

CLIENT:-



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-Rhenock in the State of West Bengal and From Rhencok-Rorathang-Pakyong along with Spur From Aritar-Relop-Menla in the State of Sikkim.

FINAL DETAILED PROJECT REPORT

PACKAGE- V A, Part of KAfer TO RESHI BORDER
(Km 40+000 To Km 61+100)

DRAWING VOLUME:-HIGHWAY/STRUCTURE - PLAN & PROFILE & GAD



FEBRUARY-2020

CONSULTANT :-



SA INFRASTRUCTURE CONSULTANTS PVT. LTD.

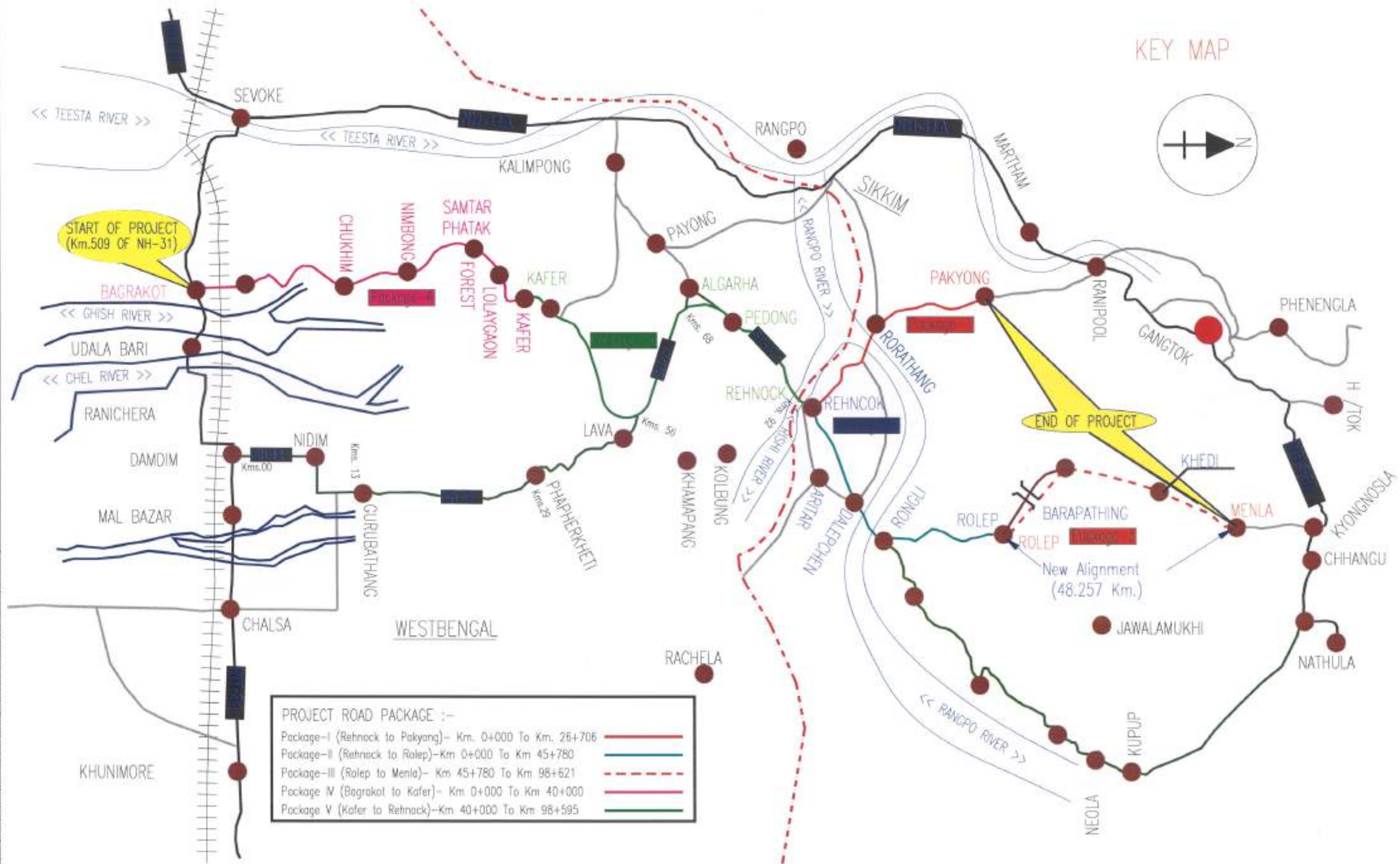
In Association with
Specialized Engineering Service Pvt. Ltd.
1101A, 11th Floor, Tower A-II, Corporate Park,
Plot No. 7A/1, Sector-142, Noida 201301, Uttar Pradesh.

LIST OF DRAWINGS

HIGHWAY		
	GENERAL DRAWINGS	DRAWING No.
i	COVER PAGE	SAICPL-SESPL/NHIDC/WB-SKM/Gen/01
ii	LIST OF DRAWING	SAICPL-SESPL/NHIDC/WB-SKM/Gen/01
iii	KEY PLAN	SAICPL-SESPL/NHIDC/WB-SKM/Gen/01
iv	LOCATION MAP	SAICPL-SESPL/NHIDC/WB-SKM/Gen/01
v	VERTICAL & HORIZONTAL CURVE DETAILS	SAICPL-SESPL/NHIDC/WB-SKM/Gen/01(3 Sheet)
02	TYPICAL CROSS SECTION	SAICPL-SESPL/NHIDC/WB-SKM/TCS/1(Sheet 11)
03	PLAN & PROFILE	SAICPL-SESPL/NHIDC/WB-SKM/P&P/01(43 Sheet)
04	MISCELLANEOUS DRAWING:-	
a	TYPICAL DRAWING ROAD SIGNS (SHEET 1 OF 3)	SAICPL-SESPL/NHIDC/WB-SKM/Misc/01
b	TYPICAL DRAWING ROAD SIGNS (SHEET 2 OF 3)	SAICPL-SESPL/NHIDC/WB-SKM/Misc/02
c	TYPICAL DRAWING ROAD SIGNS (SHEET 3 OF 3)	SAICPL-SESPL/NHIDC/WB-SKM/Misc/03
d	TYPICAL DRAWING ROAD MARKING	SAICPL-SESPL/NHIDC/WB-SKM/Misc/04
e	TYPICAL DRAWING FOR DISTANCE & BOUNDARY STONE	SAICPL-SESPL/NHIDC/WB-SKM/Misc/05
f	TYPICAL DRAWING FOR OVERHEAD GANTRY SIGNS	SAICPL-SESPL/NHIDC/WB-SKM/Misc/06
g	TYPICAL DRAWING FOR BUS BAY	SAICPL-SESPL/NHIDC/WB-SKM/Misc/07
h	TYPICAL DRAWING OF SIDE DRAIN INLET CHAMBER & MEDIAN CUT	SAICPL-SESPL/NHIDC/WB-SKM/Misc/08
i	TYPICAL DRAWING FOR BREAST WALL	SAICPL-SESPL/NHIDC/WB-SKM/Misc/09
j	TYPICAL DRAWING FOR RETAINING WALL	SAICPL-SESPL/NHIDC/WB-SKM/Misc/10
k	TYPICAL DRAWING FOR SLAB CULVERT	SAICPL-SESPL/NHIDC/WB-SKM/Misc/11

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GENERAL DRAWING



REV	DATE	DESCRIPTION OF REVISIONS	INITIALS
RD	Sep 2017	Final Feasibility Report	
RD	Nov 2016	Draft Feasibility Report	
RD	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. 1301A, 13th Floor, Tower A-II, Corporate Park, Plot No. 7A/1, Sector-142, Gurgaon 201301, Haryana, India

Project :	Consultancy for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chukhim-Nimbong-Kafir-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
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DATE :	FEB-2020
DESIGNED BY :	VIJAY GUPTA
DRAWN BY :	NARESH
CHECKED BY :	VIJAY GUPTA
APPROVED BY :	SANJAY SHUKLA
SCALE :	1:1000

PACKAGE-5	KAFER TO RHEKOK
KEY PLAN	
Dwg. No. :	SACPL-SESPL/NH-001/WB-SKM/Gen/01

HORIZONTAL & VERTICAL DETAIL

HORIZONTAL REPORT PACKAGE -5-A																
REP No.	Chainage	Circular Angle	RADIUS	Length of curve (Lc)	ARC DETAILS				Total Deflection	Tangent Dist (Tn)	Apex Dist (Ea)	HIP CO ORDINATE	SpeedV	Super Elevation in %	Hand of Arc	
					Start X	Start Y	End X	End Y				EASTING	NORTHING			
01	40+001	37.752	75	49.490	655573.2	298876.7	655633.6	2988691	37.75	25.67	6.27	655593.963	2988691.42	40	7.00	Right
02	40+325	85.747	75	86.063	655622.1	2988681	655690.8	2988753	85.75	48.47	14.30	655669.542	2988698.15	40	7.00	Left
03	40+175	1.737	500	15.381	655701.7	2988795	655708.1	2988769	1.74	7.98	0.06	655704.907	2988761.86	40	2.5	Left
04	40+224	28.866	75	37.262	655717.4	2988790	655740.4	2988818	28.47	19.03	2.38	655725.239	2988806.86	40	7.00	Right
05	40+267	30.145	75	36.46	655768.2	2988840	655792	2988870	30.15	20.20	2.67	655784.381	2988851.82	40	7.00	Left
06	40+354	45.982	75	62.033	655794.1	2988875	655835.8	2988956	45.96	31.73	6.43	655806.307	2988904.83	40	7.00	Right
07	40+422	43.506	75	56.949	655844.7	2988920	655885.1	2988958	43.51	29.93	5.75	655872.488	2988993.1	40	7.00	Left
08	40+477	25.287	75	33.105	655880	2988968	655910	2988995	25.29	16.83	1.86	655897.017	2988933.89	40	7.00	Right
09	40+589	4.709	200	25.427	655985	2990057	656006.1	2990087	4.73	8.23	0.17	655993.327	2990062.4	40	3.55	Right
10	40+667	29.49	100	51.47	656024.9	2990086	656057.8	2990125	29.49	26.32	3.41	656046.484	2990031.34	40	7	Left
11	40+731	31.77	75	41.587	656005.4	2990145	656050.2	2990172	31.77	21.34	2.96	656074.516	2990150.11	40	7.00	Right
12	40+806	26.242	75	34.353	656128	2990182	656156	2990203	26.24	17.48	2.01	656138.673	2990201.46	40	7.00	Right
13	40+852	22.001	75	28.796	656171	2990205	656198.2	2990234	27.00	14.58	1.40	656185.437	2990206.84	40	7.00	Left
14	40+926	58.515	75	76.596	656213.9	2990222	656287.2	2990221	58.52	42.02	10.97	656250.768	2990242.4	40	7.00	Right
15	40+974	38.59	75	24.384	656287.4	2990221	656306.2	2990206	38.59	22.28	1.00	656298.075	2990225.34	40	7.00	Right
16	41+078	16.266	75	21.259	656360	2990145	656376.2	2990131	16.27	10.72	0.76	656367.12	2990336.98	40	7.00	Left
17	41+120	17.785	75	23.281	656393.1	2990123	656410.6	2990105	17.79	11.74	0.91	656403.032	2990343.31	40	7.00	Right
18	41+204	96.422	21	35.343	656441.8	2990068	656473.1	2990067	96.42	23.60	10.51	656456.862	2990090.04	20	7.00	Left
19	41+261	103.307	21	37.131	656473.2	2990067	656499.3	2990059	103.31	25.62	12.12	656480.914	2990085.70	20	7.00	Left
20	41+346	57.429	75	75.175	656495	2990127	656530.1	2990151	57.43	41.09	10.52	656590.302	2990148.45	40	7.00	Right
21	41+439	48.996	75	64.136	656590	2990215	656564	2990272	48.00	34.18	7.42	656580.882	2990249.58	40	7.00	Left
22	41+524	41.405	75	54.2	656638.8	2990289	656708.4	2990336	41.41	38.35	5.18	656722.304	2990307.83	40	7.00	Right
23	41+612	37.961	75	105.304	656658.2	2990338	656750.3	2990402	77.38	60.08	21.09	656809.983	2990387.4	40	7.00	Left
24	41+695	95.061	21	34.842	656733.3	2990404	656752.4	2990328	95.06	22.94	10.10	656708.464	2990405.89	20	7.00	Right
25	41+729	88.597	21	52.472	656722.6	2990403	656735.4	2990347	88.60	25.49	8.34	656716.091	2990445.86	20	7.00	Right
26	41+818	39.421	100	68.802	656727.6	2990441	656737.1	2990409	39.42	35.82	6.22	656733.072	2990435.46	40	7.00	Right
27	41+877	37.446	75	49.016	656737.2	2990409	656756.5	2990365	37.45	25.42	4.19	656754.374	2990389.84	40	7.00	Right
28	41+930	39.241	75	51.524	656756.6	2990362	656777.5	2990316	39.25	26.82	4.65	656768.882	2990355.72	40	7.00	Left
29	41+991	30.325	75	39.682	656788.9	2990305	656822.6	2990285	30.32	20.52	2.70	656802.994	2990290.07	40	7.00	Left
30	42+050	69.536	21	25.486	656846.4	2990278	656881.1	2990206	69.54	14.58	4.56	656860.48	2990273.99	20	7.00	Left
31	42+074	39.074	21	21.853	656909.6	2990287	656942	2990207	59.08	11.90	3.14	656976.645	2990256.17	20	7.00	Left
32	42+121	33.857	75	44.253	656946.4	2990320	656938.4	2990354	33.81	22.79	3.38	656957.455	2990341.41	40	7.00	Left
33	42+172	34.226	75	44.802	656932.3	2990328	656904.1	2990292	34.23	23.09	3.48	656912.965	2990370.53	40	7.00	Right
34	42+215	24.788	75	32.447	656902.6	2990396	656984.1	2990427	34.79	16.48	1.79	656976.263	2990410.72	40	7.00	Left
35	42+247	38.312	75	23.471	656981	2990425	656988.2	2990484	18.31	12.09	0.97	656972.094	2990432.98	40	7.00	Right
36	42+296	33.175	75	43.426	656959.2	2990456	656938.6	2990486	33.18	22.34	1.86	656948.365	2990475.74	40	7.00	Left
37	42+344	38.663	75	50.846	656903.4	2990530	656924	2990517	38.84	28.44	4.52	656928.958	2990522.31	40	7.00	Left
38	42+463	76.536	21	28.052	656920.7	2990512	6569184.5	2990524	76.54	16.57	5.75	656918.387	2990508.91	20	7.00	Right
39	42+519	107.994	21	39.582	656984.1	2990525	656920.8	2990554	107.98	26.80	14.72	656972.136	2990551.13	20	7.00	Right
40	42+565	43.132	75	56.46	656922.8	2990557	656970.2	2990583	43.13	29.64	5.85	656925.043	2990560.18	40	7.00	Left
41	42+702	82.556	75	115.658	656994.3	2990631	656987.5	2990718	88.76	72.88	29.58	656943.641	2990666.85	40	7.00	Left
42	42+830	113.023	25	48.338	656925.1	2990747	6569258.2	2990789	113.02	37.20	20.31	656923.903	2990772.72	20	7.00	Right
43	42+922	80.518	75	106.305	656924	2990796	6569314.6	2990884	80.57	63.51	23.28	656931.604	2990822.89	40	7.00	Left
44	42+987	61.117	75	95.058	656931.7	2990886	6569201.2	2990943	65.12	31.36	6.21	656935.851	2990915.69	40	7.00	Right
45	43+068	23.378	200	82.685	656922.1	2990944	656940.1	2991021	23.38	41.38	4.24	656942.574	2990980.32	40	3.55	Left
46	43+234	43.001	75	52.073	656957.5	2991117	656985.7	2991146	43.80	30.00	5.78	656980.738	2991146.76	40	7.00	Right
47	43+310	50.096	75	66.360	656993.2	2991134	656918.5	2991233	50.70	35.53	7.99	656940.335	2991197.07	40	7.00	Left
48	43+385	2.064	150	5.404	656919.2	2991274	6569429	2991280	2.06	1.70	0.02	656915.128	2991276.88	40	4.74	Left
49	43+477	33.768	150	88.408	656916.7	2991334	656937.7	2991408	33.77	45.53	6.76	656914.391	2991368.98	40	4.74	Right
50	43+566	2.859	500	14.952	656945.8	2991437	6569487.1	2991459	2.86	12.48	0.16	6569481.239	2991447.88	40	2.5	Left
51	43+622	34.175	75	44.736	656976.6	2991477	6569837.8	2991508	34.18	21.06	3.46	656987.176	2991487.04	40	7.00	Right
52	43+703	51.462	75	43.183	656942	2991528	656981.7	2991534	31.46	21.12	2.92	656960.66	2991535.78	40	7.00	Right
53	43+790	79.762	75	324.408	656986.1	2991534	6569663.7	2991591	79.76	62.67	22.73	656986.911	2991530.19	40	7.00	Left
54	43+896	4.514	500	39.38	656962.4	2991634	656982.3	2991672	4.51	19.69	0.19	656970.013	2991653.14	40	2.5	Right
55	43+977	10.565	500	92.2	656960	2991686	6569736.9	2991771	10.57	46.25	2.33	656970.56	2991730.08	40	2.5	Right
56	44+107	39.21	75	25.146	656981.3	2991833	656989.6	2991856	29.21	12.69	1.07	656987.453	2991843.85	40	7.00	Left
57	44+162	50.217	75	65.734	656977.8	2991863	6569807.2	2991916	50.22	35.15	7.83	656976.742	2991898.08	40	7.00	Right
58	44+221	26.403	75	67.653	656981.1	2991918	6569842.2	2991953	36.40	24.86	3.95	656982.574	2991930.26	40	7.00	Left
59	44+284	5.881	300	30.79	656951.7	2991975	6569885.3	2992002	5.88	15.43	0.40	656957.891	2991988.84	40	2.5	Right
60	44+360	43.971	75	57.558	656980.5	2992029	656934.4	2992064	43.97	30.28	5.88	656985.266	2992055.3	40	7.00	Right
61	44+426	53.805	75	70.431	656925.7	2992064	6569734.9	2992111	53.81	38.06	9.10	656965.141	2992075.27	40	7.00	Left
62	44+509	25.838	150	67.646	656980.1	2992126	6570006.2	2992182	25.84	34.41	3.90	656991.676	2992158.26	40	4.74	Right
63	44+622	70.514	75	92.393	657005.6	2992202	657050.9	2992287	92.51	53.01	16.85	657007.389	2992238.75	40	7.00	Left
64	44+733	36.867	200	128.49	657049	2992291	657034.3	2992416	36.87	66.67	10.82	657020.724	2992351.22	40	3.55	Right
65	44+812	20.466	75	26.79	657035	2992420	657045	2992444	26.47	13.54	1.23	657037.753	2992402.92	40	7.00	Right
66	44+869	43.425	75	56.968	657052.7	2992457	657062.8	2992511	43.52	29.94	5.75	657068.687	2992481.96	40	7.00	Left
67	44+940	58.089	75	76.053	657082.4	2992513	657084.6	2992583	58.07	43.62	10.78	657054.283	2992554.19	40	7.00	Right

HORIZONTAL REPORT PACKAGE - 5-A																
HP No.	Chkage	Circular Angle	RADIUS	Length of curve (ft)	ARC DETAILS				Total Deflection	Tangent Dist (ft)	Area Dist (sq ft)	HP CD	Speed/V	Super Elevation	Hand of Arc	
					Station	Station	Station	Station								
86	46+340	138.668	21	43.508	657040.2	2993196	657040.8	2993228	118.89	35.49	20.19	657040.402	2993225.52	20	7.00	Right
87	46+334	38.4	75	50.266	657125.1	2993231	657170.7	2993249	38.40	26.12	4.42	657125.105	2993232.11	40	7.00	Left
88	46+288	108.858	21	38.066	657173.1	2993252	657171.7	2993285	103.86	28.81	13.06	657185.088	2993285.38	20	7.00	Left
89	46+513	82.867	21	25.082	657170.5	2993285	657148.5	2993288	62.87	12.86	3.81	657139.762	2993282.20	20	7.00	Left
90	46+588	15.131	75	19.852	657138.2	2993292	657098.7	2993293	15.15	9.97	0.96	657039.427	2993285.08	40	7.00	Right
91	46+628	89.771	75	52.06	657078.9	2993257	657028.2	2993293	39.77	27.13	4.75	657050.488	2993251.24	40	7.00	Right
92	46+688	30.802	75	26.968	657067.2	2993275	656981.5	2993280	20.60	13.69	1.23	656985.067	2993278.95	40	7.00	Left
93	46+750	26.797	75	35.078	656971.2	2993281	656938.4	2993293	26.80	17.87	2.10	656951.413	2993280.28	40	7.00	Right
94	46+781	21.909	75	28.579	656963.9	2993330	656885.4	2993334	21.91	14.52	1.89	656898.643	2993311.42	40	7.00	Left
95	46+840	102.719	21	40.234	656873.1	2993318	656859	2993350	59.72	29.84	15.49	656843.629	2993334.01	20	7.00	Right
96	46+884	99.188	21	36.347	656859.6	2993351	656892.1	2993354	39.17	24.46	13.89	656872.19	2993371.98	20	7.00	Right
97	46+947	45.334	75	59.342	656806.4	2993344	656861.8	2993357	49.33	31.32	6.28	656830.445	2993325.34	40	7.00	Left
98	47+002	21.658	75	28.36	656864.7	2993339	657013.8	2993357	21.66	14.95	1.56	656899.003	2993330.29	40	7.00	Left
99	47+070	38.799	75	48.17	657028.1	2993345	657014.8	2993353	36.80	24.95	4.04	657050.228	2993356.69	40	7.00	Right
100	47+134	48.586	21	17.734	657086.5	2993351	657103.2	2993355	48.39	9.44	2.02	657095.813	2993349.04	20	7.00	Left
101	47+141	82.204	21	29.785	657103.4	2993355	657108.4	2993382	81.20	18.00	6.66	657117.426	2993366.46	20	7.00	Left
102	47+178	9.009	75	11.806	657098.8	2993390	657062.1	2993408	9.02	5.92	0.28	657095.867	2993409.7	40	7.00	Left
103	47+282	51.878	75	67.908	657047.5	2993463	657032.5	2993527	51.88	36.48	8.40	657034.468	2993481.6	40	7.00	Right
104	47+377	28.284	75	37.155	657040.4	2993543	657039.7	2993589	28.38	18.96	2.36	657044.775	2993581.05	40	7.00	Left
105	47+460	72.899	75	95.425	657035.4	2993625	657067.1	2993688	72.90	55.40	18.24	657020.468	2993688.00	40	7.00	Right
106	47+580	39.091	75	51.17	657106.2	2993725	657136.9	2993765	39.08	26.63	4.59	657128.608	2993737.4	40	7.00	Left
107	47+639	40.36	75	53.643	657139	2993769	657171.8	2993810	40.36	38.03	5.07	657147.713	2993795.46	40	7.00	Right
108	47+727	10.177	75	13.122	657219.4	2993808	657230.2	2993846	10.18	6.68	0.30	657225.155	2993841.63	40	7.00	Left
109	47+773	34.525	100	82.557	657236.4	2993851	657300.7	2993875	34.53	31.06	4.72	657259.845	2993871.76	40	7.00	Right
110	47+823	21.404	75	28.018	657297.5	2993876	657304.2	2993884	21.40	14.17	1.33	657311.628	2993877.62	40	7.00	Left
111	47+926	8.684	100	30.367	657389.4	2993919	657417.2	2993951	8.69	15.20	0.58	657402.845	2993925.83	40	5.55	Right
112	47+970	17.715	75	24.188	657433.2	2993936	657453.8	2993947	17.73	11.68	0.90	657464.278	2993940.24	40	7.00	Left
113	48+008	3.799	75	4.973	657489.1	2993959	657473	2993962	5.80	2.49	0.04	657471.075	2993960.34	40	7.00	Left
114	48+052	13.466	75	17.627	657486.5	2993974	657501.1	2993980	17.47	8.06	0.52	657492.254	2993979.4	40	7.00	Right
115	48+067	27.211	75	35.62	657508.1	2993987	657542.4	2993995	27.21	18.15	2.17	657524.22	2993995.32	40	7.00	Right
116	48+125	50.064	21	18.349	657570.9	2994005	657587	2994003	50.06	8.81	1.80	657580.887	2993995.32	20	7.00	Left
117	48+153	64.016	30	33.519	657589.1	2994005	657593.4	2994037	64.02	18.75	5.38	657601.092	2994015.7	20	7.00	Left
118	48+199	76.516	40	53.419	657593.4	2994037	657549.6	2994060	76.52	31.54	10.94	657580.571	2994065.62	20	7.00	Left
119	48+269	18.368	100	32.058	657519.8	2994054	657499.8	2994045	18.37	18.17	1.30	657505.449	2994053.19	40	7.00	Left
120	48+344	13.009	100	45.41	657457.1	2994026	657451.5	2994008	13.01	22.80	1.90	657457.181	2994024.51	40	5.55	Right
121	48+416	11.957	100	41.788	657587.2	2994003	657348.6	2993985	11.96	20.95	1.09	657367.009	2993994.46	40	5.55	Left
122	48+476	40.286	75	52.377	657557.1	2993979	657208	2993972	40.17	27.42	4.86	657312.819	2993965.72	40	7.00	Right
123	48+589	38.633	75	76.731	657288.4	2993975	657238.1	2993954	38.63	49.11	11.01	657227.183	2993968.32	40	7.00	Left
124	48+639	2.519	200	8.792	657183.7	2993949	657187.8	2993943	2.52	4.40	0.05	657180.621	2993945.99	40	5.55	Left
125	48+685	104.3	21	38.238	657171	2993923	657137.9	2993925	104.30	37.02	13.22	657153.365	2993930.12	30	7.00	Right
126	48+752	97.538	21	35.757	657127.3	2993936	657145	2993957	97.56	35.97	10.87	657123.656	2993946.04	30	7.00	Right
127	48+870	7.865	200	27.454	657174	2993972	657187.5	2993986	7.87	15.76	0.47	657186.228	2993977.97	40	5.55	Left
128	48+864	6.021	200	31.524	657258.1	2994029	657285.9	2994046	6.02	15.77	0.43	657272.074	2994037.88	40	2.5	Right
129	48+912	56.736	100	26.390	657300.6	2994054	657323.7	2994071	16.73	14.70	1.08	657323.457	2994060.7	40	7.00	Left
130	48+929	27.544	75	49.172	657377.7	2994126	657420.8	2994148	37.56	25.50	4.22	657396.544	2994144.58	40	7.00	Right
131	48+983	38.957	75	50.984	657434.6	2994150	657479	2994173	38.96	26.53	4.55	657480.923	2994153.82	40	7.00	Left
132	49+138	29.454	75	51.541	657482.3	2994177	657503.8	2994205	29.94	15.90	1.67	657493.138	2994208.4	40	7.00	Right
133	49+175	16.262	75	21.208	657511.5	2994199	657555.6	2994230	16.20	10.67	0.76	657527.352	2994230.96	40	7.00	Left
134	49+227	28.339	75	37.095	657535.4	2994224	657586.7	2994240	28.34	18.94	2.35	657548.067	2994235.28	40	7.00	Right
135	49+282	28.102	75	36.786	657664	2994243	657637	2994250	28.10	18.77	2.31	657632.423	2994246.39	40	7.00	Left
136	49+385	32.862	75	43.038	657670.7	2994286	657708.9	2994303	32.86	22.12	3.19	657687.863	2994299.79	40	7.00	Right
137	49+502	69.018	75	90.364	657775.6	2994308	657838.1	2994364	69.02	51.57	16.02	657834.912	2994314.59	40	7.00	Left
138	49+579	41.931	75	54.888	657840.4	2994373	657871.8	2994417	41.93	28.74	5.52	657847.755	2994400.93	40	7.00	Right
139	49+674	9.791	75	12.816	657924.1	2994451	657994.2	2994459	9.79	8.42	0.27	657928.527	2994434.54	40	7.00	Left
140	49+713	15.745	75	30.604	657950.8	2994474	657967.1	2994488	15.74	10.37	0.71	657957.105	2994481.26	40	7.00	Right
141	49+754	5.347	75	12.335	657989.5	2994497	657999.9	2994504	5.35	8.13	0.25	657994.956	2994500.18	40	7.00	Left
142	49+828	44.014	75	57.614	658028.7	2994525	658057.9	2994573	44.01	30.11	5.89	658052.066	2994545.35	40	7.00	Left
143	49+911	50.86	75	66.575	658081.4	2994584	658088.1	2994647	50.86	35.66	8.05	658087.174	2994629.63	40	7.00	Right
144	49+972	36.623	75	47.937	658103.9	2994648	658133.3	2994665	36.62	24.82	4.00	658123.388	2994661.83	40	7.00	Left
145	50+056	44.982	75	58.880	658145.7	2994713	658187.2	2994753	44.98	41.05	6.17	658138.266	2994741.35	40	7.00	Right
146	50+095	17.528	75	22.948	658187.3	2994739	658207	2994764	17.53	11.56	0.89	658195.014	2994756.79	40	7.00	Left
147	50+201	41.61	75	54.48	658287.6	2994816	658324.6	2994882	41.62	28.50	5.23	658310.825	2994854.32	40	7.00	Left
148	50+301	26.775	75	38.976	658325.2	2994886	658341.5	2994923	26.78	39.54	2.61	658328.596	2994928.51	40	7.00	Right
149	50+347	29.391	75	38.734	658356.2	2994927	658362.2	2994962	29.38	38.81	2.57	658356.815	2994942.18	40	7.00	Left
150	50+481	30.414	150	132.567	658389.8	2995005	658443.7	2995110	50.61	70.92	15.92	658381.949	2995074.86	40	4.74	Right
151	50+579	19.525	100	34.078	658455.1	2995114	658480.1	2995128	19.58	17.23	1.47	658470.117	2995124.79	40	7.00	Right
152	50+654	98.125	21	36.331	658425.4	2995134	658451.6	2995162	98.13	24.44	11.38	658456.865	2995138.72			

			Client :  NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (Ministry of Road Transport & Highways)			Project : Consultancy for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chukhim-Nimbong-Kafer-Bakhim-Algarah-Rhenock in the State of West Bengal and From Rhenock-Rorathang-Pakyong along with Spur From Aritar-Rolep-Menla in the State of Sikkim			<table><tr><td colspan="2">DATE : FEB-2020</td><td colspan="2">Revision</td><td>RD</td></tr><tr><td>DESIGNED BY</td><td>DRAWN BY</td><td>CHECKED BY</td><td colspan="2">APPROVED BY</td></tr><tr><td></td><td></td><td></td><td colspan="2"></td></tr><tr><td colspan="5">SCALE : —</td></tr></table>				DATE : FEB-2020		Revision		RD	DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED BY							SCALE : —					PACKAGE- 5A KAFER TO RHENOCK HORIZONTAL REPORT	
DATE : FEB-2020		Revision		RD																														
DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED BY																															
																																		
SCALE : —																																		
<table><tr><td>REV</td><td>DATE</td><td>DESCRIPTION OF REVISIONS</td><td>INITIALS</td></tr><tr><td>RO</td><td>Sep 2017</td><td>Final Feasibility Report</td><td></td></tr><tr><td>RO</td><td>Nov 2016</td><td>Draft Feasibility Report</td><td></td></tr><tr><td>RO</td><td>Dec 2014</td><td>Linear Plan</td><td></td></tr></table>			REV	DATE	DESCRIPTION OF REVISIONS	INITIALS	RO	Sep 2017	Final Feasibility Report		RO	Nov 2016	Draft Feasibility Report		RO	Dec 2014	Linear Plan		Consultant :  SA INFRASTRUCTURE CONSULTANTS PVT. LTD. Specialized Engineering Service Pvt. Ltd. 1101A, 11th Floor, Tower A-4, Corporate Park, Post No. 7A/1, Sector-142, Gurgaon, Haryana-122001			Dwg. No. : SACPL-DESPL/WHDC/WH-SKM/TWO/01												
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DATE: 05/03/2020 - 4:40 PM
FILE: D:\Main\Project\Bakraket-Chuikim-Nimbong-Kafer-Bakhim-Algarah-Rhenock\Horizontal Report Package - 5-A.dwg
PLOT: 05/03/2020 11:11:11 AM, Plot No. 7A/1, Scale: 1:1000, Paper Size: A3, Plot Style: acad.ctb, Plot Device: HP DesignJet 500, Plot Range: All, Plot Orientation: Landscape, Plot Color: Black, Plot Lineweight: 0.5, Plot Linetype: Solid, Plot Font: Arial, Plot Text Size: 10, Plot Title: Horizontal Report Package - 5-A, Plot Subtitle: Consultancy for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chuikim-Nimbong-Kafer-Bakhim-Algarah-Rhenock in the State of West Bengal and From Rhenock-Rorathang-Pakyong along with Spur From Artar-Rolep-Merla in the State of Sikkim

HORIZONTAL REPORT PACKAGE - 5-A

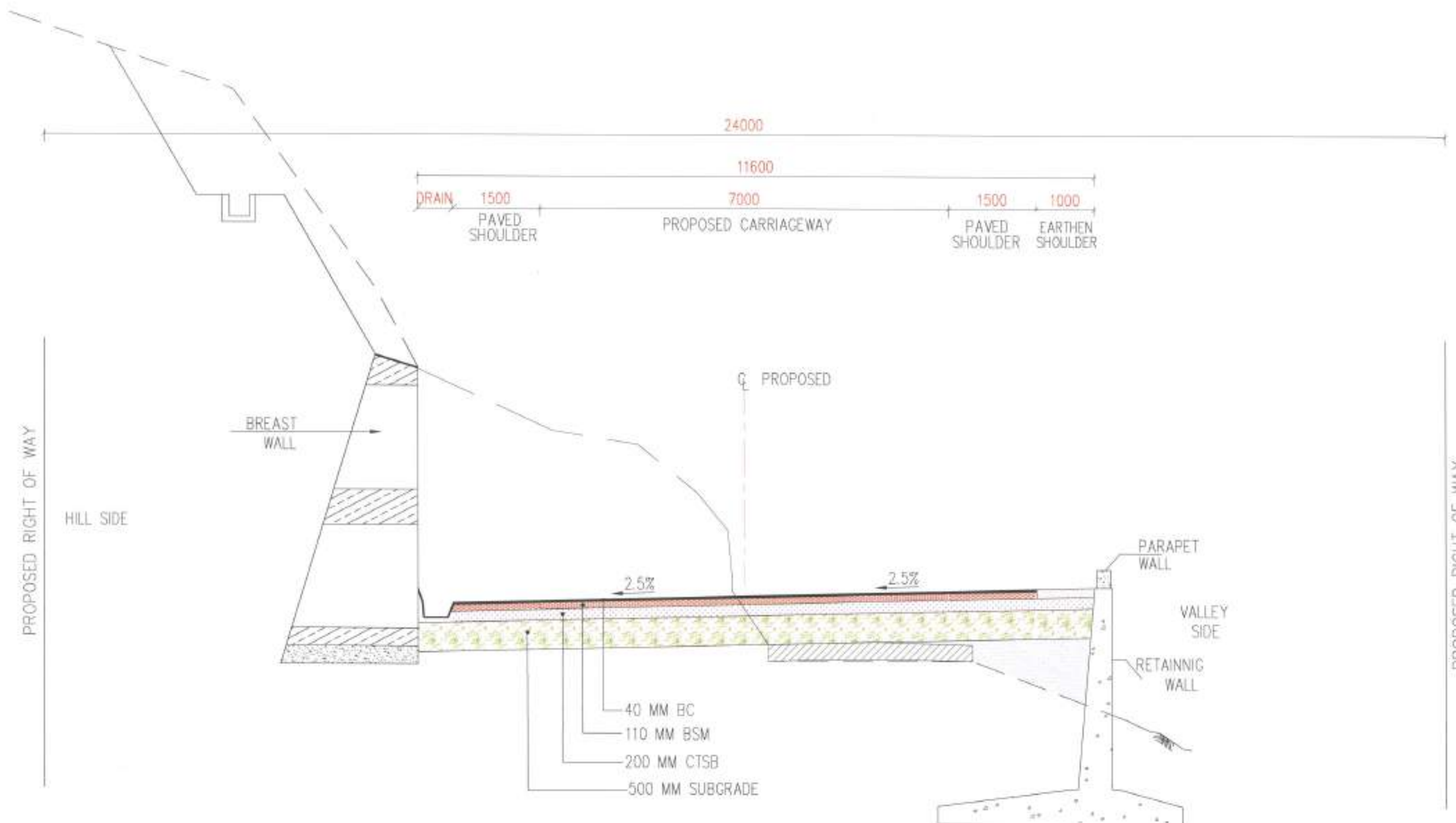
HP No.	Chainage	Circular Angle	RADIUS	Length of curve (Lc)	ARC DETAILS			Total Deflection	Tangent Dist (T)	Apex Dist (Da)	HP CO	ORDINATE	SpeedV	Super Elevation	Hand of Arc	
173	51+037	96.379	21	24.329	658536.6	2995362	658513.7	2995360	66.36	13.74	4.09	658525.794	2995353.42	20	7.00	Right
174	51+083	125.075	21	45.842	658509.1	2995382	658509.9	2995400	125.08	40.41	24.54	658475.484	2995381.42	20	7.00	Right
175	51+089	10.967	500	93.088	658526.7	2995408	658603.5	2995458	32.67	46.69	2.38	658596.419	2995429.55	20	2.5	Left
176	51+089	37.290	75	48.82	658546.5	2995489	658681.7	2995504	37.30	25.31	4.38	658686.434	2995504.59	40	7.00	Right
177	51+085	115.518	21	42.376	658732.8	2995505	658730.7	2995535	115.52	38.36	18.42	658765.15	2995504.64	20	7.00	Left
178	51+100	93.106	21	34.125	658748.1	2995538	658750	2995547	93.11	22.17	8.54	658739.425	2995557.94	20	7.00	Left
179	51+176	11.654	200	40.689	658698.9	2995536	658681.5	2995520	13.66	20.42	1.58	658681.001	2995525.74	40	3.55	Right
180	51+171	7.33	100	12.794	658643.6	2995514	658631.7	2995510	7.33	6.41	0.20	658637.479	2995512.25	40	7.00	Left
181	51+487	105.472	21	38.657	658600.7	2995496	658573.3	2995512	105.47	27.40	13.68	658577.64	2995484.95	20	7.00	Right
182	51+525	101.406	21	47.34	658579.1	2995513	658594.8	2995539	101.46	25.75	12.25	658599.027	2995538.89	20	7.00	Right
183	51+588	52.273	75	42.248	658623.9	2995536	658644.5	2995546	52.27	21.70	3.08	658645.622	2995555.5	20	7.00	Left
184	51+645	7.134	200	24.901	658685.4	2995558	658707.8	2995569	7.13	12.46	0.38	658686.251	2995564.42	40	2.5	Right
185	51+775	36.458	200	57.454	658789.4	2995603	658844.8	2995617	16.48	28.93	2.08	658838.075	2995614.3	40	2.5	Right
186	51+921	55.43	75	72.558	658923.2	2995626	658981.1	2995665	55.43	39.40	9.72	658962.389	2995630.05	20	7.00	Left
187	51+903	50.062	75	85.595	658987.6	2995677	659038.6	2995714	50.06	85.02	7.77	659004.273	2995707.42	40	7.00	Right
188	51+989	40.546	75	53.101	659069.9	2995721	659121.9	2995713	40.57	27.72	4.96	659087.046	2995726.32	40	7.00	Right
189	51+148	36.686	75	34.892	659126.8	2995758	659162.7	2995769	36.69	17.79	2.08	659144.898	2995769.73	40	7.00	Left
190	51+225	65.129	75	85.253	659175.2	2995789	659238.3	2995832	65.13	47.90	13.99	659223.006	2995836.58	40	7.00	Right
191	51+282	21.905	75	27.888	659242.6	2995844	659257.8	2995821	21.90	54.25	1.31	659248.08	2995831.35	40	7.00	Left
192	51+382	104.084	21	38.142	659296.7	2995879	659331.0	2995882	104.08	26.93	13.13	659317.289	2995899.34	20	7.00	Left
193	51+417	90.396	21	33.152	659333.4	2995885	659326.6	2995904	90.40	21.15	8.80	659344.608	2995902.64	20	7.00	Left
194	51+466	26.365	75	34.512	659310.3	2995924	659296	2995948	26.37	17.57	3.03	659296.305	2995943.13	40	7.00	Right
195	51+507	24.249	75	31.742	659239.4	2995723	659217.5	2995746	24.25	16.11	1.71	659230.886	2995746.42	40	7.00	Left
196	51+536	13.665	75	17.887	659195.1	2995761	659181.6	2995772	13.67	8.99	0.54	659187.675	2995765.6	40	7.00	Right
197	51+609	94.359	21	34.584	659162	2995794	659164.5	2995824	94.36	22.66	9.90	659164.677	2995833.57	20	7.00	Right
198	51+740	108.363	21	59.716	659185.5	2995825	659196.5	2995836	108.36	29.10	34.88	659186.429	2995843.14	20	7.00	Right
199	51+786	24.921	75	25.622	659204.1	2995799	659221.5	2995772	24.92	16.57	1.81	659209.831	2995783.58	40	7.00	Left
200	51+803	13.438	100	23.452	659255.5	2995797	659274.2	2995722	13.44	13.78	0.69	659264.392	2995728.62	40	7.00	Left
201	51+864	16.457	75	18.925	659342.2	2995980	659356.8	2995968	16.46	9.51	0.80	659350.24	2995975.11	40	7.00	Right
202	51+001	66.762	75	84.716	659363.7	2995991	659441.7	2995962	66.76	47.56	13.81	659396.583	2995926.56	40	7.00	Left
203	51+038	23.828	75	31.191	659444.9	2995949	659475.7	2995946	23.83	15.83	1.65	659459.95	2995947.67	40	7.00	Right
204	51+135	23.971	75	31.248	659492	2995965	659522.8	2995949	23.97	15.85	1.66	659507.812	2995943.14	40	7.00	Left
205	51+170	57.732	75	75.572	659596.7	2995975	659668	2995990	57.73	41.34	10.64	659635.911	2995985.95	40	7.00	Right
206	51+355	20.773	75	27.192	659687.1	2995936	659720.7	2995923	20.77	13.74	1.25	659707.695	2995927.31	40	7.00	Left
207	51+385	11.55	75	15.118	659727.2	2995961	659740.9	2995915	11.55	7.59	0.38	659734.982	2995918.4	40	7.00	Right
208	51+481	28.039	75	36.713	659803.5	2995979	659828.4	2995954	28.04	18.73	2.30	659838.463	2995969.77	40	7.00	Right
209	51+532	15.333	75	20.071	659840.8	2995934	659859.5	2995916	15.33	10.09	0.68	659846.089	2995925.43	40	7.00	Right
210	51+567	31.092	75	40.699	659850.2	2995912	659871.5	2995879	31.09	20.90	2.85	659866.106	2995891.8	40	7.00	Left
211	51+604	14.577	75	18.472	659877.3	2995878	659889.8	2995849	14.58	9.36	0.57	659894.149	2995846.27	40	7.00	Right
212	51+644	17.999	75	23.56	659898.9	2995843	659905.8	2995825	18.00	11.89	0.92	659906.304	2995832.63	40	7.00	Left
213	51+773	56.68	75	70.294	659975.8	2995878	660006	2995885	56.68	40.45	10.21	660007.546	2995852.56	40	7.00	Left
214	51+883	78.152	75	102.801	660070.7	2995873	660159.1	2995840	78.15	80.90	21.83	660128.535	2995892.54	40	7.00	Right
215	51+980	44.265	75	57.943	660166.9	2995927	660212.9	2995932	44.27	30.51	5.97	660181.908	2995930.39	40	7.00	Left
216	51+059	56.697	75	74.137	660221.8	2995989	660273.1	2995940	56.69	40.42	10.20	660280.743	2995970.57	40	7.00	Right
217	51+126	89.895	75	51.588	660275.1	2995934	660305.8	2995934	89.40	26.85	4.66	660283.279	2995936.22	40	7.00	Left
218	51+172	38.846	75	24.67	660313.6	2995989	660336.1	2995979	18.85	12.45	1.01	660328.013	2995981.82	40	7.00	Left
219	51+227	42.534	75	54.568	660340.1	2995978	660383.8	2995948	41.53	28.44	5.21	660367.791	2995971.02	40	7.00	Right
220	51+280	23.701	75	31.024	660384.6	2995945	660406.9	2995925	23.70	15.74	1.60	660393.521	2995933.45	40	7.00	Left
221	51+302	14.63	75	16.15	660421.1	2995916	660438.5	2995908	14.63	9.63	0.42	660426.376	2995911.26	40	7.00	Left
222	51+338	27.660	75	36.25	660486.4	2995910	660477.2	2995907	27.66	18.88	2.34	660464.967	2995900.48	40	7.00	Right
223	51+386	43.228	75	54.586	660484.5	2995900	660505.2	2995958	43.23	29.72	5.67	660505.51	2995959.2	40	7.00	Left
224	51+405	54.104	75	70.622	660539	2995958	660598.8	2995925	54.10	38.90	9.21	660577.297	2995957.11	40	7.00	Right
225	51+443	15.792	75	20.589	660618.8	2995996	660632.6	2995981	15.79	10.36	0.71	660624.848	2995987.52	40	7.00	Left
226	51+483	94.175	75	123.272	660647.2	2995989	660756.2	2995982	94.17	80.67	35.15	660738.947	2995993.68	40	7.00	Left
227	51+572	42.579	75	55.735	660783.4	2995920	660820.1	2995940	42.58	25.25	5.40	660800.939	2995943.31	40	7.00	Right
228	51+671	22.066	75	28.888	660886.5	2995903	660915.3	2995901	22.07	14.63	1.41	660900.875	2995903.96	40	7.00	Right
229	51+685	129.562	21	47.487	660939.1											

DATE: 07/03/2020 - 4:42pm
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 FILE: D:\Schubert's Computer\192.168.1.100 - 192.168.1.100

Curve No.	IP		Type of Curve	Curve Length	K Value	Start		End		Gradient	Gradient Length
	Chainage	Level				Chainage	Level	Chainage	Level		
1	40060	1675.748	Sag	60	131.13	40030	1677.622	40090	1674.011	-5.789	219.363
2	40339.36	1659.575	Sag	60	18.055	40309.36	1661.312	40369.36	1658.836	-2.466	27.898
3	40427.26	1657.408	Hog	60	43.92	40397.26	1658.148	40457.26	1656.258	-3.832	52.148
4	40609.41	1650.428	Hog	200	95.617	40509.41	1654.26	40709.41	1644.504	-5.924	649.214
5	41388.62	1604.27	Hog	60	1599.267	41358.62	1606.047	41418.62	1602.481	-5.961	1073.61
6	42542.24	1535.5	Sag	100	1147.245	42492.24	1538.481	42592.24	1532.563	-5.874	271.932
7	42964.17	1510.716	Sag	200	26.531	42864.17	1516.59	43064.17	1512.38	1.664	73.073
8	43262.25	1515.677	Hog	250	59.174	43137.25	1513.596	43387.25	1512.476	-2.56	122.753
9	43540	1508.565	Sag	60	18.855	43510	1509.333	43570	1508.752	0.622	110
10	43710	1509.622	Hog	60	13.148	43680	1509.435	43740	1508.439	-3.942	76.356
11	43846.36	1504.247	Hog	60	35.731	43816.36	1505.43	43876.36	1502.561	-5.621	17.958
12	43924.31	1499.865	Sag	60	20.187	43894.31	1501.551	43954.31	1499.07	-2.649	30.686
13	44015	1497.463	Hog	60	948.037	43985	1498.257	44045	1496.649	-2.712	85
14	44160	1493.53	Sag	60	10.473	44130	1494.344	44190	1494.435	3.017	15
15	44235	1495.793	Hog	60	12.404	44205	1494.888	44265	1495.247	-1.82	25
16	44320	1494.246	Sag	60	18.131	44290	1494.792	44350	1494.693	1.489	50
17	44430	1495.884	Sag	60	17.061	44400	1495.437	44460	1497.386	5.006	42.692
18	44577.69	1503.277	Hog	150	17.189	44502.69	1499.523	44652.69	1500.487	-3.721	47.277
19	44729.97	1497.611	Sag	60	16.428	44699.97	1498.728	44759.97	1497.591	-0.069	65.897
20	44855.87	1497.525	Hog	60	11.856	44825.87	1497.546	44885.87	1495.986	-5.129	10.029
21	44925.9	1493.933	Sag	60	9.258	44895.9	1495.472	44955.9	1494.339	1.352	75.572
22	45081.47	1496.036	Sag	100	54.038	45031.47	1495.36	45131.47	1497.637	3.202	83.533
23	45315	1503.514	Sag	200	82.971	45215	1500.312	45415	1509.127	5.613	461.774
24	45926.77	1537.852	Hog	100	28.792	45876.77	1535.046	45976.77	1538.922	2.14	43.586
25	46070.36	1540.924	Sag	100	26.193	46020.36	1539.855	46120.36	1543.903	5.957	975.46
26	47245.82	1610.951	Hog	300	92.32	47095.82	1602.015	47395.82	1615.013	2.708	119.96
27	47665.78	1622.323	Sag	300	93.898	47515.78	1618.261	47815.78	1631.177	5.903	1793.923
28	49709.7	1742.971	Hog	200	1081.842	49609.7	1737.068	49809.7	1748.689	5.718	216.118
29	50045.82	1762.19	Sag	40	181.984	50025.82	1761.046	50065.82	1763.378	5.938	1072.163
30	51237.98	1832.978	Sag	200	5881.624	51137.98	1827.04	51337.98	1838.95	5.972	1066.767
31	52454.75	1905.641	Hog	100	1848.739	52404.75	1902.655	52504.75	1908.6	5.918	1416.752
32	54071.5	2000.519	Hog	300	43.925	53921.5	1991.795	54221.5	1998.999	-1.013	410.683
33	54732.19	1993.825	Sag	200	42.287	54632.19	1994.838	54832.19	1997.541	3.716	612.4
34	55644.59	2027.733	Hog	400	44.61	55444.59	2020.3	55844.59	2017.232	-5.25	1228.381
35	57222.97	1944.864	Sag	300	29.628	57072.97	1952.739	57372.97	1952.177	4.875	532.684
36	57930	1979.335	Hog	48.698	64	57905.65	1978.147	57954.35	1980.336	4.114	493.441
37	58547.79	2008.967	Sag	200	287.165	58447.79	2003.761	58647.79	2014.869	5.902	791.71
38	59489.5	2064.55	Sag	100	139.472	59439.5	2061.599	59539.5	2067.86	6.619	
39	60750.84	2148.063	Sag	200	531.066	60650.84	2141.44	60850.84	2155.062	6.999	
40	61100	2172.5	Hog	60	16.778	61070	2170.4	61130	2173.527	3.423	

							Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (Ministry of Road Transport & Highways)	Project : Consultancy for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chukhim-Nimbong-Kafer-Bakhim-Algarah-Rhenock in the State of West Bengal and From Rhenock-Rorathang-Pakyong along with Spur From Arilar-Rolep-Menla in the State of Sikkim	DATE : FEB-2020	Revision		RD	PACKAGE - 5A KAFER TO RHENOCK VERTICAL REPORT	
									DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED BY		
R0	Sep 2017	Final Feasibility Report				Consultant : SA INFRASTRUCTURE CONSULTANTS PVT. LTD. Specialized Engineering Service Pvt. Ltd. 1101A, 11th Floor, Tower A-JL Corporate Park, Plot No. TAJV, Sector-142.								
R0	Nov 2016	Draft Feasibility Report												
R0	Dec 2014	Linear Plan												
REV	DATE	DESCRIPTION OF REVISIONS			INITIALS					SCALE:-				

TYPICAL CROSS SECTION

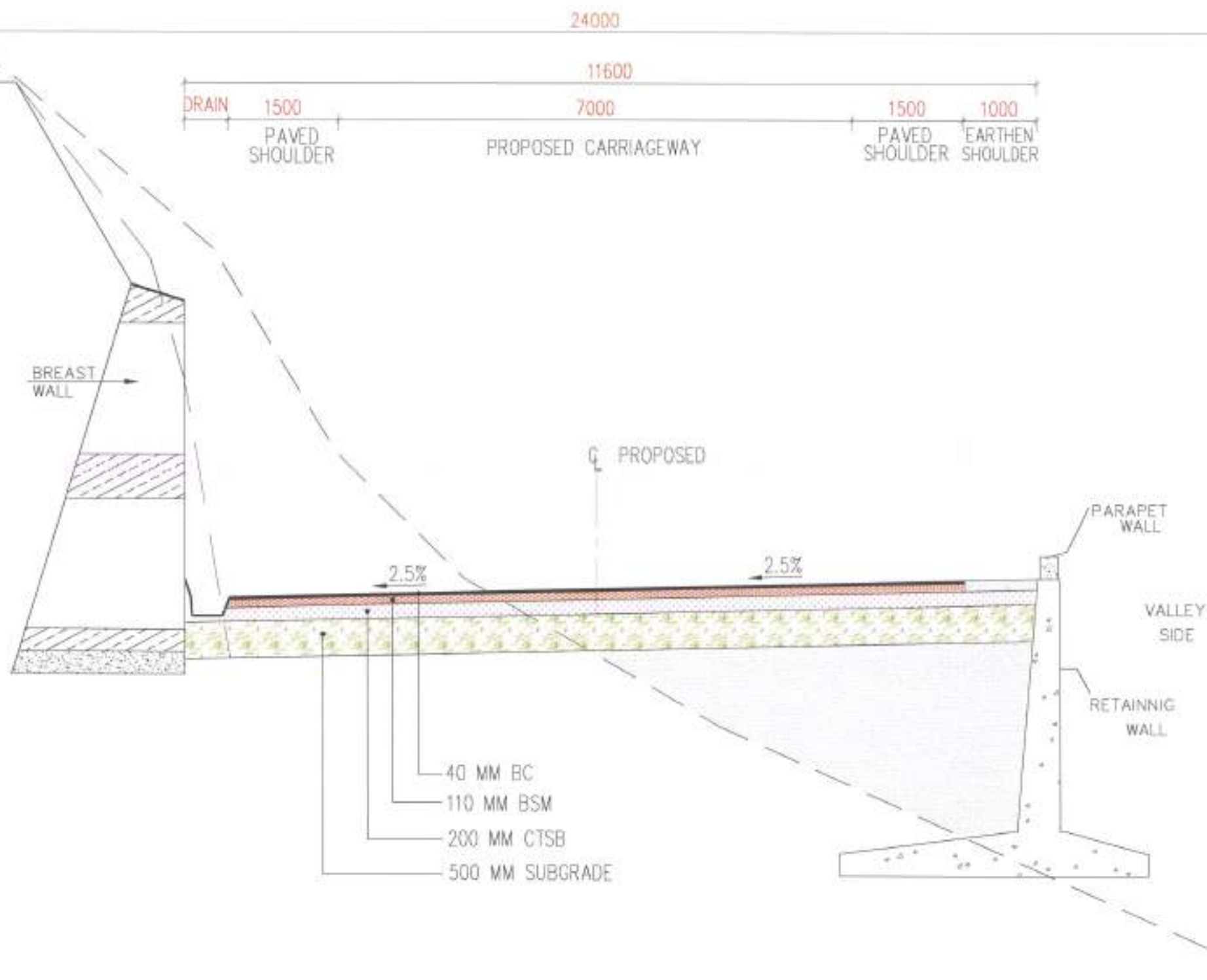


TCS-II
Two Lane With Paved Shoulder Eccentric Left Side Widening (One Side Hill One Side Valley Section)

DATE: 02/03/2020 - 2:28pm FILE: C:\Users\user\Documents\Projects\NHDC\WB\KAFER TO RHEK\TCS-II.dwg				Client: NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (Ministry of Road Transport & Highways)		Project: Consultancy for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chukhim-Nimbong-Kater-Bakim-Algarah-Rhenok in the State of West Bengal and From Rhenok-Rorathang-Pakyong along with Spur From Aritar-Rolep-Menia in the State of Sikkim		DATE: FEB-2020		Revision: RD		PACKAGE- 5 KAFER TO RHEK TYPICAL CROSS SECTION	
REV				Consultant: SA INFRASTRUCTURE CONSULTANTS PVT. LTD. (Specialized Engineering Service Pvt. Ltd.)		DESIGNED BY: Vijay Gupta		DRAWN BY: Ashish		CHECKED BY: Vijay Gupta		APPROVED BY: Sanjay Shukla	
DESCRIPTION OF REVISIONS				INITIALS		SCALE: - NTS		Dwg. No. - SACPL-SCSP/NHDC/WB-9KM/TCS/2					

PROPOSED RIGHT OF WAY

HILL SIDE



PROPOSED RIGHT OF WAY

TCS-IV
Two Lane With Paved Shoulder (One Side Hill One Side Valley Section)
(Re-Alignment)

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

Consultant : KA INFRASTRUCTURE CONSULTANTS PVT. LTD.
 Specialized Engineering Service Pvt. Ltd.
 1101A, 11th Floor, Tower A-1, Corporate Park,
 Plot No. 2A/1, Sector-14G,
 Gurgaon, Haryana

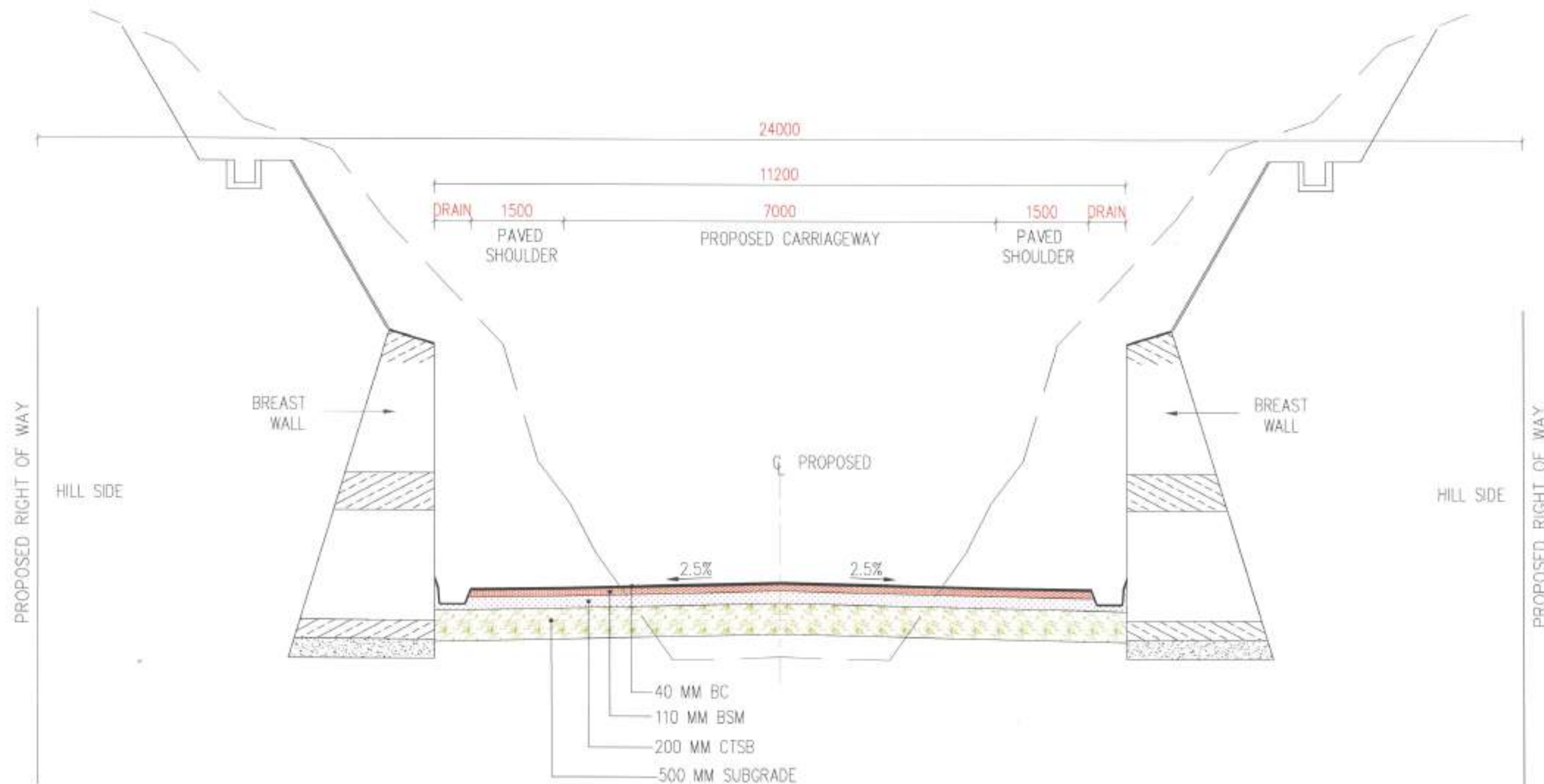
Project : Consultancy for Preparation of Feasibility Report cum Preliminary
 Design for Alternative Highway to Gangtok in Sikkim via
 Bagrakot-Chukhim-Nimbong-Kater-Bakim-Algarah-Rhenok in the State of
 West Bengal and From Rhenok-Rorathang-Pakyong along with
 Spur From Aritar-Rolep-Menta in the State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

DATE : FEB-2020	Revision : RD
DESIGNED BY : Vijay Gupta	DRAWN BY : Ashish
CHECKED BY : Vijay Gupta	APPROVED BY : Sanjay Shukla
SCALE : - NTS	

PACKAGE- 5
KAFER TO RHENOCK
TYPICAL CROSS SECTION

Dwg. No. :- S&CPL-SCSP/NH&IDCL/MB-S&M/TCS/ 4

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



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

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

Consultant : SA INFRASTRUCTURE CONSULTANTS PVT. LTD.
 Specialized Engineering Service Pvt. Ltd.
 1501A, 11th Floor, Tower A-4, Corporate Park,
 Plot No. 2A/1, Sector 142,
 Noida, 201307, Uttar Pradesh

Project :

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

DATE : FEB-2020

Revision : 00

DESIGNED BY

DRAWN BY

CHECKED BY

APPROVED BY

Vijay Gupta

Ashish

Vijay Gupta

Sanjay Shukla

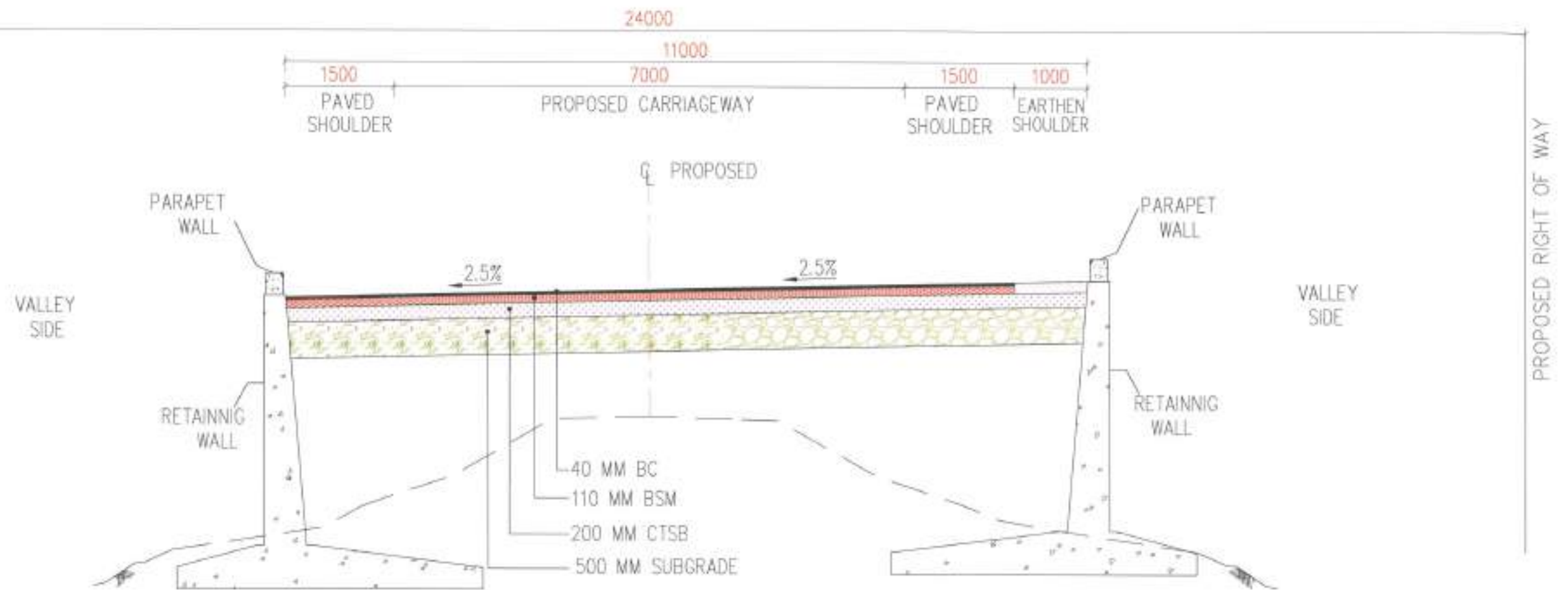
SCALE:- NTS

PACKAGE- 5
KAFER TO RHENOCK
TYPICAL CROSS SECTION

Dwg. No. : SAICPL-SESR/NHDD/MB-SKM/TCS/ 5

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

PROPOSED RIGHT OF WAY



PROPOSED RIGHT OF WAY

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

DATE: 02/03/2020 - 3:38pm

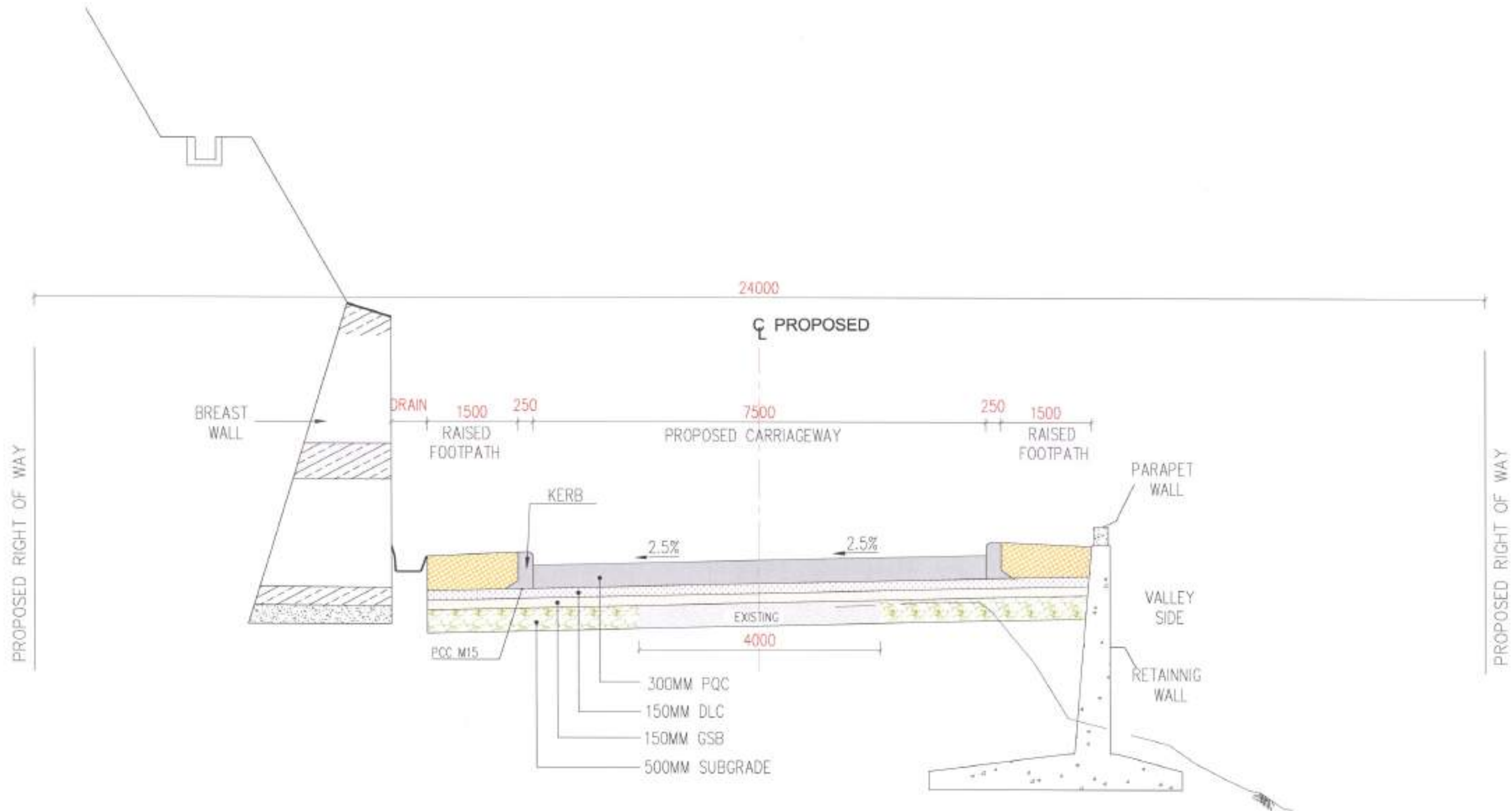
REV	DATE	DESCRIPTION OF REVISIONS	INITIALS
R0	Sep 2017	Final Feasibility Report	
R0	Nov 2016	Draft Feasibility Report	
R0	Dec 2014	Linear Plan	

Client :	NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (Ministry of Road Transport & Highways)
Consultant :	SA INFRASTRUCTURE CONSULTANTS PVT. LTD. Specialized Engineering Services Pvt. Ltd. 1101A, 11th Floor, Tower A-4, Corporate Park, Plot No. 7A/1, Sector-142, Gurgaon, Haryana

Project :	Consultancy for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chukhim-Nimbong-Kafer-Bakim-Algarah-Rhenok in the State of West Bengal and From Rhenok-Rorathang-Pakyong along with Spur From Aritar-Rolep-Menta in the State of Sikkim
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DATE :	FEB-2020	Revision :	R0
DESIGNED BY :	Vijoy Gupta	DRAWN BY :	Ashish
CHECKED BY :	Vijoy Gupta	APPROVED BY :	Sanjay Shukla
SCALE :	NTS		

PACKAGE- 5 KAFER TO RHENOCK TYPICAL CROSS SECTION
Dwg. No. : SACPL-SESPL/MHDD/WB-SKM/TCS/ 6



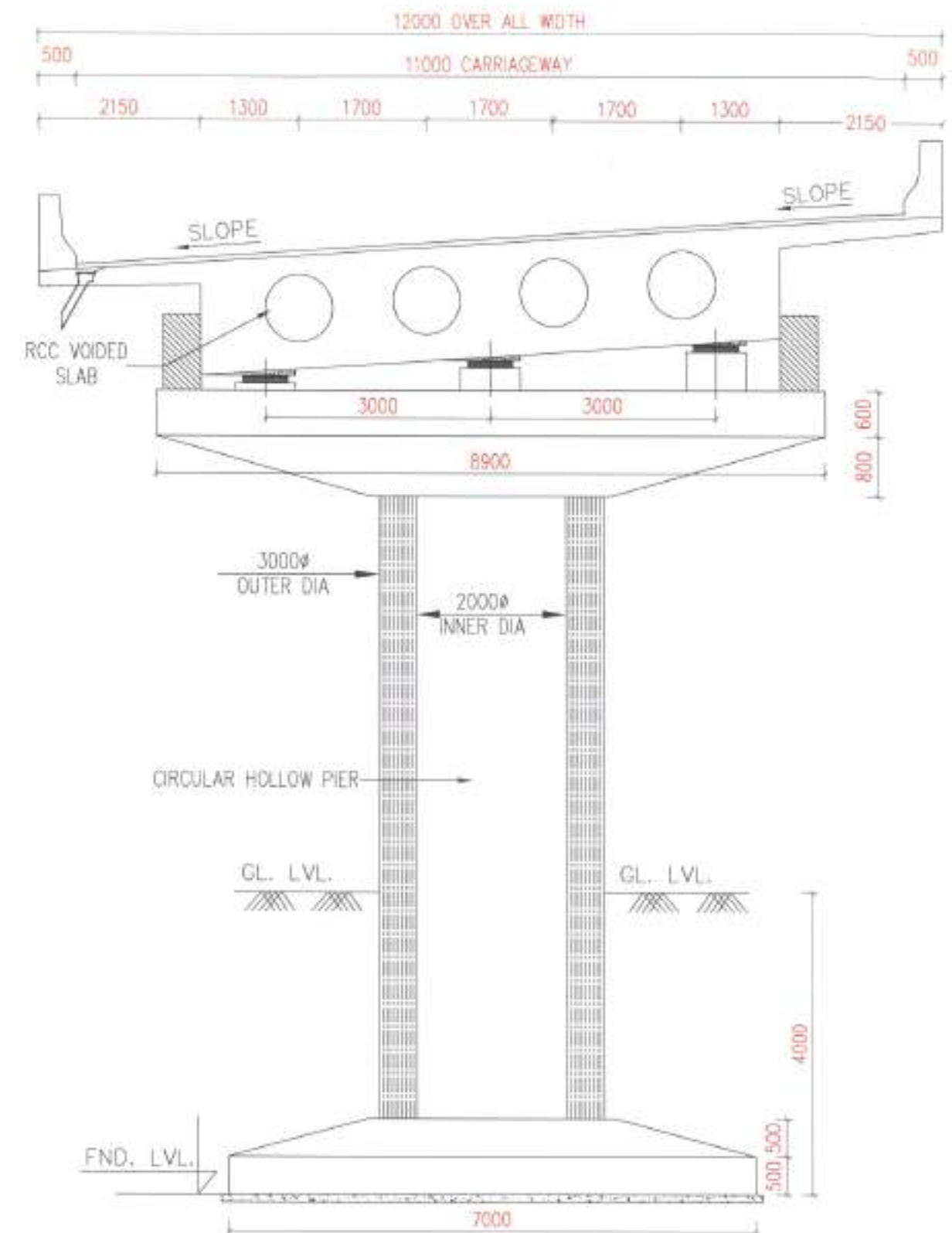
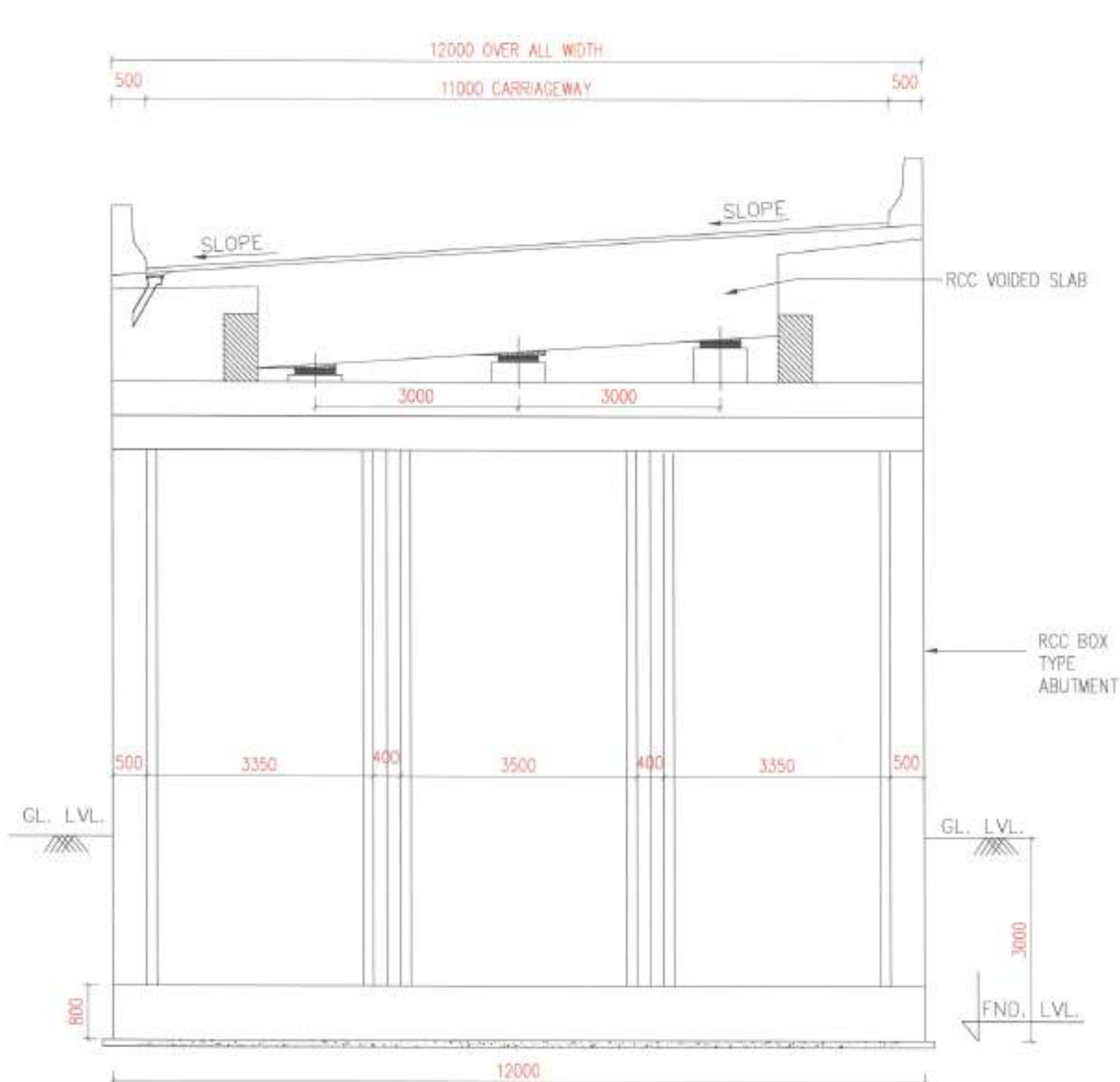
Typical Cross-Section - IX
Two Lane Carriageway With Raised Footpath Builtup Area (Hill Terrain)

DATE: 22/07/2020 TIME: 9:28 AM PROJECT: KAFER TO RHEOCK SECTION: TYPICAL CROSS SECTION				Client: NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (Ministry of Road Transport & Highways)	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 Antar-Rolep-Menta in the State of Sikkim	DATE: FEB-2020 DESIGNED BY: Vijay Gupta DRAWN BY: Anish CHECKED BY: Vijay Gupta APPROVED BY: Sanjay Shukla SCALE: NTS	Revision: 00 PACKAGE- 5 KAFER TO RHEOCK TYPICAL CROSS SECTION	Dwg. No.: SAICPL-SESPL/NHDDL/WB-SKM/TCS/0
REV	DATE	DESCRIPTION OF REVISIONS	INITIALS	Consultant: SA INFRASTRUCTURE CONSULTANTS PVT. LTD. (Specialized Engineering Service Pvt. Ltd. 1125A, 11th Floor, Tower A-1, Corporate Park, Plot No. 3A/1, Sector-14B, Noida-201301, Uttar Pradesh)				
R0	Sep. 2017	Final Feasibility Report						
R0	Nov. 2016	Draft Feasibility Report						
R0	Dec. 2014	Linear Plan						



RO	Sep. 2017	Final Feasibility Report			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-3, 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-Chukhim-Nimbung-Kafer-Bakhim-Algarah-Rhenok in the State of West Bengal and From Rhenok-Rorathang-Pakyong along with Spur From Aritar-Rolep-Merla in the State of Sikkim	DATE : FEB-2020		Revision : RD		PACKAGE- 5 KAFER TO RHENOCK TYPICAL CROSS SECTION
RO	Nov 2016	Draft Feasibility Report					DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED BY	
RO	Dec 2014	Linear Plan									
REV	DATE	DESCRIPTION OF REVISIONS		INITIALS			SCALE - NTS				

Dwg. No. : SA/PL-S/SP/L/NIHDDL/WB-SKM/TCS/ 10



TCS-XI
TYPICAL CROSS SECTION FOR ELEVATED STRUCTURE
(Including Box Abutment Length)

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

Consultant : SA INFRASTRUCTURE CONSULTANTS PVT. LTD.
 Specialized Engineering Service Pvt. Ltd.
 112/5A, 11th Floor, Tower A-1, Corporate Park,
 Plot No. 3A/1, Sector-14D,
 Gurgaon, Haryana-122002, India

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-Menta in the State of Sikkim

DATE : FEB-2020	Revision	ISS
DESIGNED BY	DRAWN BY	CHECKED BY
Vijay Gupta	Arish	Vijay Gupta
SCALE:- NTS		Sanjay Shukla

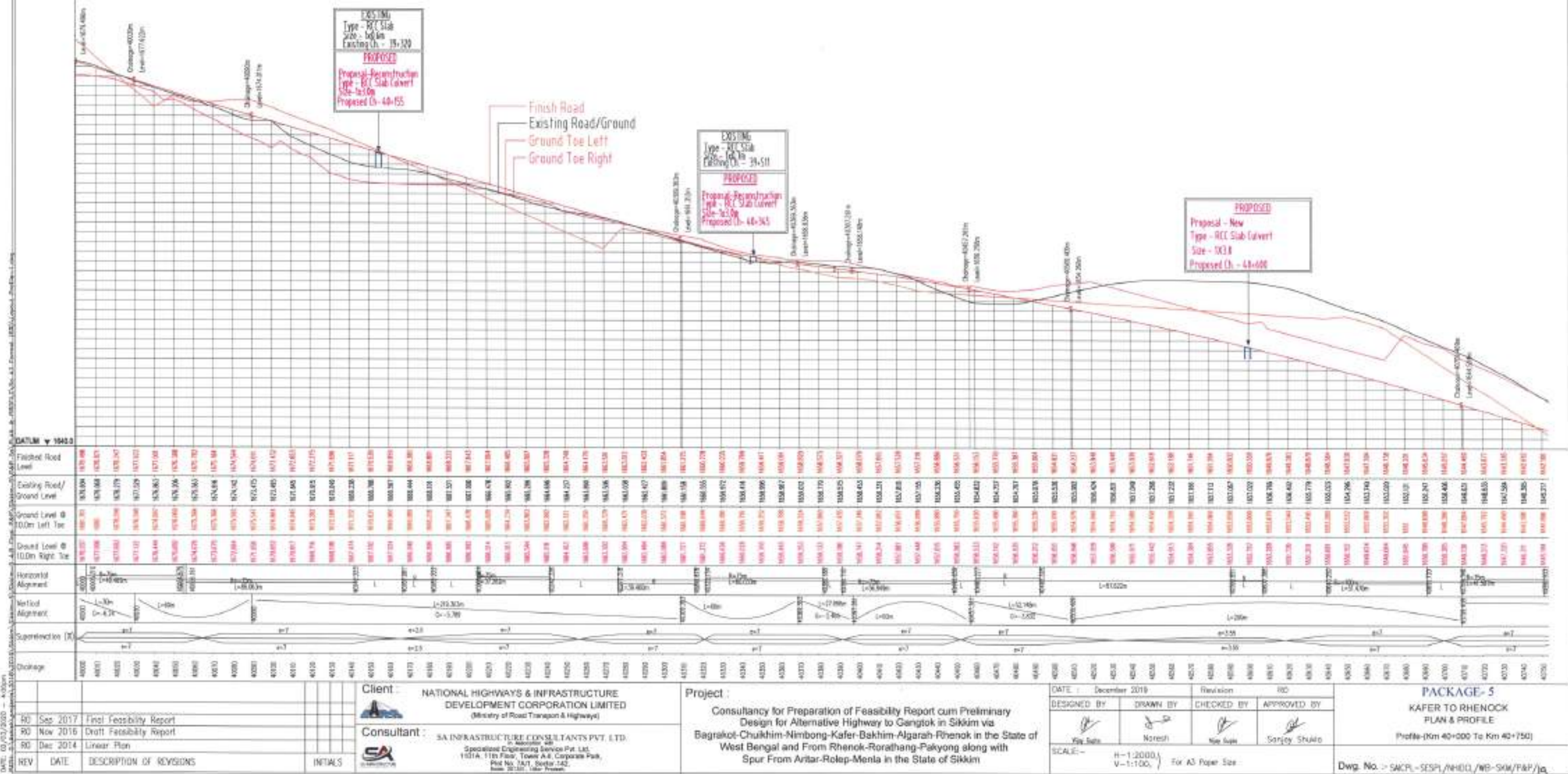
PACKAGE- 5
KAFER TO RHENOCK
TYPICAL CROSS SECTION

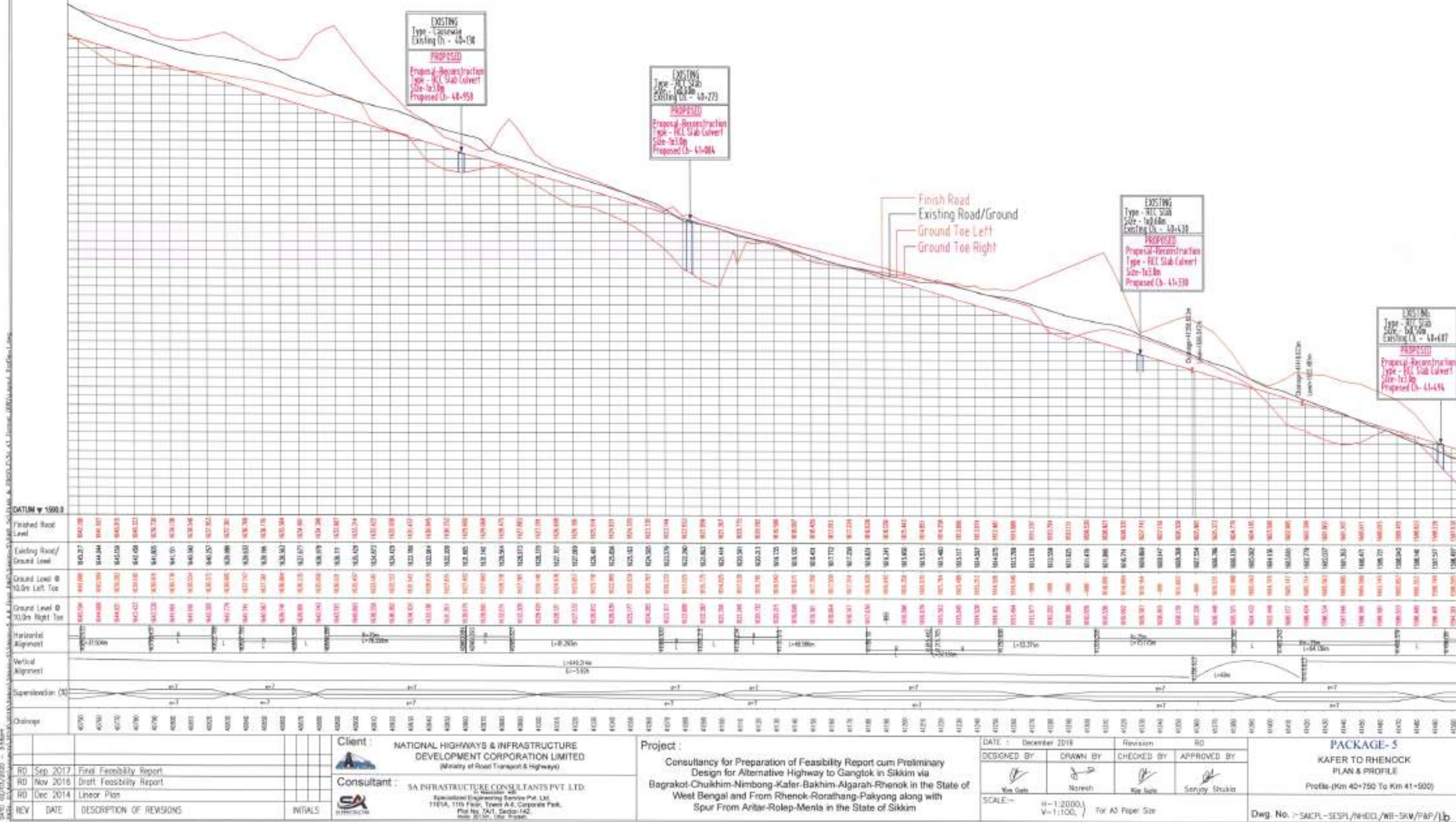
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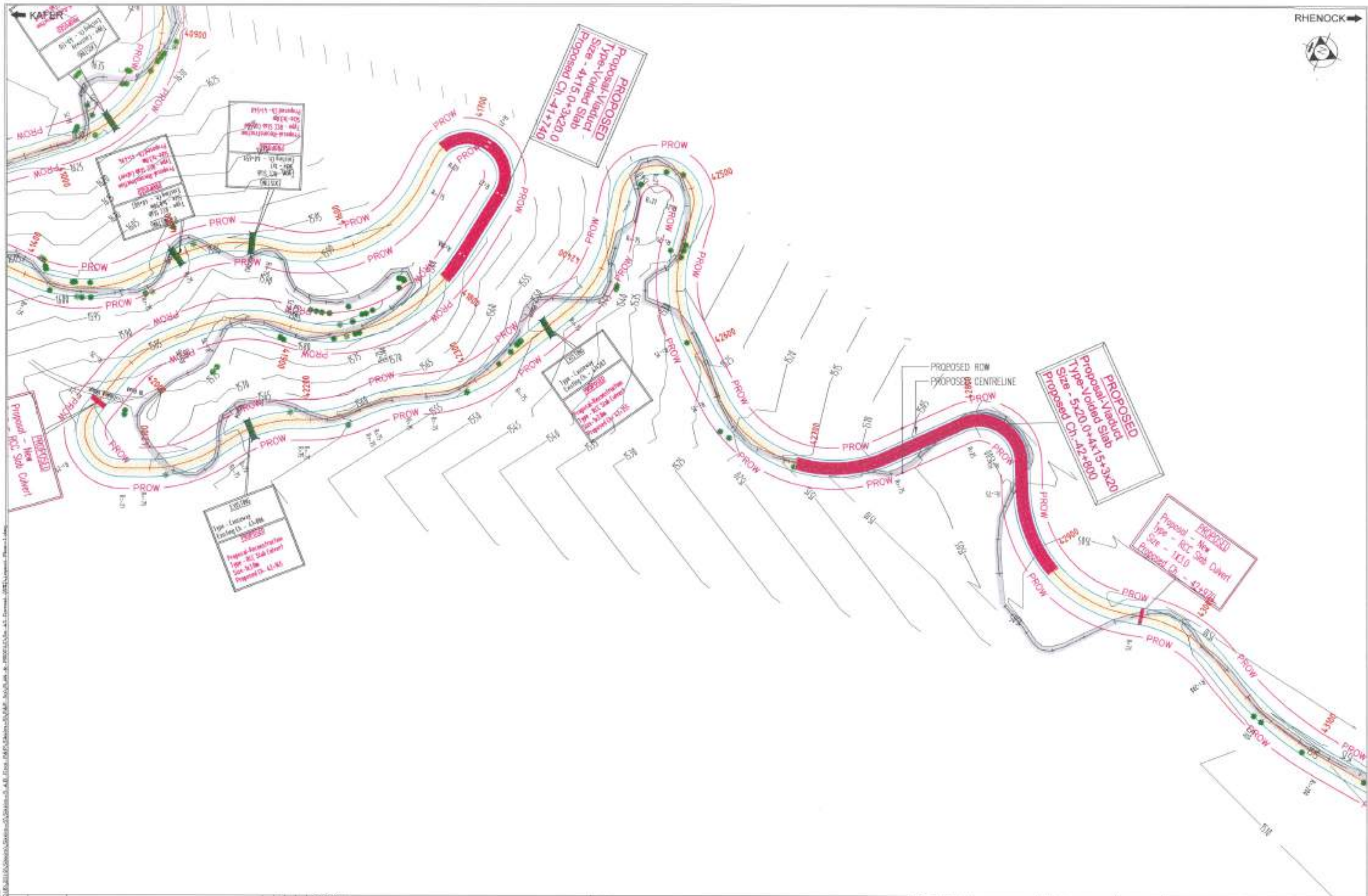
PLAN & PROFILE



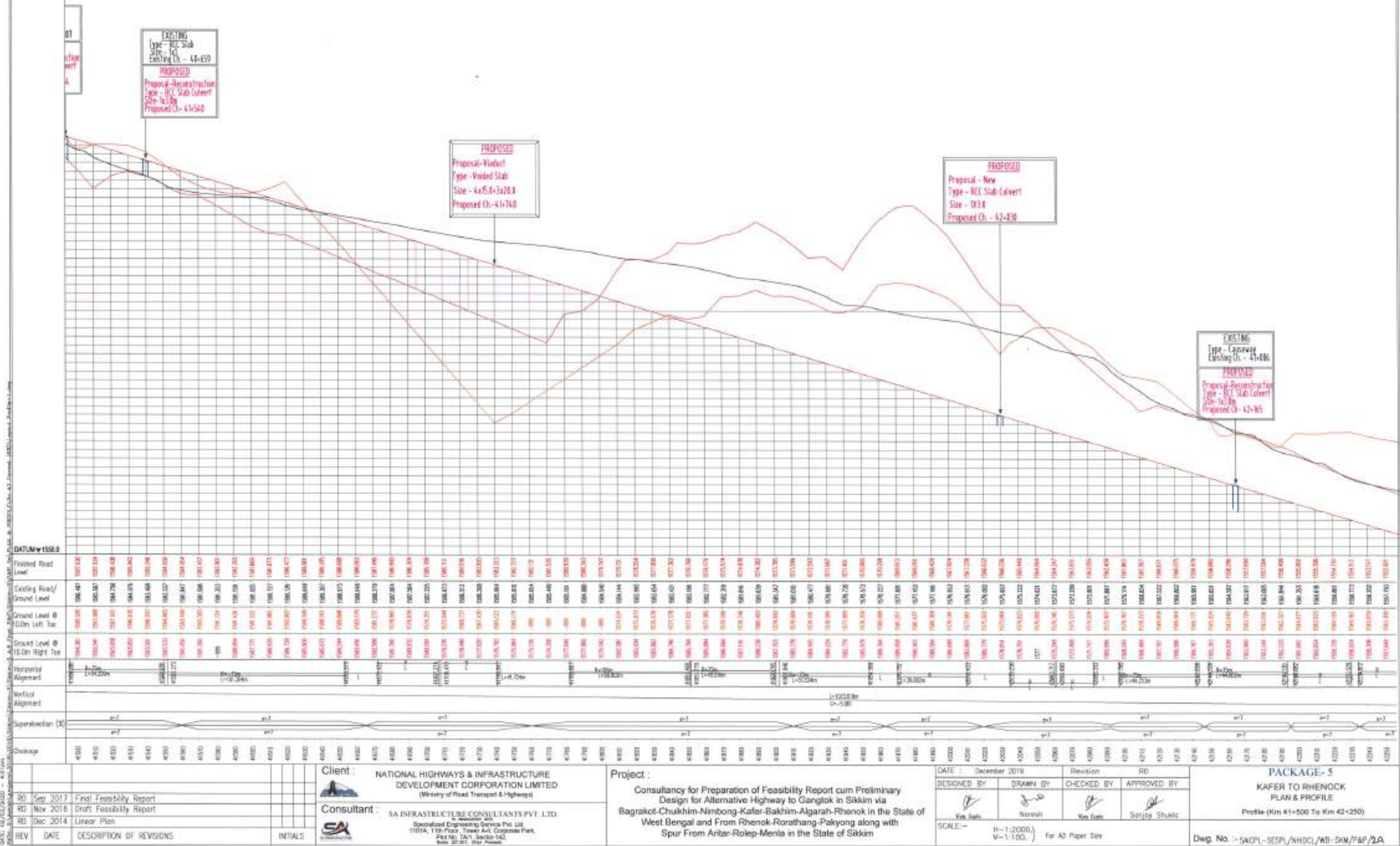
					 Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (Ministry of Road Transport & Highways) Consultant : SA INFRASTRUCTURE CONSULTANTS PVT. LTD 24, Anandpur, 4th Specialized Engineering Service Pvt. Ltd. 116/1A, 11th Floor, Tower A-8, Corporate Park, Plot No. 76/1, Sector-54D, Gurgaon-122001, Haryana, India	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-Menta in the State of Sikkim	DATE : FEB-2008		Revision		RD	PACKAGE- 5A KAFER TO RHENOCK PLAN & PROFILE (PLAN : Km 40+000 To Km 41+000)
RO	Sep. 2017	Final Feasibility Report					DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED BY		
RO	Nov 2016	Draft Feasibility Report					 Vijay Gupta	 Nareish	 Vijay Gupta	 Sanjay Shukla		
RO	Dec 2014	Linear Plan					SCALE:- H=1:2000, V=1:100, For A3 Paper Size					
REV	DATE	DESCRIPTION OF REVISIONS			INITIALS					Dwg No. :- SAEPL-SSESPL/RHEDC/WB-SKM/P&P/01		

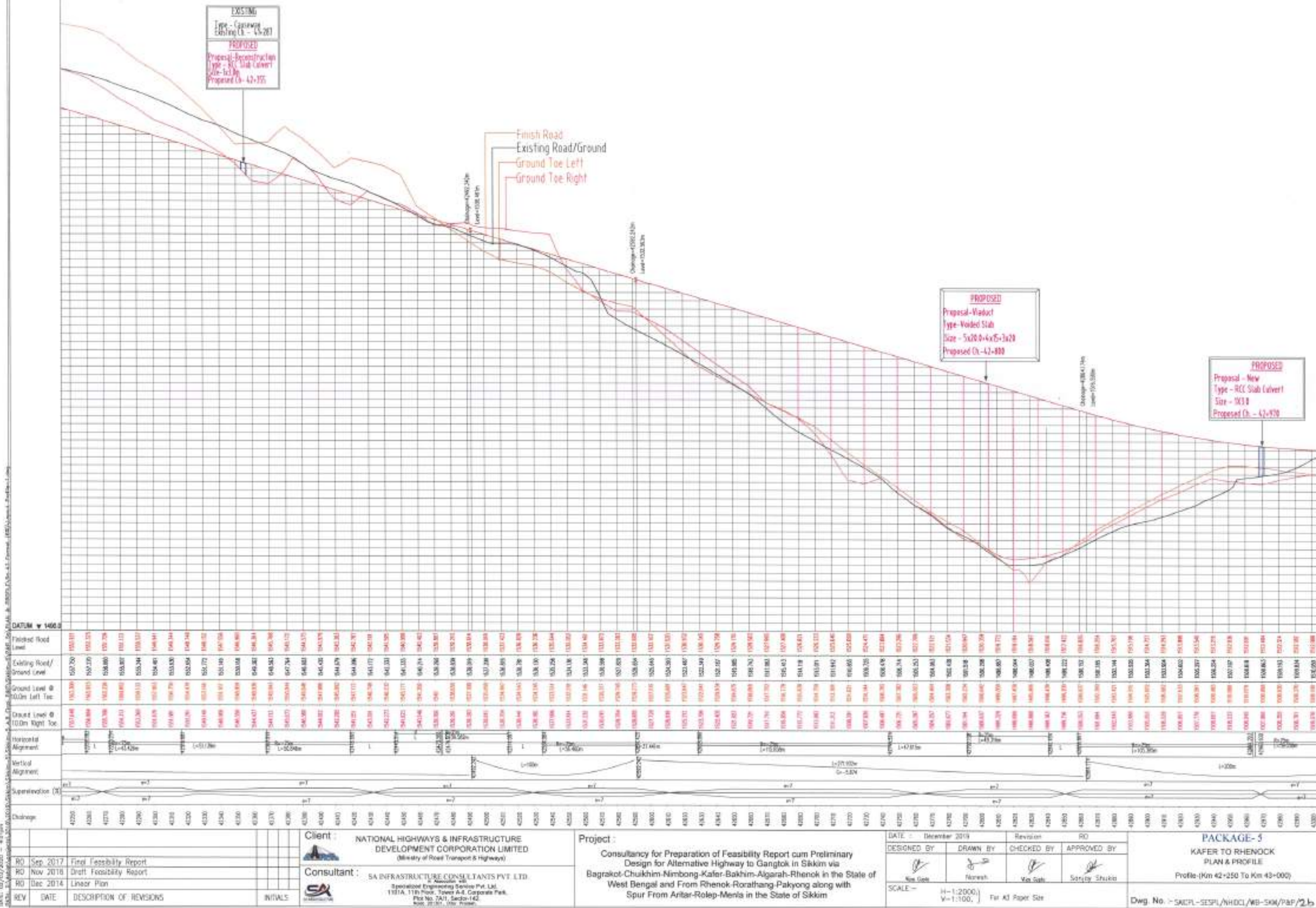


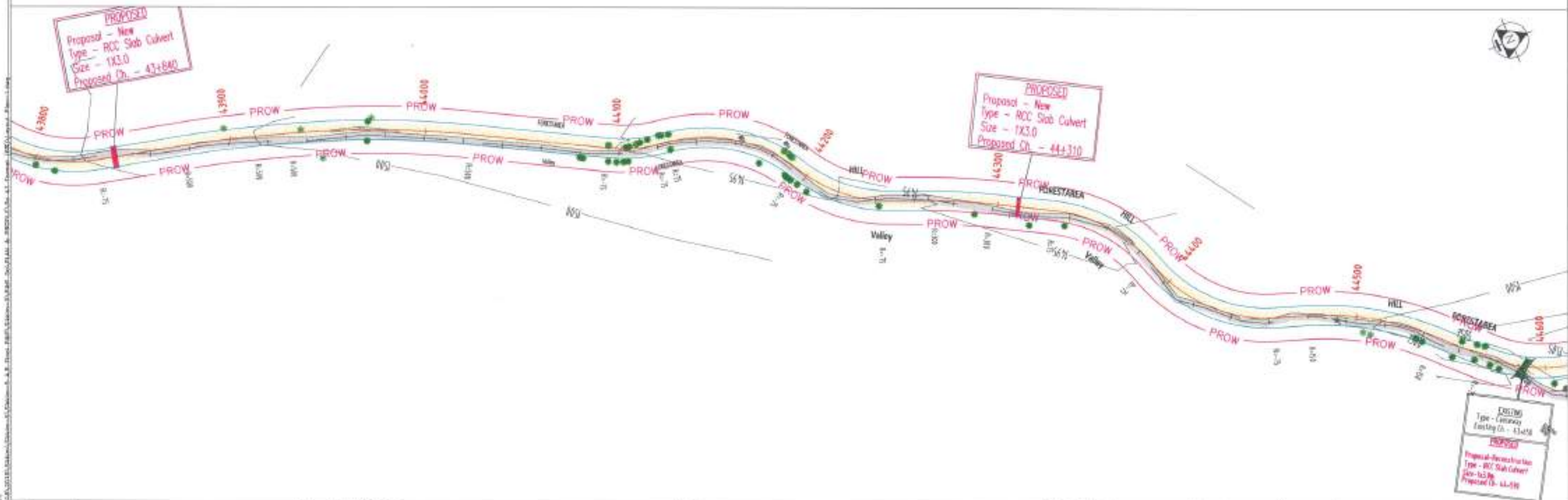
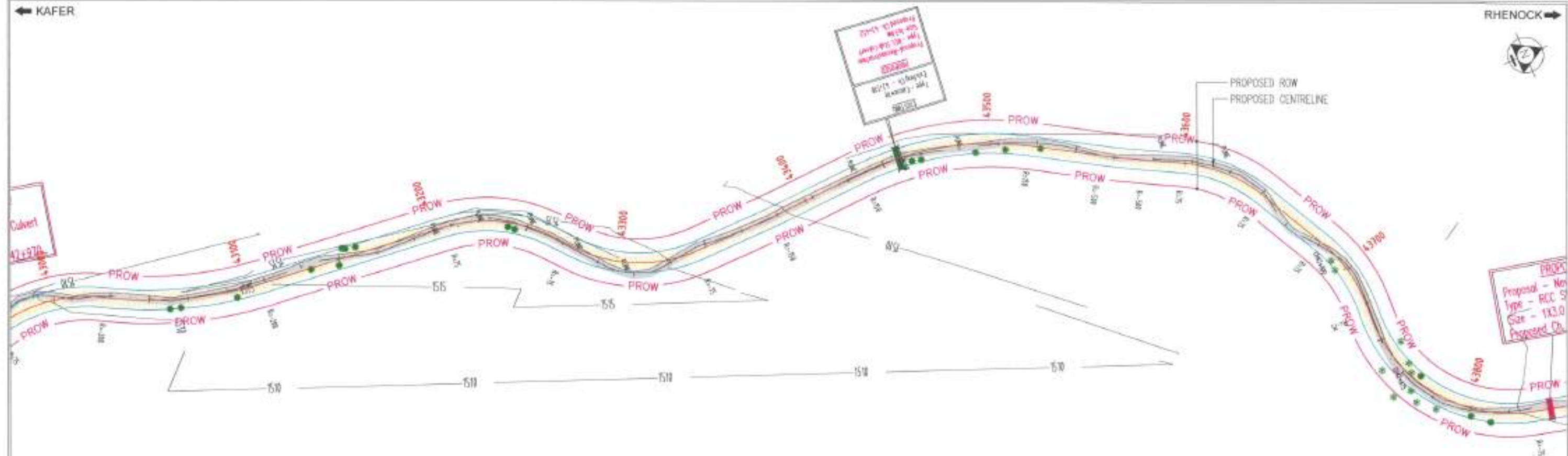




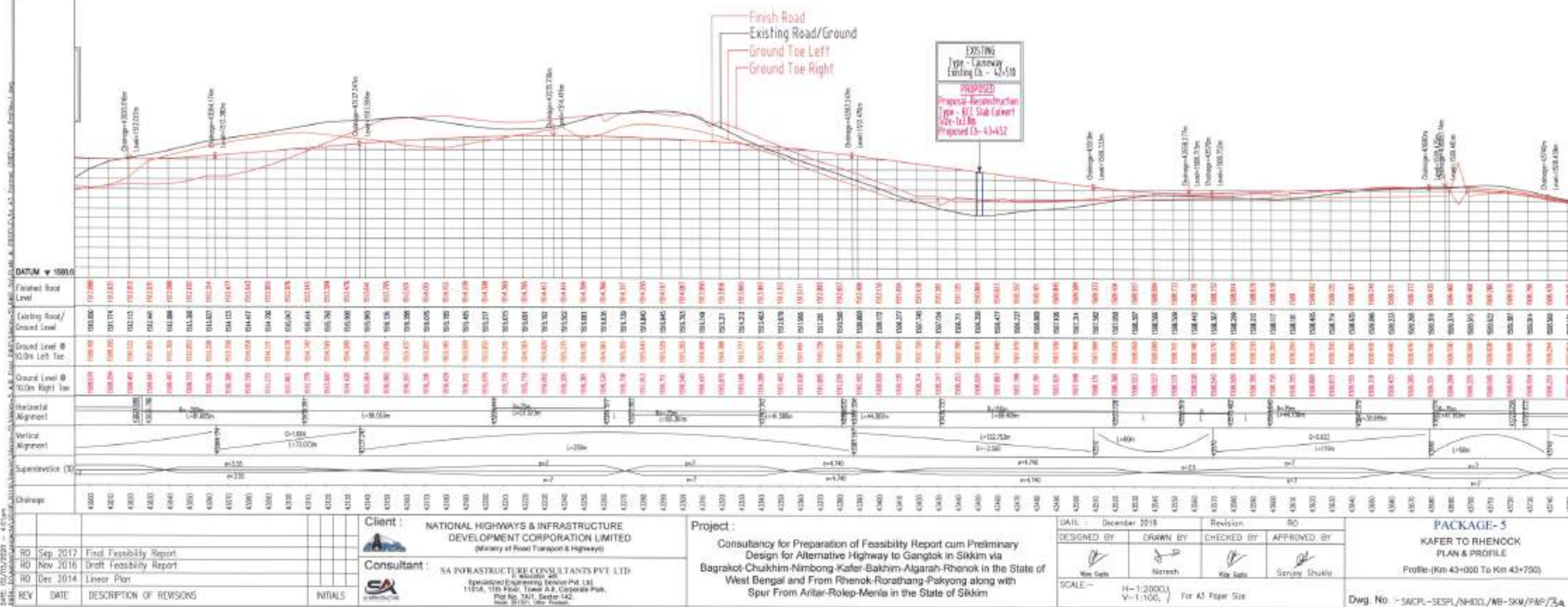
			Client :  NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (Ministry of Road Transport & Highways)			Project : Consultancy for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chukhim-Nimbong-Kafer-Bakhim-Algarah-Rhenok in the State of West Bengal and From Rhenok-Rorathang-Pakyong along with Spur From Aritar-Rolep-Menla in the State of Sikkim			DATE : 1 FEB-2020		Revision : RD		PACKAGE- 5A KAFER TO RHENOCK PLAN & PROFILE (PLAN - Km 41+500 To Km 43+000)			
			Consultant :  SA INFRASTRUCTURE CONSULTANTS PVT. LTD. Specialized Engineering Service Pvt. Ltd. 1101A, 11th Floor, Tower A-41, Corporate Park, Plot No. 7A/1, Sector 14D, Gurgaon, 122001, Haryana, India						DESIGNED BY :  Vijay Gupta		DRAWN BY :  Nareet		CHECKED BY :  Vijay Gupta		APPROVED BY :  Sonjoy Shukla	
									SCALE:- H-1:2000, V-1:100, For A3 Paper Size				Dwg. No. :- SACPL-SESPL/RHOC/L/AB-SKM/PM/02			



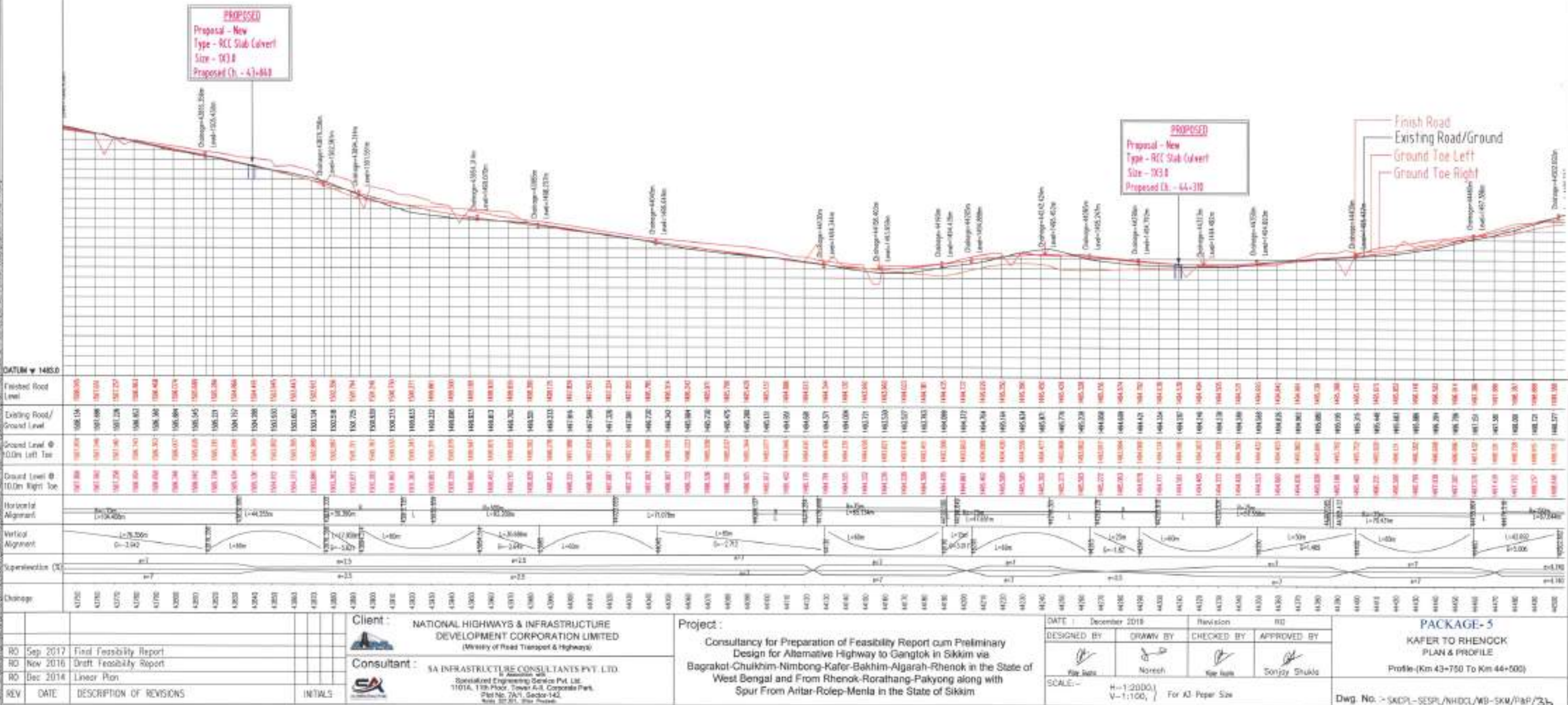




									Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (Ministry of Road Transport & Highways)		Project : Consultancy for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chukhim-Nimbong-Kaler-Bakim-Algarah-Rhenok in the State of West Bengal and From Rhenok-Rorathang-Pakyong along with Spur From Aritar-Rolep-Menla in the State of Sikkim		DATE : 1 FEB 2020		Revision		HD		PACKAGE- 5A KAHER TO RHENOCK PLAN & PROFILE (PLAN : Km 43+000 To Km 44+500)			
									Consultant : SA INFRASTRUCTURE CONSULTANTS PVT. LTD. (Incorporated in India) Specialized Engineering Services Pvt. Ltd. 1101A, 11th Floor, Tower A-1, Corporate Park, Plot No. 7A/1, Sector 142, Noida 201301, Uttar Pradesh				DESIGNED BY		DRAWN BY		CHECKED BY				APPROVED BY	
R0			Sep 2017		Final Feasibility Report																	
R0			Nov 2016		Draft Feasibility Report																	
R0			Dec 2014		Linear Plan																	
REV			DATE		DESCRIPTION OF REVISIONS						INITIALS											



DATE: 02/01/2020 - 4:05pm
 DRAWN BY: SAKPL-SESPL/NHDC/MB-SKM/P&P/3b
 CHECKED BY: SAKPL-SESPL/NHDC/MB-SKM/P&P/3b
 DESIGNED BY: SAKPL-SESPL/NHDC/MB-SKM/P&P/3b
 PROJECT: Bagrakot-Chukhim-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



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

Consultant: SA INFRASTRUCTURE CONSULTANTS PVT. LTD.
 Registered Engineering Services Pvt. Ltd.
 1101A, 11th Floor, Tower A-8, Corporate Park,
 Plot No. 7A/1, Sector-142,
 Gurgaon, Haryana

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 Antar-Rolep-Menla in the State of Sikkim

DATE: December 2018
 DESIGNED BY: [Signature]
 DRAWN BY: [Signature]
 CHECKED BY: [Signature]
 APPROVED BY: [Signature]
 SCALE: H=1:2000, V=1:100, For A3 Paper Size

PACKAGE-5
 KAFER TO RHENOCK
 PLAN & PROFILE
 Profile (Km 43+750 To Km 44+500)
 Dwg. No. - SAKPL-SESPL/NHDC/MB-SKM/P&P/3b

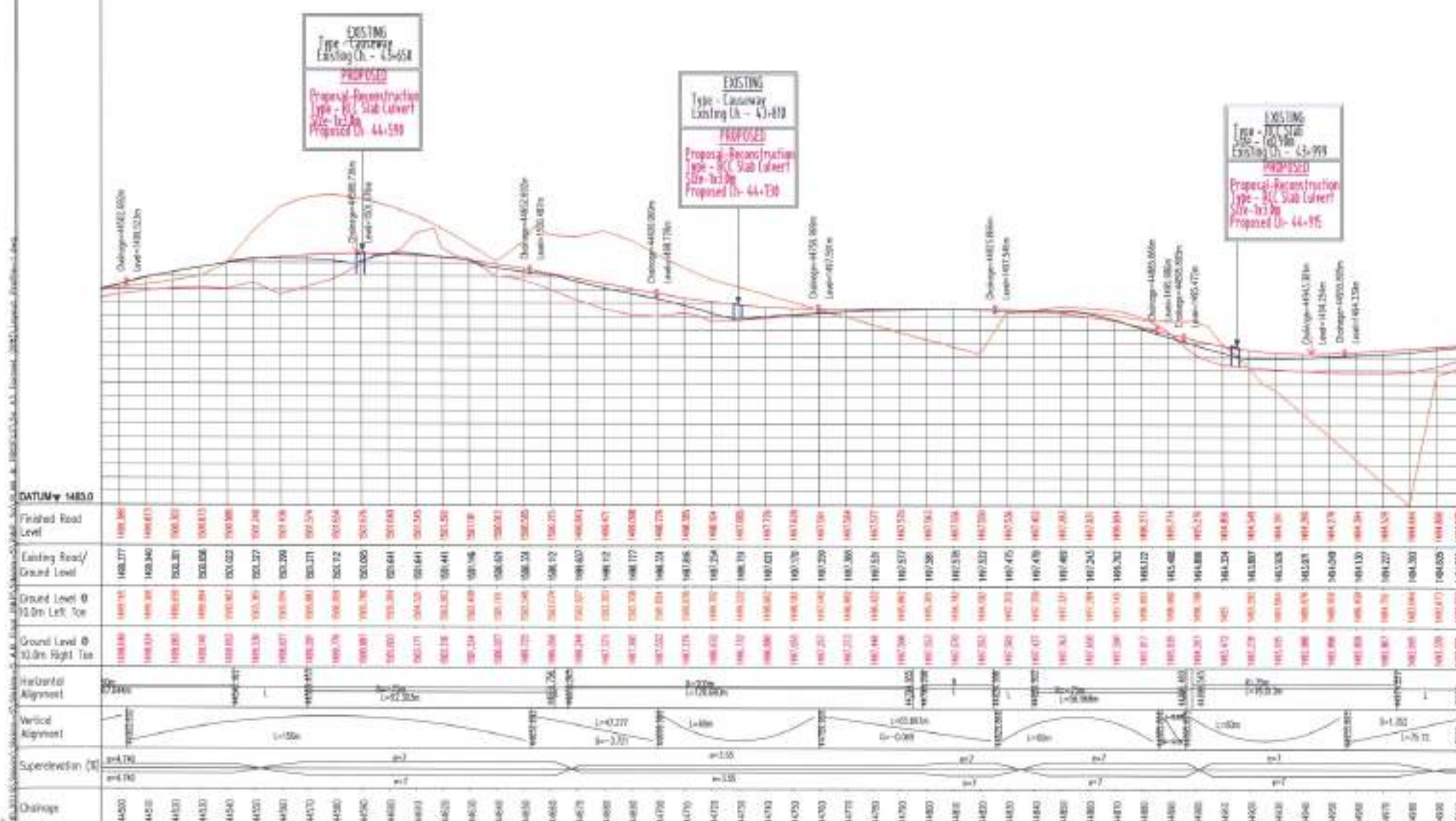
← KAHER

→ RHENOCK



							Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (Ministry of Road Transport & Highways)		Project : Consultancy for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chukhim-Nimbong-Kafer-Bakim-Algarah-Rhenok in the State of West Bengal and From Rhenok-Rorathang-Pakyong along with Spur From Artar-Rolep-Menta in the State of Sikkim		DATE : FEB-2020		Revision		RD		PACKAGE- 5A KAFER TO RHENOCK PLAN & PROFILE (PLAN - Km 44+500 To Km 45+750)			
							Consultant : SA INFRASTRUCTURE CONSULTANTS PVT. LTD. Specialized Engineering Service Pvt. Ltd. 1101A, 113 Floor, Tower A/1, Corporate Park, Plot No. 7A/1, Sector-142, Gurgaon, Haryana				DESIGNED BY		DRAWN BY		CHECKED BY				APPROVED BY	
R0			Sep. 2017		Final Feasibility Report															
R0			Nov 2016		Draft Feasibility Report						Vijay Gupta		Nareish		Vijay Gupta				Sanjay Shukla	
R0			Dec. 2014		Linear Plan															
REV			DATE		DESCRIPTION OF REVISIONS				INITIALS		SCALE:-		H-1:2000, V-1:100,		For A3 Paper Size		Dwg. No. > SACPL-SESPL/WHDC/WB-SKM/P&P/04			

DATE: 05/03/2020 - 10:50 AM



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

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

Consultant : SA INFRASTRUCTURE CONSULTANTS PVT. LTD.
Specialized Engineering Services Pvt. Ltd.
1101A, 11th Floor, Tower A-1, Corporate Park,
Plot No. 7A/1, Sector-142,
Gurgaon, Haryana

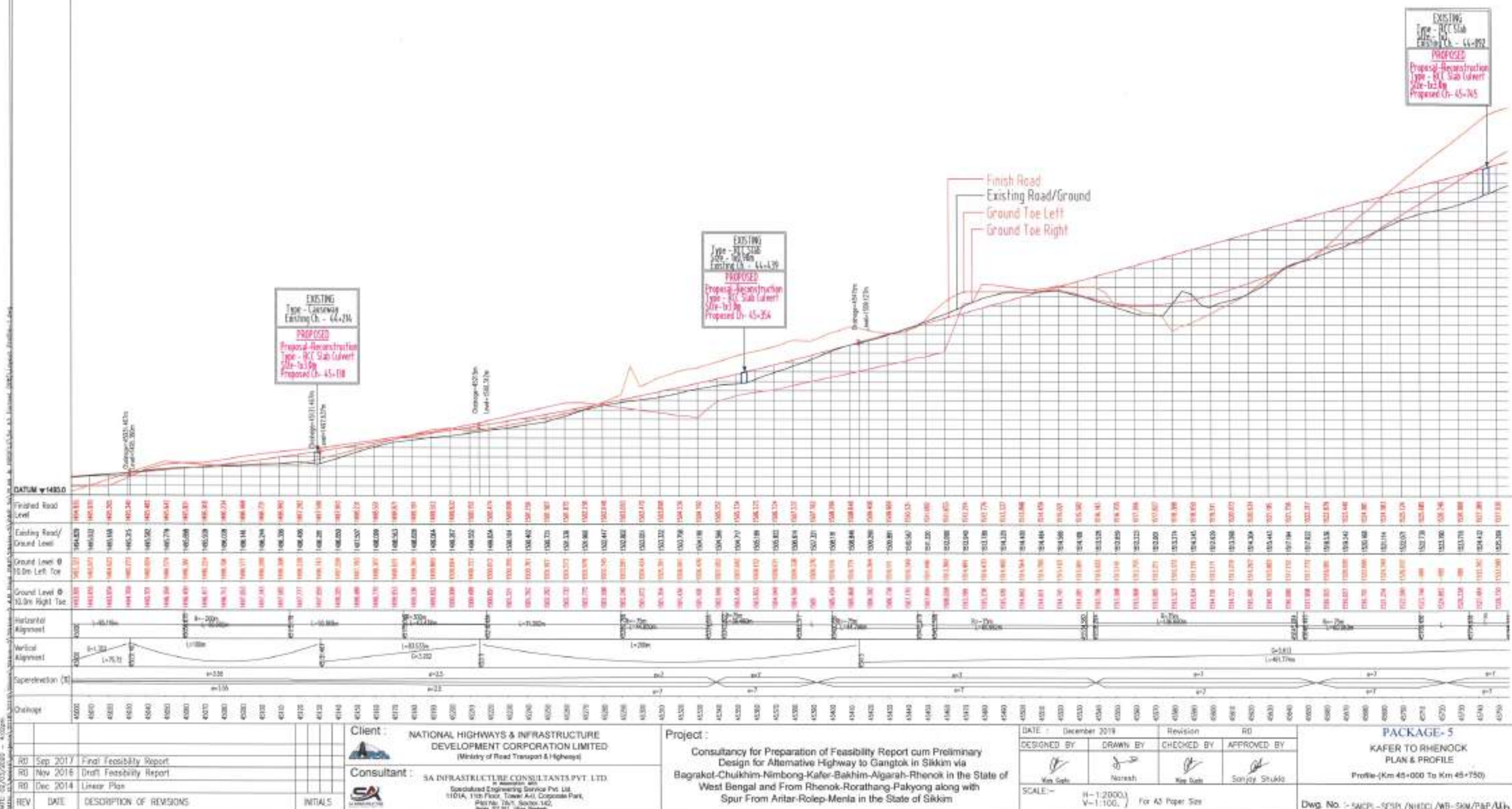
Project : Consultancy for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chukhim-Nimbong-Kafer-Bakhim-Algarah-Rhenok in the State of West Bengal and From Rhenok-Rorathang-Pakyong along with Spur From Arilar-Rolep-Menta in the State of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

DATE : December 2019	Revision	RD
DESIGNED BY	DRAWN BY	CHECKED BY
W. S. S.	R. S. S.	W. S. S.
SCALE: H=1:2000, W=1:100, For A3 Paper Size		

PACKAGE- 5
KAFER TO RHENOCK
PLAN & PROFILE
Profile (Km 44+500 To Km 45+000)

Dwg. No. - SA/PL-SESPL/NHDC/WB-SKM/P&P/4a

DATE: 02/03/2020 - 1:02PM
 DRAWN BY: [Signature]
 CHECKED BY: [Signature]
 APPROVED BY: [Signature]



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-1, 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-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 : December 2019
 DESIGNED BY : [Signature]
 DRAWN BY : [Signature]
 CHECKED BY : [Signature]
 APPROVED BY : [Signature]

SCALE : H-1:2000, V-1:100, For A3 Paper Size

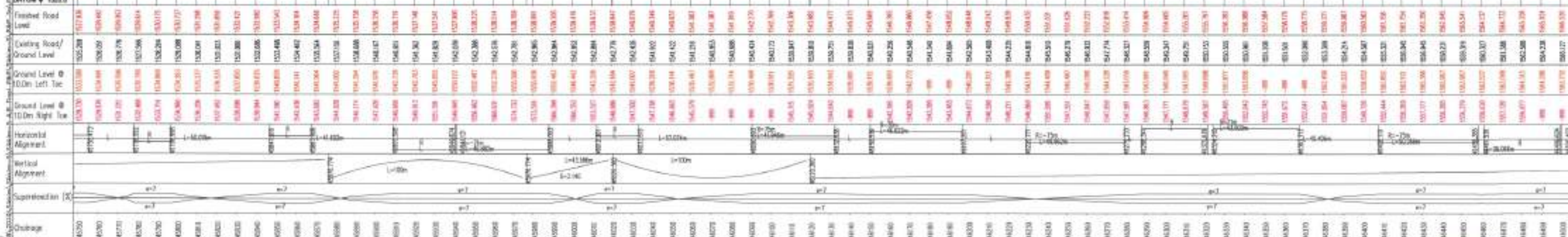
PACKAGE - 5
 KAFER TO RHENOCK
 PLAN & PROFILE
 Profile (Km 45+000 To Km 45+750)
 Dwg. No. : SACPL-SCSP/NHIDCL/WB-SKM/P&P/UB



							Client :  NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (Ministry of Road Transport & Highways)		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-Menta in the State of Sikkim		DATE : FEB-2020		Revision: RD		PACKAGE- 5A KAFER TO RHENOCK PLAN & PROFILE (PLAN - Km 45+130 To Km 47+250)					
							Consultant :  SA INFRASTRUCTURE CONSULTANTS PVT. LTD. Specialized Engineering Services Pvt. Ltd. 112/A, 11th Floor, Tower A-2, Corporate Park, Plot No. 7/91, Sector-14D, Gurgaon 122002, India				DESIGNED BY		DRAWN BY				CHECKED BY		APPROVED BY	
RD Sep 2017 Final Feasibility Report			RD Nov 2016 Draft Feasibility Report			RD Dec 2014 Linear Plan					Vijay Gupta		Nareesh				Vijay Gupta		Sanjay Shukla	
REV	DATE	DESCRIPTION OF REVISIONS					INITIALS				SCALE:-		H-1:2000, V-1:100, For A3 Paper Size		Dwg. No. :- SA/CPL-SCSP/NAHDC/NB-SKM/P&P/16					

DATE: 02.07.2019 - 4.05pm
 BY: SA Infrastructure Consultants Pvt. Ltd.
 FOR: National Highways & Infrastructure Development Corporation Limited

DATUM: 1529.0



REV	DATE	DESCRIPTION OF REVISIONS	INITIALS
01	Sep 2017	Final Feasibility Report	
02	Nov 2016	Draft Feasibility Report	
03	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-8, Corporate Park Plot No. 2A/1, Sector-142, Gurgaon, Haryana

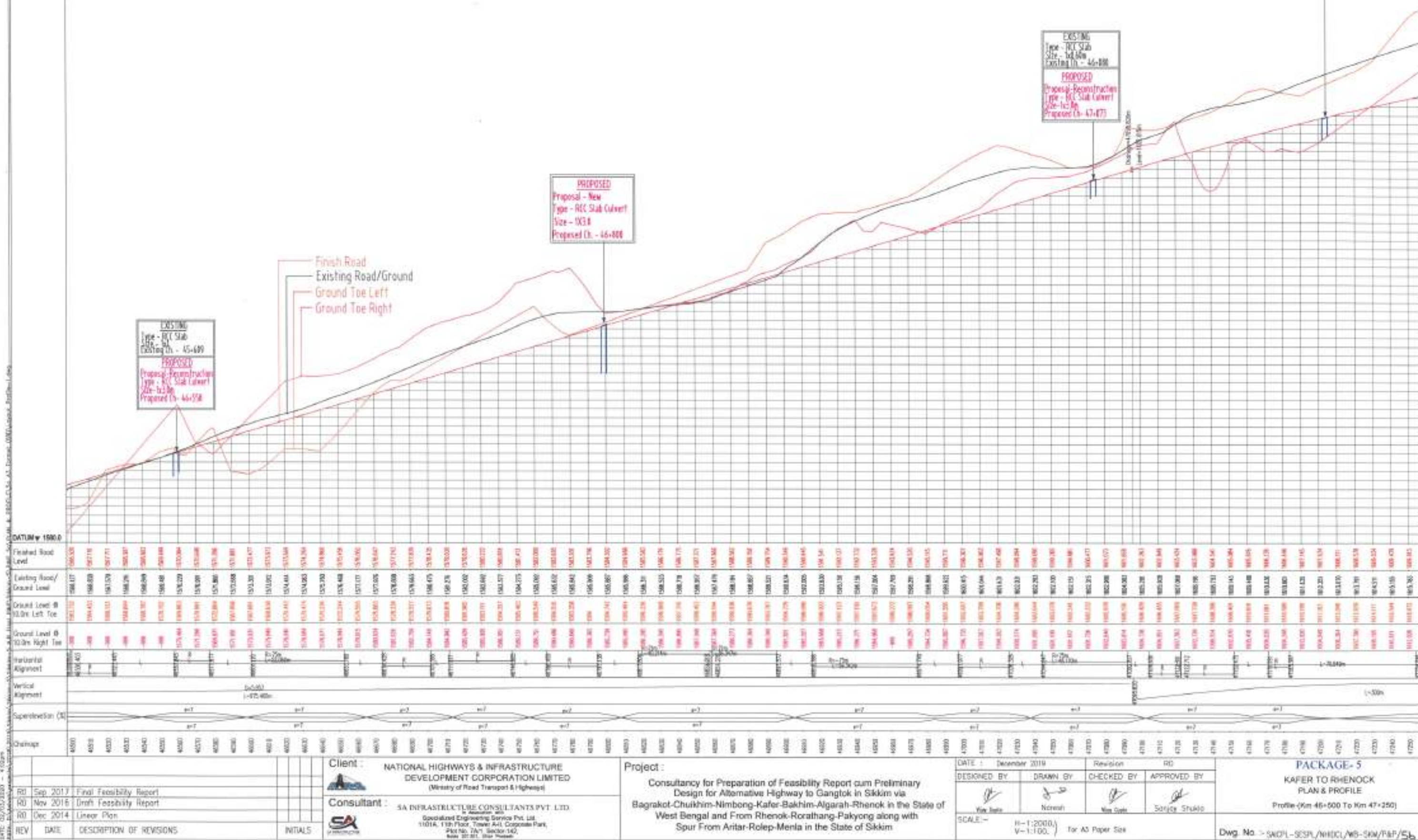
Project :	Consultancy for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chuikhim-Nimbong-Kafer-Bakhim-Algarah-Rhenok in the State of West Bengal and From Rhenok-Rorathang-Pakyong along with Spur From Antar-Rolep-Menia in the State of Sikkim
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DATE :	December 2019	Revision :	01
DESIGNED BY :	Vinay Saha	DRAWN BY :	Nareesh
CHECKED BY :	Vinay Saha	APPROVED BY :	Sonjoy Shukla

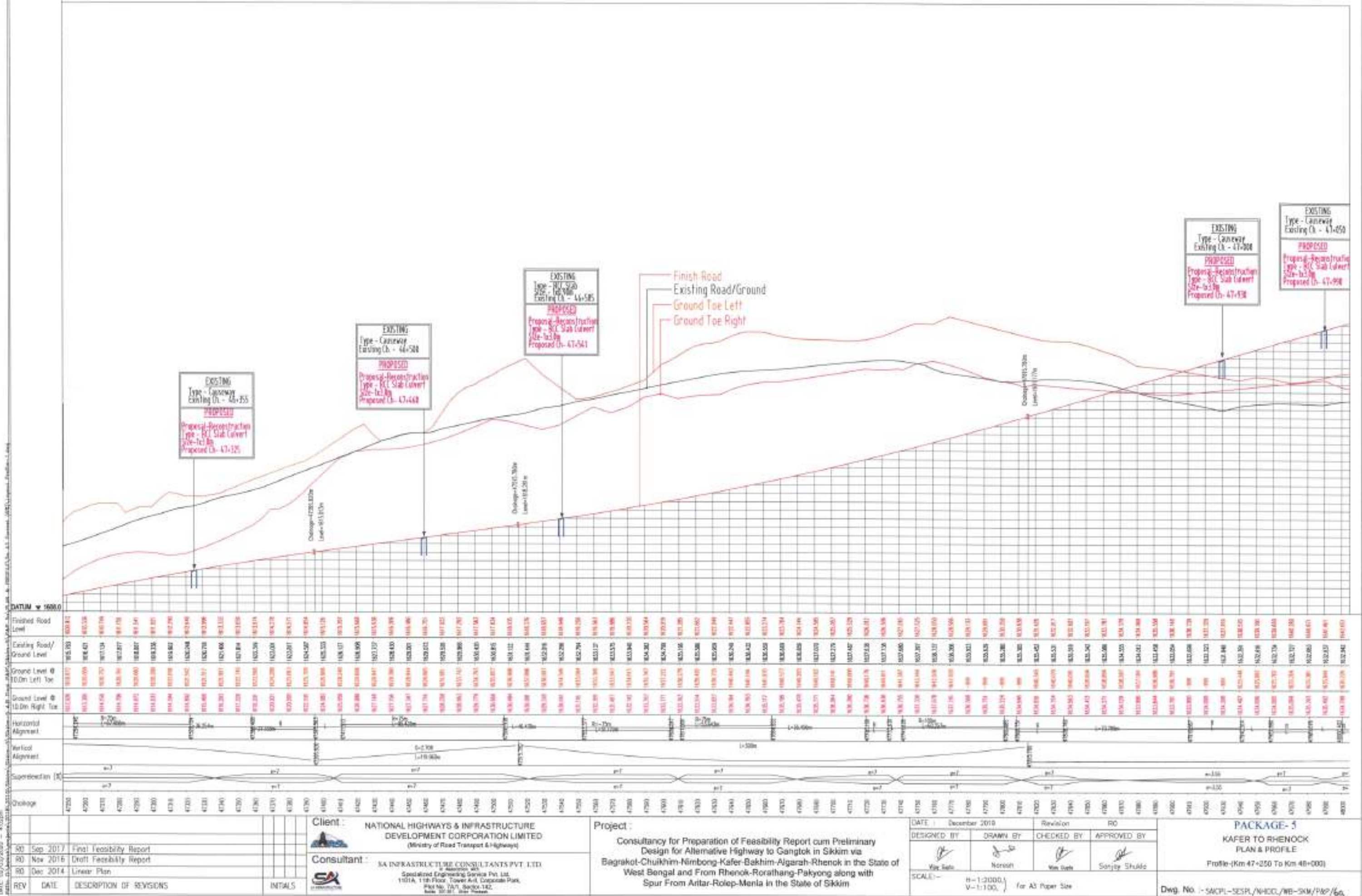
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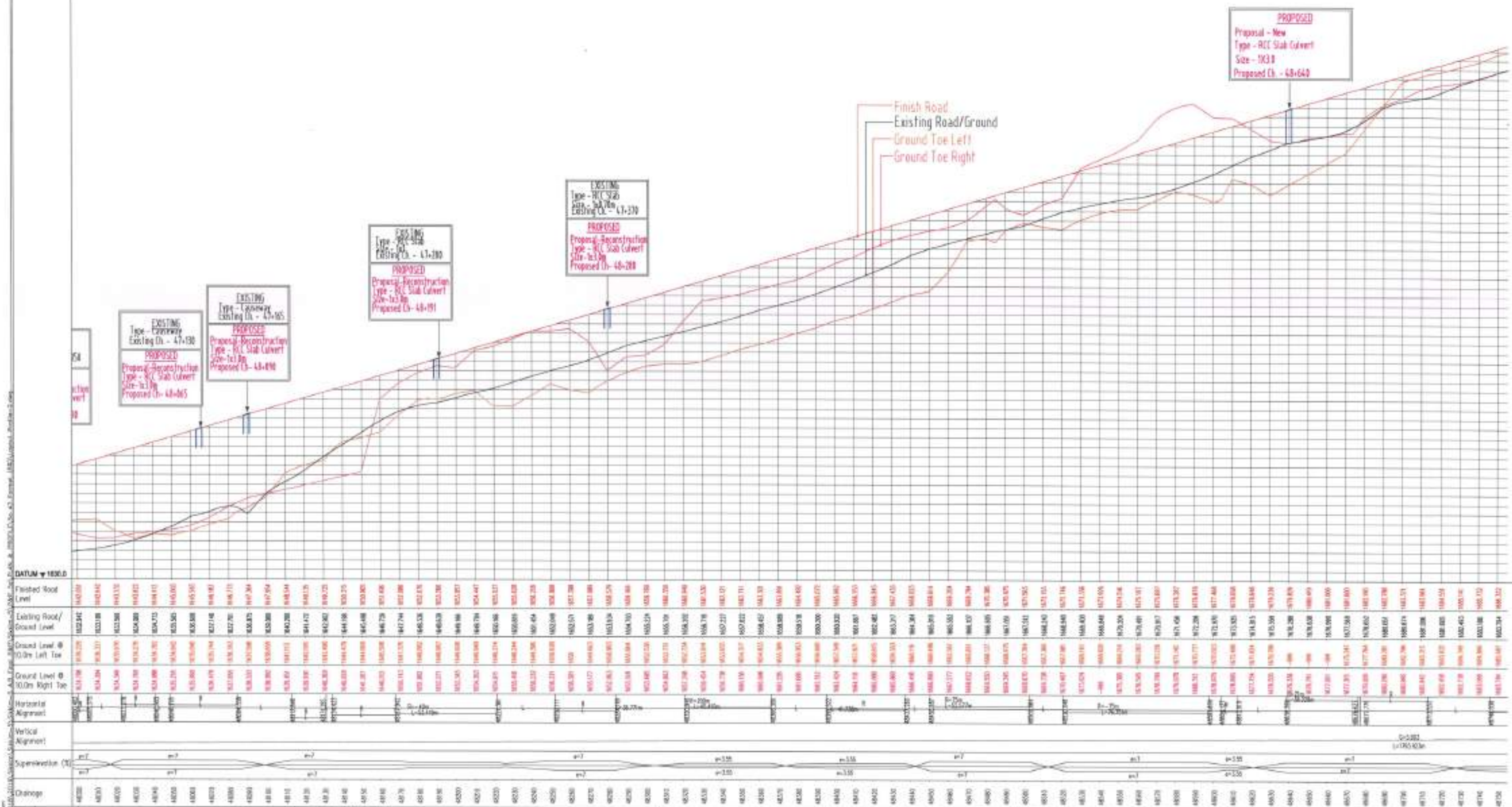
PACKAGE - 5
KAHER TO RHENOCK
PLAN & PROFILE
Profile (Km 45+750 To Km 46+500)

Dwg. No. :	SAICP-SESPL/NHDD/WB-SKM/P&P/5a
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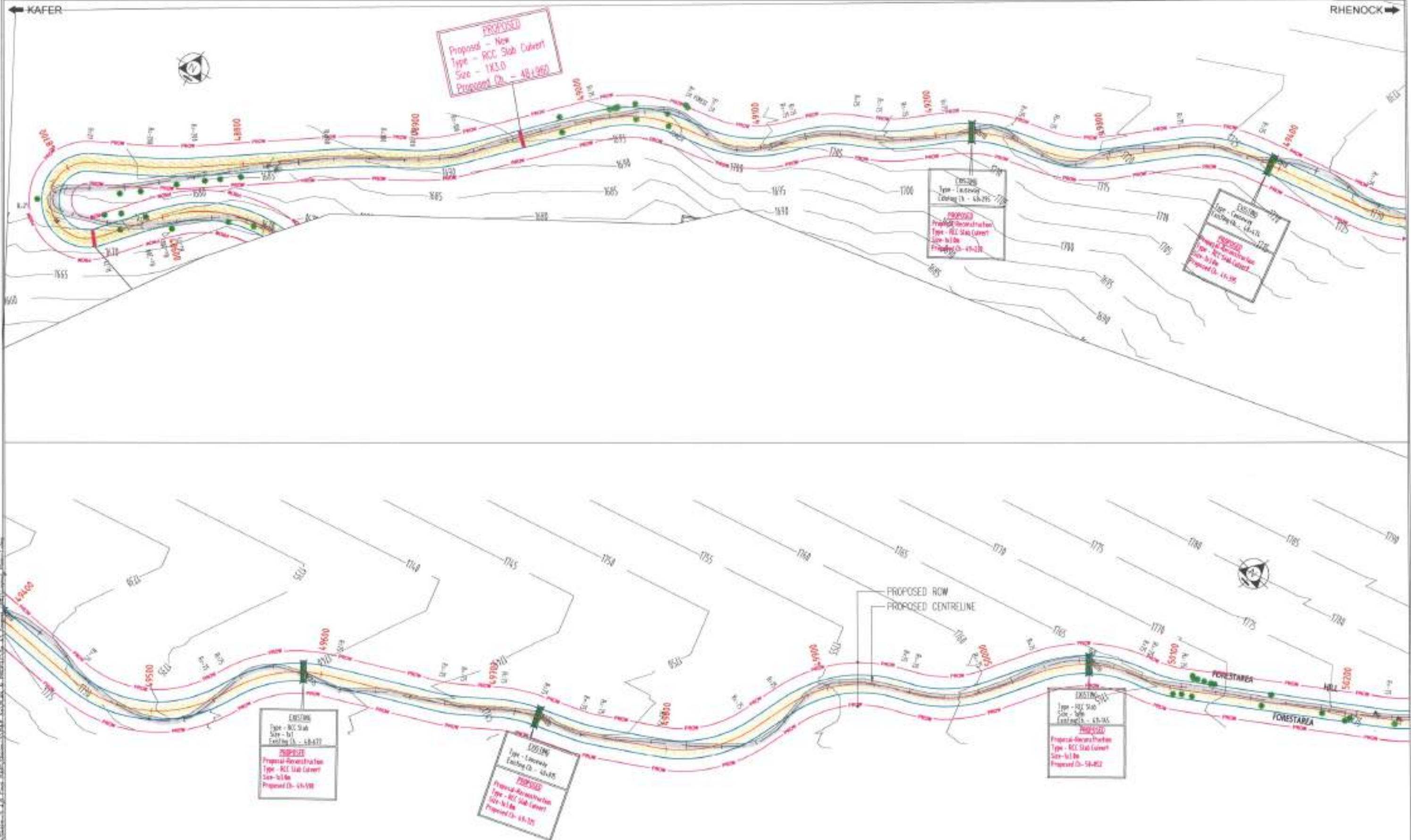


[illegible]



DATE: 02/01/2020 - 0.00m
 1. As per the latest revision of the drawing, the profile of the road is shown as per the latest revision of the drawing.


			Client :  NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (Ministry of Road Transport & Highways)			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 : December 2019 Revision RD DESIGNED BY DRAWN BY CHECKED BY APPROVED BY  Raju  Nareesh  Raju  Sonjoy Shukla				PACKAGE- 5 KAFER TO RHENOCK PLAN & PROFILE Profile (Km 48+000 To Km 48+750)	
RD Sep 2017 Final Feasibility Report RD Nov 2016 Draft Feasibility Report RD Dec 2014 Linear Plan			Consultant :  SA INFRASTRUCTURE CONSULTANTS PVT. LTD. Specialized Engineering Service Pvt. Ltd. 1101A, 11th Floor, Tower A-11, Corporate Park, Plot No. 7A/1, Sector-142, Gurgaon, Haryana			SCALE: - H=1:2000, V=1:100, For A3 Paper Size				Dwg. No. :- SACPL-SESPL/NHDC/MB-SKM/P&P/66				
REV	DATE	DESCRIPTION OF REVISIONS	INITIALS											



DATE: 02/03/2020 - 10:15 AM

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

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

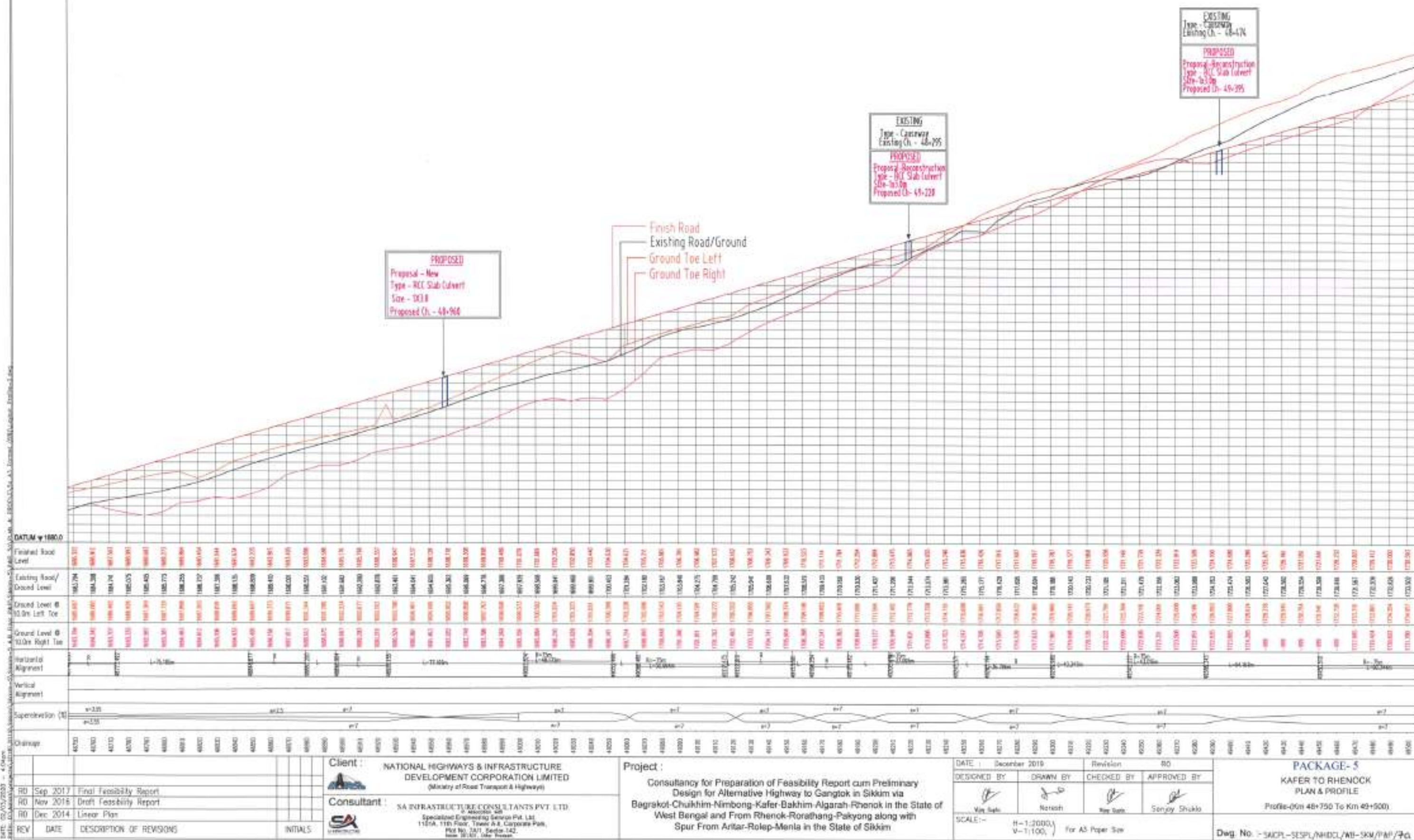
Consultant : SA INFRASTRUCTURE CONSULTANTS PVT. LTD.
Specialized Engineering Services Pvt. Ltd.
1101A, 11th Floor, Tower A-8, Corporate Park,
Plot No. 7A/1, Sector-143,
Noida, 201305, Uttar Pradesh

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

DATE: 1 FEB-2020	Revision: RD
DESIGNED BY: Vijay Gupta	DRAWN BY: Nareish
CHECKED BY: Vijay Gupta	APPROVED BY: Sanjay Shukla
SCALE: H-1:2000, V-1:100, For A3 Paper Size	

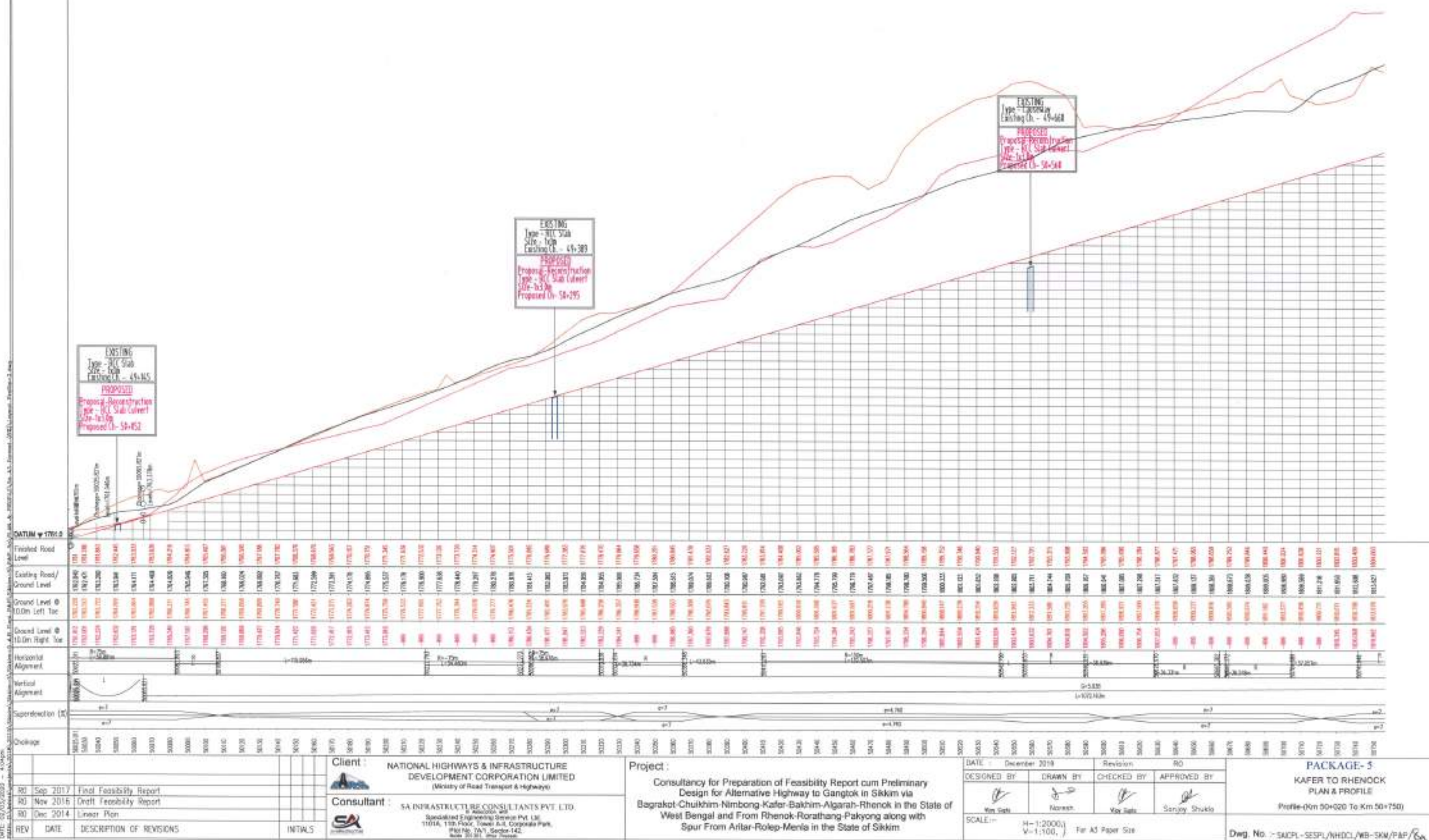
PACKAGE- 5A
KAHER TO RHENOCK
PLAN & PROFILE
(PLAN - Km 48+100 To Km 50+300)

Dwg No. : SAICL-SESPL/NHIDCL/WB-SKM/P&P/01





			Client :  NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (Ministry of Road Transport & Highways)		Project : Consultancy for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chukhim-Nimbung-Kafer-Bakhim-Algarah-Rhenok in the State of West Bengal and From Rhenok-Rorathang-Pakyong along with Spur From Antar-Rolep-Merla in the State of Sikkim			DATE : December 2018 DESIGNED BY :  DRAWN BY :  CHECKED BY :  APPROVED BY :  SCALE :- H-1:2000, V-1:100, For A3 Paper Size				PACKAGE- 5 KAFER TO RHEKOK PLAN & PROFILE Profile (Km 49+500 To Km 50+020)	
R/O Sep 2017 Final Feasibility Report R/O Nov 2016 Draft Feasibility Report R/O Dec 2014 Linear Plan			Consultant :  SA INFRASTRUCTURE CONSULTANTS PVT. LTD. Specialized Engineering Service Pvt. Ltd. 1107A, 11th Floor, Tower A-4, Corporate Park, Plot No. 7A/1, Sector 14D, B-III, 20130, Udaipur, India									Dwg. No. :- SACP/SES/PL/IN/004/WB-SKM/P&P/24	
REV. DATE DESCRIPTION OF REVISIONS			INITIALS										



DATE: 02/03/2020 - 1.04pm
 DRAWN BY: SAKPL/SESPL/NDH/WB-SKM/RWP/RB
 CHECKED BY: SAKPL/SESPL/NDH/WB-SKM/RWP/RB
 APPROVED BY: SAKPL/SESPL/NDH/WB-SKM/RWP/RB

DATUM ∇ 1000.0



EXISTING
Type - R/C Slab
Size - 12m x 12m
Existing Ch - 50+134

PROPOSED
Proposed Reconstruction
Type - R/C Slab
Size - 12m x 12m
Proposed Ch - 50+135

EXISTING
Type - R/C Slab
Size - 12m x 12m
Existing Ch - 50+161

PROPOSED
Proposed Reconstruction
Type - R/C Slab
Size - 12m x 12m
Proposed Ch - 50+170

EXISTING
Type - R/C Slab
Size - 12m x 12m
Existing Ch - 50+230

PROPOSED
Proposed Reconstruction
Type - R/C Slab
Size - 12m x 12m
Proposed Ch - 50+235

Finish Road
Existing Road/Ground
Ground Toe Left
Ground Toe Right

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

Consultant : SA INFRASTRUCTURE CONSULTANTS PVT. LTD. (Specialized Engineering Services Pvt. Ltd. 110/1A, 11th Floor, Tower A-1, 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-Chukhim-Nimbong-Kafer-Bakim-Agarah-Rhenok in the State of West Bengal and From Rhenok-Rorathang-Pakyong along with Spur From Arilar-Rolep-Menla in the State of Sikkim

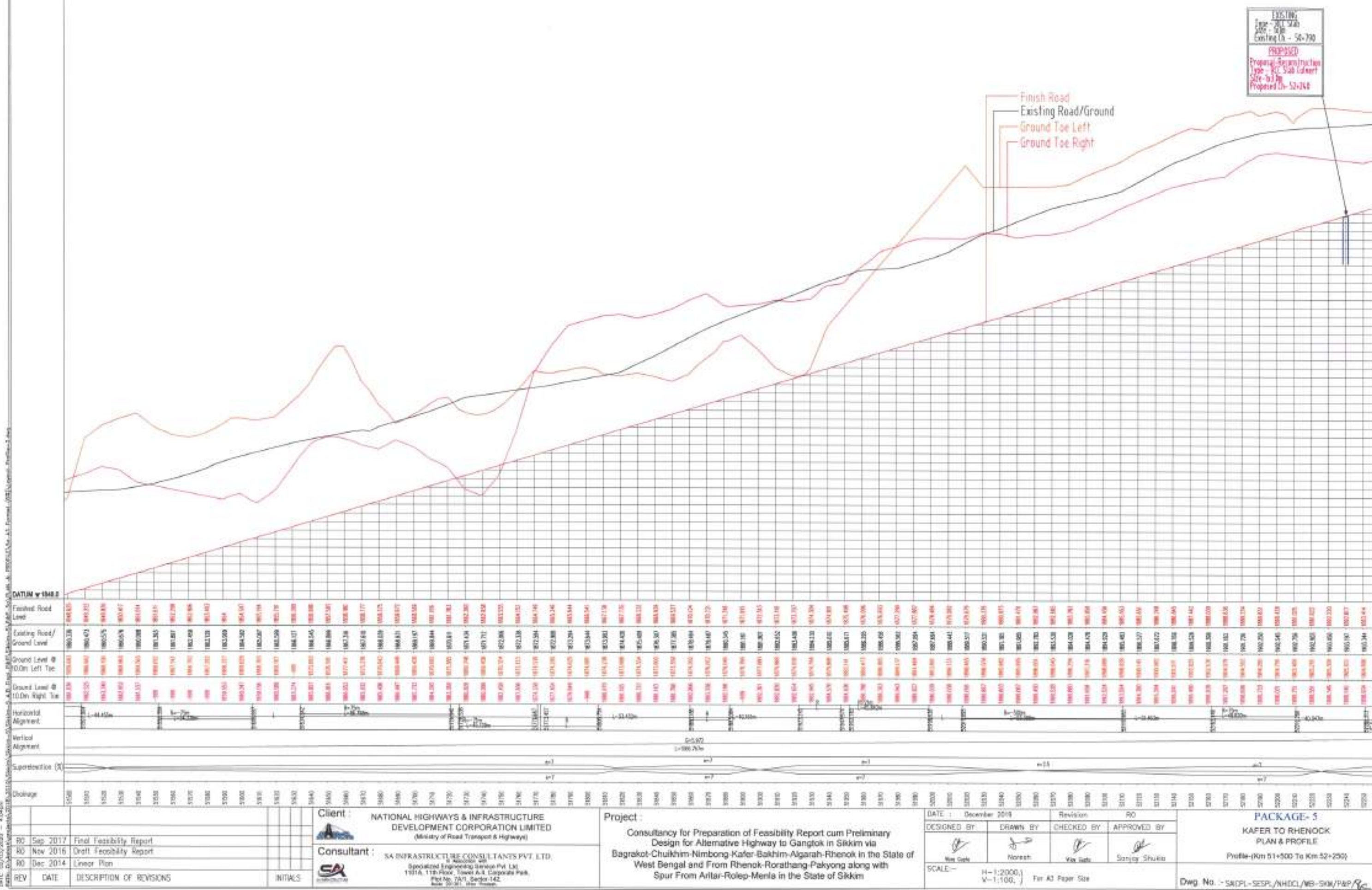
DATE : December 2019

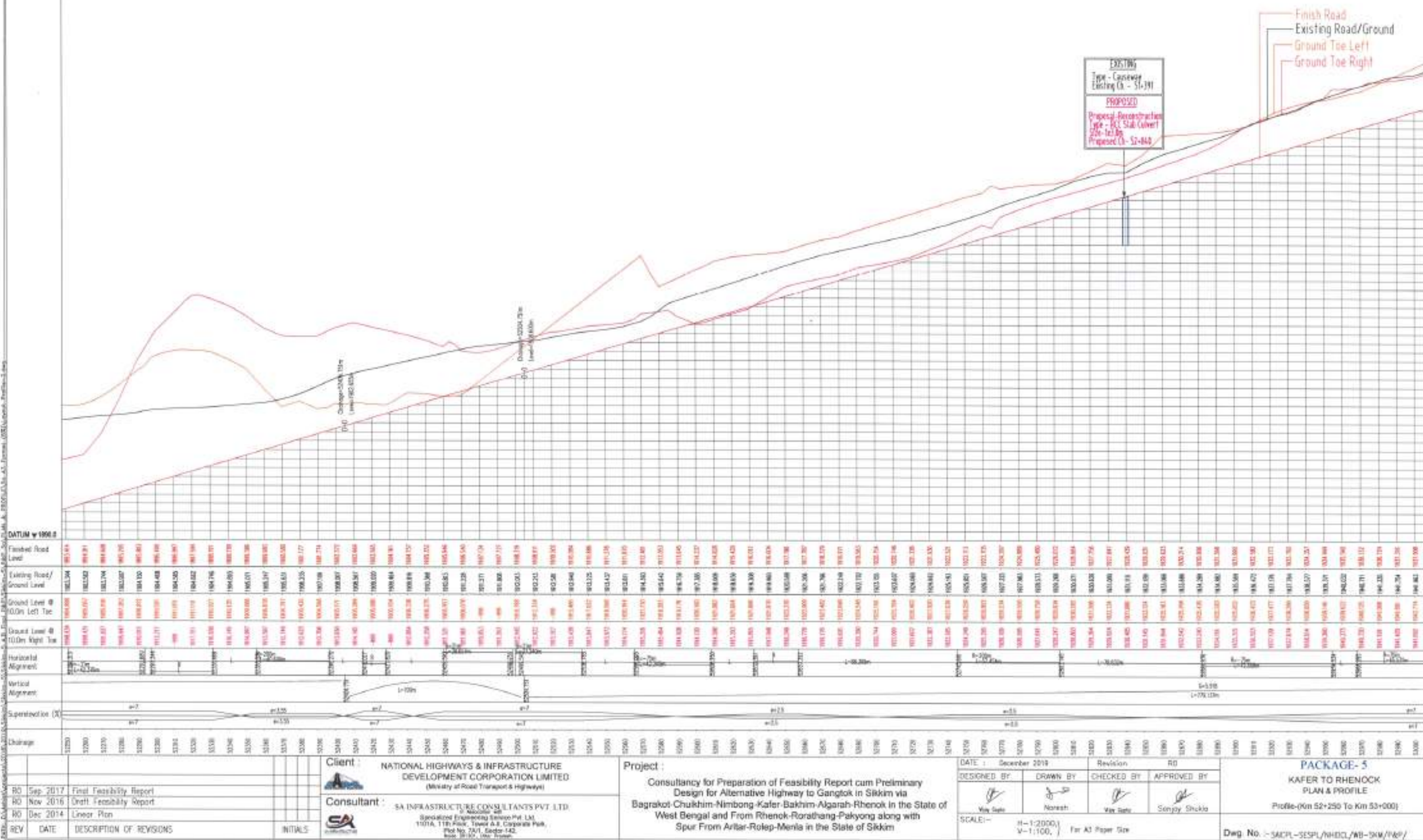
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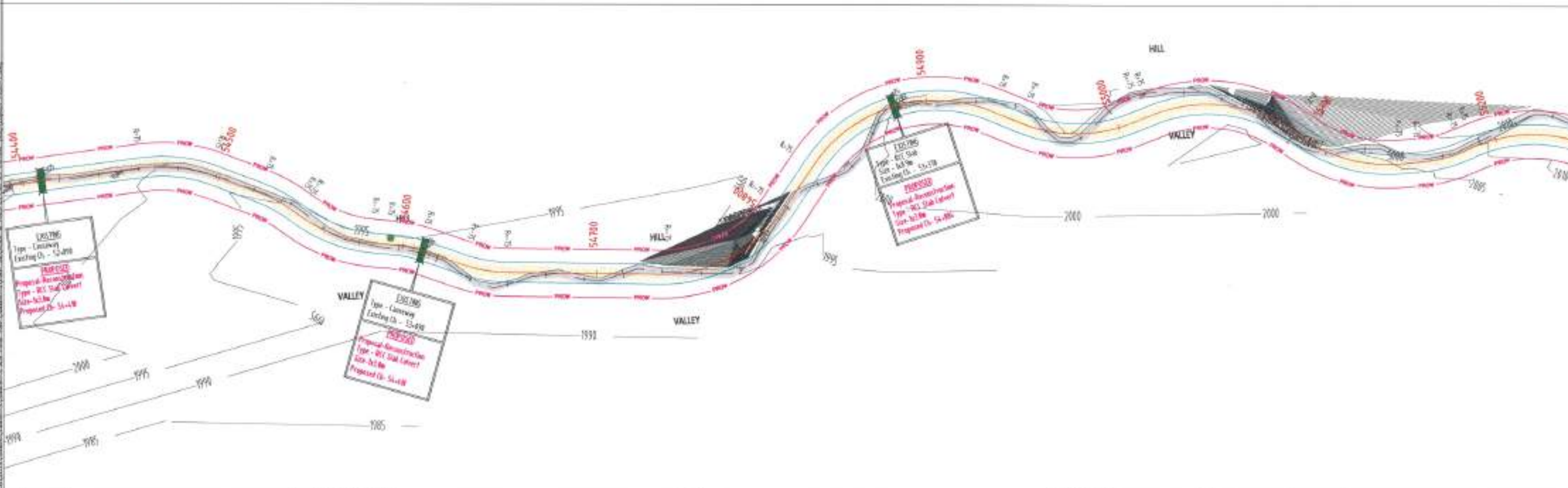
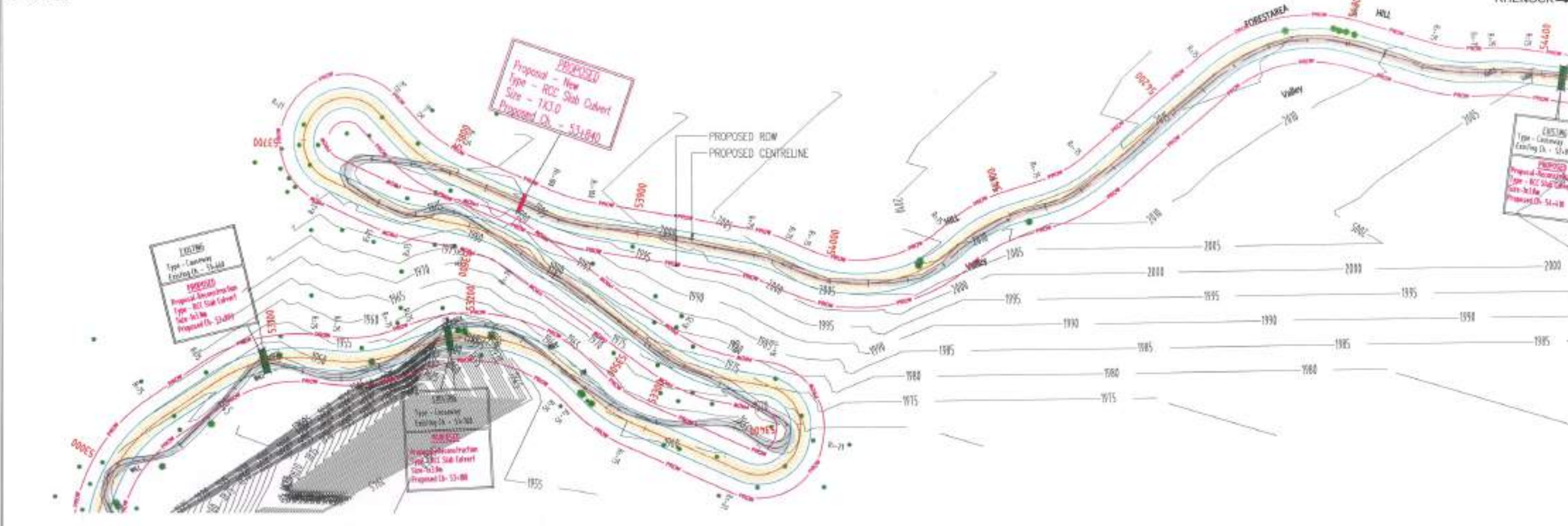
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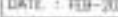
PACKAGE-5
KAFER TO RHENOCK
PLAN & PROFILE
Profile (Km 50+750 To Km 51+500)

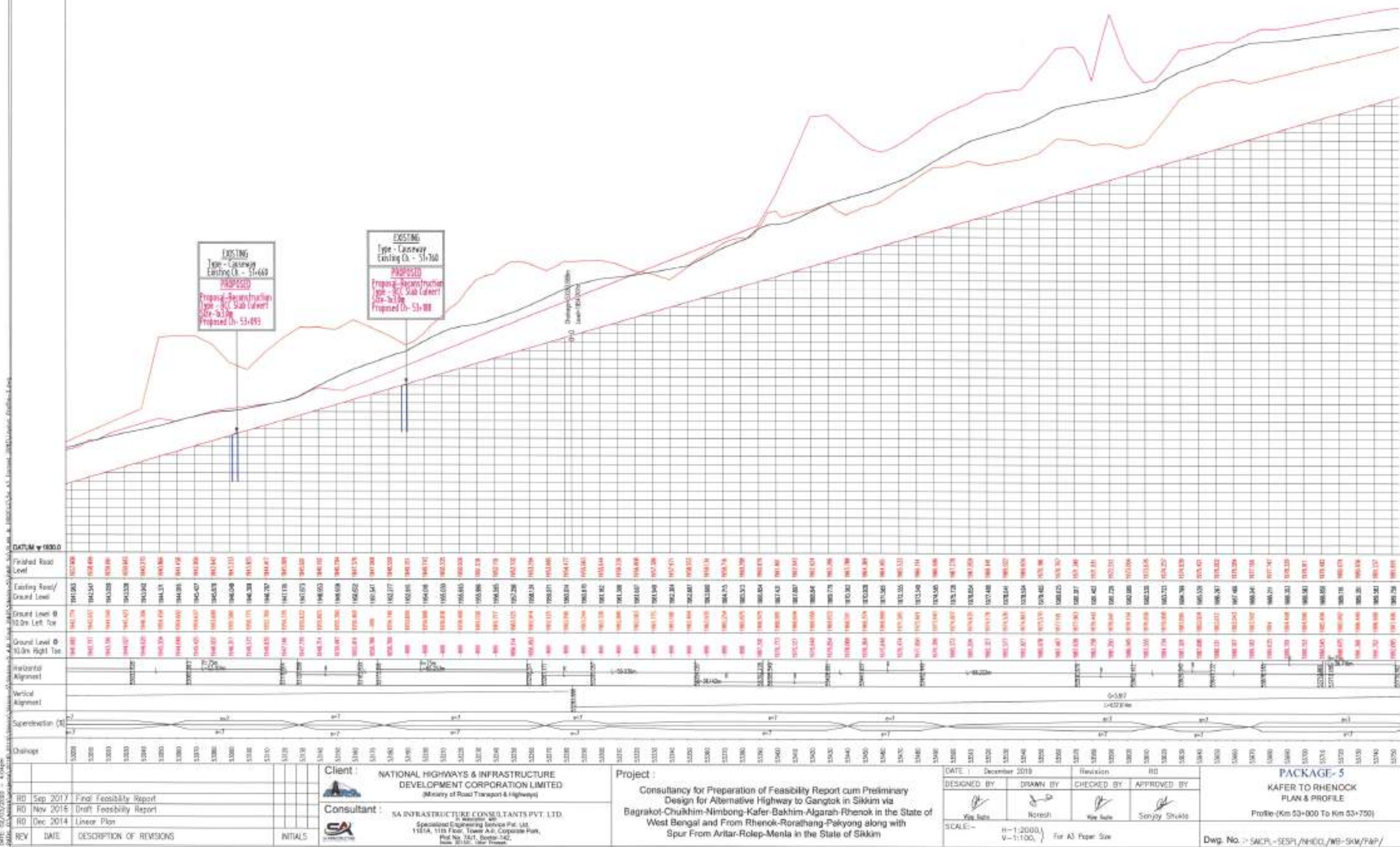
Dwg. No. : SAKPL-SESPL/NDH/WB-SKM/RWP/RB

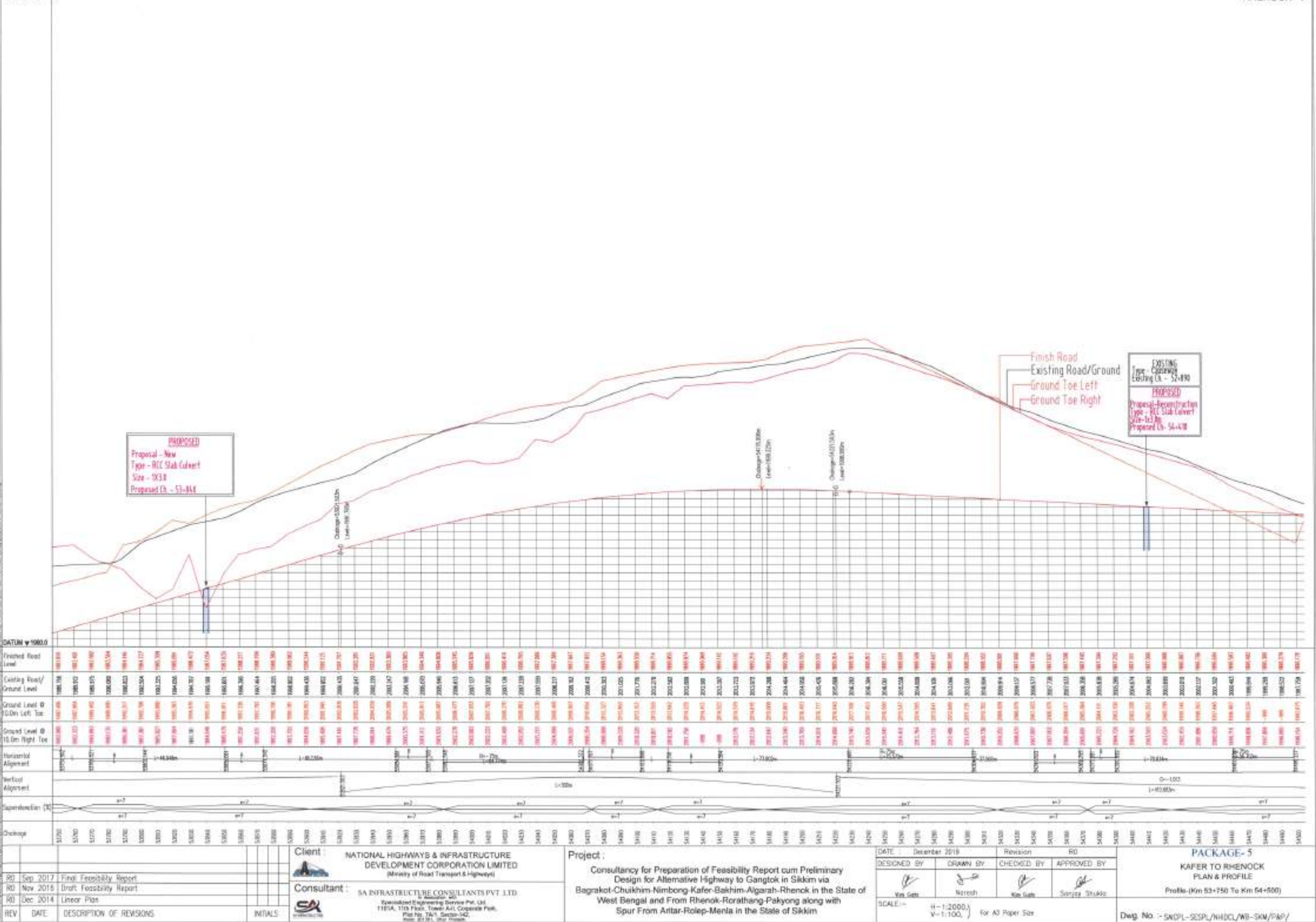






						Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (Ministry of Road Transport & Highways)			Project : Consultancy for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chukhim-Nimbong-Kaher-Bakhim-Algarah-Rhenok in the State of West Bengal and From Rhenok-Rorathang-Pakyong along with Spur From Arjar-Rolep-Menla in the State of Sikkim			DATE : FEB-2023		Revision RD		PACKAGE- 5A KAHER TO RHENOCK PLAN & PROFILE (PLAN - Km 53+000 To Km 55+350)					
						Consultant : SA INFRASTRUCTURE CONSULTANTS PVT. LTD. Specialized Engineering Services Pvt. Ltd. 1161A, 11th Floor, Tower A-8, Corporate Park, Plot No. 1A/1, Sector-142, Gurgaon, Haryana, India						DESIGNED BY		DRAWN BY				CHECKED BY		APPROVED BY	
												 Wajay Gupta		 Nareesh				 Wajay Gupta		 Sanjay Shukla	
REV			DATE			DESCRIPTION OF REVISIONS			INITIALS			SCALE :-		H=1:2000, V=1:100, For A3 Paper Size		Dwg. No. :- SACP/SESPL/INDO/WB-SKM/F&P/					
R0			Sep. 2017			Final Feasibility Report															
R0			Nov 2018			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. 110/1A, 11th Floor, Tower A/1, Corporate Park, Plot No. 7A/1, Sector-14D, Gurgaon, Haryana, India)

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

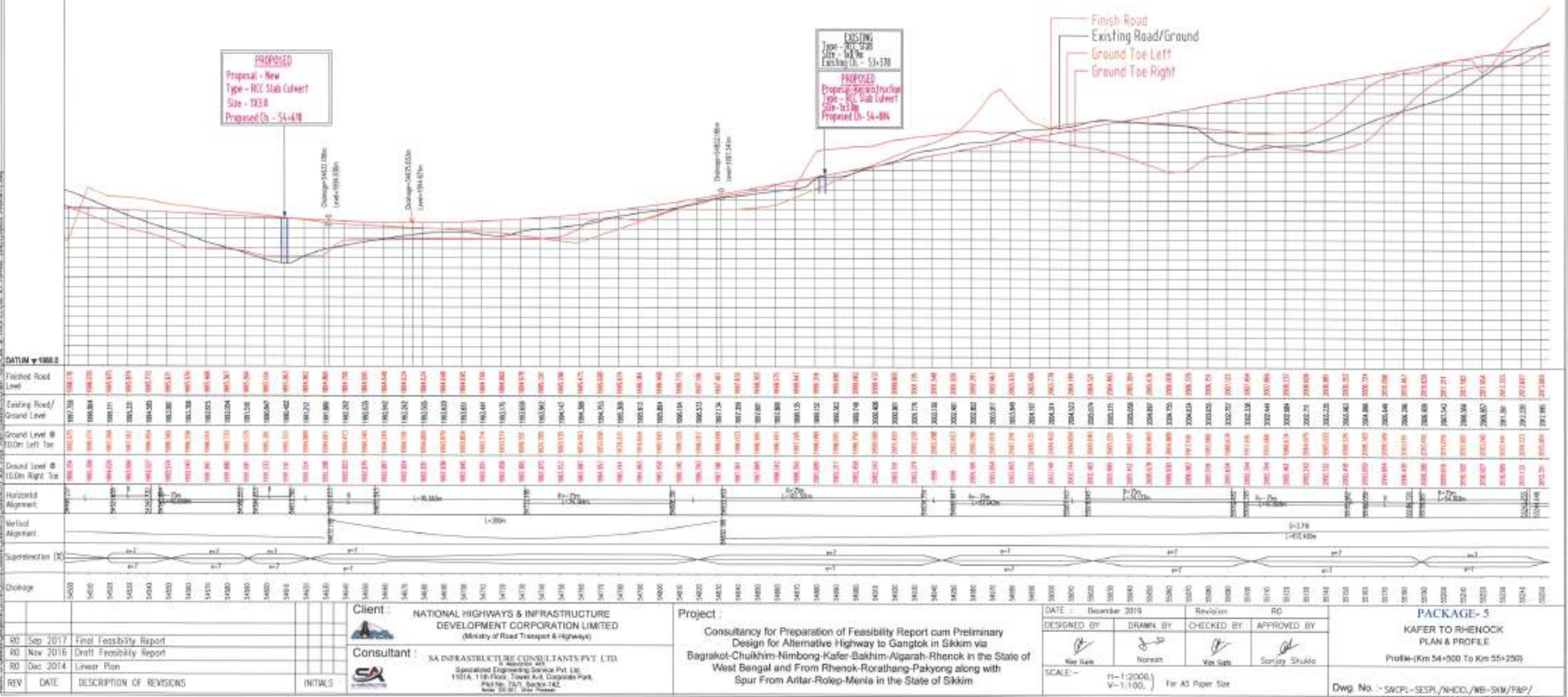
DATE: December 2019

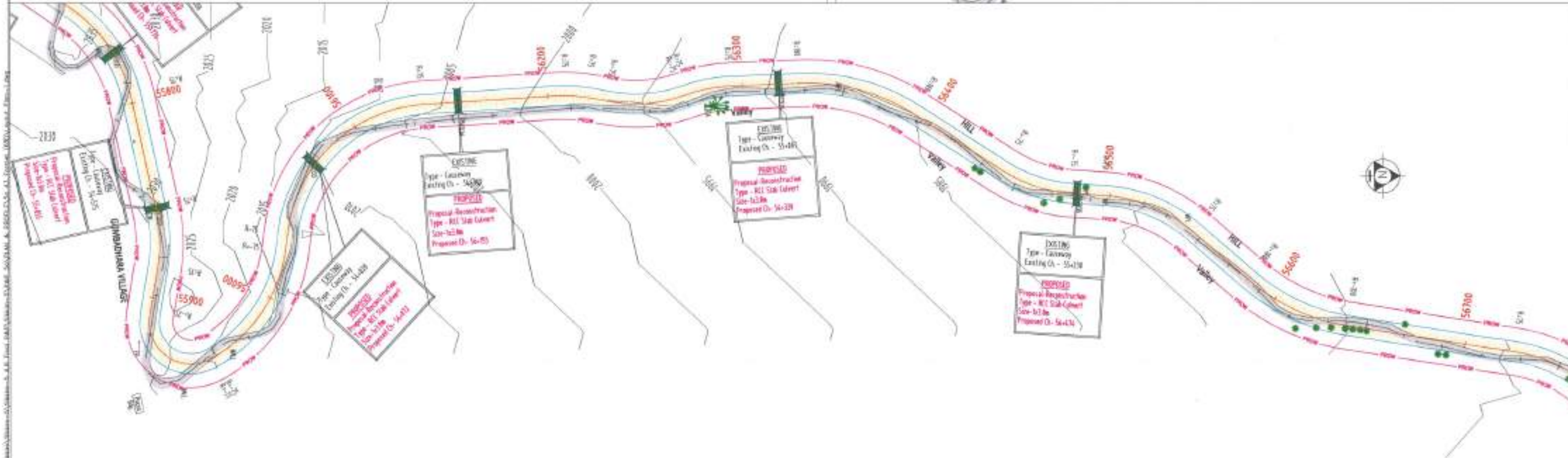
DESIGNED BY: [Signature] **DRAWN BY:** [Signature] **CHECKED BY:** [Signature] **APPROVED BY:** [Signature]

SCALE: H-1:2000, V-1:100, For A3 Paper Size

PACKAGE - 5
KAFER TO RHENOCK
PLAN & PROFILE
Profile (Km 53+750 To Km 64+500)

Dwg. No.: SA(PL)-SESPL/NHIDCL/WB-SKM/P&P/





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

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

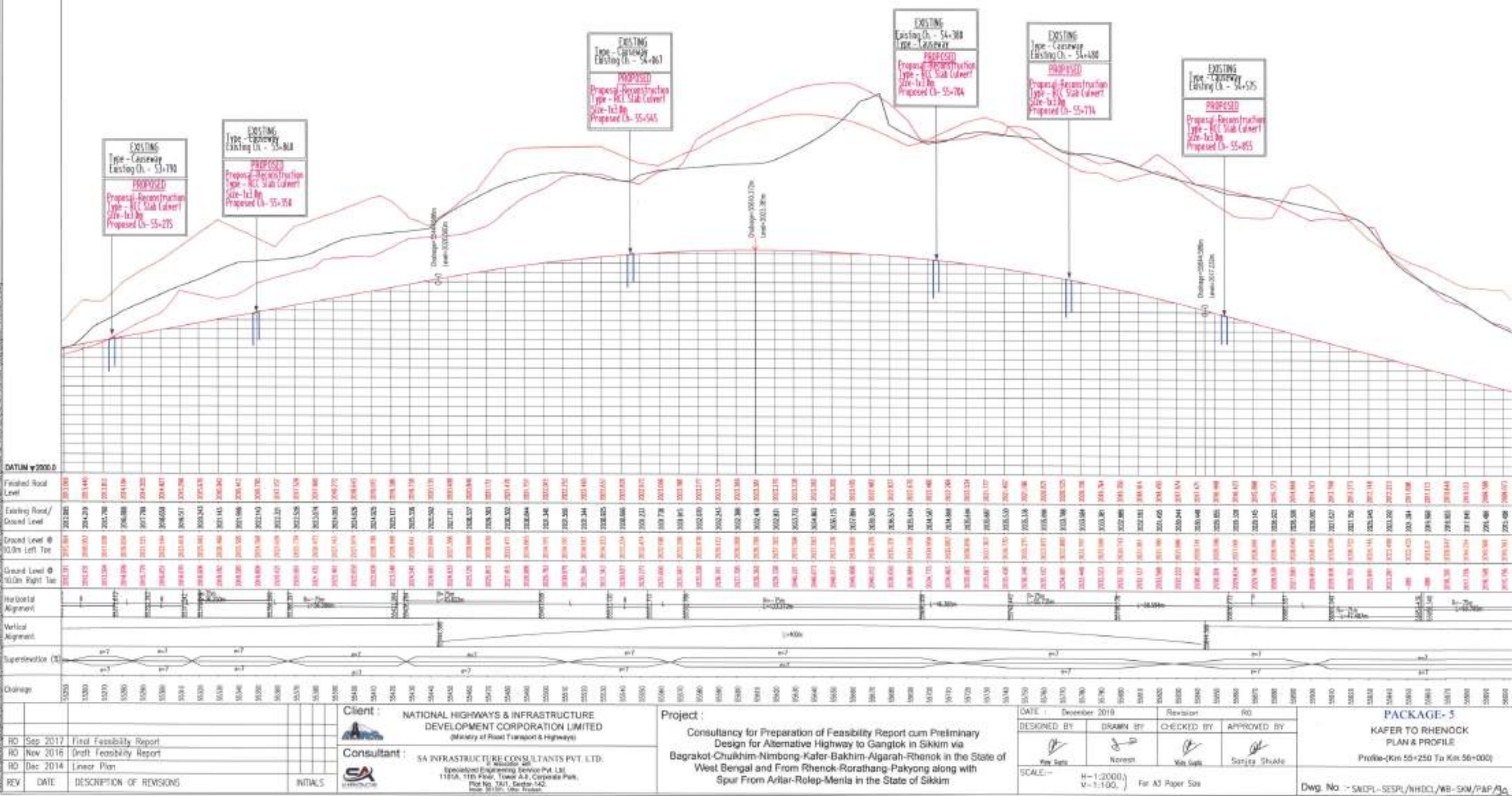
Consultant : SA INFRASTRUCTURE CONSULTANTS PVT. LTD.
Specialized Engineering Services Pvt. Ltd.
1101A, 11th Floor, Tower A-1, Corporate Park,
Plot No. 7K/1, Sector-143,

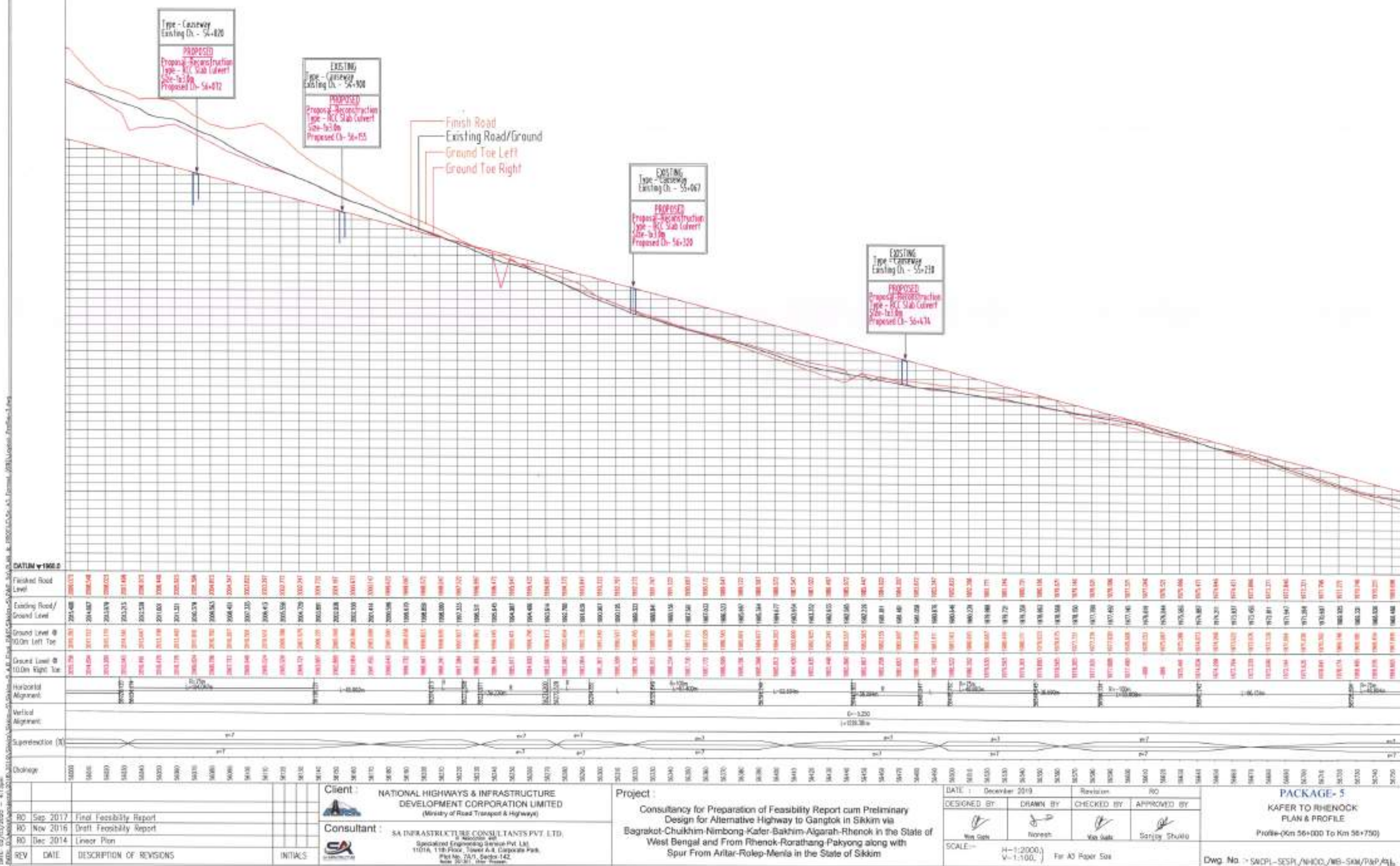
Project :	Consultancy for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chudhim-Nimbong-Kafer-Bakhim-Algarah-Rhenok in the State of West Bengal and From Rhenok-Rorathang-Pakyong along with Spur From Aritar-Rolep-Menla in the State of Sikkim
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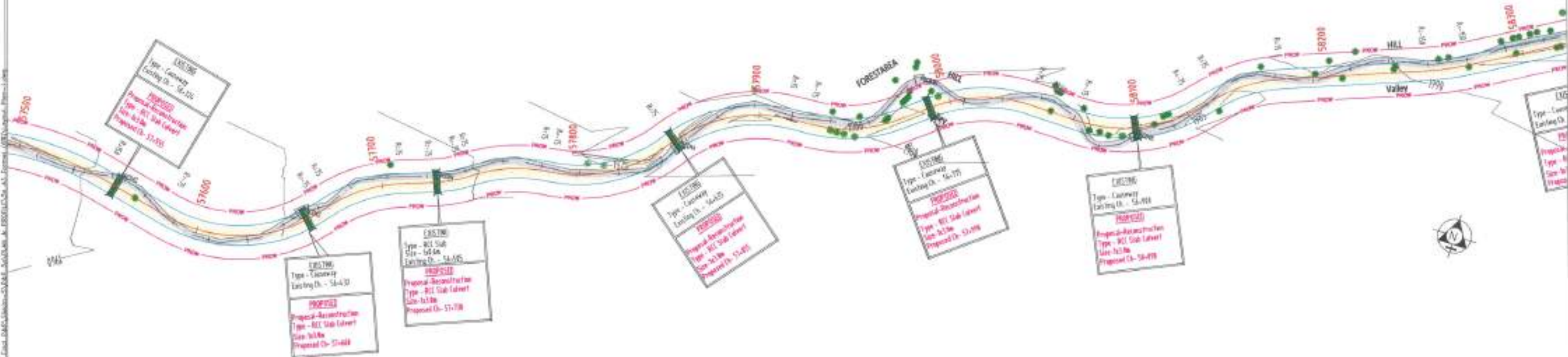
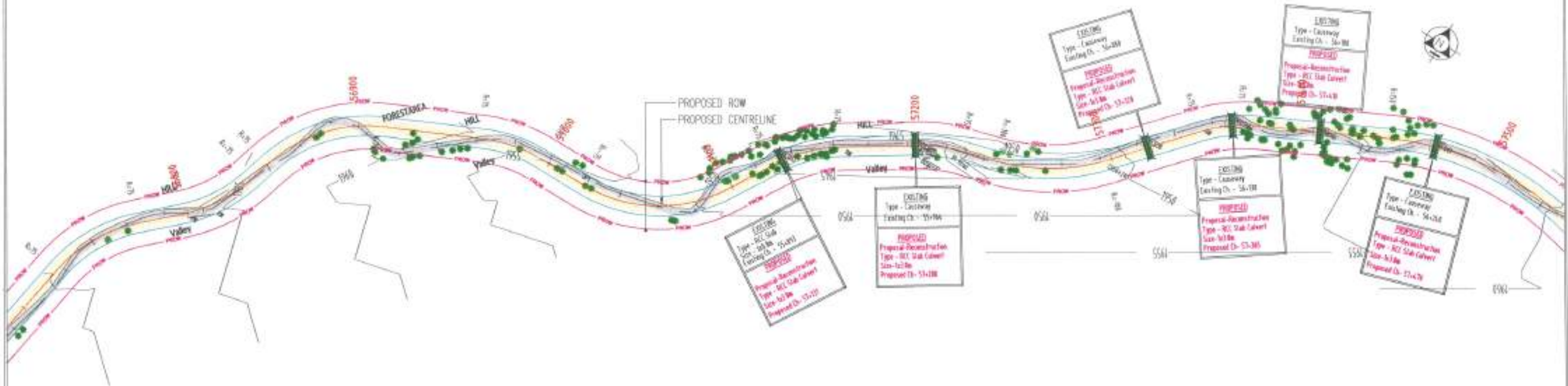
DATE : FEB-2020		Revision	
DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED BY
 Vijay Gupta	 Nareesh	 Vijay Gupta	 Sanjay Shukla
SCALE:- H-1(2000) V-1(100) For A3 Paper Size			

PACKAGE- 5A
KAFER TO RHENOCK
PLAN & PROFILE
IPLAN - Km 55+250 To Km 58+750

Dwg. No. : SACPI-SESRP/NHDC/LWB-SKM/P&P/00







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

Consultant : SA INFRASTRUCTURE CONSULTANTS PVT. LTD.
Specialized Engineering Service Pvt. Ltd.
11th Floor, Tower A-1, Corporate Park,
Plot No. T-1, Sector-142,
Gurgaon, Haryana

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

DATE : FEB-2020
DESIGNED BY : Wjey Gupta
DRAWN BY : Nareesh
CHECKED BY : Wjey Gupta
APPROVED BY : Sonjay Shukla
SCALE : H-1:2000,
V-1:100, For A3 Paper Size

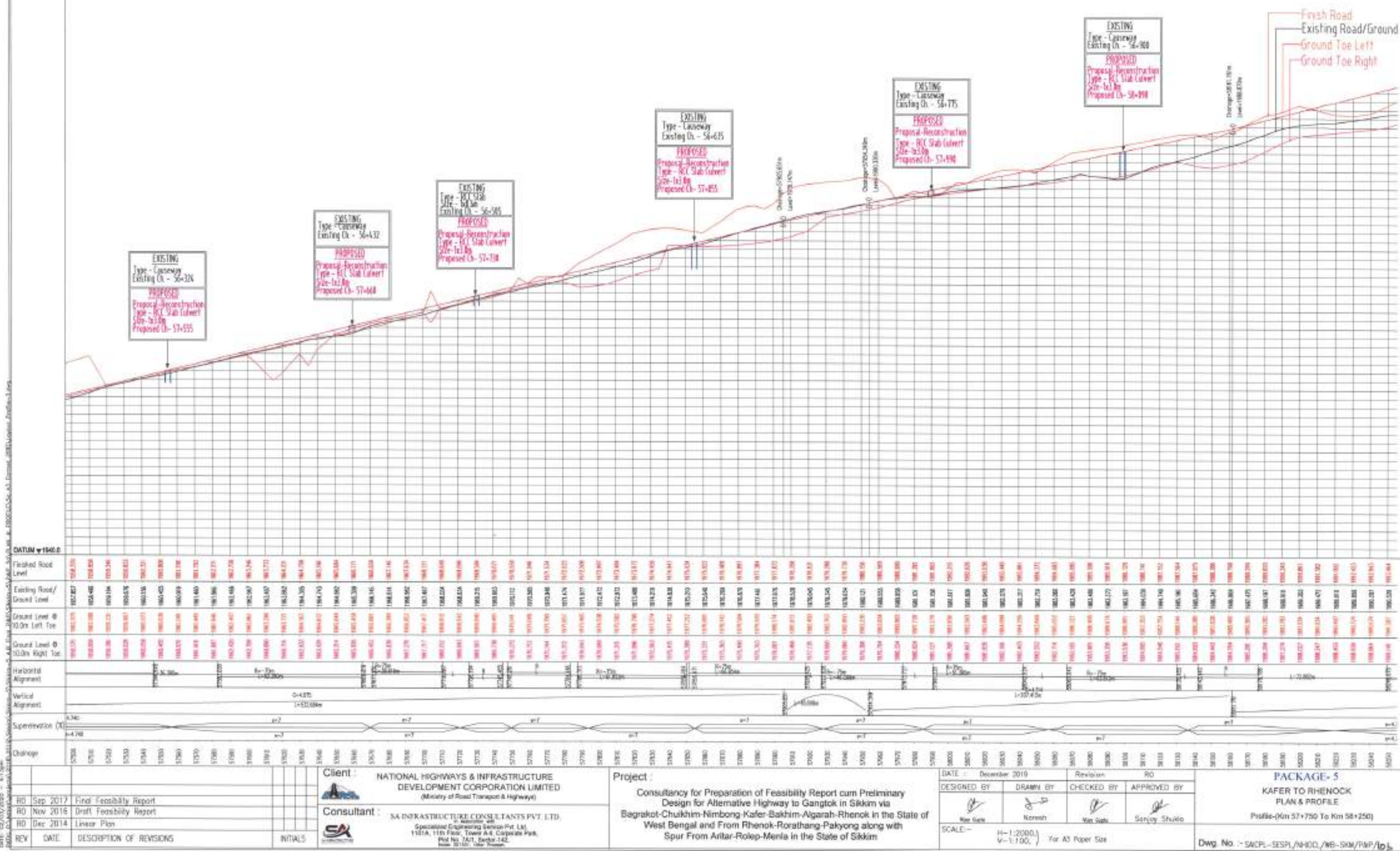
PACKAGE- 5A
KAFA TO RHENOCK
PLAN & PROFILE
PLAN : Km 56-750 To Km 58-250

Dwg. No. : SAICPL-SESP/NHDC/MB-SKM/P&P/11

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

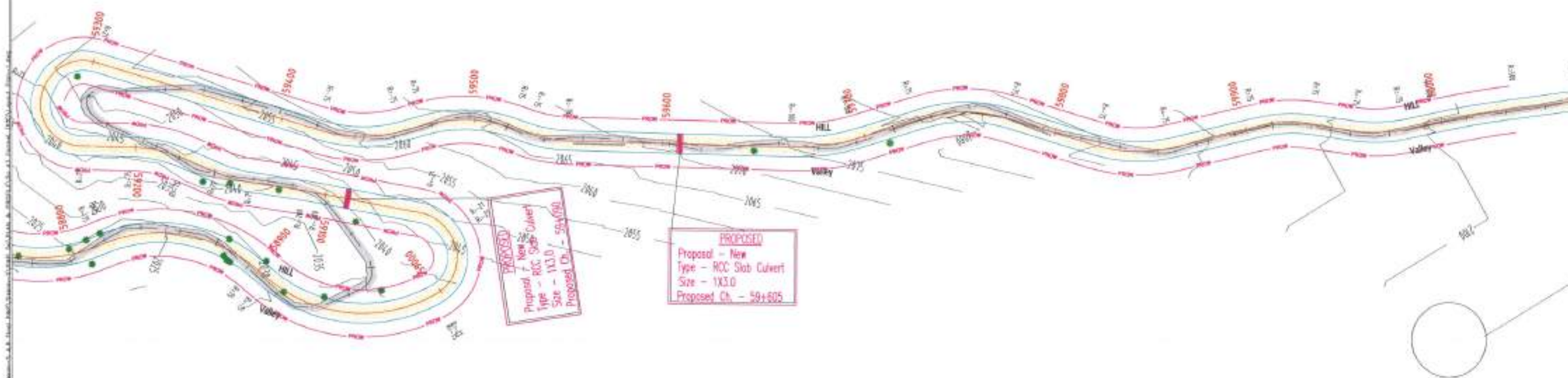
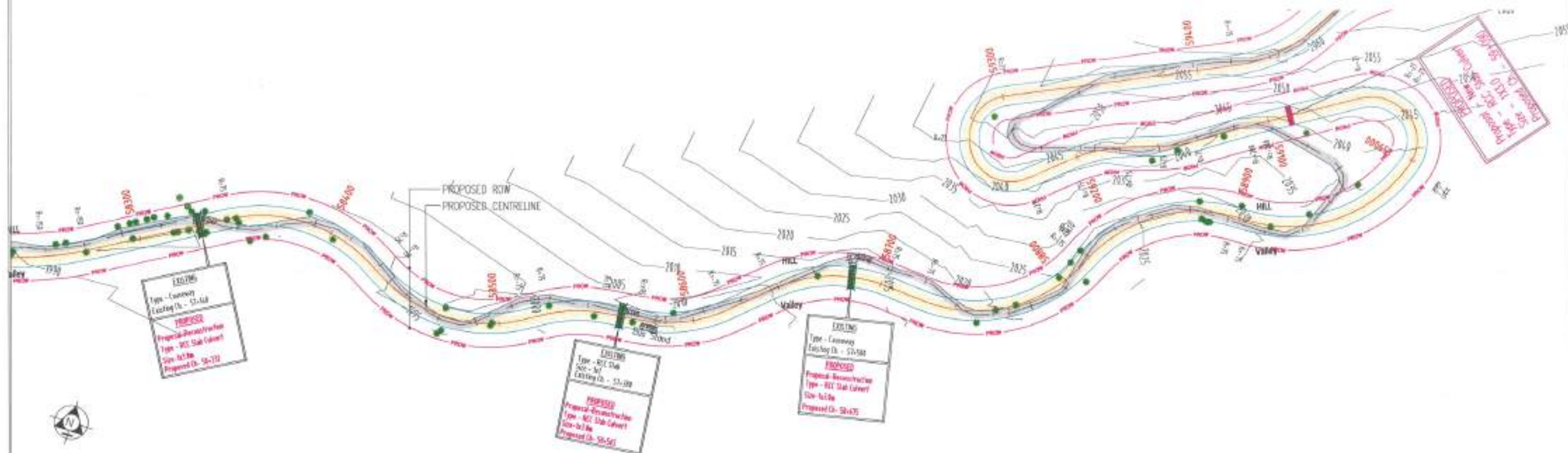


		 Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (Ministry of Road Transport & Highways)		Project : Consultancy for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chukhim-Nimbong-Kafer-Bakhim-Algarah-Rhenok in the State of West Bengal and From Rhenok-Rorathang-Pakyong along with Spur From Artar-Rolep-Menla in the State of Sikkim		DATE : December 2015 Revision RD		PACKAGE- 5 KAFER TO RHENOCK PLAN & PROFILE Profile-0Km 56+750 To Km 57+500	
RO	Sep 2017	Final Feasibility Report				DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED BY
RO	Nov 2016	Draft Feasibility Report							
RO	Dec 2014	Lower Plan				Ver. Date	Nareesh	Ver. Date	Sanjay Shukla
REV	DATE	DESCRIPTION OF REVISIONS	INITIALS			SCALE:- H=1:2000, V=1:100, For A3 Paper Size		Dwg. No. :- SACPL-SESP/NHDD/NB-SKM/P&P/10a	
		 Consultant : SA INFRASTRUCTURE CONSULTANTS PVT. LTD. Specialized Engineering Services Pvt. Ltd. 1331A, 1331 Floor, Tower A-5, Corporate Park, Plot No. 7A/1, Sector-142, Noida-201301, Uttar Pradesh.							



KAFER

RHENOCK



DATE: 15/03/2020 - 10:51 AM
 DRAWN BY: VJAY GUPTA
 CHECKED BY: NARANK
 APPROVED BY: SONJIT SHUKLA

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-1, Corporate Park,
 Plot No. 7A/1, Sector-142,
 Gurgaon 122001, Haryana

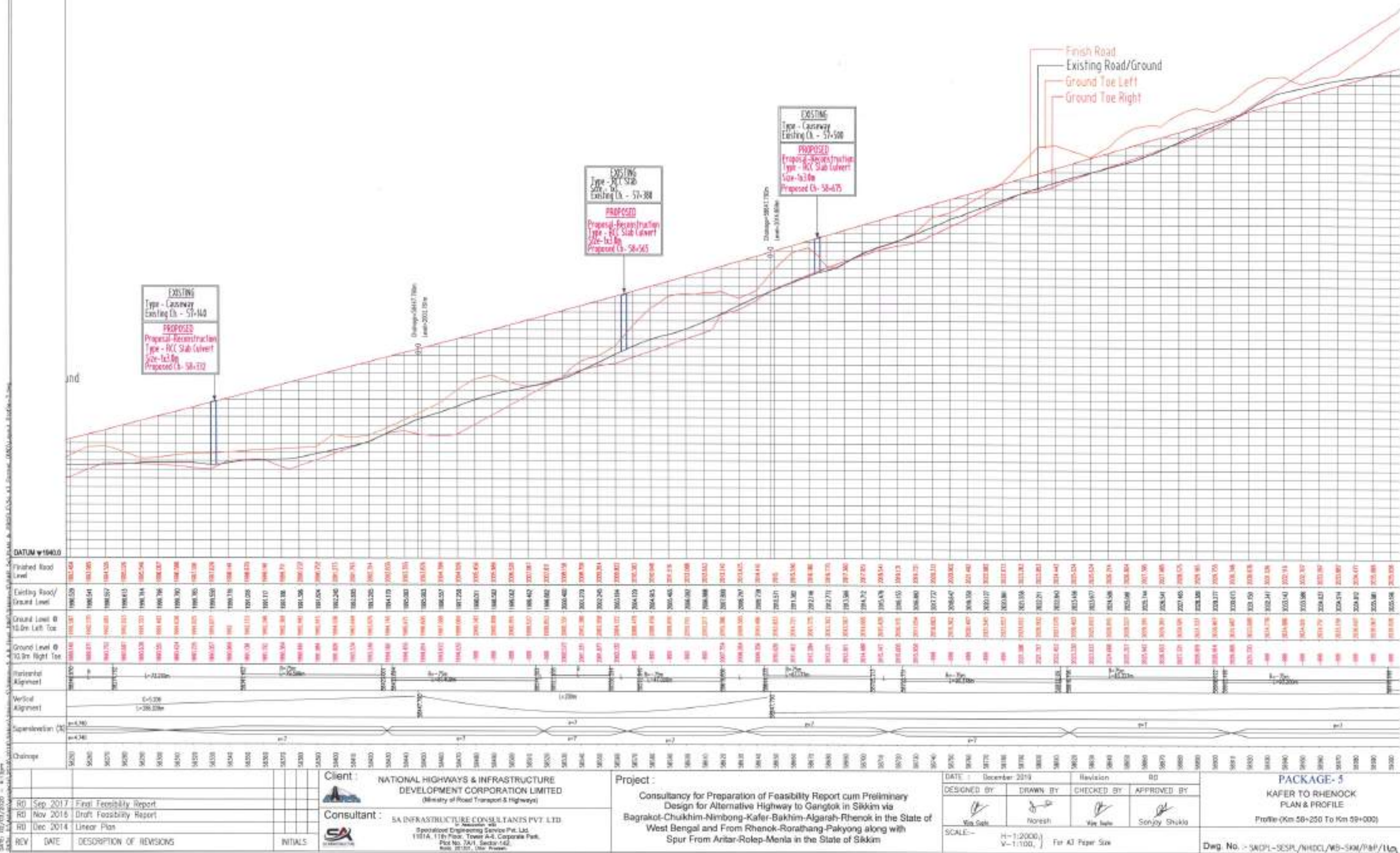
Project :
 Consultancy for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrskot-Chukhim-Nimbong-Kafer-Bakim-Algarah-Rhenok in the State of West Bengal and From Rhenok-Rorathang-Pakyong along with Spur From Antar-Rolep-Monia in the State of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

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED BY
Vjay Gupta	Narank	Vjay Gupta	Sonjit Shukla

SCALE: -
 H-1:2000
 V-1:100 For A3 Paper Size

PACKAGE- 5A
KAFER TO RHENOCK
 PLAN & PROFILE
 (PLAN - Km 50+250 To Km 60+000)

Dwg. No. - SACP/SESPL/NHDC/WB-SKM/PWP/11



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-4, Corporate Park,
Plot No. 7A/1, Sector-142,
Gurgaon, Haryana

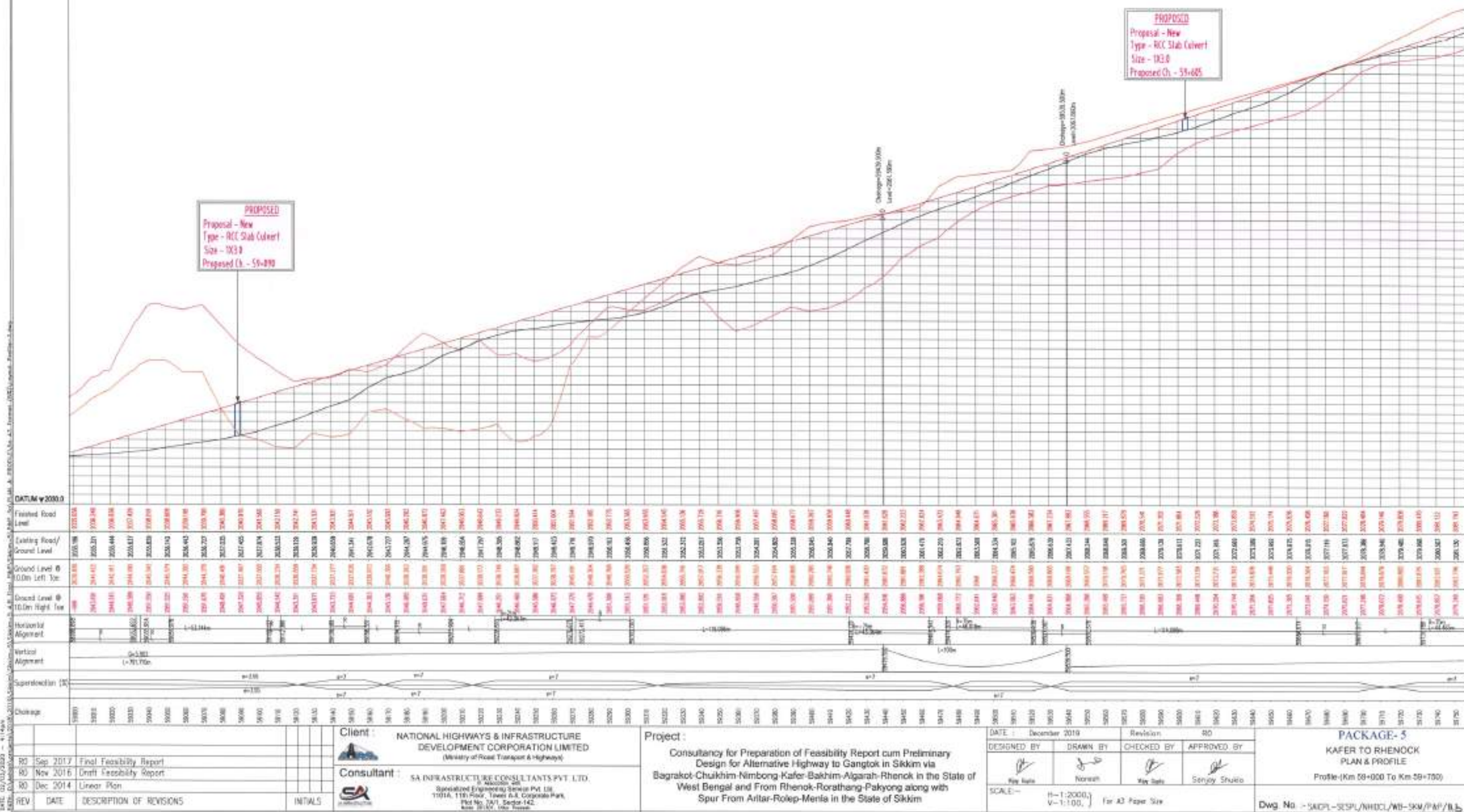
Project : Consultancy for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chuikhim-Nimbong-Kafer-Bakhim-Algarah-Rhenok in the State of West Bengal and From Rhenok-Rorathang-Pakyong along with Spur From Aritar-Rolep-Menla in the State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

DATE : December 2019
DESIGNED BY : Vignesh
DRAWN BY : Nareesh
CHECKED BY : Vignesh
APPROVED BY : Sonjoy Shikha

SCALE : H=1:2000
V=1:100
For A3 Paper Size

PACKAGE-5
KAFER TO RHENOCK
PLAN & PROFILE
Profile (Km 58+250 To Km 59+000)

Dwg No. : SNIPL-SESP/NHDC/MB-SKM/P&P/11a





RD Sep 2017	Final Feasibility Report					 Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (Ministry of Road Transport & Highways)
RD Nov 2016	Draft Feasibility Report					
RD Dec 2014	Linear Plan					
REV	DATE	DESCRIPTION OF REVISIONS			INITIALS	Consultant : SA INFRASTRUCTURE CONSULTANTS PVT. LTD.  In Association with Specialized Engineering Service Pvt. Ltd. 1001A, 11th Floor, Sector 4-A, Corporate Park, Plot No. 7A/1, Sector-142, Gurgaon, Haryana, India.

	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. 101A, 11th Floor, Tower No. 4, Corporate Park, Plot No. 7A/1, Sector-142, Gurgaon, Haryana, India

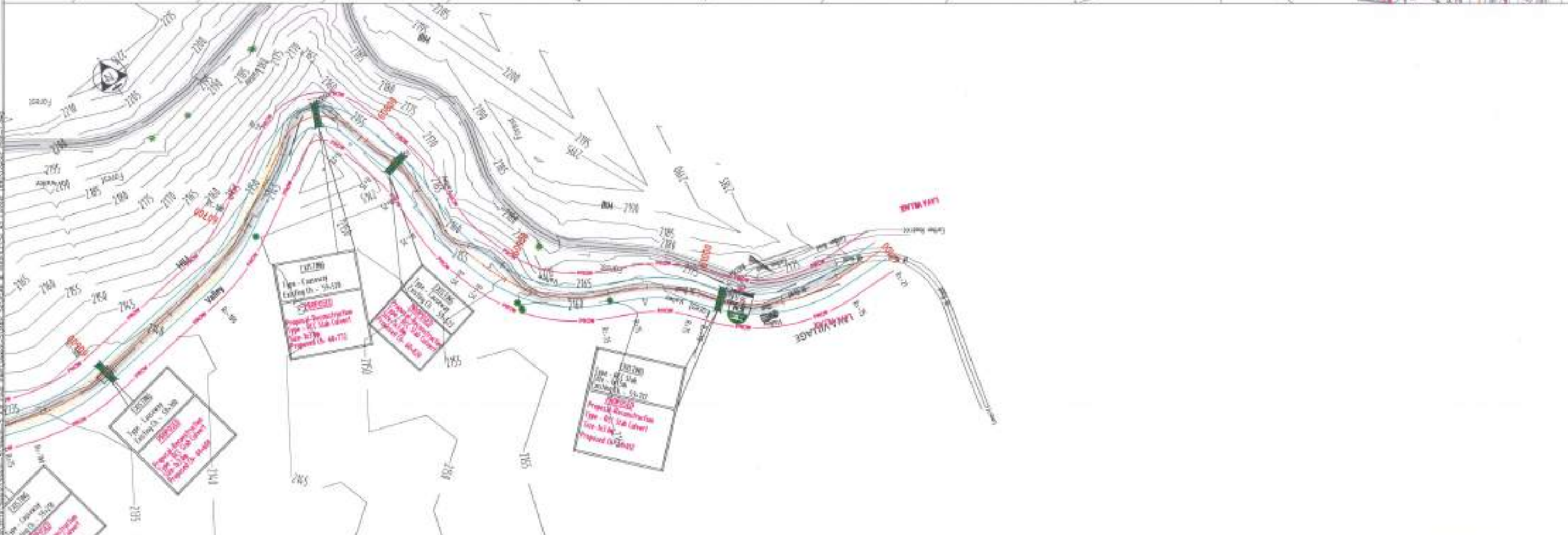
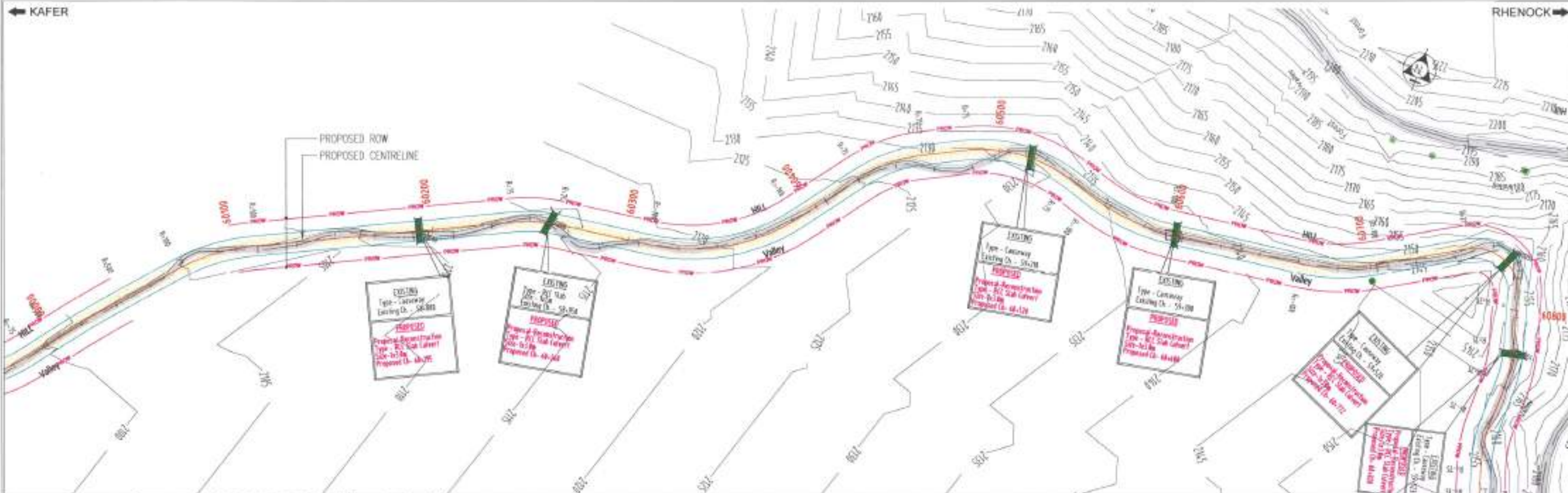
Project :	Consultancy for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chukhim-Nimbong-Kaler-Bakhim-Algarah-Rhenok in the State of West Bengal and From Rhenok-Rorathang-Pakyong along with Spur From Anbar-Rolep-Menia in the State of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

DATE : December 2019		Revision : 00	
DESIGNED BY :	DRAWN BY :	CHECKED BY :	APPROVED BY :
 Vinu Sathya	 Nareesh	 Vinu Sathya	 Srinivas Shukla
SCALE:- H-1:2000, V-1:100, For A3 Paper Size			

PACKAGE- 5 KAFER TO RHENOCK PLAN & PROFILE Profile (Km 59+750 To Km 62+030)
Dwg. No. -> SACPL-SESPL/NH/DCL/MS-SKM/T&P/11C

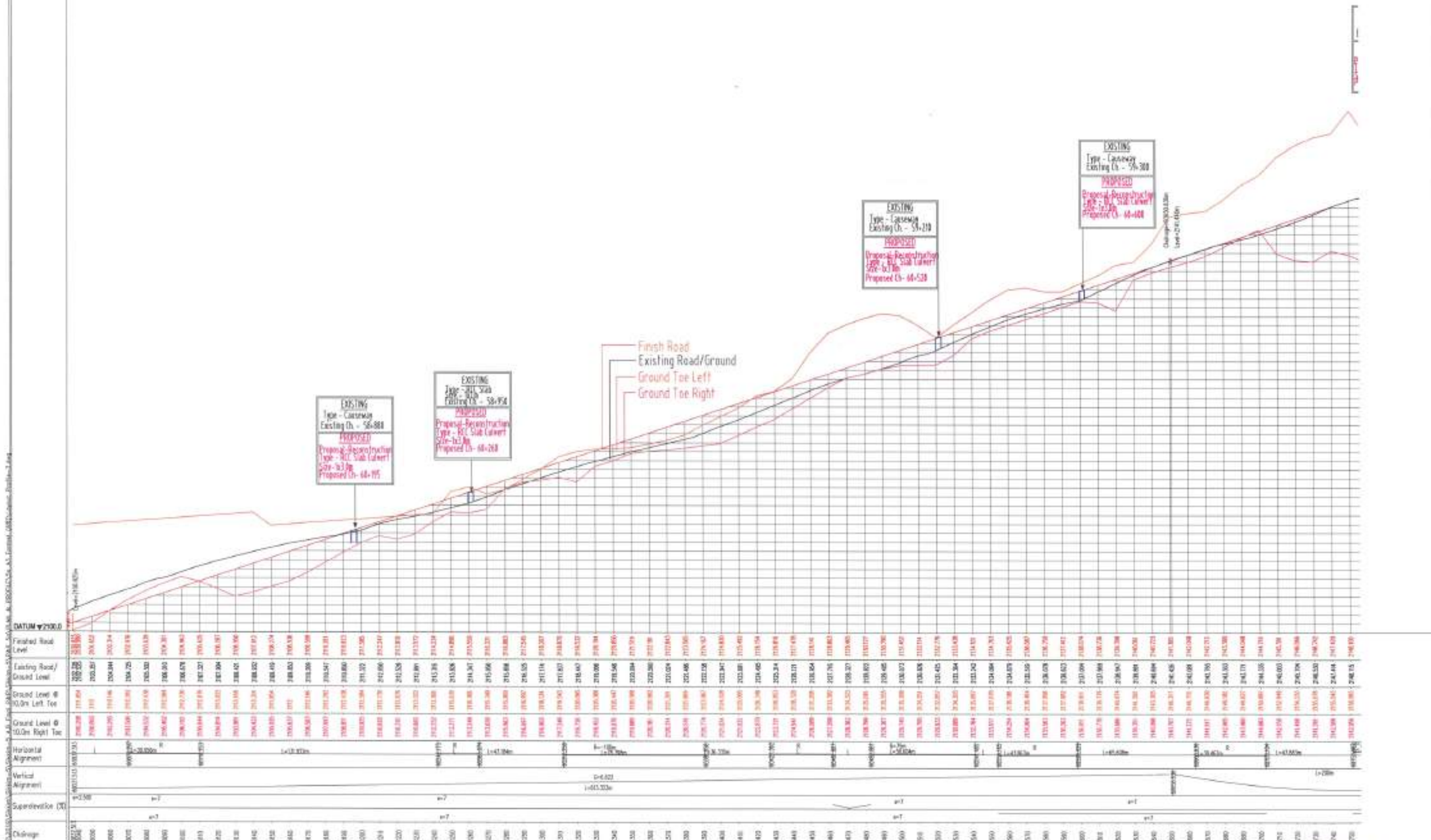
← KAIFER

→ RHENOCK



Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (Ministry of Road Transport & Highways)				Project : Consultancy for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakol-Chukhim-Nimbong-Kaler-Bakhim-Algarah-Rhenok in the State of West Bengal and From Rhenok-Rorathang-Pakyong along with Spur From Aritar-Rolep-Monia in the State of Sikkim				DATE : FEB-2020				Revision : RD				PACKAGE- 5A KAIFER TO RHENOCK PLAN & PROFILE (PLAN - Km 0+000 To Km 91+000)				Dwg No. : SACPL-SESPL/NHDC/WE-SKM/P&P/12			
Consultant : SA INFRASTRUCTURE CONSULTANTS PVT. LTD. (Specialized Engineering Service Pvt. Ltd.) 1181A, 11th Floor, Tower A-8, Corporate Park, Plot No. 7A/1, Sector-142, Gurgaon, Haryana, India				DESIGNED BY : Vijay Gupta				DRAWN BY : Namish				CHECKED BY : Vijay Gupta				APPROVED BY : Sanjay Shukla				SCALE : H-1:2000, V-1:100, For A3 Paper Size			
REV : 01/03/2020 - 10:11am				RD Sep 2017 Final Feasibility Report				RD Nov 2018 Draft Feasibility Report				RD Dec 2014 Linear Plan				INITIALS				DATE : 01/03/2020 - 10:11am			
REV : 01/03/2020 - 10:11am				RD Sep 2017 Final Feasibility Report				RD Nov 2018 Draft Feasibility Report				RD Dec 2014 Linear Plan				INITIALS				DATE : 01/03/2020 - 10:11am			

DATE: 22/03/2020 - 4:14pm
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Client: NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED
 (Ministry of Road Transport & Highways)

Consultant: SA INFRASTRUCTURE CONSULTANTS PVT. LTD.
 Specialized Engineering Service Pvt. Ltd.
 1181A, 1181 Floor, Tower A-8, Corporate Park,
 Plot No. 7A/1, Sector-54D,
 Near D-11/2, Vasant Vihar, New Delhi-110067

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

DATE: December 2019
 Revision: RD
 DESIGNED BY: [Signature] DRAWN BY: [Signature]
 CHECKED BY: [Signature] APPROVED BY: [Signature]
 SCALE: H=1:2000, V=1:100, For A3 Paper Size

PACKAGE-5
 KAFER TO RHENOCK
 PLAN & PROFILE
 Profile (Km 60+00 To Km 60+750)
 Dwg. No.: SAICPL/SESPL/NHID/1/WB-SKM/P&P/12A



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 Antar-Rolep-Mania in the State of Sikkim

	PACKAGE- 5 KAFER TO RHENOCK PLAN & PROFILE Profile (Km 60+750 To Km 60+800)
Dwg. No. :- SAKH - 2020 / SAHAR / KAFR - RHM / DWG / 19	

STANDARD DRAWING

CAUTIONARY/WARNING SIGNS



DATE: 16/11/2019 - 2:14pm
 PATH: C:\Users\Ankur\Documents\SA\PROJECTS\KAFER TO RHEKOCK\ROAD SIGN\Sheet 1 of 3.dwg

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.
 112/1A, 11B, P.O. Box, Tower A/1, Corporate Park
 4th Floor, 7A/1, Sector-142
 Gurgaon-122001, India

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

DATE: November 2018	Revision: 00
DESIGNED BY: Vicky Gupta	DRAWN BY: Nareesh
CHECKED BY: Vicky Gupta	APPROVED BY: Sanjay Shukla
SCALE: - NTS	

PACKAGE- 5
 KAFER TO RHEKOCK
 ROAD SIGN
 (Sheet 1 of 3)

Dwg. No.: SA/CL-SESPL/WHDC/WE-SKM/MSL/01



(B) DIRECTION AND PLACE IDENTIFICATION SIGNS

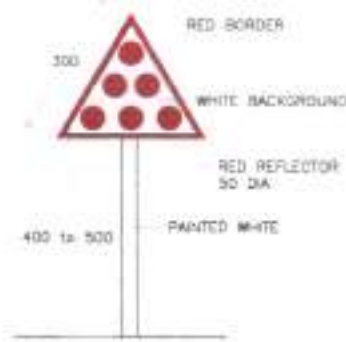
The diagram illustrates seven types of traffic signs:

- ADVANCE DIRECTION (IS-47):** A rectangular sign with a green background and white text, showing three horizontal arrows pointing up, right, and down.
- DIRECTION SIGN (IS-42):** A rectangular sign with a green background and white text, showing a single arrow pointing right.
- DISTANCE SIGN (IS-43):** A rectangular sign with a green background and white text, showing three horizontal rows with distances: 120, 10, and 150.
- PLACE IDENTIFICATION SIGN (IS-44):** A rectangular sign with a green background and white text, showing the word "NERCHOWK".
- TRUCK LAY BY (IS-45):** A rectangular sign with a green background and white text, showing the text "TRUCK LAY BY" and an arrow pointing up and to the right.
- TOLL BOOTH AHEAD (IS-46):** A rectangular sign with a green background and white text, showing the text "TOLL BOOTH AHEAD" and an arrow pointing up.
- NH ROUTE MARKER (IS-47):** A rectangular sign with a green background and white text, showing the text "NH" and "O" (for Route 102) and a shield shape.

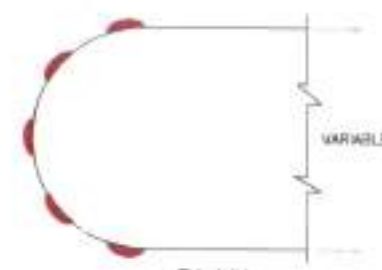
Dwg No - SMCPL-SESP/LNDC/LN-3M/Misc/02



CLUSTER OF RED REFLECTORS
TA-1



100mm DIA
RED REFLECTOR



PLAN

MEDIAN TIP REFLECTORS
TA-2

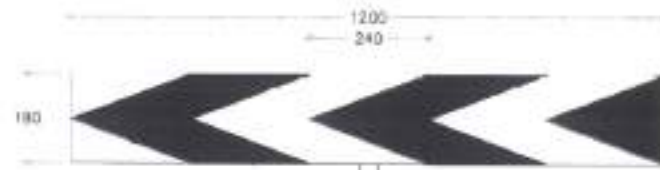
HIGH QUALITY RED REFLECTORS FIXED WITH
APPROVED MATERIAL CASING AND FIXING SYSTEM



ELEVATION

HIGH QUALITY RED REFLECTORS OF APPROVED
SIZE AND SHAPE (TO BE FIXED IN THE SHAPE OF
W-BEAM), FIXED WITH APPROVED MATERIAL
CASING AND FIXING SYSTEM

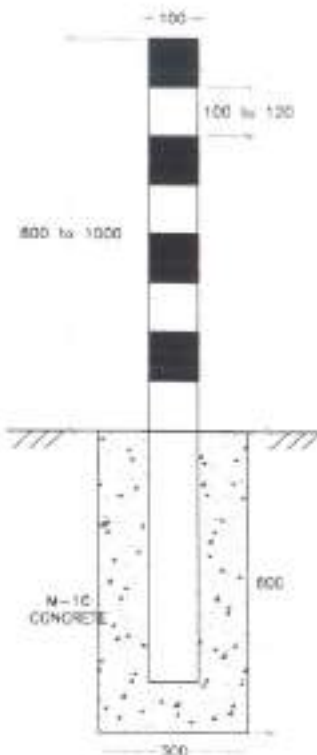
ON W-BEAM OF
METAL BEAM
CRASH BARRIER
TA-3



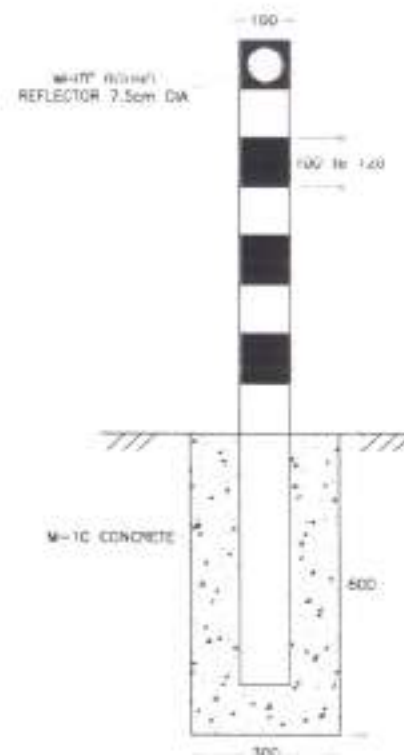
ONE-WAY HAZARD MARKER



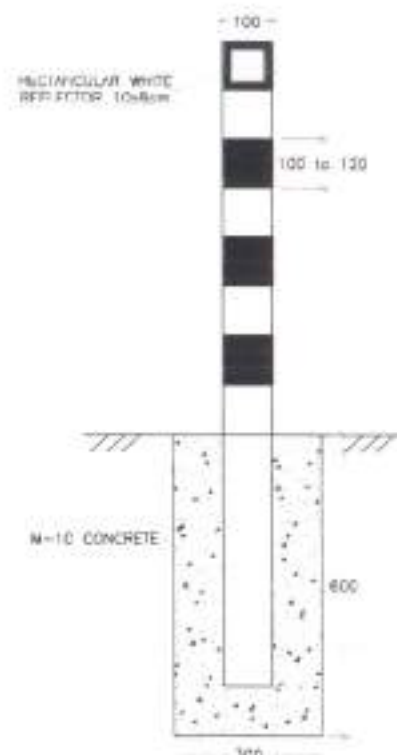
TWO-WAY HAZARD MARKER



DELINEATOR
WITHOUT
REFLECTOR

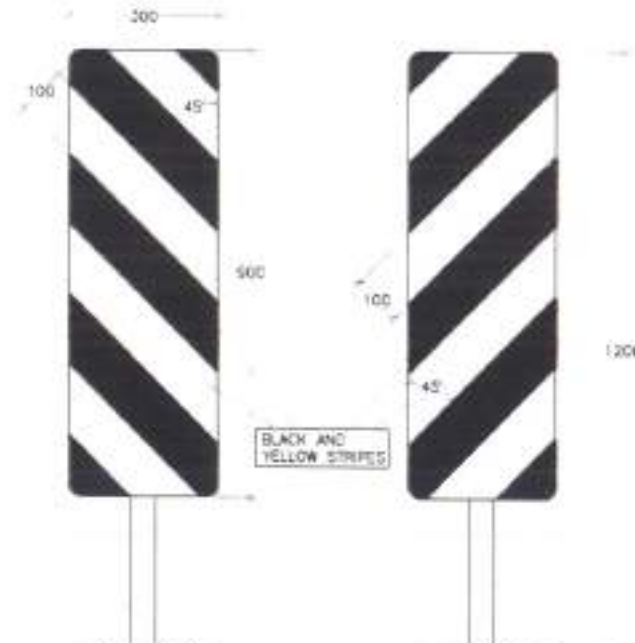


DELINEATOR
WITH CIRCULAR
REFLECTOR



DELINEATOR
WITH RECTANGULAR
REFLECTOR

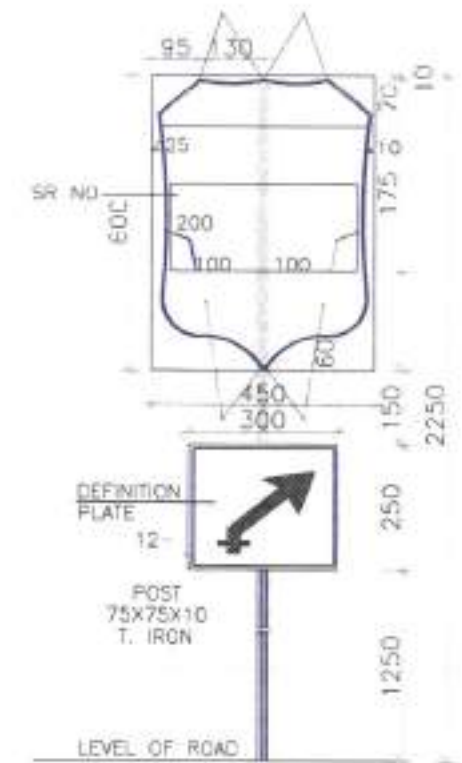
ROADWAY DELINEATORS



LEFT

RIGHT

OBJECT HAZARD MARKERS



ASSEMBLY OF ROUTE MARK SIGN
ARRANGEMENT FOR ERECTION OF
STATE ROUTE MARKER SIGN

DATE: 14/11/2018 - 3:14 PM
DRAWN BY: VIKAS GUPTA
CHECKED BY: VIKAS GUPTA
APPROVED BY: VIKAS GUPTA

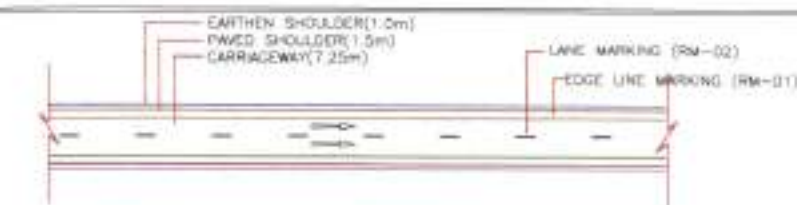
REV	DATE	DESCRIPTION OF REVISIONS	INITIALS
R0	Sep 2017	Final Feasibility Report	
R0	Nov 2016	Draft Feasibility Report	
R0	Dec 2014	Linear Plan	

Client	NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (Ministry of Road Transport & Highways)
Consultant	SA INFRASTRUCTURE CONSULTANTS PVT. LTD. Specialized Engineering Services Pvt. Ltd. 1101A, 11th Floor, Tower A-3, Corporate Park, Plot No. 2A/1, Sector-14C, Gurgaon-122002, India

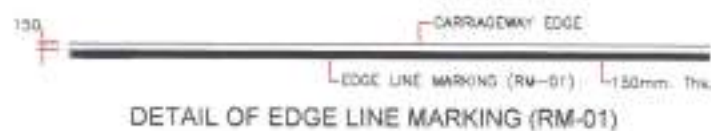
Project	Consultancy for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chukhim-Nimbong-Kafer-Bakhim-Algarah-Rhenok in the State of West Bengal and From Rhenok-Rorathang-Pakyong along with Spur From Antar-Rolep-Menla in the State of Sikkim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

DATE	November 2018	Revision	RC
DESIGNED BY	VIKAS GUPTA	CHECKED BY	VIKAS GUPTA
DRAWN BY	VIKAS GUPTA	APPROVED BY	VIKAS GUPTA
SCALE	NTS		

PACKAGE- 5 KAFER TO RHEKOCK ROAD SIGN (Sheet 03 of 03)
Dwg No. - SACPL-SESPL/NHDD/WB-SKN/Net/03



TYPICAL LAYOUT OF ROAD MARKINGS FOR 2-LANE



LANE MARKING AT STRAIGHT REACHES IN RURAL AREA (RM-02A)



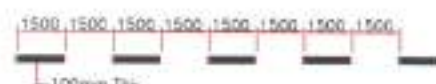
LANE MARKING AT CURVES IN RURAL AREA (RM-02B)



LANE MARKING AT APPROACHES TO INTERSECTION IN RURAL AREA (RM-02C)



LANE MARKING ON STRAIGHT REACHES IN URBAN AREA (RM-03A)



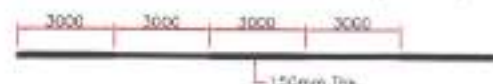
LANE MARKING AT CURVES AND APPROACHES TO INTERSECTION IN URBAN AREAS (RM-03B)



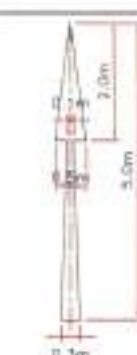
EXTENSION OF EDGE AT BUS BAY AREA (RM-04)



LANE MARKING FOR 2-LANE ROAD ON STRAIGHT REACHES IN URBAN AREA (RM-05A)



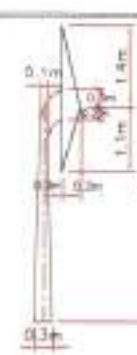
LANE MARKING FOR 2-LANE ROAD ON CURVES AND APPROACHES TO INTERSECTION IN URBAN AREA (RM-05B)



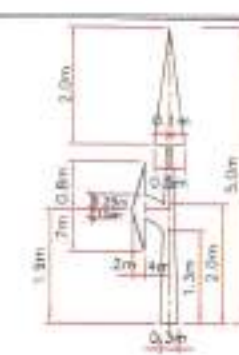
STRAIGHT RM-12



LEFT RM-13



RIGHT RM-14

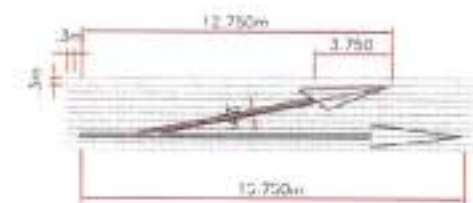


STRAIGHT & LEFT RM-15

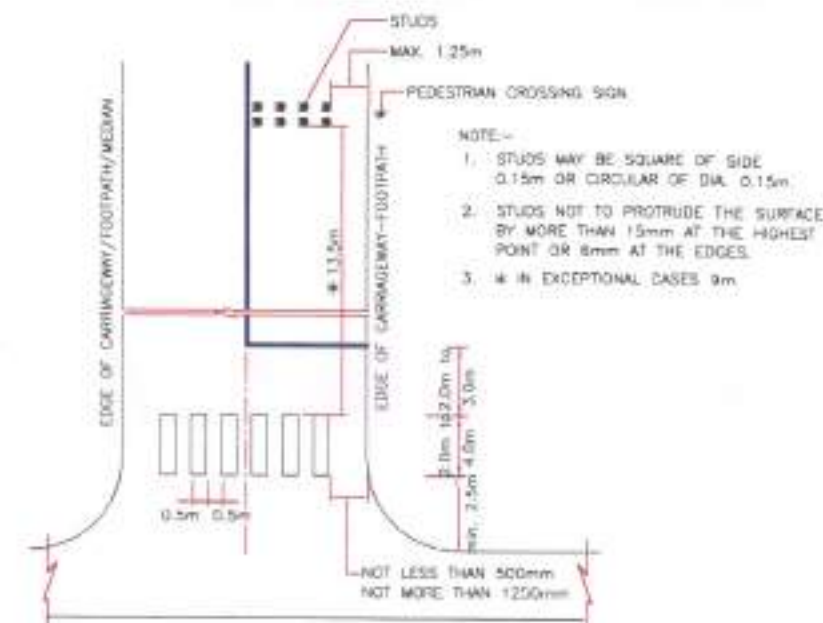


STRAIGHT & RIGHT RM-16

ROUTE DIRECTIONAL ARROWS FOR PROJECT ROAD (ALL THE ARROWS ARE IN WHITE COLOUR)



ARROWS FOR DECELERATION LANE RM-17

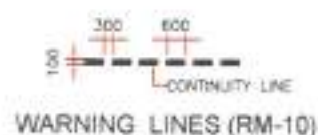


PEDESTRIAN CROSSING AT AN UNSIGNALISED INTERSECTION (RM-08)

TOTAL LENGTH OF MARKING (m)	CLEAR SPACING BETWEEN DIAGONALS OR CHEVRONS (mm)	
	SPEED (<75km/h)	SPEED (>75km/h)
<6	2100	-
6 TO 22	3500	-
>22	5000	-
<10	-	4000
>10	-	6000

1. ALL LENGTHS AND SPACINGS IN THE TABLE ARE MEASURED PARALLEL TO ROAD CENTRE LINE.
2. FIRST DIAGONAL OR CHEVRON IS TO BE SO LOCATED THAT ITS LENGTH IS AT LEAST EQUAL TO ITS WIDTH.
3. WIDTH OF ALL DIAGONALS/CHEVRONS MEASURED AT RIGHT ANGLES TO THE DIAGONALS OR CHEVRONS IS 600mm.

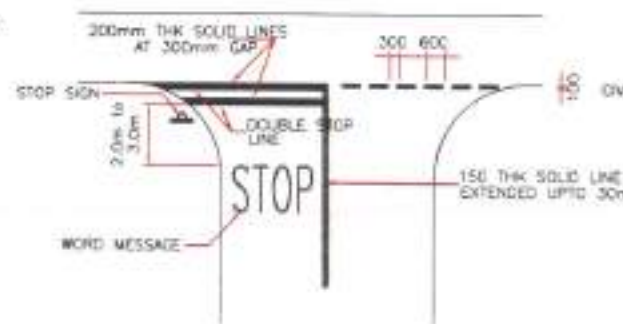
DETAILS OF DIAGONAL AND CHEVRON MARKINGS (RM-09)



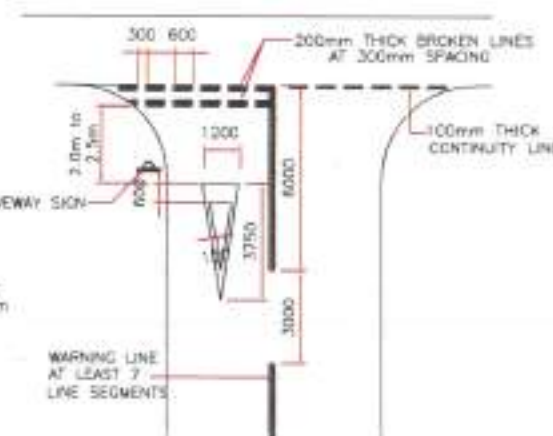
WARNING LINES (RM-10)



KERB MARKINGS (RM-11)



STOP LINE MARKINGS FOR USE WITH STOP SIGN (RM-06)



MARKINGS FOR GIVE WAY LINES (RM-07)

DATE: 14/11/2016 - 3:17pm

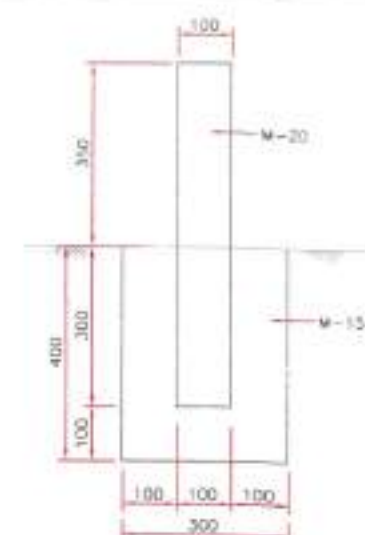
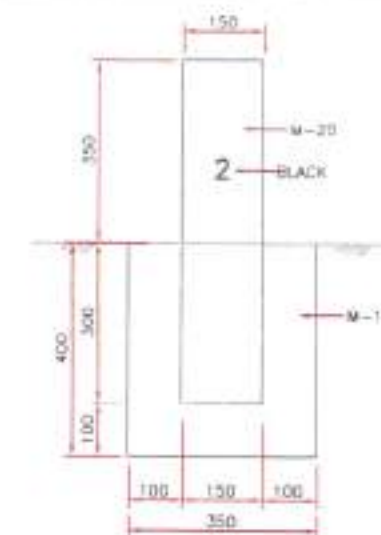
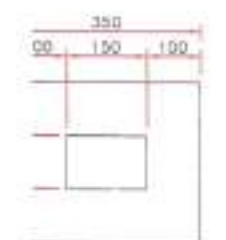
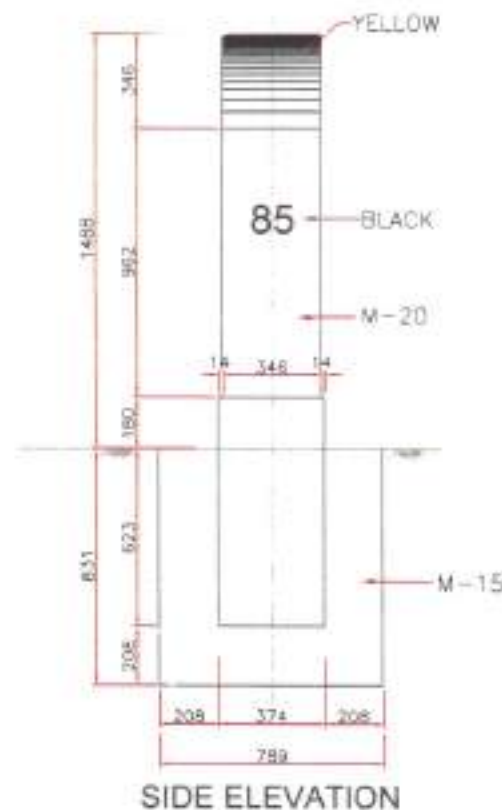
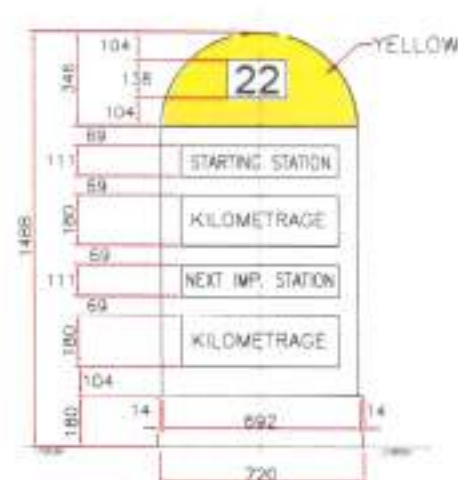
REV	DATE	DESCRIPTION OF REVISIONS	INITIALS
RO	Sep 2017	Final Feasibility Report	
RO	Nov 2016	Draft Feasibility Report	
RO	Dec 2014	Linear Plan	

Client:	NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (Ministry of Road Transport & Highways)
Consultant:	SA INFRASTRUCTURE CONSULTANTS PVT. LTD. (Specialized Engineering Services Pvt. Ltd. 112/CA, 11th Floor, Tower A/1, Corporate Park, Plot No. 12/2, Sector 142, Gurgaon, Haryana 122001)

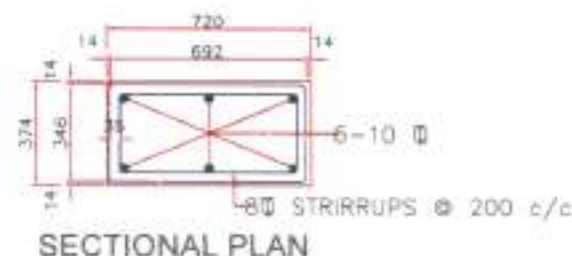
Project:	Consultancy for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chukhim-Nimbong-Kaler-Bakim-Algarah-Rhenok in the State of West Bengal and From Rhenok-Rorathang-Pakyong along with Spur From Antar-Rolep-Mania in the State of Sikkim
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DATE:	November 2019	Revision:	RC
DESIGNED BY:	DRIVEN BY:	CHECKED BY:	APPROVED BY:
Vijay Gupta	Narish	Vijay Gupta	Sonjay Shukla
SCALE:	1:NTS		

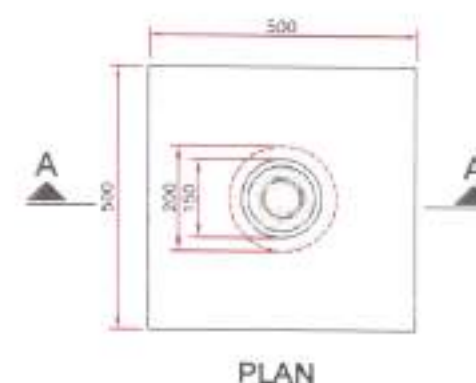
PACKAGE-5	KAFTER TO RHEKOCK
DETAIL OF ROAD MARKING	
Dwg No.	SACPL-SESPL/NHDD/WB-SKN/NSC/c4



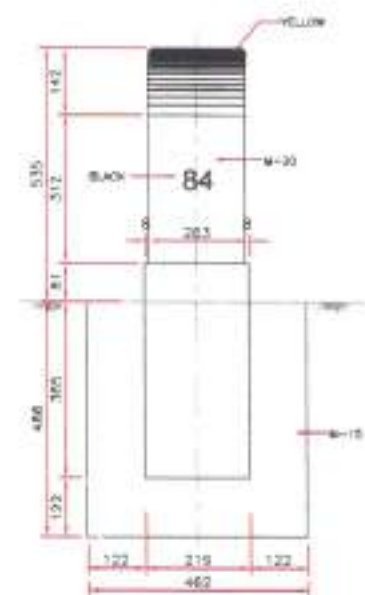
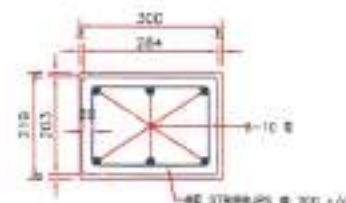
DETAIL OF 200 METRE STONE
(SCALE 1:10)



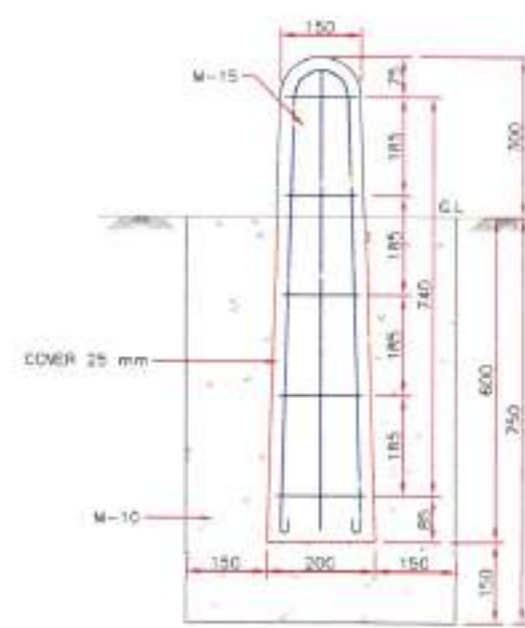
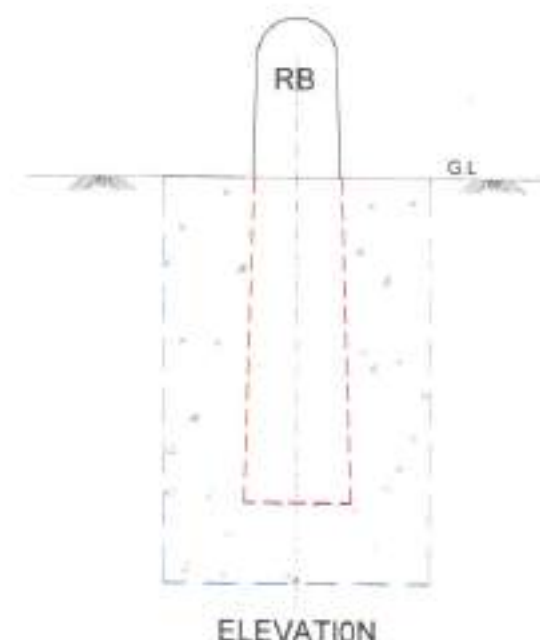
DETAIL OF FIFTH KILOMETRE STONE
(SCALE 1:20)



S. NO.	TYPE OF R.S. BAR	NO. OF BARS	SHAPE OF BARS	DIA IN mm	LENGTH OF ONE BAR INCLUDING HOOKS
1.	MAIN BARS	2		6 mm	1.48 m
2.	TOPMOST STIRRUP	1		6 mm	370 mm
3.	STIRRUP (FIRST FROM TOP)	1		6 mm	405 mm
4.	STIRRUP (SECOND FROM TOP)	1		6 mm	440 mm
5.	STIRRUP (THIRD FROM TOP)	1		6 mm	475 mm
6.	BOTTOMMOST STIRRUP	1		6 mm	810 mm

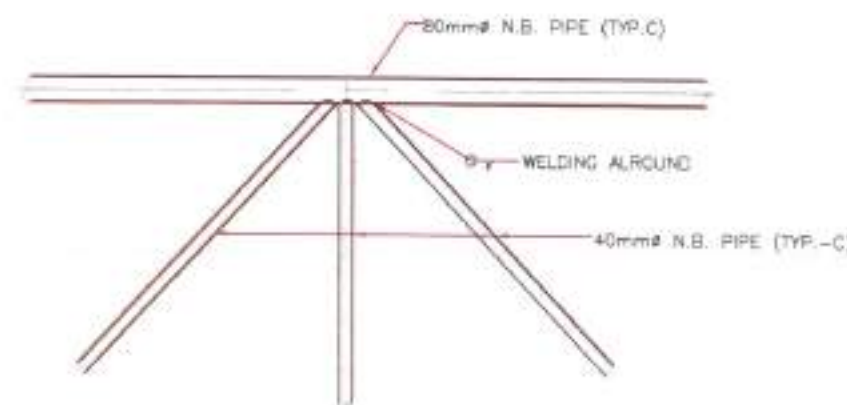
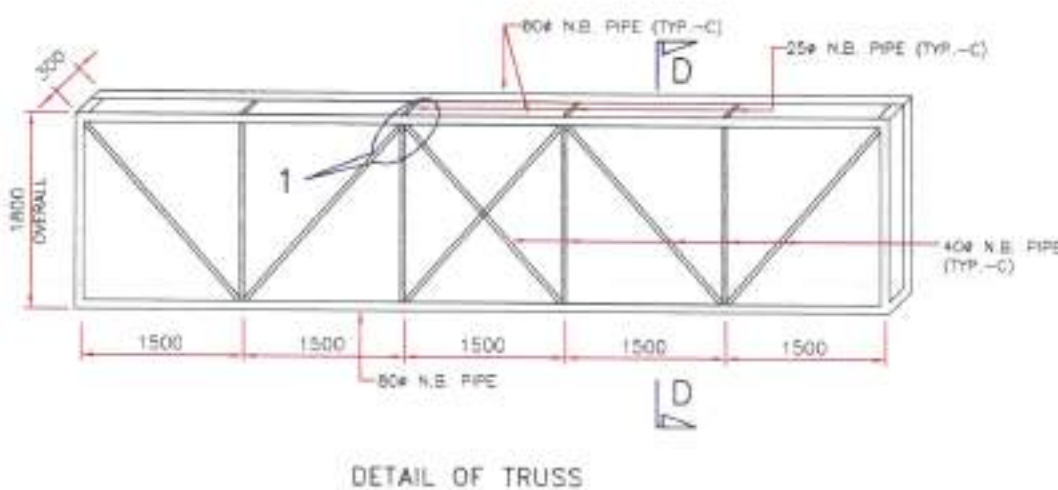
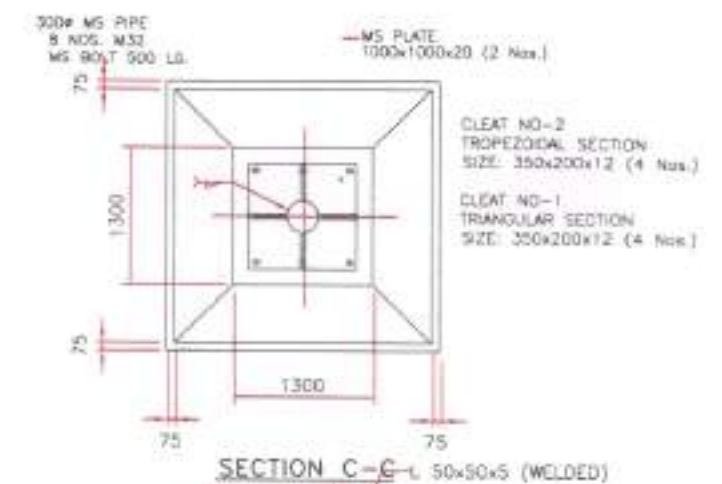
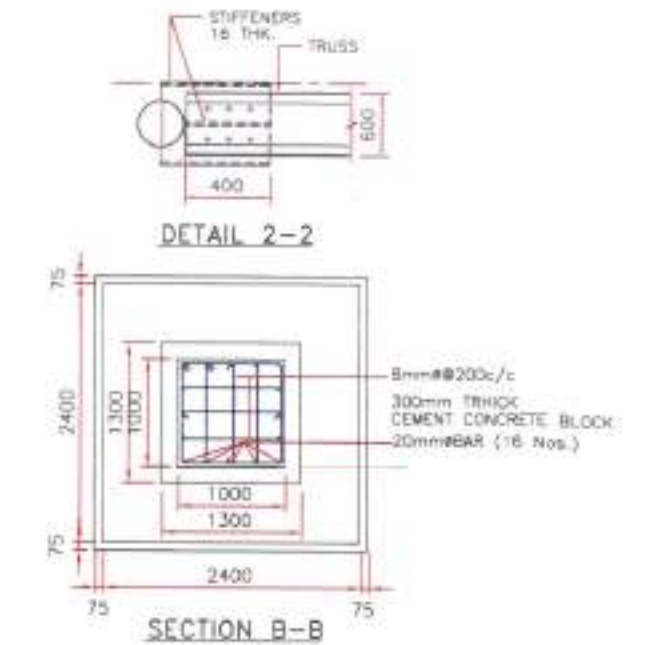
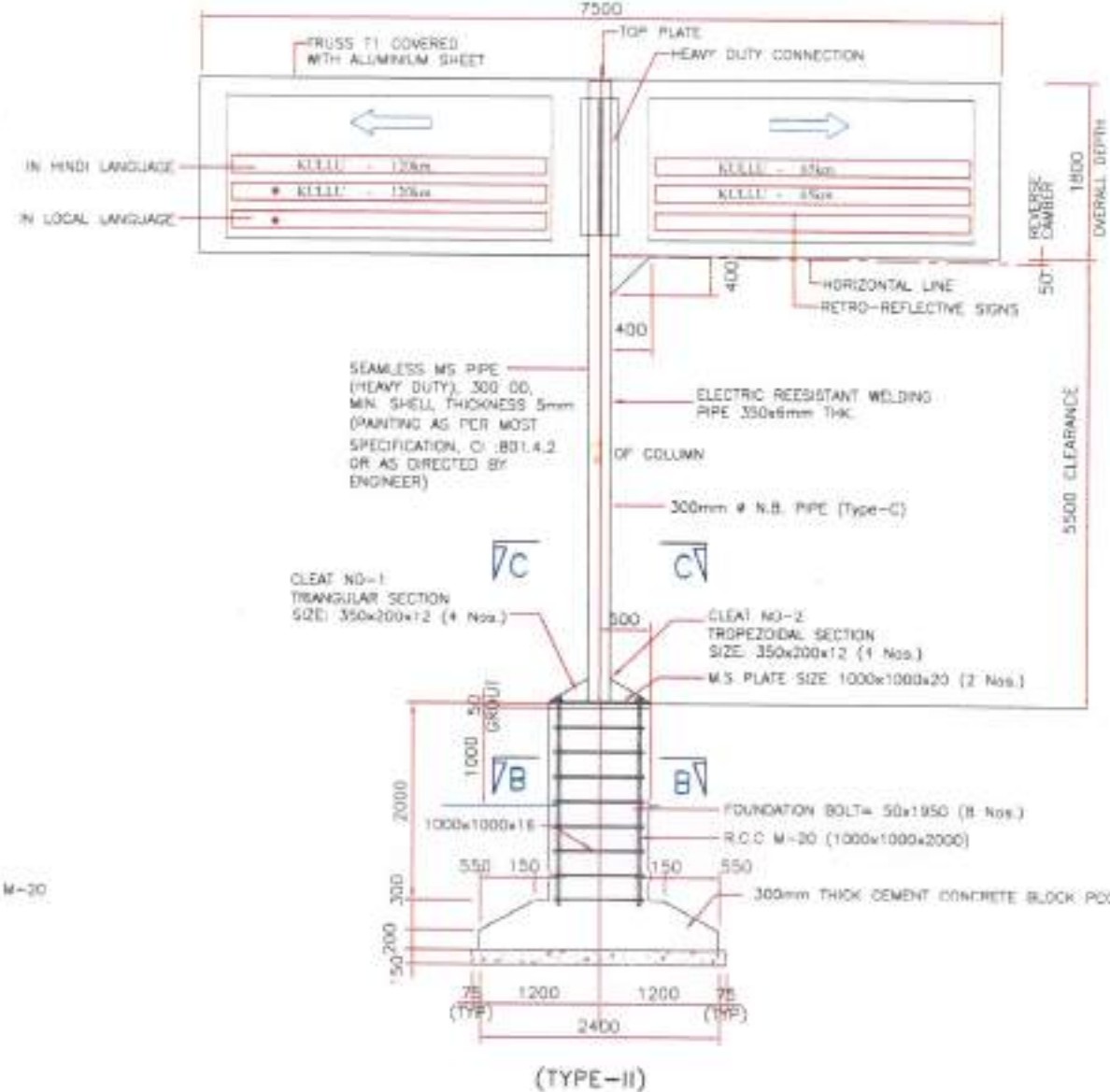
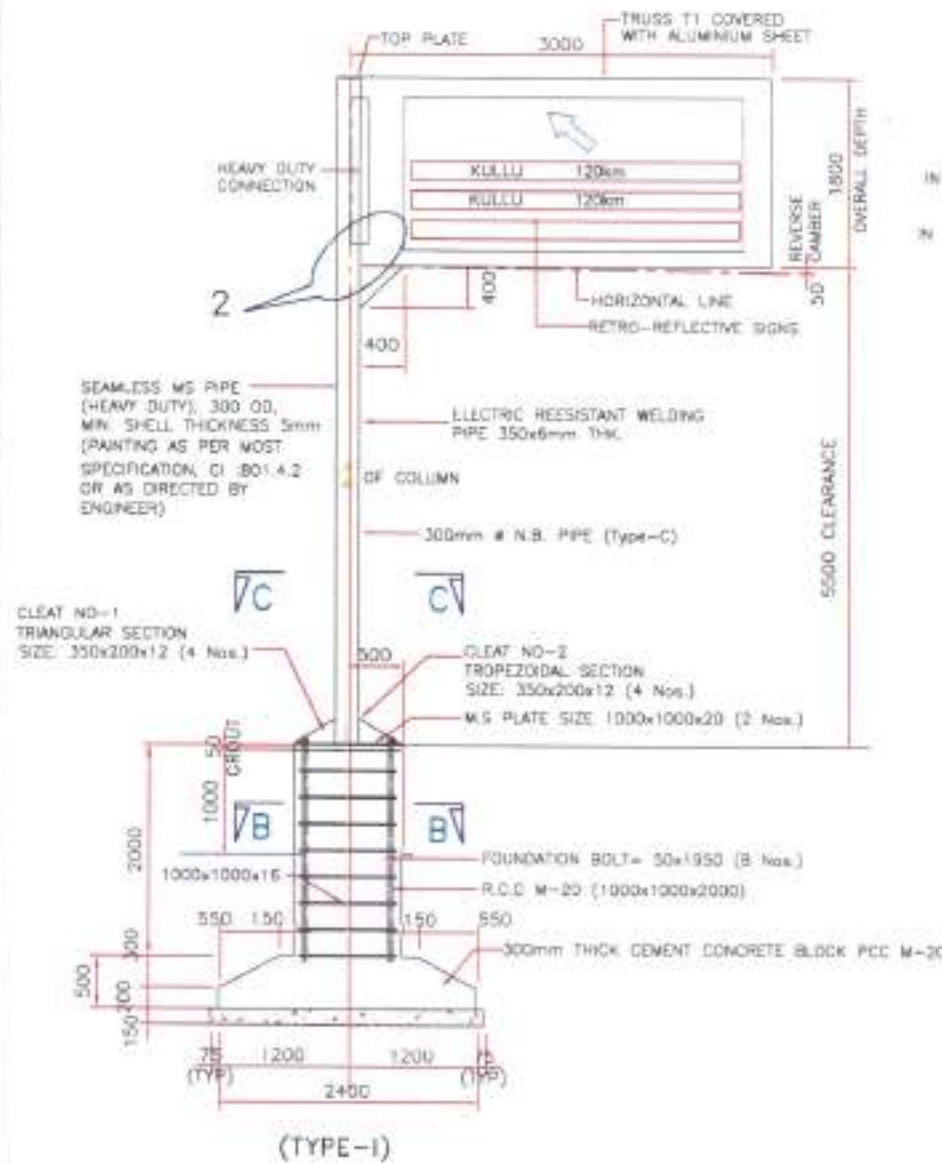


DETAIL OF KILOMETRE STONE
(SCALE: 1:10)

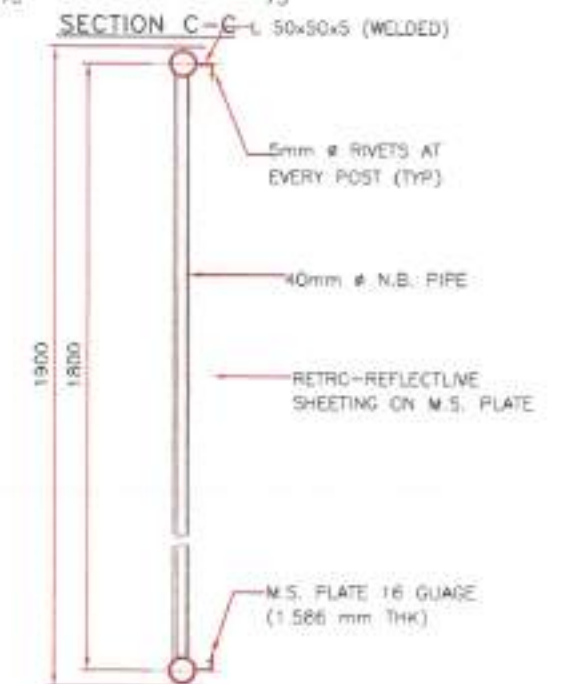


DETAIL OF BOUNDARY STONE
(SCALE 1:10)

RD Sep 2017 Final Feasibility Report RD Nov 2016 Draft Feasibility Report RD Dec 2014 Linear Plan			Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (Ministry of Road Transport & Highways)	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 Arisar-Rolep-Menia in the State of Sikkim	DATE : November 2015 DESIGNED BY : Vicky Gupta DRAWN BY : Noreesh CHECKED BY : Vicky Gupta APPROVED BY : Sanjay Shukla SCALE : NTS	(SCALE 1:10) Revision RO PACKAGE - 5 KAFER TO RHEKOCK DETAIL OF DISTANCE STONE & BOUNDARY STONE
REV	DATE	DESCRIPTION OF REVISIONS	INITIALS	Consultant : SA INFRASTRUCTURE CONSULTANTS PVT. LTD. Specialized Engineering Service Pvt. Ltd. H-1/A, 11th Floor, Tower A-1, Corporate Park, Plot No. 72B, Sector 142, Gurgaon, 122002, India		Dwg. No. : SA/RI - SP/RI - 04/2015 / NS - SKN / 04/15



OTHER SIDE



DATE: 14/11/2014 - 2:30 PM

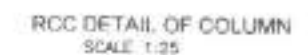
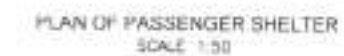
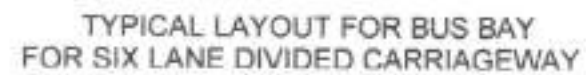
REV	DATE	DESCRIPTION OF REVISIONS	INITIALS
RD	Sep. 2017	Final Feasibility Report	
RD	Nov. 2016	Draft Feasibility Report	
RD	Dec. 2014	Linear Plan	

Client:	NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (Ministry of Road Transport & Highways)
Consultant:	SA INFRASTRUCTURE CONSULTANTS PVT. LTD. (Specialized Engineering Services Pvt. Ltd. 10/1A, 11th Floor, Tower A-1, Connaught Place, New Delhi 110028, India)

Project:	Consultancy for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chukhim-Nimbong-Kaler-Bakhim-Algarah-Rhenok in the State of West Bengal and From Rhenok-Rorathang-Pakyong along with Spur From Arter-Rolep-Menta in the State of Sikkim
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DATE:	November 2016	Revision:	RD
DESIGNED BY:	Vijay Gupta	CHECKED BY:	Vijay Gupta
DRAWN BY:	Norash	APPROVED BY:	Sanjay Shukla
SCALE:	NTS		

PACKAGE-5	KAFER TO RHENOCK
DETAILS OF OVERHEAD GANTRY SIGN	
Dwg No.:	SNICPL-SESPL/440CL/MB-SKM/MS/C&F



REV	DATE	DESCRIPTION OF REVISIONS
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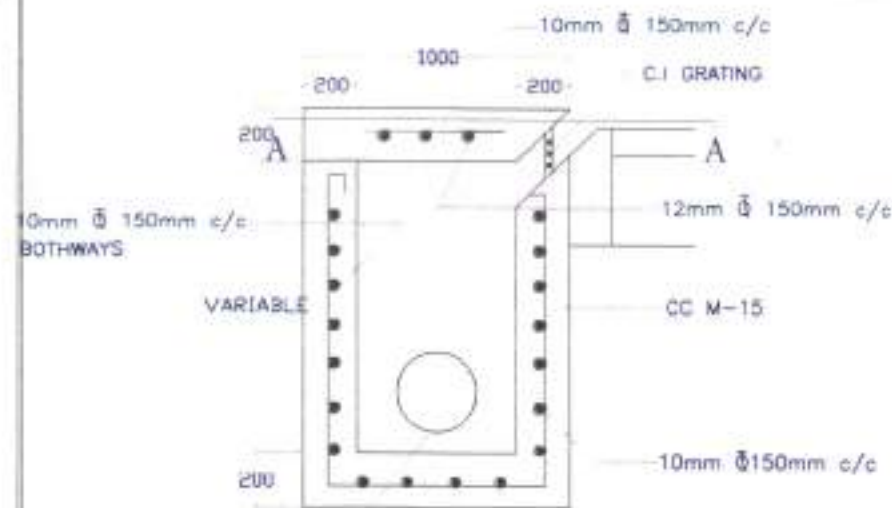
Consultant: SA INFRASTRUCTURE CONSULTANTS PVT. LTD.
Specialist Engineering Service Pvt. Ltd.
1101A, 11th Floor, Tower A-1, Corporate Park,
Plot No. 78A, Gurgaon

Designator Alternative Highway to Gangtok in Sikkim via
Bagrakot-Chuikhum-Nimbong-Kafer-Bakhim-Ajgarah-Rhenok in the State of
West Bengal and From Rhenok-Rorathang-Pakyong along with
Spur From Aritar-Rolep-Manis in the State of Sikkim

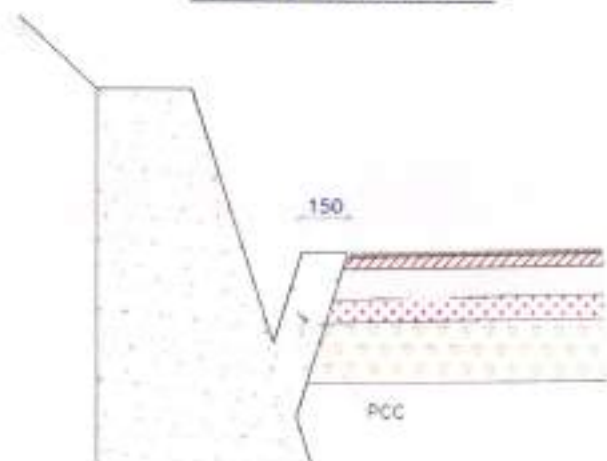
SCALE - NTS

LAYOUT OF BUNKER-DETAILS
OF PASSENGER SHELTER

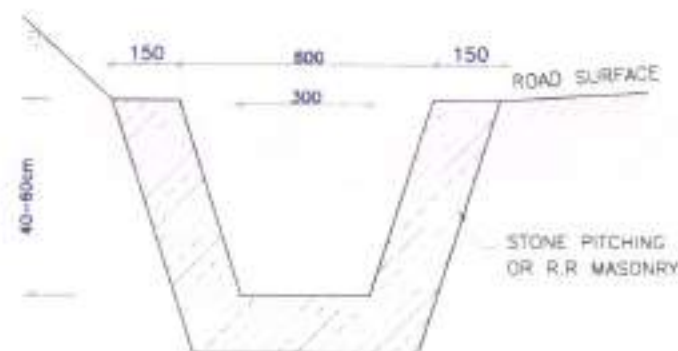
Dwg No. - SACPL-SESPL/NHCL/WB-SKM/WSC/ 03



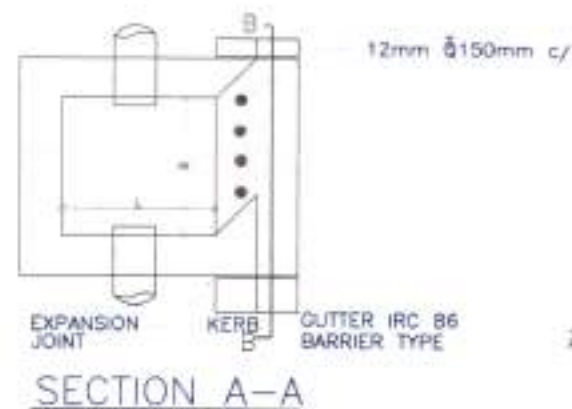
**CATCH BASIN
INLET CHAMBER**



HILL SIDE DRAIN



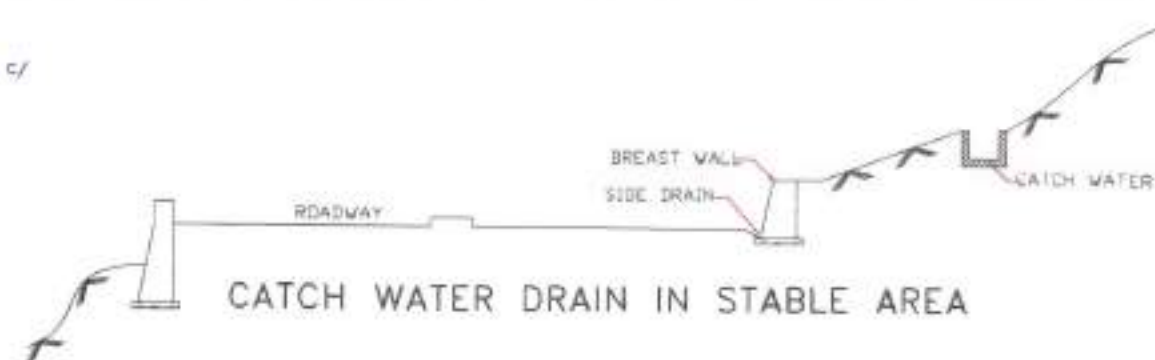
TRAPEZOIDAL DRAIN



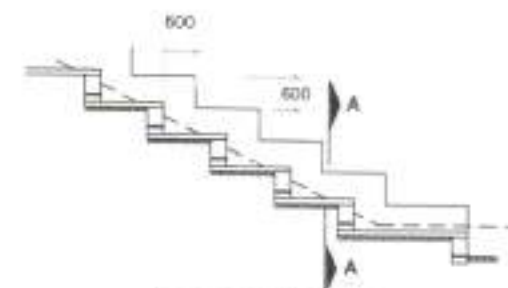
SECTION A-A



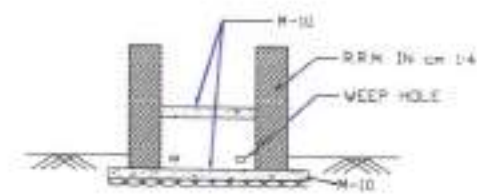
INLET DETAIL AT B-B



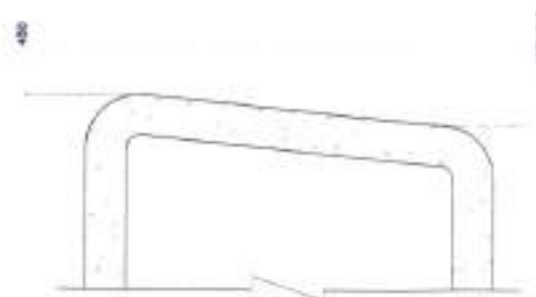
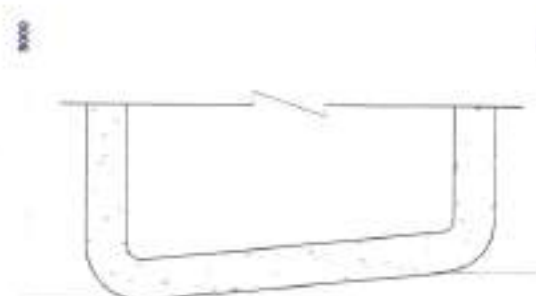
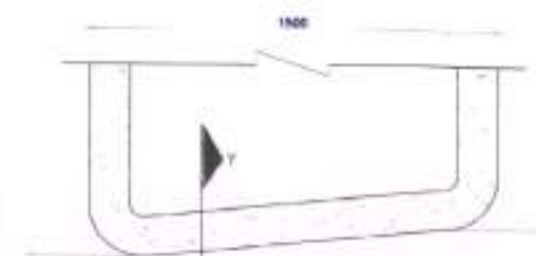
CATCH WATER DRAIN IN STABLE AREA



**LONGITUDINAL
SECTION OF CHUTE**



SECTION A-A



DATE: 14/11/2018 - 2:07pm

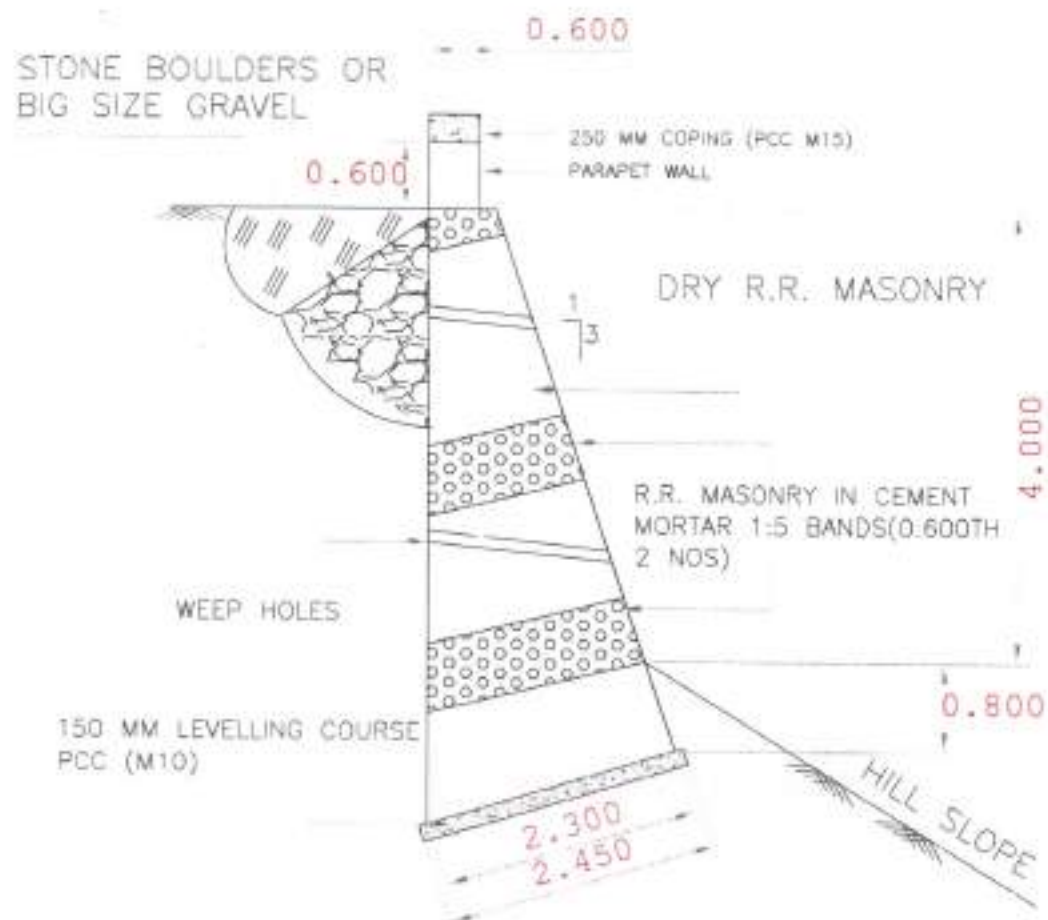
REV	DATE	DESCRIPTION OF REVISIONS	INITIALS
R0	Sep. 2017	Final Feasibility Report	
R0	Nov 2016	Draft Feasibility Report	
R0	Dec 2014	Linear Plan	

Client:	NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (Ministry of Road Transport & Highways)
Consultant:	SA INFRASTRUCTURE CONSULTANTS PVT. LTD. Specialized Engineering Services Pvt. Ltd. 1101A, 11th Floor, Tower A-4, Corporate Park, Plot No. 7A/1, Sector-142, Gurgaon, Haryana, India

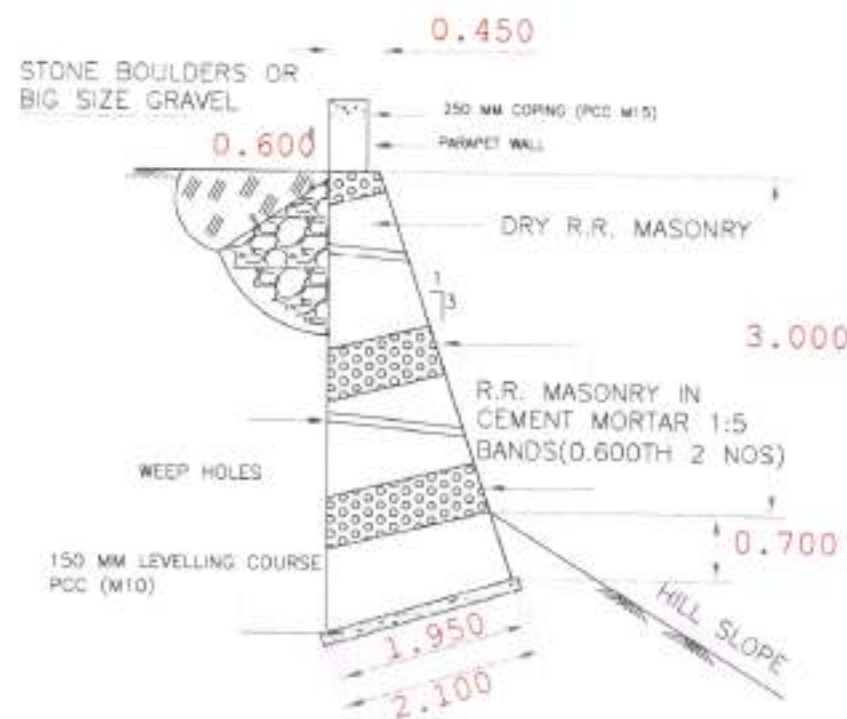
Project:	Consultancy for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chukhim-Nimbong-Kaler-Bakhim-Algarah-Rhenok in the State of West Bengal and From Rhenok-Rorathang-Pakyong along with Spur From Antar-Rolep-Ments in the State of Sikkim
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DATE:	November 2018	Revision:	RC
DESIGNED BY:	Wijay Gupta	DRAWN BY:	Nareesh
CHECKED BY:	Wijay Gupta	APPROVED BY:	Sanjay Shukla
SCALE:	1:100		

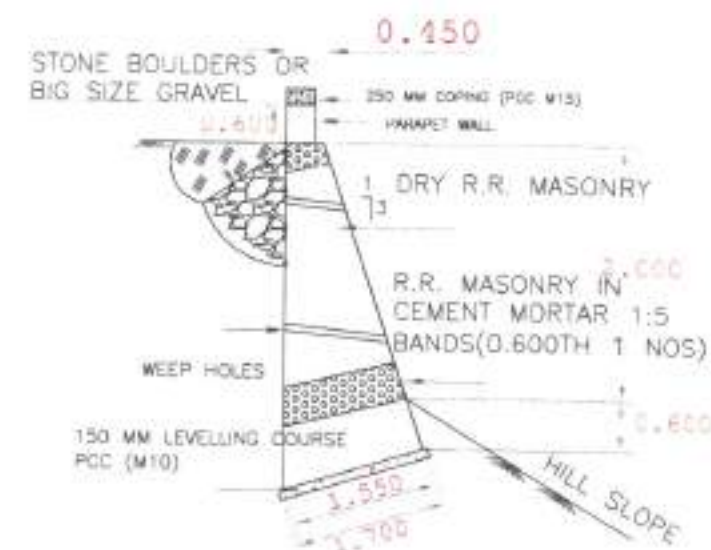
PACKAGE-5 KAFER TO RHENOCK DETAIL OF SIDE DRAIN INLET CHAMBER & MEDIAN CUT DRAIN
Dwg. No. : SACPL-SESPL/NHDD/MB-SKM/WSC/C/D



RETAINING WALL 4 M. HT.



RETAINING WALL 3 M. HT.

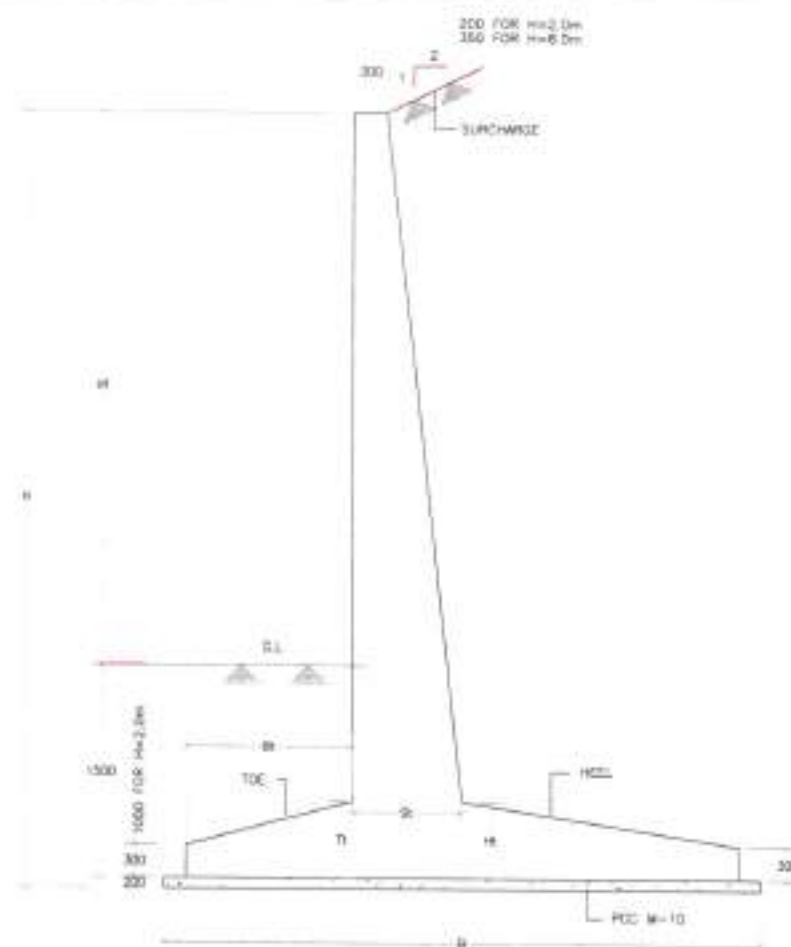


RETAINING WALL 2 M. HT.

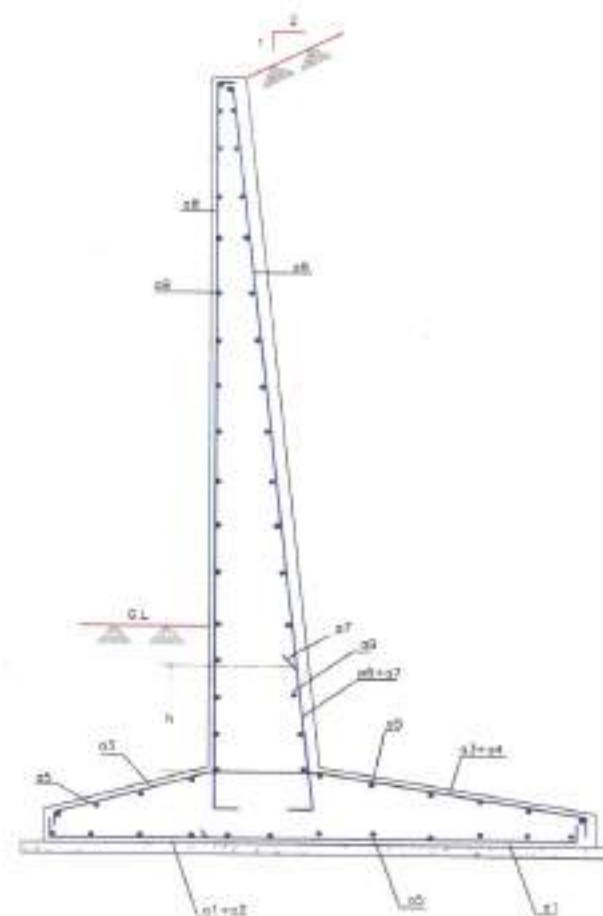
NOTES:—

1. ALL DIMENSIONS IN METRES UNLESS OTHERWISE SPECIFIED
2. DESIGN AS PER GUIDELINES OF IRC:SP:48-1998 (HILL ROAD MANUAL)
3. BATTER TO BE KEPT AS 1:3 UP TO 4.0 M HT. ADJUSTING THE BASE DIMENSIONS SUITABLY

[illegible]



TYPICAL CROSS SECTION FOR RETAINING WALL



DIMENSIONAL DETAILS OF RETAINING WALL

HEIGHT OF RET. WALL	H	B	B ₁	B ₂	B ₃	H ₁	H ₂	CONC. GRADE
2.0m	1200	1200	100	300	300	350	300	M25
3.0m	1500	1800	150	300	300	330	300	M25
3.5m	2000	2100	250	300	300	300	300	M25
4.0m	2500	2600	400	300	300	300	300	M25
4.5m	3000	3000	600	300	450	300	300	M25
5.0m	3500	3500	800	300	500	300	300	M25
5.5m	4000	3900	1000	300	550	400	400	M25
6.0m	4500	4400	1200	300	650	400	400	M25
6.5m	5000	4900	1400	300	700	450	450	M25
7.0m	5500	5400	1600	300	1000	500	500	M25
7.5m	6000	5850	1850	300	900	550	550	M30
8.0m	6500	6200	2000	350	800	500	500	M30

REINFORCEMENT DETAILS OF RETAINING WALL

HEIGHT OF RET. WALL	H (mm)	a1	a2	a3	a4	a5	a6	a7	a8	a9
2.0m	1200	10#150C/C	10#150C/C	10#150C/C	10#150C/C	10#150C/C	10#150C/C	10#150C/C	10#150C/C	10#150C/C
3.0m	1500	10#140C/C	10#140C/C	10#140C/C	10#140C/C	10#140C/C	10#140C/C	10#140C/C	10#140C/C	10#140C/C
3.5m	1450	10#140C/C	10#140C/C	10#140C/C	10#140C/C	10#140C/C	10#140C/C	10#140C/C	10#140C/C	10#140C/C
4.0m	1950	10#140C/C	10#140C/C	10#140C/C	10#140C/C	10#140C/C	10#140C/C	10#140C/C	10#140C/C	10#140C/C
4.5m	3000	10#150C/C	10#150C/C	10#150C/C	10#150C/C	10#150C/C	10#150C/C	10#150C/C	10#150C/C	10#150C/C
5.0m	2350	10#150C/C	10#150C/C	10#150C/C	10#150C/C	10#150C/C	10#150C/C	10#150C/C	10#150C/C	10#150C/C
5.5m	2700	10#140C/C	10#140C/C	10#140C/C	10#140C/C	10#140C/C	10#140C/C	10#140C/C	10#140C/C	10#140C/C
6.0m	3300	10#140C/C	10#140C/C	10#140C/C	10#140C/C	10#140C/C	10#140C/C	10#140C/C	10#140C/C	10#140C/C
6.5m	3750	10#140C/C	10#140C/C	10#140C/C	10#140C/C	10#140C/C	10#140C/C	10#140C/C	10#140C/C	10#140C/C
7.0m	5000	10#150C/C	10#150C/C	10#150C/C	10#150C/C	10#150C/C	10#150C/C	10#150C/C	10#150C/C	10#150C/C
7.5m	4100	10#140C/C	10#140C/C	10#140C/C	10#140C/C	10#140C/C	10#140C/C	10#140C/C	10#140C/C	10#140C/C
8.0m	3900	10#150C/C	10#150C/C	10#150C/C	10#150C/C	10#150C/C	10#150C/C	10#150C/C	10#150C/C	10#150C/C

SR. N	FROM	TO	LENGTH
01	20100	20140	40
02	20140	20500	360
03	20500	20640	140
04	21240	21540	300

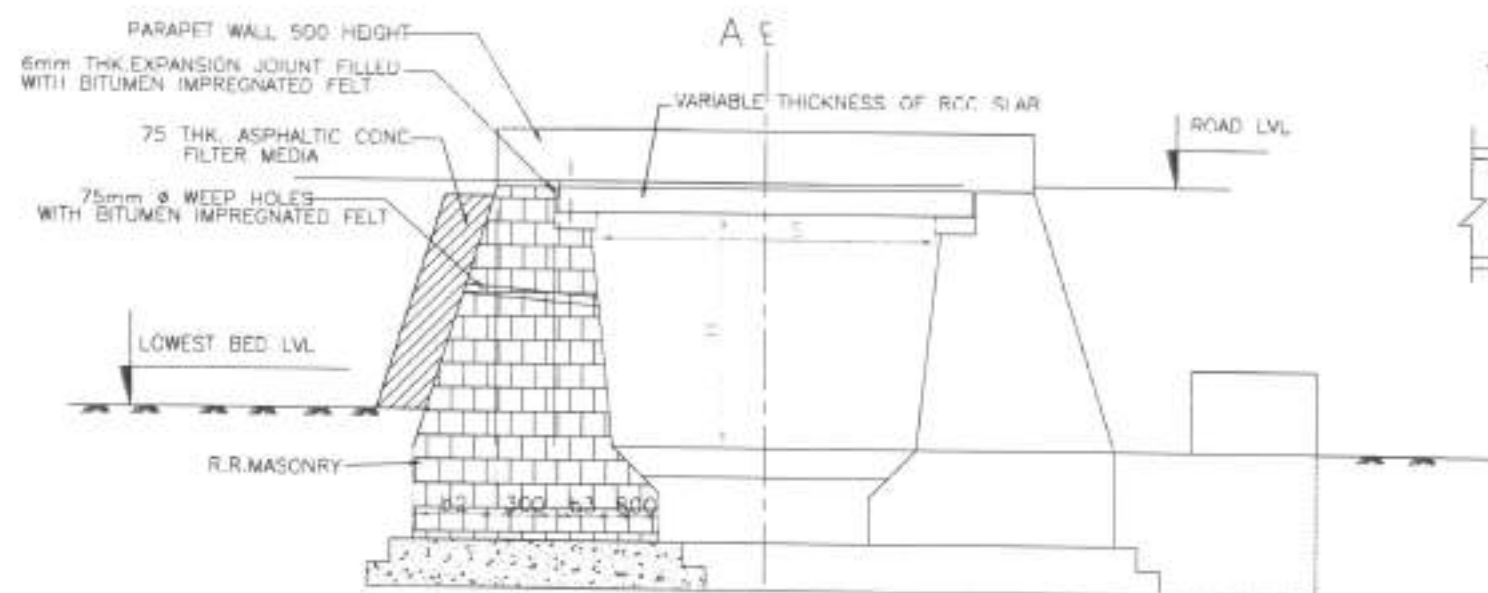
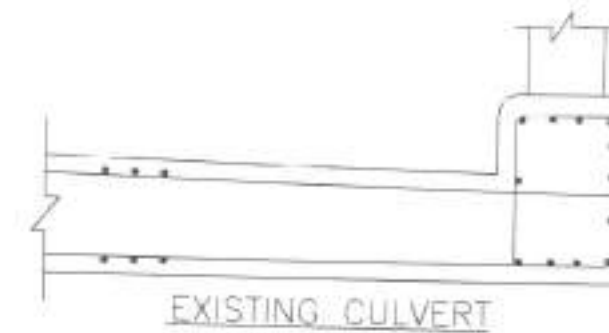
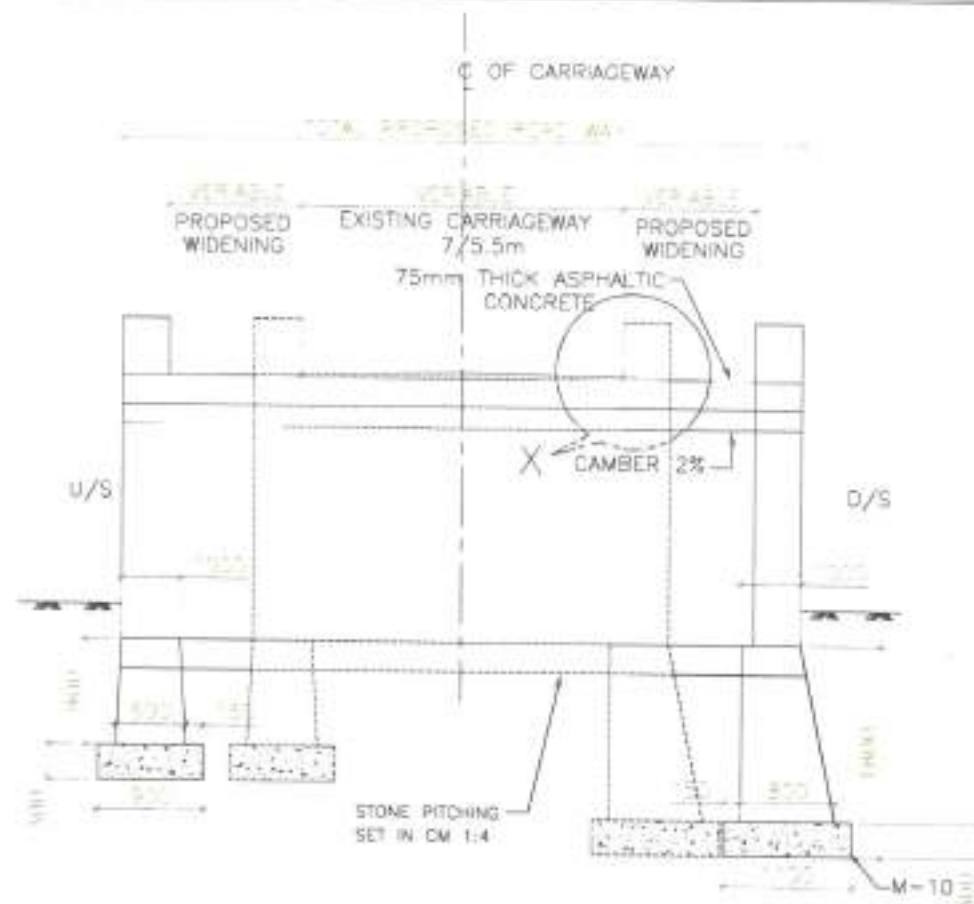
REV	DATE	DESCRIPTION OF REVISIONS	INITIALS
R0	Sep 2017	Final Feasibility Report	
R0	Nov 2016	Draft Feasibility Report	
R0	Dec 2014	Unreg. Plan	

Client:	NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (Ministry of Road Transport & Highways)
Consultant:	SA INFRASTRUCTURE CONSULTANTS PVT. LTD. Specialized Engineering Service Pvt. Ltd. 110/1A, 11th Floor, Tower A-2, Corporate Park, Plot No. 15/1, Sector-14D, Gurgaon, Haryana - 122002, India

Project:	Consultancy for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chuikhim-Nimbong-Kaler-Bakim-Algarah-Rhenok in the State of West Bengal and From Rhenok-Rorathang-Pakyong along with Spur From Antar-Rolep-Merla in the State of Sikkim
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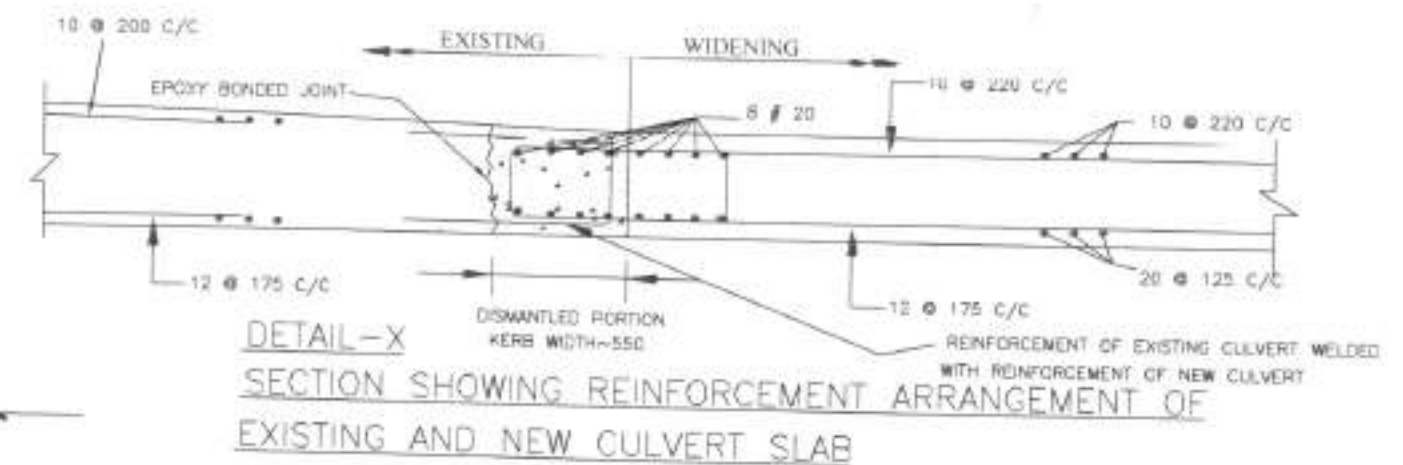
DATE:	November 2018	Revision:	RC
DESIGNED BY:	Vijay Gupta	CHECKED BY:	Vijay Gupta
DRAWN BY:	Narash	APPROVED BY:	Sonjay Shukla
SCALE:	1:100		

PACKAGE- 5
KAFER TO RHENOCK
TYPICAL DETAILS OF RCC RETAINING WALL



HALF SECTIONAL ELEVATION
SHOWING ABUTMENT

H = HEIGHT
S = CLEAR SPAN



DATE: 18/11/2019 - 2:34pm

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. 118/A, 11th Floor, Tower A, Corporate Park, Plot No. 74/1, Sector 142, Gurgaon, Haryana, India

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 Arkar-Rolep-Meria in the State of Sikkim

DATE:	November 2019	Revision:	RD
DESIGNED BY:	Wijay Gupta	CHECKED BY:	Wijay Gupta
DRAWN BY:	Nareesh	APPROVED BY:	Sanjay Shukla
SCALE:	NTS		

PACKAGE-5
KAFER TO RHENOCK
TYPICAL EXTENSION ARRANGEMENT
FOR SLAB CULVERT

Dwg. No.: SA/CL-SESPL/NHDC/MB-SHM/MSL/12

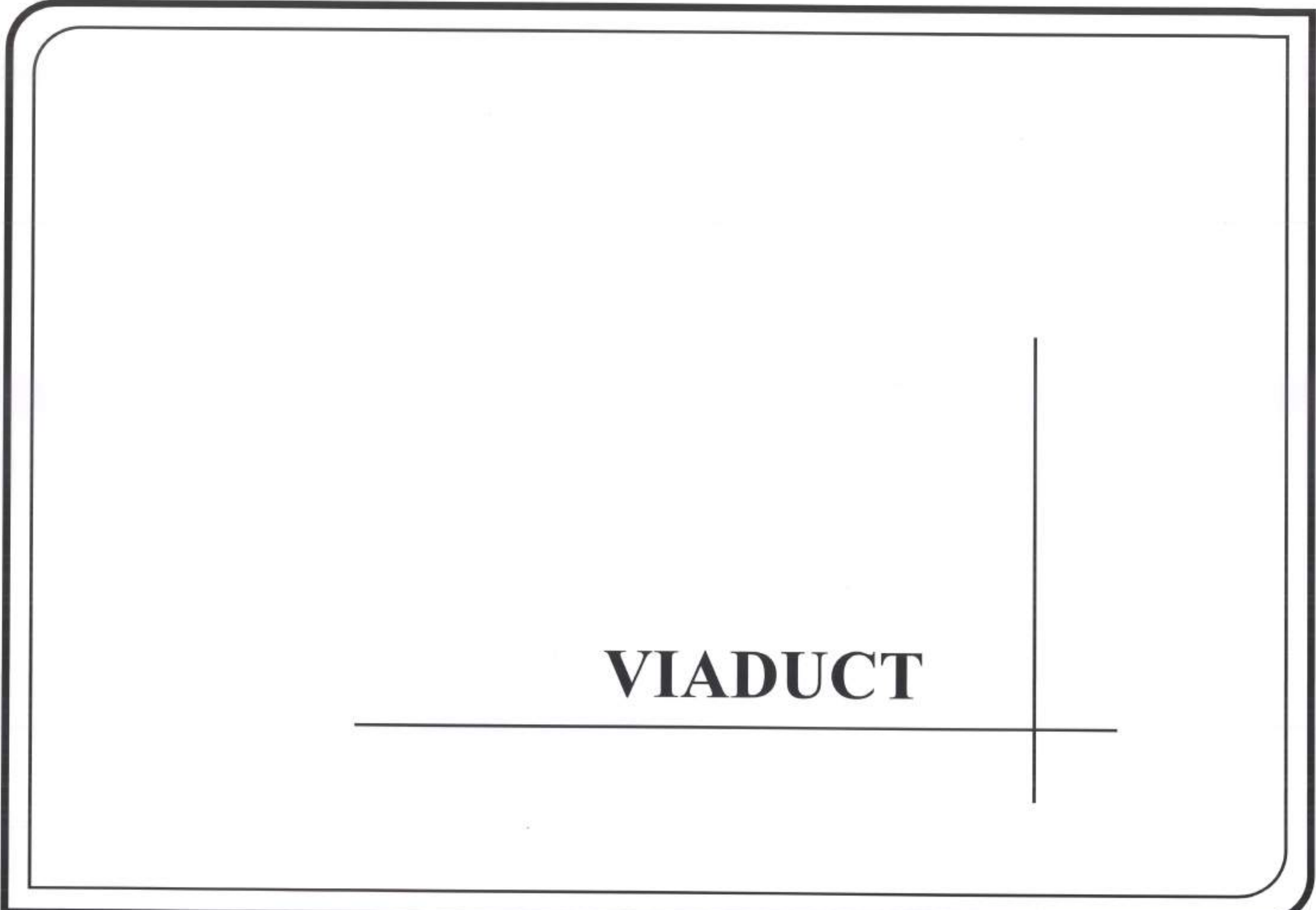
STRUCTURE DRAWINGS

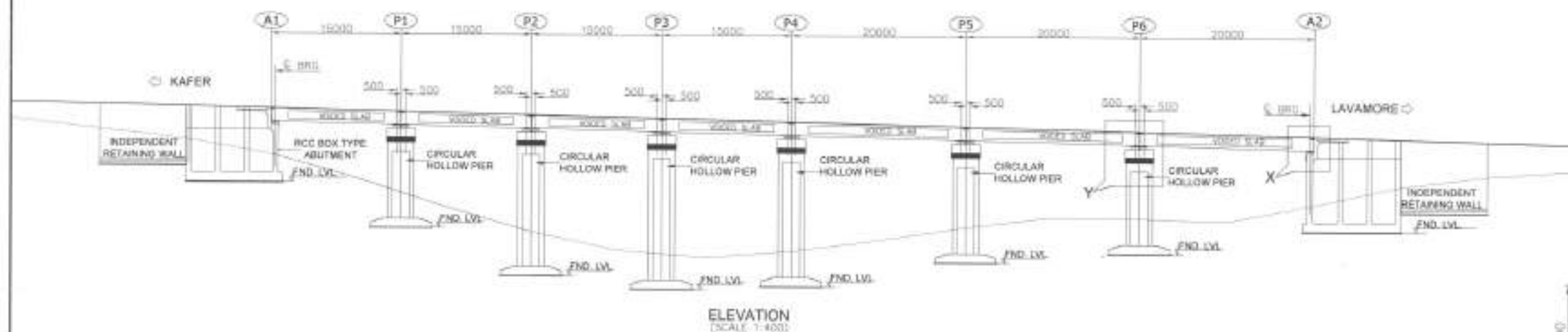
INDEX (PACKAGE-IVA)

Sr. No.	TITLE	Drawing No.	No of She	Span Arrangement
VIADUCT				
1	GENERAL ARRANGEMENT DRAWING OF VIADUCT FROM 41+680 TO 41+800	SAICPL-SESPL/NHIDC/WB-SIKKIM/41+680/GAD-01	2	4 X 15 + 3 X 20
2	GENERAL ARRANGEMENT DRAWING OF VIADUCT FROM 42+690 TO 42+910	SAICPL-SESPL/NHIDC/WB-SIKKIM/42+690/GAD-01	2	5 X 20 + 4 X 15 +3 X 20
3	GENERAL ARRANGEMENT DRAWING OF VIADUCT FROM 46+270 TO 46+290	SAICPL-SESPL/NHIDC/WB-SIKKIM/46+270/GAD-01	1	1 X 20
MISCELLANEOUS				
4	GENARAL ARRANGEMENT DRAWING OF INDEPENDENT RETAINING WALL	SAICPL-SESPL/NHIDC/WB-SIKKIM/RW/S-01	1	

				CLIENT : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED  (Ministry of Road Transport & Highways)		PROJECT : Consultancy for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chukhim-Nimboong-Kaler-Bakham-Algarah-Rhenok in the State West Bengal and From Rhenok-Rorathang-Pakyong along with of Spur From Aritar-Rolep-Merla in the State of Sikkim (PKG-5A)		DATE : NOV.2019		REVISION : R0		INDEX
				CONSULTANT : S.A. Infrastructure Consultants Pvt. Ltd.  1101A, 11 Floor Tower A-8, Ansal Corporate Park, Plot No. 7A/1, Sector 142, Noida-201301 (Uttar Pradesh) Phone No- 0120-6148500 Fax-0120-6148050 Email: info@sainfra.com				DESIGNED BY :  A. REHMAN	DRAWN BY :  S. RAWAT	CHECKED BY :  S. DE	APPROVED BY :  S. Shukla	
REV	DATE	DESCRIPTION OF REVISIONS	INITIALS					SCALE : AS SHOWN		SHEET:- 01 OF 02		

VIADUCT

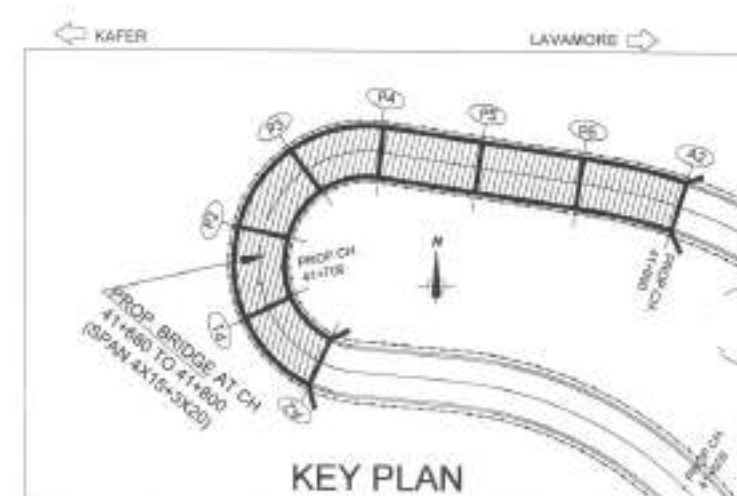
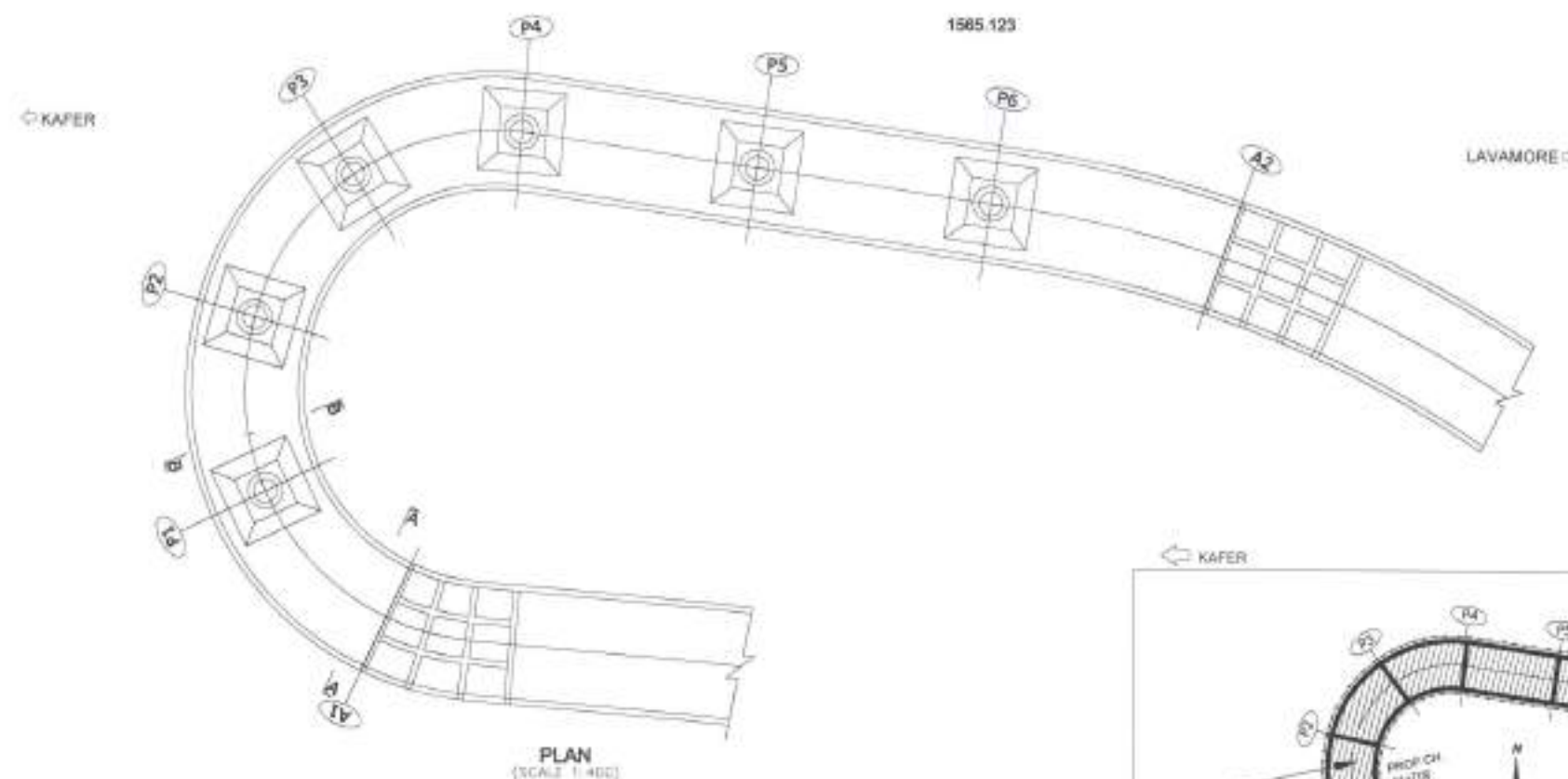
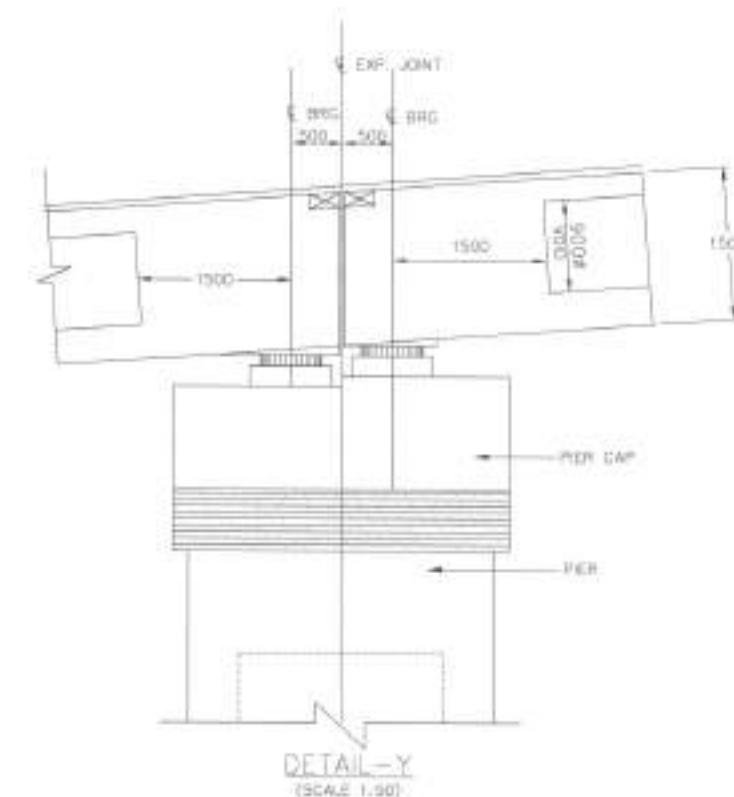
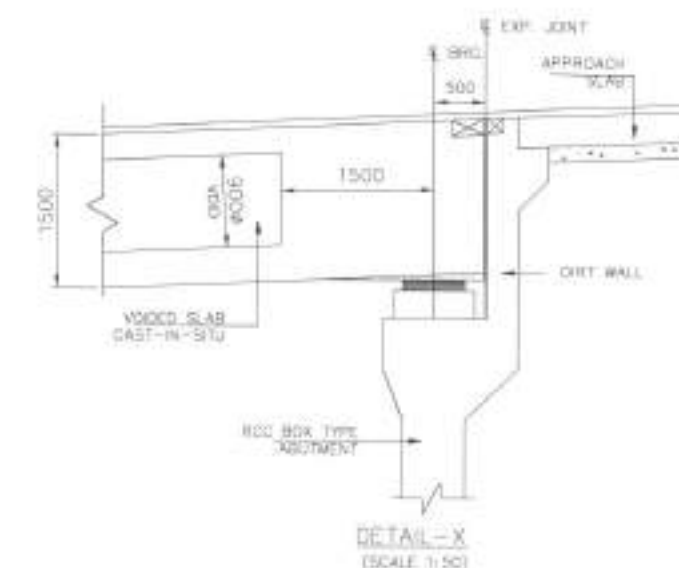




FORMATION LEVEL	1586.900	1585.504	1585.112	1583.920	1583.323	1582.131	1580.939	1579.747
BED LEVEL (CENTER)	1578.965	1576.658	1572.044	1567.430	1567.430	1572.044	1576.658	1578.965
CHAINAGE	41+680	41+695	41+710	41+725	41+740	41+760	41+780	41+800

NOTES

1. ALL DIMENSIONS ARE MILLIMETERS AND LEVELS ARE IN METERS.
2. DIMENSIONS ARE NOT TO SCALE. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
3. FOR OTHER NOTES AND SECTION REFER SHEET 2 OF 2 OF THIS DRAWING.



REV	DATE	DESCRIPTION OF REVISIONS	INITIALS
R1	02-03-2020	REVISED VERTICAL GRADIENT 7% TO 6%	A B C D

CLIENT:	NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (Ministry of Road Transport & Highways)
CONSULTANT:	S.A. Infrastructure Consultants Pvt. Ltd. 1101A, 11 Floor Tower A-8, Ansal Corporate Park, Plot No. 7A/1, Sector 142, Noida-201301 (Uttar Pradesh) Phone No- 0120-4148000 Fax-0120-4148095 Email: info@sainfra.com

PROJECT:

Consultancy for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chukhim-Nimbong-Kafer-Sakhim-Algarah-Rhenick in the State of West Bengal and From Rhenick-Rorathang-Pakyong along with Spur From Anjar-Rolep-Menis in the State of Sikkim (Package-V)

DATE: FEBRUARY-2020

REVISION R1

DESIGNED BY

DRAWN BY

CHECKED BY

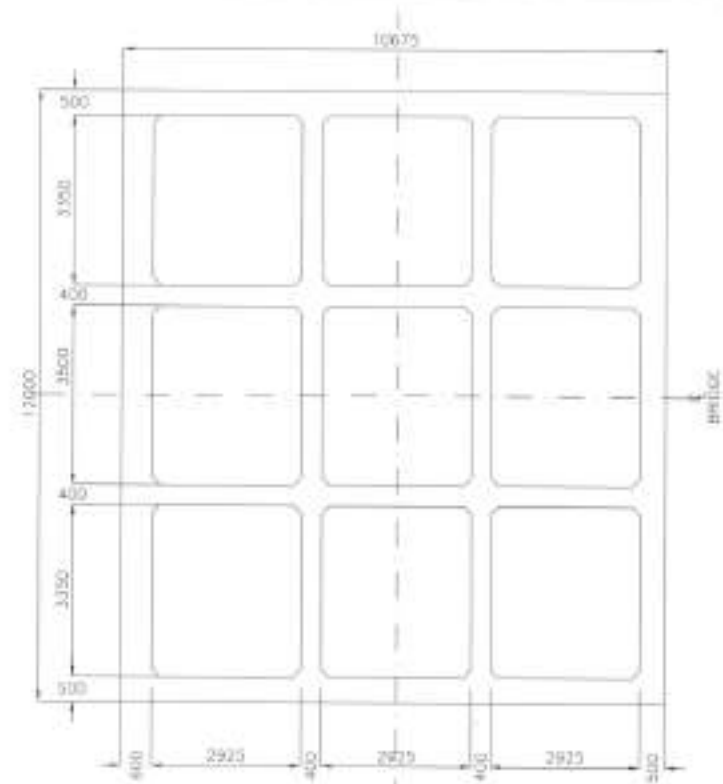
APPROVED BY

SCALE - AS SHOWN

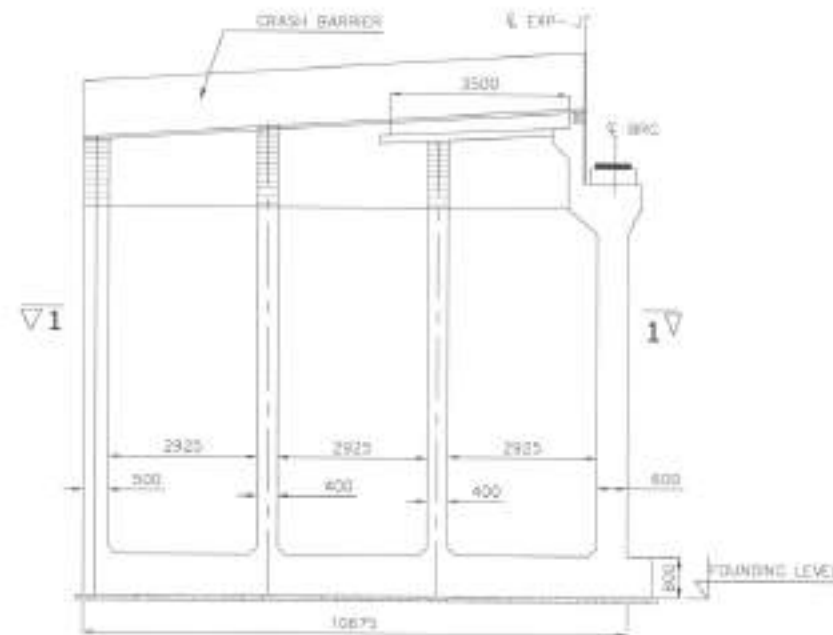
SHEET: 01 OF 02

GENERAL ARRANGEMENT DRAWINGS OF VIADUCT AT CH- 41+680 TO 41+800 SPAN = (4X15.0+3X20.0)

DWG. NO. - SAICPL-SESPL/NHIDC/WB-SKM/41+680/GAD-01



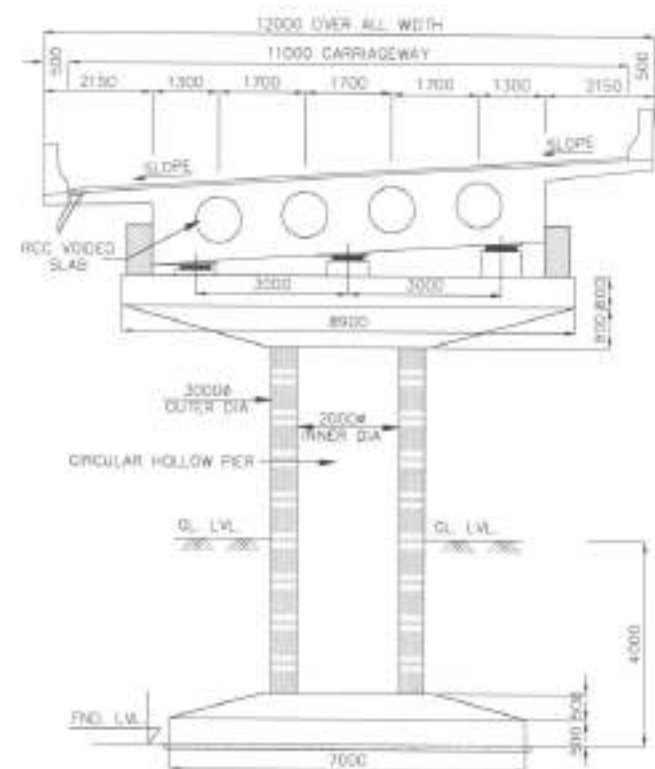
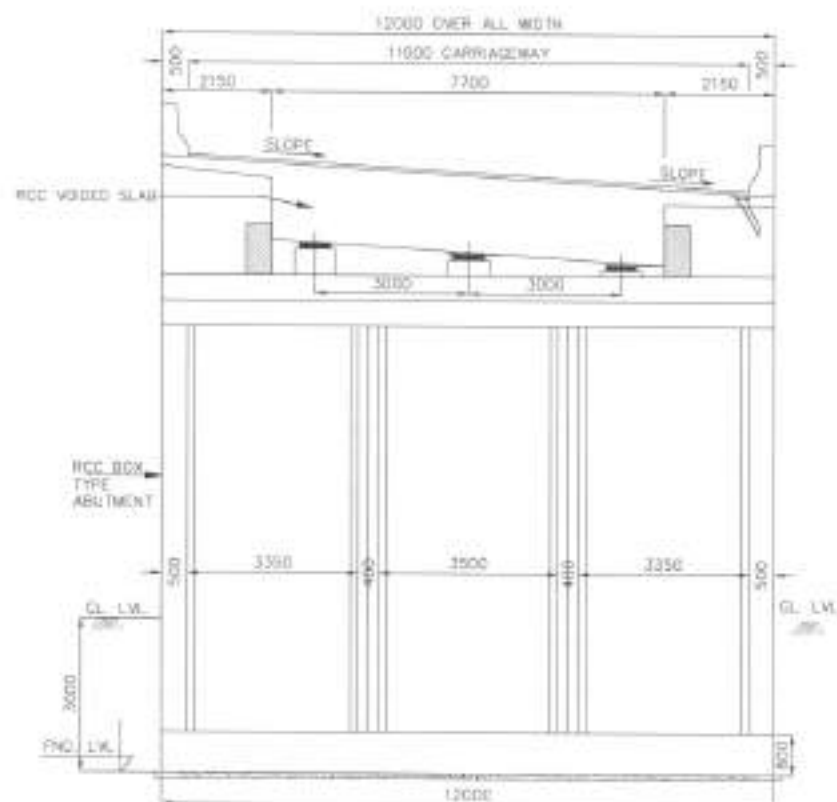
SECTION-1-1
SCALE: 1/100



BOX ABUTMENT
SCALE: 1/100

NOTES

1. ALL DIMENSIONS ARE MILLIMETERS AND LEVELS ARE IN METERS.
2. DIMENSIONS ARE NOT TO SCALE; ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
3. THE DIMENSION OF THE FOUNDATION SHOWN HERE TENTATIVE ONLY. THIS SHALL BE FINALIZED AFTER DETAILED SUBSID INVESTIGATION.
4. BRIDGE HAS BEEN DESIGNED FOR CARRIAGEWAY LIVE LOAD OF 1 LANE 70T OR 2 LANES OF CLASS A WHICHEVER GIVES WORST EFFECT.
5. GRADE OF CONCRETE FOR VARIOUS ELEMENTS ARE AS FOLLOWS:-
(i) SUPERSTRUCTURE(PSC) ----- M45
(ii) RCC SUBSTRUCTURE & FOUNDATION ----- M30
(iii) RCC RAILING ----- M30
(iv) RCC CRASH BARRIER ----- M40
(v) APPROACH SLAB ----- M30
(vi) PEDESTAL ----- M40
6. TYPE OF BEARING PROPOSED HERE IS POT-PILE AS PER IRC 83, PART-III.
7. SINGLE STRIP SEAL EXPANSION JOINT IS USED.
8. GRADE OF CEMENT IS USED HERE IS OPC 43/OPC 53.
9. ALL REINFORCEMENT BARS ARE TMT BARS (GRADE DESIGNATION Fe500D) AS PER IS 1786.
10. BRIDGE HAS BEEN DESIGNED CONSIDERING SEISMIC ZONE AS IV.
11. SUPERELEVATION SHALL BE MAINTAINED AS PER HIGHWAY PLAN & PROFILE.
12. SAFE BEARING CAPACITY FOR PRELIMINARY DESIGN AT FOUNDING LEVEL IS CONSIDERED AS 40t/m².



SECTION-B-B
SCALE: 1/100

REV	DATE	DESCRIPTION OF REVISIONS	INITIALS
R1	02-03-2020	REVISED VERTICAL GRADIENT 7% TO 8%	A B C D

CLIENT:



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

CONSULTANT:

S.A. Infrastructure Consultants Pvt. Ltd.



1101A, 11 floor Tower A-3, Ansal Corporate Park,
Plot No. 7A/1, Sector 142, Noida-201301 (Uttar Pradesh)
Phone No. 0120-6148000 Fax-0120-6148090
Email: info@sainfra.com

PROJECT:

Consultancy for Preparation of Feasibility Report cum
Preliminary Design for Alternative Highway to Gangtok in
Sikkim via Bagrakot-Chukhim-Nimbong-
Kafir-Bakhim-Algorah-Rhenok in the State of West Bengal and
From Rhenok-Rorathang-Pakyong along with Spur From
Antar-Rolep-Mania in the State of Sikkim (Package-V)

DATE: FEBRUARY-2020

REVISION

R1

DESIGNED BY

S. ROY CHOWDHURY

DRAWN BY

A. SEN

CHECKED BY

A. RITAM

APPROVED BY

S. SHARMA

GENERAL ARRANGEMENT DRAWINGS
OF VIADUCT AT CH- 41+680 TO 41+800
SPAN = (4X15.0+3X20.0)

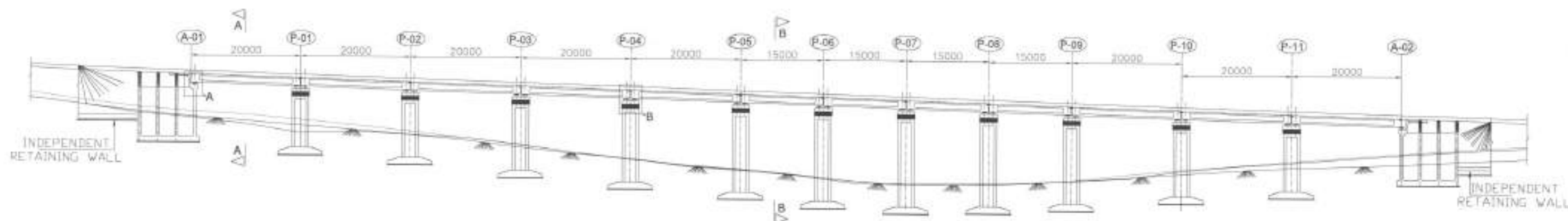
SCALE: AS SHOWN

SHEET: 02 OF 02

DWG. NO. :-
SAICPL-SESPL/NHIDCWB-SKM/41+680/GAD-01

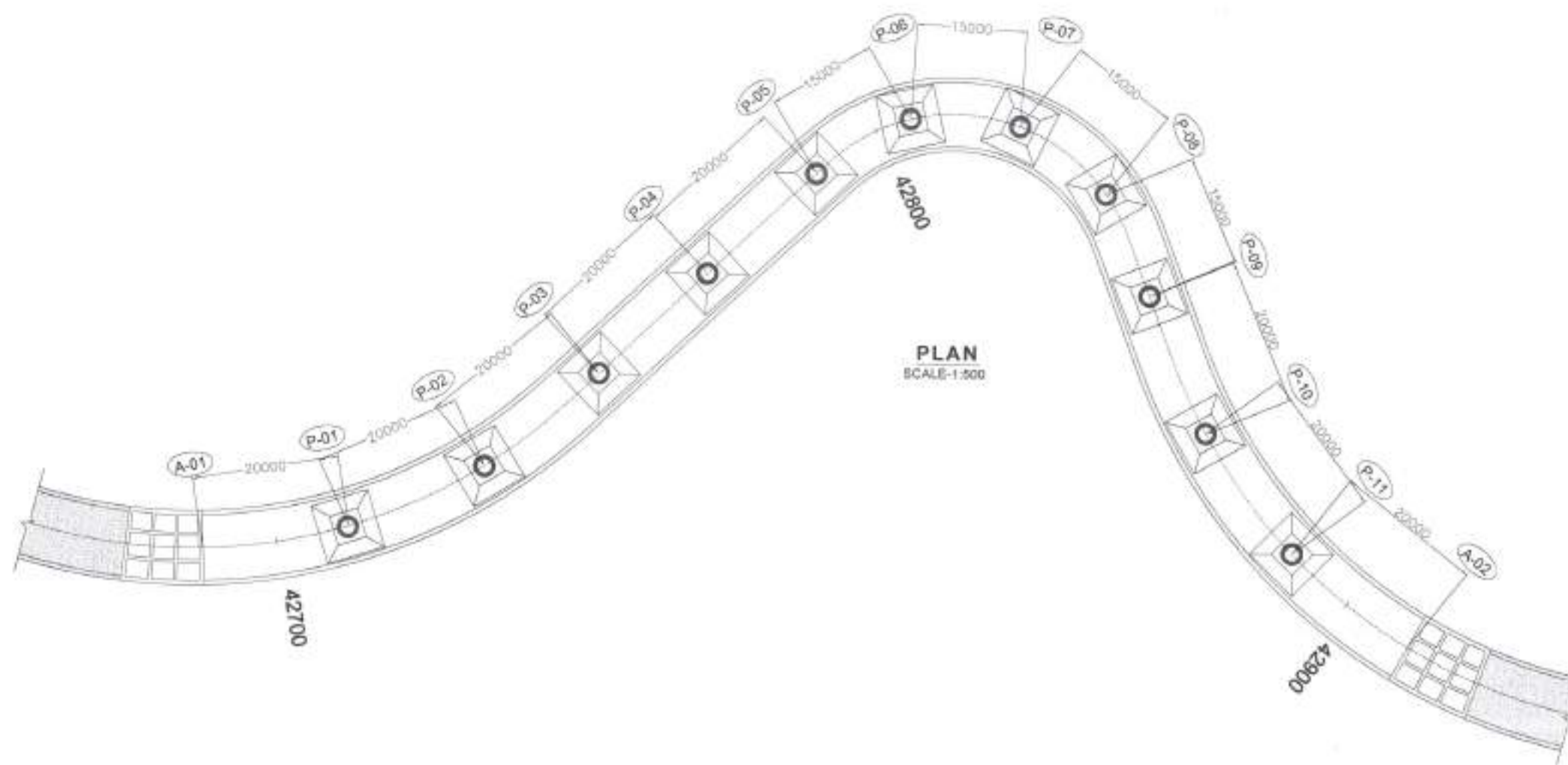
KAFER ←

LAVAMORE →



FORMATION LEVEL	1526.821	1523.646	1524.471	1523.296	1522.121	1520.947	1519.772	1519.184	1518.597	1517.422	1516.254	1515.198	1514.293
GROUND LEVEL (CENTER)	1514.119	1511.942	1509.725	1506.714	1504.063	1501.518	1498.887	1498.044	1498.037	1499.222	1501.185	1502.926	1503.904
GROUND LEVEL (RHS)-10(M)	1515.772	1511.313	1507.829	1506.721	1504.257	1501.194	1499.329	1498.689	1498.880	1499.716	1501.694	1503.980	1506.039
CHAINAGE	42+690	42+710	42+730	42+750	42+770	42+790	42+805	42+820	42+835	42+850	42+870	42+890	42+910

LONGITUDINAL ELEVATION
SCALE-1:500

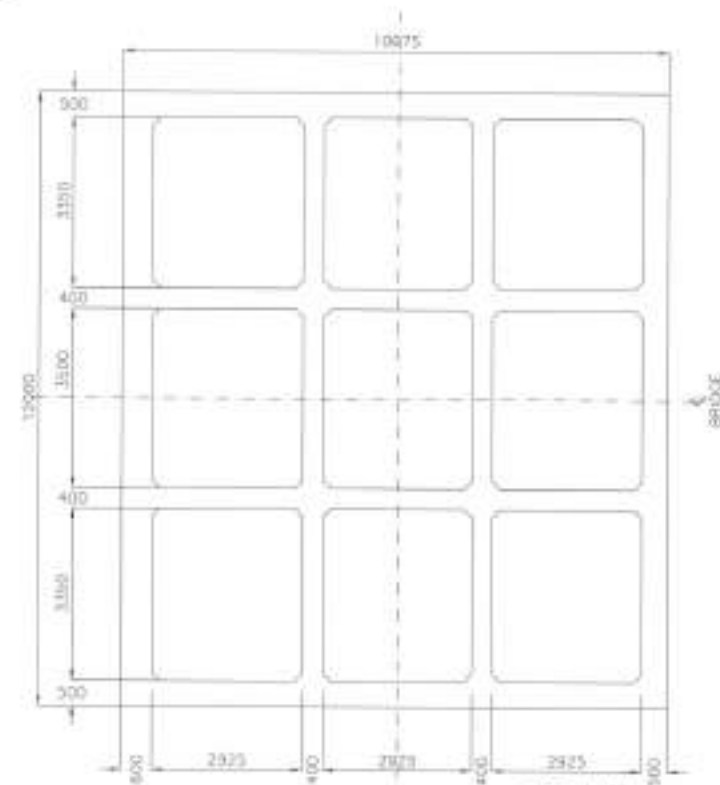
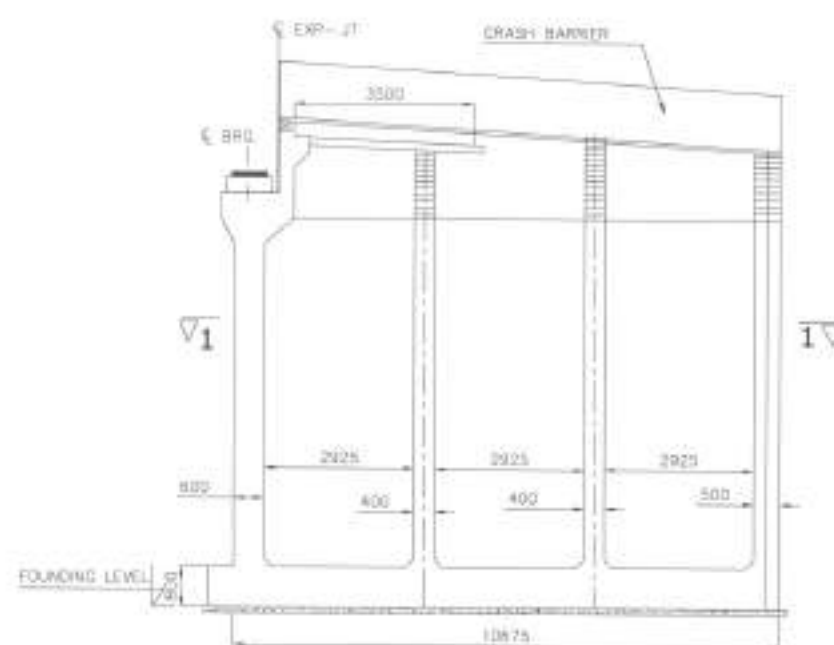
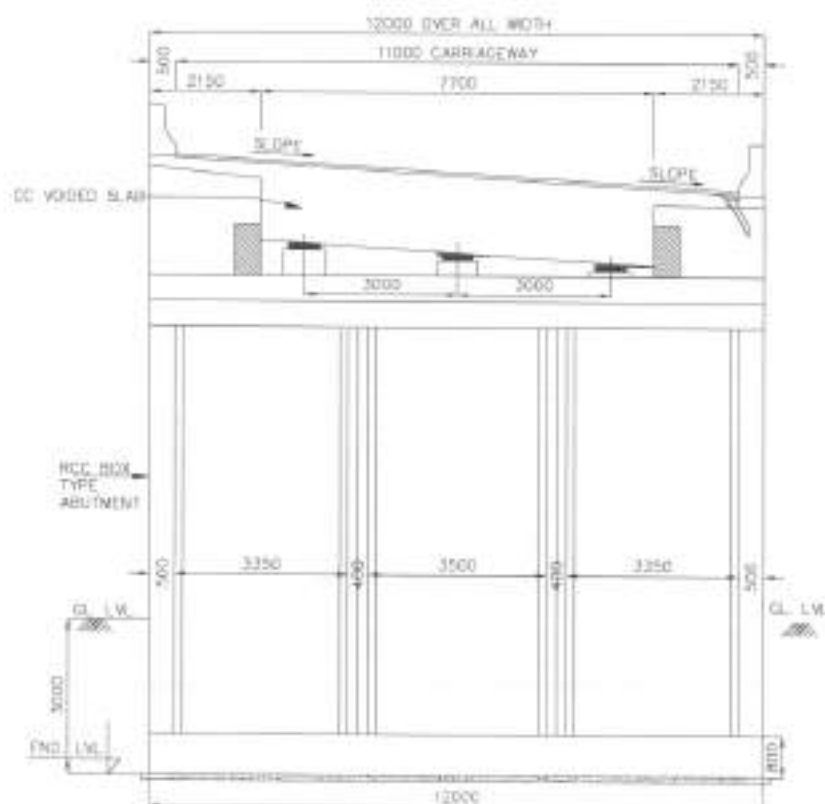
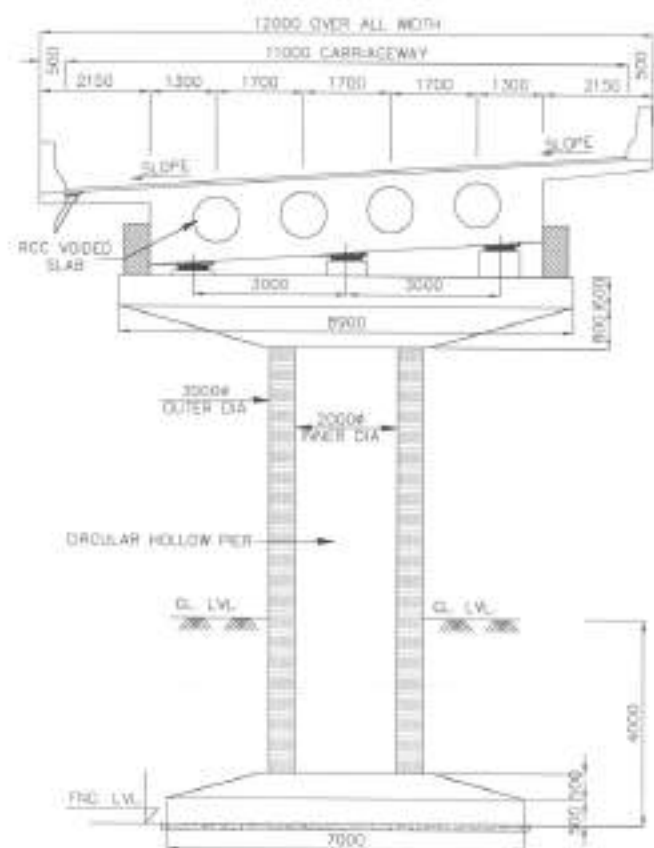
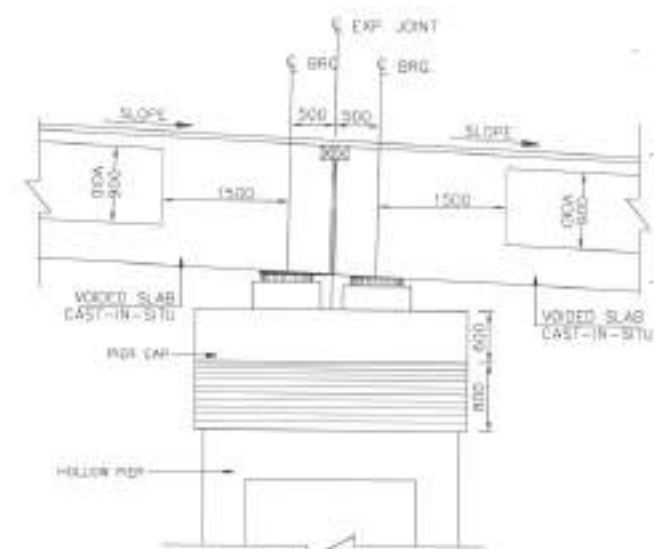
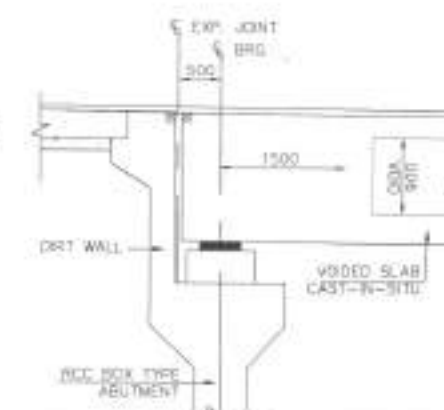


PLAN
SCALE-1:500

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KAFER ←

LAVAMORE →

SECTION-1-1
SCALE: 1:100BOX ABUTMENT
SCALE: 1:100SECTION-A-A
SCALE: 1:100SECTION-B-B
SCALE: 1:100DETAIL-B
(SCALE: 1:60)DETAIL-A
(SCALE: 1:60)

NOTES

1. ALL DIMENSIONS ARE MILLIMETERS AND LEVELS ARE IN METERS.
2. DIMENSIONS ARE NOT TO SCALE. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
3. THE DIMENSION OF THE FOUNDATION SHOWN HERE IS TENTATIVE ONLY. THIS SHALL BE FINALIZED AFTER DETAILED SUBSOIL INVESTIGATION.
4. BRIDGE HAS BEEN DESIGNED FOR CARRIAGEWAY LIVE LOAD OF 1 LANE FOR OR 2 LANES OF CLASS A WHICHEVER GIVES WORST EFFECT.
5. GRADE OF CONCRETE FOR VARIOUS ELEMENTS ARE AS FOLLOWS:-
 - (i) SUPERSTRUCTURE(PSC) ----- M40
 - (ii) SUPERSTRUCTURE(RCC) ----- M40
 - (iii) RCC SUBSTRUCTURE & FOUNDATION ----- M35
 - (iv) RCC CRASH BARRIER ----- M40
 - (v) APPROACH SLAB ----- M30
 - (vi) PEDESTAL ----- M40
6. TYPE OF BEARING PROPOSED HERE IS POT-PITE AS PER IRC:83, PART-II.
7. SINGLE STRIP SEAL EXPANSION JOINT IS USED.
8. GRADE OF CEMENT IS USED HERE IS OPC 43/OPC 53.
9. ALL REINFORCEMENT BARS ARE TMT BARS (GRADE DESIGNATION Fe300D) AS PER IS:1786.
10. BRIDGE HAS BEEN DESIGNED CONSIDERING SEISMIC ZONE AS IV.
11. SUPERELEVATION SHOULD BE MAINTAINED AS PER HIGHWAY PROFILE.
12. SAFE BEARING CAPACITY FOR PRELIMINARY DESIGN AT FOUNDING LEVEL IS CONSIDERED AS 40 t/m².

REV	DATE	DESCRIPTION OF REVISIONS	INITIALS
R1	02.03.2020	REVISED VERTICAL GRADIENT 7% TO 6%	A B C D

CLIENT	NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (Ministry of Road Transport & Highways)
CONSULTANT	S.A. Infrastructure Consultants Pvt. Ltd. 1101A, 11 Floor Tower A-II, Ansal Corporate Park, Plot No. 7A/1, Sector 142, Noida-201301 (Uttar Pradesh) Phone No- 0120-4148000 Fax-0120-4148090 Email: info@sainha.com

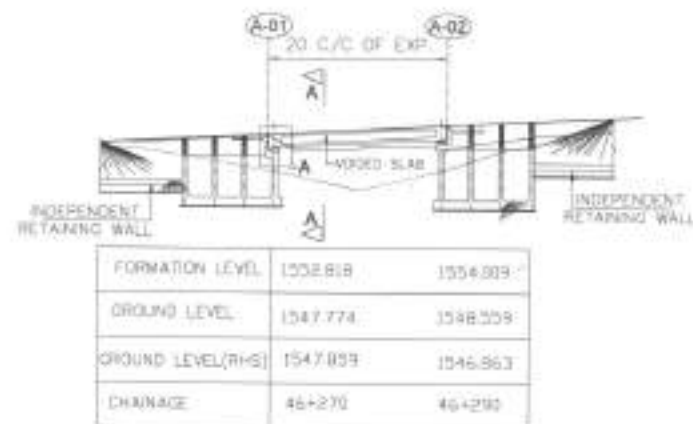
PROJECT	Consultancy for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakse-Chukhim-Nimbong-Kafer-Bakhim-Algarah-Rhenok in the State West Bengal and From Rhenok-Rorathang-Pakyong along with of Spur From Antar-Rolep-Menis in the State of Sikkim (PKG-5A)
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DATE	FEBRUARY-2020	REVISION	R1
DESIGNED BY	ARSHMAN	DRAWN BY	S RAWAT
CHECKED BY	S DE	APPROVED BY	S. Shukla
SCALE	AS SHOWN	SHEET	02 OF 02

GENERAL ARRANGEMENT DRAWINGS
OF VIADUCT AT CH-42+690 TO 42+910
SPAN = (5X20+4X15+3X20)DWG. NO. :-
SAICPL/SESPL/NHIDC/WB-SKM42+690/GAD-01

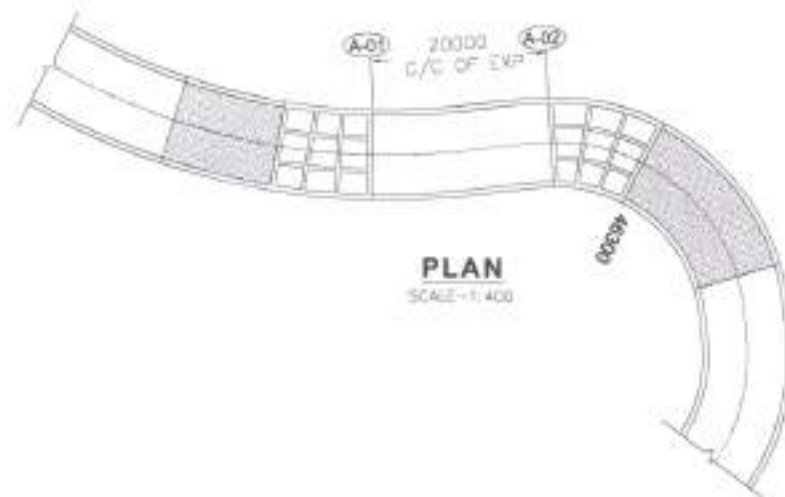
KAFER ←

LAVAMORE →



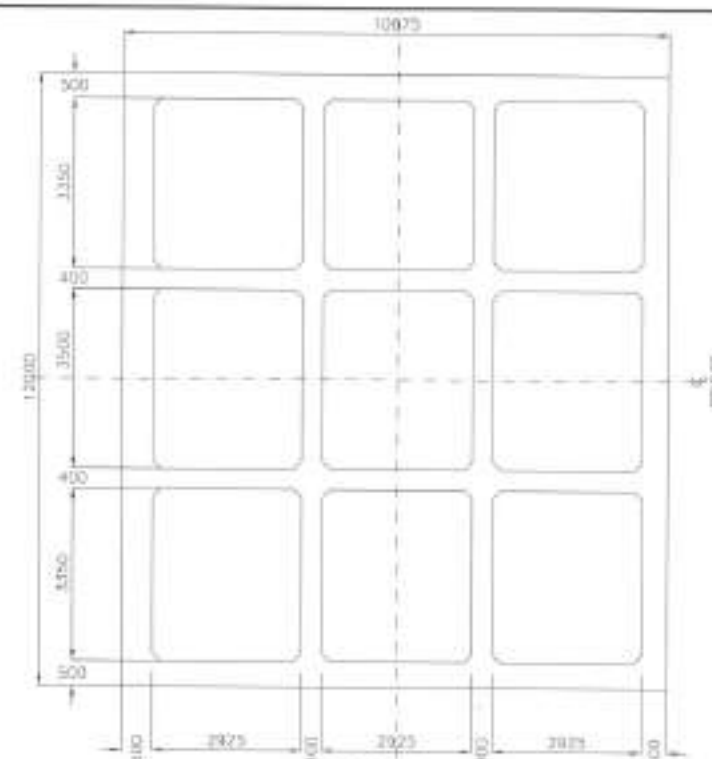
LONGITUDINAL ELEVATION

SCALE: 1:400



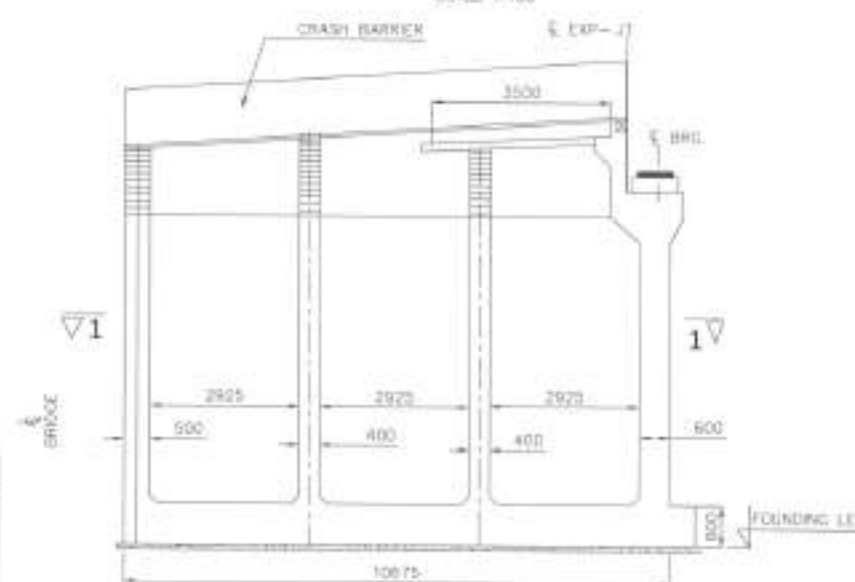
PLAN

SCALE: 1:400



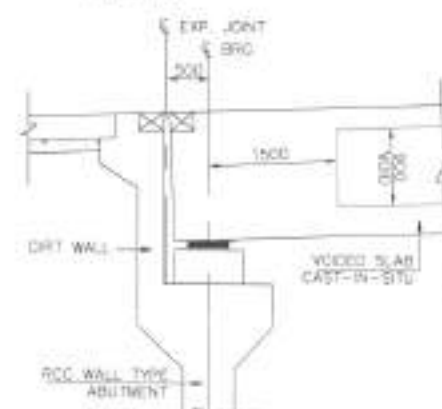
SECTION-1-1

SCALE: 1:100



BOX ABUTMENT

SCALE: 1:100

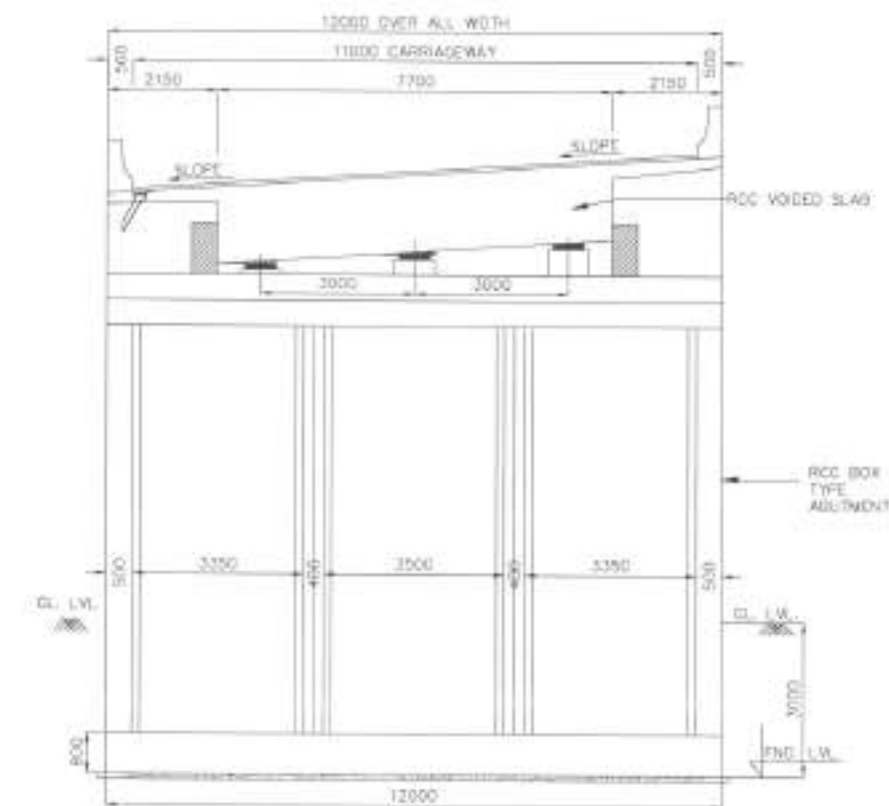


DETAIL-A

SCALE: 1:60

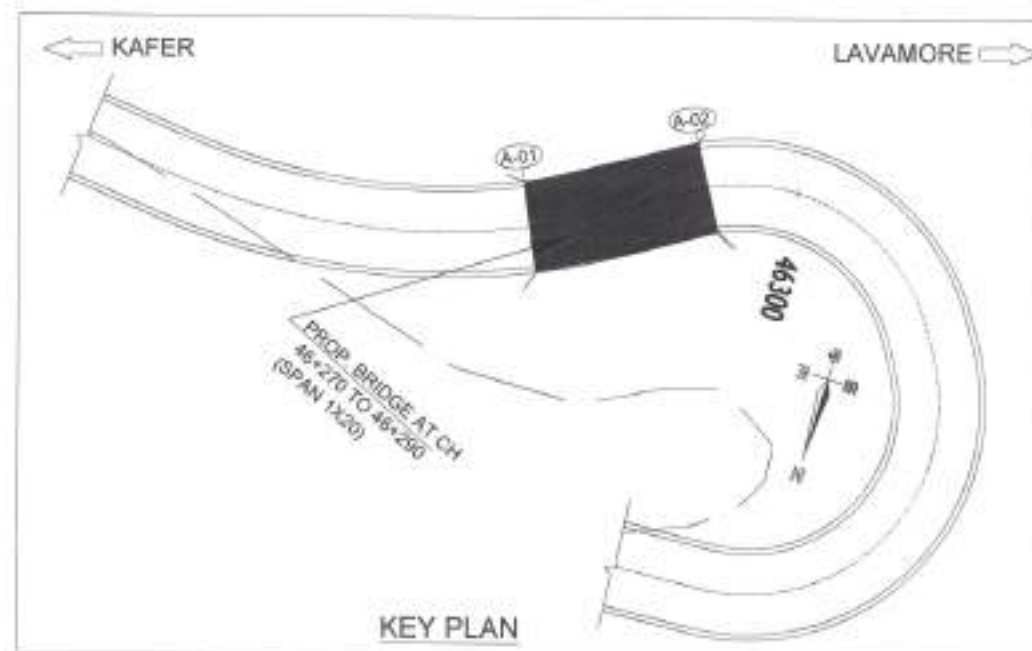
NOTES

- ALL DIMENSIONS ARE MILLIMETERS AND LEVELS ARE IN METERS.
- DIMENSIONS ARE NOT TO SCALE. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
- THE DIMENSION OF THE FOUNDATION SHOWN HERE IS TENTATIVE ONLY. THIS SHALL BE FINALIZED AFTER DETAILED SUBSOIL INVESTIGATION.
- BRIDGE HAS BEEN DESIGNED FOR CARRIAGEWAY LIVE LOAD OF 1 LANE 2GR OR 2 LANES OF CLASS A WHICHEVER GIVES WORST EFFECT.
- GRADE OF CONCRETE FOR VARIOUS ELEMENTS ARE AS FOLLOWS:-
 - (i) SUPERSTRUCTURE(PSG) ----- M45
 - (ii) SUPERSTRUCTURE(RCC) ----- M40
 - (iii) RCC SUBSTRUCTURE & FOUNDATION ----- M35
 - (iv) RCC CRASH BARRIER ----- M40
 - (v) APPROACH SLAB ----- M30
 - (vi) PEDESTAL ----- M40
- TYPE OF BEARING PROPOSED HERE IS POT-PIE AS PER IRC:83, PART-III.
- SINGLE STRIP SEAL EXPANSION JOINT IS USED.
- GRADE OF CEMENT IS USED HERE IS OPC 43/OPC 53.
- ALL REINFORCEMENT BARS ARE TMT BARS (GRADE DESIGNATION Fe500) AS PER IS:1786.
- BRIDGE HAS BEEN DESIGNED CONSIDERING SEISMIC ZONE AS IV.
- SUPERELEVATION SHOULD BE MAINTAINED AS PER HIGHWAY PROFILE.
- SAFE BEARING CAPACITY FOR PRELIMINARY DESIGN AT FOUNDING LEVEL IS CONSIDERED AS 40t/m².



SECTION-A-A

SCALE: 1:100



KEY PLAN

REV	DATE	DESCRIPTION OF REVISIONS	INITIALS
R1	02-03-2020	REVISED VERTICAL GRADIENT 7% TO 8%	A B C D

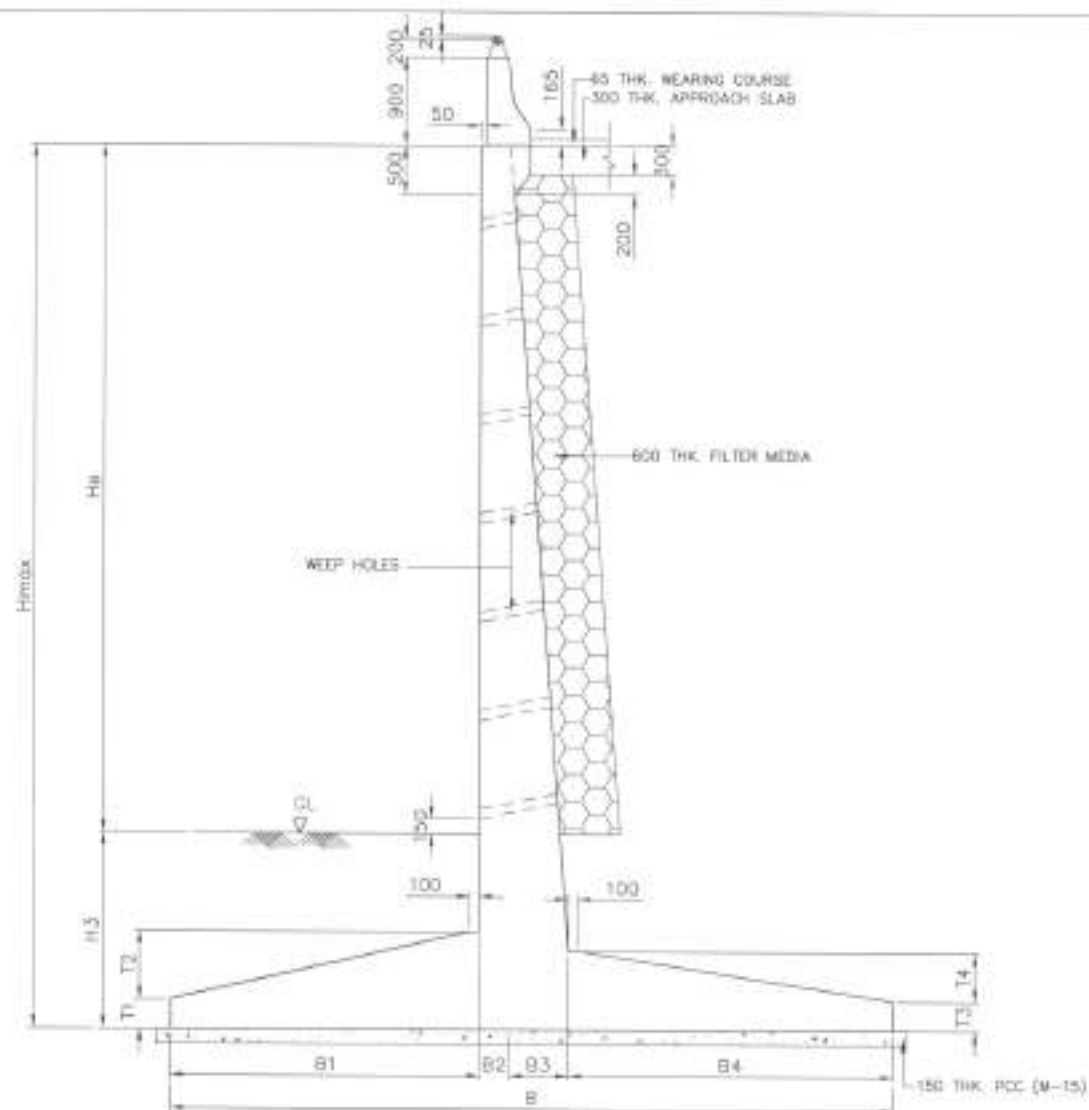
CLIENT	NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (Ministry of Road Transport & Highways)
CONSULTANT	S.A. Infrastructure Consultants Pvt. Ltd. 1101A, 11 floor Tower A-II, Ansal Corporate Park, Plot No. 7A/1, Sector 142, Noida-201301 (Uttar Pradesh) Phone No- 0120-6148000 Fax-0120-6148090 Email: info@sainfra.com

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 West Bengal and From Rhenok-Rorathang-Pakyong along with of Spur From Antar-Rolep-Menla in the State of Sikkim (PKG-SA)
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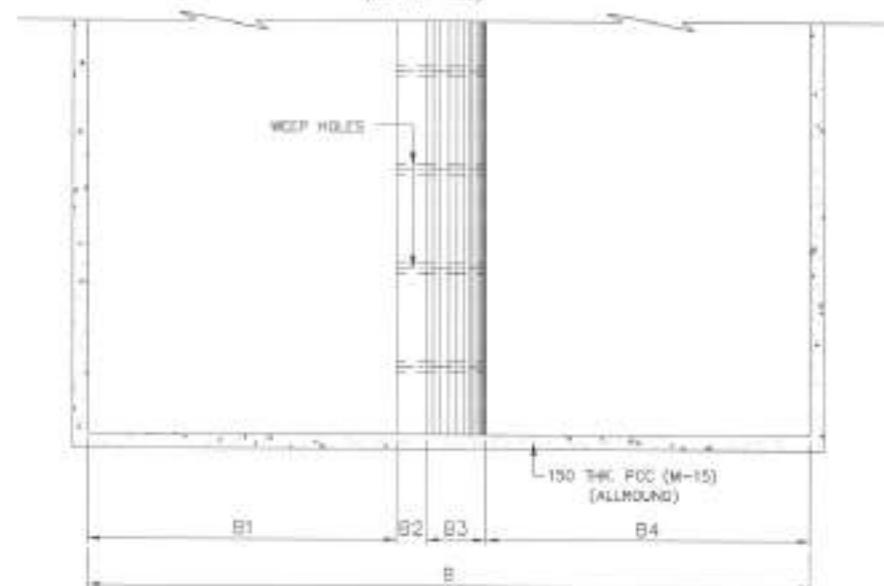
DATE	FEBRUARY-2020	REVISION	R1
DESIGNED BY	AREHMAN	DRAWN BY	S RAJAT
CHECKED BY	S DE	APPROVED BY	S Shukla
SCALE	AS SHOWN	SHEET	01 OF 01

GENERAL ARRANGEMENT DRAWINGS
OF VIADUCT AT CH-46+270 TO 46+290
SPAN = (1X20)DWG. NO. :-
SAICPL-SESPL/NHDC/WB-SKM/46+270/GAD-01

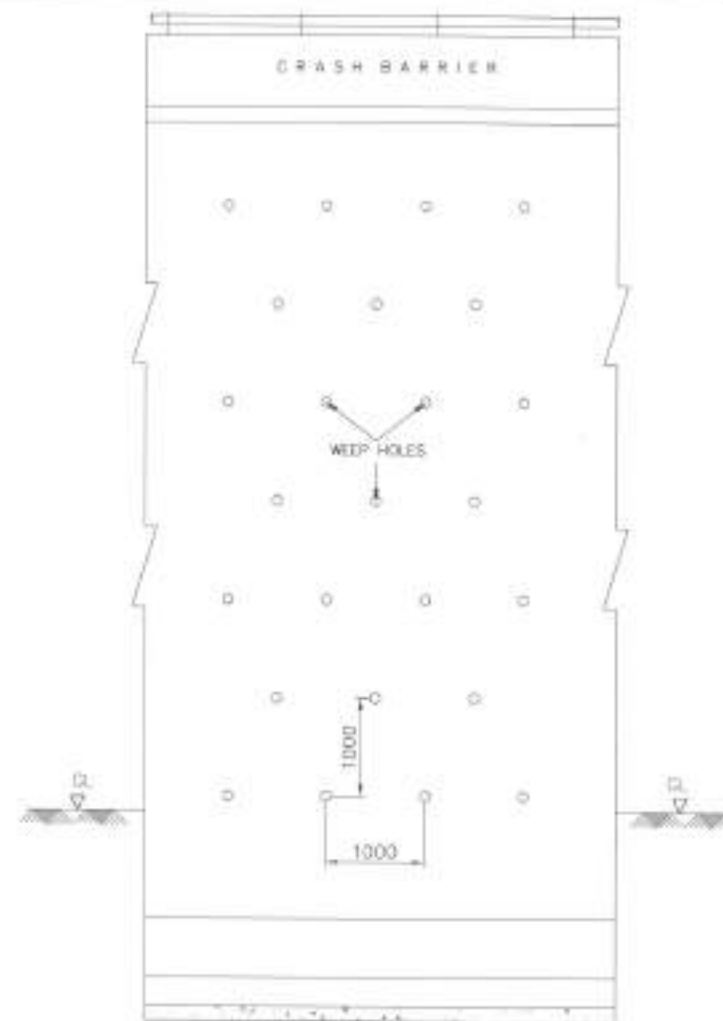
MISCELLANEOUS



TYPICAL DETAIL OF RETAINING WALL
(DIMENSIONS DETAILS ONLY)
(SCALE : 1:50)



TYPICAL PLAN OF RETAINING WALL
(DIMENSIONS DETAILS ONLY)
(SCALE : 1:50)



TYPICAL STEM ELEVATION
(SCALE : 1:50)

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SPECIFIED.
2. DIMENSIONS ARE NOT TO BE SCALED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
3. CONCRETE IN RETAINING WALL SHALL BE OF M30 GRADE.
4. CLEAR COVER TO REINFORCEMENT BARS SHALL BE 40mm IN STEM AND 75mm IN FOOTING.
5. ALL REINFORCEMENT SHALL BE TMT (HYSD) BARS OF GRADE DESIGNATION Fe-500 CONFORMING TO IS:1786 SHALL BE USED.
6. BACK FILLING SHALL BE CARRIED OUT AS PER CLAUSE NO. 710.4 OF IRC:78-2000.
7. 100 DIA WEEP HOLES SHALL BE PROVIDED IN ELEVATION THROUGHOUT IN THE RETAINING WALLS STRATING FROM 150mm ABOVE GROUND LEVEL AT SPACING NOT MORE THAN 1000mm C/C IN BOTH DIRECTION IN STAGGERED PATTERN.
8. WEEP HOLES SHALL EXTENDED THROUGH THE FULL WIDTH OF CONCRETE WITH SLOPE OF 1V : 25H TOWARDS THE DRAINING FACE.
9. THE SAFE BEARING CAPACITY AT THE FOUNDING LEVEL IS CONSIDERED 221/M² LESS THAN THE MAXIMUM BASE PRESSURES SHOWN IN THE TABLE.
10. EXPANSION JOINTS IN THE RETAINING WALLS SHALL BE PROVIDED SO THAT THE SPACING IS NOT MORE THAN 30M.

SCHEDULE OF DIMENSIONS

RETAINING WALL DIMENSIONS TABLE (MM)											
Hmax	H2	H3	B	B1	B2	B3	B4	T1	T2	T3	T4
3000	1000	2000	2700	600	200	200	1700	200	100	200	100
4000	2000	2000	3200	900	200	200	1900	200	200	200	100
5000	3000	2000	3800	1200	225	375	2000	225	375	225	225
6000	4000	2000	4800	1850	250	450	2250	250	550	250	250
7000	5000	2000	5450	2150	250	550	2500	250	650	250	450
8000	6000	2000	6350	2700	275	675	2700	250	900	250	650
9000	7000	2000	7500	3150	300	750	3300	300	1000	300	800
10000	8000	2000	8200	3600	350	900	3350	300	1100	300	1000
11000	9000	2000	8600	3600	350	1300	3350	300	1100	300	1000
12000	10000	2000	8600	3600	350	900	3350	300	1100	300	1000

REV	DATE	DESCRIPTION OF REVISIONS	INITIALS

CLIENT :



**NATIONAL HIGHWAYS & INFRASTRUCTURE
DEVELOPMENT CORPORATION LIMITED**
Ministry of Road Transport & Highways

CONSULTANT :



S.A. Infrastructure Consultants Pvt. Ltd.
1101A, 11 Road Tower A-II, Ansal Corporate Park,
Plot No. 7A/1, Sector 142, Noida-201301 (Uttar Pradesh)
Phone No- 0120-4148005 Fax-0120-4148010
Email: info@sainfra.com

PROJECT :

Consultancy for Preparation of Feasibility Report cum
Preliminary Design for Alternative Highway to Gangtok in
Sikkim via Bagrakot-Chukhim-Nimbong-
Kafra-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 (Package-SA)

DATE : FEBRUARY-2020

REVISION :

R0

DESIGNED BY :

Shri
SUDIP CHAKRABARTY

DRAWN BY :

ASR
ASR

CHECKED BY :

ARCHAN
ARCHAN

APPROVED BY :

S. S. SINGH
S. S. SINGH

GENERAL ARRANGEMENT DRAWING
OF INDEPENDENT RETAINING WALL

SCALE : AS SHOWN

SHEET : 01 OF 01

DWG. NO. :

SAICPL-SESPLNHD/CWB-SKM/RWIS-01