

Consultancy Services for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chuikhim-Nimbong-Kafer-Bakhim-Algarah-Rhenok in the State of West Bengal and from Rhenok-Rorathang-Pakyong along with Spur from Aritar-Relop-Menla in the State of Sikkim. **PKG IV B (BAGRAKOT TO KAFER Km 13.000 to Km 25.600)**

ABSTRACT OF COST ESTIMATE

Note 1 : Basis of Cost Estimate : Rate Analysis as per WB SOR 2018-19, Machinery rates from Sikkim SOR 2012-13 with 12.06% Escalation (as per WPI Index) and Major material rates from Market and as per WB SOR 2019-20.

Sl.NO	Items	Unit	Length (in Km)	Rate (in Rs.)	Amount (in Rs.)	Amount (in Cr.)
A	ROAD WORKS					
1	Site Clearance				8,512,454.10	0.851
2	Excavation	Cum			242,693,798.28	24.269
3	Earthwork Filling	Cum			65,085,592.09	6.509
4	Disposal of Excess Earthwork material	Cum			42,186,695.30	4.219
5	Sub Grade	Cum			18,913,198.50	1.891
6	CTSB	Cum			105,221,938.80	10.522
7	BSM	Cum			104,907,189.45	10.491
8	Prime Coat	Sqm			2,882,352.00	0.288
9	Tack Coat	Sqm			2,098,800.00	0.210
10	BC	Cum			52,082,888.00	5.208
B	BRIDGES and STRUCTURES					
1	Minor Bridges	No.	1		27,847,686.18	2.78
2	Culverts	No.	43		99,415,995.06	9.94
C	SLOPE STRUCTURES					
1	Elevated Structure	No.	14		790,438,531.32	79.04
2	Retaining Wall	Rnm	2650		260,350,001.04	26.04
2	Breast Wall	Rnm	9260		187,984,744.98	18.80
D	JUNCTIONS					
1	Minor Junctions	No	9.0		71,390,174.63	7.14
E	DRAIN & PROTECTION WORK					
1	Drainage Works	Km			78,378,234.89	7.84
2	Parapet Wall	Km	9.34		22,696,200.00	2.27
F	LAY BYES					
1	Bus Shelter	Nos	8.0	1,500,000.00	12,000,000.00	1.20
G	OTHER MISCELLANEOUS ITEMS					
1	Miscellaneous Items	Total			1,893,900.00	0.19
2	Traffic Signs, Marking and Road Appurtenances	Total			6,472,121.14	0.65
3	Reflective Road Studs	Nos	2770		2,311,066.40	0.23
	TOTAL CIVIL COST				2205763562.16	220.58
	Add GST (12%)				264691627.46	26.47
	TOTAL CIVIL COST including GST				2470455189.62	247.05
	COST PER KM (LENGTH = 12.60 KM) IN CRORES ...					19.61

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Summary of Cost Estimate

Sr. No.	Item of Works	Total (in Rs)	Total (in Cr)
	Civil Works		
1	Site Clearance	8,512,454.10	0.85
2	Earthwork	326,692,588.87	32.669
3	Disposal of Excess Earthwork material	42,186,695.30	4.219
4	Non-Bituminous Courses	210,129,128.25	21.01
5	Bituminous Courses	57,064,040.00	5.71
6	Minor Bridges	27,847,686.18	2.78
7	Culverts/Repairing/Dismantling	99,415,995.06	9.94
8	Elevated Structure	790,438,531.32	79.04
9	Retaining and Breast Wall	448,334,746.02	44.83
10	Drainage and Protective works	101,074,434.89	10.11
11	Traffic Signs, Marking and Road Appurtenances	8,783,187.54	0.88
12	Miscellaneous Items	1,893,900.00	0.19
13	Bus Bays	12,000,000.00	1.20
14	Junctions and Intersections	71,390,174.63	7.14
	Total for Civil Works	2,205,763,562.16	220.58
	Add GST (12%)	264,691,627.46	26.47
	TOTAL CIVIL COST including GST	2,470,455,189.62	247.05
	Cost per Km		19.61

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Summary of TCS Sections

Item No	BOQ Item No	Description	Unit	Rate (in Rs)	Total Qty	Amount		TCS-I			TCS-II			TCS-III			TCS-VI		
								Length	Qty /km	Total Qty	Length	Qty /km	Total Qty	Length	Qty /km	Total Qty	Length	Qty /km	Total Qty
1	2.3 (ii) - A	Clearing & Grubbing	Hac	60,829.00	13.99	851,119.37		3.24	1.20	3.88	1.630	1.20	1.96	0.620	1.20	0.74	0.08	1.20	0.10
2	3.18	Sub Grade	Cum	266.00	69,960.00	18,609,360.00		3.24	6,000.00	19,410.00	1.630	6,000.00	9,780.00	0.620	6,000.00	3,720.00	0.08	6,000.00	480.00
3	3.19 - Case-I	Loosening & Recompacting	Cum	82.00	-	-		3.24	-	-	1.630	-	-	0.620	-	-	0.08	-	-
4	4.6(ii)	CTSB	Cum	3,998.00	26,351.60	105,353,696.80		3.24	2,260.00	7,311.10	1.630	2,260.00	3,683.80	0.620	2,260.00	1,401.20	0.08	2,260.00	180.80
5	3.19	Earthen Shoulder	Cum	266.00	1,142.25	303,838.50		3.24	150.00	485.25	1.630	150.00	244.50	0.620	150.00	93.00	0.08	150.00	12.00
6	4.12	BSM	Cum	3,943.00	13,467.30	53,101,563.90		3.24	1,155.00	3,736.43	1.630	1,155.00	1,882.65	0.620	1,155.00	716.10	0.08	1,155.00	92.40
7	5.1	Prime Coat	Sqm	24.00	120,098.00	2,882,352.00		3.24	10,300.00	33,320.50	1.630	10,300.00	16,789.00	0.620	10,300.00	6,386.00	0.08	10,300.00	824.00
8	5.2	Tack Coat	Sqm	9.00	233,200.00	2,098,800.00		3.24	20,000.00	64,700.00	1.630	20,000.00	32,600.00	0.620	20,000.00	12,400.00	0.08	20,000.00	1,600.00
9	5.8 (i)	BC	Cum	11,167.00	4,664.00	52,082,888.00		3.24	400.00	1,294.00	1.630	400.00	652.00	0.620	400.00	248.00	0.08	400.00	32.00

								TCS-IV			TCS-V			TCS-VIII			TCS-VII		
								Length	Qty /km	Total Qty	Length	Qty /km	Total Qty	Length	Qty /km	Total Qty	Length	Qty /km	Total Qty
1	2.3 (ii) - A	Clearing & Grubbing	Hac					1.44	1.20	1.72	1.130	1.20	1.36	1.81	1.20	2.17	1.720	1.20	2.06
2	3.18	Sub Grade	Cum					1.44	6,000.00	8,610.00	1.130	6,000.00	6,780.00	1.81	6,000.00	10,860.00	1.720	6,000.00	10,320.00
3	3.19 - Case-I	Loosening & Recompacting	Cum					1.44	-	-	1.130	-	-	1.81	-	-	1.720	-	-
4	4.6(ii)	CTSB	Cum					1.44	2,260.00	3,243.10	1.130	2,260.00	2,553.80	1.81	2,260.00	4,090.60	1.720	2,260.00	3,887.20
5	4.1 B (iii)	Earthen Shoulder	Cum					1.44	150.00	215.25	1.130	150.00	169.50	1.81	-	-	1.720	-	-
6	4.12	BSM	Cum					1.44	1,155.00	1,657.43	1.130	1,155.00	1,305.15	1.81	1,155.00	2,090.55	1.720	1,155.00	1,986.60
7	5.1	Prime Coat	Sqm					1.44	10,300.00	14,780.50	1.130	10,300.00	11,639.00	1.81	10,300.00	18,643.00	1.720	10,300.00	17,716.00
8	5.2	Tack Coat	Sqm					1.44	20,000.00	28,700.00	1.130	20,000.00	22,600.00	1.81	20,000.00	36,200.00	1.720	20,000.00	34,400.00
9	5.8 (i)	BC	Cum					1.44	400.00	574.00	1.130	400.00	452.00	1.81	400.00	724.00	1.720	400.00	688.00

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TCS-I {Two lane with Paved shoulder Concentric Widening (One Side Hill, One side Valley section)}

3.235 Kms

Item No.	Description	Unit	No.	Length (in m)	Width (in m)	Depth (in m)	Qty	Rate (in Rs)	22.885
1	Clearing & Grubbing	Hac	1	1000	12	-	1.20	60,829.00	72,994.800
2	Sub Grade	Cum	1	1000	12.00	0.500	6,000.00	266.00	1,596,000.000
3	Excavation & Earthwork	Cum	Taken in Abstract Sheet					-	
4	CTSB	Cum	1	1000	11.30	0.200	2,260.00	3,993.00	9,024,180.000
5	Earthen Shoulder	Cum	1	1000	1.00	0.150	150.00	226.00	33,900.000
6	BSM	Cum	1	1000	10.50	0.110	1,155.00	7,789.77	8,997,186.06
7	Prime Coat	Sqm	1	1000	10.30	-	10,300.00	24.00	247,200.00
8	Tack Coat	Sqm	2	1000	10.00	-	20,000.00	9.00	180,000.00
9	BC	Cum	1	1000	10.00	0.040	400.00	11,167.00	4,466,800.00
							Total Cost =		24,618,260.86

Per Km Cost of TCS Type-I in Cr. = 2.462

Total Cost of TCS Type- I for 03.235 Kms Length in Cr. = 7.964

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TCS-II {Two lane with Paved shoulder Eccentric Left Widening (One Side Hill, One side Valley section)}

1.630 Kms

Item No.	Description	Unit	No.	Length (in m)	Width (in m)	Depth (in m)	Qty	Rate (in Rs)	Amount (in Rs)
1	Clearing & Grubbing	Hac	1	1000	12	-	1.20	60,829.00	72,994.80
2	Sub Grade	Cum	1	1000	12.00	0.500	6,000.00	266.00	1,596,000.00
3	Excavation & Earthwork	Cum	Taken in Abstract Sheet					-	
4	CTSB	Cum	1	1000	11.30	0.200	2,260.00	3,993.00	9,024,180.00
5	Earthen Shoulder	Cum	1	1000	1.00	0.150	150.00	226.00	33,900.000
6	BSM	Cum	1	1000	10.50	0.110	1,155.00	7,789.77	8,997,186.06
7	Prime Coat	Sqm	1	1000	10.30	-	10,300.00	24.00	247,200.00
8	Tack Coat	Sqm	2	1000	10.00	-	20,000.00	9.00	180,000.00
9	BC	Cum	1	1000	10.00	0.040	400.00	11,167.00	4,466,800.00
								Total Cost =	24,618,260.86

Per Km Cost of TCS Type-II in Cr. = 2.462

Total Cost of TCS Type- II for 01.630 Kms Length in Cr. = 4.013

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TCS-III {Two lane with Paved shoulder Eccentric Right Widening (One Side Hill, One side Valley section)}

0.62 Kms

Item No.	Description	Unit	No.	Length (in m)	Width (in m)	Depth (in m)	Qty	Rate (in Rs)	Amount (in Rs)
1	Clearing & Grubbing	Hac	1	1000	12	-	1.20	60,829.00	72,994.80
2	Sub Grade	Cum	1	1000	12.00	0.500	6,000.00	266.00	1,596,000.00
3	Excavation & Earthwork	Cum	Taken in Abstract Sheet					-	
4	CTSB	Cum	1	1000	11.30	0.200	2,260.00	3,993.00	9,024,180.00
5	Earthen Shoulder	Cum	1	1000	1.00	0.150	150.00	226.00	33,900.000
6	BSM	Cum	1	1000	10.50	0.110	1,155.00	7,789.77	8,997,186.06
7	Prime Coat	Sqm	1	1000	10.30	-	10,300.00	24.00	247,200.00
8	Tack Coat	Sqm	2	1000	10.00	-	20,000.00	9.00	180,000.00
9	BC	Cum	1	1000	10.00	0.040	400.00	11,167.00	4,466,800.00
							Total Cost =		24,618,260.86

Per Km Cost of TCS Type-III in Cr. = 2.462

Total Cost of TCS Type- III for 00.620 Kms Length in Cr. = 1.526

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TCS-IV {Two lane with Paved shoulder Realignment (One Side Hill, One side Valley section)}

1.435 Kms

Item No.	Description	Unit	No.	Length (in m)	Width (in m)	Depth (in m)	Qty	Rate (in Rs)	Amount (in Rs)
1	Clearing & Grubbing	Hac	1	1000	12	-	1.20	60,829.00	72,994.80
2	Sub Grade	Cum	1	1000	12.00	0.500	6,000.00	266.00	1,596,000.00
3	Excavation & Earthwork	Cum	Taken in Abstract Sheet					-	
5	CTSB	Cum	1	1000	11.30	0.200	2,260.00	3,993.00	9,024,180.00
6	Earthen Shoulder	Cum	1	1000	1.00	0.150	150.00	226.00	33,900.000
6	BSM	Cum	1	1000	10.50	0.110	1,155.00	7,789.77	8,997,186.06
7	Prime Coat	Sqm	1	1000	10.30	-	10,300.00	24.00	247,200.00
8	Tack Coat	Sqm	2	1000	10	-	20,000.00	9.00	180,000.00
9	BC	Cum	1	1000	10	0.040	400.00	11,167.00	4,466,800.00
							Total Cost =		24,618,260.86

Per Km Cost of TCS Type-IV in Cr. = 2.462

Total Cost of TCS Type- IV for 01.435 Kms Length in Cr. = 3.533

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TCS-VIII {Two lane with Paved shoulder Concentric Widening (Both Side Hill section)}

1.81 Kms

Item No.	Description	Unit	No.	Length (in m)	Width (in m)	Depth (in m)	Qty	Rate (in Rs)	Amount (in Rs)
1	Clearing & Grubbing	Hac	1	1000	12	-	1.20	60,829.00	72,994.80
2	Sub Grade	Cum	1	1000	12.0	0.500	6,000.00	266.00	1,596,000.00
3	Excavation & Earthwork	Cum	Taken in Abstract Sheet					-	
4	CTSB	Cum	1	1000	11.3	0.200	2,260.00	3,993.00	9,024,180.00
5	BSM	Cum	1	1000	10.5	0.110	1,155.00	7,789.77	8,997,186.06
6	Prime Coat	Sqm	1	1000	10.3	-	10,300.00	24.00	247,200.00
7	Tack Coat	Sqm	2	1000	10.0	-	20,000.00	9.00	180,000.00
8	BC	Cum	1	1000	10.0	0.040	400.00	11,167.00	4,466,800.00
								Total Cost =	24,584,360.86

Per Km Cost of TCS Type-V in Cr. = 2.458

Total Cost of TCS Type- V for 00.080 Kms Length in Cr. = 4.450

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TCS-VI {Two lane with Paved shoulder Concentric Widening (Both side Valley section)}

0.08 Kms

Item No.	Description	Unit	No.	Length (in m)	Width (in m)	Depth (in m)	Qty	Rate (in Rs)	Amount (in Rs)
1	Clearing & Grubbing	Hac	1	1000	12.00	-	1.20	60,829.00	72,994.80
2	Sub Grade	Cum	1	1000	12.00	0.500	6,000.00	266.00	1,596,000.00
3	Excavation & Earthwork	Cum	Taken in Abstract Sheet					-	
4	CTSB	Cum	1	1000	11.30	0.200	2,260.00	3,993.00	9,024,180.00
5	Earthen Shoulder	Cum	1	1000	1.00	0.150	150.00	226.00	33,900.000
6	BSM	Cum	1	1000	10.50	0.110	1,155.00	7,789.77	8,997,186.06
7	Prime Coat	Sqm	1	1000	10.30	-	10,300.00	24.00	247,200.00
8	Tack Coat	Sqm	2	1000	10.00	-	20,000.00	9.00	180,000.00
9	BC	Cum	1	1000	10.00	0.040	400.00	11,167.00	4,466,800.00
								Total Cost =	24,618,260.86

Per Km Cost of TCS Type-VI in Cr. = 2.462

Total Cost of TCS Type- VI for 01.720 Kms Length in Cr. = 0.197

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TCS-V {Two lane with Paved shoulder Realignment (Both Side Valley section)}

1.130 Kms

Item No.	Description	Unit	No.	Length (in m)	Width (in m)	Depth (in m)	Qty	Rate (in Rs)	Amount (in Rs)
1	Clearing & Grubbing	Hac	1	1000	12	-	1.20	60,829.00	72,994.80
2	Sub Grade	Cum	1	1000	12.0	0.500	6,000.00	266.00	1,596,000.00
3	Excavation & Earthwork	Cum	Taken in Abstract Sheet					-	
4	CTSB	Cum	1	1000	11.3	0.200	2,260.00	3,993.00	9,024,180.00
5	Earthen Shoulder	Cum	1	1000	1.00	0.150	150.00	226.00	33,900.000
6	BSM	Cum	1	1000	10.50	0.110	1,155.00	7,789.77	8,997,186.06
7	Prime Coat	Sqm	1	1000	10.30	-	10,300.00	24.00	247,200.00
8	Tack Coat	Sqm	2	1000	10	-	20,000.00	9.00	180,000.00
9	BC	Cum	1	1000	10	0.040	400.00	11,167.00	4,466,800.00
								Total Cost =	24,618,260.86

Per Km Cost of TCS Type-V in Cr. = 2.462

Total Cost of TCS Type- V for 01.130 Kms Length in Cr. = 2.782

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TCS-VII {Two lane with Paved shoulder Realignment (Both Side Hill section)}

1.720 Kms

Item No.	Description	Unit	No.	Length (in m)	Width (in m)	Depth (in m)	Qty	Rate (in Rs)	Amount (in Rs)
1	Clearing & Grubbing	Hac	1	1000	12.0	-	1.20	60,829.00	72,994.80
2	Sub Grade	Cum	1	1000	12.0	0.500	6,000.00	266.00	1,596,000.00
3	Excavation & Earthwork	Cum	Taken in Abstract Sheet					-	
5	CTSB	Cum	1	1000	11.3	0.200	2,260.00	3,993.00	9,024,180.00
6	BSM	Cum	1	1000	10.5	0.110	1,155.00	7,789.77	8,997,186.06
7	Prime Coat	Sqm	1	1000	10.3	-	10,300.00	24.00	247,200.00
8	Tack Coat	Sqm	2	1000	10.0	-	20,000.00	9.00	180,000.00
9	BC	Cum	1	1000	10.0	0.040	400.00	11,167.00	4,466,800.00
Total Cost =									24,584,360.86

Per Km Cost of TCS Type-VII in Cr. = 2.458

Total Cost of TCS Type- VII for 01.720 Kms Length in Cr. = 4.229

Catch Water Drain

15.59 Kms

Item No.	Description	Unit	No.	Length (in m)	Width (in m)	Depth (in m)	Qty	Rate (in Rs)	Amount (in Rs)
1	E/W in Excavation in soil	Cum	1	1000	1.00	0.50	500	208.00	104,000.00
2	Grade M15 PCC - Using Concrete Mixer	Cum	1	1000	0.95	0.10	95	8,226.00	781,470.00
3 (i)	RCC Grade M25 : Using Concrete Mixer	Cum	1	1000	0.75	0.15	112.5	8,206.00	923,175.00
3 (ii)	RCC Grade M25 : Using Concrete Mixer	Cum	2	1000	0.45	0.15	135	8,206.00	1,107,810.00
4	RCC Grade M20 : Using concrete mixer	Cum	1	1000	0.60	0.15	90	7,737.00	696,330.00
5	Supplying, Fitting and Placing un-coated HYSD bar Reinforcement in Foundation complete as per Drawing and Technical	Ton	1	1000			21.938	64,487.00	1,414,683.56
Total Cost =									5,027,468.56

Per Km Cost of Catch Water Drain in Cr.= 0.503

Total Cost of Catch Water Drain for Km Length in Cr. = 7.838

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for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chuikhim-Nimbong-Kafer-Bakhim-Algarah-Rhenok in the State of West Bengal and from Rhenok-Rorathang-Pakyong along with Spur from Aritar-Relop-Menla in the State of Sikkim. PKG IV B (BAGRAKOT TO KAHER Km 13.000 to Km 25.600)

Bill Of Quantities - Roads

Item No.	Description	Unit	Qty	Rate (in Rs.)	Amount (Rs.)
Bill No 1: Site Clearance					
1.010	Clearing and grubbing road land by mechanical means in area of light jungle including uprooting rank vegetation, grass, bushes, shrubs, saplings and trees girth up to 300 mm, removal of stumps of trees cut earlier and disposal of unserviceable materials and stacking of serviceable material to be used or auctioned, up to a lead of 1000 metres including removal and disposal of top organic soil not exceeding 150 mm in thickness.	Ha	13.99	60829.0	851119
1.020	Dismantling of existing structures like culverts, bridges, retaining walls and other structure comprising of masonry, cement concrete, wood work, steel work, including T&P and scaffolding wherever necessary, sorting the dismantled material, disposal of unserviceable material and stacking the serviceable material with all lifts and lead of 1000 metres				
(i)	Slab Culvert	No.	12.00	5000.0	60000
(ii)	Causeway	No.	22.00	2000.0	44000
(iii)	Bridges	Sqm	112.20	5000.0	561000
1.030	Cutting of trees, including cutting of trunks, branches and removal of stumps, roots stacking of serviceable material with all lifts and up to a lead of 1000 m and earth filling in the depression/pit as per MORTH specification clause 201.				
	(a) Girth from 300mm to 600mm	No.	1952	294.0	573742
	(b) Girth from 600mm to 900mm	No.	1028	526.0	540936
	(c) Girth from 900mm to 1800mm	No.	2597	1032.0	2680368
	(d) Girth above 1800mm	No.	1626	1969.0	3201288
Total (Rs)					8512454.104
Bill No 2: Earth Work					
2.010	Excavation in Ordinary Rock by Manual Means . Excavation in ordinary rock using manual means including loading in a truck and carrying of excavated material to embankment site with in all lifts and leads upto 1000 metres	Cum	239185.74	296.0	70798979
2.020	Excavation in Soil with Dozer with lead upto 100 metres. Excavation for road way in soil by mechanical means including cutting and pushing the earth to site of embankment upto a distance of 100 metres (average lead 50 metres), including trimming bottom and side slopes in accordance with requirements of lines, grades and cross sections.	Cum	318914.32	173.0	55172178
2.020	Excavation in Hard Rock (controlled blasting) with disposal upto 1000 metres. Excavation for roadway in hard rock with controlled blasting by drilling, blasting and breaking, trimming of bottom and side slopes in accordance with requirements of lines, grades and cross sections, loading and disposal of cut road with in all lifts and leads upto 1000 metres	Cum	239185.74	488.0	116722641
2.030	Removal of Unserviceable Soil with Disposal upto 1000 Metres. Removal of unserviceable soil including excavation, loading and disposal upto 1000 metres lead but excluding replacement by suitable soil which shall be paid separately as per clause 305.	Cum	397987.69	106.0	42186695
			TOTAL EXCAVATION		242693798
2.040	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 with vibratory roller 8-10 tonne to meet requirement of table 300-2 including cost of compensation for earth taken from private land with lead up to 1 km as per MoRTH specification Clause No. 305.	Cum	0.00	226.0	0
2.050	Construction of embankment with approved materials deposited at site from roadway cutting and excavation from drain and foundation of other structures graded and compacted with vibratory roller to meet requirement of table 300-2 as per MoRTH specification Clause No. 305.	Cum	399298.11	163.0	65085592
			TOTAL EMBANKMENT FILLING		65085592

for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chuikhim-Nimbong-Kafer-Bakhim-Algarah-Rhenok in the State of West Bengal and from Rhenok-Rorathang-Pakyong along with Spur from Aritar-Relop-Menla in the State of Sikkim. PKG IV B (BAGRAKOT TO KAFAER Km 13.000 to Km 25.600)

Bill Of Quantities - Roads

Item No.	Description	Unit	Qty	Rate (in Rs.)	Amount (Rs.)
2.060	Loosening of the ground upto a level of 200 mm below the sub-grade level, watered, graded and compacted in layers to meet requirement of table 300-2 for sub-grade construction.	cum	0.00	82.0	0
2.070	Construction of sub-grade and earthen shoulders with approved material obtained from borrow pits with all lifts & leads, transporting to site, spreading, grading to required slope and compacted to meet requirement of table No. 300-2	Cum	71102.25	266.0	18913199
Total (Rs)					326692589
Bill No 3: Non-Bituminous Courses					
3.010	Cement Treated Crushed Rock or combination as per clause 403.2 and table 400.4 in Sub base/ Base. Providing, laying and spreading Material on a prepared sub grade, adding the designed quantity of cement to the spread Material, mixing in place with rotavator, grading with the motor grader and compacting with the road roller at OMC to achieve the desired unconfined compressive strength and to form a layer of sub-base/base.	Cum	26351.60	3993.0	105221939
3.020	Bituminous Stabilised Material (BSM)	Cum	13467.30	7789.8	104907189
Total (Rs)					210129128
Bill No 4: Bituminous Courses					
4.010	Providing and applying primer coat with bitumen emulsion on prepared surface of granular Base including clearing of road surface and spraying primer at the rate of 0.6 kg/sqm using mechanical means as per clause 502.	Sqm	120098.00	24.0	2882352
4.020	Providing and applying tack coat with bitumen emulsion using emulsion pressure distributor at the rate of 0.30 kg per sqm on the prepared bituminous/granular surface cleaned with mechanical broom as per clause 503.	Sqm	233200.00	9.0	2098800
4.040	Providing and laying bituminous concrete with 100-120 TPH batch type hot mix plant producing an average output of 75 tonnes per hour using crushed aggregates of grading-I, premixed with polymer modified bituminous binder @ 5.5 per cent of mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MORTH specification clause No. 509 complete in all respects	Cum	4664.00	11167.0	52082888
Total (Rs)					57064040

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Bill Of Quantities - Roads

Item No.	Description	Unit	Qty	Rate (in Rs.)	Amount (Rs.)
Bill No 6: Drainage and Protective works					
6.01	Excavation for roadwork in soil with in all types of soil including marshy soil hydraulic excavator of 0.9 cum bucket capacity 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 as per clause 301.				
	(i) Catch Water Drain	Km	15.59	5027468.6	78378234.89
		TOTAL DRAINAGE COST			78,378,235
6.02	Parapet Wall of Stone masonry work in cement mortar 1:3	Rmt	5604.00	4050.0	22696200
		TOTAL OF CRASH BARRIER ...			22,696,200
				Total (Rs)	101,074,435

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Bill Of Quantities - Roads

Item No.	Description	Unit	Qty	Rate (in Rs.)	Amount (Rs.)
Bill No 7: Traffic Signs, Marking and Road Appurtenances					
7.010	Providing and fixing in position precast concrete stones in RCC M 20 grade including excavation, foundation concrete and reinforcement inscription etc. complete as per Technical Specification Clause 804.				
	(i) 5th kilometre stone	No.	3.00	4156.0	12468
	(ii) Ordinary Kilometer stone	No.	11.00	2517.0	27687
	(iii) Hectometer stone	No.	50.00	677.0	33850
	(iv) Boundary stones @200 m interval	No	128.00	542.0	69376.00
7.020	Providing and laying pavement marking with hot applied thermoplastic paint (Type-2) conforming to ASTM D36/BS-3262 (Part - I) complete as per drawings and Technical Specification Clause 803.				
	(a) Lane /center line/edge line/ transverse marking and any other markings	Sqm	5000.00	629.00	3145000
	(b) Directional Arrows, lettering etc. as per Drawing	Sqm	120.83	146.00	17640
7.030	Providing, fixing and erection of retro reflective sign boards made out of 2mm thick aluminum sheet including angle iron sign post as per drawings and Technical Specification Clause 801.				
	(i) Information sign 800mm x 600mm	No.	20.00	8372.0	167440
	(ii) Cautionary sign 900 mm triangular	No.	69.00	6685.0	461265
	(iii) Mandatory sign 600 mm circular	No.	64.00	5816.0	372224
	(iv) Mandatory sign 900 mm octagon	No.	4.00	10863.0	43452
7.040	Supply & fixing tubular gantry mounted overhead/ cantilever signs as per IRC: 67-2001 including thorough descaling, cleaning, priming and painting with two coats of epoxy paint (other than reflective portion), back side painted with gray colour, post above				
	(i) Erection of overhead gantry/ cantilever structure as per drawing including steel work in trusses, steel tubes, cutting, fixing in position with welding and bolted complete .	Ton	9.00	82561.41	743053
7.050					
	(i) Triangular object marker 300mm equilateral triangle containing cluster of red reflector on frame of ISA 35mmx35mmx3mm with fixing on post made of ISA 40mmx 40mmx 5mm at 650 mm above ground level	No.	69.00	3634.00	250746
	(ii) Rectangular hazard marker 900mm x 300mm containing black and yellow zebra strips on frame of ISA 35mmx35mmx3mm with fixing on post made of ISA 40mmx 40mmx 5mm at 600 mm above ground level	No.	58.00	7555.00	438190
	(iii) Roadway Indicator 1000mm high made by 100mm square MS pipe containing rectangular reflector of 120mm x 80mm and alternate white and black bands of 150mm including coverage of reflector by 150mm high wire mesh	No.			
7.090	Providing and fixing Cluster of Red Reflector complete as per drawings and Technical Specification Clause 805.	No.	2770.00	249.00	689730
	TOTAL OF TRAFFIC SIGN, MARKING ETC...				6472121
7.070	Providing & Ninteen degree tilted one way reflective Road Studs	No.	2770.00	834.32	2311066
Total (Rs)					8783188

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Bill Of Quantities - Roads

Item No.	Description	Unit	Qty	Rate (in Rs.)	Amount (Rs.)
Bill No 8: Miscellaneous					
8.010	Construction, provision and maintenance of 7m wide temporary diversion with 300 mm thick subgrade, 200mm granular sub-base, 225mm wet mix macadam and 20mm premix carpet overlaid by sand seal coat.	Rmt	650.00	606.00	393900
8.020	Traffic management and safety during construction operation as per Technical Specification Clause A-21.	km	3.00	500000.00	1500000
	Total (Rs.)				1893900

Bill of Quantities of Viaduct																		
Item No.	Description	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14		
			14+370 TO 14+415	14+515 TO 14+560	15+070 TO 15+145	16+985 TO 17+035	17+185 TO 17+250	17+450 TO 17+510	17+740 TO 17+810	17+880 TO 17+940	18+010 TO 18+050	18+090 TO 18+130	19+595 TO 19+725	22+290 TO 22+320	22+610 TO 22+630	24+800 TO 25+000	Total Qty	Rate (Rs.)
6.01	Earthwork in excavation of foundations for structures in all kinds of soils including all leads and lifts complete as per drawings and Technical Specifications Clause 304																	
	a) Depth up to 3.0 m																	
	i) all types of soils	cum																
	ii) Hard Rock	cum																
	iii) Soft/Ordinary rock	cum																
	b) Depth above 3.0 m and up to 6.0 m																	
	i) all types of soils	cum	918	787	969	821	969	918	969	821	672	672	1413	655	524	1521	12627	64.00
	ii) Hard Rock	cum	918	787	969	821	969	918	969	821	672	672	1413	655	524	1521	12627	545.00
	iii) Soft/Ordinary rock	cum																6881980.65
	c) Depth over 6.0 m																	
	i) all types of soils	cum																
	ii) Hard Rock	cum																
	iii) Soft/Ordinary rock	cum																
6.02	Back filling behind abutments, wing walls and return walls with selected imported granular material of approved quality, including all leads and lifts, complete as per drawings and Technical Specifications Clause 305 and Clause 710.1.4 of IRC-78	cum	2023	1918	2597	2372	2170	2023	2490	2158	2787	2040	2846	2667	2669	3466	34227	587
6.03	Providing and laying filter media behind abutments, wing walls & return walls with well packed material to the specified thickness with smaller size towards the soil and bigger size towards the wall complete with all leads and lifts as per drawings and Technical Specifications Clauses 305 and Clause 710.1.4 of IRC-78	cum	222	222	401	361	254	223	361	288	576	288	361	531	576	576	5240	3571
6.04	Plain Cement Concrete / Reinforced Cement Concrete in foundation/ leveling, course excluding reinforcement complete as per drawings and Technical Specifications Sections 1500, 1700 and 2100																	
	a) M-15 grade	cum	42	37	44	38	44	42	44	38	32	32	62	32	27	67	583	7090
	b) M-20 grade	cum																4133462.91
	c) M-35 grade	cum	324	285	351	302	351	325	351	302	254	254	496	245	205	554	4597	8621
6.12	Plain Cement Concrete/ Reinforced Cement Concrete in substructure excluding reinforcement complete as per drawings and Technical Specifications Sections 1500, 1700 and 2200																	
	a) M-20 grade	cum																
	b) M-25 grade	cum																
	c) M-30 grade	cum																
	d) M-35 grade	cum	1484	1422	1908	1773	1444	1578	1795	1570	2046	1509	2167	1968	1977	2556	25196	10020
	e) M-40 grade	cum																252461554.5
6.14	Structural Cement concrete for Prestressed Concrete in superstructure excluding reinforcement complete as per drawings and Technical Specifications Sections 1500, 1700, 1800 and 2300																	
	a) M-45 grade in slab and I girder	cum	396	324	540	360	468	432	504	432	288	288	936	216	144	1440	6768	11838
	b) M-45 grade in slab	cum																80119584.0
	c) M-40 grade in box girder	cum																
	d) M-35 grade in box girder	cum																
6.15	Supplying, fixing and placing TMT/HYSD bar reinforcement complete as per drawings and Technical Specification Section 1500																	
	a) For Sub structure/Foundation	t	198	182	247	223	185	217	232	198	234	181	319	226	216	363	3223	64598
	b) For Superstructure/Friction Slab/Facia Panels	t	67	58	97	65	84	78	91	78	52	52	168	39	26	207	1162	66104
6.16	Providing High Tensile Steel strands including all accessories for stressing and jacking operations and grouting etc. complete as per drawings and Technical Specifications Section - 1800	t	0	0	0	0	0	0	0	0	0	0	0	0	0	45	45	185379
6.18	Providing 65 mm thick wearing course consisting of 40 mm thick asphaltic concrete covered by 25 mm thick mastic asphalt on top complete as per Technical Specification Section 2700	sqm	558	468	738	513	648	603	693	603	423	423	1233	333	243	1863	9342	1365
6.19	Providing and fixing drainage spouts as per drawings and Technical Specifications Clause 2705	no	22	18	30	20	26	24	28	24	16	16	52	12	8	80	376	7875
6.21	Supplying and fixing of POT PTFE bearings complete as per drawings and IRC-83(Part III) - 2002																	
	a) Sliding bearing																	
	Capacity 1300 kN	no																
	Capacity 2000 kN	no	16	12	16	12	16	16	16	12	8	8	28	8	4	28	200	60000
	Capacity 3500 kN	no																1200000.0
	Capacity 4500 kN	no																
	Capacity 6000 kN	no																
	b) Pin bearing																	
	Capacity 1300 kN	no																
	Capacity 2000 kN	no	4	3	4	3	4	4	4	3	2	2	7	2	1	7	50	120000
	Capacity 3500 kN	no																6000000.0
	Capacity 4500 kN	no																

Total =	790438531
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Item No.	Description	Unit	1			
			15+310	Total Qty	Rate (Rs.)	Amount (Rs.)
6.01	Earthwork in excavation of foundations for structures in all kinds of soils including all leads and lifts complete as per drawings and Technical Specifications Clause 304					
a)	Depth up to 3.0 m					
	i) all types of soils	cum				
	ii) Hard Rock	cum				
	iii) Soft/ordinary rock	cum				
b)	Depth above 3.0 m and up to 6.0 m					
	i) all types of soils	cum	1014	1014	64.00	64915.20
	ii) Hard Rock	cum	580	580	545.00	315882.00
	iii) Soft/ordinary rock	cum				
c)	Depth over 6.0 m					
	i) all types of soils	cum				
	ii) Hard Rock	cum				
	iii) Soft/ordinary rock	cum				
6.02	Back filling behind abutments, wing walls and return walls with selected imported granular material of approved quality, including all leads and lifts, complete as per drawings and Technical Specifications Clause 305 and Clause 710.1.4 of IRC:78	cum	2577	2577	587	1512892.71
6.03	Providing and laying filter media behind abutments, wing walls & return walls with well packed material to the specified thickness with smaller size towards the soil and bigger size towards the wall complete with all leads and lifts as per drawings and Technical Specifications Clauses 305 and Clause 710.1.4 of IRC:78	cum	258	258	3571	921318.00
6.04	Plain Cement Concrete / Reinforced Cement Concrete in foundation/ leveling course excluding reinforcement complete as per drawings and Technical Specifications Sections 1500, 1700 and 2100					
a)	M-15 grade	cum	59	59	7090	418168.20
b)	M-20 grade	cum				
c)	M-35 grade	cum	722	722	8621	6222120.54
6.12	Plain Cement Concrete/ Reinforced Cement Concrete in substructure excluding reinforcement complete as per drawings and Technical Specifications Sections 1500, 1700 and 2200.					
a)	M-20 grade	cum				
b)	M-25 grade	cum				
c)	M-30 grade	cum				
d)	M-35 grade	cum	310	310	10020	3110225.54
e)	M-40 grade	cum				
6.14	Structural Cement concrete for Prestressed Concrete in superstructure excluding reinforcement complete as per drawings and Technical Specifications Sections 1500, 1700, 1800 and 2300					
a)	M-45 grade in slab and I girder	cum	216	216	11838	2557008.00
b)	M-45 grade in slab	cum				
c)	M-40 grade in box girder	cum				
d)	M-35 grade in box girder	cum				
6.15	Supplying, fixing and placing TMT/HYSD bar reinforcement complete as per drawings and Technical Specification Section 1600					
a)	For Sub structure/Foundation	t	109	109	64598	7068455.92
b)	For Superstructure/Friction Slab/Facia Panels	t	39	39	66104	2570123.52
6.16	Providing High Tensile Steel strands including all accessories for stressing and jacking operations and grouting etc. complete as per drawings and Technical Specifications Section - 1800	t	0	0	185379	0.00
6.18	Providing 65 mm thick wearing course consisting of 40 mm thick asphaltic concrete covered by 25 mm thick mastic asphalt on top complete as					

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Item No.	Description	Unit	1			
			15+310	Total Qty	Rate (Rs.)	Amount (Rs.)
	per Technical Specification Section 2700	sqm	429	429	1365	585994.50
6.19	Providing and fixing drainage spouts as per drawings and Technical Specifications Clause 2705	no	8	8	7875	63000.00
6.21	Supplying and fixing of POT PTFE bearings complete as per drawings and IRC:83(Part III) - 2002					
	a) Sliding bearing					
	Capacity 1300 kN	no				
	Capacity 2000 kN	no	4	4	60000	240000.00
	Capacity 3500 kN	no				
	Capacity 4500 kN	no				
	Capacity 6000 kN	no				
	b) Pin bearing					
	Capacity 1300 kN	no				
	Capacity 2000 kN	no	2	2	120000	240000.00
	Capacity 3500 kN	no				
	Capacity 4500 kN	no				
	Capacity 6000 kN	no				
	c) Metallic Guided bearing					
	Capacity 1300 kN	no				
	Capacity 2000 kN	no	2	2	90000	180000.00
	Capacity 3500 kN	no				
	Capacity 4500 kN	no				
	Capacity 6000 kN	no				
6.22	Supplying and fixing of expansion joints complete as per drawings and Technical Specifications Section 2600.					
	a) 80 mm wide strip seal joints	m				
	b) 40 mm wide strip seal joints	m	36	36	14357	516852.00
	c) 20 mm wide filler type joints	m				
6.25	Reinforced Cement Concrete Crash Barrier including reinforcement and MS pipe complete as per drawings and Technical Specifications Sections 1500, 1600, 1700, 2200 and Clause 809					
	a) M-30 grade	m				
	b) M-40 grade	m	54	54	4699	253746.00
	c) M-45 grade	m				
6.28	Plain Cement Concrete in leveling course under the approach slabs complete as per drawings and Technical Specifications Section 1700, 2100 & 2700.					
	M-15 grade	cum	18	18	5011	89446.35
6.29	Reinforced Cement Concrete in approach slabs including reinforcement and form work complete as per drawings and Technical Specifications Sections 1500, 1600, 1700 and 2100 and Clause 2704.					
	M-30 grade	cum	36	36	10561	377027.70
6.33	Providing weep holes in abutments, wing walls, retaining walls, return walls etc. complete as per drawings and Technical Specifications Clause 2706	no	430	430	1257	540510.00
					Total =	27847686

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Bill Of Quantities - Culvert

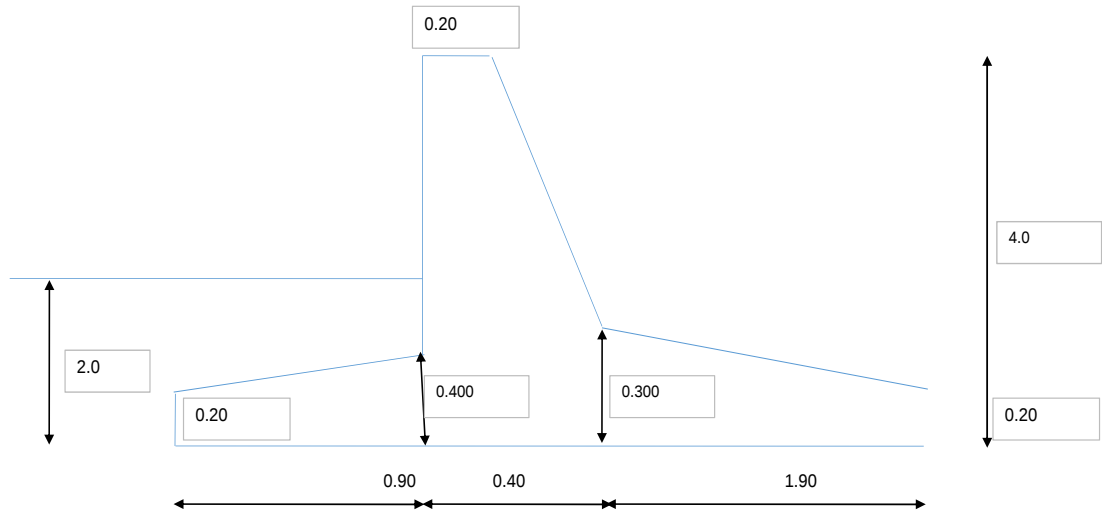
Sl No..	Description of items	Unit	Calculation	Sectional Area /Plan area in Sqm.	Length/ Thickness	No.	Qty		Rate	Amount
	Size =1 X 3.0 m RCC slab culvert									22,885
I)	Earthwork in excavation									
	a) Abutments	Cum	5.65 X 2.15	12.1475	12	1	145.77			
	b) Curtain Wall D/s	Cum	1.95 X 2.65	5.1675	9	1	46.51			
	c) Curtain Wall U/s	Cum	1.60 X 2.15	3.44	9	1	30.96			
	d) Wing Wall	Cum	2.514X3.514	8.834196	1.35	4	47.70			
	e) Apron									
	f) Flexible Apron D/s	Cum	0.55 X 0.3	0.165	8.028	1	1.32			
		Cum	5.05 X .75	3.7875	5.528	1	20.94			
	g) Flexible Apron U/s	Cum	1.30 X 0.30	0.39	7	1	2.73			
		Cum	5.05 X .75	3.7875	4.5	1	17.04			
							312.98	12.1 I - A (i)	164.00	51,328
II)	Back filling									
	a) Curtain Wall	Cum			1/3Excvn		25.82			
	b) Wing Wall	Cum			1/3Excvn		15.90			
	c) Abutments	Cum			1/3 Excvn		48.59			
							90.31	12.3	2478.00	223,798
III)	M 15 Conc.									
	a) Curtain Wall	Cum		4.30375	0.15		0.65			
	b) Abutments	Cum	2.75 X 12.30	33.825	0.15	2	10.15			
	c) Wing Wall	Cum	4.20 X 2.10	8.82	0.15	4	5.29			
	d) Floor Apron	Cum	5.514 X 1.257	6.931	0.15	2	2.08			
		Cum	12 X 0.5	0.600	0.15	1	0.09			
							18.25	12.8 A	7090.00	129,424
IV)	M 15 Conc.									
	a) Abutments	Cum	$(2.45 \times 0.2) + (2.05 \times 0.2) + (2.05 \times 0.4) + ((2.05 + 1.65) / 2 \times 0.4) + ((1.65 + 1.3) / 2 \times 1) + ((0.8 + 0.3) / 2 \times 0.95)$	3.794	12	2	91.05			
	b) Wing Wall	Cum	$((1.65 \times 0.4) + (1.25 \times 0.4) + ((1.25 + 0.85) / 2 \times 0.4) + ((0.85 + 0.5) / 2 \times 1)) + ((1.95 \times 0.4) + (1.55 \times 0.4) + ((1.55 + 1.15) / 2 \times 0.4) + ((1.15 + 0.5) / 2 \times 1.7)) / 2$	2.799	3.250	4	36.38			
	c) Curtain Wall U/s	Cum	$(1.3 \times 0.8) + (0.45 \times 0.75) + (0.2 \times 0.45)$	1.468	8.028	1	11.78			
	d) Curtain Wall D/s	Cum	$(1.65 \times 0.55) + (.75 \times 0.75) + (0.45 \times 0.75) + (0.2 \times 0.45)$	1.898	8.028	1	15.23			
							154.45	12.8 A	7090.00	1,095,036
VI)	M 25 Conc.									
	Slab	Cum		48	0.45	1	21.60			
	Wearing coat	Cum		48	0.065	1	3.12			
							24.72	14.1 C - Case-I (ii) (p)	9961.00	246,236
V)	Reinforcement Bar	MT					2.472	14.2	66104.00	163,409
VIII)	Stone (Boulder) Apron									
	a) Floor Apron (300 THK)	Cum		36	0.3	1	10.80			
	b) Floor Apron (300 THK)	Cum		13.862	0.3	1	4.16	15.1 A		
	c) Flexible Apron(750 THK)	Cum		72.252	0.75	1	54.19	15.1 A		
							69.15	15.11	3148.00	217,677
IX)	Weep Holes in Wing Wall	No..				12 X 4	48	13.8	1257.00	60,336
X)	Drainage Spout	No..				2 X 2	4	14.9	7875.00	31,500
XI)	RCC railing	Mtr		3.1		2	6.2	14.6	2182.00	13,528
XII)	600mm Th Filter Media	Mtr	1.65X0.6	0.93	12	2	22.32	13.10	3571.00	79,705
				Total Cost of One Culvert (2 Lane)					Rs.	2,312,000
			Total Cost of Culverts..			43 Nos			Rs.	99,415,995

Retaining wall

S.No.	Item	Heigh in Mtr	Length includes Left and Right Portion	Rate per m	Amount (Rs.)	Amount (Cr)
1	Retaining wall of 4 m Height	4	420	34067	14,308,340.05	1.43
2	Retaining wall of 5 m Height	5	600	54042	32,425,114.83	3.24
1	Retaining wall of 6 m Height	6	430	74960	32,232,598.58	3.22
2	Retaining wall of 7 m Height	7	390	100682	39,265,928.27	3.93
3	Retaining wall of 8 m Height	8	280	133305	37,325,413.49	3.73
4	Retaining wall of 9 m Height	9	290	173449	50,300,159.79	5.03
5	Retaining wall of 10 m Height	10	170	216018	36,723,050.23	3.67
6	Retaining wall of 11 m Height	11	70	253849	17,769,395.82	1.78
	Total ...		2650		260,350,001.04	26.04

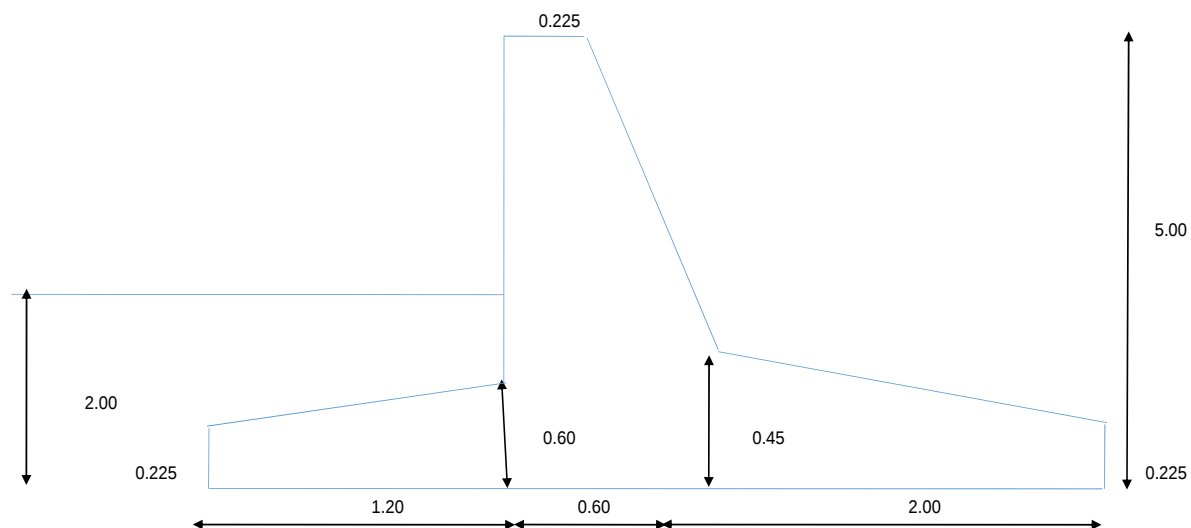
	Left Side	Right Side
	length (km)	length (km)
Retaining wall	1.26	1.39

Length	1.00	Mtr
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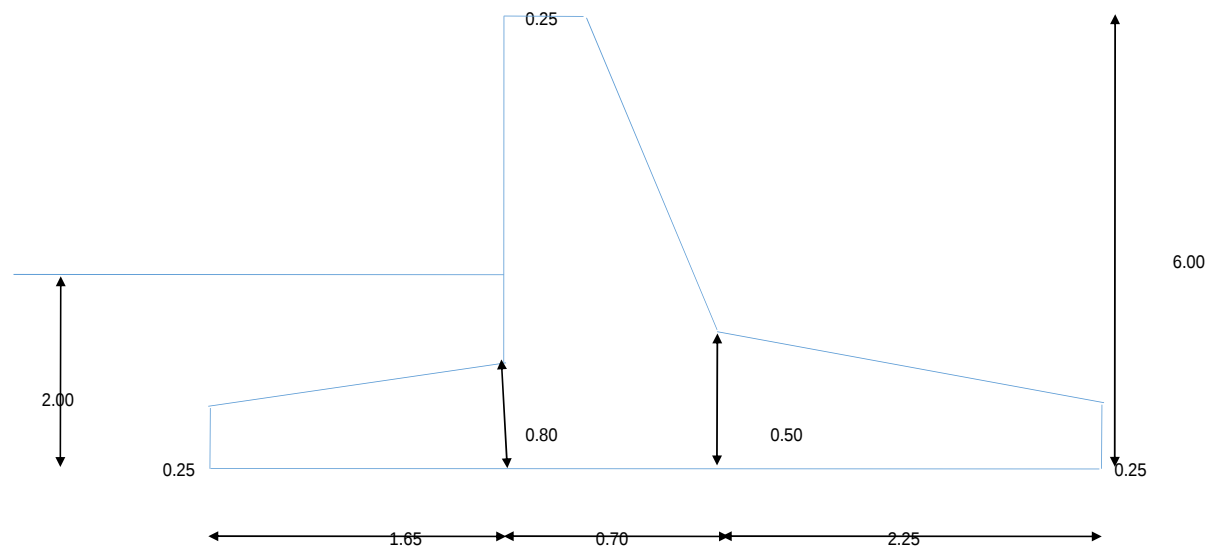
Sr. No	Item Description	Length (m)	Breadth (m)	Height (m)	QTY.	Unit	Rate	Amount
1.00	Excavation	1.00	4.20	2.10	8.82	cum	211.00	1,861.02
2.00	PCC M-15	1.00	3.40	0.10	0.34	cum	7,090.00	2,410.60
3.00	RCC M20				1.97	cum	8,530.00	16,761.45
	Footing	1.00	3.20	0.20	0.64	cum	-	
		1.00	0.90	0.20	0.09	cum	-	
		1.00	1.90	0.10	0.10	cum	-	
	Shear key	0.00	0.30	0.30	0.00	cum	-	
	Stem	1.00	0.30	3.80	1.14	cum	-	
		0.00	0.30	1.70	0.00	cum	-	
4.00	HYSD Steel				0.18	MT	64,598.00	11,424.16
4.00	Steel (HYSD 90kg/cum)				0.18	MT	-	
	Steel (HYSD 50kg/cum for foundation)				0.00	MT	-	
5.00	Soil Filling upto 1m at Toe side				7.13	cum	226.00	1,610.25
		1.00	1.90	3.75	7.13	cum	-	
		1.00	0.60	0.00	0.00	cum	-	
						Total		34,067.48

Calculation of Retaining Wall (Height 5.0 m)



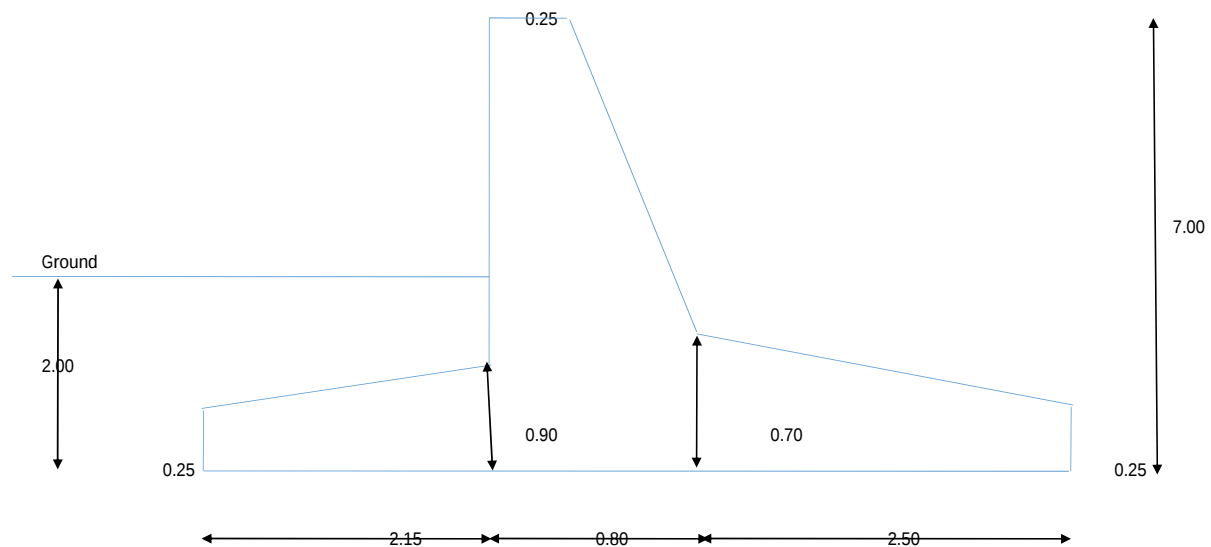
Sr. No	Item Description	Length (m)	Breadth (m)	Height (m)	QTY.	Unit	Rate	Amount
1.00	Excavation	1.00	4.80	2.10	10.08	cum	211.00	2,126.88
2.00	PCC M-15	1.00	4.00	0.10	0.40	cum	7,090.00	2,836.00
3.00	RCC M30				3.27	cum	8,530.00	27,933.08
	Footing	1.00	3.80	0.23	0.86		-	
		1.00	1.20	0.38	0.23	cum	-	
		1.00	2.00	0.23	0.23	cum	-	
	Shear key	1.00	0.30	0.00	0.00	cum	-	
	Stem	1.00	0.41	4.78	1.97	cum	-	
		0.00	0.41	1.59	0.00		-	
4.00	HYSD Steel				0.29	MT	64,598.00	19,038.44
4.00	Steel (HYSD 90kg/cum)				0.29	MT	-	
	Steel (HYSD 50kg/cum for foundation)				0.00	MT	-	
5.00	Soil Filling upto 1m at Toe side				9.33	cum	226.00	2,107.45
		1.00	2.00	4.66	9.33	cum	-	
		0.00	1.20	0.70	0.00	cum	-	
						Total ,,,,		54,041.86

Calculation of Retaining Wall (Height 6 m)



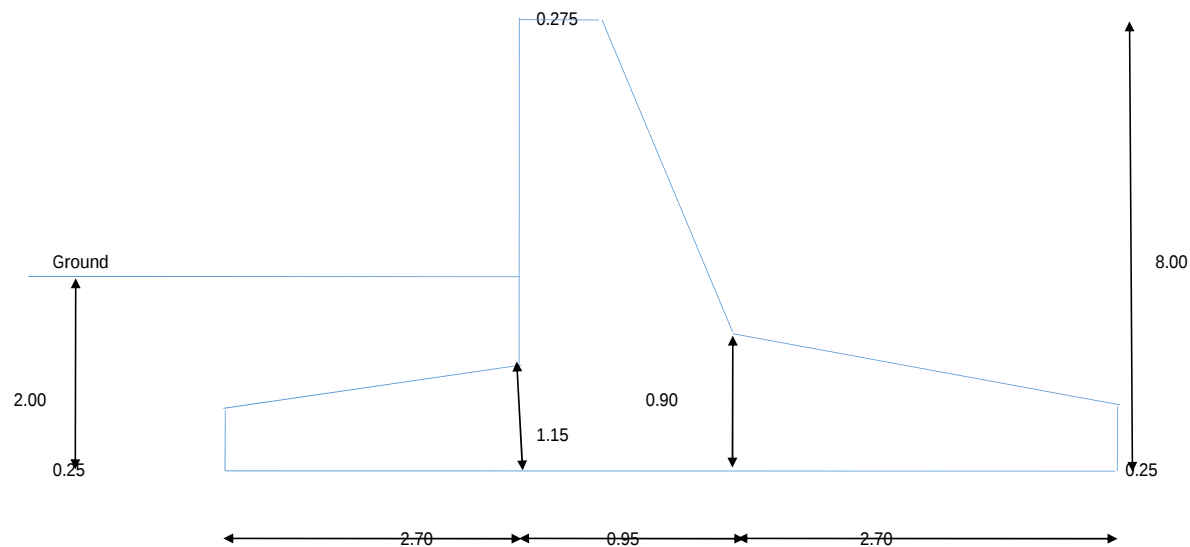
Sr. No	Item Description	Length (m)	Breadth (m)	Height (m)	QTY.	Unit	Rate	Amount
1.00	Excavation	1.00	5.60	2.10	11.76	cum	211.00	2,481.36
2.00	PCC M-15	1.00	4.80	0.10	0.48	cum	7,090.00	3,403.20
3.00	RCC M30				4.62	cum	8,530.00	39,376.61
	Footing	1.00	4.60	0.25	1.15		-	
		1.00	1.65	0.55	0.45	cum	-	
		1.00	2.25	0.25	0.28	cum	-	
	Shear key	1.00	0.30	0.00	0.00	cum	-	
	Stem	1.00	0.48	5.75	2.73	cum	-	
4.00	HYSD Steel				0.42	MT	64,598.00	26,838.05
4.00	Steel (HYSD 90kg/cum)				0.42	MT	-	
5.00	Soil Filling upto 1m at Toe side				12.66	cum	226.00	2,860.31
		1.00	2.25	5.63	12.66	cum	-	
						Total ,,,,		74,959.53

Calculation of Retaining Wall (Height 7 m)



Sr. No	Item Description	Length (m)	Breadth (m)	Height (m)	QTY.	Unit	Rate	Amount
1.00	Excavation	1.00	6.45	2.10	13.55	cum	211.00	2,858.00
2.00	PCC M-15	1.00	0.20	0.10	0.02	cum	7,090.00	141.80
3.00	RCC M30				6.17	cum	8,530.00	52,608.78
	Footing	1.00	5.45	0.25	1.36		-	
		1.00	2.15	0.65	0.70	cum	-	
		1.00	2.50	0.45	0.56	cum	-	
	Shear key	1.00	0.30	0.00	0.00	cum	-	
	Stem	1.00	0.53	6.75	3.54	cum	-	
4.00	HYSD Steel				0.56	MT	64,598.00	35,856.73
4.00	Steel (HYSD 90kg/cum for stem)				0.56	MT	-	
5.00	Soil Filling upto 1m at Toe side				40.78	cum	226.00	9,216.56
		2.50	2.50	6.53	40.78	cum	-	
						Total ,,,,		100,681.87

Calculation of Retaining Wall (Height 8 m)



Sr. No	Item Description	Length (m)	Breadth (m)	Height (m)	QTY.	Unit	Rate	Amount
1.00	Excavation	1.00	7.35	2.10	15.44	cum	211.00	3,256.79
2.00	PCC M-15	1.00	6.55	0.10	0.66	cum	7,090.00	4,643.95
3.00	RCC M30				8.43	cum	8,530.00	71,881.24
	Footing	1.00	6.35	0.25	1.59		-	
		1.00	2.70	0.90	1.22	cum	-	
		1.00	2.70	0.65	0.88	cum	-	
	Shear key	1.00	0.30	0.00	0.00	cum	-	
	Stem	1.00	0.61	7.75	4.75	cum	-	
4.00	HYSD Steel				0.76	MT	64,598.00	48,992.33
4.00	Steel (HYSD 90kg/cum)				0.76	MT	-	
5.00	Soil Filling upto 1m at Toe side				20.05	cum	226.00	4,530.74
		1.00	2.70	7.43	20.05	cum	-	
						Total ,,,,		133,305.05

The diagram illustrates the cross-section of a retaining wall and the soil behind it. The wall has a base width of 3.15 m, a top width of 0.30 m, and a height of 2.00 m. The soil behind the wall has a total height of 9.00 m. The soil profile is defined by a horizontal ground line at the top, a vertical face on the left, and a sloped face on the right. The soil is divided into three layers: a top layer of 0.30 m, a middle layer of 1.30 m, and a bottom layer of 1.10 m. The base of the wall is divided into three segments: 3.15 m, 1.05 m, and 3.30 m. The wall is shown in blue, and the soil is in light blue.

Sr. No	Item Description	Length (m)	Breadth (m)	Height (m)	QTY.	Unit	Rate	Amount
1.00	Excavation	1.00	8.50	2.10	17.85	cum	211.00	3,766.35
2.00	PCC M-15	1.00	7.70	0.10	0.77	cum	7,090.00	5,459.30
3.00	RCC M30				11.02	cum	8,530.00	93,979.28
	Footing	1.00	7.50	0.30	2.25		-	
		1.00	3.15	1.00	1.58	cum	-	
		1.00	3.30	0.80	1.32	cum	-	
	Shear key	1.00	0.30	0.00	0.00	cum	-	
	Stem	1.00	0.68	8.70	5.87	cum	-	
4.00	HYSD Steel				0.99	MT	64,598.00	64,053.76
4.00	Steel (HYSD 90kg/cum for stem)				0.99	MT	-	
5.00	Soil Filling upto 1m at Toe side				27.39	cum	226.00	6,190.14
		1.00	3.30	8.30	27.39	cum	-	
						Total ,,,,		173,448.83

The diagram shows a cross-section of a dam with the following dimensions (all in meters):

- Ground Level:** Indicated by a horizontal line on the left.
- Water Level:** Indicated by a horizontal line on the right, 10.00 m above the ground level.
- Water Depth:** 2.00 m (vertical distance from ground to water level).
- Upstream Slope:** A trapezoidal section with a top width of 0.35 m and a bottom width of 0.30 m. The height of this section is 1.40 m.
- Downstream Slope:** A trapezoidal section with a top width of 1.30 m and a bottom width of 3.35 m. The height of this section is 1.30 m.
- Core Section:** A central section with a width of 1.25 m and a height of 1.40 m.
- Foundation:** A horizontal line at the bottom, 0.30 m thick.

Sr. No	Item Description	Length (m)	Breadth (m)	Height (m)	QTY.	Unit	Rate	Amount
1.00	Excavation	1.00	9.20	2.10	19.32	cum	211.00	4,076.52
2.00	PCC M-15	1.00	8.40	0.10	0.84	cum	7,090.00	5,955.60
3.00	RCC M30				13.88	cum	8,530.00	118,353.75
	Footing	1.00	8.20	0.30	2.46		-	
		1.00	3.60	1.10	1.98	cum	-	
		1.00	3.35	1.00	1.68	cum	-	
	Shear key	1.00	0.30	0.00	0.00	cum	-	
	Stem	1.00	0.80	9.70	7.76	cum	-	
4.00	HYSD Steel				1.25	MT	64,598.00	80,666.75
4.00	Steel (HYSD 90kg/cum)				1.25	MT	-	
5.00	Soil Filling upto 1m at Toe side				30.82	cum	226.00	6,965.32
		1.00	3.35	9.20	30.82	cum	-	
						Total		216,017.94

The diagram shows a cross-section of a dam with the following dimensions (all in meters):

- Ground Level:** Indicated by a horizontal line on the left.
- Upstream Water Level:** 2.00 m above the ground level.
- Upstream Slope:** A vertical face on the left with a width of 0.30 m at the base.
- Core Slope:** A vertical face on the right with a width of 0.35 m at the top and a height of 1.40 m.
- Downstream Slope:** A sloped face on the right with a height of 1.30 m.
- Downstream Water Level:** 0.30 m above the ground level.
- Horizontal Dimensions:**
 - 3.60 m: Horizontal distance from the upstream face to the core face.
 - 1.65 m: Horizontal distance from the core face to the downstream face.
 - 3.35 m: Horizontal distance from the downstream face to the right edge of the dam.

Sr. No	Item Description	Length (m)	Breadth (m)	Height (m)	QTY.	Unit	Rate	Amount
1.00	Excavation	1.00	9.60	2.10	20.16	cum	211.00	4,253.76
2.00	PCC M-15	1.00	8.80	0.10	0.88	cum	7,090.00	6,239.20
3.00	RCC M30				16.94	cum	8,530.00	144,455.55
	Footing	1.00	8.60	0.30	2.58		-	
		1.00	3.60	1.10	1.98	cum	-	
		1.00	3.35	1.00	1.68	cum	-	
	Shear key	1.00	0.30	0.00	0.00	cum	-	
	Stem	1.00	1.00	10.70	10.70	cum	-	
4.00	HYSD Steel				1.52	MT	64,598.00	98,457.04
4.00	Steel (HYSD 90kg/cum)				1.52	MT	-	
5.00	Soil Filling upto 1m at Toe side				1.96	cum	226.00	442.96
		1.00	2.80	0.70	1.96	cum	-	
						Total		253,848.51

Breast wall

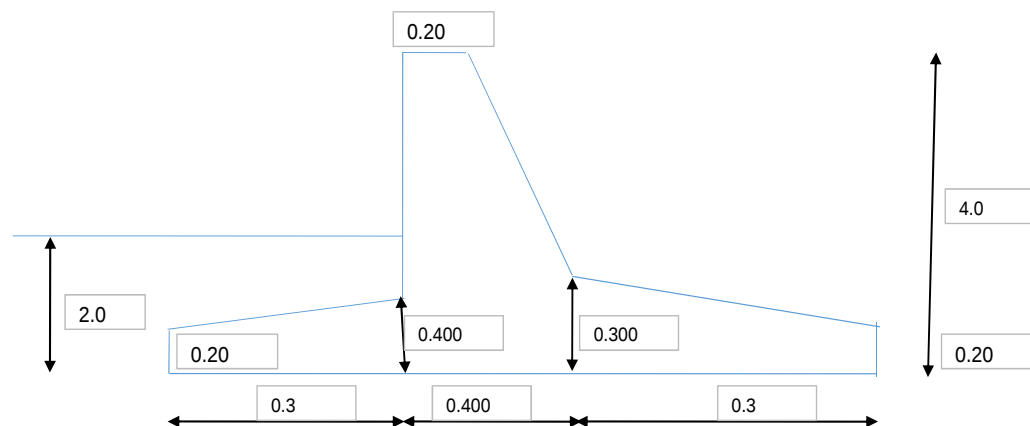
S.No.	Item	Heingh in Mtr	Length includes Left and Right Portion	Rate per m	Amount (Rs.)	Amount (Cr)
1	Breast wall	4	9260	20,301	187,984,744.98	18.80
	Total ...		9260		187,984,744.98	18.80

	Height (m)	Left Side	Right Side
		length (km)	length (km)
Breast Wall	4	4.36	4.9

Calculation of Breast Wall (Height 4.0 m)

Length 1.00 Mtr

187984744.98



Sr. No	Item Description	Length (m)	Breadth (m)	Height (m)	QTY.	Unit	Rate	Amount
1.00	Excavation	1.00	2.00	2.10	4.20	cum	211.00	886.20
2.00	PCC M-15	1.00	1.20	0.10	0.12	cum	7,090.00	850.80
3.00	RCC M20				1.39	cum	8,052.00	11,152.02
	Footing	1.00	1.00	0.20	0.20	cum	-	
		1.00	0.30	0.20	0.03	cum	-	
		1.00	0.30	0.10	0.02	cum	-	
	Shear key	0.00	0.30	0.30	0.00	cum	-	
	Stem	1.00	0.30	3.80	1.14	cum	-	
4.00	HYSD Steel				0.11	MT	64,598.00	7,157.46
4.00	Steel (HYSD 80kg/cum for stem)				0.11	MT	-	
5.00	Soil Filling upto 1m at Toe side				1.13	cum	226.00	254.25
		1.00	0.30	3.75	1.13	cum	-	
					Total ,,,			20,300.73

Earthwork Quantities (cum)

Total fill Volume	Cum			399,298
Total Cut Volume	Cum			797,286
Excavation Ordinary rock ie 30% of Total Cut				239,185.74
Excavation Soft Rock with Dozer ie 40% of Total Cut				318,914.32
Excavation hard Rock Control Blasting) ie 30% of Total Cut				239,185.74
EW filling from Borrow area				-
EW Fill ing from approved mat				399,298.11

1377996/2020/Technical

Major Junction - 3 LEG								Nos	0
Sl No	Description	Unit	Nos	Length	Width	Depth	Quantity	No of Junction	Tot Qty
1	Subgrade - in Tapper Portion	Cum	2.00	80.00	5.19	0.500	415.00	-	-
1	Subgrade - in Straight	Cum	2.00	30.00	5.50	0.500	165.00	-	-
1	Subgrade - in Curve	Cum	2.00	30.00	7.00	0.500	210.00	-	-
1	Earthern Shoulder	Cum	2.00	110.00	2.000	0.850	374.00	-	-
2	Granular Sub Base								
2	In Tapper Portion	Cum	2.00	80.00	4.69	0.150	112.50	-	-
2	In Straight	Cum	2.00	30.00	5.50	0.150	49.50	-	-
2	In Curve	Cum	2.00	30.00	6.50	0.150	58.50	-	-
2	Shoulder - Granular	Cum	2.00	110.00	2.000	0.150	66.00	-	-
3	Wet Mix Macadam								
3	In Tapper Portion	Cum	-	-	-	-	-	-	-
3	In Straight	Cum	-	-	-	-	-	-	-
3	In Curve	-	-	-	-	-	-	-	-
4	Prime Coat	Sqm	-	-	-	-	-	-	-
5	Tack Coat over primer	Sqm	-	-	-	-	-	-	-
6	Tack Coat over BT	Sqm	-	-	-	-	-	-	-
7	Dense Bituminious Macadam	Cum	-	-	-	-	-	-	-
8	Bituminuous Councrete	Cum	-	-	-	-	-	-	-
9	DLC	Cum	2.00	140.00	14.69	0.150	616.88	-	-
10	PQC	Cum	2.00	140.00	14.69	0.200	822.50	-	-

Major Junction - 4 LEG								Nos	0
Sl No	Description	Unit	Nos	Length	Width	Depth	Quantity	No of Junc	Tot Qty
1	Subgrade - in Tapper Portion	Cum	4.00	80.00	5.19	0.500	830.00	-	-
1	Subgrade - in Straight	Cum	4.00	30.00	5.50	0.500	330.00	-	-
1	Subgrade - in Curve	Cum	4.00	30.00	7.00	0.500	420.00	-	-
1	Earthern Shoulder	Cum	4.00	110.00	2.000	0.850	748.00	-	-
2	Granular Sub Base								
2	In Tapper Portion	Cum	4.00	80.00	4.69	0.150	225.00	-	-
2	In Straight	Cum	4.00	30.00	5.50	0.150	99.00	-	-
2	In Curve	Cum	4.00	30.00	6.50	0.150	117.00	-	-
2	Shoulder - Granular	Cum	4.00	110.00	2.000	0.150	132.00	-	-
3	Wet Mix Macadam								
3	In Tapper Portion	Cum	-	-	-	-	-	-	-
3	In Straight	Cum	-	-	-	-	-	-	-
3	In Curve	-	-	-	-	-	-	-	-
4	Prime Coat	Sqm	-	-	-	-	-	-	-
5	Tack Coat over primer	Sqm	-	-	-	-	-	-	-
6	Tack Coat over BT	Sqm	-	-	-	-	-	-	-
7	Dense Bituminious Macadam	Cum	-	-	-	-	-	-	-
8	Bituminuous Councrete	Cum	-	-	-	-	-	-	-
9	DLC	Cum	4.00	140.00	14.69	0.150	1,233.75	-	-
10	PQC	Cum	4.00	140.00	14.69	0.200	1,645.00	-	-

Summary of Major Junctions						0
Sl No	Description	Unit	Quantity		Rate	Amount
1	Subgrade	Cum	-	-	266.00	-
2	Granular Sub Base	Cum	-	-	3,829.00	-
3	Wet Mix Macadam	Cum	-	-		-
4	Prime Coat	Sqm	-	-		-
5	Tack Coat over primer	Sqm	-	-		-
6	Tack Coat over BT	Sqm	-	-		-
7	Dense Bituminious Macadam	Cum	-	-		-
8	Bituminuous Councrete	Cum	-	-		-
9	DLC	Cum	-	-	5,004.000	-
10	PQC	Cum	-	-	9,282.000	-
Total Cost of MAJOR Junctions Rs.						-

Minor Junction - 3 LEG								Nos 8	
Sl No	Description	Unit	Nos	Length	Width	Depth	Quantity	No of Junc	Tot Qty
1	Subgrade - in Tapper Portion	Cum	2.00	40.00	5.19	0.500	207.50	8.00	1,660.00
1	Subgrade - in Straight	Cum	2.00	20.00	5.50	0.500	110.00	8.00	880.00
1	Subgrade - in Curve	Cum	2.00	20.00	7.00	0.500	140.00	8.00	1,120.00
1	Earthern Shoulder	Cum	2.00	60.00	1.875	1.000	225.00	8.00	1,800.00
2	Granular Sub Base								
2	In Tapper Portion	Cum	2.00	40.00	4.69	0.150	56.25	8.00	450.00
2	In Straight	Cum	2.00	20.00	5.50	0.150	33.00	8.00	264.00
2	In Curve	Cum	2.00	20.00	6.50	0.150	39.00	8.00	312.00
3	Wet Mix Macadam								
3	In Tapper Portion	Cum	-	-	-	-	-	-	-
3	In Straight	Cum	-	-	-	-	-	-	-
3	In Curve	-	-	-	-	-	-	-	-
4	Prime Coat	Sqm	-	-	-	-	-	-	-
5	Tack Coat over primer	Sqm	-	-	-	-	-	-	-
6	Tack Coat over BT	Sqm	-	-	-	-	-	-	-
7	Dense Bituminious Macadam	Cum	-	-	-	-	-	-	-
8	Bituminuous Councrete	Cum	-	-	-	-	-	-	-
9	DLC	Cum	2.00	80.00	14.69	0.150	352.50	8.00	2,820.00
10	PQC	Cum	2.00	80.00	14.69	0.200	470.00	8.00	3,760.00

Minor Junction - 4 LEG								Nos 1	
Sl No	Description	Unit	Nos	Length	Width	Depth	Quantity	No of Junc	Tot Qty
1	Subgrade - in Tapper Portion	Cum	5.00	40.00	5.19	0.500	518.75	1.00	518.75
1	Subgrade - in Straight	Cum	5.00	20.00	5.50	0.500	275.00	1.00	275.00
1	Subgrade - in Curve	Cum	5.00	20.00	7.00	0.500	350.00	1.00	350.00
1	Earthern Shoulder	Cum	5.00	60.00	1.875	1.000	562.50	1.00	562.50
2	Granular Sub Base								
2	In Tapper Portion	Cum	5.00	40.00	4.69	0.150	140.63	1.00	140.63
2	In Straight	Cum	5.00	20.00	5.50	0.150	82.50	1.00	82.50
2	In Curve	Cum	5.00	20.00	6.50	0.150	97.50	1.00	97.50
3	Wet Mix Macadam								
3	In Tapper Portion	Cum	-	-	-	-	-	-	-
3	In Straight	Cum	-	-	-	-	-	-	-
3	In Curve	-	-	-	-	-	-	-	-
4	Prime Coat	Sqm	-	-	-	-	-	-	-
5	Tack Coat over primer	Sqm	-	-	-	-	-	-	-
6	Tack Coat over BT	Sqm	-	-	-	-	-	-	-
7	Dense Bituminious Macadam	Cum	-	-	-	-	-	-	-
8	Bituminuous Councrete	Cum	-	-	-	-	-	-	-
9	DLC	Cum	5.00	80.00	14.69	0.150	881.25	1.00	881.25
10	PQC	Cum	5.00	80.00	14.69	0.200	1,175.00	1.00	1,175.00

Summary of Minor Junctions					
Sl No	Description	Unit	Quantity	Rate	Amount
1	Subgrade	Cum	7,166.250	266.00	1,906,222.50
2	Granular Sub Base	Cum	1,346.625	3,829.00	5,156,227.13
3	Wet Mix Macadam	Cum	-		-
4	Prime Coat	Sqm	-		-
5	Tack Coat over primer	Sqm	-		-
6	Tack Coat over BT	Sqm	-		-
7	Dense Bituminious Macadam	Cum	-		-
8	Bituminuous Councrete	Cum	-		-
9	DLC		3,701.250	5,004.00	18,521,055.00
10	PQC		4,935.000	9,282.00	45,806,670.00
				Total Cost of MINOR Junctions Rs.	71,390,174.63

1377996/2020/Technical

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 Consultancy Services for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chuikhim-Nimbong-Kafer-Bakrim-Agarah-Rhenok in the State of West Bengal and from Rhenok-Rorathang-Pakyong along with Spur from Aritar-Relop-Menla in the State of Sikkim.PKG IV B (BAGRAKOT TO KAHER Km 13.000 to Km 25.600)

BOQ - Traffic Signs, Marking and Road Appurtenances

Road Signs

Sl No.	Item	Total Nos	Remarks
(i)	90 cm equilateral triangle	69	Has been considered in LHS & RHS Curve and at Cross road
(ii)	60 cm circular	64	Has been considered at the location where design speed is less than equal to 50 kmph
(iii)	90 cm high octagon	4	Has been considered at major junction
(iv)	Informatory Sign Boards	20	Has been considered at important village location
(v)	Hazard Marker Sign Boards	58	Has been considered at start and end of culvert, island, bridge, location
(vi)	Village Name Boards of size 900x600	10	Has been considered at village locations
(vii)	Place Identification Boards of size 1200x900	8	Has been considered at petrol pump, health center, hospital, govt office, dhaba
(viii)	Advance Direction Sign Boards of 1800x1200	6	Has been considered at important eating place and major junctions
(ix)	Chevron boards of size 600x450	60	Has been considered at locations of curves @35m C/C

Road Marking

	Items	Sides	Length (m)	Width (m)	Area (sqm)	Remarks
1	Lane marking in straight portion	1	4030	0.1	403	(RM-02)-@3m Marking per m Length
2	Lane marking in curve portion	1	510	0.1	51	(RM-03)-@3m Marking per m Length
3	Edge line marking	2	12600	0.15	3780	(RM-01)-Continuous marking
Total=					4234	
Add 10% extra for other marking=					423	
Grand total=					4657	
Say					5000	

Km Stone, Hectometer Stone and Boundary Stone

Total Length ... 12.60 Kms

Sl. No.	Item	No.	Calculation Backup
a)	5th Kilometer stones	3	(Total Length/5)
b)	Kilometer stones	11	(Total Length) - No.of km 5th Stones
c)	Hectometer stones	50	(Total Lengthx5) - No.of km 5th Stones - No.of km Stones
d)	Boundary stones	128	(Total Lengthx5x2) + 2

Delineators

Sl.No	Location	Nos / Facility	Total Nos	Remarks
a)	Solar Blinker	0	-	At start and end of the Major Junctions

Calculation for Roadway Stud

	Location	Length	No. of Studs	Remarks
	Total length	12600	2521	@ 15m spacing
			252	10 % for Junction and Zebra crossing
		Total=	2773	
		Say	2770	

Trapezoidal Reflector

	Location	No	Remarks
	Over Metal Beam	4200	@ 3mt spacing
	Over Guard Post	2520	@ 5mt spacing
	Total	6720	

BOQ - Traffic Signs, Marking and Road Appurtenances

Directional Arrow and Lettering

	Location	Area of straight arrow	Area of Left/Right arrow	No. of straight arrow	No. of left/right arrow	Area of painting (sqm)
9.00	Minor Junction	1.100	1.125	72	36	119.70
-	Major Junction	1.100	1.125		1	1.13
					Total area (sqm)=	120.83