# Schedules

# Balance work of Construction of Two-lane with hard shoulders of Merangkong-Tamlu-Mon Road on EPC basis from existing Km 76.640 to Km 98.065 [Design Km. 63.800 to Km. 86.835] (Design length-23.035 km) in the state of Nagaland under SARDP-NE Phase A"

SCHEDULE - A

*(See Clauses 2.1 and 8.1)*

**SITE OF THE PROJECT**

1. The Site

1.1 Site of the Two-Laning of Existing Merangkong-Tamlu-MonRoadon EPCbasis from Existing Km 73+640to Km 98+065 (Design Km 63+800 to Km 86+835) in the state of Nagaland under SARDP-NE,Project Highway shall include the land, buildings, structures and road works as described in Annex-I of this Schedule-A.
The Project alignment is approachable for all locations for execution of works.

1.2 The dates of handing over the Right of Way 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's Representative and the Contractor,and such inventory shall form part of the memorandum referred to in Clause 8.2.1 of this Agreement.

1.4 The alignment plans of the Project Highway are specified in Annex-III. In the case of Sections where no modification in the existing alignment of the Project Highway is contemplated, the alignment plan has not been provided. Alignment plans have only been given for sections where the existing alignment is proposed to be upgraded. The proposed profile of the Project Highways shall be followed by the contractor with minimum FRL as indicated in the alignment plan. The Contractor, however, may improve/upgrade the road profile as indicated in Annexure-III based onsite/design requirement.

1.5 The status of the environment clearances obtained or awaited is given inAnnex-IV.

**ANNEXURE – I**

1. **The Site**

The Existing Merangkong-Tamlu-Mon Road is 98.065 Km in length and after DPR Preparation the designated length is 86.835 Km. The complete road has been divided into four Packages for construction. The packages are as follows-

| S.No. | Package Name | Existing Chainage(Km) | | Design Chainage(Km) | | Design Length (Km) |
|---|---|---|---|---|---|---|
| | | From | To | From | To | |
| 1 | Package-4 | 73+640 | 98+065 | 63+800 | 86+835 | 23.035 |

The site for the instant work i.e.Design Km 63.800 to design Km 86.835 is either single lane or proposed for re-alignments. The Site of the [Single Lane / Two Lane] Project Highway comprises of Merangkong - Tamlu - Mon Road commencing from Existing Km 73.640 to Km 98.065 (Design Km 63+800 to Km 86+835) in the state of Nagaland. The road is of sub-standard single lane / Two Lane with poor / fair road surface, passing through mountainous/steep terrain, in general. The road is deficient in geometric features at almost all locations. The stretch lies within Mokokchung, Longleng and Mon districts of Nagaland State.

The project corridor passes through Tanhai, Lengnyu and Mon Town.

There are certain stretches along Project Highway wherein construction activities partially (Earthwork in excavation, Earthwork in embankment, Subgrade, GSB, WMM, DBM, Box Culvert & Retaining Wall) have been commenced by agency under previously awarded terminated works.

The consolidated statement of Existing Chainage, Design Chainage, Improvement Proposal and Construction carried out fully or partially by Previous Contractor is as tabulated below-

| Sl. No. | Existing Chainage | | Length | Design Chainage | | Length | Improvement Proposal | Details of Work done by Previous Contractor | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| | From | To | | From | To | | | | |
| 1 | 73+410 | 73+960 | 550 | 63+800 | 63+820 | 20.000 | Widening & Strengthening | GSB | Profile corrective course, Camber correction, Desirable thickness & width of present layer shall be done by the |
| 2 | | | | 63+820 | 63+910 | 90.000 | Widening & Strengthening | DBM | |
| 3 | | | | 63+910 | 63+950 | 40.000 | Widening & Strengthening | DBM | |
| 4 | | | | 63+950 | 63+970 | 20.000 | Widening & Strengthening | WMM | |

| Sl. No. | Existing Chainage | | Length | Design Chainage | | Length | Improvement Proposal | Details of Work done by Previous Contractor | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| | From | To | | From | To | | | | |
| 5 | | | | 63+970 | 64+040 | 70.000 | Widening & Strengthening | Subgrade | contractor to be appointed |
| 6 | | | | 64+040 | 64+060 | 20.000 | Widening & Strengthening | Subgrade | |
| 7 | | | | 64+060 | 64+330 | 270.000 | Widening & Strengthening | WMM | |
| 8 | 73+960 | 73+995 | 35 | 64+330 | 64+340 | 10.000 | Realignment | GSB | |
| 9 | | | | 64+340 | 64+360 | 20.000 | Realignment | GSB | |
| 10 | 73+995 | 74+090 | 95 | 64+360 | 64+450 | 90.000 | Widening & Strengthening | WMM | |
| 11 | 74+090 | 74+160 | 70 | 64+450 | 64+480 | 30.000 | Realignment | WMM | |
| 12 | | | | 64+480 | 64+510 | 30.000 | Realignment | WMM | |
| 13 | 74+160 | 74+330 | 170 | 64+510 | 64+520 | 10.000 | Widening & Strengthening | WMM | |
| 14 | | | | 64+520 | 64+550 | 30.000 | Widening & Strengthening | WMM | |
| 15 | | | | 64+550 | 64+570 | 20.000 | Widening & Strengthening | WMM | |
| 16 | | | | 64+570 | 64+630 | 60.000 | Widening & Strengthening | WMM | |
| 17 | | | | 64+630 | 64+660 | 30.000 | Widening & Strengthening | WMM | |
| 18 | 74+330 | 74+430 | 100 | 64+660 | 64+670 | 10.000 | Realignment | GSB | |
| 19 | | | | 64+670 | 64+750 | 80.000 | Realignment | Subgrade | |
| 20 | 74+430 | 74+920 | 490 | 64+750 | 64+790 | 40.000 | Widening & Strengthening | GSB | |
| 21 | | | | 64+790 | 64+810 | 20.000 | Widening & Strengthening | Subgrade | |
| 22 | | | | 64+810 | 64+818 | 8.000 | Widening & Strengthening | GSB | |
| 23 | | | | 64+8 | 64+9 | 162.00 | Widening & | WMM | |

| Sl. No. | Existing Chainage | | Length | Design Chainage | | Length | Improvement Proposal | Details of Work done by Previous Contractor | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| | From | To | | From | To | | | | |
| | | | | 18 | 80 | 0 | Strengthening | | |
| 24 | | | | 64+980 | 65+100 | 120.000 | Widening & Strengthening | DBM | |
| 25 | | | | 65+100 | 65+120 | 20.000 | Widening & Strengthening | WMM | |
| 26 | | | | 65+120 | 65+130 | 10.000 | Widening & Strengthening | GSB | |
| 27 | | | | 65+130 | 65+230 | 100.000 | Widening & Strengthening | WMM | |
| 28 | | | | 65+230 | 65+245 | 15.000 | Widening & Strengthening | WMM | |
| 29 | 74+920 | 74+960 | 40 | 65+245 | 65+275 | 30.000 | Realignment | WMM | Profile corrective course, Camber correction, Desirable thickness & width of present layer shall be done by the contractor to be appointed |
| 30 | 74+960 | 75+280 | 320 | 65+275 | 65+400 | 125.000 | Widening & Strengthening | WMM | |
| 31 | | | | 65+400 | 65+440 | 40.000 | Widening & Strengthening | WMM | |
| 32 | | | | 65+440 | 65+580 | 140.000 | Widening & Strengthening | WMM | |
| 33 | | | | 65+580 | 65+600 | 20.000 | Widening & Strengthening | DBM | |
| 34 | 75+280 | 75+410 | 130 | 65+600 | 65+620 | 20.000 | Realignment | DBM | |
| 35 | | | | 65+620 | 65+710 | 90.000 | Realignment | DBM | |
| 36 | | | | 65+710 | 65+915 | 205.000 | Widening & Strengthening | DBM | |
| 37 | | | | 65+915 | 66+170 | 255.000 | Widening & Strengthening | DBM | |
| 38 | | | | 66+170 | 66+200 | 30.000 | Widening & Strengthening | DBM | |
| 39 | | | | 66+200 | 66+300 | 100.000 | Widening & Strengthening | DBM | |
| 40 | | | | 66+300 | 66+510 | 210.000 | Widening & Strengthenin | WMM | |

| Sl. No. | Existing Chainage | | Length | Design Chainage | | Length | Improvement Proposal | Details of Work done by Previous Contractor | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| | From | To | | From | To | | | | |
| | | | | | | | g | | |
| 41 | | | | 66+510 | 66+530 | 20.000 | Widening & Strengthening | Subgrade | |
| 42 | | | | 66+530 | 66+700 | 170.000 | Widening & Strengthening | GSB | |
| 43 | 75+410 | 76+480 | 1070 | 66+700 | 66+720 | 20.000 | Widening & Strengthening | GSB | |
| 44 | 76+480 | 76+710 | 230 | 66+720 | 66+850 | 130.000 | Realignment | GSB | |
| 45 | | | | 66+850 | 66+900 | 50.000 | Realignment | WMM | |
| 46 | | | | 66+900 | 66+930 | 30.000 | Realignment | WMM | |
| 47 | 76+710 | 76+830 | 120 | 66+930 | 66+940 | 10.000 | Widening & Strengthening | WMM | |
| 48 | | | | 66+940 | 67+040 | 100.000 | Widening & Strengthening | WMM | |
| 49 | | | | 67+040 | 67+050 | 10.000 | Widening & Strengthening | Subgrade | |
| 50 | 76+830 | 77+000 | 170 | 67+050 | 67+160 | 110.000 | Realignment | GSB | |
| 51 | | | | 67+160 | 67+190 | 30.000 | Realignment | GSB | |
| 52 | | | | 67+190 | 67+200 | 10.000 | Realignment | Subgrade | |
| 53 | 77+000 | 77+200 | 200 | 67+200 | 67+300 | 100.000 | Widening & Strengthening | GSB | |
| 54 | | | | 67+300 | 67+330 | 30.000 | Widening & Strengthening | Subgrade | |
| 55 | | | | 67+330 | 67+390 | 60.000 | Widening & Strengthening | WMM | |
| 56 | 77+200 | 77+265 | 65 | 67+390 | 67+420 | 30.000 | Realignment | Subgrade | |
| 57 | | | | 67+420 | 67+445 | 25.000 | Realignment | GSB | |
| 58 | 77+265 | 77+420 | 155 | 67+445 | 67+470 | 25.000 | Widening & Strengthening | GSB | |
| 59 | | | | 67+470 | 67+605 | 135.000 | Widening & Strengthenin | WMM | Profile Corrective |

| Sl. No. | Existing Chainage | | Length | Design Chainage | | Length | Improvement Proposal | Details of Work done by Previous Contractor | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| | From | To | | From | To | | | | |
| | | | | | | | g | | course, Camber Correction, Desirable thickness & width of present layer shall be done by the contractor to be appointed |
| 60 | 77+420 | 77+500 | 80 | 67+605 | 67+670 | 65.000 | Realignment | Subgrade | |
| 61 | 77+500 | 77+520 | 20 | 67+670 | 67+700 | 30.000 | Realignment | WMM | |
| 62 | 77+520 | 77+620 | 100 | 67+700 | 67+760 | 60.000 | Widening & Strengthening | WMM | |
| 63 | | | | 67+760 | 67+810 | 50.000 | Widening & Strengthening | WMM | |
| 64 | 77+620 | 77+820 | 200 | 67+810 | 67+880 | 70.000 | Realignment | WMM | |
| 65 | | | | 67+880 | 67+900 | 20.000 | Widening & Strengthening | GSB | |
| 66 | | | | 67+900 | 67+920 | 20.000 | Realignment | WMM | |
| 67 | | | | 67+920 | 67+960 | 40.000 | Realignment | WMM | |
| 68 | 77+820 | 77+890 | 70 | 67+960 | 67+980 | 20.000 | Widening & Strengthening | WMM | |
| 69 | | | | 67+980 | 68+005 | 25.000 | Widening & Strengthening | WMM | |
| 70 | | | | 68+005 | 68+010 | 5.000 | Widening & Strengthening | WMM | |
| 71 | | | | 68+010 | 68+030 | 20.000 | Widening & Strengthening | WMM | |
| 72 | 77+890 | 77+920 | 30 | 68+030 | 68+060 | 30.000 | Realignment | WMM | |
| 73 | 77+920 | 78+000 | 80 | 68+060 | 68+120 | 60.000 | Widening & Strengthening | WMM | |
| 74 | | | | 68+120 | 68+150 | 30.000 | Widening & Strengthening | WMM | |
| 75 | 78+000 | 78+270 | 270 | 68+150 | 68+215 | 65.000 | Widening & Strengthening | WMM | |
| 76 | | | | 68+215 | 68+285 | 70.000 | Widening & Strengthening | WMM | |
| 77 | | | | 68+285 | 68+405 | 120.000 | Widening & Strengthening | DBM | |

| Sl. No. | Existing Chainage | | Length | Design Chainage | | Length | Improvement Proposal | Details of Work done by Previous Contractor | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| | From | To | | From | To | | | | |
| 78 | 78+270 | 78+320 | 50 | 68+405 | 68+450 | 45.000 | Realignment | WMM | |
| 79 | 78+320 | 78+360 | 40 | 68+450 | 68+495 | 45.000 | Widening & Strengthening | DBM | |
| 80 | 78+360 | 78+470 | 110 | 68+495 | 68+500 | 5.000 | Realignment | DBM | |
| 81 | | | | 68+500 | 68+550 | 50.000 | Realignment | WMM | |
| 82 | | | | 68+550 | 68+595 | 45.000 | Realignment | GSB | |
| 83 | 78+470 | 79+000 | 530 | 68+595 | 68+630 | 35.000 | Widening & Strengthening | GSB | |
| 84 | | | | 68+630 | 68+650 | 20.000 | Widening & Strengthening | WMM | |
| 85 | | | | 68+650 | 68+720 | 70.000 | Widening & Strengthening | DBM | |
| 86 | | | | 68+720 | 68+740 | 20.000 | Widening & Strengthening | WMM | |
| 87 | | | | 68+740 | 68+750 | 10.000 | Widening & Strengthening | Subgrade | |
| 88 | | | | 68+750 | 68+780 | 30.000 | Widening & Strengthening | GSB | |
| 89 | | | | 68+780 | 68+800 | 20.000 | Widening & Strengthening | WMM | |
| 90 | | | | 68+800 | 68+910 | 110.000 | Widening & Strengthening | WMM | |
| 91 | | | | 68+910 | 68+930 | 20.000 | Widening & Strengthening | Subgrade | |
| 92 | | | | 68+930 | 68+960 | 30.000 | Widening & Strengthening | GSB | |
| 93 | | | | 68+960 | 69+000 | 40.000 | Widening & Strengthening | DBM | |
| 94 | | | | 69+000 | 69+030 | 30.000 | Widening & Strengthening | GSB | |
| 95 | | | | 69+030 | 69+040 | 10.000 | Widening & Strengthenin | Subgrade | |

| Sl. No. | Existing Chainage | | Length | Design Chainage | | Length | Improvement Proposal | Details of Work done by Previous Contractor | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| | From | To | | From | To | | | | |
| | | | | | | | g | | |
| 96 | | | | 69+040 | 69+060 | 20.000 | Widening & Strengthening | GSB | |
| 97 | | | | 69+060 | 69+120 | 60.000 | Widening & Strengthening | DBM | |
| 98 | | | | 69+120 | 69+130 | 10.000 | Widening & Strengthening | Subgrade | |
| 99 | | | | 69+130 | 69+140 | 10.000 | Realignment | Subgrade | |
| 100 | | | | 69+140 | 69+180 | 40.000 | Realignment | WMM | |
| 101 | 79+000 | 79+130 | 130 | 69+180 | 69+210 | 30.000 | Realignment | Subgrade | |
| 102 | | | | 69+210 | 69+220 | 10.000 | Realignment | GSB | |
| 103 | | | | 69+220 | 69+245 | 25.000 | Realignment | WMM | |
| 104 | 79+130 | 79+220 | 90 | 69+245 | 69+320 | 75.000 | Widening & Strengthening | DBM | |
| 105 | | | | 69+320 | 69+330 | 10.000 | Widening & Strengthening | WMM | |
| 106 | 79+220 | 79+270 | 50 | 69+330 | 69+375 | 45.000 | Realignment | Subgrade | |
| 107 | | | | 69+375 | 69+400 | 25.000 | Widening & Strengthening | Subgrade | |
| 108 | 79+270 | 79+440 | 170 | 69+400 | 69+480 | 80.000 | Widening & Strengthening | WMM | |
| 109 | | | | 69+480 | 69+550 | 70.000 | Widening & Strengthening | DBM | |
| 110 | 79+440 | 79+570 | 130 | 69+550 | 69+590 | 40.000 | Realignment | WMM | |
| 111 | | | | 69+590 | 69+650 | 60.000 | Realignment | Subgrade | |
| 112 | | | | 69+650 | 69+660 | 10.000 | Widening & Strengthening | Subgrade | |
| 113 | 79+570 | 79+670 | 100 | 69+660 | 69+680 | 20.000 | Widening & Strengthening | WMM | |
| 114 | | | | 69+680 | 69+740 | 60.000 | Widening & Strengthenin | DBM | |

Profile Corrective course, Camber Correction, Desirable thickness & width of present layer shall be done by the contractor to be appointed

| Sl. No. | Existing Chainage | | Length | Design Chainage | | Length | Improvement Proposal | Details of Work done by Previous Contractor | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| | From | To | | From | To | | | | |
| | | | | | | | g | | |
| 115 | 79+670 | 79+860 | 190 | 69+740 | 69+800 | 60.000 | Realignment | WMM | |
| 116 | | | | 69+800 | 69+840 | 40.000 | Realignment | Subgrade | |
| 117 | | | | 69+840 | 69+880 | 40.000 | Realignment | WMM | |
| 118 | | | | 69+880 | 69+910 | 30.000 | Realignment | WMM | |
| 119 | 79+860 | 80+020 | 160 | 69+910 | 69+920 | 10.000 | Widening & Strengthening | GSB | Profile Corrective course, Camber Correction, Desirable thickness & width of present layer shall be done by |
| 120 | | | | 69+920 | 69+940 | 20.000 | Widening & Strengthening | Subgrade | |
| 121 | | | | 69+940 | 69+950 | 10.000 | Widening & Strengthening | WMM | |
| 122 | | | | 69+950 | 70+050 | 100.000 | Widening & Strengthening | DBM | |
| 123 | 80+020 | 80+080 | 60 | 70+050 | 70+120 | 70.000 | Widening & Strengthening | DBM | |
| 124 | | | | 70+120 | 70+135 | 15.000 | Widening & Strengthening | WMM | |
| 125 | 80+080 | 80+160 | 80 | 70+135 | 70+150 | 15.000 | Realignment | WMM | |
| 126 | | | | 70+150 | 70+190 | 40.000 | Realignment | WMM | |
| 127 | 80+160 | 80+220 | 60 | 70+190 | 70+240 | 50.000 | Widening & Strengthening | WMM | |
| 128 | | | | 70+240 | 70+250 | 10.000 | Widening & Strengthening | WMM | |
| 129 | 80+220 | 80+370 | 150 | 70+250 | 70+280 | 30.000 | Realignment | WMM | |
| 130 | | | | 70+280 | 70+310 | 30.000 | Realignment | WMM | |
| 131 | 80+370 | 80+530 | 160 | 70+310 | 70+340 | 30.000 | Widening & Strengthening | WMM | |
| 132 | | | | 70+340 | 70+350 | 10.000 | Widening & Strengthening | Subgrade | |
| 133 | | | | 70+350 | 70+450 | 100.000 | Widening & Strengthenin | WMM | |

| Sl. No. | Existing Chainage | | Length | Design Chainage | | Length | Improvement Proposal | Details of Work done by Previous Contractor | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| | From | To | | From | To | | | | |
| | | | | | | | g | | |
| 134 | | | | 70+450 | 70+475 | 25.000 | Widening & Strengthening | WMM | the contractor to be appointed |
| 135 | 80+530 | 80+590 | 60 | 70+475 | 70+515 | 40.000 | Realignment | WMM | |
| 136 | 80+590 | 80+860 | 270 | 70+515 | 70+540 | 25.000 | Widening & Strengthening | WMM | |
| 137 | | | | 70+540 | 70+590 | 50.000 | Widening & Strengthening | Subgrade | |
| 138 | | | | 70+590 | 70+670 | 80.000 | Widening & Strengthening | WMM | |
| 139 | | | | 70+670 | 70+720 | 50.000 | Widening & Strengthening | WMM | |
| 140 | | | | 70+720 | 70+750 | 30.000 | Widening & Strengthening | GSB | |
| 141 | | | | 70+750 | 70+790 | 40.000 | Widening & Strengthening | WMM | |
| 142 | 80+860 | 81+220 | 360 | 70+790 | 70+800 | 10.000 | Realignment | WMM | |
| 143 | | | | 70+800 | 70+840 | 40.000 | Realignment | WMM | |
| 144 | | | | 70+840 | 71+020 | 180.000 | Realignment | Subgrade | |
| 145 | | | | 71+020 | 71+060 | 40.000 | Realignment | GSB | |
| 146 | 81+220 | 81+470 | 250 | 71+060 | 71+080 | 20.000 | Widening & Strengthening | GSB | |
| 147 | | | | 71+080 | 71+150 | 70.000 | Widening & Strengthening | GSB | |
| 148 | | | | 71+150 | 71+300 | 150.000 | Widening &Strengthening | WMM | |
| 149 | 81+470 | 81+585 | 115 | 71+300 | 71+360 | 60.000 | Realignment | GSB | |
| 150 | | | | 71+360 | 71+390 | 30.000 | Realignment | GSB | |
| 151 | | | | 71+390 | 71+400 | 10.000 | Realignment | GSB | |
| 152 | 81+585 | 81+620 | 35 | 71+400 | 71+440 | 40.000 | Widening & Strengthenin | Subgrade | |

| Sl. No. | Existing Chainage | | Length | Design Chainage | | Length | Improvement Proposal | Details of Work done by Previous Contractor | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| | From | To | | From | To | | | | |
| | | | | | | | g | | |
| 153 | 81+620 | 81+690 | 70 | 71+440 | 71+500 | 60.000 | Realignment | WMM | |
| 154 | 81+690 | 82+000 | 310 | 71+500 | 71+520 | 20.000 | Widening & Strengthening | GSB | |
| 155 | | | | 71+520 | 71+640 | 120.000 | Widening & Strengthening | GSB | |
| 156 | | | | 71+640 | 71+660 | 20.000 | Widening & Strengthening | Subgrade | |
| 157 | | | | 71+660 | 71+700 | 40.000 | Widening & Strengthening | GSB | |
| 158 | | | | 71+700 | 71+780 | 80.000 | Widening & Strengthening | WMM | |
| 159 | 82+000 | 82+125 | 125 | 71+780 | 71+830 | 50.000 | Widening & Strengthening | GSB | Profile Corrective course, Camber Correction, Desirable thickness & width of present layer shall be done by the contractor to be appointed |
| 160 | | | | 71+830 | 71+850 | 20.000 | Widening & Strengthening | Subgrade | |
| 161 | 82+125 | 82+320 | 195 | 71+850 | 71+980 | 130.000 | Widening & Strengthening | GSB | |
| 162 | | | | 71+980 | 72+050 | 70.000 | Realignment | Subgrade | |
| 163 | 82+320 | 83+040 | 720 | 72+050 | 72+150 | 100.000 | Realignment | WMM | |
| 164 | | | | 72+150 | 72+310 | 160.000 | Widening & Strengthening | WMM | |
| 165 | | | | 72+310 | 72+450 | 140.000 | Widening & Strengthening | WMM | |
| 166 | | | | 72+450 | 72+480 | 30.000 | Widening & Strengthening | GSB | |
| 167 | | | | 72+480 | 72+500 | 20.000 | Widening & Strengthening | Subgrade | |
| 168 | | | | 72+500 | 72+570 | 70.000 | Widening & Strengthening | Subgrade | |
| 169 | | | | 72+570 | 72+590 | 20.000 | Widening & Strengthening | Subgrade | |

| Sl. No. | Existing Chainage | | Length | Design Chainage | | Length | Improvement Proposal | Details of Work done by Previous Contractor | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| | From | To | | From | To | | | | |
| 170 | | | | 72+590 | 72+640 | 50.000 | Widening & Strengthening | Subgrade | |
| 171 | | | | 72+640 | 72+660 | 20.000 | Widening & Strengthening | Subgrade | |
| 172 | | | | 72+660 | 72+760 | 100.000 | Widening & Strengthening | Subgrade | |
| 173 | | | | 72+760 | 72+780 | 20.000 | Widening & Strengthening | Subgrade | |
| 174 | | | | 72+780 | 72+800 | 20.000 | Widening & Strengthening | WMM | |
| 175 | 83+040 | 83+120 | 80 | 72+800 | 72+865 | 65.000 | Realignment | WMM | |
| 176 | 83+120 | 83+220 | 100 | 72+865 | 72+930 | 65.000 | Widening & Strengthening | WMM | |
| 177 | | | | 72+930 | 72+965 | 35.000 | Widening & Strengthening | WMM | |
| 178 | 83+220 | 83+270 | 50 | 72+965 | 73+005 | 40.000 | Realignment | WMM | |
| 179 | 83+270 | 83+520 | 250 | 73+005 | 73+050 | 45.000 | Widening & Strengthening | WMM | |
| 180 | | | | 73+050 | 73+060 | 10.000 | Widening & Strengthening | WMM | |
| 181 | | | | 73+060 | 73+150 | 90.000 | Widening & Strengthening | WMM | |
| 182 | | | | 73+150 | 73+230 | 80.000 | Widening & Strengthening | GSB | |
| 183 | 83+520 | 83+540 | 20 | 73+230 | 73+255 | 25.000 | Widening & Strengthening | GSB | |
| 184 | 83+540 | 83+600 | 60 | 73+255 | 73+305 | 50.000 | Realignment | WMM | |
| 185 | 83+600 | 83+940 | 340 | 73+305 | 73+330 | 25.000 | Widening & Strengthening | GSB | |
| 186 | | | | 73+330 | 73+390 | 60.000 | Widening & Strengthening | GSB | |
| 187 | | | | 73+3 | 73+4 | 20.000 | Widening & | Subgrade | Profile Corrective |

| Sl. No. | Existing Chainage | | Length | Design Chainage | | Length | Improvement Proposal | Details of Work done by Previous Contractor | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| | From | To | | From | To | | | | |
| | | | | 90 | 10 | | Strengthening | | course, Camber Correction, Desirable thickness & width of present layer shall be done by the contractor to be appointed |
| 188 | | | | 73+410 | 73+515 | 105.000 | Widening & Strengthening | WMM | |
| 189 | | | | 73+515 | 73+650 | 135.000 | Widening & Strengthening | No Work Done | |
| 190 | 83+940 | 84+090 | 150 | 73+650 | 73+690 | 40.000 | Realignment | No Work Done | |
| 191 | | | | 73+690 | 73+760 | 70.000 | Realignment | No Work Done | |
| 192 | 84+090 | 84+180 | 90 | 73+760 | 73+830 | 70.000 | Widening & Strengthening | No Work Done | |
| 193 | | | | 73+830 | 73+850 | 20.000 | Widening & Strengthening | Subgrade | |
| 194 | 84+180 | 84+240 | 60 | 73+850 | 73+905 | 55.000 | Realignment | No Work Done | |
| 195 | 84+240 | 84+600 | 360 | 73+905 | 73+930 | 25.000 | Widening & Strengthening | GSB | |
| 196 | | | | 73+930 | 73+960 | 30.000 | Widening & Strengthening | GSB | |
| 197 | | | | 73+960 | 73+980 | 20.000 | Widening & Strengthening | GSB | |
| 198 | | | | 73+980 | 74+000 | 20.000 | Widening & Strengthening | GSB | |
| 199 | | | | 74+000 | 74+100 | 100.000 | Widening & Strengthening | No Work Done | |
| 200 | | | | 74+100 | 74+160 | 60.000 | Widening & Strengthening | No Work Done | |
| 201 | | | | 74+160 | 74+180 | 20.000 | Widening & Strengthening | No Work Done | |
| 202 | | | | 74+180 | 74+230 | 50.000 | Widening & Strengthening | No Work Done | |
| 203 | | | | 74+230 | 74+250 | 20.000 | Widening & Strengthening | No Work Done | |
| 204 | | | | 74+250 | 74+255 | 5.000 | Widening & Strengthenin | No Work Done | |

| Sl. No. | Existing Chainage | | Length | Design Chainage | | Length | Improvement Proposal | Details of Work done by Previous Contractor | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| | From | To | | From | To | | | | |
| 205 | 84+600 | 84+660 | 60 | 74+255 | 74+295 | 40.000 | Realignment | No Work Done | Profile Corrective course, Camber Correction, Desirable thickness & width of present layer shall be done by the contractor to be appointed |
| 206 | 84+660 | 85+060 | 400 | 74+295 | 74+410 | 115.000 | Widening & Strengthening | No Work Done | |
| 207 | | | | 74+410 | 74+430 | 20.000 | Widening & Strengthening | No Work Done | |
| 208 | | | | 74+430 | 74+610 | 180.000 | Widening & Strengthening | No Work Done | |
| 209 | | | | 74+610 | 74+640 | 30.000 | Widening & Strengthening | No Work Done | |
| 210 | | | | 74+640 | 74+735 | 95.000 | Widening & Strengthening | No Work Done | |
| 211 | 85+060 | 85+310 | 250 | 74+735 | 74+920 | 185.000 | Realignment | No Work Done | |
| 212 | 85+310 | 85+360 | 50 | 74+920 | 74+970 | 50.000 | Widening & Strengthening | No Work Done | |
| 213 | 85+360 | 85+770 | 410 | 74+970 | 75+000 | 30.000 | Realignment | WMM | |
| 214 | | | | 75+000 | 75+240 | 240.000 | Widening & Strengthening | WMM | |
| 215 | 85+770 | 85+900 | 130 | 75+240 | 75+320 | 80.000 | Widening & Strengthening | No Work Done | |
| 216 | | | | 75+320 | 75+390 | 70.000 | Widening & Strengthening | No Work Done | |
| 217 | 85+900 | 86+160 | 260 | 75+390 | 75+400 | 10.000 | Realignment | Subgrade | |
| 218 | | | | 75+400 | 75+530 | 130.000 | Realignment | WMM | |
| 219 | | | | 75+530 | 75+555 | 25.000 | Realignment | Subgrade | |
| 220 | 86+160 | 86+200 | 40 | 75+555 | 75+560 | 5.000 | Widening & Strengthening | Subgrade | |
| 221 | | | | 75+560 | 75+600 | 40.000 | Widening & Strengthening | GSB | |
| 222 | 86+200 | 86+360 | 160 | 75+600 | 75+640 | 40.000 | Realignment | WMM | |
| 223 | | | | 75+6 | 75+6 | 50.000 | Realignment | WMM | |

| Sl. No. | Existing Chainage | | Length | Design Chainage | | Length | Improvement Proposal | Details of Work done by Previous Contractor | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| | From | To | | From | To | | | | |
| | | | | 40 | 90 | | | | |
| 224 | 86+360 | 86+475 | 115 | 75+690 | 75+800 | 110.000 | Widening & Strengthening | GSB | |
| 225 | 86+475 | 86+570 | 95 | 75+800 | 75+870 | 70.000 | Realignment | WMM | |
| 226 | 86+570 | 86+750 | 180 | 75+870 | 75+920 | 50.000 | Widening & Strengthening | GSB | |
| 227 | | | | 75+920 | 75+950 | 30.000 | Widening & Strengthening | GSB | |
| 228 | | | | 75+950 | 75+960 | 10.000 | Widening & Strengthening | GSB | |
| 229 | | | | 75+960 | 76+040 | 80.000 | Widening & Strengthening | GSB | |
| 230 | | | | 76+040 | 76+050 | 10.000 | Widening & Strengthening | GSB | |
| 231 | 86+750 | 86+820 | 70 | 76+050 | 76+110 | 60.000 | Widening & Strengthening | Subgrade | |
| 232 | 86+820 | 87+130 | 310 | 76+110 | 76+280 | 170.000 | Widening & Strengthening | GSB | |
| 233 | | | | 76+280 | 76+300 | 20.000 | Widening & Strengthening | GSB | |
| 234 | | | | 76+300 | 76+340 | 40.000 | Widening &Strengthening | Subgrade | |
| 235 | | | | 76+340 | 76+400 | 60.000 | Widening & Strengthening | WMM | |
| 236 | 87+130 | 87+180 | 50 | 76+400 | 76+445 | 45.000 | Realignment | WMM | |
| 237 | 87+180 | 87+330 | 150 | 76+445 | 76+465 | 20.000 | Widening & Strengthening | WMM | |
| 238 | | | | 76+465 | 76+540 | 75.000 | Widening & Strengthening | WMM | |
| 239 | | | | 76+540 | 76+560 | 20.000 | Widening & Strengthening | WMM | |
| 240 | | | | 76+560 | 76+600 | 40.000 | Widening & Strengthenin | WMM | |

| Sl. No. | Existing Chainage | | Length | Design Chainage | | Length | Improvement Proposal | Details of Work done by Previous Contractor | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| | From | To | | From | To | | | | |
| | | | | | | | g | | |
| 241 | 87+330 | 87+400 | 70 | 76+600 | 76+620 | 20.000 | Realignment | WMM | Profile Corrective course, Camber Correction, Desirable thickness & width of present layer shall be done by the contractor to be appointed |
| 242 | | | | 76+620 | 76+660 | 40.000 | Realignment | WMM | |
| 243 | 87+400 | 87+940 | 540 | 76+660 | 76+730 | 70.000 | Widening & Strengthening | GSB | |
| 244 | | | | 76+730 | 76+750 | 20.000 | Widening & Strengthening | Subgrade | |
| 245 | | | | 76+750 | 76+950 | 200.000 | Widening & Strengthening | Subgrade | |
| 246 | | | | 76+950 | 77+050 | 100.000 | Widening & Strengthening | GSB | |
| 247 | | | | 77+050 | 77+100 | 50.000 | Widening & Strengthening | Subgrade | |
| 248 | | | | 77+100 | 77+190 | 90.000 | Widening & Strengthening | WMM | |
| 249 | 87+940 | 88+000 | 60 | 77+190 | 77+300 | 110.000 | Realignment | WMM | |
| 250 | 88+000 | 88+320 | 320 | 77+300 | 77+320 | 20.000 | Realignment | Subgrade | |
| 251 | | | | 77+320 | 77+380 | 60.000 | Realignment | WMM | |
| 252 | | | | 77+380 | 77+400 | 20.000 | Realignment | WMM | |
| 253 | | | | 77+400 | 77+440 | 40.000 | Realignment | WMM | |
| 254 | | | | 77+440 | 77+500 | 60.000 | Realignment | Earthwork in Excavation | |
| 255 | 88+320 | 88+380 | 60 | 77+500 | 77+510 | 10.000 | Widening & Strengthening | GSB | |
| 256 | | | | 77+510 | 77+540 | 30.000 | Widening & Strengthening | WMM | |
| 257 | | | | 77+540 | 77+560 | 20.000 | Widening & Strengthening | WMM | |
| 258 | 88+380 | 88+550 | 170 | 77+560 | 77+630 | 70.000 | Realignment | WMM | |
| 259 | | | | 77+630 | 77+670 | 40.000 | Realignment | Earthwork in | |

| Sl. No. | Existing Chainage | | Length | Design Chainage | | Length | Improvement Proposal | Details of Work done by Previous Contractor | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| | From | To | | From | To | | | | |
| | | | | | | | | Excavation | |
| 260 | | | | 77+670 | 77+700 | 30.000 | Realignment | WMM | |
| 261 | | | | 77+700 | 77+720 | 20.000 | Widening & Strengthening | WMM | |
| 262 | 88+550 | 88+700 | 150 | 77+720 | 77+780 | 60.000 | Widening & Strengthening | WMM | |
| 263 | | | | 77+780 | 77+810 | 30.000 | Widening & Strengthening | GSB | |
| 264 | | | | 77+810 | 77+850 | 40.000 | Widening & Strengthening | WMM | |
| 265 | 88+700 | 88+890 | 190 | 77+850 | 77+940 | 90.000 | Realignment | WMM | |
| 266 | | | | 77+940 | 78+000 | 60.000 | Realignment | Subgrade | |
| 267 | | | | 78+000 | 78+080 | 80.000 | Widening & Strengthening | GSB | |
| 268 | | | | 78+080 | 78+220 | 140.000 | Widening & Strengthening | GSB | |
| 269 | | | | 78+220 | 78+240 | 20.000 | Widening & Strengthening | Subgrade | |
| 270 | 88+890 | 89+390 | 500 | 78+240 | 78+260 | 20.000 | Widening & Strengthening | Subgrade | |
| 271 | | | | 78+260 | 78+350 | 90.000 | Widening & Strengthening | Subgrade | |
| 272 | | | | 78+350 | 78+410 | 60.000 | Widening & Strengthening | GSB | |
| 273 | | | | 78+410 | 78+500 | 90.000 | Widening & Strengthening | GSB | |
| 274 | 89+390 | 89+440 | 50 | 78+500 | 78+540 | 40.000 | Realignment | WMM | Profile Corrective course, Camber Correction, Desirable thickness & width of present |
| 275 | 89+440 | 89+470 | 30 | 78+540 | 78+550 | 10.000 | Widening & Strengthening | GSB | |
| 276 | 89+470 | 89+640 | 170 | 78+550 | 78+610 | 60.000 | Realignment | WMM | |
| 277 | | | | 78+610 | 78+670 | 60.000 | Realignment | WMM | |

| Sl. No. | Existing Chainage | | Length | Design Chainage | | Length | Improvement Proposal | Details of Work done by Previous Contractor | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| | From | To | | From | To | | | | |
| 278 | 89+640 | 89+690 | 50 | 78+670 | 78+710 | 40.000 | Realignment | WMM | layer shall be done by the contractor to be appointed |
| 279 | | | | 78+710 | 78+735 | 25.000 | Widening & Strengthening | GSB | |
| 280 | 89+690 | 89+750 | 60 | 78+735 | 78+790 | 55.000 | Realignment | GSB | |
| 281 | 89+750 | 89+870 | 120 | 78+790 | 78+820 | 30.000 | Widening & Strengthening | GSB | |
| 282 | | | | 78+820 | 78+830 | 10.000 | Widening & Strengthening | Subgrade | |
| 283 | | | | 78+830 | 78+945 | 115.000 | Widening & Strengthening | GSB | |
| 284 | 89+870 | 89+990 | 120 | 78+945 | 79+025 | 80.000 | Realignment | WMM | |
| 285 | | | | 79+025 | 79+110 | 85.000 | Realignment | Earthwork in Excavation | |
| 286 | 89+990 | 90+540 | 550 | 79+110 | 79+260 | 150.000 | Widening & Strengthening | Subgrade | |
| 287 | | | | 79+260 | 79+280 | 20.000 | Widening & Strengthening | Subgrade | |
| 288 | | | | 79+280 | 79+320 | 40.000 | Widening & Strengthening | Subgrade | |
| 289 | | | | 79+320 | 79+500 | 180.000 | Widening & Strengthening | Subgrade | |
| 290 | | | | 79+500 | 79+520 | 20.000 | Widening & Strengthening | Subgrade | |
| 291 | | | | 79+520 | 79+650 | 130.000 | Widening & Strengthening | Subgrade | |
| 292 | 90+540 | 90+600 | 60 | 79+650 | 79+700 | 50.000 | Realignment | Earthwork in Excavation | |
| 293 | 90+600 | 90+650 | 50 | 79+700 | 79+750 | 50.000 | Widening & Strengthening | Subgrade | |
| 294 | 90+650 | 91+170 | 520 | 79+750 | 79+870 | 120.000 | Realignment | GSB | |
| 295 | | | | 79+870 | 79+960 | 90.000 | Widening & Strengthenin | Subgrade | |

| Sl. No. | Existing Chainage | | Length | Design Chainage | | Length | Improvement Proposal | Details of Work done by Previous Contractor | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| | From | To | | From | To | | | | |
| | | | | | | | g | | |
| 296 | | | | 79+960 | 80+100 | 140.000 | Widening & Strengthening | GSB | |
| 297 | | | | 80+100 | 80+160 | 60.000 | Realignment | Earthwork in Excavation | |
| 298 | | | | 80+160 | 80+180 | 20.000 | Widening & Strengthening | Subgrade | |
| 299 | 91+170 | 91+330 | 160 | 80+180 | 80+300 | 120.000 | Widening & Strengthening | GSB | |
| 300 | | | | 80+300 | 80+340 | 40.000 | Widening & Strengthening | Subgrade | |
| 301 | 91+330 | 91+420 | 90 | 80+340 | 80+420 | 80.000 | Realignment | Subgrade | |
| 302 | 91+420 | 91+600 | 180 | 80+420 | 80+600 | 180.000 | Widening & Strengthening | Subgrade | |
| 303 | 91+600 | 91+610 | 10 | 80+600 | 80+640 | 40.000 | Realignment | Earthwork in Excavation | |
| 304 | 91+610 | 91+660 | 50 | 80+640 | 80+730 | 90.000 | Widening & Strengthening | Subgrade | |
| 305 | 91+660 | 91+760 | 100 | 80+730 | 80+750 | 20.000 | Widening & Strengthening | Subgrade | |
| 306 | 91+760 | 91+820 | 60 | 80+750 | 80+800 | 50.000 | Realignment | No Work Done | |
| 307 | | | | 80+800 | 80+810 | 10.000 | Widening & Strengthening | No Work Done | |
| 308 | | | | 80+810 | 80+880 | 70.000 | Widening & Strengthening | Subgrade | |
| 309 | 91+820 | 92+105 | 285 | 80+880 | 80+955 | 75.000 | Widening & Strengthening | Subgrade | |
| 310 | | | | 80+955 | 80+975 | 20.000 | Widening & Strengthening | No Work Done | |
| 311 | | | | 80+975 | 81+095 | 120.000 | Widening & Strengthening | Subgrade | |
| 312 | 92+105 | 92+240 | 135 | 81+095 | 81+130 | 35.000 | Realignment | No Work Done | |

Profile Corrective course, Camber Correction, Desirable thickness & width of present layer shall be done by the contractor to be appointed

| Sl. No. | Existing Chainage | | Length | Design Chainage | | Length | Improvement Proposal | Details of Work done by Previous Contractor | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| | From | To | | From | To | | | | |
| 313 | | | | 81+130 | 81+200 | 70.000 | Realignment | Subgrade | |
| 314 | 92+240 | 92+290 | 50 | 81+200 | 81+210 | 10.000 | Widening & Strengthening | No Work Done | |
| 315 | | | | 81+210 | 81+240 | 30.000 | Widening & Strengthening | Subgrade | |
| 316 | | | | 81+240 | 81+250 | 10.000 | Widening & Strengthening | No Work Done | |
| 317 | 92+290 | 92+350 | 60 | 81+250 | 81+290 | 40.000 | Realignment | GSB | |
| 318 | | | | 81+290 | 81+305 | 15.000 | Realignment | No Work Done | |
| 319 | 92+350 | 92+580 | 230 | 81+305 | 81+410 | 105.000 | Widening & Strengthening | No Work Done | |
| 320 | | | | 81+410 | 81+430 | 20.000 | Widening & Strengthening | No Work Done | |
| 321 | | | | 81+430 | 81+525 | 95.000 | Widening & Strengthening | No Work Done | |
| 322 | | | | 81+525 | 81+540 | 15.000 | Widening & Strengthening | No Work Done | Profile Corrective course, Camber Correction, Desirable thickness & width of present layer shall be done by the contractor to be appointed |
| 323 | 92+580 | 92+770 | 190 | 81+540 | 81+660 | 120.000 | Widening & Strengthening | GSB | |
| 324 | 92+770 | 92+880 | 110 | 81+660 | 81+900 | 240.000 | Widening & Strengthening | GSB | |
| 325 | 92+880 | 93+005 | 125 | 81+900 | 82+160 | 260.000 | Widening & Strengthening | Subgrade | |
| 326 | 93+005 | 93+480 | 475 | 82+160 | 82+440 | 280.000 | Widening & Strengthening | No Work Done | |
| 327 | 93+480 | 93+520 | 40 | 82+440 | 82+465 | 25.000 | Realignment | No Work Done | |
| 328 | 93+520 | 97+890 | 4370 | 82+465 | 82+600 | 135.000 | No Geometric Improvement | No Work Done | |
| 329 | | | | 82+600 | 83+300 | 700.000 | Widening & Strengthening | Subgrade | |
| 330 | | | | 83+3 | 84+5 | 1250.0 | No | No Work | |

| Sl. No. | Existing Chainage | | Length | Design Chainage | | Length | Improvement Proposal | Details of Work done by Previous Contractor | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| | From | To | | From | To | | | | |
| | | | | 00 | 50 | 00 | Geometric Improvement | Done | |
| 331 | | | | 84+550 | 84+800 | 250.000 | No Geometric Improvement | DBM in MON Town | |
| 332 | | | | 84+800 | 84+850 | 50.000 | No Geometric Improvement | No Work Done | |
| 333 | | | | 84+850 | 85+420 | 570.000 | No Geometric Improvement | DBM in MON Town | |
| 334 | | | | 85+420 | 86+835 | 1415.000 | No Geometric Improvement | No Work Done | |

The Index Map is appended at the end of this Schedule-A

2. **Chainage References (Existing Vs Design)**

"ExistingChainage" means distance measuredalong existing roadway /vehicle pathway on the Project Highway.During topography survey, observations are made to these locations and after finalization of alignment by improving the existing geometry the chainage has been referred to "Design Chainage".Therelationship betweenthe "Existing Chainage" and the "Design Chainage" as per field surveys of the location for the "Project Highway" is given below:

| Sl No. | Existing Chainage | Design Chainage | Remark |
|---|---|---|---|
| 1. | 63+800 | Realignment | |
| 2. | 64+000 | Realignment | |
| 3. | 65+000 | Realignment | |
| 4. | 66+000 | Realignment | |
| 5. | 67+000 | Realignment | |
| 6. | 68+000 | Realignment | |
| 7. | 69+000 | Realignment | |
| 8. | 70+000 | Realignment | |
| 9. | 71+000 | Realignment | |
| 10. | 72+000 | Realignment | |
| 11. | 73+995 | 64+360 | |

| | | | |
|---|---|---|---|
| 12. | 74+430 | 64+750 | |
| 13. | 75+410 | 65+710 | |
| 14. | 76+480 | 66+750 | |
| 15. | 77+820 | 67+960 | |
| 16. | 77+890 | 68+030 | |
| 17. | 78+470 | 68+595 | |
| 18. | 79+000 | 69+130 | |
| 19. | 79+130 | 69+245 | |
| 20. | 79+570 | 69+650 | |
| 21. | 80+530 | 70+475 | |
| 22. | 81+690 | 71+500 | |
| 23. | 82+320 | 72+100 | |
| 24. | 83+600 | 73+305 | |
| 25. | 84+660 | 74+295 | |
| 26. | 85+060 | 74+735 | |
| 27. | 86+200 | 75+600 | |
| 28. | 87+180 | 76+445 | |
| 29. | 88+550 | 77+700 | |
| 30. | 89+640 | 78+705 | |
| 31. | 90+600 | 79+700 | |
| 32. | 91+420 | 80+420 | |
| 33. | 92+240 | 81+200 | |
| 34. | 93+520 | 82+465 | |

3. **Land**

The Siteofthe Project Highway comprises the land describedbelow:

| Sl No. | Existing Chainage | | Design Chainage | | Length In M (Design) | Existing/ Available Row (M) | Remark |
|---|---|---|---|---|---|---|---|
| | From | To | From | To | | | |
| 1 | 73+640 | 98+065 | 63+800 | 86+835 | 23035 | | No RoW available in realignment stretches of total 10.370 km as given in para 2.1.3 of Annexure-1 Schedule-B |

4. **Carriageway**

The present carriageway of theProject Highway is substandard singlelane configuration. Thetype ofthe existingpavement is flexible.

| Sl No. | Existing Chainage | Design Chainage | Length In M (Design) | Existing/ Lane Width | Remark |
|---|---|---|---|---|---|

| | From | To | From | To | | | |
|---|---|---|---|---|---|---|---|
| 1 | 73+640 | 98+065 | 63+800 | 86+835 | 23035 | 3 to 3.5/ 7.0 | Land Width Other Then realignment |

5. **Major Bridges**

The site includes the following medium size Bridge.

| Sl No. | Design Chainage | Type of Structures | | | No. of Span with span length | width(m) |
|---|---|---|---|---|---|---|
| | | Foundation | Sub-Structure | Super Structure | | |
| Nil | | | | | | |

6. **Railway over Bridges (ROB)**

The site includes the following Railway over Bridges.

| Sl No. | Design Chainage | Type Of Structures | | | No. of Span with span length | width(m) |
|---|---|---|---|---|---|---|
| | | foundation | sub-structure | Super Structure | | |
| Nil | | | | | | |

7. **Grade Separators**

The site includes the following Grade Separators.

| Sl No. | Design Chainage | Type Of Structures | | | No. of Span with span length | Width(m) |
|---|---|---|---|---|---|---|
| | | Foundation | Sub-structure | Super Structure | | |
| Nil | | | | | | |

8. **Minor bridges**

The site includes the following medium size Bridge.

| Sl No. | Road Segment | Design Chainage | Type Of Structures | | | No. of Span with span length | Width(m) |
|---|---|---|---|---|---|---|---|
| | | | foundation | sub-structure | Super Structure | | |
| 1 | Merangkong-Tamlu-Mon | 89900 | not visible | stone masonry | Steel truss | 1x15.25 | 4 |
| 2 | Merangkong-Tamlu-Mon | 98024 | not visible | stone masonry | RccSlab | 1x6 | 7.2 |

9. **Railway level crossings/Railway track**

The site includes the following railway crossings.

| Sl No. | Road Segment | Existing Chainage (km) | Remarks |
|---|---|---|---|
| Nil | | | |

10. **Underpass (vehicular, Non-Vehicular)**

The site includes the following Underpasses.

| Sl No. | Road Segment | Existing Chainage (km) | Type of structure | no. of span with span length | width |
|---|---|---|---|---|---|
| Nil | | | | | |

11. **Culverts**

11.1 The site includes 90 nos. of culverts at the following locations and types. (Culvert Detail before awarding previous contractor)

| Sl No. | Existing Chainage (km) | Type of structure | Span/Dia (m) | Width of Structure | Remarks |
|---|---|---|---|---|---|
| 1. | 73+960 | Slab | 1X1.5 | 5.1 | |
| 2. | 74+150 | Slab | 1X1.5 | 4.5 | |
| 3. | 74+202 | Slab | 1X0.9 | 5.3 | |
| 4. | 74+280 | Slab | 1X1.5 | 5.2 | |
| 5. | 75+084 | Slab | 1X1.0 | 5.6 | |
| 6. | 75+278 | Slab | 1X1.0 | 7.3 | |
| 7. | 75+388 | Slab | 1X1.0 | 7 | |
| 8. | 76+272 | Slab | 1X1.0 | 7.5 | |
| 9. | 76+425 | Slab | 1X1.5 | 7.6 | |
| 10. | 76+500 | Slab | 1X1.0 | 7.3 | |
| 11. | 76+715 | Slab | 1X1.0 | 6.1 | |
| 12. | 77+100 | Slab | 1X1.0 | 6.3 | |
| 13. | 77+240 | Slab | 1X1.0 | 6.3 | |
| 14. | 77+431 | Slab | 1X1.0 | 6.4 | |
| 15. | 77+798 | Slab | 1X1.0 | 6.2 | |
| 16. | 78+415 | Pipe | 1X1.2 | 13 | |
| 17. | 78+593 | Pipe | 1X1.0 | 12.5 | |
| 18. | 78+763 | Slab | 1X1.0 | 6.7 | |
| 19. | 78+965 | Slab | 1X1.5 | 7.6 | |

| | | | | | |
|---|---|---|---|---|---|
| 20. | 79+047 | Slab | 1X1.0 | 6.9 | |
| 21. | 79+181 | Slab | 1X1.0 | 8.5 | |
| 22. | 79+250 | Slab | 1X1.5 | 8.8 | |
| 23. | 79+431 | Slab | 1X1.5 | 8.1 | |
| 24. | 79+650 | Slab | 1X1.5 | 7 | |
| 25. | 79+752 | Slab | 1X2.0 | 7.3 | |
| 26. | 79+980 | Slab | 1X1.5 | 7 | |
| 27. | 80+232 | Slab | 1X1.5 | 6.7 | |
| 28. | 80+515 | Slab | 1X1.0 | 7 | |
| 29. | 80+690 | Slab | 1X0.9 | 7 | |
| 30. | 81+025 | Slab | 1X2.0 | 5.5 | |
| 31. | 81+450 | Slab | 1X2.0 | 5.6 | |
| 32. | 81+551 | Slab | 1X1.5 | 7.1 | |
| 33. | 82+072 | Slab | 1X1.5 | 6.6 | |
| 34. | 82+150 | Slab | 1X1.5 | 6.1 | |
| 35. | 82+262 | Slab | 1X1.5 | 7 | |
| 36. | 82+559 | not visible | 1X1.5 | 6.1 | |
| 37. | 82+760 | Slab | 1X1.5 | 7.1 | |
| 38. | 82+900 | not visible | 1X1.5 | 5.6 | |
| 39. | 82+960 | Slab | 1X0.9 | 6.2 | |
| 40. | 83+292 | Slab | 1X1.5 | 3.8 | |
| 41. | 83+462 | Slab | 1X1.0 | 6.1 | |
| 42. | 83+985 | not visible | 1X1.0 | 7.4 | |
| 43. | 84+375 | Slab | 1X0.9 | 5.6 | |
| 44. | 85+358 | Slab | 1X1.0 | 6 | |
| 45. | 85+455 | Pipe | 1X0.9 | 9 | |
| 46. | 86+072 | Slab | 1X1.5 | 8 | |
| 47. | 86+430 | Slab | 1X0.9 | 7 | |
| 48. | 86+580 | Slab | 1X1.5 | 7.3 | |
| 49. | 86+650 | Slab | 1X1.0 | 7.1 | |
| 50. | 86+960 | Slab | 1X1.0 | 6 | |
| 51. | 87+268 | Pipe | 1X1.0 | 12.9 | |
| 52. | 87+383 | Pipe | 1X1.0 | 10.3 | |
| 53. | 87+733 | Pipe | 1X1.0 | 10.2 | |
| 54. | 87+914 | Pipe | 1X1.0 | 10.3 | |
| 55. | 88+018 | Slab | 1X1.5 | 6.3 | |
| 56. | 88+121 | Slab | 1X2.0 | 7 | |
| 57. | 88+182 | Slab | 1X1.5 | 5.5 | |
| 58. | 88+535 | Pipe | 1X1.0 | 13.3 | |
| 59. | 88+825 | Pipe | 1X1.0 | 12.7 | |

| | | | | | |
|---|---|---|---|---|---|
| 60. | 89+100 | Pipe | 1X1.0 | 14.5 | |
| 61. | 89+258 | Slab | 1X1.5 | 6.3 | |
| 62. | 89+525 | Slab | 1X2.0 | 6.5 | |
| 63. | 89+650 | Pipe | 1X1.0 | 14.7 | |
| 64. | 90+116 | Pipe | 1X1.0 | 13 | |
| 65. | 90+533 | Pipe | 1X1.0 | 9.5 | |
| 66. | 90+785 | Pipe | 1X1.0 | 10.3 | |
| 67. | 90+858 | not visible | not visible | 15 | |
| 68. | 91+033 | Slab | 1X3.0 | 7.5 | |
| 69. | 91+588 | Slab | 1X1.5 | 7.1 | |
| 70. | 91+788 | Slab | 1X1.0 | 6.7 | |
| 71. | 91+975 | Slab | 1X1.0 | 6.4 | |
| 72. | 92+158 | Slab | 1X1.0 | 7.2 | |
| 73. | 92+407 | Slab | 1X1.0 | 6.2 | |
| 74. | 92+547 | Slab | 1X1.0 | 7.2 | |
| 75. | 92+875 | Slab | 1X1.0 | 6.5 | |
| 76. | 93+037 | Slab | 1X1.0 | 6.2 | |
| 77. | 93+452 | Slab | 1X1.5 | 6.6 | |
| 78. | 93+687 | Slab | 1X1.0 | 6.3 | |
| 79. | 93+932 | Slab | 1X1.0 | 7.2 | |
| 80. | 94+349 | Slab | 1X1.5 | 6.9 | |
| 81. | 94+455 | Slab | 1X1.0 | 7.1 | |
| 82. | 94+530 | Slab | 1X1.0 | 8 | |
| 83. | 94+640 | Pipe | 1X0.9 | 10.8 | |
| 84. | 94+978 | Pipe | 1X1.0 | 9.7 | |
| 85. | 96+480 | Pipe | 1X0.5 | 8.6 | |
| 86. | 96+910 | Slab | 1X1.0 | 7 | |
| 87. | 97+087 | Slab | 1X1.5 | 6.9 | |
| 88. | 97+515 | Slab | 1X1.5 | 7.1 | |
| 89. | 97+600 | Slab | 1X1.0 | 6.2 | |
| 90. | 97+725 | Slab | 1X1.0 | 7.2 | |

11.2 Previous Contractor has been completed Box Culvert 73Nos. at site. The following locations and types.

| Sl No. | Existing Chainage (km) | Type of Structure | Span/Dia (m) | Width of Structure | Remarks |
|---|---|---|---|---|---|
| 1. | 64+005 | Box | 1.5x1.5 | 12 | New Constructed |
| 2. | 64+350 | Box | 1.5x1.5 | 12 | New Constructed |
| 3. | 64+560 | Box | 1.5x1.5 | 12 | New Constructed |
| 4. | 64+770 | Box | 1.5x1.5 | 12 | New Constructed |

| | | | | | |
|---|---|---|---|---|---|
| 5. | 64+900 | Box | 3x3 | 12 | New Constructed |
| 6. | 65+130 | Box | 1.5x1.5 | 12 | New Constructed |
| 7. | 65+590 | Box | 1.5x1.5 | 12 | New Constructed |
| 8. | 65+690 | Box | 1.5x1.5 | 12 | New Constructed |
| 9. | 66+527 | Box | 1.5x1.5 | 12 | New Constructed |
| 10. | 66+660 | Box | 3x3 | 12 | New Constructed |
| 11. | 66+947 | Box | 2x2 | 12 | New Constructed |
| 12. | 67+130 | Box | 1.5x1.5 | 12 | New Constructed |
| 13. | 67+320 | Box | 1.5x1.5 | 6 | New Constructed |
| 14. | 67+645 | Box | 2x2 | 12 | New Constructed |
| 15. | 67+900 | Box | 2x2 | 12 | New Constructed |
| 16. | 67+950 | Box | 2x2 | 12 | New Constructed |
| 17. | 67+990 | Box | 1.5x1.5 | 12 | New Constructed |
| 18. | 68+650 | Box | 2x2 | 12 | New Constructed |
| 19. | 68+720 | Box | 1.5x1.5 | 12 | New Constructed |
| 20. | 68+929 | Box | 3x3 | 12 | New Constructed |
| 21. | 69+020 | Box | 2x2 | 12 | New Constructed |
| 22. | 69+135 | Box | 1.5x1.5 | 12 | New Constructed |
| 23. | 69+201 | Box | 2x2 | 6 | New Constructed |
| 24. | 69+400 | Box | 3x3 | 6 | New Constructed |
| 25. | 69+575 | Box | 2x2 | 12 | New Constructed |
| 26. | 69+700 | Box | 2X2 | 12 | New Constructed |
| 27. | 69+915 | Box | 2x2 | 12 | New Constructed |
| 28. | 69+965 | Box | 2x2 | 12 | New Constructed |
| 29. | 70+166 | Box | 2x2 | 12 | New Constructed |
| 30. | 70+326 | Box | 2x2 | 12 | New Constructed |
| 31. | 70+537 | Box | 1.5x1.5 | 12 | New Constructed |
| 32. | 70+665 | Box | 2x2 | 12 | New Constructed |
| 33. | 70+800 | Box | 1.5x1.5 | 12 | New Constructed |
| 34. | 70+942 | Box | 2x2 | 6 | New Constructed |
| 35. | 71+018 | Box | 2x2 | 6 | New Constructed |
| 36. | 71+330 | Box | 2x2 | 12 | New Constructed |
| 37. | 71+575 | Box | 2X2 | 6 | New Constructed |
| 38. | 71+965 | Box | 2X2 | 6 | New Constructed |
| 39. | 72+037 | Box | 2x2 | 6 | New Constructed |
| 40. | 72+125 | Box | 2x2 | 12 | New Constructed |
| 41. | 72+380 | Box | 2x2 | 12 | New Constructed |
| 42. | 72+984 | Box | 1.5x1.5 | 12 | New Constructed |
| 43. | 73+250 | Box | 2x2 | 12 | New Constructed |
| 44. | 73+840 | Box | 2x2 | 6 | New Constructed |
| 45. | 75+404 | Box | 2x2 | 12 | New Constructed |
| 46. | 75+542 | Box | 2x2 | 12 | New Constructed |
| 47. | 75+652 | Box | 2X2 | 6 | New Constructed |
| 48. | 75+838 | Box | 2x2 | 12 | New Constructed |
| 49. | 75+970 | Box | 2x2 | 12 | New Constructed |

| | | | | | |
|---|---|---|---|---|---|
| 50. | 76+240 | Box | 1.5x1.5 | 12 | New Constructed |
| 51. | 76+402 | Box | 1.5x1.5 | 12 | New Constructed |
| 52. | 76+545 | Box | 2x2 | 12 | New Constructed |
| 53. | 76+846 | Box | 3x3 | 12 | New Constructed |
| 54. | 76+900 | Box | 2x2 | 12 | New Constructed |
| 55. | 77+040 | Box | 1.5x1.5 | 12 | New Constructed |
| 56. | 77+274 | Box | 2x2 | 12 | New Constructed |
| 57. | 77+449 | Box | 1.5x1.5 | 12 | New Constructed |
| 58. | 77+640 | Box | 1.5x1.5 | 12 | New Constructed |
| 59. | 77+740 | Box | 2x2 | 12 | New Constructed |
| 60. | 77+920 | Box | 1.5x1.5 | 12 | New Constructed |
| 61. | 78+104 | Box | 2x2 | 6 | New Constructed |
| 62. | 78+450 | Box | 1.5x1.5 | 12 | New Constructed |
| 63. | 78+740 | Box | 1.5x1.5 | 12 | New Constructed |
| 64. | 78+900 | Box | 2x2 | 12 | New Constructed |
| 65. | 79+231 | Box | 3x3 | 12 | New Constructed |
| 66. | 79+520 | Box | 3x3 | 6 | New Constructed |
| 67. | 79+700 | Box | 1.5x1.5 | 12 | New Constructed |
| 68. | 79+820 | Box | 2x2 | 12 | New Constructed |
| 69. | 79+900 | Box | 2x2 | 12 | New Constructed |
| 70. | 80+015 | Box | 3x3 | 12 | New Constructed |
| 71. | 80+086 | Box | 3x3 | 12 | New Constructed |
| 72. | 80+994 | Box | 3x3 | 6 | New Constructed |
| 73. | 82+486 | Box | 2X2 | 6 | New Constructed |

12. **Bus shelters**

| Sl No. | Road Segment | Existing Chainage (km) | length | left hand side | right hand side |
|---|---|---|---|---|---|
| Nil | | | | | |

13. **Truck lay bye**

| Sl No. | Road Segment | Existing Chainage (km) | length | left hand side | right hand side |
|---|---|---|---|---|---|
| Nil | | | | | |

14. **Road side drain**

The details of the road side drains on the site are as follows.

| Sl No. | Existing Chainage (km) | | Side | Type | | Remarks |
|---|---|---|---|---|---|---|
| | from | To | | Masonry | Earthen(katcha) | |
| 1. | 90+500 | 91+100 | left | | Earthen(katcha) | |
| 2. | 94+500 | 94+700 | left | Masonry | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 3. | 94+900 | 95+400 | right | Masonry | | |
| 4. | 95+700 | 95+800 | right | Masonry | | |
| 5. | 95+800 | 96+000 | left | Masonry | | |
| 6. | 96+100 | 96+500 | left | | Earthen(katcha) | |

15. **Major Junctions**

The details of the major junctions are as follows.

| Sl No. | Location | | At Grade | Separated | Type | | | | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| | Ex. Km | Design km | | | NH | SH | MDR | Other | |
| Nil | | | | | | | | | |

16. **Minor Junctions**

The details of the minor junctions are as follows.

| Sl No. | Existing chainage (km) | Design Chainage | Type | |
|---|---|---|---|---|
| | | | T Junction | Cross road both sides |
| 1. | 84+450 | 74+150 | T Junction | |
| 2. | 94+520 | 83+500 | T Junction | |
| 3. | 94+670 | 83+650 | T Junction | |
| 4. | 94+675 | 83+655 | T Junction | |
| 5. | 95+125 | 84+110 | T Junction | |
| 6. | 95+190 | 84+175 | T Junction | |
| 7. | 95+192 | 84+177 | T Junction | |
| 8. | 95+195 | 84+180 | T Junction | |
| 9. | 95+245 | 84+240 | T Junction | |
| 10. | 95+450 | 84+245 | T Junction | |
| 11. | 95+595 | 84+600 | T Junction | |
| 12. | 95+630 | 84+640 | T Junction | |
| 13. | 95+965 | 84+970 | T Junction | |
| 14. | 96+060 | 85+050 | T Junction | |
| 15. | 96+340 | 85+350 | T Junction | |
| 16. | 96+650 | 85+575 | T Junction | |
| 17. | 97+075 | 85+855 | T Junction | |

17. **Bypasses**

The details of bypass are as follows.

| S.no. | Name Of Proposed Bypass | Road Segment | Existing Chainage | | length | Carriageway | |
|---|---|---|---|---|---|---|---|
| | | | from | to | | width | type |
| NIL | | | | | | | |

18. **Other Structures/Details**

The details of other structures are as follows.

| S.no. | Type | Existing Chainage | length | width |
|---|---|---|---|---|
| NIL | | | | |

**Annex - II**

*(Schedule-A)*

**Dates for providing Right of Way**

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

| Sl. No | Design Chainage | | Length (Km) | Proposed ROW Width (m) | Date of Providing proposed ROW |
|---|---|---|---|---|---|
| | From | To | | | |
| i) 90% of ROW (full width) | 63+800 | 86+835 | 23.035 | Varying ROW from minimum 24 m to maximum 45 m at different locations as per cross section in DPR | At Appointment Date |
| ii) Balance Right of way (width) | 63+800 | 86+835 | 23.035 | Varying ROW from minimum 24 m to maximum 45 m at different locations as per cross section in DPR | Within 150 days after the Appointed Date |

Annex - III
*(Schedule-A)*

## Alignment Plans

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

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

ii) Traffic Signage plan of the Project Highway showing numbers & location of traffic signs is enclosed. The contractor shall, however, improve/upgrade upon the traffic signage plan as indicated in Annex-III based on site/design requirement as per IRC: SP: 99 & IRC: 67 and other IRC codes or manuals, if applicable

Annex - IV
*(Schedule-A)*

**Environment Clearances**

As per notification of MOEF F.O. 2559(E) dated 22/08/2013, the project will not attract Environmental Clearance

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

Rehabilitation and augmentation shall include [Two-Lane and strengthening] of the Project Highway as described in Annex-I of this Schedule-B and in Schedule-C.

### 3. Specifications and Standards

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

# Annex – I
# (Schedule – B)

## Description of Two Lanning

The particulars specified in this Schedule-B are listed below as per the requirements of the Manual of Specifications and Standards for Two Laning of Highways (IRC SP:73-2015), referred to as the manual. If any standards, specifications or details are not given in the manual, the minimum design/constructionrequirements are specified in this Schedule or Schedule D.

Refer remarks column of table under Para 1.1 of Annex – I of Schedule A, construction carried out by previous contractor has been indicated. The contractor has to satisfy himself about the site conditions, quantity and quality of work done. He will be accordingly fully responsible for further requirement of design and construction of 2 lane with hard shoulders.

### 1. Widening of The Existing Highway

**1.1.** The Project Highway shall follow the existing alignment unless otherwise specified by the Authority and shown in the alignment plans specified in Annex-III of Schedule – A. Geometric deficiencies, if any, in the existing horizontal and vertical profiles shall be corrected as per the prescribed standards for [plain/rolling/hilly] terrain to the extend land available.

### 1.2. Width of Carriageway

**1.2.1.** Two Laning with hard shoulders shall be undertaken. The paved carriageway shall be 7 (Seven) m wide in accordance with the typical cross-sections drawings in the manual.

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

| Sr. No. | Built-up stretch (Township) | Location (Design Chainage) | | Width (M) | Typical Cross Section |
|---|---|---|---|---|---|
| | | From (Km) | To (Km) | | |
| 1 | Tanhai | 66+075 | 68+335 | 10 | TCS IV & V |
| 2 | Lengnyu | 78+210 | 78+410 | 10 | |
| 3 | Mon | 82+650 | 86+835 | 10 | |

Balance work of Construction of Two-lane with hard shoulders of Merangkong-Tamlu-Mon Road on EPC basis from existing Km 76.640 to Km 98.065 [Design Km. 63.800 to Km. 86.835] (Design length-23.035 km) in the state of Nagaland under SARDP-NE Phase A**"**

**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.

**1.2.3.** On horizontal curves with radius upto 300 m width of pavement and Roadway shall be increased as follows:-

| Sr. No. | Radius of Curve (M) | Extra width of Carriageway (M) |
|---|---|---|
| 1 | 21 to 40 | 1.5 |
| 2 | 41 to 60 | 1.2 |
| 3 | 61 to 100 | 0.9 |
| 4 | 101 to 300 | 0.6 |

**1.2.4** At hairpin bends the roadway width of 11.5 m should be surfaced as per section 13.4 of the Manual for minimum length of 50m.

**1. Geometric Design and General Features**

**2.1. General**

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

**2.2. Design Speed**

The design speed shall be as per IRC SPP 73: 2015 however in exceptional cases the minimum design speed can be 30 Km per hour for hilly and mountainous terrain and 20 Km per hour for hair pin bend locations.

**2.3 Improvement of the Existing Road Geometrics**

In the following sections, where improvement of the existing road geometrics to the prescribed standards is not possible, the existing road geometrics shall be improved to the extent possible in accordance with section 13 of the Manual within the given right of way and proper road signs and safety measures shall be provided and in other sections it shall be designed in accordance with section 2 of the manual.

| Sr. No. | Design Chainage (M) | | Side | Type of Deficiency | Remarks |
|---|---|---|---|---|---|
| | From | To | | | |

Balance work of Construction of Two-lane with hard shoulders of Merangkong-Tamlu-Mon Road on EPC basis from existing Km 76.640 to Km 98.065 [Design Km. 63.800 to Km. 86.835] (Design length-23.035 km) in the state of Nagaland under SARDP-NE Phase A**"**

| Sr. No. | Design Chainage (M) | | Side | Type of Deficiency | Remarks |
|---|---|---|---|---|---|
| | From | To | | | |
| 1. | 64322.56 | 64381.89 | Left | Radius<40 | |
| 2. | 64381.89 | 64441.87 | Right | Radius<40 | |
| 3. | 64482.91 | 64518.23 | Left | Radius<40 | |
| 4. | 64616.96 | 64695.26 | Left | Radius<40 | |
| 5. | 66360.13 | 66435.07 | Left | Radius<40 | |
| 6. | 66435.07 | 66506.46 | Right | Radius<40 | |
| 7. | 66546.96 | 66577.84 | Left | Radius<40 | |
| 8. | 69940.31 | 70003.85 | Left | Radius<40 | |
| 9. | 70313.88 | 70379.81 | Left | Radius<40 | |
| 10. | 70893.14 | 70953.05 | Right | Radius<40 | |
| 11. | 71429.76 | 71474.51 | Right | Radius<40 | |
| 12. | 72066.87 | 72127.27 | Right | Radius<40 | |
| 13. | 72824.77 | 72886.36 | Right | Radius<40 | |
| 14. | 72960.88 | 73024.56 | Left | Radius<40 | |
| 15. | 73684.59 | 73739.82 | Right | Radius<40 | |
| 16. | 76258.75 | 76330.76 | Right | Radius<40 | |
| 17. | 76391.33 | 76453.13 | Right | Radius<40 | |
| 18. | 76611.30 | 76710.85 | Left | Radius<40 | |
| 19. | 77072.18 | 77137.61 | Left | Radius<40 | |
| 20. | 77557.61 | 77617.19 | Left | Radius<40 | |

Balance work of Construction of Two-lane with hard shoulders of Merangkong-Tamlu-Mon Road on EPC basis from existing Km 76.640 to Km 98.065 [Design Km. 63.800 to Km. 86.835] (Design length-23.035 km) in the state of Nagaland under SARDP-NE Phase A**"**

| Sr. No. | Design Chainage (M) | | Side | Type of Deficiency | Remarks |
|---|---|---|---|---|---|
| | From | To | | | |
| 21. | 78431.95 | 78509.08 | Left | Radius<40 | |
| 22. | 78614.42 | 78673.22 | Right | Radius<40 | |
| 23. | 78956.46 | 79113.28 | Right | Radius<40 | |
| 24. | 79113.28 | 79181.23 | Left | Radius<40 | |
| 25. | 80046.15 | 80105.41 | Right | Radius<40 | |
| 26. | 80288.09 | 80343.62 | Left | Radius<40 | |
| 27. | 80582.27 | 80642.63 | Left | Radius<40 | |
| 28. | 80642.63 | 80706.11 | Right | Radius<40 | |
| 29. | 81129.14 | 81197.08 | Left | Radius<40 | |
| 30. | 81251.19 | 81332.47 | Right | Radius<40 | |
| 31. | 81640.96 | 81684.00 | Right | Radius<40 | |
| 32. | 82419.46 | 82477.28 | Right | Radius<40 | |
| 33. | 82562.32 | 82609.26 | Left | Radius<40 | |
| 34. | 82798.79 | 82842.93 | Left | Radius<40 | |
| 35. | 82893.21 | 82913.01 | Left | Radius<40 | |
| 36. | 82913.01 | 82933.70 | Right | Radius<40 | |
| 37. | 83141.80 | 83155.95 | Left | Radius<40 | |
| 38. | 83175.25 | 83196.29 | Left | Radius<40 | |
| 39. | 83238.02 | 83251.59 | Right | Radius<40 | |
| 40. | 83292.06 | 83339.02 | Right | Radius<40 | |

Balance work of Construction of Two-lane with hard shoulders of Merangkong-Tamlu-Mon Road on EPC basis from existing Km 76.640 to Km 98.065 [Design Km. 63.800 to Km. 86.835] (Design length-23.035 km) in the state of Nagaland under SARDP-NE Phase A”

| Sr. No. | Design Chainage (M) | | Side | Type of Deficiency | Remarks |
|---|---|---|---|---|---|
| | From | To | | | |
| 41. | 83355.01 | 83372.09 | Left | Radius<40 | |
| 42. | 83380.20 | 83392.52 | Right | Radius<40 | |
| 43. | 83411.39 | 83425.47 | Left | Radius<40 | |
| 44. | 83439.66 | 83463.38 | Right | Radius<40 | |
| 45. | 83490.14 | 83518.43 | Left | Radius<40 | |
| 46. | 83634.60 | 83687.90 | Right | Radius<40 | |
| 47. | 83733.72 | 83768.20 | Left | Radius<40 | |
| 48. | 84046.00 | 84078.96 | Left | Radius<40 | |
| 49. | 84373.77 | 84392.69 | Left | Radius<40 | |
| 50. | 84406.88 | 84431.19 | Right | Radius<40 | |
| 51. | 84517.84 | 84548.64 | Right | Radius<40 | |
| 52. | 84587.00 | 84613.77 | Left | Radius<40 | |
| 53. | 84634.89 | 84670.54 | Right | Radius<40 | |
| 54. | 85164.04 | 85191.81 | Left | Radius<40 | |
| 55. | 85216.43 | 85238.74 | Right | Radius<40 | |
| 56. | 85451.62 | 85471.19 | Left | Radius<40 | |
| 57. | 85518.42 | 85530.41 | Left | Radius<40 | |
| 58. | 85570.04 | 85604.21 | Left | Radius<40 | |
| 59. | 85633.64 | 85658.38 | Right | Radius<40 | |
| 60. | 85839.27 | 85860.74 | Right | Radius<40 | |

Balance work of Construction of Two-lane with hard shoulders of Merangkong-Tamlu-Mon Road on EPC basis from existing Km 76.640 to Km 98.065 [Design Km. 63.800 to Km. 86.835] (Design length-23.035 km) in the state of Nagaland under SARDP-NE Phase A**"**

| Sr. No. | Design Chainage (M) | | Side | Type of Deficiency | Remarks |
|---|---|---|---|---|---|
| | From | To | | | |
| 61. | 85904.02 | 85948.45 | Right | Radius<40 | |
| 62. | 86049.86 | 86067.20 | Left | Radius<40 | |
| 63. | 86259.75 | 86284.52 | Left | Radius<40 | |
| 64. | 86340.48 | 86382.37 | Left | Radius<40 | |
| 65. | 86398.19 | 86426.10 | Right | Radius<40 | |
| 66. | 86551.42 | 86573.10 | Right | Radius<40 | |
| 67. | 86662.29 | 86703.67 | Right | Radius<40 | |
| 68. | 86703.67 | 86769.81 | Left | Radius<40 | |
| 69. | 86769.81 | 86788.81 | Left | Radius<40 | |

### 2.3.1 Improvement due to Realignments:

| Sr. No. | Existing Chainage (Km) | | Length (M) | Design Chainage (Km) | | Length (M) |
|---|---|---|---|---|---|---|
| | From | To | | From | To | |
| 1. | 65+145 | 73+400 | 8255 | - | - | - |
| 2. | 73+960 | 73+995 | 35 | 64+330 | 64+360 | 30 |
| 3. | 74+090 | 74+160 | 70 | 64+450 | 64+510 | 60 |
| 4. | 74+330 | 74+430 | 100 | 64+660 | 64+750 | 90 |
| 5. | 74+920 | 74+960 | 40 | 65+245 | 65+275 | 30 |
| 6. | 75+280 | 75+410 | 130 | 65+600 | 65+710 | 110 |
| 7. | 76+480 | 76+710 | 230 | 66+750 | 66+930 | 180 |
| 8. | 76+830 | 77+000 | 170 | 67+050 | 67+200 | 150 |

Balance work of Construction of Two-lane with hard shoulders of Merangkong-Tamlu-Mon Road on EPC basis from existing Km 76.640 to Km 98.065 [Design Km. 63.800 to Km. 86.835] (Design length-23.035 km) in the state of Nagaland under SARDP-NE Phase A**"**

| Sr. No. | Existing Chainage (Km) | | Length (M) | Design Chainage (Km) | | Length (M) |
|---|---|---|---|---|---|---|
| | From | To | | From | To | |
| 9. | 77+200 | 77+265 | 65 | 67+390 | 67+445 | 55 |
| 10. | 77+420 | 77+520 | 100 | 67+605 | 67+700 | 95 |
| 11. | 77+620 | 77+820 | 200 | 67+810 | 67+960 | 150 |
| 12. | 77+890 | 77+920 | 30 | 68+030 | 68+060 | 30 |
| 13. | 78+270 | 78+320 | 50 | 68+405 | 68+450 | 45 |
| 14. | 78+360 | 78+470 | 110 | 68+495 | 68+595 | 100 |
| 15. | 79+000 | 79+130 | 130 | 69+130 | 69+245 | 115 |
| 16. | 79+220 | 79+270 | 50 | 69+330 | 69+375 | 45 |
| 17. | 79+440 | 79+570 | 130 | 69+550 | 69+650 | 100 |
| 18. | 79+670 | 79+860 | 190 | 69+740 | 69+910 | 170 |
| 19. | 80+080 | 80+160 | 80 | 70+135 | 70+190 | 55 |
| 20. | 80+220 | 80+370 | 150 | 70+250 | 70+310 | 60 |
| 21. | 80+530 | 80+590 | 60 | 70+475 | 70+515 | 40 |
| 22. | 80+860 | 81+220 | 360 | 70+790 | 71+060 | 270 |
| 23. | 81+470 | 81+585 | 115 | 71+300 | 71+400 | 100 |
| 24. | 81+620 | 81+690 | 70 | 71+440 | 71+500 | 60 |
| 25. | 82+125 | 82+320 | 195 | 71+950 | 72+100 | 150 |
| 26. | 83+040 | 83+120 | 80 | 72+800 | 72+865 | 65 |
| 27. | 83+220 | 83+270 | 50 | 72+965 | 73+005 | 40 |
| 28. | 83+540 | 83+600 | 60 | 73+255 | 73+305 | 50 |

Balance work of Construction of Two-lane with hard shoulders of Merangkong-Tamlu-Mon Road on EPC basis from existing Km 76.640 to Km 98.065 [Design Km. 63.800 to Km. 86.835] (Design length-23.035 km) in the state of Nagaland under SARDP-NE Phase A**"**

| Sr. No. | Existing Chainage (Km) | | Length (M) | Design Chainage (Km) | | Length (M) |
|---|---|---|---|---|---|---|
| | From | To | | From | To | |
| 29. | 83+940 | 84+090 | 150 | 73+650 | 73+760 | 110 |
| 30. | 84+180 | 84+240 | 60 | 73+850 | 73+905 | 55 |
| 31. | 84+600 | 84+660 | 60 | 74+255 | 74+295 | 40 |
| 32. | 85+060 | 85+310 | 250 | 74+735 | 74+920 | 185 |
| 33. | 85+360 | 85+770 | 410 | 74+970 | 75+260 | 290 |
| 34. | 85+900 | 86+160 | 260 | 75+390 | 75+555 | 165 |
| 35. | 86+200 | 86+360 | 160 | 75+600 | 75+690 | 90 |
| 36. | 86+475 | 86+570 | 95 | 75+800 | 75+870 | 70 |
| 37. | 86+750 | 86+820 | 70 | 76+050 | 76+110 | 60 |
| 38. | 87+130 | 87+180 | 50 | 76+400 | 76+445 | 45 |
| 39. | 87+330 | 87+400 | 70 | 76+600 | 76+660 | 60 |
| 40. | 87+940 | 88+320 | 380 | 77+190 | 77+500 | 310 |
| 41. | 88+380 | 88+550 | 170 | 77+560 | 77+700 | 140 |
| 42. | 88+700 | 88+890 | 190 | 77+850 | 78+000 | 150 |
| 43. | 89+390 | 89+440 | 50 | 78+500 | 78+54 | 40 |
| 44. | 89+470 | 89+640 | 170 | 78+565 | 78+705 | 140 |
| 45. | 89+690 | 89+750 | 60 | 78+750 | 78+790 | 40 |
| 46. | 89+870 | 89+990 | 120 | 78+945 | 79+110 | 165 |
| 47. | 90+540 | 90+600 | 60 | 79+650 | 79+700 | 50 |
| 48. | 90+650 | 91+170 | 520 | 79+750 | 80+160 | 410 |

Balance work of Construction of Two-lane with hard shoulders of Merangkong-Tamlu-Mon Road on EPC basis from existing Km 76.640 to Km 98.065 [Design Km. 63.800 to Km. 86.835] (Design length-23.035 km) in the state of Nagaland under SARDP-NE Phase A”

| Sr. No. | Existing Chainage (Km) | | Length (M) | Design Chainage (Km) | | Length (M) |
|---|---|---|---|---|---|---|
| | From | To | | From | To | |
| 49. | 91+330 | 91+420 | 90 | 80+340 | 80+420 | 80 |
| 50. | 91+600 | 91+660 | 60 | 80+600 | 80+640 | 40 |
| 51. | 91+760 | 91+820 | 60 | 80+750 | 80+800 | 50 |
| 52. | 92+105 | 92+240 | 135 | 81+095 | 81+200 | 105 |
| 53. | 92+290 | 92+350 | 60 | 81+250 | 81+305 | 55 |
| 54. | 92+580 | 92+770 | 190 | 81+540 | 81+760 | 220 |
| 55. | 92+880 | 93+005 | 125 | 81+870 | 81+965 | 95 |
| 56. | 93+480 | 93+520 | 40 | 82+440 | 82+465 | 25 |

## 2.4. Proposed Right of Way

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

Contractor has to design and construct the road, if required by provision of retaining walls and/or breast walls/slope stabilization/protection measures within the right of way given above and provision of the same shall not constitute a change of scope.

## 2.5 Type of Shoulders

(a) In built-up sections, footpaths/fully paved shoulders shall be provided in accordance with clause 1.2.1 above.
(b) In open country, Hard Shoulders with GSB having thickness of 200mm, total 3 m wide including both sides shall be provided and balance width shall be covered with 150 mm thick compacted layer of granular material.
(c) Design and specifications of paved shoulders and granular material shall conform to the requirements specified in paragraphs 5.10 and 5.11 of the Manual.

## 2.6 Lateral and vertical clearances at underpasses

**2.6.1** Lateral and Vertical clearances at underpasses and provision of guardrails/crash barriers shall be as per paragraph 2.10 of the manual.

**2.6.2 Lateral Clearance:** The width of the opening at the underpasses shall be as follow:

| Sr. No. | Location (Chainage (Km) | | Span/Opening (M) | Remarks |
|---|---|---|---|---|
| | From | To | | |
| 1. | Nil | | | |

**2.7. Lateral and Vertical Clearances at overpasses**

**2.7.1.** Lateral and Vertical Clearances at overpasses shall be as per paragraph 2.11 of the Manual.

**2.7.2** Lateral Clearance: The width of the opening at the overpasses shall be as follows;

| Sr. No | Location [Chainage Km] | | Span/Opening | Remark |
|---|---|---|---|---|
| | From | To | | |
| 1. | Nil | | | |

**2.8. Services Roads**

**Services roads shall be constructed at the locations and for the lengths indicated below: [Refer to paragraph 2.12 of the Manual and provide details]**

| Sr. No | Location of Service Road | | Right Hand side(RHS)/Left Hand side(LHS)/Both Sides | Length (Km) of Services Road |
|---|---|---|---|---|
| | From | To | | |
| Nil | | | | |

**2.9. Grade Separated Structures**

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

| Sr.No. | Location of Structure | Length (M) | Number and Length of Spans (M) | Approach Gradient | Remarks, if any |
|---|---|---|---|---|---|
| Nil | | | | | |

**2.9.2** In the case of grade separated structures, the type of structure and the level of the Project Highway and the cross roads shall be as follows: [Refer to paragraphs 2.13.1 of the Manual and specify the type of vehicular under pass/overpass structure and whether the cross road is to be carried at the existing level, raised or lowered].

| Sr. No. | Location | Type of Structure/Length (M) | Cross Road at | | | Remarks, if any |
|---|---|---|---|---|---|---|
| | | | Existing Level | Raised Level | Lowered Level | |

Balance work of Construction of Two-lane with hard shoulders of Merangkong-Tamlu-Mon Road on EPC basis from existing Km 76.640 to Km 98.065 [Design Km. 63.800 to Km. 86.835] (Design length-23.035 km) in the state of Nagaland under SARDP-NE Phase A**"**

| Nil |
|---|

## 2.10 Cattle and pedestrian underpass / Overpass

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

| Sr. No. | Location | Type of Crossing |
|---|---|---|
| Nil | | |

## 2.11Typical cross-sections of the Project Highway

The proposed cross sections for various situations are given in Fig.B-1 to B-6. These illustrate the cross sectional improvement proposals for the project highway. The Project Highway (length 23.035 km) shall be 2-lane carriageway with 3 m wide Hard shoulders facility including both sides.

Following typical cross sections shall be provided for the Project Highway However to be designed as per manual.

TCS I (a): Typical Cross Section for project road sections in Hill / Valley locations
TCS I (b): Typical Cross Section for Project Road Sections requiring Fill on Valley Side
TCS II: Typical Cross Section for project road section on ridge
TCS Ill: Typical Cross Section for Project Road Sections through Box Cut Locations
TCS IV: Typical Cross Section for Project Road Section through Town with Hill Valley Combination
TCS V: Typical Cross Section for Project Road Section through Town on Ridge

The cross section schedule shall be as follows:

| Sr. No. | Chainage (Km) | | Length(M) | Type | Remarks |
|---|---|---|---|---|---|
| | From | To | | | |
| 1. | 63+800 | 63+865 | 65 | I | |
| 2. | 63+865 | 63+910 | 45 | II | |
| 3. | 63+910 | 63+940 | 30 | I | |
| 4. | 63+940 | 64+040 | 100 | II | |
| 5. | 64+040 | 66+045 | 2005 | I | |
| 6. | 66+045 | 66+120 | 75 | II | |

Balance work of Construction of Two-lane with hard shoulders of Merangkong-Tamlu-Mon Road on EPC basis from existing Km 76.640 to Km 98.065 [Design Km. 63.800 to Km. 86.835] (Design length-23.035 km) in the state of Nagaland under SARDP-NE Phase A"

| Sr. No. | Chainage (Km) | | Length(M) | Type | Remarks |
|---|---|---|---|---|---|
| | From | To | | | |
| 7. | 66+120 | 66+380 | 260 | I | |
| 8. | 66+380 | 66+400 | 20 | II | |
| 9. | 66+400 | 68+200 | 1800 | I | |
| 10. | 68+200 | 68+260 | 60 | II | |
| 11. | 68+260 | 69+350 | 1090 | I | |
| 12. | 69+350 | 69+370 | 20 | III | |
| 13. | 69+370 | 70+030 | 660 | I | |
| 14. | 70+030 | 74+200 | 4170 | I | |
| 15. | 74+200 | 74+210 | 10 | III | |
| 16. | 74+210 | 74+300 | 90 | I | |
| 17. | 74+300 | 74+315 | 15 | III | |
| 18. | 74+315 | 74+505 | 190 | I | |
| 19. | 74+505 | 74+525 | 20 | III | |
| 20. | 74+525 | 74+710 | 185 | I | |
| 21. | 74+710 | 75+070 | 360 | III | |
| 22. | 75+070 | 75+100 | 30 | I | |
| 23. | 75+100 | 75+350 | 250 | III | |
| 24. | 75+350 | 75+370 | 20 | I | |
| 25. | 75+370 | 75+480 | 110 | III | |
| 26. | 75+480 | 75+510 | 30 | I | |

Balance work of Construction of Two-lane with hard shoulders of Merangkong-Tamlu-Mon Road on EPC basis from existing Km 76.640 to Km 98.065 [Design Km. 63.800 to Km. 86.835] (Design length-23.035 km) in the state of Nagaland under SARDP-NE Phase A”

| Sr. No. | Chainage (Km) | | Length(M) | Type | Remarks |
|---|---|---|---|---|---|
| | From | To | | | |
| 27. | 75+510 | 75+520 | 10 | II | |
| 28. | 75+520 | 78+650 | 3130 | I | |
| 29. | 78+650 | 78+680 | 30 | I | |
| 30. | 78+680 | 80+340 | 1660 | I | |
| 31. | 80+340 | 81+665 | 1325 | I | |
| 32. | 81+664 | 81+760 | 96 | III | |
| 33. | 81+760 | 81+950 | 190 | I | |
| 34. | 81+950 | 81+965 | 15 | III | |
| 35. | 81+965 | 82+760 | 795 | I | |
| 36. | 82+760 | 86+834 | 4074 | V | |

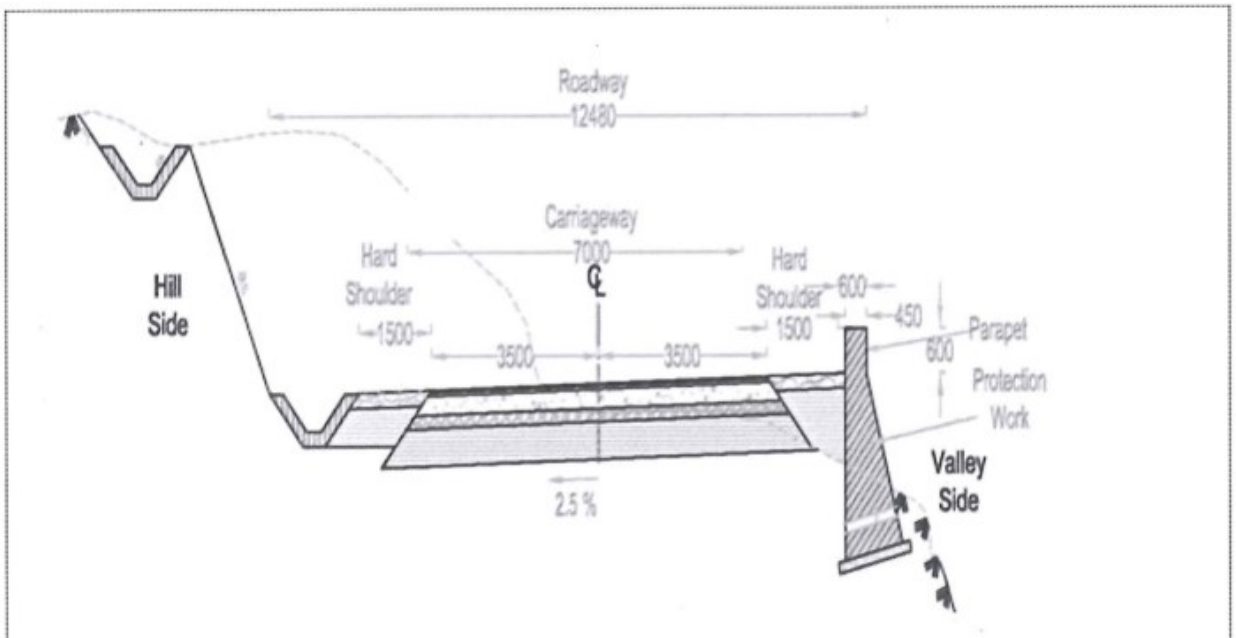


Figure B-2: TCS for Project Road Sections requiring Fill on Valley Side TCS I(b)*

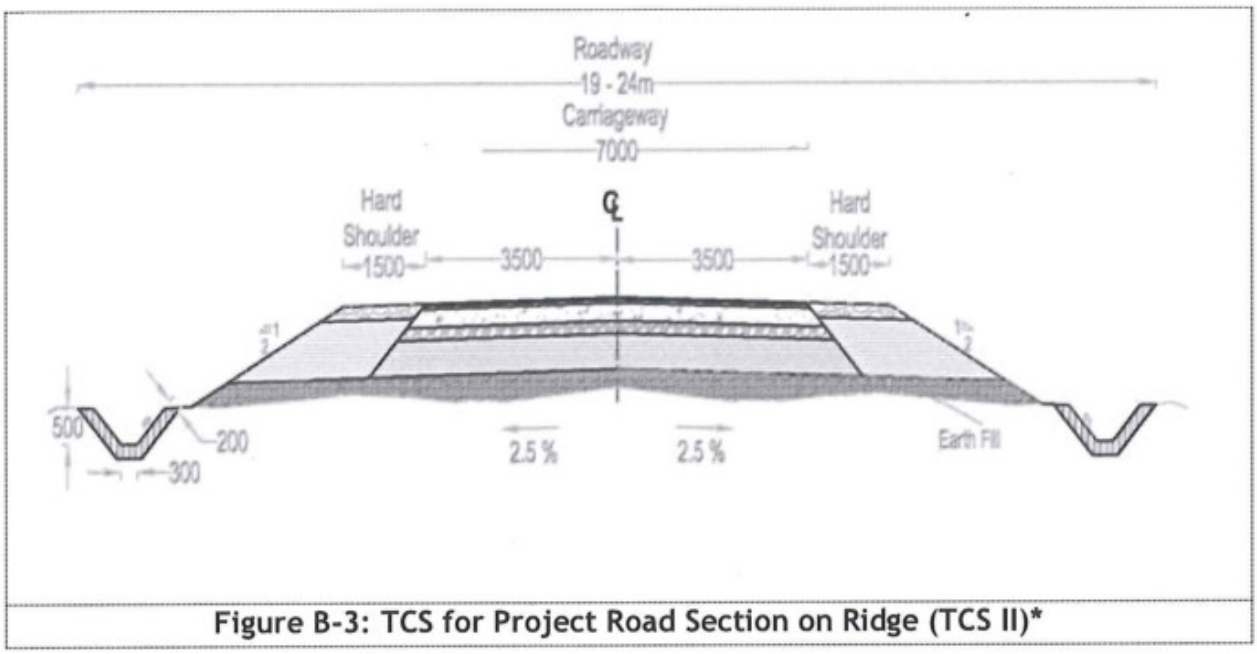


**Figure B-3: TCS for Project Road Section on Ridge (TCS II)***

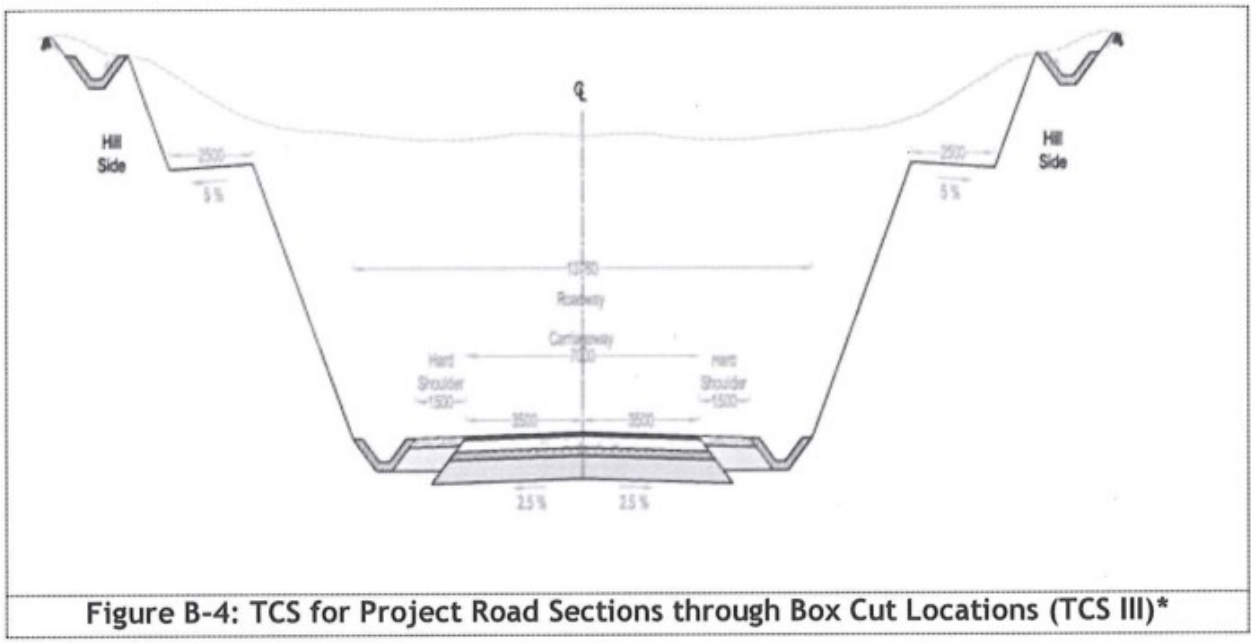


**Figure B-4: TCS for Project Road Sections through Box Cut Locations (TCS III)***

Balance work of Construction of Two-lane with hard shoulders of Merangkong-Tamlu-Mon Road on EPC basis from existing Km 76.640 to Km 98.065 [Design Km. 63.800 to Km. 86.835] (Design length-23.035 km) in the state of Nagaland under SARDP-NE Phase A"

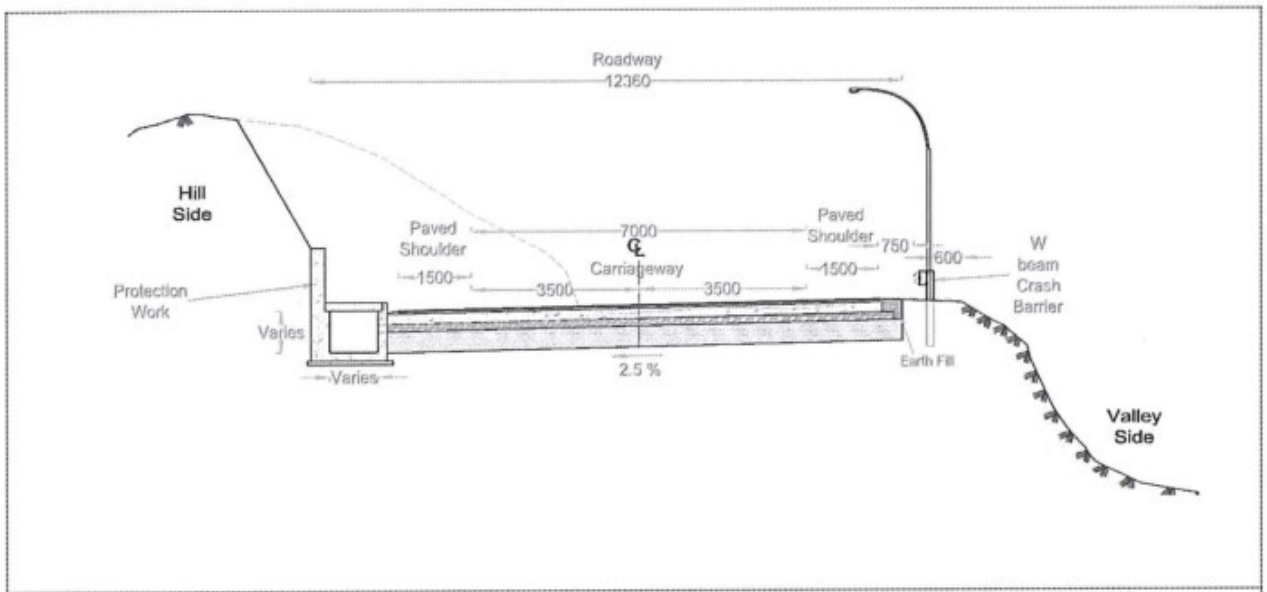


**Figure B-5: TCS for Project Road Section through Town with Hill/Valley Combination (TCS IV)**

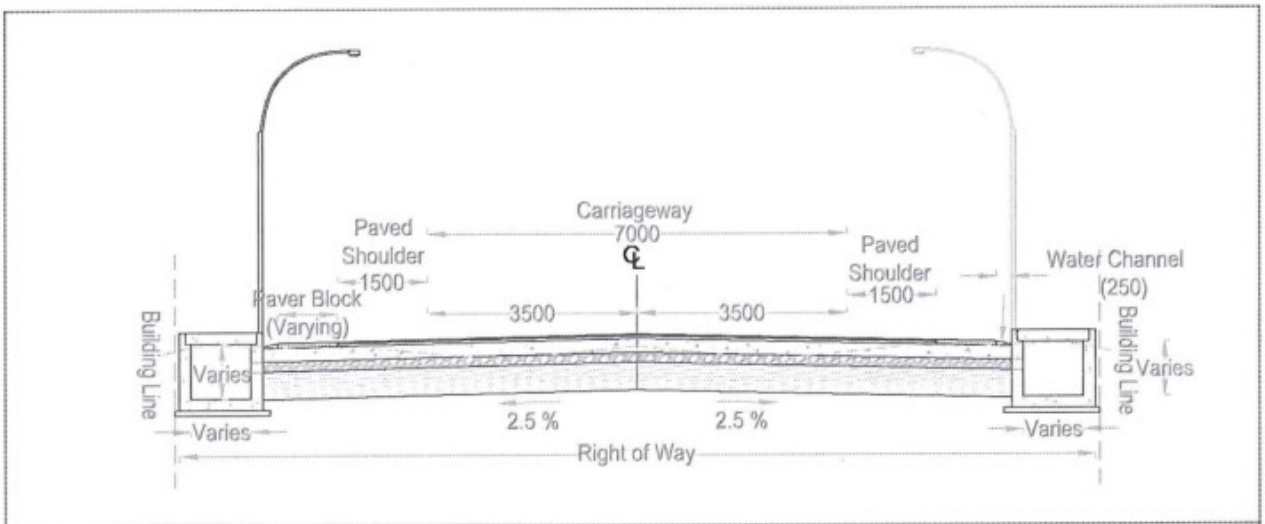


**Figure B-6: TCS for Project Road Section through Town on Ridge (TCS V)**

## 3.0 INTERSECTIONS AND GRADE SEPARATORS

All intersections 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**

**(i) Major Intersections**

Balance work of Construction of Two-lane with hard shoulders of Merangkong-Tamlu-Mon Road on EPC basis from existing Km 76.640 to Km 98.065 [Design Km. 63.800 to Km. 86.835] (Design length-23.035 km) in the state of Nagaland under SARDP-NE Phase A**"**

| Sr. No. | Location of Intersection | Intersection Towards | Type of Intersection | Figure No. | Other Features |
|---|---|---|---|---|---|
| Nil | | | | | |

Details of junction improvements shall be as per IRC SP: 73-2015.

**(ii) Minor Intersections**

| Sr. No. | Location of Intersection (Design Chainage, Km) | Type of Intersection | Side |
|---|---|---|---|
| 1. | 74+150 | T | Left |
| 2. | 83+500 | T | Left |
| 3. | 83+650 | T | Right |
| 4. | 83+655 | T | Left |
| 5. | 84+110 | T | Left |
| 6. | 84+175 | T | Left |
| 7. | 84+177 | T | Left |
| 8. | 84+180 | T | Right |
| 9. | 84+240 | T | Right |
| 10. | 84+245 | T | Right |
| 11. | 84+600 | T | Right |
| 12. | 84+640 | T | Left |
| 13. | 84+970 | T | Right |
| 14. | 85+050 | T | Right |
| 15. | 85+350 | T | Left |
| 16. | 85+575 | T | Right |
| 17. | 85+855 | T | Left / Left |

Details of junction improvements shall be as per IRC SP: 73-2015.

**(b) Grade Separated Intersections with/without Ramps**

| Sr. No. | Location (km) | Salient Features | Minimum Length of Viaduct to be Provided | Road to be carried Over/Under the |
|---|---|---|---|---|

Balance work of Construction of Two-lane with hard shoulders of Merangkong-Tamlu-Mon Road on EPC basis from existing Km 76.640 to Km 98.065 [Design Km. 63.800 to Km. 86.835] (Design length-23.035 km) in the state of Nagaland under SARDP-NE Phase A**"**

| | | | | |
|---|---|---|---|---|
| | | | **(M)** | **Structure** |
| **Nil** | | | | |

## 4.0 ROAD EMBANKMENT AND CUT SECTION

**4.1** Widening and improvement of the existing road embankment/cuttings and construction of new road embankment/ cuttings shall conform to the Specifications and Standards given in section 4 of the Manual and the specified cross sectional details. Deficiencies in the plan and profile of the existing road shall be corrected.

**4.2** Raising of the existing road [Refer to paragraph 4.2 of the Manual and specify sections to be raised]

The existing road shall be raised in the following sections:

| **Sr. No.** | **Section (Km)** | | **Length (Km)** | **Extent of Raising [Top of finished road level]** |
|---|---|---|---|---|
| | **From** | **To** | | |
| **Nil** | | | | |

## 5.0 PAVEMENT DESIGN

**5.1** Pavement design shall be carried out in accordance with section 5 of the Manual.

**5.2Type of pavement**

Flexible pavement shall be adopted for Project Highway. Notwithstanding anything contrary contained in this Agreement or the Manual, the pavement shall be designed as given below.

**5.3 Design Requirements**

The granular layers (base and sub base) shall be designed for minimum 20 msa. The bituminous courses (Dense Bituminous Macadam and Bituminous Concrete) shall be designed for minimum 5 msa. Bituminous Concrete shall be minimum 40 mm thick.

Bituminous Grade VG 40 shall be used for BC.

**5.4 Reconstructions of stretches/ Realignment/ Bypass of sections**

**5.4.1** Deleted

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

| **Sr. No.** | **Existing Section (Km)** | **Remarks** |
|---|---|---|

Balance work of Construction of Two-lane with hard shoulders of Merangkong-Tamlu-Mon Road on EPC basis from existing Km 76.640 to Km 98.065 [Design Km. 63.800 to Km. 86.835] (Design length-23.035 km) in the state of Nagaland under SARDP-NE Phase A**"**

| | From | To | |
|---|---|---|---|
| **1.** | **73+640** | **98+065** | **Poor condition of existing pavement and or Realignment Section** |

**5.4. 3 Rigid Pavement**

No rigid pavement has been considered for the Project Highway.

**6.0 ROAD SIDE DRAINAGE**

Drainage system including surface and subsurface drains for the Project Highway shall be provided as per section 6 of the Manual.
The improvements in the drainage and the slope erosion shall be made as per the following norms:

**6.1 Drainage Measures**

Following measures shall be adopted:

**i)** Minimum length of Road Side Drains= 15516 m
**ii)** Minimum length of lined covered RCC drain with Kerb Channel on Hill Side=8149 m

RCC Lined drains having rectangular shape have also been proposed in urban/semi urban/intersection stretches. The concrete drains shall be covered in reaches along commercial establishments and intersections. The drains outfall into the natural water courses i.e. either in culverts or bridges. Table below gives the location of lined drains.

These are guidelines for minimum provisions. However, contractor has to design as per requirement of road in accordance with manual.

**Details of Drains**

| **. No.** | **Chainage (Km)** | | **ength (M)** | **Remarks** |
|---|---|---|---|---|
| | **From** | **To** | | |
| 1. | 63.800 | 63.865 | 65 | Trapezoidal-shaped PCC Drain on Hill Side |
| 2. | 63.865 | 63.910 | 45 | Trapezoidal-shaped PCC Drain on Hill Side |
| 3. | 63.910 | 63.940 | 30 | Trapezoidal-shaped PCC Drain on Hill Side |
| 4. | 63.940 | 64.040 | 100 | Trapezoidal-shaped PCC Drain on Hill Side |
| 5. | 64.040 | 66.045 | 2005 | Trapezoidal-shaped PCC Drain on Hill Side |

Balance work of Construction of Two-lane with hard shoulders of Merangkong-Tamlu-Mon Road on EPC basis from existing Km 76.640 to Km 98.065 [Design Km. 63.800 to Km. 86.835] (Design length-23.035 km) in the state of Nagaland under SARDP-NE Phase A**"**

| r. No. | Chainage (Km) | | ength (M) | Remarks |
|---|---|---|---|---|
| | From | To | | |
| 6. | 66.045 | 66.120 | 75 | Trapezoidal-shaped PCC Drain on Hill Side |
| 7. | 66.120 | 66.380 | 260 | Trapezoidal-shaped PCC Drain on Hill Side |
| 8. | 66.380 | 66.400 | 20 | Trapezoidal-shaped PCC Drain on Hill Side |
| 9. | 66.400 | 68.200 | 1800 | Trapezoidal-shaped PCC Drain on Hill Side |
| 10. | 68.200 | 68.260 | 60 | Trapezoidal-shaped PCC Drain on Hill Side |
| 11. | 68.260 | 69.350 | 1090 | Trapezoidal-shaped PCC Drain on Hill Side |
| 12. | 69.350 | 69.370 | 20 | Trapezoidal-shaped PCC Drain on Hill Side |
| 13. | 69.370 | 70.030 | 660 | Trapezoidal-shaped PCC Drain on Hill Side |
| 14. | 70.030 | 74.200 | 4170 | Trapezoidal-shaped PCC Drain on Hill Side |
| 15. | 74.200 | 74.210 | 10 | Trapezoidal-shaped PCC Drain on Hill Side |
| 16. | 74.210 | 74.300 | 90 | Trapezoidal-shaped PCC Drain on Hill Side |
| 17. | 74.300 | 74.315 | 15 | Trapezoidal-shaped PCC Drain on Hill Side |
| 18. | 74.315 | 74.505 | 190 | Trapezoidal-shaped PCC Drain on Hill Side |
| 19. | 74.505 | 74.525 | 20 | Trapezoidal-shaped PCC Drain on Hill Side |
| 20. | 74.525 | 74.710 | 185 | Trapezoidal-shaped PCC Drain on Hill Side |
| 21. | 74.710 | 75.070 | 360 | Trapezoidal-shaped PCC Drain on Hill Side |
| 22. | 75.070 | 75.100 | 30 | Trapezoidal-shaped PCC Drain on Hill Side |
| 23. | 75.100 | 75.350 | 250 | Trapezoidal-shaped PCC Drain on Hill Side |
| 24. | 75.350 | 75.370 | 20 | Trapezoidal-shaped PCC Drain on Hill Side |
| 25. | 75.370 | 75.480 | 110 | Trapezoidal-shaped PCC Drain on Hill Side |

Balance work of Construction of Two-lane with hard shoulders of Merangkong-Tamlu-Mon Road on EPC basis from existing Km 76.640 to Km 98.065 [Design Km. 63.800 to Km. 86.835] (Design length-23.035 km) in the state of Nagaland under SARDP-NE Phase A**"**

| r. No. | Chainage (Km) | | ength (M) | Remarks |
|---|---|---|---|---|
| | From | To | | |
| 26. | 75.480 | 75.510 | 30 | Trapezoidal-shaped PCC Drain on Hill Side |
| 27. | 75.510 | 75.520 | 10 | Trapezoidal-shaped PCC Drain on Hill Side |
| 28. | 75.520 | 78.650 | 3130 | Trapezoidal-shaped PCC Drain on Hill Side |
| 29. | 78.650 | 78.680 | 30 | Trapezoidal-shaped PCC Drain on Hill Side |
| 30. | 78.680 | 80.340 | 1660 | Trapezoidal-shaped PCC Drain on Hill Side |
| 31. | 80.340 | 81.665 | 1325 | Trapezoidal-shaped PCC Drain on Hill Side |
| 32. | 81.665 | 81.760 | 95 | Trapezoidal-shaped PCC Drain on Hill Side |
| 33. | 81.760 | 81.950 | 190 | Trapezoidal-shaped PCC Drain on Hill Side |
| 34. | 81.950 | 81.965 | 15 | Trapezoidal-shaped PCC Drain on Hill Side |
| 35. | 81.965 | 82.760 | 795 | Trapezoidal-shaped PCC Drain on Hill Side |
| 36. | 82.760 | 86.834 | 4074 | Trapezoidal-shaped PCC Drain on Hill Side |

**Note: (i) Road side drain shall have wetted area of 0.4 sqm**

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

## 7.0 DESIGN OF STRUCTURES

### 7.1 General

**7.1.1** Project road from Merangkong to Mon from Km. 63.800 to Km.86.835 (design chainages), includes provision of 2 minor bridges (span<60m), and 41 box culverts. 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 per Clause 7. 3 of the Manual.

**7.1.3 All bridges shall be high-level bridges.**

Balance work of Construction of Two-lane with hard shoulders of Merangkong-Tamlu-Mon Road on EPC basis from existing Km 76.640 to Km 98.065 [Design Km. 63.800 to Km. 86.835] (Design length-23.035 km) in the state of Nagaland under SARDP-NE Phase A**"**

**7 .1.4** The following structures shall be designed to carry utility services specified in the table below:

| Sr. No. | Bridge at Km | Utility Services to be Carried | Remarks |
|---|---|---|---|
| **Nil** | | | |

**7. 1. 5** Cross-section of the new culverts and bridges at deck level for the Project Highway shall conform to the typical cross sections given in the section 7 of the Manual.

**7.2 Culverts**

**7.2.1** Overall width of all culverts shall be equal to the roadway width of the approaches. Catch water pit at every culvert location shall be provided as per IRC standard and Breast wall of varying height shall also be provided at the end of catch pit along hill side to protect against hill toe erosion. All box culverts (excluding the box culverts in cushion) shall be provided with approach slabs on both sides.

Minimum no. of box culverts with Span arrangement are given herein under:

| **. No.** | **Span (M)** | **No. of Culverts (New / Reconstruction** | **Culverts (Widening & Repairing)** | **Total** |
|---|---|---|---|---|
| 1. | 1.5 | 11 | 01 | 12 |
| 2. | 2.0 | 18 | 08 | 26 |
| 3. | 3.0 | 12 | 03 | 15 |
| 4. | 4.0 | 00 | 00 | 00 |
| 5. | 5.0 | 01 | 00 | 01 |

**7. 2. 2 Reconstruction of existing culverts**

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

| **Sr. No.** | **isting Chainage (Km)** | **gn Chainage (Km)** | **oposed Span (M)** | **Remark** |
|---|---|---|---|---|
| 1. | 75.084 | 65.425 | 2.00 | |
| 2. | 76.272 | 66.560 | 3.00 | |

Balance work of Construction of Two-lane with hard shoulders of Merangkong-Tamlu-Mon Road on EPC basis from existing Km 76.640 to Km 98.065 [Design Km. 63.800 to Km. 86.835] (Design length-23.035 km) in the state of Nagaland under SARDP-NE Phase A**"**

| Sr. No. | isting Chainage (Km) | gn Chainage (Km) | oposed Span (M) | Remark |
|---|---|---|---|---|
| 3. | 76.715 | 66.945 | 3.00 | |
| 4. | 78.415 | 68.560 | 1.50 | |
| 5. | 79.047 | 69.190 | 2.00 | |
| 6. | 79.431 | 69.565 | 3.00 | |
| 7. | 79.752 | 69.850 | 3.00 | |
| 8. | 82.150 | 72.000 | 3.00 | |
| 9. | 82.262 | 72.095 | 3.00 | |
| 10. | 83.292 | 73.050 | 2.00 | |
| 11. | 83.985 | 73.720 | 5.00 | |
| 12. | 85.358 | 74.840 | 3.00 | |
| 13. | 85.455 | 75.075 | 1.50 | |
| 14. | 86.072 | 75.520 | 3.00 | |
| 15. | 87.268 | 76.560 | 1.50 | |
| 16. | 90.116 | 79.270 | 1.50 | |
| 17. | 91.975 | 80.965 | 2.00 | |
| 18. | 92.158 | 81.160 | 2.00 | |
| 19. | 92.547 | 81.560 | 3.00 | |
| 20. | 92.875 | 81.905 | 2.00 | |
| 21. | 93.037 | 82.045 | 2.00 | |
| 22. | 93.452 | 82.455 | 3.00 | |
| 23. | 93.687 | 82.680 | 3.00 | |

Balance work of Construction of Two-lane with hard shoulders of Merangkong-Tamlu-Mon Road on EPC basis from existing Km 76.640 to Km 98.065 [Design Km. 63.800 to Km. 86.835] (Design length-23.035 km) in the state of Nagaland under SARDP-NE Phase A**"**

| Sr. No. | isting Chainage (Km) | gn Chainage (Km) | pposed Span (M) | Remark |
|---|---|---|---|---|
| 24. | 93.932 | 82.930 | 2.00 | |
| 25. | 94.349 | 83.340 | 2.00 | |
| 26. | 94.455 | 83.450 | 2.00 | |
| 27. | 94.530 | 83.515 | 2.00 | |
| 28. | 94.640 | 83.635 | 1.50 | |
| 29. | 94.978 | 83.990 | 1.50 | |
| 30. | 96.480 | 85.480 | 1.50 | |
| 31. | 96.910 | 85.830 | 2.00 | |
| 32. | 97.087 | 86.007 | 2.00 | |
| 33. | 97.515 | 86.435 | 2.00 | |
| 34. | 97.600 | 86.520 | 2.00 | |
| 35. | 97.725 | 86.645 | 2.00 | |

* All box culverts (excluding the box culverts in cushion) shall be provided with approach slabs on both sides. Moreover upstream and downstream protection works, including connecting stream with the culvert, catch pits; baffle piers/blocks etc. shall be provided which must be ascertained as per the site conditions and details given in drawings of culvert.

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

| . No. | ing Chainage (Km) | n Chainage (Km) | osed Span (M) | Proposal | Remark |
|---|---|---|---|---|---|
| 1. | - | 63.830 | 2.00 | RCC BOX | |
| 2. | 75.875 | 66.187 | 1.50 | RCC BOX | |
| 3. | 84.525 | 74.170 | 1.50 | RCC BOX | |

Balance work of Construction of Two-lane with hard shoulders of Merangkong-Tamlu-Mon Road on EPC basis from existing Km 76.640 to Km 98.065 [Design Km. 63.800 to Km. 86.835] (Design length-23.035 km) in the state of Nagaland under SARDP-NE Phase A**"**

| | | | | | |
|---|---|---|---|---|---|
| 4. | 84.910 | 74.290 | 1.50 | RCC BOX | |
| 5. | 85.885 | 75.420 | 2.00 | RCC BOX | |
| 6. | 90.375 | 79.515 | 3.00 | RCC BOX | |
| 7. | 91.890 | 80.870 | 1.50 | RCC BOX | |

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

| Sr. No. | Design Chainage | Proposal | Proposed Span |
|---|---|---|---|
| 1. | 67+320 | Widening & Repairing | 1.5x1.5 |
| 2. | 69+201 | Widening & Repairing | 2.0x2.0 |
| 3. | 70+942 | Widening & Repairing | 2.0x2.0 |
| 4. | 71+018 | Widening & Repairing | 2.0x2.0 |
| 5. | 72+037 | Widening & Repairing | 2.0x2.0 |
| 6. | 73+840 | Widening & Repairing | 2.0x2.0 |
| 7. | 75+652 | Widening & Repairing | 2.0X2.0 |
| 8. | 78+104 | Widening & Repairing | 2.0x2.0 |
| 9. | 79+520 | Widening & Repairing | 3.0x3.0 |
| 10. | 80+620 | Widening & Repairing | 3.0x3.0 |
| 11. | 80+994 | Widening &Repairing | 3.0 X3.0 |
| 12. | 71+575 | Widening & Repairing | 2.0x2.0 |

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

**7. 3 Bridges**

**7.3.1** The existing bridges to be re-constructed/widened

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

Balance work of Construction of Two-lane with hard shoulders of Merangkong-Tamlu-Mon Road on EPC basis from existing Km 76.640 to Km 98.065 [Design Km. 63.800 to Km. 86.835] (Design length-23.035 km) in the state of Nagaland under SARDP-NE Phase A**"**

| Sr. No. | Bridge Location (Km) | Salient Details of Existing Bridges | | | | | Adequacy or Otherwise of the Existing Waterway, Vertical Clearance etc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | Span Arrangement (M) | Carriageway width (M) | Total width (M) | Type of Superstructure | Type of Foundation | | |
| 1. | 89.900 | 1 x 15.25 | 3.5 | 4.0 | Steel Truss | Not Visible | Inadequate | Reconstruction |
| 2. | 98.024 | 1 x 6.0 | 4.3 | 7.2 | RCC Slab | Not Visible | Inadequate | Reconstruction |

**7.3.2 Additional New Bridges**

(i) Minor Bridges

New minor bridges at the following locations on the project highways shall be constructed. GADs for the new minor bridges are attached in the drawings folder.

| Sr. No. | Location Designed (Km) | Total Length (M) | Remarks |
|---|---|---|---|
| **Nil** | | | |

**(ii) Major bridges**

New major bridges at the following locations on the project highways shall be constructed. GADs for the new major bridges are attached in the drawings folder.

| Sr. No. | Location Designed (Km) | Total Length (M) | Remarks |
|---|---|---|---|
| **Nil** | | | |

**7. 3. 3** The railings of existing bridges shall be replaced by crash barriers at the following locations:

| Sr. No. | Location (Km) | Remarks |
|---|---|---|
| **Nil** | | |

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

Balance work of Construction of Two-lane with hard shoulders of Merangkong-Tamlu-Mon Road on EPC basis from existing Km 76.640 to Km 98.065 [Design Km. 63.800 to Km. 86.835] (Design length-23.035 km) in the state of Nagaland under SARDP-NE Phase A**"**

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

**7. 3. 5 Drainage system for bridge decks**

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

**7.3.6 Structures in marine environment**

Nil

**7.4 Rail-road Bridges**

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

**7.4.2 Road over-bridges**

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

| Sr. No. | Location of Level Crossing (Km) | Length of Bridge (M) |
|---|---|---|
| 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:

| Sr. No. | Location of Level Crossing (Km) | Number and Length of Span (M) |
|---|---|---|
| Nil | | |

**7.5 Grade Separated Structures**

The grade separated structures shall be provided at the locations and of the type and length specified in paragraphs 2. 9 and 3 of this Annex-I.

**7.5.1 Underpasses/Overpasses**

There is no Underpass/Overpass proposed on the Project Highway.

Balance work of Construction of Two-lane with hard shoulders of Merangkong-Tamlu-Mon Road on EPC basis from existing Km 76.640 to Km 98.065 [Design Km. 63.800 to Km. 86.835] (Design length-23.035 km) in the state of Nagaland under SARDP-NE Phase A**"**

### 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**

| Sr. No. | Location of Bridge (Km) | Nature and Extent of Repairs/Strengthening to be carried out |
|---|---|---|
| Nil | | |

**B. ROB/RUB**

| Sr. No. | Location of ROB/RUB (Km) | Nature and Extent of Repairs/Strengthening to be carried out |
|---|---|---|
| Nil | | |

**C. Overpasses/Underpasses and Other Structures**

| Sr. No. | Location Structure (Km) | Nature and Extent of Repairs/Strengthening to be carried out |
|---|---|---|
| Nil | | |

### 7. 7 List of Major Bridges and Structures

The following is the list of Major Bridges and Structures

| Sr. No. | Location Design (Km) |
|---|---|
| Nil | |

## 8.0 TRAFFIC CONTROL DEVICES AND ROAD SAFETY WORKS

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

**8.2** Specifications of the reflective sheeting [Refer to paragraph 9 .2 of the Manual and specify]

**8.3** The minimum quantity of Traffic signages and pavement marking are tabulated here for Package

| Traffic Signage's Road Marking and other appurtenances | Unit | Quantity |
|---|---|---|

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| | | |
|---|---|---|
| Road Marking on Centre line & Edge | Sqm | 7191.1 |
| Direction & Place Identification up to 0.9 sqm | Sqm | 58 |
| Direction & Place Identification more than 0.9 sqm | Sqm | Nil |
| 60 cm Equilateral Triangle | Number | 253 |
| 60 cm Circular | Number | 40 |
| 60 cm High Octagon | Number | 39 |
| 60 cm x 45 cm Rectangular | Number | 49 |
| 60 cm x 50 cm Chevron Sign | Number | 902 |
| Hectometer Stone | Number | 92 |
| Km stone | Number | 20 |
| 5th Km stone | Number | 4 |
| Boundary Stone (as per clause 13 herein under) | Number | 230 |
| Road Delineators | Number | 1492 |
| Road Marker / Road Stud | Number | 11520 |
| Hazard Marker | Number | 278 |
| PCC kerbs (duly painted) in bus bays and islands | Rm | 8149 |

**9.0 ROAD SIDE FURNITURE**

**9.1** Roadside furniture shall be provided in accordance with the provisions of Section 11 of the Manual IRC: SP: 73-2007 and corresponding updates as per IRC:SP 73 -2018

**9.2** Overhead traffic signs: location and size

The overhead signs shall be the reflectorized type with high intensity retro-reflective sheeting conforming to ASTM D 4956-01, type VIII and /or type IX of micro prismatic type. The retro reflected sheets of Engineering Grade and high intensity grade (ordinary) shall not be used. The height, lateral clearance, location the overhead signs shall be the reflectorized type with high intensity retro-reflective sheeting conforming to ASTM D 4956-01, type VIII and / or type IX of micro prismatic type. The retro reflected sheets of Engineering Grade and high intensity grade

(ordinary) shall not be used. The height, lateral clearance, location and instillation shall be as per relevant clauses of MoRTH specifications. Overhead sign shall be installed ahead of major intersections and urban areas as per detailed design requirements. The minimum number of overhead signs shall be 02 (01 No. of gantry and 01 No. of Cantilever) as per this manual. Location shall be given by the AE.

**10.0COMPULSORY AFFORESTATION**

Minimum 3000 nos. trees with deep and broad roots are required to be planted for soil conservation, in consultation with the Forest Department and AE for type and location.

**11.0 HAZARDOUS LOCATIONS**

Metal Beam crash barrier length of minimum 3170 (single runner, heavy duty and W-shape) or equivalent shall be provided at the locations of bridge approaches built up sections, high embankments (3.0m and more)and at sharp curves . Heavy duty metal beam crash barriers shall be provided on this project by theConstruction Contractor at the locations finalized in consultation with NHIDCL.

Typical details of metal crash barrier are given in as per manual. Location of sharp curves are tabulated below.

| Sr. No. | Design Chainage (M) | | Side | Type of Deficiency | Remarks |
|---|---|---|---|---|---|
| | From | To | | | |
| 1. | 64322.56 | 64381.89 | Left | Radius<40 | |
| 2. | 64381.89 | 64441.87 | Right | Radius<40 | |
| 3. | 64482.91 | 64518.23 | Left | Radius<40 | |
| 4. | 64616.96 | 64695.26 | Left | Radius<40 | |
| 5. | 66360.13 | 66435.07 | Left | Radius<40 | |
| 6. | 66435.07 | 66506.46 | Right | Radius<40 | |
| 7. | 66546.96 | 66577.84 | Left | Radius<40 | |
| 8. | 69940.31 | 70003.85 | Left | Radius<40 | |
| 9. | 70313.88 | 70379.81 | Left | Radius<40 | |

| Sr. No. | Design Chainage (M) | | Side | Type of Deficiency | Remarks |
|---|---|---|---|---|---|
| | From | To | | | |
| 10. | 70893.14 | 70953.05 | Right | Radius<40 | |
| 11. | 71429.76 | 71474.51 | Right | Radius<40 | |
| 12. | 72066.87 | 72127.27 | Right | Radius<40 | |
| 13. | 72824.77 | 72886.36 | Right | Radius<40 | |
| 14. | 72960.88 | 73024.56 | Left | Radius<40 | |
| 15. | 73684.59 | 73739.82 | Right | Radius<40 | |
| 16. | 76258.75 | 76330.76 | Right | Radius<40 | |
| 17. | 76391.33 | 76453.13 | Right | Radius<40 | |
| 18. | 76611.30 | 76710.85 | Left | Radius<40 | |
| 19. | 77072.18 | 77137.61 | Left | Radius<40 | |
| 20. | 77557.61 | 77617.19 | Left | Radius<40 | |
| 21. | 78431.95 | 78509.08 | Left | Radius<40 | |
| 22. | 78614.42 | 78673.22 | Right | Radius<40 | |
| 23. | 78956.46 | 79113.28 | Right | Radius<40 | |
| 24. | 79113.28 | 79181.23 | Left | Radius<40 | |
| 25. | 80046.15 | 80105.41 | Right | Radius<40 | |
| 26. | 80288.09 | 80343.62 | Left | Radius<40 | |
| 27. | 80582.27 | 80642.63 | Left | Radius<40 | |
| 28. | 80642.63 | 80706.11 | Right | Radius<40 | |
| 29. | 81129.14 | 81197.08 | Left | Radius<40 | |

Balance work of Construction of Two-lane with hard shoulders of Merangkong-Tamlu-Mon Road on EPC basis from existing Km 76.640 to Km 98.065 [Design Km. 63.800 to Km. 86.835] (Design length-23.035 km) in the state of Nagaland under SARDP-NE Phase A**"**

| Sr. No. | Design Chainage (M) | | Side | Type of Deficiency | Remarks |
|---|---|---|---|---|---|
| | From | To | | | |
| 30. | 81251.19 | 81332.47 | Right | Radius<40 | |
| 31. | 81640.96 | 81684.00 | Right | Radius<40 | |
| 32. | 82419.46 | 82477.28 | Right | Radius<40 | |
| 33. | 82562.32 | 82609.26 | Left | Radius<40 | |
| 34. | 82798.79 | 82842.93 | Left | Radius<40 | |
| 35. | 82893.21 | 82913.01 | Left | Radius<40 | |
| 36. | 82913.01 | 82933.70 | Right | Radius<40 | |
| 37. | 83141.80 | 83155.95 | Left | Radius<40 | |
| 38. | 83175.25 | 83196.29 | Left | Radius<40 | |
| 39. | 83238.02 | 83251.59 | Right | Radius<40 | |
| 40. | 83292.06 | 83339.02 | Right | Radius<40 | |
| 41. | 83355.01 | 83372.09 | Left | Radius<40 | |
| 42. | 83380.20 | 83392.52 | Right | Radius<40 | |
| 43. | 83411.39 | 83425.47 | Left | Radius<40 | |
| 44. | 83439.66 | 83463.38 | Right | Radius<40 | |
| 45. | 83490.14 | 83518.43 | Left | Radius<40 | |
| 46. | 83634.60 | 83687.90 | Right | Radius<40 | |
| 47. | 83733.72 | 83768.20 | Left | Radius<40 | |
| 48. | 84046.00 | 84078.96 | Left | Radius<40 | |
| 49. | 84373.77 | 84392.69 | Left | Radius<40 | |

Balance work of Construction of Two-lane with hard shoulders of Merangkong-Tamlu-Mon Road on EPC basis from existing Km 76.640 to Km 98.065 [Design Km. 63.800 to Km. 86.835] (Design length-23.035 km) in the state of Nagaland under SARDP-NE Phase A**"**

| Sr. No. | Design Chainage (M) | | Side | Type of Deficiency | Remarks |
|---|---|---|---|---|---|
| | From | To | | | |
| 50. | 84406.88 | 84431.19 | Right | Radius<40 | |
| 51. | 84517.84 | 84548.64 | Right | Radius<40 | |
| 52. | 84587.00 | 84613.77 | Left | Radius<40 | |
| 53. | 84634.89 | 84670.54 | Right | Radius<40 | |
| 54. | 85164.04 | 85191.81 | Left | Radius<40 | |
| 55. | 85216.43 | 85238.74 | Right | Radius<40 | |
| 56. | 85451.62 | 85471.19 | Left | Radius<40 | |
| 57. | 85518.42 | 85530.41 | Left | Radius<40 | |
| 58. | 85570.04 | 85604.21 | Left | Radius<40 | |
| 59. | 85633.64 | 85658.38 | Right | Radius<40 | |
| 60. | 85839.27 | 85860.74 | Right | Radius<40 | |
| 61. | 85904.02 | 85948.45 | Right | Radius<40 | |
| 62. | 86049.86 | 86067.20 | Left | Radius<40 | |
| 63. | 86259.75 | 86284.52 | Left | Radius<40 | |
| 64. | 86340.48 | 86382.37 | Left | Radius<40 | |
| 65. | 86398.19 | 86426.10 | Right | Radius<40 | |
| 66. | 86551.42 | 86573.10 | Right | Radius<40 | |
| 67. | 86662.29 | 86703.67 | Right | Radius<40 | |
| 68. | 86703.67 | 86769.81 | Left | Radius<40 | |
| 69. | 86769.81 | 86788.81 | Left | Radius<40 | |

Balance work of Construction of Two-lane with hard shoulders of Merangkong-Tamlu-Mon Road on EPC basis from existing Km 76.640 to Km 98.065 [Design Km. 63.800 to Km. 86.835] (Design length-23.035 km) in the state of Nagaland under SARDP-NE Phase A”

## 12.0 SPECIAL REQUIREMENTS FOR HILL ROADS

In accordance with section 13 of the manual, IRC: SP: 48-1998 and Recommended practices for Treatment of Embankment and Roadside slopes for Erosion control (First Revision), IRC: 56-2011 and relevant IRC codes.

### 12. 1 Slope Protection

As the project involves cutting of existing hill slopes, it is imperative that slopes are stabilized for ensuring longevity of the slope and the road. Slope stability, erosion control and landslide correction shall be accomplished in accordance with IRC: SP: 48-1998. Reference may be drawn from IRC: 56- 2011.

The minimum quantity of protection work to be taken as below:

| **Type of Protection Work** | | |
|---|---|---|
| **Protection Work** | **Unit** | **Minimum Quantity** |
| Parapet Wall having size 0.45mx0.7m with 0.7 m spacing between two parapets | Rm | 2,765 |
| Breast wall of PCC/RCC/Gabion/Cement masonry having minimum height of 1.5 m | Rm | 3,489 |
| Retaining Structure on valley side of PCC/RCC/Gabion/Cement masonry of varying height between 1 to 6 meter depending upon the slope with parapet walls | Rm | 5,605 |
| RE wall in PCC | Rm | 289 |
| Subsurface drain with perforated pipe for collection of seepage water to avoid sinking of payment | Rm | 1,098 |
| Seeding and Mulching with Jute Net | Sqm | 78,323 |
| Hydro seeding | Sqm | 16,195 |
| Catch Water Drain (Unlined) | Rm | 19,545 |

**Note-** The Contractor shall be responsible for accurate assessment of the actual requirement as per site situation Et prepare designs for slope protection & stabilization as per the specifications & standards stipulated in schedule 'D' and submit the same to the AE for review through the proof consultant and implement it accordingly thereafter.

Any increase in quantity (length, breadth and height) over and above the tentative quantity as mentioned in above table or change in specifications will not be considered as change of scope. Therefore contractor shall make thorough investigation at site and assess the requirement of slope protection and slide prone zone and other safety features at his own before submission of bid.

**12.1.1** Summary of Retaining Structure on valley side of varying height between 1 to 6metre depending upon the slope

| Sr. No. | Height of Retaining Structure | Aggregate Length |
|---|---|---|
| 1 | Upto 2 m | 2149.6 |
| 2 | 2 m to 4 m | 2691.4 |
| 3 | 4 m to 6 m | 764 |

**12.1. 2 Tentative Locations and Length**

| Sr. No. | From Design Chainage (in M) | To Design Chainage (in M) | Length (M) |
|---|---|---|---|
| 1. | 64+425 | 64+437 | 12 |
| 2. | 64+563 | 64+568 | 5 |
| 3. | 64+595 | 64+613 | 18 |
| 4. | 64+755 | 64+765 | 10 |
| 5. | 64+975 | 64+985 | 10 |
| 6. | 65+285 | 65+375 | 90 |
| 7. | 65+485 | 65+495 | 10 |
| 8. | 65+532 | 65+545 | 13 |
| 9. | 65+605 | 65+625 | 20 |
| 10. | 65+695 | 65+707 | 12 |
| 11. | 65+782 | 65+815 | 33 |
| 12. | 65+916 | 65+965 | 49 |
| 13. | 66+050 | 66+060 | 10 |
| 14. | 66+096 | 66+115 | 19 |

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| Sr. No. | From Design Chainage (in M) | To Design Chainage (in M) | Length (M) |
|---|---|---|---|
| 15. | 67+045 | 67+055 | 10 |
| 16. | 67+095 | 67+145 | 50 |
| 17. | 67+252 | 67+335 | 83 |
| 18. | 67+365 | 67+386 | 21 |
| 19. | 67+455 | 67+475 | 20 |
| 20. | 67+555 | 67+565 | 10 |
| 21. | 68+876 | 68+883 | 7 |
| 22. | 69+015 | 69+025 | 10 |
| 23. | 69+865 | 69+876 | 11 |
| 24. | 70+045 | 70+075 | 30 |
| 25. | 70+285 | 70+325 | 40 |
| 26. | 70+355 | 70+415 | 60 |
| 27. | 70+615 | 70+625 | 10 |
| 28. | 70+659 | 70+685 | 26 |
| 29. | 70+745 | 70+807 | 62 |
| 30. | 70+904 | 70+935 | 31 |
| 31. | 71+000 | 71+165 | 165 |
| 32. | 71+415 | 71+424 | 9 |
| 33. | 71+575 | 71+605 | 30 |
| 34. | 71+701 | 71+725 | 24 |
| 35. | 71+755 | 71+763 | 8 |

Balance work of Construction of Two-lane with hard shoulders of Merangkong-Tamlu-Mon Road on EPC basis from existing Km 76.640 to Km 98.065 [Design Km. 63.800 to Km. 86.835] (Design length-23.035 km) in the state of Nagaland under SARDP-NE Phase A**"**

| Sr. No. | From Design Chainage (in M) | To Design Chainage (in M) | Length (M) |
|---|---|---|---|
| 36. | 71+768 | 71+795 | 27 |
| 37. | 71+824 | 71+855 | 31 |
| 38. | 71+884 | 71+925 | 41 |
| 39. | 71+935 | 71+945 | 10 |
| 40. | 71+985 | 71+995 | 10 |
| 41. | 72+006 | 72+015 | 9 |
| 42. | 72+065 | 72+165 | 100 |
| 43. | 72+175 | 72+265 | 90 |
| 44. | 72+315 | 72+365 | 50 |
| 45. | 72+555 | 72+575 | 20 |
| 46. | 72+616 | 72+644 | 28 |
| 47. | 72+695 | 72+715 | 20 |
| 48. | 73+015 | 73+075 | 60 |
| 49. | 73+105 | 73+145 | 40 |
| 50. | 73+275 | 73+315 | 40 |
| 51. | 73+345 | 73+435 | 90 |
| 52. | 73+455 | 73+565 | 110 |
| 53. | 73+578 | 73+645 | 67 |
| 54. | 73+775 | 73+855 | 80 |
| 55. | 73+905 | 73+965 | 60 |
| 56. | 73+994 | 74+035 | 41 |

Balance work of Construction of Two-lane with hard shoulders of Merangkong-Tamlu-Mon Road on EPC basis from existing Km 76.640 to Km 98.065 [Design Km. 63.800 to Km. 86.835] (Design length-23.035 km) in the state of Nagaland under SARDP-NE Phase A**"**

| Sr. No. | From Design Chainage (in M) | To Design Chainage (in M) | Length (M) |
|---|---|---|---|
| 57. | 74+325 | 74+355 | 30 |
| 58. | 74+415 | 74+445 | 30 |
| 59. | 74+455 | 74+495 | 40 |
| 60. | 75+515 | 75+525 | 10 |
| 61. | 75+565 | 75+605 | 40 |
| 62. | 75+645 | 75+685 | 40 |
| 63. | 75+829 | 75+874 | 45 |
| 64. | 75+943 | 76+025 | 82 |
| 65. | 76+045 | 76+105 | 60 |
| 66. | 76+147 | 76+225 | 78 |
| 67. | 76+265 | 76+295 | 30 |
| 68. | 76+335 | 76+345 | 10 |
| 69. | 76+375 | 76+405 | 30 |
| 70. | 76+535 | 76+575 | 40 |
| 71. | 76+605 | 76+665 | 60 |
| 72. | 76+725 | 76+735 | 10 |
| 73. | 76+740 | 76+755 | 15 |
| 74. | 76+813 | 76+905 | 92 |
| 75. | 76+965 | 77+046 | 81 |
| 76. | 77+083 | 77+115 | 32 |
| 77. | 77+255 | 77+275 | 20 |

Balance work of Construction of Two-lane with hard shoulders of Merangkong-Tamlu-Mon Road on EPC basis from existing Km 76.640 to Km 98.065 [Design Km. 63.800 to Km. 86.835] (Design length-23.035 km) in the state of Nagaland under SARDP-NE Phase A**"**

| Sr. No. | From Design Chainage (in M) | To Design Chainage (in M) | Length (M) |
|---|---|---|---|
| 78. | 77+405 | 77+455 | 50 |
| 79. | 77+525 | 77+538 | 13 |
| 80. | 77+807 | 77+836 | 29 |
| 81. | 77+855 | 77+863 | 8 |
| 82. | 77+904 | 77+915 | 11 |
| 83. | 77+955 | 77+995 | 40 |
| 84. | 78+155 | 78+206 | 51 |
| 85. | 78+245 | 78+255 | 10 |
| 86. | 78+315 | 78+428 | 113 |
| 87. | 78+485 | 78+513 | 28 |
| 88. | 78+535 | 78+596 | 61 |
| 89. | 78+698 | 78+808 | 110 |
| 90. | 78+815 | 78+825 | 10 |
| 91. | 78+855 | 78+865 | 10 |
| 92. | 78+878 | 78+956 | 79 |
| 93. | 78+956 | 78+958 | 2 |
| 94. | 79+516 | 79+545 | 29 |
| 95. | 79+575 | 79+605 | 30 |
| 96. | 79+635 | 79+665 | 30 |
| 97. | 79+684 | 79+705 | 21 |
| 98. | 79+735 | 79+795 | 60 |

Balance work of Construction of Two-lane with hard shoulders of Merangkong-Tamlu-Mon Road on EPC basis from existing Km 76.640 to Km 98.065 [Design Km. 63.800 to Km. 86.835] (Design length-23.035 km) in the state of Nagaland under SARDP-NE Phase A**"**

| Sr. No. | From Design Chainage (in M) | To Design Chainage (in M) | Length (M) |
|---|---|---|---|
| 99. | 79+855 | 79+885 | 30 |
| 100. | 79+955 | 80+015 | 60 |
| 101. | 80+069 | 80+085 | 16 |
| 102. | 80+105 | 80+175 | 70 |
| 103. | 80+215 | 80+305 | 90 |
| 104. | 80+465 | 80+578 | 113 |
| 105. | 80+595 | 80+635 | 40 |
| 106. | 80+667 | 80+745 | 78 |
| 107. | 80+805 | 80+815 | 10 |
| 108. | 80+865 | 81+015 | 150 |
| 109. | 81+055 | 81+085 | 30 |
| 110. | 81+125 | 81+130 | 5 |
| 111. | 81+135 | 81+185 | 50 |
| 112. | 81+195 | 81+254 | 59 |
| 113. | 81+265 | 81+545 | 280 |
| 114. | 81+565 | 81+585 | 20 |
| 115. | 81+595 | 81+615 | 20 |
| 116. | 81+625 | 81+635 | 10 |
| 117. | 81+775 | 81+845 | 70 |
| 118. | 81+855 | 81+915 | 60 |
| 119. | 81+985 | 82+075 | 90 |

Balance work of Construction of Two-lane with hard shoulders of Merangkong-Tamlu-Mon Road on EPC basis from existing Km 76.640 to Km 98.065 [Design Km. 63.800 to Km. 86.835] (Design length-23.035 km) in the state of Nagaland under SARDP-NE Phase A**"**

| Sr. No. | From Design Chainage (in M) | To Design Chainage (in M) | Length (M) |
|---|---|---|---|
| 120. | 82+095 | 82+175 | 80 |
| 121. | 82+205 | 82+325 | 120 |
| 122. | 82+335 | 82+453 | 118 |
| 123. | 82+475 | 82+485 | 10 |
| 124. | 82+496 | 82+525 | 29 |
| 125. | 82+545 | 82+566 | 21 |
| 126. | 82+595 | 82+675 | 80 |
| 127. | 82+685 | 82+695 | 10 |
| 128. | 82+735 | 82+800 | 65 |
| **Total** | | | **5605** |

### 12.1.3 Reinforced Earth Wall

The locations for providing RE wall are listed in the table below.

Improvement Proposals: Reinforced Earth Wall Length

| Sr. No. | From Chainage (in M) | To Chainage (in M) | Length (M) |
|---|---|---|---|
| 1. | 63+875 | 63+915 | 40 |
| 2. | 73+565 | 73+573 | 8 |
| 3. | 75+525 | 75+565 | 40 |
| 4. | 75+605 | 75+645 | 40 |
| 5. | 75+685 | 75+723 | 38 |
| 6. | 75+735 | 75+795 | 60 |
| 7. | 75+805 | 75+815 | 10 |

Balance work of Construction of Two-lane with hard shoulders of Merangkong-Tamlu-Mon Road on EPC basis from existing Km 76.640 to Km 98.065 [Design Km. 63.800 to Km. 86.835] (Design length-23.035 km) in the state of Nagaland under SARDP-NE Phase A**"**

| | | | |
|---|---|---|---|
| 8. | 78+513 | 78+535 | 23 |
| 9. | 79+665 | 79+675 | 10 |
| 10. | 82+525 | 82+545 | 20 |
| **Total** | | | **289** |

**12.1.4** Subsurface Drains: Location of Subsurface drain with perforated pipe are provided at water seepage locations for collection of seepage water to avoid sinking of pavement

**Water Seepage Locations**

| Sr. No. | Existing Location From | New Design Chainage From |
|---|---|---|
| 1. | 68+740 | Realignment |
| 2. | 82+960 | 72+720 |
| 3. | 85+580 | 75+200 |

**12.2 ROAD LAND BOUNDARY (Clause 12.2 IRC SP: 73: 2015)**

Road land (ROW) boundary shall be demarcated by putting RCC boundary pillars of size 60cm x 15cm x 15 cm embedded in concrete (as per IRC:25) along the Project Highway at 50 m interval on both sides. All the components used in delineating road land boundary shall be aesthetically pleasing, sturdy and vandal proof. The road land boundary shall be demarcated in consultation with NHIDCL.

**12.3 Disposal of Debris: - As per Manual**

**13.0 CHANGE OF SCOPE**

The size of Structures, bridges, culverts and slope protection works whatsoever in terms of retaining wall, breast wall, gabion wall, RE wall, chute drain, catch pit, baffle piers/blocks etc. Under special requirement of hill slope specified hereinabove shall be treated as an approximate assessment. The actual lengths, heights and widths 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, heights and widths and specifications in this Schedule-B shall not constitute a Change of Scope, save and except any variations in the length, height and width arising out of a Change of Scope expressly undertaken in accordance with the provisions of Article 13.

SCHEDULE – C

*(See Clause 2.1)*

## PROJECT FACILITIES

### 1 Project Facilities

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

(a) Roadside furniture

(b) Pedestrian facilities

(c) Tree plantation

(d) Bus shelters

(e) Passing Places

(f) Truck lay byes and

(g) Others to be specified

### 2 Description of Project Facilities

**Toll Plaza**

NIL

**Bus Shelters**

To ensure orderly movement of the through traffic, bus shelters have been proposed outside the residential area, away from bridges, and high embankments and not too close to the road intersections. The bus stops have been proposed on one side of the road.

Bus shelters 6 Nos shall be provided on the Project Highway at 3 locations as mentioned herein under. Bus shelters shall be constructed as per Manual on both sides of the Project Highway. These bus shelters will also have passenger shelter.

**Details of Bus Shelters**

| SL. No. | Project Facility (in pair) | Design Chainage (km) |
|---|---|---|
| 1 | Bus Shelter | 67+500 |
| 2 | Bus Shelter | 78+300 |
| 3 | Bus Shelter | 84+500 |

## Pedestrian Facilities

Pedestrian facilities shall be provided at the locations of urban sections in order to ensure safety of pedestrians while crossing in consultation with AE. This should include (a) minimum Zebra Crossing with flashing Beacon or (b) Zebra Crossing with separate pedestrian phase or (c) any other provision as approved by AE.

## Landscaping

Landscape treatment of the Project Highway shall be undertaken through planting of trees and ground cover of appropriate varieties and landscaping on surplus land in the ROW. The Construction Contractor should plant at least 3000 nos. of trees of minimum 6 ft. height with tree guard made up of MS sections.

Plantation scheme shall be prepared in consultation with the Forest Department of the Government of Nagaland, and AE.

## Environment

The Project Highway during design, construction and maintenance during implementation period shall conform to the environmental rules and regulations in force. The Construction Contractor shall be responsible for the same

# SCHEDULE – D

*(See Clause 2.1)*

## SPECIFICATIONS AND STANDARDS

### 1. Construction

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

### 2. Design Standards

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

Manual of specification and standards for two laning of Highways with paved shoulder (Second revision) IRC:SP:73-2018, Hill road manual IRC:SP:48-1998 and Specification of roads and bridges work (fifth revision), MoRTH.

Annex – I

*(Schedule – D)*

## Specifications and Standards for Construction

### 1 Specifications and Standards

All materials, works and construction operations shall confirm to the Manual of Specifications and Standards for Two Laning of Highways (IRC: SP: 73 – 2018), referred as the Manual, MORTH Specifications for Road and Bridge Works, and IRC: SP: 48-1998. 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

The terms 'Concessionaire', 'Independent Engineer' and 'Concession Agreement' used in the Manual (IRC: SP 73- 2018) shall be deemed to be substituted by the terms **'Contractor', 'Authority's Engineer' and 'Agreement'** respectively.

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, aforesaid Specifications and Standards of following clauses shall be deemed to be amended to the extent set forth below:

| S. No. | Clause | Provision as per Manual ( IRC:SP:73-2018) | Modified Provision |
|---|---|---|---|
| 1 | 2.2 | **Design Speed:** Ruling or minimum Design speed shall be followed | Design speed shall be as per IRC 73:2018 for project highway excepting hair pin bend locations wherein design speed shall be as per IRC 73:2018. The same is mentioned in the Plan &Profile drawings given in **Annexure-III** of **Schedule A.** |
| 2 | 2.7.2 | **Roadway Width:** On horizontal curves with radius up to 300 m width of pavement and roadway shall be increased as per Table 2.4 | On horizontal Curves with radius up to 300 m width of pavement and roadway shall be increased as per Plan & Profile drawings given in Annexure – III of Schedule A |
| 3 | 2.9.4 | **Radius of Horizontal Curves:** | Radius of Horizontal curves shall be as per the alignment plan shown in Plan & Profile drawings given in **Annexure-III** of **Schedule A.** |

SCHEDULE - E

*(See Clauses 2.1 and 14.2)*

**MAINTENANCE REQUIREMENTS**

**1. Maintenance Requirements**

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

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

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

**2. Repair/Rectification of Defects and Deficiencies**

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

**3. Other Defects and Deficiencies**

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

**4. Extension of Time Limit**

Notwithstanding anything to the contrary specified in this Schedule-E, if the nature and extent of any Defect or deficiency justifies more time for its repair or rectification than the time specified

herein, the Contractor shall be entitled to additional time in conformity with Good Industry Practice. Such additional time shall be determined by the Authority's Engineer and conveyed to the Contractor and the Authority with reasons thereof.

**5. Emergency Repairs/Restoration**

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

**6. Daily inspection by the Contractor**

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

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

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

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

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

Annex - I

*(Schedule-E)*

**Repair/rectification of Defects and Deficiencies**

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

| Nature of Defect or deficiency | | Time limit for repair/rectification |
|---|---|---|
| **ROADS** | | |
| **(a)** | **Carriageway and paved shoulders** | |
| (i) | Breach or blockade | Temporary restoration of traffic within 24 hours; permanent restoration within 15 (fifteen) days |
| (ii) | Roughness value exceeding 2,200 mm in a stretch of 1 km (as measured by a calibrated bump integrator) | 120 (one hundred and twenty) days |
| (iii) | Pot holes | 24 hours |
| (iv) | Any cracks in road surface | 15 (fifteen) days |
| (v) | Any depressions, rutting exceeding 10 mm in road surface | 30 (thirty) days |
| (vi) | Bleeding/skidding | 7 (seven) days |
| (vii) | Any other defect/distress on the road | 15 (fifteen) days |
| (viii) | Damage to pavement edges | 15 (fifteen) days |
| (ix) | Removal of debris, dead animals | 6 hours |
| **(b)** | **Granular earth shoulders, side slopes, drains and culverts** | |
| (i) | Variation by more than 1 % in the prescribed slope of camber/cross fall (shall not be less than the camber on the main carriageway) | 7 (seven) days |
| (ii) | Edge drop at shoulders exceeding 40 mm | 7 (seven) days |
| (iii) | Variation by more than 15% in the prescribed side (embankment) slopes | 30 (thirty) days |
| (iv) | Rain cuts/gullies in slope | 7 (seven) days |
| (v) | Damage to or silting of culverts and side drains | 7 (seven) days |

| Nature of Defect or deficiency | | Time limit for repair/rectification |
|---|---|---|
| (vi) | Desilting of drains in urban/semi-urban areas | 24 hours |
| (vii) | Railing, parapets, crash barriers | 7 (seven) days (Restore immediately if causing safety hazard) |
| **(c)** | **Road side furniture including road sign and pavement marking** | |
| (i) | Damage to shape or position, poor visibility or loss of retro-reflectivity | 48 hours |
| (ii) | Painting of km stone, railing, parapets, crash barriers | As and when required/Once every year |
| (iii) | Damaged/missing road signs requiring replacement | 7 (seven) days |
| (iv) | Damage to road mark ups | 7 (seven) days |
| **(d)** | **Road Lighting** | |
| (i) | Any major failure of the system | 24 hours |
| (ii) | Faults and minor failures | 8 hours |
| **(e)** | **Trees and Plantation** | |
| (i) | Obstruction in a minimum head-room of 5 m above carriageway or obstruction in visibility of road signs | 24 hours |
| (ii) | Removal of fallen trees from carriageway | 4 hours |
| (iii) | Deterioration in health of trees and bushes | Timely watering and treatment |
| (iv) | Trees and bushes requiring replacement | 30 (thirty) days |
| (v) | Removal of vegetation affecting sight line and road structures | 15 (fifteen) days |
| **(f)** | **Rest Area** | |
| (i) | Cleaning of toilets | Every 4 hours |
| (ii) | Defects in electrical, water and sanitary installations | 24 hours |
| **(g)** | **Toll Plazas** | |
| **(h)** | **Other Project Facilities and Approach Roads** | |
| (i) | Damage in approach roads, pedestrian facilities, truck lay-byes, bus-bays, bus-shelters, cattle crossings, [Traffic Aid Posts, Medical Aid Posts] and service roads | 15 (fifteen) days |

Balance work of Construction of Two-lane with hard shoulders of Merangkong-Tamlu-Mon Road on EPC basis from existing Km 76.640 to Km 98.065 [Design Km. 63.800 to Km. 86.835] (Design length-23.035 km) in the state of Nagaland under SARDP-NE Phase A**"**

| Nature of Defect or deficiency | | Time limit for repair/rectification |
|---|---|---|
| (ii) | Damaged vehicles or debris on the road | 4 (four) hours |
| (iii) | Malfunctioning of the mobile crane | 4 (four) hours |
| **Bridges** | | |
| **(a)** | **Superstructure** | |
| (i) | Any damage, cracks, spalling/ scaling<br>Temporary measures<br>Permanent measures | within 48 hours<br>within 15 (fifteen) days or as specified by the Authority's Engineer |
| **(b)** | **Foundations** | |
| (i) | Scouring and/or cavitation | 15 (fifteen) days |
| **(c)** | **Piers, abutments, return walls and wing walls** | |
| (i) | Cracks and damages including settlement and tilting, spalling, scaling | 30 (thirty) days |
| **(d)** | **Bearings (metallic) of bridges** | |
| (i) | Deformation, damages, tilting or shifting of bearings | 15 (fifteen) days<br>Greasing of metallic bearings once in a year |
| **(e)** | **Joints** | |
| (i) | Malfunctioning of joints | 15 (fifteen) days |
| **(f)** | **Other items** | |
| (i) | Deforming of pads in elastomeric bearings | 7 (seven) days |
| (ii) | Gathering of dirt in bearings and joints; or clogging of spouts, weep holes and vent-holes | 3 (three) days |
| (iii) | Damage or deterioration in kerbs, parapets, handrails and crash barriers | 3 (three) days<br>(Immediately within 24 hours if posing danger to safety) |
| (iv) | Rain-cuts or erosion of banks of the side slopes of approaches | 7 (seven) days |
| (v) | Damage to wearing coat | 15 (fifteen) days |
| (vi) | Damage or deterioration in approach slabs, pitching, apron, toes, floor or guide bunds | 30 (thirty) days |
| (vii) | Growth of vegetation affecting the structure or obstructing the waterway | 15 (fifteen) days |

| Nature of Defect or deficiency | | Time limit for repair/rectification |
|---|---|---|
| **(g)** | **Hill Roads** | |
| (i) | Damage to retaining wall/breast wall | 7 (seven) days |
| (ii) | Landslides requiring clearance | 12 (twelve) hours |
| (iii) | Snow requiring clearance | 24 (twenty-four) hours |

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

SCHEDULE - F
(See Clause 3.1.7(a))

## APPLICABLE PERMITS

### 1 Applicable Permits

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

a) Permission of the State Government for extraction of boulders from quarry;
b) Permission of Village Panchayats and Pollution Control Board for installation of crushers;
c) License for use of explosives;
d) Permission of the State Government for drawing water from river/reservoir;
e) License from inspector of factories or other competent Authority for setting up batching plant;
f) Clearance of Pollution Control Board for setting up batching plant;
g) Clearance of Village Panchayats and Pollution Control Board for setting up asphalt plant;
h) Permission of Village Panchayats and State Government for borrow earth; and
i) Any other permits or clearances required under Applicable Laws.

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

The agency need to ensure compliance of AIP and FC stated in schedules 'A', Annexure – IV. The necessary certifications need to be obtained from competent local forest department.

Muck dumping locations in forest area to be freezed in consultation with the forest department, the necessary certfications from local competent forest department is to be submitted.

SCHEDULE - G
(See Clauses 7.1.1, 7.5.3 and 19.2)
**FORM OF BANK GUARANTEE**
Annex-I
(See Clause 7.1.1)
**Performance Security**

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

WHEREAS:

_____[name and address of contractor] (hereinafter called the "**Contractor**") and Managing Director, NHIDCL, PTI Building, 3rd Floor, 4, Parliament Street, New Delhi-110001(hereinafter called the **"Authority"**) have entered into an agreement (hereinafter called the "Agreement") for the Balance work of Construction of Two-lane with hard shoulders of Merangkong-Tamlu-Mon Road on EPC basis from existing Km 76.640 to Km 98.065 [Design Km. 63.800 to Km. 86.835] (Design length-23.035 km) in the state of Nagaland under SARDP-NE Phase A"

, subject to and in accordance with the provisions of the Agreement

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

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

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

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

Balance work of Construction of Two-lane with hard shoulders of Merangkong-Tamlu-Mon Road on EPC basis from existing Km 76.640 to Km 98.065 [Design Km. 63.800 to Km. 86.835] (Design length-23.035 km) in the state of Nagaland under SARDP-NE Phase A**"**

2. A letter from the Authority, under the hand of an officer not below the rank of [General Manager in the National Highways & Infrastructural Development Corporation Ltd], that the Contractor has committed default in the due and faithful performance of all or any of its obligations under and in accordance with the Agreement shall be conclusive, final and binding on the Bank. The Bank further agrees that the Authority shall be the sole judge as to whether the Contractor is in default in due and faithful performance of its obligations during and under the Agreement and its decision that the Contractor is in default shall be final and binding on the Bank, notwithstanding any differences between the Authority and the Contractor, or any dispute between them pending before any court, tribunal, arbitrators or any other authority or body, or by the discharge of the Contractor for any reason whatsoever.

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

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

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

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

7. Notwithstanding anything contained hereinbefore, the liability of the Bank under this Guarantee is restricted to the Guarantee Amount and this Guarantee will

remain in force for the period specified in paragraph 8 below and unless a demand or claim in writing is made by the Authority on the Bank under this Guarantee all rights of the Authority under this Guarantee shall be forfeited and the Bank shall be relieved from its liabilities hereunder.

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

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

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

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

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

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

| Sl. No | Particulars | Details |
|---|---|---|
| 1 | Name of the Beneficiary | National Highways and Infrastructure Development Corporation Limited |

[$]Insert date being 2 (two) years from the date of issuance of this Guarantee (in accordance with Clause 7.2 of the Agreement).

| | | |
|---|---|---|
| 2 | Beneficiary Bank Account No. | 90621010002610 |
| 3 | Beneficiary Bank Branch | IFSC CNRB0019062 |
| 4 | Beneficiary Bank Branch Name | Transport Bhawan, New Delhi |
| 5 | Beneficiary Bank Address | Syndicate Bank, Transport Bhawan, 1st Parliament street, New Delhi-110001 |

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

SIGNED, SEALED AND DELIVERED

For and on behalf of the Bank by:

(Signature)

(Name)

(Designation)

(Code Number)

(Address)

NOTES:

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

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

Annex – II
(Schedule - G)
(See Clause 7.5.3)

**Form for Guarantee for Withdrawal of Retention Money**

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

WHEREAS:

(A) [name and address of contractor] (hereinafter called the "**Contractor**") has executed an agreement (hereinafter called the "Agreement") with the and The Managing Director , NHIDCL, PTI Building, New Delhi (hereinafter called the **"Authority"**) have entered into an agreement (hereinafter called the "Agreement") for the Balance work of Construction of Two-lane with hard shoulders of Merangkong-Tamlu-Mon Road on EPC basis from existing Km 76.640 to Km 98.065 [Design Km. 63.800 to Km. 86.835] (Design length-23.035 km) in the state of Nagaland under SARDP-NE Phase A"

, subject to and in accordance with the provisions of the Agreement.

(B) In accordance with Clause 7.5.3 of the Agreement, the Contractor may withdraw the retention money (hereinafter called the "**Retention Money**") after furnishing to the Authority a bank guarantee for an amount equal to the proposed withdrawal.

(C) We, …….. through our branch at ..... (the "**Bank**") have agreed to furnish this bank guarantee (hereinafter called the "**Guarantee**") for the amount of Rs. --------- cr. (Rs ----------crore) (the "**Guarantee Amount**").

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

1. The Bank hereby unconditionally and irrevocably undertakes to pay to the Authority, upon its mere first written demand, and without any demur, reservation, recourse, contest or protest, and without any reference to the Contractor, such sum or sums up to an aggregate sum of the Guarantee Amount as the Authority shall claim, without the Authority being required to prove or to show grounds or reasons for its demand and/or for the sum specified

therein.

2. A letter from the Authority, under the hand of an officer not below the rank of General Manager in the National Highways & Infrastructural Development Corporation Ltd, that the Contractor has committed default in the due and faithful performance of all or any of its obligations for under and in accordance with the Agreement shall be conclusive, final and binding on the Bank. The Bank further agrees that the Authority shall be the sole judge as to whether the Contractor is in default in due and faithful performance of its obligations during and under the Agreement and its decision that the Contractor is in default shall be final, and binding on the Bank, notwithstanding any differences between the Authority and the Contractor, or any dispute between them pending before any court, tribunal, arbitrators or any other authority or body, or by the discharge of the Contractor for any reason whatsoever.

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

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

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

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

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

8. The Guarantee shall cease to be in force and effect 90 (ninety) days after the date of the Completion Certificate specified in Clause 12.4 of the Agreement.

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

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

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

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

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

| Sl. No | Particulars | Details |
|---|---|---|
| 1 | Name of the Beneficiary | National Highways and Infrastructure Development Corporation Limited |
| 2 | Beneficiary Bank Account No. | 90621010002610 |
| 3 | Beneficiary Bank Branch | IFSC CNRB0019062 |
| 4 | Beneficiary Bank Branch Name | Transport Bhawan, New Delhi |
| 5 | Beneficiary Bank Address | Syndicate Bank, Transport Bhawan, 1st Parliament street, New Delhi-110001 |

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

SIGNED, SEALED AND DELIVERED
For and on behalf of the Bank by:
(Signature)
(Name)
(Designation)
(Code Number)
(Address)
NOTES:

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

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

Annex – III
(Schedule - G)
(See Clause 19.2)

**Form for Guarantee for Advance Payment**

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

WHEREAS:

**(A)** [name and address of contractor] (hereinafter called the "Contractor") has executed an agreement (hereinafter called the "Agreement") with the Managing Director, Head Office New Delhi (hereinafter called the "Authority") have entered into an agreement (hereinafter called the "Agreement") for the Balance work of Construction of Two-lane with hard shoulders of Merangkong-Tamlu-Mon Road on EPC basis from existing Km 76.640 to Km 98.065 [Design Km. 63.800 to Km. 86.835] (Design length-23.035 km) in the state of Nagaland under SARDP-NE Phase A

, subject to and in accordance with the provisions of the Agreement.

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

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

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

[$]The Guarantee Amount should be equivalent to 110% of the value of the applicable instalment.

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

2. A letter from the Authority, under the hand of an officer not below the rank of [General Manager in the National Highways & Infrastructural Development Corporation Ltd], that the Contractor has committed default in the due and faithful performance of all or any of its obligations for the repayment of the instalment of the Advance Payment under and in accordance with the Agreement shall be conclusive, final and binding on the Bank. The Bank further agrees that the Authority shall be the sole judge as to whether the Contractor is in default in due and faithful performance of its obligations during and under the Agreement and its decision that the Contractor is in default shall be final and binding on the Bank, notwithstanding any differences between the Authority and the Contractor, or any dispute between them pending before any court, tribunal, arbitrators or any other authority or body, or by the discharge of the Contractor for any reason whatsoever.

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

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

5. The Authority shall have the liberty, without affecting in any manner the liability of the Bank under this Guarantee, to vary at any time, the terms and

conditions of the Advance Payment or to extend the time or period of its repayment or to postpone for any time, and from time to time, any of the rights and powers exercisable by the Authority against the Contractor, and either to enforce or forbear from enforcing any of the terms and conditions contained in the Agreement and/or the securities available to the Authority, and the Bank shall not be released from its liability and obligation under these presents by any exercise by the Authority of the liberty with reference to the matters aforesaid or by reason of time being given to the Contractor or any other forbearance, indulgence, act or omission on the part of the Authority or of any other matter or thing whatsoever which under any law relating to sureties and guarantors would but for this provision have the effect of releasing the Bank from its liability and obligation under this Guarantee and the Bank hereby waives all of its rights under any such law.

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

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

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

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

[$] Insert a date being 90 (ninety) days after the end of one year from the date of payment of the Advance payment to the Contractor (in accordance with Clause 19.2 of the Agreement).

full powers to do so on behalf of the Bank.

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

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

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

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

| Sl. No | Particulars | Details |
|---|---|---|
| 1 | Name of the Beneficiary | National Highways and Infrastructure Development Corporation Limited |
| 2 | Beneficiary Bank Account No. | 90621010002610 |
| 3 | Beneficiary Bank Branch | IFSC CNRB0019062 |
| 4 | Beneficiary Bank Branch Name | Transport Bhawan, New Delhi |
| 5 | Beneficiary Bank Address | Syndicate Bank, Transport Bhawan, 1st Parliament street, New Delhi-110001 |

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

SIGNED, SEALED AND DELIVERED

For and on behalf of the Bank by:

(Signature)

(Name)

(Designation)

(Code Number)

(Address)

NOTES:

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

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

## SCHEDULE–H

*(See Clauses* **10.1.4** *and* **19.3***)*

## CONTRACT PRICE WEIGHTAGE

1.1 The Contract Price for this Agreement is …….

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

| Item | Weightage in percentage to the Contract Price | Stage for Payment | Percentage weightage to Particular item (col.2) |
|---|---|---|---|
| 1 | 2 | 3 | 4 |
| **Road works including culverts widening and repair of culverts.** | **44.47%** | **A- Widening and strengthening of existing road** | |
| | | (1) Earthwork up to top of the sub-grade including excavation in soil/soft rock/ hard rock and clearing & grubbing | 1.21% |
| | | (2) Sub Base Course. | 2.78% |
| | | (3) Non-Bituminous Base Course. | 5.55% |
| | | (4) Dense Graded Bituminous Macadam. | 5.20% |
| | | (5) Bituminous Concrete | 3.88% |
| | | (6) Widening, reconstruction and repair of culverts | 0.00% |
| | | (7) Hard Shoulder | 1.36% |
| | | **B.1 - Reconstruction/New 2 - lane realignment/ bypass - (Flexible pavement)** | |
| | | (1) Earthwork up to top of the sub-grade including excavation in soil/soft rock/ hard rock and clearing & grubbing | 3.33% |
| | | (2) Sub Base Course | 0.87% |
| | | (3) Non-Bituminous Base Course | 2.36% |
| | | (4) Dense Graded Bituminous Macadam. | 1.69% |
| | | (5) Bituminous Concrete | 0.83% |
| | | (6) Hard Shoulder | 1.38% |
| | | **D- Reconstruction and New culverts on existing road, realignment, bypasses.** | |
| | | (1) Culverts (length <6m) | 14.02% |
| **Minor Bridge / Underpasses / Over pass** | **6.00%** | **A.1-Widening and repair of Minor Bridge (length >6m <60m)** | |
| | | (1) Minor bridge | |
| | | **A.2-New Minor Bridge (length >6m <60m)** | |

| | | | |
|---|---|---|---|
| | | (1) **Foundation + substructure:** On completion of the foundation of the foundation work including foundation for wing and return walls, abutment, piers up to the abutment/pier cap | 4.10% |
| | | (2) **Super-structure :** On completion of the super structure in all respects including wearing coat, bearings, road signs & markings, tests in completion etc. complete in all respect. | 1.18% |
| | | (3) **Approaches :** On completion of approaches including Retaining walls/ Reinforced Earth walls, stone pitching, protection works complete in all respect and fit for use. | 0.73% |
| **Other works** | **49.53%** | | |
| | | (i) Toll Plaza | 0.00% |
| | | (ii) Road side drains | 12.38% |
| | | (iii) Road signs, markings, km stones, boundary stones, safety devices etc. | |
| | | a) Pavement Marking | 1.59% |
| | | b) Crash Barrier/ W-metal crash barrier | 0.85% |
| | | c) Road / Traffic sign | 0.53% |
| | | d) Road boundary stone, km stone, 5th km stone, Hecto meter stone, rumble strips, other items etc. | 0.04% |
| | | e) Traffic blinker, LED delineators, studs, reflective pavement markers, tree reflectors | 1.92% |
| | | f) Road furniture (over head sign board etc.) | 0.03% |
| | | (iv) Project facilities | |
| | | a) Bus bye / Bus shelter | 0.16% |
| | | b) Junctions - (Major & Minor) | 3.89% |
| | | c) Others including cable duct & lighting on bridges, etc. | 0.00% |
| | | (v) Road side Plantation | 0.02% |
| | | (vi) Slope protection works as special requirement for hill road | |
| | | (a) Hydro seeding | 0.02% |
| | | (b) Seeding and Mulching with jute net | 2.11% |
| | | (c) Catch water drain | 0.11% |
| | | (d) Retaining Structure on valley side of PCC/RCC/Gabion/Cement Masonry of Varying height | 18.68% |

| | | | |
|---|---|---|---|
| | | between 1 to 6 meter with parapet walls | |
| | | (e) Reinforced earth wall | 1.38% |
| | | (f) Breast wall | 5.40% |
| | | (g) Sub surface drain with perforated pipe & Aggregate drain | 0.03% |
| | | (h) Parapet wall | 0.38% |

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:

| TABLE1.3.1 | | |
|---|---|---|
| **STAGE OF PAYMENT** | **PERCENTAGE WEIGHTAGE** | **PAYMENTPROCEDURE** |
| **A-Widening and strengthening of existing road** | | Unit of measurement is linear length. Payment of each stage shall be made on prorate basis on completion of astage in a length of not less than 10% (ten percent) of the total length. Further, If existing road length (excluding bypasses, re-alignment, structure) is say 'L'Km and the unencumbered length along the existing road as handed over on the appointed date is 'L1' Km and the balance length i.e. 'L2' Km (L-L1) is to be handed over on a later date as per the memorandum signed under provision of clause 8.2.1 of the contract document, then the stage payment shall be worked out for the 'L1'Km length handed over on the appointed date. The stage payment for the remaining'L2'Km shall be worked out on prorate basis from the date of handing over of such length. |
| (1)Earthwork up to top of the Sub-grade including excavation in soil, soft rock and hard rock including clearing & grubbing with required site clearance etc. | 1.21% | |
| (2) Sub Base Course. | 2.78% | |
| (3) Non-Bituminous Base Course. | 5.55% | |
| (4) Dense Graded Bituminous Macadam. | 5.20% | |
| (5) Bituminous Concrete. | 3.88% | |
| (6) Widening, reconstruction and repair of culverts | 0.00% | Cost of completed culverts shall be determined pro rate basis with respect to the total no. of culverts. The payment shall be made on the completion of at least five culverts. |
| (7) Hard Shoulder | 1.36% | Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in a length of not less than 10 (ten) percent of the total length. Further, If existing road length (excluding bypasses, re-alignment, structure) is say 'L'Km and the unencumbered length along the existing road as handed over on the appointed date is 'L1' Km and the balance length i.e. 'L2' Km (L-L1) is to be handed over on a later date as per the memorandum signed under provision of clause 8.2.1 of the contract |

| | | |
|---|---|---|
| | | document, then the stage date. The stage payment for the remaining 'L2'Km shall be worked out on pro rate basis from the date of handing over of such length. |
| **B.1 Reconstruction / New 2 lane realignment / bypass (Flexible pavement)** | | Unit of measurement is linear length. Payment of each stage shall be made on pro rate basis on completion of a stage in full length or 5(five) Km. length, whichever is less.<br>Further, Unit of Measurement is linear length of each Bypass /realignment (excluding structures) and payment of each stage shall be made on pro rate basis on completion of a stage in full length or 5 (Five) Km length of each bypass/realignment taken separately |
| (1) Earthwork up to top of the sub-grade including excavation in soil/soft rock/ hard rock and clearing & grubbing | 3.33% | |
| (2) Sub Base Course | 0.87% | |
| (3) Non-Bituminous Base Course | 2.36% | |
| (4) Dense Graded Bituminous Macadam. | 1.69% | |
| (5) Bituminous Concrete. | 0.83% | |
| (6) Hard Shoulder | 1.38% | |
| **C.1 Reconstruction /New Service road (Flexible Pavement)** | | Unit of measurement is linear length. Payment of each stage shall be made on prorate basis on completion of a stage in full length or 5(five) km. length, whichever is less. |
| (1) Earthwork upto top of the Sub-grade including excavation in soil, soft rock and hard rock including Clearing & grubbing with required site clearance etc. | 0.00% | |
| (2) Sub-Base Course. | 0.00% | |
| (3) Non Bituminous Base Course. | 0.00% | |
| (4) Bituminous Base Course | 0.00% | |
| (5) Wearing Coat. | 0.00% | |
| **C.2 Reconstruction / New Service road (Rigid Pavement)** | | Unit of measurement is linear length. Payment of each stage shall be made on prorate basis on completion of a stage in full length or 5(five) km. length, whichever is less. |
| (1)Earthwork upto top of the Sub-grade including excavation in soil, soft rock and hard rock including clearing & grubbing with required site clearance etc. | 0.00% | |
| (2) Sub-Base Course. | 0.00% | |
| (3)Dry Lean Concrete(DLC)Course | 0.00% | |
| (4)Pavement Quality Control(PQC) Course | 0.00% | |
| **D-Re-construction and New culverts on existing road, realignment, bypass.** | | Cost of each culvert shall be determined on prorate basis with respect to the total number of culverts. Payment shall be made on the completion of at least five culverts. |
| (1)Culverts(Length<6m) | 14.02% | |

@. For example , if the total length of bituminous work to be done is100km ,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 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

Procedureforestimatingthevalueof MinorBridgeandUnderpasses/Overpassesshallbeasstatedin table **1.3.2**:

**TABLE1.3.2**

| STAGE OF PAYMENT | PERCENTAGE WEIGHTAGE | PAYMENTPROCEDURE |
|---|---|---|
| **A.1 Widening and Repair of Minor Bridges (length>6m and <60m)** | 0.00% | Cost of each minor bridge shall be determined on prorate basis with respect to the total linear length of the minor bridges. Payment shall be made on the completion of widening & repair works of a minor bridge. |
| **A.2-NewMinorBridges(length>6mand<60m)** | | |
| (i)**Foundation + Sub Structure** :On completion of the foundation work including foundation for wing and return walls, abutments, piers upto the abutment/ pier cap | 4.10% | (i) **Foundation + Sub Structure** : Cost of each minor bridge shall be determined on prorate basis with respect to the total linear length (m) of the minor bridges. Payment against foundation + substructure shall be made on pro rate 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.<br>In case where load testing is required for<br>foundation, the trigger of first payment shall include load testing also where specified |
| (ii)**Super Structure** : On completion of the super structures in all respects including wearing coat, bearing, expansion joint, hand rail, crash barriers, road signs & markings, tests on completion etc. Complete in all respect. | 1.18% | (ii) **Super Structure**: Payment shall be made on pro rate basis on completion of a stage i.e completion of super structure of at least one span in all respects as specified in the column of" Stage of Payment" in this sub clause. |
| (iii)**Approaches**: On completion of approaches including Retaining walls, stone pitching, protection works complete in all respect | 0.73% | (iii) **Approaches**: Payment shall be made on pro rate basis on completion of a stage i.e completion of approaches in all respect as specified in the column of "Stage of Payment" |

| | | |
|---|---|---|
| and fit for use. | | in this sub clause. |
| (iv)**Guide Bunds and River Training Works:** On completion of Guide Bunds and river Training works complete in all respects. | 0.00% | (iv)**Guide Bunds and River Training Works**: Payment shall be made on pro rate basis on completion of a stage i.e completion of Guide Bunds and River Training Works in all respects as specified |
| **B.1 Widening and Repair of underpasses / overpasses** | 0.00% | Cost of each underpass /overpass shall be determined on pro rate basis with respect to the total linear length of the underpasses /overpasses.<br>Payment shall be made on the completion of Widening & repair works of a underpass /overpass |
| **B.2-New Underpasses /Overpasses** | | |
| (i)**Foundation + Sub Structure** :On completion of the foundation work including foundation for wing and return walls, abutments, piers up to the abutment/pier cap | 0.00% | (i)**Foundation + Sub Structure :**Cost of each Underpass/Overpass shall be determined on pro rate basis with respect to the total linear length (m) of the Underpasses / Overpasses .Payment against foundation + sub structure shall be made on pro rate basis on completion of a stage i.e not less than 25% of the scope of foundation + sub structure of each underpasses / overpasses subject to completion of at least two foundation along with sub structure up to abutment /pier cap level each underpass/overpass.<br>In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified. |
| (ii)**Super Structure** : On completion of the super structures in all respects including wearing coat, bearing, expansion joint, hand rail, crash barriers, road signs & marking, tests on completion etc. Complete in all respect.<br>Wearing Coat (a) incase of overpass wearing coat including expansion joints complete in all respects as specified and(b) incase of underpass-rigid pavement including facility complete in all respects as specified as specified. | 0.00% | (ii) **Super Structure:** Payment shall be made on pro rate basis on completion of a stage I,ecompletion of super structure of at least onespan in all respects as specified in the columnof"StageofPayment" inthissub clause. |
| (iii) **Approaches**: On completion of approaches including Retaining walls /Reinforced Earth walls, stone pitching, protection works complete in all respect and fit for use. | 0.00% | (iii) **Approaches**: Payment shall be made on pro rate basis on completion of 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**

| **TABLE1.3.3** | | |
|---|---|---|
| **STAGE OF PAYMENT** | **PERCENTAGE WEIGHTAGE** | **PAYMENTPROCEDURE** |
| **A.1- Widening and repairs of Major Bridges**<br>(i)Foundation | 0.00% | (i) **Foundation: Cost** of each Major Bridge shall be determined on pro rate basis with respect to the total linear length (m) of the Major Bridge. Payment against foundation shall be made on prorate basis on completion of a stage i.e not less than 25% of the scope of foundation of the major bridge subject to completion of at least two foundation of the Major Bridge. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified. |
| (ii) **Sub Structure** :On completion of the foundation work including foundation for wing and return walls, abutments, piers up to the abutment/ pier cap | 0.00% | (ii) **Sub Structure** : Payment against Sub Structure shall be made on pro rate basis on completion of a stage i.enot less than 25% of the scope of sub structure of the major bridge subject to completion of at least two substructure of abutment/piers up to abutment/pier cap level of the major bridge. |
| (iii)**Super Structure** : (including bearings) | 0.00% | (iii) **Super Structure**: Payment shall be made pro rate basis on completion of a stage i.e completion of super structure including bearing of at least one span in all respect as specified. |
| (iv) Wearing Coat including expansion joints | 0.00% | (iv) **Wearing Coat:** Payment shall be made on completion of wearing coat including expansion joint complete in all respects as specified. |
| (v) Miscellaneous items like hand rails, crash barriers, road markings etc | 0.00% | (v)**Miscellaneous** :Payment shall be made on completion of miscellaneous work like hand rail, crash barriers, road marking etc. complete in all respect as specified. |
| (vi) wing walls / return walls | 0.00% | (vi) **Wing walls/return walls**: Payments shall be made on completion of wing walls/return walls complete in all respects as specified. |
| (vii)Guide Bunds, River Training works etc | 0.00% | (vii) **Guide Bunds, River Training works:** Payments shall be made on completion of all guide bunds/rive training works etc. complete in all respects as specified.. |

| | | |
|---|---|---|
| (viii) Approaches (including Retaining walls, stone pitching and protection works) | 0.00% | (viii)**Approaches**: Payments shall be made on completion of both approaches including stone pitching ,protection works, etc. complete in all respect as specified. |
| **A.2-NewMajorBridges** | | |
| (i)Foundation | 0.00% | (i)**Foundation**: Cost of each Major Bridge shall be determined on pro rate basis with respect to the total linear length (m) of the Major Bridge. Payment against foundation shall be made on prorate basis on completion of stage i.e not less than 25% of the scope of foundation of the major bridge subject to completion of at least two foundation of the major bridge.In case where load testing is required for foundation, thetrigger of first payment shall include load testing alsowherespecified. |
| (ii)Sub-structure | 0.00% | (ii) **Sub Structure**: Payment against Sub-structure shall be made on pro rate basis on completion of a stage i.e not less than 25% of scope of sub structure of the major bridge subject to completion of at least two sub structure of abutment/ piers upto abutment/pier cal level of the major bridge. |
| (iii)Super-structure (including bearings) | 0.00% | (iii) **Super Structure** : Payment shall be made on prorate basis on completion of a stage i.e completion of super structure including bearing of at least one span in all respects as specified. |
| (iv)Wearing Coat including expansion joints | 0.00% | (iv)**Wearing Coat:** Payment shall be made on completion of wearing coat including expansion joint complete in all respects as specified. |
| (v)Miscellaneous items like handrails, crash barriers, road markings etc | 0.00% | (v)**Miscellaneous**: Payment shall be made on completion of all miscellaneous work like hand rail, crash barriers, road marking etc. Complete in all respects as specified. |
| (vi) wing walls/return walls | 0.00% | (vi)**Wing walls / Return walls:** Payment shall be made on completion of all wing walls/return walls complete in all respects as specified. |
| (vii) Guide Bunds, River Training works etc | 0.00% | (vii) **Guide Bunds, River Training works** : Payment shall be made on completion of all guide bunds /river training works etc. complete in all respects as specified. |
| (viii) Approaches (including | 0.00% | (viii)**Approaches**: Payment shall be |

| | | |
|---|---|---|
| Retaining walls, stone pitching and protection works) | | made on completion of both approaches including stone pitching, protection works, etc complete in all respects as specified. |
| **B.1-Widening and Repair of (a) ROB (b) RUB** | | |
| (i)Foundation | 0.00% | (i)**Foundation**: Cost of each ROB/RUB shall be determined on pro rate basis with respect to the total liner length (m) of the ROBs/RUBs. Payment foundation shall be made on pro rate basis on completion of a stage i.e not less than 25% of the scope of foundation of the ROB/RUB subject to completion of a stage i.e not less than 25% of the scope of foundation of the ROB/RUB subject to completion of at least two foundation of the ROB/RUB. Incase where load testing is required for foundation,The triggeroffirstpayment0.00%shallincludeloadtestingalsowherespecified. |
| (ii)Sub-structure | 0.00% | (ii) **Sub Structure** : Payment against sub structure shall be made on pro rate basis on completion of a stage i.e not less than 25% of the scope of sub structure of the ROB/RUB subject to completion of at least two substructure of abutments/piers upto Abutment/pier cap level of the ROB/RUB. |
| (iii) Super-structure(including bearings) | 0.00% | (iii) **Super Structure**: Payment shall be made on prorate basis on completion of a stage i.e completion of super structure including bearing of at least one span In all respects as specified. |
| (iv)Wearing Coat(a) incase of ROB-wearing coat including expansion joints complete in all respects as specified and (b) in case of RUB-rigid pavement underRUBincludingdrainage facilitycompleteinallrespects asspecifiedas specified | 0.00% | (iv)**WearingCoat**:Paymentshallbemadeoncompletionof(a)incaseofROB-wearingcoatincluding expansion joints complete in all respects asspecifiedand(b)incaseofRUB-rigidpavementunderincludingdrainagefacilitycompleteinallrespectsasspecified as specified. |
| (v)Miscellaneous items like hand rails, crash barriers, road marking etc | 0.00% | (v)**Miscellaneous**: Payment shall be made on completion of all miscellaneous work like hand rail, crash barriers, road marking etc. Complete in all respects as specified. |
| (vi)wing wall/return walls | 0.00% | (vi)**Wing walls/return walls**: Payment shall be made on completion of all wing walls/return |

| | | |
|---|---|---|
| | | walls Complete in all respects as specified. |
| (vii)Approaches (including Retaining walls, stone pitching and Protection work | 0.00% | (vii)**Approaches**: Payment shall be made on completion of both approaches including stone pitching, protection works, etc complete in all respect<br>As specified. |
| **C.1-Widening and repairs of Elevated Section / Flyovers/Grade Separators** | | |
| (i)Foundation | 0.00% | (i)**Foundation**: Cost of each structure shall be determined on pro rate basis with respect to the total liner length(m)of the structure Payment against foundation shall be made on prorate basis on completion of a stage i.e not less than 25% of the scope of foundation of the structure subject to completion of at least two foundation of the structure. Incase where load testing is required for foundation ,the trigger of first payment shall include load testing also where specified. |
| (ii)Sub-structure | 0.00% | (ii) **Sub Structure** : Payment against sub structure shall be made on pro rate basis on completion of a stage i.e not less than 25% of the scope of sub structure of the structure subject to completion of at least two substructure of abutments/piers upto abutment/pier cap level of the structure. |
| (iii)Super structure (including bearings) | 0.00% | (iii) **Super Structure** : Payment shall be made on prorate basis on completion of a stage i.e completion of Super structure including bearing of at least one span in all respects as specified. |
| (iv)Wearing Coat including expansion joints | 0.00% | (iv)**Wearing Coat**: Payment shall be made on completion of wearing coat including expansion joints complete in all respectsas specified |
| (v)Miscellaneous items like handrails ,crash barriers ,road marking etc | 0.00% | (v)**Miscellaneous**: Payment shall be made on completion of all miscellaneous work like hand rail,crashbarriers,roadmarkingetc.Co mpleteinallrespectsasspecified. |
| (vi)wing wall/return walls | 0.00% | (vi)**Wing walls/return walls**:<br>Payment shall be made on completion of all wing walls/return walls<br>complete in all respects as specified. |
| vii)Approaches (including Retaining walls/ Reinforced Earth wall, stone pitching and protection work) | 0.00% | (vii)**Approaches**: Payment shall be made on completion of both approaches including stone pitching, protection works, etc complete in all respect<br>As specified. |

**Note:(1)In case of innovate Major Bridge projects like cable suspension /cable stayed /Extra Dozed and exceptionally long span bridges, the schedule may be modified as per site requirements before bidding with due approval of DG(RD) & SS, MoRT&H.**

**Note:(2)TheScheduleforexclusivetunnelprojectmaybepreparedaspersiterequirementbefore bidding with dueapproval ofDG (RD)&SS, MoRT&H**

1.3.4 Othersworks

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

| **TABLE1.3.4** | | |
|---|---|---|
| **STAGE OF PAYMENT** | **PERCENTAGE WEIGHTAGE** | **PAYMENT PROCEDURE** |
| (i) Toll Plaza | 0.00% | Unit of measurement is each completed toll plaza. Payment of each toll plaza shall bemadeonpro Ratebasiswithrespecttothetotalofalltollplazas. |
| (ii)Roadsidedrain | 12.38% | UnitofmeasurementislinearlengthinKm.Paymentshallbemadeonproratebasisoncompletion of a stage in a length ofnot less than 10% (ten per cent) ofthetotallength. |
| (iii)Roadsigns,marking,Kmstones,Safetydevices etc. | 0.53% | |
| (a)PavementMarking | 1.59% | |
| (b)CrashBarrier/WmetalcrashBarrier | 0.85% | |
| (c)TrafficSign | | |
| (d) RoadBoundarystone, kmStone,5th km Stoneand hectometer stone | 0.04% | |
| (e)TrafficblinkerLEDdelineator,stud,reflectivepaymentmarker,treereflector | 1.92% | |
| (f)TrafficimpactAtAbutments AndPierstrafficisland | | |
| (g)Roadfurniture(overheadsignboardetc.) | 0.03% | |
| h) Others including construction of median & median kerb withchannel,paint,rumblestrip, RoadsidePlantationetc. | | |
| (iv)Projectfacilities | | Paymentshallbemadeonproratebasisforcompletedfacilities. |
| (a)Busbays&BusShelter | 0.16% | |
| (b)Trucklay-byes | | |
| (c,) Restareas | | |
| (d)Others | | |

| | | |
|---|---|---|
| (e)Junctions(Major&Minor) | 3.89% | |
| (v)RoadsidePlantation | 0.02% | Unit of measurement is linear length. Payment shall be made on pro rate basis on completion of a stage in a length of not less than10%(ten percent) of the total length. |
| (vi) Repair of protection works other than approaches to the bridges elevated section /flyovers /grade separators and ROBs/RUBs | | |
| (vii)Safety and traffic management during construction | | Payment shall be made on pro rate basis every six month. |
| (viii)Slope Protection Works as special Requirement for hill road | | Unit of measurement is linear length in Km. Payment shall be made on prorate basis on completion of a stage in a length of not less than 10% (ten per cent) of the total length. |
| (a)Hydro Seeding of Cut Slopes in Soil | 0.02% | |
| (b)Seeding and Mulching with Jute net all a long the perpetual slide locations | 2.11% | |
| (c)Catch water Drain | 0.11% | |
| (d)Gabion Structure on hill side/valleys sideOf varying height between 1to6 meter depending upon the slope | 18.68% | |
| (e)Reinforced earth wall | 1.38% | |
| (e)Breast wall | 5.40% | |
| (f)Sub Surface drain with perforated pipe For collection of seepage water to avoid sinking of pavement | 0.03% | |
| (g)Parapet wall | 0.38% | |
| (h)Toe wall | | |

***2. Procedure for payment for Maintenance***

2.1 The cost for maintenance shall be as stated inClause14.1.1

Payment for Maintenance shall be made in quarterly installment in accordance with the provisions of Clause 19.7

SCHEDULE - I
(See Clause 10.2.4)
**DRAWINGS**

**1 Drawings**

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

**2 Additional Drawings**

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

Annex - I

(Schedule - I)

**List of Drawings**

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

1. A minimum list of the drawings of the various components/elements of the project highway and project facility required to be submitted by the Contractor is given below:
    - (a) Drawing of plan, profile and cross sections
    - (b) Drawings of cross drainage works
    - (c) Drawings of junctions
    - (d) Drawing of typical cross sections
    - (e) Drawings of bus-bay and bus shelters with furniture and drainage system
    - (f) Drawing of a truck parking lay bye with furniture and drainage system
    - (g) Drawings of road furniture items including traffic signage, marking, safety barriers, etc.
    - (h) Drawings of traffic diversions plans and traffic control measures
    - (i) Drawings of road drainage measures
    - (j) Drawings of typical details slope protection measures

## Schedule - J

*(See Clause 10.3 (ii))*

## Project Completion Schedule

**1. Project Completion Schedule**

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

**2. Project Milestone-I**

(i) Project Milestone-I shall occur on the date falling on the **[192nd ]** day from the Appointed Date (the "**Project Milestone- I**").

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

**3. Project Milestone-II**

(i) Project Milestone-II shall occur on the date falling on the **[329th ]** day from the Appointed Date (the "**Project Milestone- II**").

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

**4. Project Milestone-III**

(i) Project Milestone-III shall occur on the date falling on the **[467th ]** day from the Appointed Date (the "**Project Milestone- III**").

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

**5. Scheduled Completion Date**

(i) The Scheduled Completion Date shall occur on the [549th] day from the Appointed Date.

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

**6. Extension of time**

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

SCHEDULE - K

(See Clause 12.1.2)

## TESTS ON COMPLETION

### 1 Schedule for Tests

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

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

### 2 Tests

Visual and physical test: The Authority's Engineer shall conduct a visual and physical check of construction to determine that all works and equipment forming part thereof conform to the provisions of this Agreement. The physical tests shall include (to be decided in consultation with Authority's Engineer as per relevant IRC codes/manual).

Riding quality test: Riding quality of each lane of the carriageway shall be checked with the help of a calibrated bump integrator and the maximum permissible roughness for purposes of this Test shall be 2,000 (two thousand) mm for each kilometre.

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

Other tests: The Authority's Engineer may require the Contractor to carry out orcause to be carried additional tests, in accordance with Good Industry Practice, for determining the compliance of the Project Highway with Specifications and Standards.

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

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

## 3 Agency for conducting Tests

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

## 4 Completion Certificate

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

SCHEDULE - L
(See Clause 12.2 and 12.4)

**PROVISIONAL CERTIFICATE**

***1*** I, ……. (Name of the Authority's Engineer), acting as the Authority's Engineer, under and in accordance with the Agreement dated ……. (the "Agreement"), for Balance work of Construction of Two-lane with hard shoulders of Merangkong-Tamlu-Mon Road on EPC basis from existing Km 76.640 to Km 98.065 [Design Km. 63.800 to Km. 86.835] (Design length-23.035 km) in the state of Nagaland under SARDP-NE Phase A (the "Project Highway") on Engineering, Procurement and Construction (EPC) basis through

…… (Name of Contractor), hereby certify that the Tests in accordance with Article 12 of the Agreement have been undertaken to determine compliance of the Project Highway with the provisions of the Agreement.

***2*** Works that are incomplete on account of Time Extension have been specified in the Punch List appended hereto, and the Contractor has agreed and accepted that it shall complete all such works in the time and manner set forth in the Agreement. In addition, certain minor works are incomplete and these are not likely to cause material inconvenience to the Users of the Project Highway or affect their safety. The Contractor has agreed and accepted that as a condition of this Provisional Certificate, it shall complete such minor works within 30 (thirty) days hereof. These minor works have also been specified in the aforesaid Punch List.

***3*** In view of the foregoing, I am satisfied that the Project Road ***of*** Balance work of Construction of Two-lane with hard shoulders of Merangkong-Tamlu-Mon Road on EPC basis from existing Km 76.640 to Km 98.065 [Design Km. 63.800 to Km. 86.835] (Design length-23.035 km) in the state of Nagaland under SARDP-NE Phase A can be safely and reliably placed in service of the Users thereof, and in terms of the Agreement, the Project Highway is hereby provisionally declared fit for entry into operation on this the …… day of
…….. 20…...

| | |
|---|---|
| ACCEPTED, SIGNED, SEALED | SIGNED, SEALED AND |
| AND DELIVERED | DELIVERED |
| For and on behalf of | for and on behalf of |

CONTRACTOR by:AUTHORITY's ENGINEER by:

(Signature) (Signature)

**COMPLETION CERTIFICATE**

1 I,..... (Name of the Authority's Engineer), acting as the Authority's Engineer, under and in accordance with the Agreement dated.....(the "Agreement"), for ***Balance work of Construction of Two-lane with hard shoulders of Merangkong-Tamlu-Mon Road on EPC basis from existing Km 76.640 to Km 98.065 [Design Km. 63.800 to Km. 86.835] (Design length-23.035 km) in the state of Nagaland under SARDP-NE Phase A***

(the "Project Highway") on Engineering, Procurement and Construction (EPC) basis through ……. (Name of Contractor), hereby certify that the Tests in accordance with Article 12 of the Agreement have been successfully undertaken to determine compliance of the Project Highway with the provisions of the Agreement, and I am satisfied that the Project Highway can be safely and reliably placed in service of the Users thereof.

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

SIGNED, SEALED AND DELIVERED

For and on behalf of

The Authority's Engineer by:

(Signature)

(Name)

(Designation)

(Address)

SCHEDULE - M

*(See Clauses 14.6, 15.2 and 19.7)*

## PAYMENT REDUCTION FOR NON-COMPLIANCE

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

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

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

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

### 2. Percentage reductions in lump sum payments

The following percentages shall govern the payment reduction:

| S. No. | Item/Defect/Deficiency | Percentage |
|---|---|---|
| **(a)** | **Carriageway/Pavement** | |
| (i) | Potholes, cracks, other surface defects | 15% |
| (ii) | Repairs of Edges, Rutting | 5% |
| **(b)** | **Road, Embankment, Cuttings, Shoulders** | |
| (i) | Edge drop, inadequate crossfall, undulations, settlement, potholes, ponding, obstructions | 10% |
| (ii) | Deficient slopes, raincuts, disturbed pitching, vegetation growth, pruning of trees | 5% |
| **(c)** | **Bridges and Culverts** | |
| (i) | Desilting, cleaning. vegetation growth, damaged pitching, flooring, parapets, wearing course, footpaths, any damage to foundations | 20% |
| **S. No.** | **Item/Defect/Deficiency** | **Percentage** |
| (ii) | Any Defects in superstructures, bearings and sub-structures | 10% |
| (iii) | Painting, repairs/replacement kerbs, railings, parapets, guideposts/crash barriers | 5% |
| **(d)** | **Roadside Drains** | |
| (i) | Cleaning and repair of drains | 5% |
| **(e)** | **Road Furniture** | |
| (i) | Cleaning, painting, replacement of road signs, delineators, road markings, 200 m/km/5$^{th}$ km stones | 5% |
| **(f)** | **Miscellaneous Items** | |
| (i) | Removal of dead animals, broken down/accidental vehicles, fallen trees, road blockades or malfunctioning of mobile crane | 10% |
| (ii) | Any other Defects in accordance with paragraph 1. | 5% |
| **(g)** | **Defects in Other Project Facilities** | 5% |

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

R=P/IOO x M x L1/L

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

M = Monthly lump-sum payment in accordance with the Bid

L1 = Non-complying length

L = Total length of the road,

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

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

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

SCHEDULE - N
(See Clause 18.1.1)

# SELECTION OF AUTHORITY'S ENGINEER

## 1 Selection of Authority's Engineer

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

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

## 2 Terms of Reference

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

## 3 Appointment of Government entity as Authority's Engineer

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

Annex – I

*(Schedule - N)*

**TERMS OF REFERENCE FOR AUTHORITY'S ENGINEER**

**1 Scope**

These Terms of Reference (the "**TOR**") for the Authority's Engineer are being specified pursuant to the EPC Agreement dated.....(the "**Agreement**), which has been entered into between the National Highways and Infrastructure Development Corporation Ltd, 3rd Floor, PTI Building, 4, Parliament Street, New Delhi – 110001the "**Authority**") and ..... (the "**Contractor**") Balance work of Construction of Two-lane with hard shoulders of Merangkong-Tamlu-Mon Road on EPC basis from existing Km 76.640 to Km 98.065 [Design Km. 63.800 to Km. 86.835] (Design length-23.035 km) in the state of Nagaland under SARDP-NE Phase A and a copy of which is annexed hereto and marked as Annex-A to form part of this TOR.

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

**2 Definitions and interpretation**

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

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

The rules of interpretation stated in Clauses 1.2, 1.3 and 1.4 of the Agreement shall apply, mutatis mutandis, to this TOR.

**3. General**

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

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

(a) any Time Extension;

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

(c) the Termination Payment; or

(d) any other matter which is not specified in (a), (b) or (c) above and which creates an obligation or liability on either Party for a sum exceeding Rs. 5,000,000 (Rs. fifty lakh).

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

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

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

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

## 4 Construction Period

During the Construction Period, the Authority's Engineer shall review the Drawings furnished by the Contractor along with supporting data, including the geo-technical and hydrological investigations, characteristics of materials from borrow areas and quarry sites, topographical surveys, and the recommendations of the Safety Consultant in accordance with the provisions of Clause 10.1.6. The Authority's Engineer shall complete such review and send its observations to the Authority and the Contractor within 15 (fifteen) days of receipt of such Drawings; provided,

however that in case of a Major Bridge or Structure, the aforesaid period of 15 (fifteen) days may be extended up to 30 (thirty) days. In particular, such comments shall specify the conformity or otherwise of such Drawings with the Scope of the Project and Specifications and Standards.

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

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

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

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

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

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

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

For determining that the Works conform to Specifications and Standards, the Authority's Engineer shall require the Contractor to carry out, or cause to be carried out, tests at such time and frequency and in such manner as specified in the Agreement and

in accordance with Good Industry Practice for quality assurance. For purposes of this Paragraph 4.9, the tests specified in the IRC Special Publication-11 (Handbook of Quality Control for Construction of Roads and Runways) and the Specifications for Road and Bridge Works issued by MORTH (the "Quality Control Manuals") or any modification/substitution thereof shall be deemed to be tests conforming to Good Industry Practice for quality assurance.

The Authority's Engineer shall test check at least 20 (twenty) percent of the quantity or number of tests prescribed for each category or type of test for quality control by the Contractor.

The timing of tests referred to in Paragraph 4.9, and the criteria for acceptance/ rejection of their results shall be determined by the Authority's Engineer in accordance with the Quality Control Manuals. The tests shall be undertaken on a random sample basis and shall be in addition to, and independent of, the tests that may be carried out by the Contractor for its own quality assurance in accordance with Good Industry Practice.

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

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

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

The Authority's Engineer shall obtain from the Contractor a copy of all the Contractor's quality control records and documents before the Completion Certificate is issued pursuant to Clause 12.4.

Authority's Engineer may recommend to the Authority suspension of the whole or part of the Works if the work threatens the safety of the Users and pedestrians. After the

Contractor has carried out remedial measure, the Authority's Engineer shall inspect such remedial measures forthwith and make a report to the Authority recommending whether or not the suspension hereunder may be revoked.

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

The Authority's Engineer shall carry out, or cause to be carried out, all the Tests specified in Schedule-K and issue a Completion Certificate or Provisional Certificate, as the case may be. For carrying out its functions under this Paragraph 4.18 and all matters incidental thereto, the Authority's Engineer shall act under and in accordance with the provisions of Article 12 and Schedule-K.

## 5. Maintenance Period

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

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

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

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

The Authority's Engineer shall examine the request of the Contractor for closure of any lane(s) of the Project Highway for undertaking maintenance/repair thereof, and shall grant permission with such modifications, as it may deem necessary, within 5 (five) days of receiving a request from the Contractor. Upon expiry of the permitted period of

closure, the Authority's Engineer shall monitor the reopening of such lane(s), and in case of delay, determine the Damages payable by the Contractor to the Authority under Clause 14.5.

**6 Determination of costs and time**

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

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

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

**7. Payments**

The Authority's Engineer shall withhold payments for the affected works for which the Contractor fails to revise and resubmit the Drawings to the Authority's Engineer in accordance with the provisions of Clause 10.2.4 (d).

Authority's Engineer shall -

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

(b) within 15 (fifteen) days of the receipt of the Stage Payment Statement referred to in Clause 19.4, deliver to the Authority and the Contractor an Interim Payment Certificate certifying the amount due and payable to the Contractor, after adjustments in accordance with the provisions of Clause 19.10.

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

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

**8. Other duties and functions**

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

## 9 Miscellaneous

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

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

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

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

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

SCHEDULE - O

*(See Clauses 19.4.1, 19.6.1, and 19.8.1)*

**Forms of Payment Statements**

## 1. Stage Payment Statement for Works

The Stage Payment Statement for Works shall state:

a. the estimated amount for the Works executed in accordance with Clause 19.3.1 subsequent to the last claim;
b. amounts reflecting adjustments in price for the aforesaid claim;
c. the estimated amount of each Change of Scope Order executed subsequent to the last claim;
d. amounts reflecting adjustment in price, if any, for (c) above in accordance with the provisions of Clause 13.2.3 (a);
e. total of (a), (b), (c) and (d) above;
f. Deductions:
    i. Any amount to be deducted in accordance with the provisions of the Agreement except taxes;
    ii. Any amount towards deduction of taxes; and
    iii. Total of (i) and (ii) above.
g. Net claim: (e) – (f) (iii);
h. The amounts received by the Contractor upto the last claim:
    i. For the Works executed (excluding Change of Scope orders);
    ii. For Change of Scope Orders, and
    iii. Taxes deducted

## 2. Monthly Maintenance Payment Statement

The monthly Statement for Maintenance Payment shall state:

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

(b) the deductions for maintenance work not done;

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

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

(e) amount towards deduction of taxes

**3. Contractor's claim for Damages**

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

SCHEDULE - P

*(See Clause 20.1)*

**INSURANCE**

**1. Insurance during Construction Period**

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

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

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

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

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

The Contractor shall effect and maintain insurance cover for the Works from the date of issue of the Completion Certificate until the end of the Defects Liability Period for any loss or damage for which the Contractor is liable and which arises from a cause occurring prior to the issue of the Completion Certificate. The Contractor shall also maintain other insurances for maximum sums as may be required under the Applicable Laws and in accordance with Good Industry Practice.

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

The Contractor shall insure against its liability for any loss, damage, death or bodily injury, or damage to any property (except things insured under Paragraphs 1 and 2 of this Schedule or to

any person (except persons insured under Clause 20.9), which may arise out of the Contractor's performance of this Agreement. This insurance shall be for a limit per occurrence of not less than the amount stated below with no limit on the number of occurrences.

The insurance cover shall be not less than value of the contract price.

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

a) the Authority's right to have the construction works executed on, over, under, in or through any land, and to occupy this land for the Works; and
b) damage which is an unavoidable result of the Contractor's obligations to execute the Works.

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

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

## Schedule-Q

*(See Clause 14.10)*

### Tests on Completion of Maintenance Period

**1. Riding Quality test:**

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

**2. Visual and physical test:**

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

## Schedule-R

*(See Clause 14.10)*

## Taking Over Certificate

I,..... (Name and designation of the Authority's Representative) under and in accordance with the Agreement dated …… (the "**Agreement**"), for **"**Balance work of Construction of Two-lane with hard shoulders of Merangkong-Tamlu-Mon Road on EPC basis from existing Km 76.640 to Km 98.065 [Design Km. 63.800 to Km. 86.835] (Design length-23.035 km) in the state of Nagaland under SARDP-NE Phase A**"**(the "**Project Highway**") on Engineering, Procurement and Construction (EPC) basis through (Name of Contractor), hereby certify that the Tests on completion of Maintenance Period in accordance with Article 14 of the Agreement have been successfully undertaken to determine compliance of the Project Highway with the provisions of the Agreement and I hereby certify that the Authority has taken over the Project highway from the Contractor on this day.....

SIGNED, SEALED AND DELIVERED

(Signature)

(Name and designation of Authority's

Representative)

(Address)