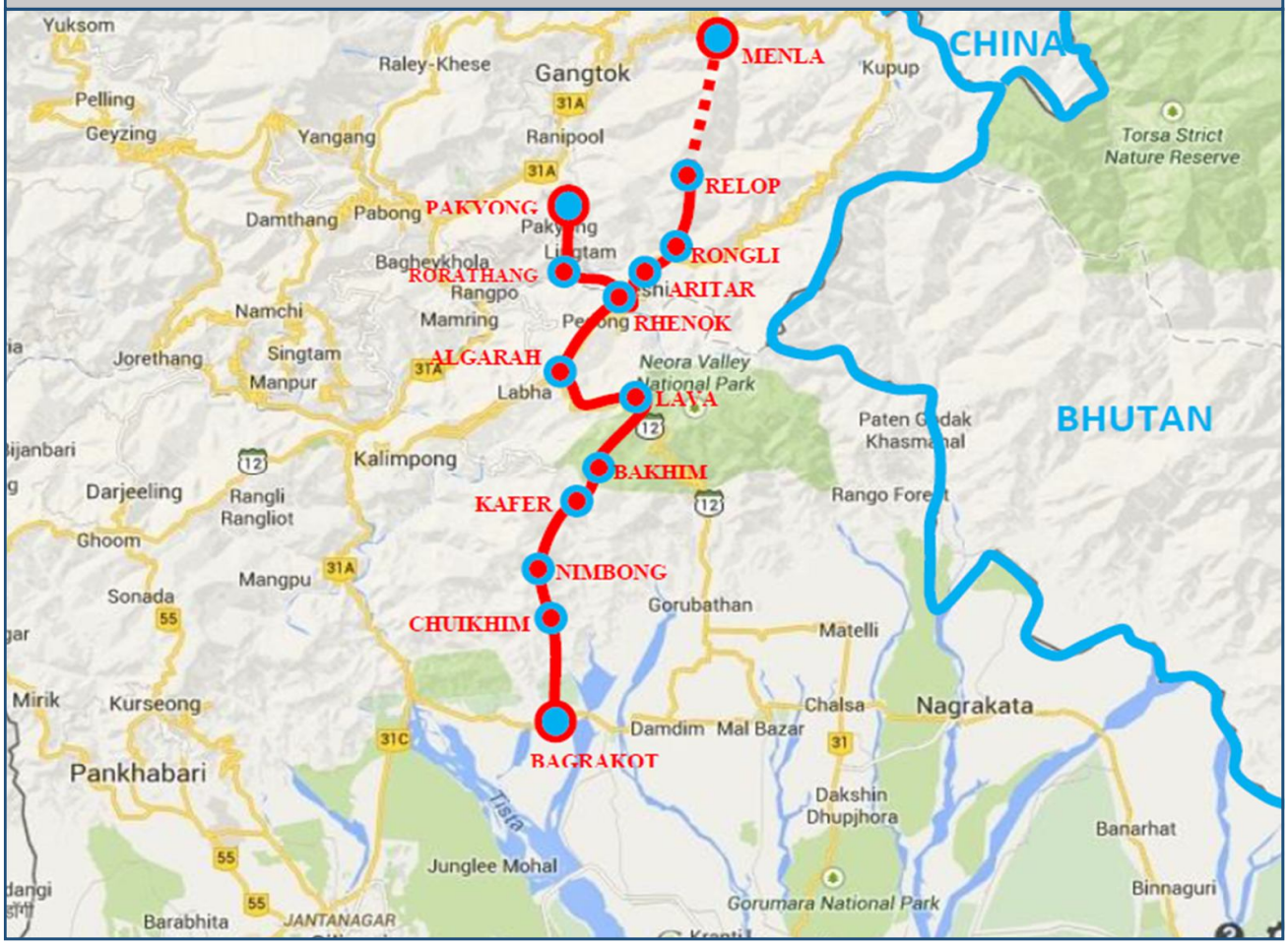
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED

(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 - VA Section of KAFER TO RESHI from Km 40.00 to Km 61.100



DPR

November, 2019

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,

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. PKG V A section of KAFER to RESHI from Km 40.000 to Km 61.100)

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	1.59
2	Earth Work	21.01
3	CTSB+BSM Pavement	56.63
4	Cement Concrete Pavement	1.15
5	Disposal of Excess Earthwork material	1.38
6	Culverts	23.41
7	Elevated Structure	27.62
8	Retaining and Breast Wall	20.78
9	Drainage and Protective Works	11.86
10	Truck and Buys Laybyes	2.70
11	Major and Minor Junctions	7.20
12	Traffic Signs, Marking and Road Appurtenances	1.55
13	Miscellaneous works	0.33
A	**Civil Construction Cost**	**177.20**
B	GST Charge 12% on (A)	21.26
C	Civil Cost including GST (A+B)	198.47
D	Add Contingency @ 2.8 % of (A)	4.96
E	Total (C+D)	203.43
F	Maintenance during DLP (5 Years) payable to Contractor @ 2.5% on (A)	4.43
G	Escalation Charges @ 7.5 % per year for 1.5 years on (A)	13.29
H	Supervision charges @ 3% on (A)	5.32
I	Administrative charges @ 3% on (A)	5.32
J	Total Cost (E+F+G+H+I)	231.78
K	Land Acquisition Cost	0.13
L	Cost of Utility Shifting	3.7
M	Cost of Forest Clearance	6.80
N	**Total Project Cost (Including LA, US & FC)**	**242.415**
Civil Cost per Km. (A/21.100 Km)		8.40
Total Project Cost per Km. (N/21.100 Km)		**11.49**

ABSTRACT OF COST ESTIMATE

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 A section of KAFER to RESHI from Km 40.000 to Km 61.100)**

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				15,889,648.89	1.589
2	Excavation	Cum			141,640,478.12	14.164
3	Earthwork Filling	Cum			34,233,863.37	3.423
4	Disposal of Excess Earthwork material	Cum			13,785,480.36	1.379
5	Loosening & Recompacting	Cum			-	-
6	Sub Grade	Cum			34,209,163.28	3.421
7	GSB	Cum			2,316,600.00	0.232
8	CTSB	Cum			236,594,684.80	23.659
9	DLC	Cum			2,822,490.00	0.282
10	PQC	Cum			8,677,612.50	0.868
11	BSM	Cum			210,033,472.61	21.003
12	Prime Coat	Sqm			5,307,210.10	0.531
13	Tack Coat	Sqm			3,980,407.57	0.398
14	BC	Cum			107,692,138.20	10.769
B	**BRIDGES and STRUCTURES**					
1	Culverts	No.	91		234,137,165.54	23.41
C	**SLOPE STRUCTURES**					
1	Elevated Structure	No.	3		276,236,704.56	27.62
2	Retaining Wall	Rnm	2020		129,954,004.58	13.00
2	Breast Wall	Rnm	3750		77,825,496.75	7.78
D	**JUNCTIONS**					
1	Major Junctions	No	2.0		26,886,075.50	2.69
1	Minor Junctions	No	6.0		45,122,280.00	4.51
E	**DRAIN & PROTECTION WORK**					
1	Drainage Works	Km			97,903,192.38	9.79
2	Parapet Wall	Km	8.38		20,655,024.00	2.07
F	**LAY BYES**					
1	Bus Shelter	Nos	18.0	1,500,000.00	27,000,000.00	2.70
G	**OTHER MISCELLANEOUS ITEMS**					
1	Footpath and Separators				330,000.00	0.03
1	Miscellaneous Items				3,287,800.00	0.33
2	Traffic Signs, Marking and Road Appurtenances				11,632,368.51	1.16
3	Reflective Road Studs	Nos	4640		3,871,244.80	0.39
	TOTAL CIVIL COST				**1772024606.40**	**177.20**
	Add GST (12%)				**212642952.77**	**21.26**
	TOTAL CIVIL COST including GST				**1984667559.17**	**198.47**
	COST PER KM (LENGTH = 21.10 KM) IN CRORES ...					**9.41**

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 A section of KAFER to RESHI from Km 40.000 to Km 61.100)

Summary of Cost Estimate

Sr. No.	Item of Works	Total (in Rs)	Total (in Cr)
	Civil Works		
1	Site Clearance	15,889,648.89	1.59
2	Earthwork	223,868,985.13	22.387
3	Non-Bituminous Courses	449,274,757.41	44.93
4	Bituminous Courses	116,979,755.87	11.70
5	Cement Concrete Pavement	11,500,102.50	1.15
6	Culverts/Repairing/Dismantling	234,137,165.54	23.41
7	Elevated Structure	276,236,704.56	27.62
8	Retaining and Breast Wall	207,779,501.33	20.78
9	Drainage and Protective works	118,558,216.38	11.86
10	Traffic Signs, Marking and Road Appurtenances	15,503,613.31	1.55
11	Miscellaneous Items	3,287,800.00	0.33
12	Bus Shelter	27,000,000.00	2.70
13	Junctions and Intersections	72,008,355.50	7.20
	Total for Civil Works	**1,772,024,606.40**	**177.20**
	Add GST (12%)	**212,642,952.77**	**21.26**
	TOTAL CIVIL COST including GST	**1,984,667,559.17**	**198.47**
	Cost per Km		**9.41**

DETAILS OF QUANTITIES

Summary of TCS Sections

Item No	BOQ Item No	Description	Unit	Rate (in Rs)	Total Qty	Amount		TCS-I		
								Length	Qty /km	Total Qty
1	2.3 (ii) - A	Clearing & Grubbing	Hac	60,829.00	24.95	1,517,561.89		7.79	1.20	9.35
2	3.18	Sub Grade	Cum	266.00	126,508.88	33,651,361.28		7.79	5,800.00	45,182.00
3	4.1 A (i)	GSB	Cum	4,680.00	495.00	2,316,600.00		7.79	-	
4	3.19 - Case-I	Loosening & Recompacting	Cum	82.00	-	-		7.79	-	-
5	4.6(ii)	CTSB	Cum	4,875.00	48,582.07	236,837,595.15		7.79	2,238.00	17,434.02
6	3.16	Earthen Shoulder	Cum	226.00	2,097.00	473,922.00		7.79	150.00	1,168.50
7	4.12	BSM	Cum	4,823.00	24,324.71	117,318,090.51		7.79	1,100.00	8,569.00
8	5.1	Prime Coat	Sqm	24.00	221,133.75	5,307,210.10		7.79	10,000.00	77,900.00
9	5.2	Tack Coat	Sqm	9.00	442,267.51	3,980,407.57		7.79	20,000.00	155,800.00
10	5.8 (i)	BC	Cum	12,175.00	8,845.35	107,692,138.20		7.79	400.00	3,116.00
11	6.1	DLC	Cum	5,702.00	495.00	2,822,490.00				
12	6.2	PQC	Cum	10,061.00	862.50	8,677,612.50				

								TCS-IV		
								Length	Qty /km	Total Qty
1	2.3 (ii) - A	Clearing & Grubbing	Hac					3.49	1.20	4.19
2	3.18	Sub Grade	Cum					3.49	5,800.00	20,242.00
3	4.1 A (i)	GSB	Cum					3.49	-	-
4	3.19 - Case-I	Loosening & Recompacting	Cum					3.49	-	-
5	4.6(ii)	CTSB	Cum					3.49	2,238.00	7,810.62
6	4.1 B (iii)	Earthen Shoulder	Cum					3.49	150.00	523.50
7	4.12	BSM	Cum					3.49	1,100.00	3,839.00
8	5.1	Prime Coat	Sqm					3.49	10,000.00	34,900.00
9	5.2	Tack Coat	Sqm					3.49	20,000.00	69,800.00
10	5.8 (i)	BC	Cum					3.49	400.00	1,396.00
11	6.1	DLC	Cum					3.49	-	-
12	6.2	PQC	Cum					3.49	-	-

imbong-Kafer-Bakhim-Algarah-Rhenok in the State of West Bengal and from
I.100)

TCS-II			TCS-III			TCS-VI		
Length	Qty /km	Total Qty	Length	Qty /km	Total Qty	Length	Qty /km	Total Qty
1.980	1.20	2.38	1.900	1.20	2.28	1.48	1.20	1.78
1.980	5,800.00	11,484.00	1.900	5,800.00	11,020.00	1.48	5,500.00	8,140.00
1.980	-		1.900	-		1.48	2,068.50	3,061.38
1.980	-	-	1.900	-	-	1.48	-	-
1.980	2,238.00	4,431.24	1.900	2,238.00	4,252.20	1.48	2,200.00	3,256.00
1.980	150.00	297.00	1.900	150.00	285.00	1.48	150.00	222.00
1.980	1,100.00	2,178.00	1.900	1,100.00	2,090.00	1.48	1,100.00	1,628.00
1.980	10,000.00	19,800.00	1.900	10,000.00	19,000.00	1.48	10,000.00	14,800.00
1.980	20,000.00	39,600.00	1.900	20,000.00	38,000.00	1.48	20,000.00	29,600.00
1.98	400.00	792.00	1.90	400.00	760.00	1.48	400.00	592.00

TCS-VIII			TCS-V			TCS-VII			TCS-IX			TCS-X		
Length	Qty /km	Total Qty	Length	Qty /km	Total Qty	Length	Qty /km	Total Qty	Length	Qty /km	Total Qty	Length	Qty /km	Total Qty
1.310	1.20	1.57	0.98	1.20	1.18	1.505	1.20	1.81	0.250	1.40	0.35	0.050	1.40	0.07
1.310	5,500.00	7,205.00	0.98	5,600.00	5,516.00	1.505	5,600.00	8,428.00	0.250	3,000.00	750.00	0.050	3,500.00	175.00
0.985	-	-	0.98	-	-	1.505	5,516.00	8,301.58	0.250	1,650.00	412.50	0.050	1,650.00	82.50
1.310	-	-	0.98	-	-	1.505	-	-	0.250	-	-	0.050	-	-
1.310	2,200.00	2,882.00	0.98	2,076.00	2,044.86	1.505	2,076.00	3,124.38	0.250	-	-	0.050	-	-
1.310	150.00	196.50	0.98	-	-	1.505	-	-	0.250	-	-	0.050	-	-
1.310	1,100.00	1,441.00	0.98	1,100.00	1,083.50	1.505	1,100.00	1,655.50	0.250	-	-	0.050	-	-
1.310	10,000.00	13,100.00	0.98	10,000.00	9,850.00	1.505	10,000.00	15,050.00	0.250	-	-	0.050	-	-
1.310	20,000.00	26,200.00	0.98	20,000.00	19,700.00	1.505	20,000.00	30,100.00	0.250	-	-	0.050	-	-
1.310	400.00	524.00	0.98	400.00	394.00	1.505	400.00	602.00	0.250	-	-	0.050	-	-
1.310	-	-	0.98	-	-	1.505	-	-	0.250	1,650.00	412.50	0.050	1,650.00	82.50
1.310	-	-	0.98	-	-	1.505	-	-	0.250	3,000.00	750.00	0.050	2,250.00	112.50

TCS WISE 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. PKG V A section of KAFER to RESHI from Km 40.000 to Km 61.100)

TCS-I {Two lane with Paved shoulder Concentric Widening (One Side Hill, One side Valley section)} **7.79 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	0.500	5,800.00	266.00	1,542,800.000
3	Excavation & Earthwork	Cum	Taken in Abstract Sheet					-	
4	CTSB	Cum	1	1000	11.19	0.200	2,238.00	4,870.00	10,899,060.000
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	12,175.00	4,870,000.00
								Total Cost =	**27,336,783.43**

Per Km Cost of TCS Type-I in Cr. = 2.734

Total Cost of TCS Type- I for 07.790 Kms Length in Cr. = 21.295

TCS-II {Two lane with Paved shoulder Eccentric Left Widening (One Side Hill, One side Valley section)} **1.98 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	0.500	5,800.00	266.00	1,542,800.00
3	Excavation & Earthwork	Cum	Taken in Abstract Sheet					-	
4	CTSB	Cum	1	1000	11.19	0.200	2,238.00	4,870.00	10,899,060.00
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	12,175.00	4,870,000.00
								Total Cost =	**27,336,783.43**

Per Km Cost of TCS Type-II in Cr. = 2.734

Total Cost of TCS Type- II for 01.980 Kms Length in Cr. = 5.413

TCS-III {Two lane with Paved shoulder Eccentric Right Widening (One Side Hill, One side Valley section)} **1.90 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	0.500	5,800.00	266.00	1,542,800.00
3	Excavation & Earthwork	Cum	Taken in Abstract Sheet					-	
4	CTSB	Cum	1	1000	11.19	0.200	2,238.00	4,870.00	10,899,060.00
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	12,175.00	4,870,000.00
								Total Cost =	**27,336,783.43**

Per Km Cost of TCS Type-III in Cr. = 2.734

Total Cost of TCS Type- III for 01.900 Kms Length in Cr. = 5.194

TCS-IV {Two lane with Paved shoulder Realignment (One Side Hill, One side Valley section)} **3.490 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	0.500	5,800.00	266.00	1,542,800.00
3	Excavation & Earthwork	Cum	Taken in Abstract Sheet					-	
5	CTSB	Cum	1	1000	11.19	0.200	2,238.00	4,870.00	10,899,060.00
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	12,175.00	4,870,000.00
								Total Cost =	**27,336,783.43**

Per Km Cost of TCS Type-IV in Cr. = 2.734

Total Cost of TCS Type- IV for 03.490 Kms Length in Cr. = 9.541

TCS-V {Two lane with Paved shoulder Concentric Widening (Both Side Hill section)} **0.985 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	0.500	5,600.00	266.00	1,489,600.00
3	Excavation & Earthwork	Cum	Taken in Abstract Sheet					-	
4	CTSB	Cum	1	1000	10.38	0.200	2,076.00	4,870.00	10,110,120.00
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	12,175.00	4,870,000.00
								Total Cost =	**26,460,743.43**

Per Km Cost of TCS Type-V in Cr. = 2.646

Total Cost of TCS Type- V for 0.985 Kms Length in Cr. = 2.606

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TCS-VI {Two lane with Paved shoulder Concentric Widening (Both side Valley section)} **1.480 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	11.00	0.500	5,500.00	266.00	1,463,000.00
3	Excavation & Earthwork	Cum	Taken in Abstract Sheet					-	
4	CTSB	Cum	1	1000	11.00	0.200	2,200.00	4,870.00	10,714,000.00
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	12,175.00	4,870,000.00
								Total Cost =	**27,071,923.43**

Per Km Cost of TCS Type-VI in Cr. = 2.707

Total Cost of TCS Type- VI for 01.480 Kms Length in Cr. = 4.007

TCS-VIII {Two lane with Paved shoulder Realignment (Both Side Valley section)} **1.310 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	11.0	0.500	5,500.00	266.00	1,463,000.00
3	Excavation & Earthwork	Cum	Taken in Abstract Sheet					-	
4	CTSB	Cum	1	1000	11.0	0.200	2,200.00	4,870.00	10,714,000.00
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	12,175.00	4,870,000.00
								Total Cost =	**27,071,923.43**

Per Km Cost of TCS Type-VIII in Cr. = 2.707

Total Cost of TCS Type- VIII for 01.310 Kms Length in Cr. = 3.546

TCS-VII {Two lane with Paved shoulder Realignment (Both Side Hill section)} **1.505 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	0.500	5,600.00	266.00	1,489,600.00
3	Excavation & Earthwork	Cum	Taken in Abstract Sheet					-	
4	CTSB	Cum	1	1000	10.38	0.200	2,076.00	4,870.00	10,110,120.00
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	12,175.00	4,870,000.00
								Total Cost =	**26,460,743.43**

Per Km Cost of TCS Type-VII in Cr. = 2.646

Total Cost of TCS Type- VII for 01.505 Kms Length in Cr. = 3.982

TCS-IX {Two lane with Paved shoulderincluding both side drain cum footpath- Buitup Area)} **0.250 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	14	-	1.40	60,829.00	85,160.60
2	Sub Grade	Cum	1	1000	6.00	0.500	3,000.00	266.00	798,000.00
3	Excavation & Earthwork	Cum	Taken in Abstract Sheet					-	
4	GSB	Cum	1	1000	11.00	0.150	1,650.00	4,680.00	7,722,000.00
5	DLC	Cum	1	1000	11.00	0.150	1,650.00	5,702.00	9,408,300.00
6	PQC	Cum	1	1000	10.00	0.300	3,000.00	10,061.00	30,183,000.00
								Total Cost =	**48,196,460.60**

Per Km Cost of TCS Type-IX in Cr. = 4.820

Total Cost of TCS Type- IX for 00.250 Kms Length in Cr. = 1.205

TCS-X {Two lane carriageway with raised footpath Builtup Area)} **0.050 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	14	-	1.40	60,829.00	85,160.60
2	Sub Grade	Cum	1	1000	7.00	0.500	3,500.00	266.00	931,000.00
3	Excavation & Earthwork	Cum	Taken in Abstract Sheet					-	
4	GSB	Cum	1	1000	11.00	0.150	1,650.00	4,680.00	7,722,000.00
5	DLC	Cum	1	1000	11.00	0.150	1,650.00	5,702.00	9,408,300.00
6	PQC	Cum	1	1000	7.50	0.300	2,250.00	10,061.00	22,637,250.00
								Total Cost =	**40,783,710.60**

Per Km Cost of TCS Type-X in Cr. = 4.078
Total Cost of TCS Type- X for 00.050 Kms Length in Cr. = 0.204

Catch Water Drain **20.89 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	7,940.00	754,300.00
3 (i)	RCC Grade M20 : Using Concrete Mixer	Cum	1	1000	0.75	0.15	112.5	8,612.00	968,850.00
3 (ii)	RCC Grade M20 : Using Concrete Mixer	Cum	2	1000	0.45	0.15	135	8,612.00	1,162,620.00
4	RCC Grade M20 : Using concrete mixer	Cum	1	1000	0.60	0.15	90	8,612.00	775,080.00
5	Supplying, Fitting and Placing un-coated HYSD bar Reinforcement in Foundation complete as per Drawing and Technical	Ton	1	1000			13.500	64,833.00	875,245.50
								Total Cost =	4,640,095.50

Per Km Cost of Catch Water Drain in Cr.= 0.464
Total Cost of Catch Water Drain for Km Length in Cr. = 9.693

Cover Drain **0.10 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	1.73	1.23	2127.9	208.00	442,603.20
2	Grade M15 PCC - Using Concrete Mixer	Cum	1	1000	1.73	0.10	173	7,940.00	1,373,620.00
3 (i)	RCC Grade M20 : Using Concrete Mixer	Cum	1	1000	1.50	0.15	225	8,612.00	1,937,700.00
3 (ii)	RCC Grade M20 : Using Concrete Mixer	Cum	2	1000	0.15	1.10	330	8,612.00	2,841,960.00
4	RCC Grade M20 : Using concrete mixer	Cum	1	1000	1.50	0.10	150	8,612.00	1,291,800.00
5	Supplying, Fitting and Placing un-coated	Ton	1	1000			28.200	64,833.00	1,828,290.60
								Total Cost =	9,715,973.80

Per Km Cost of Catch Water Drain in Cr.= 0.972
Total Cost of Catch Water Drain for Km Length in Cr. = 0.097

Extra Widening

Total length of 1.5 m widening in Km				4.46					
Item No.	Description	Unit	No.	Length(m)	Width (m)	Depth (m)	Qty	Rate (Rs)	Amount(Rs)
1	Subgrade	Cum	1	4464.111	1.5	0.500	3348.083	266.00	890590.1445
2	CTSB	Cum	1	4464.111	1.5	0.200	1339.233	4,870.00	6522066.171
3	BSM	Cum	1	4464.111	1.5	0.110	736.5783	8,634.57	6360038.111
4	Prime Coat	Cum	1	4464.111	1.5		6696.167	24.00	160707.996
5	Tack Coat	Cum	2	4464.111	1.5		13392.33	9.00	120530.997
4	BC	Cum	1	4464.111	1.5	0.040	267.8467	12,175.00	3261033.086
						Cost 1.5 m widening =			17314966.51
						Total Cost in Cr. =			1.73
						Cost per Km			0.39

Total length of 1.2 m widening in Km				4.12					
Item No.	Description	Unit	No.	Length(m)	Width (m)	Depth (m)	Qty	Rate (Rs)	Amount(Rs)
1	Subgrade	Cum	1	4120.17	1.2	0.500	2472.102	266.00	657579.132
2	CTSB	Cum	1	4120.17	1.2	0.200	988.8408	4,870.00	4815654.696
3	BSM	Cum	1	4120.17	1.2	0.110	543.8624	8,634.57	4696019.113
4	Prime Coat	Cum	1	4120.17	1.2		4944.204	24.00	118660.896
5	Tack Coat	Cum	2	4120.17	1.2		9888.408	9.00	88995.672
6	BC	Cum	1	4120.17	1.2	0.040	197.7682	12,175.00	2407827.348
						Cost 1.2 m widening =			12784736.86
						Total Cost in Cr. =			1.28
						Cost per Km			0.31

Total length of 0.9 m widening in Km				3.40					
Item No.	Description	Unit	No.	Length(m)	Width (m)	Depth (m)	Qty	Rate (Rs)	Amount(Rs)
1	Subgrade	Cum	1	3395.589	0.9	0.500	1528.015	266.00	406452.0033
2	CTSB	Cum	1	3395.589	0.9	0.200	611.206	4,870.00	2976573.317
3	BSM	Cum	1	3395.589	0.9	0.110	336.1633	8,634.57	2902626.138
4	Prime Coat	Cum	1	3395.589	0.9		3056.03	24.00	73344.7224
5	Tack Coat	Cum	2	3395.589	0.9		6112.06	9.00	55008.5418
6	BC	Cum	1	3395.589	0.9	0.040	122.2412	12,175.00	1488286.659
						Cost 0.9 m widening =			7902291.381
						Total Cost in Cr. =			0.79
						Cost per Km			0.23

Total length of 0.6 m widening in Km				3.40					
Item No.	Description	Unit	No.	Length(m)	Width (m)	Depth (m)	Qty	Rate (Rs)	Amount(Rs)
1	Subgrade	Cum	1	3395.589	0.6	0.500	1018.677	266.00	270968.0022
2	CTSB	Cum	1	3395.589	0.6	0.200	407.4707	4,870.00	1984382.212
3	BSM	Cum	1	3395.589	0.6	0.110	224.1089	8,634.57	1935084.092
4	Prime Coat	Cum	1	3395.589	0.6		2037.353	24.00	48896.4816
5	Tack Coat	Cum	2	3395.589	0.6		4074.707	9.00	36672.3612
6	BC	Cum	1	3395.589	0.6	0.040	81.49414	12,175.00	992191.1058
						Cost 0.6 m widening =			5268194.254
						Total Cost in Cr. =			0.53
						Cost per Km			0.16

Earthwork Quantities (cum)

Total fill Volume	**Cum**			**210,024**
Total Cut Volume	**Cum**			**465,310**
			Excavation Ordinary rock i.e. 30% of Total Cut	139,593.11
			Excavation Soft Rock with Dozer i.e. 40% of Total Cut	186,124.15
			Excavation hard Rock Control Blasting) i.e. 30% of Total Cut	139,593.11
			EW filling from Borrow area	-
			EW Fill ing from approved mat	210,023.70

BILL OF QUNAITITES

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**	24.95	60829.0	**1517562**
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.**	30.00	5000.0	**150000**
(ii)	Causeway	**No.**	50.00	2000.0	**100000**
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.**	528	294.0	**155232**
	(b) Girth from 600mm to 900mm	**No.**	1674	526.0	**880524**
	(c) Girth from 900mm to 1800mm	**No.**	9210	1032.0	**9504720**
	(d) Girth above 1800mm	**No.**	1819	1969.0	**3581611**
Total (Rs)					**15889648.892**
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**	139593.11	296.0	**41319561**
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**	186124.15	173.0	**32199478**
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**	139593.11	488.0	**68121439**
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**	255286.67	54.0	**13785480**
			TOTAL EXCAVATION		**155425958**
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**	210023.70	163.0	**34233863**
			TOTAL EMBANKMENT FILLING		**34233863**

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**	128605.88	266.0	**34209163**
Total (Rs)					**223868985**
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**	48582.07	4870.0	**236594685**
3.020	Bituminous Stabilised Material (BSM)	**Cum**	24324.71	8634.6	**210033473**
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**	495.00	4680.0	**2316600**
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**	150.00	2200.0	**330000**
Total (Rs)					**449274757**
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**	221133.75	24.0	**5307210**
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**	442267.51	9.0	**3980408**
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**	8845.35	12175.0	**107692138**
Total (Rs)					**116979756**
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	495.000	5702.0	**2822490**

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	862.500	10061.0	**8677613**
Total (Rs)					**11500103**

Bill Of Quantities - Roads

Item No.	Description	Unit	Qty	Rate (in Rs.)	Amount (Rs.)
Bill No 6: Drainage and Protective works					
6.01	Excavation for roadwork in soil with in all types of soil including marshy soil hydraulic excavator of 0.9 cum bucket capacity including cutting and loading in tippers, trimming bottom and side slopes, in accordance with requirements of lines, grades and cross sections, and transporting to the embankment location within all lifts and lead upto 1000m as per clause 301.				
	(i) Catch Water Drain	**Km**	20.89	4640095.5	96931595.00
	(il) Cover Drain	**Km**	0.10	9715973.8	971597.38
				TOTAL DRAINAGE COST	**97,903,192**
6.02	Parapet Wall of Stone masonry work in cement mortar 1:3	**Rmt**	5028.00	4108.0	**20655024**
				TOTAL OF CRASH BARRIER ...	**20,655,024**
				Total (Rs)	**118,558,216**

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.**	4.00	4466.0	**17864**
	(ii) Ordinary Kilometer stone	**No.**	19.00	2730.0	**51870**
	(iii) Hectometer stone	**No.**	84.00	716.0	**60144**
	(iv) Boundary stones @200 m interval	**No**	213.00	560.0	119280.00
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**	8000.00	629.00	**5032000**
	(b) Directional Arrows, lettering etc. as per Drawing	**Sqm**	94.43	146.00	**13786**
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.**	12.00	8472.0	**101664**
	(ii) Cautionary sign 900 mm triangular	**No.**	240.00	6785.0	**1628400**
	(iii) Mandatory sign 600 mm circular	**No.**	106.00	5916.0	**627096**
	(iv) Mandatory sign 900 mm octagon	**No.**	2.00	10963.0	**21926**
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**	6.00	82561.41	**495368**
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.**	240.00	3634.00	**872160**
	(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.**	190.00	7555.00	**1435450**
	(iii) Roadway Indicator 1000mm high made by 100mm square MS pipe containing rectangular reflector of 120mm x 80mm and alternate white and black bands of 150mm including coverage of reflector by 150mm high wire mesh	**No.**			
7.090	Providing and fixing Cluster of Red Reflector complete as per drawings and Technical Specification Clause 805.	**No.**	4640.00	249.00	**1155360**
				TOTAL OF TRAFFIC SIGN, MARKING ETC...	**11632369**
7.070	Providing & Ninteen degree tilted one way reflective Road Studs	**No.**	4640.00	834.32	**3871245**
Total (Rs)					**15503613**

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**	1300.00	606.00	**787800**
8.020	Traffic management and safety during construction operation as per Technical Specification Clause A-21.	**km**	5.00	500000.00	**2500000**
	Total (Rs.)				**3287800**

Bill of Quantities of Viaduct

Item No.	Description	Unit	1	2	3			
			41+680 to 41+800	42+690 to 42+910	46+270 to 46+290	Total Qty	Rate (Rs.)	Amount (Rs.)
6.01	Earthwork in excavation of foundations for structures							
	in all kinds of soils including all leads and lifts complete as							
	per drawings and Technical Specifications Clause 304							
	a) Depth up to 3.0 m							
	i) all types of soils	cum						
	ii) Hard Rock	cum						
	iii) Soft/ordinary rock	cum						
	b) Depth above 3.0 m and up to 6.0 m							
	i) all types of soils	cum	2003	3154	622	5779	64.00	369866.88
	ii) Hard Rock	cum	2003	3154	622	5779	545.00	3149647.65
	iii) Soft/ordinary rock	cum						
	c) Depth over 6.0 m							
	i) all types of soils	cum						
	ii) Hard Rock	cum						
	iii) Soft/ordinary rock	cum						
6.02	Back filling behind abutments, wing walls and return walls							
	with selected imported granular material of approved							
	quality, including all leads and lifts, complete as per							
	drawings and Technical Specifications Clause 305 and							
	Clause 710.1.4 of IRC:78	cum	3716	5688	1402	10806	587	6343048.63
6.03	Providing and laying filter media behind abutments, wing							
	walls & return walls with well packed material to the							
	specified thickness with smaller size towards the soil and							
	bigger size towards the wall complete with all leads and							
	lifts as per drawings and Technical Specifications Clauses							
	305 and Clause 710.1.4 of IRC:78	cum	222	259	190	671	4460	2990697.60
6.04	Plain Cement Concrete / Reinforced Cement Concrete in							
	foundation/ leveling course excluding reinforcement							
	complete as per drawings and Technical Specifications							
	Sections1500, 1700 and 2100							
	a) M-15 grade	cum	65	94	29	189	7940	1497746.02
	b) M-20 grade	cum						
	c) M-35 grade	cum	679	950	354	1983	9513	18861234.84
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	2371	3075	1564	7009	11025	77279350.99
	e) M-40 grade	cum						
6.14	Structural Cement concrete for Prestressed Concrete in							
	superstructure excluding reinforcement complete as per							
	drawings and Technical Specifications Sections 1500,							
	1700, 1800 and 2300							
	a) M-45 grade in slab and I girder	cum	864	1584	144	2592	12990	33670080.00
	b) M-45 grade in slab	cum						
	c) M-40 grade in box girder	cum						
	d) M-35 grade in box girder	cum						
6.15	Supplying, fixing and placing TMT/HYSD bar							
	reinforcement complete as per drawings and Technical							
	Specification Section 1600							
	a) For Sub structure/Foundation	t	399	546	223	1168	64944	75869447.84
	b) For Superstructure/Friction Slab/Facia Panels	t	156	285	26	467	66451	31003378.56
6.16	Providing High Tensile Steel strands including all							
	accessories for stressing and jacking operations							
	and grouting etc. complete as per drawings and							
	Technical Specifications Section - 1800	t	0	0	0	0	185735	0.00
6.18	Providing 65 mm thick wearing course consisting							
	of 40 mm thick asphaltic concrete covered by							
	25 mm thick mastic asphalt on top complete as							
	per Technical Specification Section 2700	sqm	1143	2043	243	3429	1427	4894554.60
6.19	Providing and fixing drainage spouts as per drawings							
	and Technical Specifications Clause 2705	no	48	88	8	144	7875	1134000.00

Bill of Quantities of Viaduct

Item No.	Description	Unit	1	2	3			
			41+680 to 41+800	42+690 to 42+910	46+270 to 46+290	Total Qty	Rate (Rs.)	Amount (Rs.)
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	28	48	4	80	60000	4800000.00
	Capacity 3500 kN	no						
	Capacity 4500 kN	no						
	Capacity 6000 kN	no						
	b) Pin bearing							
	Capacity 1300 kN	no						
	Capacity 2000 kN	no	7	12	1	20	120000	2400000.00
	Capacity 3500 kN	no						
	Capacity 4500 kN	no						
	Capacity 6000 kN	no						
	c) Metallic Guided bearing							
	Capacity 1300 kN	no						
	Capacity 2000 kN	no	7	12	1	20	90000	1800000.00
	Capacity 3500 kN	no						
	Capacity 4500 kN	no						
	Capacity 6000 kN	no						
6.22	Supplying and fixing of expansion joints complete as per							
	drawings and Technical Specifications Section 2600.							
	a) 80 mm wide strip seal joints	m						
	b) 40 mm wide strip seal joints	m	96	156	24	276	14357	3962532.00
	c) 20 mm wide filler type joints	m						
6.25	Reinforced Cement Concrete Crash Barrier							
	including reinforcement and MS pipe complete as per							
	drawings and Technical Specifications Sections 1500,							
	1600, 1700, 2200 and Clause 809							
	a) M-30 grade	m						
	b) M-40 grade	m	254	454	54	762	5015	3821430.00
	c) M-45 grade	m						
6.28	Plain Cement Concrete in leveling course under the							
	approach slabs complete as per drawings and							
	Technical Specifications Section 1700, 2100 & 2700.							
	M-15 grade	cum	12	12	12	35	5603	194143.95
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	23	23	23	69	11394	789604.20
6.33	Providing weep holes in abutments, wing walls, retaining							
	walls, return walls etc. complete as per drawings and							
	Technical Specifications Clause 2706	no	370	431	317	1118	1258	1405940.80
							Total =	276236705

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 3.0 m RCC slab culvert									22,885
I)	Earthwork in excavation									
	a) Abutments	Cum	5.65 X 2.15	12.1475	12	1	145.77			
	b) Curtain Wall D/s	Cum	1.95 X 2.65	5.1675	9	1	46.51			
	c) Curtain Wall U/s	Cum	1.60 X 2.15	3.44	9	1	30.96			
	d) Wing Wall	Cum	2.514X3.514	8.834196	1.35	4	47.70			
	e) 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	5.05 X .75	3.7875	4.5	1	17.04			
							312.98	**12.1 I - A (i)**	164.00	51,328
II)	Back filling									
	a) Curtain Wall	Cum			1/3Excvn		25.82			
	b) Wing Wall	Cum			1/3Excvn		15.90			
	c) Abutments	Cum			1/3 Excvn		48.59			
							90.31	**12.3**	2638.00	238,248
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 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			
							18.25	**12.8 A**	7940.00	144,940
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	**12.8 A**	7940.00	1,226,317
VI)	M 25 Conc.									
	Slab	Cum		48	0.45	1	21.60			
	Wearing coat	Cum		48	0.065	1	3.12			
							24.72	**14.1 C - Case-I (ii) (p)**	11036.00	272,810
V)	Reinforcement Bar	MT					**2.472**	**14.2**	66451.00	164,267
VIII)	Stone (Boulder) Appron									
	a) Floor Appron (300 THK)	Cum		36	0.3	1	10.80			
	b) Floor Appron (300 THK)	Cum		13.862	0.3	1	4.16	15.1 A		
	c) Flexible Appron(750 THK)	Cum		72.252	0.75	1	54.19	15.1 A		
							69.15	15.11	3896.00	269,399
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**	2286.00	14,173
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.**	**2,572,936**
			Total Cost of Culverts..		**91**	**Nos**			**Rs.**	**234,137,166**

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	80.00	5.19	0.500	415.00	2.00	830.00
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	110.00	2.000	0.850	374.00	2.00	748.00
2	Granular Sub Base								
2	In Tapper Portion	Cum	2.00	80.00	4.69	0.150	112.50	2.00	225.00
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	110.00	2.000	0.150	66.00	2.00	132.00
3	Wet Mix Macadam								
3	In Tapper Portion	Cum	-	-	-	-	-	-	-
3	In Straight	Cum	-	-	-	-	-	-	-
3	In Curve	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	2.00	140.00	14.69	0.150	616.88	2.00	1,233.75
10	PQC	Cum	2.00	140.00	14.69	0.200	822.50	2.00	1,645.00

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	80.00	5.19	0.500	830.00	-	-
1	Subgrade - in Straight	Cum	4.00	30.00	5.50	0.500	330.00	-	-
1	Subgrade - in Curve	Cum	4.00	30.00	7.00	0.500	420.00	-	-
1	Earthern Shoulder	Cum	4.00	110.00	2.000	0.850	748.00	-	-
2	Granular Sub Base								
2	In Tapper Portion	Cum	4.00	80.00	4.69	0.150	225.00	-	-
2	In Straight	Cum	4.00	30.00	5.50	0.150	99.00	-	-
2	In Curve	Cum	4.00	30.00	6.50	0.150	117.00	-	-
2	Shoulder - Granular	Cum	4.00	110.00	2.000	0.150	132.00	-	-
3	Wet Mix Macadam								
3	In Tapper Portion	Cum	-	-	-	-	-	-	-
3	In Straight	Cum	-	-	-	-	-	-	-
3	In Curve	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	4.00	140.00	14.69	0.150	1,233.75	-	-
10	PQC	Cum	4.00	140.00	14.69	0.200	1,645.00	-	-

Summary of Major Junctions

0

Sl No	Description	Unit	Quantity	Rate	Amount
1	Subgrade	Cum	2,328.000	266.00	619,248.00
2	Granular Sub Base	Cum	573.000	4,680.00	2,681,640.00
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	1,233.750	5,702.000	7,034,842.50
10	PQC	Cum	1,645.000	10,061.000	16,550,345.00
				Total Cost of MAJOR Junctions .... Rs.	**26,886,075.50**

Minor Junction - 3 LEG

Nos 6

Sl No	Description	Unit	Nos	Length	Width	Depth	Quantity	No of Junc	Tot Qty
1	Subgrade - in Tapper Portion	Cum	2.00	40.00	5.19	0.500	207.50	6.00	1,245.00
1	Subgrade - in Straight	Cum	2.00	20.00	5.50	0.500	110.00	6.00	660.00
1	Subgrade - in Curve	Cum	2.00	20.00	7.00	0.500	140.00	6.00	840.00
1	Earthern Shoulder	Cum	2.00	60.00	1.875	1.000	225.00	6.00	1,350.00
2	Granular Sub Base								
2	In Tapper Portion	Cum	2.00	40.00	4.69	0.150	56.25	6.00	337.50
2	In Straight	Cum	2.00	20.00	5.50	0.150	33.00	6.00	198.00
2	In Curve	Cum	2.00	20.00	6.50	0.150	39.00	6.00	234.00
3	Wet Mix Macadam								
3	In Tapper Portion	Cum	-	-	-	-	-	-	-
3	In Straight	Cum	-	-	-	-	-	-	-
3	In Curve	-	-	-	-	-	-	-	-
4	Prime Coat	Sqm	-	-			-	-	-
5	Tack Coat over primer	Sqm	-	-			-	-	-
6	Tack Coat over BT	Sqm	-	-	-		-	-	-
7	Dense Bituminious Macadam	Cum	-	-	-	-	-	-	-
8	Bituminuous Councrete	Cum	-	-	-	-	-	-	-
9	DLC	Cum	2.00	80.00	14.69	0.150	352.50	6.00	2,115.00
10	PQC	Cum	2.00	80.00	14.69	0.200	470.00	6.00	2,820.00

Minor 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	40.00	5.19	0.500	415.00	-	-
1	Subgrade - in Straight	Cum	4.00	20.00	5.50	0.500	220.00	-	-
1	Subgrade - in Curve	Cum	4.00	20.00	7.00	0.500	280.00	-	-
1	Earthern Shoulder	Cum	4.00	60.00	1.875	1.000	450.00	-	-
2	Granular Sub Base								
2	In Tapper Portion	Cum	4.00	40.00	4.69	0.150	112.50	-	-
2	In Straight	Cum	4.00	20.00	5.50	0.150	66.00	-	-
2	In Curve	Cum	4.00	20.00	6.50	0.150	78.00	-	-
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	80.00	14.69	0.150	705.00	-	-
10	PQC	Cum	4.00	80.00	14.69	0.200	940.00	-	-

Summary of Minor Junctions

Sl No	Description	Unit	Quantity	Rate	Amount
1	Subgrade	Cum	4,095.000	266.00	1,089,270.00
2	Granular Sub Base	Cum	769.500	4,680.00	3,601,260.00
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		2,115.000	5,702.00	12,059,730.00
10	PQC		2,820.000	10,061.00	28,372,020.00
				Total Cost of MINOR Junctions .... Rs.	**45,122,280.00**

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 A section of KAFER to RESHI from Km 40.000 to Km 61.100)

BOQ - Traffic Signs, Marking and Road Appurtenances

Road Signs

Sl No.	Item	Total Nos	Remarks
(i)	90 cm equilateral triangle	240	Has been considered in LHS & RHS Curve and at Cross road
(ii)	60 cm circular	106	Has been considered at the location where design speed is less than equal to 50 kmph
(iii)	90 cm high octagon	2	Has been considered at major junction
(iv)	Informatory Sign Boards	12	Has been considered at important village location
(v)	Hazard Marker Sign Boards	190	Has been considered at start and end of culvert,island,bridge, location
(vi)	Village Name Boards of size 900x600	8	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	6	Has been considered at important eating place and major junctions
(ix)	Chevron boards of size 600x450	68	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	6863	0.1	686	(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	21100	0.15	6330	(RM-01)-Continuous marking
		Total=			**7067**	
		Add 10% extra for other marking=			**707**	
		Grand total=			**7774**	
		Say			**8000**	

Km Stone, Hectometer Stone and Boundary Stone

Total Length ... 21.10 Kms

Sl. No.	Item	No.	Calculation Backup
a)	5th Kilometer stones	4	(Total Length/5)
b)	Kilometer stones	19	(Total Length) - No.of km 5th Stones
c)	Hectometer stones	84	(Total Lengthx5) - No.of km 5th Stones - No.of km Stones
d)	Boundary stones	213	(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	21100	4221	@ 15m spacing
			422	10 % for Junction and Zebra crossing
		Total=	4643	
		Say	**4640**	

Trapezoidal Reflactor

	Location	No	Remarks
	Over Metal Beam	7033	@ 3mt spacing
	Over Guard Post	4220	@ 5mt spacing
	Total	**11253**	

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)
6.00	Minor Junction	1.100	1.125	48	36	93.30
2.00	Major Junction	1.100	1.125		1	1.13
					Total area (sqm)=	**94.43**

Parapet Wall

	Location	Length	
	Deficient curves - As per annexure	500	Mtr
	more than 3 Meters	7,880	Mtr
		8,380	**Mtr**

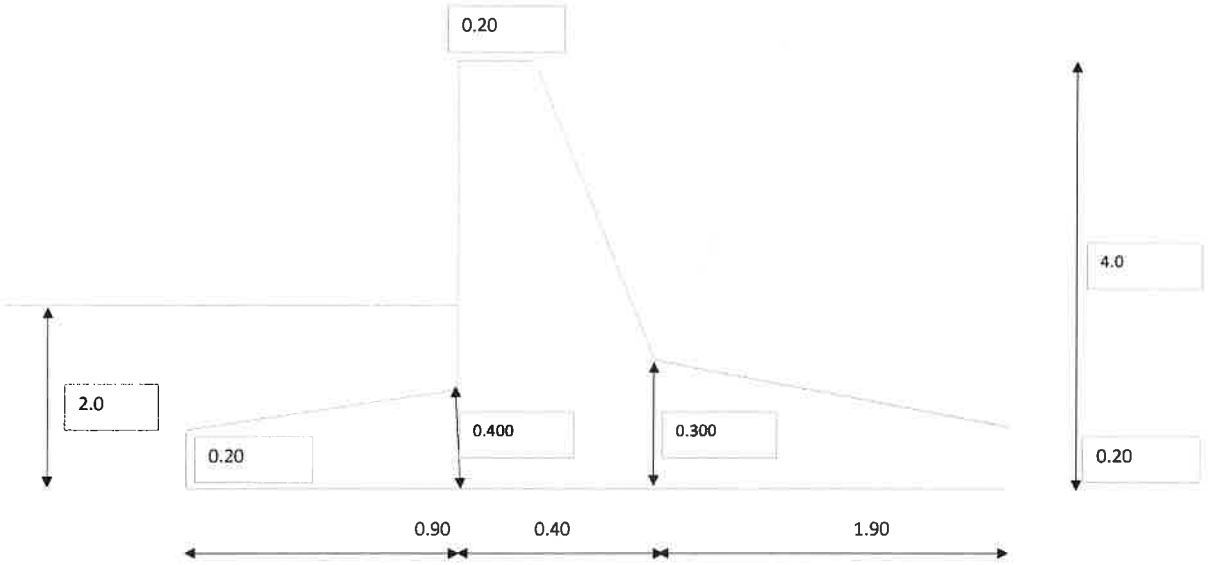
Retaining wall

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	550	34892	19,190,782.49	1.92
2	Retaining wall of 5 m Height	5	870	55275	48,089,132.84	4.81
3	Retaining wall of 6 m Height	6	270	76626	20,689,123.40	2.07
4	Retaining wall of 7 m Height	7	160	102381	16,380,919.14	1.64
5	Retaining wall of 8 m Height	8	110	136160	14,977,578.77	1.50
6	Retaining wall of 9 m Height	9	60	177108	10,626,467.95	1.06
	Total ...		**2020**		**129,954,004.58**	13.00

	Left Side	Right Side
	length (km)	length (km)
Retaining wall	0.9	1.12

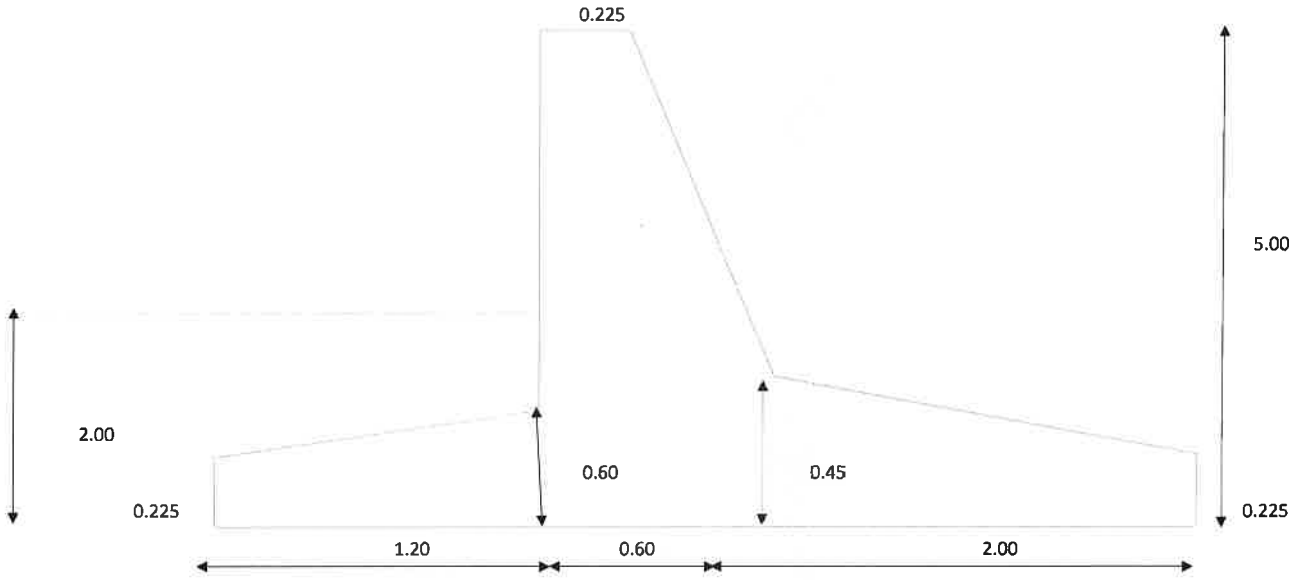
Calculation of Retaining Wall (Height 4.0 m)

Length 1.00 Mtr



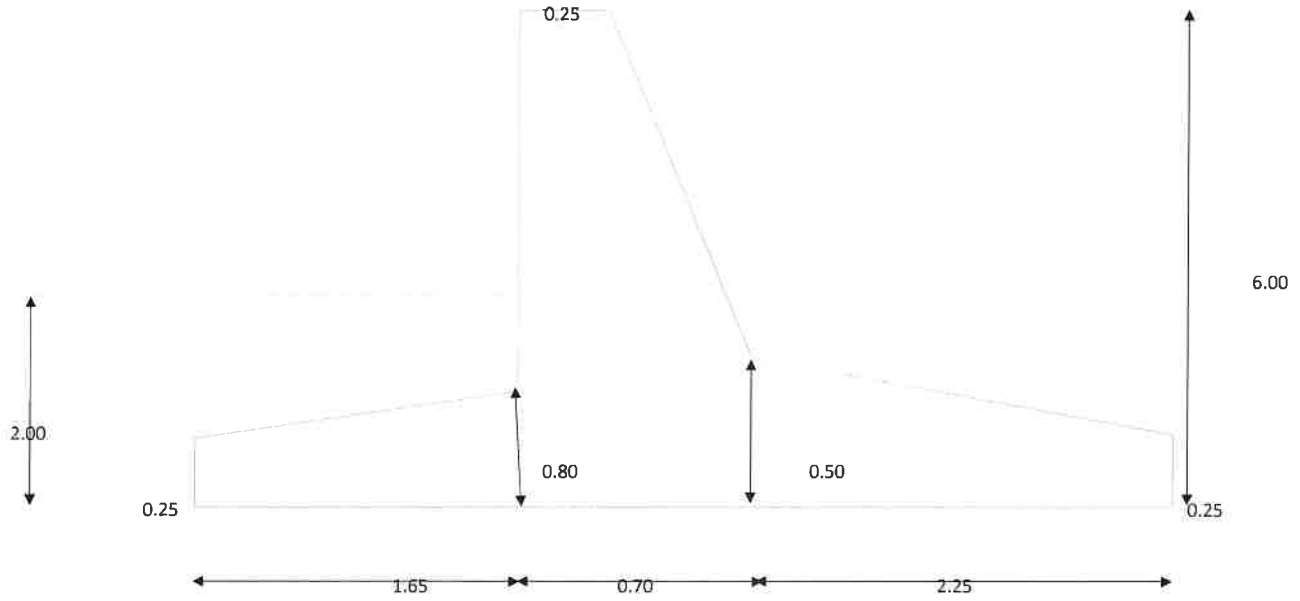
Sr. No	Item Description	Length (m)	Breadth (m)	Height (m)	QTY.	Unit	Rate	Amount
1.00	Excavation	1.00	4.20	2.10	8.82	cum	211.00	1,861.02
2.00	PCC M-15	1.00	3.40	0.10	0.34	cum	7,940.00	2,699.60
3.00	RCC M20				1.97	cum	9,421.00	18,512.27
	Footing	1.00	3.20	0.20	0.64	cum	-	
		1.00	0.90	0.20	0.09	cum	-	
		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				0.16	MT	64,944.00	10,209.20
4.00	Steel (HYSD 80kg/cum)				0.16	MT	-	
	Steel (HYSD 50kg/cum for foundation)				0.00	MT	-	
5.00	Soil Filling upto 1m at Toe side				7.13	cum	226.00	1,610.25
		1.00	1.90	3.75	7.13	cum	-	
		1.00	0.60	0.00	0.00	cum	-	
						Total		34,892.33

Calculation of Retaining Wall (Height 5.0 m)



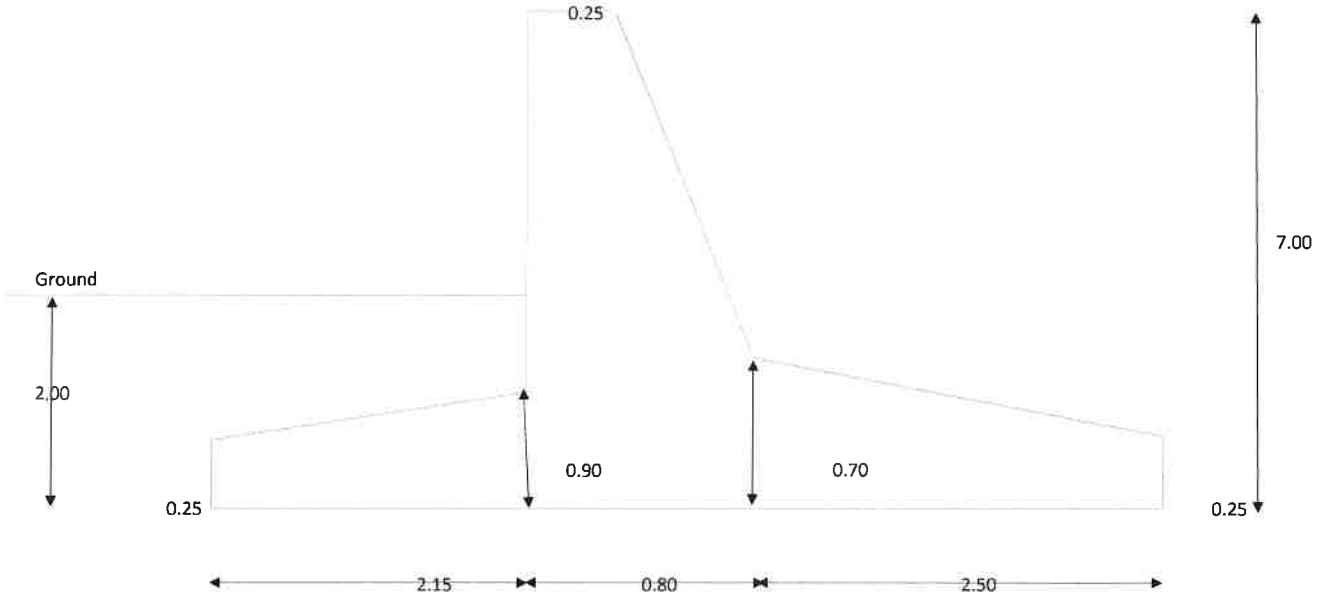
Sr. No	Item Description	Length (m)	Breadth (m)	Height (m)	QTY.	Unit	Rate	Amount
1.00	Excavation	1.00	4.80	2.10	10.08	cum	211.00	2,126.88
2.00	PCC M-15	1.00	4.00	0.10	0.40	cum	7,940.00	3,176.00
3.00	RCC M30				**3.27**	cum	9,421.00	30,850.83
	Footing	1.00	3.80	0.23	0.86		-	
		1.00	1.20	0.38	0.23	cum	-	
		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				0.26	MT	64,944.00	17,013.70
4.00	Steel (HYSD 80kg/cum)				0.26	MT	-	
	Steel (HYSD 50kg/cum for foundation)				0.00	MT	-	
5.00	Soil Filling upto 1m at Toe side				9.33	cum	226.00	2,107.45
		1.00	2.00	4.66	9.33	cum	-	
		0.00	1.20	0.70	0.00	cum	-	
						Total ,,,,		**55,274.87**

Calculation of Retaining Wall (Height 6 m)



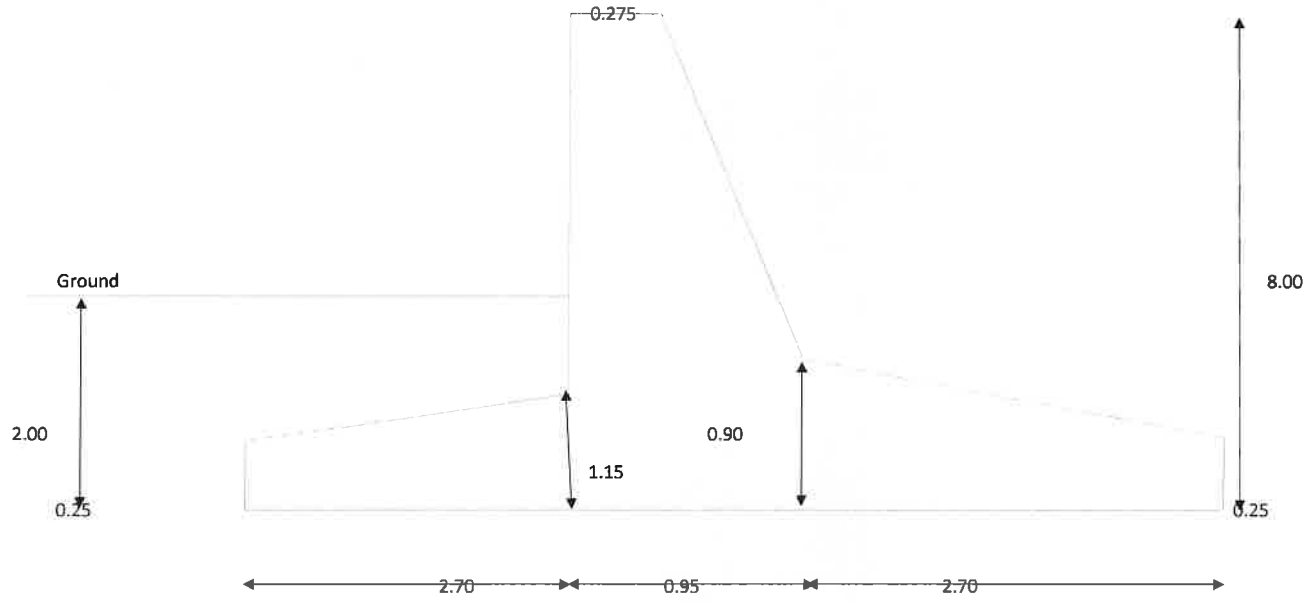
Sr. No	Item Description	Length (m)	Breadth (m)	Height (m)	QTY.	Unit	Rate	Amount
1.00	Excavation	1.00	5.60	2.10	11.76	cum	211.00	2,481.36
2.00	PCC M-15	1.00	4.80	0.10	0.48	cum	7,940.00	3,811.20
3.00	RCC M30				**4.62**	cum	9,421.00	43,489.69
	Footing	1.00	4.60	0.25	1.15		-	
		1.00	1.65	0.55	0.45	cum	-	
		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				0.37	MT	64,944.00	23,983.82
4.00	Steel (HYSD 80kg/cum)				0.37	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 ,,,,		**76,626.38**

Calculation of Retaining Wall (Height 7 m)



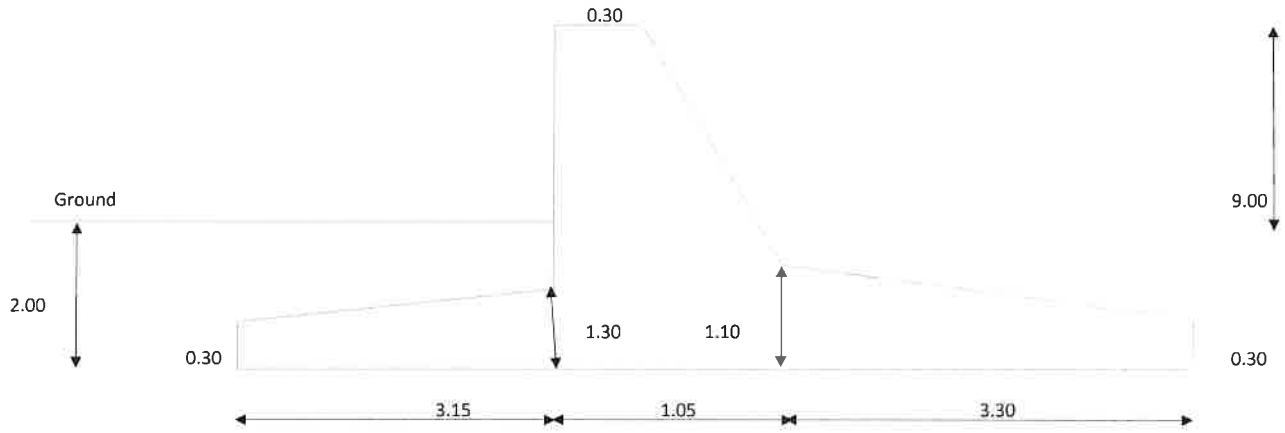
Sr. No	Item Description	Length (m)	Breadth (m)	Height (m)	QTY.	Unit	Rate	Amount
1.00	Excavation	1.00	6.45	2.10	13.55	cum	211.00	2,858.00
2.00	PCC M-15	1.00	0.20	0.10	0.02	cum	7,940.00	158.80
3.00	RCC M30				**6.17**	cum	9,421.00	58,104.02
	Footing	1.00	5.45	0.25	1.36		-	
		1.00	2.15	0.65	0.70	cum	-	
		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				0.49	MT	64,944.00	32,043.37
4.00	Steel (HYSD 80kg/cum for stem)				0.49	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 ,,,,		**102,380.74**

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				0.67	MT	64,944.00	43,782.00
4.00	Steel (HYSD 80kg/cum)				0.67	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 ,,,,		136,159.81

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				0.88	MT	64,944.00	57,241.64
4.00	Steel (HYSD 80kg/cum for stem)				0.88	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		**177,107.80**

Breast wall

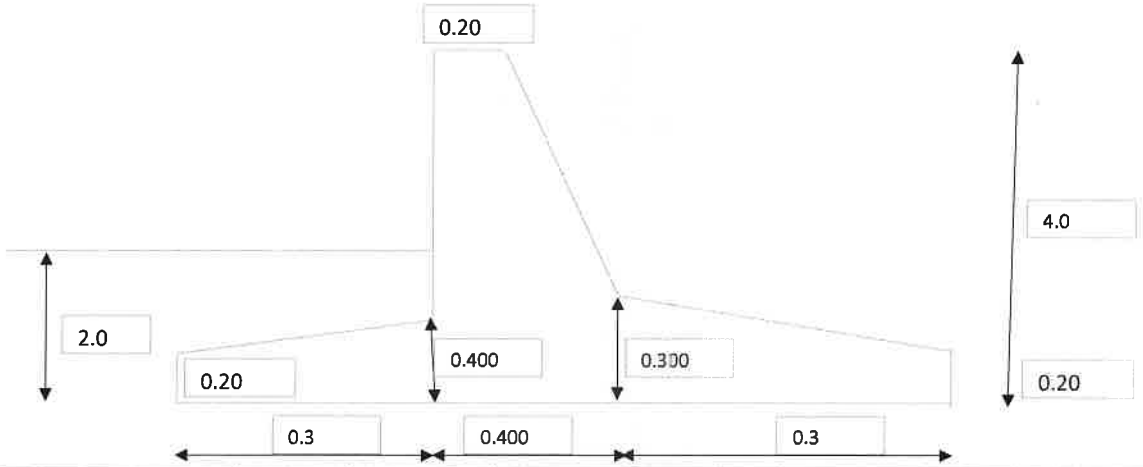
S.No.	Item	Heingh in Mtr	Length includes Left and Right Portion	Rate per m	Amount (Rs.)	Amount (Cr)
1	Breast wall	4	3750	20,753	**77,825,496.75**	**7.78**
	Total ...		**3750**		**77,825,496.75**	7.78

	Height (m)	Left Side	Right Side
		length (km)	length (km)
Breast Wall	4	2.13	1.62

Calculation of Breast Wall (Height 4.0 m)

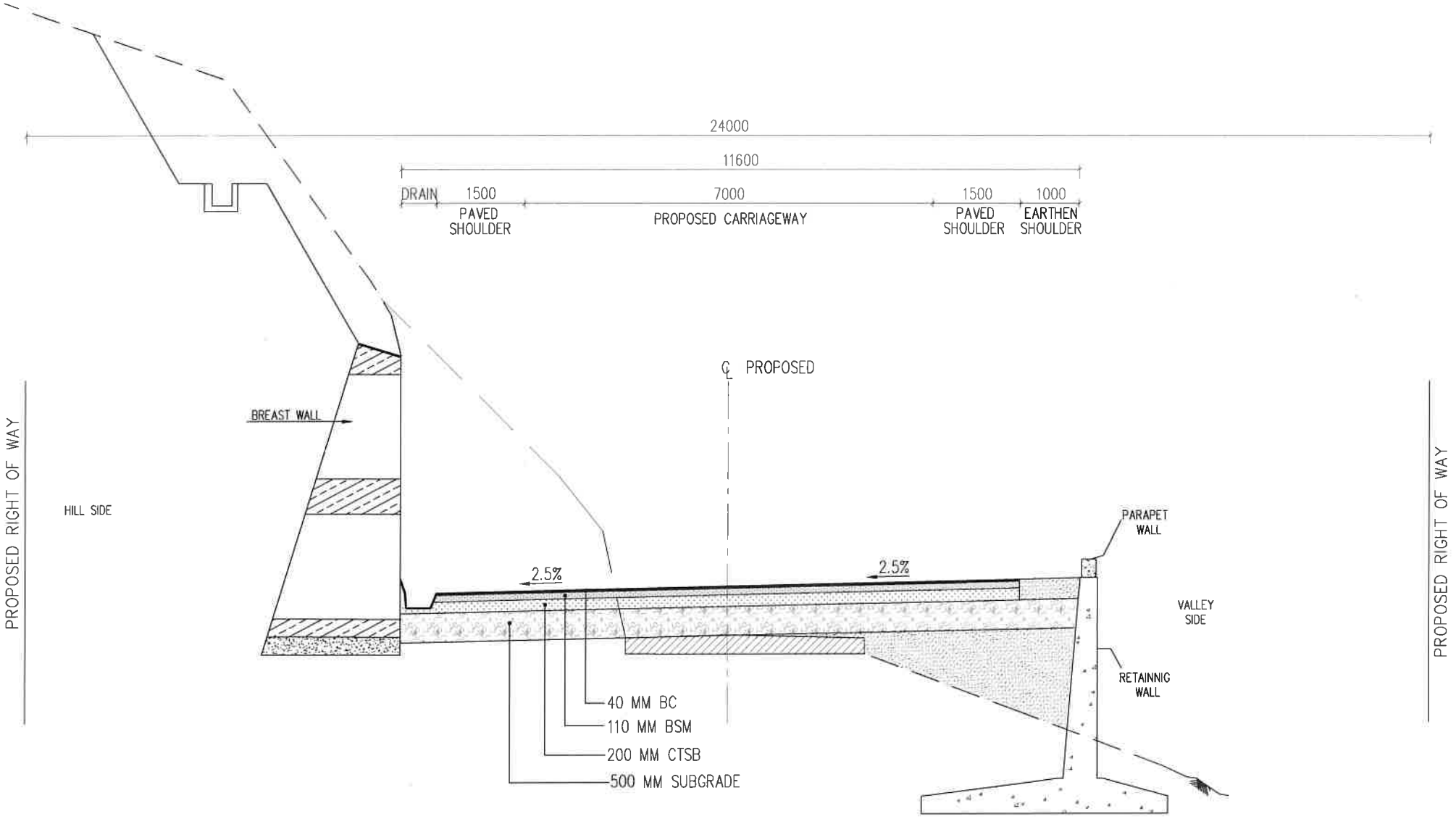
Length 1.00 Mtr

77825496.75



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				**1.39**	cum	8,927.00	12,363.90
	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				0.10	MT	64,944.00	6,296.32
4.00	Steel (HYSD 70kg/cum for stem)				0.10	MT	-	
5.00	Soil Filling upto 1m at Toe side				1.13	cum	226.00	254.25
		1.00	0.30	3.75	1.13	cum	-	
						Total ,,,,		**20,753.47**

DRAWINGS



TCS-I

Two Lane With Paved Shoulder Concentric Widening (One Side Hill One Side Valley Section)

REV	DATE	DESCRIPTION OF REVISIONS	INITIALS
R0	Sep 2017	Final Feasibility Report	
R0	Nov 2016	Draft Feasibility Report	
R0	Dec 2014	Linear Plan	

Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (Ministry of Road Transport & Highways)

Consultant : SA INFRASTRUCTURE CONSULTANTS PVT. LTD. (In association with Specialized Engineering Service Pvt. Ltd. 1101A, 11th Floor, Tower A-II, Corporate Park, Plot No. 7A/1, Sector-142, Noida 201301, Uttar Pradesh)

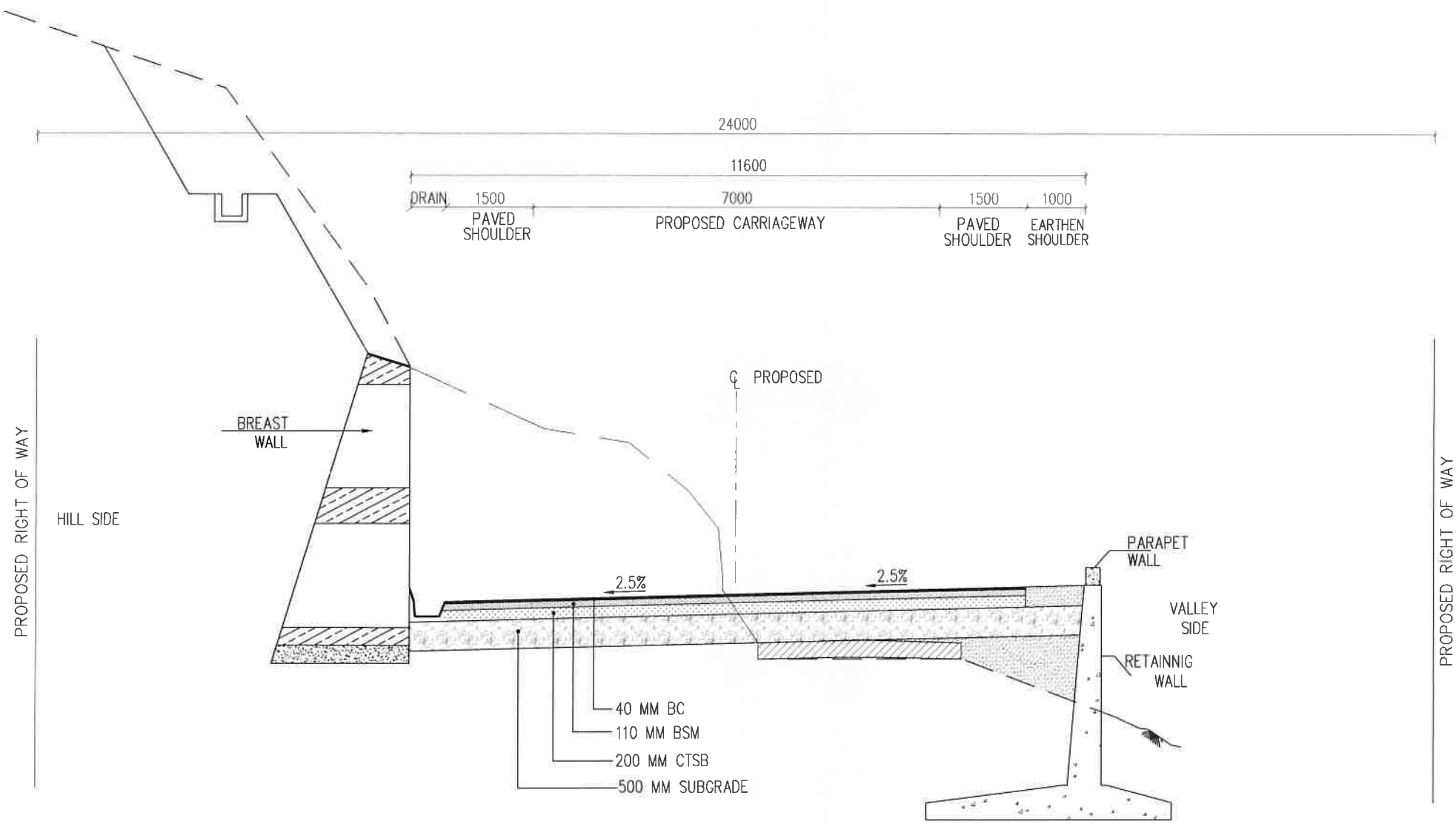
Project : Consultancy for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chuikhim-Nimbong-Kafer-Bakhim-Algarah-Rhenok in the State of West Bengal and From Rhenok-Rorathang-Pakyong along with Spur From Aritar-Rolep-Menla in the State of Sikkim

DATE : November 2019		Revision	R0
DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED BY
Vijay Gupta	Naresh	Vijay Gupta	Sanjay Shukla

SCALE:-NTS

PACKAGE- 5
KAFER TO RHENOCK
TYPICAL CROSS SECTION

Dwg. No. :- SAICPL-SESPL/NHIDCL/WB-SKM/TCS/ 1



TCS-II

Two Lane With Paved Shoulder Eccentric Left Side Widening (One Side Hill One Side Valley Section)

REV	DATE	DESCRIPTION OF REVISIONS	INITIALS
R0	Sep 2017	Final Feasibility Report	
R0	Nov 2016	Draft Feasibility Report	
R0	Dec 2014	Linear Plan	

Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (Ministry of Road Transport & Highways)

Consultant : SA INFRASTRUCTURE CONSULTANTS PVT. LTD. In Association with Specialized Engineering Services Pvt. Ltd. 1101A, 11th Floor, Tower A-II, Corporate Park, Plot No. 7A/1, Sector-142, Noida 201301, Uttar Pradesh.

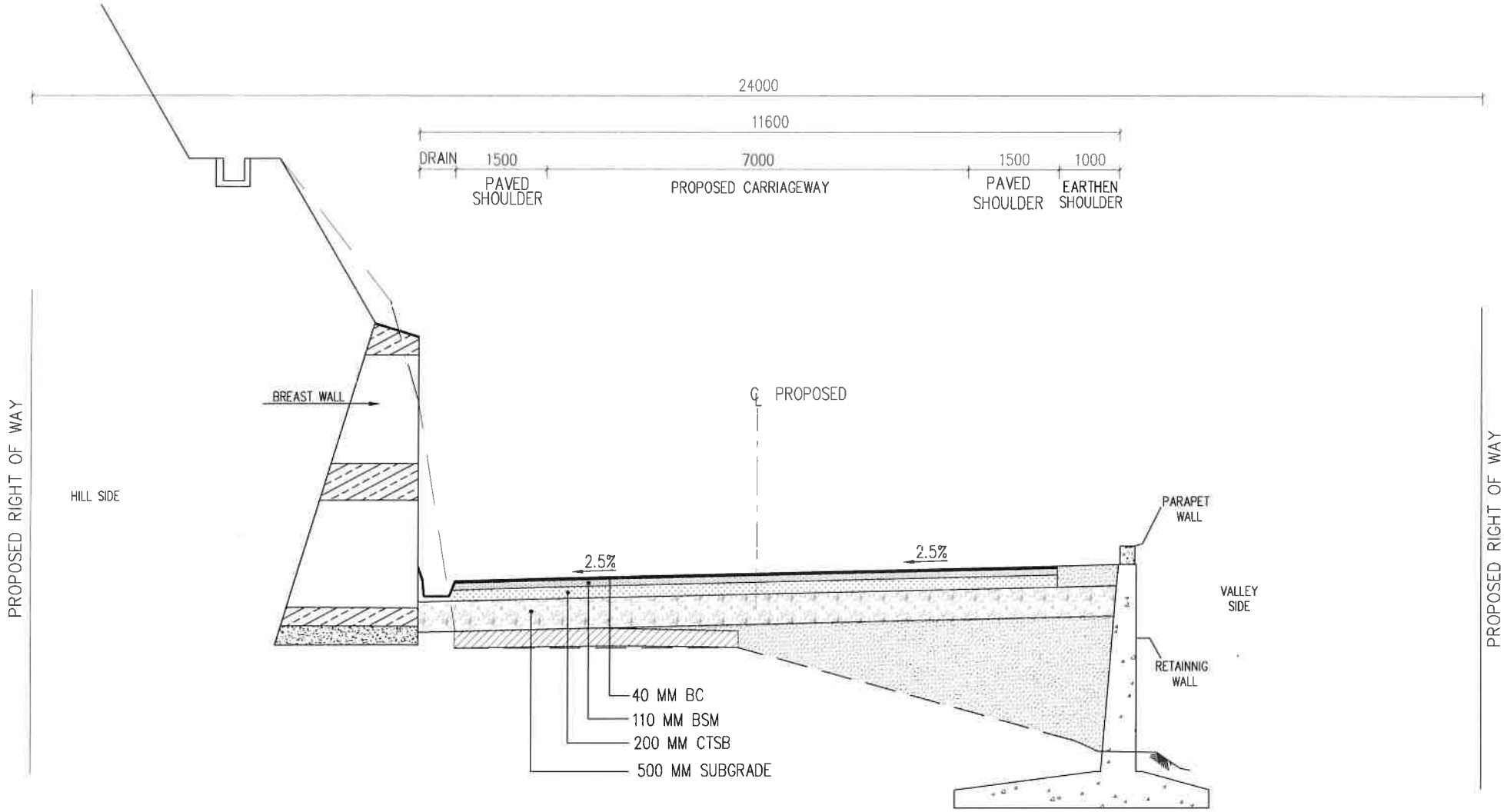
Project : Consultancy for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chulkhim-Nimbong-Kafer-Baknim-Agarah-Rhenok in the State of West Bengal and From Rhenok-Roralthang-Pakyong along with Spur From Aritar-Rolep-Menla in the State of Sikkim

DATE : November 2019		Revision R0	
DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED BY
Vijay Gupta	Naresh	Vijay Gupta	Sanjay Shukla

SCALE:–NTS

PACKAGE- 5
KAFER TO RHENOCK
TYPICAL CROSS SECTION

Dwg. No. :- SAICPL–SESPL/NHIDCL/WB–SKM/TCS/2



TCS-III

Two Lane With Paved Should Eccentric Right Widening (One Side Hill One Side Valley Section)

REV	DATE	DESCRIPTION OF REVISIONS	INITIALS
R0	Sep 2017	Final Feasibility Report	
R0	Nov 2016	Draft Feasibility Report	
R0	Dec 2014	Linear Plan	

Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (Ministry of Road Transport & Highways)

Consultant : SA INFRASTRUCTURE CONSULTANTS PVT. LTD. In Association with Specialized Engineering Service Pvt. Ltd. 1101A, 11th Floor, Tower A-II, Corporate Park, Plot No. 7A/1, Sector-142, Noida 201301, Uttar Pradesh.

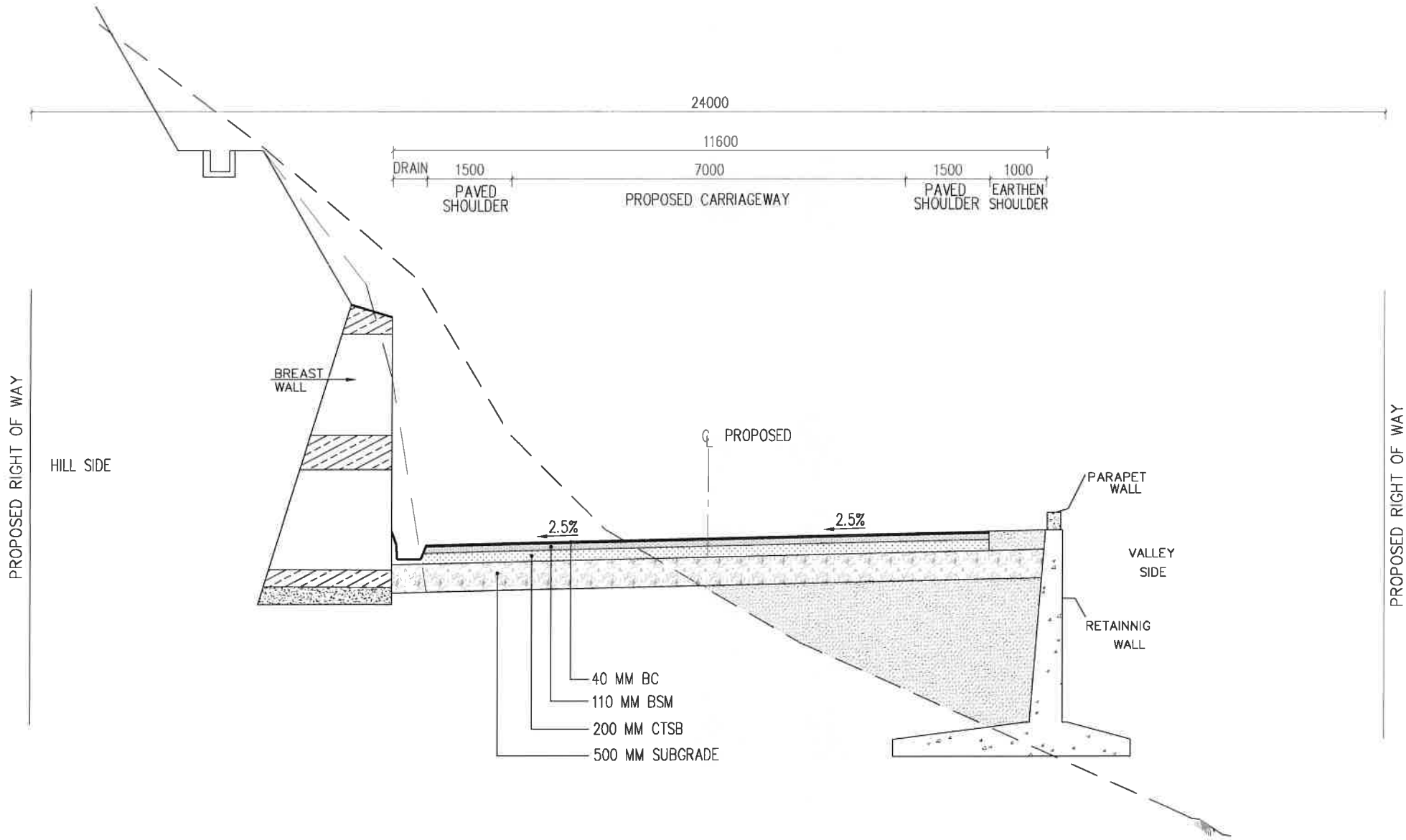
Project : Consultancy for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Ganglok in Sikkim via Bagrakot-Chuikhim-Nimbong-Kafer-Bakhim-Algarah-Rhenok in the State of West Bengal and From Rhenok-Rorathang-Pakyong along with Spur From Aritar-Rolep-Menla in the State of Sikkim

DATE : November 2019		Revision	R0
DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED BY
Vijay Gupta	Naresh	Vijay Gupta	Sanjay Shukla

SCALE:–NTS

PACKAGE- 5
KAFER TO RHENOCK
TYPICAL CROSS SECTION

Dwg. No. :- SAICPL–SESPL/NHIDCL/WB–SKM/TCS/3



TCS-IV

Two Lane With Paved Shoulder (One Side Hill One Side Valley Section)

(Re-Alignment)

REV	DATE	DESCRIPTION OF REVISIONS	INITIALS
R0	Sep 2017	Final Feasibility Report	
R0	Nov 2016	Draft Feasibility Report	
R0	Dec 2014	Linear Plan	

Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (Ministry of Road Transport & Highways)

Consultant : SA INFRASTRUCTURE CONSULTANTS PVT. LTD. In Association with Specialized Engineering Service Pvt. Ltd. 1101A, 11th Floor, Tower A-II, Corporate Park, Plot No. 7A/1, Sector-142, Noida 201301, Uttar Pradesh.

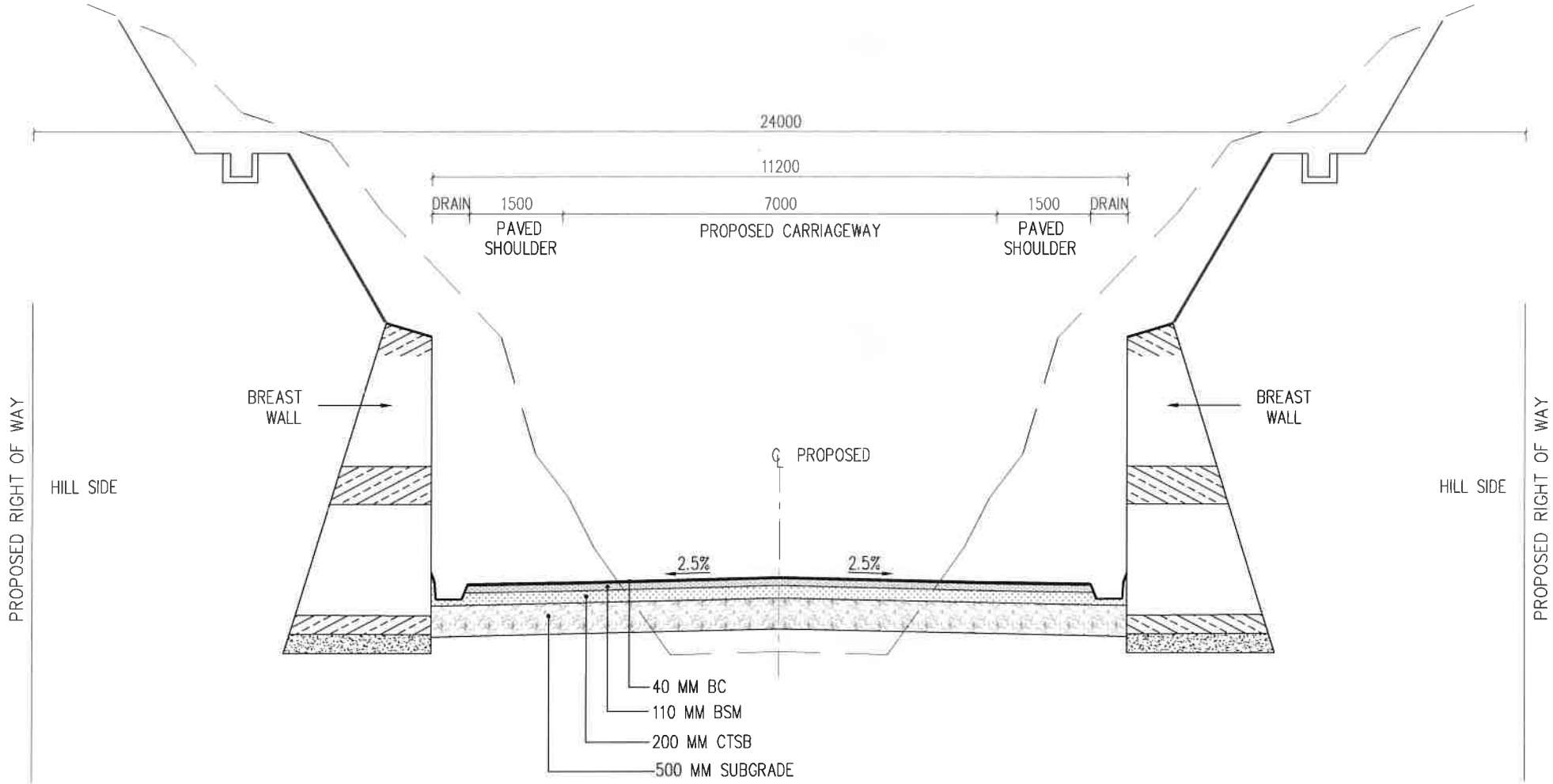
Project : Consultancy for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chulkhim-Nimbong-Kafer-Bakhim-Algarah-Rhenok in the State of West Bengal and From Rhenok-Rorathang-Pakyong along with Spur From Aritar-Rolep-Menla in the State of Sikkim

DATE : November 2019		Revision	R0
DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED BY
Vijay Gupta	Naresh	Vijay Gupta	Sanjay Shukla

SCALE:-NTS

PACKAGE- 5
KAFER TO RHENOCK
TYPICAL CROSS SECTION

Dwg. No. :- SACPL-SESPL/NHIDCL/WB-SKM/TCS/ 4



TCS-V

Two Lane With Paved Shoulder Concentric Widening (Both Side Hill Section)

REV	DATE	DESCRIPTION OF REVISIONS	INITIALS
R0	Sep 2017	Final Feasibility Report	
R0	Nov 2016	Draft Feasibility Report	
R0	Dec 2014	Linear Plan	

Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (Ministry of Road Transport & Highways)

Consultant : SA INFRASTRUCTURE CONSULTANTS PVT. LTD. in Association with Specialized Engineering Services Pvt. Ltd. 1101A, 11th Floor, Tower A-II, Corporate Park, Plot No. 7A/1, Sector-142, Noida 201301, Uttar Pradesh.

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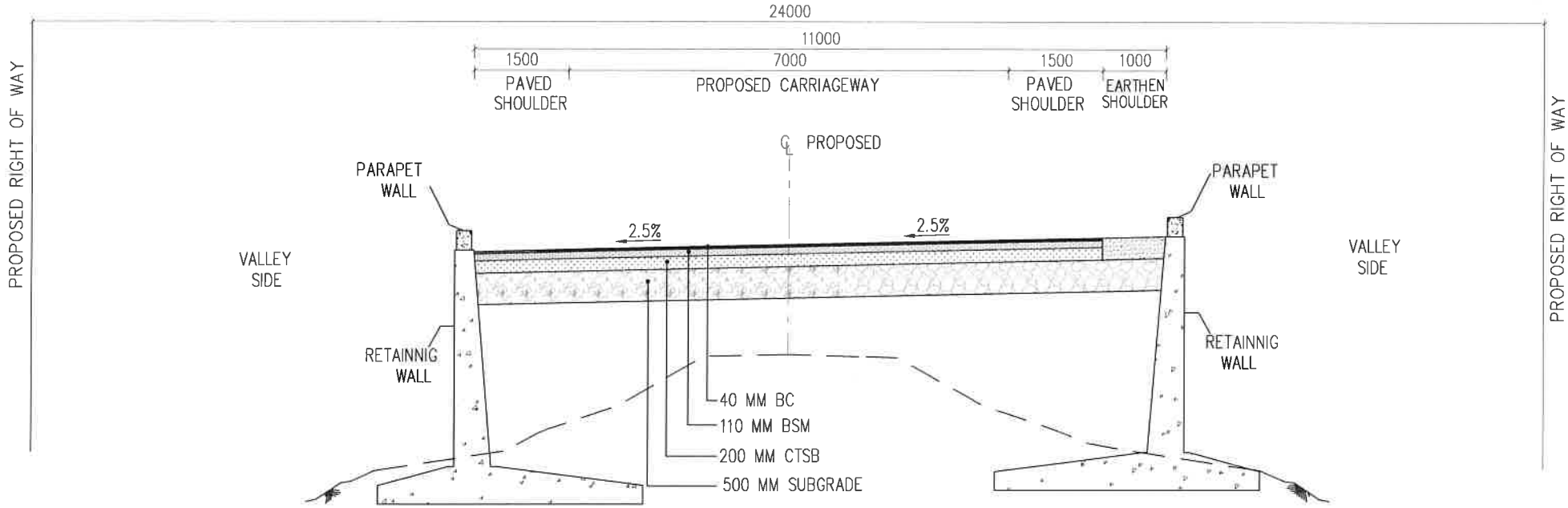
DATE : November 2019		Revision	R0
DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED BY
Vijay Gupta	Naresh	Vijay Gupta	Sanjay Shukla

SCALE:-NTS

PACKAGE- 5
KAFER TO RHENOCK
TYPICAL CROSS SECTION

Dwg. No. :- SACPL-SESPL/NHIDCL/WB-SKM/TCS/ 5



TCS-VI

Two Lane With Paved Shoulder Concentric Widening (Both Side Valley Section)

REV	DATE	DESCRIPTION OF REVISIONS	INITIALS
R0	Sep 2017	Final Feasibility Report	
R0	Nov 2016	Draft Feasibility Report	
R0	Dec 2014	Linear Plan	

Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (Ministry of Road Transport & Highways)

Consultant : SA INFRASTRUCTURE CONSULTANTS PVT. LTD. in association with Specialized Engineering Service Pvt. Ltd. 1101A, 11th Floor, Tower A-II, Corporate Park, Plot No. 7A/1, Sector-142, Noida 201301, Uttar Pradesh.

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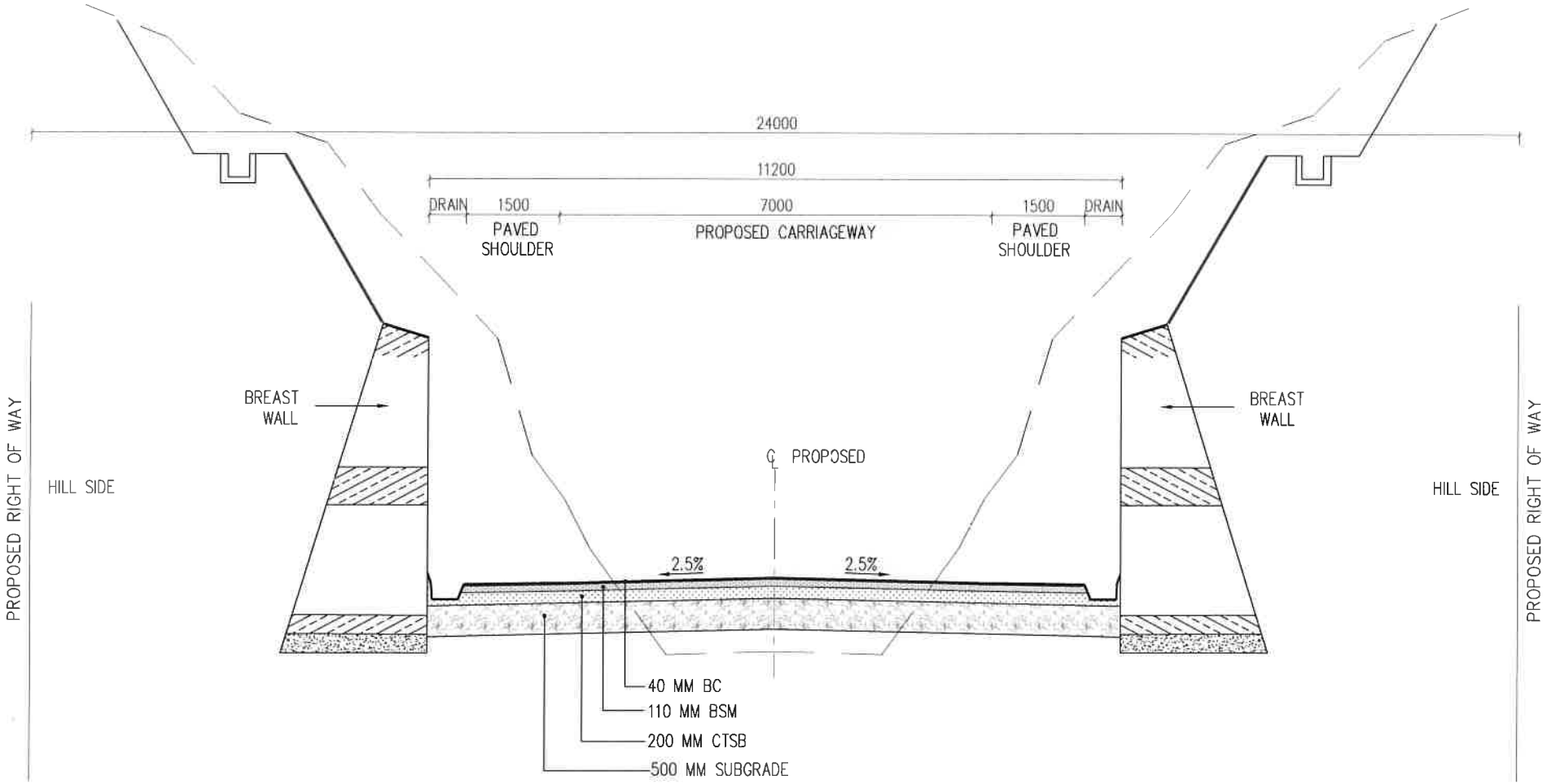
DATE : November 2019		Revision	R0
DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED BY
Vijay Gupta	Naresh	Vijay Gupta	Sanjay Shukla

SCALE:-NTS

PACKAGE-5
KAFER TO RHENOCK
TYPICAL CROSS SECTION

Dwg. No. :- SAICPL-SESPL/NHIDCL/WB-SKM/TCS/ 6



TCS-VII

Two Lane With Paved Shoulder Realignment (Both Side Hill Section)

REV	DATE	DESCRIPTION OF REVISIONS	INITIALS
R0	Sep 2017	Final Feasibility Report	
R0	Nov 2016	Draft Feasibility Report	
R0	Dec 2014	Linear Plan	

Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (Ministry of Road Transport & Highways)

Consultant : SA INFRASTRUCTURE CONSULTANTS PVT. LTD. In Association with Specialized Engineering Service Pvt. Ltd. 1101A, 11th Floor, Tower A-II, Corporate Park, Plot No. TA/1, Sector-142, Noida 201301, Uttar Pradesh.

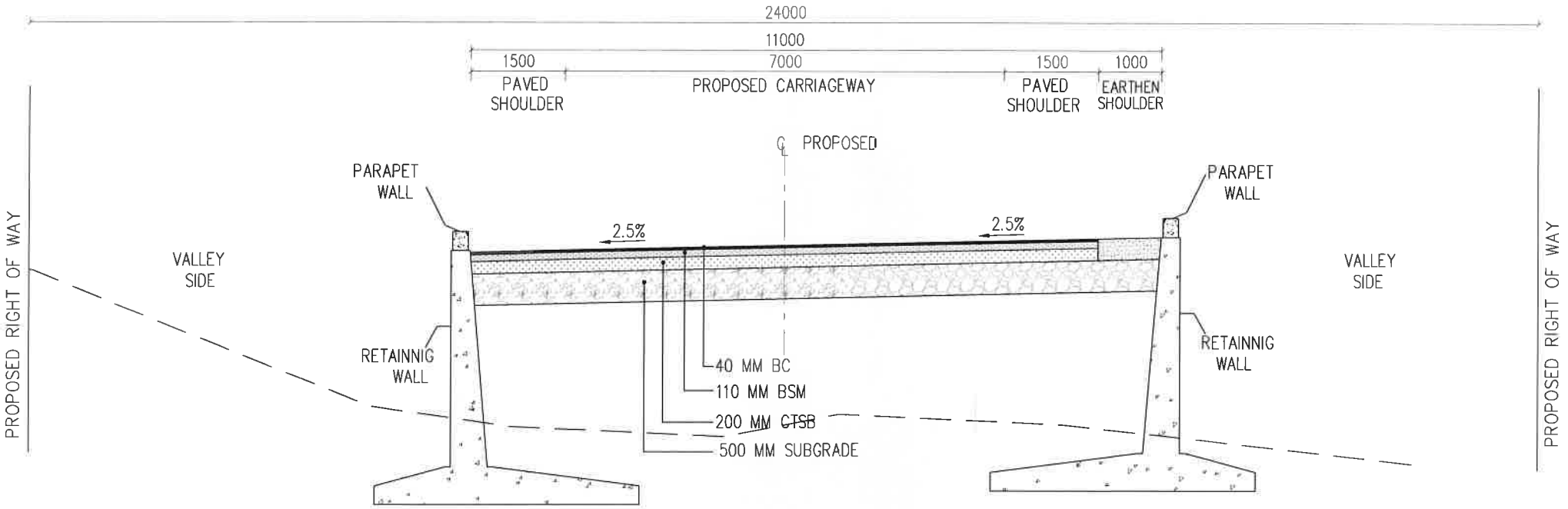
Project : Consultancy for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chulkhim-Nimbong-Kafer-Bakhim-Algarah-Rhenok in the State of West Bengal and From Rhenok-Rorathang-Pakyong along with Spur From Aritar-Rolep-Menla in the State of Sikkim

DATE : November 2019		Revision	R0
DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED BY
Vijay Gupta	Naresh	Vijay Gupta	Sanjay Shukla

SCALE:-NTS

PACKAGE- 5
KAFER TO RHENOCK
TYPICAL CROSS SECTION

Dwg. No. :- SACPL-SESPL/NHIDCL/WB-SKM/TCS/ 7



TCS-VIII
Two Lane With Paved Shoulder (Both Side Valley Section)
(Re-Alignment)

REV	DATE	DESCRIPTION OF REVISIONS	INITIALS
R0	Sep 2017	Final Feasibility Report	
R0	Nov 2016	Draft Feasibility Report	
R0	Dec 2014	Linear Plan	

Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (Ministry of Road Transport & Highways)

Consultant : SA INFRASTRUCTURE CONSULTANTS PVT. LTD. In Association with Specialized Engineering Services Pvt. Ltd. 1101A, 11th Floor, Tower A-II, Corporate Park, Plot No. 7A/1, Sector-142, Noida 201301, Uttar Pradesh.

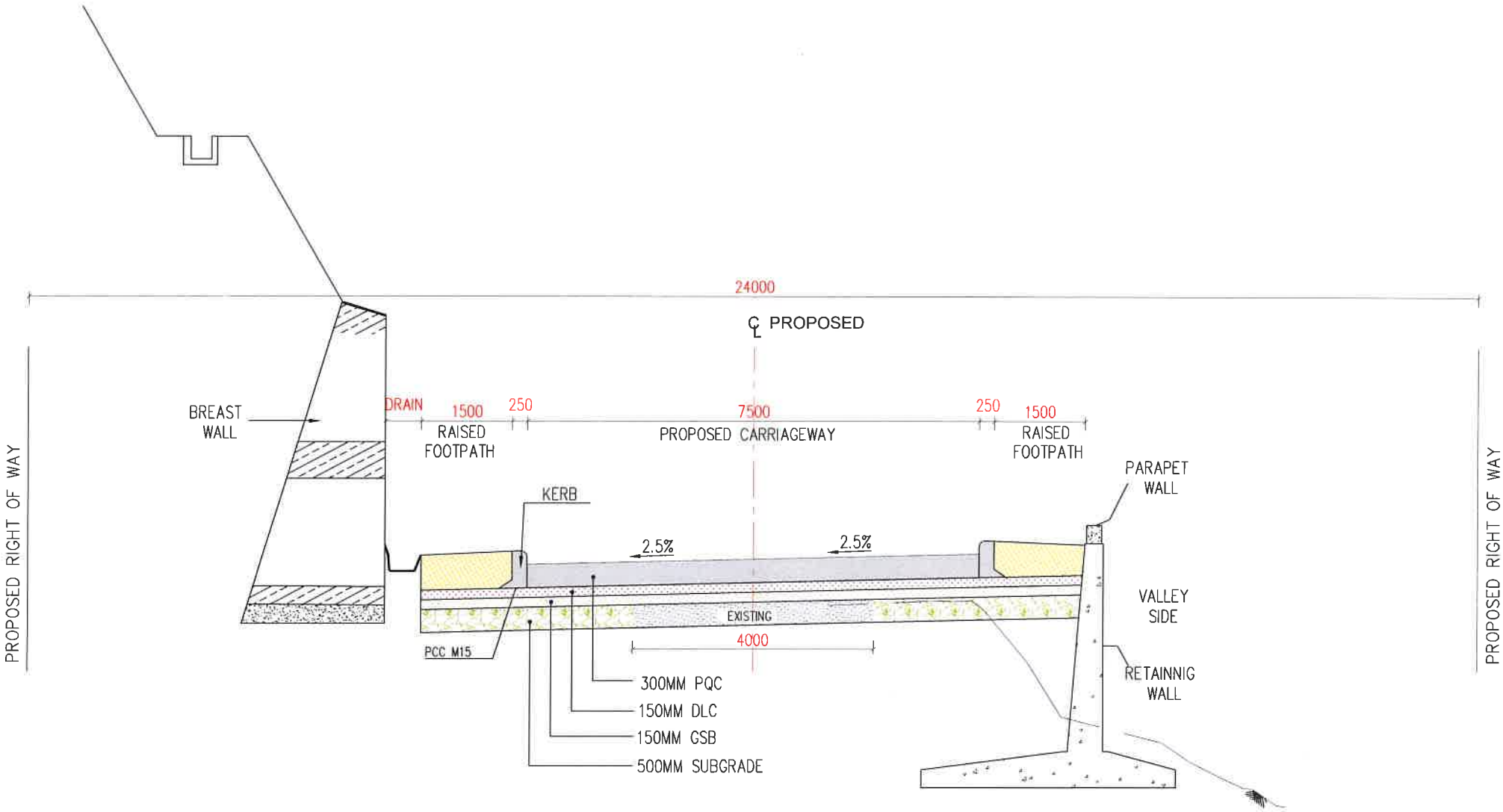
Project : Consultancy for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chuikhim-Nimbong-Kafer-Bakhim-Algarah-Rhenok in the State of West Bengal and From Rhenok-Rorathang-Pakyong along with Spur From Aritar-Rolep-Menla in the State of Sikkim

DATE : November 2019		Revision	R0
DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED BY
Vijay Gupta	Naresh	Vijay Gupta	Sanjay Shukla

SCALE:–NTS

PACKAGE- 5
KAFER TO RHENOCK
TYPICAL CROSS SECTION

Dwg. No. :- SAICPL–SESPL/NHIDCL/WB–SKM/TCS/8



Typical Cross-Section - IX

Two Lane Carriagway With Raised Foothpath Builtup Area (Hill Terrain)

REV	DATE	DESCRIPTION OF REVISIONS	INITIALS
R0	Sep 2017	Final Feasibility Report	
R0	Nov 2016	Draft Feasibility Report	
R0	Dec 2014	Linear Plan	

Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (Ministry of Road Transport & Highways)

Consultant : SA INFRASTRUCTURE CONSULTANTS PVT. LTD. Specialized Engineering Service Pvt. Ltd. 1101A, 11th Floor, Tower A-II, Corporate Park, Plot No. 7A/1, Sector-142, Noida 201301, Uttar Pradesh

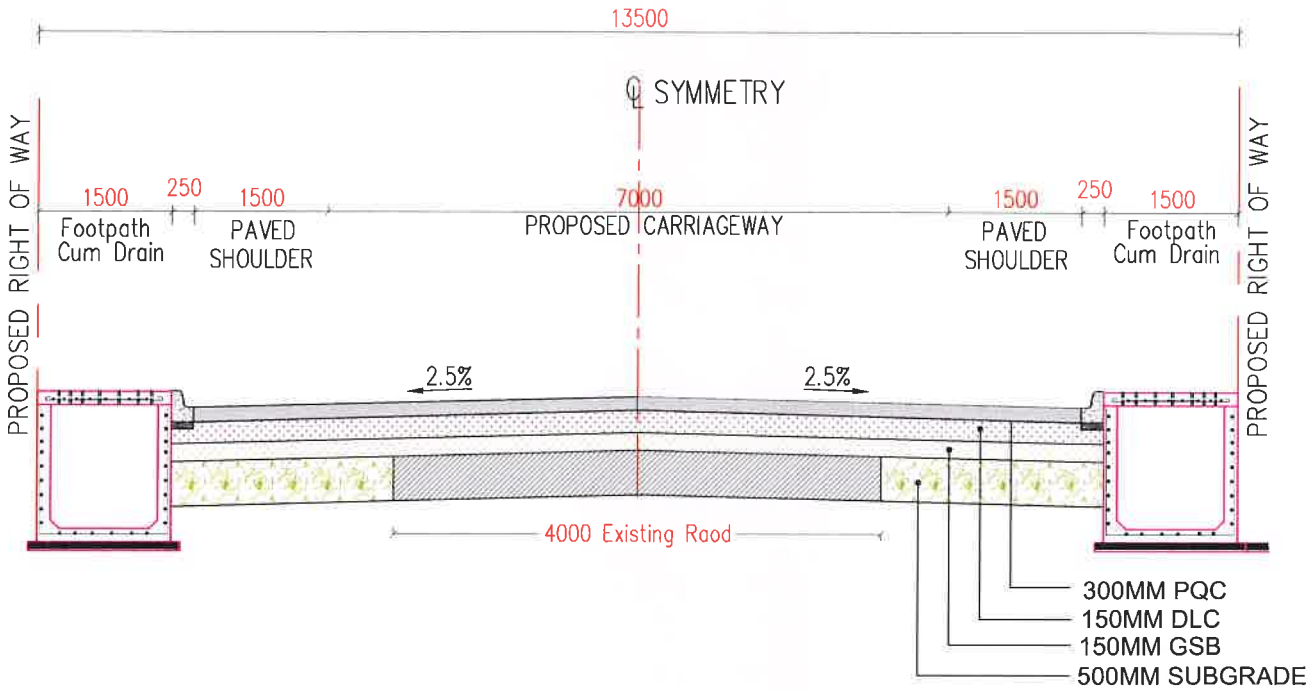
Project : Consultancy for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chuikhim-Nimbong-Kafer-Bakhim-Algarah-Rhenok in the State of West Bengal and From Rhenok-Rorathang-Pa<yong along with Spur From Aritar-Rolep-Menla in the State of Sikkim

DATE : November 2019		Revision	R0
DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED BY
Vijay Gupta	Naresh	Vijay Gupta	Sanjay Shukla

SCALE:-NTS

PACKAGE- 5
KAFER TO RHENOCK
TYPICAL CROSS SECTION

Dwg. No. :- SAICPL-SESPL/NHIDCL/WB-SKM/TCS/9



TCS X

Two Lane Carriagway With Paved Shoulders Including Both Side Drain Cum Foothpath

REV	DATE	DESCRIPTION OF REVISIONS	INITIALS
R0	Sep 2017	Final Feasibility Report	
R0	Nov 2016	Draft Feasibility Report	
R0	Dec 2014	Linear Plan	

Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (Ministry of Road Transport & Highways)

Consultant : SA INFRASTRUCTURE CONSULTANTS PVT. LTD. in association with Specialized Engineering Service Pvt. Ltd. 1101A, 11th Floor, Tower A-II, Corporate Park, Plot No. 7A/1, Sector-142, Noida 201301, Uttar Pradesh.

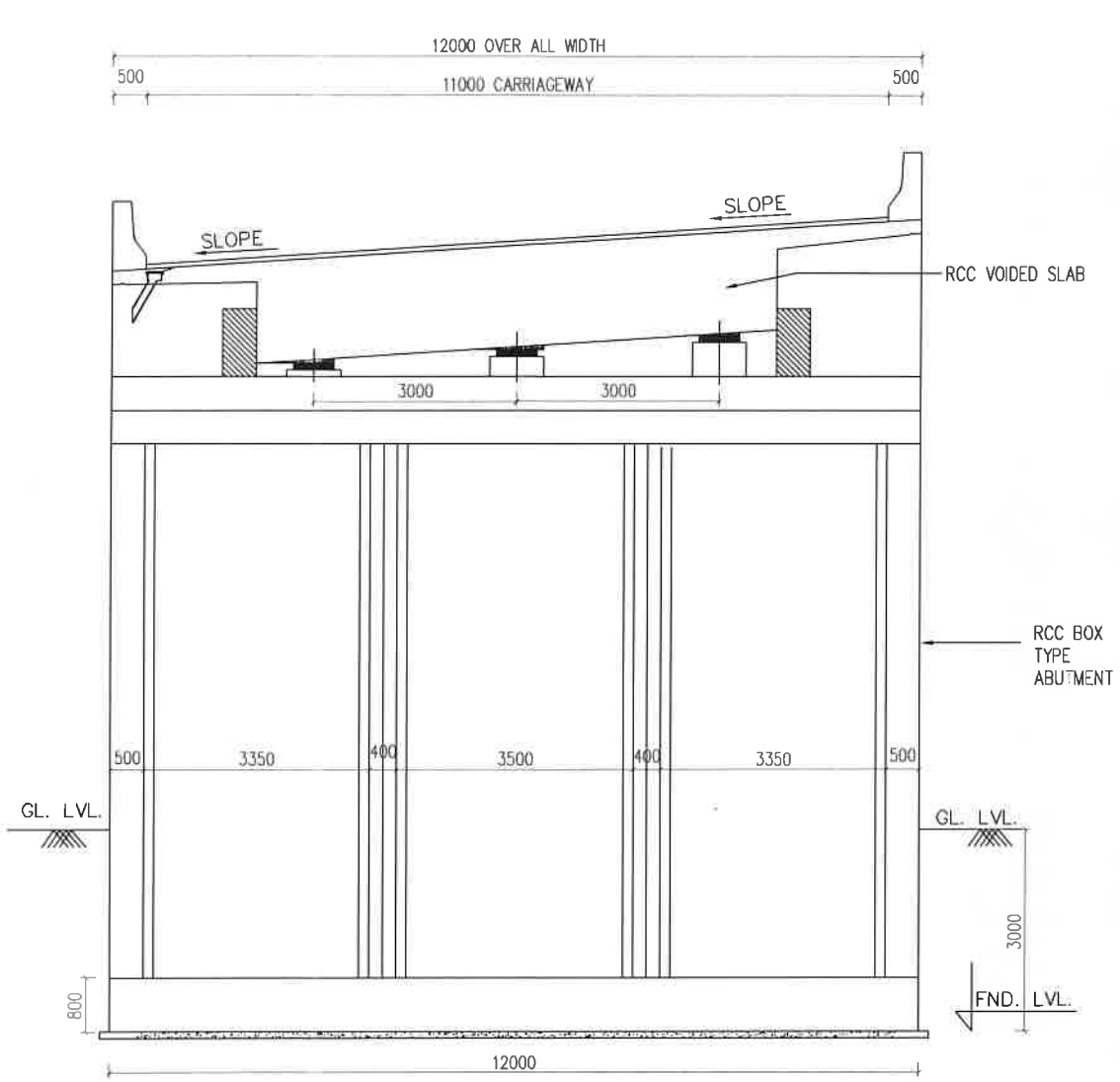
Project : Consultancy for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chulkhim-Nimbong-Kafer-Bakhim-Algarat-Rhenok in the State of West Bengal and From Rhenok-Roralhang-Pakyong along with Spur From Aritar-Rolep-Menla in the State of Sikkim

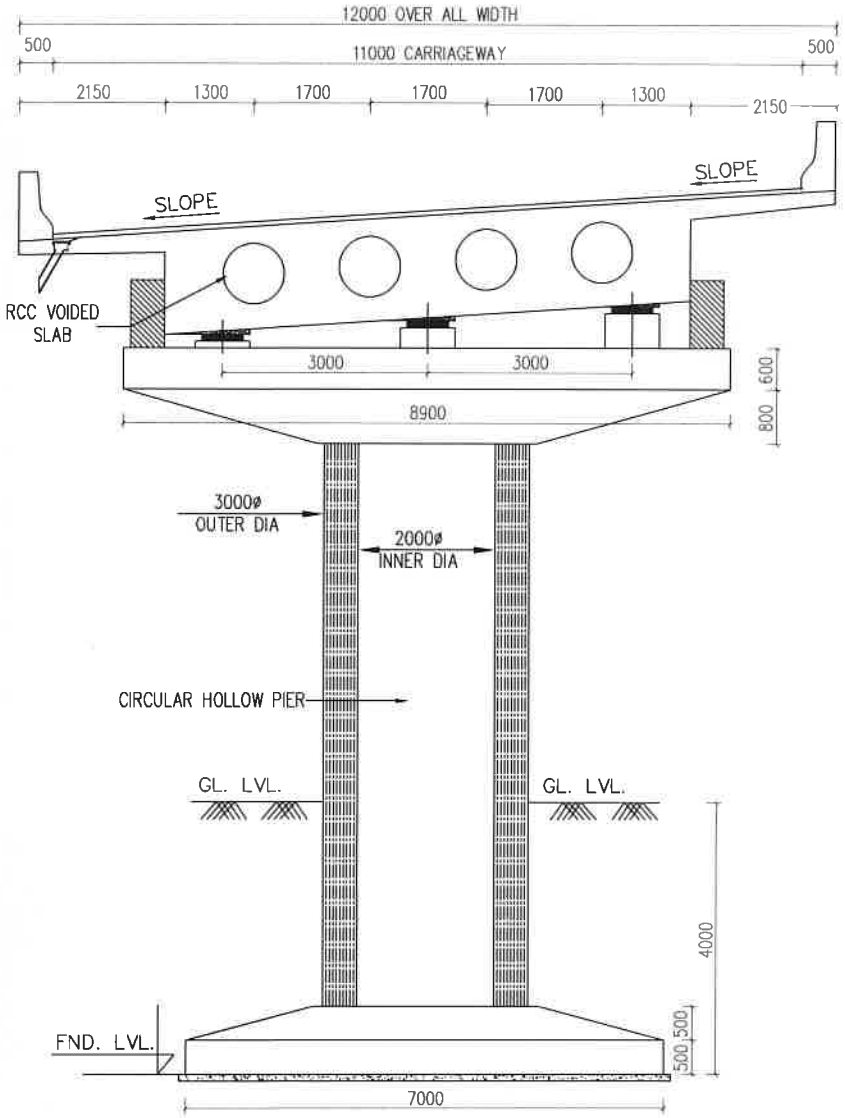
DATE : November 2019		Revision R0	
DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED BY
Vijay Gupta	Naresh	Vijay Gupta	Sanjay Shukla

SCALE:–NTS

PACKAGE- 5
KAFER TO RHENOCK
TYPICAL CROSS SECTION

Dwg. No. :- SACPL–SESPL/NHIDCL/WB–SKM/TCS/ 10





TCS-XI

TYPICAL CROSS SECTION FOR ELEVATED STRUCTURE

(Including Box Abutment Lenght)

REV	DATE	DESCRIPTION OF REVISIONS	INITIALS
R0	Sep 2017	Final Feasibility Report	
R0	Nov 2016	Draft Feasibility Report	
R0	Dec 2014	Linear Plan	

Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (Ministry of Road Transport & Highways)

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DATE : November 2019		Revision	R0
DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED BY
Vijay Gupta	Naresh	Vijay Gupta	Sanjay Shukla

SCALE:-NTS

PACKAGE- 5
KAFER TO RHENOCK
TYPICAL CROSS SECTION

Dwg. No. :- SACPL-SESPL/NHIDCL/WB-SKM/TCS/11