

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.

**DRAFT 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**



**NOVEMBER- 2019**

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.

# GENERAL DRAWING

# DRAWING LIST

DRAWING No.

## 01 GENERAL DRAWINGS

|     |                                   |                                            |
|-----|-----------------------------------|--------------------------------------------|
| i   | COVER PAGE                        |                                            |
| ii  | LIST OF DRAWING                   | SAICPL-SESPL/NHIDC/WB-SKM/LD/Gen/01        |
| iii | KEY PLAN                          | SAICPL-SESPL/NHIDC/WB-SKM/LD/Gen/          |
| iv  | LOCATION MAP                      | SAICPL-SESPL/NHIDC/WB-SKM/LD/Gen/          |
| v   | TBM LIST                          | SAICPL-SESPL/NHIDC/WB-SKM/LD/Gen/          |
| vi  | HORIZONTAL/VERTICAL CURVE DETAILS | SAICPL-SESPL/NHIDC/WB-SKM/LD/Gen/(0 Sheet) |

## 02 TYPICAL CROSS SECTION

SAICPL-SESPL/NHIDC/WB-SKM/LD/TCS/1(Sheet 08)

## 03 PLAN & PROFILE

SAICPL-SESPL/NHIDC/WB-SKM/LD/P&P/01(30 Sheet)

## 04 MISCELLANEOUS DRAWING:-

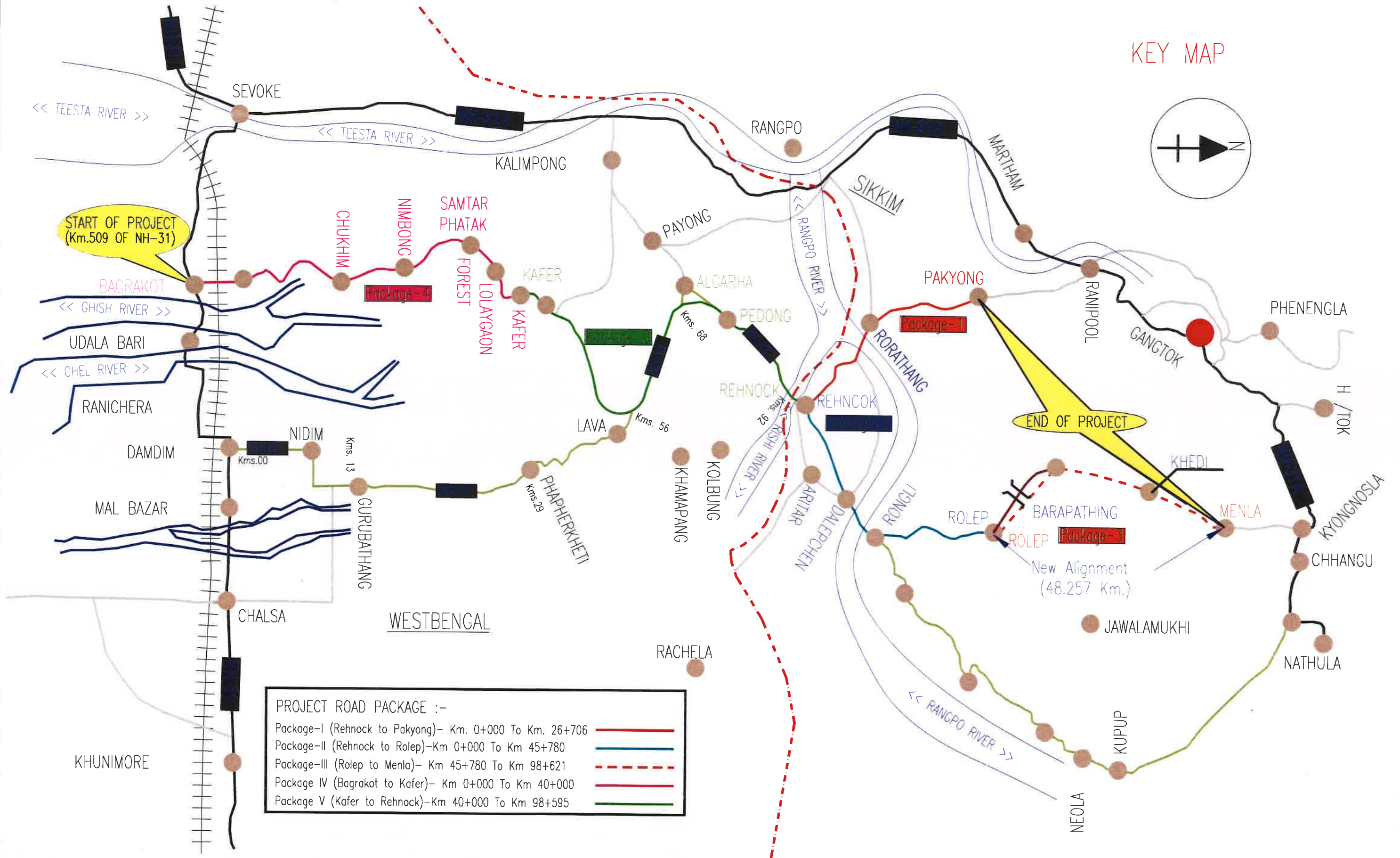
|   |                                                          |                                                |
|---|----------------------------------------------------------|------------------------------------------------|
| a | TYPICAL DRAWING ROAD SIGNS (SHEET 1 OF 3)                | SAICPL-SESPL/NHIDC/WB-SKM/LD/Misc/01           |
| b | TYPICAL DRAWING ROAD SIGNS (SHEET 2 OF 3)                | SAICPL-SESPL/NHIDC/WB-SKM/LD/Misc/02           |
| c | TYPICAL DRAWING ROAD SIGNS (SHEET 3 OF 3)                | SAICPL-SESPL/NHIDC/WB-SKM/LD/Misc/03           |
| d | TYPICAL DRAWING ROAD MARKING                             | SAICPL-SESPL/NHIDC/WB-SKM/LD/Misc/04           |
| e | TYPICAL DRAWING FOR DISTANCE & BOUNDARY STONE            | SAICPL-SESPL/NHIDC/WB-SKM/LD/Misc/05           |
| f | TYPICAL DRAWING FOR OVERHEAD GANTRY SIGNS                | SAICPL-SESPL/NHIDC/WB-SKM/LD/Misc/06           |
| g | TYPICAL DRAWING FOR BUS BAY                              | SAICPL-SESPL/NHIDC/WB-SKM/LD/Misc/07           |
| h | TYPICAL DRAWING OF SIDE DRAIN INLET CHAMBER & MEDIAN CUT | SAICPL-SESPL/NHIDC/WB-SKM/LD/Misc/08           |
| i | TYPICAL DRAWING FOR BEAST WALL                           | SAICPL-SESPL/NHIDC/WB-SKM/LD/Misc/09 (0 Sheet) |
| j | TYPICAL DRAWING FOR RETAINING WALL                       | SAICPL-SESPL/NHIDC/WB-SKM/LD/Misc/10 (0 Sheet) |
| j | TYPICAL DRAWING FOR SLAB CULVERT                         | SAICPL-SESPL/NHIDC/WB-SKM/LD/Misc/11           |

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|                                                                                                                               |             |                                 |                                                                                                                                                                                                                                                                                                                               |                                   |                            |                                  |                                     |                    |  |                                                            |  |  |  |
|-------------------------------------------------------------------------------------------------------------------------------|-------------|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|----------------------------|----------------------------------|-------------------------------------|--------------------|--|------------------------------------------------------------|--|--|--|
| <b>Client :</b> NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED<br>(Ministry of Road Transport & Highways) |             |                                 | <b>Project :</b> 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 |                                   |                            | <b>DATE :</b> November 2019      |                                     | <b>Revision</b> R0 |  | <b>PACKAGE- 4</b><br>BAGRAKOT TO KAFER<br>LIST OF DRAWINGS |  |  |  |
| <b>Rev</b>                                                                                                                    | <b>DATE</b> | <b>DESCRIPTION OF REVISIONS</b> | <b>INITIALS</b>                                                                                                                                                                                                                                                                                                               | <b>DESIGNED BY</b><br>Vijay Gupta | <b>DRAWN BY</b><br>Nareesh | <b>CHECKED BY</b><br>Vijay Gupta | <b>APPROVED BY</b><br>Sanjay Shukla | <b>SCALE:-NTS</b>  |  |                                                            |  |  |  |
| <b>REV</b>                                                                                                                    | <b>DATE</b> | <b>DESCRIPTION OF REVISIONS</b> | <b>INITIALS</b>                                                                                                                                                                                                                                                                                                               |                                   |                            |                                  |                                     |                    |  |                                                            |  |  |  |

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

# KEY MAP



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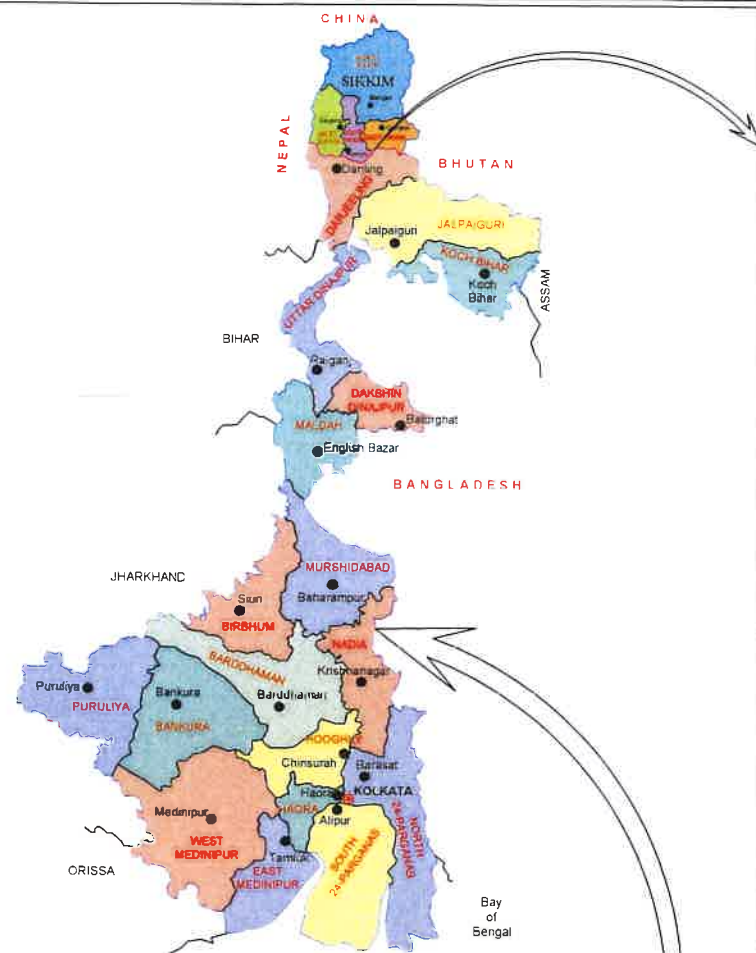
| REV | DATE     | DESCRIPTION OF REVISIONS | INITIALS |
|-----|----------|--------------------------|----------|
| R0  | Sep 2017 | Final Feasibility Report |          |
| R0  | Nov 2016 | Draft Feasibility Report |          |
| R0  | Dec 2014 | Linear Plan              |          |

|                     |                                                                                                                                                                                                     |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Client :</b>     | NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED<br>(Ministry of Road Transport & Highways)                                                                                       |
| <b>Consultant :</b> | SA INFRASTRUCTURE CONSULTANTS PVT. LTD.<br>Specialized Engineering Service Pvt. Ltd.<br>1101A, 11th Floor, Tower A-II, Corporate Park,<br>Plot No. 7A/1, Sector-142,<br>Huda, 201301, Uttar Pradesh |

|                  |                                                                                                                                                                                                                                                                                                            |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Project :</b> | Consultancy for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chuikhim-Nimbong-Kafer-Bakim-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 |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                    |                 |                   |                    |
|--------------------|-----------------|-------------------|--------------------|
| <b>DATE :</b>      | November 2019   | <b>Revision</b>   | R0                 |
| <b>DESIGNED BY</b> | <b>DRAWN BY</b> | <b>CHECKED BY</b> | <b>APPROVED BY</b> |
| Vijay Gupta        | Naresh          | Vijay Gupta       | Sanjay Shukla      |
| <b>SCALE :-NTS</b> |                 |                   |                    |

|                                                        |
|--------------------------------------------------------|
| <b>PACKAGE-5</b><br>KAFER TO RHEOCK<br><b>KEY PLAN</b> |
| Dwg. No. :- SAICPL-SESPL/NHIDCL/WB-SKM/Gen/01          |



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

DATE : November 2019

Revision RU

DESIGNED BY

DRAWN BY

CHECKED BY

APPROVED BY

Vijay Gupta

Naresh

Vijay Gupta

Sanjay Shukla

SCALE:-NTS

PACKAGE-5

KAFER TO RHENOCK

LOCATION MAP

Dwg. No. :- SAICPL-SISPL/NHIDCL/WB-SKM/Gen/01

DATE: 14/11/2019 - 5:30pm  
PATH: D:\CADD\SAICPL\WB\SAICPL\Location map\_1.dwg

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

# HORIZONTAL & VERTICAL CURVE DETAILS

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## HORIZONTAL CURVE DETAILS

| SPT No | Chaining | Lc     | Tangent Length (Lc) | Circular Angle | Radius | Length of | ARC DETAILS |             |              |             | Mid X        | Mid Y     | Tangent Angle | Total Deflection | Shift (ft) | Tangent Dist (ft) | Chord Dist (ft) | HP CO ORDMATE |             | Speed V      | Hand of Arc |      |       |
|--------|----------|--------|---------------------|----------------|--------|-----------|-------------|-------------|--------------|-------------|--------------|-----------|---------------|------------------|------------|-------------------|-----------------|---------------|-------------|--------------|-------------|------|-------|
|        |          |        |                     |                |        |           | Start X     | Start Y     | End X        | End Y       |              |           |               |                  |            |                   |                 | EASTING       | NORTHING    |              |             |      |       |
|        |          |        |                     |                |        |           |             |             |              |             |              |           |               |                  |            |                   |                 |               |             |              |             |      |       |
| 01     | 40+031   | 49.47  | 0                   | 37.7920        | 75     | 75        | 49.4990     | 655573.2010 | 298976.3110  | 655619.6130 | 298980.0510  | 655596.41 | 2989663.48    | 0                | 37.79      | 0.000             | 25.67           | 4.27          | 655593.9530 | 2989681.4240 | 40          | 7.00 | Right |
| 02     | 40+105   | 96.06  | 0                   | 65.7470        | -75    | 75        | 96.0630     | 655619.6130 | 298980.0500  | 655690.7750 | 2989732.7180 | 655653.53 | 2989711.56    | 0                | 65.75      | 0.000             | 48.47           | 14.30         | 655649.5420 | 2989690.1450 | 40          | 7.00 | Left  |
| 03     | 40+175   | 15.16  | 0                   | 1.7370         | -500   | 500       | 15.1610     | 655701.8560 | 2989750.0450 | 655706.0890 | 2989768.7730 | 655704.87 | 2989761.81    | 0                | 1.74       | 0.000             | 7.50            | 0.06          | 655704.3770 | 2989761.8600 | 40          | 2.5  | Left  |
| 04     | 40+224   | 37.26  | 0                   | 28.4860        | 75     | 75        | 37.2620     | 655717.4270 | 2989780.5100 | 655740.3730 | 2989818.3820 | 655728.90 | 2989803.85    | 0                | 28.47      | 0.000             | 19.03           | 2.36          | 655725.2390 | 2989806.8560 | 40          | 2.5  | Right |
| 05     | 40+297   | 39.46  | 0                   | 30.1450        | -75    | 75        | 39.4600     | 655768.2120 | 2989839.5820 | 655792.0310 | 2989870.4710 | 655780.12 | 2989855.03    | 0                | 30.15      | 0.000             | 20.20           | 2.67          | 655784.2810 | 2989855.0310 | 40          | 2.5  | Left  |
| 06     | 40+354   | 90.03  | 0                   | 45.8620        | 75     | 75        | 90.0330     | 655794.1320 | 2989875.5290 | 655835.8130 | 2989916.4960 | 655814.57 | 2989896.01    | 0                | 45.86      | 0.000             | 31.73           | 6.43          | 655806.3070 | 2989904.8290 | 40          | 7.00 | Right |
| 07     | 40+422   | 56.95  | 0                   | 43.5060        | -75    | 75        | 56.9490     | 655841.6890 | 2989919.9890 | 655885.1080 | 2989958.1430 | 655864.88 | 2989935.07    | 0                | 43.51      | 0.000             | 29.93           | 5.75          | 655877.4990 | 2989931.0020 | 40          | 7.00 | Left  |
| 08     | 40+477   | 33.10  | 0                   | 25.2870        | 75     | 75        | 33.1010     | 655889.9820 | 2989966.4330 | 655909.9990 | 2989994.1570 | 655899.99 | 2989981.45    | 0                | 25.29      | 0.000             | 16.83           | 1.86          | 655897.0710 | 2989981.0020 | 40          | 2.5  | Right |
| 09     | 40+509   | 16.44  | 0                   | 4.7090         | 200    | 200       | 16.4370     | 655985.0000 | 2990057.1380 | 655998.0560 | 2990067.1270 | 655991.53 | 2990063.13    | 0                | 4.71       | 0.000             | 8.23            | 0.17          | 655991.3270 | 2990067.4010 | 40          | 2.5  | Right |
| 10     | 40+567   | 51.47  | 0                   | 29.4900        | -100   | 100       | 51.4700     | 656021.9480 | 2990086.0160 | 656057.7840 | 2990134.9120 | 656041.37 | 2990125.48    | 0                | 29.48      | 0.000             | 26.32           | 4.41          | 656046.4840 | 2990121.1430 | 40          | 2.5  | Left  |
| 11     | 40+721   | 41.58  | 0                   | 31.7700        | 75     | 75        | 41.5870     | 656085.3520 | 2990140.6310 | 656092.4550 | 2990171.6700 | 656078.90 | 2990156.25    | 0                | 31.77      | 0.000             | 21.34           | 2.98          | 656074.5180 | 2990161.1070 | 40          | 7.00 | Right |
| 12     | 40+806   | 34.35  | 0                   | 26.2420        | 75     | 75        | 34.3510     | 656123.8780 | 2990191.9880 | 656156.0410 | 2990203.6370 | 656140.01 | 2990197.72    | 0                | 26.24      | 0.000             | 17.48           | 2.01          | 656138.6730 | 2990201.4560 | 40          | 7.00 | Right |
| 13     | 40+852   | 78.60  | 0                   | 22.0810        | -75    | 75        | 78.5990     | 656170.9530 | 2990229.1720 | 656198.2420 | 2990231.8080 | 656184.60 | 2990229.48    | 0                | 22.00      | 0.000             | 14.58           | 1.40          | 656185.5370 | 2990229.8390 | 40          | 2.5  | Left  |
| 14     | 40+926   | 76.60  | 0                   | 58.5150        | 75     | 75        | 76.5990     | 656213.8670 | 2990222.3140 | 656207.1710 | 2990221.4250 | 656200.52 | 2990221.87    | 0                | 58.52      | 0.000             | 42.02           | 10.97         | 656200.7680 | 2990242.4020 | 40          | 2.5  | Right |
| 15     | 40+974   | 24.33  | 0                   | 16.5900        | 75     | 75        | 24.3340     | 656267.4390 | 2990221.7710 | 656266.2010 | 2990205.9430 | 656266.82 | 2990213.61    | 0                | 16.58      | 0.000             | 12.26           | 1.00          | 656268.0750 | 2990215.1420 | 40          | 2.5  | Right |
| 16     | 41+078   | 21.30  | 0                   | 16.2880        | -75    | 75        | 21.2950     | 656300.0230 | 2990145.0180 | 656376.1830 | 2990131.2610 | 656368.10 | 2990138.14    | 0                | 16.27      | 0.000             | 10.72           | 0.76          | 656367.1300 | 2990136.9840 | 40          | 7.00 | Left  |
| 17     | 41+120   | 23.28  | 0                   | 17.7850        | 75     | 75        | 23.2810     | 656383.1100 | 2990120.5710 | 656410.5630 | 2990105.3070 | 656401.84 | 2990112.94    | 0                | 17.79      | 0.000             | 11.74           | 0.91          | 656403.0320 | 2990114.3050 | 40          | 7.00 | Right |
| 18     | 41+204   | 35.34  | 0                   | 86.4230        | -71    | 71        | 35.3410     | 656441.7570 | 2990088.2590 | 656473.0240 | 2990067.0480 | 656451.51 | 2990067.55    | 0                | 36.42      | 0.000             | 23.50           | 10.51         | 656458.8420 | 2990059.0410 | 20          | 2.5  | Left  |
| 19     | 41+241   | 37.13  | 0                   | 101.3070       | -21    | 21        | 37.1310     | 656473.2380 | 2990087.2380 | 656489.7710 | 2990099.4730 | 656471.25 | 2990083.35    | 0                | 101.31     | 0.000             | 25.62           | 12.12         | 656480.9140 | 2990087.4740 | 20          | 3.50 | Left  |
| 20     | 41+346   | 75.18  | 0                   | 57.4290        | 75     | 75        | 75.1750     | 656505.3180 | 2990127.4810 | 656530.1290 | 2990105.5040 | 656507.57 | 2990159.01    | 0                | 57.43      | 0.000             | 41.08           | 10.52         | 656530.3020 | 2990149.6540 | 40          | 3.50 | Right |
| 21     | 41+436   | 64.14  | 0                   | 48.9960        | -75    | 75        | 64.1360     | 656530.0250 | 2990125.4010 | 656533.9980 | 2990171.8820 | 656537.01 | 2990143.65    | 0                | 48.00      | 0.000             | 34.18           | 7.43          | 656538.8820 | 2990157.5770 | 40          | 2.5  | Left  |
| 22     | 41+524   | 54.30  | 0                   | 41.4050        | 75     | 75        | 54.3000     | 656533.7720 | 2990209.3270 | 656538.4490 | 2990335.9140 | 656533.11 | 2990312.62    | 0                | 41.41      | 0.000             | 28.35           | 5.18          | 656532.3040 | 2990307.8340 | 40          | 2.5  | Right |
| 23     | 41+612   | 101.30 | 0                   | 77.3800        | -75    | 75        | 101.3040    | 656538.1700 | 2990337.8860 | 656535.1180 | 2990402.4070 | 656528.14 | 2990370.15    | 0                | 77.39      | 0.000             | 60.08           | 21.09         | 656539.9850 | 2990397.4020 | 40          | 2.5  | Left  |
| 24     | 41+695   | 34.84  | 0                   | 95.0810        | 21     | 21        | 34.8420     | 656531.3260 | 2990403.9780 | 656521.2850 | 2990428.4030 | 656521.86 | 2990416.24    | 0                | 95.08      | 0.000             | 22.94           | 10.10         | 656528.4440 | 2990405.8890 | 20          | 2.5  | Right |
| 25     | 41+729   | 32.47  | 0                   | 88.7670        | 21     | 21        | 32.4720     | 656512.5890 | 2990429.6720 | 656526.3610 | 2990446.8590 | 656524.48 | 2990438.26    | 0                | 88.80      | 0.000             | 20.49           | 8.34          | 656518.0810 | 2990449.8020 | 20          | 7.00 | Right |
| 26     | 41+818   | 88.80  | 0                   | 38.4210        | 100    | 100       | 88.8020     | 656527.8340 | 2990446.7340 | 656537.1100 | 2990408.8140 | 656537.37 | 2990424.82    | 0                | 38.42      | 0.000             | 35.82           | 6.22          | 656531.0720 | 2990435.4780 | 40          | 7.00 | Right |
| 27     | 41+877   | 48.02  | 0                   | 37.4460        | 75     | 75        | 48.0180     | 656537.3180 | 2990408.6840 | 656536.4580 | 2990364.5020 | 656546.88 | 2990386.58    | 0                | 37.45      | 0.000             | 25.42           | 4.19          | 656534.3740 | 2990389.8380 | 40          | 2.5  | Right |
| 28     | 41+930   | 51.52  | 0                   | 36.3610        | -75    | 75        | 51.5240     | 656536.6240 | 2990362.4580 | 656537.4740 | 2990316.4460 | 656537.05 | 2990339.45    | 0                | 36.36      | 0.000             | 26.02           | 4.65          | 656538.8200 | 2990335.7230 | 40          | 7.00 | Left  |
| 29     | 41+991   | 39.68  | 0                   | 30.3150        | -75    | 75        | 39.6820     | 656538.8660 | 2990304.6730 | 656542.5600 | 2990284.5980 | 656545.71 | 2990294.64    | 0                | 30.32      | 0.000             | 20.32           | 2.70          | 656540.9940 | 2990290.0790 | 40          | 7.00 | Left  |
| 30     | 42+050   | 29.48  | 0                   | 89.5360        | -71    | 71        | 29.4880     | 656546.4410 | 2990277.9300 | 656548.9670 | 2990285.7730 | 656547.75 | 2990281.25    | 0                | 69.54      | 0.000             | 14.58           | 4.58          | 656540.8400 | 2990273.9530 | 20          | 2.5  | Left  |
| 31     | 42+074   | 21.65  | 0                   | 50.0760        | -21    | 21        | 21.6530     | 656548.8250 | 2990286.5510 | 656549.9980 | 2990307.1220 | 656549.82 | 2990296.84    | 0                | 50.08      | 0.000             | 11.90           | 3.14          | 656546.7650 | 2990296.1670 | 20          | 2.5  | Left  |
| 32     | 42+121   | 44.28  | 0                   | 33.8070        | -75    | 75        | 44.2830     | 656548.3500 | 2990320.4270 | 656548.3500 | 2990303.8920 | 656545.37 | 2990327.16    | 0                | 33.81      | 0.000             | 22.79           | 3.38          | 656544.4550 | 2990324.4080 | 40          | 2.5  | Left  |
| 33     | 42+172   | 44.80  | 0                   | 34.2260        | 75     | 75        | 44.8020     | 656542.2880 | 2990357.8650 | 656544.1040 | 2990391.8590 | 656548.20 | 2990374.87    | 0                | 34.23      | 0.000             | 23.08           | 3.48          | 656542.9650 | 2990370.5320 | 40          | 7.00 | Right |
| 34     | 42+215   | 32.45  | 0                   | 24.7880        | -75    | 75        | 32.4470     | 656540.5800 | 2990355.9250 | 656548.1410 | 2990421.8600 | 656533.36 | 2990408.70    | 0                | 24.79      | 0.000             | 16.48           | 1.79          | 656538.2630 | 2990410.7240 | 40          | 7.00 | Left  |
| 35     | 42+247   | 33.87  | 0                   | 18.3120        | 75     | 75        | 33.8710     | 656536.3980 | 2990424.7020 | 656536.3320 | 2990443.5810 | 656537.81 | 2990434.17    | 0                | 33.87      | 0.000             | 12.09           | 0.97          | 656537.0890 | 2990432.9820 | 40          | 2.5  | Right |
| 36     | 42+296   | 42.43  | 0                   | 33.1750        | -75    | 75        | 42.4280     | 656538.2060 | 2990456.2020 | 656538.5960 | 2990486.1480 | 656543.90 | 2990471.18    | 0                | 33.18      | 0.000             | 22.34           | 3.26          | 656548.3610 | 2990475.7350 | 40          | 7.00 | Left  |
| 37     | 42+384   | 50.85  | 0                   | 38.8430        | -75    | 75        | 50.8460     | 656538.3530 | 2990509.9880 | 6           |              |           |               |                  |            |                   |                 |               |             |              |             |      |       |

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| STATION | CHANGING | LC     | TANGENT LENGTH (L) | CHORD BEARING | RADIUS | LENGTH OF | ARC DETAILS |             |              |             | Mid X        | Mid Y     | TANGENT ANGLE | Total Deflection | "Shift In" | Tangent Dist (T) | Chord Dist (C) | HIP CO ORDINATE |             | Speed V      | Hand of Arc |      |       |
|---------|----------|--------|--------------------|---------------|--------|-----------|-------------|-------------|--------------|-------------|--------------|-----------|---------------|------------------|------------|------------------|----------------|-----------------|-------------|--------------|-------------|------|-------|
|         |          |        |                    |               |        |           | Start X     | Start Y     | End X        | End Y       |              |           |               |                  |            |                  |                | PARTIAL         | NORTHING    |              |             |      |       |
|         |          |        |                    |               |        |           |             |             |              |             |              |           |               |                  |            |                  |                |                 |             |              |             |      |       |
| 131     | 49+083   | 50.90  | 0                  | 38.9570       | -75    | 75        | 30.9540     | 657434.6480 | 2994150.1080 | 657479.0020 | 2994173.2230 | 657456.82 | 2994161.67    | 0                | 38.96      | 0.000            | 26.53          | 4.55            | 657460.9120 | 2994153.8220 | 40          | 2.5  | Left  |
| 132     | 49+138   | 31.34  | 0                  | 23.9430       | 75     | 75        | 31.3410     | 657460.3050 | 2994176.7680 | 657507.7020 | 2994194.8270 | 657485.04 | 2994185.20    | 0                | 23.94      | 0.000            | 15.90          | 1.67            | 657483.1500 | 2994188.3970 | 40          | 2.5  | Right |
| 133     | 49+175   | 21.21  | 0                  | 16.2020       | -75    | 75        | 21.2090     | 657517.5290 | 2994198.7780 | 657535.6170 | 2994208.7140 | 657528.57 | 2994205.25    | 0                | 16.20      | 0.000            | 10.67          | 0.76            | 657527.3520 | 2994202.8580 | 40          | 7.00 | Left  |
| 134     | 49+227   | 37.10  | 0                  | 28.3390       | 75     | 75        | 37.0850     | 657553.4360 | 2994224.2780 | 657586.6860 | 2994238.8500 | 657570.06 | 2994232.06    | 0                | 28.34      | 0.000            | 18.94          | 2.35            | 657568.0970 | 2994236.2620 | 40          | 7.00 | Right |
| 135     | 49+282   | 36.79  | 0                  | 26.1020       | -75    | 75        | 36.7860     | 657603.9930 | 2994243.1900 | 657637.0060 | 2994258.5660 | 657620.50 | 2994250.88    | 0                | 26.10      | 0.000            | 16.77          | 2.31            | 657622.4230 | 2994246.7470 | 40          | 2.5  | Left  |
| 136     | 49+385   | 43.02  | 0                  | 32.8630       | 75     | 75        | 43.0160     | 657670.6800 | 2994285.8600 | 657709.8520 | 2994302.1630 | 657692.27 | 2994294.01    | 0                | 32.86      | 0.000            | 22.12          | 3.19            | 657687.8620 | 2994299.7670 | 40          | 2.5  | Right |
| 137     | 49+502   | 90.34  | 0                  | 66.0180       | -75    | 75        | 90.3440     | 657773.6480 | 2994308.0520 | 657828.1010 | 2994364.4700 | 657805.87 | 2994336.74    | 0                | 66.02      | 0.000            | 51.57          | 16.02           | 657814.9130 | 2994374.5890 | 40          | 2.5  | Left  |
| 138     | 49+579   | 54.89  | 0                  | 41.9310       | 75     | 75        | 54.8880     | 657840.4080 | 2994373.1510 | 657877.7890 | 2994416.6910 | 657856.10 | 2994394.92    | 0                | 41.93      | 0.000            | 28.74          | 5.32            | 657847.7550 | 2994400.9330 | 40          | 7.00 | Right |
| 139     | 49+674   | 12.82  | 0                  | 9.7910        | -75    | 75        | 12.8140     | 657924.1450 | 2994451.0180 | 657934.2120 | 2994458.9250 | 657928.18 | 2994454.97    | 0                | 9.79       | 0.000            | 8.42           | 0.27            | 657929.5170 | 2994454.5400 | 40          | 7.00 | Left  |
| 140     | 49+713   | 20.60  | 0                  | 15.7410       | 75     | 75        | 20.6040     | 657950.3380 | 2994473.9840 | 657967.1270 | 2994485.8180 | 657956.72 | 2994479.90    | 0                | 15.74      | 0.000            | 10.57          | 0.71            | 657957.9190 | 2994481.0800 | 40          | 2.5  | Right |
| 141     | 49+754   | 12.24  | 0                  | 9.3470        | -75    | 75        | 12.2350     | 657988.5080 | 2994497.3670 | 657998.8750 | 2994503.8390 | 657994.68 | 2994500.80    | 0                | 9.35       | 0.000            | 8.13           | 0.25            | 657994.9560 | 2994500.1800 | 40          | 2.5  | Left  |
| 142     | 49+826   | 57.61  | 0                  | 44.6140       | -75    | 75        | 57.6140     | 658028.6660 | 2994525.2590 | 658057.9050 | 2994573.2630 | 658043.29 | 2994548.26    | 0                | 44.01      | 0.000            | 30.31          | 5.88            | 658052.9860 | 2994543.3520 | 40          | 2.5  | Left  |
| 143     | 49+811   | 66.58  | 0                  | 50.8800       | 75     | 75        | 66.5750     | 658064.3880 | 2994544.4420 | 658098.1190 | 2994597.3530 | 658079.75 | 2994565.90    | 0                | 50.86      | 0.000            | 35.66          | 8.05            | 658097.1740 | 2994629.6300 | 40          | 4.74 | Right |
| 144     | 49+931   | 49.94  | 0                  | 36.6210       | -75    | 75        | 49.9370     | 658101.8510 | 2994646.4900 | 658133.3150 | 2994694.5730 | 658117.58 | 2994667.03    | 0                | 36.62      | 0.000            | 24.82          | 4.00            | 658123.3680 | 2994661.8290 | 40          | 4.74 | Left  |
| 145     | 50+026   | 58.88  | 0                  | 44.9820       | 75     | 75        | 58.8810     | 658145.7010 | 2994712.8560 | 658187.1200 | 2994770.5540 | 658166.47 | 2994732.76    | 0                | 44.98      | 0.000            | 31.05          | 6.17            | 658158.2680 | 2994741.3620 | 40          | 7.00 | Right |
| 146     | 50+095   | 22.94  | 0                  | 17.5280       | -75    | 75        | 22.9440     | 658187.2300 | 2994792.5540 | 658207.0410 | 2994763.9500 | 658197.14 | 2994758.25    | 0                | 17.53      | 0.000            | 11.56          | 0.89            | 658198.0140 | 2994758.7550 | 40          | 7.00 | Left  |
| 147     | 50+251   | 54.48  | 0                  | 41.8300       | -75    | 75        | 54.4800     | 658237.5700 | 2994838.4080 | 658274.5310 | 2994882.3170 | 658251.10 | 2994858.36    | 0                | 41.82      | 0.000            | 28.50          | 5.23            | 658251.8250 | 2994854.2200 | 40          | 2.5  | Left  |
| 148     | 50+301   | 38.98  | 0                  | 28.7750       | 75     | 75        | 38.9790     | 658293.2300 | 2994885.8540 | 658331.2750 | 2994920.8970 | 658313.26 | 2994893.38    | 0                | 38.98      | 0.000            | 19.94          | 2.61            | 658318.5960 | 2994905.5080 | 40          | 2.5  | Right |
| 149     | 50+347   | 38.73  | 0                  | 29.5910       | -75    | 75        | 38.7340     | 658346.2700 | 2994928.8980 | 658382.2180 | 2994961.7030 | 658364.22 | 2994934.30    | 0                | 38.73      | 0.000            | 18.81          | 2.57            | 658358.8150 | 2994942.1880 | 40          | 2.5  | Left  |
| 150     | 50+481   | 132.51 | 0                  | 50.6140       | 150    | 150       | 132.5070    | 658388.7650 | 2995004.9940 | 658443.8840 | 2995087.7770 | 658406.72 | 2995057.38    | 0                | 50.61      | 0.000            | 70.92          | 15.92           | 658401.9490 | 2995074.8570 | 40          | 2.5  | Right |
| 151     | 50+573   | 34.08  | 0                  | 19.5200       | 100    | 100       | 34.0780     | 658455.1420 | 2995112.5980 | 658487.9630 | 2995127.7080 | 658471.10 | 2995121.98    | 0                | 19.53      | 0.000            | 17.21          | 1.47            | 658470.1170 | 2995124.7290 | 40          | 2.5  | Right |
| 152     | 50+654   | 36.33  | 0                  | 98.1250       | -21    | 21        | 36.3310     | 658525.4150 | 2995134.4490 | 658541.8240 | 2995162.0020 | 658533.52 | 2995148.33    | 0                | 99.13      | 0.000            | 24.64          | 11.38           | 658549.6850 | 2995130.7150 | 20          | 7.00 | Left  |
| 153     | 50+683   | 36.52  | 0                  | 99.6330       | -21    | 21        | 36.5180     | 658540.6180 | 2995164.9030 | 658561.0810 | 2995176.4480 | 658552.65 | 2995170.88    | 0                | 99.63      | 0.000            | 24.86          | 11.55           | 658552.4850 | 2995168.4000 | 20          | 7.00 | Left  |
| 154     | 50+756   | 22.12  | 0                  | 20.7210       | 75     | 75        | 22.1240     | 658578.1880 | 2995168.6370 | 658592.5830 | 2995190.1370 | 658585.38 | 2995184.39    | 0                | 20.72      | 0.000            | 13.71          | 1.24            | 658586.1620 | 2995152.0470 | 40          | 2.5  | Right |
| 155     | 50+804   | 36.80  | 0                  | 28.1090       | -75    | 75        | 36.7950     | 658634.7070 | 2995147.8040 | 658652.9470 | 2995144.2220 | 658637.56 | 2995141.06    | 0                | 28.11      | 0.000            | 18.78          | 2.31            | 658618.1140 | 2995145.2880 | 40          | 2.5  | Left  |
| 156     | 50+870   | 34.41  | 0                  | 83.8690       | 21     | 21        | 34.4050     | 658682.6240 | 2995118.3940 | 658703.4860 | 2995125.1530 | 658687.16 | 2995122.27    | 0                | 93.87      | 0.000            | 22.47          | 9.75            | 658684.4740 | 2995108.1510 | 20          | 2.5  | Right |
| 157     | 50+915   | 41.70  | 0                  | 113.7730      | 21     | 21        | 41.7000     | 658731.5050 | 2995126.7080 | 658768.1710 | 2995158.6940 | 658758.84 | 2995142.70    | 0                | 113.77     | 0.000            | 32.20          | 17.44           | 658754.3250 | 2995153.9300 | 20          |      |       |

| STP No. | Chainage | Lc    | Transition Length (ft) | Spiral Angle | Radius | Length of | ARC DETAILS |             |              |             | Mid X        | Mid Y     | Height Angle | Total Deflection | "Shift" (ft) | Tangent Dist (ft) | Sight Dist (ft) | HP CO ORDINATE |             | Speed "V"    | Hand of Arc |      |       |
|---------|----------|-------|------------------------|--------------|--------|-----------|-------------|-------------|--------------|-------------|--------------|-----------|--------------|------------------|--------------|-------------------|-----------------|----------------|-------------|--------------|-------------|------|-------|
|         |          |       |                        |              |        |           | Start Y     | Start X     | End Y        | End X       |              |           |              |                  |              |                   |                 | Easting        | Northing    |              |             |      |       |
|         |          |       |                        |              |        |           |             |             |              |             |              |           |              |                  |              |                   |                 |                |             |              |             |      |       |
| 261     | 58+178   | 81.41 | 0                      | 62.1920      | -75    | 75        | 81.4080     | 682402.8580 | 2996470.6370 | 682480.3280 | 2996471.0080 | 682441.59 | 2996470.82   | 0                | 62.19        | 0.000             | 45.23           | 12.58          | 682441.7040 | 2996447.4580 | 40          | 2.5  | Left  |
| 262     | 58+540   | 32.94 | 0                      | 25.1610      | 75     | 75        | 32.9380     | 682488.3160 | 2996475.8760 | 682519.2470 | 2996486.3990 | 682502.78 | 2996481.14   | 0                | 25.16        | 0.000             | 16.74           | 1.84           | 682502.8070 | 2996484.5880 | 40          | 2.5  | Right |
| 263     | 58+587   | 47.01 | 0                      | 35.9110      | -75    | 75        | 47.0080     | 682535.4080 | 2996488.1580 | 682577.5880 | 2996507.0850 | 682556.50 | 2996497.82   | 0                | 35.91        | 0.000             | 24.30           | 3.84           | 682556.5080 | 2996490.7840 | 40          | 2.5  | Left  |
| 264     | 58+676   | 61.18 | 0                      | 46.7380      | 75     | 75        | 61.1770     | 682585.5310 | 2996513.3010 | 682651.8880 | 2996542.4280 | 682632.70 | 2996532.86   | 0                | 46.74        | 0.000             | 32.41           | 6.70           | 682619.5880 | 2996545.0350 | 40          | 7.00 | Right |
| 265     | 58+774   | 90.38 | 0                      | 68.0440      | -75    | 75        | 90.3780     | 682688.3380 | 2996541.0180 | 682743.0280 | 2996583.3880 | 682706.18 | 2996582.21   | 0                | 68.04        | 0.000             | 51.58           | 16.03          | 682720.7510 | 2996536.8830 | 40          | 7.00 | Left  |
| 266     | 58+863   | 83.23 | 0                      | 63.5810      | 75     | 75        | 83.2270     | 682744.8120 | 2996586.7230 | 682811.1570 | 2996629.3400 | 682777.88 | 2996608.03   | 0                | 63.58        | 0.000             | 46.48           | 13.24          | 682764.6770 | 2996628.6530 | 40          | 2.5  | Right |
| 267     | 58+959   | 93.20 | 0                      | 71.2000      | -75    | 75        | 93.2000     | 682815.6320 | 2996623.4210 | 682886.8720 | 2996681.2930 | 682851.75 | 2996655.36   | 0                | 71.20        | 0.000             | 53.69           | 17.24          | 682870.3200 | 2996630.2130 | 40          | 2.5  | Left  |
| 268     | 58+1022  | 34.95 | 0                      | 95.3650      | -21    | 21        | 34.9530     | 682886.8720 | 2996681.2930 | 682971.4720 | 2996708.2620 | 682979.17 | 2996694.78   | 0                | 95.37        | 0.000             | 23.07           | 10.19          | 682970.9820 | 2996703.2350 | 20          | 7.00 | Left  |
| 269     | 58+1044  | 16.02 | 0                      | 43.7190      | -21    | 21        | 16.0240     | 682989.2250 | 2996708.7630 | 682985.7910 | 2996708.2440 | 682981.51 | 2996707.50   | 0                | 43.72        | 0.000             | 6.42            | 1.63           | 682981.0020 | 2996710.8000 | 20          | 7.00 | Left  |
| 270     | 58+108   | 7.24  | 0                      | 2.0760       | -200   | 200       | 7.2440      | 682989.2250 | 2996678.7700 | 682982.0200 | 2996674.9130 | 682985.23 | 2996676.84   | 0                | 2.08         | 0.000             | 3.63            | 0.03           | 682985.1990 | 2996676.8870 | 40          | 2.5  | Left  |
| 271     | 58+149   | 19.14 | 0                      | 14.6240      | 75     | 75        | 18.1430     | 682778.7750 | 2996680.2240 | 682782.5510 | 2996681.8880 | 682771.34 | 2996656.06   | 0                | 14.82        | 0.000             | 9.62            | 0.61           | 682771.6730 | 2996654.9540 | 40          | 2.5  | Right |
| 272     | 58+188   | 29.19 | 0                      | 22.2880      | -75    | 75        | 29.1880     | 682743.0210 | 2996646.6670 | 682721.8340 | 2996632.7820 | 682734.63 | 2996630.47   | 0                | 22.30        | 0.000             | 14.78           | 1.44           | 682733.0100 | 2996641.9570 | 40          | 2.5  | Left  |
| 273     | 58+267   | 42.07 | 0                      | 114.2740     | 21     | 21        | 42.0670     | 682703.1550 | 2996618.1130 | 682686.2350 | 2996628.1880 | 682686.20 | 2996621.14   | 0                | 114.77       | 0.000             | 32.82           | 17.06          | 682678.3400 | 2996604.8330 | 20          | 7.00 | Right |
| 274     | 58+280   | 29.68 | 0                      | 80.9670      | 21     | 21        | 29.6780     | 682686.7520 | 2996627.8380 | 682680.0070 | 2996632.6740 | 682674.38 | 2996640.26   | 0                | 80.97        | 0.000             | 17.83           | 6.61           | 682663.7780 | 2996645.0580 | 20          | 7.00 | Right |
| 275     | 58+443   | 43.36 | 0                      | 33.1280      | -75    | 75        | 43.3640     | 682707.8130 | 2996703.2640 | 682619.7400 | 2996711.7120 | 682613.78 | 2996717.48   | 0                | 33.13        | 0.000             | 22.31           | 3.25           | 682608.0070 | 2996712.7400 | 40          | 2.5  | Left  |
| 276     | 58+498   | 46.82 | 0                      | 35.8430      | 75     | 75        | 46.8180     | 682824.7250 | 2996738.7730 | 682826.9030 | 2996738.6540 | 682824.31 | 2996754.71   | 0                | 35.84        | 0.000             | 24.25           | 3.82           | 682837.4820 | 2996750.4020 | 40          | 2.5  | Right |
| 277     | 58+539   | 23.49 | 0                      | 17.9450      | -75    | 75        | 23.4900     | 682865.5870 | 2996771.9990 | 682865.5550 | 2996794.1880 | 682875.57 | 2996778.09   | 0                | 17.95        | 0.000             | 11.85           | 0.93           | 682876.5330 | 2996776.5180 | 40          | 2.5  | Left  |
| 278     | 58+681   | 32.34 | 0                      | 18.5310      | -100   | 100       | 32.3420     | 682972.4880 | 2996858.0880 | 682993.3420 | 2996882.6240 | 682982.91 | 2996870.36   | 0                | 18.53        | 0.000             | 16.31           | 1.32           | 682984.9150 | 2996885.6550 | 40          | 7.00 | Left  |
| 279     | 58+755   | 44.47 | 0                      | 33.9880      | 75     | 75        | 44.4850     | 683011.3020 | 2996812.3880 | 683043.9080 | 2996841.8870 | 683027.61 | 2996827.03   | 0                | 33.97        | 0.000             | 22.91           | 3.42           | 683023.1350 | 2996832.0110 | 40          | 7.00 | Right |
| 280     | 58+843   | 38.53 | 0                      | 30.1950      | -75    | 75        | 38.5250     | 683085.7080 | 2996881.0980 | 683115.8230 | 2996888.7240 | 683100.66 | 2996873.68   | 0                | 30.20        | 0.000             | 28.24           | 2.88           | 683104.0540 | 2996888.8250 | 40          | 2.5  | Left  |
| 281     | 58+921   | 28.28 | 0                      | 21.5980      | 75     | 75        | 28.2570     | 683141.2830 | 2997023.0420 | 683181.3780 | 2997042.6710 | 683151.33 | 2997032.88   | 0                | 21.59        | 0.000             | 14.30           | 1.35           | 683148.4580 | 2997034.7720 | 40          | 7.00 | Right |
| 282     | 58+989   | 26.83 | 0                      | 20.4940      | -75    | 75        | 26.8280     | 683178.6340 | 2997054.1110 | 683197.8880 | 2997072.5750 | 683188.27 | 2997063.34   | 0                | 26.48        | 0.000             | 13.56           | 1.22           | 683188.8350 | 2997081.6020 | 40          | 7.00 | Left  |
| 283     | 60+018   | 39.82 | 0                      | 4.5630       | 500    | 500       | 39.8150     | 683206.8030 | 2997084.8450 | 683231.4450 | 2997116.1050 | 683219.12 | 2997100.48   | 0                | 4.56         | 0.000             | 18.91           | 0.40           | 683218.5010 | 2997100.9880 | 40          | 2.5  | Right |
| 284     | 60+091   | 39.96 | 0                      | 22.8830      | 100    | 100       | 39.8580     | 683252.7480 | 2997141.0230 | 683284.0180 | 2997165.4720 | 683268.38 | 2997153.25   | 0                | 22.89        | 0.000             | 20.25           | 2.03           | 683265.8070 | 2997156.4130 | 40          | 7.00 | Right |
| 285     | 60+254   | 22.80 | 0                      | 17.4930      | 75     | 75        | 22.8890     | 683401.9990 | 2997224.4930 | 683423.7140 | 2997231.4770 | 683412.86 | 2997227.99   | 0                | 17.49        | 0.000             | 11.54           | 0.88           | 683412.3190 | 2997229.6580 | 40          | 7.00 | Right |
| 286     | 60+354   | 78.80 | 0                      | 45.1480      | -100   | 100       | 78.7980     | 683470.3080 | 2997238.9280 | 683535.6570 | 2997279.2210 | 683502.98 | 2997259.07   | 0                | 45.15        | 0.000             | 41.57           | 8.30           | 683511.3570 | 2997245.4880 | 40          | 2.5  | Left  |
| 287     | 60+445   | 34.42 | 0                      | 28.2910      | 75     | 75        | 34.4150     | 683554.8860 | 2997308.7020 | 683582.6080 | 2997331.1220 | 683568.75 | 2997319.91   | 0                | 28.29        | 0.000             | 17.52           | 2.02           | 683567.1340 | 2997322.9150 | 40          | 7.00 | Right |
| 288     | 60+514   | 58.60 | 0                      | 44.7700      | 75     | 75        | 58.6040     | 683601.2270 | 2997340.9880 | 683658.0920 | 2997348.5280 | 683629.65 | 2997343.76   | 0                | 44.77        | 0.000             | 30.89           | 6.11           | 683628.5180 | 2997355.4480 | 40          | 7.00 | Right |
| 289     | 60+576   | 43.86 | 0                      | 25.1320      | -100   | 100       | 43.8630     | 683670.2200 | 2997342.8540 | 683713.8120 | 2997338.8180 | 683691.82 | 2997341.24   | 0                | 25.13        | 0.000             | 22.29           | 2.45           | 683681.5560 | 2997336.4010 | 40          | 2.5  | Left  |
| 290     | 60+684   | 38.47 | 0                      | 22.8130      | -100   | 100       | 38.4670     | 683718.5520 | 2997348.0020 | 683815.4700 | 2997382.2510 | 683787.00 | 2997355.67   | 0                | 22.81        | 0.000             | 19.99           | 1.88           | 683788.3180 | 2997351.9790 | 40          | 2.5  | Left  |
| 291     | 60+778   | 38.26 | 0                      | 104.3770     | 21     | 21        | 38.2560     | 683856.5500 | 2997386.8520 | 683987.4710 | 2997374.8130 | 683872.01 | 2997380.83   | 0                | 104.38       | 0.000             | 27.06           | 13.26          | 683878.7670 | 2997400.7550 | 20          | 2.5  | Right |
| 292     | 60+826   | 21.53 | 0                      | 16.4440      | 75     | 75        | 21.5280     | 683884.9510 | 2997348.6280 | 683998.0540 | 2997328.3940 | 683986.58 | 2997339.01   | 0                | 16.44        | 0.000             | 10.83           | 0.78           | 683988.0360 | 2997336.2310 | 40          | 2.5  | Right |
| 293     | 60+868   | 23.85 | 0                      | 18.2170      | -75    | 75        | 23.8460     | 683888.0840 | 2997306.8800 | 683981.8820 | 2997286.2280 | 683989.88 | 2997297.94   | 0                | 18.22        | 0.000             | 12.03           | 0.96           | 683988.1040 | 2997297.6380 | 40          | 7.00 | Left  |
| 294     | 60+922   | 62.40 | 0                      | 47.6700      | -75    | 75        | 62.4000     | 683984.6440 | 2997277.8720 | 683945.3180 | 2997232.9280 | 683924.88 | 2997256.40   | 0                | 47.67        | 0.000             | 33.13           | 6.88           | 683915.0540 | 2997246.4180 | 40          | 7.00 | Left  |
| 295     | 60+985   | 35.48 | 0                      | 27.1010      | 75     | 75        | 35.4750     | 683988.0580 | 2997226.3620 | 683987.9130 | 2997204.9330 | 683973.98 | 2997215.05   | 0                | 27.10        | 0.000             | 18.08           | 2.15           | 683978.5670 | 2997219.0040 | 40          | 2.5  | Right |
| 296     | 61+043   | 66.51 | 0                      | 50.8070      | -75    | 75        | 66.5080     | 683981.2140 | 2997200.8380 | 684048.1880 | 2997172.8170 | 684020.20 | 2997186.88   | 0                | 50.81        | 0.000             | 35.82           | 8.03           | 684013.5710 | 2997173.1110 | 40          | 7.00 | Left  |
| 297     | 61+124   | 34.73 | 0                      | 94.7580      | -21    | 21        | 34.7300     | 684076.2990 | 2997172.7890 | 684097.3510 | 2997165.3950 | 684086.83 | 2997184.08   | 0                | 94.76        | 0.000             | 22.82           | 10.01          | 684088.1180 | 2997172.6440 | 20          | 7.00 | Left  |

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

Consultant : SA INFRASTRUCTURE CONSULTANTS PVT. LTD.  
In Association with  
Specialized Engineering Service Pvt. Ltd.  
1101A, 11th Floor, Tower A-II, Corporate Park,  
Plot No. 7A/1, Sector-142,  
Gurgaon-122001, 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-Rhenok in the State of West Bengal and From Rhenok-Rorathang-Pakyong along with Spur From Aritar-Rolep-Menla in the State of Sikkim

DATE : November 2019

|             |          |             |               |
|-------------|----------|-------------|---------------|
| DESIGNED BY | DRAWN BY | CHECKED BY  | APPROVED BY   |
| Vijay Gupta | Naresh   | Vijay Gupta | Sanjay Shukla |

SCALE:-NTS

PACKAGE- 5  
KAFER TO RHENOCK  
HORIZONTAL CURVE DETAILS

Dwg. No. :- SAICPL-SSEPL/NHIDCL/WB-SKM/H.V.R/03

DATE: 15/11/2019 - 12:42pm

PATH: D:\C:\dwg\MAI\_Desh\_Sikkim-5\Curve\_Details\Horizontal\_Curve\_Details.dwg

| VERTICAL CURVE DETAILS |           |               |              |          |            |           |            |           |          |         |
|------------------------|-----------|---------------|--------------|----------|------------|-----------|------------|-----------|----------|---------|
| IP                     |           | Type of Curve | Curve Length | K Value  | Start      |           | End        |           | Gradient |         |
| Chainage               | Level     |               |              |          | Chainage   | Level     | Chainage   | Level     | In       | Out     |
| 40160.9260             | 1668.8350 | Sog           | 100          | 59.7290  | 40110.9260 | 1672.1470 | 40210.9260 | 1666.3600 | -6.6250  | -4.9510 |
| 40296.3250             | 1662.1320 | Hog           | 60           | 393.9370 | 40266.3250 | 1663.6170 | 40326.3250 | 1660.6010 | -4.9510  | -5.1030 |
| 40358.4470             | 1658.9620 | Sog           | 60           | 21.0930  | 40328.4470 | 1660.4930 | 40388.4470 | 1658.2850 | -5.1030  | -2.2580 |
| 40427.2610             | 1657.4080 | Sog           | 60           | 631.2850 | 40397.2610 | 1658.0850 | 40457.2610 | 1656.7590 | -2.2580  | -2.1630 |
| 40628.4560             | 1653.0560 | Hog           | 200          | 50.2120  | 40528.4560 | 1655.2190 | 40728.4560 | 1646.9090 | -2.1630  | -6.1460 |
| 40950                  | 1633.2920 | Hog           | 60           | 382.4090 | 40920      | 1635.1360 | 40980      | 1631.4010 | -6.1460  | -6.3030 |
| 41365                  | 1607.1340 | Hog           | 60           | 57.1850  | 41335      | 1609.0250 | 41395      | 1604.9280 | -6.3030  | -7.3520 |
| 41580                  | 1591.3260 | Sog           | 100          | 23.6660  | 41530      | 1595.0020 | 41630      | 1589.7620 | -7.3520  | -3.1270 |
| 41854.6200             | 1582.7380 | Hog           | 100          | 25.2720  | 41804.6200 | 1584.3020 | 41904.6200 | 1579.1960 | -3.1270  | -7.0840 |
| 42650.8220             | 1526.3350 | Sog           | 100          | 34.0430  | 42600.8220 | 1529.8770 | 42700.8220 | 1524.2620 | -7.0840  | -4.1470 |
| 42995.8830             | 1512.0270 | Sog           | 200          | 35.9980  | 42895.8830 | 1516.1740 | 43095.8830 | 1513.4360 | -4.1470  | 1.4090  |
| 43254.9520             | 1515.6780 | Hog           | 250          | 43.0420  | 43129.9520 | 1513.9170 | 43379.9520 | 1510.1800 | 1.4090   | -4.3990 |
| 43449.9170             | 1507.1020 | Sog           | 60           | 9.9610   | 43419.9170 | 1508.4210 | 43479.9170 | 1507.5890 | -4.3990  | 1.6240  |
| 43540                  | 1508.5650 | Hog           | 60           | 59.8460  | 43510      | 1508.0780 | 43570      | 1508.7520 | 1.6240   | 0.6220  |
| 43710                  | 1509.6220 | Hog           | 60           | 13.6600  | 43680      | 1509.4350 | 43740      | 1508.4910 | 0.6220   | -3.7710 |
| 43846.0440             | 1504.4920 | Hog           | 60           | 23.1770  | 43816.0440 | 1505.6230 | 43876.0440 | 1502.5840 | -3.7710  | -6.3600 |
| 43922.2040             | 1499.6490 | Sog           | 60           | 14.9840  | 43892.2040 | 1501.5560 | 43952.2040 | 1498.9420 | -6.3600  | -2.3550 |
| 44015                  | 1497.4630 | Hog           | 60           | 168.1950 | 43985      | 1498.1690 | 44045      | 1496.6490 | -2.3550  | -2.7120 |
| 44160                  | 1493.5300 | Sog           | 60           | 10.4730  | 44130      | 1494.3440 | 44190      | 1494.4350 | -2.7120  | 3.0170  |
| 44235                  | 1495.7930 | Hog           | 60           | 12.4040  | 44205      | 1494.8880 | 44265      | 1495.2470 | 3.0170   | -1.8200 |
| 44320                  | 1494.2460 | Sog           | 60           | 18.1310  | 44290      | 1494.7920 | 44350      | 1494.6930 | -1.8200  | 1.4890  |
| 44430                  | 1495.8840 | Sog           | 60           | 17.0610  | 44400      | 1495.4370 | 44460      | 1497.3860 | 1.4890   | 5.0060  |
| 44577.6920             | 1503.2770 | Hog           | 150          | 17.1890  | 44502.6920 | 1499.5230 | 44652.6920 | 1500.4870 | 5.0060   | -3.7210 |
| 44729.9690             | 1497.6110 | Sog           | 60           | 16.4280  | 44699.9690 | 1498.7280 | 44759.9690 | 1497.5910 | -3.7210  | -0.0690 |
| 44855.8660             | 1497.5250 | Hog           | 60           | 11.8560  | 44825.8660 | 1497.5460 | 44885.8660 | 1495.9860 | -0.0690  | -5.1290 |
| 44925.8950             | 1493.9330 | Sog           | 60           | 9.2580   | 44895.8950 | 1495.4720 | 44955.8950 | 1494.3390 | -5.1290  | 1.3520  |
| 45081.4670             | 1496.0360 | Sog           | 100          | 54.0380  | 45031.4670 | 1495.3600 | 45131.4670 | 1497.6370 | 1.3520   | 3.2020  |
| 45315                  | 1503.5140 | Sog           | 200          | 143.4540 | 45215      | 1500.3120 | 45415      | 1508.1110 | 3.2020   | 4.5970  |
| 45676.5900             | 1520.1350 | Sog           | 100          | 41.2440  | 45626.5900 | 1517.8370 | 45726.5900 | 1523.6460 | 4.5970   | 7.0210  |
| 45966.2800             | 1540.4740 | Hog           | 100          | 14.0160  | 45916.2800 | 1536.9640 | 46016.2800 | 1540.4180 | 7.0210   | -0.1140 |
| 46157.1030             | 1540.2570 | Sog           | 100          | 15.5260  | 46107.1030 | 1540.3140 | 46207.1030 | 1543.4210 | -0.1140  | 6.3270  |
| 46303.3330             | 1549.5100 | Sog           | 60           | 55.9060  | 46273.3330 | 1547.6120 | 46333.3330 | 1551.7300 | 6.3270   | 7.4000  |
| 46750.6100             | 1582.6100 | Hog           | 60           | 65.2390  | 46720.6100 | 1580.3900 | 46780.6100 | 1584.5550 | 7.4000   | 6.4810  |
| 46906.4150             | 1592.7080 | Hog           | 60           | 104.3910 | 46876.4150 | 1590.7640 | 46936.4150 | 1594.4800 | 6.4810   | 5.9060  |
| 47033.8420             | 1600.2340 | Sog           | 60           | 48.3750  | 47003.8420 | 1598.4620 | 47063.8420 | 1602.3780 | 5.9060   | 7.1460  |
| 47275                  | 1617.4680 | Hog           | 60           | 48.1140  | 47245      | 1615.3240 | 47305      | 1619.2370 | 7.1460   | 5.8990  |
| 47625.9520             | 1638.1710 | Hog           | 300          | 42.6420  | 47475.9520 | 1629.3220 | 47775.9520 | 1636.4670 | 5.8990   | -1.1360 |
| 47915.0510             | 1634.8870 | Sog           | 200          | 47.0470  | 47815.0510 | 1636.0230 | 48015.0510 | 1638.0020 | -1.1360  | 3.1150  |

|              |          |                                                                                                                                                                                                       |          |
|--------------|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| Client :     |          | NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED<br>(Ministry of Road Transport & Highways)                                                                                         |          |
| Consultant : |          | SA INFRASTRUCTURE CONSULTANTS PVT LTD<br>Specialized Engineering Service Pvt. Ltd.<br>1101A, 11th Floor, Tower A-II, Corporate Park,<br>Plot No. 7A/1, Sector-142,<br>Road No. 201301, Uttar Pradesh. | INITIALS |
| R0           | Sep 2017 | Final Feasibility Report                                                                                                                                                                              |          |
| R0           | Nov 2016 | Draft Feasibility Report                                                                                                                                                                              |          |
| R0           | Dec 2014 | Linear Plan                                                                                                                                                                                           |          |
| REV          | DATE     | DESCRIPTION OF REVISIONS                                                                                                                                                                              | INITIALS |

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

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

|                                                          |  |
|----------------------------------------------------------|--|
| PACKAGE- 5<br>KAFER TO RHENOCK<br>VERTICAL CURVE DETAILS |  |
| Dwg. No. :- SAICPL--SESPL/NHIDCL/WB--SKM/H.V.R./         |  |

| IP         |           | Type of Curve | Curve Length | K Value  | Start      |           | End        |           | Gradient |         |
|------------|-----------|---------------|--------------|----------|------------|-----------|------------|-----------|----------|---------|
| Chainage   | Level     |               |              |          | Chainage   | Level     | Chainage   | Level     | In       | Out     |
| 48077.8100 | 1639.9570 | Sag           | 60           | 15.8180  | 48047.8100 | 1639.0220 | 48107.8100 | 1642.0290 | 3.1150   | 6.9080  |
| 48295      | 1654.9610 | Hog           | 60           | 75.5270  | 48265      | 1652.8880 | 48325      | 1656.7950 | 6.9080   | 6.1140  |
| 48537.1920 | 1669.7680 | Sag           | 100          | 213.8650 | 48487.1920 | 1666.7110 | 48587.1920 | 1673.0590 | 6.1140   | 6.5810  |
| 48759.4160 | 1684.3930 | Hog           | 60           | 553.2270 | 48729.4160 | 1682.4190 | 48789.4160 | 1686.3350 | 6.5810   | 6.4730  |
| 49782.6420 | 1750.6260 | Hog           | 200          | 108.5460 | 49682.6420 | 1744.1530 | 49882.6420 | 1755.2560 | 6.4730   | 4.6300  |
| 50690      | 1808.9950 | Hog           | 100          | 449.4810 | 50640      | 1805.4500 | 50740      | 1812.4280 | 7.0900   | 6.8670  |
| 51284.5120 | 1849.8210 | Hog           | 200          | 89.0960  | 51184.5120 | 1842.9540 | 51384.5120 | 1854.4430 | 6.8670   | 4.6220  |
| 51692.5000 | 1868.6800 | Sag           | 100          | 56.3350  | 51642.5000 | 1866.3690 | 51742.5000 | 1871.8790 | 4.6220   | 6.3980  |
| 52064.5180 | 1892.4800 | Hog           | 100          | 61.5950  | 52014.5180 | 1889.2810 | 52114.5180 | 1894.8670 | 6.3980   | 4.7740  |
| 52450      | 1910.8830 | Sag           | 100          | 178.2390 | 52400      | 1908.4960 | 52500      | 1913.5510 | 4.7740   | 5.3350  |
| 52815      | 1930.3560 | Sag           | 100          | 100.6280 | 52765      | 1927.6880 | 52865      | 1933.5200 | 5.3350   | 6.3290  |
| 53270.6450 | 1959.1930 | Sag           | 100          | 365.4800 | 53220.6450 | 1956.0290 | 53320.6450 | 1962.4940 | 6.3290   | 6.6020  |
| 53418.3330 | 1968.9440 | Sag           | 60           | 210.9100 | 53388.3330 | 1966.9630 | 53448.3330 | 1971.0100 | 6.6020   | 6.8870  |
| 53615.7300 | 1982.5390 | Hog           | 60           | 40.1510  | 53585.7300 | 1980.4730 | 53645.7300 | 1984.1560 | 6.8870   | 5.3930  |
| 53780      | 1991.3970 | Sag           | 60           | 54.8000  | 53750      | 1989.7790 | 53810      | 1993.3430 | 5.3930   | 6.4870  |
| 54193.2780 | 2018.2080 | Hog           | 300          | 23.1770  | 54043.2780 | 2008.4770 | 54343.2780 | 2008.5240 | 6.4870   | -6.4560 |
| 54601.1560 | 1991.8740 | Sag           | 200          | 23.5790  | 54501.1560 | 1998.3300 | 54701.1560 | 1993.8990 | -6.4560  | 2.0260  |
| 54831.0540 | 1996.5310 | Sag           | 100          | 26.2260  | 54781.0540 | 1995.5180 | 54881.0540 | 1999.4500 | 2.0260   | 5.8390  |
| 54975.7280 | 2004.9780 | Hog           | 100          | 36.0250  | 54925.7280 | 2002.0590 | 55025.7280 | 2006.5090 | 5.8390   | 3.0630  |
| 55229.0210 | 2012.7360 | Sag           | 100          | 24.8020  | 55179.0210 | 2011.2050 | 55279.0210 | 2016.2830 | 3.0630   | 7.0950  |
| 55390      | 2024.1570 | Hog           | 60           | 16.1450  | 55360      | 2022.0290 | 55420      | 2025.1710 | 7.0950   | 3.3780  |
| 55735      | 2035.8130 | Hog           | 400          | 38.4830  | 55535      | 2029.0560 | 55935      | 2021.7810 | 3.3780   | -7.0160 |
| 56369.6600 | 1991.2860 | Sag           | 100          | 100.7110 | 56319.6600 | 1994.7940 | 56419.6600 | 1988.2750 | -7.0160  | -6.0230 |
| 56658.2620 | 1973.9040 | Sag           | 200          | 227.1770 | 56558.2620 | 1979.9270 | 56758.2620 | 1968.7610 | -6.0230  | -5.1430 |
| 57222.9670 | 1944.8640 | Sag           | 300          | 29.9460  | 57072.9670 | 1952.5780 | 57372.9670 | 1952.1770 | -5.1430  | 4.8750  |
| 57930      | 1979.3350 | Hog           | 48.6980      | 64       | 57905.6510 | 1978.1470 | 57954.3490 | 1980.3360 | 4.8750   | 4.1140  |
| 58161.7610 | 1988.8700 | Hog           | 200          | 135.2180 | 58061.7610 | 1984.7560 | 58261.7610 | 1991.5060 | 4.1140   | 2.6350  |
| 58435.9740 | 1996.0970 | Sag           | 200          | 45.2620  | 58335.9740 | 1993.4610 | 58535.9740 | 2003.1510 | 2.6350   | 7.0540  |
| 58877.5550 | 2027.2460 | Hog           | 60           | 42.5600  | 58847.5550 | 2025.1300 | 58907.5550 | 2028.9400 | 7.0540   | 5.6440  |
| 59109.4090 | 2040.3330 | Hog           | 100          | 890.0950 | 59059.4090 | 2037.5110 | 59159.4090 | 2043.0990 | 5.6440   | 5.5320  |
| 59280      | 2049.7700 | Sag           | 60           | 60.9620  | 59250      | 2048.1100 | 59310      | 2051.7250 | 5.5320   | 6.5160  |
| 59462.2720 | 2061.6470 | Sag           | 100          | 339.5910 | 59412.2720 | 2058.3890 | 59512.2720 | 2065.0520 | 6.5160   | 6.8110  |
| 60750.8360 | 2148.0630 | Sag           | 200          | 531.0660 | 60650.8360 | 2141.4400 | 60850.8360 | 2155.0620 | 6.6220   | 6.9990  |
| 61100      | 2172.5000 | Hog           | 60           | 16.7780  | 61070      | 2170.4000 | 61130      | 2173.5270 | 6.9990   | 3.4230  |

# TYPICAL CROSS SECTION

DATE: 28/11/2019 - 11:18am  
PATH: C:\Users\sa\Documents\2019\SA TYPICAL CROSS - SECTION - SA TCS - F.dwg

PROPOSED RIGHT OF WAY

HILL SIDE

BREAST WALL

DRAIN

1500  
PAVED  
SHOULDER

7000  
PROPOSED CARRIAGEWAY

1500  
PAVED  
SHOULDER

1000  
EARTHEN  
SHOULDER

24000

11600

Q PROPOSED

2.5%

2.5%

PARAPET  
WALL

VALLEY  
SIDE

RETAINING  
WALL

40 MM BC  
110 MM BSM  
200 MM CTSB  
500 MM SUBGRADE

PROPOSED RIGHT OF WAY

**TCS-I**

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

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

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

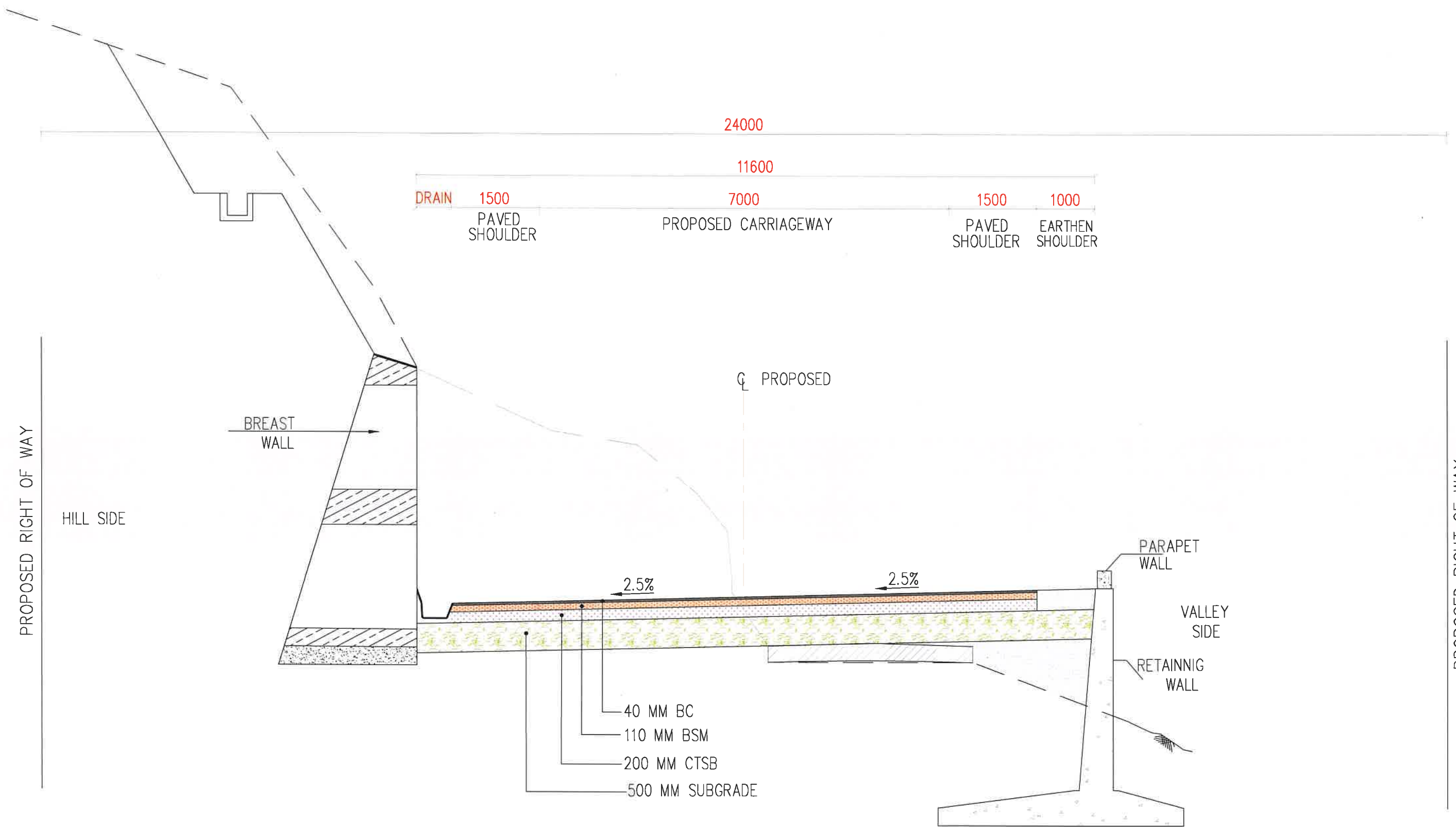
Project :  
Consultancy for Preparation of Feasibility Report cum Preliminary  
Design for Alternative Highway to Gangtok in Sikkim via  
Bagrakot-Chuikhim-Nimbong-Kafer-Bakhim-Algarah-Rhenok in the State of  
West Bengal and From Rhenok-Rorathang-Pakyong along with  
Spur From Aritar-Rolep-Menla in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

|                      |          |               |
|----------------------|----------|---------------|
| DATE : November 2019 | Revision | RO            |
| DESIGNED BY          | DRAWN BY | CHECKED BY    |
| Vijay Gupta          | Naresh   | Vijay Gupta   |
| APPROVED BY          |          | Sanjay Shukla |

SCALE:-NTS

**PACKAGE-5**  
KAFER TO RHENOCK  
TYPICAL CROSS SECTION

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



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

DATE: 29/11/2019 - 11:21am  
PATH: D:\G...15 Dec 1963\54\TYPICAL CROSS - SECTION - S\TCS-F.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<br>(Ministry of Road Transport & Highways)                                                                                        |
| Consultant : | SA INFRASTRUCTURE CONSULTANTS PVT. LTD.<br>Specialized Engineering Service Pvt. Ltd.<br>1101A, 11th Floor, Tower A-II, Corporate Park,<br>Plot No. 7A/1, Sector-142,<br>Noida-201301, Uttar Pradesh. |

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

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

|                                                        |
|--------------------------------------------------------|
| PACKAGE-5<br>KAFER TO RHENOCK<br>TYPICAL CROSS SECTION |
| Dwg. No. :- SAICPL-SESPL/NHIDCL/WB-SKM/TCS/2           |

PROPOSED RIGHT OF WAY

HILL SIDE

BREAST WALL

24000  
11600  
DRAIN 1500  
PAVED SHOULDER  
7000  
PROPOSED CARRIAGEWAY  
1500  
PAVED SHOULDER  
1000  
EARTHEN SHOULDER

CL PROPOSED

2.5%

2.5%

PARAPET WALL

VALLEY SIDE

RETAINING WALL

40 MM BC  
110 MM BSM  
200 MM CTSB  
500 MM SUBGRADE

PROPOSED RIGHT OF WAY

### TCS-III

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

DATE: 29/11/2019 - 11:21am  
PATH: C:\Users\SAICPL\Desktop\TCS-III\TCS-III.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<br>DEVELOPMENT CORPORATION LIMITED<br>(Ministry of Road Transport & Highways)                                                                                     |
| Consultant : | SA INFRASTRUCTURE CONSULTANTS PVT. LTD.<br>Specialized Engineering Service Pvt. Ltd.<br>1101A, 11th Floor, Tower A-II, Corporate Park,<br>Plot No. 7A/1, Sector-142,<br>Noida 201301, Uttar Pradesh. |

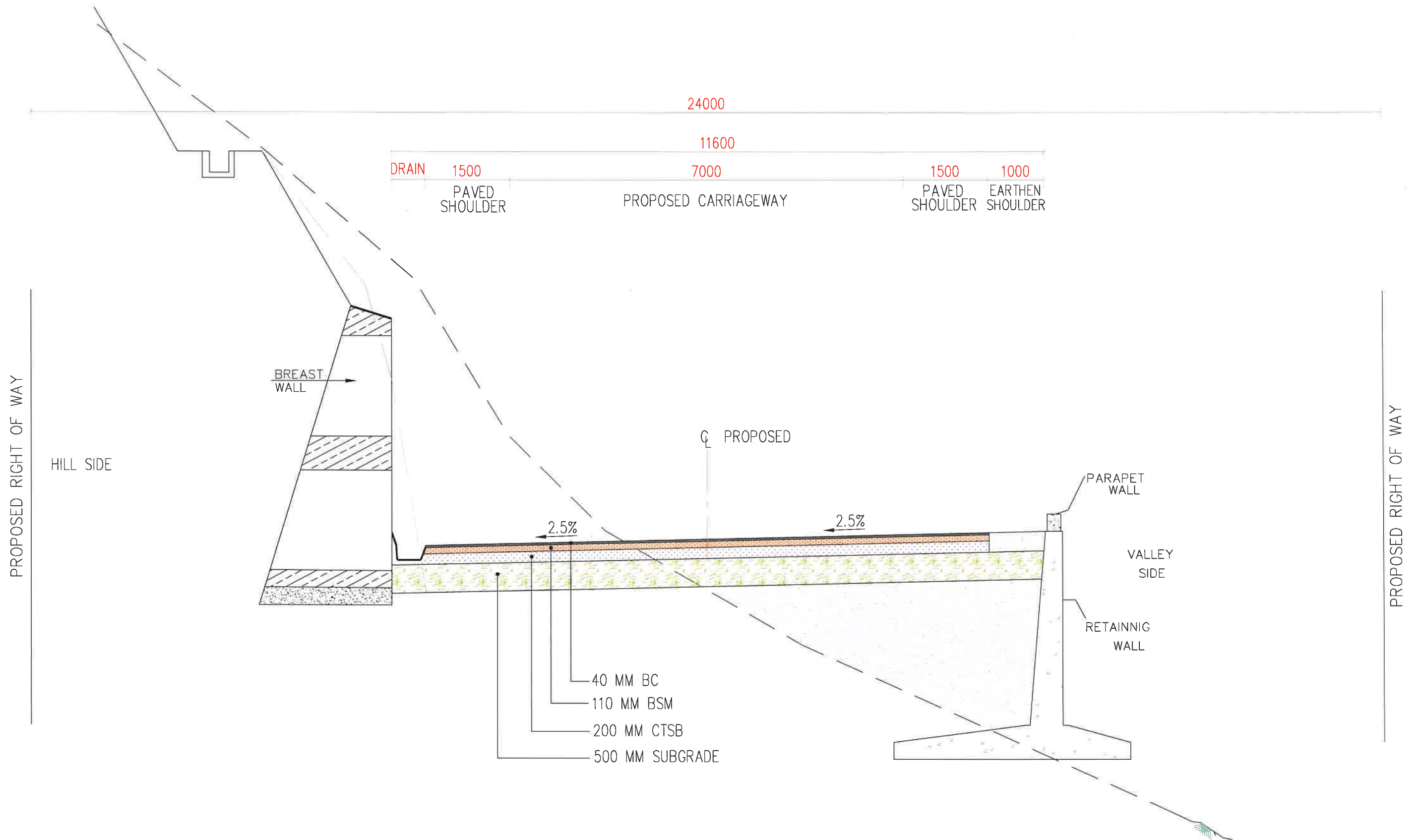
Project :  
Consultancy for Preparation of Feasibility Report cum Preliminary  
Design for Alternative Highway to Gangtok in Sikkim via  
Bagrakot-Chuikhim-Nimbong-Kafer-Bakhim-Algarah-Rhenok in the State of  
West Bengal and From Rhenok-Rorathang-Pakyong along with  
Spur From Aritar-Rolep-Menla in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

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

PACKAGE- 5  
KAFER TO RHENOCK  
TYPICAL CROSS SECTION

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

DATE: 29/11/2019 - 11:21am  
PATH: D:\2-Drawings\13-DWG-198A\TYPICAL CROSS - SECTION - SA/TCS-F.dwg



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

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

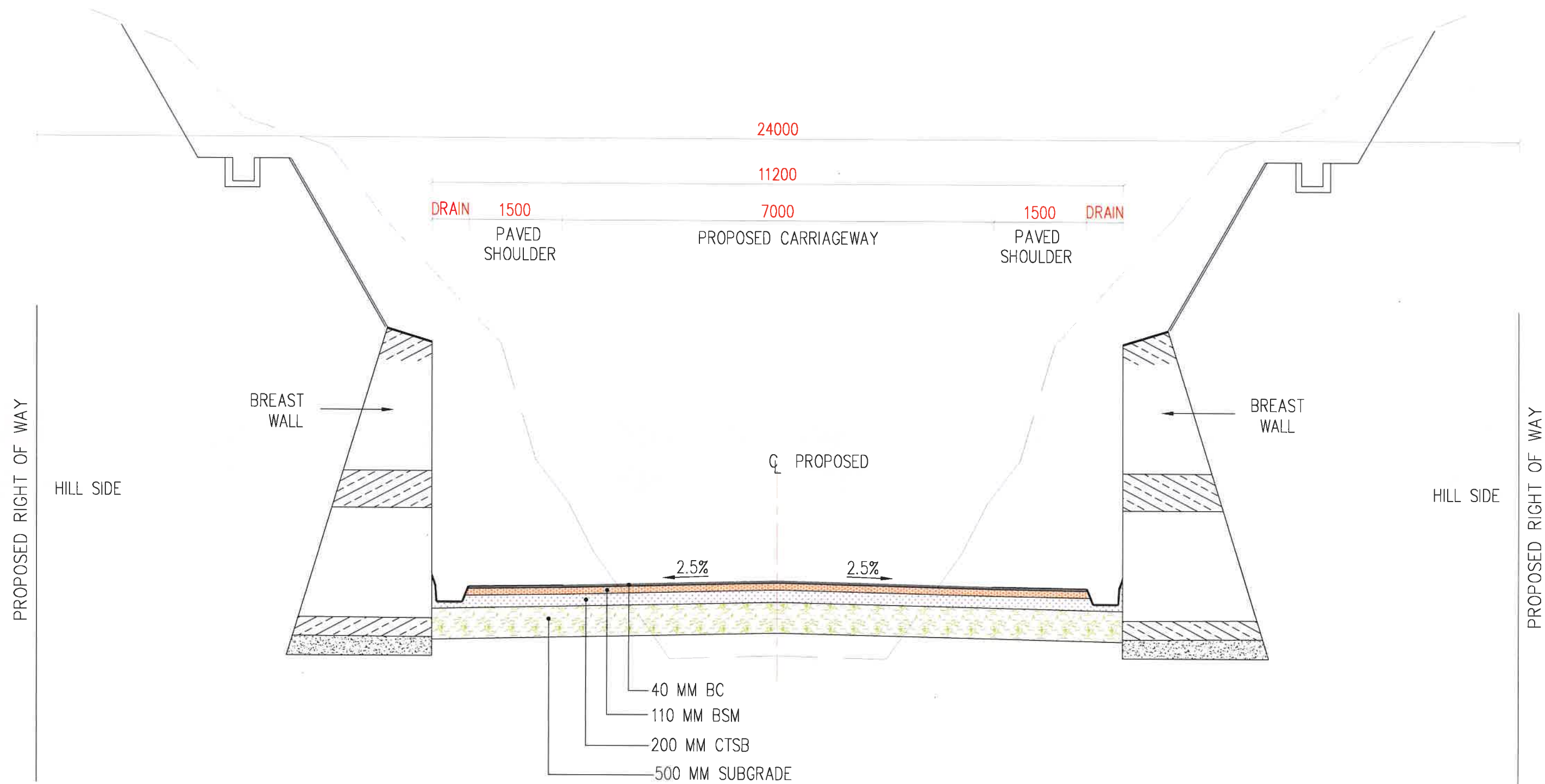
DATE : November 2019

| DESIGNED BY | DRAWN BY | CHECKED BY  | APPROVED BY   |
|-------------|----------|-------------|---------------|
| Vijay Gupta | Naresh   | Vijay Gupta | Sanjay Shukla |

SCALE: -NTS

**PACKAGE-5**  
**KAFER TO RHENOCK**  
**TYPICAL CROSS SECTION**

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



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

DATE: 19/11/2019 - 11:21am  
 PATH: D:\G-Drive\15. Dec 19\15. Dec 19\TCS-V.dwg - SECTION - TCS-V.dwg

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

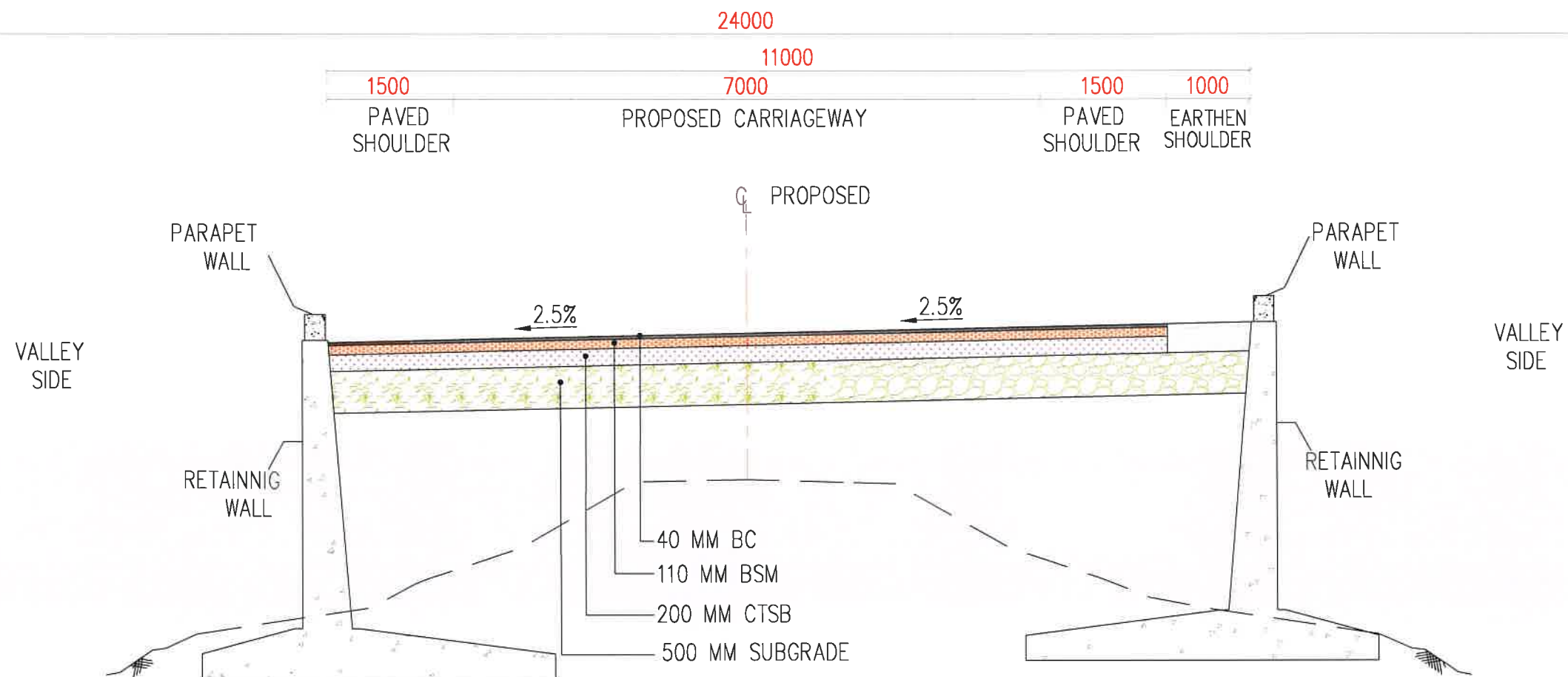
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|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Client :     | NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED<br>(Ministry of Road Transport & Highways)                                                                                      |
| Consultant : | SA INFRASTRUCTURE CONSULTANTS PVT LTD.<br>Specialized Engineering Service Pvt. Ltd.<br>1101A, 11th Floor, Tower A-II, Corporate Park,<br>Plot No. 7A/1, Sector-142,<br>Noida 201301, Uttar Pradesh |

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

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

|                                                               |
|---------------------------------------------------------------|
| <b>PACKAGE-5</b><br>KAFER TO RHENOCK<br>TYPICAL CROSS SECTION |
| Dwg. No. :- SAICPL-SESPL/NHIDCL/WB-SKM/TCS/ 5                 |

PROPOSED RIGHT OF WAY



PROPOSED RIGHT OF WAY

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

DATE: 29/11/2019 - 11:21 am  
PATH: D:\G-4\4.15 Dec 1953\SA\TYPICAL CROSS - SA\TCS-VI.dwg

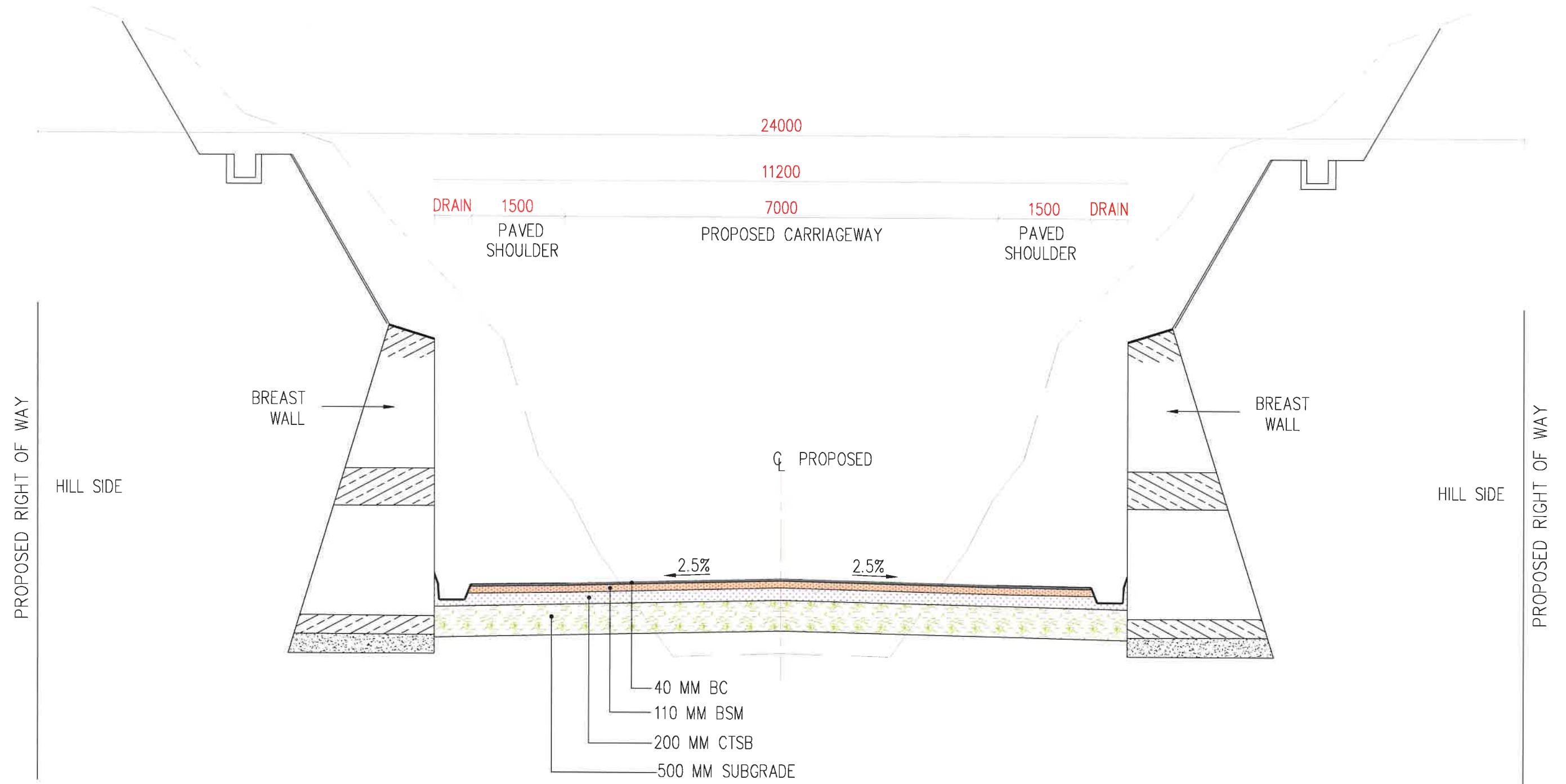
| REV | DATE     | DESCRIPTION OF REVISIONS | INITIALS |
|-----|----------|--------------------------|----------|
| R0  | Sep 2017 | Final Feasibility Report |          |
| R0  | Nov 2016 | Draft Feasibility Report |          |
| R0  | Dec 2014 | Linear Plan              |          |

|              |                                                                                                                                                                                                                            |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Client :     | NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED<br>(Ministry of Road Transport & Highways)                                                                                                              |
| Consultant : | SA INFRASTRUCTURE CONSULTANTS PVT. LTD.<br>In Association with<br>Specialized Engineering Service Pvt. Ltd.<br>1101A, 11th Floor, Tower A-II, Corporate Park,<br>Plot No. 7A/1, Sector-142,<br>Noida 201301, Uttar Pradesh |

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

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

|                                                        |
|--------------------------------------------------------|
| PACKAGE-5<br>KAFER TO RHENOCK<br>TYPICAL CROSS SECTION |
| Dwg. No. :- SAICPL-SESPL/NHIDCL/WB-SKM/TCS/ 6          |



**TCS-VII**  
**Two Lane With Paved Shoulder Realignment (Both Side Hill Section)**

DATE: 20/11/2019 - 11:21 AM  
 PATH: D:\G.4\191119\SA\TCS-VII\TCS-VII.dwg SECTION: TCS-VII

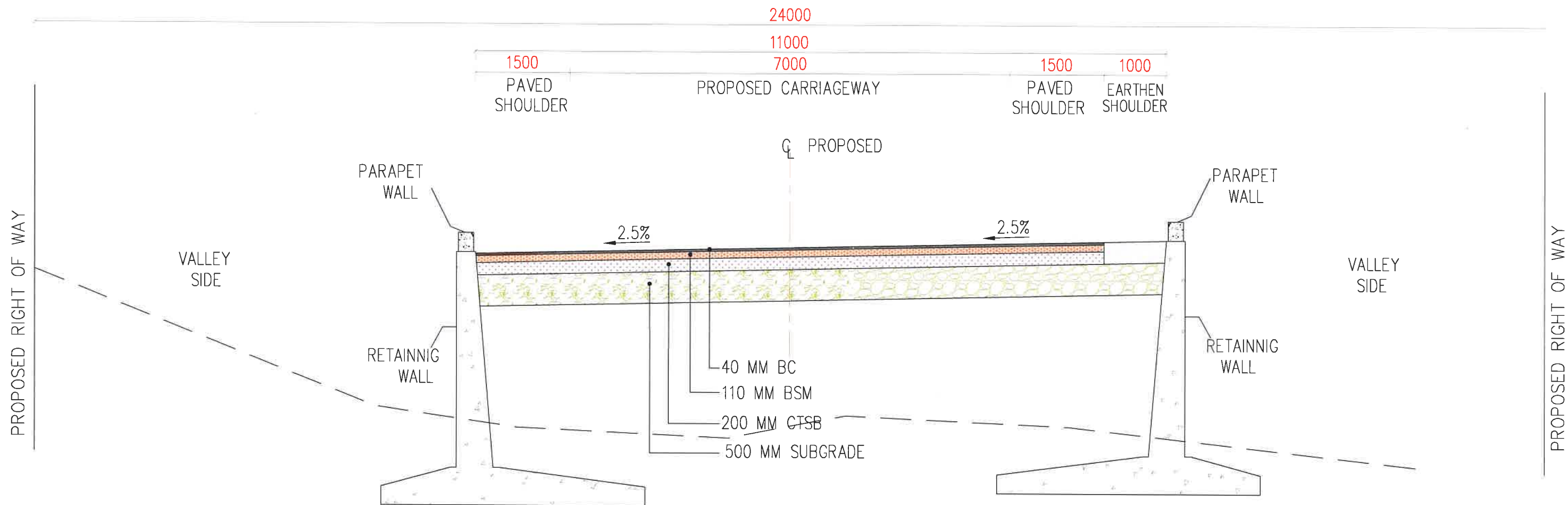
| REV | DATE     | DESCRIPTION OF REVISIONS | INITIALS |
|-----|----------|--------------------------|----------|
| R0  | Sep 2017 | Final Feasibility Report |          |
| R0  | Nov 2016 | Draft Feasibility Report |          |
| R0  | Dec 2014 | Linear Plan              |          |

|              |                                                                                                                                                                                                                             |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Client :     | NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED<br>(Ministry of Road Transport & Highways)                                                                                                               |
| Consultant : | SA INFRASTRUCTURE CONSULTANTS PVT. LTD.<br>In Association with<br>Specialized Engineering Service Pvt. Ltd.<br>1101A, 11th Floor, Tower A-II, Corporate Park,<br>Plot No. 7A/1, Sector-142,<br>Roode 201301, Uttar Pradesh. |

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

|                      |          |               |
|----------------------|----------|---------------|
| DATE : November 2019 | Revision | R0            |
| DESIGNED BY          | DRAWN BY | CHECKED BY    |
| Vijay Gupta          | Noresh   | Vijay Gupta   |
|                      |          | Sanjay Shukla |
| SCALE: - NTS         |          |               |

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|-----------------------------------------------------------------------------|
| <b>PACKAGE-5</b><br><b>KAFER TO RHENOCK</b><br><b>TYPICAL CROSS SECTION</b> |
| Dwg. No. :- SAICPL-SESPL/NHIDCL/WB-SKM/TCS/ 7                               |



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

DATE: 23/11/2019 - 11:21am  
FILE: D:\G-Data\15 Dec 19\SA\TYPICAL CROSS - SECTION - TCS-VIII.dwg

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

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|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Client :     | NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED<br>(Ministry of Road Transport & Highways)                                                                                                               |
| Consultant : | SA INFRASTRUCTURE CONSULTANTS PVT. LTD.<br>In Association with<br>Specialized Engineering Service Pvt. Ltd.<br>1101A, 11th Floor, Tower A-II, Corporate Park,<br>Plot No. 7A/1, Sector-142,<br>Noida 201301, Uttar Pradesh. |

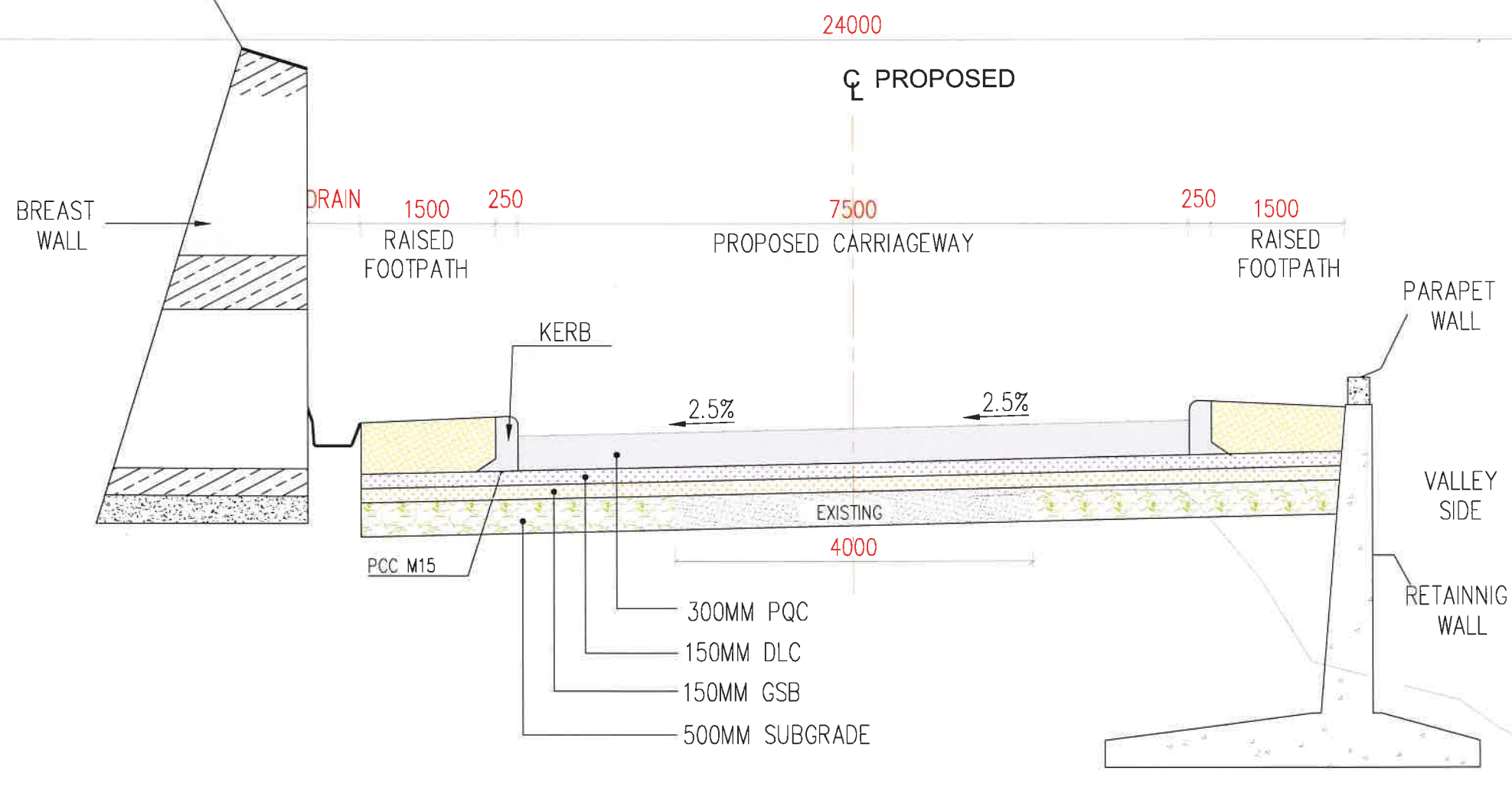
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|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------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

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|--------------------------------------------------------|
| PACKAGE-5<br>KAFER TO RHENOCK<br>TYPICAL CROSS SECTION |
| Dwg. No. :- SAICPL-SESPL/NHIDCL/WB-SKM/TCS/8           |

PROPOSED RIGHT OF WAY

PROPOSED RIGHT OF WAY



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

DATE: 20/11/2019 - 11:22am  
PATH: C:\Users\sa\Documents\SA\TCS-5.dwg - SECTION - TCS-5.dwg

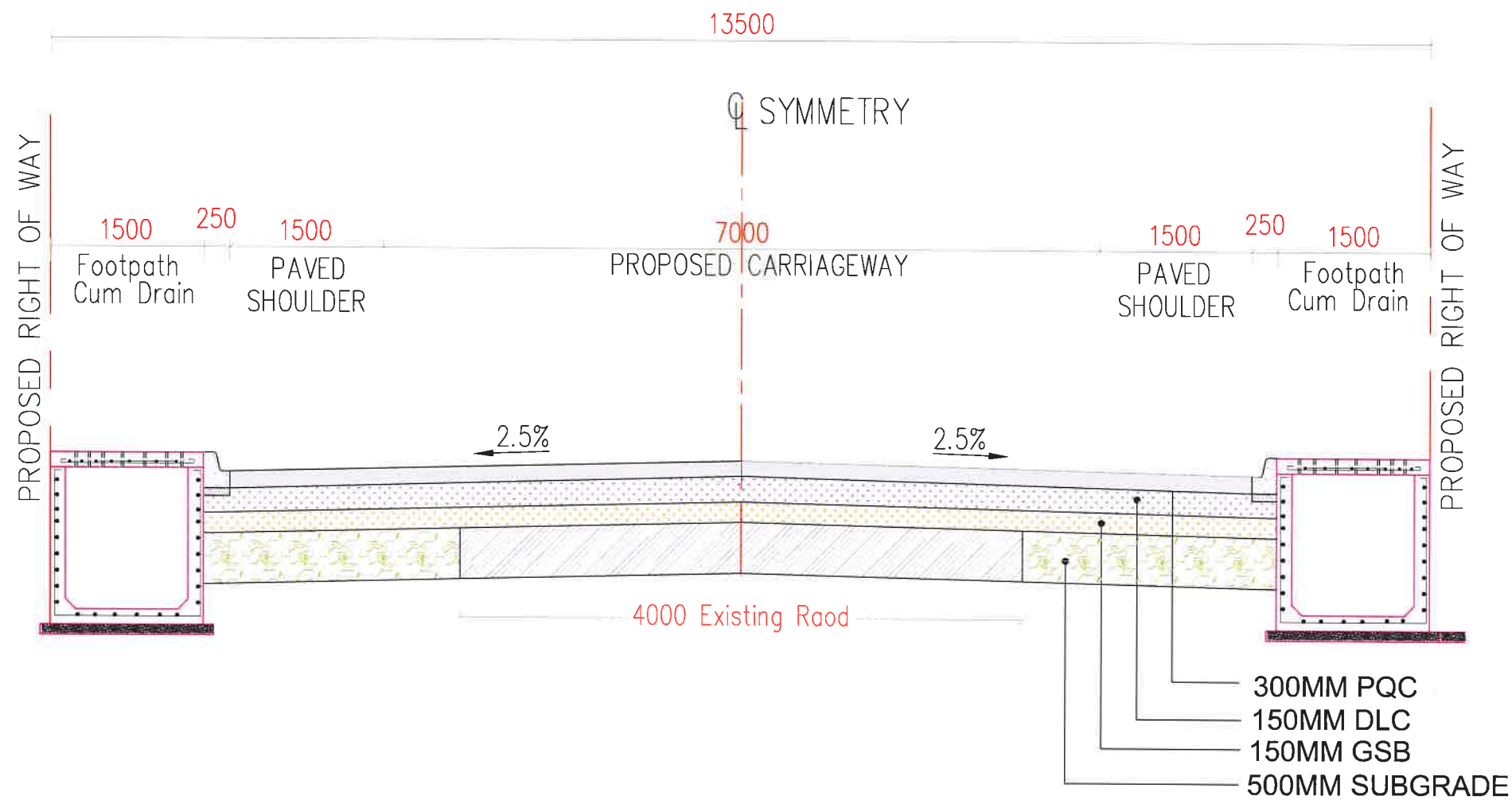
| REV | DATE     | DESCRIPTION OF REVISIONS | INITIALS |
|-----|----------|--------------------------|----------|
| RO  | Sep 2017 | Final Feasibility Report |          |
| RO  | Nov 2016 | Draft Feasibility Report |          |
| RO  | Dec 2014 | Linear Plan              |          |

|              |                                                                                                                                                                                                     |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Client :     | NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED<br>(Ministry of Road Transport & Highways)                                                                                       |
| Consultant : | SA INFRASTRUCTURE CONSULTANTS PVT. LTD.<br>Specialized Engineering Service Pvt. Ltd.<br>1101A, 11th Floor, Tower A-II, Corporate Park,<br>Plot No. 7A/1, Sector-142,<br>Noida-201301, Uttar Pradesh |

|           |                                                                                                                                                                                                                                                                                                              |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Project : | Consultancy for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chuikhim-Nimbong-Kafer-Bakhim-Algarah-Rhenok in the State of West Bengal and From Rhenok-Rorathang-Pakyong along with Spur From Aritar-Rolep-Menla in the State of Sikkim |
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|-------------|---------------|-------------|---------------|
| DATE :      | November 2019 | Revision    | RO            |
| DESIGNED BY | DRAWN BY      | CHECKED BY  | APPROVED BY   |
| Vijay Gupta | Naresh        | Vijay Gupta | Sanjay Shukla |
| SCALE:-NTS  |               |             |               |

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|--------------------------------------------------------|
| PACKAGE-5<br>KAFER TO RHENOCK<br>TYPICAL CROSS SECTION |
| Dwg. No. :- SAICPL-SISPL/NHIDCL/WB-SKM/TCS/9           |



**TCS X**  
**Two Lane Carriageway With Paved Shoulders Including Both Side Drain Cum Footpath**

DATE: 29/11/2019 - 11:25am  
 FILE: D:\CADD\15 Dec 19\SA\TYPICAL CROSS - SECTION - TCS-X.dwg

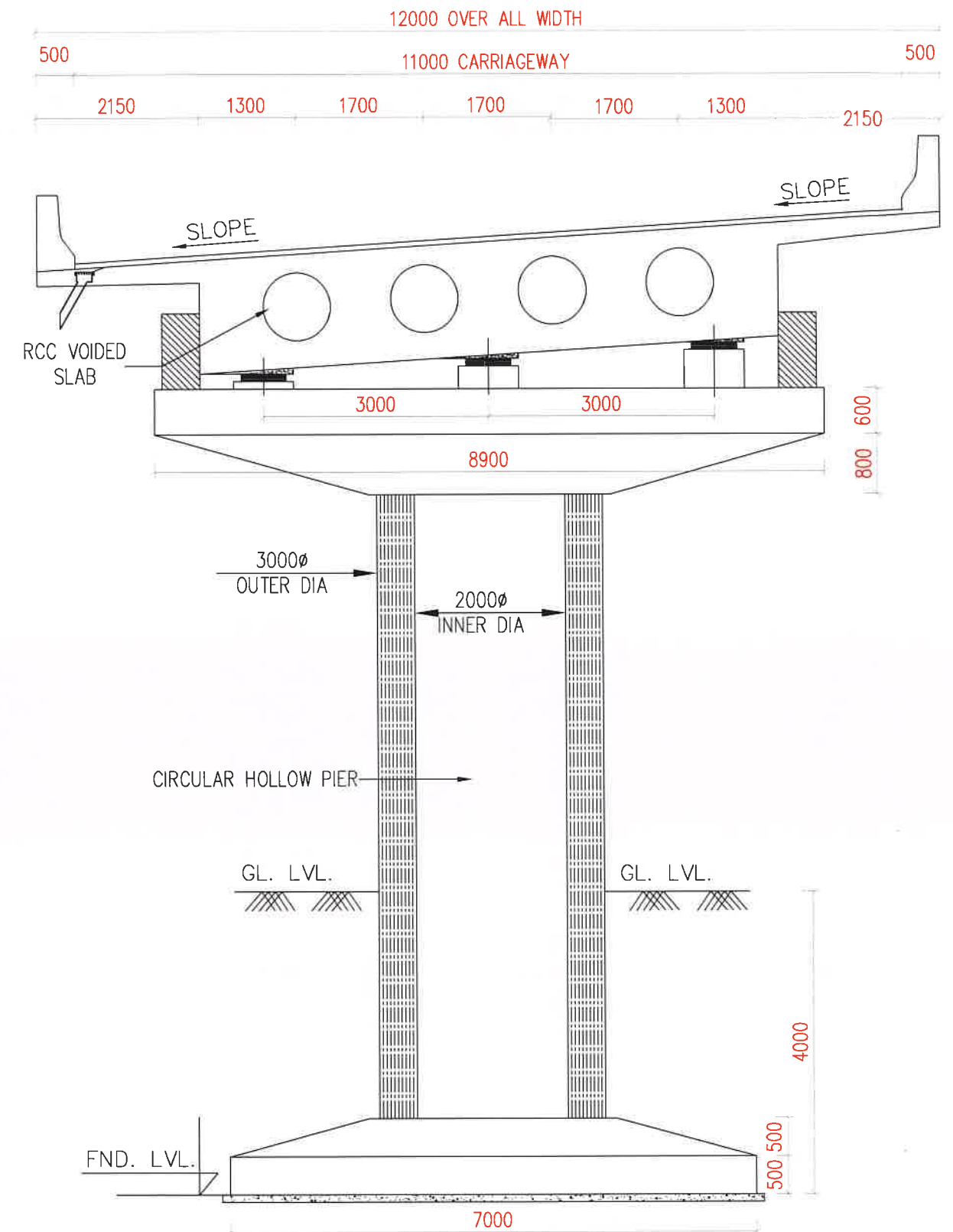
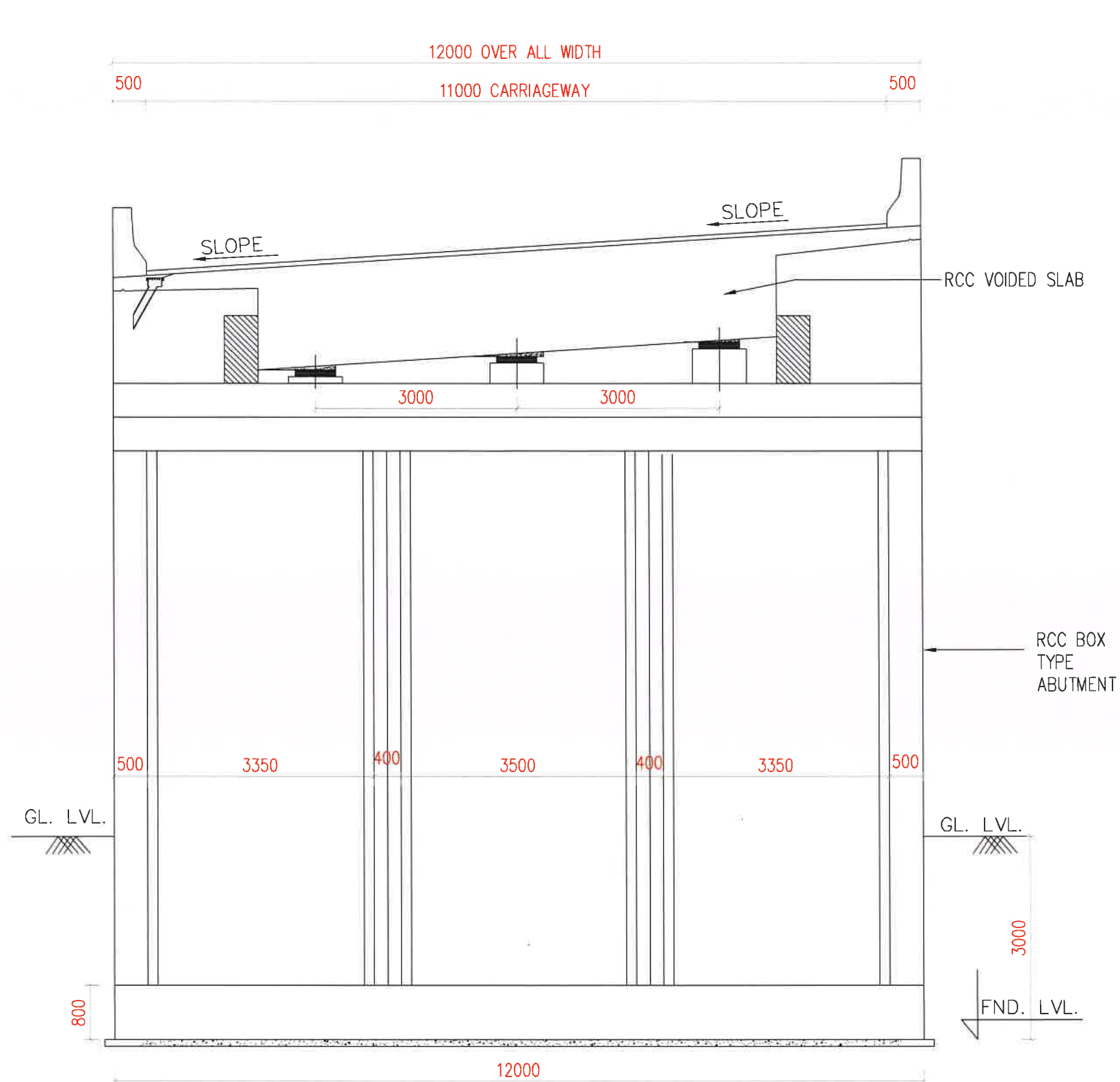
| REV | DATE     | DESCRIPTION OF REVISIONS | INITIALS |
|-----|----------|--------------------------|----------|
| R0  | Sep 2017 | Final Feasibility Report |          |
| R0  | Nov 2016 | Draft Feasibility Report |          |
| R0  | Dec 2014 | Linear Plan              |          |

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|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Client :</b>     | NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED<br>(Ministry of Road Transport & Highways)                                                                                       |
| <b>Consultant :</b> | SA INFRASTRUCTURE CONSULTANTS PVT. LTD.<br>Specialized Engineering Service Pvt. Ltd.<br>1101A, 11th Floor, Tower A-II, Corporate Park,<br>Plot No. 7A/1, Sector-142,<br>Noida-201301, Uttar Pradesh |

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

|                      |          |               |
|----------------------|----------|---------------|
| DATE : November 2019 | Revision | R0            |
| DESIGNED BY          | DRAWN BY | CHECKED BY    |
| Vijay Gupta          | Noresh   | Vijay Gupta   |
|                      |          | Sanjay Shukla |
| SCALE:-NTS           |          |               |

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|---------------------------------------------------------------|
| <b>PACKAGE-5</b><br>KAFER TO RHENOCK<br>TYPICAL CROSS SECTION |
| Dwg. No. :- SAICPL-SESPL/NHIDCL/WB-SKM/TCS/ 10                |



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

DATE: 29/11/2019 - 11:22am  
PATH: D:\G drive\15 Dec 1963\SAI\TYPICAL CROSS - SECTION - TCS-XI.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<br>(Ministry of Road Transport & Highways)                                                                                       |
| Consultant : | SA INFRASTRUCTURE CONSULTANTS PVT. LTD.<br>Specialized Engineering Service Pvt. Ltd.<br>1101A, 11th Floor, Tower A-II, Corporate Park,<br>Plot No. 7A/1, Sector-142,<br>Node 201301, Uttar Pradesh. |

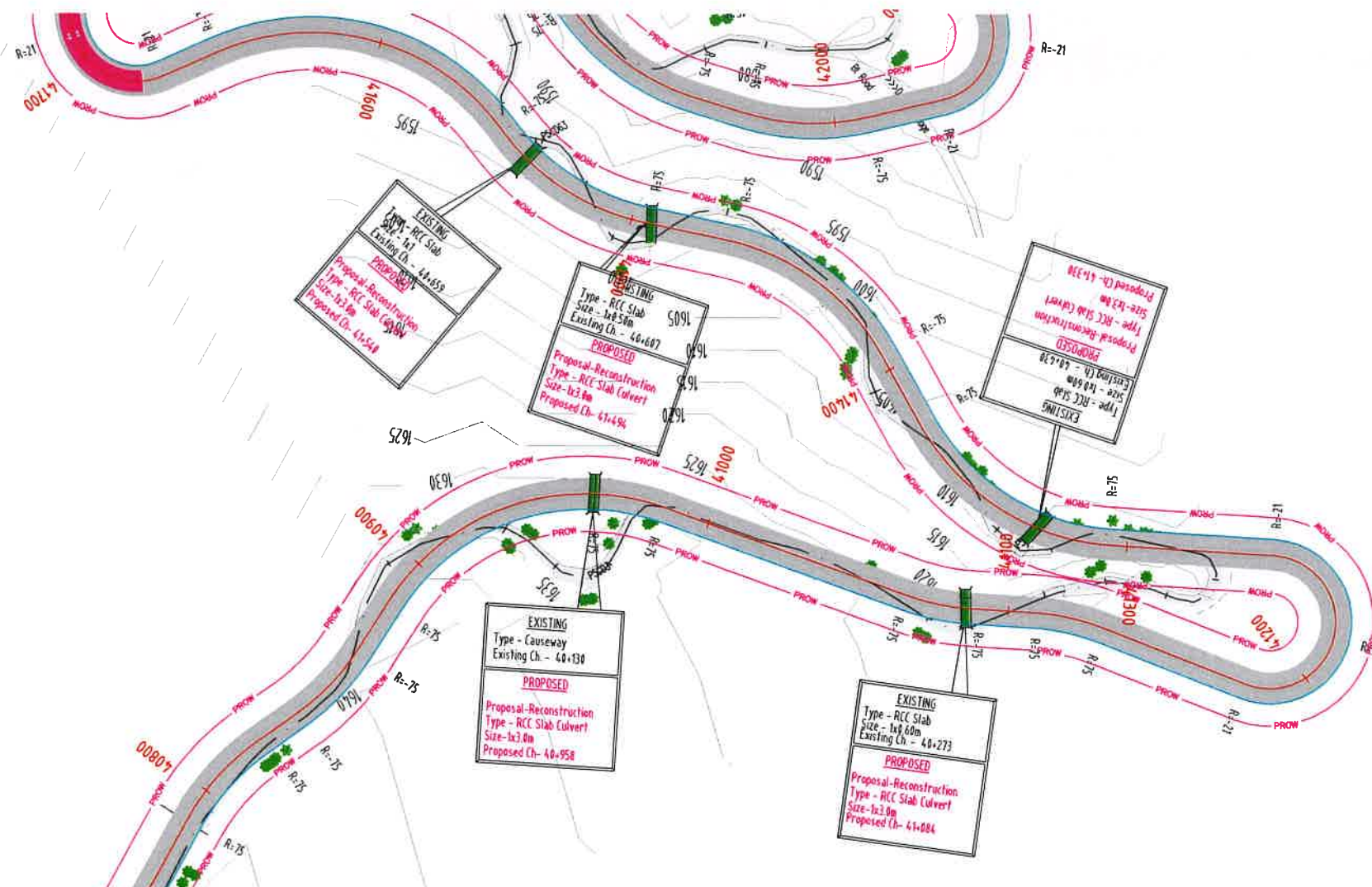
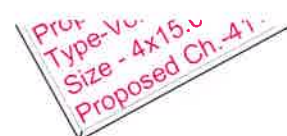
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|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------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

|                                                                             |  |
|-----------------------------------------------------------------------------|--|
| <b>PACKAGE-5</b><br><b>KAFER TO RHENOCK</b><br><b>TYPICAL CROSS SECTION</b> |  |
| Dwg. No. :- SAICPL-SESPL/NHIDCL/WB-SKM/TCS/11                               |  |

# PLAN & PROFILE

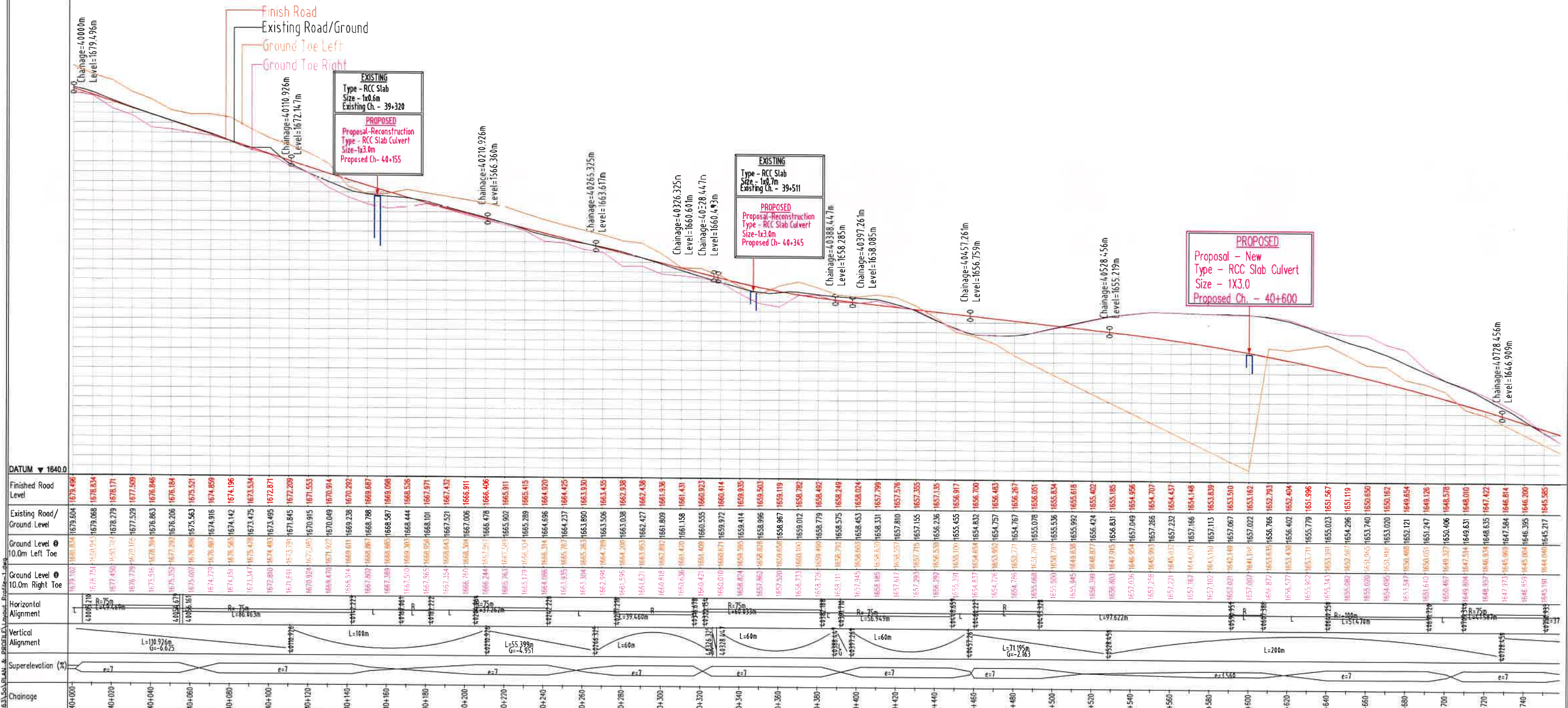
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|             |                                                                                                                                                   |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
|             | <p align="center"><b>PACKAGE- 5A</b><br/> <b>KAFER TO RHENOCK</b><br/> <b>PLAN &amp; PROFILE</b><br/>         (PLAN - Km 40+000 To Km 41+500)</p> |
|             |                                                                                                                                                   |
| Dwg. No. :- | SAICPL-SESP/L/NHIDCL/WB-SKM/P&P/01                                                                                                                |

← KAFER

RHENOCK →



DATE: 29/11/2019 - 11:45am

PROJECT: KAFER TO RHENOCK

SCALE: 1:1000

REVISION: 1

DESIGNED BY: W. Gupta

DRAWN BY: Naresh

CHECKED BY: W. Gupta

APPROVED BY: Sanjay Shukla

REVISION: 1

DATE: 29/11/2019 - 11:45am

PROJECT: KAFER TO RHENOCK

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

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

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

DATE: November 2019

DESIGNED BY: W. Gupta

DRAWN BY: Naresh

CHECKED BY: W. Gupta

APPROVED BY: Sanjay Shukla

Revision: RO

PACKAGE-5

KAFER TO RHENOCK

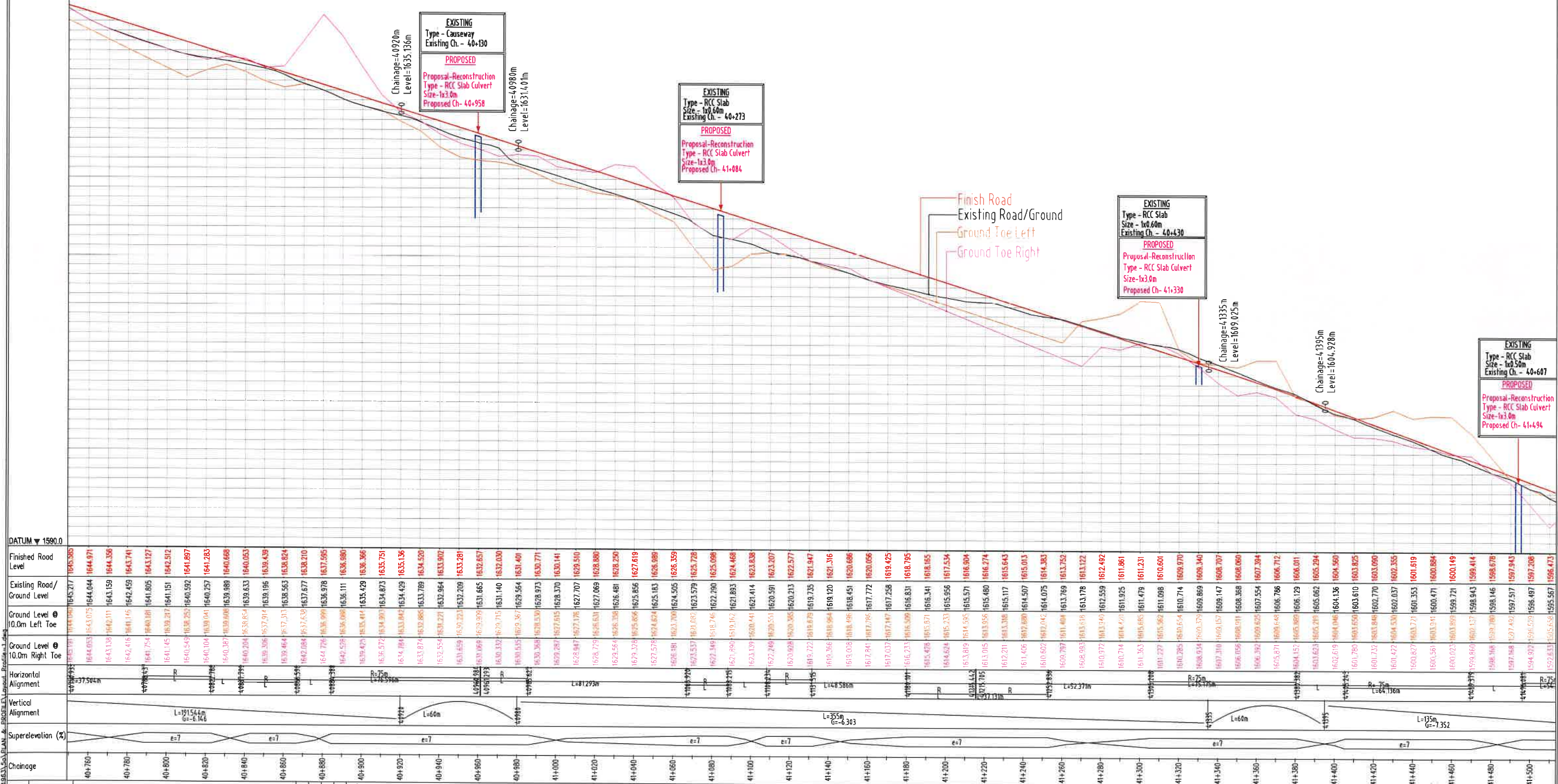
PLAN & PROFILE

Profile: (Km 40+000 To Km 40+750)

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

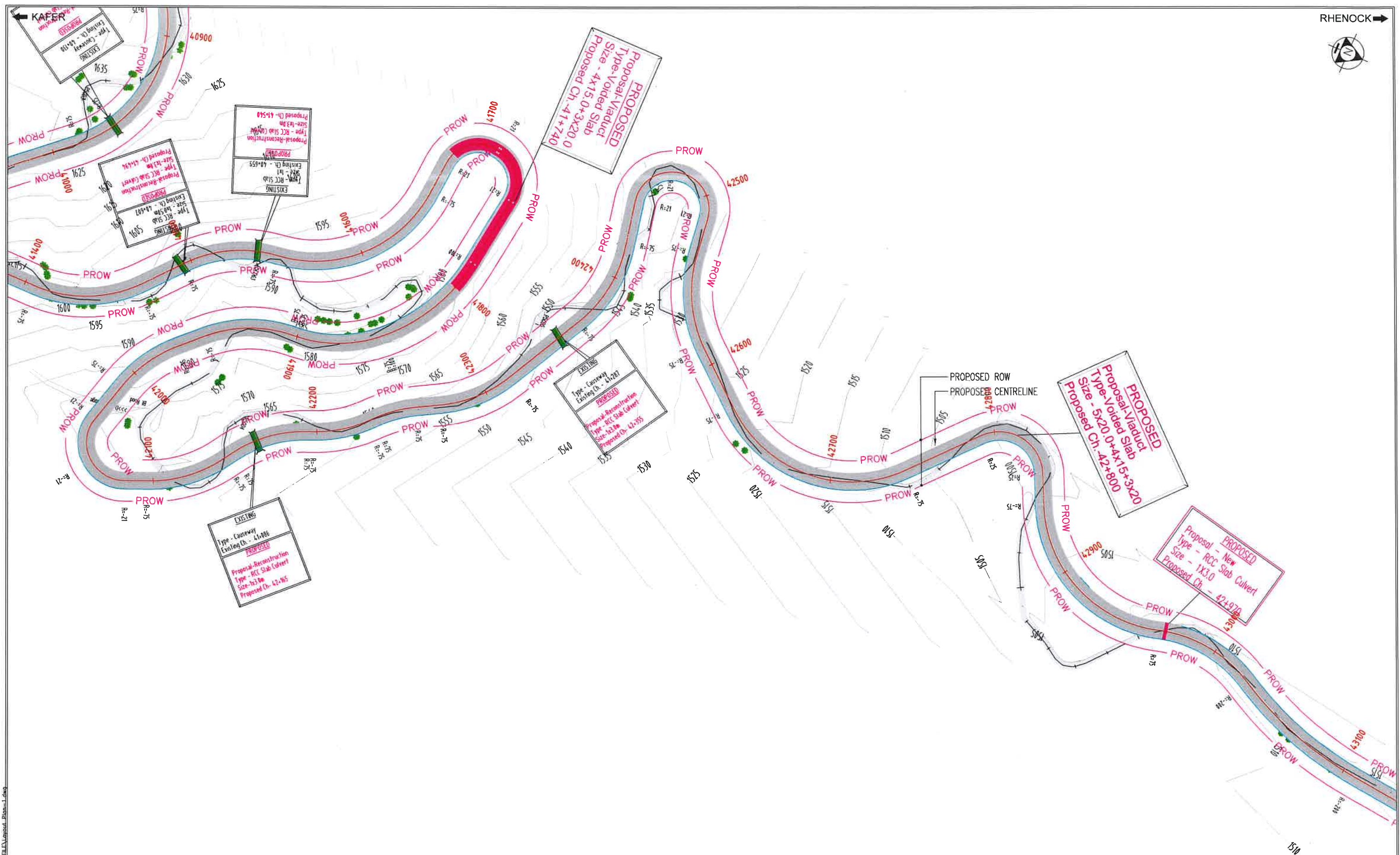
← KAFER

RHENOCK →



DATUM 1590.0

| 1:5000 SO. PLAN & PROFILE Layout Profile - L&S |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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| Finished Road Level                            | 1645.285<br>1645.217<br>1644.955<br>1644.693<br>1644.431<br>1644.169<br>1643.907<br>1643.645<br>1643.383<br>1643.121<br>1642.859<br>1642.597<br>1642.335<br>1642.073<br>1641.811<br>1641.549<br>1641.287<br>1641.025<br>1639.763<br>1639.501<br>1639.239<br>1638.977<br>1638.715<br>1638.453<br>1638.191<br>1637.929<br>1637.667<br>1637.405<br>1637.143<br>1636.881<br>1636.619<br>1636.357<br>1636.095<br>1635.833<br>1635.571<br>1635.309<br>1635.047<br>1634.785<br>1634.523<br>1634.261<br>1634.000<br>1633.738<br>1633.476<br>1633.214<br>1632.952<br>1632.690<br>1632.428<br>1632.166<br>1631.904<br>1631.642<br>1631.380<br>1631.118<br>1630.856<br>1630.594<br>1630.332<br>1630.070<br>1629.808<br>1629.546<br>1629.284<br>1629.022<br>1628.760<br>1628.498<br>1628.236<br>1627.974<br>1627.712<br>1627.450<br>1627.188<br>1626.926<br>1626.664<br>1626.402<br>1626.140<br>1625.878<br>1625.616<br>1625.354<br>1625.092<br>1624.830<br>1624.568<br>1624.306<br>1624.044<br>1623.782<br>1623.520<br>1623.258<br>1623.000<br>1622.738<br>1622.476<br>1622.214<br>1621.952<br>1621.690<br>1621.428<br>1621.166<br>1620.904<br>1620.642<br>1620.380<br>1620.118<br>1619.856<br>1619.594<br>1619.332<br>1619.070<br>1618.808<br>1618.546<br>1618.284<br>1618.022<br>1617.760<br>1617.498<br>1617.236<br>1616.970<br>1616.704<br>1616.440<br>1616.176<br>1615.912<br>1615.648<br>1615.384<br>1615.120<br>1614.856<br>1614.592<br>1614.328<br>1614.064<br>1613.800<br>1613.536<br>1613.272<br>1613.008<br>1612.744<br>1612.480<br>1612.216<br>1611.952<br>1611.688<br>1611.424<br>1611.160<br>1610.896<br>1610.632<br>1610.368<br>1610.104<br>1609.840<br>1609.576<br>1609.312<br>1609.048<br>1608.784<br>1608.520<br>1608.256<br>1607.992<br>1607.728<br>1607.464<br>1607.200<br>1606.936<br>1606.672<br>1606.408<br>1606.144<br>1605.880<br>1605.616<br>1605.352<br>1605.088<br>1604.824<br>1604.560<br>1604.296<br>1604.032<br>1603.768<br>1603.504<br>1603.240<br>1602.976<br>1602.712<br>1602.448<br>1602.184<br>1601.920<br>1601.656<br>1601.392<br>1601.128<br>1600.864<br>1600.600<br>1600.336<br>1600.072<br>1599.808<br>1599.544<br>1599.280<br>1599.016<br>1598.752<br>1598.488<br>1598.224<br>1597.960<br>1597.696<br>1597.432<br>1597.168<br>1596.904<br>1596.640<br>1596.376<br>1596.112<br>1595.848<br>1595.584<br>1595.320<br>1595.056<br>1594.792<br>1594.528<br>1594.264<br>1594.000<br>1593.736<br>1593.472<br>1593.208<br>1592.944<br>1592.680<br>1592.416<br>1592.152<br>1591.888<br>1591.624<br>1591.360<br>1591.096<br>1590.832<br>1590.568<br>1590.304<br>1590.040<br>1589.776<br>1589.512<br>1589.248<br>1588.984<br>1588.720<br>1588.456<br>1588.192<br>1587.928<br>1587.664<br>1587.400<br>1587.136<br>1586.872<br>1586.608<br>1586.344<br>1586.080<br>1585.816<br>1585.552<br>1585.288<br>1585.024<br>1584.760<br>1584.496<br>1584.232<br>1583.968<br>1583.704<br>1583.440<br>1583.176<br>1582.912<br>1582.648<br>1582.384<br>1582.120<br>1581.856<br>1581.592<br>1581.328<br>1581.064<br>1580.800<br>1580.536<br>1580.272<br>1580.008<br>1579.744<br>1579.480<br>1579.216<br>1578.952<br>1578.688<br>1578.424<br>1578.160<br>1577.896<br>1577.632<br>1577.368<br>1577.104<br>1576.840<br>1576.576<br>1576.312<br>1576.048<br>1575.784<br>1575.520<br>1575.256<br>1574.992<br>1574.728<br>1574.464<br>1574.200<br>1573.936<br>1573.672<br>1573.408<br>1573.144<br>1572.880<br>1572.616<br>1572.352<br>1572.088<br>1571.824<br>1571.560<br>1571.296<br>1571.032<br>1570.768<br>1570.504<br>1570.240<br>1570.000<br>1569.736<br>1569.472<br>1569.208<br>1568.944<br>1568.680<br>1568.416<br>1568.152<br>1567.888<br>1567.624<br>1567.360<br>1567.096<br>1566.832<br>1566.568<br>1566.304<br>1566.040<br>1565.776<br>1565.512<br>1565.248<br>1564.984<br>1564.720<br>1564.456<br>1564.192<br>1563.928<br>1563.664<br>1563.400<br>1563.136<br>1562.872<br>1562.608<br>1562.344<br>1562.080<br>1561.816<br>1561.552<br>1561.288<br>1561.024<br>1560.760<br>1560.496<br>1560.232<br>1560.000<br>1559.736<br>1559.472<br>1559.208<br>1558.944<br>1558.680<br>1558.416<br>1558.152<br>1557.888<br>1557.624<br>1557.360<br>1557.096<br>1556.832<br>1556.568<br>1556.304<br>1556.040<br>1555.776<br>1555.512<br>1555.248<br>1554.984<br>1554.720<br>1554.456<br>1554.192<br>1553.928<br>1553.664<br>1553.400<br>1553.136<br>1552.872<br>1552.608<br>1552.344<br>1552.080<br>1551.816<br>1551.552<br>1551.288<br>1551.024<br>1550.760<br>1550.496<br>1550.232<br>1550.000<br>1549.736<br>1549.472<br>1549.208<br>1548.944<br>1548.680<br>1548.416<br>1548.152<br>1547.888<br>1547.624<br>1547.360<br>1547.096<br>1546.832<br>1546.568<br>1546.304<br>1546.040<br>1545.776<br>1545.512<br>1545.248<br>1544.984<br>1544.720<br>1544.456<br>1544.192<br>1543.928<br>1543.664<br>1543.400<br>1543.136<br>1542.872<br>1542.608<br>1542.344<br>1542.080<br>1541.816<br>1541.552<br>1541.288<br>1541.024<br>1540.760<br>1540.496<br>1540.232<br>1540.000<br>1539.736<br>1539.472<br>1539.208<br>1538.944<br>1538.680<br>1538.416<br>1538.152<br>1537.888<br>1537.624<br>1537.360<br>1537.096<br>1536.832<br>1536.568<br>1536.304<br>1536.040<br>1535.776<br>1535.512<br>1535.248<br>1534.984<br>1534.720<br>1534.456<br>1534.192<br>1533.928<br>1533.664<br>1533.400<br>1533.136<br>1532.872<br>1532.608<br>1532.344<br>1532.080<br>1531.816<br>1531.552<br>1531.288<br>1531.024<br>1530.760<br>1530.496<br>1530.232<br>1530.000<br>1529.736<br>1529.472<br>1529.208<br>1528.944<br>1528.680<br>1528.416<br>1528.152<br>1527.888<br>1527.624<br>1527.360<br>1527.096<br>1526.832<br>1526.568<br>1526.304<br>1526.040<br>1525.776<br>1525.512<br>1525.248<br>1524.984<br>1524.720<br>1524.456<br>1524.192<br>1523.928<br>1523.664<br>1523.400<br>1523.136<br>1522.872<br>1522.608<br>1522.344<br>1522.080<br>1521.816<br>1521.552<br>1521.288<br>1521.024<br>1520.760<br>1520.496<br>1520.232<br>1520.000<br>1519.736<br>1519.472<br>1519.208<br>1518.944<br>1518.680<br>1518.416<br>1518.152<br>1517.888<br>1517.624<br>1517.360<br>1517.096<br>1516.832<br>1516.568<br>1516.304<br>1516.040<br>1515.776<br>1515.512<br>1515.248<br>1514.984<br>1514.720<br>1514.456<br>1514.192<br>1513.928<br>1513.664<br>1513.400<br>1513.136<br>1512.872<br>1512.608<br>1512.344<br>1512.080<br>1511.816<br>1511.552<br>1511.288<br>1511.024<br>1510.760<br>1510.496<br>1510.232<br>1510.000<br>1509.736<br>1509.472<br>1509.208<br>1508.944<br>1508.680<br>1508.416<br>1508.152<br>1507.888<br>1507.624<br>1507.360<br>1507.096<br>1506.832<br>1506.568<br>1506.304<br>1506.040<br>1505.776<br>1505.512<br>1505.248<br>1504.984<br>1504.720<br>1504.456<br>1504.192<br>1503.928<br>1503.664<br>1503.400<br>1503.136<br>1502.872<br>1502.608<br>1502.344<br>1502.080<br>1501.816<br>1501.552<br>1501.288<br>1501.024<br>1500.760<br>1500.496<br>1500.232<br>1500.000<br>1499.736<br>1499.472<br>1499.208<br>1498.944<br>1498.680<br>1498.416<br>1498.152<br>1497.888<br>1497.624<br>1497.360<br>1497.096<br>1496.832<br>1496.568<br>1496.304<br>1496.040<br>1495.776<br>1495.512<br>1495.248<br>1494.984<br>1494.720<br>1494.456<br>1494.192<br>1493.928<br>1493.664<br>1493.400<br>1493.136<br>1492.872<br>1492.608<br>1492.344<br>1492.080<br>1491.816<br>1491.552<br>1491.288<br>1491.024<br>1490.760<br>1490.496<br>1490.232<br>1490.000<br>1489.736<br>1489.472<br>1489.208<br>1488.944<br>1488.680<br>1488.416<br>1488.152<br>1487.888<br>1487.624<br>1487.360<br>1487.096<br>1486.832<br>1486.568<br>1486.304<br>1486.040<br>1485.776<br>1485.512<br>1485.248<br>1484.984<br>1484.720<br>1484.456<br>1484.192<br>1483.928<br>1483.664<br>1483.400<br>1483.136<br>1482.872<br>1482.608<br>1482.344<br>1482.080<br>1481.816<br>1481.552<br>1481.288<br>1481.024<br>1480.760<br>1480.496<br>1480.232<br>1480.000<br>1479.736<br>1479.472<br>1479.208<br>1478.944<br>1478.680<br>1478.416<br>1478.152<br>1477.888<br>1477.624<br>1477.360<br>1477.096<br>1476.832<br>1476.568<br>1476.304<br>1476.040<br>1475.776<br>1475.512<br>1475.248<br>1474.984<br>1474.720<br>1474.456<br>1474.192<br>1473.928<br>1473.664<br>1473.400<br>1473.136<br>1472.872<br>1472.608<br>1472.344<br>1472.080<br>1471.816<br>1471.552<br>1471.288<br>1471.024<br>1470.760<br>1470.496<br>1470.232<br>1470.000<br>1469.736<br>1469.472<br>1469.208<br>1468.944<br>1468.680<br>1468.416<br>1468.152<br>1467.888<br>1467.624<br>1467.360<br>1467.096<br>1466.832<br>1466.568<br>1466.304<br>1466.040<br>1465.776<br>1465.512<br>1465.248<br>1464.984<br>1464.720<br>1464.456<br>1464.192<br>1463.928<br>1463.664<br>1463.400<br>1463.136<br>1462.872<br>1462.608<br>1462.344<br>1462.080<br>1461.816<br>1461.552<br>1461.288<br>1461.024<br>1460.760<br>1460.496<br>1460.232<br>1460.000<br>1459.736<br>1459.472<br>1459.208<br>1458.944<br>1458.680<br>1458.416<br>1458.152<br>1457.888<br>1457.624<br>1457.360<br>1457.096<br>1456.832<br>1456.568<br>1456.304<br>1456.040<br>1455.776<br>1455.512<br>1455.248<br>1454.984<br>1454.720<br>1454.456<br>1454.192<br>1453.928<br>1453.664<br>1453.400<br>1453.136<br>1452.872<br>1452.608<br>1452.344<br>1452.080<br>1451.816<br>1451.552<br>1451.288<br>1451.024<br>1450.760<br>1450.496<br>1450.232<br>1450.000<br>1449.736<br>1449.472<br>1449.208<br>1448.944<br>1448.680<br>1448.416<br>1448.152<br>1447.888<br>1447.624<br>1447.360<br>1447.096<br>1446.832<br>1446.568<br>1446.304<br>1446.040<br>1445.776<br>1445.512<br>1445.248<br>1444.984<br>1444.720<br>1444.456<br>1444.192<br>1443.928<br>1443.664<br>1443.400<br>1443.136<br>1442.872<br>1442.608<br>1442.344<br>1442.080<br>1441.816<br>1441.552<br>1441.288<br>1441.024<br>1440.760<br>1440.496<br>1440.232<br>1440.000<br>1439.736<br>1439.472<br>1439.208<br>1438.944<br>1438.680<br>1438.416<br>1438.152<br>1437.888<br>1437.624<br>1437.360<br>1437.096<br>1436.832<br>1436.568<br>1436.304<br>1436.040<br>1435.776<br>1435.512<br>1435.248<br>1434.984<br>1434.720<br>1434.456<br>1434.192<br>1433.928<br>1433.664<br>1433.400<br>1433.136<br>1432.872<br>1432.608<br>1432.344<br>1432.080<br>1431.816<br>1431.552<br>1431.288<br>1431.024<br>1430.760<br>1430.496<br>1430.232<br>1430.000<br>1429.736<br>1429.472<br>1429.208<br>1428.944<br>1428.680<br>1428.416<br>1428.152<br>1427.888<br>1427.624<br>1427.360<br>1427.096<br>1426.832<br>1426.568<br>1426.304<br>1426.040<br>1425.776<br>1425.512<br>1425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|------------------------------|----------|--------------------------|--|----------|
| DATE: D:\G-drive\US Dec-2014 |          |                          |  |          |
|                              |          |                          |  |          |
| R0                           | Sep 2017 | Final Feasibility Report |  |          |
| R0                           | Nov 2016 | Draft Feasibility Report |  |          |
| R0                           | Dec 2014 | Linear Plan              |  |          |
| REV                          | DATE     | DESCRIPTION OF REVISIONS |  | INITIALS |

|                                                                                     |                                                                                                                                                                                                                                     |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <b>Client :</b> NATIONAL HIGHWAYS & INFRASTRUCTURE<br>DEVELOPMENT CORPORATION LIMITED<br>(Ministry of Road Transport & Highways)                                                                                                    |
|  | <b>Consultant :</b> SA INFRASTRUCTURE CONSULTANTS PVT. LTD.<br>In Association with<br>Specialized Engineering Service Pvt. Ltd.<br>110/1A, 11th Floor, Tower A-II, Corporate Park,<br>Plot No. 7A/1, Sector-142,<br>Gurgaon, 122001 |

|           |                                                                                                                                                                                                                                                                                                                     |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Project : | <p>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</p> |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

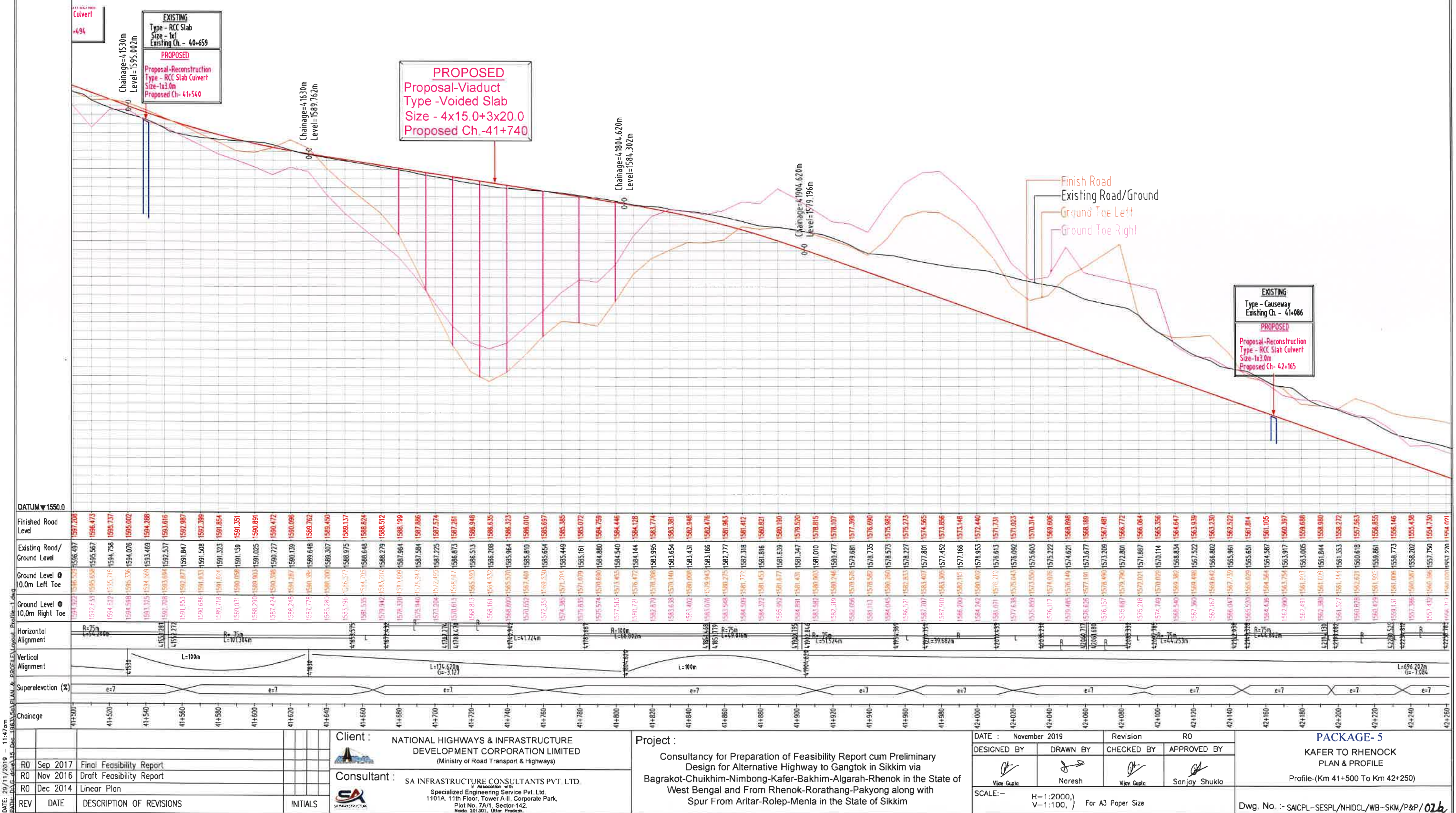
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|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|----|--|
| DATE : November 2019                                                                                                                                              |                                                                                                 | Revision                                                                                             |                                                                                                        | RO |  |
| DESIGNED BY                                                                                                                                                       | DRAWN BY                                                                                        | CHECKED BY                                                                                           | APPROVED BY                                                                                            |    |  |
| <br>Vijay Gupta                                                              | <br>Naresh | <br>Vijay Gupta | <br>Sanjay Shukla |    |  |
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**PACKAGE- 5A**  
**KAFER TO RHENOCK**  
**PLAN & PROFILE**  
**(PLAN - Km 41+500 To Km 43+000)**

Dwg. No. :- SAICPL-SESPL/NHIDCL/WB-SKM/P&P/02

← KAHER

RHENOCK →



KAFER

RHENOCK

**EXISTING**  
Type - Causeway  
Existing Ch. - 41+287

**PROPOSED**  
Proposal-Reconstruction  
Type - RCC Slab Culvert  
Size - 1x3.0m  
Proposed Ch. - 42+355

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

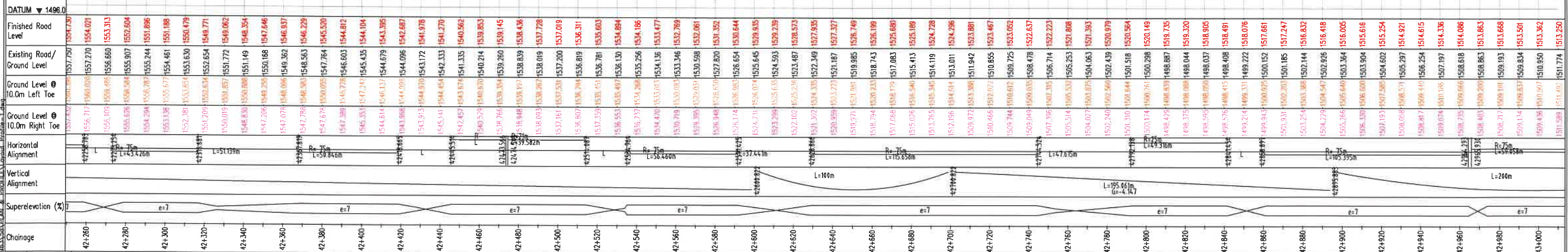
Chainage=42600.822m  
Level=1529.877m

Chainage=42700.822m  
Level=1524.262m

**PROPOSED**  
Proposal-Viaduct  
Type-Voided Slab  
Size - 5x20.0+4x15+3x20  
Proposed Ch.-42+800

Chainage=42895.883m  
Level=1516.174m

**PROPOSED**  
Proposal - New  
Type - RCC Slab Culvert  
Size - 1X3.0  
Proposed Ch. - 42+970



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

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

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

DATE : November 2019  
DESIGNED BY : Viny Gupta  
DRAWN BY : Naresh  
CHECKED BY : Viny Gupta  
APPROVED BY : Sanjay Shukla

Revision : RO

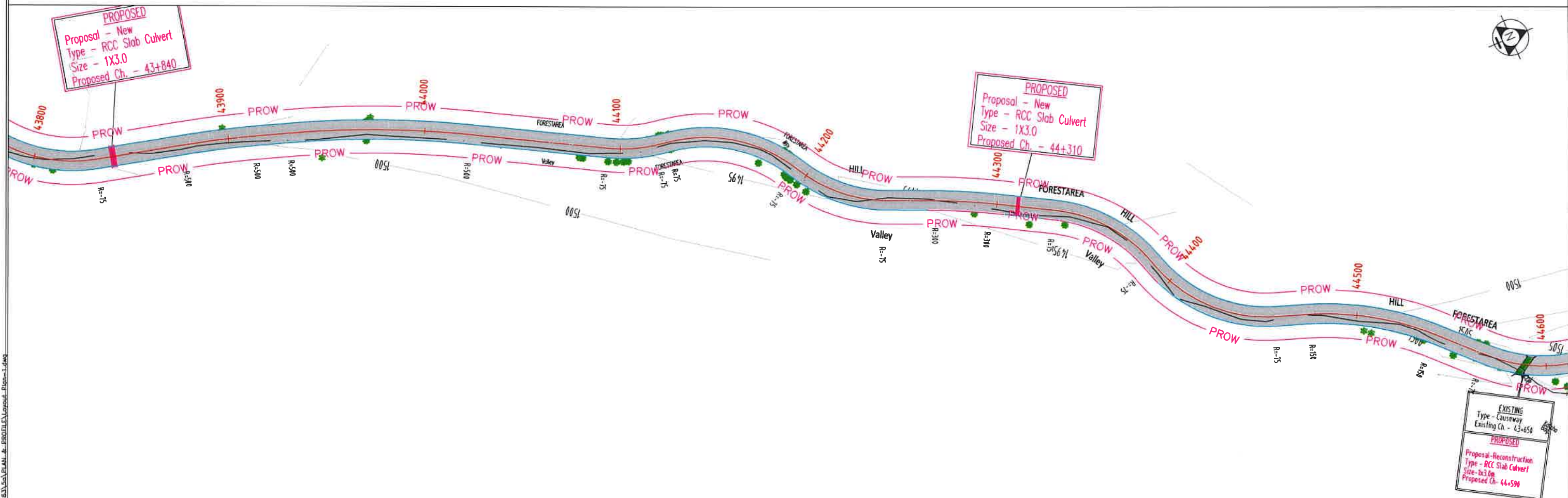
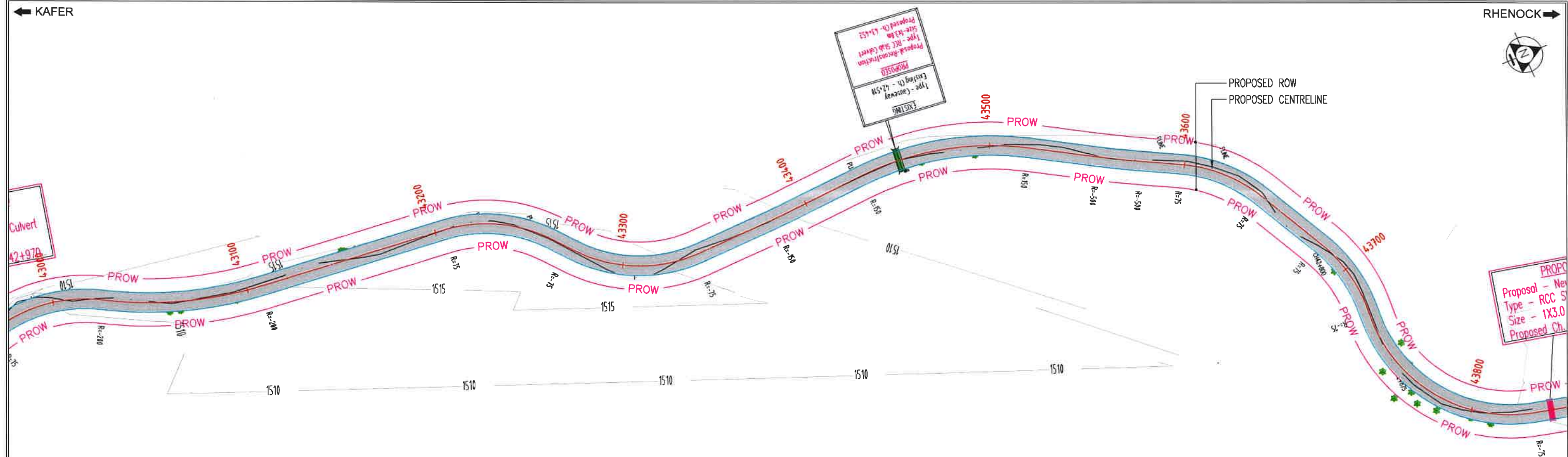
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V-1:100,  
For A3 Paper Size

**PACKAGE-5**  
KAFER TO RHENOCK  
PLAN & PROFILE  
Profile-(Km 42+250 To Km 43+000)

Dwg. No. : SAICPL-SESPL/NHIDCL/WB-SKM/P&P/ 02b

← KAHER

→ RHENOCK



| 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  
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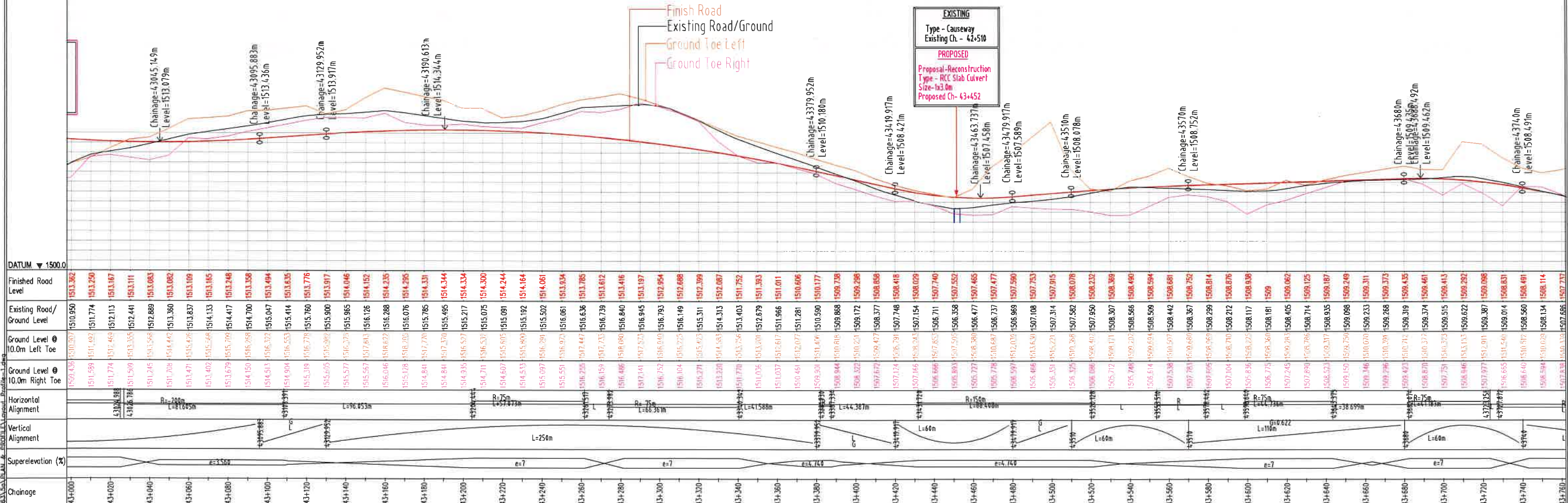
|                      |                       |               |
|----------------------|-----------------------|---------------|
| DATE : November 2019 | Revision              | RO            |
| DESIGNED BY          | DRAWN BY              | CHECKED BY    |
| Vijay Gupta          | Naresh                | Vijay Gupta   |
| SCALE : -            | H-1:2000,<br>V-1:100, | APPROVED BY   |
|                      | For A3 Paper Size     | Sanjay Shukla |

PACKAGE- 5A  
KAHER TO RHENOCK  
PLAN & PROFILE  
(PLAN - Km 43+000 To Km 44+500)

Dwg. No. :- SAICPL-SESPL/NHIDCL/WB-SKM/P&P/03

← KAFER

→ 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-Chuikhim-Nimbong-Kafer-Bakhim-Algarah-Rhenok in the State of West Bengal and From Rhenok-Rorathang-Pakyong along with Spur From Aitar-Rolep-Menla in the State of Sikkim |  |  | DATE : November 2019 |          | Revision : RO         |               | PACKAGE-5                                                              |  |
| Consultant : SA INFRASTRUCTURE CONSULTANTS PVT. LTD. Specialized Engineering Service Pvt. Ltd. 1101A, 11th Floor, Tower A-II, Corporate Park, Plot No. 7A/1, Sector-142, Noida 201301, Uttar Pradesh |  |  |                                                                                                                                                                                                                                                                                                                       |  |  | DESIGNED BY          | DRAWN BY | CHECKED BY            | APPROVED BY   | KAFER TO RHENOCK<br>PLAN & PROFILE<br>Profile-(Km 43+000 To Km 43+750) |  |
|                                                                                                                                                                                                      |  |  |                                                                                                                                                                                                                                                                                                                       |  |  | Vijay Gupta          | Nareesh  | Vijay Gupta           | Sanjay Shukla |                                                                        |  |
|                                                                                                                                                                                                      |  |  |                                                                                                                                                                                                                                                                                                                       |  |  | SCALE:-              |          | H=1:2000,<br>V=1:100, |               | For A3 Paper Size                                                      |  |
|                                                                                                                                                                                                      |  |  |                                                                                                                                                                                                                                                                                                                       |  |  |                      |          |                       |               | Dwg. No. :- SAICPL-SESPL/NHIDCL/WB-SKM/P&P/03a                         |  |

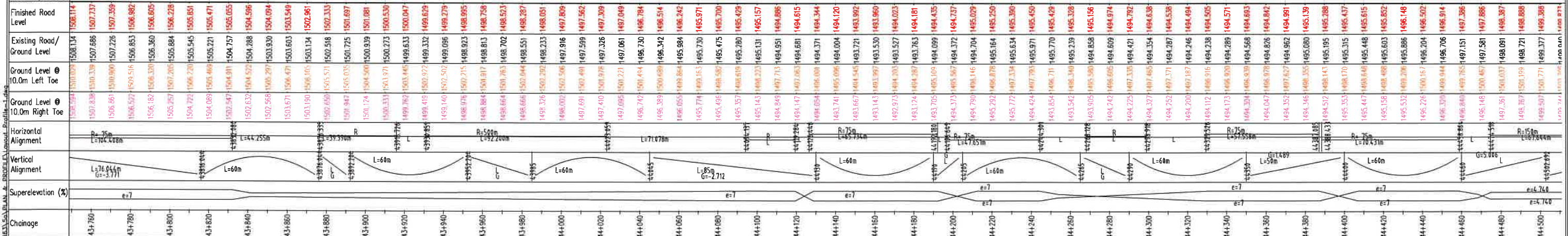
← KAFER

RHENOCK →

**PROPOSED**  
 Proposal - New  
 Type - RCC Slab Culvert  
 Size - 1X3.0  
 Proposed Ch. - 43+840

**PROPOSED**  
 Proposal - New  
 Type - RCC Slab Culvert  
 Size - 1X3.0  
 Proposed Ch. - 44+310

DATUM 1490.0



DATE: 20/11/2019 - 11:47am

PATH: D:\G... \15 Dec 19\KAFER\KAFER\Profile-1.dwg

PROJECT: KAFER TO RHENOCK

SCALE: 1:1000

REVISION: 1

DESIGNED BY: Vigney Gupta

DRAWN BY: Naresh

CHECKED BY: Vigney Gupta

APPROVED BY: Sanjay Shukla

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

Dwg. No. :- SAICPL-SESPL/NHIDCL/WB-SKM/P&amp;P/036

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

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

Project: Consultancy for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-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: November 2019

Revision: RO

DESIGNED BY: Vigney Gupta

DRAWN BY: Naresh

CHECKED BY: Vigney Gupta

APPROVED BY: Sanjay Shukla

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

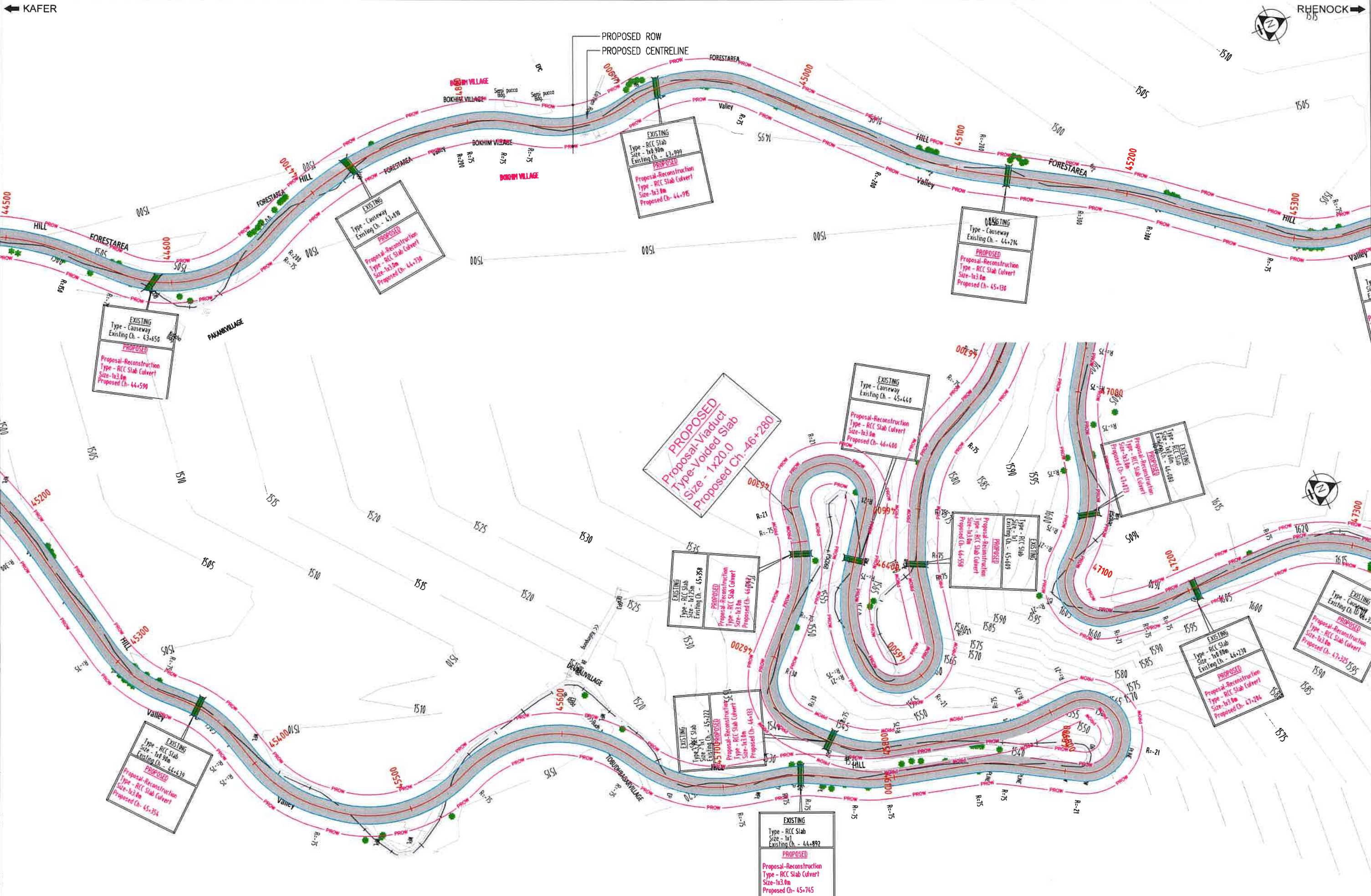
Dwg. No. :- SAICPL-SESPL/NHIDCL/WB-SKM/P&amp;P/036

PACKAGE-5

KAFER TO RHENOCK

PLAN &amp; PROFILE

Profile-(Km 43+750 To Km 44+500)



DATE: 29/11/2019 - 3:08pm  
FILE: D:\G:\dms\15 Dec 19\SA\PLAN & PROFILE\Layout\_Plan-1.dwg

| 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 Service Pvt. Ltd.  
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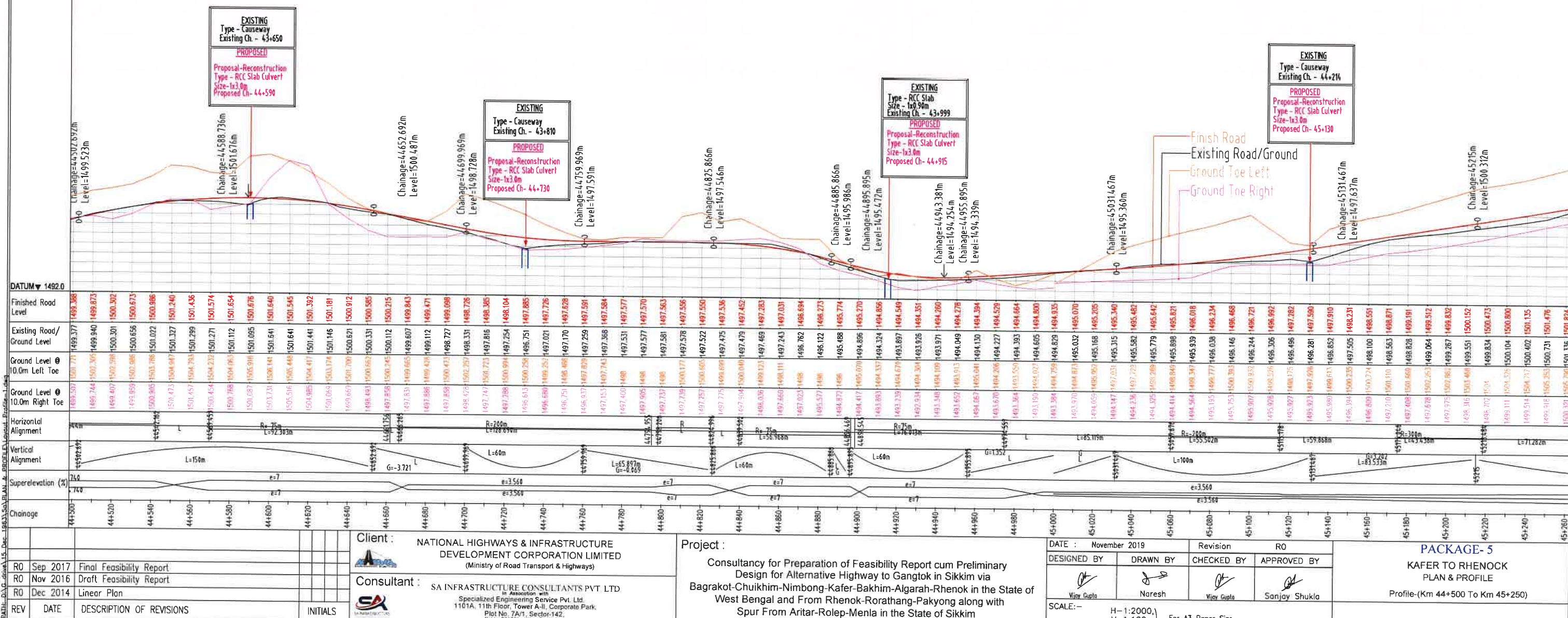
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| DATE : November 2019                    | Revision | RO            |
| DESIGNED BY                             | DRAWN BY | CHECKED BY    |
| Vijay Gupta                             | Naresh   | Vijay Gupta   |
| SCALE: -                                |          | APPROVED BY   |
| H-1:2000,<br>V-1:100, For A3 Paper Size |          | Sanjay Shukla |

PACKAGE- 5A  
KAFER TO RHENOCK  
PLAN & PROFILE  
(PLAN - Km 44+500 To Km 46+750)

Dwg. No. :- SAICPL-SESPL/NHIDCL/WB-SKM/P&P/04

DATE: 29/11/2019 - 11:48am

PATH: D:\G drive\15. Dec 1983\SAIPLAN &amp; PROFILE Layout Profile-1.dwg



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

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

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DATE : November 2019  
DESIGNED BY : Vigney Gupta  
DRAWN BY : Naresh  
CHECKED BY : Vigney Gupta  
APPROVED BY : Sanjay Shukla  
Revision : RO

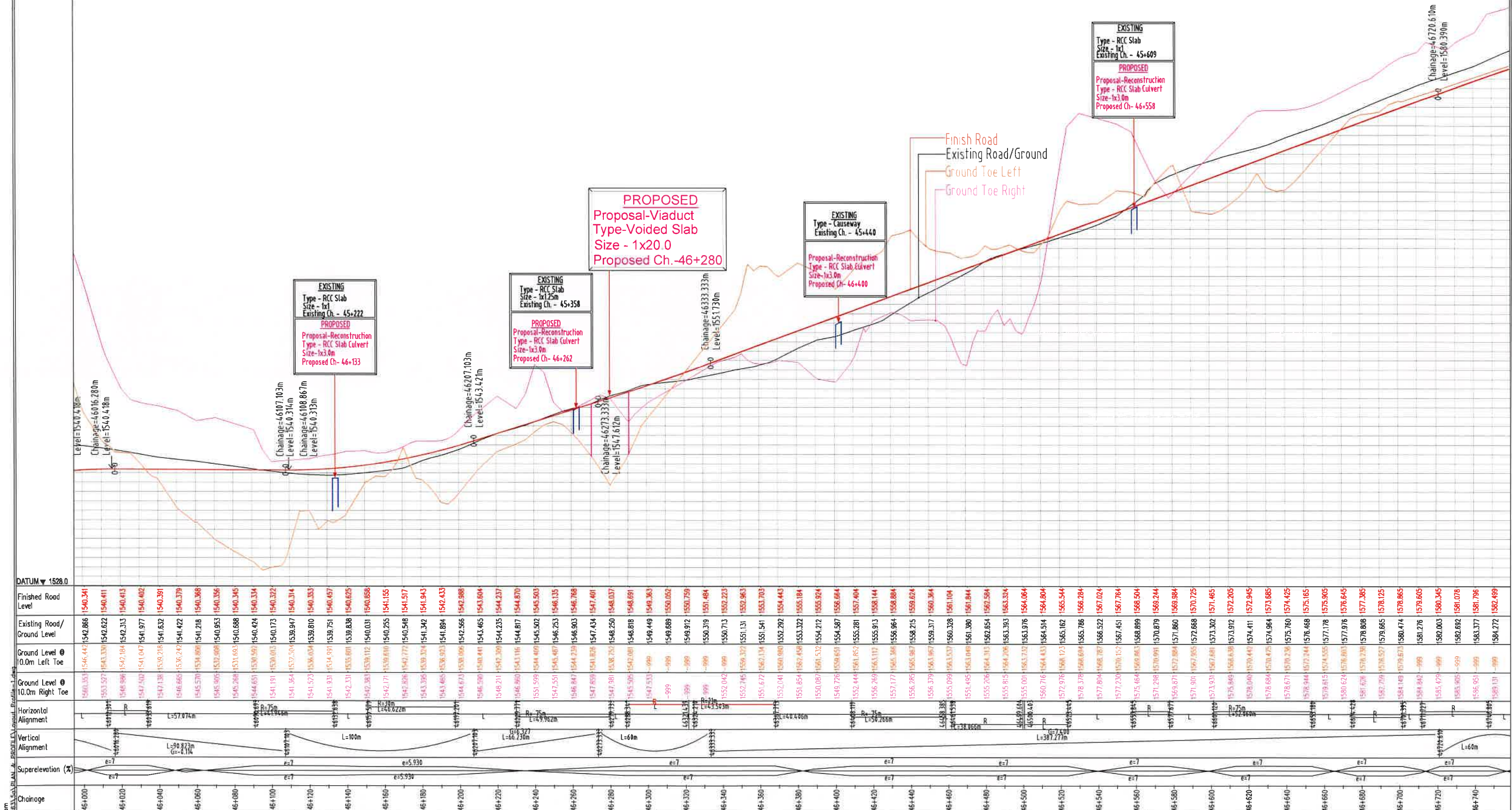
PACKAGE-5  
KAFER TO RHENOCK  
PLAN & PROFILE  
Profile-(Km 44+500 To Km 45+250)  
Dwg. No. :- SAICPL-SESPL/NHIDCL/WB-SKM/P&P/049



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← KAFER

RHENOCK →

DATE: 20/11/2019 - 11:48am  
DRAWN BY: D. C. Jha  
CHECKED BY: D. C. Jha  
DESIGNED BY: D. C. Jha  
SCALE: 1:1000

| 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<br>(Ministry of Road Transport & Highways)                                                                                        |
| Consultant : | SA INFRASTRUCTURE CONSULTANTS PVT. LTD.<br>Specialized Engineering Service Pvt. Ltd.<br>1101A, 11th Floor, Tower A-II, Corporate Park,<br>Plot No. 7A/1, Sector-142,<br>Noida 201301, Uttar Pradesh. |

|           |                                                                                                                                                                                                                                                                                                              |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Project : | Consultancy for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chuikhim-Nimbong-Kafer-Bakhim-Algarah-Rhenok in the State of West Bengal and From Rhenok-Rorathang-Pakyong along with Spur From Aritar-Rolep-Menla in the State of Sikkim |
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| DATE :      | November 2019         | Revision          | RO          |
| DESIGNED BY | DRAWN BY              | CHECKED BY        | APPROVED BY |
|             |                       |                   |             |
| SCALE: -    | H=1:2000,<br>V=1:100, | For A3 Paper Size |             |

|                                                |  |
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| PACKAGE-5                                      |  |
| KAFER TO RHENOCK                               |  |
| PLAN & PROFILE                                 |  |
| Profile-(Km 46+000 To Km 46+750)               |  |
| Dwg. No. :- SAICPL-SESPL/NHIDCL/WB-SKM/P&P/04C |  |



DATE: 29/11/2019 - 3:00pm  
PATH: D:\G drive\15 Dec 1963\SAIBAN & PROFILE\Layout\_Plan-1.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)

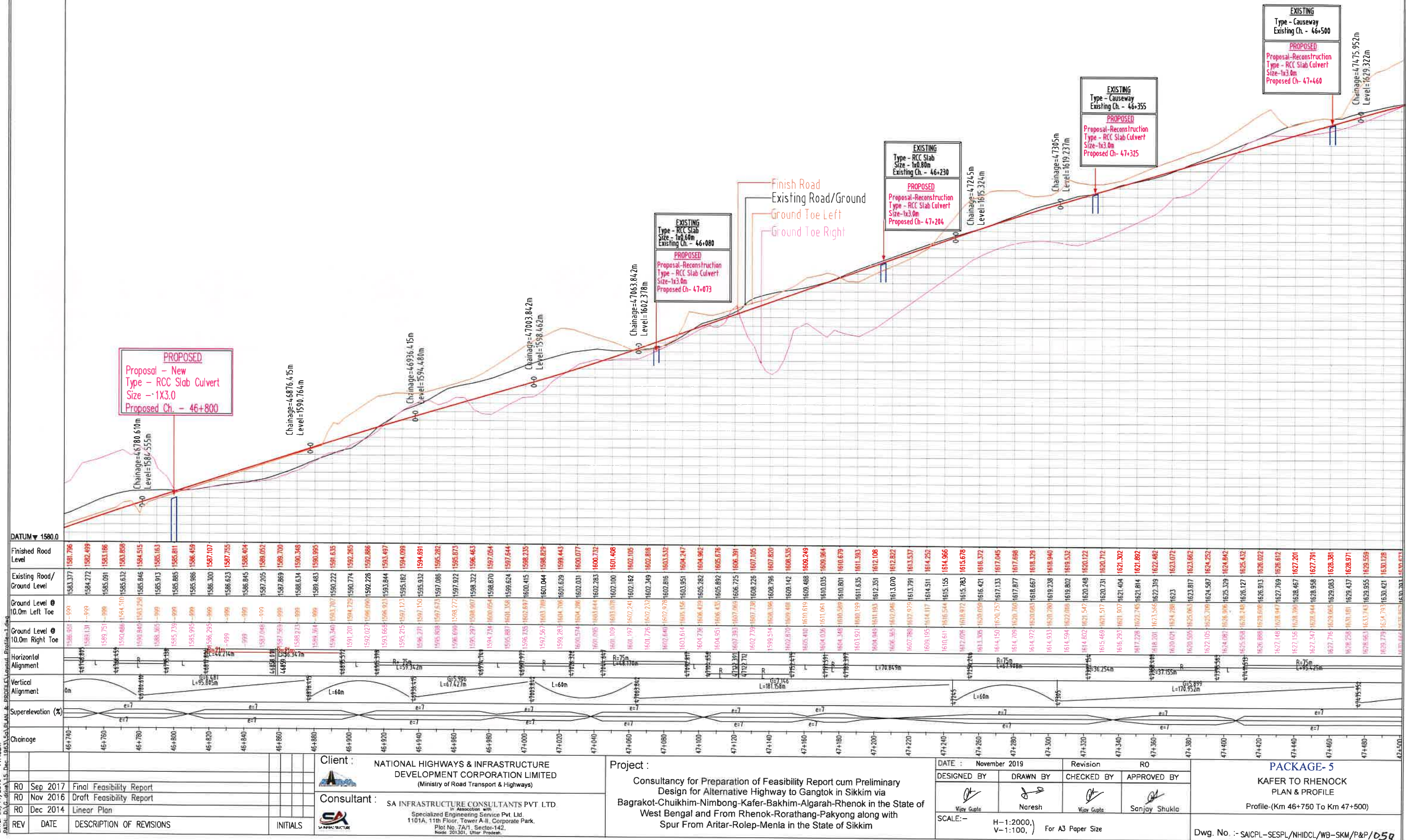
Consultant : SA INFRASTRUCTURE CONSULTANTS PVT. LTD.  
Specialized Engineering Service Pvt. Ltd.  
1101A, 11th Floor, Tower A-II, Corporate Park,  
Plot No. 7A/1, Sector-142,  
Roza 201301, Uttar Pradesh.

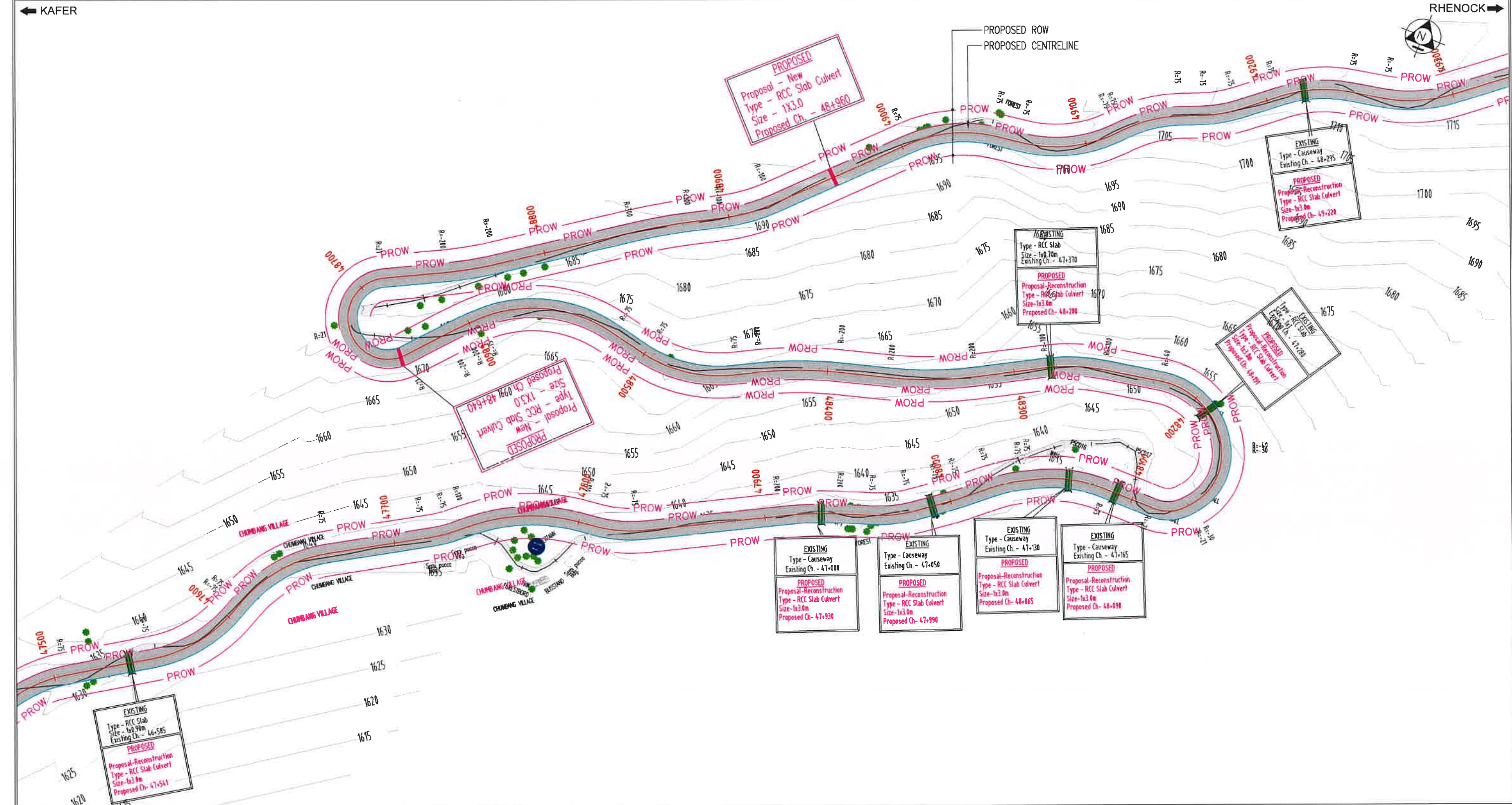
Project : Consultancy for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chuikhim-Nimbong-Kafer-Bakhim-Algarah-Rhenok in the State of West Bengal and From Rhenok-Rorathang-Pakyong along with Spur From Aritar-Rolep-Menla in the State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

|                      |                       |                   |
|----------------------|-----------------------|-------------------|
| DATE : November 2019 | Revision              | RO                |
| DESIGNED BY          | DRAWN BY              | CHECKED BY        |
| Vijay Gupta          | Noresh                | Vijay Gupta       |
|                      |                       | Sanjay Shukla     |
| SCALE: -             | H-1:2000,<br>V-1:100, | For A3 Paper Size |

PACKAGE- 5A  
KA FER TO RHENOCK  
PLAN & PROFILE  
(PLAN - Km 46+750 To Km 47+500)

Dwg. No. :- SAICPL-SESPL/NHIDCL/WB-SKM/P&P/05





DATE: 29/11/2019 - 3:09pm  
 PATH: D:\G drive\15 Dec 1961\SA\PLAN & PROFILE\Layout Plan-1.dwg

| 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)

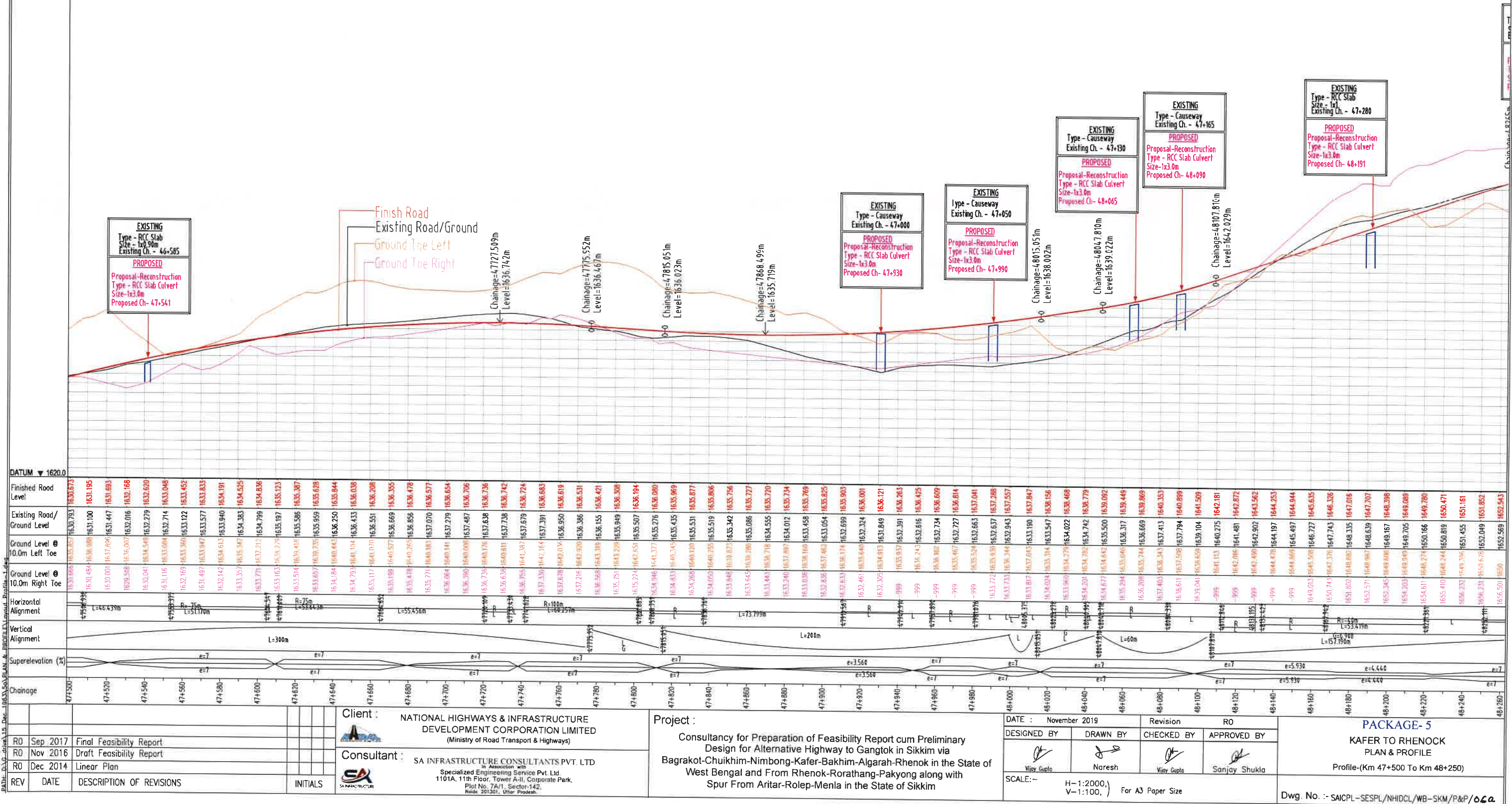
Consultant : SA INFRASTRUCTURE CONSULTANTS PVT. LTD. In Association with Specialized Engineering Service Pvt. Ltd. 1101A, 11th Floor, Tower A-II, Corporate Park, Plot No. 7A/1, Sector-142, Noida 201301, Uttar Pradesh.

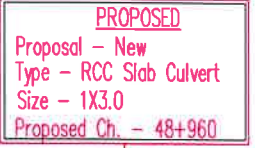
Project : Consultancy for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chuikhim-Nimbong-Kafer-Bakhim-Algarah-Rhenok in the State of West Bengal and From Rhenok-Rorathang-Pakyong along with Spur From Aritar-Rolep-Menla in the State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

|                      |                       |                   |
|----------------------|-----------------------|-------------------|
| DATE : November 2019 | Revision              | RO                |
| DESIGNED BY          | DRAWN BY              | CHECKED BY        |
| Vijay Gupta          | Naresh                | Vijay Gupta       |
|                      |                       | Sanjay Shukla     |
| SCALE: -             | H-1:2000,<br>V-1:100, | For A3 Paper Size |

PACKAGE- 5A  
 KAFER TO RHENOCK  
 PLAN & PROFILE  
 (PLAN - Km 47+500 To Km 49+000)

Dwg. No. :- SAICPL-SESPL/NHIDCL/WB-SKM/P&P/06



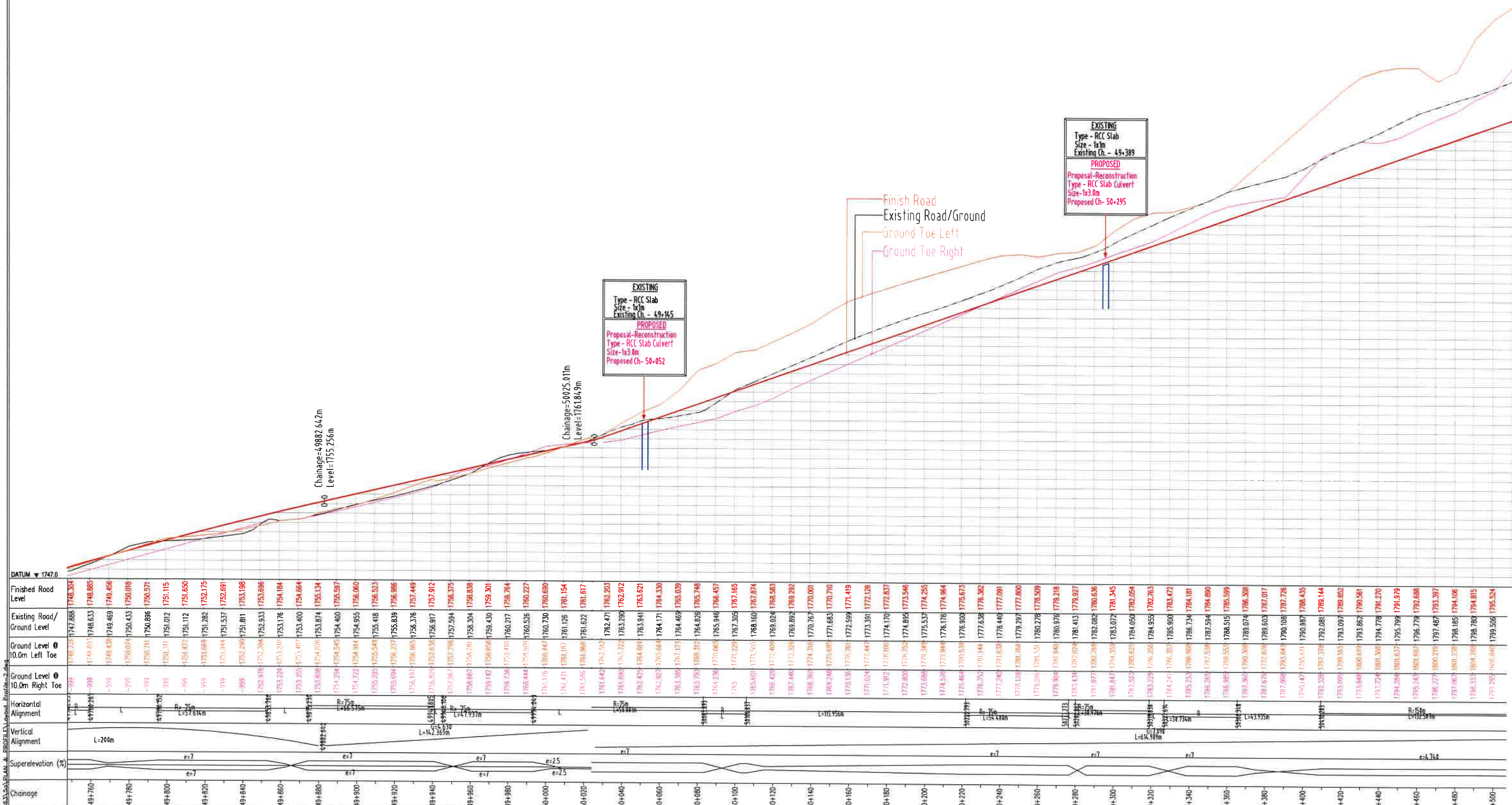


|                                      |  |  |      |  |  |                          |  |  |                                                                                                                                                                                                                                          |  |  |                                                                                                                                                                                                                                                                                                                                       |  |  |                                                                                                                  |  |                                                                                                             |  |                                                                                                                  |  |                                                                                                                    |  |                                                    |                                                                  |  |  |
|--------------------------------------|--|--|------|--|--|--------------------------|--|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|------------------------------------------------------------------------------------------------------------------|--|-------------------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------------------------|--|--------------------------------------------------------------------------------------------------------------------|--|----------------------------------------------------|------------------------------------------------------------------|--|--|
|                                      |  |  |      |  |  |                          |  |  | <div>Client :<br/><b>NATIONAL HIGHWAYS &amp; INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED</b><br/>(Ministry of Road Transport &amp; Highways)</div> |  |  | <div>Project :<br/>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</div> |  |  | <div>DATE : November 2019</div>                                                                                  |  | <div>Revision R0</div>                                                                                      |  | <div>PACKAGE- 5</div>                                                                                            |  |                                                                                                                    |  |                                                    |                                                                  |  |  |
|                                      |  |  |      |  |  |                          |  |  |                                                                                                                                                                                                                                          |  |  |                                                                                                                                                                                                                                                                                                                                       |  |  | <div>DESIGNED BY</div>                                                                                           |  | <div>DRAWN BY</div>                                                                                         |  | <div>CHECKED BY</div>                                                                                            |  | <div>APPROVED BY</div>                                                                                             |  | <div>KAFER TO RHENOCK<br/>PLAN &amp; PROFILE</div> |                                                                  |  |  |
| R0 Sep 2017 Final Feasibility Report |  |  |      |  |  |                          |  |  |                                                                                                                                                                                                                                          |  |  |                                                                                                                                                                                                                                                                                                                                       |  |  | <div><br/>Vinay Gupta</div> |  | <div><br/>Noresh</div> |  | <div><br/>Vinay Gupta</div> |  | <div><br/>Sanjay Shukla</div> |  | <div>Profile-(Km 48+250 To Km 49+000)</div>        |                                                                  |  |  |
| R0 Nov 2016 Draft Feasibility Report |  |  |      |  |  |                          |  |  |                                                                                                                                                                                                                                          |  |  |                                                                                                                                                                                                                                                                                                                                       |  |  | SCALE:—                                                                                                          |  | H=1:2000,<br>V=1:100, )                                                                                     |  | For A3 Paper Size                                                                                                |  |                                                                                                                    |  |                                                    |                                                                  |  |  |
| R0 Dec 2014 Linear Plan              |  |  |      |  |  |                          |  |  |                                                                                                                                                                                                                                          |  |  |                                                                                                                                                                                                                                                                                                                                       |  |  |                                                                                                                  |  |                                                                                                             |  |                                                                                                                  |  |                                                                                                                    |  |                                                    |                                                                  |  |  |
| REV                                  |  |  | DATE |  |  | DESCRIPTION OF REVISIONS |  |  | INITIALS                                                                                                                                                                                                                                 |  |  | <div>Consultant :<br/><b>SA INFRASTRUCTURE CONSULTANTS PVT. LTD.</b><br/>Specialized Engineering Services Pvt. Ltd.<br/>1101A, 11th Floor, Tower A-II, Corporate Park,<br/>Plot No. 7A/1, Sector-142,<br/>Noida 201301, Uttar Pradesh</div>        |  |  |                                                                                                                  |  |                                                                                                             |  |                                                                                                                  |  |                                                                                                                    |  |                                                    | <div>Dwg. No. :- SAICPL--SESP/L/NHIDCL/WB--SKM/P&amp;P/066</div> |  |  |



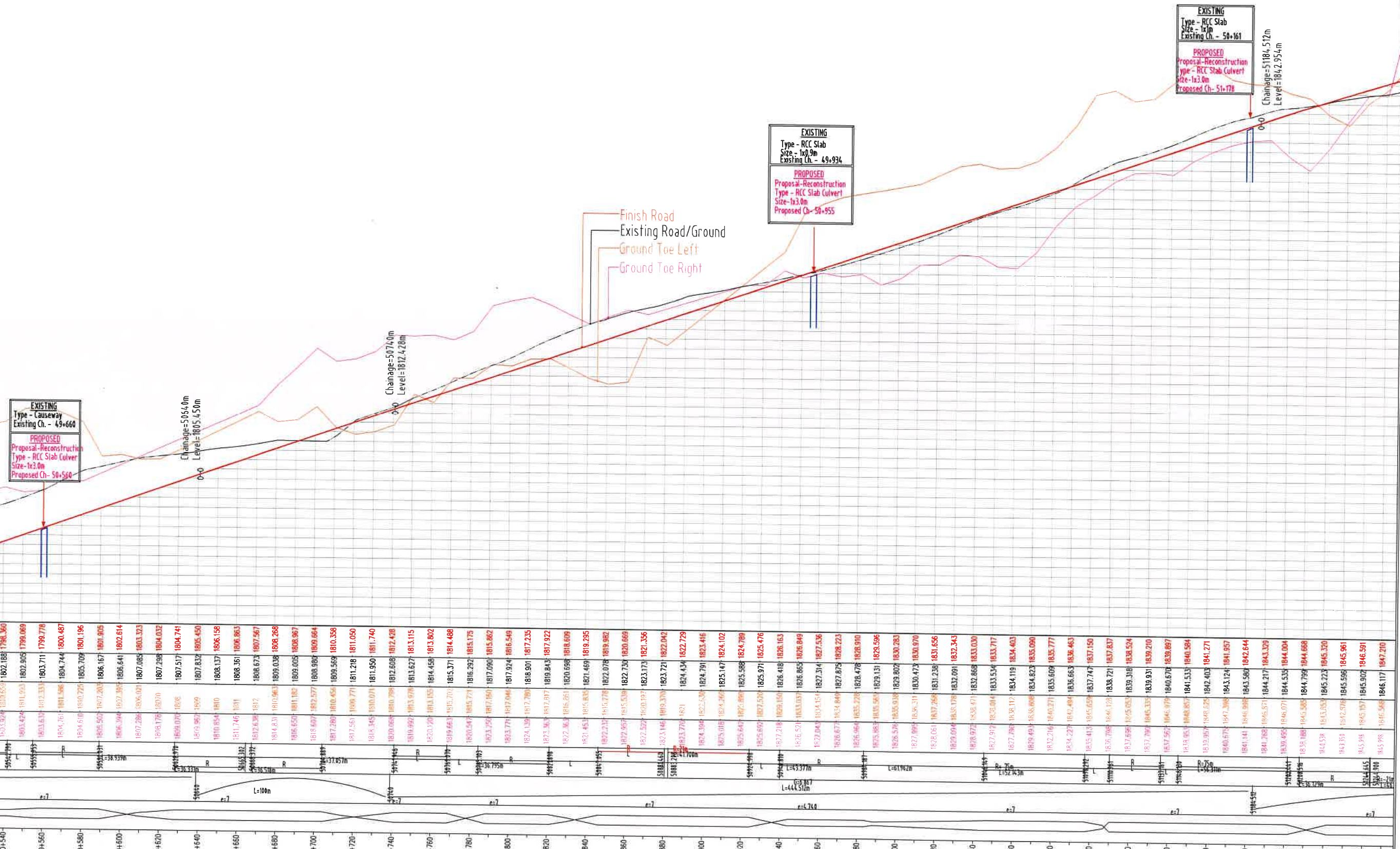


|                             |  |                                        |  |                                                                                                                                                      |  |                                                |  |                      |  |             |  |                                                                        |  |
|-----------------------------|--|----------------------------------------|--|------------------------------------------------------------------------------------------------------------------------------------------------------|--|------------------------------------------------|--|----------------------|--|-------------|--|------------------------------------------------------------------------|--|
| DATE: 20/11/2019 - 12:01 PM |  | Client :                               |  | NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED<br>(Ministry of Road Transport & Highways)                                        |  | Project :                                      |  | DATE : November 2019 |  | Revision RO |  | PACKAGE-5                                                              |  |
| DESIGNED BY                 |  | DRAWN BY                               |  | CHECKED BY                                                                                                                                           |  | APPROVED BY                                    |  | DESIGNED BY          |  | DRAWN BY    |  | KAFER TO RHENOCK<br>PLAN & PROFILE<br>Profile-(Km 49+000 To Km 49+750) |  |
| Vijay Gupta                 |  | Naresh                                 |  | Vijay Gupta                                                                                                                                          |  | Sanjoy Shukla                                  |  | Vijay Gupta          |  | Naresh      |  |                                                                        |  |
| SCALE:-                     |  | H-1:2000,<br>V-1:100,                  |  | For A3 Paper Size                                                                                                                                    |  | Dwg. No. :- SAICPL-SESPL/NHIDCL/WB-SKM/P&P/070 |  |                      |  |             |  |                                                                        |  |
| REV                         |  | DATE                                   |  | DESCRIPTION OF REVISIONS                                                                                                                             |  | INITIALS                                       |  |                      |  |             |  |                                                                        |  |
| R0                          |  | Sep 2017                               |  | Final Feasibility Report                                                                                                                             |  |                                                |  |                      |  |             |  |                                                                        |  |
| R0                          |  | Nov 2016                               |  | Draft Feasibility Report                                                                                                                             |  |                                                |  |                      |  |             |  |                                                                        |  |
| R0                          |  | Dec 2014                               |  | Linear Plan                                                                                                                                          |  |                                                |  |                      |  |             |  |                                                                        |  |
| CONSULTANT :                |  | SA INFRASTRUCTURE CONSULTANTS PVT. LTD |  | Specialized Engineering Service Pvt. Ltd,<br>1101A, 11th Floor, Tower A-II, Corporate Park,<br>Plot No. 7A/1, Sector-142,<br>Gurgaon, Haryana-122001 |  |                                                |  |                      |  |             |  |                                                                        |  |



| DATUM               | 1747.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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| Finished Road Level | 1746.228 1747.888 1748.304 1748.865 1749.456 1750.018 1750.571 1751.115 1751.650 1752.175 1752.691 1753.198 1753.696 1754.184 1754.664 1755.134 1755.597 1756.060 1760.227 1760.690 1761.154 1761.617 1762.083 1762.549 1763.012 1763.471 1763.931 1764.391 1764.851 1765.311 1765.771 1766.231 1766.691 1767.151 1767.611 1768.071 1768.531 1768.991 1769.451 1769.911 1770.371 1770.831 1771.291 1771.751 1772.211 1772.671 1773.131 1773.591 1774.051 1774.511 1774.971 1775.431 1775.891 1776.351 1776.811 1777.271 1777.731 1778.191 1778.651 1779.111 1779.571 1780.031 1780.491 1780.951 1781.411 1781.871 1782.331 1782.791 1783.251 1783.711 1784.171 1784.631 1785.091 1785.551 1786.011 1786.471 1786.931 1787.391 1787.851 1788.311 1788.771 1789.231 1789.691 1790.151 1790.611 1791.071 1791.531 1791.991 1792.451 1792.911 1793.371 1793.831 1794.291 1794.751 1795.211 1795.671 1796.131 1796.591 1797.051 1797.511 1797.971 1798.431 1798.891 1799.351 1799.811 1800.271 1800.731 1801.191 1801.651 1802.111 1802.571 1803.031 1803.491 1803.951 1804.411 1804.871 1805.331 1805.791 1806.251 1806.711 1807.171 1807.631 1808.091 1808.551 1809.011 1809.471 1809.931 1810.391 1810.851 1811.311 1811.771 1812.231 1812.691 1813.151 1813.611 1814.071 1814.531 1814.991 1815.451 1815.911 1816.371 1816.831 1817.291 1817.751 1818.211 1818.671 1819.131 1819.591 1820.051 1820.511 1820.971 1821.431 1821.891 1822.351 1822.811 1823.271 1823.731 1824.191 1824.651 1825.111 1825.571 1826.031 1826.491 1826.951 1827.411 1827.871 1828.331 1828.791 1829.251 1829.711 1830.171 1830.631 1831.091 1831.551 1832.011 1832.471 1832.931 1833.391 1833.851 1834.311 1834.771 1835.231 1835.691 1836.151 1836.611 1837.071 1837.531 1837.991 1838.451 1838.911 1839.371 1839.831 1840.291 1840.751 1841.211 1841.671 1842.131 1842.591 1843.051 1843.511 1843.971 1844.431 1844.891 1845.351 1845.811 1846.271 1846.731 1847.191 1847.651 1848.111 1848.571 1849.031 1849.491 1849.951 1850.411 1850.871 1851.331 1851.791 1852.251 1852.711 1853.171 1853.631 1854.091 1854.551 1855.011 1855.471 1855.931 1856.391 1856.851 1857.311 1857.771 1858.231 1858.691 1859.151 1859.611 1860.071 1860.531 1860.991 1861.451 1861.911 1862.371 1862.831 1863.291 1863.751 1864.211 1864.671 1865.131 1865.591 1866.051 1866.511 1866.971 1867.431 1867.891 1868.351 1868.811 1869.271 1869.731 1870.191 1870.651 1871.111 1871.571 1872.031 1872.491 1872.951 1873.411 1873.871 1874.331 1874.791 1875.251 1875.711 1876.171 1876.631 1877.091 1877.551 1878.011 1878.471 1878.931 1879.391 1879.851 1880.311 1880.771 1881.231 1881.691 1882.151 1882.611 1883.071 1883.531 1883.991 1884.451 1884.911 1885.371 1885.831 1886.291 1886.751 1887.211 1887.671 1888.131 1888.591 1889.051 1889.511 1889.971 1890.431 1890.891 1891.351 1891.811 1892.271 1892.731 1893.191 1893.651 1894.111 1894.571 1895.031 1895.491 1895.951 1896.411 1896.871 1897.331 1897.791 1898.251 1898.711 1899.171 1899.631 1900.091 1900.551 1901.011 1901.471 1901.931 1902.391 1902.851 1903.311 1903.771 1904.231 1904.691 1905.151 1905.611 1906.071 1906.531 1906.991 1907.451 1907.911 1908.371 1908.831 1909.291 1909.751 1910.211 1910.671 1911.131 1911.591 1912.051 1912.511 1912.971 1913.431 1913.891 1914.351 1914.811 1915.271 1915.731 1916.191 1916.651 1917.111 1917.571 1918.031 1918.491 1918.951 1919.411 1919.871 1920.331 1920.791 1921.251 1921.711 1922.171 1922.631 1923.091 1923.551 1924.011 1924.471 1924.931 1925.391 1925.851 1926.311 1926.771 1927.231 1927.691 1928.151 1928.611 1929.071 1929.531 1929.991 1930.451 1930.911 1931.371 1931.831 1932.291 1932.751 1933.211 1933.671 1934.131 1934.591 1935.051 1935.511 1935.971 1936.431 1936.891 1937.351 1937.811 1938.271 1938.731 1939.191 1939.651 1940.111 1940.571 1941.031 1941.491 1941.951 1942.411 1942.871 1943.331 1943.791 1944.251 1944.711 1945.171 1945.631 1946.091 1946.551 1947.011 1947.471 1947.931 1948.391 1948.851 1949.311 1949.771 1950.231 1950.691 1951.151 1951.611 1952.071 1952.531 1952.991 1953.451 1953.911 1954.371 1954.831 1955.291 1955.751 1956.211 1956.671 1957.131 1957.591 1958.051 1958.511 1958.971 1959.431 1959.891 1960.351 1960.811 1961.271 1961.731 1962.191 1962.651 1963.111 1963.571 1964.031 1964.491 1964.951 1965.411 1965.871 1966.331 1966.791 1967.251 1967.711 1968.171 1968.631 1969.091 1969.551 1970.011 1970.471 1970.931 1971.391 1971.851 1972.311 1972.771 1973.231 1973.691 1974.151 1974.611 1975.071 1975.531 1975.991 1976.451 1976.911 1977.371 1977.831 1978.291 1978.751 1979.211 1979.671 1980.131 1980.591 1981.051 1981.511 1981.971 1982.431 1982.891 1983.351 1983.811 1984.271 1984.731 1985.191 1985.651 1986.111 1986.571 1987.031 1987.491 1987.951 1988.411 1988.871 1989.331 1989.791 1990.251 1990.711 1991.171 1991.631 1992.091 1992.551 1993.011 1993.471 1993.931 1994.391 1994.851 1995.311 1995.771 1996.231 1996.691 1997.151 1997.611 1998.071 1998.531 1998.991 1999.451 1999.911 2000.371 2000.831 2001.291 2001.751 2002.211 2002.671 2003.131 2003.591 2004.051 2004.511 2004.971 2005.431 2005.891 2006.351 2006.811 2007.271 2007.731 2008.191 2008.651 2009.111 2009.571 2010.031 2010.491 2010.951 2011.411 2011.871 2012.331 2012.791 2013.251 2013.711 2014.171 2014.631 2015.091 2015.551 2016.011 2016.471 2016.931 2017.391 2017.851 2018.311 2018.771 2019.231 2019.691 2020.151 2020.611 2021.071 2021.531 2021.991 2022.451 2022.911 2023.371 2023.831 2024.291 2024.751 2025.211 2025.671 2026.131 2026.591 2027.051 2027.511 2027.971 2028.431 2028.891 2029.351 2029.811 2030.271 2030.731 2031.191 2031.651 2032.111 2032.571 2033.031 2033.491 2033.951 2034.411 2034.871 2035.331 2035.791 2036.251 2036.711 2037.171 2037.631 2038.091 2038.551 2039.011 2039.471 2039.931 2040.391 2040.851 2041.311 2041.771 2042.231 2042.691 2043.151 2043.611 2044.071 2044.531 2044.991 2045.451 2045.911 2046.371 2046.831 2047.291 2047.751 2048.211 2048.671 2049.131 2049.591 2050.051 2050.511 2050.971 2051.431 2051.891 2052.351 2052.811 2053.271 2053.731 2054.191 2054.651 2055.111 2055.571 2056.031 2056.491 2056.951 2057.411 2057.871 2058.331 2058.791 2059.251 2059.711 2060.171 2060.631 2061.091 2061.551 2062.011 2062.471 2062.931 2063.391 2063.851 2064.311 2064.771 2065.231 2065.691 2066.151 2066.611 2067.071 2067.531 2067.991 2068.451 2068.911 2069.371 2069.831 2070.291 2070.751 2071.211 2071.671 2072.131 2072.591 2073.051 2073.511 2073.971 2074.431 2074.891 2075.351 2075.811 2076.271 2076.731 2077.191 2077.651 2078.111 2078.571 2079.031 2079.491 2079.951 2080.411 2080.871 2081.331 2081.791 2082.251 2082.711 2083.171 2083.631 2084.091 2084.551 2085.011 2085.471 2085.931 2086.391 2086.851 2087.311 2087.771 2088.231 2088.691 2089.151 2089.611 2090.071 2090.531 2090.991 2091.451 2091.911 2092.371 2092.831 2093.291 2093.751 2094.211 2094.671 2095.131 2095.591 2096.051 2096.511 2096.971 2097.431 2097.891 2098.351 2098.811 2099.271 2099.731 2100.191 2100.651 2101.111 2101.571 2102.031 2102.491 2102.951 2103.411 2103.871 2104.331 2104.791 2105.251 2105.711 2106.171 2106.631 2107.091 2107.551 2108.011 2108.471 2108.931 2109.391 2109.851 2110.311 2110.771 2111.231 2111.691 2112.151 2112.611 2113.071 2113.531 2113.991 2114.451 2114.911 2115.371 2115.831 2116.291 2116.751 2117.211 2117.671 2118.131 2118.591 2119.051 2119.511 2119.971 2120.431 2120.891 2121.351 2121.811 2122.271 2122.731 2123.191 2123.651 2124.111 2124.571 2125.031 2125.491 2125.951 2126.411 2126.871 2127.331 2127.791 2128.251 2128.711 2129.171 2129.631 2130.091 2130.551 2131.011 2131.471 2131.931 2132.391 2132.851 2133.311 2133.771 2134.231 2134.691 2135.151 2135.611 2136.071 2136.531 2136.991 2137.451 2137.911 2138.371 2138.831 2139.291 2139.751 2140.211 2140.671 2141.131 2141.591 2142.051 2142.511 2142.971 2143.431 2143.891 2144.351 2144.811 2145.271 2145.731 2146.191 2146.651 2147.111 2147.571 2148.031 2148.491 2148.951 2149.411 2149.871 2150.331 2150.791 2151.251 2151.711 2152.171 2152.631 2153.091 2153.551 2154.011 2154.471 2154.931 2155.391 2155.851 2156.311 2156.771 2157.231 2157.691 2158.151 2158.611 2159.071 2159.531 2159.991 2160.451 2160.911 2161.371 2161.831 2162.291 2162.751 2163.211 2163.671 2164.131 2164.591 2165.051 2165.511 2165.971 2166.431 2166.891 2167.351 2167.811 2168.271 2168.731 2169.191 2169.651 2170.111 2170.571 2171.031 2171.491 2171.951 2172.411 2172.871 2173.331 2173.791 2174.251 2174.711 2175.171 2175.631 2176.091 2176.551 2177.011 2177.471 2177.931 2178.391 2178.851 2179.311 2179.771 2180.231 2180.691 2181.151 2181.611 2182.071 2182.531 2182.991 2183.451 2183.911 2184.371 2184.831 2185.291 2185.751 2186.211 2186.671 2187.131 2187.591 2188.051 2188.511 2188.971 2189.431 2189.891 2190.351 2190.811 2191.271 2191.731 2192.191 2192.651 2193.111 2193.571 2194.031 2194.491 2194.951 2195.411 2195.871 2196.331 2196.791 2197.251 2197.711 2198.171 2198.631 2199.091 2199.551 2200.011 2200.471 2200.931 2201.391 2201.851 2202.311 2202.771 2203.231 2203.691 2204.151 2204.611 2205.071 2205.531 2205.991 2206.451 2206.911 2207.371 2207.831 2208.291 2208.751 2209.211 2209.671 2210.131 2210.591 2211.051 2211.511 2211.971 2212.431 2212.891 2213.351 2213.811 2214.271 2214.731 2215.191 2215.651 2216.111 2216.571 2217.031 2217.491 2217.951 2218.411 2218.871 2219.331 2219.791 2220.251 2220.711 2221.171 2221.631 2222.091 2222.551 2223.011 2223.471 2223.931 2224.391 2224.851 2225.311 2225.771 2226.231 2226.691 2227.151 2227.611 2228.071 2228.531 2228.991 2229.451 2229.911 2230.371 2230.831 2231.291 2231.751 2232.211 2232.671 2233.131 2233.591 2234.051 2234.511 2234.971 2235.431 2235.891 2236.351 2236.811 2237.271 2237.731 2238.191 2238.651 2239.111 2239.571 2240.031 2240.491 2240.951 2241.411 2241.871 2242.331 2242.791 2243.251 2243.711 2244.171 2244.631 2245.091 2245.551 2246.011 2246.471 2246.931 2247.391 2247.851 2248.311 2248.771 2249.231 2249.691 2250.151 2250.611 2251.071 2251.531 2251.991 2252.451 2252.911 2253.371 2253.831 2254.291 2254.751 2255.211 2255.671 2256.131 2256.591 2257.051 2257.511 2257.971 2258.431 2258.891 2259.351 2259.811 2260.271 2260.731 2261.191 2261.651 2262.111 2262.571 2263.031 2263.491 2263.951 2264.411 2264.871 2265.331 2265.791 2266.251 2266.711 2267.171 2267.631 2268.091 2268.551 2269.011 2269.471 2269.931 2270.391 2270.851 2271.311 2271.771 2272.231 2272.691 2273.151 2273.611 2274.071 2274.531 2274.991 2275.451 2275.911 2276.371 2276.831 2277.291 2277.751 2278.211 2278.671 2279.131 2279.591 2280.051 2280.511 2280.971 2281.431 2281.891 2282.351 2282.811 2283.271 2283.731 2284.191 2284.651 2285.111 2285.571 2286.031 2286.491 2286.951 2287.411 2287.871 2288.331 2288.791 2289.251 2289.711 2290.171 2290.631 2291.091 2291.551 2292.011 2292.471 2292.931 2293.391 2293.851 2294.311 2294.771 2295.231 2295.691 2296.151 2296.611 2297.071 2297.531 2297.991 2298.451 2298.911 2299.371 2299.831 2300.291 2300.751 2301.211 2301.671 2302.131 2302.591 2303.051 2303.511 2303.971 2304.431 2304.891 2305.351 2305.811 2306.271 2306.731 2307.191 2307.651 2308.111 2308.571 2309.031 2309.491 2309.951 2310.411 2310.871 2311.331 2311.791 2312.251 2312.711 2313.171 2313.631 2314.091 2314.551 2315.011 2315.471 2315.931 2316.391 2316.851 2317.311 2317.771 2318.231 2318.691 2319.151 2319.611 2320.071 2320.531 2320.991 2321.451 2321.911 2322.371 2322.831 2323.291 2323.751 2324.211 2324.671 2325.131 2325.591 2326.051 2326.511 2326.971 2327.431 2327.891 2328.351 2328.811 2329.271 2329.731 2330.191 2330.651 2331.111 2331.571 2332.031 2332.491 2332.951 2333.411 2333.871 2334.331 2334.791 2335.251 2335.711 2336.171 2336.631 2337.091 2337.551 2338.011 2338.471 2338.931 2339.391 2339.851 2340.311 2340.771 2341.231 2341.691 2342.151 2342.611 2343.071 2343.531 2343.991 2344.451 2344.911 2345.371 2345.831 2346.291 2346.751 2347.211 2347.671 2348.131 2348.591 2349.051 2349.511 2349.971 2350.431 2350.891 2351.351 2351.811 2352.271 2352.731 2353.191 2353.651 2354.111 2354.571 2355.031 2355.491 2355.951 2356.411 2356.871 2357.331 2357.791 2358.251 2358.711 2359.171 2359.63 |

[illegible]



DATUM 1790.0

| Chainage                       | 50+500   | 50+520   | 50+540   | 50+560   | 50+580   | 50+600   | 50+620   | 50+640   | 50+660   | 50+680   | 50+700   | 50+720   | 50+740   | 50+760   | 50+780   | 50+800   | 50+820   | 50+840   | 50+860   | 50+880   | 50+900   | 50+920   | 50+940   | 50+960   | 50+980   | 51+000   | 51+020   | 51+040   | 51+060   | 51+080   | 51+100   | 51+120   | 51+140   | 51+160   | 51+180   | 51+200   | 51+220   | 51+240   |          |          |          |          |
|--------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Finished Road Level            | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 |          |
| Existing Road/Ground Level     | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 |          |
| Ground Level @ 10.0m Left Toe  | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 |
| Ground Level @ 10.0m Right Toe | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 | 1795.504 |
| Horizontal Alignment           |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |
| Vertical Alignment             |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |
| Superelevation (%)             |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |

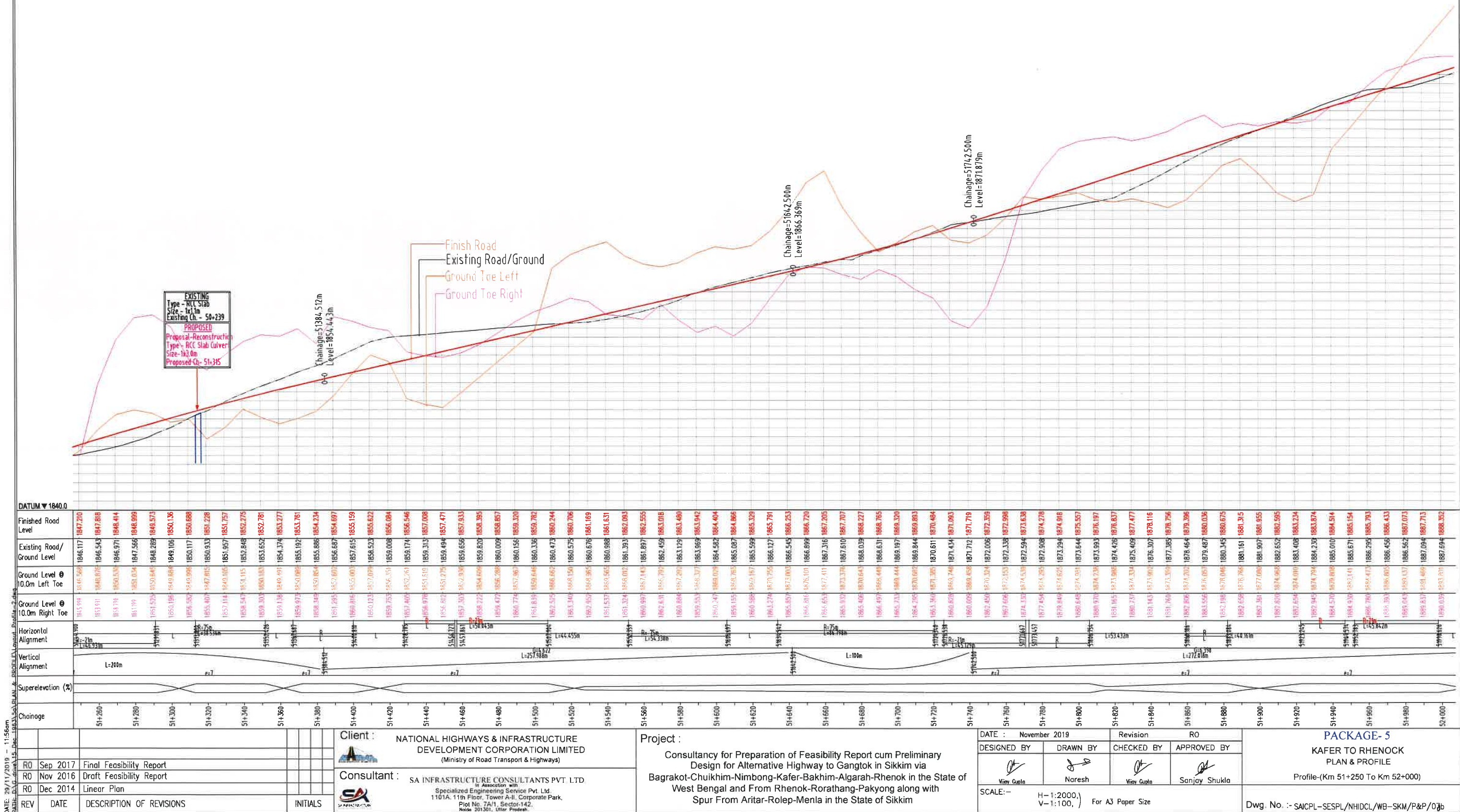
| REV | DATE     | DESCRIPTION OF REVISIONS | INITIALS |
|-----|----------|--------------------------|----------|
| R0  | Sep 2017 | Final Feasibility Report |          |
| R0  | Nov 2016 | Draft Feasibility Report |          |
| R0  | Dec 2014 | Linear Plan              |          |

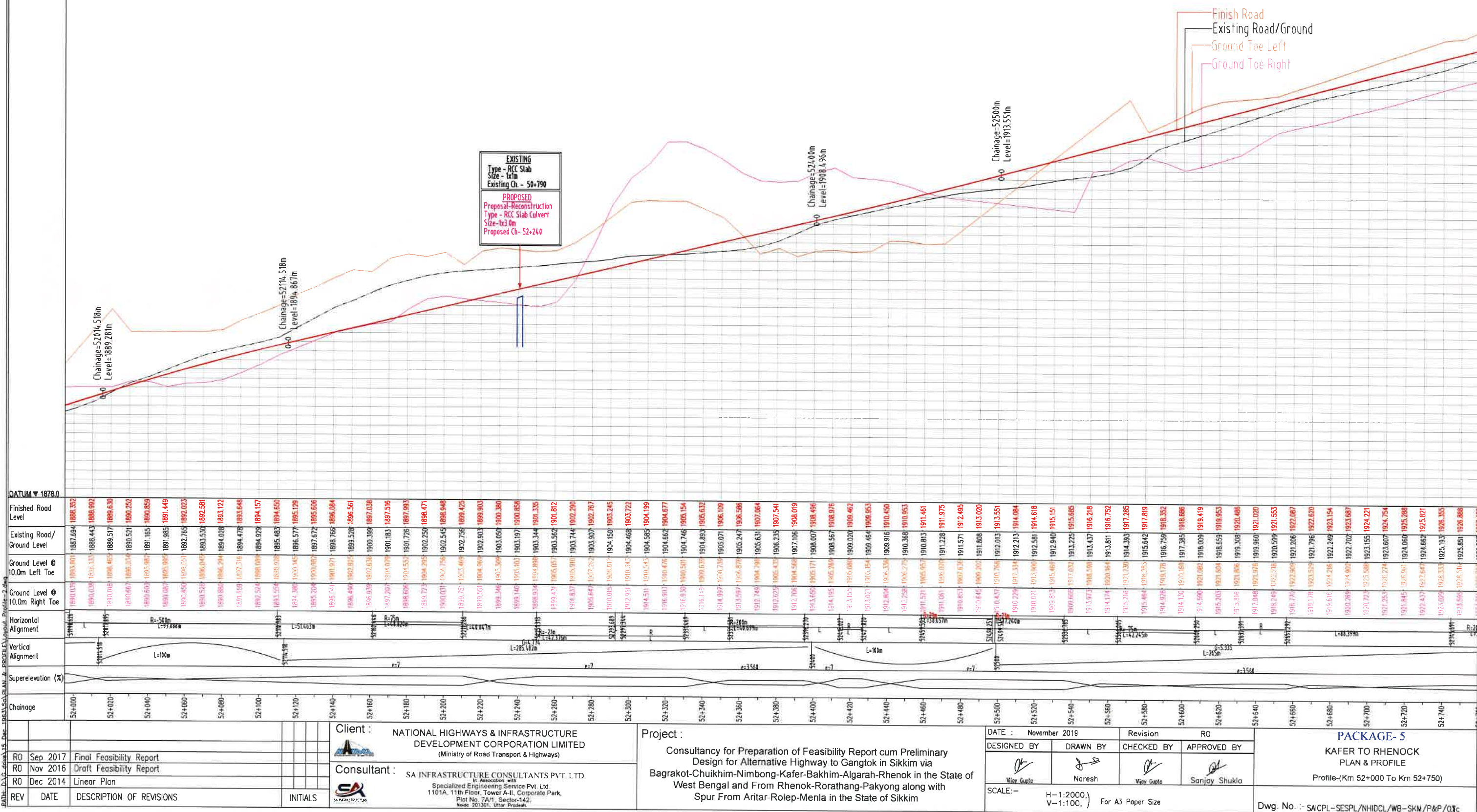
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|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Client :     | NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED<br>(Ministry of Road Transport & Highways)                                                                                                               |
| Consultant : | SA INFRASTRUCTURE CONSULTANTS PVT. LTD.<br>In Association with<br>Specialized Engineering Service Pvt. Ltd.<br>1101A, 11th Floor, Tower A-II, Corporate Park,<br>Plot No. 7A/1, Sector-142,<br>Noida-201301, Uttar Pradesh. |

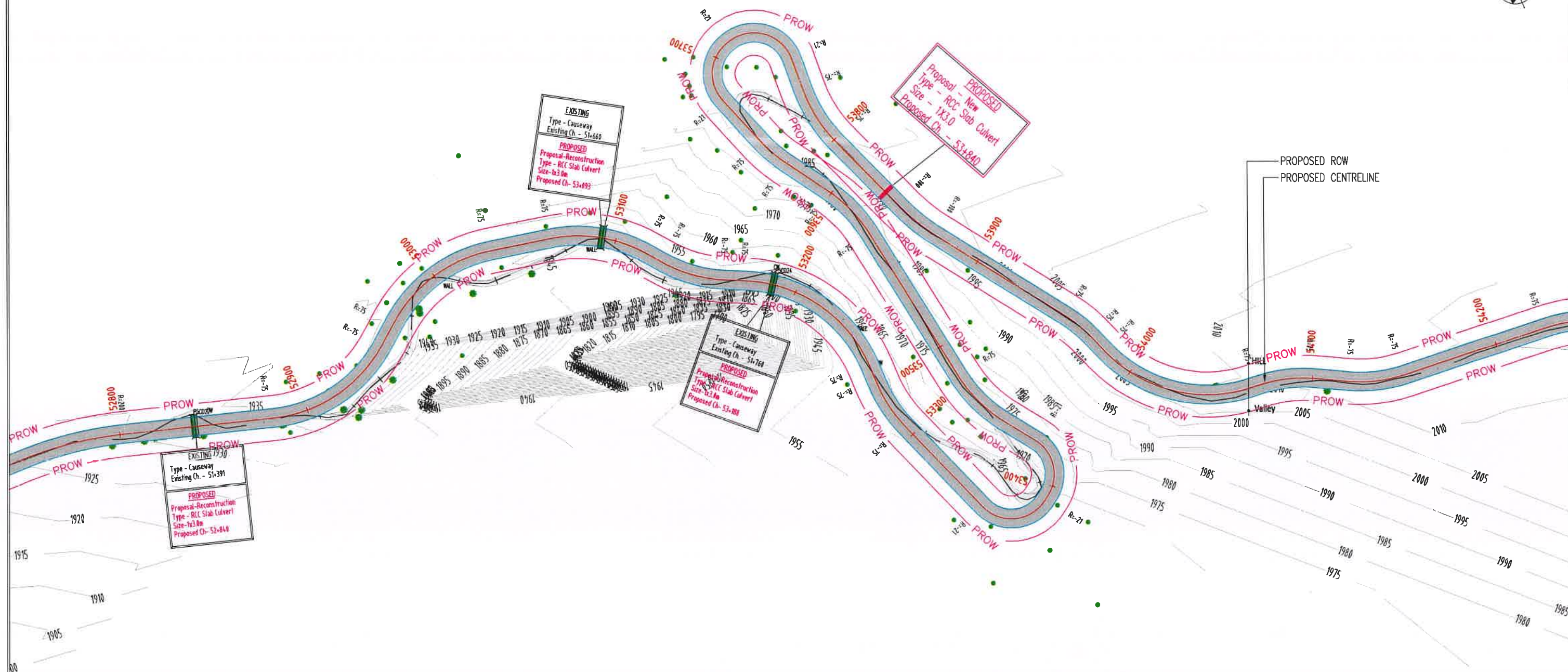
|           |                                                                                                                                                                                                                                                                                               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

|             |                       |                   |               |
|-------------|-----------------------|-------------------|---------------|
| DATE :      | November 2019         | Revision          | RO            |
| DESIGNED BY | VIEW GUPTA            | DRAWN BY          | NORESH        |
| CHECKED BY  | VIEW GUPTA            | APPROVED BY       | SANJAY SHUKLA |
| SCALE:-     | H-1:2000,<br>V-1:100, | For A3 Paper Size |               |

|                                                |
|------------------------------------------------|
| PACKAGE-5                                      |
| KAFER TO RHENOCK                               |
| PLAN & PROFILE                                 |
| Profile-(Km 50+500 To Km 51+250)               |
| Dwg. No. :- SAICPL-SESPL/NHIDCL/WB-SKM/P&P/090 |







DATE: 29/11/2019 - 3:10pm  
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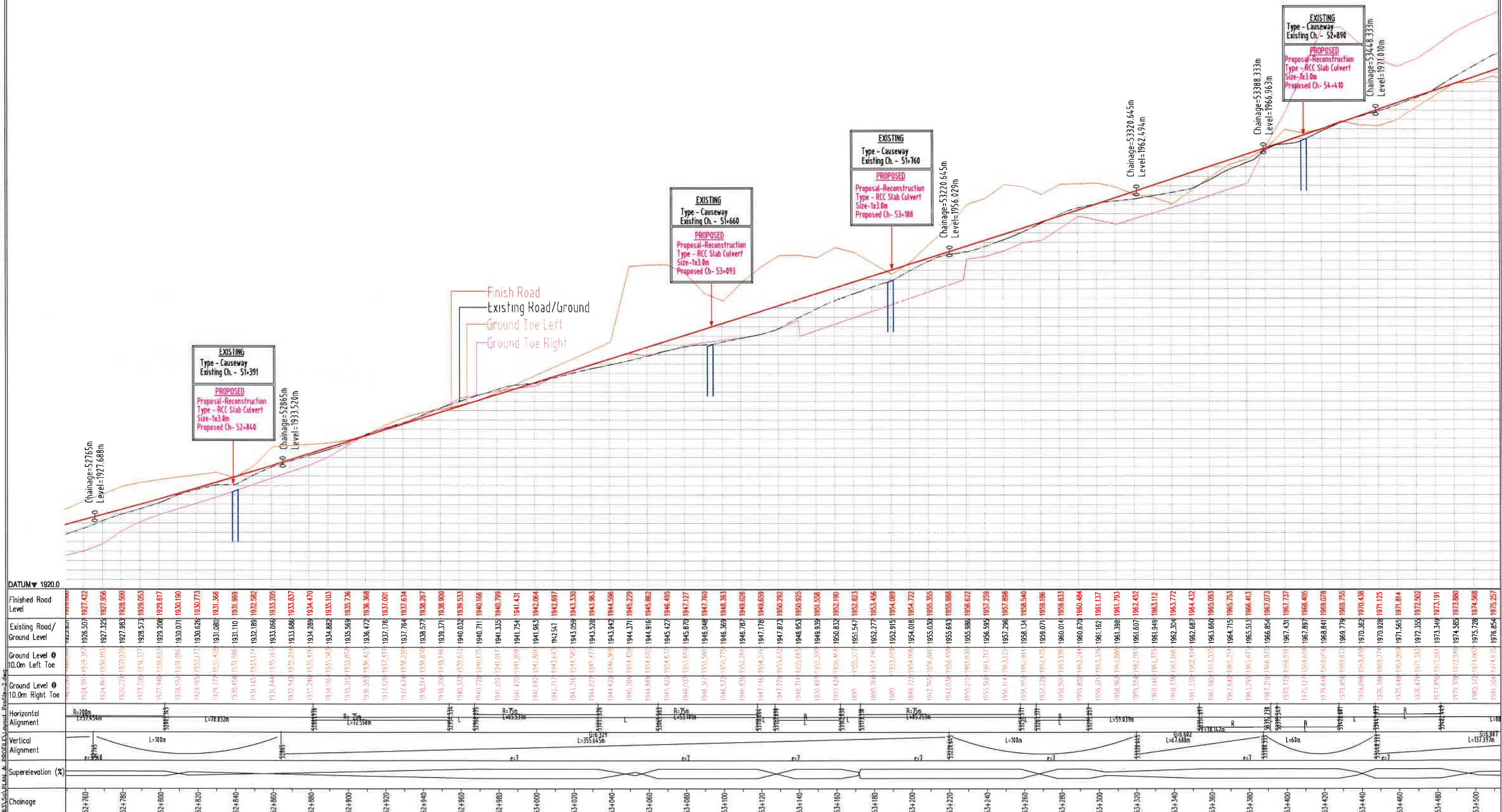
| REV | DATE     | DESCRIPTION OF REVISIONS | INITIALS |
|-----|----------|--------------------------|----------|
| RO  | Sep 2017 | Final Feasibility Report |          |
| RO  | Nov 2016 | Draft Feasibility Report |          |
| RO  | Dec 2014 | Linear Plan              |          |

|              |                                                                                                                                                                                                     |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Client :     | NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED<br>(Ministry of Road Transport & Highways)                                                                                       |
| Consultant : | SA INFRASTRUCTURE CONSULTANTS PVT. LTD.<br>Specialized Engineering Service Pvt. Ltd.<br>1101A, 11th Floor, Tower A-II, Corporate Park,<br>Plot No. 7A/1, Sector-142,<br>Noida-201301, Uttar Pradesh |

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

|                      |                       |                   |
|----------------------|-----------------------|-------------------|
| DATE : November 2019 | Revision              | RO                |
| DESIGNED BY          | DRAWN BY              | CHECKED BY        |
| Vijay Gupta          | Naresh                | Vijay Gupta       |
|                      |                       | Sanjay Shukla     |
| SCALE:-              | H-1:2000,<br>V-1:100, | For A3 Paper Size |

|                                                                                      |
|--------------------------------------------------------------------------------------|
| PACKAGE- 5A<br>KAHER TO RHENOCK<br>PLAN & PROFILE<br>(PLAN - Km 52+750 To Km 54+250) |
| Dwg. No. :- SAICPL-SPL/NHIDCL/WB-SKM/P&P/09                                          |

DATE: 20/11/2019 - 11:56am  
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| 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 Service Pvt. Ltd. 1101A, 11th Floor, Tower A-II, Corporate Park, Plot No. 7A/1, Sector-142, Noida-201301, Uttar Pradesh.

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

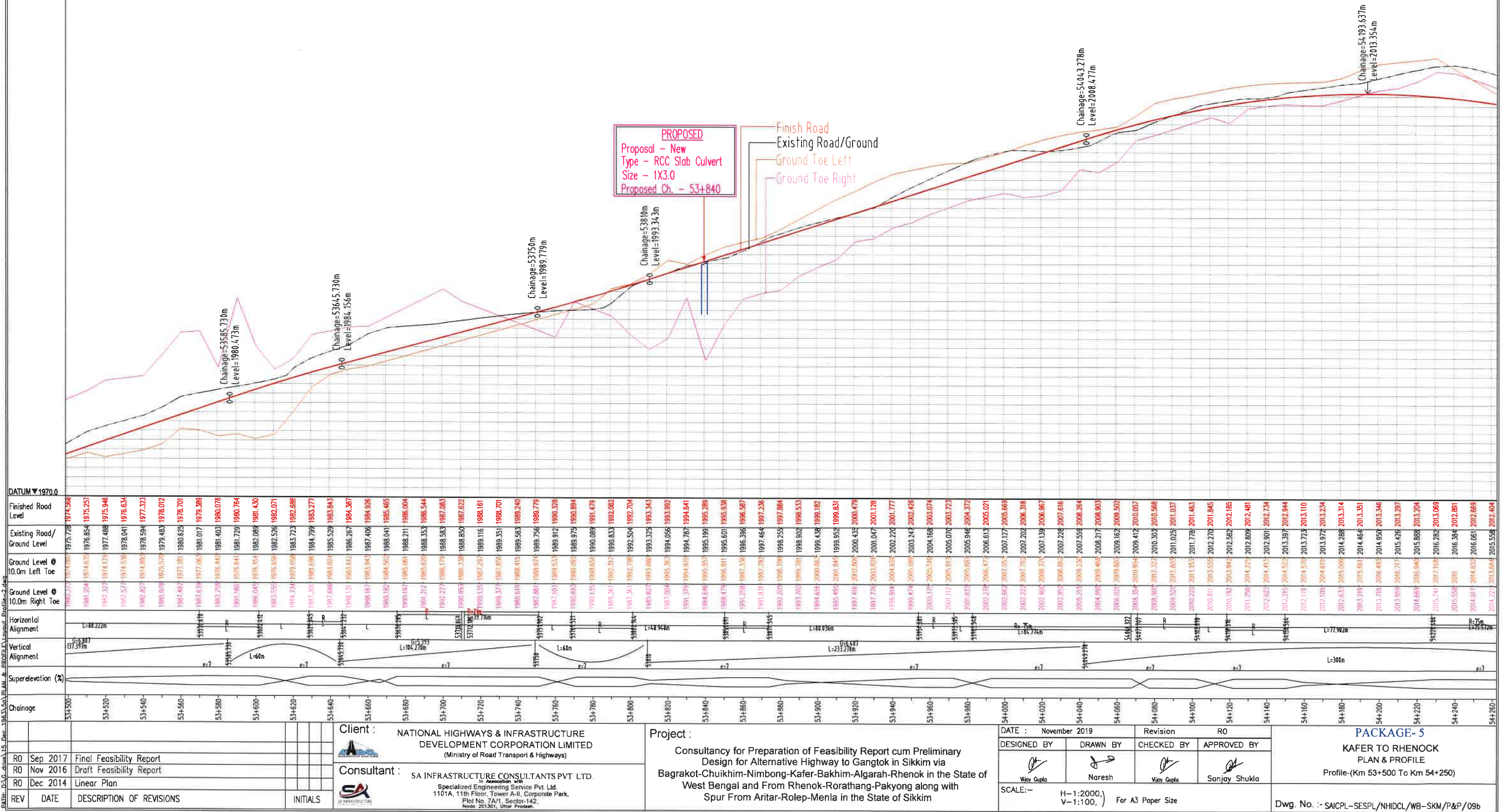
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| DESIGNED BY          | DRAWN BY                             | CHECKED BY |
| APPROVED BY          |                                      |            |
| SCALE: -             | H-1:2000, V-1:100, For A3 Paper Size |            |

PACKAGE-5  
KAHER TO RHENOCK  
PLAN & PROFILE  
Profile-(Km 52+750 To Km 53+500)

Dwg. No. :- SAICPL-SESPL/NHIDCL/WB-SKM/P&P/090

← KAHER

RHENOCK →



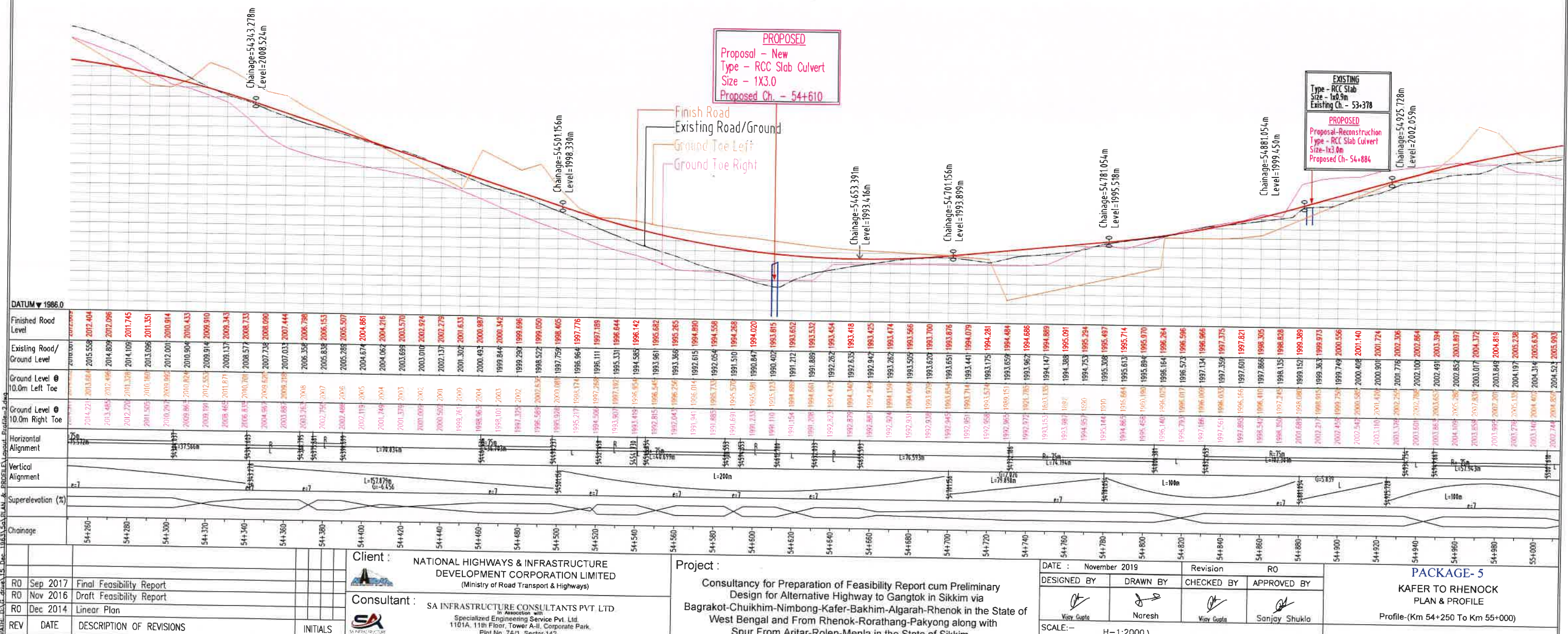
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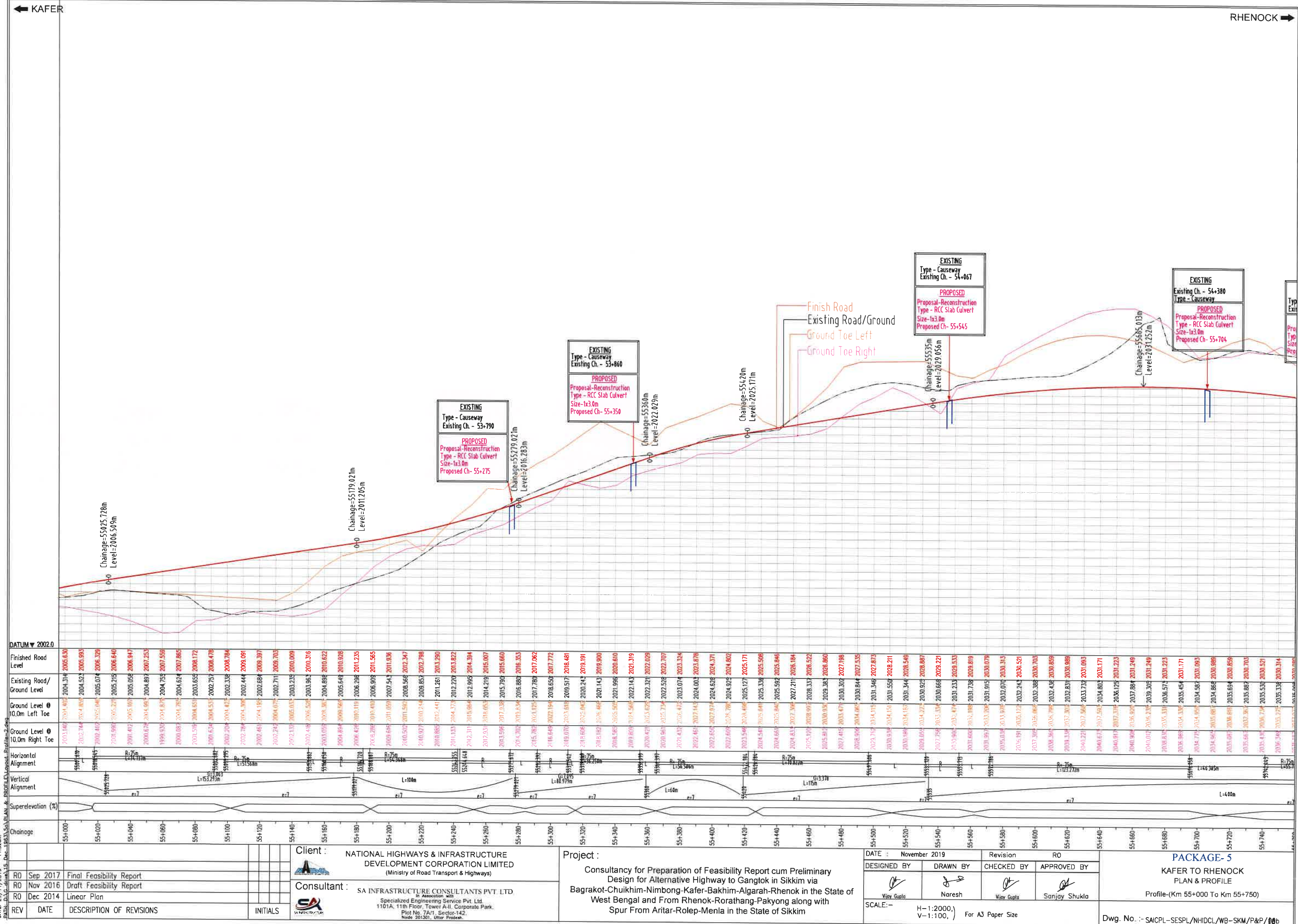
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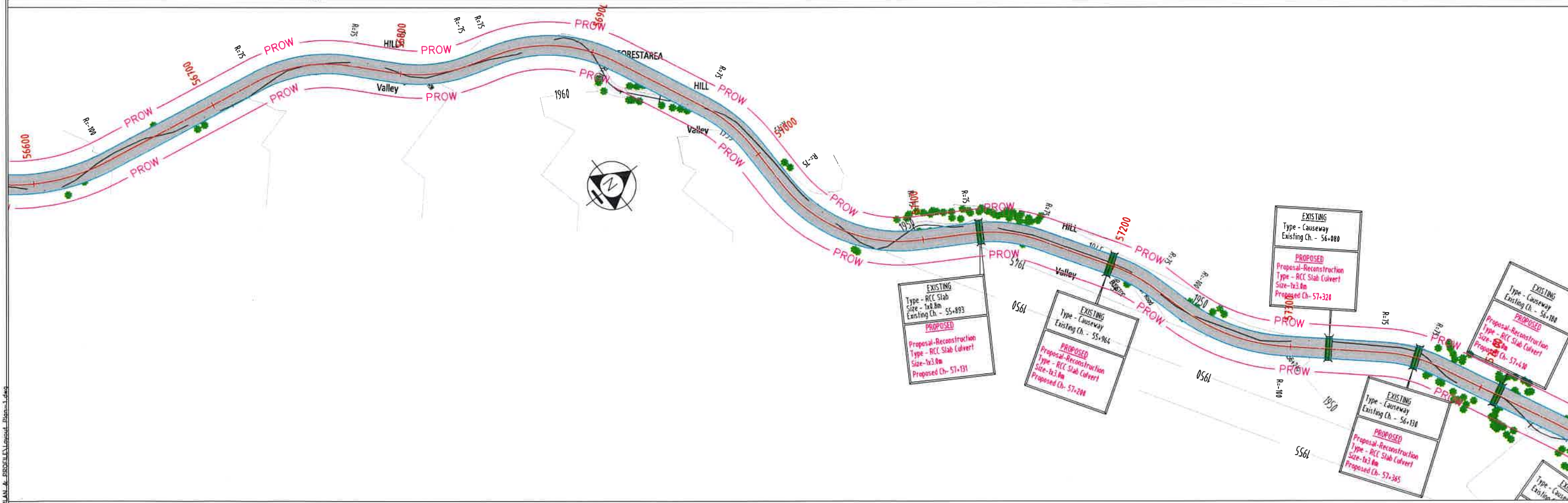
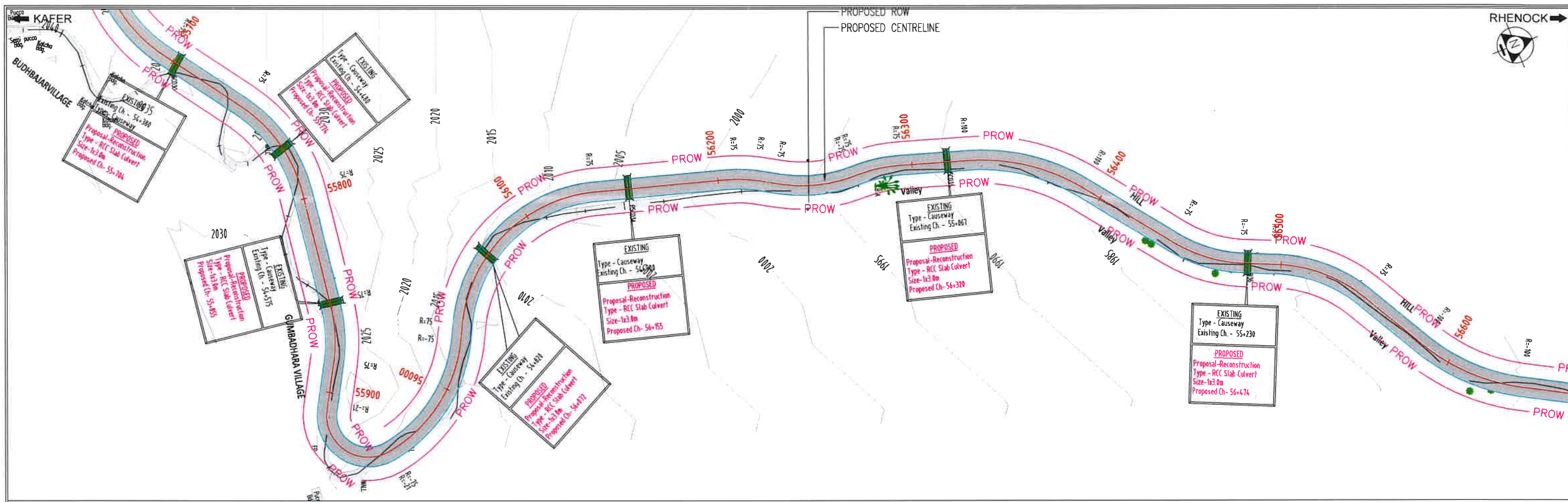


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| REV | DATE     | DESCRIPTION OF REVISIONS | INITIALS |
|-----|----------|--------------------------|----------|
| RO  | Sep 2017 | Final Feasibility Report |          |
| RO  | Nov 2016 | Draft Feasibility Report |          |
| RO  | Dec 2014 | Linear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

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

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

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

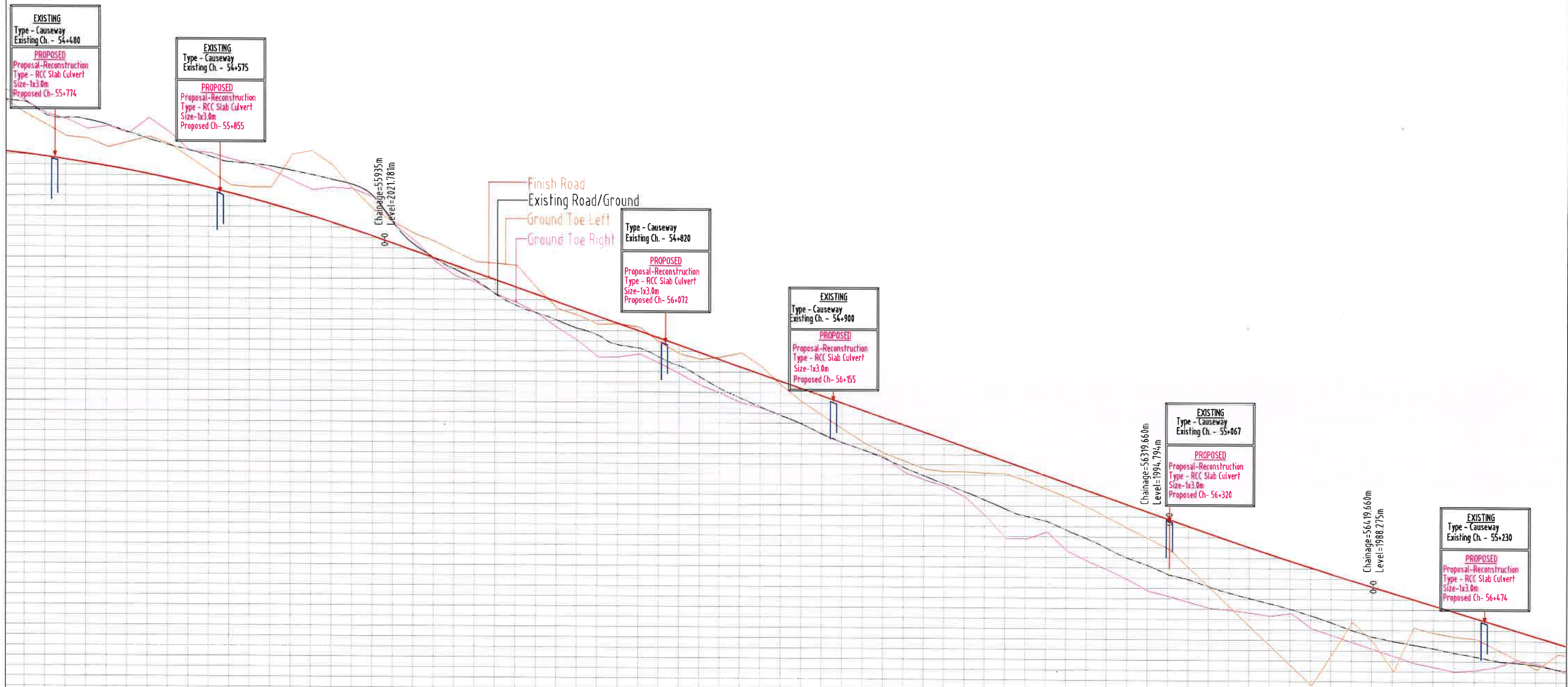
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|----------------------|-----------------------|-------------------|
| DATE : November 2019 | Revision              | RO                |
| DESIGNED BY          | DRAWN BY              | CHECKED BY        |
| Vijay Gupta          | Naresh                | Vijay Gupta       |
|                      |                       | Sanjay Shukla     |
| SCALE:—              | H-1:2000,<br>V-1:100, | For A3 Paper Size |

PACKAGE- 5A  
KAFER TO RHENOCK  
PLAN & PROFILE  
(PLAN - Km 55+750 To Km 57+250)

Dwg. No. :- SAICPL-SESPL/NHIDCL/WB-SKM/P&P/ 11

← KAHER

RHENOCK →



DATUM 1976.0

| Chainage | Finished Road Level | Existing Road/Ground Level | Ground Level @ 10.0m Left Toe | Ground Level @ 10.0m Right Toe | Horizontal Alignment | Vertical Alignment | Superelevation (%) |
|----------|---------------------|----------------------------|-------------------------------|--------------------------------|----------------------|--------------------|--------------------|
| 54+760   | 2035.187            | 2035.098                   | 2033.972                      | 2035.187                       | R=75m                |                    |                    |
| 54+780   | 2034.991            | 2033.904                   | 2033.788                      | 2034.991                       |                      |                    |                    |
| 54+800   | 2033.448            | 2033.354                   | 2033.238                      | 2033.448                       |                      |                    |                    |
| 54+820   | 2032.522            | 2032.428                   | 2032.312                      | 2032.522                       |                      |                    |                    |
| 54+840   | 2032.762            | 2032.668                   | 2032.552                      | 2032.762                       |                      |                    |                    |
| 54+860   | 2032.177            | 2032.083                   | 2031.967                      | 2032.177                       |                      |                    |                    |
| 54+880   | 2031.588            | 2031.494                   | 2031.378                      | 2031.588                       |                      |                    |                    |
| 54+900   | 2032.222            | 2032.128                   | 2032.012                      | 2032.222                       |                      |                    |                    |
| 54+920   | 2030.442            | 2030.348                   | 2030.232                      | 2030.442                       |                      |                    |                    |
| 54+940   | 2030.120            | 2030.026                   | 2029.910                      | 2030.120                       |                      |                    |                    |
| 54+960   | 2029.614            | 2029.520                   | 2029.404                      | 2029.614                       |                      |                    |                    |
| 54+980   | 2028.148            | 2028.054                   | 2027.938                      | 2028.148                       |                      |                    |                    |
| 55+000   | 2028.538            | 2028.444                   | 2028.328                      | 2028.538                       |                      |                    |                    |
| 55+020   | 2027.592            | 2027.498                   | 2027.382                      | 2027.592                       |                      |                    |                    |
| 55+040   | 2026.654            | 2026.560                   | 2026.444                      | 2026.654                       |                      |                    |                    |
| 55+060   | 2025.918            | 2025.824                   | 2025.708                      | 2025.918                       |                      |                    |                    |
| 55+080   | 2026.354            | 2026.260                   | 2026.144                      | 2026.354                       |                      |                    |                    |
| 55+100   | 2027.222            | 2027.128                   | 2027.012                      | 2027.222                       |                      |                    |                    |
| 55+120   | 2028.148            | 2028.054                   | 2027.938                      | 2028.148                       |                      |                    |                    |
| 55+140   | 2029.120            | 2029.026                   | 2028.910                      | 2029.120                       |                      |                    |                    |
| 55+160   | 2030.148            | 2030.054                   | 2030.938                      | 2030.148                       |                      |                    |                    |
| 55+180   | 2031.222            | 2031.128                   | 2031.012                      | 2031.222                       |                      |                    |                    |
| 55+200   | 2032.354            | 2032.260                   | 2032.144                      | 2032.354                       |                      |                    |                    |
| 55+220   | 2033.448            | 2033.354                   | 2033.238                      | 2033.448                       |                      |                    |                    |
| 55+240   | 2034.522            | 2034.428                   | 2034.312                      | 2034.522                       |                      |                    |                    |
| 55+260   | 2035.596            | 2035.502                   | 2035.386                      | 2035.596                       |                      |                    |                    |
| 55+280   | 2036.670            | 2036.576                   | 2036.460                      | 2036.670                       |                      |                    |                    |
| 55+300   | 2037.744            | 2037.650                   | 2037.534                      | 2037.744                       |                      |                    |                    |
| 55+320   | 2038.818            | 2038.724                   | 2038.608                      | 2038.818                       |                      |                    |                    |
| 55+340   | 2039.892            | 2039.798                   | 2039.682                      | 2039.892                       |                      |                    |                    |
| 55+360   | 2040.966            | 2040.872                   | 2040.756                      | 2040.966                       |                      |                    |                    |
| 55+380   | 2042.040            | 2041.946                   | 2041.830                      | 2042.040                       |                      |                    |                    |
| 55+400   | 2043.114            | 2043.020                   | 2042.904                      | 2043.114                       |                      |                    |                    |
| 55+420   | 2044.188            | 2044.094                   | 2043.978                      | 2044.188                       |                      |                    |                    |
| 55+440   | 2045.262            | 2045.168                   | 2045.052                      | 2045.262                       |                      |                    |                    |
| 55+460   | 2046.336            | 2046.242                   | 2046.126                      | 2046.336                       |                      |                    |                    |
| 55+480   | 2047.410            | 2047.316                   | 2047.200                      | 2047.410                       |                      |                    |                    |
| 55+500   | 2048.484            | 2048.390                   | 2048.274                      | 2048.484                       |                      |                    |                    |

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

Consultant : SA INFRASTRUCTURE CONSULTANTS PVT. LTD.  
In Association with  
Specialized Engineering Service Pvt. Ltd.  
1101A, 11th Floor, Tower A-II, Corporate Park,  
Plot No. 74/2, Sector-142,  
Noida 201301, Uttar Pradesh.

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

DATE : November 2019  
DESIGNED BY : [Signature]  
DRAWN BY : [Signature]  
CHECKED BY : [Signature]  
APPROVED BY : [Signature]  
SCALE : - H-1:2000,  
V-1:100, For A3 Paper Size

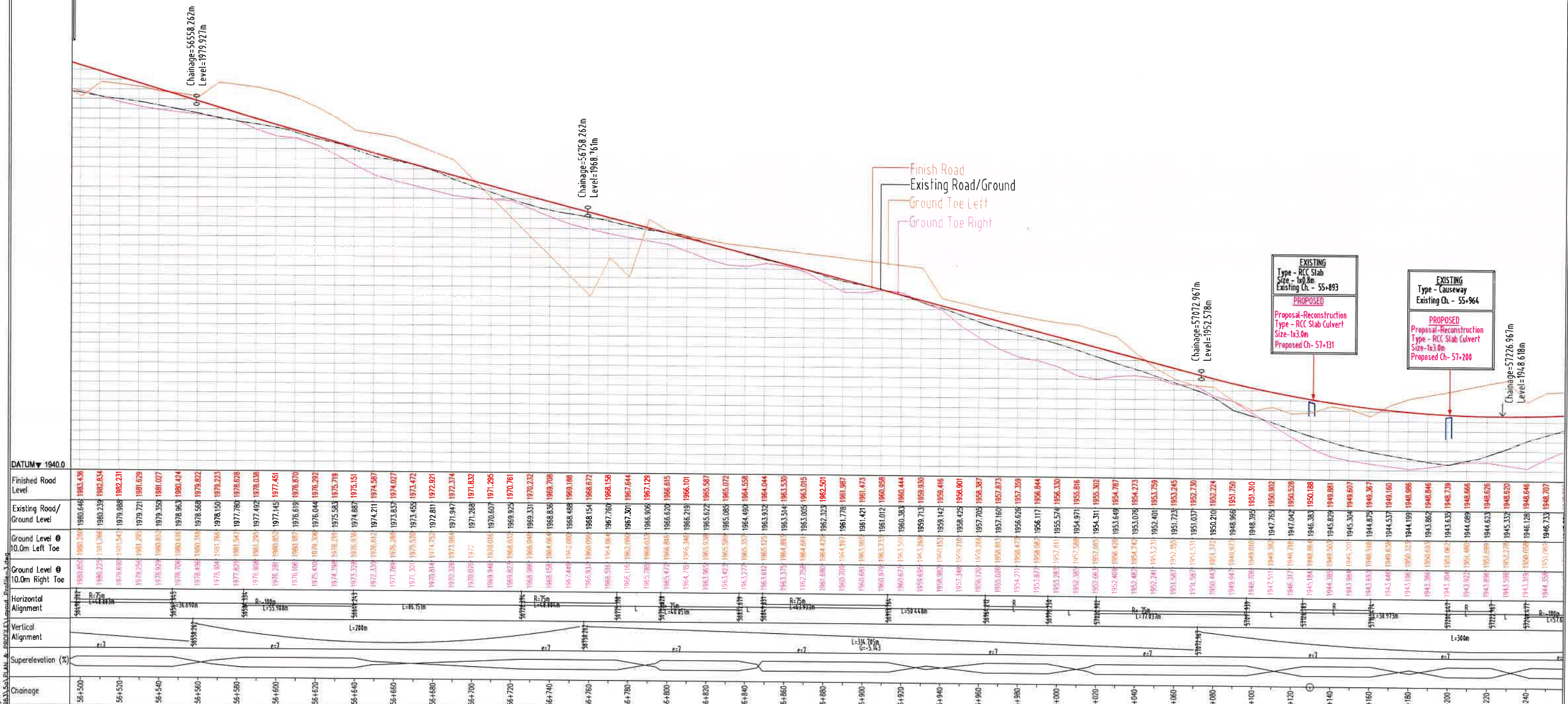
Revision : R0  
PACKAGE-5  
KAHER TO RHENOCK  
PLAN & PROFILE  
Profile-(Km 55+750 To Km 56+500)  
Dwg. No. : SAICPL-SESPL/NHIDCL/WB-SKM/P&P/10

DATE: 29/11/2019 - 12:00pm

PATH: C:\Users\SAICPL\Desktop\Profile-3.dwg

← KAHER

RHENOCK →



|                            |                            |                            |                            |
|----------------------------|----------------------------|----------------------------|----------------------------|
| DATE: 28/11/2019 - 12:00pm | DATE: 28/11/2019 - 12:00pm | DATE: 28/11/2019 - 12:00pm | DATE: 28/11/2019 - 12:00pm |
| REV                        | DATE                       | DESCRIPTION OF REVISIONS   | INITIALS                   |
| R0                         | Sep 2017                   | Final Feasibility Report   |                            |
| R0                         | Nov 2016                   | Draft Feasibility Report   |                            |
| R0                         | Dec 2014                   | Linear Plan                |                            |

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

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

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

DATE : November 2019 Revision RO

|             |          |             |               |
|-------------|----------|-------------|---------------|
| DESIGNED BY | DRAWN BY | CHECKED BY  | APPROVED BY   |
| Vijay Gupta | Naresh   | Vijay Gupta | Sanjay Shukla |

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

PACKAGE-5  
KAHER TO RHENOCK  
PLAN & PROFILE  
Profile-(Km 56+500 To Km 57+250)

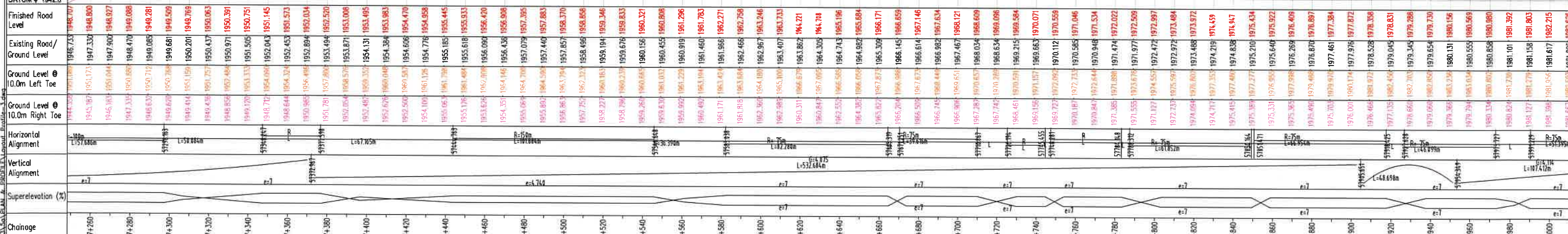
Dwg. No. :- SAICPL-SESPL/NHIDCL/WB-SKM/P&P/10b



KAFER

RHENOCK

DATUM 1942.0

DATE: 29/11/2019 - 12:00pm  
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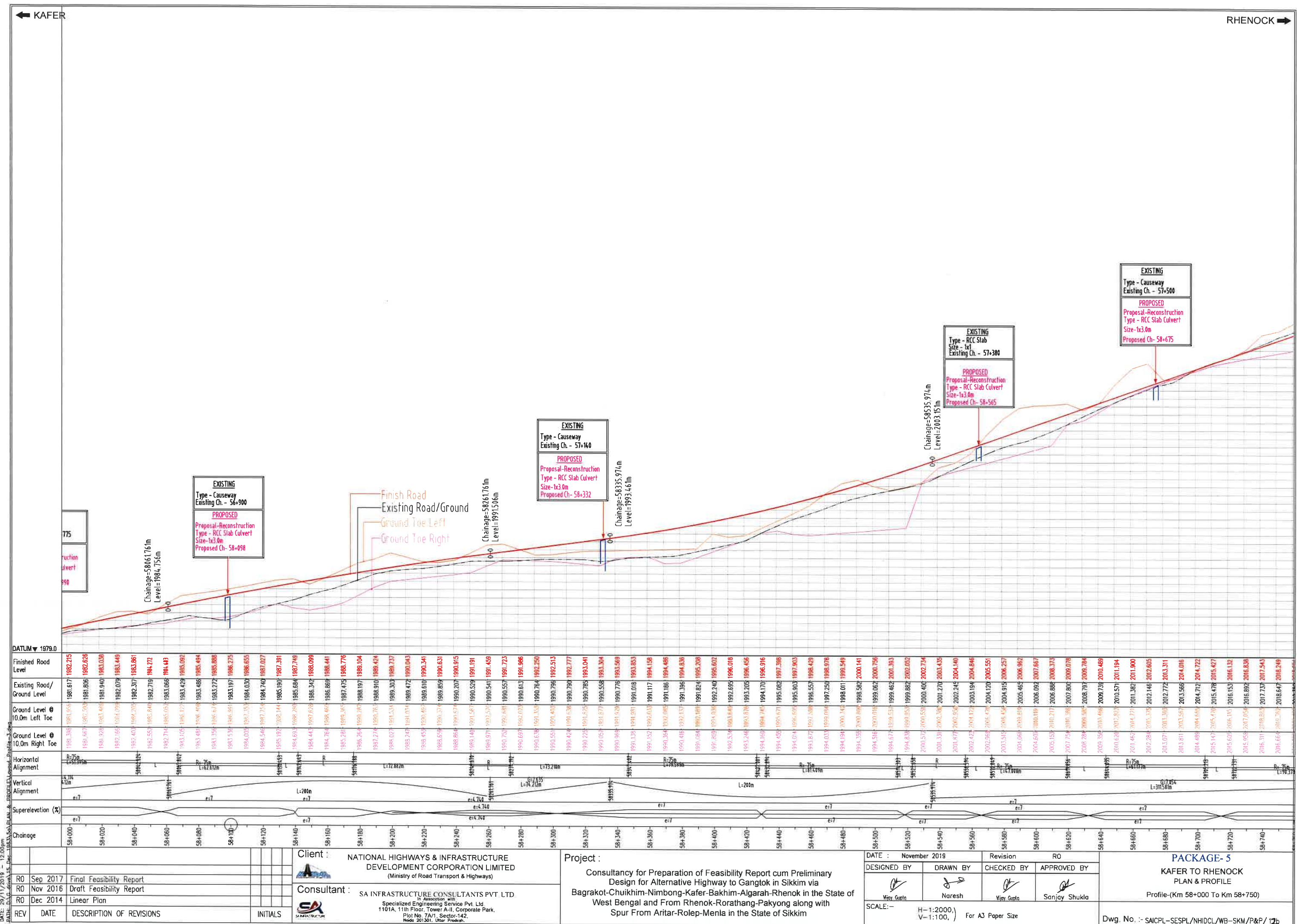
| REV | DATE     | DESCRIPTION OF REVISIONS | INITIALS |
|-----|----------|--------------------------|----------|
| RO  | Sep 2017 | Final Feasibility Report |          |
| RO  | Nov 2016 | Draft Feasibility Report |          |
| RO  | Dec 2014 | Linear Plan              |          |

|              |                                                                                                                                                                                                                              |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Client :     | NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED<br>(Ministry of Road Transport & Highways)                                                                                                                |
| Consultant : | SA INFRASTRUCTURE CONSULTANTS PVT. LTD.<br>In Association with<br>Specialized Engineering Service Pvt. Ltd.<br>1101A, 11th Floor, Tower A-II, Corporate Park,<br>Plot No. 7A/1, Sector-142,<br>Noida, 201301, Uttar Pradesh. |

Project :  
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|             |                       |                   |    |
|-------------|-----------------------|-------------------|----|
| DATE :      | November 2019         | Revision          | RO |
| DESIGNED BY |                       | DRAWN BY          |    |
| CHECKED BY  |                       | APPROVED BY       |    |
| SCALE:-     | H=1:2000,<br>V=1:100, | For A3 Paper Size |    |

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|------------------------------------------------|--|
| PACKAGE-5                                      |  |
| KAFER TO RHENOCK<br>PLAN & PROFILE             |  |
| Profile-(Km 57+250 To Km 58+000)               |  |
| Dwg. No. :- SAICPL-S&SPL/NHIDCL/WB-SKM/P&P/12a |  |



|    |          |                          |
|----|----------|--------------------------|
| RO | Sep 2017 | Final Feasibility Report |
| RO | Nov 2016 | Draft Feasibility Report |
| RO | Dec 2014 | Linear Plan              |

| REV | DATE | DESCRIPTION OF REVISIONS | INITIALS |
|-----|------|--------------------------|----------|
|-----|------|--------------------------|----------|

Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED  
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|                      |          |               |
|----------------------|----------|---------------|
| DATE : November 2019 | Revision | RO            |
| DESIGNED BY          | DRAWN BY | CHECKED BY    |
| APPROVED BY          |          |               |
| Vijay Gupta          | Naresh   | Vijay Gupta   |
|                      |          | Sanjay Shukla |

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

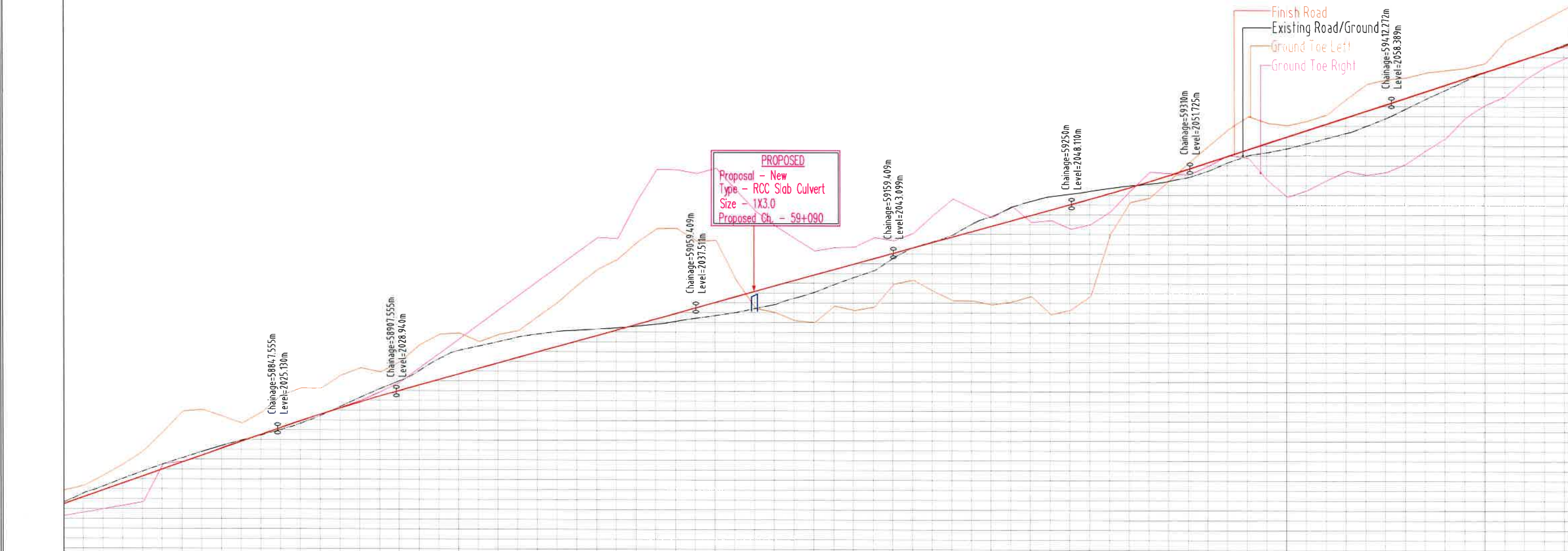
PACKAGE-5  
KAHER TO RHENOCK  
PLAN & PROFILE  
Profile-(Km 58+000 To Km 58+750)

Dwg. No. :- SAICPL-SSEPL/NHIDCL/WB-SKM/P&P/12b



← KAFER

RHENOCK →



| DATUM ▼ 2010.0                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Finished Road Level            | 2018.249, 2018.647, 2018.954, 2019.659, 2020.365, 2021.070, 2021.776, 2022.481, 2023.186, 2023.892, 2024.597, 2025.302, 2025.990, 2026.684, 2027.395, 2028.103, 2028.807, 2029.507, 2030.207, 2030.907, 2031.607, 2032.307, 2033.007, 2033.707, 2034.407, 2035.107, 2035.807, 2036.507, 2037.207, 2037.907, 2038.607, 2039.307, 2040.007, 2040.707, 2041.407, 2042.107, 2042.807, 2043.507, 2044.207, 2044.907, 2045.607, 2046.307, 2047.007, 2047.707, 2048.407, 2049.107, 2049.807, 2050.507, 2051.207, 2051.907, 2052.607, 2053.307, 2054.007, 2054.707, 2055.407, 2056.107, 2056.807, 2057.507, 2058.207, 2058.907, 2059.607, 2060.307, 2061.007, 2061.707, 2062.407, 2063.107, 2063.807, 2064.507                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Existing Road/Ground Level     | 2016.664, 2017.017, 2017.370, 2017.723, 2018.076, 2018.429, 2018.782, 2019.135, 2019.488, 2019.841, 2020.194, 2020.547, 2020.900, 2021.253, 2021.606, 2021.959, 2022.312, 2022.665, 2023.018, 2023.371, 2023.724, 2024.077, 2024.430, 2024.783, 2025.136, 2025.489, 2025.842, 2026.195, 2026.548, 2026.901, 2027.254, 2027.607, 2027.960, 2028.313, 2028.666, 2029.019, 2029.372, 2029.725, 2030.078, 2030.431, 2030.784, 2031.137, 2031.490, 2031.843, 2032.196, 2032.549, 2032.902, 2033.255, 2033.608, 2033.961, 2034.314, 2034.667, 2035.020, 2035.373, 2035.726, 2036.079, 2036.432, 2036.785, 2037.138, 2037.491, 2037.844, 2038.197, 2038.550, 2038.903, 2039.256, 2039.609, 2039.962, 2040.315, 2040.668, 2041.021, 2041.374, 2041.727, 2042.080, 2042.433, 2042.786, 2043.139, 2043.492, 2043.845, 2044.198, 2044.551, 2044.904, 2045.257, 2045.610, 2045.963, 2046.316, 2046.669, 2047.022, 2047.375, 2047.728, 2048.081, 2048.434, 2048.787, 2049.140, 2049.493, 2049.846, 2050.199, 2050.552, 2050.905, 2051.258, 2051.611, 2051.964, 2052.317, 2052.670, 2053.023, 2053.376, 2053.729, 2054.082, 2054.435, 2054.788, 2055.141, 2055.494, 2055.847, 2056.200, 2056.553, 2056.906, 2057.259, 2057.612, 2057.965, 2058.318, 2058.671, 2059.024, 2059.377, 2059.730, 2060.083, 2060.436, 2060.789, 2061.142, 2061.495, 2061.848, 2062.201, 2062.554, 2062.907, 2063.260, 2063.613, 2063.966, 2064.319 |
| Ground Level @ 10.0m Left Toe  | 2016.664, 2017.017, 2017.370, 2017.723, 2018.076, 2018.429, 2018.782, 2019.135, 2019.488, 2019.841, 2020.194, 2020.547, 2020.900, 2021.253, 2021.606, 2021.959, 2022.312, 2022.665, 2023.018, 2023.371, 2023.724, 2024.077, 2024.430, 2024.783, 2025.136, 2025.489, 2025.842, 2026.195, 2026.548, 2026.901, 2027.254, 2027.607, 2027.960, 2028.313, 2028.666, 2029.019, 2029.372, 2029.725, 2030.078, 2030.431, 2030.784, 2031.137, 2031.490, 2031.843, 2032.196, 2032.549, 2032.902, 2033.255, 2033.608, 2033.961, 2034.314, 2034.667, 2035.020, 2035.373, 2035.726, 2036.079, 2036.432, 2036.785, 2037.138, 2037.491, 2037.844, 2038.197, 2038.550, 2038.903, 2039.256, 2039.609, 2039.962, 2040.315, 2040.668, 2041.021, 2041.374, 2041.727, 2042.080, 2042.433, 2042.786, 2043.139, 2043.492, 2043.845, 2044.198, 2044.551, 2044.904, 2045.257, 2045.610, 2045.963, 2046.316, 2046.669, 2047.022, 2047.375, 2047.728, 2048.081, 2048.434, 2048.787, 2049.140, 2049.493, 2049.846, 2050.199, 2050.552, 2050.905, 2051.258, 2051.611, 2051.964, 2052.317, 2052.670, 2053.023, 2053.376, 2053.729, 2054.082, 2054.435, 2054.788, 2055.141, 2055.494, 2055.847, 2056.200, 2056.553, 2056.906, 2057.259, 2057.612, 2057.965, 2058.318, 2058.671, 2059.024, 2059.377, 2059.730, 2060.083, 2060.436, 2060.789, 2061.142, 2061.495, 2061.848, 2062.201, 2062.554, 2062.907, 2063.260, 2063.613, 2063.966, 2064.319 |
| Ground Level @ 10.0m Right Toe | 2016.664, 2017.017, 2017.370, 2017.723, 2018.076, 2018.429, 2018.782, 2019.135, 2019.488, 2019.841, 2020.194, 2020.547, 2020.900, 2021.253, 2021.606, 2021.959, 2022.312, 2022.665, 2023.018, 2023.371, 2023.724, 2024.077, 2024.430, 2024.783, 2025.136, 2025.489, 2025.842, 2026.195, 2026.548, 2026.901, 2027.254, 2027.607, 2027.960, 2028.313, 2028.666, 2029.019, 2029.372, 2029.725, 2030.078, 2030.431, 2030.784, 2031.137, 2031.490, 2031.843, 2032.196, 2032.549, 2032.902, 2033.255, 2033.608, 2033.961, 2034.314, 2034.667, 2035.020, 2035.373, 2035.726, 2036.079, 2036.432, 2036.785, 2037.138, 2037.491, 2037.844, 2038.197, 2038.550, 2038.903, 2039.256, 2039.609, 2039.962, 2040.315, 2040.668, 2041.021, 2041.374, 2041.727, 2042.080, 2042.433, 2042.786, 2043.139, 2043.492, 2043.845, 2044.198, 2044.551, 2044.904, 2045.257, 2045.610, 2045.963, 2046.316, 2046.669, 2047.022, 2047.375, 2047.728, 2048.081, 2048.434, 2048.787, 2049.140, 2049.493, 2049.846, 2050.199, 2050.552, 2050.905, 2051.258, 2051.611, 2051.964, 2052.317, 2052.670, 2053.023, 2053.376, 2053.729, 2054.082, 2054.435, 2054.788, 2055.141, 2055.494, 2055.847, 2056.200, 2056.553, 2056.906, 2057.259, 2057.612, 2057.965, 2058.318, 2058.671, 2059.024, 2059.377, 2059.730, 2060.083, 2060.436, 2060.789, 2061.142, 2061.495, 2061.848, 2062.201, 2062.554, 2062.907, 2063.260, 2063.613, 2063.966, 2064.319 |
| Horizontal Alignment           | Horizontal Alignment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Vertical Alignment             | Vertical Alignment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Superelevation (%)             | Superelevation (%)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Chainage                       | Chainage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

| 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. In Association with Specialized Engineering Service Pvt. Ltd. 1101A, 11th Floor, Tower A-II, Corporate Park, Plot No. 74/1, Sector-142, Noida 201301, Uttar Pradesh

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

|                      |                                      |               |
|----------------------|--------------------------------------|---------------|
| DATE : November 2019 | Revision                             | RO            |
| DESIGNED BY          | DRAWN BY                             | CHECKED BY    |
| VIEW Gupta           | Nareish                              | VIEW Gupta    |
| SCALE:-              | H=1:2000, V=1:100, For A3 Paper Size | APPROVED BY   |
|                      |                                      | Sanjay Shukla |

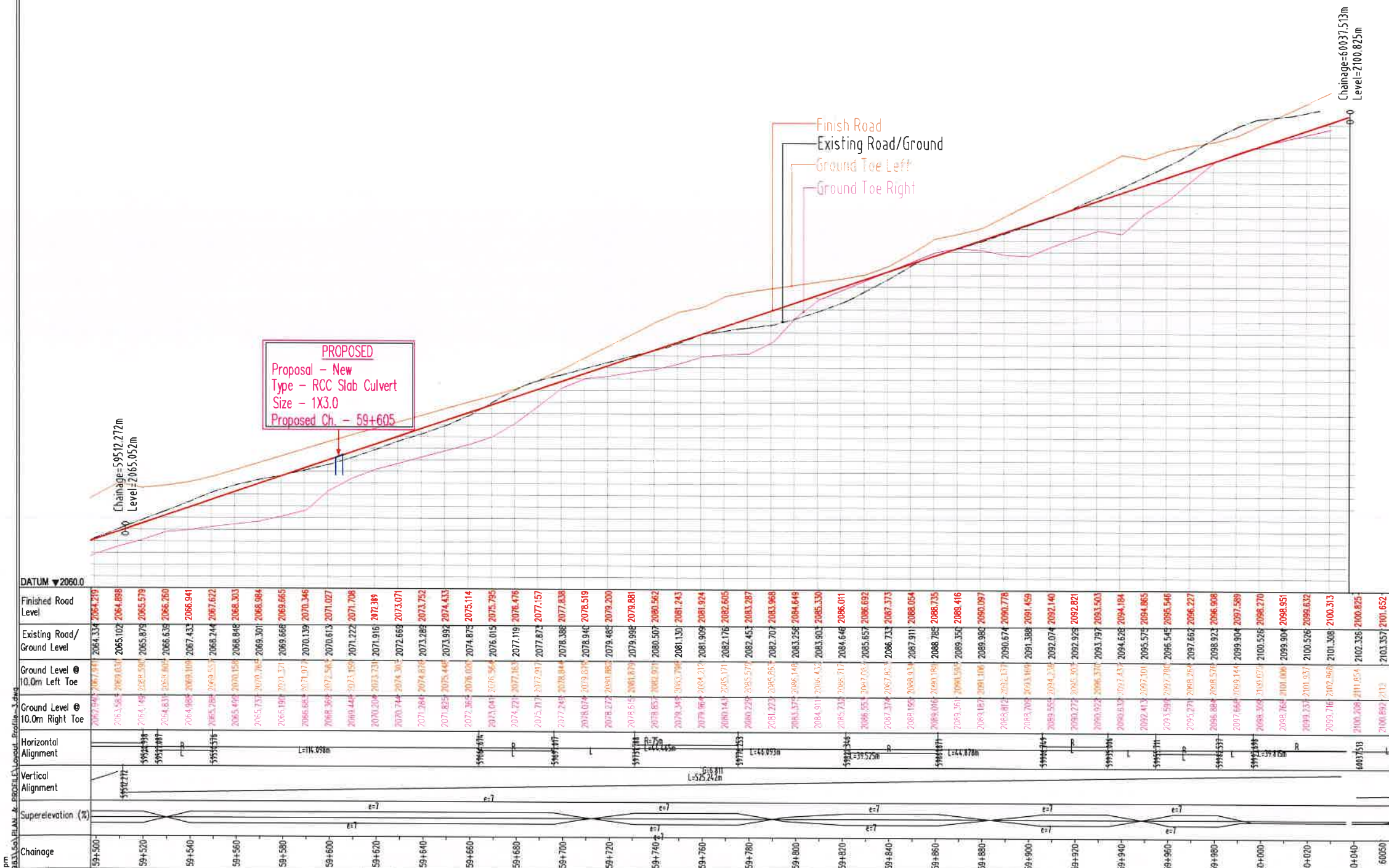
PACKAGE-5

KAFER TO RHENOCK

PLAN & PROFILE

Profile-(Km 58+750 To Km 59+500)

Dwg. No. :- SAICPL-SESPL/NHIDCL/WB-SKM/P&P/12a



| DATUM                          | 2060.0   |
|--------------------------------|----------|
| Finished Road Level            | 2064.219 |
| Existing Road/Ground Level     | 2064.334 |
| Ground Level @ 10.0m Left Toe  | 2064.334 |
| Ground Level @ 10.0m Right Toe | 2064.334 |
| Horizontal Alignment           |          |
| Vertical Alignment             |          |
| Superelevation (%)             |          |
| Chainage                       | 59+500   |
|                                | 59+520   |
|                                | 59+540   |
|                                | 59+560   |
|                                | 59+580   |
|                                | 59+600   |
|                                | 59+620   |
|                                | 59+640   |
|                                | 59+660   |
|                                | 59+680   |
|                                | 59+700   |
|                                | 59+720   |
|                                | 59+740   |
|                                | 59+760   |
|                                | 59+780   |
|                                | 59+800   |
|                                | 59+820   |
|                                | 59+840   |
|                                | 59+860   |
|                                | 59+880   |
|                                | 59+900   |
|                                | 59+920   |
|                                | 59+940   |
|                                | 59+960   |
|                                | 59+980   |
|                                | 60+000   |
|                                | 60+020   |
|                                | 60+040   |
|                                | 60+060   |
|                                | 60+080   |
|                                | 60+100   |

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

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

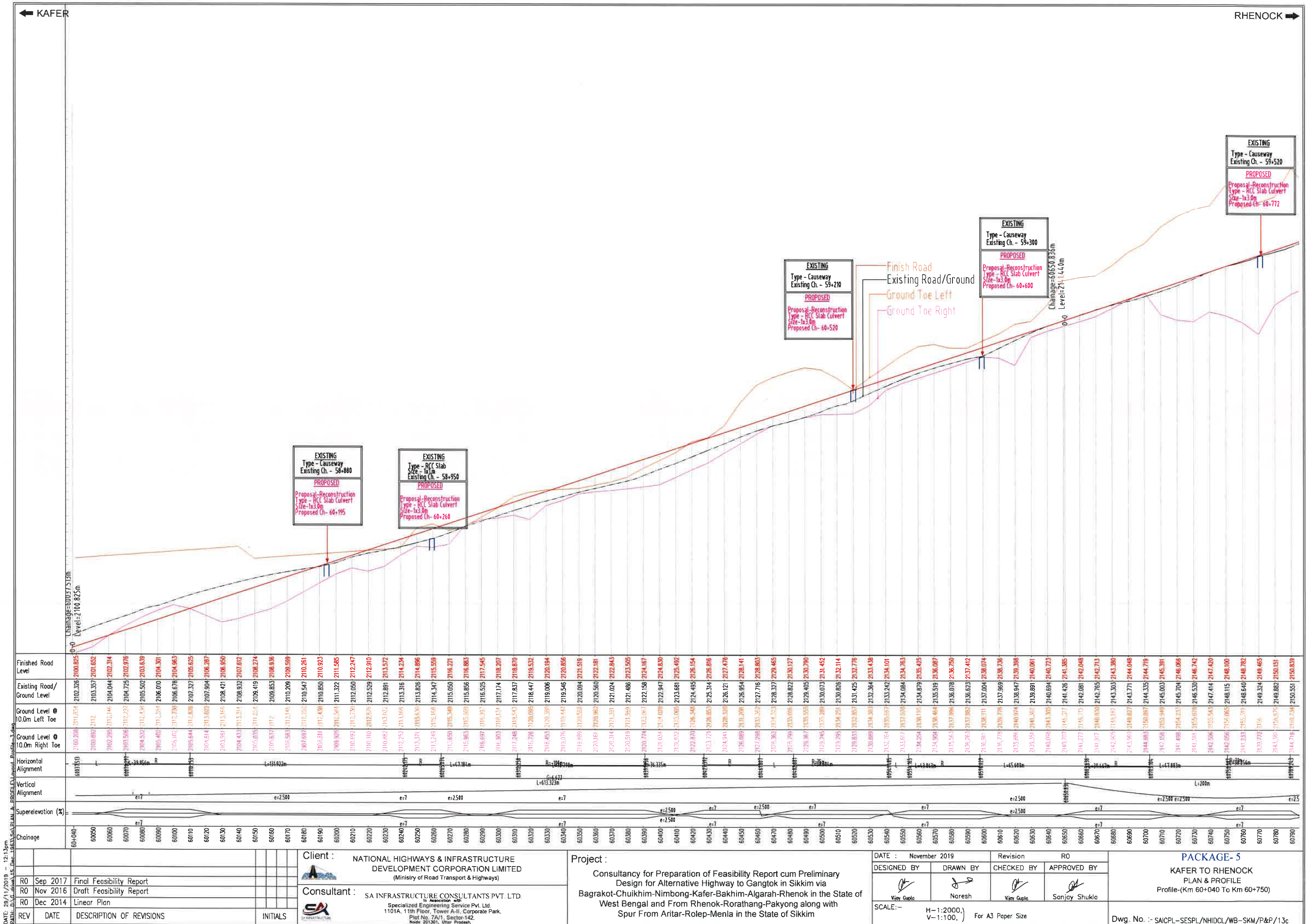
|                      |                       |                   |
|----------------------|-----------------------|-------------------|
| DATE : November 2019 | Revision              | RO                |
| DESIGNED BY          | DRAWN BY              | CHECKED BY        |
| APPROVED BY          |                       |                   |
| SCALE:-              | H-1:2000,<br>V-1:100, | For A3 Paper Size |

PACKAGE-5  
KAFER TO RHENOCK  
PLAN & PROFILE  
Profile-(Km 59+500 To Km 60+040)

Dwg. No. :- SAICPL-SESPL/NHIDCL/WB-SKM/P&P/13b

← KAHER

RHENOCK →

DATE: 28/11/2019 - 12:13pm  
PATH: D:\G...15 Dec 1963\SAIPLAN A PROFILE\Profile\_1.dwg

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

Consultant : SA INFRASTRUCTURE CONSULTANTS PVT. LTD. Specialized Engineering Service Pvt. Ltd. 1101A, 11th Floor, Tower A-II, Corporate Park, Plot No. 7A/1, Sector-142, Model 201/201, Uttar Pradesh.

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

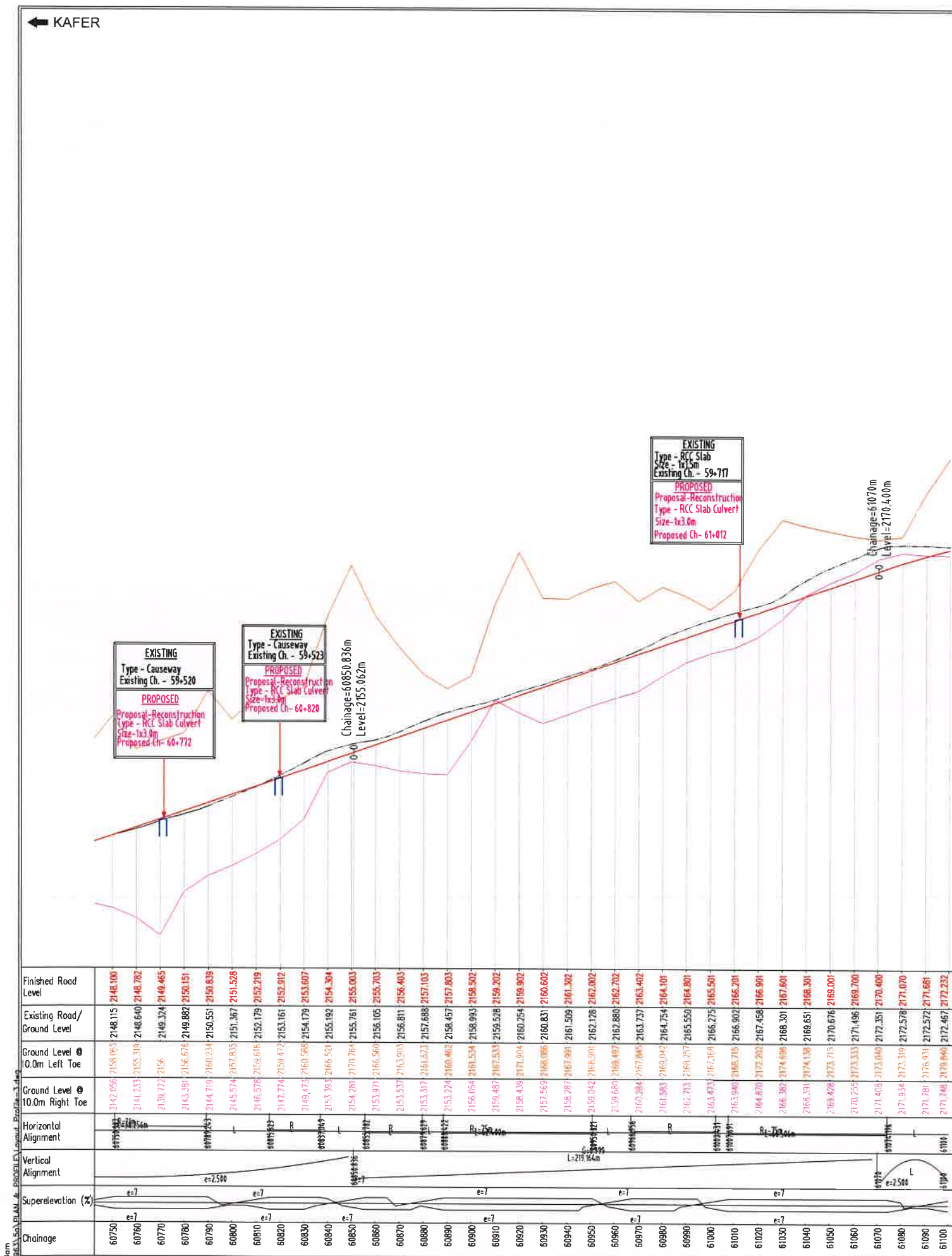
DATE : November 2019  
DESIGNED BY : [Signature]  
DRAWN BY : Naresh  
CHECKED BY : [Signature]  
APPROVED BY : Sanjay Shukla

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

Revision RO  
PACKAGE-5  
KAHER TO RHENOCK  
PLAN & PROFILE  
Profile-(Km 60+040 To Km 60+750)  
Dwg. No. :- SAICPL-SESPL/NHIDCL/WB-SKM/P&P/13c

← KAFER

RHENOCK →

DATE: 29/11/2019 - 11:58am  
PATH: D:\G-Data\15 Dec 19\3\SA PLAN & PROFILE\Level Profile-3.jpg

| 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<br>(Ministry of Road Transport & Highways)                                                                                                               |
| Consultant : | SA INFRASTRUCTURE CONSULTANTS PVT. LTD.<br>In Association with<br>Specialized Engineering Service Pvt. Ltd.<br>1101A, 11th Floor, Tower A-II, Corporate Park,<br>Plot No. 7A/1, Sector-142,<br>Noida 201301, Uttar Pradesh. |

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

|             |                       |                   |             |
|-------------|-----------------------|-------------------|-------------|
| DATE :      | November 2019         | Revision          | RO          |
| DESIGNED BY | DRAWN BY              | CHECKED BY        | APPROVED BY |
|             |                       |                   |             |
| SCALE:-     | H-1:2000,<br>V-1:100, | For A3 Paper Size |             |

|                                                                                     |  |
|-------------------------------------------------------------------------------------|--|
| PACKAGE-5<br>KAFER TO RHENOCK<br>PLAN & PROFILE<br>Profile-(Km 60+750 To Km 61+100) |  |
| Dwg. No. :- SAICPL-SSEPL/NHIDCL/WB-SKM/P&P/13                                       |  |

# STANDARD DRAWING

---



# CAUTIONARY/WARNING SIGNS



DATE: 14/11/2019 - 2:14pm  
PATH: D:\G:\Sikim\STANDARD DRAWINGS\MS-1-ROAD SIGNS-1\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              |          |

|                     |                                                                                                                                                                                                                           |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Client :</b>     | NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED<br>(Ministry of Road Transport & Highways)                                                                                                             |
| <b>Consultant :</b> | SA INFRASTRUCTURE CONSULTANTS PVT LTD<br>In Association with<br>Specialized Engineering Service Pvt. Ltd.<br>1101A, 11th Floor, Tower A-II, Corporate Park,<br>Plot No. 7A/1, Sector-142,<br>Noida 201301, Uttar Pradesh. |

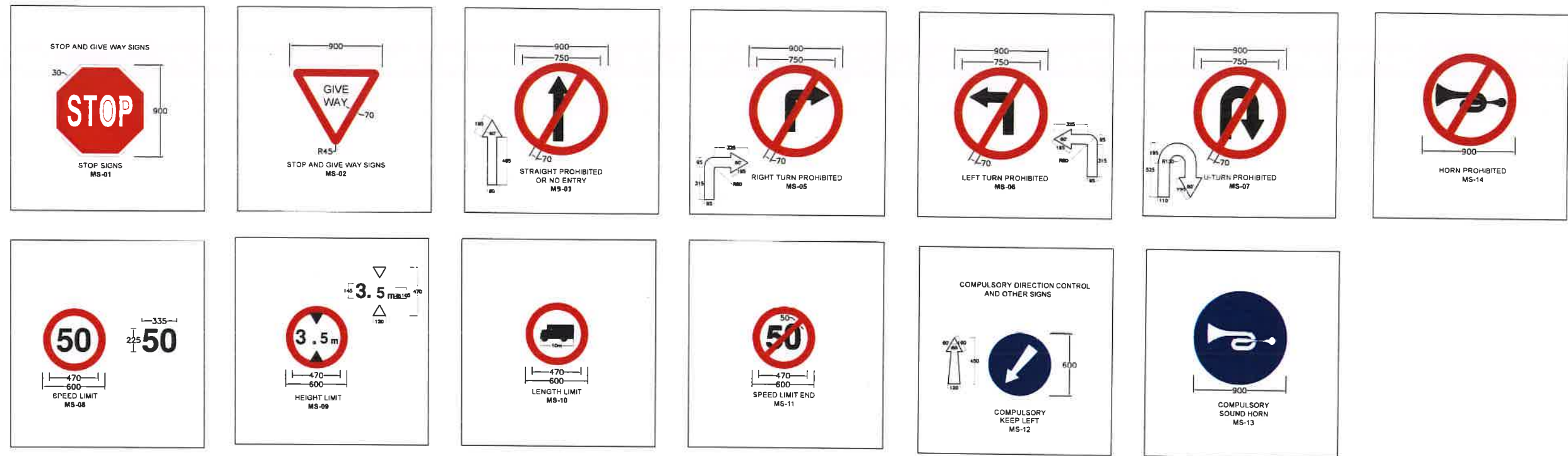
**Project :**  
Consultancy for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chuikhim-Nimbong-Kafer-Bakhim-Algarah-Rhenok in the State of West Bengal and From Rhenok-Rorathang-Pakyong along with Spur From Antar-Rolep-Menla in the State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

|                      |          |             |               |
|----------------------|----------|-------------|---------------|
| DATE : November 2019 |          | Revision R0 |               |
| DESIGNED BY          | DRAWN BY | CHECKED BY  | APPROVED BY   |
| Vijay Gupta          | Naresh   | Vijay Gupta | Sonjay Shukla |
| SCALE:-NTS           |          |             |               |

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

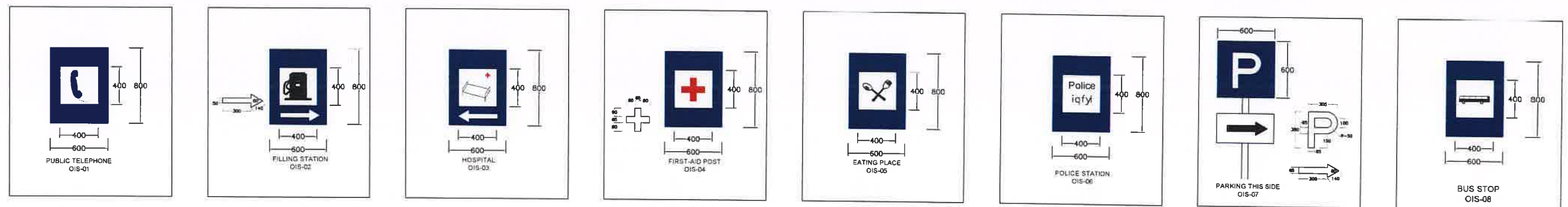
Dwg No. :- SAICPL-SSESPL/NHIDCL/WB-SKM/Misc/01

## MANDATORY/REGULATORY SIGNS

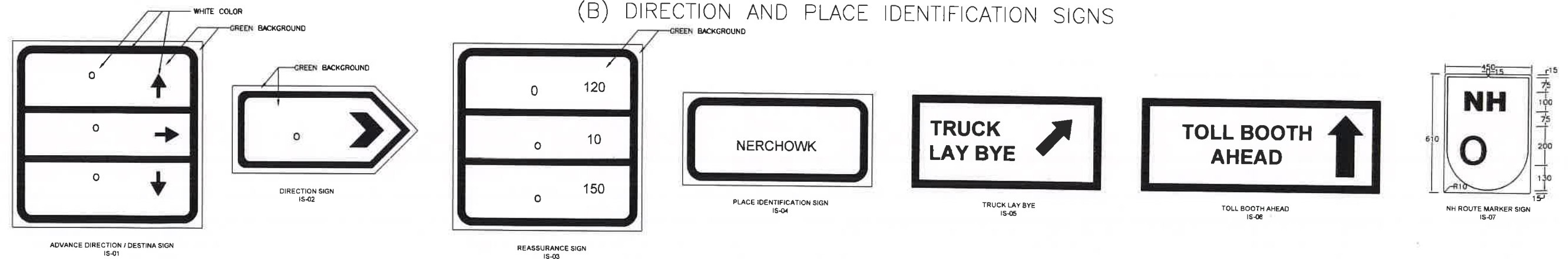


## INFORMATORY SIGN BOARD:-

### (A) FACILITY INFORMATION SIGNS

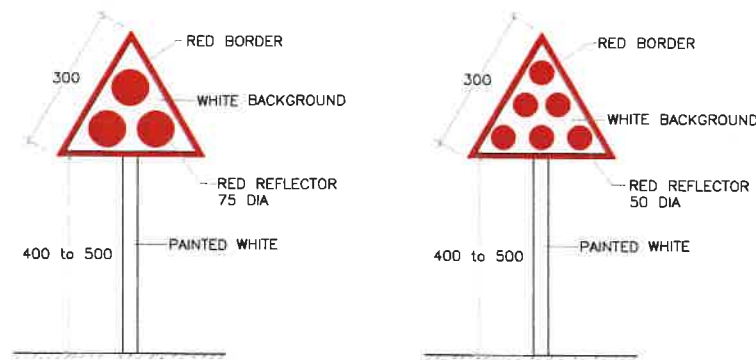


### (B) DIRECTION AND PLACE IDENTIFICATION SIGNS

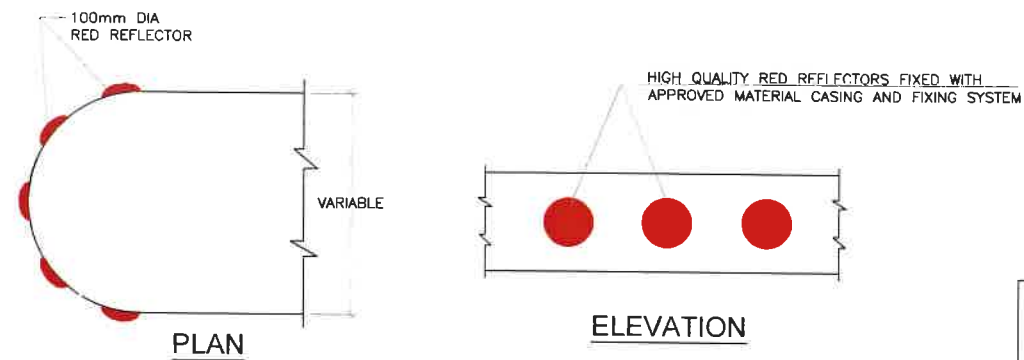


DATE: 14/11/2019 - 2:14pm  
PATH: C:\Users\SAICPL\Desktop\STANDARD DRAWING\MS-2-ROAD SIGNS-II (Sheet 2 of 3).dwg

|     |          |                          |          |                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                       |                                                      |                                        |                             |                                |                                                              |                                                |
|-----|----------|--------------------------|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|----------------------------------------|-----------------------------|--------------------------------|--------------------------------------------------------------|------------------------------------------------|
| REV | DATE     | DESCRIPTION OF REVISIONS | INITIALS | Client :<br>NATIONAL HIGHWAYS & INFRASTRUCTURE<br>DEVELOPMENT CORPORATION LIMITED<br>(Ministry of Road Transport & Highways)                                                                                        | Project :<br>Consultancy for Preparation of Feasibility Report cum Preliminary<br>Design for Alternative Highway to Gangtok in Sikkim via<br>Bagrakot-Chuikhim-Nimbong-Kafer-Bakhim-Algarah-Rhenok in the State of<br>West Bengal and From Rhenok-Rorathang-Pakyong along with<br>Spur From Aritar-Rolep-Menla in the State of Sikkim | DATE : November 2019<br>DESIGNED BY :<br>Vijay Gupta | Revision<br>RO<br>DRAWN BY :<br>Naresh | CHECKED BY :<br>Vijay Gupta | APPROVED BY :<br>Sanjay Shukla | PACKAGE-5<br>KAFER TO RHENOCK<br>ROAD SIGN<br>(Sheet 2 of 3) | Dwg. No. :- SAICPL-SESPL/NHIDCL/WB-SKM/Misc/02 |
| RO  | Sep 2017 | Final Feasibility Report |          |                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                       |                                                      |                                        |                             |                                |                                                              |                                                |
| RO  | Nov 2016 | Draft Feasibility Report |          |                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                       |                                                      |                                        |                             |                                |                                                              |                                                |
| RO  | Dec 2014 | Linear Plan              |          | Consultant :<br>SA INFRASTRUCTURE CONSULTANTS PVT. LTD.<br>Specialized Engineering Service Pvt. Ltd.<br>1101A, 11th Floor, Tower A-II, Corporate Park,<br>Plot No. 7A/1, Sector-142,<br>Noida-201301, Uttar Pradesh |                                                                                                                                                                                                                                                                                                                                       |                                                      |                                        |                             |                                |                                                              |                                                |



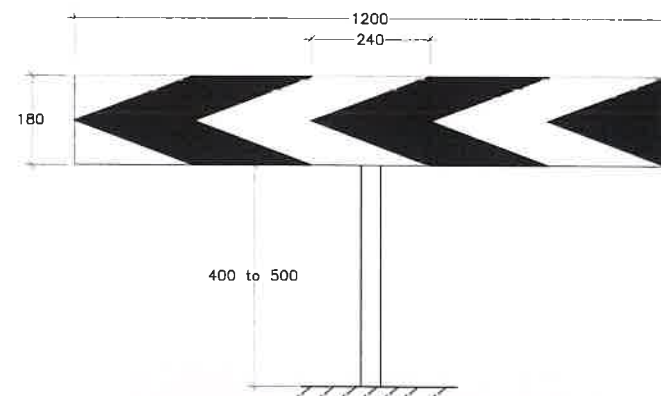
CLUSTER OF RED REFLECTORS  
TA-1



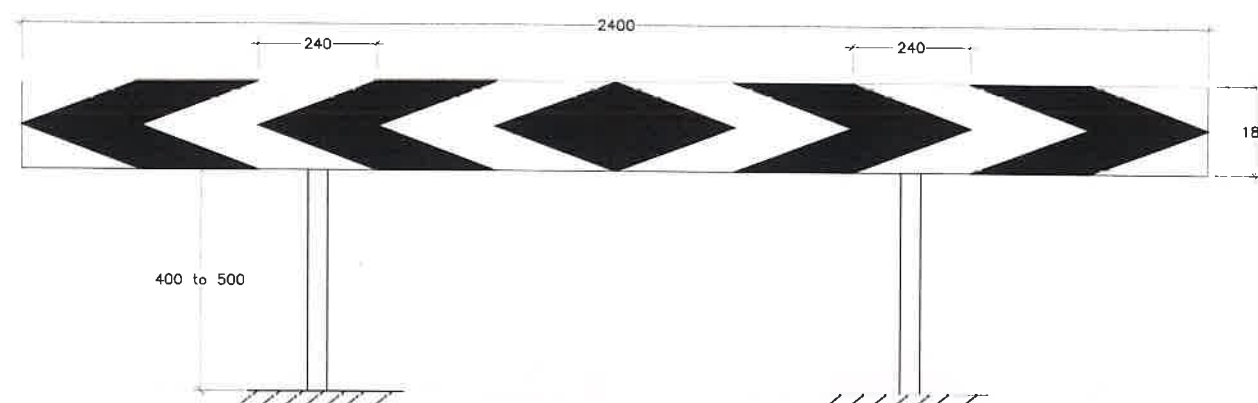
MEDIAN TIP REFLECTORS  
TA-2

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

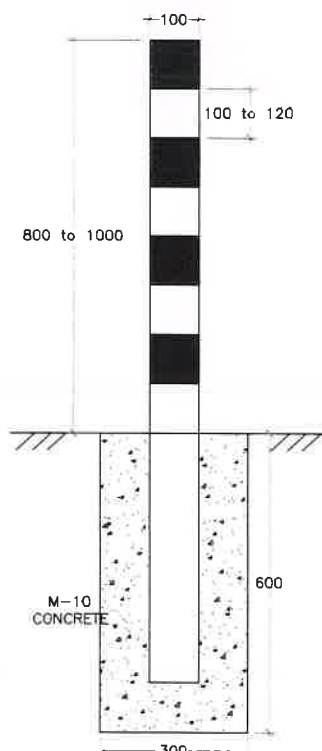
ON W-BEAM OF  
METAL BEAM  
CRASH BARRIER  
TA-3



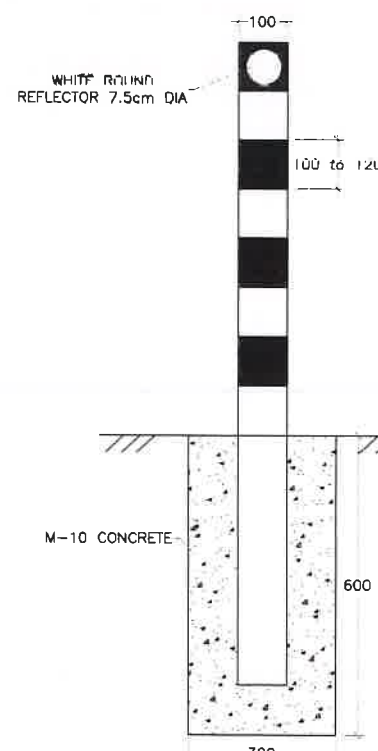
ONE-WAY HAZARD MARKER



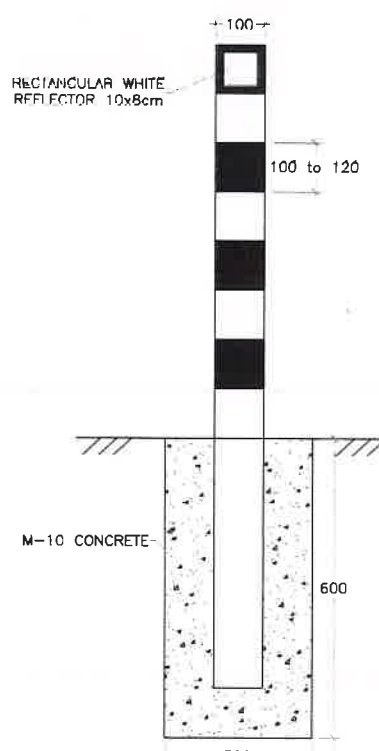
TWO-WAY HAZARD MARKER



DELINEATOR  
WITHOUT  
REFLECTOR

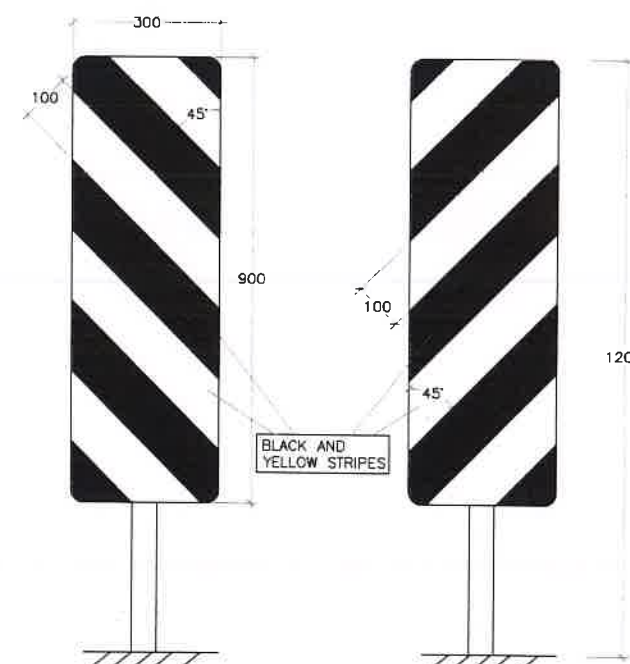


DELINEATOR  
WITH CIRCULAR  
REFLECTOR



DELINEATOR  
WITH RECTANGULAR  
REFLECTOR

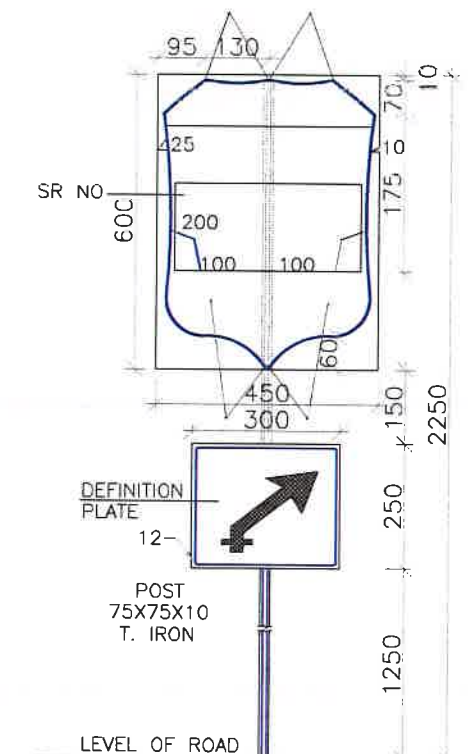
ROADWAY DELINEATORS



LEFT

RIGHT

OBJECT HAZARD MARKERS



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

DATE: 14/11/2019 - 21:59pm  
FILE: D:\C:\Users\SAI\Documents\SAI\STANDARD DRAWINGS\MS-3-ROAD SIGNS-III (Sheet 3 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              |          |

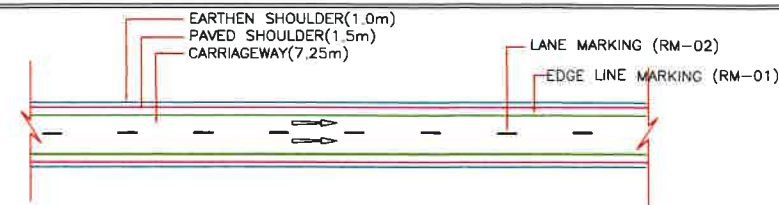
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|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Client :     | NATIONAL HIGHWAYS & INFRASTRUCTURE<br>DEVELOPMENT CORPORATION LIMITED<br>(Ministry of Road Transport & Highways)                                                                                                              |
| Consultant : | SA INFRASTRUCTURE CONSULTANTS PVT. LTD.<br>In Association with<br>Specialized Engineering Service Pvt. Ltd.<br>1101A, 11th Floor, Tower A-II, Corporate Park,<br>Plot No. 7A/1, Sector-142,<br>Gurgaon 201301, Uttar Pradesh. |

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

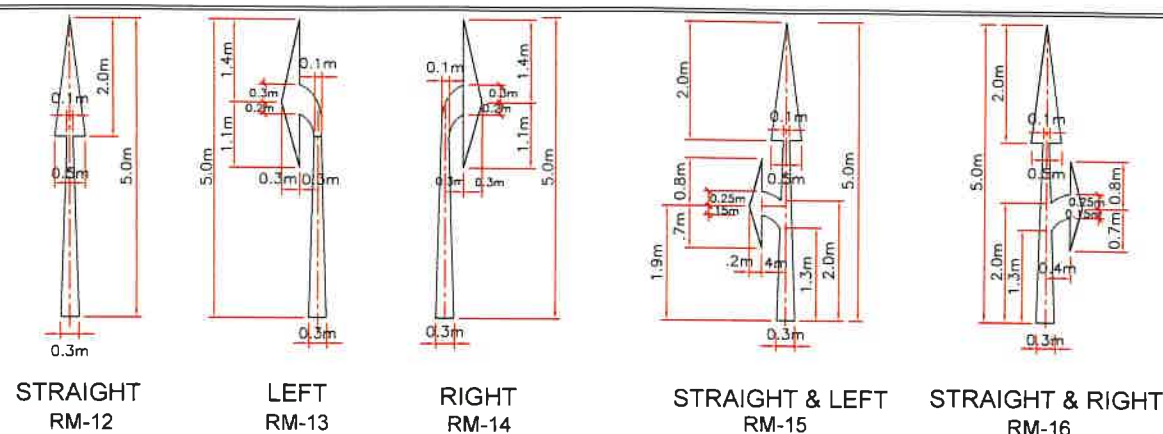
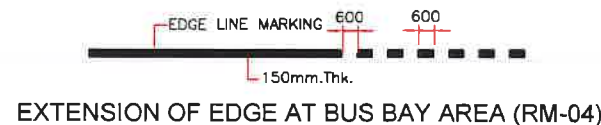
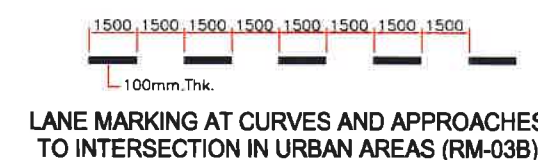
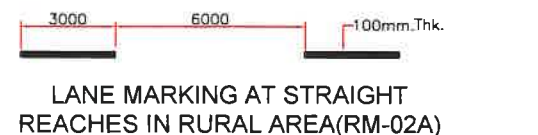
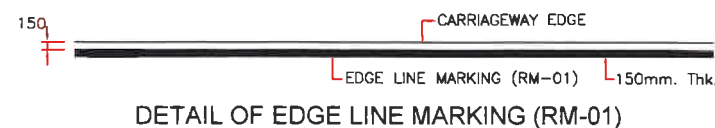
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|-------------|---------------|-------------|---------------|
| DATE :      | November 2019 | Revision    | R0            |
| DESIGNED BY | DRAWN BY      | CHECKED BY  | APPROVED BY   |
| Vijay Gupta | Naresh        | Vijay Gupta | Sanjay Shukla |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

PACKAGE-5  
KAFER TO RHENOCK  
ROAD SIGN  
(Sheet 03 of 03)

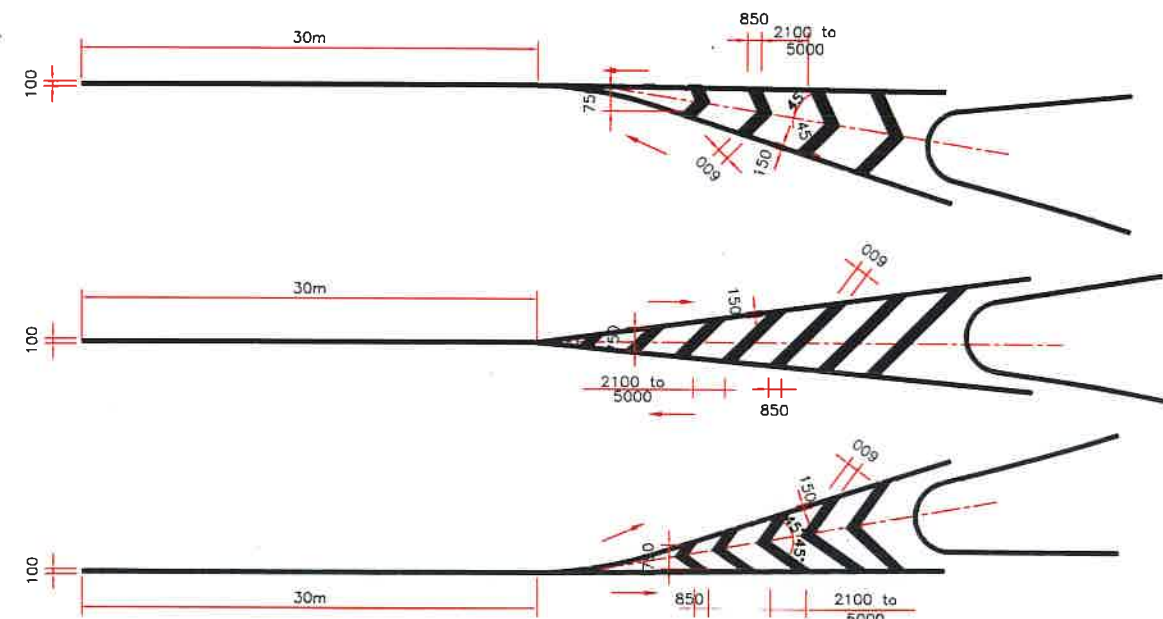
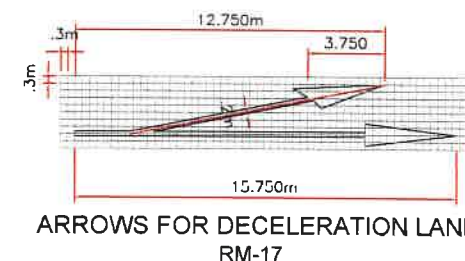
Dwg. No. :- SAICPL-SESPL/NHIDCL/WB-SKM/Misc/03



TYPICAL LAYOUT OF ROAD MARKINGS FOR 2-LANE



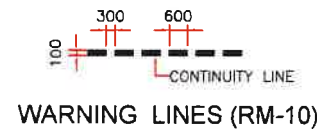
ROUTE DIRECTIONAL ARROWS FOR PROJECT ROAD  
(ALL THE ARROWS ARE IN WHITE COLOUR)



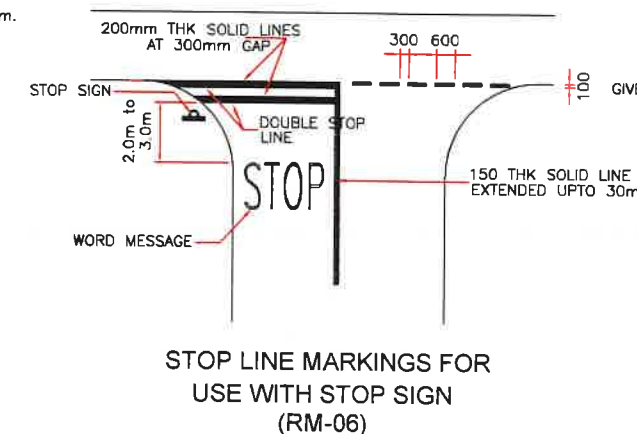
| TOTAL LENGTH OF MARKING (m) | CLEAR SPACING BETWEEN DIAGONALS OR CHEVRONS(mm) |                |
|-----------------------------|-------------------------------------------------|----------------|
|                             | SPEED(<75km/h)                                  | SPEED(>75km/h) |
| <6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

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

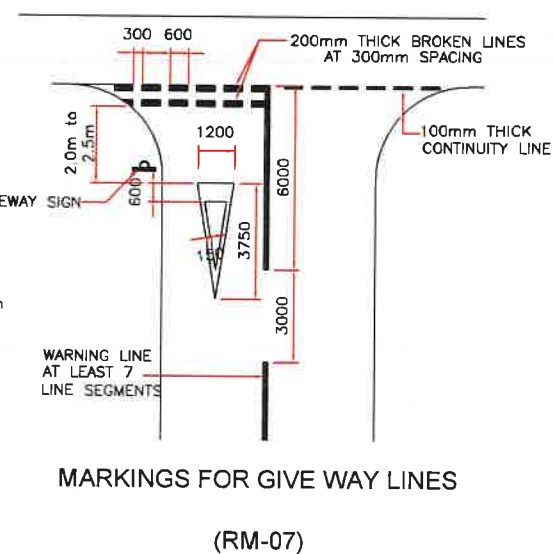
DETAILS OF DIAGONAL AND CHEVRON MARKINGS (RM-09)



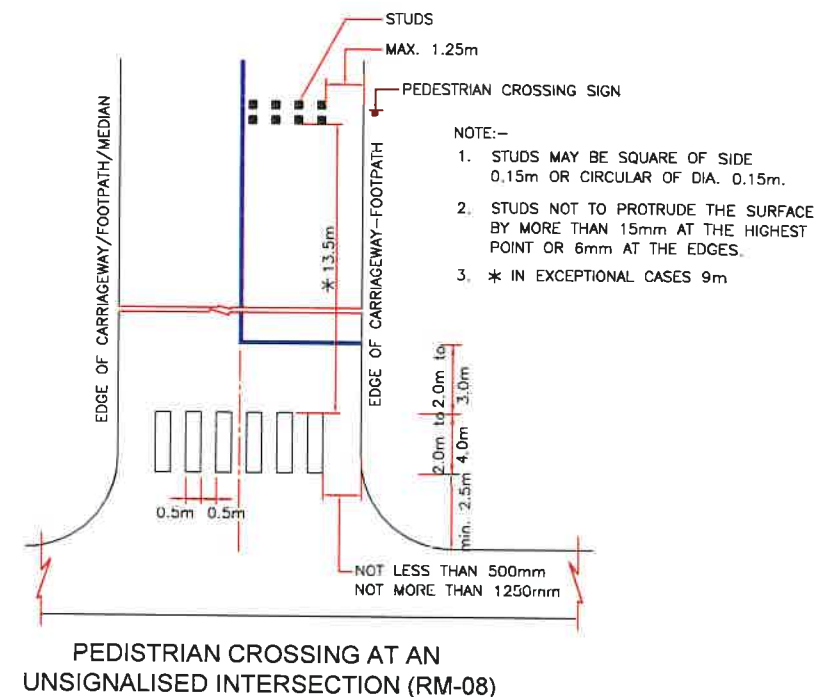
KERB MARKINGS (RM-11)



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



MARKINGS FOR GIVE WAY LINES  
(RM-07)



PEDISTRIAN CROSSING AT AN  
UNSIGNALISED INTERSECTION (RM-08)

DATE: 14/11/2019 - 2:17pm  
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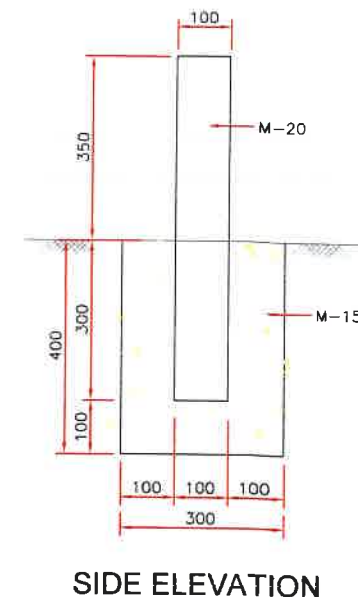
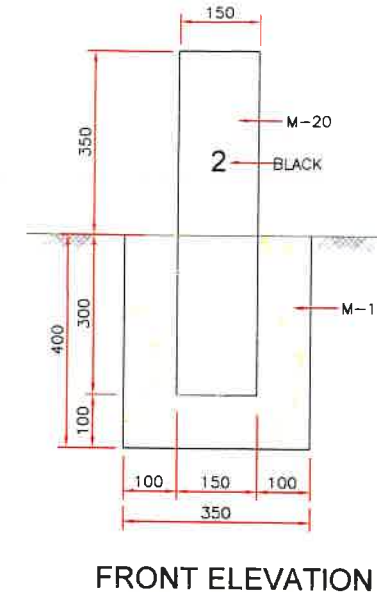
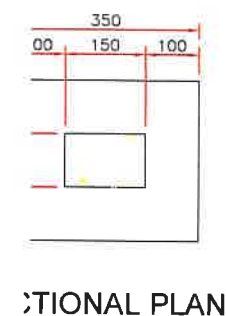
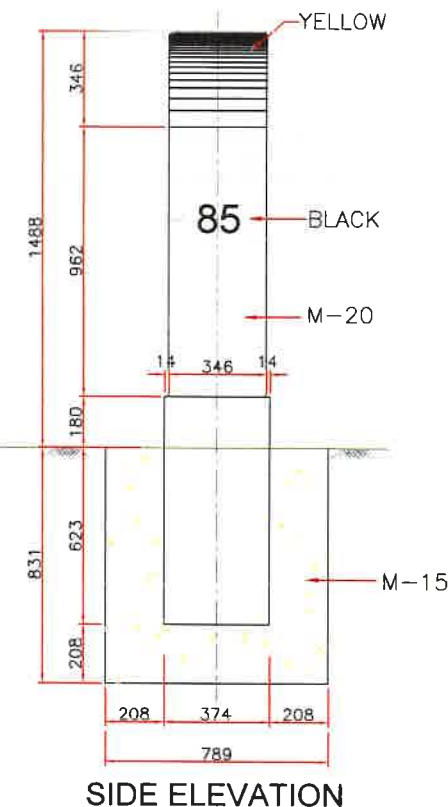
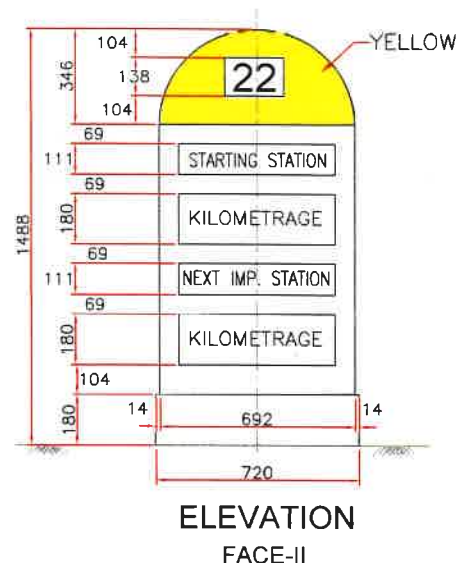
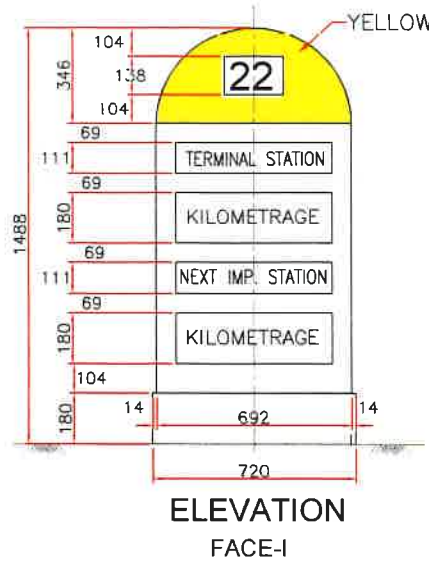
| REV | DATE     | DESCRIPTION OF REVISIONS | INITIALS |
|-----|----------|--------------------------|----------|
| R0  | Sep 2017 | Final Feasibility Report |          |
| R0  | Nov 2016 | Draft Feasibility Report |          |
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|              |                                                                                                                                                                                                        |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Client :     | NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED<br>(Ministry of Road Transport & Highways)                                                                                          |
| Consultant : | SA INFRASTRUCTURE CONSULTANTS PVT. LTD.<br>Specialized Engineering Service Pvt. Ltd.<br>1101A, 11th Floor, Tower A-II, Corporate Park,<br>Plot No. 7A/1, Sector-142,<br>Noida - 201301, Uttar Pradesh. |

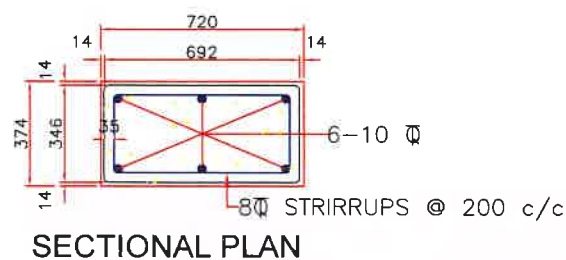
Project :  
Consultancy for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-Chuikhim-Nimbong-Kafer-Bakhim-Algarah-Rhenok in the State of West Bengal and From Rhenok-Rorathang-Pakyong along with Spur From Aritar-Rolep-Menla in the State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

|             |               |             |               |
|-------------|---------------|-------------|---------------|
| DATE :      | November 2019 | Revision    | RO            |
| DESIGNED BY | DRAWN BY      | CHECKED BY  | APPROVED BY   |
| Vijay Gupta | Naresh        | Vijay Gupta | Sanjay Shukla |
| SCALE:--NTS |               |             |               |

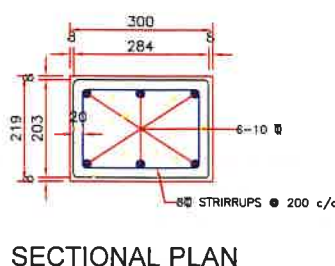
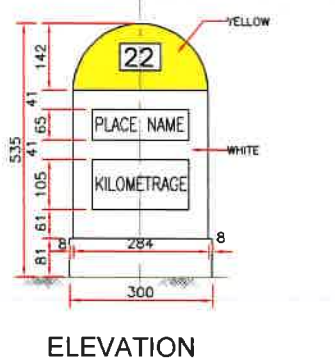
|                                                         |  |
|---------------------------------------------------------|--|
| PACKAGE-5<br>KAFER TO RHENOCK<br>DETAIL OF ROAD MARKING |  |
| Dwg. No. :- SAICPL--SESPL/NHIDCL/WB--SKM/Misc/c4        |  |



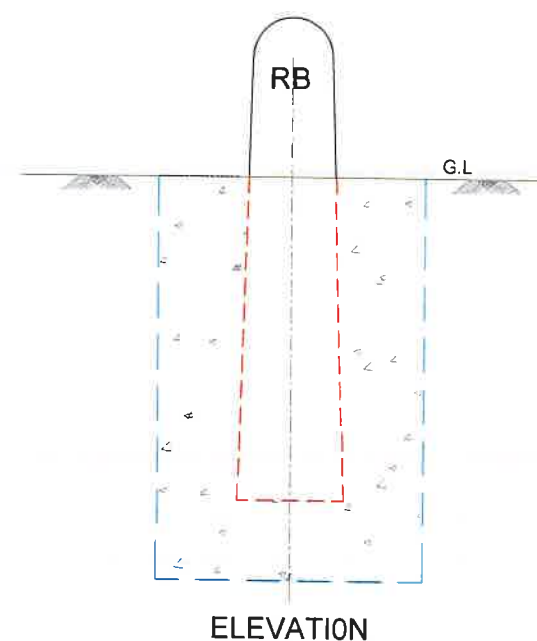
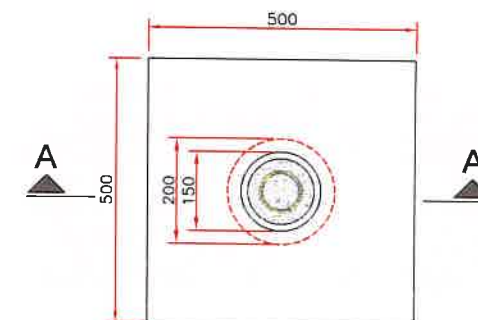
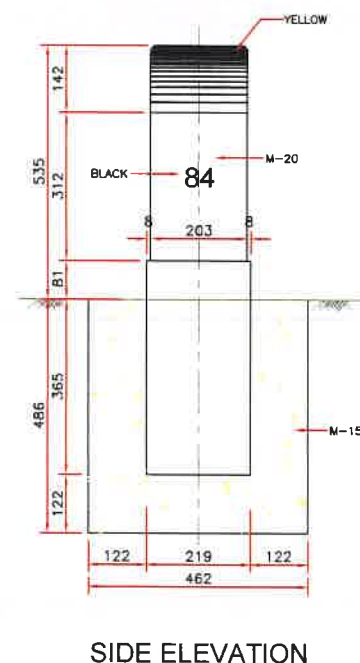
**DETAIL OF 200 METRE STONE**  
(SCALE 1:10)



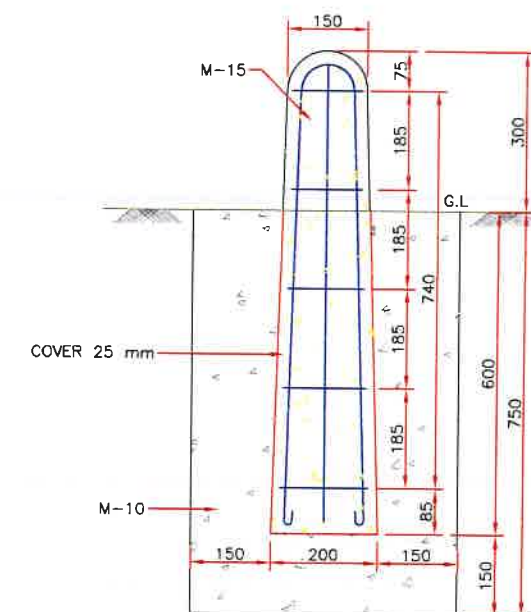
**DETAIL OF FIFTH KILOMETRE STONE**  
(SCALE 1:20)



**DETAIL OF KILOMETRE STONE**



**DETAIL OF BOUNDARY STONE**



**BAR BENDING SCHEDULE FOR BOUNDARY STONE**

| S NO. | TYPE OF M.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      | 440mm                             |
| 5.    | STIRRUP (THIRD FROM TOP)  | 1          |               | 6 mm      | 475 mm                            |
| 6.    | BOTTOMMOST STIRRUP        | 1          |               | 6 mm      | 810 mm                            |

DATE: 14/11/2019 - 2:16pm  
PATH: D:\C:\Users\Amit\OneDrive\Documents\5\STANDARD DRAWING\MS-5-DETAIL OF DISTANCE & BOUNDARY STONE.dwg

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

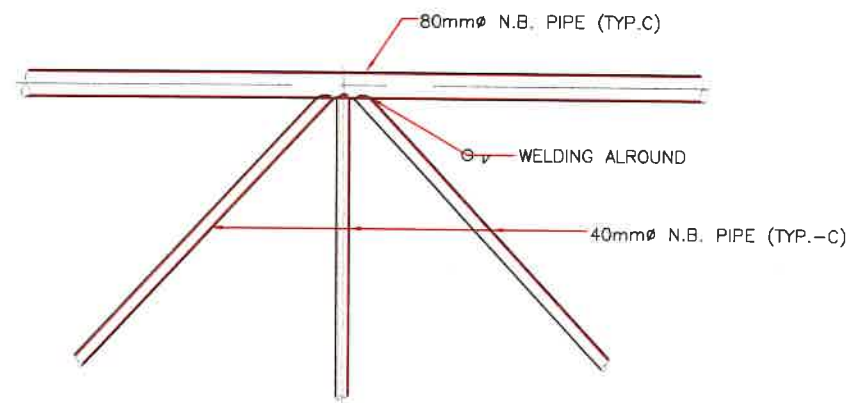
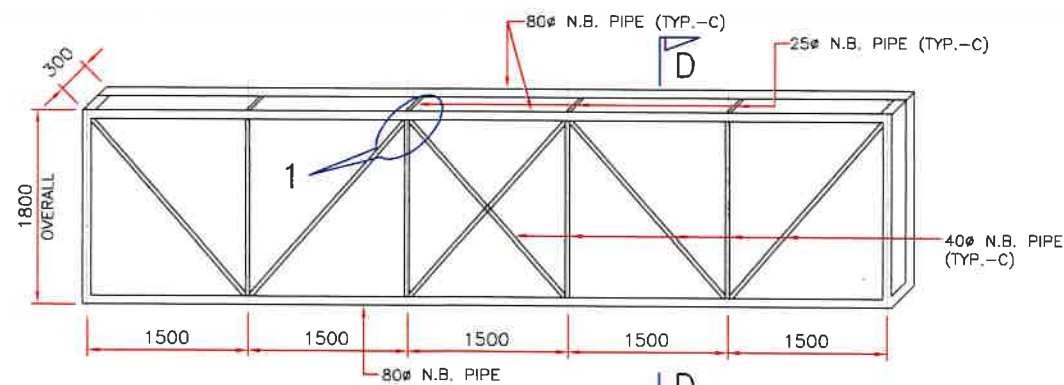
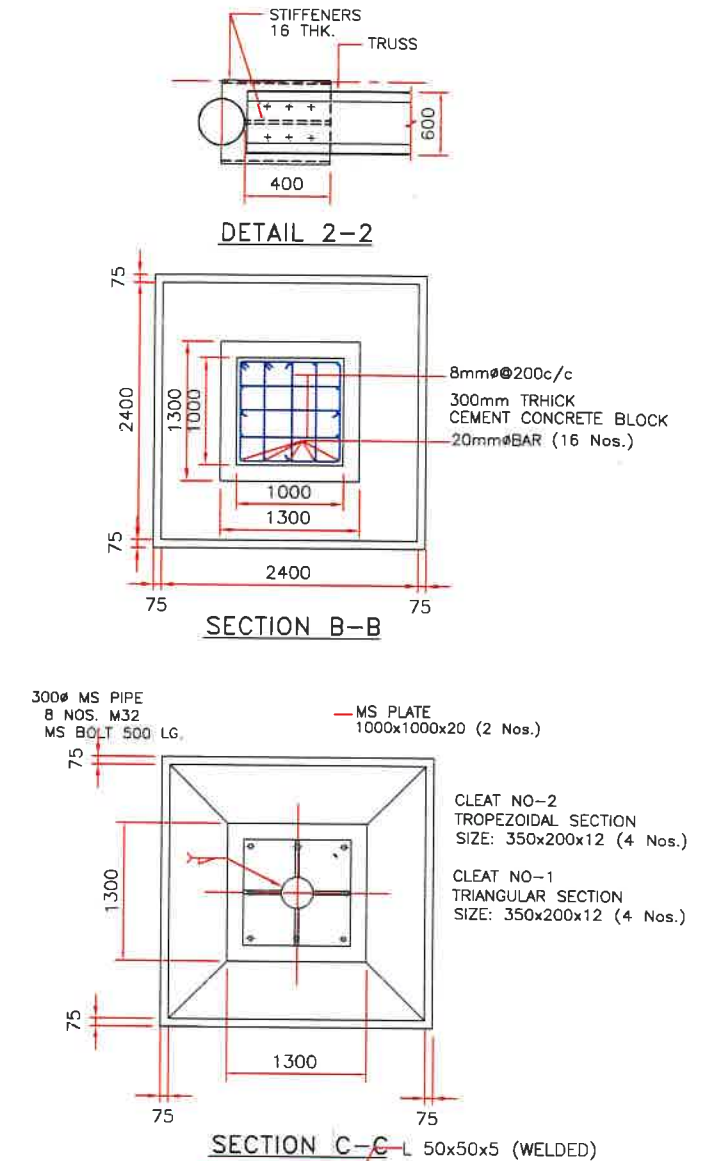
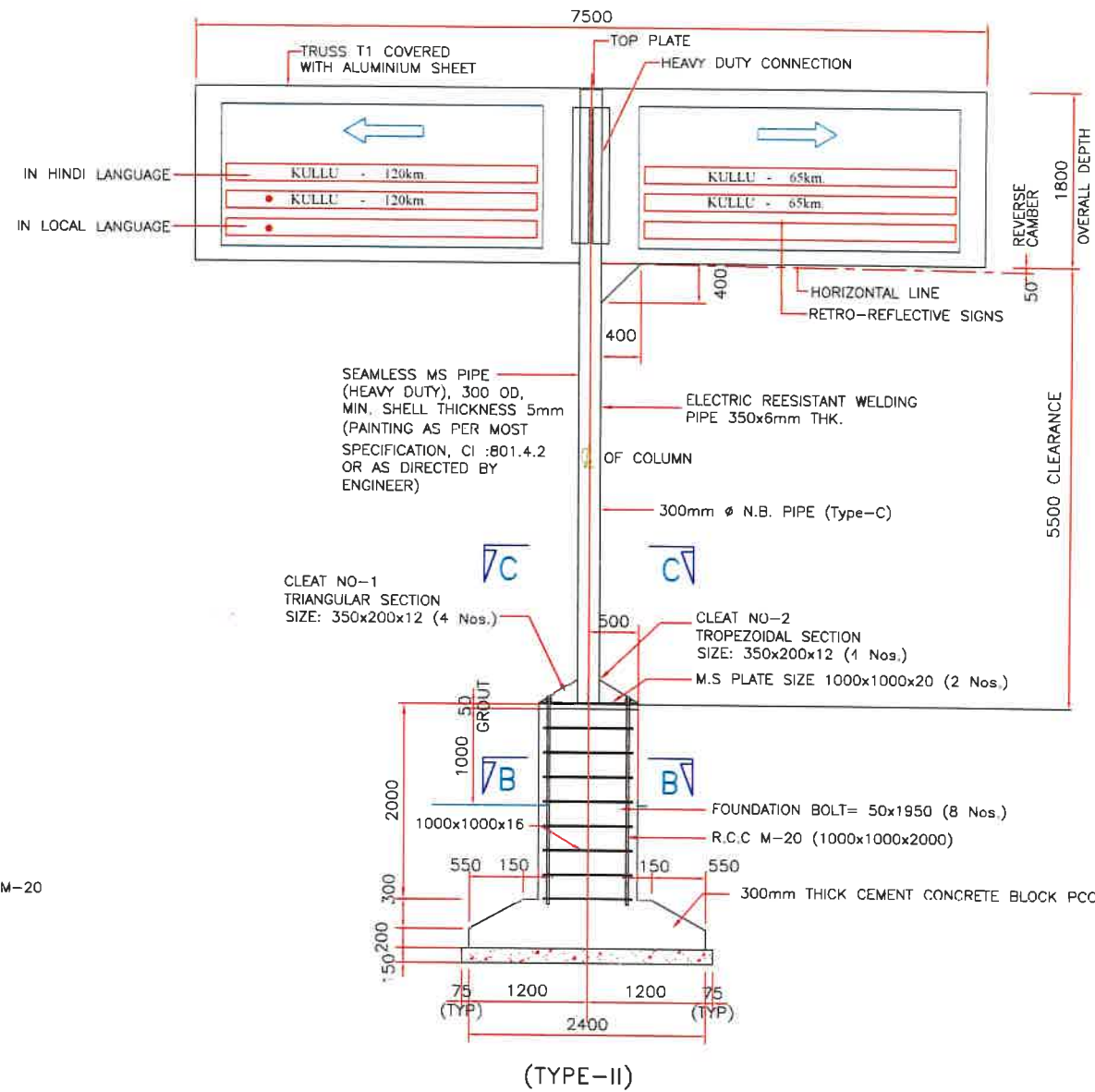
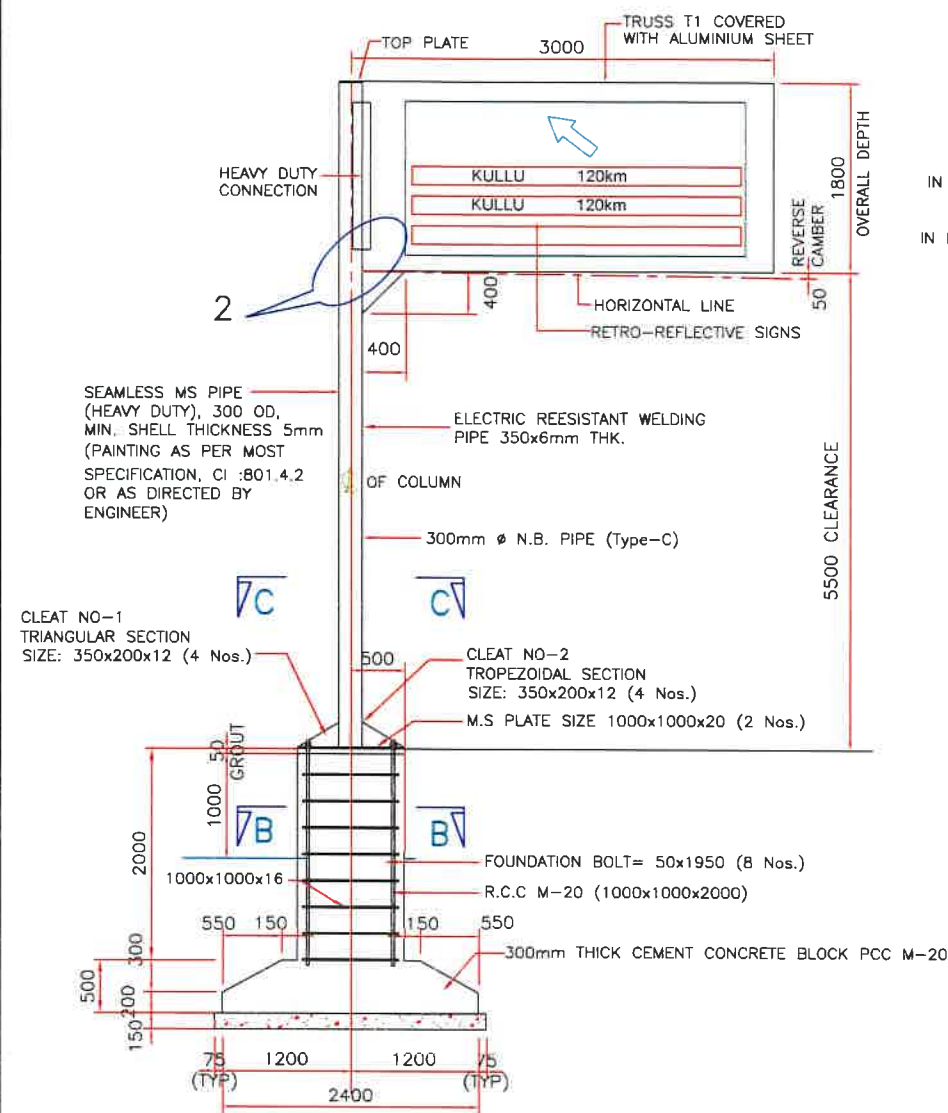
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|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Client :     | NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED<br>(Ministry of Road Transport & Highways)                                                                                        |
| Consultant : | SA INFRASTRUCTURE CONSULTANTS PVT. LTD.<br>Specialized Engineering Service Pvt. Ltd.<br>1101A, 11th Floor, Tower A-II, Corporate Park,<br>Plot No. 7A/1, Sector-142,<br>Noida-201301, Uttar Pradesh. |

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

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

**PACKAGE-5**  
KAFER TO RHENOCK  
DETAIL OF DISTANCE STONE  
& BOUNDARY STONE

Dwg. No. :- SAICPL-SESPL/NHIDCL/WB-SKM/Misc/05



OTHER SIDE

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

Consultant : SA INFRASTRUCTURE CONSULTANTS PVT LTD Specialized Engineering Service Pvt. Ltd. 1101A, 11th Floor, Tower A-II, Corporate Park, Plot No. 7A/1, Sector-142, 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 : November 2019

DESIGNED BY : Vijay Gupta

DRAWN BY : Naresh

CHECKED BY : Vijay Gupta

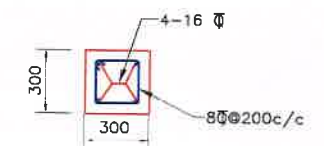
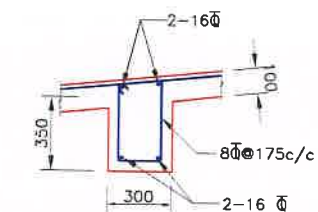
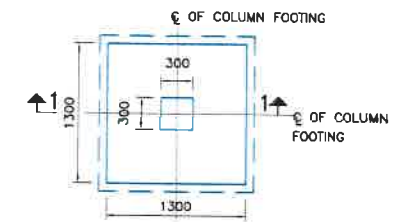
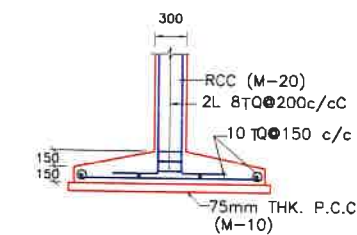
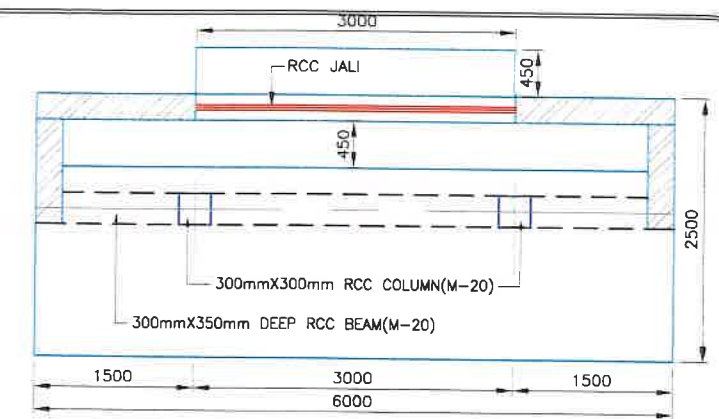
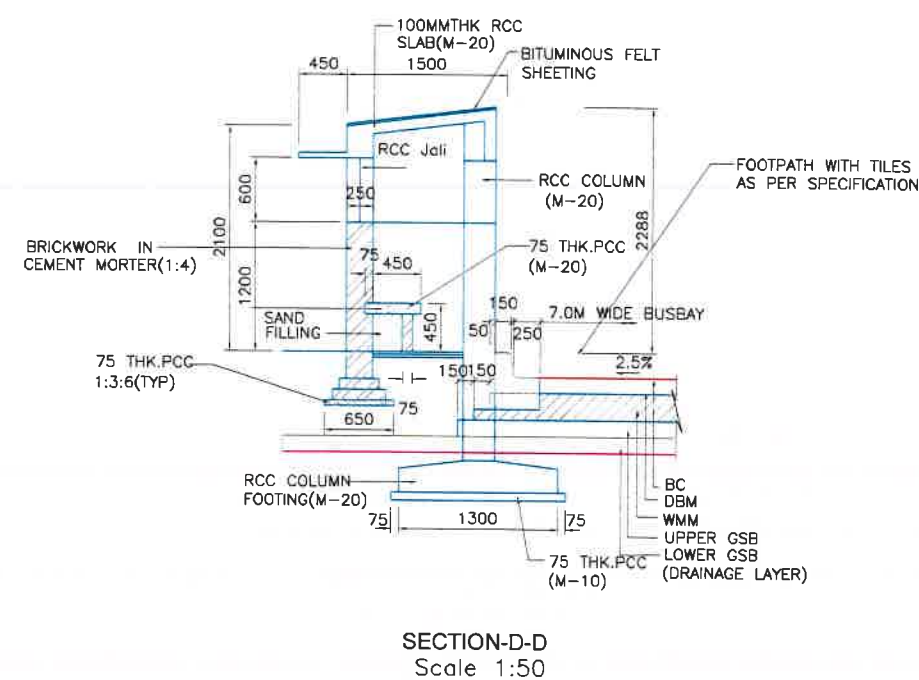
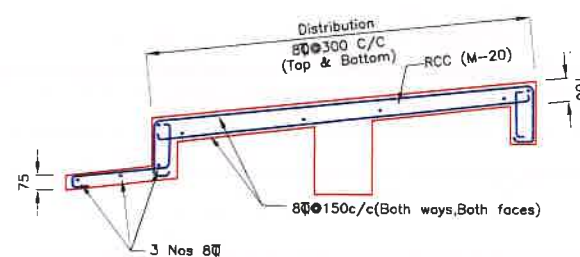
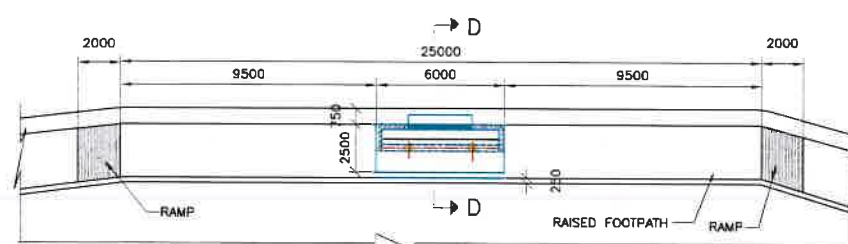
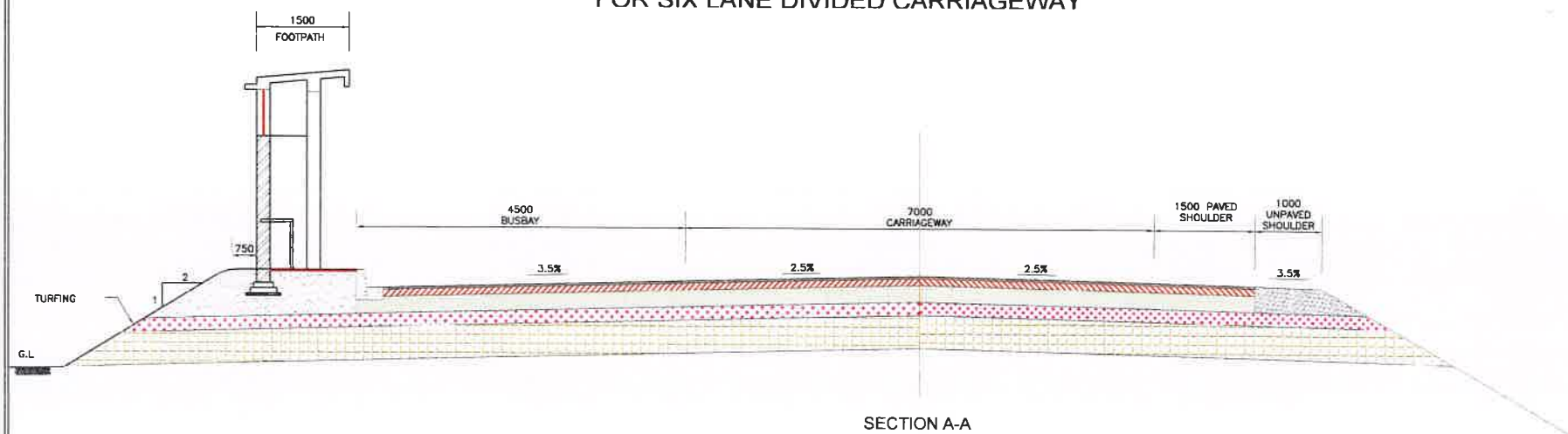
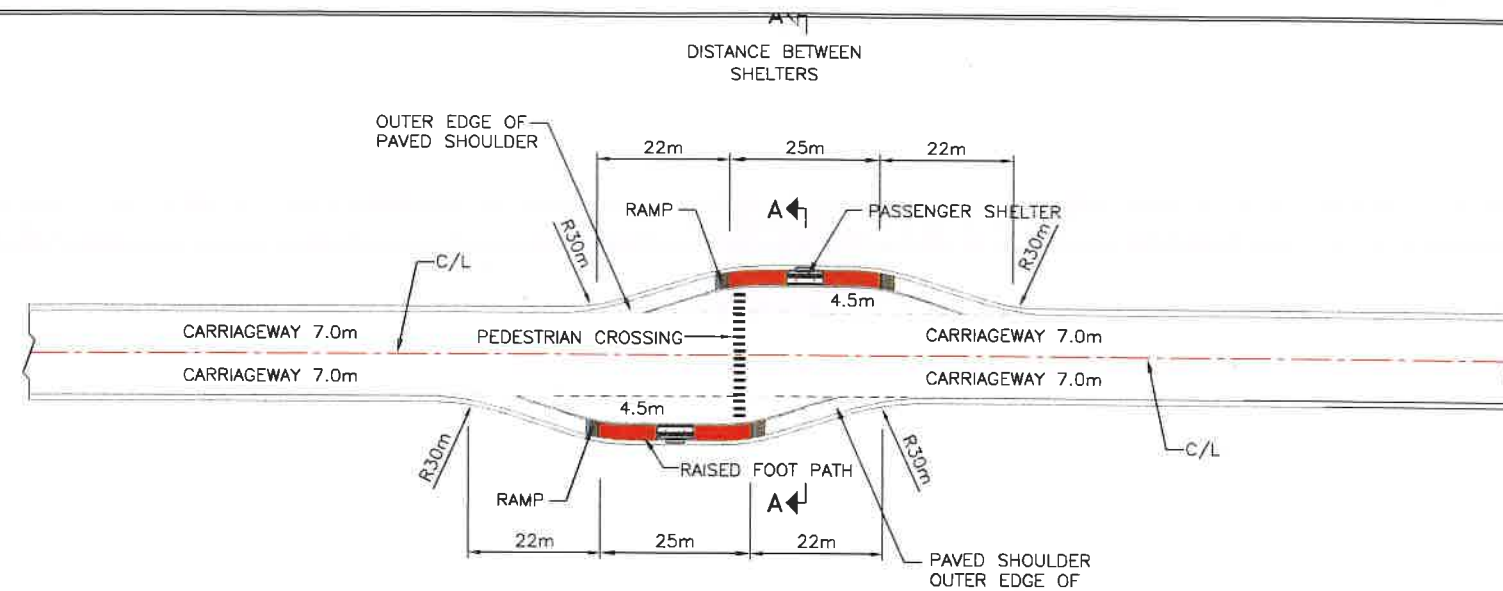
APPROVED BY : Sanjay Shukla

SCALE : -NTS

SECTION D-D (SCALE 1:20)

PACKAGE-5 KAFER TO RHENOCK DETAILS OF OVERHEAD GANTRY SIGN

Dwg. No. :- SAICPL-SESPL/NHIDCL/WB-SKM/Misc/ 06



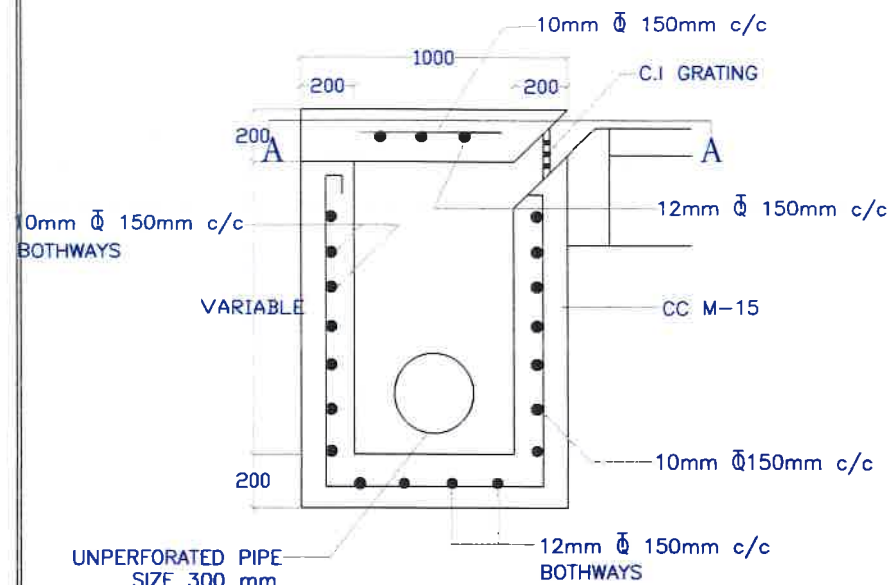
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|-----|----------|--------------------------|
| REV | DATE     | DESCRIPTION OF REVISIONS |
| R0  | Sep 2017 | Final Feasibility Report |
| R0  | Nov 2016 | Draft Feasibility Report |
| R0  | Dec 2014 | Linear Plan              |

|                                                                                     |                                                                                                                                                                                                       |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <b>Client :</b> NATIONAL HIGHWAYS & INFRASTRUCTURE<br>DEVELOPMENT CORPORATION LIMITED<br>(Ministry of Road Transport & Highways)                                                                      |
|  | <b>Consultant :</b> SA INFRASTRUCTURE CONSULTANTS PVT. LTD.<br>Specialized Engineering Service Pvt. Ltd.<br>1101A, 11th Floor, Tower 11 Corporate Park,<br>Plot No. 7A/L, Sector 10, Gurgaon, Haryana |

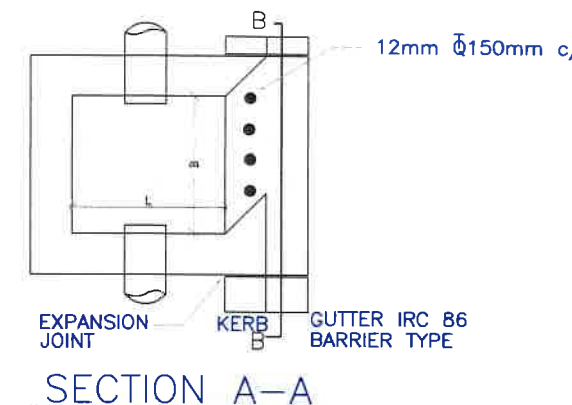
|           |                                                                                                                                                                                                                                                                                                                     |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Project : | <p>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</p> |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                      |          |              |             |    |  |
|----------------------|----------|--------------|-------------|----|--|
| DATE : November 2019 |          | Revision     |             | RO |  |
| DESIGNED BY          | DRAWN BY | CHECKED BY   | APPROVED BY |    |  |
| Vijay SURESH         | Aravind  | Vijay SURESH | SURESH S.P. |    |  |
| SCALE:--NTS          |          |              |             |    |  |

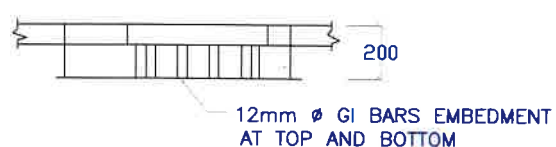
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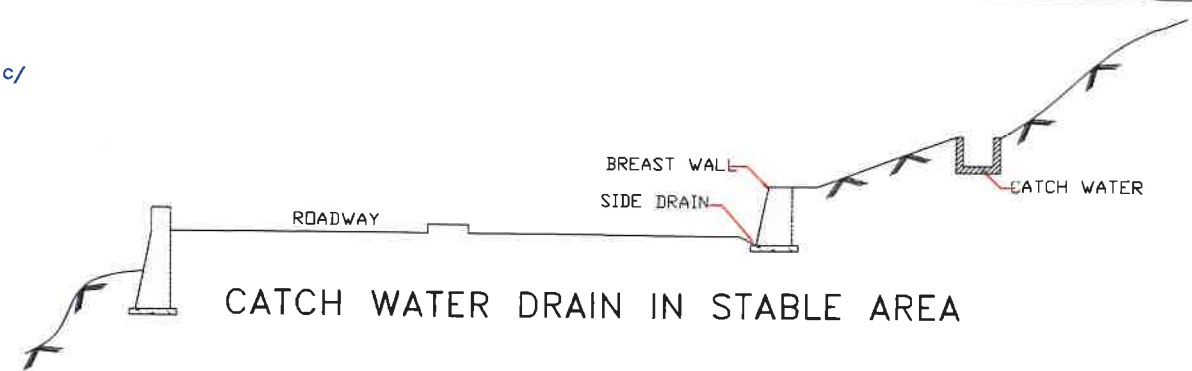
**CATCH BASIN INLET CHAMBER**



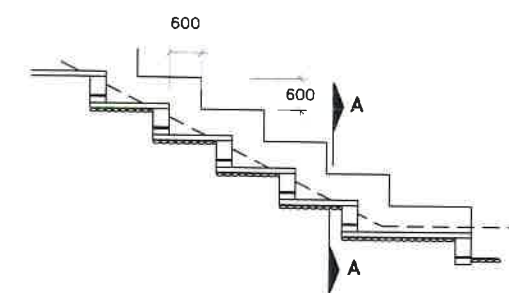
**SECTION A-A**



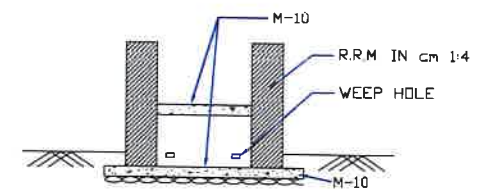
**INLET DETAIL AT B-B**



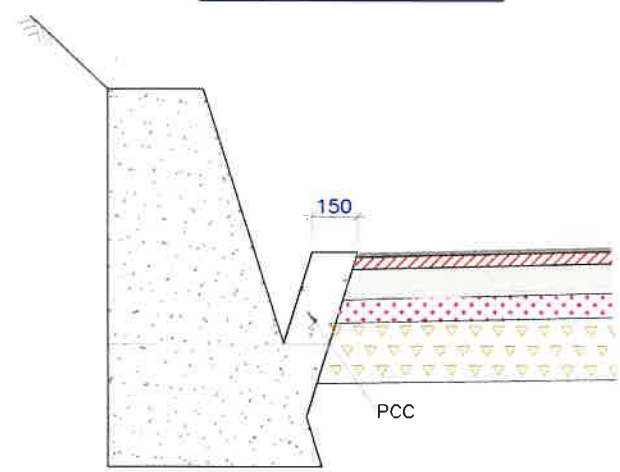
**CATCH WATER DRAIN IN STABLE AREA**



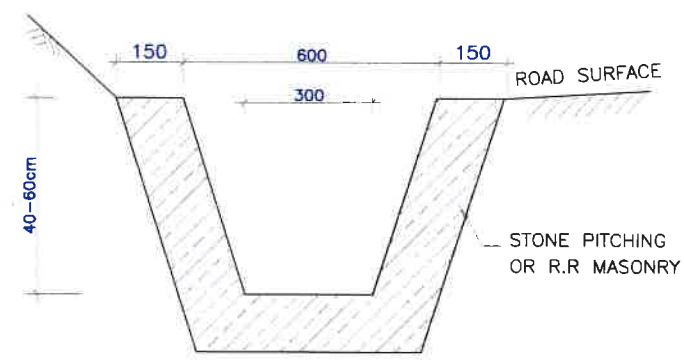
**LONGITUDINAL SECTION OF CHUTE**



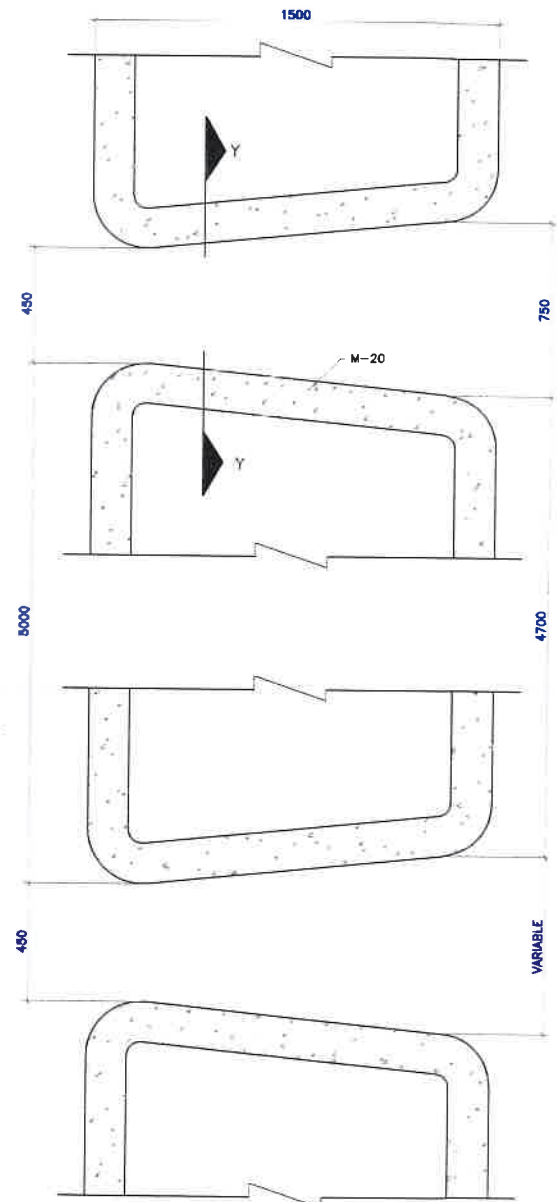
**SECTION A-A**



**HILL SIDE DRAIN**



**TRAPEZOIDAL DRAIN**



DATE: 14/11/2019 - 2:23pm  
 Path: C:\Users\Nikhil\Documents\SA\STANDARD DRAWING\MS-11-DETAIL OF DRAIN MEDIAN OPEN.dwg

| REV | DATE     | DESCRIPTION OF REVISIONS | INITIALS |
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 (Ministry of Road Transport & Highways)

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

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

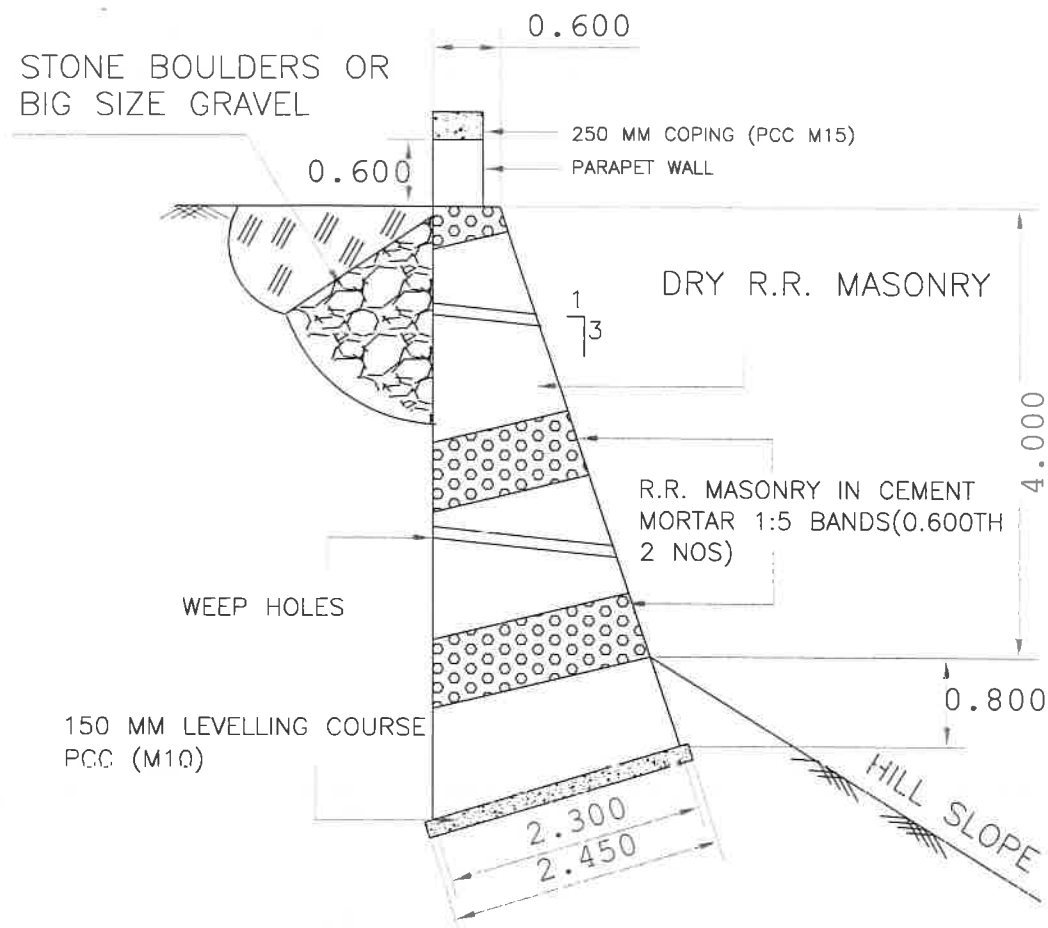
| DATE          | DESIGNED BY | DRAWN BY | CHECKED BY  | APPROVED BY   |
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| November 2019 | Vijay Gupta | Narash   | Vijay Gupta | Sanjay Shukla |

Revision R0

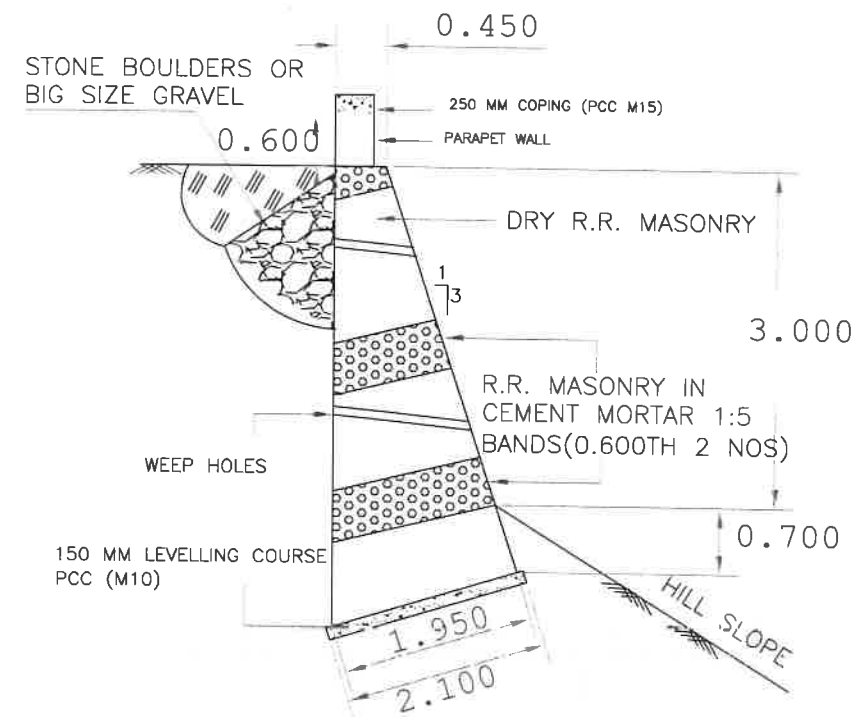
**PACKAGE-5**  
 KAFER TO RHENOCK  
 DETAIL OF SIDE DRAIN, INLET CHAMBER & MEDIAN CUT DRAIN

Dwg. No. :- SAICPL-SESPL/NHIDCL/WB-SKM/Misc/08

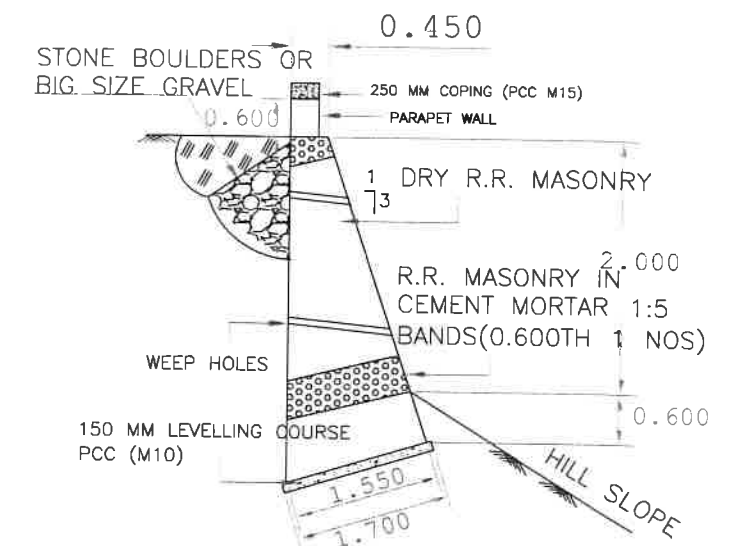




**RETAINING WALL 4 M. HT.**



**RETAINING WALL 3 M. HT.**



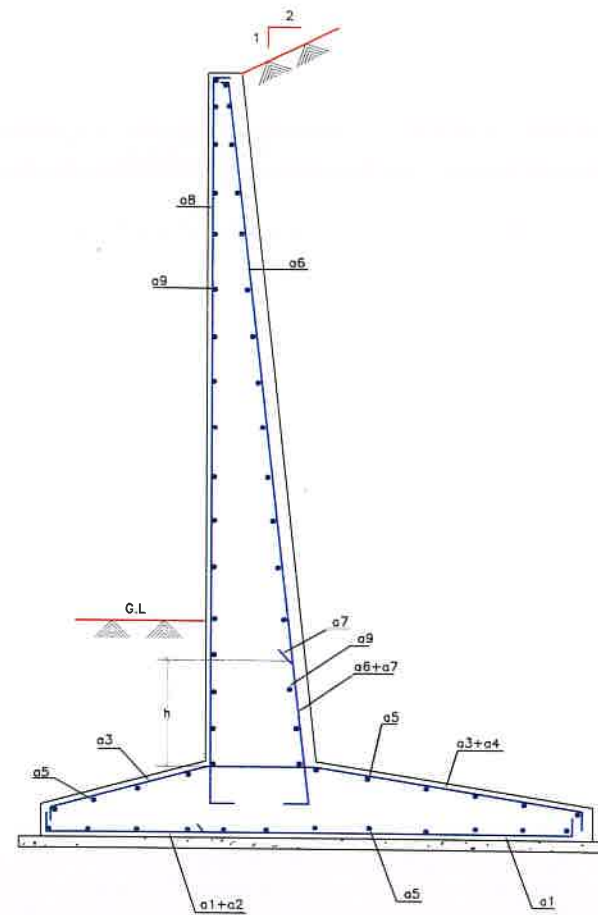
**RETAINING WALL 2 M. HT.**

**NOTES:—**

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

DATE: 14/11/2019 - 2:26pm  
 PATH: D:\G. Dina\MALE\Sikkim-5\STANDARD DRAWING\MS-14-DETAIL OF RR Masonry Retaining wall.dwg

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| HEIGHT OF RET.WALL | Hf   | B    | Bt   | St  | Sb   | Ht  | Tt  | CONC. GRADE |
|--------------------|------|------|------|-----|------|-----|-----|-------------|
| 2.0m               | 1000 | 1200 | 100  | 200 | 200  | 200 | 200 | M25         |
| 3.0m               | 1500 | 1800 | 150  | 300 | 300  | 300 | 300 | M25         |
| 3.5m               | 2000 | 2100 | 250  | 300 | 300  | 300 | 300 | M25         |
| 4.0m               | 2500 | 2600 | 400  | 300 | 350  | 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 | 800  | 550 | 550 | M30         |
| 8.0m               | 6500 | 6200 | 2000 | 350 | 800  | 500 | 500 | M30         |

| HEIGHT OF<br>RET.WALL | h(mm) | a1                | a2                | a3                | a4                | a5                | a6                | a7                | a8                | a9                |
|-----------------------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| 2.0m                  | NIL   | 10% $\phi$ 150C/C | NIL               | 10% $\phi$ 150C/C | NIL               | 10% $\phi$ 200C/C | 10% $\phi$ 150C/C | NIL               | 10% $\phi$ 150C/C | 10% $\phi$ 200C/C |
| 3.0m                  | NIL   | 10% $\phi$ 140C/C | NIL               | 10% $\phi$ 140C/C | NIL               | 10% $\phi$ 200C/C | 12% $\phi$ 140C/C | NIL               | 10% $\phi$ 140C/C | 10% $\phi$ 200C/C |
| 3.5                   | 1450  | 10% $\phi$ 140C/C | NIL               | 12% $\phi$ 140C/C | NIL               | 10% $\phi$ 200C/C | 12% $\phi$ 140C/C | 10% $\phi$ 140C/C | 10% $\phi$ 140C/C | 10% $\phi$ 200C/C |
| 4.0m                  | 1950  | 10% $\phi$ 140C/C | NIL               | 10% $\phi$ 140C/C | 10% $\phi$ 140C/C | 10% $\phi$ 200C/C | 12% $\phi$ 140C/C | 12% $\phi$ 140C/C | 10% $\phi$ 140C/C | 10% $\phi$ 200C/C |
| 4.5m                  | 3000  | 10% $\phi$ 150C/C | NIL               | 10% $\phi$ 150C/C | 12% $\phi$ 150C/C | 10% $\phi$ 200C/C | 12% $\phi$ 150C/C | 16% $\phi$ 150C/C | 10% $\phi$ 150C/C | 10% $\phi$ 200C/C |
| 5.0m                  | 2350  | 10% $\phi$ 150C/C | 10% $\phi$ 150C/C | 12% $\phi$ 150C/C | 12% $\phi$ 150C/C | 10% $\phi$ 200C/C | 16% $\phi$ 150C/C | 16% $\phi$ 150C/C | 10% $\phi$ 150C/C | 10% $\phi$ 200C/C |
| 5.5m                  | 2700  | 10% $\phi$ 140C/C | 10% $\phi$ 140C/C | 10% $\phi$ 140C/C | 12% $\phi$ 140C/C | 10% $\phi$ 200C/C | 16% $\phi$ 140C/C | 16% $\phi$ 140C/C | 10% $\phi$ 140C/C | 10% $\phi$ 200C/C |
| 6.0m                  | 3300  | 10% $\phi$ 140C/C | 12% $\phi$ 140C/C | 10% $\phi$ 140C/C | 12% $\phi$ 140C/C | 10% $\phi$ 200C/C | 16% $\phi$ 140C/C | 20% $\phi$ 140C/C | 10% $\phi$ 140C/C | 10% $\phi$ 200C/C |
| 6.5m                  | 3750  | 12% $\phi$ 140C/C | 12% $\phi$ 140C/C | 10% $\phi$ 140C/C | 12% $\phi$ 140C/C | 10% $\phi$ 200C/C | 16% $\phi$ 140C/C | 20% $\phi$ 140C/C | 10% $\phi$ 140C/C | 10% $\phi$ 200C/C |
| 7.0m                  | 5000  | 12% $\phi$ 150C/C | 16% $\phi$ 150C/C | 10% $\phi$ 150C/C | 10% $\phi$ 150C/C | 10% $\phi$ 200C/C | 16% $\phi$ 150C/C | 20% $\phi$ 150C/C | 10% $\phi$ 150C/C | 10% $\phi$ 150C/C |
| 7.5m                  | 4100  | 12% $\phi$ 140C/C | 16% $\phi$ 140C/C | 10% $\phi$ 140C/C | 12% $\phi$ 140C/C | 10% $\phi$ 150C/C | 20% $\phi$ 140C/C | 25% $\phi$ 140C/C | 10% $\phi$ 150C/C | 10% $\phi$ 150C/C |
| 8.0m                  | 3900  | 16% $\phi$ 150C/C | 20% $\phi$ 150C/C | 12% $\phi$ 150C/C | 16% $\phi$ 150C/C | 10% $\phi$ 150C/C | 25% $\phi$ 150C/C | 25% $\phi$ 150C/C | 10% $\phi$ 150C/C | 10% $\phi$ 150C/C |

| SR N | FROM  | TO    | LENGTH |                          |            |
|------|-------|-------|--------|--------------------------|------------|
| 01   | 20100 | 20140 | 40     | Both Side Retaining Wall | Avg Ht c3m |
| 02   | 20140 | 20500 | 360    | Left Side Retaining Wall | Avg Ht c3m |
| 03   | 20500 | 20640 | 140    | Left Side Retaining Wall | Avg Ht c4m |
| 04   | 21240 | 21540 | 300    | Left Side Retaining Wall |            |

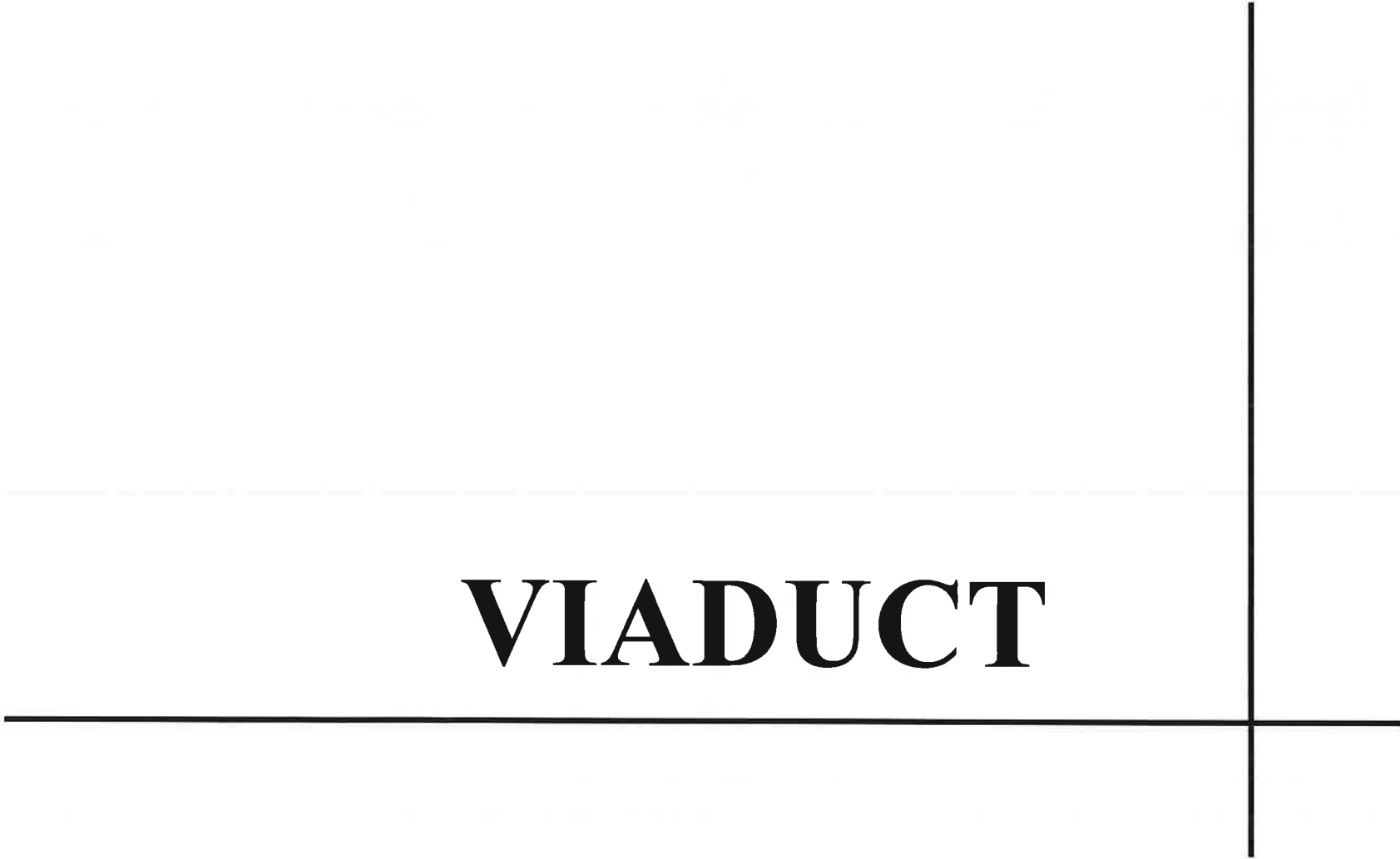
[illegible]



# **STRUCTURE DRAWINGS**

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**VIADUCT**

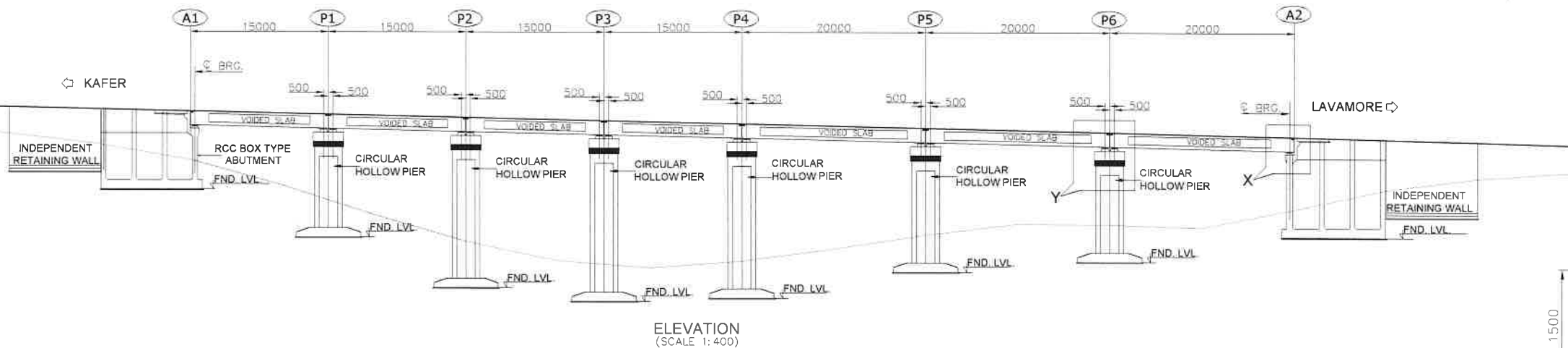


| INDEX (PACKAGE-IVA) |                                                              |                                            |           |                         |
|---------------------|--------------------------------------------------------------|--------------------------------------------|-----------|-------------------------|
| 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         |                         |

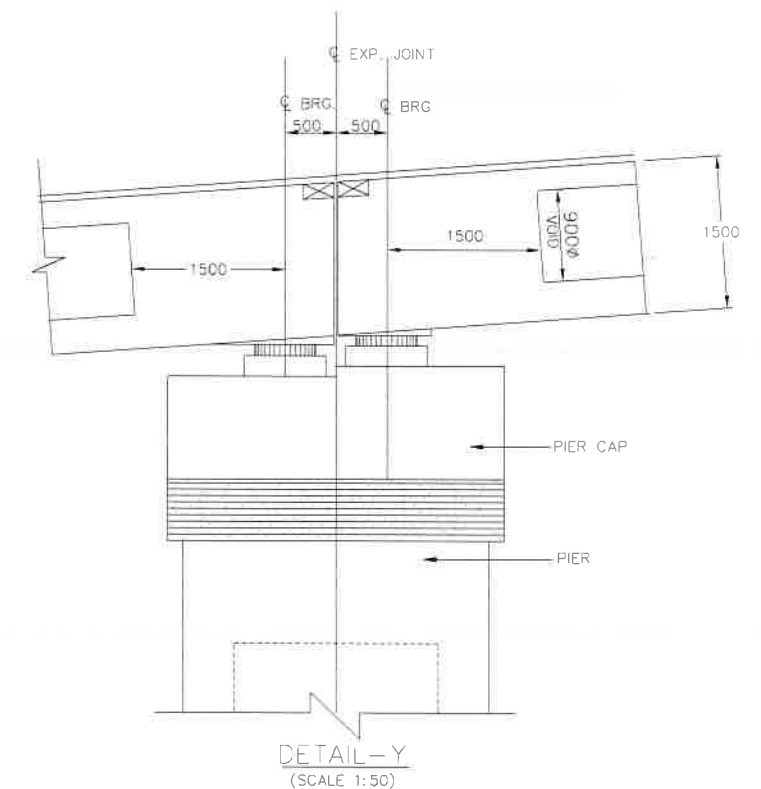
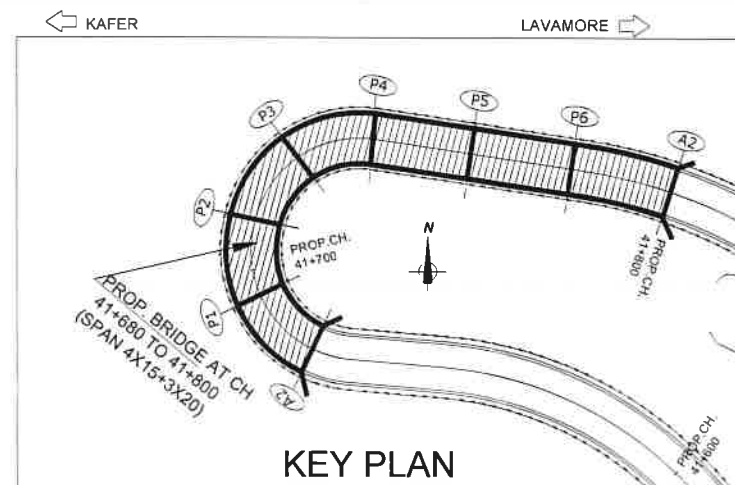
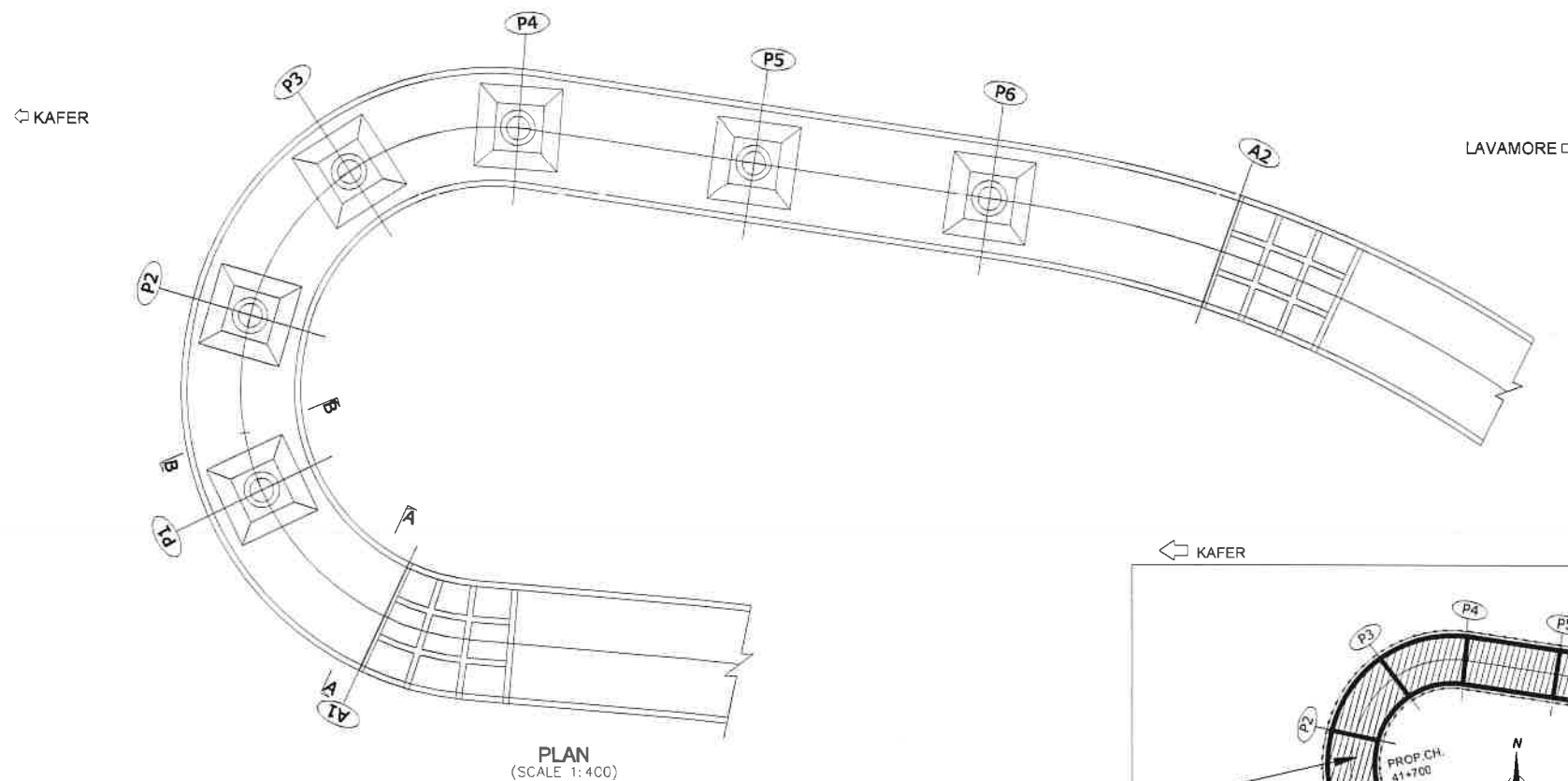
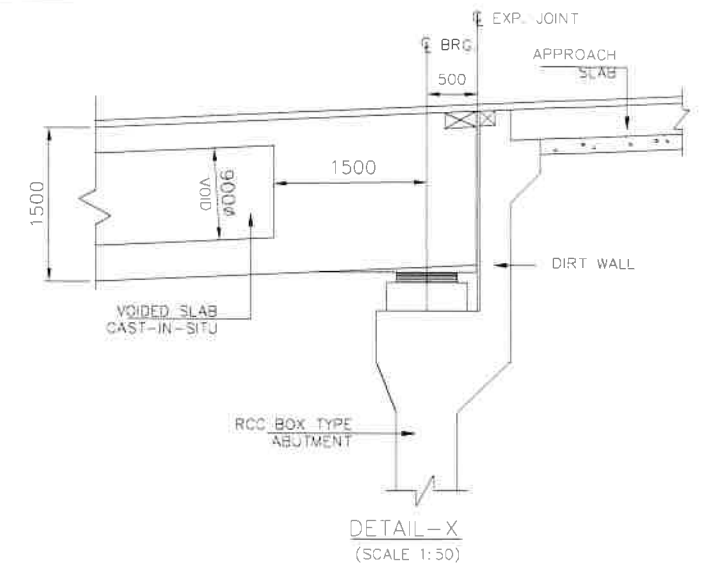
|     |      |                          |          |                                                                                                                                                                                                                                                                                                                                 |  |                                                                                                                                                                                                                                                                                                                                    |  |                                                                                                                   |                                                                                                               |                                                                                                              |                                                                                                                   |                   |
|-----|------|--------------------------|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|-------------------|
|     |      |                          |          | CLIENT : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED<br><br>(Ministry of Road Transport & Highways)                                                                                                                   |  | PROJECT :<br>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 West Bengal and From Rhenok-Rorathang-Pakyong along with of Spur From Aritar-Rolep-Menla in the State of Sikkim (PKG-5A) |  | DATE : NOV.2019                                                                                                   |                                                                                                               | REVISION R0                                                                                                  |                                                                                                                   | INDEX             |
|     |      |                          |          | CONSULTANT: S.A. Infrastructure Consultants Pvt. Ltd.<br><br>1101A, 11 Floor Tower A-II, Ansal Corporate Park, Plot No. 7A/1, Sector 142, Noida-201301 (Uttar Pradesh)<br>Phone No- 0120-6148000 Fax-0120-6148090<br>Email: info@sainfra.com |  |                                                                                                                                                                                                                                                                                                                                    |  | DESIGNED BY<br><br>A. REHMAN | DRAWN BY<br><br>S. RAWAT | CHECKED BY<br><br>S. DE | APPROVED BY<br><br>S. Shukla |                   |
| REV | DATE | DESCRIPTION OF REVISIONS | INITIALS |                                                                                                                                                                                                                                                                                                                                 |  |                                                                                                                                                                                                                                                                                                                                    |  | SCALE:- AS SHOWN                                                                                                  |                                                                                                               | SHEET:- 01 OF 02                                                                                             |                                                                                                                   | DWG. NO. :- INDEX |

## NOTES

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



|                    |          |          |          |          |          |          |          |          |
|--------------------|----------|----------|----------|----------|----------|----------|----------|----------|
| FORMATION LEVEL    | 1588.190 | 1587.730 | 1587.261 | 1586.792 | 1586.323 | 1585.697 | 1585.072 | 1584.445 |
| BED LEVEL (CENTER) | 1578.320 | 1574.572 | 1570.631 | 1568.487 | 1568.800 | 1572.351 | 1575.835 | 1577.513 |
| CHAINAGE           | 41+680   | 41+695   | 41+710   | 41+725   | 41+740   | 41+760   | 41+780   | 41+800   |



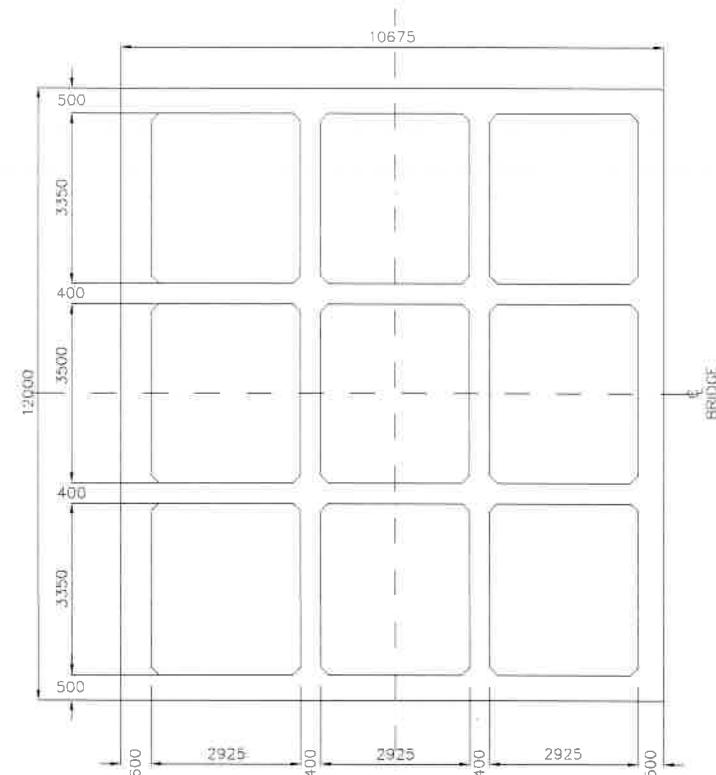
| REV | DATE | DESCRIPTION OF REVISIONS | INITIALS |
|-----|------|--------------------------|----------|
|     |      |                          |          |
|     |      |                          |          |
|     |      |                          |          |
|     |      |                          |          |

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

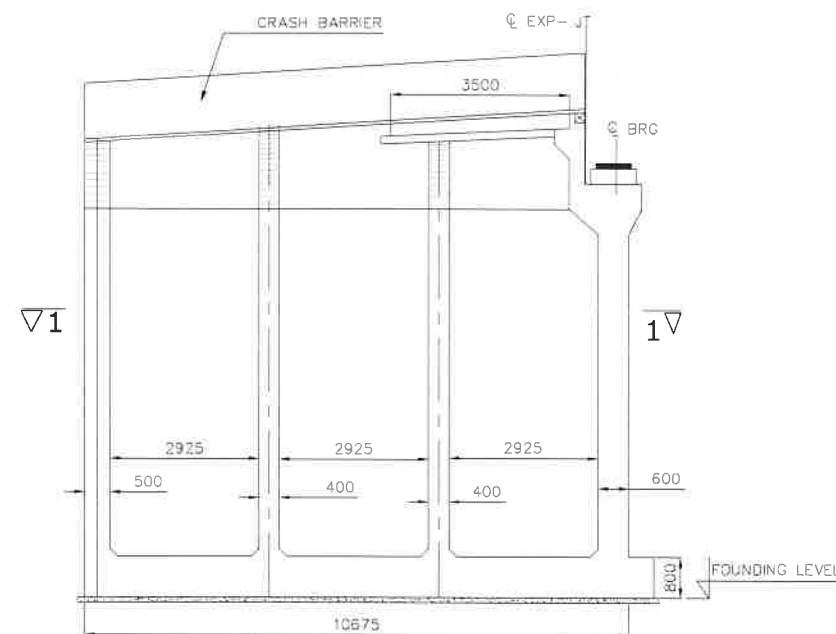
CONSULTANT: S.A. Infrastructure Consultants Pvt. Ltd.  
1101A, 11 Floor Tower A-II, Ansal Corporate Park,  
Plot No. 7A/1, Sector 142, Noida-201301 (Uttar Pradesh)  
Phone No- 0120-6148000 Fax-0120-6148090  
Email: info@sainfra.com

PROJECT : Consultancy for Preparation of Feasibility Report cum Preliminary Design for Alternative Highway to Gangtok in Sikkim via Bagrakot-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 (Package-V)

|                                |                         |                                                                                           |
|--------------------------------|-------------------------|-------------------------------------------------------------------------------------------|
| DATE : NOVEMBER-2019           | REVISION R0             | GENERAL ARRANGEMENT DRAWINGS OF VIADUCT AT CH- 41+680 TO 41+800<br>SPAN = (4X15.0+3X20.0) |
| DESIGNED BY<br>S ROY CHOUDHURY | DRAWN BY<br>A SEN       |                                                                                           |
| CHECKED BY<br>A REHMAN         | APPROVED BY<br>S Shukla |                                                                                           |
| SCALE:- AS SHOWN               | SHEET:- 01 OF 02        | DWG. NO. :- SAICPL-SESPL/NHIDC/WB-SKM/41+680/GAD-01                                       |



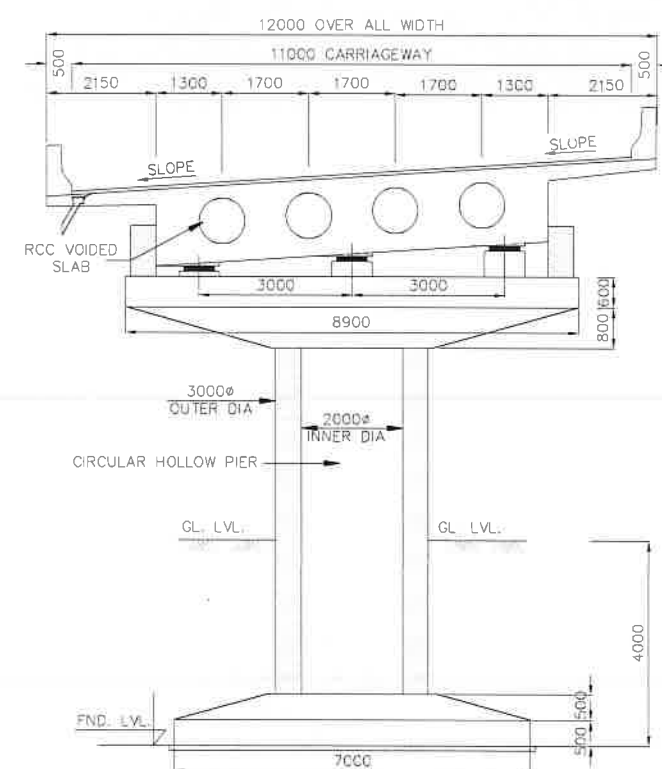
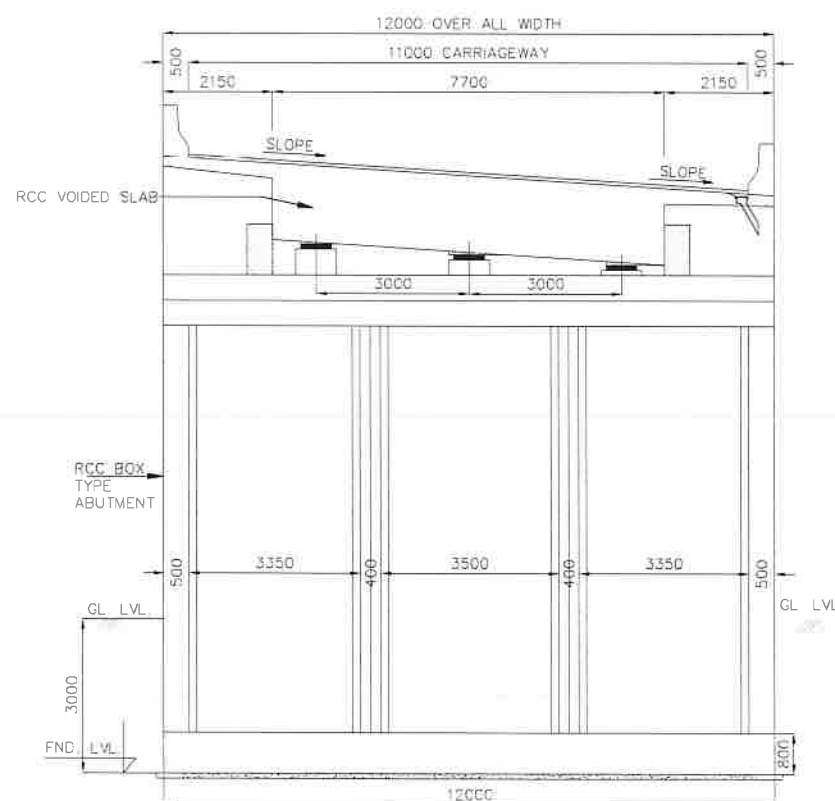
**SECTION-1-1**  
SCALE 1:100



**BOX ABUTMENT**  
SCALE 1:100

## NOTES

- ALL DIMENSIONS ARE MILLIMETERS AND LEVELS ARE IN METERS
- DIMENSIONS ARE NOT TO SCALED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
- THE DIMENSION OF THE FOUNDATION SHOWN HERE TENTATIVE ONLY. THIS SHALL BE FINALIZED AFTER DETAILED SUBSOIL INVESTIGATION
- BRIDGE HAS BEEN DESIGNED FOR CARRIAGEWAY LIVE LOAD OF 1 LANE 70R OR 2 LANES OF CLASS A WHICHEVER GIVES WORST EFFECT
- GRADE OF CONCRETE FOR VARIOUS ELEMENTS ARE AS FOLLOWS: -  
(i) SUPERSTRUCTURE(PSC) ----- M45  
(ii) RCC SUBSTRUCTURE & FOUNDATION --- M35  
(iii) RCC RAILING -----M30  
(iv) RCC CRASH BARRIER ----- M40  
(v) APPROACH SLAB ----- M30  
(vi) PEDESTAL ----- M40
- TYPE OF BEARING PROPOSED HERE IS POT-PTFE 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 Fe500D) AS PER IS:1786.
- BRIDGE HAS BEEN DESIGNED CONSIDERING SEISMIC ZONE AS IV.
- SUPERELEVATION SHALL BE MAINTAINED AS PER HIGHWAY PLAN & PROFILE.
- SAFE BEARING CAPACITY FOR PRELIMINARY DESIGN AT FOUNDING LEVEL IS CONSIDERED AS 40t/m<sup>2</sup>



**SECTION-B-B**  
SCALE 1:100

| REV | DATE | DESCRIPTION OF REVISIONS | INITIALS |
|-----|------|--------------------------|----------|
|     |      |                          |          |
|     |      |                          |          |
|     |      |                          |          |
|     |      |                          |          |

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

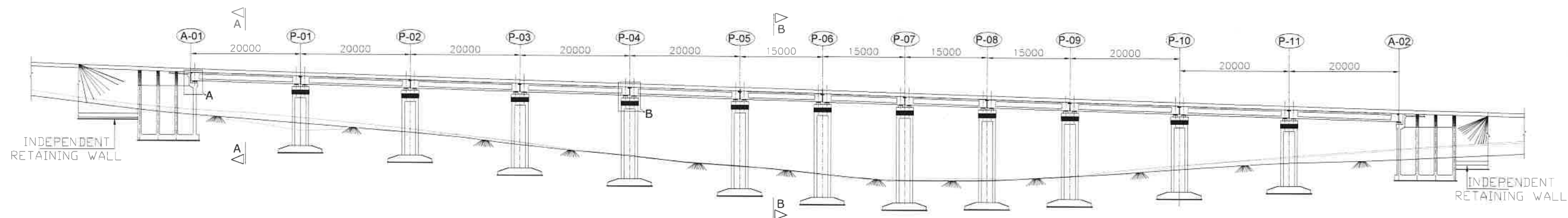
|           |                                                                                                                                                                                                                                                                                                                          |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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 (Package-V) |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                                |                         |
|--------------------------------|-------------------------|
| DATE : NOVEMBER-2019           | REVISION R0             |
| DESIGNED BY<br>S ROY CHOUDHURY | DRAWN BY<br>A SEN       |
| CHECKED BY<br>A REHMAN         | APPROVED BY<br>S Shukla |
| SCALE:- AS SHOWN               | SHEET:- 02 OF 02        |

|                                                                                           |
|-------------------------------------------------------------------------------------------|
| GENERAL ARRANGEMENT DRAWINGS OF VIADUCT AT CH- 41+680 TO 41+800<br>SPAN = (4X15.0+3x20.0) |
| DWG. NO. :- SAICPL-SESPL/NHIDC/WB-SKM/41+680/GAD-01                                       |

KAFER ←

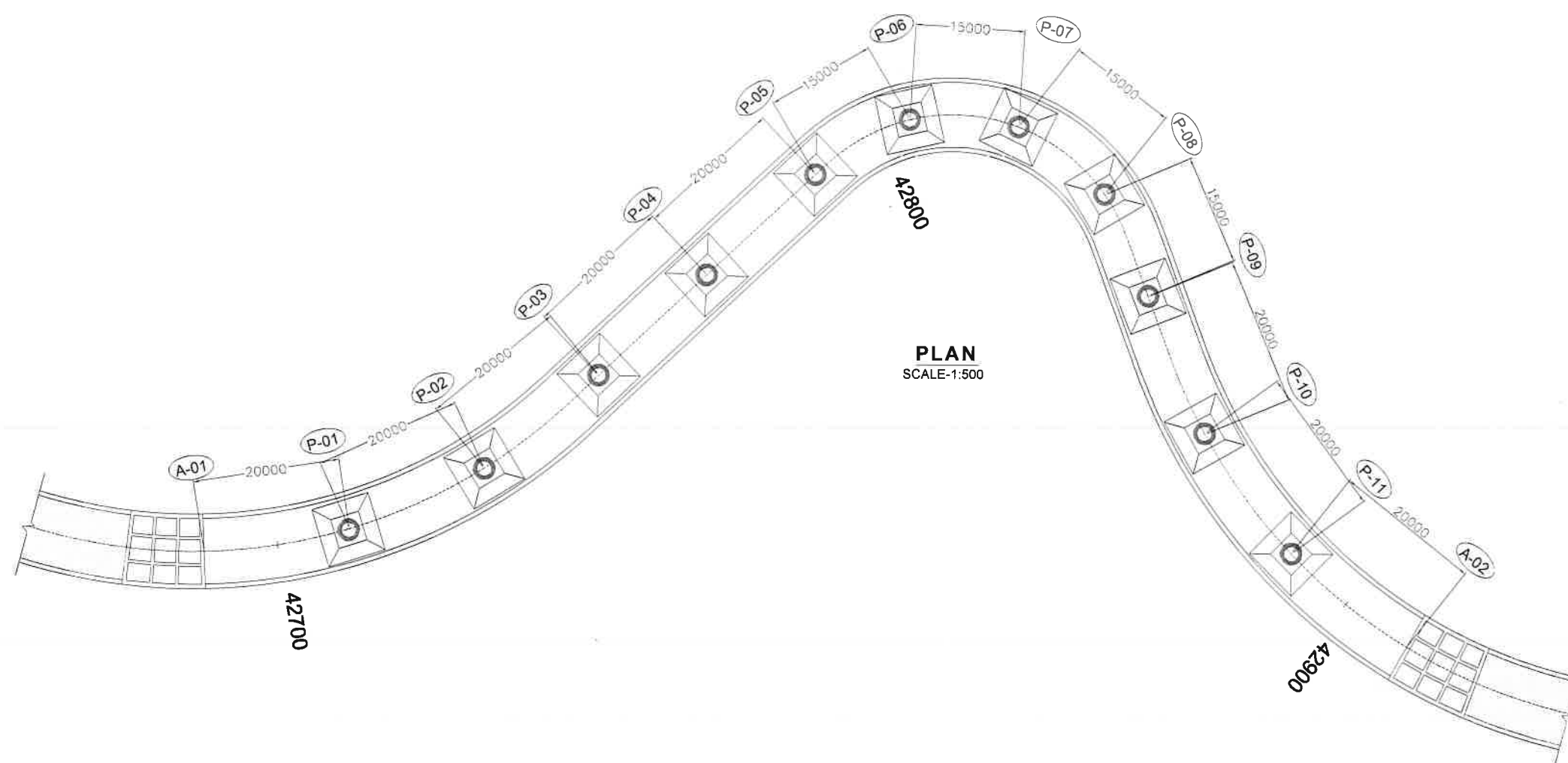
LAVAMORE →



|                          |          |          |          |          |          |          |          |          |          |          |          |          |          |
|--------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| FORMATION LEVEL          | 1524.728 | 1523.881 | 1523.052 | 1522.223 | 1521.393 | 1520.564 | 1520.149 | 1519.320 | 1518.905 | 1518.076 | 1517.247 | 1516.418 | 1515.616 |
| GROUND LEVEL (CENTER)    | 1514.119 | 1511.942 | 1509.725 | 1506.714 | 1504.063 | 1501.518 | 1498.887 | 1498.044 | 1498.408 | 1499.222 | 1501.185 | 1502.926 | 1503.904 |
| GROUND LEVEL (RHS)-10(M) | 1515.345 | 1513.388 | 1510.612 | 1507.315 | 1503.875 | 1501.644 | 1498.839 | 1498.088 | 1498.415 | 1499.331 | 1502.203 | 1504.547 | 1506.600 |
| 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



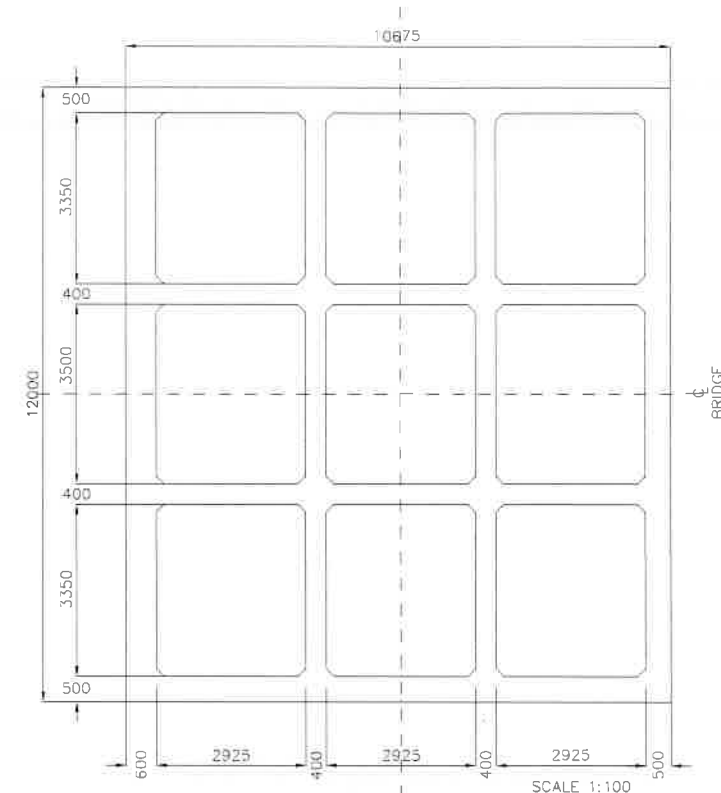
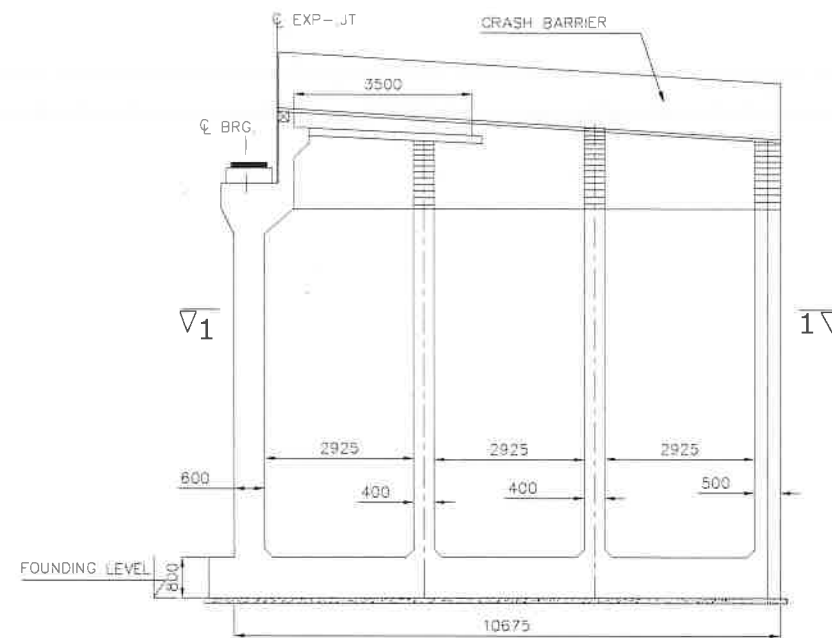
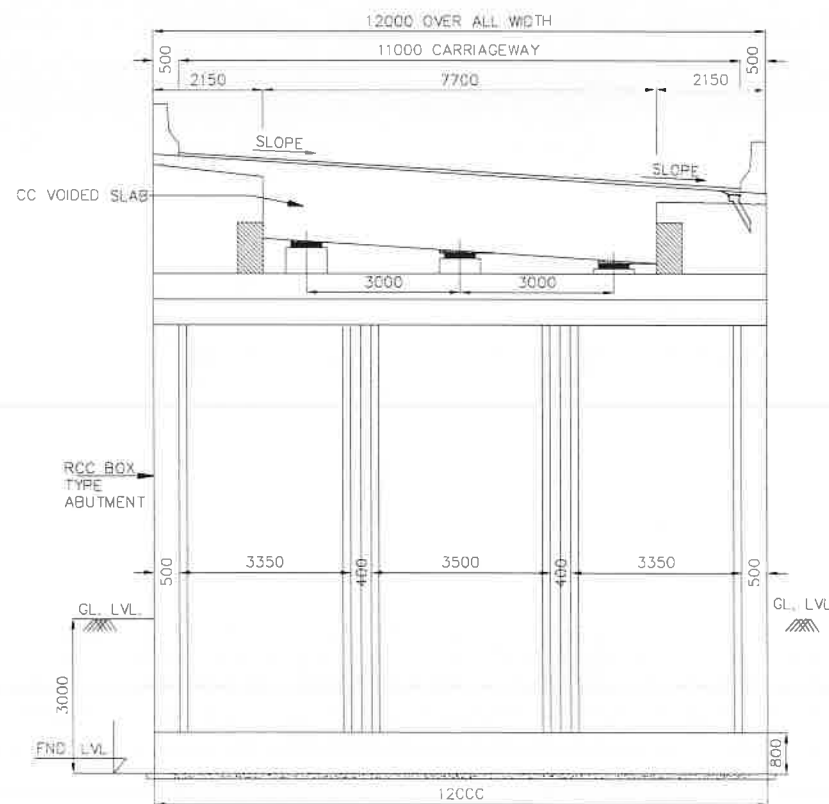
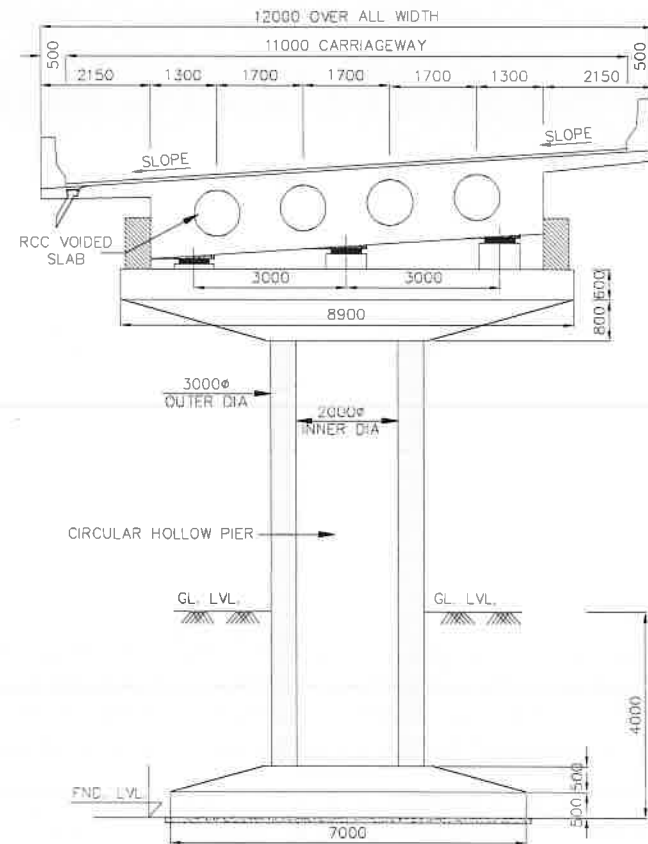
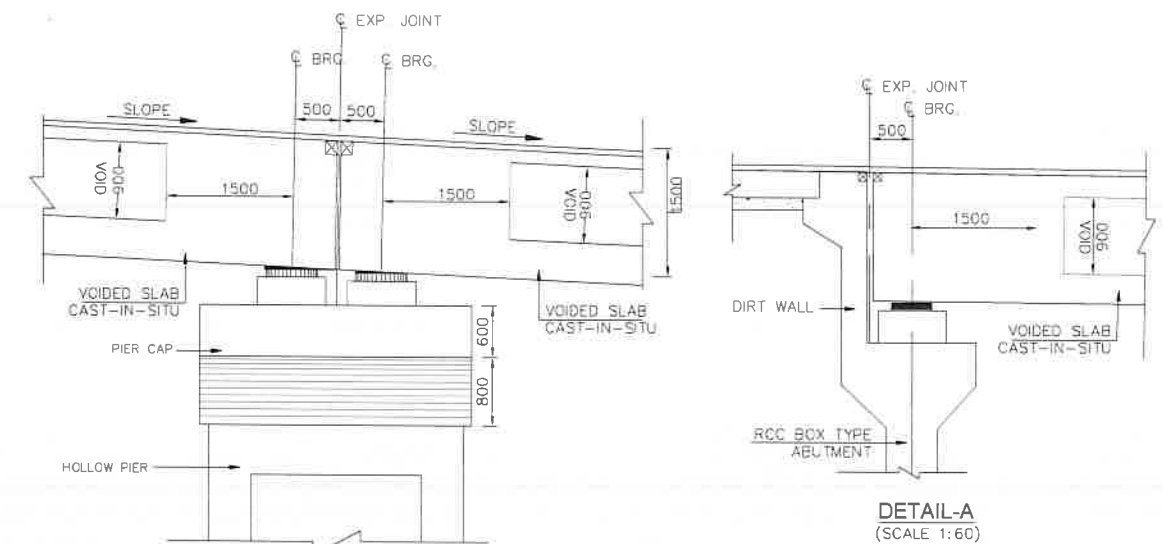
PLAN

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-A  
(SCALE 1:60)DETAIL-B  
(SCALE 1:60)

## NOTES

1. ALL DIMENSIONS ARE MILLIMETERS AND LEVELS ARE IN METERS.
2. DIMENSIONS ARE NOT TO SCALED, 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 70R 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) 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-PTE 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 SHOULD BE MAINTAINED AS PER HIGHWAY PROFILE.
12. SAFE BEARING CAPACITY FOR PRILIMINARY DESIGN AT FOUNDING LEVEL IS CONSIDERED AS 40t/m<sup>2</sup>

| REV | DATE | DESCRIPTION OF REVISIONS | INITIALS |
|-----|------|--------------------------|----------|
|     |      |                          |          |
|     |      |                          |          |
|     |      |                          |          |
|     |      |                          |          |

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

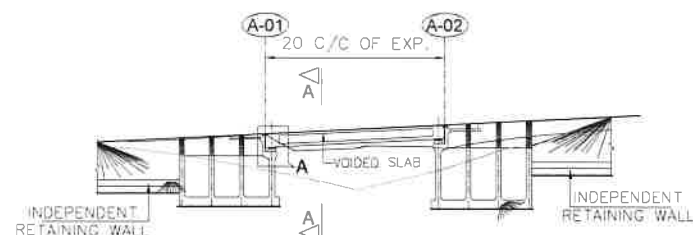
|                                                                                                                                                                                                                                                                                                                                                       |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PROJECT :<br>Consultancy for Preparation of Feasibility Report cum<br>Preliminary Design for Alternative Highway to Gangtok in<br>Sikkim via Bagrakot-Chuikhim-Nimbong-Kafer-Bakhim-<br>Algarah-Rhenok in the State West Bengal and From<br>Rhenok-Rorathang-Pakyong along with of Spur From<br>Aritar-Rolep-Menla in the State of Sikkim<br>(PKG-5A) |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                         |                         |
|-------------------------|-------------------------|
| DATE : NOVEMBER -2019   | REVISION R0             |
| DESIGNED BY<br>A REHMAN | DRAWN BY<br>S RAWAT     |
| CHECKED BY<br>S DE      | APPROVED BY<br>S Shukla |
| SCALE:- AS SHOWN        | SHEET:- 02 OF 02        |

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

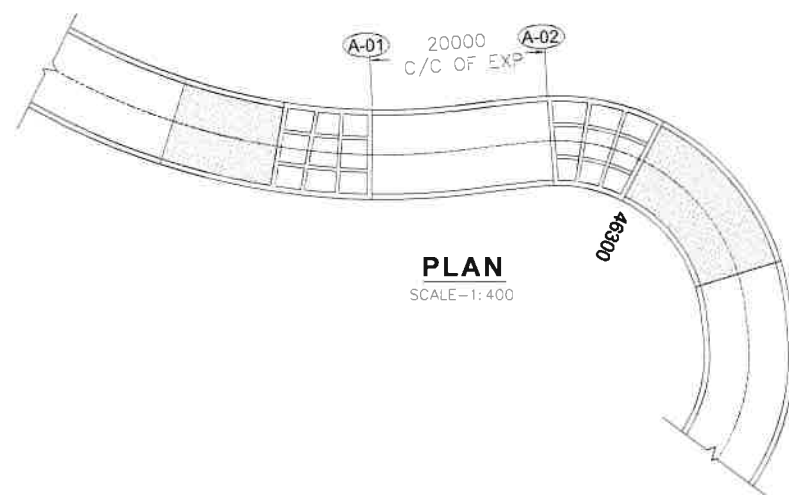
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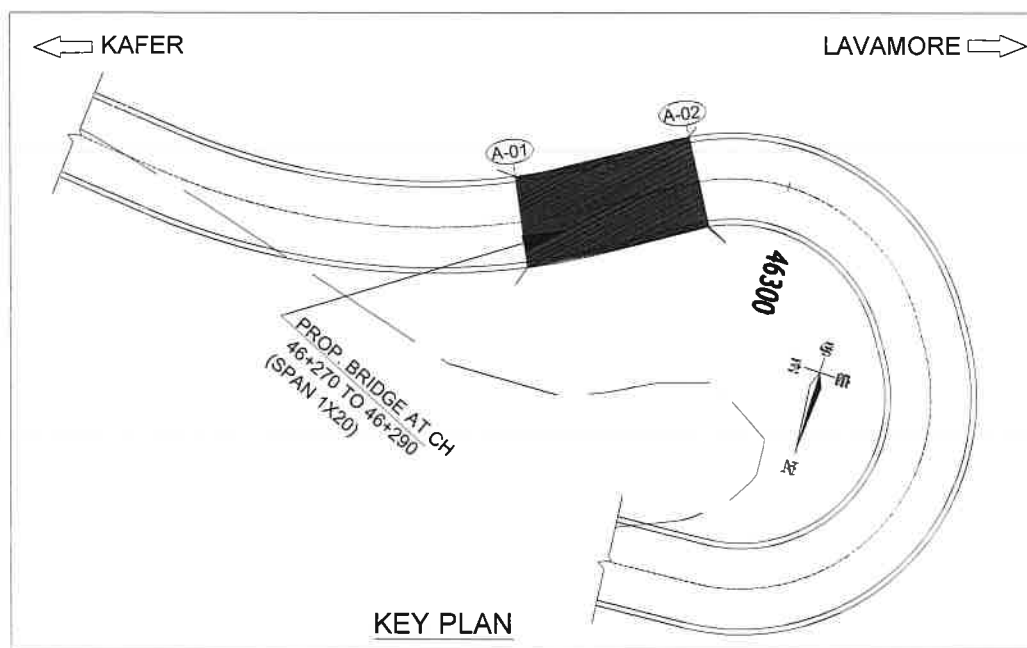
**LONGITUDINAL ELEVATION**

SCALE-1: 400

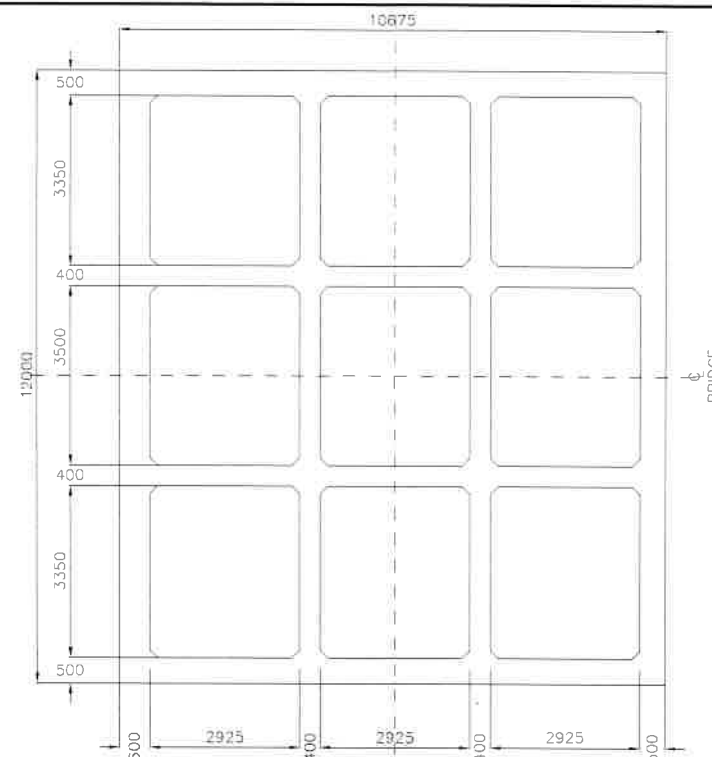


**PLAN**

SCALE-1: 400

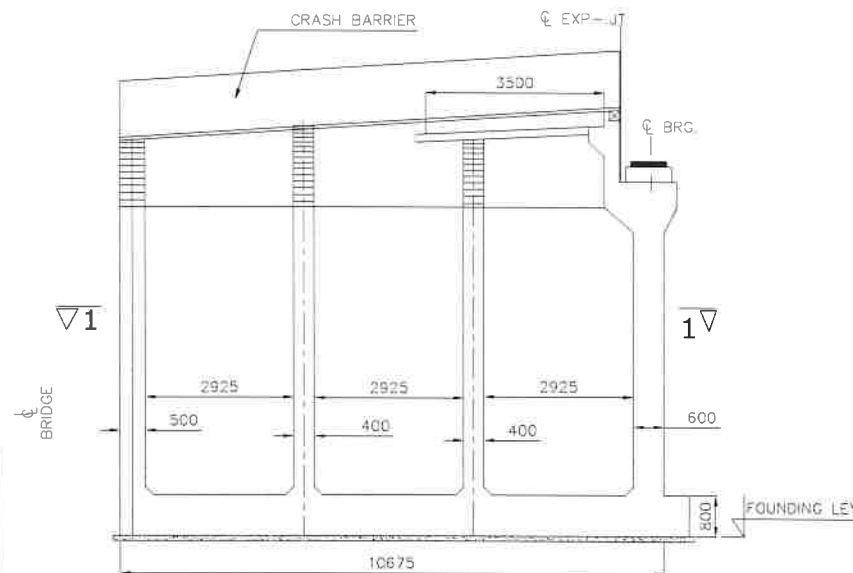


**KEY PLAN**



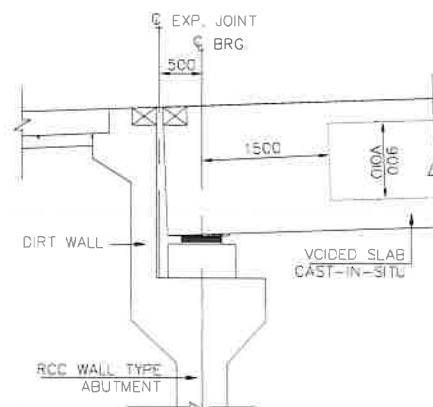
**SECTION-1-1**

SCALE 1:100



**BOX ABUTMENT**

SCALE 1:100

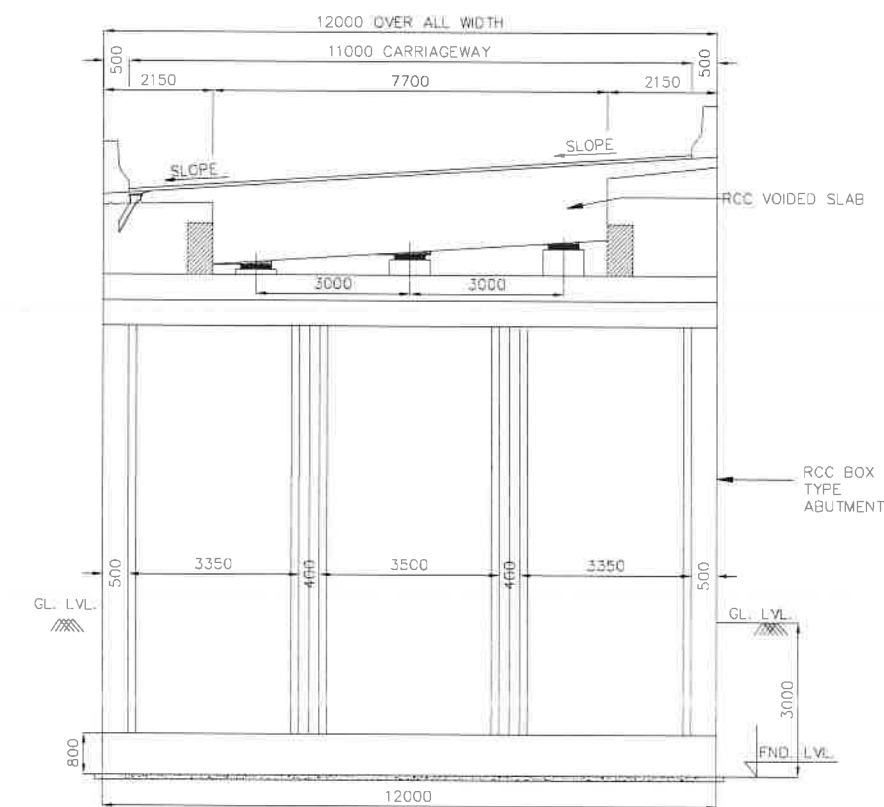


**DETAIL-A**

(SCALE 1:60)

## NOTES

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  - (iv) RCC CRASH BARRIER ----- M40
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- SAFE BEARING CAPACITY FOR PRILIMINARY DESIGN AT FOUNDING LEVEL IS CONSIDERED AS 40t/m<sup>2</sup>



**SECTION-A-A**

SCALE 1:100

| REV | DATE | DESCRIPTION OF REVISIONS | INITIALS |
|-----|------|--------------------------|----------|
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|     |      |                          |          |
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|     |      |                          |          |

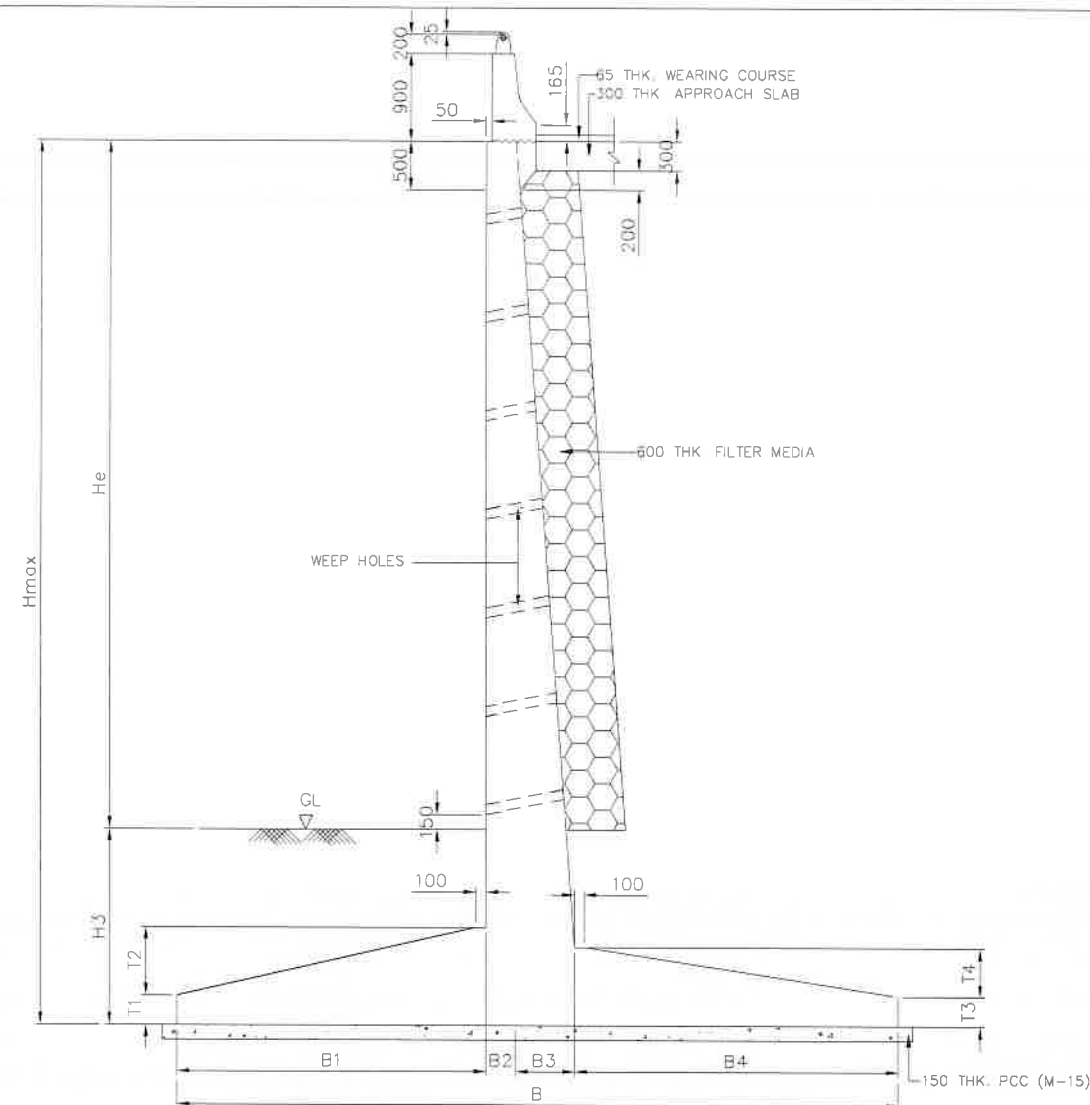
|                                                                                                                       |                                                                                                                                                                                                                                             |
|-----------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CLIENT: NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED<br>(Ministry of Road Transport & Highways) | CONSULTANT: S.A. Infrastructure Consultants Pvt. Ltd.<br>1101A, 11 Floor Tower A-II, Ansal Corporate Park,<br>Plot No. 7A/1, Sector 142, Noida-201301 (Uttar Pradesh)<br>Phone No- 0120-6148000 Fax-0120-6148090<br>Email: info@sainfra.com |
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|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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 West Bengal and From Rhenok-Rorathang-Pakyong along with of Spur From Aritar-Rolep-Merla in the State of Sikkim (PKG-5A) |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

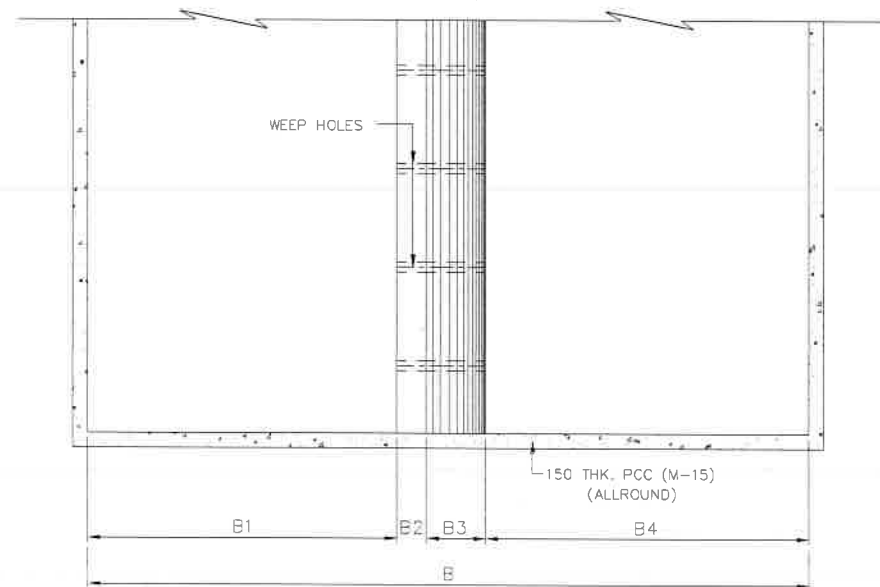
|                                                                                                                  |  |                                                                                                              |  |                                                                                                                  |  |
|------------------------------------------------------------------------------------------------------------------|--|--------------------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------------------------|--|
| DATE : NOV-2019                                                                                                  |  | REVISION                                                                                                     |  | R0                                                                                                               |  |
| DESIGNED BY<br><br>A REHMAN |  | DRAWN BY<br><br>S RAWAT |  | CHECKED BY<br><br>S DE      |  |
|                                                                                                                  |  |                                                                                                              |  | APPROVED BY<br><br>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/NHIDC/WB-SKM/46+270/GAD-01                          |

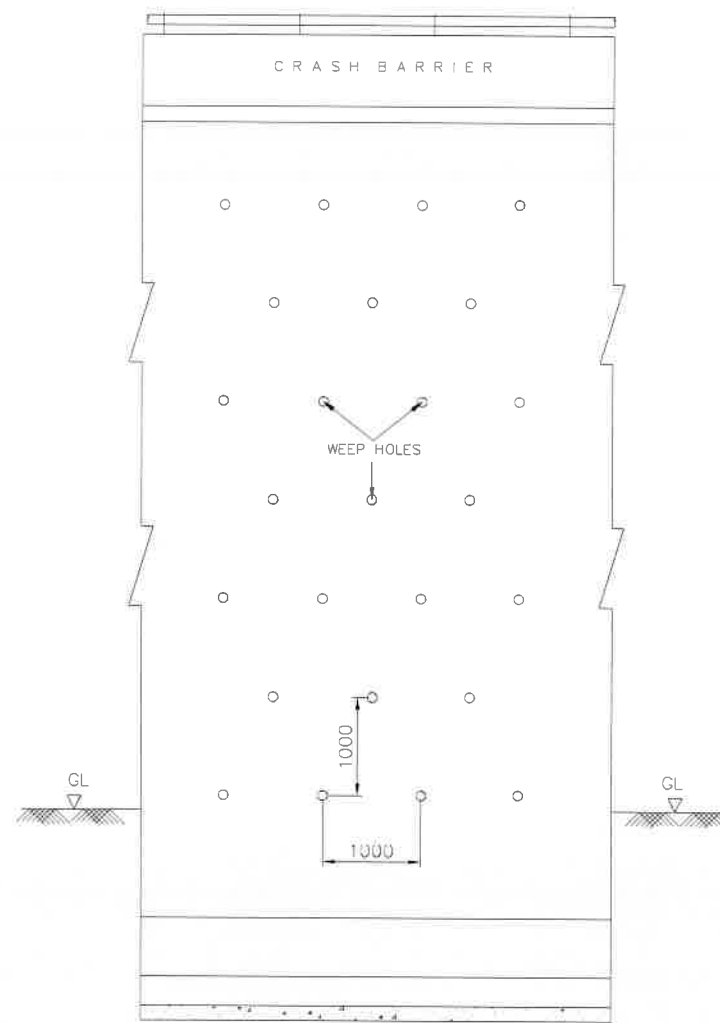
**MISCELLANEOUS**



**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-500D 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 STARTING 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 : 20H TOWARDS THE DRAINING FACE.
9. THE SAFE BEARING CAPACITY AT THE FOUNDING LEVEL IS CONSIDERED 22t/M<sup>2</sup> 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                                 | He    | 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 | 4600 | 1650 | 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 :    |  | <b>NATIONAL HIGHWAYS &amp; INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED</b><br>(Ministry of Road Transport & Highways)                                                                                                               |
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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 (Package-IVD)

|                                                                                                                         |                                                                                                                  |
|-------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| DATE : NOVEMBER-2019                                                                                                    | REVISION R0                                                                                                      |
| DESIGNED BY<br><br>S ROY CHOUDHURY | DRAWN BY<br><br>A SEN       |
| CHECKED BY<br><br>A REHMAN         | APPROVED BY<br><br>S SHUKLA |
| SCALE:- AS SHOWN                                                                                                        | SHEET:- 01 OF 01                                                                                                 |

GENERAL ARRANGEMENT DRAWING OF INDEPENDENT RETAINING WALL

DWG. NO. :-  
SAICPL-SESPL/NHDC/WB-SKM/RW/S-01