



NATIONAL HIGHWAY AUTHORITY OF INDIA

(Ministry of Road Transport & Highways)

Consultancy 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.

COST ESTIMATE PKG -I (RHENOCK TO PAKYONG)



NOVEMBER-2016



SA INFRASTRUCTURE CONSULTANTS PVT. LTD.

IN ASSOCIATION WITH

SPECIALIZED ENGINEERING SERVICES PVT. LTD.

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TOTAL PROJECT COST

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.

Total Project Cost

Sl. No.	Description of Item	Amount (Rs. in Crore)
1	Site Clearance	0.28
2	Earth Work	16.00
3	Flexible Pavement	51.50
4	Minor Bridges	9.56
5	Culverts	15.44
6	Sliding and Slope Structure at Km 14	13.78
7	Retaining and Brest Wall & Reinforced Slope Structure	95.23
8	Drainage and Protective Works	34.70
9	Truck and Buys Laybyes	3.46
10	Manjor and Minor Junctions	8.12
A	Civil Construction Cost	248.84
B	Contingency @ 2.8 % of (1)	6.97
C	Sub total (A+B)	255.81
D	Supervision charges @ 3% of (1)	7.67
E	Agency charges @ 3% of (1)	7.67
F	Quality Control Charges @ 0.25% of (1)	0.64
G	Road Safety Charges @ 0.25% of (1)	0.64
H	Sub total (C+D+E+F+G)	272.44
I	Maintenance Charges @ 4 years @ 5% of (A)	12.44
J	Escalation Charges @ 5 % per year for 3 years on (A)	37.33
K	Grand Total	322.21
L	Land Acquisition Cost	15.00
M	Cost of Utility Shifting	5.00
N	Cost of Forest Clearance	0.60
	Sub Total (L+M+N)	20.60
	Total Project Cost (Excluding LA, US & FC)	342.81
	Civil Cost per Km. (A/26.706 Km)	9.32
	Project Cost per Km. (A/26.706 Km)	12.84



***ABSTRACT OF COST
ESTIMATE***

ABSTRACT OF COST ESTIMATE

Sl.NO	Items	Unit	Length (in Km)	Rate (in Rs.)	Amount (in Rs.)	Amount (in Cr.)
A	ROAD WORKS					
1	Site Clearance				2,788,275.40	0.28
2	Excavation	Cum			28,476,098.08	2.85
3	Earthwork Filling	Cum			95,055,663.20	9.51
4	Loosening & Recompacting	Cum			3,479,607.72	0.35
5	Sub Grade	Cum			32,969,686.03	3.30
6	GSB	Cum			73,843,870.66	7.38
7	WMM	Cum			60,476,764.05	6.05
8	Prime Coat	Sqm			10,087,480.00	1.01
9	Tack Coat	Sqm			8,993,784.80	0.90
10	DBM / Profile Corrective Course	Cum			240,974,155.42	24.10
11	BC				120,657,091.57	12.07
B	BRIDGES and STRUCTURES					
(a)	Minor Bridges	No./m	1/40		81,908,961.24	8.19
(c)	Repair of Existing Bridges	No.	1/159		13,645,163.50	1.36
(d)	Pipe Culverts	No.	111 nos.		154,416,318.00	15.44
(e)	Reinforced Slope Structure	No./m			761,827,260.00	76.18
(f)	Sliding and Sinking at Km 14				137,780,910.00	13.78
(g)	Retaining and Breast Wall				190,518,204.06	19.05
C	OTHER ROAD APPURTENANCE/MISCELLANEOUS ITEMS					
(a)	JUNCTIONS	No				
(i)	Major Junctions	No	1.00	4,879,175.85	4,879,175.85	0.49
(ii)	Minor Junctions	No	18.00	1,834,799.56	33,026,392.01	3.30
(iii)	Bus ways and Shelter	No	20.00		43,252,701.02	4.33
(iv)	Truck Laybe	No.	1.00		4,194,952.16	0.42
(b)	DRAIN & PROTECTION WORK					
(i)	Covered Drain	Km	1.00	7,789,590.15	7,789,590.15	0.78
(ii)	Earthen Drain/Unlined Drain		47,520.00	64.00	3,041,280.00	0.30
(iii)	METAL CRASH BARRIER	Km	15,064.00	4,334.00	65,287,376.00	6.53
(iv)	Stone Pitching	Cum			237,637,612.80	23.76
(v)	Chute Drain	Lm			33,216,120.00	3.32
(c')	Road Side plantation	LS			3,600,000.00	0.36
(d)	OTHER MISCELLANEOUS ITEMS (sign boards, rest areas, Traffic Management during construction)	Total			23,920,212.70	2.39
(e)	Road Stud with Lense Reflector	Total			10,698,652.00	1.07
TOTAL CIVIL COST					2488443358.41	248.84
CIVIL COST IN CRORES					248.84	
COST PER KM (LENGTH = 26.71 KM) IN CRORES ...					9.32	



TCS WISE COST

Summary of TCS Sections

Item No	BOQ Item No	Description	Unit	Rate (in Rs)	Total Qty	TCS-I			TCS-II			TCS-III		
						Length	Qty /km	Total Qty	Length	Qty /km	Total Qty	Length	Qty /km	Total Qty
1	2.3 (ii) - A	Clearing & Grubbing	Hac	20,093.68	27.32	17.477	1.20	20.97	8.569	0.70	6.00	0.500	0.70	0.35
2	3.18	Sub Grade	Cum	266.52	123,704.36	17.477	4,660.00	81,442.82	8.569	4,660.00	39,931.54	0.500	4,660.00	2,330.00
3	3.19 - Case-I	Loosening & Recompacting	Cum	67.50	51,549.74	17.477	1,864.00	32,577.13	8.569	1,864.00	15,972.62	0.500	6,000.00	3,000.00
4	4.1 A (i)	GSB	Cum	1,578.73	46,624.22	17.477	1,744.00	30,479.89	8.569	1,744.00	14,944.34	0.500	2,400.00	1,200.00
5	4.1 B (iii)	GSB	Cum	1,578.73	150.00	17.477	-	-	8.569	-	-	0.500	300.00	150.00
6	4.12	WMM (Bottom Layer)	Cum	1,267.42	28,789.14	17.477	1,084.50	18,953.81	8.569	1,084.50	9,293.08	0.500	1,084.50	542.25
7	4.12	WMM (Top Layer)	Cum	1,267.42	18,927.30	17.477	713.00	12,461.10	8.569	713.00	6,109.70	0.500	713.00	356.50
8	5.1	Prime Coat	Sqm	38.00	265,460.00	17.477	10,000.00	174,770.00	8.569	10,000.00	85,690.00	0.500	10,000.00	5,000.00
9	5.2	Tack Coat	Sqm	16.94	530,920.00	17.477	20,000.00	349,540.00	8.569	20,000.00	171,380.00	0.500	20,000.00	10,000.00
10	5.6 (i)	DBM / Profile Corrective Course	Cum	10,086.23	23,891.40	17.477	900.00	15,729.30	8.569	900.00	7,712.10	0.500	900.00	450.00
11	5.8 (i)	BC	Cum	11,363.02	10,618.40	17.477	400.00	6,990.80	8.569	400.00	3,427.60	0.500	400.00	200.00
12	3.1	E/W in Excavation in soil	Cum	100.18	-	-	-	-	-	-	-	-	-	-
13	12.11 E (i) - Case-I	Grade M15 PCC - Using Concrete Mixer	Cum	4,476.53	180.00	-	-	-	-	-	-	-	-	-
14	12.8 E - Case-I	RCC Grade M25 : Using Concrete Mixer	Cum	6,040.60	180.00	-	-	-	-	-	-	-	-	-
15	12.8 C - Case-I	RCC Grade M20 : Using concrete mixer	Cum	5,509.02	150.00	-	-	-	-	-	-	-	-	-
16	12.40	Supplying, Fitting and Placing un-coated HYSD bar Reinforc	Ton	70,269.59	38.78	-	-	-	-	-	-	-	-	-
17	12.1 II - B (vi)	Back Filling in Marshy Foundation Pits	Cum	286.00	38.78	-	-	-	-	-	-	-	-	-
18	15.5	Filter Media	Cum	965.81	38.78	-	-	-	-	-	-	-	-	-
19	13.8	Weep Holes	Nos	1,110.40	38.78	-	-	-	-	-	-	-	-	-



Road Work at Bridge Locations

Item No	Description	Unit	Total Qty	Major Bridges		Minor Bridges		
				Length	Qty /km	Length	Qty /km	Total Qty
1	Clearing & Grubbing	Hac	1.00		0.10		0.05	0.90
2	Scarification	Cum	-		-		-	-
3	Excavation	Cum	-		-		-	-
4	Embankment Filling	Cum	-		-		-	-
5	Loosening & Recompacting	Cum	-		-		-	-
6	Subgrade	Cum	9,450.00		1,000.00		470.00	8,480.00
7	Granular Shoulder	Cum	540.00		-		30.00	540.00
8	Earthen Shoulder	Cum	1,804.00		220.00		88.00	1,584.00
9	GSB	Cum	4,650.00		420.00		235.00	4,230.00
10	WMM (Bottom Layer)	Cum	2,377.50		262.50		117.50	2,115.00
11	WMM (Top Layer)	Cum	2,377.50		262.50		117.50	2,115.00
12	Prime Coat	Sqm	19,020.00		2,100.00		940.00	16,920.00
13	Tack Coat	Sqm	38,040.00		4,200.00		1,880.00	33,840.00
14	DBM	Cum	1,056.00		210.00		47.00	846.00
15	BC	Cum	760.80		84.00		37.60	676.80



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.

Typical Cross Section Type-I { 2-lane CW without Paved Shoulder in Rural Areas }

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	20,093.68	24,112.42		
2	Sub Grade	Cum	1	1000	9.32	0.500	4,660.00	266.52	1,241,983.20		
3	Excavation & Earthwork	Cum	Taken in Abstract Sheet							-	
4	Loosening & Recompacting	Cum	1	1000	9.32	0.200	1,864.00	67.50	125,820.00		
5	GSB	Cum	1	1000	8.72	0.200	1,744.00	1,578.73	2,753,305.12		
6	WMM (Bottom Layer)	Cum	1	1000	7.23	0.150	1,084.50	1,267.42	1,374,516.99		
7	WMM (Top Layer)	Cum	1	1000	7.13	0.100	713.00	1,267.42	903,670.46		
8	Prime Coat	Sqm	1	1000	10	-	10,000.00	38.00	380,000.00		
9	Tack Coat	Sqm	2	1000	10	-	20,000.00	16.94	338,800.00		
10	DBM / Profile Corrective Course	Cum	1	1000	10	0.090	900.00	10,086.23	9,077,607.00		
11	BC	Cum	1	1000	10	0.040	400.00	11,363.02	4,545,208.00		
								Total Cost =	20,765,023.19		

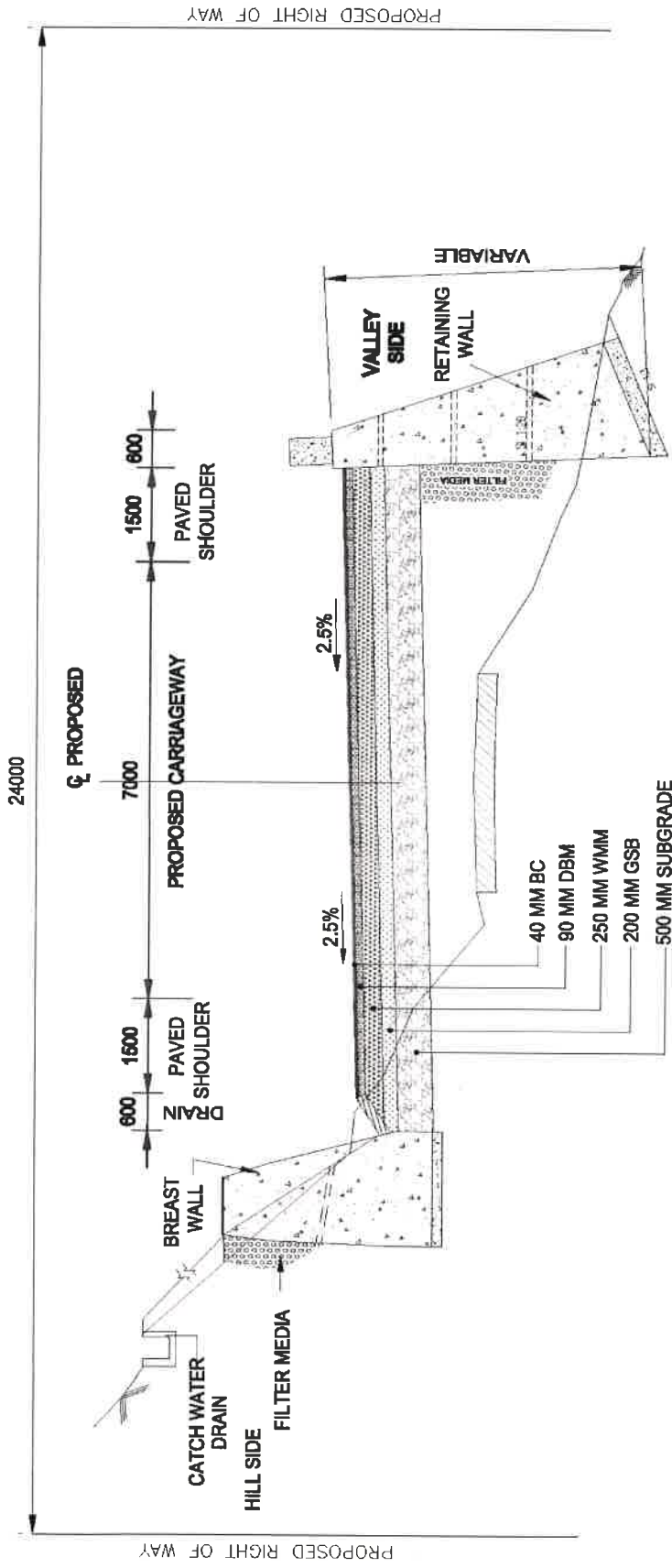
Per Km Cost of TCS Type-I in Cr. = 2.077

Total Cost of TCS Type-I for 17.973 Km length in Cr. = 37.321



Construction of upgradation of existing road to 2-lane with paved shoulder including geometric improvement from Km. 0.00 to Km. 26.706 in Rhenok-Rorathang-Pakyong of NH-717A on EPC basis under SARDP-NE Phase 'A' in the State of Sikkim

Typical Cross Section-01



Two Lane With Paved Shoulder Raised Portion (Hill Section)



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Typical Cross Section Type-II { 2-lane C/W without Paved Shoulder in Rural Areas }

Item No.	Description	Unit	No.	Length (in m)	Width (in m)	Depth (in m)	Qty	Rate (in Rs)	Amount (in Rs)	
1	Cleaning & Grubbing	Hac	1	1000	7	-	0.70	20,093.68	14,065.58	
2	Sub Grade	Cum	1	1000	9.32	0.500	4,660.00	266.52	1,241,983.20	
3	Excavation & Earthwork	Cum	Taken in Abstract Sheet						-	
4	Loosening & Recompacting	Cum	1	1000	9.32	0.200	1,864.00	67.50	125,820.00	
5	GSB	Cum	1	1000	8.72	0.200	1,744.00	1,578.73	2,753,305.12	
6	WMM (Bottom Layer)	Cum	1	1000	7.23	0.150	1,084.50	1,267.42	1,374,516.99	
7	WMM (Top Layer)	Cum	1	1000	7.13	0.100	713.00	1,267.42	903,670.46	
8	Prime Coat	Sqm	1	1000	10	-	10,000.00	38.00	380,000.00	
9	Tack Coat	Sqm	2	1000	10	-	20,000.00	16.94	338,800.00	
10	DBM / Profile Corrective Course	Cum	1	1000	10	0.090	900.00	10,086.23	9,077,607.00	
11	BC	Cum	1	1000	10	0.040	400.00	11,363.02	4,545,208.00	
								Total Cost =	20,754,976.35	

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

2.075

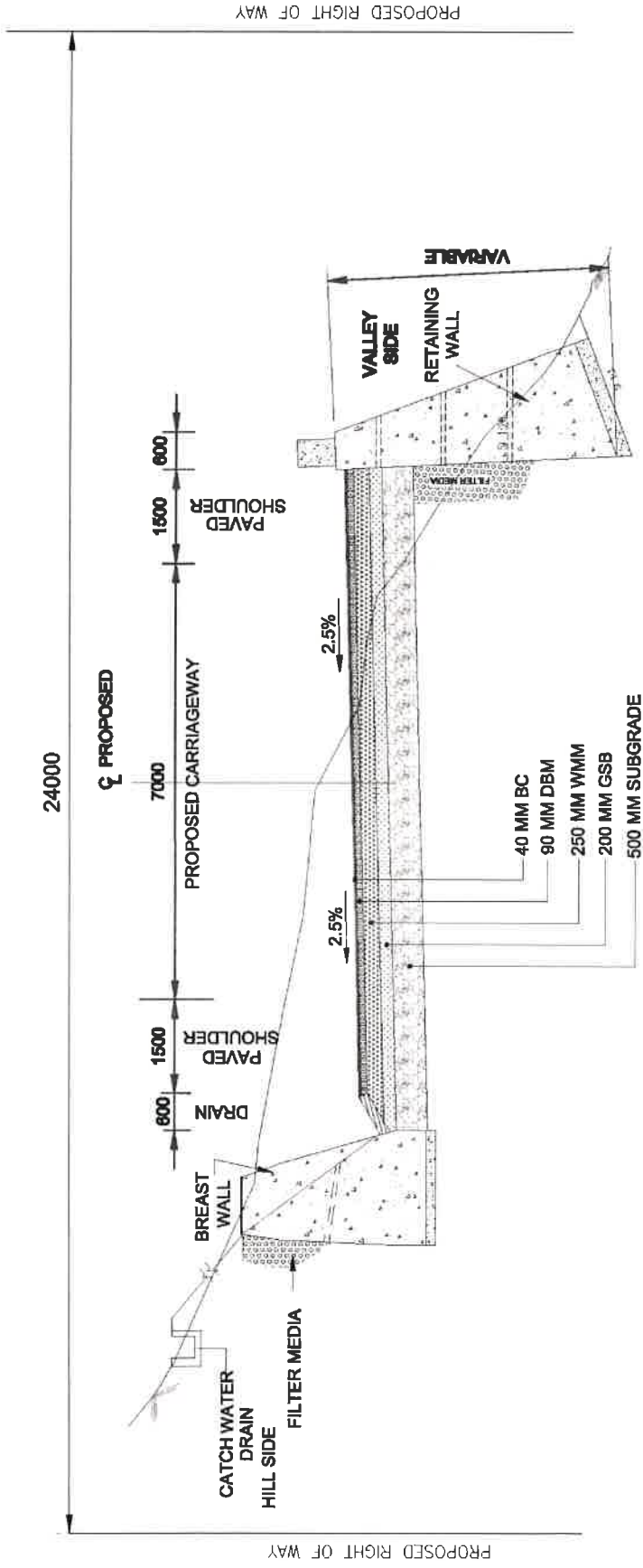
Total Cost of TCS Type-II for 8.569 Km length in Cr. =

17.785



Construction of upgradation of existing road to 2-lane with paved shoulder including geometric improvement from Km. 0.00 Oto Km. 26.706 in Rhenok-Rorathang-Pakyong of NH-717A on EPC basis under SARDP-NE Phase 'A' in the State of Sikkim

Typical Cross Section-02



Two Lane With Paved Shoulder Raised Portion(Hill Section)
(New Alignment)



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-Menta in the State of Sikkim.

Typical Cross Section Type-III { Flexible Pavement in Builtup areas }

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	7	-	0.70	20,093.68	14,065.58	
2	Sub Grade	Cum	1	1000	9.32	0.5	4,660.00	266.52	1,241,983.20	
3	Excavation & Earthwork	Cum	Taken in Abstract Sheet						-	
4	Loosening & Recompacting	Cum	1	1000	12	0.5	6,000.00	67.50	405,000.00	
5	GSB	Cum	1	1000	12	0.2	2,400.00	1,578.73	3,788,952.00	
5a	GSB On Top 150mm Earthen Shoulder	Cum	2	1000	1	0.15	300.00	1,578.73	473,619.00	
6	WMM (Bottom Layer)	Cum	1	1000	7.23	0.15	1,084.50	1,267.42	1,374,516.99	
7	WMM (Top Layer)	Cum	1	1000	7.13	0.1	713.00	1,267.42	903,670.46	
8	Prime Coat	Sqm	1	1000	10	-	10,000.00	38.00	380,000.00	
9	Tack Coat	Sqm	2	1000	10	-	20,000.00	16.94	338,800.00	
10	DBM / Profile Corrective Course	Cum	1	1000	10	0.09	900.00	10,086.23	9,077,607.00	
11	BC	Cum	1	1000	10	0.04	400.00	11,363.02	4,545,208.00	
								Total Cost =	22,543,422.23	

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

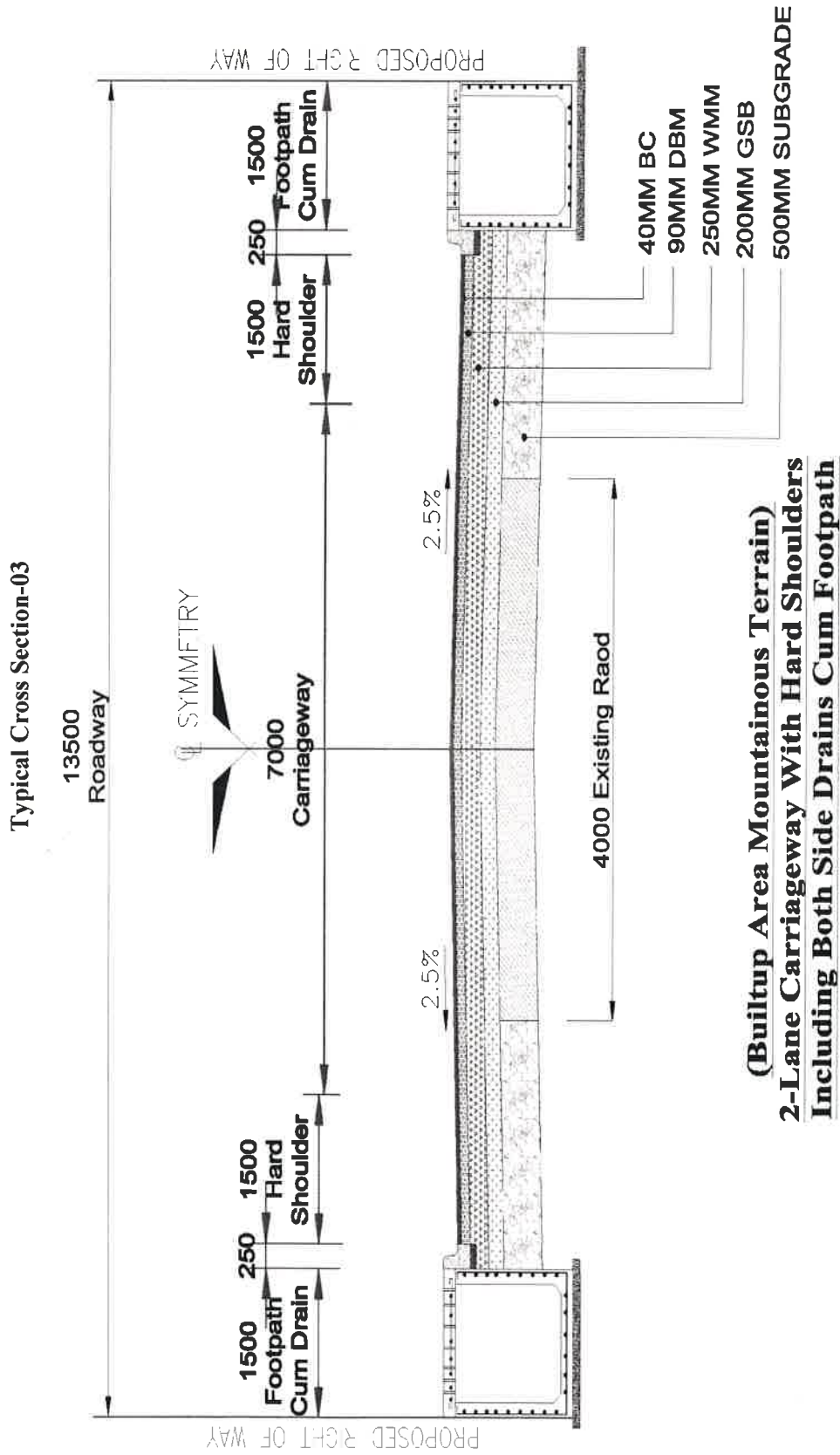
2.254

Total Cost of TCS Type- III for Km length in Cr. =

1.127



Construction of upgradation of existing road to 2-lane with paved shoulder including geometric improvement from Km. 0.00 0to Km. 26.706 in Rhenok-Rorathang-Pakyong of NH-717A on EPC basis under SARDP-NE Phase 'A' in the State of Sikkim



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.

Covered Drain

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	1.20	0.80	960	100.18	96,172.80
2	Grade M15 PCC - Using Concrete Mixer	Cum	1	1000	1.20	0.15	180	4,476.53	805,775.40
3 (i)	RCC Grade M25 : Using Concrete Mixer	Cum	1	1000	1.50	0.15	225	6,040.60	1,359,135.00
3 (ii)	RCC Grade M25 : Using Concrete Mixer	Cum	2	1000	0.15	1.00	300	6,040.60	1,812,180.00
4	RCC Grade M20 : Using concrete mixer	Cum	1	1000	1.20	0.15	180	5,509.02	991,623.60
5	Supplying, Fitting and Placing un-coated HYSD bar	Ton	1	1000			38.775	70,269.59	2,724,703.35
								Total Cost =	7,789,590.15

Per Km Cost of Covered Drain Type -III Used in TCS -IV in Cr.= 0.779

Total Cost of Covered Drain Type -III Used in TCS -IV for Km Length in Cr. = 0.779



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.

Major Junctions

Item No.	Description	Unit	No.	Length X Width (in Sqm)	Depth (in m)	Qty	Rate (in Rs)	Amount (in Rs)
1	Clearing & Grubbing	Hac	1	1000	-	0.1	20,093.68	2,009.37
2	Sub Grade	Cum	1	2000	0.500	1000	266.52	266,520.00
3	Sub Grade 150mm top of Earthen Shoulder	Cum	2	250	0.440	220	266.52	58,634.40
4	GSB	Cum	1	2100	0.200	420	1,578.73	663,066.60
5	WMM (Bottom Layer)	Cum	1	2100	0.125	262.5	1,267.42	332,697.75
6	WMM (Top Layer)	Cum	1	2100	0.125	262.5	1,267.42	332,697.75
7	Prime Coat	Sqm	1	2100	-	2100	38.00	79,800.00
8	Tack Coat	Sqm	2	2100	-	4200	16.94	71,148.00
9	DBM / Profile Corrective Course	Cum	1	2100	0.100	210	10,086.23	2,118,108.30
10	BC	Cum	1	2100	0.040	84	11,363.02	954,493.68
Total Cost =							4,879,175.85	

Per No Cost of Major Junction in Cr.= 0.488

Total Cost of Major Junction for No in Cr. = 0.488



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.

Minor Junctions

Item No.	Description	Unit	No.	Length X Width (in Sqm)	Depth (in m)	Qty	Rate (in Rs)	Amount (in Rs)
1	Clearing & Grubbing	Hac	1	500	-	0.05	20,093.68	1,004.68
2	Sub Grade	Cum	1	940	0.500	470	266.52	125,264.40
3	Sub Grade 150mm top of Earthen Shoulder	Cum	2	100	0.440	88	266.52	23,453.76
4	GSB	Cum	1	940	0.250	235	1,578.73	371,001.55
5	GSB 150mm top of Granular Shoulder	Cum	2	100	0.150	30	1,578.73	47,361.90
6	WMM (Bottom Layer)	Cum	1	940	0.125	117.5	1,267.42	148,921.85
7	WMM (Top Layer)	Cum	1	940	0.125	117.5	1,267.42	148,921.85
8	Prime Coat	Sqm	1	940	-	940	38.00	35,720.00
9	Tack Coat	Sqm	2	940	-	1880	16.94	31,847.20
10	DBM / Profile Corrective Course	Cum	1	940	0.050	47.000	10,086.23	474,052.81
11	BC	Cum	1	940	0.040	37.6	11,363.02	427,249.55
Total Cost =								1,834,799.56

Per No Cost of Minor Junction in Cr.=

0.183

Total Cost of 3 Legged Minor Junction for 18 No in Cr. =

3.303



BILL OF QUANTITY

Summary of Cost Estimate

Sr. No.	Item of Works	Total (in Rs)	Total (in Cr)	Ref Page
	Civil Works			
1	Site Clearance	2,788,275.40	0.28	15
2	Earthwork	159,981,055.03	16.00	16
3	Non-Bituminous Courses	134,320,634.70	13.43	16
4	Bituminous Courses	380,712,511.79	38.07	16
6	Minor Bridges and Reinforced Slope Str	857,381,384.74	85.74	25,27,36
7	Culverts/Repairing/Dismantling	154,416,318.00	15.44	39
8	Sliding and Sinking at Km 14	137,780,910.00	13.78	38
9	Retaining and Breast Wall	190,518,204.06	19.05	28
8	Drainage and Protective works	346,971,978.95	34.70	17
9	Traffic Signs, Marking and Road Appurtenances	14,788,524.70	1.48	18
10	Miscellaneous Items, bus bay etc	19,926,640.00	1.99	18
11	Junctions and Intersections i/c road works at Structure location	78,158,268.87	7.82	19,12,13
12	Road Stud with Lens reflector	10,698,652.00	1.07	18b
	Total for Civil Works	2,488,443,358.25	248.84	
	Cost per Km		9.32	
	Physical and price contingency ()			
	TOTAL PROJECT COST	2,488,443,358.25	248.84	



Bill Of Quantities - Roads

Item No.	Description	Unit	Qty	Rate (in Rs.)	Amount (Rs.)	Amount (Cr)
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	27.32	20093.7	548973	0.055
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) Brick/Tile work in Cement Morter	Cum	2000.00	433.0	866000	0.087
	(ii) Lime Concrete, cement concrete grade M-10 and below	Cum	150.00	293.0	43950	0.004
	(iii) Removing all type of Hume Pipes and Stacking within a lead of 1000 metres including Earthwork and Dismantling of Masonry Works.	Lm	800.00	303.0	242400	0.024
	(iv) Kilometer stone	Nr.			0	0.0000
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.				0	0.000
	(a) Girth from 300mm to 600mm	No.	869	192.0	166848	0.017
	(b) Girth from 600mm to 900mm	No.	604	355.0	214420	0.021
	(c) Girth from 900mm to 1800mm	No.	782	672.0	525504	0.053
	(d) Girth above 1800mm	No.	143	1260.0	180180	0.018
	(d) Kilometer stone (50% missing)	Nr.			0	0.00000
	(e) Dismanteling of pavement (Bituminous work)	Cum			0	0.000
Total (Rs)					2788275	0.279
Bill No 2: Earth Work						
2.010	Excavation for roadwork in soil with in all types of 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.	Cum	495997.61	47.0	23311888	2.331
2.020	Excavation for roadway in ordinary rock with hydraulic excavator of 0.9 cum bucket capacity including cutting and loading in tippers, transporting to embankment site within all lifts and lead upto 1000 m, trimming bottom and side slopes in accordance with requirements of lines, grades and cross sections.	Cum	87528.99	59.0	5164210	0.516
2.030	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	46104.20	220.0	10142924	1.014
2.040	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	537422.40	158.0	84912739	8.491
2.050	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	123704.36	266.52	32969686	3.297
2.080	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	51549.74	67.50	3479608	0.348
Total (Rs)					159981055	15.998



Bill Of Quantities - Roads

Bill No 3: Non-Bituminous Courses						
3.010	Construction of granular sub-base by providing coarse graded material of grading-I(lower layer), spreading in uniform layers with motor grader on prepared surface, mixing by mix in plant method with rotavator at OMC, and compacting with vibratory roller to achieve the desired density, complete as per clause 401.	Cum	46774.22	1578.73	73843871	7.384
3.020	Providing, laying, spreading and compacting graded stone aggregate to wet mix macadam specification including premixing the Material with water at OMC in mechanical mix plant carriage of mixed Material by tipper to site, laying in uniform layers with paver in sub- base / base course on well prepared surface and compacting with vibratory roller to achieve the desired density complete as per clause 406.	Cum	47716.44	1267.42	60476764	6.048
Total (Rs)					134320635	13.432
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	265460.00	38.00	10087480	1.009
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	530920.00	16.94	8993785	0.899
4.030	Providing and laying dense graded bituminous macadam with 100-120 TPH batch type HMP producing an average output of 75 tonnes per hour using crushed aggregates of grading I, premixed with bituminous binder @ 4.5 per cent by weight of total 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. 507 complete in all respects.	Cum	23891.40	10086.23	240974155	24.097
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	10618.40	11363.02	120657092	12.066
Total (Rs)					380712512	38.071
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) Covered Drain	Cum	1.00	7789590.15	7789590.15	0.78
	(ii) Unlined Drain	Cum	47520.00	64.0	3041280	0.304
6.02	Provide Metal Crash barrier As per drawing and as per the instruction of the Engineer	Rmt	15064.00	4334.0	65287376	6.529
6.03	Providing and laying Pitching on slopes laid over prepared filter media including boulder apron laid dry in front of toe of embankment complete as per drawing and Technical specifications Clause 2504.	Cum	94903.20	1554.0	147479572.80	14.748
6.04	Providing and laying filter media underneath stone pitching complete as per drawings and Technical Specification Clause 2504.	Cum	47451.60	1900.0	90158040.00	9.016
6.05	Providing Chute drains consisting of NP-2 RCC half round, 300 mm dia pipes, laid over block of C.C 1:3:6 (20mm and down aggregates) size 450 mm x 265 mm laid over filter media (measured and paid separately) including all false work etc. complete.	LM	47451.60	700.0	33216120	3.322
Total (Rs)					346971979	34.697



Bill Of Quantities - Roads

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.	5.00	3943.00	19715	0.002
	(ii) Ordinary Kilometer stone	No.	24.00	2418.00	58032	0.006
	(iii) Hectometer stone	No.	108.00	665.00	71820	0.007
	(iv) Boundary stones @200 m interval	No	273.00	543.00	148239.00	0.01
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.				0	0.000
	(a) Lane /center line/edge line/ transverse marking and any other markings	Sqm	11000.00	629.00	6919000	0.692
	(b) Directional Arrows, lettering etc. as per Drawing	Sqm	128.50	146.00	18761	0.002
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.					0.000
	(i) Information sign 800mm x 600mm	No.	4.00	8981.00	35924	0.004
	(ii) Cautionary sign 900 mm triangular	No.	58.00	7127.00	413366	0.041
	(iii) Mandatory sign 600 mm circular	No.	50.00	6172.00	308600	0.031
	(iv) Mandatory sign 900 mm octagon	No.	12.00	11718.00	140616	0.014
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	10.00	82561.41	825614	0.083
	(ii) Sign board made out of 2mm thick aluminum sheet, face to be fully covered by high intensity grade retro-reflective sheeting fixed on iron frame as per drawing with additional bracing at every 600 mm c/c if any dimension exceeds 1200mm.	Sqm	53.00	17060.00	904180	0.090
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.	58.00	3634.00	210772	0.021
	(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.	192.00	7555.00	1450560	0.145
	(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.				
7.060	Providing and fixing road delineators complete as per drawings and Technical Specification Clause 805.	No.	6.00	3458.0	20748	0.002
7.070	Providing & Ninteen degree tilted one way reflective Road Studs	No.			0	0.000
7.080	Construction of cement concrete kerb with top and bottom width 115 and 265 mm respectively, 225 mm high in M 20 grade PCC on M-10 grade foundation 100 mm thick, foundation having 75 mm projection beyond kerb stone, kerb stone laid with kerb laying machine, foundation concrete laid manually, all complete as per clause 408	Rmt	0.00		0	0.000
7.090	Providing and fixing Cluster of Red Reflector complete as per drawings and Technical Specification Clause 805.	No.	13022.40	249.0	3242578	0.324
Total (Rs)					14788525	1.479



Bill Of Quantities - Roads

Bill No 8: Miscellaneous						
8.010	Routine maintenance including repairs of pot holes, shoulders cleaning of drains/ culverts and bridges, clearing/ cleaning of roadway, clearing / removal of vegetation/ dead animal etc complete as per Technical Specification Clause 3002 and/or as directed by the Engineer.	Sqm month	220.00	19712.00	4336640	0.434
8.020	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	2000.00	606.0	1212000	0.121
8.030	Traffic management and safety during construction operation as per Technical Specification Clause A-21.	km	3.00	500000.0	1500000	0.150
8.040	Providing & Laying precast cement concrete interlocking TilesM-30 with stone aggregate 20 mm nominal size in cement concrete duly compacted with hydraulic machine including form work placing & fixing in position complete in all respect.	cum	2000.00	4639.0	9278000	0.928
8.050	Truck Lay bye	No	1.00		4194952	0.419
8.060	Road Side Plantation				3600000	0.360
Total (Rs.)					9131688	0.9132
ITEM	BUS BAYS					
Total (Rs.)						
14.01	Clearing and grubbing road land including uprooting rank vegetation, grass, bush scrubs, saplings and trees of girth up to 300mm, removal and stacking of serviceable material up to 100m from road boundary as per MORT&H specification clause 201.	Ha	1.00	0.0	0	0.000
14.02	Earthwork in excavation necessary for construction of roadway in all types of soils including all lifts and leads complete as per MORT&H Specifications Clause 301.	cum				
14.03	Construction of embankment with approved material from borrow areas with all leads and lifts, compacting to 95% of modified proctor density, all complete as per drawings and MORT&H Specifications Clause 305.	cum				
14.04	Construction of subgrade and Earthen shoulder satisfying the requirements of minimum soaked CBR value as indicated in the drawings with approved material from borrow areas , with all leads & lifts, compacting to 97% of modified proctor density, all complete as per drawing and MORT&H specification clause 305.	cum	9460.00	266.5	2521279	0.252
14.05	Providing and laying Granular Sub-base (drainage layer) complete as per MORT&H Specifications Clause 401. Grading-I (Table -400-2).	cum	6994.00	1578.7	11041638	1.104
14.06	Providing and laying Wet Mix Macadam base course of required thickness complete as per MORT&H Specifications Clause 406.	cum	4755.00	1267.4	6026582	0.603
14.07	Providing bituminous primer coat over granular surface with bituminous emulsion complete as per MORT&H Specifications Clause 502 @ 6.0 to 9.0 kg/10 sq.m.	Sqm	19020.00	38.0	722760	0.072
14.08	Providing tackcoat with bituminous emulsions all complete as per MORT&H specifications clause 503.	Sqm	38040.00	16.9	644398	0.064
14.09	Providing & laying Dense Bituminous Macadam course of required thickness on prepared surface complete as per MORT&H Specifications Clause 507	cum	1056.00	10086.2	10651059	1.065
14.10	Providing & laying Bituminous Concrete wearing course using modified bitumen from the refinery of required thickness on prepared surface complete as per MORT&H Specifications Clause 509 & 521.	cum	760.80	11363.0	8644986	0.864
14.11	Filling in median/island with approved material with all leads and lifts complete as per MORT&H Specification Clauses 305 & 407.	cum				
14.12	Turfing	Sqm				
		No	20.00	150000.0	3000000	0.300
TOTAL OF MISCELLANEOUS ITEMS					40252701	4.3253



Bill Of Quantities - Bridges

Item No.	Description	Unit	Total Quantity	Rate	Amount (in Rs.)
Bill 6A Reconstruction of Minor Bridge					
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	2888	59	170,800
(ii)	Hard Rock without blasting	cum	180	358	64,570
(iii)	Hard Rock with controlled blasting	cum	180	339	61,245
(iv)	Soft/ordinary rock	cum	361	76	27,298
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	4298	1311	5,635,103
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	422	2125	896,127
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	96	5217	498,790
b)	M-35 grade	cum	765	6142	4,696,796
6.05	Plain Cement Concrete/ Reinforced Cement Concrete in substructure excluding reinforcement complete as per drawings and Technical Specifications Sections 1500, 1700 and 2200.				
a)	M-35 grade	cum	698	6748	4,708,023
6.06	Reinforced Cement Concrete in superstructure excluding reinforcement complete as per drawings and Technical Specifications Sections 1500, 1700 and 2300				
a)	Solid slab				
i)	M-30 grade	cum	21	6804	140,848
b)	T-beam and slab				
i)	M-35 grade	cum	210	7033	1,476,947
6.07	Supplying, fixing and placing TMT/HYSD bar reinforcement complete as per drawings and Technical Specification Section 1600				
a)	For Foundation	t	88	54699	4,813,490
b)	For Sub structure	t	92	54758	5,037,753
c)	For Superstructure	t	38	55940	2,114,526
6.08	Providing 65 mm thick wearing course consisting of 40 mm thick asphaltic concrete over 25 mm thick mastic asphalt on top complete as per Technical Specification Section 2700	sqm	449	695	311,499
6.09	Providing and fixing drainage spouts as per drawings and Technical Specifications Clause 2705	no	7	852	6,061
6.10	Supplying and fixing of POT PTFE bearings complete as per drawings and IRC:83(Part III) - 2002				
a)	Sliding bearing Capacity 3500 kN	no	6	56000	336,000
b)	Fixed bearing Capacity 2500 kN	no	2	52500	105,000
c)	Guided bearing Capacity 2500 kN	no	8	61250	490,000
6.11	Supplying and fixing of expansion joints complete as per drawings and Technical Specifications Section 2600.				
a)	40 mm wide strip seal joints	m	49	12000	588,000
6.12	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-40 grade (In main structure)	m	92	16879	1,552,846

Bill Of Quantities - Bridges

Item No.	Description	Unit	Total Quantity	Rate	Amount (in Rs.)
6.13	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	26	5065	130,298
6.14	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	51	8772	451,317
6.15	Providing and laying filter material underneath stone boulder pitching on slopes complete as per drawings and Technical Specifications Section 2500	cum	210	2280	477,819
6.16	Providing and laying stone boulder pitching on slopes with cement mortar filled joints 1:3 complete as per drawings and Technical Specifications Section 2500	cum	419	2280	955,638
6.17	Providing weep holes in abutments, wing walls, retaining walls, return walls etc. complete as per drawings and Technical Specifications Clause 2706	no	703	124	86,966
6.18	Painting of Bridge no. and span arrangement as per drawing, IRC:7-1971 and Technical Specifications Section 800.	no	4	44	175
6.20	Providing & erecting Thrie Metal Beam Crash Barrier of dimension & location as per Drawing and MoRT&H Specification Clause 810 and Technical Specification.	RM	0	2288	-
6.19	Providing 100 mm dia PVC service pipe of approved quality in footpath as per drawings and directions of the Engineer	cum	138	250	34,500
6.20	Providing and painting on substructures, superstructures, crash barrier and other exposed parts as per Technical Specifications and directions of the Engineer	cum	2818	150	422,625
TOTAL AMOUNT OF RECONSTRUCTION OF MINOR BRIDGE					36,291,061
Bill 6B Reconstruction of Major Bridge					
6.21	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)	i) all types of soils	cum	9978	59	590,182
ii)	ii) Hard Rock without blasting	cum	5660	358	2,024,906
iii)	iii) Hard Rock with controlled blasting	cum		339	-
iv)	iv) Soft/ordinary rock	cum		76	-
6.22	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	8509	1333	11,344,808
6.23	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	0	2181	-
6.24	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	3502	5376	18,827,067
b)	M-35 grade	cum	2411	6335	15,273,661
6.25	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	304	5928	1,802,021
b)	M-35 grade	cum	3748	6617	24,799,804
6.26	Reinforced Cement Concrete in superstructure excluding reinforcement complete as per drawings and Technical Specifications Sections 1500, 1700 and 2300				
a)	Solid slab				
i)	M-35 grade	cum	1653	7025	11,612,986
b)	T-beam and slab				
i)	M-35 grade	cum	0	7663	-
6.27	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	cum	6444	7102	45,765,288
6.28	Supplying, fixing and placing TMT/HYSD bar reinforcement complete as per drawings and Technical Specification Section 1600				



Bill Of Quantities - Bridges

Item No.	Description	Unit	Total Quantity	Rate	Amount (in Rs.)
a)	For Foundation	t	265	56949	15,091,440
b)	For Sub structure	t	525	57083	29,968,659
c)	For Superstructure/Friction Slab/Facia Panels	t	1247	58242	72,627,313
6.29	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	226	112231	25,364,206
6.30	Providing 65 mm thick wearing course consisting of 40 mm thick asphaltic concrete over 25 mm thick mastic asphalt on top complete as per Technical Specification Section 2700	sqm	10595	695	7,358,600
6.31	Providing and fixing drainage spouts as per drawings and Technical Specifications Clause 2705	no	449	888	398,618
6.32	Supplying and fixing of POT PTFE bearings complete as per drawings and IRC:83(Part III) - 2002				
a)	Sliding bearing				
	Capacity 3500 kN	no	80	66500	5,320,000
b)	Fixed bearing				
	Capacity 3500 kN	no	83	63000	5,229,000
c)	Guided bearing				
	Capacity 3500 kN	no	163	70000	11,410,000
6.33	Supplying and fixing of expansion joints complete as per drawings and Technical Specifications Section 2600.				
a)	40 mm wide strip seal joints	m	529	12000	6,348,000
b)	20 mm wide filler type joints	m	26	304	7,904
6.24	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-40 grade	m	2019	16558	33,431,551
6.25	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	5	5218	26,088
6.26	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	14	9074	127,035
6.30	Painting of Bridge no. and span arrangement as per drawing, IRC:7-1971 and Technical Specifications Section 800.	no	2	44	87
6.44	Construction of reinforced earth retaining structures together with construction of earthwork in layers, assembling and erection of reinforcing elements and placing of facing panels and all associated components as per Technical Specifications Section 31				
	a) Providing and laying M-35 grade RCC facia panels including reinforcement and reinforcing elements with all fixtures and assesories complete	sqm	3417	5500	18,793,500
	b) Providing leveling pad in cement concrete M-20 grade below facia panels , including earthwork in excavation, backfilling and profiling of fore slope complete as per approved design, drawing and Technical Specifications sections 300,1500,1700 and 2100.	cum	121	6371	770,891
	c) Providing filter media behind reinforced earth panel with well packed material to specified thickness with smaller size towards the soil and bigger size towards the wall complete with all leads and lifts as per approved design, drawings and Technical Specification	cum	2050	412	844,600
	d) Providing well compacted grannular material within RE Wall strip area of approved quality, including all leads and lifts, complete as per drawings and Technical Specifications.	cum	3234	1671	5,404,014
	e) Providing well compacted normal selected material inside panels of approved quality, including all leads and lifts, complete as per drawings and Technical Specifications.	cum	9701	263	2,551,363
6.46	Providing friction slab M40 grade for crash barrier at RE wall location as per detailed drawing and Technical Specification Sections 1500, 1700 & 2100.	cum	965	16879	16,288,003
6.52	Structural steel work of Fe410WA in truss built up of steel plates, joist, angles or channel section welded including cutting and fixing all gusset plates,bolts,nuts,welding rods etc complete including cost of transportation to the site, erection and placing/launching with launching nose, kentledge, lowering in position, preparation of surface by sand blasting, epoxy painting complete as per Technical Specifications section 1900. IRC 24-2000.	t	372	121200	45,086,400

Bill Of Quantities - Bridges

Item No.	Description	Unit	Total Quantity	Rate	Amount (in Rs.)
AMOUNT FOR RECONSTRUCTION OF MAJOR BRIDGE					434,487,994
Bill 7 BOX CULVERTS					
7.01	Earthwork in excavation of foundation for structures including pipe culverts in all types of soil complete as per drawings and Technical Specifications Clauses 304, 309 & 2903	Cum	1563	144	225,722
7.02	Back filling behind abutments, wing walls and return walls with selected granular material of approved quality including all material, labour, equipment carriage etc. all complete as per Drawing and Technical Specifications clause 305.	Cum	7724	1311	10,128,003
7.03	Filter media behind abutments, wing walls and return walls including all material, labour, equipment carriage etc. all complete as per drawing and Technical Specifications Clauses 305,309 & 2502.	Cum	5034	2125	10,698,171
7.04	Cement concrete in foundation/levelling course on pipe culvert and under approach slab etc.including centering and shuttering all complete as drawing and Technical Specifications Sections 2100 and 2200 M-15 grade	Cum	8622	6142	52,952,684
7.05	Cement concrete for plain concrete concrete for substructure complete as per drawing and Technical Specification Sections 1500, 1700, 2100				
a)	M-20 grade	Cum	3727	6748	25,147,800
7.06	Structural Reinforced cement concrete in superstructure including centering and shuttering but excluding reinforcement,complete as per drawing and Technical Specifications Sections 1500 & 1700 and 2300				
a)	M-25 grade for superstructure	Cum	6970	7164	49,929,378
7.07	HYSD bar reinforcement for culverts, underpass, retaining walls etc. complete as per drawings and Technical Specifications Section 1600	T	537	54758	29,393,499
7.08	Providing and laying Stone boulder apron complete as per drawings and Technical Specifications Section 2500	Cum	3681	1862	6,855,823
7.09	Filter material underneath stone pitching on slopes complete as per drawing and Technical Specifications Section 2500.	Cum	38	2280	86,517
7.10	Providing and laying 300mm stone boulder pitching on slope complete as per drawing and Technical Specifications section 2500.	Cum	76	1862	141,333
7.11	Expansion joints complete as per Drawing and Technical Specifications Sections 2600	Lm	2808	12000	33,696,000
7.12	Providing weep holes in abutments, wing walls, Retaining walls, return walls etc. complete as per drawing and Technical Specifications Clause 2706	Nr	1584	124	196,020
7.13	Painting with synthetic enamel of culvert no. and span arrangement on culvert ends as per drawings and directions of Engineer	Nr.	132	44	5,759
7.14	Providing cement concrete M-15 grade in cut off wall / foundation complete as per drawing and Technical Specifications Sections 1500 & 1700 and Clause 2507.				
	Curtain Wall	Cum	1791	5217	9,342,977
7.15	Reinforced cement concrete railing complete as per drawing and Technical Specification Sections 1500,1600,1700,2700,809 and Clause 2703	Lm	1325	1843	2,443,104
7.16	Drainage spouts complete as per drawing and Technical Specifications Clause 2705	Nr	132	852	112,501
7.17	Providing rubble stone flooring in cement mortar (1:3) with stone boulder of specified size, quarry spalls and clean course sand of FM 2 and above, well screened free from dirt, dust, and other deleterious materials including cost of all materials, labour, handling materials at site, curing, cost of water with all leads and lifts, taxes and royalties, incidental charges, tools and plants etc all complete job as per approved design/ drawing / technical specifications, relevant clauses of MOST specification (4th revision) and direction of F/I				
	i) Flat stone flooring	Cum	1182	4775	5,644,908
	ii) Cement concrete M-15 grade	Cum	543	5217	2,831,939
TOTAL AMOUNT OF CULVERTS					239,832,138
BILL NO. 8: REPAIR OF EXISTING BRIDGES					
8.01	Repair of Cracks and bad construction joint Chip off all the loose materials in the cracks in the structure, clean all the cracks/gaps thoroughly, apply epoxy mortars prepared using resin, hardener and silica sand in the proportion 1:0.5:6, leaving injection tube at regular intervals, inject cement grout from the bottom-most hole and proceeding upwards etc., complete as per the specifications and as directed by the Engineer. The rate shall include all labour, materials, scaffolding or other access arrangement, equipment and accessories for cement grout all complete. Clause 2803	m	73	1,423.00	103,513
	Repair of Honey Comb, Spalling and Soft or Spongy Concrete Surface (a) Chipping out the damaged, spalled or honey combed portion of concrete upto reinforcement level or upto good parent concrete or upto behind rebars with rusting, cleaning the concrete surface and rebars, cleaning of all rust, scale and loose materials including labour, materials, scaffolding, compressed air, machinery etc., complete.	sqm	148	771.00	114,412



Bill Of Quantities - Bridges

Item No.	Description	Unit	Total Quantity	Rate	Amount (in Rs.)
8.02	(b) Provide and apply well mixed polymer cement slurry (Polymer to cement ratio 1:2) over well soaked but surface dry concrete and steel rebar for adhesion of fresh cement and sand mortar as per specification and as directed by the Engineer.	sqm	148	561.00	83,249
	(c) Provide and apply repair mortar of thickness as per site and in a mix of 1 cement : 3 sand over freshly applied polymer cement slurry upto 8-10 mm short of outer surface and scarifying the exposed surface for mechanical bondage of new polymer modified mortar as per specification and as directed by the Engineer.	sqm	148	1,178.00	174,809
	(d) Providing and laying Polymer modified cement sand mortar in the proportion of 1 Polymer:2 cement:6 smooth silica sand over scarified cement sand mortar in maximum 10mm thickness and finishing smooth upto the existing surface of concrete as per specification and as directed by the Engineer.	sqm	148	109.00	16,175
8.03	Repair of Corroded Reinforcement Cleaning of corroded reinforcement upto minimum 150mm length on either side of reinforcement and providing and welding of new reinforcement of same or higher diameter to the existing reinforcement as per specification and as directed by the Engineer.	kg	468	78.00	36,481
8.04	Repair of Expansion Joint (a) Removal and disposal of concrete of wearing course including bituminous topping if any near the expansion joints by jack hammer or by any suitable means including cleaning, surface preparation etc. as directed by the Engineer.	sqm	80	90.00	7,225
	(b) Providing structural steel for laying of new expansion joint including cutting, welding, binding, anchoring, galvanizing etc. complete as directed by the Engineer.	kg	482	120.00	57,801
	(c) Providing new strip seal expansion joint position or in existing joint after cleaning the gap as Technical Specification .	m	54	8,841.54	473,194
	(d) Aligning existing reinforcement and providing S 500 HYSD additional steel for laying of new wearing coat as per specifications and drawing including cutting, bending, binding, anchoring etc. complete as per drawing and as directed by the Engineer.	kg	1,606	63.00	101,152
	(e) Providing, supplying and laying of concrete near the expansion joint as per drawing, specification and as directed by the Engineer.	cum	16	7,751.00	124,449
8.05	Wearing Coat Providing and laying 25mm thick mastic asphalt layer on top of existing wearing course after repair by leveling through bituminous concrete or bitumen sand mixture on local depression, pot holes etc, all complete including cleaning of excess mastic asphalt to obtain smooth surface and as directed by the Engineer. The mastic asphalt shall end by turning up or down along kerb or deck edge by 150mm.	sqm	997	1,496.51	1,492,201
8.06	Providing and fixing of damaged reinforced concrete railing and kerbs including replacement of completely damaged railing and repair with cement mortar to the portions with minor damages .	m	298	1,710.00	508,978
8.07	Cleaning of debris from top of the pier cap by using any suitable means including labour as per drawing and as directed by the engineer.	cum	5	620.00	3,253
8.08	Providing and installing drip course at deck slab soffit corner with 1:3 cement mortar and reinforcements attached to existing reinforcements as shown and directed. The work shall include all labour, material, scaffolding etc. for the complete work as per drawing.	m	291	300.00	87,291
8.09	Cleaning of mud along the edges of the kerb and the drainage spouts or any other area by using suitable means including labour as specified and as directed by the Engineer. Clause 201.	sqm	145	90.00	13,094
8.10	Cleaning of the masonry joints from all loose particles, mortar etc. and filling up with cement sand mortar (1:3) after adding a cementitious admixture having non-shrink property as per Additional Technical Specification Clause A-17 and as directed by the Engineer.	m	582	280.00	162,943
8.11	Cleaning of the masonry joints from all loose particles, mortar etc. and filling up the joint with polymer modified cementitious repair mortar after application of PMC slurry as per specification and as directed by the engineer.	m	218	450.00	98,202
8.12	Repair of damaged masonry work with 1:3 (cement:sand) mortar by placing and setting of displaced masonry blocks including supplying missing blocks, pointing and finishing with mortar, to bring the repaired area in line, level cleaning of the area and scaffolding etc. as required.	cum	74	3,500.00	259,691
8.13	Repair of broken edge and corners of reinforced concrete members of superstructure, substructure, foundation etc. as per specification or as directed by Engineer.	m	145	200.00	29,097
8.14	Painting of Bridge no. and span arrangement as per drawing, IRC:7-1971 and Technical Specifications Section 800.	nos.	1	150.00	143
8.15	Supplying and fixing of bearings complete as per drawings and Technical Specifications Section 2000.		0		
	a) POT-PTFE bearing (450 Mton)	nos.	53	173221	9,166,713



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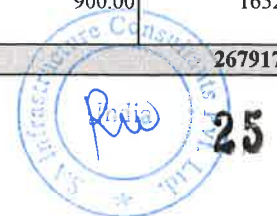
Bill Of Quantities - Bridges

Item No.	Description	Unit	Total Quantity	Rate	Amount (in Rs.)
8.16	Providing and fixing drainage spouts as per drawings and Technical Specifications Clause 2705	nos.	203	915.06	185,597
8.17	Providing and laying boulder apron complete as per drawings and Technical Specifications Section 2500	cum	200	1,488.00	296,856
TOTAL AMOUNT OF R&R					13,645,163



Bill Of Quantities - Reinforced Slope Structure

Item No.	Description	Unit	Total Quantity	Rate	Amount (in Rs.)
A Reinforced Slope Structure (Height Up to 15m)					
1	Earthwork in excavation and surface preparation	Cum of excavation	6195	300	1858500
2	PCC M-20 for levelling pad (350mm wide x 150mm thick)	Cum	113	3500	395500
3	Design, preparation of construction drawings and detail construction methodology of Reinforced Slope Structure that includes supply of prefabricated galvanized steel mesh facing units (dia. of bars to be used is 8mm, 10mm and 12mm with galvanization of 610 grams per sqm), high adherence geosynthetic straps 50mm wide with trapezoidal groove like rib (lateral teeth) on both edge of the strap, mechanical connection to connect the geosynthetic strap with the steel mesh fascia as per the technical specifications mentioned in Schedule-D of the EPC document. The maximum height of Reinforced Slope structure is 15m from the PCC levelling pad.	Sqm of face area	20650	7532	155535800
4	Labour cost for Installation of Reinforced Slope Structure	Sqm of face area	20650	500	10325000
5	Providing and Laying of selected backfill soil as per MoRT&H's specification in	Cum of	234615	1200	281538000
6	Providing 600 mm drainage gallery as Chimney drain wrapped with non-woven geotextile with 19.5mm passing and 9.1mm retaining aggregates behind reinforced earth zone with proper compaction for entrapping of seepage or subsurface water from the existing slope area .	Cum	14249	1600	22797600
7	150-200 crushed boulder packing of 400mm wide at the face of Reinforced Earth GeoTrel wall	Cum	8260	900.00	7434000
Total					479884400
B Reinforced Earth Composite System (Height up to 30m)					
8	Earthwork in excavation and surface preparation	Cum of excavation	1377	300	413100
9	Design, preparation of construction drawings and detail construction methodology of Reinforced Earth Composite System that includes , prefabricated galvanized steel mesh facing units (dia. of bars to be used is 8mm, 10mm and 12mm with galvanization of 610 grams per sqm), high adherence geosynthetic straps 50mm wide with trapezoidal groove like rib (lateral teeth) on both edge of the strap, mechanical connection to connect the geosynthetic strap with the steel mesh fascia and also with the soil nails as per the technical specifications mentioned in Schedule-D of the EPC document. The maximum height of Reinforced Earth Composite System is 30m from the PCC levelling pad.	Sqm of face area	4590	16405	75298950
10	Drilling, inserting and grouting including supply of fully threaded solid hot laminated geotechnical bars as soil nails that are hot-dip galvanized for strenthening and stabilizing the valley slopes, supply of fasteners and nail bearing plates, couplers with all equipments, labours, machineries, tools and tackles complete with all lead and lift excluding cement and non-shrink grout admixture as per the technical specifications mentioned in Schedule-D of the EPC document	Rmt of Soil Nail	21555	4910	105835050
11	Supply of OPC-43 Grade cement including handling charges etc complete	Bags	21555	700	15088500
12	Supply of Admixture to make smooth non shrink grout for anchoring activities including handling charges etc complete	Kgs	5389	500	2694500
13	PCC M-20 for levelling pad (350mm wide x 150mm thick)	Cum	10	3500	35000
14	Labour cost for Installation of Reinforced Earth Composite System	Sqm of face area	4590	500	2295000
15	Providing and Laying of selected backfill soil as per MoRT&H's specification in	Cum of	49615	1200	59538000
16	Providing 600 mm drainage gallery as Chimney drain wrapped with non-woven geotextile with 19.5mm passing and 9.1mm retaining aggregates behind reinforced earth zone with proper compaction for entrapping of seepage or subsurface water from the existing slope area .	Cum	3167	1600	5067360
17	150-200 crushed boulder packing of 400mm wide at the face of Reinforced Earth GeoTrel wall	Cum	1836	900.00	1652400
Total					267917860



Bill Of Quantities - Reinforced Slope Structure

Item No.	Description	Unit	Total Quantity	Rate	Amount (in Rs.)
C Toe Erosion Protection					
18	Design, preparation of construction drawings, detail construction methodology of 100mm thick fabric form concrete liner system including supply of the Articulating Block fabric form mattress for toe erosion protection as per the technical specifications mentioned in Schedule-D of the EPC document.	Sqm of Lay Flat Area of Fabric Form	3000	1975	5925000
19	Supply and pouring of High Strength Fine Aggregate Concrete for Articulating Block Fabric Form Concrete Lining	Cum	300	7000	2100000
Total			8025000		8025000
D Permanent Ground Anchors for protection of existing Electric Tower					
20	Designing, providing and installing prestressed permanent high tensile strand	Rmt of	300	20000	6000000
Total			6000000		6000000
Total Cost of all the four work mentioned in Item A to D above			14025000		761827260
Seventy Six Crore Eighteen Lakh Twenty Seven Thousand Two Hundred and Sixty only					
<p>**Note :</p> <p>i) In the absence of borelog data the Global Stability of the slope against slip</p> <p>ii) The above mentioned cost are excluding of Main Contractor's profit and</p>					



DETAILS OF QUANTITY

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.

Summary of Cost for Retaining wall and Breast Wall

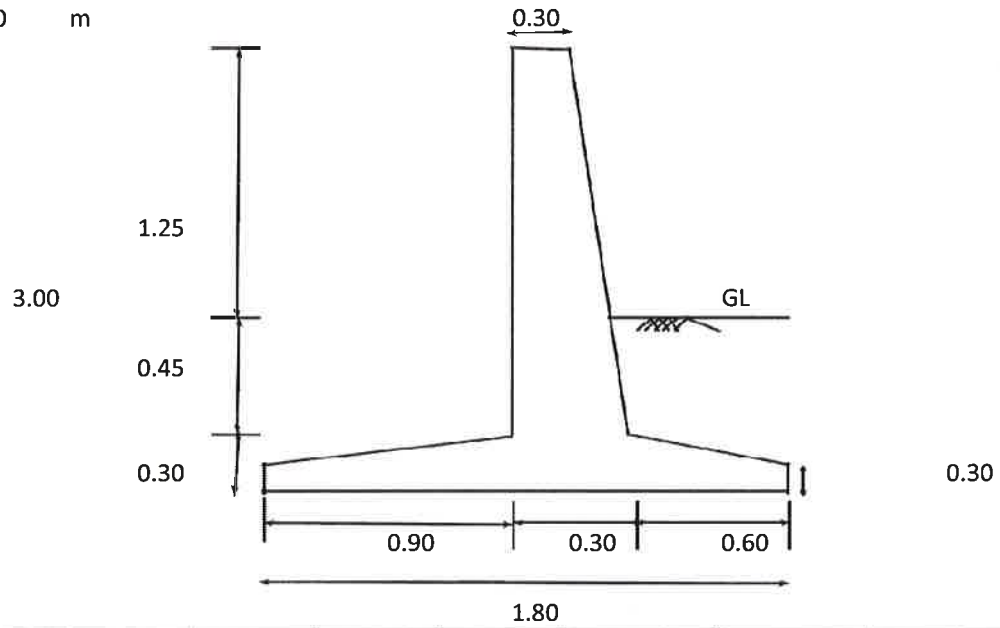
S.No.	Item	Height	Length	Rate per m	Amount (Rs.)	Amount (Cr)
1	Retaining wall	2 m	700	17704	12,392,663.92	1.24
2	Retaining wall	4.5 m	1310	63172	82,755,685.82	8.28
3	Breast Wall	2 m	320	17704	5,665,217.79	0.57
4	Breast Wall	4.5 m	1420	63172	89,704,636.54	8.97
			Total ...		190,518,204.06	19.05



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.

Calculation of Retaining Wall (Height 2.0 m)

Length = 1.00 m



Sr. No	Item Description	Length (m)	Breadth (m)	Height (m)			QTY.	Unit
1.00	Excavation	1.00	2.00	0.90	=		1.80	cum
2.00	PCC M-15	1.00	2.00	0.15	=		0.30	cum
3.00	RCC M25							
	Footing	1.00	1.80	0.30	=		0.54	cum
		1.00	1.50	0.00	=		0.00	cum
		1.00	0.30	0.00	=		0.00	cum
	Shear key	0.00	0.30	0.30	=		0.00	cum
	Stem	1.00	0.30	1.70	=		0.51	cum
		1.00	0.00	1.70	=		0.00	cum
	Total				=		1.05	cum
4.00	Steel (HYSD 80kg/cum for stem)				=		0.04	MT
	Steel (HYSD 60kg/cum for foundation)				=		0.03	MT
	Total				=		0.07	MT
5.00	Soil Filling upto 1m at Toe side							
		1.00	0.60	0.45	=		0.27	cum
		1.00	0.60	0.00	=		0.00	cum
	Total				=		0.27	cum
6.00	Filter media 600 mm							
		1.00	0.60	1.70	=		1.02	cum
7.00	Weep Holes				=		2.00	Nos.



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.

Sr. No.	Description	Unit	QTY.	Rates (Rs)	Amount (Rs)
1	Excavation in Soil using Hydraulic Excavator CK 90 and Tippers with disposal upto 1000 metres. (Excavation for roadwork in soil with 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)	Cum	1.80	100.18	180.32
2	Plain cement concrete M-15 (1:3:6) grade levelling course below foundation and approach slab complete as per tech./ Specification 1700, 1500 & 2704 (of MOSRTH Specification)	Cum	0.30	4476.53	1342.96
3	Cement concrete for reinforced concrete (M-25) in Retaining wall complete as per drawing and Technical Specifications 1500, 1600 & 2100 (of MOSRTH Specification)	Cum	1.05	6,040.60	6342.63
4	Supplying, fitting and placing HYSD bar reinforcement in sub-structure complete as per drawing and technical specifications	Tonne	0.073	70,269.59	5143.73
5	Back filling behind abutment, wing wall and return wall complete as per drawing and Technical specification	Cum	0.27	286.00	77.22
6	Providing and laying of Filter media with granular materials/stone crushed aggregates satisfying the requirements laid down in clause 2504.2.2. of MoRTH specifications to a thickness of not less than 600 mm with smaller size towards the soil and bigger size towards the wall and provided over the entire surface behind abutment, wing wall and return wall to the full height compacted to a firm condition complete as per drawing and technical specification.	Cum	1.02	965.81	985.13
7	Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia 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	Nos.	2	1,110.40	2220.80
Total Cost per Rm =					16293

2.2941826
1.1470913



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.

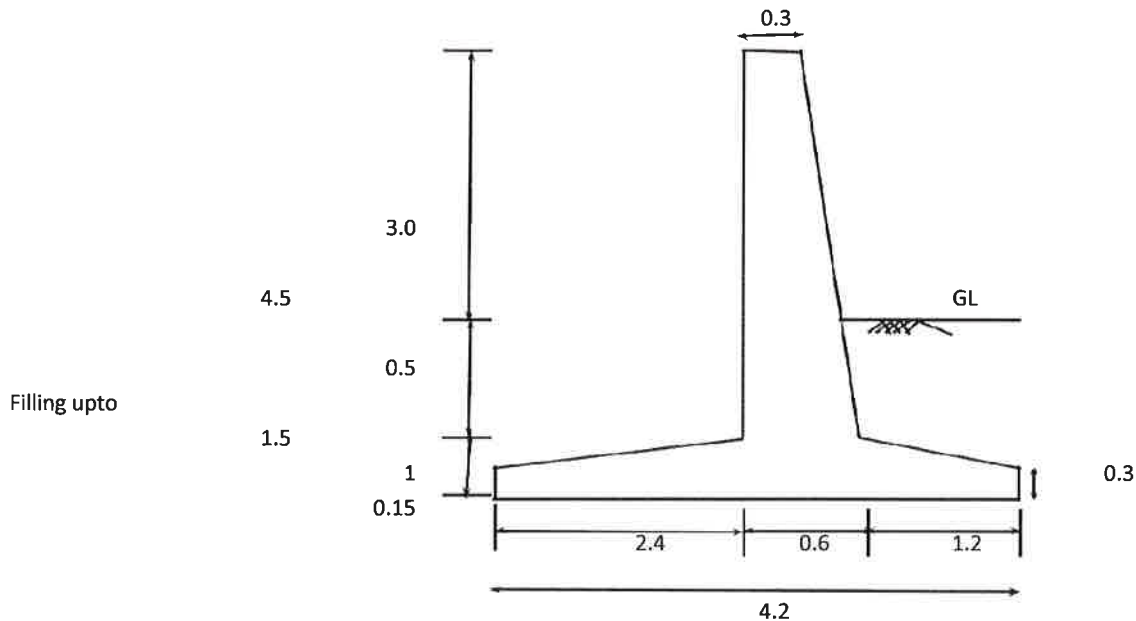
Details of Unit Rate for Retaining Wall of 4.5m Average Height

Item. No.	Description	Unit	QTY.	Rates (Rs.)	Amount (Rs)
1	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.	Cum	7.43	100.18	743.84
2	Plain cement concrete M-15 (1:2:4) grade levelling course below foundation and approach slab complete as per tech./ Specification 1700, 1500 & 2704 (of MOSRTH Specification)	Cum	0.68	4476.53	3021.66
3	Cement concrete for reinforced concrete (M-25) in Retaining wall complete as per drawing and Technical Specifications 1500, 1600 & 2100 (of MOSRTH Specification)	Cum	4.515	6040.60	27273.31
4	Supplying, fitting and placing HYSD bar reinforcement in sub-structure complete as per drawing and technical specifications	Tonne	0.257	70269.59	18076.85
5	Back filling behind abutment, wing wall and return wall complete as per drawing and Technical specification	Cum	2.1	286.00	600.60
6	Providing and laying of Filter media with granular materials/stone crushed aggregates satisfying the requirements laid down in clause 2504.2.2. of MoRTH specifications to a thickness of not less than 600 mm with smaller size towards the soil and bigger size towards the wall and provided over the entire surface	Cum	1.44	965.81	1390.77
7	Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia 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	Nos.	4	1110.40	4441.60
Total Cost per Rm					55549



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.

Quantity of Unit Length for Retaining Wall of 4.5m Average Height



Item. No.	Item Name	Unit	No	Length (in m)	Width (in m)	Height (in m)	Quantity
1	Earth Work Excavation	cum	1	1	4.5	1.7	7.43
2	PCC (M15)	cum	1	1	4.5	0.15	0.68
3	RCC M25	cum	1	1	4.2	0.3	1.26
	Footing	cum	1	1	3.6	0.7	1.26
	Footing	cum	1	1	0.6	0.7	0.42
	Skear key	cum	1	1	0.3	3.50	1.05
	Stem	cum	1	1	0.3	3.5	0.525
	Total RCC(M-25)						4.515
4	Steel (HYSD 70kg/cum for stem)	MT	-	-	-	-	0.11
	Steel (HYSD 50kg/cum for footing)	MT	-	-	-	-	0.15
	Total Steel						0.26
5	Soil Filling upto 1m at Toe side	cum	1	1	1.2	0.5	0.6
		cum	1	1	1.2	0.7	0.84
	Total Soil Filling						1.44
6	Filter media 600 mm	cum	1	1	0.6	3.50	2.1
7	Weep Holes	Nos.	4	-	-	-	4



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.

Retaining Wall Location

Sl. No.	From	To	Length (m)	vg. Height (m)
1	1+700	1+800	100	2.5
2	2+300	2+380	80	2.5
3	5+550	5+700	150	3.6
4	5+800	5+920	120	3.5
5	7+800	7+880	80	2.5
6	9+340	9+440	100	3.3
7	10+140	10+340	200	4
8	11+660	11+780	120	6
9	12+960	13+060	100	2.64
10	16+820	17+040	220	2.3
11	18+980	19+100	120	2.6
12	21+820	22+100	280	6
13	24+000	24+100	100	3.6
14	25+160	25+300	140	6
15	26+040	26+140	100	3

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Retaining wall	2 m	700
Retaining wall	4.5 m	1310
Breast Wall	2 m	0
Breast Wall	4.5 m	0

Breast Wall Location

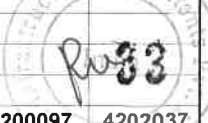
From	To	Length	Avg Height
1220	1260	40	2.5
1520	1600	80	5
2460	2500	40	6
4520	4880	360	6.48
5260	5300	40	6.8
5720	5800	80	5.5
6820	7000	180	2.5
8720	8760	40	5.5
9020	9100	80	6
11360	11560	200	3.7
11980	12160	180	6.5
12660	12720	60	2.5
14300	14340	40	8.5
14420	14460	40	15
15000	15060	60	4
16080	16140	60	5.6
17660	17720	60	4.68
23320	23440	120	4
24420	24500	80	2.6
26960	26980	20	6

1740



Bill Of Quantities - Minor Bridge

Item No.	Description	Unit	MNB	MNB	Rate (Rs.)	Amount (Rs.)
			05+500	26+378		
			Quantity	Quantity		
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	2015	925	55	161700
	ii) Hard Rock	cum				
	iii) Soft/ordinary rock	cum	1010	617	69	112263
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	4192	1569	1415	8151815
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	383	144	1388	731476
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	765	464	6068	7457572
b)	M-20 grade	cum				
c)	M-30 grade	cum				
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	1116	423	13204	20320956
e)	M-40 grade	cum			13700	0
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	384	192	15615	8994240
b)	M-45 grade in slab	cum				
c)	M-40 grade in box girder	cum				
d)	M-45 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	43	86414	13134928
b)	For Superstructure/Friction Slab/Facia Panels	t	61	31	87634	8062328
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	14	7	200097	4202037



Bill Of Quantities - Minor Bridge

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	658	378	1209	1252773
6.19	Providing and fixing drainage spouts as per drawings and Technical Specifications Clause 2705	no	16	8	8581	205944
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	2	60000	360000
	Capacity 3500 kN	no				
	Capacity 4500 kN	no				
	Capacity 6000 kN	no				
b)	Fixed bearing					
	Capacity 1300 kN	no				
	Capacity 2000 kN	no	4	2	60000	360000
	Capacity 3500 kN	no				
	Capacity 4500 kN	no				
	Capacity 6000 kN	no				
c)	Guided bearing					
	Capacity 1300 kN	no				
	Capacity 2000 kN	no	8	4	200000	2400000
	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	48	32	15756	1260480
c)	20 mm wide filler type joints	m				
6.24	Reinforced Cement Concrete Railing in M-30 grade including reinforcement complete as per drawings and Technical Specifications Sections 1500, 1600, 1700, 2200 and Clause 2703	m	94	54	2684.00	397232
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	94	54	8750	1295000
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	16	16	5836	184418
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	32	32	15510	992640
6.30	Providing and laying boulder apron complete as per drawings and Technical Specifications Section 2500	cum				



Bill Of Quantities - Minor Bridge

6.31	Providing and laying filter material underneath stone boulder pitching on slopes complete as per drawings and Technical Specifications Section 2500	cum	73	17	1448	130320
6.32	Providing and laying stone boulder pitching on slopes with cement mortar filled joints 1:3 complete as per drawings and Technical Specifications Section 2500	cum	146	34	2308	415440
6.33	Providing weep holes in abutments, wing walls, retaining walls, return walls etc. complete as per drawings and Technical Specifications Clause 2706	no	639	241	1380	1214400
6.39	Providing 150 mm dia PVC service pipe of approved quality in footpath as per drawings and directions of the Engineer	m	94	54	750	111000
6.52	Structural steel work of Fe410WA in truss built up of steel plates, joist, angles or channel section welded including cutting and fixing all gusset plates, bolts, nuts, welding rods etc complete including cost of transportation to the site, erection and placing/launching with launching nose, kentledge, lowering in position, preparation of surface by sand blasting, epoxy painting complete as per Technical Specifications section 1900, IRC 24-2000.					
Total =						81908961



Bill Of Quantities - Protective Work of Sliding and Sinking at KM 14

S.No.	Particular of Items	Unit	Quantities	Rate (in Rs.)	Amount (in Rs.)
A Reinforced Earth Composite System					
1	Earthwork in excavation and surface preparation	Cum of excavation	381	300	114300
2	Supply of prefabricated galvanized steel mesh facing units (dia. of bars to be used is 8mm, 10mm and 12mm with galvanization of 610 grams per sqm) including supply of high adherence geosynthetic staps 50mm wide with trapezoidal groove like rib (lateral teeth) on both edge of the strap, supply of mechanical connection to connect the geosynthetic stap with the steel mesh fascia and also with the soil nails, supply of back steel mesh, supply of connectors, etc. including the design, preparation of construction drawings and detail construction methodology of Reinforced Earth Composite System as per the technical specifications mentioned in Schedule-D of the EPC document.	Sqm of face area	1270	16405	20834350
3	Drilling, inserting and grouting including supply of fully threaded solid hot laminated geotechnical bars as soil nails that are hot-dip galvanized for strenthening and stabilizing the valley slopes, supply of fasteners and nail bearing plates, couplers with all equipments, labours, machineries, tools and tackles complete with all lead and lift excluding cement and non-shrink grout admixture as per the technical specifications mentioned in Schedule-D of the EPC document .	Rmt of Soil Nail	14000	4910	68740000
4	Supply of OPC-43 Grade cement including handling charges etc complete	Bags	14000	520	7280000
5	Supply of Admixture to make smooth non shrink grout for anchoring activities including handling charges etc complete	Kgs	3500	300	1050000
6	PCC M-20 for levelling pad (350mm wide x 150mm thick)	Cum	6	3500	21000
7	Labour cost for Installation of Reinforced Earth Composite System	Sqm of face area	1270	500	635000
8	Providing and Laying of selected backfill soil as per MoRT&H's specification in between slope surface and the facing element to a full height compacted to a firm condition complete as per drawings and Technical Specification.	Cum of filling	6985	1200	8382000
9	Providing 600 mm drainage gallery as Chimney drain wrapped with non-woven geotextile with 19.5mm passing and 9.1mm retaining aggregates behind reinforced earth zone with proper compaction for entrapping of seepage or subsurface water from the existing slope area .	Cum	876	1200	1051560
10	150-200 crushed boulder packing of 400mm wide at the face of	Cum	508	900.00	457200.00
Total Cost of Reinforced Earth Composite System					108565410
B Toe Erosion Protection					

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Bill Of Quantities - Protective Work of Sliding and Sinking at KM 14

S.No.	Particular of Items	Unit	Quantities	Rate (in Rs.)	Amount (in Rs.)
11	Design, preparation of construction drawings, detail construction methodology of 100mm thick fabric form concrete liner system including supply of the Articulating Block fabric form mattress for toe erosion protection as per the technical specifications mentioned in Schedule-D of the EPC document.	Sqm of Lay Flat Area of Fabric Form	4800	1975	9480000
12	Supply and pouring of High Strength Fine Aggregate Concrete for Articulating Block Fabric Form Concrete Lining	Cum	480	5000	2400000
Total Cost of Fabric Form Concrete Liner					11880000
C	High Strength Wire Mesh				
13	Supply of diamond mesh shape High Strength Wire Mesh , having diameter 3 mm twisted or Straight of high tensile steel wire with tensile strength ≥ 1770 N/mm ² , made from high Tensile carbon steel , with maximum mesh size with a inscribed circle of 65mm dia and Tensile Strength of Mesh should be min. 150 KN/m and Bearing resistance against puncturing should be min. 180 kN with Zn (95%) + AL (5%) Ultra Coating min 150 gm/sqm (High Tensile Steel Wire). The System should be tailor made according to the site conditions and requirements with accessories like Connection Clips / Press Claws / Shackles/ Boundary Ropes / Wire Rope Anchors etc. of appropriate grade , system duly tested at reputed National or International Laboratory. (Self - Drilling Anchors might be necessitated , depending on strata) (Equivalent / Higher Protection system will be Technically Evaluated by Approving Authority). The Final Type of product to be used shall be decided upon approval of final design / drawing.	Sqm of face area	4445	3600	16002000
14	Installation of high strength steel mesh	Sqm of face area	4445	300	1333500
Total Cost of High Strength Wire Mesh					17335500
Total Cost of all the four work mentioned in Item A to C above					137780910
					Rupees Thirteen Crore Seventy Seven
**Note :					
i) In the absence of borelog data the Global Stability of the slope against slip circle and compound failure has been ignored in					
ii) The above mentioned cost are excluding of Main Contractor's profit and necessary taxes					



Bill Of Quantities - Culvert and Pipes

SI No..	Description of items	Unit	Calculation	Sectional Area /Plan area in Sgm.	Length/ Thicknes s	No.	Qty	Rate	Amount (As per SoR-2010)
Size =1 X 3.0 m RCC slab culvert									
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) Aprron								
	I) Flexible Aprron 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		
	II) Flexible Aprron 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	52.00	16275.00
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	937	84624.00
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 Aprron	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	4476.53	81716.00
IV)	M 15 Conc.								
	a) Abutments	Cum	(2.45X0.2)+(2.05X0.2)+(2.05X0.4)+(2.05+1.65)/2X0.4)+((1.65+1.3)/2X1)+(0.8+0.3)/2X0.95	3.794	12	2	91.05		
	b) Wing Wall	Cum	((1.65X0.4)+(1.25X0.4)+((1.25+0.85)/2X0.4)+((0.85+0.5)/2X1))+((1.95X0.4)+(1.55X0.4)+((1.55+1.15)/2X0.4)+((1.15+0.5)/2X1.7))/2	2.799	3.250	4	36.38		
	c) Curtain Wall U/s	Cum	(1.3X0.8)+(0.45X0.75)+(0.2X0.45)	1.468	8.028	1	11.78		
	d) Curtain Wall D/s	Cum	(1.65X0.55)+(.75X0.75)+(0.45X0.75)+(0.20X0.45)	1.898	8.028	1	15.23		
							154.45	4590	708916.00
VI)	M 25 Conc.								
	Slab	Cum		48	0.45	1	21.60		
	Wearing coat	Cum		48	0.065	1	3.12		
							24.72	6730.00	166366.00
V)	Reinforcement Bar	MT					2.472	82689.00	204407.00
VII)	Tar paper bearing	Sqm.		6		2	12	43.70	524.00
VIII)	Stone (Boulder) Aprron								
	a) Floor Aprron (300 THK)	Cum		36	0.3	1	10.80		
	b) Floor Aprron (300 THK)	Cum		13.862	0.3	1	4.16		
	c) Flexible Aprron(750 THK)	Cum		72.252	0.75	1	54.19		
							69.15	1164	80488.00
IX)	Weep Holes in Wing Wall	No..				12 X 4	48	251.00	12048.00
X)	Drainage Spout	No..				2 X 2	4	1727.00	6908.00
XI)	RCC railing	Mtr		3.1		2	6.2	631.00	3912.00
XII)	600mm Th Filter Media	Mtr	1.65X0.6	0.93	12	2	22.32	1118.00	24954.00
	Cost for 2 lane					Total		Rs.	1391138.00
				Total Cost	111	Culvert			154416318.00

