

SCHEDULES

SCHEDULE - A

(See Clauses 2.1 and 8.1)

SITE OF THE PROJECT

The Site

- (i) Site of the **“Treatment of 06 landslide location (Ch. 73.270 to 73.370 near Ghagra, Ch. 81.450 to 81.755 near Kalika, Ch. 94.720 to 94.830 near Tapowan, Ch, 97.040 to 97.415 near Dobat, Ch. 100.465 to 101.425 near Jumma, Ch. 106.230 to 106.360 near Tawaghat) in Pithoragarh - Tawaghat section of NH-09 (Old NH-125) in the State of Uttarakhand on EPC Mode.”**
- (ii) **“Treatment of 06 landslide location (Ch. 73.270 to 73.370 near Ghagra, Ch. 81.450 to 81.755 near Kalika, Ch. 94.720 to 94.830 near Tapowan, Ch, 97.040 to 97.415 near Dobat, Ch. 100.465 to 101.425 near Jumma, Ch. 106.230 to 106.360 near Tawaghat) in Pithoragarh - Tawaghat section of NH-09 (Old NH-125) in the State of Uttarakhand on EPC Mode.”** shall include the land, buildings, structures and road works as described in Annex-I of this Schedule-A.
- (iii) The dates of handing over the Right of Way to the Contractor are specified in Annex-II of this Schedule-A.
- (iv) An inventory of the Site including the land, buildings, structures, road works, trees and any other immovable property on, or attached to, the Site shall be prepared jointly by the Authority Representative and the Contractor, and such inventory shall form part of the memorandum referred to in Clause 8.2 (i) of this Agreement.
- (v) The status of the environment clearances obtained or awaited is given in Annex-IV.

Annex - I
(Schedule-A)

Site

1. Site

The Site of the Project Highway for “Treatment of 06 landslide location (Ch. 73.270 to 73.370 near Ghagra, Ch. 81.450 to 81.755 near Kalika, Ch. 94.720 to 94.830 near Tapowan, Ch. 97.040 to 97.415 near Dobat, Ch. 100.465 to 101.425 near Jumma, Ch. 106.230 to 106.360 near Tawaghat) in Pithoragarh - Tawaghat section of NH-09 (Old NH-125) in the State of Uttarakhand on EPC Mode.” The land, carriageway and structures comprising the Site are described below.



Site View Landslide Loc Ch. 73.270 Km to Ch. 73.370 Km (NH-09) ON P-T ROAD



Site View Landslide Loc Ch. 81.450 Km to Ch. 81.755 Km (NH-09) P-T ROAD



Site View Landslide Loc Ch. 94.720 Km to Ch. 94.830 Km (NH-09) ON P-T ROAD



Site View Landslide Loc Ch. 97.040 Km to Ch. 97.415 Km (NH-09) ON P-T ROAD



Site View Landslide Loc Ch. 100.465 Km to Ch. 101.425 Km (NH-09) ON P-T ROAD



Site View Landslide Loc Ch. 106.230 Km to Ch. 106.360 Km (NH-09) ON P-T ROAD

2. Land

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

S No	Chainage (km)		ROW (m)	Remarks
	From	To		
1	73.270	73.370	24.00	Pithoragarh – Tawaghat road
2	81.450	81.755	24.00	
3	94.720	94.830	24.00	
4	97.040	97.415	24.00	
5	100.465	101.425	24.00	
6	106.230	106.360	24.00	

3. **Carriageway - Nil**
4. **Major Bridges - Nil**
5. **Road over-bridges (ROB)/ Road under-bridges (RUB) - Nil**
6. **Grade Separators - Nil**
7. **Minor Bridges - Nil**
8. **Railway level crossings - Nil**
9. **Underpasses (vehicular, non vehicular) - Nil**
10. **Culverts - Nil**
11. **Bus bays / Bus stop - Nil**
12. **Truck Lay byes - Nil**
13. **Road side drains - Nil**
14. **Major junctions - Nil**
15. **Minor Junctions - Nil**
16. **Bypasses - Nil**
17. **Other Structures - Nil**
18. **Referencing System - Nil**

Annex – II
(As per clause 8.3(ii))
(Schedule-A)

Dates for providing Right of Way-

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

“Treatment of 06 landslide location (Ch. 73.270 to 73.370 near Ghagra, Ch. 81.450 to 81.755 near Kalika, Ch. 94.720 to 94.830 near Tapowan, Ch, 97.040 to 97.415 near Dobat, Ch. 100.465 to 101.425 near Jumma, Ch. 106.230 to 106.360 near Tawaghat) in Pithoragarh - Tawaghat section of NH-09 (Old NH-125) in the State of Uttarakhand on EPC Mode”

Sr. No.	Existing Chainage (In Km)		Design (In Km)	Chainage		Length (m)	Width (m)	Date of Providing ROW
	From	To	From	To				
(i) Full Right of Way (Full width)								
1	73.270	73.370	73.270	73.370	100.00	24	On Appointed Date	
2	81.450	81.755	81.450	81.755	305.00	24	On Appointed Date	
3	94.720	94.830	94.720	94.830	110.00	24	On Appointed Date	
4	97.040	97.415	97.040	97.415	375.00	24	On Appointed date	
5	100.465	101.425	100.465	101.425	960.00	24	On Appointed date	
6	106.230	106.360	106.230	106.360	130.00	24	On Appointed date	
(ii) Part Right of way (Part Width)								
Nil								
(iii) Balance Right of Way (Width)								
Nil								

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:

- (i) The Contractor shall design and construct the site as per requirement and provisions made in IRC: SP: 73-2015 referred to as the Manual, IRC 56-2011, IRC SP:106-2015. The contractor shall, however, improve/upgrade the Road profile as indicated in Annex-III based on site/design requirement (Attached in drawing volume).
- (ii) The contractor shall provide the traffic signage plan based on site/design requirement as per IRC: SP: 99 & IRC: 67.

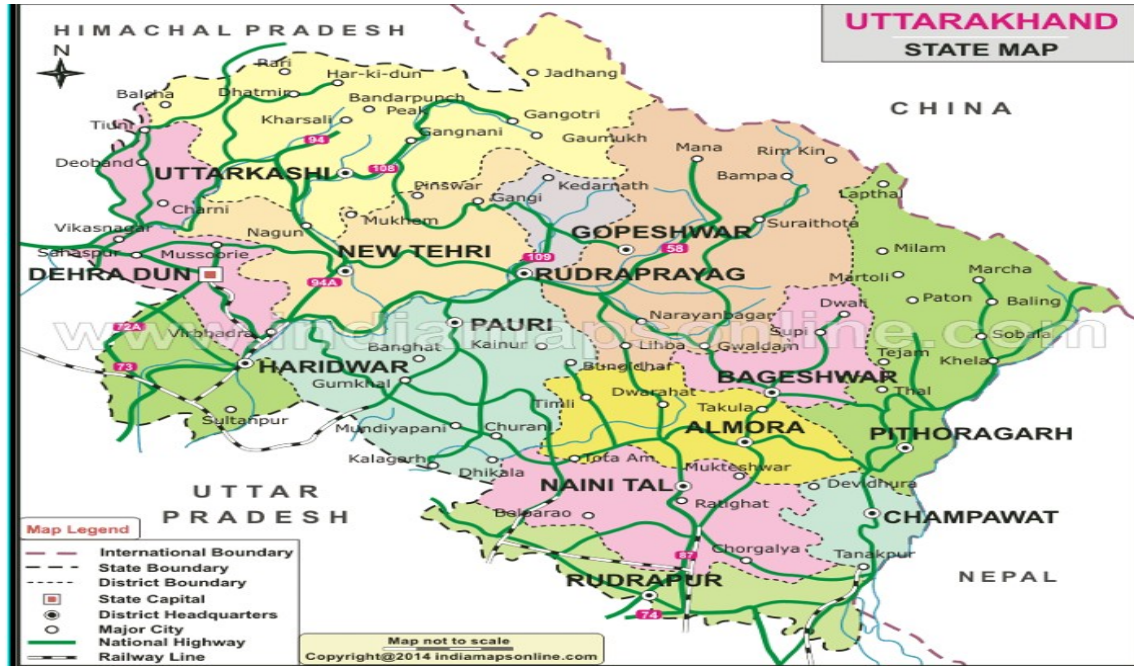
Annex - IV
(Schedule-A)

Environment Clearances

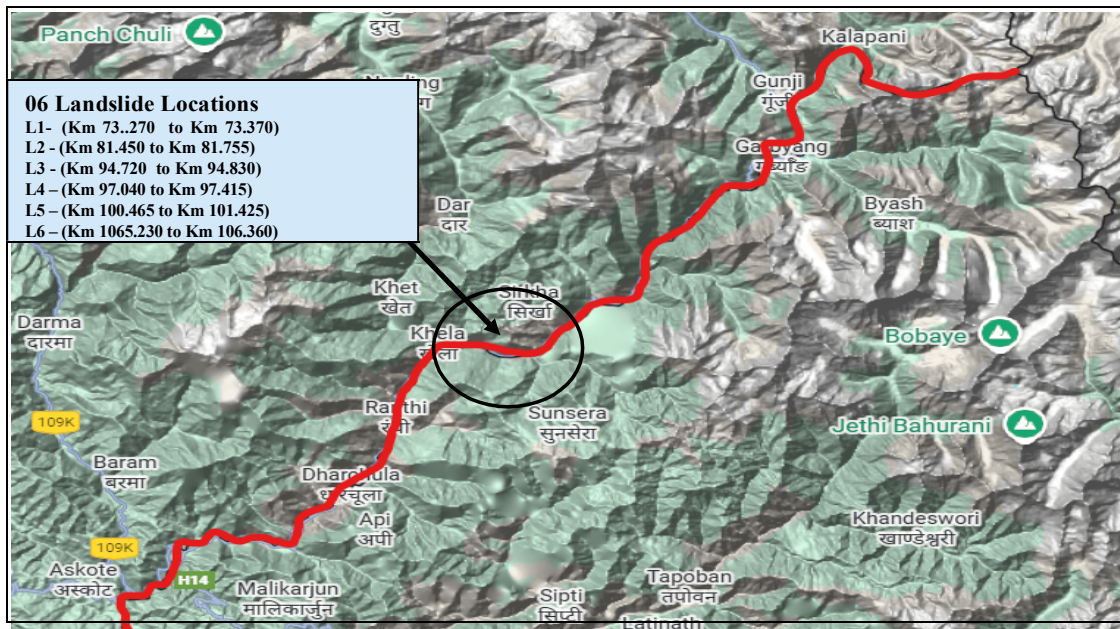
Environment Clearance is not required for two laning of Project Highway as per MOEF Notification on 22nd Aug, 2013.

Appendix A-I

“Treatment of 06 landslide location (Ch. 73.270 to 73.370 near Ghagra, Ch. 81.450 to 81.755 near Kalika, Ch. 94.720 to 94.830 near Tapowan, Ch. 97.040 to 97.415 near Dobat, Ch. 100.465 to 101.425 near Jumma, Ch. 106.230 to 106.360 near Tawaghat) in Pithoragarh - Tawaghat section of NH-09 (Old NH-125) in the State of Uttarakhand on EPC Mode”



ROAD MAP OF UTTARAKHAND



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 slope protection work as described in this **Schedule-B** and in **Schedule-C**.

2 Improvement and augmentation (land slide treatment work)

Improvement and augmentation shall include slope protection work of the Project Highway as described in Annex-I of this Schedule-B and in Schedule-C.

3 Specifications and Standards

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

Annex – I
(Schedule – B)

Description of Work

“Treatment of 06 landslide location (Ch. 73.270 to 73.370 near Ghagra, Ch. 81.450 to 81.755 near Kalika, Ch. 94.720 to 94.830 near Tapowan, Ch. 97.040 to 97.415 near Dobat, Ch. 100.465 to 101.425 near Jumma, Ch. 106.230 to 106.360 near Tawaghat) in Pithoragarh - Tawaghat section of NH-09 (Old NH-125) in the State of Uttarakhand on EPC Mode”

1. **WIDENING OF THE EXISTING HIGHWAY** - Deleted
2. **GEOMETRIC DESIGN AND GENERAL FEATURES** - Deleted
3. **INTERSECTIONS AND GRADE SEPARATORS** - Deleted
4. **ROAD EMBANKMENT AND CUT SECTION** -Deleted
5. **PAVEMENT DESIGN** - Deleted
6. **ROADSIDE DRAINAGE** – Deleted
7. **DESIGN OF STRUCTURES** - Deleted
8. **TRAFFIC CONTROL DEVICES AND ROAD SAFETY WORKS** - Deleted
9. **ROADSIDE FURNITURE** - Deleted
10. **COMPULSORY AFFORESTATION** - Deleted
11. **HAZARDOUS LOCATIONS** - Deleted
12. **SLOPE PROTECTION WORKS** “Treatment of 06 landslide location (Ch. 73.270 to 73.370 near Ghagra, Ch. 81.450 to 81.755 near Kalika, Ch. 94.720 to 94.830 near Tapowan, Ch. 97.040 to 97.415 near Dobat, Ch. 100.465 to 101.425 near Jumma, Ch. 106.230 to 106.360 near Tawaghat) in Pithoragarh - Tawaghat section of NH-09 (Old NH-125) in the State of Uttarakhand on EPC Mode”

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Tender No. CE (P) HRK/06 Landslide location/2026-27/(EPC)

(12.1) **Qty of the works:-** The Location wise minimum required qty assessed and tabulated below. These quantities may exceed as per site requirement. Any increase in the length and quantity as per site requirements shall not be considered as positive change of scope.

(A) Landslide Location Ch. 73.270 Km to Ch. 73.370 Km (NH-09)

S No.	Description of items	Unit	Qty
CH-73.270 TO 73.370 KM			
SLOPE PROTECTION MEASURES			
1	Excavation in Soil with Dozer with lead upto 1000 metres (Excavation for road way in soil by mechanical means including cutting and transporting the earth to site of embankment/dumping area with lead upto 1000 metres, including trimming bottom and side slopes in accordance with requirements of lines, grades and cross sections.)	CUM	6300
	Excavation in Ordinary Rock with Dozer with lead upto 1000 metres (Excavation for roadway in ordinary rock by deploying a dozer, including cutting and transporting the earth to site of embankment/dumping area with lead upto 1000 metres, trimming bottom and side slopes in accordance with the requirements of lines, grades and cross sections.)		1575
	Cost of Haulage Excluding Loading and Unloading.Case I Surfaced Road Hilly.Within Lead 4Km	T.KM	20475
2	Supply and installation of high tensile rolled cable net having aperture size not more than 300mm in one direction and minimum longitudinal tensile strength 100 KN/M and punching resistance 200 kN, comprising of minimum 8mm dia wire rope cable with a minimum breaking load of 40.7kN. The tensile strength of wire of the cable should be 1770 N/sqmm having corrosion protection of Zn Coating Class A or 95% Zn + 5% Al Class-B (Galfan) Coating as per IS/ISO-17746-2016 for treatment of slopes including all cost of material (net, boundary rope & rope anchor etc. comprising of the complete system), labour, special labour and T&P required to complete the work in all respect in accordance with drawings,Technical Specifications and as per the direction of Engineer-in-charge. Product Manufacturer shall have in-house test facility for conducting longitudinal tensile strength and punching resistance test and shall be responsible for carrying out both test (longitudinal tensile strength and punching resistance) during PDI, per lot in presence of representative/s of E-i-C on his own expenses.	SQM	4050
3	Supply and fixing of Double Twisted Mesh including all cost of material, labour and T&P required to complete the work in all respect with following properties: a. Mesh type : 6x8, Mesh opening : 60mm X 80mm b. Mesh Wire dia. 2.2/3.2mm (ID/OD), mechanically edged/selvedged with galvanization as per EN 10223-3, and shall have minimum 16 numbers of mesh openings per meter of mesh perpendicular to twist. c. Tensile strength (500 Mpa) at a minimum elongation of	SQM	4050

	10%. The minimum tensile strength of the mesh panel must be 34.0 kN/m (+/-5kN/m) in the parallel to the twist direction and 13 kN/m in the perpendicular to the twist direction in accordance with the requirements of IS 16014:2018. d. Zinc Coating: The coating weight shall be heavily coated and soft type confirming to the requirements of specifications IS 4826:1972. Adhesion of Zinc Coating: No flakes or crack shall be observed while testing for adhesion of zinc coating as per IS 4826:1972. * ID/OD - Internal diameter/Outer diameter of Polymer coated wire.		
4	Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	RM	15750
5	Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	MT	591
CATCH DRAIN			
6	Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom and backfilling with approved material.)(i) Ordinary soil A Manual Means (Depth upto 3 m)	CUM	145
7	PCC 1:3:6 in Foundation (Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.)	CUM	15
8	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20.Height Upto 5m.	CUM	74
9	Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing	SQM	145
4M HIGH CC GRAVITY WALL ALONG BENCH (CH-73.355 TO 73.370 KM)			
10	Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m).	CUM	49
11	Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including	CUM	5

	curing for 14 days.		
12	Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications.PCC Grade M20.	CUM	5
13	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20.Height Upto 5m.	CUM	73
14	Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing	SQM	150
15	Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical specifications	Each	15
16	Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers,10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	RM	432
17	Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	MT	16
18	Back filling behind abutment, wing wall and return wall complete as per drawing and Technical specification. Granular material	CUM	15
4M HIGH CC GRAVITY WALL (CH-73.270 TO 73.330 KM)			
19	Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m).	CUM	195
20	Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	CUM	20
21	Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications.PCC Grade M20.	CUM	18
22	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20.Height Upto 5m.	CUM	294
23	Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing	SQM	600
24	Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall	Each	60

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	with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical specifications		
25	Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	RM	2208
26	Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	MT	83
27	Back filling behind abutment, wing wall and return wall complete as per drawing and Technical specification. Granular material	CUM	60

(B) Landslide Location Ch. 81.450 Km to Ch. 81.755 Km (NH-09)

SN	Description of items	Unit	Qty
EXCAVATION (CONSIDERING 60% LOOSE MASS & 40% ROCK)			
1	Excavation in Soil with Dozer with lead upto 1000 metres (Excavation for road way in soil by mechanical means including cutting and transporting the earth to site of embankment/dumping area with lead upto 1000 metres, including trimming bottom and side slopes in accordance with requirements of lines, grades and cross sections.)	CUM	63312
2	Excavation in Ordinary Rock with Dozer with lead upto 1000 metres (Excavation for roadway in ordinary rock by deploying a dozer, including cutting and transporting the earth to site of embankment/dumping area with lead upto 1000 metres, trimming bottom and side slopes in accordance with the requirements of lines, grades and cross sections.)	CUM	42208
SHOTCRETE WITH 25.0 MM SOLID ANCHORS AT HILL SIDE			
FROM CH.81.450 KM TO CH. 81.615 KM			
3	Application of 150mm thick Shotcrete (M-25) in two layers 75mm each sandwiched with chain link fabric 50mmx50mm size including supply of all material for shot crete (Inclusive for rebound) and excluding the cost of chain link fabric, labour T&P etc. for proper completion of the work as per drawings, Technical Specifications and the direction of Engineer-in-charge.	CUM	1182
4	Supply and installation of Chain link fabric (2.7mm wire dia with zinc coating 240g/ sq.m) of 50X50 mm size (Fe 500) including 2mm dia binding wire or nuts, bolts and washers as required for proper completion of the work as per drawings, Technical Specifications and the direction of Engineer-in-charge. Made of G.I. wire of dia 2.7mm.for treatment of slopes as secondary mesh including all	SQM	7880

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	cost of material, labour, special labour and T&P required to complete the work in all respect as per drawings.		
5	Drilling of 50 mm dia. hole for installation of 25mm dia. Anchors in rock by sufficient drilling equipment with necessary auxiliary equipment & accessories and including all cost of equipments, labour, materials & works connected with drilling.	RM	10088
6	Supply and installation of 25mm dia fully threaded rock anchors (Fe550D) including supply of all material, labour, t&p for proper completion of work.	RM	10088
7	Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	MT	25
PROVISION OF 100KN/M HT ROLLED CABLE NET WITH DT MESH AT HILL SIDE			
FROM CH.81.615 KM TO CH.81.720 KM			
8	Supply and installation of high tensile rolled cable net having aperture size not more than 300mm in one direction and minimum longitudinal tensile strength 100 KN/M and punching resistance 200 kN, comprising of minimum 8mm dia wire rope cable with a minimum breaking load of 40.7kN. The tensile strength of wire of the cable should be 1770 N/sqmm having corrosion protection of Zn Coating Class A or 95% Zn + 5% Al Class-B (Galfan) Coating as per IS/ISO-17746-2016 for treatment of slopes including all cost of material (net, boundary rope & rope anchor etc. comprising of the complete system), labour, special labour and T&P required to complete the work in all respect in accordance with drawings, Technical Specifications and as per the direction of Engineer-in-charge. Product Manufacturer shall have in-house test facility for conducting longitudinal tensile strength and punching resistance test and shall be responsible for carrying out both test (longitudinal tensile strength and punching resistance) during PDI, per lot in presence of representative/s of E-i-C on his own expenses.	SQM	5125
9	Supply and fixing of Double Twisted Mesh including all cost of material, labour and T&P required to complete the work in all respect with following properties: a. Mesh type : 6x8, Mesh opening : 60mm X 80mm b. Mesh Wire dia. 2.2/3.2mm (ID/OD), mechanically edged/selvedged with galvanization as per EN 10223-3, and shall have minimum 16 numbers of mesh openings per meter of mesh perpendicular to twist. c. Tensile strength (500 Mpa) at a minimum elongation of 10%. The minimum tensile strength of the mesh panel must be 34.0 kN/m (+/-5kN/m) in the parallel to the twist direction and 13 kN/m in the perpendicular to the twist direction in accordance with the requirements of IS 16014:2018. d. Zinc Coating: The coating weight shall be heavily coated and soft type confirming to the requirements of specifications IS 4826:1972. Adhesion of Zinc Coating: No flakes or crack shall be observed while testing for adhesion of zinc coating as per IS 4826:1972. * ID/OD - Internal diameter/Outer diameter of Polymer coated wire	SQM	5125

10	Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	RM	6560
11	Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	MT	246
PROVISION OF 100KN/M HT ROLLED CABLE NET WITH DT MESH AT VALLEY SIDE			
FROM CH.81.455 KM TO CH.81.755 KM			
12	Supply and installation of high tensile rolled cable net having aperture size not more than 300mm in one direction and minimum longitudinal tensile strength 100 KN/M and punching resistance 200 kN, comprising of minimum 8mm dia wire rope cable with a minimum breaking load of 40.7kN. The tensile strength of wire of the cable should be 1770 N/sqmm having corrosion protection of Zn Coating Class A or 95% Zn + 5% Al Class-B (Galfan) Coating as per IS/ISO-17746-2016 for treatment of slopes including all cost of material (net, boundary rope & rope anchor etc. comprising of the complete system), labour, special labour and T&P required to complete the work in all respect in accordance with drawings, Technical Specifications and as per the direction of Engineer-in-charge. Product Manufacturer shall have in-house test facility for conducting longitudinal tensile strength and punching resistance test and shall be responsible for carrying out both test (longitudinal tensile strength and punching resistance) during PDI, per lot in presence of representative/s of E-i-C on his own expenses.	SQM	8815
13	Supply and fixing of Double Twisted Mesh including all cost of material, labour and T&P required to complete the work in all respect with following properties: a. Mesh type : 6x8, Mesh opening : 60mm X 80mm b. Mesh Wire dia. 2.2/3.2mm (ID/OD), mechanically edged/selvedged galvanization as per EN 10223-3, and shall have minimum 16 numbers of mesh openings per meter of mesh perpendicular to twist. c. Tensile strength (500 Mpa) at a minimum elongation of 10%. The minimum tensile strength of the mesh panel must be 34.0 kN/m (+/-5kN/m) in the parallel to the twist direction and 13 kN/m in the perpendicular to the twist direction in accordance with the requirements of IS 16014:2018. d. Zinc Coating: The coating weight shall be heavily coated and soft type confirming to the requirements of specifications IS 4826:1972. Adhesion of Zinc Coating: No flakes or crack shall be observed while testing for adhesion of zinc coating as per	SQM	8815

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	IS 4826:1972. * ID/OD - Internal diameter/Outer diameter of Polymer coated wire.		
14	Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	RM	14110
15	Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	MT	529
4.0M HIGH ANCHORED CC GRAVITY WALL			
FROM CH.81.615 KM TO CH.81.720 KM			
16	Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m).	CUM	-
17	Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	CUM	27
18	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20 (p) Height upto 5m	CUM	546
19	Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications. RCC M30	CUM	126
20	Supplying, fitting and placing HYSD bar reinforcement in open foundation complete as per drawing and technical specifications	MT	15
21	Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	RM	672
22	Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit,	RM	2520

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	couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.		
23	Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	MT	120
24	Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical specifications	Each	105
25	Providing and installing subsurface drainage pipes - Perforated PVC pipe (lined with Non -woven Geotextile) of 75 mm internal diameter as per the drawings etc. complete including the cost of drilling and as directed by Engineer -In -Charge.	RM	180
26	Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing.	SQM	919
27	Hand Packed stone filling in back of walls including cost of all materials, royalty, T&P etc. complete as per direction of Engineer-in- charge. (As per PWD Uttarakhand specifications)	CUM	126
LONGITUDINAL DRAINS			
28	Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	CUM	17
29	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications. PCC Grade M20 (p) Height upto 5m	CUM	12
4.0M HIGH ANCHORED CC CLADDING			
FROM CH.81.450 KM TO CH.81.615 KM			
30	Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.) ordinary soil, Manual Means (Depth upto 3 m to 6m).	CUM	609
31	Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	CUM	26
32	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications. PCC Grade M25 (p) Height upto 5m	CUM	990
33	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications. PCC Grade M20 (p) Height upto 5m	CUM	18

34	Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	RM	1056
35	Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	RM	528
36	Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	MT	59
37	Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing.	SQM	3964
38	Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical specifications	Each	165
39	Providing and installing subsurface drainage pipes - Perforated PVC pipe (lined with Non -woven Geotextile) of 75 mm internal diameter as per the drawings etc. complete including the cost of drilling and as directed by Engineer -In -Charge.	RM	275
6.0M HIGH ANCHORED RCC WALL			
FROM CH.81.455 KM TO CH.81.755 KM			
40	Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m to 6m).	CUM	8661
41	Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	CUM	156
42	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.RCC Grade M30 (p) Height upto 5m to 10m	CUM	2394
43	Supplying, fitting and placing HYSD bar reinforcement in open foundation complete as per drawing	MT	282

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	and technical specifications		
44	Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	RM	2880
45	Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	RM	8640
46	Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	MT	432
47	Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical specifications	Each	300
10.0M LONG, 300MM ARTICULATING MATTRESSES			
FROM CH. 81.455KM & CH.81.755 KM			
48	Supply and installation of 300mm thick Articulating Grouted Concrete Mattress, fabric form made from woven geotextile of minimum 400 g/m2, having Wide Width Tensile Strength, ASTM D4595, (kN/m) =MD (50)/ TD (50), Wide Width Elongation at Break, ASTM D4595, (%) =MD (>10)/ TD (>10) and Trapezoidal Tear Strength, ASTM D4533, (N) =MD (440)/ TD (440) with reinforcing galvanized steel cables on both directions as per the detailed design, thickness and technical specifications. The mattress shall be customized as per site geometry or profile at factory in the form of panels along with geotextile baffles and one panel shall be connected with the adjacent panel by using Industrial Zipper. Cables shall be of minimum 6mm diameter and the breaking strength of the cable shall not be less than 30kN, including all cost of material, concrete, labour T&P and special T&P to complete the work in all respect. (To be done on the river banks).	SQM	3000
DEWATERING OF RIVER			
49	Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of	CUM	2700

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	stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m).		
50	Construction of Embankment with Material Obtained from Borrow Pits (Construction of embankment with approved material obtained from borrow pits with all lifts and leads, transporting to site, spreading,grading to required slope and compacting to meet requirement of table 300-2)	CUM	2700
51	Dewatering of water caused due to seepage of ground water and surface water due to rain etc. excluding excavation of foundation but during execution of civil works including supply of all machine operator, khalashi, POL, T&P, accessories required for proper completion of the work.	HP/Hr	26880
CONTOUR DRAIN			
52	Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	CUM	38
53	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20 (p) Height upto 5m	CUM	143
54	Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing.	SQM	308

(C) Landslide Location Ch. 94.720 Km – Ch. 94.830 Km (NH-09)

SNo	Description of items	Unit	Qty
EXCAVATION (FOR HILL CUTTING AND OFFLOADING)			
1	Excavation in Soil with Dozer with lead upto 1000 metres (Excavation for road way in soil by mechanical means including cutting and transporting the earth to site of embankment/dumping area with lead upto 1000 metres, including trimming bottom and side slopes in accordance with requirements of lines, grades and cross sections.)	CUM	464
2	Excavation in Ordinary Rock with Dozer with lead upto 1000 metres (Excavation for roadway in ordinary rock by deploying a dozer, including cutting and transporting the earth to site of embankment/dumping area with lead upto 1000 metres, trimming bottom and side slopes in accordance with the requirements of lines, grades and cross sections.)	CUM	464
PROVISION OF HT ROLLED CABLE NET WITH DT MESH AND SDRA			
3	Supply and installation of high tensile rolled cable net with single/ double knot connection having aperture size not more than 300mm in one direction and minimum longitudinal tensile strength 220 KN/M, and puncturing resistance 350 kN, comprising of minimum 10mm dia wire rope cable	SQM	3890

	with steel core with a minimum breaking load of 63kN. The tensile strength of wire of the cable should be 1770 N/sqmm having corrosion protection of Zn Coating Class A or 95% Zn + 5% Al Class-B (Galfan) Coating as per IS/ISO- 17746-2016 for treatment of slopes including all cost of material (net, boundary rope & rope anchor etc comprising of the complete system), labour, special labour and T&P required to complete the work in all respect in accordance with drawings, Technical Specifications and as per the direction of Engineer-incharge. Product Manufacturer shall have in-house test facility for conducting longitudinal tensile strength and puncturing resistance test and shall be responsible for carrying out both test (longitudinal tensile strength and puncturing resistance) during PDI per lot in presence of representative/s of E-i-C on his own expenses.		
4	Supply and fixing of Double Twisted Mesh including all cost of material, labour and T&P required to complete the work in all respect with following properties: a. Mesh type : 6x8, Mesh opening : 60mm X 80mm b. Mesh Wire dia. 2.2/3.2mm (ID/OD), mechanically edged/selvedged with galvanization as per EN 10223-3, and shall have minimum 16 numbers of mesh openings per meter of mesh perpendicular to twist. c. Tensile strength (500 Mpa) at a minimum elongation of 10%. The minimum tensile strength of the mesh panel must be 34.0 kN/m (+/-5kN/m) in the parallel to the twist direction and 13 kN/m in the perpendicular to the twist direction in accordance with the requirements of IS 16014:2018. d. Zinc Coating: The coating weight shall be heavily coated and soft type confirming to the requirements of specifications IS 4826:1972. Adhesion of Zinc Coating: No flakes or crack shall be observed while testing for adhesion of zinc coating as per IS 4826:1972. * ID/OD - Internal diameter/Outer diameter of Polymer coated wire.	SQM	3890
5	Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	RM	9730
6	Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	MT	365
CONTOUR DRAIN			
7	Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom and backfilling with approved material.)(i) Ordinary soil A Manual Means (Depth upto 3 m)	CUM	350
8	PCC 1:3:6 in Foundation (Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted	SQM	11

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	by vibration including curing for 14 days.)		
9	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20.Height Upto 5m.	RM	71
10	Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing	RM	154
3.0M HIGH ANCHORED CC GRAVITY WALL ON RCC RAFT WITH BUNDLED SDRA FROM CH. 97.785 M TO 94.805M (ON HILL SIDE)			
11	Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom and backfilling with approved material.)(ii) Ordinary rock (not requiring blasting) A Manual Means (Depth upto 3 m)	CUM	17
12	PCC 1:3:6 in Foundation (Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.)	CUM	4
13	Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications.RCC Grade M25.	CUM	17
14	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20.Height Upto 5m.	CUM	56
15	Supplying, fitting and placing HYSD bar reinforcement in open foundation complete as per drawing and technical specifications	MT	1
16	Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers,10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	RM	240
17	Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers,10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	RM	576
18	Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	MT	31
19	Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete	SQM	215

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	screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing.		
20	Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical specifications	Each	30
6.0M HIGH CC GRAVITY WALL WITH DRAIN OVER RCC RAFT WITH MICROPILE FROM CH. 94.720KM TO CH. 94.830KM (ON HILL SIDE)			
21	Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m).	CUM	615
22	Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	CUM	29
23	Reinforced Cement Concrete in Sub Structure complete as per drawing and technical specifications RCC M25	CUM	132
24	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20.Height Upto 5m.	CUM	862
25	Supplying, fitting and placing HYSD bar reinforcement in open foundation complete as per drawing and technical specifications	MT	10
26	Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers,10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	RM	1320
27	Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	MT	49
28	Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical specifications	Each	110
29	Construction of 300mm dia. friction Micro Pile including drilling in soil mixed with boulders and in soft rock upto desired depth(ODEX drilling using tyre or crawler mounted machine as per site requirement), cement grouting using double packer, redrilling, perforated MS Casing, including all cost of material labour, special labour and T&P required to complete the work in all respect in	RM	1110

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	accordance to drawings, Technical Specifications and as per direction of Engineer-in-charge. However cost of concrete and reinforcement will be paid separately as per relevant BOQ items.		
30	Bored cast-in-situ M35 grade R.C.C. pile excluding reinforcement complete as per drawing and technical specifications and removal of excavated earth with all lifts and lead upto 1000 m. (Pile diameter-300 mm)	RM	1110
31	Supplying, fitting and placing HYSD bar reinforcement in open foundation complete as per drawing and technical specifications	MT	25
32	Providing and installing subsurface drainage pipes - Perforated PVC pipe (lined with Non -woven Geotextile) of 75 mm internal diameter as per the drawings etc. complete including the cost of drilling and as directed by Engineer -In -Charge.	RM	25
LONGITUDINAL DRAIN			
33	Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	CUM	2
34	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20 (p) Height upto 5m	CUM	7
5.0M HIGH ANCHORED CC GRAVITY WALL ON RCC RAFT WITH BUNDLED SDRAFROM CH. 94.740KM TO CH. 94.820KM (ON VALLEY SIDE)			
35	Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m).	CUM	158
36	Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	CUM	22
37	Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications. PCC M25	CUM	100
38	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20 (p) Height upto 5m	CUM	651
39	Supplying, fitting and placing HYSD bar reinforcement in open foundation complete as per drawing and technical specifications	MT	8
40	Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76	RM	996

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	mm couplers,10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	dia drill bit,		
41	Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers,10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.		RM	2988
42	Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.		MT	149
43	Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing.		SQM	645
44	Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical specifications		Each	125
5.0M HIGH ANCHORED CC GRAVITY WALL ON RCC RAFT WITH BUNDLED SDRAFROM CH. 94.760KM TO CH. 94.800KM (ON VALLEY SIDE)				
45	Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m).		CUM	82
46	Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.		CUM	11
47	Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications. PCC M25		CUM	52
48	Plain/Reinforced cement concrete insub-structure complete as per drawing and technical specifications. PCC Grade M20 (p) Height upto 5m		CUM	337
49	Supplying, fitting and placing HYSD bar reinforcement in open foundation complete as per drawing and technical specifications		MT	4
50	Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76		RM	516

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	mm couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	dia drill bit,		
51	Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.		RM	1548
52	Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure		MT	77
53	Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing.		SQM	645
54	Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical specifications		EACH	65
DEEP DRAINAGE HOLES AT EL. ± 990M				
55	Providing and installing subsurface drainage pipes - Perforated PVC pipe (lined with Non -woven Geotextile) of 75 mm internal diameter as per the drawings etc. complete including the cost of drilling and as directed by Engineer -In -Charge.		RM	550

(D) Landslide Location Ch. 97.040 Km – Ch. 97.415 Km (NH-09) P-T Road section

SNo	Description of items	Unit	Qty
SLOPE PROTECTION MEASURES			
1	Excavation in Soil with Dozer with lead upto 1000 metres (Excavation for road way in soil by mechanical means including cutting and transporting the earth to site of embankment/dumping area with lead upto 1000 metres, including trimming bottom and side slopes in accordance with requirements of lines, grades and cross sections.)	CUM	118913
	Excavation in Ordinary Rock with Dozer with lead upto 1000 metres (Excavation for roadway in ordinary rock by deploying a dozer, including cutting and transporting the earth to site of embankment/dumping area with lead upto 1000 metres, trimming bottom and side slopes in accordance with the requirements of lines, grades and cross sections.)		50963

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	Cost of Haulage Excluding Loading and Unloading.Case I Surfaced Road Hilly.Within Lead 4Km	T.KM	441675
2	Supply and installation of high tensile rolled cable net with single/ double knot connection having aperture size not more than 300mm in one direction and minimum longitudinal tensile strength 220 KN/M, and puncturing resistance 350 kN, comprising of minimum 10mm dia wire rope cable with steel core with a minimum breaking load of 63kN. The tensile strength of wire of the cable should be 1770 N/sqmm having corrosion protection of Zn Coating Class A or 95% Zn + 5% Al Class-B (Galfan) Coating as per IS/ISO- 17746-2016 for treatment of slopes including all cost of material (net, boundary rope & rope anchor etc comprising of the complete system), labour, special labour and T&P required to complete the work in all respect in accordance with drawings,Technical Specifications and as per the direction of Engineer-incharge. Product Manufacturer shall have in-house test facility for conducting longitudinal tensile strength and puncturing resistance test and shall be responsible for carrying out both test (longitudinal tensile strength and puncturing resistance) during PDI per lot in presence of representative/s of E-i-C on his own expenses.		
	CH. 97.040 KM TO CH 97.160 KM	SQM	6400
	CH. 97.160 KM TO CH 97.410KM BEYOND EL ±1055 UPTO EL ±1080	SQM	5565
3	Supply and fixing of Double Twisted Mesh including all cost of material, labour and T&P required to complete the work in all respect with following properties: a. Mesh type : 6x8, Mesh opening : 60mm X 80mm b. Mesh Wire dia. 2.2/3.2mm (ID/OD), mechanically edged/selvedged with galvanization as per EN 10223-3, and shall have minimum 16 numbers of mesh openings per meter of mesh perpendicular to twist. c. Tensile strength (500 Mpa) at a minimum elongation of 10%. The minimum tensile strength of the mesh panel must be 34.0 kN/m (+/-5kN/m) in the parallel to the twist direction and 13 kN/m in the perpendicular to the twist direction in accordance with the requirements of IS 16014:2018. d. Zinc Coating: The coating weight shall be heavily coated and soft type confirming to the requirements of specifications IS 4826:1972. Adhesion of Zinc Coating: No flakes or crack shall be observed while testing for adhesion of zinc coating as per IS 4826:1972. * ID/OD - Internal diameter/Outer diameter of Polymer coated wire.		
	CH. 97.040 KM TO CH 97.160 KM	SQM	6400
	CH. 97.160 KM TO CH 97.410KM BEYOND EL ±1055 UPTO EL ±1080	SQM	5565
4	Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers,10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	RM	15320
5	Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in	MT	574

	Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.		
CH. 97.160 KM TO CH 97.410KM UPTO EL ±1055			
6	Supply and installation of high tensile rolled cable net having aperture size not more than 400mm in one direction and minimum longitudinal tensile strength 80 KN/M and puncturing resistance 150 kN, comprising of minimum 6mm dia wire rope cable with a minimum breaking load of 35kN. The tensile strength of wire of the cable should be 1770 N/sqmm having corrosion protection of Zn Coating Class A or 95% Zn + 5% Al Class-B (Galfan) Coating as per IS/ISO- 17746-2016 for treatment of slopes including all cost of material (net, boundary rope & rope anchor etc. comprising of the complete system), labour, special labour and T&P required to complete the work in all respect in accordance with drawings, Technical Specifications and as per the direction of Engineer-in-charge. Product Manufacturer shall have in-house test facility for conducting longitudinal tensile strength and puncturing resistance test and shall be responsible for carrying out both test (longitudinal tensile strength and puncturing resistance) during PDI, per lot in presence of representative/s of E-i-C on his own expenses.		
	CH. 97.160 KM TO CH 97.410KM UPTO EL ±1055	CUM	25675
7	Supply and fixing of Double Twisted Mesh including all cost of material, labour and T&P required to complete the work in all respect with following properties: a. Mesh type : 6x8, Mesh opening : 60mm X 80mm b. Mesh Wire dia. 2.2/3.2mm (ID/OD), mechanically edged/selvedged with galvanization as per EN 10223-3, and shall have minimum 16 numbers of mesh openings per meter of mesh perpendicular to twist. c. Tensile strength (500 Mpa) at a minimum elongation of 10%. The minimum tensile strength of the mesh panel must be 34.0 kN/m (+/-5kN/m) in the parallel to the twist direction and 13 kN/m in the perpendicular to the twist direction in accordance with the requirements of IS 16014:2018.d. Zinc Coating: The coating weight shall be heavily coated and soft type confirming to the requirements of specifications IS 4826:1972. Adhesion of Zinc Coating: No flakes or crack shall be observed while testing for adhesion of zinc coating as per IS 4826:1972. * ID/OD - Internal diameter/Outer diameter of Polymer coated wire		
	CH. 97.160 KM TO CH 97.410KM UPTO EL ±1055	CUM	25675
8	Supply and fixing layer of Geo-jute mat with spraying of seeds of Lemon grass/Dedonia/Vetiver etc., including all cost of material, labour and T&P required to complete the work in all respect, with following properties : a. Material 100% natural, b. Weight 500 GSM, , c. Minimum Breaking Load along Machine Direction (warp way) -10.0(kN/m), Cross Direction (Weft way)- 10.0(kN/m),	SQM	25675

	d. Max. Elongation at break (in %): Machine Direction (warp way)-10, Cross Direction (Weft way)-12.		
9	Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	CUM	17118
10	Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	MT	642
CATCH DRAIN			
11	Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom and backfilling with approved material.) (i) Ordinary soil A Manual Means (Depth upto 3 m)	CUM	400
12	PCC 1:3:6 in Foundation (Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.)	CUM	40
13	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications. PCC Grade M20. Height Upto 5m.	CUM	204
14	Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing	SQM	400
3M HIGH CC GRAVITY WALL ALONG BENCHES			
15	Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom and backfilling with approved material.) (i) Ordinary soil A Manual Means (Depth upto 3 m)	CUM	859
16	PCC 1:3:6 in Foundation (Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.)	CUM	86
17	Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications. PCC Grade M20.	CUM	101
18	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications. PCC Grade M20. Height Upto 5m.	CUM	944

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19	Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing	SQM	2359
20	Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical specifications	Each	337
21	Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	RM	2426
	SDRA FOR WALL		
22	Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	MT	91
23	Back filling behind abutment, wing wall and return wall complete as per drawing and Technical specification. Granular material	CUM	337
RCC RETAINING WALL			
24	Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom and backfilling with approved material.)(i) Ordinary soil A Manual Means (Depth upto 3 m)	CUM	1961
25	PCC 1:3:6 in Foundation (Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.)	CUM	170
26	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications. RCC Grade M25. Height 5m to 10m.	CUM	6105
27	Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications RCC Grade M35	CUM	111
28	Supplying, fitting and placing un-coated HYSD bar reinforcement in foundation complete as per drawing and technical specifications	TONNE	96
29	Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications RCC Grade M30	CUM	814
30	Construction of 300mm dia. friction Micro Pile including drilling in soil mixed with boulders and in soft rock upto desired depth(ODEX drilling using tyre or crawler mounted machine as per site requirement), cement grouting using double packer, redrilling, perforated MS Casing, including all	RM	1850

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	cost of material labour, special labour and T&P required to complete the work in all respect in accordance to drawings, Technical Specifications and as per direction of Engineer-in-charge. However cost of concrete and reinforcement will be paid seperately as per relevant BOQ items.		
31	Bored cast-in-situ M35 grade R.C.C. pile excluding reinforcement complete as per drawing and technical specifications and removal of excavated earth with all lifts and lead upto 1000 m. (Pile diameter-300 mm)	RM	1850
32	Supplying, fitting and placing un-coated HYSD bar reinforcement in sub structure complete as per drawing and technical specifications		
	RCC Retaining wall	TONNE	640
	Micropile		
33	Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers,10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.		
	Lateral Anchors	RM	3552
34	Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	MT	133
35	Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical specifications	Each	740
36	Back filling behind abutment, wing wall and return wall complete as per drawing and Technical specification. Granular material	CUM	370
FOR 3.0M WIDE CC CHANNEL			
37	Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom and backfilling with approved material.)(i) Ordinary soil A Manual Means (Depth upto 3 m)	CUM	45
38	PCC 1:3:6 in Foundation (Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.)	CUM	18
39	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20.Height Upto 5m.	CUM	90

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40	Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing	SQM	270
41	Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	RM	4320
42	Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	MT	162
GABION WALL			
43	Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom and backfilling with approved material.) (i) Ordinary soil A Manual Means (Depth upto 3 m)	CUM	150
44	Providing and Laying of Mechanically Woven Double Twisted Hexagonal shaped Gabions (Zinc plus PVC coated), of size 1mX1mX1m with two diaphragms at 1m interval, having mesh opening 100mmx120 mm, mesh wire diameter 2.7mm/3.7mm, edge/selvedge wire diameter 3.4/4.4 mm and lacing wire diameter 2.2/3.2 mm. (The work includes filling boulders in the gabions).	NO	400

(E) Landslide Location Zone-1 (Ch. 100.465 Km – Ch. 100.905 Km) (NH-09)

SNo	Description of items	Unit	Qty
EXCAVATION (CONSIDERING 60% LOOSE MASS & 40% ROCK)			
1	Excavation in Soil with Dozer with lead upto 1000 metres (Excavation for road way in soil by mechanical means including cutting and transporting the earth to site of embankment/dumping area with lead upto 1000 metres, including trimming bottom and side slopes in accordance with requirements of lines, grades and cross sections.)	CUM	193860
2	Excavation in Ordinary Rock with Dozer with lead upto 1000 metres (Excavation for roadway in ordinary rock by deploying a dozer, including cutting and transporting the earth to site of embankment/dumping area with lead upto 1000 metres, trimming bottom and side slopes in accordance with the requirements of lines, grades and cross sections.)	CUM	129240
3	Supply and installation of high tensile rolled cable net with single/ double knot connection having aperture size not more than 300mm in one direction and minimum longitudinal tensile strength 220	SQM	68070

	KN/M, and punching resistance 350 kN, comprising of minimum 10mm dia wire rope cable with steel core with a minimum breaking load of 63kN. The tensile strength of wire of the cable should be 1770 N/sqmm having corrosion protection of Zn Coating Class A or 95% Zn + 5% Al Class-B (Galfan) Coating as per IS/ISO-17746-2016 for treatment of slopes including all cost of material (net, boundary rope & rope anchor etc comprising of the complete system), labour, special labour and T&P required to complete the work in all respect in accordance with drawings, Technical Specifications and as per the direction of Engineer-in-charge. Product Manufacturer shall have in-house test facility for conducting longitudinal tensile strength and punching resistance test and shall be responsible for carrying out both test (longitudinal tensile strength and punching resistance) during PDI per lot in presence of representative/s of E-i-C on his own expenses.		
4	Supply and fixing of Double Twisted Mesh including all cost of material, labour and T&P required to complete the work in all respect with following properties: a. Mesh type : 6x8, Mesh opening : 60mm X 80mm b. Mesh Wire dia. 2.2/3.2mm (ID/OD), mechanically edged/selvedged with galvanization as per EN 10223-3, and shall have minimum 16 numbers of mesh openings per meter of mesh perpendicular to twist. c. Tensile strength (500 Mpa) at a minimum elongation of 10%. The minimum tensile strength of the mesh panel must be 34.0 kN/m (+/-5kN/m) in the parallel to the twist direction and 13 kN/m in the perpendicular to the twist direction in accordance with the requirements of IS 16014:2018. d. Zinc Coating: The coating weight shall be heavily coated and soft type confirming to the requirements of specifications IS 4826:1972. Adhesion of Zinc Coating: No flakes or crack shall be observed while testing for adhesion of zinc coating as per IS 4826:1972. * ID/OD - Internal diameter/Outer diameter of Polymer coated wire.	SQM	68070
5	Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	RM	108920
6	Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	MT	4084
2.0 M HIGH GABION WALL WITH DRAIN ON BENCH			
FROM CH.100.535 KM TO CH.100.905 KM & FROM CH.100.565 TO CH.100.905 KM			
7	Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of	CUM	-

	stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m).		
8	Providing & making Gabion structure with Mechanically Woven Double Twisted Hexagonal Shaped Wire mesh Gabion Boxes as per IS 16014:2012, MORT&H Clause 2500, of required size, Mesh Type 10x12 (D=100 mm with tolerance of $\pm 2\%$) Zinc coated, Mesh wire diameter 3.0 mm, mechanically edged/selvedged with partitions at every 1m interval and shall have minimum 10 numbers of openings per meter of mesh perpendicular to twist, tying with lacing wire of diameter 2.2 mm, supplied @3% by weight of Gabion boxes, filled with boulders with least dimension of 200 mm, as per drawing, all complete as per direction of Engineer-in-charge.	CUM	1420
9	Supplying, Laying and fixing in position of 10 MM thick Geosynthetic Cementitious composite mat, specified as per ASTM: D 8364 – GCCM Type - III specification . flexural strength (28 Day) should be > 4MPa and 28 days compressive strength as per ASTM D8329 should not be less 60 MPa.	SQM	1065
5.0 M HIGH GABION WALL			
10	Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m).	CUM	589
11	Providing & making Gabion structure with Mechanically Woven Double Twisted Hexagonal Shaped Wire mesh Gabion Boxes as per IS 16014:2012, MORT&H Clause 2500, of required size, Mesh Type 10x12 (D=100 mm with tolerance of $\pm 2\%$) Zinc coated, Mesh wire diameter 3.0 mm, mechanically edged/selvedged with partitions at every 1m interval and shall have minimum 10 numbers of openings per meter of mesh perpendicular to twist, tying with lacing wire of diameter 2.2 mm, supplied @3% by weight of Gabion boxes, filled with boulders with least dimension of 200 mm, as per drawing, all complete as per direction of Engineer-in-charge.	CUM	715
12	Supply and installation of non woven geotextile having mass/unit area - 250gsm over the slope to be treated including all cost of labour, material and T&P required for proper completion of work	SQM	345
13	Hand Packed stone filling in back of walls including cost of all materials,royalty, T&P etc. complete as per direction of Engineer-in- charge. (As per PWD Uttarakhand specifications)	CUM	122
6.0 M HIGH ANCHORED RCC STEPPED WALL ON RCC RAFT WITH MICROPILE			
14	Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual	CUM	12191

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	Means (Depth upto 3 m to 6m).		
15	Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	CUM	186
16	Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications. RCC M35	CUM	1069
17	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications. RCC Grade M25 (p) Height upto 5m	CUM	6683
18	Supplying, fitting and placing HYSD bar reinforcement in open foundation complete as per drawing and technical specifications	MT	609
19	Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	RM	3888
20	Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	MT	146
21	Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical specifications	Each	648
22	Construction of 300mm dia. friction Micro Pile including drilling in soil mixed with boulders and in soft rock upto desired depth(ODEX drilling using tyre or crawler mounted machine as per site requirement), cement grouting using double packer, redrilling, perforated MS Casing, including all cost of material labour, special labour and T&P required to complete the work in all respect in accordance to drawings, Technical Specifications and as per direction of Engineer-in-charge. However cost of concrete and reinforcement will be paid separately as per relevant BOQ items.	RM	4860
23	Bored cast-in-situ M35 grade R.C.C. pile excluding reinforcement complete as per drawing and technical specifications and removal of excavated earth with all lifts and lead upto 1000 m. (Pile diameter-300 mm).	RM	4860

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24	Supplying, fitting and placing HYSD bar reinforcement in open foundation complete as per drawing and technical specifications	MT	108
25	Hand Packed stone filling in back of walls including cost of all materials,royalty, T&P etc. complete as per direction of Engineer-in- charge. (As per PWD Uttarakhand specifications)	CUM	4379
LONGITUDINAL DRAIN			
26	Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	CUM	28
27	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20 (p) Height upto 5m	CUM	73
5.0M HIGH ANCHORED CC CLADDING			
FRQM CH. 100.465 KM TO CH.100.500 KM			
28	Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m to 6m).	CUM	175
29	Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	CUM	8
30	Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers,10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	RM	700
31	Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	MT	26
32	Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing.	SQM	1314
33	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M25	CUM	219

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	(p) Height upto 5m		
34	Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical specifications	Each	35
35	Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	RM	120
DEEP DRAINAGE HOLE SEMI PERFORATED PIPE			
36	Providing and installing subsurface drainage pipes - Perforated PVC pipe (lined with Non -woven Geotextile) of 75 mm internal diameter as per the drawings etc. complete including the cost of drilling and as directed by Engineer -In -Charge.	RM	3060
CONTOUR DRAIN			
37	Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m).	CUM	477
38	Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	CUM	72
39	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20	cum	270
	(p) Height upto 5m		
40	Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing.	SQM	583

(F) Landslide Location Zone-2 (Ch. 100.905 Km – Ch. 101.100 Km) (NH-09)

SN	Description of items	Unit	Qty
EXCAVATION (CONSIDERING 60% LOOSE MASS & 40% ROCK)			
1	Excavation in Soil with Dozer with lead upto 1000 metres (Excavation for road way in soil by mechanical means including cutting and transporting the earth to site of embankment/dumping area with lead upto 1000 metres, including trimming bottom and side slopes in accordance with	CUM	56340

	requirements of lines, grades and cross sections.)		
2	Excavation in Ordinary Rock with Dozer with lead upto 1000 metres (Excavation for roadway in ordinary rock by deploying a dozer, including cutting and transporting the earth to site of embankment/dumping area with lead upto 1000 metres, trimming bottom and side slopes in accordance with the requirements of lines, grades and cross sections.)	CUM	37560
PROVISION OF 100KN/M HT ROLLED CABLE NET WITH DT MESH AT HILL SIDE (ZONE-II)			
FROM CH.100.905 KM TO CH.101.100 KM			
3	Supply and installation of high tensile rolled cable net having aperture size not more than 300mm in one direction and minimum longitudinal tensile strength 100 KN/M and puncturing resistance 200 kN, comprising of minimum 8mm dia wire rope cable with a minimum breaking load of 40.7kN. The tensile strength of wire of the cable should be 1770 N/sqmm having corrosion protection of Zn Coating Class A or 95% Zn + 5% Al Class-B (Galfan) Coating as per IS/ISO-17746-2016 for treatment of slopes including all cost of material (net, boundary rope & rope anchor etc. comprising of the complete system), labour, special labour and T&P required to complete the work in all respect in accordance with drawings, Technical Specifications and as per the direction of Engineer-in-charge. Product Manufacturer shall have in-house test facility for conducting longitudinal tensile strength and punching resistance test and shall be responsible for carrying out both test (longitudinal tensile strength and punching resistance) during PDI, per lot in presence of representative/s of E-i-C on his own expenses.	SQM	16770
4	Supply and fixing of Double Twisted Mesh including all cost of material, labour and T&P required to complete the work in all respect with following properties: a. Mesh type : 6x8, Mesh opening : 60mm X 80mm b. Mesh Wire dia. 2.2/3.2mm (ID/OD), mechanically edged/selvedge with galvanization as per EN 10223-3, and shall have minimum 16 numbers of mesh openings per meter of mesh perpendicular to twist. c. Tensile strength (500 Mpa) at a minimum elongation of 10%. The minimum tensile strength of the mesh panel must be 34.0 kN/m (+/-5kN/m) in the parallel to the twist direction and 13 kN/m in the perpendicular to the twist direction in accordance with the requirements of IS 16014:2018. d. Zinc Coating: The coating weight shall be heavily coated and soft type confirming to the requirements of specifications IS 4826:1972. Adhesion of Zinc Coating: No flakes or crack shall be observed while testing for adhesion of zinc coating as per IS 4826:1972. * ID/OD - Internal diameter/Outer diameter of Polymer coated wire.	SQM	16770

5	Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers,10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	RM	26840
6	Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	MT	1006
6.0M HIGH ANCHORED RCC STEPPED WALL ON RCC RAFT WITH MICROPILE			
7	Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil, Manual Means (Depth upto 3 m to 6m).	CUM	5870
8	Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	CUM	90
9	Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications. RCC M35	CUM	515
10	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications. RCC Grade M25 (p) Height upto 5m	CUM	3218
11	Supplying, fitting and placing HYSD bar reinforcement in open foundation complete as per drawing and technical specifications	MT	293
12	Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers,10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	RM	1872
13	Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	MT	70

14	Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and technical specifications	Each	312
15	Construction of 300mm dia. friction Micro Pile including drilling in soil mixed with boulders and in soft rock upto desired depth(ODEX drilling using tyre or crawler mounted machine as per site requirement), cement grouting using double packer, redrilling, perforated MS Casing, including all cost of material labour, special labour and T&P required to complete the work in all respect in accordance to drawings, Technical Specifications and as per direction of Engineer-in-charge. However cost of concrete and reinforcement will be paid separately as per relevant BOQ items.	RM	2340
16	Bored cast-in-situ M35 grade R.C.C. pile excluding reinforcement complete as per drawing and technical specifications and removal of excavated earth with all lifts and lead upto 1000 m. (Pile diameter-300 mm).	RM	2340
17	Supplying, fitting and placing HYSD bar reinforcement in open foundation complete as per drawing and technical specifications	MT	52
18	Hand Packed stone filling in back of walls including cost of all materials,royalty, T&P etc. complete as per direction of Engineer-in- charge. (As per PWD Uttarakhand specifications)	CUM	2108
LONGITUDINAL DRAIN			
19	Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	CUM	14
20	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20 (p) Height upto 5m	CUM	35
21	Providing and installing subsurface drainage pipes - Perforated PVC pipe (lined with Non -woven Geotextile) of 75 mm internal diameter as per the drawings etc. complete including the cost of drilling and as directed by Engineer -In -Charge.	RM	990
CONTOUR DRAIN			
22	Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual	CUM	212

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	Means (Depth upto 3 m).		
23	Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	CUM	32
24	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20 (p) Height upto 5m	CUM	120
25	Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing.	SQM	259

(G) Landslide Location Zone-3 (Ch. 101.100 Km – Ch. 101.425 Km) (NH-09)

SN	Description of items	Unit	Qty
EXCAVATION (CONSIDERING 60% LOOSE MASS & 40% ROCK)			
1	Excavation in Soil with Dozer with lead upto 1000 metres (Excavation for road way in soil by mechanical means including cutting and transporting the earth to site of embankment/dumping area with lead upto 1000 metres, including trimming bottom and side slopes in accordance with requirements of lines, grades and cross sections.)	CUM	60762
2	Excavation in ordinary rock with dozer upto 1000 metres (Excavation for road way in ordinary by deploying a dozer including cutting and transporting the earth to site of embankment/dumping area with lead upto 1000 metres, including trimming bottom and side slopes in accordance with requirements of lines, grades and cross sections.)	CUM	14508
PROVISION OF 100KN/M HT ROLLED CABLE NET WITH DT MESH AT HILL SIDE (ZONE-III)			
FROM CH.101.100 KM TO CH.101.335 KM			
3	Supply and installation of high tensile rolled cable net having aperture size not more than 300mm in one direction and minimum longitudinal tensile strength 100 KN/M and punching resistance 200 kN, comprising of minimum 8mm dia wire rope cable with a minimum breaking load of 40.7kN. The tensile strength of wire of the cable should be 1770 N/sqmm having corrosion protection of Zn Coating Class A or 95% Zn + 5% Al Class-B (Galfan) Coating as per IS/ISO-17746-2016 for treatment of slopes including all cost of material (net, boundary rope & rope anchor etc. comprising of the complete system), labour, special labour and T&P required to complete the	SQM	13830

	work in all respect in accordance with drawings, Technical Specifications and as per the direction of Engineer-in-charge. Product Manufacturer shall have in-house test facility for conducting longitudinal tensile strength and punching resistance test and shall be responsible for carrying out both test (longitudinal tensile strength and punching resistance) during PDI, per lot in presence of representative/s of E-i-C on his own expenses.		
4	Supply and fixing of Double Twisted Mesh including all cost of material, labour and T&P required to complete the work in all respect with following properties: a. Mesh type : 6x8, Mesh opening : 60mm X 80mm b. Mesh Wire dia. 2.2/3.2mm (ID/OD), mechanically edged/selvedged with galvanization as per EN 10223-3, and shall have minimum 16 numbers of mesh openings per meter of mesh perpendicular to twist. c. Tensile strength (500 Mpa) at a minimum elongation of 10%. The minimum tensile strength of the mesh panel must be 34.0 kN/m (+/-5kN/m) in the parallel to the twist direction and 13 kN/m in the perpendicular to the twist direction in accordance with the requirements of IS 16014:2018. d. Zinc Coating: The coating weight shall be heavily coated and soft type confirming to the requirements of specifications IS 4826:1972. Adhesion of Zinc Coating: No flakes or crack shall be observed while testing for adhesion of zinc coating as per IS 4826:1972. * ID/OD - Internal diameter/Outer diameter of Polymer coated wire.	SQM	13830
5	Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	RM	11070
6	Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	RM	20748
7	Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	MT	415
PROVISION OF 80KN/M HT ROLLED CABLE NET WITH DT MESH AT HILL SIDE (ZONE-IV)			
FROM CH.101.200 KM TO CH.101.330 KM			
8	Supply and installation of high tensile rolled cable net having aperture size not more than 400mm in one direction and minimum longitudinal tensile strength 80 KN/M and punching resistance 150	SQM	12750

	kN, comprising of minimum 6mm dia wire rope cable with a minimum breaking load of 35kN. The tensile strength of wire of the cable should be 1770 N/sqmm having corrosion protection of Zn Coating Class A or 95% Zn + 5% Al Class-B (Galfan) Coating as per IS/ISO-17746-2016 for treatment of slopes including all cost of material (net, boundary rope & rope anchor etc. comprising of the complete system), labour, special labour and T&P required to complete the work in all respect in accordance with drawings, Technical Specifications and as per the direction of Engineer-in-charge. Product Manufacturer shall have in-house test facility for conducting longitudinal tensile strength and punching resistance test and shall be responsible for carrying out both test (longitudinal tensile strength and punching resistance) during PDI, per lot in presence of representative/s of E-i-C on his own expenses.		
9	Supply and fixing of Double Twisted Mesh including all cost of material, labour and T&P required to complete the work in all respect with following properties: a. Mesh type : 6x8, Mesh opening : 60mm X 80mm b. Mesh Wire dia. 2.2/3.2mm (ID/OD), mechanically edged/selvedged with galvanization as per EN 10223-3, and shall have minimum 16 numbers of mesh openings per meter of mesh perpendicular to twist.c. Tensile strength (500 Mpa) at a minimum elongation of 10%. The minimum tensile strength of the mesh panel must be 34.0 kN/m (+/-5kN/m) in the parallel to the twist direction and 13 kN/m in the perpendicular to the twist direction in accordance with the requirements of IS 16014:2018.d. Zinc Coating: The coating weight shall be heavily coated and soft type confirming to the requirements of specifications IS 4826:1972. Adhesion of Zinc Coating: No flakes or crack shall be observed while testing for adhesion of zinc coating as per IS 4826:1972.* ID/OD - Internal diameter/Outer diameter of Polymer coated wire.	SQM	12750
10	Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	RM	24480
11	Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	MT	918
2.0M HIGH GABION WALL WITH DRAIN ON BENCH			
12	Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m).	CUM	0.00

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13	Providing & making Gabion structure with Mechanically Woven Double Twisted Hexagonal Shaped Wire mesh Gabion Boxes as per IS 16014:2012, MORT&H Clause 2500, of required size, Mesh Type 10x12 (D=100 mm with tolerance of $\pm 2\%$) Zinc coated, Mesh wire diameter 3.0 mm, mechanically edged/selvedged with partitions at every 1m interval and shall have minimum 10 numbers of openings per meter of mesh perpendicular to twist, tying with lacing wire of diameter 2.2 mm, supplied @3% by weight of Gabion boxes, filled with boulders with least dimension of 200 mm, as per drawing, all complete as per direction of Engineer-in-charge.	CUM	280
14	Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	CUM	19
15	Supplying, Laying and fixing in position of 10 MM thick Geosynthetic Cementitious composite mat, specified as per ASTM: D 8364 – GCCM Type - III specification . flexural strength (28 Day) should be > 4MPa and 28 days compressive strength as per ASTM D8329 should not be less 60 MPa.	SQM	210
4.0M HIGH ANCHORED CC GRAVITY WALL ON RCC RAFT WITH MICROPILE ON BENCH			
FROM CH.101.160 KM TO CH. 101.330 KM			
16	Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m to 6m).	CUM	0.00
17	Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	CUM	52
18	Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications. RCC M35	CUM	240
19	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20 (p) Height upto 5m	CUM	1040
20	Supplying, fitting and placing HYSD bar reinforcement in open foundation complete as per drawing and technical specifications	MT	19

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21	Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	RM	1280
22	Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	MT	48
23	Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical specifications	Each	200
24	Construction of 300mm dia. friction Micro Pile including drilling in soil mixed with boulders and in soft rock upto desired depth(ODEX drilling using tyre or crawler mounted machine as per site requirement), cement grouting using double packer, redrilling, perforated MS Casing, including all cost of material labour, special labour and T&P required to complete the work in all respect in accordance to drawings, Technical Specifications and as per direction of Engineer-in-charge. However cost of concrete and reinforcement will be paid separately as per relevant BOQ items.	RM	2010
25	Bored cast-in-situ M35 grade R.C.C. pile excluding reinforcement complete as per drawing and technical specifications and removal of excavated earth with all lifts and lead upto 1000 m. (Pile diameter-300 mm).	RM	2010
26	Supplying, fitting and placing HYSD bar reinforcement in open foundation complete as per drawing and technical specifications	MT	45
LONGITUDINAL DRAIN			
27	Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	CUM	9
28	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications. PCC Grade M20 (p) Height upto 5m	CUM	22
5.0M HIGH GABION WALL			

29	Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m).	CUM	2075
30	Providing & making Gabion structure with Mechanically Woven Double Twisted Hexagonal Shaped Wire mesh Gabion Boxes as per IS 16014:2012, MORT&H Clause 2500, of required size, Mesh Type 10x12 (D=100 mm with tolerance of $\pm 2\%$) Zinc coated, Mesh wire diameter 3.0 mm, mechanically edged/selvedged with partitions at every 1m interval and shall have minimum 10 numbers of openings per meter of mesh perpendicular to twist, tying with lacing wire of diameter 2.2 mm, supplied @3% by weight of Gabion boxes, filled with boulders with least dimension of 200 mm, as per drawing, all complete as per direction of Engineer-in-charge.	CUM	4565
31	Supply and installation of non woven geotextile having mass/unit area - 250gsm over the slope to be treated including all cost of labour, material and T&P required for proper completion of work	SQM	2200
32	Hand Packed stone filling in back of walls including cost of all materials,royalty, T&P etc. complete as per direction of Engineer-in- charge. (As per PWD Uttarakhand specifications)	CUM	777
6.0M HIGH ANCHORED RCC STEPPED WALL ON RCC RAFT WITH MICROPILE			
FROM CH.101.100 KM TO CH.101.335 KM			
33	Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m to 6m).	CUM	7074
34	Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	CUM	108
35	Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications. RCC M35	CUM	620
36	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.RCC Grade M25 (p) Height upto 5m	CUM	3878

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37	Supplying, fitting and placing HYSD bar reinforcement in open foundation complete as per drawing and technical specifications	MT	353
38	Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	RM	2256
39	Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	MT	85
40	Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical specifications	Each	376
41	Construction of 300mm dia. friction Micro Pile including drilling in soil mixed with boulders and in soft rock upto desired depth(ODEX drilling using tyre or crawler mounted machine as per site requirement), cement grouting using double packer, redrilling, perforated MS Casing, including all cost of material labour, special labour and T&P required to complete the work in all respect in accordance to drawings, Technical Specifications and as per direction of Engineer-in-charge. However cost of concrete and reinforcement will be paid separately as per relevant BOQ items.	RM	2820
42	Bored cast-in-situ M35 grade R.C.C. pile excluding reinforcement complete as per drawing and technical specifications and removal of excavated earth with all lifts and lead upto 1000 m. (Pile diameter-300 mm).	RM	2820
43	Supplying, fitting and placing HYSD bar reinforcement in open foundation complete as per drawing and technical specifications	MT	63
44	Hand Packed stone filling in back of walls including cost of all materials, royalty, T&P etc. complete as per direction of Engineer-in-charge. (As per PWD Uttarakhand specifications)	CUM	2541
LONGITUDINAL DRAIN			
45	Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	CUM	16

46	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20 (p) Height upto 5m	CUM	42
5.0M HIGH ANCHORED CC CLADDING			
FROM CH.101.335 KM TO CH.101.425 KM			
47	Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m to 6m).	CUM	0.00
48	Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	CUM	20
49	Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers,10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	RM	1800
50	Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	MT	68
51	Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing.	SQM	3379
52	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M25 (p) Height upto 5m	CUM	563
53	Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical specifications	Each	125

54	Providing and installing subsurface drainage pipes - Perforated PVC pipe (lined with Non -woven Geotextile) of 75 mm internal diameter as per the drawings etc. complete including the cost of drilling and as directed by Engineer -In -Charge.	RM	300
PROVISION OF CULVERT AND CATCHPIT			
BOX CULVERT			
AT CH. 101.300 KM			
55	Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m to 6m).	CUM	115
56	Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	CUM	5
57	Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications. RCC M25	CUM	55
58	Supplying, fitting and placing HYSD bar reinforcement in open foundation complete as per drawing and technical specifications	MT	5
BOX CULVERT			
AT CH. 101.320 KM			
59	Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m to 6m).	CUM	96
60	Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	CUM	4
61	Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications. RCC M25	CUM	46
62	Supplying, fitting and placing HYSD bar reinforcement in open foundation complete as per drawing and technical specifications	MT	4

FOR 2.0M WIDE CC CHANNEL			
AT CH. 101.300 KM & CH. 101.320 KM			
63	Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m).	CUM	66
64	Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	CUM	2
65	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20 (p) Height upto 5m	CUM	21
66	Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	CUM	39
67	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M25 (p) Height upto 5m	CUM	532
68	Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing.	SQM	616
69	Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers,10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	RM	840
70	Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	MT	31
DEEP DRAINAGE HOLE SEMI PERFORATED PIPE			

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71	Providing and installing subsurface drainage pipes - Perforated PVC pipe (lined with Non -woven Geotextile) of 75 mm internal diameter as per the drawings etc. complete including the cost of drilling and as directed by Engineer -In -Charge.	RM	2010
CONTOUR DRAIN			
72	Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m).	CUM	450
73	Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	CUM	68
74	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20 (p) Height upto 5m	CUM	255
75	Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing.	SQM	550

(H) Landslide Location Ch. 106.230 Km – Ch. 106.360 Km (NH-09)

SNo	Description of items	Unit	Qty
EXCAVATION (CONSIDERING 60% ROCK & 40% SOIL)			
1	Excavation in Soil using Hydraulic Excavator and Tippers with disposal upto 1000 metres.(Excavation for roadwork in soil with hydraulic excavator including cutting and loading in tippers, trimming bottom and side slopes, in accordance with requirements of lines, grades and cross sections, and transporting to the embankment location within all lifts and lead upto 1000m)	CUM	8440
2.	Excavation in Hard Rock (blasting prohibited) (Excavation for roadwork in Hard Rock (blasting prohibited) with hydraulic excavator including cutting and loading in tippers, trimming bottom and side slopes, in accordance with requirements of lines, grades and cross sections, and transporting to the embankment location within all lifts and lead upto 1000 m.)	CUM	12660
PROVISION OF HT ROLLED CABLE NET WITH DT MESH			

FROM CH.106.300 KM TO CH.106.360 KM			
3	Supply and installation of high tensile rolled cable net with single/ double knot connection having aperture size not more than 300mm in one direction and minimum longitudinal tensile strength 220 KN/M, and punching resistance 350 kN, comprising of minimum 10mm dia wire rope cable with steel core with a minimum breaking load of 63kN. The tensile strength of wire of the cable should be 1770 N/sqmm having corrosion protection of Zn Coating Class A or 95% Zn + 5% Al Class-B (Galfan) Coating as per IS/ISO-17746-2016 for treatment of slopes including all cost of material (net, boundary rope & rope anchor etc comprising of the complete system), labour, special labour and T&P required to complete the work in all respect in accordance with drawings, Technical Specifications and as per the direction of Engineer-in-charge. Product Manufacturer shall have in-house test facility for conducting longitudinal tensile strength and punching resistance test and shall be responsible for carrying out both test (longitudinal tensile strength and punching resistance) during PDI per lot in presence of representative/s of E-i-C on his own expenses.	SQM	3150
4	Supply and fixing of Double Twisted Mesh including all cost of material, labour and T&P required to complete the work in all respect with following properties: a. Mesh type : 6x8, Mesh opening : 60mm X 80mm b. Mesh Wire dia. 2.2/3.2mm (ID/OD), mechanically edged/selvedged with galvanization as per EN 10223-3, and shall have minimum 16 numbers of mesh openings per meter of mesh perpendicular to twist. c. Tensile strength (500 Mpa) at a minimum elongation of 10%. The minimum tensile strength of the mesh panel must be 34.0 kN/m (+/-5kN/m) in the parallel to the twist direction and 13 kN/m in the perpendicular to the twist direction in accordance with the requirements of IS 16014:2018. d. Zinc Coating: The coating weight shall be heavily coated and soft type confirming to the requirements of specifications IS 4826:1972. Adhesion of Zinc Coating: No flakes or crack shall be observed while testing for adhesion of zinc coating as per IS 4826:1972. * ID/OD - Internal diameter/Outer diameter of Polymer coated wire.	SQM	3150
5	Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	RM	4536
6	Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	MT	170
SHOTCRETE WITH 32.0 MM SOLID ANCHORS AT HILL SIDE			
FROM CH.106.235 KM TO CH. 106.300 KM			

Tender No. CE (P) HRK/06 Landslide location/2026-27/(EPC)

7	Application of 150mm thick Shotcrete (M-25) in two layers 50mm each sandwiched with chain link fabric 50mmx50mm size including supply of all material for shot crete (Inclusive for rebound) and excluding the cost of chain link fabric, labour T&P etc. for proper completion of the work as per drawings, Technical Specifications and the direction of Engineer-in-charge.	CUM	383
8	Supply and installation of Chain link fabric (2.7mm wire dia with zinc coating 240g/ sq.m) of 50X50 mm size (Fe 500) including 2mm dia binding wire or nuts, bolts and washers as required for proper completion of the work as per drawings, Technical Specifications and the direction of Engineer-in-charge. Made of G.I. wire of dia 2.7mm.for treatment of slopes as secondary mesh including all cost of material, labour, special labour and T&P required to complete the work in all respect as per drawings.	SQM	2550
9	Drilling of 76 mm dia. hole for installation of 32mm dia. Anchors in rock by sufficient drilling equipment with necessary auxiliary equipment & accessories and including all cost of equipments, labour, materials & works connected with drilling.	RM	3264
10	Supply and installation of 32mm dia fully threaded rock anchors (Fe550D) including supply of all material, labour, t&p for proper completion of work.	RM	3264
11	Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	MT	18
PROVISION OF ROCKFALL BARRIER OF DIMENSION 30M LENGTH AND 6M HIGH			
12	Supply and installation of rock fall barrier (Category A), comprising of steel meshes and cables coated in Zn-Al 5% class A, with post to post distance of maximum 10m and energy absorption by deformation including all cost of material (consisting of posts, anchor bolts (6m deep in rock and 8 m deep in consolidated debris), plate for fixing anchor bolts, base anchors, cable anchors, cables/support ropes, clamps, retention panels, energy dissipaters etc.) , labour special labour, T&P required to complete the work in all respect as per drawings, Technical Specifications and the direction of Engineer-in-charge. ETAG 027/ EAD certified rock fall barrier shall be used. F. 6m high having minimum energy absorption in the entire system of 5000 K J	RM	30
PROVISION OF 2 NO. OF DEBRIS FLOW BARRIER OF DIMENSION 15M LENGTH AND 6M HIGH			
13	Supply and installation of complete assembly upto 6.0 m high Debris Flow Barrier with double twisted mesh and high tensile wire mesh or high tensile ring net having Impact absorption energy of the system must be minimum of 150 KN/SQM in dynamic loading conditions and as per drawings, Technical Specifications and the direction of Engineer-in-charge. ETAG/ EAD certified debris flow barrier shall be used.Upto 15m span without middle post	RM	180
FOR 2.0M WIDE CC CHANNEL AT CH 106.230M			

Tender No. CE (P) HRK/06 Landslide location/2026-27/(EPC)

14	Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	CUM	7
15	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20 (p) Height upto 5m	CUM	73
	CC CHANNEL STEPS		
	CC CHANNEL SIDE WALLS		
16	Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing.	SQM	113
17	Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers,10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	RM	1040
18	Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	MT	39
CC CATCH PIT AT 106.230			
19	Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m).	CUM	32
20	Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	CUM	1
21	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20 (p) Height upto 5m	CUM	19
6.0M HIGH ANCHORED CC GRAVITY WALL OVER BUNDLED SDRA			
22	Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m).	CUM	3120

Tender No. CE (P) HRK/06 Landslide location/2026-27/(EPC)

23	Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	CUM	58
24	Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications. RCC M25	CUM	302
25	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications. PCC Grade M20 (p) Height upto 5m	CUM	1524
26	Supplying, fitting and placing HYSD bar reinforcement in open foundation complete as per drawing and technical specifications	MT	24
27	Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	RM	768
28	Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	RM	2400
29	Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	MT	119
30	Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical specifications	Each	180
31	Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing.	SQM	1596
45.0 M HIGH ANCHORED CC CLADDING			
FROM CH. 106.260 KM TO CH. 106.305 KM			
32	Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.) ordinary soil, Manual Means (Depth above 6m).	CUM	2120
33	Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm	CUM	10

Tender No. CE (P) HRK/06 Landslide location/2026-27/(EPC)

	nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.		
34	Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications. RCC M25	CUM	48
35	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications. PCC Grade M20 (p) Height upto 5m	CUM	3060
36	Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	RM	2944
37	Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	RM	960
38	Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	MT	146
39	Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical specifications	EACH	460
40	Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing.	SQM	3240
CONTOUR DRAIN			
41	Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	CUM	27
42	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications. PCC Grade M20 (p) Height upto 5m	CUM	104
43	Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing.	SQM	223

Note 1-The Contractor shall be responsible for accurate assessment of the actual requirements as per site situation &

prepare designs for slope protection & stabilization as per the specifications & standards stipulated in schedule 'D' and submit the same to the AE duly proof checked and implement it accordingly thereafter.

Note 2- Any increase in quantity over and above the minimum qty. 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.

Note 3 - The specification including mandatory certification and Quality Assurance for rock fall mitigation measures for National Highway Projects shall confirm to Ministry's Circular No RW/NH-33044/55/2021-S&R (P&B) pt./Hill slope Monitoring dated 01 Jul 2026.

13 CHANGE OF SCOPE

- 13.1 The length of Structures and bridges specified herein above shall be treated as approximate assessment. The actual lengths as required on the basis of detailed investigations shall be determined by the Contractor in accordance with the Specifications and Standards. Any variations in the lengths specified in this Schedule-B shall not constitute a Change of Scope, save and except any variations in the length arising out of a Change of Scope expressly undertaken in accordance with the provisions of Article 13.
- 13.2 The layout dimensions, structural cross-sections, linear horizontal spans, and vertical heights of all retaining walls, breast walls, concrete face cladding panels, shotcreting setups, cross-drainage channels, and rockfall barriers specified under this Schedule-B represent mandatory project minimum requirements firmed up by the Authority. Any localized quantitative change up to 10% for items measured in linear meters, or up to 10% for items measured in square meters or Cum of a designated landslide stretch given in Table 12.2 shall not constitute a Change of Scope (CoS), nor shall they qualify for additional financial variations, save and except for alterations executed strictly outside these thresholds under Article 13."

14 DISCLAIMER

Any other rectification work not mentioned herein and required at site in the already executed work shall be assessed and carried out as per specification, standards & satisfaction of the Authority's Engineer and shall not constitute a Change of Scope under Article 13.

Appendix B-I

Applicable Stretches of Typical Cross-Sections

Sr. No.	Design Chainage (Km)		Length (m)	TCS Type
	From	To		
1	73.270	73.370	100	TCS 1
2	81.450	81.755	305	TCS 2
3	94.720	94.830	110	TCS 3
4	97.040	97.415	375	TCS 4
5	100.465	101.425	960	TCS 5
6	106.230	106.360	130	TCS 6

Appendix B-II

Co-ordinates of proposed

“LANDSLIDE TREATMENT ON 06 (SIX) NOS LOCATION ON PITHORAGARH-TAWAGHAT-LIPULEKH STRETCH OF ROAD NH-09 UNDER 765 BRTF/PROJECT HIRAK IN UTTARAKHAND STATE ON EPC MODE.”

Location		<u>Geographical Information</u>	
From	To		
73.270	73.370	29°47'55.07"N	80°25'1.42"E
81.450	81.755	29°47'46.53"N	80°29'20.53"E
94.720	94.830	29°51'52.98"N	80°33'22.15"E
97.040	97.415	29°52'51.6"N	80°33'56.2"E
100.465	101.425	29°54'41.18"N	80°34'9.70"E
106.230	106.360	29°57'1.06"N	80°35'28.37"E

SCHEDULE - C

(See Clause 2.1)

PROJECT FACILITIES

1 PROJECT FACILITIES

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

- a) Toll Plaza (s);
- b) Roadside Furniture;
- c) Pedestrian facilities;
- d) Truck Lay-Byes;
- e) Bus-Bays and Bus Shelters;
- f) Parking and Rest Area; and
- g) Utility duct

2 DESCRIPTION OF PROJECT FACILITIES

Each of the Project Facilities is briefly described below:

(a) Toll Plazas

Not Applicable

(b) Roadside Furniture

Not applicable

(c) Pedestrian facilities

Not Applicable

(d) Truck Lay-Byes

Not Applicable

(e) Bus Shelters

Not Applicable

(f) Parking & Rest Area

Not Applicable

(g) Utility Duct

Not Applicable

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.

2. DESIGN STANDARDS

The project Highway including project facilities shall confirm to design requirement set out in the following documents:

Manual of Specifications and standards for stabilization of hill slopes (IS 14680 (1999), IS 16014-2012, IS 14458 Part 1&2, IS 4999-1991 and BS 8006-1-2010 regarding stabilization of hill slopes, referred to herein as the Manual). In addition to above listed codes other codes may also be used as per the requirement

2.1 Additional Provision for Hill Road Projects

All materials, structural designs, site investigation regimes, and construction operations concerning hill cutting and landslide mitigation shall strictly conform to:

i) IRC:75 (Guidelines for the Design of High Embankments and Cut Slopes in Hill Roads) and IRC: SP:48 (Hill Roads Manual).

ii) Expert Committee Report on Cost Effective Long Term Remedial Measures for landslide Prone Areas in Hilly Regions issued by Ministry Vide Circular No RW/NH-33044/55/2021- S&R(P&B) pt/Hill Slope Monitoring dated 28.11.2024

iii) Ministry circular No RW/NH-33044/37/2025-S&R(P&B) dated 07.11.2025 on Additional Augmented and Systematic Remedial Measures to Address Concerns regarding Construction of National Highways in Hilly Regions

2.2 The specification including mandatory certification and Quality Assurance for rock fall mitigation measures for National Highway Projects shall confirm to Ministry's Circular No RW/NH-33044/55/2021-S&R (P&B) pt./Hill slope Monitoring dated 01 Jul 2026.

Annex - I
(Schedule-D)

1 SPECIFICATIONS AND STANDARDS

All Materials, works and construction operations shall conform to the Manual of Specifications and Standards for Two-Lane Highways (IRC: SP: 73-2015) referred to as the Manual, IRC 56-2011, IRC SP:106-2015 and MORTH Specifications for Road and Bridge Works (fifth revision). Where the specification for a work is not given, Good Industry Practice shall be adopted to the satisfaction of the Authority's Engineer.

Traffic management during the construction of the work shall be done in accordance with stipulations of IRC: SP:55-20'14 to ensure proper regulation of traffic and causing the least inconvenience to road users. Further, guidelines for Road Safety measures on NHs issued vide Ministry's Circular no. NHIII-33 (126)/72 dated 20.03.1973, RW/NH-11060/1/1998-D.O.1 dated 07.10.1987 & Rw/NH_ 29011 101/2015'P&M(RSCE) dated 20.09.2019 shall be strictly followed. The cost of the same shall be considered accidental to the work and no extra cost shall be paid to the contractor.

Guidelines for Road Safety vide Ministry letter No. RwtNH- 33072 /0412004-5&R(R) dated 27.04.2010 shall be followed wherever applicable.

The project display boards are to be erected by the contractor on the either end of the project reach as per the Ministry's letter no. Rw/NH-33044/10/2001-S&R (R) dated 17.07.2001 and Ministry's letter no. RW/ NH- 33044/10/ 2000-S&R (R) dated 12.08.2002. Cost of the same shall be considered accidental to the work and no extra cost shall be paid to the contractor.

The work is to be carried out in accordance with the "Hand Book of Quality Control for construction of Roads & Runways (second Revision) -IRC: SP:11- 1988", observing strict permanent quality control instructions contained in Ministry's letter No. NH-III/P/II/83 dated 19.04.1984 and records maintained thereof.

- 1.1 **Additional for Hilly Terrain Projects:** All materials, structural designs, site investigation regimes, and construction operations concerning hill cutting and landslide mitigation shall strictly conform to:

i) **IRC:75 (Guidelines for the Design of High Embankments and Cut Slopes in Hill Roads) and IRC: SP:48 (Hill Roads Manual).**

ii) Expert Committee Report on Cost Effective Long Term Remedial Measures for landslide Prone Areas in Hilly Regions issued by Ministry vide circular No RW/NH-33044/55/2021-S&R(P&B) pt/Hill Slope Monitoring dated 28.11.2024.

iii) Ministry circular No RW/NH-33044/37/2025-S&R(P&B) dated 07. 11.2025 on Additional Augmented and Systematic Remedial Measures to Address Concerns regarding Construction of National Highways in Hilly Regions

In the event of any technical contradiction or ambiguity between the standard MORT&H Specifications and the Expert Committee Guidelines of 28.11.2024 regarding slope stabilization items, the provisions, generic matrices, and material requirements of the Expert Committee Guidelines shall explicitly override the former."

2 DEVIATIONS FROM THE SPECIFICATIONS AND STANDARDS

- (i) The terms "Concessionaire", "Independent Engineer" and "Concession Agreement" used in the Manual shall be deemed to be substituted by the terms "Contractor", "Authority's Engineer" and "Agreement" respectively
- (ii) Notwithstanding anything to the contrary contained in the 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:

Sr. No.	Item	Clause referred in Manual	Provision as per Manual	Modified Provision
NIL				

Technical Specification of the Project

1. **High-Tensile Rolled Cable Net (Minimum Tensile strength - 220 kN/m) - Following are the minimum parameter must satisfy for acceptance of the system.**

Minimum Tensile strength of the net	220 KN /m	Test certificate for the same shall be provided by the Contractor.
Puncturing resistance of the net	350 kN	
Dia of rope cable of net	10mm	
Breaking load of Cable	63kN	
Tensile strength of wire of the cable	1770 N/sqm	
Dia of boundary rope	12mm	
Corrosion protection of Zn Coating Class A or 95% Zn + 5% Al Class-B (Galfan) Coating as per IS/ISO-17746-2016		

**Product Manufacturer shall have in-house test facility for conducting longitudinal tensile strength and puncturing resistance test and shall be responsible for carrying out both test (longitudinal tensile strength and puncturing resistance) during PDI, per lot in presence of representative/s of E-i-C on his own expenses.*

2. High-Tensile Rolled Cable Net (Minimum Tensile strength - 100 kN/m) - Following are the minimum parameter must satisfy for acceptance of the system.

Minimum Tensile strength of the net	100 KN /m	Test certificate for the same shall be provided by the Contractor.
Puncturing resistance of the net	200 kN	
Dia of rope cable of net	8mm	
Breaking load of Cable	40.7kN	
Tensile strength of wire of the cable	1770 N/sqm	
Dia of boundary rope	10mm	
Corrosion protection of Zn Coating Class A or 95% Zn + 5% Al Class-B (Galfan) Coating as per IS/ISO-17746-2016		

**Product Manufacturer shall have in-house test facility for conducting longitudinal tensile strength and puncturing resistance test and shall be responsible for carrying out both test (longitudinal tensile strength and puncturing resistance) during PDI, per lot in presence of representative/s of E-i-C on his own expenses.*

3. Self-Driven Rock Anchors (SDRA: 38 MM

DIA) Technical Information

Self-Drilling Hollow Soil/Rock Anchors suits well in the conditions where there is huge overburden. The system consists of the standard sacrificial drill bits and fully threaded hollow bar for core injection of cement grouting. The system does not require drilling and cased borehole and therefore installed without difficulty. The system achieved corrosion protection through encapsulation with grout after installation.

Product	Outer Ø (mm)	Inner Ø (mm)	Ultimate load (KN)	Yield load (KN)
38/19 mm dia. SDRA	38	19	500	400

Grouting

The cement grouting shall be done at a pressure ranging from 1 to 3 kg/cm².

Pull out test

2% anchors shall be tested as per IS 11309 1985. All the arrangements for pull out test shall be done by the contractor at his own cost and test shall be done as per instruction of the Authority's Engineer.

4. Grouted Anchors

- i) The anchor bar for grouted anchors shall be of 25 mm diameter conforming to IS: 1786. The diameter of the drill hole for grouted anchors shall not be less than 50 mm. The grade of steel shall be Fe 550D.

- ii) ***Pull out test:***

2 % anchors shall be tested as per IS 11309 1985. All the arrangements for pull out test shall be done by the contractor at his own cost and test shall be done as per instruction of the officials of Authority's Engineer.

5. DT MESH: Specification of DT Mesh:

- a. Mesh type: 6x8,
- b. Mesh opening: 60mm X 80mm
- c. Mesh Wire dia. 2.2/3.2mm (ID/OD)*, mechanically edged/selvedged with galvanization as per EN 10223-3, and shall have minimum 16 numbers of mesh openings per meter of mesh perpendicular to twist.
- d. Tensile strength (500 Mpa) at a minimum elongation of 10%. The

minimum tensile strength of the mesh panel must be 34.0 kN/m (+/- 5kN/m) in the parallel to the twist direction and 13 kN/m in the perpendicular to the twist direction in accordance with the requirements of IS 16014:2018.

- e. Zinc Coating: The coating weight shall be heavily coated and softtype confirming to the requirements of specifications IS 4826:1972. Adhesion of Zinc Coating: No flakes or crack shall be observed while testing for adhesion of zinc coating as per IS 4826:1972.

*ID/OD - Internal diameter/Outer diameter of Polymer coated wire.

(iii) Note 1: Deviations from the aforesaid Specifications and Standards shall be listed out here. Such deviations shall be specified only if they are considered essential in view of project-specific requirements.

(iv) Additional Specifications and Material Standards for Hill terrain projects: -

All works of Slope stabilization and drainage shall comply with the following material properties, operational tolerances, and testing codes:

Table D-1: Material Specifications & Testing Codes for Slope Works

S No.	Slope Treatment Component	Mandatory Minimum Technical Specification & Enforceable code compliance	Mandatory Field Testing & Sampling frequency
1.	Geotechnical Sub-Surface Core Investigations	- All core drilling must log Rock Quality Designation (RQD), Geological Strength Index (GSI), and Rock Mass Rating (RMR) basic metrics. - Bulk sampling of gravelly, boulder-strewn, or river-borne debris mass must be tested using a Large-Scale Shear Box apparatus (minimum box dimension of 300mm x 300mm) to establish realistic cohesion and internal friction angle values.	- Minimum 1 core borehole per 500 meters or closer at critical landslide clusters, deep cut sections (\$6.0m), or soft ground zones. - Minimum 3 Large Shear Box tests per representative strata change
2.	Subsurface Anchors, Rock Bolts, and Soil Nails (Expert Committee Codes G07a / G07b)	- Solid steel reinforcement bars must be Thermo-Mechanically Treated (TMT) conforming to IS: 1786 with a minimum yield strength of 500 MPa. - Self-Drilling Anchors (SDA) must conform to ASTM A615 or equivalent European (EN) standards. - For highly aggressive, weathered rock environments (Grades W3 to W5), Double-Corrosion Protection	Pull-out Proof Testing: - Minimum 2% of the total number of installed production anchors/bolts must be proof-tested up to 1.5 times the design load in accordance with ASTM D4435 or IS:11309 under the supervision of the Authority's Engineer. - Grout cube testing (IS:4031)

		(DCP) sheathing (pre-encapsulated smooth corrugated HDPE tube) is compulsory.	for every 5m ³ of grout mix or per day's work (minimum compressive strength 30 MPa at 28 days).
3.	Surficial Cladding and Face Shotcreting (Expert Committee Code G041)	- Shotcreting must be Fiber Reinforced Shotcrete (FRC) utilizing alkali-resistant macro-synthetic or steel fibers (minimum dosage of 40 kg/m² for steel or 5 kg/m³ for macro-synthetic) to control shrinkage and handle structural shear strains. - Minimum characteristic compressive strength must be M25 grade in compliance with 15:9013/15:9103.	- Minimum 3 compressive strength test cores shall be extracted from field-sprayed test panels (minimum panel size 500mm x 500mm x 100mm) for every 50 m³ of shotcrete sprayed or per shift's output. - Thickness checks via physical probing pin penetrations at a frequency of 1 test per 10 m² of sprayed slope face.
4.	High-Capacity Flexible Drapery & Rockfall Barriers (Expert Committee Codes G060/G09b)	- All high-tensile steel wire mesh drapery and dynamic flexible rockfall barriers must be system-certified under international dynamic drop impact testing protocols (ETAG 027/EN 15746). - Dynamic barriers must possess an energy absorption capacity rating not less than the firmed-up baseline hazard requirement (e.g., 2000 kJ to 5000 kJ) with an uncompromised net retention grid	- Manufacturer's Test Certificate (MTC): Compulsory for every structural component batch (wire ropes, energy dissipators, anchors, and shackles). - Visual verification and grid alignment checks across 100% of the barrier post positions prior to tensioning works.
5.	Multi-Tiered Mountain Drainage Infrastructures (Expert Committee Codes G12e / G02a)	- Catch Water Drains (CWD): Must be lined with M20 grade cast in-situ cement concrete, reinforced with galvanized steel chicken mesh or structural geo-synthetics to prevent cracking induced by micro-settlements of the hill slope profile. - Sub-surface Perforated PVC Lines: Must be High-Density Polyethylene (HDPE) or PVC semi-perforated pipes wrapped tightly in a non-woven, needle-punched geotextile fabric filter (minimum weight 200 g/m²) to prevent internal siltation.	Geotextile permeability and puncture resistance test certificates must be produced for every batch delivered to the project site.

Schedule - E
(See Clauses 2.1 and 14.2)
Maintenance Requirements

1. Maintenance Requirements

- (i) The Contractor shall, at all times maintain the Project Highway in accordance with the provisions of this Agreement, Applicable Laws and Applicable Permits.
- (ii) The Contractor shall repair or rectify any Defect or deficiency set forth in Paragraph 2 of this Schedule-E within the time limit specified therein and any failure in this behalf shall constitute non-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.
- (iii) All Materials, works and construction operations shall conform to the MORTH Specifications for Road and Bridge Works, and the relevant IRC publications. Where the specifications for a work are not given, Good Industry Practice shall be adopted.

2. Repair/rectification of Defects and deficiencies

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

3. Other Defects and deficiencies

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

be repaired or rectified by the Contractor within the time limit specified by the Authority's Engineer.

4. Extension of time limit

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

5. Emergency repairs/restoration

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

6. Daily inspection by the Contractor

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

7. Pre-monsoon inspection / Post-monsoon inspection

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

damages observed and proposed action to remedy the same shall be sent to the Authority's Engineer.

8. Repairs on account of natural calamities

All damages occurring to the Project Highway on account of a Force Majeure Event or wilful 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.

9. Recovery against failure to Maintenance.

Recovery shall be made against EPC Contractor in case of failure in satisfactory Maintenance requirement during Construction period (for keeping the project in traffic worthy conditions) /DL Pperiod. Recovery Rate shall be 0.003% of the Contract value per day.

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.

Table -1: Maintenance Criteria for Pavements:

Asset Type	Performance Parameter	Level of Service (LOS)		Frequency of Inspection	Tools/ Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/ Repair	Maintenance Specifications
		Desirable	Acceptable					
Flexible Pavement (Pavement of MCW, Service Road, approach)	Potholes	Nil	< 0.1 % of area and subject to limit of 10 mm in depth	Daily	Length Measurement Unit like Scale, Tape, odometer etc.	IRC 82: 2015 and Distress Identification Manual for Long Term Pavement Performance Program, FHWA 2003 (http://www.tfhr.com/pavement/ltp/reports/03031/)	24-48 hours	MORT&H Specification 3004.2

	Performance Parameter	Level of Service (LOS)		Frequency of Inspection	Tools/ Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/ Repair	Maintenance Specifications
		Desirable	Acceptable					
Asset Types of Grade structure, approaches of connecting roads, slip roads, lay byes etc. as applicable	Cracking	Nil	< 5 % subject to limit of 0.5 sqm for any 50 m length	Daily			7-15 days	MORT&H Specification 3004.3
	Rutting	Nil	< 5 mm	Daily	Straight Edge		15 -30 days	MORT&H Specification 3004.2
	Corrugations and Shoving	Nil	< 0.1 % of area	Daily	Length Measurement Unit like		2-7 days	IRC:82- 2015

	Perform ance Paramet er	Level of Service (LOS)		Frequency of Inspect ion	Tools/ Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectificatio n/ Repair	Maintena nce Specificati ons
		Desirab le	Accepta ble					
Asset Type	Bleeding	Nil	< 1 % of area	Daily	Scale, Tape, odometer etc.		3-7 days	MORT&H Specification 3004.4
	Ravelling / Stripping	Nil	< 1 % of area	Daily			7-15 days	IRC:82- 2015 read with IRC SP 81
	Edge Deformati on/ Breaking	Nil	< 1 m for any 100m section and width < 0.1 m at any location, Restricted to 30 cm from the edge	Daily			7- 15 days	IRC:82- 2015

	Perform ance Parameter	Level of Service (LOS)		Freque ncy of Inspect ion	Tools/ Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectificatio n/ Repair	Maintena nce Specificati ons
		Desirable	Acceptable					
Asset Type	Roughness BI	2000 mm/km	2400 mm/km	Bi- Annually	Class I Profilometer SCRIM (Sideway- force Coefficient Routine Investigation Machine or equivalent)	Class I Profilometer : ASTM E950 (98) :2004 –Standard Test Method for measuring Longitudinal Profile of Travelled Surfaces with Accelerometer Established Inertial Profiling Reference ASTM E1656 - 94: 2000- Standard Guide for Classification of Automatic Pavement Condition Survey Equipment	180 days	IRC:82- 2015
	Skid Number	60SN	50SN	Bi- Annually			180 days	BS: 7941-1: 2006
	Pavement Condition Index	3	2.1	Bi- Annually			180 days	IRC:82- 2015

Asset Type	Performance Parameter	Level of Service (LOS)		Frequency of Inspection	Tools/ Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/ Repair	Maintenance Specifications
		Desirable	Acceptable					
	Other Pavement Distresses			Bi- Annually			2-7 days	IRC:82-2015
	Deflection / Remaining Life			Annually	Falling Weight Deflectometer	IRC 115: 2014	180 days	IRC:115-2014
Rigid Pavement (Pavement of MCW, Service Road, Grade structure,	Roughness BI	2200 m m/km	2400 mm /km	Bi- Annually	Class I Profilometer	ASTM E950 (98) :2004 and ASTM E1656 -94: 2000	180 days	IRC:SP:83-2008
	Skid	Skid Resistance no. at different speed of vehicles		Bi- Annually	SCRIM (Sideway-force	IRC:SP:83-2008	180 days	IRC:SP:83-2008

Asset Type	Performance Parameter	Level of Service (LOS)		Frequency of Inspection	Tools/ Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification / Repair	Maintenance Specifications
		Desirable	Acceptable					
approaches of connecting roads, slip roads, lay byes etc. as applicable)		Minimum SN	Traffic Speed (Km/h)		Coefficient Routine Investigation Machine or equivalent)			
		36	50					
		33	65					
		32	80					
		31	95					
		31	110					

Asset Type	Performance Parameter	Level of Service (LOS)		Frequency of Inspection	Tools/ Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/ Repair	Maintenance Specifications
		Desirable	Acceptable					
Embankment/ Slope	Edge drop at shoulders	Nil	40mm	Daily	Length Measurement Unit like Scale, Tape, odometer etc.	IRC	7-15 days	MORT&H Specification 408.4
	Slope of camber/cross fall	Nil	<2% variation in prescribed slope of camber /crossfall	Daily			7-15 days	MORT&H Specification 408.4
	Embankment Slopes	Nil	<15 % variation in prescribe side slope	Daily			7-15 days	MORT&H Specification 408.4

Asset Type	Performance Parameter	Level of Service (LOS)		Frequency of Inspection	Tools/ Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/ Repair	Maintenance Specifications
		Desirable	Acceptable					
	Embankment Protection	Nil	Nil	Daily	NA		7-15 days	MORT&H Specification
	Rain Cuts/ Gullies in slope	Nil	Nil	Daily Specially During Rainy Season	NA		7-15 days	MORT&H Specification

Table -3: Maintenance Criteria for Safety Related Items and Other Furniture Items:

Asset Type	Performance Parameter	Level of Service (LOS)			Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
Highway	Availability of Safe Sight Distance	As per IRC SP :84-2014, a minimum of safe stopping sight distance shall be available throughout.			Monthly	Manual Measurements with Odometer along with video/ image backup	Removal of obstruction within 24 hours, in case of sight line affected by temporary objects such as trees, temporary encroachments.	In case of permanent structure or design deficiency: Removal of obstruction/improvement of deficiency at the earliest Speed Restriction boards and suitable traffic calming measures such as transverse bar marking, blinkers, etc. shall be applied during the period of rectification.	IRC:SP 84-2014
		Design Speed, kmph	Desirable Minimum Sight Distance (m)	Safe Stopping Sight Distance (m)					
		100	360	180					
		80	260	130					
Pavement Marking	Wear	<70% of marking remaining			Bi-Annually	Visual Assessment as per Annexure-F of IRC:35-2015	Re - painting	Cat-1 Defect – within 24 hours Cat-2 Defect - within 2 months	IRC:35-2015

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
	Day time Visibility	During expected life Service Time Cement Road - 130mcd/m ² /lux Bituminous Road - 100mcd/m ² /lux	Monthly	As per Annexure-D of IRC:35- 2015	Re - painting	Cat-1 Defect –within 24 hours Cat-2 Defect – within 2 months	IRC:35- 2015
	Night Time Visibility	<u>Initial and Minimum Performance for Dry Retro reflectivity during night time:</u>		As per Annexure-E of IRC:35-2015	Re - painting	Cat-1 Defect –within 24 hours Cat-2 Defect – within 2 months	IRC:35- 2015
		Design	(RL) Retro				
		Speed	Reflectivity (mcd/m ² /lux)				
			Initial (7 days)				
			Minimum Threshold level (TL) & warranty period required up to 2 years				
		Up to 65	200				
		65 - 100	250				
		Above 100	350				
		<u>Initial and Minimum Performance for Night Visibility under wet condition (Retro reflectivity):</u>					

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
		Initial 7 days Retro reflectivity: 100 mcd/m ² /lux Minimum Threshold Level: 50 mcd/m ² /lux					
	Skid Resistance	Initial and Minimum performance for Skid Resistance: Initial (7days): 55BPN Min. Threshold: 44BPN *Note: shall be considered under urban/city traffic condition encompassing the locations like pedestrian crossings, bus bay, bus stop, cycle track intersection delineation, transverse bar markings etc	Bi-Annually	As per Annexure-G of IRC:35-2015		Within 24 hours	IRC:35-2015
Road Signs	Shape and Position	Shape and Position as per IRC:67-2012. Signboard should be clearly visible for the design speed of the section.	Daily	Visual with video/image backup	Improvement of shape, in case if shape is damaged. Relocation as per requirement	48 hours in case of Mandatory Signs, Cautionary and Informatory Signs (Single and Dual post signs) 15 Days in case of Gantry/ Cantilever Sign boards	IRC:67-2012
	Retro reflectivity	As per specifications in IRC:67-2012	Bi-Annually	Testing of each	change of signboard	48 hours in case of Mandatory	IRC:67-2012

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
				signboard using Retro Reflectivity Measuring Device. In accordance with ASTM D 4956-09.		Signs, Cautionary and Informatory Signs (Single and Dual post signs) 1 Month in case of Gantry/Cantilever Sign boards	
Kerb	Kerb Height	As per IRC 86:1983 depending upon type of Kerb	Bi-Annually	Use of distance measuring tape	Raising Kerb Height	Within 1 Month	RC 86:1983
	Kerb Painting	<u>Functionality:</u> Functioning of Kerb painting as intended	Daily	Visual with video/image backup	Kerb Repainting	Within 7-days	RC 35:2015
Other Road Furniture	Reflective Pavement Markers (Road Studs)	Numbers and Functionality as per specifications in IRC:SP:84-201 and IRC:35-2015, unless specified in Schedule-B.	Daily	Counting	New Installation	Within 2 months	IRC:SP:84-2014, IRC:35-2015
	Pedestrian Guardrail	<u>Functionality:</u> Functioning of guardrail as intended	Daily	Visual with video/image backup	Rectification	Within 15 days	IRC:SP:84-2014
	Traffic Safety Barriers	<u>Functionality:</u> Functioning of Safety Barriers as intended	Daily	Visual with video/image backup	Rectification	Within 7 days	IRC:SP:84-2014, IRC:119-2015
	End Treatment of	<u>Functionality:</u> Functioning of End Treatment as intended	Daily	Visual with video/image	Rectification	Within 7 days	IRC:SP:84-2014,

AssetType	Performanc e Parameter	Level of Service (LOS)	Frequency of Measureme n t	Testing Method	Recommended Remedial measures	Time limit for Rectificatio n	Specificat ions and Standards
	TrafficSafety Barriers			backup			IRC:119- 2015
	Attenuators	<u>Functionality:</u> Functioning of Attenuators as intended	Daily	Visual with video/image backup	Rectification	Within 7 days	IRC:SP- 2014, IRC:119- 2015
	GuardPosts and Delineator s	<u>Functionality:</u> Functioning of GuardPosts and Delineators as intended	Daily	Visual with video/image backup	Rectificati on	Within 15 days	IRC: 79 – 1981
	Overhead Sign Structure	Overhead sign structure shall be structurally adequate	Daily	Visual with video/image backup	Rectification	Within 15 days	IRC:67- 2012
	Traffic Blinkers	<u>Functionality:</u> Functioning of TrafficBlinkers as intended	Daily	Visual with video/image backup	Rectification	Within 7 days	IRC:SP:84- 2014
Highway Lighting System	Highway Lights	Illumination: Minimum 40 Lux illumination on theroad surface	Daily	The illumination level shall be measured with luxmeter	Improvement in Lighting System	24 hours	IRC:SP:84- 2014
		No major failure in the lighting system	Daily	-	Rectification of failure	24 hours	IRC:SP:84- 2014
		No minor failure in the lighting system	Monthly	-	Rectification of failure	8 hours	IRC:SP:84- 2014
	Toll Plaza Canopy Lights	Minimum 40 Lux illumination on theroad surface	Daily	The illumination level shall be measured with luxmeter	Improvement in Lighting System	24 hours	IRC:SP:84- 2014
		No major/minor failure in the lightingsystem	Daily	-	Rectification of failure	8 hours	IRC:SP:84- 2014

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
Trees and Plantation including median plantation	Obstruction in a minimum head-room of 5.5 m above carriageway or obstruction in visibility of road signs	No obstruction due to trees	Monthly	Visual with video/image backup	Removal of trees	Immediate	IRC:SP:84-2014
	Deterioration in health of trees and bushes	Health of plantation shall be as per requirement of specifications & instructions issued by Authority from time to time	Daily	Visual with video/image backup	Timely watering and treatment. Or Replacement of Trees and Bushes.	Within 90 days	IRC:SP:84-2014
	Vegetation affecting sight line and road structures	Sight line shall be free from obstruction by vegetation	Daily	Visual with video/image backup	Removal of Trees	Immediate	IRC:SP 84-2014
Rest Areas	Cleaning of toilets	-	Daily	-	-	Every 4 hours	
	Defects in electrical, water and sanitary installations	-	Daily	-	Rectification	24 hours	

AssetType	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
Other Project Facilities and Approach roads	Damage or deterioration in Approach Roads, pedestrian facilities, truck lay-bys, bus-bays, bus- shelters, cattle crossings, Traffic Aid Posts, Medical Aid Posts and other works		Daily	-	Rectification	15 days	IRC:SP 84-2014

Table 4: Maintenance Criteria for Culverts: Deleted.**Table 5: Maintenance Criteria for Hill Roads**

In addition to above, for hill roads the following provisions for maintenance is also to done.

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

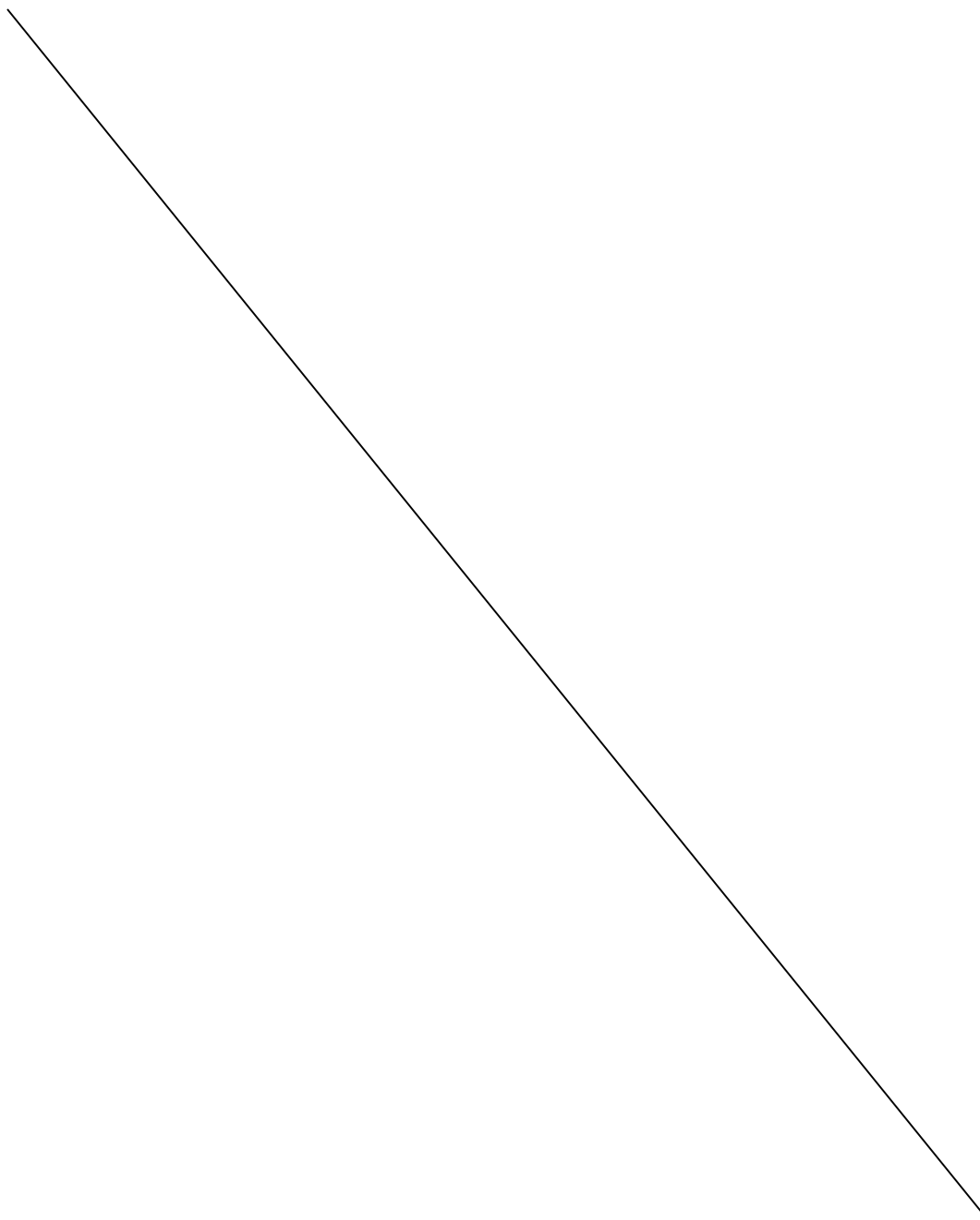
Note: For all tables 1 to 5 above, latest BIS & IRC standards (even those not indicated herewith) along with MoRTH specifications shall be binding for all maintenance activities.

A. Flexible Pavement

Nature of Defect or deficiency		Time limit for repair/ rectification
(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
(vi)	Desilting of drains in urban/semi- urban areas	24 (twenty four) 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 (forty eight) hours
(ii)	Painting of km stone, railing, parapets, crash barriers	As and when required/ Once every year
(iii)	Damaged/missing signs road 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 (twenty four) hours
(ii)	Faults and minor failures	8 (eight) 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 (twenty four) hours
(ii)	Removal of fallen trees from carriageway	4 (four) 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
(g) Hill Roads		
(i)	Damage to retaining wall/ breast wall / Anchor trench cum Drain / Catch Water Drain / Chutes/ Nailing / Slope Protection Work etc.	7 (seven) days
(ii)	Landslides requiring clearance	12 (twelve) hours
(iii)	Snow requiring clearance	24 (twenty four) hours

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



SCHEDULE-F
(See Clause 4.1 (vii)(a))
APPLICABLE PERMITS

1 Applicable Permits

- (i) 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 Panchayat 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;
 - (i) Any other permits, clearances or approvals required under Applicable Laws
- (ii) Applicable permits, as required, relating to environmental protection and conservation shall have been procured by the Authority in accordance with provisions of this Agreement.

SCHEDULE – G
FORM OF BANK GUARANTEE
Annexure-I
[Performance Security/Additional Performance Security]

The Chief Engineer,

Project Hirak

C/o 56 APO

Pin - 931724

WHEREAS

_____ [name and address of contractor] (hereinafter called the “**Contractor**”) and [The Chief Engineer Project Hirak, C/O 56 APO], (hereinafter called the “**Authority**”) have entered into an agreement (hereinafter called the “**Agreement**”) for the “**Treatment of 06 landslide location (Ch. 73.270 to 73.370 near Ghagra, Ch. 81.450 to 81.755 near Kalika, Ch. 94.720 to 94.830 near Tapowan, Ch. 97.040 to 97.415 near Dobat, Ch. 100.465 to 101.425 near Jumma, Ch. 106.230 to 106.360 near Tawaghat) in Pithoragarh - Tawaghat section of NH-09 (Old NH-125) in the State of Uttarakhand on EPC Mode.**” on Engineering, Procurement and Construction (the “EPC”) basis, 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**”).

(C) We,Through our branch at (The “**Bank**”) have agreed to furnish this bank guarantee (*hereinafter called the “**Guarantee**”*) by way of Performance Security.

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

1. The Bank hereby unconditionally and irrevocably guarantees the due and faithful performance of the Contractor’s obligations during the {Construction Period/ Defects Liability Period and Maintenance Period} under and in accordance with the Agreement, and agrees and undertakes to pay to the Authority, upon its mere first written demand, and without any demur, reservation, recourse, contest or protest, and without any reference to the Contractor, such sum or sums up to an aggregate sum of the Guarantee Amount as the Authority shall claim, without the Authority being required to prove or to show grounds or reasons for its demand and/or for the sum specified therein.
2. A letter from the Authority, under the hand of an officer not below the rank of [General Manager in the National Highways Authority of India], 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 is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revision, ICC Publication No. 758, except that the supporting statement under Article 15(a) is hereby excluded.

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.

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

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

Form for Guarantee for Withdrawal of Retention Money

The Chief Engineer

Project Hirak

C/O 56 APO

Pin 931724

WHEREAS:

- (A) [Name and address of Bidder] (hereinafter called the “**Bidder**”) has executed an agreement (hereinafter called the “**Agreement**”) with the [name and address of the authority], (hereinafter called the “**Authority**”) for “**Treatment of 06 landslide location (Ch. 73.270 to 73.370 near Ghagra, Ch. 81.450 to 81.755 near Kalika, Ch. 94.720 to 94.830 near Tapowan, Ch. 97.040 to 97.415 near Dobat, Ch. 100.465 to 101.425 near Jumma, Ch. 106.230 to 106.360 near Tawaghat) in Pithoragarh - Tawaghat section of NH-09 (Old NH-125) in the State of Uttarakhand on EPC Mode.**”subject to and in accordance with the provisions of the Agreement.
- (B) In accordance with the Clause 7.5.3 of the Agreement, the Bidder may withdraw the retention money (hereinafter called “**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

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 Bidder, 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 Executive Engineer in BRO that the Bidder 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 Bidder is in default in due and faithful performance of its obligations during and under the Agreement and its decision that the Bidder is in default shall be final, and binding on the Bank, notwithstanding any difference between the Authority and the Bidder, or any dispute between them pending before any court, tribunal, arbitrators or any other Authority or body, or by the discharge of the Bidder 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 Bidder 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 Bidder 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 Bidder, 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 Bidder 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 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 end of the Defects Liability Period specified in Clauses 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 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.

Signed and sealed this Day of 2026..... 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.*
- (iii) *Insert a date being 2(two) years from the date of issuance of the Guarantee (in accordance with clause 7.2 of the Agreement).*

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

Form for Guarantee for Advance Payment

The Chief Engineer

Project Hirak

C/O 56 APO

Pin 931724

WHEREAS:

(A) [Name and address of Bidder] (hereinafter called the “**Bidder**”) has executed an agreement (hereinafter called the “**Agreement**”) with the [name and address of the authority], (hereinafter called the “**Authority**”) (the “**Authority**”) have entered into an agreement (the “**Agreement**”) for the “**Treatment of 06 landslide location (Ch. 73.270 to 73.370 near Ghagra, Ch. 81.450 to 81.755 near Kalika, Ch. 94.720 to 94.830 near Tapowan, Ch. 97.040 to 97.415 near Dobat, Ch. 100.465 to 101.425 near Jumma, Ch. 106.230 to 106.360 near Tawaghat) in Pithoragarh - Tawaghat section of NH-09 (Old NH-125) in the State of Uttarakhand on EPC Mode.**” subject to and in accordance with the provisions of the Agreement.

(B) In accordance with the Clause 19.2 of the Agreement the Authority shall make to the Bidder an interest free advance payment (hereinafter called “**Advance Payment**”) equal to 10% (ten per cent) of the Contract Price; and that the advance payment shall be made in two installments subject to the Bidder furnishing an irrevocable and unconditional guarantee by a scheduled bank for an amount equal to 110% (One hundred and ten percent) of such installment to remain effective till the complete and full repayment of the installment of the Advance Payment as security for compliance with its obligations in accordance with the Agreement. The amount of (first/second/third) installment of the Advance Payment is Rs. Cr (Rupees..... Crore) and the amount Guarantee & Rs..... Cr. (Rupees Crore) (the “**Guarantee Amount**”).

(C) We, Through our branch at (The “**Bank**”) have agreed to furnish this bank guarantee (hereinafter called the “**Guarantee**”) for the Guarantee Amount.

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

1. The Bank hereby unconditionally and irrevocably guarantees the due and faithful repayment on time of the aforesaid installment of the Advance Payment under and in accordance with the Agreement, and agrees and undertakes to pay to the Authority, upon its mere first written demand, and without any demur, reservation, recourse, contest or protest, and without any reference to the Bidder, 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 Executive Engineer in BRO, that the Bidder has committed default in the due and faithful performance of all or any of its obligations for the repayment of the installment 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

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

Signed and sealed this Day of 2026..... 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.*
- (iii) *\$The Guarantee Amount should be equivalent to 110% of the value of the applicable installment.*
- (iv) *\$Insert a date being 90 (ninety) days after the end of one year from the date of payment of the Advance Payment to the Bidder (in accordance with Clause 19.2 of the Agreement)*

SCHEDULE-H

(See Clauses 10.1. (iv) and 19.3)

Contract Price Weightages

1.1 The Contract Price for this Agreement is Rs.

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

Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
1	2	3	4
Road works	00.00%	A- Widening and strengthening of existing road	
		(a) Earthwork up to top of the embankment	0%
		(b) Subgrade	0%
		(c) SubBase Course (GSB)	0%
		(d) Non-Bituminous Base Course (WMM)	0%
		(e) Bituminous Base Course	0%
		(f) Wearing Coat	0%
		(g) Widening and repair of culverts	0%
		B.1 - Reconstruction/New Single-lane realignment/ bypass (Flexible Pavement)	
		(a) Earthwork up to top of the Subgrade	0.00%
		(b) Subbase Course (GSB)	0.00%
		(c) Non-Bituminous Base Course (WMM)	0.00%
		(d) Bituminous Base Course	0.00%
		(e) Wearing Coat	0.00%
		(f) Construction of Earthen Shoulders	0.00%
		B.2 - Reconstruction/New Single-lane realignment/ bypass (Rigid Pavement)	
		(a) Earthwork up to top of the embankment	0.00%
		(b) Subgrade	
		(c) Sub Base Course (GSB)	0.00%
		(d) Dry Lean Concrete (DLC) Course	0.00%
		(e) Pavement Quality Control (PQC) Course	0.00%
		C - Reconstruction & New Culverts on existing road, realignments, bypasses (Culverts length <6m)	
		Culvert (Length < 6m)	
		Culverts	0.00%

Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
Minor Bridges/ Underpasses/ Overpasses	0.00%	A.1 Widening and Repair of Minor Bridges (Length>6m and <60m)	
		Minor Bridge	
		A.2 Reconstruction/New Minor Bridges (Length>6m and <60m)	
		(a) Foundation: On completion of the foundation work of abutment and piers	0.00%
		(b) Sub-structure: On completion of abutments and piers with abutment/ pier cap.	0.00%
		(c) Super-structure: On completion of the super-structure up to Deck slab including bearings	0.00%
		(d) Miscellaneous works: On completion of wearing coat, expansion joint, crash barriers, railing, protection works and any remaining work associated to bridge including tests on bridge	0.00%
		(e) Approaches: On completion of Approach Slab complete in all respect	0.00%
		(f) Guide Bunds and River Training Works: On completion of Guide Bunds and river training works complete in all respects	0.00%
		B.1 Widening and Repair of Underpasses/ Overpasses	
		Underpasses/ Overpasses	0.00%
		B.2 New Underpasses/ Overpasses	
		(a) Foundation: On completion of the foundation work including foundations for wing and return walls, abutments, piers.	0.00%
		(b) Sub-structure: On completion of abutments, piers up to the abutment/ pier cap up to top	0.00%
		(c) Super-structure: On completion of the super-structure upto Deck slab including bearings	0.00%
		(d) Miscellaneous works: On completion of wearing coat, expansion joints, crash barriers, railing, protection works and any remaining work associated to bridge including tests on bridge.	0.00%
		(e) Approaches: On completion of approaches including wing walls/ return walls, Retaining walls, stone pitching, protection works for floor, embankment slope etc. complete in all respect and fit for use	0.00%
		(f) Guide Bunds and River Training Works: On completion of Guide Bunds and river training works complete in all respects	0.00%

Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
Others10.33	00.00%	(i) Toll Plaza	0.00%
		(ii) Road side drains (a) Drain (b) Cover Slab	0.00%
		(iii) Road signs, markings, km stones, safety devices etc.	0.00%
		(iv) Overhead gantry mounted signs	0.00%
		(v) Project facilities (a) Bus Bays (b) Truck lay-byes (c) Rest areas (d) others	0.00%
		(vi) Road side plantation	0.00%
		(vii) Protection works# other than approaches to the bridges, elevated sections/ flyovers/grade separators and ROB/RUBs. (a) Crash Barrier (b) Retaining Wall (c) Breast Wall.	0.00%
		(viii) Safety and traffic management during construction	0.00%
	100%	(ix) SLOPE PROTECTION WORK	
	3.08%	<u>(A) Landslide Location Ch. 73.270 Km to Ch. 73.370 Km (NH-09)</u>	
		CH-73.270 TO 73.370 KM	
		SLOPE PROTECTION MEASURES	
		a) Excavation in Soil with Dozer with lead upto 1000 metres (Excavation for road way in soil by mechanical means including cutting and transporting the earth to site of embankment/dumping area with lead upto 1000 metres, including trimming bottom and side slopes in accordance with requirements of lines, grades and cross sections.)	1.27%
		b) Excavation in Ordinary Rock with Dozer with lead upto 1000 metres (Excavation for roadway in ordinary rock by deploying a dozer, including cutting and transporting the earth to site of embankment/dumping area with lead upto 1000 metres, trimming bottom and side slopes in accordance with the requirements of lines, grades and cross sections.)	0.48%
		c) Cost of Haulage Excluding Loading and Unloading. Case I Surfaced Road Hilly. Within Lead 4Km	0.52%
		d) Supply and installation of high tensile rolled cable net having aperture size not more than 300mm in one direction and minimum longitudinal tensile strength 100 KN/M and punching resistance 200 kN, comprising of minimum 8mm dia wire rope cable with a minimum breaking load of 40.7kN. The tensile strength of wire of the cable should be 1770 N/sqmm having corrosion protection of Zn Coating Class A or 95% Zn + 5% Al Class-B (Galfan) Coating as per IS/ISO-17746-2016 for treatment of slopes including all cost of material (net, boundary rope & rope anchor etc.	8.24%

		comprising of the complete system), labour, special labour and T&P required to complete the work in all respect in accordance with drawings, Technical Specifications and as per the direction of Engineer-in-charge. Product Manufacturer shall have in-house test facility for conducting longitudinal tensile strength and punching resistance test and shall be responsible for carrying out both test (longitudinal tensile strength and punching resistance) during PDI, per lot in presence of representative/s of E-i-C on his own expenses.	
		e) Supply and fixing of Double Twisted Mesh including all cost of material, labour and T&P required to complete the work in all respect with following properties: a. Mesh type : 6x8, Mesh opening : 60mm X 80mm b. Mesh Wire dia. 2.2/3.2mm (ID/OD), mechanically edged/selvedged with galvanization as per EN 10223-3, and shall have minimum 16 numbers of mesh openings per meter of mesh perpendicular to twist. c. Tensile strength (500 Mpa) at a minimum elongation of 10%. The minimum tensile strength of the mesh panel must be 34.0 kN/m (+/-5kN/m) in the parallel to the twist direction and 13 kN/m in the perpendicular to the twist direction in accordance with the requirements of IS 16014:2018. d. Zinc Coating: The coating weight shall be heavily coated and soft type confirming to the requirements of specifications IS 4826:1972. Adhesion of Zinc Coating: No flakes or crack shall be observed while testing for adhesion of zinc coating as per IS 4826:1972. * ID/OD - Internal diameter/Outer diameter of Polymer coated wire.	1.98%
		f) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	60.47%
		g) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	9.96%
		CATCH DRAIN	
		h) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom and backfilling with approved material.)(i) Ordinary soil A Manual Means (Depth upto 3 m)	0.05%
		i) PCC 1:3:6 in Foundation (Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.)	0.11%
		j) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications. PCC Grade M20. Height Upto 5m.	0.68%
		k) Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing	0.03%

		4M HIGH CC GRAVITY WALL ALONG BENCH (CH-73.355 TO 73.370 KM)	
		l) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m).	0.02%
		m) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.04%
		n) Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications.PCC Grade M20.	0.04%
		o) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20.Height Upto 5m.	0.72%
		p) Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing	0.03%
		q) Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical specifications	0.01%
		r) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers,10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	1.65%
		s) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	0.26%
		t) Back filling behind abutment, wing wall and return wall complete as per drawing and Technical specification. Granular material	0.03%
		4M HIGH CC GRAVITY WALL (CH-73.270 TO 73.330 KM)	
		u) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m).	0.07%
		v) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.14%
		w) Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications.PCC Grade M20.	0.17%
		x) Plain/Reinforced cement concrete in sub-structure	2.87%

		complete as per drawing and technical specifications.PCC Grade M20.Height Upto 5m.	
		y) Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing	0.13%
		z) Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical specifications	0.02%
		aa) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers,10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	8.48%
		bb) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	1.40%
		cc) Back filling behind abutment, wing wall and return wall complete as per drawing and Technical specification. Granular material	0.13%
	11.57%	<u>(B) Landslide Location Ch. 81.450 Km to Ch. 81.755 Km (NH-09)</u>	
		EXCAVATION (CONSIDERING 60% LOOSE MASS & 40% ROCK)	
		a) Excavation in Soil with Dozer with lead upto 1000 metres (Excavation for road way in soil by mechanical means including cutting and transporting the earth to site of embankment/dumping area with lead upto 1000 metres, including trimming bottom and side slopes in accordance with requirements of lines, grades and cross sections.)	3.40%
		b) Excavation in Ordinary Rock with Dozer with lead upto 1000 metres (Excavation for roadway in ordinary rock by deploying a dozer, including cutting and transporting the earth to site of embankment/dumping area with lead upto 1000 metres, trimming bottom and side slopes in accordance with the requirements of lines, grades and cross sections.)	3.44%
		SHOTCRETE WITH 25.0 MM SOLID ANCHORS AT HILL SIDE	
		FROM CH.81.450 KM TO CH. 81.615 KM	
		c) Application of 150mm thick Shotcrete (M-25) in two layers 75mm each sandwiched with chain link fabric 50mmx50mm size including supply of all material for shot crete (Inclusive for rebound) and excluding the cost of chain link fabric, labour T&P etc. for proper completion of the work as per drawings, Technical Specifications and the direction of Engineer-in-charge.	6.96%
		d) Supply and installation of Chain link fabric (2.7mm wire dia with zinc coating 240g/ sq.m) of 50X50 mm size (Fe 500) including 2mm dia binding wire or nuts, bolts and washers as required for proper completion of the work as per drawings, Technical Specifications and the direction of	0.76%

		Engineer-in-charge. Made of G.I. wire of dia 2.7mm.for treatment of slopes as secondary mesh including all cost of material, labour, special labour and T&P required to complete the work in all respect as per drawings.	
		e) Drilling of 50 mm dia. hole for installation of 25mm dia. Anchors in rock by sufficient drilling equipment with necessary auxiliary equipment & accessories and including all cost of equipments, labour, materials & works connected with drilling.	4.57%
		f) Supply and installation of 25mm dia fully threaded rock anchors (Fe550D) including supply of all material, labour, t&p for proper completion of work.	2.26%
		g) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	0.11%
		PROVISION OF 100KN/M HT ROLLED CABLE NET WITH DT MESH AT HILL SIDE	
		FROM CH.81.615 KM TO CH.81.720 KM	
		h) Supply and installation of high tensile rolled cable net having aperture size not more than 300mm in one direction and minimum longitudinal tensile strength 100 KN/M and punching resistance 200 kN, comprising of minimum 8mm dia wire rope cable with a minimum breaking load of 40.7kN. The tensile strength of wire of the cable should be 1770 N/sqmm having corrosion protection of Zn Coating Class A or 95% Zn + 5% Al Class-B (Galfan) Coating as per IS/ISO-17746-2016 for treatment of slopes including all cost of material (net, boundary rope & rope anchor etc. comprising of the complete system), labour, special labour and T&P required to complete the work in all respect in accordance with drawings, Technical Specifications and as per the direction of Engineer-in-charge. Product Manufacturer shall have in-house test facility for conducting longitudinal tensile strength and punching resistance test and shall be responsible for carrying out both test (longitudinal tensile strength and punching resistance) during PDI, per lot in presence of representative/s of E-i-C on his own expenses.	2.78%
		i) Supply and fixing of Double Twisted Mesh including all cost of material, labour and T&P required to complete the work in all respect with following properties: a. Mesh type : 6x8, Mesh opening : 60mm X 80mm b. Mesh Wire dia. 2.2/3.2mm (ID/OD), mechanically edged/selvedged with galvanization as per EN 10223-3, and shall have minimum 16 numbers of mesh openings per meter of mesh perpendicular to twist. c. Tensile strength (500 Mpa) at a minimum elongation of 10%. The minimum tensile strength of the mesh panel must be 34.0 kN/m (+/-5kN/m) in the parallel to the twist direction and 13 kN/m in the perpendicular to the twist direction in accordance with the requirements of IS 16014:2018. d. Zinc Coating: The coating weight shall be heavily coated and soft type confirming to the requirements of specifications IS 4826:1972. Adhesion of Zinc Coating: No flakes or crack shall be observed while testing for adhesion of zinc coating as per IS 4826:1972. * ID/OD - Internal diameter/Outer diameter of Polymer coated wire	0.67%
		j) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner	6.70%

		dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	
		k) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	1.10%
		PROVISION OF 100KN/M HT ROLLED CABLE NET WITH DT MESH AT VALLEY SIDE	
		FROM CH.81.455 KM TO CH.81.755 KM	
		l) Supply and installation of high tensile rolled cable net having aperture size not more than 300mm in one direction and minimum longitudinal tensile strength 100 KN/M and punching resistance 200 kN, comprising of minimum 8mm dia wire rope cable with a minimum breaking load of 40.7kN. The tensile strength of wire of the cable should be 1770 N/sqmm having corrosion protection of Zn Coating Class A or 95% Zn + 5% Al Class-B (Galfan) Coating as per IS/ISO-17746-2016 for treatment of slopes including all cost of material (net, boundary rope & rope anchor etc. comprising of the complete system), labour, special labour and T&P required to complete the work in all respect in accordance with drawings, Technical Specifications and as per the direction of Engineer-in-charge. Product Manufacturer shall have in-house test facility for conducting longitudinal tensile strength and punching resistance test and shall be responsible for carrying out both test (longitudinal tensile strength and punching resistance) during PDI, per lot in presence of representative/s of E-i-C on his own expenses.	4.77%
		m) Supply and fixing of Double Twisted Mesh including all cost of material, labour and T&P required to complete the work in all respect with following properties: a. Mesh type : 6x8, Mesh opening : 60mm X 80mm b. Mesh Wire dia. 2.2/3.2mm (ID/OD), mechanically edged/selvedged galvanization as per EN 10223-3, and shall have minimum 16 numbers of mesh openings per meter of mesh perpendicular to twist. c. Tensile strength (500 Mpa) at a minimum elongation of 10%. The minimum tensile strength of the mesh panel must be 34.0 kN/m (+/-5kN/m) in the parallel to the twist direction and 13 kN/m in the perpendicular to the twist direction in accordance with the requirements of IS 16014:2018. d. Zinc Coating: The coating weight shall be heavily coated and soft type confirming to the requirements of specifications IS 4826:1972. Adhesion of Zinc Coating: No flakes or crack shall be observed while testing for adhesion of zinc coating as per IS 4826:1972. * ID/OD - Internal diameter/Outer diameter of Polymer coated wire.	1.15%
		n) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit,	14.41%

		couplers,10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	
		o) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	2.37%
		4.0M HIGH ANCHORED CC GRAVITY WALL	
		FROM CH.81.615 KM TO CH.81.720 KM	
		p) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m).	0.01%
		q) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.05%
		r) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20 (p) Height upto 5m	1.42%
		s) Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications. RCC M30	0.36%
		t) Supplying, fitting and placing HYSD bar reinforcement in open foundation complete as per drawing and technical specifications	0.31%
		u) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers,10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	0.69%
		v) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers,10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	2.57%
		w) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	0.54%
		x) Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and	0.01%

		Technical specifications	
		y) Providing and installing subsurface drainage pipes - Perforated PVC pipe (lined with Non -woven Geotextile) of 75 mm internal diameter as per the drawings etc. complete including the cost of drilling and as directed by Engineer -In -Charge.	0.11%
		z) Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing.	0.05%
		aa) Hand Packed stone filling in back of walls including cost of all materials,royalty, T&P etc. complete as per direction of Engineer-in- charge. (As per PWD Uttarakhand specifications)	0.04%
		LONGITUDINAL DRAINS	
		bb) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.03%
		cc) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20 (p) Height upto 5m	0.03%
		4.0M HIGH ANCHORED CC CLADDING	
		FROM CH.81.450 KM TO CH.81.615 KM	
		dd) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m to 6m).	0.07%
		ee) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.05%
		ff) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M25 (p) Height upto 5m	2.77%
		gg) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20 (p) Height upto 5m	0.05%
		hh) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers,10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	1.08%
		ii) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers,10mm thick base plate and nut and bolt complete	0.54%

		in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	
		jj) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	0.27%
		kk) Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing.	0.22%
		ll) Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical specifications	0.01%
		mm) Providing and installing subsurface drainage pipes - Perforated PVC pipe (lined with Non -woven Geotextile) of 75 mm internal diameter as per the drawings etc. complete including the cost of drilling and as directed by Engineer -In -Charge.	0.17%
		6.0M HIGH ANCHORED RCC WALL	
		FROM CH.81.455 KM TO CH.81.755 KM	
		nn) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m to 6m).	1.03%
		oo) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.31%
		pp) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.RCC Grade M30 (p) Height upto 5m to 10m	7.37%
		qq) Supplying, fitting and placing HYSD bar reinforcement in open foundation complete as per drawing and technical specifications	5.94%
		rr) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers,10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	2.94%
		ss) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers,10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting	8.83%

		which will be paid extra as per relevant BOQ item.	
		tt) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	1.94%
		uu) Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical specifications	0.02%
		10.0M LONG, 300MM ARTICULATING MATTRESSES	
		FROM CH. 81.455KM & CH.81.755 KM	
		vv) Supply and installation of 300mm thick Articulating Grouted Concrete Mattress, fabric form made from woven geotextile of minimum 400 g/m2, having Wide Width Tensile Strength, ASTM D4595, (kN/m) =MD (50)/ TD (50), Wide Width Elongation at Break, ASTM D4595, (%) =MD (>10)/ TD (>10) and Trapezoidal Tear Strength, ASTM D4533, (N) =MD (440)/ TD (440) with reinforcing galvanized steel cables on both directions as per the detailed design, thickness and technical specifications. The mattress shall be customized as per site geometry or profile at factory in the form of panels along with geotextile baffles and one panel shall be connected with the adjacent panel by using Industrial Zipper. Cables shall be of minimum 6mm diameter and the breaking strength of the cable shall not be less than 30kN, including all cost of material, concrete, labour T&P and special T&P to complete the work in all respect. (To be done on the river banks).	3.10%
		DEWATERING OF RIVER	
		ww) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m).	0.25%
		xx) Construction of Embankment with Material Obtained from Borrow Pits (Construction of embankment with approved material obtained from borrow pits with all lifts and leads, transporting to site, spreading,grading to required slope and compacting to meet requirement of table 300-2)	0.36%
		yy) Dewatering of water caused due to seepage of ground water and surface water due to rain etc. excluding excavation of foundation but during execution of civil works including supply of all machine operator, khalashi, POL, T&P, accessories required for proper completion of the work.	0.55%
		CONTOUR DRAIN	
		zz) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.07%
		aaa) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20 (p) Height upto 5m	0.37%

		bbb) Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing.	0.02%
	4.18%	<u>(C) Landslide Location Ch. 94.720 Km – Ch. 94.830 Km (NH-09)</u>	
		EXCAVATION (FOR HILL CUTTING AND OFFLOADING)	
		a) Excavation in Soil with Dozer with lead upto 1000 metres (Excavation for road way in soil by mechanical means including cutting and transporting the earth to site of embankment/dumping area with lead upto 1000 metres, including trimming bottom and side slopes in accordance with requirements of lines, grades and cross sections.)	0.07%
		b) Excavation in Ordinary Rock with Dozer with lead upto 1000 metres (Excavation for roadway in ordinary rock by deploying a dozer, including cutting and transporting the earth to site of embankment/dumping area with lead upto 1000 metres, trimming bottom and side slopes in accordance with the requirements of lines, grades and cross sections.)	0.10%
		PROVISION OF HT ROLLED CABLE NET WITH DT MESH AND SDRA	
		c) Supply and installation of high tensile rolled cable net with single/ double knot connection having aperture size not more than 300mm in one direction and minimum longitudinal tensile strength 220 KN/M, and puncturing resistance 350 kN, comprising of minimum 10mm dia wire rope cable with steel core with a minimum breaking load of 63kN. The tensile strength of wire of the cable should be 1770 N/sqmm having corrosion protection of Zn Coating Class A or 95% Zn + 5% Al Class-B (Galfan) Coating as per IS/ISO- 17746-2016 for treatment of slopes including all cost of material (net, boundary rope & rope anchor etc comprising of the complete system), labour, special labour and T&P required to complete the work in all respect in accordance with drawings, Technical Specifications and as per the direction of Engineer-incharge. Product Manufacturer shall have in-house test facility for conducting longitudinal tensile strength and puncturing resistance test and shall be responsible for carrying out both test (longitudinal tensile strength and puncturing resistance) during PDI per lot in presence of representative/s of E-i-C on his own expenses.	5.84%
		d) Supply and fixing of Double Twisted Mesh including all cost of material, labour and T&P required to complete the work in all respect with following properties: a. Mesh type : 6x8, Mesh opening : 60mm X 80mm b. Mesh Wire dia. 2.2/3.2mm (ID/OD), mechanically edged/selvedged with galvanization as per EN 10223-3, and shall have minimum 16 numbers of mesh openings per meter of mesh perpendicular to twist. c. Tensile strength (500 Mpa) at a minimum elongation of 10%. The minimum tensile strength of the mesh panel must be 34.0 kN/m (+/-5kN/m) in the parallel to the twist direction and 13 kN/m in the perpendicular to the twist direction in accordance with the requirements of IS 16014:2018. d. Zinc Coating: The coating weight shall be heavily coated and soft type confirming to the requirements of specifications IS 4826:1972. Adhesion of Zinc Coating:	1.40%

		No flakes or crack shall be observed while testing for adhesion of zinc coating as per IS 4826:1972. * ID/OD - Internal diameter/Outer diameter of Polymer coated wire.	
		e) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers,10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	27.56%
		f) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	4.54%
		CONTOUR DRAIN	
		g) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom and backfilling with approved material.)(i) Ordinary soil A Manual Means (Depth upto 3 m)	0.13%
		h) PCC 1:3:6 in Foundation (Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.)	0.06%
		i) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20.Height Upto 5m.	0.51%
		j) Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing	0.02%
		3.0M HIGH ANCHORED CC GRAVITY WALL ON RCC RAFT WITH BUNDLED SDRA FROM CH. 97.785 M TO 94.805M (ON HILL SIDE)	
		k) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom and backfilling with approved material.)(ii) Ordinary rock (not requiring blasting) A Manual Means (Depth upto 3 m)	0.10%
		l) PCC 1:3:6 in Foundation (Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.)	0.02%
		m) Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications.RCC Grade M25.	0.12%
		n) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20.Height Upto 5m.	0.40%

		o) Supplying, fitting and placing HYSD bar reinforcement in open foundation complete as per drawing and technical specifications	0.08%
		p) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers,10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	0.68%
		q) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers,10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	1.63%
		r) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	0.38%
		s) Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing.	0.03%
		t) Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical specifications	0.01%
		6.0M HIGH CC GRAVITY WALL WITH DRAIN OVER RCC RAFT WITH MICROPILE FROM CH. 94.720KM TO CH. 94.830KM (ON HILL SIDE)	
		u) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m).	0.22%
		v) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.16%
		w) Reinforced Cement Concrete in Sub Structure complete as per drawingand technical specifications RCC M25	1.12%
		x) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20.Height Upto 5m.	6.21%
		y) Supplying, fitting and placing HYSD bar reinforcement in	0.61%

		open foundation complete as per drawing and technical specifications	
		z) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers,10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	3.75%
		aa) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	0.62%
		bb) Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical specifications	0.02%
		cc) Construction of 300mm dia. friction Micro Pile including drilling in soil mixed with boulders and in soft rock upto desired depth(ODEX drilling using tyre or crawler mounted machine as per site requirement), cement grouting using double packer, redrilling, perforated MS Casing, including all cost of material labour, special labour and T&P required to complete the work in all respect in accordance to drawings, Technical Specifications and as per direction of Engineer-in-charge. However cost of concrete and reinforcement will be paid seperately as per relevant BOQ items.	10.79%
		dd) Bored cast-in-situ M35 grade R.C.C. pile excluding reinforcement complete as per drawing and technical specifications and removal of excavated earth with all lifts and lead upto 1000 m. (Pile diameter-300 mm)	1.02%
		ee) Supplying, fitting and placing HYSD bar reinforcement in open foundation complete as per drawing and technical specifications	1.44%
		ff) Providing and installing subsurface drainage pipes - Perforated PVC pipe (lined with Non -woven Geotextile) of 75 mm internal diameter as per the drawings etc. complete including the cost of drilling and as directed by Engineer -In -Charge.	0.04%
		LONGITUDINAL DRAIN	
		gg) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.01%
		hh) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20 (p) Height upto 5m	0.05%
		5.0M HIGH ANCHORED CC GRAVITY WALL ON RCC RAFT WITH BUNDLED SDRAFROM CH. 94.740KM TO CH. 94.820KM (ON VALLEY SIDE)	
		ii) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other	0.06%

		deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m).	
		jj) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.12%
		kk) Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications. PCC M25	0.73%
		ll) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20 (p) Height upto 5m	4.60%
		mm) Supplying, fitting and placing HYSD bar reinforcement in open foundation complete as per drawing and technical specifications	0.46%
		nn) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers,10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	2.82%
		oo) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers,10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	8.47%
		pp) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	1.86%
		qq) Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing.	0.10%
		rr) Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical specifications	0.03%
		5.0M HIGH ANCHORED CC GRAVITY WALL ON RCC RAFT WITH BUNDLED SDRAFROM CH. 94.760KM TO CH. 94.800KM (ON VALLEY SIDE)	
		ss) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and	0.03%

		utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m).	
		tt) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.06%
		uu) Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications. PCC M25	0.38%
		vv) Plain/Reinforced cement concrete insub-structure complete as per drawing and technical specifications. PCC Grade M20 (p) Height upto 5m	2.43%
		ww) Supplying, fitting and placing HYSD bar reinforcement in open foundation complete as per drawing and technical specifications	0.24%
		xx) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers,10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	1.46%
		yy) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers,10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	4.39%
		zz) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure	0.96%
		aaa) Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing.	0.10%
		bbb) Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical specifications	0.01%
		DEEP DRAINAGE HOLES AT EL. ± 990M	
		ccc) Providing and installing subsurface drainage pipes - Perforated PVC pipe (lined with Non -woven Geotextile) of 75 mm internal diameter as per the drawings etc. complete including the cost of drilling and as directed by Engineer -In -Charge.	0.95%
	16.31%	<u>(D) Landslide Location Ch. 97.040 Km – Ch. 97.415 Km (NH-09)</u>	
		SLOPE PROTECTION MEASURES	

		a) Excavation in Soil with Dozer with lead upto 1000 metres (Excavation for road way in soil by mechanical means including cutting and transporting the earth to site of embankment/dumping area with lead upto 1000 metres, including trimming bottom and side slopes in accordance with requirements of lines, grades and cross sections.)	4.53%
		b) Excavation in Ordinary Rock with Dozer with lead upto 1000 metres (Excavation for roadway in ordinary rock by deploying a dozer, including cutting and transporting the earth to site of embankment/dumping area with lead upto 1000 metres, trimming bottom and side slopes in accordance with the requirements of lines, grades and cross sections.)	2.95%
		c) Cost of Haulage Excluding Loading and Unloading.Case I Surfaced Road Hilly.Within Lead 4Km	2.13%
		d) Supply and installation of high tensile rolled cable net with single/ double knot connection having aperture size not more than 300mm in one direction and minimum longitudinal tensile strength 220 KN/M, and puncturing resistance 350 kN, comprising of minimum 10mm dia wire rope cable with steel core with a minimum breaking load of 63kN. The tensile strength of wire of the cable should be 1770 N/sqmm having corrosion protection of Zn Coating Class A or 95% Zn + 5% Al Class-B (Galfan) Coating as per IS/ISO- 17746-2016 for treatment of slopes including all cost of material (net, boundary rope & rope anchor etc comprising of the complete system), labour, special labour and T&P required to complete the work in all respect in accordance with drawings,Technical Specifications and as per the direction of Engineer-incharge. Product Manufacturer shall have in-house test facility for conducting longitudinal tensile strength and puncturing resistance test and shall be responsible for carrying out both test (longitudinal tensile strength and puncturing resistance) during PDI per lot in presence of representative/s of E-i-C on his own expenses.	6.43%
		CH. 97.040 KM TO CH 97.160 KM	
		CH. 97.160 KM TO CH 97.410KM BEYOND EL ±1055 UPTO EL ±1080	
		e) Supply and fixing of Double Twisted Mesh including all cost of material, labour and T&P required to complete the work in all respect with following properties: a. Mesh type : 6x8, Mesh opening : 60mm X 80mm b. Mesh Wire dia. 2.2/3.2mm (ID/OD), mechanically edged/selvedged with galvanization as per EN 10223-3, and shall have minimum 16 numbers of mesh openings per meter of mesh perpendicular to twist. c. Tensile strength (500 Mpa) at a minimum elongation of 10%. The minimum tensile strength of the mesh panel must be 34.0 kN/m (+/-5kN/m) in the parallel to the twist direction and 13 kN/m in the perpendicular to the twist direction in accordance with the requirements of IS 16014:2018. d. Zinc Coating: The coating weight shall be heavily coated and soft type confirming to the requirements of specifications IS 4826:1972. Adhesion of Zinc Coating: No flakes or crack shall be observed while testing for adhesion of zinc coating as per IS 4826:1972. * ID/OD - Internal diameter/Outer diameter of Polymer coated wire.	1.10%
		CH. 97.040 KM TO CH 97.160 KM	
		CH. 97.160 KM TO CH 97.410KM BEYOND EL ±1055	

		UPTO EL ± 1080	
		f) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	11.10%
		g) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	1.83%
		CH. 97.160 KM TO CH 97.410KM UPTO EL ± 1055	
		h) Supply and installation of high tensile rolled cable net having aperture size not more than 400mm in one direction and minimum longitudinal tensile strength 80 KN/M and puncturing resistance 150 kN, comprising of minimum 6mm dia wire rope cable with a minimum breaking load of 35kN. The tensile strength of wire of the cable should be 1770 N/sqmm having corrosion protection of Zn Coating Class A or 95% Zn + 5% Al Class-B (Galfan) Coating as per IS/ISO- 17746-2016 for treatment of slopes including all cost of material (net, boundary rope & rope anchor etc. comprising of the complete system), labour, special labour and T&P required to complete the work in all respect in accordance with drawings, Technical Specifications and as per the direction of Engineer-in-charge. Product Manufacturer shall have in-house test facility for conducting longitudinal tensile strength and puncturing resistance test and shall be responsible for carrying out both test (longitudinal tensile strength and puncturing resistance) during PDI, per lot in presence of representative/s of E-i-C on his own expenses.	8.36%
		CH. 97.160 KM TO CH 97.410KM UPTO EL ± 1055	
		i) Supply and fixing of Double Twisted Mesh including all cost of material, labour and T&P required to complete the work in all respect with following properties: a. Mesh type : 6x8, Mesh opening : 60mm X 80mm b. Mesh Wire dia. 2.2/3.2mm (ID/OD), mechanically edged/selvedged with galvanization as per EN 10223-3, and shall have minimum 16 numbers of mesh openings per meter of mesh perpendicular to twist. c. Tensile strength (500 Mpa) at a minimum elongation of 10%. The minimum tensile strength of the mesh panel must be 34.0 kN/m (+/-5kN/m) in the parallel to the twist direction and 13 kN/m in the perpendicular to the twist direction in accordance with the requirements of IS 16014:2018. d. Zinc Coating: The coating weight shall be heavily coated and soft type confirming to the requirements of specifications IS 4826:1972. Adhesion of Zinc Coating: No flakes or crack shall be observed while testing for adhesion of zinc coating as per IS 4826:1972. * ID/OD - Internal diameter/Outer diameter of Polymer coated wire.	2.37%
		CH. 97.160 KM TO CH 97.410KM UPTO EL ± 1055	
		j) Supply and fixing layer of Geo-jute mat with spraying of seeds of Lemon grass/Dedonia/Vetiver etc., including all cost of material, labour and T&P required to complete the	1.04%

		work in all respect, with following properties : a. Material 100% natural, b. Weight 500 GSM, , c. Minimum Breaking Load along Machine Direction (warp way) -10.0(kN/m), Cross Direction (Weft way)- 10.0(kN/m), d. Max. Elongation at break (in %): Machine Direction (warp way)-10, Cross Direction (Weft way)-12.	
		k) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers,10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	12.40%
		l) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	2.04%
		CATCH DRAIN	
		m) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom and backfilling with approved material.)(i) Ordinary soil A Manual Means (Depth upto 3 m)	0.03%
		n) PCC 1:3:6 in Foundation (Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.)	0.06%
		o) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20.Height Upto 5m.	0.38%
		p) Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing	0.02%
		3M HIGH CC GRAVITY WALL ALONG BENCHES	
		q) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom and backfilling with approved material.)(i) Ordinary soil A Manual Means (Depth upto 3 m)	0.06%
		r) PCC 1:3:6 in Foundation (Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.)	0.12%
		s) Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications.PCC Grade M20.	0.18%
		t) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20.Height Upto 5m.	1.74%
		u) Supplying and fixing 10 Gauge weld mesh of size 100mm	0.09%

		x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing	
		v) Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical specifications	0.02%
		w) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers,10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	1.76%
		SDRA FOR WALL	
		x) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	0.29%
		y) Back filling behind abutment, wing wall and return wall complete as per drawing and Technical specification. Granular material	0.14%
		RCC RETAINING WALL	
		z) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom and backfilling with approved material.)(i) Ordinary soil A Manual Means (Depth upto 3 m)	0.13%
		aa) PCC 1:3:6 in Foundation (Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.)	0.24%
		bb) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.RCC Grade M25.Height 5m to 10m.	13.29%
		cc) Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications RCC Grade M35	0.23%
		dd) Supplying, fitting and placing un-coated HYSD bar reinforcement in foundation complete as per drawing and technical specifications	1.43%
		ee) Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications RCC Grade M30	1.64%
		ff) Construction of 300mm dia. friction Micro Pile including drilling in soil mixed with boulders and in soft rock upto desired depth(ODEX drilling using tyre or crawler mounted machine as per site requirement), cement grouting using double packer, redrilling, perforated MS Casing, including all cost of material labour, special labour and T&P required to complete the work in all respect in accordance to drawings, Technical Specifications and as per direction of Engineer-in-charge. However cost of concrete and	4.59%

		reinforcement will be paid seperately as per relevant BOQ items.	
		gg) Bored cast-in-situ M35 grade R.C.C. pile excluding reinforcement complete as per drawing and technical specifications and removal of excavated earth with all lifts and lead upto 1000 m. (Pile diameter-300 mm)	0.40%
		hh) Supplying, fitting and placing un-coated HYSD bar reinforcement in sub structure complete as per drawing and technical specifications	9.59%
		RCC Retaining wall	
		Micropile	
		ii) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers,10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	2.57%
		Lateral Anchors	
		jj) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	0.42%
		kk) Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical specifications	0.04%
		ll) Back filling behind abutment, wing wall and return wall complete as per drawing and Technical specification. Granular material	0.15%
		FOR 3.0M WIDE CC CHANNEL	
		mm) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom and backfilling with approved material.)(i) Ordinary soil A Manual Means (Depth upto 3 m)	0.01%
		nn) PCC 1:3:6 in Foundation (Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.)	0.03%
		oo) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20.Height Upto 5m.	0.17%
		pp)Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing	0.01%
		qq)Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as	3.13%

		76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	
		rr) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	0.52%
		GABION WALL	
		ss) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom and backfilling with approved material.)(i) Ordinary soil A Manual Means (Depth upto 3 m)	0.01%
		tt) Providing and Laying of Mechanically Woven Double Twisted Hexagonal shaped Gabions (Zinc plus PVC coated), of size 1mX1mX1m with two diaphragms at 1m interval, having mesh opening 100mmx120 mm, mesh wire diameter 2.7mm/3.7mm, edge/selvedge wire diameter 3.4/4.4 mm and lacing wire diameter 2.2/3.2 mm. (The work includes filling boulders in the gabions).	0.23%
	32.71%	<u>(E) Landslide Location Zone-1 (Ch. 100.465 Km – Ch. 100.905 Km) (NH-09)</u>	
		EXCAVATION (CONSIDERING 60% LOOSE MASS & 40% ROCK)	
		a) Excavation in Soil with Dozer with lead upto 1000 metres (Excavation for road way in soil by mechanical means including cutting and transporting the earth to site of embankment/dumping area with lead upto 1000 metres, including trimming bottom and side slopes in accordance with requirements of lines, grades and cross sections.)	3.68%
		b) Excavation in Ordinary Rock with Dozer with lead upto 1000 metres (Excavation for roadway in ordinary rock by deploying a dozer, including cutting and transporting the earth to site of embankment/dumping area with lead upto 1000 metres, trimming bottom and side slopes in accordance with the requirements of lines, grades and cross sections.)	3.73%
		c) Supply and installation of high tensile rolled cable net with single/ double knot connection having aperture size not more than 300mm in one direction and minimum longitudinal tensile strength 220 KN/M, and punching resistance 350 kN, comprising of minimum 10mm dia wire rope cable with steel core with a minimum breaking load of 63kN. The tensile strength of wire of the cable should be 1770 N/sqmm having corrosion protection of Zn Coating Class A or 95% Zn + 5% Al Class-B (Galfan) Coating as per IS/ISO-17746-2016 for treatment of slopes including all cost of material (net, boundary rope & rope anchor etc comprising of the complete system), labour, special labour and T&P required to complete the work in all respect in accordance with	18.22%

		drawings, Technical Specifications and as per the direction of Engineer-in-charge. Product Manufacturer shall have in-house test facility for conducting longitudinal tensile strength and punching resistance test and shall be responsible for carrying out both test (longitudinal tensile strength and punching resistance) during PDI per lot in presence of representative/s of E-i-C on his own expenses.	
		d) Supply and fixing of Double Twisted Mesh including all cost of material, labour and T&P required to complete the work in all respect with following properties: a. Mesh type : 6x8, Mesh opening : 60mm X 80mm b. Mesh Wire dia. 2.2/3.2mm (ID/OD), mechanically edged/selvedged with galvanization as per EN 10223-3, and shall have minimum 16 numbers of mesh openings per meter of mesh perpendicular to twist. c. Tensile strength (500 Mpa) at a minimum elongation of 10%. The minimum tensile strength of the mesh panel must be 34.0 kN/m (+/-5kN/m) in the parallel to the twist direction and 13 kN/m in the perpendicular to the twist direction in accordance with the requirements of IS 16014:2018. d. Zinc Coating: The coating weight shall be heavily coated and soft type confirming to the requirements of specifications IS 4826:1972. Adhesion of Zinc Coating: No flakes or crack shall be observed while testing for adhesion of zinc coating as per IS 4826:1972. * ID/OD - Internal diameter/Outer diameter of Polymer coated wire.	3.13%
		e) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	39.33%
		f) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	6.49%
		2.0 M HIGH GABION WALL WITH DRAIN ON BENCH	
		FROM CH.100.535 KM TO CH.100.905 KM & FROM CH.100.565 TO CH.100.905 KM	
		g) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of	0.00%

		stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m).	
		h) Providing & making Gabion structure with Mechanically Woven Double Twisted Hexagonal Shaped Wire mesh Gabion Boxes as per IS 16014:2012, MORT&H Clause 2500, of required size, Mesh Type 10x12 (D=100 mm with tolerance of $\pm 2\%$) Zinc coated, Mesh wire diameter 3.0 mm, mechanically edged/selvedged with partitions at every 1m interval and shall have minimum 10 numbers of openings per meter of mesh perpendicular to twist, tying with lacing wire of diameter 2.2 mm, supplied @3% by weight of Gabion boxes, filled with boulders with least dimension of 200 mm, as per drawing, all complete as per direction of Engineer-in-charge.	0.30%
		i) Supplying, Laying and fixing in position of 10 MM thick Geosynthetic Cementitious composite mat, specified as per ASTM: D 8364 – GCCM Type - III specification . flexural strength (28 Day) should be > 4MPa and 28 days compressive strength as per ASTM D8329 should not be less 60 MPa.	0.56%
		5.0 M HIGH GABION WALL	
		j) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m).	0.02%
		k) Providing & making Gabion structure with Mechanically Woven Double Twisted Hexagonal Shaped Wire mesh Gabion Boxes as per IS 16014:2012, MORT&H Clause 2500, of required size, Mesh Type 10x12 (D=100 mm with tolerance of $\pm 2\%$) Zinc coated, Mesh wire diameter 3.0 mm, mechanically edged/selvedged with partitions at every 1m interval and shall have minimum 10 numbers of openings per meter of mesh perpendicular to twist, tying with lacing wire of diameter 2.2 mm, supplied @3% by weight of Gabion boxes, filled with boulders with least dimension of 200 mm, as per drawing, all complete as per direction of Engineer-in-charge.	0.15%
		l) Supply and installation of non woven geotextile having mass/unit area - 250gsm over the slope to be treated including all cost of labour, material and T&P required for proper completion of work	0.01%
		m) Hand Packed stone filling in back of walls including cost of all materials,royalty, T&P etc. complete as	0.01%

		per direction of Engineer-in- charge. (As per PWD Uttarakhand specifications)	
		6.0 M HIGH ANCHORED RCC STEPPED WALL ON RCC RAFT WITH MICROPILE	
	n)	Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m to 6m).	0.51%
	o)	Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.13%
	p)	Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications. RCC M35	1.09%
	q)	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.RCC Grade M25 (p) Height upto 5m	7.02%
	r)	Supplying, fitting and placing HYSD bar reinforcement in open foundation complete as per drawing and technical specifications	4.54%
	s)	Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers,10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	1.40%
	t)	Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	0.23%
	u)	Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical specifications	0.02%
	v)	Construction of 300mm dia. friction Micro Pile including drilling in soil mixed with boulders and in soft rock upto desired depth(ODEX drilling using tyre or crawler mounted machine as per site requirement), cement grouting using double packer, redrilling, perforated MS Casing, including all cost of	6.02%

		material labour, special labour and T&P required to complete the work in all respect in accordance to drawings, Technical Specifications and as per direction of Engineer-in-charge. However cost of concrete and reinforcement will be paid seperately as per relevant BOQ items.	
		w) Bored cast-in-situ M35 grade R.C.C. pile excluding reinforcement complete as per drawing and technical specifications and removal of excavated earth with all lifts and lead upto 1000 m. (Pile diameter-300 mm).	0.57%
		x) Supplying, fitting and placing HYSD bar reinforcement in open foundation complete as per drawing and technical specifications	0.80%
		y) Hand Packed stone filling in back of walls including cost of all materials, royalty, T&P etc. complete as per direction of Engineer-in- charge. (As per PWD Uttarakhand specifications)	0.50%
		LONGITUDINAL DRAIN	
		z) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.02%
		aa) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications. PCC Grade M20 (p) Height upto 5m	0.07%
		5.0M HIGH ANCHORED CC CLADDING	
		FRQM CH. 100.465 KM TO CH.100.500 KM	
		bb) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.) ordinary soil, Manual Means (Depth upto 3 m to 6m).	0.01%
		cc) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.01%
		dd) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	0.25%
		ee) Cement pressure grouting through Hollow Soil/Solid	0.04%

		Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	
		ff) Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing.	0.03%
		gg) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M25 (p) Height upto 5m	0.22%
		hh) Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical specifications	0.01%
		ii) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	0.02%
		DEEP DRAINAGE HOLE SEMI PERFORATED PIPE	
		jj) Providing and installing subsurface drainage pipes - Perforated PVC pipe (lined with Non -woven Geotextile) of 75 mm internal diameter as per the drawings etc. complete including the cost of drilling and as directed by Engineer -In -Charge.	0.53%
		CONTOUR DRAIN	
		kk) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m).	0.02%
		ll) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.05%
		mm) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20 (p) Height upto 5m	0.25%
		nn) Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing.	0.01%

	9.42%	<u>(F) Landslide Location Zone-2 (Ch. 100.905 Km – Ch. 101.100 Km) (NH-09)</u>	
		EXCAVATION (CONSIDERING 60% LOOSE MASS & 40% ROCK)	
		a) Excavation in Soil with Dozer with lead upto 1000 metres (Excavation for road way in soil by mechanical means including cutting and transporting the earth to site of embankment/dumping area with lead upto 1000 metres, including trimming bottom and side slopes in accordance with requirements of lines, grades and cross sections.)	3.72%
		b) Excavation in Ordinary Rock with Dozer with lead upto 1000 metres (Excavation for roadway in ordinary rock by deploying a dozer, including cutting and transporting the earth to site of embankment/dumping area with lead upto 1000 metres, trimming bottom and side slopes in accordance with the requirements of lines, grades and cross sections.)	3.76%
		PROVISION OF 100KN/M HT ROLLED CABLE NET WITH DT MESH AT HILL SIDE (ZONE-II)	
		c) Supply and installation of high tensile rolled cable net having aperture size not more than 300mm in one direction and minimum longitudinal tensile strength 100 KN/M and puncturing resistance 200 kN, comprising of minimum 8mm dia wire rope cable with a minimum breaking load of 40.7kN. The tensile strength of wire of the cable should be 1770 N/sqmm having corrosion protection of Zn Coating Class A or 95% Zn + 5% Al Class-B (Galfan) Coating as per IS/ISO-17746-2016 for treatment of slopes including all cost of material (net, boundary rope & rope anchor etc. comprising of the complete system), labour, special labour and T&P required to complete the work in all respect in accordance with drawings, Technical Specifications and as per the direction of Engineer-in-charge. Product Manufacturer shall have in-house test facility for conducting longitudinal tensile strength and puncturing resistance test and shall be responsible for carrying out both test (longitudinal tensile strength and puncturing resistance) during PDI, per lot in presence of representative/s of E-i-C on his own expenses.	11.15%
		d) Supply and fixing of Double Twisted Mesh including all cost of material, labour and T&P required to complete the work in all respect with following properties: a. Mesh type : 6x8, Mesh opening : 60mm X 80mm b. Mesh Wire dia. 2.2/3.2mm (ID/OD), mechanically edged/selvedge with galvanization as per EN 10223-3, and shall have minimum 16 numbers of mesh openings per meter of mesh perpendicular to twist. c. Tensile strength (500 Mpa) at a minimum elongation of 10%. The minimum tensile strength of the mesh panel must be 34.0 kN/m (+/-5kN/m) in the parallel to the twist direction and 13 kN/m in the perpendicular to the twist direction in accordance with the requirements of IS 16014:2018. d. Zinc Coating: The coating weight shall be heavily coated and soft type confirming to the requirements of specifications IS 4826:1972. Adhesion of Zinc Coating: No flakes or crack shall be observed while testing for adhesion of zinc coating as per IS 4826:1972. * ID/OD - Internal diameter/Outer diameter of Polymer	2.68%

		coated wire.	
		e) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers,10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	33.68%
		f) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	5.55%
		6.0M HIGH ANCHORED RCC STEPPED WALL ON RCC RAFT WITH MICROPILE	
		g) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil, Manual Means (Depth upto 3 m to 6m).	0.86%
		h) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.22%
		i) Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications. RCC M35	1.83%
		j) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications. RCC Grade M25 (p) Height upto 5m	11.75%
		k) Supplying, fitting and placing HYSD bar reinforcement in open foundation complete as per drawing and technical specifications	7.60%
		l) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers,10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	2.35%
		m) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	0.39%
		n) Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and technical specifications	0.03%
		o) Construction of 300mm dia. friction Micro Pile including drilling in soil mixed with boulders and in soft rock upto desired depth(ODEX drilling using tyre or crawler mounted	10.07%

		machine as per site requirement), cement grouting using double packer, redrilling, perforated MS Casing, including all cost of material labour, special labour and T&P required to complete the work in all respect in accordance to drawings, Technical Specifications and as per direction of Engineer-in-charge. However cost of concrete and reinforcement will be paid separately as per relevant BOQ items.	
		p) Bored cast-in-situ M35 grade R.C.C. pile excluding reinforcement complete as per drawing and technical specifications and removal of excavated earth with all lifts and lead upto 1000 m. (Pile diameter-300 mm).	0.95%
		q) Supplying, fitting and placing HYSD bar reinforcement in open foundation complete as per drawing and technical specifications	1.34%
		r) Hand Packed stone filling in back of walls including cost of all materials,royalty, T&P etc. complete as per direction of Engineer-in- charge. (As per PWD Uttarakhand specifications)	0.84%
		LONGITUDINAL DRAIN	
		s) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.03%
		t) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20 (p) Height upto 5m	0.11%
		u) Providing and installing subsurface drainage pipes - Perforated PVC pipe (lined with Non -woven Geotextile) of 75 mm internal diameter as per the drawings etc. complete including the cost of drilling and as directed by Engineer -In -Charge.	0.59%
		CONTOUR DRAIN	
		v) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m).	0.02%
		w) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.08%
		x) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20 (p) Height upto 5m	0.38%
		y) Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing.	0.02%
	17.54%	<u>(G) Landslide Location Zone-3 (Ch.101.100 Km – Ch. 101.425 Km) (NH-09)</u>	
		a) Excavation in Soil with Dozer with lead upto 1000 metres (Excavation for road way in soil by	2.15%

		mechanical means including cutting and transporting the earth to site of embankment/dumping area with lead upto 1000 metres, including trimming bottom and side slopes in accordance with requirements of lines, grades and cross sections.)	
		b) Excavation in Soil with Dozer with lead upto 1000 metres (Excavation for road way in soil by mechanical means including cutting and transporting the earth to site of embankment/dumping area with lead upto 1000 metres, including trimming bottom and side slopes in accordance with requirements of lines, grades and cross sections.)	2.18%
		PROVISION OF 100KN/M HT ROLLED CABLE NET WITH DT MESH AT HILL SIDE (ZONE-III)	
		FROM CH.101.100 KM TO CH.101.335 KM	
		c) Supply and installation of high tensile rolled cable net having aperture size not more than 300mm in one direction and minimum longitudinal tensile strength 100 KN/M and punching resistance 200 kN, comprising of minimum 8mm dia wire rope cable with a minimum breaking load of 40.7kN. The tensile strength of wire of the cable should be 1770 N/sqmm having corrosion protection of Zn Coating Class A or 95% Zn + 5% Al Class-B (Galfan) Coating as per IS/ISO-17746-2016 for treatment of slopes including all cost of material (net, boundary rope & rope anchor etc. comprising of the complete system), labour, special labour and T&P required to complete the work in all respect in accordance with drawings, Technical Specifications and as per the direction of Engineer-in-charge. Product Manufacturer shall have in-house test facility for conducting longitudinal tensile strength and punching resistance test and shall be responsible for carrying out both test (longitudinal tensile strength and punching resistance) during PDI, per lot in presence of representative/s of E-i-C on his own expenses.	4.94%
		d) Supply and fixing of Double Twisted Mesh including all cost of material, labour and T&P required to complete the work in all respect with following properties: a. Mesh type : 6x8, Mesh opening : 60mm X 80mm b. Mesh Wire dia. 2.2/3.2mm (ID/OD), mechanically edged/selvedged with galvanization as per EN 10223-3, and shall have minimum 16 numbers of mesh openings per meter of mesh perpendicular to twist. c. Tensile strength (500 Mpa) at a minimum elongation of 10%. The minimum tensile strength of the mesh panel must be 34.0 kN/m (+/-5kN/m) in the parallel to the twist direction and 13 kN/m in the perpendicular to the twist direction in accordance with the requirements of IS 16014:2018. d. Zinc Coating: The coating weight shall be heavily coated and soft type confirming to the requirements of specifications IS 4826:1972. Adhesion of Zinc Coating: No flakes or crack shall be observed while testing for adhesion of zinc coating as per IS 4826:1972. * ID/OD - Internal diameter/Outer diameter of Polymer coated wire.	1.19%
		e) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and	7.46%

		cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	
		f) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	13.98%
		g) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	1.23%
		PROVISION OF 80KN/M HT ROLLED CABLE NET WITH DT MESH AT HILL SIDE (ZONE-IV)	
		h) FROM CH.101.200 KM TO CH.101.330 KM	
		i) Supply and installation of high tensile rolled cable net having aperture size not more than 400mm in one direction and minimum longitudinal tensile strength 80 KN/M and punching resistance 150 kN, comprising of minimum 6mm dia wire rope cable with a minimum breaking load of 35kN. The tensile strength of wire of the cable should be 1770 N/sqmm having corrosion protection of Zn Coating Class A or 95% Zn + 5% Al Class-B (Galfan) Coating as per IS/ISO-17746-2016 for treatment of slopes including all cost of material (net, boundary rope & rope anchor etc. comprising of the complete system), labour, special labour and T&P required to complete the work in all respect in accordance with drawings, Technical Specifications and as per the direction of Engineer-in-charge. Product Manufacturer shall have in-house test facility for conducting longitudinal tensile strength and punching resistance test and shall be responsible for carrying out both test (longitudinal tensile strength and punching resistance) during PDI, per lot in presence of representative/s of E-i-C on his own expenses.	3.86%
		j) Supply and fixing of Double Twisted Mesh including all cost of material, labour and T&P required to complete the work in all respect with following properties: a. Mesh type : 6x8, Mesh opening : 60mm X 80mm b. Mesh Wire dia. 2.2/3.2mm (ID/OD), mechanically edged/selvedged with galvanization as per EN 10223-3, and shall have minimum 16 numbers of mesh openings per meter of mesh perpendicular to twist.c. Tensile strength (500 Mpa) at a minimum elongation of 10%. The minimum tensile strength of the mesh panel must be 34.0 kN/m (+/-5kN/m) in the parallel to the twist direction and 13 kN/m in the perpendicular to the twist direction in accordance with the requirements of IS 16014:2018.d. Zinc Coating: The coating weight shall be heavily coated and soft type confirming to the requirements of specifications IS 4826:1972. Adhesion of Zinc Coating: No flakes or crack shall be observed while testing for adhesion of zinc coating as per IS 4826:1972.* ID/OD - Internal diameter/Outer diameter of Polymer coated wire.	1.09%
		k) Supply and Installation of Self driven rock anchor made of	16.50%

		40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	
		l) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	2.72%
		2.0M HIGH GABION WALL WITH DRAIN ON BENCH	
		m) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m).	0.00%
		n) Providing & making Gabion structure with Mechanically Woven Double Twisted Hexagonal Shaped Wire mesh Gabion Boxes as per IS 16014:2012, MORT&H Clause 2500, of required size, Mesh Type 10x12 (D=100 mm with tolerance of $\pm 2\%$) Zinc coated, Mesh wire diameter 3.0 mm, mechanically edged/selvedged with partitions at every 1m interval and shall have minimum 10 numbers of openings per meter of mesh perpendicular to twist, tying with lacing wire of diameter 2.2 mm, supplied @3% by weight of Gabion boxes, filled with boulders with least dimension of 200 mm, as per drawing, all complete as per direction of Engineer-in-charge.	0.11%
		o) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.02%
		p) Supplying, Laying and fixing in position of 10 MM thick Geosynthetic Cementitious composite mat, specified as per ASTM: D 8364 – GCCM Type - III specification . flexural strength (28 Day) should be > 4MPa and 28 days compressive strength as per ASTM D8329 should not be less 60 MPa.	0.21%
		4.0M HIGH ANCHORED CC GRAVITY WALL ON RCC RAFT WITH MICROPILE ON BENCH	
		FROM CH.101.160 KM TO CH. 101.330 KM	
		q) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m to 6m).	0.00%
		r) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.07%
		s) Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications.	0.46%

		RCC M35	
		t) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20 (p) Height upto 5m	1.78%
		u) Supplying, fitting and placing HYSD bar reinforcement in open foundation complete as per drawing and technical specifications	0.26%
		v) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers,10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	0.86%
		w) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	0.14%
		x) Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical specifications	0.01%
		y) Construction of 300mm dia. friction Micro Pile including drilling in soil mixed with boulders and in soft rock upto desired depth(ODEX drilling using tyre or crawler mounted machine as per site requirement), cement grouting using double packer, redrilling, perforated MS Casing, including all cost of material labour, special labour and T&P required to complete the work in all respect in accordance to drawings, Technical Specifications and as per direction of Engineer-in-charge. However cost of concrete and reinforcement will be paid separately as per relevant BOQ items.	4.65%
		z) Bored cast-in-situ M35 grade R.C.C. pile excluding reinforcement complete as per drawing and technical specifications and removal of excavated earth with all lifts and lead upto 1000 m. (Pile diameter-300 mm).	0.44%
		aa) Supplying, fitting and placing HYSD bar reinforcement in open foundation complete as per drawing and technical specifications	0.62%
		LONGITUDINAL DRAIN	
		bb) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.01%
		cc) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20 (p) Height upto 5m	0.04%
		5.0M HIGH GABION WALL	
		dd) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the	0.13%

		excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m).	
		ee) Providing & making Gabion structure with Mechanically Woven Double Twisted Hexagonal Shaped Wire mesh Gabion Boxes as per IS 16014:2012, MORT&H Clause 2500, of required size, Mesh Type 10x12 (D=100 mm with tolerance of $\pm 2\%$) Zinc coated, Mesh wire diameter 3.0 mm, mechanically edged/selvedged with partitions at every 1m interval and shall have minimum 10 numbers of openings per meter of mesh perpendicular to twist, tying with lacing wire of diameter 2.2 mm, supplied @3% by weight of Gabion boxes, filled with boulders with least dimension of 200 mm, as per drawing, all complete as per direction of Engineer-in-charge.	1.82%
		ff) Supply and installation of non woven geotextile having mass/unit area - 250gsm over the slope to be treated including all cost of labour, material and T&P required for proper completion of work	0.05%
		gg) Hand Packed stone filling in back of walls including cost of all materials,royalty, T&P etc. complete as per direction of Engineer-in- charge. (As per PWD Uttarakhand specifications)	0.17%
		6.0M HIGH ANCHORED RCC STEPPED WALL ON RCC RAFT WITH MICROPILE	
		FROM CH.101.100 KM TO CH.101.335 KM	
		hh) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m to 6m).	0.56%
		ii) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.14%
		jj) Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications. RCC M35	1.18%
		kk) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications. RCC Grade M25 (p) Height upto 5m	7.60%
		ll) Supplying, fitting and placing HYSD bar reinforcement in open foundation complete as per drawing and technical specifications	4.91%
		mm) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers,10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	1.52%
		nn) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	0.25%

	oo) Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical specifications	0.02%
	pp) Construction of 300mm dia. friction Micro Pile including drilling in soil mixed with boulders and in soft rock upto desired depth(ODEX drilling using tyre or crawler mounted machine as per site requirement), cement grouting using double packer, redrilling, perforated MS Casing, including all cost of material labour, special labour and T&P required to complete the work in all respect in accordance to drawings, Technical Specifications and as per direction of Engineer-in-charge. However cost of concrete and reinforcement will be paid separately as per relevant BOQ items.	6.51%
	qq) Bored cast-in-situ M35 grade R.C.C. pile excluding reinforcement complete as per drawing and technical specifications and removal of excavated earth with all lifts and lead upto 1000 m. (Pile diameter-300 mm).	0.61%
	rr) Supplying, fitting and placing HYSD bar reinforcement in open foundation complete as per drawing and technical specifications	0.87%
	ss) Hand Packed stone filling in back of walls including cost of all materials, royalty, T&P etc. complete as per direction of Engineer-in-charge. (As per PWD Uttarakhand specifications)	0.54%
	LONGITUDINAL DRAIN	
	tt) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.02%
	uu) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications. PCC Grade M20 (p) Height upto 5m	0.07%
	5.0M HIGH ANCHORED CC CLADDING	
	FROM CH.101.335 KM TO CH.101.425 KM	
	vv) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.) ordinary soil, Manual Means (Depth upto 3 m to 6m).	0.00%
	ww) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.03%
	xx) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	1.21%

	yy) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	0.20%
	zz) Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing.	0.12%
	aaa) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M25 (p) Height upto 5m	1.04%
	bbb) Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical specifications	0.01%
	ccc) Providing and installing subsurface drainage pipes - Perforated PVC pipe (lined with Non -woven Geotextile) of 75 mm internal diameter as per the drawings etc. complete including the cost of drilling and as directed by Engineer -In -Charge.	0.10%
	PROVISION OF CULVERT AND CATCHPIT	
	BOX CULVERT	
	AT CH. 101.300 KM	
	ddd) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m to 6m).	0.01%
	eee) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.01%
	fff) Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications. RCC M25	0.10%
	ggg) Supplying, fitting and placing HYSD bar reinforcement in open foundation complete as per drawing and technical specifications	0.07%
	BOX CULVERT	
	AT CH. 101.320 KM	
	hhh) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m to 6m).	0.01%
	iii) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.01%
	jjj) Plain/Reinforced cement concrete in open foundation	0.08%

		complete as per drawing and technical specifications. RCC M25	
		kkk) Supplying, fitting and placing HYSD bar reinforcement in open foundation complete as per drawing and technical specifications	0.06%
		FOR 2.0M WIDE CC CHANNEL	
		AT CH. 101.300 KM & CH. 101.320 KM	
		lll) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m).	0.01%
		mmm) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.01%
		nnn) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20 (p) Height upto 5m	0.04%
		ooo) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.05%
		ppp) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M25 (p) Height upto 5m	0.98%
		qqq) Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing.	0.02%
		rrr) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers,10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	0.57%
		sss) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	0.09%
		DEEP DRAINAGE HOLE SEMI PERFORATED PIPE	
		ttt) Providing and installing subsurface drainage pipes - Perforated PVC pipe (lined with Non -woven Geotextile) of 75 mm internal diameter as per the drawings etc. complete including the cost of drilling and as directed by Engineer -In -Charge.	0.65%
		CONTOUR DRAIN	
		uuu) Excavation for Structures (Earth work in excavation	0.03%

		of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m).	
		vvv) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.09%
		www) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20 (p) Height upto 5m	0.44%
		xxx) Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing.	0.02%
	5.19%	<u>(H) Landslide Location Ch. 106.230 Km – Ch. 106.360 Km (NH-09)</u>	
		EXCAVATION (CONSIDERING 60% ROCK & 40% SOIL)	
		a) Excavation in Soil using Hydraulic Excavator and Tippers with disposal upto 1000 metres.(Excavation for roadwork in soil with` hydraulic excavator including cutting and loading in tippers, trimming bottom and side slopes, in accordance with requirements of lines, grades and cross sections, and transporting to the embankment location within all lifts and lead upto 1000m)	0.44%
		b) Excavation in Hard Rock (blasting prohibited) (Excavation for roadwork in Hard Rock (blasting prohibited) with hydraulic excavator including cutting and loading in tippers, trimming bottom and side slopes, in accordance with requirements of lines, grades and cross sections, and transporting to the embankment location within all lifts and lead upto 1000 m.)	4.81%
		PROVISION OF HT ROLLED CABLE NET WITH DT MESH	
		FROM CH.106.300 KM TO CH.106.360 KM	
		c) Supply and installation of high tensile rolled cable net with single/ double knot connection having aperture size not more than 300mm in one direction and minimum longitudinal tensile strength 220 KN/M, and punching resistance 350 kN, comprising of minimum 10mm dia wire rope cable with steel core with a minimum breaking load of 63kN. The tensile strength of wire of the cable should be 1770 N/sqmm having corrosion protection of Zn Coating Class A or 95% Zn + 5% Al Class-B (Galfan) Coating as per IS/ISO-17746-2016 for treatment of slopes including all cost of material (net, boundary rope & rope anchor etc comprising of the complete system), labour, special labour and T&P required to complete the work in all respect in accordance with drawings,Technical Specifications and as per the direction of Engineer-in-charge. Product Manufacturer shall have in-house test facility for conducting longitudinal tensile strength and punching resistance test and shall be responsible for carrying out both test (longitudinal tensile strength and punching resistance) during PDI per lot in presence of	5.32%

		representative/s of E-i-C on his own expenses.	
		d) Supply and fixing of Double Twisted Mesh including all cost of material, labour and T&P required to complete the work in all respect with following properties: a. Mesh type : 6x8, Mesh opening : 60mm X 80mm b. Mesh Wire dia. 2.2/3.2mm (ID/OD), mechanically edged/selvedged with galvanization as per EN 10223-3, and shall have minimum 16 numbers of mesh openings per meter of mesh perpendicular to twist. c. Tensile strength (500 Mpa) at a minimum elongation of 10%. The minimum tensile strength of the mesh panel must be 34.0 kN/m (+/-5kN/m) in the parallel to the twist direction and 13 kN/m in the perpendicular to the twist direction in accordance with the requirements of IS 16014:2018. d. Zinc Coating: The coating weight shall be heavily coated and soft type confirming to the requirements of specifications IS 4826:1972. Adhesion of Zinc Coating: No flakes or crack shall be observed while testing for adhesion of zinc coating as per IS 4826:1972. * ID/OD - Internal diameter/Outer diameter of Polymer coated wire.	0.91%
		e) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	10.33%
		f) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	1.70%
		SHOTCRETE WITH 32.0 MM SOLID ANCHORS AT HILL SIDE	
		FROM CH.106.235 KM TO CH. 106.300 KM	
		g) Application of 150mm thick Shotcrete (M-25) in two layers 50mm each sandwiched with chain link fabric 50mmx50mm size including supply of all material for shotcrete (Inclusive for rebound) and excluding the cost of chain link fabric, labour T&P etc. for proper completion of the work as per drawings, Technical Specifications and the direction of Engineer-in-charge.	5.00%
		h) Supply and installation of Chain link fabric (2.7mm wire dia with zinc coating 240g/ sq.m) of 50X50 mm size (Fe 500) including 2mm dia binding wire or nuts, bolts and washers as required for proper completion of the work as per drawings, Technical Specifications and the direction of Engineer-in-charge. Made of G.I. wire of dia 2.7mm. for treatment of slopes as secondary mesh including all cost of material, labour, special labour and T&P required to complete the work in all respect as per drawings.	0.55%
		i) Drilling of 76 mm dia. hole for installation of 32mm dia. Anchors in rock by sufficient drilling equipment with necessary auxiliary equipment & accessories and including all cost of equipments, labour, materials & works connected with drilling.	3.65%
		j) Supply and installation of 32mm dia fully threaded rock anchors (Fe550D) including supply of all material, labour, t&p for proper completion of work.	2.41%
		k) Cement pressure grouting through Hollow Soil/Solid Rock	0.18%

		Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	
		PROVISION OF ROCKFALL BARRIER OF DIMENSION 30M LENGTH AND 6M HIGH	
		l) Supply and installation of rock fall barrier (Category A), comprising of steel meshes and cables coated in Zn-Al 5% class A, with post to post distance of maximum 10m and energy absorption by deformation including all cost of material (consisting of posts, anchor bolts (6m deep in rock and 8 m deep in consolidated debris), plate for fixing anchor bolts, base anchors, cable anchors, cables/support ropes, clamps, retention panels, energy dissipaters etc.) , labour special labour, T&P required to complete the work in all respect as per drawings, Technical Specifications and the direction of Engineer-in-charge. ETAG 027/ EAD certified rock fall barrier shall be used. F. 6m high having minimum energy absorption in the entire system of 5000 K J	4.47%
		PROVISION OF 2 NO. OF DEBRIS FLOW BARRIER OF DIMENSION 15M LENGTH AND 6M HIGH	
		m) Supply and installation of complete assembly upto 6.0 m high Debris Flow Barrier with double twisted mesh and high tensile wire mesh or high tensile ring net having Impact absorption energy of the system must be minimum of 150 KN/SQM in dynamic loading conditions and as per drawings, Technical Specifications and the direction of Engineer-in-charge. ETAG/ EAD certified debris flow barrier shall be used.Upto 15m span without middle post	5.13%
		FOR 2.0M WIDE CC CHANNEL AT CH 106.230M	
		n) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.03%
		o) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20 (p) Height upto 5m	0.42%
		CC CHANNEL STEPS	
		CC CHANNEL SIDE WALLS	
		p) Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing.	0.01%
		q) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers,10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	2.37%
		r) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	0.39%
		CC CATCH PIT AT 106.230	
		s) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring	0.01%

		and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m).	
		t) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.01%
		u) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20 (p) Height upto 5m	0.11%
		6.0M HIGH ANCHORED CC GRAVITY WALL OVER BUNDLED SDRA	
		v) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m).	0.65%
		w) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.25%
		x) Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications. RCC M25	1.90%
		y) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20 (p) Height upto 5m	8.83%
		z) Supplying, fitting and placing HYSD bar reinforcement in open foundation complete as per drawing and technical specifications	1.12%
		aa) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers,10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	1.75%
		bb) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers,10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	5.46%
		cc) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	1.19%
		dd) Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face.	0.03%

		Complete as per drawing and Technical specifications	
		ee) Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing.	0.20%
		45.0 M HIGH ANCHORED CC CLADDING	
		FROM CH. 106.260 KM TO CH. 106.305 KM	
		ff) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth above 6m).	0.75%
		gg) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.04%
		hh) Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications. RCC M25	0.30%
		ii) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20 (p) Height upto 5m	17.71%
		jj) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers,10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	6.69%
		kk) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers,10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	2.19%
		ll) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	1.46%
		mm) Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical specifications	0.08%
		nn) Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing.	0.40%
		CONTOUR DRAIN	
		oo) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size	0.12%

		mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	
		pp) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20 (p) Height upto 5m	0.60%
		qq) Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing.	0.03%

Note - In case of CTB and AIL layer, this stage may be modified suitably to permit separate weightage for each of these layers.

Note – For specific type of protection work detailed stages can be included

1.3 Procedure of estimating the value of work done

1.3.1 Road works

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

Table 1.3.1

Stage of Payment	Percentages weightage	Payment Procedure
(A) Widening and strengthening of existing road		Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in a length of not less than 10 (ten) percent of the total length or 500m whichever is less.
1) Earthwork up to top of the embankment	0.00%	
2) Subgrade	0.00%	
3) Sub Base Course (GSB)	0.00%	
4) Non-Bituminous Base Course (WMM)	0.00%	
5) Bituminous Base Course	0.00%	
6) Wearing Coat	0.00%	
7) Widening and repair of culverts	0.00%	Cost of completed culverts shall be determined pro rata basis with respect to the total no. of culverts. The payment shall be made on the completion of atleast one culvert. 75 % of the cost will be payable on completion of box/ abutments and slab/ pipe and head wall. Remaining 25% will become payable on completion of protection works including return/ wing walls and any other work associated with culverts.
B.1 - Reconstruction/New Single-lane realignment/ bypass (Flexible Pavement)		Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in full length or 500m length, whichever is less
(a) Earthwork up to top of the Subgrade	0.00%	
(b) Subbase Course (GSB)	0.00%	
(c) Non-Bituminous Base Course (WMM)	0.00%	
(d) Bituminous Base Course	0.00%	
(e) Wearing Coat	0.00%	

(f) Construction of Earthen Shoulders	0.00%	
B.2 - Reconstruction/New Single-lane realignment/bypass (Rigid 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 500m length, whichever is less
1) Earthwork up to top of the embankment	0.00%	
2) Subgrade	0.00%	
3) Sub Base Course (GSB)	0.00%	
4) Dry Lean Concrete (DLC) Course	0.00%	
5) Pavement Quality Control (PQC) Course	0.00%	Cost of each culvert shall be determined on pro rata basis with respect to the total number of culverts. Payment shall be made on the completion of at least one culvert. 75% of the cost will be payable on completion of box/ abutments and slab/ pipe and head wall. Remaining 25% will become payable on completion of protection works including return/ wing walls and any other work associated with culverts.
C - Reconstruction & New Culverts on existing road, realignments, bypasses (Culverts length <6m)		
1. Culverts (length < 6m)	0.00%	
Culverts		

*Note – In case of CTB and AIL layer, this stage may be modified suitably to permit separate weightages for each of these layers.

@. For example, if the total length of bituminous work to be done is 100 Km, the cost per Km of bituminous work shall be determined as follows:

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

Where P = Contract Price

L = Total length in Km

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

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

1.3.2 Minor Bridges and Underpasses / Overpasses

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

Table 1.3.2

Stage of Payment	Weightage	Payment Procedure
A.1 – Widening and repair of minor bridges (length > 6m and < 60m)		

A.2 Reconstruction/New Minor Bridges (Length>6m and <60m)		Cost of each minor bridge shall be determined on pro rata basis with respect to the total linear length (m) of the minor bridges.
(a) Foundation: On completion of the foundation work of abutment and piers	0.00%	(i) Foundation: payment against foundation shall be made on pro-rata basis on completion of a stage completion of atleast two foundations of each bridge. In case where load testing is specified for foundation, the trigger of first payment shall include load testing also.
(b) Sub-structure: On completion of abutments and piers with abutment/ pier cap.	0.00%	(ii) Sub-structure – Payment shall be made on pro-rata basis on completion of stage i.e. completion of atleast one sub- structure upto abutment/ pier cap level of each bridge.
(c) Super-structure: On completion of the super-structure up to Deck slab including bearings	0.00%	(iii) Super-structure : Payment shall be made on pro-rata basis on completion of a stage i.e., completion of super-structure of at least one span upto deck slab including bearing as specified in the column of “Stage of Payment” in this sub clause. If pre-cast girders/ segments are used, interim payments shall be made at 75% of the cost of that elements, as derived from MoRTH Data Book, applicable SOR of State PWD on Base Date with tender discount/ premium applied thereon.
(d) Miscellaneous works: On completion of wearing coat, expansion joint, crash barriers, railing, protection works and any remaining work associated to bridge including tests on bridge	0.00%	(iv) Miscellaneous works: Payment shall be made on pro-rata basis on completion of a stage. i.e. wearing coat, expansion joint, crash barriers, railing, protection works and any remaining work associated to bridge including tests on bridge
(e) Approaches: On completion of Approach Slab complete in all respect	0.00%	(v) Approaches: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of approaches slab.
(f) Guide Bunds and River Training Works: On completion of Guide Bunds and river training works complete in all respects	0.00%	(vi) Guide Bunds and River Training Works : Payment shall be made on completion of all bridge works including Guide Bunds and River training works in all respects if any as specified for each bridge.

1.3.3 Major Bridges and Underpasses / Overpasses

Procedure for estimating the value of Major bridge and Underpasses/ Overpasses shall be as stated in table 1.3.3:

Table 1.3.3

Stage of Payment	Weightage	Payment Procedure
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A.1 – Widening and repair of major bridges (length >60m)		
A.2 Reconstruction/New Major Bridges (Length>60m)		Cost of each Major bridge shall be determined on pro rata basis with respect to the total linear length (m) of the minor bridges.
(i) Foundation: On completion of the foundation work including foundations for wing and return walls, abutments, piers.	0.00%	(i) Foundation: payment against foundation shall be made on pro-rata basis on completion of a stage completion of atleast one foundation of each bridge.
(ii) Sub-structure: On completion of abutments, piers up to the abutment/ pier cap up to top	0.00%	(ii) Sub-structure – Payment against substructure shall be made on pro-rata basis on completion of stage i.e. completion of atleast one sub- structure upto abutment/ pier cap level of each bridge.
(iii) Super-structure: On completion of the super-structure upto Deck slab including bearings	0.00%	(iii) Super-structure : Payment shall be made on pro-rata basis on completion of a stage i.e., completion of super-structure upto Deck slab including bearings of atleast one span as specified here in under: If pre-cast RCC/PSC/Steel girders/ segments are used, interim payments shall be made at 75% of the cost of that element, as derived from MoRTH Data Book, applicable SOR of State PWD on Base Date with tender discount/ premium applied thereon.
(iv) Wearing coat including expansion joints	0.00%	(iv) Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified for each bridge.
(v) Miscellaneous works: On completion of crash barriers, hand rail, road markings etc.	0.00%	(v) Miscellaneous works: Payment shall be made on completion of all miscellaneous works like hand rails, crash barrier, road markings etc. complete in all respects as specified for each bridge.
(vi) Guide Bunds and River Training Works: On completion of Guide Bunds and river training works complete in all respects	0.00%	(vi) Guide Bunds and River Training Works: Payment shall be made on completion of all the bridge works including Guide Bunds and River training works etc if any in all respects as specified for each bridge.
(vii) Approaches: On completion of approaches including wing walls/ return walls, Retaining walls, stone pitching, protection works for floor, embankment slope etc. complete in all respect and fit for use	0.00%	(vii) Approaches : Payment shall be made on completion of a stage i.e. completion of both approaches including wing walls/ return walls, retaining walls, stone pitching in all respect as specified in the column of “Stage of Payment” in this sub-clause for each bridge.
B.1 – Widening and		

repair of underpasses/overpasses		
Underpasses/Overpasses		
B.2 New Underpasses/Overpasses		Cost of each underpass/ overpass shall be determined on pro rata basis with respect to the total linear length (m) of the minor bridges.
(1) Foundation: On completion of the foundation work including foundations for wing and return walls, abutments, piers.	0.00%	(i) Foundation: payment against foundation shall be made on pro-rata basis on completion of a stage completion of atleast one foundation of each bridge.
(2) Sub-structure: On completion of abutments, piers up to the abutment/ pier cap up to top	0.00%	(ii) Sub-structure – Payment against substructure shall be made on pro-rata basis on completion of stage i.e. completion of atleast one sub- structure upto abutment/ pier cap level of each bridge.
(3) Super-structure: On completion of the super-structure upto Deck slab including bearings	0.00%	(iii) Super-structure : Payment shall be made on pro-rata basis on completion of a stage i.e., completion of super-structure upto Deck slab including bearings of atleast one span as specified here in under: If pre-cast RCC/PSC/Steel girders/ segments are used, interim payments shall be made at 75% of the cost of that elements, as derived from MoRTH Data Book, applicable SOR of State PWD on Base Date with tender discount/ premium applied thereon.
(4) Wearing coat including expansion joints	0.00%	(iv) Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified for each bridge.
(5) Miscellaneous works: On completion of crash barriers, hand rail, road markings etc.	0.00%	(v) Miscellaneous works: Payment shall be made on completion of all miscellaneous works like hand rails, crash barrier, road markings etc. complete in all respects as specified for each bridge.
(6) Guide Bunds and River Training Works: On completion of Guide Bunds and river training works complete in all respects	0.00%	(vi) Guide Bunds and River Training Works: Payment shall be made on completion of all Guide Bunds and River training works etc. in all respects as specified for each bridge.
(7) Approaches: On completion of approaches including wing walls/ return walls, Retaining walls, stone pitching, protection works for floor, embankment slope etc. complete in all respect and fit for use	0.00%	(vii) Approaches : Payment shall be made on completion of a stage i.e. completion of both approaches including wing walls/ return walls, retaining walls, stone pitching in all respect as specified in the column of “Stage of Payment” in this sub-clause for each bridge.

1.3.4 Other works.

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

Table 1.3.4

Stage of Payment	Weightage	Payment Procedure
1	2	3
(i) Toll Plaza	0.00%	
(ii) Road side drains (a) Drain (b) Cover Slab	0.00%	
(iii) Road signs, markings, km stones, safety devices etc.	0.00%	Unit of measurement is linear length. Payment shall be made on pro rata basis on completion of a stage in a length of not less than 10% (ten percent) of the total length and 100m whichever is less.
(iv) Overhead gantry mounted signs	0.00%	
(v) Project facilities (a) Bus Bays (b) Truck lay-byes (c) Rest areas (d) others	0.00%	
(vi) Road side plantation	0.00%	
(vii) Protection works# other than approaches to the bridges, elevated sections/ flyovers/grade separators and ROBs/RUBs. (a) Crash Barrier (b) Retaining Wall (c) Breast Wall.	0.00%	
(viii) Safety and traffic management during construction	0.00%	
(ix) SLOPE PROTECTION WORK		
<u>(A) Landslide Location Ch. 73.270 Km to Ch. 73.370 Km (NH-09)</u>		
CH-73.270 TO 73.370 KM		
SLOPE PROTECTION MEASURES		
a) Excavation in Soil with Dozer with lead upto 1000 metres (Excavation for road way in soil by mechanical means including cutting and transporting the earth to site of embankment/dumping area with lead upto 1000 metres, including trimming bottom and side slopes in accordance with requirements of lines, grades and cross sections.)	1.27%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
b) Excavation in Ordinary Rock with Dozer with lead upto 1000 metres (Excavation for roadway in ordinary rock by deploying a dozer, including cutting and transporting the earth to	0.48%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.

site of embankment/dumping area with lead upto 1000 metres, trimming bottom and side slopes in accordance with the requirements of lines, grades and cross sections.)		
c) Cost of Haulage Excluding Loading and Unloading.Case I Surfaced Road Hilly.Within Lead 4Km	0.52%	Unit of measurement is Tonne-Km. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
d) Supply and installation of high tensile rolled cable net having aperture size not more than 300mm in one direction and minimum longitudinal tensile strength 100 KN/M and punching resistance 200 kN, comprising of minimum 8mm dia wire rope cable with a minimum breaking load of 40.7kN. The tensile strength of wire of the cable should be 1770 N/sqmm having corrosion protection of Zn Coating Class A or 95% Zn + 5% Al Class-B (Galfan) Coating as per IS/ISO-17746-2016 for treatment of slopes including all cost of material (net, boundary rope & rope anchor etc. comprising of the complete system), labour, special labour and T&P required to complete the work in all respect in accordance with drawings, Technical Specifications and as per the direction of Engineer-in-charge. Product Manufacturer shall have in-house test facility for conducting longitudinal tensile strength and punching resistance test and shall be responsible for carrying out both test (longitudinal tensile strength and punching resistance) during PDI, per lot in presence of representative/s of E-i-C on his own expenses.	8.24%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
e) Supply and fixing of Double Twisted Mesh including all cost of material, labour and T&P required to complete the work in all respect with following properties: a. Mesh type : 6x8, Mesh opening : 60mm X 80mm b. Mesh Wire dia. 2.2/3.2mm (ID/OD), mechanically edged/selvedged with galvanization as per EN 10223-3, and shall have minimum 16 numbers of mesh openings per meter of mesh perpendicular to twist. c. Tensile strength (500 Mpa) at a minimum elongation of 10%. The minimum tensile strength of the mesh panel must be 34.0 kN/m (+/-5kN/m) in	1.98%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.

the parallel to the twist direction and 13 kN/m in the perpendicular to the twist direction in accordance with the requirements of IS 16014:2018. d. Zinc Coating: The coating weight shall be heavily coated and soft type confirming to the requirements of specifications IS 4826:1972. Adhesion of Zinc Coating: No flakes or crack shall be observed while testing for adhesion of zinc coating as per IS 4826:1972. * ID/OD - Internal diameter/Outer diameter of Polymer coated wire.		
f) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	60.47%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
g) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	9.96%	Unit of measurement is MT. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
CATCH DRAIN		
h) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom and backfilling with approved material.)(i) Ordinary soil A Manual Means (Depth upto 3 m)	0.05%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
i) PCC 1:3:6 in Foundation (Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.)	0.11%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
j) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications. PCC Grade	0.68%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than

M20.Height Upto 5m.		10% (ten percent) of the total qty.
k) Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing	0.03%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
4M HIGH CC GRAVITY WALL ALONG BENCH (CH-73.355 TO 73.370 KM)		
l) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m).	0.02%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
m) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.04%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
n) Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications.PCC Grade M20.	0.04%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
o) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20.Height Upto 5m.	0.72%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
p) Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing	0.03%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
q) Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical specifications	0.01%	Unit of measurement is Each. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
r) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock	1.65%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.

suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.		
s) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	0.26%	Unit of measurement is MT. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
t) Back filling behind abutment, wing wall and return wall complete as per drawing and Technical specification. Granular material	0.03%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
4M HIGH CC GRAVITY WALL (CH-73.270 TO 73.330 KM)		
u) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m).	0.07%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
v) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.14%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
w) Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications.PCC Grade M20.	0.17%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
x) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20.Height Upto 5m.	2.87%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
y) Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing	0.13%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
z) Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe,	0.02%	Unit of measurement is Each. Payment shall be made on pro rata basis on completion of a stage of not less than

extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical specifications		10% (ten percent) of the total qty.
aa) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	8.48%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
bb) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	1.40%	Unit of measurement is MT. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
cc) Back filling behind abutment, wing wall and return wall complete as per drawing and Technical specification. Granular material	0.13%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
<u>(B) Landslide Location Ch. 81.450 Km to Ch. 81.755 Km (NH-09)</u>		
EXCAVATION (CONSIDERING 60% LOOSE MASS & 40% ROCK)		
a) Excavation in Soil with Dozer with lead upto 1000 metres (Excavation for road way in soil by mechanical means including cutting and transporting the earth to site of embankment/dumping area with lead upto 1000 metres, including trimming bottom and side slopes in accordance with requirements of lines, grades and cross sections.)	3.40%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
b) Excavation in Ordinary Rock with Dozer with lead upto 1000 metres (Excavation for roadway in ordinary rock by deploying a dozer, including cutting and transporting the earth to site of embankment/dumping area with lead upto 1000 metres, trimming bottom and side slopes in accordance with the requirements of lines, grades and cross sections.)	3.44%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
SHOTCRETE WITH 25.0 MM SOLID ANCHORS AT HILL SIDE		

FROM CH.81.450 KM TO CH. 81.615 KM		
c) Application of 150mm thick Shotcrete (M-25) in two layers 75mm each sandwiched with chain link fabric 50mmx50mm size including supply of all material for shot crete (Inclusive for rebound) and excluding the cost of chain link fabric, labour T&P etc. for proper completion of the work as per drawings, Technical Specifications and the direction of Engineer-in-charge.	6.96%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
d) Supply and installation of Chain link fabric (2.7mm wire dia with zinc coating 240g/ sq.m) of 50X50 mm size (Fe 500) including 2mm dia binding wire or nuts, bolts and washers as required for proper completion of the work as per drawings, Technical Specifications and the direction of Engineer-in-charge. Made of G.I. wire of dia 2.7mm.for treatment of slopes as secondary mesh including all cost of material, labour, special labour and T&P required to complete the work in all respect as per drawings.	0.76%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
e) Drilling of 50 mm dia. hole for installation of 25mm dia. Anchors in rock by sufficient drilling equipment with necessary auxiliary equipment & accessories and including all cost of equipments, labour, materials & works connected with drilling.	4.57%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
f) Supply and installation of 25mm dia fully threaded rock anchors (Fe550D) including supply of all material, labour, t&p for proper completion of work.	2.26%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
g) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	0.11%	Unit of measurement is MT. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
PROVISION OF 100KN/M HT ROLLED CABLE NET WITH DT MESH AT HILL SIDE		
FROM CH.81.615 KM TO CH.81.720 KM		
h) Supply and installation of high tensile rolled cable net having aperture size not more than 300mm in one direction and minimum longitudinal tensile strength 100 KN/M and punching	2.78%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.

resistance 200 kN, comprising of minimum 8mm dia wire rope cable with a minimum breaking load of 40.7kN. The tensile strength of wire of the cable should be 1770 N/sqmm having corrosion protection of Zn Coating Class A or 95% Zn + 5% Al Class-B (Galfan) Coating as per IS/ISO-17746-2016 for treatment of slopes including all cost of material (net, boundary rope & rope anchor etc. comprising of the complete system), labour, special labour and T&P required to complete the work in all respect in accordance with drawings, Technical Specifications and as per the direction of Engineer-in-charge. Product Manufacturer shall have in-house test facility for conducting longitudinal tensile strength and punching resistance test and shall be responsible for carrying out both test (longitudinal tensile strength and punching resistance) during PDI, per lot in presence of representative/s of E-i-C on his own expenses.		
i) Supply and fixing of Double Twisted Mesh including all cost of material, labour and T&P required to complete the work in all respect with following properties: a. Mesh type : 6x8, Mesh opening : 60mm X 80mm b. Mesh Wire dia. 2.2/3.2mm (ID/OD), mechanically edged/selvedged with galvanization as per EN 10223-3, and shall have minimum 16 numbers of mesh openings per meter of mesh perpendicular to twist. c. Tensile strength (500 Mpa) at a minimum elongation of 10%. The minimum tensile strength of the mesh panel must be 34.0 kN/m (+/-5kN/m) in the parallel to the twist direction and 13 kN/m in the perpendicular to the twist direction in accordance with the requirements of IS 16014:2018. d. Zinc Coating: The coating weight shall be heavily coated and soft type confirming to the requirements of specifications IS 4826:1972. Adhesion of Zinc Coating: No flakes or crack shall be observed while testing for adhesion of zinc coating as per IS 4826:1972. * ID/OD - Internal diameter/Outer diameter of	0.67%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.

Polymer coated wire		
j) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	6.70%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
k) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	1.10%	Unit of measurement is MT. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
PROVISION OF 100KN/M HT ROLLED CABLE NET WITH DT MESH AT VALLEY SIDE		
FROM CH.81.455 KM TO CH.81.755 KM		
l) Supply and installation of high tensile rolled cable net having aperture size not more than 300mm in one direction and minimum longitudinal tensile strength 100 KN/M and punching resistance 200 kN, comprising of minimum 8mm dia wire rope cable with a minimum breaking load of 40.7kN. The tensile strength of wire of the cable should be 1770 N/sqmm having corrosion protection of Zn Coating Class A or 95% Zn + 5% Al Class-B (Galfan) Coating as per IS/ISO-17746-2016 for treatment of slopes including all cost of material (net, boundary rope & rope anchor etc. comprising of the complete system), labour, special labour and T&P required to complete the work in all respect in accordance with drawings, Technical Specifications and as per the direction of Engineer-in-charge. Product Manufacturer shall have in-house test facility for conducting longitudinal tensile strength and punching resistance test and shall be responsible for carrying out both test (longitudinal tensile strength and punching resistance) during PDI, per lot in	4.77%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.

presence of representative/s of E-i-C on his own expenses.		
m) Supply and fixing of Double Twisted Mesh including all cost of material, labour and T&P required to complete the work in all respect with following properties: a. Mesh type : 6x8, Mesh opening : 60mm X 80mm b. Mesh Wire dia. 2.2/3.2mm (ID/OD), mechanically edged/selvedged galvanization as per EN 10223-3, and shall have minimum 16 numbers of mesh openings per meter of mesh perpendicular to twist. c. Tensile strength (500 Mpa) at a minimum elongation of 10%. The minimum tensile strength of the mesh panel must be 34.0 kN/m (+/-5kN/m) in the parallel to the twist direction and 13 kN/m in the perpendicular to the twist direction in accordance with the requirements of IS 16014:2018. d. Zinc Coating: The coating weight shall be heavily coated and soft type confirming to the requirements of specifications IS 4826:1972. Adhesion of Zinc Coating: No flakes or crack shall be observed while testing for adhesion of zinc coating as per IS 4826:1972. * ID/OD - Internal diameter/Outer diameter of Polymer coated wire.	1.15%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
n) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	14.41%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
o) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	2.37%	Unit of measurement is MT. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
4.0M HIGH ANCHORED CC GRAVITY WALL		
FROM CH.81.615 KM TO CH.81.720 KM		

p) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m).	0.01%	Unit of measurement is Cum Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
q) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.05%	Unit of measurement is Cum Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
r) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20 (p) Height upto 5m	1.42%	Unit of measurement is Cum Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
s) Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications. RCC M30	0.36%	Unit of measurement is Cum Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
t) Supplying, fitting and placing HYSD bar reinforcement in open foundation complete as per drawing and technical specifications	0.31%	Unit of measurement is MT. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
u) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers,10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	0.69%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
v) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers,10mm thick base plate	2.57%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.

and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.		
w) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	0.54%	Unit of measurement is MT. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
x) Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical specifications	0.01%	Unit of measurement is Each. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
y) Providing and installing subsurface drainage pipes - Perforated PVC pipe (lined with Non -woven Geotextile) of 75 mm internal diameter as per the drawings etc. complete including the cost of drilling and as directed by Engineer -In -Charge.	0.11%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
z) Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing.	0.05%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
aa) Hand Packed stone filling in back of walls including cost of all materials, royalty, T&P etc. complete as per direction of Engineer-in- charge. (As per PWD Uttarakhand specifications)	0.04%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
LONGITUDINAL DRAINS		
bb) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.03%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
cc) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications. PCC Grade M20 (p) Height upto 5m	0.03%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
4.0M HIGH ANCHORED CC CLADDING		
FROM CH.81.450 KM TO CH.81.615 KM		
dd) Excavation for Structures (Earth work in excavation of	0.07%	Unit of measurement is Cum. Payment shall be made on pro rata basis on

foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m to 6m).		completion of a stage of not less than 10% (ten percent) of the total qty.
ee) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.05%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
ff) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M25 (p) Height upto 5m	2.77%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
gg) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20 (p) Height upto 5m	0.05%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
hh) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers,10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	1.08%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
ii) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers,10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	0.54%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
jj) Cement pressure grouting through	0.27%	Unit of measurement is MT. Payment

Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.		shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
kk) Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing.	0.22%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
ll) Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical specifications	0.01%	Unit of measurement is Each. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
mm) Providing and installing subsurface drainage pipes - Perforated PVC pipe (lined with Non -woven Geotextile) of 75 mm internal diameter as per the drawings etc. complete including the cost of drilling and as directed by Engineer -In -Charge.	0.17%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
6.0M HIGH ANCHORED RCC WALL		
FROM CH.81.455 KM TO CH.81.755 KM		
nn) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m to 6m).	1.03%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
oo) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.31%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
pp) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.RCC Grade M30 (p) Height upto 5m to 10m	7.37%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
qq) Supplying, fitting and placing	5.94%	Unit of measurement is MT. Payment

HYSR bar reinforcement in open foundation complete as per drawing and technical specifications		shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
rr) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	2.94%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
ss) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	8.83%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
tt) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	1.94%	Unit of measurement is MT. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
uu) Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical specifications	0.02%	Unit of measurement is Each. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
10.0M LONG, 300MM ARTICULATING MATTRESSES		
FROM CH. 81.455KM & CH.81.755 KM		
vv) Supply and installation of 300mm thick Articulating Grouted Concrete Mattress, fabric form made from woven geotextile of minimum 400 g/m ² , having Wide Width Tensile Strength, ASTM D4595, (kN/m)	3.10%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.

=MD (50)/ TD (50), Wide Width Elongation at Break, ASTM D4595, (%) =MD (>10)/ TD (>10) and Trapezoidal Tear Strength, ASTM D4533, (N) =MD (440)/ TD (440) with reinforcing galvanized steel cables on both directions as per the detailed design, thickness and technical specifications. The mattress shall be customized as per site geometry or profile at factory in the form of panels along with geotextile baffles and one panel shall be connected with the adjacent panel by using Industrial Zipper. Cables shall be of minimum 6mm diameter and the breaking strength of the cable shall not be less than 30kN, including all cost of material, concrete, labour T&P and special T&P to complete the work in all respect. (To be done on the river banks).		
DEWATERING OF RIVER		
WW) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m).	0.25%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
XX) Construction of Embankment with Material Obtained from Borrow Pits (Construction of embankment with approved material obtained from borrow pits with all lifts and leads, transporting to site, spreading,grading to required slope and compacting to meet requirement of table 300-2)	0.36%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
yy) Dewatering of water caused due to seepage of ground water and surface water due to rain etc. excluding excavation of foundation but during execution of civil works including supply of all machine operator, khalashi, POL, T&P, accessories required for proper completion of the work.	0.55%	Unit of measurement is HP/Hr. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
CONTOUR DRAIN		
ZZ) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm	0.07%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than

nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.		10% (ten percent) of the total qty.
aaa) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20 (p) Height upto 5m	0.37%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
bbb) Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing.	0.02%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
<u>(C) Landslide Location Ch. 94.720 Km – Ch. 94.830 Km (NH-09)</u>		
EXCAVATION (FOR HILL CUTTING AND OFFLOADING)		
a) Excavation in Soil with Dozer with lead upto 1000 metres (Excavation for road way in soil by mechanical means including cutting and transporting the earth to site of embankment/dumping area with lead upto 1000 metres, including trimming bottom and side slopes in accordance with requirements of lines, grades and cross sections.)	0.07%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
b) Excavation in Ordinary Rock with Dozer with lead upto 1000 metres (Excavation for roadway in ordinary rock by deploying a dozer, including cutting and transporting the earth to site of embankment/dumping area with lead upto 1000 metres, trimming bottom and side slopes in accordance with the requirements of lines, grades and cross sections.)	0.10%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
PROVISION OF HT ROLLED CABLE NET WITH DT MESH AND SDRA		
c) Supply and installation of high tensile rolled cable net with single/ double knot connection having aperture size not more than 300mm in one direction and minimum longitudinal tensile strength 220 KN/M, and puncturing resistance 350 kN, comprising of minimum 10mm dia wire rope cable with steel core with a minimum breaking load of 63kN. The tensile strength of wire of the cable should be 1770 N/sqmm having corrosion protection of Zn Coating Class A or 95% Zn + 5% Al Class-B (Galfan) Coating as per IS/ISO- 17746-2016 for treatment of slopes including all	5.84%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.

cost of material (net, boundary rope & rope anchor etc comprising of the complete system), labour, special labour and T&P required to complete the work in all respect in accordance with drawings, Technical Specifications and as per the direction of Engineer-in-charge. Product Manufacturer shall have in-house test facility for conducting longitudinal tensile strength and puncturing resistance test and shall be responsible for carrying out both test (longitudinal tensile strength and puncturing resistance) during PDI per lot in presence of representative/s of E-i-C on his own expenses.		
d) Supply and fixing of Double Twisted Mesh including all cost of material, labour and T&P required to complete the work in all respect with following properties: a. Mesh type : 6x8, Mesh opening : 60mm X 80mm b. Mesh Wire dia. 2.2/3.2mm (ID/OD), mechanically edged/selvedged with galvanization as per EN 10223-3, and shall have minimum 16 numbers of mesh openings per meter of mesh perpendicular to twist. c. Tensile strength (500 Mpa) at a minimum elongation of 10%. The minimum tensile strength of the mesh panel must be 34.0 kN/m (+/-5kN/m) in the parallel to the twist direction and 13 kN/m in the perpendicular to the twist direction in accordance with the requirements of IS 16014:2018. d. Zinc Coating: The coating weight shall be heavily coated and soft type confirming to the requirements of specifications IS 4826:1972. Adhesion of Zinc Coating: No flakes or crack shall be observed while testing for adhesion of zinc coating as per IS 4826:1972. * ID/OD - Internal diameter/Outer diameter of Polymer coated wire.	1.40%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
e) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of	27.56%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.

cement grouting which will be paid extra as per relevant BOQ item.		
f) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	4.54%	Unit of measurement is MT. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
CONTOUR DRAIN		
g) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom and backfilling with approved material.)(i) Ordinary soil A Manual Means (Depth upto 3 m)	0.13%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
h) PCC 1:3:6 in Foundation (Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.)	0.06%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
i) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20.Height Upto 5m.	0.51%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
j) Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing	0.02%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
3.0M HIGH ANCHORED CC GRAVITY WALL ON RCC RAFT WITH BUNDLED SDRA FROM CH. 97.785 M TO 94.805M (ON HILL SIDE)		
k) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom and backfilling with approved material.)(ii) Ordinary rock (not requiring blasting) A Manual Means (Depth upto 3 m)	0.10%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
l) PCC 1:3:6 in Foundation (Plain cement concrete 1:3:6 nominal mix	0.02%	Unit of measurement is Cum. Payment shall be made on pro rata basis on

in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.)		completion of a stage of not less than 10% (ten percent) of the total qty.
m) Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications. RCC Grade M25.	0.12%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
n) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications. PCC Grade M20. Height Upto 5m.	0.40%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
o) Supplying, fitting and placing HYSD bar reinforcement in open foundation complete as per drawing and technical specifications	0.08%	Unit of measurement is MT. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
p) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	0.68%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
q) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	1.63%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
r) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	0.38%	Unit of measurement is MT. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
s) Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over	0.03%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than

the micro beams as reinforcement. The weld mesh shall be fixed as per drawing.		10% (ten percent) of the total qty.
t) Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical specifications	0.01%	Unit of measurement is Each. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
6.0M HIGH CC GRAVITY WALL WITH DRAIN OVER RCC RAFT WITH MICROPILE FROM CH. 94.720KM TO CH. 94.830KM (ON HILL SIDE)		
u) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m).	0.22%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
v) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.16%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
w) Reinforced Cement Concrete in Sub Structure complete as per drawing and technical specifications RCC M25	1.12%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
x) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20.Height Upto 5m.	6.21%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
y) Supplying, fitting and placing HYSD bar reinforcement in open foundation complete as per drawing and technical specifications	0.61%	Unit of measurement is MT. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
z) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill	3.75%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.

bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.		
aa) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	0.62%	Unit of measurement is MT. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
bb) Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical specifications	0.02%	Unit of measurement is Each. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
cc) Construction of 300mm dia. friction Micro Pile including drilling in soil mixed with boulders and in soft rock upto desired depth(ODEX drilling using tyre or crawler mounted machine as per site requirement), cement grouting using double packer, redrilling, perforated MS Casing, including all cost of material labour, special labour and T&P required to complete the work in all respect in accordance to drawings, Technical Specifications and as per direction of Engineer-in-charge. However cost of concrete and reinforcement will be paid separately as per relevant BOQ items.	10.79%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
dd) Bored cast-in-situ M35 grade R.C.C. pile excluding reinforcement complete as per drawing and technical specifications and removal of excavated earth with all lifts and lead upto 1000 m. (Pile diameter-300 mm)	1.02%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
ee) Supplying, fitting and placing HYSD bar reinforcement in open foundation complete as per drawing and technical specifications	1.44%	Unit of measurement is MT. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
ff) Providing and installing subsurface drainage pipes - Perforated PVC pipe (lined with Non -woven Geotextile) of 75 mm internal diameter as per the drawings etc. complete including the cost of drilling and as directed by Engineer -In -Charge.	0.04%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
LONGITUDINAL DRAIN		
gg) Plain cement concrete 1:3:6	0.01%	Unit of measurement is Cum. Payment

nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.		shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
hh) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20 (p) Height upto 5m	0.05%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
5.0M HIGH ANCHORED CC GRAVITY WALL ON RCC RAFT WITH BUNDLED SDRAFROM CH. 94.740KM TO CH. 94.820KM (ON VALLEY SIDE)		
ii) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m).	0.06%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
jj) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.12%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
kk) Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications. PCC M25	0.73%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
ll) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20 (p) Height upto 5m	4.60%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
mm) Supplying, fitting and placing HYSD bar reinforcement in open foundation complete as per drawing and technical specifications	0.46%	Unit of measurement is MT. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
nn) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit,	2.82%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.

couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.		
oo) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden / rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	8.47%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
pp) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	1.86%	Unit of measurement is MT. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
qq) Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing.	0.10%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
rr) Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical specifications	0.03%	Unit of measurement is Each. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
5.0M HIGH ANCHORED CC GRAVITY WALL ON RCC RAFT WITH BUNDLED SDRAFROM CH. 94.760KM TO CH. 94.800KM (ON VALLEY SIDE)		
ss) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.) ordinary soil, Manual Means (Depth upto 3 m).	0.03%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
tt) Plain cement concrete 1:3:6	0.06%	Unit of measurement is Cum. Payment

nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.		shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
uu) Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications. PCC M25	0.38%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
vv) Plain/Reinforced cement concrete insub-structure complete as per drawing and technical specifications. PCC Grade M20 (p) Height upto 5m	2.43%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
ww) Supplying, fitting and placing HYSD bar reinforcement in open foundation complete as per drawing and technical specifications	0.24%	Unit of measurement is MT. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
xx) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	1.46%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
yy) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	4.39%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
zz) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure	0.96%	Unit of measurement is MT. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
aaa) Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as	0.10%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than

reinforcement. The weld mesh shall be fixed as per drawing.		10% (ten percent) of the total qty.
bbb) Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical specifications	0.01%	Unit of measurement is Each. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
DEEP DRAINAGE HOLES AT EL. $\pm$ 990M		
ccc) Providing and installing subsurface drainage pipes - Perforated PVC pipe (lined with Non -woven Geotextile) of 75 mm internal diameter as per the drawings etc. complete including the cost of drilling and as directed by Engineer -In -Charge.	0.95%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
<u>(D) Landslide Location Ch. 97.040 Km – Ch. 97.415 Km (NH-09)</u>		
SLOPE PROTECTION MEASURES		
a) Excavation in Soil with Dozer with lead upto 1000 metres (Excavation for road way in soil by mechanical means including cutting and transporting the earth to site of embankment/dumping area with lead upto 1000 metres, including trimming bottom and side slopes in accordance with requirements of lines, grades and cross sections.)	4.53%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
b) Excavation in Ordinary Rock with Dozer with lead upto 1000 metres (Excavation for roadway in ordinary rock by deploying a dozer, including cutting and transporting the earth to site of embankment/dumping area with lead upto 1000 metres, trimming bottom and side slopes in accordance with the requirements of lines, grades and cross sections.)	2.95%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
c) Cost of Haulage Excluding Loading and Unloading. Case I Surfaced Road Hilly. Within Lead 4Km	2.13%	Unit of measurement is T-Km. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
d) Supply and installation of high tensile rolled cable net with single/ double knot connection having aperture size not more than 300mm in one direction and minimum longitudinal tensile strength 220 KN/M, and puncturing resistance 350 kN, comprising of minimum 10mm dia wire rope cable with steel core with a	6.43%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.

minimum breaking load of 63kN. The tensile strength of wire of the cable should be 1770 N/sqmm having corrosion protection of Zn Coating Class A or 95% Zn + 5% Al Class-B (Galfan) Coating as per IS/ISO-17746-2016 for treatment of slopes including all cost of material (net, boundary rope & rope anchor etc comprising of the complete system), labour, special labour and T&P required to complete the work in all respect in accordance with drawings, Technical Specifications and as per the direction of Engineer-incharge. Product Manufacturer shall have in-house test facility for conducting longitudinal tensile strength and puncturing resistance test and shall be responsible for carrying out both test (longitudinal tensile strength and puncturing resistance) during PDI per lot in presence of representative/s of E-i-C on his own expenses.		
CH. 97.040 KM TO CH 97.160 KM		
CH. 97.160 KM TO CH 97.410KM BEYOND EL ±1055 UPTO EL ±1080		
e) Supply and fixing of Double Twisted Mesh including all cost of material, labour and T&P required to complete the work in all respect with following properties: a. Mesh type : 6x8, Mesh opening : 60mm X 80mm b. Mesh Wire dia. 2.2/3.2mm (ID/OD), mechanically edged/selvedged with galvanization as per EN 10223-3, and shall have minimum 16 numbers of mesh openings per meter of mesh perpendicular to twist. c. Tensile strength (500 Mpa) at a minimum elongation of 10%. The minimum tensile strength of the mesh panel must be 34.0 kN/m (+/-5kN/m) in the parallel to the twist direction and 13 kN/m in the perpendicular to the twist direction in accordance with the requirements of IS 16014:2018. d. Zinc Coating: The coating weight shall be heavily coated and soft type confirming to the requirements of specifications IS 4826:1972. Adhesion of Zinc Coating: No flakes or crack shall be observed while testing for adhesion of zinc coating as per IS 4826:1972. * ID/OD - Internal diameter/Outer diameter of Polymer coated wire.	1.10%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
CH. 97.040 KM TO CH 97.160 KM		
CH. 97.160 KM TO CH 97.410KM BEYOND EL ±1055 UPTO EL ±1080		

f) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	11.10%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
g) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	1.83%	Unit of measurement is MT. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
CH. 97.160 KM TO CH 97.410KM UPTO EL ±1055		
h) Supply and installation of high tensile rolled cable net having aperture size not more than 400mm in one direction and minimum longitudinal tensile strength 80 KN/M and puncturing resistance 150 kN, comprising of minimum 6mm dia wire rope cable with a minimum breaking load of 35kN. The tensile strength of wire of the cable should be 1770 N/sqmm having corrosion protection of Zn Coating Class A or 95% Zn + 5% Al Class-B (Galfan) Coating as per IS/ISO- 17746-2016 for treatment of slopes including all cost of material (net, boundary rope & rope anchor etc. comprising of the complete system), labour, special labour and T&P required to complete the work in all respect in accordance with drawings, Technical Specifications and as per the direction of Engineer-in-charge. Product Manufacturer shall have in-house test facility for conducting longitudinal tensile strength and puncturing resistance test and shall be responsible for carrying out both test (longitudinal tensile strength and puncturing resistance) during PDI, per lot in presence of representative/s of E-i-C on his own expenses.	8.36%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
CH. 97.160 KM TO CH 97.410KM UPTO EL ±1055		
i) Supply and fixing of Double Twisted Mesh including all cost of material, labour and T&P required to complete the work in all respect with	2.37%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than

following properties: a. Mesh type : 6x8, Mesh opening : 60mm X 80mm b. Mesh Wire dia. 2.2/3.2mm (ID/OD), mechanically edged/selvedged with galvanization as per EN 10223-3, and shall have minimum 16 numbers of mesh openings per meter of mesh perpendicular to twist. c. Tensile strength (500 Mpa) at a minimum elongation of 10%. The minimum tensile strength of the mesh panel must be 34.0 kN/m (+/-5kN/m) in the parallel to the twist direction and 13 kN/m in the perpendicular to the twist direction in accordance with the requirements of IS 16014:2018. d. Zinc Coating: The coating weight shall be heavily coated and soft type confirming to the requirements of specifications IS 4826:1972. Adhesion of Zinc Coating: No flakes or crack shall be observed while testing for adhesion of zinc coating as per IS 4826:1972. * ID/OD - Internal diameter/Outer diameter of Polymer coated wire.		10% (ten percent) of the total qty.
CH. 97.160 KM TO CH 97.410KM UPTO EL ±1055		
j) Supply and fixing layer of Geojute mat with spraying of seeds of Lemon grass/Dedonia/Vetiver etc., including all cost of material, labour and T&P required to complete the work in all respect, with following properties : a. Material 100% natural, b. Weight 500 GSM, , c. Minimum Breaking Load along Machine Direction (warp way) -10.0(kN/m), Cross Direction (Weft way)-10.0(kN/m), d. Max. Elongation at break (in %): Machine Direction (warp way)-10, Cross Direction (Weft way)-12.	1.04%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
k) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	12.40%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
l) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in	2.04%	Unit of measurement is MT. Payment shall be made on pro rata basis on completion of a stage of not less than

Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.		10% (ten percent) of the total qty.
CATCH DRAIN		
m) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom and backfilling with approved material.)(i) Ordinary soil A Manual Means (Depth upto 3 m)	0.03%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
n) PCC 1:3:6 in Foundation (Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.)	0.06%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
o) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20.Height Upto 5m.	0.38%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
p) Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing	0.02%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
3M HIGH CC GRAVITY WALL ALONG BENCHES		
q) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom and backfilling with approved material.)(i) Ordinary soil A Manual Means (Depth upto 3 m)	0.06%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
r) PCC 1:3:6 in Foundation (Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.)	0.12%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
s) Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications.PCC Grade M20.	0.18%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
t) Plain/Reinforced cement	1.74%	Unit of measurement is Cum. Payment

concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20.Height Upto 5m.		shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
u) Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing	0.09%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
v) Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical specifications	0.02%	Unit of measurement is Each. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
w) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers,10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	1.76%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
SDRA FOR WALL		
x) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	0.29%	Unit of measurement is MT. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
y) Back filling behind abutment, wing wall and return wall complete as per drawing and Technical specification. Granular material	0.14%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
RCC RETAINING WALL		
z) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom and backfilling with approved material.)(i) Ordinary soil A Manual Means (Depth upto 3 m)	0.13%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
aa) PCC 1:3:6 in Foundation (Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone	0.24%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than

aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.)		10% (ten percent) of the total qty.
bb) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.RCC Grade M25.Height 5m to 10m.	13.29%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
cc) Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications RCC Grade M35	0.23%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
dd) Supplying, fitting and placing un-coated HYSD bar reinforcement in foundation complete as per drawing and technical specifications	1.43%	Unit of measurement is MT. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
ee) Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications RCC Grade M30	1.64%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
ff) Construction of 300mm dia. friction Micro Pile including drilling in soil mixed with boulders and in soft rock upto desired depth(ODEX drilling using tyre or crawler mounted machine as per site requirement), cement grouting using double packer, redrilling, perforated MS Casing, including all cost of material labour, special labour and T&P required to complete the work in all respect in accordance to drawings, Technical Specifications and as per direction of Engineer-in-charge. However cost of concrete and reinforcement will be paid seperately as per relevant BOQ items.	4.59%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
gg) Bored cast-in-situ M35 grade R.C.C. pile excluding reinforcement complete as per drawing and technical specifications and removal of excavated earth with all lifts and lead upto 1000 m. (Pile diameter-300 mm)	0.40%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
hh) Supplying, fitting and placing un-coated HYSD bar reinforcement in sub structure complete as per drawing and technical specifications	9.59%	Unit of measurement is MT. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
RCC Retaining wall		
Micropile		
ii) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting.	2.57%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.

Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.		
Lateral Anchors		
jj) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	0.42%	Unit of measurement is MT. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
kk) Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical specifications	0.04%	Unit of measurement is Each. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
ll) Back filling behind abutment, wing wall and return wall complete as per drawing and Technical specification. Granular material	0.15%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
FOR 3.0M WIDE CC CHANNEL		
mm) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom and backfilling with approved material.)(i) Ordinary soil A Manual Means (Depth upto 3 m)	0.01%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
nn) PCC 1:3:6 in Foundation (Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.)	0.03%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
oo) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications. PCC Grade M20. Height Upto 5m.	0.17%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
pp) Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing	0.01%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
qq) Supply and Installation of Self driven rock anchor made of 40CR	3.13%	Unit of measurement is RM. Payment shall be made on pro rata basis on

material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.		completion of a stage of not less than 10% (ten percent) of the total qty.
rr) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	0.52%	Unit of measurement is MT. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
GABION WALL		
ss) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom and backfilling with approved material.)(i) Ordinary soil A Manual Means (Depth upto 3 m)	0.01%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
tt) Providing and Laying of Mechanically Woven Double Twisted Hexagonal shaped Gabions (Zinc plus PVC coated), of size 1mX1mX1m with two diaphragms at 1m interval, having mesh opening 100mmx120 mm, mesh wire diameter 2.7mm/3.7mm, edge/selvedge wire diameter 3.4/4.4 mm and lacing wire diameter 2.2/3.2 mm. (The work includes filling boulders in the gabions).	0.23%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
<u>(E) Landslide Location Zone-1 (Ch. 100.465 Km – Ch. 100.905 Km) (NH-09)</u>		
EXCAVATION (CONSIDERING 60% LOOSE MASS & 40% ROCK)		
a) Excavation in Soil with Dozer with lead upto 1000 metres (Excavation for road way in soil by mechanical means including cutting and transporting the earth to site of embankment/dumping area with lead upto 1000 metres, including trimming bottom and side slopes in accordance with requirements of lines, grades and cross sections.)	3.68%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
b) Excavation in Ordinary	3.73%	Unit of measurement is Cum. Payment shall be made on pro rata basis on

Rock with Dozer with lead upto 1000 metres (Excavation for roadway in ordinary rock by deploying a dozer, including cutting and transporting the earth to site of embankment/dumping area with lead upto 1000 metres, trimming bottom and side slopes in accordance with the requirements of lines, grades and cross sections.)		completion of a stage of not less than 10% (ten percent) of the total qty.
c) Supply and installation of high tensile rolled cable net with single/ double knot connection having aperture size not more than 300mm in one direction and minimum longitudinal tensile strength 220 KN/M, and punching resistance 350 kN, comprising of minimum 10mm dia wire rope cable with steel core with a minimum breaking load of 63kN. The tensile strength of wire of the cable should be 1770 N/sqmm having corrosion protection of Zn Coating Class A or 95% Zn + 5% Al Class-B (Galfan) Coating as per IS/ISO-17746-2016 for treatment of slopes including all cost of material (net, boundary rope & rope anchor etc comprising of the complete system), labour, special labour and T&P required to complete the work in all respect in accordance with drawings, Technical Specifications and as per the direction of Engineer-in-charge. Product Manufacturer shall have in-house test facility for conducting longitudinal tensile strength and punching resistance test and shall be responsible for carrying out both test (longitudinal tensile strength and punching resistance) during PDI per lot in presence of representative/s of E-i-C on his own expenses.	18.22%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
d) Supply and fixing of Double Twisted Mesh including all cost of material, labour and T&P required to complete the work in all respect with following properties: a. Mesh type : 6x8, Mesh opening : 60mm X 80mm b. Mesh Wire dia. 2.2/3.2mm (ID/OD), mechanically	3.13%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.

edged/selvedged with galvanization as per EN 10223-3, and shall have minimum 16 numbers of mesh openings per meter of mesh perpendicular to twist. c. Tensile strength (500 Mpa) at a minimum elongation of 10%. The minimum tensile strength of the mesh panel must be 34.0 kN/m (+/- 5kN/m) in the parallel to the twist direction and 13 kN/m in the perpendicular to the twist direction in accordance with the requirements of IS 16014:2018. d. Zinc Coating: The coating weight shall be heavily coated and soft type confirming to the requirements of specifications IS 4826:1972. Adhesion of Zinc Coating: No flakes or crack shall be observed while testing for adhesion of zinc coating as per IS 4826:1972. * ID/OD - Internal diameter/Outer diameter of Polymer coated wire.		
e) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	39.33%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
f) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	6.49%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
2.0 M HIGH GABION WALL WITH DRAIN ON BENCH		
FROM CH.100.535 KM TO CH.100.905 KM & FROM CH.100.565 TO CH.100.905 KM		
g) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification,	0.00%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.

including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m).		
h) Providing & making Gabion structure with Mechanically Woven Double Twisted Hexagonal Shaped Wire mesh Gabion Boxes as per IS 16014:2012, MORT&H Clause 2500, of required size, Mesh Type 10x12 (D=100 mm with tolerance of $\pm 2\%$) Zinc coated, Mesh wire diameter 3.0 mm, mechanically edged/selvedged with partitions at every 1m interval and shall have minimum 10 numbers of openings per meter of mesh perpendicular to twist, tying with lacing wire of diameter 2.2 mm, supplied @3% by weight of Gabion boxes, filled with boulders with least dimension of 200 mm, as per drawing, all complete as per direction of Engineer-in-charge.	0.30%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
i) Supplying, Laying and fixing in position of 10 MM thick Geosynthetic Cementitious composite mat, specified as per ASTM: D 8364 – GCCM Type - III specification . flexural strength (28 Day) should be > 4MPa and 28 days compressive strength as per ASTM D8329 should not be less 60 MPa.	0.56%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
5.0 M HIGH GABION WALL		
j) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m).	0.02%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
k) Providing & making Gabion structure with Mechanically Woven	0.15%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on

Double Twisted Hexagonal Shaped Wire mesh Gabion Boxes as per IS 16014:2012, MORT&H Clause 2500, of required size, Mesh Type 10x12 (D=100 mm with tolerance of $\pm 2\%$) Zinc coated, Mesh wire diameter 3.0 mm, mechanically edged/selvedged with partitions at every 1m interval and shall have minimum 10 numbers of openings per meter of mesh perpendicular to twist, tying with lacing wire of diameter 2.2 mm, supplied @3% by weight of Gabion boxes, filled with boulders with least dimension of 200 mm, as per drawing, all complete as per direction of Engineer-in-charge.		completion of a stage of not less than 10% (ten percent) of the total qty.
l) Supply and installation of non woven geotextile having mass/unit area - 250gsm over the slope to be treated including all cost of labour, material and T&P required for proper completion of work	0.01%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
m) Hand Packed stone filling in back of walls including cost of all materials, royalty, T&P etc. complete as per direction of Engineer-in- charge. (As per PWD Uttarakhand specifications)	0.01%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
6.0 M HIGH ANCHORED RCC STEPPED WALL ON RCC RAFT WITH MICROPILE		
n) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m to 6m).	0.51%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
o) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.13%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
p) Plain/Reinforced cement	1.09%	Unit of measurement is Cum. Payment

concrete in open foundation complete as per drawing and technical specifications. RCC M35		shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
q) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications. RCC Grade M25 (p) Height upto 5m	7.02%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
r) Supplying, fitting and placing HYSD bar reinforcement in open foundation complete as per drawing and technical specifications	4.54%	Unit of measurement is MT. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
s) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	1.40%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
t) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	0.23%	Unit of measurement is MT. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
u) Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical specifications	0.02%	Unit of measurement is Each. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
v) Construction of 300mm dia. friction Micro Pile including drilling in soil mixed with boulders and in soft rock upto desired depth(ODEX drilling using tyre or crawler mounted machine as per site requirement), cement grouting using double packer, redrilling, perforated MS Casing, including all cost of material labour, special labour and T&P required to	6.02%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.

complete the work in all respect in accordance to drawings, Technical Specifications and as per direction of Engineer-in-charge. However cost of concrete and reinforcement will be paid seperately as per relevant BOQ items.		
w) Bored cast-in-situ M35 grade R.C.C. pile excluding reinforcement complete as per drawing and technical specifications and removal of excavated earth with all lifts and lead upto 1000 m. (Pile diameter-300 mm).	0.57%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
x) Supplying, fitting and placing HYSD bar reinforcement in open foundation complete as per drawing and technical specifications	0.80%	Unit of measurement is MT. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
y) Hand Packed stone filling in back of walls including cost of all materials, royalty, T&P etc. complete as per direction of Engineer-in- charge. (As per PWD Uttarakhand specifications)	0.50%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
LONGITUDINAL DRAIN		
z) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.02%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
aa) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications. PCC Grade M20 (p) Height upto 5m	0.07%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
5.0M HIGH ANCHORED CC CLADDING		
FRQM CH. 100.465 KM TO CH.100.500 KM		
bb) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally	0.01%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.

for road work.)ordinary soil,Manual Means (Depth upto 3 m to 6m).		
cc) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.01%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
dd) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers,10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	0.25%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
ee) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	0.04%	Unit of measurement is MT. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
ff) Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing.	0.03%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
gg) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M25 (p) Height upto 5m	0.22%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
hh) Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical specifications	0.01%	Unit of measurement is Each. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
ii) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all	0.02%	Unit of measurement is MT. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.

cost of material and equipments required to complete the grouting work at desired pressure.		
DEEP DRAINAGE HOLE SEMI PERFORATED PIPE		
jj) Providing and installing subsurface drainage pipes - Perforated PVC pipe (lined with Non -woven Geotextile) of 75 mm internal diameter as per the drawings etc. complete including the cost of drilling and as directed by Engineer -In -Charge.	0.53%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
CONTOUR DRAIN		
kk) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m).	0.02%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
ll) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.05%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
mm) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20 (p) Height upto 5m	0.25%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
nn) Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing.	0.01%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
<u>(F) Landslide Location Zone-2 (Ch. 100.905 Km – Ch. 101.100 Km) (NH-09)</u>		
EXCAVATION (CONSIDERING 60% LOOSE MASS & 40% ROCK)		
a) Excavation in Soil with Dozer with lead upto 1000 metres (Excavation for road way in soil by mechanical means including cutting	3.72%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.

and transporting the earth to site of embankment/dumping area with lead upto 1000 metres, including trimming bottom and side slopes in accordance with requirements of lines, grades and cross sections.)		
b) Excavation in Ordinary Rock with Dozer with lead upto 1000 metres (Excavation for roadway in ordinary rock by deploying a dozer, including cutting and transporting the earth to site of embankment/dumping area with lead upto 1000 metres, trimming bottom and side slopes in accordance with the requirements of lines, grades and cross sections.)	3.76%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
PROVISION OF 100KN/M HT ROLLED CABLE NET WITH DT MESH AT HILL SIDE (ZONE-II)		
c) Supply and installation of high tensile rolled cable net having aperture size not more than 300mm in one direction and minimum longitudinal tensile strength 100 KN/M and puncturing resistance 200 kN, comprising of minimum 8mm dia wire rope cable with a minimum breaking load of 40.7kN. The tensile strength of wire of the cable should be 1770 N/sqmm having corrosion protection of Zn Coating Class A or 95% Zn + 5% Al Class-B (Galfan) Coating as per IS/ISO-17746-2016 for treatment of slopes including all cost of material (net, boundary rope & rope anchor etc. comprising of the complete system), labour, special labour and T&P required to complete the work in all respect in accordance with drawings, Technical Specifications and as per the direction of Engineer-in-charge. Product Manufacturer shall have in-house test facility for conducting longitudinal tensile strength and puncturing resistance test and shall be responsible for carrying out both test (longitudinal tensile strength and puncturing resistance) during PDI, per lot in presence of representative/s of E-i-C on his own expenses.	11.15%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
d) Supply and fixing of Double Twisted Mesh including all cost of material, labour and T&P required to complete the work in all respect with following properties: a. Mesh type : 6x8, Mesh opening : 60mm X 80mm b. Mesh Wire dia. 2.2/3.2mm (ID/OD), mechanically edged/selvage with	2.68%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.

galvanization as per EN 10223-3, and shall have minimum 16 numbers of mesh openings per meter of mesh perpendicular to twist. c. Tensile strength (500 Mpa) at a minimum elongation of 10%. The minimum tensile strength of the mesh panel must be 34.0 kN/m (+/-5kN/m) in the parallel to the twist direction and 13 kN/m in the perpendicular to the twist direction in accordance with the requirements of IS 16014:2018. d. Zinc Coating: The coating weight shall be heavily coated and soft type confirming to the requirements of specifications IS 4826:1972. Adhesion of Zinc Coating: No flakes or crack shall be observed while testing for adhesion of zinc coating as per IS 4826:1972. * ID/OD - Internal diameter/Outer diameter of Polymer coated wire.		
e) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	33.68%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
f) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	5.55%	Unit of measurement is MT. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
6.0M HIGH ANCHORED RCC STEPPED WALL ON RCC RAFT WITH MICROPILE		
g) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.) ordinary soil, Manual Means (Depth upto 3 m to 6m).	0.86%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
h) Plain cement concrete 1:3:6 nominal mix in foundation with	0.22%	Unit of measurement is Cum. Payment shall be made on pro rata basis on

crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.		completion of a stage of not less than 10% (ten percent) of the total qty.
i) Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications. RCC M35	1.83%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
j) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications. RCC Grade M25 (p) Height upto 5m	11.75%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
k) Supplying, fitting and placing HYSD bar reinforcement in open foundation complete as per drawing and technical specifications	7.60%	Unit of measurement is MT. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
l) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	2.35%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
m) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	0.39%	Unit of measurement is MT. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
n) Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and technical specifications	0.03%	Unit of measurement is Each. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
o) Construction of 300mm dia. friction Micro Pile including drilling in soil mixed with boulders and in soft rock upto desired depth(ODEX drilling using tyre or crawler mounted machine as per site requirement), cement grouting using double packer, redrilling, perforated MS Casing, including all cost of material labour, special labour and T&P required to complete the work in all respect in accordance to drawings, Technical	10.07%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.

Specifications and as per direction of Engineer-in-charge. However cost of concrete and reinforcement will be paid separately as per relevant BOQ items.		
p) Bored cast-in-situ M35 grade R.C.C. pile excluding reinforcement complete as per drawing and technical specifications and removal of excavated earth with all lifts and lead upto 1000 m. (Pile diameter-300 mm).	0.95%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
q) Supplying, fitting and placing HYSD bar reinforcement in open foundation complete as per drawing and technical specifications	1.34%	Unit of measurement is MT. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
r) Hand Packed stone filling in back of walls including cost of all materials, royalty, T&P etc. complete as per direction of Engineer-in-charge. (As per PWD Uttarakhand specifications)	0.84%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
LONGITUDINAL DRAIN		
s) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.03%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
t) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications. PCC Grade M20 (p) Height upto 5m	0.11%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
u) Providing and installing subsurface drainage pipes - Perforated PVC pipe (lined with Non - woven Geotextile) of 75 mm internal diameter as per the drawings etc. complete including the cost of drilling and as directed by Engineer -In - Charge.	0.59%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
CONTOUR DRAIN		
v) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.) ordinary soil, Manual Means (Depth upto 3 m).	0.02%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
w) Plain cement concrete 1:3:6 nominal mix in foundation with	0.08%	Unit of measurement is Cum. Payment shall be made on pro rata basis on

crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.		completion of a stage of not less than 10% (ten percent) of the total qty.
x) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20 (p) Height upto 5m	0.38%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
y) Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing.	0.02%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
<u>(G) Landslide Location Zone-3 (Ch.101.100 Km – Ch. 101.425 Km) (NH-09)</u>		
a) Excavation in Soil with Dozer with lead upto 1000 metres (Excavation for road way in soil by mechanical means including cutting and transporting the earth to site of embankment/dumping area with lead upto 1000 metres, including trimming bottom and side slopes in accordance with requirements of lines, grades and cross sections.)	2.15%	
b) Excavation in Soil with Dozer with lead upto 1000 metres (Excavation for road way in soil by mechanical means including cutting and transporting the earth to site of embankment/dumping area with lead upto 1000 metres, including trimming bottom and side slopes in accordance with requirements of lines, grades and cross sections.)	2.18%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
PROVISION OF 100KN/M HT ROLLED CABLE NET WITH DT MESH AT HILL SIDE (ZONE-III)		
FROM CH.101.100 KM TO CH.101.335 KM		
c) Supply and installation of high tensile rolled cable net having aperture size not more than 300mm in one direction and minimum longitudinal tensile strength 100 KN/M and punching resistance 200 kN, comprising of minimum 8mm dia wire rope cable with a minimum breaking load of 40.7kN. The tensile strength of wire of the cable should be 1770 N/sqmm having corrosion protection of Zn Coating Class A or 95% Zn + 5% Al	4.94%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.

Class-B (Galfan) Coating as per IS/ISO-17746-2016 for treatment of slopes including all cost of material (net, boundary rope & rope anchor etc. comprising of the complete system), labour, special labour and T&P required to complete the work in all respect in accordance with drawings, Technical Specifications and as per the direction of Engineer-in-charge. Product Manufacturer shall have in-house test facility for conducting longitudinal tensile strength and punching resistance test and shall be responsible for carrying out both test (longitudinal tensile strength and punching resistance) during PDI, per lot in presence of representative/s of E-i-C on his own expenses.		
d) Supply and fixing of Double Twisted Mesh including all cost of material, labour and T&P required to complete the work in all respect with following properties: a. Mesh type : 6x8, Mesh opening : 60mm X 80mm b. Mesh Wire dia. 2.2/3.2mm (ID/OD), mechanically edged/selvedged with galvanization as per EN 10223-3, and shall have minimum 16 numbers of mesh openings per meter of mesh perpendicular to twist. c. Tensile strength (500 Mpa) at a minimum elongation of 10%. The minimum tensile strength of the mesh panel must be 34.0 kN/m (+/- 5kN/m) in the parallel to the twist direction and 13 kN/m in the perpendicular to the twist direction in accordance with the requirements of IS 16014:2018. d. Zinc Coating: The coating weight shall be heavily coated and soft type confirming to the requirements of specifications IS 4826:1972. Adhesion of Zinc Coating: No flakes or crack shall be observed while testing for adhesion of zinc coating as per IS 4826:1972. * ID/OD - Internal diameter/Outer diameter of Polymer coated wire.	1.19%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
e) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock	7.46%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.

	suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.		
f)	Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	13.98%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
g)	Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	1.23%	Unit of measurement is MT. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
	PROVISION OF 80KN/M HT ROLLED CABLE NET WITH DT MESH AT HILL SIDE (ZONE-IV)		
	FROM CH.101.200 KM TO CH.101.330 KM		
h)	Supply and installation of high tensile rolled cable net having aperture size not more than 400mm in one direction and minimum longitudinal tensile strength 80 KN/M and punching resistance 150 kN, comprising of minimum 6mm dia wire rope cable with a minimum breaking load of 35kN. The tensile strength of wire of the cable should be 1770 N/sqmm having corrosion protection of Zn Coating Class A or 95% Zn + 5% Al Class-B (Galfan) Coating as per IS/ISO-17746-2016 for treatment of slopes including all cost of material (net, boundary rope & rope anchor etc. comprising of the complete system), labour, special labour and T&P required to complete the work in all respect in accordance with drawings, Technical Specifications and as per the direction of Engineer-in-charge. Product Manufacturer shall have in-house test facility for conducting longitudinal tensile strength and	3.86%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.

	punchuring resistance test and shall be responsible for carrying out both test (longitudinal tensile strength and punchuring resistance) during PDI, per lot in presence of representative/s of E-i-C on his own expenses.		
i)	Supply and fixing of Double Twisted Mesh including all cost of material, labour and T&P required to complete the work in all respect with following properties: a. Mesh type : 6x8, Mesh opening : 60mm X 80mm b. Mesh Wire dia. 2.2/3.2mm (ID/OD), mechanically edged/selvedged with galvanization as per EN 10223-3, and shall have minimum 16 numbers of mesh openings per meter of mesh perpendicular to twist.c. Tensile strength (500 Mpa) at a minimum elongation of 10%. The minimum tensile strength of the mesh panel must be 34.0 kN/m (+/- 5kN/m) in the parallel to the twist direction and 13 kN/m in the perpendicular to the twist direction in accordance with the requirements of IS 16014:2018.d. Zinc Coating: The coating weight shall be heavily coated and soft type confirming to the requirements of specifications IS 4826:1972. Adhesion of Zinc Coating: No flakes or crack shall be observed while testing for adhesion of zinc coating as per IS 4826:1972.* ID/OD - Internal diameter/Outer diameter of Polymer coated wire.	1.09%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
j)	Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	16.50%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
k)	Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	2.72%	Unit of measurement is MT. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
2.0M HIGH GABION WALL WITH			

DRAIN ON BENCH		
l) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m).	0.00%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
m) Providing & making Gabion structure with Mechanically Woven Double Twisted Hexagonal Shaped Wire mesh Gabion Boxes as per IS 16014:2012, MORT&H Clause 2500, of required size, Mesh Type 10x12 (D=100 mm with tolerance of $\pm 2\%$) Zinc coated, Mesh wire diameter 3.0 mm, mechanically edged/selvedged with partitions at every 1m interval and shall have minimum 10 numbers of openings per meter of mesh perpendicular to twist, tying with lacing wire of diameter 2.2 mm, supplied @3% by weight of Gabion boxes, filled with boulders with least dimension of 200 mm, as per drawing, all complete as per direction of Engineer-in-charge.	0.11%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
n) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.02%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
o) Supplying, Laying and fixing in position of 10 MM thick Geosynthetic Cementitious composite mat, specified as per ASTM: D 8364 – GCCM Type - III specification . flexural strength (28 Day) should be > 4MPa and 28 days compressive strength as per ASTM D8329 should not be less 60 MPa.	0.21%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
4.0M HIGH ANCHORED CC GRAVITY WALL ON RCC RAFT WITH MICROPILE ON BENCH		
FROM CH.101.160 KM TO CH. 101.330 KM		
p) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and	0.00%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than

technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m to 6m).		10% (ten percent) of the total qty.
q) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.07%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
r) Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications. RCC M35	0.46%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
s) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20 (p) Height upto 5m	1.78%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
t) Supplying, fitting and placing HYSD bar reinforcement in open foundation complete as per drawing and technical specifications	0.26%	Unit of measurement is MT. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
u) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers,10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	0.86%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
v) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	0.14%	Unit of measurement is MT. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
w) Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical	0.01%	Unit of measurement is Each. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.

specifications		
x) Construction of 300mm dia. friction Micro Pile including drilling in soil mixed with boulders and in soft rock upto desired depth(ODEX drilling using tyre or crawler mounted machine as per site requirement), cement grouting using double packer, redrilling, perforated MS Casing, including all cost of material labour, special labour and T&P required to complete the work in all respect in accordance to drawings, Technical Specifications and as per direction of Engineer-in-charge. However cost of concrete and reinforcement will be paid separately as per relevant BOQ items.	4.65%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
y) Bored cast-in-situ M35 grade R.C.C. pile excluding reinforcement complete as per drawing and technical specifications and removal of excavated earth with all lifts and lead upto 1000 m. (Pile diameter-300 mm).	0.44%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
z) Supplying, fitting and placing HYSD bar reinforcement in open foundation complete as per drawing and technical specifications	0.62%	Unit of measurement is MT. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
LONGITUDINAL DRAIN		
aa) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.01%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
bb) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20 (p) Height upto 5m	0.04%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
5.0M HIGH GABION WALL		
cc) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m).	0.13%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
dd) Providing & making Gabion structure with Mechanically Woven Double Twisted Hexagonal Shaped	1.82%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than

Wire mesh Gabion Boxes as per IS 16014:2012, MORT&H Clause 2500, of required size, Mesh Type 10x12 (D=100 mm with tolerance of $\pm 2\%$) Zinc coated, Mesh wire diameter 3.0 mm, mechanically edged/selvedged with partitions at every 1m interval and shall have minimum 10 numbers of openings per meter of mesh perpendicular to twist, tying with lacing wire of diameter 2.2 mm, supplied @3% by weight of Gabion boxes, filled with boulders with least dimension of 200 mm, as per drawing, all complete as per direction of Engineer-in-charge.		10% (ten percent) of the total qty.
ee) Supply and installation of non woven geotextile having mass/unit area - 250gsm over the slope to be treated including all cost of labour, material and T&P required for proper completion of work	0.05%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
ff) Hand Packed stone filling in back of walls including cost of all materials, royalty, T&P etc. complete as per direction of Engineer-in- charge. (As per PWD Uttarakhand specifications)	0.17%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
6.0M HIGH ANCHORED RCC STEPPED WALL ON RCC RAFT WITH MICROPILE		
FROM CH.101.100 KM TO CH.101.335 KM		
gg) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m to 6m).	0.56%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
hh) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.14%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
ii) Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications. RCC M35	1.18%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
jj) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical	7.60%	Unit of measurement is Cum. Payment shall be made on pro rata basis on

specifications.RCC Grade M25 (p) Height upto 5m		completion of a stage of not less than 10% (ten percent) of the total qty.
kk) Supplying, fitting and placing HYSD bar reinforcement in open foundation complete as per drawing and technical specifications	4.91%	Unit of measurement is MT. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
ll) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers,10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	1.52%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
mm) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	0.25%	Unit of measurement is MT. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
nn) Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical specifications	0.02%	Unit of measurement is Each. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
oo) Construction of 300mm dia. friction Micro Pile including drilling in soil mixed with boulders and in soft rock upto desired depth(ODEX drilling using tyre or crawler mounted machine as per site requirement), cement grouting using double packer, redrilling, perforated MS Casing, including all cost of material labour, special labour and T&P required to complete the work in all respect in accordance to drawings, Technical Specifications and as per direction of Engineer-in-charge. However cost of concrete and reinforcement will be paid seperately as per relevant BOQ items.	6.51%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
pp) Bored cast-in-situ M35 grade R.C.C. pile excluding reinforcement complete as per drawing and technical specificationsand removal of excavated earth with all lifts and lead upto 1000 m. (Pile diameter-300 mm).	0.61%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.

qq) Supplying, fitting and placing HYSD bar reinforcement in open foundation complete as per drawing and technical specifications	0.87%	Unit of measurement is MT. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
rr) Hand Packed stone filling in back of walls including cost of all materials, royalty, T&P etc. complete as per direction of Engineer-in-charge. (As per PWD Uttarakhand specifications)	0.54%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
LONGITUDINAL DRAIN		
ss) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.02%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
tt) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications. PCC Grade M20 (p) Height upto 5m	0.07%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
5.0M HIGH ANCHORED CC CLADDING		
FROM CH.101.335 KM TO CH.101.425 KM		
uu) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.) ordinary soil, Manual Means (Depth upto 3 m to 6m).	0.00%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
vv) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.03%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
ww) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden / rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of	1.21%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.

cement grouting which will be paid extra as per relevant BOQ item.		
xx) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	0.20%	Unit of measurement is MT. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
yy) Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing.	0.12%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
zz) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M25 (p) Height upto 5m	1.04%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
aaa) Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical specifications	0.01%	Unit of measurement is Each. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
bbb) Providing and installing subsurface drainage pipes - Perforated PVC pipe (lined with Non -woven Geotextile) of 75 mm internal diameter as per the drawings etc. complete including the cost of drilling and as directed by Engineer -In -Charge.	0.10%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
PROVISION OF CULVERT AND CATCHPIT		
BOX CULVERT		
AT CH. 101.300 KM		
ccc) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m to 6m).	0.01%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
ddd) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14	0.01%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.

days.		
eee) Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications. RCC M25	0.10%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
fff) Supplying, fitting and placing HYSD bar reinforcement in open foundation complete as per drawing and technical specifications	0.07%	Unit of measurement is MT. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
BOX CULVERT		
AT CH. 101.320 KM		
ggg) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m to 6m).	0.01%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
hhh) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.01%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
iii) Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications. RCC M25	0.08%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
jjj) Supplying, fitting and placing HYSD bar reinforcement in open foundation complete as per drawing and technical specifications	0.06%	Unit of measurement is MT. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
FOR 2.0M WIDE CC CHANNEL		
AT CH. 101.300 KM & CH. 101.320 KM		
kkk) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m).	0.01%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
lll) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed,	0.01%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than

placed in foundation and compacted by vibration including curing for 14 days.		10% (ten percent) of the total qty.
mmm) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20 (p) Height upto 5m	0.04%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
nnn) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.05%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
ooo) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M25 ppp) (p) Height upto 5m	0.98%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
qqq) Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing.	0.02%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
rrr) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers,10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	0.57%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
sss) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	0.09%	Unit of measurement is MT. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
DEEP DRAINAGE HOLE SEMI PERFORATED PIPE		
ttt) Providing and installing subsurface drainage pipes - Perforated PVC pipe (lined with Non -woven Geotextile) of 75 mm internal diameter as per the drawings etc. complete including the cost of drilling and as directed by Engineer -In -Charge.	0.65%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
CONTOUR DRAIN		
uuu) Excavation for Structures	0.03%	Unit of measurement is Cum. Payment

(Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m).		shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
vvv) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.09%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
www) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20 (p) Height upto 5m	0.44%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
xxx) Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing.	0.02%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
<u>(H) Landslide Location Ch. 106.230 Km – Ch. 106.360 Km (NH-09)</u>		
EXCAVATION (CONSIDERING 60% ROCK & 40% SOIL)		
a) Excavation in Soil using Hydraulic Excavator and Tippers with disposal upto 1000 metres.(Excavation for roadwork in soil with` hydraulic excavator including cutting and loading in tippers, trimming bottom and side slopes, in accordance with requirements of lines, grades and cross sections, and transporting to the embankment location within all lifts and lead upto 1000m)	0.44%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
b) Excavation in Hard Rock (blasting prohibited) (Excavation for roadwork in Hard Rock (blasting prohibited) with hydraulic excavator including cutting and loading in tippers, trimming bottom and side slopes, in accordance with requirements of lines, grades and cross sections, and transporting to the embankment location within all lifts and lead upto 1000 m.)	4.81%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
PROVISION OF HT ROLLED CABLE NET WITH DT MESH		

FROM CH.106.300 KM TO CH.106.360 KM		
c) Supply and installation of high tensile rolled cable net with single/double knot connection having aperture size not more than 300mm in one direction and minimum longitudinal tensile strength 220 KN/M, and punching resistance 350 kN, comprising of minimum 10mm dia wire rope cable with steel core with a minimum breaking load of 63kN. The tensile strength of wire of the cable should be 1770 N/sqmm having corrosion protection of Zn Coating Class A or 95% Zn + 5% Al Class-B (Galfan) Coating as per IS/ISO-17746-2016 for treatment of slopes including all cost of material (net, boundary rope & rope anchor etc comprising of the complete system), labour, special labour and T&P required to complete the work in all respect in accordance with drawings, Technical Specifications and as per the direction of Engineer-in-charge. Product Manufacturer shall have in-house test facility for conducting longitudinal tensile strength and punching resistance test and shall be responsible for carrying out both test (longitudinal tensile strength and punching resistance) during PDI per lot in presence of representative/s of E-i-C on his own expenses.	5.32%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
d) Supply and fixing of Double Twisted Mesh including all cost of material, labour and T&P required to complete the work in all respect with following properties: a. Mesh type : 6x8, Mesh opening : 60mm X 80mm b. Mesh Wire dia. 2.2/3.2mm (ID/OD), mechanically edged/selvedged with galvanization as per EN 10223-3, and shall have minimum 16 numbers of mesh openings per meter of mesh perpendicular to twist. c. Tensile strength (500 Mpa) at a minimum elongation of 10%. The minimum tensile strength of the mesh panel must be 34.0 kN/m (+/-5kN/m) in the parallel to the twist direction and 13 kN/m in the perpendicular to the twist direction in accordance with the requirements of IS 16014:2018. d. Zinc Coating: The coating weight shall be heavily coated and soft type confirming to the requirements	0.91%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.

	of specifications IS 4826:1972. Adhesion of Zinc Coating: No flakes or crack shall be observed while testing for adhesion of zinc coating as per IS 4826:1972. * ID/OD - Internal diameter/Outer diameter of Polymer coated wire.		
e)	Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	10.33%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
f)	Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	1.70%	Unit of measurement is MT. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
	SHOTCRETE WITH 32.0 MM SOLID ANCHORS AT HILL SIDE		
	FROM CH.106.235 KM TO CH. 106.300 KM		
g)	Application of 150mm thick Shotcrete (M-25) in two layers 50mm each sandwiched with chain link fabric 50mmx50mm size including supply of all material for shot crete (Inclusive for rebound) and excluding the cost of chain link fabric, labour T&P etc. for proper completion of the work as per drawings, Technical Specifications and the direction of Engineer-in-charge.	5.00%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
h)	Supply and installation of Chain link fabric (2.7mm wire dia with zinc coating 240g/ sq.m) of 50X50 mm size (Fe 500) including 2mm dia binding wire or nuts, bolts and washers as required for proper completion of the work as per drawings, Technical Specifications and the direction of Engineer-in-charge. Made of G.I. wire of dia 2.7mm.for treatment of slopes as secondary mesh including all cost of material, labour, special labour and T&P required to complete the work in all respect as per drawings.	0.55%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
i)	Drilling of 76 mm dia. hole for installation of 32mm dia. Anchors in	3.65%	Unit of measurement is RM. Payment shall be made on pro rata basis on

rock by sufficient drilling equipment with necessary auxiliary equipment & accessories and including all cost of equipments, labour, materials & works connected with drilling.		completion of a stage of not less than 10% (ten percent) of the total qty.
j) Supply and installation of 32mm dia fully threaded rock anchors (Fe550D) including supply of all material, labour, t&p for proper completion of work.	2.41%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
k) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	0.18%	Unit of measurement is MT. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
PROVISION OF ROCKFALL BARRIER OF DIMENSION 30M LENGTH AND 6M HIGH		
l) Supply and installation of rock fall barrier (Category A), comprising of steel meshes and cables coated in Zn-Al 5% class A, with post to post distance of maximum 10m and energy absorption by deformation including all cost of material (consisting of posts, anchor bolts (6m deep in rock and 8 m deep in consolidated debris), plate for fixing anchor bolts, base anchors, cable anchors, cables/support ropes, clamps, retention panels, energy dissipaters etc.) , labour special labour, T&P required to complete the work in all respect as per drawings, Technical Specifications and the direction of Engineer-in-charge. ETAG 027/ EAD certified rock fall barrier shall be used. F. 6m high having minimum energy absorption in the entire system of 5000 K J	4.47%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
PROVISION OF 2 NO. OF DEBRIS FLOW BARRIER OF DIMENSION 15M LENGTH AND 6M HIGH		
m) Supply and installation of complete assembly upto 6.0 m high Debris Flow Barrier with double twisted mesh and high tensile wire mesh or high tensile ring net having Impact absorption energy of the system must be minimum of 150 KN/SQM in dynamic loading conditions and as per drawings, Technical Specifications and the direction of Engineer-in-charge. ETAG/ EAD certified debris flow barrier shall be used.Upto 15m span without middle post	5.13%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
FOR 2.0M WIDE CC CHANNEL		

AT CH 106.230M		
n) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.03%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
o) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20 (p) Height upto 5m	0.42%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
CC CHANNEL STEPS		
CC CHANNEL SIDE WALLS		
p) Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing.	0.01%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
q) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers,10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	2.37%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
r) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	0.39%	Unit of measurement is MT. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
CC CATCH PIT AT 106.230		
s) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m).	0.01%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
t) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed,	0.01%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.

	placed in foundation and compacted by vibration including curing for 14 days.		
u)	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20 (p) Height upto 5m	0.11%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
	6.0M HIGH ANCHORED CC GRAVITY WALL OVER BUNDLED SDRA		
v)	Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth upto 3 m).	0.65%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
w)	Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.25%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
x)	Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications. RCC M25	1.90%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
y)	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20 (p) Height upto 5m	8.83%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
z)	Supplying, fitting and placing HYSD bar reinforcement in open foundation complete as per drawing and technical specifications	1.12%	Unit of measurement is MT. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
aa)	Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers,10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	1.75%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
bb)	Supply and Installation of Self driven rock anchor made of 40CR	5.46%	Unit of measurement is RM. Payment shall be made on pro rata basis on

material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.		completion of a stage of not less than 10% (ten percent) of the total qty.
cc) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	1.19%	Unit of measurement is MT. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
dd) Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical specifications	0.03%	Unit of measurement is Each. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
ee) Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing.	0.20%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
45.0 M HIGH ANCHORED CC CLADDING		
FROM CH. 106.260 KM TO CH. 106.305 KM		
ff) Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)ordinary soil,Manual Means (Depth above 6m).	0.75%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
gg) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.	0.04%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
hh) Plain/Reinforced cement concrete in open foundation complete as per drawing and technical	0.30%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than

specifications. RCC M25		10% (ten percent) of the total qty.
ii) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications. PCC Grade M20 (p) Height upto 5m	17.71%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
jj) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	6.69%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
kk) Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden /rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.	2.19%	Unit of measurement is RM. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
ll) Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.	1.46%	Unit of measurement is MT. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
mm) Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia PVC/AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical specifications	0.08%	Unit of measurement is Each. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
nn) Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing.	0.40%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
CONTOUR DRAIN		
oo) Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed,	0.12%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than

placed in foundation and compacted by vibration including curing for 14 days.		10% (ten percent) of the total qty.
pp) Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications.PCC Grade M20 (p) Height upto 5m	0.60%	Unit of measurement is Cum. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.
qq) Supplying and fixing 10 Gauge weld mesh of size 100mm x100 mm for floor/ roof slab concrete screed over the micro beams as reinforcement. The weld mesh shall be fixed as per drawing.	0.03%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage of not less than 10% (ten percent) of the total qty.

Note : (1) In case of innovative Major Bridge Projects like cable suspension/cable stayed and exceptionally long span bridges, the schedule may be modified as per site requirements before bidding with due approval of Competent Authority.

(2) The Schedule for exclusive Tunnel Projects site requirements before bidding with due approval of Competent Authority.

(3) (a) In order to maintain cash flow in the project, the Authority shall also make interim monthly payments to the Contractor for the work done during the month for which the corresponding stage, as mentioned in Schedule-H, has not been achieved. Such work shall be measured, in a length, number, area, volume or weight as specified in corresponding stage of Schedule-H and valued in accordance with the proportion of the weightage of Contract Price assigned to that stage in Schedule-H. 90% of value of such work shall be paid as an Interim Monthly Payment' under clause 19.3 (1) of Contract Agreement.

(b) For Pre cast/ pre-fabricated elements to be used in permanent works, interim payments to be made @ 75% of cost of that element (to be derived from MoRT&H data book) as per schedule H.

(c) Upon completion of the defined 'stage', a reconciliation of the interim payments shall be carried out, and any balance amount shall be paid. For the avoidance of doubt, it is clarified that the interim monthly payments are made solely to maintain cash flow in the project. In the event of termination of the project, under Clause23.1, 23.2 or 23,3, as the case may be, such interim payments shall be dealt with as per Clause 23.5 (i) (b) of the Contract Agreement.

1.3.5 Deletion of Clause 19.20 (Bonus for Early Completion): In compliance with Para 4.2 of the MoRT&H Hilly Terrain Contractual Guidelines dated 07.11.2025, the standard provision concerning a Bonus for Early Completion' is hereby completely deleted for this project. No financial premium, cash incentive, or accelerated payment triggers shall be applied to any milestones."

SCHEDULE - I
(See Clause 10.2 (iv))

DRAWINGS

1 Drawings

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

2 Additional Drawings

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

Annex - I
(Schedule - I)

List of Drawings

A broad list of the drawings of the various components/elements of the Project Highway and project facilities required to be submitted by the Concessionaire is given below:

Various drawings as listed below shall be prepared strictly as per the specifications given in the bid document and latest IRC/MORT&H/BIS provisions and specifications.

1. Structural drawings.

Note:- i) Structural drawings shall be supported with the design calculations as per the latest Codal provisions.

SCHEDULE - J
(See Clause 10.3 (ii))
PROJECT COMPLETION SCHEDULE

1 Project Completion Schedule

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

2 Project Milestone-I

- (i) Project Milestone-I shall occur on the date falling on **the 255th (Two Hundred Fifty-Five)** day from the Appointed Date (the **"Project Milestone-I"**).
- (ii) Prior to the occurrence of Project Milestone-I, the Contractor shall have commenced construction of the Project Highway and submitted to the Authority duly and validly prepared Stage Payment Statements for an amount not less than **10% (Ten percent)** of the Contract Price.
- (iii) Addition for Hill Road Projects: Completed 100% of the pre-construction UAV/LIDAR topographical strip surveys, completed the sealing of all identified ground tension cracks within the 300-meter influence zone, and completed not less than 10% of the firmed-up subsurface slope stabilization works (soil nails, rock bolts, active anchors).

3 Project Milestone-II

- (i) Project Milestone-II shall occur on the date falling on **the 438th (Four Hundred Thirty Eight)** day from the Appointed Date (the **"Project Milestone-II"**).
- (ii) Prior to the occurrence of Project Milestone-II, the Contractor shall have continued with construction of the Project Highway and submitted to the Authority duly and validly prepared Stage Payment Statements for an amount not less than **35% (Thirty Five percent)** of the Contract Price.
- (iii) Addition for Hill Road Projects: Provided always that the startup of bridge abutments, high fills, or valley-side approaches in mountainous stretches is strictly contingent upon the respective founding slopes being certified as fully stabilized. Furthermore, the Contractor must demonstrate 100% physical completion of slope profiling and cutting works for the designated first-stage road length."

4 Project Milestone-III

- (i) Project Milestone-III shall occur on the date falling on the **620th (Six Hundred Twenty)** 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 an amount not less than **70% (Seventy percent)** of the Contract Price

5 Scheduled Completion Date

- (i) The Scheduled Completion Date shall occur on the **730th (Seven Hundred Thirty)** day from the Appointed Date.
- (ii) On or before the Scheduled Completion Date, the Contractor shall have completed construction in accordance with this Agreement.

6 Extension of time

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

SCHEDULE - K

(See Clause 12.1 (ii))

Tests on Completion

1. Schedule for Tests

- (i) The Contractor shall, no later than 30 (thirty) days prior to the likely completion of construction, notify the Authority's Engineer and the Authority of its intent to subject the Project Highway to Tests, and no later than 10 (ten) days prior to the actual date of Tests, furnish to the Authority's Engineer and the Authority detailed inventory and particulars of all works and equipment forming part of Works.
- (ii) The Contractor shall notify the Authority's Engineer of its readiness to subject the Project Highway to Tests at any time after 10 (ten) days from the date of such notice, and upon receipt of such notice, the Authority's Engineer shall, in consultation with the Contractor, determine the date and time for each Test and notify the same to the Authority who may designate its representative to witness the Tests. The Authority's Engineer shall thereupon conduct the Tests itself or cause any of the Tests to be conducted in accordance with Article 12 and this Schedule-K.

2. Tests

- (i) Visual and physical test: The Authority's Engineer shall conduct a visual and physical check of construction to determine that all works and equipment forming part thereof conform to the provisions of this Agreement. The physical tests shall include [***].
- (ii) Riding quality test: Riding quality of each lane of the carriageway shall be checked with the help of a Network Survey Vehicle (NSV) fitted with latest equipments and the maximum permissible roughness for purposes of this Test shall be [2,000 (two thousand)] mm for each kilometre.
- (iii) Tests for bridges: All major and minor bridges shall be subjected to the rebound hammer and ultrasonic pulse velocity tests, to be conducted in accordance with the procedure described in Special Report No. 17: 1996 of the IRC Highway Research Board on Nondestructive Testing Techniques, at two spots in every span, to be chosen at random by the Authority's Engineer. Bridges with a span of 15 (fifteen) metres or more shall also be subjected to load testing.
- (iv) Other tests: The Authority's Engineer may require the Contractor to carry out or cause to be carried additional tests, in accordance with Good Industry Practice, for determining the compliance of the Project Highway with Specifications and Standards, except tests as specified in clause 5,

but shall include measuring the reflectivity of road markings and road signs; and measuring the illumination level (lux) of lighting using requisite testing equipment.

- (v) Environmental audit: The Authority's Engineer shall carry out a check to determine conformity of the Project Highway with the environmental requirements set forth in Applicable Laws and Applicable Permits.
- (vi) Safety Audit: The Authority's Engineer shall carry out, or cause to be carried out, a safety audit to determine conformity of the Project Highway with the safety requirements and Good Industry Practice.

3. Agency for conducting Tests

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

4. Completion Certificate

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

5. DELETED

SCHEDULE-L

(See Clause 12.2)

Completion Certificate

- 1 I, (Name of the Authority's Engineer), acting as the Authority's Engineer, under and in accordance with the Agreement dated (the "**Agreement**"), for "**TREATMENT OF 03 LANDSLIDE LOCATIONS (CH. 4.680 KM TO CH. 4.880 KM, CH. 4.890 KM TO CH. 5.250 KM AND CH. 5.733 KM TO CH. 5.833 KM NEAR TINTOLA) IN TAWAGHAT – GHATIABAGARH SECTION OF NH-09 (OLD NH-125) IN THE STATE OF UTTARAKHAND ON EPC MODE**" on Engineering, Procurement and Construction (EPC) basis through (Name of Contractor), hereby certify that the Tests in accordance with Article 12 of the Agreement have been successfully undertaken to determine compliance of the Project Highway with the provisions of the Agreement, and I am satisfied that the Project Highway can be safely and reliably placed in service of the Users thereof.
- 2 It is certified that, in terms of the aforesaid Agreement, all works forming part of Project Highway have been completed, and the Project Highway is hereby declared fit for entry into operation on this the day of 20....., Scheduled Completed Date for which was the day of20.....

SIGNED, SEALED AND DELIVERED

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

(Signature)

(Name)

(Designation) (Address)

SCHEDULE -M**(See Clauses 14.6, 15.2 and 19.7)****PAYMENT REDUCTION FOR NON-COMPLIANCE****1. Payment Reduction for Non-compliance with the Maintenance Requirements**

- (i) Monthly lump sum payments for maintenance shall be reduced in the case of non-compliance with the Maintenance Requirements set forth in Schedule-E.
- (ii) Any deduction made on account of non-compliance with the Maintenance Requirements shall not be paid even after compliance subsequently. The deductions shall continue to be made every month until compliance is done.
- (iii) The Authority's Engineer shall calculate the amount of payment reduction on the basis of weightage in percentage assigned to non-conforming items as given in Paragraph 2.

2. Percentage Reductions in Lump Sum Payments

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

Sr. No.	Item/Defect/Deficiency	Percentage
(a)	Carriageway/Pavement	
(i)	Potholes, cracks, other surface defects	
(ii)	Repairs of Edges, Rutting	
(b)	Road, Embankment, Cuttings, Shoulders	
(i)	Edge drop, inadequate cross-fall, undulations, settlement, potholes, ponding, obstructions	
(ii)	Deficient slopes, rain-cuts, disturbed pitching, vegetation growth, pruning of trees	
(c)	Bridges and Culverts	
(i)	Desilting, cleaning, vegetation growth, damaged pitching, flooring, parapets, wearing course, footpaths, any damage to foundations	
(ii)	Any Defects in superstructures, bearings and sub-structures	
(iii)	Painting, repairs/replacement kerbs, railings, parapets, guideposts/crash barriers	
(d)	Roadside Drains	
(i)	Cleaning and repair of drains	
(e)	Road Furniture	
(i)	Cleaning, painting, replacement of road signs, delineators, road markings, 200 m/Km/5 th Km stones	
(f)	Miscellaneous Items	

Sr. No.	Item/Defect/Deficiency	Percentage
(i)	Removal of dead animals, broken down/accidented vehicles, fallen trees, road blockades or malfunctioning of mobile crane	
(ii)	Any other Defects in accordance with paragraph 1.	
(g)	Defects in Other Project Facilities / Slope Protection works	100%

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

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

Where,

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

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

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

L1 = Non-complying length

L = Total length of the road,

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

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

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

SCHEDULE - N

(See Clause 18.1.(i))

SELECTION OF AUTHORITY'S ENGINEER

1 Selection of Authority's Engineer

- (i) The provisions of the Model Request for Proposal for Selection of Technical Consultants, issued by the Ministry of Finance in May 2009, or any substitute thereof shall apply for selection of an experienced firm to discharge the functions and duties of an Authority's Engineer.
- (ii) In the event of termination of the Technical Consultants appointed in accordance with the provisions of Paragraph 1.1, the Authority shall appoint another firm of Technical Consultants forthwith and may engage a government-owned entity in accordance with the provisions of Paragraph 3 of this Schedule-N.

2 Terms of Reference

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

3 Appointment of Government Entity as Authority's Engineer

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

Annex – I

(Schedule - N)

TERMS OF REFERENCE FOR AUTHORITY'S ENGINEER

1 Scope

(i) These Terms of Reference (the “**TOR**”) for the Authority's Engineer are being specified pursuant to the EPC Agreement dated (the “**Agreement**”), which has been entered into between the [name and address of the Authority] (the “**Authority**”) and (the “**Contractor**”)[#] for “**Treatment of 06 landslide location (Ch. 73.270 to 73.370 near Ghagra, Ch. 81.450 to 81.755 near Kalika, Ch. 94.720 to 94.830 near Tapowan, Ch. 97.040 to 97.415 near Dobat, Ch. 100.465 to 101.425 near Jumma, Ch. 106.230 to 106.360 near Tawaghat) in Pithoragarh - Tawaghat section of NH-09 (Old NH-125) in the State of Uttarakhand on EPC Mode.**” on Engineering, Procurement, Construction (EPC) basis, and a copy of which is annexed hereto and marked as Annex-A to form part of this TOR.

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

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

2 Definitions and Interpretation

- (i) The words and expressions beginning with or in capital letters and not defined herein but defined in the Agreement shall have, unless repugnant to the context, the meaning respectively assigned to them in the Agreement.
- (ii) References to Articles, Clauses and Schedules in this TOR shall, except where the context otherwise requires, be deemed to be references to the Articles, Clauses and Schedules of the Agreement, and references to Paragraphs shall be deemed to be references to Paragraphs of this TOR.
- (iii) The rules of interpretation stated in Article 1 of the Agreement shall apply, *mutatis mutandis*, to this TOR.

3 General

- (i) The Authority Engineer shall discharge its duties in a fair, impartial and efficient manner, consistent with the highest standards of professional integrity and Good Industry Practice.
- (ii) The Authority's Engineer shall perform the duties and exercise the authority in accordance with the provisions of this Agreement, but subject to obtaining prior written approval of the Authority before determining:
 - (a) any Time Extension;

- (b) any additional cost to be paid by the Authority to the Contractor;
 - (c) the Termination Payment; or
 - (d) issuance of Completion Certificate or
 - (e) any other matter which is not specified in (a), (b), (c) or (d) above and which creates a financial liability on either Party
- (iii) The Authority's Engineer shall submit regular periodic reports, at least once every month, to the Authority in respect of its duties and functions under this Agreement. Such reports shall be submitted by the Authority's Engineer within 10 (ten) days of the beginning of every month.
- (iv) The Authority's Engineer shall inform the Contractor of any delegation of its duties and responsibilities to its suitably qualified and experienced personnel; provided, however, that it shall not delegate the authority to refer any matter for the Authority's prior approval in accordance with the provisions of Clause 18.2.
- (v) The Authority's Engineer shall aid and advise the Authority on any proposal for Change of Scope under Article 13.
- (vi) In the event of any disagreement between the Parties regarding the meaning, scope and nature of Good Industry Practice, as set forth in any provision of the Agreement, the Authority's Engineer shall specify such meaning, scope and nature by issuing a reasoned written statement relying on good industry practice and authentic literature.

4. Construction Period

- (i) During the Construction Period, the Authority's Engineer shall review and approve the Drawings furnished by the Contractor along with supporting data, including the geo-technical and hydrological investigations, characteristics of materials from borrow areas and quarry sites, topographical surveys, and the recommendations of the Safety Consultant in accordance with the provisions of Clause 10.1 (vi). The Authority's Engineer shall complete such review and approval and send its observations to the Authority and the Contractor within 15 (fifteen) days of receipt of such Drawings; provided, however that in case of a Major Bridge or Structure, the aforesaid period of 15 (fifteen) days may be extended upto 30 (thirty) days. In particular, such comments shall specify the conformity or otherwise of such Drawings with the Scope of the Project and Specifications and Standards.
- (ii) The Authority's Engineer shall review and approve any revised Drawings sent to it by the Contractor and furnish its comments within 10 (ten) days of receiving such Drawings.
- (iii) The Authority's Engineer shall review and approve the Quality Assurance Plan submitted by the Contractor and shall convey its

comments to the Contractor within a period of 21 (twenty one) days stating the modifications, if any, required thereto.

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

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

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

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

(iii) 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.

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

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

- (vi) The timing of tests referred to in Paragraph 4 (ix), and the criteria for acceptance/ rejection of their results shall be determined by the Authority's Engineer in accordance with the Quality Control Manuals. The tests shall be undertaken on a random sample basis and shall be in addition to, and independent of, the tests that may be carried out by the Contractor for its own quality assurance in accordance with Good Industry Practice.
- (vii) 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.
- (viii) 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.
- (ix) 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.
- (x) The Authority's Engineer shall obtain from the Contractor a copy of all the Contractor's quality control records and documents before the Completion Certificate is issued pursuant to Clause 12.2.
- (xi) 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.
- (xii) 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.

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

5. Maintenance Period

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

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

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

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

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

6. Determination of costs and time

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

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

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

7. Payments

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

(ii) Authority's Engineer shall -

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

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

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

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

8. Other duties and functions

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

9, Miscellaneous

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

Engineer thereon, shall be furnished by the Authority's Engineer to the Authority forthwith.

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

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

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

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

SCHEDULE -O

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

FORMS OF PAYMENT STATEMENTS

1. Stage Payment Statement for Works

The Stage Payment Statement for Works shall state:

- (a) the estimated amount for the Works executed in accordance with Clause 19.3.(i) subsequent to the last claim;
- (b) amounts reflecting adjustments in price for the aforesaid claim;
- (c) the estimated amount of each Change of Scope Order executed subsequent to the last claim;
- (d) amounts reflecting adjustment in price, if any, for (c) above in accordance with the provisions of Clause 13.2.(iii) (a);
- (e) total of (a), (b), (c) and (d) above;
- (f) Deductions:
 - (i) Any amount to be deducted in accordance with the provisions of the Agreement except taxes;
 - (ii) Any amount towards deduction of taxes; and
 - (iii) Total of (i) and (ii) above.
- (g) Net claim: (e) – (f) (iii);
- (h) The amounts received by the Contractor upto the last claim:
 - (i) For the Works executed (excluding Change of Scope orders);
 - (ii) For Change of Scope Orders, and
 - (iii) Taxes deducted

2. Monthly Maintenance Payment Statement

The monthly Statement for Maintenance Payment shall state:

- (a) the monthly payment admissible in accordance with the provisions of the Agreement;
- (b) the deductions for maintenance work not done;
- (c) net payment for maintenance due, (a) minus (b);
- (d) amounts reflecting adjustments in price under Clause 19.12; and
- (e) amount towards deduction of taxes

3. Contractor's Claim for Damages

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

SCHEDULE -P
(See Clause 20.1)

INSURANCE

1. Insurance during Construction Period

- (i) The Contractor shall effect and maintain at its own cost, from the Appointed Date till the date of issue of the Completion Certificate, the following insurances for any loss or damage occurring on account of Non Political Event of Force Majeure, malicious act, accidental damage, explosion, fire and terrorism:
 - (a) insurance of Works, Plant and Materials and an additional sum of [15 (fifteen)] per cent of such replacement cost to cover any additional costs of and incidental to the rectification of loss or damage including professional fees and the cost of demolishing and removing any part of the Works and of removing debris of whatsoever nature; and
 - (b) Insurance for the Contractor's equipment and Documents brought onto the Site by the Contractor, for a sum sufficient to provide for their replacement at the Site.
- (ii) The insurance under sub para (a) and (b) of paragraph 1(i) above shall cover the Authority and the Contractor against all loss or damage from any cause arising under paragraph 1.1 other than risks which are not insurable at commercial terms

2. Insurance for Contractor's Defects Liability

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

3. Insurance against Injury to Persons and Damage to Property

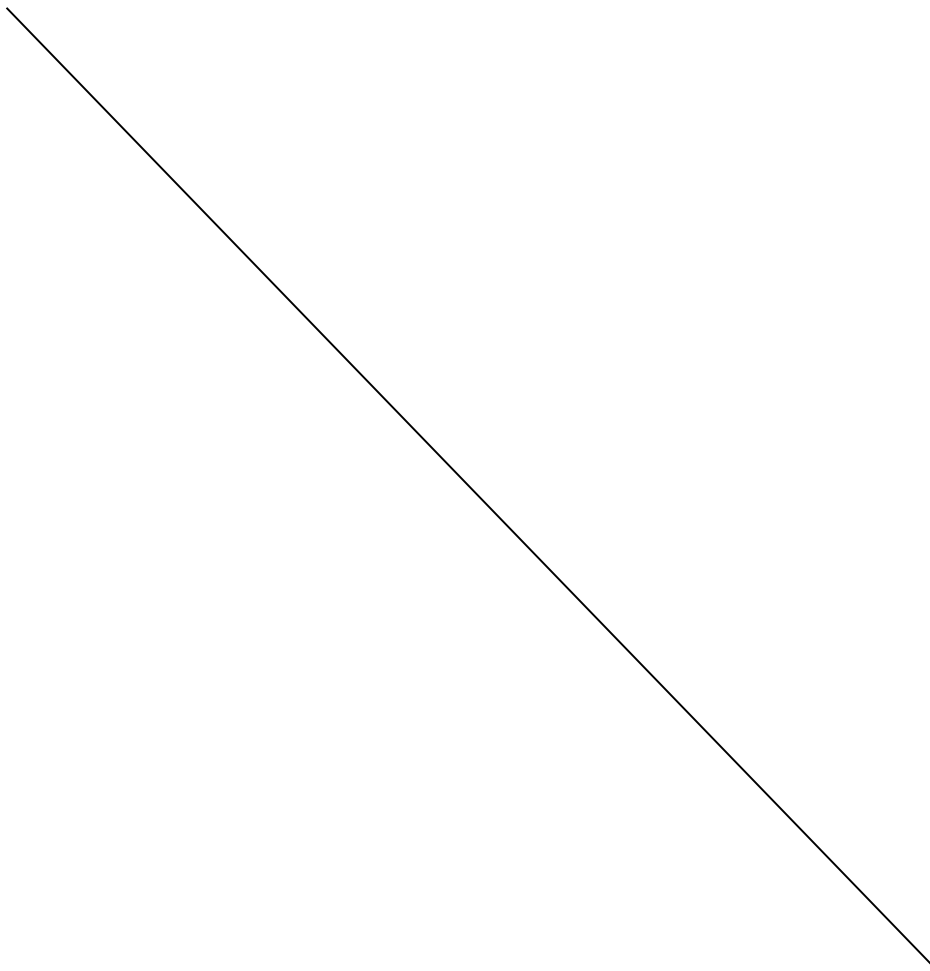
- (i) The Contractor shall insure against its liability for any loss, damage, death or bodily injury, or damage to any property (except things insured under Paragraphs 1 and 2 of this Schedule or to any person (except persons insured under Clause 20.9), which may arise out of the Contractor's performance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

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

- (ii) The insurance shall be extended to cover liability for all loss and damage to the Authority's property arising out of the Contractor's performance of this Agreement excluding:
 - (a) the Authority's right to have the construction works executed on, over, under, in or through any land, and to occupy this land for the Works; and
 - (b) damage which is an unavoidable result of the Contractor's obligations to execute the Works.

4. Insurance to be in Joint Names

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



SCHEDULE-Q

(See Clause 14.10)

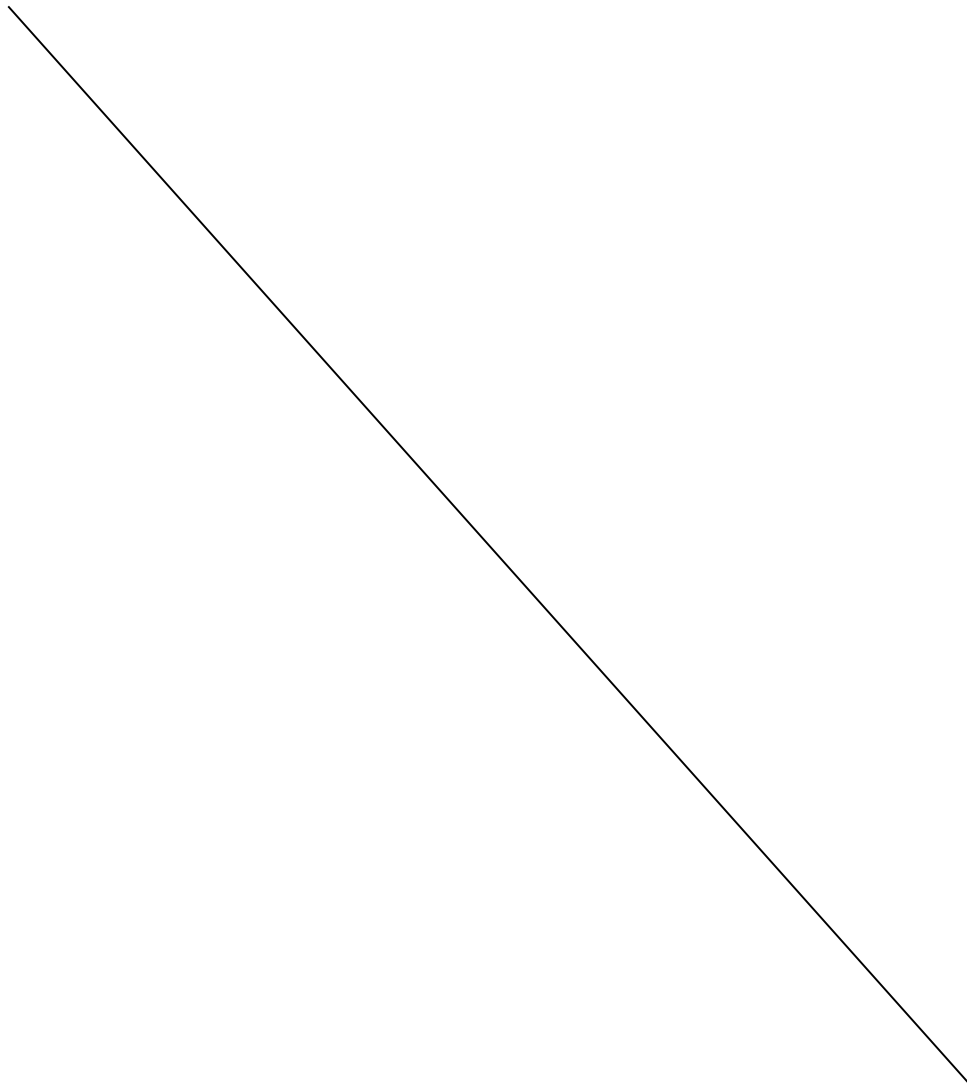
Tests on Completion of Maintenance Period

1. Riding Quality test:

DELETED

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.



SCHEDULE-R

(See Clause 14.10)

Taking Over Certificate

I, (Name and designation of the Authority's Representative) under **"Treatment of 06 landslide location (Ch. 73.270 to 73.370 near Ghagra, Ch. 81.450 to 81.755 near Kalika, Ch. 94.720 to 94.830 near Tapowan, Ch. 97.040 to 97.415 near Dobat, Ch. 100.465 to 101.425 near Jumma, Ch. 106.230 to 106.360 near Tawaghat) in Pithoragarh - Tawaghat section of NH-09 (Old NH-125) in the State of Uttarakhand on EPC Mode."** 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)

SCHEDULE (S)
(See Clause 26.1 (iii))

Procedure for Dispute Resolution Board

The parties to the Contract Agreement mutually agree as follows :

- (1) The Board shall comprise of three Members having experience in the field of construction or have been involved in the Works related to construction and with the interpretation of contractual documents. One Member shall be selected by each of the Employer and the Contractor from the list maintained by NHAI hosted on its website (www.nhai.gov.in). In the event the parties fail to select the member within 28 days of the date of the signing of Contract Agreement, in that eventuality, upon the request of either or both parties such Member shall be selected by SAROD within 14 days. The third Member shall be selected by the other two members from the same list. If the two Members selected by or on behalf of the parties fail to select the third Member within 14 days after the later of their selections, then upon the request of either or both parties such third Member shall be selected by SAROD within 14 days. The third Member shall serve as Chairman of the Board.
- (2) The Board shall be constituted when each of the three Board Members has signed a Board Members declaration of Acceptance as required by the DRB's rules and procedures (which, along with the declaration of acceptance form are attached as Annexure herewith).
- (3) In the event of death, disability, or resignation of any Member, such Members shall be replaced in the same manner as the Member being replaced was selected. If for any other reason, a Member fails or is unable to serve, the Chairman (or failing the action of the Chairman then either of the other members) shall inform the Parties and such non-serving Member shall be replaced in the same manner as the Member being replaced was selected. Any replacement made by the parties shall be completed within 28 days after the event giving rise to the vacancy of the Board, failing which the replacement shall be made by SAROD in the same manner as described above. Replacement shall be considered complete when the new Member signs the Board Member's Declaration of Acceptance. Throughout any replacement process, the Members not being replaced shall continue to serve and the Board shall continue to function and its activities shall have the

same force and effect as if the vacancy had not occurred, provided, however, that the Board shall not conduct a hearing nor issue a decision until the replacement is completed.

- (4) If either the Employer or the Contractor is dissatisfied with any decision of the Board, and/or if the Board fails to issue its decision within 56 days after receipt of all the pleadings (alongwith the supporting documents) of the parties by the Chairman of the Board or any extension mutually agreed upon by the Employer and the Contractor, in such a case, either the Employer or the Contractor may, within 28 days after his receipt of the decision, or within 28 days after the expiry of the said period, as the case may be, give notice to the other party, with a copy for information to the Authority engineer, of his intention to refer the matter to the Conciliation Committee of Independent Experts (CCIE) of the Authority for Conciliation/amicable settlement.
- (5) It is mandatory to refer all the disputes to DRB before issuance of completion certificate and satisfactory completion of punch list items. No dispute shall be entertained after completion of aforementioned date.
- (6) If the Board has issued a decision to the employer and the Contractor within the said 56 days or any extension mutually agreed upon by the Employer and the Contractor and no notice of intention to commence Conciliation by the Conciliation Committee of Independent Experts (CCIE) of the Authority for Conciliation/amicable settlement as to such dispute has been given by either the Employer or the Contractor within 28 days after the parties received such decision from the Boards, the decision shall become final and binding upon the employer and Contractor.
- (7) Whether or not it has become final and binding upon the Employer and the Contractor, a decision shall be admissible as evidence in any subsequent dispute resolution procedure, including any arbitration or litigation having any relation to the dispute to which the decision relates.
- (8) All decision of DRB which have become final and binding or till they have been reversed in subsequent conciliation/Arbitration process shall be implemented by the parties forthwith. Such implementation shall also include any relevant action of the Authority engineer.

- (9) If during the Contract period, the Employer and the Contractor are of the opinion that the Disputes Resolution Board is not performing its functions properly, the Employer and the Contractor may together disband the Disputes Resolution Board and reconstitute it. In that case, a new board shall be selected in accordance with the provisions applying to the selection of the original Board as specified above, except that words “within 28 days after the signing of this Contract Agreements” shall be replaced by the words “within 28 days after the date on which the notice disbanding the original Board become effective”.
- (10) The Employer and the Contractor shall jointly sign a notice specifying that the Board shall stand disbanded with effect from the date specified in the notice. The notice shall be posted by email to each Member of the Board. A Member shall be deemed to have received the email even if he refuses to have received the same.
- (11) All other terms and conditions of the original Contract Agreement shall remain unaltered/unaffected and the parties shall remain bound by terms and conditions as contained therein.

Annexure to Schedule (S)
Disputes Resolution Board's Rules and Procedures

1. Except for providing the services required hereunder, the Board Members shall not give any advice to either party or to the Authority engineer concerning conduct of the Works. The Board Members:
 - (a) Shall have no financial interest in any party to the Contract, or the Authority engineer, or a financial interest in the contract except for payment for services on the Board.
 - (b) Shall have had no previous employment by, or financial ties to, any party to the Contract Agreement, or the Authority engineer, except for fee based consulting services/advisers on other projects, and/or be Retired Government Officers (not connected in whole or part with the project), all of which must be disclosed in writing to both parties prior to appointment to the Board.
 - (c) Shall have disclosed in writing to both parties prior to appointment to the Board any and all recent or close professional or personal relationships with any director, officer, or employee of any party to the Contract, or the Authority engineer, and any and all prior involvement in the project to which the Contract relates;
 - (d) Shall not, while Board member, be employed whether as a consultant or adviser or otherwise by either party to the Contract, or the Authority engineer, except as a board member, without the prior consent of the parties and the other Board Members;
 - (e) Shall not, while a Board Member, engage in discussion or make any agreement with any party to the Contract, or with the Authority engineer, regarding employment whether as a consultant or otherwise whether after the Contract is completed or after service as a Board Member is completed.
 - (f) Shall remain and be impartial and independent of the parties and shall disclose in writing to the Employer, the Contractor and one another any fact or circumstance which might be such as to cause either the Employer or the Contractor to question the continued existence of the impartiality and independence required of Board Members; and
 - (g) Shall be fluent in the language of the Contract.
2. Except for its participation in the Board's activities as provided in the Contract Agreement and in this Agreement none of the Employer, the Contractor, and or the Authority engineer shall solicit advice or consultation from the Board or the Board Members on matters dealing with the conduct of the Works.
3. The Contractor shall:
 - (a) Furnish to each Board member one copy of all documents which the Board may request including Contract Agreement, progress reports and other documents pertinent to the performance of the Contract Agreement.

- (b) In cooperation with the Employer, coordinate the site visits of the Board, including Conference facilities, and secretarial and copying service.
- 4. The Board shall begin its activities following the signing of a Board Member's Declaration of Acceptance by all three Board Members, and it shall terminate these activities as set forth below:
 - (a) The Board shall terminate its regular activities when either (I) issuance of completion certificate and completion of punch list items or (II) the parties have terminated the contract and when, in either case, the Board has communicated to the parties and the Authority engineer its decision on all disputes previously referred to it.
 - (b) Once the Board has terminated its regular activities as provided by the previous paragraph, the Board shall remain available to process any dispute referred to it by either party. In case of such a referral, Board Members shall receive payments as provided in paragraphs 7 (a) (ii), (iii) and (iv).
- 5. Board Members shall not assign or subcontract any of their works under these Rules and Procedures.
- 6. The Board Members are Independent and not employees or agents of either the Employer or the Contractor.
- 7. Payments to the Board Members for their services shall be governed by the following provisions
 - (a) Each Board Member will receive payments as follows:
 - i. A retainer fee per calendar month as specified in the schedule of fee made part of this Schedule and its revision from time to time. This retainer fee shall be considered as payment in full for:
 - (A) Being available, on 7 days' notice, for all hearings, Sites, and other meetings of the Board.
 - (B) Being available, on 7 days' notice, for all hearing, and maintaining relevant files.
 - (C) All officer and overhead expenses such as secretarial services, photocopying and office supplies (but not include telephone calls, faxes and telexes) INCURRED IN CONNECTION WITH THE DUTIES AS A Board Member.
 - ii. A daily fee as specified in the schedule of fee in respect of fee for site visit & meeting, fee for meeting/hearing not at site and extra charges for days (max. of 02 days for travel on each occasion) other than hearing/meeting days.
 - iii. Expenses, in addition to the above, all reasonable and necessary travel expenses (including economy class air fare, subsistence, and other direct travel expenses).Receipts for all expenses in excess of Rs. 2000/- (Rupees Two Thousand only) shall be provided.

- iv. Reimbursement of any taxes that may be levied on payments made to the Board Member pursuant to this paragraph 7.
- (b) The retainer fee and other fees shall remain fixed for the period of each Board Member's term until revised by NHAI.
- (c) Phasing out of monthly retainer fee, Beginning with the next month after the completion certificate (or, if there are more than one, the one issued last) has been issued, the Board members shall receive only one-third of the monthly retainer fee till next one year. Beginning with the next month after the Board has terminated its regular activities pursuant to paragraph 4 (a) above, the Board members shall no longer receive any monthly retainer fee.
- (d) Payments to the Board Members shall be shared equally by the Employer and the Contractor. The concerned Project Implementation Unit (PIU) of Employer shall pay members' invoices within 30 calendar days after receipt of such invoices and shall invoice the Contractor for one-half of the amounts of such invoices. The Contractor shall pay such invoices within 30 days' time period after receipt of such invoices.

8. Board site visits:

- (a) The Board shall visit the Site and meet the representatives of the Employer and the Contractor and the Authority engineer at regular intervals, at times of critical construction events, at the written request of either party, and in any case not less than 6 times in any period of 12 months. The timing of Site visits shall be as agreed among the Employer, the Contractor and the Board, but failing agreement shall be fixed by the Board.
- (b) Site visits shall include an informal discussion of the status of the construction of the Works. Site visits shall be attended by personnel from the Employer, the Contractor and the Authority engineer.
- (c) At the conclusion of such Site visit, the Board shall prepare a report covering its activities during the visit and shall send copies to the parties and to the Authority engineer.

9. Procedure for Dispute Referral to the Board:

- (a) If either party objects to any action or inaction of the other party or the Authority engineer, the objecting party may file a written Notice of Dispute to the other party with a copy to the Authority engineer stating that it is given pursuant to the Agreement and state clearly and in details the basis of the dispute
- (b) The party receiving the Notice of Dispute will consider it and respond to it in writing within 14 days after receipt.
- (c) This response shall be final and conclusive on the subject, unless a written appeal to the response is filed with the responding party within 10 days after receiving the response and call upon Authority engineer to mediate and assist the parties in arriving an amicable

settlement thereof. Both parties are encouraged to pursue the matter further to attempt to settle the dispute.

- (d) If the Authority engineer receiving the Notice of Dispute fails to provide a written response within 14 days after receipt of such Notice or failing mediation by Authority engineer, either party may require such dispute to be referred to the Board, either party may refer the dispute to the Board by written Request to the Board. The Request for decision shall state clearly and in full detail the specific issues of the dispute (s) to be considered by Board and shall be addressed to the Chairman of the Board, with copies to the other Board Members, the other party, and the Authority engineer and it shall state that it is made pursuant to this Agreement.
- (e) When a dispute is referred to the Board, and the Board is satisfied that the dispute requires the Board's assistance, the Board decides when to conduct a hearing on the dispute. The Board may request that written documentation and arguments from both parties be submitted to each Board Member before the hearing begins. The parties shall submit insofar as possible agreed statements of the relevant facts.
- (f) During the hearing, the Contractor, the Employer, and the Authority engineer shall each have ample opportunity to be heard and to offer evidence. The Board's decision for resolution of the dispute will be given in writing to the Employer, the Contractor and the Authority engineer as soon as possible, and in any event not more than 56 days or any mutually extended period between the Employer and the Contractor. The time period of 55 days of issuance of DRB decision will reckon/start from the day of first hearing that begins after submission of complete pleadings (including supporting documents, if any) by the parties.

10. Conduct of Hearings:

- (a) Normally hearings will be conducted at the Site, but any location that would be more convenient and still provide all required facilities and access to necessary documentation may be utilized by the Board. Private session of the Board may be held at any cost effective location convenient to the Board. Video recordings of all hearings shall invariably be made
- (b) The Employer, the Authority engineer and the Contractor shall be given opportunity to have representatives at all hearings. Parties should refrain to bring any Advocate/Law Firm during DRB hearings.
- (c) During the hearings, no Board Member shall express any opinion concerning the merit of the respective agreements of the parties.
- (d) After the hearings are concluded, the Board shall meet privately to formulate its decision. The private meeting (s) of the Board shall not exceed 3 sittings. All Board deliberations shall be conducted in private, with all Members' individual views kept strictly confidential. The Board's decisions, together with an explanation of its reasoning shall be submitted in writing to both parties and to the Authority engineer. The decision shall be based on the pertinent contract

provisions, applicable laws and regulations and the facts and circumstances involved in the dispute.

- (e) The Board shall make every effort to reach a unanimous decision. If this proves impossible the majority shall decide and the dissenting Member may prepare a written minority report together with an explanation of its reasoning for submission to both parties and to the Authority engineer.
11. In all procedural matters, including the furnishing of written documents and arguments relating to disputes, site visits and conduct of hearings, the Board shall have full and the final authority. If a unanimous decision on any such matter proves impossible, the majority shall prevail.
 12. After having been selected and where necessary approved each Board Member shall sign two copies of the following declaration and make one copy available each to the Employer and to the Contractor.

"BOARD MEMBER'S DECLARATION OF ACCEPTANCE"

WHEREAS

- (a) A Contract agreement (the Contract) for the _____ project [fill in the name of project] has been signed on _____ (fill in date) between _____ [name of Employer] and _____ (name of Contractor);
- (b) The provisions of Agreement and Dispute Resolution Board's rules and procedure provided for establishment and operation of Dispute Resolution Board (DRB).
- (c) The undersigned has been selected to serve as a Board Member on said Board;

NOW THEREFORE, the undersigned Board Member hereby declares as follows:

- 1. I accept the selection as a Board Member and agree to serve on the Board and to be bound by the provisions of Contract agreement and rules and procedure provided for establishment and operation of Dispute Resolution Board (ORB).
- 2. With respect to paragraph1 of Dispute Resolution Board's Rules and Procedure. said Annex A, I declare
 - (a) that I have no financial interest of the kind referred to in subparagraph (a):
 - (b) that I have had no previous employment nor financial ties of the kind referred to in subparagraph (b); and
 - (c) that I have made to both parties any disclosures that may be required by sub-paragraphs (b) and (c).
- 3. I declare that I have----no. of Arbitrations (list enclosed) and _____ no. of DRBS (list enclosed) in progress and that I will give sufficient time for the current assignment.

BOARD MEMBER

_____(insert name of Board Member)

Date:

**Schedule of expenses and fees payable to the
Member (s) of Dispute Resolution Board (DRB)**

The fee and other expenses payable to the Members of DRB shall be as under:-

S. No.	PARTICULAR	AMOUNT PAYBLE
1	Retainer-ship fee, secretarial assistance and incidental charges (telephone, fax, postage etc.)	Rs. 50,000/- per month for one package and maximum of Rs. 75,000/- per month for 2 or more packages
2(i)	Fee for site visit or meetings at site	Rs. 25,000/- per day
(ii)	Fee for meetings/hearings not at site	Rs. 10,000/- per day
3	Traveling expenses	Economy class by air, AC first class by train and AC taxi by road
4.	Lodging & Boarding	Rs.15,000/- per day (Metro Cities); or Rs. 10,000/- per day (in other cities); or Rs. 5,000/- per day (own arrangement)
5	Extra charges for days other than hearing/meeting days (travel days maximum of 2 days on each Occasion)	Rs.5,000/-
6	Local conveyance	Rs.2,000/-

Notes:

- (i) Lodging, boarding and travelling expenses will be allowed only for those members who are residing 100 Kms away from the place of meeting.
- (ii) Delhi, Mumbai, Chennai, Kolkata, Bangalore and Hyderabad shall be considered as Metro Cites
- (iii) The above schedule of fee and expenses shall be applicable on or after the date of issue of this circular.
- (iv) The expenses are to be shared equally by the parties i.e. Employer and Contractor.

Appendix-I1:
Arbitration Rules of the Society for Affordable Redressal of Disputes
(SAROD)(SAROD'ARBITRATION RULES)
Under Clause 44.3.1

Rule	INDEX	ARBITRATION	RULES
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PREAMBLE

In order to seek speedy, affordable, just and reasonable Redressal of Dispute/Differences between BRO/MoRTH and Concessionaire/Contractor arising out of and during the course of execution of various contracts, a Society for Affordable Redressal of Disputes (SAROD) has been formed as a Society under Societies Registration Act, 1860 With registration No S/RS SW/044/2013 it has been formed by National Highways Authority of India (NHAI) and National Highways Builders federation (NHBF) with founding members as mentioned in the Memorandum of Association of SAROD.

SAROD ARBITRATION RULES

Rule 1- Scope of Application

- 1.1 Where any agreement, submission or reference provides for arbitration at the Society for Affordable Redressal of Disputes ("SAROD"), or under the Arbitration Rules of the SAROD and where the case is a domestic arbitration shall be conducted in accordance With the following Rules, or such Rules as amended by the SAROD where the amendments take effect before the commencement of the Arbitration. Parties may adopt following clause for inclusion in the contract:-

"Any dispute or difference whatsoever arising between the parties and of or relating to the Construction, interpretation, application, meaning, scope, operation or effect of this contract or the validity or the breach thereof, shall be settled by arbitration in accordance with the rules of arbitration of the "SAROD" and the award made in pursuance thereof shall be final and binding on the parties subject to Provisions of The Arbitration and Conciliation Act, 1996.

- 1.2 These rules shall come into effect from the day of approval by Governing Body of SAROD.

Rule 2 - Definitions

- 2.1 These Rules shall be referred to as the SAROD Arbitration Rules".
- 2.2 In these Rules:

"**Act**" means the 'Arbitration and Conciliation Act 1996' of India and any statutory Modifications or re-enactments thereof.

"**SAROD**" means the Society for Affordable Redressal of Disputes.

"**SAROD Arbitrator Panel**" means the list of persons admitted to serve as arbitrators under these Rules.

"**NHAI**" means National Highways Authority of India.

"NHBF" means the National Highways Builders Federation.

"GOVERNING BODY" means Governing Body of SAROD as defined in Article 9 of Memorandum of Association.

"PRESIDENT" means President of Government Body of SAROD as defined in Rules & Regulation of SAROD

"SECRETARY" means Secretary of SAROD as defined in Rules & Regulation of SAROD.

TRIBUNAL" means either a Sole Arbitrator or all arbitrators when more than one is appointed

PARTY" means a party to an arbitration agreement.

Arbitration" means submission of pleadings, defence statement etc by E mail and holding of proceedings via video conferencing.

Rule 3- Notice, Calculation of periods of Time

3.1 For the purposes of these Rules, any notice, including a notification, communication or

proposal, is deemed to have been received if it is physically delivered to the addressee or if it is delivered at his habitual residence, place of business or mailing address, or, if none of these can be found after making reasonable inquiry, then at the addressee's last-known residence or place of business. Notice shall be deemed to have been received on the day it is so delivered,.

3.2 For the purposes of calculating a period of time under these Rules, such period shall begin to run on the day following the day when a notice, notification, communication or proposal is received. If the last day of such period is an official holiday or a non-business day at the residence or place of business of the addressee, the period is extended until the first business day which follows. Gazetted public holidays or non-business days occurring during the running of the period of time are included in calculating the period.

3.3 Without prejudice to the effectiveness of any other form of written communication, written communication may be made by fax. E-mail or any other means of electronic transmission effected to a number, address or site of a party.

3.4 The transmission is deemed to have been received on the day of transmission.

Rule 4 - Commencement of Arbitration

4.1 Any party wishing to commence arbitration under these Rules ("The Claimant") shall be with the Secretary and serve on the other party ("the Respondent"), a written Notice of Arbitration ("the Notice of Arbitration") which shall include the following:

- a. a request that the dispute be referred to arbitration:
 - b. the names, addresses, telephone numbers, fax numbers and email addresses of the parties to the dispute.
 - c. a reference to the arbitration clause or any separate arbitration agreement that is invoked and provide a copy of the arbitration clause or arbitration agreement :
 - d. a reference to the contract out of which the dispute arises and provide a copy of the contract where possible:
 - e. a brief statement describing the nature and circumstances of the dispute:
 - f. the relief or remedy sought, including the amount of claim if quantifiable at the time the Notice of Arbitration is filed;
 - g. a proposal as to the number of arbitrators (i.e. one or three), if the parties have not previously agreed on the number; and
 - h. the name of the Claimant's nominated arbitrator.
- 4.2 A filing fee of Rs. 10,000/-(Ten thousand or any amount decided by Governing Body from time to time is payable at the time of filing the Notice of arbitration.
- 4.3 The date of filing of the Notice of Arbitration with the Secretary is the date of commencement of the arbitration for the purpose of these Rules.

Rule 5 - Response by Respondent

- 5.1 Within 14 days of receipt of the Notice of Arbitration, the Respondent shall file with the Secretary and serve upon on the Claimant, a Response including
- a. A confirmation or denial of all or part of the claims:
 - b. Brief statement of the nature and circumstances of any envisaged counterclaims:
 - c. A comment in response to any proposals contained in the Notice of Arbitration; and
 - d. The name of the respondent's nominated arbitrator.
- 5.2 A filing fee of Rs. 10,000- or any amount decided by Governing Body from time to time is payable at the time of filing the Response.
- 5.3 In case parties have objection to the jurisdiction of Arbitral Tribunal, such objection shall be raised not less than 15 days of the commencement of Arbitration proceedings failing which it will be deemed that parties have waived their right to objection.

Rule 6 Filing of Case Statements

- 6.1 Within 30 days after the filing of the Notice of Arbitration, the claimant must file with the Secretary and serve on the Respondent, a Statement of Claimant's Case alongwith all documents to be relied upon by the Claimant

- 6.2 Within 30 days after the service of the statement of Claimant's Case, the Respondent must file with the Secretary and serve on the Claimant, a statement of respondent's defence and counterclaim (if any) alongwith all documents to be relied upon by the Respondent.
- 6.3 Within 30 days after the service of the statement of Respondent's defence, if the Claimant intends to challenge anything in the statement of Respondent's defence and/or counterclaim, the Claimant must then file with the Secretary and serve on the Respondent: a statement of claimant's reply and if necessary, defence to counterclaim.
- 6.4 No further case statement may be filed without the leave of the Tribunal or if a Tribunal has not been appointed, the Secretary.
- 6.5 The Tribunal or if a Tribunal has not been appointed, the Secretary, may upon the written application of a party, extend the time limits provided under this Rule.
- 6.6 Thy party required to file a case statement must at the same time deposit with the Secretary for eventual transmission to the Tribunal an additional copy or additional copies of the case statement, according to the number of arbitrators constituting or who will constitute the Tribunal

Rule 7- Contents of Case Statements

- 7.1 The case statements contain the detailed particulars of the party's claim, defence or counterclaim and must thus contain a comprehensive statement of the facts and contentions of law supporting the party's position
- 7.2 It must
- a. Set out all items of relief or other remedies sought together with the amount of all quantifiable claims and detailed calculations.
 - b. State fully its reasons for denying any allegation or statement of the other party.
 - c. State fully its own version of events if a party intends to put forward a version of events different from that given by the other party.
- 7.3 A case statement must be signed by or on behalf of the party making it.

Rule 8 - Default in Filing and Serving Case Statements

- 8.1 If the Claimant fails within the time specified under these Rules or as may be fixed by the Tribunal or by the Secretary, to submit its Statement of Case, the Tribunal or if a Tribunal has not been appointed. the Governing

Body may issue an order for the termination of the arbitral proceedings or make such other directions as may be appropriate in the circumstances.

- 8.2 It the Respondent fails to submit a Statement of Respondent's Defence, the Tribunal may never the less proceed with the arbitration and make the award.

Rule 9 - Further Written Statements

- 9.1 The Tribunal will decide which further written statements, in addition to the case statement(s) already filed, are required from the parties and shall fix the periods of time for giving. Filing and serving such statements
- 9.2 All such further statements must be given to the Tribunal, filed with the Secretary and served on the Claimant or Respondent, whichever is applicable.

Rule 10 - SARO to Provide Assistance

- 10.1 At the request of the Tribunal or either party, the Secretary will render such assistance as is required for the conduct of the arbitration, including arranging for facilities, suitable accommodation for sittings of the Tribunal, secretarial assistance or interpretation of these rules.
- 10.2 Any additional expenses incurred or to be incurred for any such arrangements shall be borne by the parties.

Rule 11 - Appointment of Tribunal

- 11.1 The disputes shall be decided by a Sole Arbitrator when the total claim of dispute is Rs. 3 Crores or less.
- 11.2 In all cases of disputes claimed for more than Rs. 3 Crores, the tribunal shall consist of odd number of arbitrator to be nominated by the parties. The Presiding Arbitrator shall be appointed by the Arbitrator nominated by the parties from amongst the panel maintained by SAROD For deciding the Presiding Arbitrator a draw of lots can be carried out from amongst the names suggested by the Arbitrators nominated by the Parties. The eligibility criteria for empanelment of Arbitrators will be decided by the Governing Body.
- 11.3 If a sole Arbitrator is to be appointed the Governing Body will appoint the Arbitrator within 21 days from the date the Respondent's Statement of Defence and Counterclaim (if any) is filed or falls due, whichever is earlier. The Governing Body will appoint the Arbitrator from the panel of Arbitrators by draw of lots,
- 11.4 Arbitrator Presiding Arbitrator to be appointed under these Rules shall be a person on the SAROD Arbitration panel as at the date of the appointment,

- 11.5 In the event of any party failing to appoint Arbitrator within 30 days of receipt of the notice of Arbitration, the Governing Body shall appoint the Arbitrator or Presiding Arbitrator as the case may be by a draw of lots.

Rule 12- Multiparty appointment of the Tribunal

- 12.1 If there are more than 2 parties in the arbitration, the parties shall agree on the procedure for appointing the Tribunal within 21 days of the receipt of the Notice of Arbitration
- 12.2 If the parties are unable to do so, upon the lapse of the 21 days time period mentioned herein, the Tribunal shall be appointed by the Governing Body as soon as practicable.

Rule 13 - Appointment of Substitute Arbitrator

In the event of the death or resignation of any of the arbitrators, a substitute arbitrator must be appointed by the same procedure as in Rule 11 by which the arbitrator concerned was appointed, failing which, the Governing Body will make the appointment.

Rule 14 - Independence and Impartiality of the Tribunal

- 14.1 The Tribunal conducting arbitration under these Rules shall be and remain at all times independent and impartial, and shall not act as advocate for any party.
- 14.2 A prospective arbitrator shall disclose to those who approach him in connection with his possible appointment, any circumstances likely to give rise to justifiable doubts as to his impartiality or independence.
- 14.3 An arbitrator, once nominated or appointed, shall disclose any such circumstance referred to in Rule 14.2 to the Secretary and or to all parties.

Rule 15 - Code of Ethics for Arbitrators

An Arbitrator is a fountain of justice and emblem of equity, fairness and good conscience therefore he/she is expected to exhibit a noble conduct. The code of conduct prescribed by the Governing Body has to be adopted.

Appointment

- 15.1 A prospective arbitrator shall accept an appointment only if he is fully satisfied that he is able to discharge his duties without bias, he has an adequate knowledge of the language of the arbitration, and he is able to give to the arbitration the time and attention which the parties are reasonably entitled to expect,
- 15.2 In this code, the masculine includes the feminine.

Disclosure

- 15.3 A prospective arbitrator shall disclose, all facts or circumstances that may give rise to justifiable doubts as to Ms impartially or independence. such duty to continue thorough out the arbitral proceedings with regard to new facts and circumstances.
- 15.4 A prospective arbitrator shall disclose to the Secretary and any party who approaches him for a possible appointment.
- (a) Any past or present close personal relationship or business relationship, whether direct or indirect, with any party to the dispute, or any representative of a party, or any person known to be a potentially important witness in the arbitration:
- (b) The extent of any prior knowledge he may have of the dispute.

Bias

- 15.5 The criteria for assessing questions relating to bias are impartiality and independence. Partiality arises when an arbitrator favours one of the parties or where he is prejudiced in relation to the subject matter of the dispute. Dependence arises from relationships between an arbitrator and one of the parties, or with someone closely connected with one of the parties.
- 15.6 Any close personal relationship or current direct or indirect business relationship between an arbitrator and a party, or any representative of a party, or with a person who is known to be a potentially important witness, will normally give rise to justifiable doubts as to a prospective arbitrator's impartiality or independence. Past business relationships will only give rise to justifiable doubts if they are of such magnitude or nature as to be likely to affect a prospective arbitrator's judgment. He should decline to accept an appointment in such circumstances unless the parties agree in writing that he may proceed.

Communications

- 15.7 Before accepting an appointment, an arbitrator may only enquire as to the general nature of the dispute, the names of the parties and he expected time period required for the arbitration.
- 15.8 No arbitrator shall confer with any of the parties or their Counsel until after the Secretary gives notice of the formation of the Tribunal to the parties.
- 15.9 Throughout he arbitral proceedings, an arbitrator hall avoid any unilateral Communications regarding the case with any party, or its representatives.

Fees

- 15.10 In accepting an appointment, an arbitrator agrees to the remuneration as prescribed in the rules of SAROD, and he shall make no unilateral arrangements with any of the parties or their Counsel for any additional fees or expenses without the agreement of all the parties and the consent of the Secretary of SAROD.

Conduct

- 15.11 Once the arbitration proceedings commence, the arbitrator shall acquaint himself with all the facts and arguments presented and all discussions relative to the proceedings so that he may properly understand the dispute.

Confidentiality

- 15.12 The arbitration proceedings shall remain confidential. An arbitrator is in a relationship of trust to the parties and should not, at any time, use confidential information acquired during the course of the proceedings to gain personal advantage or advantage for others, or to affect adversely the interest of another.

- 15.13 This Code is not intended to provide grounds for the setting aside of any award.

Rule 16 - Challenge of Arbitrators

- 16.1 An arbitrator may be challenged if there are circumstances that give rise to justifiable doubts as to his impartiality or independence and also if he or she has committed any misconduct.
- 16.2 An arbitrator may also be challenged if he does not possess the qualifications required by the agreement of the parties.
- 16.3 A party may challenge an arbitrator appointed on its nomination or with its agreement only for reasons of which it becomes aware after the appointment has been made.
- 16.4 A party who intends to challenge an arbitrator shall file with the Secretary and serve on the other party or all other parties, whichever is applicable, a Notice of Challenge.
- 16.5 The Notice of challenge must be filed and served within 14 days from the appointment of the arbitrator or within 14 days after the circumstances mentioned in Rule 15.1 became known to that party.
- 16.6 The Notice of Challenge must state the reasons for the challenge.
- 16.7 The arbitration shall be suspended until the challenge is resolved or decided upon.
- 16.8 When an arbitrator has been challenged by one party, the other party may agree to the challenge. The arbitrator may also, after the challenge, withdraw from his office. However, it is not implied in either case that

there has been an acceptance of the validity of the grounds for the challenge. In both cases, the procedure provided in Rule 11 read with Rule 13, shall be used for the appointment of a substitute arbitrator.

Rule 17 - Decision on Challenge

- 17.1 If the other party does not agree to the challenge and the arbitrator does not withdraw, the decision on the challenge will be made by the Governing Body.
- 17.2 If the Governing Body sustains the challenge, a substitute arbitrator shall be appointed or chosen pursuant to the procedure applicable to the appointment of an arbitrator as provided in Rule 11 read with Rule 13. If the Governing Body dismisses the challenge, the arbitrator shall continue with the arbitration.

Rule 18- Removal of the Tribunal

- 18.1 The Governing Body may on the application of a party remove an arbitrator.
- a. Who is physically or mentally incapable of conducting the proceedings or where there are justifiable doubts as to his ability to do so; or
 - b. Who has refused or failed to use all reasonable dispatch in conducting the arbitration or making an award
 - c. Who has continuously absented from attending the proceedings for more than 3 sitting without prior permission of Presiding Arbitrator Governing Body of SAROD.
- 18.2 The arbiter(s) conceded is entitled to appear and be heard at the hearing of the application to remove him.
- 18.3 Upon the removal of the arbitrator, a substitute arbitration shall be appointed in accordance with Rule 11 read with Rule 13.
- 18.4 The Governing Body's decision on the application is final and is not subject to appeal or review.

Rule 19 - Re-hearing in the Event of Replacement of the Tribunal

If the sole o presiding Arbitrator is replaced, there shall be a re-hearing. If any other arbitrator is replaced, such re-hearing may take place at the discretion of the Tribunal.

Rule 20 - Jurisdiction of the Tribunal

- 20.1 The Tribunal shall have the power to rule on its own jurisdiction, including any objection with respect to the existence, termination or validity of the arbitration agreement. For that purpose, an arbitration agreement which forms part of a contract shall be treated as an agreement independent of

the other terms of the contract. A decision by the Tribunal that the contract is null and void shall not entail ipso jure the invalidity of the arbitration agreement.

- 20.2 The plea that the Tribunal does not have jurisdiction shall be raised not later than in the Statement of Defense. A plea that the Tribunal is exceeding the scope of its authority shall be raised promptly after the Tribunal has indicated its intention to decide on the matter alleged to be beyond the scope of its authority. In either case the Tribunal may nevertheless admit a late plea under this Rule if it considers the delay justified. A party is not precluded from raising such a plea by the fact that he has nominated, or participated in the appointment of an arbitrator.
- 20.3 The Tribunal must rule on an objection that it lacks jurisdiction as a preliminary question upon the objection being raised. It may rule on an objection that it exceeds the scope of its authority either as a preliminary question or in an award on the merits, as it deems just and convenient
- 20.4 In addition to the jurisdiction to exercise the powers defined elsewhere in these Rules. The Tribunal shall have jurisdiction to determine any question of law arising in the arbitration: proceed with the arbitration not with setting aside the failure or refusal of any party to comply with these Rules or with the Tribunal's orders or directions, or to attend any meeting or hearing, but only after giving that party written notice that it intends to do so; and to receive and take into account such written or oral evidence as it shall determine to be relevant, whether or not strictly admissible in law.

Rule 21 : Fees of SAROD and Arbitral Tribunal

Fee Schedule

Registration Fee (Non - Refundable): Rs 10,000 or any amount fixed by Governing Body from time to time. The Schedule of Fees and allied expenditure shall be decided by Governing Body.

Rule 22- Transmission of File to the Tribunal

- 22.1 The Secretary shall, as soon as practicable transmit to the Tribunal, a file containing the Notice of Arbitration, the Response and all case statements.
- 22.2 The Tribunal shall as soon as practicable, after consultation with the parties, issue such orders and or directions as are necessary for the conduct of the arbitration to conclusion, including a timetable for steps to be taken in the arbitration and for the hearing of the arbitration.

Rule 23 - Judicial Seat of Arbitration

- 23.1 Unless otherwise agreed by the parties, the judicial seat of arbitration shall be New Delhi.

- 23.2 Notwithstanding Rule 22.1 and 22.2. the Tribunal may, unless otherwise agreed by the parties, hold hearings and meetings anywhere convenient, subject to the provisions of Rule 28.2.

Rule 24 - Language of Arbitration

The language of arbitrators shall be English. In case of material existing are in any other language, other than English the same has to be translated to English language.

Rule 25 - Conduct of the Proceedings

The Tribunal shall have the widest discretion allowed by the Act to ensure the just. Expeditious, economical and final determination of the dispute. The proceedings shall be conducted from 10.AM to 5.PM with a recess of one hour.

Rule 26 - Communication between Parties and the Tribunal

- 26.1 Where the Tribunal sends any written communication to one party, it shall send a copy to the other party or parties as the case may be.
- 26.2 Where a party sends any written communication (including Statements, expert reports or evidentiary documents) to the Tribunal, the same shall be copied to the other party or all other parties, whichever is applicable, and show to the Tribunal that the same has been so copied.
- 26.3 The address of the parties for the purpose of all communications during the proceedings shall be those set out in the Notice of Arbitration, or as either party may at any time notify the Tribunal and the other party or parties, whichever is applicable.
- 26.4 A copy of correspondence between the parties and the Tribunal shall be sent to the Secretary.

Rule 27-Party Representatives

Any party may be represented by legal practitioners or any other representatives, subject to such proof of authority as the Tribunal may require. The names and addresses of such representatives must be notified to the other party or parties. In case one party is represented by non-legal person, another party will also be represented by non-legal person so as to maintain natural justice.

Rule 28- Hearings

- 28.1 Unless the parties have agreed or documents-only arbitration, the tribunal shall hold a hearing for the presentation of evidence by witnesses, including expert witnesses, or for oral submissions.

- 28.2 The Tribunal shall fix the date, time and place of any meetings and hearings in the arbitrations on the first hearing, and complete time table pertaining to all the activities of the Arbitration, e.g., submission of statement of claim, reply therein, admission and denial of documents, visit/inspection of site if any. The tribunal shall stick to the time table with or without any deviations unless there are unavoidable circumstances warranting such deviation which will be with the prior permission of the tribunal.
- 28.3 Prior to the hearing, the Tribunal may provide the Parties with matters or questions to which it wishes them to give special consideration.
- 28.4 In the event that a party to the proceedings without sufficient cause, fails to appear at a hearing of which the notice has been given, the Tribunal may proceed with the arbitration and may make the Award after the party present has submitted evidence to prove its case.
- 28.5 All meetings and hearing shall be in private unless the parties agree otherwise.

Rule 29 - Documents Only Arbitration

- 29.1 The Disputes may be decided without an oral hearing if it is so agreed by the parties.
- 29.2.1 Where the parties agree to dispense with oral hearing, the Tribunal must be promptly informed by either of the parties as soon as is practicable. The Tribunal must also be promptly informed if, at a later stage, the parties or either of them intends to apply for an oral hearing.
- 29.2.2 Parties may seek discovery of documents if they are not satisfied with existence of documents annexed with statement of claim, reply and counter claim by giving self contained request to the Tribunal justifying the necessity for such documents. Decision of tribunal shall be final and binding upon the parties.

Rule 30- Witnesses

- 30.1 The Tribunal may require each party to give notice of the names and designations of the witnesses it intends to call and reasons for legal necessity of such witness.
- 30.2 No party shall call any expert witness without the leave of the Tribunal.
- 30.3 Any witness who gives evidence may be questioned by each party or its representative subject to any rulings made by the Tribunal.
- 30.4 A Witness may be required by the Tribunal to testify under oath or affirmation.

30.5 Subject to such order or direction which the Tribunal may make, the testimony of witness may be presented in written form, either as signed statements or by duly sworn or affirmed affidavits,

30.6 Any party may require a witness to attend an oral examination at a hearing. If the witness fails to attend the Tribunal may place such weight on the written testimony as it thinks fit, (05 may exclude it together).

30.7 The Tribunal shall determine the admissibility, relevance, materiality and weight of the evidence given by any witnesses.

Rule 31 - Experts Appointed by the Tribunal

31.1 Unless otherwise agreed by the parties, the Tribunal may:

- a. appoint one or more experts to report the Tribunal on specific issues:
- b. require a party to give any such expert any relevant information or to produce, or to provide access to, any relevant documents, goods or property for inspection by the expert.

31.2 Unless otherwise agreed by the parties, if a party so requests or if the Tribunal deem it fit, the expert shall, after delivery of his written or oral report, participate in an oral hearing, at which the parties may question him and present expert witnesses in order to testify on the points at issue.

31.3 Rule 30.2 shall not apply to an assessor appointed by agreement of the parties, or to an expert appointed by the Tribunal to advise solely in relation to procedural matters.

Rule 32 - Rules applicable to substance of dispute- (1) where the place of arbitration is situated in India,

32.1 In an arbitration, the arbitral tribunal shall decide the dispute submitted to arbitration in accordance with the substantive law for the time being in force in India;

Rule 33- Closure of Hearing

33.1 The Tribunal may inquire of the parties if they have any further proof to offer or

Witnesses to be heard or submission to make and. if there are none, declare the hearing closed.

33.2 The Tribunal may also. in view of exceptional circumstance, reopen the hearings at any time before the award is made.

Rule 34 - Additional Powers of the Tribunal

34.1 In addition to the powers conferred by the Act, the Tribunal shall also have the power to:-

- a. Allow any party, upon such terms (as to costs and otherwise) as it shall determine, to amend claims or counterclaims;
- b. Extend or abbreviate any time limits provided by these Rules;
- c. Conduct such enquires as may appear to the Tribunal to be necessary or expedient;
- d. Order the parties to make any property or thing available for inspection
- e. order any parties to produce to the Tribunal, and to the other parties for inspection, and to supply copies of any documents or classes of documents in their possession, custody or power which the Tribunal determines to be relevant.
- f. Make orders or give directions to any party for interrogations;
- g. Make orders or give directions to any party for an interim injunction or any other interim measure;
- h. Make such orders or give such directions as it deems fit in so far as they are not inconsistent with the Act or any statutory re-enactment thereof or such law which is applicable of these Rules.

34.2 If the parties so agree, the Tribunal shall also have the power to add other parties (with their consent to be joined in the arbitration and make a single Final Award determining all disputes between them.

Rule 35 - Deposits to Costs and Expenses

35.1 The Tribunal's fees and SAROD administration fees shall be ascertained in accordance with the Schedule of Fees in Force at the time of commencement of the arbitration.

35.2 The Claimant shall deposit with the SAROD half of the fees payable at the time of filing of the Statement of Case. The Respondent shall deposit with the SAROD one-half of the fees payable at the time of filing the Statement of Respondent's Defence and Counterclaim (if any). The balance of fees payable shall be paid 60 days before the date of the final hearing or on such other date that the Secretary may direct.

35.3 Where the amount of the claim or the counterclaim is not quantifiable at the time payment is due, the Secretary will make a provisional estimate. The fees will be adjusted in light of such information as may subsequently become available if the arbitration is settled or disposed of without a hearing, the amount of the Tribunal's fees and SAROD administration fees shall be finally determined by the Secretary who will have regard to all the circumstances of the case, including the stage of proceedings at which the arbitration is settled or otherwise disposed of.

- 35.4 The Secretary may from time to time direct parties make one or more deposit(s) towards any further expenses incurred or to be incurred on behalf of or for the benefit of the parties.
- 35.5 All deposit(s) shall be made to and held by the SAROD, Any interest which may accrue on such deposits) shall be retained by the SAROD.
- 35.6 If a party fails to make the payments or deposits required or directed. the Tribunal may refuse to hear the claims or counterclaims, whichever is applicable. by the non-complying party, although it may proceed to determine claims or counterclaims by any party who has complied with orders.
- 35.7 The parties shall remain jointly and severally liable to the SAROD for payment of all such fees and expenses until they have been paid in full even if the arbitration is abandoned, suspended or concluded. by agreement or otherwise, before the final Award is made.

Rule 36 - Decision Making by the Tribunal

- 36.1 Where a Tribunal has been appointed, any direction, order, decision or award of the Tribunal must be made by the whole Tribunal or a majority. If an arbitrator refuses or fails to sign the Award, the signatures of the majority shall be sufficient, provided that the reason for the omitted signature is stated.
- 36.2 If there is no unanimity, the same shall be made by the majority arbitrators' as well as by the dissenting Arbitrator alone as if acting as a sole arbitrator.
- 36.3 However in the case of a three member tribunal the presiding arbitrator may, after consulting the other arbitrators, make procedural ratings alone.

Rule 37 - The Award

- 37.1 It will be mandatory for the parties to submit written synopss of their arguments respectively which will form part of the arbitral proceedings.
- 37.2 The Tribunal shall assemble at the assigned place in SAROD and shall exercise utmost secrecy and confidentiality in writing the award.
- 37.3 Unless the Secretary extends the time or the parties agree otherwise, the Tribunal shall make is Award in writing within 30 days from the date on which the hearings are closed and shall state the reasons upon which its award is based. The award shall contain the date and shall be signed by the arbitrator or arbitrators.

- 37.4 The Tribunal may make interim awards or separate awards on different issues at different times.
- 37.5 All Awards must be submitted by the Tribunal to the Secretary and they shall be issued through the Secretary
- 37.6 The Tribunal must deliver to the Secretary number of originals of the award sufficient for the parties and for filing with the Secretary.
- 37.7 The Secretary shall release the award to the parties only upon receipt of sufficient deposits to cover the fees and expenses due to the Tribunal and to the SAROD.
- 37.8 By agreeing to have arbitration under these Rules, the parties undertake to carry out the award without delay.
- 37.9 Stamp duty on award shall be payable by the party in whose favor the award has been pronounced.

Rule 38 - Additional Award

- 38.1 Within 30 days after the receipt of the award, either party, with notice to the Secretary and the other party may request the Tribunal to make an additional award as to claims presented in the arbitral proceedings but omitted from the award.
- 38.2 If the Tribunal considers the request for an additional award to be justified and considers that the omission can be rectified without any further hearings or evidence, it shall notify all the parties within 7 days of the receipt of the request, that it will make an additional award, and complete the additional award within 30 days after the receipt of the request.

Rule 39 - Correction of Awards

- 39.1 Within 30 days of receiving an Award, unless another period of time has been agreed upon by the parties, a party may by notice to the Secretary and the other party request the Tribunal to correct in the Award, any errors in computation, any clerical or typographical errors or any errors of similar nature.
- 39.2 If the Tribunal considers the request to be justified, it shall make the corrections) within 30 days of receiving the request. Any correction shall be notified in writing to the parties and shall become part of the Award.
- 39.3 The Tribunal may correct any error of the type referred to in Rule 37,1 on its own initiative within 30 days of the date of the Award.

Rule 40- Settlement

40.1 If the parties arrived at amiable settlement of the disputes during the currency proceedings, the parties shall file memo of settlement before the tribunal who shall either issue an order for the termination of the arbitral proceedings of, if requested by both parties or accepted by the Tribunal, record the settlement of an arbitral award on agreed terms. The Tribunal is not, obliged to give reasons for such an award.

40.2 The Parties shall:

- a. Notify the Tribunal and the Secretary immediately if the arbitration is settled or otherwise Terminated
- b. Make provision in any settlement for payment of all the costs of the arbitration and fees and expenses due to the SAROD and the Tribunal.

40.3 If the continuation of the arbitral proceedings becomes unnecessary or impossible for any reason not mentioned in Rule 38.1. before the award is made, the Tribunal shall inform the parties of its intention to issue an order for the termination of the proceedings. The Tribunal shall have the power to issue such an order unless party raises justifiable grounds for objection.

40.4 Copies of the order for termination of the arbitral proceedings or of the arbitral award on, agreed terms, signed by the Tribunal, shall be communicated by the Tribunal to the parties through the Secretary.

Rule 41 - Interest

The Tribunal may award interest on any sum awarded at such rate as applicable in fixed deposits of Sate Bank of India in respect of such periods ending not later than the date of the award as the Tribunal considers just.

Rule 42 - Costs

42 .1 The Tribunal shall specify in the final award, the costs of the arbitrations and decide which party shall bear them and in what proportion they shall be borne.

42.2 In this Rule, "costs of the arbitration" shall include:

- a. The fees and expenses of the Tribunal and the administration fees of the SAROD as determined by the Secretary in accordance with the Schedule of Fees:
- b. The costs of tribunal appointed experts or of other assistance rendered: and
- c. All expenses which are reasonably incurred by the SAROD in connection with the arbitration.

- 42.3 The Tribunal has power to order in its Award, that all or part of the legal or other costs (such as legal fees and expenses, costs incurred in respect of party appointed experts etc) of one party shall be paid by the other party.

Rule 43- Waiver

A party which is aware of non-compliance with these Rules and yet proceeds with the arbitration without promptly stating its objection in writing to such non-compliance shall be deemed to have waived its right to object.

Rule 44- Exclusion Liability

- 44.1 The Tribunal, the President, the SAROD and any of its officers, employees or agents shall not be liable to any party for any act or omission in connection with any arbitration conducted under these Rules.
- 44.2 After the Award has been made and the possibilities of corrections and additional Awards have lapsed or been exhausted, neither the Tribunal nor the President shall be under any obligation to make any statement to any person about any matter concerning the arbitration, and no party shall seek to make any arbitrator or the President or the SAROD and any of its officers a witness in any legal proceedings arising out of the arbitration.

Rule 45 - General Provisions

- 45.1 In all matters not expressly provided for in these Rules, the President, the Secretary and the Tribunal shall act in the spirit of these Rules and shall make every reasonable effort to ensure the just, expeditious and economical conclusion of the arbitration.
- 45.2 The Secretary may from time to time issue Practice Notes on the implementation of these Rules.

Rule 46 – Amendment to Rules

These Rules may from time to time be amended by the Governing Body of SAROD

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