span length (m)	Width (m)
NIL				

12. Culverts: The Site has the following culvert:

SL.No.	Design Ch.	Span Arrangement	Type of Culvert	Completed	Remarks
1	152+515	(1X1.5X1.5)	Box culvert	1.00	Completed
2	152+577	(1X1.5X1.5)	Box culvert	1.00	Completed
3	152+826	(1X1.5X1.5)	Box culvert	1.00	Completed
4	152+858	(1X1.5X1.5)	Box culvert	1.00	Completed
5	152+900	(1X1.5X1.5)	Box culvert	1.00	Completed
6	152+965	(1X1.5X1.5)	Box culvert	1.00	Completed
7	153+104	(1X1.5X1.5)	Box culvert	1.00	Completed
8	153+422	(1X1.5X1.5)	Box culvert	1.00	Completed
9	153+450	(1X1.5X1.5)	Box culvert	1.00	Completed
10	153+610	(1X1.5X1.5)	Box culvert	1.00	Completed
11	153+652	(1X1.5X1.5)	Box culvert	1.00	Completed
12	153+820	(1X1.5X1.5)	Box culvert	1.00	Completed
13	153+881	(1X1.5X1.5)	Box culvert	1.00	Completed
14	153+980	(1X1.5X1.5)	Box culvert	1.00	Completed
15	154+022	(1X1.5X1.5)	Box culvert	1.00	Completed
16	154+133	(1X1.5X1.5)	Box culvert	1.00	Completed
17	154+243	(1X1.5X1.5)	Box culvert	1.00	Completed
18	154+340	(1X1.5X1.5)	Box culvert	1.00	Completed
19	154+388	(1X1.5X1.5)	Box culvert	1.00	Completed
20	154+450	(1X1.5X1.5)	Box culvert	1.00	Completed
21	154+495	(1X1.5X1.5)	Box culvert	1.00	Completed
22	154+612	(1X1.5X1.5)	Box culvert	1.00	Completed
23	154+808	(1X1.5X1.5)	Box culvert	1.00	Completed
24	154+834	(1X1.5X1.5)	Box culvert	1.00	Completed
25	154+908	(1X1.5X1.5)	Box culvert	0.50	Partially Completed
26	154+989	(1X1.5X1.5)	Box culvert	0.00	To be constructed
27	155+039	(1X1.5X1.5)	Box culvert	0.00	To be constructed
28	155+130	(1X1.5X1.5)	Box culvert	0.00	To be constructed
29	155+445	(1X1.5X1.5)	Box culvert	0.00	To be constructed
30	155+555	(1X1.5X1.5)	Box culvert	0.00	To be constructed
31	155+680	(1X1.5X1.5)	Box culvert	0.00	To be constructed
32	155+707	(1X1.5X1.5)	Box culvert	0.00	To be constructed
33	155+820	(1X1.5X1.5)	Box culvert	0.00	To be constructed
34	155+867	(1X1.5X1.5)	Box culvert	0.00	To be constructed

35	156+087	(1X1.5X1.5)	Box culvert	0.00	To be constructed
36	156+230	(1X1.5X1.5)	Box culvert	0.50	Partially Completed
37	156+418	(1X1.5X1.5)	Box culvert	1.00	Completed
38	156+485	(1X1.5X1.5)	Box culvert	1.00	Completed
39	156+543	**(1x4.0X3.0)**	Box culvert	1.00	Completed
40	156+595	(1X1.5X1.5)	Box culvert	1.00	Completed
41	156+786	(1X1.5X1.5)	Box culvert	1.00	Completed
42	156+847	(1X1.5X1.5)	Box culvert	1.00	Completed
43	157+003	(1X1.5X1.5)	Box culvert	1.00	Completed
44	157+074	**(1x3.0x3.0)**	Box culvert	1.00	Completed
45	157+750	(1X1.5X1.5)	Box culvert	1.00	Completed
46	157+800	(1X1.5X1.5)	Box culvert	1.00	Completed
47	157+475	**(1X4.0X3.0)**	Box culvert	0.00	To be constructed
48	158+045	**(1x3.0x3.0)**	Box culvert	0.00	To be constructed
49	158+140	(1X1.5X1.5)	Box culvert	0.50	Partially Completed
50	158+254	(1X1.5X1.5)	Box culvert	1.00	Completed
51	158+296	(1X1.5X1.5)	Box culvert	1.00	Completed
52	158+754	(1X1.5X1.5)	Box culvert	1.00	Completed
53	158+896	(1X1.5X1.5)	Box culvert	1.00	Completed
54	159+445	(1X1.5X1.5)	Box culvert	1.00	Completed
55	159+567	(1X1.5X1.5)	Box culvert	1.00	Completed
56	159+656	(1X1.5X1.5)	Box culvert	1.00	Completed
57	159+701	(1X1.5X1.5)	Box culvert	1.00	Completed
58	159+860	(1X1.5X1.5)	Box culvert	1.00	Completed
59	159+891	(1X1.5X1.5)	Box culvert	1.00	Completed
60	159+978	(1X1.5X1.5)	Box culvert	1.00	Completed
61	160+037	(1X1.5X1.5)	Box culvert	1.00	Completed
62	160+279	(1X1.5X1.5)	Box culvert	1.00	Completed
63	160+385	(1X1.5X1.5)	Box culvert	1.00	Completed
64	160+541	(1X1.5X1.5)	Box culvert	1.00	Completed
65	160+640	**(1x3.0x3.0)**	Box culvert	1.00	Completed
66	160+822	(1X1.5X1.5)	Box culvert	1.00	Completed
67	160+876	(1X1.5X1.5)	Box culvert	1.00	Completed
68	160+990	(1X1.5X1.5)	Box culvert	1.00	Completed
69	161+057	(1X1.5X1.5)	Box culvert	1.00	Completed
70	161+205	(1X1.5X1.5)	Box culvert	0.50	Partially Completed
71	161+300	(1X1.5X1.5)	Box culvert	0.00	To be constructed
72	161+556	(1X1.5X1.5)	Box culvert	1.00	Completed
73	161+640	(1X1.5X1.5)	Box culvert	1.00	Completed
74	161+715	(1X1.5X1.5)	Box culvert	1.00	Completed
75	161+758	(1X1.5X1.5)	Box culvert	1.00	Completed
76	161+820	**(1x6.0x3.0)**	Box culvert	1.00	Completed
77	161+918	(1X1.5X1.5)	Box culvert	1.00	Completed
78	162+030	(1X1.5X1.5)	Box culvert	1.00	Completed

79	162+085	(1X1.5X1.5)	Box culvert	1.00	Completed
80	162+175	(1X1.5X1.5)	Box culvert	1.00	Completed
81	162+222	(1X1.5X1.5)	Box culvert	1.00	Completed
82	162+299	(1X1.5X1.5)	Box culvert	1.00	Completed
83	162+326	(1X1.5X1.5)	Box culvert	1.00	Completed
84	162+364	(1X1.5X1.5)	Box culvert	1.00	Completed
85	162+392	(1X1.5X1.5)	Box culvert	1.00	Completed
86	162+428	(1X1.5X1.5)	Box culvert	1.00	Completed
87	162+457	(1X1.5X1.5)	Box culvert	1.00	Completed
88	162+497	(1X1.5X1.5)	Box culvert	1.00	Completed
89	162+551	(1X1.5X1.5)	Box culvert	1.00	Completed
90	162+730	(1X1.5X1.5)	Box culvert	1.00	Completed
91	162+820	(1X1.5X1.5)	Box culvert	0.50	Partially Completed
92	162+980	(1X1.5X1.5)	Box culvert	1.00	Completed
93	163+065	(1X1.5X1.5)	Box culvert	1.00	Completed
94	163+138	(1X1.5X1.5)	Box culvert	1.00	Completed
95	163+177	(1X1.5X1.5)	Box culvert	1.00	Completed
96	163+280	(1X1.5X1.5)	Box culvert	1.00	Completed
97	163+309	(1x2.0X2.0)	Box culvert	1.00	Completed
98	163+380	(1X1.5X1.5)	Box culvert	1.00	Completed
99	163+514	(1X1.5X1.5)	Box culvert	1.00	Completed
100	163+579	(1X1.5X1.5)	Box culvert	1.00	Completed
101	163+694	(1X1.5X1.5)	Box culvert	1.00	Completed
102	163+892	(1X1.5X1.5)	Box culvert	1.00	Completed
103	164+018	(1x2.0X2.0)	Box culvert	1.00	Completed
104	164+123	(1X1.5X1.5)	Box culvert	1.00	0.50(Extension of culvert due to alignment change)
105	164+314	(1X1.5X1.5)	Box culvert	1.00	Completed
106	164+431	(1X1.5X1.5)	Box culvert	1.00	Completed
107	164+507	(1X1.5X1.5)	Box culvert	1.00	Completed
108	164+596	(1X1.5X1.5)	Box culvert	1.00	Completed
109	164+667	(1X1.5X1.5)	Box culvert	1.00	Completed
110	164+782	(1x2.0X2.0)	Box culvert	1.00	Completed
111	164+907	(1X1.5X1.5)	Box culvert	1.00	Completed
112	165+014	(1X1.5X1.5)	Box culvert	1.00	Completed
113	165+290	(1X1.5X1.5)	Box culvert	1.00	Completed
114	165+390	(1X1.5X1.5)	Box culvert	0.00	To be constructed
115	165+418	(1X1.5X1.5)	Box culvert	0.50	Partially Completed
116	165+691	(1X1.5X1.5)	Box culvert	0.00	To be constructed
117	166+247	(1X1.5X1.5)	Box culvert	0.00	To be constructed
118	165+762	(1X1.5X1.5)	Box culvert	1.00	Completed
119	165+837	(1X1.5X1.5)	Box culvert	1.00	Completed
120	165+974	(1X1.5X1.5)	Box culvert	1.00	Completed

121	166+092	(1X1.5X1.5)	Box culvert	0.50	Partially Completed
122	166+191	(1X1.5X1.5)	Box culvert	0.50	Partially Completed
123	166+210	(1X1.5X1.5)	Box culvert	0.50	Partially Completed
124	166+340	(1X1.5X1.5)	Box culvert	1.00	Completed
125	166+450	(1X1.5X1.5)	Box culvert	1.00	Completed

Protection work to be constructed for balanceculverts and other pending culverts already constructed earlier by M/s Gayatri Projects Ltd. as per site condition. The new Contractor shall be fully responsible for the rectification of defects and maintenance for such works including the portion or part of the work done earlier by M/s Gayatri Projects Ltd.

13. Bus Bays

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

SI. No.	Design Chainage	LHS	RHS	Village Name	Remarks
				Nil	

14. Truck Lay Byes

The details of truck lay byes are as follows:

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

15. Road Side Drains

The details of completed PCC roadside drains are as follows:

SL. NO.	Design Chainage		LENGTH in Mtrs	SIDE
	From	To		
1	152+490	152+575	85	RHS
2	152+581	152+852	271	RHS
3	152+863	152+894	31	RHS
4	152+904	152+961	57	RHS
5	152+970	153+101	131	RHS
6	153+465	153+606	141	RHS
7	153+613	153+649	36	RHS
8	153+740	153+790	50	RHS
9	153+985	154+020	35	RHS
10	154+025	154+129	104	RHS

11	154+136	154+240	104	RHS
12	154+255	154+300	45	RHS
13	154+390	154+560	170	RHS
14	154+615	154+680	65	RHS
15	156+660	156+780	120	RHS
16	156+790	156+840	50	RHS
17	159+450	159+560	110	RHS
18	159+570	159+650	80	RHS
19	159+660	159+695	35	RHS
20	159+710	159+880	170	RHS
21	159+965	159+975	10	RHS
22	159+980	160+035	55	RHS
23	160+040	160+080	40	RHS
24	160+180	160+250	70	RHS
25	160+310	160+350	40	RHS
26	160+470	160+540	70	RHS
27	161+830	161+910	80	RHS
28	161+930	162+020	90	RHS
29	162+180	162+295	115	RHS
30	162+305	162+325	20	RHS
31	162+330	162+360	30	RHS
32	162+400	162+425	25	RHS
33	162+430	162+450	20	RHS
34	163+180	163+220	40	RHS
		Total	**2595**	

The new Contractor shall be fully responsible for the rectification of defects and maintenance for such works including the portion or part of the work done earlier by M/s Gayatri Projects Ltd.

16. Major Junctions

Sl. No.	Location		At Grade	Separated	Category of Cross Road			
	Existing Ch.	Design Ch.			NH	SH	MDR	Others
NIL								

The details of major junctions are as follows,

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

17. Minor Junctions

The details of the minor junctions are as follows:

Sl. No.	Design Ch. (m)	Side	Type of Junction	Remarks
1	156556	RHS	Minor	To Village
2	166600	RHS	Minor	To Jotsoma

18. Bypass

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

Sl. No.	Name of Bypass to Town	Chainage (km) from km to km
NIL		

19. Other Structure/Details

The locations of other structure/Land Slide are as follows:

Sl. No.	Existing Chainage (m)		Design Chainage (m)		Length in m (Design)	Remarks
	From	To	From	To		
NIL						

The Following location Breast wall, Gabion wall and Retaining wall already constructed.

Sl. No.	Design Chainage		Length (m)	Structure	Remarks
	From	To			
1	152+490	152+510	20	Breast wall	
2	152+520	152+570	50	Breast wall	
3	152+770	152+820	50	Breast wall	
4	152+833	152+850	17	Breast wall	
5	152+862	152+885	23	Breast wall	
6	152+910	152+960	50	Breast wall	
7	153+060	153+090	30	Breast wall	
8	153+460	153+580	120	Breast wall	
9	153+615	153+730	115	Breast wall	
10	153+740	153+810	70	Breast wall	
11	153+820	153+875	55	Breast wall	
12	153+890	153+920	30	Breast wall	
13	153+940	153+970	30	Breast wall	
14	153+980	154+015	35	Breast wall	
15	154+030	154+130	100	Breast wall	
16	154+137	154+230	93	Breast wall	
17	154+250	154+300	50	Breast wall	
18	154+470	154+490	20	Breast wall	
19	154+500	154+560	60	Breast wall	
20	154+630	154+680	50	Retaining wall	

21	154+840	154+870	30	Breast wall	Rectification required
22	155+740	155+760	20	Breast wall	
23	155+740	155+750	10	Gabion wall	
24	155+750	155+840	90	Gabion wall	
25	156+390	156+400	10	Breast wall	
26	156+410	156+480	70	Breast wall	156+420 to 152+430 Rectification required
27	156+600	156+625	25	Breast wall	
28	156+700	156+710	10	Breast wall	
29	156+730	156+780	50	Breast wall	
30	156+790	156+840	50	Breast wall	
31	156+850	156+995	145	Gabion wall	156+860 to 156+990 Rectification required
32	157+010	157+065	55	Breast wall	157+060 to 157+065 Rectification required
33	157+470	157+480	10	Gabion wall	
34	157+780	157+830	50	Breast wall	Rectification required
35	157+955	157+965	10	Breast wall	
36	157+980	158+000	20	Breast wall	Rectification required
37	158+530	158+540	10	Breast wall	
38	158+640	158+740	100	Breast wall	158+650 to 158+690 Rectification required
39	158+760	158+780	20	Breast wall	
40	158+840	158+890	50	Breast wall	
41	158+900	159+070	170	Breast wall	158+900 to 158+950 Rectification required
42	158+265	158+280	15	Gabion wall	
43	159+070	159+130	60	Breast wall	
44	159+350	159+440	90	Breast wall	
45	159+460	159+550	90	Breast wall	
46	159+570	159+650	80	Breast wall	159+570 to 159+590 Rectification required
47	159+660	159+680	20	Breast wall	
48	159+695	159+725	30	Breast wall	
49	159+840	159+870	30	Breast wall	
50	159+875	159+895	20	Breast wall	
51	159+930	159+960	30	Breast wall	
52	160+490	160+535	45	Breast wall	
53	160+550	160+635	85	Breast wall	
54	161+100	161+150	50	Breast wall	
55	161+880	161+900	20	Breast wall	
56	161+930	161+960	30	Breast wall	
57	161+970	162+010	40	Breast wall	
58	162+020	162+030	10	Breast wall	
59	162+040	162+080	40	Breast wall	162+060 to162+080 Rectification required

60	162+090	162+160	70	Breast wall	162+090 to 162+110 Rectification required
61	162+165	162+170	5	Breast wall	
62	162+180	162+185	5	Breast wall	
63	162+190	162+295	105	Breast wall	
64	162+305	162+322	17	Breast wall	
65	162+330	162+360	30	Breast wall	
66	162+370	162+417	47	Breast wall	
67	162+430	162+450	20	Breast wall	
68	162+462	162+469	7	Breast wall	
69	162+470	162+490	20	Breast wall	162+475 to 162+485 Rectification required
70	162+500	162+507	7	Breast wall	
71	162+510	162+527	17	Breast wall	
72	162+550	162+570	20	Breast wall	
73	162+730	162+770	40	Breast wall	
74	162+990	163+060	70	Breast wall	
75	163+070	163+080	10	Breast wall	Rectification required
76	163+110	163+170	60	Breast wall	
77	163+185	163+245	60	Breast wall	
78	163+490	163+500	10	Breast wall	Rectification required
79	163+520	163+530	10	Breast wall	
80	163+930	163+940	10	Breast wall	
81	163+970	164+010	40	Breast wall	
82	164+105	164+145	40	Breast wall	
83	163+940	163+970	30	Breast wall	
84	164+320	164+425	105	Breast wall	164+325 to 164+375 Rectification required
85	164+435	164+495	60	Breast wall	164+440 to 164+500 Rectification required
86	164+510	164+530	20	Breast wall	
87	164+690	164+740	50	Breast wall	
88	164+910	164+940	30	Breast wall	
89	165+045	165+110	65	Retaining wall	
90	165+280	165+310	30	Breast wall	
91	166+000	166+060	60	Breast wall	
Total Length in Meters			**4028**		

The new Contractor shall be fully responsible for the rectification of defects and maintenance for such works including the portion or part of the work done earlier by M/s Gayatri Projects Ltd.

20. There are certain sinking, sliding areas and slopes prone to slides in the project stretch which is mentioned in Schedule-B. The Geotechnical investigation and engineering solution of such areas and locations within ROW, this being an EPC Contract, shall be the responsibility of the new contractor. It is mentioned that, no Change of Scope (COS) shall be given nor additional ROW shall be acquired on this account

Annex-Ill
(Schedule-A)

Alignment Plans

The existing alignment of the Project Highway may be modified insome sections as per the site condition.

Annex-IV
(Schedule-A)

Environment Clearances

Environment Clearance for the Project Road Section has been obtained on 22.10.2007.

MODIFIED SCHEDULE– B

(See Clause 2.1)

Development of the Project Highway

1. Development of the Project Highway

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

2. Upgradation to 4 lane highway

Upgradation shall include Four-Lanning of the Project Highway as described in Annex-I of this Schedule-B and in Schedule-C.

3. Specifications and Standards

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

Annex – I

(**MODIFIED SCHEDULE-B**)

Description of Four-Lanning

1. WIDENING OF THE EXISTING HIGHWAY

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

1.2**WIDTH OF CARRIAGEWAY**

1.2.1 Construction of Four-Lane pavement with paved shoulders shall be undertaken. The paved carriageway on both side of median shall be 7m wide with paved shoulders and 1.5 m wide median in accordance with the typical cross sections drawings as per four lane manual 2014

1.2.1 Except as otherwise provided in this Agreement, the width of the paved carriageway and cross-sectional features shall conform to paragraph 1.1 above.

2. GEOMETRIC DESIGN AND GENERAL FEATURES

2.1General

Geometric design and general features of the Project Highway shall be in accordance with Section 2 of the Manual.

2.2 Design speed

Thedesign speed shall be the minimum design speed of 40 km/hr and ruling design speed of 60 km/hr for mountainous and steep terrain.

2.3 Improvement of the existing road geometrics

Improvement of the existing road geometrics shall be carried out as per section 2 of the Manual (IRC: 84-2014).

2.4 Right of Way

Details of the Right of Way are given below.

Design ch. (from)	Design ch. (to)	Design Length	PROW width (m)	EROW width (m)
152+490	166+700	14210	45	45

2.5 Type of shoulders

The shoulder shall be paved shoulder on hill and valley in open areas along with divided carriageway and

1.75m wide raised footpath in Built-up locations as per typical cross section of Four lane manual 2014

1. In built-up sections. Raised footpaths shall be provided in the following stretches:

Sl. No.	Stretch (from Km to Km)	Raised footpaths	Reference to cross section
1	Length of 555m	2 X 1.75 m width Footpath	TCS-II

(b) Paved shoulders of 1.5 m width shall be provided with selected earth wherever applicable as per TCS drawing.

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

2.6 Lateral and vertical clearances at underpasses

2.6.1 Lateral and vertical clearances at underpasses and provision of guardrails/crash barriers shall be as per requirements specified in the relevant Manual.

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

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

2.7 Lateral and vertical clearances at overpasses

2.7.1 Lateral and vertical clearances at overpasses shall be as per requirements specified in the relevant Manual.

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

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

2.8 Service roads

Service roads shall be constructed at the locations and for the lengths indicated below:
[Refer requirements specified in the relevant Manual]

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

2.9 Grade separated structures

2.9.1 Grade separated structures shall be provided as per provision of the Manual. The requisite are given below:

[Refer to requirements specified in the relevant Manual]

Sl. No.	Location of Structure (VUP)	Length (m)	Number andlengthofspans	Approach gradient	Remarks. if any
Nil					

(b) In the case of grade separated structures the type of structure and the level of the Project Highway and the crossroads shall be as follows:[Refer to provision of the Manual and specify the type of vehicular underpass/ overpass structure and whether the cross road is to be carried at the existing
Level. Raised or lowered]

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

2.10 Cattle and pedestrian underpass /overpass

Cattle and pedestrian underpass/overpass shall be constructed as follows: [Refer to provision of the relevant Manual and specify the requirements of cattle and pedestrian underpass/overpass]

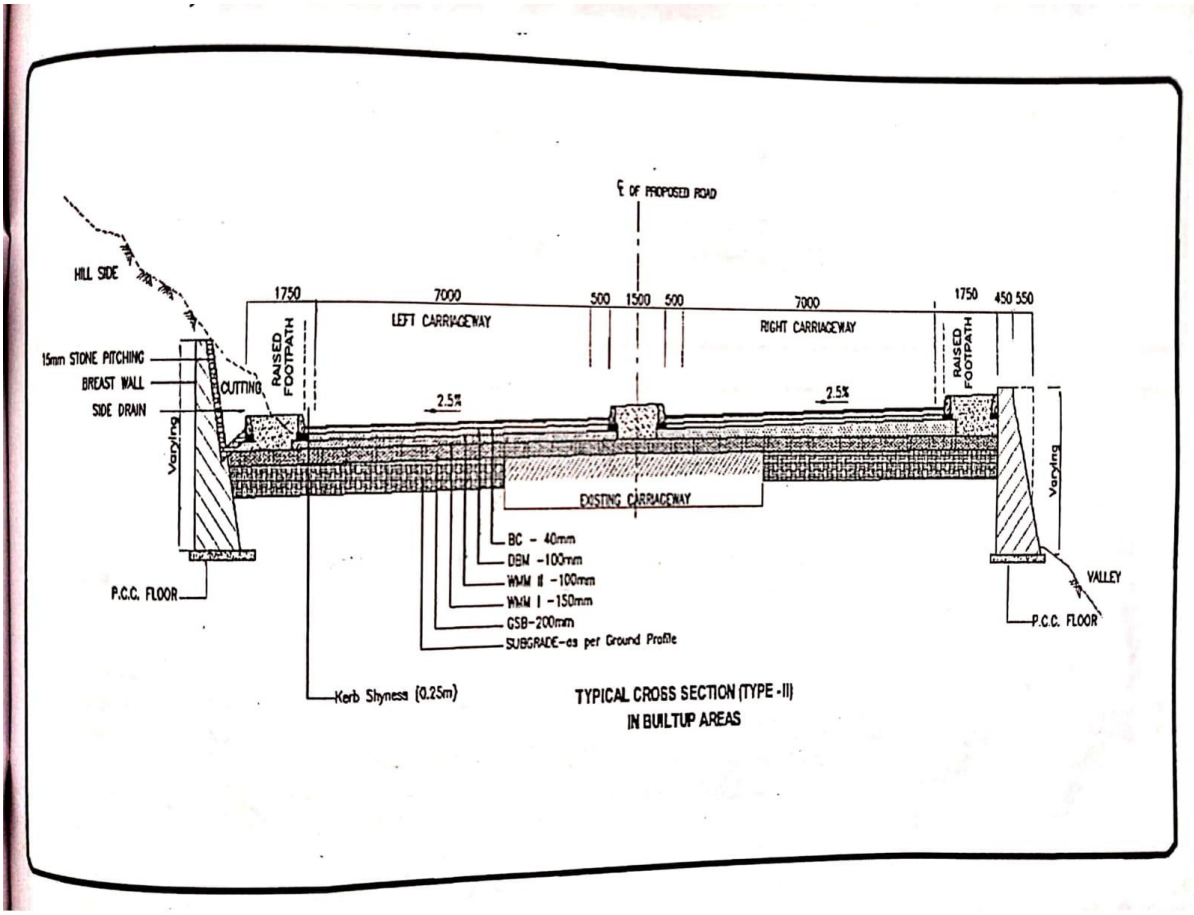
Sl.No.	Location	Type of crossing
Nil		

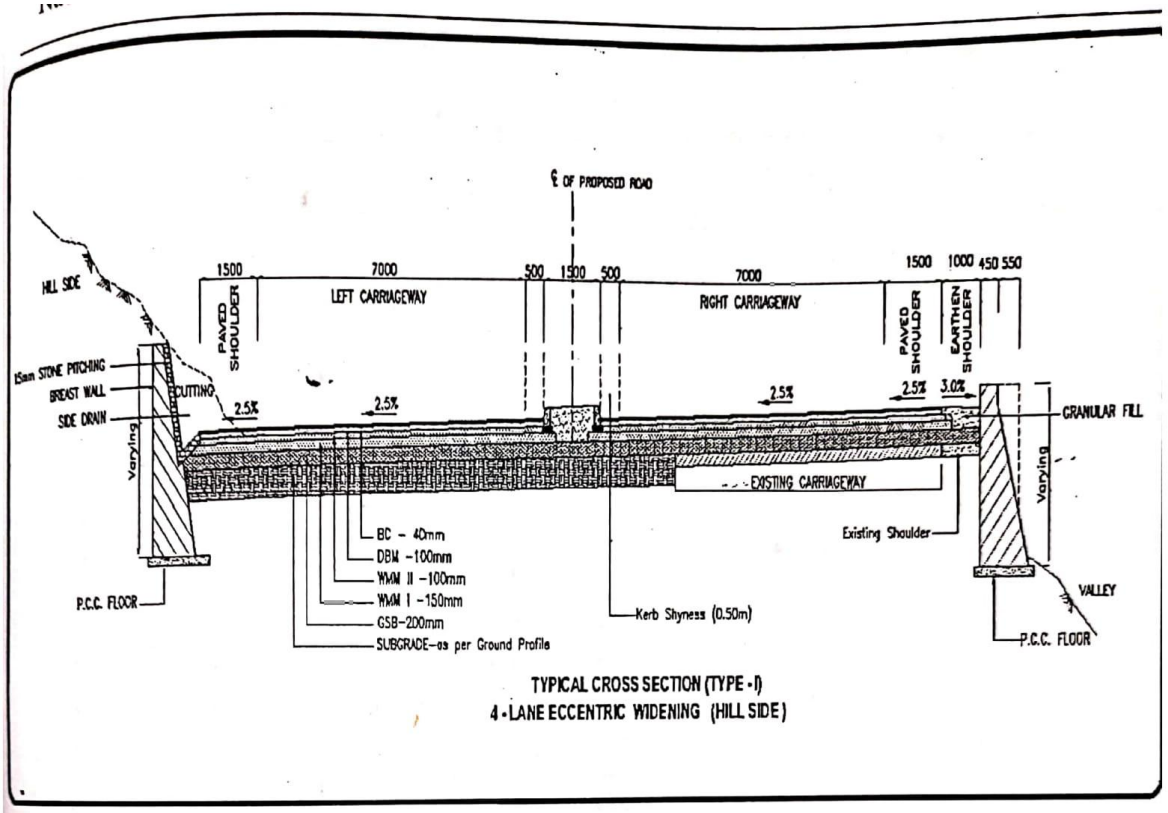
2.11 Typical cross-sections of the Project Highway

TCS TYPE	DESCRIPTION
TCS-II	In Built Up section
TCS-I	Widening on Hill side
TCS-II	Re-alignment section

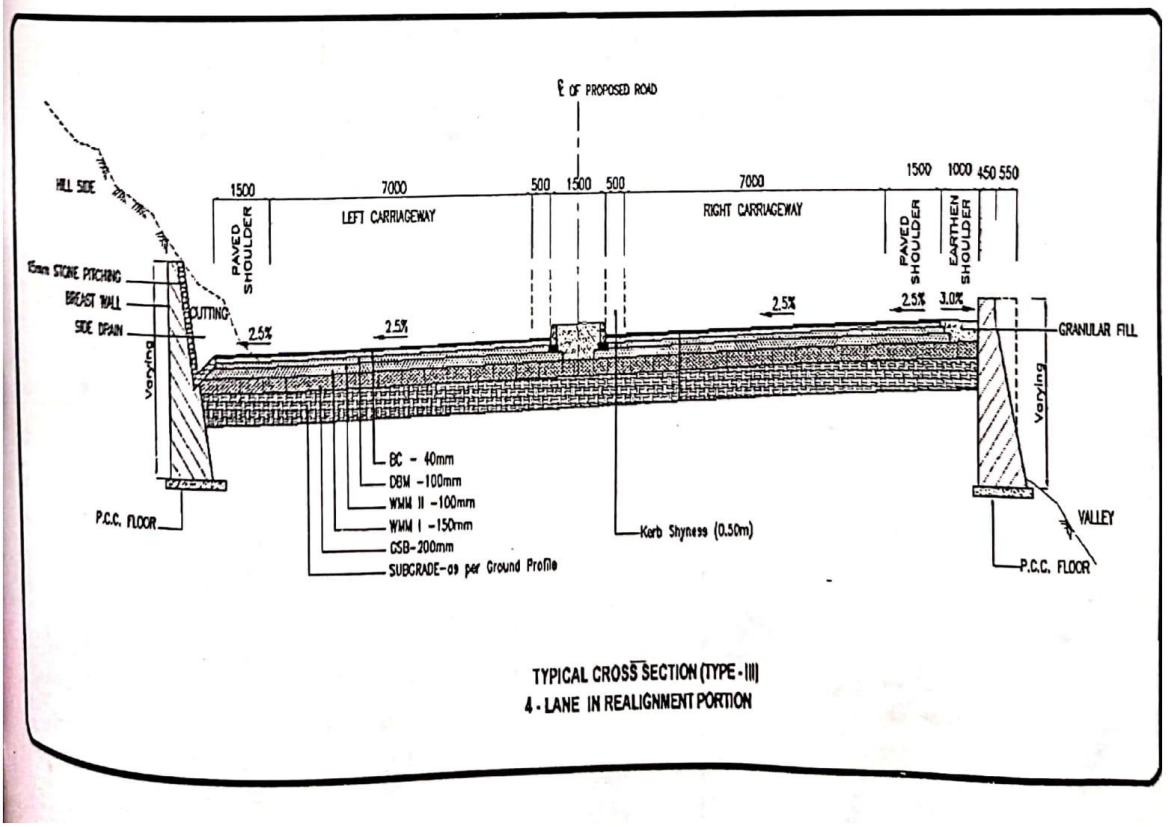
The following TCS is based on the work done by M/s Gayatri Projects Ltd.

Balance Work of Construction of balance Four laning of ExisitngDimapur-Kohima RoadfromDesignKm152.490 to designKm166.700 (Existing Km 156.000 to 172.900) (Package-III) excluding Dimapur&Kohima Bypass,in the stateof Nagalandthrough an Engineering, procurement and Construction (EPC) Contract under SARDPE-NE.





TYPICAL CROSS SECTION (TYPE - I)
4 - LANE ECCENTRIC WIDENING (HILL SIDE)



TYPICAL CROSS SECTION (TYPE - III)
4 - LANE IN REALIGNMENT PORTION

The EPC Contractor may modify the TCS according to the Pavement design mentioned in Clause 5.2.2 of Schedule-B. In addition to that subsurface drainage system to be incorporated in this cross-section as per manual.

Balance Work of Construction of balance Four laning of ExisitngDimapur-Kohima RoadfromDesignKm152.490 to designKm166.700 (Existing Km 156.000 to 172.900) (Package-III) excluding Dimapur&Kohima Bypass,in the stateof Nagalandthrough an Engineering, procurement and Construction (EPC) Contract under SARDPE-NE.

Realignment chainages of the Project Highway are tabulated below:

Design Chainage (m) as per Plan & Profile		
From	**To**	**Length (m)**
152490	152560	70
152620	152700	80
152800	152860	60
152975	153425	450
153680	153780	100
153820	153870	50
154155	154235	80
155040	155120	80
155580	155650	70
155710	156220	510
156300	156980	680
157130	157480	350
158300	158470	170
158680	158760	80
158830	159450	620
159590	159660	70
159730	159760	30
159800	159830	30
159880	159930	50
160060	160150	90
160620	160810	190
160910	160970	60
161530	161690	160
161790	162030	240
162100	162165	65
162210	162275	65
162600	162710	110
162745	162790	45
162840	162900	60
162960	163040	80
163080	163290	210
163380	163440	60
163570	163850	280
163920	164010	90
164220	164270	50
164100	164150	50
164800	164860	60
164910	164990	80
165740	165800	60
165870	165920	50

165980	166140	160
166235	166495	260
166640	166670	30
	Total	**6235**

In above realignment chainages some stretches particularly landslide portion Plan & Profile may be modified as per site condition.

3. INTERSECTIONS AND GRADE SEPARATORS

All intersections and grade separators shall be as per Section 3 of the Manual. Existing intersections which are deficient shall be improved to the prescribed standards.

[Refer to provision of the relevant Manual and specify the requirements. Explain where necessary with drawings/sketches/general arrangement]

Properlydesignedintersectionsshallbeprovidedatthelocationsandofthetypes and features given in the tables below:

1. At-grade intersections

Sl. No.	Design chainage(Km)	Side	Type of Junction	Remarks
1	**156550**	**RHS**	**Minor**	**To Village**

(b) Grade separated intersection with/without ramps

Sl. No.	Location	Salient features	Minimum length of viaduct to be provided	Roadtobecarriedover/underthestructures
Nil				

4. ROAD EMBANKMENT AND CUT SECTION

4.1 Widening and improvement of the existing road embankment/cuttings and construction of new road embankment/cuttings shall conform to the Specifications and Standards given in Section 4 of the Manual and the specified cross sectional details. Deficiencies in the plan and profile of the existing road shall be corrected.

4.2 The existing road including raisingshall be reconstructed as per FRL mentioned in Plan & Profile as attached in Annex III of Schedule A.

The existing road shall be raised in the following sections:

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

5. PAVEMENT DESIGN

1. Pavement design shall be carried out in accordance with provision of the relevant manual.
2. **Type of pavement**

5.2.1 Flexible pavement design i.e. Granular base and sub base with DBM & BC as per IRC 37-2012, plate for 8 CBR and 30 msa, was considered in previous completed stretch as tabulated below-

Sl. No.	Section (Design Km)	Design Length (km)	BC (mm)	DBM (mm)	WMM (250)	GSB (mm)	Total Crust (mm)
1	Km 152+490 to Km 166+700	14.210	40	100	250	200	590

5.2.2. As per latest code IRC:37-2018 Flexible pavement design as per Clause 2.2 Cementitious Base and Sub bases with a Crack Relief layer of aggregate interlayer below the bituminous surfacing, as per Plate 36 & Effective CBR 8% and 40 msa is considered as tabulated below.

Sl. No.	Section (Design Km)	Design Length (km)	BC (mm)	DBM (mm)	WMM (mm) as CRL	Cementitious Base (mm)	GSB (mm)	Total Crust (mm)
1	Km 152+490 to Km 166+700	Balance length	40	60	100	190	200	590

Since, the successful bidder under EPC mode can use various types of flexible pavements mentioned in IRC:37-2018, they may carry out their own due diligence to arrive at project cost before submitting bids and also use of New/ alternative material and Technology in Construction of Highways may be adopted as per MoRTH Circular no. RW/NH-33044/18/2020-S&R (P&B) dated 14.12.2020.

Bituminous Grade VG 30 / VG 40/ CRMB/ PMB shall be used for DBM &BC.

3. Design requirements

5.3.1 Design Period and Strategy

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

5.3.2 Design Traffic

Notwithstanding anything to the contrary contained in this Agreement or the Manual. The Contractor shall design the pavement for design traffic of 40 msa& minimum Effective CBR of 8%.

2. Reconstruction of stretches

[Refer to provision of the relevant Manual and specify the stretches if any to be reconstructed.]

Balance Work of Construction of balance Four laning of ExisitngDimapur-Kohima RoadfromDesignKm152.490 to designKm166.700 (Existing Km 156.000 to 172.900) (Package-III) excluding Dimapur&Kohima Bypass,in the stateof Nagalandthrough an Engineering, procurement and Construction (EPC) Contract under SARDPE-NE.

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

SL NO.	Stretch from Km to Km	Remarks	TCS Type
1	Nil		

3. Balance work of 4 laning: layer wise and side wise

1. Earthwork :

SL. NO.	CHAINAGE			LENGTH IN Mtrs
	From	To	Side	
1	155+840	156+100	LHS	260
2	157+250	157+450	LHS	200
3	155+450	155+540	LHS	90
4	154+960	155+000	RHS	40
5	153+180	153+250	RHS	70
6	155+690	155+710	RHS	20
7	155+840	156+200	RHS	360
8	156+300	156+400	RHS	100
9	157+250	157+450	RHS	200
10	161+300	161+420	RHS	120
11	162+900	162+960	RHS	60
12	165+180	165+220	RHS	40
13	166+450	166+540	RHS	90
14	166+600	166+640	RHS	40
15	166+670	166+700	RHS	30
	Total Length (2 Lane)			**1720**
	Total Length (4 Lane)			**860**

2. Earthwork upto Top of subgrade:

SL. NO.	CHAINAGE			LENGTH IN Mtrs
	From	To	Side	
1	153+070	153+450	RHS	380
2	154+890	156+420	LHS	1530
3	157+130	158+240	LHS	1110
4	158+400	158+610	LHS	210
5	160+640	160+660	LHS	20

6	161+170	161+300	LHS	130
7	162+540	162+980	LHS	440
8	164+000	164+300	LHS	300
9	165+100	166+230	LHS	1130
10	166+590	166+700	LHS	110
11	154+770	156+400	RHS	1630
12	156+850	158+240	RHS	1390
13	158+390	158+610	RHS	220
14	158+820	158+900	RHS	80
15	159+140	159+370	RHS	230
16	161+195	161+470	RHS	275
17	162+530	163+000	RHS	470
18	165+100	165+630	RHS	530
19	166+090	166+290	RHS	200
20	166+380	166+700	RHS	320
	Total Length (2 Lane)			**10705**
	Total Length (4 Lane)			**5353**

3. Granular Works (Sub –Base)

SL. NO.	CHAINAGE			LENGTH IN Mtrs
	From	To	Side	
1	153+070	153+450	LHS	380
2	154+890	156+420	LHS	1530
3	157+130	158+240	LHS	1110
4	158+400	158+610	LHS	210
5	160+640	160+660	LHS	20
6	161+170	161+300	LHS	130
7	162+540	162+980	LHS	440
8	164+000	164+300	LHS	300
9	165+100	166+230	LHS	1130

10	166+590	166+700	LHS	110
11	154+770	156+400	RHS	1630
12	156+850	158+240	RHS	1390
13	158+390	158+610	RHS	220
14	158+820	158+900	RHS	80
15	159+140	159+370	RHS	230
16	161+195	161+470	RHS	275
17	162+530	163+000	RHS	470
18	165+100	165+630	RHS	530
19	166+090	166+290	RHS	200
20	166+380	166+700	RHS	320
	Total Length (2 Lane)			**10705**
	Total Length (4 Lane)			**5353**

4. Granular Works (Base, Shoulders)

SL. NO.	CHAINAGE			LENGTH IN Mtrs
	From	To	Side	
1	152+830	152+990	LHS	160
2	153+070	153+500	LHS	430
3	154+800	156+420	LHS	1620
4	157+100	158+660	LHS	1560
5	159+430	160+030	LHS	600
6	160+540	160+660	LHS	120
7	161+170	161+530	LHS	360
8	162+540	162+980	LHS	440
9	164+000	164+315	LHS	315
10	165+100	166+265	LHS	1165
11	166+550	166+700	LHS	150
12	153+065	153+500	RHS	435
13	153+780	153+980	RHS	200
14	154+760	156+610	RHS	1850

15	156+850	158+900	RHS	2050
16	159+100	159+430	RHS	330
17	160+690	160+825	RHS	135
18	161+195	161+550	RHS	355
19	162+100	162+190	RHS	90
20	162+501	163+100	RHS	599
21	163+340	165+650	RHS	2310
22	166+090	166+700	RHS	610
	Total Length (2 Lane)			**15884**
	Total Length (4 Lane)			**7942**

5. DBM with Prime coat & Tack Coat

SL NO	CHAINAGE			LENGTH IN Mtrs
	From	To	Side	
1	152+830	152+990	LHS	160
2	153+050	153+550	LHS	500
3	154+770	156+420	LHS	1650
4	156+950	158+660	LHS	1710
5	159+445	160+040	LHS	595
6	160+510	160+665	LHS	155
7	161+160	161+560	LHS	400
8	162+540	163+080	LHS	540
9	164+000	164+320	LHS	320
10	165+100	166+265	LHS	1165
11	166+560	166+700	LHS	140
12	153+065	154+010	RHS	945
13	154+760	156+610	RHS	1850
14	156+830	159+440	RHS	2610
15	160+690	160+820	RHS	130
16	161+200	161+715	RHS	515

17	162+030	165+640	RHS	3610
18	166+090	166+700	RHS	610
	Total Length (2 Lane)			**17605**
	Total Length (4 Lane)			**8802.5**

6. BC with Tack Coat : From Km 152+490 to Km 166+700= 14.210 Km (4 lane)

Bidders are requested to visit the site/stretch to understand the requirement of rectification as per their own assessment. The locations and length given in Schedule-A are tentative. The distressed locations should be identified with their exact chainages. The distresses should then be marked up in a grid pattern covering the distressed portion and also beyond the distressed portion. Then the entire DBM layer within the identified grid must be scrapped off thoroughly. After scrapping of DBM layer, the top WMM surface must be thoroughly checked with respect to degree of compaction and plasticity (within the grid) randomly by doing the test pits at few locations. Further it should be extended for GSB and subgrade layer with extraction of layer material to observe CBR value. If result does not comply in any of the layers then in that grid all the material including subgrade should be excavated and reconstructed freshly.

If subgrade soil is complying with the physical properties while GSB does not, then excavation should be made upto GSB layer and reconstruction should be done from GSB layer. The same should be done for WMM also.

8. ROADSIDEDRAINAGE

Drainage system including surface and subsurface drains for the Project Highway has been provided as per Section 6 of the Manual. However balance drains shall be provided in the table given below:

RCCCovered Drain (U Shaped) in built up area and other section PCC Drain (Trapezoidal shaped)

SL. NO.	DESIGN CHAINAGE (Km)		Length (M)	Remarks
	FROM	TO		
1	As per TCS II Schedule	In Built up section	555m	**As per Four lane manual 2014 & IRC : SP-48**
2	As per TCS I Schedule	Widening on Hill Side	5480m	
3	As per TCS III Schedule	Re-alignment section	6235m	

9. DESIGN OF STRUCTURES

9.1 General

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

9.1.2 Width of the carriageway of new bridges and structures shall be as per figure 7.2 A and figure 7.3 of the Four lane manual (IRC SP:84-2014)

9.1.3 Cross section of two lane new bridge with existing two lane shall be as per figure 7.4 A &&.4 B of four lane Manual (IRC:84-2014)

9.1.4 The following structures shall be provided with footpaths:

Sl. No.	Design (Km)	Type of Structure			Span Length (m)	Footpath Width (m)	Remarks
		Foundation	Sub-structure	Superstructure			
1	165+158	RCC T-Beam Girder			1 x 24.75	1.5	Dzuza

9.1.5 All bridges shall be high-level bridges.

9.1.6 The following structures shall be designed to carry utility services specified in Table below:

Sl.No.	Bridge at km	Utility service to be carried	Scope
1	165+158	Water Pipe	New

9.1.7Cross-section of the new culverts and bridges at deck level for the Project Highway shall conform to the typical cross-sections given in provision of the relevant Manual.

9.2 Culverts

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

9.2.2 Widening of Proposed culverts:

The culverts at the following locations shall be constructed as widening / new culverts:

S.No	Design Ch.	Span Arrangement	Type of Culvert	Completed	Balance to be constructed
1	152+515	(1X1.5X1.5)	Box culvert	1.00	0.0
2	152+577	(1X1.5X1.5)	Box culvert	1.00	0.0
3	152+826	(1X1.5X1.5)	Box culvert	1.00	0.0
4	152+858	(1X1.5X1.5)	Box culvert	1.00	0.0
5	152+900	(1X1.5X1.5)	Box culvert	1.00	0.0
6	152+965	(1X1.5X1.5)	Box culvert	1.00	0.0
7	153+104	(1X1.5X1.5)	Box culvert	1.00	0.0
8	153+422	(1X1.5X1.5)	Box culvert	1.00	0.0
9	153+450	(1X1.5X1.5)	Box culvert	1.00	0.0
10	153+610	(1X1.5X1.5)	Box culvert	1.00	0.0
11	153+652	(1X1.5X1.5)	Box culvert	1.00	0.0
12	153+820	(1X1.5X1.5)	Box culvert	1.00	0.0
13	153+881	(1X1.5X1.5)	Box culvert	1.00	0.0
14	153+980	(1X1.5X1.5)	Box culvert	1.00	0.0

15	154+022	(1X1.5X1.5)	Box culvert	1.00	0.0
16	154+133	(1X1.5X1.5)	Box culvert	1.00	0.0
17	154+243	(1X1.5X1.5)	Box culvert	1.00	0.0
18	154+340	(1X1.5X1.5)	Box culvert	1.00	0.0
19	154+388	(1X1.5X1.5)	Box culvert	1.00	0.0
20	154+450	(1X1.5X1.5)	Box culvert	1.00	0.0
21	154+495	(1X1.5X1.5)	Box culvert	1.00	0.0
22	154+612	(1X1.5X1.5)	Box culvert	1.00	0.0
23	154+808	(1X1.5X1.5)	Box culvert	1.00	0.0
24	154+834	(1X1.5X1.5)	Box culvert	1.00	0.0
25	154+908	(1X1.5X1.5)	Box culvert	0.50	0.5
26	154+989	(1X1.5X1.5)	Box culvert	0.00	1.0
27	155+039	(1X1.5X1.5)	Box culvert	0.00	1.0
28	155+130	(1X1.5X1.5)	Box culvert	0.00	1.0
29	155+445	(1X1.5X1.5)	Box culvert	0.00	1.0
30	155+555	(1X1.5X1.5)	Box culvert	0.00	1.0
31	155+680	(1X1.5X1.5)	Box culvert	0.00	1.0
32	155+707	(1X1.5X1.5)	Box culvert	0.00	1.0
33	155+820	(1X1.5X1.5)	Box culvert	0.00	1.0
34	155+867	(1X1.5X1.5)	Box culvert	0.00	1.0
35	156+087	(1X1.5X1.5)	Box culvert	0.00	1.0
36	156+230	(1X1.5X1.5)	Box culvert	0.50	0.50
37	156+418	(1X1.5X1.5)	Box culvert	1.00	0.0
38	156+485	(1X1.5X1.5)	Box culvert	1.00	0.0
39	156+543	**(1x4.0X3.0)**	Box culvert	1.00	0.0
40	156+595	(1X1.5X1.5)	Box culvert	1.00	0.0
41	156+786	(1X1.5X1.5)	Box culvert	1.00	0.0
42	156+847	(1X1.5X1.5)	Box culvert	1.00	0.0
43	157+003	(1X1.5X1.5)	Box culvert	1.00	0.0
44	157+074	**(1x3.0x3.0)**	Box culvert	1.00	0.0
45	157+750	(1X1.5X1.5)	Box culvert	1.00	0.0
46	157+800	(1X1.5X1.5)	Box culvert	1.00	0.0
47	157+475	**(1X4.0X3.0)**	Box culvert	0.00	1.0
48	158+045	**(1x3.0x3.0)**	Box culvert	0.00	1.0
49	158+140	(1X1.5X1.5)	Box culvert	0.50	0.5
50	158+254	(1X1.5X1.5)	Box culvert	1.00	0.0
51	158+296	(1X1.5X1.5)	Box culvert	1.00	0.0
52	158+754	(1X1.5X1.5)	Box culvert	1.00	0.0
53	158+896	(1X1.5X1.5)	Box culvert	1.00	0.0
54	159+445	(1X1.5X1.5)	Box culvert	1.00	0.0
55	159+567	(1X1.5X1.5)	Box culvert	1.00	0.0
56	159+656	(1X1.5X1.5)	Box culvert	1.00	0.0
57	159+701	(1X1.5X1.5)	Box culvert	1.00	0.0
58	159+860	(1X1.5X1.5)	Box culvert	1.00	0.0
59	159+891	(1X1.5X1.5)	Box culvert	1.00	0.0

60	159+978	(1X1.5X1.5)	Box culvert	1.00	0.0
61	160+037	(1X1.5X1.5)	Box culvert	1.00	0.0
62	160+279	(1X1.5X1.5)	Box culvert	1.00	0.0
63	160+385	(1X1.5X1.5)	Box culvert	1.00	0.0
64	160+541	(1X1.5X1.5)	Box culvert	1.00	0.0
65	160+640	**(1x3.0x3.0)**	Box culvert	1.00	0.0
66	160+822	(1X1.5X1.5)	Box culvert	1.00	0.0
67	160+876	(1X1.5X1.5)	Box culvert	1.00	0.0
68	160+990	(1X1.5X1.5)	Box culvert	1.00	0.0
69	161+057	(1X1.5X1.5)	Box culvert	1.00	0.0
70	161+205	(1X1.5X1.5)	Box culvert	0.50	0.5
71	161+300	(1X1.5X1.5)	Box culvert	0.00	1.0
72	161+556	(1X1.5X1.5)	Box culvert	1.00	0.0
73	161+640	(1X1.5X1.5)	Box culvert	1.00	0.0
74	161+715	(1X1.5X1.5)	Box culvert	1.00	0.0
75	161+758	(1X1.5X1.5)	Box culvert	1.00	0.0
76	161+820	**(1x6.0x3.0)**	Box culvert	1.00	0.0
77	161+918	(1X1.5X1.5)	Box culvert	1.00	0.0
78	162+030	(1X1.5X1.5)	Box culvert	1.00	0.0
79	162+085	(1X1.5X1.5)	Box culvert	1.00	0.0
80	162+175	(1X1.5X1.5)	Box culvert	1.00	0.0
81	162+222	(1X1.5X1.5)	Box culvert	1.00	0.0
82	162+299	(1X1.5X1.5)	Box culvert	1.00	0.0
83	162+326	(1X1.5X1.5)	Box culvert	1.00	0.0
84	162+364	(1X1.5X1.5)	Box culvert	1.00	0.0
85	162+392	(1X1.5X1.5)	Box culvert	1.00	0.0
86	162+428	(1X1.5X1.5)	Box culvert	1.00	0.0
87	162+457	(1X1.5X1.5)	Box culvert	1.00	0.0
88	162+497	(1X1.5X1.5)	Box culvert	1.00	0.0
89	162+551	(1X1.5X1.5)	Box culvert	1.00	0.0
90	162+730	(1X1.5X1.5)	Box culvert	1.00	0.0
91	162+820	(1X1.5X1.5)	Box culvert	0.50	0.5
92	162+980	(1X1.5X1.5)	Box culvert	1.00	0.0
93	163+065	(1X1.5X1.5)	Box culvert	1.00	0.0
94	163+138	(1X1.5X1.5)	Box culvert	1.00	0.0
95	163+177	(1X1.5X1.5)	Box culvert	1.00	0.0
96	163+280	(1X1.5X1.5)	Box culvert	1.00	0.0
97	163+309	(1x2.0X2.0)	Box culvert	1.00	0.0
98	163+380	(1X1.5X1.5)	Box culvert	1.00	0.0
99	163+514	(1X1.5X1.5)	Box culvert	1.00	0.0
100	163+579	(1X1.5X1.5)	Box culvert	1.00	0.0
101	163+694	(1X1.5X1.5)	Box culvert	1.00	0.0
102	163+892	(1X1.5X1.5)	Box culvert	1.00	0.0
103	164+018	(1x2.0X2.0)	Box culvert	1.00	0.0
104	164+123	(1X1.5X1.5)	Box culvert	1.00	0.5 (Extension Culvert of due to

					alignment change)
105	164+314	(1X1.5X1.5)	Box culvert	1.00	0.0
106	164+431	(1X1.5X1.5)	Box culvert	1.00	0.0
107	164+507	(1X1.5X1.5)	Box culvert	1.00	0.0
108	164+596	(1X1.5X1.5)	Box culvert	1.00	0.0
109	164+667	(1X1.5X1.5)	Box culvert	1.00	0.0
110	164+782	(1x2.0X2.0)	Box culvert	1.00	0.0
111	164+907	(1X1.5X1.5)	Box culvert	1.00	0.0
112	165+014	(1X1.5X1.5)	Box culvert	1.00	0.0
113	165+290	(1X1.5X1.5)	Box culvert	1.00	0.0
114	165+390	(1X1.5X1.5)	Box culvert	0.00	1.0
115	165+418	(1X1.5X1.5)	Box culvert	0.50	0.5
116	165+691	(1X1.5X1.5)	Box culvert	0.00	1.0
117	166+247	(1X1.5X1.5)	Box culvert	0.00	1.0
118	165+762	(1X1.5X1.5)	Box culvert	1.00	0.0
119	165+837	(1X1.5X1.5)	Box culvert	1.00	0.0
120	165+974	(1X1.5X1.5)	Box culvert	1.00	0.0
121	166+092	(1X1.5X1.5)	Box culvert	0.50	0.5
122	166+191	(1X1.5X1.5)	Box culvert	0.50	0.5
123	166+210	(1X1.5X1.5)	Box culvert	0.50	0.5
124	166+340	(1X1.5X1.5)	Box culvert	1.00	0.0
125	166+450	(1X1.5X1.5)	Box culvert	1.00	0.0

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

[Refer provision of the relevant Manual and provide details]

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

9.2.4 Floor protection works shall be as specified in the relevant IRC Codes and Specifications.

9.3 Bridges

9.3.1 Existing bridges to be re-constructed/widened

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

[Refer provision of the relevant Manual and provide details]

Sl. No.	Bridge location	Salient details of existing bridge		Adequacy or otherwise of the existing waterway, vertical clearance etc.*	Scope
	(km)	Type of Structures	Span Arrangement and Total Vent way (No. x Length) (m)		
1	Nil				

(ii) The following narrow bridges shall be widened:

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

9.3.2 Additional new bridges (Minor)

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

Sl. No.	Location (km)	Total Length (m)	Scope
1	165+158	24.75	2 lane

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

[Refer provision of the relevant Manualand provide details:]

Sl.No.	Location at km	Scope
Nil		

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

[Refer to provision of the relevant Manual and provide details]

Sl.No.	Location atkm	Scope
1	161+225	Repair
2	165+158	Repair

9.3.5 Drainage system for bridge decks

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

9.3.6 Structures in marine environment

Nil

9.4 Rail-road bridges

9.4.1 Design construction and detailing of ROB/RUB shall be as specified in provision of the relevant Manual

Nil

9.4.2 Road over-bridges

Road over-bridges(road over rail)shall be provided at the following level crossings.

Sl. No.	Location of Level crossing(Chainagekm)	Length of bridge(m)
Nil		

9.4.3 Road under-bridges

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

Sl. No.	Location of Level crossing (Chainage km)	Number and length of span(m)
1	Nil	

9.5 Grade separated structures

Nil

9.6 **Repairs and strengthening of bridges and structures**

Bridges

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

Sl. No.	Location of bridge (km)	Scope
1	161+255	Existing 2 lane
2	165+158	Existing 2 lane
3	155+254	Existing 2 lane

ROB / RUB

Nil

Overpasses/Underpasses and other structures

Nil

9.7**List of Major Bridges and Structures**

The following is the list of the Major Bridges and Structures:

Location (Km)	Proposed span (in m)	Proposed width
155+254	**Nil**	Nil

10. TRAFFIC CONTROL DEVICES AND ROAD SAFETY WORKS

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

2. Specifications of the reflective sheeting. As per the Clause 9.3 of the Manual of Specifications and Standards

11. ROADSIDE FURNITURE

1. Road side furniture shall be provided in accordance with the provisions of Section 12 of the Manual.

2. The Overhead traffic signs: location and size

Sl. No.	Location (Km)	Remarks
1	Full width overhead sign at 166+700	Location may change in consultation with Authority's Engineer
2	Cantilever over head signs (6 nos.)	Location to be identified in consultation with Authority's Engineer

12. COMPULSORY AFFORESTATION

The number of trees which are required to be planted by the contractor as compulsory afforestation shall be as per Forest Conservation Act and as per the section 11 of four lane Manual 2014

13. HAZARDOUS LOCATION / SAFETY PRECAUTIONS / PROTECTION WORKS

The safety barriers/protection works shall also be provided at the following hazardous locations:

13.1 Gabion Breast Wall :- The provision of Gabion Breast wall including slope protection measures are:

Sl. no.	Chainage		Length(m)
	From km.	To Km.	
1	158350	158538	188
		Total	**188**

13.2 PCC / RCC Breast Wall :- The tentative locations and proposed type of Breast walls are as following:

Sl. No.	Chainage		Side	Length (M)	Proposed Provision	Remarks
	From	To				
1	152965	153050	RHS	85	Breast Wall (3m ht.)	
2	154880	154910	RHS	30		
3	155050	155200	RHS	150	Breast Wall (3m ht.)	
4	155680	155700	RHS	20	Breast Wall (3m ht.) required to protect HT tower which is 10 m away from ROW	
5	155840	156230	BHS	780	Breast Wall (3m ht.)	
6	156230	156390	RHS	160	Breast Wall (3m ht.)	
7	156850	156960	RHS	110	Breast Wall (3m ht.)	
8	157830	158650	RHS	820		
9	158840	158900	RHS	60		
10	158690	158810	RHS	120		
11	158820	158840	RHS	20		
12	158950	159100	RHS	150		
13	159980	160040	RHS	60		

14	160070	160110	RHS	40	Breast Wall (3m ht.)	
15	161300	161550	RHS	250	Breast Wall (3m ht.)	
16	163360	163840	RHS	480		
17	164530	164550	RHS	20		
18	165650	165680	RHS	30		
19	164750	164910	RHS	160		
20	164950	165100	RHS	150		
21	165180	165290	RHS	110		
22	165390	165420	RHS	30		
23	165670	165840	RHS	170	Breast Wall (3m ht.)	
24	165910	166000	RHS	90		
25	166250	166340	RHS	90		
26	166340	166700	RHS	360		
27	166100	166250	RHS	150		
28	165290	165390	RHS	100		
29	164315	164430	RHS	115		
30	164000	164300	RHS	300		
31	162550	162980	RHS	430		
32	159100	159370	RHS	270	RCC Breast Wall (3m ht.)	
32	157950	158300	RHS	350	as per site requirement	
33	157100	157750	RHS	650		
34	156100	156230	RHS	130		
35	155700	155840	RHS	140		
36	153104	153420	RHS	316		
37	165420	165520	RHS	100		
Total				**7596**		

13.2.1 Retaining Wall : The Provision of Retaining wall including slope protection measures are:

Sl.No	**CHAINAGE**		**Length**
	From	**To**	**(m)**
1	154890	154910	20
2	155100	155140	40
3	156220	156280	60
4	156490	156530	40
5	157990	158080	90
6	159460	159470	10
7	159550	159560	10
8	159840	159860	20
9	160280	160360	80
10	161130	161170	40
11	161300	161360	60
12	162570	162600	30

13	162780	162800	20
14	162925	162950	25
15	164180	164200	20
16	164200	164220	20
17	164270	164305	35
18	164415	164470	55
19	165330	165400	70
20	165550	165565	15
21	165595	165640	45
22	165680	165730	50
23	165800	165850	50
24	165930	165970	40
Total			**945**

14. Metal Beam Crash Barrier / Parapet wall with Cement Concrete block:

The parapet wall shall be provided on valley edge in complete length minus built up length, bridge span etc. Minimum length of parapet shall be 7362 m. The design of parapet shall be as per IRC SP48:1998.Typical details of metal crash barrier are given in as per manual. Increase in length if any as per site requirement will not constitute change of scope.

15. SPECIAL REQUIREMENT FOR HILL ROADS

All special features shall be provided as per Manual. The side slope shall be protected by using suitable slope protection measures all along the highway on Hill side and valley side as per site requirements.

a) Landslide Mitigation:

Landslide Mitigation has to be provided at the specified chainages mentioned below. The following are the Landslide Mitigation measures to be adopted with the technical specification mentioned below:

(a) For Sinking Zone in the following chainages :

1. Between Km 152.830 to Km 152.990
2. Between Km 157.400 to Km 157.500
3. Between Km 158.000 to Km 158.070
4. Between Km 162.010 to Km 162.100
5. Between Km 162.800 to Km 162.850

System for reinforcing the earth

It includes reinforcing and strengthening of the unstable slopes while doing the excavation in a top down manner by in-situ soil reinforcement of the excavated slope surface based on the detail soil investigation and slope stability analysis.

System for reinforcing the earth shall consist of reinforced earth wall structure as per the specification below and soil nailing/ ground anchors. The backfilled reinforced earth wall is to be mechanically connected with the soil nailed/ ground anchored stabilized slope.

(i) **Fascia :** The fascia element shall be of prefabricated and hot deep galvanized mild steel bar steel mesh having minimum bar diameter of 8mm and minimum galvanization thickness in accordance with BS 729: 1971 (1994).

(ii) **Soil Reinforcing Element:** High Adherence Geosynthetic Straps with grooves on both sides to generate high friction and having coating for better durability as soil reinforcing element. Any other similar material for Soil Reinforcement can be used after the approval from AE.

(iii) **Connection between fascia and soil reinforcing element:** mechanical connection system shall be used, using rust/corrosion resistant steel meeting the long term strength criteria.

(iv) **Fill material:** Backfill material shall be reasonably free from organic or other deleterious material confirming to MoRTH "Specification of Road and Bridges Works", Fifth Revision or IRC: SP: 102-2014.

(v) **Drainage:** Drainage gallery minimum 600mm wide having 20mm down aggregates as per MoRTH specification.

(vi) **Soil Nailing:** To be done as per AS 4678:2002 or any other relevant code as per site condition with approval of AE.

(vii) **Ground Anchors:** Depending on the soil strata, height of the structure and slope stability design, the excavated slope surface to be strengthened by Permanent Ground Anchors.

(viii) **Connection System:** The connection between the reinforced soil slope and soil nail and/ or ground anchors shall be mechanical in nature for full load transfer mechanism. All steel components of the connection shall be hot-dip galvanized to BS 729:1971 requirements or IS 4759:1996.

The Contractor shall be responsible for accurate assessment of the actual requirement as per site situation & prepare designs for slope protection & stabilization as per the specifications & standards stipulated in schedule 'D' and submit the same to the AE for review through the proof consultant and implement it accordingly thereafter.Further the Proof and Safety Consultancy for the above work will only be done through IIT/CBRI/CSIR.

b) Landslide in the following chainages:

1. Between Km 153.104 to 153.350 = 316m
2. Between Km 155.700 to 155.840 = 140m6y
3. Between Km 156.100 to 156.230 = 130m
4. Between Km 157.200 to 157.500 = 300m
5. Between Km 157.500 to 157.750= 250m
6. Between Km 157.950 to 158.300=350m
7. Between Km 158.900 to 159.400= 500m
8. Between Km 160.600 to 160.700=100m
9. Between Km 162.030 to 162.100=70m
10. Between Km 162.550 to 163.000=450m
11. Between Km 163.300 to 163.850=550m
12. Between Km 164.000 to 164.430=430m
13. Between Km 165.000 to 165.100=100m
14. Between Km 165.250 to 165.390=140m
15. Between Km 165.420 to 165.520=100m
16. Between Km 166.100 to 166.250=150m

Total= **3706m**

A brief chainage-wise summary of the slope stabilization solutions is given below which is to be implemented in consultation with Authority's Engineer.

Sl. No.	Chainage		Length (m)	Avg. Height(m)	Area (sqm.)	Suggested Slope Stability Solution
	From	To				
1	153.000	153.350	350	35	12250	Hydroseeding with Coir Mat
2	154.840	154.900	60	15	900	Vetiver Plantation
3	155.500	155.840	340	15	5100	Drapery with Pocket Reinforced Erosion Control System (PRECS) which is proven anti-erosion Geocomposite with a combination of Double Twist (DT) hexagonal wire mesh (10x12) with wire dia. 2.7mm & Zinc coating & soil nails along with a pocket based non-woven geo – green blanket of 600 GSM system including lacing wire & ropes for reinforcement, seeds & mulches.
4	156.100	156.390	290	15	4350	Drapery with Pocket Reinforced Erosion Control System (PRECS) which is proven anti-erosion Geocomposite with a combination of Double Twist (DT) hexagonal wire mesh (10x12) with wire dia. 2.7mm & Zinc coating & soil nails along with a pocket based non-woven geo – green blanket of 600 GSM system including lacing wire & ropes for reinforcement, seeds & mulches.

5	157.100	157.700	600	25	15000	Drapery with Pocket Reinforced Erosion Control System (PRECS) which is proven anti-erosion Geocomposite with a combination of Double Twist (DT) hexagonal wire mesh (10x12) with wire dia. 2.7mm & Zinc coating & soil nails along with a pocket based non-woven geo – green blanket of 600 GSM system including lacing wire & ropes for reinforcement, seeds & mulches.
6	158.000	158.300	300	25	7500	Debris Flow Barriers in stages
7	158.660	158.760	100	20	2000	Hydroseeding with Coir Mat Vetiver grass
8	159.000	159.400	400	15	6000	Hydroseeding with Coir Mat
9	159.000	159.400	400	15	6000	Drapery with Pocket Reinforced Erosion Control System (PRECS) which is proven anti-erosion Geocomposite with a combination of Double Twist (DT) hexagonal wire mesh (10x12) with wire dia. 2.7mm & Zinc coating & soil nails along with a pocket based non-woven geo – green blanket of 600 GSM system including lacing wire & ropes for reinforcement, seeds & mulches with Drainages Holes
10	159.700	159.750	50	15	750	Hydroseeding with Coir Mat
11	159.870	160.050	180	15	2700	Drapery with ATLAS, DT Mesh & Coir mat
12	160.650	160.800	150	15	2250	TUTOR with nailing 1.5 x 1.5, 6m
13	161.050	161.170	120	20	2400	Drapery with ATLAS, DT Mesh & Coir mat
14	161.300	161.550	250	20	5000	Hydroseeding with Coir Mat
15	162.080	162.170	90	15	1350	Vetiver Plantation
16	162.500	163.000	500	25	12500	Hydroseeding with Coir Mat
17	163.000	163.270	270	15	4050	Vetiver Plantation
18	163.350	163.450	100	10	1000	Hydroseeding with Coir Mat
19	163.930	164.300	370	25	9250	Hydroseeding with Coir Mat
20	164.600	165.000	400	15	6000	Vetiver&Hydroseeding with Coir Mat
21	165.230	165.500	270	20	5400	Drapery with Pocket Reinforced Erosion Control System (PRECS) which is proven anti-erosion Geocomposite with a combination of Double Twist (DT) hexagonal wire mesh (10x12) with wire dia. 2.7mm & Zinc coating & soil nails along with a pocket based non-woven geo – green blanket of 600 GSM system including lacing wire & ropes for reinforcement, seeds & mulches.
22	165.670	166.090	420	20	8400	Hydroseeding with Coir Mat
23	166.100	166.700	600	15	9000	HydroseedingWith Coir Mat

Slope Protection/Stabilization work includes Jute netting with vetiver grass, nailing, wire Mess/Cable Net and Geogrid etc. The land for muck dumping to be leased/procured by the contractor and generated muck to be deposited in the leased/purchased ground. The muck dumping ground to be stabilized as per NGT orders and shall be covered with bio-engineering.

Any increase in quantity over and above the minimum qty. as mentioned in both the tables above or through change in specifications will not be considered as change of scope. Therefore contractor shall make thorough investigation at site and assess the requirement of slope protection and slide prone zone and other safety features at his own before submission of bid.

All special features shall be provided as per Manual. The side slope shall be protected by using suitable slope protection measures all along the highway on Hill side and valley side as per Cross Sections. Contractor shall identify areas abd provide the suitable protection measures to stabilize all the landslide zones. A report on the landslide zones shall be furnished along with the design for the review of the Authority Engineer in accordance with the section 13 of the manual (IRC: SP 73:2015 & IRC: SP 48:1998) and recommended practices for the treatment of embankment and road side slopes erosion control (First Revision), IRC: 56-2011 and relevant IRC.

The length as mentioned at sub clause 13.1,13.2&13.3 for Gabion Breast wall, PCC/RCC Breast Wall and Retaining wall respectively and slope protection measures mentioned at sub clause 14 above are indicative and minimum. The bidders may access the actual requirement as per site condition and the change in length and height in these items shall not be considered as change of scope.

Note : The contractor shall be responsible for accurate assessment and design of the actual requirement as per site situation and prepare design for slope protection and stabilization as per specification and standards stipulated in Schedule-D and submit the same to the Authority's Engineer/Authority for review through the Proof/Safety Consultant only through IIT/CBRI/CSIR and implement it accordingly thereafter. Therefore contractor shall make thorough investigation at site and assess the requirement of slope protection and slide prone zone and other safety features at his own before submission of bid. However, mechanical bio-engineering is essentially to be done for uniform vegetation all over the treated area.

16. UTILITIES

Provision of accommodating utilities shall be made both over as well as underground wherever required.

17. Change of Scope

The length of Slope protection measures (either on hill side or on valley side),Structures and Bridges specified here in above shall be treated as an approximate assessment. The actual lengths as required on the basis of detailed investigations shall be determined by the Contractor in accordance with the Specifications and Standards. Any variations in the lengths specified in this Schedule- B shall not constitute a Change of Scope save and except any variations in the length arising out of a Change of Scope expressly under taken in accordance with the provisions of Article 13.

(Schedule-B1)

1. The shifting of utilities and felling of trees shall be carried out by the concerned department. The cost of the same shall be borne by the concerned department.

MODIFIED SCHEDULE - C

(See Clause 2.1)

PROJECT FACILITIES

1 Project Facilities

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

a) Toll plaza [s];

b) Roadside furniture;

c) Pedestrian facilities;

d) Tree plantation;

e) Truck lay-bays;

f) Bus-bays and bus shelters;

g) Rest areas; and

h) Others to be specified

2 Description of Project Facilities

a) **Toll Plaza:** The detail of Toll plaza proposed on Project road section is:

SI. No.	Existing Chainage (Km)	Design Chainage (Km)	Remarks
NIL			

*Typical layout of Toll plaza shall be as per fig 10.1 & 10.2 of four lane manual 2014

b) **Road Side Furniture**

Roadside furniture shall be provided in accordance with the provisions of Section 12 of the manual.

c) **Pedestrian Facilities**

Pedestrian Facilities in the form of guard rails, footpath, at grade pedestrian crossing etc. shall be provided wherever required as per Four Lane Manual.

d) **Tree plantation**

Tree plantation shall be done as per section 11 of Manual.

e) **Truck lay-bays**

The locations of proposed truck lay byes are as under:

SI. No.	Existing Km	Design Km	Side	Remarks
NIL				

f) **Bus-bays and bus shelters**

11nos of Bus bays shall be provided, the location of proposed Bus bays are as under:

SI. No.	Design Chainage	LHS	RHS	Village Name	Remarks
1	154+330		√		
2	155+400	√	√		
3	156+650	√	√	KIRUPHEMA	
4	158+400	√	√	ZUBZA	
5	160+820	√	√	SECHU ZUBZA	
6	161+600	√	√		
Total Numbers….		**11**			

g) **Rest areas:**

NIL

h) **Others to be specified:**

NIL

MODIFIED SCHEDULE-H
(See Clauses 10.1.4 and 19.3)
Contract Price Weightages

1.1 The Contract Price for Balance works in this Agreement is

1.2 Proportions of the Contract Price for different stges of Construction of the project highway shall be as specified below:

ITEM	WEIGHTAGE IN PERCENTAGE TO THE CONTRACT PRICE	STAGE FOR PAYMENT	PERCENTAGE WEIGHTAGE OF CONTRACT PRICE
1	2	3	4
Road works including culverts, minor bridges, underpasses, overpasses, approaches to ROB/RUB/ Major Bridges/ Structures	**49.24%**	**A-Widening and Strengthening**	
		(1) Earthwork up to top of the sub-grade including excavation in soil, soft rock and hard rock.	2.46%
		(2) Granular work (sub-base)	2.53%
		(3) Granular work (base, shoulders)	5.81%
		(4) Bituminous work	
		a) DBM with Prime coat & Tack Coat	4.85%
		b) BC with Tack Coat	4.29%
		(5) Widening and repair of culverts	0.00%
		(6) Widening and repair of minor bridges	0.53%
		B- New 4-lane alignment	
		(1) Earthwork up to top of the sub-grade including excavation in soil, soft rock and hard rock.	3.71%
		(2) Granular work (sub- base)	1.69%
		(3) Granular work (base, shoulders)	3.83%
		(4) Bituminous work	
		a) DBM with Prime coat & Tack Coat	6.37%
		b) BC with Tack Coat	3.77%
		C- New culverts, minor bridges, underpasses, overpasses on existing road, realignments, bypasses:	
		(1) Culverts	4.05%
		(2) Protection work of Culverts	2.77%
		(3) Minor bridges balance work	
		(a) Foundation	0.90%
		(b) Sub-structure	1.03%
		(c) Super-structure (including crash barriers etc. complete)	0.68%
Major Bridge works and ROB/RUB	**0.00%**	**D- New Major Bridges**	
		(1) Balance work of Sub-structure	0.00%
		(2) Super-structure (including crash barriers etc. complete)	0.00%

ITEM 1	WEIGHTAGE IN PERCENTAGE TO THE CONTRACT PRICE 2	STAGE FOR PAYMENT 3	PERCENTAGE WEIGHTAGE OF CONTRACT PRICE 4
Other Works	**50.76%**		
		(i) Foot Over Bridge	0.00%
		(ii) Toll Plaza	0.00%
		(iii) Road side drains	
		a) RCC / PCC Drain	1.22%
		(iv) Road signs, markings, km stones, safety devices, ….	0.49%
		(v) Project facilities	
		(a) Bus bays	0.37%
		(b) Truck lay-byes	
		(c) Junction Improvement	0.06%
		(d) others	0.06%
		(vi) Protection works	
		a) Slope Protection Works (Including Retaining wall, Gabion wall & Breast wall, Parapet etc)	
		Parapet wall on Valley Side.	1.66%
		Gabion Wall	0.65%
		Retaining Wall	3.07%
		Breast Wall	23.33%
		Slope protection measures in hill side i.e. a) vetiver plantation, b)Hydroseeding with coir netting c) Rock netting, d) Debris arrester, e) Reinforcement erosion control f) Sinking zone protection works etc.	
		a) Vetiver plantation	0.55%
		b) Hydroseeding with coir netting	3.06%
		c) Rock netting	4.28%
		d) Debris arrester	4.22%
		e) Erosion control system	3.06%
		f) Sinking zone protection works	3.90%
		(vii) Road furniture, Road Light, plantation & Miscellaneous works on issue of completion certificate	0.79%
			100.00%

TABLE 1.3.1

1.3 Procedure of estimating the value of work done

STAGE OF PAYMENT	PERCENTAGE -WEIGHTAGE	PAYMENT PROCEDURE
A-Widening and Strengthening		Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in a length of not less than 5 (Five) percent of the balance length.
(1) Earthwork up to top of the sub-grade including excavation in soil, soft rock and hard rock.	2.46%	
(2) Granular work (sub- base)	2.53%	
(3) Granular work (base, shoulders)	5.81%	
(4) Bituminous work		
a) DBM with Prime coat & Tack Coat	4.85%	
b) BC with Tack Coat	4.29%	
(5) Widening and repair of culverts	0.00%	Cost of five completed culverts shall be determined pro rata with respect to the total number of culverts. Payment shall be made on the completion of five culverts.
(6) Widening and repair of minor bridges	0.53%	Cost of each minor bridge shall be determined on pro rata basis with respect to the total linear length of the minor bridges. Payment shall be made on the completion of a minor bridge.
(7) Recostruction of Damaged DBM stretch	0.00%	Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in 0.25 km length.
B- New 4-lane alignment		Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in a length of not less than 5 (five) percent of the balance length.
(1) Earthwork up to top of the sub-grade including excavation in soil, soft rock and hard rock.	3.71%	
(2) Granular work (sub- base)	1.69%	
(3) Granular work (base, shoulders)	3.83%	
(4) Bituminous work		
a) DBM with Prime coat & Tack Coat	6.37%	
b) BC with Tack Coat	3.77%	
C- New culverts, minor bridges, underpasses, overpasses on existing road, realignments, bypasses:		
(1) Culverts	4.05%	Cost of each culvert shall be determined on pro rata basis with respect to the total number of culverts. Payment shall be made on the completion of five culverts.
(2) Protection work of Culverts	2.77%	Cost of each culvert shall be determined on pro rata basis with respect to the total number of culverts. Payment shall be made on the completion of five culverts.
(3) Minor bridges balance work		Cost of each minor bridge shall be determined on pro rata basis with respect to the total linear length of the minor bridges. Payment shall be made on the completion of a minor bridge.
(a) Foundation	0.90%	
(b) Sub-structure	1.03%	
(c) Super-structure (including crash barriers etc. complete)	0.68%	

1.3.2 Major Bridge works.

Procedure for estimating the value of Major Bridge works shall be as stated in table 1.3.2

TABLE 1.3.2

STAGE OF PAYMENT	PERCENTAGE -WEIGHTAGE	PAYMENT PROCEDURE
D- New Major Bridges		Payment shall be made on pro rata basis on completion of each stage of a Major Bridge as per the weightage given in this table.
(1) Balance work of Sub-structure	0.00%	
(2) Super-structure (including crash barriers etc. complete)	0.00%	

1.3.4 Other works.

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

TABLE 1.3.4

STAGE OF PAYMENT	WEIGHTAGE	PAYMENT PROCEDURE
(i) Foot Over Bridge	0.00%	Unit of measurement is completed FOB. Payment of FOB shall be made on pro rata basis with respect to the total of all items completed.
(ii) Toll Plaza	0.00%	Unit of measurement is each completed toll plaza. Payment of each toll plaza shall be made on pro rata basis with respect to the total of all toll plazas.
(iii) Road side drains		Unit of measurement is linear length in km. Payment shall be made on pro rata basis on completion of a stage in a length of not less than 10 (ten) percent of the total length.
a) RCC / PCC Drain	1.22%	
b) Random Rubble Masonry Drain	0.00%	
(iv) Road signs, markings, km stones, safety devices, ….	0.49%	Payment shall be made on pro rata basis for completed facilities.
(v) Project facilities		
(a) Bus bays	0.37%	
(b) Truck lay-byes	0.00%	
(c) Junction Improvement	0.06%	
(d) others	0.06%	
(vi) Protection works		Unit of measurement is linear length. Payment shall be made on pro rata basis on completion of a stage in a length of not less than 5 (ten) percent of the total length.
a) Slope Protection Works (Including Retaining wall, Gabion wall & Breast wall, Parapet etc)		
Parapet wall on Valley Side.	1.66%	Unit of measurement is linear length. Payment shall be made on pro rata basis on completion of a stage in a length of not less than 5 (ten) percent of the total length.
Gabion Wall	0.65%	
Retaining Wall	3.07%	
Breast Wall	23.33%	
Slope protection measures in hill side i.e. a) vetiver plantation, b)Hydroseeding with coir netting c) Rock netting, d) Debris arrester, e) Reinforcement erosion control f) Sinking zone protection works etc.		Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage in a area of not less than 10 (ten) percent of the total quantity.
a) Vetiver plantation	0.55%	Payment shall be Made on succesfull growth of grass of Minumum 6 inches (and not on plantation of grass)
b) Hydroseeding with coir netting	3.06%	Payment shall be Made on succesfull growth of grass of Minumum 6 inches (and not on plantation of grass)
c) Rock netting	4.28%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage in a area of not less than 10 (ten) percent of the total quantity.
d) Debris arrester	4.22%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage in a area of not less than 10 (ten) percent of the total quantity.
e) Erosion control system	3.06%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage in a area of not less than 10 (ten) percent of the total quantity.
f) Sinking zone protection works	3.90%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage in a area of not less than 10 (ten) percent of the total quantity.
(vii) Road furniture, Road Light, plantation & Miscellaneous works on issue of completion certificate	0.79%	Payment shall be made for completed items.