# Schedules

SCHEDULE - A
(See Clauses 2.1 and 8.1)

## SITE OF THE PROJECT

**1.** ***The Site***

i. Site of the Bagrakot to Kafer Section of NH-717A 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. In the case of sections where no modification in the existing alignment of the Project Highway is contemplated, the alignment plan has not been provided. Alignment plans have only been given for sections where the existing alignment is proposed to be upgraded. The proposed profile of the Project Highways shall be followed by the contractor with minimum FRL as indicated in the alignment plan. The Contractor, however, improve/upgrade the Road Profile as indicated in Annex-III based on site/design requirement.

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

**Annex – I**
**(Schedule – A)**

**Site**

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

### *1. Site*

The Site of the Two-Lane Project Highway comprises the section of National Highway -717A commencing from km 12+030 to km 24+448 i.e. the Bagrakot to Kafer section (Length 12.418 Km) in the State of West Bengal. The land, carriageway and structures comprising the Site are described below.

### *2. Land*

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

| Sr. No. | Chainage (km) | | ROW ( Meter) | Remarks |
|---|---|---|---|---|
| | From | To | | |
| 1 | 12+030 | 24+448 | 8-10 | |

### *3. Carriageway*

The present width of carriageway varies from 3.75 m to 5.00m as under. The type of the existing pavement is Flexible.

| Sr. No. | Carriageway | | | | | |
|---|---|---|---|---|---|---|
| | Single Lane | | Two Lane | | Four Lane | |
| | From | To | From | To | From | To |
| 1 | 12+030 | 24+448 | Nil | | Nil | |

### *4. Major Bridges*

The Site includes the following Major Bridges

| Sr. No. | Existing Chainage (km) | Type of Structure | | | No. of Spans with span length (m) | Width (m) | Remarks |
|---|---|---|---|---|---|---|---|
| | | Foundation | Sub-structure | Super structure | | | |
| NIL | | | | | | | |

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

The Site includes the following ROB/RUB:

| Sr. No. | Existing Chainage (km) | Type of Structure | | No. of Spans with Span length (m) | Width (m) | ROB/ RUB |
|---|---|---|---|---|---|---|
| | | Foundation | Super Structure | | | |
| NIL | | | | | | |

### *6. Grade separators*

The Site includes the following grade separators:

| Sr. No. | Existing Chainage (km) | Type of Structure | | No. of Spans with Span length (m) | Width (m) |
|---|---|---|---|---|---|
| | | Foundation | Super Structure | | |
| Nil | | | | | |

### *7. Minor bridges*

The Site includes the following minor bridges:

| Sr. No. | Chainage (km) | Type of Structure | | No. of Spans with span length (m) |
|---|---|---|---|---|
| | | Foundation | Superstructure | |
| 1 | 13+411 | Open | RCC Slab | 1x10 |
| 2 | 14+200 | Open | RCC Slab | 2x5.2 |

### *8. Railway level crossings*

The Site includes the following railway level crossings:

| Sr. No. | Existing Chainage (km) | Remarks |
|---|---|---|
| NIL | | |

### *9. Underpasses (vehicular, Non-vehicular)*

The Site includes the following underpasses:

| Sr. No. | Existing Chainage (km) | Type of Structure | No. of Spans with Span length (m) | Width (m) |
|---|---|---|---|---|
| Nil | | | | |

### *10. Culverts and causeway:*

The Site has the following culverts:

| Sl. No. | Existing Chainage (Km) | Type of Culvert | Existing No. of Spans with Span Length x Vertical Clearance (In m) |
|---|---|---|---|
| 1 | 13+231 | RCC SLAB | 1X4.5 |
| 2 | 14+783 | RCC SLAB | 1X4 |
| 3 | 14+922 | RCC SLAB | 1X2 |
| 4 | 14+940 | RCC SLAB | 1X2 |
| 5 | 14+973 | RCC SLAB | 1X2 |
| 6 | 18+407 | RCC SLAB | 1X1.5 |
| 7 | 18+413 | RCC SLAB | 1X1.5 |
| 8 | 21+321 | RCC SLAB | 1X0.3 |
| 9 | 21+525 | RCC SLAB | 1X1.35 |
| 10 | 21+902 | RCC SLAB | 1X1.5 |
| 11 | 22+692 | RCC SLAB | 1X1.5 |
| 12 | 23+263 | RCC SLAB | 1X2 |

The Site has the Causeway at following chainages:

| Sl. No. | Existing Chainage (Km) | Type of Culvert |
|---|---|---|
| 1 | 12+050 | Causeway |
| 2 | 12+486 | Causeway |
| 3 | 12+626 | Causeway |
| 4 | 12+760 | Causeway |
| 5 | 12+960 | Causeway |
| 6 | 14+310 | Causeway |
| 7 | 14+633 | Causeway |
| 8 | 14+941 | Causeway |
| 9 | 15+105 | Causeway |
| 10 | 15+261 | Causeway |
| 11 | 15+470 | Causeway |
| 12 | 15+775 | Causeway |
| 13 | 16+020 | Causeway |
| 14 | 17+500 | Causeway |
| 15 | 17+890 | Causeway |
| 16 | 20+360 | Causeway |
| 17 | 21+400 | Causeway |
| 18 | 22+540 | Causeway |
| 19 | 22+980 | Causeway |
| 20 | 23+055 | Causeway |
| 21 | 23+876 | Causeway |
| 22 | 24+165 | Causeway |
| 23 | 24+220 | Causeway |

### *11. Bus Stops*

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

| Sl. No. | Existing Chainage | Sides |
|---|---|---|
| 1 | 15+922 | R.H.S |
| 2 | 19+765 | L.H.S |

### *12. Truck Lay bays*

The details of truck lay byes are as follows:

| Sr. No. | Existing Chainage (Km) | Length (m) | LHS | RHS |
|---|---|---|---|---|
| Nil | | | | |

### *13. Road side drains*

The details of the roadside drains are as follows:

| Sr. No. | Location | | Type | |
|---|---|---|---|---|
| | From km | To km | Masonry/cc (Pucca) | Earthen (Kutcha) |
| 1 | 17+000 | 15+922 | pipe Line | - |

| Sr. No. | Location | | Type | |
|---|---|---|---|---|
| | From km | To km | Masonry/cc | Earthen |
| 2 | 23+300 | 23+450 | U shape/pucca | - |

### *14. Major junctions*

The detail of major junction is as follows:

| Sr. No. | Existing Chainage | Type | Link | Direction | Remarks |
|---|---|---|---|---|---|
| Nil | | | | | |

### *15. Minor junctions*

*The details of the minor junctions are as follows:-*

| Sl. No. | Existing Chainage | Type of Intersection | Direction | Type of Road | Towards |
|---|---|---|---|---|---|
| | | | Left/Right | ER/BT/CC | |
| 1 | 12+600 | Y | Right | ER | Yalbong Village |
| 2 | 15+515 | Y | Left | - | Chuikhim Village |
| 3 | 15+920 | Y | Left | ER | Chuikhim Village |
| 4 | 19+185 | Y | Right | ER | Nabgaon Village |
| 5 | 19+915 | X | BHS | ER | Nabgaon Village |
| 6 | 21+730 | Y | Right | ER | Lungret Village |
| 7 | 23+400 | T | Left | BT | Barbot Village |
| 8 | 23+840 | Y | Left | BT | Barbot Village |
| 9 | 24+340 | Y | Right | BT | Ghantidara Village |

### *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. Other structures*

*Nil*

**Annex - II**
(Schedule-A)

## 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:

| Sr. No. | From km To km | Length (Km) | Proposed Width (m) | Date of providing ROW* |
|---|---|---|---|---|
| **1** | **2** | **3** | **4** | **5** |
| Full Right of Way (full width) | Excluding Bypass & Realignment, Bus bays, Truck Lay Bye | 7.385 | 24 | At appointed date |
| Full Right of Way (full width) | Excluding Bypass & Realignment, Bus bays, Truck Lay Bye (22+600 to 23+100) | 0.500 | 18 | At appointed date |
| Balance Right of Way (Width) | Realignment | 5.215 | 24 | Within 90 days of declaration of appointed date |
| | Bus bays | - | - | |
| | Truck Lay Bye | - | - | |

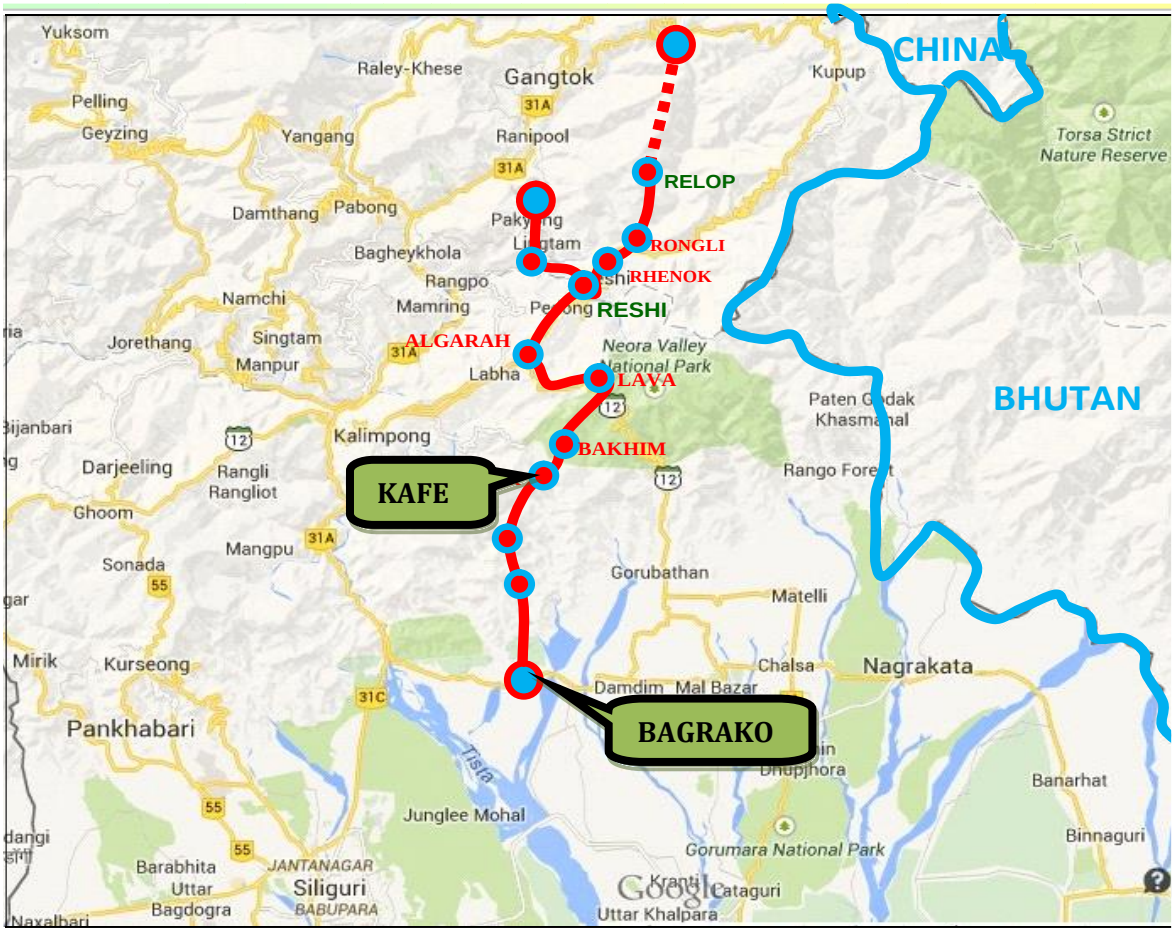
*The dates specified herein shall in no case be beyond 150 (one hundred and fifty) days after the Appointed Date.

**Annex - III**
(Schedule-A)

## Alignment Plans

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

An alignment plan is given in soft copy.




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 IRC: SP: 99 & IRC: 67.

**Annex - IV**
(Schedule-A)

## Environment Clearances

The following clearances have been obtained:

| Sr. No. | Clearances | Present Status |
|---|---|---|
| 1 | Environment clearance | Not Required |
| 2 | Forest Clearance | Stage I has been Approved |
| 3 | Wildlife Approval | Not Required |

**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 Two Lane with Paved shoulder*

Two laning shall be done to strengthening of the existing lane along with construction of paved shoulders as described in Annex-I of this Schedule-B and Annex-I of 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)

**Description of Two Lane with Paved Shoulder**

[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 Specifications and Standards for [Two Laning of Highways (IRC:SP:73)], referred to as the Manual. If any standards, specifications or details are not given in the Manual, 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.]

## 1.1 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 Annexure 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.

ii. **WIDTH OF CARRIAGEWAY**

(a) Two Lanning with paved shoulder shall be undertaken. The paved carriageway shall be 7m wide with 1.5m paved shoulder on both sides and 1.0m earthen shoulder on valley side in accordance with the typical cross section drawings and as per IRC:SP:73-2018. On Horizontal Curves, roadways width should be increased to provide for extra widening at Curves as per Cl. 6.8.5 of IRC:SP:48-1998.

Provided that in the built-up areas the width of the carriageway shall be as specified in the following table:

| Sr. No. | Built-up Stretch (Township) | Location/Design Chainage (Km) | | Width (m) | Typical Cross Section |
|---|---|---|---|---|---|
| | | From | To | | |
| NIL | | | | | |

**Indicative Chainage with applicable Typical Cross section :**

| Sr. No. | Proposed Chainage | | Length | Type of Cross Section | TCS No. |
|---|---|---|---|---|---|
| | From (Km) | To (Km) | in (Km) | | |
| 1 | 13.000 | 13.160 | 0.160 | Two lane with Paved shoulder Concentric Widening (One Side Hill, One side Valley section) | I |
| 2 | 13.160 | 13.300 | 0.140 | Two lane with Paved shoulder Realignment (One Side Hill, One side Valley section) | IV |
| 3 | 13.300 | 13.840 | 0.540 | Two lane with Paved shoulder Concentric Widening (One Side Hill, One side Valley section) | I |
| 4 | 13.840 | 13.980 | 0.140 | Two lane with Paved shoulder Realignment (One Side Hill, One side Valley section) | IV |
| 5 | 13.980 | 14.100 | 0.120 | Two lane with Paved shoulder Eccentric Right Widening | III |

| Sr. No. | Proposed Chainage | | Length | Type of Cross Section | TCS No. |
|---|---|---|---|---|---|
| | From (Km) | To (Km) | in (Km) | | |
| | | | | (One Side Hill, One side Valley section) | |
| 6 | 14.100 | 14.200 | 0.100 | Two lane with Paved shoulder Realignment (Both Side Hill section) | VII |
| 7 | 14.200 | 14.360 | 0.160 | Two lane with Paved shoulder Eccentric Right Widening (One Side Hill, One side Valley section) | III |
| 8 | 14.360 | 14.415 | 0.055 | Elevated Structure (including box abutment length) | IX |
| 9 | 14.415 | 14.515 | 0.100 | Two lane with Paved shoulder Eccentric Right Widening (One Side Hill, One side Valley section) | III |
| 10 | 14.515 | 14.560 | 0.045 | Elevated Structure (including box abutment length) | IX |
| 11 | 14.560 | 14.720 | 0.160 | Two lane with Paved shoulder Eccentric Right Widening (One Side Hill, One side Valley section) | III |
| 12 | 14.720 | 14.910 | 0.190 | Two lane with Paved shoulder Realignment (One Side Hill, One side Valley section) | IV |
| 13 | 14.910 | 14.980 | 0.070 | Two lane with Paved shoulder Eccentric Left Widening (One Side Hill, One side Valley section) | II |
| 14 | 14.980 | 15.070 | 0.090 | Two lane with Paved shoulder Realignment (One Side Hill, One side Valley section) | IV |
| 15 | 15.070 | 15.145 | 0.075 | Elevated Structure (including box abutment length) | IX |
| 16 | 15.145 | 16.440 | 1.295 | Two lane with Paved shoulder Concentric Widening (One Side Hill, One side Valley section) | I |
| 17 | 16.440 | 16.580 | 0.140 | Two lane with Paved shoulder Realignment (Both Side Hill section) | VII |
| 18 | 16.580 | 16.900 | 0.320 | Two lane with Paved shoulder Concentric Widening (One Side Hill, One side Valley section) | I |
| 19 | 16.900 | 16.985 | 0.085 | Two lane with Paved shoulder Realignment (One Side Hill, One side Valley section) | IV |
| 20 | 16.985 | 17.035 | 0.050 | Elevated Structure (including box abutment length) | IX |
| 21 | 17.035 | 17.040 | 0.005 | Two lane with Paved shoulder Realignment (One Side Hill, One side Valley section) | IV |
| 22 | 17.040 | 17.120 | 0.080 | Two lane with Paved shoulder Eccentric Right Widening (One Side Hill, One side Valley section) | III |
| 23 | 17.120 | 17.185 | 0.065 | Two lane with Paved shoulder Realignment (One Side Hill, One side Valley section) | IV |
| 24 | 17.185 | 17.250 | 0.065 | Elevated Structure (including box abutment length) | IX |
| 25 | 17.250 | 17.340 | 0.090 | Two lane with Paved shoulder Realignment (One Side Hill, One side Valley section) | IV |
| 26 | 17.340 | 17.420 | 0.080 | Two lane with Paved shoulder Concentric Widening (Both Side Valley section) | VI |
| 27 | 17.420 | 17.450 | 0.030 | Two lane with Paved shoulder Realignment (Both Side Valley) | V |
| 28 | 17.450 | 17.510 | 0.060 | Elevated Structure (including box abutment length) | IX |
| 29 | 17.510 | 17.600 | 0.090 | Two lane with Paved shoulder Realignment (Both Side Valley) | V |
| 30 | 17.600 | 17.740 | 0.140 | Two lane with Paved shoulder Eccentric Left Widening (One | II |

| Sr. No. | Proposed Chainage | | Length | Type of Cross Section | TCS No. |
|---|---|---|---|---|---|
| | From (Km) | To (Km) | in (Km) | | |
| | | | | Side Hill, One side Valley section) | |
| 31 | 17.740 | 17.810 | 0.070 | Elevated Structure (including box abutment length) | IX |
| 32 | 17.810 | 17.880 | 0.070 | Two lane with Paved shoulder Realignment (Both Side Valley) | V |
| 33 | 17.880 | 17.940 | 0.060 | Elevated Structure (including box abutment length) | IX |
| 34 | 17.940 | 18.000 | 0.060 | Two lane with Paved shoulder Concentric Widening (One Side Hill, One side Valley section) | I |
| 35 | 18.000 | 18.010 | 0.010 | Two lane with Paved shoulder Realignment (Both Side Valley) | V |
| 36 | 18.010 | 18.050 | 0.040 | Elevated Structure (including box abutment length) | IX |
| 37 | 18.050 | 18.090 | 0.040 | Two lane with Paved shoulder Realignment (Both Side Valley) | V |
| 38 | 18.090 | 18.130 | 0.040 | Elevated Structure (including box abutment length) | IX |
| 39 | 18.130 | 18.140 | 0.010 | Two lane with Paved shoulder Realignment (Both Side Valley) | V |
| 40 | 18.140 | 18.270 | 0.130 | Two lane with Paved shoulder Realignment (Both Side Hill section) | VII |
| 41 | 18.270 | 18.360 | 0.090 | Two lane with Paved shoulder Concentric Widening (One Side Hill, One side Valley section) | I |
| 42 | 18.360 | 18.500 | 0.140 | Two lane with Paved shoulder Realignment (Both Side Hill section) | VII |
| 43 | 18.500 | 18.820 | 0.320 | Two lane with Paved shoulder Eccentric Left Widening (One Side Hill, One side Valley section) | II |
| 44 | 18.820 | 18.930 | 0.110 | Two lane with Paved shoulder Realignment (Both Side Hill section) | VII |
| 45 | 18.930 | 19.340 | 0.410 | Two lane with Paved shoulder Concentric Widening (One Side Hill, One side Valley section) | I |
| 46 | 19.340 | 19.450 | 0.110 | Two lane with Paved shoulder Realignment (Both Side Valley) | V |
| 47 | 19.450 | 19.570 | 0.120 | Two lane with Paved shoulder Realignment (Both Side Hill section) | VII |
| 48 | 19.570 | 19.595 | 0.025 | Two lane with Paved shoulder Realignment (Both Side Valley) | V |
| 49 | 19.595 | 19.725 | 0.130 | Elevated Structure (including box abutment length) | IX |
| 50 | 19.725 | 19.740 | 0.015 | Two lane with Paved shoulder Realignment (Both Side Valley) | V |
| 51 | 19.740 | 19.860 | 0.120 | Two lane with Paved shoulder Eccentric Left Widening (One Side Hill, One side Valley section) | II |
| 52 | 19.860 | 20.140 | 0.280 | Two lane with Paved shoulder Realignment (One Side Hill, One side Valley section) | IV |
| 53 | 20.140 | 20.240 | 0.100 | Two lane with Paved shoulder Concentric Widening (One Side Hill, One side Valley section) | I |
| 54 | 20.240 | 20.400 | 0.160 | Two lane with Paved shoulder Realignment (Both Side Hill section) | VII |

| Sr. No. | Proposed Chainage | | Length | Type of Cross Section | TCS No. |
|---|---|---|---|---|---|
| | From (Km) | To (Km) | in (Km) | | |
| 55 | 20.400 | 20.460 | 0.060 | Two lane with Paved shoulder Eccentric Left Widening (One Side Hill, One side Valley section) | II |
| 56 | 20.460 | 20.520 | 0.060 | Two lane with Paved shoulder Realignment (One Side Hill, One side Valley section) | IV |
| 57 | 20.520 | 20.660 | 0.140 | Two lane with Paved shoulder Concentric Widening (Both Side Hill Section) | VIII |
| 58 | 20.660 | 20.720 | 0.060 | Two lane with Paved shoulder Realignment (Both Side Hill section) | VII |
| 59 | 20.720 | 20.840 | 0.120 | Two lane with Paved shoulder Concentric Widening (Both Side Hill Section) | VIII |
| 60 | 20.840 | 21.030 | 0.190 | Two lane with Paved shoulder Realignment (Both Side Hill section) | VII |
| 61 | 21.030 | 21.460 | 0.430 | Two lane with Paved shoulder Realignment (Both Side Valley) | V |
| 62 | 21.460 | 22.290 | 0.830 | Two lane with Paved shoulder Concentric Widening (Both Side Hill Section) | VIII |
| 63 | 22.290 | 22.320 | 0.030 | Elevated Structure (including box abutment length) | IX |
| 64 | 22.320 | 22.580 | 0.260 | Two lane with Paved shoulder Concentric Widening (Both Side Hill Section) | VIII |
| 65 | 22.580 | 22.610 | 0.030 | Two lane with Paved shoulder Realignment (One Side Hill, One side Valley section) | IV |
| 66 | 22.610 | 22.630 | 0.020 | Elevated Structure (including box abutment length) | IX |
| 67 | 22.630 | 22.800 | 0.170 | Two lane with Paved shoulder Realignment (One Side Hill, One side Valley section) | IV |
| 68 | 22.800 | 23.520 | 0.720 | Two lane with Paved shoulder Eccentric Left Widening (One Side Hill, One side Valley section) | II |
| 69 | 23.520 | 23.780 | 0.260 | Two lane with Paved shoulder Realignment (Both Side Hill section) | VII |
| 70 | 23.780 | 23.980 | 0.200 | Two lane with Paved shoulder Concentric Widening (One Side Hill, One side Valley section) | I |
| 71 | 23.980 | 24.140 | 0.160 | Two lane with Paved shoulder Realignment (Both Side Valley) | V |
| 72 | 24.140 | 24.200 | 0.060 | Two lane with Paved shoulder Concentric Widening (One Side Hill, One side Valley section) | I |
| 73 | 24.200 | 24.290 | 0.090 | Two lane with Paved shoulder Realignment (One Side Hill, One side Valley section) | IV |
| 74 | 24.290 | 24.400 | 0.110 | Two lane with Paved shoulder Realignment (Both Side Hill section) | VII |
| 75 | 24.400 | 24.700 | 0.300 | Two lane with Paved shoulder Concentric Widening (Both Side Hill Section) | VIII |
| 76 | 24.700 | 24.800 | 0.100 | Two lane with Paved shoulder Realignment (Both Side Valley) | V |
| 77 | 24.800 | 25.000 | 0.200 | Elevated Structure (including box abutment length) | IX |
| 78 | 25.000 | 25.040 | 0.040 | Two lane with Paved shoulder Realignment (Both Side Valley) | V |

| Sr. No. | Proposed Chainage | | Length | Type of Cross Section | TCS No. |
|---|---|---|---|---|---|
| | From (Km) | To (Km) | in (Km) | | |
| 79 | 25.040 | 25.200 | 0.160 | Two lane with Paved shoulder Concentric Widening (Both Side Hill Section) | VIII |
| 80 | 25.200 | 25.400 | 0.200 | Two lane with Paved shoulder Realignment (Both Side Hill section) | VII |
| 81 | 25.400 | 25.600 | 0.200 | Two lane with Paved shoulder Eccentric Left Widening (One Side Hill, One side Valley section) | II |

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

## 2. GEOMETRIC DESIGN AND GENERAL FEATURES

### *2.1 General*

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

### *2.2 Design speed*

The design speed shall be minimum design speed of 20/40 km per hr. for Mountainous and Steep terrain.

### *2.3 Improvement of the existing road geometrics*

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

| Sr. No. | Proposed Chainage | | Length | Type of Cross Section | TCS no. |
|---|---|---|---|---|---|
| | From (Km) | To (Km) | in (Km) | | |
| 1 | 13.160 | 13.300 | 0.140 | Two lane with Paved shoulder Realignment (One Side Hill, One side Valley section) | IV |
| 2 | 13.840 | 13.980 | 0.140 | Two lane with Paved shoulder Realignment (One Side Hill, One side Valley section) | IV |
| 3 | 14.100 | 14.200 | 0.100 | Two lane with Paved shoulder Realignment (Both Side Hill section) | VII |
| 4 | 14.360 | 14.415 | 0.055 | Elevated Structure (including box abutment length) | IX |
| 5 | 14.515 | 14.560 | 0.045 | Elevated Structure (including box abutment length) | IX |
| 6 | 14.720 | 14.910 | 0.190 | Two lane with Paved shoulder Realignment (One Side Hill, One side Valley section) | IV |
| 7 | 14.980 | 15.070 | 0.090 | Two lane with Paved shoulder Realignment (One Side Hill, One side Valley section) | IV |
| 8 | 15.070 | 15.145 | 0.075 | Elevated Structure (including box abutment length) | IX |
| 9 | 16.440 | 16.580 | 0.140 | Two lane with Paved shoulder Realignment (Both Side Hill section) | VII |

| Sr. No. | Proposed Chainage | | Length | Type of Cross Section | TCS no. |
|---|---|---|---|---|---|
| | From (Km) | To (Km) | in (Km) | | |
| 10 | 16.900 | 16.985 | 0.085 | Two lane with Paved shoulder Realignment (One Side Hill, One side Valley section) | IV |
| 11 | 16.985 | 17.035 | 0.050 | Elevated Structure (including box abutment length) | IX |
| 12 | 17.035 | 17.040 | 0.005 | Two lane with Paved shoulder Realignment (One Side Hill, One side Valley section) | IV |
| 13 | 17.120 | 17.185 | 0.065 | Two lane with Paved shoulder Realignment (One Side Hill, One side Valley section) | IV |
| 14 | 17.185 | 17.250 | 0.065 | Elevated Structure (including box abutment length) | IX |
| 15 | 17.250 | 17.340 | 0.090 | Two lane with Paved shoulder Realignment (One Side Hill, One side Valley section) | IV |
| 16 | 17.420 | 17.450 | 0.030 | Two lane with Paved shoulder Realignment (Both Side Valley) | V |
| 17 | 17.450 | 17.510 | 0.060 | Elevated Structure (including box abutment length) | IX |
| 18 | 17.510 | 17.600 | 0.090 | Two lane with Paved shoulder Realignment (Both Side Valley) | V |
| 19 | 17.740 | 17.810 | 0.070 | Elevated Structure (including box abutment length) | IX |
| 20 | 17.810 | 17.880 | 0.070 | Two lane with Paved shoulder Realignment (Both Side Valley) | V |
| 21 | 17.880 | 17.940 | 0.060 | Elevated Structure (including box abutment length) | IX |
| 22 | 18.000 | 18.010 | 0.010 | Two lane with Paved shoulder Realignment (Both Side Valley) | V |
| 23 | 18.010 | 18.050 | 0.040 | Elevated Structure (including box abutment length) | IX |
| 24 | 18.050 | 18.090 | 0.040 | Two lane with Paved shoulder Realignment (Both Side Valley) | V |
| 25 | 18.090 | 18.130 | 0.040 | Elevated Structure (including box abutment length) | IX |
| 26 | 18.130 | 18.140 | 0.010 | Two lane with Paved shoulder Realignment (Both Side Valley) | V |
| 27 | 18.140 | 18.270 | 0.130 | Two lane with Paved shoulder Realignment (Both Side Hill section) | VII |
| 28 | 18.360 | 18.500 | 0.140 | Two lane with Paved shoulder Realignment (Both Side Hill section) | VII |
| 29 | 18.820 | 18.930 | 0.110 | Two lane with Paved shoulder Realignment (Both Side Hill section) | VII |
| 30 | 19.340 | 19.450 | 0.110 | Two lane with Paved shoulder Realignment (Both Side Valley) | V |
| 31 | 19.450 | 19.570 | 0.120 | Two lane with Paved shoulder Realignment (Both Side Hill section) | VII |
| 32 | 19.570 | 19.595 | 0.025 | Two lane with Paved shoulder Realignment (Both Side Valley) | V |
| 33 | 19.595 | 19.725 | 0.130 | Elevated Structure (including box abutment length) | IX |
| 34 | 19.725 | 19.740 | 0.015 | Two lane with Paved shoulder Realignment (Both Side Valley) | V |
| 35 | 19.860 | 20.140 | 0.280 | Two lane with Paved shoulder Realignment (One Side Hill, One side Valley section) | IV |

| Sr. No. | Proposed Chainage | | Length | Type of Cross Section | TCS no. |
|---|---|---|---|---|---|
| | From (Km) | To (Km) | in (Km) | | |
| 36 | 20.240 | 20.400 | 0.160 | Two lane with Paved shoulder Realignment (Both Side Hill section) | VII |
| 37 | 20.460 | 20.520 | 0.060 | Two lane with Paved shoulder Realignment (One Side Hill, One side Valley section) | IV |
| 38 | 20.660 | 20.720 | 0.060 | Two lane with Paved shoulder Realignment (Both Side Hill section) | VII |
| 39 | 20.840 | 21.030 | 0.190 | Two lane with Paved shoulder Realignment (Both Side Hill section) | VII |
| 40 | 21.030 | 21.460 | 0.430 | Two lane with Paved shoulder Realignment (Both Side Valley) | V |
| 41 | 22.290 | 22.320 | 0.030 | Elevated Structure (including box abutment length) | IX |
| 42 | 22.580 | 22.610 | 0.030 | Two lane with Paved shoulder Realignment (One Side Hill, One side Valley section) | IV |
| 43 | 22.610 | 22.630 | 0.020 | Elevated Structure (including box abutment length) | IX |
| 44 | 22.630 | 22.800 | 0.170 | Two lane with Paved shoulder Realignment (One Side Hill, One side Valley section) | IV |
| 45 | 23.520 | 23.780 | 0.260 | Two lane with Paved shoulder Realignment (Both Side Hill section) | VII |
| 46 | 23.980 | 24.140 | 0.160 | Two lane with Paved shoulder Realignment (Both Side Valley) | V |
| 47 | 24.200 | 24.290 | 0.090 | Two lane with Paved shoulder Realignment (One Side Hill, One side Valley section) | IV |
| 48 | 24.290 | 24.400 | 0.110 | Two lane with Paved shoulder Realignment (Both Side Hill section) | VII |
| 49 | 24.700 | 24.800 | 0.100 | Two lane with Paved shoulder Realignment (Both Side Valley) | V |
| 50 | 24.800 | 25.000 | 0.200 | Elevated Structure (including box abutment length) | IX |
| 51 | 25.000 | 25.040 | 0.040 | Two lane with Paved shoulder Realignment (Both Side Valley) | V |
| 52 | 25.200 | 25.400 | 0.200 | Two lane with Paved shoulder Realignment (Both Side Hill section) | VII |

### *2.4 Right of Way*

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

### *2.5 Type of shoulders*

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

| Sl. No. | Design Chainage | | Fully Paved Shoulder/Footpath | Reference to Cross Section (TCS) |
|---|---|---|---|---|
| | From | To | | |
| NIL | | | | |

(b) In open country, (Paved shoulders of 1.5 m width shall be provided and balance 1.0 m width shall

be covered with 150 mm thick compacted layer of granular material).

(c) Design and specifications of paved shoulders and granular material shall conform to the requirements specified in paragraphs 5.9.9 and 5.9.10 of the Manual.

### *2.6 Lateral and vertical clearances at underpasses*

**2.6.1** Lateral and vertical clearances at underpasses and provision of guard rails/crash barriers shall be as per paragraph 2.11 of 2-lanning Manual.

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

| Sr. No. | Location Chainage (From km to km) | Span / Opening (m) | Remarks |
|---|---|---|---|
| Nil | | | |

Vertical clearance: Vertical Clearance at underpasses/Flyovers shall not be less than 5.5 m and for Cattle underpass shall not be less than 4.5 m.

### *2.7 Lateral and vertical clearances at overpasses*

2.7.1 Lateral and vertical clearances at overpasses shall be as per paragraph 2.11 of the 2-lanning Manual.

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

| Sr. No. | Design Chainage (Km) | Span / Opening (m) | Remarks |
|---|---|---|---|
| Nil | | | |

2.7.3 Vertical clearance: A minimum 5.5 m vertical clearance shall be provided at all points of the carriageway of the project highway.

### *2.8 Service roads*

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

| Sr. 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 | | | |

**Details of Slip Road**

| Sr. No. | Existing Chainage | | Design Chainage | | Right Hand side(RHS ) or Left Hand side (LHS) or Both side | Length Km of Service Road |
|---|---|---|---|---|---|---|
| | From | To | From | To | | |
| NIL | | | | | | |

### *2.9 Grade separated structures*

**2.9.1** Grade separated structures shall be provided as per paragraph 2.14 of the 2-lanning

Manual. The requisite particulars are given below:
[Refer to paragraphs 2.14.1 of the Manual and provide details]

| Sr. No. | Location of structure (Existing) | Location of structure (Design) | Length (m) | Number & 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: [Refer to paragraphs 2.14.2 of the Manual and specify the type of vehicular under pass/ overpass structure and whether the cross road is to be carried at the existing level, raised or lowered]

| Sr. No. | Location (Design Chainage) | Location (Design Chainage) | Type of Structure Length | Cross road at | | |
|---|---|---|---|---|---|---|
| | | | | Existing level | Raised Level | Lowered Level |
| NIL | | | | | | |

### *2.10 Cattle and pedestrian underpass /overpass*

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

[Refer to paragraphs 2.13.3 of the Manual and specify the requirements of Cattle and pedestrian underpass/ overpass].

### *2.11 Typical cross-sections of the Project Highway*

*Indicative typical cross section of the Project highway shall be Fig. 2.8 to 2.9 of the manual (IRC: SP: 73-2018) and Fig. 6.1 of the manual (IRC: SP: 48-1998).*

| TCS No. | Description | Total Length (m) |
|---|---|---|
| I | Two lane with Paved shoulder Concentric Widening (One Side Hill, One side Valley section) | 3235 |
| II | Two lane with Paved shoulder Eccentric Left Widening (One Side Hill, One side Valley section) | 1630 |
| III | Two lane with Paved shoulder Eccentric Right Widening (One Side Hill, One side Valley section) | 620 |
| IV | Two lane with Paved shoulder Realignment (One Side Hill, One side Valley section) | 1435 |
| V | Two lane with Paved shoulder Realignment (Both Side Valley) | 1130 |
| VI | Two lane with Paved shoulder Concentric Widening (Both Side Valley section) | 80 |
| VII | Two lane with Paved shoulder Realignment (Both Side Hill section) | 1720 |
| VIII | Two lane with Paved shoulder Concentric Widening (Both Side Hill section) | 1810 |
| IX | Elevated Structure (including box abutment length) | 940 |
| | **Total** | **12600** |

## 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:

### *3.1 At-Grade Intersection:*

#### *3.1.1 Major intersections*

*At grade major intersections shall be improved at intersecting roads with the Project highway is given below:*

| Sr. No. | Existing Chainage | Design Chainage | Type of Intersection | Direction | Type of Road |
|---|---|---|---|---|---|
| | | | | (Left/Right) | (E/BT/CC) |
| Nil | | | | | |

#### *3.1.2 Minor Intersections*

*At grade minor intersections shall be improved at intersecting roads with the Project highway is given below:*

| Sl. No. | Design Chainage | Type of Intersection | Direction | Type of Road | Towards |
|---|---|---|---|---|---|
| | | | Left/Right | ER/BT/CC | |
| 1 | 13+549 | Y | Right | ER | Yalbong Village |
| 2 | 16+630 | Y | Left | - | Chuikhim Village |
| 3 | 16+960 | Y | Left | ER | Chuikhim Village |
| 4 | 20+490 | Y | Right | ER | Nabgaon Village |
| 5 | 21+410 | X | Right | ER | Nabgaon Village |
| 6 | 23+085 | Y | Right | ER | Lungret Village |
| 7 | 24+715 | T | Left | BT | Barbot Village |
| 8 | 25+040 | Y | Left | BT | Barbot Village |
| 9 | 25+500 | Y | Right | BT | Ghantidara Village |

## 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 (7.385 km):

| Sr. No. | Proposed Chainage | | Length | Type of Cross Section | TCS No. |
|---|---|---|---|---|---|
| | From (Km) | To (Km) | in (Km) | | |
| 1 | 13.000 | 13.160 | 0.160 | Two lane with Paved shoulder Concentric Widening (One Side Hill, One side Valley section) | I |
| 3 | 13.300 | 13.840 | 0.540 | Two lane with Paved shoulder Concentric Widening (One Side Hill, One side Valley section) | I |
| 5 | 13.980 | 14.100 | 0.120 | Two lane with Paved shoulder Eccentric Right Widening (One Side Hill, One side Valley section) | III |

| Sr. No. | Proposed Chainage | | Length | Type of Cross Section | TCS No. |
|---|---|---|---|---|---|
| | From (Km) | To (Km) | in (Km) | | |
| 7 | 14.200 | 14.360 | 0.160 | Two lane with Paved shoulder Eccentric Right Widening (One Side Hill, One side Valley section) | III |
| 9 | 14.415 | 14.515 | 0.100 | Two lane with Paved shoulder Eccentric Right Widening (One Side Hill, One side Valley section) | III |
| 11 | 14.560 | 14.720 | 0.160 | Two lane with Paved shoulder Eccentric Right Widening (One Side Hill, One side Valley section) | III |
| 13 | 14.910 | 14.980 | 0.070 | Two lane with Paved shoulder Eccentric Left Widening (One Side Hill, One side Valley section) | II |
| 16 | 15.145 | 16.440 | 1.295 | Two lane with Paved shoulder Concentric Widening (One Side Hill, One side Valley section) | I |
| 18 | 16.580 | 16.900 | 0.320 | Two lane with Paved shoulder Concentric Widening (One Side Hill, One side Valley section) | I |
| 22 | 17.040 | 17.120 | 0.080 | Two lane with Paved shoulder Eccentric Right Widening (One Side Hill, One side Valley section) | III |
| 26 | 17.340 | 17.420 | 0.080 | Two lane with Paved shoulder Concentric Widening (Both Side Valley section) | VI |
| 30 | 17.600 | 17.740 | 0.140 | Two lane with Paved shoulder Eccentric Left Widening (One Side Hill, One side Valley section) | II |
| 34 | 17.940 | 18.000 | 0.060 | Two lane with Paved shoulder Concentric Widening (One Side Hill, One side Valley section) | I |
| 41 | 18.270 | 18.360 | 0.090 | Two lane with Paved shoulder Concentric Widening (One Side Hill, One side Valley section) | I |
| 43 | 18.500 | 18.820 | 0.320 | Two lane with Paved shoulder Eccentric Left Widening (One Side Hill, One side Valley section) | II |
| 45 | 18.930 | 19.340 | 0.410 | Two lane with Paved shoulder Concentric Widening (One Side Hill, One side Valley section) | I |
| 51 | 19.740 | 19.860 | 0.120 | Two lane with Paved shoulder Eccentric Left Widening (One Side Hill, One side Valley section) | II |
| 53 | 20.140 | 20.240 | 0.100 | Two lane with Paved shoulder Concentric Widening (One Side Hill, One side Valley section) | I |
| 55 | 20.400 | 20.460 | 0.060 | Two lane with Paved shoulder Eccentric Left Widening (One Side Hill, One side Valley section) | II |
| 57 | 20.520 | 20.660 | 0.140 | Two lane with Paved shoulder Concentric Widening (Both Side Hill Section) | VIII |
| 59 | 20.720 | 20.840 | 0.120 | Two lane with Paved shoulder Concentric Widening (Both Side Hill Section) | VIII |
| 62 | 21.460 | 22.290 | 0.830 | Two lane with Paved shoulder Concentric Widening (Both Side Hill Section) | VIII |
| 64 | 22.320 | 22.580 | 0.260 | Two lane with Paved shoulder Concentric Widening (Both Side Hill Section) | VIII |
| 68 | 22.800 | 23.520 | 0.720 | Two lane with Paved shoulder Eccentric Left Widening (One Side Hill, One side Valley section) | II |
| 70 | 23.780 | 23.980 | 0.200 | Two lane with Paved shoulder Concentric Widening (One Side Hill, One side Valley section) | I |
| 72 | 24.140 | 24.200 | 0.060 | Two lane with Paved shoulder Concentric Widening (One | I |

| Sr. No. | Proposed Chainage | | Length | Type of Cross Section | TCS No. |
|---|---|---|---|---|---|
| | From (Km) | To (Km) | in (Km) | | |
| | | | | Side Hill, One side Valley section) | |
| 75 | 24.400 | 24.700 | 0.300 | Two lane with Paved shoulder Concentric Widening (Both Side Hill Section) | VIII |
| 79 | 25.040 | 25.200 | 0.160 | Two lane with Paved shoulder Concentric Widening (Both Side Hill Section) | VIII |
| 81 | 25.400 | 25.600 | 0.200 | Two lane with Paved shoulder Eccentric Left Widening (One Side Hill, One side Valley section) | II |

## 5. PAVEMENT DESIGN

Pavement design shall be carried out for a design life of 15 years considering 25MSA.

### 5.1 Type of pavement

Flexible pavement shall be adopted for the Main carriageway in the open country and rigid pavement in the built up section as per the details given below:
Crust composition for flexible pavement:

| | |
|---|---|
| BC | 40 mm |
| BSM | 110 mm |
| CTSB | 200 mm |
| SUBGRADE | 500 mm |

### 5.2 Design requirements

#### 5.2.1 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.

#### 5.2.2 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 million standard axles.

### 5.3 Reconstruction of stretches

The stretches mention in clause 4 (ii) of the same document shows the table of the existing road that shall be reconstructed.

## 6. ROAD SIDE DRAINAGE

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

**Lined Drain Locations:**

| TCS No. | Description | Total Length (m) | Side (m) | Linear Length (m) |
|---|---|---|---|---|
| 1 | Two lane with Paved shoulder Concentric Widening (One Side Hill, One side Valley section) | 3235 | 1 | 3235 |
| 2 | Two lane with Paved shoulder Eccentric Left Widening (One Side Hill, One side Valley section) | 1630 | 1 | 1630 |
| 3 | Two lane with Paved shoulder Eccentric Right Widening (One Side Hill, One side Valley section) | 620 | 1 | 620 |
| 4 | Two lane with Paved shoulder Realignment (One Side Hill, One side Valley section) | 1435 | 1 | 1435 |
| 7 | Two lane with Paved shoulder Realignment (Both Side Hill section) | 1720 | 2 | 3440 |
| 8 | Two lane with Paved shoulder Concentric Widening (Both Side Hill section) | 1810 | 2 | 3620 |
| | | | **Total** | **13980** |

**Catch Water Drain Location on Hill side (Cutting height is more than 10m)**

| Sr. No. | Left Side (m) | Right Side (m) |
|---|---|---|
| 1 | 770 | 840 |

Therefore, total length of lined drain and catch water drain will be **15.590km**.

## 7. DESIGN OF STRUCTURES

### *7.1 General*

**7.1.1** 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

**7.1.2** Width of the carriageway of new bridges and structures shall be as follows:
[Refer to paragraph 7.1 (ii) of the Manual and specify the width of carriageway of new bridges and structures of more than 60 (sixty) meter length, if the carriageway width is different from 7.5 (seven point five) meter including kerb shyness in the table below.]

| Sr. No. | Bridge (km) | Width of carriageway and Cross - Sectional feature |
|---|---|---|
| Nil | | |

**7.1.3** The following structures shall be provided with footpaths:
[Refer to paragraph 7.1 (iii) of the Manual and provide details of new Structures with footpath.]

| Sr. No. | Location at km | | Remarks |
|---|---|---|---|
| | (Existing Chainage) | (Design Chainage) | |
| Nil | | | |

**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:

| Sr. No. | Bridge (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 given in section 7 of the Manual.

### *7.2 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 reconstructed as new culverts:

| Sl. No. | Existing Chainage (Km) | Type of Culvert | Existing No. of Spans with Span Length(m) | Recommendation | Design Chainage (Km) | Type of Culvert | No. of Spans with Span Length (m) |
|---|---|---|---|---|---|---|---|
| 1 | 12+050 | Causeway | - | Reconstruction | 13+080 | RCC SLAB | 1X3 |
| 2 | 12+486 | Causeway | - | Reconstruction | 13+435 | RCC SLAB | 1X3 |
| 3 | 12+626 | Causeway | - | Reconstruction | 13+615 | RCC SLAB | 1X3 |
| 4 | 12+760 | Causeway | - | Reconstruction | 13+730 | RCC SLAB | 1X3 |
| 5 | 12+960 | Causeway | - | Reconstruction | 13+925 | RCC SLAB | 1X3 |
| 6 | 13+231 | RCC SLAB | 1X4.5 | Reconstruction | 14+190 | RCC SLAB | 2X3 |
| 7 | 14+310 | Causeway | - | Reconstruction | 15+415 | RCC SLAB | 1X3 |
| 8 | 14+633 | Causeway | - | Reconstruction | 15+735 | RCC SLAB | 1X3 |
| 9 | 14+783 | RCC SLAB | 1X4 | Reconstruction | 15+865 | RCC SLAB | 2X3 |
| 10 | 14+922 | RCC SLAB | 1X2 | Reconstruction | 15+996 | RCC SLAB | 1X3 |
| 11 | 14+941 | Causeway | - | Reconstruction | 16+015 | RCC SLAB | 1X3 |
| 12 | 14+973 | RCC SLAB | 1X2 | Reconstruction | 16+050 | RCC SLAB | 1X3 |
| 13 | 14+940 | RCC SLAB | 1X2 | Reconstruction | 16+120 | RCC SLAB | 1X3 |

| Sl. No. | Existing Chainage (Km) | Type of Culvert | Existing No. of Spans with Span Length(m) | Recommendation | Design Chainage (Km) | Type of Culvert | No. of Spans with Span Length (m) |
|---|---|---|---|---|---|---|---|
| 14 | 15+105 | Causeway | - | Reconstruction | 16+180 | RCC SLAB | 1X3 |
| 15 | 15+261 | Causeway | - | Reconstruction | 16+340 | RCC SLAB | 1X3 |
| 16 | 15+470 | Causeway | - | Reconstruction | 16+583 | RCC SLAB | 1X3 |
| 17 | 15+775 | Causeway | - | Reconstruction | 16+887 | RCC SLAB | 1X3 |
| 18 | 16+020 | Causeway | - | Reconstruction | 17+080 | RCC SLAB | 1X3 |
| 19 | 17+500 | Causeway | - | Reconstruction | 18+720 | RCC SLAB | 1X3 |
| 20 | 17+890 | Causeway | - | Reconstruction | 19+103 | RCC SLAB | 1X3 |
| 21 | 18+407 | RCC SLAB | 1X1.5 | Reconstruction | 19+565 | RCC SLAB | 1X3 |
| 22 | 18+413 | RCC SLAB | 1X1.5 | Reconstruction | 19+575 | RCC SLAB | 1X3 |
| 23 | 20+360 | Causeway | - | Reconstruction | 21+840 | RCC SLAB | 1X3 |
| 24 | 21+321 | RCC SLAB | 1X0.3 | Reconstruction | 22+710 | RCC SLAB | 1X3 |
| 25 | 21+400 | Causeway | - | Reconstruction | 22+778 | RCC SLAB | 1X3 |
| 26 | 21+525 | RCC SLAB | 1X1.35 | Reconstruction | 22+900 | RCC SLAB | 1X3 |
| 27 | 21+902 | RCC SLAB | 1X1.5 | Reconstruction | 23+272 | RCC SLAB | 1X3 |
| 28 | 22+540 | Causeway | - | Reconstruction | 23+860 | RCC SLAB | 1X3 |
| 29 | 22+692 | RCC SLAB | 1X1.5 | Reconstruction | 23+996 | RCC SLAB | 1X3 |
| 30 | 22+980 | Causeway | - | Reconstruction | 24+256 | RCC SLAB | 1X3 |
| 31 | 23+055 | Causeway | - | Reconstruction | 24+385 | RCC SLAB | 1X3 |
| 32 | 23+263 | RCC SLAB | 1X2 | Reconstruction | 24+590 | RCC SLAB | 1X3 |
| 33 | 23+876 | Causeway | - | Reconstruction | 25+070 | RCC SLAB | 1X3 |
| 34 | 24+165 | Causeway | - | Reconstruction | 25+327 | RCC SLAB | 1X3 |
| 35 | 24+220 | Causeway | - | Reconstruction | 25+385 | RCC SLAB | 1X3 |

(c) **Widening and Repairing 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 (Km) | Type , Span, Height and width of existing culvert | Type of Repair Required |
|---|---|---|---|
| Nil | | | |

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

| Sl. No. | Design Chainage | Type | Size | Proposal |
|---|---|---|---|---|
| 1 | 14+570 | RCC Slab | 1x3m | New Construction |
| 2 | 15+550 | RCC Slab | 1x3m | New Construction |
| 3 | 16+460 | RCC Slab | 1x3m | New Construction |
| 4 | 17+185 | RCC Slab | 1x3m | New Construction |
| 5 | 18+345 | RCC Slab | 1x3m | New Construction |
| 6 | 18+803 | RCC Slab | 1x3m | New Construction |
| 7 | 20+985 | RCC Slab | 1x3m | New Construction |
| 8 | 22+677 | RCC Slab | 1x3m | New Construction |

(e) Repairs/ Replacement of Railing/Parapets, flooring and protection works of the existing culverts shall be undertaken as follows:

[Refer to paragraph 7.23 of the Manual and provide details]

| Sr. No. | Existing Chainage (km) | Design Chainage (km) | Type of Culvert | Span (m) | Type of Repair |
|---|---|---|---|---|---|
| NIL | | | | | |
| **1= Replacement of Wearing coat, 2= Repair of parapet wall, 3= Repair of Substructure, 4=Repair of superstructure** | | | | | |

(f) Floor Protection works shall be as specified in the relevant IRC codes and specifications.

## *7.3 Bridges*

### 7.3.1 Existing Bridges to be reconstructed/widened or retained

(i) The existing major bridges at the following locations shall be retained:

| Sl. No. | Existing Chainage (Km) | Design Chainage (Km) | Existing no. of Spans with span length (m) | Remarks |
|---|---|---|---|---|
| NIL | | | | |

(ii) The following narrow bridges shall be widened:

| Sr. No. | Location (Km) | Existing Width (m) | Extent of Widening (m) | Cross-section at deck level for widening |
|---|---|---|---|---|
| NIL | | | | |

(iii) The following Minor bridges shall be reconstructed:

| Sl. No. | Existing Chainage (Km) | Design Chainage (Km) | Design no. of Spans with span length (m) | Existing no. of Spans with span length (m) | Existing Structure | Proposed Structure |
|---|---|---|---|---|---|---|
| 1 | 14+200 | 15+307 | 1X20 | 2x5.1 | RCC Slab | Voided Slab |

**7.3.2 Additional New Bridges**

a. New major bridge 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 | | Span Arrangement | Total length (m) | Remarks |
|---|---|---|---|---|---|
| | Existing Chainage (Km) | Design Chainage (Km) | | | |
| NIL | | | | | |

b. New minor 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. | Design Chainage | Span Arrangement | Total length (m) | Remarks |
|---|---|---|---|---|
| NIL | | | | |

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

| Sr. No. | Location (km) | Remarks |
|---|---|---|
| Nil | | |

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

| Sl. No. | Existing Chainage (Km) | Design Chainage (Km) | Existing no. of Spans with span length (m) | Remarks |
|---|---|---|---|---|
| Nil | | | | |

**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**

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

## *7.4 Rail - Road Bridges*

**7.4.1** 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)

**7.4.2 Road Over-Bridges and Loop section combined**

Road over-bridges (road over railway line) and loop shall be provided at the following level crossings, as per manual:

| Sl. No. | Location of Level crossing (Chainage km) | Length of bridge (m) | Type of structure | Remarks |
|---|---|---|---|---|
| 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:

| Sl. No. | Location of Level crossings (km) | Number and length of Span (m) |
|---|---|---|
| Nil | | |

## *7.5 Grade separated structures*

(Refer to paragraph 7.20 of the Manual)
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.

| Sr. No. | Design Chainage | Span Arrangement | Total length (m) | Remarks |
|---|---|---|---|---|
| Nil | | | | |

## *7.6 Repairs and strengthening of bridges and structures*

*(Refer to paragraph 7.23 of the Manual and provide details)*
All 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 / Design Chainage (In km)/Span | Side (LHS/RHS) | Nature and Extent of Repairs / Strengthening to be carried out |
|---|---|---|---|
| Nil | | | |

**B. ROB / RUB**

| Sl. No. | Location / Design Chainage (In km) | Side (LHS/RHS) | Nature and Extent of Repairs / Strengthening to be carried out |
|---|---|---|---|
| Nil | | | |

**C. Overpass / Underpass and Other structures**

| Sr. No. | Location / Design Chainage (In km) | Side (LHS/RHS) | Nature and Extent of Repairs/ Strengthening to be carried out |
|---|---|---|---|
| Nil | | | |

## *7.7 List of Major Bridges and Structures*

**Viaduct:** The minimum requirement of Viaducts are suggested as following which may vary as per final drawings and design approved by competent authority. The Contractor is required to conduct detail investigation to assess the work based on site survey, investigations and assessment before commencement of work. Viaduct shall be provided where embankment

height is more than 12m. Tentative locations of the Viaduct are given below :

| Sl. No. | Start Chainage | End Chainage | Length (m) | Span Arrangement upto Expansion joint (m) | Type | Width of Carriageway (m) |
|---|---|---|---|---|---|---|
| 1 | 14+360 | 14+415 | 55 | 3x15+1x10 | Voided Slab | 11 |
| 2 | 14+515 | 14+560 | 45 | 3x15 | Voided Slab | 11 |
| 3 | 15+070 | 15+145 | 75 | 1x15 + 3x20 | Voided Slab | 11 |
| 4 | 16+985 | 17+035 | 50 | 1x15 + 1x20 + 1x15 | Voided Slab | 11 |
| 5 | 17+185 | 17+250 | 65 | 1x20 + 3x15 | Voided Slab | 11 |
| 6 | 17+450 | 17+510 | 60 | 4x15 | Voided Slab | 11 |
| 7 | 17+740 | 17+810 | 70 | 1x15 + 2x20 + 1x15 | Voided Slab | 11 |
| 8 | 17+880 | 17+940 | 60 | 3x20 | Voided Slab | 11 |
| 9 | 18+010 | 18+050 | 40 | 2x20 | Voided Slab | 11 |
| 10 | 18+090 | 18+130 | 40 | 2x20 | Voided Slab | 11 |
| 11 | 19+595 | 19+725 | 130 | 5x20 + 2x15 | Voided Slab | 11 |
| 12 | 22+290 | 22+320 | 30 | 2x15 | Voided Slab | 11 |
| 13 | 22+610 | 22+630 | 20 | 1x20 | Voided Slab | 11 |
| 14 | 24+800 | 25+000 | 200 | 1x20 + 6x30 | Voided Slab + PSC Girder | 11 |
| | | **Total** | **940** | | | |

***NOTE:-** The viaduct length mention above is exclusive of box abutment length. For total length of the elevated structure refer clause 2.11 and clause 13 of the same document.

## 8. TRAFFIC CONTROL DEVICES AND ROAD SAFETY WORKS

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

(a) Traffic Signs: Traffic signs include roadside signs, overhead signs and curb mounted signs along the entire Project Highway.

(b) Pavement Marking: Pavement markings shall cover road marking for the entire Project Highway.

(c) Safety Barrier: Provide W-beam crash barrier along the project highway at all locations as specified in manual recommended in Schedule D.

**8.2 Specifications of the reflecting sheeting.**

Retro reflective sheeting should be of high intensity grade with encapsulated lens or with micro prismatic retro reflective element in accordance with ASTM Standard D 4956-04 and IRC 67:2010 shall be provided.

## 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.

(b) Pedestrian Guard Rail: The pedestrian facilities shall include the provision of the;

(i) Pedestrian guardrail: Provide pedestrian guardrail at each bus stop location.

(ii) Pedestrian Crossings: Provide pedestrian crossing facilities on Junctions.

(c) Overhead traffic signs: Location and Size

(i) Full width Overhead signs: Full width Overhead signs shall be provided as suggested in manual recommended in Schedule D.

(ii) Cantilever Overhead signs: Overhead signs shall be provided as suggested in manual recommended in Schedule D.

(iii) Delineators: Delineators for the entire Project Highway at the locations as suggested in manual recommended in Schedule D

## 10. COMPULSORY AFFORESTATION

The number of Trees which are required to be planted by the contractor as compensatory afforestation should be as per Forest Conservation Act, ten times the number of trees to be cut.

## 11. HAZARDOUS LOCATIONS

The safety barriers (Parapet wall) shall also be provided at the following locations**:**

| TCS No. | Description | Total Length (m) | Side (m) | Linear Length (m) |
|---|---|---|---|---|
| I | Two lane with Paved shoulder Concentric Widening (One Side Hill, One side Valley section) | 3235 | 1 | 3235 |
| II | Two lane with Paved shoulder Eccentric Left Widening (One Side Hill, One side Valley section) | 1630 | 1 | 1630 |
| III | Two lane with Paved shoulder Eccentric Right Widening (One Side Hill, One side Valley section) | 620 | 1 | 620 |
| IV | Two lane with Paved shoulder Realignment (One Side Hill, One side Valley section) | 1435 | 1 | 1435 |
| V | Two lane with Paved shoulder Realignment (Both Side Valley) | 1130 | 2 | 2260 |
| VI | Two lane with Paved shoulder Concentric Widening (Both Side Valley section) | 80 | 2 | 160 |
| | | | **Total** | **9340** |

## 12. Special Requirement for Hill Roads

**i. Retaining Wall: -** The minimum requirement of Retaining wall are suggested as following which may vary as per final drawings and design approved by competent authority. The Contractor is required to conduct detail investigation to assess the work based on site survey, investigations and assessment before commencement of work.

***Retaining Walls Locations (LHS):***

| S.No. | Chainage | | Length (m) | Height (m) | S.No. | Chainage | | Length (m) | Height (m) |
|---|---|---|---|---|---|---|---|---|---|
| | From | To | | | | From | To | | |
| 1 | 14+180 | 14+190 | 10 | 4 | 64 | 18+980 | 18+990 | 10 | 6 |
| 2 | 14+260 | 14+270 | 10 | 5 | 65 | 19+230 | 19+240 | 10 | 4 |
| 3 | 14+770 | 14+780 | 10 | 4 | 66 | 19+310 | 19+320 | 10 | 5 |

| S.No. | Chainage | | Length (m) | Height (m) |
|---|---|---|---|---|
| | From | To | | |
| 4 | 14+820 | 14+830 | 10 | 5 |
| 5 | 14+830 | 14+840 | 10 | 5 |
| 6 | 14+840 | 14+850 | 10 | 5 |
| 7 | 15+040 | 15+050 | 10 | 5 |
| 8 | 15+050 | 15+060 | 10 | 8 |
| 9 | 15+140 | 15+150 | 10 | 10 |
| 10 | 15+150 | 15+160 | 10 | 8 |
| 11 | 15+160 | 15+170 | 10 | 7 |
| 12 | 15+170 | 15+180 | 10 | 6 |
| 13 | 15+180 | 15+190 | 10 | 5 |
| 14 | 15+290 | 15+300 | 10 | 4 |
| 15 | 15+300 | 15+310 | 10 | 5 |
| 16 | 15+460 | 15+470 | 10 | 4 |
| 17 | 15+470 | 15+480 | 10 | 4 |
| 18 | 15+550 | 15+560 | 10 | 5 |
| 19 | 15+560 | 15+570 | 10 | 7 |
| 20 | 15+570 | 15+580 | 10 | 5 |
| 21 | 15+720 | 15+730 | 10 | 5 |
| 22 | 15+730 | 15+740 | 10 | 5 |
| 23 | 15+740 | 15+750 | 10 | 5 |
| 24 | 16+230 | 16+240 | 10 | 4 |
| 25 | 16+440 | 16+450 | 10 | 4 |
| 26 | 16+450 | 16+460 | 10 | 5 |
| 27 | 16+460 | 16+470 | 10 | 6 |
| 28 | 16+470 | 16+480 | 10 | 5 |
| 29 | 16+970 | 16+980 | 10 | 6 |
| 30 | 17+240 | 17+250 | 10 | 7 |
| 31 | 17+340 | 17+350 | 10 | 6 |
| 32 | 17+350 | 17+360 | 10 | 7 |
| 33 | 17+360 | 17+370 | 10 | 7 |
| 34 | 17+370 | 17+380 | 10 | 8 |
| 35 | 17+380 | 17+390 | 10 | 9 |
| 36 | 17+390 | 17+400 | 10 | 10 |
| 37 | 17+400 | 17+410 | 10 | 9 |
| 38 | 17+410 | 17+420 | 10 | 8 |
| 39 | 17+420 | 17+430 | 10 | 7 |
| 40 | 17+430 | 17+440 | 10 | 7 |
| 41 | 17+440 | 17+450 | 10 | 8 |
| 42 | 17+500 | 17+510 | 10 | 4 |
| 43 | 17+580 | 17+590 | 10 | 4 |
| 44 | 17+590 | 17+600 | 10 | 6 |
| 45 | 17+600 | 17+610 | 10 | 7 |
| 46 | 17+610 | 17+620 | 10 | 8 |

| S.No. | Chainage | | Length (m) | Height (m) |
|---|---|---|---|---|
| | From | To | | |
| 67 | 19+380 | 19+390 | 10 | 8 |
| 68 | 19+390 | 19+400 | 10 | 10 |
| 69 | 19+410 | 19+420 | 10 | 8 |
| 70 | 19+570 | 19+580 | 10 | 4 |
| 71 | 19+580 | 19+590 | 10 | 7 |
| 72 | 19+590 | 19+600 | 10 | 10 |
| 73 | 19+820 | 19+830 | 10 | 5 |
| 74 | 21+340 | 21+350 | 10 | 4 |
| 75 | 21+350 | 21+360 | 10 | 4 |
| 76 | 21+360 | 21+370 | 10 | 9 |
| 77 | 21+370 | 21+380 | 10 | 11 |
| 78 | 21+380 | 21+390 | 10 | 9 |
| 79 | 21+390 | 21+400 | 10 | 7 |
| 80 | 21+400 | 21+410 | 10 | 4 |
| 81 | 21+460 | 21+470 | 10 | 7 |
| 82 | 21+470 | 21+480 | 10 | 10 |
| 83 | 21+480 | 21+490 | 10 | 8 |
| 84 | 21+490 | 21+500 | 10 | 5 |
| 85 | 21+530 | 21+540 | 10 | 5 |
| 86 | 21+540 | 21+550 | 10 | 4 |
| 87 | 21+550 | 21+560 | 10 | 4 |
| 88 | 21+560 | 21+570 | 10 | 4 |
| 89 | 21+570 | 21+580 | 10 | 4 |
| 90 | 22+270 | 22+280 | 10 | 9 |
| 91 | 22+660 | 22+670 | 10 | 7 |
| 92 | 22+670 | 22+680 | 10 | 6 |
| 93 | 22+940 | 22+950 | 10 | 9 |
| 94 | 22+950 | 22+960 | 10 | 4 |
| 95 | 23+180 | 23+190 | 10 | 5 |
| 96 | 23+190 | 23+200 | 10 | 5 |
| 97 | 23+200 | 23+210 | 10 | 5 |
| 98 | 23+210 | 23+220 | 10 | 6 |
| 99 | 23+220 | 23+230 | 10 | 6 |
| 100 | 23+230 | 23+240 | 10 | 8 |
| 101 | 23+240 | 23+250 | 10 | 9 |
| 102 | 23+250 | 23+260 | 10 | 10 |
| 103 | 23+260 | 23+270 | 10 | 9 |
| 104 | 23+270 | 23+280 | 10 | 9 |
| 105 | 23+280 | 23+290 | 10 | 8 |
| 106 | 23+290 | 23+300 | 10 | 7 |
| 107 | 23+300 | 23+310 | 10 | 7 |
| 108 | 23+310 | 23+320 | 10 | 6 |
| 109 | 23+320 | 23+330 | 10 | 5 |

| S.No. | Chainage | | Length (m) | Height (m) |
|---|---|---|---|---|
| | From | To | | |
| 47 | 17+620 | 17+630 | 10 | 8 |
| 48 | 17+630 | 17+640 | 10 | 8 |
| 49 | 17+640 | 17+650 | 10 | 7 |
| 50 | 17+650 | 17+660 | 10 | 7 |
| 51 | 17+660 | 17+670 | 10 | 7 |
| 52 | 17+670 | 17+680 | 10 | 6 |
| 53 | 17+680 | 17+690 | 10 | 4 |
| 54 | 17+720 | 17+730 | 10 | 4 |
| 55 | 18+570 | 18+580 | 10 | 7 |
| 56 | 18+610 | 18+620 | 10 | 6 |
| 57 | 18+620 | 18+630 | 10 | 6 |
| 58 | 18+720 | 18+730 | 10 | 5 |
| 59 | 18+730 | 18+740 | 10 | 6 |
| 60 | 18+780 | 18+790 | 10 | 5 |
| 61 | 18+790 | 18+800 | 10 | 6 |
| 62 | 18+960 | 18+970 | 10 | 6 |
| 63 | 18+970 | 18+980 | 10 | 6 |

| S.No. | Chainage | | Length (m) | Height (m) |
|---|---|---|---|---|
| | From | To | | |
| 110 | 23+330 | 23+340 | 10 | 5 |
| 111 | 23+370 | 23+380 | 10 | 5 |
| 112 | 23+970 | 23+980 | 10 | 4 |
| 113 | 23+980 | 23+990 | 10 | 6 |
| 114 | 23+990 | 24+000 | 10 | 7 |
| 115 | 24+000 | 24+010 | 10 | 7 |
| 116 | 24+010 | 24+020 | 10 | 5 |
| 117 | 24+020 | 24+030 | 10 | 4 |
| 118 | 24+160 | 24+170 | 10 | 4 |
| 119 | 24+170 | 24+180 | 10 | 8 |
| 120 | 24+180 | 24+190 | 10 | 7 |
| 121 | 24+190 | 24+200 | 10 | 9 |
| 122 | 24+200 | 24+210 | 10 | 11 |
| 123 | 24+210 | 24+220 | 10 | 10 |
| 124 | 24+220 | 24+230 | 10 | 8 |
| 125 | 24+230 | 24+240 | 10 | 6 |
| 126 | 24+240 | 24+250 | 10 | 5 |
| | **Total Length (m)** | | **1260** | |

***Retaining Walls Locations (RHS):***

| S.No. | Chainage | | Length (m) | Height (m) |
|---|---|---|---|---|
| | From | To | | |
| 1 | 13+180 | 13+190 | 10 | 4 |
| 2 | 13+490 | 13+500 | 10 | 5 |
| 3 | 13+720 | 13+730 | 10 | 4 |
| 4 | 13+730 | 13+740 | 10 | 4 |
| 5 | 13+740 | 13+750 | 10 | 4 |
| 6 | 13+880 | 13+890 | 10 | 5 |
| 7 | 13+890 | 13+900 | 10 | 9 |
| 8 | 13+900 | 13+910 | 10 | 5 |
| 9 | 14+180 | 14+190 | 10 | 5 |
| 10 | 14+350 | 14+360 | 10 | 5 |
| 11 | 14+360 | 14+370 | 10 | 7 |
| 12 | 14+560 | 14+570 | 10 | 7 |
| 13 | 14+570 | 14+580 | 10 | 8 |
| 14 | 14+580 | 14+590 | 10 | 9 |
| 15 | 14+590 | 14+600 | 10 | 6 |
| 16 | 14+600 | 14+610 | 10 | 6 |
| 17 | 14+610 | 14+620 | 10 | 6 |
| 18 | 14+620 | 14+630 | 10 | 4 |
| 19 | 14+740 | 14+750 | 10 | 5 |
| 20 | 14+750 | 14+760 | 10 | 6 |
| 21 | 14+760 | 14+770 | 10 | 6 |

| S.No. | Chainage | | Length (m) | Height (m) |
|---|---|---|---|---|
| | From | To | | |
| 71 | 18+120 | 18+130 | 10 | 8 |
| 72 | 18+250 | 18+260 | 10 | 5 |
| 73 | 19+390 | 19+400 | 10 | 4 |
| 74 | 19+400 | 19+410 | 10 | 4 |
| 75 | 20+370 | 20+380 | 10 | 4 |
| 76 | 20+380 | 20+390 | 10 | 5 |
| 77 | 20+390 | 20+400 | 10 | 6 |
| 78 | 20+400 | 20+410 | 10 | 6 |
| 79 | 21+040 | 21+050 | 10 | 5 |
| 80 | 21+070 | 21+080 | 10 | 7 |
| 81 | 21+080 | 21+090 | 10 | 7 |
| 82 | 21+090 | 21+100 | 10 | 7 |
| 83 | 21+100 | 21+110 | 10 | 7 |
| 84 | 21+110 | 21+120 | 10 | 7 |
| 85 | 21+120 | 21+130 | 10 | 7 |
| 86 | 21+340 | 21+350 | 10 | 5 |
| 87 | 21+350 | 21+360 | 10 | 6 |
| 88 | 21+360 | 21+370 | 10 | 10 |
| 89 | 21+370 | 21+380 | 10 | 11 |
| 90 | 21+380 | 21+390 | 10 | 8 |
| 91 | 21+390 | 21+400 | 10 | 6 |

| S.No. | Chainage | | Length (m) | Height (m) |
|---|---|---|---|---|
| | From | To | | |
| 22 | 14+770 | 14+780 | 10 | 8 |
| 23 | 14+780 | 14+790 | 10 | 5 |
| 24 | 14+790 | 14+800 | 10 | 6 |
| 25 | 14+800 | 14+810 | 10 | 6 |
| 26 | 14+810 | 14+820 | 10 | 6 |
| 27 | 14+820 | 14+830 | 10 | 7 |
| 28 | 14+830 | 14+840 | 10 | 6 |
| 29 | 14+840 | 14+850 | 10 | 5 |
| 30 | 15+030 | 15+040 | 10 | 5 |
| 31 | 15+040 | 15+050 | 10 | 7 |
| 32 | 15+050 | 15+060 | 10 | 9 |
| 33 | 16+960 | 16+970 | 10 | 5 |
| 34 | 16+970 | 16+980 | 10 | 8 |
| 35 | 17+020 | 17+030 | 10 | 9 |
| 36 | 17+030 | 17+040 | 10 | 6 |
| 37 | 17+040 | 17+050 | 10 | 5 |
| 38 | 17+090 | 17+100 | 10 | 6 |
| 39 | 17+160 | 17+170 | 10 | 5 |
| 40 | 17+170 | 17+180 | 10 | 9 |
| 41 | 17+430 | 17+440 | 10 | 5 |
| 42 | 17+440 | 17+450 | 10 | 8 |
| 43 | 17+500 | 17+510 | 10 | 7 |
| 44 | 17+550 | 17+560 | 10 | 4 |
| 45 | 17+560 | 17+570 | 10 | 7 |
| 46 | 17+570 | 17+580 | 10 | 9 |
| 47 | 17+580 | 17+590 | 10 | 10 |
| 48 | 17+590 | 17+600 | 10 | 10 |
| 49 | 17+600 | 17+610 | 10 | 10 |
| 50 | 17+610 | 17+620 | 10 | 11 |
| 51 | 17+620 | 17+630 | 10 | 11 |
| 52 | 17+630 | 17+640 | 10 | 9 |
| 53 | 17+640 | 17+650 | 10 | 9 |
| 54 | 17+650 | 17+660 | 10 | 9 |
| 55 | 17+660 | 17+670 | 10 | 9 |
| 56 | 17+670 | 17+680 | 10 | 9 |
| 57 | 17+680 | 17+690 | 10 | 9 |
| 58 | 17+690 | 17+700 | 10 | 9 |
| 59 | 17+700 | 17+710 | 10 | 9 |
| 60 | 17+710 | 17+720 | 10 | 9 |
| 61 | 17+720 | 17+730 | 10 | 10 |
| 62 | 17+810 | 17+820 | 10 | 5 |
| 63 | 17+860 | 17+870 | 10 | 5 |
| 64 | 17+940 | 17+950 | 10 | 8 |

| S.No. | Chainage | | Length (m) | Height (m) |
|---|---|---|---|---|
| | From | To | | |
| 92 | 21+400 | 21+410 | 10 | 4 |
| 93 | 21+450 | 21+460 | 10 | 6 |
| 94 | 21+460 | 21+470 | 10 | 9 |
| 95 | 21+480 | 21+490 | 10 | 10 |
| 96 | 21+490 | 21+500 | 10 | 7 |
| 97 | 21+500 | 21+510 | 10 | 4 |
| 98 | 21+530 | 21+540 | 10 | 6 |
| 99 | 21+540 | 21+550 | 10 | 11 |
| 100 | 21+560 | 21+570 | 10 | 6 |
| 101 | 21+570 | 21+580 | 10 | 6 |
| 102 | 21+780 | 21+790 | 10 | 5 |
| 103 | 21+790 | 21+800 | 10 | 5 |
| 104 | 22+300 | 22+310 | 10 | 8 |
| 105 | 23+190 | 23+200 | 10 | 5 |
| 106 | 23+220 | 23+230 | 10 | 4 |
| 107 | 23+230 | 23+240 | 10 | 6 |
| 108 | 23+240 | 23+250 | 10 | 7 |
| 109 | 23+250 | 23+260 | 10 | 10 |
| 110 | 23+260 | 23+270 | 10 | 9 |
| 111 | 23+270 | 23+280 | 10 | 10 |
| 112 | 23+280 | 23+290 | 10 | 10 |
| 113 | 23+290 | 23+300 | 10 | 9 |
| 114 | 23+300 | 23+310 | 10 | 7 |
| 115 | 23+310 | 23+320 | 10 | 5 |
| 116 | 23+320 | 23+330 | 10 | 4 |
| 117 | 23+330 | 23+340 | 10 | 5 |
| 118 | 23+370 | 23+380 | 10 | 4 |
| 119 | 23+540 | 23+550 | 10 | 7 |
| 120 | 23+550 | 23+560 | 10 | 8 |
| 121 | 23+560 | 23+570 | 10 | 5 |
| 122 | 23+740 | 23+750 | 10 | 4 |
| 123 | 23+750 | 23+760 | 10 | 5 |
| 124 | 23+890 | 23+900 | 10 | 7 |
| 125 | 23+900 | 23+910 | 10 | 6 |
| 126 | 23+970 | 23+980 | 10 | 6 |
| 127 | 23+980 | 23+990 | 10 | 8 |
| 128 | 23+990 | 24+000 | 10 | 9 |
| 129 | 24+000 | 24+010 | 10 | 11 |
| 130 | 24+020 | 24+030 | 10 | 10 |
| 131 | 24+030 | 24+040 | 10 | 8 |
| 132 | 24+040 | 24+050 | 10 | 7 |
| 133 | 24+050 | 24+060 | 10 | 5 |
| 134 | 24+770 | 24+780 | 10 | 4 |

| S.No. | Chainage | | Length (m) | Height (m) |
|---|---|---|---|---|
| | From | To | | |
| 65 | 17+950 | 17+960 | 10 | 5 |
| 66 | 17+960 | 17+970 | 10 | 5 |
| 67 | 17+970 | 17+980 | 10 | 4 |
| 68 | 17+980 | 17+990 | 10 | 4 |
| 69 | 17+990 | 18+000 | 10 | 6 |
| 70 | 18+000 | 18+010 | 10 | 8 |

| S.No. | Chainage | | Length (m) | Height (m) |
|---|---|---|---|---|
| | From | To | | |
| 135 | 24+790 | 24+800 | 10 | 6 |
| 136 | 25+000 | 25+010 | 10 | 8 |
| 137 | 25+140 | 25+150 | 10 | 5 |
| 138 | 25+510 | 25+520 | 10 | 5 |
| 139 | 25+520 | 25+530 | 10 | 5 |
| | **Total Length (m)** | | **1390** | |

**ii. Breast Wall** : The minimum requirement of 4m height Breast wall are suggested as following which may vary as per final drawings and design approved by competent authority. The Contractor is required to conduct detail investigation to assess the work based on site survey, investigations and assessment before commencement of work. Hill cutting slope should not exceed 60 degrees, 1.5m benching to be provided at least every 10m height.

| Breast Wall | Left Side Length (m) | Right Side Length (m) |
|---|---|---|
| | 4360 | 4900 |

## 13. CHANGE OF SCOPE

The length of Viaducts, Culverts, Retaining Walls, Breast Walls, Bridges etc. specified here in above shall be treated as an approximate assessment. The actual lengths as required on the basis of detailed investigations shall be determined by the Contractor in accordance with the Specifications and Standards. Any variations in the lengths specified in this Schedule-B shall not constitute a Change of Scope, save and except any variations in the length arising out of a Change of Scope expressly undertaken in accordance with the provisions of Article 13.

## 14. Details of Utility Shifting

*The Details of Utilities to be shifted are as follow:-*

| Chainage in Km | | Pole | | | | Low Tension Overhead | | | High Tension Overhead | | | Isolator | Distribution transformer |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| From Km | To Km | Single | Double | Triple | Four | Single Phase | Two Phase | Three Phase | Single Phase | Two Phase | Three Phase | | |
| 17+400 | | 1 | 1 | | | 1 | | | | | | | |
| 20+500 | | | | | | | 4 | | | | | | |
| 21+400 | | | | | | | | 2 | | | | | 1 |
| 21+700 | | | 1 | | | | | | | | | | |
| 22+000 | 22+200 | 2 | 2 | | | | | | | | | | |
| 22+300 | 22+600 | | 2 | | | | | | | | | | |
| 23+000 | 23+700 | 3 | 3 | | | | | 1 | | | | 1 | |
| 23+800 | 24+700 | 7 | 4 | | | | | | | | | | |
| 25+000 | | 2 | | | | 1 | | | | | | | |
| **Total** | | **28** | | | | **9** | | | **0** | | | **1** | **1** |

| Drinking Water Supply | | |
|---|---|---|
| Chainage in Km | | Village Name |
| From Km | To Km | |
| 17+050 | 18+800 | Chukhim |
| 20+200 | 20+500 | Sanyasi Dara and Novgaon |
| 21+100 | 22+500 | |
| 22+700 | 24+700 | |

**SCHEDULE - C**
(See Clause 2.1)

**PROJECT FACILITIES**

***1 Project Facilities***

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

(a) Toll plaza;

(b) Roadside furniture;

(c) Pedestrian facilities;

(d) Tree plantation;

(e) Truck lay-byes;

(f) Bus stop and shelters;

(h) Rest areas; and

(i) Others to be specified

***2 Description of Project Facilities***

Each of the Project Facilities is described below showing:

**(a) Toll Plaza**

Toll plaza shall be designed as per the guidelines of manual and it is provided at following locations:

| Sl. No. | Toll Plaza Location (Design Chainage in Km) |
|---|---|
| Nil | |

**(b) Roadside Furniture**

The roadside furniture shall include the provision of the;

**i. Traffic Signs**

Typical drawings of Traffic signs include roadside signs, overhead signs and curb mounted signs etc provided for the entire Project Highway is given and location of the same shall be as per IRC:67 recommended in Schedule D.

**ii. Pavement Markings**

Pavement markings shall cover road marking for the entire Project Highway as per manual recommended in Schedule D.

**iii. LED Traffic Blinkers**

LED traffic blinker signal provided for entire project.

**iv. Crash barrier**

Provide W-beam crash barrier along the project highway at the locations as suggested in manual recommended in Schedule D.

**v. Delineators**

Delineators for the entire Project Highway at the locations as suggested in relevant IRC Manual recommended in Schedule D.

**vi. Boundary stones**

For the entire Project Highway as suggested in relevant IRC Manual recommended in Schedule D.

**vii. Hectometer / Kilometer stones**

For the entire Project Highway as suggested in relevant IRC Manual recommended in Schedule D.

**(c) Pedestrian Facilities**

The pedestrian facilities shall include the provision of the;

i. Pedestrian guardrail: Provide pedestrian guardrail at each bus stop location.

ii. Pedestrian Crossings: Provide pedestrian crossing facilities on locations as recommended in Schedule D.

**(d) Landscaping and Tree Plantation**

The landscaping and tree plantation shall be provided. The locations for these provisions shall be finalized in consultation with Independent Engineer.

**(e) Truck Lay-byes**

Truck lay byes shall be provided at the following locations for a capacity of minimum 10 trucks at each location.

| Sr. No. | Proposed Ch. |
|---|---|
| Nil | |

**(f) Bus Stops**

Bus Stops shall be provided at locations given below:

| Sl. No. | Design Chainage (Km) | Sides |
|---|---|---|
| 1 | 16+680 | LHS |
| 2 | 20+470 | RHS |
| 3 | 22+920 | RHS |
| 4 | 24+630 | LHS |

**(g) Rest Areas,**

Rest areas shall be provided at truck lay byes locations.

**(h) Others**

**1. Highway Lighting**

Lighting shall be provided at the following locations (Minimum 40 Lux to be maintained):

(i) Lighting shall be provided at approach to bridges, Built up areas, Toll plaza, Bus stops, truck Lay-bys, and as per manual recommended in Schedule D.

(ii) High Mast Lighting shall be provided at all Major Junctions, Toll plaza locations,

**2. Highway Patrol**

Not applicable

**3. Ambulances**

Not applicable

**4. Cranes**

Not applicable

**5. Advance Traffic Management System (ATMS)**

Typical Drawing of Advance Traffic Management System (ATMS) is given and location of the same shall be as per IRC: 67: 2001 and IRC: SP: 84-2014. Provisions of other facilities, if required may be made in similar manner.

**SCHEDULE - D**
(See Clause 2.1)

**SPECIFICATIONS AND STANDARDS**

## *1 Construction*

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

## *2 Design Standards*

The Project Highway including Project Facilities shall conform to design requirements set out in the following documents:

Manual of Specifications and Standards for Two Lanning of Highways (IRC: SP: 73 2018), referred to herein as the Manual.
IRC-37: Guidelines for the design of flexible pavements

Code for Practice of Road Signs IRC 67.

The Hill Road Manual IRC: SP: 48 should be referred.

The NGT Order dated 01.11.2018 should be followed for disposal of muck.

**Annex - I**
(Schedule-D)

## Specifications and Standards for Construction

### *1 Specifications and Standards*

All Materials, works and construction operations shall conform to the Manual of Specifications and Standards for Two-Lanning of Highways (IRC:SP:73-2018), referred to as the Manual, and MORTH Specifications for Road and Bridge Works. Where the specification for a work is not given, Good Industry Practice shall be adopted to the satisfaction of the Authority's Engineer.

### *2 Deviations from the Specifications and Standards*

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

**1.2** Notwithstanding anything to the contrary contained in Paragraph 1 above, the following Specifications and Standards shall apply to the Project Highway, and for purposes of this Agreement, the aforesaid Specifications and Standards shall be deemed to be amended to the extent as set forth below:-

| Clause Referred in Manual | Item | Provision as per Manual | Modified Provision | Remarks |
|---|---|---|---|---|
| 2.2.1 | Minimum design speed in hilly terrain. | 40 kmph | At some locations listed below, where the horizontal curve radius is not meeting the criteria as per clause 2.9.4 and table 2.5 of IRC:SP:73-2018. | Speed is restricted for Curve having radius less 50m. |

### *3 CURVE DETAILS:*

*Details of the curves where speed limit is restricted to 20Km/hr is given in the table below:*

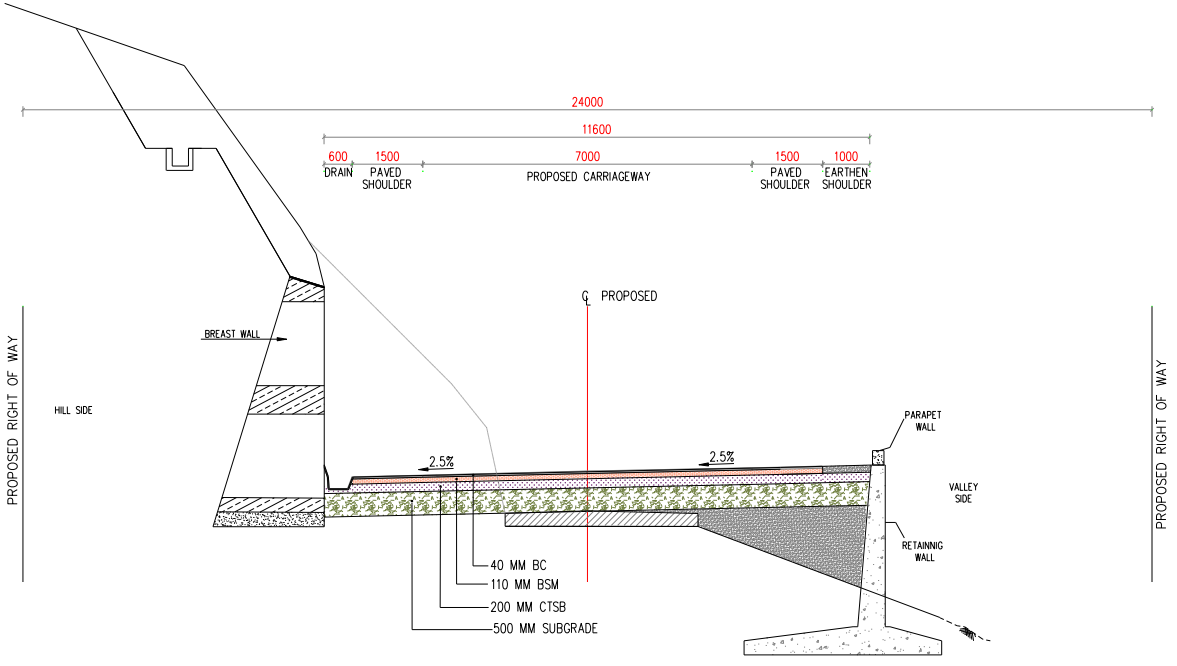
| Sl. No. | Chainage (km) | Radius (m) | Length of curve (Lc) (m) | Speed | Superelevation |
|---|---|---|---|---|---|
| | | | | V | |
| 1 | 13+111 | 25 | 68.928 | 20 | 7.00% |
| 2 | 13+241 | 75 | 159.058 | 20 | 2.50% |
| 3 | 13+468 | 21 | 45.774 | 20 | 7.00% |
| 4 | 13+553 | 21 | 39.546 | 20 | 7.00% |
| 5 | 13+669 | 21 | 38.968 | 20 | 7.00% |
| 6 | 13+739 | 21 | 39.484 | 20 | 7.00% |
| 7 | 13+785 | 21 | 41.906 | 20 | 7.00% |
| 8 | 14+360 | 21 | 27.277 | 20 | 7.00% |
| 9 | 14+402 | 21 | 37.687 | 20 | 7.00% |
| 10 | 14+561 | 21 | 33.962 | 20 | 7.00% |

| Sl. No. | Chainage (km) | Radius (m) | Length of curve (Lc) (m) | Speed V | Superelevation |
|---|---|---|---|---|---|
| 11 | 14+588 | 21 | 23.818 | 20 | 7.00% |
| 12 | 14+869 | 21 | 33.437 | 20 | 7.00% |
| 13 | 14+910 | 21 | 39 | 20 | 7.00% |
| 14 | 15+013 | 21 | 28.6 | 20 | 7.00% |
| 15 | 15+057 | 21 | 40.548 | 20 | 7.00% |
| 16 | 15+285 | 21 | 23.66 | 20 | 7.00% |
| 17 | 15+319 | 21 | 32.216 | 20 | 7.00% |
| 18 | 15+538 | 21 | 25.465 | 20 | 7.00% |
| 19 | 15+584 | 21 | 31.496 | 20 | 7.00% |
| 20 | 15+874 | 21 | 34.766 | 20 | 7.00% |
| 21 | 16+073 | 21 | 55.458 | 20 | 7.00% |
| 22 | 16+465 | 21 | 34.129 | 20 | 7.00% |
| 23 | 16+503 | 21 | 36.799 | 20 | 7.00% |
| 24 | 17+229 | 21 | 26.681 | 20 | 7.00% |
| 25 | 17+282 | 21 | 45.292 | 20 | 7.00% |
| 26 | 17+485 | 21 | 45.908 | 20 | 7.00% |
| 27 | 17+506 | 21 | 25.542 | 20 | 7.00% |
| 28 | 18+395 | 21 | 36.578 | 20 | 7.00% |
| 29 | 18+434 | 21 | 36.626 | 20 | 7.00% |
| 30 | 18+518 | 200 | 85.215 | 20 | 2.50% |
| 31 | 18+586 | 21 | 14.493 | 20 | 7.00% |
| 32 | 18+627 | 21 | 40.277 | 20 | 7.00% |
| 33 | 18+670 | 40 | 42.94 | 20 | 4.44% |
| 34 | 18+753 | 50 | 86.532 | 20 | 3.56% |
| 35 | 18+866 | 21 | 53.708 | 20 | 7.00% |
| 36 | 18+866 | 21 | 21.285 | 20 | 7.00% |
| 37 | 20+017 | 21 | 38.588 | 20 | 7.00% |
| 38 | 20+060 | 21 | 38.175 | 20 | 7.00% |
| 39 | 20+251 | 30 | 53.737 | 20 | 5.93% |
| 40 | 20+321 | 30 | 62.893 | 20 | 5.93% |
| 41 | 20+913 | 21 | 44.181 | 20 | 7.00% |
| 42 | 20+941 | 21 | 30.23 | 20 | 7.00% |
| 43 | 21+079 | 21 | 30.019 | 20 | 7.00% |
| 44 | 21+119 | 21 | 38.725 | 20 | 7.00% |
| 45 | 21+182 | 21 | 29.196 | 20 | 7.00% |
| 46 | 21+215 | 21 | 31.562 | 20 | 7.00% |
| 47 | 21+566 | 25 | 33.291 | 20 | 7.00% |
| 48 | 21+784 | 25 | 42.701 | 20 | 7.00% |
| 49 | 21+854 | 25 | 39.05 | 20 | 7.00% |
| 50 | 24+045 | 21 | 31.332 | 20 | 7.00% |
| 51 | 24+089 | 21 | 41.039 | 20 | 7.00% |
| 52 | 24+293 | 21 | 32.598 | 20 | 7.00% |
| 53 | 24+332 | 21 | 37.744 | 20 | 7.00% |
| 54 | 26+425 | 25 | 28.046 | 20 | 7.00% |
| 55 | 26+519 | 75 | 121.658 | 20 | 2.50% |
| 56 | 26+588 | 25 | 28.878 | 20 | 7.00% |
| 57 | 27+719 | 21 | 38.106 | 20 | 7.00% |
| 58 | 27+757 | 21 | 37.643 | 20 | 7.00% |
| 59 | 27+979 | 21 | 39.2 | 20 | 7.00% |
| 60 | 28+018 | 50 | 22.418 | 20 | 3.56% |

| Sl. No. | Chainage (km) | Radius (m) | Length of curve (Lc) (m) | Speed V | Superelevation |
|---|---|---|---|---|---|
| 61 | 28+087 | 25 | 32.695 | 20 | 7.00% |
| 62 | 28+158 | 25 | 57.75 | 20 | 7.00% |
| 63 | 30+078 | 21 | 41.382 | 20 | 7.00% |
| 64 | 30+109 | 21 | 31.835 | 20 | 7.00% |
| 65 | 31+048 | 21 | 37.311 | 20 | 7.00% |
| 66 | 31+085 | 21 | 36.185 | 20 | 7.00% |
| 67 | 31+329 | 21 | 38.828 | 20 | 7.00% |
| 68 | 31+364 | 21 | 35.768 | 20 | 7.00% |
| 69 | 31+596 | 21 | 34.937 | 20 | 7.00% |
| 70 | 31+634 | 21 | 36.13 | 20 | 7.00% |
| 71 | 31+873 | 21 | 40.416 | 20 | 7.00% |
| 72 | 31+901 | 21 | 26.152 | 20 | 7.00% |
| 73 | 32+629 | 21 | 33.529 | 20 | 7.00% |
| 74 | 32+672 | 21 | 40.477 | 20 | 7.00% |
| 75 | 33+714 | 21 | 34.74 | 20 | 7.00% |
| 76 | 33+765 | 21 | 45.171 | 20 | 7.00% |
| 77 | 34+051 | 21 | 43.651 | 20 | 7.00% |
| 78 | 34+080 | 21 | 31.793 | 20 | 7.00% |
| 79 | 34+278 | 21 | 23.41 | 20 | 7.00% |
| 80 | 34+317 | 21 | 37.569 | 20 | 7.00% |
| 81 | 34+937 | 21 | 40.767 | 20 | 7.00% |
| 82 | 34+975 | 21 | 38.332 | 20 | 7.00% |
| 83 | 35+364 | 21 | 35.041 | 20 | 7.00% |
| 84 | 35+396 | 21 | 30.94 | 20 | 7.00% |
| 85 | 36+709 | 21 | 42.869 | 20 | 7.00% |
| 86 | 36+824 | 21 | 54.818 | 20 | 7.00% |
| 87 | 36+989 | 21 | 35.253 | 20 | 7.00% |
| 88 | 37+022 | 21 | 32.033 | 20 | 7.00% |

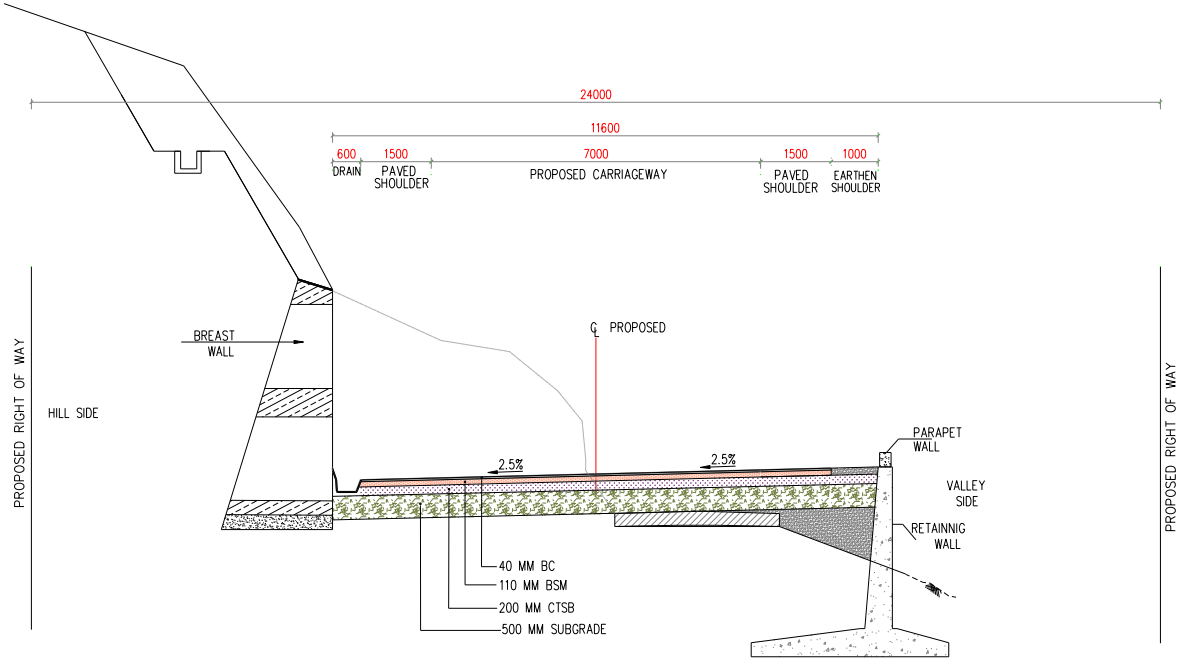
**Applicable Typical Cross Section:**

**TCS-I**




TCS-I
Two Lane With Paved Shoulder Concentric Widening (One Side Hill One Side Valley Section)

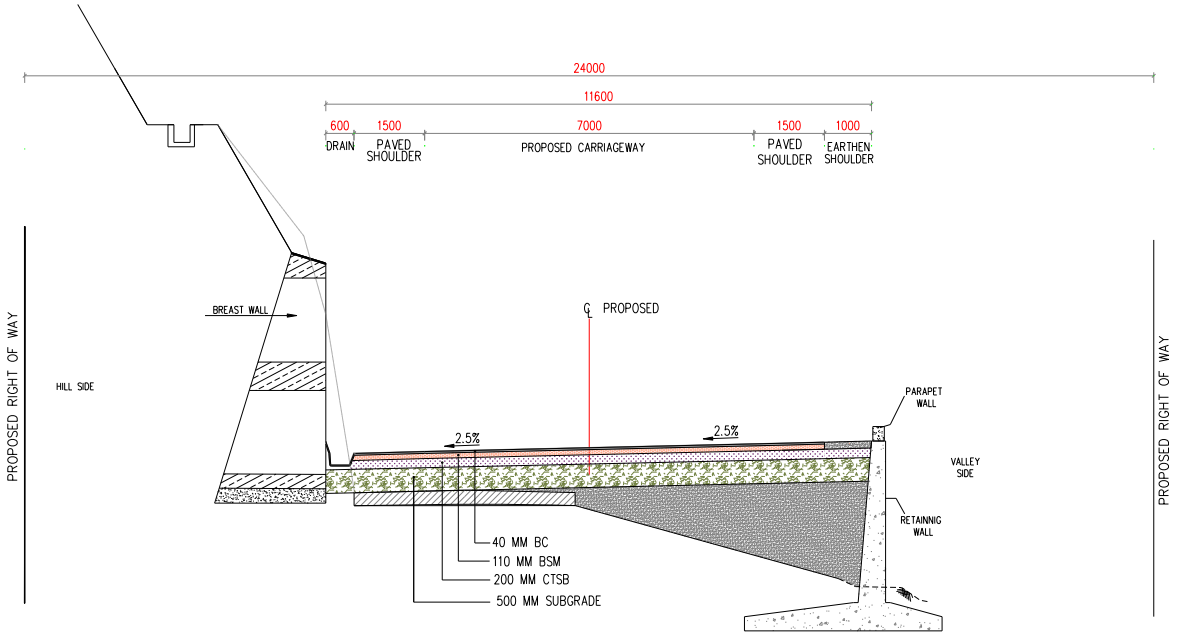
**TCS-II**




TCS-III

Two Lane With Paved Shoulder Eccentric Left Side Widening (One Side Hill One Side Valley Section)

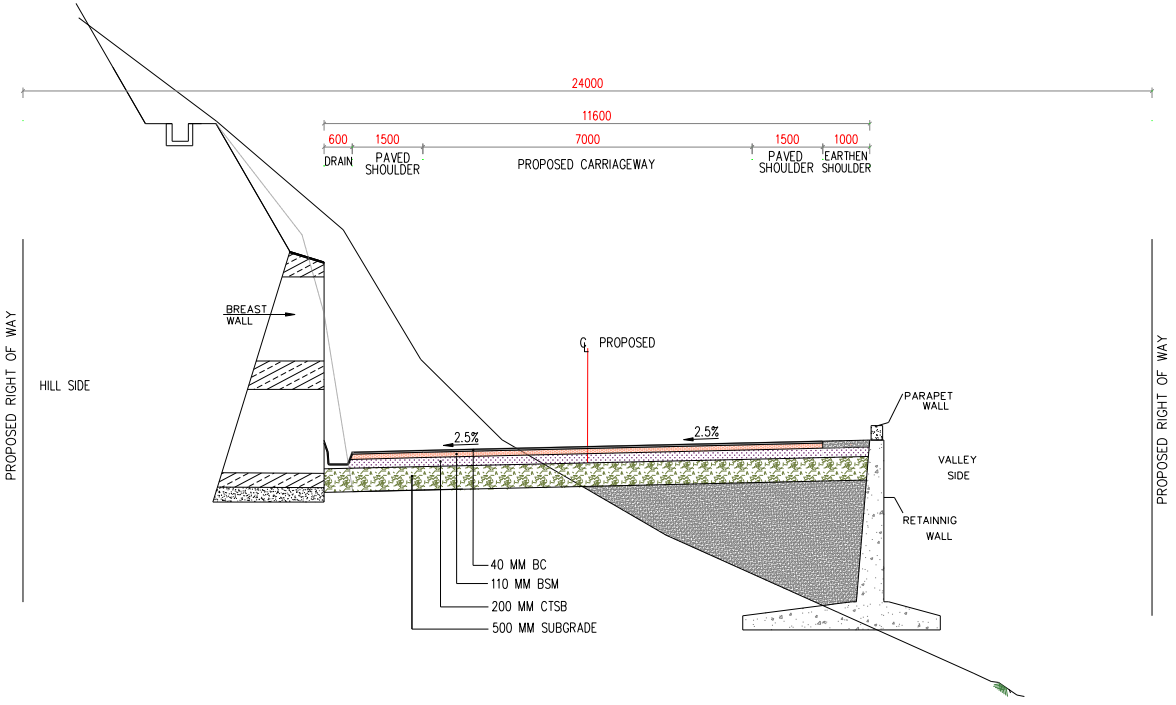
**TCS-III**




TCS-IIII

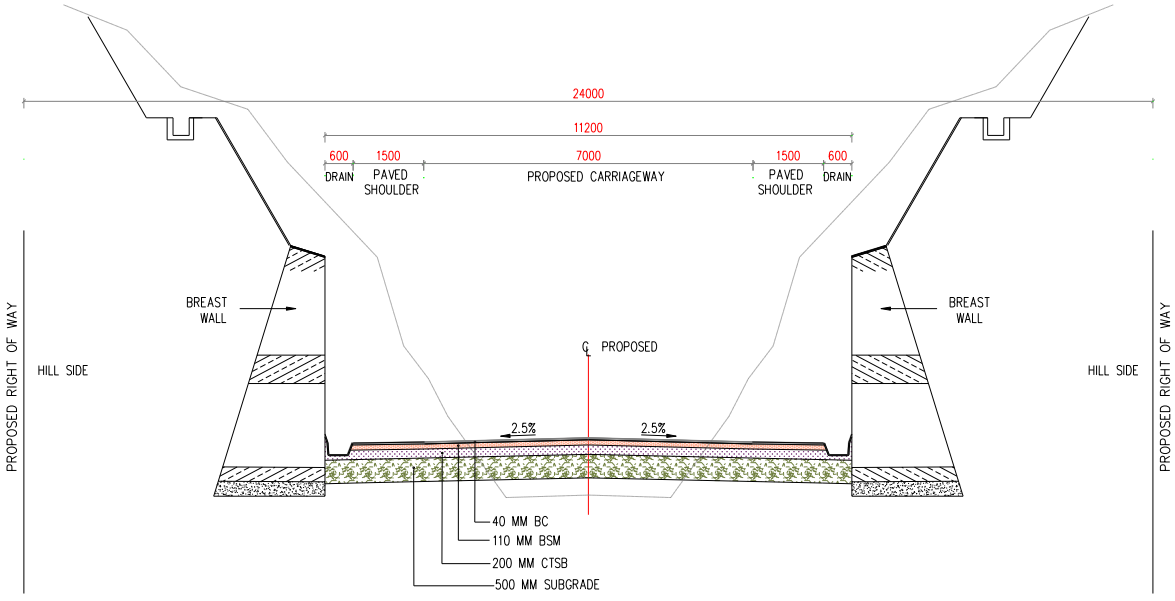
Two Lane With Paved Should Eccentric Right Widening (One Side Hiill One Side Valley Section)

**TCS-IV**



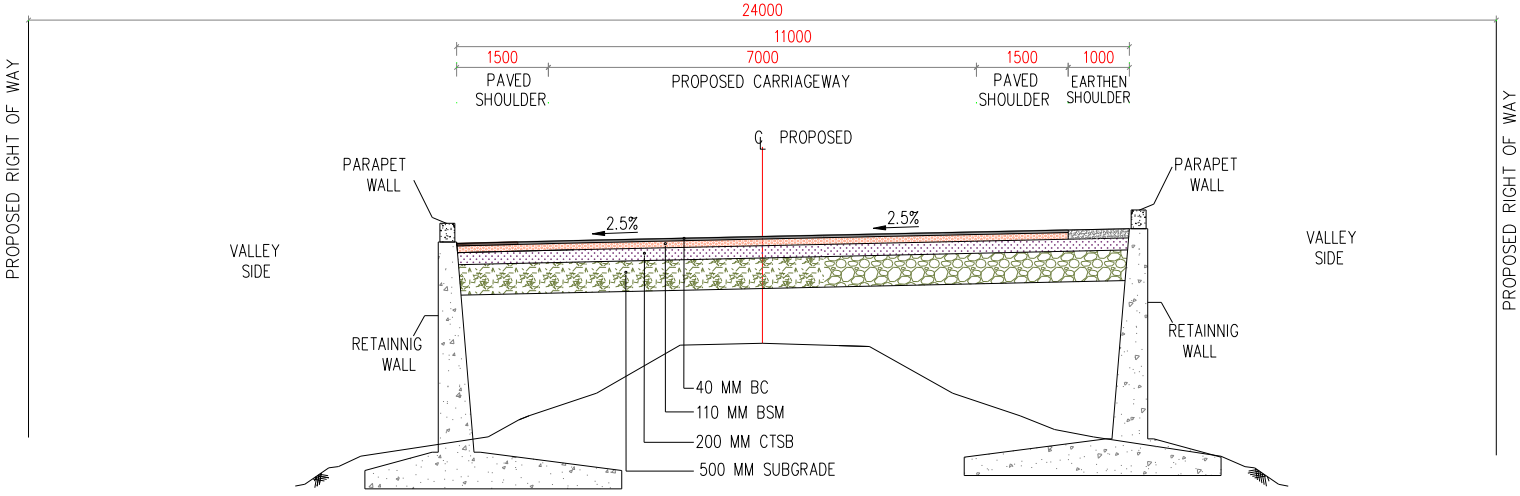

TCS-IV
Two Lane With Paved Shoulder (One Side Hill One Side Valley Section)
(Re-Alignment)

**TCS-V**



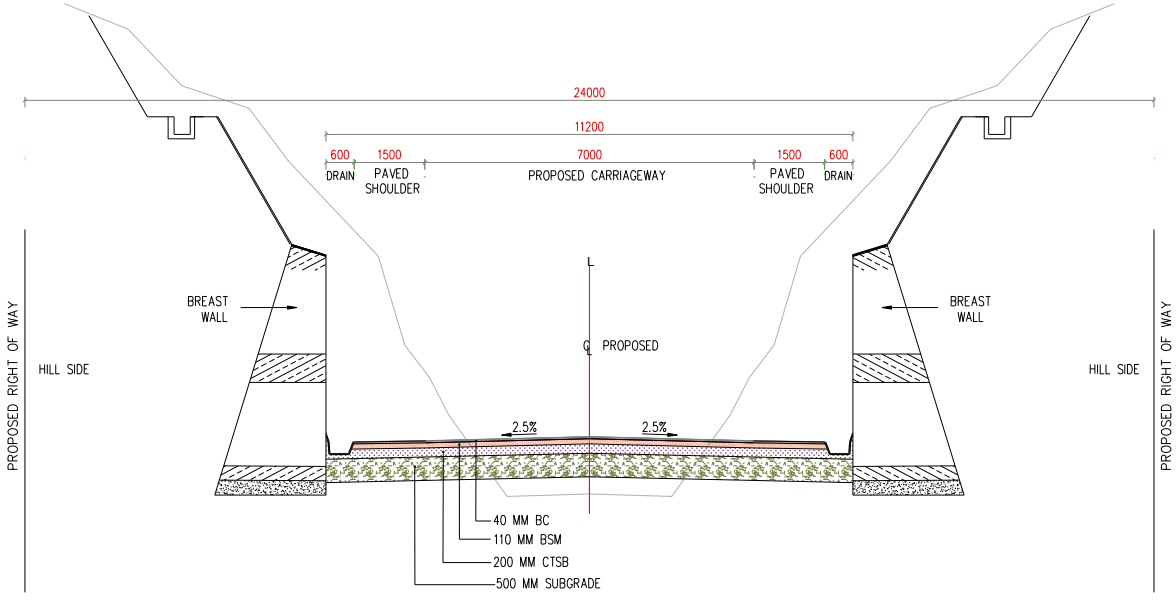

TCS-V
Two Lane With Paved Shoulder Raised Portion(Both Side Hill Section)

**TCS-VI**



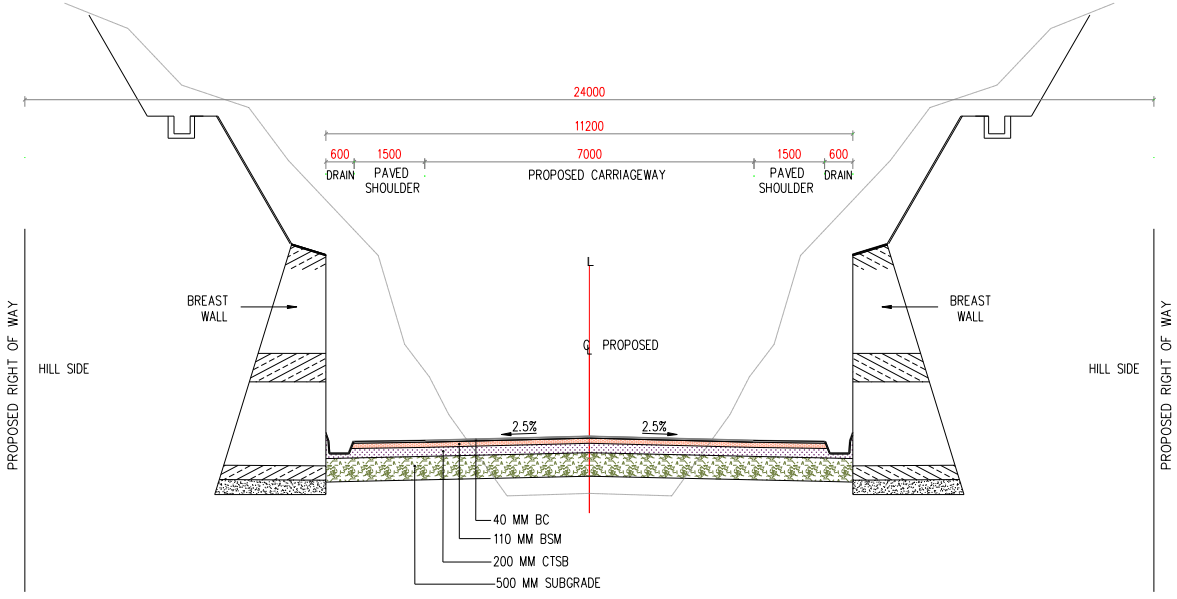

**TCS-VI**
**Two Lane With Paved Shoulder (Both Side Valley Section)**

**TCS-VII**




TCS-VIII
Two Lane With Paved Shoulder Realignment (Both Side Hill Section)

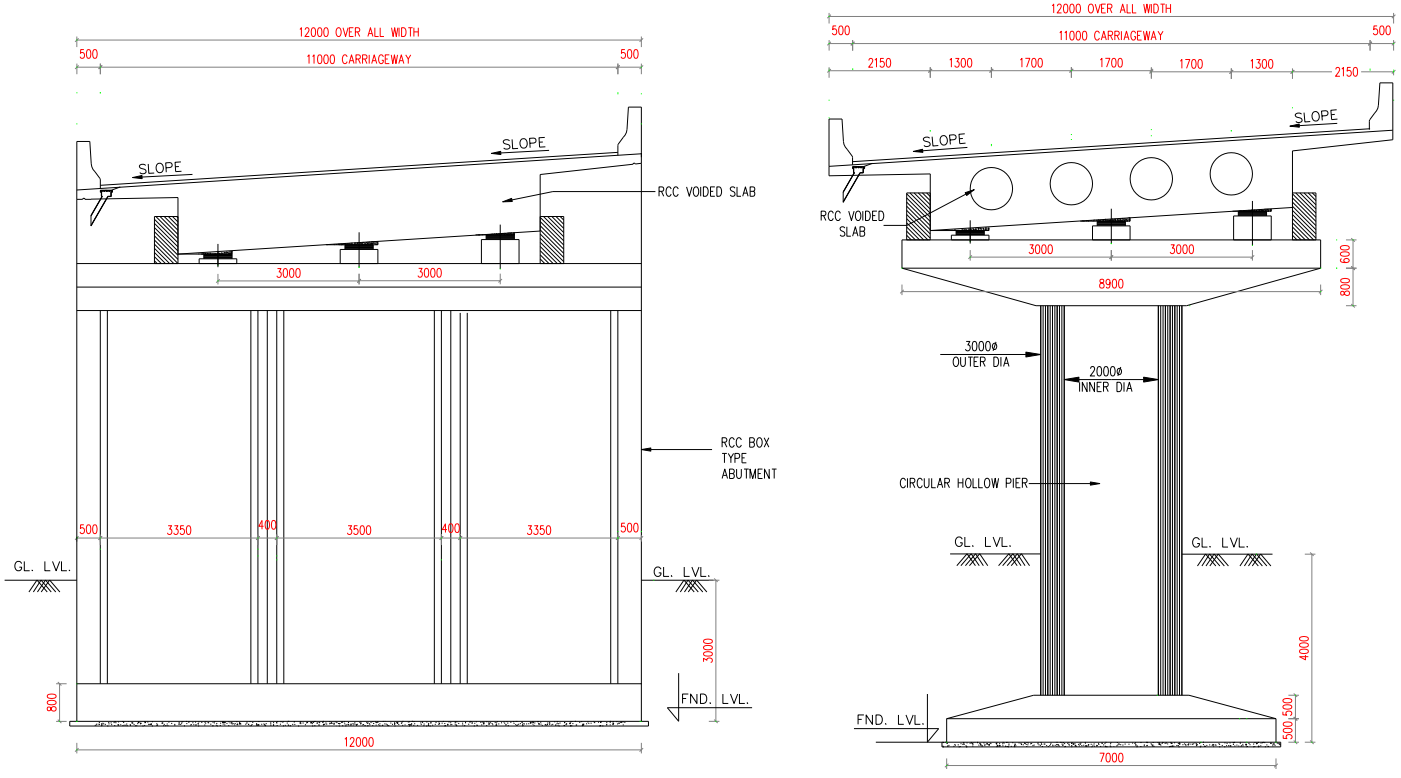
**TCS-VIII**




TCS-VIIII

Two Lane With Paved Shoulder Concentric Widening(Both Side Hiill Section)

**TCS-IX**




TCS-IX
TYPICAL CROSS SECTION FOR ELEVATED STRUCTURE

SCHEDULE - E
(See Clauses 2.1 and 14.2)

**MAINTENANCE REQUIREMENTS**

1 Maintenance Requirements

i. **The Contractor shall, at all times maintain the Project Highway in accordance with the provisions of this Agreement, Applicable Laws and Applicable Permits.**

ii. **The Contractor shall repair or rectify any Defect or deficiency set forth in Paragraph 2 of this Schedule-E within the time limit specified therein and any failure in this behalf shall constitute non-fulfillment of the Maintenance obligations by the Contractor. Upon occurrence of any breach hereunder, the Authority shall be entitled to effect reduction in monthly lump sum payment as set forth in Clause 14.6 of this Agreement, without prejudice to the rights of the Authority under this Agreement, including Termination thereof.**

iii. **All Materials, works and construction operations shall conform to the MORTH Specifications for Road and Bridge Works, and the relevant IRC publications. Where the specifications for a work are not given, Good Industry Practice shall be adopted.**

2 Repair/rectification of Defects and deficiencies

**The obligations of the Contractor in respect of Maintenance Requirements shall include repair and rectification of the Defects and deficiencies specified in Annex - I of this Schedule-E within the time limit set forth therein.**

3 Other Defects and deficiencies

**In respect of any Defect or deficiency not specified in Annex - I of this Schedule-E, the Authority's Engineer may, in conformity with Good Industry Practice, specify the permissible limit of deviation or deterioration with reference to the Specifications and Standards, and any deviation or deterioration beyond the permissible limit shall be repaired or rectified by the Contractor within the time limit specified by the Authority's Engineer.**

4 Extension of time limit

**Notwithstanding anything to the contrary specified in this Schedule-E, if the nature and extent of any Defect or deficiency justifies more time for its repair or rectification than the time specified herein, the Contractor shall be entitled to additional time in conformity with Good Industry Practice. Such additional time shall be determined by the Authority's Engineer and conveyed to the Contractor and the Authority with reasons thereof.**

5 Emergency repairs/restoration

**Notwithstanding anything to the contrary contained in this Schedule-E, if any Defect, deficiency or deterioration in the Project Highway poses a hazard to safety or risk of damage to property, the Contractor shall promptly take all reasonable measures for eliminating or minimizing such danger.**

6 Daily inspection by the Contractor

**The Contractor shall, through its engineer, undertake a daily visual inspection of the Project Highway and maintain a record thereof in a register to be kept in such form and manner as the Authority's Engineer may specify. Such record shall be kept in safe custody of the Contractor and shall be open to inspection by the Authority and the Authority's Engineer at any time during office hours.**

**7. Pre-monsoon inspection / Post-monsoon inspection**

The Contractor shall carry out a detailed pre-monsoon inspection of all bridges, culverts and drainage system before [1st June] every year in accordance with the guidelines contained in IRC: SP35. Report of this inspection together with details of proposed maintenance works as required on the basis of this inspection shall be sent to the Authority's Engineer before the [10th June] every year. The Contractor shall complete the required repairs before the onset of the monsoon and send to the Authority's Engineer a compliance report. Post monsoon inspection shall be done by the [30th September] and the inspection report together with details of any damages observed and proposed action to remedy the same shall be sent to the Authority's Engineer.

**8. Repairs on account of natural calamities**

All damages occurring to the Project Highway on account of a Force Majeure Event or default or neglect of the Authority shall be undertaken by the Authority at its own cost. The Authority may instruct the Contractor to undertake the repairs at the rates agreed between the Parties.

Annex - I
(Schedule-E)

## Repair/rectification of Defects and deficiencies

The Contractor shall repair and rectify the Defects and deficiencies specified in this Annex-I of Schedule-E within the time limit set forth in the table below.

| **Nature of Defect or deficiency** | | **Time limit for repair/rectification** |
|---|---|---|
| **ROADS** | | |
| **(a)** | **Carriageway and paved shoulders** | |
| (i) | Breach or blockade | Temporary restoration of traffic within 24 hours; permanent restoration within 15 (fifteen) days |
| (ii) | Roughness value exceeding 2,200 mm in a stretch of 1 km (as measured by a calibrated bump integrator) | 120 (one hundred and twenty) days |
| (iii) | Pot holes | 24 hours |
| (iv) | Any cracks in road surface | 15 (fifteen) days |
| (v) | Any depressions, rutting exceeding 10 mm in road surface | 30 (thirty) days |
| (vi) | Bleeding/skidding | 7 (seven) days |
| (vii) | Any other defect/distress on the road | 15 (fifteen) days |
| (viii) | Damage to pavement edges | 15 (fifteen) days |
| (ix) | Removal of debris, dead animals | 6 hours |
| **(b)** | **Granular earth shoulders, side slopes, drains and culverts** | |
| (i) | Variation by more than 1 % in the prescribed slope of camber/cross fall (shall not be less than the camber on the main carriageway) | 7 (seven) days |
| **Nature of Defect or deficiency** | | **Time limit for repair/rectification** |
| (ii) | Edge drop at shoulders exceeding 40 mm | 7 (seven) days |
| (iii) | Variation by more than 15% in the prescribed side (embankment) slopes | 30 (thirty) days |
| (iv) | Rain cuts/gullies in slope | 7 (seven) days |
| (v) | Damage to or silting of culverts and side drains | 7 (seven) days |
| (vi) | Desilting of drains in urban/semi-urban areas | 24 hours |
| (vii) | Railing, parapets, crash barriers | 7 (seven) days (Restore immediately if causing safety hazard) |
| **(c)** | **Road side furniture including road sign and pavement marking** | |
| (i) | Damage to shape or position, poor visibility or loss of retro-reflectivity | 48 hours |
| (ii) | Painting of km stone, railing, | As and when required/Once |

| | | |
|---|---|---|
| | parapets, crash barriers | every year |
| (iii) | Damaged/missing road signs requiring replacement | 7 (seven) days |
| (iv) | Damage to road mark ups | 7 (seven) days |
| **(d)** | **Road lighting** | |
| (i) | Any major failure of the system | 24 hours |
| (ii) | Faults and minor failures | 8 hours |
| **(e)** | **Trees and plantation** | |
| (i) | Obstruction in a minimum head-room of 5 m above carriageway or obstruction in visibility of road signs | 24 hours |
| (ii) | Removal of fallen trees from carriageway | 4 hours |
| (iii) | Deterioration in health of trees and bushes | Timely watering and treatment |
| **Nature of Defect or deficiency** | | **Time limit for repair/rectification** |
| (iv) | Trees and bushes requiring replacement | 30 (thirty) days |
| (v) | Removal of vegetation affecting sight line and road structures | 15 (fifteen) days |
| **(f)** | **Rest area** | |
| (i) | Cleaning of toilets | Every 4 hours |
| (ii) | Defects in electrical, water and sanitary installations | 24 hours |
| **(g)** | **[Toll Plaza]** | |
| **(h)** | **Other Project Facilities and Approach roads** | |
| (i) | Damage in approach roads, pedestrian facilities, truck lay-byes, bus-bays, bus-shelters, cattle crossings, [Traffic Aid Posts, Medical Aid Posts] and service roads | 15 (fifteen) days |
| (ii) | Damaged vehicles or debris on the road | 4 (four) hours |
| (iii) | Malfunctioning of the mobile crane | 4 (four) hours |
| **Bridges** | | |
| **(a)** | **Superstructure** | |
| (i) | Any damage, cracks, spalling/ scaling<br>Temporary measures<br>Permanent measures | within 48 hours<br>within 15 (fifteen) days or as specified by the Authority's Engineer |
| **(b)** | **Foundations** | |
| (i) | Scouring and/or cavitation | 15 (fifteen) days |
| **(c)** | **Piers, abutments, return walls and wing walls** | |
| (i) | Cracks and damages including settlement and tilting, spalling, scaling | 30 (thirty) days |
| **Nature of Defect or deficiency** | | **Time limit for repair/rectification** |

| | | |
|---|---|---|
| **(d)** | **Bearings (metallic) of bridges** | |
| (i) | Deformation, damages, tilting or shifting of bearings | 15 (fifteen) days Greasing of metallic bearings once in a year |
| **(e)** | **Joints** | |
| (i) | Malfunctioning of joints | 15 (fifteen) days |
| **(f)** | **Other items** | |
| (i) | Deforming of pads in elastomeric bearings | 7 (seven) days |
| (ii) | Gathering of dirt in bearings and joints; or clogging of spouts, weep holes and vent-holes | 3 (three) days |
| (iii) | Damage or deterioration in kerbs, parapets, handrails and crash barriers | 3 (three) days (immediately within 24 hours if posing danger to safety) |
| (iv) | Rain-cuts or erosion of banks of the side slopes of approaches | 7 (seven) days |
| (v) | Damage to wearing coat | 15 (fifteen) days |
| (vi) | Damage or deterioration in approach slabs, pitching, apron, toes, floor or guide bunds | 30 (thirty) days |
| (vii) | Growth of vegetation affecting the structure or obstructing the waterway | 15 (fifteen) days |
| **(g)** | **Hill Roads** | |
| (i) | Damage to retaining wall/breast wall | 7 (seven) days |
| (ii) | Landslides requiring clearance | 12 (twelve) hours |
| (iii) | Snow requiring clearance | 24 (twenty four) hours |

[Note: Where necessary, the Authority may modify the time limit for repair/rectification, or add to the nature of Defect or deficiency before issuing the bidding document, with the approval of the competent authority.]

SCHEDULE - F
(See Clause 4.1.(vii)(a))

**APPLICABLE PERMITS**

1 Applicable Permits

**1.1 The Contractor shall obtain, as required under the Applicable Laws, the following Applicable Permits:**

**a) Permission of the State Government for extraction of boulders from quarry;**

**b) Permission of Village Panchayats and Pollution Control Board for installation of crushers;**

**c) Licence for use of explosives;**

**d) Permission of the State Government for drawing water from river/reservoir;**

**e) Licence from inspector of factories or other competent Authority for setting up batching plant;**

**f) Clearance of Pollution Control Board for setting up batching plant;**

**g) Clearance of Village Panchayats and Pollution Control Board for setting up asphalt plant;**

**h) Permission of Village Panchayats and State Government for borrow earth; and**

**i) Any other permits or clearances required under Applicable Laws.**

1.2 Applicable Permits, as required, relating to environmental protection and conservation shall have been procured by the Authority in accordance with the provisions of this Agreement.

SCHEDULE - G

(See Clauses 7.1.and 19.2)

**FORM OF BANK GUARANTEE**

**Annexure-I**

(See Clause 7.1)

[Performance Security/Additional Performance Security]

The Managing Director,
National Highways & Infrastructural Development Corporation Ltd.
PTI Building, 3rd Floor,
4, Parliament Street
New Delhi - 110001

WHEREAS:

(A) _____ [name and address of contractor] (hereinafter called the "Contractor") and National Highways and Infrastructure Development Corporation Ltd. , (hereinafter called the "Authority") have entered into an agreement (hereinafter called the "Agreement") for **"Construction and upgradation of existing road to 2-lane with paved shoulder of Bagrakot-Kafer section of NH-717A from Km. 13.000 to Km. 25.600 on EPC basis under SARDP-NE Phase 'Á' in the State of West Bengal (Package-IV B)** subject to and in accordance with the provisions of the Agreement

(B) The Agreement requires the Contractor to furnish a Performance Security for due and faithful performance of its obligations, under and in accordance with the Agreement, during the {Construction Period/ Defects Liability Period and Maintenance Period} (as defined in the Agreement) in a sum of Rs….. cr. (Rupees ……..….. crore) (the "Guarantee Amount ").

(C) We, …….. through our branch at ……. (the "Bank") have agreed to furnish this bank guarantee (hereinafter called the "Guarantee") by way of Performance Security.

NOW, THEREFORE, the Bank hereby, unconditionally and irrevocably, guarantees and affirms as follows:

1. The Bank hereby unconditionally and irrevocably guarantees the due and faithful performance of the Contractor's obligations during the {Construction Period/ Defects Liability Period and Maintenance Period} under and in accordance with the Agreement, and agrees and undertakes to pay to the Authority, upon its mere first written demand, and without any demur, reservation, recourse, contest or protest, and without any reference to the Contractor, such sum or sums up to an aggregate sum of the Guarantee Amount as the Authority shall claim, without the Authority being required to prove or to show grounds or reasons for its demand and/or for the sum specified therein.

2. A letter from the Authority, under the hand of an officer not below the rank of General Manager in the National Highways & Infrastructure Development Corporation Limited, that the Contractor has committed default in the due and faithful performance of all or any of its obligations under and in accordance with the Agreement shall be conclusive, final and binding on the Bank. The Bank further agrees that the Authority shall be the sole judge as to whether the Contractor is in

default in due and faithful performance of its obligations during and under the Agreement and its decision that the Contractor is in default shall be final and binding on the Bank, notwithstanding any differences between the Authority and the Contractor, or any dispute between them pending before any court, tribunal, arbitrators or any other authority or body, or by the discharge of the Contractor for any reason whatsoever.

3. In order to give effect to this Guarantee, the Authority shall be entitled to act as if the Bank were the principal debtor and any change in the constitution of the Contractor and/or the Bank, whether by their absorption with any other body or corporation or otherwise, shall not in any way or manner affect the liability or obligation of the Bank under this Guarantee.

4. It shall not be necessary, and the Bank hereby waives any necessity, for the Authority to proceed against the Contractor before presenting to the Bank its demand under this Guarantee.

The Authority shall have the liberty, without affecting in any manner the liability of the Bank under this Guarantee, to vary at any time, the terms and conditions of the Agreement or to extend the time or period for the compliance with, fulfillment and/ or performance of all or any of the obligations of the Contractor contained in the Agreement or to postpone for any time, and from time to time, any of the rights and powers exercisable by the Authority against the Contractor, and either to enforce or forbear from enforcing any of the terms and conditions contained in the Agreement and/or the securities available to the Authority, and the Bank shall not be released from its liability and obligation under these presents by any exercise by the Authority of the liberty with reference to the matters aforesaid or by reason of time being given to the Contractor or any other forbearance, indulgence, act or omission on the part of the Authority or of any other matter or thing whatsoever which under any law relating to sureties and guarantors would but for this provision have the effect of releasing the Bank from its liability and obligation under this Guarantee and the Bank hereby waives all of its rights under any such law.

5. This Guarantee is in addition to and not in substitution of any other guarantee or security now or which may hereafter be held by the Authority in respect of or relating to the Agreement or for the fulfillment, compliance and/or performance of all or any of the obligations of the Contractor under the Agreement.

7. Notwithstanding anything contained hereinbefore, the liability of the Bank under this Guarantee is restricted to the Guarantee Amount and this Guarantee will remain in force for the period specified in paragraph 8 below and unless a demand or claim in writing is made by the Authority on the Bank under this Guarantee all rights of the Authority under this Guarantee shall be forfeited and the Bank shall be relieved from its liabilities hereunder.

8. The Guarantee shall cease to be in force and effect on ……[$]. Unless a demand or claim under this Guarantee is made in writing before expiry of the Guarantee, the Bank shall be discharged from its liabilities hereunder.

9. The Bank undertakes not to revoke this Guarantee during its currency, except with the previous express consent of the Authority in writing, and declares and warrants that it has the power to issue this Guarantee and the undersigned has full powers to do so on behalf of the Bank.

10. Any notice by way of request, demand or otherwise hereunder may be sent by post addressed to the Bank at its above referred branch, which shall be deemed to have been duly authorised to receive such notice and to effect payment thereof forthwith,

and if sent by post it shall be deemed to have been given at the time when it ought to have been delivered in due course of post and in proving such notice, when given by post, it shall be sufficient to prove that the envelope containing the notice was posted and a certificate signed by an officer of the Authority that the envelope was so posted shall be conclusive.

11. This Guarantee shall come into force with immediate effect and shall remain in force and effect for up to the date specified in paragraph 8 above or until it is released earlier by the Authority pursuant to the provisions of the Agreement.

12. This guarantee shall also be operatable at our…….. Branch at New Delhi, from whom, confirmation regarding the issue of this guarantee or extension / renewal thereof shall be made available on demand. In the contingency of this guarantee being invoked and payment there under claimed, the said branch shall accept such invocation letter and make payment of amounts so demanded under the said invocation.

13. Bank Guarantee has been sent to authority's bank through SFMS gateway as per the details below:-

| **Sl.** | **Particulars** | **Details** |
|---|---|---|
| 1 | Name of the Beneficiary | National Highways and Infrastructure Development Corporation Limited |
| 2 | Beneficiary Bank Account No. | 90621010002659 |
| 3 | Beneficiary Bank Branch | IFSC SYNB0009062 |
| 4 | Beneficiary Bank Branch Name | Transport Bhawan, New Delhi |
| 5 | Beneficiary Bank Address | Syndicate Bank, Transport Bhawan, 1st Parliament street, New Delhi-110001 |

Signed and sealed this ……. day of …….., 20…… at ……..

SIGNED , SEALED AND DELIVERED

For and on behalf of the bank by:

(Signature)

(Name)

(Designation)

(Code Number)

(Address)

Notes:

(i) The bank guarantee should contain the name, designation and code number of the officer(s) signing the guarantee.

(ii) The address, telephone number and other details of the head office of the Bank as well as of issuing branch should be mentioned on the covering letter of issuing branch.

Annexure – II
(Schedule - G)

**(See Clause 19.2)**

Form for Guarantee for Advance Payment

The Managing Director,
National Highways & Infrastructural Development Corporation Ltd.
PTI Building, 3rd Floor,
4, Parliament Street
New Delhi - 110001

WHEREAS:

(A) [name and address of contractor] (hereinafter called the "**Contractor**") has executed an agreement (hereinafter called the "**Agreement**") with the National Highways and Infrastructure Corporation Ltd., (hereinafter called the "**Authority**") for the "**Construction and upgradation of existing road to 2-lane with paved shoulder of Bagrakot-Kafer section of NH-717A from Km. 13.000 to Km. 25.600 on EPC basis under SARDP-NE Phase 'Á' in the State of West Bengal (Package-IV B).**, subject to and in accordance with the provisions of the Agreement

(B) In accordance with Clause 19.2 of the Agreement, the Authority shall make to the Contractor an interest free advance payment (herein after called " **Advance Payment**") equal to 10% (ten per cent) of the Contract Price; and that the Advance Payment shall be made in three installments subject to the Contractor furnishing an irrevocable and unconditional guarantee by a scheduled bank for an amount equivalent to 110% (one hundred and ten percent) of such installment to remain effective till the complete and full repayment of the installment of the Advance Payment as security for compliance with its obligations in accordance with the Agreement. The amount of {first/second/third} installment of the Advance Payment is Rs. --- --- cr. (Rupees ------ crore) and the amount of this Guarantee is Rs. ------- cr. (Rupees ------ crore) (the "**Guarantee Amount**")[$] .

(C) We, …….. through our branch at ……. (the "Bank") have agreed to furnish this bank guarantee (hereinafter called the "Guarantee" ) for the Guarantee Amount.

NOW, THEREFORE, the Bank hereby, unconditionally and irrevocably, guarantees and affirms as follows:

1. The Bank hereby unconditionally and irrevocably guarantees the due and faithful repayment on time of the aforesaid installment of the Advance Payment under and in accordance with the Agreement, and agrees and undertakes to pay to the Authority, upon its mere first written demand, and without any demur, reservation, recourse, contest or protest, and without any reference to the Contractor, such sum or sums up to an aggregate sum of the Guarantee Amount as the Authority shall claim, without the Authority being required to prove or to show grounds or reasons for its demand and/or for the sum specified therein.

2. A letter from the Authority, under the hand of an officer not below the rank of [General Manager in the National Highways & Infrastructure Development Corporation Limited], that the Contractor has committed default in the due and faithful performance of all or any of its obligations for the repayment of the instalment of the Advance Payment under and in accordance with the Agreement shall

be conclusive, final and binding on the Bank. The Bank further agrees that the Authority shall be the sole judge as to whether the Contractor is in default in due and faithful performance of its obligations during and under the Agreement and its decision that the Contractor is in default shall be final and binding on the Bank, notwithstanding any differences between the Authority and the Contractor, or any dispute between them pending before any court, tribunal, arbitrators or any other authority or body, or by the discharge of the Contractor for any reason whatsoever.

3 In order to give effect to this Guarantee, the Authority shall be entitled to act as if the Bank were the principal debtor and any change in the constitution of the Contractor and/or the Bank, whether by their absorption with any other body or corporation or otherwise, shall not in any way or manner affect the liability or obligation of the Bank under this Guarantee.

4 It shall not be necessary, and the Bank hereby waives any necessity, for the Authority to proceed against the Contractor before presenting to the Bank its demand under this Guarantee.

5 The Authority shall have the liberty, without affecting in any manner the liability of the Bank under this Guarantee, to vary at any time, the terms and conditions of the Advance Payment or to extend the time or period of its repayment or to postpone for any time, and from time to time, any of the rights and powers exercisable by the Authority against the Contractor, and either to enforce or forbear from enforcing any of the terms and conditions contained in the Agreement and/or the securities available to the Authority, and the Bank shall not be released from its liability and obligation under these presents by any exercise by the Authority of the liberty with reference to the matters aforesaid or by reason of time being given to the Contractor or any other forbearance, indulgence, act or omission on the part of the Authority or of any other matter or thing whatsoever which under any law relating to sureties and guarantors would but for this provision have the effect of releasing the Bank from its liability and obligation under this Guarantee and the Bank hereby waives all of its rights under any such law.

6 This Guarantee is in addition to and not in substitution of any other guarantee or security now or which may hereafter be held by the Authority in respect of or relating to the Advance Payment.

7 Notwithstanding anything contained hereinbefore, the liability of the Bank under this Guarantee is restricted to the Guarantee Amount and this Guarantee will remain in force for the period specified in paragraph 8 below and unless a demand or claim in writing is made by the Authority on the Bank under this Guarantee all rights of the Authority under this Guarantee shall be forfeited and the Bank shall be relieved from its liabilities hereunder.

8. The Guarantee shall cease to be in force and effect on ****.[$] Unless a demand or claim under this Guarantee is made in writing on or before the aforesaid date, the Bank shall be discharged from its liabilities hereunder.

9. The Bank undertakes not to revoke this Guarantee during its currency, except with the previous express consent of the Authority in writing, and declares and warrants that it has the power to issue this Guarantee and the undersigned has full powers to do so on behalf of the Bank.

10. Any notice by way of request, demand or otherwise hereunder may be sent by post addressed to the Bank at its above referred branch, which shall be deemed to have been duly authorised to receive such notice and to effect payment thereof forthwith, and if sent by post it shall be deemed to have been given at the time when it ought to have been delivered in due course of post and in proving such notice, when given by post, it shall be sufficient to prove that the envelope containing the notice was posted

and a certificate signed by an officer of the Authority that the envelope was so posted shall be conclusive.

11. This Guarantee shall come into force with immediate effect and shall remain in force and effect up to the date specified in paragraph 8 above or until it is released earlier by the Authority pursuant to the provisions of the Agreement.

Signed and sealed this ……. day of …….., 20…… at ……..

SIGNED , SEALED AND DELIVERED

For and on behalf of the bank by:

(Signature)

(Name)

(Designation)

(Code Number)

(Address)

Notes:

i. The bank guarantee should contain the name, designation and code number of the officer(s) signing the guarantee.

ii. The address, telephone number and other details of the head office of the Bank as well as of issuing branch should be mentioned on the covering letter of issuing branch

**Schedule-H**

(See Clause 10.1 (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. | 33.345% | **A- Widening and strengthening of existing road** | |
| | | (1) Earthwork up to top of the sub-grade | 0.000% |
| | | (2) Sub-base Course | 0.000% |
| | | (3) Non Bituminous Base Course | 0.000% |
| | | (4) Bituminous Base Course | 0.000% |
| | | (5) Wearing Coat | 0.000% |
| | | (6) Widening and repair of culvert | 0.000% |
| | | **B1- Reconstruction/ New 2-Lane realignment/bypass (Flexible Pavement)** | |
| | | (1) Earthwork up to top of the sub-grade | 50.154% |
| | | (2) Cement Treated Sub Base (CTSB) | 14.306% |
| | | (3) Bituminous Stabilized Materail (BSM) | 14.264% |
| | | (4) BC | 7.759% |
| | | **B2- Reconstruction/ New 2-Lane realignment/bypass (Rigid Pavement)** | |
| | | (1) Earthwork up to top of the sub-grade | 0.000% |
| | | (2) Sub-base Course | 0.000% |
| | | (3) Dry Lean Concrete (DLC) Course | 0.000% |
| | | (4) Pavement Quality Control (PQC) Course | 0.000% |
| | | **C1- Reconstruction/ New Service Road (Flexible Pavement)** | |
| | | (1) Earthwork up to top of the sub-grade | 0.000% |
| | | (2) Sub-base Course | 0.000% |
| | | (3) Non Bituminous Base Course | 0.000% |
| | | (4) Bituminous Base Course | 0.000% |
| | | (5) Wearing Coat | 0.000% |

| Item | Weightage in percentage to the Contract Price | Stage for Payment | Percentage weightage |
|---|---|---|---|
| | | **C2- Reconstruction/ New Service Road (Rigid Pavement)** | |
| | | (1) Earthwork up to top of the sub-grade | 0.000% |
| | | (2) Sub-base Course | 0.000% |
| | | (3) Dry Lean Concrete (DLC) Course | 0.000% |
| | | (4) Pavement Quality Control (PQC) Course | 0.000% |
| | | **D - Re-Construction and new culverts on existing road, realignments on existing road, realignments, bypasses:** | |
| | | Culverts(Length<6m) | 13.517% |
| Minor Bridges/Underpasses/ Overpasses | 1.262% | **A1-<u>Widening and Repairs of Minor Bridges (Length>6m and <60m)</u>** | |
| | | Minor bridges | 0.000% |
| | | **A2-New <u>Minor Bridges (Length>6m and <60m)</u>** | |
| | | **(1) Foundation** | |
| | | On completion of the foundation work including foundations for wing and return walls ,abutments, piers. | 50.595% |
| | | **(2) Sub-structure:** | |
| | | On completion of abutments, piers upto the abutment/ pier cap including wing/ return/ retaining wall upto top | 26.465% |
| | | **(3) Super Structure:** | |
| | | On completion ofthe super-structure in all respects including Girder, Deck slab, bearings | 16.167% |
| | | **(4) Approaches:** | |
| | | On completion of approaches including Retaining walls, stone pitching, protection works complete in all respect and fit for use | 2.813 |
| | | **(5) Guide Bund and River Training Works:** | |
| | | On completion of Guide Bund and River Training Works complete in all respect. | 0.000% |
| | | **(6) Other Ancilliary Works:** | |
| | | On completion of wearing coat, expansion joints, hand rails, crash barriers, roadsigns & markings, tests on completion in all respect. | 3.960% |

| Item | Weightage in percentage to the Contract Price | Stage for Payment | Percentage weightage |
|---|---|---|---|
| | | **B.1- Widening and repair of Underpasses/overpasses** | |
| | | Underpasses/Overpasses | 0.000% |
| | | **B.2- New Underpasses/overpasses** | |
| | | **(1) Foundation** | |
| | | On completion of the foundation work including foundations for wing and return walls ,abutments, piers. | 0.000% |
| | | **(2) Sub-structure** | |
| | | On completion of abutments, piers upto the abutment/ pier cap including wing/ return/ retaining wall upto top | 0.000% |
| | | **(3) Super Structure:** | |
| | | On completion ofthe super-structure in all respects including Girder, Deck slab, bearings | 0.000% |
| | | Wearing Coat (a) in case of Overpass-wearing coat including expansion joint complete in all respect as specified and (b) in case of underpass rigid pavement including drainage facility complete in all respects as specified. | |
| | | **(4)** On completion of Retaining / Reinforced earth walls, complete in allrespect and fit for use | 0.000% |
| | | **(5) Approaches and other Ancillary Works:** | |
| | | On completion of wearing coat,expansion joints, hand rails, crash barriers, stone pitching, protection works, road signs & markings, tests on completion in all respect. Wearing Coat (a) in case of Overpass wearing coat including expansion joints complete in all respect as specified and (b) in case of underpass-rigid pavement including drainage facility complete in all respects as specified | 0.000% |
| Major Bridge (length>60m) works and RUB/ROB/elevated sections/flyovers including viaducts, if any | 35.835% | **A.1 -<u>Widening and repairs of Major Bridges</u>** | |
| | | (1) Foundation: on completion of the foundation work including foundations for return walls, abutments, piers | 0.000% |

| Item | Weightage in percentage to the Contract Price | Stage for Payment | Percentage weightage |
|---|---|---|---|
| | | (2) Sub-structure: on completion abutments, piers upto the abutment/Pier cap | 0.000% |
| | | (3) Super-structure: On completion of the super-structure in all respects including girder,deck slab, bearings | 0.000% |
| | | (4) Wearing coat including expansion joints | 0.000% |
| | | (5) Miscellaneous items like hand rails, crash barriers, road markings etc. | 0.000% |
| | | (6) Wing walls/Return Walls | 0.000% |
| | | (7) Guide bunds, River Training Works etc | 0.000% |
| | | (8) Approaches (including retaining walls, stone pitching and protection works) | 0.000% |
| | | **A.2 -New Major Bridges** | |
| | | (1) Foundation: on completion of the foundation work including foundations for return walls, abutments, piers | 0.000% |
| | | (2) Sub-structure: on completion abutments, piers upto the abutment/Pier cap | 0.000% |
| | | (3) Super-structure: On completion of the super-structure in all respects including girder,deck slab, bearings | 0.000% |
| | | (4) Wearing Coat including expansion joints | 0.000% |
| | | (5) Miscellaneous items like hand rails, crash barriers, road markings etc. | 0.000% |
| | | (6) Wing walls/Return Walls | 0.000% |
| | | (7) Guide bunds, River Training Works etc | 0.000% |
| | | (8) Approaches (including retaining walls, stone pitching and protection works) | 0.000% |
| | | **B.1-Widening and repair of** | |
| | | **(a) ROB** | |
| | | **(b) RUB** | |
| | | (1) Foundation | 0.000% |
| | | (2) Sub-structure | 0.000% |
| | | (3) Super-structure (including bearings) | 0.000% |

| Item | Weightage in percentage to the Contract Price | Stage for Payment | Percentage weightage |
|---|---|---|---|
| | | (4) Wearing Coat (a) in case of ROB - wearing coat including expansion joint complete in all respect as specified and (b) in case of RUB rigid pavement under RUB including drainage facility complete in all respects as specified. | 0.000% |
| | | (5) Miscellaneous items like hand rails, crash barriers, road markings etc. | 0.000% |
| | | (6) Wing walls/Return Walls | 0.000% |
| | | (7) Retaining/Reinforced earth walls | 0.000% |
| | | (8) Approaches and ancillary works (wearing coat, expansion joints, hand rails, crash barriers, road signs & markings, stone pitching, protection works etc.)) | 0.000% |
| | | **B.2-<u>New ROB/RUB</u>** | |
| | | **(a) ROB** | |
| | | **(b) RUB** | |
| | | (1) Foundation | 0.000% |
| | | (2) Sub-structure | 0.000% |
| | | (3) Super-structure (including bearings) | 0.000% |
| | | (4) Wearing Coat (a) in case of ROB - wearing coat including expansion joint complete in all respect as specified and (b) in case of RUB rigid pavement under RUB including drainage facility complete in all respects as specified. | 0.000% |
| | | (5) Miscellaneous items like hand rails, crash barriers, road markings etc. | 0.000% |
| | | (6) Wing walls/Return Walls | 0.000% |
| | | (7) Retaining/Reinforced earth walls | 0.000% |
| | | (8) Approaches and ancillary works (wearing coat, expansion joints, hand rails, crash barriers, road signs & markings, stone pitching, protection works etc.)) | 0.000% |
| | | **C.1- Widening and repair of Elevated Sections/Flyovers/Grade Separators** | |
| | | (1) Foundation | 0.000% |
| | | (2) Sub-structure | 0.000% |
| | | (3) Super-structure (including bearings) | 0.000% |
| | | (4) Wearing Coat including expansion joints. | 0.000% |

| Item | Weightage in percentage to the Contract Price | Stage for Payment | Percentage weightage |
|---|---|---|---|
| | | (5) Miscellaneous items like hand rails, crash barriers, road markings etc. | 0.000% |
| | | (6) Wing walls/Return Walls | 0.000% |
| | | (7) Retaining/Reinforced earth walls | 0.000% |
| | | (8) Approaches and ancillary works (wearing coat, expansion joints, hand rails, crash barriers, road signs & markings, stone pitching, protection works etc.)) | 0.000% |
| | | **C.2.New Elevated Sections / Flyovers / Grade Separators** | |
| | | (1) Foundation: On completion of the foundation work including foundations for wing and return walls, abutments, piers. | 32.846% |
| | | (2) Sub-structure: On completion of abutments, piers upto the abutment/pier cap including wing/return/retaining wall upto top | 43.096% |
| | | (3) Super-structure: On completion of the super structure in all respects including girder,deck slab,bearings | 18.906% |
| | | (4) Wearing Coat including expansion joints. | 2.143% |
| | | (5) Miscellaneous items like hand rails, crash barriers, road markings etc. | 3.009% |
| | | (6) Wing walls/Return Walls | 0.000% |
| | | (7) Retaining/Reinforced earth walls | 0.000% |
| | | (8) Approaches and ancillary works (wearing coat, expansion joints, hand rails, crash barriers, road signs & markings, stone pitching, protection works etc.)) | 0.000% |
| Other works | 29.558% | (i) Toll Plaza | 0.000% |
| | | (ii)Road side drains | |
| | | Lined Drain/Catch water Drain | 12.021% |
| | | Unlined Drain | 0.000% |
| | | (iii)Road signs, markings, km stones, safety devices, … | 0.508% |
| | | (iv) Road Studs | 0.840% |
| | | (v)Project facilities | 0.000% |
| | | a) Bus Shelter | 1.840% |
| | | b) Truck lay bye | 0.000% |

| Item | Weightage in percentage to the Contract Price | Stage for Payment | Percentage weightage |
|---|---|---|---|
| | | c) Rest Areas | 0.000% |
| | | d) Others (Includes junction and Site Clearance) | 12.255% |
| | | (vi)Retaining Wall | 39.932% |
| | | (vii) Breast Wall | 28.833% |
| | | (viii)RE Wall | 0.000% |
| | | (ix) Street Lighting | 0.000% |
| | | (x) Utility ducts | 0.000% |
| | | (xi) Parapet walls | 3.481% |
| | | (xii) ATMS | 0.000% |
| | | (xiii) Rain water harvesting | 0.000% |
| | | (xiv)Road side plantation including horticultrure in wayside aminities | 0.000% |
| | | (xv) Repair of protection works other than approaches to the bridges, elevated sections/ flyovers/grade separators and ROBs/RUBs | 0.000% |
| | | (xvi)Safety and traffic management during construction | 0.290% |
| | | (xvii)Protection works like pitching on side slopes, chutes, crash barrier | 0.000% |

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 |
|---|---|---|
| **A- Widening and strengthening of existing road** | | 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 10 (ten) percent of the total length. |
| (1) Earthwork up to top of the sub-grade | 0.00% | |
| (2) Sub-base Course | 0.00% | |
| (3) Non Bituminous Base Course | 0.00% | |
| (4) Bituminous Base Course | 0.00% | |
| (5) Wearing Coat | 0.00% | |
| (6) Widening and repair of culvert | 0.00% | Cost of completed culverts shall be determined pro rate with respect to the total number of culverts. Payment shall be made on the completion of atleast five culverts. |

| Stage of Payment | Percentage - weightage | Payment Procedure |
|---|---|---|
| **B1- 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 full length or 5 (five) km length whichever is less. |
| (1) Earthwork up to top of the sub-grade | 50.154% | |
| (2)Cement Treated Sub Base (CTSB) | 14.306% | |
| (3)Bituminous Stabilized Materail (BSM) | 14.264% | |
| (4)BC | 7.759% | |
| **B2- 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 full length or 5 (five) km length whichever is less. |
| (1) Earthwork up to top of the sub-grade | 0.00% | |
| (2) Sub-base Course | 0.00% | |
| (3) Dry Lean Concrete (DLC) Course | 0.00% | |
| (4) Pavement Quality Control (PQC) Course | 0.00% | |
| **C1- Reconstruction/ New Service Road (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 full length or 5 (five) km length whichever is less. |
| (1) Earthwork up to top of the sub-grade | 0.00% | |
| (2) Sub-base Course | 0.00% | |
| (3) Non Bituminous Base Course | 0.00% | |
| (4) Bituminous Base Course | 0.00% | |
| (5) Wearing Coat | 0.00% | |
| **C2- Reconstruction/ New Service Road (Rigid Pavement)** | | Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in full length or 5 (five) km length whichever is less. |
| (1) Earthwork up to top of the sub-grade | 0.00% | |
| (2) Sub-base Course | 0.00% | |
| (3) Dry Lean Concrete (DLC) Course | 0.00% | |
| (4) Pavement Quality Control (PQC) Course | 0.00% | |
| **D - Re-Construction and new culverts on existing road, realignments on existing road, realignments, bypasses:** | | Cost of completed culverts shall be determined pro rate with respect to the total number of culverts. Payment shall be made on the completion of atleast five culverts. |
| Culverts(Length<6m) | 13.517% | |

@ 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 Bridge and Underpasses/Overpasses

Procedure for estimating the value of Minor Bridge works and Underpasses/Overpasses shall be stated in table 1.3.2

**Table 1.3.2**

| **Stage of Payment** | **Percentage - weightage** | **Payment Procedure** |
|---|---|---|
| **1** | **2** | **3** |
| **A1-Widening and Repairs of Minor Bridges (Length>6m and <60m)** | 0.0% | Cost of each minor bridge shall be determined on pro rata basis with respect to the total linear length of the minor bridges. Payment shall be made on the completion of widening and repair works of a minor bridge. |
| **A2-New Minor Bridges** | | |
| **(i) Foundation:** | | **(i) Foundation:** Cost of each minor bridge shall be determined on pro rata basis with respect to the total linear length (m) of the minor bridges. Payment against foundation+sub structure shall be made on pro rata basis on copletion of a stage i.e. not less than 25% of the scope of foundation each bridge.<br>In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified |
| On completion of the foundation work including foundations for wing and return walls ,abutments, piers. | 50.595% | |
| **(ii) Sub-structure:** | | |
| On completion of abutments, piers upto the abutment/pier cap including wing/return/retaining wall upto top | 26.465% | Sub-structure: Cost of each minor bridge shall be determined on pro- rata basis with respect to the total linear length (m) of the minor bridges. 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 each bridge. |
| **(iii) Super Structure:** | | **(ii) Super Structure:** |
| On completion of the super structure in all respects including girder,deck slab,bearings | 16.167% | Super-structure: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super structure of atleast one span in all respects as specified in the column of "Stage of Payment" in this sub- clause. In case of structures where pre-cast girders have been proposed by the Contractor, 50% of the |

| Stage of Payment | Percentage - weightage | Payment Procedure |
|---|---|---|
| | | stage payment shall be due and payable on casting of girders for each span and balance 50% of the stage payment shall be made on completion of stage specified as above |
| **(iv) Approaches:** | | **(iii) Approaches:** |
| On completion of approaches including Retaining walls, stone pitching, protection works complete in all respect and fit for use | 2.813% | Payment shall be made on pro rata basis on completion of a stage i.e. completion of approaches in all respect as specified in the column of " Stage of Payment" in this sub clause. |
| **(v) Guide Bund and River Training Works:** | | **(iv) Guide Bund and River Training Works:** |
| On completion of Guide Bund and River Training Works complete in all respect. | 0.00% | Payment shall be made on pro rata basis on completion of a stage i.e. completion of Guide Bunds and River Training Works in all respect as specified. |
| **(6)** Other Ancillary Works: On Completion of wearing coat,expansion joints, hand rails, crash barriers, road signs markings, tests on completion in all respect. | 3.960% | Other Ancillary Works: Payment shall be made on pro-rata basis on completion of a stage in all respects as specified |
| **B.1- Widening and repair of Underpasses/overpasses** | | Cost of each overpass/underpass shall be determined on pro rata basis with respect to the total linear length of the underpass/overpass. Payment shall be made on the completion of wiening & repair works of a underpass/overpass. |
| **B.2- New Underpasses/overpasses** | | |
| **(i) Foundation:** | | **(i) Foundation:** Cost of each minor bridge shall be determined on pro rata basis with respect to the total linear length (m) of the minor bridges. Payment against foundation+sub structure shall be made on pro rata basis on copletion of a stage i.e. not less than 25% of the scope of foundation each bridge. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified |
| On completion of the foundation work including foundations for wing and return walls ,abutments, piers. | 0.00% | |
| **(ii) Sub-structure:** | | |
| On completion of abutments, piers upto the abutment/pier cap including wing/return/retaining wall upto top | 0.00% | Sub-structure: Cost of each minor bridge shall be determined on pro- rata basis with respect to the total linear length (m) of the minor bridges. 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 each bridge. |
| **(iii) Super Structure:** | | **(ii) Super Structure:** |

| Stage of Payment | Percentage - weightage | Payment Procedure |
|---|---|---|
| On completion of the super structure in all respects including girder,deck slab,bearings | 0.00% | Super-structure: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super structure of atleast one span in all respects as specified in the column of "Stage of Payment" in this sub- clause. In case of structures where pre-cast girders have been proposed by the Contractor, 50% of the stage payment shall be due and payable on casting of girders for each span and balance 50% of the stage payment shall be made on completion of stage specified as above |
| **(iv)** On completion of Retaining /Reinforced earth walls complete inall respect and fit for use | 0.00% | Payments shall be made on pro rata basis on completion of 20% of the total area. |
| **(iii) Approaches:** | | **(iii) Approaches:** |
| On completion of approaches including Retaining Walls, stone pitching, protection works complete in all respect and fit for use | 0.00% | Payment shall be made on pro rata basis on completion of a stage in all respect as specified |

### 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** |
| **A1-Widening and Repairs of Major Bridges** | | |
| **(i) Foundation:** | | **(i) Foundation:** Cost of each Major bridge shall be determined on pro rata basis with respect to the total linear length (m) of the Major bridges. 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 Major Bridge subject to completion of atleast two foundations of the Major Bridge.<br>In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified. |
| On completion of the foundation work including foundations for wing and return walls ,abutments,piers upto the abutment/pier cap | 0.00% | |
| **(ii) Sub Structure:** | | **(ii) Sub Structure:** |

| Stage of Payment | Percentage - weightage | Payment Procedure |
|---|---|---|
| On completion ofabutments, piers upto the abutment/pier cap including wing/ return/retaining wall upto top | 0.00% | Payment against sub structure shall be made on pro rata basis on copletion of a stage i.e. not less than 25% of the scope of sub structure of Major Bridge subject to completion of atleast two sub structure of the abutment/pier upto abutment/pier cap level of the major bridge. |
| **(iii) Super Structure** | | **(iii) Super Structure:** |
| On completion of the super structure in all respect including wearing coat, bearings, expansion joints, hand rails, crash barriers,road sign & markings, tests on completion etc. complete in all respect, | 0.00% | Payment shall be made on pro rata basis on completion of a stage i.e. completion of super structure including bearings of atleast one span in all respect as specified. |
| **(iv) Wearing Coat including expansion joints.** | | **Wearing Coat** |
| | 0.00% | Payment shall be made on completion of wearing coat including expansion joints complete in all respect as specified. |
| **(v) Miscellaneous items like hand rails, crash barriers, road markings etc.** | | **(v) Miscellaneous** |
| | 0.00% | Payment shall be made on completion of all Miscellaneous works like hand rails, crash barriers, road markings etc.complete in all respect as specified. |
| **(vi) Wing walls/Return Walls** | | **(vi) Wing walls/Return Walls** |
| | 0.00% | Payment shall be made on completion of all Wing walls/Return Walls complete in all respect as specified. |
| **(vii) Guide bunds, River Training Works etc** | | **(vii) Guide bunds, River Training Works etc** |
| | 0.00% | Payment shall be made on completion of all Guide bunds/River Training Works etc. complete in all respect as specified. |
| **(viii) Approaches (including retaining walls, stone pitching and protection works)** | | **(viii) Approaches:** |
| | 0.00% | Payment shall be made on completion of both approaches including stone pitching, protection works, etc. complete in all respects as specified. |
| **A2-New Major Bridges** | | |
| **(i) Foundation:** | | **(i) Foundation:** Cost of each Major bridge |

| Stage of Payment | Percentage - weightage | Payment Procedure |
|---|---|---|
| On completion of the foundation work including foundations for wing and return walls ,abutments, piers. | 0.00% | shall be determined on pro rata basis with respect to the total linear length (m) of the Major bridges. 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 Major Bridge subject to completion of atleast two foundations of the Major Bridge.<br>In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified. |
| **(ii) Sub Structure:** | | **(ii) Sub Structure:** |
| On completion of abutments, piers upto the abutment/pier cap including wing/return/retaining wall upto top | 0.00% | 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 Major Bridge subject to completion of atleast two sub structure of the abutment/pier upto abutment/pier cap level of the major bridge. |
| **(iii) Super Structure** | | **(iii) Super Structure:** |
| On completion of the super structure in all respects including girder,deck slab,bearings | 0.00% | Payment shall be made on pro rata basis on completion of a stage i.e. completion of super structure including bearings of atleast one span in all respect as specified. |
| **(iv) Wearing Coat including expansion joints.** | | **Wearing Coat** |
| | 0.00% | Payment shall be made on completion of wearing coat including expansion joints complete in all respect as specified. |
| **(v) Miscellaneous items like hand rails, crash barriers, road markings etc.** | | **(v) Miscellaneous** |
| | 0.00% | Payment shall be made on completion of all Miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respect as specified. |
| **(vi) Wing walls/Return Walls** | | **(vi) Wing walls/Return Walls** |
| | 0.00% | Payment shall be made on completion of all Wing walls/Return Walls complete in all respect as specified. |
| **(vii) Guide bunds, River Training Works etc** | | **(vii) Guide bunds, River Training Works etc** |
| | 0.00% | Payment shall be made on completion of all Guide bunds/River Training Works etc. complete in all respect as specified. |
| **(viii) Approaches (including retaining walls, stone pitching and protection works)** | | **(viii) Approaches:** |
| | 0.00% | Payment shall be made on completion of both approaches including stone pitching, protection works, etc. complete in all respects as specified. |
| **B1 - Widening and repairs of** | | |

| Stage of Payment | Percentage - weightage | Payment Procedure |
|---|---|---|
| **(a) ROB** | | |
| **(b) RUB** | | |
| **(i) Foundation:** | 0.00% | **(i) Foundation:** Cost of each ROB/RUB shall be determined on pro rata basis with respect to the total linear length (m) of the ROB/RUB. 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 ROB/RUB subject to completion of atleast two foundations of the ROB/RUB.<br>In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified. |
| On completion of the foundation work including foundations for wing and return walls ,abutments,piers upto the abutment/pier cap | | |
| **(ii) Sub Structure:** | | **(ii) Sub Structure:** |
| On completion ofabutments, piers upto the abutment/pier cap including wing/ return/retaining wall upto top | 0.00% | Payment against sub structure shall be made on pro rata basis on copletion of a stage i.e. not less than 25% of the scope of sub structure of ROB/RUB subject to completion of atleast two sub structure of the abutment/pier upto abutment/pier cap level of the ROB/RUB. |
| **(iii) Super Structure** | | **(iii) Super Structure:** |
| On completion of the super structure in all respect including wearing coat, bearings, expansion joints, hand rails, crash barriers,road sign & markings, tests on completion etc. complete in all respect, | 0.00% | Payment shall be made on pro rata basis on completion of a stage i.e. completion of super structure including bearings of atleast one span in all respect as specified. |
| **(iv) Wearing Coat including expansion joints in case of ROB. In case of RUB, rigid pavement under RUB including drainage facility as specified.** | | **(iv) Wearing Coat:** |
| | 0.00% | Payment shall be made on completion of (a) in case of ROB - wearing coat including expansion joint complete in all respect as specified and (b) in case of RUB rigid pavement under RUB including drainage facility complete in all respects as specified. |
| **(v)Miscellaneous items like hand rails, crash barriers, road markings etc.** | | **(v) Miscellaneous** |
| | 0.00% | Payment shall be made on completion of all Miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respect as specified. |
| **(vi) Wing walls/Return Walls** | | **(vi) Wing walls/Return Walls** |
| | 0.00% | Payment shall be made on completion of all Wing walls/Return Walls complete in all respect as specified. |
| **(vii) Approaches (including** | | **(viii) Approaches:** |

| Stage of Payment | Percentage - weightage | Payment Procedure |
|---|---|---|
| **retaining walls, stone pitching and protection works)** | | |
| | 0.00% | Payment shall be made on completion of both approaches including stone pitching, protection works, etc. complete in all respects as specified. |
| **B2 - New** | | |
| **(a) ROB** | | |
| **(b) RUB** | | |
| **(i) Foundation:** | | **(i) Foundation:** Cost of each ROB/RUB shall be determined on pro rata basis with respect to the total linear length (m) of the ROB/RUB. 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 ROB/RUB subject to completion of atleast two foundations of the ROB/RUB.<br>In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified. |
| On completion of the foundation work including foundations for wing and return walls ,abutments, piers. | 0.00% | |
| **(ii) Sub Structure:** | | **(ii) Sub Structure:** |
| On completion of abutments, piers upto the abutment/pier cap including wing/return/retaining wall upto top | 0.00% | Payment against sub structure shall be made on pro rata basis on copletion of a stage i.e. not less than 25% of the scope of sub structure of ROB/RUB subject to completion of atleast two sub structure of the abutment/pier upto abutment/pier cap level of the ROB/RUB. |
| **(iii) Super Structure** | | **(iii) Super Structure:** |
| On completion of the super structure in all respects including girder,deck slab,bearings | 0.00% | Payment shall be made on pro rata basis on completion of a stage i.e. completion of super structure including bearings of atleast one span in all respect as specified. |
| **(iv) Wearing Coat including expansion joints in case of ROB. In case of RUB, rigid pavement under RUB including drainage facility as specified.** | | **(iv) Wearing Coat:** |
| | 0.00% | Payment shall be made on completion of (a) in case of ROB - wearing coat including expansion joint complete in all respect as specified and (b) in case of RUB rigid pavement under RUB including drainage facility complete in all respects as specified. |
| **(v) Miscellaneous items like hand rails, crash barriers, road markings etc.** | | **(v) Miscellaneous** |
| | 0.00% | Payment shall be made on completion of all Miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respect as specified. |
| **(vi) Wing walls/Return Walls** | | **(vi) Wing walls/Return Walls** |
| | 0.00% | Payment shall be made on completion of all |

| Stage of Payment | Percentage - weightage | Payment Procedure |
|---|---|---|
| | | Wing walls/Return Walls complete in all respect as specified. |
| **(vii) Approaches (including retaining walls, stone pitching and protection works)** | | **(viii) Approaches:** |
| | 0.00% | Payment shall be made on completion of both approaches including stone pitching, protection works, etc. complete in all respects as specified. |
| **C1 - Widening and repairs of Elevated Section/Flyovers/ Grade Separators** | | |
| **(i) Foundation:** | 0.00% | **(i) Foundation:** Cost of each Structure shall be determined on pro rata basis with respect to the total linear length (m) of the structures. 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 structures subject to completion of atleast two foundations of the structures.<br>In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified. |
| On completion of the foundation work including foundations for wing and return walls ,abutments,piers upto the abutment/pier cap | | |
| **(ii) Sub Structure:** | | **(ii) Sub Structure:** |
| On completion ofabutments, piers upto the abutment/pier cap including wing/ return/retaining wall upto top | 0.00% | 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 structures subject to completion of atleast two sub structure of the abutment/pier upto abutment/pier cap level of the structures. |
| **(iii) Super Structure** | | **(iii) Super Structure:** |
| On completion of the super structure in all respect including wearing coat, bearings, expansion joints, hand rails, crash barriers,road sign & markings, tests on completion etc. complete in all respect. | 0.00% | Payment shall be made on pro rata basis on completion of a stage i.e. completion of super structure including bearings of atleast one span in all respect as specified. |
| **(iv) Wearing Coat including expansion joints.** | | **Wearing Coat** |
| | 0.00% | Payment shall be made on completion of wearing coat including expansion joints complete in all respect as specified. |
| **(v) Miscellaneous items like hand rails, crash barriers, road markings etc.** | | **(v) Miscellaneous** |
| | 0.00% | Payment shall be made on completion of all Miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respect as specified. |
| **(vi) Wing walls/Return Walls** | | **(vi) Wing walls/Return Walls** |

| Stage of Payment | Percentage - weightage | Payment Procedure |
|---|---|---|
| | 0.00% | Payment shall be made on completion of all Wing walls/Return Walls complete in all respect as specified. |
| **(vii) Approaches (including retaining walls, stone pitching and protection works)** | | **(viii) Approaches:** |
| | 0.00% | Payment shall be made on completion of both approaches including stone pitching, protection works, etc. complete in all respects as specified. |
| **C2-New Elevated Section/ Flyovers/ Grade Separators** | | |
| **(i) Foundation:** | | **(i) Foundation:** Cost of each Structure shall be determined on pro rata basis with respect to the total linear length (m) of the structures. 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 structures subject to completion of atleast two foundations of the structures.<br>In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified. |
| On completion of the foundation work including foundations for wing and return walls, abutments, piers. | 32.846% | |
| **(ii) Sub Structure:** | | **(ii) Sub Structure:** |
| On completion of abutments, piers upto the abutment/pier cap including wing/return/retaining wall upto top | 43.096% | 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 structures subject to completion of atleast two sub structure of the abutment/pier upto abutment/pier cap level of the structures. |
| **(iii) Super Structure** | | **(iii) Super Structure:** |
| On completion of the super structure in all respects including girder, deck slab, bearings | 18.906% | Payment shall be made on pro rata basis on completion of a stage i.e. completion of super structure including bearings of atleast one span in all respect as specified. |
| **(iv) Wearing Coat including expansion joints.** | | **Wearing Coat** |
| | 2.143% | Payment shall be made on completion of wearing coat including expansion joints complete in all respect as specified. |
| **(v) Miscellaneous items like hand rails, crash barriers, road markings etc.** | | **(v) Miscellaneous** |
| | 3.009% | Payment shall be made on completion of all Miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respect as specified. |
| **(vi) Wing walls/Return Walls** | | **(vi) Wing walls/Return Walls** |
| | 0.00% | Payment shall be made on completion of all Wing walls/Return Walls complete in all respect as specified. |

| Stage of Payment | Percentage - weightage | Payment Procedure |
|---|---|---|
| **(vii) Approaches (including retaining walls, stone pitching and protection works)** | | **(viii) Approaches:** |
| | 0.00% | Payment shall be made on completion of both approaches including stone pitching, protection works, etc. complete in all respects as specified. |

**1.3.4 Other works.**

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

**Table 1.3.4**

| Stage of Payment | Weightage | Payment Procedure |
|---|---|---|
| **(i) Toll Plaza** | 0.00% | Unit of measurement is each completed toll plaza. Payment of each toll plaza shall be made on pro rata basis with respect to the total of all toll plazas. |
| **(ii)Road side drains** | | Unit of measurement is linear length in km. Payment shall be made on pro rata basis on completion of a stage in a length of not less than 10% (ten per cent) of the total length. |
| **Lined Drain/ Catch Water Drain** | 12.021% | |
| **Unlined Drain** | 0.00% | |
| **(iii)Road signs, markings, km stones, safety devices, etc.** | 0.508% | |
| **(iv) Road Studs** | 0.840% | |
| **(v)Project facilities** | 0.00% | Payment shall be made on pro rata basis for completed facilities. |
| **a) Bus Shelter** | 1.840% | |
| **b) Truck Lay Bye** | 0.00% | |
| **c) Rest Areas** | 0.00% | |
| **d) Others** | 12.255% | |
| **(vi) Retaining Wall / Breast wall** | 39.932%/ 28.833% | Unit of measurement is linear length. Payment shall be made on pro-rata basis on completion of a stage in a length of not less than 10% (ten per cent) of the total length. |
| **(vii) RE Wall** | 0.00% | Unit of measurement is linear length. Payment shall be made on pro-rata basis on completion of a stage in a length of not less than 10% (ten per cent) of the total length. |
| **(viii) Street Lighting** | 0.00% | Unit of measurement is linear length. Payment shall be made on pro rata basis on completion of a stage in a length of not less than 10% (ten per cent) of the total length. |
| **(ix) Utility ducts** | 0.00% | |
| **(x) Parapet walls** | 3.481% | |
| **(xi) ATMS** | 0.00% | |
| **(xii) Rain water harvesting** | 0.00% | |
| **(xiii)Road side plantation** | 0.00% | |
| **(xiv) Repair of Protection works other than approaches to the bridges, elevated sections/ flyovers/ grade separators and ROBs/RUBs.** | 0.00% | |
| **(xv) Safety and traffic** | 0.290% | Payment shall be made on prorate basis every |

| Stage of Payment | Weightage | Payment Procedure |
|---|---|---|
| **management during construction** | | six month. |
| **(xvi) Protection works like pitching on side slopes, chutes, crash barrier** | 0.00% | Unit of measurement is linear length. Payment shall be made on pro rata basis on completion of a stage in a length of not less than 10% (ten per cent) of the total length. |

**2. Procedure for payment for Maintenance**

2.1 The cost for maintenance shall be as stated in Clause 14.1(v).

2.2 Payment for Maintenance shall be made in quarterly installments in accordance with the provisions of Article 14 and Article 19.

# Schedule - I

*(See Clause 10.2 (iv))*

## Drawings

**1. Drawings**

In compliance of the obligations set forth in Clause 10.2 of this Agreement, the Contractor shall furnish to the Authority's Engineer, free of cost, all Drawings listed in Annex-I of this Schedule-I.

**2. Additional Drawings**

If the Authority's Engineer determines that for discharging its duties and functions under this Agreement, it requires any drawings other than those listed in Annex-I, it may by notice require the Contractor to prepare and furnish such drawings forthwith. Upon receiving a requisition to this effect, the Contractor shall promptly prepare and furnish such drawings to the Authority's Engineer, as if such drawings formed part of Annex-I of this Schedule-I.

## Annex – I

*(Schedule - I)*

**List of Drawings**

[**Note**: The Authority shall describe in this Annex-I, all the Drawings that the Contractor is required to furnish under Clause 10.2.]

# Schedule - J

*(See Clause 10.3 (ii))*

## Project Completion Schedule

**1. Project Completion Schedule**

During Construction period, the Contractor shall comply with the requirements set forth in this Schedule-J for each of the Project Milestones and the **Scheduled Completion Date**. Within 15 (fifteen) days of the date of each Project Milestone, the Contractor shall notify the Authority of such compliance along with necessary particulars thereof.

**2. Project Milestone-I**

(i) Project Milestone-I shall occur on the date falling on the **320th** day from the Appointed Date (the "**Project Milestone-I**").

(ii) Prior to the occurrence of Project Milestone-I, the Contractor shall have commenced construction of the Project Highway and submitted to the Authority duly and validly prepared Stage Payment Statements for an amount not less than 10% (ten per cent) of the Contract Price.

**3. Project Milestone-II**

(i) Project Milestone-II shall occur on the date falling on the **548th** day from the Appointed Date (the "**Project Milestone-II**").

**(ii)** Prior to the occurrence of Project Milestone-II, the Contractor shall have continued with construction of the Project Highway and submitted to the Authority duly and validly prepared Stage Payment Statements for an amount not less than 35% (thirty five per cent) of the Contract Price **and should have started construction of all bridges**

**4. Project Milestone-III**

(i) Project Milestone-III shall occur on the date falling on the **776th** day from the Appointed Date (the "**Project Milestone-III**").

(ii) Prior to the occurrence of Project Milestone-III, the Contractor shall have continued with construction of the Project Highway and submitted to the Authority duly and validly prepared Stage Payment Statements for anamount not less than 70% (seventy per cent) of the Contract Price and **should have** started construction of all project facilities.

**5. Scheduled Completion Date**

(i) The Scheduled Completion Date shall occur on the **913th** day from the Appointed

Date.

(ii) On or before the Scheduled Completion Date, the Contractor shall have completed construction in accordance with this Agreement.

**6. Extension of time**

Upon extension of any or all of the aforesaid Project Milestones or the Scheduled Completion Date, as the case may be, under and in accordance with the provisions of this Agreement, the Project Completion Schedule shall be deemed to have been amended accordingly.

## Schedule - K

*(See Clause 12.1 (ii))*

## Tests on Completion

**1. Schedule for Tests**

(i) The Contractor shall, no later than 30 (thirty) days prior to the likely completion of construction, notify the Authority's Engineer and the Authority of its intent to subject the Project Highway to Tests, and no later than 10(ten) days prior to the actual date of Tests, furnish to the Authority's Engineer and the Authority detailed inventory and particulars of all works and equipment forming part of Works.

(ii) The Contractor shall notify the Authority's Engineer of its readiness to subject the Project Highway to Tests at any time after 10 (ten) days from the date of such notice, and upon receipt of such notice, the Authority's Engineer shall, in consultation with the Contractor, determine the date and time for each Test and notify the same to the Authority who may designate its representative to witness the Tests. The Authority's Engineer shall thereupon conduct the Tests itself or cause any of the Tests to be conducted in accordance with Article 12 and this Schedule-K.

**2. Tests**

(i) Visual and physical test: The Authority's Engineer shall conduct a visual and physical check of construction to determine that all works and equipment forming part thereof conform to the provisions of this Agreement. The physical tests shall include [***].

(ii) Riding quality test: Riding quality of each lane of the carriageway shall be checked with the help of a Network Survey Vehicle (NSV) fitted with latest equipments and the maximum permissible roughness for purposes of this Test shall be [2,000 (two thousand)] mm for each kilometre.

(iii) Tests for bridges: All major and minor bridges shall be subjected to the rebound hammer and ultrasonic pulse velocity tests, to be conducted in accordance with the procedure described in Special Report No. 17: 1996 of the IRC Highway Research Board on Nondestructive Testing Techniques, at two spots in every span, to be chosen at random by the Authority's Engineer. Bridges with a span of 15 (fifteen) metres or more shall also be subjected to load testing.

(iv) Other tests: The Authority's Engineer may require the Contractor to carry out or cause to be carried additional tests, in accordance with Good Industry Practice, for determining the compliance of the Project Highway with Specifications and Standards, except tests as specified in clause 5,but shall include measuring the reflectivity of road markings and road signs; and measuring the illumination level (lux) of lighting using requisite testing equipment.

(v) Environmental audit: The Authority's Engineer shall carry out a check to determine conformity of the Project Highway with the environmental requirements set forth in Applicable Laws and Applicable Permits.

(vi) Safety Audit: The Authority's Engineer shall carry out, or cause to be carried out, a safety audit to determine conformity of the Project Highway with the safety requirements and Good Industry Practice.

**3. Agency for conducting Tests**

All Tests set forth in this Schedule-K shall be conducted by the Authority's Engineer or such other agency or person as it may specify in consultation with the Authority.

**4. Completion Certificate**

Upon successful completion of Tests, the Authority's Engineer shall issue the Completion Certificate in accordance with the provisions of Article 12.

**5.** The Authority Engineer will carry out tests with following equipment at his own cost in the presence of contractor's representative.

| Sr. No. | Key metrics of Asset | Equipment to be used | Frequency of condition survey |
|---|---|---|---|
| 1 | Surface defects of pavement | Network Survey Vehicle (NSV) | At least twice a year (As per survey months defined for the state basis rainy season) |
| 2 | Roughness of pavement | Network Survey Vehicle (NSV) | At least twice a year (As per survey months defined for the state basis rainy season) |
| 3 | Strength of pavement | Falling Weight Deflectometer (FWD) | At least once a year |
| 4 | Bridges | Mobile Bridge Inspection Unit (MBU) | At least twice a year (As per survey months defined for the state basis rainy season) |
| 5 | Road signs | Retro-reflectometer | At least twice a year (As per survey months defined for the state basis rainy season) |

The first testing with the help of NSV shall be conducted at the time of issue of Completion Certificate.

## Schedule - L

*(See Clause 12.2)*

## Completion Certificate

1 I, …….. (Name of the Authority's Engineer), acting as the Authority's Engineer, under and in accordance with the Agreement dated.....(the "**Agreement**"), for **Construction and upgradation of existing road to 2-lane with paved shoulder of Bagrakot-Kafer section of NH-717A from Km. 13.000 to Km. 25.600 on EPC basis under SARDP-NE Phase 'Á' in the State of West Bengal (Package-IV B)** of National Highway No. NH-717A (the "**Project Highway**") on Engineering, Procurement and Construction (EPC) basis through (Name of Contractor), hereby

certify that the Tests in accordance with Article 12 of the Agreement have been successfully undertaken to determine compliance of the Project Highway with the provisions of the Agreement, and I am satisfied that the Project Highway can be safely and reliably placed in service of the Users thereof.

2 It is certified that, in terms of the aforesaid Agreement, all works forming part of Project Highway have been completed, and the Project Highway is hereby declared fit for entry into operation on this the ……. day of ……. 20… , Scheduled Completed Date for which was the ……. day of ……20…..

SIGNED, SEALED AND DELIVERED

For and on behalf of the Authority's Engineer by:

(Signature)

(Name)

(Designation) (Address)

## Schedule - M

*(See Clauses 14.6, 15.2 and 19.7)*

## Payment Reduction for Non-Compliance

**1. Payment reduction for non-compliance with the Maintenance Requirements**

(i) Monthly lump sum payments for maintenance shall be reduced in the case of non-compliance with the Maintenance Requirements set forth in Schedule-E.

(ii) Any deduction made on account of non-compliance with the Maintenance Requirements shall not be paid even after compliance subsequently. The deductions shall continue to be made every month until compliance is done.

(iii) The Authority's Engineer shall calculate the amount of payment reduction on the basis of weightage in percentage assigned to non-conforming items as given in Paragraph 2.

**2. Percentage reductions in lump sum payments on monthly basis**

(i) The following percentages shall govern the payment reduction:

| S. No. | Item/Defect/Deficiency | Percentage |
|---|---|---|
| **(a)** | **Carriageway/Pavement** | |
| (i) | Potholes, cracks, other surface defects | 15% |
| (ii) | Repairs of Edges, Rutting | 5% |
| **(b)** | **Road, Embankment, Cuttings, Shoulders** | |
| (i) | Edge drop, inadequate cross fall, undulations, settlement, potholes, ponding, obstructions | 10% |
| (ii) | Deficient slopes, raincuts, disturbed pitching, vegetation growth, pruning of trees | 5% |
| **(c)** | **Bridges and Culverts** | |
| (i) | Desilting, cleaning. vegetation growth, damaged pitching, flooring, parapets, wearing course, footpaths, any damage to foundations | 20% |
| (ii) | Any Defects in superstructures, bearings and sub-structures | 10% |

| S. No. | Item/Defect/Deficiency | Percentage |
|---|---|---|
| (iii) | Painting, repairs/replacement kerbs, railings, parapets, guideposts/crash barriers | 5% |
| **(d)** | **Roadside Drains** | |
| (i) | Cleaning and repair of drains | 5% |
| **(e)** | **Road Furniture** | |
| (i) | Cleaning, painting, replacement of road signs, delineators, road markings, 200 m/km/5th km stones | 5% |
| **(f)** | **Miscellaneous Items** | |
| (i) | Removal of dead animals, broken down/accidented vehicles, fallen trees, road blockades or malfunctioning of mobile crane | 10% |
| (ii) | Any other Defects in accordance with paragraph 1. | 5% |
| **(g)** | **Defects in Other Project Facilities** | 5% |

(ii) The amount to be deducted from monthly lump-sum payment for non- compliance of particular item shall be calculated as under:

$$R = {}^{P}/_{100} \times (M1 \text{ or } M2) \times {}^{L1}/_{L}$$

Where,

P= Percentage of particular item/Defect/deficiency for deduction

M1= Monthly lump-sum payment in accordance para 1.2 above of this Schedule

M2= Monthly lump-sum payment in accordance para 1.2 above of this Schedule

L1= Non-complying length L = Total length of the road,

R= Reduction (the amount to be deducted for non-compliance for a particular item/Defect/deficiency

The total amount of reduction shall be arrived at by summation of reductions for such items/Defects/deficiency or non-compliance.

For any Defect in a part of one kilometer, the non-conforming length shall be taken as one kilometer.

## Schedule - N

*(See Clause 18.1 (i))*

## Selection of Authority's Engineer

**1. Selection of Authority's Engineer**

(i) The provisions of the Model Request for Proposal for Selection of Technical Consultants, issued by the Ministry of Finance in May 2009, or any substitute thereof shall apply for selection of an experienced firm to discharge the functions and duties of an Authority's Engineer.

(ii) In the event of termination of the Technical Consultants appointed in accordance with the provisions of Paragraph 1.1, the Authority shall appoint another firm of Technical Consultants forthwith and may engage a government-owned entity in accordance with the provisions of Paragraph 3 of this Schedule-N.

**2. Terms of Reference**

The Terms of Reference for the Authority's Engineer (the "**TOR**") shall substantially conform with Annex 1 to this Schedule N.

**3. Appointment of Government entity as Authority's Engineer**

Notwithstanding anything to the contrary contained in this Schedule, the Authority may in its discretion appoint a government-owned entity as the Authority's Engineer; provided that such entity shall be a body corporate having as one of its primary functions the provision of consulting, advisory and supervisory services for engineering projects; provided further that a government-owned entity which is owned or controlled by the Authority shall not be eligible for appointment as Authority's Engineer.

Annex – I

*(Schedule - N)*

**Terms of Reference for Authority's Engineer**

**1. Scope**

(i) These Terms of Reference (the "**TOR**") for the Authority's Engineer are being specified pursuant to the EPC Agreement dated ..... (the "**Agreement**), which has been entered into between the [name and address of the Authority] (the "**Authority**") and ..... (the "**Contractor**")# for **Construction and upgradation of existing road to 2-lane with paved shoulder of Bagrakot-Kafer section of NH-717A from Km. 13.000 to Km. 25.600 on EPC basis under SARDP-NE Phase 'Á' in the State of West Bengal (Package-IV B)** of National Highway No. NH-717A in the State of West Bengal on Engineering, Procurement, Construction (EPC) basis, and a copy of which is annexed hereto and marked as Annex-A to form part of this TOR.

# - In case the bid of Authority's Engineer is invited simultaneously with the bid of EPC project, then the status of bidding of EPC project only to be indicated

(ii) The TOR shall apply to construction and maintenance of the Project Highway.

**2. Definitions and interpretation**

(i) The words and expressions beginning with or in capital letters and not defined herein but defined in the Agreement shall have, unless repugnant to the context, the meaning respectively assigned to them in the Agreement.

(ii) References to Articles, Clauses and Schedules in this TOR shall, except where the context otherwise requires, be deemed to be references to the Articles, Clauses and Schedules of the Agreement, and references to Paragraphs shall be deemed to be references to Paragraphs of this TOR.

(iii) The rules of interpretation stated in Article 1 of the Agreement shall apply, mutatis mutandis, to this TOR.

**3. General**

(i) The Authority's Engineer shall discharge its duties in a fair, impartial and efficient manner, consistent with the highest standards of professional integrity and Good Industry Practice.

(ii) The Authority's Engineer shall perform the duties and exercise the authority in accordance with the provisions of this Agreement, but subject to obtaining prior written approval of the Authority before determining:

(a) any Time Extension;

(b) any additional cost to be paid by the Authority to the Contractor;

(c) the Termination Payment; or

(d) issuance of Completion Certificate or

(e) any other matter which is not specified in (a), (b), (c) or (d) above and which creates a financial liability on either Party.

(iii) The Authority's Engineer shall submit regular periodic reports, at least once every month, to the Authority in respect of its duties and functions under this Agreement. Such reports shall be submitted by the Authority's Engineer within 10 (ten) days of the beginning of every month.

(iv) The Authority's Engineer shall inform the Contractor of any delegation of its duties and responsibilities to its suitably qualified and experienced personnel; provided, however, that it shall not delegate the authority to refer any matter for the Authority's prior approval in accordance with the provisions of Clause 18.2.

(v) The Authority's Engineer shall aid and advise the Authority on any proposal for Change of Scope under Article 13.

(vi) In the event of any disagreement between the Parties regarding the meaning, scope and nature of Good Industry Practice, as set forth in any provision of the Agreement, the Authority's Engineer shall specify such meaning, scope and nature by issuing a reasoned written statement relying on good industry practice and authentic literature.

**4. Construction Period**

(i) During the Construction Period, the Authority's Engineer shall review and approve the Drawings furnished by the Contractor along with supporting data, including the geo-technical and hydrological investigations, characteristics of materials from borrow areas and quarry sites, topographical surveys, and the recommendations of the Safety Consultant in accordance with the provisions of Clause 10.1 (vi). The Authority's Engineer shall complete such review and approval and send its observations to the Authority and the Contractor within 15 (fifteen) days of receipt of such Drawings; provided, however that in case of a Major Bridge or Structure, the aforesaid period of 15 (fifteen) days may be extended upto 30 (thirty) days. In particular, such comments shall specify the conformity or otherwise of such Drawings with the Scope of the Project and Specifications and Standards.

(ii) The Authority's Engineer shall review and approve any revised Drawings sent to it by the Contractor and furnish its comments within 10 (ten) days of receiving such Drawings.

(iii) The Authority's Engineer shall review and approve the Quality Assurance Plan submitted by the Contractor and shall convey its comments to the Contractor within a period of 21 (twenty one) days stating the modifications, if any, required thereto.

(iv) The Authority's Engineer shall complete the review and approve of the methodology proposed to be adopted by the Contractor for executing the Works, and convey its comments to the Contractor within a period of 10 (ten) days from the date of receipt of the proposed methodology from the Contractor.

(v) The Authority's Engineer shall grant written approval to the Contractor, where necessary, for interruption and diversion of the flow of traffic in the existing lane(s) of the Project Highway for purposes of maintenance during the Construction Period in accordance with the provisions of Clause 10.4.

(vi) The Authority's Engineer shall review the monthly progress report furnished by the Contractor and send its comments thereon to the Authority and the Contractor within 7 (seven) days of receipt of such report.

(vii) The Authority's Engineer shall inspect the Construction Works and the Project Highway and shall submit a monthly Inspection Report bringing out the results of inspections and the remedial action taken by the Contractor in respect of Defects or deficiencies. In particular, the Authority's Engineer shall include in its Inspection Report, the compliance of the recommendations made by the Safety Consultant.

(viii) The Authority's Engineer shall conduct the pre-construction review of manufacturer's test reports and standard samples of manufactured Materials, and such other Materials as the Authority's Engineer may require.

(ix) For determining that the Works conform to Specifications and Standards, the Authority's Engineer shall require the Contractor to carry out, or cause to be carried out, tests at such time and frequency and in such manner as specified in the Agreement and in accordance with Good Industry Practice for quality assurance. For purposes of this Paragraph 4 (ix), the tests specified in the IRC Special Publication-11 (Handbook of Quality Control for Construction of Roads and Runways) and the Specifications for Road and Bridge Works issued by MORTH (the "Quality Control Manuals") or any modification/substitution thereof shall be deemed to be tests conforming to Good Industry Practice for quality assurance.

(x) The Authority's Engineer shall test check at least 50 (fifty) percent of the quantity or number of tests prescribed for each category or type of test for quality control by the Contractor.

(xi) The timing of tests referred to in Paragraph 4 (ix), and the criteria for acceptance/ rejection of their results shall be determined by the Authority's Engineer in accordance with the Quality Control Manuals. The tests shall be undertaken on a random sample basis and shall be in addition to, and independent of, the tests that may be carried out by the Contractor for its own quality assurance in accordance with Good Industry Practice.

(xii) In the event that results of any tests conducted under Clause 11.10 establish any Defects or deficiencies in the Works, the Authority's Engineer shall require the Contractor to carry out remedial measures.

(xiii) The Authority's Engineer may instruct the Contractor to execute any work which is urgently required for the safety of the Project Highway, whether because of an accident, unforeseeable event or otherwise; provided that in case of any work required on account of a Force Majeure Event, the provisions of Clause 21.6 shall apply.

(xiv) In the event that the Contractor fails to achieve any of the Project Milestones, the Authority's Engineer shall undertake a review of the progress of construction and identify potential delays, if any. If the Authority's Engineer shall determine that completion of the Project Highway is not feasible within the time specified in the Agreement, it shall require the Contractor to indicate within 15 (fifteen) days the steps proposed to be taken to expedite progress, and the period within which the Project Completion Date shall be achieved. Upon receipt of a report from the Contractor, the Authority's Engineer shall review the same and send its comments to the Authority and the Contractor forthwith.

(xv) The Authority's Engineer shall obtain from the Contractor a copy of all the Contractor's quality control records and documents before the Completion Certificate is issued pursuant to Clause 12.2.

(xvi) Authority's Engineer may recommend to the Authority suspension of the whole or part of the Works if the work threatens the safety of the Users and pedestrians. After the Contractor has carried out remedial measure, the Authority's Engineer shall inspect such remedial measures forthwith and make a report to the Authority recommending whether or not the suspension hereunder may be revoked.

(xvii) In the event that the Contractor carries out any remedial measures to secure the safety of suspended works and Users, and requires the Authority's Engineer to inspect such works, the Authority's Engineer shall inspect the suspended works within 3 (three) days of receiving such notice, and make a report to the Authority forthwith, recommending whether or not such suspension may be revoked by the Authority.

(xviii) The Authority's Engineer shall carry out, or cause to be carried out, all the Tests specified in Schedule-K and issue a Completion Certificate, as the case may be. For carrying out its functions under this Paragraph 4 (xviii) and all matters incidental thereto, the Authority's Engineer shall act under and in accordance with the provisions of Article 12 and Schedule-K.

**5. Maintenance Period**

(i) The Authority's Engineer shall aid and advise the Contractor in the preparation of its monthly Maintenance Programme and for this purpose carry out a joint monthly inspection with the Contractor.

(ii) The Authority's Engineer shall undertake regular inspections, at least once every month, to evaluate compliance with the Maintenance Requirements and submit a Maintenance Inspection Report to the Authority and the Contractor.

(iii) The Authority's Engineer shall specify the tests, if any, that the Contractor shall carry out, or cause to be carried out, for the purpose of determining that the Project Highway is in conformity with the Maintenance Requirements. It shall monitor and review the results of such tests and the remedial measures, if any, taken by the Contractor in this behalf.

(iv) In respect of any defect or deficiency referred to in Paragraph 3 of Schedule- E, the Authority's Engineer shall, in conformity with Good Industry Practice, specify the permissible limit of deviation or deterioration with reference to the Specifications and Standards and shall also specify the time limit for repair or rectification of any deviation or deterioration beyond the permissible limit.

(v) The Authority's Engineer shall examine the request of the Contractor for closure of any lane(s) of the Project Highway for undertaking maintenance/repair thereof, and shall grant permission with such modifications, as it may deem necessary, within 5 (five) days of receiving a request from the Contractor. Upon expiry of the permitted period of closure, the Authority's Engineer shall monitor the reopening of such lane(s), and in case of delay, determine the Damages payable by the Contractor to the Authority under Clause 14.5.

**6. Determination of costs and time**

(i) The Authority's Engineer shall determine the costs, and/or their reasonableness, that are required to be determined by it under the Agreement.

(ii) The Authority's Engineer shall determine the period of Time Extension that is required to be determined by it under the Agreement.

(iii) The Authority's Engineer shall consult each Party in every case of determination in accordance with the provisions of Clause 18.5.

**7. Payments**

(i) The Authority's Engineer shall withhold payments for the affected works for which the Contractor fails to revise and resubmit the Drawings to the Authority's Engineer in accordance with the provisions of Clause 10.2 (iv) (d).

(ii) Authority's Engineer shall -

(a) within 10 (ten) days of receipt of the Stage Payment Statement from the Contractor pursuant to Clause 19.4, determine the amount due to the Contractor and recommend the release of 90 (ninety) percent of the amount so determined as part payment, pending issue of the Interim Payment Certificate; and

(b) within 15 (fifteen) days of the receipt of the Stage Payment Statement referred to in Clause 19.4, deliver to the Authority and the Contractor an Interim Payment Certificate certifying the amount due and payable to the

Contractor, after adjustments in accordance with the provisions of Clause 19.10.

(iii) The Authority's Engineer shall, within 15 (fifteen) days of receipt of the Monthly Maintenance Statement from the Contractor pursuant to Clause 19.6, verify the Contractor's monthly statement and certify the amount to be paid to the Contractor in accordance with the provisions of the Agreement.

(iv) The Authority's Engineer shall certify final payment within 30 (thirty) days of the receipt of the final payment statement of Maintenance in accordance with the provisions of Clause 19.16.

**8. Other duties and functions**

The Authority's Engineer shall perform all other duties and functions as specified in the Agreement.

**9. Miscellaneous**

(i) A copy of all communications, comments, instructions, Drawings or Documents sent by the Authority's Engineer to the Contractor pursuant to this TOR, and a copy of all the test results with comments of the Authority's Engineer thereon, shall be furnished by the Authority's Engineer to the Authority forthwith.

(ii) The Authority's Engineer shall retain at least one copy each of all Drawings and Documents received by it, including 'as-built' Drawings, and keep them in its safe custody.

(iii) Within 90 (ninety) days of the Project Completion Date, the Authority's Engineer shall obtain a complete set of as-built Drawings, in 2 (two) hard copies and in micro film form or in such other medium as may be acceptable to the Authority, reflecting the Project Highway as actually designed, engineered and constructed, including an as-built survey illustrating the layout of the Project Highway and setback lines, if any, of the buildings and structures forming part of Project Facilities; and shall hand them over to the Authority against receipt thereof.

(iv) The Authority's Engineer, if called upon by the Authority or the Contractor or both, shall mediate and assist the Parties in arriving at an amicable settlement of any Dispute between the Parties.

(v) The Authority's Engineer shall inform the Authority and the Contractor of any event of Contractor's Default within one week of its occurrence.

## Schedule - O

*(See Clauses 19.4 (i), 19.6 (i), and 19.8 (i))*

## Forms of Payment Statements

### 1. Stage Payment Statement for Works

The Stage Payment Statement for Works shall state:

(a) the estimated amount for the Works executed in accordance with Clause 19.3 (i) subsequent to the last claim;

(b) amounts reflecting adjustments in price for the aforesaid claim;

(c) the estimated amount of each Change of Scope Order executed subsequent to the last claim;

(d) amounts reflecting adjustment in price, if any, for (c) above in accordance with the provisions of Clause 13.2 (iii) (a);

(e) total of (a), (b), (c) and (d) above;

(f) Deductions:

i. Any amount to be deducted in accordance with the provisions of the Agreement except taxes;

ii. Any amount towards deduction of taxes; and

iii. Total of (i) and (ii) above.

(g) Net claim: (e) – (f) (iii);

(h) The amounts received by the Contractor upto the last claim:

i. For the Works executed (excluding Change of Scope orders);

ii. For Change of Scope Orders, and

iii. Taxes deducted

### 2. Monthly Maintenance Payment Statement

The monthly Statement for Maintenance Payment shall state:

(a) the monthly payment admissible in accordance with the provisions of the Agreement;

(b) the deductions for maintenance work not done;

(c) net payment for maintenance due, (a) minus (b);

(d) amounts reflecting adjustments in price under Clause 19.12; and

(e) amount towards deduction of taxes

### 3. Contractor's claim for Damages

**Note**: The Contractor shall submit its claims in a form acceptable to the Authority.

## Schedule - P

*(See Clause 20.1)*

## Insurance

**1. Insurance during Construction Period**

(i) The Contractor shall effect and maintain at its own cost, from the Appointed Date till the date of issue of the Completion Certificate, the following insurances for any loss or damage occurring on account of Non Political Event of Force Majeure, malicious act, accidental damage, explosion, fire and terrorism:

(a) insurance of Works, Plant and Materials and an additional sum of [15 (fifteen)] per cent of such replacement cost to cover any additional costs of and incidental to the rectification of loss or damage including professional fees and the cost of demolishing and removing any part of the Works and of removing debris of whatsoever nature; and

(b) Insurance for the Contractor's equipment and Documents brought onto the Site by the Contractor, for a sum sufficient to provide for their replacement at the Site.

(ii) The insurance under sub para (a) and (b) of paragraph 1(i) above shall cover the Authority and the Contractor against all loss or damage from any cause arising under paragraph 1.1 other than risks which are not insurable at commercial terms.

**2. Insurance for Contractor's Defects Liability**

The Contractor shall effect and maintain insurance cover of not less than 15% of the Contract Price for the Works from the date of issue of the Completion Certificate until the end of the Defects Liability Period for any loss or damage for which the Contractor is liable and which arises from a cause occurring prior to the issue of the Completion Certificate. The Contractor shall also maintain other insurances for maximum sums as may be required under the Applicable Laws and in accordance with Good Industry Practice.

**3. Insurance against injury to persons and damage to property**

(i) The Contractor shall insure against its liability for any loss, damage, death or bodily injury, or damage to any property (except things insured under Paragraphs 1 and 2 of this Schedule or to any person (except persons insured under Clause 20.9), which may arise out of the Contractor's performance of this Agreement. This insurance shall be for a limit per occurrence of not less than the amount stated below with no limit on the number of occurrences.

The insurance cover shall be not less than: Rs. [*****]

(ii) The insurance shall be extended to cover liability for all loss and damage to the Authority's property arising out of the Contractor's performance of this Agreement excluding:

(a) the Authority's right to have the construction works executed on, over, under, in or through any land, and to occupy this land for the Works; and

(b) Damage which is an unavoidable result of the Contractor's obligations to execute the Works.

**4. Insurance to be in joint names**

The insurance under paragraphs 1 to 3 above shall be in the joint names of the Contractor and the Authority.

## Schedule-Q

*(See Clause 14.10)*

## Tests on Completion of Maintenance Period

**1. Riding Quality test:**

Riding quality test: Riding quality of each lane of the carriageway shall be checked with the help of a calibrated bump integrator and the maximum permissible roughness for purposes of this Test shall be [2,200 (two thousand and two hundred only)] mm for each kilometre.

**2. Visual and physical test:**

***The Authority's Engineer shall conduct a visual and physical check of construction to determine that all works and equipment forming part thereof conform to the provisions of this Agreement. The physical tests shall include measurement of cracking, rutting, stripping and potholes and shall be as per the requirement of maintenance mentioned in Schedule-E.***

## Schedule-R

*(See Clause 14.10)*

## Taking Over Certificate

I, …….. (Name and designation of the Authority's Representative) under and in accordance with the Agreement dated …….. (the "**Agreement**"), for **Construction and upgradation of existing road to 2-lane with paved shoulder of Bagrakot-Kafer section of NH-717A from Km. 13.000 to Km. 25.600 on EPC basis under SARDP-NE Phase 'Á' in the State of West Bengal (Package-IV B)** of National Highway No. NH-717A (the "**Project Highway**") on Engineering, Procurement and Construction (EPC) basis through (Name of Contractor), hereby certify that the Tests on completion of
Maintenance Period in accordance with Article 14 of the Agreement have been successfully undertaken to determine compliance of the Project Highway with the provisions of the Agreement and I hereby certify that the Authority has taken over the Project highway from the Contractor on this day.....

SIGNED, SEALED AND DELIVERED

(Signature)

(Name and designation of Authority's Representative)

(Address)

***** **End of the Document** *****