SCHEDULE – B

(See Clause 2.1)

DEVELOPMENT OF THE PROJECT HIGHWAY

1 **Development of the Project Highway**

Development of the Project Highway in accordance with IRC SP: 84-2014 shall primarily include design and construction of the Project Highway as described in this Schedule-B and in Schedule-C.

2 Four laning with paved shoulder

Four laningshall include widening and strengthening ofthe Project Highway as described inAnnex-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 IRC SP: 84-2014.

Annex I

(Schedule-B)

Description of Four Laning

[Note: Description of the Project Highway shall be given by the Authority in detail together with explanatory drawings (where necessary) to explain the Authority's requirements precisely in order to avoid subsequent changes in the Scope of the Project. The particulars that must be specified in this Schedule-B are listed below as per the requirements of the Manual of Standards and Specifications for Four Laning of Highways (IRC: SP: 84-2014), referred to as the Manual or IRC codal provision as applicable. If any standards, specifications or details are not given in the Manual/IRC codal provisions as applicable, the minimum design/construction requirements shall be specified in this Schedule. In addition to these particulars, all other essential project specific details, as required, should be provided in order to define the Scope of the Project clearly and precisely.

1. SCOPE OF THE PROJECT

1.1 GENERAL

The following sections of this schedule briefly highlight the scope of the work of the 'Project'. The descriptions of the requirements for the various elements of the Project Highway given here in under are the bare minimum requirements for the 'Project'.

In the planning, design and execution of the works and other works in connection with the repair, maintenance or improvement of the Project Highway and functions associated with the construction of the Project Highway and roadside facilities, the Construction Contractor shall take all such actions and do all such things (including, but not limiting to, organizing itself, adopting measures and standards, executing procedures, including inspection procedures and highway patrols, and engaging and managing agents and employees) as will;

a. enable the NHIDCL to provide an acceptably safe highway in respect of its condition (structural safety) and use (road safety);

b. enable the NHIDCL to fulfill its statutory and common law obligations;

c. enable the NHIDCL to provide a congestion free uninterrupted flow of traffic on the Project Highway;

d. enable the NHIDCL to provide a level of highway service to the public not inferior to that provided on the trunk road during construction or improvement works;

e. enable the police, local authorities, and others with statutory duties or functions in relation to the Project Highway or adjoining roads to fulfill those duties and functions;

f. minimize the occurrence and adverse effects of accidents and ensure that all accidents and emergencies are responded to as quickly as possible;

g. minimize the risk of damage, destruction or disturbance to third party property;

h. ensure that members of the public are treated with all due courtesy and consideration;

i. provide a safe, clear and informative system of road signs;

j. comply with any specified programme requirements, including for the completion of the new road;

k. enable standards of reliability, durability, accessibility, maintainability, quality control and assurance, and fitness for purpose appropriate to a highway of the character of the Project Highway to be achieved throughout the Contract Period;

l. ensure adequate off-street parking facilities for both passenger and goods vehicles;

m. provide adequate bus bays for stopping of buses and bus shelters for commuters to wait under protection;

n. achieve a high standard in the appearance and aesthetic quality of the Project Highway and achieve integration of the Project Highway with the character of the surrounding landscape through both sensitive design and sensitive management of all visible elements including those on the existing road;

o. Undertake proper safety audit through an appropriate consultant (i.e. apart from the Authority Engineer)

p. Carry out accident recording and reporting (to NHIDCL) by type on regular basis; and

q. Ensure adequate safety of the Project Workers on the work site.

2. WIDENING OF THE EXISTING HIGHWAY

2.1 There is no existing alignment.

Notwithstanding the basic alignment plans enclosed with this document the Construction Contractor shall himself carryout and be responsible for engineering surveys, investigation and detailed engineering designs and prepare the working drawings for all the components relevant for the improvement and up-gradation of the Project Highway to fulfill the scope of the project as envisaged hereinunder. These shall comply with design specifications and standards given in **Schedule–D.** The designs for different project facilities shall follow the locations and indicative designs given in **Schedule–C** and shall comply with design specifications and standards outlined in **Schedule–D.** All the designs and drawings shall be reviewed by the Authority Engineer prior to execution.

The Project Highway shall follow 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 [plain/rolling] terrain to

the extent land is available.

2.2 Width of Carriageway

2.2.1 The Construction of Four Lane with paved shoulder from Km 132.375 to Km 153.058 of Dimapur Bypass shall be undertaken. The width of carriageway in open country, built up areas and approaches of grade separated structures shall be as per the manual (IRC SP 84:2014) (hereinafter called the 'Manual') unless otherwise specified in this Schedule-B and Schedule-D.

2.2.2 Locations of built up areas as under: The Cross section of the Carriageway to be adopted in the table below:

Sl no	Built up areas	Design Chainage (km)	Typical Cross Section of the Manual
NIL			

2.2.3 Except as otherwise provided in this Agreement, the width of the paved carriagewayand cross-sectional features shall conform to paragraph 2.1 above.

3. GEOMETRIC DESIGN AND GENERAL FEATURES

3.1 General

Geometric design and general features of the Project Highway shall be in accordance with Section 2 of the Manual. [IRC SP 84:2014]

3.2 Design speed

The design speed shall be Ruling 100 kmph & Minimum 80 Kmph for Plain and Rolling terrain, and Ruling 60 kmph & Minimum 40 Kmph for the mountainous and steep terrain, wherever applicable.

3.3 Improvement of the existing road geometries

There is no existing Road.

In the following sections, where improvement of the existing road geometrics to the 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:

SNO	Stretch	Type of deficiency	Remark
NIL			

3.4 Proposed Right of Way

[Refer to paragraph 2.3 of the Manual]. Details of the proposedRight of Way are tabulated below.

Sl. No	Design Chainage		Length	Width (m)
	From	To		
1.	132.375	153.058	20.683	45.00 to 60.00

3.4.1 The Scheduled date on which the Authority shall provide ROW to the contractor is given in Annexure-II of Schedule A

3.5 Type of Shoulders

The Shoulders along the project shall be made in accordance with clause 2.6.1 of the Four lane Manual (IRC: SP 84:2014)

3.6 Lateral and vertical clearances at underpasses

3.6.1 Lateral and vertical clearances at underpasses and provision of guardrails/crash barriers shall be as per paragraph 2.10 of the Four Lane Manual (IRC: SP 84:2014).

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

Sl No.	**Location [Chainage (km)]**		**Span/Opening (m)**	**Remarks**
	From	**To**		
Nil				

3.7 Lateral and vertical clearances at overpasses

3.7.1 Lateral and vertical clearances at overpasses shall be as per paragraph 2.10 of the Four Lane Manual (IRC: SP 84:2014).

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

Sl No.	**Location [Chainage (km)]**		**Span/Opening (m)**	**Remarks**
	From	**To**		

Sl No.	Location [Chainage (km)]		Span/Opening (m)	Remarks
	From	To		
Nil				

3.8 Service roads

Service roads shall be constructed at the locations and for the lengths indicated below[Refer to paragraph 2.12.2 of the Four Lane Manual i.e IRC: SP:84:2014 and provide details]

Sl No.	Location of Service Road (km)		Right Hand Side (RHS) / Left Hand Side (LHS) / Both Sides	Length (km) of Service Road
	From	To		
1.	137+807	138+131	LHS	0.324
2.	138+131	138+308	RHS	0.177
3.	145+220	146+150	Both sides	1.860
4.	150+150	150+595	LHS	0.445
5.	150+595	150+919	RHS	0.324
TOTAL				3.130

3.9 Grade Separated Structures

3.9.1 Grade separated structures shall be provided as per section 3 of the Four Lane Manual (IRC: SP 84:2014).
There is one grade separated structure/Flyover:

Sl No.	Location of Structure	Number and Length of Spans (m)	Remarks, if any
1	145+700	1X12	Flyover

3.10 Cattle and pedestrian underpass / Overpass

Pedestrian & Cattle underpasses and underpasses are to be designed as per the four lane manual IRC: SP:84-2014.

(1) Pedestrian underpass

Sl No.	Location	Vertical Clearance (m)
1	150+595	3.00

(2) Cattle underpass

Sl No.	Location	Type of Crossing (m)
1	3+1001	3.00

2	**138+131**	**3.00**

3.11 Typical cross-sections of the Project Highway

Typical cross-sections to be followed as per IRC: SP-84:2014 and in addition the proposed cross section for various situations are given in TCS 1A, 1B, 1C, 2, 3 & 4. These illustrate the new construction for the project highway.

3.12 Longitudinal Section

As a minimum, the Construction Contractor shall achieve the proposed finished road level as indicated in the plan and profile drawings.

3.13 Built-Up Areas

The alignment passes through Built up areas as tabulated below.

Sno	Location/Chainage		Name of Village/town etc
	From (Km)	To (Km)	
Nil			

4. INTERSECTIONS AND GRADE SEPARATORS

All intersections shall be as per Section3 of the Manual IRC: SP:84-2014. 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 table below:

(a) At-grade Intersections

Major Intersections:

Sno	**Location of Intersection, Km of Project Highway**		**Type of Intersection**	**Other Features**	
	Existing Chainage (Km)	**Proposed Chainage (Km)**		**LHS**	**RHS**
1	**-**	**153+054**	**T**	**NH-39**	

Minor Junctions

Sno	**Location of Intersection,**		**Type of Intersection**	**Other Features**

	Km of Project Highway				
	Existing Chainage (Km)	Proposed Chainage (Km)		LHS	RHS
1	-	132+630	X	VILLAGE Road	Purana Bazar
2	-	133+305	X	VILLAGE Road	Purana Bazar
3	-	140+569	X	Nihoto	Henivi
4	-	144+272	X	Kobutak	Showba
5	-	150+325	X	Seithekema C	Village road
6	-	152+625	T	Patkai Christian college	-

Grade Separated Structures

Sno	Bridge Location (km)	Span Arrangement (M)	Remarks
1	145+700	1X12	Flyover

5. PAVEMENT DESIGN

5.1 Pavement design shall be carried out in accordance with section 5 of the Manual(IRC: 84-2014)& IRC 58.

5.2 Type of pavement

The contractor is to adopt rigid pavement for the project highway.

5.3 Design requirements

Geometric design should be as per the four lane manual [IRC:SP:84-2014]

5.3.1 Design Period and strategy

The project highway should have deign life of 30 years and the type of pavement is rigid .

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 25.97 million standard axles as follows.

PACKAGE	Design Chainage (km)		Length (km)	30 Year MSA*
	From	To		
Dimapur-bypass	132.375	153.058	20.683	103.92

Year	2W	3W	Car	Jeep/Car	Mini Bus	Bus	Mini Truck		2 Axle Truck	3 Axle Truck	Total
							Pass	Freight			
Traffic count in 2015	1176	1411	2268	1494	271	244	61	735	1887	544	10090
Conversion factor	0.5	0.8	1	1	2.2	3.5	2.2	2.2	3.5	3.5	
PCU	588	1128.8	2268	1494	596.2	854	134.2	1617	6604.5	1904	17188.7

5.3.3 Design Parameters

The Minimum crust thickness to be adopted for the rigid pavement shall also be provided as below:

Crust Details		Thickness
Drainage Layer/GSB	=	150 mm
DLC	=	150 mm
PQC	=	300 mm
Total Thickness	**=**	**600mm**

The above crust thickness is for design life of 30 years and to sustain design traffic of 25.97 MSA, the thickness of typical cross section of the proposed rigid pavement with sub-grade of 500mm thickness with 7% CBR.

6. ROADSIDE DRAINAGE

Drainage system including surface and subsurface drains for the Project Highwayshall be provided as per the Four Lane Manual (IRC: SP 84:2014)

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

6.1 Drainage Measures

Following measures shall be adopted:

i) Triangular Shaped Drain (lined) of Minimum 2708 Rm .
ii) Open side Trapezoidal drains (Unlined)of Minimum 18051 Rm
iii) Toe wall of ht. 4.0 m of minimum length 2708 Rm

6.2 Slope Protection Measures

6.2.1 Breast Wall (minimum provision= 903 Rm)

Following measures shall be adopted:

Slope protection along hill slope side shall be with breast wallswith PCC minimum M15 grade concrete.However, at the zones prone to sliding breast walls will be of sausage type (by stone-mesh gabions).Retaining wall has been considered at valley sides. The height of breast walls is of Avg Ht. 3.5 as per site requirement and to be finalized by consultation with Authority Engineers. The breast wall of height 3.5 m has been considered if the height of hill cut is more than 9m and in this circumstances 3m berm with catch water drain is required to beprovided. The maximum cut slope at hill side is 55^0 (0.7H to 1V).

6.2.2 Embankment less than 3m in height shall be turfed as per MoRTH Specifications.

6.2.3 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 mall along theslopesin each cutting locations except hard rock location which needs to be protected with appropriate applicable technologies, if required.

7.0 Culverts

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

7.1.2 Reconstruction of existing culverts

The following existing HP/Box culverts are proposed for reconstruction with Box Culvert.

Sno	Chainage Location	Size	Type
1	Km 141.271	2 X3	Box Culvert
2	Km 148.136	2X3	Box Culvert
3	Km 148.951	2X3	Box Culvert
4	Km 152.746	2X3	Box Culvert

7.1.3 Additional New Culverts: The following culverts are to be constructed as new culvert.

Sno	Chainage Location	Size	Type
1	Km 132.537	2 X 2	Box Culvert
2	Km 132.695	2 X 2	Box Culvert
3	Km 132.828	2 X 2	Box Culvert
4	Km 133.327	2 X 2	Box Culvert

5	Km 133.483	2 X 2	Box Culvert
6	Km 133.667	2 X 2	Box Culvert
7	Km 133.804	2 X 2	Box Culvert
8	Km 134.202	2 X 2	Box Culvert
9	Km 134.385	2 X 2	Box Culvert
10	Km 135.253	2 X 2	Box Culvert
11	Km 135.476	2 X 2	Box Culvert
12	Km 136.054	2 X 2	Box Culvert
13	Km 136.248	2 X 2	Box Culvert
14	Km 136.455	2 X 2	Box Culvert
15	Km 136.634	2 X 2	Box Culvert
16	Km 136.847	2 X 2	Box Culvert
17	Km 137.074	2 X 2	Box Culvert
18	Km 137.257	2 X 2	Box Culvert
19	Km 137.473	2 X 2	Box Culvert
20	Km 137.681	2 X 2	Box Culvert
21	Km 137.891	2 X 2	Box Culvert
22	Km 138.812	2 X 2	Box Culvert
23	Km 138.970	2 X 2	Box Culvert
24	Km 139.173	2 X 2	Box Culvert
25	Km 139.367	2 X 2	Box Culvert
26	Km 139.580	2 X 2	Box Culvert
27	Km 140.315	2 X 2	Box Culvert
28	Km 140.425	2 X 2	Box Culvert

29	Km 140.696	2 X 2	Box Culvert
30	Km 140.858	2 X 2	Box Culvert
31	Km 141.335	2 X 2	Box Culvert
32	Km 141.578	2 X 2	Box Culvert
33	Km 142.174	2 X 2	Box Culvert
34	Km 142.359	2 X 2	Box Culvert
35	Km 142.591	2 X 2	Box Culvert
36	Km 142.929	2 X 2	Box Culvert
37	Km 143.046	2 X 2	Box Culvert
38	Km 143.321	2 X 2	Box Culvert
39	Km 143.620	2 X 2	Box Culvert
40	Km 144.787	2 X 2	Box Culvert
41	Km 144.929	2 X 2	Box Culvert
42	Km 145.090	2 X 2	Box Culvert
43	Km 145.257	2 X 2	Box Culvert
44	Km 146.112	2 X 2	Box Culvert
45	Km 146.328	2 X 2	Box Culvert
46	Km 146.975	2 X 2	Box Culvert
47	Km 147.150	2 X 2	Box Culvert
48	Km 147.605	2 X 2	Box Culvert
49	Km 147.900	2 X 2	Box Culvert
50	Km 148.410	2 X 2	Box Culvert
51	Km 148.685	2 X 2	Box Culvert
52	Km 149.115	2 X 2	Box Culvert

53	Km 149.350	2 X 2	Box Culvert
54	Km 149.561	2 X 2	Box Culvert
55	Km 149.825	2 X 2	Box Culvert
56	Km 150.120	2 X 2	Box Culvert
57	Km 151.041	2 X 2	Box Culvert
58	Km 151.182	2 X 2	Box Culvert
59	Km 151.309	2 X 2	Box Culvert
60	Km 151.846	2 X 2	Box Culvert
61	Km 152.428	2 X 2	Box Culvert
62	Km 152.608	2 X 2	Box Culvert
63	Km 133.954	2 X 3	Box Culvert
64	Km 134.592	2 X 3	Box Culvert
65	Km 134.748	2 X 3	Box Culvert
66	Km 135.028	2 X 3	Box Culvert
67	Km 138.498	2 X 3	Box Culvert
68	Km 138.678	2 X 3	Box Culvert
69	Km 139.890	2 X 3	Box Culvert
70	Km 141.015	2 X 3	Box Culvert
71	Km 141.154	2 X 3	Box Culvert
72	Km 141.947	2 X 3	Box Culvert
73	Km 143.848	2 X 3	Box Culvert
74	Km 144.555	2 X 3	Box Culvert
75	Km 146.719	2 X 3	Box Culvert
76	Km 147.350	2 X 3	Box Culvert

77	Km 151.635	2 X 3	Box Culvert

Theseare guidelines for minimum provisions. However, contractor has to design as per requirement of road in accordance with the four lane Manual (IRC:SP 84-2014) and latest applicable IRC codes.

7.2 Bridges

7.2.1 The existing bridges to be reconstructed/widened

(i) The existing bridges at the following locations shall be reconstructed as new structures(Minor Bridge)

Sl No.	Existing Chainage	Design Chainage	Proposed Span(m)	Proposed Width(m)	Remarks
Nil					

Sl No	Bridge Location (km)	Salient Details of Existing Bridge					Adequacy or Otherwise of the Existing Waterway, Vertical Clearance etc.	Remarks
		Span Arrangement (m)	Carriageway Width (m)	Total Width (m)	Type of Superstructure	Type of Foundation		
Nil								

7.2.2 The following structures shall be provided with footpaths:

Sl No.	Location (km)	Remarks
Nil		

7.2.3 Additional New Minor Bridges

New minor bridges at the following locations on the project highways shall be constructed

Sl No.	Bridge at km	Span Arrangement	Remarks
1	134+781	1X24	Minor
2	152+093	1X16	Minor

7.2.4 Additional new Major bridges

New major bridges at the following locations on the project highways shall be constructed

Sl No.	Bridge at km	Span Arrangement	Remarks
1	135+781	3X21	Major

7.2.5 The railings of existing bridges shall be replaced by crash barriers at the following locations:
[Refer to paragraph 7.18 (iv) of the Manual and provide details]

Sl No.	Location (km)	Remarks
Nil		

7.2.6 Repairs/replacements of railings/parapets of the existing bridges shall be undertaken as follows:
[Refer to paragraph 7.18 (v) of the Manual and provide details]

Sl No.	Location (km)	Remarks
Nil		

7.2.7 Drainage system for bridge decks

An effective drainage system for bridge decks shall be provided as specified in paragraph 7.21 of the Manual

7.2.8 Structures in marine environment

[Refer to paragraph 7.22 of the Manual and specify the necessary measures / treatments for protecting structures in marine environment, where applicable]

7.3 Rail-road Bridges

7.3.1 Design, construction and detailing of ROB/RUB shall be as specified in section 7 of the Manual. [Refer to paragraph 7.19 of the Manual and specify modification, if any]

7.3.2 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 (km)	Length of Bridge (m)
Nil		

7.3.3 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 (km)	Number and Length of Span (m)
Nil		

7.4 Underpasses/Overpasses

Vehicular Underpass

Sno	Location of Structure (km)	Junction layout below the structure
NIL		

Pedestrian Underpass

Sno	Vertical Clearance (m)
150+595	3.00

Cattle Underpass

Sno	Vertical Clearance (m)
133+100	3.00
138+131	3.00

7.5 Repairs and strengthening of bridges and structures

[Refer to paragraph 7.23 of the Manual and provide details]
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 Bridge (km)	Nature and Extent of Repairs/Strengthening to be Carried out
Nil		

C. Overpasses / Underpasses and Other Structures

Sl No.	Location of	Nature and Extent of Repairs/Strengthening to be Carried out

	Bridge (km)	
Nil		

7.6 List of Major Bridges and Structures

The following is the list of Major Bridges

Sl No.	Location (km)
Nil	

8.0 TRAFFIC CONTROL DEVICES AND ROAD SAFETY WORKS

8.1 General

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

Specificationsof the reflective sheeting [Refer to paragraph 9.3 of the Manual andspecify]

Traffic signs and pavements markings shall include roadside signs, overhead signs, curve amounted signs and road marking along the Project Highway. The design and marking for the project Highway shall be as per design standards indicated in **Schedule–D** and the location for various treatments shall be finalized in consultation with the Authority Engineer and NHIDCL.

The road markings shall be applied to lane lines, road center lines, edge lines, continuity line, stop lines, give way lines, directional arrows, diagonal/chevron markings, and Zebracrossings at parking areas.

PCC kerbs (duly painted) approximately 460 RM (minimum) shall be provided by EPC Contractor in busbays and Islands.

8.2 Traffic Signs

(i) A complete range of permanent retro-reflective traffic signs as per the requirements defined in but not limited to the FPR, for the safe and efficient movement of traffic. These sign are to be of regulatory, warning and informatory types and placed on the roadside except at the start and end of the project road and start and end of two bypasses where overhead directional and lane designation signs shall be mounted on the steels portals.

(ii) Temporary traffic and construction signs are to be provided during construction and maintenance operations for traffic diversion and pedestrian safety.

8.3 Pavement Marking

(i) Retro-reflective thermoplastic paint is proposed for use.
The road markings shall be applied to lane lines, road center lines, edge lines, continuity line, stop lines, give way lines, diagonal/chevron markings, Zebra crossings and at parking areas.

i) Delineators bollards and other safety devices shall be provided on entire project Highway and other locations as directed by NHIDCL.

ii) All signs shall be the reflectorized type with high intensity retro-reflective sheeting conforming to ASTM D 4956-01, type VIII and /or type IX of micro prismatic type. All sign boards of size more than 1.2 m and less than 0.9 m shall be provided at the locations finalized in consultation with NHIDCL.

iii) Cautionary sign boards (900mm Equilateral Triangle), stop sign (900mm Octagonal) mandatory sign boards(600mm dia), Village name boards (600X900mm), Hazard Plate (300X900mm), chevron signboard (600X750mm), Facility information sign (600X800mm), Advance direction sign (1800X1200mm), Place identification sign (1200X900mm) shall be provided by the Construction Contractor with suitable interval in consultation with NHIDCL.

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

9.0 ROADSIDE FURNITURE

9.1.1 Roadside furniture shall be provided in accordance with the provisions of Section 11 of the Manual.

Retro- reflectorised Traffic signs	Minimum provision
90 cm equilateral triangle	85.00
60 cm equilateral triangle	75.00
60 cm circular	65.00
80 mm x 60 mm rectangular	65.00
60 cm x 45 cm rectangular	75.00
60 cm x 60 cm square	45.00
90 cm high octagon	65.00

90 cm Circular	65.00
Identification signs upto 0.9 sqm size	9.60
Identification signs with more than 0.9 sqm size	16.20
Overhead Signs	2.00
5th Kilometer stones#	8.00
Hectometer Stone (precast) #	166.00
Ordinary Km Stone (precast) #	27
Road Delineators	1000
RCC M15 Boundary pillar	2070
Cable duct	200(single row)+540 (double row)

The marking of all stones will be done considering total length of bypass i.e 35.008 Km on the directions of NHIDCL.

10.0 COMPULSORY AFFORESTATION

[Refer to paragraph 12.1 of the Manual and specify the number of trees which arerequired to be planted by the Contractor as compensatory afforestation.]

Minimum 850 nos. trees are required to be planted.

11.0 HAZARDOUS LOCATIONS

Metal Beam crash barrier length of minimum 8545.28 Rm (single runner, heavy duty and W-shape) shall be provided at the locations of bridge approaches and high embankments (3.0m and more), 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 NHIDCL. Typical details of metal crash barrier are given in as per manual.

The safety barriers, protective works shall also be provided at the hazardous location/lengths. The minimum quantity of protection work is presented in the following table:

Type of Protection Work		
Protection Work	**Unit**	**Quantity**
Breast wall with PCC avg ht 3.5 m	Rm	903

12.0 ROAD LAND BOUNDARY

As per the Clause 12.2 of Manual (IRC: SP:84:2014).

Road land (ROW) boundary shall be demarcated by putting RCC boundary pillars of size 60cm x 15cm x 15 cm embedded in concrete (as per IRC:25) along the Project Highway at 200 m interval on both sides. All the components used in delineating road land boundary shall be aesthetically pleasing, sturdy and vandal proof. The road land boundary shall be demarcated in consultation with NHIDCL.

13.0 SPECIAL REQUIREMENT FOR HILL ROADS

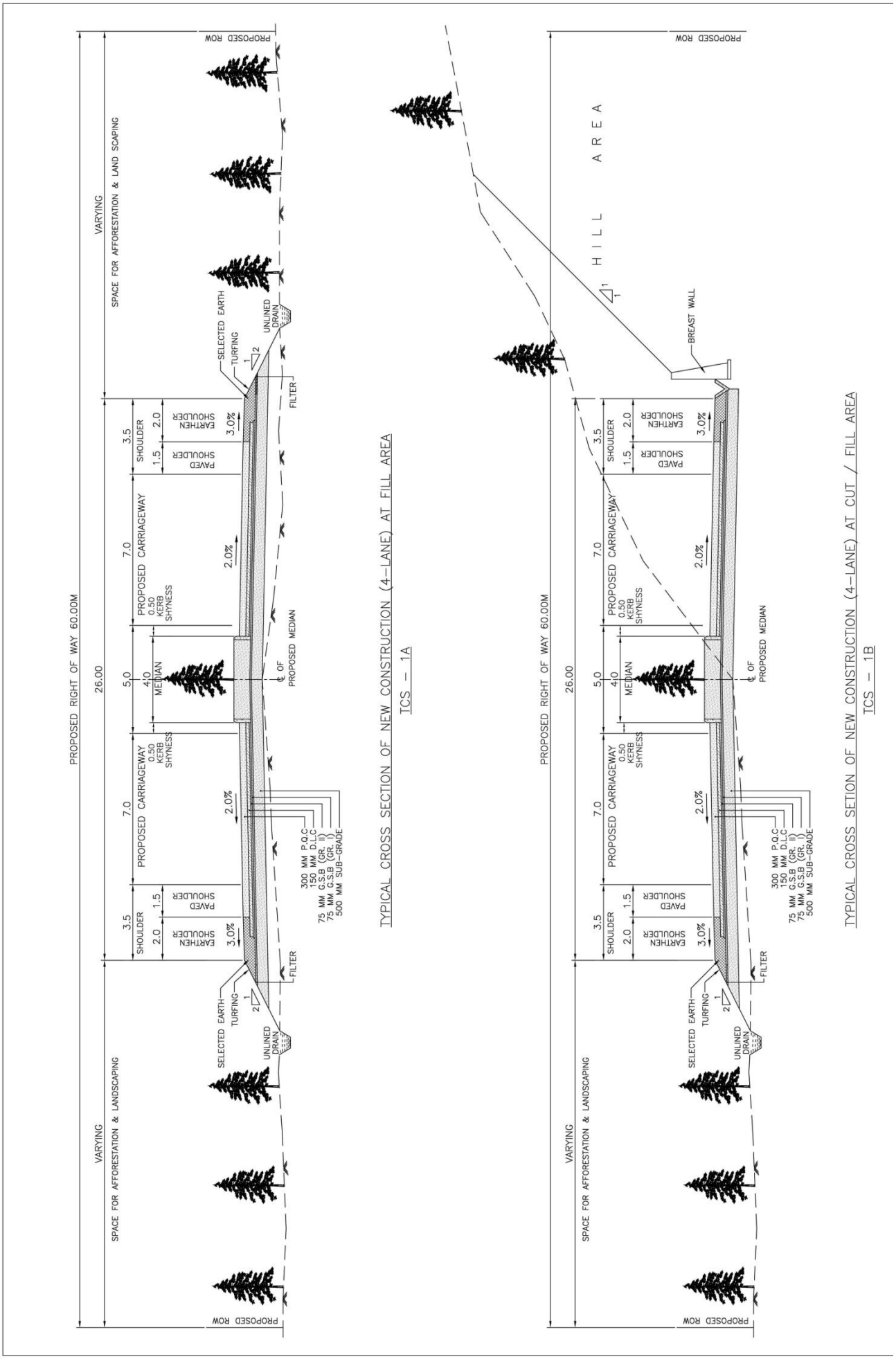
[Refer to paragraphs 14.5 and 14.8 of the Manual and provide details where relevant and required.]

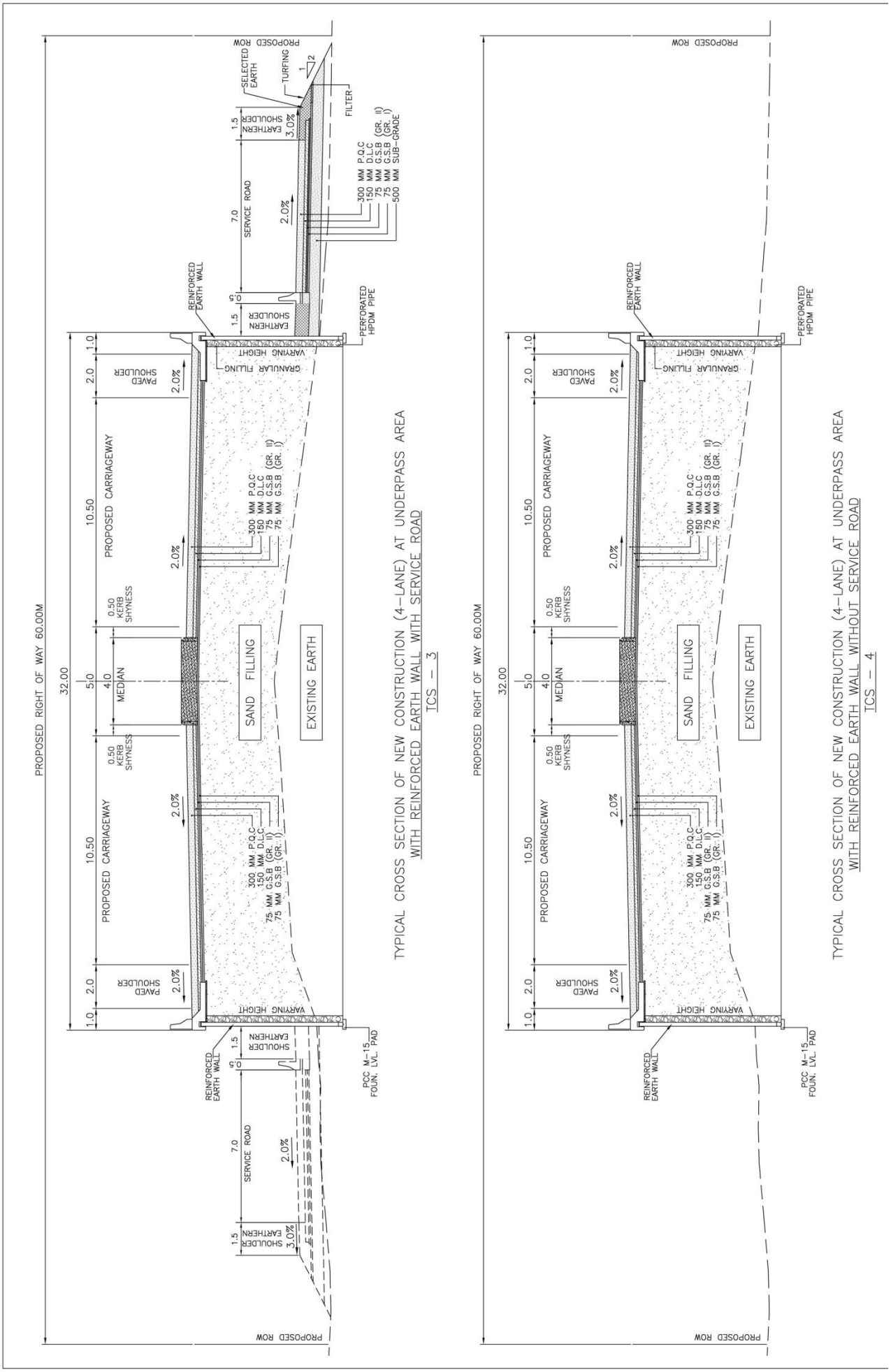
14.0 CHANGE OF SCOPE

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 of DCA.

Applicable Stretches of Typical Cross-section

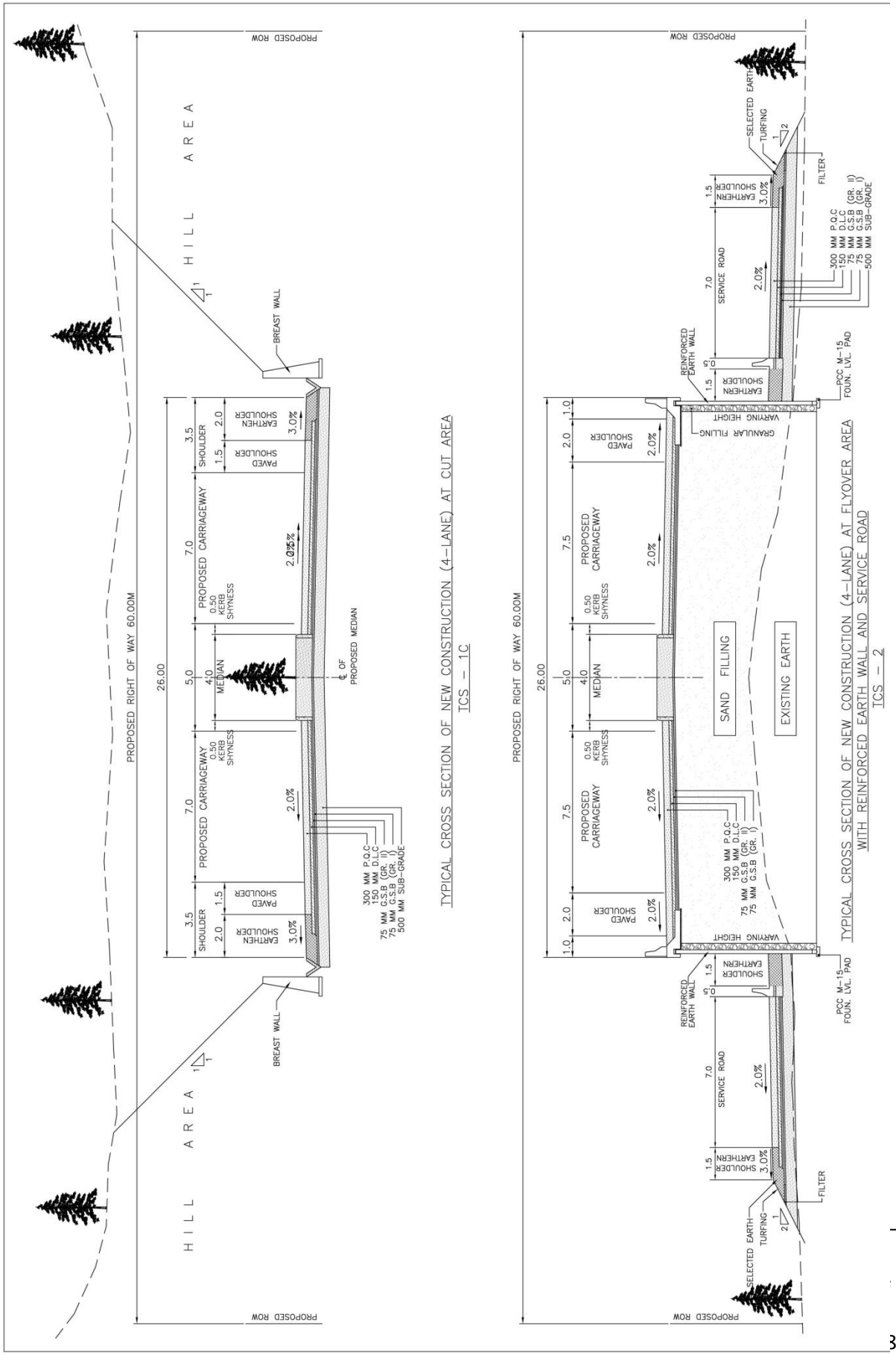
Sl No	Chainage (Km)		Length (M)	TCS Type	Remarks
	From	To			
1	132+375	132+975	600.000	TCS - 1A,1B & 1C	
2	132+975	133+093	118.000	TCS - 4	
3	133+093	133+106	13.440	STRUCTURE PORTION	
4	133+106	133+266	159.560	TCS - 4	
5	133+266	134+829	1563.000	TCS - 1A,1B & 1C	
6	134+829	134+861	31.840	STRUCTURE PORTION	
7	134+861	135+745	884.160	TCS - 1A,1B & 1C	
8	135+745	135+816	71.440	STRUCTURE PORTION	
9	135+816	137+947	2130.560	TCS - 1A,1B & 1C	
10	137+947	138+124	177.000	TCS - 3	
11	138+124	138+137	13.440	STRUCTURE PORTION	
12	138+137	138+308	170.560	TCS - 3	
13	138+308	145+360	7052.000	TCS - 1A,1B & 1C	
14	145+360	145+690	330.000	TCS - 2	
15	145+690	145+709	19.440	STRUCTURE PORTION	
16	145+709	146+012	302.560	TCS - 2	
17	146+012	150+336	4324.000	TCS - 1A,1B & 1C	
18	150+336	150+588	252.000	TCS - 3	
19	150+588	150+601	13.440	STRUCTURE PORTION	
20	150+601	150+778	176.560	TCS - 3	
21	150+778	152+081	1303.000	TCS - 1A,1B & 1C	
22	152+081	152+105	23.840	STRUCTURE PORTION	
23	152+105	153+058	953.160	TCS - 1A,1B & 1C	


PROPOSED RIGHT OF WAY 60.00M
26.00
VARYING
SPACE FOR AFFORESTATION & LAND SCAPING
PROPOSED ROW
SHOULDER 3.5
EARTHEN SHOULDER 2.0
PAVED SHOULDER 1.5
PROPOSED CARRIAGEWAY 7.0
0.50 KERB SHYNESS
MEDIAN 4.0
5.0
3.0%
2.0%
SELECTED EARTH TURFING
UNLINED DRAIN
FILTER
300 MM P.Q.C
150 MM D.L.C
75 MM G.S.B (GR. II)
75 MM G.S.B (GR. I)
500 MM SUB-GRADE
℄ OF PROPOSED MEDIAN
TYPICAL CROSS SECTION OF NEW CONSTRUCTION (4-LANE) AT FILL AREA
TCS – 1A
HILL AREA
BREAST WALL
TYPICAL CROSS SETION OF NEW CONSTRUCTION (4-LANE) AT CUT / FILL AREA
TCS – 1B



TYPICAL CROSS SECTION OF NEW CONSTRUCTION (4-LANE) AT UNDERPASS AREA
WITH REINFORCED EARTH WALL WITH SERVICE ROAD
TCS – 3

TYPICAL CROSS SECTION OF NEW CONSTRUCTION (4-LANE) AT UNDERPASS AREA
WITH REINFORCED EARTH WALL WITHOUT SERVICE ROAD
TCS – 4


PROPOSED ROW
HILL AREA
BREAST WALL
PROPOSED RIGHT OF WAY 60.00M
26.00
3.5
SHOULDER
2.0
EARTHEN SHOULDER
3.0%
1.5
PAVED SHOULDER
7.0
PROPOSED CARRIAGEWAY
0.50 KERB SHYNESS
2.0%
5.0
4.0
MEDIAN
℄ OF PROPOSED MEDIAN
300 MM P.Q.C
150 MM D.L.C
75 MM G.S.B (GR. II)
75 MM G.S.B (GR. I)
500 MM SUB-GRADE
TYPICAL CROSS SECTION OF NEW CONSTRUCTION (4-LANE) AT CUT AREA
TCS - 1C
SELECTED EARTH
TURFING
FILTER
SERVICE ROAD
REINFORCED EARTH WALL
PCC M-15 FOUN. LVL. PAD
VARYING HEIGHT
GRANULAR FILLING
SAND FILLING
EXISTING EARTH
TYPICAL CROSS SECTION OF NEW CONSTRUCTION (4-LANE) AT FLYOVER AREA WITH REINFORCED EARTH WALL AND SERVICE ROAD
TCS - 2