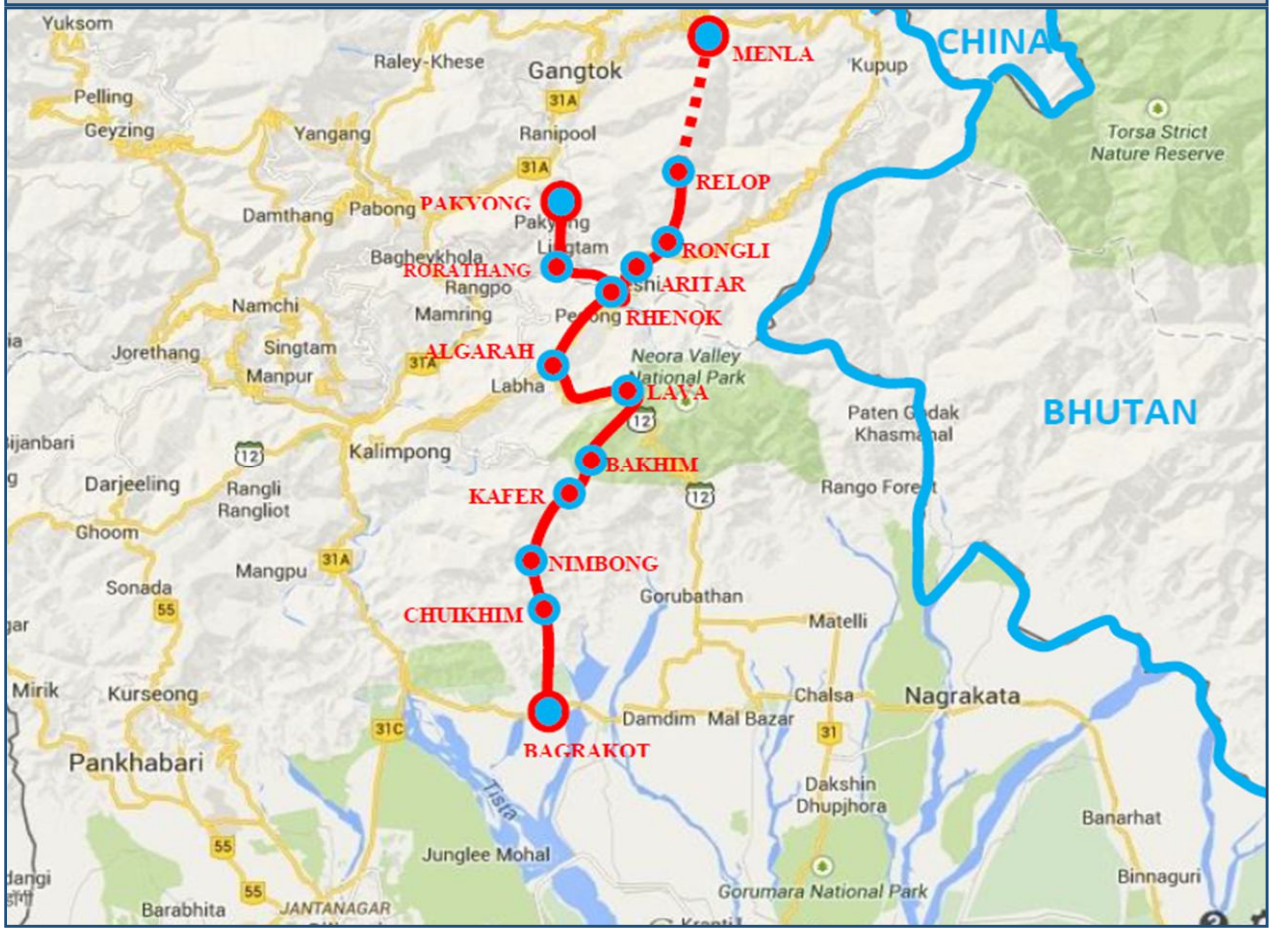
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED

(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 - VB Section of Start of Pedong Bypass to RESHI Border from Km 79.700 to Km 96.254



Final Detailed Project Report

March, 2020

SA INFRASTRUCTURE CONSULTANTS PVT. LTD.
IN ASSOCIATION WITH
SPECIALIZED ENGINEERING SERVICES PVT. LTD.
1101A, XIth Floor, Tower A/2, Corporate Park, Plot No. 7A/1,

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 V B section of Start of Pedong Bypass to RESHI from Km 79.700 to Km 96.254)

Total Project Cost

Note 1 : Basis of Cost Estimate : Rate Analysis as per WB SOR 2019-20, 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.	Description of Item	Amount (Rs. in Crore)
1	Site Clearance	0.20
2	Earth Work	29.80
3	CTSB+BSM Pavement	38.57
4	Hydroseeding by mechanical means	5.73
5	Disposal of Excess Earthwork material	6.98
6	Culverts	15.03
7	Elevated Structure	131.76
8	Minor Bridge	1.56
9	Retaining and Breast Wall	22.22
10	Drainage and Protective Works	7.63
11	Truck and Buys Laybyes	0.15
12	Major and Minor Junctions	2.13
13	Traffic Signs, Marking and Road Appurtenances	1.35
14	Miscellaneous works	0.37
A	**Civil Construction Cost**	**262.94**
B	GST Charge 12% on (A)	31.55
C	Civil Cost including GST (A+B)	294.49
D	Add Contingency @ 2.8 % of (A)	7.36
E	Total (C+D)	301.85
F	Maintenance during DLP (5 Years) payable to Contractor @ 2.5% on (A)	6.57
G	Escalation Charges @ 7.5 % per year for 1.5 years on (A)	19.72
H	Supervision charges @ 3% on (A)	7.89
I	Administrative charges @ 3% on (A)	7.89
J	Total Cost (E+F+G+H+I)	343.92
K	Land Acquisition Cost	6.18
L	Cost of Utility Shifting	2.63
M	R&R Cost	5.80
N	**Total Project Cost (Including LA, US & FC)**	**358.53**
Civil Cost per Km. (A/16.554 Km)		15.88
Project Cost per Km. (N/16.554 Km) (Including LA, US & FC)		**21.66**

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 V B section of Start of Pedong Bypass to RESHI from Km 79.700 to Km 96.254)**

ABSTRACT OF COST ESTIMATE

Note 1 : Basis of Cost Estimate : Rate Analysis as per WB SOR 2019-20, 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				2,004,341.37	0.200
2	Excavation	Cum			280,083,249.67	28.008
3	Earthwork Filling	Cum			12,539,850.38	1.254
4	Disposal of Excess Earthwork material	Cum			69,824,120.10	6.982
5	Sub Grade	Cum			-	-
6	GSB	Cum			-	-
7	CTSB	Cum			155,599,934.20	15.560
8	BSM	Cum			147,808,588.97	14.781
9	Prime Coat	Sqm			3,734,886.76	0.373
10	Tack Coat	Sqm			2,801,165.07	0.280
11	BC	Cum			75,793,301.95	7.579
B	**BRIDGES and STRUCTURES**					
1	Elevated Structure	No.	14		1,317,600,000.00	131.76
2	Minor Bridge	No.	1	240	15,600,000.00	1.56
3	Culverts	No.	70		150,272,561.95	15.03
C	**SLOPE STRUCTURES**					
1	Hydroseeding by mechanical means	Sqm	143,350.00		57,340,000.00	5.73
2	Retaining Wall	Rnm	2.760		151,248,993.52	15.12
3	Breast Wall	Rnm	6.270		70,916,314.59	7.09
D	**JUNCTIONS**					
1	Major Junctions	No	2.0		11,437,955.25	1.14
1	Minor Junctions	No	7.0		9,825,887.50	0.98
E	**DRAIN & PROTECTION WORK**					
1	Drainage Works	Km			65,873,948.04	6.59
2	W Type Crash Barrier	Km	4.23		10,390,406.40	1.04
F	**LAY BYES**					
1	Bus Shelter	Nos	1.0	1,500,000.00	1,500,000.00	0.15
G	**OTHER MISCELLANEOUS ITEMS**					
1	Footpath and Separators				-	-
1	Miscellaneous Items				3,712,000.00	0.37
2	Traffic Signs, Marking and Road Appurtenances				10,416,019.05	1.04
3	Reflective Road Studs	Nos	3640		3,036,924.80	0.30
	TOTAL CIVIL COST				**2629360449.58**	**262.94**
	Add GST (12%)				**315523253.95**	**31.55**
	TOTAL CIVIL COST including GST				**2944883703.53**	**294.49**
	COST PER KM (LENGTH = 16.55 KM) IN CRORES ...					**17.79**

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 V B section of Start of Pedong Bypass to RESHI from Km 79.700 to Km 96.254)

Summary of Cost Estimate

Sr. No.	Item of Works	Total (in Rs)	Total (in Cr)
	Civil Works		
1	Site Clearance	2,004,341.37	0.20
2	Earthwork	367,821,441.74	36.782
3	Non-Bituminous Courses	303,408,523.18	30.34
4	Bituminous Courses	82,329,353.78	8.23
5	Hydroseeding by mechanical means	57,340,000.00	5.73
6	Culverts/Repairing/Dismantling	150,272,561.95	15.03
7	Minor Bridge	15,600,000.00	1.56
8	Elevated Structure	1,317,600,000.00	131.76
9	Retaining and Breast Wall	222,165,308.11	22.22
10	Drainage and Protective works	76,264,354.44	7.63
11	Traffic Signs, Marking and Road Appurtenances	13,452,943.85	1.35
12	Miscellaneous Items	3,712,000.00	0.37
13	Bus Byes	1,500,000.00	0.15
14	Junctions and Intersections	21,263,842.75	2.13
	Total for Civil Works	**2,634,734,671.17**	**263.47**
	Add GST (12%)	**316,168,160.54**	**31.62**
	TOTAL CIVIL COST including GST	**2,950,902,831.71**	**295.09**
	Cost per Km		**17.83**

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	17.45	1,061,636.37		2.83	1.20	3.39	1.404	1.20	1.68	1.074	1.20	1.29	0.85	1.20	1.02
2	3.18	Sub Grade	Cum	266.00	-	-		2.83	-	-	1.404	-	-	1.074	-	-	0.85	-	-
3	4.1 A (i)	GSB	Cum	4,680.00	-	-		2.83	-		1.404	-		1.074	-		0.85	-	-
4	4.6(ii)	CTSB	Cum	4,868.00	31,996.70	155,759,917.69		2.83	2,060.00	5,825.68	1.404	2,060.00	2,892.24	1.074	2,060.00	2,212.44	0.85	2,060.00	1,759.24
5	3.16	Earthen Shoulder	Cum	226.00	-	-		2.83	150.00	424.20	1.404	150.00	210.60	1.074	150.00	161.10	0.85	150.00	128.10
6	4.12	BSM	Cum	4,823.00	17,118.23	82,561,228.00		2.83	1,100.00	3,110.80	1.404	1,100.00	1,544.40	1.074	1,100.00	1,181.40	0.85	1,100.00	939.40
7	5.1	Prime Coat	Sqm	24.00	155,620.28	3,734,886.76		2.83	10,000.00	28,280.00	1.404	10,000.00	14,040.00	1.074	10,000.00	10,740.00	0.85	10,000.00	8,540.00
8	5.2	Tack Coat	Sqm	9.00	311,240.56	2,801,165.07		2.83	20,000.00	56,560.00	1.404	20,000.00	28,080.00	1.074	20,000.00	21,480.00	0.85	20,000.00	17,080.00
9	5.8 (i)	BC	Cum	12,176.00	6,224.81	75,793,301.95		2.83	400.00	1,131.20	1.40	400.00	561.60	1.07	400.00	429.60	0.85	400.00	341.60
10	6.1	DLC	Cum	5,631.00	-	-													
11	6.2	PQC	Cum	9,968.00	-	-													

								TCS-IV			TCS-VIII			TCS-V			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					1.03	1.20	1.24	1.225	1.20	1.47	1.87	1.20	2.24	4.254	1.20	5.10
2	3.18	Sub Grade	Cum					1.03	-	-	1.225	-	-	1.87	-	-	4.254	-	-
3	4.1 A (i)	GSB	Cum					1.03	-	-	1.886	-	-	1.87	-	-	4.254	-	-
5	4.6(ii)	CTSB	Cum					1.03	2,060.00	2,132.10	1.225	2,060.00	2,523.50	1.87	2,060.00	3,852.20	4.254	2,060.00	8,763.24
6	4.1 B (iii)	Earthen Shoulder	Cum					1.03	150.00	155.25	1.225	150.00	183.75	1.87	-	-	4.254	-	-
7	4.12	BSM	Cum					1.03	1,100.00	1,138.50	1.225	1,100.00	1,347.50	1.87	1,100.00	2,057.00	4.254	1,100.00	4,679.40
8	5.1	Prime Coat	Sqm					1.03	10,000.00	10,350.00	1.225	10,000.00	12,250.00	1.87	10,000.00	18,700.00	4.254	10,000.00	42,540.00
9	5.2	Tack Coat	Sqm					1.03	20,000.00	20,700.00	1.225	20,000.00	24,500.00	1.87	20,000.00	37,400.00	4.254	20,000.00	85,080.00
10	5.8 (i)	BC	Cum					1.03	400.00	414.00	1.225	400.00	490.00	1.87	400.00	748.00	4.254	400.00	1,701.60
11	6.1	DLC	Cum					1.03	-	-	1.225	-	-	1.87	-	-	4.254	-	-
12	6.2	PQC	Cum					1.03	-	-	1.225	-	-	1.87	-	-	4.254	-	-

TCS-I {Two lane with Paved shoulder Concentric Widening (One Side Hill, One side Valley section)} **2.83 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	11.60	0.000	-	266.00	-
3	Excavation & Earthwork	Cum	Taken in Abstract Sheet					-	
4	CTSB	Cum	1	1000	10.30	0.200	2,060.00	4,863.00	10,017,780.000
5	Earthen Shoulder	Cum	1	1000	1.00	0.150	150.00	226.00	33,900.000
6	BSM	Cum	1	1000	10.00	0.110	1,100.00	8,634.57	9,498,028.63
7	Prime Coat	Sqm	1	1000	10.00	-	10,000.00	24.00	240,000.00
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	12,176.00	4,870,400.00
								Total Cost =	**24,913,103.43**

Per Km Cost of TCS Type-I in Cr. = 2.491

Total Cost of TCS Type- I for 02.844 Kms Length in Cr. = 7.045

TCS-II {Two lane with Paved shoulder Eccentric Left Widening (One Side Hill, One side Valley section)} **1.40 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	11.60	0.000	-	266.00	-
3	Excavation & Earthwork	Cum	Taken in Abstract Sheet					-	
4	CTSB	Cum	1	1000	10.30	0.200	2,060.00	4,863.00	10,017,780.00
5	Earthen Shoulder	Cum	1	1000	1.00	0.150	150.00	226.00	33,900.000
6	BSM	Cum	1	1000	10.00	0.110	1,100.00	8,634.57	9,498,028.63
7	Prime Coat	Sqm	1	1000	10.00	-	10,000.00	24.00	240,000.00
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	12,176.00	4,870,400.00
								Total Cost =	**24,913,103.43**

Per Km Cost of TCS Type-II in Cr. = 2.491

Total Cost of TCS Type- II for 01.420 Kms Length in Cr. = 3.498

TCS-III {Two lane with Paved shoulder Eccentric Right Widening (One Side Hill, One side Valley section)} **1.07 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	11.60	0.000	-	266.00	-
3	Excavation & Earthwork	Cum	Taken in Abstract Sheet					-	
4	CTSB	Cum	1	1000	10.30	0.200	2,060.00	4,863.00	10,017,780.00
5	Earthen Shoulder	Cum	1	1000	1.00	0.150	150.00	226.00	33,900.000
6	BSM	Cum	1	1000	10.00	0.110	1,100.00	8,634.57	9,498,028.63
7	Prime Coat	Sqm	1	1000	10.00	-	10,000.00	24.00	240,000.00
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	12,176.00	4,870,400.00
								Total Cost =	**24,913,103.43**

Per Km Cost of TCS Type-III in Cr. = 2.491

Total Cost of TCS Type- III for 01.090 Kms Length in Cr. = 2.676

TCS-IV {Two lane with Paved shoulder Realignment (One Side Hill, One side Valley section)} **1.035 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	11.60	0.000	-	266.00	-
3	Excavation & Earthwork	Cum	Taken in Abstract Sheet					-	
5	CTSB	Cum	1	1000	10.30	0.200	2,060.00	4,863.00	10,017,780.00
6	Earthen Shoulder	Cum	1	1000	1.00	0.150	150.00	226.00	33,900.000
7	BSM	Cum	1	1000	10.00	0.110	1,100.00	8,634.57	9,498,028.63
8	Prime Coat	Sqm	1	1000	10.00	-	10,000.00	24.00	240,000.00
9	Tack Coat	Sqm	2	1000	10.00	-	20,000.00	9.00	180,000.00
10	BC	Cum	1	1000	10.00	0.040	400.00	12,176.00	4,870,400.00
								Total Cost =	**24,913,103.43**

Per Km Cost of TCS Type-IV in Cr. = 2.491

Total Cost of TCS Type- IV for 01.051 Kms Length in Cr. = 2.579

TCS-V {Two lane with Paved shoulder Concentric Widening (Both Side Hill section)} **1.870 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	11.2	0.000	-	266.00	-
3	Excavation & Earthwork	Cum	Taken in Abstract Sheet					-	
4	CTSB	Cum	1	1000	10.30	0.200	2,060.00	4,863.00	10,017,780.00
5	BSM	Cum	1	1000	10.00	0.110	1,100.00	8,634.57	9,498,028.63
6	Prime Coat	Sqm	1	1000	10.00	-	10,000.00	24.00	240,000.00
7	Tack Coat	Sqm	2	1000	10.00	-	20,000.00	9.00	180,000.00
8	BC	Cum	1	1000	10.00	0.040	400.00	12,176.00	4,870,400.00
								Total Cost =	**24,879,203.43**

Per Km Cost of TCS Type-V in Cr. = 2.488

Total Cost of TCS Type- V for 1.886 Kms Length in Cr. = 4.652

TCS-VI {Two lane with Paved shoulder Concentric Widening (Both side Valley section)} **0.854 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	10.30	0.000	-	266.00	-
3	Excavation & Earthwork	Cum	Taken in Abstract Sheet					-	
4	CTSB	Cum	1	1000	10.30	0.200	2,060.00	4,863.00	10,017,780.00
5	Earthen Shoulder	Cum	1	1000	1.00	0.150	150.00	226.00	33,900.000
6	BSM	Cum	1	1000	10.00	0.110	1,100.00	8,634.57	9,498,028.63
7	Prime Coat	Sqm	1	1000	10.00	-	10,000.00	24.00	240,000.00
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	12,176.00	4,870,400.00
								Total Cost =	**24,913,103.43**

Per Km Cost of TCS Type-VI in Cr. = 2.491

Total Cost of TCS Type- VI for 00.870 Kms Length in Cr. = 2.128

TCS-VIII {Two lane with Paved shoulder Realignment (Both Side Valley section)} **1.225 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	10.3	0.000	-	266.00	-
3	Excavation & Earthwork	Cum	Taken in Abstract Sheet					-	
4	CTSB	Cum	1	1000	10.3	0.200	2,060.00	4,863.00	10,017,780.00
5	Earthen Shoulder	Cum	1	1000	1.00	0.150	150.00	226.00	33,900.000
6	BSM	Cum	1	1000	10.00	0.110	1,100.00	8,634.57	9,498,028.63
7	Prime Coat	Sqm	1	1000	10.00	-	10,000.00	24.00	240,000.00
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	12,176.00	4,870,400.00
								Total Cost =	**24,913,103.43**

Per Km Cost of TCS Type-VIII in Cr. = 2.491

Total Cost of TCS Type- VIII for 01.241 Kms Length in Cr. = 3.052

TCS-VII {Two lane with Paved shoulder Realignment (Both Side Hill section)} **4.254 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	11.2	0.000	-	266.00	-
3	Excavation & Earthwork	Cum	Taken in Abstract Sheet					-	
4	CTSB	Cum	1	1000	10.30	0.200	2,060.00	4,863.00	10,017,780.00
5	BSM	Cum	1	1000	10.00	0.110	1,100.00	8,634.57	9,498,028.63
6	Prime Coat	Sqm	1	1000	10.00	-	10,000.00	24.00	240,000.00
7	Tack Coat	Sqm	2	1000	10.00	-	20,000.00	9.00	180,000.00
8	BC	Cum	1	1000	10.00	0.040	400.00	12,176.00	4,870,400.00
								Total Cost =	**24,879,203.43**

Per Km Cost of TCS Type-VII in Cr. = 2.488

Total Cost of TCS Type- VII for 04.270 Kms Length in Cr. = 10.584

Lined Drain **14.34 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	7,845.00	745,275.00
3 (i)	RCC Grade M20 : Using Concrete Mixer	Cum	1	1000	0.75	0.15	112.5	8,510.00	957,375.00
3 (ii)	RCC Grade M20 : Using Concrete Mixer	Cum	2	1000	0.45	0.15	135	8,510.00	1,148,850.00
4	RCC Grade M20 : Using concrete mixer	Cum	1	1000	0.60	0.15	90	8,510.00	765,900.00
5	Supplying, Fitting and Placing un-coated HYSD bar Reinforcement in Foundation complete as per Drawing and Technical	Ton	1	1000			13.500	64,735.00	873,922.50
								Total Cost =	4,595,322.50

Per Km Cost of Catch Water Drain in Cr.= 0.460

Total Cost of Catch Water Drain for Km Length in Cr. = 6.587

Extra Widening

Total length of 1.5 m widening in Km				1.84					
Item No.	Description	Unit	No.	Length(m)	Width (m)	Depth (m)	Qty	Rate (Rs)	Amount(Rs)
1	Subgrade	Cum	1	1840.617	1.5	0.000	0	266.00	0
2	CTSB	Cum	1	1840.617	1.5	0.200	552.1851	4,863.00	2685276.141
3	BSM	Cum	1	1840.617	1.5	0.110	303.7018	8,634.57	2622334.944
4	Prime Coat	Cum	1	1840.617	1.5		2760.926	24.00	66262.212
5	Tack Coat	Cum	2	1840.617	1.5		5521.851	9.00	49696.659
4	BC	Cum	1	1840.617	1.5	0.040	110.437	12,176.00	1344681.156
						Cost 1.5 m widening =			6768251.112
						Total Cost in Cr. =			0.68
						Cost per Km			0.37

Total length of 1.2 m widening in Km				0.45					
Item No.	Description	Unit	No.	Length(m)	Width (m)	Depth (m)	Qty	Rate (Rs)	Amount(Rs)
1	Subgrade	Cum	1	454.966	1.2	0.000	0	266.00	0
2	CTSB	Cum	1	454.966	1.2	0.200	109.1918	4,863.00	530999.9179
3	BSM	Cum	1	454.966	1.2	0.110	60.05551	8,634.57	518553.6111
4	Prime Coat	Cum	1	454.966	1.2		545.9592	24.00	13103.0208
5	Tack Coat	Cum	2	454.966	1.2		1091.918	9.00	9827.2656
6	BC	Cum	1	454.966	1.2	0.040	21.83837	12,176.00	265903.9688
						Cost 1.2 m widening =			1338387.784
						Total Cost in Cr. =			0.13
						Cost per Km			0.29

Total length of 0.9 m widening in Km				6.80					
Item No.	Description	Unit	No.	Length(m)	Width (m)	Depth (m)	Qty	Rate (Rs)	Amount(Rs)
1	Subgrade	Cum	1	6797.253	0.9	0.000	0	266.00	0
2	CTSB	Cum	1	6797.253	0.9	0.200	1223.506	4,863.00	5949907.441
3	BSM	Cum	1	6797.253	0.9	0.110	672.928	8,634.57	5810445.323
4	Prime Coat	Cum	1	6797.253	0.9		6117.528	24.00	146820.6648
5	Tack Coat	Cum	2	6797.253	0.9		12235.06	9.00	110115.4986
6	BC	Cum	1	6797.253	0.9	0.040	244.7011	12,176.00	2979480.691
						Cost 0.9 m widening =			14996769.62
						Total Cost in Cr. =			1.50
						Cost per Km			0.22

Total length of 0.6 m widening in Km				1.26					
Item No.	Description	Unit	No.	Length(m)	Width (m)	Depth (m)	Qty	Rate (Rs)	Amount(Rs)
1	Subgrade	Cum	1	1259.782	0.6	0.000	0	266.00	0
2	CTSB	Cum	1	1259.782	0.6	0.200	151.1738	4,863.00	735158.3839
3	BSM	Cum	1	1259.782	0.6	0.110	83.14561	8,634.57	717926.7301
4	Prime Coat	Cum	1	1259.782	0.6		755.8692	24.00	18140.8608
5	Tack Coat	Cum	2	1259.782	0.6		1511.738	9.00	13605.6456
6	BC	Cum	1	1259.782	0.6	0.040	30.23477	12,176.00	368138.5352
						Cost 0.6 m widening =			1852970.156
						Total Cost in Cr. =			0.19
						Cost per Km			0.15

Earthwork Quantities (cum)

Total fill Volume	**Cum**			**109,902**
Total Cut Volume	**Cum**			**1,402,942**
			Excavation Ordinary rock i.e. 40% of Total Cut	561,176.62
			Excavation Soft Rock with Dozer i.e. 40% of Total Cut	561,176.62
			Excavation hard Rock Control Blasting) i.e. 20% of Total Cut	280,588.31
			EW filling from Borrow area	-
			EW Fill ing from approved mat	109,902.28

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**	17.45	60829.0	**1061636**
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.**	49.00	5000.0	**245000**
(ii)	Causeway	**No.**	5.00	2000.0	**10000**
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.**	425	294.0	**124950**
	(b) Girth from 600mm to 900mm	**No.**	255	526.0	**134130**
	(c) Girth from 900mm to 1800mm	**No.**	215	1032.0	**221880**
	(d) Girth above 1800mm	**No.**	105	1969.0	**206745**
Total (Rs)					**2004341.371**
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**	561176.62	207.2	**116275795**
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 lead50 metres), including trimming bottom and side slopes in accordance with requirements of lines, grades and cross sections.	**Cum**	561176.62	121.1	**67958488**
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**	280588.31	341.6	**95848966**
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**	1293039.26	54.0	**69824120**
				TOTAL EXCAVATION ….	**349907370**
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**	109902.28	163.0	**17914072**
				TOTAL EMBANKMENT FILLING ….	**17914072**

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**	0.00	266.0	**0**
Total (Rs)					**367821442**
Bill No 3: Non-Bituminous Courses					
3.010	Cement Treated Crushed Rock or combination as per clause 403.2 and table 400.4in 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**	31996.70	4863.0	**155599934**
3.020	Bituminous Stabilised Material (BSM)	**Cum**	17118.23	8634.6	**147808589**
3.030	Plant Mix Method (Construction of granular sub-base by providing close graded Material, mixing in a mechanical mix plant at OMC, carriage of mixed Material to work site, spreading in uniform layers with motor grader on prepared surface and compacting with vibratory power roller to achieve the desired density, complete as per clause 401)-Grading-1	**Cum**	0.00	4680.0	**0**
3.040	Footpaths and Separators. Construction of footpath/separator by providing a 150 mm compacted granular sub base as per clause 401 and 25 mm thick cement concrete grade M15, over laid with pre-cast concrete tiles in cement mortar 1:3 including provision of all drainage arrangements but excluding kerb channel..	**Sqm**	0.00	2195.0	**0**
Total (Rs)					**303408523**
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**	155620.28	24.0	**3734887**
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**	311240.56	9.0	**2801165**
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**	6224.81	12176.0	**75793302**
Total (Rs)					**82329354**
Bill No 4: Cement Concrete Pavement					
5.010	Dry Lean Cement Concrete Sub- base. Construction of dry lean cement concrete Sub- base over a prepared sub-grade with coarse and fine aggregate conforming to IS: 383, the size of coarse aggregate not exceeding 25 mm, aggregate cement ratio not to exceed 15:1, aggregate gradation after blending to be as per table 600-1, cement content not to be less than 150 kg/ cum, optimum moisture content to be determined during trial length construction, concrete strength not to be less than 10 Mpa at 7 days, mixed in a batching plant, transported to site, laid with a paver with electronic sensor, compacting with 8-10 tonnes vibratory roller, finishing and curing.	Cum	0.000	5631.0	**0**

Bill Of Quantities - Roads

Item No.	Description	Unit	Qty	Rate (in Rs.)	Amount (Rs.)
5.020	Cement Concrete Pavement.Construction of un-reinforced, dowel jointed, plain cement concrete pavement over a prepared sub base with 43 grade cement @ 400 kg per cum, coarse and fine aggregate conforming to IS 383, maximum size of coarse aggregate not exceeding 25 mm, mixed in a batching and mixing plant as per approved mix design, transported to site, laid with a fixed form or slip form paver, spread, compacted and finished in a continuous operation including provision of contraction, expansion, construction and longitudinal joints, joint filler, separation membrane, sealant primer, joint sealant, debonding strip, dowel bar, tie rod, admixtures as approved, curing compound, finishing to lines and grades as per drawing	Cum	0.000	9968.0	**0**
Total (Rs)					**0**

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) Lined Drain	**Km**	14.34	4595322.5	65873948.04
	(iI) Cover Drain	**Km**	0.00	0.0	0.00
				TOTAL DRAINAGE COST ….	**65,873,948**
6.02	W Type Crash Barrier	**Cum**	2539	4092.0	**10390406**
				TOTAL OF CRASH BARRIER …	**10,390,406**
				Total (Rs)	**76,264,354**

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	4455.0	**13365**
	(ii) Ordinary Kilometer stone	**No.**	15.00	2722.0	**40830**
	(iii) Hectometer stone	**No.**	66.00	714.0	**47124**
	(iv) Boundary stones @200 m interval	**No**	168.00	559.0	93912.00
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**	7000.00	629.00	**4403000**
	(b) Directional Arrows, lettering etc. as per Drawing	**Sqm**	103.23	146.00	**15071**
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.**	10.00	8467.0	**84670**
	(ii) Cautionary sign 900 mm triangular	**No.**	200.00	6781.0	**1356200**
	(iii) Mandatory sign 600 mm circular	**No.**	110.00	5911.0	**650210**
	(iv) Mandatory sign 900 mm octagon	**No.**	3.00	10958.0	**32874**
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**	7.00	82561.41	**577930**
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.**	200.00	3634.00	**726800**
	(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.**	188.00	7555.00	**1420340**
	(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.**	133	355.00	47333
7.090	Providing and fixing Cluster of Red Reflector complete as per drawings and Technical Specification Clause 805.	**No.**	3640.00	249.00	**906360**
	TOTAL OF TRAFFIC SIGN, MARKING ETC…				**10416019**
7.070	Providing & Ninteen degree tilted one way reflective Road Studs	**No.**	3640.00	834.32	**3036925**
Total (Rs)					**13452944**

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**	2000.00	606.00	**1212000**
8.020	Traffic management and safety during construction operation as per Technical Specification Clause A-21.	**km**	5.00	500000.00	**2500000**
	Total (Rs.)				**3712000**

Bill Of Quantities - Culvert and Pipes

Sl No..	Description of items	Unit	Calculation	Sectional Area /Plan area in Sqm.	Length/ Thickness	No.	Qty		Rate	Amount
	Size =1 X 2.0 m RCC slab culvert									22.885
I)	Earthwork in excavation									
	a) Abutments	Cum	3.64 X 2.55	9.282	12	1	111.38			
	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) Appron									
	I) Flexible Appron 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 Appron U/s	Cum	1.30 X 0.30	0.39	7	1	2.73			
		Cum	4.05 X .75	3.0375	4.5	1	13.67			
							275.22	**12.1 I - A (i)**	164.00	45,136
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		37.13			
							78.85	**12.3**	2465.00	194,370
III)	M 15 Conc.									
	a) Curtain Wall	Cum		4.30375	0.15		0.65			
	b) Abutments	Cum	1.75 X 10.30	18.025	0.15	2	5.41			
	c) Wing Wall	Cum	4.20 X 2.10	8.82	0.15	4	5.29			
	d) Floor Appron	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			
							13.51	**12.8 A**	7845.00	106,020
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	3.394	12	2	81.45			
	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			
							144.85	**12.8 A**	7845.00	1,136,332
VI)	M 25 Conc.									
	Slab	Cum		36	0.45	1	16.20			
	Wearing coat	Cum		48	0.065	1	3.12			
							19.32	**14.1 C - Case-I (ii) (p)**	10908.00	210,743
V)	Reinforcement Bar	MT					**1.932**	**14.2**	66353.00	128,194
VIII)	Stone (Boulder) Appron									
	a) Floor Appron (300 THK)	Cum		30	0.3	1	9.00			
	b) Floor Appron (300 THK)	Cum		12.605	0.3	1	3.78	15.1 A		
	c) Flexible Appron(750 THK)	Cum		24.168	0.75	1	18.13	15.1 A		
							30.91	15.11	3896.00	120,416
IX)	Weep Holes in Wing Wall	No..				12 X 4	**48**	**13.8**	1258.00	60,384
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**	2272.00	14,086
XII)	600mm Th Filter Media	Mtr	1.65X0.6	0.93	12	2	**22.32**	**13.10**	4460.00	99,547
						Total Cost of One Culvert (2 Lane)			**Rs.**	**2,146,751**
			Total Cost of Culverts..		**70**	**Nos**			**Rs.**	**150,272,562**

Major Junction - 3 LEG

Nos 2

Sl No	Description	Unit	Nos	Length	Width	Depth	Quantity	No of Juncion	Tot Qty
1	Subgrade - in Tapper Portion	Cum	2.00	0.00	5.19	0.500	-	2.00	-
1	Subgrade - in Straight	Cum	2.00	30.00	5.50	0.500	165.00	2.00	330.00
1	Subgrade - in Curve	Cum	2.00	30.00	7.00	0.500	210.00	2.00	420.00
1	Earthern Shoulder	Cum	2.00	30.00	2.000	0.850	102.00	2.00	204.00
2	Granular Sub Base								
2	In Tapper Portion	Cum	2.00	0.00	4.69	0.150	-	2.00	-
2	In Straight	Cum	2.00	30.00	5.50	0.150	49.50	2.00	99.00
2	In Curve	Cum	2.00	30.00	6.50	0.150	58.50	2.00	117.00
2	Shoulder - Granular	Cum	2.00	30.00	2.000	0.150	18.00	2.00	36.00
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	60.00	14.69	0.150	264.38	2.00	528.75
10	PQC	Cum	2.00	60.00	14.69	0.200	352.50	2.00	705.00

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	0.00	5.19	0.500	-	-	-
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	30.00	2.000	0.850	204.00	-	-
2	Granular Sub Base								
2	In Tapper Portion	Cum	4.00	0.00	4.69	0.150	-	-	-
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	30.00	2.000	0.150	36.00	-	-
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	60.00	14.69	0.150	528.75	-	-
10	PQC	Cum	4.00	60.00	14.69	0.200	705.00	-	-

Summary of Major Junctions

0

Sl No	Description	Unit	Quantity	Rate	Amount
1	Subgrade	Cum	954.000	266.00	253,764.00
2	Granular Sub Base	Cum	252.000	4,680.00	1,179,360.00
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	528.750	5,631.000	2,977,391.25
10	PQC	Cum	705.000	9,968.000	7,027,440.00
				Total Cost of MAJOR Junctions .... Rs.	**11,437,955.25**

Minor Junction - 3 LEG — Nos 3

Sl No	Description	Unit	Nos	Length	Width	Depth	Quantity	No of Junc	Tot Qty
1	Subgrade - in Tapper Portion	Cum	2.00	0.00	2.25	0.500	-	3.00	-
1	Subgrade - in Straight	Cum	2.00	20.00	5.50	0.500	110.00	3.00	330.00
1	Subgrade - in Curve	Cum	2.00	0.00	1.50	0.500	-	3.00	-
1	Earthern Shoulder	Cum	2.00	20.00	-	1.000	-	3.00	-
2	Granular Sub Base								
2	In Tapper Portion	Cum	2.00	0.00	1.75	0.150	-	3.00	-
2	In Straight	Cum	2.00	20.00	5.50	0.150	33.00	3.00	99.00
2	In Curve	Cum	2.00	0.00	1.00	0.150	-	3.00	-
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	20.00	6.25	0.150	37.50	3.00	112.50
10	PQC	Cum	2.00	20.00	6.25	0.200	50.00	3.00	150.00

Minor Junction - 4 LEG — Nos 4

Sl No	Description	Unit	Nos	Length	Width	Depth	Quantity	No of Junc	Tot Qty
1	Subgrade - in Tapper Portion	Cum	4.00	0.00	2.25	0.500	-	4.00	-
1	Subgrade - in Straight	Cum	4.00	20.00	5.50	0.500	220.00	4.00	880.00
1	Subgrade - in Curve	Cum	4.00	0.00	1.50	0.500	-	4.00	-
1	Earthern Shoulder	Cum	4.00	20.00	-	1.000	-	4.00	-
2	Granular Sub Base								
2	In Tapper Portion	Cum	4.00	0.00	1.75	0.150	-	4.00	-
2	In Straight	Cum	4.00	20.00	5.50	0.150	66.00	4.00	264.00
2	In Curve	Cum	4.00	0.00	1.00	0.150	-	4.00	-
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	20.00	6.25	0.150	75.00	4.00	300.00
10	PQC	Cum	4.00	20.00	6.25	0.200	100.00	4.00	400.00

Summary of Minor Junctions

Sl No	Description	Unit	Quantity	Rate	Amount
1	Subgrade	Cum	1,210.000	266.00	321,860.00
2	Granular Sub Base	Cum	363.000	4,680.00	1,698,840.00
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		412.500	5,631.00	2,322,787.50
10	PQC		550.000	9,968.00	5,482,400.00
				Total Cost of MINOR Junctions .... Rs.	**9,825,887.50**

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 V B section of Start of Pedong Bypass to RESHI from Km 79.700 to Km 96.254)

BOQ - Traffic Signs, Marking and Road Appurtenances

Road Signs

Sl No.	Item	Total Nos	Remarks
(i)	90 cm equilateral triangle	200	Has been considered in LHS & RHS Curve and at Cross road
(ii)	60 cm circular	110	Has been considered at the location where design speed is less than equal to 50 kmph
(iii)	90 cm high octagon	3	Has been considered at major junction
(iv)	Informatory Sign Boards	10	Has been considered at important village location
(v)	Hazard Marker Sign Boards	188	Has been considered at start and end of culvert,island,bridge, location
(vi)	Village Name Boards of size 900x600	6	Has been considered at village locations
(vii)	Place Identification Boards of size 1200x900	4	Has been considered at petrol pump, health center, hospital,govt office, dhaba
(viii)	Advance Direction Sign Boards of 1800x1200	3	Has been considered at important eating place and major junctions
(ix)	Chevron boards of size 600x450	65	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	5348	0.1	535	(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	16554	0.15	4966	(RM-01)-Continuous marking
Total=					**5552**	
Add 10% extra for other marking=					**555**	
Grand total=					**6107**	
Say					**7000**	

Km Stone, Hectometer Stone and Boundary Stone

Total Length ... 16.554 Kms

Sl. No.	Item	No.	Calculation Backup
a)	5th Kilometer stones	3	(Total Length/5)
b)	Kilometer stones	15	(Total Length) - No.of km 5th Stones
c)	Hectometer stones	66	(Total Lengthx5) - No.of km 5th Stones - No.of km Stones
d)	Boundary stones	168	(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	16554	3312	@ 15m spacing
			331	10 % for Junction and Zebra crossing
		Total=	3643	
		Say	**3640**	

Trapezoidal Reflactor

	Location	No	Remarks
	Over Metal Beam	5518	@ 3mt spacing
	Over Guard Post	3311	@ 5mt spacing
	Total	**8829**	

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)
7.00	Minor Junction	1.100	1.125	56	36	102.10
2.00	Major Junction	1.100	1.125		1	1.13
					Total area (sqm)=	**103.23**

W Type Crash Barrier

	Location	Length	
	TCS-I	2.83	Mtr
	TCS-II	1.40	
	TCS-III		
	TCS-IV		
	TCS-VI		
	TCS-VIII		
		4,232	**Mtr**

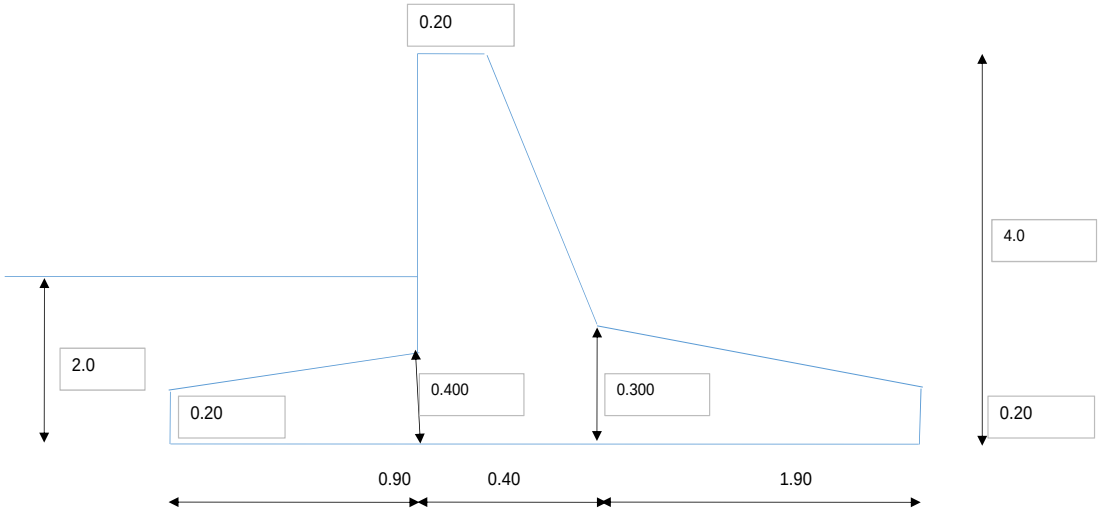
Retaining wall

S.No.	Item	Heingh in Mtr	Length includes Left and Right Portion	Rate per m	Amount (Rs.)	Amount (Cr)
1	Retaining wall of 4 m Height	4	420	29788	12,510,848.03	1.25
2	Retaining wall of 5 m Height	5	700	46768	32,737,609.20	3.27
3	Retaining wall of 6 m Height	6	1640	64634	106,000,536.29	10.60
	Total ...		**2760**		**151,248,993.52**	15.12

	Left Side	Right Side
	length (km)	length (km)
Retaining wall	1.19	1.57

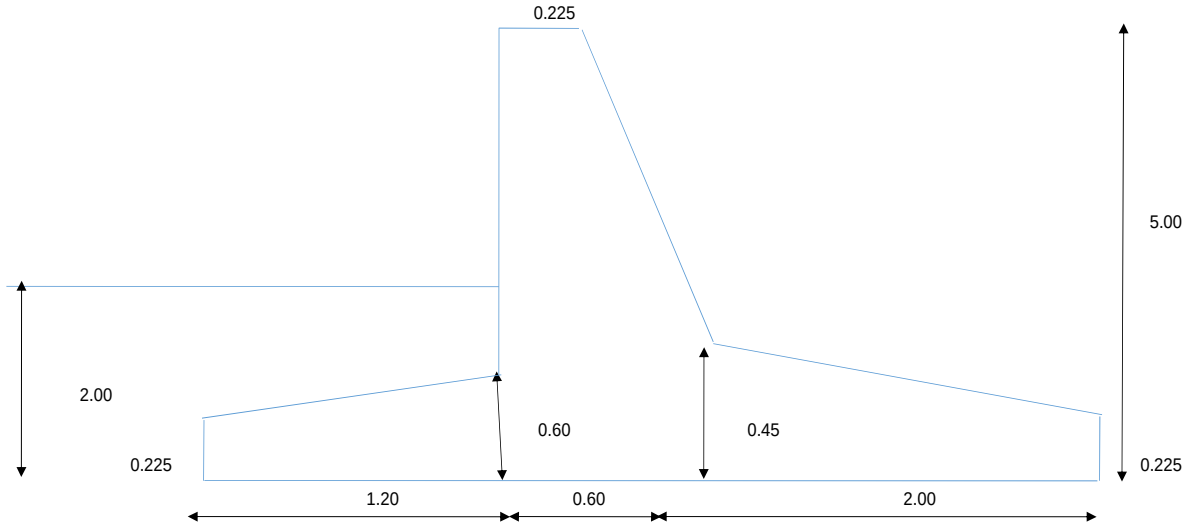
Calculation of Retaining Wall (Height 4.0 m)

Length 1.00 Mtr



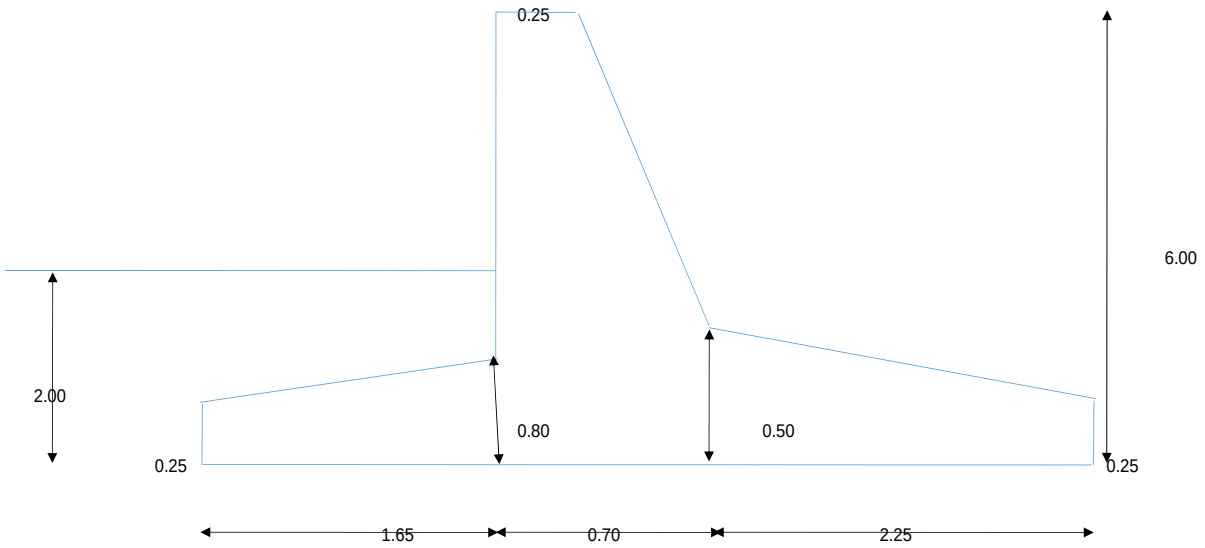
Sr. No	Item Description	Length (m)	Breadth (m)	Height (m)	QTY.	Unit	Rate	Amount
1.00	Excavation	1.00	4.20	2.10	8.82	cum	211.00	1,861.02
2.00	PCC M-15	1.00	3.40	0.10	0.34	cum	7,940.00	2,699.60
3.00	RCC M20				**1.97**	cum	9,421.00	18,512.27
	Footing	1.00	3.20	0.20	0.64	cum	-	
		1.00	0.90	0.20	0.09	cum	-	
		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				0.08	MT	64,944.00	5,104.60
4.00	Steel (HYSD 60kg/cum)				0.08	MT	-	
	Steel (HYSD 60kg/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 ,,,,		**29,787.73**

Calculation of Retaining Wall (Height 5.0 m)



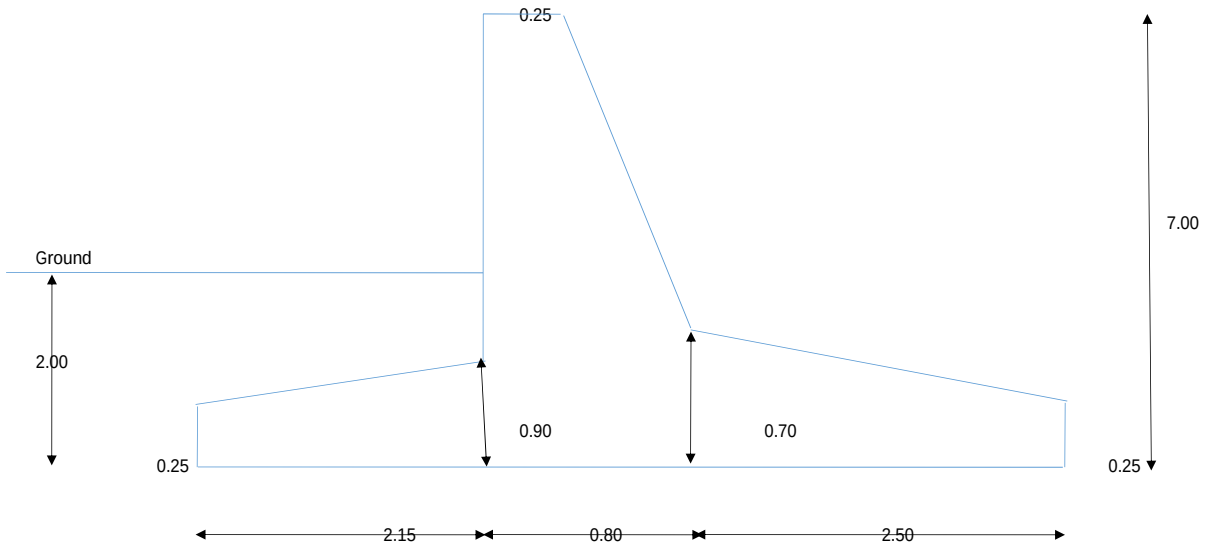
Sr. No	Item Description	Length (m)	Breadth (m)	Height (m)	QTY.	Unit	Rate	Amount
1.00	Excavation	1.00	4.80	2.10	10.08	cum	211.00	2,126.88
2.00	PCC M-15	1.00	4.00	0.10	0.40	cum	7,940.00	3,176.00
3.00	RCC M30				**3.27**	cum	9,421.00	30,850.83
	Footing	1.00	3.80	0.23	0.86		-	
		1.00	1.20	0.38	0.23	cum	-	
		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				0.13	MT	64,944.00	8,506.85
4.00	Steel (HYSD 60kg/cum)			`	0.13	MT	-	
	Steel (HYSD 60kg/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 ,,,,		**46,768.01**

Calculation of Retaining Wall (Height 6 m)



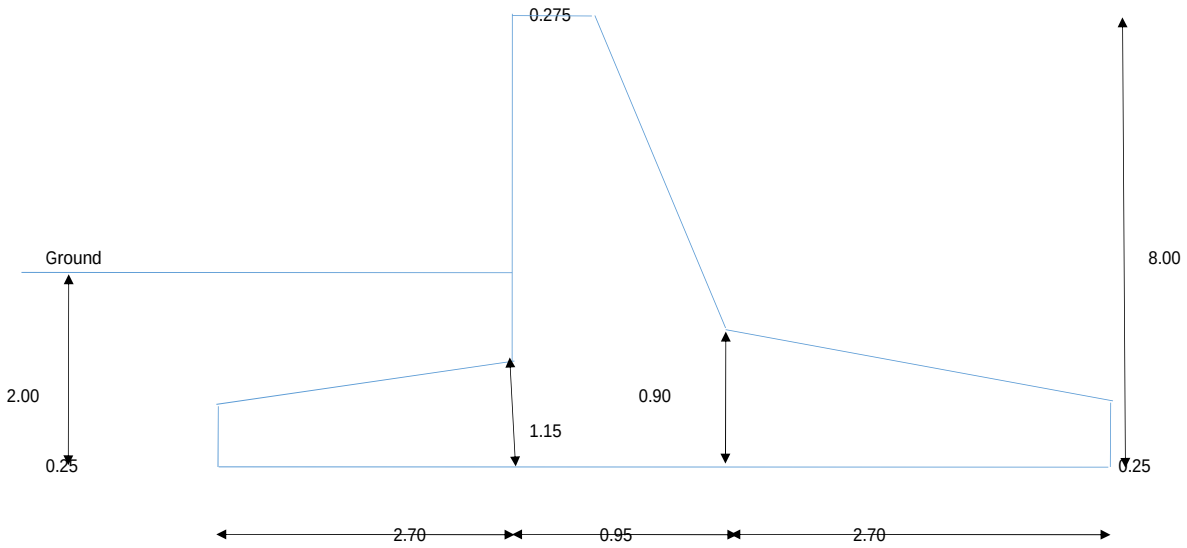
Sr. No	Item Description	Length (m)	Breadth (m)	Height (m)	QTY.	Unit	Rate	Amount
1.00	Excavation	1.00	5.60	2.10	11.76	cum	211.00	2,481.36
2.00	PCC M-15	1.00	4.80	0.10	0.48	cum	7,940.00	3,811.20
3.00	RCC M30				**4.62**	cum	9,421.00	43,489.69
	Footing	1.00	4.60	0.25	1.15		-	
		1.00	1.65	0.55	0.45	cum	-	
		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				0.18	MT	64,944.00	11,991.91
4.00	Steel (HYSD 60kg/cum)				0.18	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 ,,,,		**64,634.47**

Calculation of Retaining Wall (Height 7 m)



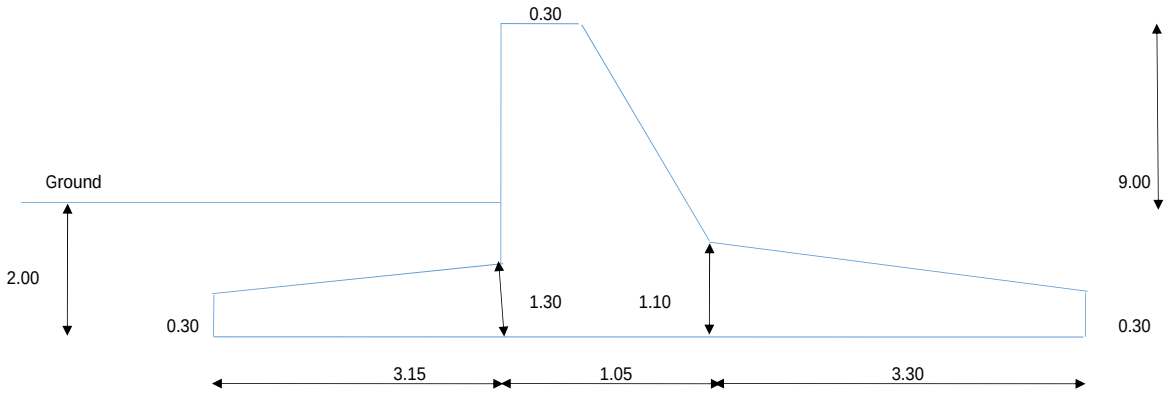
Sr. No	Item Description	Length (m)	Breadth (m)	Height (m)	QTY.	Unit	Rate	Amount
1.00	Excavation	1.00	6.45	2.10	13.55	cum	211.00	2,858.00
2.00	PCC M-15	1.00	0.20	0.10	0.02	cum	7,940.00	158.80
3.00	RCC M30				**6.17**	cum	9,421.00	58,104.02
	Footing	1.00	5.45	0.25	1.36		-	
		1.00	2.15	0.65	0.70	cum	-	
		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				0.25	MT	64,944.00	16,021.68
4.00	Steel (HYSD 60kg/cum for stem)				0.25	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 ,,,,		**86,359.06**

Calculation of Retaining Wall (Height 8 m)



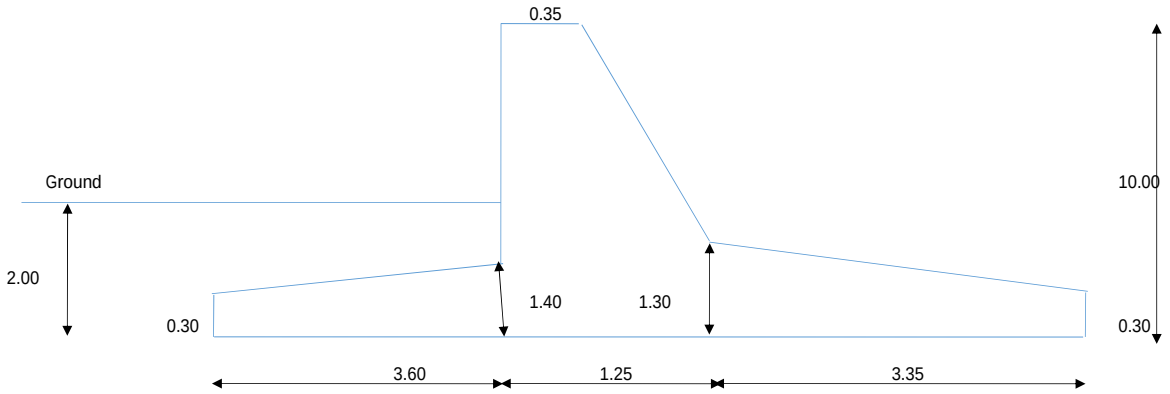
Sr. No	Item Description	Length (m)	Breadth (m)	Height (m)	QTY.	Unit	Rate	Amount
1.00	Excavation	1.00	7.35	2.10	15.44	cum	211.00	3,256.79
2.00	PCC M-15	1.00	6.55	0.10	0.66	cum	7,940.00	5,200.70
3.00	RCC M30				**8.43**	cum	9,421.00	79,389.59
	Footing	1.00	6.35	0.25	1.59		-	
		1.00	2.70	0.90	1.22	cum	-	
		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				0.34	MT	64,944.00	21,891.00
4.00	Steel (HYSD 60kg/cum)				0.34	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 ,,,,		**114,268.81**

Calculation of Retaining Wall (Height 9 m)



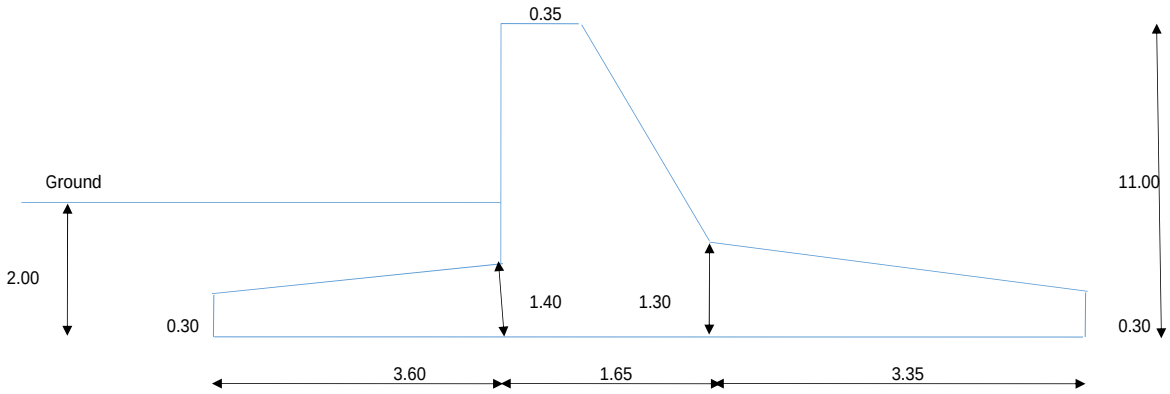
Sr. No	Item Description	Length (m)	Breadth (m)	Height (m)	QTY.	Unit	Rate	Amount
1.00	Excavation	1.00	8.50	2.10	17.85	cum	211.00	3,766.35
2.00	PCC M-15	1.00	7.70	0.10	0.77	cum	7,940.00	6,113.80
3.00	RCC M30				**11.02**	cum	9,421.00	103,795.87
	Footing	1.00	7.50	0.30	2.25		-	
		1.00	3.15	1.00	1.58	cum	-	
		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				0.44	MT	64,944.00	28,620.82
4.00	Steel (HYSD 60kg/cum for stem)				0.44	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 ,,,,		**148,486.98**

Calculation of Retaining Wall (Height 10 m)



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	7,940.00	6,669.60
3.00	RCC M30				**13.88**	cum	9,421.00	130,716.38
	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				0.56	MT	64,944.00	36,043.92
4.00	Steel (HYSD 60kg/cum)				0.56	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 ,,,,		**184,471.74**

Calculation of Retaining Wall (Height 11 m)



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	7,940.00	6,987.20
3.00	RCC M30				**16.94**	cum	9,421.00	159,544.64
	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				0.68	MT	64,944.00	43,993.07
4.00	Steel (HYSD 60kg/cum)				0.68	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 ,,,,		**215,221.62**

Breast wall

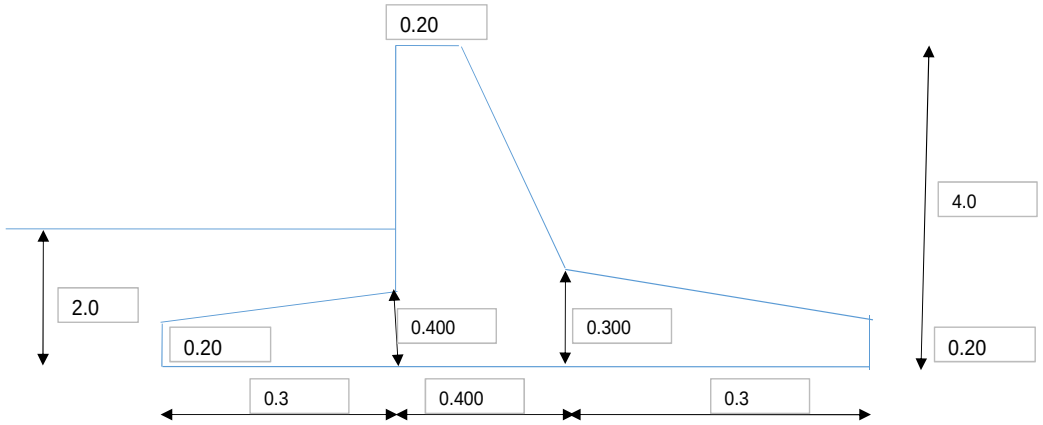
S.No.	Item	Heingh in Mtr	Length includes Left and Right Portion	Rate per m	Amount (Rs.)	Amount (Cr)
1	Breast wall	4	6270	11,310	**70,916,314.59**	**7.09**
	Total ...		**6270**		**70,916,314.59**	7.09

	Height (m)	Left Side	Right Side
		length (km)	length (km)
Breast Wall	4	6.59	5.95

Calculation of Breast Wall (Height 4.0 m)

Length 1.00 Mtr

70916314.59



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	7,940.00	952.80
3.00	RCC M20				**0.83**	cum	8,927.00	7,418.34
	Stone boulder				**0.47**	cum	3,795.00	1,798.83
	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				0.00	MT	64,944.00	-
4.00	Steel (HYSD 70kg/cum for stem)				0.06	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 ,,,,		**11,310.42**