राष्ट्रीय राजमार्ग एवं अवसंरचना विकास निगम लिमिटेड
सड़क परिवहन और राजमार्ग मंत्रालय, भारत सरकार
तीसरी मंजिल, पीटीआई बिल्डिंग, 4–संसद मार्ग, नई दिल्ली–110001

**National Highways & Infrastructure Development Corporation Limited**
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आज़ादी का अमृत महोत्सव

BUILDING INFRASTRUCTURE - BUILDING THE NATION
CIN: U45400DL2014GOI269062

(भारत सरकार का उद्यम) (A Government of India Enterprise)

**NHIDCL/Manipur/Imp-Koh(NH-39)/Pkg-5A/2ndcall/2022/212612/3179 06.10.2022**

To,

All Prospective Bidders

**Name of Work:** Improvement/ Up-gradation to 4-Lane Divided Highway from Kuraopokpi to Sekmai section (Pkg-5A) of Imphal Kohima Road (NH-39) (Design Chainage from Km 287+000 to Km 297+700) in the state of Manipur on EPC Mode.

**Tender Id:** 2022_NHIDC_707830_1

## Corrigendum No-1

| Sr. No | Reference to Clause | As per instant RFP | Modified Clause |
|---|---|---|---|
| 1 | Section 7(Data Sheet), bidding Schedule of RFP | **BID Due Date**: 06.10.2022 up to 1100 hrs]<br>**Physical Submission of Bid Documents/POA etc.**: [Upto 11:00 hrs IST on the date of technical opening<br>**Opening of Technical BIDs at venue 2.11.4 (i)**: 07.10.2022 up to 1130 hrs] | **BID Due Date**: 20.10.2022 up to 1100 hrs]<br>**Physical Submission of Bid Documents/POA etc.**: [Upto 11:00 hrs IST on the date of technical opening<br>**Opening of Technical BIDs at venue 2.11.4 (i)**: 21.10.2022 up to 1130 hrs] |
| 2 | Schedules | - | Technical Schedules (Attached as Annexure-A) |
| 3 | 2.2.2.2(i) of RFP | 15(five) years in case of normal highway projects and 10(Ten) years in case of stand alone specified projects (Major) Bridges/ROB/Flyover/Tunnel) | 15(five) years in case of normal highway projects and 10(Ten) years in case of stand along specialized projects (Major) Bridges/ROB/Flyover/Tunnel) |
| 4 | Para 5 of table under 2.2.2.2(i)(B) of RFP | **Estimated Project coct (EPC) if the project being invited**: Estimated project cost > 100 Crore of stand-alone specialize projects<br>**Technical Threshold Capacity**: 1.0 time of the estimate project cost of Rs. 1000 Crore, whichever is less | **Estimated Project coct (EPC) if the project being invited**: Estimated project cost > 1000 Crore of stand-alone specialize projects<br>**Technical Threshold Capacity**: 1.0 time of the estimate project cost of Rs. 1000 Crore, whichever is less |
| 5 | 2.2.2.2(ii) of RFP | **For normal Highways projects (including major bridges/ROB/Flyovers/Tunnels):**<br>Provided that at least one similar work of 20% of Estimated Project Cost [Rs. --Cr.] shall | **For normal Highways projects (including major bridges/ROB/Flyovers/Tunnels):**<br>Provided that at least one similar work of 20% of Estimated Project Cost [Rs. -- Cr.] shall have |

| Sr. No | Reference to Clause | As per instant RFP | Modified Clause |
|---|---|---|---|
| | | have been completed from the Eligible Projects in Category 1 and/or Category 3 specified in Clause 2.2.2.5. For this purpose, a project shall be considered to be completed, if more than 90% of the value of work has been completed, if more than 90% of the value of work has been completed value of work is equal to or more than 20% of the estimated project cost. Eligible projects shall include the following:<br><br>**(a) Widening/ reconstruction/up-gradation works on NH/SH/Expressway or on any category of road taken up under CRF, ISC/EI, SARDP, LWE**<br>**(b) Widening/reconstruction/up-gradation on MDRs with loan assistance from multilateral agencies or on BOT basis.**<br>**(c) Widening/reconstruction/up-gradation work of roads in Municipal Corporation limits, construction of Bypasses**<br>**(d) Construction of stand-alone bridges, ROBs, tunnels**<br>**(e) Construction/reconstruction of linear projects like airport runways, railways (construction/re-construction of railway yards for keeping containers etc) metro rail and ports (including construction/re-construction of Jetties)**<br><br>If any Major Bridge/ROB/Flyover/Tunnel is (are) part of the project, then the Bidder shall necessarily demonstrate additional experience in construction of Bridge/ROBs/Flyovers/Tunnel in the last 10 (Ten) financial years preceding the Bid Due Date i.e. shall have completed atleast one similar Bridge/ROB/Flyover/Tunnel of following sizes:<br>(a) In case, longest span of bridge/ROB/flyover is less than or equal to 60m, no additional qualification is required.<br>(b) When longest span is more than 60 m: 50% of the longest span or 100 m, whichever is less, of the structure proposed in this project.<br>(c) in case of tunnel is a part of project having 200m, then no additional qualification is required. | been completed from the Eligible Projects in Category 1 and/or Category 3 specified in Clause 2.2.2.5. For this purpose, a project shall be considered to be completed, if more than 90% of the value of work has been completed and such completed value of work is equal to or more than 20% of the estimated project cost. Eligible projects shall include the following:<br><br>**(a) Widening/ reconstruction/up-gradation works on NH/SH/Expressway or on any category of road taken up under CRF, ISC/EI, SARDP, LWE**<br>**(b) Widening/reconstruction/up-gradation on MDRs with loan assistance from multilateral agencies or on BOT basis.**<br>**(c) Widening/reconstruction/up-gradation work of roads in Municipal Corporation limits, construction of Bypasses**<br>**(d) Construction of stand-alone bridges, ROBs, tunnels**<br>**(e) Construction/reconstruction of linear projects like airport runways, railways (construction/re-construction of railway tracks, yards for keeping containers etc) metro rail and ports (including construction/re-construction of Jetties)**<br><br>If any Major Bridge/ROB/Flyover/Tunnel is (are) part of the project, then the Bidder shall necessarily demonstrate additional experience in construction of Major Bridge /ROBs/Flyovers/Tunnel in the last 10 (Ten) financial years preceding the Bid Due Date i.e. shall have completed atleast one similar Major Bridge/ ROB/Flyover/Tunnel of following sizes:<br>(a) In case, longest span of bridge/ROB/flyover is less than or equal to 60m, no additional qualification is required.<br>(b) When longest span is more than 60 m: 50% of the longest span or 100 m, whichever is less, of the structure proposed in this project.<br>(c) In case tunnel is part of project having length less than or equal to 200 mtr, then no additional qualification is required.<br>(d) When length of tunnel more than 200 m: 50% of the cross sectional area of proposed tunnel or two lane highway tunnel cross-sectional area, |

| Sr. No | Reference to Clause | As per instant RFP | Modified Clause |
|---|---|---|---|
| | | (d) When length of tunnel more than 200 m: 50% of the cross sectional area of proposed tunnel or two lane highway tunnel cross-sectional area, whichever is less and 20% length of the tunnel to be constructed in this project or 2 km, whichever is less. For the purpose of this requirement, tunnel may have single/twin tubes for roads/railways/metro rail/irrigation/hydroelectricity projects etc. | whichever is less and 20% length of the tunnel to be constructed in this project or 2 km, whichever is less. For the purpose of this requirement, tunnel may have single/twin tubes for roads/railways/metro rail/irrigation/hydroelectricity projects etc. |
| 6 | 2.2.2.2.(iii)(a)(a1) of the RFP | **(a) Major bridges/ROB/Flyover projects:**<br><br>**(a1) In case the cost of specialized project is less than or equal to Rs. 1000 Cr:** The sole Bidder shall have completed at least one similar Major Bridge/ ROB/ Flyover project in the last 10 (Ten) financial years preceding the Bid Due Date, having span equal to or greater than 50% of the longest span or 100 m, whichever is less of the structure proposed in this project and also the cost of such similar project shall be atleast 20% of the Estimated Project Cost. For this purpose, a project shall be considered to be completed, if more than 90% of the value of work has been completed and such completed value of work is equal to or more than 20% of the Estimated Project Cost | **(a) Major bridges/ROB/Flyover projects:**<br><br>**(a1) In case the cost of specialized project is less than or equal to Rs. 1000 Cr:** The bidder shall have completed at least one similar Major Bridge/ ROB/ Flyover project in the last 10 (Ten) financial years preceding the Bid Due Date, having span equal to or greater than 50% of the longest span or 100 m, whichever is less of the structure proposed in this project and also the cost of such similar project shall be atleast 20% of the Estimated Project Cost. For this purpose, a project shall be considered to be completed, if more than 90% of the value of work has been completed and such completed value of work is equal to or more than 20% of the Estimated Project Cost |
| 7 | 2.2.2.2.(iii)(b) of the RFP | **(b) Tunnel project:** The Sole Bidder or in case the Bidder being a Joint Venture, any member of JV shall have completed atleast one tunnel project in the last 10 (Ten) financial years preceding the Bid Due Date, consisting of single or twin tubes (including tunnel(s) for roads/Railway /Metro rail/ irrigation/ hydro-electric projects etc.) having atleast 50% of the cross-sectional area of the tunnel to be constructed or cross-sectional area of 2 lane highway tunnel, whichever is less and 20% length of the tunnel to be constructed in this project or 2 km, whichever is less and the cost of such project shall be atleast 20% of the Estimated Project Cost or Rs. 1000 crore, whichever is less. For this purpose, a project shall be considered to be completed, if more than 90% of the value of work has been completed and such completed value of work is equal to or more than 20% of the Estimated Project Cost or ₹ 1000 Cr., whichever is less. | **(b) Tunnel project:** The Bidder shall have completed atleast one tunnel project in the last 10 (Ten) financial years preceding the Bid Due Date, consisting of single or twin tubes (including tunnel(s) for roads/Railway /Metro rail/ irrigation/ hydro-electric projects etc.) having atleast 50% of the cross-sectional area of the tunnel to be constructed or cross-sectional area of 2 lane highway tunnel, whichever is less and 20% length of the tunnel to be constructed in this project or 2 km, whichever is less and the cost of such project shall be atleast 20% of the Estimated Project Cost or Rs. 1000 crore, whichever is less. For this purpose, a project shall be considered to be completed, if more than 90% of the value of work has been completed and such completed value of work is equal to or more than 20% of the Estimated Project Cost or ₹ 1000 Cr., whichever is less. |

| Sr. No | Reference to Clause | As per instant RFP | Modified Clause |
|---|---|---|---|
| 8 | 2.2.2.5(v) of RFP | Maintenance works are not considered as eligible project for evaluation as per instruction No.6 to Annex-IV. As such works with nomenclature like PR, OR, FDR, SR, site/micro grading, surface renewal, resurfacing work, Tarring, B.T. surface work, temporary restoration, urgent works, periodic maintenance, repair & rehabilitation, one time maintenance, permanent protection work of bank, external pre stressing, repair of central hinge, short term OMT contract of NHAI, any type of work related to border fencing, work of earthwork alone, construction of buildings/ hostels, etc., or not specified, shall not be considered. However, such maintenance works shall be considered as eligible projects in case of Maintenance works to be taken up on EPC mode. | Maintenance works are not considered as eligible project for evaluation as per instruction No.6 to Annex-IV. As such works with nomenclature like PR, OR, FDR, SR, site/micro grading, surface renewal, resurfacing work, Tarring, B.T. surface work, temporary restoration, urgent works, periodic maintenance, repair & rehabilitation, one time maintenance, permanent protection work of bank, external pre stressing, repair of central hinge, short term OMT contract of NHAI, any type of work related to border fencing, work of earthwork alone, construction of buildings/ hostels/hospitals, etc., or not specified, shall not be considered. However, such maintenance works shall be considered as eligible projects in case of Maintenance works to be taken up on EPC mode. |
| 9 | 2.2.2.5(vi) of RFP | The works such as Improvement in Riding Quality work (IRQP/IRQ), shall be considered for Technical Capacity [2.2.2.2 (i)] but not for similar completed works [2.2.2.2 (ii) & 2.2.2.2 (iii)]. However, such work shall be considered for single completed works [2.2.2.2 (ii)] in case of Maintenance works to be taken up on EPC mode. | The works such as Improvement in Riding Quality work (IRQP/IRQ), shall be considered for Technical Capacity [2.2.2.2 (i)] but not for similar completed works [2.2.2.2 (ii) & 2.2.2.2 (iii)]. However, such work shall be considered for similar completed works [2.2.2.2 (ii)] in case of Maintenance works to be taken up on EPC mode. |

06/10/22

(K.C. Bhatt)
Dy. General Manager (T)

**Schedules**

## SCHEDULE - A

*(See Clauses 2.1 and 8.1)*

## SITE OF THE PROJECT

1. The Site

1.1 Site of the Project Highway shall include the land, buildings, structures and road works as described in Annex-I of this Schedule-A.

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

1.3 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.

1.4 The alignment plans of the Project Highway are specified in Annex-III. 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 Annexure-III based on site/design requirement.

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

**Annex - I**

*(Schedule-A)*

# Site

1. The Site

The Site of the Project Highway comprises the section of National Highway - 39 (New NH-2) from Kuraopokpi (Ex. Km288+815)to Sekmai(Ex.Km299+538) in the state of Manipur. The contract package of the project comprises the rehabilitation and upgradation of existing two lanes to 4 lane divided carriageway configuration. The land, carriageway and structures comprising the Site are described below:

2. Land

The Site of the Project Highway comprises the land (existing right of way (ROW)) as described below:

| S. No | Existing Chainage (Km) | | Existing ROW (m) | Remarks |
|---|---|---|---|---|
| | From | To | | |
| 1 | 288+815 | 290+000 | 12 | |
| 2 | 290+000 | 299+538 | 30 | |

3. Carriageway

The present carriageway of the Project Highway is generally Two Lane carriageway. The type of the existing pavement is flexible and road width details of package-5are as below:

| S No | Existing Chainage | | Length (m) | Terrain | | Carriageway | |
|---|---|---|---|---|---|---|---|
| | From | To | | LHS | RHS | Type | Width (m) |
| 1 | 288+815 | 289+400 | 585 | Rolling | Rolling | BT | 6.5 |
| 2 | 289+400 | 290+600 | 1200 | Valley | Hilly | BT | 6.5 |
| 3 | 290+600 | 291+200 | 600 | Valley | Hilly | BT | 6.75 |
| 4 | 291+200 | 291+400 | 200 | Valley | Hilly | BT | 6.7 |
| 5 | 291+400 | 291+800 | 400 | Valley | Hilly | BT | 6.8 |
| 6 | 291+800 | 292+400 | 600 | Valley | Hilly | BT | 6.75 |
| 7 | 292+400 | 292+600 | 200 | Valley | Hilly | BT | 6.8 |
| 8 | 292+600 | 292+800 | 200 | Hilly | Hilly | BT | 6.8 |
| 9 | 292+800 | 293+200 | 400 | Valley | Rolling | BT | 6.8 |

| S No | Existing Chainage | | Length (m) | Terrain | | Carriageway | |
|---|---|---|---|---|---|---|---|
| | From | To | | LHS | RHS | Type | Width (m) |
| 10 | 293+200 | 293+400 | 200 | Valley | Valley | BT | 7 |
| 11 | 293+400 | 293+600 | 200 | Valley | Valley | BT | 8 |
| 12 | 293+600 | 293+800 | 200 | Hilly | Hilly | BT | 8 |
| 13 | 293+800 | 294+000 | 200 | Rolling | Rolling | BT | 8 |
| 14 | 294+000 | 294+400 | 400 | Rolling | Rolling | BT | 7 |
| 15 | 294+400 | 295+000 | 600 | Rolling | Rolling | BT | 7.2 |
| 16 | 295+000 | 297+800 | 2800 | Rolling | Rolling | BT | 6.8 |
| 17 | 297+800 | 299+538 | 1738 | Rolling | Rolling | BT | 7 |

4. Major Bridges

The Site includes the following Major Bridges:

| S No. | Ex. Chainage | Ex. Span arrangement ( No. x Span) | Total Outer Width (m) | Type of Structure | | |
|---|---|---|---|---|---|---|
| | | | | Superstructure | Substructure | Foundation |
| NIL | | | | | | |

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

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

| S. No. | Existing Chainage (KM) | Type of Structure | | No. of Spans with span length(m) | Width (m) | ROB /RUB | Remarks |
|---|---|---|---|---|---|---|---|
| | | Found-ation | Super-structure | | | | |
| NIL | | | | | | | |

6. Grade separators

The Site includes the following grade separators:

| S.N | Existing | Type of Structure | No. of Spans | |
|---|---|---|---|---|

| o. | Chainage (KM) | Foundation | Super structure | with span length (m) | Width (m) |
|---|---|---|---|---|---|
| NIL | | | | | |

7. Minor bridges

The Site includes the following minor bridges:

| S. No. | Ex. Chainage (Km) | Ex. Span arrangement ( No. x Span) | Total Outer Width of Deck (m) | Type of Structure | | |
|---|---|---|---|---|---|---|
| | | | | Super structure | Sub structure | Foundation |
| 1 | 289+968 | 1 x 6.7 | 10.6 | Solid Slab | RCC wall type | Open |
| 2 | 293+279 | 1 x 14 | 8.5 | RCC T-Beam | RCC wall type | Open |
| 3 | 297+007 | 1 x 26 | 11.0 | PSC I Girder | RCC wall type | Open |
| 4 | 297+1067 | 1 x 11.5 | 11.2 | RCC T-Beam | RCC wall type | Open |
| 5 | 299+015 | 1 x 6.7 | 10 | Solid Slab | RCC wall type | Open |

8. Railway level crossings

The Site includes the following railway level crossings:

| S. No. | Location/ Existing Chainage (KM) | Remarks |
|---|---|---|
| NIL | | |

9. Underpasses (Vehicular, Non Vehicular)

The Site includes the following underpasses:

| S. No. | Existing Chainage (Km) | Type of Structure | No. of Spans with span length (m) | Width (m) |
|---|---|---|---|---|
| NIL | | | | |

10. Culverts

10.1 Pipe Culverts:

The Site has the following existing pipe culverts:

| S. No. | Ex. Chainages (Km) | Type of Culvert | No. of Pipes | Pipe Dia (m) | Carriageway Width (m) | Remarks |
|---|---|---|---|---|---|---|
| 1 | 288+828 | Pipe | 2 | 1 | 7 | Repairing Required (Broken) |
| 2 | 288+950 | Pipe | 1 | 1 | 6.8 | Repairing Required (Broken) |
| 3 | 289+200 | Pipe | 1 | 1 | 6.8 | Repairing Required (Broken) |
| 4 | 289+337 | Pipe | 1 | 1 | 6.5 | Repairing Required (Broken) |
| 5 | 289+490 | Pipe | 1 | 1 | 6.9 | Repairing Required (Broken) |
| 6 | 289+601 | Pipe | 1 | 1 | | Cleaning Required (Block) |

| S. No. | Ex. Chainages (Km) | Type of Culvert | No. of Pipes | Pipe Dia (m) | Carriageway Width (m) | Remarks |
|---|---|---|---|---|---|---|
| 7 | 289+660 | Pipe | 1 | 1 | 7 | Blocked-L |
| 8 | 289+748 | Pipe | 1 | 1 | 7 | Blocked-L |
| 9 | 289+799 | Pipe | 1 | 1 | 7 | Blocked-L |
| 10 | 289+867 | Pipe | 1 | 1 | 6.8 | Repairing Required (Broken) |
| 11 | 290+057 | Pipe | 1 | 1 | 6.5 | |
| 12 | 290+649 | Pipe | - | - | - | Blocked |
| 13 | 290+677 | Pipe | 1 | 1 | 7.1 | |
| 14 | 290+830 | Pipe | 2 | 1 | 6.8 | |
| 15 | 291+016 | Pipe | 1 | 1 | 6.3 | |
| 16 | 291+055 | Pipe | 1 | 1 | 6.7 | Blocked-R |
| 17 | 292+029 | Pipe | 1 | 1 | 6.2 | |
| 18 | 292+093 | Pipe | 1 | 1 | 6.4 | Cleaning Required (Block) |
| 19 | 292+368 | Pipe | 1 | 1 | 7 | Cleaning Required (Block) |
| 20 | 292+406 | Pipe | 1 | 1 | 6 | |
| 21 | 292+753 | Pipe | 1 | 1 | 6.7 | |
| 22 | 293+664 | Pipe | 1 | 1.2 | 6.1 | Cleaning Required (Block) |
| 23 | 294+097 | Pipe | 1 | 1 | 6.1 | Blocked-R |
| 24 | 294+293 | Pipe | 1 | 1 | 6.4 | |
| 25 | 294+392 | Pipe | 1 | 1 | 6.4 | |
| 26 | 294+797 | Pipe | 1 | 1 | 6.2 | |
| 27 | 295+342 | Pipe | 1 | 1 | 6.6 | |
| 28 | 295+498 | Pipe | 1 | 1 | 6.6 | |
| 29 | 296+250 | Pipe | 1 | 1 | 6.4 | |
| 30 | 296+505 | Pipe | 1 | 1 | 7.2 | |

### 10.2 Slab Culverts

The Site has the following existing slab culverts:

| S. No. | Ex. Chainages (Km) | Type of Culvert | Thickness of Slab (m) | No. of Span | Clear Span (m) | Carriageway Width (m) | Remarks |
|---|---|---|---|---|---|---|---|
| 1 | 289+105 | Slab | 0.2 | 1 | 3 | 6.5 | |
| 2 | 289+541 | Slab | 0.2 | 1 | 2 | 6.8 | |
| 3 | 290+171 | Slab | 0.2 | 1 | 2 | 6.5 | Blocked-L |
| 4 | 290+346 | Slab | 0.2 | 1 | 1.2 | 6.3 | |
| 5 | 290+405 | Slab | 0.2 | 1 | 2 | 7.2 | |
| 6 | 290+497 | Slab | 0.2 | 1 | 2 | 7.2 | |
| 7 | 290+572 | Slab | 0.2 | 1 | 2 | 7.2 | |

| S. No. | Ex. Chainages (Km) | Type of Culvert | Thickness of Slab (m) | No. of Span | Clear Span (m) | Carriageway Width (m) | Remarks |
|---|---|---|---|---|---|---|---|
| 8 | 291+104 | Slab | 0.3 | 1 | 1.5 | Under Construction | |
| 9 | 291+203 | Slab | 0.2 | 1 | 2 | 6.5 | |
| 10 | 291+341 | Slab | 0.2 | 1 | 1 | 6.7 | |
| 11 | 291+530 | Slab | 0.2 | 1 | 1 | 6.6 | |
| 12 | 291+716 | Slab | 0.25 | 1 | 1.5 | 6.6 | |
| 13 | 291+836 | Slab | 0.2 | 1 | 1 | 6.6 | |
| 14 | 291+855 | Slab | 0.2 | 1 | 1 | 7 | |
| 15 | 291+890 | Slab | 0.25 | 1 | 1 | 6.5 | |
| 16 | 292+441 | Slab | 0.2 | 1 | 1 | 6.3 | Cleaning Required (Block) |
| 17 | 292+503 | Slab | 0.5 | 1 | 6 | 7 | |
| 18 | 292+913 | Slab | 0.5 | 1 | 5 | 6.6 | |
| 19 | 293+534 | Slab | 0.2 | 1 | 1 | 6.7 | |
| 20 | 293+895 | Slab | 0.2 | 1 | 0.9 | 7 | Blocked-L |
| 21 | 293+923 | Slab | 0.2 | 1 | 0.9 | 7 | Blocked-R |
| 22 | 294+002 | Slab | 0.2 | 1 | 1 | 7 | Blocked-R |
| 23 | 294+194 | Slab | 0.2 | 1 | 1 | 6.6 | Blocked-R |
| 24 | 294+464 | Slab | 0.3 | 1 | 2 | 6.7 | |
| 25 | 294+594 | Slab | 0.2 | 1 | 1 | 6.6 | |
| 26 | 294+685 | Slab | 0.2 | 1 | 1 | 6.7 | |
| 27 | 294+885 | Slab | 0.2 | 1 | 1 | 6.5 | |
| 28 | 294+960 | Slab | 0.2 | 1 | 1 | 6 | |
| 29 | 295+091 | Slab | 0.2 | 1 | 0.9 | 7.25 | |
| 30 | 295+143 | Slab | 0.2 | 1 | 1 | 7.25 | |
| 31 | 295+593 | Slab | 0.2 | 1 | 1 | 6.6 | |
| 32 | 295+697 | Slab | 0.2 | 1 | 1 | 6.9 | |
| 33 | 295+827 | Slab | 0.22 | 1 | 1 | 6.9 | |
| 34 | 296+399 | Slab | 0.2 | 1 | 0.9 | 7.1 | |
| 35 | 296+693 | Slab | 0.2 | 1 | 0.6 | 6.6 | |
| 36 | 296+696 | Slab | 0.2 | 1 | 0.6 | 6.6 | |
| 37 | 297+238 | Slab | 0.2 | 1 | 3.2 | 7 | |
| 38 | 297+470 | Slab | 0.23 | 1 | 1 | 7 | |
| 39 | 298+166 | slab | | - | - | - | Blocked |
| 40 | 299+313 | Slab | 0.2 | 1 | 1.4 | 7.25 | |

10.3 Other Culverts

| S. No. | Ex. Chainages (Km) | Type of Culvert | Thickness of Slab (m) | Span Arrangement | Clear Span (m) | Carriageway Width (m) | Remarks |
|---|---|---|---|---|---|---|---|
| 1 | 296+123 | Arch | - | 1 | 4.5 | 6 | |

11. Bus bays& Bus Shelters

The details of bus stops on the site are as follows:

| S.No | Ex. Chainages (Km) | Ex. Bus Stop | Side | Remarks |
|---|---|---|---|---|
| 1 | 290+720 | Ex.bus stop | LHS | Motbung |
| 2 | 291+330 | Ex.bus stop | LHS | Saparmeina |
| 3 | 293+013 | Ex.bus stop | LHS | N-SongLung |
| 4 | 293+600 | Ex.bus stop | LHS | N-SongLung |
| 5 | 294+355 | Ex.bus stop | RHS | N-SongLung |
| 6 | 295+810 | Ex.bus stop | RHS | N-SongLung |
| 7 | 297+136 | Ex.bus stop | LHS | Motbung |
| 8 | 297+450 | Ex.bus stop | LHS | Kanglatongbi |
| 9 | 297+750 | Ex.bus stop | RHS | Konglatongbi |
| 10 | 298+215 | Ex.bus stop | RHS | Konglatongbi |

12. Truck Lay byes

The details of truck lay byes are as follows:

| S. No. | Existing Chainage (km) | Length(m) | Left Hand Side | Right Hand Side |
|---|---|---|---|---|
| NIL | | | | |

13. Road side drains

| S. No. | Existing Chainage(Km) | | Type | |
|---|---|---|---|---|
| | From | To | Masonry/cc (Pucca) | Earthen (Kutcha) |
| | | | | |

NIL

14. Major junctions

The details of Major junctions are as follows:

| SN | Ex. Chainage | At Grade/ Grade | Details of Cross Road | Starts From |
|---|---|---|---|---|

| | (Km ) | Separated | Direction (LHS/RH S) | Road Type (NH/SH/MDR) | |
|---|---|---|---|---|---|
| Nl | | | | | |

15. Minor junctions

The details of the minor junctions are as follows:

| S.No | Existing Chainage (Km) | Type of Junction | Width of Cross Road | Side | Village/Town Name |
|---|---|---|---|---|---|
| 1 | 288+893 | Y | 4.2 | RHS | Tokpakhul |
| 2 | 290+386 | Y | 3.8 | RHS | Tokpakhul |
| 3 | 290+728 | T | 3.4 | RHS | Pangmoul |
| 4 | 290+775 | T | 2.9 | RHS | Pangmoul |
| 5 | 290+826 | Y | 3 | RHS | Pangmoul |
| 6 | 291+361 | T | 2.4 | LHS | Pangmoul |
| 7 | 291+507 | T | 2.3 | LHS | Pangmoul |
| 8 | 291+614 | T | 2.1 | RHS | Motbung |
| 9 | 291+730 | T | 2.5 | RHS | Motbung |
| 10 | 291+762 | T | 2.7 | LHS | Motbung |
| 11 | 291+860 | T | 3 | RHS | Motbung |
| 12 | 291+878 | Y | 3.9 | LHS | Motbung |
| 13 | 291+919 | T | 2.6 | LHS | Motbung |
| 14 | 291+920 | T | 3.6 | RHS | Motbung |
| 15 | 292+114 | T | 3 | RHS | Motbung |
| 16 | 292+202 | T | 2.3 | LHS | Motbung |
| 17 | 292+383 | Y | 2.5 | LHS | Motbung |
| 18 | 292+617 | T | 2.6 | LHS | Motbung |
| 19 | 292+835 | T | 3.3 | RHS | Motbung |
| 20 | 292+938 | T | 3.5 | LHS | Motbung |
| 21 | 293+274 | T | 2.6 | LHS | Motbung |
| 22 | 293+349 | T | 2.2 | RHS | Motbung |
| 23 | 293+567 | Y | 5.1 | RHS | Kuraopokpi |
| 24 | 294+394 | T | 5.2 | RHS | Stantipur |
| 25 | 294+553 | T | 3.3 | LHS | Vijaynagar |
| 26 | 294+900 | T | 3.3 | RHS | Vijaynagar |
| 27 | 294+932 | T | 4.3 | LHS | Vijaynagar |
| 28 | 294+960 | T | 1.7 | RHS | Vijaynagar |
| 29 | 295+062 | T | 3.7 | LHS | Vijaynagar |
| 30 | 295+350 | T | 4.2 | LHS | Kanglatongbi |
| 31 | 295+494 | T | 5.1 | RHS | Kanglatongbi |
| 32 | 295+547 | T | 4.8 | RHS | Kanglatongbi |
| 33 | 295+822 | Y | 4.3 | RHS | Kanglatongbi |
| 34 | 295+908 | T | 3.4 | LHS | Kanglatongbi |

| S.No | Existing Chainage (Km) | Type of Junction | Width of Cross Road | Side | Village/Town Name |
|---|---|---|---|---|---|
| 35 | 297+211 | Y | 6.7 | RHS | Kanglatongbi |
| 36 | 297+874 | Y | 2.8 | RHS | Kanglatongbi |
| 37 | 298+175 | Y | 3.6 | LHS | Seknai |
| 38 | 298+492 | T | 3 | LHS | Seknai |
| 39 | 298+502 | Y | 3.7 | RHS | Seknai |
| 40 | 298+634 | T | 2.4 | RHS | Seknai |
| 41 | 298+898 | Y | 3.5 | LHS | Seknai |
| 42 | 298+978 | Y | 3.2 | RHS | Seknai |
| 43 | 299+009 | Y | 2.7 | LHS | Seknai |
| 44 | 299+116 | Y | 3.9 | RHS | Seknai |
| 45 | 299+188 | T | 2.3 | RHS | Seknai |
| 46 | 299+400 | T | 3.5 | LHS | Tendongyan |

16. Bypasses

The details of the bypasses are as follows:

| S. No. | Name of bypass (town) | Chainage (km) | Length | Carriageway | |
|---|---|---|---|---|---|
| | | From ----to | (in Km) | Width (m) | Type |
| NIL | | | | | |

17. Other structures

- Nil –

18. Referencing

The relationship between the "Existing Chainage" as per field survey and "Design Chainage" is given below:

| S. No. | Existing Chainage | Design Chainage | Remarks |
|---|---|---|---|
| 1 | 288+815 | 287+000 | Start of Package-5a |
| 2 | 289+000 | 287+175 | |
| 3 | 290+000 | 288+153 | |
| 4 | 291+000 | 289+132 | |
| 5 | 292+000 | 289+995 | |
| 6 | 293+000 | 290+998 | |
| 7 | 294+000 | 291+997 | |
| 8 | 295+000 | 292+970 | |
| 9 | 296+000 | 293+990 | |

| S. No. | Existing Chainage | Design Chainage | Remarks |
|---|---|---|---|
| 10 | 297+000 | 295+142 | |
| 11 | 298+000 | 296+251 | |
| 12 | 299+000 | 297+162 | |
| 13 | 299+538 | 299+700 | End of Package-5a |

## Annex - II

*(Schedule-A)*

## Utilities

The Site includes the following Utilities:

**1. Electric Utilities- MSPDCL:**

| | |
|---|---|
| New HT DP | 2 |
| HT DP | 10 |
| HT Single Pole | 27 |
| Affected LT Poles | 186 |
| Affected DTR | 7 |
| Street Lamp | 5 |
| New LT pole | 25 |
| Composite Single Pole | 7 |
| Composite Double Pole | 1 |
| Transformer | 1 |

**2. Distribution Pipe underground-PHED**

| S. No. | Village | Pipe Size | Side | Chainage (Km) | | Length (m) |
|---|---|---|---|---|---|---|
| | | | | From | To | |
| 1 | Kholep | 32 mm | Right | 290+380 | 290+800 | 520 |
| 2 | Gamgiphai & Motbung Bazar | 32 mm | Both | 292+000 | 293+850 | 3700 |
| 3 | Gamgiphai & Motbung Bazar | 32 mm | Both | 292+000 | 293+850 | 3700 |
| 4 | Gamgiphai & Motbung Bazar | 32 mm | Right | 292+000 | 293+850 | 1950 |
| 5 | Motbung | 65 mm | Right | 291+500 | 292+100 | 700 |
| 6 | Motbung bazar | 80 mm | Right | 291+900 | 292+100 | 300 |
| 7 | Kanglatongbi | 100 mm | Right | 294+650 | 295+250 | 600 |
| 8 | Kanglatongbi | 80 mm | Right | 295+250 | 295+650 | 400 |

**3. Other Pipes -PHED**

| S. No. | Village | Chainage | Remarks | |
|---|---|---|---|---|
| 1 | G Hengjiang | 287+685 | Water distribution Tanks | |
| 2 | Motbung | 291+200 | Water distribution Tanks | |
| 3 | Motbung | 292+900 | Water distribution Tanks | |
| 4 | Kholep | 290+365 | Community Toilets | |

# Annex - III

*(Schedule-A)*

## Dates for providing Right of Way of Construction Zone

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

| S. No. | Ex Chainage (m) | | Design Chainage(m) | | Length (m) | PROW width (m) | Date of Providing ROW* |
|---|---|---|---|---|---|---|---|
| | From | To | From | To | | | |
| 1 | 288+817 | 288+866 | 287+000 | 287+050 | 50 | 45.0 | 90% land will be available at the time of appointed date and balance 10% land after 150(one hundred and fifty) days from Appointed date. |
| 2 | 288+866 | 289+064 | 287+050 | 287+240 | 190 | 47.5 | |
| 3 | 289+064 | 289+313 | 287+240 | 287+390 | 150 | 52.5 | |
| 4 | 289+313 | 289+303 | 287+390 | 287+480 | 90 | 45.0 | |
| 5 | 289+303 | 289+435 | 287+480 | 287+600 | 120 | 47.5 | |
| 6 | 289+435 | 289+690 | 287+600 | 287+850 | 250 | 45.0 | |
| 7 | 289+690 | 289+740 | 287+850 | 287+900 | 50 | 47.5 | |
| 8 | 289+740 | 289+939 | 287+900 | 288+100 | 200 | 52.5 | |
| 9 | 289+939 | 290+298 | 288+100 | 288+450 | 350 | 46.5 | |
| 10 | 290+298 | 290+456 | 288+450 | 288+600 | 150 | 45.0 | |
| 11 | 290+456 | 290+508 | 288+600 | 288+650 | 50 | 47.5 | |
| 12 | 290+508 | 290+722 | 288+650 | 288+850 | 200 | 57.5 | |
| 13 | 290+722 | 290+774 | 288+850 | 288+900 | 50 | 47.5 | |
| 14 | 290+774 | 291+163 | 288+900 | 289+290 | 390 | 46.5 | |
| 15 | 291+163 | 291+422 | 289+290 | 289+550 | 260 | 45.0 | |
| 16 | 291+422 | 291+481 | 289+550 | 289+600 | 50 | 47.5 | |
| 17 | 291+481 | 291+586 | 289+600 | 289+680 | 80 | 54.0 | |
| 18 | 291+586 | 291+612 | 289+680 | 289+700 | 20 | 59.0 | |
| 19 | 291+612 | 291+676 | 289+700 | 289+750 | 50 | 52.5 | |
| 20 | 291+676 | 291+737 | 289+750 | 289+800 | 50 | 47.5 | |
| 21 | 291+737 | 292+409 | 289+800 | 290+400 | 600 | 45.0 | |
| 22 | 292+409 | 292+559 | 290+400 | 290+550 | 150 | 46.5 | |
| 23 | 292+559 | 292+859 | 290+550 | 290+850 | 300 | 45.0 | |
| 24 | 292+859 | 292+959 | 290+850 | 290+950 | 100 | 52.0 | |
| 25 | 292+959 | 293+002 | 290+950 | 291+000 | 50 | 48.5 | |
| 26 | 293+002 | 293+503 | 291+000 | 291+500 | 500 | 45.0 | |
| 27 | 293+503 | 293+943 | 291+500 | 291+940 | 440 | 37.5 | |
| 28 | 293+943 | 294+064 | 291+940 | 292+060 | 120 | 58.0 | |
| 29 | 294+064 | 296+060 | 292+060 | 294+050 | 1990 | 37.5 | |
| 30 | 296+060 | 296+400 | 294+050 | 294+390 | 340 | 45.0 | |
| 31 | 296+400 | 296+810 | 294+390 | 294+800 | 410 | 37.5 | |
| 32 | 296+810 | 296+910 | 294+800 | 294+900 | 100 | 38.8 | |
| 33 | 296+910 | 296+1110 | 294+900 | 295+100 | 200 | 37.5 | |
| 34 | 296+1110 | 297+058 | 295+100 | 295+200 | 100 | 42.5 | |

| S. No. | Ex Chainage (m) | | Design Chainage(m) | | Length (m) | PROW width (m) | Date of Providing ROW* |
|---|---|---|---|---|---|---|---|
| | From | To | From | To | | | |
| 35 | 297+058 | 297+257 | 295+200 | 295+400 | 200 | 40.0 | |
| 36 | 297+257 | 297+457 | 295+400 | 295+600 | 200 | 45.0 | |
| 37 | 297+457 | 297+607 | 295+600 | 295+750 | 150 | 37.5 | |
| 38 | 297+607 | 297+678 | 295+750 | 295+820 | 70 | 41.2 | |
| 39 | 297+678 | 298+850 | 295+820 | 297+100 | 1280 | 45.0 | |
| 40 | 298+850 | 299+088 | 297+100 | 297+250 | 150 | 41.3 | |
| 41 | 299+088 | 299+488 | 297+250 | 297+650 | 400 | 37.5 | |
| 42 | 299+488 | 299+538 | 297+650 | 297+700 | 50 | 41.3 | |

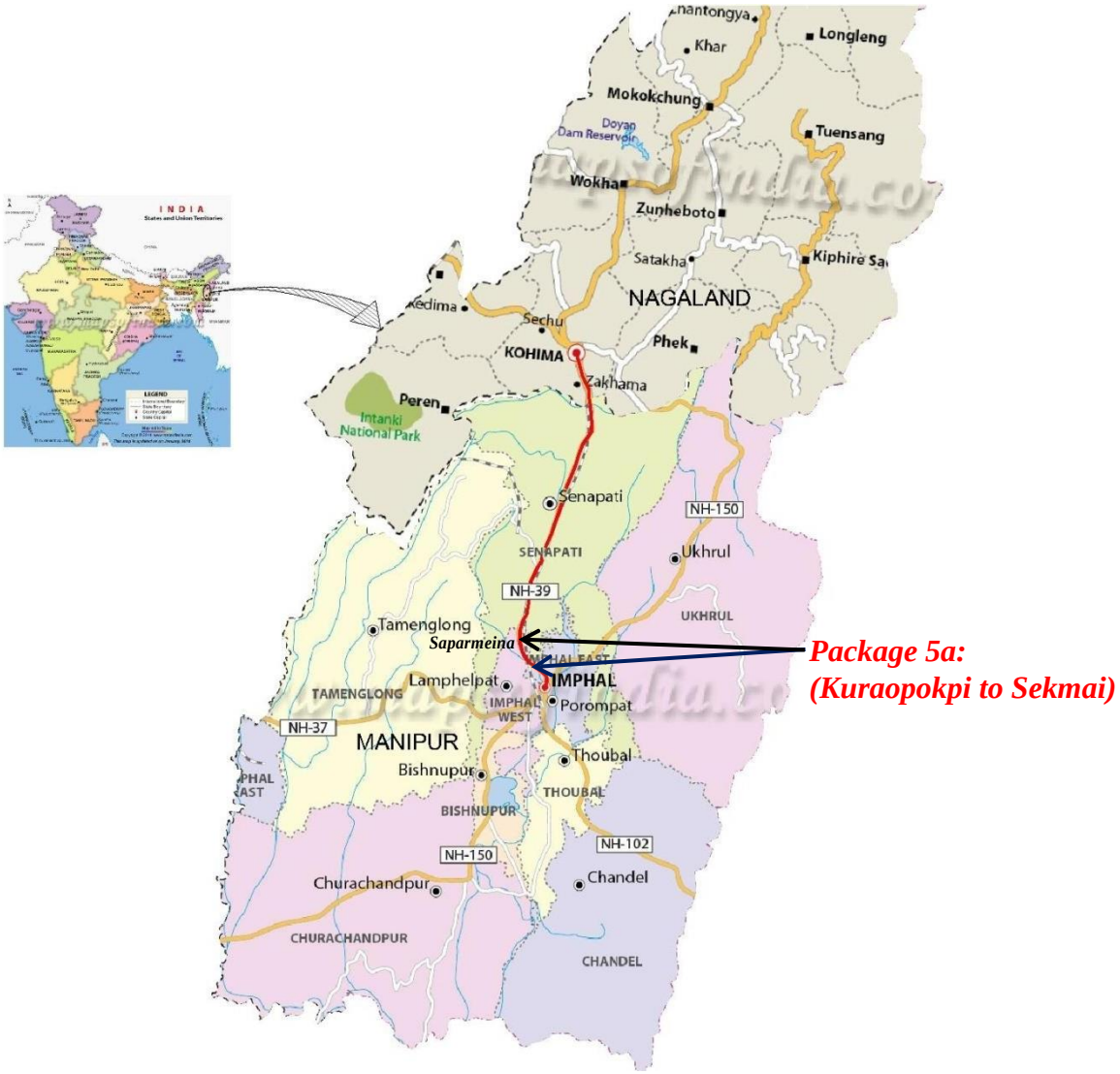
- The dates specified herein, shall in no case be beyond 150 (one hundred and fifty) days after the Appointed Date.

# Annex - IV

*(Schedule-A)*

## Alignment Plans

The existing alignment of the Package-5A i.e. Kuraopokpi to Sekmai section of Project Highway shall be modified as per the Alignment plan.




The proposed Alignment Plan and Profile of the Project Highway is available on e-Portal. Finished road level indicated in the alignment plan shall be followed by the contractor as minimum FRL.

# Annex - V

*(Schedule-A)*

## Environment Clearances

As per GoI, MoEF notification No. 21-270/2008-IA, III dated 22nd August 2013, proposed project involves expansion of 10.700 Km existing National Highway (less than 100 Km). As a result Environmental clearances will not be required from MoEF.

However, forest clearance is required for Tree cutting.

# SCHEDULE - B

*(See Clause 2.1)*

## Development of the Project Highway

**1. Development of the Project Highway**

Development of the Project Highway shall include design and construction of the Project Highway as described in this Schedule-B and in Schedule-C.

**2. Rehabilitation and Augmentation as Four lane divided carriageway**

Rehabilitation and Upgradation shall include Four lane divided carriageway of project highway as described in Annex-I of this Schedule-B and in Schedule-C.

**3. Specifications and Standards**

The Project Highway shall be designed and constructed in conformity with the Specifications and Standards specified in Annex-I of Schedule-D.

# Annex - I
(Schedule-B)

## Description of Four-Laning

**1.1.** Widening of the Existing Highway

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

**1.2.** Width of Carriageway

1.2.1 Four laning with paved shoulder from Kuraopokpi (Km287+000) to Sekmai (Km297+700) shall be undertaken. The width of paved carriageway shall be 2x9.0mwide in accordance with the Typical Cross Section (TCS) drawings presented in ***Appendix B1- Typical Cross Sections*** or Manual referred to in the Schedule-D (herein after called the "Manual") unless otherwise specified in this Schedule-B and Schedule-D.

The total roadway width of project highway shall be 18 m wide.

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

| S. No. | Built-up stretch (Township) | Design Chainage (Km) | | Length (m) | Paved Width (m) | (Typical cross section) (Ref. to Schedule B Appendix B-1) |
|---|---|---|---|---|---|---|
| | | From | To | | | |
| 1 | Motbung | 291+700 | 292+350 | 650 | 2x9.0m Main Carriageway +2x6.0m Service Road | TCS-11 & TCS-12 |

1.2.2 Except as otherwise provided in this Agreement, the width of the paved carriageway and cross-sectional features shall conform to paragraph 1.2.1 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 (IRC:SP: 84-2014).

**2.2.** Design speed

The design Speed for the project highway adopted for plain/rolling terrain is 100km/hr. However due to certain site constraints, the minimum design speed adopted for plain/rolling terrain is 80km/hr at locations mentioned in Schedule D.

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

The alignment of existing road has been improved at many locations along the route either by eliminating sharp curves and/or increasing the radii of horizontal curves. Also, at few locations the existing steep gradient have been improved through cutting/filling so as to conform the requirement of IRC:SP:84-2014 and achieving ruling gradient for plain/rolling terrain. So the reconstruction of road shall follow the improved alignment as enclosed in the bid document.

| Sl. No. | Design Chainage (Km) | | Type of deficiency | Remarks |
|---|---|---|---|---|
| | From Km | To Km | | |
| As per Alignment Plan (Annex-III, Schedule A) | | | | |

**2.3.1 Details of proposed Realignments:**

| S. No | Design Chainage(Km) | | Side | Design Length (Km) | Remarks |
|---|---|---|---|---|---|
| | From | To | | | |
| As per Alignment Plan (Annex-III, Schedule A) | | | | | |

2.3.2 Details of Proposed Bypasses:

| S. No | Design Chainage(Km) | | Side | Design Length (km) | Remarks |
|---|---|---|---|---|---|
| | From | To | | | |
| Nil | | | | | |

**2.4.** Right of Way

Details of the Right-of-Way (ROW) 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 in the following stretch:

| S. No. | Design Chainage (Km) | | Length (m) | (Typical cross section) (Ref. to Schedule B Appendix B-1) |
|---|---|---|---|---|
| | From | To | | |
| | 391+700 | 392+350 | 650 | TCS-11 & TCS-12 |

(b) In open country, paved shoulders of 1.5 m width shall be provided with same pavement layers of carriageway and balance 2.0m wide earthen shoulder shall be covered with 150mm thick compacted layer of granular/hard material. The granular sub-base(GSB) layer to be extended till side slope.

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

**2.6.** Lateral and vertical clearances at Underpasses

2.6.1 Lateral and vertical clearances at underpasses and provisions of guard rails/ crash barriers shall be as per the paragraph 2.10 of the Manual.

2.6.2 Lateral Clearance: The width of the openings at underpasses shall be as follows:

| S. No. | Location (Chainage) | Span/opening (m) | Remarks |
|---|---|---|---|
| Nil | | | |

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

2.7.1 Lateral and vertical clearances at overpasses and provision of guard rails/crash barriers shall be as per the paragraph 2.11 of the Manual.

2.7.2 Lateral Clearance: The size of the openings at overpasses shall be as follows:

| S. No. | Location (Chainage) (from km to km) | Span/opening (m) | Remarks |
|---|---|---|---|
| NIL | | | |

**2.8.** Service roads / Slip roads

Service roads/Slip roads shall be constructed at the locations and for the lengths

indicated below:

| S. No. | Design Chainage (km) | | Side | Length (m) |
|---|---|---|---|---|
| | from | to | | |
| 1 | 291+700 | 292+350 | Both Side | 650 |

**2.9.** Grade separated structures:

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

| S. No. | Location of Structure | Deck Width (m) | Number and length of spans | Approach gradient |
|---|---|---|---|---|
| NIL | | | | |

**2.10.** Cattle and Pedestrian under pass / over pass

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

| S. No. | Location | Type of crossing |
|---|---|---|
| NIL | | |

**2.11.** Typical Cross Section of the Project Highway

Typical Cross Sections (TCS) have been developed as TCS-1 to TCS-9 and TCS-11 to TCS-12 showing configuration along with a schedule of their applicability is presented in Appendix B-1 to this Schedule-B.

**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.

**(a) At-grade intersections**

**Major Junctions: -**

| S. No | Existing Chainage (Km) | Design Chainage (Km) | Type of Junction | Side | Remarks |
|---|---|---|---|---|---|
| Nil | | | | | |

**Minor Junctions: -**

| S.No | Existing Chainage | Design Chainage | Type of Junction | Side | Proposed Width | Village/Town Name |
|---|---|---|---|---|---|---|
| 1 | 287575 | 285465 | T | RHS | 3.5 | Phoibih |
| 2 | 288060 | 285955 | T | RHS | 2.7 | Phoibih |
| 3 | 288125 | 286010 | T | LHS | 2.4 | Saparmeina |
| 4 | 288150 | 286050 | T | RHS | 5.7 | Saparmeina |
| 5 | 288255 | 286145 | T | LHS | 3.8 | Saparmeina |
| 6 | 288265 | 286170 | T | RHS | 6 | Saparmeina |
| 7 | 288875 | 286765 | T | LHS | 5.3 | Saparmeina |
| 8 | 288640 | 286820 | Y | RHS | 4.2 | Saparmeina |
| 9 | 292389 | 290385 | T | RHS | 3.8 | Tokpakhul |
| 10 | 292738 | 290725 | T | BOTH | 2.2(LHS)/ 3.4(RHS) | Tokpakhul |
| 11 | 292781 | 290775 | T | RHS | 2.9 | Tokpakhul |
| 12 | 292843 | 290840 | T | RHS | 2.7 | Pangmoul |
| 13 | 293510 | 291505 | T | LHS | 2.4 | Pangmoul |
| 14 | 293617 | 291620 | T | BOTH | 2.3(LHS)/ 2.1(RHS) | Pangmoul |
| 15 | 293741 | 291755 | T | RHS | 2.4 | Pangmoul |
| 16 | 293765 | 291775 | T | LHS | 2.7 | Pangmoul |
| 17 | 293882 | 291880 | T | LHS | 3.8 | Pangmoul |
| 18 | 293922 | 291920 | T | LHS | 2.6 | Pangmoul |

| | | | | | | |
|---|---|---|---|---|---|---|
| 19 | 294118 | 292110 | T | RHS | 3.2 | Motbung |
| 20 | 294205 | 292200 | T | LHS | 2.2 | Motbung |
| 21 | 294381 | 292385 | T | LHS | 2.2 | Motbung |
| 22 | 294483 | 292480 | T | LHS | 3.2 | Motbung |
| 23 | 294622 | 292605 | T | LHS | 2.4 | Motbung |
| 24 | 294837 | 292825 | T | RHS | 3.5 | Motbung |
| 25 | 294940 | 292940 | T | LHS | 3.5 | Motbung |

| S.No | Existing Chainage | Design Chainage | Type of Junction | Side | Proposed Width | Village/Town Name |
|---|---|---|---|---|---|---|
| 26 | 295300 | 293280 | T | LHS | 2.3 | Motbung |
| 27 | 295380 | 293350 | T | RHS | 2.2 | Motbung |
| 28 | 295600 | 293575 | T | RHS | 4 | Kuraopokpi |
| 29 | 296400 | 294400 | T | RHS | 4.2 | Stantipur |
| 30 | 296562 | 294555 | T | LHS | 2 | Vijaynagar |
| 31 | 296908 | 294900 | T | RHS | 2.7 | Vijaynagar |
| 32 | 296940 | 294925 | T | LHS | 3.6 | Vijaynagar |
| 33 | 296978 | 294960 | T | RHS | 1.5 | Vijaynagar |
| 34 | 297072 | 295065 | T | LHS | 3.1 | Vijaynagar |
| 35 | 297208 | 295355 | T | LHS | 4.1 | Vijaynagar |
| 36 | 297351 | 295500 | T | RHS | 5.1 | Kanglatongbi |
| 37 | 297400 | 295550 | T | BOTH | 2.8(LHS)/ 4.3(RHS) | Kanglatongbi |
| 38 | 297682 | 295820 | T | RHS | 3.9 | Kanglatongbi |
| 39 | 297766 | 295905 | T | LHS | 2.5 | Kanglatongbi |
| 40 | 299075 | 297245 | T | RHS | 5.2 | Kanglatongbi |

For the drainage, additional Pipe Culvert (NP4 class) shall be provided on cross roads as per site condition.

**(b) Grade separated intersection with/without ramps**

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

**4.** Road Embankment and Cut Section

**4.1** The reconstruction of the existing road 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.

## 4.2 Raising of the Existing Road

The profile of the existing road at the following locations shall be raised:

| S. No. | Chainage | | Length | Extent of raising |
|---|---|---|---|---|
| | From | To | | |
| As per Alignment Plan & Profile (Annex-III, Schedule A) | | | | |

**5.** Pavement Design

**5.1.** Pavement design

Pavement design shall be carried out in accordance with Section 5 of the Manual and IRC:37-2018.

**5.2.** Type of pavement

Flexible pavement should be provided on entire project length.

**5.3.** Design requirements

Pavement design shall be as per section 5 of the Manual and IRC: 37: 2018.

**Design Period and Strategy**

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

**5.3.1 Design Traffic**

Notwithstanding anything to the contrary contained in this Agreement or the Manual, the Contractor shall design the pavement for minimum design traffic of ***30*** Million Standard Axles (MSA).

**5.4.** Reconstruction stretches

The entire length of the Project road requires ‘reconstruction’ following the Alignment Plan (Annex III-Schedule A). The entire road shall be designed as new flexible pavement.

**6.** Roadside Drainage

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

## 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:

| S. No. | Bridge (Km) | Carriageway width and Cross section Features |
|---|---|---|

7.1.3 The following structures shall be provided with footpaths:

| S. No. | Bridge (Km) | Carriageway width and Cross section Features |
|---|---|---|

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:

| Sl. No. | Bridge at km | Utility service to be carried | Remarks |
|---|---|---|---|
| To be finalized as per the site condition, during the execution, in consultation with the Authority Engineer. | | | |

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

### 7.2. Culverts

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

**7.2.2 Reconstruction of Existing Culverts:**

**(i) Reconstruction of Pipe Culvert to Pipe Culvert**

The following pipe culverts are proposed for reconstruction to pipe culverts:

| S.No. | Location | | Proposed Span (m) | Type | Remarks |
|---|---|---|---|---|---|
| | Existing | Proposed | | | |

| S. No. | Location | | Proposed Span (m) | Type | Remarks |
|---|---|---|---|---|---|
| | Existing | Proposed | | | |
| NIL | | | | | |

**(ii) Reconstruction of Pipe/Slab Culvert to Box Culvert**

The following pipe/slab culverts are proposed for reconstruction to box culverts:

| S No | Chainage (Km) | | Type | Proposed Span (m) | Remark |
|---|---|---|---|---|---|
| | Existing | Design | | | |
| 1 | 288+828 | 287+013 | Box Culvert | 1x3.0x3.0 m | |
| 2 | 289+541 | 287+703 | Box Culvert | 1x2.0x2.0 m | |
| 3 | 289+660 | 287+822 | Box Culvert | 1x2.0x2.0 m | |
| 4 | 290+171 | 288+324 | Box Culvert | 1x2.0x2.0 m | |
| 5 | 290+497 | 288+640 | Box Culvert | 1x2.0x2.0 m | |
| 6 | 290+830 | 288+955 | Box Culvert | 1x2.0x2.0 m | |
| 7 | 291+203 | 289+334 | Box Culvert | 1x2.0x2.0 m | |
| 8 | 291+855 | 289+916 | Box Culvert | 1x2.0x2.0 m | |
| 9 | 292+093 | 290+089 | Box Culvert | 1x2.0x2.0 m | |
| 10 | 292+406 | 290+397 | Box Culvert | 1x2.0x2.0 m | |
| 11 | 292+503 | 290+490 | Box Culvert | 1x6.0x3.0 m | Cushion 3.0m |
| 12 | 292+913 | 290+905 | Box Culvert | 1X5.0X3.0 m | |
| 13 | 293+664 | 291+661 | Box Culvert | 1x2.0x2.0 m | |
| 14 | 294+097 | 292+093 | Box Culvert | 1x2.0x2.0 m | |
| 15 | 294+194 | 292+191 | Box Culvert | 1x2.0x2.0 m | |
| 16 | 294+293 | 292+290 | Box Culvert | 1x2.0x2.0 m | |
| 17 | 294+392 | 292+389 | Box Culvert | 1x2.0x2.0 m | |
| 18 | 294+464 | 292+461 | Box Culvert | 1x3.0x3.0 m | |
| 19 | 294+594 | 292+590 | Box Culvert | 1x3.0x3.0 m | |
| 20 | 294+685 | 292+681 | Box Culvert | 1x2.0x2.0 m | |
| 21 | 294+797 | 292+794 | Box Culvert | 1x2.0x2.0 m | |
| 22 | 294+885 | 292+882 | Box Culvert | 1x2.0x2.0 m | |
| 23 | 294+960 | 292+957 | Box Culvert | 1x2.0x2.0 m | |
| 24 | 295+143 | 293+113 | Box Culvert | 1x2.0x2.0 m | |
| 25 | 295+342 | 293+312 | Box Culvert | 1x2.0x2.0 m | |
| 26 | 295+827 | 293+797 | Box Culvert | 1x2.0x2.0 m | |
| 27 | 296+123 | 294+113 | Box Culvert | 1X5.0X3.0 m | Cushion 3.0m |
| 28 | 296+399 | 294+389 | Box Culvert | 1x2.0x2.0 m | |
| 29 | 296+505 | 294+495 | Box Culvert | 1x2.0x2.0 m | |
| 30 | 296+696 | 294+686 | Box Culvert | 1x2.0x2.0 m | |
| 31 | 297+238 | 295+380 | Box Culvert | 1X4.0x5.0 m | |
| 32 | 297+470 | 295+612 | Box Culvert | 1x2.0x2.0 m | |

| S No | Chainage (Km) | | Type | Proposed Span (m) | Remark |
|---|---|---|---|---|---|
| | Existing | Design | | | |
| 33 | 298+166 | 296+418 | Box Culvert | 1x2.0x2.0 m | |

### 7.2.3 Widening of Existing Culverts:

All existing culverts which are not to be reconstructed shall be widened to the roadway width of the Project Highway as per the typical cross section given in Appendix B-1 to this Schedule-B. Repairs and strengthening of existing structures where required shall be carried out.

**(a) Retaining / widening of Pipe Culverts.**

| S No | Chainage (Km) | | Type | (Nos x dia in m ) | Remark |
|---|---|---|---|---|---|
| | Existing | Design | | | |
| 1 | 291+016 | 289+148 | Pipe | 1X1.0 m | Widened Both side |
| 2 | 292+753 | 290+744 | Pipe | 1X1.0 m | Widened Both side |
| 3 | 295+498 | 293+468 | Pipe | 1X1.0 m | Widened Both side |
| 4 | 296+250 | 294+240 | Pipe | 1X1.0 m | Widened Both side |

**(b) Retaining / widening of Slab Culverts**

| S No | Chainage (Km) | | Type | Span | Remark |
|---|---|---|---|---|---|
| | Existing | Design | | | |
| 1 | 299+313 | 297+475 | Slab | 1X1.4 m | Widened Both side |

7.2.4 Additional **New culverts** shall be constructed as per particulars given in the table below:

| S No | Design Chainage (Km) | Type | Proposed Span (m) | Remark |
|---|---|---|---|---|
| 1 | 287+283 | Box Culvert | 1x3.0x2.0 m | |
| 2 | 291+920 | Box Culvert | 1x2.0x2.0 m | |
| 3 | 294+840 | Box Culvert | 1x2.0x2.0 m | |
| 4 | 295+850 | Box Culvert | 1x2.0x2.0 m | |
| 5 | 296+760 | Box Culvert | 1x3.0x3.0 m | |
| 6 | 297+030 | Box Culvert | 1x3.0x3.0 m | |

One additional culvert shall also be provided at each 'T' or 'Y' shape junction and two additional pipe culvers at each cross roads as per site condition for drainage requirement.

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

| Sl. No. | Location | | Type | Size | Type of repair required |
|---|---|---|---|---|---|
| | Existing | Proposed | | | |
| Necessary repair and rehabilitation / strengthening works are to be carried out for all widening and retained culverts as per site condition and as directed by Authority's Engineer. | | | | | |

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

**7.3.** Bridges

**7.3.1 Existing bridges to be re-constructed**

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

**a) Major Bridges:**

| S.No. | Location | | Type of Existing structure | Span Arrangement | | Deck width |
|---|---|---|---|---|---|---|
| | Existing | Proposed | | Existing | Proposed | |
| NIL | | | | | | |

**b) Minor Bridges:**

| S. No. | Location | | Type of Existing structure | Span Arrangement | | Deck width |
|---|---|---|---|---|---|---|
| | Existing | Proposed | | Existing | Proposed | |
| NIL | | | | | | |

**(ii)The following bridges shall be retained / widened:**

**a) Major Bridges:**

| S. No | Chainage (km) | | Span Arrangement (m) | Outer Width (m) | Super Struc. Type | Remarks |
|---|---|---|---|---|---|---|
| | Design | Existing | | | | |
| NIL | | | | | | |

**b) Minor Bridges:**

| S. No | Chainage (km) | | Span Arrangement | Outer Width | Super Structure Type | Super Structure Type |
|---|---|---|---|---|---|---|
| | Design | Existing | (m) | (m) | | |
| 1 | 288+129 | 289+968 | 1 x 6.0 (Clear span) x 3 | 11.0+11.0 | Box Cell | Existing bridge dismantled new 4L bridge is proposed. |
| 2 | 291+277 | 293+279 | 1 x 14.8 | 11.0+11.0 | RCC T-Beam | Existing bridge dismantled new 4L bridge is proposed. |
| 3 | 295+148 | 297+007 | 1 x 26.0 | 11.0 | PSC T Beam with RCC Deck | Existing bridge retained as same, new 2L bridge is proposed. |
| 4 | 296+209 | 297+1067 | 1 x 11.8 | 11.0 | RCC T-Beam | Existing bridge retained as same, new 2L bridge is proposed. |
| 5 | 297+177 | 299+015 | 1 x 6.0 (Clear span) x 3 | 11.0 | Box Cell | Existing bridge retained as same, new 2L bridge is proposed. |

**Note:** Necessary repair and rehabilitation/ strengthening works are to be carried out for all widening and retained bridges as per site condition and as directed by the Authority's Engineer

### 7.3.2 Additional New bridges:

New bridges at the following locations on the Project Highway shall be constructed. The GADs of new bridges are attached in Volume II: Drawings folder.

| S. No. | Design Chainage (km) | Proposed Span (m) | Outer Width (m) | Type of Structure | Remarks |
|---|---|---|---|---|---|
| Nil | | | | | |

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

| S. No. | Location at km | Remarks |
|---|---|---|
| NIL | | |

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

| S.No. | Location | | Type of Existing structure | Span Arrangement | Remarks |
|---|---|---|---|---|---|
| | Existing | Proposed | | | |
| As per Note given under clause 7.3.1 | | | | | |

7.3.5 Drainage system for bridge decks

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

7.3.6 Structures in marine environment

| Sl. No. | Location at km | Remarks |
|---|---|---|
| NIL | | |

**7.4.** Rail-road bridges- NIL

7.4.1 Design, construction and detailing of ROB/RUB shall be as specified in section 7 of the Manual.

*7.4.2 Road over-bridges- NIL*

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

| S. No. | Chainage | Proposed Span | Type of Superstructure | Deck Width | 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:

| S.No. | Location of Level crossing | Proposed Span arrangement |
|---|---|---|
| NIL | | |

**7.5.** Grade separated structures

| S. No. | Design | Type of | Proposed | Deck width |
|---|---|---|---|---|

| | Chainage | Structure | Span (m) | (M) |
|---|---|---|---|---|
| NIL | | | | |

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

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

**A. Bridges**

| Sl. No. | Location of bridge (km) | Nature and extent of repairs/strengthening to be carried out |
|---|---|---|
| Repair of wearing course and partially damaged railing most of existing bridge location. Vegetation growth need to be removed from existing structure. | | |

**B. ROB / RUB**

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

**C.Overpasses/Underpasses and other structures**

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

**7.7.** W- Beam Metal Crash Barrier

The W beam crash Barriers are proposed where the embankment height is more than 3m height. The locations are as below:

| S. No. | Design Chainage (Km) | | TCS Type | Length (m) |
|---|---|---|---|---|
| | From | To | | |
| **Left Hand Side (LHS)** | | | | |
| 1 | 288+132 | 288+500 | TCS - 4 | 368 |
| 2 | 288+500 | 288+560 | TCS - 6 | 60 |
| 3 | 288+93 | 289+00 | TCS - 8 | 70 |

| | | | | |
|---|---|---|---|---|
| | 0 | 0 | | |
| 4 | 289+000 | 289+030 | TCS - 5 | 30 |
| 5 | 289+030 | 289+070 | TCS - 6 | 40 |
| 6 | 289+070 | 289+120 | TCS - 5 | 50 |
| 7 | 289+120 | 289+220 | TCS - 6 | 100 |

| S. No. | Design Chainage (Km) | | TCS Type | Length (m) |
|---|---|---|---|---|
| | From | To | | |
| 8 | 289+220 | 289+240 | TCS - 3 | 20 |
| 9 | 289+240 | 289+300 | TCS - 4 | 60 |
| 10 | 290+020 | 290+050 | TCS - 6 | 30 |
| 11 | 290+050 | 290+250 | TCS - 5 | 200 |
| 12 | 290+250 | 290+260 | TCS - 6 | 10 |
| 13 | 290+380 | 290+390 | TCS - 1 | 10 |
| 14 | 290+390 | 290+560 | TCS - 8 | 170 |
| 15 | 290+880 | 290+980 | TCS - 4 | 100 |
| 16 | 290+980 | 291+070 | TCS - 1 | 90 |
| 17 | 291+070 | 291+110 | TCS - 8 | 40 |
| 18 | 291+110 | 291+220 | TCS - 7 | 110 |
| 19 | 291+220 | 291+269 | TCS - 8 | 49 |
| 20 | 291+284 | 291+330 | TCS - 8 | 46 |
| 21 | 291+330 | 291+360 | TCS - 1 | 30 |
| 22 | 291+500 | 291+550 | TCS - 1 | 50 |
| 23 | 292+450 | 292+500 | TCS - 9 | 50 |
| 24 | 294+090 | 294+100 | TCS - 1 | 10 |
| 25 | 294+100 | 294+180 | TCS - 7 | 80 |
| 26 | 294+180 | 294+220 | TCS - 8 | 40 |
| 27 | 294+220 | 294+270 | TCS - 1 | 50 |
| 28 | 295+161 | 295+190 | TCS-9 to TCS-1 | 29 |
| 29 | 296+040 | 296+090 | TCS - 1 | 50 |
| 30 | 296+120 | 296+204 | TCS - 1 | 84 |
| 31 | 296+216 | 296+270 | TCS - 1 | 54 |
| 32 | 296+750 | 296+850 | TCS - 1 | 100 |
| **RIGHT HAND SIDE (RHS)** | | | | |
| 1 | 290+49 | 290+54 | TCS - 8 | 50 |

| | | | | |
|---|---|---|---|---|
| | 0 | 0 | | |
| 2 | 291+090 | 291+110 | TCS - 8 | 20 |
| 3 | 291+110 | 291+220 | TCS - 7 | 110 |
| 4 | 291+220 | 291+269 | TCS - 8 | 49 |
| 5 | 291+284 | 291+330 | TCS - 8 | 46 |
| 6 | 291+330 | 291+350 | TCS - 1 | 20 |
| 7 | 294+090 | 294+100 | TCS - 1 | 10 |
| 8 | 294+100 | 294+180 | TCS - 7 | 80 |
| 9 | 294+180 | 294+220 | TCS - 8 | 40 |
| 10 | 294+220 | 294+270 | TCS - 1 | 50 |
| 11 | 295+161 | 295+200 | TCS-9 to TCS-1 | 39 |
| 12 | 295+200 | 295+230 | TCS - 1 | 30 |

## **7.8.** Protection Work

The Stone Masonry Breast wall have been proposed on hill side section along the roadway edge where cutting is required or cutting is more than available ROW.

Retaining walls are proposed to restrict the earth along the filling section where normal side slope crosses the available ROW. The PCC toe walls are adopted upto the height of 2m and RCC retaining wall where the required height of wall at site is more than 2m.

The project section where the hill cut heights of side slope is more than 25m, Surficial protection and Erosion Control measures have been considered and details of Typical measures for soil and Rocky surface are presented in Appendix B-1 of this Schedule B.

Breast wall and Retaining wall shall be provided in accordance with section 13 of the Manual.

1. **Breast wall**

The Stone masonry Breast Wall shall be provided at the following locations**:**

| S No | Design Chainage (Km) | | TCS type | Breast Wall height above GL | | Length (m) | |
|---|---|---|---|---|---|---|---|
| | From | To | | LHS | RHS | LHS | RHS |
| 1 | 287+770 | 287+780 | 6 | | 1.5 | | 10 |
| 2 | 287+780 | 287+790 | 6 | | 1.5 | | 10 |
| 3 | 287+790 | 287+800 | 6 | | 1.5 | | 10 |
| 4 | 287+800 | 287+810 | 6 | | 1.5 | | 10 |
| 5 | 287+810 | 287+820 | 6 | | 1.5 | | 10 |
| 6 | 287+820 | 287+830 | 6 | | 3 | | 10 |
| 7 | 287+830 | 287+840 | 6 | | 3 | | 10 |
| 8 | 287+840 | 287+850 | 6 | | 3 | | 10 |
| 9 | 287+850 | 287+860 | 6 | | 3 | | 10 |
| 10 | 287+860 | 287+870 | 6 | | 3 | | 10 |
| 11 | 287+870 | 287+880 | 6 | | 3 | | 10 |
| 12 | 287+880 | 287+890 | 6 | | 3 | | 10 |
| 13 | 287+890 | 287+900 | 6 | | 3 | | 10 |
| 14 | 287+900 | 287+910 | 6 | | 3 | | 10 |
| 15 | 287+910 | 287+920 | 6 | | 3 | | 10 |
| 16 | 287+920 | 287+930 | 6 | | 3 | | 10 |
| 17 | 287+930 | 287+940 | 6 | | 3 | | 10 |
| 18 | 287+940 | 287+950 | 6 | 1.5 | 3 | 10 | 10 |
| 19 | 287+950 | 287+960 | 6 | 1.5 | 3 | 10 | 10 |
| 20 | 287+960 | 287+970 | 6 | 1.5 | 3 | 10 | 10 |
| 21 | 287+970 | 287+980 | 6 | 1.5 | 3 | 10 | 10 |
| 22 | 287+980 | 287+990 | 6 | 1.5 | 3 | 10 | 10 |
| 23 | 287+990 | 288+000 | 6 | 1.5 | 3 | 10 | 10 |
| 24 | 288+000 | 288+010 | 6 | 1.5 | 3 | 10 | 10 |
| 25 | 288+010 | 288+020 | 6 | 1.5 | 3 | 10 | 10 |

| S No | Design Chainage (Km) | | TCS type | Breast Wall height above GL | | Length (m) | |
|---|---|---|---|---|---|---|---|
| | From | To | | LHS | RHS | LHS | RHS |
| 26 | 288+020 | 288+030 | 6 | 1.5 | 3 | 10 | 10 |
| 27 | 288+030 | 288+040 | 6 | 1.5 | 3 | 10 | 10 |
| 28 | 288+040 | 288+050 | 6 | 1.5 | 3 | 10 | 10 |
| 29 | 288+050 | 288+060 | 6 | 1.5 | 3 | 10 | 10 |
| 30 | 288+060 | 288+070 | 6 | | 3 | | 10 |
| 31 | 288+070 | 288+080 | 6 | | 3 | | 10 |
| 32 | 288+080 | 288+090 | 6 | | 3 | | 10 |
| 33 | 288+090 | 288+100 | 6 | | 3 | | 10 |
| 34 | 288+100 | 288+110 | 6 | | 1.5 | | 10 |
| 35 | 288+110 | 288+120 | 6 | | 1.5 | | 10 |
| | | | | | | | |
| 36 | 288+150 | 288+160 | 4 | | 1.5 | | 10 |
| 37 | 288+160 | 288+170 | 4 | | 1.5 | | 10 |
| 38 | 288+170 | 288+180 | 4 | | 1.5 | | 10 |
| 39 | 288+180 | 288+190 | 4 | | 1.5 | | 10 |
| 40 | 288+190 | 288+200 | 4 | | 1.5 | | 10 |
| 41 | 288+200 | 288+210 | 4 | | 3 | | 10 |
| 42 | 288+210 | 288+220 | 4 | | 3 | | 10 |
| 43 | 288+220 | 288+230 | 4 | | 1.5 | | 10 |
| 44 | 288+230 | 288+240 | 4 | | 1.5 | | 10 |
| 45 | 288+240 | 288+250 | 4 | | 1.5 | | 10 |
| 46 | 288+250 | 288+260 | 4 | | 1.5 | | 10 |
| 47 | 288+260 | 288+270 | 4 | | 1.5 | | 10 |
| 48 | 288+270 | 288+280 | 4 | | 1.5 | | 10 |
| 49 | 288+280 | 288+290 | 4 | | 1.5 | | 10 |
| 50 | 288+290 | 288+300 | 4 | | 1.5 | | 10 |
| 51 | 288+300 | 288+310 | 4 | | 1.5 | | 10 |
| 52 | 288+310 | 288+320 | 4 | | 1.5 | | 10 |
| 53 | 288+320 | 288+330 | 4 | | 1.5 | | 10 |
| 54 | 288+330 | 288+340 | 4 | | 1.5 | | 10 |
| 55 | 288+340 | 288+350 | 4 | | 1.5 | | 10 |
| 56 | 288+350 | 288+360 | 4 | | 1.5 | | 10 |
| 57 | 288+360 | 288+370 | 4 | | 1.5 | | 10 |
| 58 | 288+370 | 288+380 | 4 | | 1.5 | | 10 |
| 59 | 288+380 | 288+390 | 4 | | 1.5 | | 10 |
| 60 | 288+390 | 288+400 | 4 | | 1.5 | | 10 |
| 61 | 288+400 | 288+410 | 4 | | 1.5 | | 10 |
| 62 | 288+410 | 288+420 | 4 | | 1.5 | | 10 |
| 63 | 288+420 | 288+430 | 4 | | 3 | | 10 |
| 64 | 288+430 | 288+440 | 4 | | 3 | | 10 |
| 65 | 288+440 | 288+450 | 4 | | 3 | | 10 |
| 66 | 288+450 | 288+460 | 4 | | 3 | | 10 |

| S No | Design Chainage (Km) | | TCS type | Breast Wall height above GL | | Length (m) | |
|---|---|---|---|---|---|---|---|
| | From | To | | LHS | RHS | LHS | RHS |
| 67 | 288+460 | 288+470 | 4 | | 3 | | 10 |
| 68 | 288+470 | 288+480 | 4 | | 3 | | 10 |
| 69 | 288+480 | 288+490 | 4 | | 3 | | 10 |
| 70 | 288+490 | 288+500 | 4 | | 3 | | 10 |
| 71 | 288+500 | 288+510 | 6 | | 3 | | 10 |
| 72 | 288+510 | 288+520 | 6 | | 3 | | 10 |
| 73 | 288+520 | 288+530 | 6 | | 3 | | 10 |
| 74 | 288+530 | 288+540 | 6 | | 3 | | 10 |
| 75 | 288+540 | 288+550 | 6 | | 3 | | 10 |
| 76 | 288+550 | 288+560 | 6 | | 3 | | 10 |
| 77 | 288+560 | 288+570 | 6 | | 3 | | 10 |
| 78 | 288+570 | 288+580 | 6 | | 3 | | 10 |
| 79 | 288+580 | 288+590 | 6 | | 3 | | 10 |
| 80 | 288+590 | 288+600 | 6 | | 3 | | 10 |
| 81 | 288+600 | 288+610 | 6 | | 3 | | 10 |
| 82 | 288+610 | 288+620 | 6 | | 3 | | 10 |
| 83 | 288+620 | 288+630 | 6 | | 3 | | 10 |
| 84 | 288+630 | 288+640 | 6 | | 3 | | 10 |
| 85 | 288+640 | 288+650 | 6 | | 3 | | 10 |
| 86 | 288+650 | 288+660 | 6 | | 3 | | 10 |
| 87 | 288+660 | 288+670 | 6 | | 3 | | 10 |
| 88 | 288+670 | 288+680 | 6 | | 3 | | 10 |
| 89 | 288+680 | 288+690 | 6 | | 3 | | 10 |
| 90 | 288+690 | 288+700 | 6 | | 3 | | 10 |
| 91 | 288+700 | 288+710 | 6 | | 3 | | 10 |
| 92 | 288+710 | 288+720 | 6 | | 3 | | 10 |
| 93 | 288+720 | 288+730 | 6 | | 3 | | 10 |
| 94 | 288+730 | 288+740 | 6 | 1.5 | 3 | 10 | 10 |
| 95 | 288+740 | 288+750 | 6 | 1.5 | 3 | 10 | 10 |
| 96 | 288+750 | 288+760 | 6 | 1.5 | 3 | 10 | 10 |
| 97 | 288+760 | 288+770 | 6 | 1.5 | 3 | 10 | 10 |
| 98 | 288+770 | 288+780 | 6 | 1.5 | 3 | 10 | 10 |
| 99 | 288+780 | 288+790 | 6 | 1.5 | 3 | 10 | 10 |
| 100 | 288+790 | 288+800 | 6 | 3 | 3 | 10 | 10 |
| 101 | 288+800 | 288+810 | 6 | 1.5 | 3 | 10 | 10 |
| 102 | 288+810 | 288+820 | 6 | 1.5 | 3 | 10 | 10 |
| 103 | 288+820 | 288+830 | 6 | 1.5 | 3 | 10 | 10 |
| 104 | 288+830 | 288+840 | 6 | 1.5 | 3 | 10 | 10 |
| 105 | 288+840 | 288+850 | 6 | 1.5 | 3 | 10 | 10 |
| 106 | 288+850 | 288+860 | 6 | | 3 | | 10 |
| 107 | 288+860 | 288+870 | 6 | | 3 | | 10 |
| 108 | 288+870 | 288+880 | 6 | | 3 | | 10 |

| S No | Design Chainage (Km) | | TCS type | Breast Wall height above GL | | Length (m) | |
|---|---|---|---|---|---|---|---|
| | From | To | | LHS | RHS | LHS | RHS |
| | | | | | | | |
| 109 | 289+120 | 289+130 | 6 | | 3 | | 10 |
| 110 | 289+130 | 289+140 | 6 | | 3 | | 10 |
| 111 | 289+140 | 289+150 | 6 | | 3 | | 10 |
| 112 | 289+150 | 289+160 | 6 | | 3 | | 10 |
| 113 | 289+160 | 289+170 | 6 | | 3 | | 10 |
| 114 | 289+170 | 289+180 | 6 | | 1.5 | | 10 |
| 115 | 289+180 | 289+190 | 6 | | 1.5 | | 10 |
| 116 | 289+190 | 289+200 | 6 | | 1.5 | | 10 |
| 117 | 289+200 | 289+210 | 6 | | 1.5 | | 10 |
| 118 | 289+210 | 289+220 | 6 | | 1.5 | | 10 |
| | | | | | | | |
| 119 | 289+370 | 289+380 | 6 | | 1.5 | | 10 |
| 120 | 289+380 | 289+390 | 6 | | 1.5 | | 10 |
| 121 | 289+390 | 289+400 | 6 | | 1.5 | | 10 |
| 122 | 289+400 | 289+410 | 6 | | 1.5 | | 10 |
| 123 | 289+410 | 289+420 | 6 | | 1.5 | | 10 |
| 124 | 289+420 | 289+430 | 6 | | 1.5 | | 10 |
| 125 | 289+430 | 289+440 | 6 | | 1.5 | | 10 |
| 126 | 289+440 | 289+450 | 6 | | 1.5 | | 10 |
| 127 | 289+450 | 289+460 | 6 | | 1.5 | | 10 |
| 128 | 289+460 | 289+470 | 6 | | 1.5 | | 10 |
| 129 | 289+470 | 289+480 | 6 | | 1.5 | | 10 |
| 130 | 289+480 | 289+490 | 6 | | 1.5 | | 10 |
| 131 | 289+490 | 289+500 | 6 | | 3 | | 10 |
| 132 | 289+500 | 289+510 | 6 | | 3 | | 10 |
| 133 | 289+510 | 289+520 | 6 | | 3 | | 10 |
| 134 | 289+520 | 289+530 | 6 | | 3 | | 10 |
| 135 | 289+530 | 289+540 | 6 | | 3 | | 10 |
| 136 | 289+540 | 289+550 | 6 | | 3 | | 10 |
| 137 | 289+550 | 289+560 | 6 | | 3 | | 10 |
| 138 | 289+560 | 289+570 | 6 | | 3 | | 10 |
| 139 | 289+570 | 289+580 | 6 | 1.5 | 3 | 10 | 10 |
| 140 | 289+580 | 289+590 | 2 | 1.5 | 3 | 10 | 10 |
| 141 | 289+590 | 289+600 | 2 | 1.5 | 3 | 10 | 10 |
| 142 | 289+600 | 289+610 | 2 | 1.5 | 3 | 10 | 10 |
| 143 | 289+610 | 289+620 | 2 | 3 | 3 | 10 | 10 |
| 144 | 289+620 | 289+630 | 2 | 3 | 3 | 10 | 10 |
| 145 | 289+630 | 289+640 | 2 | 3 | 3 | 10 | 10 |
| 146 | 289+640 | 289+650 | 2 | 3 | 3 | 10 | 10 |
| 147 | 289+650 | 289+660 | 2 | 3 | 3 | 10 | 10 |
| 148 | 289+660 | 289+670 | 2 | 3 | 3 | 10 | 10 |

| S No | Design Chainage (Km) | | TCS type | Breast Wall height above GL | | Length (m) | |
|---|---|---|---|---|---|---|---|
| | From | To | | LHS | RHS | LHS | RHS |
| 149 | 289+670 | 289+680 | 2 | 3 | 3 | 10 | 10 |
| 150 | 289+680 | 289+690 | 2 | 3 | 3 | 10 | 10 |
| 151 | 289+690 | 289+700 | 2 | 3 | 3 | 10 | 10 |
| 152 | 289+700 | 289+710 | 2 | 3 | 3 | 10 | 10 |
| 153 | 289+710 | 289+720 | 2 | 3 | 3 | 10 | 10 |
| 154 | 289+720 | 289+730 | 2 | 3 | 3 | 10 | 10 |
| 155 | 289+730 | 289+740 | 2 | 3 | 3 | 10 | 10 |
| 156 | 289+740 | 289+750 | 2 | 3 | 3 | 10 | 10 |
| 157 | 289+750 | 289+760 | 2 | 1.5 | 3 | 10 | 10 |
| 158 | 289+760 | 289+770 | 2 | 1.5 | 3 | 10 | 10 |
| 159 | 289+770 | 289+780 | 6 | 1.5 | 3 | 10 | 10 |
| 160 | 289+780 | 289+790 | 6 | 1.5 | 3 | 10 | 10 |
| 161 | 289+790 | 289+800 | 6 | | 3 | | 10 |
| 162 | 289+800 | 289+810 | 6 | | 3 | | 10 |
| 163 | 289+810 | 289+820 | 6 | | 3 | | 10 |
| 164 | 289+820 | 289+830 | 6 | | 3 | | 10 |
| 165 | 289+830 | 289+840 | 6 | | 1.5 | | 10 |
| 166 | 289+840 | 289+850 | 6 | | 1.5 | | 10 |
| 167 | 289+850 | 289+860 | 6 | | 1.5 | | 10 |
| 168 | 289+860 | 289+870 | 6 | | 1.5 | | 10 |
| | | | | | | | |
| 169 | 290+000 | 290+010 | 6 | | 1.5 | | 10 |
| 170 | 290+010 | 290+020 | 6 | | 1.5 | | 10 |
| 171 | 290+020 | 290+030 | 6 | | 3 | | 10 |
| 172 | 290+030 | 290+040 | 6 | | 3 | | 10 |
| 173 | 290+040 | 290+050 | 6 | | 3 | | 10 |
| 174 | 290+050 | 290+060 | 5 | | 3 | | 10 |
| 175 | 290+060 | 290+070 | 5 | | 3 | | 10 |
| 176 | 290+070 | 290+080 | 5 | | 3 | | 10 |
| 177 | 290+080 | 290+090 | 5 | | 3 | | 10 |
| 178 | 290+090 | 290+100 | 5 | | 3 | | 10 |
| 179 | 290+100 | 290+110 | 5 | | 3 | | 10 |
| 180 | 290+110 | 290+120 | 5 | | 3 | | 10 |
| 181 | 290+120 | 290+130 | 5 | | 3 | | 10 |
| 182 | 290+130 | 290+140 | 5 | | 3 | | 10 |
| 183 | 290+140 | 290+150 | 5 | | 3 | | 10 |
| 184 | 290+150 | 290+160 | 5 | | 3 | | 10 |
| 185 | 290+160 | 290+170 | 5 | | 3 | | 10 |
| 186 | 290+170 | 290+180 | 5 | | 3 | | 10 |
| 187 | 290+180 | 290+190 | 5 | | 3 | | 10 |
| 188 | 290+190 | 290+200 | 5 | | 3 | | 10 |
| 189 | 290+200 | 290+210 | 5 | | 3 | | 10 |

| S No | Design Chainage (Km) | | TCS type | Breast Wall height above GL | | Length (m) | |
|---|---|---|---|---|---|---|---|
| | From | To | | LHS | RHS | LHS | RHS |
| 190 | 290+210 | 290+220 | 5 | | 3 | | 10 |
| 191 | 290+220 | 290+230 | 5 | | 3 | | 10 |
| 192 | 290+230 | 290+240 | 5 | | 3 | | 10 |
| 193 | 290+240 | 290+250 | 5 | | 3 | | 10 |
| 194 | 290+250 | 290+260 | 6 | | 3 | | 10 |
| 195 | 290+260 | 290+270 | 6 | | 3 | | 10 |
| 196 | 290+270 | 290+280 | 6 | | 3 | | 10 |
| 197 | 290+280 | 290+290 | 6 | | 3 | | 10 |
| 198 | 290+290 | 290+300 | 6 | | 3 | | 10 |
| 199 | 290+300 | 290+310 | 6 | | 3 | | 10 |
| 200 | 290+310 | 290+320 | 6 | | 3 | | 10 |
| 201 | 290+320 | 290+330 | 6 | | 1.5 | | 10 |
| | | | | | | | |
| 202 | 290+560 | 290+570 | 6 | | 1.5 | | 10 |
| 203 | 290+570 | 290+580 | 6 | | 3 | | 10 |
| 204 | 290+580 | 290+590 | 6 | | 3 | | 10 |
| 205 | 290+590 | 290+600 | 6 | | 1.5 | | 10 |
| 206 | 290+600 | 290+610 | 6 | | 1.5 | | 10 |
| 207 | 290+610 | 290+620 | 6 | | 1.5 | | 10 |
| 208 | 290+620 | 290+630 | 6 | | 1.5 | | 10 |
| 209 | 290+630 | 290+640 | 6 | | 1.5 | | 10 |
| 210 | 290+640 | 290+650 | 6 | | 1.5 | | 10 |
| 211 | 290+650 | 290+660 | 6 | | | | |
| 212 | 290+660 | 290+670 | 6 | | 1.5 | | 10 |
| 213 | 290+670 | 290+680 | 6 | | 1.5 | | 10 |
| 214 | 290+680 | 290+690 | 6 | | 1.5 | | 10 |
| 215 | 290+690 | 290+700 | 6 | | 1.5 | | 10 |

**2. Toe/Retaining wall:**

Retaining walls shall be designed considering appropriate height as per site condition. The PCC walls have been adopted upto the height of 2m only and RCC retaining walls for height more than 2 m. The proposal shall be got approved from the Authority Engineer. The minimum length and height details of Toe Wall are as below:

Details of Toe Walls:

| S No | Design Chainage (Km) | | TCS Type | Toe wall height above GL (m) | | Length (m) | |
|---|---|---|---|---|---|---|---|
| | From | To | | LHS | RHS | LHS | RHS |
| 1 | 287000 | 287010 | 8 | 0.832 | | 10 | |
| 2 | 287010 | 287020 | 8 | 0.485 | | 10 | |

| S No | Design Chainage (Km) | | TCS Type | Toe wall height above GL (m) | | Length (m) | |
|---|---|---|---|---|---|---|---|
| | From | To | | LHS | RHS | LHS | RHS |
| 3 | 287020 | 287030 | 8 | 0.240 | | 10 | |
| | | | | | | | |
| 4 | 288190 | 288200 | 4 | 1.606 | | 10 | |
| | | | | | | | |
| 5 | 288200 | 288210 | 4 | 1.238 | | 10 | |
| 6 | 288210 | 288220 | 4 | 0.986 | | 10 | |
| 7 | 288220 | 288230 | 4 | 0.850 | | 10 | |
| 8 | 288230 | 288240 | 4 | 0.686 | | 10 | |
| 9 | 288240 | 288250 | 4 | 0.503 | | 10 | |
| 10 | 288250 | 288260 | 4 | 0.545 | | 10 | |
| 11 | 288260 | 288270 | 4 | 0.537 | | 10 | |
| 12 | 288270 | 288280 | 4 | 0.490 | | 10 | |
| 13 | 288280 | 288290 | 4 | 0.571 | | 10 | |
| 14 | 288290 | 288300 | 4 | 0.657 | | 10 | |
| 15 | 288300 | 288310 | 4 | 0.725 | | 10 | |
| 16 | 288310 | 288320 | 4 | 0.955 | | 10 | |
| 17 | 288320 | 288330 | 4 | 1.022 | | 10 | |
| 18 | 288330 | 288340 | 4 | 0.779 | | 10 | |
| 19 | 288340 | 288350 | 4 | 0.783 | | 10 | |
| 20 | 288350 | 288360 | 4 | 0.845 | | 10 | |
| 21 | 288360 | 288370 | 4 | 1.042 | | 10 | |
| 22 | 288370 | 288380 | 4 | 1.224 | | 10 | |
| 23 | 288380 | 288390 | 4 | 1.089 | | 10 | |
| 24 | 288390 | 288400 | 4 | 0.721 | | 10 | |
| 25 | 288400 | 288410 | 4 | 0.379 | | 10 | |
| 26 | 288410 | 288420 | 4 | 0.038 | | 10 | |
| 27 | 288420 | 288430 | 4 | 0.100 | | 10 | |
| 28 | 288430 | 288440 | 4 | 0.100 | | 10 | |
| 29 | 288440 | 288450 | 4 | 0.339 | | 10 | |
| 30 | 288450 | 288460 | 4 | 1.480 | | 10 | |
| 31 | 288460 | 288470 | 4 | 1.143 | | 10 | |
| 32 | 288470 | 288480 | 4 | 0.763 | | 10 | |
| 33 | 288480 | 288490 | 4 | 0.409 | | 10 | |
| 34 | 288490 | 288500 | 4 | 0.369 | | 10 | |
| | | | | | | | |
| 35 | 288930 | 288940 | 8 | 0.317 | | 10 | |
| 36 | 288940 | 288950 | 8 | 1.237 | | 10 | |
| 37 | 288950 | 288960 | 8 | 1.084 | | 10 | |
| 38 | 288960 | 288970 | 8 | 0.955 | | 10 | |
| 39 | 288970 | 288980 | 8 | 0.901 | | 10 | |
| 40 | 288980 | 288990 | 8 | 0.922 | | 10 | |
| 41 | 288990 | 289000 | 8 | 0.834 | | 10 | |
| 42 | 289000 | 289010 | 5 | 0.485 | | 10 | |

| S No | Design Chainage (Km) | | TCS Type | Toe wall height above GL (m) | | Length (m) | |
|---|---|---|---|---|---|---|---|
| | From | To | | LHS | RHS | LHS | RHS |
| 43 | 289010 | 289020 | 5 | 0.277 | | 10 | |
| 44 | 289020 | 289030 | 5 | 0.146 | | 10 | |
| | | | | | | | |
| 45 | 289070 | 289080 | 5 | 0.231 | | 10 | |
| 46 | 289080 | 289090 | 5 | 0.465 | | 10 | |
| 47 | 289090 | 289100 | 5 | 0.708 | | 10 | |
| 48 | 289100 | 289110 | 5 | 0.636 | | 10 | |
| 49 | 289110 | 289120 | 5 | 0.250 | | 10 | |
| | | | | | | | |
| 50 | 289240 | 289250 | 4 | 0.619 | | 10 | |
| 51 | 289250 | 289260 | 4 | 0.915 | | 10 | |
| 52 | 289260 | 289270 | 4 | 1.211 | | 10 | |
| 53 | 289270 | 289280 | 4 | 1.265 | | 10 | |
| 54 | 289280 | 289290 | 4 | 0.930 | | 10 | |
| 55 | 289290 | 289300 | 4 | 0.673 | | 10 | |
| | | | | | | | |
| 56 | 290050 | 290060 | 5 | 0.418 | | 10 | |
| 57 | 290060 | 290070 | 5 | 0.243 | | 10 | |
| 58 | 290070 | 290080 | 5 | 0.078 | | 10 | |
| 59 | 290080 | 290090 | 5 | 0.178 | | 10 | |
| 60 | 290090 | 290100 | 5 | 0.357 | | 10 | |
| 61 | 290100 | 290110 | 5 | 0.457 | | 10 | |
| 62 | 290110 | 290120 | 5 | 0.258 | | 10 | |
| 63 | 290120 | 290130 | 5 | 0.298 | | 10 | |
| 64 | 290130 | 290140 | 5 | 0.547 | | 10 | |
| 65 | 290140 | 290150 | 5 | 0.613 | | 10 | |
| 66 | 290150 | 290160 | 5 | 0.851 | | 10 | |
| 67 | 290160 | 290170 | 5 | 1.061 | | 10 | |
| 68 | 290170 | 290180 | 5 | 1.548 | | 10 | |
| 69 | 290180 | 290190 | 5 | 1.743 | | 10 | |
| 70 | 290190 | 290200 | 5 | 1.653 | | 10 | |
| 71 | 290200 | 290210 | 5 | 1.625 | | 10 | |
| 72 | 290210 | 290220 | 5 | 1.535 | | 10 | |
| 73 | 290220 | 290230 | 5 | 1.428 | | 10 | |
| 74 | 290230 | 290240 | 5 | 1.057 | | 10 | |
| 75 | 290240 | 290250 | 5 | 0.588 | | 10 | |
| | | | | | | | |
| 76 | 290390 | 290400 | 8 | 0.441 | | 10 | |
| 77 | 290400 | 290410 | 8 | 1.352 | | 10 | |
| | | | | | | | |
| 78 | 290550 | 290560 | 8 | 0.868 | | 10 | |
| | | | | | | | |
| 79 | 290880 | 290890 | 4 | 1.458 | | 10 | |

| S No | Design Chainage (Km) | | TCS Type | Toe wall height above GL (m) | | Length (m) | |
|---|---|---|---|---|---|---|---|
| | From | To | | LHS | RHS | LHS | RHS |
| | | | | | | | |
| 80 | 290960 | 290970 | 4 | 1.518 | | 10 | |
| 81 | 290970 | 290980 | 4 | 0.804 | | 10 | |
| | | | | | | | |
| 82 | 291070 | 291080 | 8 | 0.187 | | 10 | |
| 83 | 291080 | 291090 | 8 | 0.198 | | 10 | |
| 84 | 291090 | 291100 | 8 | 1.353 | | 10 | |
| | | | | | | | |
| 85 | 291110 | 291120 | 7 | | 0.660 | | 10 |
| 86 | 291120 | 291130 | 7 | | 1.338 | | 10 |
| 87 | 291130 | 291140 | 7 | 1.882 | 2.018 | 10 | 10 |
| 88 | 291140 | 291150 | 7 | 1.726 | 2.205 | 10 | 10 |
| 89 | 291150 | 291160 | 7 | 1.533 | 1.901 | 10 | 10 |
| | | | | | | | |
| 90 | 291160 | 291170 | 7 | 1.340 | 1.260 | 10 | 10 |
| 91 | 291170 | 291180 | 7 | 0.851 | 1.358 | 10 | 10 |
| 92 | 291180 | 291190 | 7 | 1.313 | 1.683 | 10 | 10 |
| 94 | 291190 | 291200 | 7 | 1.606 | 1.601 | 10 | 10 |
| 95 | 291200 | 291210 | 7 | 1.898 | 0.293 | 10 | 10 |
| 97 | 291210 | 291220 | 7 | 1.470 | 0.061 | 10 | 10 |
| 98 | 291220 | 291230 | 8 | 1.760 | | 10 | |
| 99 | 291230 | 291240 | 8 | 1.854 | | 10 | |
| | | | | | | | |
| 100 | 291260 | 291269 | 8 | 0.228 | | 9 | |
| | | | | | | | |
| 101 | 291284 | 291290 | 8 | | 1.973 | | 6 |
| 102 | 291290 | 291300 | 8 | 0.235 | | 10 | |
| 103 | 291300 | 291310 | 8 | 1.020 | 1.817 | 10 | 10 |
| 104 | 291310 | 291320 | 8 | 2.262 | 0.795 | 10 | 10 |
| 105 | 291320 | 291330 | 8 | 0.543 | | 10 | |
| | | | | | | | |
| 106 | 294100 | 294110 | 7 | 0.714 | 0.726 | 10 | 10 |
| 107 | 294110 | 294120 | 7 | | 1.950 | | 10 |
| 108 | 294120 | 294130 | 7 | | 1.473 | | 10 |
| 109 | 294130 | 294140 | 7 | | 1.011 | | 10 |
| 110 | 294140 | 294150 | 7 | | 0.578 | | 10 |
| 111 | 294150 | 294160 | 7 | | 0.508 | | 10 |
| 112 | 294160 | 294170 | 7 | 1.929 | 0.390 | 10 | 10 |
| 113 | 294170 | 294180 | 7 | 1.584 | 0.200 | 10 | 10 |
| 114 | 294180 | 294190 | 8 | 1.342 | | 10 | |
| 115 | 294190 | 294200 | 8 | 1.226 | | 10 | |
| 116 | 294200 | 294210 | 8 | 0.949 | | 10 | |
| 117 | 294210 | 294220 | 8 | 0.566 | | 10 | |

| S No | Design Chainage (Km) | | TCS Type | Toe wall height above GL (m) | | Length (m) | |
|---|---|---|---|---|---|---|---|
| | From | To | | LHS | RHS | LHS | RHS |
| | | | | | | | |
| 118 | 295161 | 295170 | 9 to 1 | 1.024 | | 9 | |
| 119 | 295170 | 295180 | 9 to 1 | 0.387 | | 10 | |

Details of Retaining Walls:

| S No | Design Chainage (Km) | | TCS type | Retaining Wall height above GL | | Length (m) | |
|---|---|---|---|---|---|---|---|
| | From | To | | LHS | RHS | LHS | RHS |
| 1 | 288120 | 288130 | 4 | 4.012 | | 10 | |
| 2 | 288130 | 288140 | 4 | 4.021 | | 10 | |
| 3 | 288140 | 288150 | 4 | 4.082 | | 10 | |
| 4 | 288150 | 288160 | 4 | 3.672 | | 10 | |
| 5 | 288160 | 288170 | 4 | 3.075 | | 10 | |
| 6 | 288170 | 288180 | 4 | 2.532 | | 10 | |
| 7 | 288180 | 288190 | 4 | 2.041 | | 10 | |
| | | | | | | | |
| 16 | 290410 | 290420 | 8 | 2.075 | | 10 | |
| 17 | 290420 | 290430 | 8 | 3.170 | | 10 | |
| 18 | 290430 | 290440 | 8 | 4.027 | | 10 | |
| 19 | 290440 | 290450 | 8 | 4.388 | | 10 | |
| 20 | 290450 | 290460 | 8 | 4.552 | | 10 | |
| 21 | 290460 | 290470 | 8 | 4.157 | | 10 | |
| 22 | 290470 | 290480 | 8 | 4.150 | | 10 | |
| 23 | 290480 | 290490 | 8 | 4.304 | | 10 | |
| 24 | 290490 | 290500 | 8 | 4.283 | | 10 | |
| 25 | 290500 | 290510 | 8 | 4.059 | | 10 | |
| 26 | 290510 | 290520 | 8 | 3.957 | | 10 | |
| 27 | 290520 | 290530 | 8 | 2.837 | | 10 | |
| 28 | 290530 | 290540 | 8 | 2.985 | | 10 | |
| 29 | 290540 | 290550 | 8 | 3.546 | | 10 | |
| | | | | | | | |
| 32 | 290890 | 290900 | 4 | 3.289 | | 10 | |
| 33 | 290900 | 290910 | 4 | 4.690 | | 10 | |
| 34 | 290910 | 290920 | 4 | 5.346 | | 10 | |
| 35 | 290920 | 290930 | 4 | 4.987 | | 10 | |
| 36 | 290930 | 290940 | 4 | 4.371 | | 10 | |
| 37 | 290940 | 290950 | 4 | 2.817 | | 10 | |
| 38 | 290950 | 290960 | 4 | 2.282 | | 10 | |
| | | | | | | | |
| 41 | 291100 | 291110 | 8 | 2.089 | | 10 | |
| 42 | 291110 | 291120 | 7 | 2.265 | | 10 | |
| 43 | 291120 | 291130 | 7 | 2.014 | | 10 | |
| | | | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 52 | 291240 | 291250 | 8 | 2.050 | | 10 | |
| 53 | 291250 | 291260 | 8 | 2.118 | | 10 | |
| | | | | | | | |
| 56 | 291290 | 291300 | 8 | | 2.345 | | 10 |
| | | | | | | | |
| 60 | 294110 | 294120 | 7 | 2.630 | | 10 | |
| 61 | 294120 | 294130 | 7 | 3.314 | | 10 | |
| 62 | 294130 | 294140 | 7 | 2.999 | | 10 | |
| 63 | 294140 | 294150 | 7 | 2.264 | | 10 | |
| 64 | 294150 | 294160 | 7 | 2.114 | | 10 | |

**4. Stone Pitching**

The Stone pitching has been adopted to protect the erosion of embankment side slope where the river stream are very close and may damage the side slope. The minimum locations on the project highway are as below:

| S. No. | Design Chainage (Km) | | Length (m) | Avg. height (m) | Side |
|---|---|---|---|---|---|
| | From | To | | | |
| 1 | 288+132 | 288+500 | 368 | 3.50 | LHS |
| 2 | 289+220 | 289+240 | 20 | 3.00 | LHS |
| 3 | 289+240 | 289+300 | 60 | 3.50 | LHS |
| 4 | 290+880 | 290+980 | 100 | 1.50 | LHS |

**(b) Surficial Protection and Erosion Control Measures (Cut Height of Side Slope >25m)**

The Hill side surficial protection and erosion control measures is proposed at locations where the cut height of side slope is more than 25m.

The minimum details of locations with length and average height are as below and may be finalized in consultation with the Authority Engineer.

| S No | Design Chainage (m) | | Length (m) | Average Height (m) |
|---|---|---|---|---|
| | From | To | | |
| Nil | | | | |

Hill side Typical Surficial Protection and Erosion Control Measures for cut height of side slope more than 25m are presented in Appendix-1 of this Schedule B and described below:

**(a) Hill side Toe Gabion wall for Isolated Soil Strata-** Mechanically woven Zn+10%Al with PVC coated steel wire mesh gabion toe wall with minimum height of wall 3.0 m shall be constructed for the locations wherever soil strata is encountered after cutting at the toe of hill side slope. Gabion toe wall shall be constructed along with non-woven geotextile behind the gabion for filtration & separation and road edge drain.

**(b) Surficial Protection for Rocky Strata -**Continuously threaded anchors shall be installed wherever rocky strata are encountered on the slope. Surficial protection with secured drapery system shall be done for full length and height of cut slope surface developed by cutting the rock with slope angle of 80 degree with horizontal after excavation, wherever rocky strata is encountered. Surface protection for rocky strata shall be done by high resistance double twisted hexagonal Zn+5%Al coated wire mesh with top, bottom and surface continuously threaded anchors. Top, bottom and surface anchors shall have minimum length and minimum diameter as 3.0 m and 25 mm respectively. Top and bottom anchors shall be provided at a maximum spacing of 1.5 m and 3.0 m c/c in longitudinal direction respectively. Surface anchors shall be provided with maximum spacing of 3 m c/c in longitudinal and vertical directions for total area. All rock anchors shall be fully grouted. Minimum yield strength of anchorages shall be 500 MPa.

**(c) Erosion Control Measures for Soil Surface** - Self drilling anchors shall be installed wherever collapsible strata is encountered on the slope. Erosion control measures shall be adopted for cut slope wherever soil strata is encountered at the surface and slope angle shall be limited to 45 degrees or flatter with horizontal after the excavation upto proposed right of way. Three dimensional reinforced synthetic geomat shall be used for erosion control measures along with hydraulically applied erosion control measures. Self Drilling Anchors shall be used for supporting geomat along with u-pins. Minimum length and outer diameter of self drilling anchors shall be 1 m and 32 mm respectively. Self drilling anchors shall be provided with maximum spacing of 3 m c/c in longitudinal and vertical directions.

**(d) Drainage Measures for Cut Slopes** - Drainage measures for internal seepage in the cut slope shall be adopted by installing PVC pipes inside the slope. PVC pipes for internal seepage shall be half perforated and lined with geotextile. PVC pipes shall be installed for minimum 4 m length at spacing of 4 m c/c in longitudinal direction in minimum 4 layers at the bottom of the cut slope. Top drain shall also be constructed at the toe wherever soil strata is encountered after rocky strata. In addition to the above mentioned drainage measures, suitable surface drainage measures shall be adopted as per the site condition.

## 8. Traffic Control Devices and Road Safety Works

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

## 8.1. Traffic signs, Pavement marking and Safety barriers

### a) Traffic Signs:

Traffic signs include roadside signs, overhead signs and curb mounted signs along the entire Project Highway as per section 9 of Manual.

### b) Pavement marking:

Pavement markings shall cover road marking for the entire Project Highway as per section 9 of Manual

**c) Safety Barrier:**

Provide W-beam crash barrier, and parapet walls along the project highway as suggested in the section 9 of Manual.

**8.2.** Specifications of the Reflective Sheeting

The prismatic Reflective sheeting shall be provided in accordance with the para 9.2.3 of the Manual.

**9.** Roadside Furniture

**a.** Roadside furniture shall be provided in accordance with the provisions of Section 9and 12 of the Manual and as given in Schedule-C.

**b.** Overhead traffic signs: location and size

Overhead traffic signs are provided as per site requirement according to paragraph 9.2.5 of the Manual and as given in Schedule-C.
Major Road Junctions

a) Delineators: Delineators for the entire Project Highway

**10.** Compulsory

Afforestation NIL

**11.** Hazardous Locations

The hazardous locations those require safety barriers are the locations such as Road Side obstacles, Sharp Curves, Bridge approaches and any other locations identified in consultation with Authority Engineer during the execution of project highway.

(a) The safety barriers shall be provided on both side of curves with radius upto 450m as per clause 9.7.1 of Manual at the following hazardous locations on:

| S No | **CHAINAGE** | | **Length** | Remark (Curve Radius) |
|---|---|---|---|---|
| | **Start** | **End** | | |
| **Inner edge on Median** | | | | |
| 1 | 287+021 | 287+377 | 357 | -360 |
| 2 | 287+384 | 287+760 | 376 | 360 |
| 3 | 287+991 | 288+293 | 302 | -360 |
| 4 | 288+333 | 288+782 | 450 | 360 |
| 5 | 288+827 | 289+092 | 265 | -360 |
| 6 | 289+521 | 289+879 | 357 | 360 |
| 7 | 289+945 | 290+220 | 275 | -360 |

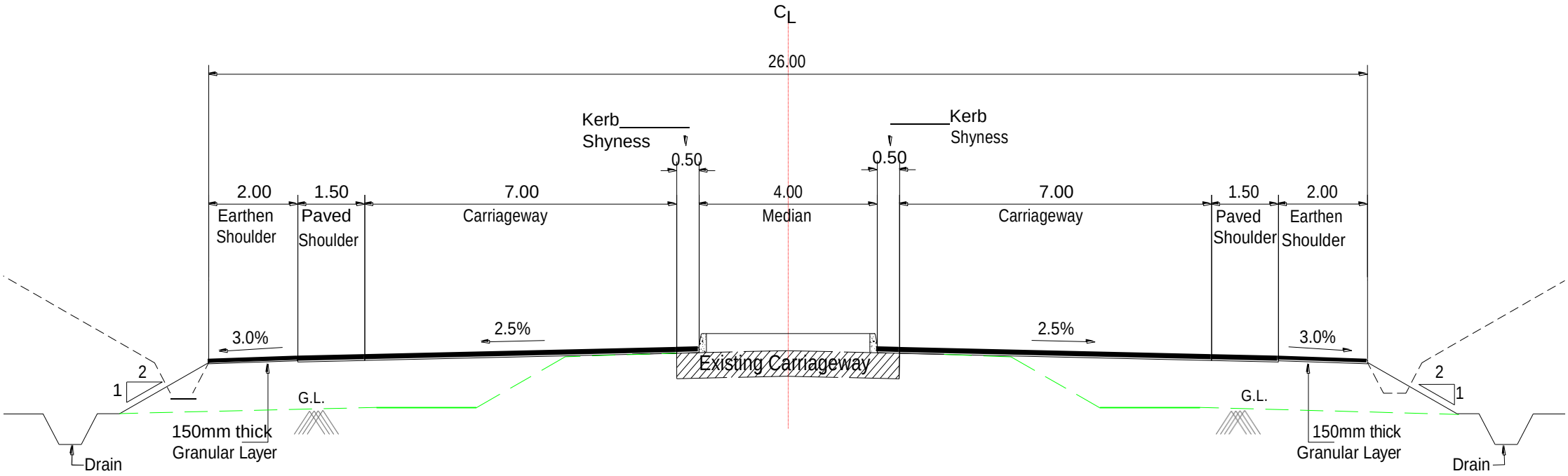
| Outer Edge left Side | | | | Outer Edge right Side | | | |
|---|---|---|---|---|---|---|---|
| S No | CHAINAGE | | Length | S No | CHAINAGE | | Length |
| | Start | End | | | Start | End | |
| 1 | 287+384 | 287+760 | 376 | 1 | 287+021 | 287+377 | 357 |
| 2 | 288+560 | 288+782 | 222 | 2 | 287+991 | 288+293 | 302 |
| 3 | 289+521 | 289+879 | 357 | 3 | 288+827 | 289+092 | 265 |
| | | | | 4 | 289+945 | 290+220 | 275 |

## 12. Special Requirement for Hill Roads

In accordance with the Section 13 of the Manual and recommended practices for treatment of Embankment and road side slope erosion control.

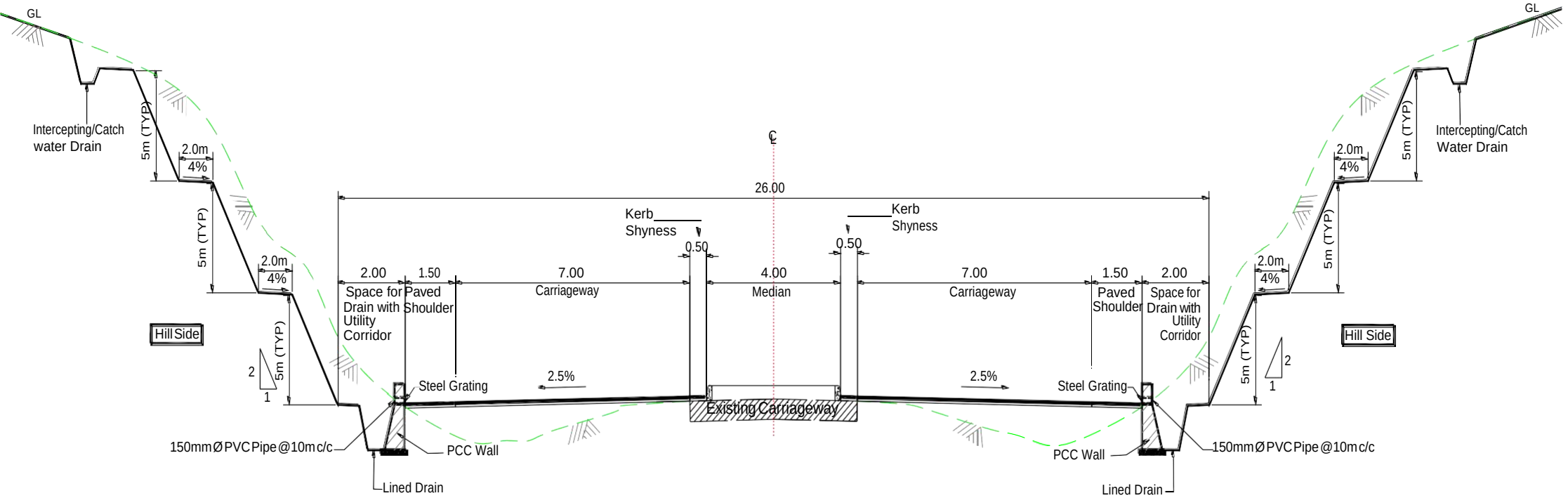
**13. Change of Scope:** The length of Structures and bridges specified hereinabove shall be treated as an approximate assessment. The actual lengths as required on the basis of detailed investigations shall be determined by the Contractor in accordance with the Specifications and Standards. Any variations in the lengths specified in this Schedule-B shall not constitute a Change of Scope, save and except any variations in the length arising out of a Change of Scope expressly undertaken in accordance with the provisions of Article 13

# Appendix B1 - Typical Cross Sections

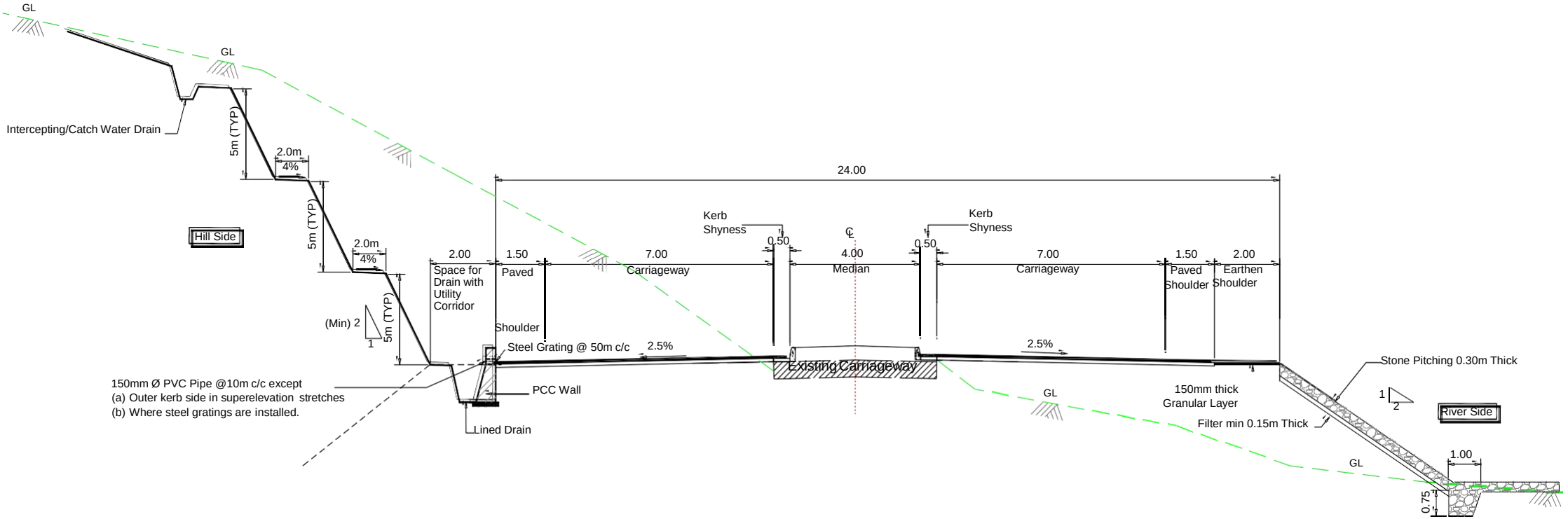



TCS-1 : 4-Lane Divided Carriageway With Raised Media

(Normal Fill/Cut Section– Rural Section)

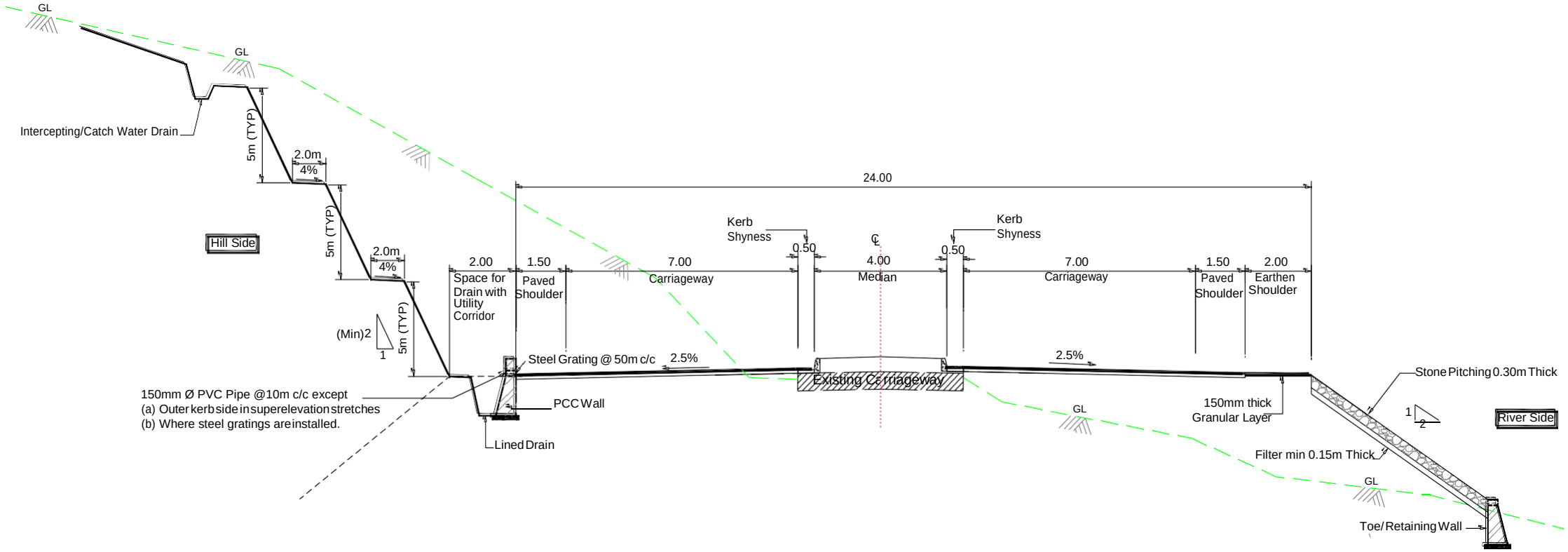



TCS-2 : 4-Lane Divided Carriageway with Both-sideHill Cutting



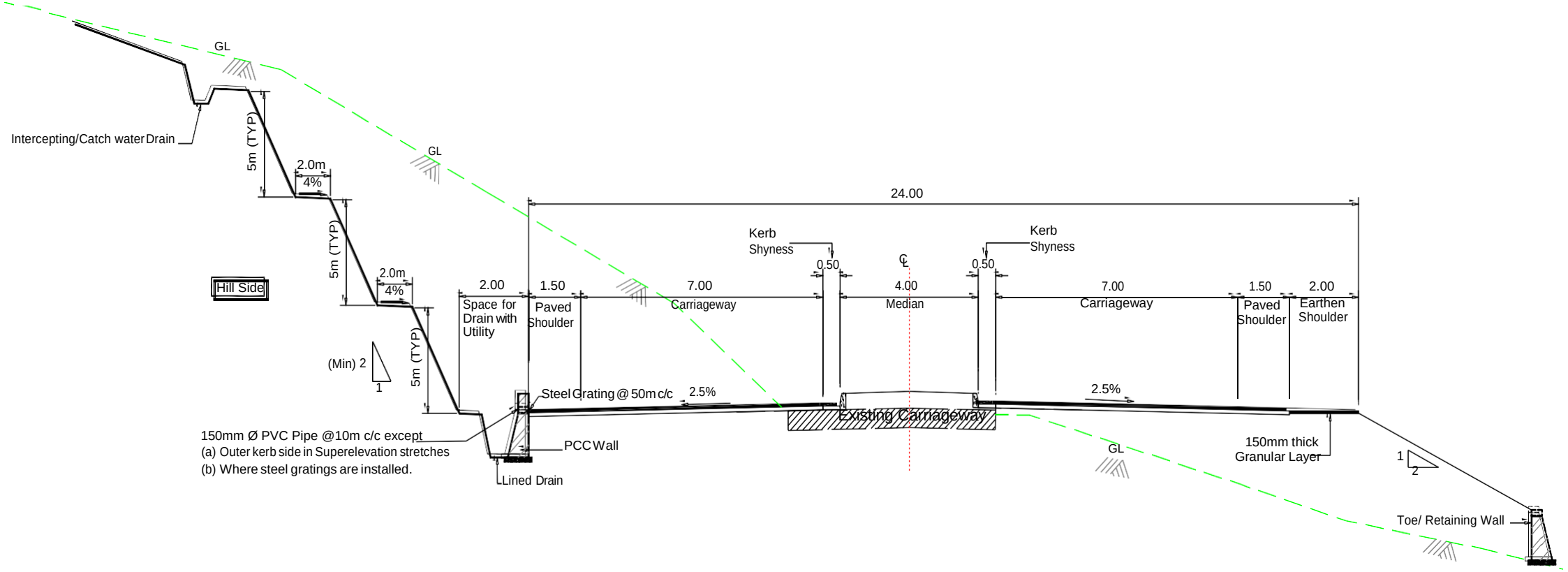

TCS-3 :4-Lane Divided Carriageway

(Hill Side Cutting / Fill and River Side Stone Pitching)



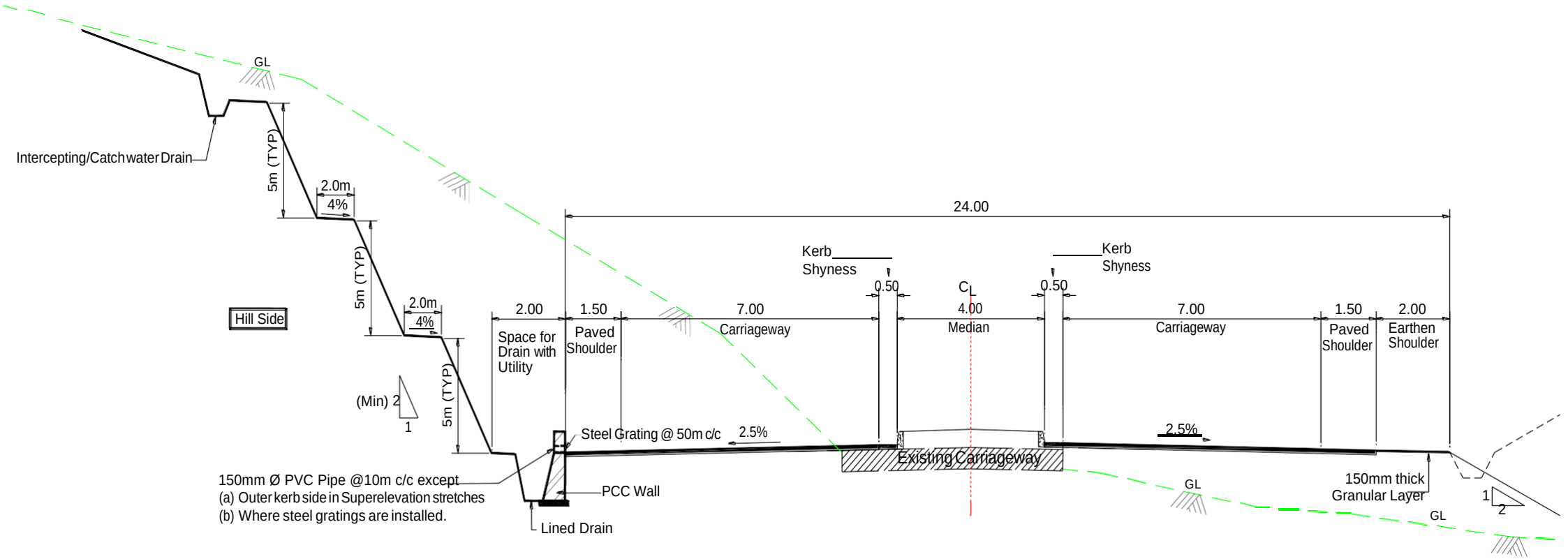

TCS-4 : 4-Lane Divided Carriageway

(Hill Side Cutting / Fill and River Side Stone Pitching with Toe/Retaining Wall)

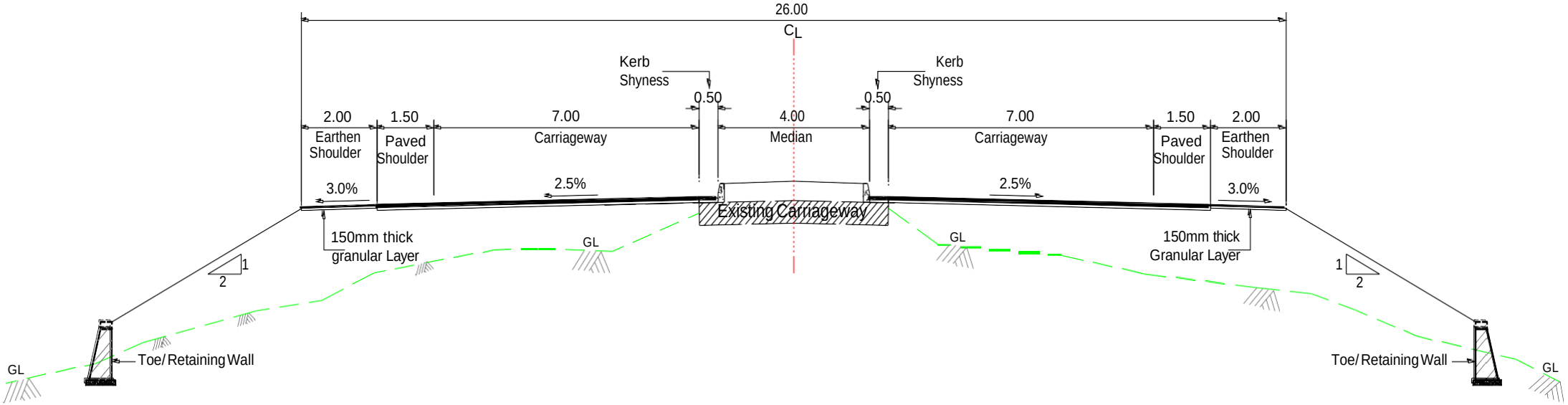



TCS-5 : 4-Lane Divided Carriageway

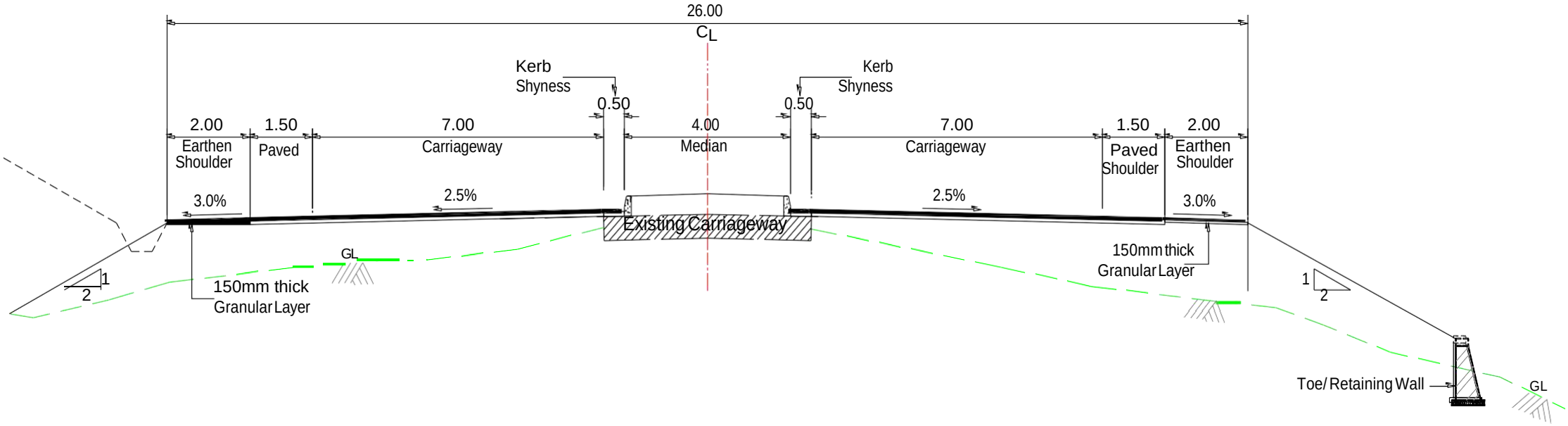
(One Side Hill Cutting and Other Side Toe/Retaining Wall)



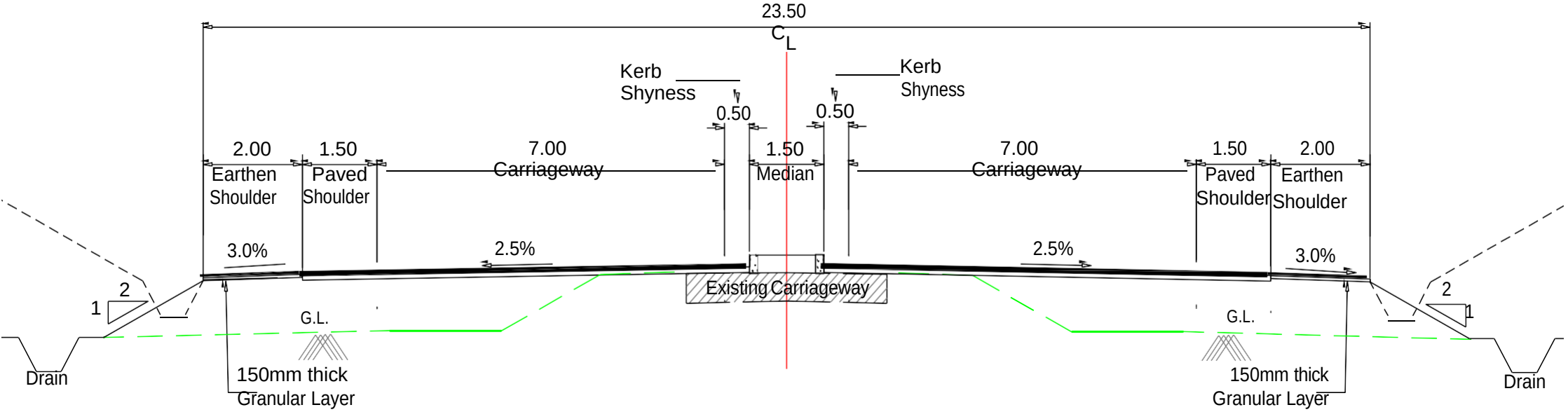

TCS-6 : 4-Lane Divided Carriageway
(One Side Hill Cutting and Other Side normal Cut/Fill Section)



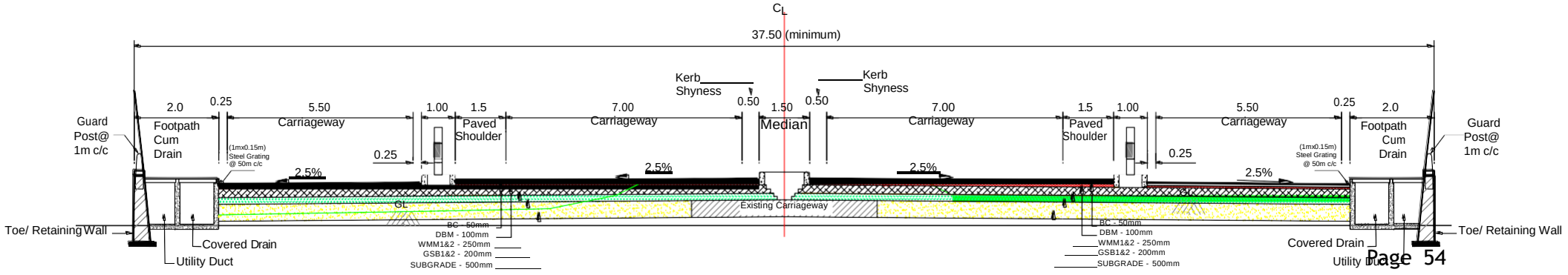

TCS-7 : 4-Lane Divided Carriageway with Bothside Toe/Retaining Walls



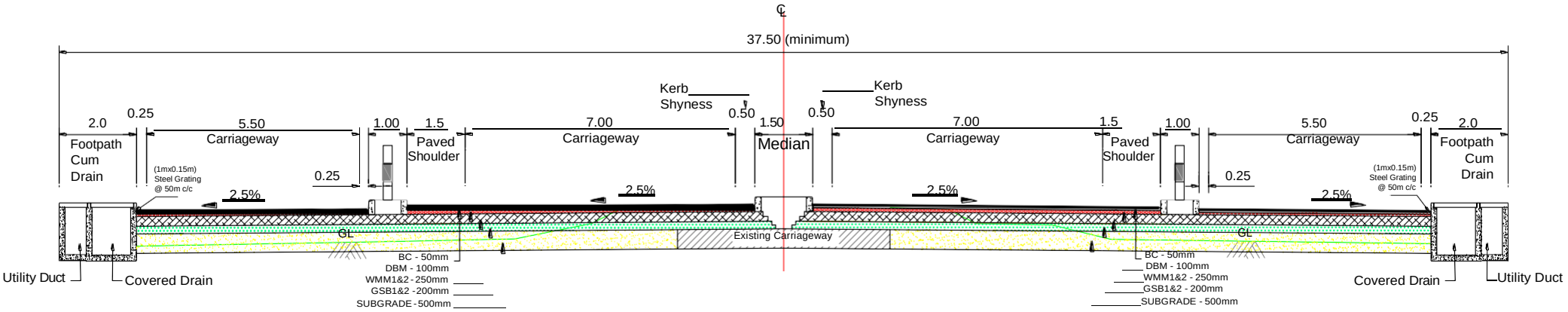

TCS-8 : 4-Lane Divided Carriageway
(One Side Retaining Wall and Other Side normal Cut/Fill Section)



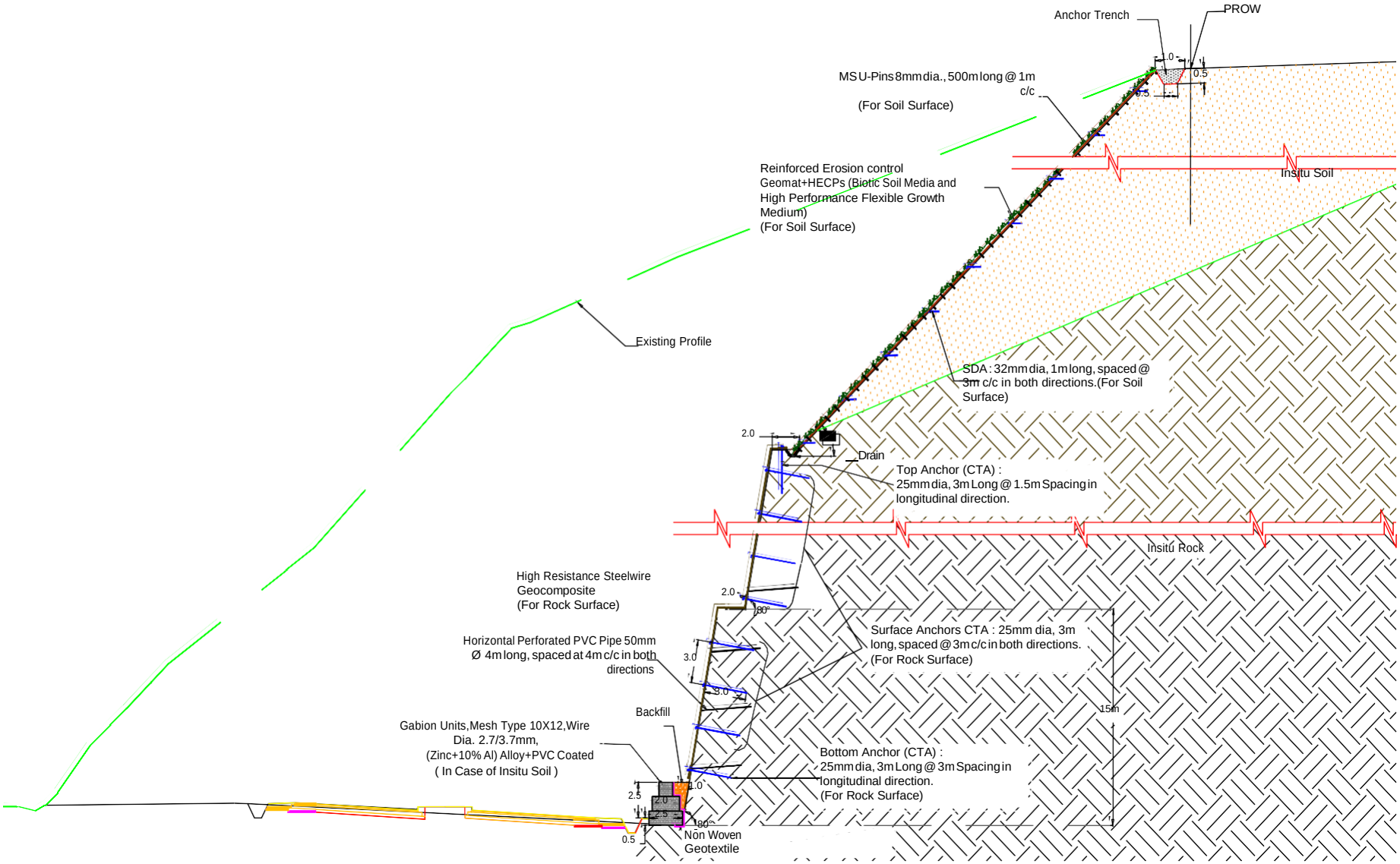

## TCS-9 : 4-Lane Divided Carriageway WithCut/Fill (Semi Built up Area)



## TCS - 11 : 4-Lane Divided Carriageway with Service Road (Built up Area)
## (with Teo / Retaining wall or Breast wall as per Site Condition)




## TCS - 12 : 4-Lane Divided Carriageway with Service Road (Market Area)




Typical Surficial Protection and Erosion Control Measures(Cut Height of Side Slope > 25m)

# Applicable Stretches of Typical Cross-section

| S No | Design Chainage (Km) | | Length (m) | TCS Type |
|---|---|---|---|---|
| | From | To | | |
| 1 | 287+000 | 287+030 | 30 | 8 |
| 2 | 287+030 | 287+640 | 610 | 6 |
| 3 | 287+640 | 287+770 | 130 | 1 |
| 4 | 287+770 | 288+126 | 356 | 6 |
| 5 | 288+126 | 288+132 | 6 | BRG |
| 6 | 288+132 | 288+500 | 368 | 4 |
| 7 | 288+500 | 288+880 | 380 | 6 |
| 8 | 288+880 | 288+930 | 50 | 1 |
| 9 | 288+930 | 289+000 | 70 | 8 |
| 10 | 289+000 | 289+030 | 30 | 5 |
| 11 | 289+030 | 289+070 | 40 | 6 |
| 12 | 289+070 | 289+120 | 50 | 5 |
| 13 | 289+120 | 289+220 | 100 | 6 |
| 14 | 289+220 | 289+240 | 20 | 3 |
| 15 | 289+240 | 289+300 | 60 | 4 |
| 16 | 289+300 | 289+580 | 280 | 6 |
| 17 | 289+580 | 289+770 | 190 | 2 |
| 18 | 289+770 | 289+870 | 100 | 6 |
| 19 | 289+870 | 290+000 | 130 | 1 |
| 20 | 290+000 | 290+050 | 50 | 6 |
| 21 | 290+050 | 290+250 | 200 | 5 |
| 22 | 290+250 | 290+330 | 80 | 6 |
| 23 | 290+330 | 290+390 | 60 | 1 |
| 24 | 290+390 | 290+560 | 170 | 8 |
| 25 | 290+560 | 290+700 | 140 | 6 |
| 26 | 290+700 | 290+880 | 180 | 1 |
| 27 | 290+880 | 290+980 | 100 | 4 |
| 28 | 290+980 | 291+070 | 90 | 1 |
| 29 | 291+070 | 291+110 | 40 | 8 |
| 30 | 291+110 | 291+220 | 110 | 7 |
| 31 | 291+220 | 291+269 | 49 | 8 |
| 32 | 291+269 | 291+284 | 15 | BRG |
| 33 | 291+284 | 291+330 | 46 | 8 |
| 34 | 291+330 | 291+600 | 270 | 1 |
| 35 | 291+600 | 291+700 | 100 | 1 to 12 |
| 36 | 291+700 | 292+190 | 490 | 12 |
| 37 | 292+190 | 292+210 | 20 | 11 |
| 38 | 292+210 | 292+350 | 140 | 12 |
| 39 | 292+350 | 292+450 | 100 | 12 to 9 |
| 40 | 292+450 | 293+400 | 950 | 9 |
| 41 | 293+400 | 293+500 | 100 | 9 to 1 |
| 42 | 293+500 | 294+100 | 600 | 1 |

| S No | Design Chainage (Km) | | Length (m) | TCS Type |
|---|---|---|---|---|
| | From | To | | |
| 43 | 294+100 | 294+180 | 80 | 7 |
| 44 | 294+180 | 294+220 | 40 | 8 |
| 45 | 294+220 | 294+300 | 80 | 1 |
| 46 | 294+300 | 294+400 | 100 | 1 to 9 |
| 47 | 294+400 | 295+100 | 700 | 9 |
| 48 | 295+100 | 295+135 | 35 | 9 to 1 |
| 49 | 295+135 | 295+161 | 26 | BRG |
| 50 | 295+161 | 295+200 | 39 | 9 to 1 |
| 51 | 295+200 | 296+204 | 1004 | 1 |
| 52 | 296+204 | 296+216 | 12 | BRG |
| 53 | 296+216 | 297+175 | 959 | 1 |
| 54 | 297+175 | 297+181 | 6 | BRG |
| 55 | 297+181 | 297+700 | 519 | 1 |

| Total Length (m) of each TCS: | | |
|---|---|---|
| TCS-1 | 4072 | 4 Lane Divided Carriageway with 4m Raised Median- Normal Cut/Fill section in Rural Section |
| TCS-2 | 190 | 4 Lane Divided Carriageway with 4m Raised Median- Both side Hill Cutting with PCC Toe wall cum lined drain |
| TCS-3 | 20 | 4 Lane Divided Carriageway with 4m Raised Median- Hill side Cutting/Normal Filling and River side Stone Pitching on |
| TCS-4 | 528 | 4 Lane Divided Carriageway with 4m Raised Median- Hill side Cutting/Normal Filling and River side Stone Pitching on Embankment with Toe/Retaining wall |
| TCS-5 | 280 | 4 Lane Divided Carriageway with 4m Raised Median- One side Hill Cutting with PCC Toe wall cum lined drain and other side |
| TCS-6 | 2136 | 4 Lane Divided Carriageway with 4m Raised Median- One side Hill Cutting with PCC Toe wall cum lined drain and other side Normal Cut/Fill |
| TCS-7 | 190 | 4 Lane Divided Carriageway with 4m Raised Median- Both side Toe/Retaining walls |
| TCS-8 | 445 | 4 Lane Divided Carriageway with 4m Raised Median- One side Normal Cut/Fill and other side Toe/Retaining wall |
| TCS-9 | 1650 | 4 Lane Divided Carriageway with 1.5m Raised Median- Normal Cut/Fill section in Semi Built up Area |
| TCS-11 | 20 | 4-Lane Divided Carriageway with 1.5m Raised Median & both side Service Road with Footpath cum Drain (with Teo / Retaining wall or Breast wall as per Site Condition)(at Built up Area) |
| TCS-12 | 630 | 4-Lane Divided Carriageway with 1.5m Raised Median & both side Service Road with Footpath cum Drain at Market Area. |
| Varies | 474 | |
| Bridges | 65 | Bridge Section as per GAD |

## (Schedule B-1)

**(Schedule B-1)**

The details of utilities are as follows:

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

Note-The details are given in utility shifting plan in Schedule - A. The actual 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 specified in this Schedule B shall not constitute a Change of Scope.

(i) Any Other Line

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

(b) The supervision charges at the rates/charges applicable between implementing agencies of MoRTH and utility owning department shall be paid directly by the Authority to the Utility Owning Entity as and when Contractor furnishing a demand of Utility Owning Department along with a copy of sanctioned estimate.

(c) The credit of dismantled materials has been accounted for in the estimated cost. The dismantled material /scrap of existing Utility to be shifted/dismantled shall belong to the Contractor/Concessionaire who would be free to dispose-off the dismantled material as deemed fit by them. If the Contractor is forced to deposit the dismantled material to utility owning department then the amount of credit for dismantled material indicated in the sanctioned estimates of utility owning department will be reimbursed to the Contractor after submitting the duly authenticated receipt of the dismantled material from utility owning department to the Authority.

(d) The utilities shall be handed over after shifting work is completed to Utility Owning

Department up to their entire satisfaction. The maintenance liability shall rest with the Utility Owning Department after handing over process is complete as far as utility shifting works are concerned.

(e) No change of scope shall be paid for any over-ground utilities. However, for any underground utilities not mentioned in Schedule B shall form change of scope, which shall be worked out as per the estimation of the concerned utility owning dept. and shall be payable to the contractor accordingly.

Annex – I

**SCHEDULE - C**

**PROJECT**

**FACILITIES**

**1.** Project Facilities

The Contractor shall construct the Project Facilities described in this Annex-I to form part of the Two Lane with Paved Shoulders Project Highway. Such Project Facilities shall include:

(a) Toll Plaza

(b) Roadside furniture;

(c) Pedestrian facilities;

(d) Tree plantation;

(e) Truck lay-byes;

(f) Bus-bays and bus shelters;

(g) Median Opening

(h) Utility duct

(i) Others to be specified

1. Operational and maintenance base camp
2. Utilities

**2.** Description of Project Facilities

Each of the Project Facilities is described below:

**a) Roadside furniture**

The roadside furniture shall include the provision of the;

**i. Traffic Signs**

Traffic signs include roadside signs, overhead signs and curb mounted signs along the entire Project Highway as per manual recommended in Schedule D. locations of the sign boards shall be finalized with the consultation of Authority Engineer.

**ii. Pavement Markings**

Pavement markings shall cover road marking for the entire Project Highway as per the manual recommended in Schedule D. locations of the sign boards shall be finalized with the consultation of Authority Engineer.

**iii. LED Traffic Blinkers**

For all **Pedestrian** cross walks along the alignment, at all Major Junction locations and at Curve locations where curve radius not confirming to minimum radius as per design standards and any other locations specified in relevant manual recommended in Schedule D.

**iv. Crash barrier**

Provide W-beam Steel crash barrier along the Project Highway at the locations as suggested in the manual recommended in Schedule D.

No W-Beam Steel crash barrier is required where already masonry/ concrete parapet wall is provisioned.

**v. Delineators**

Delineators for the entire project highway at the locations as recommend in relevant IRC Manual (mentioned in Schedule D) or as directed by Authority's Engineer shall be provided.

**vi. Boundary stones**

For the entire project highway as recommend in relevant IRC Manual (mentioned in Schedule D) shall be provided.

**vii. Hectometer/Kilometer stones**

For the entire project highway as recommend in relevant IRC Manual (mentioned in Schedule D) shall be provided

**b) Pedestrian Facilities**

**i. Pedestrian Guard Rail:** Provide pedestrian guard rail at each bus stop location, shall be provided.

**ii.** Additional Pedestrian facilities shall be provided at vulnerable locations as per specifications and standards specified in Schedule D.

**c) Landscaping and Tree Plantation**

**Landscaping**: At major intersections, interchange etc.

Landscaping within ROW of the project highway shall be done as per specifications and standards specified in Schedule D.

**d) Truck Lay-Byes:** NIL

**e) Bus Bays/Bus Shelters**

Bus Bays (15m length and 3.5m width) with ghost island (width=1.5m) and taper of 100m length on both side as per Figure 12.2 of IRC:SP:84- 2014 are proposed at following locations. The design of bus shelters should be aesthetically pleased with surrounding. However, locations shall be decided with Authority & Authority's Engineer at site. The minimum number of bus bays/ shelters is given below.

| S No | Design Chainage (Km) | Side | Location |
|---|---|---|---|
| 1 | 288+710 | Both | Takpakhul |
| 2 | 290+910 | Both | Pangmoul |
| 3 | 292+000 | Both | Motbung (Urban) |
| 4 | 294+850 | Both | Kanglatongbi |
| 5 | 295+520 | Both | Kanglatongbi |

**f) Median Opening**

The median opening of 20m length are proposed at following locations with both side storage lanes of 3.5m for 55mlength (minimum) where the proposed median width is 4m:

| S No | Design Chainage (m) | Median Width (m) | Name of Place |
|---|---|---|---|
| 1 | 288+400 | 4 | |
| 2 | 290+650 | 4 | Pangmoul |
| 3 | 291+650 | 4 to 1.5 | Motbong |
| 4 | 292+100 | 1.5 | Motbong |
| 5 | 293+200 | 1.5 | Motbong |
| 6 | 294+600 | 1.5 | Vijaynagar |
| 7 | 295+600 | 4 | Kanglatongbi |

**g) Utility Duct**

A 600mm diameter NP-4 Pipe with inspection box/chamber as per clause 2.16 of IRC:SP:84-2014 are proposed.

| Design Chainage (Km) | | Length | No. Utility Duct | Built-up Area |
|---|---|---|---|---|
| From | To | | | |
| 291+700 | 292+350 | 650 | 2 | Motbong |

**h) Others:** NIL

**1. Operational and maintenance base camp-** NIL

**2. Utilities-** NIL

**3. Rainwater Harvesting-** NIL

**SCHEDULE – D**

(Refer 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 Four Laning of Highways through Public Private Partnership (IRC: SP: 84-2014), referred to herein as the Manual.

**Annex - I**

*(Schedule-D)*

**Specifications and Standards for Construction of Project Highway**

## 1. Specifications and Standards

All Materials, works and construction operations shall conform to the Manual of Specifications and Standards for Four Laning of Highways through Public Private Partnership (IRC: SP: 84-2014), referred to as the Manual and MoR&TH Specifications for Road and Bridge Work (Fifth Revision 2013). 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

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

2.2 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 Manual shall be deemed to be amended to the extent set forth below:

| S. No | Clause No | Description | Deviation to Clause |
|---|---|---|---|
| **1** | **2.5.1** | Median width in Open country with isolated built up area | The median width of 2.5 including Kerb<br>Shyness of 0.5m on either side has been adopted in TCS-9 and TCS-10 |

# SCHEDULE - H

*(See Clauses 10.1(iv) and 19.3)*

## Contract Price Weightages

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

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 of for Payment | Percentage Weightage |
|---|---|---|---|
| **1** | **2** | **3** | **4** |
| Roadworks including New Culverts, Widening and Repair of Culverts | 71.67% | **A-Widening and Strengthening of Existing Road** | |
| | | (1) Earthwork up to top of the sub-grade | |
| | | (2) Sub Base Course | |
| | | (3) Non-Bituminous Base Course | |
| | | (4) Bituminous Base Course | |
| | | (5) Bituminous Concrete | |
| | | (6) Widening and repair of culverts | 0.61% |
| | | **B.1- Reconstruction/ New 4 Lane/Realignment/ Bypass (Flexible Pavement)** | |
| | | (1) Earthwork up to top of the sub-grade | 15.43% |
| | | (2) Sub Base Course (Granular work sub-base, shoulders) | 13.69% |
| | | (3) Non Bituminous Base Course (WMM) | 15.57% |
| | | (4) Bituminous Base Course (DBM) | 19.41% |
| | | (5) Wearing Coat (Bituminous Concrete) | 9.16% |
| | | **C.1- Reconstruction/ New Service road (Flexible pavement)** | |
| | | (1) Earthwork up to top of the sub-grade | 0.42% |
| | | (2) Sub Base Course (Granular work sub-base, shoulders) | 0.91% |

| Item | Weightage in Percentage to the Contract Price | Stage of for Payment | Percentage Weightage |
|---|---|---|---|
| 1 | 2 | 3 | 4 |
| | | (3) Non-Bituminous Base Course (WMM) | 1.35% |
| | | (4) Bituminous Base Course (DBM) | 0.46% |
| | | (5) Wearing Coat (Bituminous Concrete) | 0.35% |
| | | **D-Reconstruction and New Culverts on existing road, realignment and Bypasses,** | |
| | | (1) Culverts (length <6m) | 22.64% |
| Minor Bridges/ Underpasses/ Overpasses | 9.95% | **A.1- Widening and Repair of Minor bridges (length>6m and <60m)** | |
| | | Minor Bridges | |
| | | **A.2-New Minor bridges (length>6m and <60m)** | |
| | | **1. Foundation+Sub-Structure:** On completion of foundation work including foundations for wing and return walls, abutments, piers up to the abutment/pier cap | 57.73% |
| | | **2. Super-structure:** On completion of super structure in all respects including wearing coat, bearings, expansion joints, hand rails, crash barriers, road signs and markings, tests on completion etc., complete in all respects | 37.29% |
| | | **3. Approaches:** On completion of approaches including Retaining walls, stone pitching, protection works, filter media. etc., complete in all respects & fit for use. | 4.98% |
| | | **4. Guide Bunds and river Training Works:** On completion of Guide Bund and River Training Works complete in all respects | |
| | | **B.2-New Underpass** | |

| Item | Weightage in Percentage to the Contract Price | Stage of for Payment | Percentage Weightage |
|---|---|---|---|
| 1 | 2 | 3 | 4 |
| | | **1. Foundation+Sub-Structure:** On completion of foundation work including foundations for wing and return walls, abutments, piers up to the abutment/pier cap | |
| | | 1. **Super-structure:** On completion of super structure in all respects including wearing coat, bearings, expansion joints, hand rails, crash barriers, road signs and markings, tests on completion etc., complete in all respects<br><br>Wearing Coat<br><br>(a) in case of Overpass- wearing coat including expansion joints complete in all respects as specified and (b) in case of underpass-rigid pavement including drainage facility complete in all respects as specified | |
| | | **2. Approaches:** On completion of approaches including Retaining walls/Reinforced Earth walls, stone pitching, protection works, etc., complete in all respects & fit for use. | |
| Major Bridge (length>60m) works and ROB/UB/Elevated sections/ Flyovers including viaducts, if any | | **A.1- Widening and Repair of Major Bridges** | |
| | | 1. Foundation | |
| | | 2. Sub-structure | |
| | | 3. Super-structure (including bearings) | |
| | | 4. Wearing Coat including expansion joints | |
| | | 5. Miscellaneous Items like hand rails, crash barriers, road marking etc.) | |

| | | | |
|---|---|---|---|
| | | 6. Wing walls/Return walls | |

| Item | Weightage in Percentage to the Contract Price | Stage of for Payment | Percentage Weightage |
|---|---|---|---|
| **1** | **2** | **3** | **4** |
| | | 7. Guide Bunds, River Training works etc. | |
| | | 8. Approaches (Including Retaining walls, stone pitching and protection works) | |
| | | **A.2- New Major Bridges** | |
| | | 1. Foundation | |
| | | 2. Sub-structure | |
| | | 3. Super-structure (including bearings) | |
| | | 4. Wearing Coat including expansion joints | |
| | | 5. Miscellaneous Items like hand rails, crash barriers, road marking etc.) | |
| | | 6. Wing walls/Return walls | |
| | | 7. Guide Bunds, River Training works etc. | |
| | | 8. Approaches (Including Retaining walls, stone pitching and protection works) | |
| Other Works | 18.38% | (i) Road Side Drain | 21.78% |
| | | (ii) Road signs, markings, km stones, safety devices…<br>a) W beam crash barrier<br>b) Utility Duct<br>c) Misc. | 10.72%<br>13.31% |
| | | (iii) Project Facilities<br>a) Bus Shelter<br>b) Truck lay byes | 8.32% |
| | | (iv) Road side Plantation | |

| Item | Weightage in Percentage to the Contract Price | Stage of for Payment | Percentage Weightage |
|---|---|---|---|
| 1 | 2 | 3 | 4 |
| | | (v) Protection works other than approaches to the bridges, elevated section/flyover/grade separator and ROBs/ RUBs | 1.14% |
| | | (vi) Protection works<br>a) Retaining wall<br>b) Breast wall<br>c) Toe Wall<br>d) Surfacial protection and Erosion Control Measures (Cut Height of Side slope >25m) | <br>8.97%<br>26.82%<br>2.77% |
| | | (vii) Safety and Traffic Management during Construction | - |
| | | (viii) Utility Shifting | 6.17% |

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** | | |
| (6) Widening and repair of culverts | 0.61% | Cost of each culvert shall be determined on pro rata basis with respect to the total number of culverts. Payment shall be made on the completion of at least 5(Five) Culverts. |
| **B.1- Reconstruction/ New 4 Lane/Realignment/ Bypass (Flexible Pavement)** | | |
| (1) Earthwork up to top of the sub-grade | 15.43% | Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis |

| | | |
|---|---|---|
| (2) Sub Base Course (Granular work sub-base, shoulders) | 13.69% | on completion of a stage in full length or 5 (five) km length, whichever is less. |
| (3) Non Bituminous Base Course (WMM) | 15.57% | |
| (4) Bituminous Base Course (DBM) | 19.41% | |
| (5) Wearing Coat (Bituminous Concrete) | 9.16% | |
| **C.1- Reconstruction/ New Service road (Flexible pavement)** | | |
| (1) Earthwork up to top of the sub-grade | 0.42% | 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. |
| (2) Sub Base Course (Granular work sub-base, shoulders) | 0.91% | |
| (3) Non Bituminous Base Course (WMM) | 1.35% | |
| (4) Bituminous Base Course (DBM) | 0.46% | |
| (5) Wearing Coat (Bituminous Concrete) | 0.35% | |
| **D-Reconstruction and New Culverts on existing road, realignment and Bypasses,** | | |
| (1) Culverts(length <6m) | 22.64% | Cost of each culvert shall be determined on pro rata basis with respect to the total number of culverts. Payment shall be made on the completion of at least 5(Five) Culverts. |

@. For example, 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 length in km

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 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 and Underpass/overpasses shall be as stated in Table 1.3.2:

**Table 1.3.2**

| Stage of Payment | Percentage Weightage | Payment Procedure |
|---|---|---|
| **A.1- Widening and repairs of Minor Bridges**<br>(length >6m and <60m) | - | Cost of each Minor Bridge shall be determined on pro rata basis with respect to the total linear length of the Minor Bridge.<br>Payment shall be made on the completion of widening and repair work of Minor Bridge. |
| **A.2- New Minor Bridges** | | |
| **1. Foundation +Sub-Structure:** On completion of foundation work including foundations for wing and return walls, abutments, piers up to the abutment/pier cap | 57.73% | **1. Foundation +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 foundation+ substructure shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of foundation + substructure of each bridge subject to completion of at least two foundations along with sub structure upto abutment/pier cap level of each bridge. |
| **2. Super-structure:** On completion of super structure in all respects including wearing coat, bearings, expansion joints, hand rails, crash barriers, road signs and markings, tests on completion etc., complete in all respects | 37.29% | **2. Super-structure:** Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super structure of at least one span in all respect as specified in the column of "Stage of Payment" in this sub-clause. |

| Stage of Payment | Percentage Weightage | Payment Procedure |
|---|---|---|
| **3. Approaches:** On completion of approaches including Retaining walls, stone pitching, protection works, filter media. etc., complete in all respects & fit for use. | 4.98% | **3. Approaches** : 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. |
| **4. Guide Bunds and River Training Works:** On completion of Guide Bunds and River Training Works complete in all respects | | **4. Guide Bunds and River Training Works:** 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 respects as specified. |
| **B.2- New Underpass/Overpasses** | | |
| **1. Foundation +Sub-Structure:** On completion of foundation work including foundations for wing and return walls, abutments, piers up to the abutment/pier cap | | **1. Foundation +Sub-Structure:** Cost of each Underpass shall be determined on pro rata basis with respect to the total linear length (m) of the Underpass. Payment against foundation+ substructure shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of foundation + substructure of each Underpass subject to completion of at least two foundations along with sub-structure upto abutment/pier cap level of each Underpass. |
| 3. **Super-structure:** On completion of super structure in all respects including wearing coat, bearings, expansion joints, hand rails, crash barriers, road signs and markings, tests on completion etc., complete in all respects | | **2. Super-structure:** Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super structure of at least one span in all respect as specified in the column of "Stage of Payment" in this sub-clause. |

| Stage of Payment | Percentage Weightage | Payment Procedure |
|---|---|---|
| Wearing Coat<br>(a) in case of Overpass- wearing coat including expansion joints complete in all respects as specified and (b) in case of underpass-rigid pavement including drainage facility complete in all respects as specified. | | |
| **3. Approaches:** On completion of approaches including Retaining walls/Reinforced Earth walls, stone pitching, protection works, etc., complete in all respects & fit for use. | | **3. Approaches** : Payment shall be made on pro-rata basis on completion of a stage i.e. completion of approaches 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 shall be as stated in Table 1.3.3

**Table 1.3.3**

| Stage of Payment | Percentage Weightage | Payment Procedure |
|---|---|---|
| **A.2- New Major Bridges and Cut & Cover Tunnel** | | |
| **1. Foundation:** | | **1. 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><br>Incase where load testing is |

| Stage of Payment | Percentage Weightage | Payment Procedure |
|---|---|---|
| | | required for foundation, the trigger of first payment shall include load testing also where specified. |
| **2. Sub-Structure** | | **2. Sub-Structure:** Payment against Sub-structure shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of sub-structure of the major bridge subject to completion of atleast two sub-structures of abutments/piers upto abutment/pier cap level of the major bridge. |
| **3.Super-structure**<br>(including bearings) | | **3. Super-structure:** Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super structure including bearing of at least one span in all respect as specified. |
| **4.Wearing coat including expansion joints** | | **4. Wearing Coat:** Payment shall be made on completion of wearing coat including expansion joints complete in all respect as specified. |
| **5.Miscellaneous** Items like hand rails, crash barriers, road marking etc. | | **5. Miscellaneous:** Payment shall be made on completion of all miscellaneous works like hand rails, crash barrier, road marking etc. complete in all respect as specified. |

| Stage of Payment | Percentage Weightage | Payment Procedure |
|---|---|---|
| **6.Wing walls/ Return walls** | | **6. Wing walls/ Return walls:** Payment shall be made on completion of all wing walls/return walls complete in all respect as specified. |
| **7.Guide bunds, River Training works etc.** | | **7. Guide bunds, River Training works:** Payment shall be made on completion of all Guide bunds/ River Training works etc. complete in all respect as specified. |
| **8.Approaches** (including Retaining walls, stone pitching and protection works) | | **8. Approaches:** Payment shall be made on completion of both approaches including stone pitching; protection works etc. complete in all respect 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 | Percentage Weightage | Payment Procedure |
|---|---|---|
| (i) Road side drains | 21.78% | 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) percent of the total length. |
| (ii) Road signs, markings, km stones, safety devices…<br>d) W beam crash barrier<br>e) Utility Duct<br>f) Misc. | <br><br>10.72%<br><br>13.31% | |

| Stage of Payment | Percentage Weightage | Payment Procedure |
|---|---|---|
| (iii) Project facilities | | |
| a) Bus Shelter | 8.32% | Payment shall be made on pro rata basis for completed facilities. |
| b) Truck lay-byes | | |
| (iv) Roadside plantation | | Unit of measurement is linear length. |
| (v) Protection works other than approaches to the bridges, elevated section/flyover/grade separator and ROBs/ RUBs | 1.14% | 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) percent of the total length. |
| (vi) Protection works<br>a) Retaining<br>b) Breast wall<br>c) Toe Wall<br>d) Surfacial protection and Erosion Control Measures (Cut Height of Side slope >25m) | <br>8.97%<br>26.82%<br>2.77% | |
| (vii) Safety and traffic management during construction | | Payment shall be made on pro rata basis every six months. |
| (viii) Utility Shifting | 6.17% | 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 percent) of the total length. |

**2. Procedure for payment for Maintenance**

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

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