National Highways & Infrastructure Development Corporation Limited

BUILDING INFRASTRUCTURE - BUILDING THE NATION

Ministry of Road Transport & Highways,
(Govt. of India)

SCHEDULES-A, B & H

For

"Construction of 2-lane Aizawl Bypass from km 15.200 to km 34.500 (Package-3) on Sairang - Phaibawk section of NH-6 in the State of Mizoram under Bharatmala Pariyojna on EPC Mode"

December 2022

National Highways & Infrastructure Development Corporation Ltd
3rd floor, PTI Building, 4-Parliament Street,
New Delhi – 110001

Schedules

Schedule-A

(See Clauses 2.1 and 8.1)

Site of the Project

1. The Site

(i) Site of the [Two-Lane] Project Highway shall include the land, buildings, structures and road works as described in **Annex-I** of this Schedule-A.

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

(iii) An inventory of the Site including the land, buildings, structures, road works, trees and any other immovable property on, or attached to, the Site shall be prepared jointly by the Authority Representative and the Contractor, and such inventory shall form part of the memorandum referred to in Clause 8.2 (i) of this Agreement.

(iv) The alignment plans of the Project Highway are specified in **Annex-III**.

(v) The status of the environment clearances obtained or awaited is given in **Annex-IV**.

Annex -I

(Schedule-A)

Annex –I: Site

1. Site

The Site of the Two-Lane Project Highway comprises the section of [National Highway -6] of from Km 15+200 to Km 34+500 of Aizawl Bypass on realignment of NH-6 From Km 163+900 to Km 220+300 on NH-6 (Old NH-54), (from Sairang to Near Phaibawk Village) in the State of Mizoram. The land, carriageway and structures comprising the Site are described below.

Sr. No.	Package No	Design		Remarks
		From	To	
1	P-3	15+200	34+500	Green field Alignment on Northeastern side of Aizawl City

2. Land

The Site of the Project Highway comprises the land (sum total of land already in possession and land to be possessed) as described below:

Sl. No.	Design Chainage (km)		Length in m (Design)	Existing/ Available ROW (m)	Remarks
	From	To			
1	15+200	34+500	19.300	-	Green field Alignment on Northeastern side of Aizawl City

3. Carriageway

New Green field Alignment on Northeastern side of Aizawl City. There is no existing carriageway.

4. Major Bridges

The Site includes the following Major Bridges:

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

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

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

Sr. No.	Chainage (km)	Type of Structure		No. of Spans with span length (m)	Width (m)	ROB/ RUB
		Foundation	Superstructure			

Nil

6. Grade separators

The Site includes the following grade separators:

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

7. Minor bridges

The Site includes the following minor bridges

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

8. Railway level crossings

The Site includes the following railway level crossings

Sr. No.	Location (km)	Remarks
Nil		

9. Underpasses (vehicular, non vehicular)

The Site includes the following underpasses:

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

10. Culverts

The Site has the following culverts:

Sr.No.	Chainage (m)	Type of Culvert	Span /Opening with span length (m)	Width (m)	Remarks
Nil					

11. Bus bays

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

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

12. Truck Lay byes

The details of truck lay byes are as follows:

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

Nil

13. Road side drains

The details of the roadside drains are as follows:

S. No.	Location		Type	
	From km	To km	Masonry/cc (Pucca)	Earthen (Kutcha)
Nil				

14. Major junctions

The details of major junctions are as follows:

Sr. No.	Location (Km)	At grade	Separated	Category of Cross Road			
				NH	SH	MDR	Others
Nil							

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

15. Minor junctions

The details of the minor junctions are as follows:

Sl. No.	Existing Chainage(Km)	Type	Type of junction	Place
Nil				

16. Bypasses

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

S.No.	Name of bypass (town)	Chainage (km) From km to km	Length (in Km)
Nil			

17. Built Up Locations

The following are the Built-up locations on the Project Road.

Sr. No.	Name of Village	Name of Road	Existing Chainage		Block	District
			From	To		
Nil						

18. Details of Existing utilities

The existing utilities are as below:

18.1 Electrical utilities

The site includes the following electrical utilities: -

(a) Extra High-Tension Lines (EHT Lines)

SL.	Chainage		Length (in Km)				Crossings			
	From	To	400KV	220KV	110KV	66KV	400KV	220KV	110KV	66KV
Nil										

b) High Tension/Low Tension Lines (HT/LT Lines) *

SL.	Chainage		No of poles affected			Transformers	
	From	To	33KV	11KV	LT	No	Capacity
1.	CH:0+000	CH: 0+150	Nil	20	Nil	Nil	

18.2 Public Health utilities (Water/Sewage Pipelines)

(a) The site includes the following Public Health utilities: -

S. No	Chainage		Length (in Km)
	From	To	Water Supply line
Nil			

(b) Bore well/Hand Pump within RoW – **Nil**

(c) Water Tank within RoW - **Nil**

18.3 Any Other Lines: **No**

19. Other structures]

[Provide details of other structures, if any.]

Total number of structures on the Site is noted below:

a) Total No. of Major Bridges - Nil

b) Total No. of Railway Over/Under Bridges - Nil

c) Total No. of Minor Bridges - Nil

d) Total No. of Pipe Culverts - Nil

e) Total No. of Slab Culverts - Nil

f) Total No. of Box Culverts - Nil

g) Total No. of Flyovers - Nil

h) Level Crossings - Nil

i) Pedestrian Underpass - Nil

Annex - II

(As per Clause 8.3 (i))

(Schedule-A)

Annex –II: Dates for providing Right of Way of Construction Zone

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

Sl. No	**From km to km**	**Length (km)**	**Width (m)**	**Date of providing Right of Way***
(1)	**(2)**	**(3)**	**(4)**	**(5)**
(i) 90% of Right of Way (full width)	Km 15+200 to Km 34+500	19.30	24m-45m	At Appointed Date
(ii) Balance Right of Way (full width)				Within 150 days after the appointed date

Annex - III

(Schedule-A)

Annex – III: **Alignment Plans**

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

(i) The alignment of the Project Highway is enclosed in alignment plan. Finished road level indicated in the alignment plan shall be followed by the contractor as minimum FRL. In any case, the finished road level of the project highway shall not be less than those indicated in the alignment plan. The contractor shall, however, improve/upgrade the Road profile as indicated in Annex-III based on site/design requirement.

(ii) Traffic Signage plan of the Project Highway showing numbers & location of traffic signs is enclosed. The contractor shall, however, improve/upgrade upon the traffic signage plan as indicated in Annex-III based on site/design requirement as per the relevant specifications/IRC Codes/Manual.

Annex - IV

(Schedule-A)

Annex – IV:Environment Clearances

The following environment clearances have been obtained: [***]

The following environment clearances are awaited: [***]

The project Highway does not require Environment Clearance as per MoRTH corrigendum dated 22.08.2013. The muck dumping sites in forest area stand identified and finalized by Forest department to be abided by agency during dumping of muck as stated in Schedule 'F'.

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]

Two laning shall include construction of Two-Laning with Paved shoulder 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

(Schedule –B)

Annex -I: Description of Two –Laning

Coordinates of Start and End of Project Stretch

Location		UTM Co-ordinate	
Description	**Design Chainage**	**Easting (m)**	**Northing (m)**
Start of Project Road	15+200	465468.306	2632986.558
End of Project Road	34+500	471299.257	2628357.847

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 in accordance with the typical cross sections drawings in the Manual.

Provided that in the built-up areas [refer to paragraphs 2.1 (ii) of the Manual and provide necessary details]: the width of the carriageway shall be as specified in the following table:

Sl. No.	Built-up stretch (Township)	Location in m		Width (m)	Typical cross section (Ref. to Manual)
		From	To		
Nil					

(b) Except as otherwise provided in this Agreement, the width of the paved carriageway and cross-sectional features shall conform to paragraph 1.1(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 Hilly terrain.

(iii) Improvement of the existing road geometrics

Not Applicable due to Green Field Alignment.

(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 open country, [Paved shoulders of 1.5 m width shall be provided with same configuration as main carriageway and hard shoulder 1.0m on valley side 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:

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:

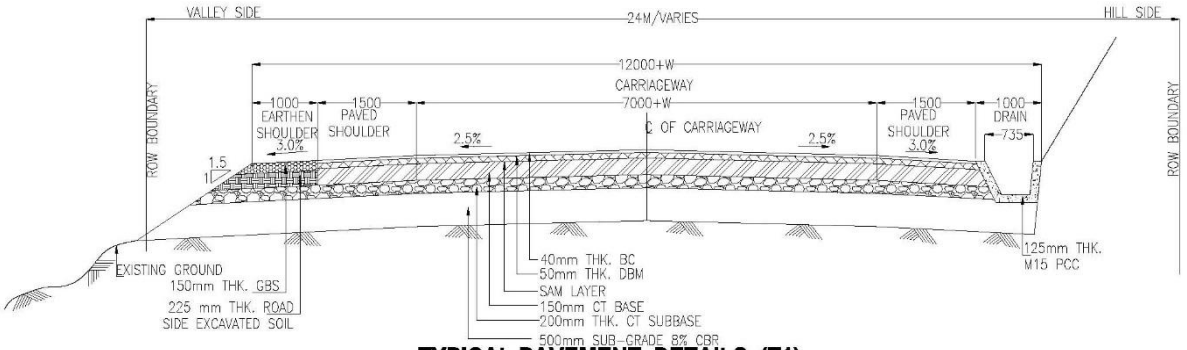
Sl. No.	Location	Type of structure Length (m)	Cross road at			Remarks, if any
			Existing Level	Raised Level	Lowered Level	
Nil						

(x) Cattle and pedestrian underpass /overpass

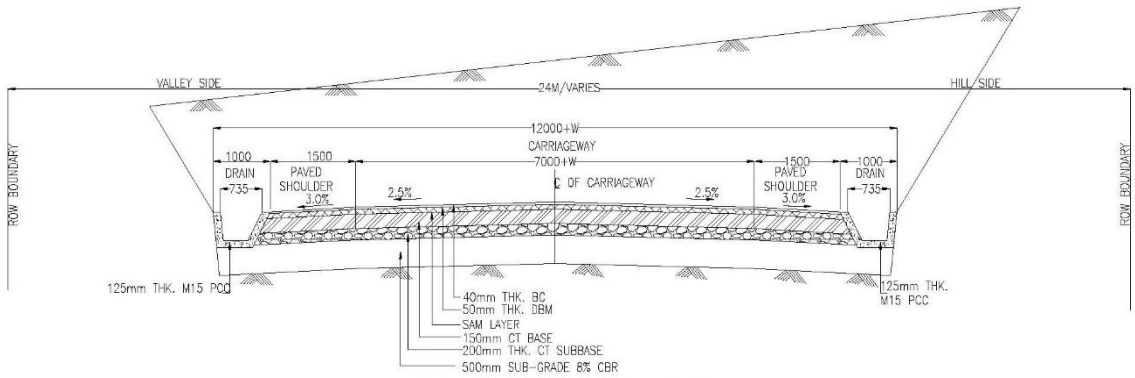
Cattle and pedestrian underpass/ overpass shall be constructed as follows:

Sl. No.	Location	Type of crossing
Nil		

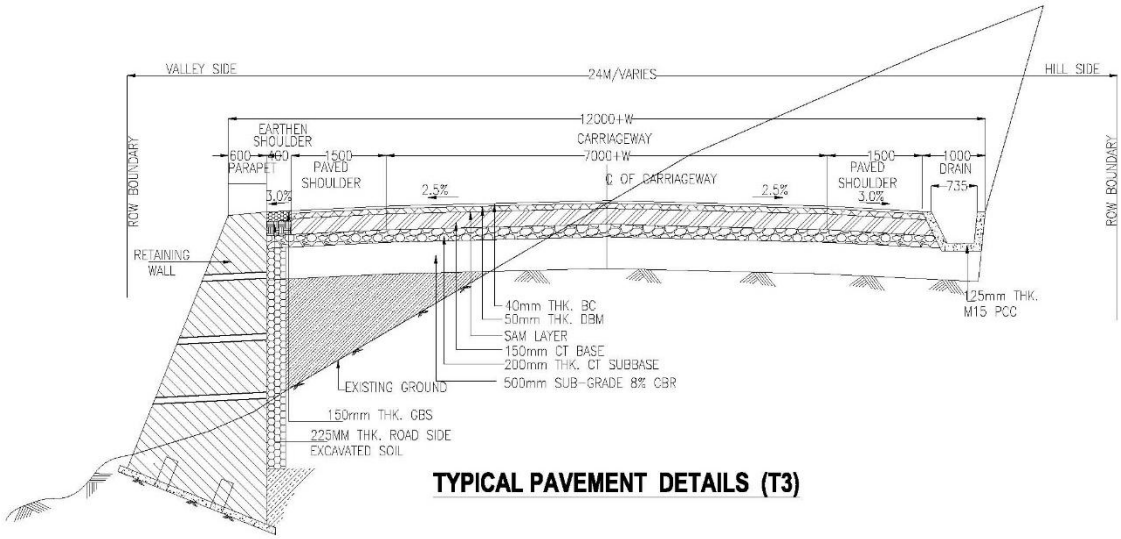
(xi) Typical cross-sections of the Project Highway



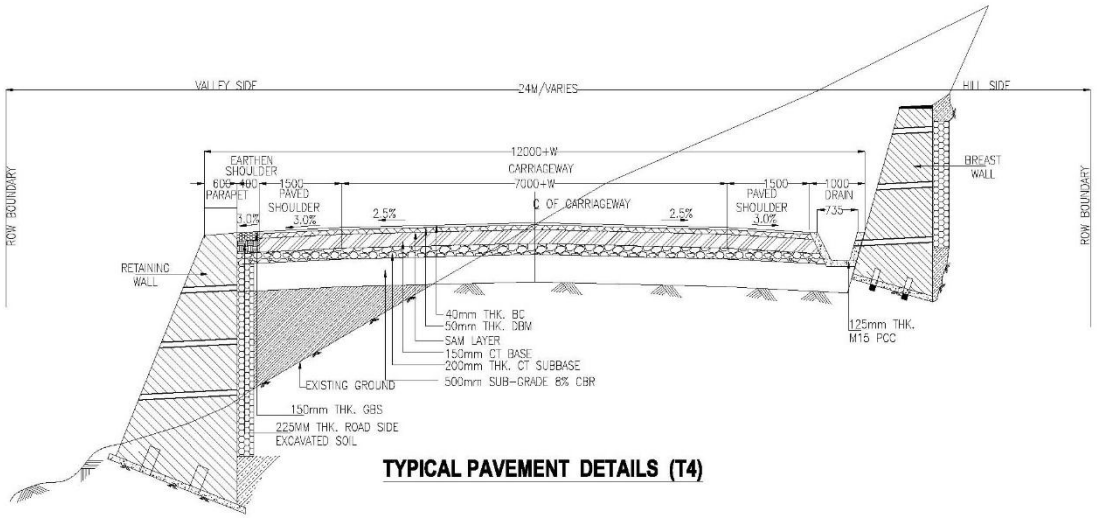
TYPICAL PAVEMENT DETAILS (T1)



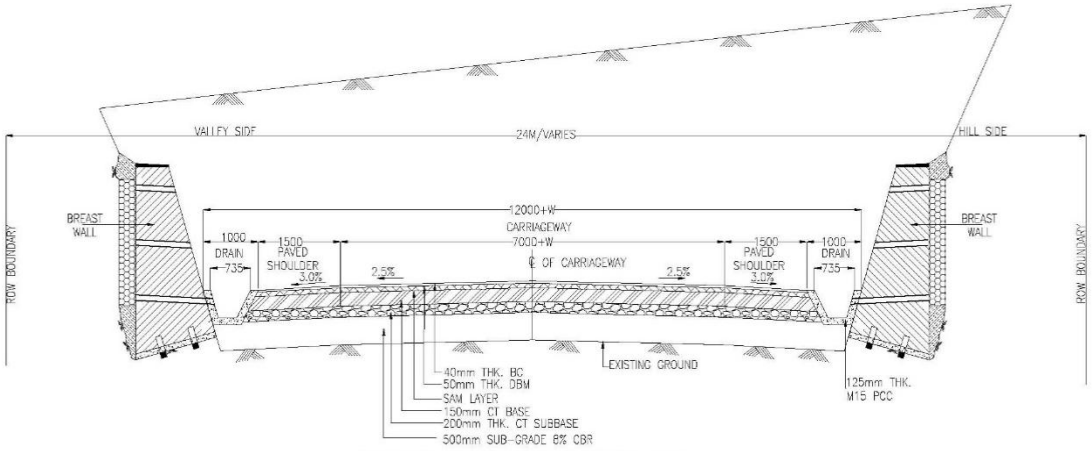
TYPICAL PAVEMENT DETAILS (T2)



TYPICAL PAVEMENT DETAILS (T3)



TYPICAL PAVEMENT DETAILS (T4)



TYPICAL PAVEMENT DETAILS (T5)

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

Sl. No.	Location of intersection	Type of intersection	Other features
1	15+300	Major Junction	Junction with City Road
2	34+500	Major Junction	Junction merging with existing NH-06
3	22+000	Minor Junction	Agriculture Link Road
4	27+900	Minor Junction	Agriculture Link Road

(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 (i), 5.9 & 5.10 of IRC: SP: 73- 2018

b. Design Traffic

As per clause 5.4.1 (i), 5.9 & 5.10 of IRC: SP: 73- 2018

Notwithstanding anything to the contrary contained in this agreement or the manual, the contractor shall design the pavement of main carriageway for design traffic of 20 MSA with a minimum design period of 20 years irrespective of the design traffic. CBR value as obtained at site shall be taken for design if CBR is less than 8%. Maximum value of CBR to be taken for design shall not exceed 8%. Bituminous Grade VG 40 shall be used for BC.

(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	
NIl			

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:

Open side trapezoidal lined 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. 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 in m	Remarks
	From	To		
1	15+200	34+500	17512	Trapezoidal line drain
2	Box cutting portion		10770	Trapezoidal line drain

Sr. No.	Chainage in m		Length in m	Remarks
	From	To		
3	Catch water drain		6460	Trapezoidal Drain

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

6.1 Chutes Drain

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.

Sr.No.	Clear Width of Chute	Length of Chute	Remarks
1	1.85	1600	Type-1
2	2.70	300	Type-2
3	3.20	160	Type-3

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

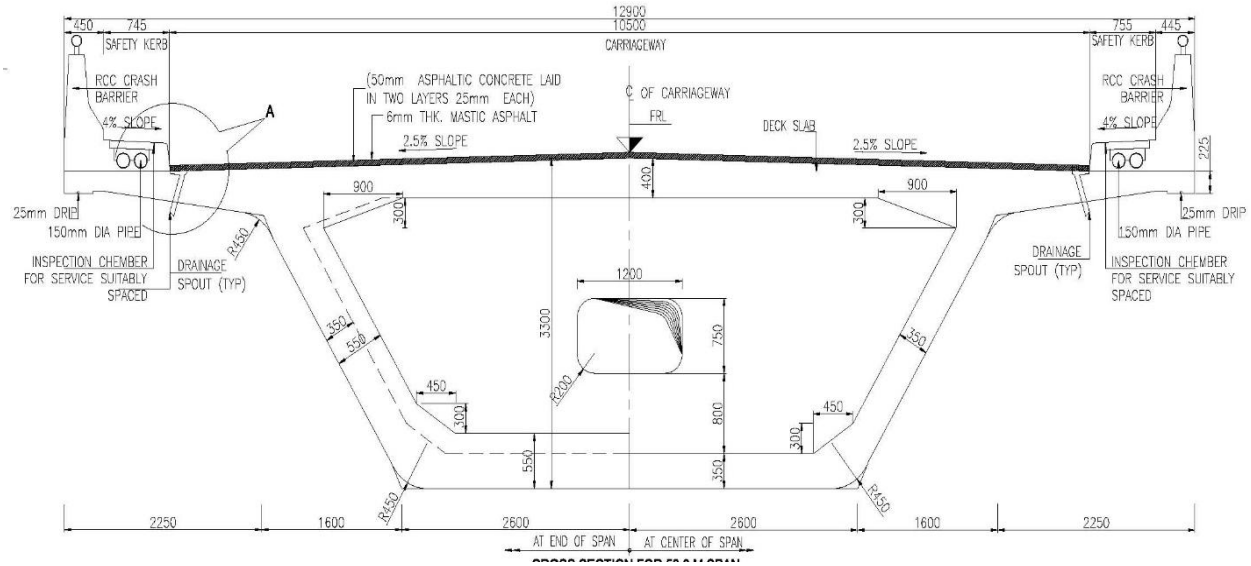
7. Design of Structures

(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	20+580	10.90 m to total width 12.90
2	22+680	10.90 m to total width 12.90
3	24+145	10.90 m to total width 12.90
4	24+405	10.90 m to total width 12.90
5	24+840	10.90 m to total width 12.90
6	33+435	10.90 m to total width 12.90



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

Sr.No.	Location at Km	Remarks
1	20+580	Safety Kerb 0.75 m
2	22+680	Safety Kerb 0.75 m
3	24+145	Safety Kerb 0.75 m
4	24+405	Safety Kerb 0.75 m
5	24+840	Safety Kerb 0.75 m
6	33+435	Safety Kerb 0.75 m

(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	20+580	OFC and Electric cable	
2	22+680	OFC and Electric cable	
3	24+145	OFC and Electric cable	
4	24+405	OFC and Electric cable	
5	24+840	OFC and Electric cable	
6	33+435	OFC and Electric 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:

Sr. No.	Culvert location in m	Span / Opening (m)	Remarks, if any*
Nil			

(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	Culvert location	Type, span, height and width of existing culvert	Repairs to be carried out
Nil			

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

Sr. No.	Culvert location in m	Span / Opening (m)	Remarks, if any*
1	15235	2 X 2	RCC Box
2	15580	2 X 2	RCC Box
3	15740	2 X 2	RCC Box
4	15840	2 X 2	RCC Box
5	16025	3 X 3	RCC Box
6	16240	2 X 2	RCC Box
7	16370	2 X 2	RCC Box
8	16520	2 X 2	RCC Box
9	16800	3 X 3	RCC Box
10	17070	2 X 2	RCC Box
11	17217	4 X 4	RCC Box
12	17290	3 X 3	RCC Box
13	17500	2 X 2	RCC Box
14	17650	3 X 3	RCC Box
15	18150	2 X 2	RCC Box
16	18660	3 X 3	RCC Box
17	18910	2 X 2	RCC Box
18	19300	2 X 2	RCC Box
19	19425	2 X 2	RCC Box
20	19870	2 X 2	RCC Box
21	20105	2 X 2	RCC Box
22	20285	2 X 2	RCC Box
23	20775	2 X 2	RCC Box
24	21090	4 X 4	RCC Box
25	21285	3 X 3	RCC Box
26	21450	4 X 4	RCC Box
27	21835	2 X 2	RCC Box

Sr. No.	Culvert location in m	Span / Opening (m)	Remarks, if any*
28	22055	2 X 2	RCC Box
29	22225	4 X 4	RCC Box
30	22450	4 X 4	RCC Box
31	22505	2 X 2	RCC Box
32	22930	3 X 3	RCC Box
33	23015	3 X 3	RCC Box
34	23290	4 X 4	RCC Box
35	23390	3 X 3	RCC Box
36	23560	5 X 5	RCC Box
37	23840	2 X 2	RCC Box
38	24601	3 X 3	RCC Box
39	25151	3 X 3	RCC Box
40	25245	2 X 2	RCC Box
41	25360	4 X 4	RCC Box
42	25455	4 X 4	RCC Box
43	25620	2 X 2	RCC Box
44	25720	5 X 5	RCC Box
45	25839	2 X 2	RCC Box
46	26156	2 X 2	RCC Box
47	26355	2 X 2	RCC Box
48	26445	2 X 2	RCC Box
49	26605	4 X 4	RCC Box
50	26785	2 X 2	RCC Box
51	26855	2 X 2	RCC Box
52	27044	3 X 3	RCC Box
53	27150	4 X 4	RCC Box
54	27250	5 X 5	RCC Box
55	27500	3 X 3	RCC Box
56	27685	5 X 5	RCC Box
57	27825	2 X 2	RCC Box
58	28380	3 X 3	RCC Box
59	28540	2 X 2	RCC Box
60	28825	2 X 2	RCC Box
61	28925	2 X 2	RCC Box
62	29150	2 X 2	RCC Box
63	29520	5 X 5	RCC Box
64	29605	2 X 2	RCC Box
65	29675	3 X 3	RCC Box
66	29885	2 X 2	RCC Box
67	30050	5 X 5	RCC Box
68	30275	2 X 2	RCC Box
69	30515	4 X 4	RCC Box
70	30640	5 X 5	RCC Box

Sr. No.	Culvert location in m	Span / Opening (m)	Remarks, if any*
71	30925	3 X 3	RCC Box
72	31040	3 X 3	RCC Box
73	31130	4 X 4	RCC Box
74	31455	2 X 2	RCC Box
75	31685	5 X 5	RCC Box
76	31880	2 X 2	RCC Box
77	31960	5 X 5	RCC Box
78	32420	2 X 2	RCC Box
79	32725	3 X 3	RCC Box
80	32925	5 X 5	RCC Box
81	33255	2 X 2	RCC Box
82	33925	2 X 2	RCC Box
83	34150	4 X 4	RCC Box
84	34460	2 X 2	RCC Box

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]

Sl. No.	Bridge Location (Km)	Salient details of existing bridge	Adequacy or otherwise of the existing waterway, vertical clearance,etc	Remarks
Nil				

*Attach GAD

(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				

@ Attach cross-section

(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.

Sr. No.	Location (Km)	Proposed bridges in Package-3 of Aizawl Bypass			
		Type	Span Arrangement	Carria geway	Total width
1	20+580	PSC	3X40	10.5	12.9
2	22+680	PSC	1X20+2X60	10.5	12.9
3	24+145	PSC	1X50+1X60+2X50	10.5	12.9
4	24+405	PSC	1X20+1X50+1X20	10.5	12.9
5	24+840	PSC	2X60+2X50	10.5	12.9
6	33+435	PSC	1X40+2X50+1X40	10.5	12.9

(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

[Refer to paragraph 7.21 of the Manual and specify the necessary measures / treatments for protecting structures in marine environment, where applicable]

(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 2.9 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:

Sr. No.	Location (Km)	Proposed bridges in Package-3 of Aizawl Bypass			
		Type	Span Arrangement	Carria geway	Total width
1	20+580	PSC	3X40	10.5	12.9
2	22+680	PSC	1X20+2X60	10.5	12.9
3	24+145	PSC	1X50+1X60+2X50	10.5	12.9

Sr. No.	Location (Km)	Proposed bridges in Package-3 of Aizawl Bypass			
		Type	Span Arrangement	Carria geway	Total width
4	24+405	PSC	1X20+1X50+1X20	10.5	12.9
5	24+840	PSC	2X60+2X50	10.5	12.9
6	33+435	PSC	1X40+2X50+1X40	10.5	12.9

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.

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

10. **Compulsory Afforestation - Nil**

11. Hazardous Locations

The safety barriers shall also be provided at the following hazardous locations as per Clause 7.18 of the Manual (IRC: SP: 73-2018).W-Beam metal crash barriers shall however be provided for a minimum length at all hazardous locations. All hazardous locations shall be finalized in consultation with the Authority Engineer.

Sl. No.	Location stretches from (Km) to (Km)	Length in m
1	Type - A, "W" : Metal Beam Crash Barrier	3500

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.

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.

The minimum quantity of protection works may be taken as below

Sl.No.	Description	Unit	Quantity

Sl.No.	Description	Unit	Quantity
1	Vetiver grass	Sqm	50000
2	Seeding and Mulching	Sqm	38760
3	Non-woven Coir Erosion Control Blanket	Sqm	38760
4	Turfing with Sods	Sqm	70000
5	Vegetated bamboo crib wall	Rm	13500
6	Retaining wall for 2.0 m Height	Rm	120
7	Retaining wall for 3.0 m Height	Rm	390
8	Retaining wall for 4.0 m Height	Rm	470
9	Retaining wall for 5.0 m Height	Rm	690
10	Retaining wall for 6.0 m Height	Rm	440
11	Retaining wall for 8.0 m Height	Rm	1185
12	Retaining wall for 10.0 m Height	Rm	1590
13	Gabion RE Wall	Sqm	42650
14	Breast Wall 2.00m high	Rm	4310
15	Breast Wall 3.00m high	Rm	2150
16	Gabion Wall 2.00 m high	Rm	1730
17	Gabion Wall 3.00 m high	Rm	1880
18	Toe Wall 2.00 m high	Rm	590
19	Toe Wall 3.00 m high	Rm	880

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

(i) Bio Engineering:

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 8-15 m all along the slopes in each cutting locations except hard rock location which needs to be protected with appropriate applicable technologies, if required.As per Engineering Guidelines on Landslide Mitigation Measures for Indian Roads IRC: SP-106-2015, Clause 8.3.8.1, Table 8.7

(ii) 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 disposals location by Dozer at least four passes including construction of approach road to dumping site and construction of Bamboo crib wall and construction of Gabion Toe wall

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.

14. Utility Shifting

Shifting of obstructing existing utilities indicated in Schedule A to an appropriate location in accordance with the standards and specification of concerned Utility Owning Department is part of the scope of work of the Contractor/Concessionaire. The bidders may visit the site and assess the quantum of shifting of utilities for the projects before submission of their bid. The specification of concerned Utility Owning Department shall be applicable and followed.

Note-I:

a) The type/spacing/size/specifications of poles/towers/lines/cables to be used in shifting work shall be as per the guidelines of utility owning department and it is to be agreed solely between the contractor/Concessionaire and the utility owning department. No change of scope shall be admissible and no cost shall be paid for using different type/spacing/size/specifications in shifted work in comparison to those in the existing work or for making any overhead crossing to underground as per requirement of utility owning department and/or construction of project highway. The contractor/ concessionaire shall carry out joint inspection with utility owning department and get the estimates from the utility owning department. The assistance of the Authority is limited to giving forwarding letter on the proposal of contractor/concessionaire to utility owning department whenever asked by the contractor/concessionaire. The decision/ approval of utility owning department shall be on the contractor/concessionaire.

b) The supervision charges at the rates/charges applicable of the utility owning department shall be paid directly by the Authority to the utility Owning department as and when contractor/concessionaire furnishes demand of utility Owning Department along with a copy of estimated cost given by later.

c) The dismantled material/scrap of existing Utility to be shifted/Dismantled shall belong to the contractor/concessionaire who would be free to dispose-off the dismantled material as deemed fit by them unless the contractor/concessionaire is required to deposit the dismantled material may be availed by the contractor/concessionaire as per estimate agreed between them.

d) The utilities shall be handed over after shifting work is completed to utility Owning Department to their entire satisfaction. The maintenance liability shall rest with the Utility Owning Department after Handing over Process is complete as far as utility shifting works are concerned.

Note-II: Copy of utility shifting plan is enclosed.

14.1. Details of proposed Utilities

Utilities Relocation Plan and its Schedule initially prepared by DPR consultant followed by joint verification with P&E and PHE department in presence of

NHIDCL officers dully certified details as shown below:

14.2. Electrical Utilities

The site includes the following electrical utilities:-

a) Extra High-Tension Lines (EHT Lines)

Sl. No.	Chainage		Length (in Km)				Crossings			
	From	To	400KV	220KV	110KV	66KV	400KV	220KV	110KV	66KV
	NIL									

b) High Tension/ Low Tension Lines(HT/LT Lines)

c)

Sl. No.	Chainage		No of poles affected			Transformers	
	From	To	33KV	11KV	LT	No	Capacity
	CH: 15+200	CH: 34+500	Nil	20	Nil	Nil	

14.3. Public Health utilities (Water/Sewage Pipelines)

(a) The site includes the following Public Health utilities:-

S. No.	Chainage		Length (in Km)
	From	To	Water Supply line
Nil			

(b) Bore well / Hand Pump within ROW – **NIL**

(c) Water Tank - **NIL**

14.4. Any Other line: NIL

15. Utility Duct: NIL

Note: Variation upto 10% in quantities of Utilities to be shifted will not constitute Change of Scope.

Schedule - H

(See Clauses10.1 (iv) and 19.3)

Contract Price Weightages

1.1 The Contract Price for this Agreement is Rs. ******

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

Item	Weightage in percentage to the contract Price		Stage for Payment	Percentage Weightage
1	2		3	4
Road works including culverts, widening and repair of culverts.	52.08%	**B.1**	**Reconstruction/ New 2-Lane realignment/ bypass (Flexible pavement)**	
		1	Earthwork up to top of the sub-grade	60.41%
		2	Earthwork in Shoulders	0.92%
		3	Sub-base Course	8.85%
		4	Non bituminous Base course	5.86%
		5	Bituminous Base course	7.95%
		6	Wearing Coat	5.95%
		D	**Re- Construction and New culverts on existing road,realignments,bypassed:**	
			Culverts (length<6m)	
		a	RCC Box Culvert	10.06%
Major Bridge (length< 60 m.) works and ROB/RUB. Elevated sections/ flyov ers including viaducts, if any	24.23%	**A2**	**New Major Bridges**	
		1	Foundation	15.76%
		2	Sub-structure	17.54%
		3	Super-structure (including bearings)	63.33%
		4	Wearing Coat including expansion joints	1.28%
		5	Miscellaneous items like hand rails, crase barriers, road markings etc.)	2.09%
Other works	23.67%	(i)	Toll plaza	0.00%
		(ii)	Road side drains	5.35%
		(iii)	Road signs markings, km stones, safety devices,…	

Item	Weightage in percentage to the contract Price		Stage for Payment	Percentage Weightage
1	2		3	4
		a	Traffic Sign	0.19%
		b	Pavement marking	1.04%
		c	Direction and Place Identification signs upto 0.9 sqm size board.	0.04%
		d	Boundary stone, km stone,5th km stone, & hectometre stones	0.03%
		e	Traffic blinker LED Delineator, stud, reflective payment marker, tree reflector	0.15%
		f	Road furniture	0.30%
		g	Steel Crash Barrier	2.20%
		h	Minor junction	0.53%
		i	Major Junction	2.38%
		j	Catch Water Drain	0.12%
		k	Chute Drain	2.12%
		l	Site Clearance	0.40%
		(iv)	Project Facilitities	
		(a)	Truck lay-byes	0.37%
		(b)	Wayside Amenities	0.08%
		(c)	Busbays	0.22%
		(v)	Roadside plantation	
		a	Road side plantation & medium Plantation.	0.00%
		b	Plantation (Vetiver, Hydro seeding& Turfing etc.) for slope protection on exposed hill slopes as slide mitigation measure.	1.82%
		(vi)	Repair of protection works other than approaches to the bridges, elevated section/ flyovers/grade separators and ROBs.	0.00%
		(vii)	Safety and traffic management during construction	0.00%
		(viii)	**Protection works**	
		a	Breast wall	11.13%
		b	Retaining wall	36.47%
		c	Gabion wall	6.15%
		d	Toe wall	3.03%
		e	Gabion RE Wall	21.28%

Item	Weightage in percentage to the contract Price		Stage for Payment	Percentage Weightage
1	2		3	4
		f	Seeding and Mulching (Soil Cut Slope)	1.07%
		g	Erosion Control Blanket	2.38%
		h	Vegetated bamboo crib wall	1.15%
Electrical utilities and Public Health Utilities (Water pipe lines and Sewage lines)	0.02%	(i)	Electrical lines	100%
		(ii)	Water and sewage pipelines	-

1.3 Procedure of estimating the value of work done.

1.3.1 Road works

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

Table 1.3.1

	Stage of Payment	Percentage-weightage	Payment Procedure
B.1	**Reconstruction /New 2- lane realignment/bypass (Flexible pavement**		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 500 m. In case of Hill cutting, the payment procedure will be as under: Hill cutting: 40% of weightage of B.1 (1). Preparation of Sub-grade: 60% of weightage of B.1 (1).
1	Earthwork up top of the sub-grade	60.41%	
2	Earthwork in shoulders	0.92%	
3	Sub-Base Course	8.85%	
4	Non Bituminous Base Course	5.86%	
5	Bituminous Base Course	7.95%	
6	Wearing Coat	5.95%	
D	**Re- Construction and New culverts on existing road, realignments, bypasses,:** Culverts (length,6m)		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 at least 01 (One) culvert.
	RCC Box culvert	10.06%	

@ For calculation of payment stage for main carriageway the project length shall be converted into equivalent 2 lane length. For example, if the total length of 4 lane main carriageway is 100 km, then the equivalent length for calculation of payment stage will be 2 x 100 km. Now, if the total length of bituminous work to be done is 100 km, the cost per km of bituminous work shall be determined as follows:

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

Where

P = Contract Price

L = Total equivalent 2-Lane length in km as defined above

Similarly, the rates per km for other stages shall be worked out accordingly.

Note: The length affected due to law and order problems or litigation during execution including the length not handed over to the Contractor under clause 8.3 of this Contract Agreement due to which the Contractor is unable to execute the work, may be deducted from the total project length for payment purposes. The total length calculated here is only for payment purposes and will not affect and referred in other clauses of the Contract Agreement.

1.3.2 Minor Bridges and Underpasses/Overpasses

Procedure for estimating the value of Minor bridge and Underpasses/Overpasses shall be as stated in table 1.3.2:

Table 1.3.2

	Stage of Payment	Percentage-weightage	Payment Procedure
	1	**2**	**3**
Nil			

1.3.3 Major Bridge works, ROB/RUB and Structures

Procedure for estimating the value of Major Bridge works, ROB/RUB and Structures Work shall be as stated in table 1.3.3:

Table 1.3.3

	Stage of Payment	Percentage-weightage	Payment Procedure
	1	2	3
A.2	**New major Bridges**		
1	**Foundation:** On completion of the foundation work including foundations for return walls, abutments, piers.		Cost of each Major Bridge shall be determined on pro rata basis with respect to the total linear length (m) of the Major Bridge. Payment against foundation shall be made on pro- rata basis on completion of a stage i.e. not less than 25% of the scope of foundation of
a	CH:20580 (3X40)	16.69%	
b	CH:22680 (1X20+2X60)	14.38%	

	Stage of Payment	Percentage-weightage	Payment Procedure
	1	2	3
c	CH:24145 (1X50+1X60+2X50)	14.51%	the major Bridge as per weighatge given in this table, subject to completion of at least two foundations in all respect. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
d	CH:24405 (1X20+1X50+1X20)	24.64%	
e	CH:24840 (2X60+2X50)	15.63%	
f	CH:33435 (1X40+2X50+1X40+1X50+1X40)	14.05%	
2	**Sub-structure:** On completion of abutments, piers upto the abutment/ pier cap		Payment against Sub- structure shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of sub- structure of the major bridge subject to completion of at least two sub-structures of abutments/piers upto abutment/pier cap level of the major bridge.
a	CH:20580 (3X40)	20.34%	
b	CH:22680 (1X20+2X60)	18.97%	
c	CH:24145 (1X50+1X60+2X50)	13.46%	
d	CH:24405 (1X20+1X50+1X20)	26.16%	
e	CH:24840 (2X60+2X50)	16.55%	
f	CH:33435 (1X40+2X50+1X40+1X50+1X40)	16.68%	
3	**Super-structure:** On completion of the superstructure in all respects including Girder, Deck slab, bearings		**Casting of girders/ fabrication of girders (steel), 40% weightage:** Unit of measurement is numbers. Payment against casting of girders/ fabrication of girders shall be made on pro-rata basis with respect to total numbers of girders required in the structure on completion of a stage i.e. not less than completion of casting/ fabrication of at least five girders of a structure. **Erection of girders, deck slab and bearings, 60% weightage:** Payment shall be made on pro-rata basis on completion of a stage i.e. Completion of super-structure including bearing of at least one span in all respects as specified.
a	CH:20580 (3X40)	59.22%	
b	CH:22680 (1X20+2X60)	63.33%	
c	CH:24145 (1X50+1X60+2X50)	68.78%	
d	CH:24405 (1X20+1X50+1X20)	45.47%	
e	CH:24840 (2X60+2X50)	64.84%	
f	CH:33435 (1X40+2X50+1X40+1X50+1X40)	65.80%	
4	**Wearing Coat including expansion joints**		Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified.
a	CH:20580 (3X40)	1.52%	
b	CH:22680 (1X20+2X60)	1.27%	
c	CH:24145 (1X50+1X60+2X50)	1.18%	
d	CH:24405 (1X20+1X50+1X20)	1.64%	
e	CH:24840 (2X60+2X50)	1.07%	
f	CH:33435 (1X40+2X50+1X40+1X50+1X40)	1.30%	

	Stage of Payment	Percentage-weightage	Payment Procedure
	1	2	3
5	**Miscellaneous Items like hand rails, crash barrier, road markings etc.**		Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified.
a	CH:20580 (3X40)	2.23%	
b	CH:22680 (1X20+2X60)	2.05%	
c	CH:24145 (1X50+1X60+2X50)	2.07%	
d	CH:24405 (1X20+1X50+1X20)	2.09%	
e	CH:24840 (2X60+2X50)	1.91%	
f	CH:33435 (1X40+2X50+1X40+1X50+1X40)	2.17%	

1.3.4 Other Works.

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

	Stage of Payment	weightage	Payment Procedure
(i)	Toll plaza	0.000%	
(ii)	Roadside drains	5.35%	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 5% (five per cent) of the total length.
(iii)	Road signs markings, km stones, safety devices,		
a	Traffic Sign	0.19%	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 5% (five per cent) of the total length.
b	Pavement marking	1.04%	
c	Direction and Place Identification signs upto 0.9 sqm size board.	0.04%	
d	Boundary stone, km stone,5th km stone, & hectometre stones	0.03%	
e	Traffic blinker LED Delineator, stud, reflective payment marker, tree reflector	0.15%	
f	Road furniture	0.30%	
g	Steel Crash Barrier	2.20%	
h	Minor junction	0.53%	Payment shall be made on pro rata basis for completed facilities.
i	Major Junction	2.38%	
j	Catch Water Drain	0.12%	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 5% (five per cent) of the total length.
k	Chute Drain	2.12%	
l	Site Clearance	0.40%	

	Stage of Payment	weightage	Payment Procedure
(iv)	Project Facilitities		
(a)	Truck Lay-Byes	0.37%	Payment shall be made on pro rata basis for completed facilities.
(b)	Wayside Amenities excluding Slip Roads & but including all internal roads (Service areas including Truck Lay-Byes)	0.08%	
(c)	Busbays	0.22%	
(v)	Roadside plantation		
a	Road side plantation & medium Plantation.	0.00%	Payment shall be made on pro rata basis on completion of a stage in a length of not less than 5% (five per cent) of the total length.
b	Plantation (Vetiver, Hydro seeding& Turfine etc.) for slope protection on exposed hill slopes as slide mitigation measure.	1.82%	
(vi)	Repair of protection works other than approaches to the bridges, elevated section/ flyovers/grade separators and ROBs.	0.00%	
(vii)	Safety and traffic management during construction	0.00%	
(viii)	**Protection works**		
a	Breast wall	11.13%	Payment shall be made on pro rata basis on completion of a stage in a length of not less than 5% (five per cent) of the total length.
b	Retaining wall	36.47%	
c	Gabion wall	6.15%	
d	Toe wall	3.03%	
e	Gabion RE Wall	21.28%	
f	Seeding and Mulching (Soil Cut Slope)	1.07%	
g	Erosion Control Blanket	2.38%	
h	Vegetated bamboo crib wall	1.15%	

1.3.5 Electrical utilities and Public Health Utilities (Water pipelines and sewage lines)

Procedure for estimating the value of other works done shall be as stated in table 1.3.5:

Table 1.3.5

Stage of	Weightage	Payment Procedure
(i) Electrical lines including crossings, transformers if any.	100%	Unit of measurement is as per completed activities. Cost per activity shall be determined on pro-rata basis as per its weightage with reference to total cost of Electrical lines. Payment shall be made for completed activity. The average weightage of major activities (only for payment purpose) in shifting work is :- (i) Erection of Poles- 20%, (ii) Conductor stringing including laying of cable- 30%, (iii) DTR erection (if involved)- 15% and (iv) Charging of line including dismantling and site clearance- 35%
(ii) Water and sewage pipelines including crossing if any.	-	Unit of measurement is as per completed activities. Cost per activity shall be determined on pro-rata basis as per its weightage with reference to total cost of pipeline. Payment shall be made for completed activity. The average weightage of major activities (only for payment purpose) in shifting work is:- (i) Laying of pipe- 50%, (ii) Chargingof line including all miscellaneous works and dismantling and site clearance- 50%.

2. Procedure for payment for Maintenance

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

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

*******END OF THE DOCUMENT*******