

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. Construction and augmentation

Construction and augmentation shall include Two-Laning 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.

(Schedule-B)

Description of Double-Laning

1. WIDENING OF CARRIAGEWAY

The Project Highway is existing Single Lane road.

1.1 Width of Carriage way

Widening/strengthening of single lane existing carriage way having width of 5.5 m has to be done to two lanes having width of 7.0 m. There is no provision of paved shoulder, only unpaved shoulder of selected earth on each side on berms in 1.0 m width is provisioned.

Provided that in the built- up areas the width of the carriageway shall be as in entire Stretch:

S. No.	stretch	Location (km to km)	Width (m)
1	Kurti Bridge to Chand Khera (NH -208 A)	45.000 to 62.950	7.00

- 1.2** Except as otherwise provided in this Agreement, the width of the carriageway and cross-sectional features shall conform to paragraph 1.1 above and IRC SP:73-2015.

2. GEOMETRIC DESIGN AND GENERAL FEATURES**2.1 General**

Geometric design and general features of the Project Highway shall be in accordance with Section 2 of the IRC SP: 73-2015. However, at certain locations radius of the horizontal curves may have to be restricted as per existing ROW with reduced design speeds.

- 2.2 Design speed:** 80 km/hr with restricted speed at few locations.

2.3 Improvement of the existing road geometries

The existing road geometries shall be improved to the extent possible within the given right of way and proper road signs and safety measures shall be provided.

2.4 Right of Way

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

Chainage		Length (km)	Width (m)
From	To		
Ch. 45.000	Ch. 62.950(plane Road area)	17.950	12.00 m.(up to 20 m in few stretches)

2.5 Type of shoulders

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

S. No.	Stretch (from km to km)	Fully paved shoulders/ footpaths	Reference to cross section
1	45.000 to 62.950	Selected earth Shoulder of 1.0 m each side	

(b) Paved shoulder not provisioned.

2.6 Lateral and vertical clearances at underpasses

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

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

S. No.	Location(chainage)	Span/opening (m)	Remarks
-NIL-			

2.7 Lateral and vertical clearances at overpasses

2.7.1 Lateral and vertical clearances at underpasses and provision of guardrails/crash barriers shall be as per paragraph 2.12 of the Manual.

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

S. No.	Location (chainage)	Span/opening (m)	Remarks
NIL			

2.8 Slip roads

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

SI No.	Location of slip road (Chainage)	Width(m)	Length (km) of slip road	
			Right	Left
NIL				

2.9 Grade separated structures

2.9.1 Grade separated structures shall be provided as per paragraph 2.14 of the Manual. The requisite particulars are given below:

S. No.	Location of structure	Length (m)	Number and length of spans (m)	Approach gradient	Remarks, if any
NIL					

2.9.2 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:

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

2.10 Cattle and pedestrian underpass /overpass

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

Location (Design Chainage)	Name of Intersecting Road	Span Arrangement(m)	Structure Width(m)	Type of Structure
NIL				

2.11 Typical cross-sections of the Project Highway

Cross Section schedule for the project highway is as follows:

S. No.	Design Ch.		Length	Remarks
	From	To		
1	45.000	62.950	17.950	Typical Cross Section For Proposed Double Lane Road

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 table below.

(a) At-grade intersections

Major Intersection

SI. No.	Location of intersection	Type of intersection	Other features
1	Chand Khera	T Junction	Junction with NH-8

Minor Intersection

SI. No.	Location of intersection	Type of intersection	Other features
1	Kukital	Y Junction	km 53.3
2	Sonakhara	Y Junction	km 61.5
3	Khataitali	T Junction	km 45.25
4	Rubber Garden	T Junction	km 52.3
5	km 56 near school	Y Junction	km 56
6	km 59.6	Y Junction	km 59.6
7	km 58 (Tea Garden)	Y Junction	km 58

(b) Grade separated intersection without ramps

S. No.	Location	Salient features	Minimum length of viaduct to be provided	Road to be carried over/under the stretches
NIL				

4. ROAD EMBANKMENT AND CUT SECTION

Top formation width generally varies between 7 mts-9mts. Therefore, widening of the embankment /full shall be carried out throughout the project length. Details are as under:

- i) Widening with average depth upto 0.6 m: 6 km approx
- ii) Widening with depth between 0.6 m- 1.5 m (Average 1m) : 5.0 km approx
- iii) Widening with depth between 1.5 m-2.5 m (Avg. 2 m) : 1.5 km Approx.
- iv) Widening with depth between 2.5 m- 3.5m (Avg.3 m) : 1 km Approx.
- v) Raising of embankment 1 m avg. height in full formation width: 1 km Approx.
- vi) Widening/ cutting in hilly section to achieve grade and profile

However, work shall be executed as per actual ground condition at the time of execution.

5. PAVEMENT DESIGN

Flexible pavement for new pavement or for widening and strengthening of the existing pavement shall be designed for minimum design period of 15 years. Stage construction shall not be permitted.

- 5.1 Pavement design shall be carried out in accordance with the relevant IRC and MoRTH Codes, Standard and Specification. Innovative design as per IRC: 37-2012 may also be explored by the bidder and quote the cost accordingly. However, any innovative design used by the Contractor must be approved by premier institutes like IITs and CRRI etc.

5.2 Type of pavement

Flexible Pavement shall be provided.

5.3 Design requirements

Refer to Manual of standard and specifications. (at few locations with reduced speed due to lesser radius at few horizontal curves.)

5.3.1 Design Period and strategy

Flexible pavement for new pavement or for widening and strengthening of the existing pavement shall be designed for a minimum design period of 15 years. Stage construction shall not be permitted.

5.3.2 Design Traffic.

Notwithstanding anything to the contrary contained in this Agreement or the relevant IRC and MoRTH Codes, Standard and Specification, the Contractor shall design the pavement for design traffic of minimum 20 million standard axles. If however, as per

actual traffic survey design traffic exceeds 20 MSA, pavement design will be done as per actual MSA in lieu of minimum 20 MSA.

5.4 Reconstruction of stretches

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

S. No.	Stretch from km to km	Remarks
1	New / Raised Embankment (average height 1 m to 1.5 m in overall 1 km length approx.)	As per site requirement / as directed by Engineer – In – Charge

ROADSIDE DRAINAGE

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

The proposed drainage works are as under:-

- (i) Lined drain : 3000 m with RCC cover slab
- (ii) Unlined surface drain: 10000 m

7. DESIGN OF STRUCTURES

7.1 General

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

7.1.2 Width of the carriageway of bridges and structures shall be as follows:

S. No	Location (km)	Design Chainage	Type of Proposed Structure	Proposed Span Arrangement (m)	Proposed Width of Carriageway (m)	Proposed Width (m)	Remarks/ Proposal
NIL							

7.1.3 The following structures (RCC retaining wall/Brick Retaining Wall/ Breast Wall) shall be provided:

S. No.	Location	Type of Structure	Height	Quantity (m)	Remarks
1	45000-62950	RCC Retaining wall	2.5 m-3.5 m	240	Location to be finalised in consultation with Engineer In charge
2	45000-62950	RCC Retaining wall	1.5 m- 2.5 m	1200	
3	45000-62950	Brick Retaining wall	1 m	2400	
4	45000-62950	Brick Breast wall	1 m- 2 m	500	

In the stretches where height of embankment is less than 1 m, wherever required, retaining wall/ Toe wall shall be provided to achieve 12 m formation width

7.1.4 All bridges shall be high-level bridges.

7.1.5 The following structures shall be designed to carry utility services specified in table below:

S. No.	Bridge at km	Utility service to be carried	Remarks
NIL			

7.1.6 Cross-section of the new culverts and bridges at deck level for the Project Highway shall conform to the typical cross-sections for the Project Highway.

7.2 Culverts

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

7.2.2 Reconstruction of existing culverts:

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

S. No	Chainage	Type of culverts	Span	Nos.	Remarks
1	45000- 62950	1 m hume pipe	1 m	16	Re- construction with RCC Box Culverts 2×2 m, 12 m width (16 nos.)
2	60850	6 m slab culvert, 6 m width	6 m	1	Re-construction with 6 m span RCC slab Culvert, 12 m width (1 no.)

7.2.3 Widening of existing culverts

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

S. No.	Design Chainage	Type of structure	Span	Remarks
Nil				

There are six minor bridges with clear width of 7.6 m which is sufficient for two lanes, as such widening to 12 m has not been proposed as of now.

7.2.4. New culverts (given in table below) shall be constructed for width equal to the roadway width of the project Highway & as per typical cross section given in the manual

S. No.	Chainage	Types Of Culverts	Span	Remarks
NIL				

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

S. No.	Location at km	Type of repair required
1	Km 53.895	Broken slab to be repaired
2	Km 52.53	Railing to be repaired
3	All other culverts as listed in Schedule A	Minor repairs as per actual condition

7.2.6 Floor protection works shall be as specified in the relevant IRC Codes and specifications.

7.3 Bridges

7.3.1 Existing bridges to be re-constructed/widened

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

S. No	Existing km	Design Chainage	Type of crossing	Existing Span Arrangement	Proposed span arrangement(m)	Adequacy or otherwise of the existing waterway, vertical clearance, etc*
NIL						

(ii) The following narrow bridges shall be widened: NIL

7.3.2 Additional new bridges

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

S. No	Existing km	Design Chainage	Type of Crossing	Proposed structure configuration	Proposed span arrangement (m)
Nil					

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

S. No.	Existing km	Type of crossing	Proposed structural configuration	Proposed span arrangement (m)	Remarks
			NIL		

7.3.4 Repairs/replacements of railing/parapets/wearing coat/ expansion joint/ approach slab/ retaining or dirt wall, painting of railing, kerbs etc of the existing bridges shall be undertaken as follows:

S. No.	Existing km Design Ch.	Type of crossing	Proposed structural configuration	Existing span arrangement (m)	Remarks
1	46550			14.750	Conditioning of all these bridges will be carried out and rehabilitation will be done accordingly
2	47450			16.750	
3	47750			24.750	
4	49850			16.750	
5	50050			16.750	
6	50150			16.750	

7.3.5 Drainage system for bridge decks

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

7.3.6 Structures in marine environment

The Project Alignment does not lie in Marine Alignment.

7.4. Rail-road bridges

7.4.1 Design, construction and detailing of ROB/RUB shall be as specified in the Manual.

7.4.2 Road over-bridges

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

S. No.	Proposed Structure	Existing km/ Design Ch	Design Chainage	Name of Crossing	Proposed structural configuration	Proposed Super Structure	Proposed span arrangement (m)	Total Width of Structure
				NIL				

7.4.3 Road under-bridges

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

SI. No.	Location of Level crossing	Number and length of span (m)
		NIL

7.5 Grade separated structures

The grade separated structures shall be provided at the following locations.

SI. No.	Location of structure	Length (m)	Number and length of spans (m)	Approach gradient	Remarks, if any
			NIL		

7.6 Repairs and strengthening of bridges and structure

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.	Existing km/Design Ch.	Span Arrangement (m)	Details of Rehabilitation
		NIL	

B. ROB/RUB

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

C. Overpasses/Underpasses and other structures

S. No.	Location of Structure (km)	Nature and extent of repairs /strengthening to be carried out
		NIL

7.7 List of Major Bridges and Structures

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

S. No.	Type of Structure	Location
NIL		

Note: - 1. The location and vent size of all the culverts proposed for irrigation purposes shall be decided in consultation with irrigation authority/ independent engineer.

2. Width of culvert shall be reconciled as per cross section at that location

3. Cross road culvert to be provided at the location of Major Junction/ Minor Junctions or utility purposes etc. shall be decided with Engineer and shall not be treated as change of scope.

8. TRAFFIC CONTROL DEVICES AND ROAD SAFETY WORKS

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

8.2 Specifications of the reflective sheeting shall be as per the Manual of Specifications (IRC SP: 73-2015).

9. ROADSIDE FURNITURE

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

(a) Road boundary stone for the entire project highway – Not provisioned

(b) Pedestrian guard rails - Not provisioned.

(c) Delineators - Not provisioned.

(d) 5th km stone – 8 Nos provided

(e) Ordinary km – 36 Nos provided

9.2 Overhead traffic signs: location and size

(a) Full width overhead signs: 2 Nos. Overhead Gantry in full width having signage board

(b) Cantilever overhead signs: Not provisioned

(c) Retro- reflectories cautionary, mandatory and informatory sign:

{i} Retro- reflectorized traffic Sign Board size 90cmx90 cm equilateral triangle 72 Nos provided.

{ii} Retro- reflectorized traffic Sign Board size 80 cmx60 cm equilateral triangle 12 Nos provided

(d) Type A “W” metal Beam Crash barrier : 500 m provided

Overhead Traffic Signs (locations & Size) shall conform to the Manual of Specifications.

10. COMPULSORY AFFORESTATION: Not involved.

11. HAZARDOUS LOCATIONS The safety barriers shall also be provided as per the Manual of Specifications.

S. No.	Location stretch from (km) to (km)	LHS/RHS
NIL		

12. SPECIAL REQUIREMENTS FOR HILL ROADS

Not Applicable

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.