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.

REVISED COST ESTIMATE

PKG - IV A of (BAGRAKOT TO KAFER Km 0 to Km 13)

JANUARY, 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,

Consultancy Services for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chuikhim-Nimbong-Kafer-Bakhim-Algarah-Rhenok in the State of West Bengal and from Rhenok-Rorathang-Pakyong along with Spur from Aritar-Relop-Menla in the State of Sikkim.PKG-IV A (BAGRAKOT TO KAFER Km 0 to Km 13) and 2.24km for ROB Approach Loop & NH-31 widening at ROB Locations

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TOTAL PROJECT COST

Consultancy Services for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chuikhim-Nimbong-Kafer-Bakhim-Algarah-Rhenok in the State of West Bengal and from Rhenok-Rorathang-Pakyong along with Spur from Aritar-Relop-Menla in the State of Sikkim.PKG-IV A (BAGRAKOT TO KAFER Km 0 to Km 13) and 2.24km for ROB Approach Loop & NH-31 widening at ROB Locations

Total Project Cost

Note 1: Basis of Cost Estimate : Rate Analysis as per WB SOR 2015-16 with 4.74% Escalation, Machinery rates from Sikkim SOR 2011-12 with 14.90% Escalation and Major material rates from Market as on Jan 2019.

Sl. No.	Description of Item	Amount (Rs. in Crore)
1	Site Clearance	0.24
2	Earth Work	20.82
3	CTSB+BSM Pavement	26.22
4	Minor Bridges	3.99
5	ROB+Loop	15.07
6	Culverts	7.86
7	Elevated Structure	132.05
8	RE Wall	18.64
9	Retaining and Breast Wall	31.99
10	Drainage and Protective Works	5.73
11	Truck and Buys Laybyes	0.30
12	Major and Minor Junctions	1.87
13	Traffic Signs, Marking and Road Appurtenances	1.47
14	Miscellaneous works	0.63
A	**Civil Construction Cost**	**266.87**
B	GST Charge 12% on (A)	32.02
C	Civil Cost including GST (A+B)	298.89
D	Add Contingency @ 2.8 % of (C)	8.37
E	Total (C+D)	307.26
F	Maintenance during DLP (5 Years) payable to Contractor @ 2.5% on (E)	7.68
G	Escalation Charges @ 5 % per year for 2 years on (C)	29.89
H	Supervision charges @ 3% on (C)	8.97
I	Administrative charges @ 3% on (E)	9.22
J	Total Cost (E+F+G+H+I)	363.01
K	Land Acquisition Cost	25.00
L	Cost of Utility Shifting	3.25
M	Cost of Forest Clearance	3.20
N	**Total Project Cost (Including LA, US & FC)**	**394.46**
Civil Cost per Km. (A/15.240 Km)		17.51
Project Cost per Km. (J/15.240 Km) (Excluding LA, US & FC)		**23.82**

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-IV A (BAGRAKOT TO KAFER Km to Km 13) and 2.24km for ROB Approach Loop & NH-31 widening at ROB Locations**

ABSTRACT OF COST ESTIMATE

Note 1 : Basis of Cost Estimate : Rate Analysis as per WB SOR 2015-16 with 4.74% Escalation, Machinery rates from Sikkim SOR 2011 12 with 14.90% Escalation and Major material rates from Market as on Jan 2019.

Sl.NO	Items	Unit	Length (in Km)	Rate (in Rs.)	Amount (in Rs.)	Amount (in Cr.)
A	**ROAD WORKS**					
1	Site Clearance				24,41,339.82	0.244
2	Excavation	Cum			13,94,11,871.31	13.941
3	Earthwork Filling	Cum			3,54,74,069.89	3.547
4	Loosening & Recompacting	Cum			37,21,172.20	0.372
5	Sub Grade	Cum			2,96,06,003.00	2.961
6	CTSB	Cum			8,84,19,177.00	8.842
7	BSM	Cum			10,73,45,692.49	10.735
8	Prime Coat	Sqm			33,95,490.00	0.340
9	Tack Coat	Sqm			26,57,340.00	0.266
10	BC	Cum			5,79,59,538.00	5.796
B	**BRIDGES and STRUCTURES**					
1	Minor Bridges	No.	2.00		3,99,29,273.62	3.99
2	ROB+Viaduct(Loop)	No.	1		15,06,50,297.79	15.07
3	Culverts	No.	43	1827785.89	7,85,94,793.06	7.86
C	**SLOPE STRUCTURES**					
1	Elevated Structure	No.	12		1,32,04,89,869.59	132.05
2	RE Wall				18,63,52,080.90	18.64
3	Retaining and Breast Wall				31,98,64,207.15	31.99
D	**JUNCTIONS**					
1	Major Junctions	No	1.00		53,86,827.10	0.54
2	Minor Junctions	No	6.00		1,32,68,289.30	1.33
E	**DRAIN & PROTECTION WORK**					
1	Drainage Works	Km	-		3,55,74,313.10	3.56
2	Parapet Wall	Km	5.54		2,17,04,283.40	2.17
F	**LAY BYES**					
1	Bus Bays	Nos	2.00	15,02,585.43	30,05,170.86	0.30
G	**OTHER MISCELLANEOUS ITEMS**					
1	Footpath and Separators				24,40,200.00	0.24
2	Miscellaneous Items	Total			63,18,658.00	0.63
3	Traffic Signs, Marking and Road Appurtenances	Total			85,48,852.13	0.85
4	Reflective Road Studs	Nos	7318		61,05,220.03	0.61
	TOTAL CIVIL COST				**2668664029.73**	**266.87**
	COST PER KM (LENGTH = 15.24 KM) IN CRORES ...					**17.51**

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Summary of Cost Estimate

Sr. No.	Item of Works	Total (in Rs)	Total (in Cr)
	Civil Works		
1	Site Clearance	2,441,339.82	0.24
2	Earthwork	208,213,116.40	20.82
3	Non-Bituminous Courses	198,205,069.49	19.82
4	Bituminous Courses	64,012,368.00	6.40
5	Minor Bridges	39,929,273.62	3.99
6	ROB+Loop	150,650,297.79	15.07
7	Culverts/Repairing/Dismantling	78,594,793.06	7.86
8	RE Wall	186,352,080.90	18.64
9	Elevated Structure	1,320,489,869.59	132.05
10	Retaining and Breast Wall	319,864,207.15	31.99
11	Drainage and Protective works	57,278,596.50	5.73
12	Traffic Signs, Marking and Road Appurtenances	14,654,072.16	1.47
13	Miscellaneous Items	6,318,658.00	0.63
14	Bus Byes	3,005,170.86	0.30
15	Junctions and Intersections	18,655,116.40	1.87
	Total for Civil Works	**2,668,664,029.73**	**266.87**
	Cost per Km		**17.51**

TCS WISE COST

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	61,371.00	23.36	1,433,872.04		2.90	1.70	4.93	2.190	2.20	4.82	3.400	1.60	5.44	0.31	1.00	0.31
2	3.18	Sub Grade	Cum	266.00	109,379.50	29,094,947.00		2.90	8,250.00	23,925.00	2.190	10,750.00	23,542.50	3.400	7,900.00	26,860.00	0.31	5,000.00	1,550.00
2	4.13	Subgrade in Median fill	Cum	273.00	1,872.00												0.31		-
3	3.19 - Case	Loosening & Recompacting	Cum	83.00	44,833.40	3,721,172.20		2.90	3,300.00	9,570.00	2.190	4,300.00	9,417.00	3.400	3,160.00	10,744.00	0.31	2,000.00	620.00
4	4.6(ii)	CTSB	Cum	2,541.00	34,797.00	88,419,177.00		2.90	2,060.00	5,974.00	2.190	2,060.00	4,511.40	3.400	3,000.00	10,200.00	0.31	2,000.00	620.00
7	4.12	BSM	Cum	2,558.00	16,363.64	41,858,201.35		2.90	1,108.80	3,215.52	2.190	1,108.80	2,428.27	3.400	1,108.80	3,769.92	0.31	1,100.00	341.00
8	5.1	Prime Coat	Sqm	23.00	147,838.00	3,395,490.00		2.90	10,000.00	29,000.00	2.190	10,000.00	21,900.00	3.400	10,000.00	34,000.00	0.31	10,000.00	3,100.00
9	5.2	Tack Coat	Sqm	9.00	295,260.00	2,657,340.00		2.90	20,000.00	58,000.00	2.190	20,000.00	43,800.00	3.400	20,000.00	68,000.00	0.31	20,000.00	6,200.00
11	5.8 (i)	BC	Cum	9,815.00	5,905.20	57,959,538.00		2.90	400.00	1,160.00	2.190	400.00	876.00	3.400	400.00	1,360.00	0.31	400.00	124.00

								TCS-IV			TCS-IVA			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					0.70	2.40	1.68	0.900	1.10	0.99	1.04	2.60	2.70	1.78	1.40	2.49
2	3.18	Sub Grade	Cum					0.70	11,750.00	8,225.00	0.900	5,250.00	4,725.00	1.04	9,150.00	9,516.00	1.78	6,200.00	11,036.00
2	4.13	Subgrade in Median fill	Cum					0.70	575.00		0.900		-	1.04	1,800.00	1,872.00	1.78		-
3	3.19 - Case-I	Loosening & Recompacting	Cum					0.70	4,700.00	3,290.00	0.900	2,100.00	1,890.00	1.04	4,700.00	4,888.00	1.78	2,480.00	4,414.40
4	4.6(ii)	CTSB	Cum					0.70	4,200.00	2,940.00	0.900	2,100.00	1,890.00	1.04	4,700.00	4,888.00	1.78	2,120.00	3,773.60
7	4.12	BSM	Cum					0.70	2,310.00	1,617.00	0.900	1,155.00	1,039.50	1.04	1,887.60	1,963.10	1.78	1,117.60	1,989.33
8	5.1	Prime Coat	Sqm					0.70	21,000.00	14,700.00	0.900	10,500.00	9,450.00	1.04	17,000.00	17,680.00	1.78	10,000.00	17,800.00
9	5.2	Tack Coat	Sqm					0.70	42,000.00	29,400.00	0.900	21,000.00	18,900.00	1.04	34,000.00	35,360.00	1.78	20,000.00	35,600.00
11	5.8 (i)	BC	Cum					0.70	840.00	588.00	0.900	420.00	378.00	1.04	680.00	707.20	1.78	400.00	712.00

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Typical Cross Section Type-I { 2-lane Paved Shoulder raised portion in hilly Areas } **2.90 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	17	-	1.70	61,371.00	104,330.700
2	Sub Grade	Cum	1	1000	16.50	0.500	8,250.00	266.00	2,194,500.000
3	Excavation & Earthwork	Cum	Taken in Abstract Sheet					-	
4	Loosening & Recompacting	Cum	1	1000	16.50	0.200	3,300.00	83.00	273,900.000
5	CTSB	Cum	1	1000	10.30	0.200	2,060.00	2,541.00	5,234,460.000
7	BSM	Cum	1	1000	10.08	0.110	1,108.80	6,560.01	7,273,740.73
8	Prime Coat	Sqm	1	1000	10	-	10,000.00	23.00	230,000.00
9	Tack Coat	Sqm	2	1000	10	-	20,000.00	9.00	180,000.00
11	BC	Cum	1	1000	10	0.040	400.00	9,815.00	3,926,000.00
								Total Cost =	**19,416,931.43**

Per Km Cost of TCS Type-I in Cr. = 1.942

Total Cost of TCS Type- I for 02.900 Kms Length in Cr. = 5.631

Consultancy Services for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chuikhim-Nimbong-Kafer-Bakhim-Algarah-Rhenok in the State of West Bengal and from Rhenok-Rorathang-Pakyong along with Spur from Aritar-Relop-Menla in the State of Sikkim.PKG-IV A (BAGRAKOT TO KAFER Km 0 to Km 13) and 2.24km for ROB Approach Loop & NH-31 widening at ROB Locations

Typical Cross Section Type-II { 2-lane Paved Shoulder raised portion in hilly Areas, new alignment } **2.19 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	22	-	2.20	61,371.00	135,016.20
2	Sub Grade	Cum	1	1000	21.50	0.500	10,750.00	266.00	2,859,500.00
3	Excavation & Earthwork	Cum	Taken in Abstract Sheet					-	
4	Loosening & Recompacting	Cum	1	1000	21.50	0.200	4,300.00	83.00	356,900.00
5	CTSB	Cum	1	1000	10.30	0.200	2,060.00	2,541.00	5,234,460.00
7	BSM	Cum	1	1000	10.08	0.110	1,108.80	6,560.01	7,273,740.73
8	Prime Coat	Sqm	1	1000	10	-	10,000.00	23.00	230,000.00
9	Tack Coat	Sqm	2	1000	10	-	20,000.00	9.00	180,000.00
11	BC	Cum	1	1000	10	0.040	400.00	9,815.00	3,926,000.00
								Total Cost =	**20,195,616.93**

Per Km Cost of TCS Type-II in Cr. = 2.020

Total Cost of TCS Type- II for 02.190 Kms Length in Cr. = 4.423

Consultancy Services for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chuikhim-Nimbong-Kafer-Bakhim-Algarah-Rhenok in the State of West Bengal and from Rhenok-Rorathang-Pakyong along with Spur from Aritar-Relop-Menla in the State of Sikkim.PKG-IV A (BAGRAKOT TO KAFER Km 0 to Km 13) and 2.24km for ROB Approach Loop & NH-31 widening at ROB Locations

Typical Cross Section Type-III { 2-lane bypass (Open country-plain/rolling terrain) } **3.40 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	16	-	1.60	61,371.00	98,193.60
2	Sub Grade	Cum	1	1000	15.8	0.500	7,900.00	266.00	2,101,400.00
3	Excavation & Earthwork	Cum	Taken in Abstract Sheet					-	
4	Loosening & Recompacting	Cum	1	1000	15.8	0.200	3,160.00	83.00	262,280.00
5	CTSB	Cum	1	1000	15.00	0.200	3,000.00	2,541.00	7,623,000.00
7	BSM	Cum	1	1000	10.08	0.110	1,108.80	6,560.01	7,273,740.73
8	Prime Coat	Sqm	1	1000	10	-	10,000.00	23.00	230,000.00
9	Tack Coat	Sqm	2	1000	10	-	20,000.00	9.00	180,000.00
11	BC	Cum	1	1000	10	0.04	400.00	9,815.00	3,926,000.00
								Total Cost =	**21,694,614.33**

Per Km Cost of TCS Type-III in Cr. = 2.169

Total Cost of TCS Type- III for 03.400 Kms Length in Cr. = 7.376

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Typical Cross Section Type-IV { 4-lane highway (Open country-plain/rolling terrain)} **0.70 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	24	-	2.40	61,371.00	147,290.40
2	Sub Grade	Cum	1	1000	23.5	0.500	11,750.00	266.00	3,125,500.00
2	Subgrade in Median fill	Cum	1	1000	2.5	0.230	575.00	273.00	
3	Excavation & Earthwork	Cum	Taken in Abstract Sheet					-	
4	Loosening & Recompacting	Cum	1	1000	23.5	0.200	4,700.00	83.00	390,100.00
5	CTSB	Cum	1	1000	21	0.200	4,200.00	2,541.00	10,672,200.00
7	BSM	Cum	1	1000	21	0.110	2,310.00	6,560.01	15,153,626.52
8	Prime Coat	Sqm	1	1000	21	-	21,000.00	23.00	483,000.00
9	Tack Coat	Sqm	2	1000	21	-	42,000.00	9.00	378,000.00
11	BC	Cum	1	1000	21	0.04	840.00	9,815.00	8,244,600.00
								Total Cost =	**38,594,316.92**

Per Km Cost of TCS Type-IV in Cr. = 3.859

Total Cost of TCS Type- IV for 00.700 Kms Length in Cr. = 2.702

Typical Cross Section Type-IV { Flexible Pavment in Builtup areas }

Item No.	Description	Unit	No.	Length (In m)	Width (In m)	Depth (In m)	Qty	Rate (In Rs)	Amount (In Rs)
1	Kerb	Hac	1	1,400.00	0.25	0.250	87.50		

Typical Cross Section Type-IVA { 2-lane highway (Open country-plain/rolling terrain)} **0.90 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	11	-	1.10	61,371.00	67,508.10
2	Sub Grade	Cum	1	1000	10.5	0.500	5,250.00	266.00	1,396,500.00
3	Excavation & Earthwork	Cum	Taken in Abstract Sheet					-	
4	Loosening & Recompacting	Cum	1	1000	10.5	0.200	2,100.00	83.00	174,300.00
5	CTSB	Cum	1	1000	10.5	0.200	2,100.00	2,541.00	5,336,100.00
7	BSM	Cum	1	1000	10.5	0.110	1,155.00	6,560.01	7,576,813.26
8	Prime Coat	Sqm	1	1000	10.5	-	10,500.00	23.00	241,500.00
9	Tack Coat	Sqm	2	1000	10.5	-	21,000.00	9.00	189,000.00
11	BC	Cum	1	1000	10.5	0.04	420.00	9,815.00	4,122,300.00
								Total Cost =	**19,104,021.36**

Per Km Cost of TCS Type-IVA in Cr. = 1.910
Total Cost of TCS Type- IVA for 00.900 Kms Length in Cr. = 1.719

Typical Cross Section Type-V{4-lane highway(Open country-plain/rolling terrain} **1.04 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	26	-	2.60	61,371.00	159,564.60
2	Sub Grade	Cum	1	1000	18.3	0.5	9,150.00	266.00	2,433,900.00
2	Subgrade in Median fill	Cum	1	1000	1.5	1.2	1,800.00	273.00	491,400.00
3	Excavation & Earthwork	Cum	Taken in Abstract Sheet					-	
4	Loosening & Recompacting	Cum	1	1000	23.5	0.200	4,700.00	83.00	390,100.00
5	CTSB	Cum	1	1000	23.5	0.200	4,700.00	2,541.00	11,942,700.00
7	BSM	Cum	1	1000	17.2	0.110	1,887.60	6,560.01	12,382,677.67
8	Prime Coat	Sqm	1	1000	17	-	17,000.00	23.00	391,000.00
9	Tack Coat	Sqm	2	1000	17	-	34,000.00	9.00	306,000.00
11	BC	Cum	1	1000	17	0.04	680.00	9,815.00	6,674,200.00
								Total Cost =	**35,171,542.27**

Per Km Cost of TCS Type-V in Cr. = 3.517
Total Cost of TCS Type- V for 01.040 Kms Length in Cr. = 3.658

Typical Cross Section Type-VI {Two lane with paved shoulder Raised portion (Both Side Valley section} **0.31 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	10.00	-	1.00	61,371.00	61,371.00
2	Sub Grade	Cum	1	1000	10.00	0.500	5,000.00	266.00	1,330,000.00
3	Excavation & Earthwork	Cum	Taken in Abstract Sheet					-	
4	Loosening & Recompacting	Cum	1	1000	10.00	0.200	2,000.00	83.00	166,000.00
5	CTSB	Cum	1	1000	10.00	0.200	2,000.00	2,541.00	5,082,000.00
7	BSM	Cum	1	1000	10.00	0.110	1,100.00	6,560.01	7,216,012.63
8	Prime Coat	Sqm	1	1000	10	-	10,000.00	23.00	230,000.00
9	Tack Coat	Sqm	2	1000	10	-	20,000.00	9.00	180,000.00
11	BC	Cum	1	1000	10	0.040	400.00	9,815.00	3,926,000.00
								Total Cost =	**18,191,383.63**

Per Km Cost of TCS Type-VI in Cr. = 1.819

Total Cost of TCS Type- VI for 00.310 Kms Length in Cr. = 0.564

Typical Cross Section Type-VII {Two lane with paved shoulder Raised portion (Both Side Hill section)} **1.78 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	61,371.00	85,919.40
2	Sub Grade	Cum	1	1000	12.40	0.500	6,200.00	266.00	1,649,200.00
3	Excavation & Earthwork	Cum	Taken in Abstract Sheet					-	
4	Loosening & Recompacting	Cum	1	1000	12.40	0.200	2,480.00	83.00	205,840.00
5	CTSB	Cum	1	1000	10.60	0.200	2,120.00	2,541.00	5,386,920.00
7	BSM	Cum	1	1000	10.16	0.110	1,117.60	6,560.01	7,331,468.83
8	Prime Coat	Sqm	1	1000	10	-	10,000.00	23.00	230,000.00
9	Tack Coat	Sqm	2	1000	10	-	20,000.00	9.00	180,000.00
11	BC	Cum	1	1000	10	0.040	400.00	9,815.00	3,926,000.00
								Total Cost =	**18,995,348.23**

Per Km Cost of TCS Type-VII in Cr. = 1.900

Total Cost of TCS Type- VII for 01.780 Kms Length in Cr. = 3.381

Lined Drain **8.65 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	194.00	97,000.00
2	Grade M15 PCC - Using Concrete Mixer	Cum	1	1000	0.95	0.10	95	7,187.00	682,765.00
3 (i)	RCC Grade M25 : Using Concrete Mixer	Cum	1	1000	0.75	0.15	112.5	7,148.00	804,150.00
3 (ii)	RCC Grade M25 : Using Concrete Mixer	Cum	2	1000	0.45	0.15	135	7,148.00	964,980.00
4	RCC Grade M20 : Using concrete mixer	Cum	1	1000	0.60	0.15	90	6,637.00	597,330.00
5	Supplying, Fitting and Placing un-coated HYSD bar Reinforcement in Foundation complete as per Drawing and Technical Specifications.	Ton	1	1000			11.813	69,136.00	816,669.00
								Total Cost =	3,962,894.00

Per Km Cost of Catch Water Drain in Cr.= 0.396

Total Cost of Catch Water Drain for Km Length in Cr. = 3.428

Consultancy Services for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chuikhim-Nimbong-Kafer-Bakhim-Algarah-Rhenok in the State of West Bengal and from Rhenok-Rorathang-Pakyong along with Spur from Aritar-Relop-Menla in the State of Sikkim.PKG-IV A (BAGRAKOT TO KAFER Km 0 to Km 13) and 2.24km for ROB Approach Loop & NH-31 widening at ROB Locations

MAJOR JUNCTION **1.00 Nos**

Item No.	Description	Unit	No.	Length X Width (In Sqm)	Depth (In m)	Qty	Rate (In Rs)	Amount (In Rs)
1	Clearing & Grubbing	Hac	1	1000	-	0.1	61,371.00	6,137.10
2	Sub Grade	Cum	1	2000	0.500	1000	266.00	266,000.00
3	Sub Grade 150mm top of Earthern Shoulder	Cum	2	250	0.440	220	266.00	58,520.00
4	GSB	Cum	1	2100	0.200	420	2,479.00	1,041,180.00
5	WMM (Bottom Layer)	Cum	1	2100	0.125	262.5	2,558.00	671,475.00
6	WMM (Top Layer)	Cum	1	2100	0.125	262.5	2,558.00	671,475.00
7	Prime Coat	Sqm	1	2100	-	2100	23.00	48,300.00
8	Tack Coat	Sqm	2	2100	-	4200	9.00	37,800.00
9	DBM / Profile Corrective Course	Cum	1	2100	0.100	210	8,388.00	1,761,480.00
10	BC	Cum	1	2100	0.040	84	9,815.00	824,460.00
							Total Cost =	5,386,827.10
							Per No Cost of Major Junction In Cr.=	0.539
							Total Cost of Major Junction in Rs. . =	**5,386,827**

MINOR JUNCTION **6.00 Nos**

Item No.	Description	Unit	No.	Length X Width (In Sqm)	Depth (In m)	Qty	Rate (In Rs)	Amount (In Rs)
1	Clearing & Grubbing	Hac	1	500	-	0.05	61,371.00	3,068.55
2	Sub Grade	Cum	1	940	0.500	470	266.00	125,020.00
3	Sub Grade 150mm top of Earthern Shoulder	Cum	2	100	0.440	88	266.00	23,408.00
4	GSB	Cum	1	940	0.250	235	2,479.00	582,565.00
5	GSB 150mm top of Granular Shoulder	Cum	2	100	0.150	30	2,479.00	74,370.00
6	WMM (Bottom Layer)	Cum	1	940	0.125	117.5	2,558.00	300,565.00
7	WMM (Top Layer)	Cum	1	940	0.125	117.5	2,558.00	300,565.00
8	Prime Coat	Sqm	1	940	-	940	23.00	21,620.00
9	Tack Coat	Sqm	2	940	-	1880	9.00	16,920.00
10	DBM / Profile Corrective Course	Cum	1	940	0.050	47.000	8,388.00	394,236.00
11	BC	Cum	1	940	0.040	37.6	9,815.00	369,044.00
							Total Cost =	2,211,381.55
							Per No Cost of Minor Junction in Cr.=	0.221
							Total Cost of Minor Junction in Rs. =	**13,268,289**

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	23.36	61371.0	1433872
1.020	Dismantling of existing structures like culverts, bridges, retaining walls and other structure comprising of masonry, cement concrete, wood work, steel work, including T&P and scaffolding wherever necessary, sorting the dismantled material, disposal of unserviceable material and stacking the serviceable material with all lifts and lead of 1000 metres				
(i)	Brick/Tile work in Cement Morter	Cum	650.00	520.0	338000
(ii)	Lime Concrete, cement concrete grade M-10 and below	Cum	48.75	410.0	19988
(iii)	Removing all type of Hume Pipes and Stacking within a lead of 1000 metres including Earthwork and Dismantling of Masonry Works.	Lm	260.00	460.0	119600
(iv)	Kilometer stone	Nr.			0
1.030	Cutting of trees, including cutting of trunks, branches and removal of stumps, roots stacking of serviceable material with all lifts and up to a lead of 1000 m and earth filling in the depression/pit as per MORTH specification clause 201.				0
	(a) Girth from 300mm to 600mm	No.	0	272.0	0
	(b) Girth from 600mm to 900mm	No.	44	493.0	21692
	(c) Girth from 900mm to 1800mm	No.	397	956.0	379532
	(d) Girth above 1800mm	No.	70.885	1815.0	128656
Total (Rs)					**2441340**
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	140394.63	273.0	38327735
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	187192.85	177.0	33133134
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	140394.63	484.0	67951003
				TOTAL EXCAVATION	**139411871**
2.030	Construction of embankment with approved material obtained from borrow pits with all lifts and leads, transporting to site, spreading, grading to required slope and compacting with vibratory roller 8-10 tonne to meet requirement of table 300-2 including cost of compensation for earth taken from private land with lead up to 1 km as per MoRTH specification Clause No. 305.	Cum	40588.18	226.0	9172929
2.040	Construction of embankment with approved materials deposited at site from roadway cutting and excavation from drain and foundation of other structures graded and compacted with vibratory roller to meet requirement of table 300-2 as per MoRTH specification Clause No. 305.	Cum	162352.72	162.0	26301141
				TOTAL EMBANKMENT FILLING	**35474070**

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Bill Of Quantities - Roads

Item No.	Description	Unit	Qty	Rate (in Rs.)	Amount (Rs.)
2.080	**Loosening** of the ground upto a level of 200 mm below the sub-grade level, watered, graded and compacted in layers to meet requirement of table 300-2 for sub-grade construction.	cum	44833.40	83.0	3721172
2.050	Construction of **sub-grade** and earthen shoulders with approved material obtained from borrow pits with all lifts & leads, transporting to site, spreading, grading to required slope and compacted to meet requirement of table No. 300-2	Cum	109379.50	266.0	29094947
2.060	Construction of Median and Island with Soil Taken from Roadway Cutting. Construction of Median and Island above road level with approved material deposited at site from roadway cutting and excavation for drain and foundation of other structures, spread, graded and compacted as per clause 407	Cum	1872.00	273.0	511056
Total (Rs)					**208213116**
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	34797.00	2541.0	88419177
3.020	Bituminous Stabilised Material (BSM)	Cum	16363.64	6560.0	107345692
3.600	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	1400.00	1743.0	2440200
Total (Rs)					198205069
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	147630.00	23.0	3395490
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	295260.00	9.0	2657340
4.030	Providing and laying dense graded bituminous macadam with 100-120 TPH batch type HMP producing an average output of 75 tonnes per hour using crushed aggregates of grading I, premixed with bituminous binder @ 4.5 per cent by weight of total mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MoRTH specification clause No. 507 complete in all respects.	Cum	0.00	8388.0	0
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	5905.20	9815.0	57959538
Total (Rs)					**64012368**

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Bill Of Quantities - Roads

Item No.	Description	Unit	Qty	Rate (in Rs.)	Amount (Rs.)
Bill No 6: Drainage and Protective works					
6.01	Excavation for roadwork in soil with in all types of soil including marshy soil hydraulic excavator of 0.9 cum bucket capacity including cutting and loading in tippers, trimming bottom and side slopes, in accordance with requirements of lines, grades and cross sections, and transporting to the embankment location within all lifts and lead upto 1000m as per clause 301.				
	(i) Lined Drain	**Km**	8.65	3962894.00	34279033.10
	(ii) Unlined Drain	**Cum**	18504.00	70.0	1295280.00
				TOTAL DRAINAGE COST	**35,574,313**
6.02	Parapet Wall of Stone masonry work in cement mortar 1:3	**Rmt**	3323.40	4001.0	**13296923**
6.021	Reinforced Cement Concrete Crash Barrier. Provision of an Reinforced cement concrete crash barrier at the edges of the road, approaches to bridge structures and medians, constructed with M-20 grade concrete with HYSD reinforcement conforming to IRC:21 and dowel bars 25 mm dia, 450 mm long at expansion joints filled with pre-moulded asphalt filler board, keyed to the structure on which it is built and installed as per design given in the enclosure to MOST circular No. RW/NH - 33022/1/94-DO III dated 24 June 1994 as per dimensions in the approved drawing and at locations directed by the Engineer, all as specified	**Rmt**	2080.00	4042.0	**8407360**
				TOTAL OF CRASH BARRIER ...	**21,704,283**
Total (Rs)					**57,278,596**

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Bill Of Quantities - Roads

Item No.	Description	Unit	Qty	Rate (in Rs.)	Amount (Rs.)
Bill No 7: Traffic Signs, Marking and Road Appurtenances					
7.010	Providing and fixing in position precast concrete stones in RCC M 20 grade including excavation, foundation concrete and reinforcement inscription etc. complete as per Technical Specification Clause 804.				
	(i) 5th kilometre stone	**No.**	3.00	3808.0	**11424**
	(ii) Ordinary Kilometer stone	**No.**	14.00	2282.0	**31948**
	(iii) Hectometer stone	**No.**	61.00	637.0	**38857**
	(iv) Boundary stones @200 m interval	**No**	154.00	522.0	80388.00
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**	6000.00	629.00	**3774000**
	(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.**	8.00	8072.0	**64576**
	(ii) Cautionary sign 900 mm triangular	**No.**	58.00	6455.0	**374390**
	(iii) Mandatory sign 600 mm circular	**No.**	50.00	5621.0	**281050**
	(iv) Mandatory sign 900 mm octagon	**No.**	4.00	10461.0	**41844**
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**	3.25	82561.41	**268325**
	(ii) Sign board made out of 2mm thick aluminum sheet, face to be fully covered by high intensity grade retro-reflective sheeting fixed on iron frame as per drawing with additional bracing at every 600 mm c/c if any dimension exceeds 1200mm.	**Sqm**	17.23	17060.00	**293859**
7.050					
	(i) Triangular object marker 300mm equilateral triangle containing cluster of red reflector on frame of ISA 35mmx35mmx3mm with fixing on post made of ISA 40mmx 40mmx 5mm at 650 mm above ground level	**No.**	58.00	3634.00	**210772**
	(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.**	102.00	7555.00	**770610**
	(iii) Roadway Indicator 1000mm high made by 100mm square MS pipe containing rectangular reflector of 120mm x 80mm and alternate white and black bands of 150mm including coverage of reflector by 150mm high wire mesh	**No.**			
7.060	Providing and fixing road delineators complete as per drawings and Technical Specification Clause 805.	**No.**	6.00	3024.0	**18144**
7.080	Construction of cement concrete kerb with top and bottom width 115 and 265 mm respectively, 225 mm high in M 20 grade PCC on M-10 grade foundation 100 mm thick, foundation having 75 mm projection beyond kerb stone, kerb stone laid with kerb laying machine, foundation concrete laid manually, all complete as per clause 408	**Rmt**	1400.00	323.00	**452200**
7.090	Providing and fixing Cluster of Red Reflector complete as per drawings and Technical Specification Clause 805.	**No.**	7320.00	249.00	**1822680**
	TOTAL OF TRAFFIC SIGN, MARKING ETC...				**8548852**
7.070	Providing & Ninteen degree tilted one way reflective Road Studs	**No.**	7317.60	834.32	**6105220**
Total (Rs)					**14654072**

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Bill Of Quantities - Roads

Item No.	Description	Unit	Qty	Rate (in Rs.)	Amount (Rs.)
Bill No 8: Miscellaneous					
8.010	Routine maintenance including repairs of pot holes, shoulders cleaning of drains/ culverts and bridges, clearing/ cleaning of roadway, clearing / removal of vegetation/ dead animal etc complete as per Technical Specification Clause 3002 and/or as directed by the Engineer.	**Sqm month**	71.50	19712.00	**1409408**
8.020	Construction, provision and maintenance of 7m wide temporary diversion with 300 mm thick subgrade, 200mm granular sub-base, 225mm wet mix macadam and 20mm premix carpet overlaid by sand seal coat.	**Rmt**	650.00	606.00	**393900**
8.030	Traffic management and safety during construction operation as per Technical Specification Clause A-21.	**km**	3.00	500000.00	**1500000**
8.040	Providing & Laying precast cement concrete interlocking TilesM-30 with stone aggregate 20 mm nominal size in cement concrete duly compacted with hydraulic machine including form work placing & fixing in position complete in all respect.	**cum**	650.00	4639.00	**3015350**
	Total (Rs.)				**6318658**

DETAILS OF QUANTITIES

Bill of Quantities of Elevated Structures

Item No.	Description	Unit	Quantity												Total Qty	Rate (Rs.)	Amount (Rs.)
			4+120 to 4+190	4+620 to 4+610	4+760 to 4+850	6+710 to 7+040	7+120 to 7+280	7+450 to 8+420	10+030 to 10+100	10+480 to 10+520	10+650 to 10+720	12+590 to 12+620	12+910 to 12+940	04+400 to 04+460			
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	1333	1592	1822	3893	2197	12946	1362	902	1362	902	902	1316	30628	64.00	1963793.29
	ii) Hard Rock	cum	1333	1592	1822	3893	2197	11611	1362	902	1362	902	902	1316	29193	530.00	15472269.33
	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	7509	7577	9301	9729	8527	22941	7327	6461	6875	6674	4646	7240	104708	1180	123553201.00
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	689	662	815	478	650	677	669	651	614	659	435	666	7654	1719	13156463.82
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	37	44	60	104	69	369	38	26	39	26	26	37	856	5793	4957522.63
	b) M-20 grade	cum															
	c) M-35 grade	cum	414	482	536	1024	602	4315	428	319	428	319	319	409	9594	7667	73560736.21
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	1733	1813	2233	3306	2076	7769	1767	1514	1725	1509	1206	1718	28390	8933	253604837.08
	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	477	614	682	2251	1091	6615	477	273	477	205	205	409	13776	10645	146649778.00
	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	263	288	361	655	351	1823	276	214	269	213	177	261	5150	69233	356548773.16
	b) For Superstructure/Friction Slab/Facia Panels	t	78	102	123	364	180	1035	78	38	78	29	29	74	2207	70607	155826259.86
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	7	7	0	36	14	136	7	10	7	7	7	0	239	178798	42679082.50
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	770	970	1070	3370	1670	9770	770	470	770	370	370	670	21040	1265	26616441.60
6.19	Providing and fixing drainage spouts as per drawings and Technical Specifications Clause 2705	no	28	36	40	132	64	388	28	16	28	12	12	24	808	7545	6096360.00
6.21	Supplying and fixing of POT PTFE bearings complete as per drawings and IRC:83(Part III) - 2002																
	a) Sliding bearing																
	Capacity 1300 kN	no															
	Capacity 2000 kN	no	18	24	30	84	42	234	18	6	18	6	6	18	504	60000	30240000.00
	Capacity 3500 kN	no															
	Capacity 4500 kN	no															
	Capacity 6000 kN	no															
	b) Pin bearing																
	Capacity 1300 kN	no															
	Capacity 2000 kN	no	3	4	5	14	7	39	3	1	3	1	1	3	84	120000	10080000.00
	Capacity 3500 kN	no															
	Capacity 4500 kN	no															
	Capacity 6000 kN	no															
	c) Metallic Guided bearing																
	Capacity 1300 kN	no															
	Capacity 2000 kN	no	3	4	5	14	7	39	3	1	3	1	1	3	84	90000	7560000.00
	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 2500																
	a) 80 mm wide strip seal joints	m															
	b) 40 mm wide strip seal joints	m	44	55	66	165	88	440	44	22	44	22	22	44	1056	13767	14537952.00
	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	154	194	214	674	334	1954	154	94	154	74	74	134	4208	4481	18856048.00
	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	11	11	11	11	11	11	11	11	11	11	11	11	126	4581	577206.00
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	21	21	21	21	21	21	21	21	21	21	21	21	252	10248	2582496.00
6.33	Providing weep holes in abutments, wing walls, retaining walls, return walls etc. complete as per drawings and Technical Specifications Clause 2706	no	1147	1056	1358	796	1084	1128	1115	1084	1023	1089	728	1110	12758	1206	15383648.51
																Total =	1320489870

Consultancy Services for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chuikhim-Nimbong-Kafer-Bakhim-Algarah-Rhenok in the State of West Bengal and from Rhenok-Rorathang-Pakyong along with Spur from Aritar-Relop-Menla in the State of Sikkim.PKG-IV A (BAGRAKOT TO KAFER Km 0 to Km 13) and 2.24km for ROB Approach Loop & NH-31 widening at ROB Locations

Bill of Quantities of Minor Bridge

Item No.	Description	Unit	Girder(1x40m)	BOX(1x10m)	Quantity	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		1089.00	1089	56.00	60984.00
	ii) Hard Rock	cum					
	iii) Soft/ordinary rock	cum				0.00	0.00
	b) Depth above 3.0 m and up to 6.0 m						
	i) all types of soils	cum	838.89		839	64.00	53689.21
	ii) Hard Rock	cum	716.04		716	530.00	379501.20
	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	1782.58	1463.00	3246	1180.00	3829781.45
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	108.52	175.00	284	1719.00	487377.41
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	600.15	33.00	633	5793.00	3667839
	b) M-20 grade	cum					
	c) M-35 grade	cum	183.04		183	7396.00	1353745
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	179	540	719	7396.00	5317595
	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	448		448	10239.00	4587072
	b) M-45 grade in slab	cum					
	c) M-40 grade in box girder	cum					
	d) M-35 grade in box girder	cum			0	9072.00	0
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	35.79	55.00	91	69233.00	6285462
	b) For Superstructure/Friction Slab/Facia Panels	t	62.72		63	70607.00	4428471
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	16.00		16	178798.00	2860768
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						

Consultancy Services for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chuikhim-Nimbong-Kafer-Bakhim-Algarah-Rhenok in the State of West Bengal and from Rhenok-Rorathang-Pakyong along with Spur from Aritar-Relop-Menla in the State of Sikkim.PKG-IV A (BAGRAKOT TO KAFER Km 0 to Km 13) and 2.24km for ROB Approach Loop & NH-31 widening at ROB Locations

Bill of Quantities of Minor Bridge

Item No.	Description	Unit	Girder(1x40m)	BOX(1x10m)	Quantity	Rate (Rs.)	Amount (Rs.)
	per Technical Specification Section 2700	sqm	658.00	239.00	897	1225.80	1099543
6.19	Providing and fixing drainage spouts as per drawings						
	and Technical Specifications Clause 2705	no	16.00	7.00	23	7545.00	173535
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	8.00		8	60,000.00	480000
	Capacity 3500 kN	no					
	Capacity 4500 kN	no					
	Capacity 6000 kN	no					
	b) Pin bearing						
	Capacity 1300 kN	no					
	Capacity 2000 kN	no	1.00		1	120,000.00	120000
	Capacity 3500 kN	no					
	Capacity 4500 kN	no					
	Capacity 6000 kN	no					
	c) Metallic Guided bearing						
	Capacity 1300 kN	no					
	Capacity 2000 kN	no	1.00		1	90,000.00	90000
	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			0		
	b) 40 mm wide strip seal joints	m	32	34	66	13767.00	908622
	c) 20 mm wide filler type joints	m				201	
6.23	Providing Buried type expansion joint complete as per						
	MORTH Modified Interim Specification, drawing and						
	Technical specification	m			0		
6.24	Reinforced Cement Concrete Railing in M-30 grade						
	including reinforcement complete as per drawings and						
	Technical Specifications Sections 1500, 1600, 1700,						
	2200 and Clause 2703	m	94.00	34.00	128	2161.00	276608
6.25	Reinforced Cement Concrete Crash Barrier						
	including reinforcement and MS pipe complete as per						
	drawings and Technical Specifications Sections 1500,						
	1600, 1700, 2200 and Clause 809						
	a) M-30 grade	m					
	b) M-40 grade	m	94.00	34.00	128	4481.00	573568
	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	15.75	16.00	32	4581.00	145447
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	31.50	32.00	64	10248.00	650748
6.30	Providing and laying boulder apron complete as per						
	drawings and Technical Specifications Section 2500	cum			0		
6.31	Providing and laying filter material underneath stone						
	boulder pitching on slopes complete as per drawings and						
	Technical Specifications Section 2500	cum	10.00	32.00	42	1919.00	80598

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Consultancy Services for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chuikhim-Nimbong-Kafer-Bakhim-Algarah-Rhenok in the State of West Bengal and from Rhenok-Rorathang-Pakyong along with Spur from Aritar-Relop-Menla in the State of Sikkim.PKG-IV A (BAGRAKOT TO KAFER Km 0 to Km 13) and 2.24km for ROB Approach Loop & NH-31 widening at ROB Locations

Bill of Quantities of Minor Bridge

Item No.	Description	Unit	Girder(1x40m)	BOX(1x10m)	Quantity	Rate (Rs.)	Amount (Rs.)
6.32	Providing and laying stone boulder pitching on slopes						
	with cement mortar filled joints 1:3 complete as per						
	drawings and Technical Specifications Section 2500	cum	19.00	64.00	83	1589.00	131887
6.33	Providing weep holes in abutments, wing walls, retaining						
	walls, return walls etc. complete as per drawings and						
	Technical Specifications Clause 2706	no	180.87	292.00	473	1206.00	570285
6.41	Cement concrete for bed protection complete as per						
	Technical Specifications Section 2500.						
	(a) M-15 grade for flooring below floor apron	cum		59	59	7314.00	430579
	(b) M-20 grade for flooring	cum					
	(c) M-20 grade for curtain walls.	cum		44	44	5445.00	239700
	(d) M-20 grade for cut off wall	cum					
	(e) M-20 grade for flexible apron	cum		88	88	7314.00	645869
						Total =	39929274

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CH.	ROB	Flyover		ROB Amount			Flyover Amount			
		(New 4L) (3x25+1x45.5+1x40.5m)								
Skew Angle	0.000	0								
			rate							amount
1.0 Excavation										
Total excavation (cum)	791	651	56.00	44,270.89	37,304,930.78	41.90	36,435.17	30,926,598.79	50.18	80706
	791	651	56.00	44,270.89			36,435.17			80706
2.0 Backfilling				-			-			0
Total backfilling (cum)	198	163	1,180.00	233,211.66			191,935.26			425147
				-			-			0
3.0 Levelling Course				-			-			0
Total levelling course (cum)	28	23	5,793.00	164,231.55			132,949.35			297181
				-			-			0
4.0 Piles				-			-			0
Total length of piles	1200	1000	21,142.00	25,370,400.00			21,142,000.00			46512400
MS Liner thickness (m)	0.000	0.000		-			-			0
Quantity for liners (Mton) =	0	0		-			-			0
				-			-			0
5.0 Pile Cap				-			-			0
Total concrete (cum)	399	321	7,787.00	3,103,976.07			2,501,262.27			5605238
				-			-			0
6.0 Open Foundation				-			-			0
Total concrete (cum)	0	0		-			-			0
				-			-			0
7.0 HYSD				-			-			0
Total HYSD (Mton)	121	100	69,136.00	8,344,570.13			6,885,581.58			15230152
	175	166		-			-			0
8.0 Abutment, Piers and Wall				-			-			0
				-			-			0
Abutments				-			-			0
Formation Level =	11.500	11.500		-			-			0
Ht of abutment =	11.500	13.600		-			-			0
Width of dirt wall at top =	12.500	12.500		-	7,506,144.01	8.43	-	8,656,632.40	14.05	0
Width of dirt wall at bottom =	9.000	9.000		-			-			0
Total Height of dirt wall =	2.465	2.465		-			-			0
Uniform Height of dirt wall =	1.000	1.000		-			-			0
Varying Height of dirt wall =	1.465	1.465		-			-			0
Thickness of dirt wall =	0.3	0.3		-			-			0
Width of cap at top =	9.000	9.000		-			-			0
Width of cap at bottom =	3.000	3.000		-			-			0
Uniform thk of cap =	0.6	0.6		-			-			0
Varying thk of cap =	0.9	0.9		-			-			0
Cross Area of abutment column =	4.909	4.909		-			-			0
Length of cap =	3	3		-			-			0
Ht of abutment stem =	6.035	8.135		-			-			0
Min footing thk at edge =	1.5	1.5		-			-			0
Footing thk at junction =	1.5	1.5		-			-			0
Width of Seismic Arrester1=	1.2	1.2		-			-			0
Depth of Seismic Arrester1=	0.3	0.3		-			-			0
Height of Seismic Arrester1=	0.9	0.9		-			-			0
No of Seismic Arrester1=	0	0		-			-			0
Width of Seismic Arrester2=	1.5	1.5		-			-			0
Depth of Seismic Arrester2=	0.5	0.5		-			-			0
Height of Seismic Arrester2=	0.9	0.9		-			-			0
No of Seismic Arrester2=	0	0		-			-			0
Qty of abutment substructure (cum) =	0.0	161.6		-			-			0
R/F @ 150 kg/cum =	0.00	24.24		-			-			0
				-			-			0
Retaining Walls				-			-			0
Length of retaining wall =	0	0		-			-			0
Concrete Qty per meter (cum) =	7.69	10.18		-			-			0
Concrete Qty (cum) =	0.0	0.0		-			-			0
R/F @ 100 kg/cum =	0.0	0.0		-			-			0
				-			-			0
Piers				-			-			0
C/S area of pier wall (sqm) =	4.909	4.909		-			-			0
Ht of pier wall =	8.123	8.123		-			-			0
Width of cap at top =	9.000	9.000		-			-			0
Width of cap at bottom =	3.000	3.000		-			-			0
Uniform thk of cap =	0.6	0.6		-			-			0
Varying thk of cap =	0.9	0.9		-			-			0
Length of pier cap	3.000	3.000		-			-			0
Conc Qty in piers (cum) =	216.8	72.3		-			-			0
R/F @ 125 kg/cum =	27.1	9.0		-			-			0
				-			-			0
			8,656.00							
Total conc qty in substructures (cum)	434	468		3,753,478.53			4,049,028.45			7802507
Total R/F qty in substructures (t)	54.2	66.6	69,233.00	3,752,665.48			4,607,603.95			8360269
				-			-			0
9.0 Superstructure				-			-			0
				-			-			0
Conc Qty in superstructures (cum) =	354.4	0.0	10,239.00	3,628,445.63	38,762,415.10	43.54	-	2,280,000.00	3.70	3628446
R/F Qty in superstructures (t) =	56.7	0	70,607.00	4,003,416.90			-			4003417
Strand Qty in superstructures (t) =	12	0	178,798.00	2,217,653.94			-			2217654
Total Structural Steel (t) =	340.5	0.0	70,607.00	24,041,683.50			-			24041684
Concrete Quantity in Deck Slab (cum)=	116.9	0.0	10,239.00	1,192,843.50			-			1192844
R/F Qty in Deck Slab (t) =	19.8	0.0	70,607.00	1,398,371.64			-			1398372
Wearing Coat (sqm) =	1632	1558	1225.80	2,000,628.18	2,000,628.18	2.25	1,909,796.40	1,909,796.40	3.10	3910425
Elastomer bearing (cucm) =	0	0		-			-			0
Total No of Free bearings =	24	24	60,000.00	1,440,000.00			1,440,000.00			2880000
Total No of Guided bearings =	4	4	90,000.00	360,000.00			360,000.00			720000
Total No of Fixed bearings =	4	4	120,000.00	480,000.00			480,000.00			960000
Expansion Joint (m) =	100	50	13,767.00	1,376,700.00	3,449,813.46	3.88	688,350.00	17,195,067.40	27.90	2065050
Drainage spouts (nos) =	38	33	7,545.00	288,051.33			251,500.00			539551
Crash Barrier (m) =	344	3928	4,042.00	1,388,831.20			15,876,976.00			17265807
Railing (m) =	172	164	2,161.00	371,259.80			354,404.00			725664
RCC in Kerb (cum) =	77	74	323.00	24,971.13			23,837.40			48809
Approach slab (cum) =	0	53	10,248.00	-			538,020.00			538020
PCC below approach slab (cum) =	0	26	4,581.00	-			120,251.25	658,271.25	1.07	120251
			Total	89023932	89023932	100	61626366	61626366	100	150650298
			Total in Cr	8.902393154	8.902393154		6.162636625	6.162636625		15.06502978

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)**	148.00	46,321
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**	1516.00	136,916
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**	5793.00	105,748
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**	5793.00	894,717
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)**	8685.00	214,693
V)	Reinforcement Bar	MT					**2.472**	**14.2**	70607.00	174,541
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	1663.00	114,993
IX)	Weep Holes in Wing Wall	No..				12 X 4	**48**	**13.8**	1206.00	57,888
X)	Drainage Spout	No..				2 X 2	**4**	**14.9**	7545.00	30,180
XI)	RCC railing	Mtr		3.1		2	**6.2**	**14.6**	2161.00	13,398
XII)	600mm Th Filter Media	Mtr	1.65X0.6	0.93	12	2	**22.32**	**13.10**	1719.00	38,368
				Total Cost of One Culvert (2 Lane)					**Rs.**	**1,827,786**
			Total Cost of Culverts..		**43**	**Nos**			**Rs.**	**78,594,793**

Earthwork Quantities (cum)

Total fill area	Cum			202,941
Total Cut area	Cum			467,982
			Excavation Ordinary rock ie 30% of Total Cut	140,394.63
			Excavation Soft Rock with Dozer ie 40% of Total Cut	187,192.85
			Excavation hard Rock Control Blasting) ie 30% of Total Cut	140,394.63
			EW filling from Borrow area	40,588.18
			EW Fill ing from approved mat	162,352.72

BUS BYES

TOTAL QUANTITIES

Item Detail	Unit	No	Length	Width	Quantity	Rate	Amount
SUBGRADE	CU.M	1			199.69	266.00	53,118
Earthen Shoulder		1			0.00	266.00	-
GSB I (Layer-1)	CU.M	1			23.89	2,541.00	60,704
GSB I (Layer-2)	CU.M	1			32.86	2,541.00	83,492
WMM	CU.M	1			55.30	2,558.00	141,457
PRIME COAT	SQ.M	1			203.50	23.00	4,681
TACK COAT	SQ.M	1			407.00	9.00	3,663
DBM	CU.M	1			18.32	8,388.00	153,626
BC	CU.M	1			8.14	9,815.00	79,894
Footpath	sqm	2	165.00	2.5	825.00	750.00	618,750
Road Markings					20.40	500.00	10,200
Bus Shelter Cost		Lump Sum					30,000
Miscellaneous Items							263,000
						Per Bus Bay Cost Rs ...	1,502,585
					Total Cost for....	2 Nos	3,005,171

BUS BYES

BUS BAY

SR. NO.		FROM	TO	LENGTH	CWIDTH	REMARK
1				100.00	2.75	TAPERING 100.0M (0 TO 5.5M)
2				15.00	5.5	BUS STOPING LENGTH
3				50.00	2.75	TAPERING 50.0M (5.5 M TO 0.0)

DESIGN LENGTH **(Tapered width 0 to 5.5m)** **165.00 m**

Item Detail		Unit	Sides	Length	Avg .Width	Thickness	Total
BC		CU.M	1	22.00	2.75	0.040	2.42
DBM		CU.M	1	22.00	2.75	0.090	5.45
TACK COAT		SQ.M	2	22.00	2.75		121.00
PRIME COAT		SQ.M	1	22.00	2.75		60.50
WMM		CU.M	1	22.00	3.05	0.250	16.78
GSB I (Layer-1)		CU.M	1	22.00	3.35	0.100	7.37
GSB I (Layer-2)		CU.M	1	22.00	4.87	0.100	10.71
SUBGRADE		CU.M	1	22.00	6.07	0.500	66.77
Earthen Shoulder			2	22.00	2.00	0.480	0.00

Road Markings

edge lines	2 side	2	22.00	0.15	6.600
lane markings	1 side	2	11	0.1	1.467

Note: Total length of Lane markings is taken 1/3 because after every 6m interval 3m will be left gap

At Bus shelter (stoppage) location, length 15.0m and width is 5.5m

Item Detail		Unit	Sides	Length	Width	Thickness	Total
BC		CU.M	1	15.00	5.500	0.040	3.30
DBM		CU.M	1	15.00	5.50	0.090	7.43
TACK COAT		SQ.M	2	15.00	5.50		165.00
PRIME COAT		SQ.M	1	15.00	5.50		82.50
WMM		CU.M	1	15.00	5.80	0.250	21.75
GSB I (Layer-1)		CU.M	1	15.00	6.10	0.100	9.15
GSB I (Layer-2)		CU.M	1	15.00	7.62	0.100	11.43
SUBGRADE		CU.M	1	15.00	8.82	0.500	66.15
Earthen Shoulder			2	15.00	2.00	0.480	0.00

Road Markings

edge lines	2 side	2	15.00	0.15	4.500
lane markings	1 side	1	7.5	0.1	0.500

Note: Total length of Lane markings is taken 1/3 because after every 6m interval 3m will be left gap

Tapered length 22.0m and width varying from 5.50m to 0.0

Item Detail		Unit	Sides	Length	Width	Thickness	Total
BC		CU.M	1	22.00	2.750	0.040	2.42
DBM		CU.M	1	22.00	2.75	0.090	5.45
TACK COAT		SQ.M	2	22.00	2.75		121.00
PRIME COAT		SQ.M	1	22.00	2.75		60.50
WMM		CU.M	1	22.00	3.05	0.250	16.78
GSB I (Layer-1)		CU.M	1	22.00	3.35	0.100	7.37
GSB I (Layer-2)		CU.M	1	22.00	4.87	0.100	10.71
SUBGRADE		CU.M	1	22.00	6.07	0.500	66.77
Earthen Sholder		CU.M	2	22.00	2.000	0.480	0.00

Road Markings

edge lines	2 side	2	22.00	0.15	6.600
lane markings	2 side	1	11	0.1	0.733

Note: Total length of Lane markings is taken 1/3 because after every 6m interval 3m will be left gap

Consultancy Services for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chuikhim-Nimbong-Kafer-Bakhim-Algarah-Rhenok in the State of West Bengal and from Rhenok-Rorathang-Pakyong along with Spur from Aritar-Relop-Menla in the State of Sikkim.PKG-IV A (BAGRAKOT TO KAFER Km 0 to Km 13) and 2.24km for ROB Approach Loop & NH-31 widening at ROB Locations

BUS BYES (MISCELLANEOUS ITEMS)

S.I.	ITEM	UNIT	NOS	LENGTH	BREADTH	HEIGHT	QUANTITY	RATE	AMOUNT
1	**Delinators**							**22.885**	
	Supplying and installation of delineators (road way indicators, hazard markers, object markers), 80-100 cm high above ground level, painted black and white in 15 cm wide strips, fitted with 80 x 100 mm rectangular or 75 mm dia circular reflectorised panels at the top, buried or pressed into the ground and conforming toIRC-79 and the drawings.								
	Bus Bay	Nos.	1	6			6.00	**2,815.400**	**16,892.40**
2	**Hot applied Thermoplastic**								
	Providing and laying of hot applied thermoplastic compound 2.5 mm thick including reflectorising glass beads @ 250 gms per sqm area, thickness of 2.5 mm is exclusive of surface applied glass beads as per IRC:35 .The finished surface to be level, uniform and free from streaks and holes.								
	Bus Bay	sqm.	2	59	0.15		17.7	**1053.74**	**18,651.20**
3	**Traffic signages 900 mm size**								
	Providing and fixing of retro- reflectorised cautionary, mandatory and informatory sign as per IRC :67 made of high intensity grade sheeting vide clause 801.3, fixed over aluminium sheeting, 1.5 mm thick supported on a mild steel angle iron post 75 mm x 75 mm x 6 mm firmly fixed to the ground by means of properly designed foundation with M15 grade cement concrete 45 cm x 45 cm x 60 cm, 60 cm below ground level as per approved drawing							5156.05	
	90 cm Equilateral Triangle (Giveway Sign)	No.	1				1	**5798.07**	5,798.07
4	**Cat eyes/Road studs**								
	Road Markers/Road Stud with Lense Reflector (Providing and fixing of road stud 100x 100 mm, vide cl. 804.2 of MORTH (5th Revision), resistant to corrosive effect of salt and grit, fitted with lense reflectors, installed in concrete or asphaltic surface by drilling hole 30 mm upto a depth of 60 mm and bedded in a suitable bituminous grout or epoxy mortar, all as per BS 873 part 4:1973)								
	@ 5 m c/c	No	1	20			20.00	**834.32**	16,686.40
5	**Direction Signs**								
	Providing and erecting direction and place identification retro- reflectorised sign as per IRC :67 made of high intensity grade sheeting vide clause 801.3, fixed over aluminium sheeting, 2 mm thick with area exceeding 0.9 sqm supported on a mild steel angle iron post 75 mm x 75 mm x 6 mm, 2 Nos. firmly fixed to the ground by means of properly designed foundation with M 15 grade cement concrete45 cm x 45 cm x 60 cm, 60 cm below ground level as per approved drawing								
	Advance sign for Bus Stop	sqm.	1	0.66			0.66	13522.87	**8,925.09**
6	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.								
	Tapered & Bus Stop portion	sqm	1	24	1.5		36	**1501.65**	**54,059.40**
7	**Channel Kerb**								
	Construction of cement concrete kerb with top and bottom width 115 and 165 mm respectively, 250 mm high in M 20 grade PCC on M-10 grade foundation 150 mm thick, foundation having 50 mm projection beyond kerb stone, kerb stone laid with kerb laying machine, foundation concrete laid manually, all complete as per clause 408								
	Tapered & Bus Stop portion	Rm	1	59			59	482.45	28,464.55
8	**Road Lighting**	Nos	2					**56735**	113,470.00
								Total	**262,947.11**
								Say	**263,000.00**

BOQ - Traffic Signs, Marking and Road Appurtenances

Road Signs

Sl No.	Item	Total Nos	Remarks
(i)	90 cm equilateral triangle	58	Has been considered in LHS & RHS Curve and at Cross road
(ii)	60 cm circular	50	Has been considered at the location where design speed is less than equal to 50 kmph
(iii)	90 cm high octagon	4	Has been considered at major junction
(iv)	Informatory Sign Boards	8	Has been considered at important village location
(v)	Hazard Marker Sign Boards	102	Has been considered at start and end of culvert,island,bridge, location
(vi)	Village Name Boards of size 900x600	15	Has been considered at village locations
(vii)	Place Identification Boards of size 1200x900	2	Has been considered at petrol pump, health center, hospital,govt office, dhaba
(viii)	Advance Direction Sign Boards of 1800x1200	6	Has been considered at important eating place and major junctions
(ix)	Chevron boards of size 600x450	60	Has been considered at locations of curves @35m C/C

Road Marking

	Items	Sides	Length (m)	Width (m)	Area (sqm)	Remarks
1	Lane marking in straight portion	0.5	11006	0.1	550	(RM-02)-@3m Marking per m Length
2	Lane marking in curve portion	0.5	4234	0.1	212	(RM-03)-@3m Marking per m Length
3	Edge line marking	2	15240	0.15	4572	(RM-01)-Continuous marking
				Total=	**5334**	
				Add 10% extra for other marking=	**533**	
				Grand total=	**5867**	
				Say	**6000**	

Km Stone, Hectometer Stone and Boundary Stone

Total Length ... 15.24 Kms

Sl. No.	Item	No.	Calculation Backup
a)	5th Kilometer stones	3	(Total Length/5)
b)	Kilometer stones	14	(Total Length) - No.of km 5th Stones
c)	Hectometer stones	61	(Total Lengthx5) - No.of km 5th Stones - No.of km Stones
d)	Boundary stones	154	(Total Lengthx5x2) + 2

Delineators

Sl.No	Location	Nos / Facility	Total Nos	Remarks
a)	Solar Blinker	6	6.00	At start and end of the Major Junctions

Calculation for Roadway Stud

	Location	Length	No. of Studs	Remarks
	Total length	15240	6098	@ 15m spacing
			1220	10 % for Junction and Zebra crossing
		Total=	7318	
		Say	**7320**	

Trapezoidal Reflactor

	Location	No	Remarks
	Over Metal Beam	5080	@ 3mt spacing
	Over Guard Post	3048	@ 5mt spacing
	Total	**8128**	

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
1.00	Major Junction	1.100	1.125		1	1.13
					Total area (sqm)=	94.43

Parapet Wall

	Location	Length	
	Deficient curves - As per annexure	1,449	Mtr
	more than 3 Meters	4,090	Mtr
		5,539	Mtr

Consultancy Services for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chuikhim-Nimbong-Kafer-Bakhim-Algarah-Rhenok in the State of West Bengal and from Rhenok-Rorathang-Pakyong along with Spur from Aritar-Relop-Menla in the State of Sikkim.PKG-IV A (BAGRAKOT TO KAFER Km 0 to Km 13) and 2.24km for ROB Approach Loop & NH-31 widening at ROB Locations

Budgetary Estimate of Mechanically Stabilized Reinforced Earth Wall

S.No.	Particular of Items			Unit	Quanitites	Rate (in INR)	Amount (in INR)
	Mechanically Stabilized Reinforced Earth Wall						
1	Mechanically Stabilized Reinforced Earth Wall with precast RCC panel as facing as per clause 3105.1 of MoRT&H specifications Designing and construction of Mechanically Stabilized Reinforced Earth Wall with precast RCC panel including precasting & erection as approved by the engineer-in-chief, to the required line, grade, and cross section using Polymeric Strap (50mm wide strap), mechanically connected with the facing element) as per design length. Facing units are to be seated on PCC levelling pad (350mm wide and 150mm depth) of M15 grade of concrete before placing of the very first layer of panels and after that panels to be placed on each other till completion as per approved drawing and specification including cost of polymeric strap materials, connectors to the facia elements, non-woven geo-textile, fasteners and all accessories etc., cost of all materials, prefabricated form works, excluding the cost of steel reinforcement rebars & concrete used in precast RCC panels.			Sqm of face area			
	(a) For Height Range from 0 to 10m.				21,675	2,595	56,246,625.00
2	PCC M-15 Grade for levelling pad (350mm wide x 150mm thick)			Cum	89	4,714	420,724.50
3	Labour cost for precasting and Installation of Mechanically Stabilized Reinforced Earth Wall			Sqm of face area	21,675	600	13,005,000.00
4	Providing and Laying of selected backfill soil as per MoRT&H's specification behind the RCC precast facing element to a full height compacted to a firm condition complete as per drawings and Technical Specification.			Cum of filling	145,819	380	55,411,053.75
5	Providing 600 mm drainage gallery as as per MoRT&H's specification between the RCC Precast facia panels and Reinforced Earth zone.			Cum	13,005	889	11,561,445.00
6	M-35 Grade of concrete in Precasting of RCC facia Panels including all lead and lift, loading, unloading and hire charges of machineries.			Cum	3,902	7,254	28,301,481.00
7	Friction Slab			Meter	1,378	9,000	12,402,000.00
8	HYSD Reinforcement bars in Precasting of RCC facia Panels including all lead and lift, loading, unloading, hire charges of machineries.			MT	130	69,233	9,003,751.65
						Total Cost of Reinforced Earth Composite System Works (in INR)...	**186,352,081**
						Total in Cr ...	**18.64**

Consultancy Services for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chuikhim-Nimbong-Kafer-Bakhim-Algarah-Rhenok in the State of West Bengal and from Rhenok-Rorathang-Pakyong along with Spur from Aritar-Relop-Menla in the State of Sikkim.PKG-IV A (BAGRAKOT TO KAFER Km 0 to Km 13) and 2.24km for ROB Approach Loop & NH-31 widening at ROB Locations

TREE CUTTING PLAN LIST

S. No.	DESIGN CHANIGE		TREE GIRTH-I 300mm to 600mm		TREE GIRTH-II 600mm to 900mm		TREE GIRTH-III 900mm to 1800mm		TREE GIRTH-IV above 1800mm	
	From	To	LHS	RHS	LHS	RHS	LHS	RHS	LHS	RHS
1	0+000	1+000			1	3	5	30	2	23
2	1+000	2+000			8	6	16	18	2	2
3	2+000	3+000					6	16	1	1
4	3+000	4+000			5	7	8	22	5	0
5	4+000	5+000			4	5	36	27	10	0
6	5+000	6+000				3	16	18	1	1
7	6+000	7+000					18	3	0	0
8	7+000	8+000					17	37	0	0
9	8+000	9+000					9	13	2	1
10	9+000	10+000					7	8	0	2
11	10+000	11+000					4	19	5	6
12	11+000	12+000					10	4	0	0
13	12+000	13+000			2		10	20	2	5
		TOTAL	0	0	20	24	162	235	30	41
		G. TOTAL=	0		44		397		71	

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	5190	20,950	**108,730,500.00**	**10.87**
	Total ...		**5190**		**108,730,500.00**	10.87

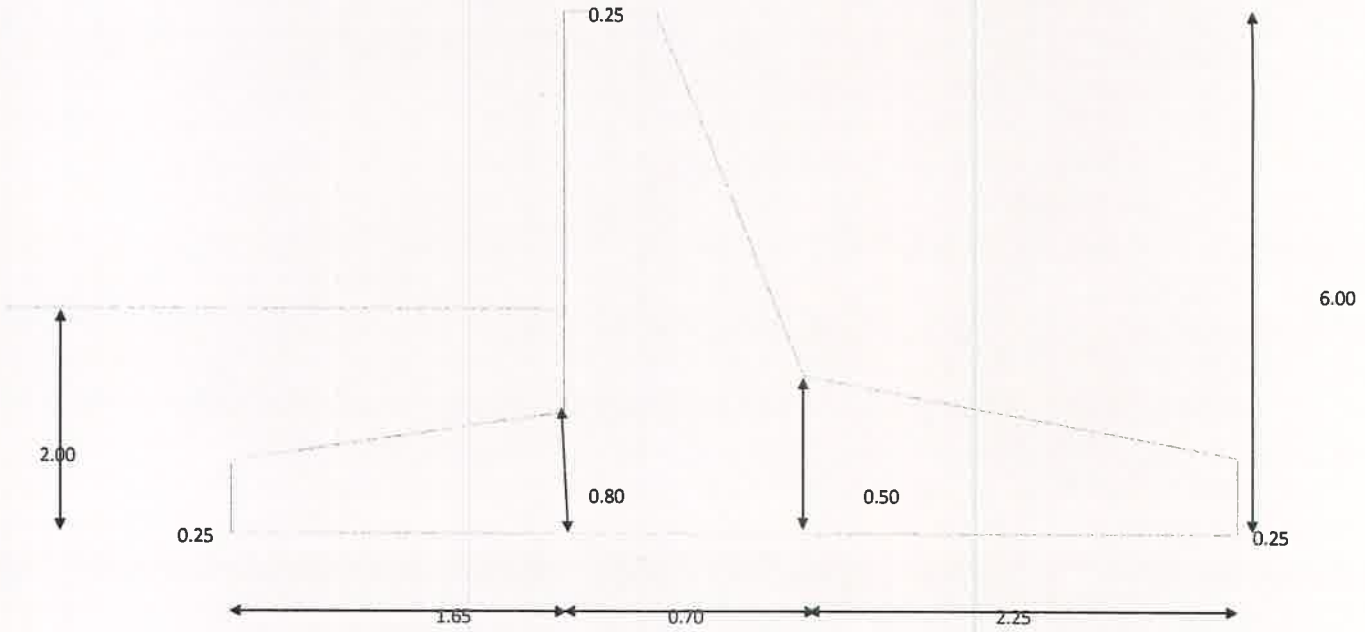
	Height (m)	Left Side	Right Side
		length (km)	length (km)
Breast Wall	4	2.88	2.31

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	0	22726	-	0.00
2	Retaining wall of 5 m Height	5	0	40069	-	0.00
3	Retaining wall of 6 m Height	6	230	52834	12,151,798.06	1.22
4	Retaining wall of 7 m Height	7	330	72115	23,797,789.81	2.38
5	Retaining wall of 8 m Height	8	260	93988	24,437,001.96	2.44
6	Retaining wall of 9 m Height	9	420	135983	57,113,009.23	5.71
7	Retaining wall of 10 m Height	10	280	169307	47,406,094.40	4.74
8	Retaining wall of 11 m Height	11	190	197716	37,566,015.22	3.76
9	Retaining wall of 12 m Height	12	40	216550	8,661,998.46	0.87
10	**Total ...**		**1750**		**211,133,707.15**	21.11

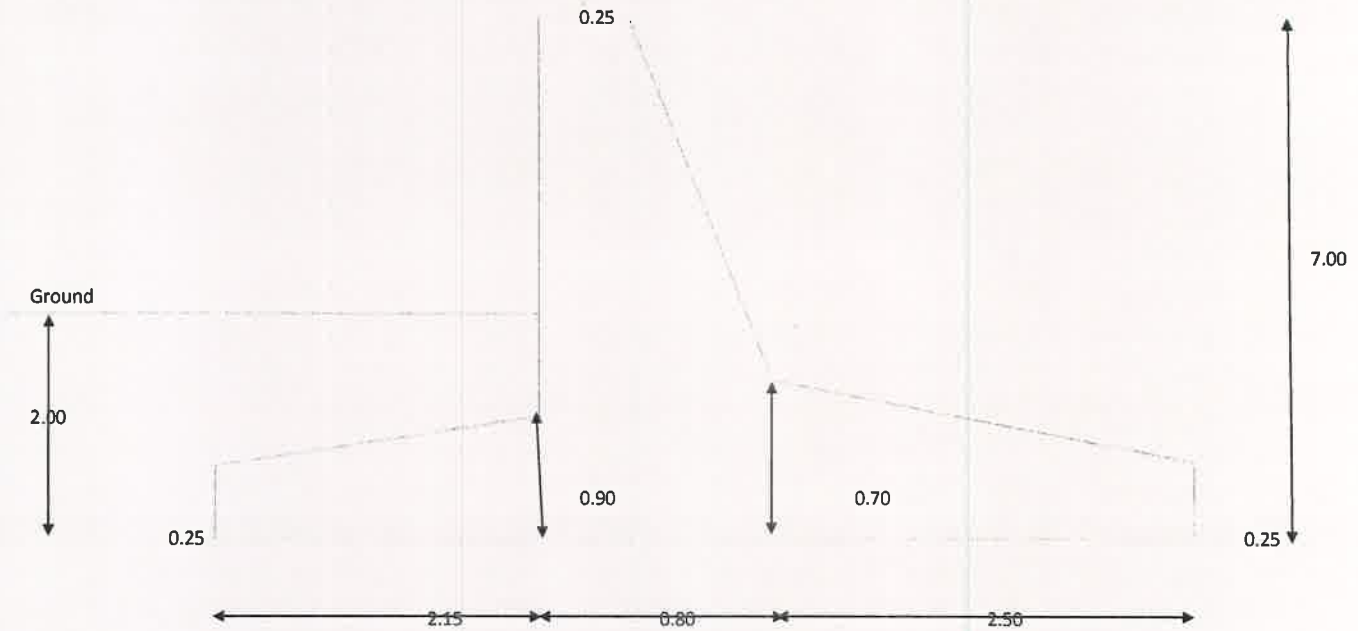
	Left Side	Right Side
	length (km)	length (km)
Retaining wall	0.68	1.07

Calculation of Retaining Wall (Height 6 m)



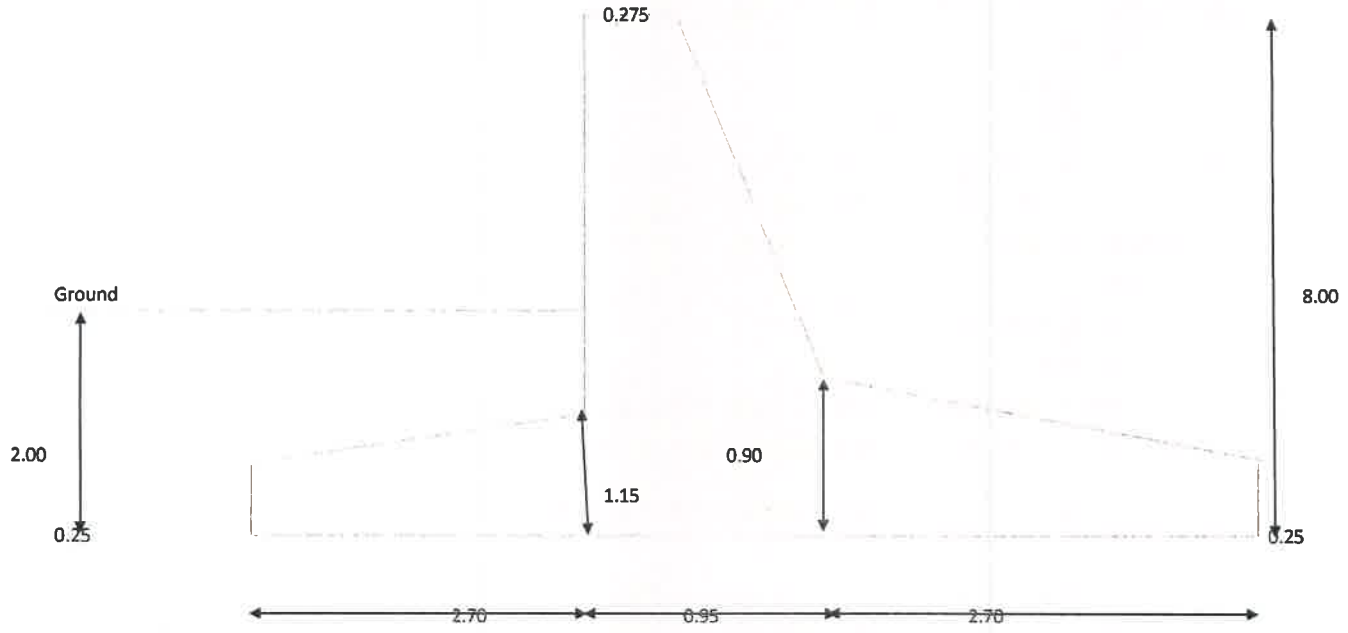
Sr. No	Item Description	Length (m)	Breadth (m)	Height (m)	QTY.	Unit	Rate	Amount
1.00	Excavation	1.00	5.60	2.10	11.76	cum	171.00	2,010.96
2.00	PCC M-15	1.00	4.80	0.10	0.48	cum	5,214.00	2,502.72
3.00	RCC M30				**4.62**	cum	6,804.00	31,408.97
	Footing	1.00	4.60	0.25	1.15		-	
		1.00	1.65	0.55	0.45	cum	-	
		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	62,310.00	23,011.08
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 ,,,,		55,614.64

Calculation of Retaining Wall (Height 7 m)



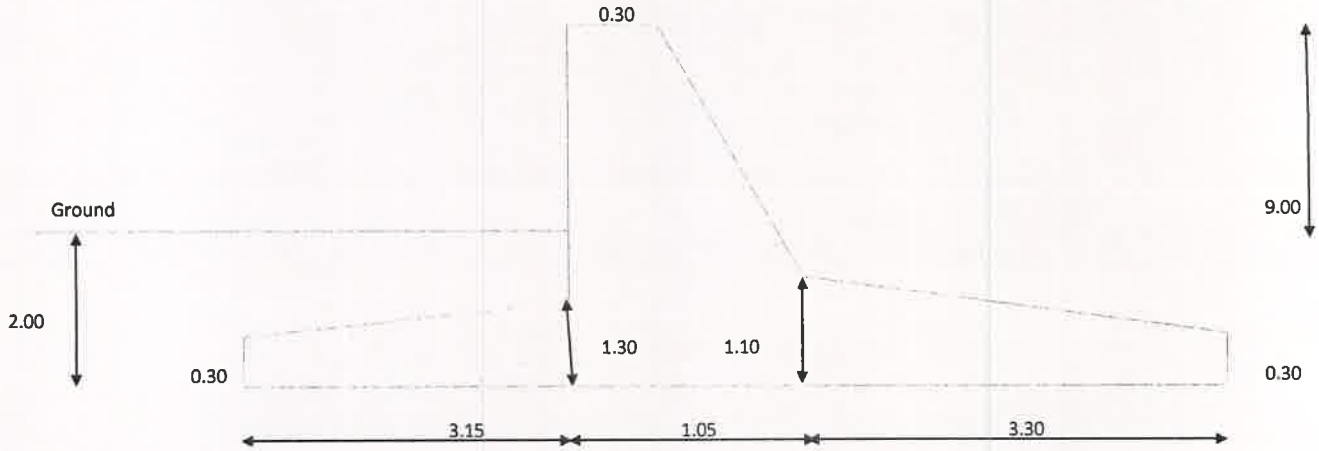
Sl. No	Item Description	Length (m)	Breadth (m)	Height (m)	QTY.	Unit	Rate	Amount
1.00	Excavation	1.00	6.45	2.10	13.55	cum	171.00	2,316.20
2.00	PCC M-15	1.00	0.20	0.10	0.02	cum	5,214.00	104.28
3.00	RCC M30				**6.17**	cum	6,804.00	41,963.67
	Footing	1.00	5.45	0.25	1.36		-	
		1.00	2.15	0.65	0.70	cum	-	
		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	62,310.00	30,743.75
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 ,,,,		**75,910.02**

Calculation of Retaining Wall (Height 8 m)



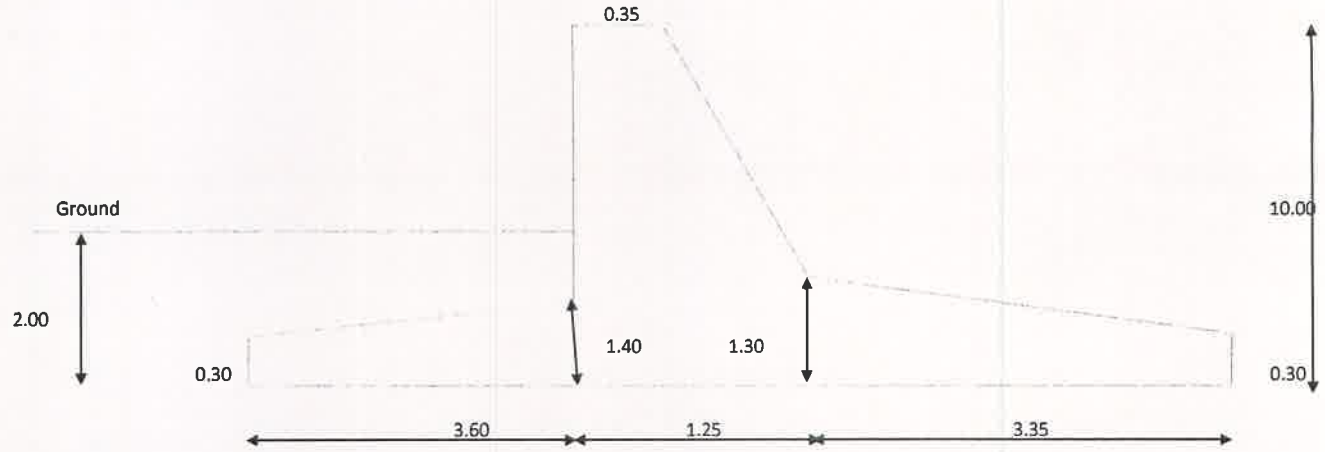
Sr. No	Item Description	Length (m)	Breadth (m)	Height (m)	QTY.	Unit	Rate	Amount
1.00	Excavation	1.00	7.35	2.10	15.44	cum	171.00	2,639.39
2.00	PCC M-15	1.00	6.55	0.10	0.66	cum	5,214.00	3,415.17
3.00	RCC M30				8.43	cum	6,804.00	57,336.46
	Footing	1.00	6.35	0.25	1.59		-	
		1.00	2.70	0.90	1.22	cum	-	
		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	62,310.00	42,006.29
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 ,,,,		98,935.23

Calculation of Retaining Wall (Height 9 m)



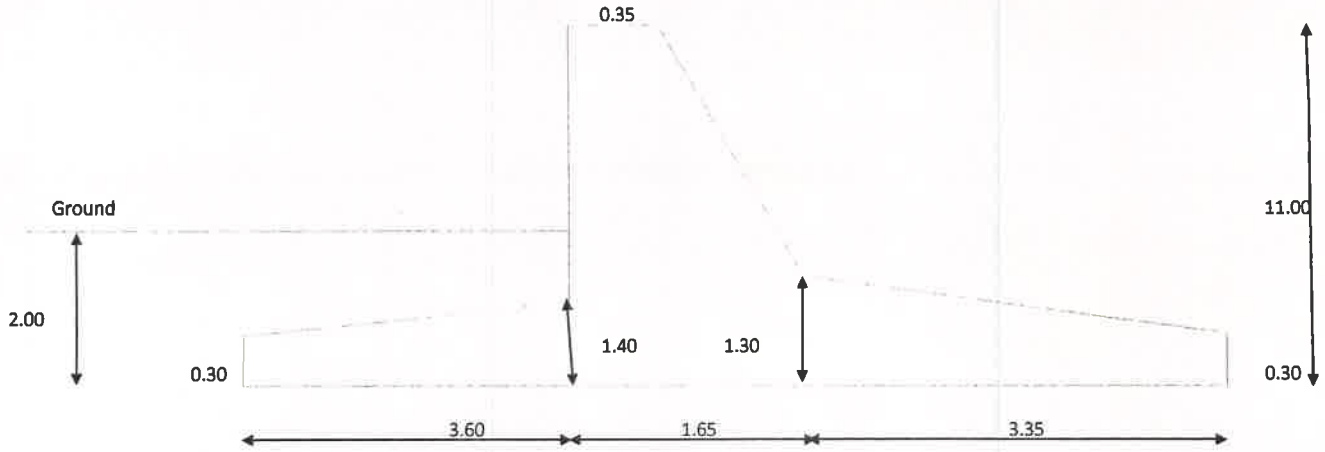
Sr. No	Item Description	Length (m)	Breadth (m)	Height (m)	QTY.	Unit	Rate	Amount
1.00	Excavation	1.00	8.50	2.10	17.85	cum	171.00	3,052.35
2.00	PCC M-15	1.00	7.70	0.10	0.77	cum	5,214.00	4,014.78
3.00	RCC M30				**11.02**	cum	6,804.00	74,963.07
	Footing	1.00	7.50	0.30	2.25		-	
		1.00	3.15	1.00	1.58	cum	-	
		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	62,310.00	54,920.03
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 ,,,,		**143,140.37**

Calculation of Retaining Wall (Height 10 m)



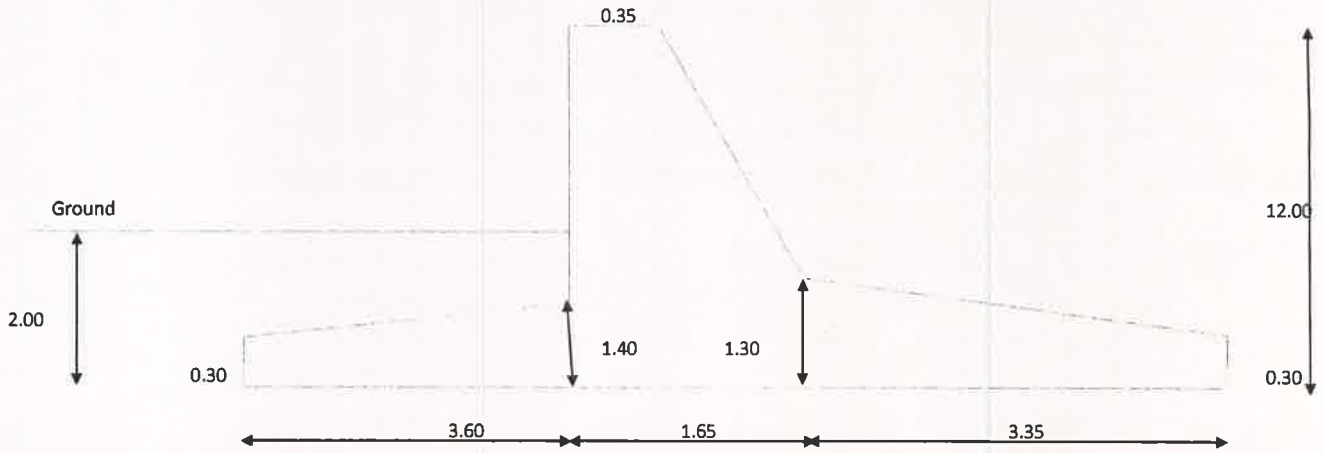
Sr. No	Item Description	Length (m)	Breadth (m)	Height (m)	QTY.	Unit	Rate	Amount
1.00	Excavation	1.00	9.20	2.10	19.32	cum	171.00	3,303.72
2.00	PCC M-15	1.00	8.40	0.10	0.84	cum	5,214.00	4,379.76
3.00	RCC M30				13.88	cum	6,804.00	94,405.50
	Footing	1.00	8.20	0.30	2.46		-	
		1.00	3.60	1.10	1.98	cum	-	
		1.00	3.35	1.00	1.68	cum	-	
	Shear key	1.00	0.30	0.00	0.00	cum	-	
	Stem	1.00	0.80	9.70	7.76	cum	-	
4.00	HYSD Steel				1.11	MT	62,310.00	69,164.10
4.00	Steel (HYSD 80kg/cum)				1.11	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 ,,,,		178,218.40

Calculation of Retaining Wall (Height 11 m)



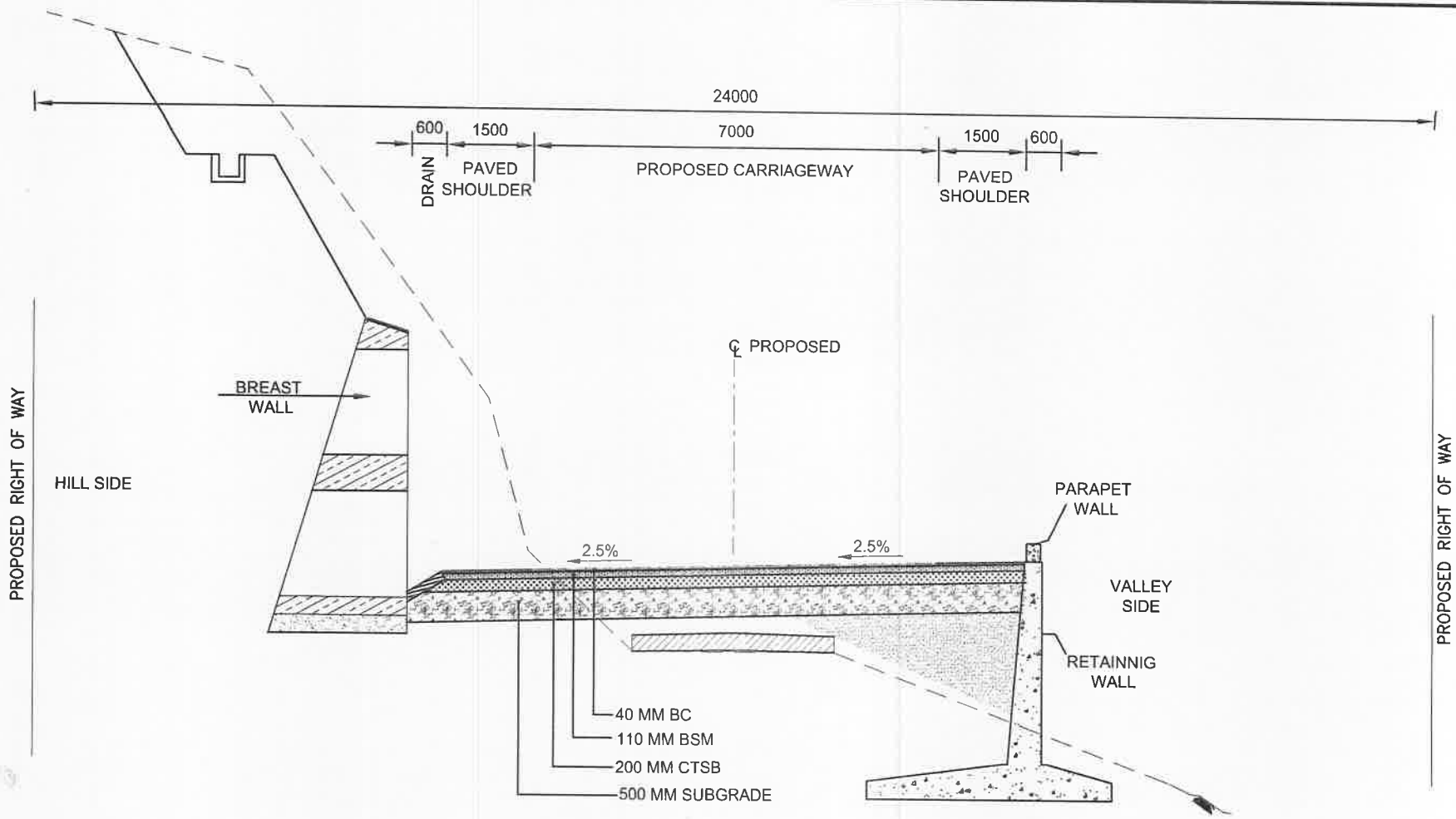
Sr. No	Item Description	Length (m)	Breadth (m)	Height (m)	QTY.	Unit	Rate	Amount
1.00	Excavation	1.00	9.60	2.10	20.16	cum	171.00	3,447.36
2.00	PCC M-15	1.00	8.80	0.10	0.88	cum	5,214.00	4,588.32
3.00	RCC M30				**16.94**	cum	6,804.00	115,225.74
	Footing	1.00	8.60	0.30	2.58		-	
		1.00	3.60	1.10	1.98	cum	-	
		1.00	3.35	1.00	1.68	cum	-	
	Shear key	1.00	0.30	0.00	0.00	cum	-	
	Stem	1.00	1.00	10.70	10.70	cum	-	
4.00	HYSD Steel				1.35	MT	62,310.00	84,417.59
4.00	Steel (HYSD 80kg/cum)				1.35	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 ,,,,		208,121.97

Calculation of Retaining Wall (Height 12 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	171.00	3,447.36
2.00	PCC M-15	1.00	8.80	0.10	0.88	cum	5,214.00	4,588.32
3.00	RCC M30				**17.94**	cum	6,804.00	122,029.74
	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	11.70	11.70	cum	-	
4.00	HYSD Steel				1.43	MT	62,310.00	89,402.39
4.00	Steel (HYSD 80kg/cum for stem)				1.43	MT	-	
5.00	Soil Filling upto 1m at Toe side				37.52	cum	226.00	8,479.52
		1.00	3.35	11.20	37.52	cum	-	
						Total ,,,,		227,947.33

DRAWINGS



TCS-I

Two Lane With Paved Shoulder Raised Portion(Hill Section)

Note:-

Hill cutting slope should not exceed 60°,

1.5m benching to be provided at every 10m height.

REV	DATE	DESCRIPTION OF REVISIONS	INITIALS
01	Jan 2018	Modification after Pre-bid Query	

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

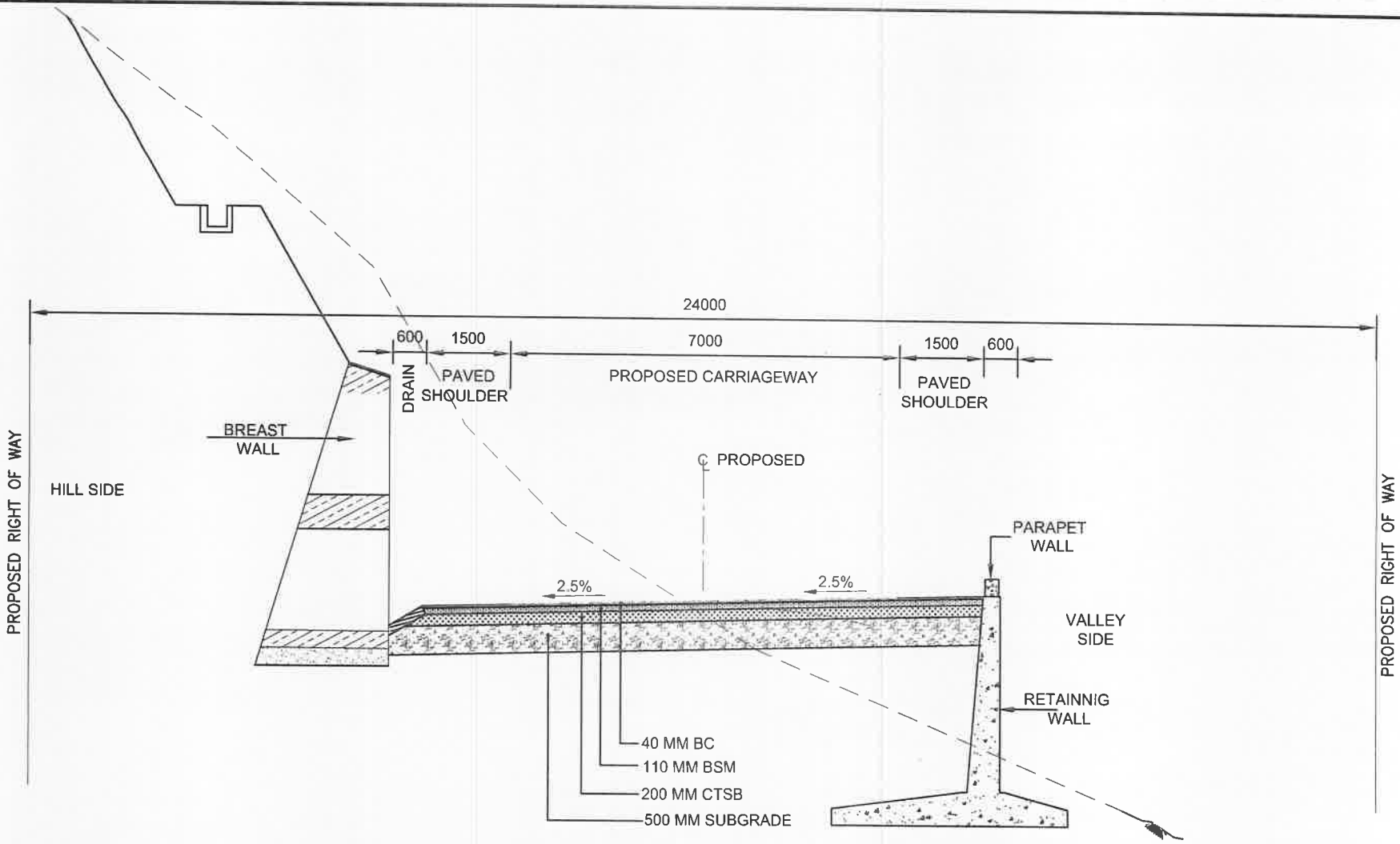
Project : Consultancy for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chuikhim-Nimbong-Kafer-Bakhim-Algarah-Rhenok in the State of West Bengal and From Rhenok-Rorathang-Pakyong along with Spur From Antar-Rolep-Menla in the State of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

DATE : Jan-2018		Revision	R0
DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED BY
P.S	Manish	P.S	L.A.Z.

SCALE:- NTS

PACKAGE-IV
PART OF BAGRAKOT TO KAFER
TYPICAL CROSS SECTION

Dwg. No. :-
SAICPL-SESPL/NHIDC/WB-SKM/01



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

Note:-

Hill cutting slope should not exceed 60°,
1.5m benching to be provided at every 10m height.

01	Jan 2018	Modification after Pre-bid Query	
R/N	DATE	DESCRIPTION OF REVISIONS	INITIALS

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, Logistic Park,
Plot No. 7A1, Sector-132, Noida 201301, Uttar Pradesh

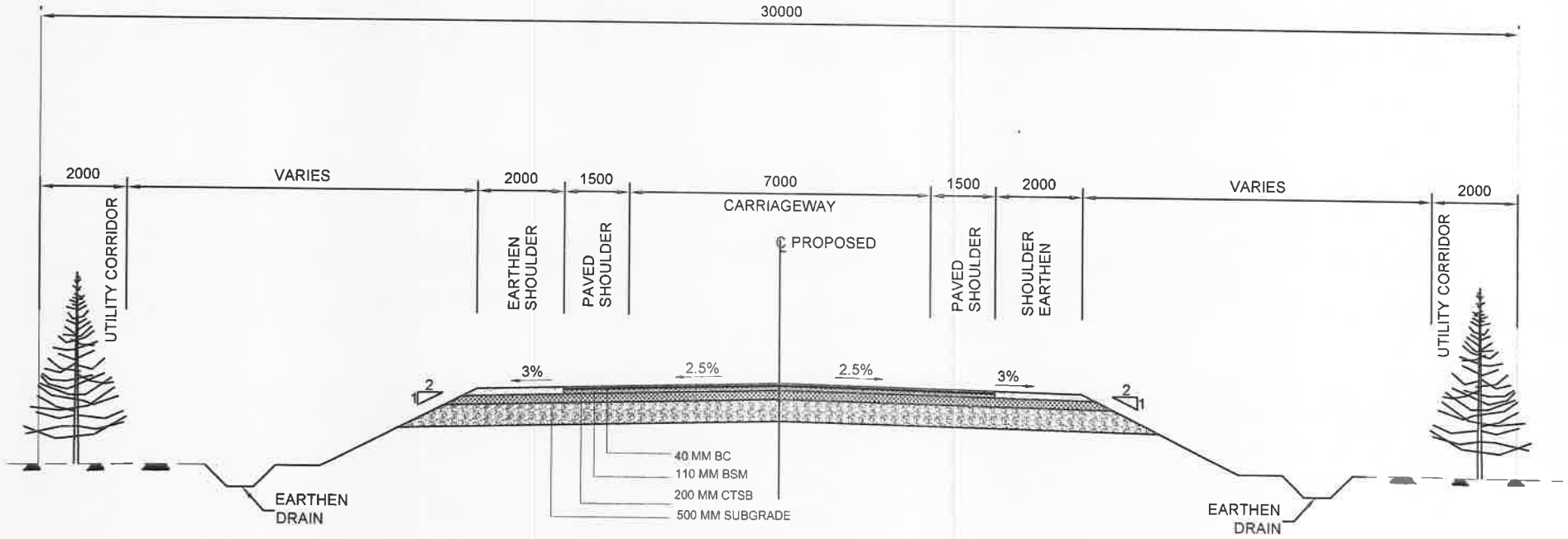
Project : Consultancy for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chuikhim-Nimbong-Kafer-Bakhim-Algarah-Rhenok in the State of West Bengal and From Rhenok-Rorathang-Pakyong along with Spur From Aritar-Rolep-Menla in the State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

DATE : Jan–2018		Revision	R0
DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED BY
P.S	Naresh	P.S	L.A.Z.

SCALE:- NTS

PACKAGE-IV
PART OF BAGRAKOT TO KAFER
TYPICAL CROSS SECTION

Dwg. No. -
SAICPL-SESPL/NHIDC/WB-SKM/ 02



TCS-III

Two Lane with Paved Shoulder (Open Country-Plain/Rolling Terrain)

REV	DATE	DESCRIPTION OF REVISIONS	INITIALS
01	Jan 2018	Modification after Pre-bid Query	

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, IT 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 : Jan–2018		Revision	R0
DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED BY
P.S	Manish	P.S	L.A.Z.

SCALE:- NTS

PACKAGE-IV
PART OF BAGRAKOT TO KAFER
TYPICAL CROSS SECTION

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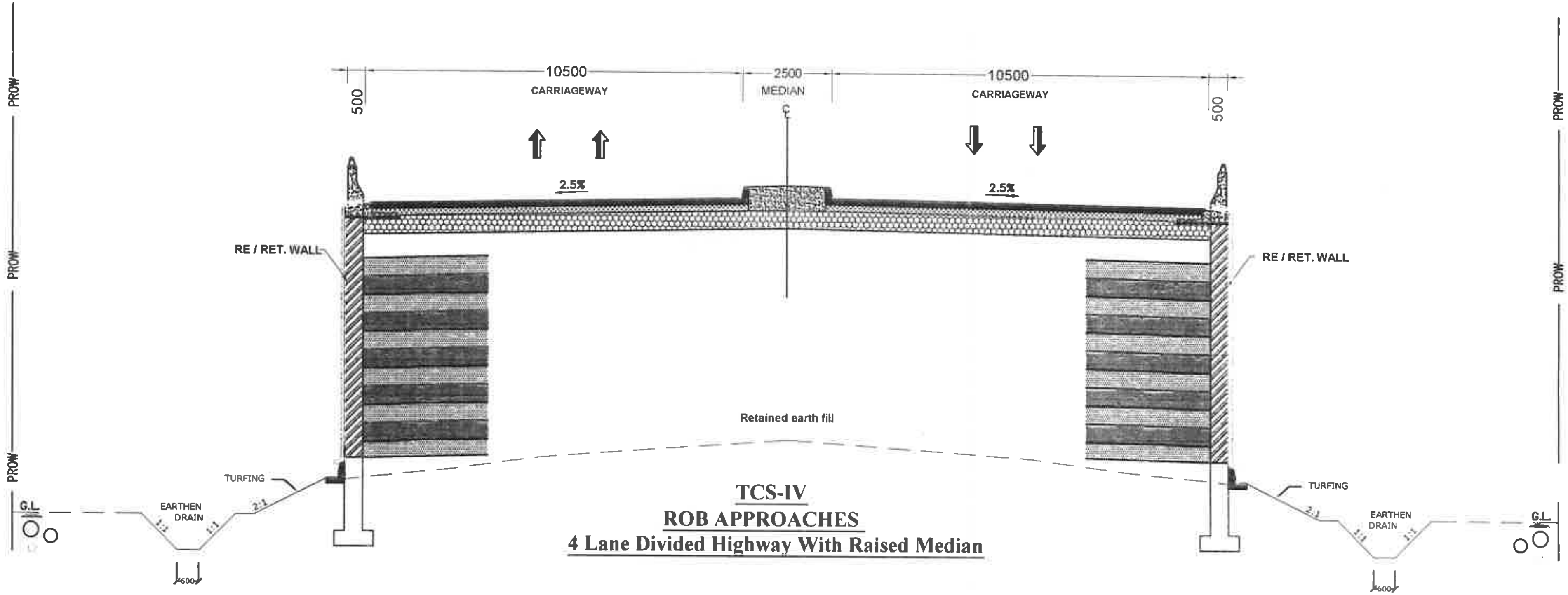
SAICPL-SESPL/NHIDC/WB-SKM/03



TCS-IV
ROB APPROACHES
4 Lane Divided Highway With Raised Median

REV	DATE	DESCRIPTION OF REVISIONS	INITIALS
01	Jan 2018	Modification after Pre-bid Query	

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

Consultant : SA INFRASTRUCTURE CONSULTANTS PVT. LTD.

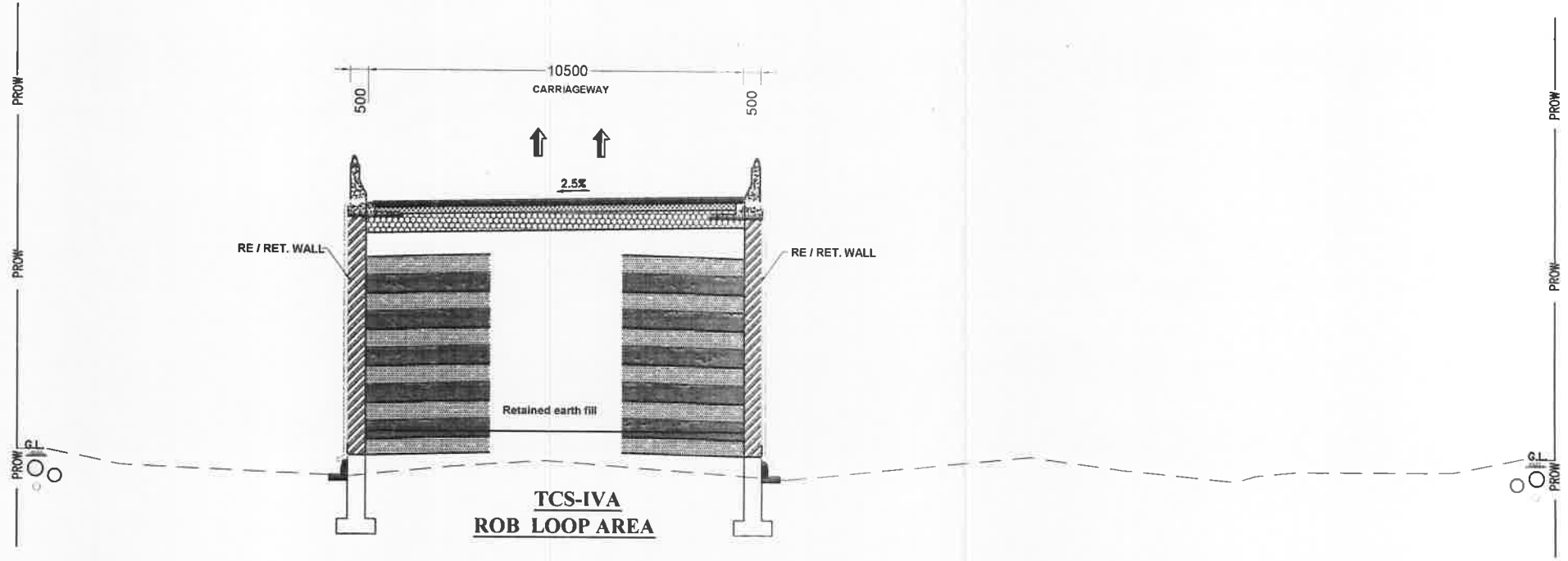
Project : Consultancy for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chukhim-Nimbong-Kafer-Bakhim-Algarah-Rhenok in the State of West Bengal and From Rhenok-Rorathang-Pakyong along with Spur From Antal-Rolep-Menla in the State of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

DATE : Jan–2018		Revision	R0
DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED BY
P.S		P.S	L.A.Z.

SCALE:- NTS

PACKAGE-IV
PART OF BAGRAKOT TO KAFER
TYPICAL CROSS SECTION

Dwg. No :- SAICPL-SESPL/NHIDC/WB-SKM/ 04



TCS-IVA
ROB LOOP AREA

REV	DATE	DESCRIPTION OF REVISIONS	INITIALS
01	Jan 2018	Modification after Pre-bid Query	

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

Consultant :
SA INFRASTRUCTURE CONSULTANTS PVT. LTD.
Specialized Engineering Service Pvt. Ltd.

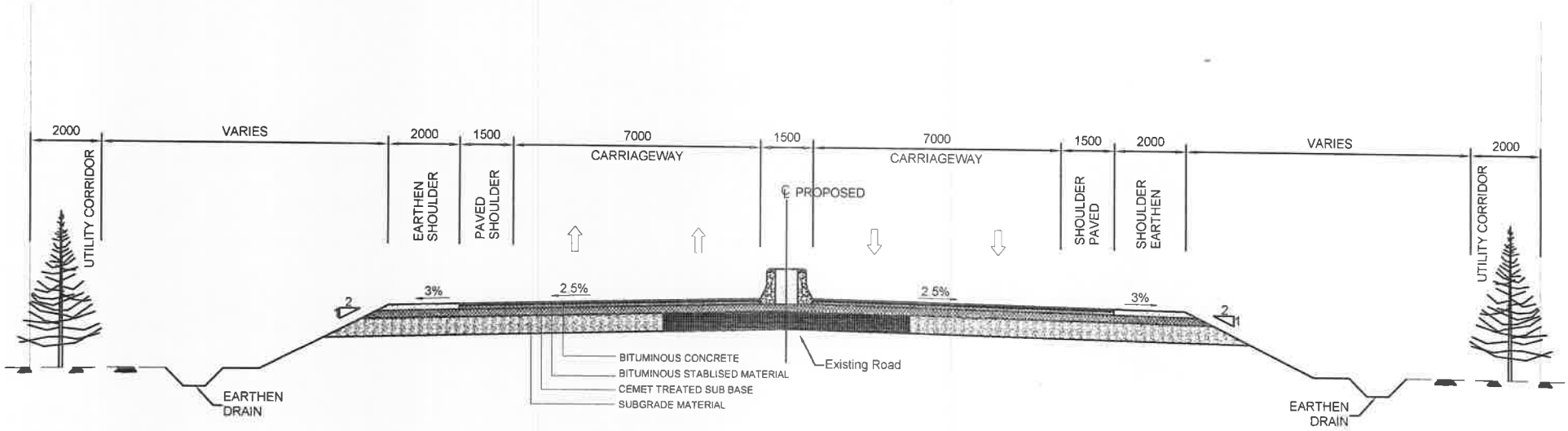
Project :
Consultancy for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chukhim-Nimbong-Kafer-Bakhim-Algarah-Rhenok in the State of West Bengal and From Rhenok-Rorathang-Pakyong along with Spur From Aritar-Rolep-Menla in the State of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

DATE : Jan–2018		Revision	R0
DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED BY
P.S	Naresh	P.S	L.A.Z.

SCALE:- NTS

PACKAGE-IV
PART OF BAGRAKOT TO KAFER
TYPICAL CROSS SECTION

Dwg. No. :-
SAICPL-SESPL/NHIDC/WB-SKM/ 4A



TCS-V

Open Country - Plain/Rolling Terrain

4 Lane Divided Highway With Raised Median(At NH-31 Widening)

Median width restricted to avoid Oil pipe line in MCW

REV	DATE	DESCRIPTION OF REVISIONS	INITIALS
01	Jan 2018	Modification after Pre-bid Query	

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

Consultant : SA INFRASTRUCTURE CONSULTANTS PVT. LTD. Specialized Engineering Service Pvt. Ltd. 1001A, 10th Floor, Tower A-II, Corporate Park, Plot No. 7A/1, Sector-132, Noida 201301, Uttar Pradesh

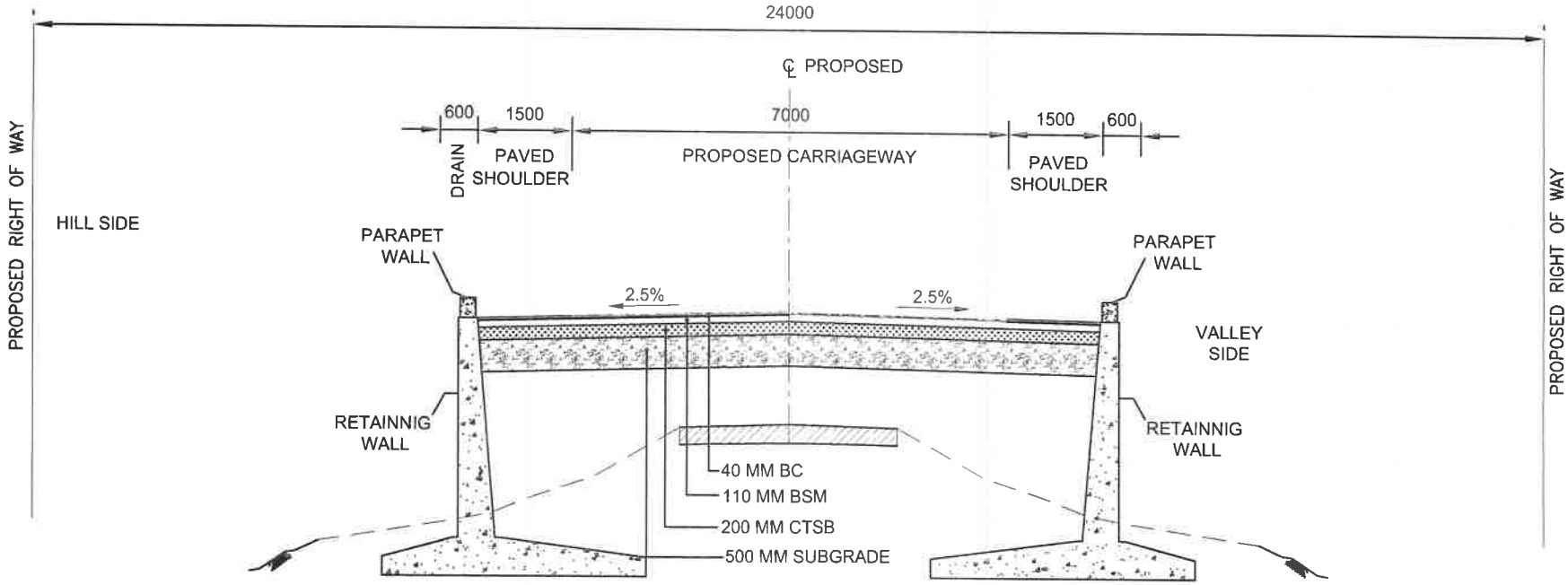
Project : Consultancy for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chuikhim-Nimbong-Kafer-Baknim-Algarah-Rhenok in the State of West Bengal and From Rhenok-Rorathang-Pakyong along with Spur From Aritar-Rolep-Menla in the State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

DATE : Jan-2018		Revision	R0
DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED BY
P.S	Manish	P.S	L.A.Z.

SCALE:- NTS

PACKAGE-IV
PART OF BAGRAKOT TO KAFER
TYPICAL CROSS SECTION

Dwg. No. :-
SAICPL-SESPL/NHIDC/WB-SKM/05



TCS-VI

Two Lane With Paved Shoulder (Both Side Valley Section)

REV	DATE	DESCRIPTION OF REVISIONS	INITIALS
01	Jan 2018	Modification after Pre-bid Query	

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 of Corporate Park
Plot No. SA-1, Sector-142, Noida 201305, 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

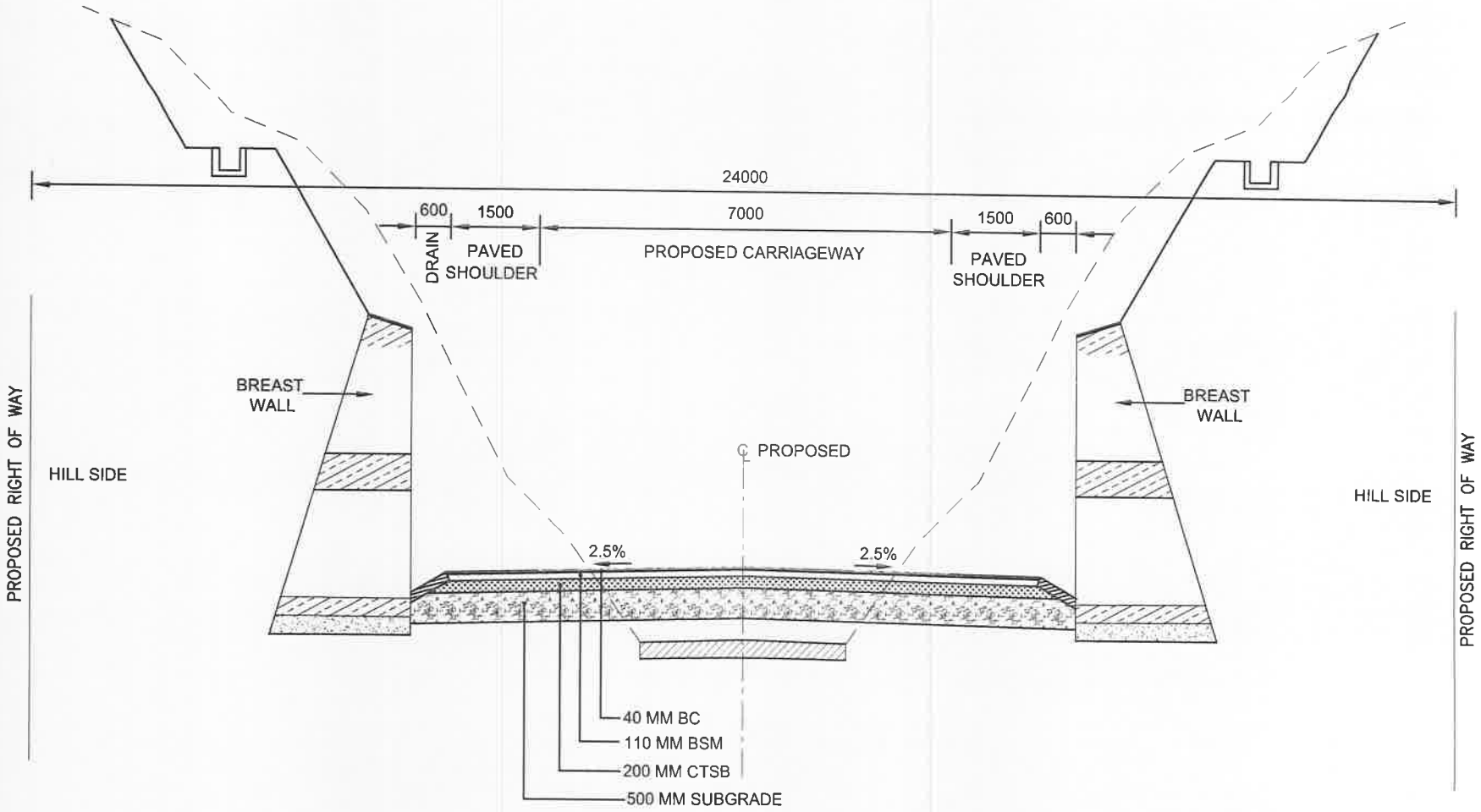
DATE : Jan-2018		Revision	R0
DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED BY
P.S	Nanak	P.S	L.A.Z.

SCALE:- NTS

PACKAGE-IV
PART OF BAGRAKOT TO KAFER
TYPICAL CROSS SECTION

Dwg. No :-
SAICPL-SESPL/NHIDC/WB-SKM/06

94



TCS-VII
Two Lane With Paved Shoulder Raised Portion(Both Side Hill Section)

Note:-

Hill cutting slope should not exceed 60°,

1.5m benching to be provided at every 10m height.

REV	DATE	DESCRIPTION OF REVISIONS	INITIALS
01	Jan 2018	Modification after Pre-bid Query	

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

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

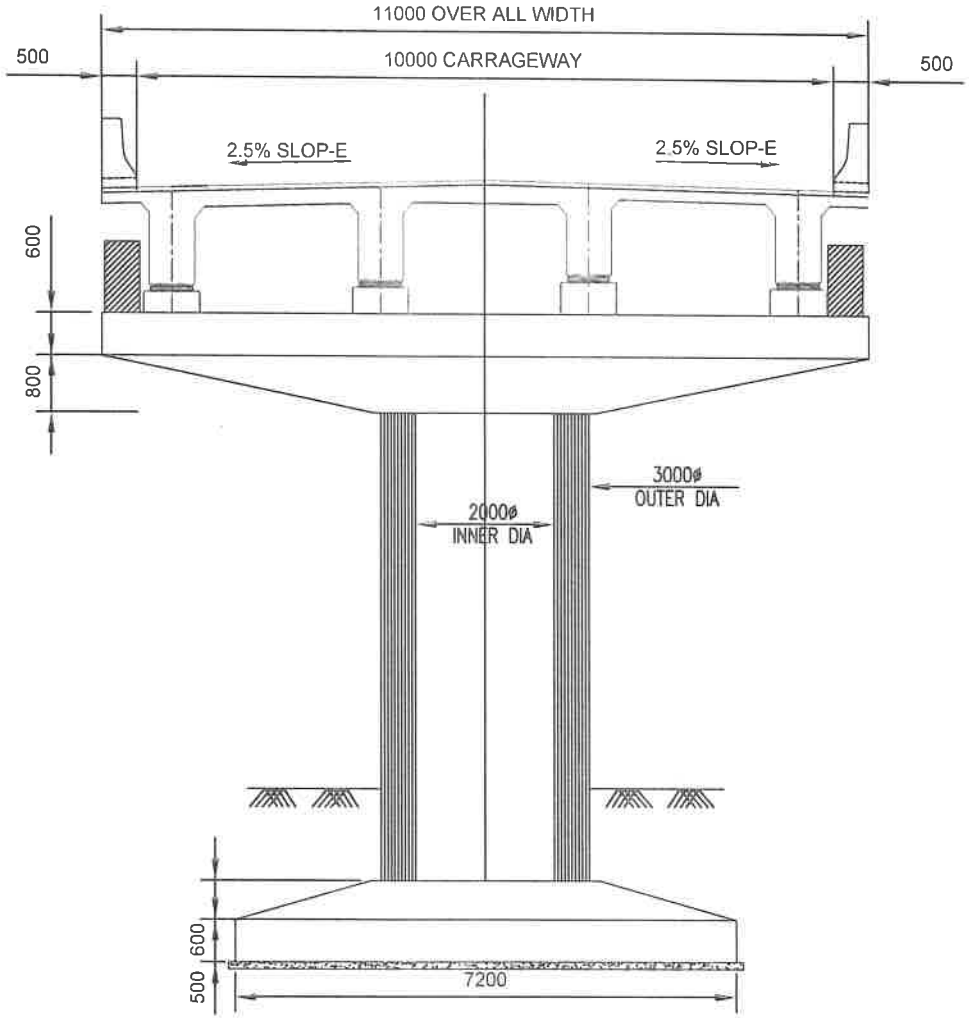
Project : Consultancy for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chuikhim-Nimbong-Kafer-Bakhim-Algarah-Rhenok in the State of West Bengal and From Rhenok-Rorathang-Pakyong along with Spur From Antar-Rolep-Menla in the State of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

DATE : Jan–2018		Revision	R0
DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED BY
P.S		P.S	L.A.Z.

SCALE:- NTS

PACKAGE-IV
PART OF BAGRAKOT TO KAFER
TYPICAL CROSS SECTION

Dwg. No. - SAICPL-SESPL/NHIDC/WB-SKM/07



TCS-VIII
Typical Cross Section for 2 Lane Elevated Section

REV	DATE	DESCRIPTION OF REVISIONS	INITIALS
01	Jan 2018	Modification after Pre-bid Query	

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(I), Corporate Park,
Plot No. 7A(I), 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 Antar-Rolep-Menla in the State of Sikkim

DATE : Jan–2018		Revision	R0
DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED BY
P.S	Ramesh	P.S	L.A.Z.

SCALE:- NTS

PACKAGE-IV
PART OF BAGRAKOT TO KAFER
TYPICAL CROSS SECTION

Dwg. No. :-
SAICPL-SESPL/NHIDC/WB-SKM/08

8h