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. Rehabilitation and augmentation

Rehabilitation and augmentation shall include Two-Laning with Paved Shoulder and Strengthening 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.

4 As per Government of Sikkim Gazette Notification, **Blasting** is not allowed for road formation widening work. In case of any special situation, controlled blasting can be resorted with the prior permission of the concerned District Administration after taking all necessary safety measures.

Annex -I

(Schedule –B)

Construction of 2-Lane with paved shoulder including geometric improvement from Km 00.00 to Km 16.00 of stretch Singtam-Tarku of NH-510 on EPC basis under SARDP-NE Phase "A" in The State of Sikkim

1. Widening of the Existing Highway

(i) The Project Highway shall follow the existing alignment unless otherwise specified by the Authority and shown in the alignment plans specified in Annex-III of Schedule-A. Geometric deficiencies, if any, in the existing horizontal and vertical profiles shall be corrected as per the prescribed standards for Mountainous /steep terrain to the extent land is available.

(ii) Width of Carriageway

(a) Two-Laning with paved shoulders shall be undertaken. The paved carriageway shall be 7 (seven) m wide along with paved shoulders in accordance with the typical cross sections drawings in the Manual.

In the built-up areas also, the width of the carriageway shall be as specified in the following table:

Sl. No.	Built-up stretch (Township)	Location in m		Carriage Way Width (m)	Paved Shoulder Width (m)
		From	To		
1	Manpari	750	2400	7.0	1.5 (both side)
2	Lower Dalep	3120	3850	7.0	1.5 (both side)
3	Amalay Dara	4475	5525	7.0	1.5 (both side)
4	Lower Tanak	7335	8740	7.0	1.5 (both side)
5	Nepal Gaon	9720	11630	7.0	1.5 (both side)
6	Upper Tanak	11630	11710	7.0	1.5 (both side)
7	Khadi	12375	14050	7.0	1.5 (both side)
8	Tarku	14275	15225	7.0	1.5 (both side)
9	Dentam	15895	16490	7.0	1.5 (both side)

(b) Except as otherwise provided in this Agreement, the width of the paved carriageway and cross-sectional features shall conform to paragraph 1 (ii) (a) above.

2. Geometric Design and General Features

(i) General

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

(ii) Design speed

The design speed shall be the minimum design speed of 40 km per hr for Mountainous /Steep terrain.

(iii) Improvement of the existing road geometrics

The hilly gradients shall be corrected in such a way so as to attain a limiting gradient of 7% in order to achieve longitudinal drainage. Also vertical curves shall be improved / introduced so that the vertical curves meet IRC: SP-73 - 2015 standards.

The horizontal alignment of the Project Highway shall be improved as per the standards set out in IRC-SP: 48:1998.

The improvement shall be done in consultation with the Independent consultant / Project Company ensuring that the proposed improvements are accommodated within the land width available as far as practical otherwise action to acquire more land shall be resorted to through NHIDCL.

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

S. No.	From	To	Radius	Type of Deficiency	Remarks
1	6040.00	6068.00	20	Hair pin bend curve	Adopted Design Speed of 20 Kmph
2	6116.00	6131.00	20	Hair pin bend curve	Adopted Design Speed of 20 Kmph
3	6291.00	6315.00	20	Hair pin bend curve	Adopted Design Speed of 20 Kmph
4	6316.00	6350.00	20	Hair pin bend curve	Adopted Design Speed of 20 Kmph
5	6588.00	6598.00	20	Hair pin bend curve	Adopted Design Speed of 20 Kmph
6	6599.00	6640.00	20	Hair pin bend curve	Adopted Design Speed of 20 Kmph
7	7176.00	7203.00	20	Hair pin bend curve	Adopted Design Speed of 20 Kmph
8	7203.00	7230.00	20	Hair pin bend curve	Adopted Design Speed of 20 Kmph
9	7998.00	8016.00	20	Hair pin bend curve	Adopted Design Speed of 20 Kmph
10	8016.00	8052.00	20	Hair pin bend curve	Adopted Design Speed of 20 Kmph
11	8092.00	8106.00	20	Hair pin bend curve	Adopted Design

S. No.	From	To	Radius	Type of Deficiency	Remarks
					Speed of 20 Kmph
12	10569.00	10593.00	20	Hair pin bend curve	Adopted Design Speed of 20 Kmph
13	10593.00	10625.00	20	Hair pin bend curve	Adopted Design Speed of 20 Kmph
14	12933.00	12958.00	20	Hair pin bend curve	Adopted Design Speed of 20 Kmph
15	12958.00	12984.00	20	Hair pin bend curve	Adopted Design Speed of 20 Kmph
16	13354.00	13390.00	20	Hair pin bend curve	Adopted Design Speed of 20 Kmph
17	15165.00	15184.00	20	Hair pin bend curve	Adopted Design Speed of 20 Kmph

The proposed horizontal and vertical alignment is available in digital format and this is for information and authority shall not be held responsible for any implications of the contract. EPC contractor shall carry out his own survey and investigations and due diligence both during bidding and during design and construction.

(iv) Right of Way

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

(v) Type of shoulders

(a) In built-up sections, footpaths/fully paved shoulders shall be provided in the following stretches:

Sl. No.	Stretch (from km to km)	Fully paved shoulders/ footpaths	Reference to cross section
Nil			

(b) In Built up Sections/open country, paved shoulders of 1.5 m on width shall be provided and balance 1.0m width shall be covered with 150 mm thick compacted layer of granular material.

(c) Design and specifications of paved shoulders and granular material shall conform to the requirements specified in paragraphs 5.10 of the Manual.

(vi) Lateral and vertical clearances at underpasses

(a) Lateral and vertical clearances at underpasses and provision of guardrails/crash barriers shall be as per paragraph 2.11 of the Manual.

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

(c)

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

(vii) Lateral and vertical clearances at overpasses

(a) Lateral and vertical clearances at overpasses shall be as per paragraph 2.11 of the Manual.

(b) 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			

(viii) Service roads

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

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

(ix) Grade separated structures

a. Grade separated structures shall be provided as per paragraph 2.13 of the Manual. The requisite particulars are given below:

Sl. No.	Location of structure	Length (m)	Number and length of spans	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 cross roads shall be as follows:

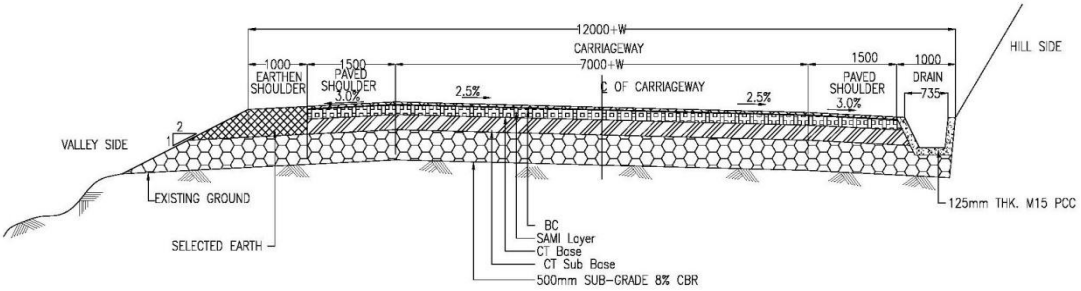
Sl. No.	Location	Type of structure Length (m)	Cross road at			Remarks, if any
			Existing Level	Raised Level	Lowered Level	
Nil						

(x) Cattle and pedestrian underpass /overpass

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

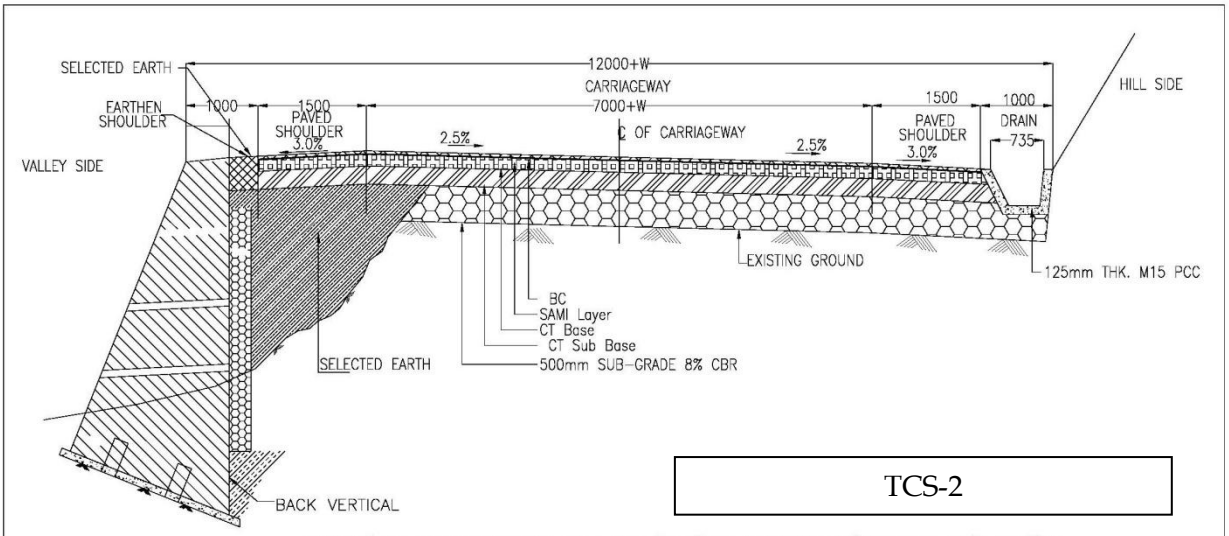
Sl. No.	Location	Type of crossing
Nil		

(xi) Typical cross-sections of the Project Highway



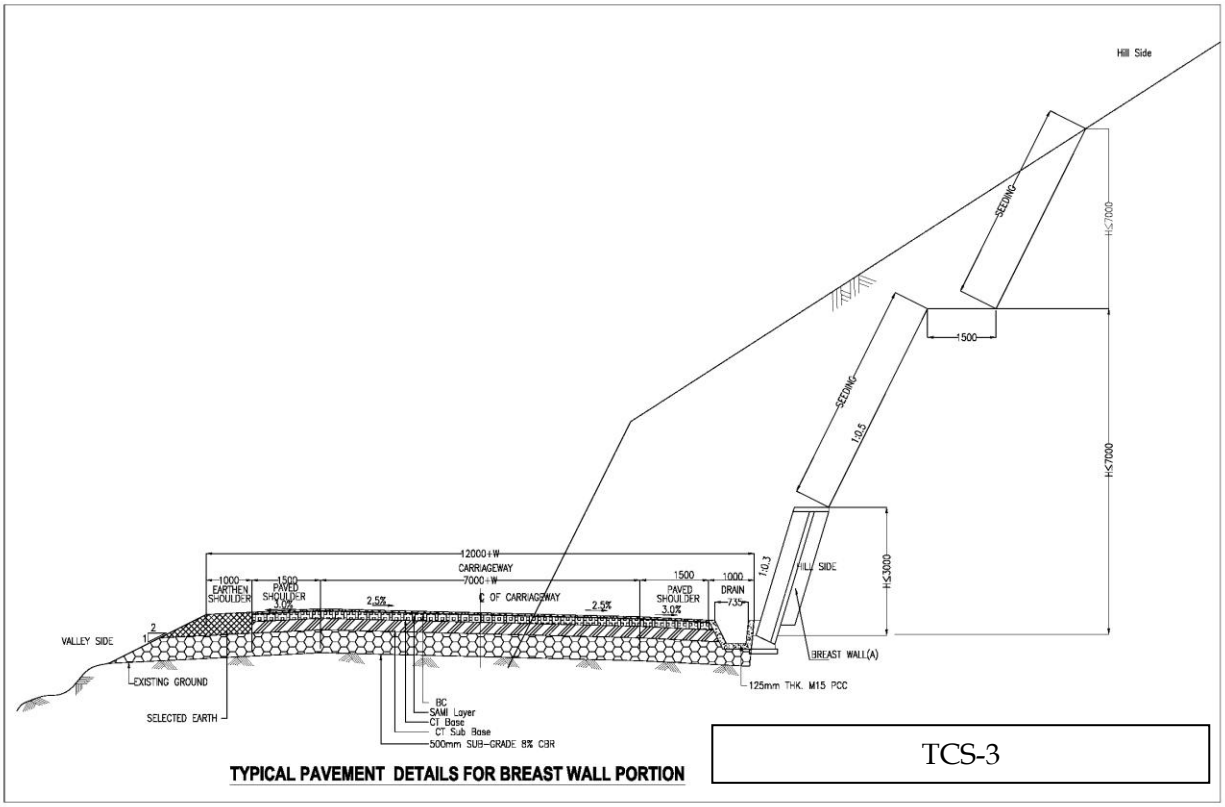
TYPICAL PAVEMENT DETAILS FOR MAIN ROAD

TCS-1



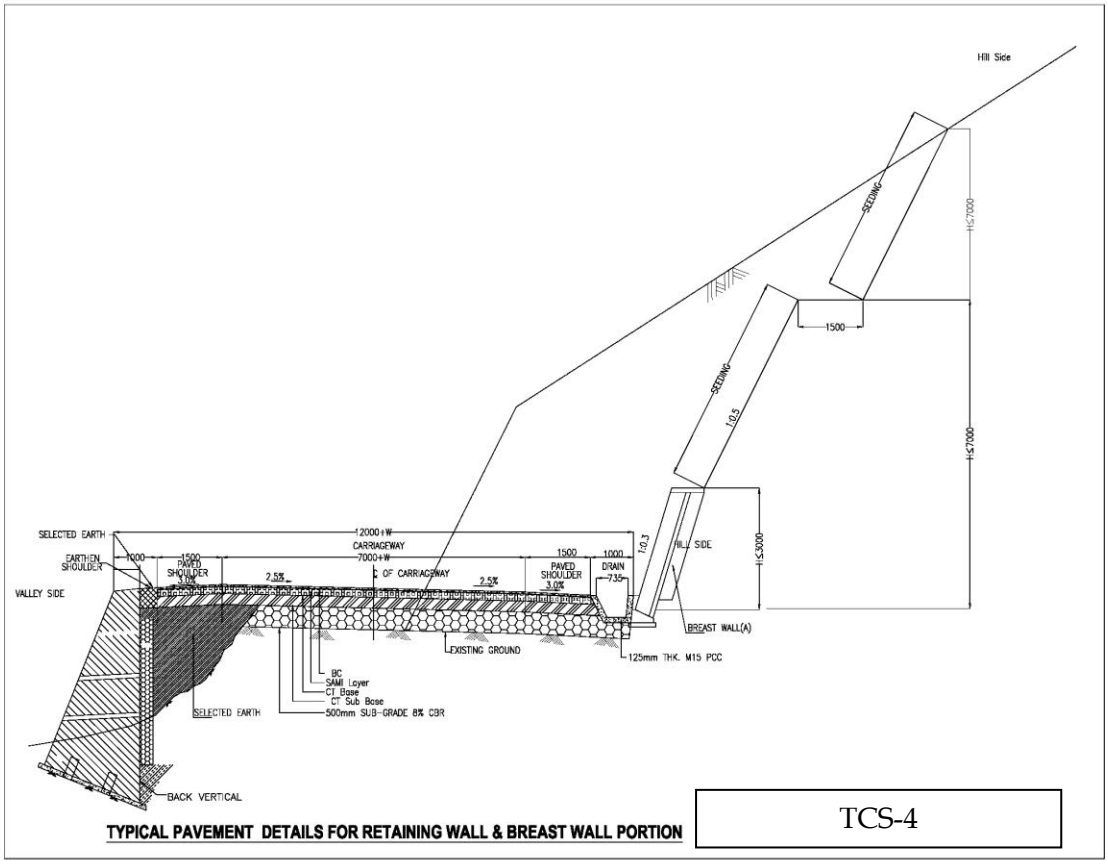
TCS-2

TYPICAL PAVEMENT DETAILS FOR RETAINING WALL PORTION



TYPICAL PAVEMENT DETAILS FOR BREAST WALL PORTION

TCS-3



Sr. No.	Typical section	TCS No.	Remarks
1	Typical Cross section -1	TCS-1	General typical section of pavement
2	Typical Cross section -2	TCS-2	Ref clause No -12.1 & 12.2
3	Typical Cross section -3	TCS-3	Ref clause No -12.4,12.5&12.6
4	Typical Cross section -4	TCS-4	Ref clause No -12.1,12.4,12.5 &12.6

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.

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

(i) At-grade intersections

Sr. No.	Location of intersection	Type of intersection	Side	Remarks	Shape
1	0.00	Major		Junction with NH-10 at Take off point	Y
2	3110.00	Minor	RHS	Merging with Existing Road	Y
3	3835.00	Minor	LHS	Junction with Bermoik Road	Y
4	6300.00	Major	RHS	Junction with Yanyang Road	Y
5	12955.00	Minor	LHS	Junction with Timi Road	Y
6	15160.00	Major	LHS	Junction with NH-710	Y

(ii) Grade separated intersection with/without ramps

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

4. Road Embankment and Cut Section

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

(ii) Raising of the existing road

The existing road shall be raised in the following sections:

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

5. Pavement Design

(i) Pavement design shall be carried out in accordance with Section 5 of the Manual.

(ii) Type of pavement

Flexible Pavement

(iii) Design requirements

(a) Design Period and strategy

As per clause 5.4.1, 5.9 & 5.10 of IRC: SP: 73- 2015

(b) Design Traffic

As per clause 5.4.1, 5.9 & 5.10 of IRC: SP: 73- 2015

(iv) Reconstruction of stretches

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

Sr. No.	Stretch in Km		Remarks
	From	To	
1	3+11	16+00	Construction of new pavement

6. Roadside Drainage

Drainage system including surface and subsurface drains for the Project Highway shall be provided as per Section 6 of the Manual.

The improvements in the drainage and the slope erosion shall be made as per the following norms:

6.1. Road side Drainage Measures

Following measures shall be adopted:

Open side V shape drains at the hill side for widening at hill sides and both sides in realignment stretches by hill cut.

Open side V shape cross section drain shall be provided on hill sides of the project highway in order to intercept surface water from the carriageway, shoulders and hill slopes. Trapezoidal Lined drains have slopes also been proposed in urban/semi urban/intersection stretches. The concrete drains shall be covered in reaches along commercial establishments and intersections. The drains outfall into the natural water courses i.e. either in culverts or bridges. Table below gives the location of lined drains.

These are guidelines for minimum provisions. However, contractor has to design as per requirement of road in accordance with manual.

Sr.No.	Chainage in m		Length	Type	Remarks
	From	To			
1	0	750	750.0	Type-1	V shape Drain
2	750	2400	1650.0	Type-2	Trapezoidal Drain
3	2400	3120	720.0	Type-1	V shape Drain
4	3120	3850	730.0	Type-2	Trapezoidal Drain
5	3850	4475	625.0	Type-1	V shape Drain
6	4475	5525	1050.0	Type-2	Trapezoidal Drain
7	5525	7335	1810.0	Type-1	V shape Drain
8	7335	8740	1405.0	Type-2	Trapezoidal Drain
9	8740	9720	980.0	Type-1	V shape Drain
10	9720	11630	1910.0	Type-2	Trapezoidal Drain
11	11630	11710	80.0	Type-2	Trapezoidal Drain

Sr.No.	Chainage in m		Length	Type	Remarks
	From	To			
12	11710	12375	665.0	Type-1	V shape Drain
13	12375	14050	1675.0	Type-2	Trapezoidal Drain
14	14050	14275	225.0	Type-1	V shape Drain
15	14275	15225	950.0	Type-2	Trapezoidal Drain
16	15225	15895	670.0	Type-1	V shape Drain
17	15895	16000	105.0	Type-2	Trapezoidal Drain

Note: (The above locations shall be reviewed in consultation with the Independent Consultant at the time of construction as per the site condition).

6.2. Chutes

Surface run off on a hill slope flows down in the form of natural gulleys / chutes. The water entrapped in the catch water drains is also brought down by connecting them with existing natural gulleys. It is therefore desired to provide lined chutes to lead the discharge to the catch pit of culvert or to a natural drainage channel.

Note: The length is indicative and shall be estimated by the EPC contractor.

6.3. Drain on valley side at Box Cutting portion – 2400 m V shaped drain.

As per plan & Profile drawing

6.4. Catch water drain - 1200 m V shaped drain

Location will be finalized during construction stage as per site conditions in consultation with NHIDCL / AE

7. Design of Structures

(i) General

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

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

Sr.No.	Bridge at Km	Width of carriageway and cross-sectional features*
1	0+070	Carriageway width 11.0 m + Safety Kerbs 1.0(2x0.5) m+ Crash barrier 1.0 (2x.50) m Width of the approach spans of both end shall be bell mouth as per junction width requirement
2	1+590	Carriageway width 11.0 m + Safety Kerbs 1.0(2x0.5) m+ Crash barrier 1.0 (2x.50) m
3	2+860	Carriageway width 11.0 m + Safety Kerbs 1.0(2x0.5) m+ Crash barrier 1.0 (2x.50) m

4	2+975	Carriageway width 11.0 m + Safety Kerbs 1.0(2x0.5) m+ Crash barrier 1.0 (2x.50) m
5	6+090	Carriageway width 11.0 m + Safety Kerbs 1.0(2x0.5) m+ Crash barrier 1.0 (2x.50) m

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

Sr.No.	Location at Km	Remarks
Nil		

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

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

Sr.No.	Bridge at Km	Utility services to be carried	Remarks
1	0+070	Cable	Two nos of 150 mm diameter duct below the Safety kerbs
2	1+590	Cable	
3	2+860	Cable	
4	2+975	Cable	
5	6+090	Cable	

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

(ii) Culverts

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

(b) Reconstruction of existing culverts:

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

S/N	Chainage (m)	Type	Nos X Span
1	3204	BOX	1 X 3
2	3235	BOX	1 X 2
3	4074	HPC	1X1.2D
4	4151	BOX	1 X 3
5	4188	BOX	1 X 3
6	4278	BOX	1 X 3
7	4444	BOX	1 X 4
8	5855	BOX	1 X 3
9	5987	BOX	1 X 3
10	7802	HPC	1X1.2D
11	8462	HPC	1X1.2D
12	8989	HPC	1X1.2D
13	9264	BOX	1 X 3
14	9446	HPC	1X1.2D

S/N	Chainage (m)	Type	Nos X Span
15	9814	HPC	1X1.2D
16	11513	BOX	1 X 4
17	11728	HPC	1X1.2D
18	11746	HPC	1X1.2D
19	11816	BOX	1 X 2
20	11915	BOX	1 X 3
21	11998	HPC	1X1.2D
22	12140	HPC	1X1.2D
23	12252	BOX	1 X 3
24	12658	HPC	1X1.2D
25	12875	HPC	1X1.2D
26	13043	HPC	1X1.2D
27	13271	HPC	1X1.2D
28	13862	BOX	1 X 2
29	14064	BOX	1 X 4
30	14324	HPC	1X1.2D
31	14430	HPC	1X1.2D

Note: (The above locations and size shall be reviewed in consultation with the AE at the time of construction as per the site condition).

(c) Widening of existing culverts:

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

Sl. No	Chainages	Description
1	9+702	HPC
2	13+497	HPC
3	11+135	HPC
4	9+600	Box Culvert (2*2)
5	14+225	Box Culvert (3*3)

Note- The work done of above culverts is incomplete by earlier EPC contractor and need to widen/repair as per Technical standards. Repair works like Catch pit, Head wall, Outfall, Parapet wall etc.

(d) Additional new culverts shall be constructed as per particulars given in the table below:

S/N	Chainage (m)	Type	Nos X Span
1	422	BOX	1 X 2
2	738	BOX	1 X 2
3	1160	BOX	1 X 6
4	1990	BOX	1 X 2
5	2243	BOX	1 X 2
6	2542	BOX	1 X 2
7	2758	BOX	1 X 2
8	3355	HPC	1X1.2 D
9	3681	BOX	1 X 2
10	3852	BOX	1 X 3
11	4760	HPC	1X1.2 D
12	5078	HPC	1X1.2 D
13	5460	BOX	1 X 2
14	5684	BOX	1 X 2
15	6193	BOX	1 X 2
16	6432	BOX	1 X 2
17	6784	BOX	1 X 2
18	7066	HPC	1X1.2 D
19	7351	HPC	1X1.2 D
20	7587	BOX	1 X 2
21	7869	BOX	1 X 2
22	8149	BOX	1 X 2
23	8631	BOX	1 X 2
24	9925	HPC	1X1.2 D
25	10155	HPC	1X1.2 D
26	10486	BOX	1 X 2
27	10707	BOX	1 X 2
28	11000	BOX	1 X 2
29	13589	HPC	1X1.2 D
30	14743	BOX	1 X 2
31	14983	BOX	1 X 2
32	15372	BOX	1 X 2
33	15611	BOX	1 X 2
34	15914	BOX	1 X 2

Note: (The above locations and size shall be reviewed in consultation with the AE at the time of construction as per the site condition).

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

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

(f) Floor protection works shall be as specified in the relevant IRC Codes and Specifications

(iii) Bridges

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

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

S/N	Location in m	Super structure	Foundation	Remarks	Span Arrangement
1	6090	PSC	Open	Nala	1X48

(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				

(b) Additional new bridges

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

S/N	Location in m	Super structure	Foundation	Remarks	Span Arrangement	Remarks
1	70	PSC	Pile	Teesta River	1X20+1X65+2X20	Please refer clause 7 (i) (b) for carriageway
2	1590	PSC	Open	Nala	1X25+1X48+1X25	
3	2860	PSC	Open	Nala	1X40	
4	2975	PSC	Open	Nala	1X48+1X20	

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

Sl. No.	Location at Km	Remarks, if any
Nil		

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

Sl. No.	Location at Km	Remarks, if any
Nil		

(e) Drainage system for bridge decks

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

(f) Structures in marine environment- Nil

(iv) Rail-road bridges

(a) Design, construction and detailing of ROB/RUB shall be as specified in section 7 of the Manual : - Nil

(b) Road over-bridges

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

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

(c) Road under-bridges

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

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

(v) Grade separated structures

The grade separated structures shall be provided at the locations and of the type and length specified in paragraphs 2 (ix) and 3 of this Annex-I.

(vi) Repairs and strengthening of bridges and structures

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

(a) Bridges

Sl. No.	Location of bridge (km)	Nature and extent of repairs /strengthening to be carried out
Nil		

(b) ROB/RUB

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

(c) Overpasses/Underpasses and other structures

(d)

Sl. No.	Location of structure (km)	Nature and extent of repairs /strengthening to be carried out
Nil		

(vii) List of Major Bridges and Structures

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

Sl.No.	Location in Km	Span arrangement	Remarks
1	0+070	1X20+1X65+2X20	New Construction
2	1+590	1X25+1X48+1X25	New Construction
3	2+860	1X40	New Construction
4	2+975	1X48+1X20	New Construction
5	6+090	1X48	Reconstruction

8. Traffic Control Devices and Road Safety Works

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

(ii) Specifications of the reflective sheeting.

The minimum quantity of Traffic signages and pavement marking are tabulated here

Sr.No.	Traffic Signages, Road Marking and other appurtenances	unit	Quantity
1	90 cm equilateral triangle	each	12
2	60 cm equilateral triangle	each	25
3	60 cm circular	each	32
4	80 mm x 60 mm rectangular	each	28
5	60 cm x 45 cm rectangular	each	22
6	60 cm x 60 cm square	each	30
7	Direction and Place Identification signs upto 0.9 sqm size board.	Sqm	7.5
8	Road Marking with Hot Applied Thermoplastic Compound with Reflectorising Glass	Sqm	4000
9	5th kilometre stone (precast)	each	3
10	Ordinary Kilometer stone (Precast)	each	13
11	Hectometer stone (Precast)	each	65
12	Road Delineators	each	14
13	Boundary pillar	each	150
14	Street Furniture	each	1050

9. **Roadside Furniture**

(i) Roadside furniture shall be provided in accordance with the provisions of Section -9 of the Manual.

(ii) Overhead traffic signs: location and size - Nil

10. Compulsory Afforestation : - Nil

11. Hazardous Locations

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

Metal Beam crash barrier length of minimum 3000 m (single runner, heavy duty and W-shape) shall be provided at the locations of bridge approaches, steep valley side and at sharp curves on both sides. Heavy duty metal beam crash barriers shall be provided on this project by the Construction Contractor at the locations finalized in consultation with AE/NHIDCL. Typical details of metal crash barrier are given in as per manual.

12. Special Requirement for Hill Roads

As the project involves cutting of the hill slopes, it's imperative that slopes are stabilized for ensuring longevity of the slopes and the road. Slope stability, erosion control and landslide correction shall be accomplished in accordance with IRC: SP 48:1998. Reference may be drawn from IRC: 56-2011.

The minimum quantity of protection works may be taken as below

12.1. Retaining wall

A) Slope protection along valley side shall be Plum concrete retaining wall height from 2 m to 4 m. and for 4m & above, RCC Cantilever retaining wall with Relief Shelves shall be used.

Sr.No.	Chainage		Length in m	Height in m	Remarks	Type
	From	To				
1	125.00	135.00	10	8.00	RHS	RCC Relief Shelves
2	135.00	145.00	10	5.00	RHS	RCC Relief Shelves
3	145.00	155.00	10	3.00	RHS	Plum Concrete
4	155.00	165.00	10	2.00	RHS	Plum Concrete
5	165.00	175.00	10	2.00	RHS	Plum Concrete
6	175.00	185.00	10	2.00	RHS	Plum Concrete
7	185.00	195.00	10	2.00	RHS	Plum Concrete
8	195.00	205.00	10	2.00	RHS	Plum Concrete
9	435.00	445.00	10	2.00	RHS	Plum Concrete
10	455.00	465.00	10	4.00	RHS	Plum Concrete
11	465.00	475.00	10	3.00	RHS	Plum Concrete
12	475.00	485.00	10	3.00	RHS	Plum Concrete
13	485.00	495.00	10	3.00	RHS	Plum Concrete
14	495.00	505.00	10	5.00	RHS	RCC Relief Shelves
15	505.00	515.00	10	3.00	RHS	Plum Concrete
16	515.00	525.00	10	4.00	RHS	Plum Concrete
17	525.00	535.00	10	2.00	RHS	Plum Concrete
18	555.00	565.00	10	2.00	RHS	Plum Concrete
19	575.00	585.00	10	2.00	RHS	Plum Concrete
20	585.00	595.00	10	2.00	RHS	Plum Concrete

Sr.No.	Chainage		Length in m	Height in m	Remarks	Type
	From	To				
21	595.00	605.00	10	3.00	RHS	Plum Concrete
22	605.00	615.00	10	2.00	RHS	Plum Concrete
23	635.00	645.00	10	2.00	RHS	Plum Concrete
24	685.00	695.00	10	2.00	RHS	Plum Concrete
25	695.00	705.00	10	4.00	RHS	Plum Concrete
26	705.00	715.00	10	4.00	RHS	Plum Concrete
27	735.00	745.00	10	2.00	RHS	Plum Concrete
28	745.00	755.00	10	8.00	RHS	RCC Relief Shelves
29	755.00	765.00	10	8.00	RHS	RCC Relief Shelves
30	765.00	775.00	10	6.00	RHS	RCC Relief Shelves
31	775.00	785.00	10	5.00	RHS	RCC Relief Shelves
32	785.00	795.00	10	4.00	RHS	Plum Concrete
33	795.00	805.00	10	3.00	RHS	Plum Concrete
34	805.00	815.00	10	3.00	RHS	Plum Concrete
35	915.00	925.00	10	2.00	RHS	Plum Concrete
36	925.00	935.00	10	2.00	RHS	Plum Concrete
37	935.00	945.00	10	3.00	RHS	Plum Concrete
38	945.00	955.00	10	3.00	RHS	Plum Concrete
39	965.00	975.00	10	3.00	RHS	Plum Concrete
40	975.00	985.00	10	3.00	RHS	Plum Concrete
41	985.00	995.00	10	4.00	RHS	Plum Concrete
42	995.00	1005.00	10	2.00	RHS	Plum Concrete
43	1005.00	1015.00	10	2.00	RHS	Plum Concrete
44	1015.00	1025.00	10	4.00	RHS	Plum Concrete
45	1025.00	1035.00	10	5.00	RHS	RCC Relief Shelves
46	1035.00	1045.00	10	5.00	RHS	RCC Relief Shelves
47	1045.00	1055.00	10	6.00	RHS	RCC Relief Shelves
48	1055.00	1065.00	10	4.00	RHS	Plum Concrete
49	1065.00	1075.00	10	5.00	RHS	RCC Relief Shelves
50	1075.00	1085.00	10	6.00	RHS	RCC Relief Shelves
51	1085.00	1095.00	10	10.00	RHS	RCC Relief Shelves
52	1095.00	1105.00	10	4.00	LHS	Plum Concrete
53	1095.00	1105.00	10	12.00	RHS	RCC Relief Shelves
54	1105.00	1115.00	10	6.00	LHS	RCC Relief Shelves
55	1105.00	1115.00	10	12.00	RHS	RCC Relief Shelves
56	1115.00	1125.00	10	8.00	LHS	RCC Relief Shelves
57	1115.00	1125.00	10	12.00	RHS	RCC Relief Shelves
58	1125.00	1135.00	10	10.00	LHS	RCC Relief Shelves
59	1125.00	1135.00	10	12.00	RHS	RCC Relief Shelves
60	1135.00	1145.00	10	10.00	LHS	RCC Relief Shelves
61	1135.00	1145.00	10	12.00	RHS	RCC Relief Shelves

Sr.No.	Chainage		Length in m	Height in m	Remarks	Type
	From	To				
62	1145.00	1155.00	10	8.00	LHS	RCC Relief Shelves
63	1145.00	1155.00	10	12.00	RHS	RCC Relief Shelves
64	1155.00	1165.00	10	8.00	LHS	RCC Relief Shelves
65	1155.00	1165.00	10	10.00	RHS	RCC Relief Shelves
66	1165.00	1175.00	10	6.00	LHS	RCC Relief Shelves
67	1165.00	1175.00	10	6.00	RHS	RCC Relief Shelves
68	1175.00	1185.00	10	3.00	LHS	Plum Concrete
69	1175.00	1185.00	10	4.00	RHS	Plum Concrete
70	1185.00	1195.00	10	3.00	RHS	Plum Concrete
71	1195.00	1205.00	10	3.00	RHS	Plum Concrete
72	1205.00	1215.00	10	3.00	RHS	Plum Concrete
73	1215.00	1225.00	10	3.00	RHS	Plum Concrete
74	1225.00	1235.00	10	4.00	RHS	Plum Concrete
75	1235.00	1245.00	10	3.00	RHS	Plum Concrete
76	1245.00	1255.00	10	3.00	RHS	Plum Concrete
77	1255.00	1265.00	10	2.00	RHS	Plum Concrete
78	1265.00	1275.00	10	2.00	RHS	Plum Concrete
79	1505.00	1515.00	10	2.00	RHS	Plum Concrete
80	1665.00	1675.00	10	2.00	RHS	Plum Concrete
81	1725.00	1735.00	10	6.00	RHS	RCC Relief Shelves
82	1735.00	1745.00	10	2.00	RHS	Plum Concrete
83	1745.00	1755.00	10	2.00	RHS	Plum Concrete
84	1815.00	1825.00	10	2.00	RHS	Plum Concrete
85	1825.00	1835.00	10	3.00	RHS	Plum Concrete
86	2025.00	2035.00	10	3.00	RHS	Plum Concrete
87	2035.00	2045.00	10	2.00	RHS	Plum Concrete
88	2045.00	2055.00	10	2.00	RHS	Plum Concrete
89	2055.00	2065.00	10	2.00	RHS	Plum Concrete
90	2075.00	2085.00	10	5.00	RHS	RCC Relief Shelves
91	2085.00	2095.00	10	3.00	RHS	Plum Concrete
92	2095.00	2105.00	10	3.00	RHS	Plum Concrete
93	2105.00	2115.00	10	3.00	RHS	Plum Concrete
94	2115.00	2125.00	10	5.00	RHS	RCC Relief Shelves
95	2125.00	2135.00	10	3.00	RHS	Plum Concrete
96	2135.00	2145.00	10	4.00	RHS	Plum Concrete
97	2145.00	2155.00	10	5.00	RHS	RCC Relief Shelves
98	2155.00	2165.00	10	4.00	RHS	Plum Concrete
99	2165.00	2175.00	10	3.00	RHS	Plum Concrete
100	2175.00	2185.00	10	4.00	RHS	Plum Concrete
101	2185.00	2195.00	10	3.00	RHS	Plum Concrete
102	2195.00	2205.00	10	3.00	RHS	Plum Concrete

Sr.No.	Chainage		Length in m	Height in m	Remarks	Type
	From	To				
103	2205.00	2215.00	10	2.00	RHS	Plum Concrete
104	2215.00	2225.00	10	3.00	RHS	Plum Concrete
105	2225.00	2235.00	10	3.00	RHS	Plum Concrete
106	2235.00	2245.00	10	4.00	RHS	Plum Concrete
107	2245.00	2255.00	10	4.00	RHS	Plum Concrete
108	2255.00	2265.00	10	4.00	RHS	Plum Concrete
109	2265.00	2275.00	10	4.00	RHS	Plum Concrete
110	2275.00	2285.00	10	6.00	RHS	RCC Relief Shelves
111	2285.00	2295.00	10	2.00	LHS	Plum Concrete
112	2285.00	2295.00	10	6.00	RHS	RCC Relief Shelves
113	2295.00	2305.00	10	3.00	LHS	Plum Concrete
114	2295.00	2305.00	10	8.00	RHS	RCC Relief Shelves
115	2305.00	2315.00	10	8.00	RHS	RCC Relief Shelves
116	2315.00	2325.00	10	6.00	RHS	RCC Relief Shelves
117	2325.00	2335.00	10	6.00	RHS	RCC Relief Shelves
118	2335.00	2345.00	10	3.00	RHS	Plum Concrete
119	2375.00	2385.00	10	4.00	RHS	Plum Concrete
120	2385.00	2395.00	10	5.00	RHS	RCC Relief Shelves
121	2395.00	2405.00	10	6.00	RHS	RCC Relief Shelves
122	2685.00	2695.00	10	2.00	RHS	Plum Concrete
123	2925.00	2935.00	10	5.00	RHS	RCC Relief Shelves
124	3205.00	3215.00	10	2.00	RHS	Plum Concrete
125	3325.00	3335.00	10	3.00	RHS	Plum Concrete
126	3335.00	3345.00	10	2.00	RHS	Plum Concrete
127	3345.00	3355.00	10	3.00	RHS	Plum Concrete
128	3355.00	3365.00	10	2.00	RHS	Plum Concrete
129	3705.00	3715.00	10	5.00	RHS	RCC Relief Shelves
130	3715.00	3725.00	10	5.00	RHS	RCC Relief Shelves
131	3725.00	3735.00	10	2.00	RHS	Plum Concrete
132	3995.00	4005.00	10	2.00	RHS	Plum Concrete
133	4175.00	4185.00	10	5.00	RHS	RCC Relief Shelves
134	4185.00	4195.00	10	2.00	RHS	Plum Concrete
135	4355.00	4365.00	10	3.00	RHS	Plum Concrete
136	4365.00	4375.00	10	6.00	RHS	RCC Relief Shelves
137	4385.00	4395.00	10	2.00	RHS	Plum Concrete
138	4415.00	4425.00	10	3.00	RHS	Plum Concrete
139	4425.00	4435.00	10	2.00	RHS	Plum Concrete
140	4435.00	4445.00	10	2.00	RHS	Plum Concrete
141	4445.00	4455.00	10	2.00	RHS	Plum Concrete
142	4495.00	4505.00	10	2.00	RHS	Plum Concrete
143	4575.00	4585.00	10	2.00	RHS	Plum Concrete

Sr.No.	Chainage		Length in m	Height in m	Remarks	Type
	From	To				
144	4635.00	4645.00	10	2.00	RHS	Plum Concrete
145	4835.00	4845.00	10	2.00	RHS	Plum Concrete
146	4845.00	4855.00	10	2.00	RHS	Plum Concrete
147	4875.00	4885.00	10	3.00	RHS	Plum Concrete
148	4895.00	4905.00	10	2.00	RHS	Plum Concrete
149	4905.00	4915.00	10	2.00	RHS	Plum Concrete
150	4925.00	4935.00	10	3.00	RHS	Plum Concrete
151	4935.00	4945.00	10	2.00	RHS	Plum Concrete
152	4945.00	4955.00	10	2.00	RHS	Plum Concrete
153	5085.00	5095.00	10	2.00	RHS	Plum Concrete
154	5195.00	5205.00	10	4.00	RHS	Plum Concrete
155	5245.00	5255.00	10	2.00	RHS	Plum Concrete
156	5255.00	5265.00	10	4.00	RHS	Plum Concrete
157	5265.00	5275.00	10	4.00	RHS	Plum Concrete
158	5275.00	5285.00	10	4.00	RHS	Plum Concrete
159	5345.00	5355.00	10	4.00	RHS	Plum Concrete
160	5355.00	5365.00	10	4.00	RHS	Plum Concrete
161	5365.00	5375.00	10	4.00	RHS	Plum Concrete
162	5375.00	5385.00	10	3.00	RHS	Plum Concrete
163	5525.00	5535.00	10	2.00	RHS	Plum Concrete
164	5535.00	5545.00	10	3.00	RHS	Plum Concrete
165	5545.00	5555.00	10	2.00	RHS	Plum Concrete
166	5725.00	5735.00	10	2.00	RHS	Plum Concrete
167	5835.00	5845.00	10	2.00	RHS	Plum Concrete
168	5845.00	5855.00	10	3.00	RHS	Plum Concrete
169	5855.00	5865.00	10	4.00	RHS	Plum Concrete
170	5865.00	5875.00	10	2.00	RHS	Plum Concrete
171	5925.00	5935.00	10	2.00	RHS	Plum Concrete
172	5935.00	5945.00	10	3.00	RHS	Plum Concrete
173	5945.00	5955.00	10	3.00	RHS	Plum Concrete
174	5955.00	5965.00	10	4.00	RHS	Plum Concrete
175	5965.00	5975.00	10	10.00	RHS	RCC Relief Shelves
176	5975.00	5985.00	10	8.00	RHS	RCC Relief Shelves
177	5985.00	5995.00	10	3.00	RHS	Plum Concrete
178	5995.00	6005.00	10	2.00	RHS	Plum Concrete
179	5995.00	6005.00	10	3.00	LHS	Plum Concrete
180	6255.00	6265.00	10	3.00	RHS	Plum Concrete
181	6265.00	6275.00	10	4.00	RHS	Plum Concrete
182	6275.00	6285.00	10	3.00	RHS	Plum Concrete
183	6285.00	6295.00	10	3.00	RHS	Plum Concrete
184	6385.00	6395.00	10	3.00	LHS	Plum Concrete

Sr.No.	Chainage		Length in m	Height in m	Remarks	Type
	From	To				
185	6565.00	6575.00	10	3.00	LHS	Plum Concrete
186	6575.00	6585.00	10	2.00	RHS	Plum Concrete
187	6575.00	6585.00	10	6.00	LHS	RCC Relief Shelves
188	6585.00	6595.00	10	2.00	LHS	Plum Concrete
189	6585.00	6595.00	10	2.00	RHS	Plum Concrete
190	6685.00	6695.00	10	2.00	LHS	Plum Concrete
191	6825.00	6835.00	10	2.00	RHS	Plum Concrete
192	6835.00	6845.00	10	2.00	RHS	Plum Concrete
193	6895.00	6905.00	10	2.00	RHS	Plum Concrete
194	6905.00	6915.00	10	2.00	RHS	Plum Concrete
195	6915.00	6925.00	10	3.00	RHS	Plum Concrete
196	6925.00	6935.00	10	3.00	RHS	Plum Concrete
197	6935.00	6945.00	10	2.00	RHS	Plum Concrete
198	6945.00	6955.00	10	3.00	RHS	Plum Concrete
199	6975.00	6985.00	10	4.00	RHS	Plum Concrete
200	6985.00	6995.00	10	5.00	RHS	RCC Relief Shelves
201	6995.00	7005.00	10	5.00	RHS	RCC Relief Shelves
202	7005.00	7015.00	10	4.00	RHS	Plum Concrete
203	7015.00	7025.00	10	4.00	RHS	Plum Concrete
204	7025.00	7035.00	10	5.00	RHS	RCC Relief Shelves
205	7035.00	7045.00	10	5.00	RHS	RCC Relief Shelves
206	7045.00	7055.00	10	6.00	RHS	RCC Relief Shelves
207	7055.00	7065.00	10	4.00	RHS	Plum Concrete
208	7065.00	7075.00	10	5.00	RHS	RCC Relief Shelves
209	7075.00	7085.00	10	5.00	RHS	RCC Relief Shelves
210	7085.00	7095.00	10	8.00	RHS	RCC Relief Shelves
211	7095.00	7105.00	10	5.00	RHS	RCC Relief Shelves
212	7105.00	7115.00	10	8.00	RHS	RCC Relief Shelves
213	7115.00	7125.00	10	8.00	RHS	RCC Relief Shelves
214	7125.00	7135.00	10	10.00	RHS	RCC Relief Shelves
215	7135.00	7145.00	10	10.00	RHS	RCC Relief Shelves
216	7145.00	7155.00	10	2.00	LHS	Plum Concrete
217	7145.00	7155.00	10	12.00	RHS	RCC Relief Shelves
218	7155.00	7165.00	10	3.00	LHS	Plum Concrete
219	7155.00	7165.00	10	12.00	RHS	RCC Relief Shelves
220	7165.00	7175.00	10	2.00	LHS	Plum Concrete
221	7165.00	7175.00	10	8.00	RHS	RCC Relief Shelves
222	7175.00	7185.00	10	4.00	RHS	Plum Concrete
223	7185.00	7195.00	10	4.00	RHS	Plum Concrete
224	7205.00	7215.00	10	2.00	LHS	Plum Concrete
225	7285.00	7295.00	10	2.00	LHS	Plum Concrete

Sr.No.	Chainage		Length in m	Height in m	Remarks	Type
	From	To				
226	7295.00	7305.00	10	3.00	LHS	Plum Concrete
227	7305.00	7315.00	10	3.00	LHS	Plum Concrete
228	7315.00	7325.00	10	2.00	LHS	Plum Concrete
229	7345.00	7355.00	10	2.00	LHS	Plum Concrete
230	7355.00	7365.00	10	2.00	LHS	Plum Concrete
231	7355.00	7365.00	10	8.00	RHS	RCC Relief Shelves
232	7375.00	7385.00	10	2.00	LHS	Plum Concrete
233	7385.00	7395.00	10	2.00	LHS	Plum Concrete
234	7415.00	7425.00	10	2.00	LHS	Plum Concrete
235	7425.00	7435.00	10	3.00	LHS	Plum Concrete
236	7435.00	7445.00	10	2.00	LHS	Plum Concrete
237	7865.00	7875.00	10	2.00	LHS	Plum Concrete
238	8085.00	8095.00	10	2.00	RHS	Plum Concrete
239	9665.00	9675.00	10	2.00	RHS	Plum Concrete
240	9675.00	9685.00	10	2.00	RHS	Plum Concrete
241	9685.00	9695.00	10	2.00	RHS	Plum Concrete
242	9845.00	9855.00	10	2.00	RHS	Plum Concrete
243	9855.00	9865.00	10	4.00	RHS	Plum Concrete
244	9865.00	9875.00	10	5.00	RHS	RCC Relief Shelves
245	9875.00	9885.00	10	2.00	RHS	Plum Concrete
246	9915.00	9925.00	10	3.00	RHS	Plum Concrete
247	9925.00	9935.00	10	2.00	RHS	Plum Concrete
248	9935.00	9945.00	10	2.00	RHS	Plum Concrete
249	9985.00	9995.00	10	2.00	RHS	Plum Concrete
250	9995.00	10005.00	10	5.00	RHS	RCC Relief Shelves
251	10005.00	10015.00	10	2.00	LHS	Plum Concrete
252	10005.00	10015.00	10	5.00	RHS	RCC Relief Shelves
253	10015.00	10025.00	10	5.00	RHS	RCC Relief Shelves
254	10025.00	10035.00	10	5.00	RHS	RCC Relief Shelves
255	10035.00	10045.00	10	3.00	RHS	Plum Concrete
256	10045.00	10055.00	10	4.00	RHS	Plum Concrete
257	10055.00	10065.00	10	3.00	RHS	Plum Concrete
258	10065.00	10075.00	10	5.00	RHS	RCC Relief Shelves
259	10075.00	10085.00	10	6.00	RHS	RCC Relief Shelves
260	10085.00	10095.00	10	4.00	RHS	Plum Concrete
261	10095.00	10105.00	10	4.00	RHS	Plum Concrete
262	10135.00	10145.00	10	2.00	RHS	Plum Concrete
263	10145.00	10155.00	10	3.00	RHS	Plum Concrete
264	10155.00	10165.00	10	2.00	RHS	Plum Concrete
265	10165.00	10175.00	10	2.00	RHS	Plum Concrete
266	10175.00	10185.00	10	2.00	RHS	Plum Concrete

Sr.No.	Chainage		Length in m	Height in m	Remarks	Type
	From	To				
267	10335.00	10345.00	10	2.00	RHS	Plum Concrete
268	10365.00	10375.00	10	2.00	RHS	Plum Concrete
269	10475.00	10485.00	10	2.00	RHS	Plum Concrete
270	10485.00	10495.00	10	2.00	RHS	Plum Concrete
271	10495.00	10505.00	10	2.00	RHS	Plum Concrete
272	10505.00	10515.00	10	4.00	RHS	Plum Concrete
273	10515.00	10525.00	10	5.00	RHS	RCC Relief Shelves
274	10525.00	10535.00	10	5.00	RHS	RCC Relief Shelves
275	10535.00	10545.00	10	6.00	RHS	RCC Relief Shelves
276	10545.00	10555.00	10	8.00	RHS	RCC Relief Shelves
277	10555.00	10565.00	10	5.00	RHS	RCC Relief Shelves
278	10565.00	10575.00	10	2.00	RHS	Plum Concrete
279	10855.00	10865.00	10	2.00	LHS	Plum Concrete
280	10865.00	10875.00	10	3.00	LHS	Plum Concrete
281	10875.00	10885.00	10	2.00	LHS	Plum Concrete
282	11075.00	11085.00	10	2.00	LHS	Plum Concrete
283	11085.00	11095.00	10	3.00	LHS	Plum Concrete
284	11385.00	11395.00	10	2.00	LHS	Plum Concrete
285	11495.00	11505.00	10	2.00	LHS	Plum Concrete
286	11505.00	11515.00	10	2.00	RHS	Plum Concrete
287	11505.00	11515.00	10	4.00	LHS	Plum Concrete
288	11515.00	11525.00	10	4.00	LHS	Plum Concrete
289	12145.00	12155.00	10	3.00	LHS	Plum Concrete
290	12155.00	12165.00	10	3.00	LHS	Plum Concrete
291	12165.00	12175.00	10	5.00	LHS	RCC Relief Shelves
292	12175.00	12185.00	10	2.00	LHS	Plum Concrete
293	12285.00	12295.00	10	2.00	LHS	Plum Concrete
294	12295.00	12305.00	10	3.00	LHS	Plum Concrete
295	12305.00	12315.00	10	2.00	LHS	Plum Concrete
296	12315.00	12325.00	10	2.00	LHS	Plum Concrete
297	12325.00	12335.00	10	2.00	LHS	Plum Concrete
298	12335.00	12345.00	10	2.00	LHS	Plum Concrete
299	12345.00	12355.00	10	2.00	LHS	Plum Concrete
300	12365.00	12375.00	10	2.00	LHS	Plum Concrete
301	12375.00	12385.00	10	3.00	LHS	Plum Concrete
302	12435.00	12445.00	10	2.00	LHS	Plum Concrete
303	12495.00	12505.00	10	2.00	LHS	Plum Concrete
304	12505.00	12515.00	10	4.00	LHS	Plum Concrete
305	12515.00	12525.00	10	2.00	LHS	Plum Concrete
306	12545.00	12555.00	10	2.00	LHS	Plum Concrete
307	12555.00	12565.00	10	3.00	LHS	Plum Concrete

Sr.No.	Chainage		Length in m	Height in m	Remarks	Type
	From	To				
308	12685.00	12695.00	10	2.00	LHS	Plum Concrete
309	12695.00	12705.00	10	2.00	LHS	Plum Concrete
310	12705.00	12715.00	10	2.00	LHS	Plum Concrete
311	12715.00	12725.00	10	2.00	LHS	Plum Concrete
312	12735.00	12745.00	10	2.00	LHS	Plum Concrete
313	12745.00	12755.00	10	2.00	LHS	Plum Concrete
314	12915.00	12925.00	10	2.00	LHS	Plum Concrete
315	13065.00	13075.00	10	2.00	RHS	Plum Concrete
316	13285.00	13295.00	10	2.00	RHS	Plum Concrete
317	13295.00	13305.00	10	2.00	RHS	Plum Concrete
318	13305.00	13315.00	10	2.00	RHS	Plum Concrete
319	13315.00	13325.00	10	4.00	RHS	Plum Concrete
320	13325.00	13335.00	10	5.00	RHS	RCC Relief Shelves
321	13335.00	13345.00	10	3.00	RHS	Plum Concrete
322	13345.00	13355.00	10	3.00	RHS	Plum Concrete
323	13385.00	13395.00	10	2.00	RHS	Plum Concrete
324	13395.00	13405.00	10	3.00	RHS	Plum Concrete
325	13405.00	13415.00	10	2.00	RHS	Plum Concrete
326	13415.00	13425.00	10	3.00	RHS	Plum Concrete
327	13575.00	13585.00	10	2.00	RHS	Plum Concrete
328	13585.00	13595.00	10	2.00	RHS	Plum Concrete
329	13915.00	13925.00	10	3.00	RHS	Plum Concrete
330	13925.00	13935.00	10	3.00	RHS	Plum Concrete
331	13935.00	13945.00	10	2.00	RHS	Plum Concrete
332	13945.00	13955.00	10	2.00	RHS	Plum Concrete
333	13955.00	13965.00	10	2.00	RHS	Plum Concrete
334	13965.00	13975.00	10	3.00	RHS	Plum Concrete
335	13975.00	13985.00	10	3.00	RHS	Plum Concrete
336	14515.00	14525.00	10	5.00	RHS	RCC Relief Shelves
337	14525.00	14535.00	10	12.00	RHS	RCC Relief Shelves
338	14535.00	14545.00	10	12.00	RHS	RCC Relief Shelves
339	14565.00	14575.00	10	3.00	RHS	Plum Concrete
340	14575.00	14585.00	10	4.00	RHS	Plum Concrete
341	14585.00	14595.00	10	5.00	RHS	RCC Relief Shelves
342	14595.00	14605.00	10	6.00	RHS	RCC Relief Shelves
343	14605.00	14615.00	10	3.00	LHS	Plum Concrete
344	14605.00	14615.00	10	6.00	RHS	RCC Relief Shelves
345	14615.00	14625.00	10	6.00	RHS	RCC Relief Shelves
346	14625.00	14635.00	10	6.00	RHS	RCC Relief Shelves
347	14635.00	14645.00	10	6.00	RHS	RCC Relief Shelves
348	14645.00	14655.00	10	6.00	RHS	RCC Relief Shelves

Sr.No.	Chainage		Length in m	Height in m	Remarks	Type
	From	To				
349	14655.00	14665.00	10	5.00	RHS	RCC Relief Shelves
350	14665.00	14675.00	10	5.00	RHS	RCC Relief Shelves
351	14675.00	14685.00	10	4.00	RHS	Plum Concrete
352	14685.00	14695.00	10	3.00	RHS	Plum Concrete
353	14695.00	14705.00	10	3.00	RHS	Plum Concrete
354	14705.00	14715.00	10	2.00	RHS	Plum Concrete
355	14715.00	14725.00	10	2.00	RHS	Plum Concrete
356	14725.00	14735.00	10	2.00	RHS	Plum Concrete
357	14735.00	14745.00	10	2.00	RHS	Plum Concrete
358	14905.00	14915.00	10	3.00	RHS	Plum Concrete
359	14945.00	14955.00	10	2.00	RHS	Plum Concrete
360	14955.00	14965.00	10	2.00	RHS	Plum Concrete
361	14965.00	14975.00	10	2.00	RHS	Plum Concrete
362	14975.00	14985.00	10	2.00	RHS	Plum Concrete
363	15005.00	15015.00	10	10.00	LHS	RCC Relief Shelves
364	15175.00	15185.00	10	3.00	RHS	Plum Concrete
365	15185.00	15195.00	10	5.00	RHS	RCC Relief Shelves
366	15195.00	15205.00	10	3.00	RHS	Plum Concrete
367	15205.00	15215.00	10	3.00	RHS	Plum Concrete
368	15215.00	15225.00	10	2.00	RHS	Plum Concrete
369	15345.00	15355.00	10	2.00	RHS	Plum Concrete
370	15355.00	15365.00	10	2.00	RHS	Plum Concrete
371	15365.00	15375.00	10	2.00	LHS	Plum Concrete
372	15375.00	15385.00	10	2.00	RHS	Plum Concrete
373	15385.00	15395.00	10	2.00	RHS	Plum Concrete
374	15395.00	15405.00	10	2.00	RHS	Plum Concrete
375	15405.00	15415.00	10	2.00	RHS	Plum Concrete
376	15415.00	15425.00	10	2.00	RHS	Plum Concrete
377	15425.00	15435.00	10	2.00	RHS	Plum Concrete
378	15435.00	15445.00	10	3.00	RHS	Plum Concrete
379	15445.00	15455.00	10	2.00	RHS	Plum Concrete
380	15455.00	15465.00	10	2.00	RHS	Plum Concrete
381	15505.00	15515.00	10	12.00	LHS	RCC Relief Shelves
382	15685.00	15695.00	10	2.00	RHS	Plum Concrete
383	15695.00	15705.00	10	3.00	RHS	Plum Concrete
384	15705.00	15715.00	10	4.00	RHS	Plum Concrete
385	15715.00	15725.00	10	4.00	RHS	Plum Concrete
386	15725.00	15735.00	10	5.00	RHS	RCC Relief Shelves
387	15735.00	15745.00	10	4.00	RHS	Plum Concrete
388	15745.00	15755.00	10	4.00	RHS	Plum Concrete
389	15755.00	15765.00	10	4.00	RHS	Plum Concrete

Sr.No.	Chainage		Length in m	Height in m	Remarks	Type
	From	To				
390	15765.00	15775.00	10	4.00	RHS	Plum Concrete
391	15775.00	15785.00	10	3.00	RHS	Plum Concrete
392	15785.00	15795.00	10	3.00	RHS	Plum Concrete
393	15795.00	15805.00	10	3.00	RHS	Plum Concrete
394	15855.00	15865.00	10	2.00	RHS	Plum Concrete
395	15875.00	15885.00	10	3.00	RHS	Plum Concrete
396	15905.00	15915.00	10	2.00	RHS	Plum Concrete
397	15915.00	15925.00	10	2.00	RHS	Plum Concrete
398	15925.00	15935.00	10	2.00	RHS	Plum Concrete
399	15955.00	15965.00	10	2.00	RHS	Plum Concrete

Note: The wall length is indicative and shall be estimated by the EPC contractor.

B) Maintenance & Repair of Protection Works:- **The work done of following retaining wall locations is incomplete by earlier EPC contractor** and need to repair as per Technical statndards. Repair works like Backfilling ,Filter media, Weep Holes, Coping as per specifications in following Retaining wall which chainages are given below:-

Sl. No	Chainages		Description	Side	Length (M)
	From	To			
1	4+280	4+299	Retaining wall	RHS	19
3	5+267	5+290	Retaining wall	RHS	23
4	5+620	5+639	Retaining wall	RHS	19
6	6+380	6+413	Retaining wall	LHS	33
7	6+520	6+535	Retaining wall	LHS	15
8	6+705	6+724	Retaining wall	LHS	19
9	8+620	8+644	Retaining wall	RHS	24
10	8+650	8+662	Retaining wall	RHS	12
11	9+290	9+309	Retaining wall	RHS	19
12	9+752	9+820	Retaining wall	RHS	68
13	13+480	13+533	Retaining Wall	RHS	53
14	13+920	13+940	Retaining wall	RHS	20
				Total	**324**

12.2. Toe wall

The requirement of the Toe walls is generated only when the road has been in use and problems of the slope line have been identified. These are proposed at locations having

hill with steep slope & height of filling are more and retaining wall height more than 6.0 m along with valley side toe protection.

Sr.No.	Chainage		Length in m	Height in m	Remarks
	From	To			
1	1095.00	1105.00	10	2.00	RHS
2	1105.00	1115.00	10	2.00	RHS
3	1115.00	1125.00	10	2.00	RHS
4	1125.00	1135.00	10	2.00	RHS
5	1135.00	1145.00	10	2.00	RHS
6	1145.00	1155.00	10	2.00	RHS
7	7145.00	7155.00	10	2.00	RHS
8	7155.00	7165.00	10	2.00	RHS
9	14525.00	14535.00	10	3.00	RHS
10	15505.00	15515.00	10	3.00	LHS
11	Disposal Portion		100	3.00	
12	Disposal Portion		150	2.00	

Note: The wall length is indicative and shall be estimated by the EPC contractor.

12.3. Gabion Wall:

The requirement of the Gabion wall is generated only where the road is aligned along a saddle portion, Near bus stand & river bank or a nala (stream) slope failure and erosion of toe has also to be prevented and valley side slope made stable These are proposed at locations having hill with steep slope, having soil matrix Soil Mixed with Boulders and sharp curve portion. It is also proposed where the road side excavated spoils dumping area and embankment toe.

Sr. No.	Chainage		Length in m	Height in m	Remarks
	From	To			
1	2320	2370	50	2	Sliding Portion
2	3195	3465	270	2	Sinking Portion
3	3540	3695	155	3	Sinking Portion
4	4085	4145	60	2	Sliding Portion
5	4285	4370	85	2	Sinking Portion
6	4390	4390	0	2	Sinking Portion
7	4520	4545	25	3	Sinking Portion
8	4660	4735	75	3	Sinking Portion
9	5200	5285	85	2	Sinking Portion
10	5455	5575	120	2	Sinking Portion
11	6905	6970	65	2	Sinking Portion
12	14595	14705	110	2	Sinking Portion
13	3100	3600	500	3	Disposal Yard on RHS
14	12060	12135	75	2	Disposal Yard

The wall length is indicative and shall be estimated by the EPC contractor.

12.4. Breast Wall:

A) The requirement of the breast walls is generated only when the road has been in use and problems of the slope line have been identified. These are proposed at locations having hill with steep slope, having soil matrix Soil Mixed with Boulders and sharp curve portion. It is also proposed where the rain water spills all around causing mud flow.

Plum concrete shall be use in construction of Breast wall.

Sr. No.	Chainage		Length in m	Height in m	Side	Remarks
	From	To				
1	3090	3130	40.00	3.00	LHS	Merging with Existing Road
2	3290	3375	85.00	3.00	LHS	
3	3695	3720	25.00	2.00	LHS	
4	3815	3855	40.00	2.00	LHS	Junction with Bermick Road
5	4285	4315	30.00	2.00	LHS	
6	5775	5830	55.00	2.00	LHS	
7	6000	6055	55.00	2.00	LHS	
8	6125	6185	60.00	2.00	LHS	
9	6200	6260	60.00	2.00	LHS	
10	6280	6320	40.00	3.00	RHS	Junction with Yanyang Road
11	6320	6390	70.00	2.00	RHS	
12	7070	7135	65.00	2.00	LHS	
13	8040	8130	90.00	2.00	LHS	
14	8165	8260	95.00	2.00	LHS	
15	8455	8530	75.00	3.00	LHS	
16	9325	9555	230.00	3.00	LHS	
17	9615	9690	75.00	3.00	LHS	
18	9740	9790	50.00	3.00	LHS	
19	10070	10100	30.00	3.00	LHS	
20	10110	10200	90.00	3.00	LHS	
21	10360	10460	100.00	2.00	LHS	
22	10460	10540	80.00	2.00	LHS	
23	10865	10915	50.00	2.00	RHS	
24	11530	11555	25.00	2.00	RHS	
25	11555	11670	115.00	2.00	RHS	
26	11685	11725	40.00	2.00	RHS	
27	11765	11825	60.00	2.00	RHS	
28	11875	11910	35.00	2.00	RHS	

Sr. No.	Chainage		Length in m	Height in m	Side	Remarks
	From	To				
29	11920	11985	65.00	2.00	RHS	
30	12360	12430	70.00	2.00	RHS	
31	12450	12560	110.00	2.00	RHS	
32	12820	12895	75.00	2.00	RHS	
33	12935	12975	40.00	2.00	LHS	Junction with Timi Road
34	13070	13170	100.00	2.00	LHS	
35	13225	13505	280.00	2.00	LHS	
36	13595	13630	35.00	3.00	LHS	
37	13870	13935	65.00	2.00	LHS	
38	13955	14035	80.00	3.00	LHS	
39	14070	14170	100.00	3.00	LHS	
40	14250	14320	70.00	2.00	LHS	
41	14350	14405	55.00	3.00	LHS	
42	14450	14500	50.00	2.00	LHS	
43	14855	14890	35.00	3.00	LHS	
44	14975	15295	320.00	3.00	LHS	
45	15140	15180	40.00	3.00	LHS	Junction with NH-310
46	15360	15505	145.00	2.00	LHS	
47	15985	16000	15.00	2.00	LHS	

Note: The wall length is indicative and shall be estimated by the EPC contractor.

B) **Maintenance & Repair of Protection Works: - The work done of following breast wall locations is incomplete by earlier EPC contractor** and need to repair as per Technical standards. Repair works like Backfilling ,Filter media, Weep Holes, Coping in following Locations of Breast wall shall be completed as per specifications which are given below:-

Chainage		Description	Side	Length (m)
From	To			
6+290	6+306	Breast wall	RHS	16
6+480	6+496	Breast wall	RHS	16
8+635	8+660	Breast wall	LHS	25
9+282	9+314	Breast wall	LHS	32
9+364	9+394	Breast wall	LHS	30
11+120	11+135	Breast wall	RHS	15
11+155	11+176	Breast wall	RHS	21
11+705	11+725	Breast wall	RHS	20
12+679	12+741	Breast wall	RHS	62
			Total	**237 m**

12.5. Cut Slope wall / Revetment wall :

Slope protection along hill side to protect the public properties and soil exposed face on hill side Height of wall varies from 3m to 5.0 m and shall be constructed with M 15 PCC .Length of wall – 6500 m

Location will be finalized during construction stage as per site conditions in consultation with NHIDCL / AE

12.6. Vetiver Plantation, Hydro Seeding and Hydro Mulching etc or similar works is to be done for slope protection and site mitigation measure upto a height of 12-15 m all along the slopes in each cutting locations except hard rock location which needs to be protected with appropriate applicable technologies, if required. Turfing with Sods on hill side slope shall be as per MoRTH Specifications

12.7. Spreading & Compaction of Roadway cutting and excavation from drain and foundation of other structures surplus material in layers not exceeding 300mm thickness at selected disposal location by Dozer at least four passes including construction of approach road to dumping site.

12.8. Land Slide Clearance in soil: Clearance of landslides in soil , ordinary rock and rock disposal of the same on the valley side/selected disposal side.

Sr. No.	Landslide Location		Disaster Type	Soil/Rock Condition	Landslide Size	
	Start	End			Length	Width
1	2320	2370	Sliding/Sliding	Bed Rock	50	50
2	3195	3465	Sliding/Sliding	Very Soft	270	50
3	3540	3695	Sliding/Sliding	Soft	155	30
4	4085	4145	Sliding/Sliding	Soft	60	80
5	4285	4370	Sliding/Sliding	Soft	85	180
6	4390	4490	Sliding/Sliding	Bed Rock	100	
7	4520	4545	Sliding/Sliding	Bed Rock	25	30
8	4660	4735	Sliding/Sliding	Bed Rock	75	
9	5200	5285	Sliding/Sliding	Soft	85	60
10	5455	5575	Sliding/Sliding	Bed Rock	120	40
11	6905	6970	Sliding/Sliding	Soft	65	

Sr. No.	Landslide Location		Disaster Type	Soil/Rock Condition	Landslide Size	
	Start	End			Length	Width
12	14595	14705	Sliding/Sliding	Bed Rock	110	50

Note: The length is indicative and shall be estimated by the EPC contractor.

12.9. Mitigation measure adopted in above location

Sr.No.	Description	Unit	Quantity
1	Seeding and Mulching (Soil Cut Slope)	sqm	30000
2	Vegetation Mat (Steep Slope)	sqm	1400
3	Crib Work (F300)	sqm	900
4	Crib Work (F500)	sqm	1600
5	Groundwater Drainage Work	meter	4500
6	Anchor Work	Rm	1600
7	Rock-bolt Work	Rm	800
8	Turfing with Sods	sqm	25000

However, 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 AE for review through the proof consultant and implement it accordingly thereafter.

Any increase in quantity over and above the tentative quantity as mentioned in above tables or through change in specifications will not be considered for payment as change of scope. Therefore Contractor shall make through investigation of the site and assess the requirement of slope protection and slide prone zones and other safety features on his own before submission of bid.

12.10. Dismantling of Structures

Dismantling of existing structures like culverts, bridges, retaining walls and other structure comprising of masonry, cement concrete, wood work, steel work, including T&P and scaffolding wherever necessary, sorting the dismantled material, disposal of unserviceable material and stacking the serviceable material with all lifts and lead of 1000 metres.

No of culvert & other cross drainage structure 65 No.

Nos of retaining wall, breast wall & other protection structure 460 Nos

12.11. Dismantling of Flexible Pavements

Dismantling of flexible pavements and disposal of dismantled materials up to a lead of 1000 metres, stacking serviceable and unserviceable materials separately

Length of existing pavement - 13.00 Km

12.12. Removal of landslide

Clearance of landslides in soil and ordinary rock and disposal of the same on the valley side.

12.13. Disposal of cut material

Disposal of cut material at designed disposal area. Spreading & Compaction of Roadway cutting and excavation from drain and foundation of other structures surplus material in layers not exceeding 300mm thickness at selected disposal location by Dozer at least four passes including construction of approach road to dumping site.

Construction of Plum concrete Toe wall

Construction of Gabion W**a**ll

12.14. Realignments

S. No	Design Chainage (Km)		Length (m)
	From	To	
1	0	3+100	3100

13. Change of Scope

The length of Structures and bridges specified hereinabove 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 undertaken in accordance with the provisions of Article 13.

Schedule - D

(See Clause 2.1)

Specifications and Standards

1. Construction

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

2. Design Standards

The Project Highway including Project Facilities shall conform to design requirements set out in the following documents:
Manual of Specifications and Standards for Two Laning of Highways (IRC: SP: 73), referred to herein as the Manual
Code for Practice of Road Signs IRC 67:2001.
The Hill Road Manual IRC SP 48 -1998 should be referred.

THE NATIONAL GREEN TRIBUNAL PRINCIPAL BENCH, NEW DELHI on 01th Nov, 2018

Following recommendations and suggestions have been made for dumping muck & dumping yard:-

a. Before dumping muck at the dumping yard first of all retaining/ gabion walls of specified capacity and suitable design should be constructed.

b. All the dumping sites should be properly designed with retaining wall/gabion structures and should be maintained regularly in order to check the spillage of the muck down the slope and into the rivers and other places.

c. Wherever boulders are rolling down along with much, gabion structures/retaining wall should have sufficient foundation and bottom width should be 4-5 m. Length of one gabion structure should not be more than 6-8 m. Wherever more length of gabion structure is required one gabion structure should be bound with another

d. If any new dumping sites are identified in future, then the retaining / gabion structures should be constructed at suitable vertical interval of 5-6 m so that entire disposed muck may not exert pressure only at one wall/ toe wall rather the load of muck should be distributed on different walls.

e. Angle of repose of muck should be maintained between 30 to 450. Long slopes should be intercepted to several short ones with the help of 1.5 to

2.0 m wide berms / terraces/ benches in between in order to maintain less than critical velocity for runoff water and simultaneously mass erosion with be controlled.

f. The capacity/ volume of muck disposal site should be more than volume of muck to be disposed.

g. Proper sign boards indicating the name, number, location, dumping capacity, etc. should be installed at all the dumping sites.

h. Dumping sites which are full of their capacity they should be rehabilitated with local grass or shrubs. Jute geo textile (JGT) may also be used for establishment of vegetation at vulnerable sites.

i. Gabion walls should be constructed above HFL of River. If slope is very high to construct a gabion wall then a RCC/stone masonry retaining wall should be given at bank of River after proper design including foundation. Height of this wall should be well above the HFL of River.

j. Proper protection measures should be taken along with river-side stretch in order to stop spilling/falling of muck into the river.

k. All construction sites should follow and comply with the provisions of the Construction and Demolition Waste Management Rules, 2016".

3. The contractor shall ensure maintaining plan/profile/x-sections approved by Authority's Engineer and any slope protection required shall be considered incidental to the original work with no extra payment/change of scope on this account.

Annex -I

(Schedule-D)

Annex –I: Specifications and Standards for Construction

1. Specifications and Standards

All Materials, works and construction operations shall conform to the Manual of Specifications and Standards for Two-Laning of Highways (IRC:SP:73), referred to as the Manual, and MORTH Specifications for Road and Bridge Works. Where the specification for a work is not given, Good Industry Practice shall be adopted to the satisfaction of the Authority's Engineer.

2. Deviations from the Specifications and Standards

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