



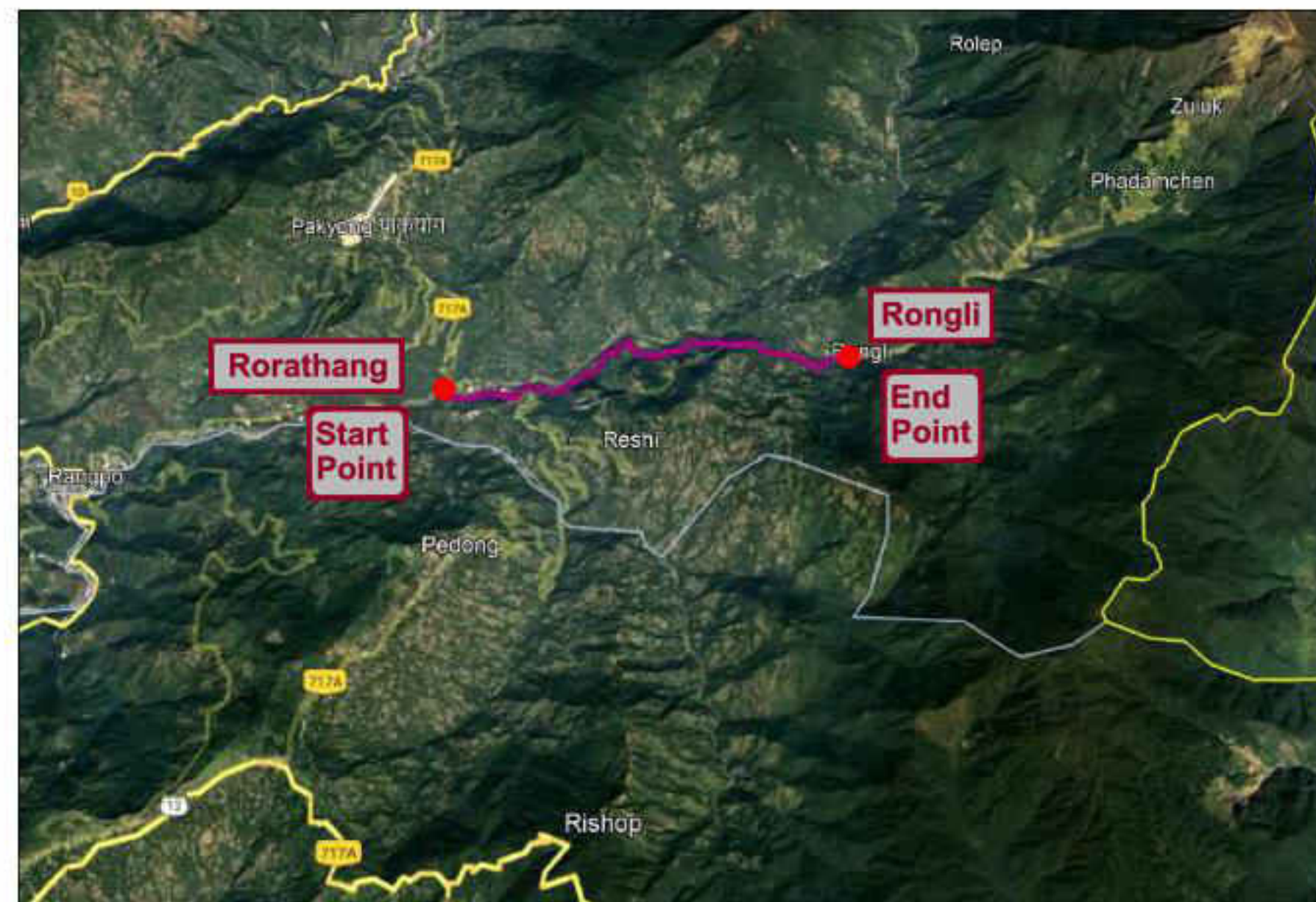
ROADS & BRIDGES DEPARTMENT

(Government of Sikkim)

Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim

FINAL DETAIL PROJECT REPORT

NAME OF ROAD: RORATHANG TO RONGLI (E1)



DRAWINGS (VOLUME - IX)

DESIGN CONSULTANT :



LEA ASSOCIATES SOUTH ASIA PVT. LTD.,
B-1/E-27, Mohan Cooperative Industrial Estate,
Mathura Road, New Delhi-110044

September 2023

LIST OF DRAWINGS

Sl. No.	Title of Drawing	Drawing No.	Revision
1	LIST OF DRAWINGS	73806/LASA/HWY/E1/LIST-001	R0
2	INDEX MAP	73806/LASA/HWY/E1/INDEX-201	R0
ROAD DRAWINGS			
3	LEGEND AND ABBREVIATION	73806/LASA/HWY/E1/LEGEND-111	R0
4	SURVEY LAYOUT	73806/LASA/HWY/E1/SUR-121 To 129	R0
5	TYPICAL CROSS SECTION	73806/LASA/HWY/E1/TCS-201 To 214	R0
6	SCHEDULE OF TYPICAL CROSS SECTION	73806/LASA/HWY/E1/TCS-221	R0
7	PLAN & PROFILE OF ROAD	73806/LASA/HWY/E1/PP-301 To 318	R0
8	DETAILED REPORT OF VERTICAL CURVE	73806/LASA/HWY/E1/VC-401 (2 Sheets)	R0
9	DETAILED REPORT OF HORIZONTAL CURVE	73806/LASA/HWY/E1/HC-411 (5 Sheets)	R0
10	DETAILED CROSS SECTION OF ROAD	73806/LASA/E1/CS-501 To 527	R0
JUNCTION DRAWINGS			
11	LAYOUT OF MAJOR JUNCTION AT CH. 0+000 Km	73806/LASA/HWY/E1/JUNC-601	R0
12	LAYOUT OF MAJOR JUNCTION AT CH. 0+910 Km	73806/LASA/HWY/E1/JUNC-602	R0
13	LAYOUT OF MAJOR JUNCTION AT CH. 2+210 Km	73806/LASA/HWY/E1/JUNC-603	R0
14	LAYOUT OF MAJOR JUNCTION AT CH. 8+889 Km	73806/LASA/HWY/E1/JUNC-604	R0
STRUCTURE DRAWINGS			
15	GAD OF SINGLE CELL BOX CULVERT	73806/LASA/HWY/E1/STR/BC-651 (2 Sheets)	R0
16	REINFORCEMENT DETAIL OF SINGLE CELL BOX CULVERT	73806/LASA/HWY/E1/STR/BC-652 (2 Sheets)	R0
17	GAD OF MINOR BRIDGE AT CH. 0+970 Km (BRIDGE-01)	73806/LASA/E1/STR/BR-01/GAD-661 (2 Sheets)	R0
18	SUBSTRUCTURE & FOUNDATION DRAWING FOR A1 ABUTMENT OF MINOR BRIDGE AT CH. 0+970 Km (BRIDGE-01)	73806/LASA/E1/STR/BR-01/SUB-662	R0
19	REINFORCEMENT DETAIL DRAWING FOR A1 ABUTMENT OF MINOR BRIDGE AT CH. 0+970 Km (BRIDGE-01)	73806/LASA/E1/STR/BR-01/SUB-663	R0
20	SUBSTRUCTURE & FOUNDATION DRAWING FOR A2 ABUTMENT OF MINOR BRIDGE AT CH. 0+970 Km (BRIDGE-01)	73806/LASA/E1/STR/BR-01/SUB-664	R0
21	REINFORCEMENT DETAIL DRAWING FOR A2 ABUTMENT OF MINOR BRIDGE AT CH. 0+970 Km (BRIDGE-01)	73806/LASA/E1/STR/BR-01/SUB-665	R0
22	GAD OF MINOR BRIDGE AT CH. 1+925 Km (BRIDGE-02)	73806/LASA/E1/STR/BR-02/GAD-671 (2 Sheets)	R0
23	SUBSTRUCTURE & FOUNDATION DRAWING FOR MINOR BRIDGE AT CH. 1+925 Km (BRIDGE-02)	73806/LASA/E1/STR/BR-02/SUB-672	R0
24	REINFORCEMENT DETAIL DRAWING FOR ABUTMENT OF MINOR BRIDGE AT CH. 1+925 Km (BRIDGE-02)	73806/LASA/E1/STR/BR-02/SUB-673	R0
25	GAD OF MAJOR BRIDGE AT CH. 4+077 Km (BRIDGE-03)	73806/LASA/E1/STR/BR-03/GAD-681 (2 Sheets)	R0
26	SUBSTRUCTURE & FOUNDATION DRAWING FOR A1 ABUTMENT OF MAJOR BRIDGE AT CH. 4+077 Km (BRIDGE-03)	73806/LASA/E1/STR/BR-03/SUB-682	R0
27	REINFORCEMENT DETAIL DRAWING FOR A1 ABUTMENT OF MAJOR BRIDGE AT CH. 4+077 Km (BRIDGE-03)	73806/LASA/E1/STR/BR-03/SUB-683	R0
28	SUBSTRUCTURE & FOUNDATION DRAWING FOR A2 ABUTMENT OF MAJOR BRIDGE AT CH. 4+077 Km (BRIDGE-03)	73806/LASA/E1/STR/BR-03/SUB-684	R0
29	REINFORCEMENT DETAIL DRAWING FOR A2 ABUTMENT OF MAJOR BRIDGE AT CH. 4+077 Km (BRIDGE-03)	73806/LASA/E1/STR/BR-03/SUB-685	R0
30	DETAILS OF STEEL COMPOSITE SUPERSTRUCTURE WITH RCC DECK SLAB OF 40.0M SPAN	73806/LASA/STR/SUP-701 (6 Sheets)	R0
31	DETAILS OF STEEL TRUSS TYPE SUPERSTRUCTURE WITH RCC DECK SLAB OF 60.0M SPAN	73806/LASA/STR/SUP-711 (4 Sheets)	R0

Sl. No.	Title of Drawing	Drawing No.	Revision
DRAWINGS OF PROTECTION WORK			
32	TYPICAL DETAILS OF BREAST WALL	73806/LASA/STR/PROT-751	R0
33	TYPICAL DETAILS OF BREAST WALL (PLUM CONCRETE)	73806/LASA/STR/PROT-752	R0
34	TYPICAL DETAILS OF RETAINING WALL	73806/LASA/STR/PROT-753	R0
35	TYPICAL DETAILS OF GABION RETAINING WALL	73806/LASA/STR/PROT-754	R0
36	TYPICAL CROSS SECTION OF ROCK FALL PROTECTION	73806/LASA/STR/PROT-755	R0
37	TYPICAL CROSS SECTION IN LAND SLIDE AREA	73806/LASA/STR/PROT-756	R0
HILL SLOPE PROTECTION			
38	HILL SLOPE PROTECTION AT CH. 0+225 Km	73806/LASA/GEO/E1/PROT-761	R0
39	HILL SLOPE PROTECTION From Ch. 0+420 To Ch. 0+510 Km	73806/LASA/GEO/E1/PROT-762	R0
40	HILL SLOPE PROTECTION From Ch. 2+000 To Ch. 2+040 Km	73806/LASA/GEO/E1/PROT-763	R0
41	HILL SLOPE PROTECTION From Ch. 2+980 To Ch. 3+050 Km	73806/LASA/GEO/E1/PROT-764	R0
42	HILL SLOPE PROTECTION From Ch. 4+180 To Ch. 4+240 Km	73806/LASA/GEO/E1/PROT-765	R0
MISCELLANEOUS DRAWINGS			
43	TYPICAL DETAILS OF CRASH BARRIER, FOOTPATH AND ASPHALT EXPANSION JOINT	73806/LASA/STR/MISC-801	R0
44	TYPICAL DETAILS OF DRAINAGE SPOUT AND STRIP SEAL EXPANSION JOINT	73806/LASA/STR/MISC-802	R0
45	TYPICAL DETAILS OF APPROACH SLAB	73806/LASA/STR/MISC-803	R0
46	TYPICAL LAYOUT PLAN FOR VIEW POINT	73806/LASA/STR/MISC-804	R0
47	TYPICAL STRUCTURE DRAWING FOR VIEW POINT	73806/LASA/STR/MISC-805	R0
48	TYPICAL DRAWING FOR BUS WAITING SHED	73806/LASA/STR/MISC-806	R0
49	TYPICAL DRAWING FOR PUBLIC TOILET AT BUS STOP	73806/LASA/STR/MISC-807 (2 Sheets)	R0
50	TYPICAL DETAILS OF METALLIC CRASH BARRIER	73806/LASA/STR/MISC-808	R0
51	DETAILS OF REHABILITATION WORKS AT SLIDE LOCATION	73806/LASA/STR/MISC-809	R0
52	TYPICAL DRAWING FOR KM STONE	73806/LASA/STR/MISC-810	R0
53	TYPICAL DETAILS OF STONE PITCHING	73806/LASA/STR/MISC-811	R0
54	TYPICAL DETAILS FOR JUNCTION	73806/LASA/STR/MISC-812	R0
55	TYPICAL DRAWING FOR GUARD POST & BOUNDARY STONE	73806/LASA/STR/MISC-813	R0
56	TYPICAL DRAWING ROAD MARKING	73806/LASA/STR/MISC-814	R0
57	TYPICAL DETAILS OF ROAD SIGNS	73806/LASA/STR/MISC-815 (6 Sheets)	R0
58	TYPICAL DETAILS OF OVERHEAD GANTRY BOARD	73806/LASA/STR/MISC-816 (2 Sheets)	R0
59	TYPICAL DRAWING OF BOX CULVERT AT HAIRPIN BEND LOCATION	73806/LASA/STR/MISC-817	R0
60	TYPICAL DETAILS OF EXTRA WIDENING	73806/LASA/STR/MISC-818	R0
61	TYPICAL DETAILS OF DRAIN AND KERB STONE	73806/LASA/STR/MISC-819	R0
DRAWINGS OF DUMPING YARD			
62	DUMPING YARD ON VALLEY SIDE From Ch. 1+080 Km To Ch. 1+180 Km	73806/LASA/HWY/E1/DY-901	R0
63	DUMPING YARD ON VALLEY SIDE From Ch. 3+650 Km To Ch. 3+700 Km	73806/LASA/HWY/E1/DY-902	R0
64	DUMPING YARD ON VALLEY SIDE From Ch. 5+240 Km To Ch. 5+300 Km	73806/LASA/HWY/E1/DY-903	R0
65	DUMPING YARD ON VALLEY SIDE From Ch. 5+940 Km To Ch. 5+980 Km	73806/LASA/HWY/E1/DY-904	R0



CLIENT :
Roads & Bridges Department
(Government of Sikkim)

PROJECT :
Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim

DESIGN CONSULTANT :
 LEA ASSOCIATES SOUTH ASIA PVT. LTD.
B-1/E-27, Mohan Cooperative Industrial Estate,
Mathura Road, New Delhi-110044

DRAWING TITLE:-
LIST OF DRAWINGS
E1 - RORATHANG TO RONGLI

DRAWING No : 73806/LASA/HWY/E1/LIST-001

REV.	DRAWN	A. DHAR	CHECKED	S. ROY
R0	DESIGN	SOURMENDU	REVIEWED	J. K. DAS
SHEET	DATE	DEC. 2022	SCALE :	
A2				

← TO RORATHANG

TO RONGLI →

EXISTING STRUCTURE	
TYPE	: SLAB
SOFFIT LEVEL	: NOT AVAILABLE
INVERT LEVEL	: NOT AVAILABLE
SIZE	: NOT AVAILABLE

EXISTING STRUCTURE	
TYPE	: SLAB
SOFFIT LEVEL	: 579.189 M
INVERT LEVEL	: 578.137 M
SIZE	: 1 X 1.200 M

PLAN
(Ch. 0+000 To Ch. 0+500)
(SCALE - 1:1000)

EXISTING STRUCTURE	
TYPE	: MNB
SOFFIT LEVEL	: 556.310 M
INVERT LEVEL	: 541.633 M
SIZE	: 1 X 15.500 M

EXISTING STRUCTURE	
TYPE	: SLAB
SOFFIT LEVEL	: 564.404 M
INVERT LEVEL	: 563.555 M
SIZE	: 1 X 1.100 M

EXISTING STRUCTURE	
TYPE	: SLAB
SOFFIT LEVEL	: 574.571 M
INVERT LEVEL	: 573.785 M
SIZE	: 1 X 1.000 M

PLAN
(Ch. 0+500 To Ch. 1+000)
(SCALE - 1:1000)

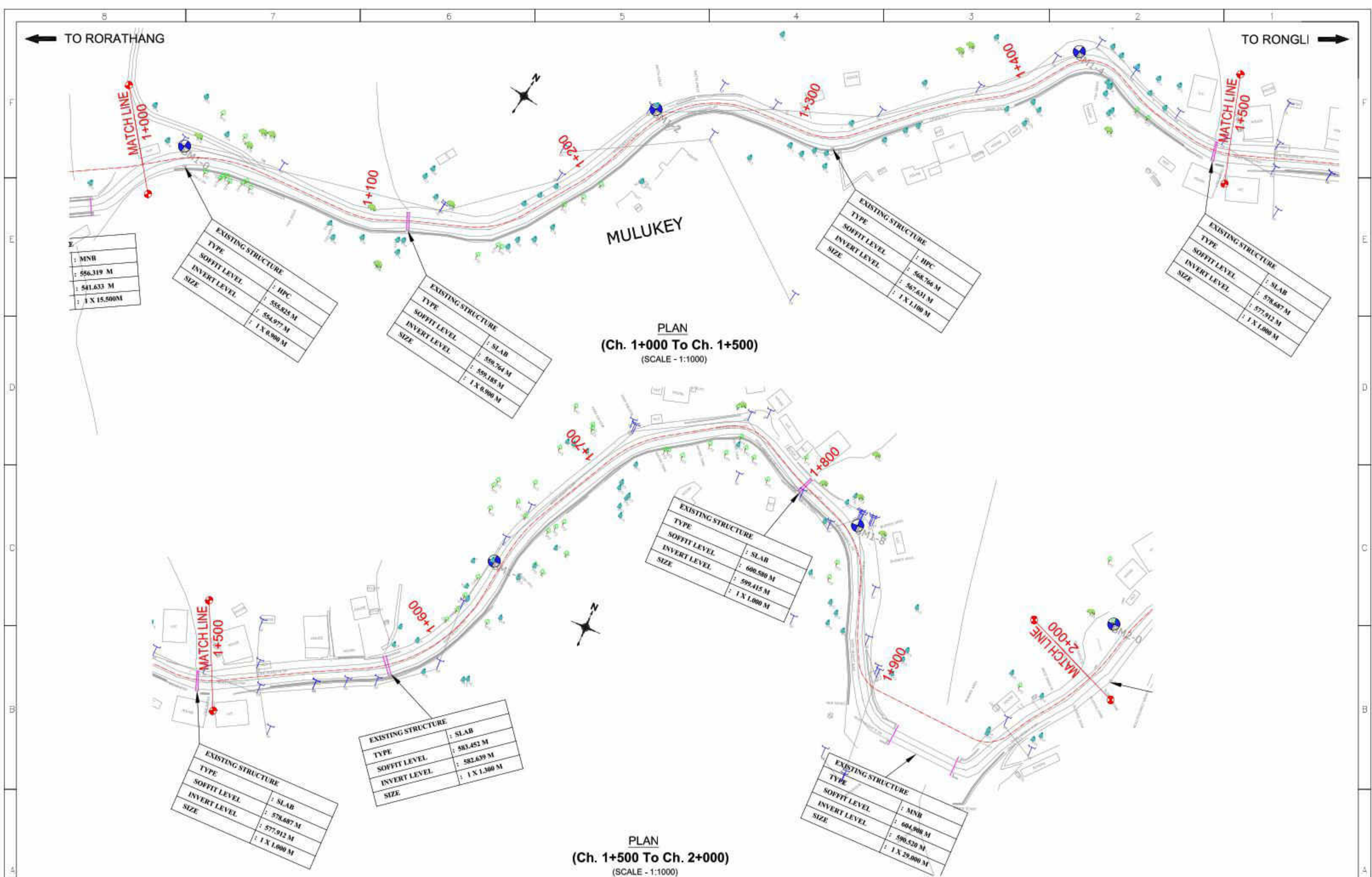
CLIENT :
 **Roads & Bridges Department**
(Government of Sikkim)

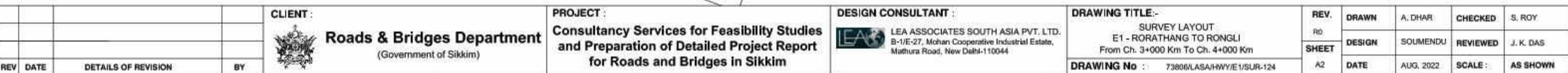
PROJECT :
Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim

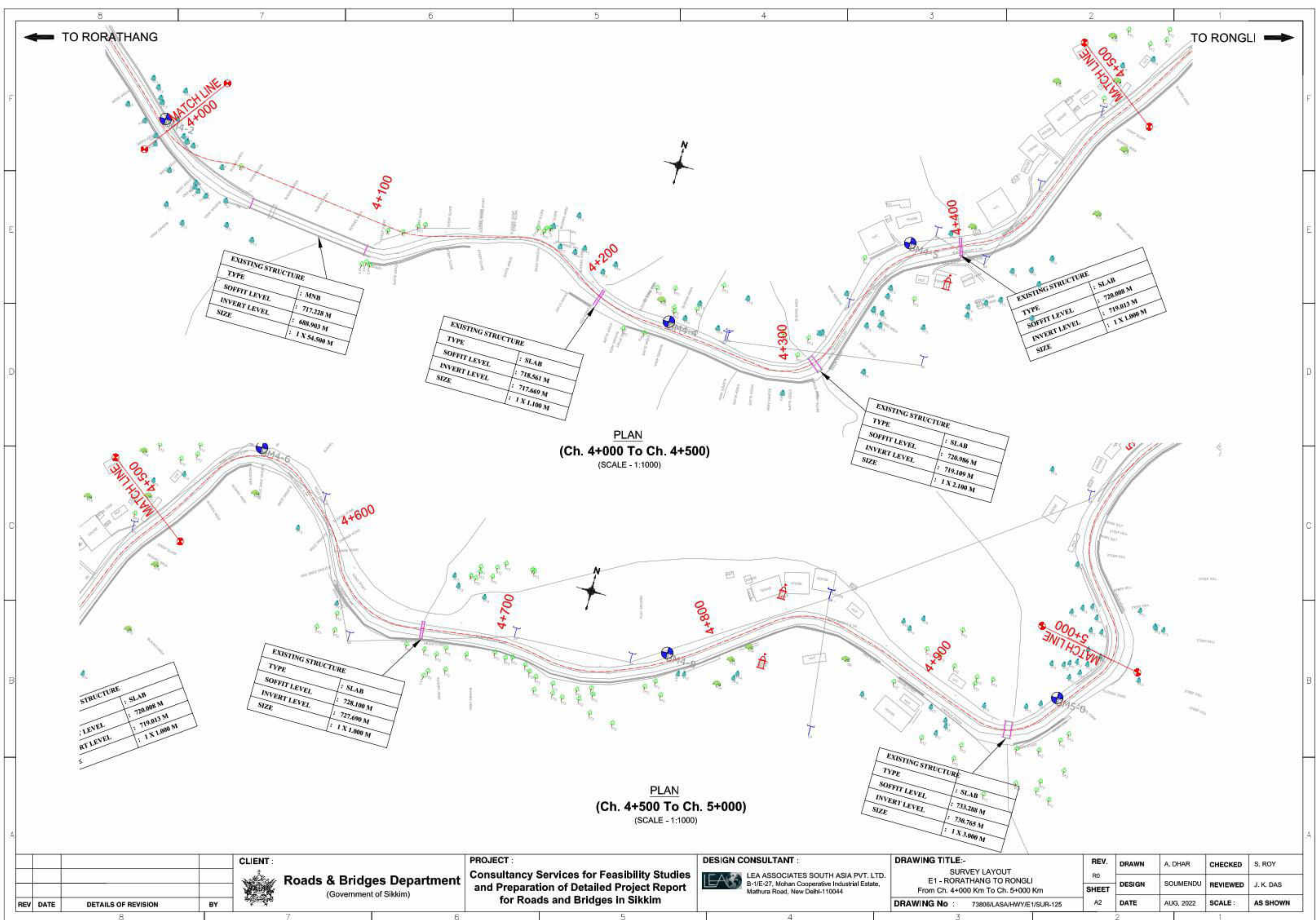
DESIGN CONSULTANT :
 **LEA ASSOCIATES SOUTH ASIA PVT. LTD.**
B-1/E-27, Mchan Cooperative Industrial Estate,
Mathura Road, New Delhi-110044

DRAWING TITLE:-
SURVEY LAYOUT
E1 - RORATHANG TO RONGLI
From Ch. 0+000 Km To Ch. 1+000 Km
DRAWING No : 73806/LASA/HWY/E1/SUR-121

REV.	DRAWN	CHECKED	BY
R0	A. DHAR	S. ROY	
SHEET	DESIGN	REVIEWED	
A2	SOURMENDU	J. K. DAS	
DATE	SCALE	AS SHOWN	
AUG, 2022			

[illegible]





← TO RORATHANG

TO RONGLI →

PLAN
(Ch. 5+000 To Ch. 5+500)
(SCALE - 1:1000)

PLAN
(Ch. 5+500 To Ch. 6+000)
(SCALE - 1:1000)

EXISTING STRUCTURE	
TYPE	: SLAB
SOFFIT LEVEL	: 738.525 M
INVERT LEVEL	: 737.667 M
SIZE	: 1 X 1.000 M

EXISTING STRUCTURE	
TYPE	: SLAB
SOFFIT LEVEL	: 745.443 M
INVERT LEVEL	: 744.311 M
SIZE	: 1 X 1.000 M

EXISTING STRUCTURE	
TYPE	: SLAB
SOFFIT LEVEL	: 745.443 M
INVERT LEVEL	: 744.311 M
SIZE	: 1 X 1.000 M

EXISTING STRUCTURE	
TYPE	: HPC
SOFFIT LEVEL	: 745.905 M
INVERT LEVEL	: 745.157 M
SIZE	: 1 X 0.900 M

EXISTING STRUCTURE	
TYPE	: HPC
SOFFIT LEVEL	: 746.089 M
INVERT LEVEL	: 745.374 M
SIZE	: 1 X 0.900 M

EXISTING STRUCTURE	
TYPE	: SLAB
SOFFIT LEVEL	: 747.580 M
INVERT LEVEL	: 746.389 M
SIZE	: 1 X 1.000 M

EXISTING STRUCTURE	
TYPE	: SLAB
SOFFIT LEVEL	: 747.580 M
INVERT LEVEL	: 746.389 M
SIZE	: 1 X 1.000 M

REV	DATE	DETAILS OF REVISION	BY

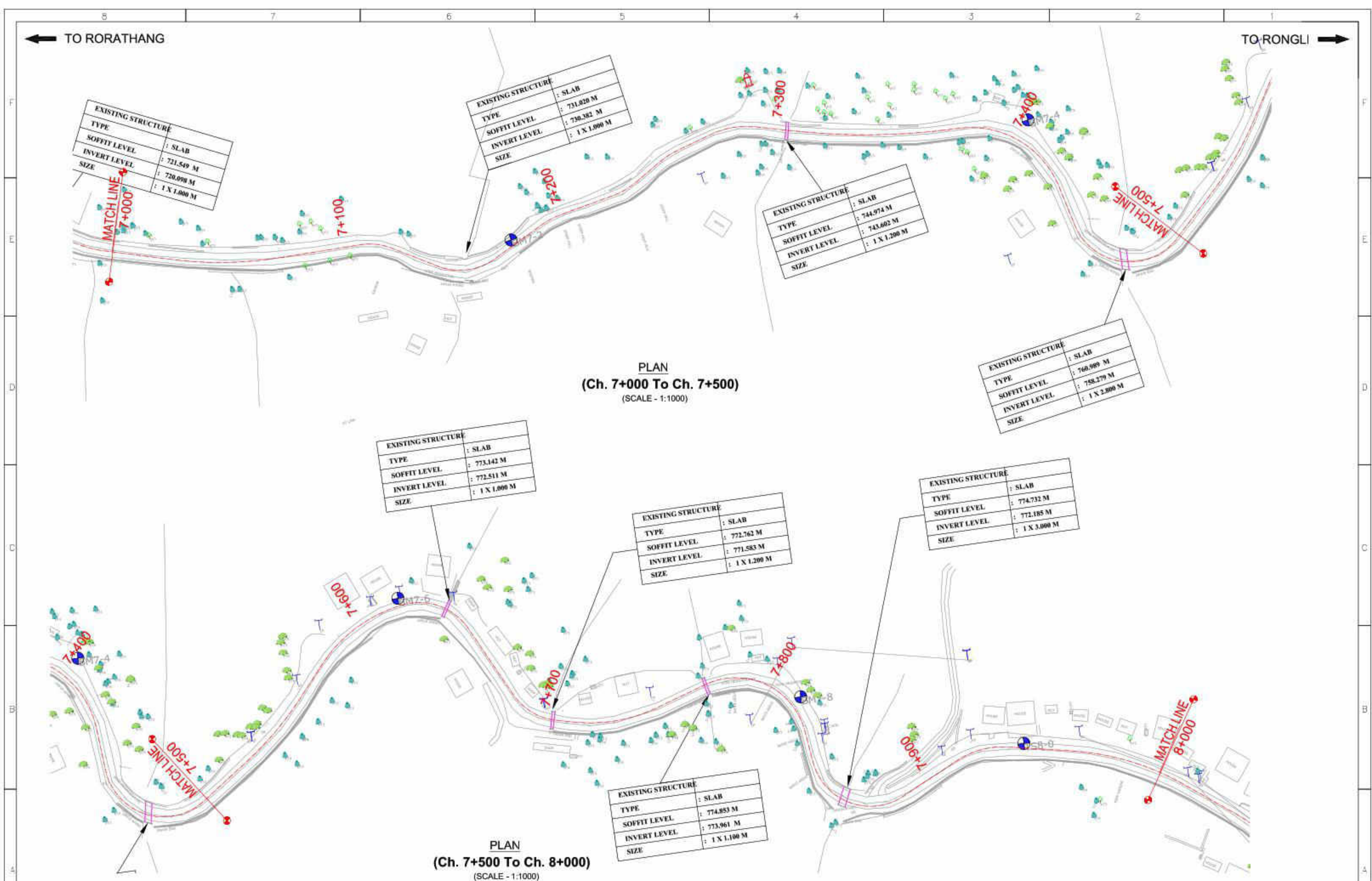
CLIENT :	
	
Roads & Bridges Department	
(Government of Sikkim)	



PROJECT :	
Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim	

DESIGN CONSULTANT :	
	
LEA ASSOCIATES SOUTH ASIA PVT. LTD.	
B-1/E-27, Mchan Cooperative Industrial Estate, Mathura Road, New Delhi-110044	

DRAWING TITLE:-	
SURVEY LAYOUT	
E1 - RORATHANG TO RONGLI	
From Ch. 5+000 Km To Ch. 6+000 Km	
DRAWING No : 73806/LASA/HWY/E1/SUR-126	

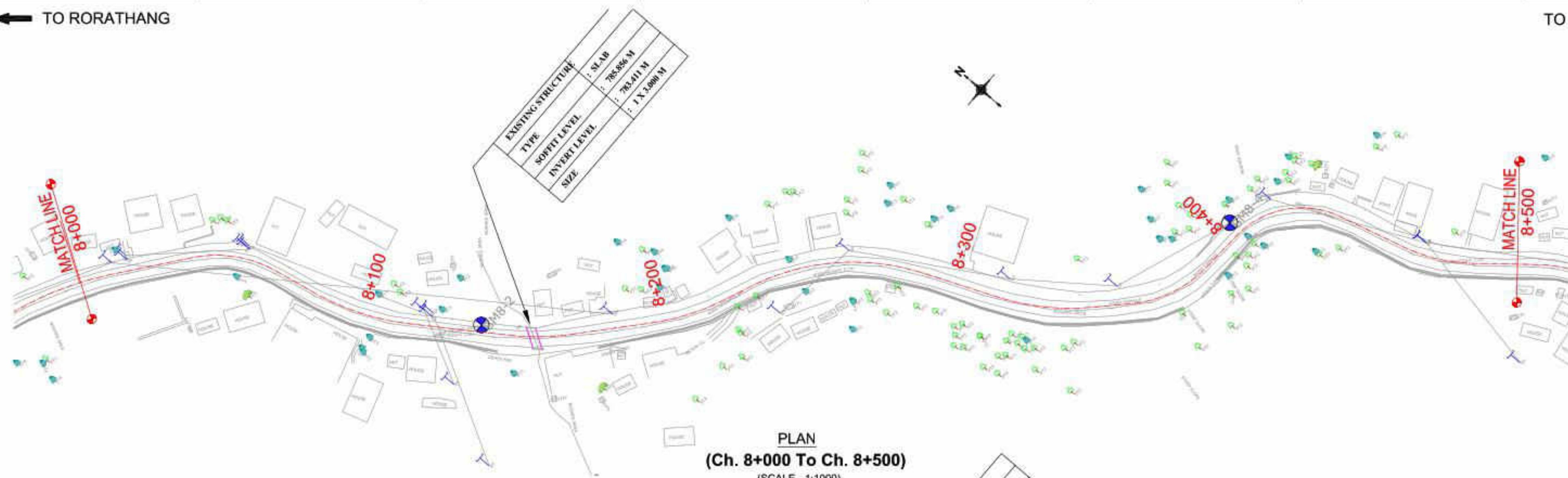
REV.	DRAWN	CHECKED	S. ROY
R0	A. DHAR	S. ROY	
SHEET	DESIGN	REVIEWED	J. K. DAS
A2	SOURMENDU	J. K. DAS	
DATE	AUG, 2022	SCALE :	AS SHOWN



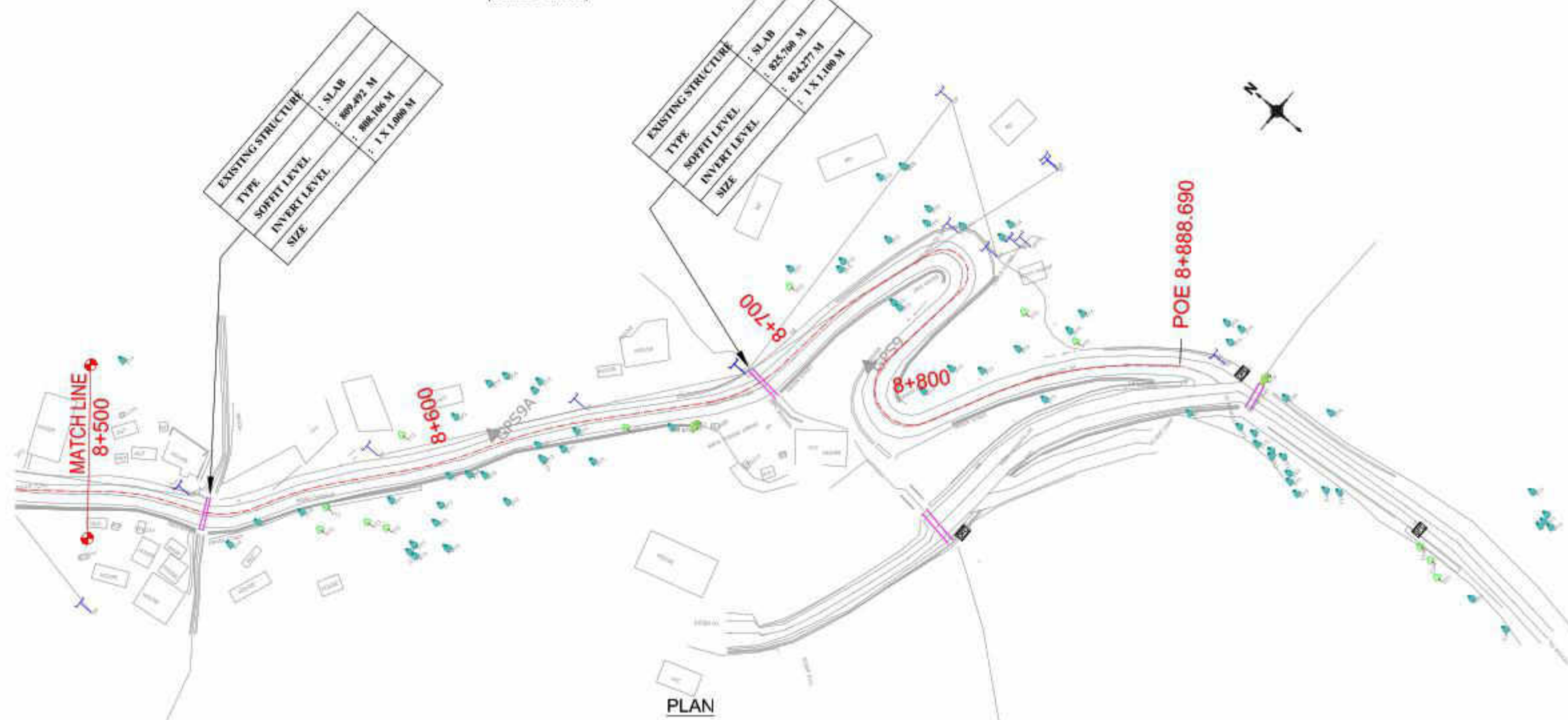
					CLIENT :  Roads & Bridges Department (Government of Sikkim)	PROJECT : Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim	DESIGN CONSULTANT :  LEA ASSOCIATES SOUTH ASIA PVT. LTD. B-1/E-27, Mohan Cooperative Industrial Estate, Mathura Road, New Delhi-110044	DRAWING TITLE:- SURVEY LAYOUT E1 - RORATHANG TO RONGLI From Ch. 7+000 Km To Ch. 8+000 Km DRAWING No : 73806/LASA/HWY/E1/SUR-128	REV.	DRAWN	A. DHAR	CHECKED	S. ROY
									SHEET	DESIGN	SOU MENDU	REVIEWED	J. K. DAS
REV	DATE	DETAILS OF REVISION		BY					A2	DATE	AUG. 2022	SCALE :	AS SHOWN

← TO RORATHANG

TO RONGLI →





PLAN
(Ch. 8+000 To Ch. 8+500)
(SCALE - 1:1000)



PLAN
(Ch. 8+500 To Ch. 8+920)
(SCALE - 1:1000)

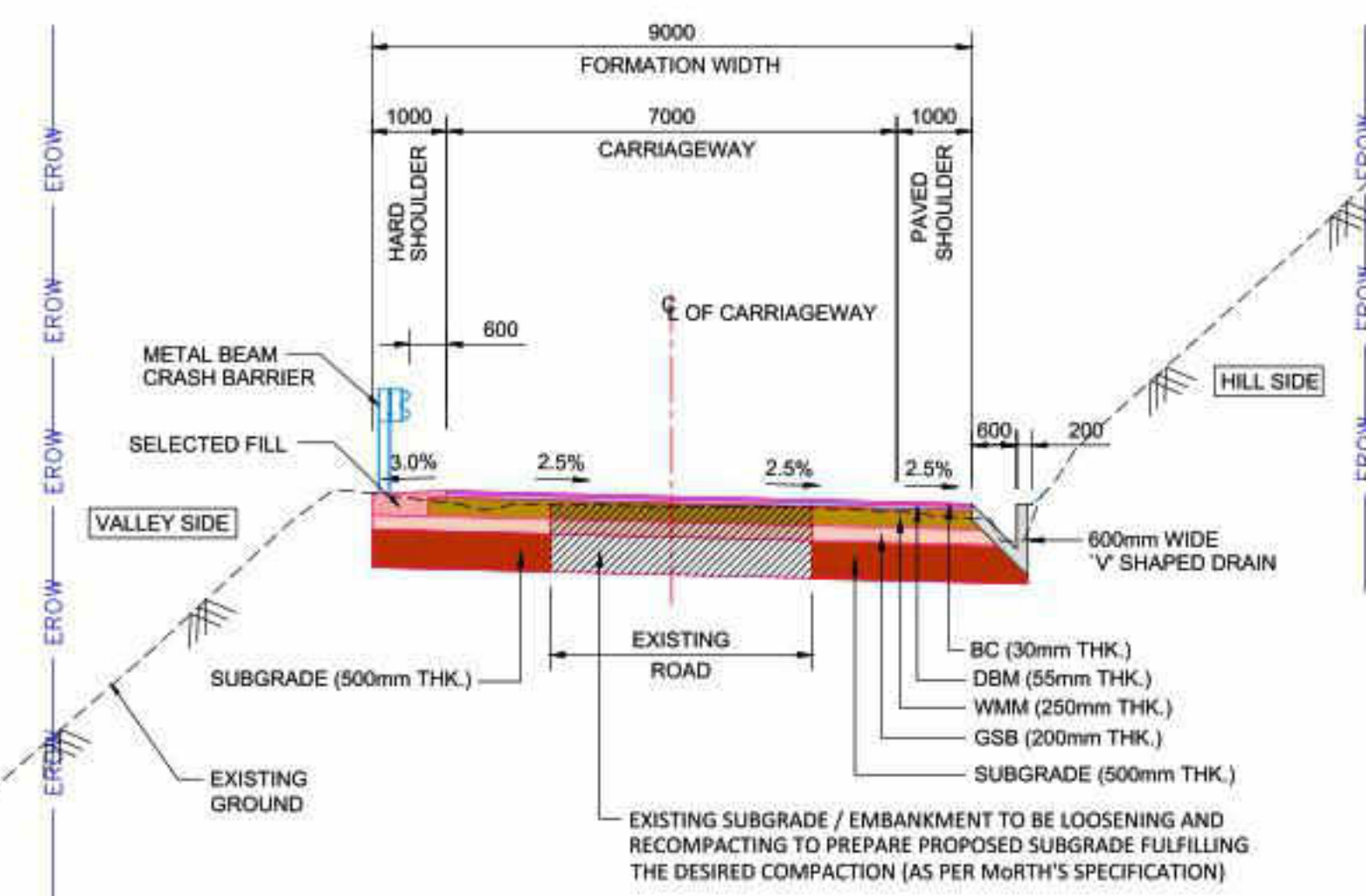
POE 8+888.690

				 CLIENT : Roads & Bridges Department (Government of Sikkim)	PROJECT : Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim	 DESIGN CONSULTANT : LEA ASSOCIATES SOUTH ASIA PVT. LTD. B-1/E-27, Mohan Cooperative Industrial Estate, Mathura Road, New Delhi-110044	DRAWING TITLE:- SURVEY LAYOUT E1 - RORATHANG TO RONGLI From Ch. 8+000 Km To Ch. 8+920 Km	DRAWING No : 73806/LASA/HWY/E1/SUR-129	REV.	DRAWN	A. DHAR	CHECKED	S. ROY	
REV	DATE	DETAILS OF REVISION		BY					SHEET	DESIGN	SOURMENDU	REVIEWED	J. K. DAS	
									A2	DATE	AUG. 2022	SCALE :	AS SHOWN	

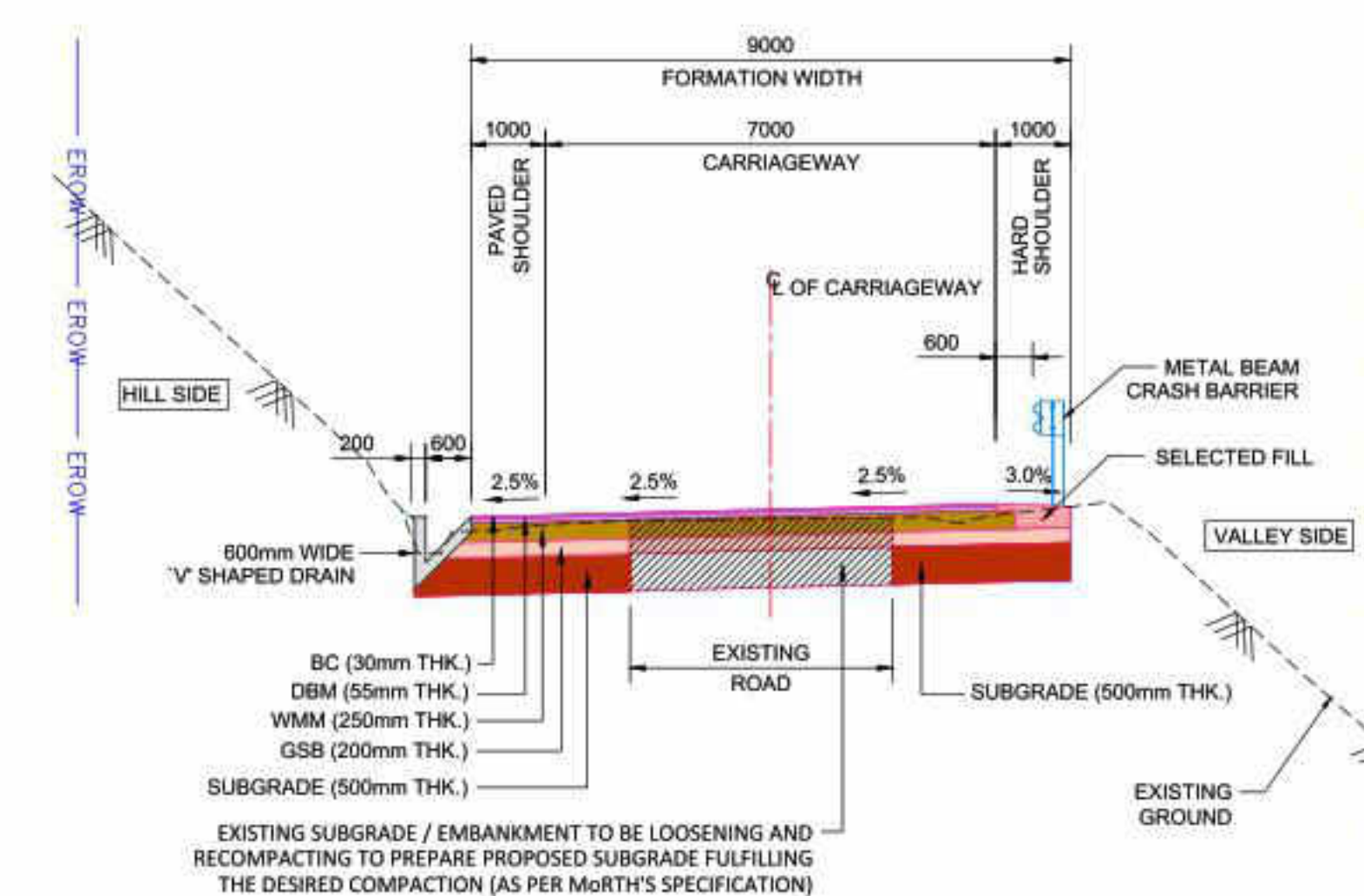
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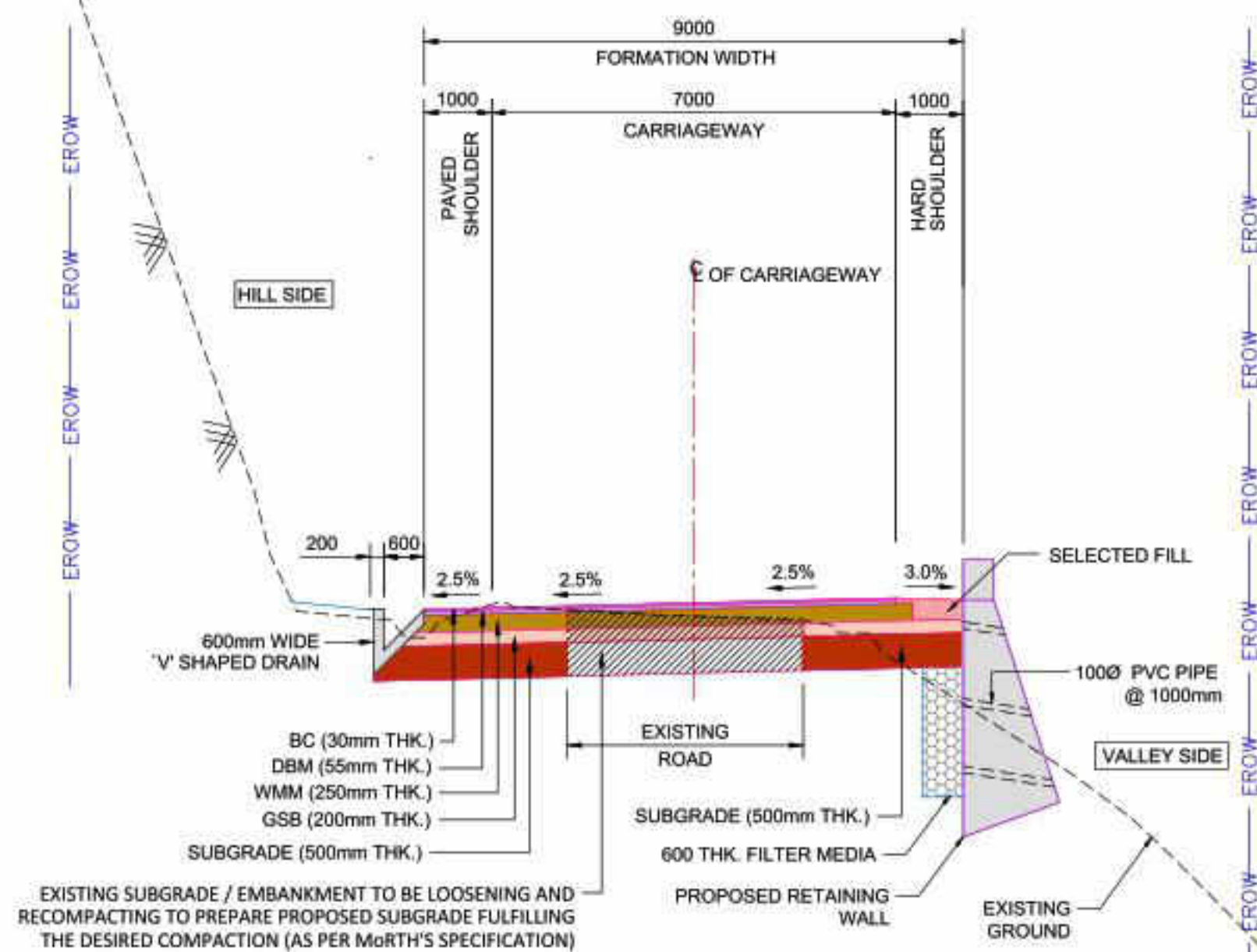
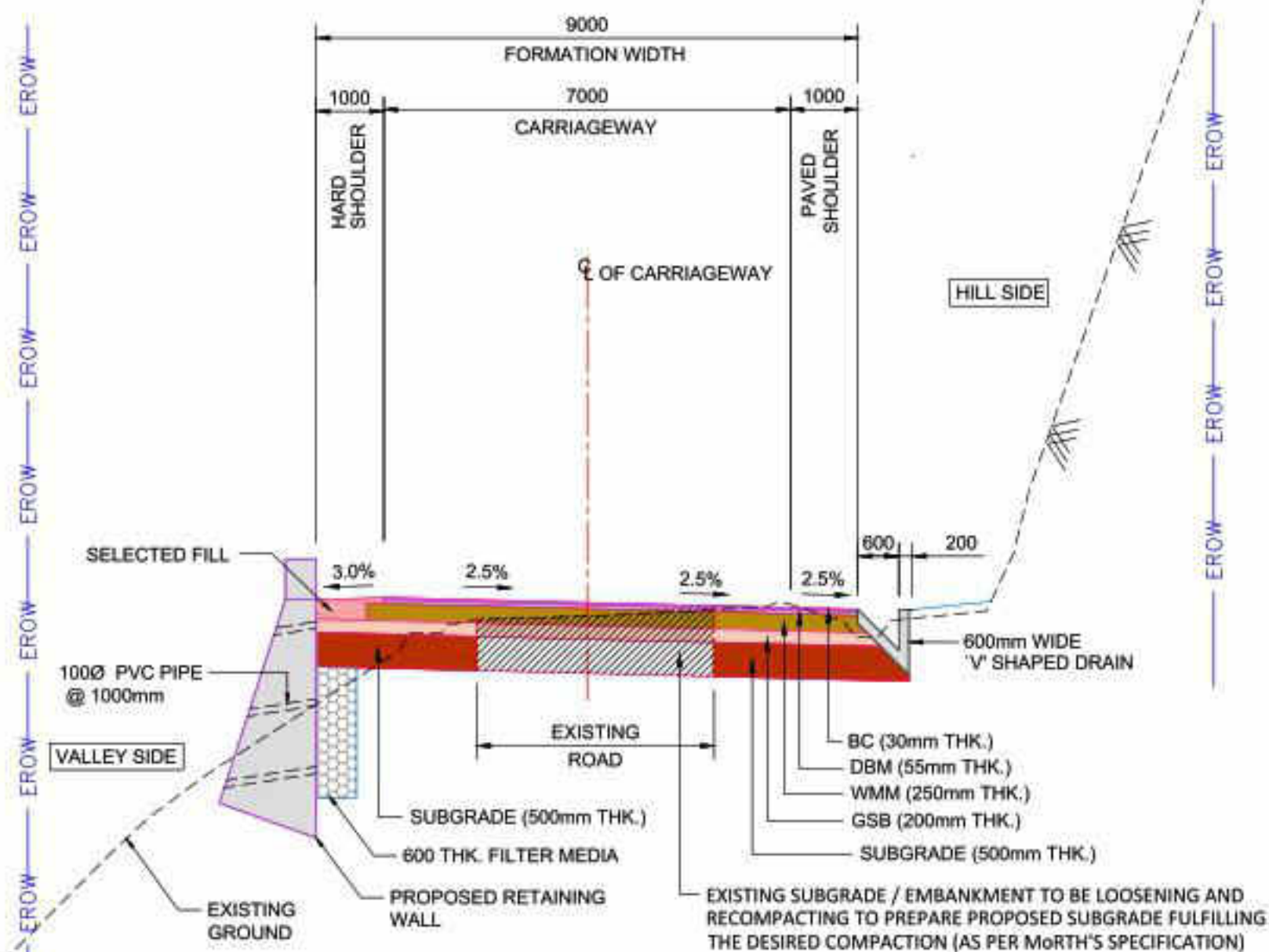
TCS - 1
TYPICAL CROSS SECTION FOR RECONSTRUCTION OF EXISTING ROAD





TCS - 1A
TYPICAL CROSS SECTION FOR RECONSTRUCTION OF EXISTING ROAD

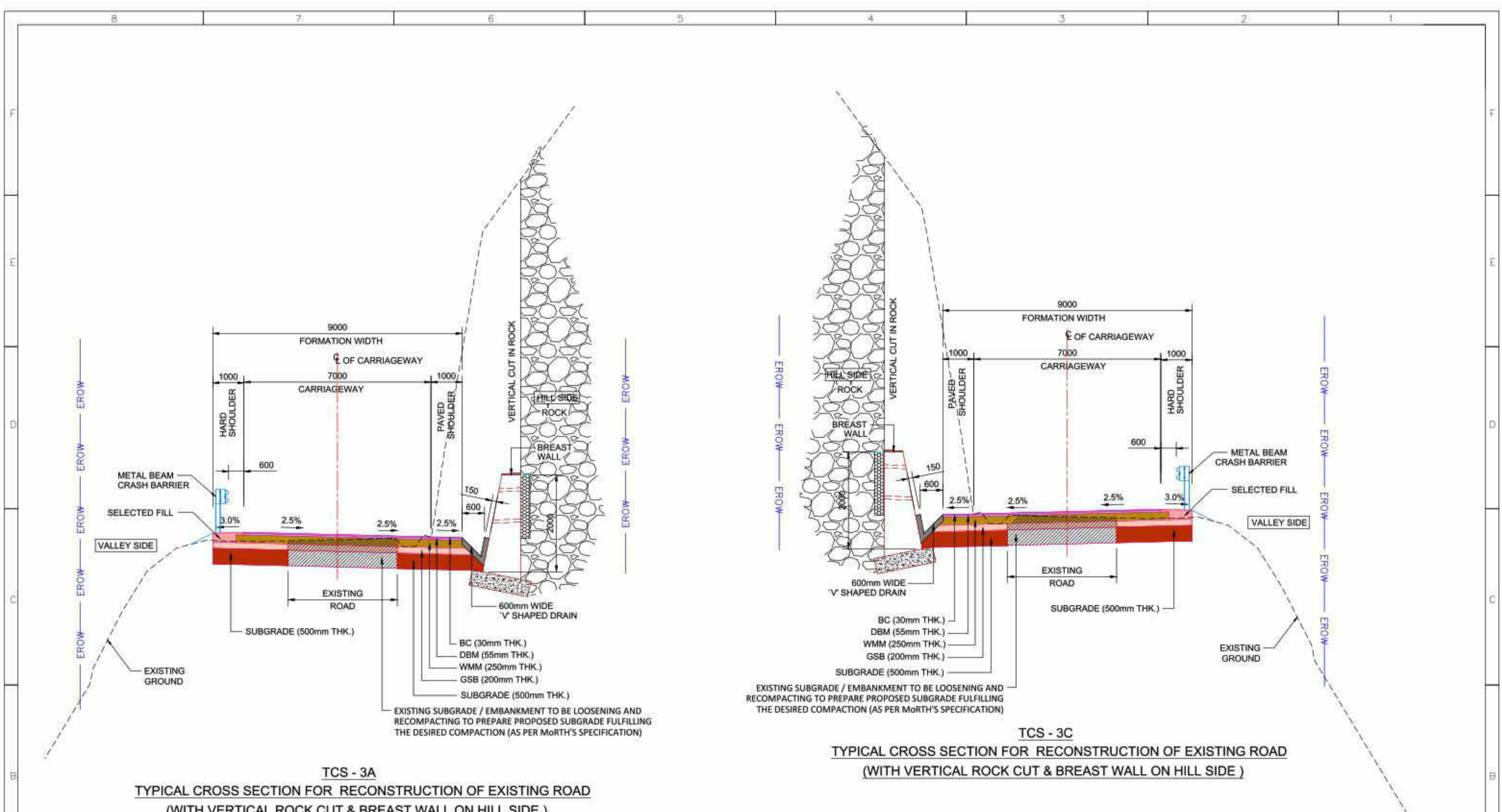
NOTE:-
1. ALL DIMENSIONS ARE IN MM, UNLESS NOTED OTHERWISE.
2. DO NOT IN SCALE, ONLY FOLLOW THE WRITTEN DIMENSIONS.

CLIENT :  Roads & Bridges Department (Government of Sikkim)				PROJECT : Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim				DESIGN CONSULTANT :  LEA ASSOCIATES SOUTH ASIA PVT. LTD. B-1/E-27, Mohan Cooperative Industrial Estate, Mathura Road, New Delhi-110044				DRAWING TITLE:- TYPICAL CROSS SECTION (TCS- 1 & TCS-1A) DRAWING No : 73806/LASA/HWY/TCS-201				REV. R0 SHEET A2	DRAWN DESIGN DATE	A. DHAR SOUMENDU MARCH 2023	CHECKED REVIEWED SCALE : NTS	S. ROY J. K. DAS NTS
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NOTE:-
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2. DO NOT IN SCALE, ONLY FOLLOW THE WRITTEN DIMENSIONS

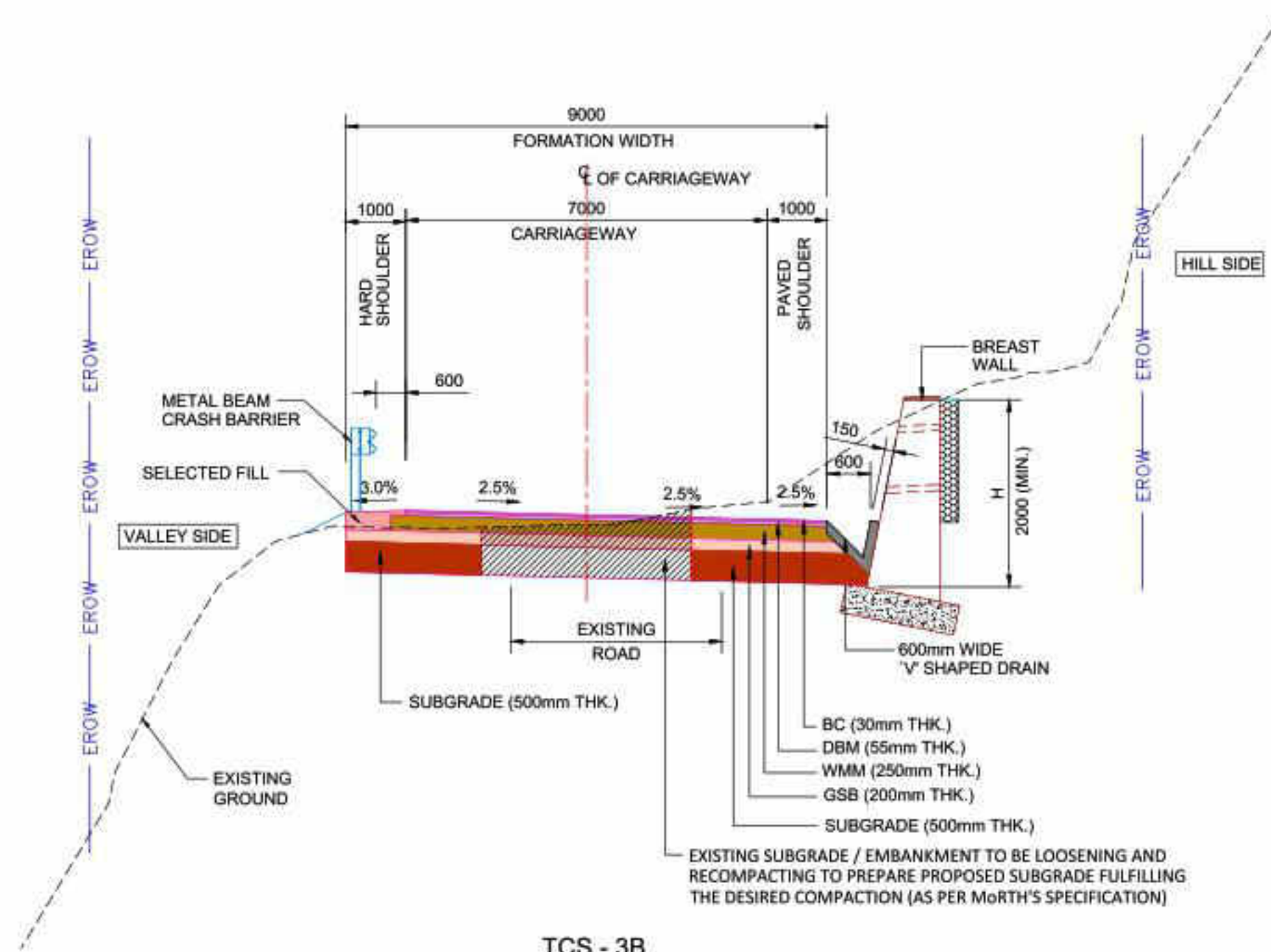
				 CLIENT : Roads & Bridges Department (Government of Sikkim)	PROJECT : Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim	 DESIGN CONSULTANT : LEA ASSOCIATES SOUTH ASIA PVT. LTD. B-1/E-27, Mohan Cooperative Industrial Estate, Mathura Road, New Delhi-110044	DRAWING TITLE:- TYPICAL CROSS SECTION (TCS- 2 & TCS- 2A)	REV.	DRAWN	A. DHAR	CHECKED	S. ROY		
REV	DATE	DETAILS OF REVISION	BY											
							DRAWING No : 73806/LASA/HWY/TCS-202	SHEET	DESIGN	SOURMENDU	REVIEWED	J. K. DAS		
								A2	DATE	MARCH 2023	SCALE :	NTS		



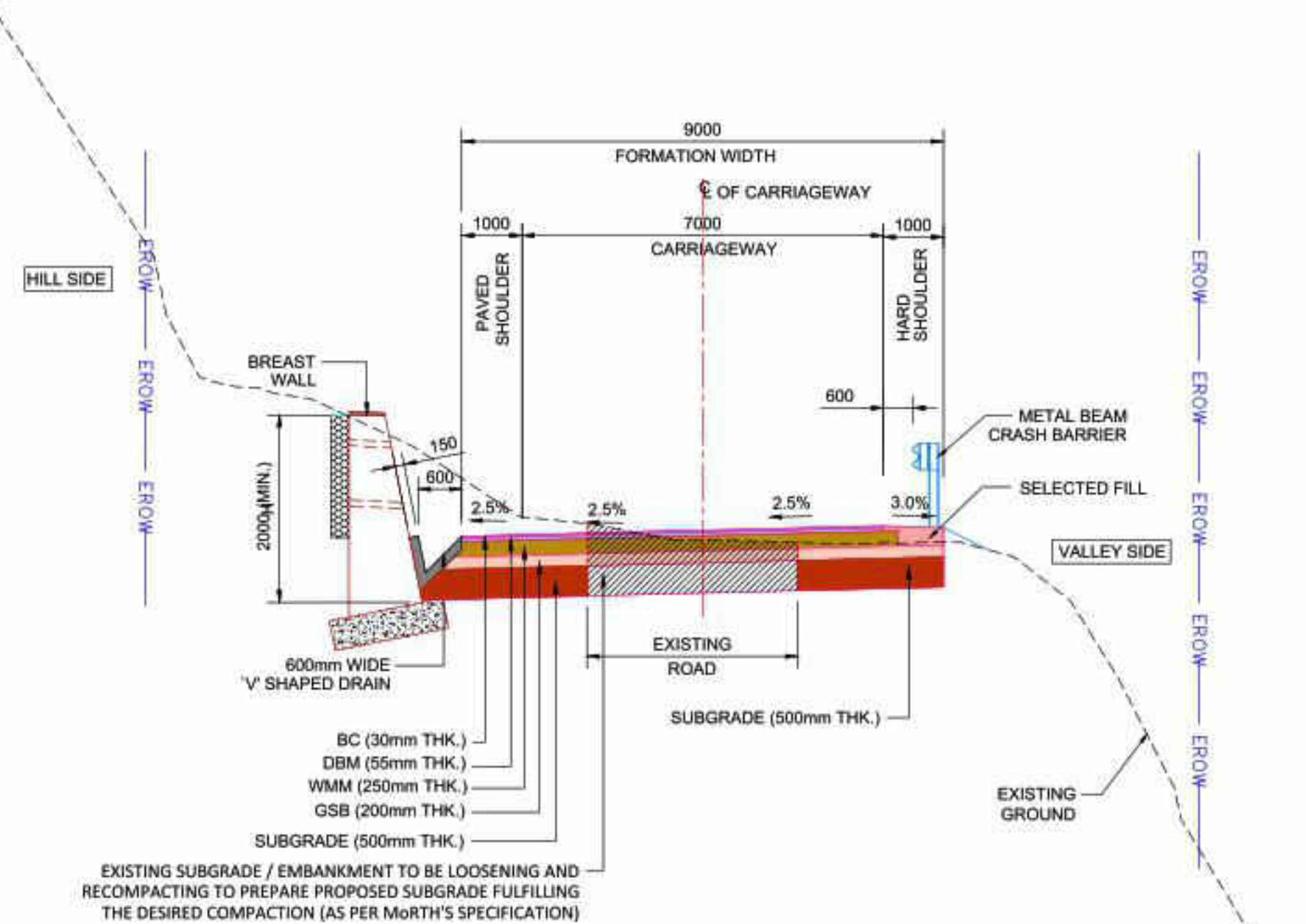
H= HEIGHT OF BREAST WALL
(FOR DETAIL OF BREAST WALL REFER MISCELLANEOUS DRAWING)

NOTE:-
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TCS - 3B
TYPICAL CROSS SECTION FOR RECONSTRUCTION OF EXISTING ROAD
(WITH BREAST WALL ON HILL SIDE)

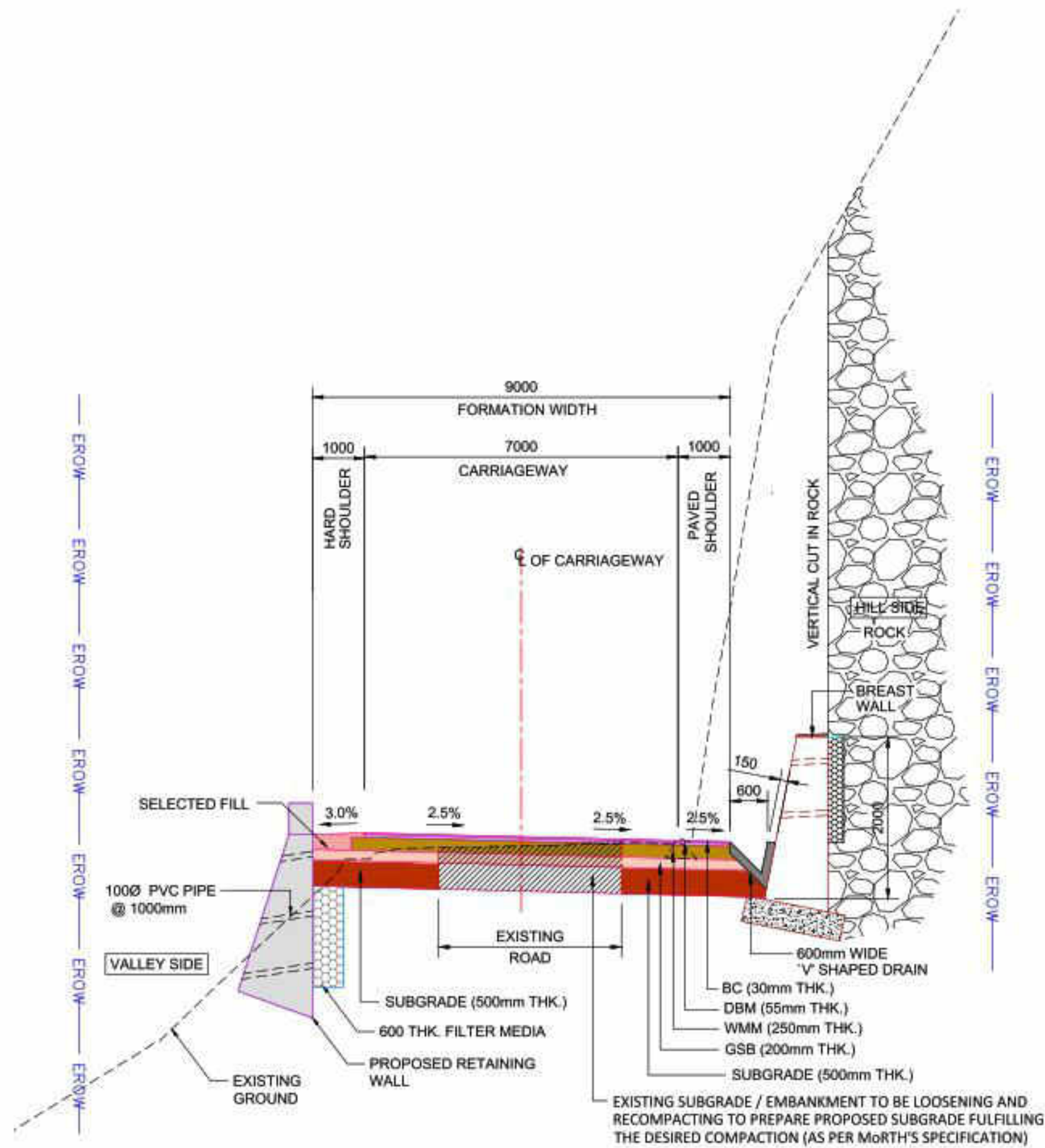


TCS - 3D
TYPICAL CROSS SECTION FOR RECONSTRUCTION OF EXISTING ROAD
(WITH BREAST WALL ON HILL SIDE)

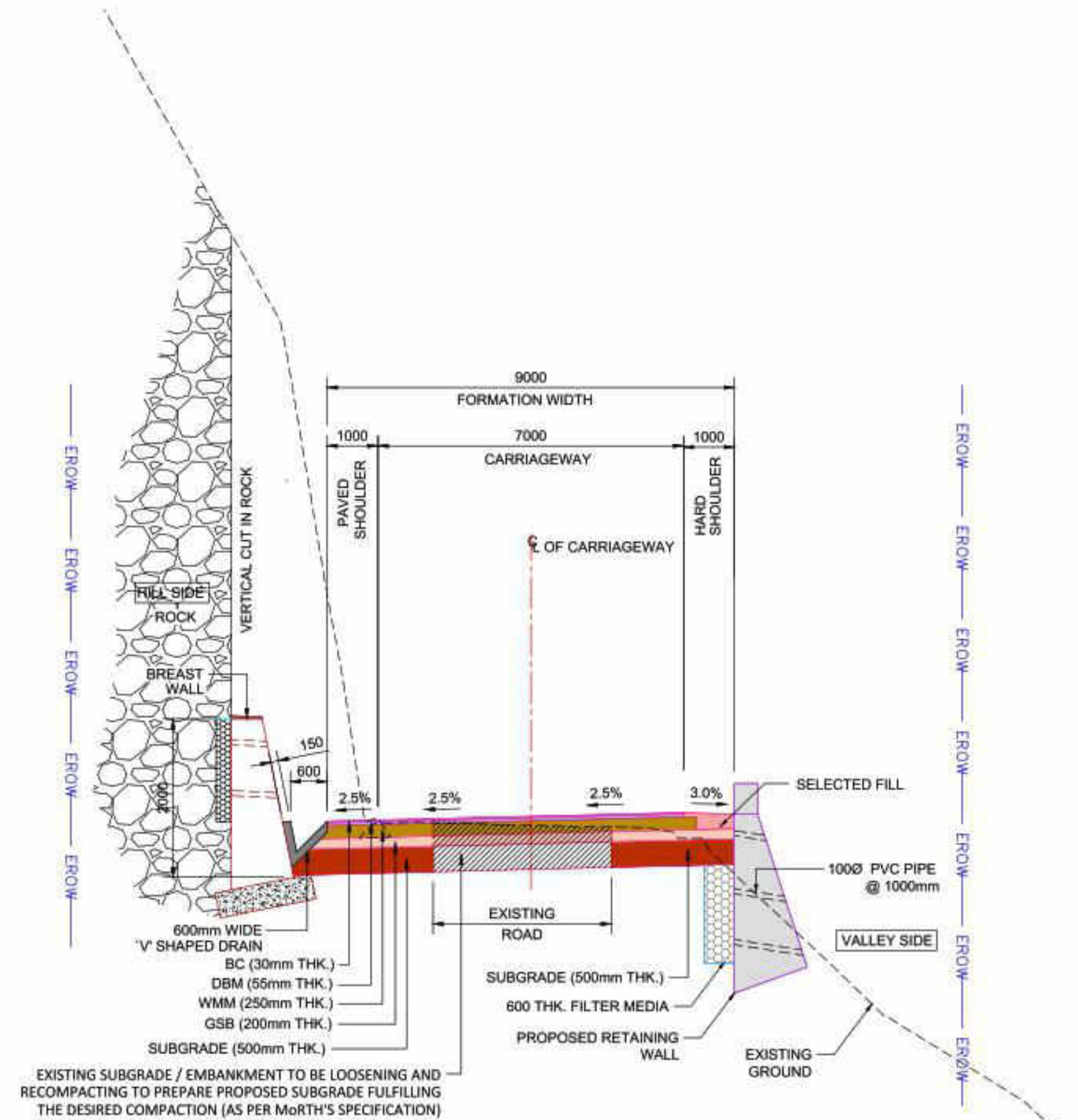
H= HEIGHT OF BREAST WALL
 (FOR DETAIL OF BREAST WALL REFER MISCELLANEOUS DRAWING)

NOTE:-
 1. ALL DIMENSIONS ARE IN MM. UNLESS NOTED OTHERWISE.
 2. DO NOT IN SCALE. ONLY FOLLOW THE WRITTEN DIMENSIONS.

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TCS - 4A
TYPICAL CROSS SECTION FOR RECONSTRUCTION OF EXISTING ROAD
(RETAINING WALL ON VALLEY SIDE & VERTICAL ROCK CUT WITH BREAST WALL ON HILL SIDE)



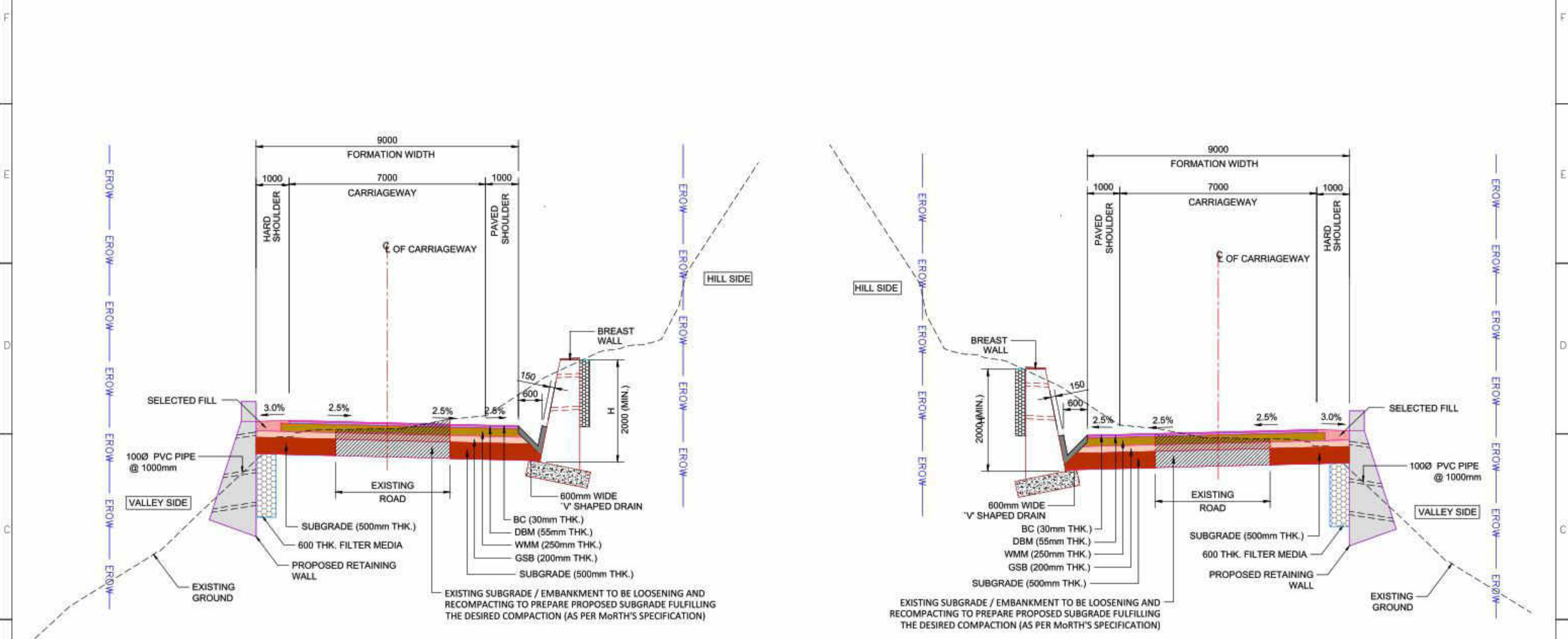
TCS - 4C
TYPICAL CROSS SECTION FOR RECONSTRUCTION OF EXISTING ROAD
(RETAINING WALL ON VALLEY SIDE & VERTICAL ROCK CUT WITH BREAST WALL ON HILL SIDE)

H= HEIGHT OF BREAST WALL
 (FOR DETAIL OF BREAST WALL REFER MISCELLANEOUS DRAWING)

NOTE:-
 1. ALL DIMENSIONS ARE IN MM. UNLESS NOTED OTHERWISE.
 2. DO NOT IN SCALE. ONLY FOLLOW THE WRITTEN DIMENSIONS.

CLIENT :  Roads & Bridges Department (Government of Sikkim)				PROJECT : Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim				DESIGN CONSULTANT :  LEA ASSOCIATES SOUTH ASIA PVT. LTD. B-1/E-27, Mohan Cooperative Industrial Estate, Mathura Road, New Delhi-110044				DRAWING TITLE:- TYPICAL CROSS SECTION (TCS- 4A & TCS- 4C) DRAWING No : 73806/LASA/HWY/TCS-205				REV. R0 SHEET A2	DRAWN A. DHAR DESIGN SOUMENDU DATE MARCH 2023	CHECKED S. ROY REVIEWED J. K. DAS SCALE : NTS
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8 7 6 5 4 3 2 1



TCS - 4B
TYPICAL CROSS SECTION FOR RECONSTRUCTION OF EXISTING ROAD
(RETAINING WALL ON VALLEY SIDE & BREAST WALL ON HILL SIDE)

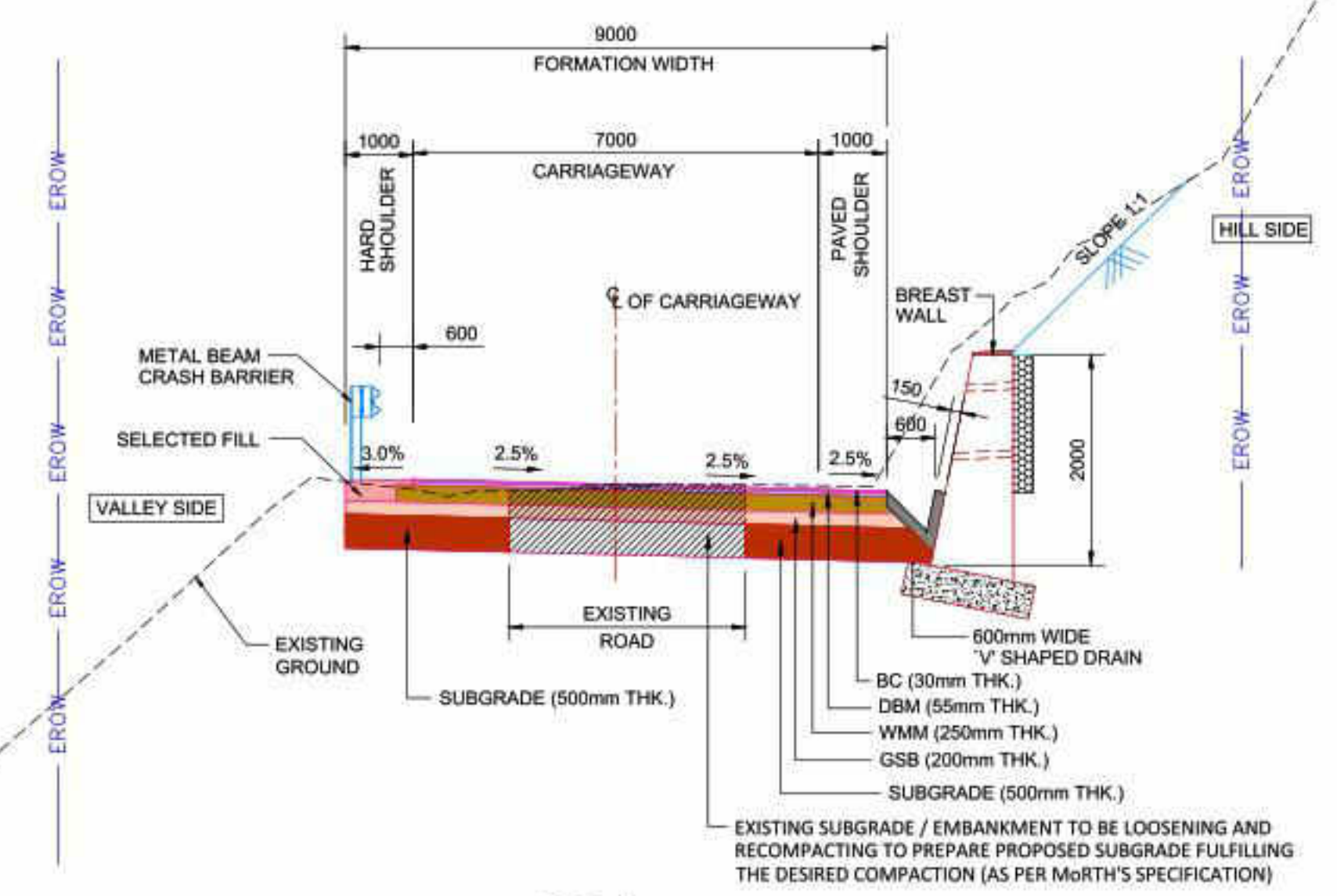
TCS - 4D
TYPICAL CROSS SECTION FOR RECONSTRUCTION OF EXISTING ROAD
(RETAINING WALL ON VALLEY SIDE & BREAST WALL ON HILL SIDE)

H= HEIGHT OF BREAST WALL
(FOR DETAIL OF BREAST WALL REFER MISCELLANEOUS DRAWING)

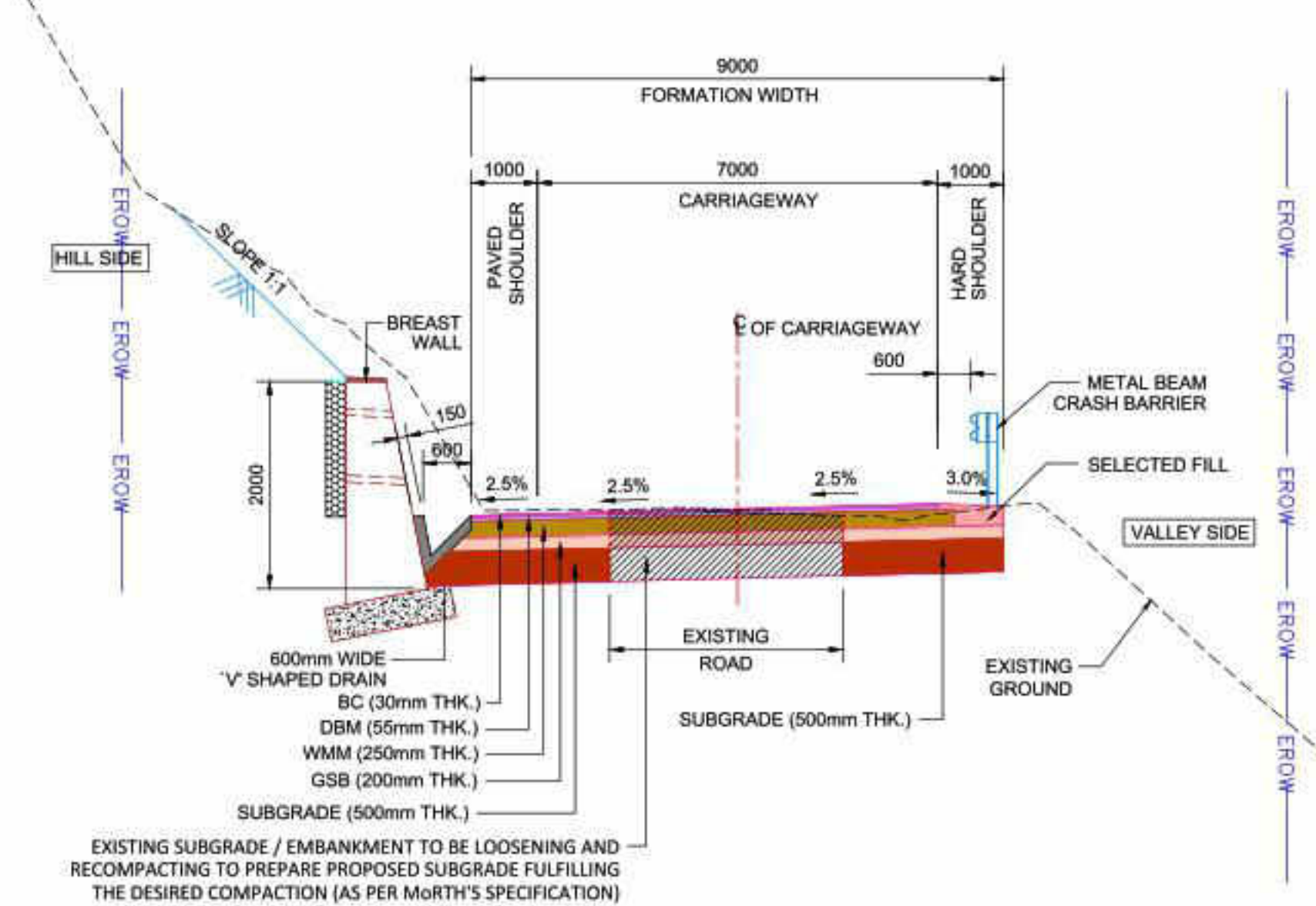
NOTE:-
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CLIENT : Roads & Bridges Department (Government of Sikkim)				PROJECT : Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim				DESIGN CONSULTANT : LEA ASSOCIATES SOUTH ASIA PVT. LTD. B-1/E-27, Mohan Cooperative Industrial Estate, Mathura Road, New Delhi-110044				DRAWING TITLE:- TYPICAL CROSS SECTION (TCS- 4B & TCS- 4D) DRAWING No : 73806/LASA/HWY/TCS-206				REV. R0 SHEET A2	DRAWN DESIGN DATE	A. DHAR SOURMENDU MARCH 2023	CHECKED REVIEWED SCALE : NTS	S. ROY J. K. DAS NTS
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8 7 6 5 4 3 2 1



TCS - 5
TYPICAL CROSS SECTION FOR RECONSTRUCTION OF EXISTING ROAD
(ROCK CUT WITH BREAST WALL ON HILL SIDE)



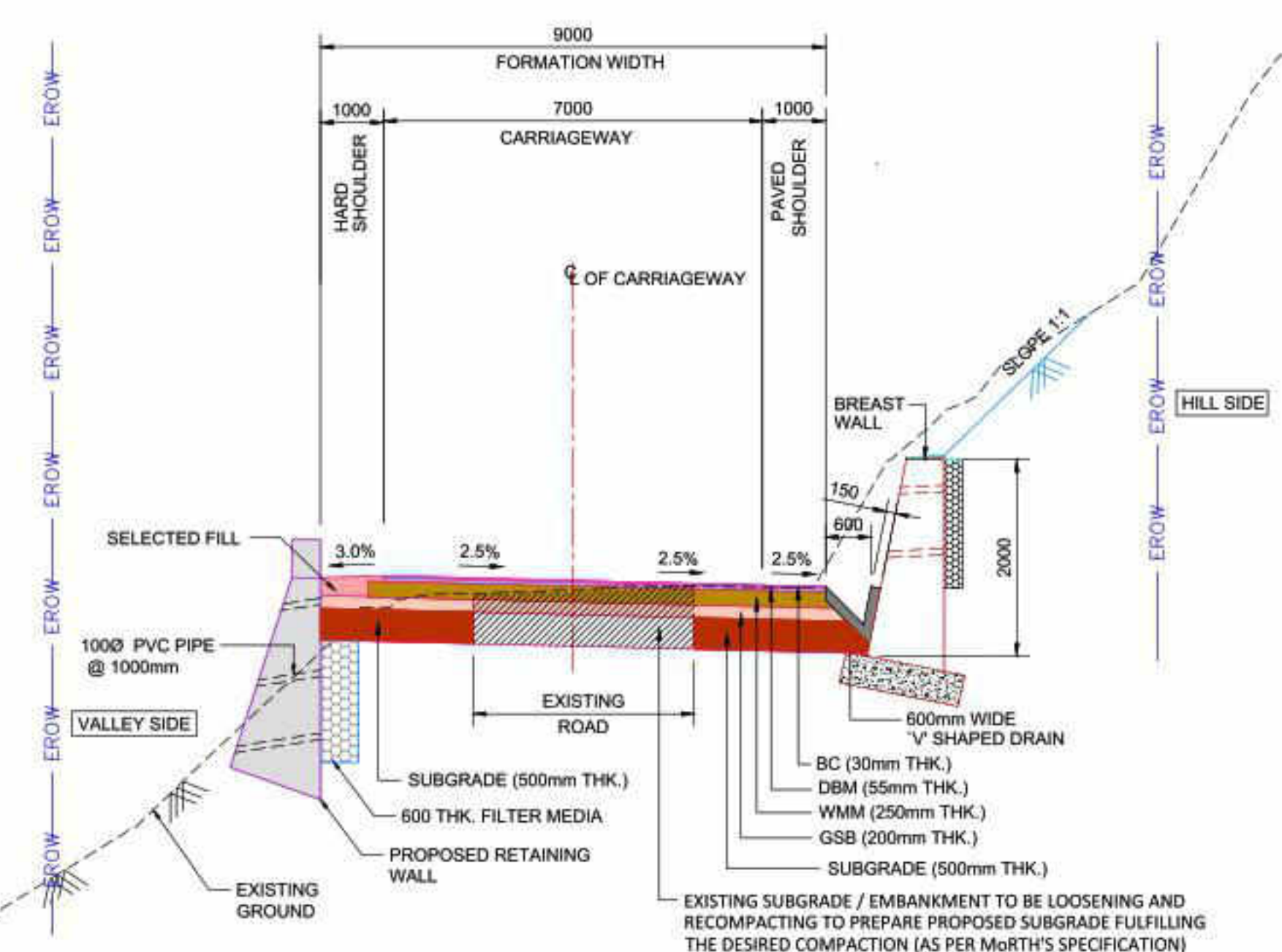
TCS - 5A
TYPICAL CROSS SECTION FOR RECONSTRUCTION OF EXISTING ROAD
(ROCK CUT WITH BREAST WALL ON HILL SIDE)

H= HEIGHT OF BREAST WALL
(FOR DETAIL OF BREAST WALL REFER MISCELLANEOUS DRAWING)

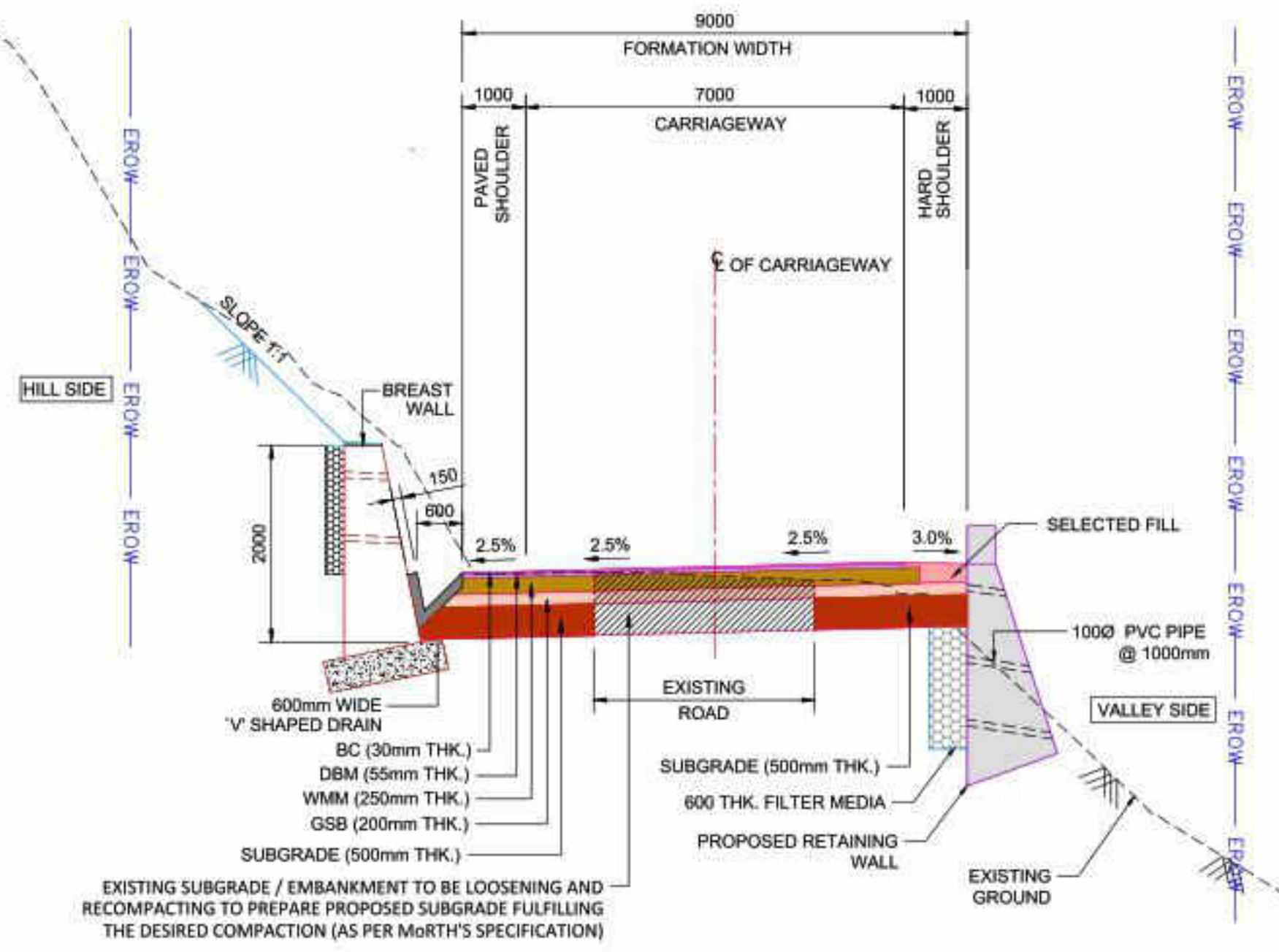
NOTE:-
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2. DO NOT IN SCALE, ONLY FOLLOW THE WRITTEN DIMENSIONS.

CLIENT : Roads & Bridges Department (Government of Sikkim)				PROJECT : Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim				DESIGN CONSULTANT : LEA ASSOCIATES SOUTH ASIA PVT. LTD. B-1/E-27, Mohan Cooperative Industrial Estate, Mathura Road, New Delhi-110044				DRAWING TITLE:- TYPICAL CROSS SECTION (TCS- 5 & TCS- 5A) DRAWING No : 73806/LASA/HWY/TCS-207				REV. R0 SHEET A2	DRAWN DESIGN DATE	A. DHAR SOURMENDU MARCH 2023	CHECKED REVIEWED SCALE : NTS	S. ROY J. K. DAS NTS
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8 7 6 5 4 3 2 1



TCS - 6
TYPICAL CROSS SECTION FOR RECONSTRUCTION OF EXISTING ROAD
(RETAINING WALL ON VALLEY SIDE & BREAST WALL ON HILL SIDE)

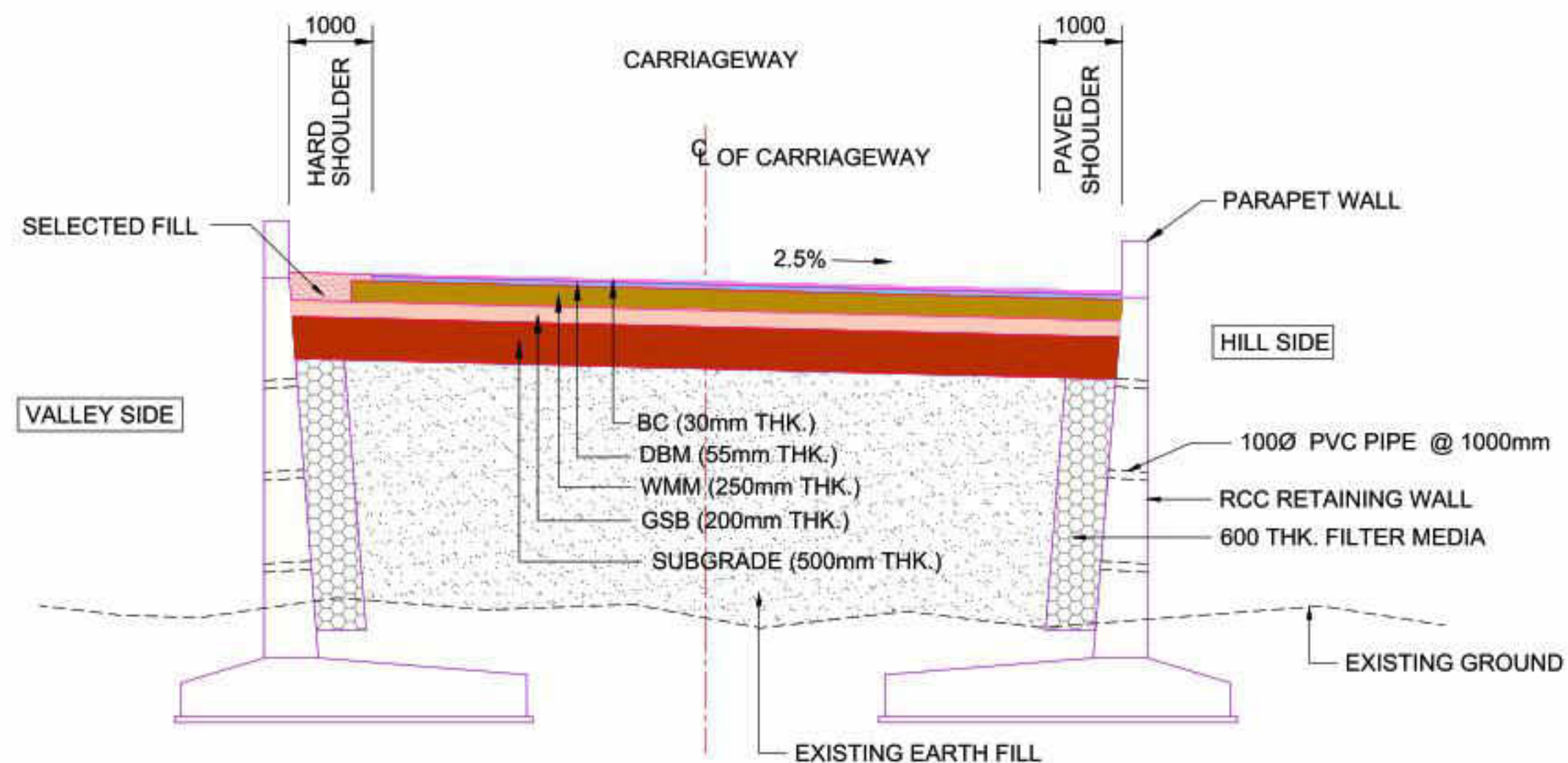


TCS - 6A
TYPICAL CROSS SECTION FOR RECONSTRUCTION OF EXISTING ROAD
(RETAINING WALL ON VALLEY SIDE & BREAST WALL ON HILL SIDE)

H= HEIGHT OF BREAST WALL
(FOR DETAIL OF BREAST WALL REFER MISCELLANEOUS DRAWING)

NOTE:-
1. ALL DIMENSIONS ARE IN MM. UNLESS NOTED OTHERWISE.
2. DO NOT IN SCALE, ONLY FOLLOW THE WRITTEN DIMENSIONS.

CLIENT : Roads & Bridges Department (Government of Sikkim)				PROJECT : Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim				DESIGN CONSULTANT : LEA ASSOCIATES SOUTH ASIA PVT. LTD. B-1/E-27, Mohan Cooperative Industrial Estate, Mathura Road, New Delhi-110044				DRAWING TITLE:- TYPICAL CROSS SECTION (TCS- 6 & TCS- 6A) DRAWING No : 73806/LASA/HWY/TCS-208				REV. R0 SHEET A2	DRAWN DESIGN DATE	A. DHAR SOURMENDU MARCH 2023	CHECKED REVIEWED SCALE : NTS	S. ROY J. K. DAS NTS
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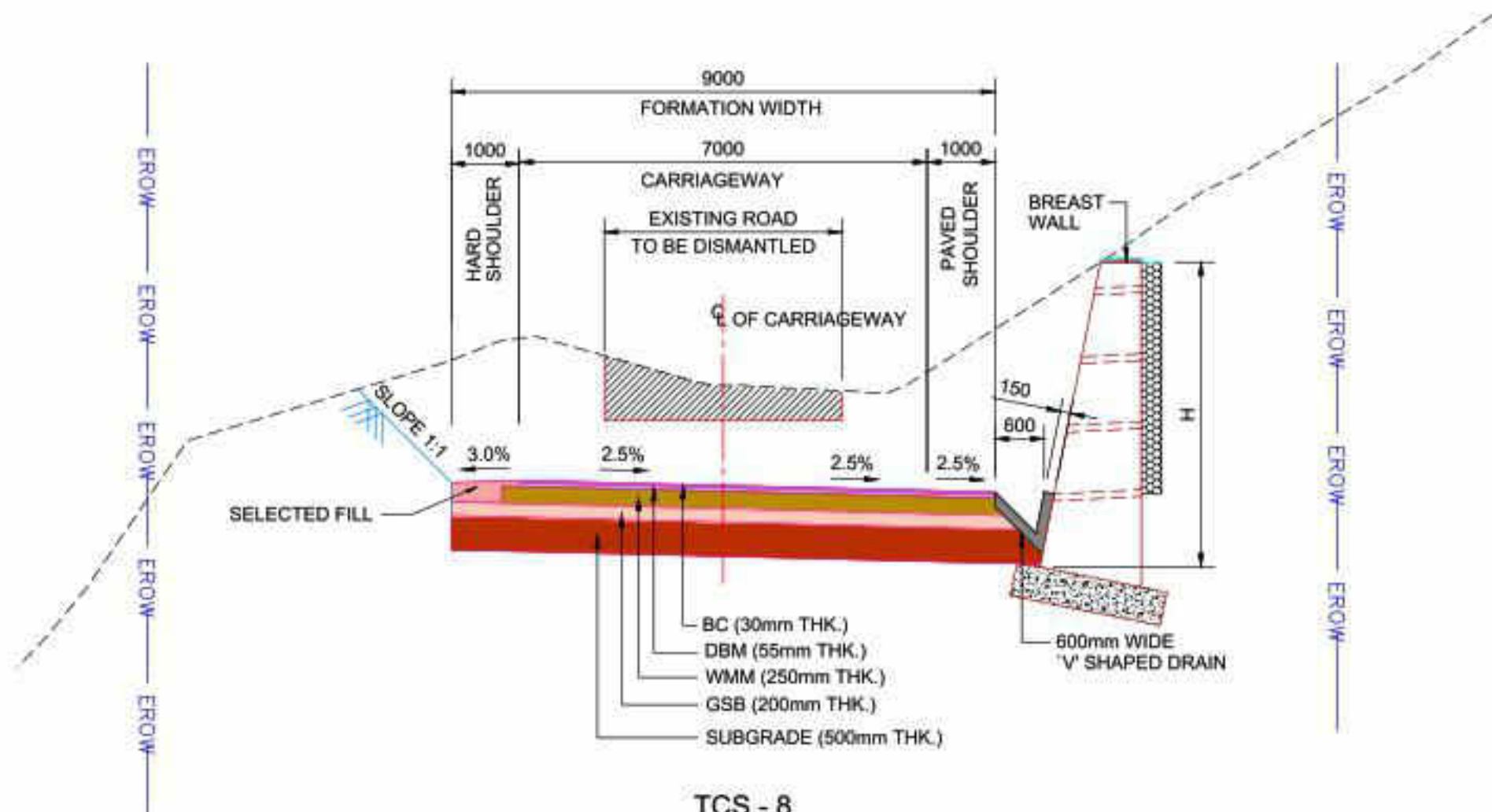


TCS - 7
TYPICAL CROSS SECTION FOR BRIDGE APPROACH LOCATION

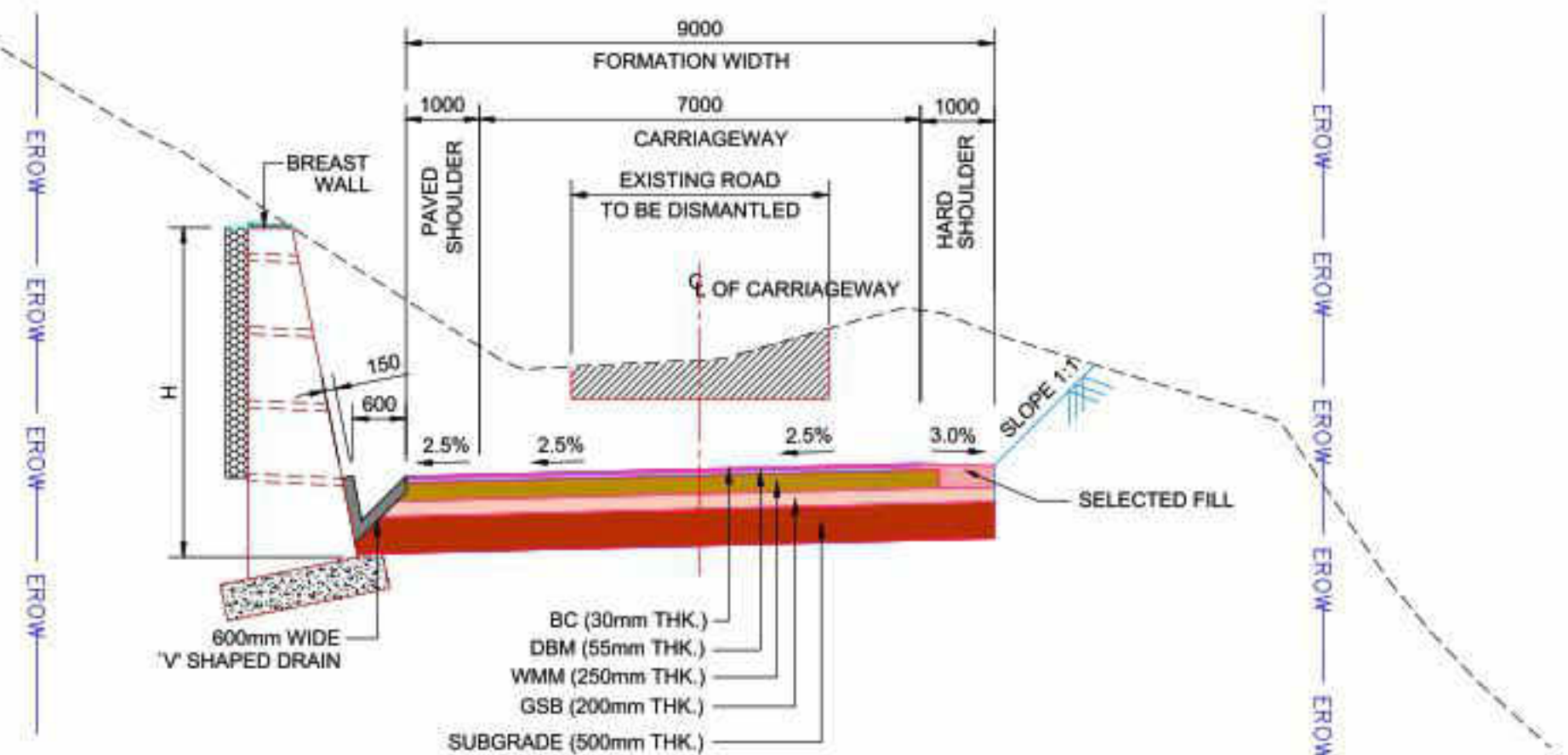
H= HEIGHT OF BREAST WALL
 (FOR DETAIL OF BREAST WALL REFER MISCELLANEOUS DRAWING)

NOTE:-
 1. ALL DIMENSIONS ARE IN MM. UNLESS NOTED OTHERWISE.
 2. DO NOT IN SCALE, ONLY FOLLOW THE WRITTEN DIMENSIONS.

REV	DATE	DETAILS OF REVISION	BY	CLIENT :	PROJECT :	DESIGN CONSULTANT :	DRAWING TITLE:-	REV.	DRAWN	A. DHAR	CHECKED	S. ROY
				Roads & Bridges Department (Government of Sikkim)	Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim	LEA ASSOCIATES SOUTH ASIA PVT. LTD. B-1/E-27, Mohan Cooperative Industrial Estate, Mathura Road, New Delhi-110044	TYPICAL CROSS SECTION (TCS- 7)	R0	DESIGN	SOURMENDU	REVIEWED	J. K. DAS
							DRAWING No : 73806/LASA/HWY/TCS-209	A2	DATE	MARCH 2023	SCALE :	NTS





TCS - 8
TYPICAL CROSS SECTION FOR RECONSTRUCTION OF EXISTING ROAD WITH CUTTING
(SLOPE CUT ON VALLEY SIDE & BREAST WALL ON HILL SIDE)

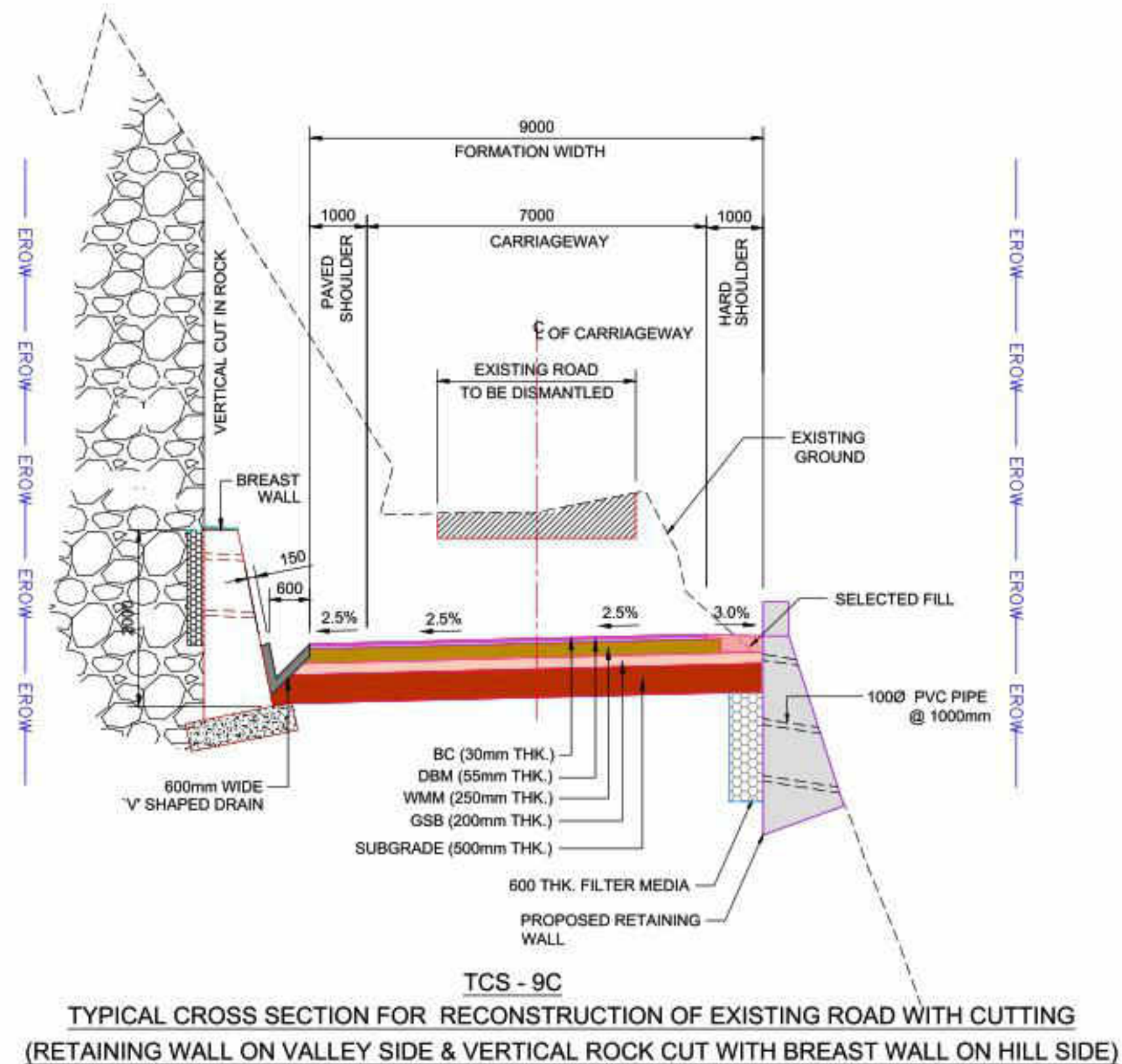
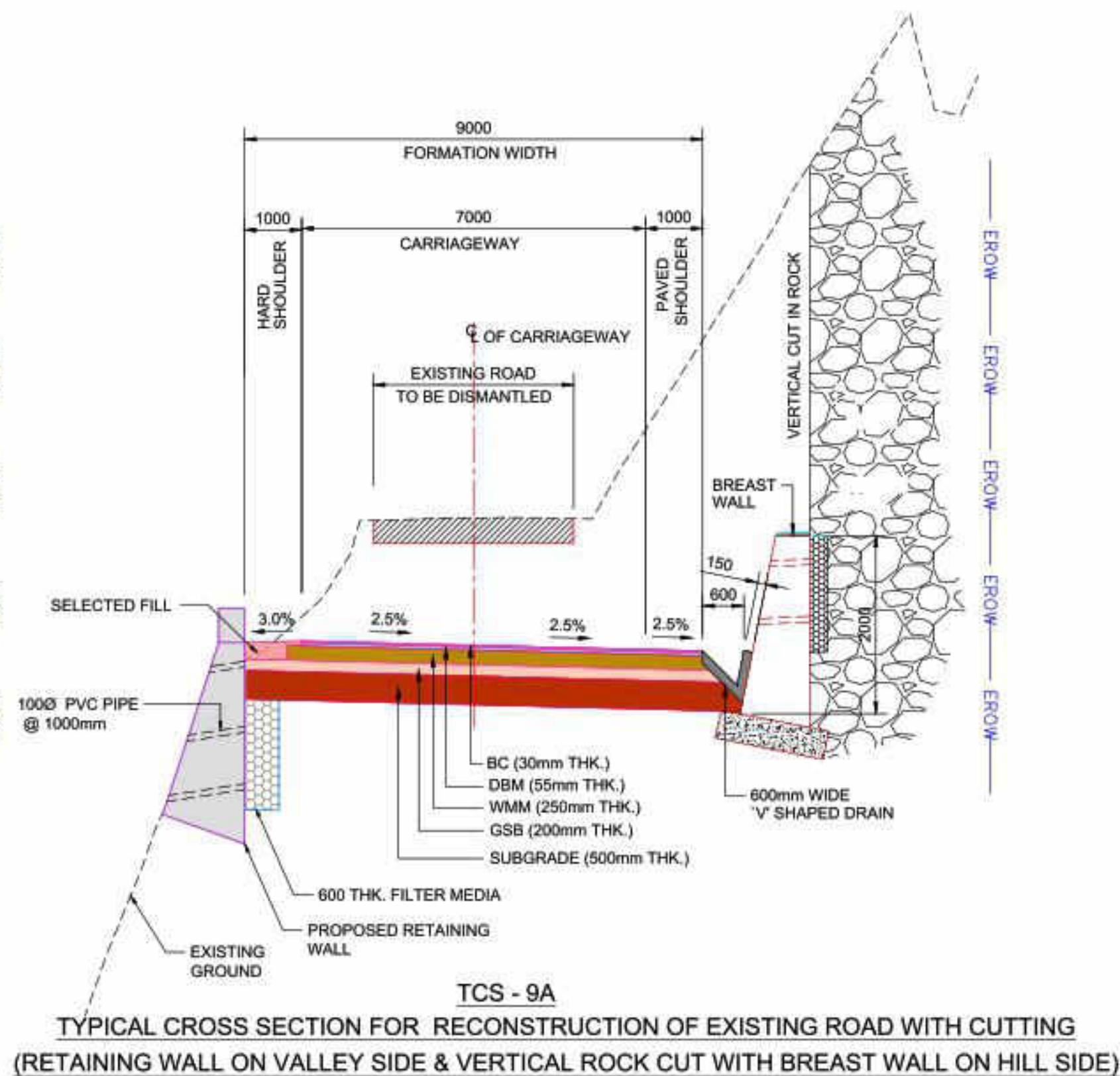


TCS - 8A
TYPICAL CROSS SECTION FOR RECONSTRUCTION OF EXISTING ROAD WITH CUTTING
(SLOPE CUT ON VALLEY SIDE & BREAST WALL ON HILL SIDE)

H= HEIGHT OF BREAST WALL
(FOR DETAIL OF BREAST WALL REFER MISCELLANEOUS DRAWING)



NOTE:-
1. ALL DIMENSIONS ARE IN MM. UNLESS NOTED OTHERWISE.
2. DO NOT IN SCALE, ONLY FOLLOW THE WRITTEN DIMENSIONS.

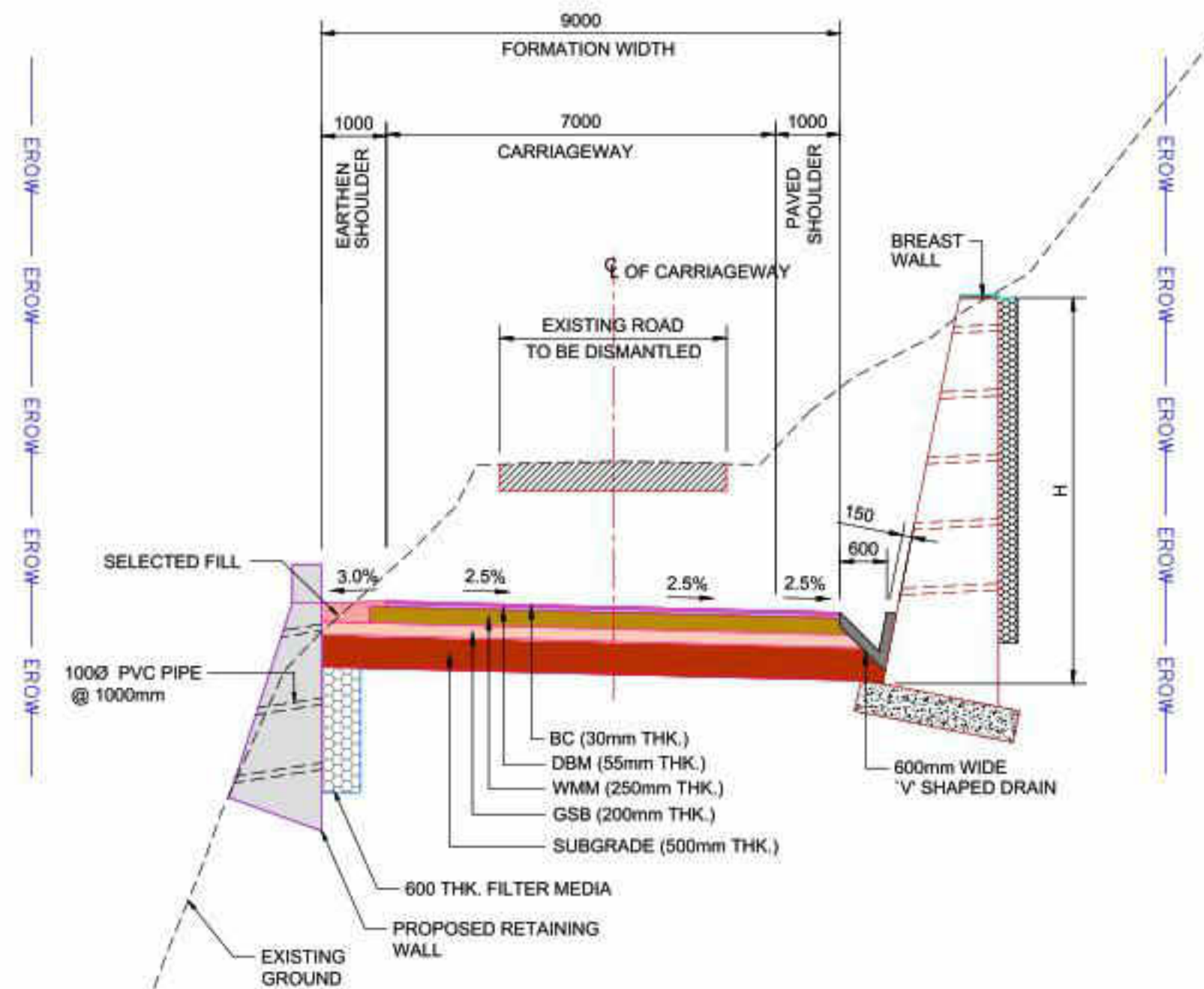
CLIENT :  Roads & Bridges Department (Government of Sikkim)				PROJECT : Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim				DESIGN CONSULTANT :  LEA ASSOCIATES SOUTH ASIA PVT. LTD. B-1/E-27, Mohan Cooperative Industrial Estate, Mathura Road, New Delhi-110044				DRAWING TITLE:- TYPICAL CROSS SECTION (TCS- 8 & TCS- 8A) DRAWING No : 73806/LASA/HWY/TCS-210				REV. R0 SHEET A2	DRAWN A. DHAR DESIGN SOURMENDU DATE MARCH 2023	CHECKED S. ROY REVIEWED J. K. DAS SCALE : NTS
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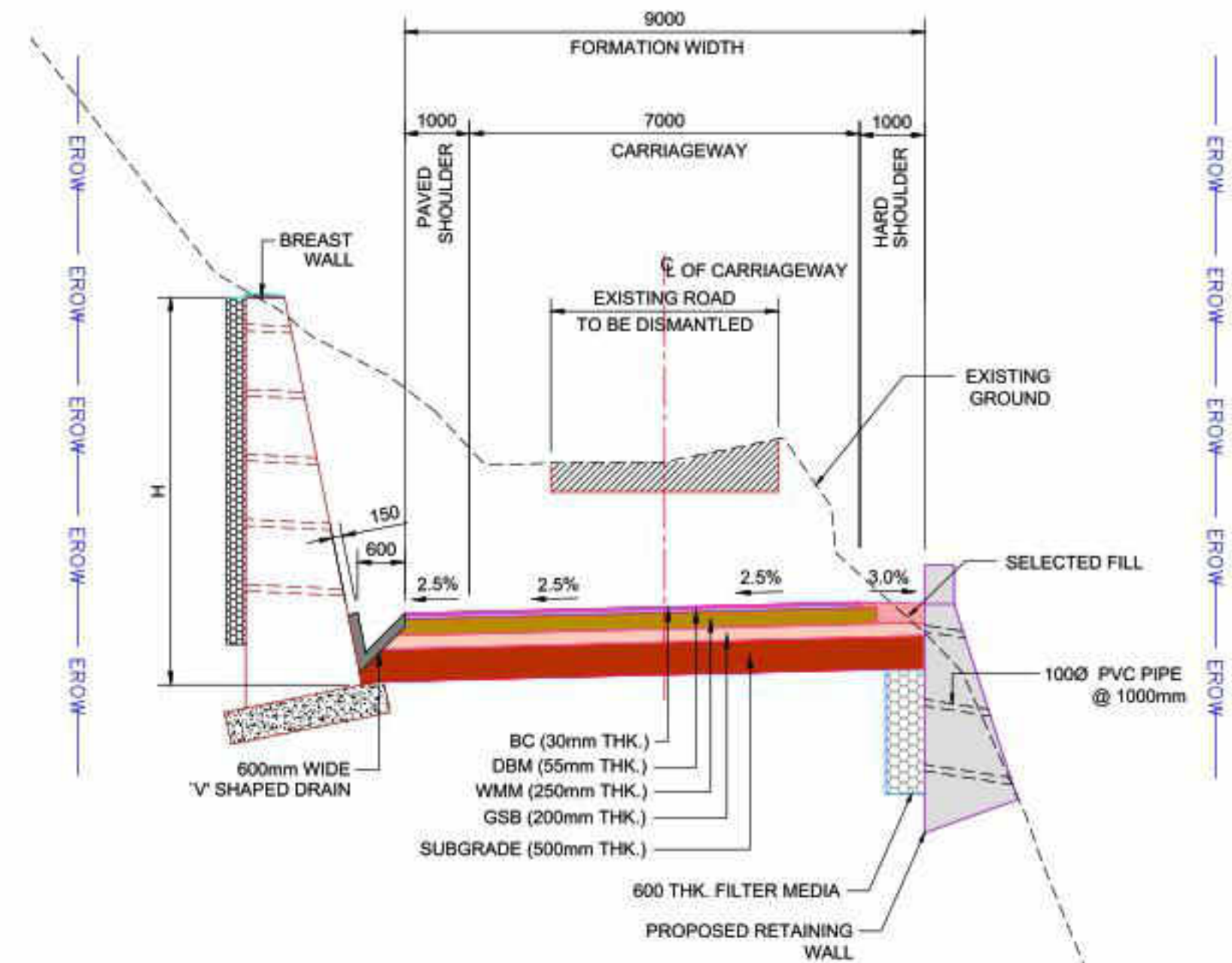
H= HEIGHT OF BREAST WALL
(FOR DETAIL OF BREAST WALL REFER MISCELLANEOUS DRAWING)

NOTE:-
1. ALL DIMENSIONS ARE IN MM. UNLESS NOTED OTHERWISE.
2. DO NOT IN SCALE. ONLY FOLLOW THE WRITTEN DIMENSIONS.

CLIENT :  Roads & Bridges Department (Government of Sikkim)				PROJECT : Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim				DESIGN CONSULTANT :  LEA ASSOCIATES SOUTH ASIA PVT. LTD. B-1/E-27, Mohan Cooperative Industrial Estate, Mathura Road, New Delhi-110044				DRAWING TITLE:- TYPICAL CROSS SECTION (TCS- 9A & TCS- 9C) DRAWING No : 73806/LASA/HWY/TCS-211				REV. R0 SHEET A2	DRAWN A. DHAR DESIGN SOURMENDU DATE MARCH 2023	CHECKED S. ROY REVIEWED J. K. DAS SCALE : NTS
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TCS - 9B
TYPICAL CROSS SECTION FOR RECONSTRUCTION OF EXISTING ROAD WITH CUTTING
(RETAINING WALL ON VALLEY SIDE & BREAST WALL ON HILL SIDE)

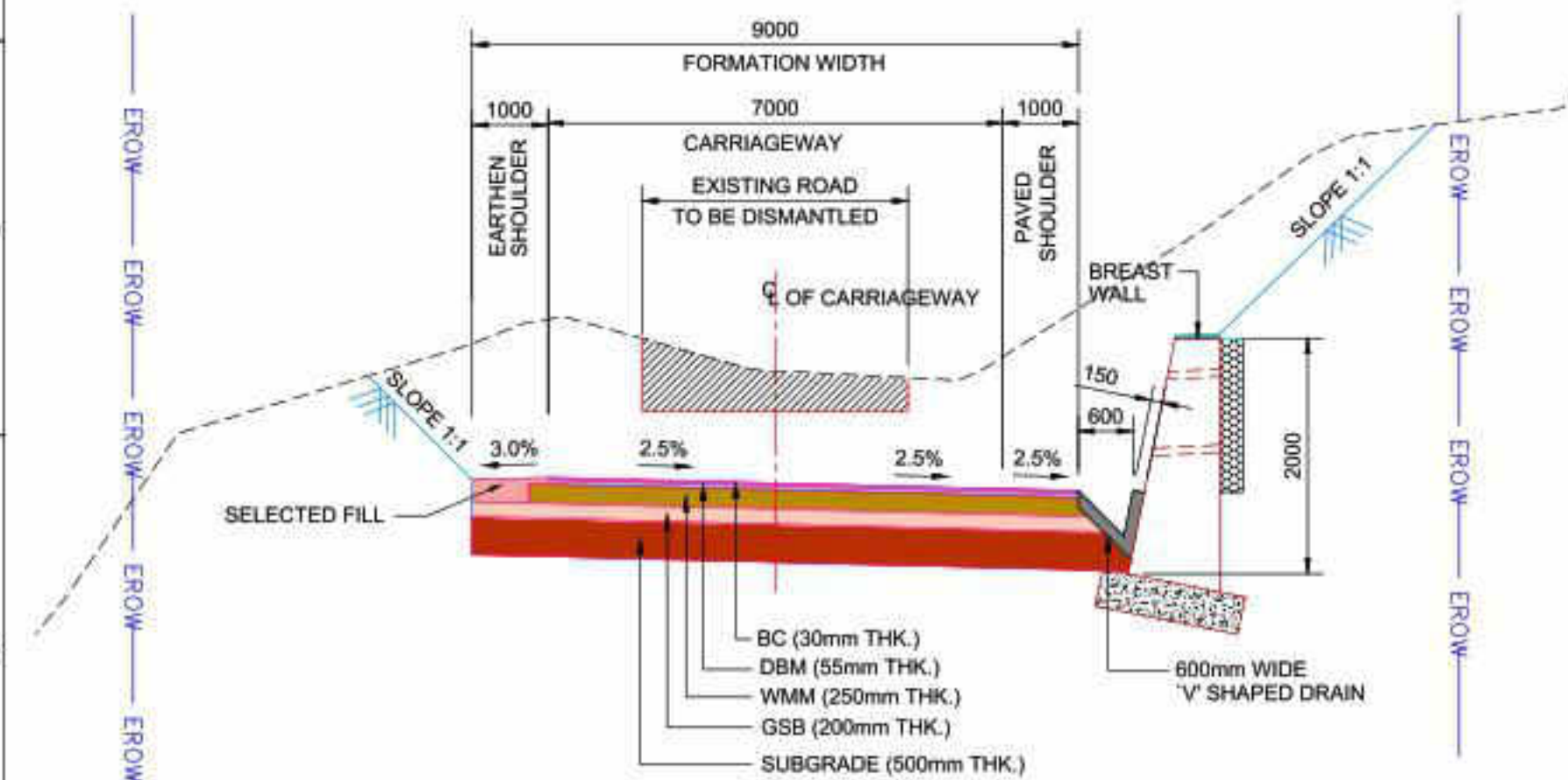


TCS - 9D
TYPICAL CROSS SECTION FOR RECONSTRUCTION OF EXISTING ROAD WITH CUTTING
(RETAINING WALL ON VALLEY SIDE & BREAST WALL ON HILL SIDE)

H= HEIGHT OF BREAST WALL
(FOR DETAIL OF BREAST WALL REFER MISCELLANEOUS DRAWING)

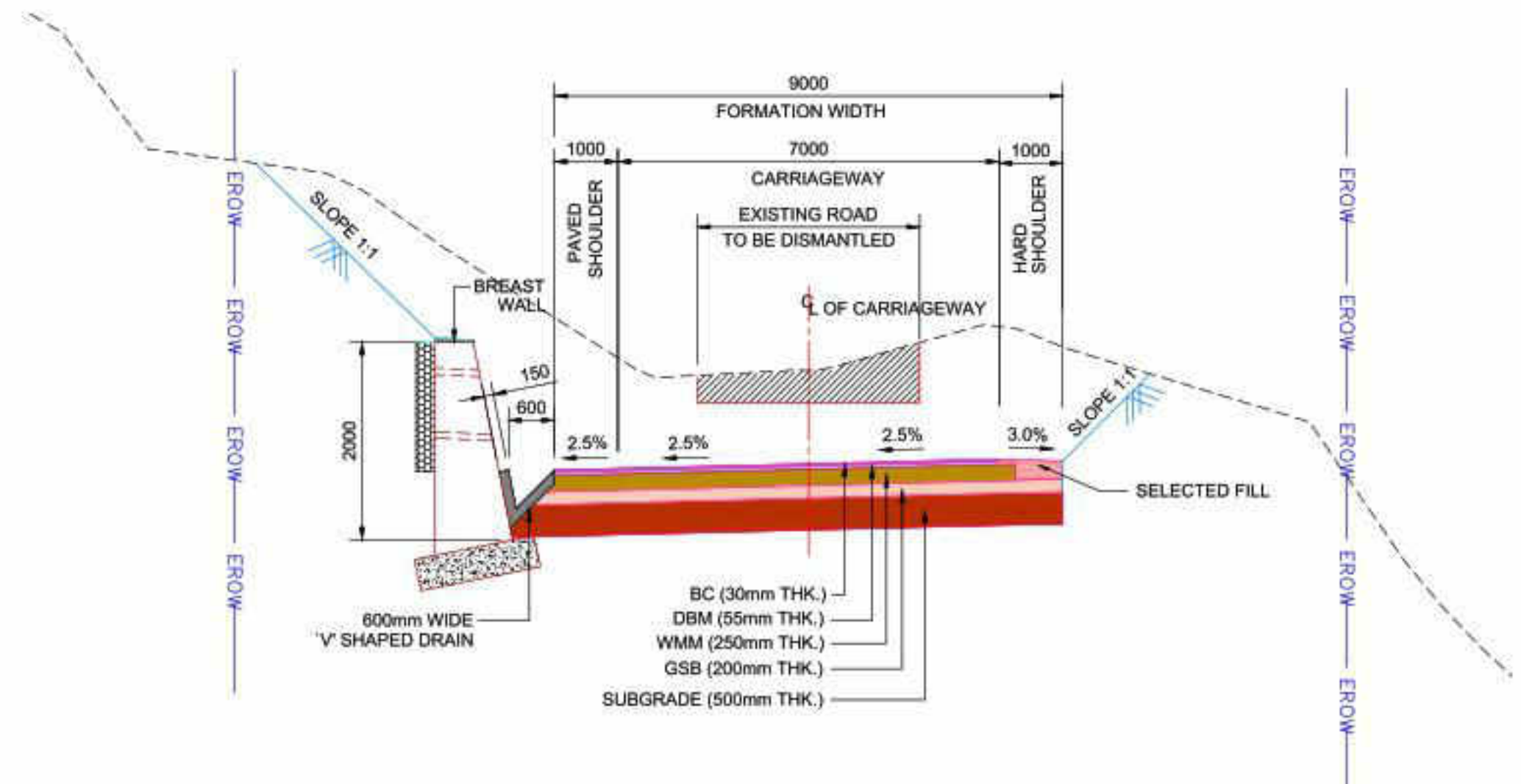
NOTE:-
1. ALL DIMENSIONS ARE IN MM. UNLESS NOTED OTHERWISE.
2. DO NOT IN SCALE, ONLY FOLLOW THE WRITTEN DIMENSIONS.

REV	DATE	DETAILS OF REVISION	BY	CLIENT :	PROJECT :	DESIGN CONSULTANT :	DRAWING TITLE:-	REV.	DRAWN	A. DHAR	CHECKED	S. ROY
				Roads & Bridges Department (Government of Sikkim)	Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim	LEA ASSOCIATES SOUTH ASIA PVT. LTD. B-1/E-27, Mohan Cooperative Industrial Estate, Mathura Road, New Delhi-110044	TYPICAL CROSS SECTION (TCS- 9B & TCS- 9D)	R0	DESIGN	SOURMENDU	REVIEWED	J. K. DAS
							DRAWING No : 73806/LASA/HWY/TCS-212	A2	DATE	MARCH 2023	SCALE :	NTS



TCS - 10

**TYPICAL CROSS SECTION FOR RECONSTRUCTION OF EXISTING ROAD WITH CUTTING
(SLOPE CUT ON VALLEY SIDE & BREAST WALL ON HILL SIDE)**





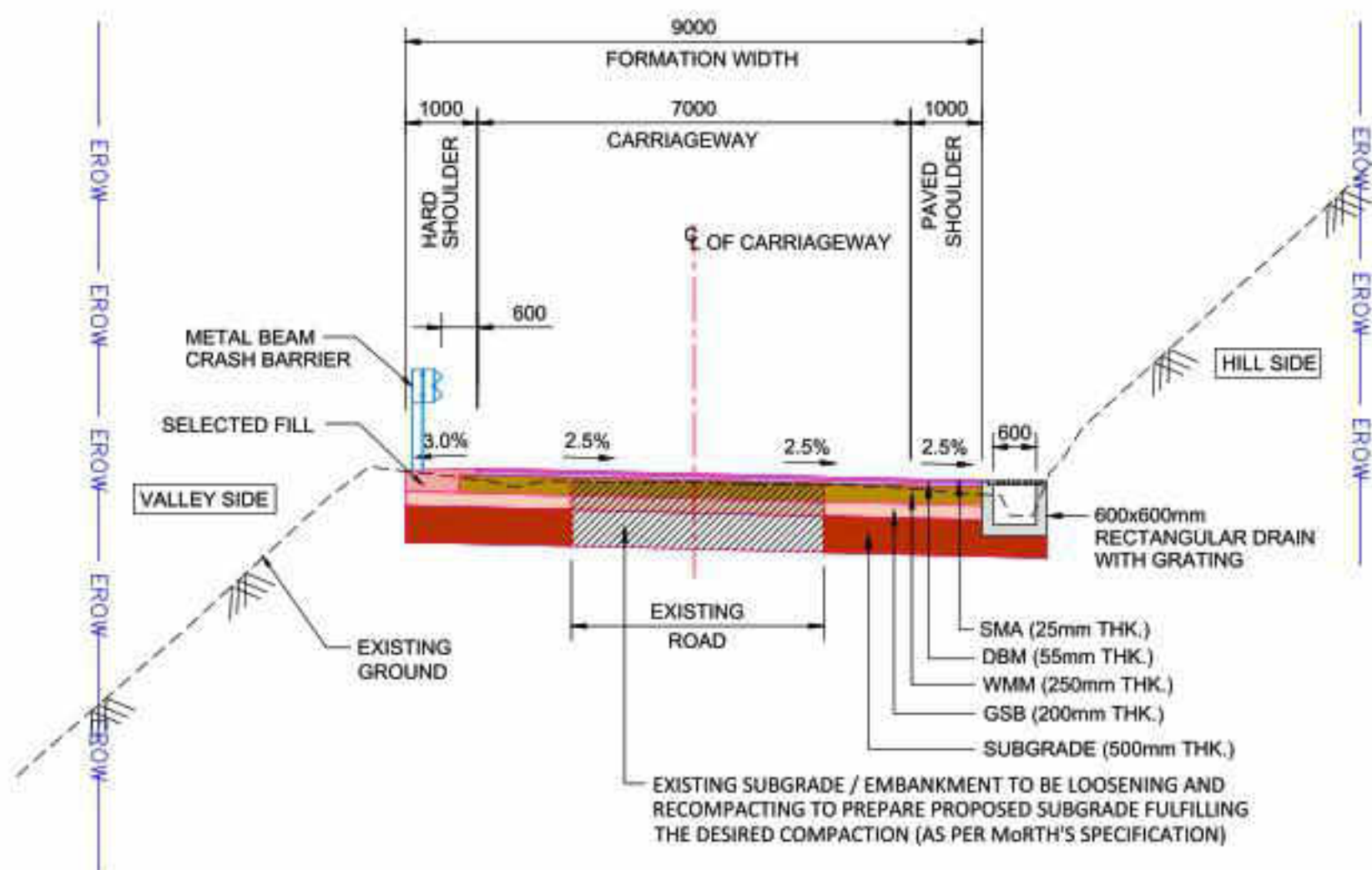
TCS - 10A

**TYPICAL CROSS SECTION FOR RECONSTRUCTION OF EXISTING ROAD WITH CUTTING
(SLOPE CUT ON VALLEY SIDE & BREAST WALL ON HILL SIDE)**

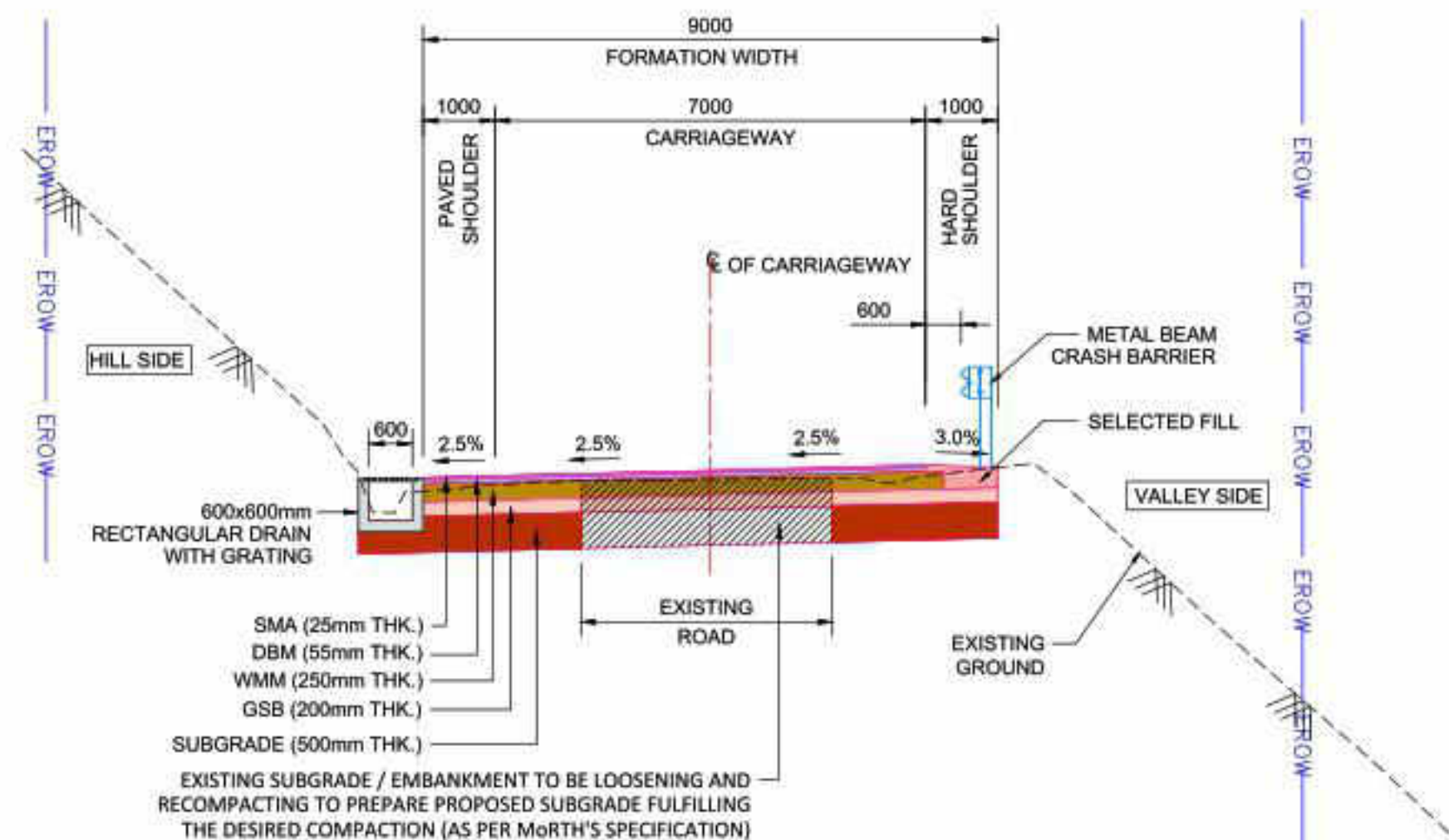
H= HEIGHT OF BREAST WALL
(FOR DETAIL OF BREAST WALL REFER MISCELLANEOUS DRAWING)

NOTE:-
1. ALL DIMENSIONS ARE IN MM. UNLESS NOTED OTHERWISE.
2. DO NOT IN SCALE, ONLY FOLLOW THE WRITTEN DIMENSIONS.

CLIENT :  Roads & Bridges Department (Government of Sikkim)				PROJECT : Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim				DESIGN CONSULTANT :  LEA ASSOCIATES SOUTH ASIA PVT. LTD. B-1/E-27, Mohan Cooperative Industrial Estate, Mathura Road, New Delhi-110044				DRAWING TITLE:- TYPICAL CROSS SECTION (TCS- 10 & TCS- 10A) DRAWING No : 73806/LASA/HWY/TCS-213				REV. R0 SHEET A2	DRAWN A. DHAR	CHECKED S. ROY	DESIGN SOUMENDU	REVIEWED J. K. DAS	DATE MARCH 2023	SCALE : NTS
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TCS - 11
TYPICAL CROSS SECTION FOR RECONSTRUCTION OF EXISTING ROAD
IN BUILT-UP AREA





TCS - 11A
TYPICAL CROSS SECTION FOR RECONSTRUCTION OF EXISTING ROAD
IN BUILT-UP AREA

SPECIAL NOTE:-
RETAINING WALL AND BREAST WALL SHOULD BE PROPOSED AS PER
RETAINING WALL & BREAST WALL SCHEDULE

H= HEIGHT OF BREAST WALL
(FOR DETAIL OF BREAST WALL REFER MISCELLANEOUS DRAWING)

NOTE:-
1. ALL DIMENSIONS ARE IN MM. UNLESS NOTED OTHERWISE.
2. DO NOT IN SCALE. ONLY FOLLOW THE WRITTEN DIMENSIONS.

CLIENT :  Roads & Bridges Department (Government of Sikkim)				PROJECT : Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim				DESIGN CONSULTANT :  LEA ASSOCIATES SOUTH ASIA PVT. LTD. B-1/E-27, Mohan Cooperative Industrial Estate, Mathura Road, New Delhi-110044				DRAWING TITLE:- TYPICAL CROSS SECTION (TCS- 11 & TCS- 11A) DRAWING No : 73806/LASA/HWY/TCS-214				REV. R0 SHEET A2	DRAWN A. DHAR DESIGN SOURMENDU DATE MARCH 2023	CHECKED S. ROY REVIEWED J. K. DAS SCALE : NTS
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B					
C					
D					
E					
F					

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[illegible][illegible]

REV. R0	DRAWN	A. DHAR	CHECKED	S. ROY
SHEET A2	DESIGN	SOLIMENDU	REVIEWED	J. K. DAS
	DATE	JULY 2022	SCALE :	NTS

CLIENT :  **Roads & Bridges Department**
(Government of Sikkim)

PROJECT :
**Consultancy Services for Feasibility Studies
and Preparation of Detailed Project Report
for Roads and Bridges in Sikkim**

DESIGN CONSULTANT :

 **LEA ASSOCIATES SOUTH ASIA PVT. LTD.**
B-1/E-27, Mohan Cooperative Industrial Estate,
Mathura Road, New Delhi-110044

DRAWING TITLE:-	
SCHEDULE OF TYPICAL CROSS SECTION	
DRAWING No :	73806/ASA/HWY/E1/TCS-221

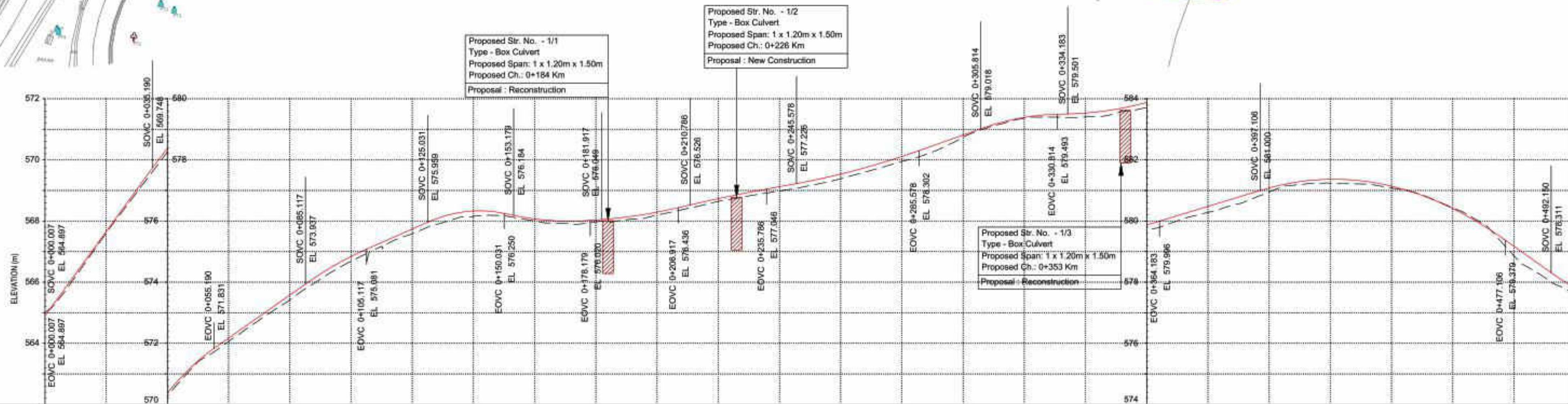
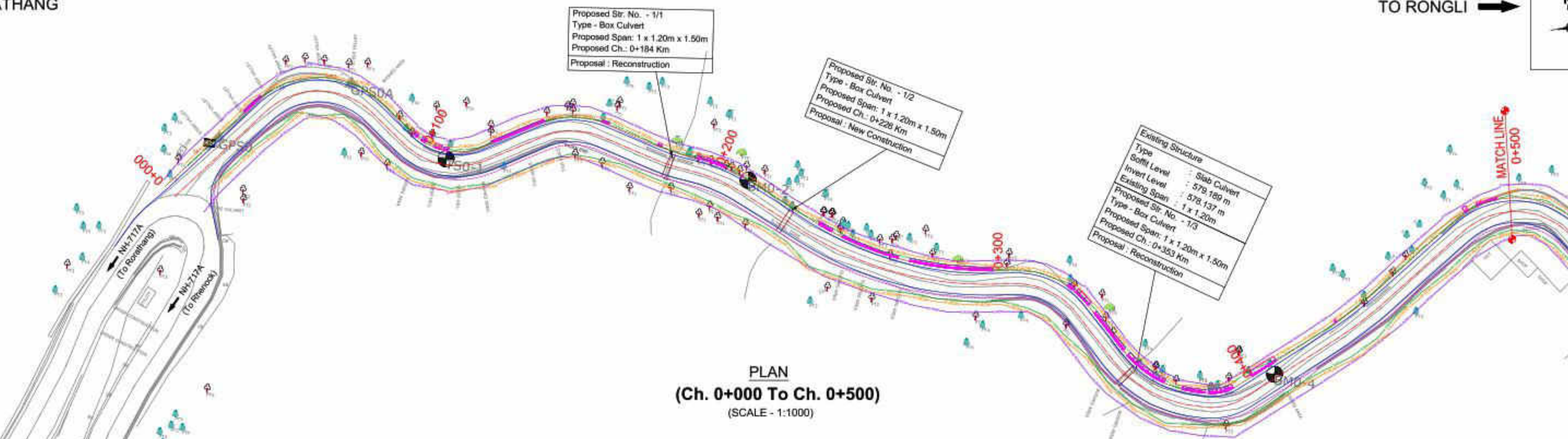
REV. R0	DRAWN	A. DHAR	CHECKED	S. ROY
	DESIGN	SOURMENDU	REVIEWED	J. K. DAS
	A2	DATE	JULY 2022	SCALE :

TO RORATHANG

TO RONGLI



PLAN
(Ch. 0+000 To Ch. 0+500)
(SCALE : 1:1000)



TCS TYPE	
PROPOSED FINISHED ROAD LEVEL (FRL)	
EXISTING GROUND LEVEL (EGL)	
HORIZONTAL SCHEMATIC DIAGRAM	
VERTICAL SCHEMATIC DIAGRAM	
SCHEMATIC SUPER-ELEVATION	
DESIGN CHAINAGE (M)	

PROFILE
(SCALE - HOR 1:1000, VER 1:100)

NOTE:-
1. All Dimensions are in Meter, unless noted otherwise.

CLIENT :



Roads & Bridges Department
(Government of Sikkim)

PROJECT :

**Consultancy Services for Feasibility Studies
and Preparation of Detailed Project Report
for Roads and Bridges in Sikkim**

DESIGN CONSULTANT :

LEA ASSOCIATES SOUTH ASIA PVT. LTD.
B-1/E-27, Mohan Cooperative Industrial Estate,
Mathura Road, New Delhi-110044

DRAWING TITLE:-

**PLAN AND PROFILE
E1 - RORATHANG TO RONGLI
From Ch. 0+000 Km To Ch. 0+500 Km**

DRAWING No : 73806/LASA/HWY/E1/PP-301

REV.

R0

SHEET

A2

DRAWN

DESIGN

DATE

AUG. 2022

A. DHAR

SOURMENDU

AUG. 2022

SCALE :

AS SHOWN

CHECKED

REVIEWED

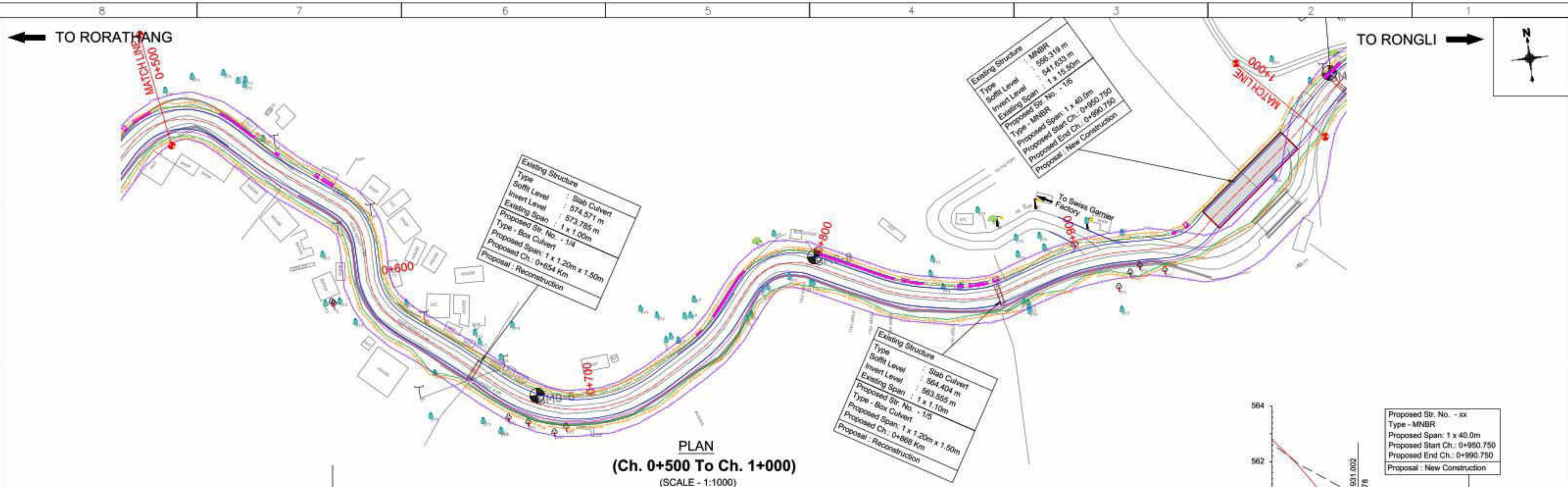
SCALE :

AS SHOWN

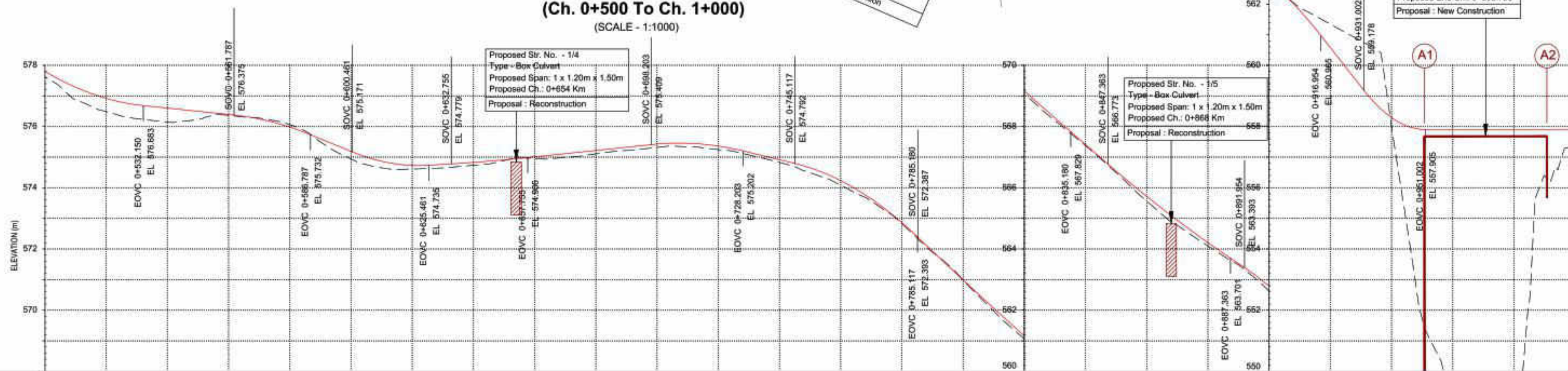
S. ROY

J. K. DAS

AS SHOWN



PLAN
(Ch. 0+500 To Ch. 1+000)
(SCALE - 1:1000)



DATUM = 568.000 m

TCS TYPE																				
PROPOSED FINISHED ROAD LEVEL (FRL)	577.617	577.601	577.622	576.602	576.393	576.982	575.190	574.730	574.730	574.828	575.009	575.218	575.426	575.362	574.916	574.233	572.859	570.988	569.164	567.411
EXISTING GROUND LEVEL (EGL)	577.617	576.487	576.922	576.143	576.602	576.384	576.084	574.942	574.611	574.734	574.950	575.107	575.317	575.245	574.827	574.083	572.832	570.990	569.054	567.372
HORIZONTAL SCHEMATIC DIAGRAM	<div> <div>L = 15.507m</div> <div>L = 26.895m</div> <div>L = 9.811m</div> <div>L = 19.119m</div> <div>L = 19.451m</div> <div>L = 15.737m</div> <div>L = 12.983m</div> <div>L = 24.123m</div> <div>L = 12.215m</div> <div>L = 14.506m</div> <div>L = 15.355m</div> <div>L = 0.29m</div> <div>L = 40.087m</div> <div>L = 1</div> </div>																			
VERTICAL SCHEMATIC DIAGRAM	<div> <div>25.000m VC K = 7</div> <div>R = 10.000m</div> <div>25.000m VC K = 8</div> <div>R = 20.000m</div> <div>25.000m VC K = 5</div> <div>R = 25.000m</div> <div>25.000m VC K = 57</div> <div>R = 50.000m</div> <div>30.000m VC K = -9</div> <div>R = 60.000m</div> <div>40.000m VC K = -6</div> <div>R = 20.000m</div> <div>50.000m VC K = 55</div> <div>R = 60.000m</div> <div>40.000m VC K = 20</div> <div>R = 85.000m</div> <div>20.000m VC K = 2</div> <div>R = 20.000m</div> <div>R = 35.000m</div> </div>																			
SCHEMATIC SUPER-ELEVATION	<div> <div>7.00%</div> <div>7.00%</div> <div>2.50%</div> <div>2.50%</div> <div>7.00%</div> <div>7.00%</div> <div>7.00%</div> <div>7.00%</div> <div>7.00%</div> <div>7.00%</div> <div>7.00%</div> <div>7.00%</div> <div>7.00%</div> <div>7.00%</div> <div>7.00%</div> <div>7.00%</div> <div>7.00%</div> <div>7.00%</div> <div>7.00%</div> <div>7.00%</div> </div>																			
DESIGN CHAINAGE (M)	0+500	0+520	0+540	0+560	0+580	0+600	0+620	0+640	0+660	0+680	0+700	0+720	0+740	0+760	0+780	0+800	0+820	0+840	0+860	0+880

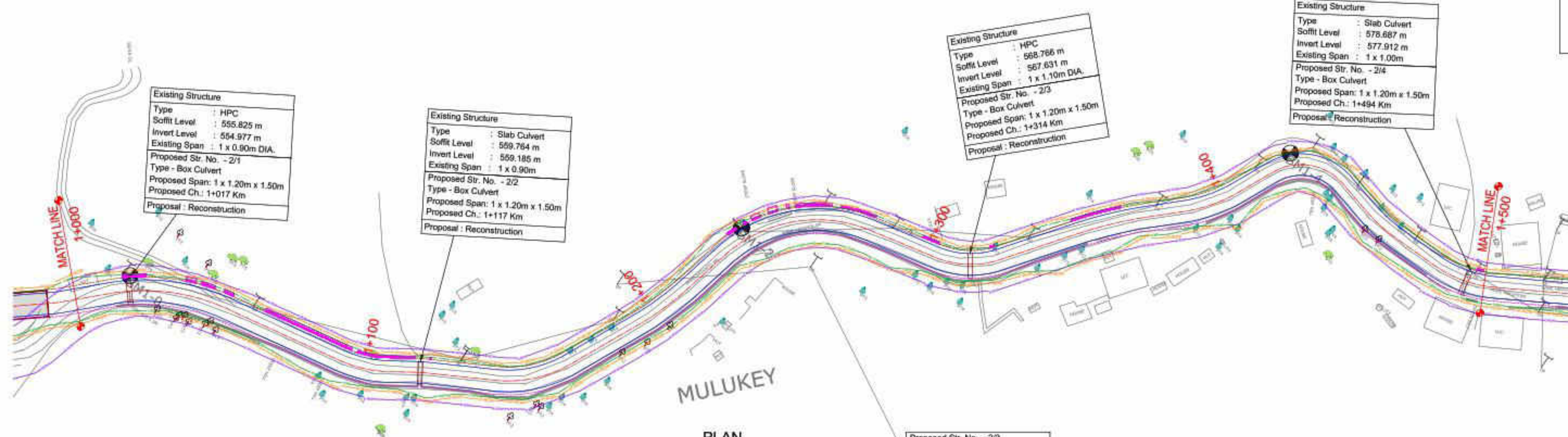
PROFILE
(SCALE - HOR 1:1000, VER 1:100)

NOTE:-
1. All Dimensions are in Meter, unless noted otherwise.

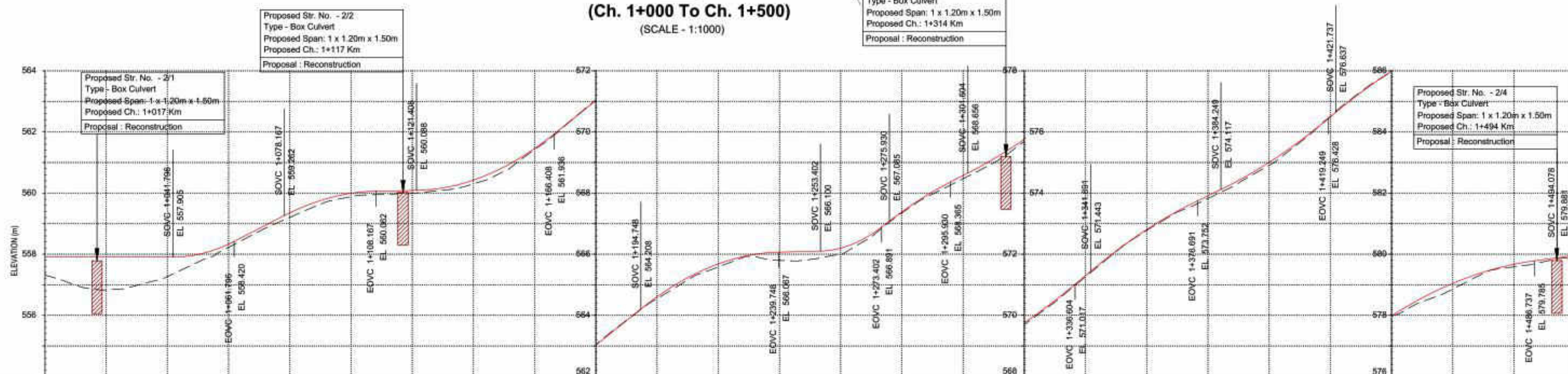
CLIENT : Roads & Bridges Department (Government of Sikkim)			PROJECT : Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim			DESIGN CONSULTANT : LEA ASSOCIATES SOUTH ASIA PVT. LTD. B-1/E-27, Mohan Cooperative Industrial Estate, Mathura Road, New Delhi-110044			DRAWING TITLE:- PLAN AND PROFILE E1 - RORATHANG TO RONGLI From Ch. 0+500 Km To Ch. 1+000 Km			DRAWING No : 73806/LASA/HWY/E1/PP-302			REV. R0 SHEET A2			DRAWN A. DHAR CHECKED S. ROY DESIGN SOUMENDU REVIEWED J. K. DAS DATE AUG. 2022 SCALE : AS SHOWN		
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TO RORATHANG

TO RONGLI



PLAN
(Ch. 1+000 To Ch. 1+500)
(SCALE - 1:1000)



DATUM = 554.000 m

TCS TYPE	PROPOSED FINISHED ROAD LEVEL (FRL)	EXISTING GROUND LEVEL (EGL)	HORIZONTAL SCHEMATIC DIAGRAM	VERTICAL SCHEMATIC DIAGRAM	SCHEMATIC SUPER-ELEVATION	DESIGN CHAINAGE (M)
	557.317	557.905	15.486m	R = 55.000m	7.00%	1+000
	556.831	557.905			7.00%	1+020
	557.270	557.905			7.00%	1+040
	558.225	558.331	L = 40.191m	20.000m VC K = 4	2.50%	1+060
	559.207	559.353			2.50%	1+080
	559.882	559.991	L = 8.050m	R = 40.000m	7.00%	1+100
	559.989	560.085			7.00%	1+120
	560.301	560.424	L = 21.503m	30.000m VC K = 6	7.00%	1+140
	561.427	561.457			7.00%	1+160
	563.044	563.025	L = 25.666m	R = 40.000m	7.00%	1+180
	564.545	564.605			7.00%	1+200
	565.653	565.662	L = 15.757m	R = 35.000m	7.00%	1+220
	565.797	565.669			7.00%	1+240
	566.009	566.197	L = 22.738m	45.000m VC K = 6	7.00%	1+260
	567.354	567.386			7.00%	1+280
	568.469	568.574	L = 22.738m	R = 45.000m	7.00%	1+300
	569.690	569.759			7.00%	1+320
	571.261	571.301	L = 26.010m	35.000m VC K = 11	2.50%	1+340
	572.779	572.804			2.50%	1+360
	573.820	573.912	L = 11.776m	R = 140.000m	7.00%	1+380
	574.904	575.005			7.00%	1+400
	576.505	576.491	L = 12.933m	R = 50.000m	7.00%	1+420
	577.967	577.984			7.00%	1+440
	578.660	579.045	L = 11.440m	R = 18.000m	7.00%	1+460
	579.589	579.071			7.00%	1+480
	579.893	579.975	L = 14.912m	R = 65.000m	7.00%	1+500

PROFILE
(SCALE - HOR 1:1000, VER 1:100)

NOTE:-
1. All Dimensions are in Meter, unless noted otherwise.

CLIENT :



Roads & Bridges Department
(Government of Sikkim)

PROJECT :

**Consultancy Services for Feasibility Studies
and Preparation of Detailed Project Report
for Roads and Bridges in Sikkim**

DESIGN CONSULTANT :

LEA ASSOCIATES SOUTH ASIA PVT. LTD.
B-1/E-27, Mohan Cooperative Industrial Estate,
Mathura Road, New Delhi-110044

DRAWING TITLE:-

**PLAN AND PROFILE
E1 - RORATHANG TO RONGLI
From Ch. 1+000 Km To Ch. 1+500 Km**

DRAWING No : 73806/LASA/HWY/E1/PP-303

REV.

R0

SHEET

A2

DRAWN

DESIGN

DATE

AUG. 2022

A. DHAR

SOURMENDU

SCALE :

AS SHOWN

CHECKED

REVIEWED

SCALE :

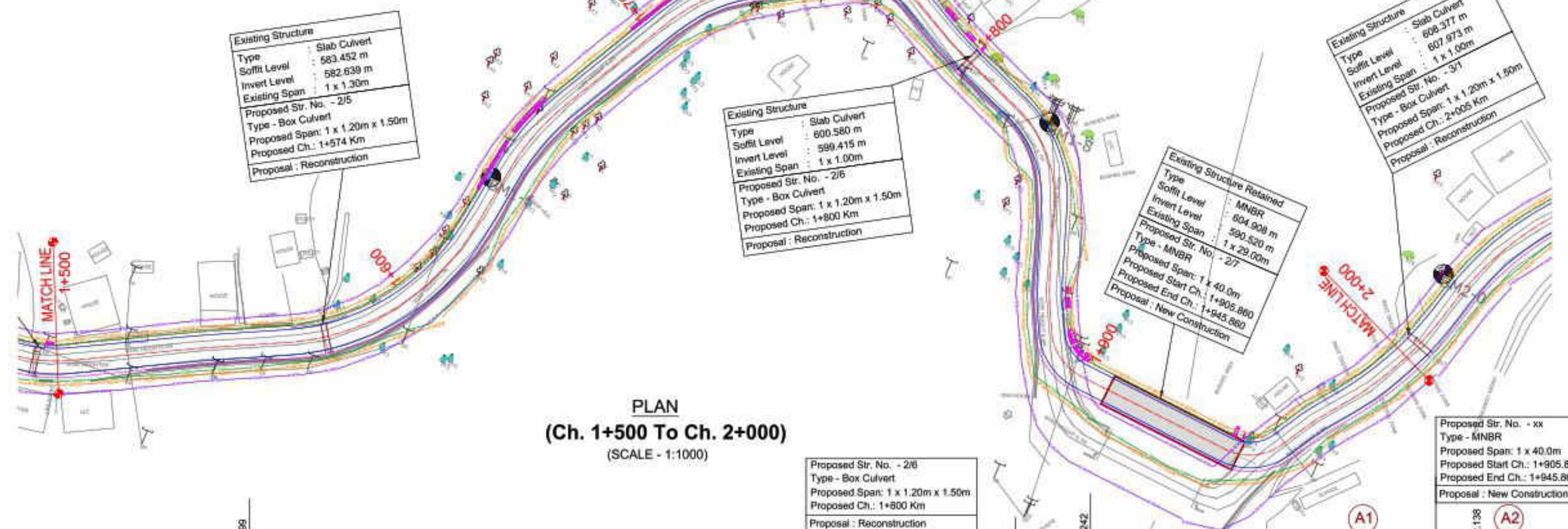
AS SHOWN

S. ROY

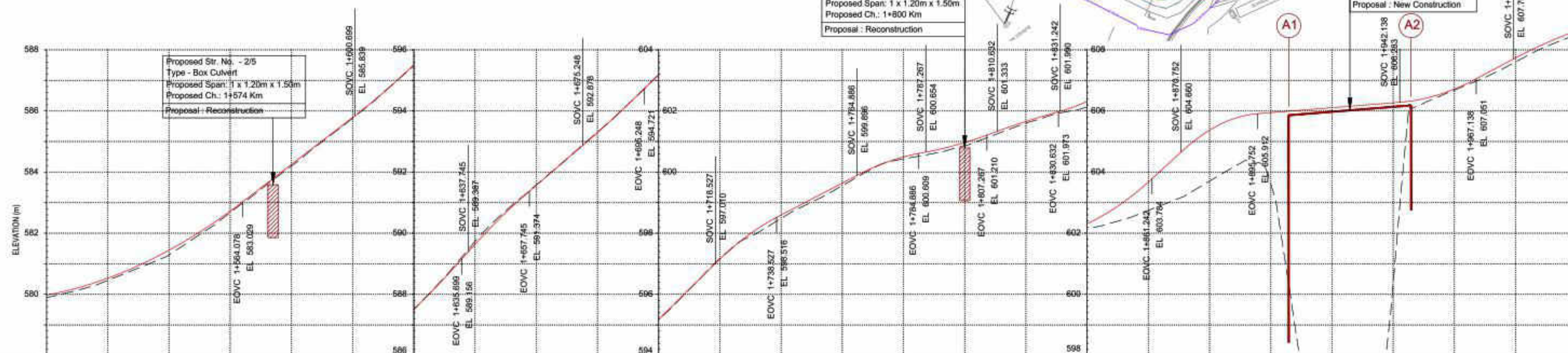
J. K. DAS

SCALE :

AS SHOWN





PLAN
(Ch. 1+500 To Ch. 2+000)
(SCALE - 1:1000)



TCS TYPE																				
PROPOSED FINISHED ROAD LEVEL (FRL)	<div> </div>																			
EXISTING GROUND LEVEL (EGL)	<div> </div>																			
HORIZONTAL SCHEMATIC DIAGRAM																				
VERTICAL SCHEMATIC DIAGRAM																				
SCHEMATIC SUPER-ELEVATION																				
DESIGN CHAINAGE (M)	<div> </div>																			

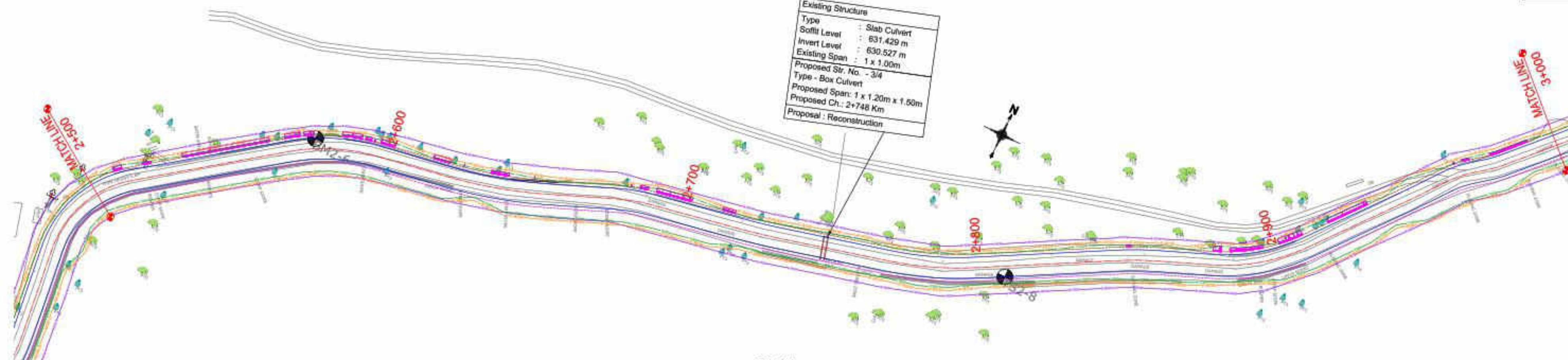
PROFILE
(SCALE - HOR 1:1000, VER 1:100)

NOTE:
1. All Dimensions are in Meter, unless noted otherwise

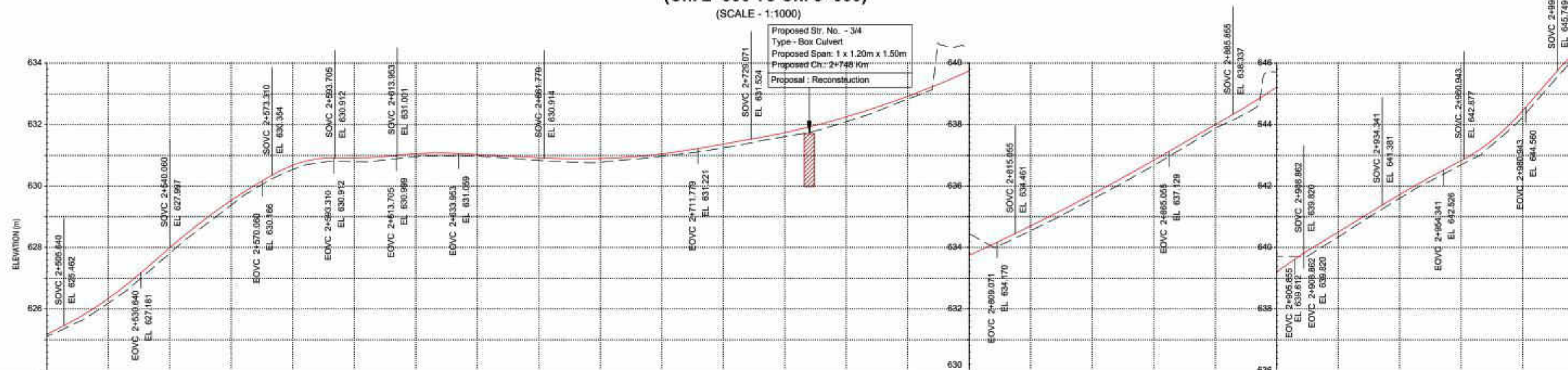
				<div></div> <div>CLIENT : Roads & Bridges Department (Government of Sikkim)</div>	<div>PROJECT : Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim</div>	<div>DESIGN CONSULTANT :  LEA ASSOCIATES SOUTH ASIA PVT. LTD. B-1/E-27, Mohan Cooperative Industrial Estate, Mathura Road, New Delhi-110044</div>	<div>DRAWING TITLE:- PLAN AND PROFILE E1 - RORATHANG TO RONGLI From Ch. 1+500 Km To Ch. 2+000 Km DRAWING No : 73806/LASA/HWY/E1/PP-304</div>	REV.	DRAWN	A. DHAR	CHECKED	S. ROY
Rd.	DESIGN	SOU MENDU	REVIEWED					J. K. DAS				
SHEET	A2	DATE	AUG. 2022					SCALE :	AS SHOWN			
REV	DATE	DETAILS OF REVISION		BY								

TO RORATHANG

TO RONGLI



PLAN
(Ch. 2+500 To Ch. 3+000)
(SCALE - 1:1000)



DATUM = 624.000 m

TCS TYPE																			
PROPOSED FINISHED ROAD LEVEL (FRL)	625.174	626.340	627.981	629.534	630.875	630.911	631.053	631.027	630.823	630.894	631.046	631.365	631.736	632.251	632.920	633.744	634.704	635.733	636.838
EXISTING GROUND LEVEL (EGL)	625.106	626.192	627.814	629.380	630.839	630.794	630.957	630.879	630.829	630.774	630.870	631.244	631.606	632.095	632.629	634.455	634.547	635.575	636.669
HORIZONTAL SCHEMATIC DIAGRAM																			
VERTICAL SCHEMATIC DIAGRAM	25.000m VC K=7	30.000m VC K=11	5.000m VC K=3	5.000m VC K=3	20.000m VC K=15	20.000m VC K=12	50.000m VC K=22	80.000m VC K=26	50.000m VC K=53	50.000m VC K=18	20.000m VC K=25	35.000m VC K=3	35.000m VC K=3	25.000m VC K=7					
SCHEMATIC SUPER-ELEVATION	7.00% 2.50%	2.50% 7.00%	7.00% 2.50%	7.00% 2.50%	7.00% 2.50%	7.00% 2.50%	7.00% 2.50%	7.00% 2.50%	7.00% 2.50%	7.00% 2.50%	7.00% 2.50%	7.00% 2.50%	7.00% 2.50%	7.00% 2.50%	7.00% 2.50%	7.00% 2.50%	7.00% 2.50%	7.00% 2.50%	7.00% 2.50%
DESIGN CHAINAGE (M)	2+500	2+520	2+540	2+560	2+580	2+600	2+620	2+640	2+660	2+680	2+700	2+720	2+740	2+760	2+780	2+800	2+820	2+840	2+860

PROFILE
(SCALE - HOR 1:1000, VER 1:100)

NOTE:-
1. All Dimensions are in Meter, unless noted otherwise.

CLIENT :



Roads & Bridges Department
(Government of Sikkim)

PROJECT :

**Consultancy Services for Feasibility Studies
and Preparation of Detailed Project Report
for Roads and Bridges in Sikkim**

DESIGN CONSULTANT :

LEA ASSOCIATES SOUTH ASIA PVT. LTD.
B-1/E-27, Mohan Cooperative Industrial Estate,
Mathura Road, New Delhi-110044

DRAWING TITLE:-

**PLAN AND PROFILE
E1 - RORATHANG TO RONGLI
From Ch. 2+500 Km To Ch. 3+000 Km**

DRAWING No : 73806/LASA/HWY/E1/PP-306

REV.

R0

SHEET

A2

DRAWN

A. DHAR

DESIGN

SOURMENDU

DATE

AUG. 2022

CHECKED

S. ROY

REVIEWED

J. K. DAS

SCALE :

AS SHOWN

REV DATE DETAILS OF REVISION BY

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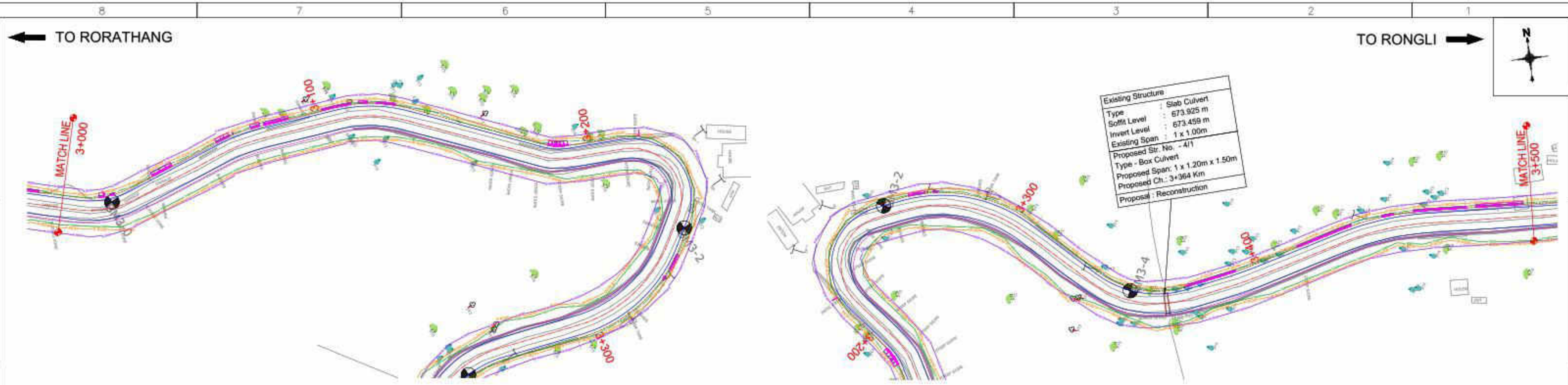
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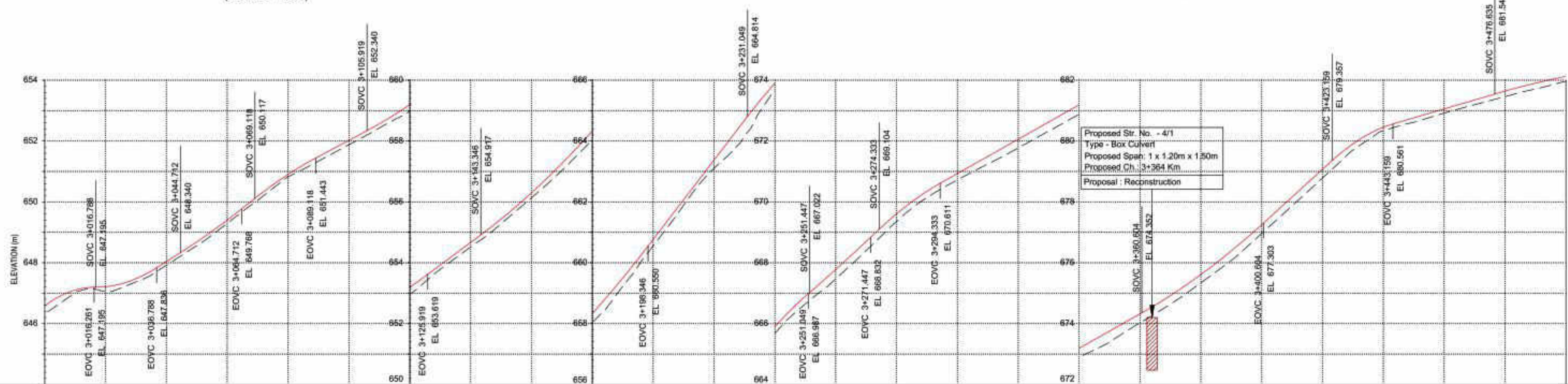
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-234



PLAN
(Ch. 3+000 To Ch. 3+300)
(SCALE - 1:1000)

PLAN
(Ch. 3+300 To Ch. 3+500)
(SCALE - 1:1000)



TCS TYPE																				
PROPOSED FINISHED ROAD LEVEL (FRL)	646.323	646.590	647.069	647.213	647.917	648.041	649.404	650.825	650.902	651.882	652.024	652.869	653.197	654.516	654.868	656.133	656.258	658.035	658.329	660.553
EXISTING GROUND LEVEL (EGL)	646.323	646.590	647.069	647.213	647.917	648.041	649.404	650.825	650.902	651.882	652.024	652.869	653.197	654.516	654.868	656.133	656.258	658.035	658.329	660.553
HORIZONTAL SCHEMATIC DIAGRAM																				
VERTICAL SCHEMATIC DIAGRAM	5.000m VC	20.000m VC	20.000m VC	20.000m VC	20.000m VC	20.000m VC	20.000m VC	20.000m VC	20.000m VC	20.000m VC	20.000m VC	20.000m VC	20.000m VC	20.000m VC	20.000m VC	20.000m VC	20.000m VC	20.000m VC	20.000m VC	20.000m VC
SCHEMATIC SUPER-ELEVATION	7.00%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
DESIGN CHAINAGE (M)	3+000	3+020	3+040	3+060	3+080	3+100	3+120	3+140	3+160	3+180	3+200	3+220	3+240	3+260	3+280	3+300	3+320	3+340	3+360	3+380

CLIENT :
Roads & Bridges Department
(Government of Sikkim)

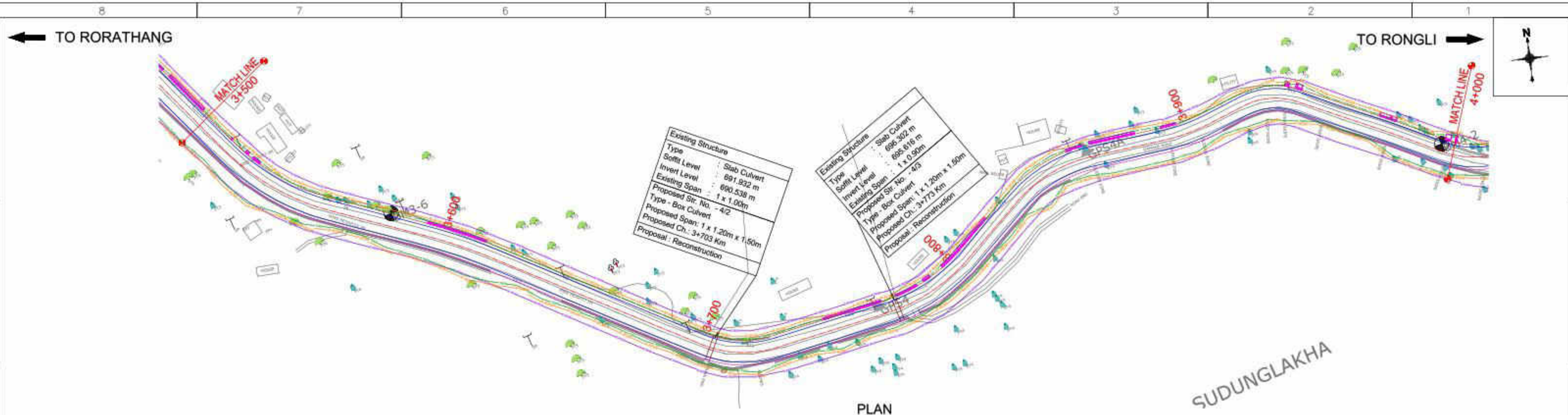
PROJECT :
Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim

DESIGN CONSULTANT :
LEA ASSOCIATES SOUTH ASIA PVT. LTD.
B-1/E-27, Mohan Cooperative Industrial Estate, Mathura Road, New Delhi-110044

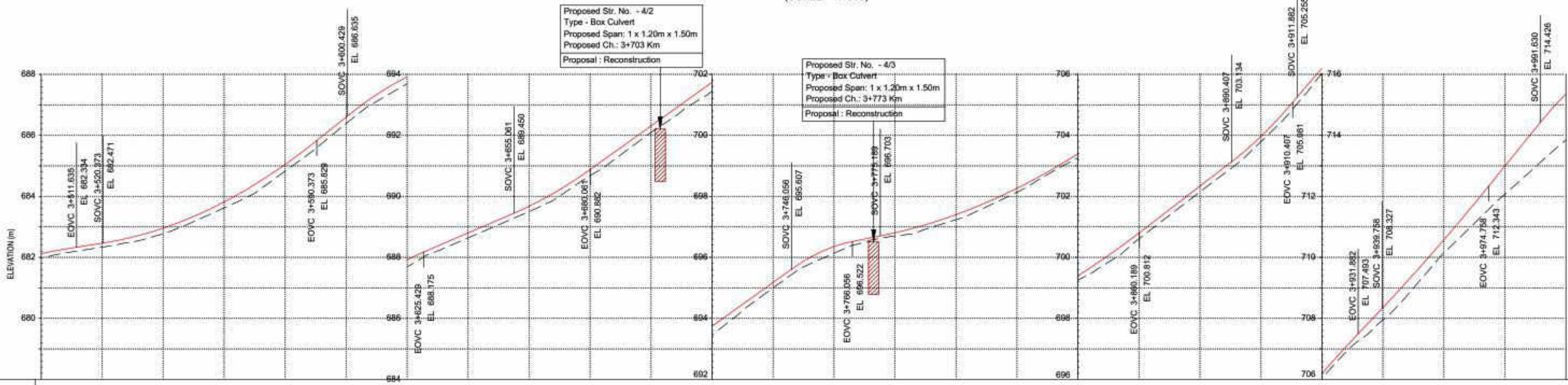
DRAWING TITLE:-
**PLAN AND PROFILE
E1 - RORATHANG TO RONGLI
From Ch. 3+000 Km To Ch. 3+500 Km**

DRAWING No : 73806/LASA/HWY/E1/PP-307

REV.	DRAWN	A. DHAR	CHECKED	S. ROY
R0	DESIGN	SOURMENDU	REVIEWED	J. K. DAS
SHEET	DATE	AUG. 2022	SCALE :	AS SHOWN



PLAN
(Ch. 3+500 To Ch. 4+000)
(SCALE - 1:1000)

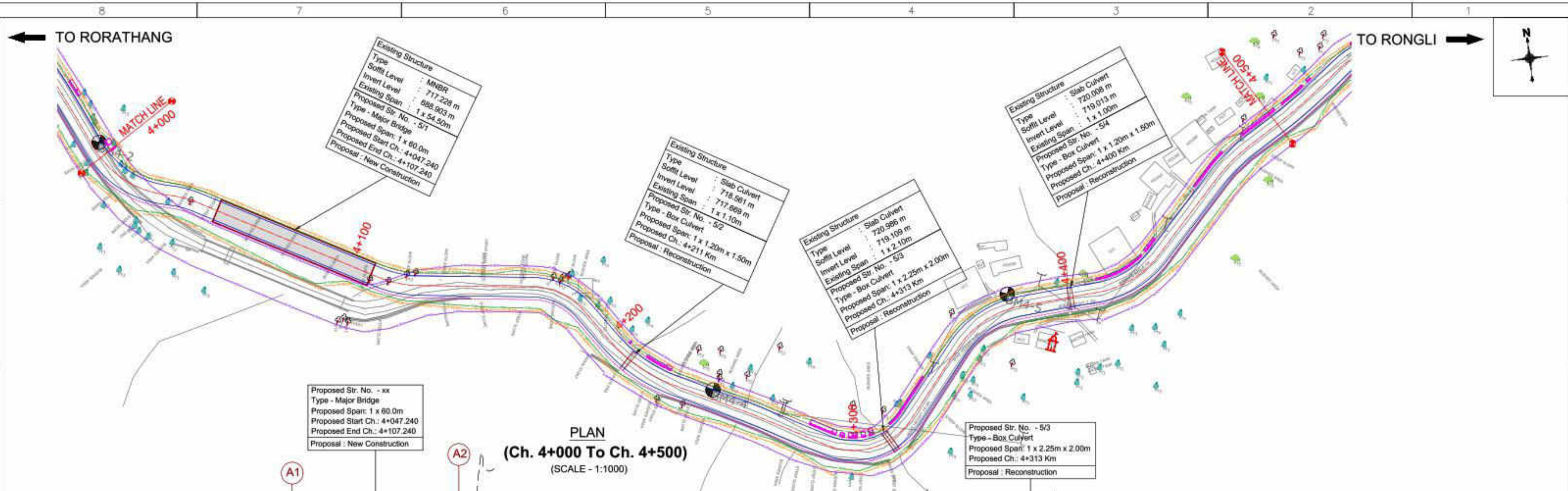


TCS TYPE																																					
PROPOSED FINISHED ROAD LEVEL (FRL)	682.124	682.465	682.958	683.818	685.047	686.801	687.920	688.802	689.676	690.578	692.310	693.742	695.174	696.354	696.806	697.402	698.266	699.308	700.807	702.335	703.968	706.191	708.353	710.875	712.990	713.853											
EXISTING GROUND LEVEL (EGL)	681.967	682.336	682.767	683.622	684.428	686.388	687.690	688.640	689.500	690.678	692.099	693.454	694.939	696.138	696.700	697.235	698.137	699.259	700.807	702.148	703.793	706.023	707.949	710.144	712.072	713.853											
HORIZONTAL SCHEMATIC DIAGRAM		L = 35.013m			L = 80.526m						L = 40.876m			L = 27.013m			L = 26.218m			L = 13.833m			L = 34.070m			L = 13.793m											
VERTICAL SCHEMATIC DIAGRAM	VC	R = 85.990m		70.000m VC K = 11		R = 200.000m		25.000m VC K = 7		4.30%		25.000m VC K = 9		R = 40.990m		20.000m VC K = 4		1.98%		R = 85.990m		85.000m VC K = 15		7.68%		R = 70.990m		20.000m VC K = 5		R = 25.990m		35.000m VC K = 20		R = 200.000m		12.35%	
SCHEMATIC SUPER-ELEVATION	%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	
DESIGN CHAINAGE (M)	3+500	3+520	3+540	3+560	3+580	3+600	3+620	3+640	3+660	3+680	3+700	3+720	3+740	3+760	3+780	3+800	3+820	3+840	3+860	3+880	3+900	3+920	3+940	3+960	3+980	4+000											

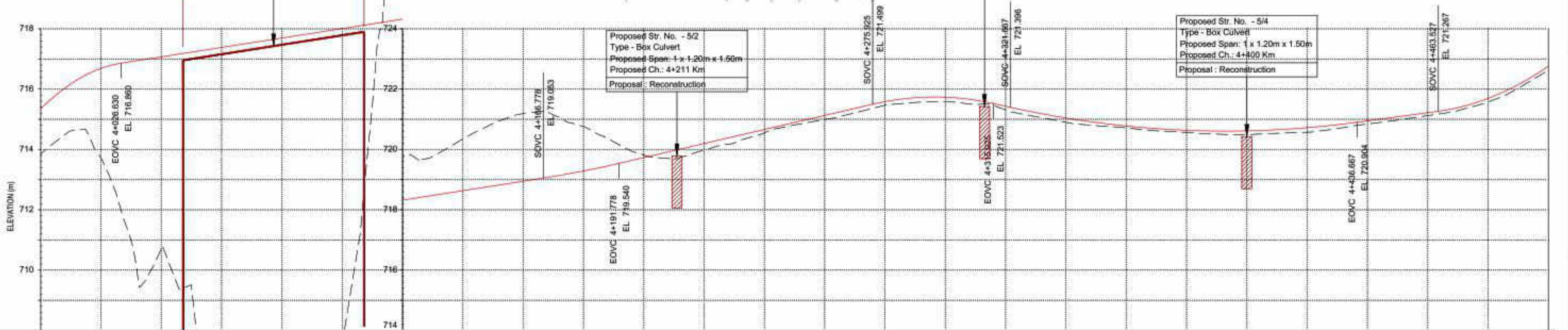
PROFILE
(SCALE - HOR 1:1000, VER 1:100)

NOTE:-
1. All Dimensions are in Meter, unless noted otherwise.

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PLAN
(Ch. 4+000 To Ch. 4+500)
(SCALE - 1:1000)



TCS TYPE	PROPOSED FINISHED ROAD LEVEL (FRL)	EXISTING GROUND LEVEL (EGL)	HORIZONTAL SCHEMATIC DIAGRAM	VERTICAL SCHEMATIC DIAGRAM	SCHEMATIC SUPER-ELEVATION	DESIGN CHAINAGE (M)
	713.953	713.953	L = 35.000m	R = 35.000m	0.00%	4+000
	713.712	713.712	L = 35.000m	R = 35.000m	7.00%	4+020
	710.729	710.729	L = 70.703m	R = 40.000m	2.50%	4+040
	704.361	704.361	L = 40.959m	R = 25.000m	2.50%	4+060
	705.877	705.877	L = 14.627m	R = 55.000m	2.50%	4+080
	707.854	707.854	L = 28.288m	R = 175.000m	2.50%	4+100
	718.321	718.321	L = 24.361m	R = 25.000m	2.50%	4+120
	720.349	720.349	L = 30.389m	R = 35.000m	2.50%	4+140
	721.190	721.190	L = 27.958m	R = 55.000m	2.50%	4+160
	720.750	720.750	L = 34.071m	R = 65.000m	2.50%	4+180
	719.287	719.287	L = 14.957m	R = 55.000m	2.50%	4+200
	719.819	719.819	L = 14.957m	R = 55.000m	2.50%	4+220
	720.197	720.197	L = 14.957m	R = 55.000m	2.50%	4+240
	720.550	720.550	L = 14.957m	R = 55.000m	2.50%	4+260
	721.128	721.128	L = 14.957m	R = 55.000m	2.50%	4+280
	721.465	721.465	L = 14.957m	R = 55.000m	2.50%	4+300
	721.580	721.580	L = 14.957m	R = 55.000m	2.50%	4+320
	721.310	721.310	L = 14.957m	R = 55.000m	2.50%	4+340
	721.043	721.043	L = 14.957m	R = 55.000m	2.50%	4+360
	720.715	720.715	L = 14.957m	R = 55.000m	2.50%	4+380
	720.667	720.667	L = 14.957m	R = 55.000m	2.50%	4+400
	720.495	720.495	L = 14.957m	R = 55.000m	2.50%	4+420
	720.572	720.572	L = 14.957m	R = 55.000m	2.50%	4+440
	720.843	720.843	L = 14.957m	R = 55.000m	2.50%	4+460
	721.123	721.123	L = 14.957m	R = 55.000m	2.50%	4+480
	721.578	721.578	L = 14.957m	R = 55.000m	2.50%	4+500

PROFILE
(SCALE - HOR 1:1000, VER 1:100)

NOTE:-
1. All Dimensions are in Meter, unless noted otherwise.

REV	DATE	DETAILS OF REVISION	BY

CLIENT :
Roads & Bridges Department
(Government of Sikkim)

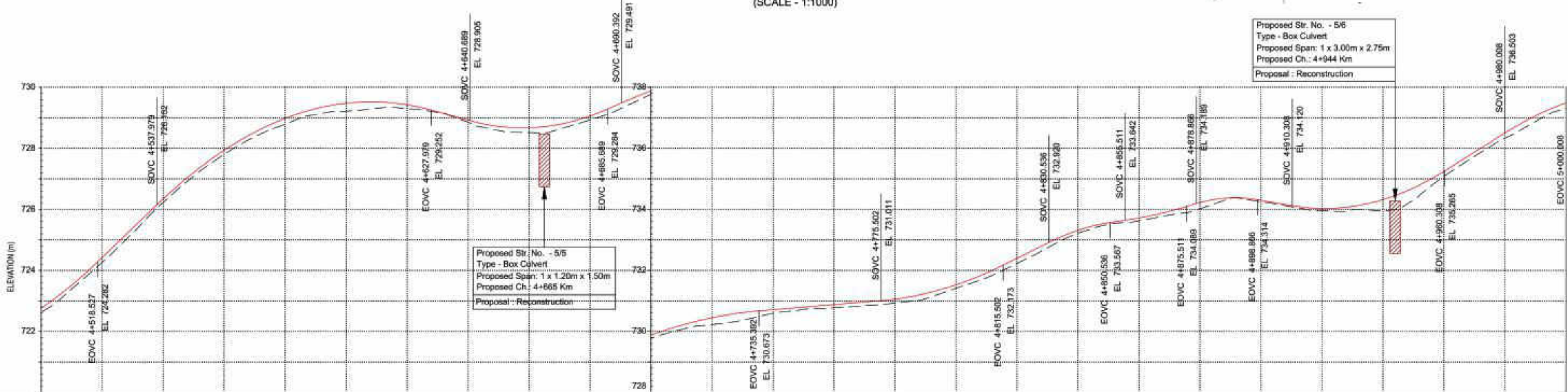
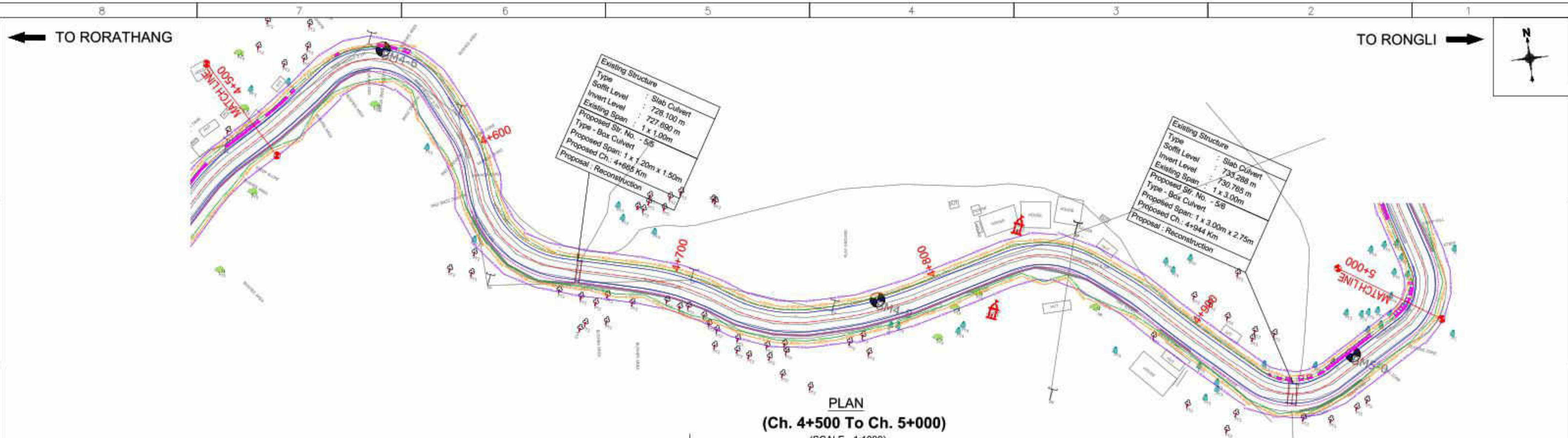
PROJECT :
Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim

DESIGN CONSULTANT :
LEA ASSOCIATES SOUTH ASIA PVT. LTD.
B-1/E-27, Mohan Cooperative Industrial Estate, Mathura Road, New Delhi-110044

DRAWING TITLE:-
**PLAN AND PROFILE
E1 - RORATHANG TO RONGLI
From Ch. 4+000 Km To Ch. 4+500 Km**

REV.	DRAWN	CHECKED	S. ROY
R0	SOURMENDU	REVIEWED	J. K. DAS
SHEET	DATE	SCALE	AS SHOWN
A2	AUG. 2022	SCALE :	AS SHOWN

DRAWING No : 73806/LASA/HWY/E1/PP-309



TCS TYPE																				
PROPOSED FINISHED ROAD LEVEL (FRL)	722.627	722.769	724.423	726.343	727.936	728.981	729.477	729.425	728.924	728.675	729.059	729.878	730.449	730.712	730.889	731.059	731.527	732.399	733.312	734.221
EXISTING GROUND LEVEL (EGL)	722.627	724.263	724.423	726.224	727.801	728.784	729.218	729.285	728.855	728.517	728.929	729.767	730.226	730.552	730.772	730.927	731.412	732.227	733.022	734.022
HORIZONTAL SCHEMATIC DIAGRAM																				
VERTICAL SCHEMATIC DIAGRAM																				
SCHEMATIC SUPER-ELEVATION																				
DESIGN CHAINAGE (M)	4+500	4+520	4+540	4+560	4+580	4+600	4+620	4+640	4+660	4+680	4+700	4+720	4+740	4+760	4+780	4+800	4+820	4+840	4+860	4+880

REV	DATE	DETAILS OF REVISION	BY

CLIENT :

Roads & Bridges Department

(Government of Sikkim)

PROJECT :

Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim

DESIGN CONSULTANT :

LEA ASSOCIATES SOUTH ASIA PVT. LTD.

B-1/E-27, Mohan Cooperative Industrial Estate, Mathura Road, New Delhi-110044

DRAWING TITLE:-

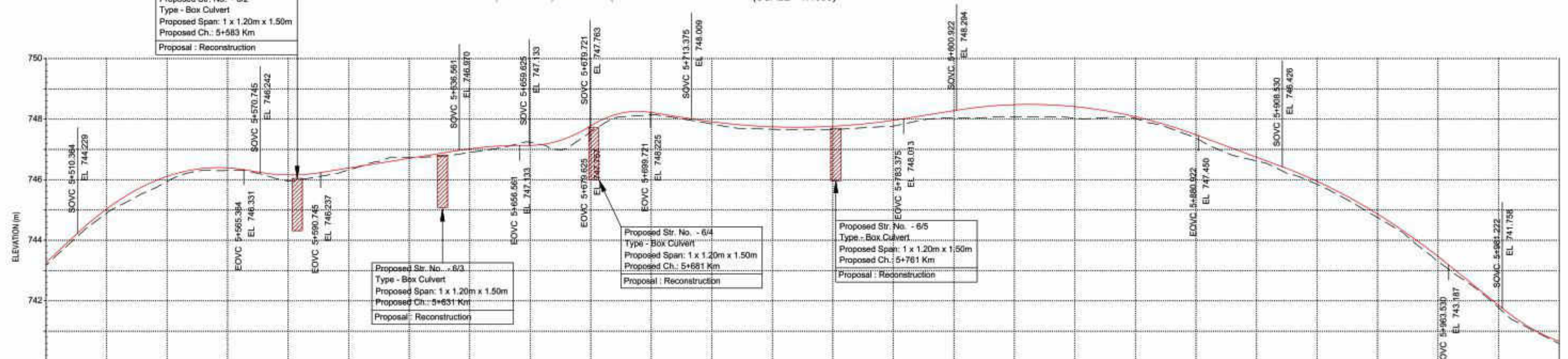
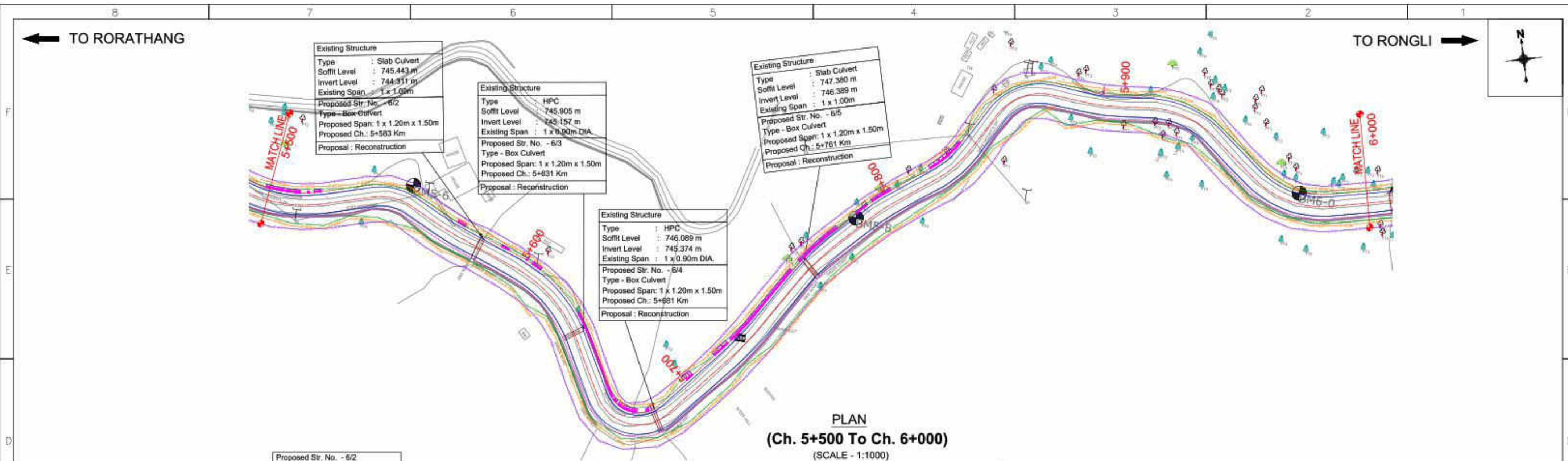
PLAN AND PROFILE

E1 - RORATHANG TO RONGLI

From Ch. 4+500 Km To Ch. 5+000 Km

DRAWING No : 73806/LASA/HWY/E1/PP-310

REV.	DRAWN	CHECKED	S. ROY
R0	DESIGN	REVIEWED	J. K. DAS
SHEET	DATE	SCALE :	AS SHOWN
A2	AUG. 2022	1	



TCS TYPE	
PROPOSED FINISHED ROAD LEVEL (FRL) —————	
EXISTING GROUND LEVEL (EGL) - - - - -	
HORIZONTAL SCHEMATIC DIAGRAM	
VERTICAL SCHEMATIC DIAGRAM	
SCHEMATIC SUPER-ELEVATION	
DESIGN CHAINAGE (M)	

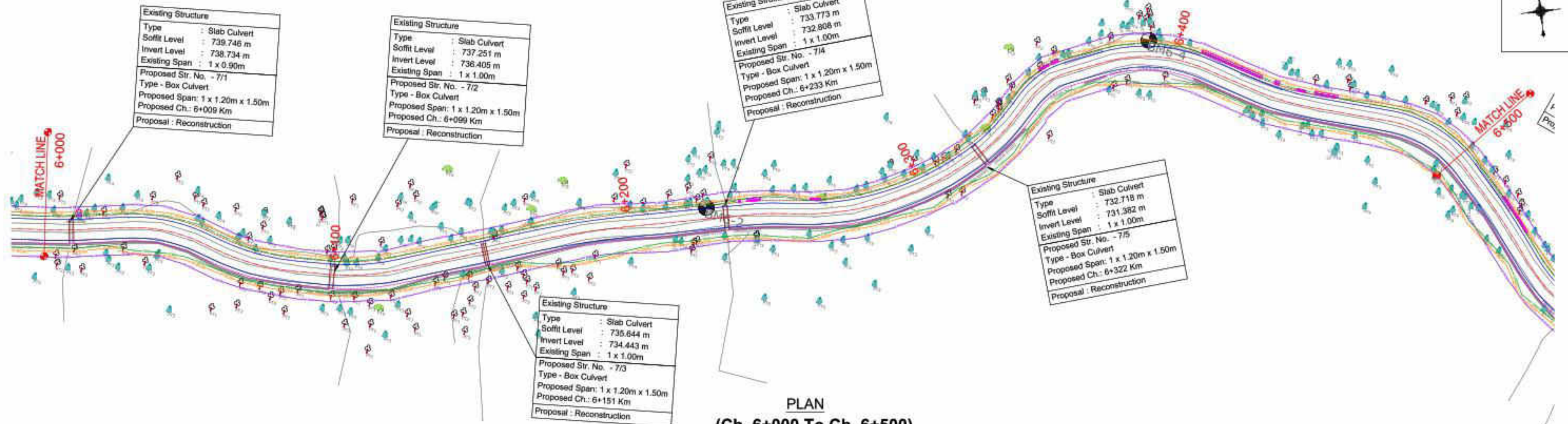
PROFILE
(SCALE - HOR 1:1000, VER 1:100)

NOTE:
1. All Dimensions are in Meter, unless noted otherwise.

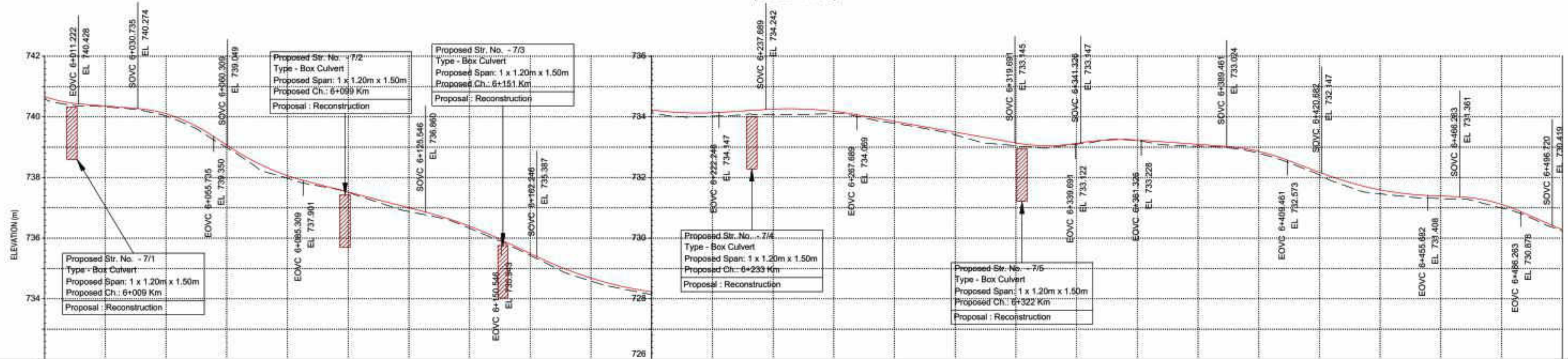
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TO RORATHANG

TO RONGLI



PLAN
(Ch. 6+000 To Ch. 6+500)
(SCALE - 1:1000)



DATUM = 732.000 m

TCS TYPE	PROPOSED FINISHED ROAD LEVEL (FRL)	EXISTING GROUND LEVEL (EGL)	HORIZONTAL SCHEMATIC DIAGRAM	VERTICAL SCHEMATIC DIAGRAM	SCHEMATIC SUPER-ELEVATION	DESIGN CHAINAGE (M)
	740.870	740.591	L = 14.413m	R = 140.00m 25.000m VC K = -4	-7.60%	6+000
	740.359	740.328	L = 4.879m	R = 55.000m 25.000m VC K = -4	-7.00%	6+020
	740.100	740.024	L = 10.143m	R = 80.000m 25.000m VC K = -4	-7.00%	6+040
	739.069	738.885	L = 43.635m	R = 80.000m 25.000m VC K = -4	-7.00%	6+060
	738.061	737.874	L = 10.143m	R = 80.000m 25.000m VC K = -4	-7.00%	6+080
	737.521	737.511	L = 43.635m	R = 80.000m 25.000m VC K = -4	-7.00%	6+100
	737.004	736.876	L = 43.635m	R = 80.000m 25.000m VC K = -4	-7.00%	6+120
	736.399	736.327	L = 43.635m	R = 80.000m 25.000m VC K = -4	-7.00%	6+140
	735.694	735.431	L = 43.635m	R = 80.000m 25.000m VC K = -4	-7.00%	6+160
	734.885	734.586	L = 43.635m	R = 80.000m 25.000m VC K = -4	-7.00%	6+180
	734.231	734.138	L = 43.635m	R = 80.000m 25.000m VC K = -4	-7.00%	6+200
	734.136	734.022	L = 43.635m	R = 80.000m 25.000m VC K = -4	-7.00%	6+220
	734.255	734.078	L = 43.635m	R = 80.000m 25.000m VC K = -4	-7.00%	6+240
	734.182	734.106	L = 43.635m	R = 80.000m 25.000m VC K = -4	-7.00%	6+260
	733.850	733.785	L = 43.635m	R = 80.000m 25.000m VC K = -4	-7.00%	6+280
	733.485	733.408	L = 43.635m	R = 80.000m 25.000m VC K = -4	-7.00%	6+300
	733.140	733.043	L = 43.635m	R = 80.000m 25.000m VC K = -4	-7.00%	6+320
	733.126	733.059	L = 43.635m	R = 80.000m 25.000m VC K = -4	-7.00%	6+340
	733.237	733.216	L = 43.635m	R = 80.000m 25.000m VC K = -4	-7.00%	6+360
	733.093	733.034	L = 43.635m	R = 80.000m 25.000m VC K = -4	-7.00%	6+380
	732.862	732.801	L = 43.635m	R = 80.000m 25.000m VC K = -4	-7.00%	6+400
	732.773	732.680	L = 43.635m	R = 80.000m 25.000m VC K = -4	-7.00%	6+420
	731.594	731.461	L = 43.635m	R = 80.000m 25.000m VC K = -4	-7.00%	6+440
	731.369	731.303	L = 43.635m	R = 80.000m 25.000m VC K = -4	-7.00%	6+460
	731.114	730.953	L = 43.635m	R = 80.000m 25.000m VC K = -4	-7.00%	6+480
	730.278	730.235	L = 43.635m	R = 80.000m 25.000m VC K = -4	-7.00%	6+500

PROFILE
(SCALE - HOR 1:1000, VER 1:100)

NOTE:
1. All Dimensions are in Meter, unless noted otherwise.

CLIENT :



Roads & Bridges Department
(Government of Sikkim)

PROJECT :

**Consultancy Services for Feasibility Studies
and Preparation of Detailed Project Report
for Roads and Bridges in Sikkim**

DESIGN CONSULTANT :

LEA ASSOCIATES SOUTH ASIA PVT. LTD.
B-1/E-27, Mohan Cooperative Industrial Estate,
Mathura Road, New Delhi-110044

DRAWING TITLE:-

**PLAN AND PROFILE
E1 - RORATHANG TO RONGLI
From Ch. 6+000 Km To Ch. 6+500 Km**

DRAWING No : 73806/LASA/HWY/E1/PP-313

REV.

R0

SHEET

A2

DRAWN

A. DHAR

DESIGN

SOURMENDU

DATE

AUG. 2022

CHECKED

S. ROY

REVIEWED

J. K. DAS

SCALE :

AS SHOWN

REV DATE DETAILS OF REVISION BY

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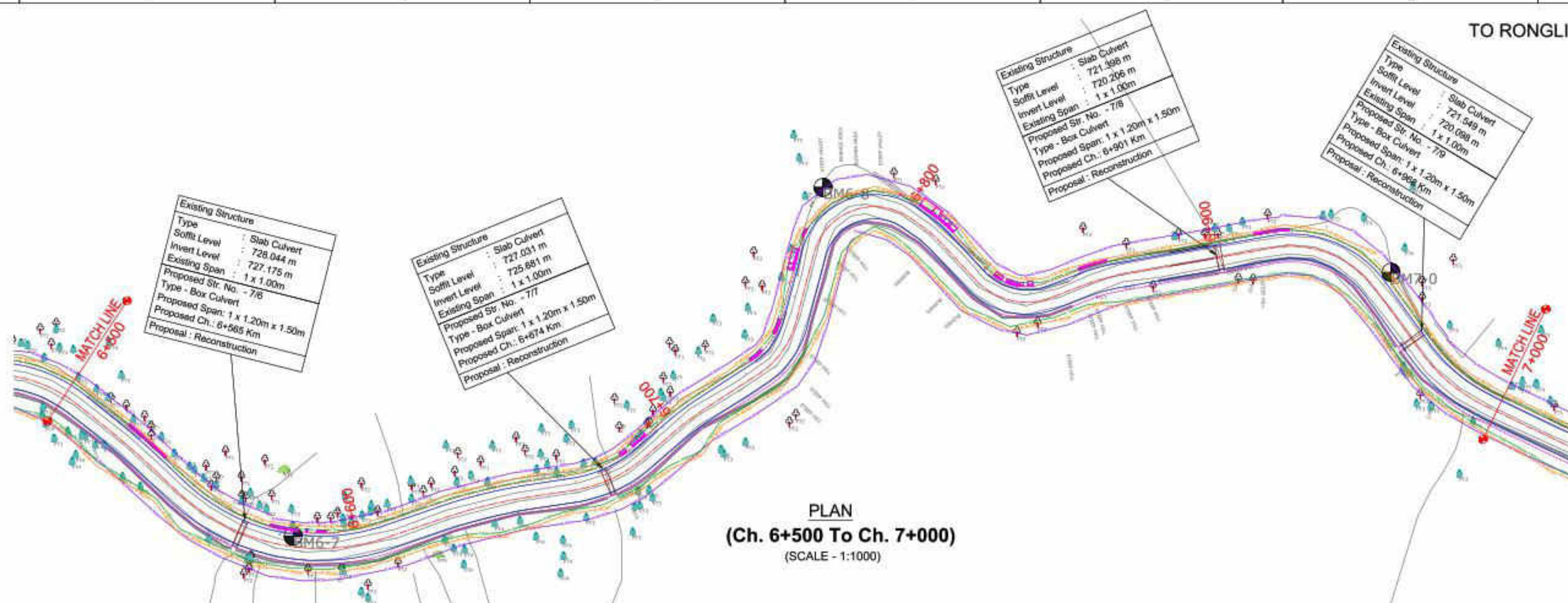
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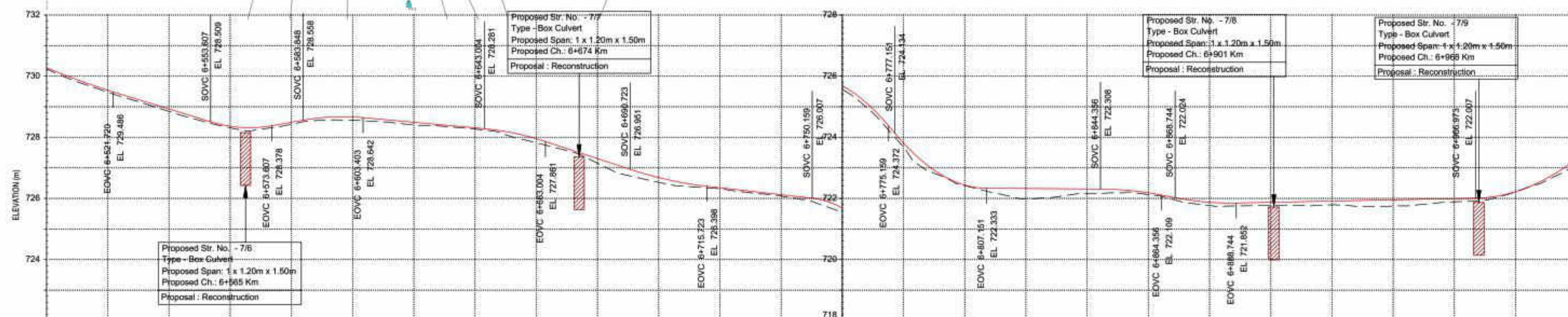
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PLAN
(Ch. 6+500 To Ch. 7+000)
(SCALE - 1:1000)

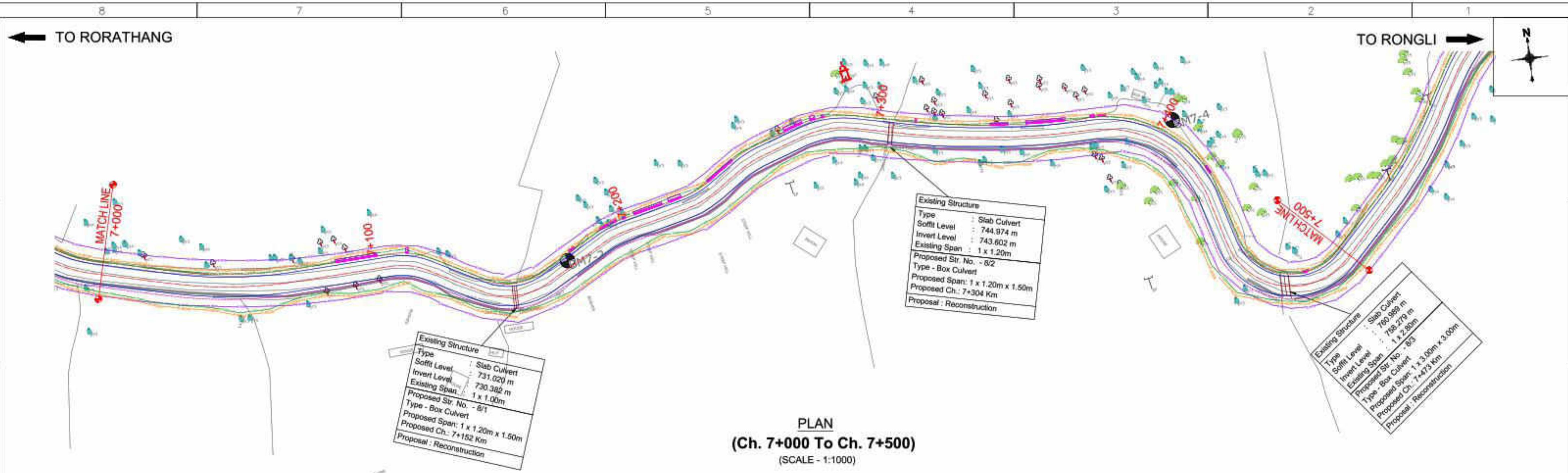


TCS TYPE																				
PROPOSED FINISHED ROAD LEVEL (FRL)	<div> </div>																			
EXISTING GROUND LEVEL (EGL)	<div> </div>																			
HORIZONTAL SCHEMATIC DIAGRAM	<div> </div>																			
VERTICAL SCHEMATIC DIAGRAM	<div> </div>																			
SCHEMATIC SUPER-ELEVATION	<div> </div>																			
DESIGN CHAINAGE (M)	<div> </div>																			

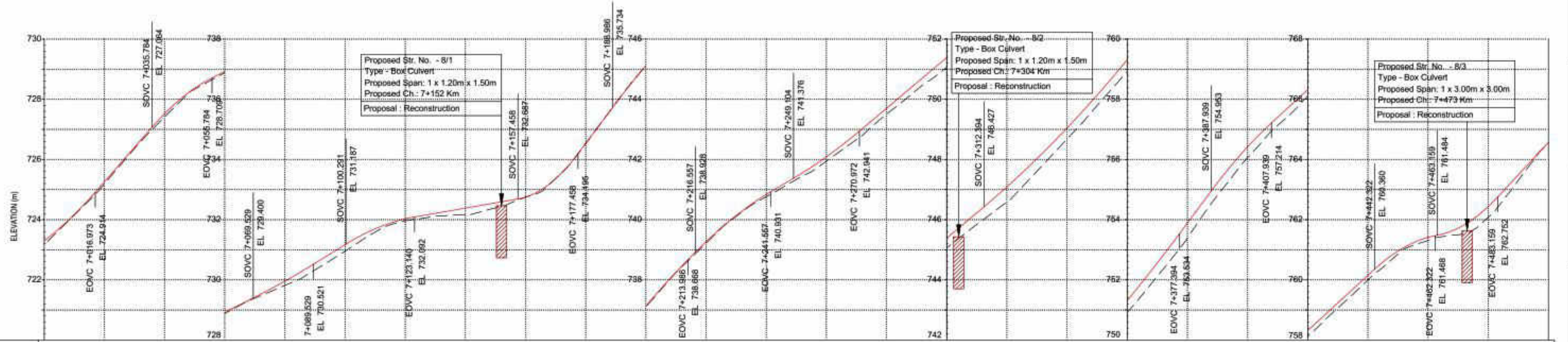
PROFILE
(SCALE - HOR 1:1000, VER 1:100)

NOTE:
1. All Dimensions are in Meter, unless noted otherwise

				<div><div></div><div><div>CLIENT :</div><div>Roads & Bridges Department</div><div>(Government of Sikkim)</div></div></div>	<div><div>PROJECT :</div><div>Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim</div></div>	<div><div>DESIGN CONSULTANT :</div><div><div></div><div>LEA ASSOCIATES SOUTH ASIA PVT. LTD. B-1/E-27, Mohan Cooperative Industrial Estate, Mathura Road, New Delhi-110044</div></div></div>	<div><div>DRAWING TITLE:-</div><div>PLAN AND PROFILE E1 - RORATHANG TO RONGLI From Ch. 6+500 Km To Ch. 7+000 Km</div></div>	<div><div>DRAWING No :</div><div>73806/LASA/HWY/E1/PP-314</div></div>	REV.	DRAWN	A. DHAR	CHECKED	S. ROY
R0													
SHEET	DESIGN	SOURMENDU	REVIEWED						J. K. DAS				
A2	DATE	AUG. 2022.	SCALE :						AS SHOWN				



PLAN
(Ch. 7+000 To Ch. 7+500)
(SCALE - 1:1000)

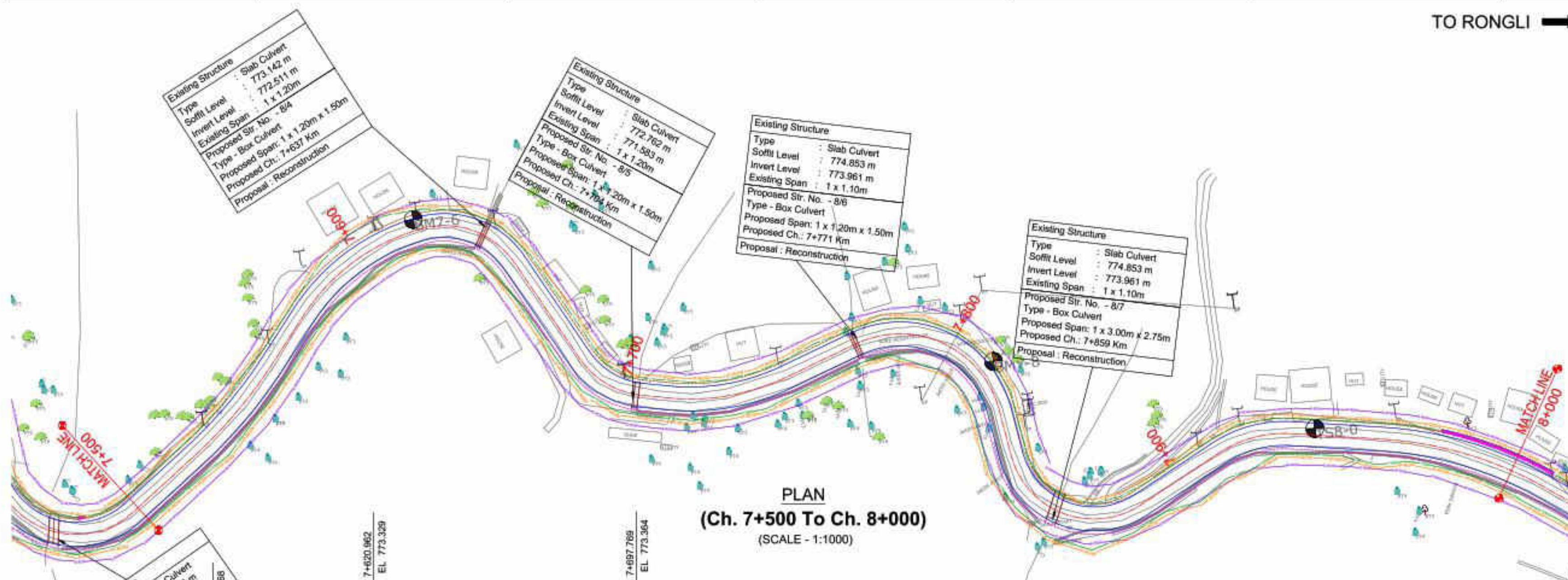


TCS TYPE																				
PROPOSED FINISHED ROAD LEVEL (FRL)	723.307	725.960	727.518	728.921	729.959	731.189	732.028	732.384	732.760	734.535	737.126	739.267	740.637	742.087	743.701	745.384	747.089	748.045	750.311	753.885
EXISTING GROUND LEVEL (EGL)	723.169	725.166	727.413	728.880	729.815	730.950	731.982	732.169	732.745	734.526	737.100	739.214	740.760	741.944	743.606	745.063	746.559	748.679	750.920	753.389
HORIZONTAL SCHEMATIC DIAGRAM	L = 28.256m, L = 34.583m, L = 21.147m, L = 24.309m, L = 22.599m, L = 11.800m, L = 15.709m, L = 16.977m, L = 12.44m, L = 17.506m																			
VERTICAL SCHEMATIC DIAGRAM	11.43%, 5.02%, 6.19%, 1.73%, 13.35%, 10.12%, 8.42%, 13.45%, 9.15%, 10.76%																			
SCHEMATIC SUPER-ELEVATION	7.90%, 2.50%, 2.50%, 2.50%, 2.50%, 2.50%, 2.50%, 2.50%, 2.50%, 2.50%, 2.50%, 2.50%, 2.50%, 2.50%, 2.50%, 2.50%, 2.50%, 2.50%, 2.50%, 2.50%																			
DESIGN CHAINAGE (M)	7+000	7+020	7+040	7+060	7+080	7+100	7+120	7+140	7+160	7+180	7+200	7+220	7+240	7+260	7+280	7+300	7+320	7+340	7+360	7+380

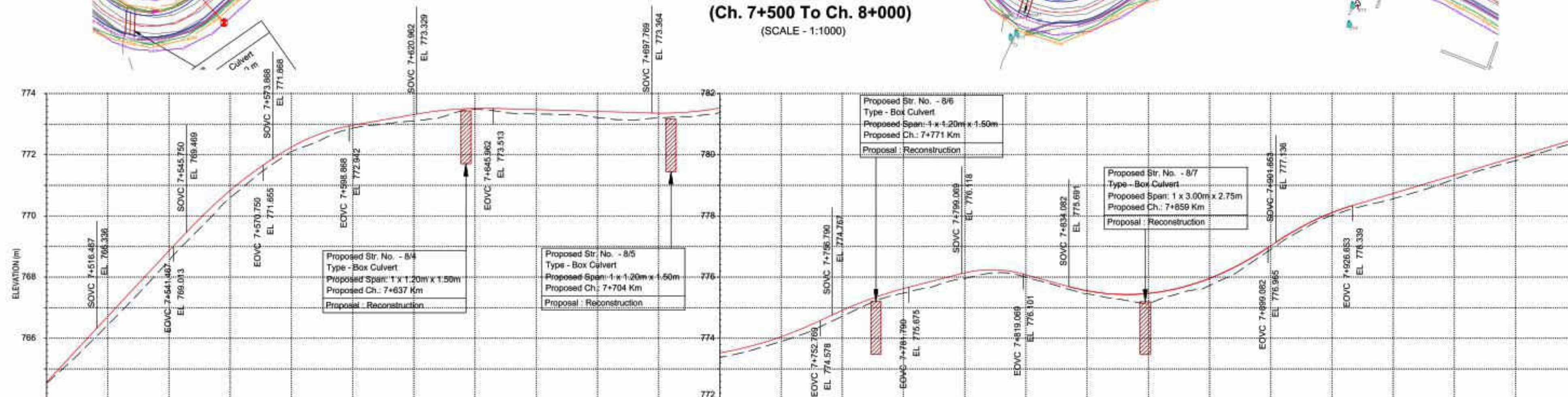
PROFILE
(SCALE - HOR 1:1000, VER 1:100)

NOTE:
1. All Dimensions are in Meter, unless noted otherwise.

CLIENT :			PROJECT :			DESIGN CONSULTANT :			DRAWING TITLE:-			REV.		
Roads & Bridges Department (Government of Sikkim)			Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim			LEA ASSOCIATES SOUTH ASIA PVT. LTD. B-1/E-27, Mohan Cooperative Industrial Estate, Mathura Road, New Delhi-110044			PLAN AND PROFILE E1 - RORATHANG TO RONGLI From Ch. 7+000 Km To Ch. 7+500 Km			R0		
BY									DRAWING No : 73806/LASA/HWY/E1/PP-315			A2		
DETAILS OF REVISION									DESIGN			AUG. 2022		
									CHECKED			S. ROY		
									REVIEWED			J. K. DAS		
									SCALE :			AS SHOWN		





PLAN
(Ch. 7+500 To Ch. 8+000)
(SCALE - 1:1000)

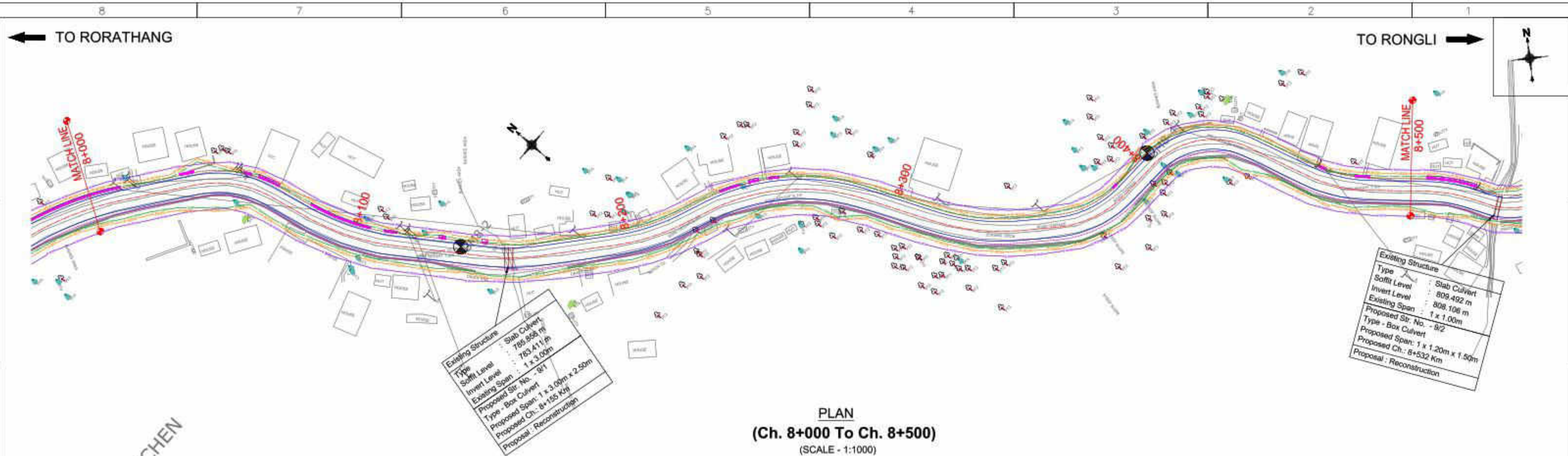


TCS TYPE																																																				
PROPOSED FINISHED ROAD LEVEL (FRL)	<div></div>																																																			
EXISTING GROUND LEVEL (EGL)	<div></div>																																																			
	764.529	764.564	766.430	766.716	768.543	768.856	770.592	770.833	772.100	772.249	772.867	772.962	773.089	773.312	773.485	773.515	773.332	773.472	773.215	773.415	773.203	773.369	773.372	773.525	773.897	774.052	774.720	774.913	775.480	775.627	775.957	775.140	776.001	775.076	776.454	775.555	775.149	775.468	775.728	775.959	776.910	777.026	778.015	778.108	778.562	778.737	779.203	779.333	779.803	779.929	780.350	780.505
HORIZONTAL SCHEMATIC DIAGRAM	<div></div>																																																			
VERTICAL SCHEMATIC DIAGRAM	<div></div>																																																			
SCHEMATIC SUPER-ELEVATION	<div></div>																																																			
DESIGN CHAINAGE (M)	7+500	7+520	7+540	7+560	7+580	7+600	7+620	7+640	7+660	7+680	7+700	7+720	7+740	7+760	7+780	7+800	7+820	7+840	7+860	7+880	7+900	7+920	7+940	7+960	7+980	8+000	8+020	8+040	8+060	8+080	8+100	8+120	8+140	8+160	8+180	8+200	8+220	8+240	8+260	8+280	8+300	8+320	8+340	8+360	8+380	8+400	8+420	8+440	8+460	8+480	8+500	

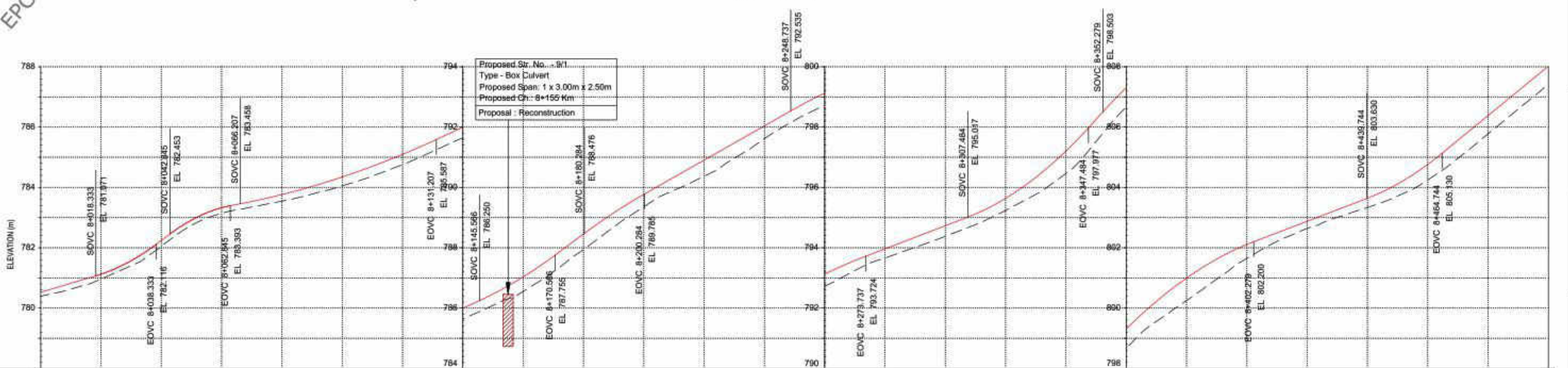
PROFILE
(SCALE - HOR 1:1000, VER 1:100)

NOTE:
1. All Dimensions are in Meter, unless noted otherwise

				CLIENT :  Roads & Bridges Department (Government of Sikkim)				PROJECT : Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim				DESIGN CONSULTANT :  LEA ASSOCIATES SOUTH ASIA PVT. LTD. B-1/E-27, Mohan Cooperative Industrial Estate, Mathura Road, New Delhi-110044				DRAWING TITLE:- PLAN AND PROFILE E1 - RORATHANG TO RONGLI From Ch. 7+500 Km To Ch. 8+000 Km				REV. R0	DRAWN A. DHAR	CHECKED S. ROY
																SHEET A2	DESIGN SOUMENDU	REVIEWED J. K. DAS				
REV	DATE	DETAILS OF REVISION		BY									DRAWING No : 73806/LASA/HWY/E1/PP-316				DATE AUG. 2022.	SCALE : AS SHOWN				



EPCHEN



TCS TYPE	PROPOSED FINISHED ROAD LEVEL (FRL)																			
EXISTING GROUND LEVEL (EGL)	EXISTING GROUND LEVEL (EGL)																			
HORIZONTAL SCHEMATIC DIAGRAM	HORIZONTAL SCHEMATIC DIAGRAM																			
VERTICAL SCHEMATIC DIAGRAM	VERTICAL SCHEMATIC DIAGRAM																			
SCHEMATIC SUPER-ELEVATION	SCHEMATIC SUPER-ELEVATION																			
DESIGN CHAINAGE (M)	DESIGN CHAINAGE (M)																			

CLIENT :

Roads & Bridges Department

(Government of Sikkim)

PROJECT :

Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim

DESIGN CONSULTANT :

LEA ASSOCIATES SOUTH ASIA PVT. LTD.

B-1/E-27, Mohan Cooperative Industrial Estate, Mathura Road, New Delhi-110044

DRAWING TITLE:-

PLAN AND PROFILE

E1 - RORATHANG TO RONGLI

From Ch. 8+000 Km To Ch. 8+500 Km

DRAWING No : 73806/LASA/HWY/E1/PP-317

REV. R0

SHEET A2

DRAWN A. DHAR

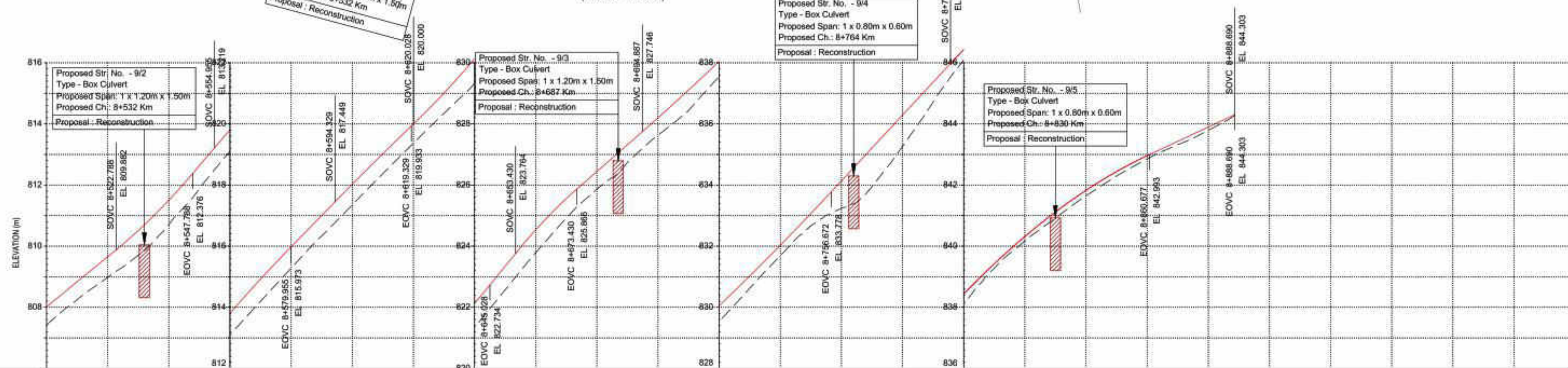
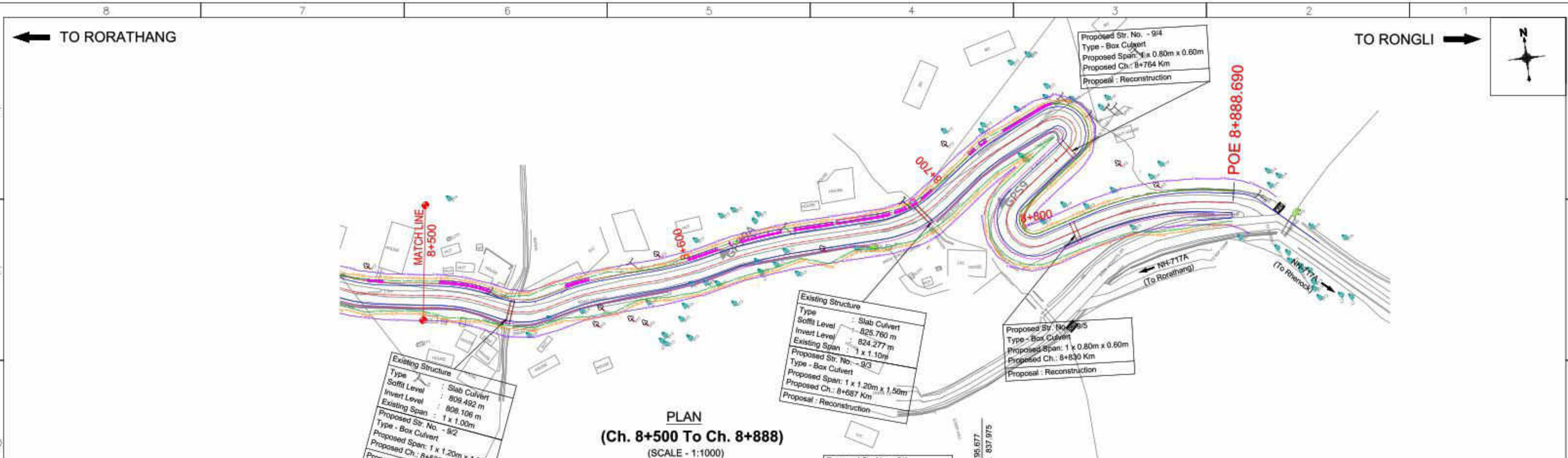
DESIGN SOUMENDU

DATE AUG. 2022

CHECKED S. ROY

REVIEWED J. K. DAS



SCALE : AS SHOWN



TCS TYPE																
PROPOSED FINISHED ROAD LEVEL (FRL)	<div> <div>808.016</div> <div>808.654</div> <div>811.503</div> <div>813.805</div> <div>815.979</div> <div>816.027</div> <div>819.997</div> <div>822.131</div> <div>824.532</div> <div>826.442</div> <div>828.198</div> <div>830.848</div> <div>832.028</div> <div>834.136</div> <div>836.288</div> <div>838.852</div> <div>840.316</div> <div>841.826</div> <div>842.961</div> <div>843.897</div> </div>															
EXISTING GROUND LEVEL (EGL)	<div> <div>807.429</div> <div>808.991</div> <div>810.704</div> <div>813.099</div> <div>815.281</div> <div>817.351</div> <div>819.369</div> <div>821.339</div> <div>823.789</div> <div>825.863</div> <div>827.629</div> <div>829.542</div> <div>831.687</div> <div>833.028</div> <div>835.271</div> <div>836.095</div> <div>840.172</div> <div>841.646</div> <div>842.853</div> <div>843.789</div> </div>															
HORIZONTAL SCHEMATIC DIAGRAM	<div> <div>80m</div> <div> <div>L = 7.155m</div> <div>L = 6.573m</div> <div>L = 19.156m</div> <div>L = 4.442m</div> <div>L = 30.674m</div> <div>L = 16.662m</div> <div>L = 20.892m</div> <div>L = 27.142m</div> <div>L = 18.603m</div> <div>L = 7.929m</div> </div> </div>															
VERTICAL SCHEMATIC DIAGRAM	<div> <div> <div>R = 55.999m</div> <div>25.000m VC K = 7</div> <div> <div>R = 25.999m</div> <div>11.77%</div> <div>25.000m VC K = -17</div> </div> <div> <div>R = 50.999m</div> <div>10.27%</div> <div>25.000m VC K = -38</div> </div> <div> <div>R = 140.999m</div> <div>9.91%</div> <div>25.000m VC K = 9</div> </div> <div> <div>2.29%</div> <div>20.000m VC K = -6</div> <div>8.76%</div> </div> <div> <div>R = 55.999m</div> <div>61.786m VC K = 31</div> </div> <div> <div>R = 6.599m</div> <div>10.76%</div> <div>65.000m VC K = -11</div> </div> <div> <div>R = 100.999m</div> <div>4.68%</div> </div> </div> </div>															
SCHEMATIC SUPER-ELEVATION	<div> <div> <div>7.00%</div> <div>7.00%</div> <div>7.00%</div> <div>7.00%</div> <div>7.00%</div> <div>7.00%</div> <div>7.00%</div> <div>7.00%</div> <div>7.00%</div> <div>7.00%</div> <div>7.00%</div> <div>7.00%</div> <div>7.00%</div> <div>7.00%</div> <div>7.00%</div> <div>7.00%</div> </div> </div>															
DESIGN CHAINAGE (M)	<div> <div>8+500</div> <div>8+520</div> <div>8+540</div> <div>8+560</div> <div>8+580</div> <div>8+600</div> <div>8+620</div> <div>8+640</div> <div>8+660</div> <div>8+680</div> <div>8+700</div> <div>8+720</div> <div>8+740</div> <div>8+760</div> <div>8+780</div> <div>8+800</div> <div>8+820</div> <div>8+840</div> <div>8+860</div> <div>8+880</div> </div>															

PROFILE
(SCALE - HOR 1:1000, VER 1:100)

NOTE:
1. All Dimensions are in Meter, unless noted otherwise

				<div></div> <div>CLIENT : Roads & Bridges Department (Government of Sikkim)</div>	<div>PROJECT : Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim</div>	<div>DESIGN CONSULTANT :  LEA ASSOCIATES SOUTH ASIA PVT. LTD. B-1/E-27, Mohan Cooperative Industrial Estate, Mathura Road, New Delhi-110044</div>	<div>DRAWING TITLE:- PLAN AND PROFILE E1 - RORATHANG TO RONGLI From Ch. 8+500 Km To Ch. 8+888 Km DRAWING No : 73606/LASA/HWY/E1/PP-318</div>	REV.	DRAWN	A. DHAR	CHECKED	S. ROY
	RO	DESIGN	SOLUMENDU					REVIEWED	J. K. DAS			
	SHEET	DATE	AUG. 2022					SCALE :	AS SHOWN			
	A2											
REV	DATE	DETAILS OF REVISION		BY								

DETAILED REPORT OF VERTICAL CURVE
ROAD NAME : RORATHANG TO RONGLI (E1)



Sl. No.	PVI Chainage (m)	Level of PVI (m)	Length of Curve (m)	Type of Curve	Grade IN (%)	Grade OUT (%)	Grade Difference (%)	K Value	Chainage		Level		Level of Road at PVI
									Start of Curve	End of Curve	Start of Curve	End of Curve	
1	0+045	571.127	20	Hog	13.8	7	6.8	2.94	0+035	0+055	569.748	571.831	570.957
2	0+095	574.641	20	Hog	7	4.4	2.6	7.69	0+085	0+105	573.937	575.081	574.576
3	0+138	576.509	25	Hog	4.4	-2.1	6.5	3.85	0+125	0+150	575.959	576.250	576.306
4	0+166	575.925	25	Sag	-2.1	0.8	2.9	8.62	0+153	0+178	576.184	576.020	576.016
5	0+194	576.144	25	Sag	0.8	2.3	1.5	16.67	0+182	0+207	576.049	576.436	576.191
6	0+223	576.817	25	Hog	2.3	1.8	0.5	50.00	0+211	0+236	576.526	577.046	576.801
7	0+266	577.593	40	Sag	1.8	3.5	1.7	23.53	0+246	0+286	577.226	578.302	577.678
8	0+318	579.461	25	Hog	3.5	0.3	3.2	7.81	0+306	0+331	579.018	579.493	579.361
9	0+349	579.539	30	Sag	0.3	3	2.7	11.11	0+334	0+364	579.501	579.996	579.640
10	0+437	582.219	80	Hog	3	-7.1	10.1	7.92	0+397	0+477	581.000	579.379	581.209
11	0+512	576.891	40	Sag	-7.1	-1	6.1	6.56	0+492	0+532	578.311	576.683	577.196
12	0+574	576.245	25	Hog	-1	-4.1	3.1	8.06	0+562	0+587	576.375	575.732	576.148
13	0+613	574.659	25	Sag	-4.1	0.6	4.7	5.32	0+600	0+625	575.171	574.735	574.806
14	0+645	574.855	25	Sag	0.6	1	0.4	62.50	0+633	0+658	574.779	574.986	574.868
15	0+713	575.566	30	Hog	1	-2.4	3.4	8.82	0+698	0+728	575.409	575.202	575.439
16	0+765	574.307	40	Hog	-2.4	-9.6	7.2	5.56	0+745	0+785	574.792	572.393	573.947
17	0+810	569.994	50	Sag	-9.6	-8.7	0.9	55.56	0+785	0+835	572.387	567.829	570.050
18	0+867	565.041	40	Sag	-8.7	-6.7	2	20.00	0+847	0+887	566.773	563.701	565.141
19	0+904	562.556	25	Hog	-6.7	-12.7	6	4.17	0+892	0+917	563.393	560.965	562.369
20	0+941	557.905	20	Sag	-12.7	0	12.7	1.57	0+931	0+951	559.178	557.905	558.223
21	1+052	557.905	20	Sag	0	5.1	5.1	3.92	1+042	1+062	557.905	558.420	558.033
22	1+093	560.033	30	Hog	5.1	0.2	4.9	6.12	1+078	1+108	559.262	560.062	559.849
23	1+144	560.131	45	Sag	0.2	8	7.8	5.77	1+121	1+166	560.088	561.936	560.570
24	1+217	566.012	45	Hog	8	0.2	7.8	5.77	1+195	1+240	564.208	566.067	565.573
25	1+263	566.124	20	Sag	0.2	7.7	7.5	2.67	1+253	1+273	566.100	566.891	566.312
26	1+286	567.851	20	Hog	7.7	5.1	2.6	7.69	1+276	1+296	567.085	568.365	567.786
27	1+319	569.555	35	Sag	5.1	8.4	3.3	10.61	1+302	1+337	568.656	571.017	569.699
28	1+359	572.905	35	Hog	8.4	4.8	3.6	9.72	1+342	1+377	571.443	573.752	572.748
29	1+402	574.964	35	Sag	4.8	8.4	3.6	9.72	1+384	1+419	574.117	576.428	575.122
30	1+454	579.356	65	Hog	8.4	1.3	7.1	9.15	1+422	1+487	576.637	579.785	578.779
31	1+529	580.342	70	Sag	1.3	7.7	6.4	10.94	1+494	1+564	579.881	583.029	580.902
32	1+618	587.182	35	Sag	7.7	11.3	3.6	9.72	1+601	1+636	585.839	589.156	587.340
33	1+648	590.515	20	Hog	11.3	8.6	2.7	7.41	1+638	1+658	589.387	591.374	590.448
34	1+685	593.737	20	Sag	8.6	9.8	1.2	16.67	1+675	1+695	592.878	594.721	593.767
35	1+729	597.993	20	Hog	9.8	5.2	4.6	4.35	1+719	1+739	597.010	598.516	597.878
36	1+775	600.419	20	Hog	5.2	1.9	3.3	6.06	1+765	1+785	599.896	600.609	600.337
37	1+797	600.844	20	Sag	1.9	3.7	1.8	11.11	1+787	1+807	600.654	601.210	600.889
38	1+821	601.699	20	Hog	3.7	2.7	1	20.00	1+811	1+831	601.333	601.973	601.674
39	1+846	602.401	30	Sag	2.7	9.2	6.5	4.62	1+831	1+861	601.990	603.784	602.645
40	1+883	605.812	25	Hog	9.2	0.8	8.4	2.98	1+871	1+896	604.660	605.912	605.550
41	1+955	606.383	25	Sag	0.8	5.3	4.5	5.56	1+942	1+967	606.283	607.051	606.524
42	1+994	608.507	30	Hog	5.3	2.7	2.6	11.54	1+979	2+009	607.705	608.908	608.410
43	2+053	610.072	30	Hog	2.7	2.1	0.6	50.00	2+038	2+068	609.671	610.385	610.050
44	2+098	611.013	25	Hog	2.1	0.6	1.5	16.67	2+085	2+110	610.751	611.094	610.966
45	2+151	611.355	55	Sag	0.6	4.4	3.8	14.47	2+123	2+178	611.177	612.552	611.616

Sl. No.	PVI Chainage (m)	Level of PVI (m)	Length of Curve (m)	Type of Curve	Grade IN (%)	Grade OUT (%)	Grade Difference (%)	K Value	Chainage		Level		Level of Road at PVI
									Start of Curve	End of Curve	Start of Curve	End of Curve	
46	2+197	613.382	25	Hog	4.4	2	2.4	10.42	2+185	2+210	612.837	613.628	613.307
47	2+236	614.139	20	Hog	2	1.3	0.7	28.57	2+226	2+246	613.943	614.272	614.122
48	2+256	614.402	15	Sag	1.3	2.2	0.9	16.67	2+248	2+263	614.302	614.568	614.419
49	2+294	615.253	40	Sag	2.2	4.7	2.5	16.00	2+274	2+314	614.810	616.202	615.378
50	2+355	618.120	50	Hog	4.7	2.1	2.6	19.23	2+330	2+380	616.934	618.654	617.958
51	2+433	619.795	70	Sag	2.1	9.1	7	10.00	2+398	2+468	619.047	622.966	620.408
52	2+483	624.290	20	Hog	9.1	5.1	4	5.00	2+473	2+493	623.384	624.800	624.190
53	2+518	626.099	25	Sag	5.1	8.7	3.6	6.94	2+506	2+531	625.462	627.181	626.212
54	2+555	629.295	30	Hog	8.7	5.8	2.9	10.34	2+540	2+570	627.997	630.166	629.186
55	2+583	630.935	20	Hog	5.8	-0.2	6	3.33	2+573	2+593	630.354	630.912	630.785
56	2+604	630.889	20	Sag	-0.2	1.1	1.3	15.38	2+594	2+614	630.912	630.999	630.922
57	2+624	631.111	20	Hog	1.1	-0.5	1.6	12.50	2+614	2+634	631.001	631.059	631.071
58	2+687	630.784	50	Sag	-0.5	1.8	2.3	21.74	2+662	2+712	630.914	631.221	630.928
59	2+769	632.224	80	Sag	1.8	4.9	3.1	25.81	2+729	2+809	631.524	634.170	632.534
60	2+840	635.677	50	Sag	4.9	5.8	0.9	55.56	2+815	2+865	634.461	637.129	635.733
61	2+896	638.918	20	Sag	5.8	6.9	1.1	18.18	2+886	2+906	638.337	639.612	638.946
62	2+944	641.994	20	Hog	6.1	5.3	0.8	25.00	2+934	2+954	641.381	642.526	641.974
63	2+971	643.409	20	Sag	5.3	11.5	6.2	3.23	2+961	2+981	642.877	644.560	643.564
64	3+004	647.188	25	Hog	11.5	0.1	11.4	2.19	2+991	3+016	645.749	647.195	646.832
65	3+027	647.200	20	Sag	0.1	6.4	6.3	3.17	3+017	3+037	647.195	647.836	647.358
66	3+055	648.977	20	Sag	6.4	7.9	1.5	13.33	3+045	3+065	648.340	649.768	649.015
67	3+079	650.908	20	Hog	7.9	5.3	2.6	7.69	3+069	3+089	650.117	651.443	650.843
68	3+116	652.874	20	Sag	5.3	7.4	2.1	9.52	3+106	3+126	652.340	653.619	652.927
69	3+171	656.964	55	Sag	7.4	13	5.6	9.82	3+143	3+198	654.917	660.550	657.349
70	3+241	666.118	20	Hog	13	8.7	4.3	4.65	3+231	3+251	664.814	666.987	666.011
71	3+261	667.890	20	Sag	8.7	9.4	0.7	28.57	3+251	3+271	667.022	668.832	667.908
72	3+284	670.046	20	Hog	9.4	5.6	3.8	5.26	3+274	3+294	669.104	670.611	669.951
73	3+381	675.481	40	Sag	5.6	9.1	3.5	11.43	3+361	3+401	674.352	677.303	675.656
74	3+433	680.268	20	Hog	9.1	2.9	6.2	3.23	3+423	3+443	679.357	680.561	680.113
75	3+494	682.058	35	Hog	2.9	1.6	1.3	26.92	3+477	3+512	681.544	682.334	682.001
76	3+555	683.022	70	Sag	1.6	8	6.4	10.94	3+520	3+590	682.471	685.829	683.582
77	3+613	687.637	25	Hog	8	4.3	3.7	6.76	3+600	3+625	686.635	688.175	687.521
78	3+668	689.987	25	Sag	4.3	7.2	2.9	8.62	3+655	3+680	689.450	690.882	690.078
79	3+756	696.323	20	Hog	7.2	2	5.2	3.85	3+746	3+766	695.607	696.522	696.193
80	3+818	697.547	85	Sag	2	7.7	5.7	14.91	3+775	3+860	696.703	700.812	698.153
81	3+900	703.903	20	Sag	7.7	11.8	4.1	4.88	3+890	3+910	703.134	705.081	704.006
82	3+922	706.433	20	Hog	11.8	10.6	1.2	16.67	3+912	3+932	705.255	707.493	706.403
83	3+957	710.182	35	Sag	10.6	12.3	1.7	20.59	3+940	3+975	708.327	712.343	710.256
84	4+009	716.587	35	Hog	12.3	1.6	10.7	3.27	3+992	4+027	714.426	716.860	716.119
85	4+179	719.249	25	Sag	1.6	2.3	0.7	35.71	4+167	4+192	719.053	719.540	719.271
86	4+296	721.965	40	Hog	2.3	-2.2	4.5	8.89	4+276	4+316	721.499	721.523	721.740
87	4+379	720.126	115	Sag	-2.2	1.4	3.6	31.94	4+322	4+437	721.396	720.904	720.644
88	4+491	721.638	55	Sag	1.4	9.6	8.2	6.71	4+464	4+519	721.267	724.282	722.202
89	4+583	730.478	90	Hog	9.6	-2.7	12.3	7.32	4+538	4+628	726.152	729.252	729.094
90	4+663	728.292	45	Sag	-2.7	4.4	7.1	6.34	4+641	4+686	728.905	729.284	728.691



DETAILED REPORT OF VERTICAL CURVE
ROAD NAME : RORATHANG TO RONGLI (E1)

Sl. No.	PVI Chainage (m)	Level of PVI (m)	Length of Curve (m)	Type of Curve	Grade IN (%)	Grade OUT (%)	Grade Difference (%)	K Value	Chainage		Level		Level of Road at PVI
									Start of Curve	End of Curve	Start of Curve	End of Curve	
91	4+713	730.483	45	Hog	4.4	0.8	3.6	12.50	4+690	4+735	729.491	730.673	730.281
92	4+796	731.180	40	Sag	0.8	5	4.2	9.52	4+776	4+816	731.011	732.173	731.390
93	4+841	733.416	20	Hog	5	1.5	3.5	5.71	4+831	4+851	732.920	733.567	733.329
94	4+866	733.793	20	Sag	1.5	3	1.5	13.33	4+856	4+876	733.642	734.089	733.831
95	4+889	734.485	20	Hog	3	-1.7	4.7	4.26	4+879	4+899	734.189	734.314	734.368
96	4+935	733.694	50	Sag	-1.7	6.3	8	6.25	4+910	4+960	734.120	735.265	734.194
97	4+990	737.131	20	Hog	6.3	3.6	2.7	7.41	4+980	5+000	736.503	737.489	737.064
98	5+020	738.199	20	Sag	3.6	5.2	1.6	12.50	5+010	5+030	737.841	738.721	738.239
99	5+047	739.605	20	Hog	5.2	3.5	1.7	11.76	5+037	5+057	739.083	739.953	739.563
100	5+069	740.385	20	Sag	3.5	10.8	7.3	2.74	5+059	5+079	740.036	741.465	740.568
101	5+125	746.437	20	Hog	10.8	7.5	3.3	6.06	5+115	5+135	745.357	747.183	746.355
102	5+200	751.984	65	Hog	7.5	-10.6	18.1	3.59	5+167	5+232	749.559	748.545	750.513
103	5+287	742.719	35	Sag	-10.6	0	10.6	3.30	5+270	5+305	744.571	742.723	743.183
104	5+365	742.736	20	Hog	0	-8.6	8.6	2.33	5+355	5+375	742.734	741.878	742.521
105	5+389	740.637	20	Sag	-8.6	-5.5	3.1	6.45	5+379	5+399	741.496	740.085	740.715
106	5+441	737.775	70	Sag	-5.5	9.3	14.8	4.73	5+406	5+476	739.709	741.029	739.070
107	5+538	746.786	55	Hog	9.3	-1.7	11	5.00	5+510	5+565	744.229	746.331	746.030
108	5+581	746.077	20	Sag	-1.7	1.6	3.3	6.06	5+571	5+591	746.242	746.237	746.160
109	5+647	747.131	20	Hog	1.6	0	1.6	12.50	5+637	5+657	746.970	747.133	747.091
110	5+670	747.136	20	Sag	0	6.2	6.2	3.23	5+660	5+680	747.133	747.757	747.291
111	5+690	748.384	20	Hog	6.2	-1.6	7.8	2.56	5+680	5+700	747.763	748.225	748.189
112	5+748	747.454	70	Sag	-1.6	1.6	3.2	21.88	5+713	5+783	748.009	748.013	747.734
113	5+841	748.933	80	Hog	1.6	-3.7	5.3	15.09	5+801	5+881	748.294	747.450	748.403
114	5+936	745.407	55	Hog	-3.7	-8.1	4.4	12.50	5+909	5+964	746.426	743.187	745.105
115	5+996	740.547	30	Sag	-8.1	-0.8	7.3	4.11	5+981	6+011	741.758	740.428	740.821
116	6+043	740.174	25	Hog	-0.8	-6.6	5.8	4.31	6+031	6+056	740.274	739.350	739.993
117	6+073	738.225	25	Sag	-6.6	-2.6	4	6.25	6+060	6+085	739.049	737.901	738.350
118	6+138	736.537	25	Hog	-2.6	-4.8	2.2	11.36	6+126	6+151	736.860	735.943	736.468
119	6+192	733.962	60	Sag	-4.8	0.6	5.4	11.11	6+162	6+222	735.387	734.147	734.367
120	6+253	734.335	30	Hog	0.6	-1.8	2.4	12.50	6+238	6+268	734.242	734.069	734.245
121	6+330	732.968	20	Sag	-1.8	1.5	3.3	6.06	6+320	6+340	733.145	733.122	733.051
122	6+351	733.301	20	Hog	1.5	-0.7	2.2	9.09	6+341	6+361	733.147	733.228	733.246
123	6+399	732.951	20	Hog	-0.7	-3.8	3.1	6.45	6+389	6+409	733.024	732.573	732.874
124	6+438	731.485	35	Sag	-3.8	-0.4	3.4	10.29	6+421	6+456	732.147	731.408	731.634
125	6+476	731.317	20	Hog	-0.4	-4.4	4	5.00	6+466	6+486	731.361	730.878	731.217
126	6+509	729.870	25	Sag	-4.4	-3.1	1.3	19.23	6+497	6+522	730.419	729.486	729.911
127	6+564	728.202	20	Sag	-3.1	1.8	4.9	4.08	6+554	6+574	728.509	728.378	728.325
128	6+594	728.731	20	Hog	1.8	-0.9	2.7	7.24	6+584	6+603	728.558	728.642	728.665
129	6+653	728.190	20	Hog	-0.9	-3.3	2.4	8.33	6+643	6+663	728.281	727.861	728.130
130	6+703	726.541	25	Sag	-3.3	-1.1	2.2	11.36	6+691	6+716	726.951	726.398	726.610
131	6+763	725.864	25	Hog	-1.1	-11.9	10.8	2.31	6+750	6+775	726.007	724.372	725.527
132	6+792	722.343	30	Sag	-11.9	-0.1	11.8	2.54	6+777	6+807	724.134	722.333	722.786
133	6+854	722.301	20	Hog	-0.1	-1.9	1.8	11.11	6+844	6+864	722.308	722.109	722.256
134	6+879	721.832	20	Sag	-1.9	0.2	2.1	9.52	6+869	6+889	722.024	721.852	721.885
135	6+992	722.056	50	Sag	0.2	11.4	11.2	4.46	6+967	7+017	722.007	724.914	722.756

Sl. No.	PVI Chainage (m)	Level of PVI (m)	Length of Curve (m)	Type of Curve	Grade IN (%)	Grade OUT (%)	Grade Difference (%)	K Value	Chainage		Level		Level of Road at PVI
									Start of Curve	End of Curve	Start of Curve	End of Curve	
136	7+046	728.207	20	Hog	11.4	5	6.4	3.13	7+036	7+056	727.064	728.709	728.047
137	7+080	729.902	20	Sag	5	6.2	1.2	16.67	7+070	7+090	729.400	730.521	729.932
138	7+112	731.894	20	Hog	6.2	1.7	4.5	4.44	7+100	7+123	731.187	732.092	731.782
139	7+167	732.860	20	Sag	1.7	13.3	11.6	1.72	7+157	7+177	732.687	734.195	733.150
140	7+201	737.403	25	Hog	13.3	10.1	3.2	7.81	7+189	7+214	735.734	738.668	737.303
141	7+229	740.193	25	Hog	10.1	5.9	4.2	5.95	7+217	7+242	738.928	740.931	740.062
142	7+260	742.021	20	Sag	5.9	8.4	2.5	8.00	7+249	7+271	741.376	742.941	742.084
143	7+345	749.162	65	Sag	8.4	13.5	5.1	12.75	7+312	7+377	746.427	753.534	749.576
144	7+398	756.299	20	Hog	13.5	9.2	4.3	4.65	7+388	7+408	754.953	757.214	756.192
145	7+452	761.275	20	Hog	9.2	1.9	7.3	2.74	7+442	7+462	760.360	761.468	761.093
146	7+473	761.676	20	Sag	1.9	10.8	8.9	2.25	7+463	7+483	761.484	762.752	761.899
147	7+529	767.681	25	Hog	10.8	10.7	0.1	250.00	7+516	7+541	766.336	769.013	767.678
148	7+558	770.800	25	Hog	10.7	6.8	3.9	6.41	7+546	7+571	769.469	771.655	770.678
149	7+586	772.723	25	Hog	6.8	1.8	5	5.00	7+574	7+599	771.868	772.942	772.567
150	7+633	773.548	25	Hog	1.8	-0.3	2.1	11.90	7+621	7+646	773.329	773.513	773.482
151	7+725	773.285	55	Sag	-0.3	4.7	5	11.00	7+698	7+753	773.364	774.578	773.629
152	7+769	775.354	25	Hog	4.7	2.6	2.1	11.90	7+757	7+782	774.767	775.675	775.288
153	7+809	776.374	20	Hog	2.6	-2.7	5.3	3.77	7+799	7+819	776.118	776.101	776.242
154	7+867	774.804	65	Sag	-2.7	6.6	9.3	6.99	7+834	7+899	775.691	776.965	775.560
155	7+914	777.967	25	Hog	6.6	3	3.6	6.94	7+902	7+927	777.136	778.339	777.855
156	8+028	781.369	20	Sag	3	7.5	4.5	4.44	8+018	8+038	781.071	782.116	781.482
157	8+053	783.201	20	Hog	7.5	1.9	5.6	3.57	8+043	8+063	782.453	783.393	783.061
158	8+099	784.085	65	Sag	1.9	4.6	2.7	24.07	8+066	8+131	783.458	785.587	784.304
159	8+158	786.828	25	Sag	4.6	7.4	2.8	8.93	8+146	8+171	786.250	787.755	786.916
160	8+190	789.217	20	Hog	7.4	5.7	1.7	11.76	8+180	8+200	788.476	789.785	789.175
161	8+261	793.245	25	Hog	5.7	3.8	1.9	13.16	8+249	8+274	792.535	793.724	793.186
162	8+327	795.784	40	Sag	3.8	11	7.2	5.56	8+307	8+347	795.017	797.977	796.144
163	8+377	801.245	50	Hog	11	3.8	7.2	6.94	8+352	8+402	798.503	802.200	800.795
164	8+452	804.107	25	Sag	3.8	8.2	4.4	5.68	8+440	8+465	803.630	805.130	804.245
165	8+535	810.905	25	Sag	8.2	11.8	3.6	6.94	8+523	8+548	809.882	812.376	811.018
166	8+567	814.690	25	Hog	11.8	10.3	1.5	16.67	8+555	8+580	813.219	815.973	814.643
167	8+607	818.732	25	Hog	10.3	9.6	0.7	35.71	8+594	8+619	817.449	819.933	818.710
168	8+633	821.201	25	Sag	9.6	12.3	2.7	9.26	8+620	8+645	820.000	822.734	821.285
169	8+663	824.990	20	Hog	12.3	8.8	3.5	5.71	8+653	8+673	823.764	825.866	824.903
170	8+726	830.453	60	Sag	8.8	10.8	2	30.00	8+695	8+757	827.746	833.778	830.603
171	8+828	841.473	65	Hog	10.8	4.7	6.1	10.66	8+796	8+861	837.975	842.993	840.977

					 <div>CLIENT : Roads & Bridges Department (Government of Sikkim)</div>	<div>PROJECT : Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim</div>	<div><div>DESIGN CONSULTANT : LEA ASSOCIATES SOUTH ASIA PVT. LTD. B-1/E-27, Mohan Cooperative Industrial Estate, Mathura Road, New Delhi-110044</div></div>	<div>DRAWING TITLE:- DETAILED REPORT OF VERTICAL CURVE E1 - RORATHANG TO RONGLI (SH. 2 OF 2)</div> <div>DRAWING No : 73806/LASA/HWY/E1/VC-401</div>	REV. R0	DRAWN	A. DHAR	CHECKED	S. ROY
									SHEET	DESIGN	SOU MENDU	REVIEWED	J. K. DAS
REV	DATE	DETAILS OF REVISION	BY						A2	DATE	AUG. 2022	SCALE :	



ROAD NAME : RORATHANG TO RONGLI (E1)

				CLIENT :  Roads & Bridges Department (Government of Sikkim)	PROJECT : Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim	DESIGN CONSULTANT :  LEA ASSOCIATES SOUTH ASIA PVT. LTD. B-1/E-27, Mohan Cooperative Industrial Estate, Mathura Road, New Delhi-110044	DRAWING TITLE:- DETAILED REPORT OF HORIZONTAL CURVE E1 - RORATHANG TO RONGLI (SH. 1 OF 5)	REV. R0	DRAWN A. DHAR	CHECKED S. ROY	
								SHEET A2	DESIGN SOLUMENDU	REVIEWED J. K. DAS	
REV 	DATE 	DETAILS OF REVISION 	BY 					DRAWING No : 73806/LASA/HWY/E1/HG-411	DATE AUG. 2022	SCALE :	

DETAILED REPORT OF HORIZONTAL CURVE

ROAD NAME : RORATHANG TO RONGLI (E1)



Curve No.	Chainage (m)					HIP Detail		Design Speed (Kmph)	Radius (m)	Δc			Deflection Angle (Radian)	Deflection Angle (Deg)	Δs	Δs	Δc	Δc	Ls (m)	Shift(s) (m)	Es (m)	Ts (m)	Lc (m)	e (%)	Hand of Arc
	TS	PC/SC	HIP	PT/CS	ST	Northing	Eastng			D	M	S			(Radian)	(Deg)	(Radian)	(Deg)							
41		1+755	1+767	1+776		3009575.282	662371.196	20	20	60	9	38.663	1.050003	60.1607397	0	0	1.050003	60.161	0	0	3.113	11.584	21.000	7.0	Right
42		1+789	1+795	1+801		3009561.493	662397.754	20	100	6	40	58.402	0.116638	6.68288944	0	0	0.116638	6.6829	0	0	0.170	5.839	11.664	7.0	Left
43		1+818	1+834	1+848		3009547.631	662434.337	20	35	49	18	2.581	0.86046	49.3007169	0	0	0.86046	49.301	0	0	3.509	16.061	30.116	7.0	Right
44		1+867	1+872	1+876		3009510.314	662447.879	20	70	7	27	25.038	0.130148	7.456955	0	0	0.130148	7.457	0	0	0.148	4.562	9.110	7.0	Left
45		1+882	1+891	1+898		3009493.240	662456.730	20	15	59	14	26.324	1.033944	59.2406456	0	0	1.033944	59.241	0	0	2.255	8.528	15.509	7.0	Left
46		1+942	1+951	1+959		3009489.611	662518.610	20	15	63	45	17.481	1.112732	63.7548558	0	0	1.112732	63.755	0	0	2.664	9.328	16.691	7.0	Left
47		1+965	1+969	1+973		3009506.714	662528.326	20	65	6	55	18.107	0.120806	6.92169639	0	0	0.120806	6.9217	0	0	0.119	3.931	7.852	7.0	Right
48		1+978	1+997	2+016		3009529.453	662545.166	20	95	22	27	20.994	0.391928	22.4558317	0	0	0.391928	22.456	0	0	1.854	18.859	37.233	7.0	Left
49		2+021	2+047	2+071		3009577.915	662557.310	20	85	33	36	4.941	0.586455	33.6013725	0	0	0.586455	33.601	0	0	3.790	25.664	49.849	7.0	Right
50	2089.864	2+110	2+124	2+138	2158.273	3009632.678	662614.154	20	95	17	8	1.483	0.509567	29.1960146	0.105263	6.0311	0.29904	17.134	20	0.17544	3.350	34.788	28.409	7.0	Left
51		2+194	2+207	2+218		3009710.305	662642.412	20	35	40	10	22.906	0.701152	40.1730294	0	0	0.701152	40.173	0	0	2.267	12.799	24.540	7.0	Right
52		2+248	2+278	2+304		3009747.833	662704.004	20	65	48	54	22.114	0.853573	48.9061428	0	0	0.853573	48.906	0	0	6.405	29.558	55.482	7.0	Left
53		2+315	2+331	2+346		3009803.718	662713.597	20	190	9	22	53.012	0.163736	9.38139222	0	0	0.163736	9.3814	0	0	0.639	15.590	31.110	7.0	Right
54		2+362	2+390	2+417		3009859.399	662732.902	20	285	11	1	26.901	0.192408	11.0241392	0	0	0.192408	11.024	0	0	1.324	27.503	54.836	7.0	Left
55		2+426	2+436	2+447		3009905.706	662739.490	20	80	15	2	9.534	0.262427	15.0359817	0	0	0.262427	15.036	0	0	0.694	10.558	20.994	7.0	Left
56		2+476	2+496	2+513		3009965.326	662732.234	20	35	60	32	9.096	1.05655	60.53586	0	0	1.05655	60.536	0	0	5.524	20.426	36.979	7.0	Right
57		2+565	2+581	2+595		3010017.744	662803.325	20	65	26	35	25.769	0.464092	26.5904914	0	0	0.464092	26.59	0	0	1.790	15.360	30.166	7.0	Right
58		2+619	2+637	2+654		3010027.385	662859.066	20	160	12	18	52.461	0.21493	12.3145725	0	0	0.21493	12.315	0	0	0.928	17.261	34.389	7.0	Left
59		2+676	2+682	2+689		3010044.698	662901.844	20	65	11	24	33.968	0.199132	11.4094356	0	0	0.199132	11.409	0	0	0.324	6.493	12.944	7.0	Right
60		2+716	2+726	2+736		3010052.790	662944.400	20	310	3	36	59.377	0.06312	3.61649361	0	0	0.06312	3.6165	0	0	0.154	9.787	19.567	7.0	Left
61		2+770	2+784	2+799		3010067.243	663000.962	20	115	14	28	51.945	0.252743	14.4810958	0	0	0.252743	14.481	0	0	0.924	14.611	29.065	7.0	Left
62		2+846	2+852	2+859		3010100.154	663060.788	20	115	6	48	15.024	0.118755	6.80417333	0	0	0.118755	6.8042	0	0	0.203	6.836	13.657	7.0	Right
63		2+878	2+894	2+910		3010115.867	663099.659	20	65	28	54	35.950	0.504574	28.9099861	0	0	0.504574	28.91	0	0	2.125	16.756	32.797	7.0	Left
64		2+948	2+951	2+953		3010160.027	663135.520	20	170	1	28	9.911	0.025646	1.46941972	0	0	0.025646	1.4694	0	0	0.014	2.180	4.360	7.0	Left
65		2+961	2+966	2+970		3010172.177	663144.880	20	35	14	36	19.321	0.254912	14.6053669	0	0	0.254912	14.605	0	0	0.286	4.485	8.922	7.0	Right
66		2+976	2+978	2+981		3010179.942	663154.895	20	35	8	45	12.813	0.152778	8.75355917	0	0	0.152778	8.7536	0	0	0.102	2.679	5.347	7.0	Left
67		3+006	3+017	3+027		3010207.860	663181.352	20	35	35	20	30.850	0.616833	35.3419028	0	0	0.616833	35.342	0	0	1.733	11.150	21.589	7.0	Left
68		3+063	3+071	3+078		3010261.739	663189.039	20	65	13	51	12.570	0.241789	13.8534917	0	0	0.241789	13.853	0	0	0.478	7.897	15.716	7.0	Right
69		3+106	3+119	3+131		3010306.560	663207.123	20	50	28	55	42.282	0.504896	28.9284117	0	0	0.504896	28.928	0	0	1.637	12.898	25.245	7.0	Right
70		3+181	3+187	3+192		3010349.663	663260.164	20	25	24	29	23.333	0.427428	24.4898147	0	0	0.427428	24.49	0	0	0.582	5.426	10.686	7.0	Left
71		3+211	3+243	3+249		3010400.195	663285.261	20	18	120	35	43.071	2.104785	120.595298	0	0	2.104785	120.6	0	0	18.327	31.554	37.886	7.0	Right
72		3+259	3+284	3+305		3010344.599	663321.356	20	50	52	34	29.291	0.917603	52.5748031	0	0	0.917603	52.575	0	0	5.767	24.698	45.880	7.0	Right
73		3+334	3+355	3+372		3010274.697	663296.490	20	40	53	54	48.766	0.940969	53.9135461	0	0	0.940969	53.914	0	0	4.876	20.343	37.639	7.0	Left
74		3+386	3+393	3+400		3010240.410	663319.907	20	160	5	0	48.129	0.0875	5.01336917	0	0	0.0875	5.0134	0	0	0.153	7.004	14.000	7.0	Left
75		3+431	3+447	3+463		3010198.822	663354.002	20	100	18	16	18.563	0.318903	18.2718231	0	0	0.318903	18.272	0	0	1.285	16.082	31.890	7.0	Right
76		3+512	3+535	3+557		3010116.214	663385.834	20	85	30	20	33.070	0.529577	30.3425194	0	0	0.529577	30.343	0	0	3.069	23.048	45.014	7.0	Left
77		3+592	3+606	3+619		3010071.696	663441.632	20	200	7	37	16.417	0.133016	7.62122694	0	0	0.133016	7.6212	0	0	0.443	13.321	26.603	7.0	Right
78		3+699	3+714	3+727		3009993.526	663516.581	20	40	39	43	4.286	0.693207	39.7178572	0	0	0.693207	39.718	0	0	2.529	14.447	27.728	7.0	Left
79		3+768	3+787	3+804		3009985.164	663590.113	20	65	32	4	24.104	0.559786	32.0733622	0	0	0.559786	32.073	0	0	2.632	18.683	36.386	7.0	Left
80		3+831	3+848	3+863		3010012.067	663646.298	20	50	36	43	31.603	0.64098	36.7254453	0	0	0.64098	36.725	0	0	2.683	16.597	32.049	7.0	Right

REV		DATE	DETAILS OF REVISION	BY	CLIENT :		PROJECT :		DESIGN CONSULTANT :		DRAWING TITLE:-		REV.	DRAWN	A. DHAR	CHECKED	S. ROY.
					 Roads & Bridges Department (Government of Sikkim)		Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim		 LEA ASSOCIATES SOUTH ASIA PVT. LTD. B-1/E-27, Mohan Cooperative Industrial Estate, Mathura Road, New Delhi-110044		DETAILED REPORT OF HORIZONTAL CURVE E1 - RORATHANG TO RONGLI (SH. 2 OF 5) DRAWING No : 73806/LASA/HWY/E1/HC-411		R0	DESIGN	SOURMENDU	REVIEWED	J. K. DAS
													A2	DATE	AUG. 2022	SCALE :	

DETAILED REPORT OF HORIZONTAL CURVE

ROAD NAME : RORATHANG TO RONGLI (E1)



Curve No.	Chainage (m)					HIP Detail		Design Speed (Kmph)	Radius (m)	Δc			Deflection Angle (Radian)	Deflection Angle (Deg)	Δs	Δs	Δc	Δc	Ls (m)	Shift(s) (m)	Es (m)	Ts (m)	Lc (m)	e (%)	Hand of Arc
	TS	PC/SC	HIP	PT/CS	ST	Northing	Eastng			D	M	S			(Radian)	(Deg)	(Radian)	(Deg)							
81		3+890	3+899	3+907		3010002.064	663697.098	20	70	14	35	20.061	0.254624	14.5889058	0	0	0.254624	14.589	0	0	0.571	8.960	17.824	7.0	Left
82		3+921	3+932	3+941		3010004.070	663730.380	20	25	45	45	18.170	0.798576	45.7550472	0	0	0.798576	45.755	0	0	2.134	10.549	19.964	7.0	Right
83		3+975	3+979	3+982		3009971.803	663765.834	20	220	1	43	45.468	0.030182	1.72929667	0	0	0.030182	1.7293	0	0	0.025	3.320	6.640	7.0	Right
84		3+996	4+013	4+027		3009948.203	663790.243	20	35	51	23	8.700	0.896851	51.38575	0	0	0.896851	51.386	0	0	3.840	16.839	31.390	7.0	Left
85		4+031	4+035	4+039		3009951.367	663814.768	20	35	14	12	30.405	0.247984	14.2084458	0	0	0.247984	14.208	0	0	0.271	4.362	8.679	7.0	Right
86		4+110	4+118	4+125		3009941.493	663896.870	20	40	21	35	34.441	0.376867	21.5929003	0	0	0.376867	21.593	0	0	0.721	7.628	15.075	7.0	Left
87		4+166	4+177	4+187		3009956.698	663954.683	20	25	48	14	17.599	0.841916	48.2382219	0	0	0.841916	48.238	0	0	2.391	11.193	21.048	7.0	Right
88		4+202	4+216	4+229		3009934.682	663987.942	20	55	28	41	21.139	0.500721	28.6892053	0	0	0.500721	28.689	0	0	1.770	14.065	27.540	7.0	Left
89		4+258	4+261	4+264		3009930.846	664033.494	20	175	2	12	1.144	0.038403	2.20031778	0	0	0.038403	2.2003	0	0	0.032	3.361	6.720	7.0	Right
90		4+289	4+309	4+323		3009924.931	664081.571	20	25	79	17	55.380	1.384024	79.2987167	0	0	1.384024	79.299	0	0	7.469	20.718	34.601	7.0	Left
91		4+354	4+369	4+382		3009987.967	664101.707	20	35	46	34	56.304	0.813015	46.5823067	0	0	0.813015	46.582	0	0	3.105	15.067	28.456	7.0	Right
92		4+410	4+424	4+436		3010012.562	664152.806	20	35	42	42	40.366	0.745451	42.7112128	0	0	0.745451	42.711	0	0	2.580	13.685	26.091	7.0	Left
93		4+470	4+479	4+488		3010065.086	664173.587	20	65	15	17	54.608	0.267009	15.2985022	0	0	0.267009	15.299	0	0	0.584	8.730	17.356	7.0	Right
94		4+503	4+509	4+516		3010089.553	664191.947	20	130	6	4	42.314	0.106088	6.07842056	0	0	0.106088	6.0784	0	0	0.183	6.902	13.791	7.0	Left
95		4+531	4+562	4+575		3010134.335	664218.649	20	25	100	46	30.256	1.758857	100.775071	0	0	1.758857	100.78	0	0	14.210	30.206	43.971	7.0	Right
96		4+594	4+601	4+608		3010096.977	664260.754	20	35	23	36	49.836	0.412139	23.6138433	0	0	0.412139	23.614	0	0	0.757	7.316	14.425	7.0	Right
97		4+614	4+640	4+659		3010061.467	664277.165	20	35	73	27	57.302	1.282222	73.4659172	0	0	1.282222	73.466	0	0	8.672	26.120	44.878	7.0	Left
98		4+689	4+702	4+715		3010071.430	664345.704	20	80	19	7	39.716	0.333841	19.1276989	0	0	0.333841	19.128	0	0	1.128	13.479	26.707	7.0	Right
99		4+721	4+738	4+753		3010064.698	664380.803	20	55	33	53	8.538	0.591417	33.885705	0	0	0.591417	33.886	0	0	2.496	16.755	32.528	7.0	Left
100		4+760	4+777	4+793		3010080.288	664417.480	20	130	14	21	18.209	0.250543	14.3550581	0	0	0.250543	14.355	0	0	1.027	16.371	32.571	7.0	Left
101		4+826	4+843	4+858		3010120.860	664470.578	20	35	52	31	0.279	0.91659	52.5167442	0	0	0.91659	52.517	0	0	4.027	17.266	32.081	7.0	Right
102		4+871	4+877	4+883		3010111.410	664505.523	20	100	7	12	51.742	0.125915	7.21437278	0	0	0.125915	7.2144	0	0	0.199	6.304	12.591	7.0	Right
103		4+899	4+903	4+908		3010101.448	664529.756	20	185	2	51	3.329	0.049758	2.85092472	0	0	0.049758	2.8509	0	0	0.057	4.604	9.205	7.0	Left
104		4+929	4+947	4+960		3010086.768	664571.217	20	25	72	29	26.351	1.265201	72.4906531	0	0	1.265201	72.491	0	0	5.998	18.328	31.630	7.0	Left
105		4+991	5+007	5+018		3010138.643	664610.316	20	20	76	14	19.284	1.330616	76.23869	0	0	1.330616	76.239	0	0	5.422	15.693	26.612	7.0	Left
106		5+036	5+055	5+070		3010179.422	664577.019	20	35	55	44	43.112	0.972939	55.7453089	0	0	0.972939	55.745	0	0	4.593	18.510	34.053	7.0	Right
107		5+079	5+097	5+114		3010222.673	664589.841	20	70	28	29	20.911	0.497229	28.4891419	0	0	0.497229	28.489	0	0	2.220	17.771	34.806	7.0	Right
108		5+164	5+178	5+191		3010280.436	664647.607	20	40	38	28	47.022	0.671598	38.4797283	0	0	0.671598	38.48	0	0	2.366	13.961	26.864	7.0	Left
109		5+212	5+231	5+243		3010334.455	664653.783	20	20	88	17	18.570	1.540925	88.2884917	0	0	1.540925	88.288	0	0	7.871	19.411	30.818	7.0	Right
110		5+264	5+271	5+278		3010330.468	664701.152	20	55	15	12	26.705	0.26542	15.2074181	0	0	0.26542	15.207	0	0	0.488	7.342	14.598	7.0	Left
111		5+291	5+296	5+301		3010334.994	664725.818	20	25	23	39	14.932	0.412843	23.6541478	0	0	0.412843	23.654	0	0	0.542	5.235	10.321	7.0	Left
112		5+312	5+324	5+334		3010350.711	664749.076	20	25	48	50	11.020	0.852356	48.8363944	0	0	0.852356	48.836	0	0	2.456	11.350	21.309	7.0	Right
113		5+346	5+357	5+369		3010341.762	664782.981	20	100	13	6	42.111	0.228842	13.1116975	0	0	0.228842	13.112	0	0	0.658	11.492	22.884	7.0	Right
114		5+400	5+406	5+413		3010318.781	664826.391	20	100	7	4	25.371	0.12346	7.07371417	0	0	0.12346	7.0737	0	0	0.191	6.181	12.346	7.0	Left
115		5+416	5+435	5+453		3010308.795	664852.648	20	500	4	15	41.223	0.074376	4.26145083	0	0	0.074376	4.2615	0	0	0.346	18.603	37.188	0.4	Right
116		5+484	5+503	5+521		3010279.559	664915.104	20	50	41	38	2.123	0.726649	41.6339231	0	0	0.726649	41.634	0	0	3.492	19.010	36.332	7.0	Left
117		5+539	5+547	5+554		3010292.423	664958.395	20	20	42	14	17.037	0.737193	42.2380658	0	0	0.737193	42.238	0	0	1.440	7.725	14.744	7.0	Right
118		5+565	5+570	5+575		3010282.221	664979.603	20	100	5	48	13.122	0.101293	5.803645	0	0	0.101293	5.8036	0	0	0.128	5.069	10.129	7.0	Left
119		5+598	5+616	5+633		3010266.440	665023.233	20	50	40	57	24.781	0.714832	40.9568836	0	0	0.714832	40.957	0	0	3.373	18.673	35.742	7.0	Right
120		5+655	5+679	5+686		3010210.400	665054.499	20	16	111	21	56.225	1.943697	111.365618	0	0	1.943697	111.37	0	0	12.380	23.440	31.099	7.0	Left

				 CLIENT : Roads & Bridges Department (Government of Sikkim)	PROJECT : Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim	 DESIGN CONSULTANT : LEA ASSOCIATES SOUTH ASIA PVT. LTD. B-1/E-27, Mohan Cooperative Industrial Estate, Mathura Road, New Delhi-110044	DRAWING TITLE:- DETAILED REPORT OF HORIZONTAL CURVE E1 - RORATHANG TO RONGLI (SH. 3 OF 5) DRAWING No. : 73806/LEA/SHWY/E1/HC-411	REV.	DRAWN	A. DHAR	CHECKED	S. ROY		
REV	DATE	DETAILS OF REVISION	BY											

DETAILED REPORT OF HORIZONTAL CURVE

ROAD NAME : RORATHANG TO RONGLI (E1)



Curve No.	Chainage (m)					HIP Detail		Design Speed (Kmph)	Radius (m)	Δc			Deflection Angle (Radian)	Deflection Angle (Deg)	Δs	Δs	Δc	Δc	Ls (m)	Shift(s) (m)	Es (m)	Ts (m)	Lc (m)	e (%)	Hand of Arc
	TS	PC/SC	HIP	PT/CS	ST	Northing	Eastng			D	M	S			(Radian)	(Deg)	(Radian)	(Deg)							
121		5+718	5+726	5+734		3010259.007	665094.534	20	110	8	42	58.832	0.152129	8.71634222	0	0	0.152129	8.7163	0	0	0.319	8.383	16.734	7.0	Left
122		5+752	5+765	5+778		3010292.614	665114.537	20	110	13	9	55.268	0.229779	13.1653522	0	0	0.229779	13.165	0	0	0.730	12.694	25.276	7.0	Right
123		5+791	5+795	5+798		3010314.105	665135.236	20	50	8	17	41.109	0.144771	8.2947525	0	0	0.144771	8.2948	0	0	0.131	3.626	7.239	7.0	Right
124		5+817	5+826	5+834		3010333.071	665159.704	20	40	23	34	11.040	0.411369	23.5697333	0	0	0.411369	23.57	0	0	0.861	8.345	16.455	7.0	Left
125		5+850	5+863	5+873		3010365.733	665177.550	20	20	65	16	53.327	1.139377	65.2814797	0	0	1.139377	65.281	0	0	3.751	12.811	22.788	7.0	Right
126		5+886	5+891	5+896		3010363.592	665208.707	20	55	10	18	43.271	0.179979	10.3120197	0	0	0.179979	10.312	0	0	0.223	4.963	9.899	7.0	Left
127		5+908	5+922	5+935		3010367.081	665239.916	20	35	43	43	5.750	0.763028	43.7182639	0	0	0.763028	43.718	0	0	2.711	14.041	26.706	7.0	Right
128		5+955	5+972	5+987		3010336.099	665280.529	20	35	51	8	51.088	0.892693	51.1475244	0	0	0.892693	51.148	0	0	3.801	16.749	31.244	7.0	Left
129		6+002	6+007	6+013		3010345.026	665316.848	20	140	4	21	25.394	0.076045	4.35705389	0	0	0.076045	4.3571	0	0	0.101	5.326	10.646	7.0	Left
130		6+027	6+041	6+054		3010355.454	665348.626	20	55	27	59	16.960	0.488484	27.9880444	0	0	0.488484	27.988	0	0	1.682	13.707	26.867	7.0	Right
131		6+059	6+073	6+087		3010349.846	665381.021	20	80	20	15	24.199	0.353546	20.2567219	0	0	0.353546	20.257	0	0	1.266	14.291	28.284	7.0	Left
132		6+097	6+109	6+121		3010356.458	665416.926	20	80	17	9	43.541	0.299535	17.1620947	0	0	0.299535	17.162	0	0	0.906	12.072	23.963	7.0	Left
133		6+165	6+183	6+201		3010390.648	665482.333	20	320	6	28	26.054	0.112991	6.47390389	0	0	0.112991	6.4739	0	0	0.511	18.098	36.157	7.0	Right
134		6+242	6+245	6+249		3010413.182	665540.663	20	65	6	37	41.747	0.115685	6.62826306	0	0	0.115685	6.6283	0	0	0.109	3.764	7.520	7.0	Right
135		6+257	6+286	6+314		3010423.364	665580.045	20	95	34	10	5.913	0.596349	34.1683092	0	0	0.596349	34.168	0	0	4.385	29.197	56.653	7.0	Left
136		6+316	6+327	6+338		3010455.550	665608.358	20	65	19	16	8.061	0.336306	19.2689058	0	0	0.336306	19.269	0	0	0.930	11.034	21.860	7.0	Left
137		6+347	6+355	6+363		3010481.593	665618.916	20	25	36	33	41.382	0.638118	36.561495	0	0	0.638118	36.561	0	0	1.329	8.259	15.953	7.0	Right
138		6+375	6+393	6+409		3010501.653	665651.818	20	50	39	6	10.557	0.682475	39.1029325	0	0	0.682475	39.103	0	0	3.059	17.756	34.124	7.0	Right
139		6+428	6+438	6+448		3010495.403	665697.853	20	85	13	17	19.283	0.231931	13.2886897	0	0	0.231931	13.289	0	0	0.575	9.902	19.714	7.0	Left
140		6+474	6+490	6+505		3010500.471	665749.953	20	40	44	2	45.420	0.768747	44.04595	0	0	0.768747	44.046	0	0	3.148	16.180	30.750	7.0	Right
141		6+515	6+525	6+534		3010478.158	665778.015	20	220	4	47	46.368	0.08371	4.79621333	0	0	0.08371	4.7962	0	0	0.193	9.213	18.416	7.0	Right
142		6+543	6+579	6+608		3010440.803	665817.674	20	60	62	19	53.066	1.087888	62.3314072	0	0	1.087888	62.331	0	0	10.120	36.288	65.273	7.0	Left
143		6+625	6+638	6+651		3010462.497	665880.517	20	145	10	13	51.857	0.178566	10.2310714	0	0	0.178566	10.231	0	0	0.580	12.981	25.892	7.0	Right
144		6+664	6+675	6+686		3010468.130	665916.838	20	40	31	55	51.016	0.557298	31.9308378	0	0	0.557298	31.931	0	0	1.605	11.444	22.292	7.0	Left
145		6+698	6+704	6+709		3010487.267	665939.051	20	85	7	39	20.711	0.133618	7.65575306	0	0	0.133618	7.6558	0	0	0.190	5.687	11.358	7.0	Right
146		6+727	6+737	6+746		3010505.343	665966.791	20	25	42	17	55.293	0.738251	42.2986925	0	0	0.738251	42.299	0	0	1.806	9.671	18.456	7.0	Left
147		6+766	6+792	6+801		3010559.882	665981.009	20	18	110	16	49.840	1.924758	110.280511	0	0	1.924758	110.28	0	0	13.492	25.841	34.646	7.0	Right
148		6+805	6+809	6+813		3010540.593	666008.667	20	35	11	58	36.257	0.209034	11.9767381	0	0	0.209034	11.977	0	0	0.192	3.671	7.316	7.0	Right
149		6+827	6+841	6+851		3010517.490	666030.309	20	20	68	7	53.928	1.189122	68.1316467	0	0	1.189122	68.132	0	0	4.143	13.524	23.782	7.0	Left
150		6+861	6+866	6+871		3010527.842	666056.910	20	50	10	53	16.660	0.190031	10.8879611	0	0	0.190031	10.888	0	0	0.227	4.765	9.502	7.0	Right
151		6+916	6+935	6+950		3010540.338	666125.168	20	30	64	14	51.223	1.121331	64.2475619	0	0	1.121331	64.248	0	0	5.423	18.836	33.640	7.0	Right
152		6+972	6+985	6+997		3010497.017	666156.790	20	50	28	23	53.371	0.495641	28.3981586	0	0	0.495641	28.398	0	0	1.576	12.651	24.782	7.0	Left
153		7+025	7+048	7+071		3010469.547	666214.446	20	160	16	19	50.974	0.285027	16.3308261	0	0	0.285027	16.331	0	0	1.639	22.958	45.604	7.0	Left
154		7+105	7+112	7+119		3010459.326	666277.951	20	25	30	21	2.956	0.529722	30.3508211	0	0	0.529722	30.351	0	0	0.903	6.781	13.243	7.0	Right
155		7+140	7+153	7+165		3010432.897	666310.017	20	25	57	11	5.049	0.998062	57.1847358	0	0	0.998062	57.185	0	0	3.472	13.626	24.952	7.0	Left
156		7+189	7+194	7+199		3010445.904	666350.798	20	35	15	50	24.812	0.276464	15.8402256	0	0	0.276464	15.84	0	0	0.337	4.869	9.676	7.0	Right
157		7+221	7+228	7+234		3010446.997	666384.646	20	35	20	43	8.169	0.361614	20.7189358	0	0	0.361614	20.719	0	0	0.580	6.398	12.656	7.0	Left
158		7+246	7+250	7+255		3010455.778	666405.772	20	35	15	13	54.704	0.265846	15.2318622	0	0	0.265846	15.232	0	0	0.311	4.680	9.305	7.0	Right
159		7+271	7+281	7+290		3010459.647	666435.819	20	35	31	36	13.020	0.551587	31.6036167	0	0	0.551587	31.604	0	0	1.375	9.905	19.306	7.0	Right
160		7+307	7+340	7+372		3010435.213	666490.016	20	280	13	16	9.049	0.231591	13.2691803	0	0	0.231591	13.269	0	0	1.888	32.568	64.845	7.0	Left

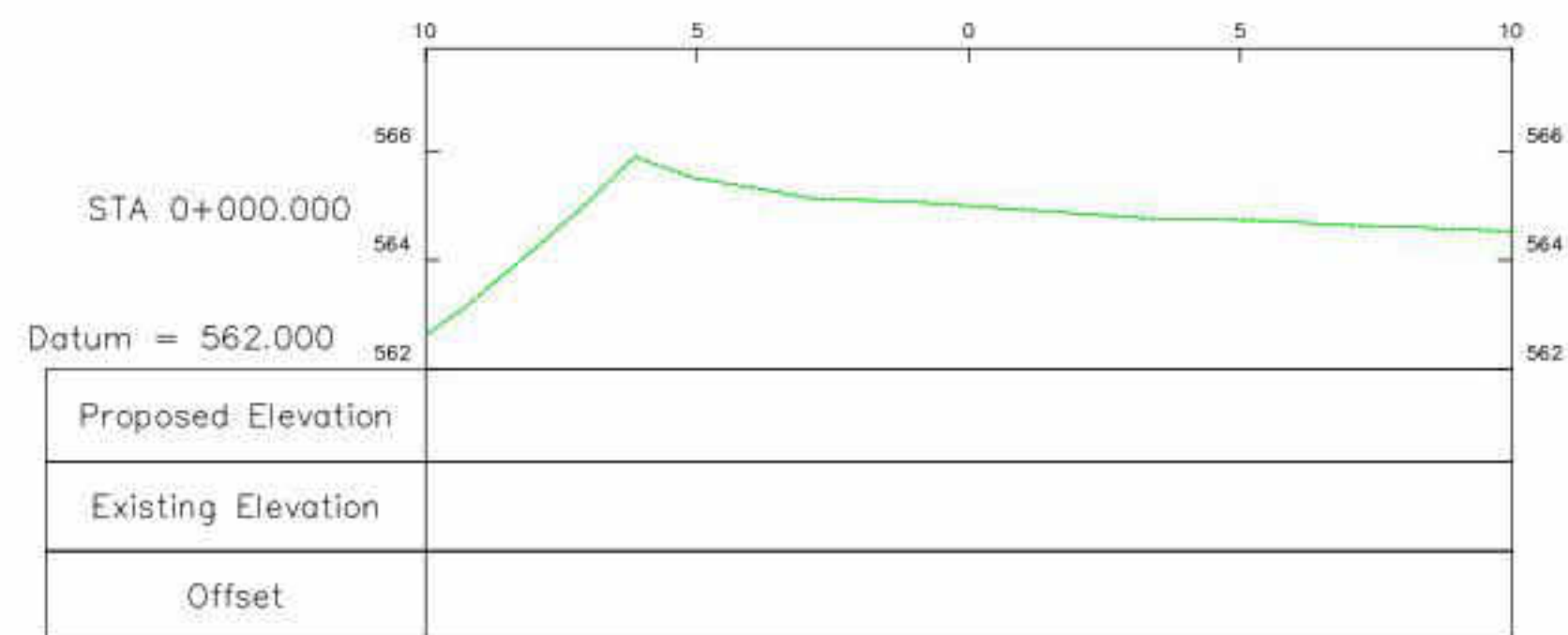
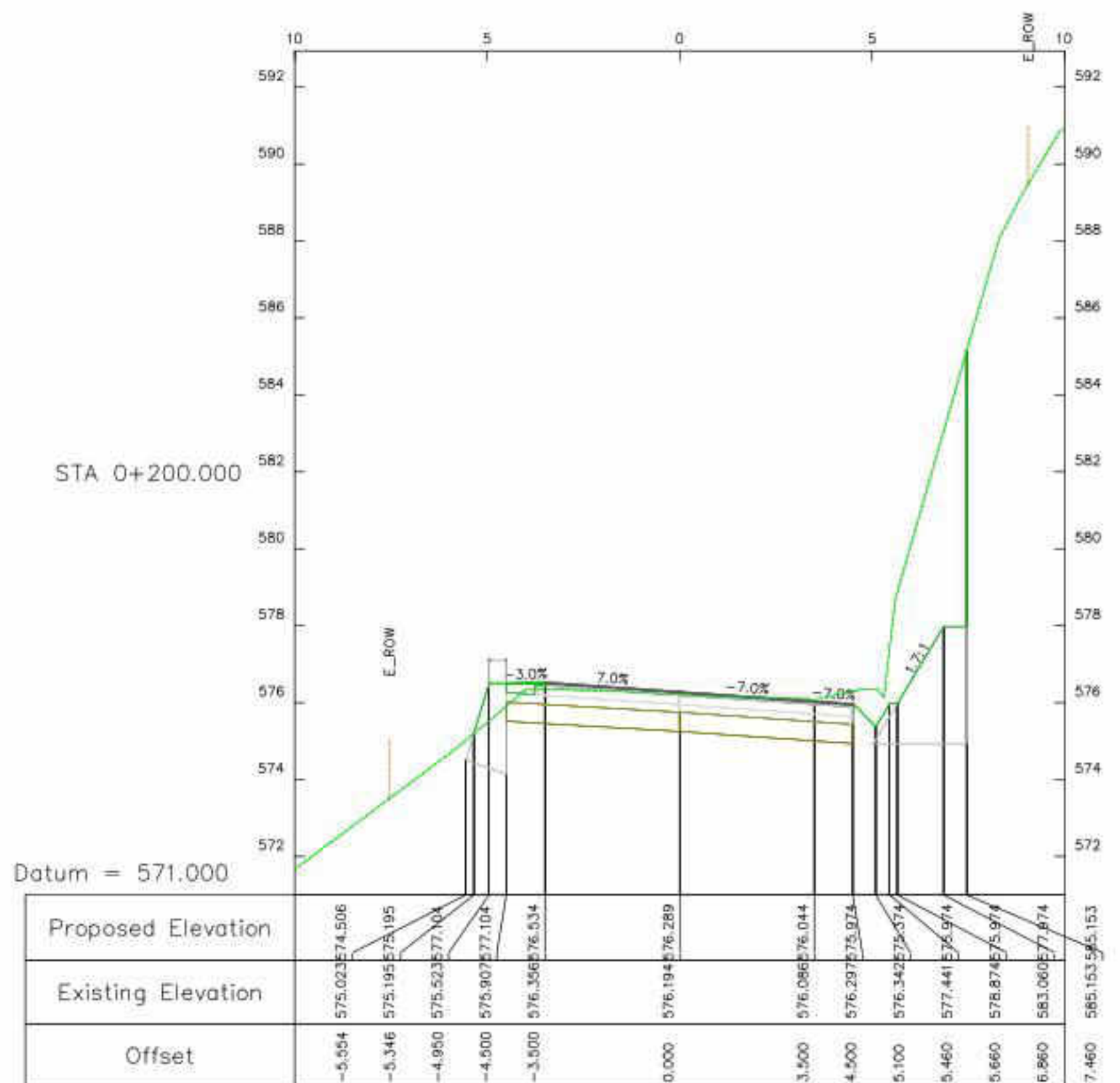
REV	DATE	DETAILS OF REVISION	BY	 CLIENT : Roads & Bridges Department (Government of Sikkim)	PROJECT : Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim	DESIGN CONSULTANT :  LEA ASSOCIATES SOUTH ASIA PVT. LTD. B-1/E-27, Mohan Cooperative Industrial Estate, Mathura Road, New Delhi-110044	DRAWING TITLE:- DETAILED REPORT OF HORIZONTAL CURVE E1 - RORATHANG TO RONGLI (SH. 4 OF 5)	DRAWING No. : 73806/LEA/SHWY/E1/HC-411	REV.	DRAWN	A. DHAR	CHECKED	S. ROY
									R0	DESIGN	SOURMENDU	REVIEWED	J. K. DAS
									A2	DATE	AUG. 2022	SCALE :	



DETAILED REPORT OF HORIZONTAL CURVE

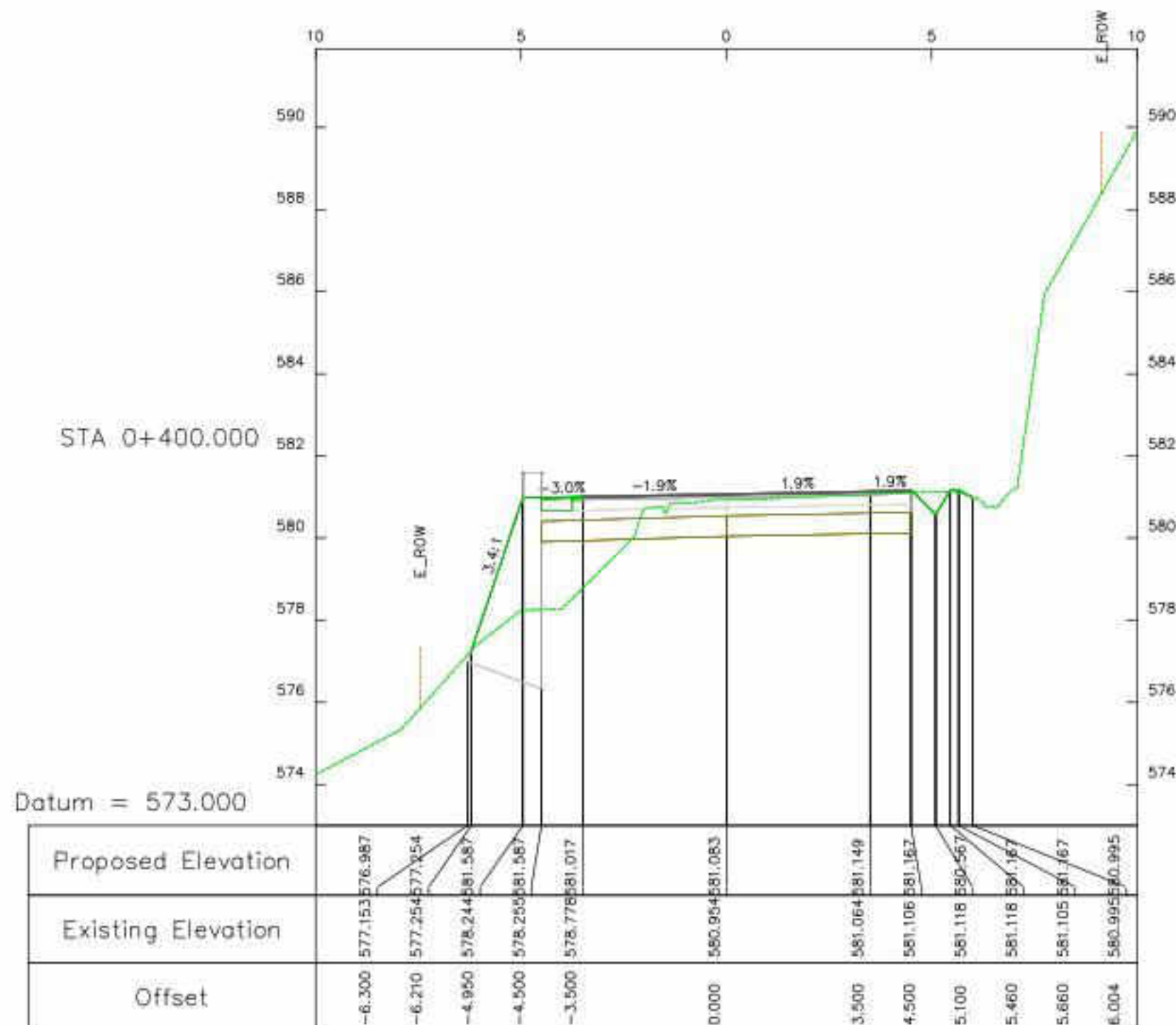
ROAD NAME : RORATHANG TO RONGLI (E1)



Curve No.	Chainage (m)					HIP Detail		Design Speed (Kmph)	Radius (m)	Δ _c			Deflection Angle (Radian)	Deflection Angle (Deg)	Δ _S	Δ _S	Δ _C	Δ _C	Ls (m)	Shift(s) (m)	Es (m)	Ts (m)	Lc (m)	e (%)	Hand of Arc
	TS	PC/SC	HIP	PT/CS	ST	Northing	Easting			D	M	S			(Radian)	(Deg)	(Radian)	(Deg)							
161		7+376	7+407	7+428		3010422.340	666556.261	20	40	75	0	57.924	1.309278	75.01609	0	0	1.309278	75.016	0	0	10.424	30.702	52.371	7.0	Right
162		7+446	7+490	7+499		3010330.608	666562.654	20	25	120	30	20.839	2.103223	120.505789	0	0	2.103223	120.51	0	0	25.386	43.746	52.581	7.0	Left
163		7+523	7+541	7+559		3010379.429	666633.709	20	140	14	37	53.297	0.255367	14.6314714	0	0	0.255367	14.631	0	0	1.149	17.973	35.751	7.0	Left
164		7+575	7+596	7+615		3010420.828	666669.540	20	60	38	4	23.353	0.664502	38.0731536	0	0	0.664502	38.073	0	0	3.471	20.703	39.870	7.0	Right
165		7+617	7+636	7+650		3010428.896	666710.852	20	25	74	52	9.611	1.306716	74.8693364	0	0	1.306716	74.869	0	0	6.484	19.138	32.668	7.0	Right
166		7+683	7+695	7+705		3010370.941	666739.346	20	25	50	1	33.182	0.873116	50.0258839	0	0	0.873116	50.026	0	0	2.587	11.665	21.828	7.0	Left
167		7+713	7+731	7+749		3010361.972	666775.879	20	65	31	14	37.997	0.545309	31.2438881	0	0	0.545309	31.244	0	0	2.493	18.175	35.445	7.0	Left
168		7+771	7+807	7+824		3010385.082	666849.394	20	30	100	49	20.588	1.759683	100.822386	0	0	1.759683	100.82	0	0	17.076	36.278	52.790	7.0	Right
169		7+837	7+872	7+885		3010300.858	666859.181	20	25	108	50	42.094	1.899704	108.845026	0	0	1.899704	108.85	0	0	17.970	34.949	47.493	7.0	Left
170		7+912	7+924	7+935		3010332.610	666925.829	20	35	37	4	11.062	0.646989	37.0697394	0	0	0.646989	37.07	0	0	1.915	11.735	22.645	7.0	Right
171		7+961	7+987	8+011		3010319.806	666988.225	20	110	26	4	2.935	0.454963	26.0674819	0	0	0.454963	26.067	0	0	2.909	25.464	50.046	7.0	Right
172		8+038	8+053	8+067		3010278.778	667041.378	20	40	41	24	28.074	0.722702	41.4077983	0	0	0.722702	41.408	0	0	2.762	15.118	28.908	7.0	Right
173		8+080	8+098	8+115		3010233.400	667050.140	20	85	23	9	28.593	0.404182	23.1579425	0	0	0.404182	23.158	0	0	1.766	17.415	34.355	7.0	Left
174		8+147	8+158	8+168		3010183.425	667083.959	20	80	14	37	46.913	0.255336	14.6296981	0	0	0.255336	14.63	0	0	0.656	10.269	20.427	7.0	Left
175		8+194	8+208	8+221		3010150.343	667121.636	20	80	18	54	24.584	0.329986	18.9068289	0	0	0.329986	18.907	0	0	1.101	13.321	26.399	7.0	Left
176		8+230	8+261	8+288		3010130.091	667170.829	20	75	44	47	38.407	0.781803	44.7940019	0	0	0.781803	44.794	0	0	6.119	30.908	58.635	7.0	Right
177		8+314	8+330	8+346		3010063.298	667198.946	20	80	22	46	38.176	0.397538	22.7772711	0	0	0.397538	22.777	0	0	1.607	16.114	31.803	7.0	Left
178		8+358	8+374	8+388		3010032.434	667230.470	20	40	41	37	20.531	0.726447	41.6223697	0	0	0.726447	41.622	0	0	2.792	15.204	29.058	7.0	Left
179		8+401	8+423	8+439		3010029.977	667281.243	20	30	72	18	47.121	1.262101	72.3130892	0	0	1.262101	72.313	0	0	7.156	21.922	37.863	7.0	Right
180		8+462	8+474	8+485		3009975.239	667295.823	20	55	24	36	45.304	0.429571	24.6125844	0	0	0.429571	24.613	0	0	1.294	11.998	23.626	7.0	Left
181		8+506	8+514	8+522		3009943.877	667321.702	20	55	16	33	21.613	0.288957	16.5560036	0	0	0.288957	16.556	0	0	0.579	8.002	15.893	7.0	Right
182		8+529	8+538	8+546		3009921.836	667331.045	20	25	38	42	45.956	0.675665	38.7127656	0	0	0.675665	38.713	0	0	1.498	8.783	16.892	7.0	Left
183		8+553	8+560	8+568		3009910.910	667351.324	20	80	10	57	57.933	0.191394	10.9660925	0	0	0.191394	10.966	0	0	0.368	7.679	15.312	7.0	Right
184		8+587	8+597	8+607		3009887.570	667379.859	20	115	9	58	6.276	0.173982	9.96841	0	0	0.173982	9.9684	0	0	0.437	10.029	20.008	7.0	Left
185		8+612	8+625	8+639		3009873.679	667404.600	20	140	11	20	32.518	0.197962	11.3423661	0	0	0.197962	11.342	0	0	0.689	13.903	27.715	7.0	Right
186		8+670	8+683	8+694		3009836.419	667447.988	20	40	35	0	21.921	0.610972	35.0060892	0	0	0.610972	35.006	0	0	1.942	12.614	24.439	7.0	Left
187		8+711	8+717	8+723		3009832.943	667483.124	20	55	12	31	0.271	0.218458	12.5167419	0	0	0.218458	12.517	0	0	0.330	6.032	12.015	7.0	Right
188		8+744	8+806	8+763		3009805.143	667567.849	20	6.5	168	4	37.172	2.933497	168.076992	0	0	2.933497	168.08	0	0	56.084	62.246	19.068	10.0	Right
189		8+790	8+847	8+818		3009821.016	667422.751	20	10	159	57	9.981	2.791703	159.952773	0	0	2.791703	159.95	0	0	47.453	56.576	27.917	10.0	Left
190		8+837	8+859	8+881		3009777.796	667510.238	20	100	25	15	9.698	0.440743	25.2526939	0	0	0.440743	25.253	0	0	2.478	22.401	44.074	7.0	Right

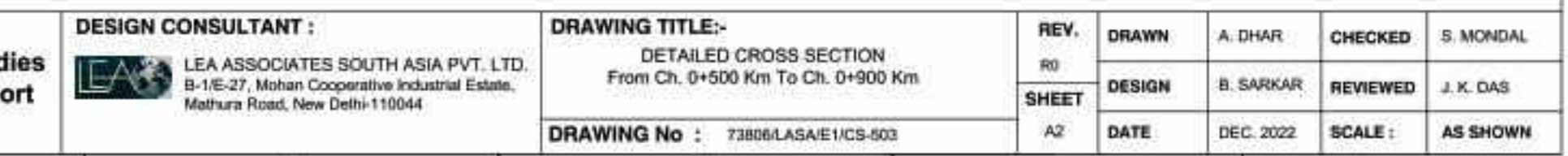
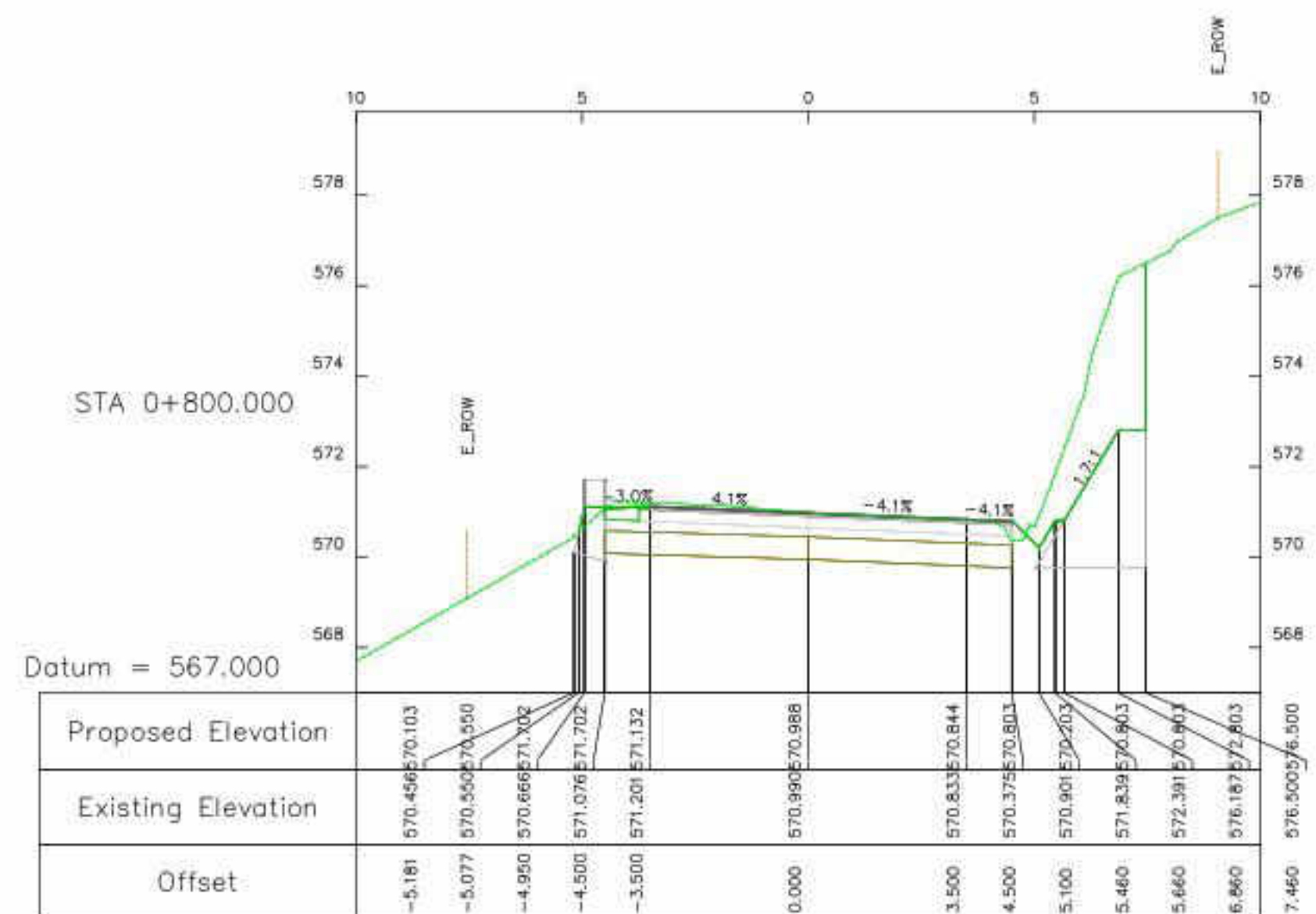
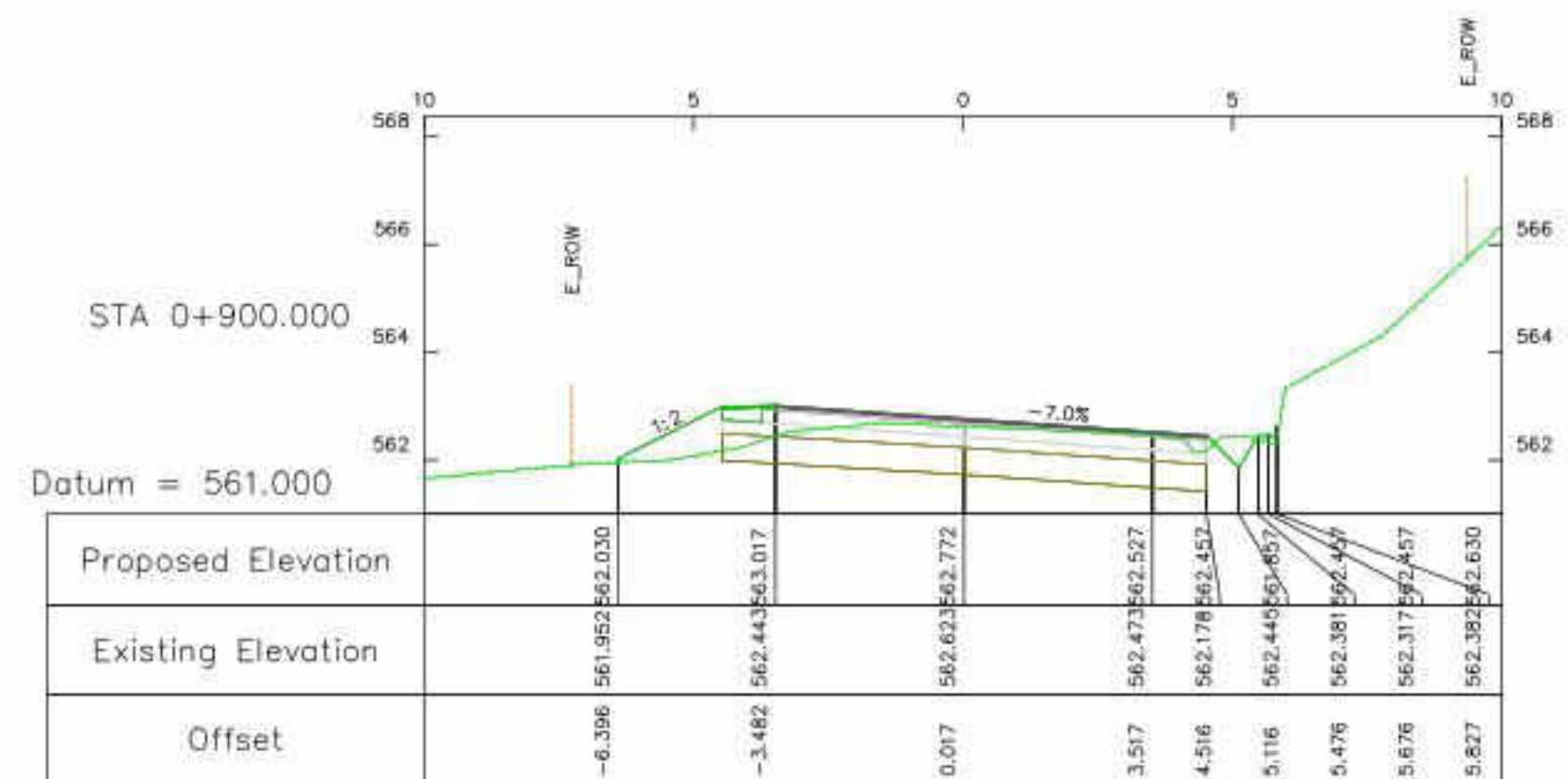
REV		DATE	DETAILS OF REVISION	BY	CLIENT :		PROJECT :		DESIGN CONSULTANT :		DRAWING TITLE:-		REV.	DRAWN	A. DHAR	CHECKED	S. ROY
					 Roads & Bridges Department (Government of Sikkim)		Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim		 LEA ASSOCIATES SOUTH ASIA PVT. LTD. B-1/E-27, Mohan Cooperative Industrial Estate, Mathura Road, New Delhi-110044		DETAILED REPORT OF HORIZONTAL CURVE E1 - RORATHANG TO RONGLI (SH. 5 OF 5)		R0	DESIGN	SOURMENDU	REVIEWED	J. K. DAS
													A2	DATE	AUG. 2022	SCALE :	

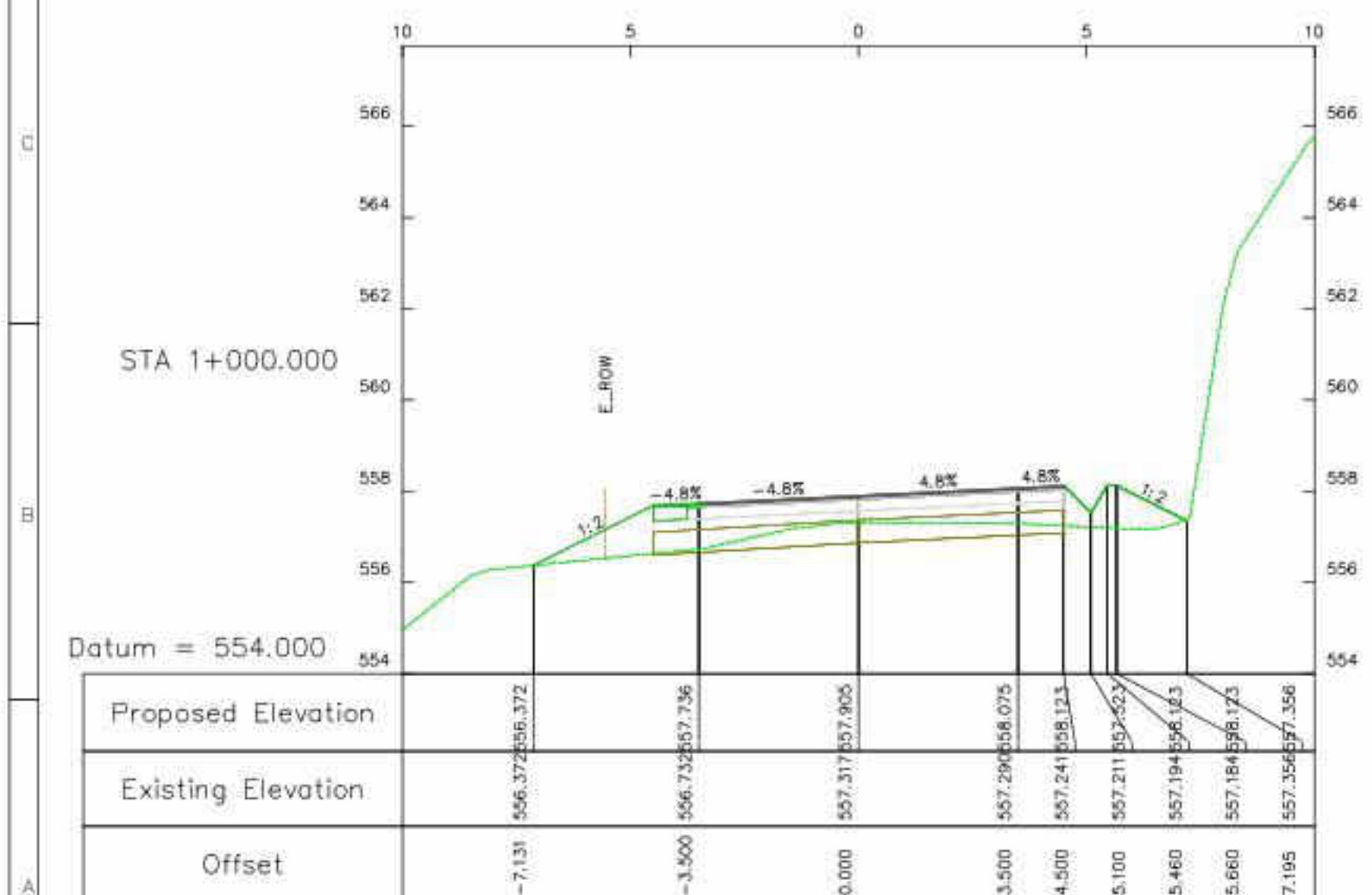


				<div></div> <div>CLIENT : Roads & Bridges Department (Government of Sikkim)</div>	<div>PROJECT : Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim</div>	<div>LEA ASSOCIATES SOUTH ASIA PVT. LTD. B-1/E-27, Mohan Cooperative Industrial Estate, Mathura Road, New Delhi-110044</div>	<div>DRAWING TITLE:- DETAILED CROSS SECTION From Ch. 0+000 Km To Ch. 0+200 Km</div>	REV.	DRAWN	A. DHAR	CHECKED	S. MONDAL	
REV	DATE	DETAILS OF REVISION	BY					SHEET	DESIGN	B. SARKAR	REVIEWED	J. K. DAS	
				A2	DATE	DEC. 2022	SCALE :	AS SHOWN					



				<div>CLIENT :</div> <div></div> <div>Roads & Bridges Department</div> <div>(Government of Sikkim)</div>	<div>PROJECT :</div> <div>Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim</div>	<div>DESIGN CONSULTANT :</div> <div></div> <div>LEA ASSOCIATES SOUTH ASIA PVT. LTD.</div> <div>B-1/E-27, Mohan Cooperative Industrial Estate,</div> <div>Mathura Road, New Delhi-110044</div>	<div>DRAWING TITLE:-</div> <div>DETAILED CROSS SECTION</div> <div>From Ch. 0+300 Km To Ch. 0+400 Km</div>	REV.	DRAWN	A. DHAR	CHECKED	S. MONDAL	
REV	DATE	DETAILS OF REVISION	BY							DRAWING No : 73806/LSA/E/1/CS-502	SHEET	DESIGN	B. SARKAR
								A2	DATE	DEC. 2022	SCALE :	AS SHOWN	





REV	DATE	DETAILS OF REVISION	BY

CLIENT :



Roads & Bridges Department
(Government of Sikkim)

PROJECT :	
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**Consultancy Services for Feasibility Studies
and Preparation of Detailed Project Report
for Roads and Bridges in Sikkim**

DESIGN CONSULTANT :



LEA ASSOCIATES SOUTH ASIA PVT. LTD.
B-1/E-27, Mohan Cooperative Industrial Estate,
Mathura Road, New Delhi-110044

DRAWING TITLE:-

DETAILED CROSS SECTION
From Ch. 1+000 Km To Ch. 1+300 Km

DRAWING No : 73806/LASA/E1/CS-504

REV.	
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8

SHEET

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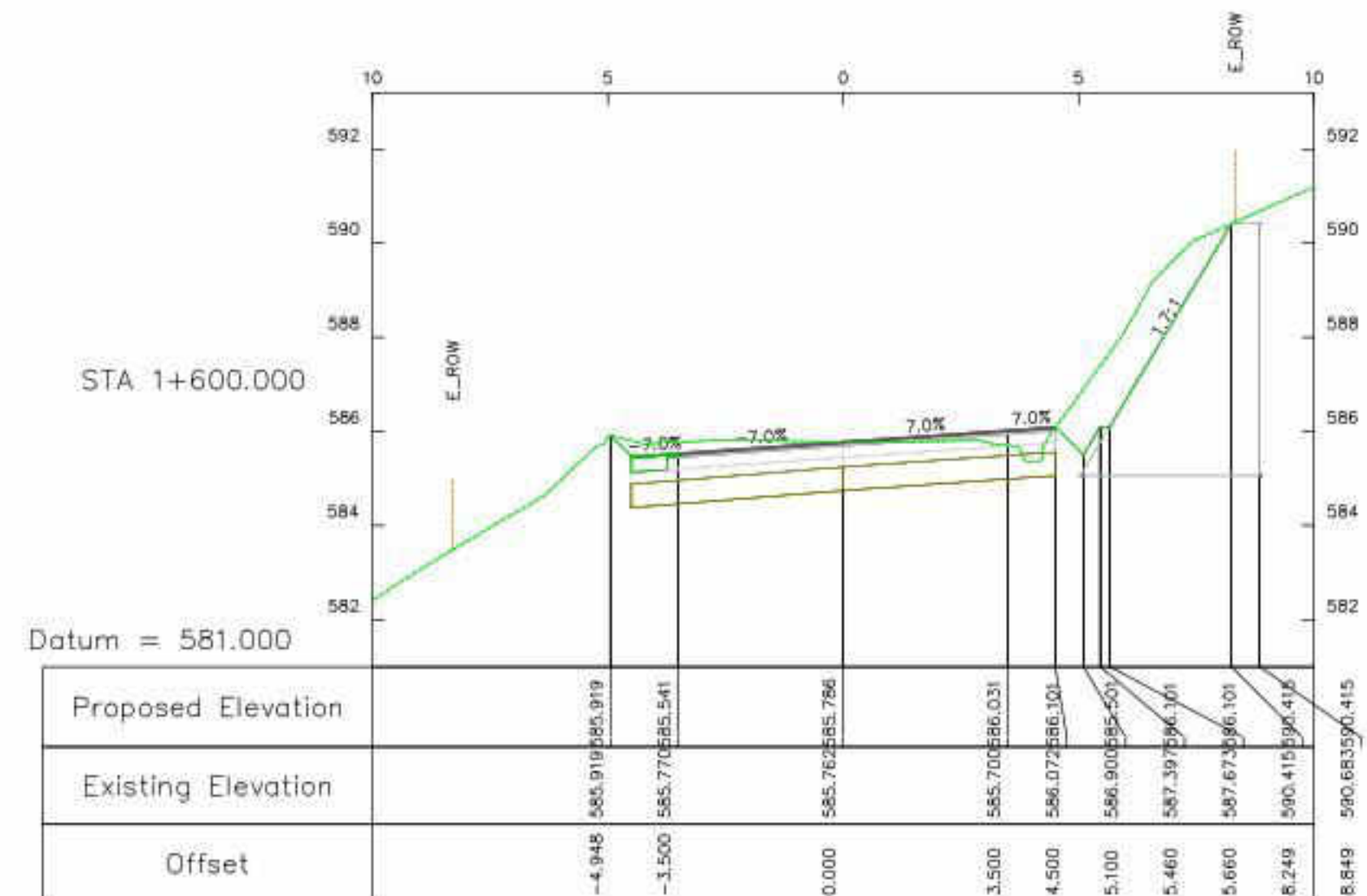
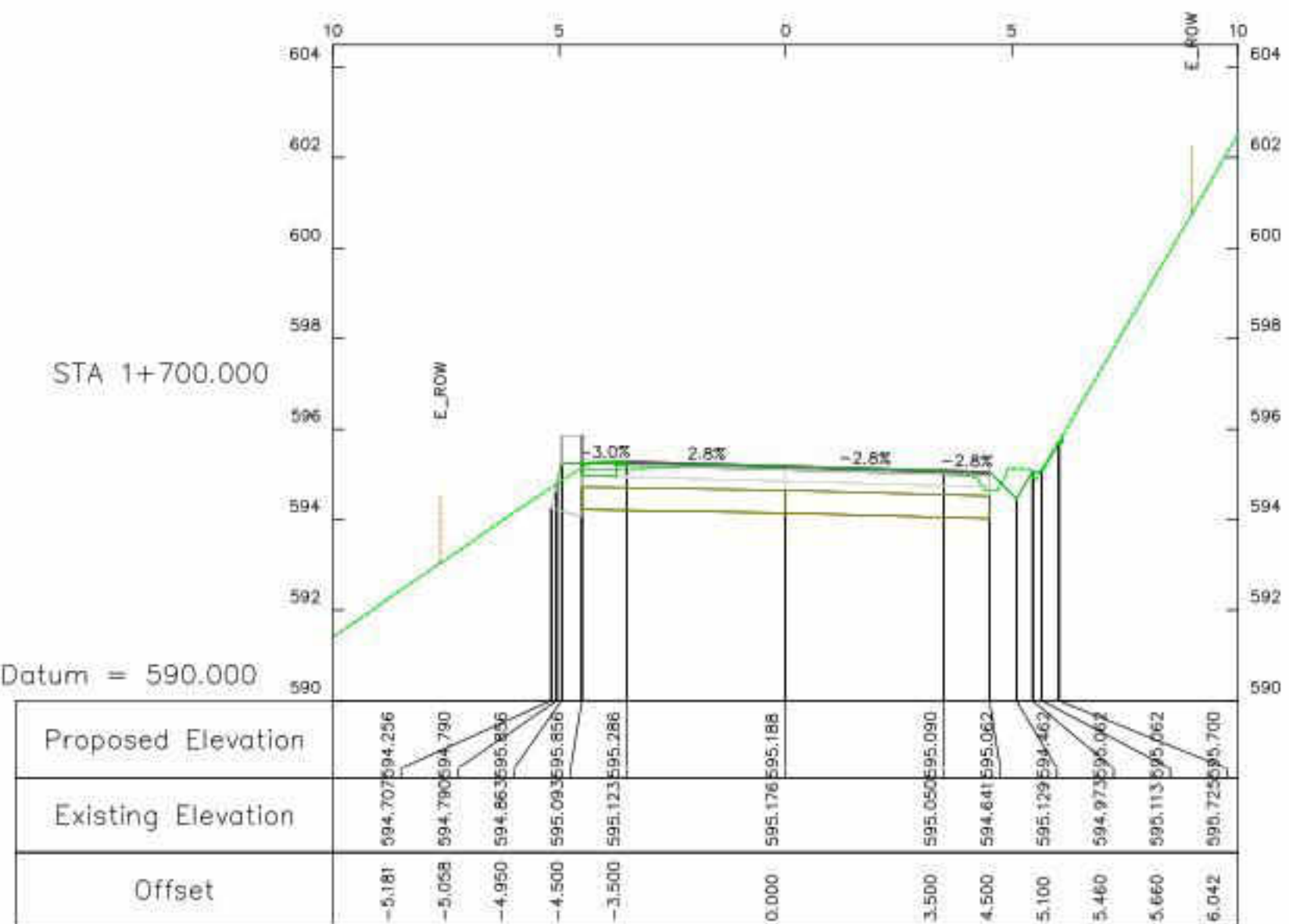
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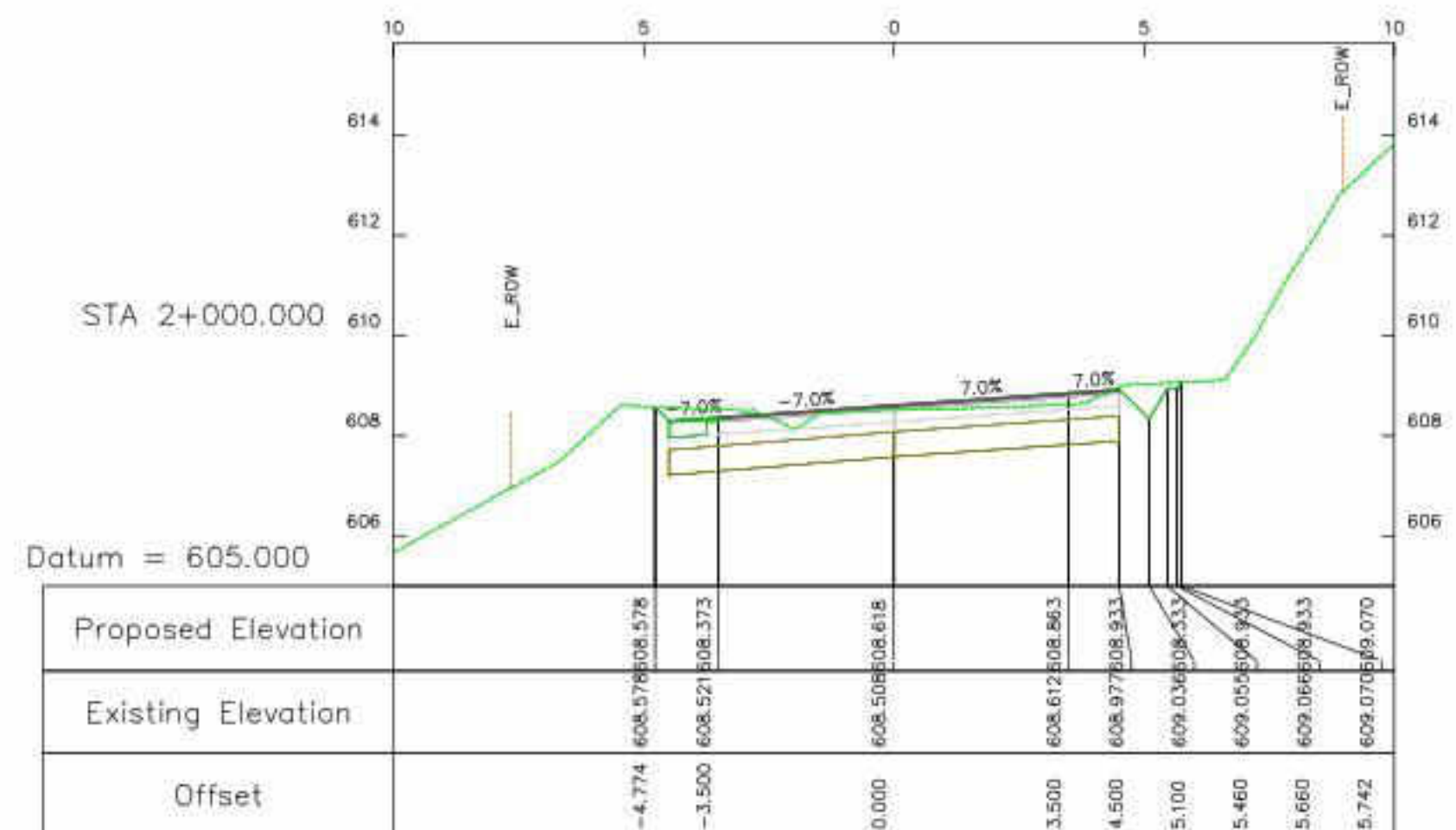
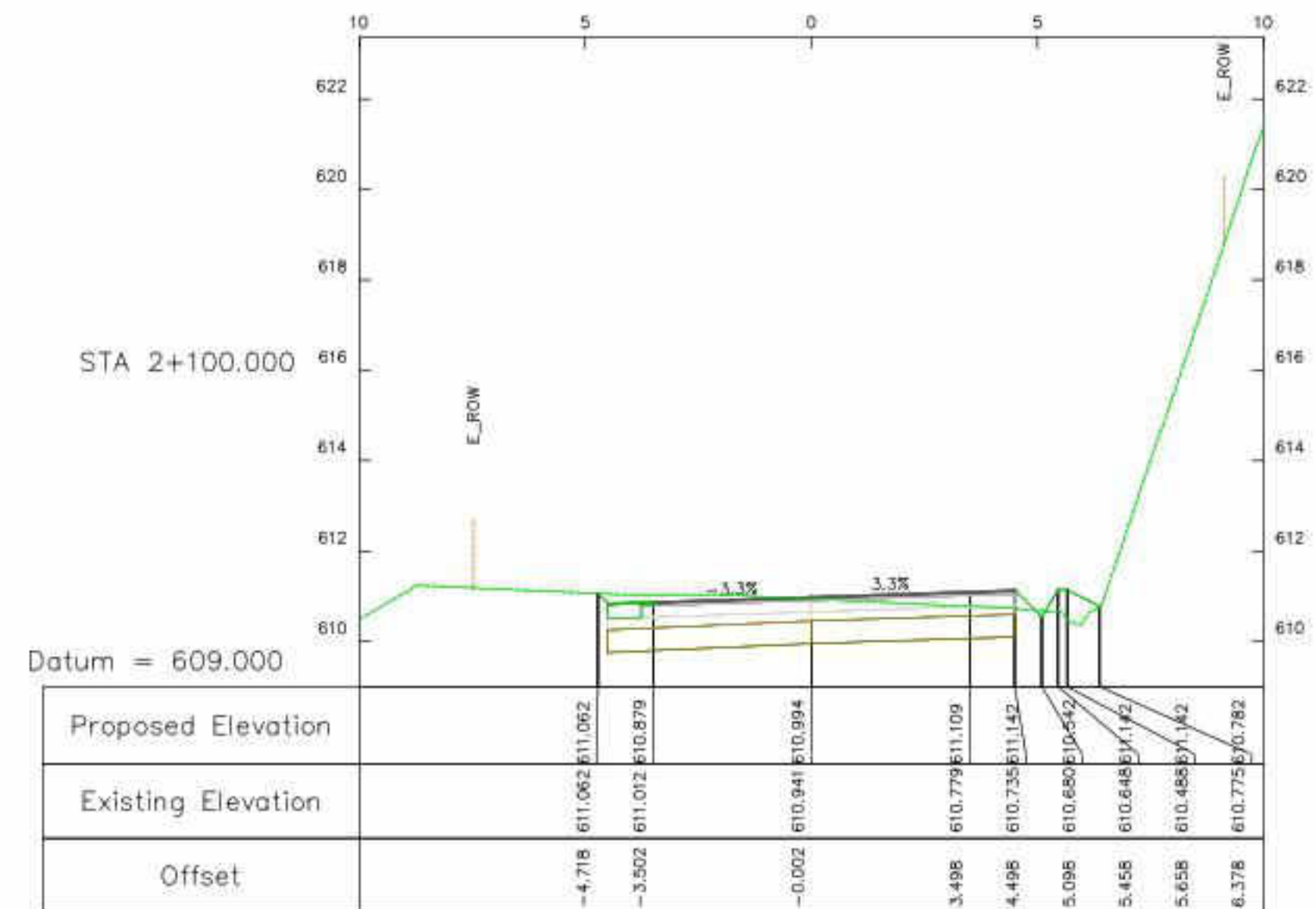
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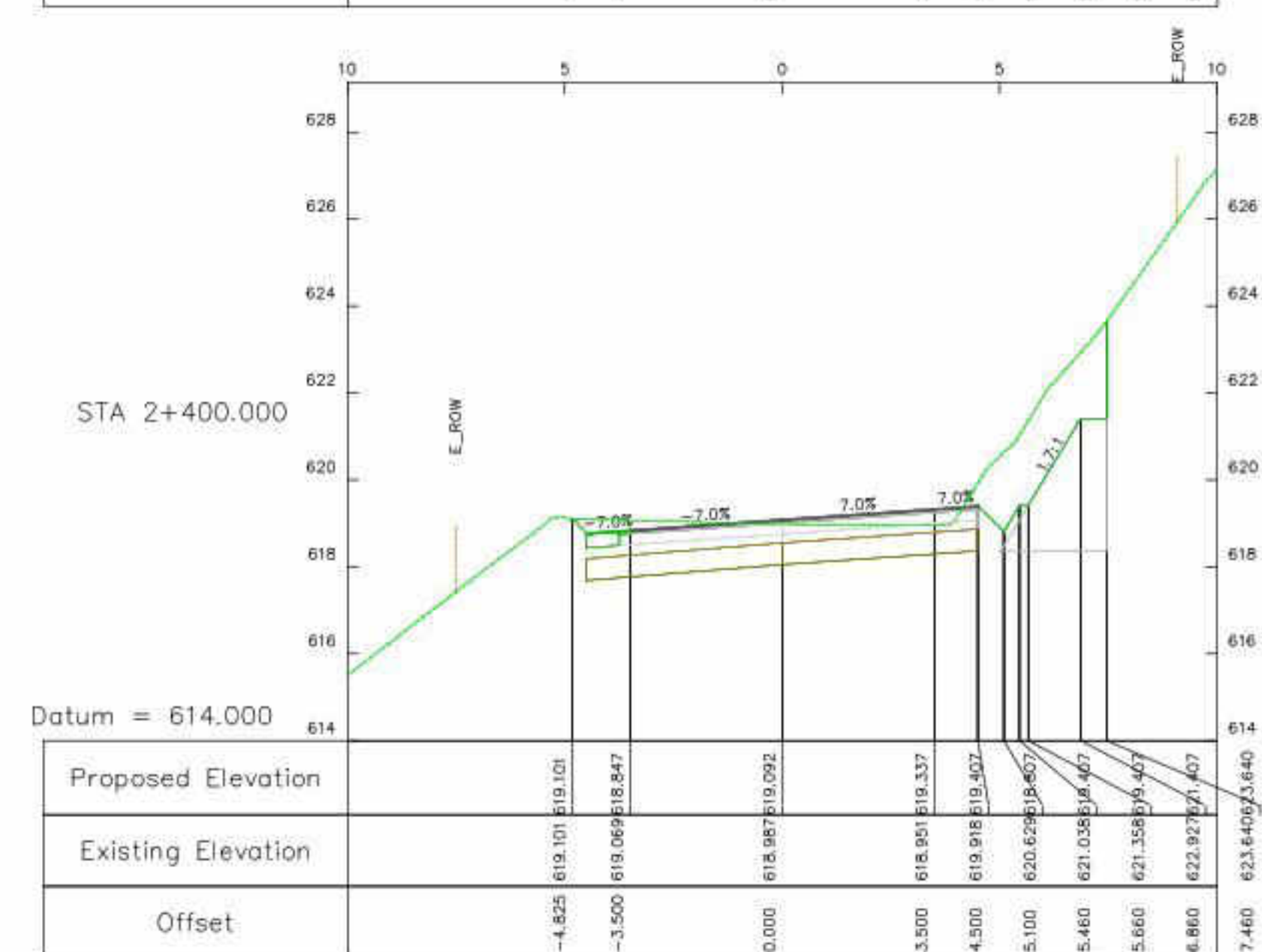
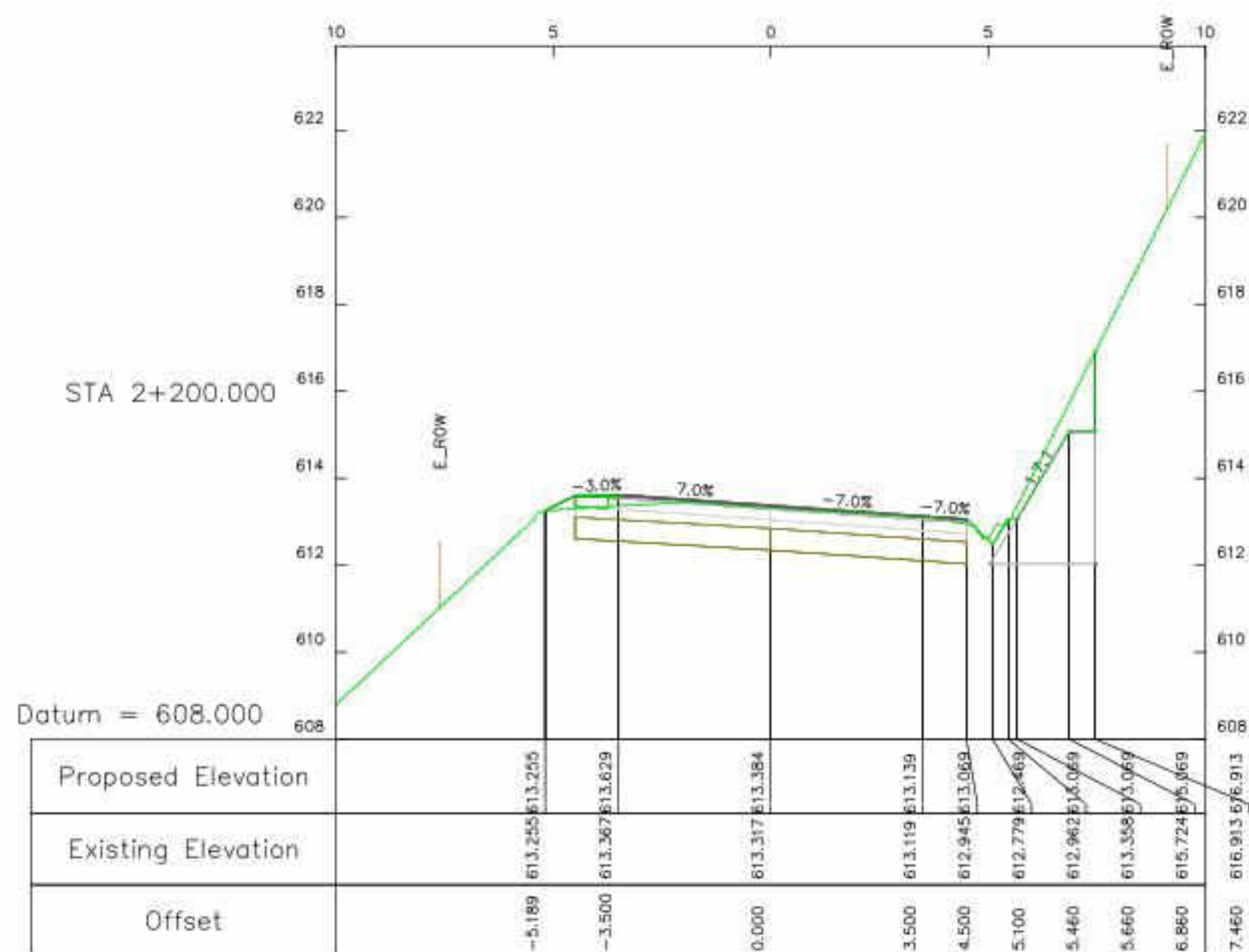
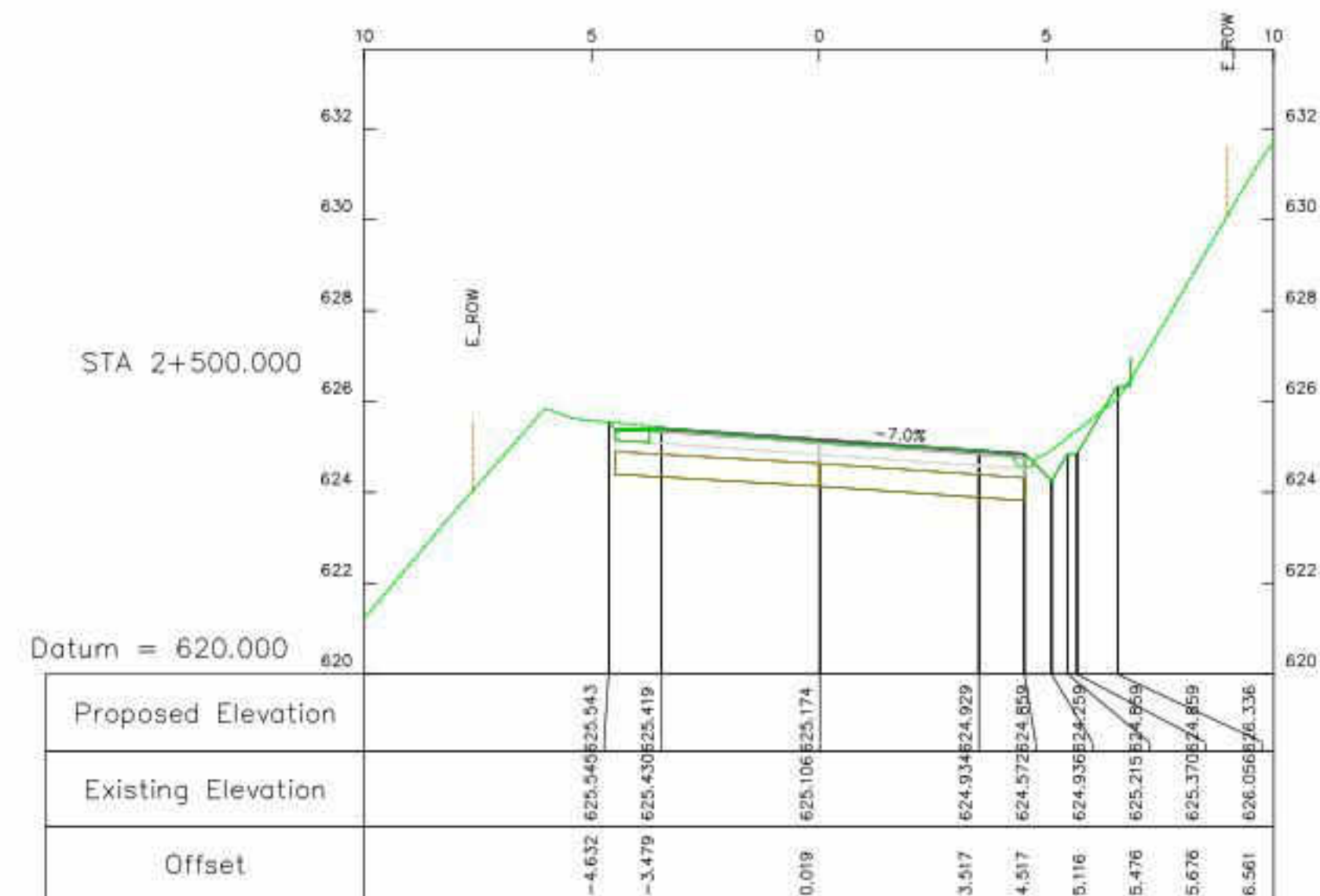
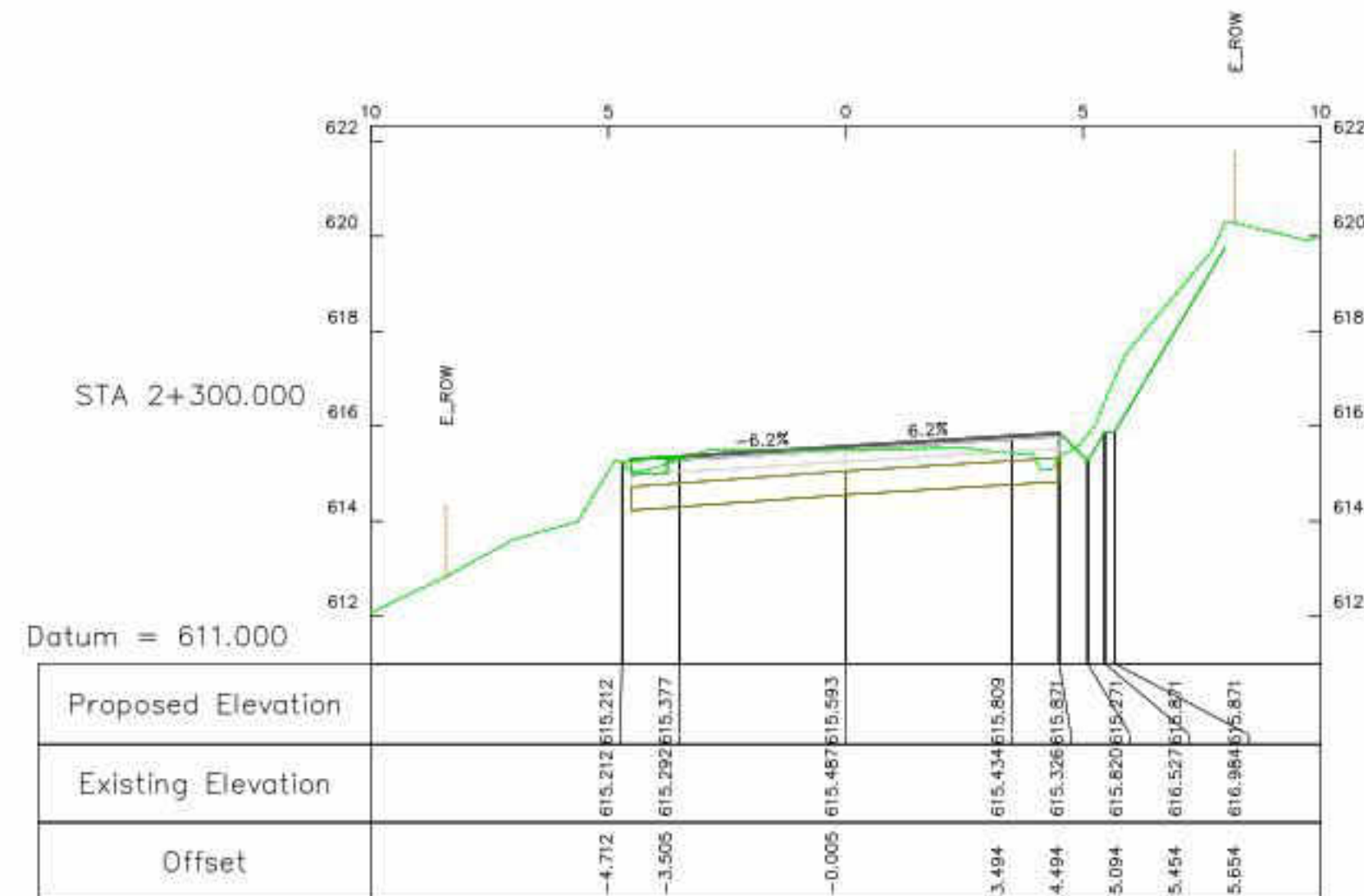
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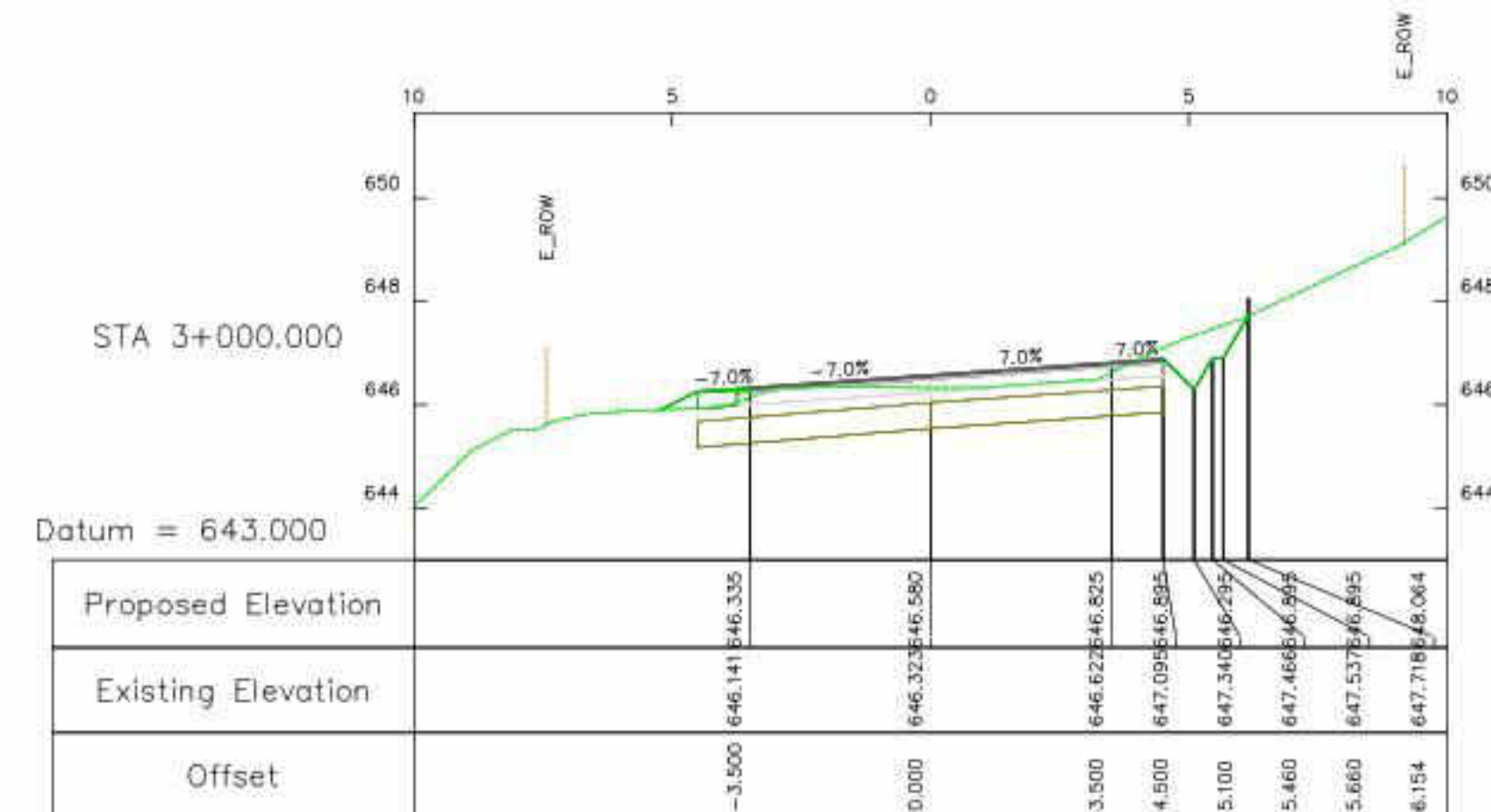
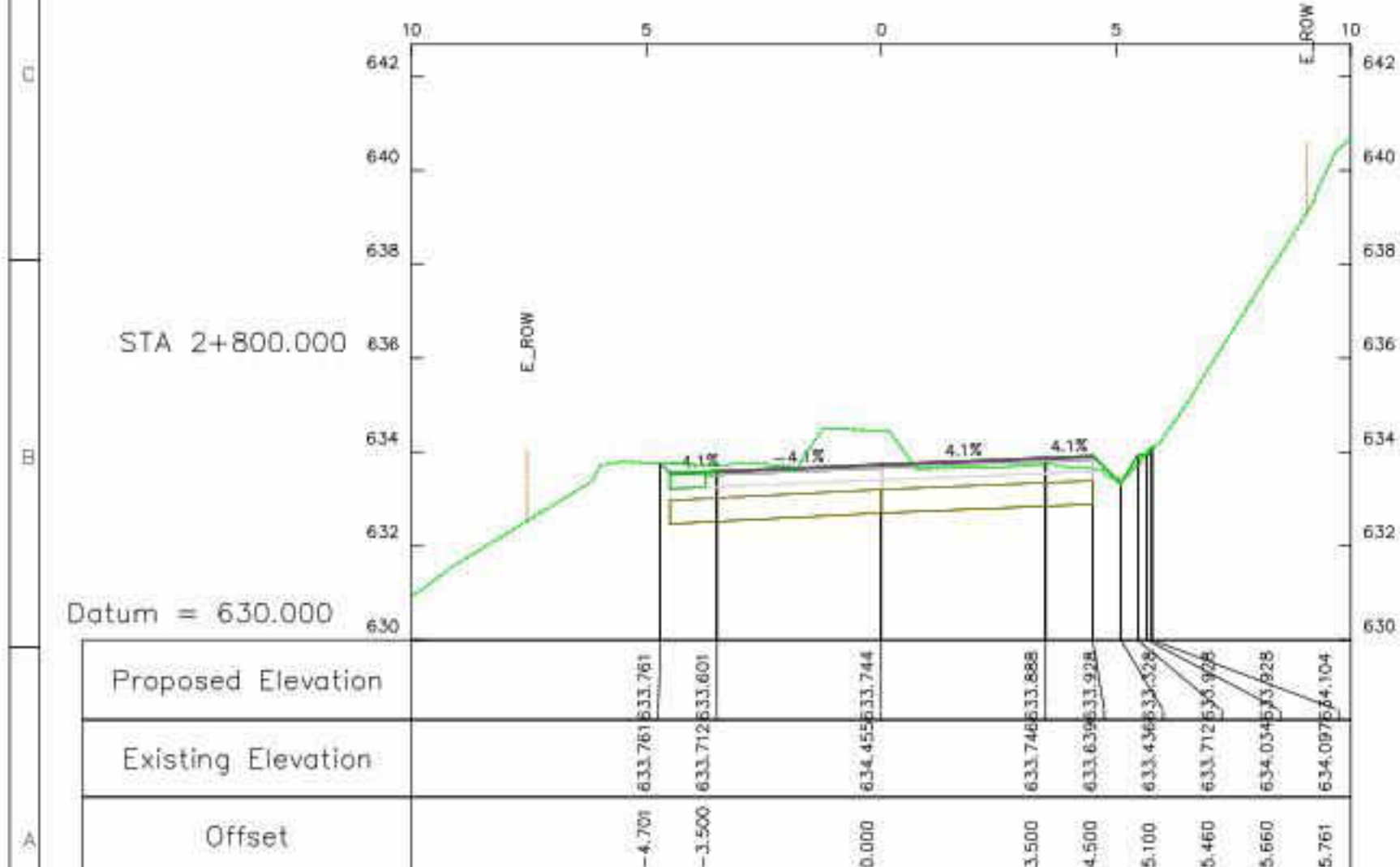
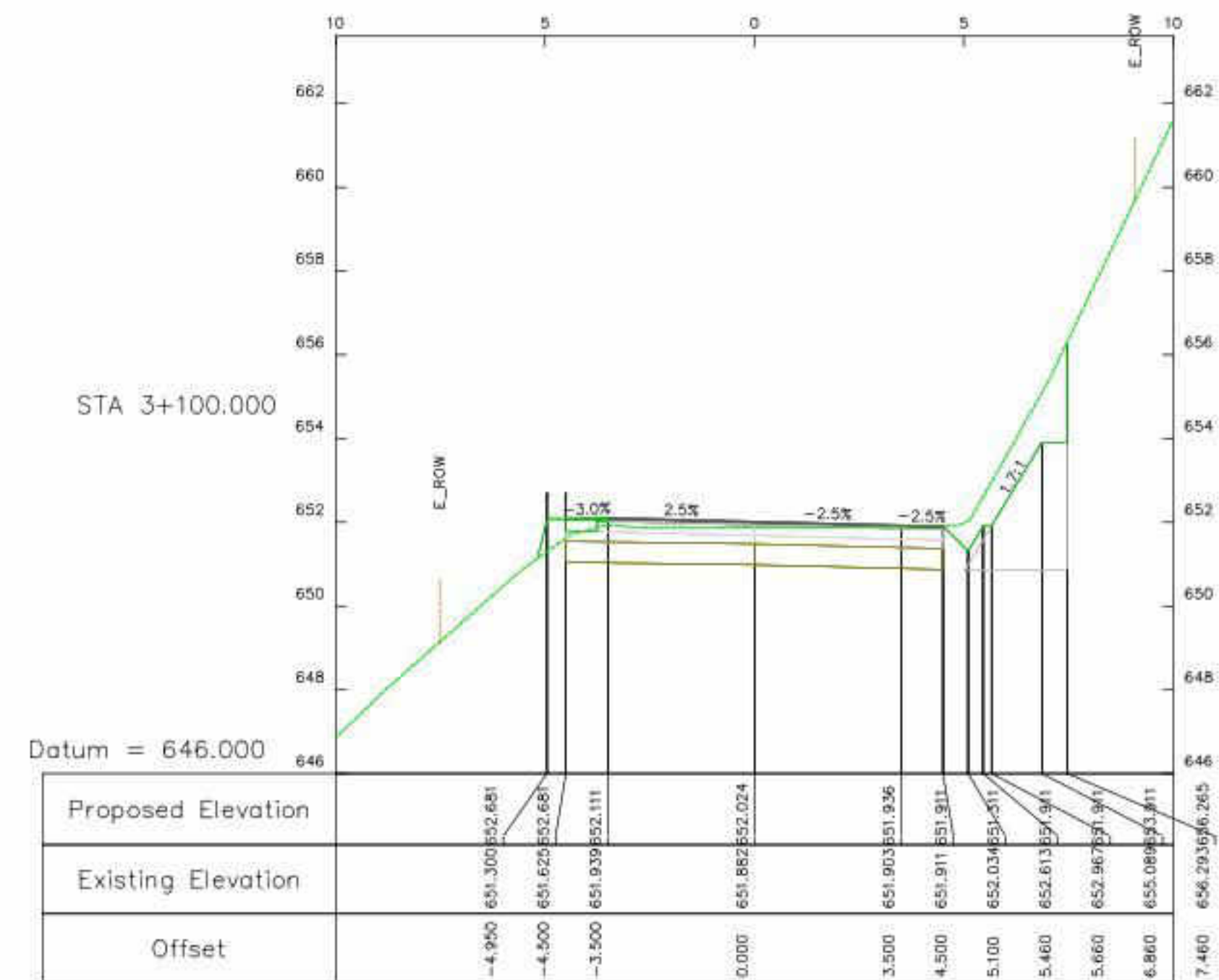
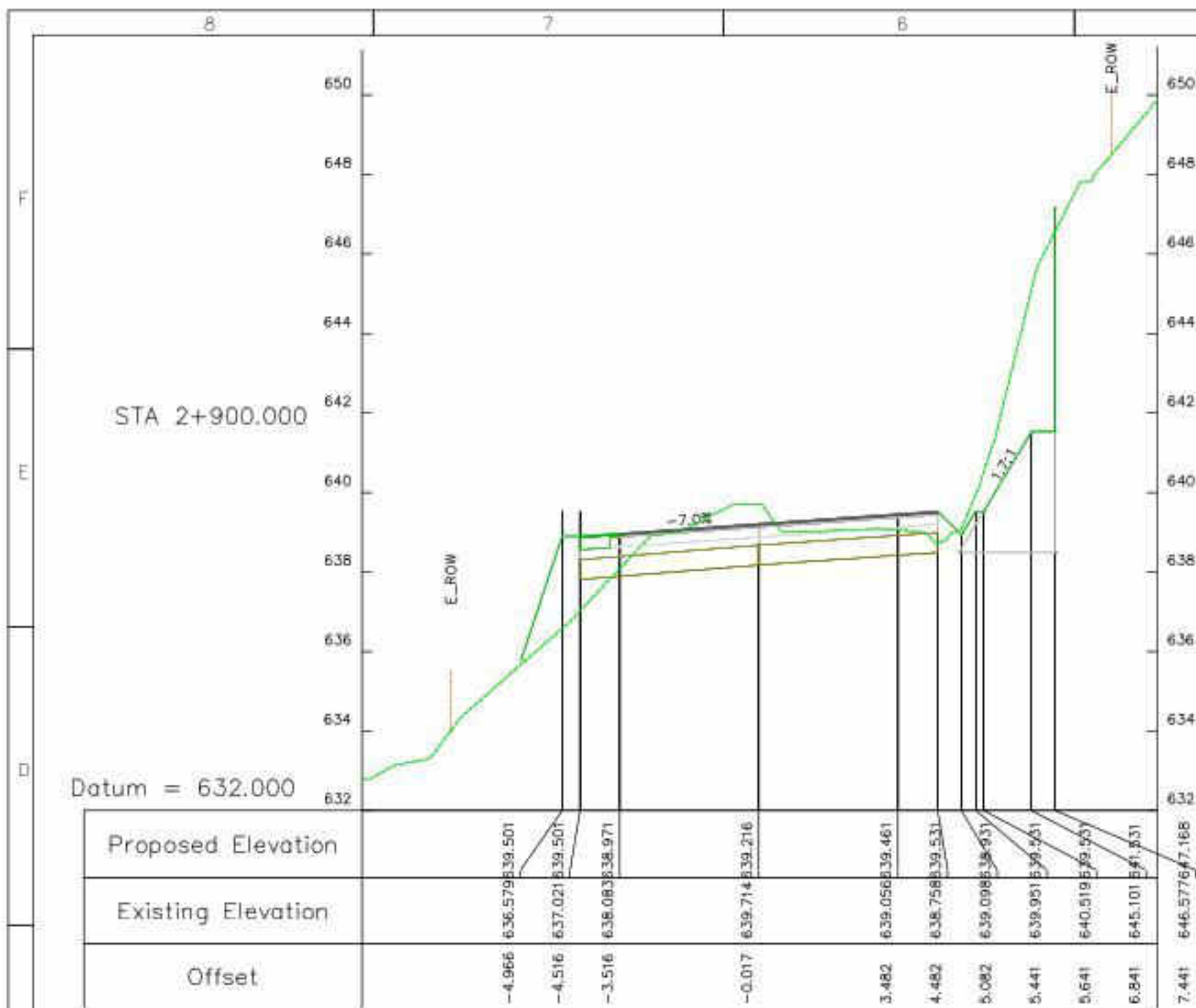
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							SHEET	DESIGN	B. SARKAR	REVIEWED	J. K. DAS	
REV	DATE	DETAILS OF REVISION	BY				A2	DATE	DEC. 2022	SCALE :	AS SHOWN	
						DRAWING No : 73806/LASA/E1/CS-505						



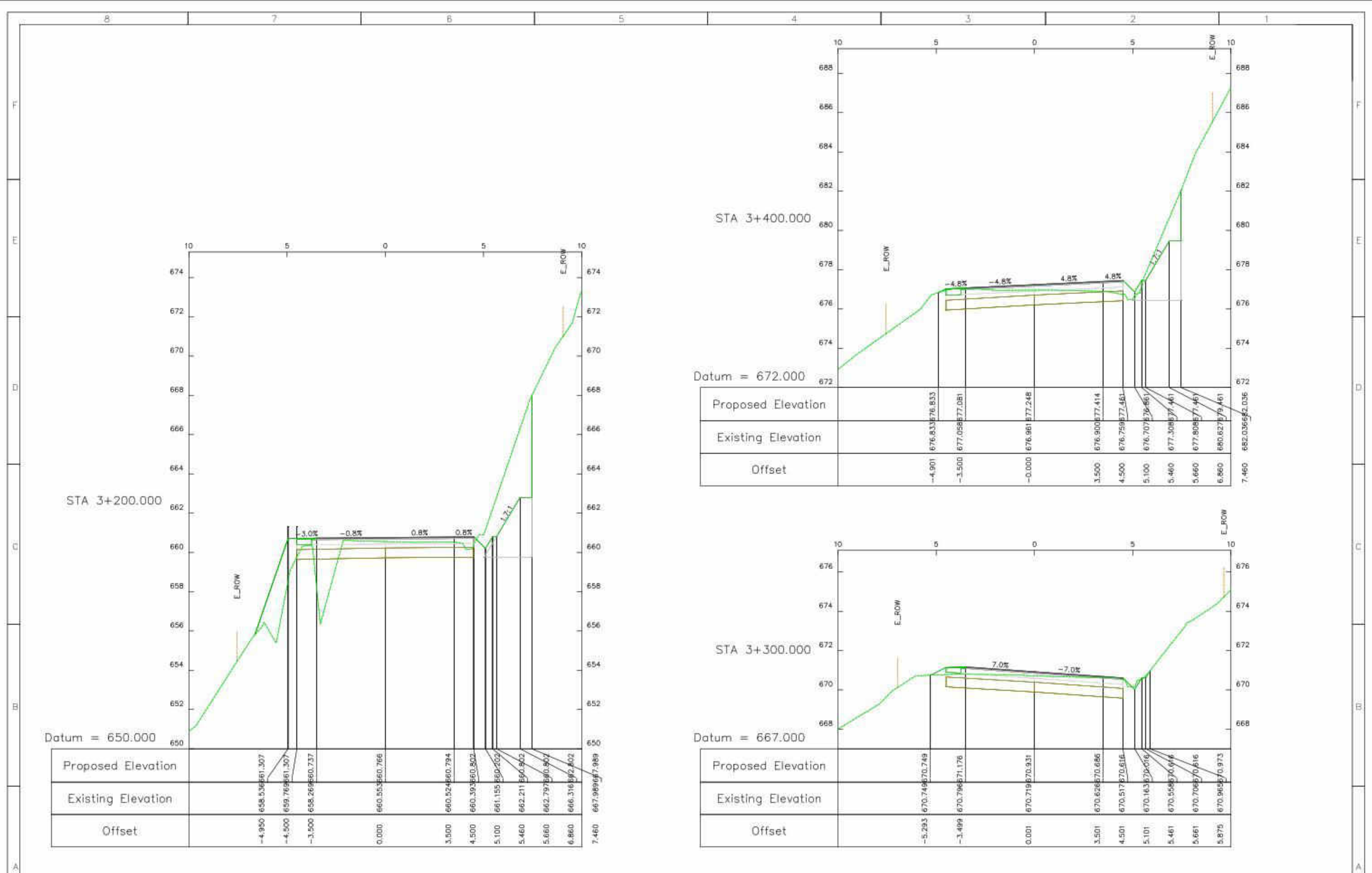
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							<div>SHEET A2</div>	<div>DESIGN B. SARKAR</div>	<div>REVIEWED J. K. DAS</div>		
<div>REV A2</div>	<div>DATE DEC. 2022</div>	<div>DETAILS OF REVISION SCALE :</div>	<div>BY AS SHOWN</div>								





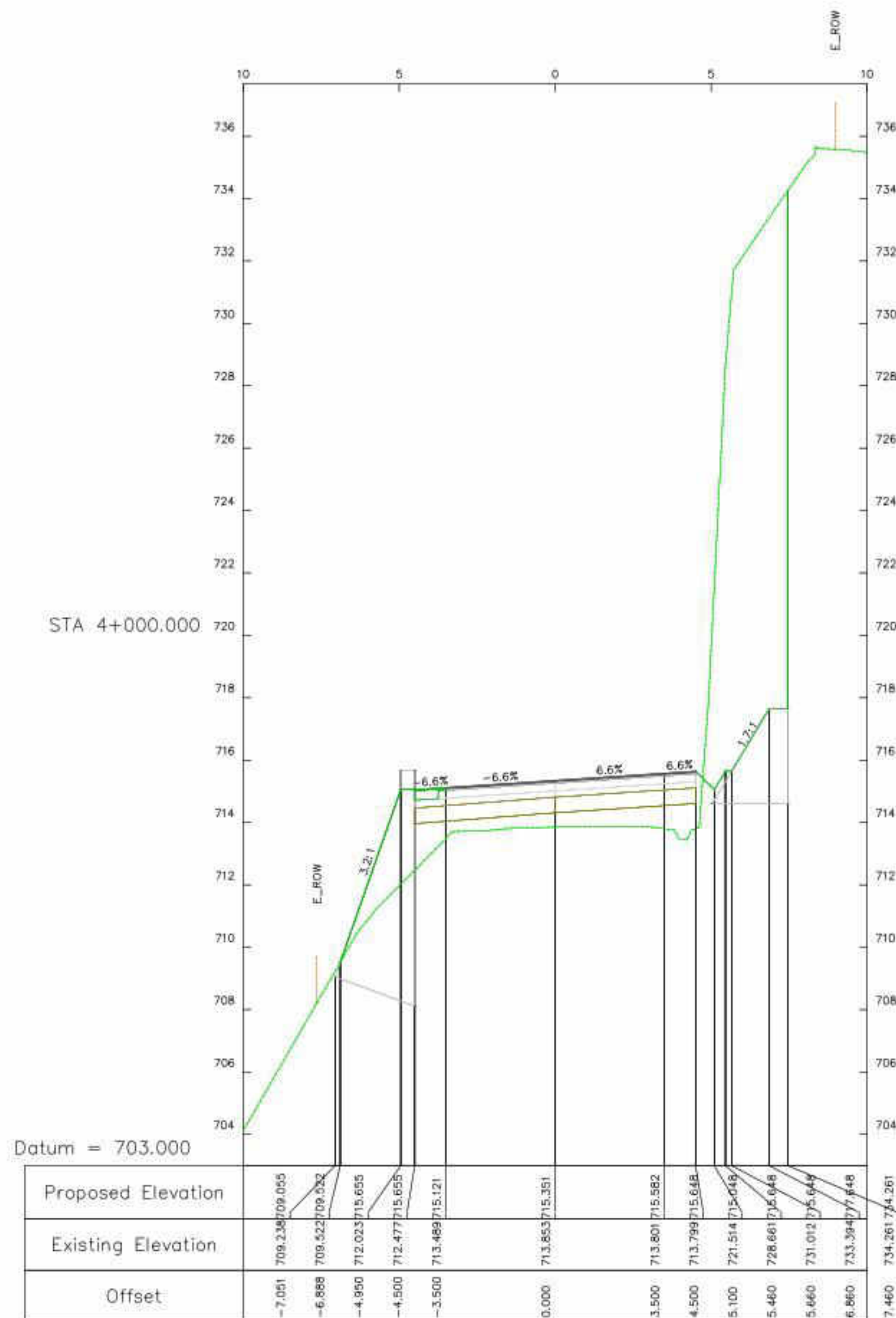
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REV	DATE	DETAILS OF REVISION	BY				SHEET	DESIGN	B. SARKAR	REVIEWED	J. K. DAS	
							A2	DATE	DEC. 2022	SCALE :	AS SHOWN	





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			(Government of Sikkim)		and Preparation of Detailed Project Report		B-1/E-27, Mohan Cooperative Industrial Estate,		From Ch. 2+800 Km To Ch. 3+100 Km		SHEET		DATE		SCALE :		AS SHOWN	
					for Roads and Bridges in Sikkim		Mathura Road, New Delhi-110044		DRAWING No : 73806/LASA/E1/CS-509		A2		DEC. 2022					

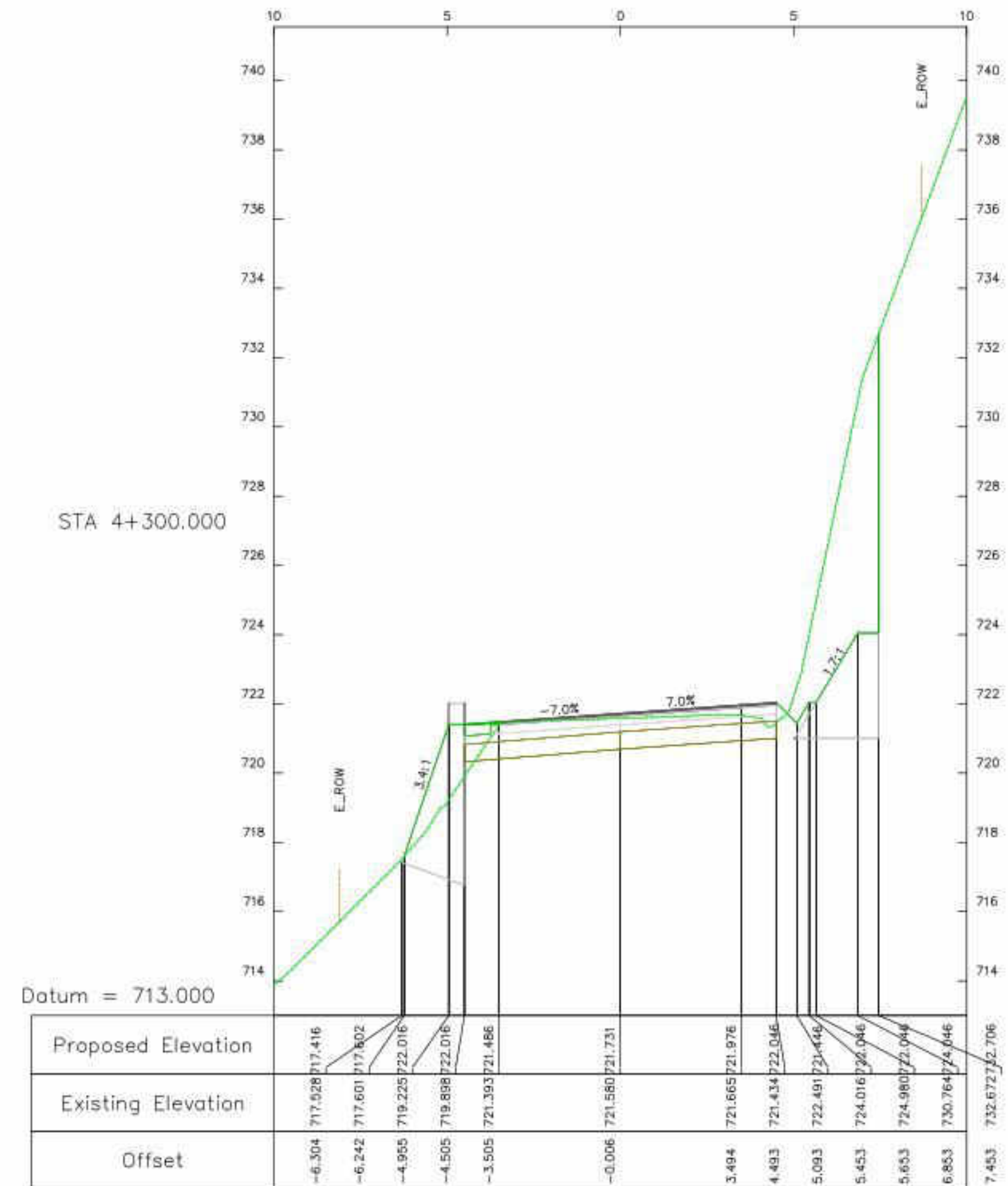
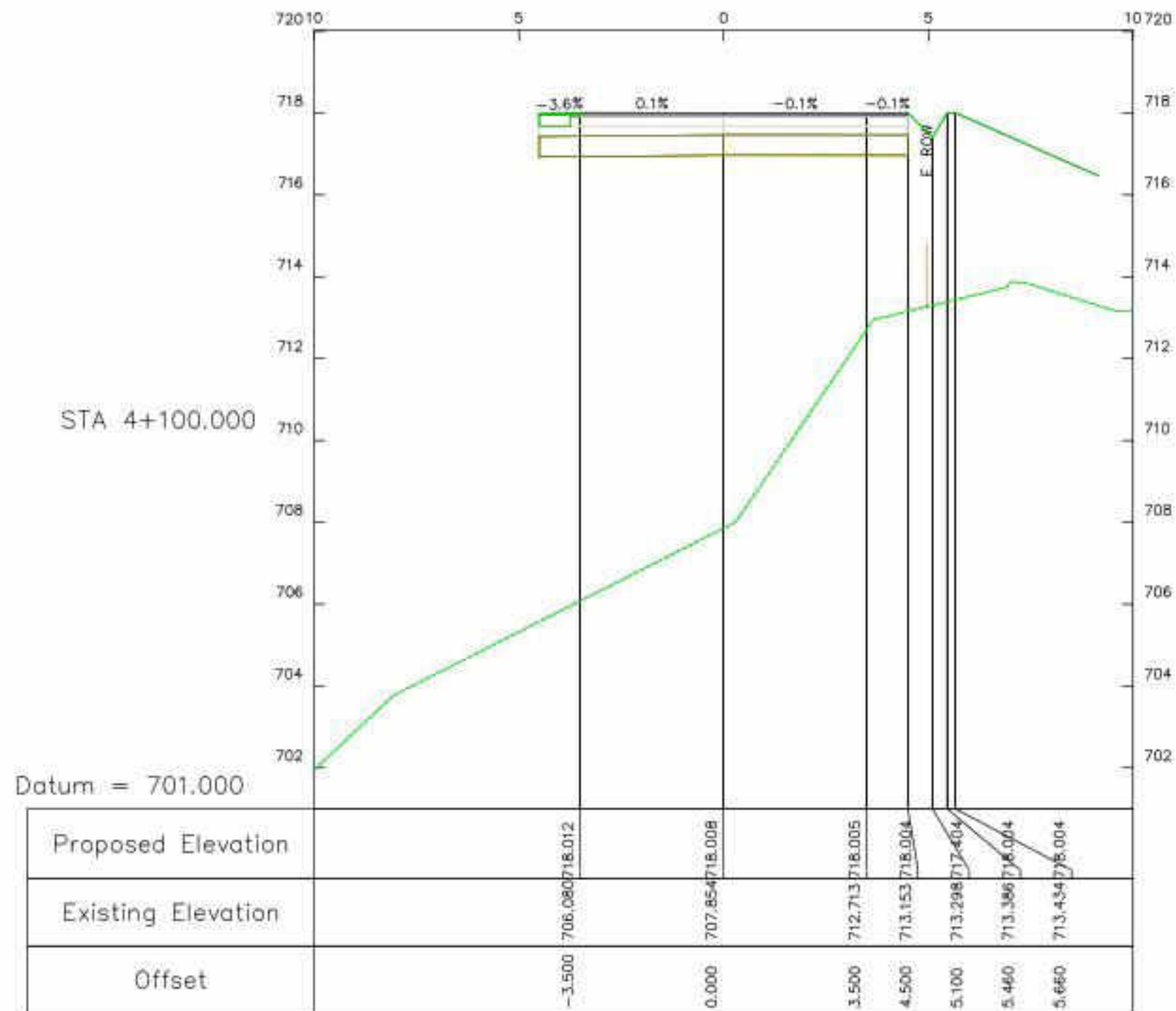
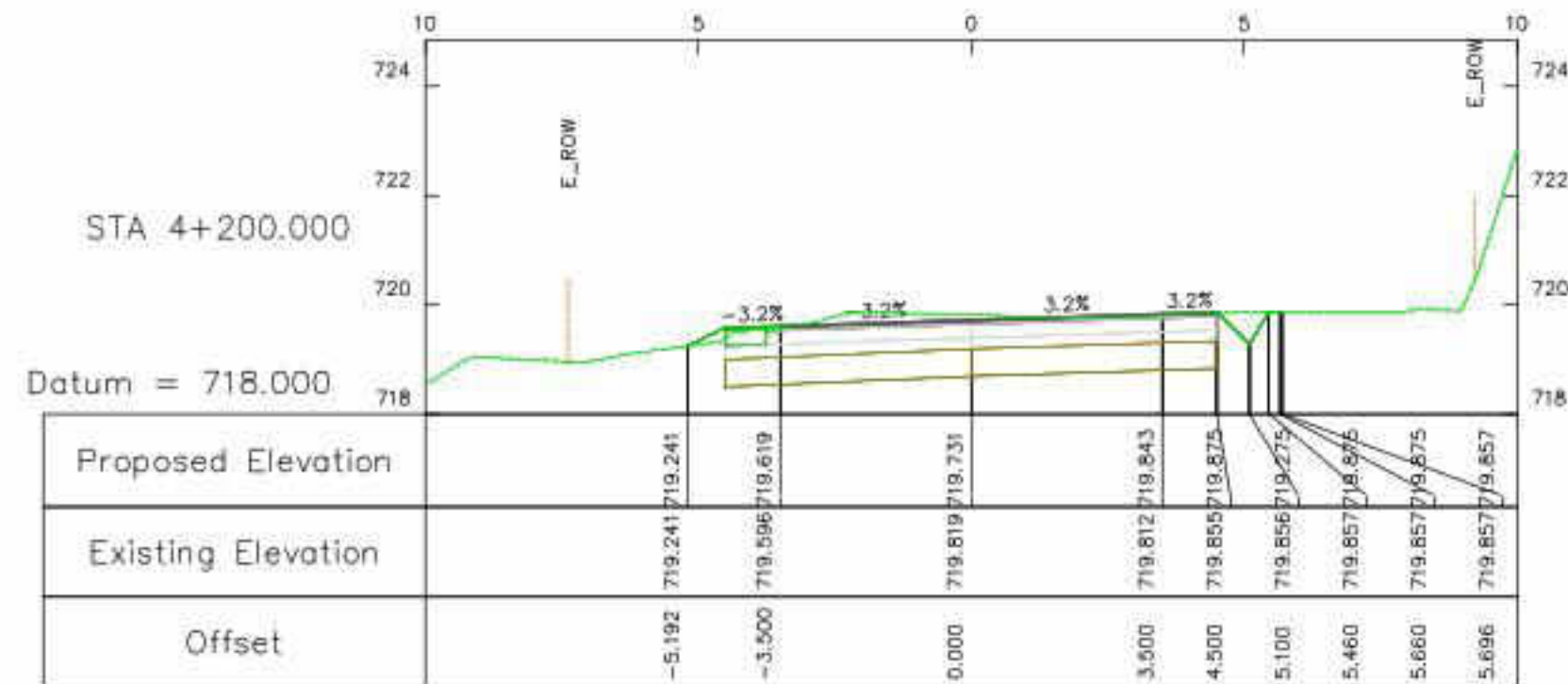


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REV	DATE	DETAILS OF REVISION		BY							DRAWING No : 73806/LASA/E1/CS-510		A2	DATE	DEC. 2022	SCALE :	AS SHOWN		
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Cust File No: 3230000 PROJECT/Working/Output/SP/Phase 1/SP/1/1/ROADS/BRIDGES/Details/Case Section/01/Consultant/Intd.dwg																		Plot Date: 16 January, 2023 / 11:45 AM	

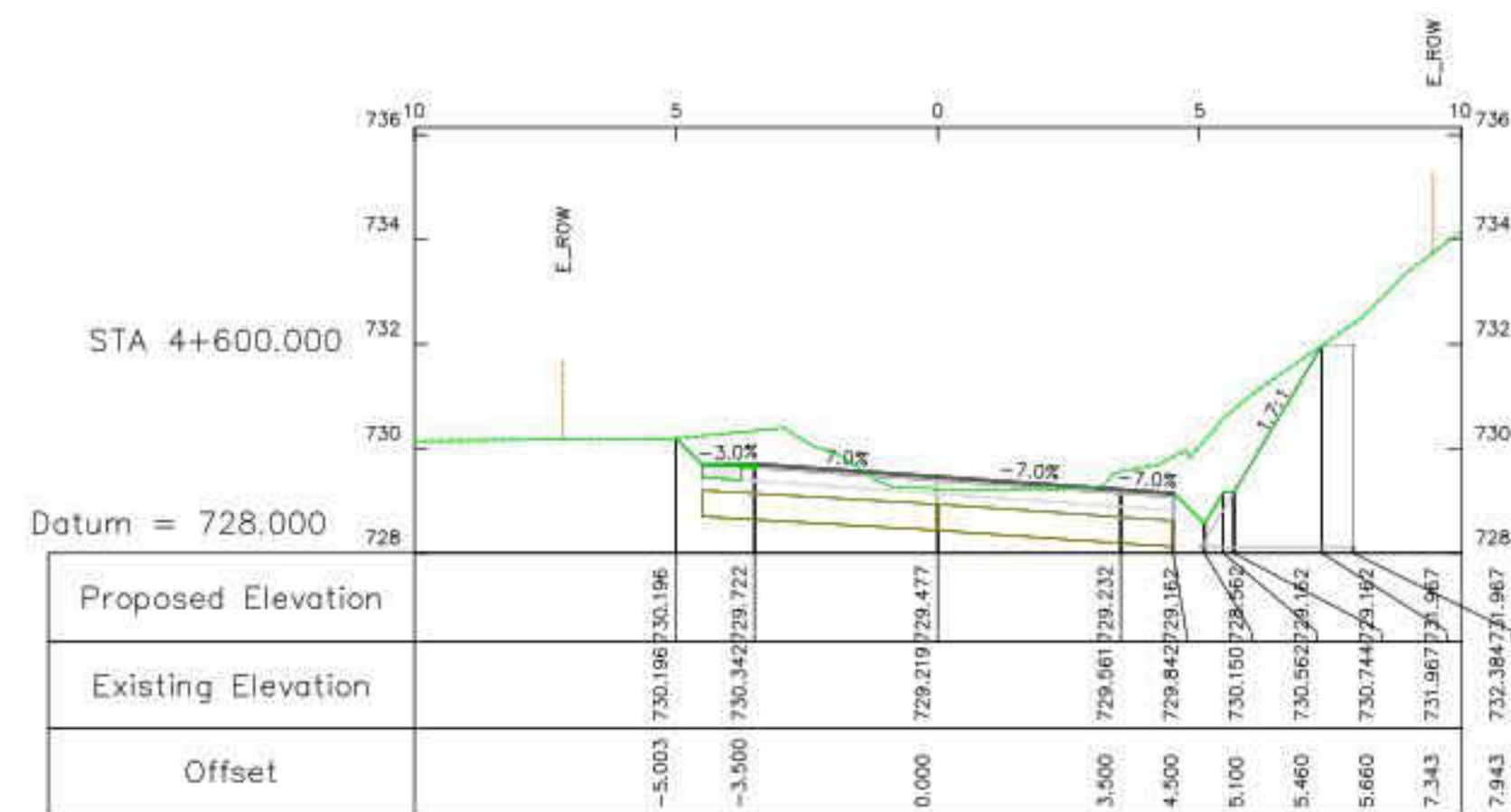
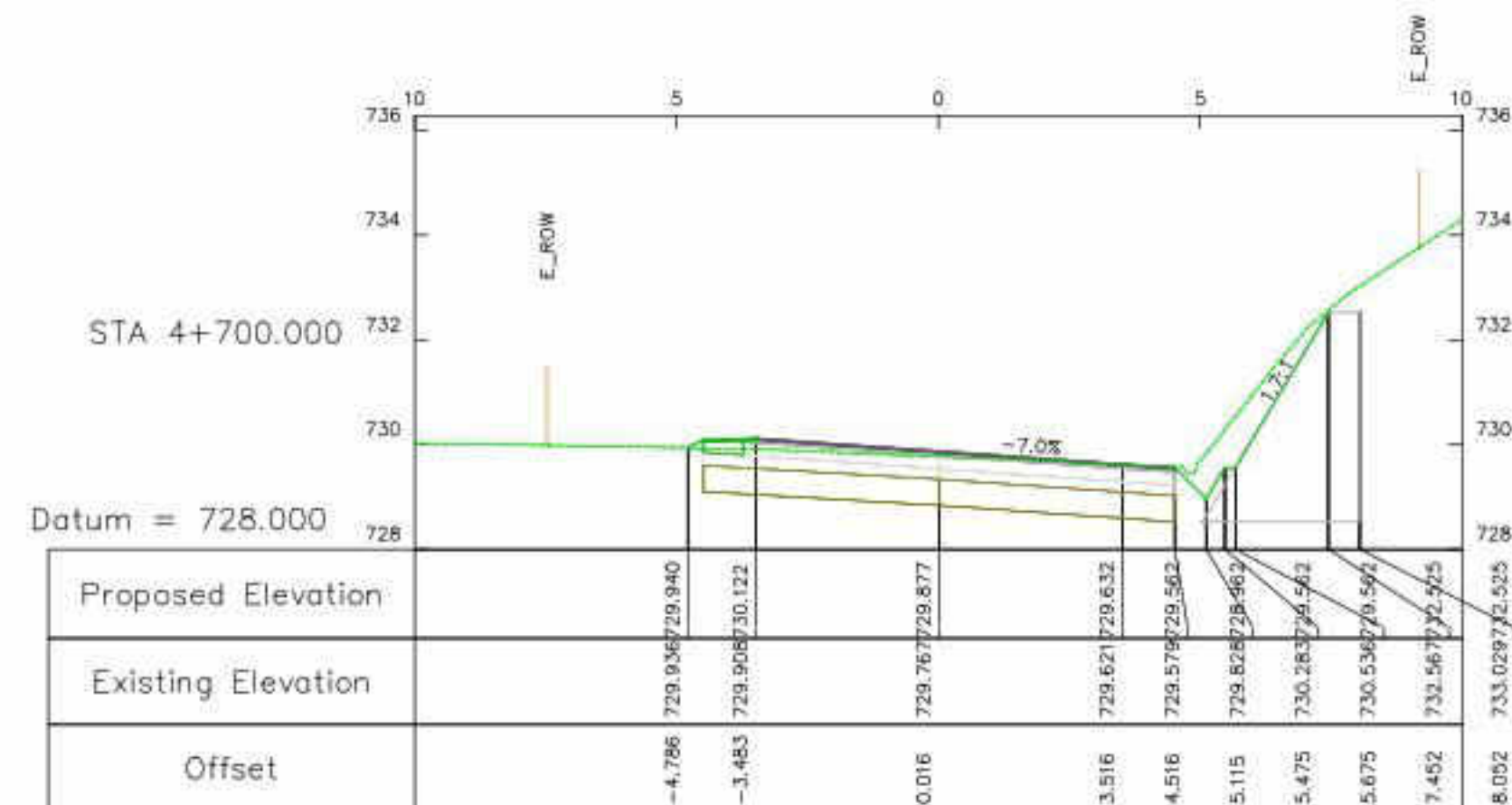




Offset	Existing Elevation	Proposed Elevation
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-4.950	712.023	715.695
-4.500	712.477	715.695
-3.500	713.489	715.121
0.000	713.553	715.351
3.500	713.801	715.582
4.500	713.799	715.648
5.100	721.514	715.048
5.460	728.661	715.048
5.660	731.015	715.648
6.860	733.394	716.648
7.460	734.261	734.261

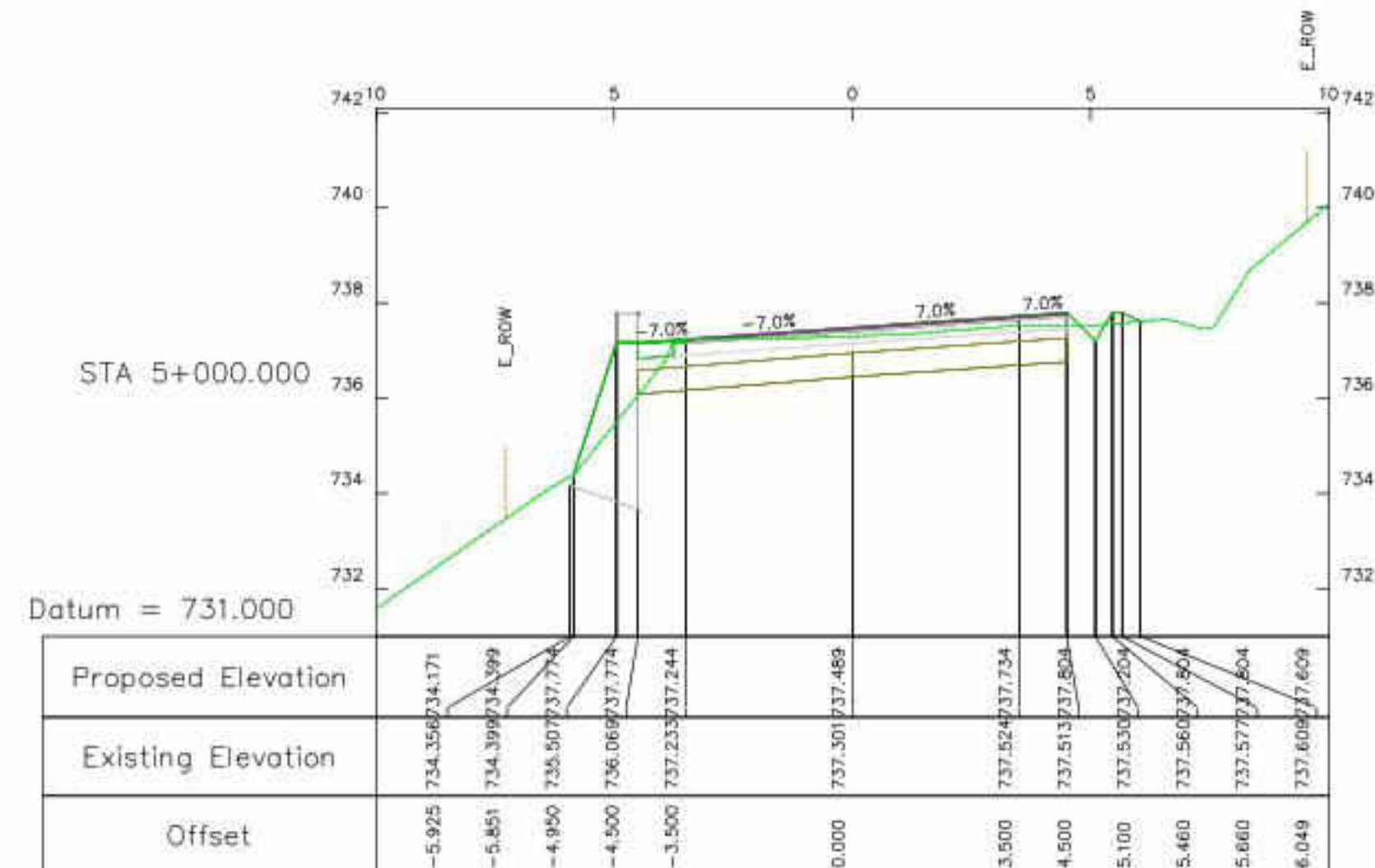
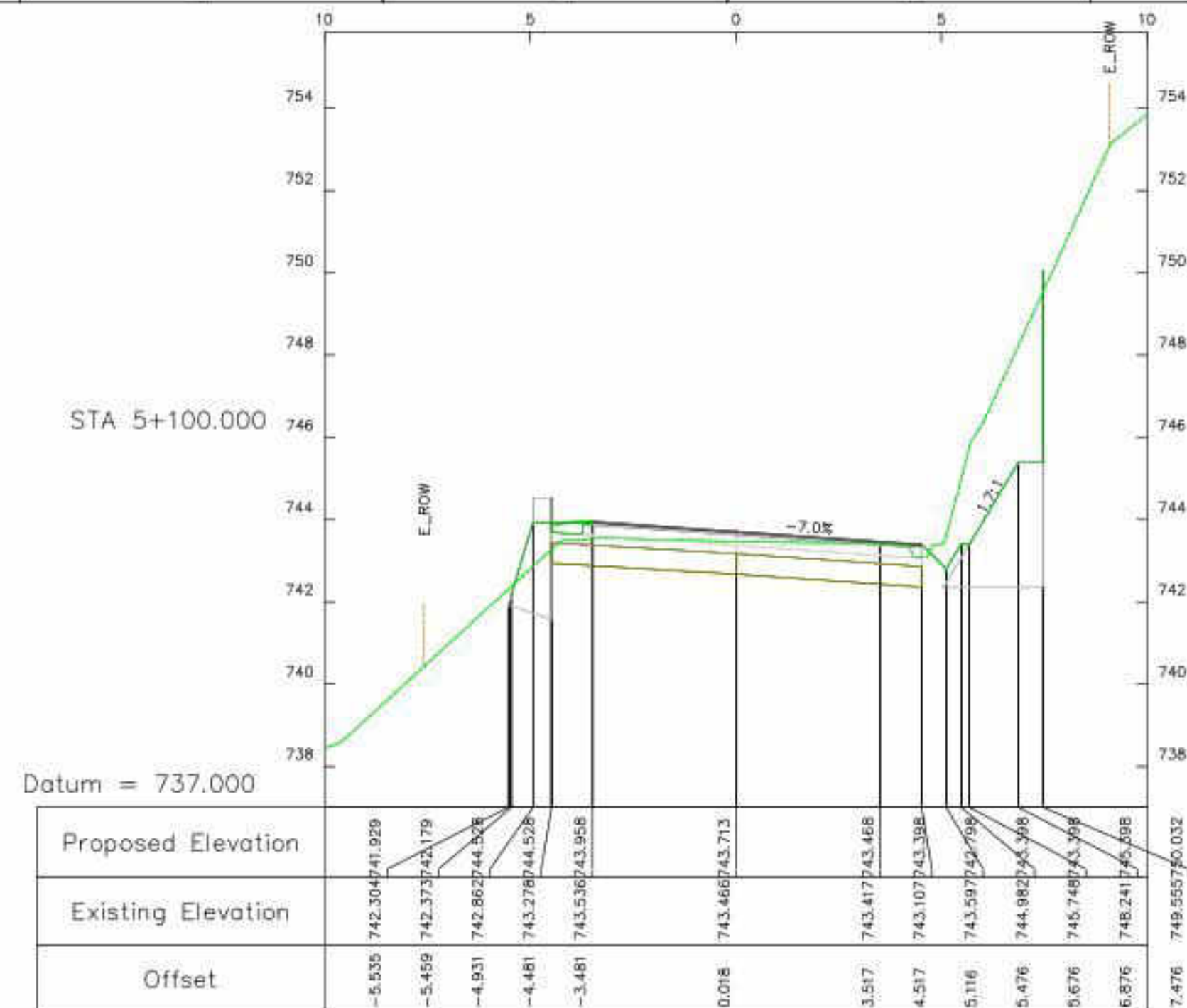
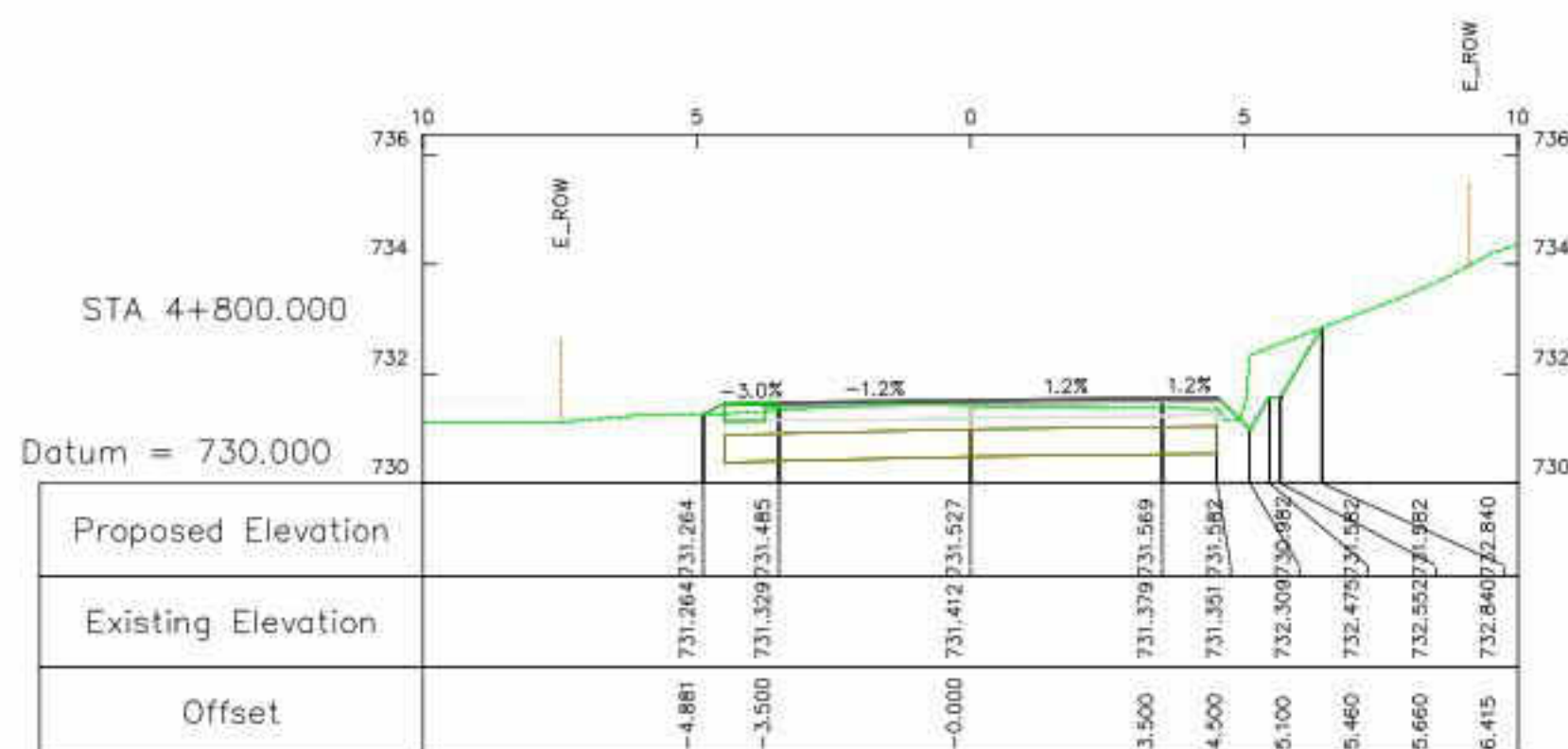
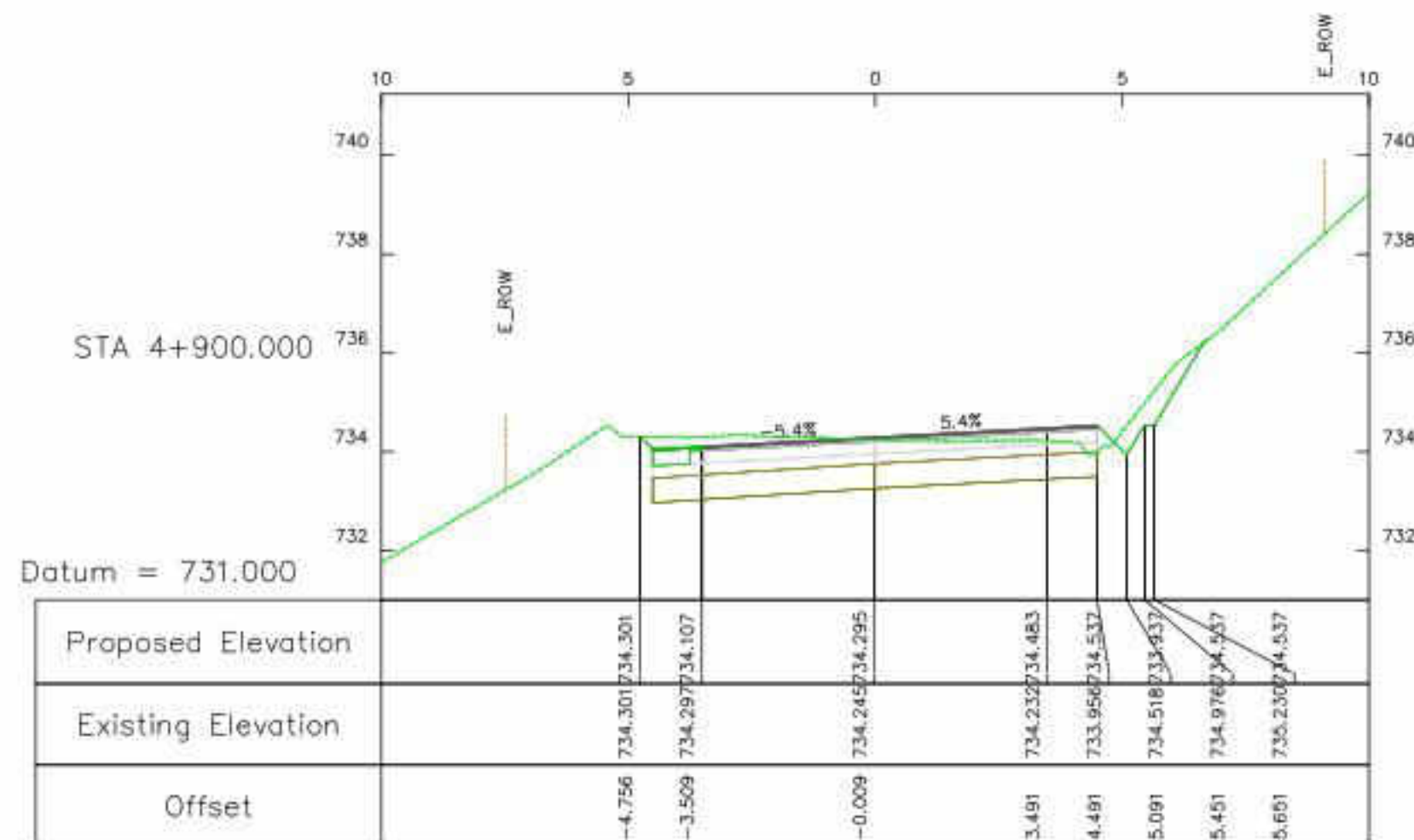
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							<div><div>SHEET</div><div>A2</div></div>	<div><div>DESIGN</div><div>B. SARKAR</div></div>	<div><div>REVIEWED</div><div>J. K. DAS</div></div>	
<div><div>REV</div><div>A2</div></div>	<div><div>DATE</div><div>DEC. 2022</div></div>	<div><div>DETAILS OF REVISION</div><div>SCALE :</div></div>	<div><div>BY</div><div>AS SHOWN</div></div>							





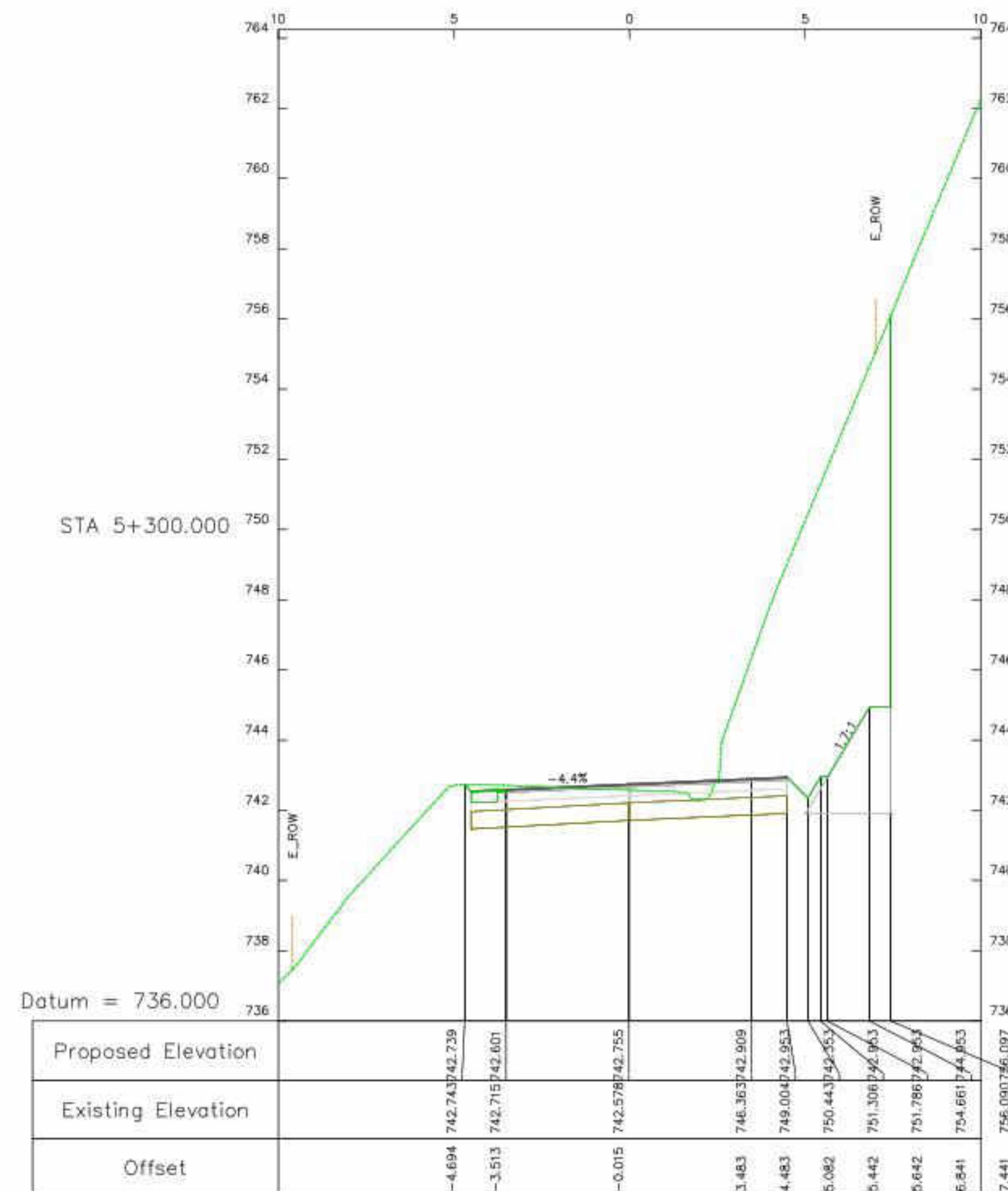
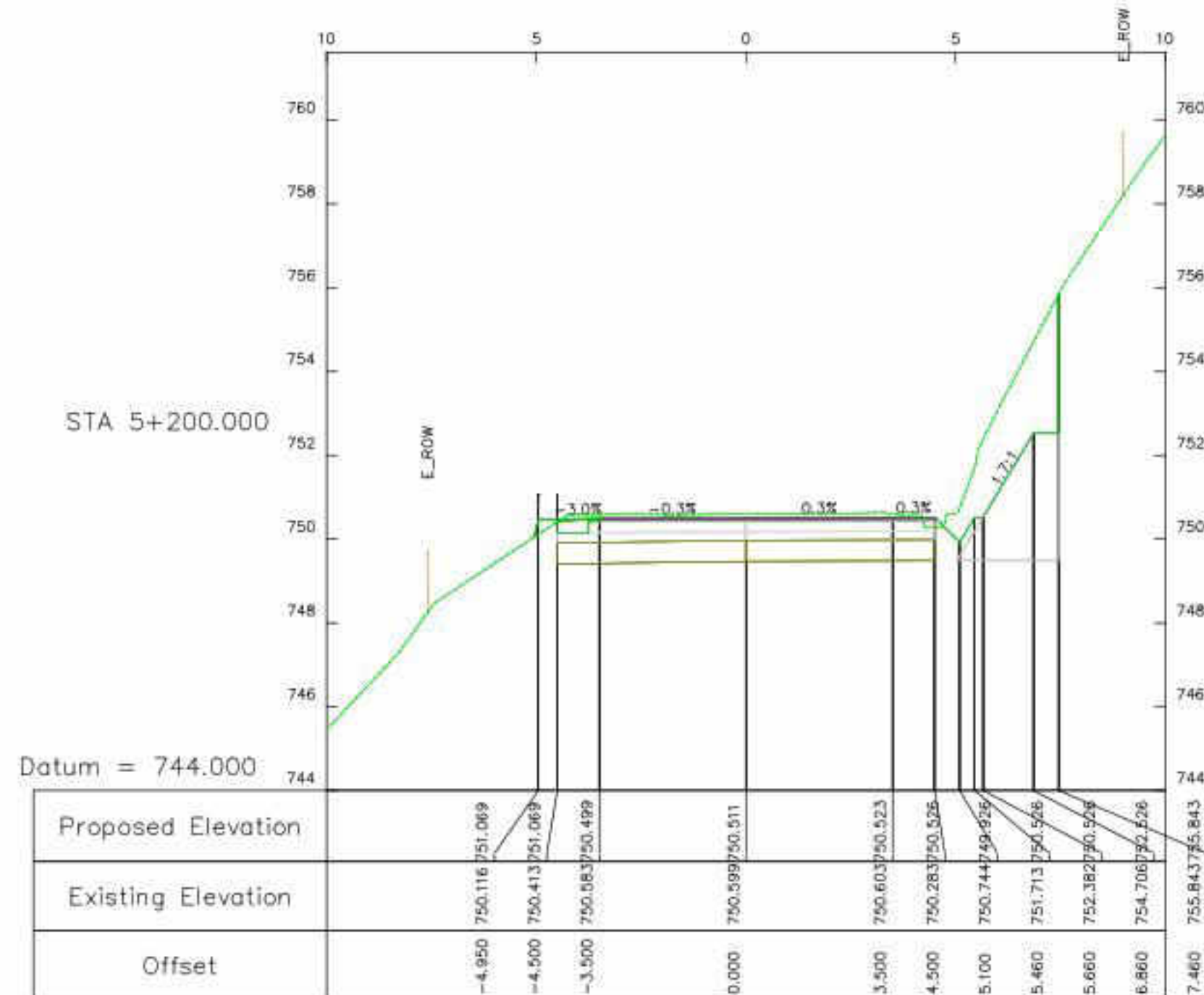
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				(Government of Sikkim)		and Preparation of Detailed Project Report		B-1/E-27, Mohan Cooperative Industrial Estate,		From Ch. 4+000 Km To Ch. 4+300 Km		SHEET	DATE	DEC. 2022	SCALE :	AS SHOWN
						for Roads and Bridges in Sikkim		Mathura Road, New Delhi-110044		DRAWING No : 73806/LASA/E1/CS-513		A2				



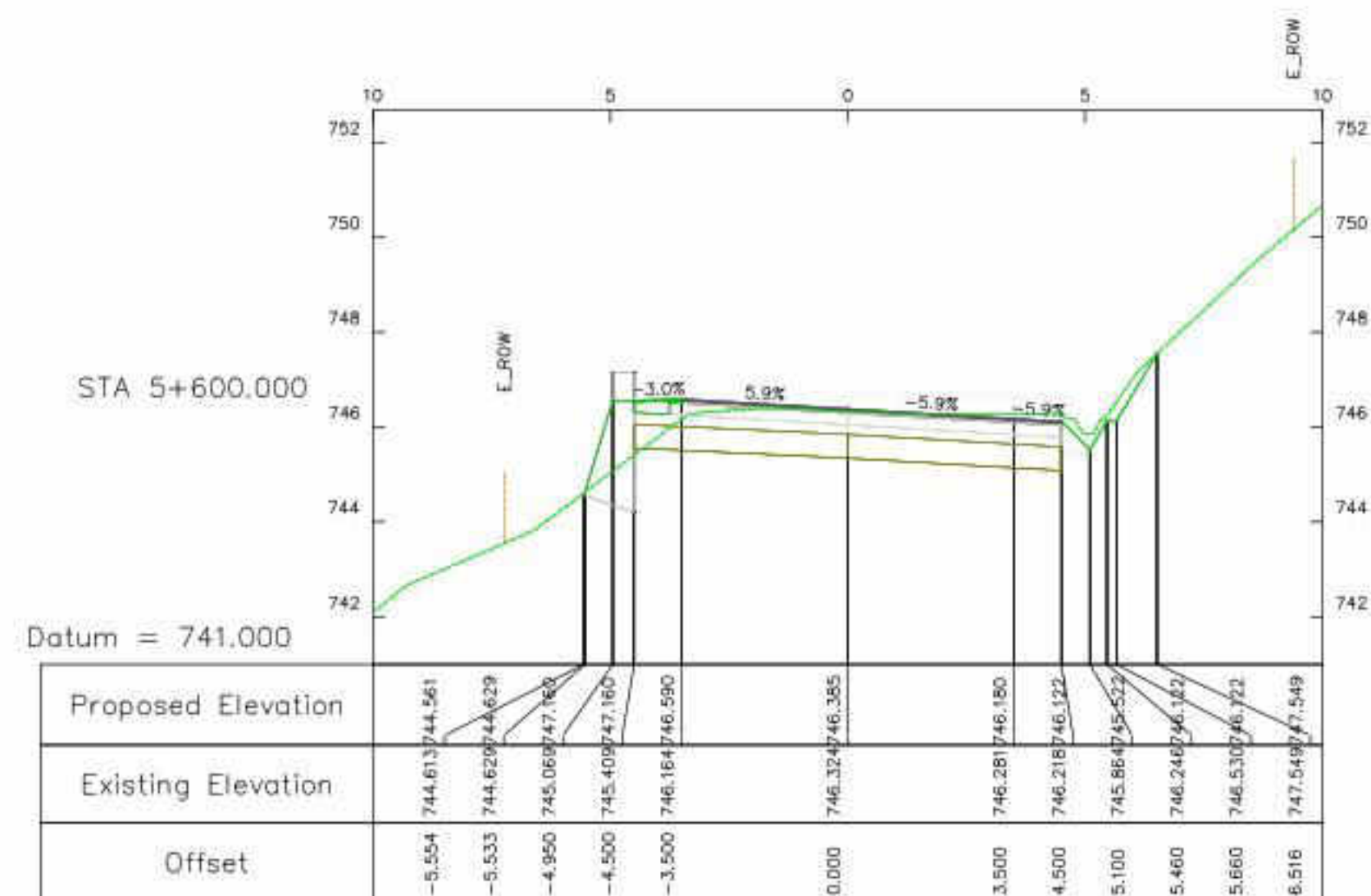
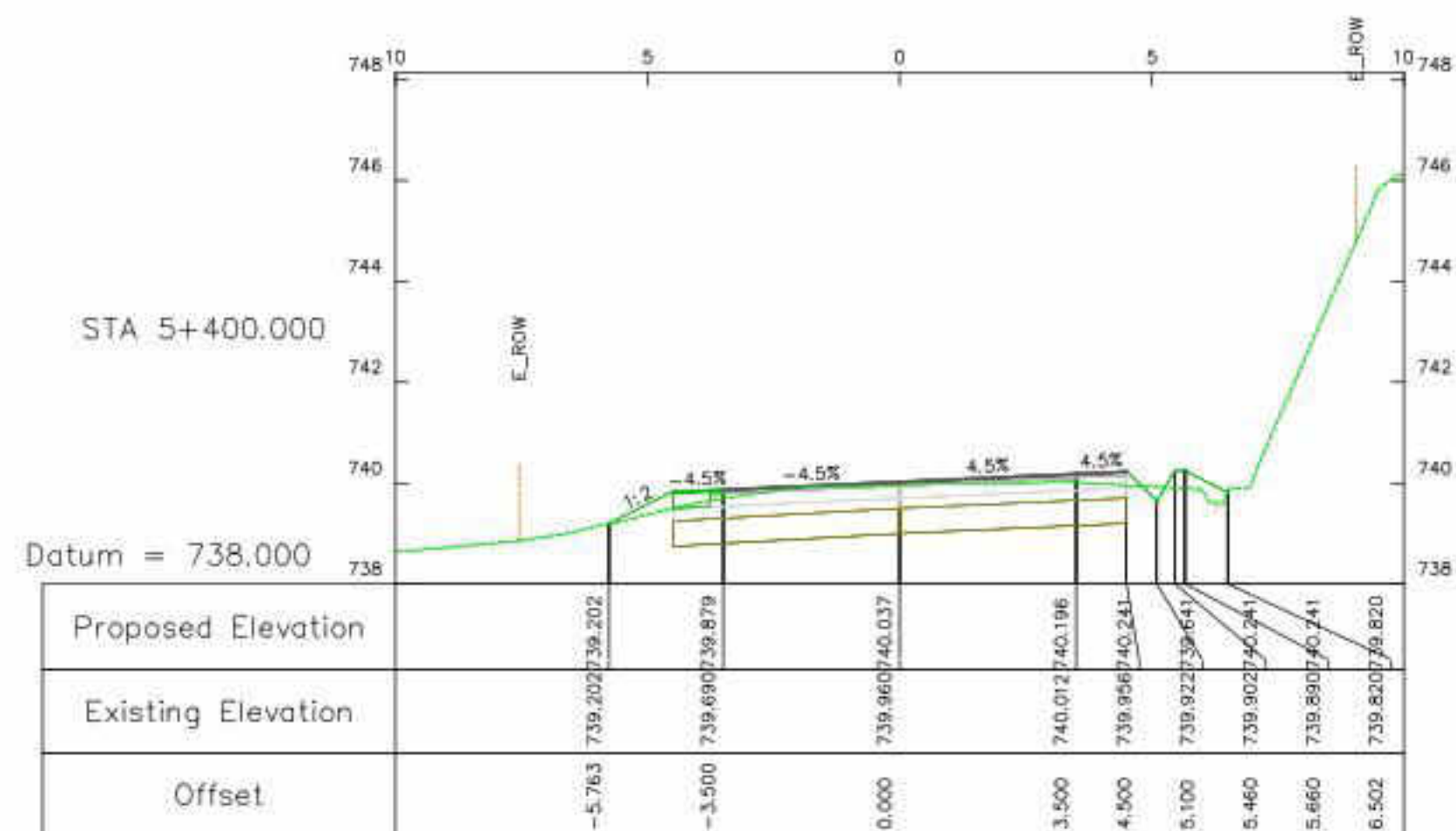
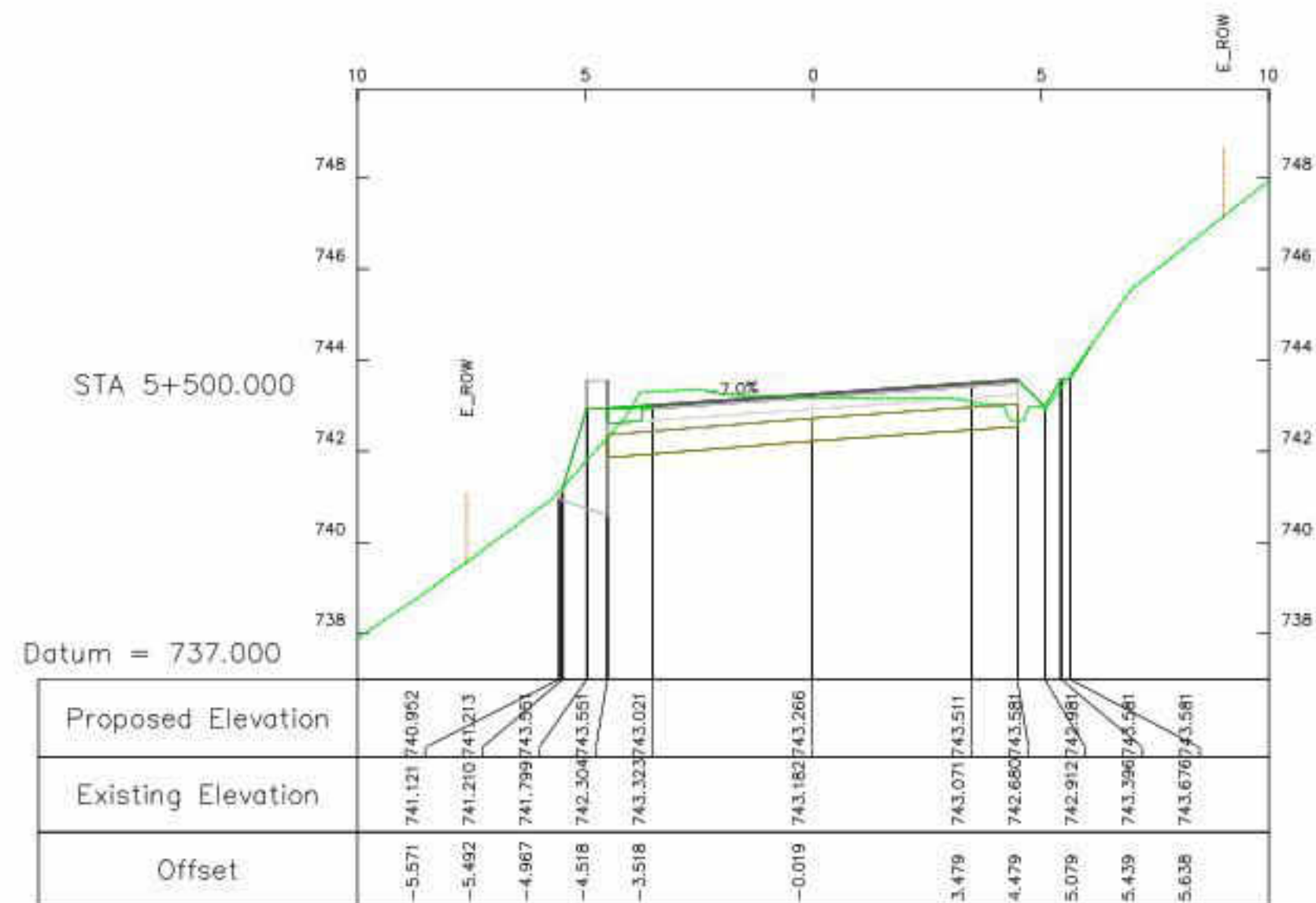
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REV A2	DATE DEC. 2022	DETAILS OF REVISION SCALE :	BY AS SHOWN							





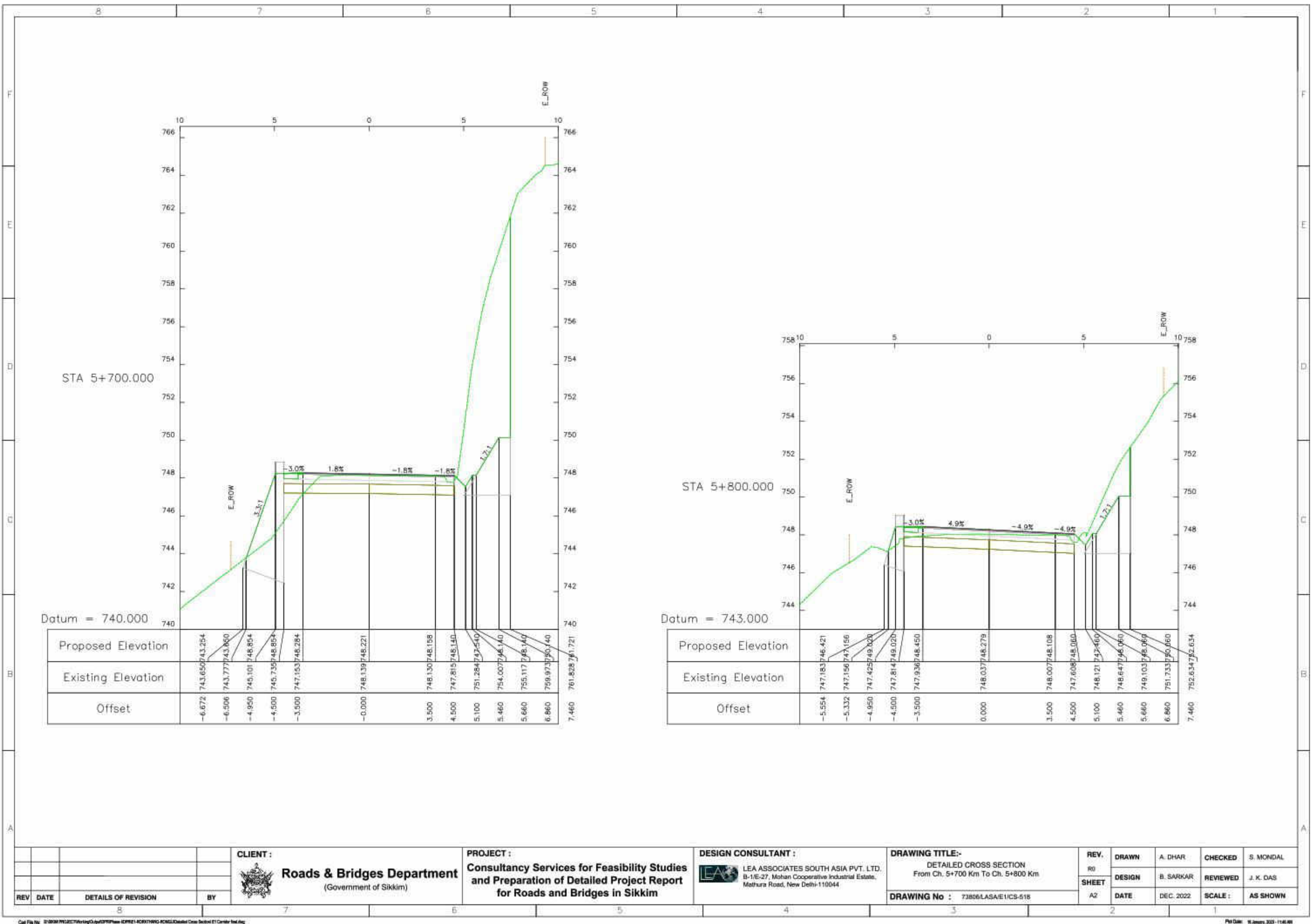
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REV	DATE	DETAILS OF REVISION	BY				SHEET	DESIGN	B. SARKAR	REVIEWED	J. K. DAS	
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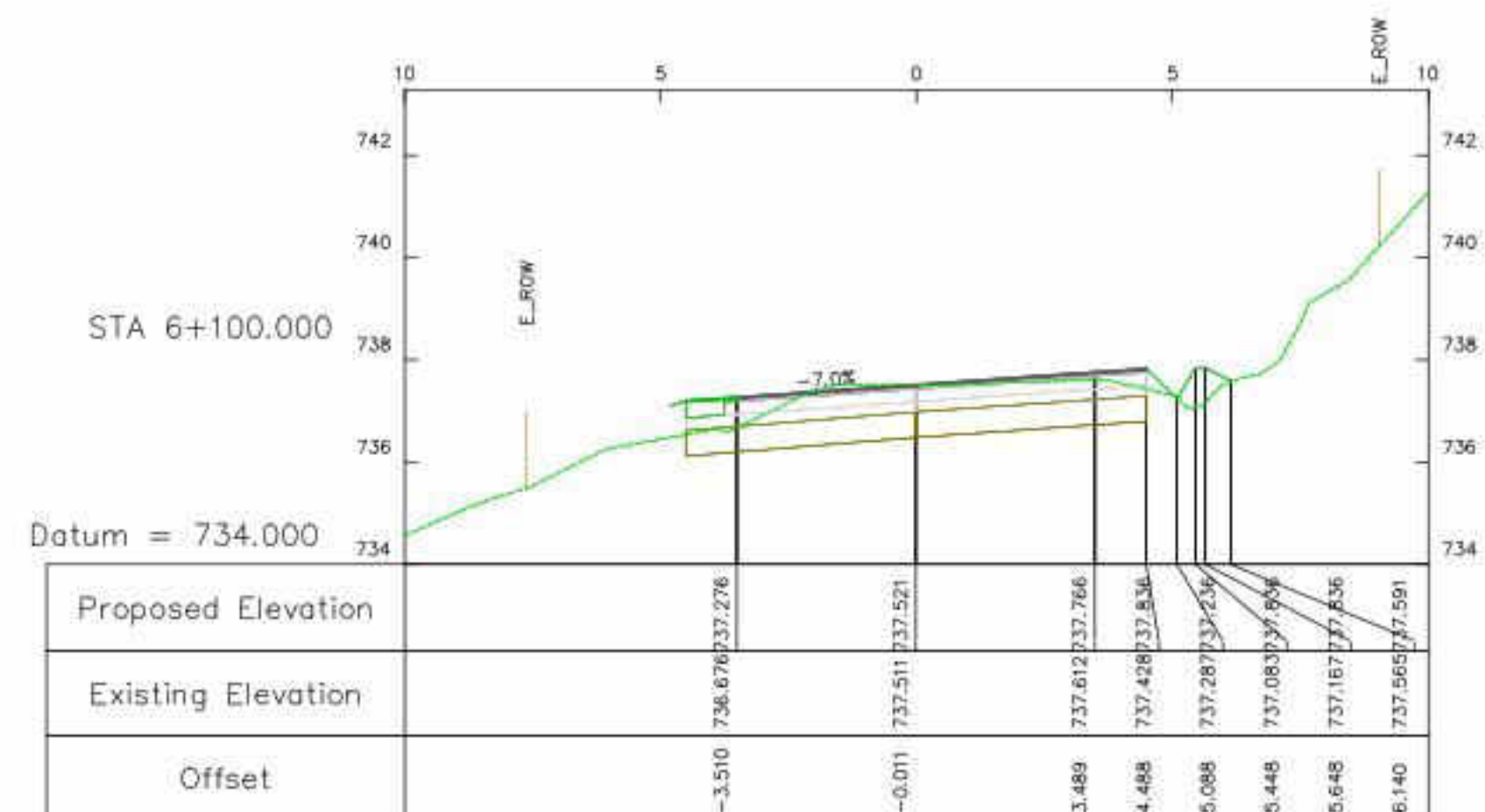
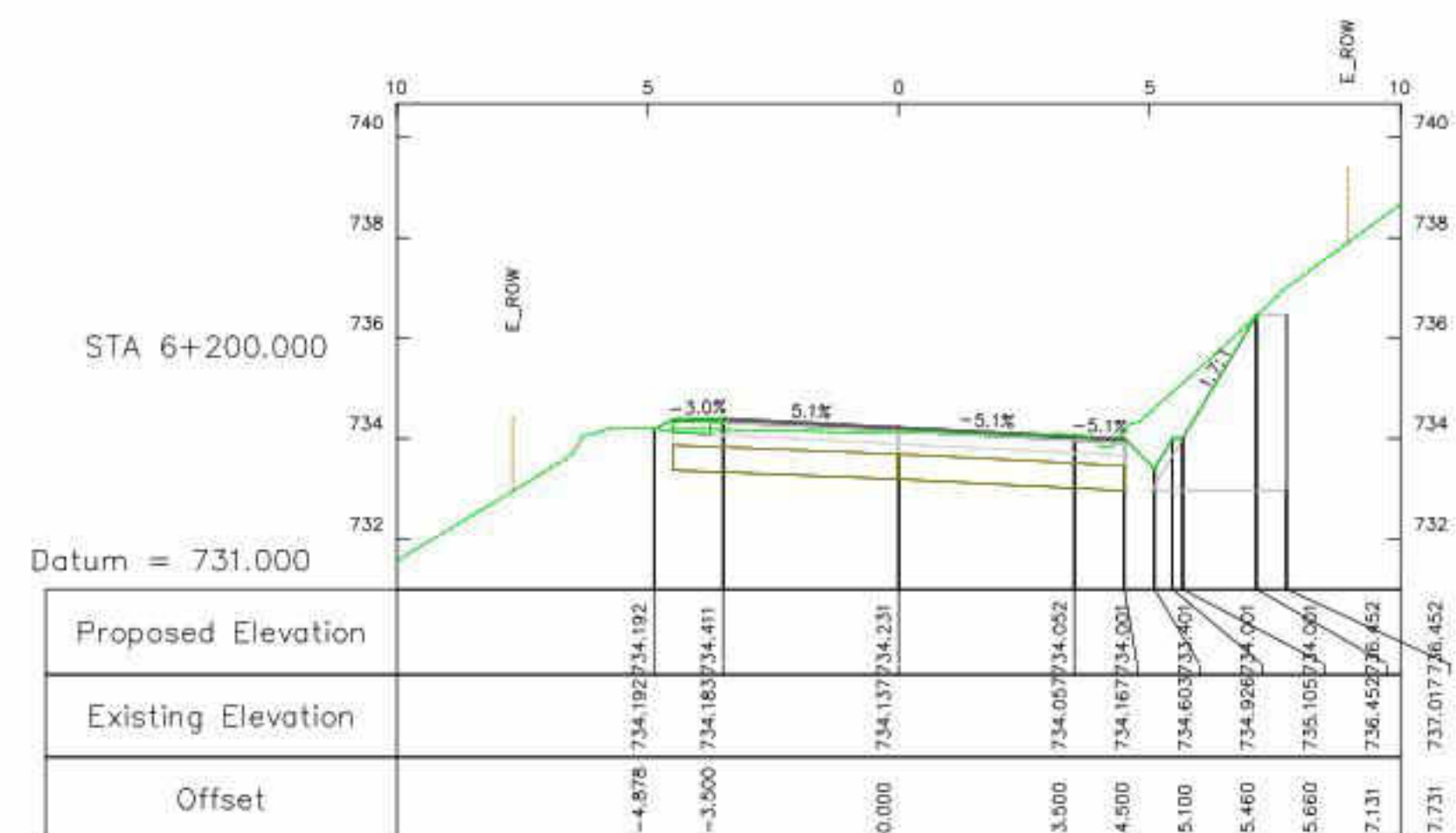




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				(Government of Sikkim)		and Preparation of Detailed Project Report		B-1/E-27, Mohan Cooperative Industrial Estate,		From Ch. 5+200 Km To Ch. 5+300 Km		SHEET	DATE	DEC. 2022	SCALE :	AS SHOWN
						for Roads and Bridges in Sikkim		Mathura Road, New Delhi-110044		DRAWING No : 73806/LASA/IE/CS-515		A2				

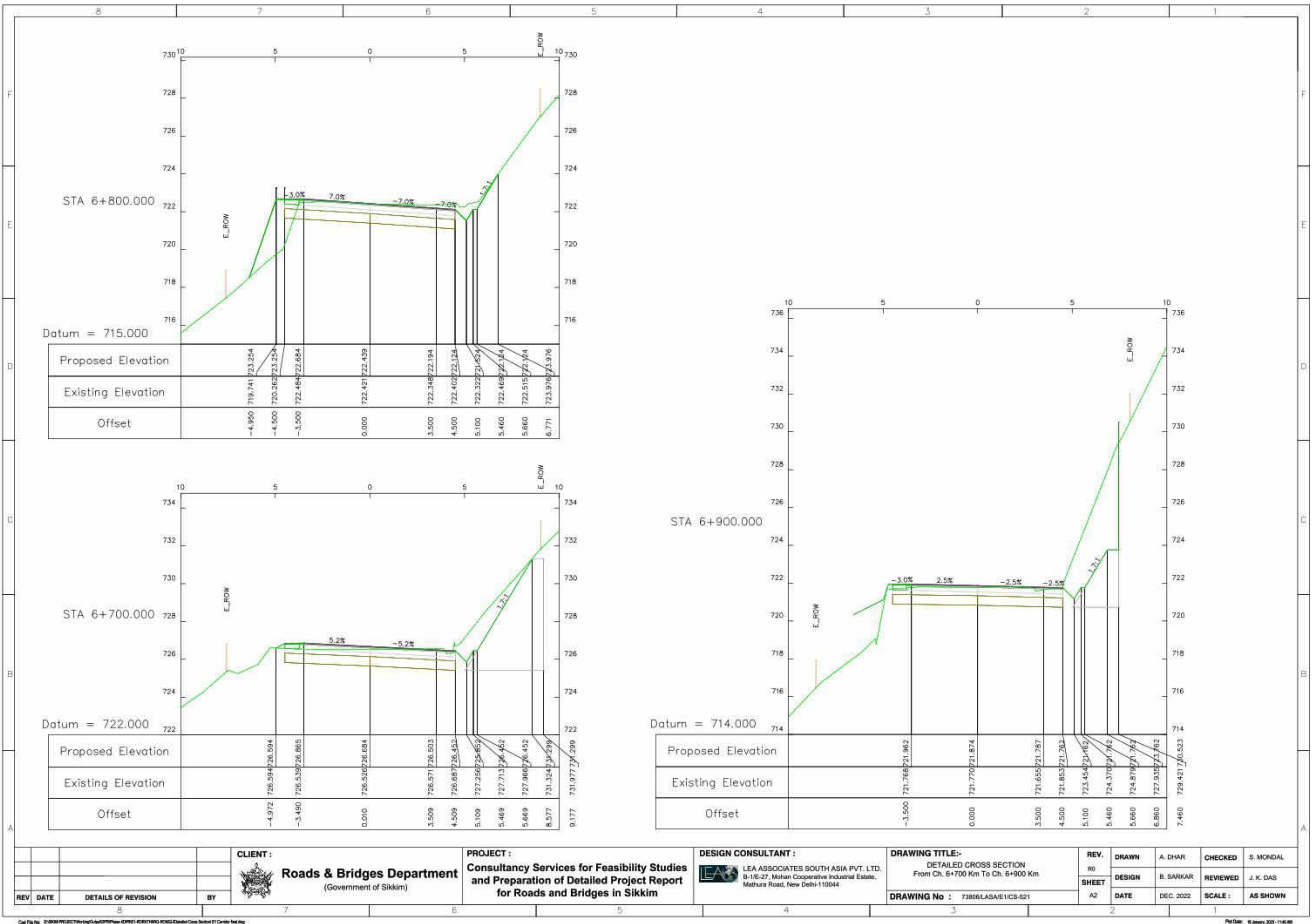


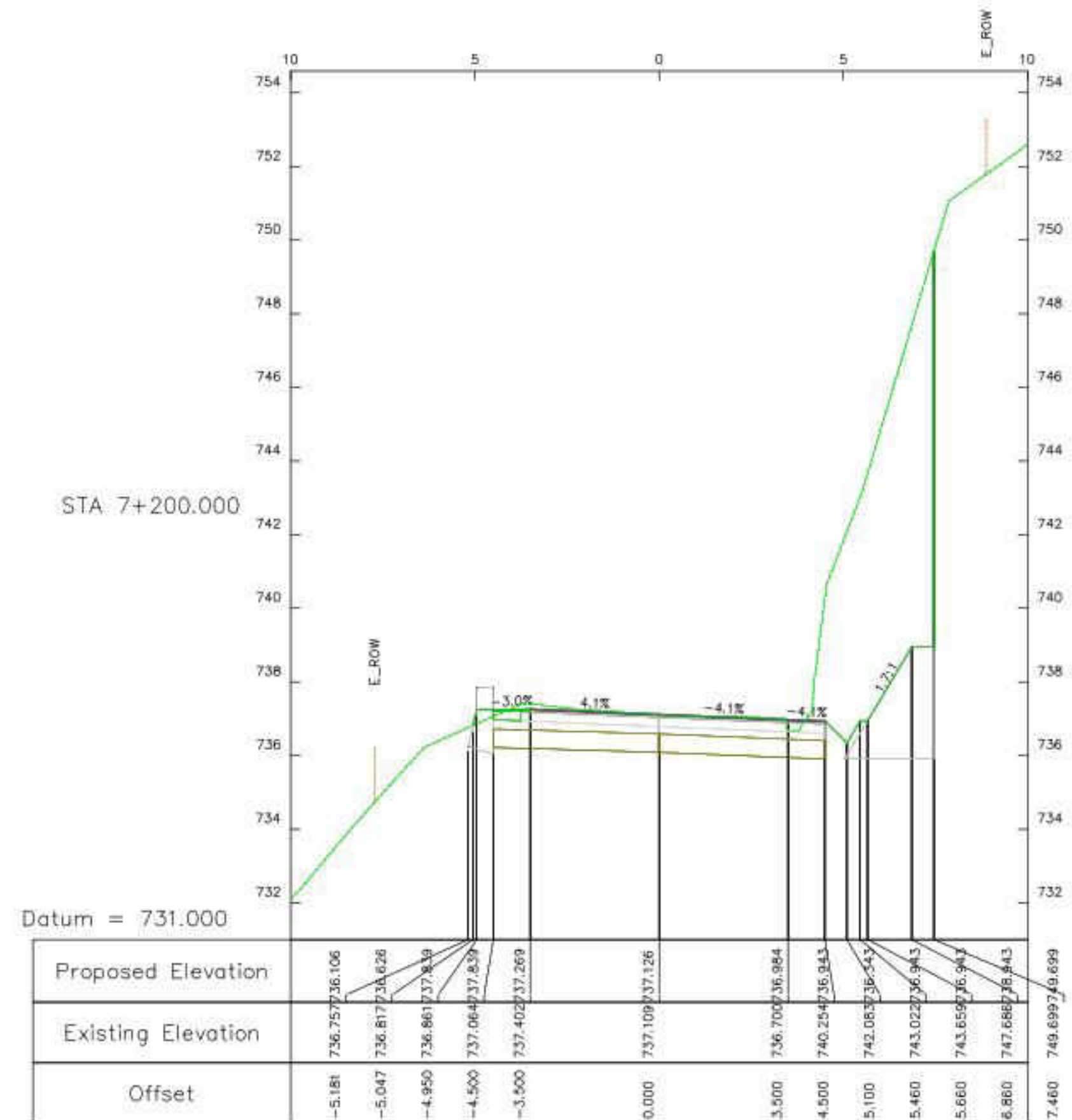
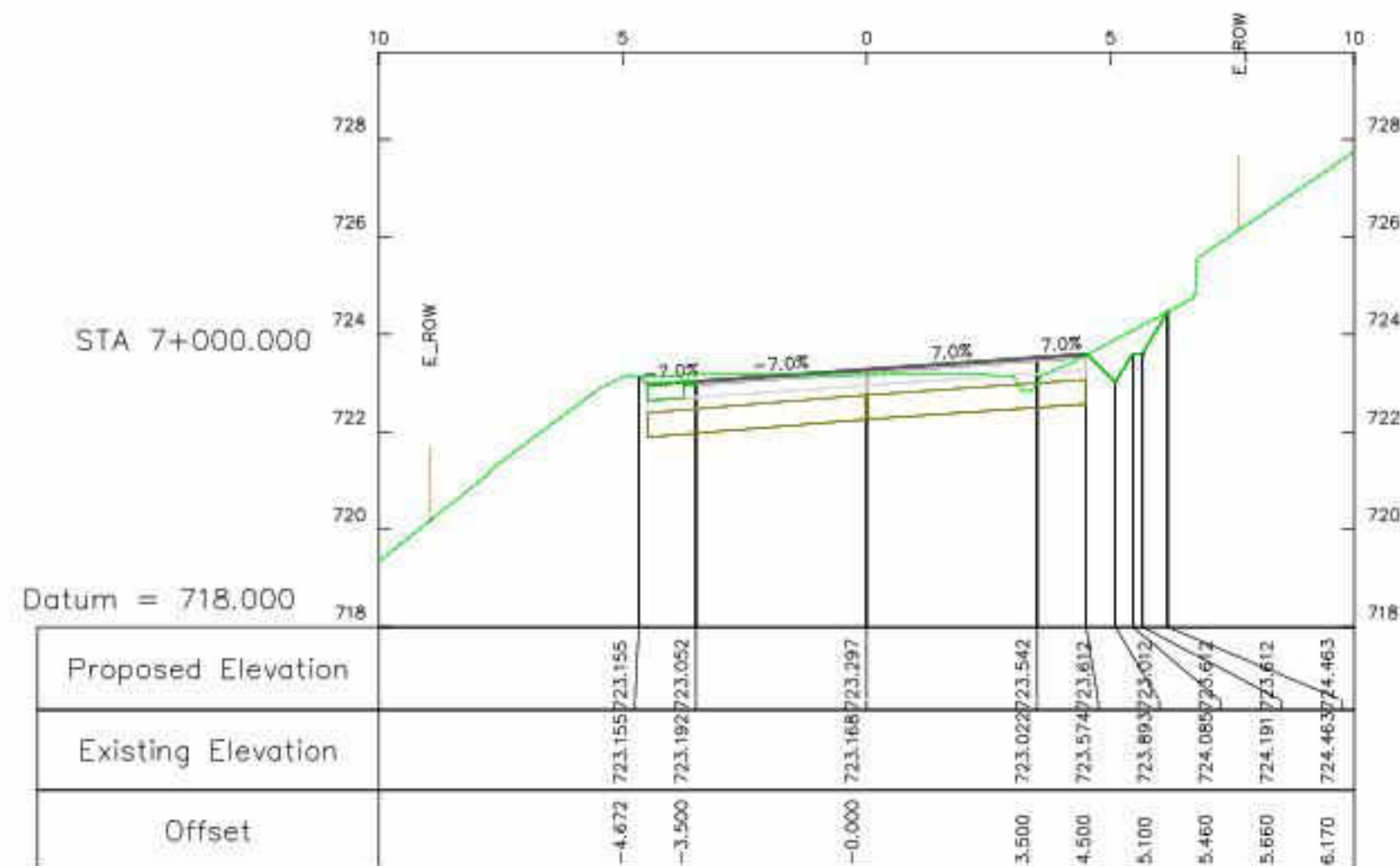
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REV	DATE	DETAILS OF REVISION						BY	SHEET	DESIGN	B. SARKAR	REVIEWED
								A2	DATE	DEC. 2022	SCALE :	AS SHOWN





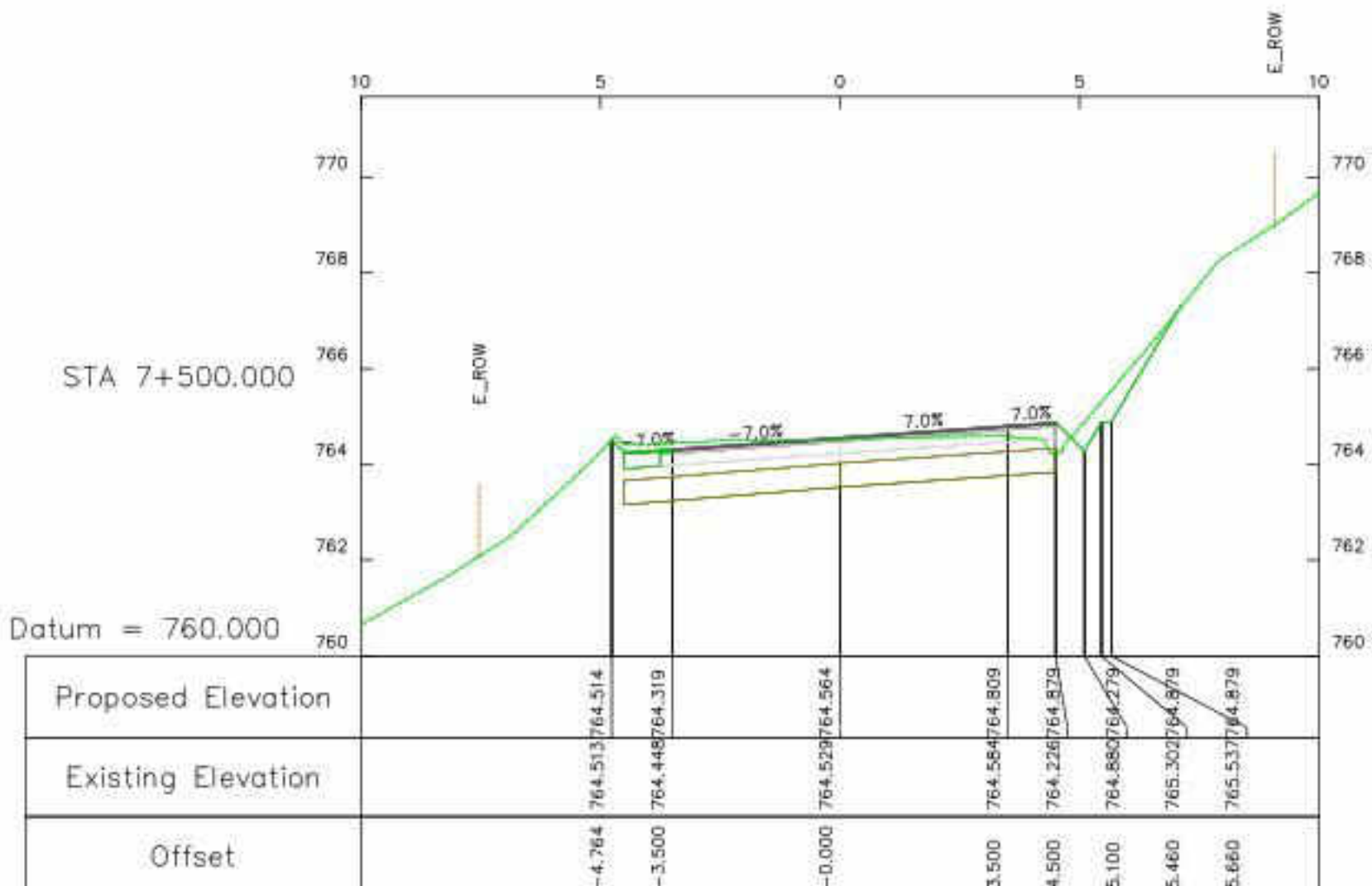
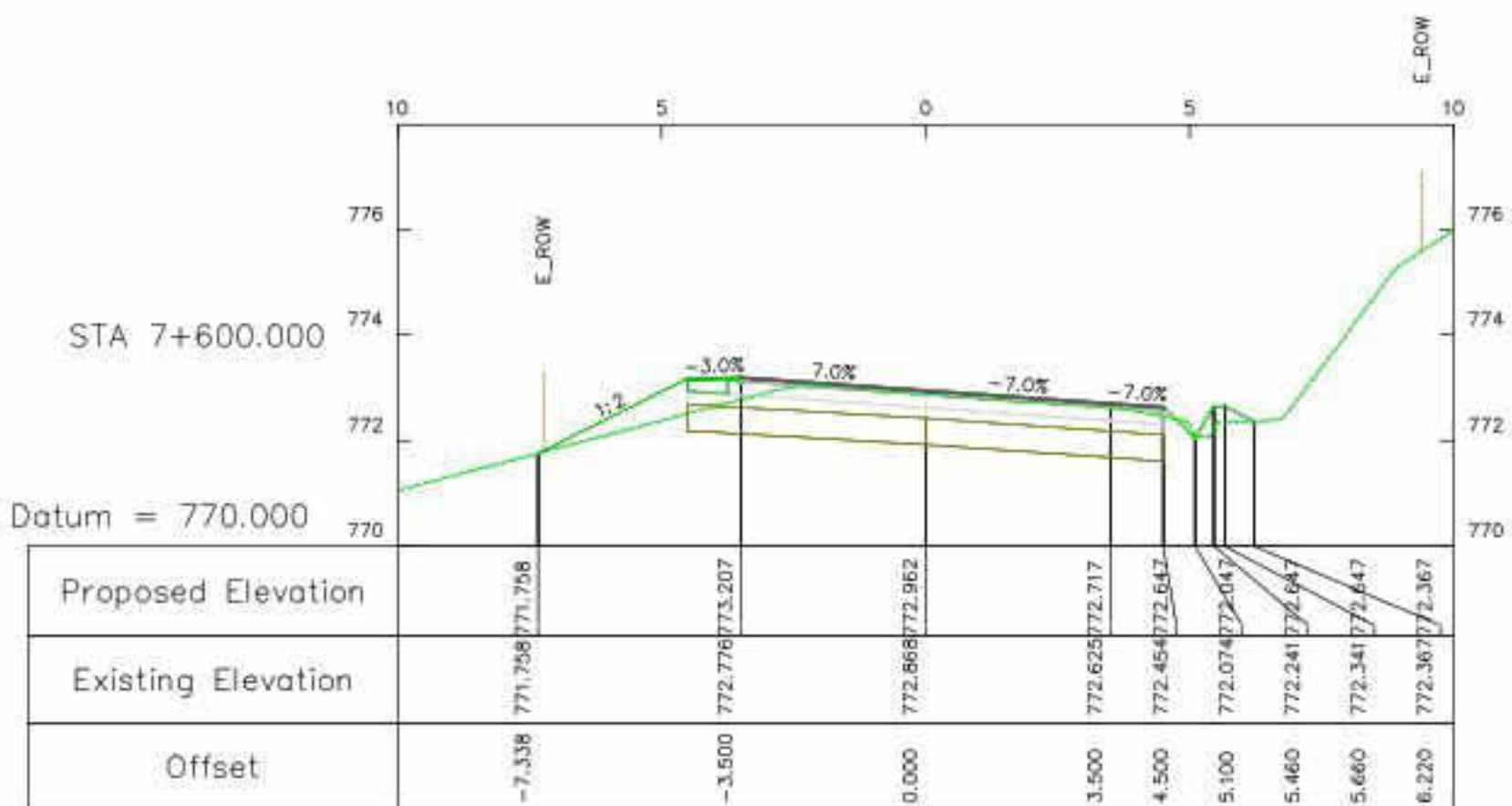




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REV	DATE	DETAILS OF REVISION	BY					SHEET	DESIGN	B. SARKAR	REVIEWED	J. K. DAS	
				A2	DATE	DEC. 2022	SCALE :	AS SHOWN					

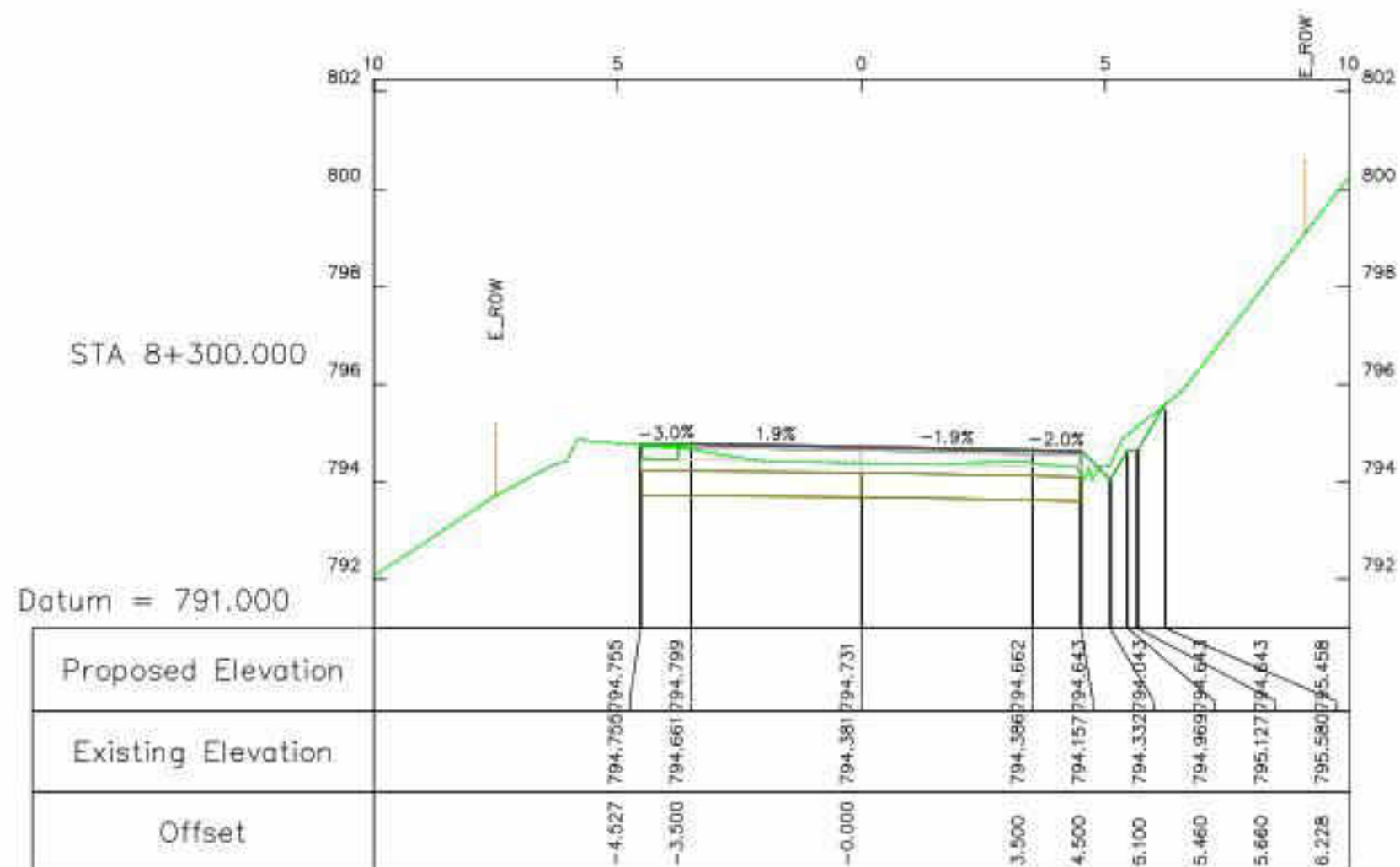
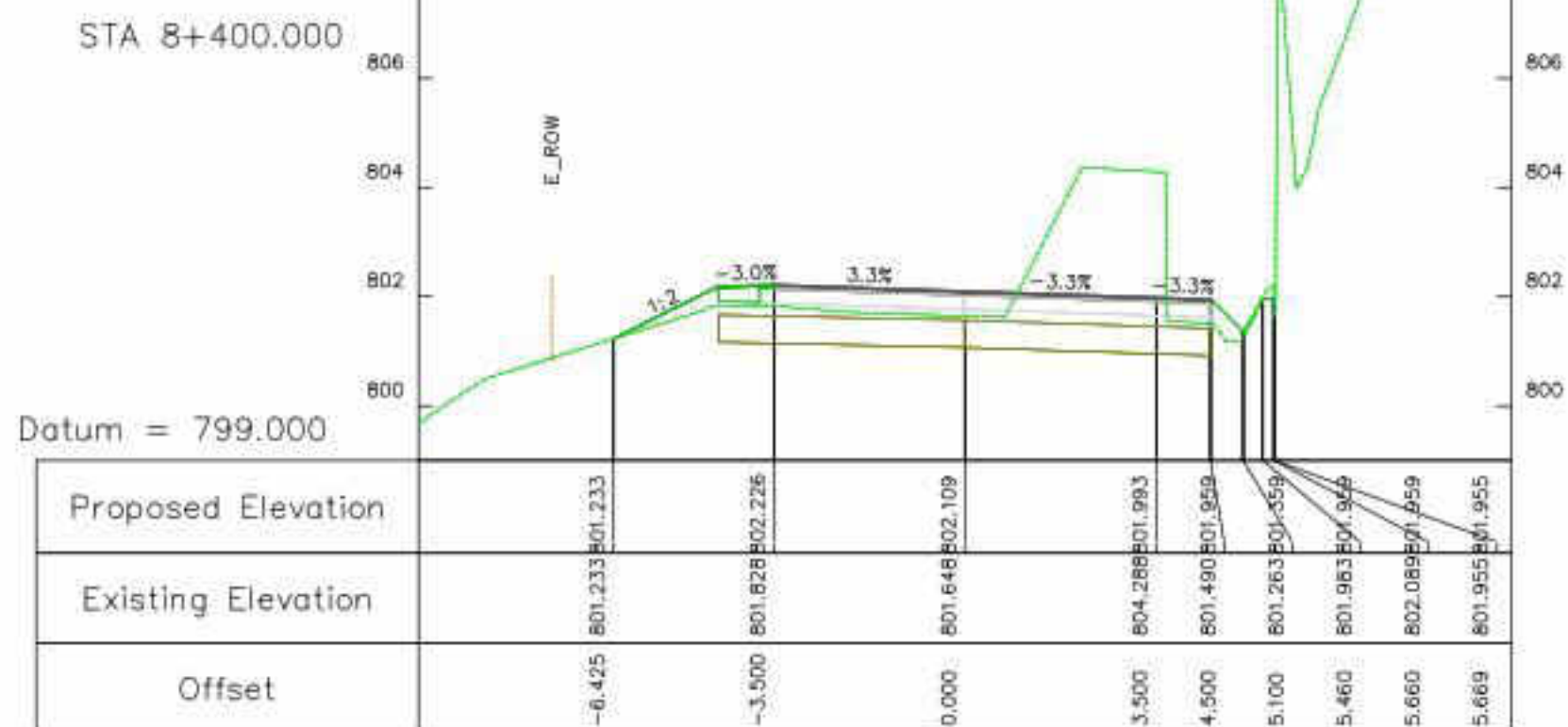




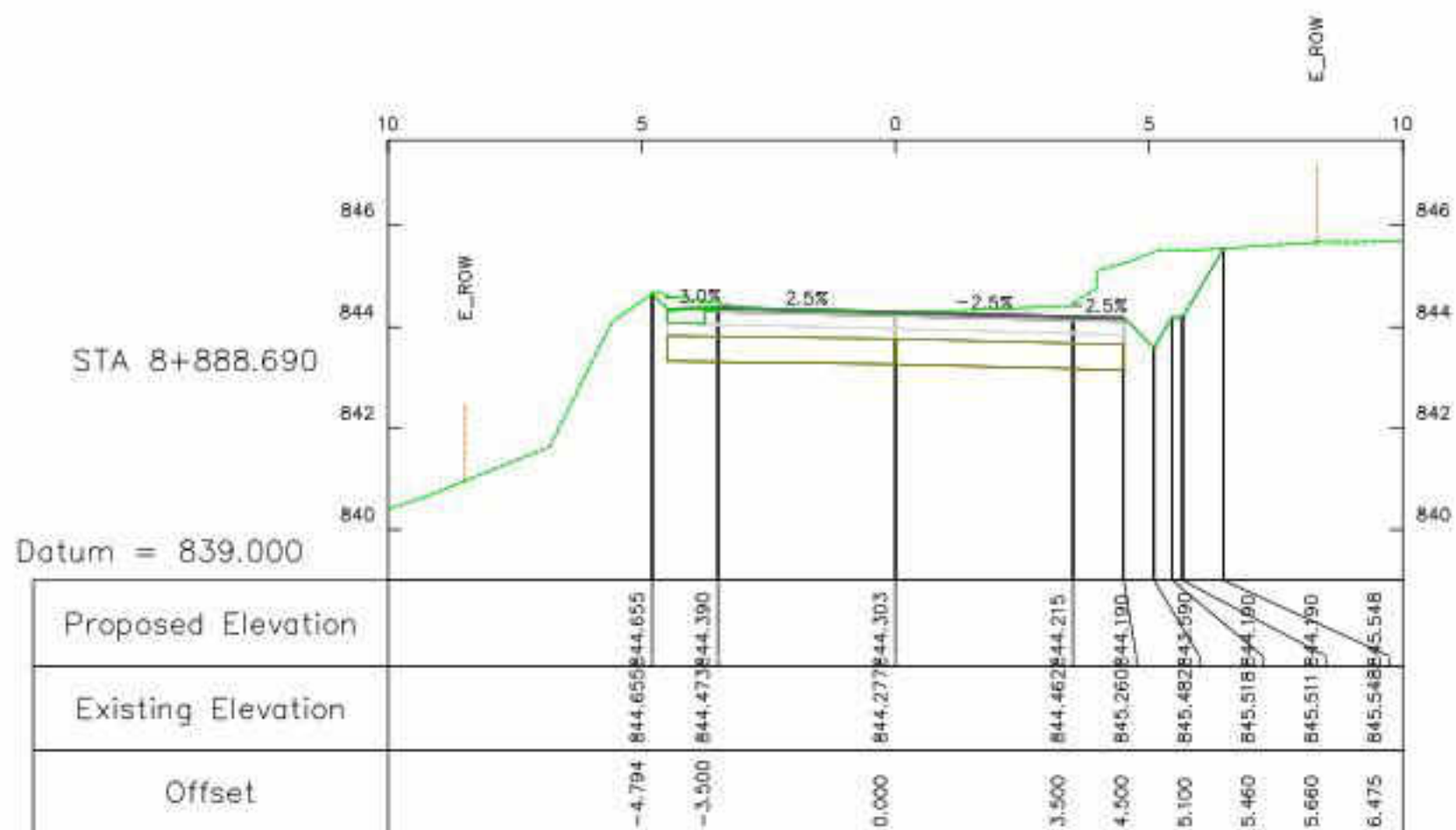
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REV	DATE	DETAILS OF REVISION	BY				DRAWING No :	A2	DATE	DEC. 2022	SCALE :	AS SHOWN
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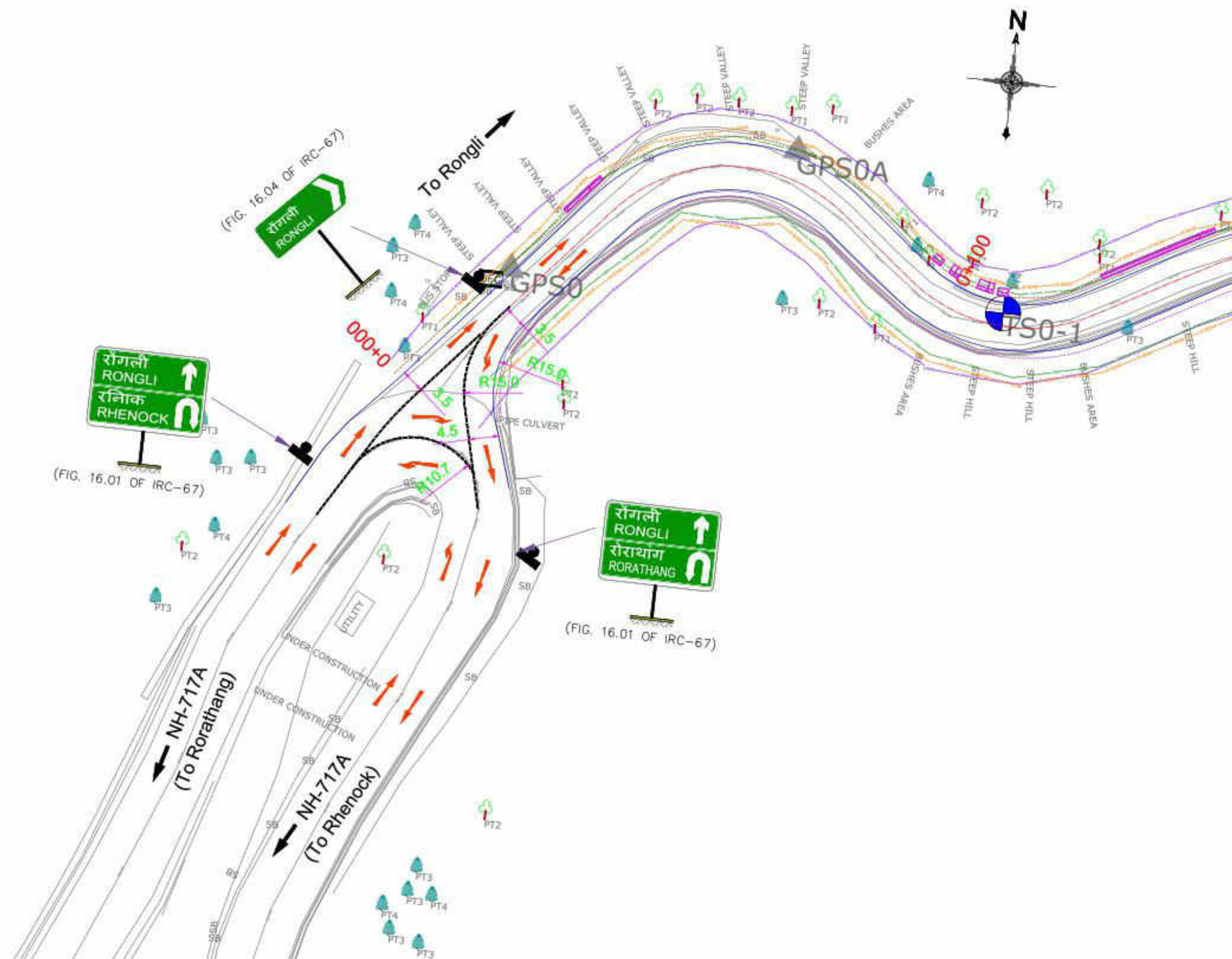
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							SHEET A2	DESIGN B. SARKAR	REVIEWED J. K. DAS	
REV A2	DATE DEC. 2022	DETAILS OF REVISION SCALE :	BY AS SHOWN							



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MAJOR JUNCTION



PLAN OF MAJOR JUNCTION
(AT Ch. 0+000 Km)
(SCALE - 1:500)

CLIENT :



Roads & Bridges Department
(Government of Sikkim)

PROJECT :

**Consultancy Services for Feasibility Studies
and Preparation of Detailed Project Report
for Roads and Bridges in Sikkim**

DESIGN CONSULTANT :

LEA ASSOCIATES SOUTH ASIA PVT. LTD.
B-1/E-27, Mohan Cooperative Industrial Estate,
Mathura Road, New Delhi-110044

DRAWING TITLE:-

LAYOUT PLAN OF MAJOR JUNCTION
AT CH. 0+000 Km
E1 - RORATHANG TO RONGLI

DRAWING No : 73806/LASA/HWY/E1/JUNC-601

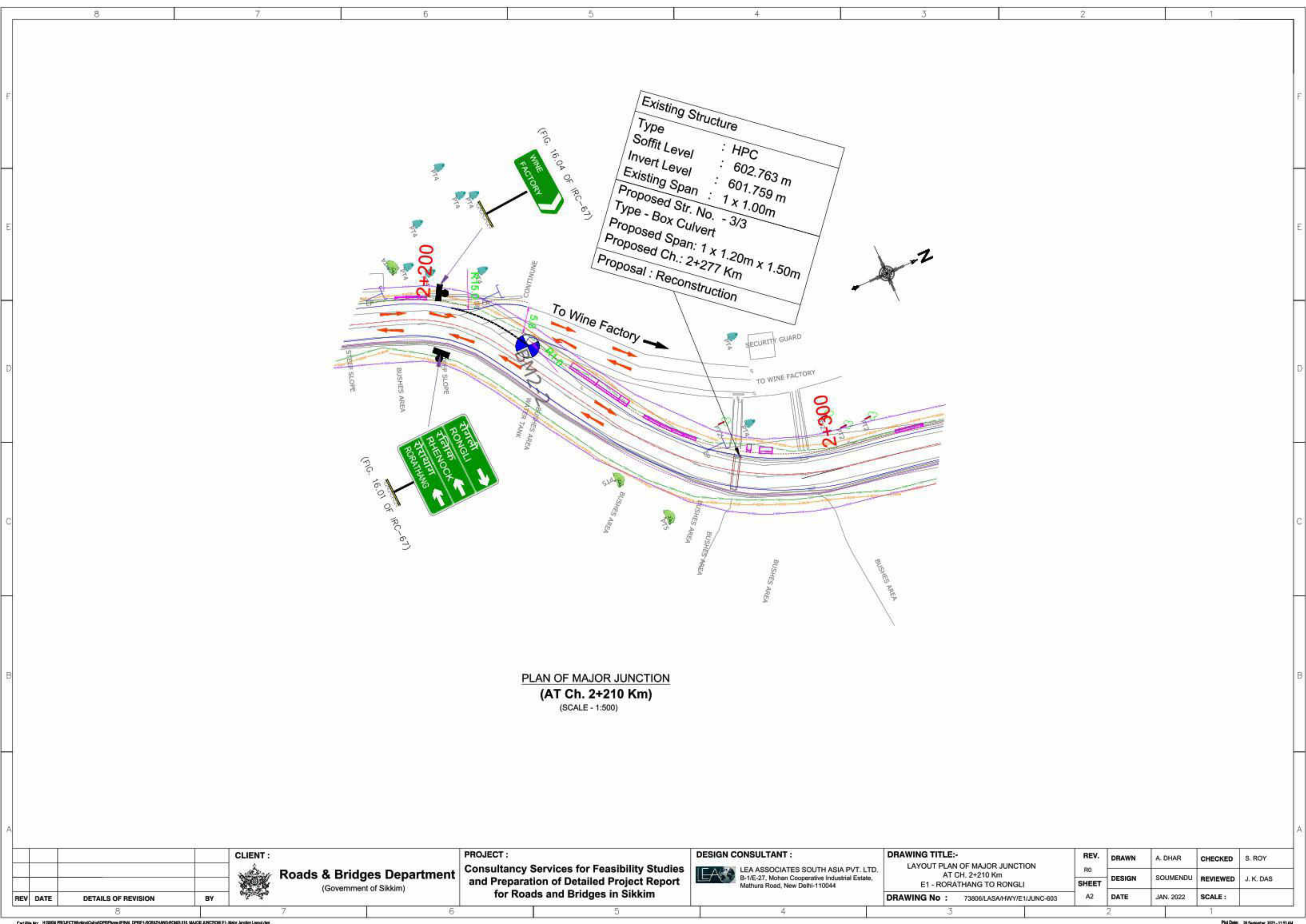
REV.



R0

SHEET

A2

DRAWN	A. DHAR	CHECKED	S. ROY
DESIGN	SOURMENDU	REVIEWED	J. K. DAS
DATE	JAN. 2022	SCALE :	



				 CLIENT : Roads & Bridges Department (Government of Sikkim)	PROJECT : Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim	 DESIGN CONSULTANT : LEA ASSOCIATES SOUTH ASIA PVT. LTD. B-1/E-27, Mohan Cooperative Industrial Estate, Mathura Road, New Delhi-110044	DRAWING TITLE:- LAYOUT PLAN OF MAJOR JUNCTION AT CH. 2+210 Km E1 - RORATHANG TO RONGLI	REV.	DRAWN	A. DHAR	CHECKED	S. ROY			
REV	DATE	DETAILS OF REVISION		BY			DRAWING No : 73806/LASA/HWY/E1/JUNC-603	SHEET	DESIGN	SOURMENDU	REVIEWED	J. K. DAS			
								A2	DATE	JAN. 2022	SCALE :				

STRUCTURE DRAWING

TABLE FOR DETAILS OF DIMENSIONS FOR SINGLE CELL BOX CULVERT

Sl. No.	Proposed Chainage (km)	Proposed Structure	Proposed No. of span x Span length x Vent Height (Nos.) x (m) x (m)			Skew Angle	Type of culvert	Top Slab Thickness mm	Wall Thickness mm	bottom Slab Thickness mm	Proposed Width of Box Culvert (m)
				(a)	(b)			(d)	(c)	(e)	
1	0+172	Box Culvert	1	x 1.20	x 1.50	-	Type B	200	200	200	9.00
2	0+355	Box Culvert	1	x 1.20	x 1.50	-	Type B	200	200	200	9.00
3	0+655	Box Culvert	1	x 1.20	x 1.50	-	Type B	200	200	200	9.00
4	0+868	Box Culvert	1	x 1.20	x 1.50	-	Type B	200	200	200	9.00
5	1+020	Box Culvert	1	x 1.20	x 1.50	-	Type B	200	200	200	9.00
6	1+117	Box Culvert	1	x 1.20	x 1.50	-	Type B	200	200	200	9.00
7	1+315	Box Culvert	1	x 1.20	x 1.50	-	Type B	200	200	200	9.00
8	1+495	Box Culvert	1	x 1.20	x 1.50	-	Type B	200	200	200	9.00
9	1+575	Box Culvert	1	x 1.50	x 1.50	-	Type B	200	200	200	9.00
10	1+800	Box Culvert	1	x 1.20	x 1.50	-	Type B	200	200	200	9.00
11	2+005	Box Culvert	1	x 1.20	x 1.50	-	Type B	200	200	200	9.00
12	2+150	Box Culvert	1	x 1.20	x 1.50	-	Type B	200	200	200	9.00
13	2+275	Box Culvert	1	x 1.20	x 1.50	-	Type B	200	200	200	9.00
14	2+746	Box Culvert	1	x 1.20	x 1.50	-	Type B	200	200	200	9.00
15	3+360	Box Culvert	1	x 1.20	x 1.50	-	Type B	200	200	200	9.00
16	3+702	Box Culvert	1	x 1.20	x 1.50	-	Type B	200	200	200	9.00
17	3+775	Box Culvert	1	x 1.20	x 1.50	-	Type B	200	200	200	9.00
18	4+210	Box Culvert	1	x 1.20	x 1.50	-	Type B	200	200	200	9.00
19	4+320	Box Culvert	1	x 2.25	x 2.00	-	TYPE D	300	300	300	9.00
20	4+400	Box Culvert	1	x 1.20	x 1.50	-	Type B	200	200	200	9.00
21	4+660	Box Culvert	1	x 1.20	x 1.50	-	Type B	200	200	200	9.00
22	4+940	Box Culvert	1	x 3.00	x 2.75	-	TYPE D	300	300	300	9.00
23	5+425	Box Culvert	1	x 1.20	x 1.50	-	Type B	200	200	200	9.00
24	5+580	Box Culvert	1	x 1.20	x 1.50	-	Type B	200	200	200	9.00
25	5+630	Box Culvert	1	x 1.20	x 1.50	-	Type B	200	200	200	9.00
26	5+660	Box Culvert	1	x 1.20	x 1.50	-	Type B	200	200	200	9.00
27	5+760	Box Culvert	1	x 1.20	x 1.50	-	Type B	200	200	200	9.00
28	6+010	Box Culvert	1	x 1.20	x 1.50	-	Type B	200	200	200	9.00
29	6+097	Box Culvert	1	x 1.20	x 1.50	-	Type B	200	200	200	9.00
30	6+150	Box Culvert	1	x 1.20	x 1.50	-	Type B	200	200	200	9.00
31	6+230	Box Culvert	1	x 1.20	x 1.50	-	Type B	200	200	200	9.00
32	6+320	Box Culvert	1	x 1.20	x 1.50	-	Type B	200	200	200	9.00
33	6+560	Box Culvert	1	x 1.20	x 1.50	-	Type B	200	200	200	9.00
34	6+670	Box Culvert	1	x 1.20	x 1.50	-	Type B	200	200	200	9.00
35	6+898	Box Culvert	1	x 1.20	x 1.50	-	Type B	200	200	200	9.00
36	6+970	Box Culvert	1	x 1.20	x 1.50	-	Type B	200	200	200	9.00
37	7+150	Box Culvert	1	x 1.20	x 1.50	-	Type B	200	200	200	9.00
38	7+300	Box Culvert	1	x 1.20	x 1.50	-	Type B	200	200	200	9.00
39	7+483	Box Culvert	1	x 3.00	x 3.00	-	TYPE D	300	300	300	9.00
40	7+632	Box Culvert	1	x 1.20	x 1.50	-	Type B	200	200	200	9.00
41	7+700	Box Culvert	1	x 1.20	x 1.50	-	Type B	200	200	200	9.00
42	7+766	Box Culvert	1	x 1.20	x 1.50	-	Type B	200	200	200	9.00
43	7+850	Box Culvert	1	x 3.00	x 2.75	-	TYPE D	300	300	300	9.00
44	8+150	Box Culvert	1	x 3.00	x 2.50	-	TYPE D	300	300	300	9.00
45	8+526	Box Culvert	1	x 1.20	x 1.50	-	Type B	200	200	200	9.00
46	8+680	Box Culvert	1	x 1.20	x 1.50	-	Type B	200	200	200	9.00
47	8+762	Box Culvert at Hair Pin	1	x 0.80	x 0.60	-	Type A	175	200	200	9.00
48	8+831	Box Culvert at Hair Pin	1	x 0.80	x 0.60	-	Type A	175	200	200	9.00

CLIENT :



Roads & Bridges Department
(Government of Sikkim)

PROJECT :

Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim

DESIGN CONSULTANT :



LEA ASSOCIATES SOUTH ASIA PVT. LTD.
B-1/E-27, Mohan Cooperative Industrial Estate,
Mathura Road, New Delhi-110044

DRAWING TITLE:-

SCHEDULE OF DIMENSIONS FOR
SINGLE CELL BOX CULVERT
(SH. 2 OF 2)

DRAWING No : 73806/LASA/HWY/E1/STR/BC-651

REV.

R0

SHEET

A2

DRAWN	A. DHAR	CHECKED	S. ROY
DESIGN	SOURMENDU	REVIEWED	J. K. DAS
DATE	FEB. 2022	SCALE :	AS SHOWN

REV DATE DETAILS OF REVISION

BY



LEGEND:
TOP/NEAR FACE BAR SHOWN THUS ---
BOTTOM/FAR FACE BAR SHOWN THUS _____

NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETRES. NO PART OF THE DRAWING SHALL BE SCALED.
2. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH OTHER RELEVANT DRAWINGS FOR THE RESPECTIVE CHAINAGES.
3. CLEAR COVER FOR REINFORCEMENT SHALL BE AS PER FOLLOWS:
 - EARTH FACE = 75mm
 - INSIDE FACE = 40mm
4. THE GRADE OF CONCRETE FOR DIFFERENT COMPONENTS ARE AS FOLLOWS:
 - a. RCC BOX - M30
 - b. PCC CONCRETE - M15
5. ALL REINFORCEMENT SHALL BE OF GRADE Fe 500 CONFIRMING TO IS:1786.
6. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS.





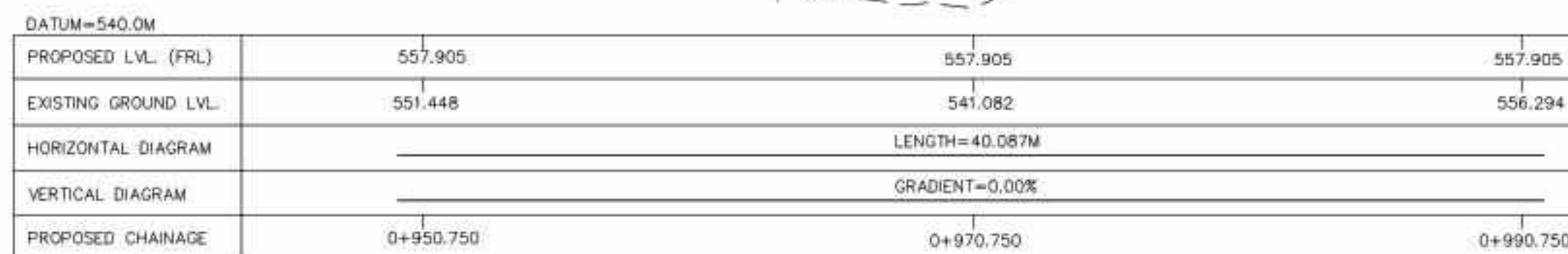
				<div></div> <div>CLIENT : Roads & Bridges Department (Government of Sikkim)</div>	<div>PROJECT : Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim</div>	<div></div> <div>DESIGN CONSULTANT : LEA ASSOCIATES SOUTH ASIA PVT. LTD. B-1/E-27, Mohan Cooperative Industrial Estate, Mathura Road, New Delhi-110044</div>	<div>DRAWING TITLE:- REINFORCEMENT DETAIL OF SINGLE CELL BOX CULVERT (SH. 1 OF 2)</div>	REV.	DRAWN	A. DHAR	CHECKED	S. ROY
R0.	DESIGN	SOURMENDU	REVIEWED					J. K. DAS				
SHEET												
REV	DATE	DETAILS OF REVISION	BY				<div>DRAWING No : 73806/LASA/HWY/E1/STR/BC-652</div>	A2	DATE	FEB. 2022	SCALE :	AS SHOWN

TABLE FOR REINFORCEMENT DETAILS FOR SINGLE CELL BOX CULVERT

Type		Type A	Type B	Type C	Type D
Dimensions	a	1.0 m	1.5 m	2.0 m	3.0 m
	b	1.0 m	1.5 m	2.0 m	3.0 m
	c	0.200 m	0.200 m	0.275 m	0.300 m
	d	0.175 m	0.200 m	0.250 m	0.300 m
	e	0.200 m	0.200 m	0.275 m	0.300 m
Top slab	ts1	12mm@150mm C/C	12mm@150mm C/C	10mm@125mm C/C	12mm@200mm C/C+16mm@200mmC/C ALT
	ts2	12mm@100mm C/C	10mm@300mm C/C+12mm@300mm C/C ALT	10mm@100mm C/C	12mm@125mm C/C+16mm@125mm C/C ALT
	ts3	10mm@200mm C/C	10mm@250mm C/C	10mm@250mm C/C	10mm@100mm C/C
	ts4	10mm@200mm C/C	10mm@250mm C/C	10mm@250mm C/C	10mm@100mm C/C
Wall	w1	12mm@100mm C/C	10mm@250mm C/C+12mm@250mm C/C ALT	10mm@125mm C/C	12mm@250mmC/C+16mm@250mmC/C ALT
	w2	12mm@100mm C/C	10mm@250mm C/C+12mm@250mm C/C ALT	10mm@100mm C/C	10mm@125mmC/C
	w3	10mm@200mm C/C	10mm@250mm C/C	10mm@250mm C/C	10mm@100mmC/C
	w4	10mm@200mm C/C	10mm@250mm C/C	10mm@250mm C/C	10mm@100mmC/C
Bottom Slab	bs1	12mm@100mm C/C	10mm@250mm C/C+12mm@250mm C/C ALT	10mm@100mm C/C	12mm@200mmC/C+16mm@200mmC/C ALT
	bs2	12mm@150mm C/C	10mm@250mm C/C+12mm@250mmC/C ALT	10mm@125mm C/C	10mm@125mmC/C
	bs3	10mm@150mm C/C	10mm@250mm C/C	10mm@250mm C/C	10mm@100mmC/C
	bs4	10mm@150mm C/C	10mm@250mmC/C	10mm@250mm C/C	10mm@100mmC/C
Haunch	h1	10mm@150mmC/C	10mm@150mmC/C	10mm@125mmC/C	10mm@200mmC/C
	h2	10mm@150mmC/C	10mm@150mmC/C	10mm@125mmC/C	10mm@200mmC/C
	sk1	10mm@150mmC/C	10mm@150mmC/C	10mm@150mmC/C	10mm@150mmC/C
	sk2	2L 10mm @150mm C/C	2L 10mm @150mm C/C	2L 10mm @150mm C/C	2L 10mm @150mm C/C
	L1	350mm	600mm	700mm	1000mm
	L2	350mm	600mm	700mm	1000mm
Net SBC	SBC	100KN/m^2	100KN/m^2	100KN/m^2	100KN/m^2

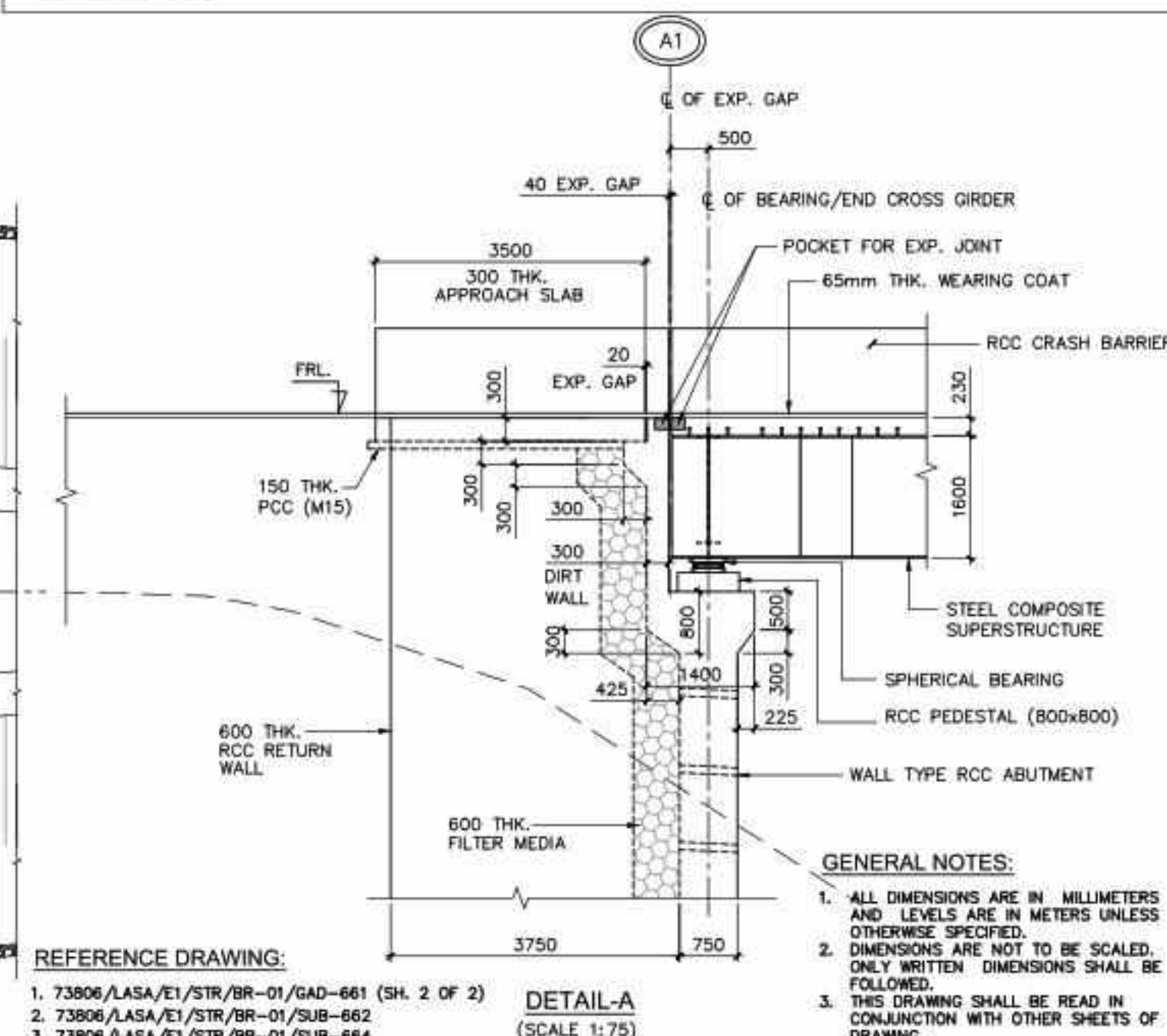
CLIENT :  Roads & Bridges Department (Government of Sikkim)		PROJECT : Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim		DESIGN CONSULTANT :  LEA ASSOCIATES SOUTH ASIA PVT. LTD. B-1/E-27, Mohan Cooperative Industrial Estate, Mathura Road, New Delhi-110044		DRAWING TITLE:- REINFORCEMENT SCHEDULE OF SINGLE CELL BOX CULVERT (SH. 2 OF 2)		REV. R0 SHEET A2	DRAWN A. DHAR	CHECKED S. ROY
DETAILS OF REVISION REV DATE BY		DRAWING No : 73606/LASA/HWY/E1/STR/BC-652		DESIGN SOUMENDU		REVIEWED J. K. DAS		DATE FEB. 2022		SCALE : AS SHOWN



Technical drawing of a bridge plan, showing half plans of the bottom and top, with dimensions and labels for RORATHANG and RONGLI.

Labels and Dimensions:

- Scale:** (SCALE- 1:200)
- Orientation:** RORATHANG (Left), RONGLI (Right)
- Reference Points:** A1, A2, Q OF EXP. GAP/PIER, Q OF END CROSS GIRDER/BEARING
- Dimensions:**
 - 40000 (C/C OF EXP. JOINT)
 - 39000 (C/C OF BEARING)
 - 500
 - 12000
 - 8000
 - 6000 (TYP)
 - 1500
 - 500
- Structural Features:**
 - CRASH BARRIER
 - RAISED FOOTPATH
 - CARRIAGEWAY
 - TRAFFIC DIRECTION
 - STONE PITCHING (TYP)
 - DRAINAGE SPOUT @ 6000 C/C
- Plan Views:**
 - HALF PLAN OF BOTTOM
 - HALF PLAN OF TOP
 - PLAN OF BRIDGE
- Slopes:** SLOPE 1:1.5, SLOPE 1:2



REV	DATE	DETAILS OF REVISION	BY

CLIENT :  **Roads & Bridges Department**
(Government of Sikkim)

PROJECT :
**Consultancy Services for Feasibility Studies
and Preparation of Detailed Project Report
for Roads and Bridges in Sikkim**

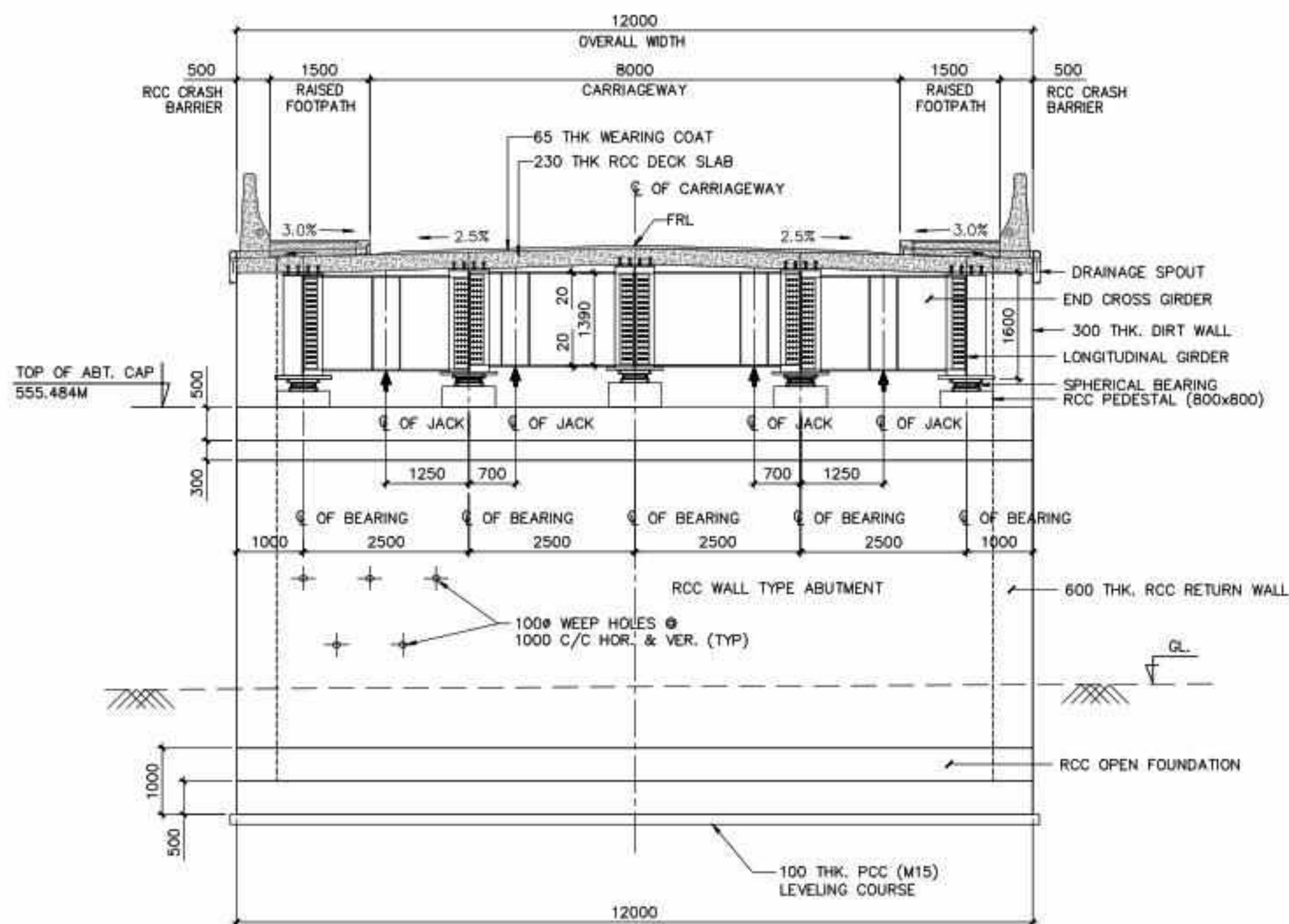
DESIGN CONSULTANT :

 **LEA ASSOCIATES SOUTH ASIA PVT. LTD.**
B-1/E-27, Mohan Cooperative Industrial Estate,
Mathura Road, New Delhi-110044

DRAWING TITLE:-
GENERAL ARRANGEMENT DRAWING
FOR MINOR BRIDGE AT CH. 0+970 Km
(SH. 1 OF 2)

DRAWING No : 73806/LASA/E1/STR/BR-01/GAD-661

S1	REV. R0	DRAWN	A. DHAR	CHECKED	S. MONDAL
	SHEET A2	DESIGN	B. SARKAR	REVIEWED	J. K. DAS
		DATE	JULY 2022	SCALE :	AS SHOWN



SECTION A-A
(SCALE 1:75)

BORE LOG AT ABUTMENT A1 LOCATION

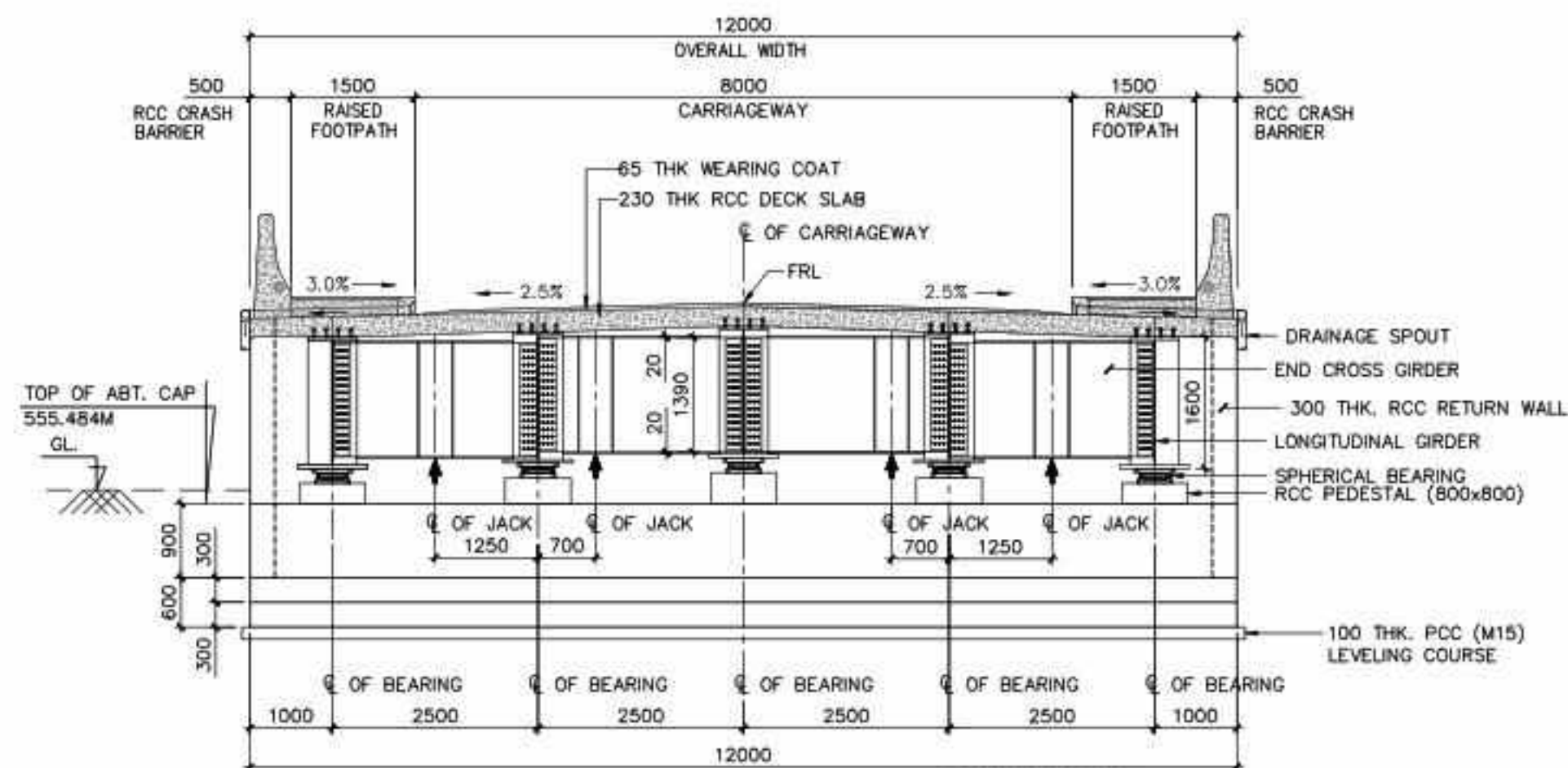
BH No.: BH-1					
TIME (min)	DEPTH/RUN (m)		LENGTH (m)	SPT ('N' VALUE)	DESCRIPTION OF STRATA
	From	To			
	0.00	0.50	0.50	N>100	WHITISH GREY CLAYEY SILT MIXED WITH SAND AND TRACES OF PEBBLES, GRAVELS ETC.
	0.50	0.54	0.04		
28	0.50	1.25	0.75		22.7 NIL
27	1.25	2.00	0.75		29.3 NIL
30	2.00	2.75	0.75		26.7 NIL
31	2.75	3.50	0.75		29.3 NIL
34	3.50	4.25	0.75		30.7 NIL
31	4.25	5.00	0.75		24.0 NIL
29	5.00	5.75	0.75		25.3 NIL
27	5.75	6.50	0.75		26.7 NIL
30	6.50	7.25	0.75		29.3 NIL
33	7.25	8.00	0.75		30.7 NIL
26	8.00	8.75	0.75		25.3 NIL
28	8.75	9.50	0.75		32.0 NIL
33	9.50	10.50	1.00		25.0 NIL

NOTE:-
SPT- STANDARD PENETRATION TEST
CR- CORE RECOVERY
RQD- ROCK QUALITY DESIGNATION

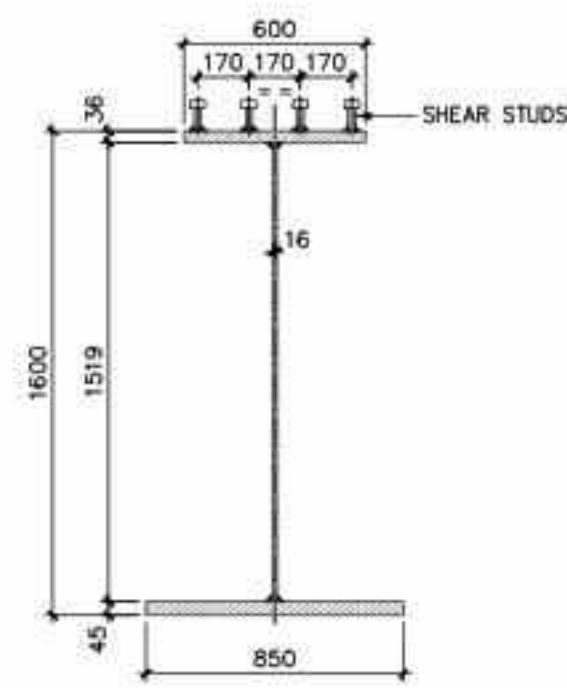
BORE LOG AT ABUTMENT A2 LOCATION

BH No.: BH-2					
TIME (min)	DEPTH/RUN (m)		LENGTH (m)	SPT ('N' VALUE)	DESCRIPTION OF STRATA
	From	To			
	0.00	0.50	0.50	N>100	WHITISH GREY CLAYEY SILT MIXED WITH SAND AND TRACES OF PEBBLES, GRAVELS ETC.
	0.50	0.53	0.03		
35	0.50	1.25	0.75		24.0 NIL
32	1.25	2.00	0.75		29.3 NIL
34	2.00	2.75	0.75		24.0 NIL
30	2.75	3.50	0.75		26.7 NIL
28	3.50	4.25	0.75		28.0 NIL
31	4.25	5.00	0.75		29.3 NIL
29	5.00	5.75	0.75		24.0 NIL
32	5.75	6.50	0.75		24.0 NIL
26	6.50	7.25	0.75		26.7 NIL
30	7.25	8.00	0.75		24.0 NIL
33	8.00	8.75	0.75		25.3 NIL
31	8.75	9.50	0.75		26.7 NIL
32	9.50	10.50	1.00		26.0 NIL

NOTE:-
SPT- STANDARD PENETRATION TEST
CR- CORE RECOVERY
RQD- ROCK QUALITY DESIGNATION



SECTION B-B
(SCALE 1:75)



CROSS SECTION
OF STEEL LONG GIRDER
(SCALE 1:25)

GENERAL NOTES:

- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS UNLESS OTHERWISE SPECIFIED.
- DIMENSIONS ARE NOT TO BE SCALED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
- THE SELECTED EARTH FILL USED FOR BACKFILLING BEHIND THE WALL AND RETAINING WALL SHALL HAVE THE FOLLOWING PROPERTIES:
 $c=0$, $\phi=30^\circ$, $\gamma=2.01/m^3$
- GRADE OF CONCRETE FOR VARIOUS STRUCTURAL COMPONENTS SHALL BE AS FOLLOWS:-

• SUPERSTRUCTURE STEEL COMPOSITE	E350 (Fe490 B0)
• APPROACH SLAB	M30
• RCC DECK	M30
• ABUTMENT WALL, DIRT WALL & RETURN WALL	M30
• ABUTMENT FOUNDATION	M30
• CRASH BARRIER & RCC PEDESTAL	M40
• GRADE OF PCC LEVELING COURSE	M15
- CLEAR COVER SHALL BE AS FOLLOWS SHALL BE AS FOLLOWS:-

• RCC DECK SLAB & APPROACH SLAB	45mm
• ABUTMENT WALL, DIRT WALL & RETURN WALL	75mm
• ABUTMENT FOUNDATION	75mm
• CRASH BARRIER	45mm
- ALL REINFORCING STEEL SHOULD BE HIGH YIELD STRENGTH DEFORMED (TMT) BARS OF GRADE-Fe 500 CONFORMING TO IS:1786-2008.
- 600mm THK. FILTER MEDIA SHALL BE PROVIDED BEHIND THE WALL.
- ADEQUATE NUMBER OF WEEP HOLES CONSISTING OF 100mm PVC PIPES SHALL BE PROVIDED IN STAGGERED MANNER AT A SPACING NOT MORE THAN 1000mm c/c BOTH VERTICALLY & HORIZONTALLY AT A SLOPE OF 1 V : 2 H FROM BED LVL. TO ABUTMENT CAP TOP LVL. IN ABUTMENT & RETURN WALL.
- EXISTING BED LEVEL & ROCK LEVEL HAS BEEN GIVEN BASED ON AVAILABLE DATA, DURING EXECUTION IF ANY VARIATION IS BEING OBSERVED AT SITE PLEASE INFORM IT TO ENGINEER-IN-CHARGE.
- JACKING LOCATION TO BE CLEARLY MARKED BY ETCHING ON ABUTMENT CAP.
- FOR DETAILS OF EXPANSION JOINT, RCC APPROACH SLAB, RCC CRASH BARRIER AND RCC RETURN/RETAINING WALL REFER RESPECTIVE MISCELLANEOUS DRAWING.
- FRL, CAMBER/SUPER-ELEVATION & LAYOUT SHALL BE FOLLOWED AS PER LATEST PLAN & PROFILE DRAWING.
- THE STRUCTURE HAS BEEN DESIGNED FOR ZONE-IV OF SEISMIC MAP.
- HYDRAULIC DATA FOR SUBSTRUCTURE DESIGN :

a) DESIGN DISCHARGE = 57.413 cumec	c) VELOCITY = 7.152m/sec
b) DESIGN HFL = 546.116m	d) LOW BED LEVEL = 543.345m
- 65mm THICK WEARING COAT SHALL BE PROVIDED ON TOP OF DECK IN CONFORMITY WITHIN SECTION 500 OF MORTH'S SPECIFICATION.
- STRIP SEAL TYPE EXPANSION JOINT SHOULD BE USED CONFORMING TO IRC:SP:069-2011.
- 100mm Ø PVC PIPE SHALL BE USED FOR DRAINAGE. DRAINAGE SPOUT SHALL BE PROVIDED IN DECK SLAB AS PER MORTH'S SPECIFICATION.
- THE DESIGN OF NEW STRUCTURES SHALL CONFORM TO FOLLOWING CODES:
 - IRC : 78-2014
 - IRC : 6-2017
 - IRC : 112-2020
- BEARING CAPACITY OF FOUNDATION SHALL BE 42T/M² AT FOUNDING LEVEL OF A1 AND 35T/M² OF A2. ACCORDING TO GEO-TECHNICAL REPORT AS PER MORTH, ANY LOOSE POCKETS AT FOUNDATION LEVEL SHALL BE REMOVED COMPLETELY AND THE ABOVE LOOSE POCKETS SHALL BE REPLACED BY PCC M15. THE ABOVE BEARING CAPACITY SHALL BE VERIFIED BY PLATE LOAD TEST.
- DESIGN OF BRIDGE IS DONE FOR LIVE LOAD COMBINATION OF THREE LANES OF CLASS A OR 1 LANE OF 70R+1 LANE OF CLASS A WHICHEVER PRODUCES SEVERE EFFECT.
- SPECIAL VEHICLE LOAD & CONGESTIONS FACTOR HAS NOT BEEN CONSIDERED IN THE DESIGN OF STRUCTURES.
- SPHERICAL BEARING SHOULD BE USED CONFORMING TO IRC:83 (PART-IV)-2014.

REFERENCE DRAWING:

- 73806/LASA/E1/STR/BR-01/GAD-661 (SH. 1 OF 2)
- 73806/LASA/E1/STR/BR-01/SUB-662
- 73806/LASA/E1/STR/BR-01/SUB-664

CLIENT :



Roads & Bridges Department
(Government of Sikkim)

PROJECT :

Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim

DESIGN CONSULTANT :

LEA ASSOCIATES SOUTH ASIA PVT. LTD.
B-1/E-27, Mohan Cooperative Industrial Estate,
Mathura Road, New Delhi-110044

DRAWING TITLE:-

GENERAL ARRANGEMENT DRAWING FOR BRIDGE AT CH. 0+970 Km (SH. 2 OF 2)

DRAWING No : 73806/LASA/E1/STR/BR-01/GAD-661

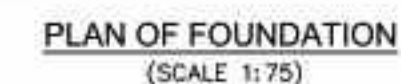
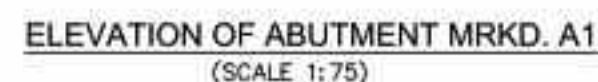
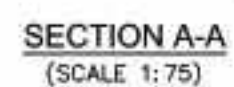
REV.

R0

SHEET

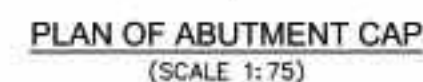
REV.	DRAWN	CHECKED	S. MONDAL
R0	A. DHAR	B. SARKAR	J. K. DAS
DATE	SCALE	AS SHOWN	
JULY 2022			



REV	DATE	DETAILS OF REVISION	BY



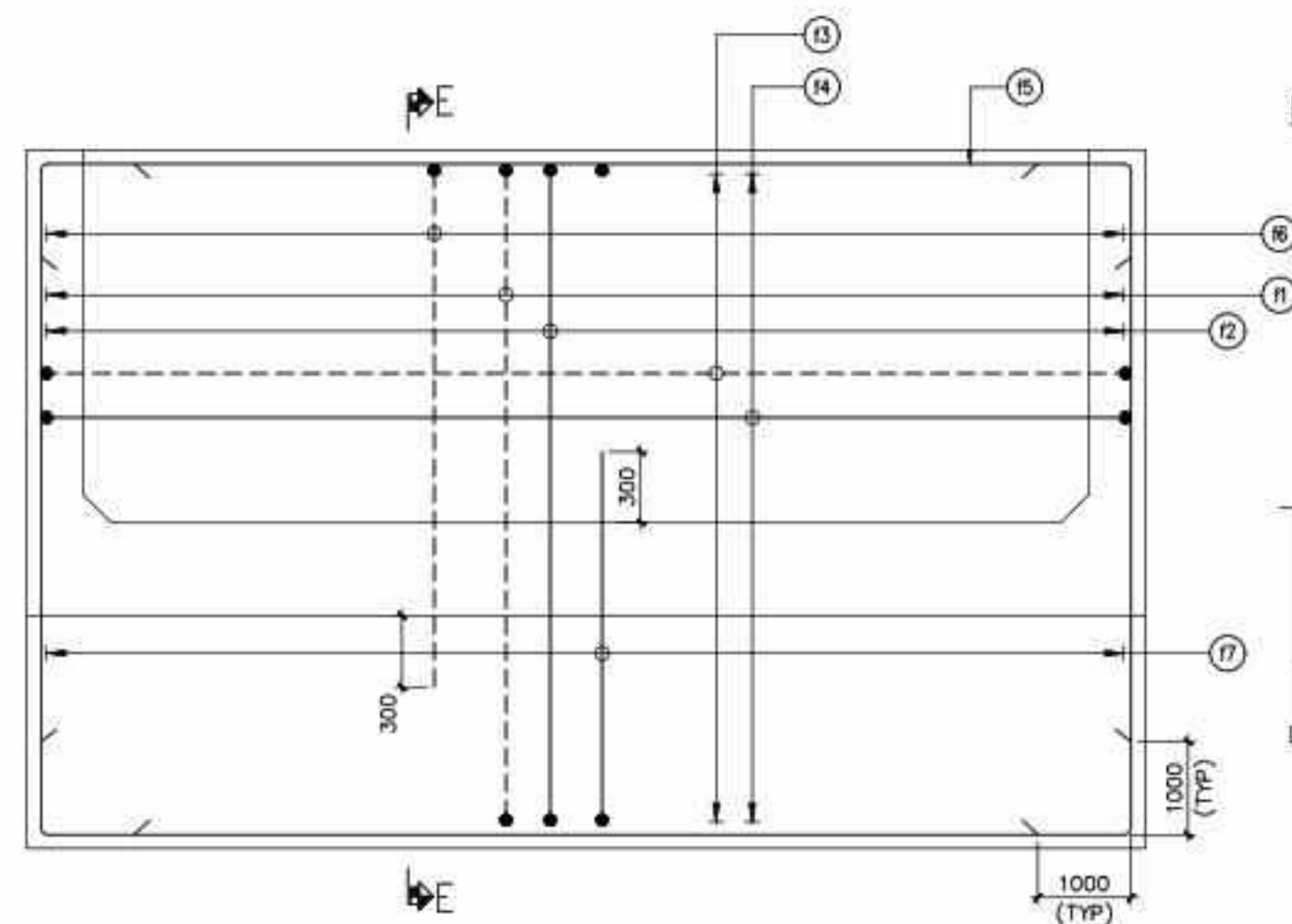
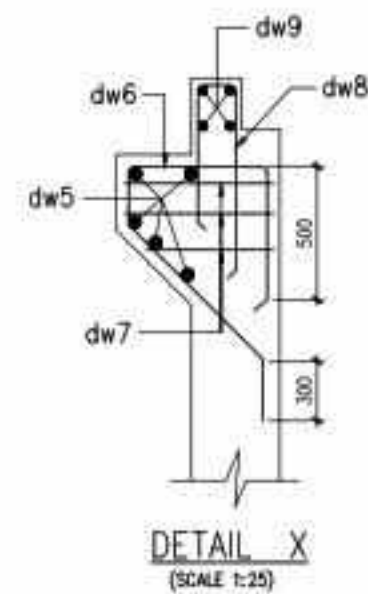
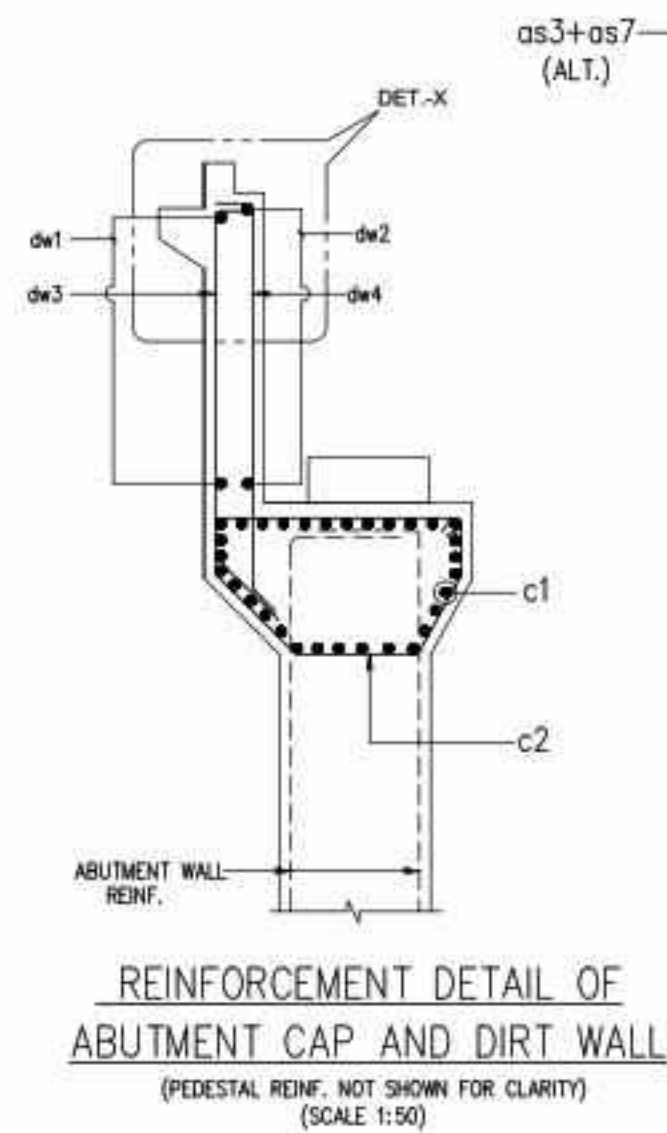
1. 73806/LASA/E1/STR/BR-01/SUB-661
2. 73806/LASA/E1/STR/BR-01/SUB-663

1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS UNLESS OTHERWISE SPECIFIED.
2. DIMENSIONS ARE NOT TO BE SCALED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
3. THE SELECTED EARTH FILL USED FOR BACKFILLING BEHIND THE WALL AND RETAINING WALL SHALL HAVE THE FOLLOWING PROPERTIES:
 $C=0$, $\phi > 30^\circ$, $\gamma = 2.0 \text{ t/m}^3$
4. GRADE OF CONCRETE FOR VARIOUS STRUCTURAL COMPONENTS SHALL BE AS FOLLOWS:—
 - APPROACH SLAB _____ M30
 - ABUTMENT WALL, DIRT WALL & RETURN WALL _____ M30
 - ABUTMENT FOUNDATION _____ M30
 - RCC PEDESTAL _____ M40
 - GRADE OF PCC LEVELING COURSE _____ M15
5. CLEAR COVER SHALL BE AS FOLLOWS SHALL BE AS FOLLOWS:—
 - APPROACH SLAB _____ 45mm
 - ABUTMENT WALL, DIRT WALL & RETURN WALL _____ 75mm
 - ABUTMENT FOUNDATION _____ 75mm
6. ALL REINFORCING STEEL SHOULD BE HIGH YIELD STRENGTH DEFORMED (TMT) BARS OF GRADE—Fe 500 CONFORMING TO IS:1786-2008.
7. 600mm THK. FILTER MEDIA SHALL BE PROVIDED BEHIND THE WALL.
8. ADEQUATE NUMBER OF WEEP HOLES CONSISTING OF 100 ϕ PVC PIPES SHALL BE PROVIDED IN STAGGERED MANNER AT A SPACING NOT MORE THAN 1000mm c/c BOTH VERTICALLY & HORIZONTALLY AT A SLOPE OF 1 V : 2 H FROM BED LVL TO ABUTMENT CAP TOP LVL IN ABUTMENT & RETURN WALL.
9. THE STRUCTURE HAS BEEN DESIGNED FOR ZONE-IV OF SEISMIC MAP.
10. THE DESIGN OF NEW STRUCTURES SHOULD CONFORM TO FOLLOWING CODES:
 - IRC : 78-2014
 - IRC : 8-2017
 - IRC : 112-2020
11. BEARING CAPACITY OF FOUNDATION SHALL BE 42T/M² AT FOUNDING LEVEL ACCORDING TO GEO-TECHNICAL REPORT AS PER MORTH. ANY LOOSE POCKETS AT FOUNDATION LEVEL SHALL BE REMOVED COMPLETELY AND THE ABOVE LOOSE POCKETS SHALL BE REPLACED BY PCC M15. THE ABOVE BEARING CAPACITY SHALL BE VERIFIED BY PLATE LOAD TEST.
12. DESIGN OF BRIDGE IS DONE FOR LIVE LOAD COMBINATION OF THREE LANES OF CLASS A OR 1 LANE OF 70R+1 LANE OF CLASS A WHICHEVER PRODUCES SEVERE EFFECT.
13. SPECIAL VEHICLE LOAD & CONGESTIONS FACTOR HAS NOT BEEN CONSIDERED IN THE DESIGN OF STRUCTURES.

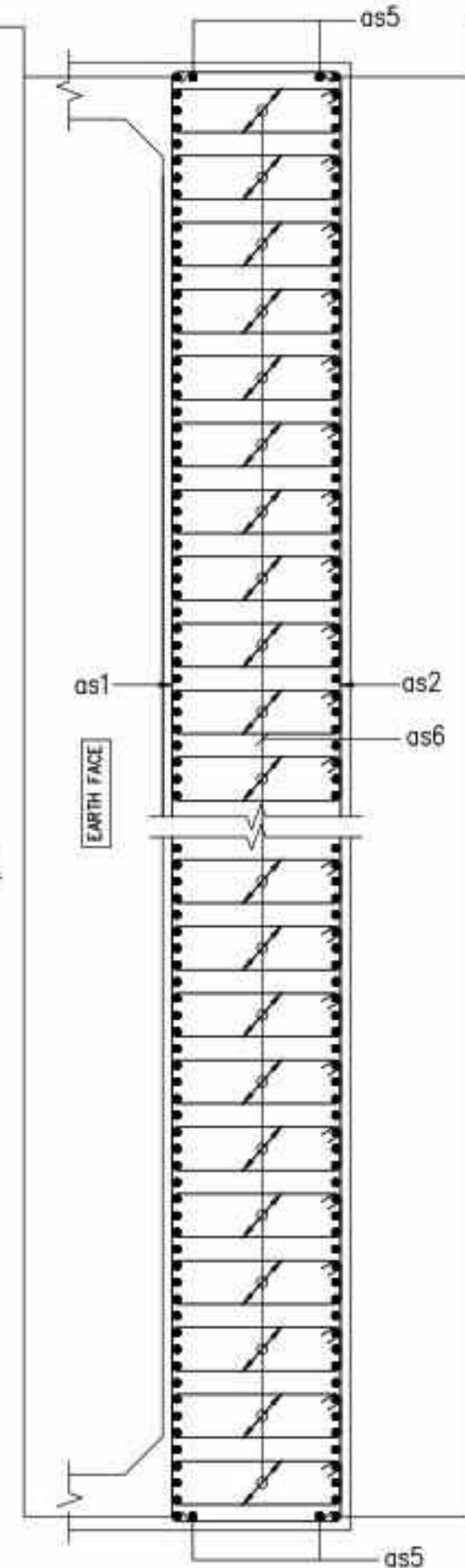


				<div></div> <div>CLIENT : Roads & Bridges Department (Government of Sikkim)</div>	<div>PROJECT : Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim</div>	<div><div></div><div>DESIGN CONSULTANT : LEA ASSOCIATES SOUTH ASIA PVT. LTD. B-1/E-27, Mohan Cooperative Industrial Estate, Mathura Road, New Delhi-110044</div></div>	<div>DRAWING TITLE:- DIMENSION DETAIL DRAWING OF ABUTMENT MRKD. A1 FOR BRIDGE AT CH. 0+970 Km</div>	REV. R0	DRAWN	A. DHAR	CHECKED	S. MONDAL	
								SHEET	DESIGN	B. SARKAR	REVIEWED	J. K. DAS	
REV	DATE	DETAILS OF REVISION	BY						DRAWING No :	73808/LASA/E1/STR/BR-01/SUB-662			
							DRAWING No :	73808/LASA/E1/STR/BR-01/SUB-662		DATE	JULY 2022	SCALE :	AS SHOWN

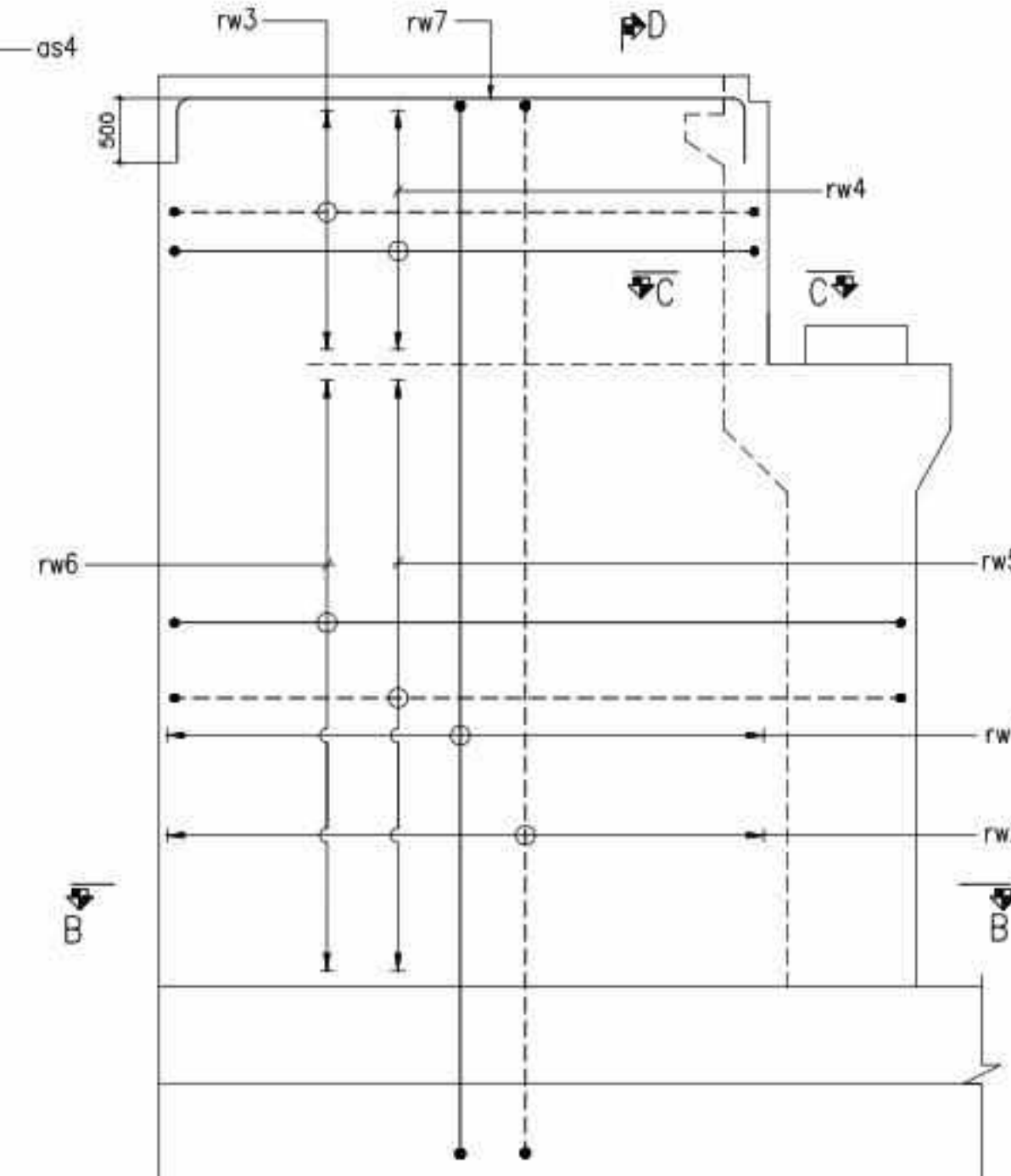
REINFORCEMENT DETAIL OF
ABUTMENT WALL
(SCALE 1:50)



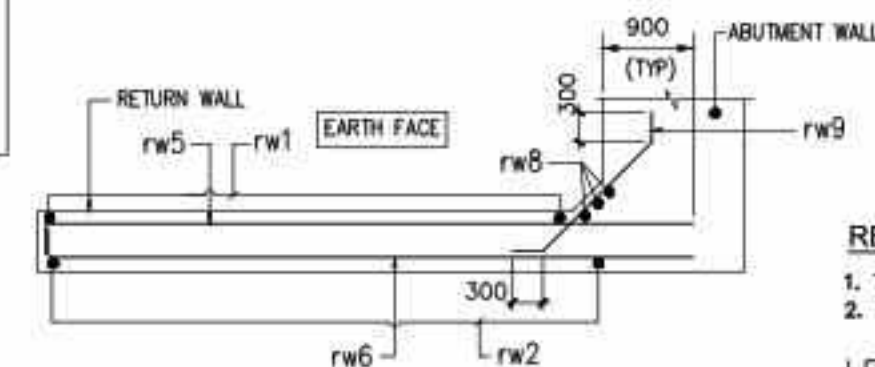
REINFORCEMENT PLAN OF FOUNDATION
(SCALE 1:75)



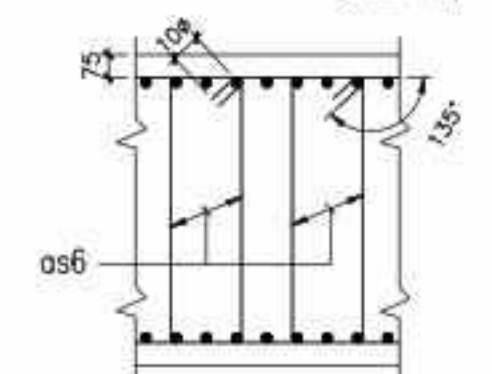
SECTION A-A
(SCALE 1:50)



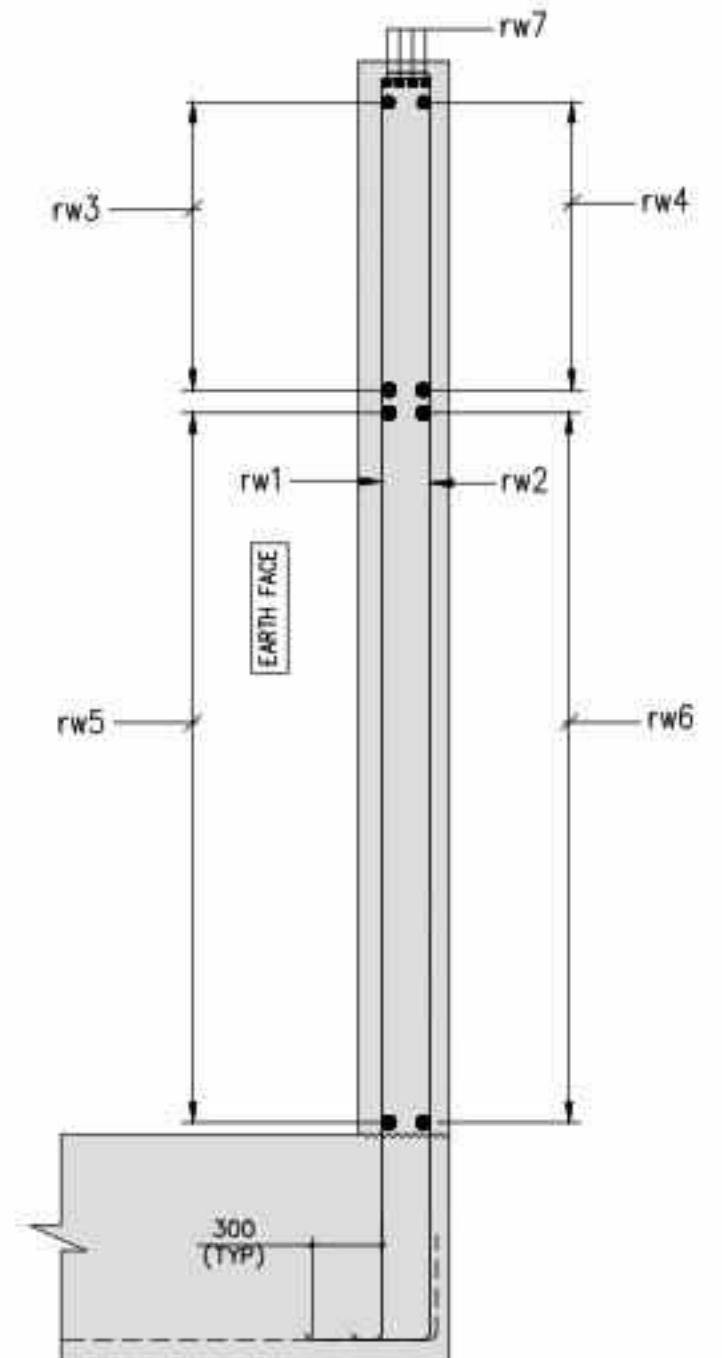
TYPICAL REINFORCEMENT DETAIL
OF RETURN WALL
(SCALE 1:50)



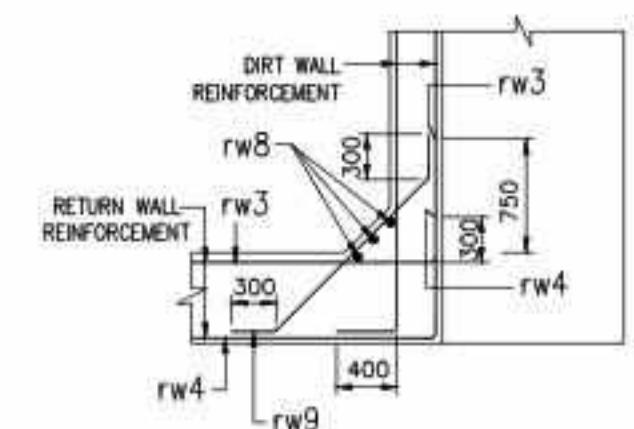
SECTION B-B
(ABUTMENT WALL REINFORCEMENT NOT SHOWN FOR CLARITY)
(SCALE 1:75)



TYP. DETAIL OF STIRRUPS
(SCALE 1:25)



SECTION D-D
(SCALE 1:50)



SECTION C-C
(SCALE 1:50)

REFERENCE DRAWING:

1. 73806/LASA/E1/STR/BR-01/SUB-661
2. 73806/LASA/E1/STR/BR-01/SUB-662

LEGENDS: –

- TOP OR NEAR FACE REINFORCEMENT
 _____ BOTTOM OR FAR FACE REINFORCEMENT
 L.V. LENGTH VARIES

NOTES:—

1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS.
2. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. DIMENSIONS ARE NOT TO BE SCALED.
3. GRADE OF CONCRETE FOR VARIOUS STRUCTURAL COMPONENTS SHALL BE AS FOLLOWS:-
 - ABUTMENT WALL, DIRT WALL & RETURN WALL _____ M30
 - ABUTMENT FOUNDATION _____ M30
 - GRADE OF PCC LEVELING COURSE _____ M15
4. CLEAR COVER SHALL BE AS FOLLOWS SHALL BE AS FOLLOWS:-
 - EARTH FACE _____ 45mm
 - NON-EARTH FACE _____ 75mm
5. 'T' DENOTES H.Y.S.D. BARS (GRADE DESIGNATION : Fe500) CONFORMING TO IS: 1786 (LATEST).
6. MINIMUM ANCHORAGE LENGTH OF REINFORCEMENT SHALL BE 42 x DIA OF BARS UNLESS NOTED OTHERWISE.
7. BARS SHALL BE LAPPED IN SUCH A WAY THAT NOT MORE THAN 50% OF THE BARS ARE LAPPED AT ANY SECTION. LAP LENGTH SHALL BE KEPT AS MINIMUM 50d (d = DIA. OF BAR).

REV	DATE	DETAILS OF REVISION	BY

CLIENT :



Roads & Bridges Department
(Government of Sikkim)

PROJECT :	
------------------	--

Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim

DESIGN CONSULTANT :



LEA ASSOCIATES SOUTH ASIA PVT. LTD.
B-1/E-27, Mohan Cooperative Industrial Estate,
Mathura Road, New Delhi-110044

DRAWING TITLE:-

REINFORCEMENT DETAIL OF ABUTMENT
MKD. A1 FOR BRIDGE AT CH. 0+970 Km
(SH. 1 OF 2)

DRAWING No : 73808/LASAVE1/STR/BR-01/SUB-663

REV.

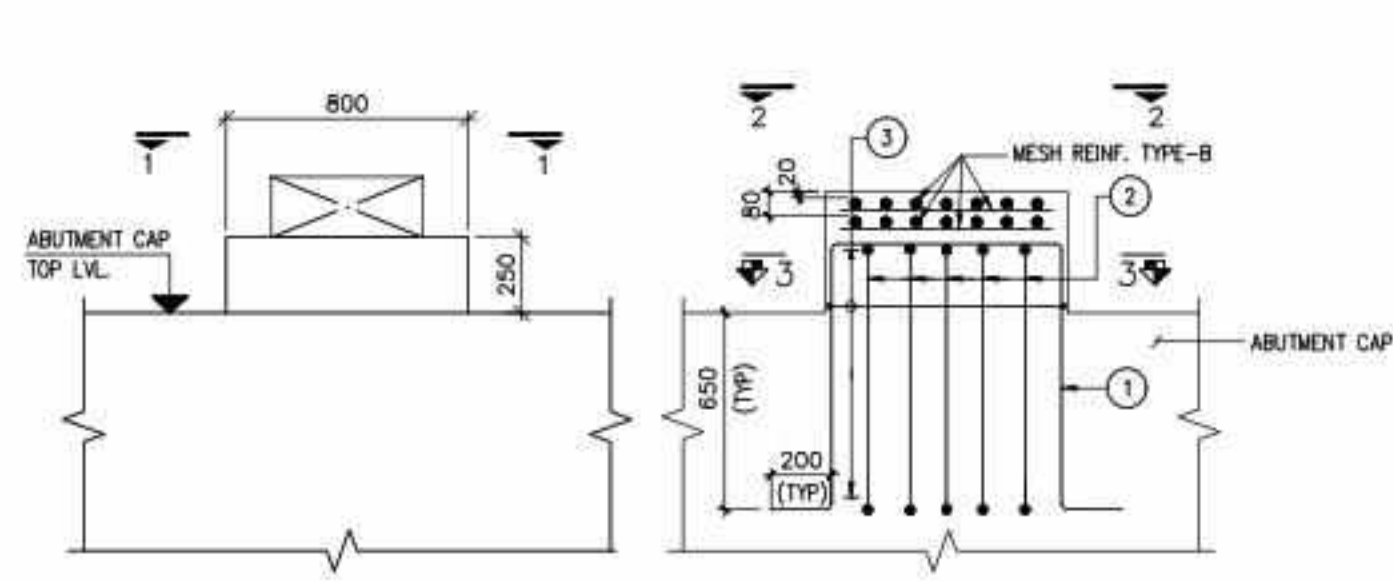
SHEET

A2

DRAWN	A. GHAR	CHECKED	S. MONDAL
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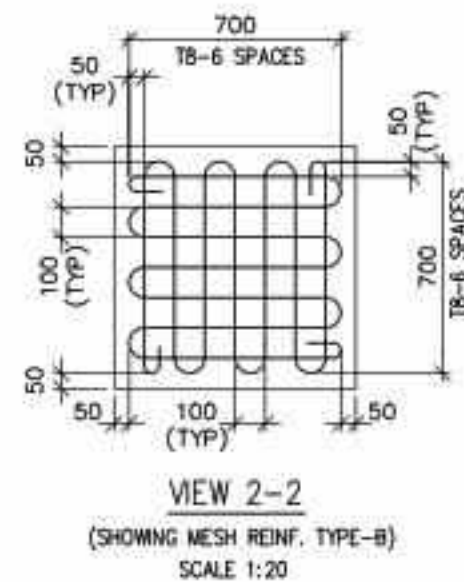
DRAWN	A. DHAR	CHECKED	S. MONDAL
DESIGN	B. SARKAR	REVIEWED	J. K. DAS

DATE :	JULY 2022	SCALE :	AS SHOWN
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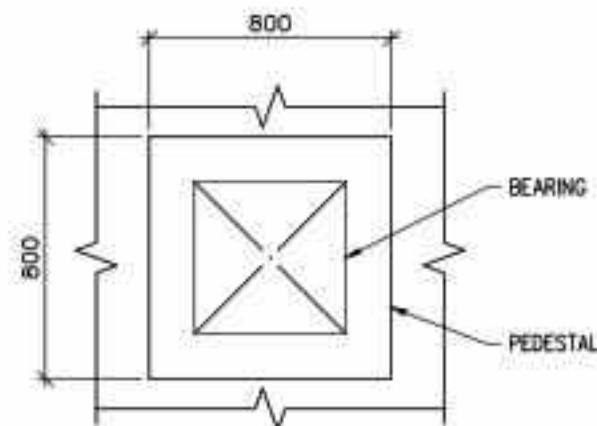


ELEVATION OF PEDESTALS
SCALE 1:20

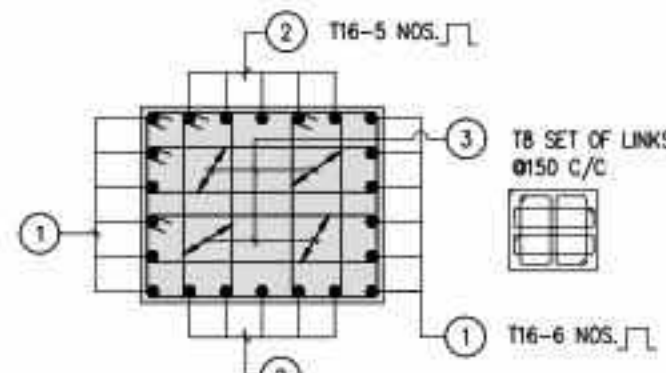
REINF. DETAIL FOR PEDESTALS
SCALE 1:20



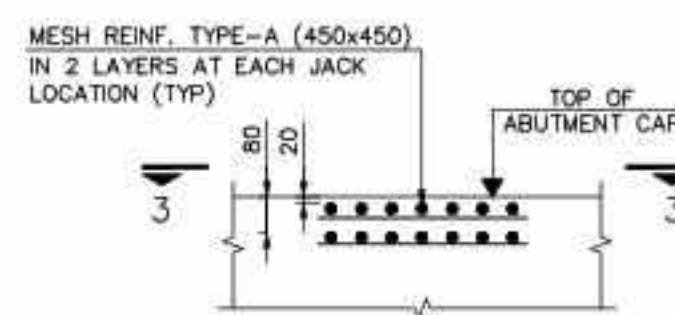
VIEW 2-2
(SHOWING MESH REINF. TYPE-B)
SCALE 1:20



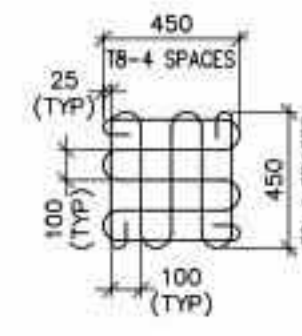
VIEW 1-1
PLAN OF PEDESTALS
SCALE 1:20



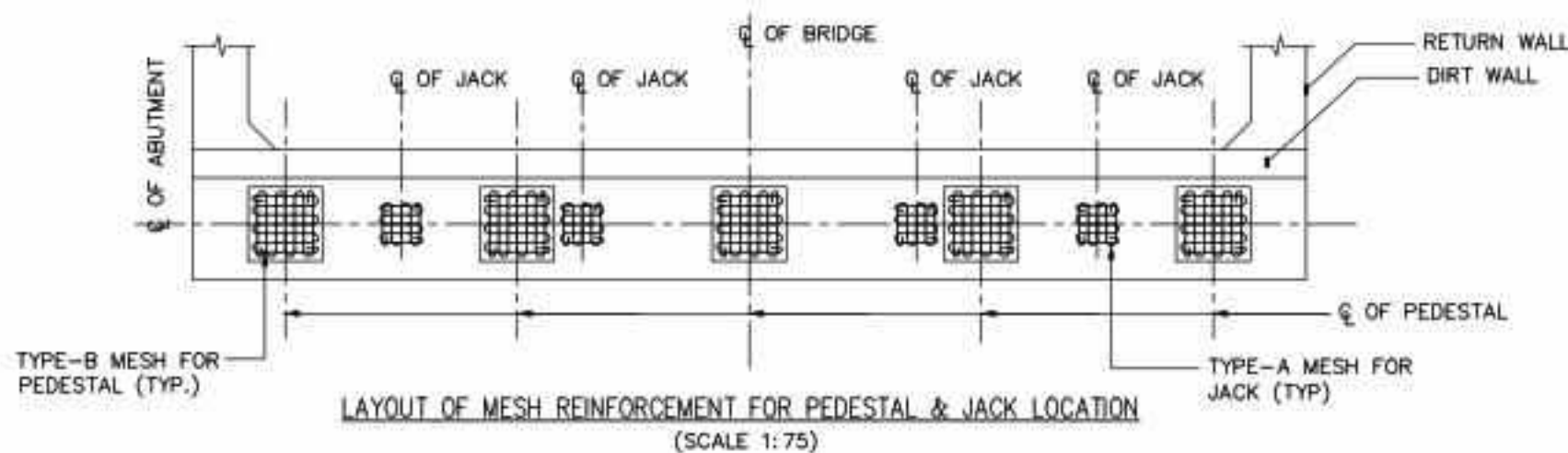
SECTION 3-3
SCALE 1:20



DETAIL OF MESH TYPE-A
(BELOW JACK LOCATION)
SCALE 1:20



VIEW 3-3
(DETAIL OF MESH REINF.)
SCALE 1:20



LAYOUT OF MESH REINFORCEMENT FOR PEDESTAL & JACK LOCATION
(SCALE 1:75)

LEGENDS: -

----- TOP OR NEAR FACE REINFORCEMENT
----- BOTTOM OR FAR FACE REINFORCEMENT
L.V. LENGTH VARIES

REFERENCE DRAWING:

- 73806/LASA/E1/STR/BR-01/SUB-661
- 73806/LASA/E1/STR/BR-01/SUB-662

NOTES:-

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 - ABUTMENT WALL, DIRT WALL & RETURN WALL M30
 - ABUTMENT FOUNDATION M30
 - RCC PEDESTAL M40
 - GRADE OF PCC LEVELING COURSE M15
- CLEAR COVER SHALL BE AS FOLLOWS SHALL BE AS FOLLOWS:-
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 - NON-EARTH FACE 75mm
- 'T' DENOTES H.Y.S.D. BARS (GRADE DESIGNATION : Fe500) CONFORMING TO IS: 1786 (LATEST).
- MINIMUM ANCHORAGE LENGTH OF REINFORCEMENT SHALL BE 42 x DIA OF BARS UNLESS NOTED OTHERWISE.
- BARS SHALL BE LAPPED IN SUCH A WAY THAT NOT MORE THAN 50% OF THE BARS ARE LAPPED AT ANY SECTION. LAP LENGTH SHALL BE KEPT AS MINIMUM 50d (d = DIA. OF BAR).

REINFORCEMENT SCHEDULE

SL. No.	BAR MARK	BAR DIA.	NUMBER/ SPACING	BAR SHAPE	REMARKS
1	f1	20	200 c/c		
2	f2	25	200 c/c		
3	f3	20	200 c/c		
4	f4	20	200 c/c		
5	f5	12	200 c/c		
6	f6	25	200 c/c		
7	f7	20	200 c/c		
8	f8	20L-T10	100 c/c		
9	as1	25	200 c/c		
10	as2	12	200 c/c		
11	as3	25	200 c/c		
12	as4	16	200 c/c		
13	as5	16	200 c/c		
14	as6	2L-T10	200 c/c		30 NOS. IN EACH LAYER
15	as7	32	200 c/c		
16	rw1	25	200 c/c		
17	rw2	12	200 c/c		
18	rw3	20	200 c/c		
19	rw4	12	200 c/c		
20	rw5	20	200 c/c		
21	rw6	12	200 c/c		
22	rw7	12	200 c/c		
23	rw8	12	3 Nos		
24	rw9	12	200 c/c		
25	dw1	10	200 c/c		
26	dw2	10	200 c/c		
27	dw3	16	200 c/c		
28	dw4	10	200 c/c		
29	dw5	10	5 Nos		
30	dw6	12	200 c/c		
31	dw7	2L-10	200 c/c		3 Layers
32	dw8	10	200 c/c		
33	dw9	10	4 Nos		
34	c1	12	200 c/c		
35	c2	12	200 c/c		

CLIENT :



Roads & Bridges Department
(Government of Sikkim)

PROJECT :

Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim

DESIGN CONSULTANT :



LEA ASSOCIATES SOUTH ASIA PVT. LTD.
B-1/E-27, Mohan Cooperative Industrial Estate,
Mathura Road, New Delhi-110044

DRAWING TITLE:-

REINFORCEMENT DETAIL OF ABUTMENT
MKD. A1 FOR BRIDGE AT CH. 0+970 Km
(SH. 2 OF 2)

DRAWING No : 73806/LASA/E1/STR/BR-01/SUB-663

REV.

R0

SHEET

A2

DRAWN

DESIGN

DATE

JULY 2022

A. DHAR

B. SARKAR

SCALE :

AS SHOWN

CHECKED

REVIEWED

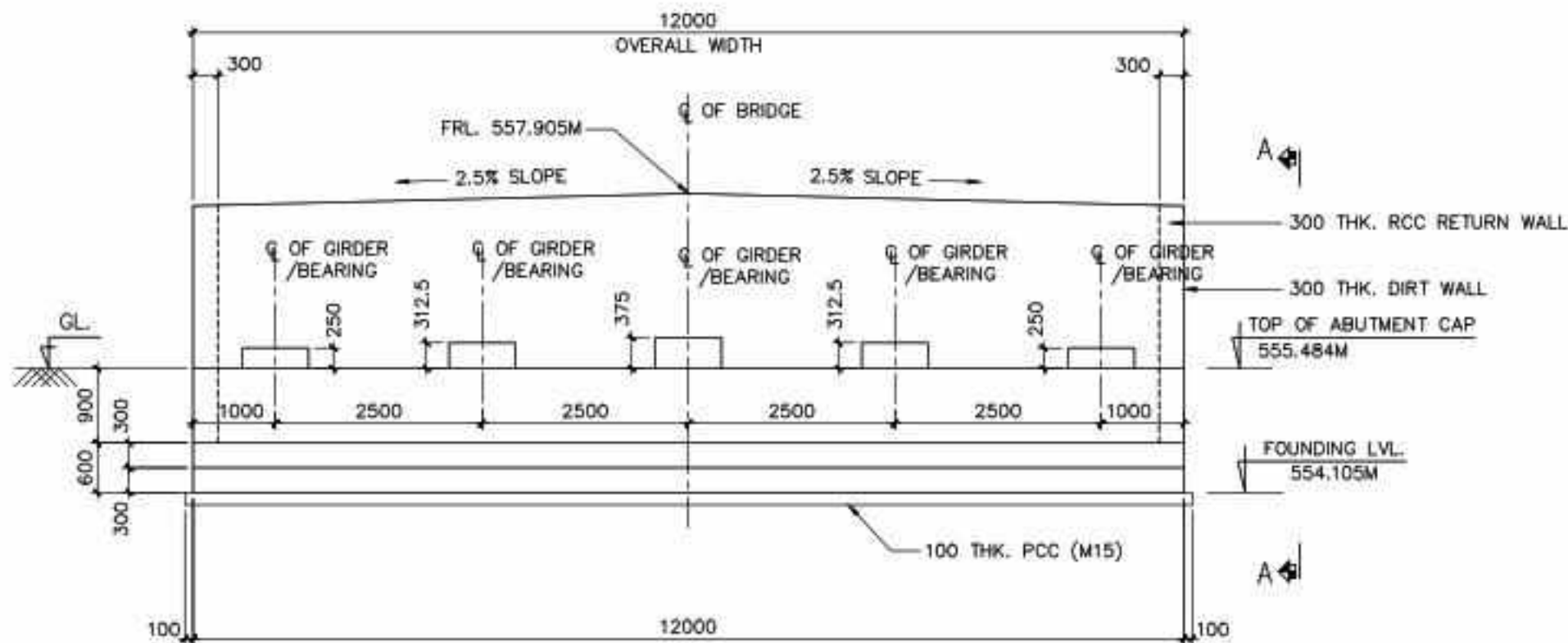
J. K. DAS

1

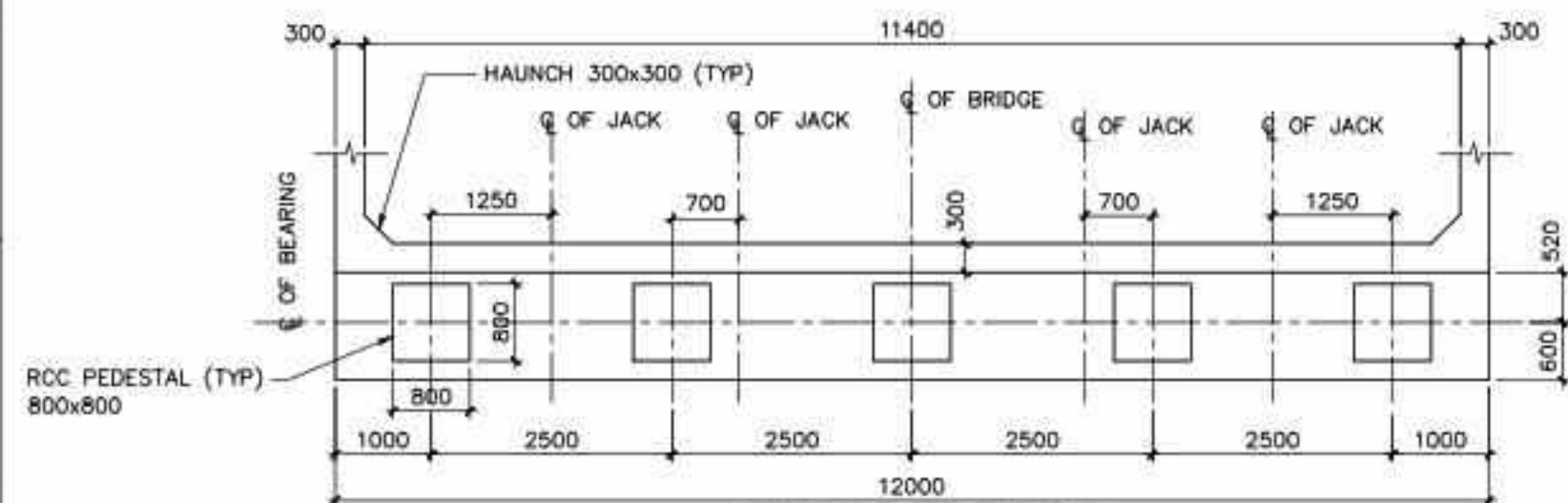
S. MONDAL

J. K. DAS

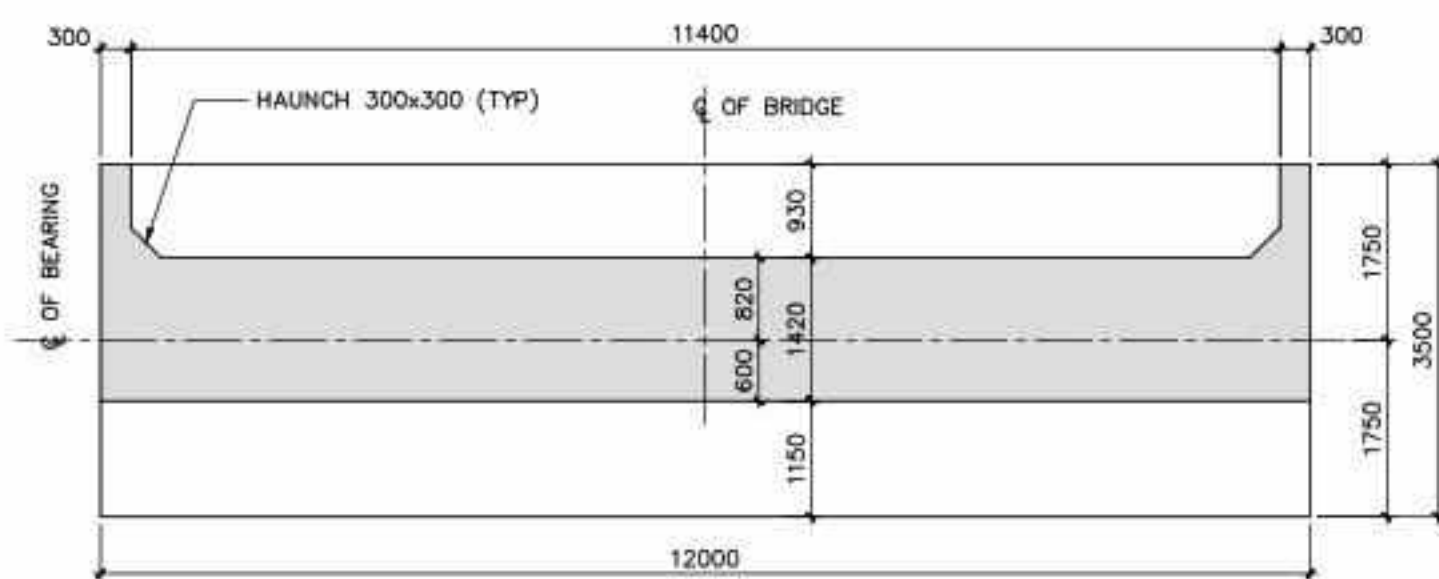
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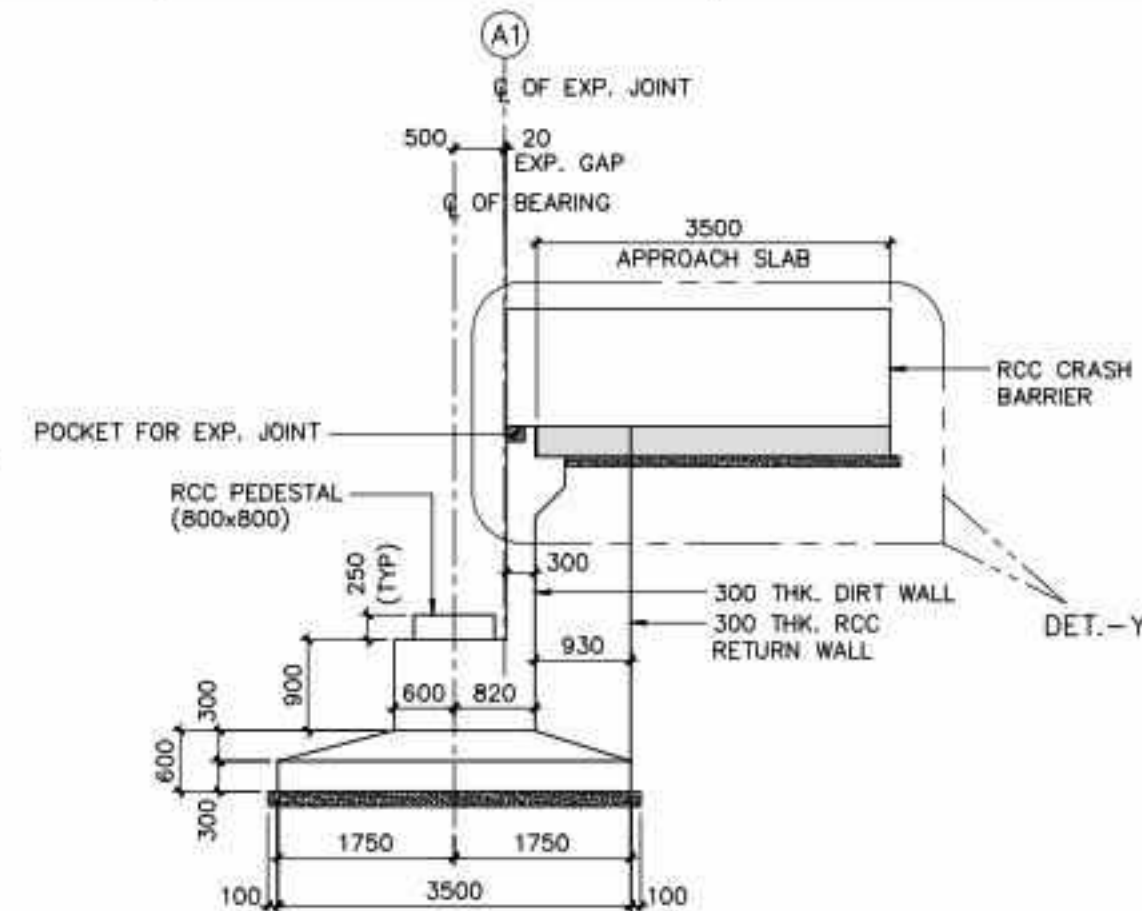
ELEVATION OF ABUTMENT MRKD. A2
(SCALE 1:75)



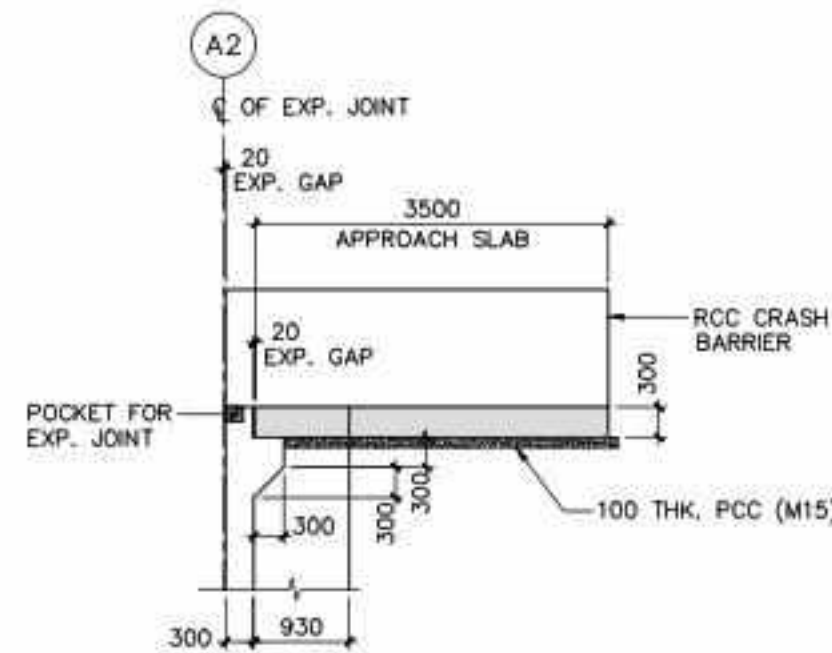
PLAN OF ABUTMENT CAP
(SCALE 1:75)



PLAN OF FOUNDATION
(SCALE 1:75)



SECTION A-A
(SCALE 1:75)



DETAIL-Y
(SCALE 1:75)

REFERENCE DRAWING:

- 73806/LASA/E1/STR/BR-01/SUB-661
- 73806/LASA/E1/STR/BR-01/SUB-665

GENERAL NOTES:

- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS UNLESS OTHERWISE SPECIFIED.
- DIMENSIONS ARE NOT TO BE SCALED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
- THE SELECTED EARTH FILL USED FOR BACKFILLING BEHIND THE WALL AND RETAINING WALL SHALL HAVE THE FOLLOWING PROPERTIES:
 $C=0$, $\phi=30^\circ$, $\gamma=2.0t/m^3$
- GRADE OF CONCRETE FOR VARIOUS STRUCTURAL COMPONENTS SHALL BE AS FOLLOWS:-
 - APPROACH SLAB M30
 - ABUTMENT WALL, DIRT WALL & RETURN WALL M30
 - ABUTMENT FOUNDATION M30
 - RCC PEDESTAL M40
 - GRADE OF PCC LEVELING COURSE M15
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 - APPROACH SLAB 45mm
 - ABUTMENT WALL, DIRT WALL & RETURN WALL 75mm
 - ABUTMENT FOUNDATION 75mm
- ALL REINFORCING STEEL SHOULD BE HIGH YIELD STRENGTH DEFORMED (TMT) BARS OF GRADE-Fe 500 CONFORMING TO IS:1786-2008.
- 600mm THK. FILTER MEDIA SHALL BE PROVIDED BEHIND THE WALL.
- ADEQUATE NUMBER OF WEEP HOLES CONSISTING OF 100# PVC PIPES SHALL BE PROVIDED IN STAGGERED MANNER AT A SPACING NOT MORE THAN 1000mm c/c BOTH VERTICALLY & HORIZONTALLY AT A SLOPE OF 1 V : 2 H FROM BED LVL. TO ABUTMENT CAP TOP LVL. IN ABUTMENT & RETURN WALL.
- THE STRUCTURE HAS BEEN DESIGNED FOR ZONE-IV OF SEISMIC MAP.
- THE DESIGN OF NEW STRUCTURES SHALL CONFORM TO FOLLOWING CODES:
 - IRC : 78-2014
 - IRC : 6-2017
 - IRC : 112-2020
- BEARING CAPACITY OF FOUNDATION SHALL BE $35T/M^2$ AT FOUNDING LEVEL ACCORDING TO GEO-TECHNICAL REPORT AS PER MORTH. ANY LOOSE POCKETS AT FOUNDATION LEVEL SHALL BE REMOVED COMPLETELY AND THE ABOVE LOOSE POCKETS SHALL BE REPLACED BY PCC M15. THE ABOVE BEARING CAPACITY SHALL BE VERIFIED BY PLATE LOAD TEST.
- DESIGN OF BRIDGE IS DONE FOR LIVE LOAD COMBINATION OF THREE LANES OF CLASS A OR 1 LANE OF 70R+1 LANE OF CLASS A WHICHEVER PRODUCES SEVERE EFFECT.
- SPECIAL VEHICLE LOAD & CONGESTIONS FACTOR HAS NOT BEEN CONSIDERED IN THE DESIGN OF STRUCTURES.

CLIENT :



Roads & Bridges Department
(Government of Sikkim)

PROJECT :

Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim

DESIGN CONSULTANT :



LEA ASSOCIATES SOUTH ASIA PVT. LTD.
B-1/E-27, Mohan Cooperative Industrial Estate,
Mathura Road, New Delhi-110044

DRAWING TITLE:-

DIMENSION DETAIL DRAWING OF ABUTMENT MRKD. A2 FOR BRIDGE AT CH. 0+970 Km

DRAWING No : 73806/LASA/E1/STR/BR-01/SUB-664

REV.

R0

SHEET

A2

DRAWN

A. DHAR

DESIGN

DATE

CHECKED

B. SARKAR

REVIEWED

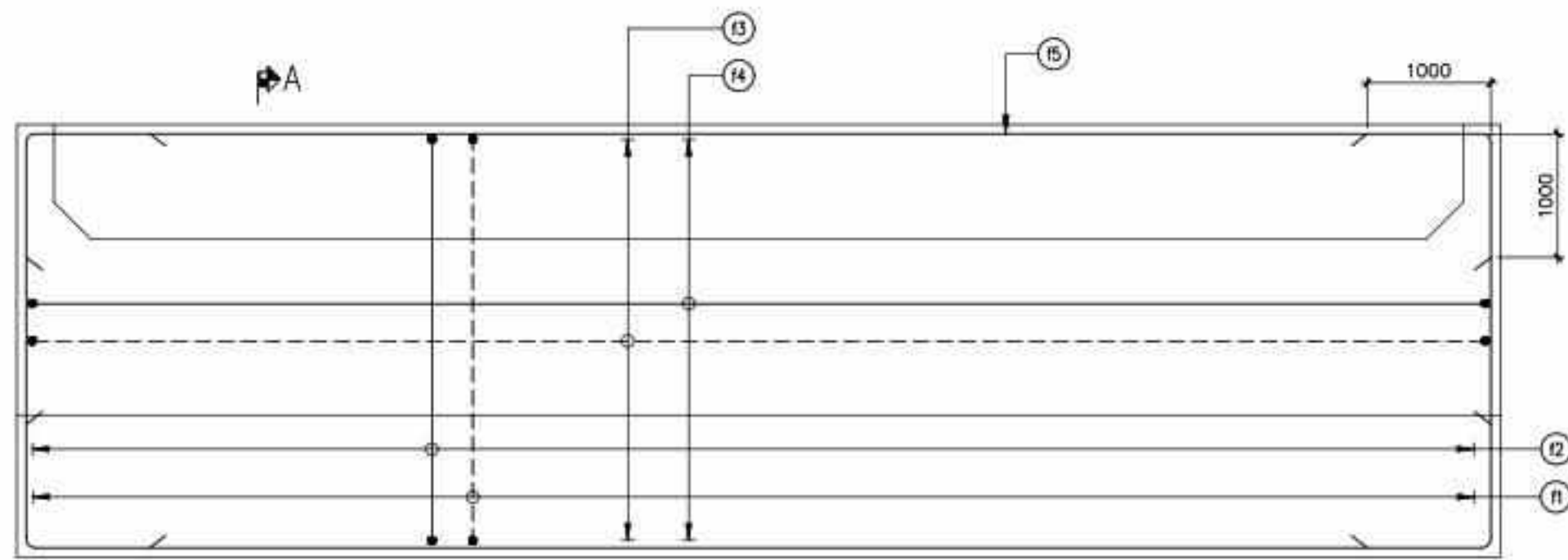
JULY 2022

S. MONDAL

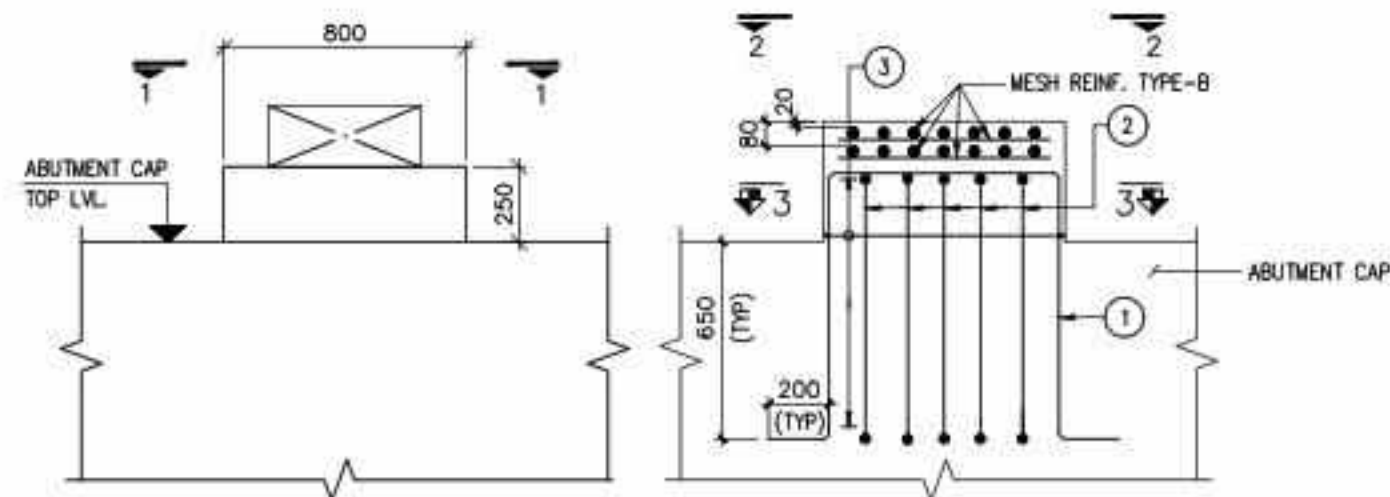
J. K. DAS

SCALE :

AS SHOWN

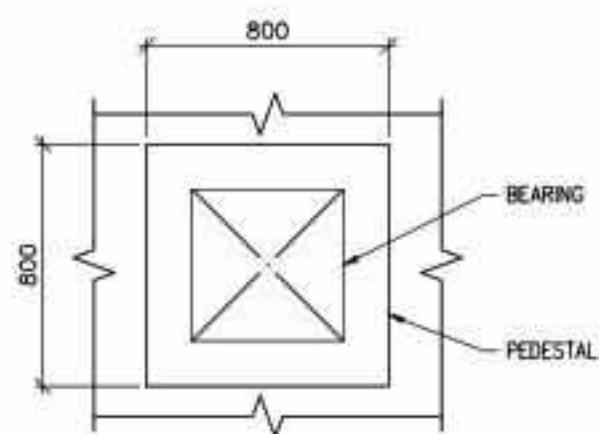


REINFORCEMENT PLAN OF FOUNDATION
(SCALE 1:50)

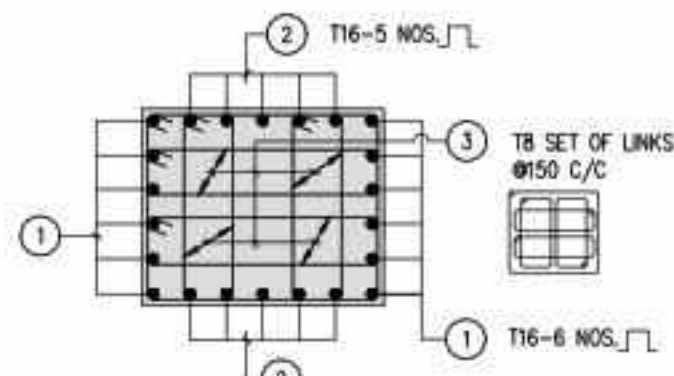


ELEVATION OF PEDESTALS
SCALE 1:20

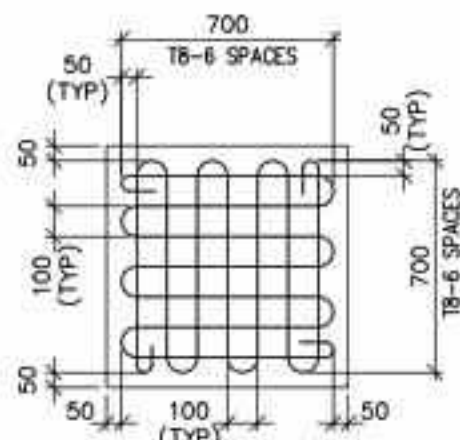
REINF. DETAIL FOR PEDESTALS
SCALE 1:20



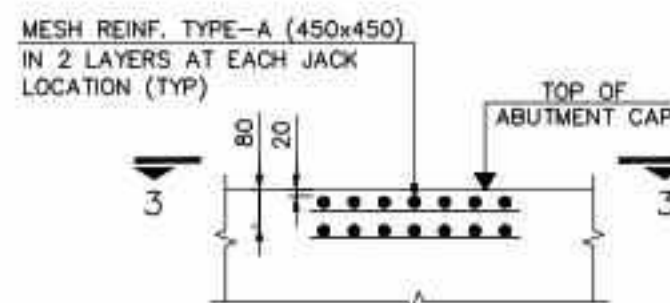
VIEW 1-1
PLAN OF PEDESTALS
SCALE 1:20



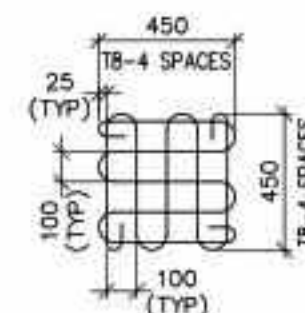
SECTION 3-3
SCALE 1:20



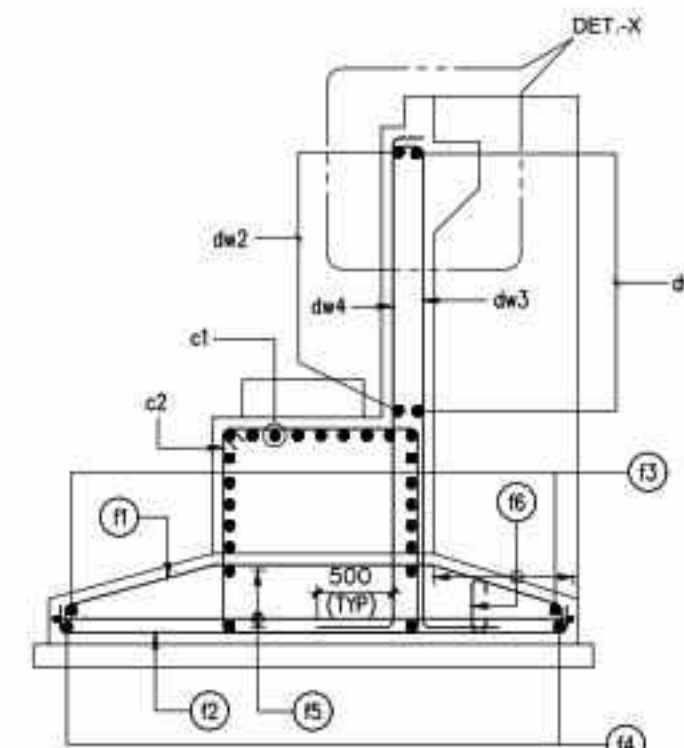
VIEW 2-2
(SHOWING MESH REINF. TYPE-B)
SCALE 1:20



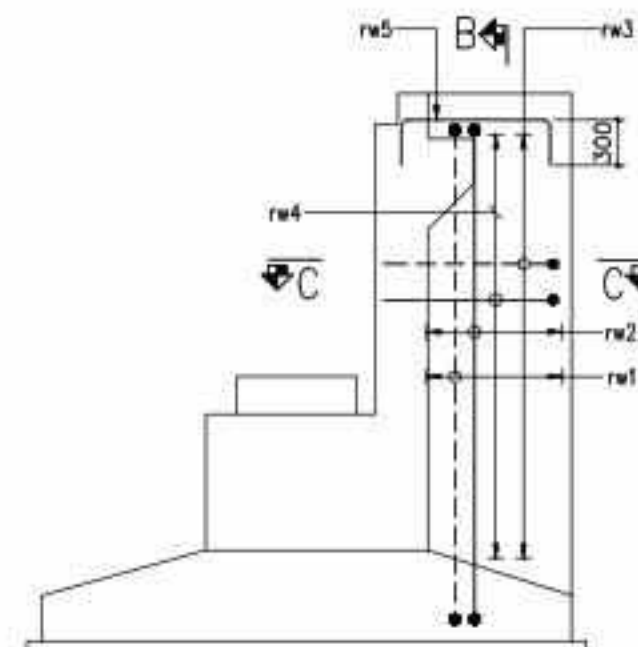
DETAIL OF MESH TYPE-A
(BELOW JACK LOCATION)
SCALE 1:20



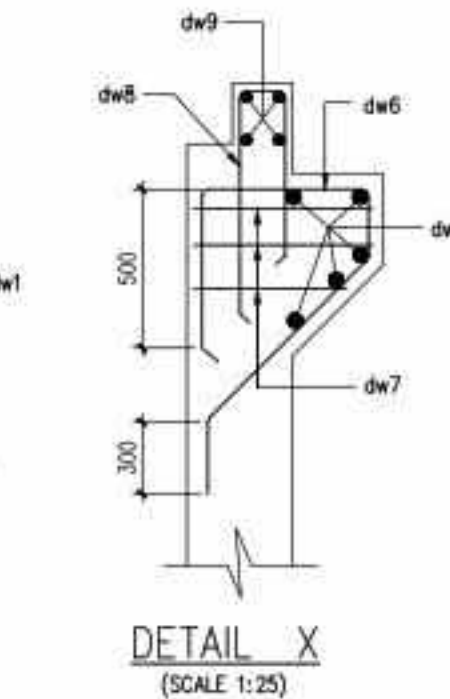
VIEW 3-3
(DETAIL OF MESH REINF.)
SCALE 1:20



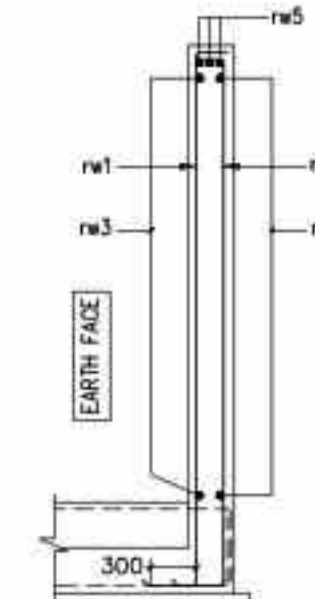
SECTION A-A
(SCALE 1:50)



REINFORCEMENT DETAIL
OF RETURN WALL
(SCALE 1:50)



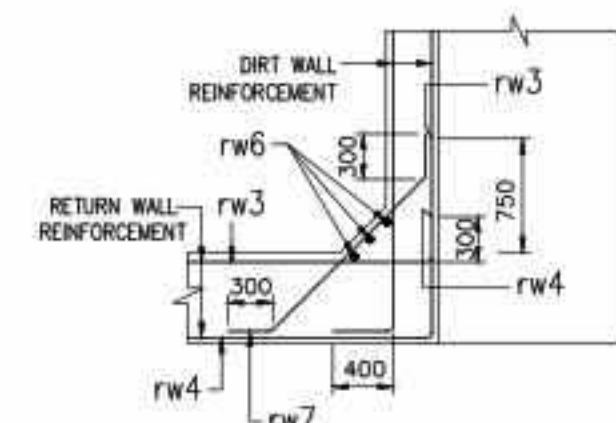
DETAIL X
(SCALE 1:25)



SECTION B-B
(SCALE 1:50)

REINFORCEMENT SCHEDULE

SL. No.	BAR MARK	BAR DIA.	NUMBER/SPACING	BAR SHAPE	REMARKS
1	f1	20	180 c/c		
2	f2	20	180 c/c		
3	f3	20	200 c/c		
4	f4	20	200 c/c		
5	f5	12	200 c/c		
6	f6	6L-T10	100 c/c		
7	rw1	12	200 c/c		
8	rw2	10	200 c/c		
9	rw3	12	200 c/c		
10	rw4	10	200 c/c		
11	rw5	12	200 c/c		
12	rw6	12	3 Nos		
13	rw7	12	200 c/c		
14	dw1	10	200 c/c		
15	dw2	10	200 c/c		
16	dw3	16	200 c/c		
17	dw4	10	200 c/c		
18	dw5	10	5 Nos		
19	dw6	12	200 c/c		
20	dw7	2L-10	200 c/c		3 Layers
21	dw8	10	200 c/c		
22	dw9	10	4 Nos		
23	c1	12	100 c/c		
24	c2	16	100 c/c		



SECTION C-C
(SCALE 1:50)

LEGENDS:-

--- TOP OR NEAR FACE REINFORCEMENT
--- BOTTOM OR FAR FACE REINFORCEMENT
L.V. LENGTH VARIES

NOTES:-

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- CLEAR COVER SHALL BE AS FOLLOWS:-
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REFERENCE DRAWING:

- 73806/LASA/E1/STR/BR-01/SUB-661
- 73806/LASA/E1/STR/BR-01/SUB-664

CLIENT :



Roads & Bridges Department
(Government of Sikkim)

PROJECT :

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LEA ASSOCIATES SOUTH ASIA PVT. LTD.
B-1/E-27, Mohan Cooperative Industrial Estate,
Mathura Road, New Delhi-110044

DRAWING TITLE:-

REINFORCEMENT DETAIL OF ABUTMENT MKD. A2 FOR BRIDGE AT CH. 0+970 Km

DRAWING No : 73806/LASA/E1/STR/BR-01/SUB-665

REV.

R0

SHEET

A2

DRAWN

A. DHAR

DESIGN

DATE

CHECKED

B. SARKAR

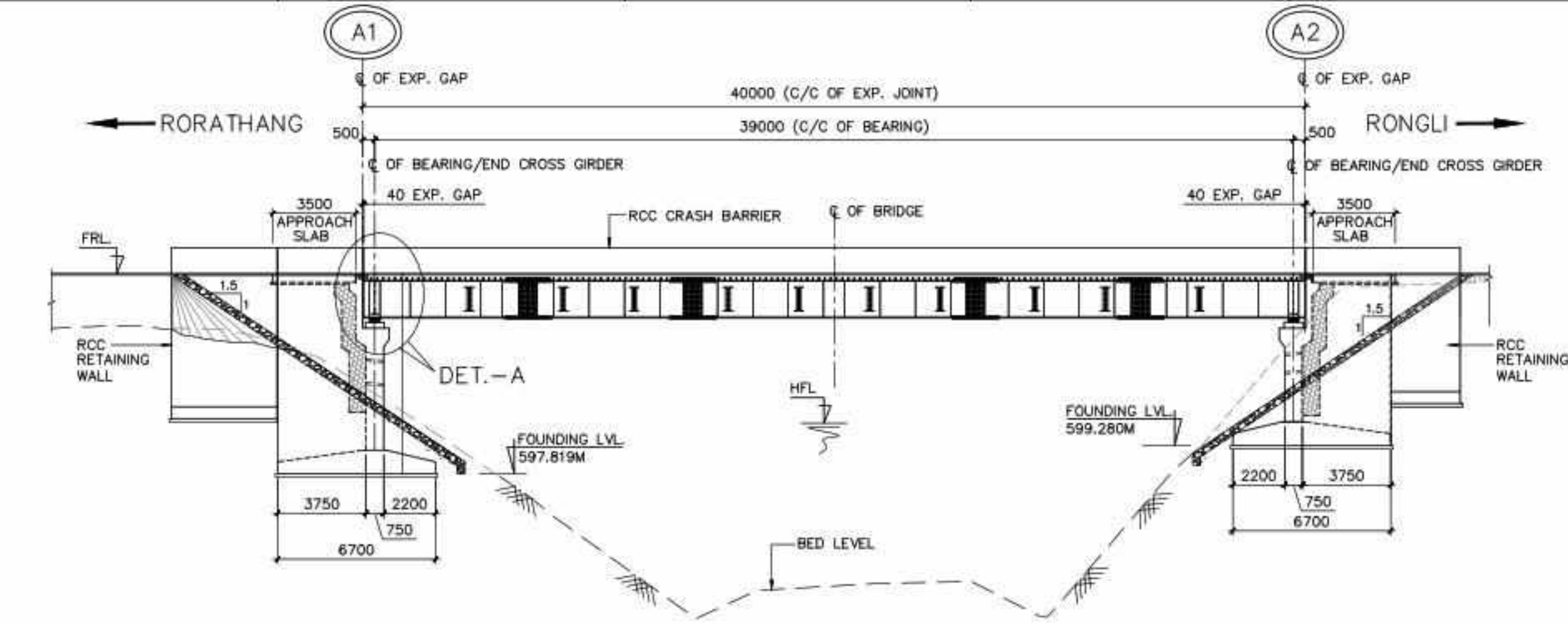
REVIEWED

SCALE :

S. MONDAL

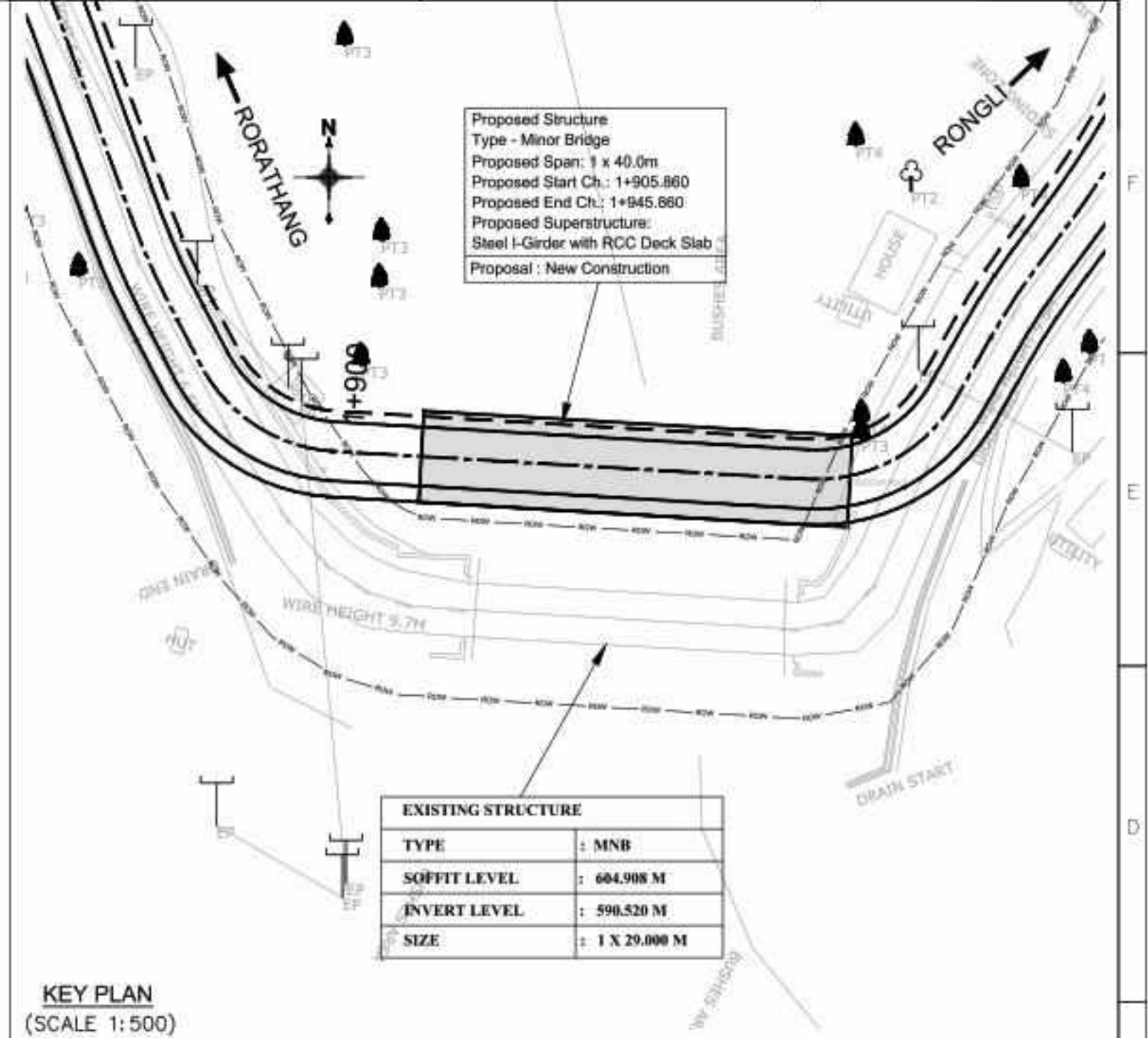
J. K. DAS

AS SHOWN

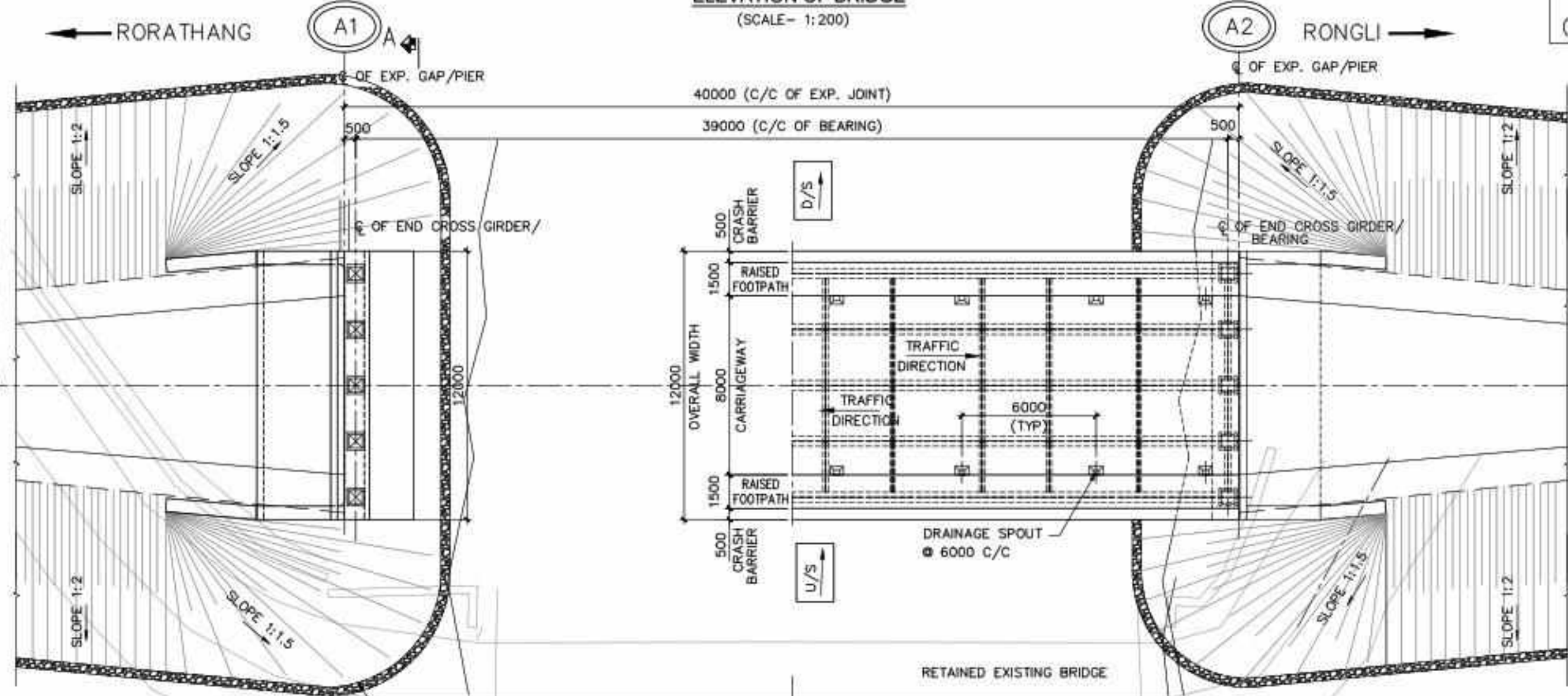


DATUM=540.0M			
PROPOSED LVL (FRL)	606.319	606.448	606.578
EXISTING GROUND LVL	600.974	593.441	605.852
HORIZONTAL DIAGRAM	LENGTH=44.129M		
VERTICAL DIAGRAM	GRADIENT=0.65%		
PROPOSED CHAINAGE	1+905.860	1+925.860	1+945.860

ELEVATION OF BRIDGE
(SCALE= 1:200)



KEY PLAN
(SCALE 1:500)



PLAN OF BRIDGE
(SCALE= 1:200)

REFERENCE DRAWING:

- 73806/LASA/E1/STR/BR-02/GAD-671 (SH. 2 OF 2)
- 73806/LASA/E1/STR/BR-02/SUB-672
- 73806/LASA/E1/STR/BR-02/SUB-673

GENERAL NOTES:

- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS UNLESS OTHERWISE SPECIFIED.
- DIMENSIONS ARE NOT TO BE SCALED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH OTHER SHEETS OF DRAWING.

CLIENT :



Roads & Bridges Department
(Government of Sikkim)

PROJECT :

Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim

DESIGN CONSULTANT :



LEA ASSOCIATES SOUTH ASIA PVT. LTD.
B-1/E-27, Mohan Cooperative Industrial Estate,
Mathura Road, New Delhi-110044

DRAWING TITLE:-

GENERAL ARRANGEMENT DRAWING
FOR MINOR BRIDGE AT CH. 1+925 Km
(SH. 1 OF 2)

DRAWING No : 73806/LASA/E1/STR/BR-02/GAD-671

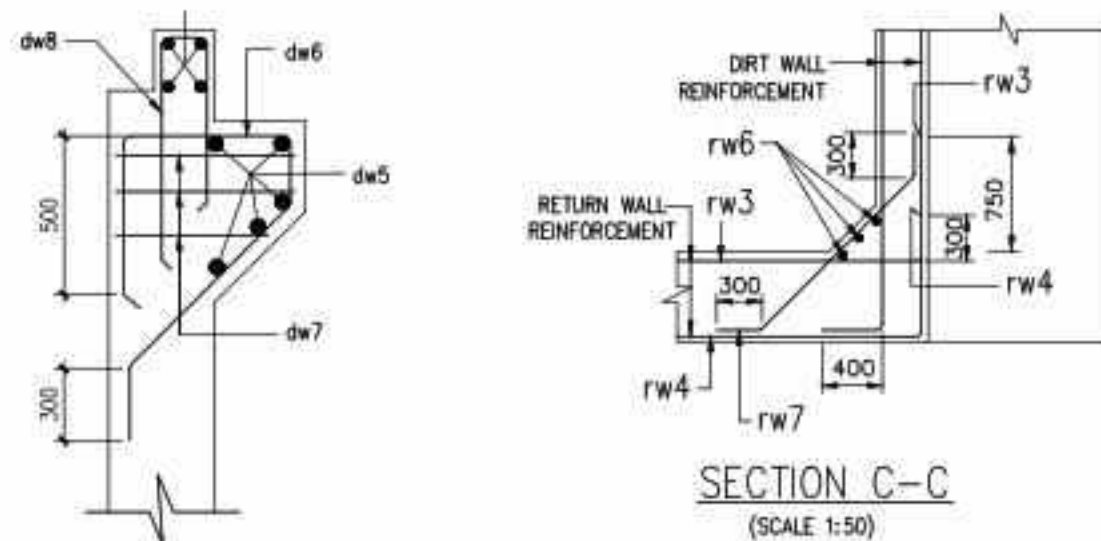
REV.

R0

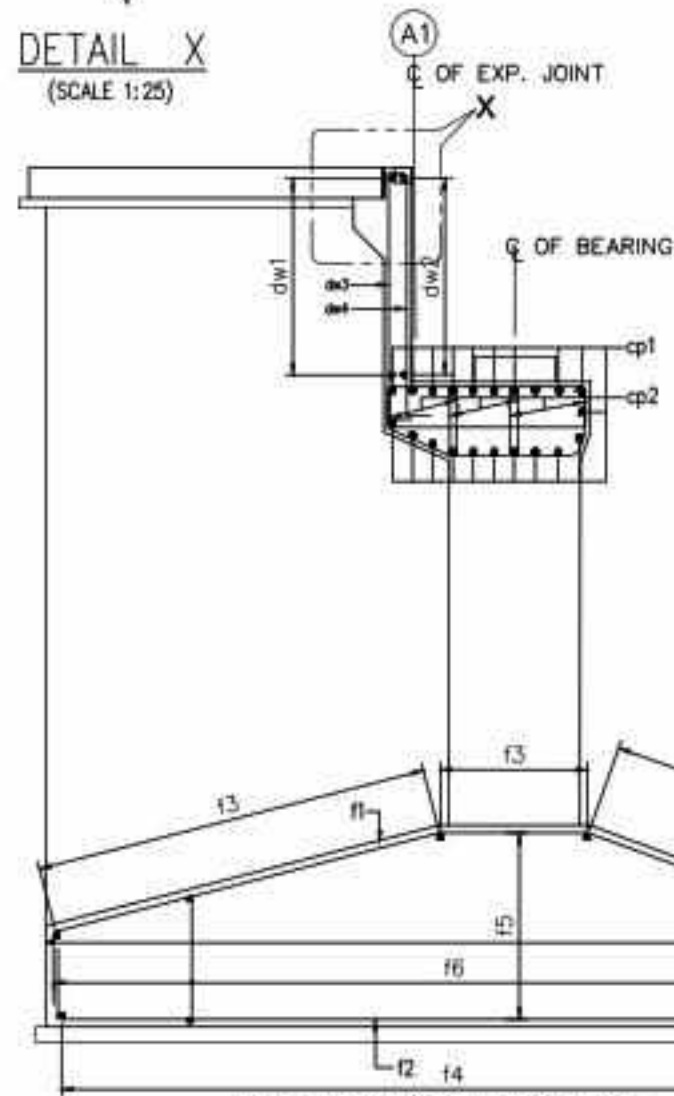
SHEET

A2

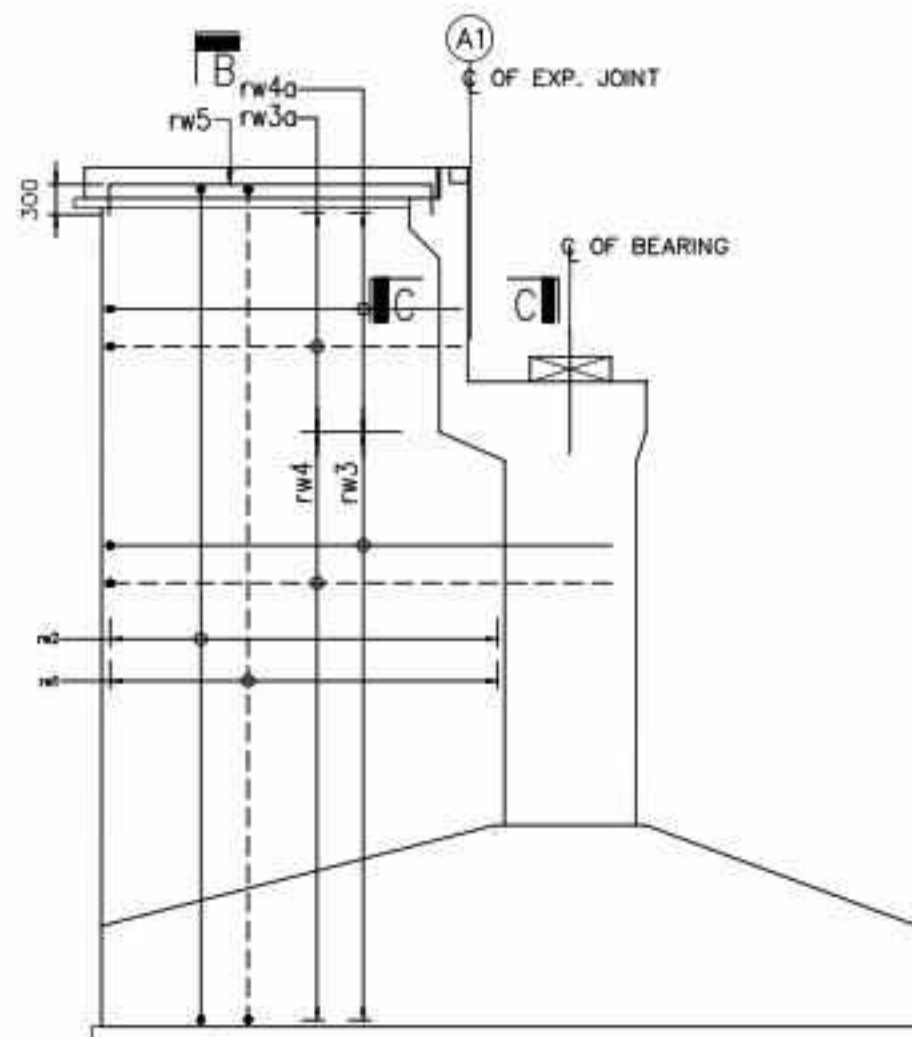
DRAWN	A. DHAR	CHECKED	S. MONDAL
DESIGN	B. SARKAR	REVIEWED	J. K. DAS
DATE	JULY 2022	SCALE :	AS SHOWN



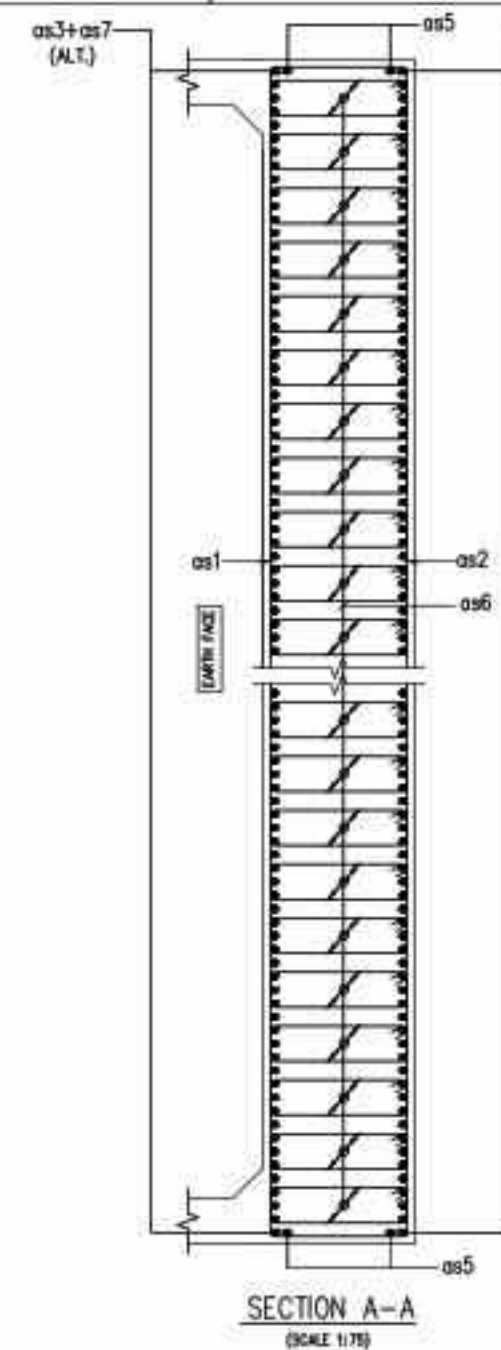
DETAIL X
(SCALE 1:25)



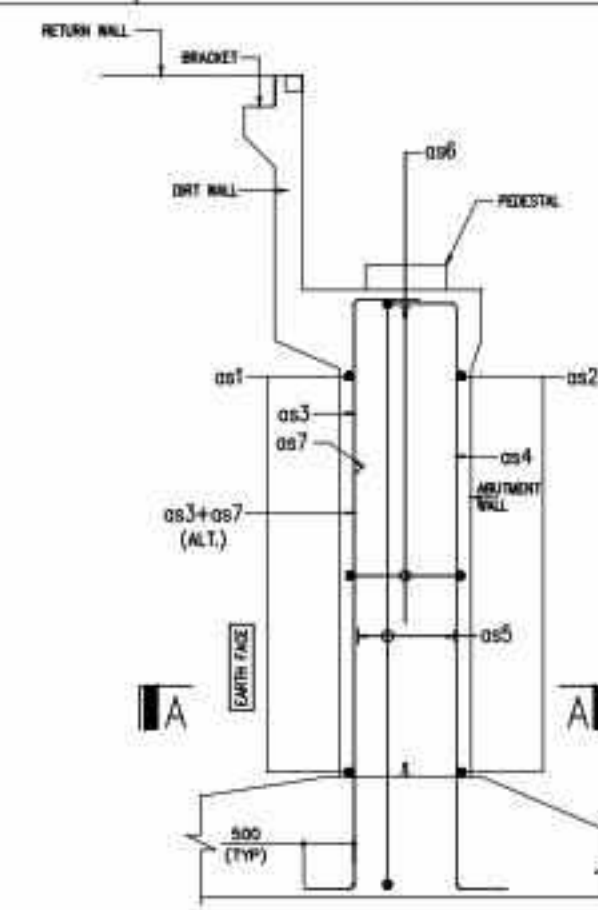
SECTION SHOWING REINF.
OF FOUNDATION AND ABUT. CAP
(SCALE 1:75)



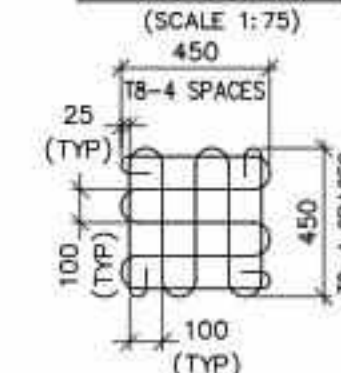
SECTION SHOWING REINF.
OF CANTILVER RETURN WALL
(SCALE 1:75)



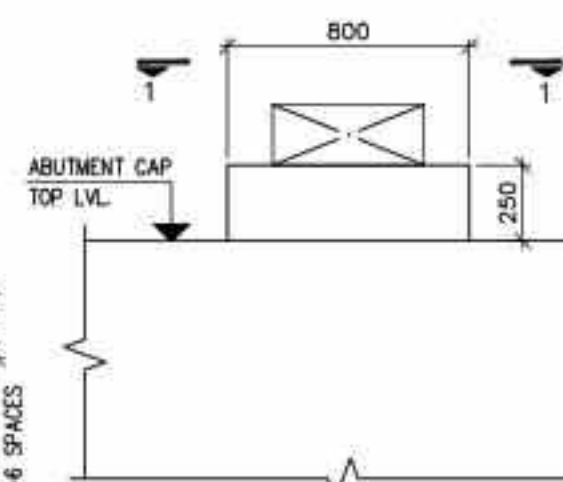
SECTION A-A
(SCALE 1:75)



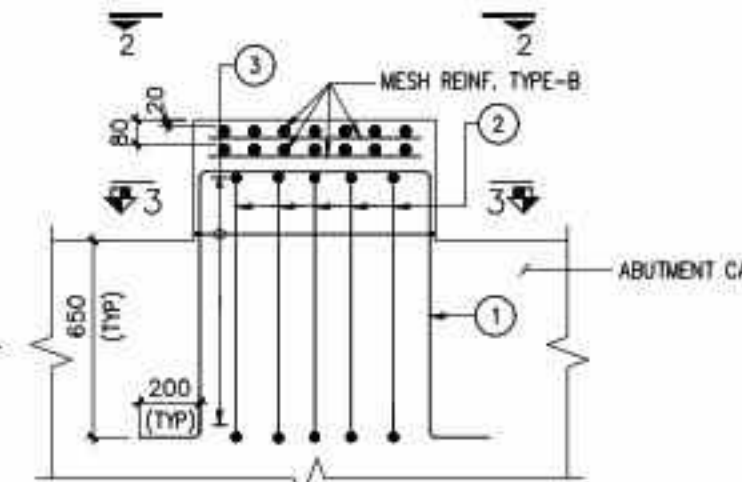
REINFORCEMENT DETAIL OF
ABUTMENT WALL
(SCALE 1:75)



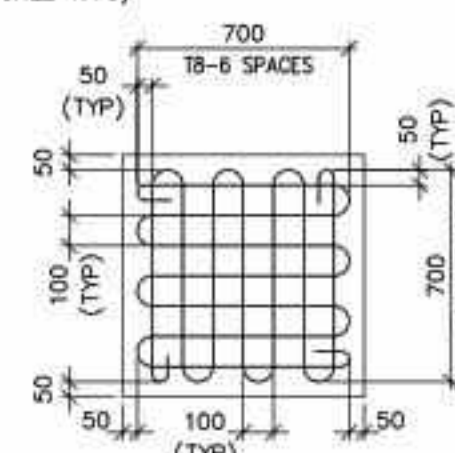
MESH TYPE-A
(DETAIL OF MESH REINF.)
SCALE 1:20



ELEVATION OF PEDESTALS
SCALE 1:20

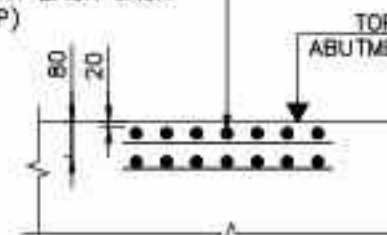


REINF. DETAIL FOR PEDESTALS
SCALE 1:20

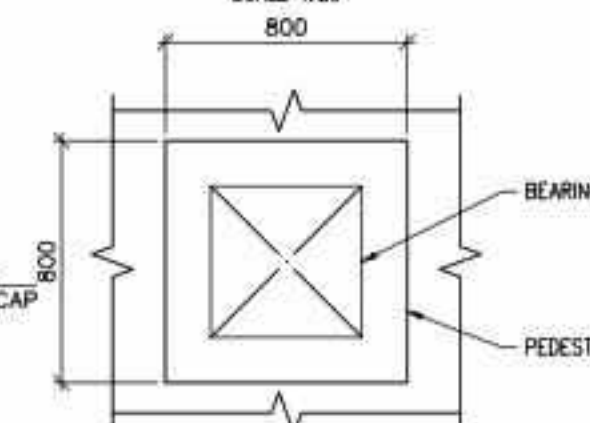


VIEW 2-2
(SHOWING MESH REINF. TYPE-B)
SCALE 1:20

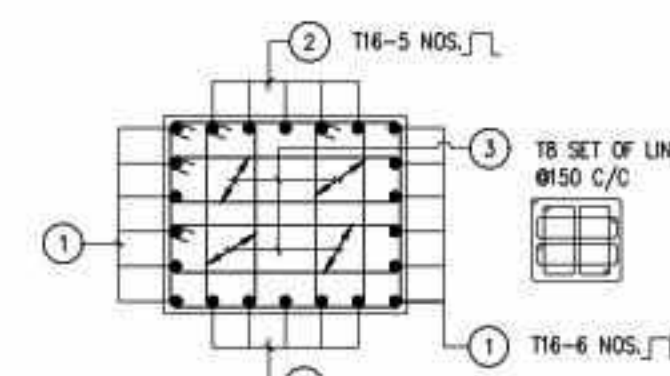
MESH REINF. TYPE-A (450x450)
IN 2 LAYERS AT EACH JACK
LOCATION (TYP)



DETAIL OF MESH TYPE-A
(BELOW JACK LOCATION)
SCALE 1:20



VIEW 1-1
PLAN OF PEDESTALS
SCALE 1:20



SECTION A-A
SCALE 1:20

REINFORCEMENT SCHEDULE

SL. No.	BAR MARK	BAR DIA.	NUMBER/ SPACING	BAR SHAPE	REMARKS
1	f1	32	100 c/c		
2	f2	25	100 c/c		
3	f3	16	100 c/c		
4	f4	16	150 c/c		
5	f5	12	200 c/c		
6	f6	10	100 c/c		
7	rw1	12	200 c/c		
8	rw2	25	200 c/c		
9	rw3	20	200 c/c		
10	rw4	12	200 c/c		
11	rw5	12	200 c/c		
14	dw1	10	200 c/c		
15	dw2	10	200 c/c		
16	dw3	16	200 c/c		
17	dw4	10	200 c/c		
18	dw5	10	5 Nos		
19	dw6	12	200 c/c		
20	dw7	2L-10	200 c/c		3 Layers
21	dw8	10	200 c/c		
22	dw9	10	4 Nos		
23	cp1	12	100 c/c		
24	cp2	12	100 c/c		
25	as1	16	90 c/c		
26	as2	16	90 c/c		
27	as3	32	110 c/c		
28	as4	16	200 c/c		
29	as5	12	100 c/c		
30	as6	10	100 c/c		

REFERENCE DRAWING:

- 73806/LASA/E1/STR/BR-02/GAD-671
- 73806/LASA/E1/STR/BR-02/SUB-672

LEGENDS:-

- TOP OR NEAR FACE REINFORCEMENT
- BOTTOM OR FAR FACE REINFORCEMENT
- L.V. LENGTH VARIES

NOTES:-

- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS.
- ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. DIMENSIONS ARE NOT TO BE SCALED.
- GRADE OF CONCRETE FOR VARIOUS STRUCTURAL COMPONENTS SHALL BE AS FOLLOWS:-
 - ABUTMENT WALL, DIRT WALL & RETURN WALL M30
 - ABUTMENT FOUNDATION M30
 - RCC PEDESTAL M40
 - GRADE OF PCC LEVELING COURSE M15
- CLEAR COVER SHALL BE AS FOLLOWS SHALL BE AS FOLLOWS:-
 - EARTH FACE 45mm
 - NON-EARTH FACE 75mm
- 'T' DENOTES H.Y.S.D. BARS (GRADE DESIGNATION : Fe500) CONFORMING TO IS: 1786 (LATEST).
- MINIMUM ANCHORAGE LENGTH OF REINFORCEMENT SHALL BE 42 x DIA OF BARS UNLESS NOTED OTHERWISE.
- BARS SHALL BE LAPPED IN SUCH A WAY THAT NOT MORE THAN 50% OF THE BARS ARE LAPPED AT ANY SECTION. LAP LENGTH SHALL BE KEPT AS MINIMUM 50d (d = DIA. OF BAR).

CLIENT :



Roads & Bridges Department
(Government of Sikkim)

PROJECT :

**Consultancy Services for Feasibility Studies
and Preparation of Detailed Project Report
for Roads and Bridges in Sikkim**

DESIGN CONSULTANT :

LEA ASSOCIATES SOUTH ASIA PVT. LTD.
B-1/E-27, Mohan Cooperative Industrial Estate,
Mathura Road, New Delhi-110044

DRAWING TITLE:-

**REINFORCEMENT DETAIL OF ABUTMENT
FOR BRIDGE AT CH. 1+925 Km**

DRAWING No : 73806/LASA/E1/STR/BR-02/SUB-673

REV.

R0

SHEET

A2

DRAWN

A. DHAR

DESIGN

DATE

CHECKED

B. SARKAR

REVIEWED

JULY 2022

SCALE :

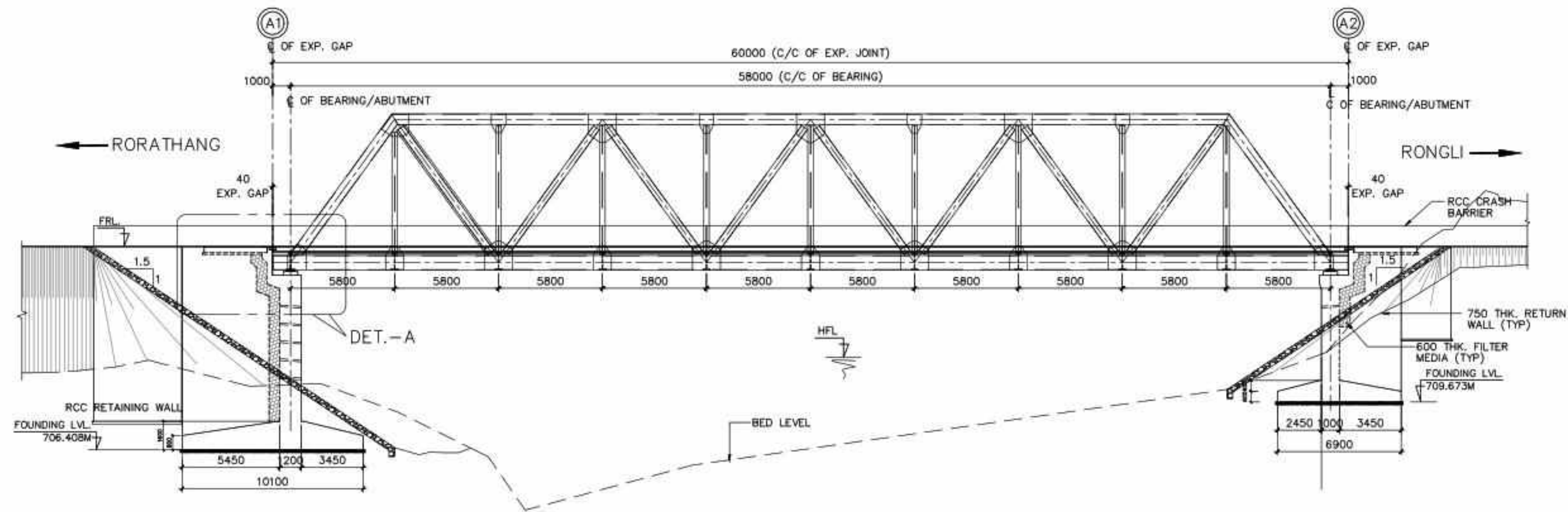
AS SHOWN

S. MONDAL

J. K. DAS

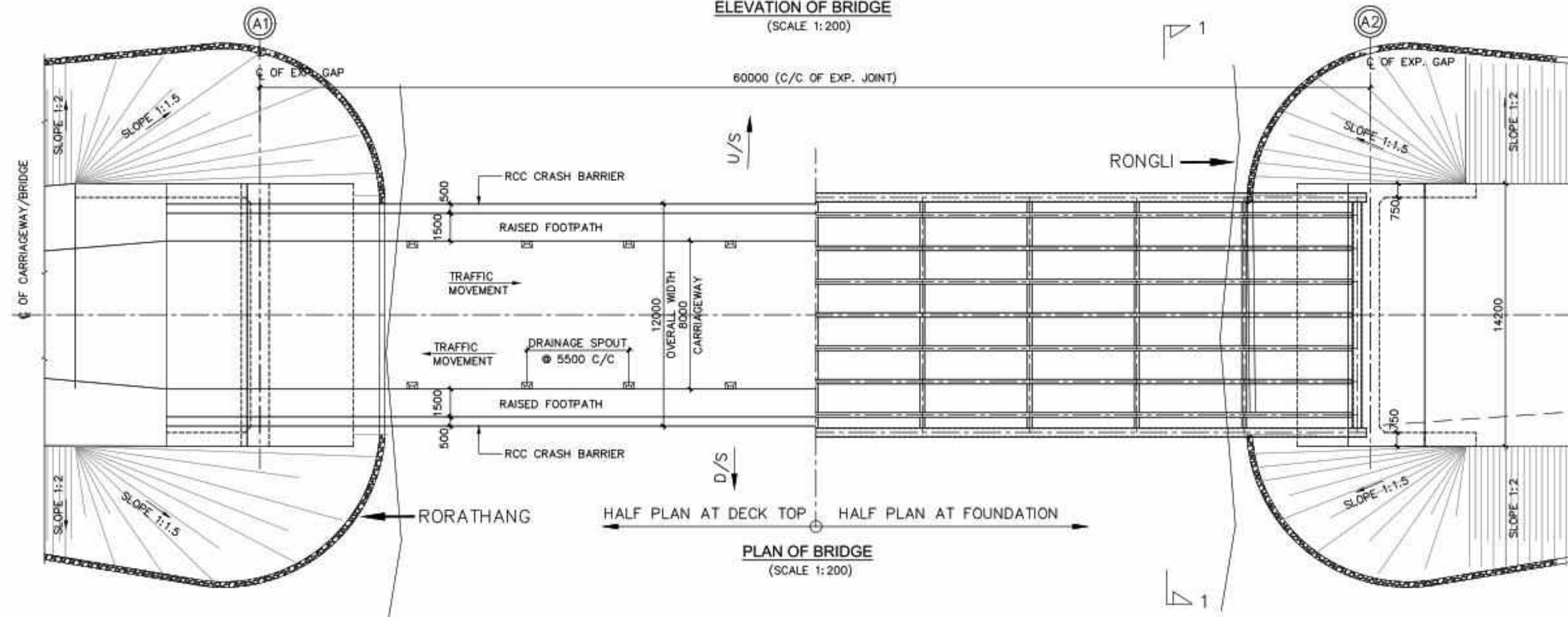
SCALE :

AS SHOWN



DATUM=540.0M			
PROPOSED LVL. (FRL)	718.121	718.121	718.121
EXISTING GROUND LVL.	709.408	705.603	712.673
HORIZONTAL DIAGRAM	LENGTH=70.703M		
VERTICAL DIAGRAM	GRADIENT=1.56%		
PROPOSED CHAINAGE	4+047.240	4+077.240	4+107.240

ELEVATION OF BRIDGE
(SCALE 1:200)



PLAN OF BRIDGE
(SCALE 1:200)

REFERENCE DRAWING:

- 73806/LASA/E1/STR/BR-03/GAD-681 (SH. 2 OF 3)
- 73806/LASA/E1/STR/BR-03/SUB-682
- 73806/LASA/E1/STR/BR-03/SUB-684

GENERAL NOTES:

- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS UNLESS OTHERWISE SPECIFIED.
- DIMENSIONS ARE NOT TO BE SCALED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH OTHER SHEETS OF DRAWING.

CLIENT :



Roads & Bridges Department
(Government of Sikkim)

PROJECT :

Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim

DESIGN CONSULTANT :



LEA ASSOCIATES SOUTH ASIA PVT. LTD.
B-1/E-27, Mohan Cooperative Industrial Estate,
Mathura Road, New Delhi-110044

DRAWING TITLE:-

GENERAL ARRANGEMENT DRAWING
FOR MAJOR BRIDGE AT CH. 4+077 Km
(SH 1 OF 3)

DRAWING No : 73806/LASA/E1/STR/BR-03/GAD-681

REV.	DRAWN	A. DHAR	CHECKED	S. MONDAL
R0	DESIGN	B. SARKAR	REVIEWED	J. K. DAS
SHEET	DATE	FEB. 2022	SCALE :	AS SHOWN
A2				

REV	DATE	DETAILS OF REVISION	BY

BORE LOG AT ABUTMENT A1 LOCATION



BH No.: BH-1							
SAMPLE AND IN-SITU TEST			LENGTH (m)	SPT (‘N’ VALUE)	CR (%)	RQD (%)	DESCRIPTION OF STRATA
TIME (min)	DEPTH/RUN (m)						
	From	To					
	1.00	1.06	0.06	N>100			BROWNISH GREY SANDY GRAVEL
41	1.00	1.75	0.75		25.3	NIL	METASEDIMENTS(GRANULITES) : DARK COLOUR; HARD;MAFICS ARE PROBABLY PYROXENE WITH QUARTZ AS VEIN QUARTZ; ABUNDANCE OF IRON LEACHING DUE TO DECOMPOSITION PHYLITES: STRIATED; BANDED QUARTZ -CHLORITE, SERICITE SCHIST ; EARTHY; GRAYISH GREEN; MODERATELY HARD AND LITTLE IRON LEACHING DUE TO DECOMPOSITION, QUARTZ APPEARS AS VEINS
45	1.75	2.50	0.75		28.0	NIL	
42	2.50	3.25	0.75		30.7	NIL	
40	3.25	4.00	0.75		36.0	NIL	
48	4.00	4.75	0.75		42.7	NIL	
50	4.75	5.50	0.75		25.3	NIL	
82	5.50	6.25	0.75		30.7	NIL	
89	6.25	7.00	0.75		34.7	NIL	
78	7.00	7.75	0.75		25.3	NIL	
94	7.75	8.50	0.75		30.7	NIL	
54	8.50	9.25	0.75		18.7	NIL	
50	9.25	10.00	0.75		21.3	NIL	
67	10.00	11.00	1.00		23.0	NIL	
NOTE:- SPT- STANDARD PENETRATION TEST CR- CORE RECOVERY RQD- ROCK QUALITY DESIGNATION							

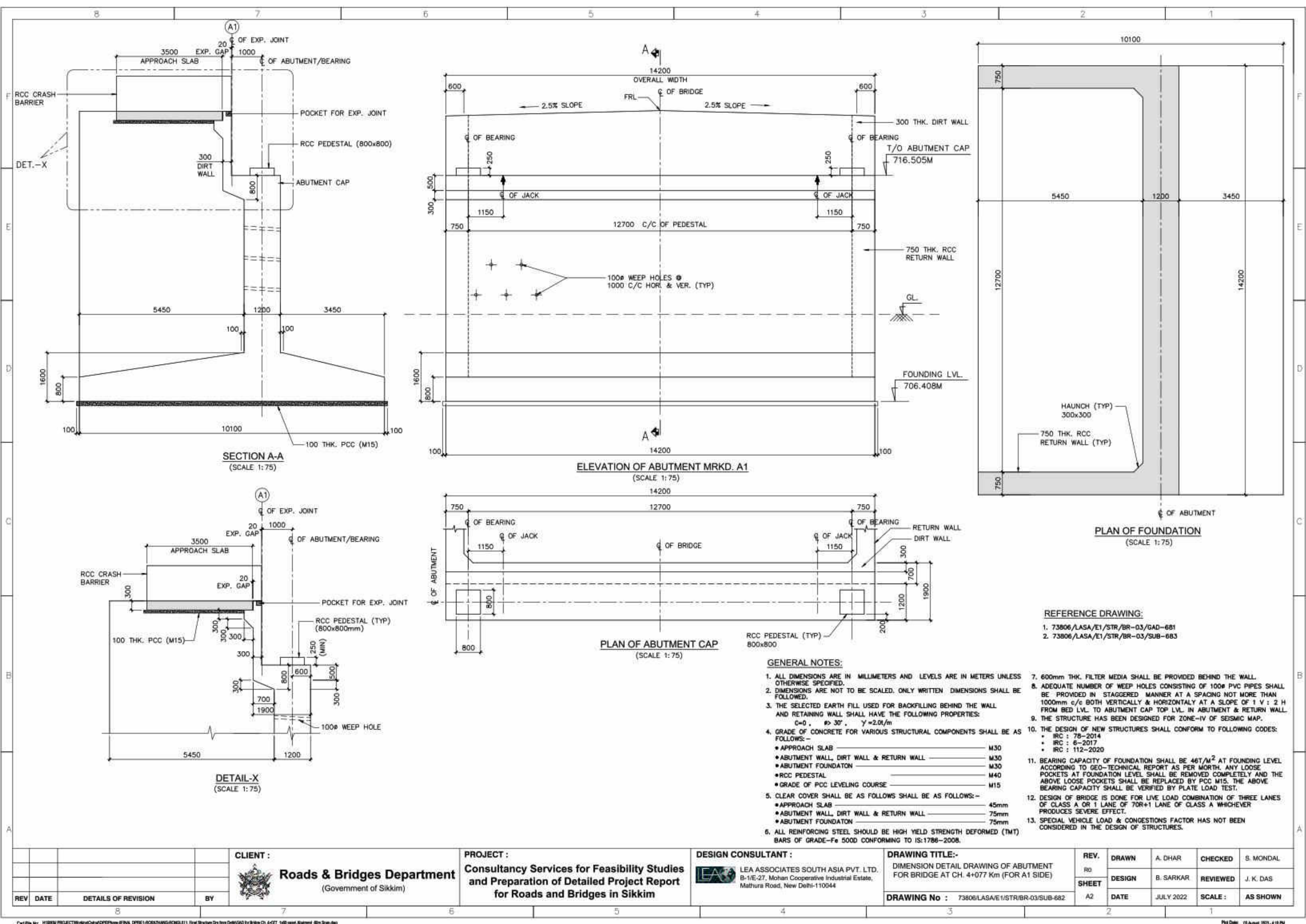
BORE LOG AT ABUTMENT A2 LOCATION

BH No.: BH-2							
SAMPLE AND IN-SITU TEST			LENGTH (m)	SPT (‘N’ VALUE)	CR (%)	RQD (%)	DESCRIPTION OF STRATA
TIME (min)	DEPTH/RUN (m)						
	From	To					
	0.00	0.50	0.50	N>100			PHYLLITES: STRIATED; BANDED QUARTZ -CHLORITE SERICITE SCHIST ; EARTHY; GRAYISH GREEN;MODERATELY HARD AND LITTLE IRON LEACHING DUE TO DECOMPOSITION. QUARTZ APPEARS AS VEINS
	1.50	1.72	0.22				
35	1.50	2.25	0.75		20.0	NIL	
31	2.25	3.00	0.75		18.7	NIL	
34	3.00	3.75	0.75		14.7	NIL	PHYLLITES: STRIATED; BANDED QUARTZ -CHLORITE SERICITE SCHIST ; EARTHY; GRAYISH GREEN;MODERATELY HARD AND LITTLE IRON LEACHING DUE TO DECOMPOSITION.
37	3.75	4.50	0.75		20.0	NIL	
80	4.50	5.25	0.75		24.0	NIL	
85	5.25	6.00	0.75		25.3	NIL	
42	6.00	6.75	0.75		24.0	NIL	PHYLLITES: STRIATED; BANDED QUARTZ -CHLORITE SERICITE SCHIST ; EARTHY; GRAYISH GREEN;MODERATELY HARD AND LITTLE IRON LEACHING DUE TO DECOMPOSITION. QUARTZ APPEARS AS VEINS
46	6.75	7.50	0.75		21.3	NIL	
43	7.50	8.25	0.75		24.0	NIL	
51	8.25	9.00	0.75		25.3	NIL	
45	9.00	9.75	0.75		24.0	NIL	
47	9.75	10.50	0.75		28.0	NIL	
49	10.50	11.50	1.00	20.0	NIL		
NOTE:- SPT- STANDARD PENETRATION TEST CR- CORE RECOVERY RQD- ROCK QUALITY DESIGNATION							

REFERENCE DRAWING:

1. 73806/LASA/E1/STR/BR-03/GAD-681 (SH. 1 OF 3)

				 <div>CLIENT : Roads & Bridges Department (Government of Sikkim)</div>	<div>PROJECT : Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim</div>	<div>DESIGN CONSULTANT :  LEA ASSOCIATES SOUTH ASIA PVT. LTD. B-1/E-27, Mohan Cooperative Industrial Estate, Mathura Road, New Delhi-110044</div>	<div>DRAWING TITLE:- BORE LOG DETAILS FOR MAJOR BRIDGE AT CH. 4+077 Km (SH 3 OF 3)</div>	<div>DRAWING No : 73806/LASA/E1/STR/BR-03/GAD-681</div>	REV.	DRAWN	A. DHAR	CHECKED	S. MONDAL
RO	DESIGN	B. SARKAR	REVIEWED						J. K. DAS				
SHEET	DATE	JULY 2022	SCALE :						AS SHOWN				
A2													
REV	DATE	DETAILS OF REVISION		BY									



CLIENT :

Roads & Bridges Department
(Government of Sikkim)

PROJECT :

Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim

DESIGN CONSULTANT :

LEA ASSOCIATES SOUTH ASIA PVT. LTD.
B-1/E-27, Mohan Cooperative Industrial Estate,
Mathura Road, New Delhi-110044

DRAWING TITLE:-

DIMENSION DETAIL DRAWING OF ABUTMENT FOR BRIDGE AT CH. 4+077 Km (FOR A1 SIDE)

DRAWING No : 73806/LASA/E1/STR/BR-03/SUB-682

REV.	DRAWN	CHECKED	S. MONDAL
R0	A. DHAR		
SHEET	DESIGN	REVIEWED	J. K. DAS
A2	B. SARKAR		
DATE	JULY 2022	SCALE :	AS SHOWN

REINFORCEMENT DETAIL OF
ABUTMENT WALL
(SCALE 1:50)

REINFORCEMENT DETAIL OF
ABUTMENT CAP AND DIRT WALL
(PEDESTAL REINF. NOT SHOWN FOR CLARITY)
(SCALE 1:50)

DETAIL X
(SCALE 1:25)

REINFORCEMENT PLAN OF FOUNDATION
(SCALE 1:75)

SECTION E-E
(SCALE 1:75)

LEGENDS:—

- TOP OR NEAR FACE REINFORCEMENT
 ----- BOTTOM OR FAR FACE REINFORCEMENT
 L.V. LENGTH VARIES

SECTION A-A
(SCALE 1:50)

TYPICAL REINFORCEMENT DETAIL
OF RETURN WALL

(ABUTMENT WALL REINFORCEMENT NOT SHOWN FOR CLARITY)
(SCALE 1:75)

TYP. DETAIL OF STIRRUPS

SECTION D-D
(SCALE 1:50)

SECTION C-C
(SCALE 1:50)

- REFERENCE DRAWING:**
1. 73806/LASA/E1/STR/BR-03/GAD-681
 2. 73806/LASA/E1/STR/BR-03/SUB-682

NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS.
2. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. DIMENSIONS ARE NOT TO BE SCALED.
3. GRADE OF CONCRETE FOR VARIOUS STRUCTURAL COMPONENTS SHALL BE AS FOLLOWS:-
 - ABUTMENT WALL, DIRT WALL & RETURN WALL _____ M30
 - ABUTMENT FOUNDATION _____ M30
 - RCC PEDESTAL _____ M40
 - GRADE OF PCC LEVELING COURSE _____ M15
4. CLEAR COVER SHALL BE AS FOLLOWS SHALL BE AS FOLLOWS:-
 - EARTH FACE _____ 45mm
 - NON-EARTH FACE _____ 75mm
5. 'T' DENOTES H.Y.S.D. BARS (GRADE DESIGNATION : Fe500) CONFORMING TO IS: 1786 (LATEST).
6. MINIMUM ANCHORAGE LENGTH OF REINFORCEMENT SHALL BE 42 x DIA OF BARS, UNLESS NOTED OTHERWISE.
7. BARS SHALL BE LAPPED IN SUCH A WAY THAT NOT MORE THAN 50% OF THE BARS ARE LAPPED AT ANY SECTION, LAP LENGTH SHALL BE KEPT AS MINIMUM 50d (d = DIA. OF BAR).

REV	DATE	DETAILS OF REVISION	BY

CLIENT :



Roads & Bridges Department
(Government of Sikkim)

PROJECT :	
------------------	--

Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim

DESIGN CONSULTANT :



LEA ASSOCIATES SOUTH ASIA PVT. LTD.
B-1/E-27, Mohan Cooperative Industrial Estate,
Mathura Road, New Delhi-110044

DRAWING TITLE:-

REINFORCEMENT DETAIL OF ABUTMENT
FOR BRIDGE AT CH. 4+077 Km (FOR A1 SIDE)
(SH. 1 OF 2)

DRAWING No : 73808/LASA/E1/STR/BR-03/SUB-683

REV.	
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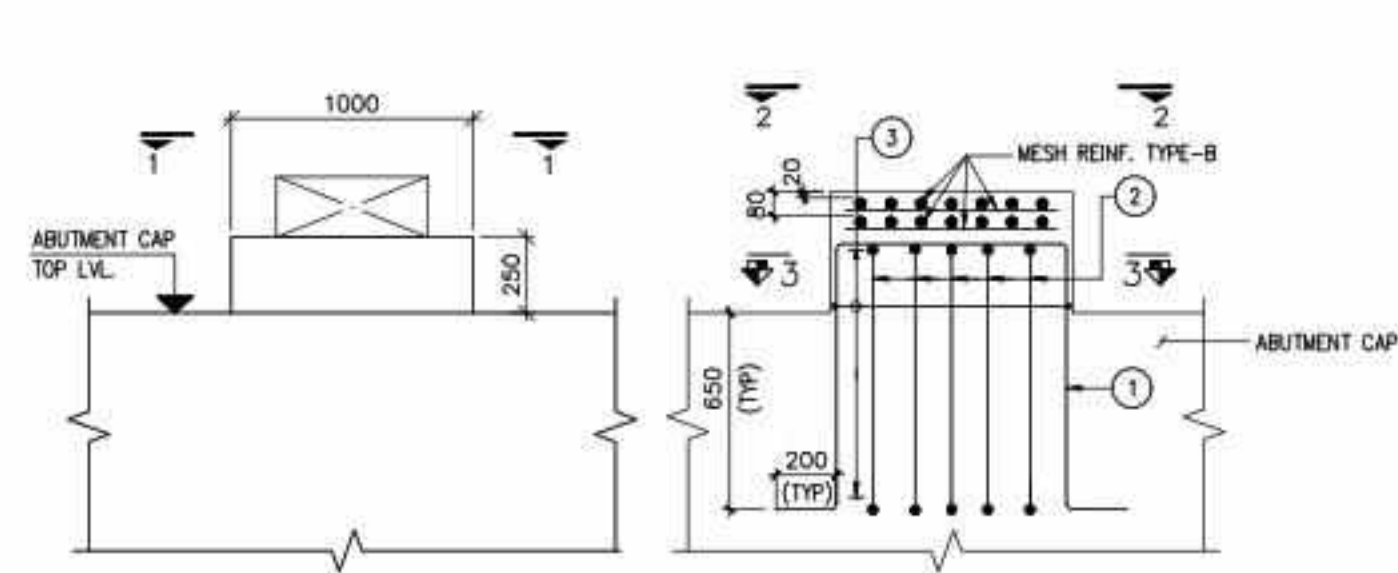
SHEET

A2

DRAWN	A. DHAR	CHECKED	S. MONDAL
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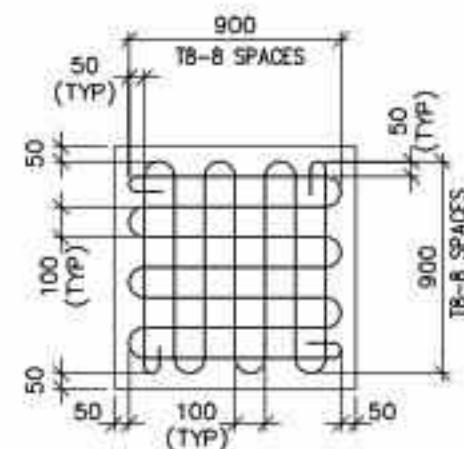
DRAWN	A. CHAK	CHECKED	S. MONDAL
DESIGN	B. SARKAR	REVIEWED	J. K. DAS

DATE :	JULY 2022	SCALE :	AS SHOWN
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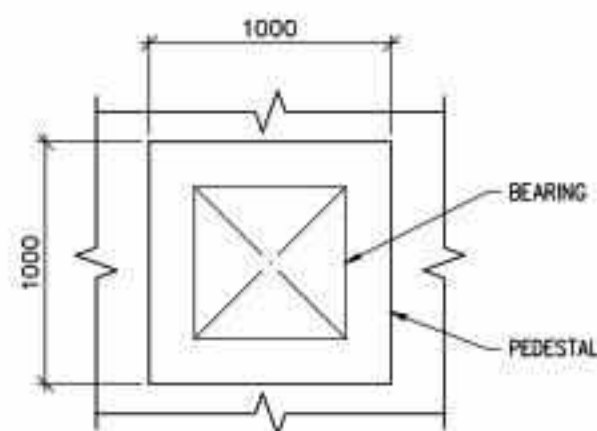


ELEVATION OF PEDESTALS
SCALE 1:20

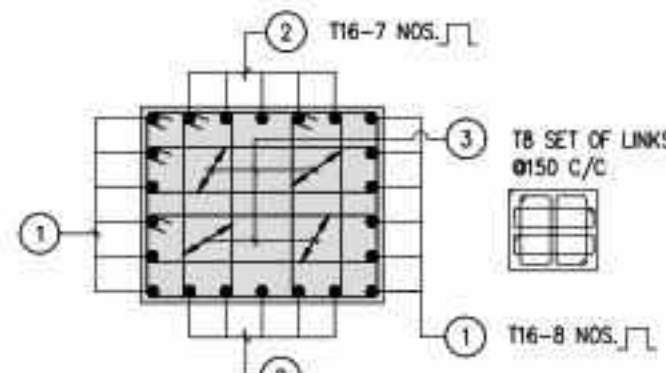
REINF. DETAIL FOR PEDESTALS
SCALE 1:20



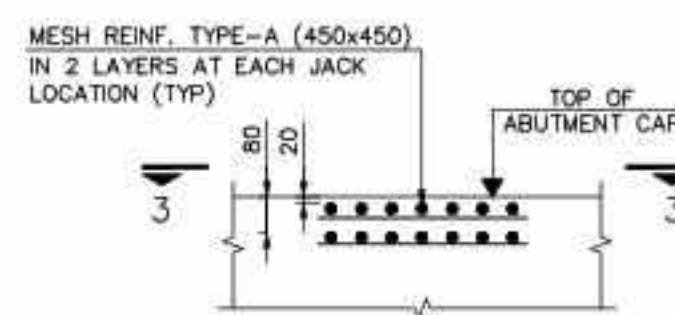
VIEW 2-2
(SHOWING MESH REINF. TYPE-B)
SCALE 1:20



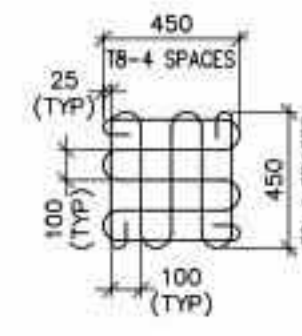
VIEW 1-1
PLAN OF PEDESTALS
SCALE 1:20



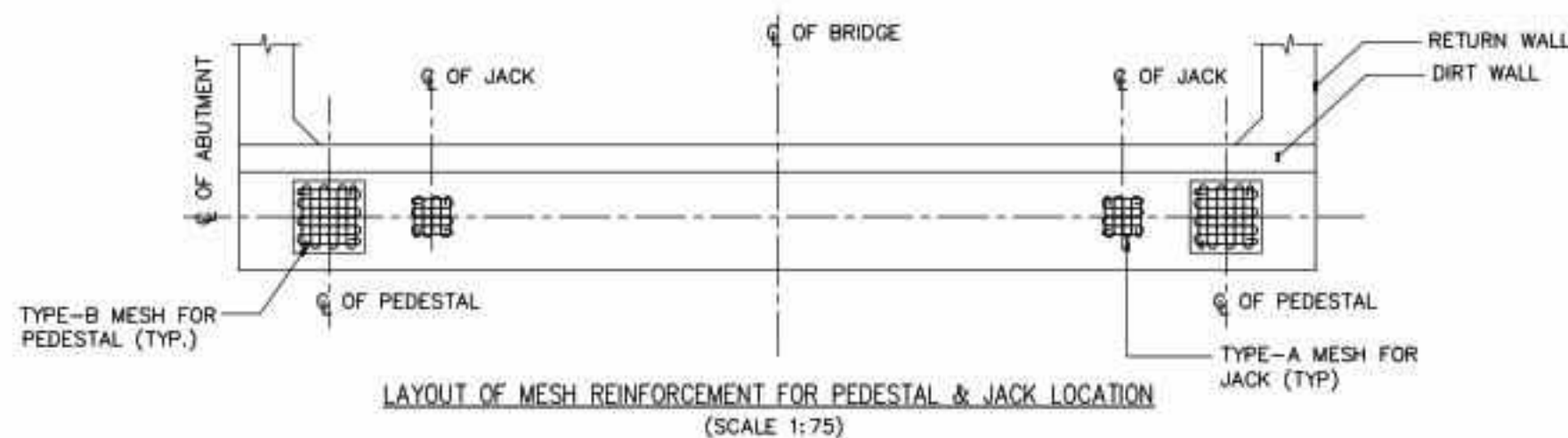
SECTION 3-3
SCALE 1:20



DETAIL OF MESH TYPE-A
(BELOW JACK LOCATION)
SCALE 1:20



VIEW 3-3
(DETAIL OF MESH REINF.)
SCALE 1:20



LAYOUT OF MESH REINFORCEMENT FOR PEDESTAL & JACK LOCATION
(SCALE 1:75)

LEGENDS:-

----- TOP OR NEAR FACE REINFORCEMENT
----- BOTTOM OR FAR FACE REINFORCEMENT
L.V. LENGTH VARIES

REFERENCE DRAWING:

- 73806/LASA/E1/STR/BR-03/GAD-681
- 73806/LASA/E1/STR/BR-03/SUB-682

NOTES:-

- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS.
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 - ABUTMENT WALL, DIRT WALL & RETURN WALL M30
 - ABUTMENT FOUNDATION M30
 - RCC PEDESTAL M40
 - GRADE OF PCC LEVELING COURSE M15
- CLEAR COVER SHALL BE AS FOLLOWS SHALL BE AS FOLLOWS:-
 - EARTH FACE 45mm
 - NON-EARTH FACE 75mm
- 'T' DENOTES H.Y.S.D. BARS (GRADE DESIGNATION : Fe500) CONFORMING TO IS: 1786 (LATEST).
- MINIMUM ANCHORAGE LENGTH OF REINFORCEMENT SHALL BE 42 x DIA OF BARS, UNLESS NOTED OTHERWISE.
- BARS SHALL BE LAPPED IN SUCH A WAY THAT NOT MORE THAN 50% OF THE BARS ARE LAPPED AT ANY SECTION. LAP LENGTH SHALL BE KEPT AS MINIMUM 50d (d = DIA. OF BAR).

REINFORCEMENT SCHEDULE FOR A1 SIDE ABUTMENT :-

SL. No.	BAR MARK	BAR DIA.	NUMBER/ SPACING	BAR SHAPE	REMARKS
1	f1	32	Ø 180 c/c	└─┘	
2	f2	32	Ø 190 c/c	└─┘	
3	f3	16	Ø 100 c/c	└─┘	
4	f4	16	Ø 100 c/c	└─┘	
5	f5	12	Ø 200 c/c	└─┘	
6	f6	32	Ø 180 c/c	└─┘	
7	f7	32	Ø 190 c/c	└─┘	
8	f8	10	Ø 100 c/c	└─┘	
9	as1	20	Ø 180 c/c	└─┘	
10	as2	20	Ø 180 c/c	└─┘	
11	as3	32	Ø 100 c/c	└─┘	
12	as4	20	Ø 200 c/c	└─┘	
13	as5	16	Ø 200 c/c	└─┘	
14	as6	10	Ø 100 c/c	└─┘	
15	as7		NOT IN USE	└─┘	
16	rw1	20	Ø 150 c/c	└─┘	
17	rw2	12	Ø 150 c/c	└─┘	
18	rw3	25	Ø 150 c/c	└─┘	
19	rw4	12	Ø 150 c/c	└─┘	
20	rw5	25	Ø 150 c/c	└─┘	
21	rw6	12	Ø 150 c/c	└─┘	
22	rw7	12	Ø 200 c/c	└─┘	
23	rw8	12	3 Nos	└─┘	
24	rw9	12	Ø 200 c/c	└─┘	
25	dw1	10	Ø 200 c/c	└─┘	
26	dw2	10	Ø 200 c/c	└─┘	
27	dw3	16	Ø 180 c/c	└─┘	
28	dw4	10	Ø 200 c/c	└─┘	
29	dw5	10	5 Nos	└─┘	
30	dw6	12	Ø 200 c/c	└─┘	
31	dw7	2L-10	Ø 200 c/c	└─┘	3 Layers
32	dw8	10	Ø 200 c/c	└─┘	
33	dw9	10	4 Nos	└─┘	
34	c1	12	Ø 200 c/c	└─┘	
35	c2	12	Ø 200 c/c	└─┘	

CLIENT :



Roads & Bridges Department
(Government of Sikkim)

PROJECT :

Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim

DESIGN CONSULTANT :



LEA ASSOCIATES SOUTH ASIA PVT. LTD.
B-1/E-27, Mohan Cooperative Industrial Estate,
Mathura Road, New Delhi-110044

DRAWING TITLE:-

REINFORCEMENT DETAIL OF ABUTMENT
FOR BRIDGE AT CH. 4+077 Km (FOR A1 SIDE)
(SH. 2 OF 2)

DRAWING No : 73806/LASA/E1/STR/BR-03/SUB-683

REV.

R0

SHEET

A2

DRAWN

DESIGN

DATE

JULY 2022

A. DHAR

B. SARKAR

SCALE :

AS SHOWN

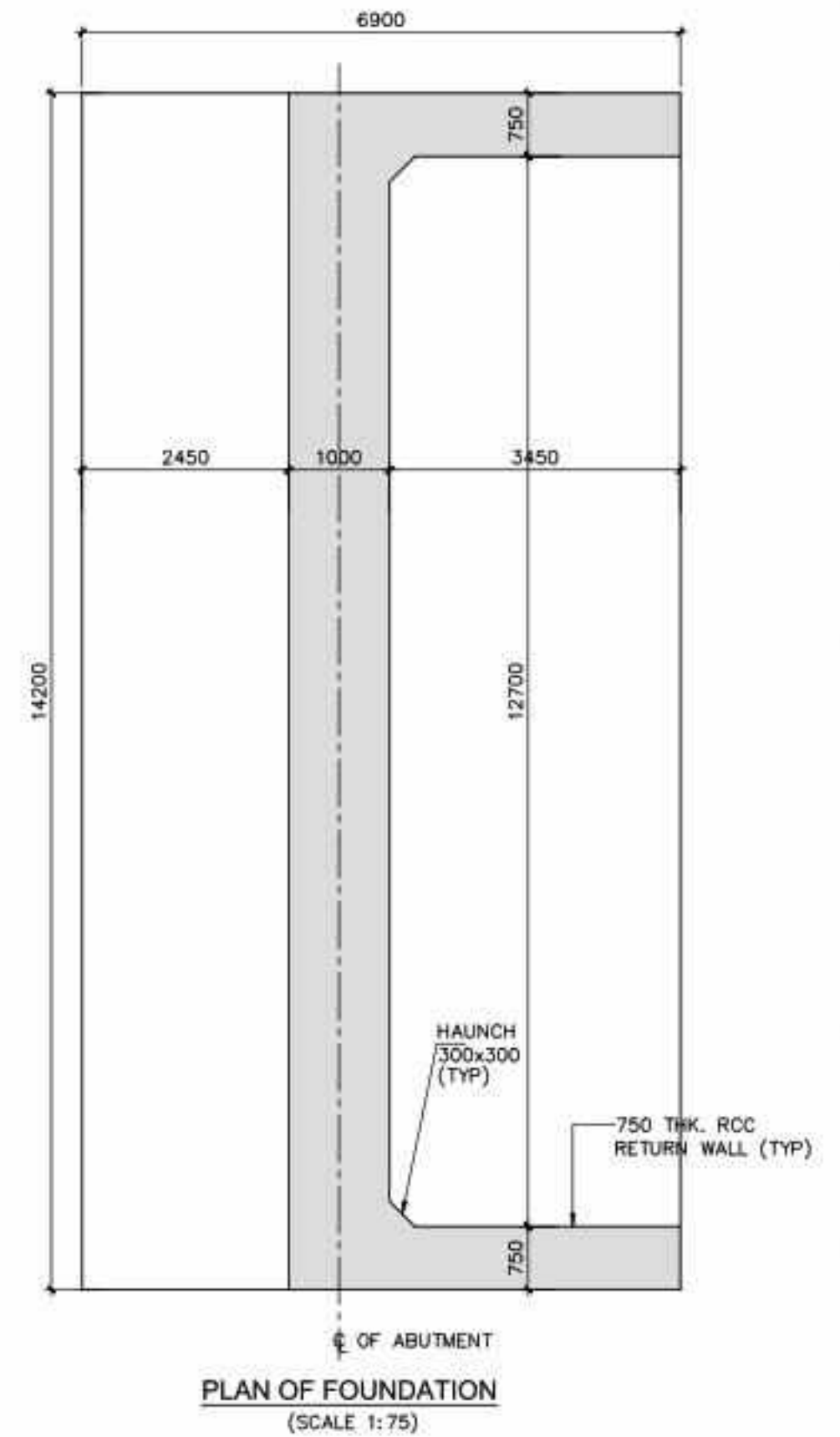
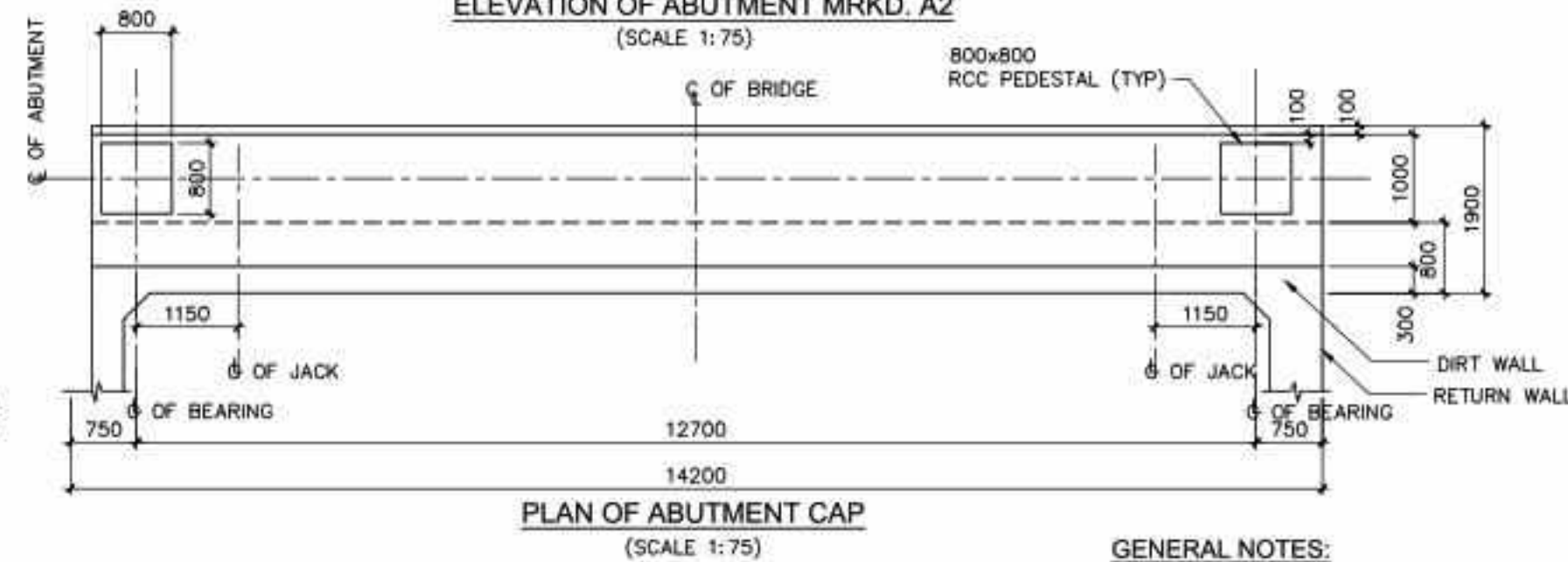
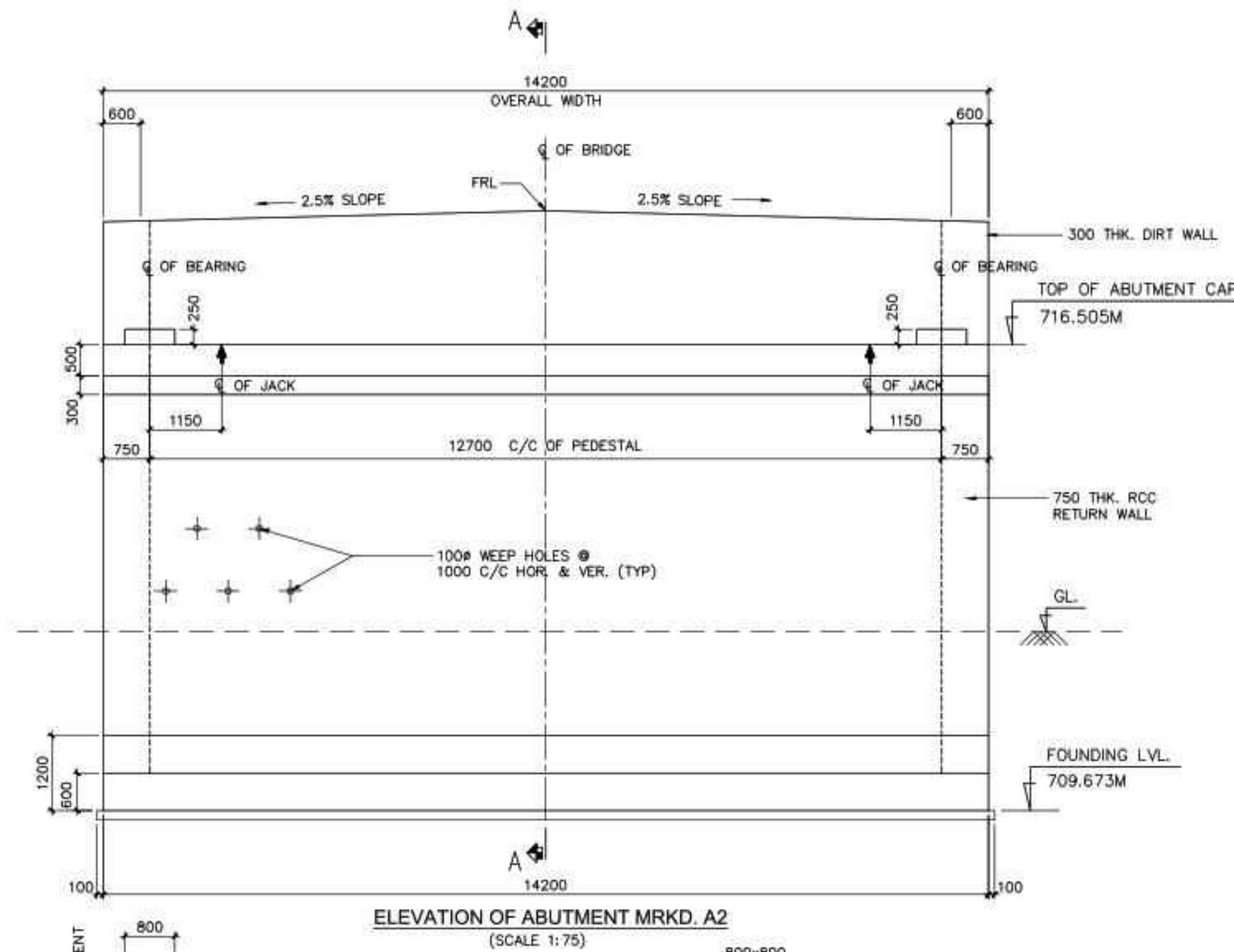
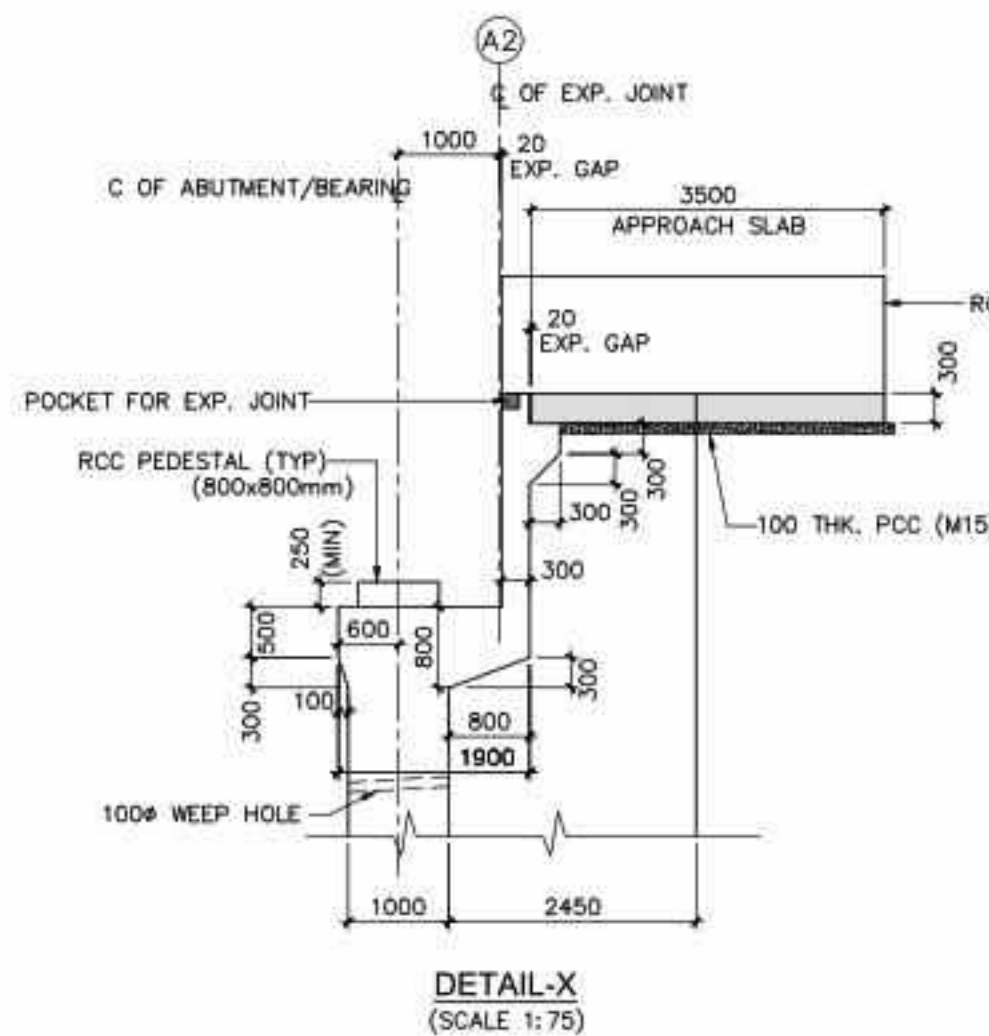
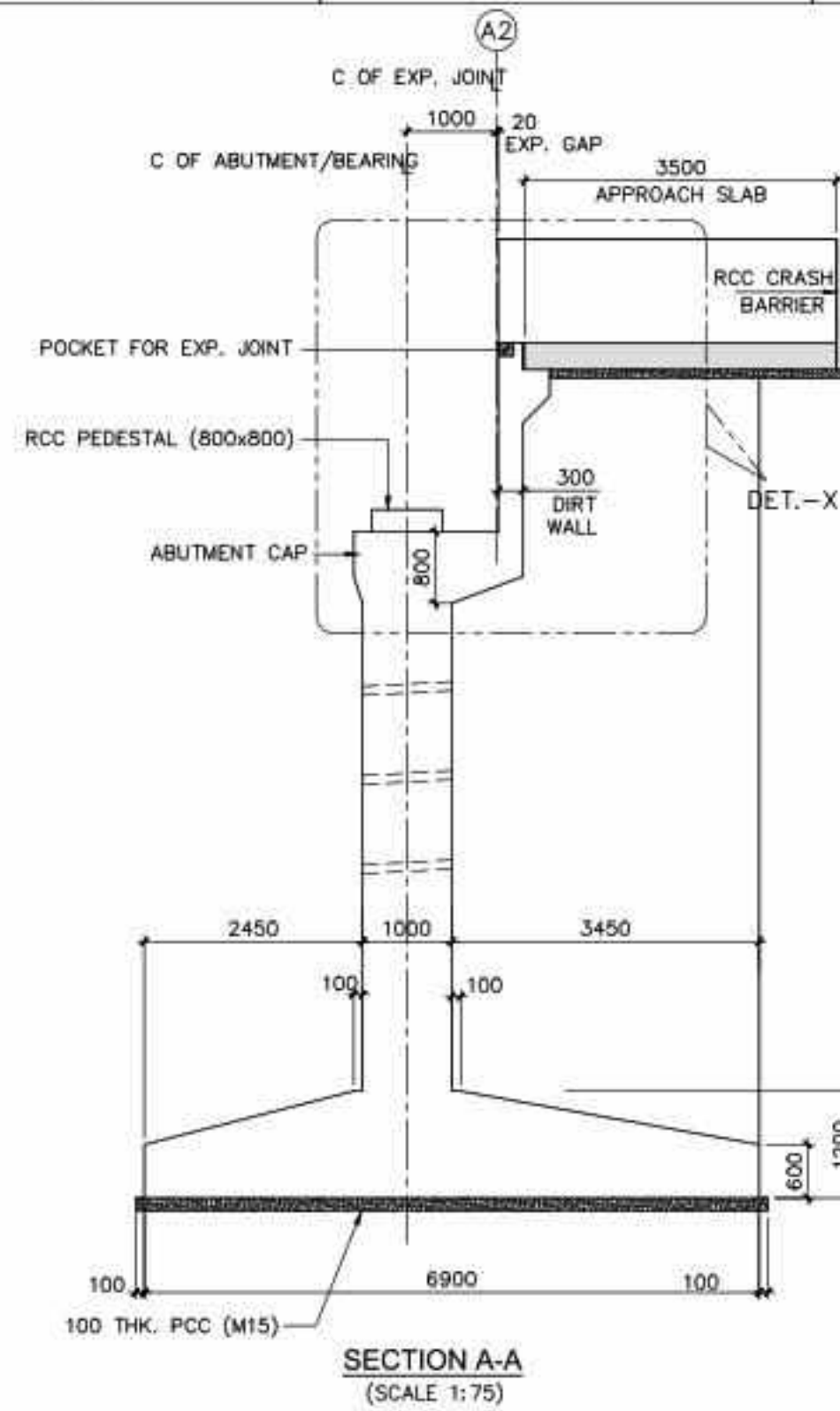
CHECKED

REVIEWED

1

J. K. DAS

S. MONDAL



REFERENCE DRAWING:

- 73806/LASA/E1/STR/BR-03/GAD-681
- 73806/LASA/E1/STR/BR-03/SUB-685

GENERAL NOTES:

- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS UNLESS OTHERWISE SPECIFIED.
- DIMENSIONS ARE NOT TO BE SCALED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
- THE SELECTED EARTH FILL USED FOR BACKFILLING BEHIND THE WALL AND RETAINING WALL SHALL HAVE THE FOLLOWING PROPERTIES:
C=0, $\phi > 30^\circ$, $\gamma = 2.0t/m$
- GRADE OF CONCRETE FOR VARIOUS STRUCTURAL COMPONENTS SHALL BE AS FOLLOWS:-
 - APPROACH SLAB M30
 - ABUTMENT WALL, DIRT WALL & RETURN WALL M30
 - ABUTMENT FOUNDATION M30
 - RCC PEDESTAL M40
 - GRADE OF PCC LEVELING COURSE M15
- CLEAR COVER SHALL BE AS FOLLOWS SHALL BE AS FOLLOWS:-
 - APPROACH SLAB 45mm
 - ABUTMENT WALL, DIRT WALL & RETURN WALL 75mm
 - ABUTMENT FOUNDATION 75mm
- ALL REINFORCING STEEL SHOULD BE HIGH YIELD STRENGTH DEFORMED (TMT) BARS OF GRADE-F_{500D} CONFORMING TO IS:1786-2008.
- 600mm THK. FILTER MEDIA SHALL BE PROVIDED BEHIND THE WALL.
- ADEQUATE NUMBER OF WEEP HOLES CONSISTING OF 100# PVC PIPES SHALL BE PROVIDED IN STAGGERED MANNER AT A SPACING NOT MORE THAN 1000mm c/c BOTH VERTICALLY & HORIZONTALLY AT A SLOPE OF 1 V : 2 H FROM BED LVL. TO ABUTMENT CAP TOP LVL. IN ABUTMENT & RETURN WALL.
- THE STRUCTURE HAS BEEN DESIGNED FOR ZONE-IV OF SEISMIC MAP.
- THE DESIGN OF NEW STRUCTURES SHALL CONFORM TO FOLLOWING CODES:
 - IRC : 78-2014
 - IRC : 6-2017
 - IRC : 112-2020
- BEARING CAPACITY OF FOUNDATION SHALL BE 45T/M² AT FOUNDING LEVEL ACCORDING TO GEO-TECHNICAL REPORT AS PER MORTH. ANY LOOSE POCKETS AT FOUNDATION LEVEL SHALL BE REMOVED COMPLETELY AND THE ABOVE LOOSE POCKETS SHALL BE REPLACED BY PCC M15. THE ABOVE BEARING CAPACITY SHALL BE VERIFIED BY PLATE LOAD TEST.
- DESIGN OF BRIDGE IS DONE FOR LIVE LOAD COMBINATION OF THREE LANES OF CLASS A OR 1 LANE OF 70R+1 LANE OF CLASS A WHICHEVER PRODUCES SEVERE EFFECT.
- SPECIAL VEHICLE LOAD & CONGESTIONS FACTOR HAS NOT BEEN CONSIDERED IN THE DESIGN OF STRUCTURES.

CLIENT :



Roads & Bridges Department
(Government of Sikkim)

PROJECT :

Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim

DESIGN CONSULTANT :

LEA ASSOCIATES SOUTH ASIA PVT. LTD.
B-1/E-27, Mohan Cooperative Industrial Estate,
Mathura Road, New Delhi-110044

DRAWING TITLE:-

DIMENSION DETAIL DRAWING OF ABUTMENT FOR BRIDGE AT CH. 4+077 Km (FOR A2 SIDE)

DRAWING No : 73806/LASA/E1/STR/BR-03/SUB-684

REV.

R0

SHEET

A2

DRAWN

A. DHAR

DESIGN

DATE

CHECKED

B. SARKAR

REVIEWED

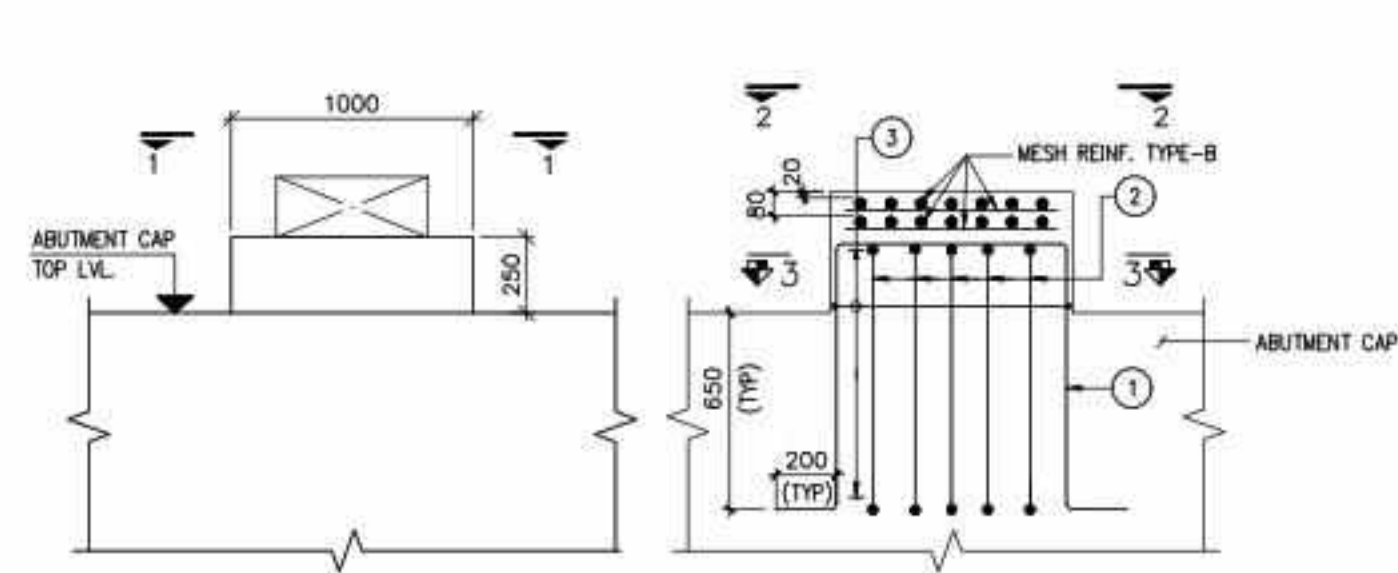
JULY 2022

S. MONDAL

J. K. DAS

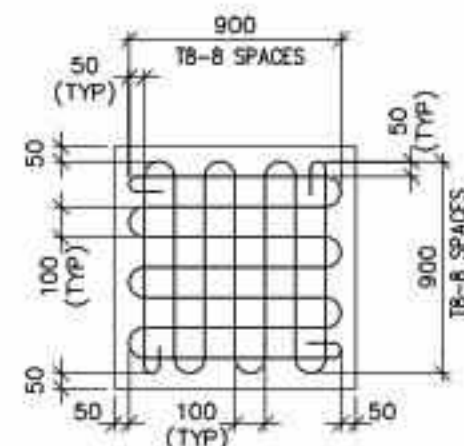
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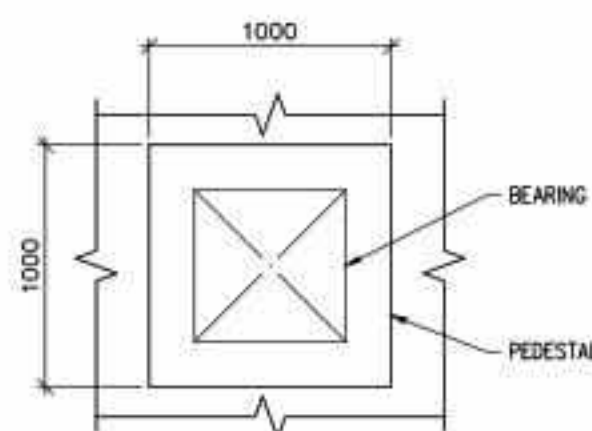


ELEVATION OF PEDESTALS
SCALE 1:20

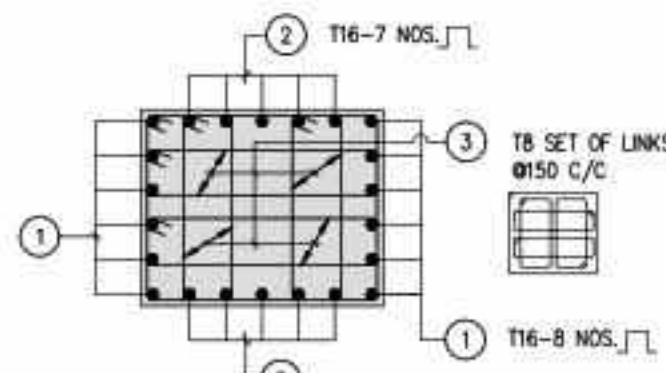
REINF. DETAIL FOR PEDESTALS
SCALE 1:20



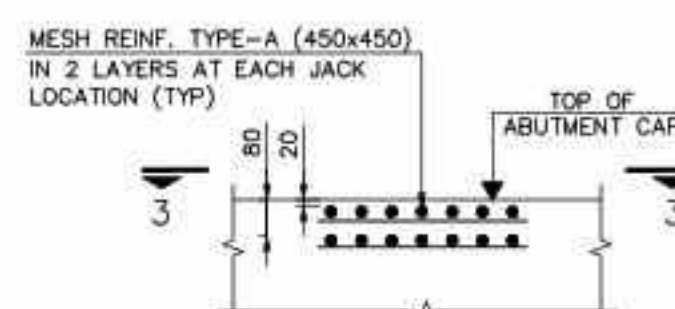
VIEW 2-2
(SHOWING MESH REINF. TYPE-B)
SCALE 1:20



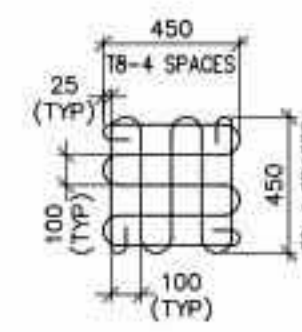
VIEW 1-1
PLAN OF PEDESTALS
SCALE 1:20



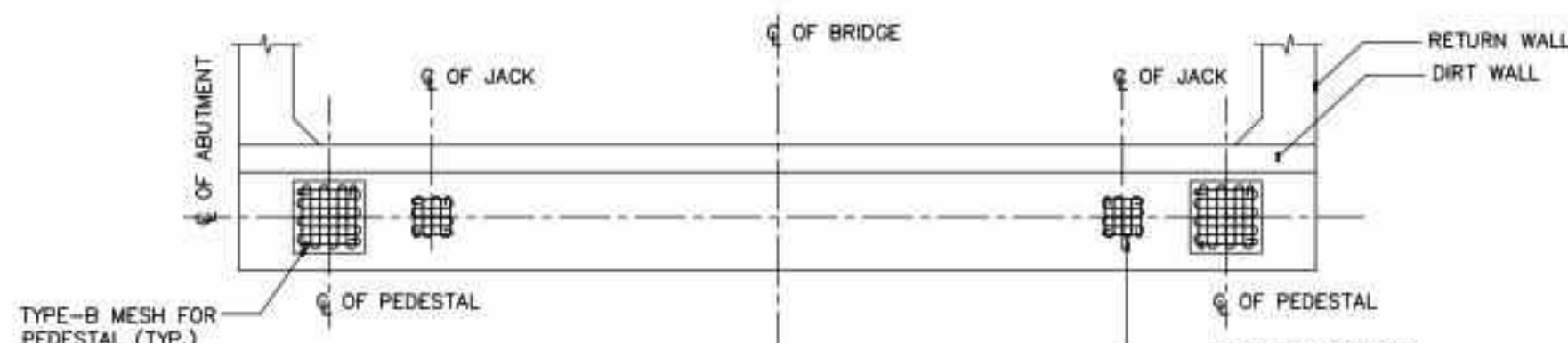
SECTION 3-3
SCALE 1:20



DETAIL OF MESH TYPE-A
(BELOW JACK LOCATION)
SCALE 1:20



VIEW 3-3
(DETAIL OF MESH REINF.)
SCALE 1:20



LAYOUT OF MESH REINFORCEMENT FOR PEDESTAL & JACK LOCATION
(SCALE 1:75)

LEGENDS:-

----- TOP OR NEAR FACE REINFORCEMENT
----- BOTTOM OR FAR FACE REINFORCEMENT
L.V. LENGTH VARIES

REFERENCE DRAWING:

- 73806/LASA/E1/STR/BR-03/GAD-681
- 73806/LASA/E1/STR/BR-03/SUB-684

NOTES:-

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 - ABUTMENT WALL, DIRT WALL & RETURN WALL M30
 - ABUTMENT FOUNDATION M30
 - RCC PEDESTAL M40
 - GRADE OF PCC LEVELING COURSE M15
- CLEAR COVER SHALL BE AS FOLLOWS SHALL BE AS FOLLOWS:-
 - EARTH FACE 45mm
 - NON-EARTH FACE 75mm
- 'T' DENOTES H.Y.S.D. BARS (GRADE DESIGNATION : Fe500) CONFORMING TO IS: 1786 (LATEST).
- MINIMUM ANCHORAGE LENGTH OF REINFORCEMENT SHALL BE 42 x DIA OF BARS, UNLESS NOTED OTHERWISE.
- BARS SHALL BE LAPPED IN SUCH A WAY THAT NOT MORE THAN 50% OF THE BARS ARE LAPPED AT ANY SECTION. LAP LENGTH SHALL BE KEPT AS MINIMUM 50d (d = DIA. OF BAR).

REINFORCEMENT SCHEDULE FOR A2 SIDE ABUTMENT :-

SL. No.	BAR MARK	BAR DIA.	NUMBER/ SPACING	BAR SHAPE	REMARKS
1	f1	32	Ø 150 c/c		
2	f2	32	Ø 150 c/c		
3	f3	16	Ø 150 c/c		
4	f4	16	Ø 150 c/c		
5	f5	12	Ø 200 c/c		
6	f6		NOT IN USE		
7	f7		NOT IN USE		
8	f8	10	Ø 100 c/c		
9	as1	20	Ø 150 c/c		
10	as2	20	Ø 150 c/c		
11	as3	32	Ø 150 c/c		
12	as4	20	Ø 200 c/c		
13	as5	16	Ø 200 c/c		
14	as6	10	Ø 200 c/c		
15	as7	25	Ø 200 c/c		
16	rw1	12	Ø 150 c/c		
17	rw2	25	Ø 150 c/c		
18	rw3	20	Ø 150 c/c		
19	rw4	12	Ø 150 c/c		
20	rw5	20	Ø 200 c/c		
21	rw6	12	Ø 200 c/c		
22	rw7	12	Ø 200 c/c		
23	rw8	12	3 Nos		
24	rw9	12	Ø 200 c/c		
25	dw1	10	Ø 200 c/c		
26	dw2	10	Ø 200 c/c		
27	dw3	16	Ø 180 c/c		
28	dw4	10	Ø 200 c/c		
29	dw5	10	5 Nos		
30	dw6	12	Ø 200 c/c		
31	dw7	2L-10	Ø 200 c/c		3 Layers
32	dw8	10	Ø 200 c/c		
33	dw9	10	4 Nos		
34	c1	12	Ø 200 c/c		
35	c2	12	Ø 200 c/c		

CLIENT :



Roads & Bridges Department
(Government of Sikkim)

PROJECT :

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DESIGN CONSULTANT :



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DRAWING TITLE:-

REINFORCEMENT DETAIL OF ABUTMENT
FOR BRIDGE AT CH. 4+077 Km (FOR A2 SIDE)
(SH. 2 OF 2)

DRAWING No : 73806/LASA/E1/STR/BR-03/SUB-685

REV.

R0

SHEET

A2

DRAWN

DESIGN

DATE

JULY 2022

A. DHAR

B. SARKAR

SCALE :

AS SHOWN

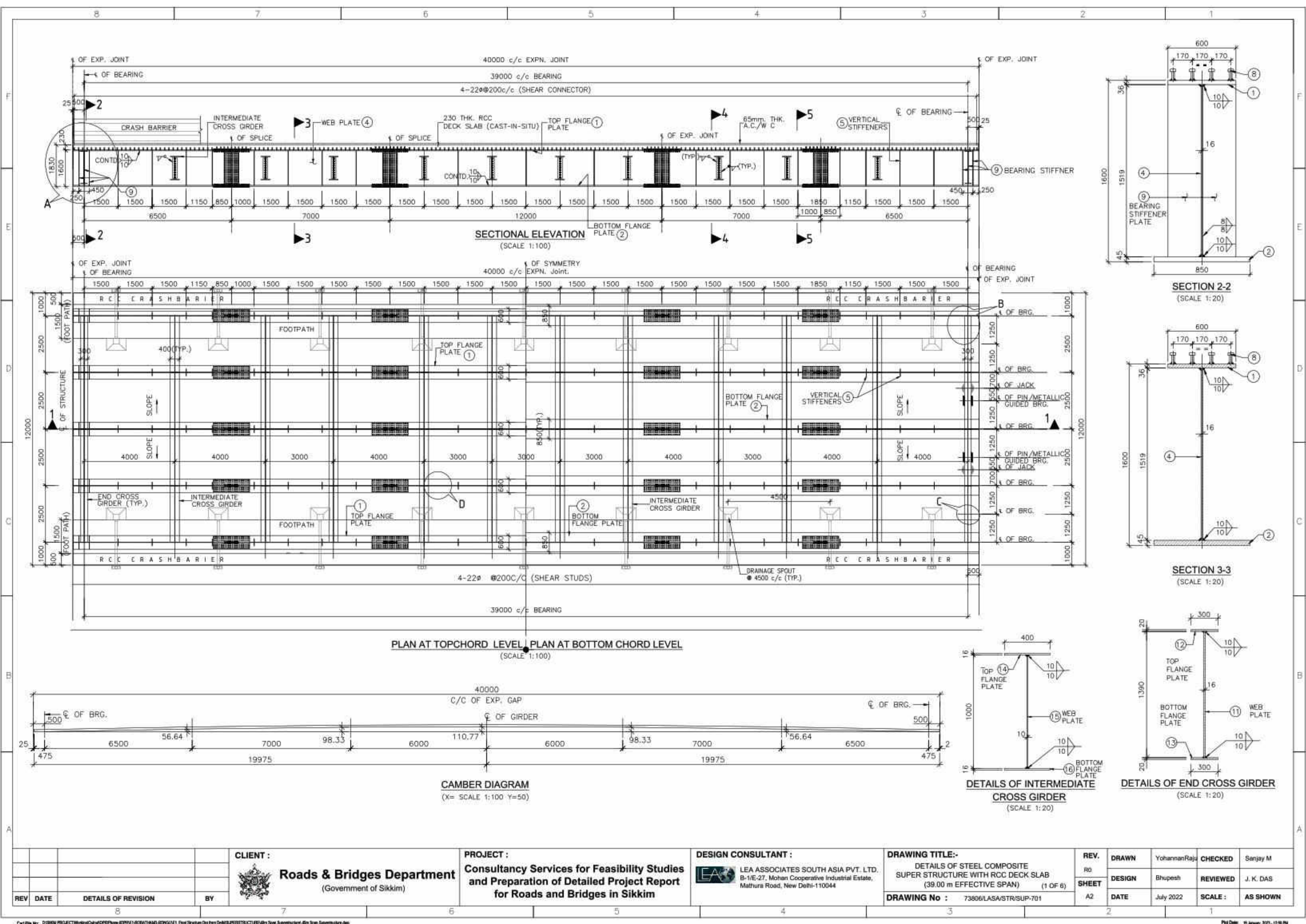
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REVIEWED

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J. K. DAS

S. MONDAL



CLIENT :

Roads & Bridges Department
(Government of Sikkim)

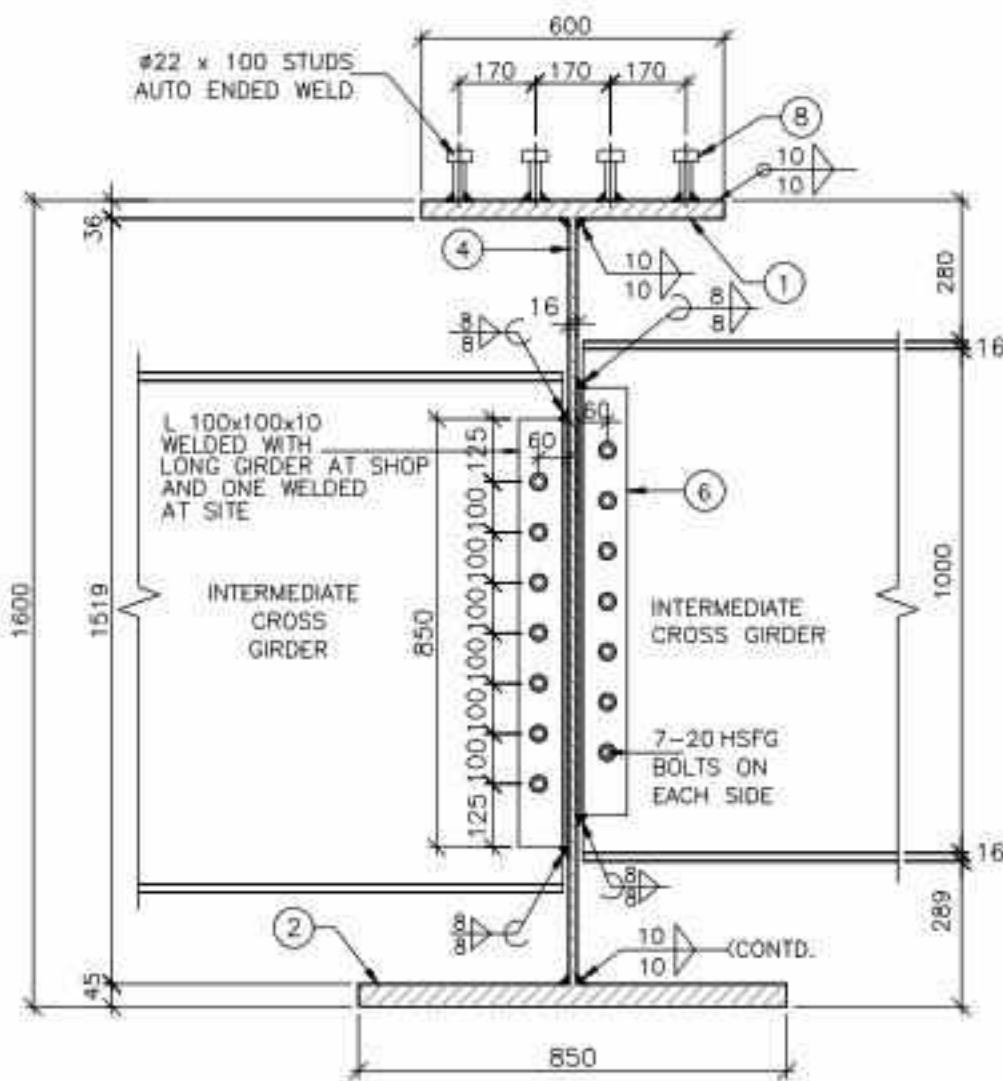
PROJECT :
Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim

DESIGN CONSULTANT :

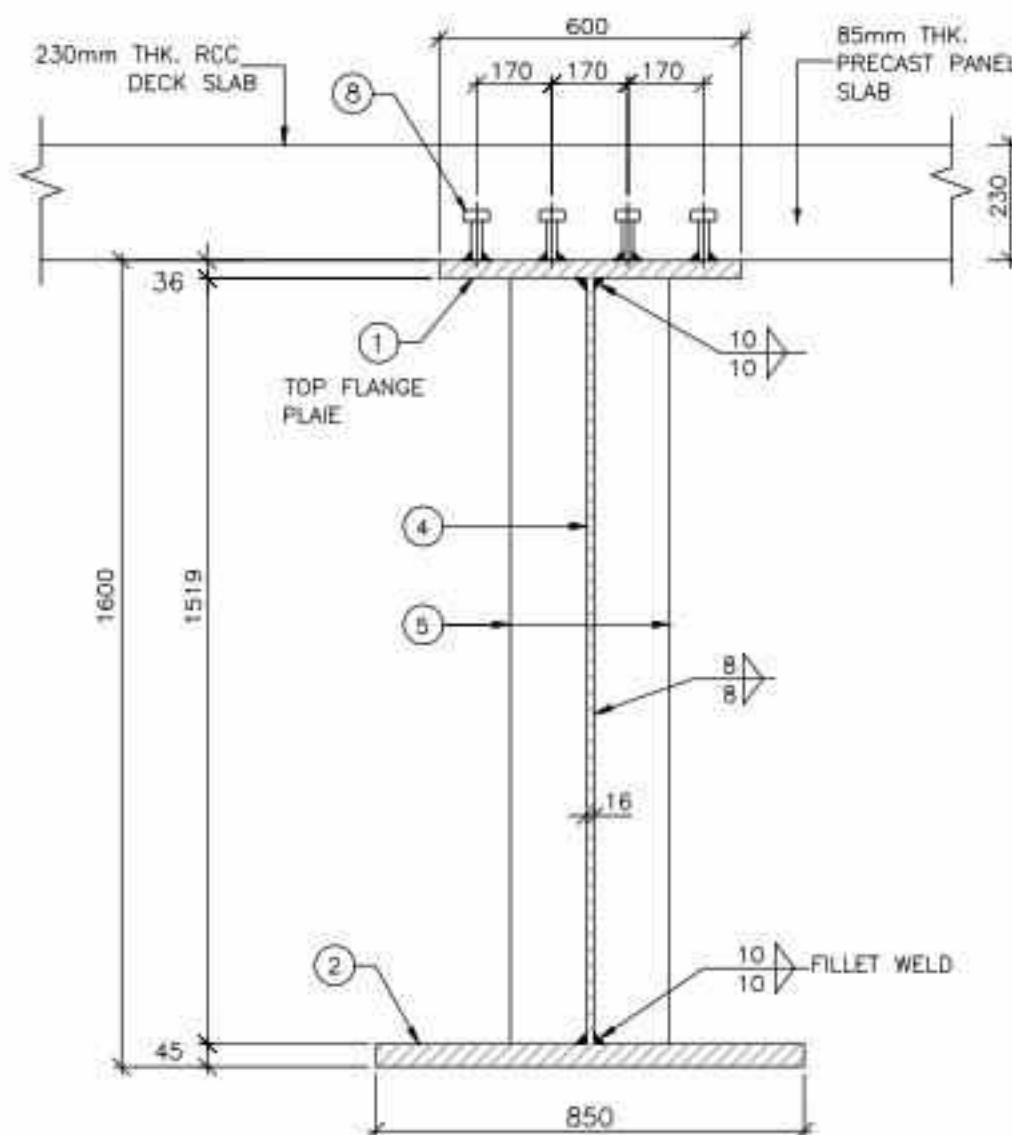
LEA ASSOCIATES SOUTH ASIA PVT. LTD.
B-1/E-27, Mohan Cooperative Industrial Estate,
Mathura Road, New Delhi-110044

DRAWING TITLE:-
DETAILS OF STEEL COMPOSITE
SUPER STRUCTURE WITH RCC DECK SLAB
(39.00 m EFFECTIVE SPAN) (1 OF 6)
DRAWING No : 73806/LASA/STR/SUP-701

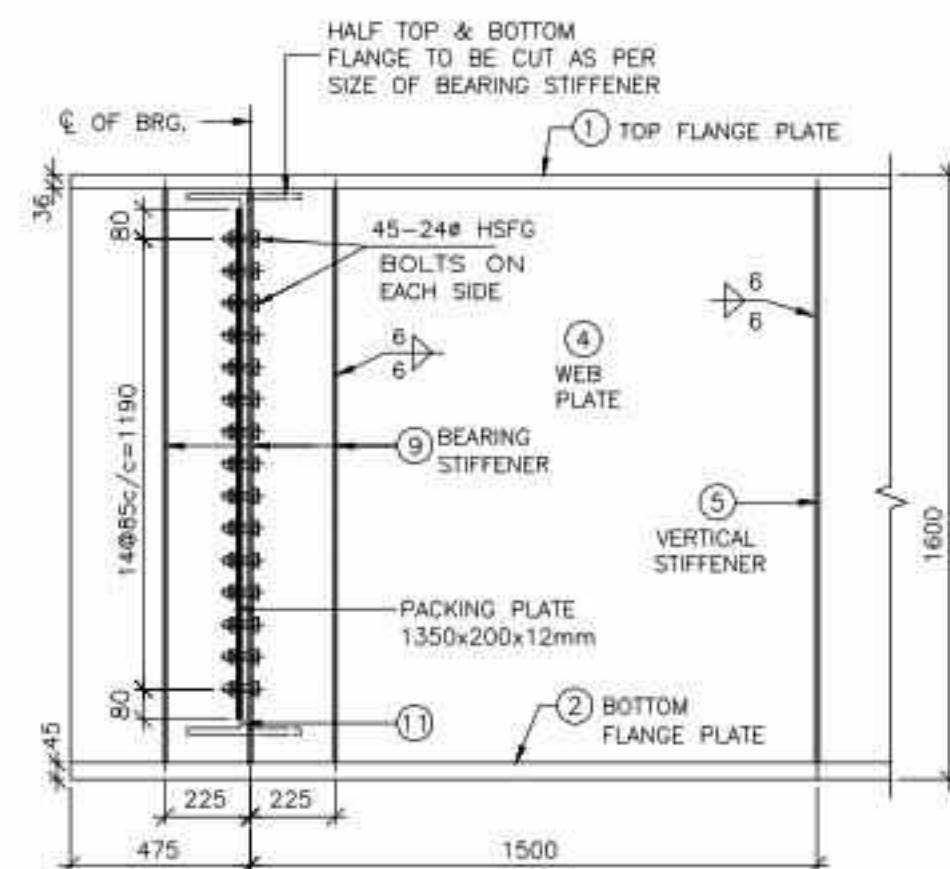
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A2	Bhupesh	J. K. DAS	
	July 2022	SCALE :	AS SHOWN



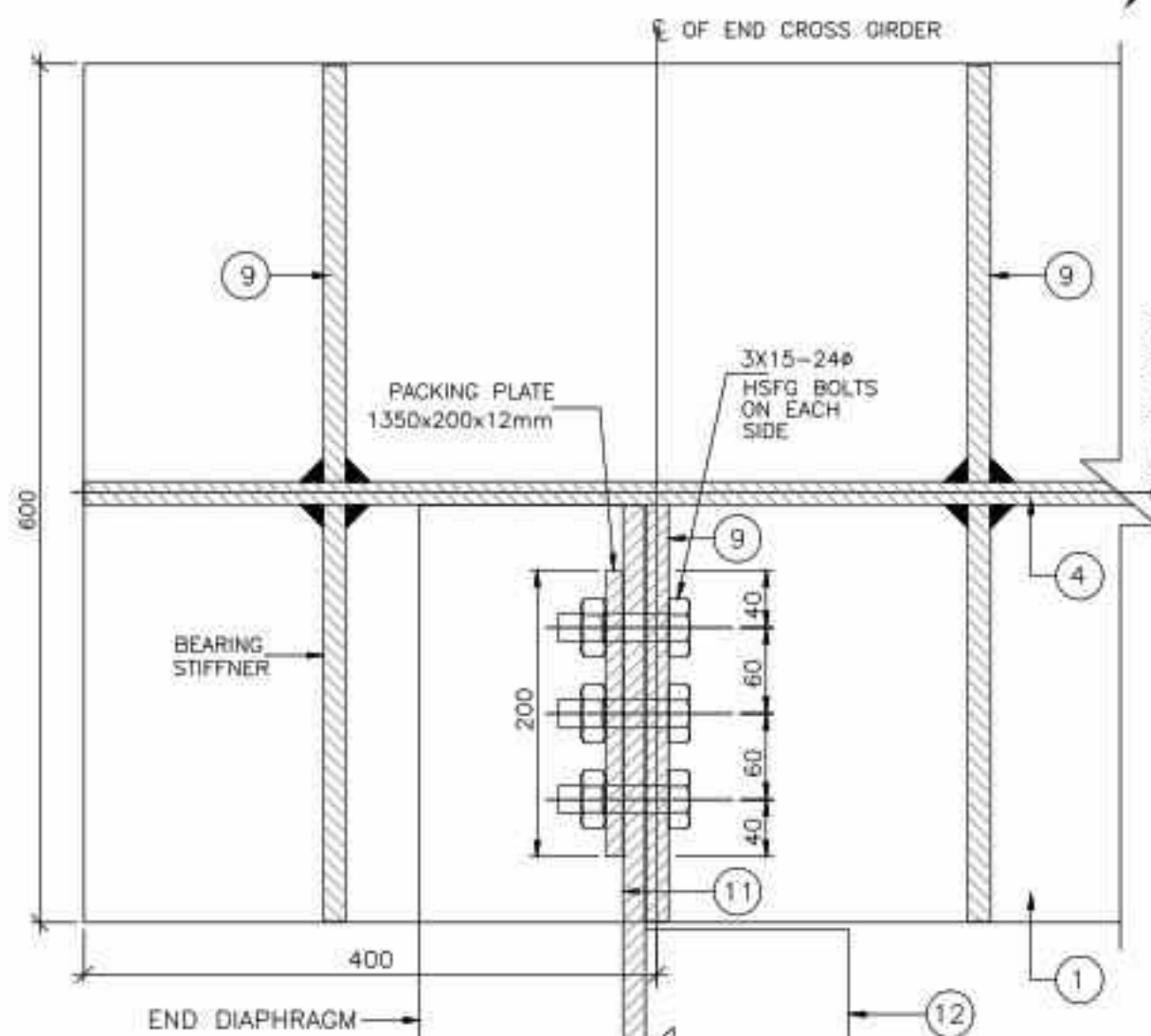
SECTION 4-4
(SCALE 1:15)



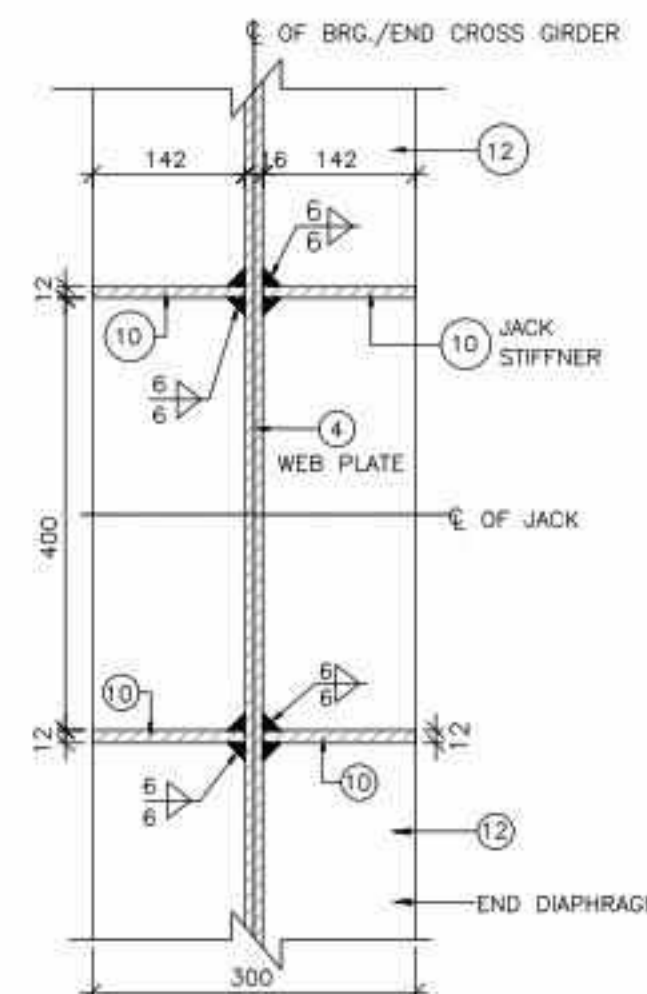
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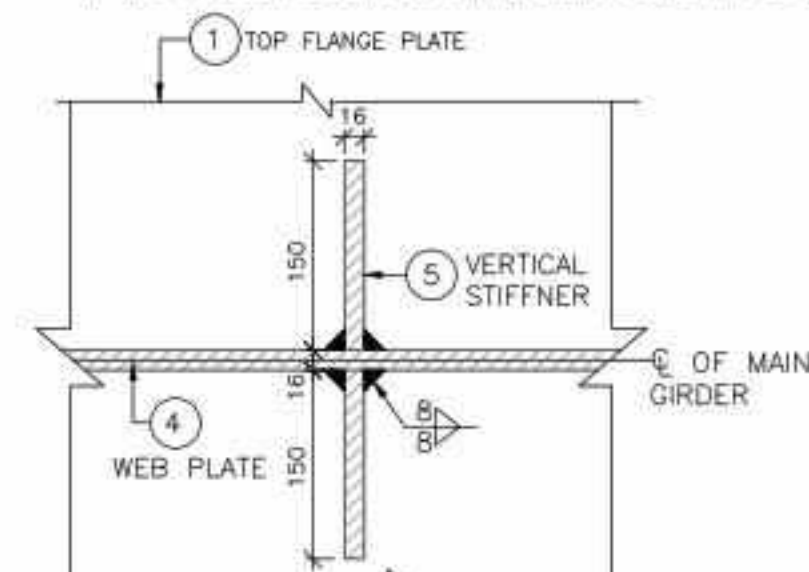
DETAIL-A
(SCALE 1:20)



DETAIL-B
(SHOWING LOAD BEARING
STIFFNER AT BEARING LOCATION)
(SCALE 1:7)



DETAIL-C
(SHOWING LOAD BEARING
STIFFNER AT JACK LOCATION)
(SCALE 1:7)



DETAIL-D
(SHOWING VERTICAL STIFFNER (TYP.))
(SCALE 1:7)

- 1 : TOP FLANGE PLATE (600x36)
 - 2 : BOTTOM FLANGE PLATE (850x45)
 - 3 : NOT IN USE
 - 4 : WEB PLATE (1519x16)
 - 5 : VERTICAL STIFFENER PLATE 150x16x1519
 - 6 : CLEAT ANGLE (ISA 100x100x10)
 - 7 : GUSSET PLATE (12 THK.)
 - 8 : SHEAR STUDS 4-#22x100
 - 9 : BEARING STIFFENER PLATE (260x16) (AT BEARING LOCATION)
 - 10 : BEARING STIFFENER PLATE (142x16) (AT JACK LOCATION)
 - 11 : WEB PLATE FOR END X-GIRDER (1390x20)
 - 12 : TOP FLANGE PLATE FOR END CROSS GIRDER (300x20)
 - 13 : BOTTOM FLANGE PLATE FOR END CROSS GIRDER (300x20)
 - 14 : TOP FLANGE PLATE FOR INT. CROSS GIRDER (400x16)
 - 15 : WEB PLATE FOR INTERMEDIATE CROSS GIRDER (1000x10)
 - 16 : BOTTOM FLANGE PLATE FOR INT. CROSS GIRDER (400x16)
 - 17 : NOT IN USE
 - 18 : OUT SIDE SPLICE PLATE FOR TOP FLANGE (1602x550x32)
 - 19 : INSIDE SPLICE PLATE FOR TOP FLANGE (2X1602X250X32)
 - 20 : OUT SIDE SPLICE PLATE FOR BOTTOM FLANGE (1602x800x32)
 - 21 : IN SIDE SPLICE PLATE FOR BOTTOM FLANGE (2X1602x375x32)
 - 22 : SPLICE PLATE FOR WEB (1355x642x14)
- HSFG BOLTS
FILLET WELD

NOTES :-

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE MENTIONED.
2. THE PROPOSED 3-LANE BRIDGE SHALL BE DESIGNED FOR SINGLE LANE OF IRC CLASS 70R LOADING+ONE LANE OF IRC CLASS A OR 3-LANES OF CLASS A LOADING WHICHEVER GOVERNS.
3. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH OTHER RELEVANT DRAWINGS.
4. ALL STRUCTURAL STEEL ROLLED SECTION & PLATES SHALL BE OF Fe490 (E350 GRADE) CONFORMING TO IS: 2062-2011.
5. MINIMUM THICKNESS OF FILLET WELD SHALL BE 8mm FOR CONNECTION BETWEEN MAIN PLATES AND 6mm FOR OTHER CONNECTIONS UNLESS OTHERWISE SPECIFIED.
6. ALL WELDING SHALL CONFORM TO IS:816-1989 AND IS:1323-1982.
7. MATERIAL & FABRICATION FOR ALL HIGH STRENGTH FRICTION GRIP BOLTS, NUTS & WASHERS SHALL CONFORM TO IS:4000-1992, IS:3757-1985,IS:6623-1985 & IS:6649-1985.
8. SURFACE PREPARATION FOR CONNECTIONS USING HSFG BOLT MUST CONFORM TO IS 4000:1992 TO ATTAIN A SLIP FACTOR OF 0.35.
9. ALL HSFG BOLTS, NUTS AND WASHERS ARE OF PROPERTY CLASS 8.8 HOT DIP GALVANIZED CONFORMING TO IS:3757-1985.
10. MINIMUM BOLT TENSION FOR M24 HSFG BOLT OF PROPERTY CLASS 8.8 MUST BE 212 KN CONFORMING TO IS:4000-1992.
11. ERECTION BOLTS AND NUTS SHALL CONFORM TO IS:1363-1967 AND IS:1367-1967.
12. FABRICATION AND ERECTION OF STRUCTURAL STEEL WORKS SHALL CONFORM TO IRC:24-2010 (SECTION-V), IS:7205-1974 AND IS: 7215-1974.
13. DIAMETER OF HOLES FOR HIGH STRENGTH FRICTION GRIP BOLTS SHALL BE 2mm LARGER THAN NOMINAL DIA OF BOLTS. FOR ERECTION BOLTS HOLE DIAMETER SHALL BE 1.5mm LARGER THAN NOMINAL BOLT DIAMETER UP TO 25mm BOLT DIAMETER AND 2.0mm LARGER FOR BOLT HAVING DIAMETER MORE THAN 25mm.
14. ALL HOLES FOR HSFG BOLTS AND ERECTION BOLTS SHALL BE DRILLED.
15. ALL HOLES NECESSARY FOR ERECTION BOLTS SHALL BE PLUGGED FULLY AFTER SUCCESSFUL COMPLETION OF ERECTION WORK.
16. CUTTING LENGTH OF ALL DIAGONAL MEMBER AND SIZE OF GUSSET PLATES TO BE FINALIZED BY FULL SCALE SHOP LAYOUT.
17. FABRICATION DRAWING SHOULD BE PREPARED & GOT APPROVED FROM ENGINEER-IN-CHARGE BEFORE CONSTRUCTION.
18. ALL DIMENSIONS TO BE CONFIRMED AT SITE BEFORE CUTTING OF MEMBERS.
19. GRADE OF CONCRETE FOR DECK SLAB SHALL BE M-30.
20. FLEXIBLE SHEAR CONNECTORS IN THE FORM OF STUDS SHALL HAVE A CHARACTERISTIC YIELD STRENGTH OF 385MPa, MINIMUM ELONGATION OF 18% AND A CHARACTERISTIC TENSILE STRENGTH OF 495MPa CONFORMING TO Cl. 606.4.1.1 OF IRC: 22-2008.
21. SPECIAL PRECAUTIONS SHALL BE TAKEN TO ENSURE SOUNDNESS OF WELDS IN THE BUILTUP GIRDERS HAVING THICK PLATES.
22. THE WELDS ARE TO BE CONTINUOUS UNLESS SHOWN OTHERWISE.
23. MINIMUM THICKNESS OF GUSSET PLATES WILL BE 12mm UNLESS OTHERWISE SPECIFIED.
24. ALL STIFFENER PLATES WILL BE MILLED TO BEAR PERFECTLY UNDER TOP AND BOTTOM FLANGES OF GIRDERS.
25. THE CORNERS OF THE STIFFENERS SHOULD BE NOTCHED TO PREVENT CONCENTRATION OF LONGITUDINAL AND TRANSVERSE WELDS.
26. (i) FOR LIFTING OF THE SUPERSTRUCTURE 4Nos. FREYSSINET FLAT JACKS OF CAPACITY 160 kN EACH WILL BE USED.
(ii) THE LOCATION OF JACKS FOR LIFTING UP THE SUPERSTRUCTURE TO REPLACE BEARING ETC. IS SHOWN THUS. THESE SHOULD BE DISTINCTLY ETCHED ON THE END CROSS GIRDER AND ABUTMENT CAPS.
27. WHEN SPAN IS LIFTED ON JACKS LIVE LOAD WILL NOT BE ALLOWED OVER THE BRIDGE.

NOTES FOR PAINTING :-

1. SURFACE PREPARATION BY SAND BLASTING EXCEPT AT CONNECTIONS USING HSFG BOLTS WHERE SURFACE HAS TO BE PREPARED SEPARATELY (SEE NOTE 6 OF GENERAL NOTES OF THIS DRAWING).
2. TWO COATS OF ZINC CHROMATE RED OXIDE PRIMER CONFORM TO IS : 2074.
3. TWO FINISHING COATS OF ALUMINIUM PAINT CONFORM TO IS : 2339 OVER PRIMER COATS.
4. ALL PROTECTIVE SURFACE COATING SHALL CONFORM TO IRC : 24-2001.

CLIENT :



Roads & Bridges Department
(Government of Sikkim)

PROJECT :

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DESIGN CONSULTANT :



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DRAWING TITLE:-

DETAILS OF STEEL COMPOSITE
SUPER STRUCTURE WITH RCC DECK SLAB
(39.00 m EFFECTIVE SPAN) (2 OF 6)

DRAWING No : 73806/LASA/STR/SUP-701

REV.

R0

SHEET

A2

DRAWN

DESIGN

DATE

July 2022

CHECKED

REVIEWED

SCALE :

AS SHOWN

YohannanRaju

Bhupesh

J. K. DAS

Sanjay M

TOP PLAN OF SPLICE PLATE (18)
SPLICING DETAIL OF TOP FLANGE PLATE
(WITH OUTSIDE SPLICE PLATE)

TOP PLAN OF SPLICE PLATE 20
 SPlicing DETAIL OF TOP FLANGE PLATE
 (WITH OUTSIDE SPLICE PLATE)
 (SCALE 1:15)

SPLICING DETAILS OF WEB PLATE
(SCALE 1:15)



SECTION 8-8
(SCALE 1:15)

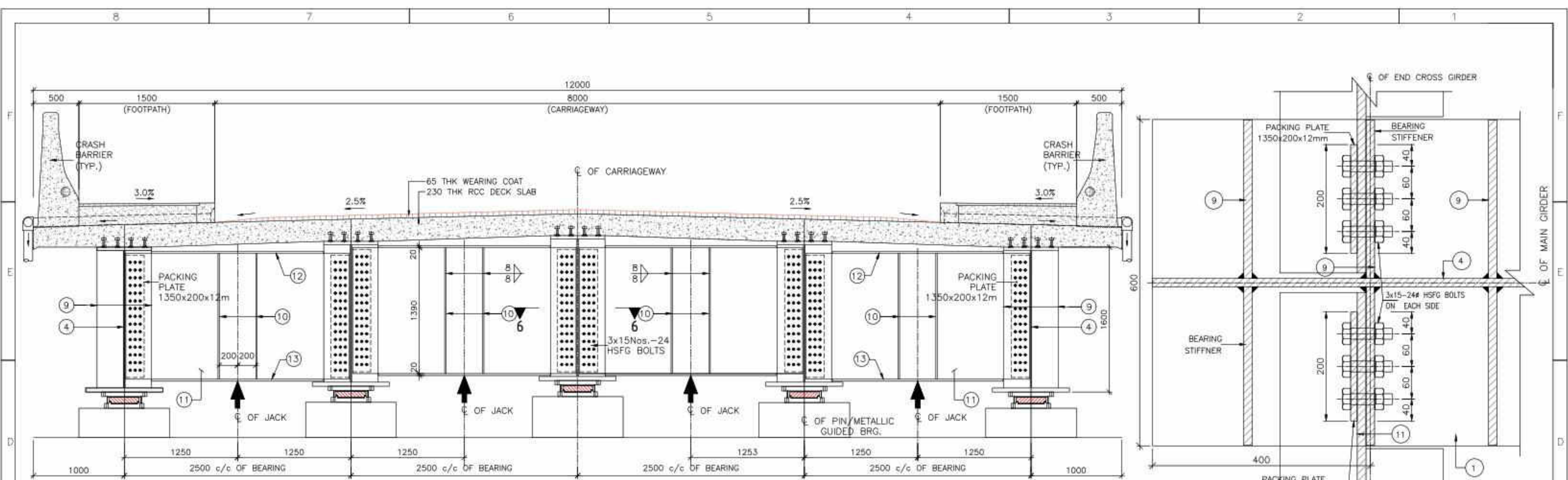
TOP PLAN OF SPLICE PLATE (21)
SPLICING DETAIL OF TOP FLANGE PLATE
(WITH OUTSIDE SPLICE PLATE)
(SCALE 1:15)

TOP PLAN OF SPLICE PLATE (20)
SPLICING DETAIL OF TOP FLANGE PLATE
(WITH OUTSIDE SPLICE PLATE)
 (SCALE 1 :15)

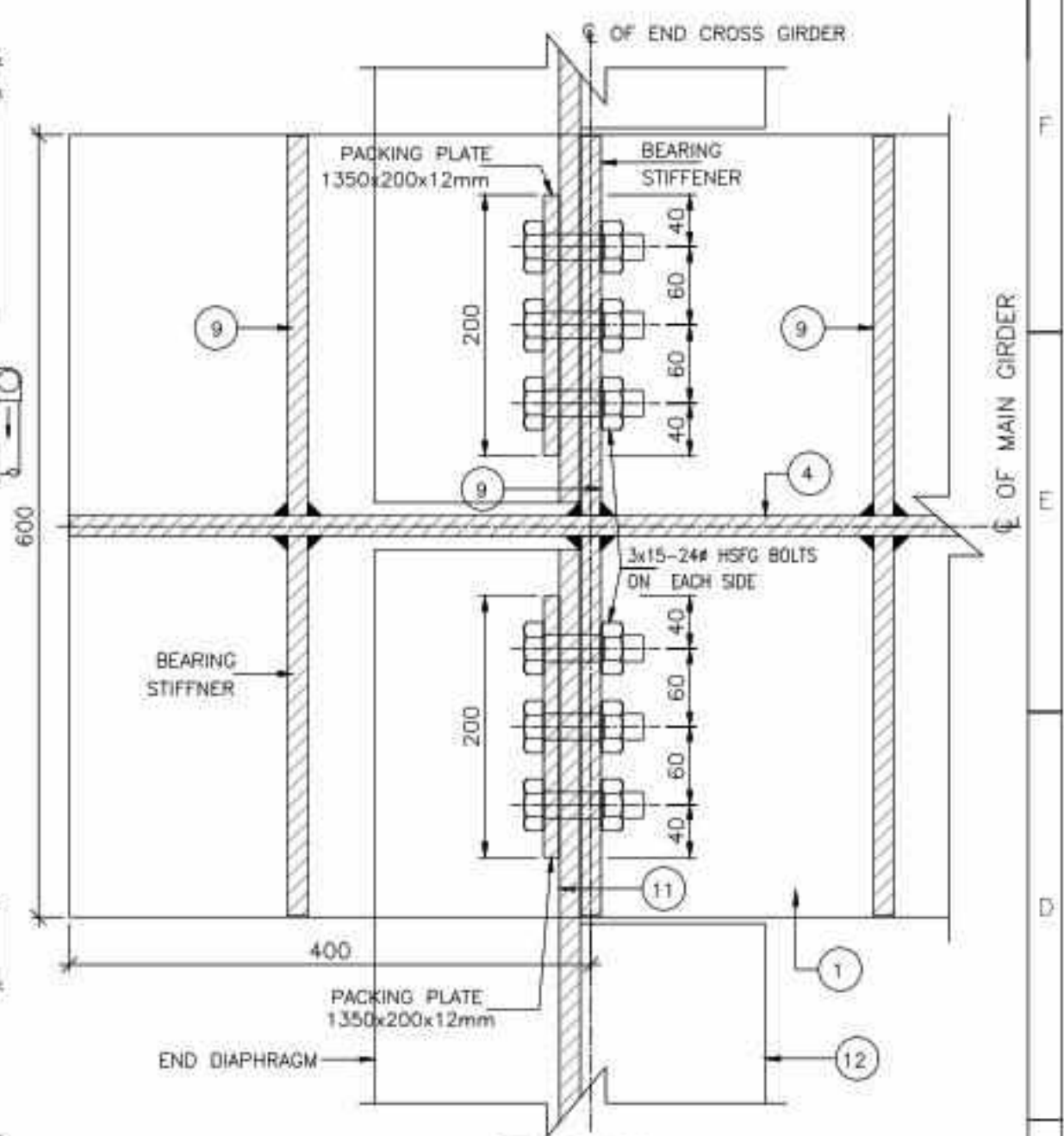
DETAIL-6
(SCALE 1:10)

TOP PLAN OF SPLICE PLATE (19)
 SPlicing DETAIL OF TOP FLANGE PLATE
 (WITH OUTSIDE SPLICE PLATE)
 (SCALE 1:15)

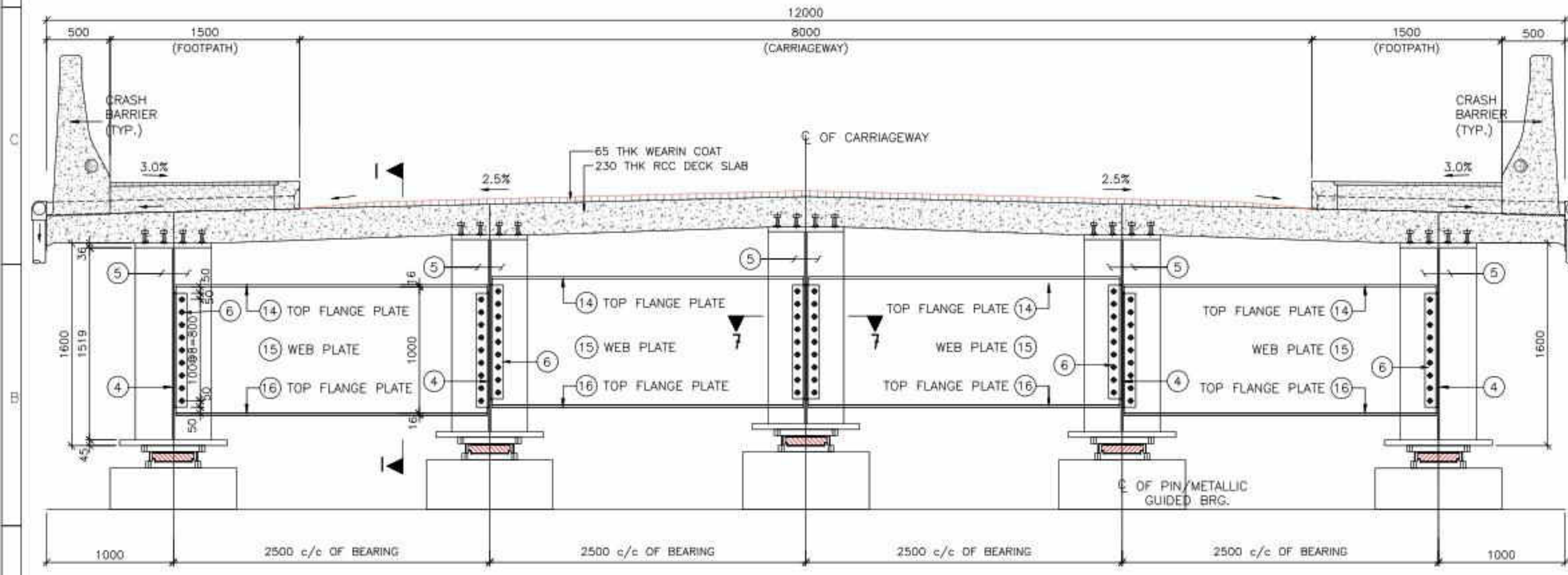
				 CLIENT : Roads & Bridges Department (Government of Sikkim)	PROJECT : Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim	 DESIGN CONSULTANT : LEA ASSOCIATES SOUTH ASIA PVT. LTD. B-1/E-27, Mohan Cooperative Industrial Estate, Mathura Road, New Delhi-110044	DRAWING TITLE:- DETAILS OF STEEL COMPOSITE SUPER STRUCTURE WITH RCC DECK SLAB (39.00 m EFFECTIVE SPAN) (3 OF 6) DRAWING No : 73806/LASA/STR/SUP-701	REV.	DRAWN	YohannanRaju	CHECKED	Sanjay M
								R0	DESIGN	Bhupesh	REVIEWED	J. K. DAS
REV	DATE	DETAILS OF REVISION	BY					SHEET	DATE	July 2022	SCALE :	AS SHOWN



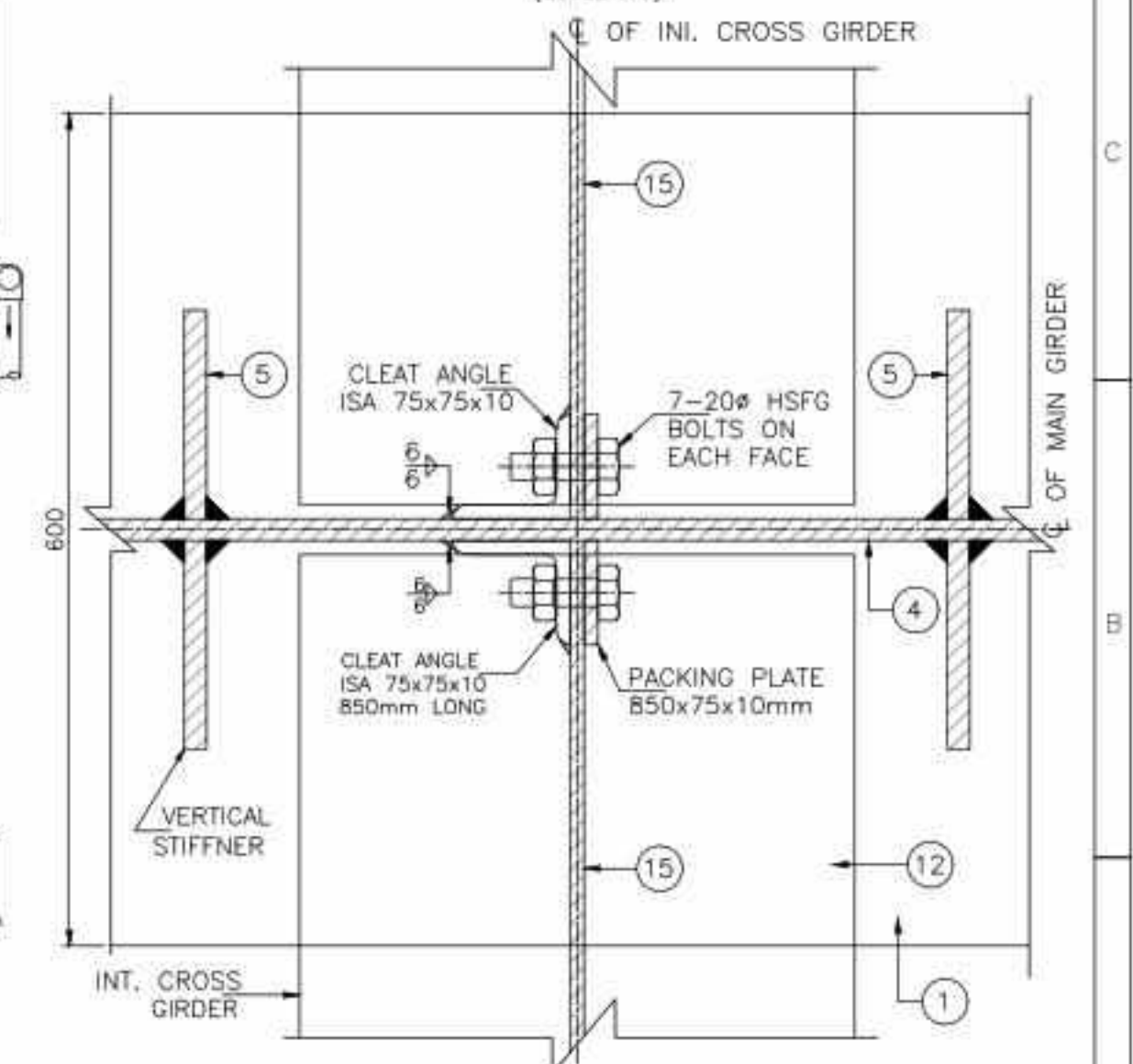
SECTIONAL ELEVATION SHOWING DETAILS OF END CROSS GIRDER
(SCALE 1:30)





SECTION 6-6
(SCALE 1:5)

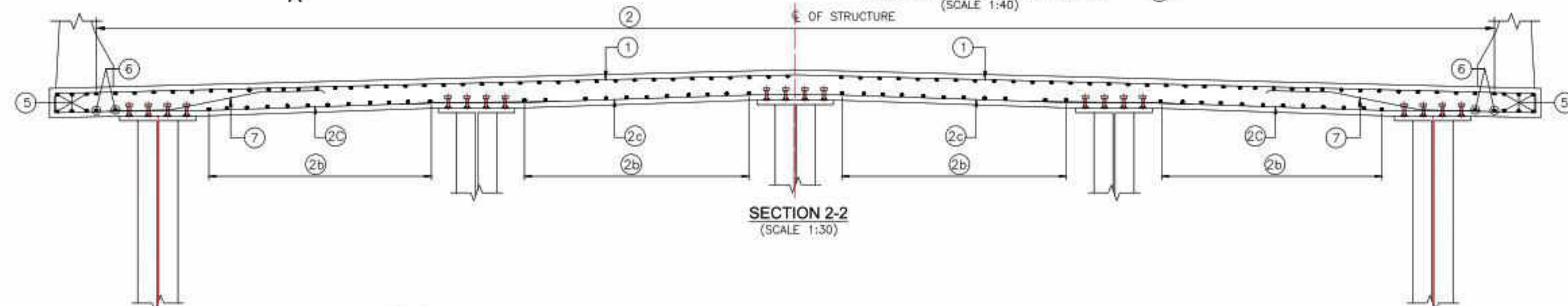
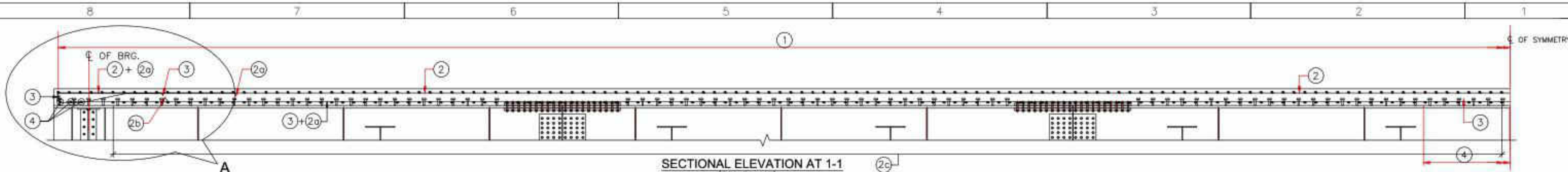


SECTIONAL ELEVATION SHOWING DETAILS OF END CROSS GIRDER
(SCALE 1:30)



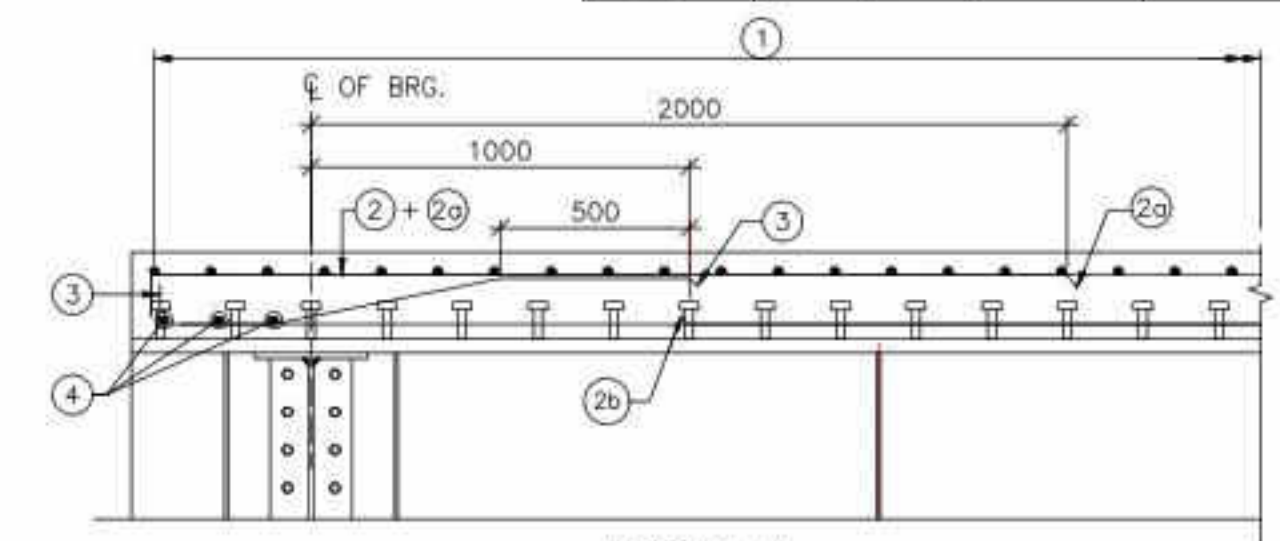
SECTION 7-7
(SCALE 1:5)

CLIENT :  Roads & Bridges Department (Government of Sikkim)			PROJECT : Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim			DESIGN CONSULTANT :  LEA ASSOCIATES SOUTH ASIA PVT. LTD. B-1/E-27, Mohan Cooperative Industrial Estate, Mathura Road, New Delhi-110044			DRAWING TITLE:- DETAILS OF STEEL COMPOSITE SUPER STRUCTURE WITH RCC DECK SLAB (39.00 m EFFECTIVE SPAN) (4 OF 8)			REV. R0 SHEET A2		DRAWN YohannanRaju	CHECKED Sanjay M
REV 8			DATE 7			DETAILS OF REVISION 6			DRAWING No : 73806/LASA/STR/SUP-701			DESIGN Bhupesh	REVIEWED J. K. DAS	DATE July 2022	SCALE : AS SHOWN



REINF. SCHEDULE

MARK	DESCRIPTION	SHAPE
1	16 # @200c/c	
2	10 # @200c/c	
2a	16 # @100c/c	
2b	10 # @200 C/C	
2c	16 # @100c/c	
3	12 # @200c/c	
4	10 # @200c/c	
5	16 # 6 Nos.	
5a	16 # 4 Nos.	
5b	16 # 8 Nos.	
6	10 # 2 Nos.	
7	12 # @200c/c	



DETAIL-A
(SCALE 1:20)

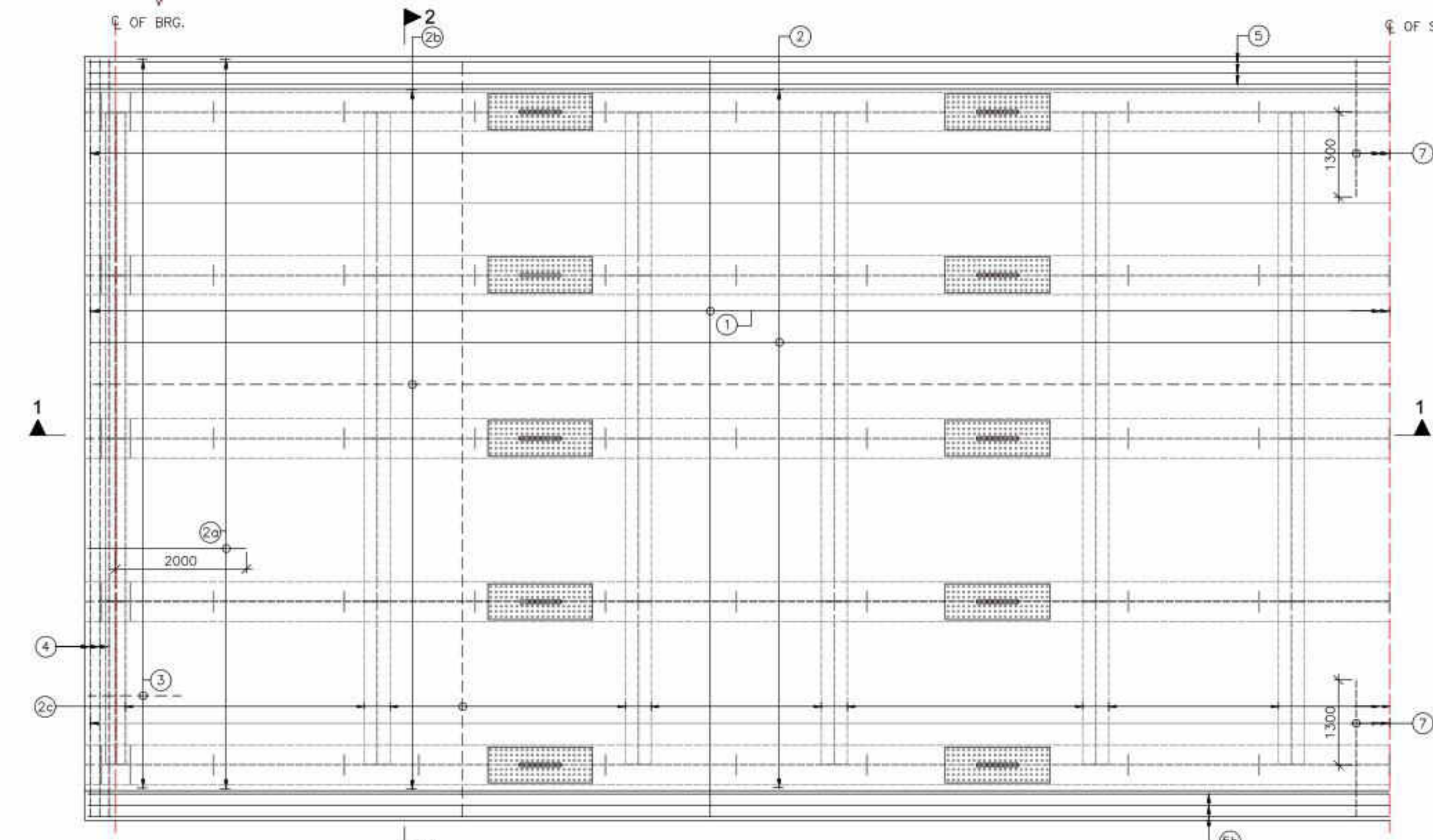
NOTES:-

- ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NO DIMENSIONS SHALL BE SCALED.
- CONCRETE SHALL BE DESIGN MIX WITH A MINIMUM 28 DAYS CHARACTERISTIC STRENGTH OF 30 MPa.
- THE REINFORCING BARS SHALL BE OF THERMO MECHANICALLY TREATED (TMT) HYSD BARS (GRADE DESIGNATION Fe-500), CONFORMING TO IS:1786-2008 STANDARD.
- CLEAR COVER TO OUTERMOST STEEL IS 40mm.
- THE REINFORCEMENT OF CRASH BARRIER SHALL BE INCORPORATED BEFORE CASTING THE DECK SLAB.

LEGEND:-

TOP REINFORCEMENT

BOTTOM REINFORCEMENT



PLAN SHOWING CAST-IN-SITU SLAB REINFORCEMENT
(SCALE 1:60)

CLIENT :

Roads & Bridges Department
(Government of Sikkim)

PROJECT :
Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim

DESIGN CONSULTANT :

LEA ASSOCIATES SOUTH ASIA PVT. LTD.
B-1/E-27, Mohan Cooperative Industrial Estate,
Mathura Road, New Delhi-110044

DRAWING TITLE:-
DETAILS OF STEEL COMPOSITE
SUPER STRUCTURE WITH RCC DECK SLAB
(39.00 m EFFECTIVE SPAN) (5 OF 6)

REV.	DRAWN	CHECKED
R0	YohannanRaju	Sanjay M
SHEET	DESIGN	REVIEWED
A2	Bhupesh	J. K. DAS
DATE	SCALE	AS SHOWN
July 2022	1	

REV	DATE	DETAILS OF REVISION	BY



(SCALE 1:200)



(SCALE 1:150)



(SCALE 1:50)



(SCALE 1:50)



(SCALE 1:15)





(SCALE 1:15)

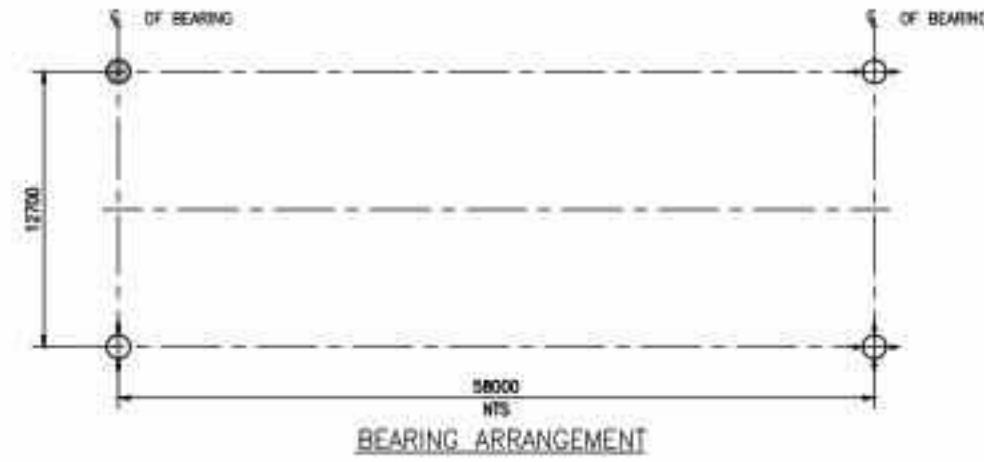


(SCALE 1:15)

TOP BARS SHOWN THUS
BOTTOM BARS SHOWN THUS

1. ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS ARE IN METRES UNLESS OTHERWISE SPECIFIED.
2. ONLY WRITTEN DIMENSIONS TO BE FOLLOWED. NO DIMENSION SHOULD BE SCALED.
3. GRADE OF CONCRETE FOR VARIOUS COMPONENTS SHALL BE AS FOLLOWS:-
 - a) RCC DECK SLAB ----- M30
 - b) RCC CRASH BARRIER ----- M30
4. STEEL REINFORCEMENT SHALL CONFORM TO IS:1786 (GRADE DESIGNATION Fe-500D)
5. MINIMUM CLEAR COVER FOR ANY REINFORCEMENT SHALL BE 40mm.
6. LAP AND ANCHORAGE LENGTH FOR REINFORCEMENT SHALL BE AS PER IRC 112-2019, NOT MORE THAN 50% REINFORCEMENT SHALL BE LAPPED AT ANY SECTION.
7. HIGH STRENGTH ORDINARY PORTLAND CEMENT CONFORMING TO IS : 12269 AND IS : 8112 OR ORDINARY PORTLAND CEMENT CONFORMING TO IS:269 CAPABLE OF ACHIEVING THE REQUIRED DESIGN STRENGTH SHALL ONLY BE USED.
8. STRIP SEAL TYPE EXPANSION JOINTS OF PROVEN QUALITY SHALL BE PROVIDED.
9. 65mm THK. WEARING COURSE COMPRISING OF 40MM BITUMINOUS CONCRETE OVERLAD WITH 25MM THICK BITUMEN MASTIC LAYER SHALL BE PROVIDED IN CONFORMITY WITH SECTION 500 OF MORTH SPECIFICATIONS.
10. ALL MATERIAL SHALL PASS TESTS / ANALYSIS PRESCRIBED BY RELEVANT BIS SPECIFICATIONS.

						<div></div> <div>CLIENT : Roads & Bridges Department (Government of Sikkim)</div>	<div>PROJECT : Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim</div>	<div></div> <div>DESIGN CONSULTANT : LEA ASSOCIATES SOUTH ASIA PVT. LTD. B-1/E-27, Mohan Cooperative Industrial Estate, Mathura Road, New Delhi-110044</div>	<div>DRAWING TITLE:- DECK SLAB DETAILS (3 OF 4)</div> <div>DRAWING No : 73806/LASA/STR/SUP-711</div>	REV.	DRAWN	S. PATHAK	CHECKED	BHUPESH
R0	DESIGN	BHUPESH	REVIEWED	S. MANDAL										
SHEET	DATE	JULY 2022	SCALE :	AS SHOWN										
A2														
REV	DATE	DETAILS OF REVISION			BY									



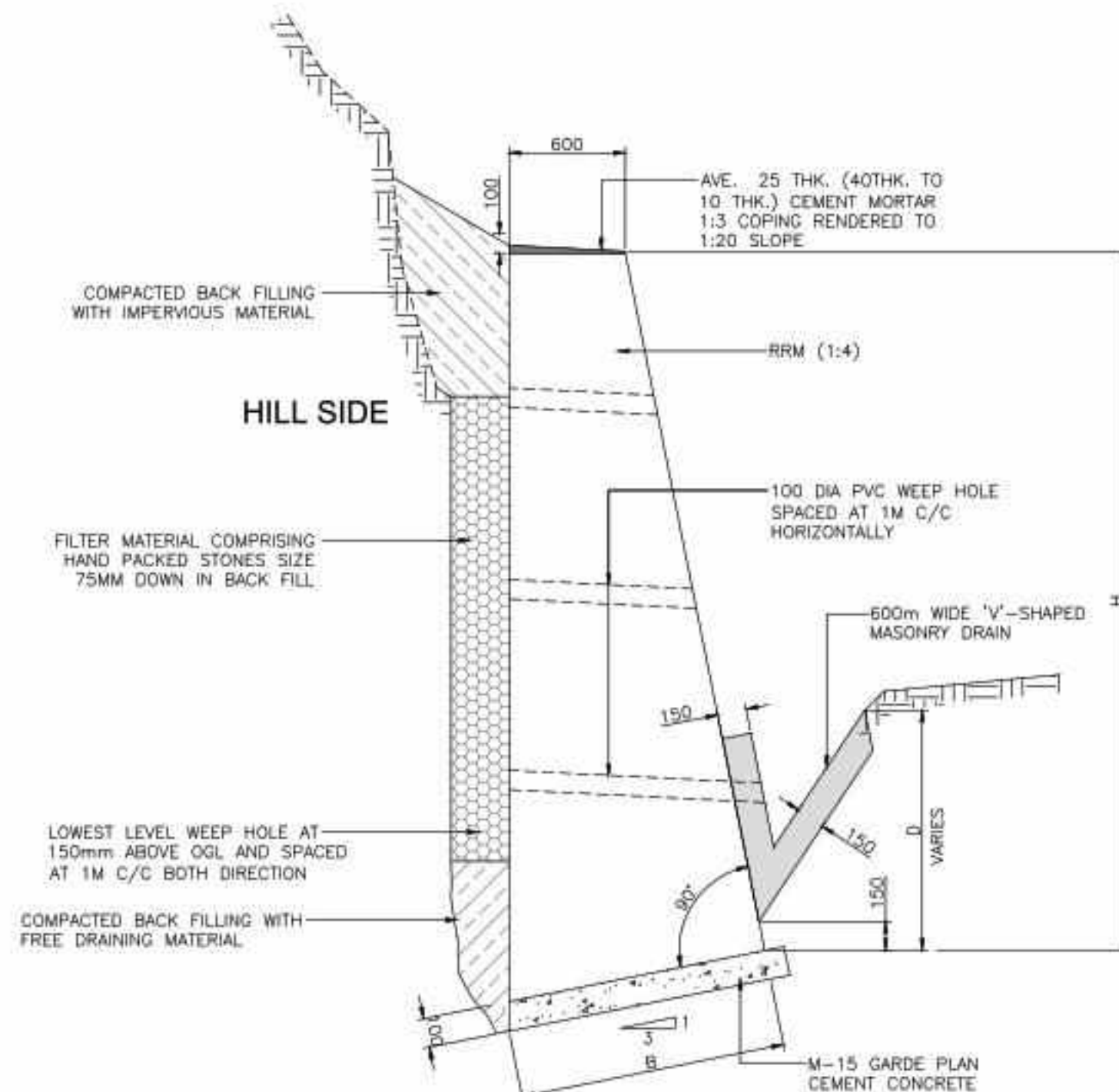
Spherical Bearing Type & Load Details				Fixed	Guided Sliding Assembly (Trans Free)	Guided Sliding Assembly (Long Free)	Free Sliding
BEARING IDENTIFICATION MARK/NUMBER				A	B	C	D
TOTAL QTY. REQUIRED FOR 65.5m STEEL TRUSS BRIDGE				1	1	1	1
SEATING MATERIAL	UPPER SURFACE			STEEL	STEEL	STEEL	STEEL
	LOWER SURFACE			CONCRETE	CONCRETE	CONCRETE	CONCRETE
ALLOWABLE CONTACT PRESSURE (Mpa)	UPPER SURFACE	SERVICABILITY		E250 (B0)	E250 (B0)	E250 (B0)	E250 (B0)
	LOWER SURFACE	SERVICABILITY		M30	M30	M30	M30
DESIGN LOAD (KN)	SERVICABILITY LIMIT STATE	VERTICAL (KN)	MAX.	3836	3917	3838	3847
			PERMANENT	2354	2354	2354	2354
			MIN.	1926	1926	1926	1926
		LONGITUDINAL		397	397	211	212
		TRANSVERSE		1220	215	1220	212
	ULTIMATE LIMIT STATE	VERTICAL	MAX.	5517	5664	5520	5557
			MIN.	2279	2194	2298	2213
		LONGITUDINAL	MAX.	5348	5348	304	306
			MIN.	0	0	248	250
		TRANSVERSE	MAX.	5499	312	5499	306
			MIN.	0	255	0	250
TRANSLATION (mm)	SERVICABILITY LIMIT STATE	IRREVERSIBLE	LONGITUDINAL	-	-	-63	-63
			TRANSVERSE	-	-29	-	-29
		REVERSIBLE	LONGITUDINAL	-	-	63	63
			TRANSVERSE	-	28	-	28
	ULTIMATE LIMIT STATE	IRREVERSIBLE	LONGITUDINAL	-	-	-85	-85
			TRANSVERSE	-	-34	-	-34
		REVERSIBLE	LONGITUDINAL	-	-	85	85
			TRANSVERSE	-	32	-	32
ROTATION (Rad)	SERVICABILITY LIMIT STATE	IRREVERSIBLE	LONGITUDINAL	0.01	0.01	0.01	0.01
			TRANSVERSE	0.01	0.01	0.01	0.01
		REVERSIBLE	LONGITUDINAL	0.01	0.01	0.01	0.01
			TRANSVERSE	0.01	0.01	0.01	0.01
TYPE OF FIXING REQD. (E.g. DOWELS /STUDS /DISTRIBUTION PLATE)		UPPER SURFACE		STUDS	STUDS	STUDS	STUDS
		LOWER SURFACE		STUDS	STUDS	STUDS	STUDS

NOTES:

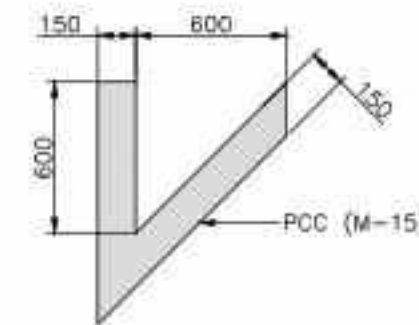
- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS SPECIFIED OTHERWISE.
- DIMENSIONS ARE NOT TO BE SCALED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
- THE CONTRACTOR SHALL SUBMIT DESIGN/DRAWING OF INDIVIDUAL BEARINGS BASED ON FORCES, TRANSLATION & ROTATIONS AS GIVEN IN THIS DRAWING.
- BEARING SHALL BE PROCURED FROM THE LIST OF APPROVED MANUFACTURERS.
- BEARING SHALL CONFORM TO LATEST MORTH'S SPECIFICATIONS AND TENDER STIPULATION IF ANY AND IRC:83-PART IV (2014).
- THE TESTING OF RAW MATERIALS, METALLIC COMPONENTS, ELASTOMER & PTFE AND ACCEPTANCE TESTS ON BEARINGS SHALL CONFORM TO MORTH'S SPECIFICATIONS/TENDER SPECIFICATIONS.
- MANUFACTURER SHALL SUBMIT THE CERTIFICATES FOR LOAD TESTING AND DIMENSIONS OF BEARINGS.
- SUITABLE ERECTION CLAMPS FOR SAFE TRANSPORTATION & HANDLING ALONG WITH TEMPLATE FOR ALIGNMENT SHALL BE PROVIDED BY THE MANUFACTURER.
- THE SUPERSTRUCTURE HAS BEEN DESIGNED BY TAKING MAXIMUM SPECTRAL ACCELERATION VALUE OF 2.5 FROM THE RESPONSE SPECTRA. THE SUB STRUCTURE SHALL BE DESIGNED BY CALCULATING THE EARTHQUAKE FORCE BASED UPON TIME PERIOD OF THE BRIDGE STRUCTURE WHICH IN TURN IS BASED UPON STIFFNESS OF PIER AND LUMPED MASS OF SUPERSTRUCTURE ON PIER TOP AS PER IRC 6.
- BEARING LOADS HAS BEEN CALCULATED FOR WIND ZONE V.

CLIENT :				PROJECT :				DESIGN CONSULTANT :				DRAWING TITLE:-				REV.	DRAWN	S. PATHAK	CHECKED	BHUPESH
Roads & Bridges Department (Government of Sikkim)				Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim				LEA ASSOCIATES SOUTH ASIA PVT. LTD. B-1/E-27, Mohan Cooperative Industrial Estate, Mathura Road, New Delhi-110044				BEARING DETAILS (4 OF 4)				R0	DESIGN	BHUPESH	REVIEWED	S. MANDAL
																A2	DATE	JULY 2022	SCALE :	AS SHOWN
REV	DATE	DETAILS OF REVISION		BY	DRAWING No :		73806/LASA/STR/SUP-711													

PROTECTION WORK DRAWING



SECTION A-A
RANDOM RUBBLE MASONRY BREAST WALL
(SCALE 1 : 30)



DETAIL OF 'V'-SHAPED DRAIN
(SCALE 1 : 30)

DIMENSIONS TABLE IN METER

SL. NO.	H FROM	H TO	D	B
1	0	2.0	0.75	1.80
2	2.0	3.0	1.00	2.40
3	3.0	4.0	1.20	3.00
4	4.0	5.0	1.45	3.60
5	5.0	6.0	1.65	4.20
6	6.0	7.0	1.90	4.80
7	7.0	8.0	2.00	5.40

SPECIAL NOTE:

IN THE RANDOM RUBBLE MASONRY OR PLUM CONCRETE BREAST WALL 20mm EXPANSION GAP SHALL BE PROVIDED AT THE FOLLOWING LOCATION:-

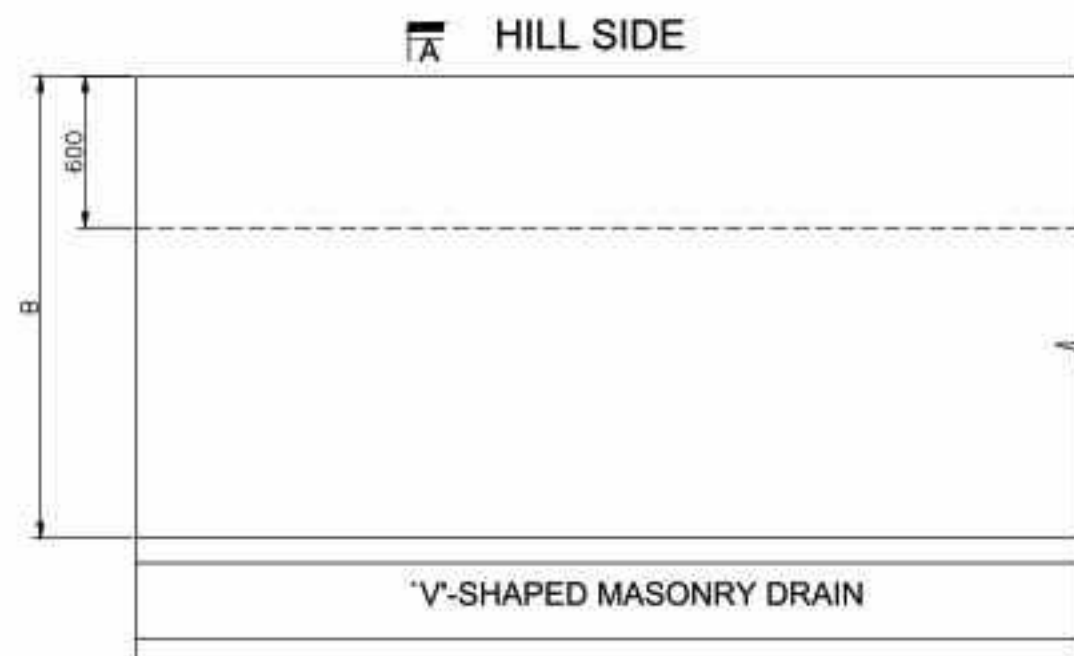
1. APART 30M C/C DISTANCE OF BREAST WALL/RETAINING WALL FOR STRAIGHT STRETCH.
2. 6M TO 10M APART AT CURVE STRETCH DEPENDING UPON RADIUS OF CURVE. FOR THIS CASE, THE WIDTH OF EXPANSION JOINT MAY BE 10mm INSTEAD OF 20mm.
3. SALITEX BOARD OR APPROVED FILLER MATERIAL SHALL BE PROVIDED AT THE EXPANSION JOINT LOCATION.

LEGENDS:

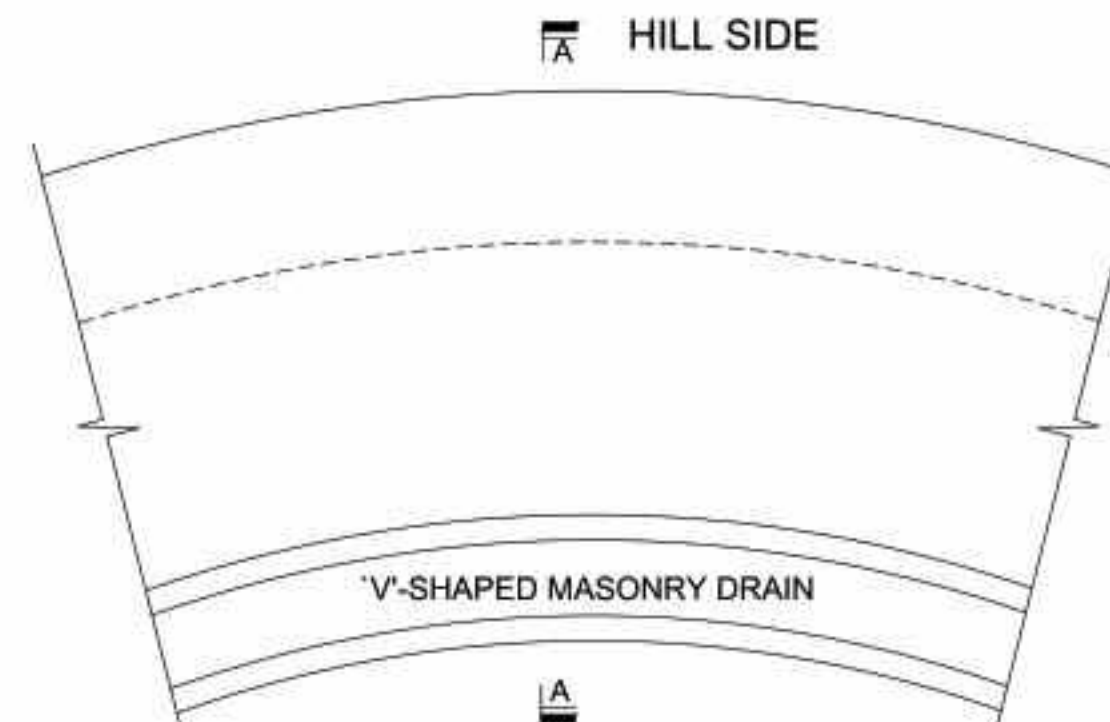
H = HEIGHT OF WALL
B = WIDTH OF FOUNDATION
D = DEPTH OF FOUNDATION BELOW GROUND

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS AND CHAINAGE IN Km. UNLESS MENTIONED OTHERWISE.
2. DIMENSIONS ARE NOT TO BE SCALED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
3. BREAST WALL SHALL NORMALLY BE PROVIDED AT LANDSLIDE PRONE AREAS. THE LOCATION, LENGTH AND HEIGHT OF WALL SHALL BE AS SHOWN IN THE SCHEDULE OF SLOPE PROTECTION WORK OR AS DIRECTED BY THE ENGINEER ON SITE.
4. EXCAVATION FOR BREAST WALL SHALL BE IN ACCORDANCE WITH SUB-SECTION 304 OF THE TECHNICAL SPECIFICATION. UNSUITABLE OR SURPLUS MATERIALS SHALL BE DISPOSED OF TO CONTRACTOR'S OWN DUMP SITE AT HIS OWN COST AND RISK. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR DAMAGE TO PUBLIC OR PRIVATE LAND AND PROPERTIES DUE TO HIS NEGLIGENCE.
5. FOUNDATION SHALL BE TAKEN DEEP ENOUGH TO REST ON SOUND FOUNDATION MATERIALS SAFE FROM SCOUR AND SURFACE WATER. THE SAFE BEARING CAPACITY OF SOIL AT FOUNDING LEVEL SHALL NOT BE LESS THAN 15MT/SQM. THE CONTRACTOR SHALL BE REQD. TO CARRY OUT DYNAMIC CONE PENETRATION TESTS TO ASCERTAIN THE SOIL BEARING CAPACITY IF DIRECTED BY THE ENGINEER. THIS IS DEEMED INCIDENTAL TO THE WORK AND SHALL NOT BE PAID SEPARATELY. THE FOUNDATION SHALL HAVE BEEN APPROVED BY THE ENGINEER BEFORE LAYING OF PCC.
6. IF HARD ROCK STRATA IS ENCOUNTERED, DEPTH OF FOUNDATION MAY BE REDUCED, STEPPED OR OTHERWISE AS DIRECTED BY THE ENGINEER.
7. AFTER FIRM FOUNDATION HAS BEEN REACHED AND APPROVED BY THE ENGINEER, THE CONTRACTOR SHALL TAKE THE FOUNDING LEVEL AND PREPARE WORKING DRAWING ACCORDINGLY. THE DRAWING SHALL BE APPROVED BY THE ENGINEER AND SHALL FORM THE BASIS OF MEASUREMENT.
8. THE FOUNDATION SHALL BE PREPARED FOR THE FULL LENGTH AND WIDTH OF THE BREAST WALL BEFORE STARTING STONE MASONRY WORK.
9. KEY STONE USING SELECTED LONG STONES OF APPROX. SIZE 100 TO 150X450 TO 900 SHALL BE PROVIDED FOR BONDING PCC AND MASONRY.
10. FACE STONES SHALL BE OF APPROX. SIZE 400X200X200 AND SHALL BE LAID AS HEADERS AND STRETCHERS ALTERNATELY.
11. PLUM STONE USING SELECTED LONG STONES SHALL BE PROVIDED AT 900 INTERVALS IN STAGGERED MANNER AND EMBEDDED VERTICALLY IN THE INTERIOR OF MASONRY AT SUCCESSIVE COURSES.
12. BOND STONES SHALL BE PROVIDED IN EVERY COURSE 1.5 TO 1.8M CLEAR APART.
13. WEEP HOLE DETAILS:-
 - a) SIZE AND TYPE = 100mm DIA PVC PIPE
 - b) GRADIENT = 1 IN 20 TOWARDS VALLEY SIDE
 - c) HORIZONTAL SPACING = 1m C/C AND STAGGERED
 - d) VERTICAL SPACING = 1m APPROX. C/C
 - e) SPACING OF WEEP SHALL BE PRE-DETERMINED AND SHOWN IN THE WORKING DRAWING.
 - f) THE INNER END OF WEEP HOLE SHALL BE WRAPPED WITH GEOTEXTILE FABRIC. THE SIDE OF FABRIC INTENDED FOR ENTRY OF WATER SHALL BE CLEARLY MARKED.
14. BACK FILLING TO BREAST WALL INCLUDING FILTER MEDIA SHALL BE DONE IN COMPACTED 150 THK. LAYERS IN ACCORDANCE WITH CLAUSE 304.3.7 OF THE TECHNICAL SPECIFICATION AND BROUGHT UP PROGRESSIVELY AS THE WALL IS RAISED. BACK FILLING AFTER FULL HEIGHT OF WALL IS REACHED SHALL NOT BE ACCEPTABLE DAMAGE TO WALL CAUSED BY SURFACE RUNOFF DISCHARGING DIRECTLY ONTO THE UNCOVERED REAR FACE OF WALL SHALL BE RECTIFIED AT THE CONTRACTOR'S OWN COST AND RISKS.
15. BOTH ENDS OF WALL SHALL ABUT. THE SIDE SLOPE SOIL FACE, THUS LEAVING NO GAP ANY GAP SHALL BE CLOSED UP WITH SUITABLE MATERIALS AS DIRECTED DAMAGE TO WALL AND SIDE SLOPE DUE TO WATER FLOWING THROUGH THE GAP SHALL BE RECTIFIED AT THE CONTRACTOR'S OWN COST AND RISKS.
16. REQUIRED BATTER OF BREAST WALL SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION USING SUITABLE MEANS.
17. HAND PACKED STONES OF SIZE 75mm DOWN SHALL BE USED USED AS FILTER MATERIAL.
18. RECTIFICATION TO EXISTING BREAST WALLS SHALL BE AS DIRECTED BY THE ENGINEER.



PLAN OF BREAST WALL IN STRAIGHT PORTION



PLAN OF BREAST WALL IN CURVE PORTION

CLIENT :



Roads & Bridges Department
(Government of Sikkim)

PROJECT :

Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim

DESIGN CONSULTANT :



LEA ASSOCIATES SOUTH ASIA PVT. LTD.
B-1/E-27, Mohan Cooperative Industrial Estate,
Mathura Road, New Delhi-110044

DRAWING TITLE:-

TYPICAL DETAILS OF BREAST WALL
(SH. 1 OF 2)

DRAWING No : 73806/LASA/STR/PROT-751

REV.

R0

SHEET

A2

DRAWN

DESIGN

DATE

A. DHAR

B. SARKAR

JULY 2022

CHECKED

REVIEWED

SCALE :

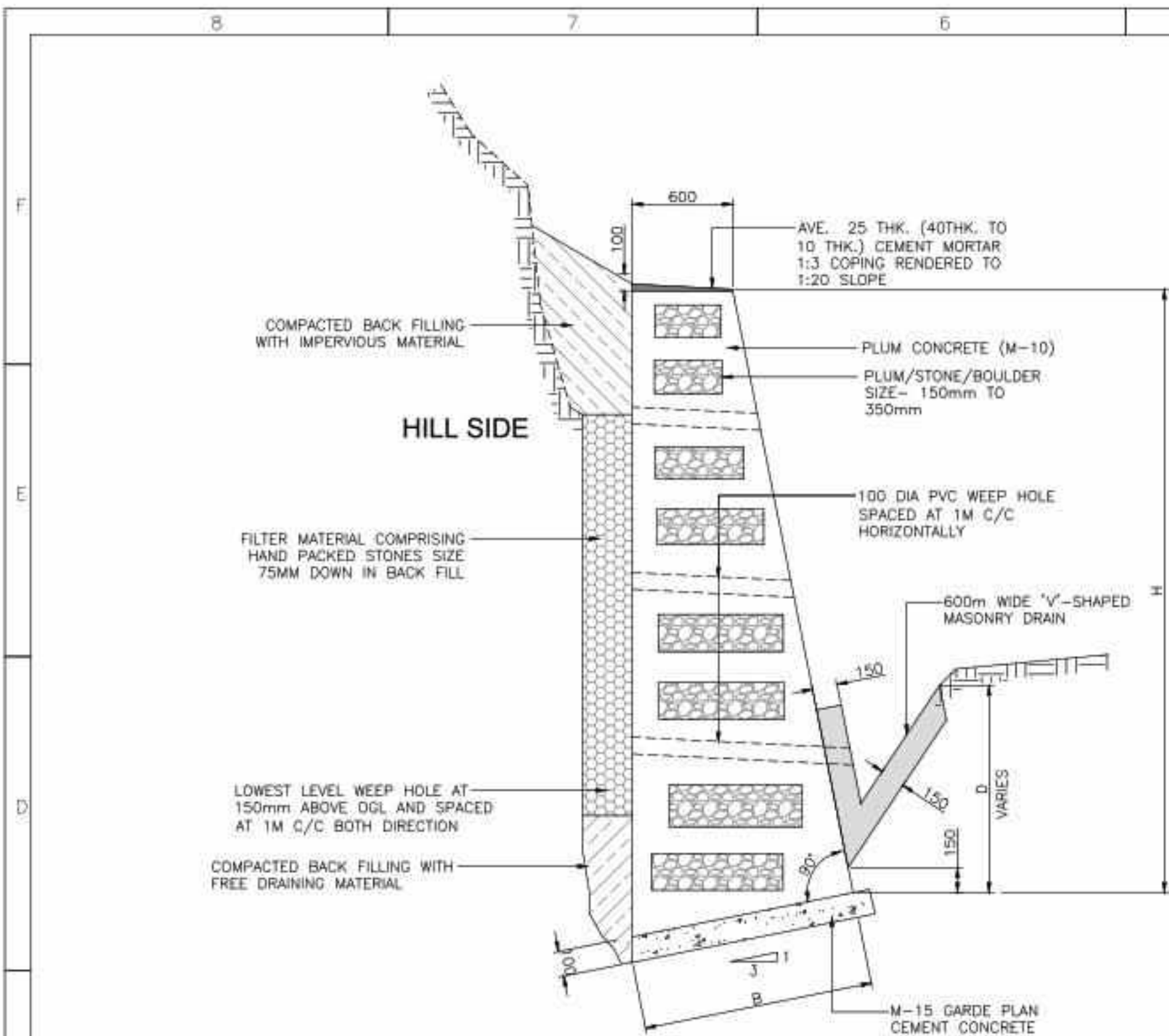
S. MONDAL

J. K. DAS

NTS

SCHEDULE OF BREAST WALL

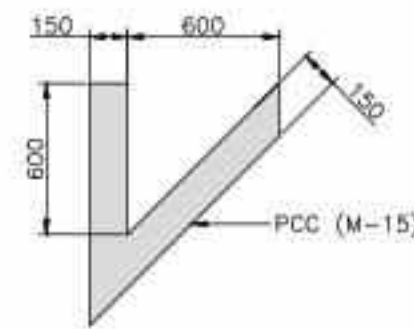
Chainage (m)				Chainage (m)				Chainage (m)				Chainage (m)				Chainage (m)				Chainage (m)			
From	To	Length	Type on Hill Side	From	To	Length	Type on Hill Side	From	To	Length	Type on Hill Side	From	To	Length	Type on Hill Side	From	To	Length	Type on Hill Side	From	To	Length	Type on Hill Side
35.19	35.19	0	BRE_2_6	1595.493	1621.168	25.675	BRE_2_6	3300.153	3302.374	2.221	BRE_T_2	4702.854	4705.054	2.2	BRE_2_6	6043.651	6047.881	4.23	BRE_2_6	7468.166	7468.951	0.785	BRE_T_2
40	42.668	2.668	BRE_T_2	1623.76	1650.013	26.253	BRE_T_2	3305.631	3339.236	33.605	BRE_2_6	4709.219	4714.643	5.424	BRE_T_2	6049.872	6053.099	3.227	BRE_T_2	7481.435	7488.733	7.298	BRE_T_2
45.788	45.788	0	BRE_2_6	1654.491	1656.712	2.221	BRE_2_6	3342.636	3346.064	3.428	BRE_T_2	4775.761	4787.134	11.373	BRE_T_2	6125.825	6164.687	38.862	BRE_T_2	7493.419	7496.527	3.108	BRE_T_2
47.858	48.181	1.323	BRE_T_2	1659.713	1662.799	3.086	BRE_T_2	3353.936	3356.187	2.251	BRE_T_2	4792.989	4806.979	13.99	BRE_T_2	6169.993	6196.526	26.533	BRE_2_6	7517.332	7519.331	1.999	BRE_T_2
52.846	63.895	11.049	BRE_2_6	1700.257	1715.806	15.549	BRE_T_2	3360.053	3360.053	0	BRE_2_6	4821.565	4825.548	3.983	BRE_T_2	6198.533	6200.542	2.009	BRE_2_6	7527.851	7536.358	8.507	BRE_T_2
67.673	67.673	0	BRE_T_2	1718.549	1724.056	5.507	BRE_2_6	3362.072	3371.462	9.39	BRE_T_2	4833.614	4843.391	9.777	BRE_2_6	6206.393	6245.722	39.329	BRE_T_2	7546.247	7549.109	2.862	BRE_T_2
76.563	160.159	83.596	BRE_T_2	1727.311	1729.629	2.318	BRE_T_2	3395.627	3438.989	43.362	BRE_T_2	4853.582	4870.556	16.976	BRE_2_6	6249.73	6260.259	10.529	BRE_2_6	7570.937	7572.915	1.978	BRE_T_2
188.028	217.097	29.069	BRE_T_2	1751.689	1788.854	37.165	BRE_T_2	3443.089	3446.347	3.258	BRE_2_6	4874.167	4878.341	4.174	BRE_T_2	6280.159	6282.951	2.792	BRE_T_2	7634.357	7635.651	1.294	BRE_T_2
232.989	244.745	11.756	BRE_2_6	1800.93	1816.88	15.95	BRE_T_2	3450.864	3466.68	15.816	BRE_T_2	4880.382	4882.5	2.118	BRE_T_2	6291.435	6309.155	17.72	BRE_T_2	7683.901	7684.705	0.804	BRE_T_2
249.241	264.302	15.061	BRE_T_2	1820.428	1837.454	17.026	BRE_2_6	3477.185	3522.35	45.164	BRE_2_6	4903.13	4906.947	3.817	BRE_T_2	6320.027	6361.625	41.598	BRE_T_2	7720.076	7728.288	8.212	BRE_T_2
304.325	333.659	29.334	BRE_T_2	1827.992	1828.37	0.378	BRE_T_2	3530.173	3532.879	2.706	BRE_2_6	4927.136	4927.136	0	BRE_T_2	6370.86	6385.077	14.217	BRE_T_2	7772.048	7775.766	3.717	BRE_T_2
370.22	374.489	4.269	BRE_T_2	1831.721	1831.721	0	BRE_T_2	3536.74	3553.16	16.42	BRE_T_2	4976.013	4976.013	0	BRE_2_6	6389.109	6399.671	10.562	BRE_2_6	7788.921	7788.921	0	BRE_2_6
410.079	444.172	34.093	BRE_T_2	1835.003	1837.578	2.575	BRE_T_2	3573.161	3625.031	51.87	BRE_2_6	5009.627	5009.767	0.14	BRE_2_6	6404.954	6408.433	3.479	BRE_2_6	7793.265	7837.273	44.008	BRE_T_2
464.441	476.393	11.952	BRE_T_2	1841.045	1846.813	5.768	BRE_2_6	3640.345	3679.298	38.953	BRE_T_2	5030.035	5086.407	56.372	BRE_T_2	6438.428	6442.136	3.708	BRE_T_2	7840.625	7845.333	4.708	BRE_T_2
502.596	522.089	19.493	BRE_T_2	1856.345	1857.93	1.585	BRE_T_2	3717.162	3723.991	6.829	BRE_T_2	5045.314	5045.314	0	BRE_2_6	6456.367	6469.201	2.834	BRE_T_2	7850.026	7850.773	0.747	BRE_T_2
543.729	599.287	55.558	BRE_T_2	1874.9	1874.9	0	BRE_T_2	3742.47	3752.468	9.998	BRE_T_2	5088.624	5104.145	15.521	BRE_T_2	6474.24	6475.44	1.2	BRE_T_2	7869.17	7872.87	3.7	BRE_2_6
606.988	624.843	17.855	BRE_T_2	1882.521	1882.521	0	BRE_T_2	3766.655	3779.567	12.912	BRE_T_2	5108.48	5110.513	2.033	BRE_2_6	6479.566	6493.079	13.513	BRE_2_6	7875.286	7884.542	9.256	BRE_T_2
632.769	645.737	12.968	BRE_2_6	1958.646	1979.037	20.391	BRE_T_2	3819.83	3825.815	5.985	BRE_T_2	5114.681	5114.681	0	BRE_T_2	6495.56	6499.181	3.621	BRE_T_2	7899.735	7901.623	1.888	BRE_2_6
717.875	727.829	9.954	BRE_T_2	1997.538	2037.546	40.008	BRE_T_2	3837.018	3839.891	2.873	BRE_2_6	5119.232	5134.227	14.995	BRE_2_6	6503.692	6521.914	18.222	BRE_2_6	7907.97	7916.912	8.942	BRE_T_2
773.075	799.909	26.834	BRE_T_2	2039.696	2039.696	0	BRE_T_2	3842.052	3844.371	2.319	BRE_T_2	5164.061	5166.535	2.474	BRE_2_6	6523.996	6523.996	0	BRE_2_6	7919.922	7926.077	6.155	BRE_2_6
803.855	807.763	3.908	BRE_2_6	2041.836	2084.859	43.023	BRE_T_2	3858.837	3859.964	1.127	BRE_T_2	5169.33	5222.109	52.779	BRE_T_2	6529.07	6533.199	4.129	BRE_T_2	7960.225	7961.125	0.9	BRE_2_6
825.776	830.108	4.332	BRE_T_2	2163.849	2188.849	25	BRE_T_2	3868.264	3901.9	33.636	BRE_T_2	5225.153	5228.197	3.044	BRE_T_2	6543.159	6553.821	10.662	BRE_2_6	7974.016	7977.202	3.186	BRE_T_2
840.41	856.667	16.257	BRE_T_2	2198.997	2272.253	73.256	BRE_T_2	3905.184	3906.898	1.714	BRE_2_6	5231.246	5234.119	2.873	BRE_2_6	6557.984	6573.143	15.159	BRE_T_2	7982.992	7986.123	3.131	BRE_2_6
887.71	891.924	4.214	BRE_2_6	2283.305	2285.096	1.791	BRE_T_2	3910.526	3945.004	34.478	BRE_T_2	5236.531	5239.146	2.615	BRE_T_2	6578.835	6592.427	13.592	BRE_T_2	7990.766	7999.092	8.326	BRE_T_2
905.112	911.498	6.386	BRE_T_2	2292.125	2293.872	1.747	BRE_T_2	3970.974	4004.465	33.491	BRE_T_2	5267.205	5331.148	63.943	BRE_T_2	6629.712	6629.712	0	BRE_T_2	8006.538	8040.095	33.557	BRE_T_2
916.626	919.59	2.964	BRE_2_6	2304.05	2319.195	15.145	BRE_T_2	4110.657	4112.4	1.743	BRE_T_2	5360.565	5360.565	0	BRE_T_2	6633.971	6650.784	16.813	BRE_2_6	8042.49	8054.532	12.042	BRE_T_2
931.334	944.242	12.908	BRE_T_2	2321.27	2361.173	39.903	BRE_T_2	4118.301	4174.639	56.338	BRE_T_2	5364.775	5367.959	3.184	BRE_2_6	6685.837	6689.787	3.95	BRE_T_2	8058.149	8059.315	1.166	BRE_2_6
1014.489	1019.909	5.42	BRE_T_2	2379.749	2386.49	6.741	BRE_2_6	4178.156	4187.058	8.902	BRE_2_6	5423.779	5429.843	6.064	BRE_T_2	6698.676	6708.525	9.849	BRE_2_6	8064.074	8079.519	15.445	BRE_T_2
1062.646	1099.121	36.475	BRE_T_2	2392.637	2404.355	11.718	BRE_T_2	4229.554	4260.613	31.059	BRE_T_2	5440.032	5492.143	52.111	BRE_T_2	6740.698	6788.963	48.265	BRE_T_2	8120.051	8131.977	11.926	BRE_T_2
1104.884	1107.399	2.515	BRE_2_6	2412.611	2430.045	17.434	BRE_T_2	4263.289	4264.159	0.87	BRE_2_6	5501.405	5511.784	10.379	BRE_T_2	6791.578	6795.952	4.374	BRE_2_6	8234.155	8236.345	2.19	BRE_2_6
1115.372	1125.756	10.384	BRE_2_6	2471.619	2475.619	4	BRE_T_2	4289.19	4301.745	12.555	BRE_T_2	5515.374	5520.574	5.2	BRE_2_6	6798.81	6798.81	0	BRE_T_2	8240.611	8244.999	4.388	BRE_T_2
1157.998	1159.704	1.706	BRE_T_2	2479.387	2479.387	0	BRE_2_6	4319.766	4319.766	0	BRE_T_2	5539.634	5547.244	7.61	BRE_T_2	6801.853	6804.7	2.847	BRE_2_6	8250.64	8256.982	6.342	BRE_T_2
1162.181	1162.181	0	BRE_2_6	2481.451	2512.247	30.796	BRE_T_2	4323.874	4363.887	40.013	BRE_T_2	5550.268	5553.238	2.97	BRE_2_6	6807.38	6848.772	41.392	BRE_T_2	8264.962	8270.385	5.423	BRE_T_2
1165.139	1166.822	1.683	BRE_T_2	2514.343	2592.182	77.839	BRE_T_2	4367.23	4370.908	3.678	BRE_2_6	5559.765	5605.754	45.989	BRE_T_2	6851.692	6953.982	102.29	BRE_T_2	8278.708	8281.525	2.817	BRE_2_6
1200.099	1205.732	5.633	BRE_T_2	2594.577	2623.493	28.916	BRE_T_2	4440.458	4474.961	34.503	BRE_T_2	5608.905	5619.137	10.232	BRE_2_6	6989.058	7043.318	54.26	BRE_T_2	8283.821	8288.224	4.403	BRE_T_2
1231.939	1244.541	12.602	BRE_T_2	2634.1	2715.622	81.522	BRE_T_2	4479.857	4486.565	6.708	BRE_T_2	5623.323	5624.377	1.054	BRE_T_2	7048.379	7061.508	13.129	BRE_2_6	8299.641	8306.637	6.996	BRE_T_2
1248.131	1252.904	4.773	BRE_2_6	2751.238	2790.004	38.766	BRE_T_2	4502.721	4517.763	15.042	BRE_2_6	5648.154	5648.154	0	BRE_2_6	7066.724	7070.575	3.851	BRE_T_2	8403.564	8407.454	3.89	BRE_T_2
1256.444	1274.142	17.698	BRE_T_2	2794.395	2794.395	0	BRE_2_6	4531.494	4542.519	11.025	BRE_T_2	5685.133	5716.586	31.453	BRE_T_2	7086.617	7108.464	21.847	BRE_T_2	8444.547	8446.465	1.918	BRE_T_2
1276.618	1278.982	2.364	BRE_2_6	2799.277	2799.277	0	BRE_T_2	4545.275	4545.275	0	BRE_T_2	5729.419	5816.578	87.159	BRE_T_2	7111.734	7122.624	10.89	BRE_T_2	8480.549	8484.994	4.445	BRE_T_2
1287.117	1295.083	7.966	BRE_2_6	2840.277	2876.893	36.616	BRE_T_2	4548.032	4556.301	8.269	BRE_T_2	5850.365	5850.365	0	BRE_2_6	7140.124	7151.073	10.949	BRE_T_2	8501.244	8510.74	9.496	BRE_2_6
1323.814	1335.772	11.958	BRE_T_2	2895.753	2934.207	38.454	BRE_T_2	4560.334	4568.079	7.745	BRE_T_2	5855.102	5867.587	12.485	BRE_2_6	7157.636	7205.529	47.893	BRE_T_2	8514.601	8519.113	4.512	BRE_T_2
1338.841	1369.73	30.889	BRE_2_6	2948.54	2980.856	32.316	BRE_2_6	4570.716	4605.29	34.574	BRE_2_6	5872.443	5879.503	7.06	BRE_2_6	7214.902	7220.878	5.976	BRE_2_6	8522.92	8528.838	5.918	BRE_T_2
1373.989	1384.949	10.96	BRE_T_2	2992.125	2999.102	6.977	BRE_T_2	4605.448	4605.448	0	BRE_T_2	5881.25	5887.975	6.725	BRE_T_2	7226.47	7239.35	32.88	BRE_T_2	8542.84	8546.003	3.163	BRE_T_2
1393.87	1399.87	0	BRE_2_6	3006.276	3007.779	1.503	BRE_2_6	4608.576	4613.525	4.949	BRE_T_2	5909.023	5912										



SECTION A-A
BREAST WALL BY PLUM CONCRETE
(SCALE 1 : 30)

CONSTRUCTION SEQUENCE OF PLUM CONCRETE:

1. THE EXCAVATION OF FOUNDATION OF BREAST WALL SHALL BE DONE AS PER APPROVED DRAWING. THE PCC M15 LEVELING COURSE OR FOUNDATION OF BREAST WALL CONCRETE SHALL BE LAID OVER CLEAN, STRONG GROUND.
2. SURFACE AREA OF PCC M15 SHALL BE WETTED BY SPRAYING WATER TO MAKE THE BONDING STRONG BETWEEN PLUM CONCRETE & PCC. SOMETIMES THE TERMIC RESISTANCE AS ANTI-TERMIC TREATMENT MAY BE ADDED.
3. PLUM SHALL BE PLACED AT ENTIRE OF WALL OVER 150mm THICK PCC M10. THE GAP BETWEEN PLUMS SHALL NOT BE LESS THAN 150mm.
4. CONCRETE SHALL BE POURED OVER THE PLUMS AS PER DESIGNED THICKNESS. THE CONCRETE SHALL BE SLOWLY SPRAYED BETWEEN THE GAPS AND OVER THE PLUMS. NECESSARY SIDE SHUTTER SHALL BE PROVIDED DURING CONCRETE.
5. ONCE THE CONCRETE IS SPRAYED EVENLY, AGAIN PLUMS SHALL BE PLACED AND THEN CONCRETE. THE PROCESS WILL CONTINUE UNTIL THE SURFACE ATTAINS THE REQUIRED LEVEL.
6. CURING SHALL BE DONE FOR A MINIMUM OF 7 DAYS AFTER THE CONCRETE SHALL BE MOISTEN BY WET JUTE BAGS.



DETAIL OF 'V'-SHAPED DRAIN
(SCALE 1 : 30)

DIMENSIONS TABLE IN METER

SL. NO.	H		D	B
	FROM	TO		
1	0	2.0	0.75	1.80
2	2.0	3.0	1.00	2.40
3	3.0	4.0	1.20	3.00
4	4.0	5.0	1.45	3.60
5	5.0	6.0	1.65	4.20
6	6.0	7.0	1.90	4.80
7	7.0	8.0	2.00	5.40

SPECIAL NOTE:

IN THE RANDOM RUBBLE MASONRY OR PLUM CONCRETE BREAST WALL 20mm EXPANSION GAP SHALL BE PROVIDED AT THE FOLLOWING LOCATION:-

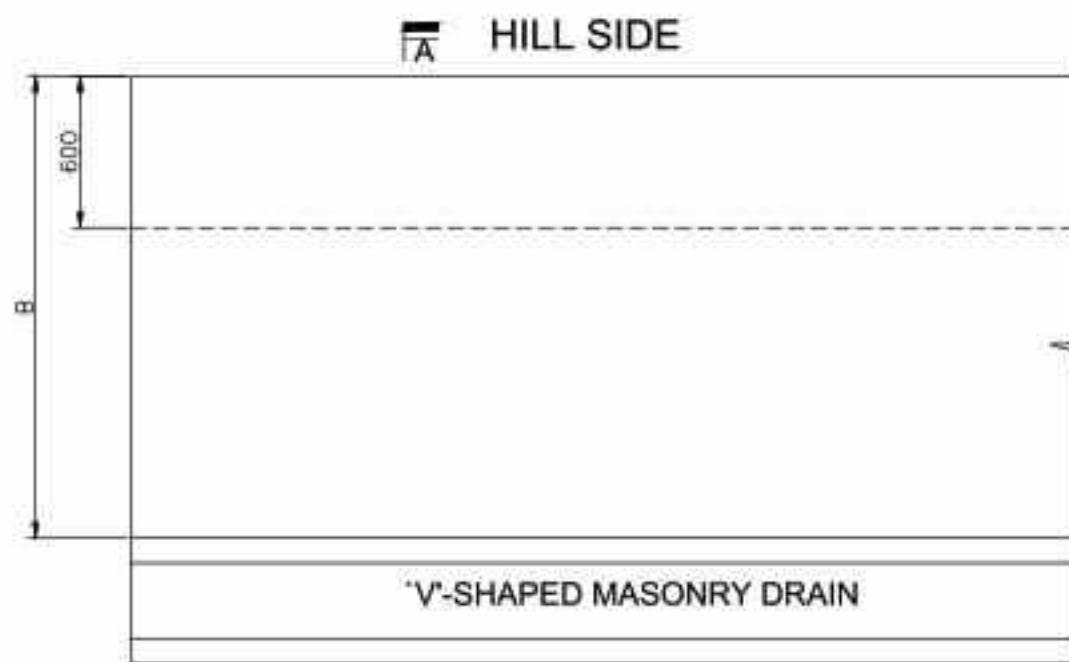
1. APART 30M C/C DISTANCE OF BREAST WALL/RETAINING WALL FOR STRAIGHT STRETCH.
2. 6M TO 10M APART AT CURVE STRETCH DEPENDING UPON RADIUS OF CURVE. FOR THIS CASE, THE WIDTH OF EXPANSION JOINT MAY BE 10mm INSTEAD OF 20mm.
3. SALITEX BOARD OR APPROVED FILLER MATERIAL SHALL BE PROVIDE AT THE EXPANSION JOINT LOCATION.

LEGENDS:

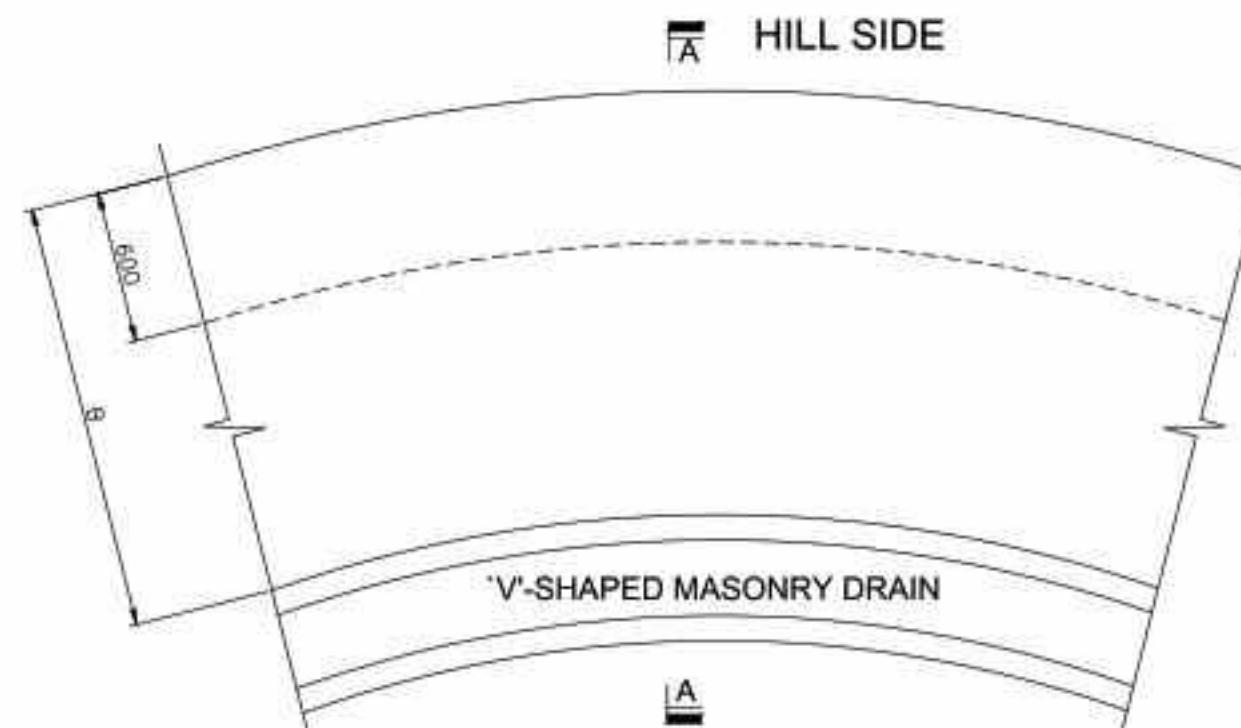
H = HEIGHT OF WALL
B = WIDTH OF FOUNDATION
D = DEPTH OF FOUNDATION BELOW GROUND

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS AND CHAINAGE IN Km. UNLESS MENTIONED OTHERWISE.
2. DIMENSIONS ARE NOT TO BE SCALED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
3. BREAST WALL SHALL NORMALLY BE PROVIDED AT LANDSLIDE PRONE AREAS. THE LOCATION, LENGTH AND HEIGHT OF WALL SHALL BE AS SHOWN IN THE SCHEDULE OF SLOPE PROTECTION WORK OR AS DIRECTED BY THE ENGINEER ON SITE.
4. EXCAVATION FOR BREAST WALL SHALL BE IN ACCORDANCE WITH SUB-SECTION 304 OF THE TECHNICAL SPECIFICATION. UNSUITABLE OR SURPLUS MATERIALS SHALL BE DISPOSED OF TO CONTRACTOR'S OWN DUMP SITE AT HIS OWN COST AND RISK. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR DAMAGE TO PUBLIC OR PRIVATE LAND AND PROPERTIES DUE TO HIS NEGLIGENCE.
5. FOUNDATION SHALL BE TAKEN DEEP ENOUGH TO REST ON SOUND FOUNDATION MATERIALS SAFE FROM SCOUR AND SURFACE WATER. THE SAFE BEARING CAPACITY OF SOIL AT FOUNDING LEVEL SHALL NOT BE LESS THAN 15MT/SQM. THE CONTRACTOR SHALL BE REQD. TO CARRY OUT DYNAMIC CONE PENETRATION TESTS TO ASCERTAIN THE SOIL BEARING CAPACITY IF DIRECTED BY THE ENGINEER. THIS IS DEEMED INCIDENTAL TO THE WORK AND SHALL NOT BE PAID SEPARATELY. THE FOUNDATION SHALL HAVE BEEN APPROVED BY THE ENGINEER BEFORE LAYING OF PCC.
6. IF HARD ROCK STRATA IS ENCOUNTERED, DEPTH OF FOUNDATION MAY BE REDUCED, STEPPED OR OTHERWISE AS DIRECTED BY THE ENGINEER.
7. AFTER FIRM FOUNDATION HAS BEEN REACHED AND APPROVED BY THE ENGINEER, THE CONTRACTOR SHALL TAKE THE FOUNDING LEVEL AND PREPARE WORKING DRAWING ACCORDINGLY. THE DRAWING SHALL BE APPROVED BY THE ENGINEER AND SHALL FORM THE BASIS OF MEASUREMENT.
8. THE FOUNDATION SHALL BE PREPARED FOR THE FULL LENGTH AND WIDTH OF THE BREAST WALL BEFORE STARTING STONE MASONRY WORK.
9. PLUM CONCRETE THAT IS M10 NORMAL MIX CONCRETE WITH LARGE STONES/BOULDER OF UPTO 300mm AS INNER FILLERS SHALL BE LAID FOR CONSTRUCTION OF BREAST WALL OVER 100 THK. FOUNDATION LAYER.
10. PLUM i.e. LARGE SIZE OF STONE/BOULDER SHALL BE OCCUPIED MAXIMUM 30% OF THE TOTAL MASS OF CONCRETE.
11. STONE/BOULDER USED FOR PLUM SHALL BE ANGULAR, CLEAN FROM DIRT, HARD, DURABLE, SOUND AND FREE FROM CRACKS AND STRUCTURAL DEFECTS.
12. PLUM CONCRETE APPLICATION:-
a) SIZE OF PLUM = 150mm TO 300mm
b) SPACING OF PLUM = 150mm (MINIMUM)
c) CRUSHING STRENGTH OF PLUM = 100Kg/sqcm (MINIMUM)
d) THE SIZE OF COARSE AGGREGATE OF M10 NOMINAL CONCRETE = 25mm TO DOWN
13. WEEP HOLE DETAILS:-
a) SIZE AND TYPE = 100mm DIA PVC PIPE
b) GRADIENT = 1 IN 20 TOWARDS VALLEY SIDE
c) HORIZONTAL SPACING = 1m C/C AND STAGGERED
d) VERTICAL SPACING = 1m APPROX. C/C
e) SPACING OF WEEP SHALL BE PRE-DETERMIND AND SHOWN IN THE WORKING DRAWING.
f) THE INNER END OF WEEP HOLE SHALL BE WRAPPED WITH GEOTEXTILE FABRIC. THE SIDE OF FABRIC INTENDED FOR ENTRY OF WATER SHALL BE CLEARLY MARLED.
14. BACK FILLING TO BREAST WALL INCLUDING FILTER MEDIA SHALL BE DONE IN COMPACTED 150 THK. LAYERS IN ACCORDANCE WITH CLAUSE 304.3.7 OF THE TECHNICAL SPECIFICATION AND BROUGHT UP PROGRESSIVELY AS THE WALL IS RAISED. BACK FILLING AFTER FULL HEIGHT OF WALL IS REACHED SHALL NOT BE ACCEPTABLE DAMAGE TO WALL CAUSED BY SURFACE RUNOFF DISCHARGING DIRECTLY ONTO THE UNCOVERED REAR FACE OF WALL SHALL BE RECTIFIED AT THE CONTRACTOR'S OWN COST AND RISKS.
15. BOTH ENDS OF WALL SHALL ABUT. THE SIDE SLOPE SOIL FACE, THUS LEAVING NO GAP ANY GAP SHALL BE CLOSED UP WITH SUITABLE MATERIALS AS DIRECTED DAMAGE TO WALL AND SIDE SLOPE DUE TO WATER FLOWING THROUGH THE GAP SHALL BE RECTIFIED AT THE CONTRACTOR'S OWN COST AND RISKS.
16. REQUIRED BATTER OF BREAST WALL SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION USING SUITABLE MEANS.
17. HAND PACKED STONES OF SIZE 75mm DOWN SHALL BE USED USED AS FILTER MATERIAL.
18. RECTIFICATION TO EXISTING BREAST WALLS SHALL BE AS DIRECTED BY THE ENGINEER.



PLAN OF BREAST WALL IN STRAIGHT PORTION



PLAN OF BREAST WALL IN CURVE PORTION

CLIENT :



Roads & Bridges Department
(Government of Sikkim)

PROJECT :

Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim

DESIGN CONSULTANT :



LEA ASSOCIATES SOUTH ASIA PVT. LTD.
B-1/E-27, Mohan Cooperative Industrial Estate,
Mathura Road, New Delhi-110044

DRAWING TITLE:-

TYPICAL DETAILS OF BREAST WALL
(PLUM CONCRETE)

DRAWING No : 73806/LASA/STR/PROT-752

REV.

R0

SHEET

A2

DRAWN

DESIGN

DATE

JULY 2022

A. DHAR

D. MISHRA

SCALE :

NTS

CHECKED

REVIEWED

J. K. DAS

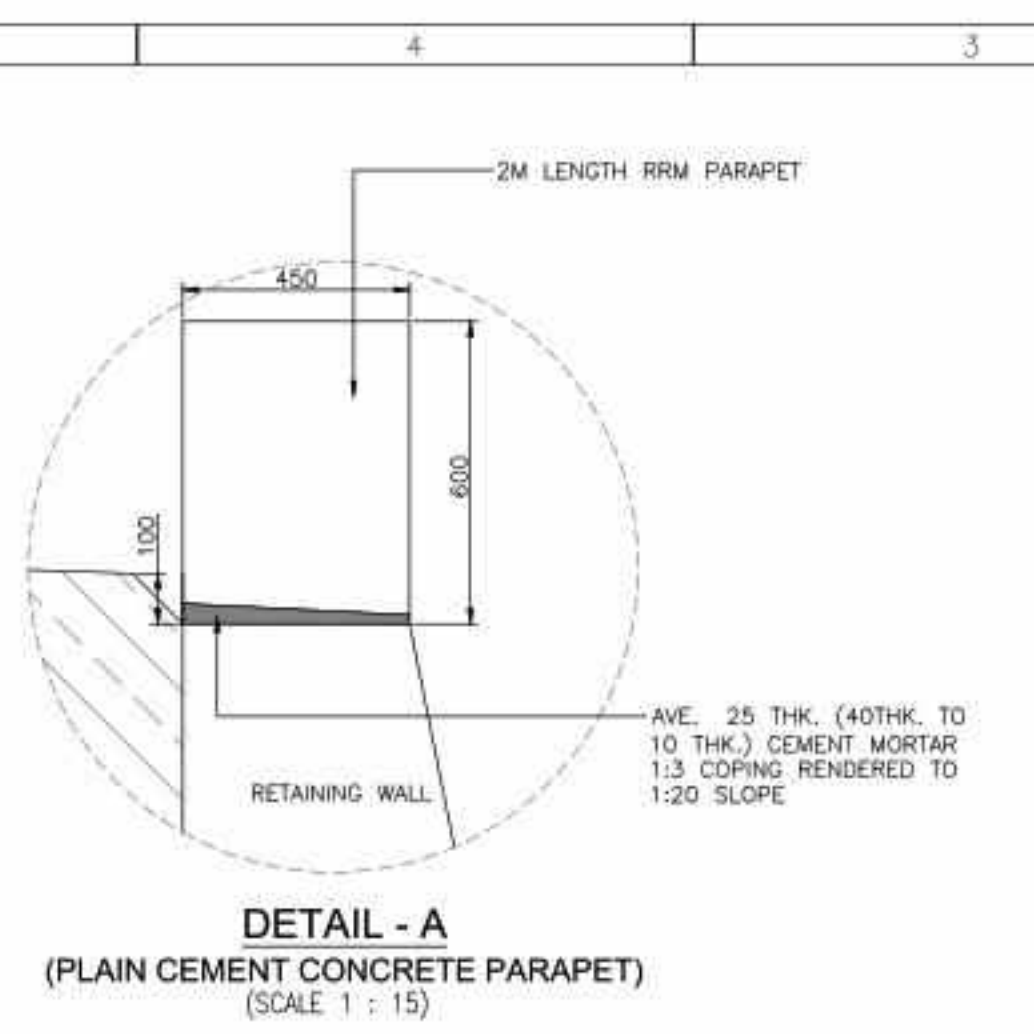
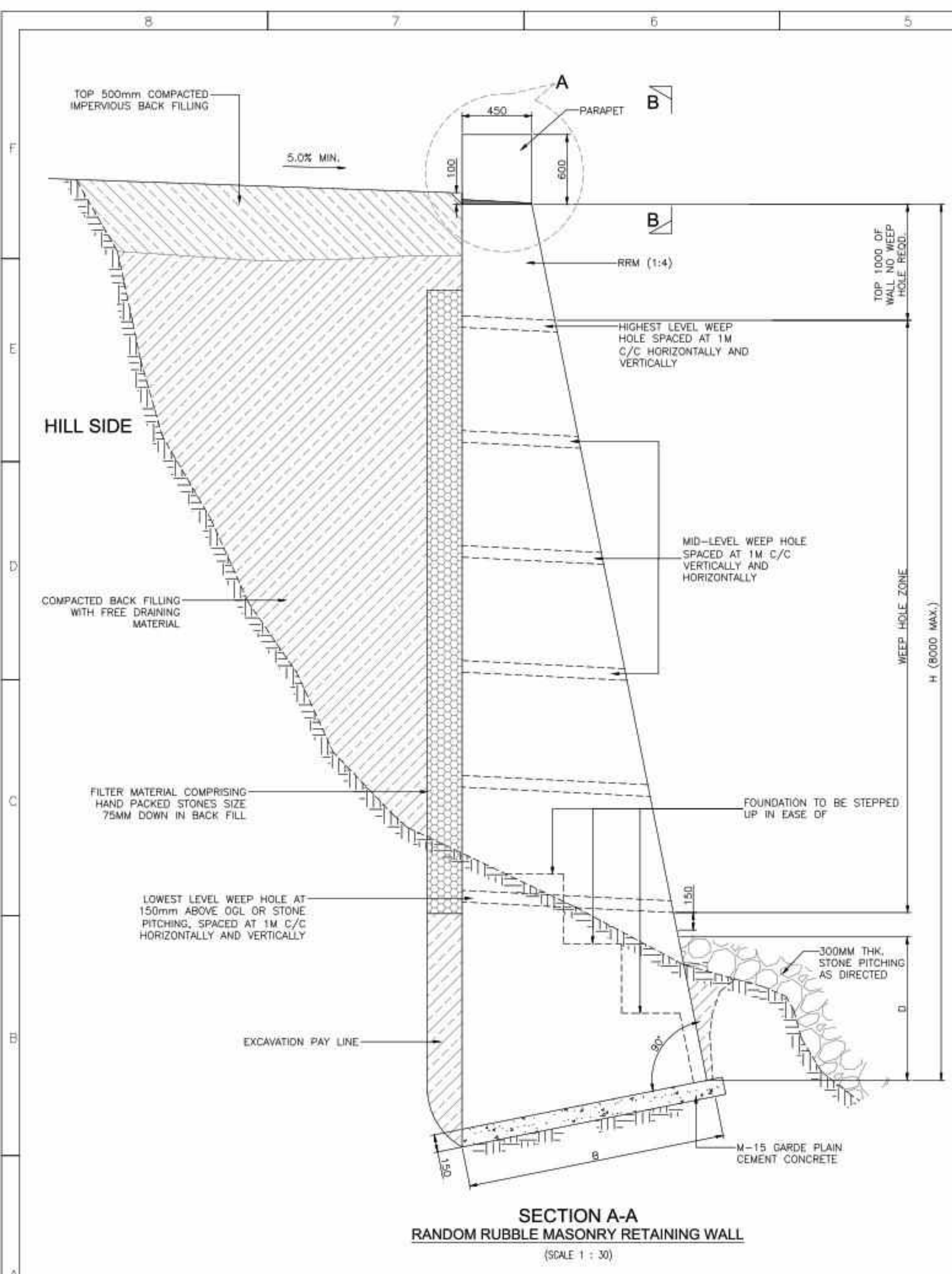
NTS

S. MONDAL

J. K. DAS

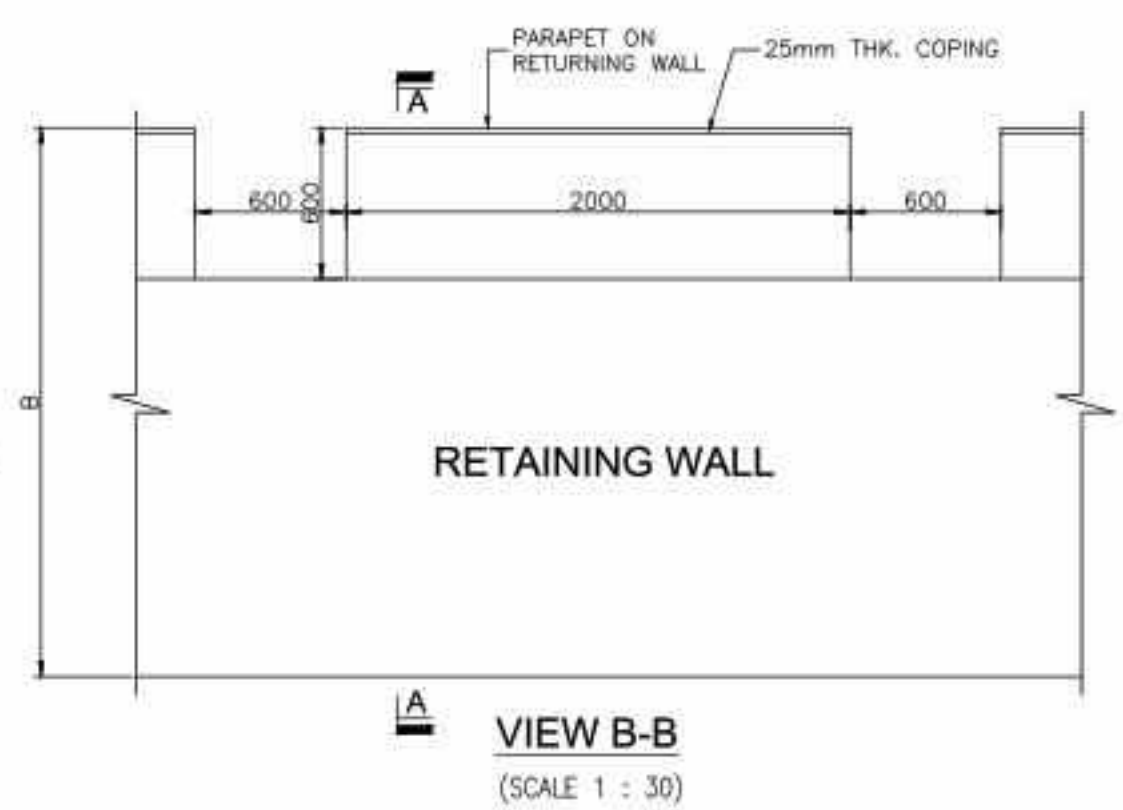
SCALE :

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LEGENDS:

H = HEIGHT OF WALL < 8M
B = 0.40H + 0.30 FOR H < 6M
B = 0.40H + 0.60 FOR H > 6M
D = 0.10H + 0.30





- NOTES:**
- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS AND CHAINAGE IN Km, UNLESS MENTIONED OTHERWISE.
 - DIMENSIONS ARE NOT TO BE SCALED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
 - EXCAVATION FOR RETAINING WALL SHALL BE IN ACCORDANCE WITH SUB-SECTION 304 OF THE TECHNICAL SPECIFICATION. UNSUITABLE OR SURPLUS MATERIALS SHALL BE DISPOSED OF TO CONTRACTOR'S OWN DUMP SITE AT HIS OWN COST AND RISK. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR DAMAGE TO PUBLIC OR PRIVATE LAND AND PROPERTIES DUE TO HIS NEGLIGENCE.
 - FOUNDATION SHALL BE TAKEN DEEP ENOUGH TO REST ON SOUND FOUNDATION MATERIALS SAFE FROM EROSION. THE SAFE BEARING CAPACITY OF SOIL AT FOUNDING LEVEL SHALL NOT BE LESS THAN 20MT/SQM. THE CONTRACTOR SHALL BE REQD. TO CARRY OUT DYNAMIC CONE PENETRATION TESTS TO ASCERTAIN THE SOIL BEARING CAPACITY IF DIRECTED BY THE ENGINEER. THIS IS DEEMED INCIDENTAL TO THE WORK AND SHALL NOT BE PAID SEPARATELY. THE FOUNDATION SHALL HAVE BEEN APPROVED BY THE ENGINEER BEFORE LAYING OF PCC.
 - FOUNDATION SHALL BE STEPPED UP IF ROCK STRATA IS ENCOUNTERED THE STRATA SHALL BE CUT IN STEPS WITH BED SLOPE TOWARDS THE HILL SIDE.
 - AFTER FIRM FOUNDATION HAS BEEN REACHED AND APPROVED BY THE ENGINEER, THE CONTRACTOR SHALL TAKE THE FOUNDING LEVEL AND PREPARE WORKING DRAWING ACCORDINGLY. THE DRAWING SHALL BE APPROVED BY THE ENGINEER AND SHALL FORM THE BASIS OF MEASUREMENT.
 - THE FOUNDATION SHALL BE PREPARED FOR THE FULL LENGTH AND WIDTH OF THE RETAINING WALL BEFORE STARTING STONE MASONRY WORK.
 - STEP APRON SHALL BE PROVIDED WHEN GROUND SLOPE IS MORE THAN 1V:10H.
 - IN CASE WHERE FOUNDATION STRATA OF RETAINING WALL IS AT DIFFERENT LEVELS / ELEVATION THE CONSTRUCTION WILL START AT LOWEST LEVEL / ELEVATION.
 - TOE PROTECTION IN CASE OF SOFT ROCK/SOIL SHALL BE STONE PITCHING.
 - FACE STONES SHALL BE OF APPROX. SIZE 400X200X200 AND SHALL BE LAID AS HEADERS AND STRETCHERS ALTERNATELY.
 - PLUM STONE USING SELECTED LONG STONES SHALL BE PROVIDED AT 900 INTERVALS IN STAGGERED MANNER AND EMBEDDED VERTICALLY IN THE INTERIOR OF MASONRY AT SUCCESSIVE COURSES.
 - BOND STONES SHALL BE PROVIDED IN EVERY COURSE 1.5 TO 1.8M CLEAR APART.
 - WEEP HOLE DETAILS:-
 - SIZE AND TYPE = 100mm DIA PVC PIPE
 - GRADIENT = 1 IN 20 TOWARDS VALLEY SIDE
 - HORIZONTAL SPACING = 1m C/C AND STAGGERED
 - VERTICAL SPACING = 1m APPROX. C/C (MAY VARY TO SUIT WEEP HOLE ZONE)
 - SPACING OF WEEP SHALL BE PRE-DETERMINED AND SHOWN IN THE WORKING DRAWING.
 - THE INNER END OF WEEP HOLE SHALL BE WRAPPED WITH GEOTEXTILE FABRIC. THE SIDE OF FABRIC INTENDED FOR ENTRY OF WATER SHALL BE CLEARLY MARKED.
 - BACK FILLING TO RETAINING WALL INCLUDING FILTER MEDIA SHALL BE DONE IN COMPACTED 150 THK. LAYERS IN ACCORDANCE WITH CLAUSE 304.3.7 OF THE TECHNICAL SPECIFICATION AND BROUGHT UP PROGRESSIVELY AS THE WALL IS RAISED. BACK FILLING AFTER FULL HEIGHT OF WALL IS REACHED SHALL NOT BE ACCEPTABLE DAMAGE TO WALL CAUSED BY SURFACE RUNOFF DISCHARGING DIRECTLY ONTO THE UNCOVERED REAR FACE OF WALL SHALL BE RECTIFIED AT THE CONTRACTOR'S OWN COST AND RISKS.
 - BACKFILL LAYER SHALL BE SLOPED TOWARDS THE BACK OF RETAINING WALL.
 - BOTH ENDS OF WALL SHALL ABUT. THE SIDE SLOPE SOIL FACE, THUS LEAVING NO GAP ANY GAP SHALL BE CLOSED UP WITH SUITABLE MATERIALS AS DIRECTED DAMAGE TO WALL AND SIDE SLOPE DUE TO WATER FLOWING THROUGH THE GAP SHALL BE RECTIFIED AT THE CONTRACTOR'S OWN COST AND RISKS.
 - REQUIRED BATTER OF RETAINING WALL SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION USING SUITABLE MEANS.
 - WHEREVER CULVERT IS RESTING ON RETAINING WALL, CULVERT OUTLET APRON SHOULD BE STARTED SIMULTANEOUSLY WITH RETAINING WALL. APRON SHOULD REST ON WELL COMPACTED SOIL.
 - HAND PACKED STONES OF SIZE 75mm DOWN SHALL BE USED USED AS FILTER MATERIAL.
 - RETAINING WALL SHALL NOT EXCEED 8M IN HEIGHT. FOR DEPTH OF VALLEY UPTO ABUT. 10M SPLIT-LEVEL RETAINING WALL MAY BE ADOPTED THIS SHALL BE DECIDED ON CASE-BY-CASE BASIS.
 - RECTIFICATION TO EXISTING RETAINING WALLS SHALL BE AS DIRECTED BY THE ENGINEER.

SPECIAL NOTE:

IN THE RANDOM RUBBLE MASONRY OR PLUM CONCRETE BREAST WALL 20mm EXPANSION GAP SHALL BE PROVIDED AT THE FOLLOWING LOCATION:-

- APART 30M C/C DISTANCE OF BREAST WALL/RETAINING WALL FOR STRAIGHT STRETCH.
- 6M TO 10M APART AT CURVE STRETCH DEPENDING UPON RADIUS OF CURVE. FOR THIS CASE, THE WIDTH OF EXPANSION JOINT MAY BE 10mm INSTEAD OF 20mm.
- SALITEX BOARD OR APPROVED FILLER MATERIAL SHALL BE PROVIDE AT THE EXPANSION JOINT LOCATION.

						CLIENT :		PROJECT :		DESIGN CONSULTANT :		DRAWING TITLE:-		REV.		DRAWN		A. DHAR		CHECKED		S. MONDAL			
								Roads & Bridges Department (Government of Sikkim)		Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim		 LEA ASSOCIATES SOUTH ASIA PVT. LTD. B-1/E-27, Mohan Cooperative Industrial Estate, Mathura Road, New Delhi-110044		TYPICAL DETAILS OF RETAINING WALL (SH. 1 OF 2)		R0		DESIGN		B. SARKAR		REVIEWED		J. K. DAS	
																SHEET									
REV		DATE		DETAILS OF REVISION		BY						DRAWING No :		73806/LASA/STR/PROT-753		A2		DATE		JULY 2022		SCALE :		NTS	
																				</					

SCHEDULE OF RETAINING WALL

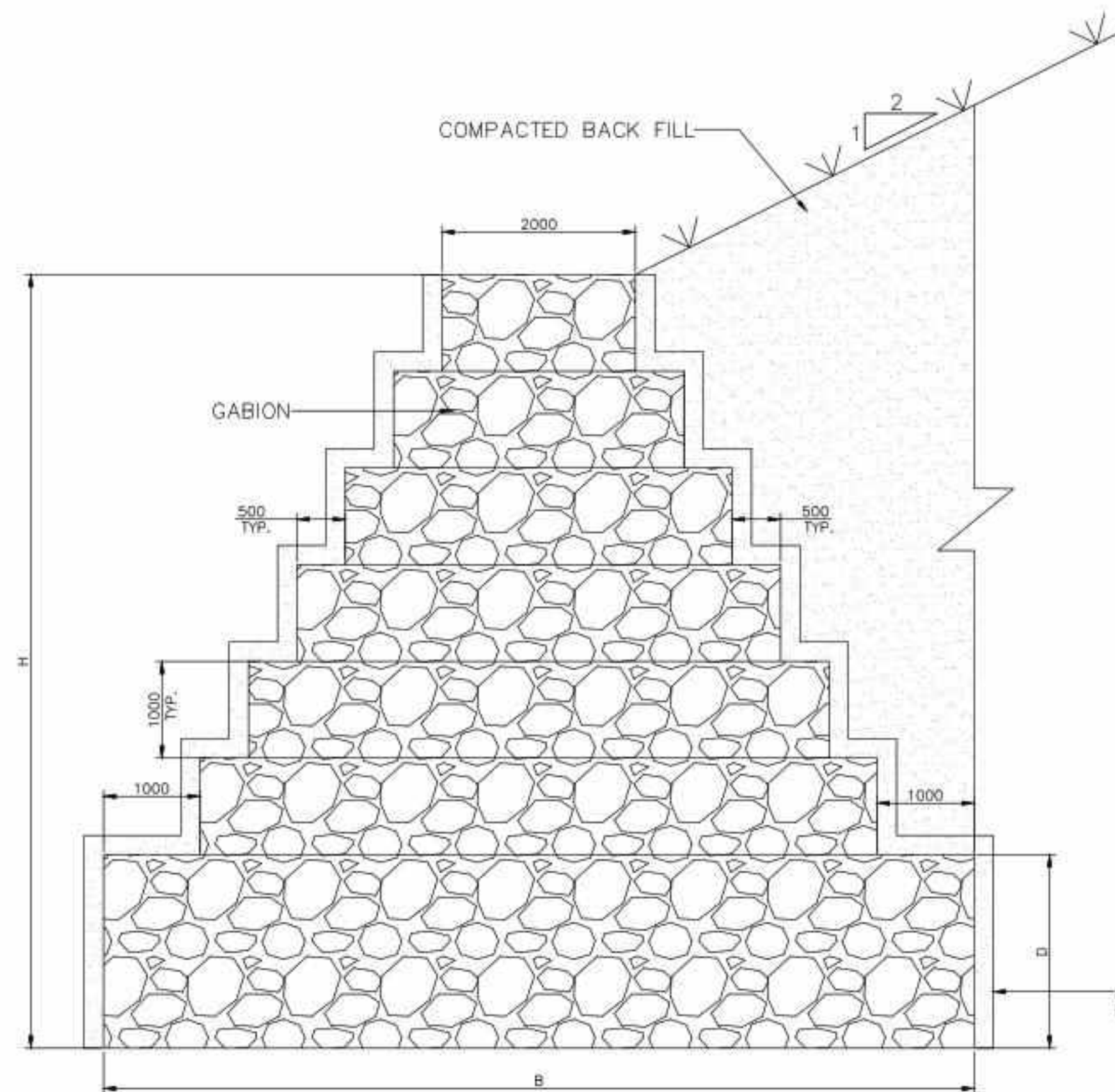
Chainage (m)		Length	Type on Hill Side
From	To		
35.19	41.851	6.661	RET_1
92.368	93.637	1.274	RET_2
96.269	97.555	1.286	RET_3
102.758	104.049	1.291	RET_3
106.636	107.914	1.278	RET_2
125.78	142.424	16.694	RET_1
160.354	160.354	0	RET_1
179.117	179.117	0	RET_2
193.114	200.395	7.281	RET_2
204.136	205.878	2.742	RET_1
236.167	240.37	4.203	RET_2
245.959	264.837	18.878	RET_1
269.615	296.94	27.325	RET_2
320.169	320.989	0.82	RET_2
322.649	325.093	2.444	RET_3
327.68	345.677	17.997	RET_2
348.916	364.091	15.175	RET_3
372.987	379.521	6.534	RET_2
382.155	392.009	9.854	RET_3
400	408.999	8.999	RET_4
432.455	432.455	0	RET_2
487.624	487.624	0	RET_4
492.774	494.436	1.662	RET_1
520.033	531.392	11.359	RET_1
542.351	543.497	1.146	RET_1
559.538	559.538	0	RET_3
562.583	565.529	2.996	RET_2
747.483	748.597	1.114	RET_1
757.17	775.507	18.337	RET_1
800.779	828.19	27.411	RET_1
831.99	834.167	2.177	RET_2
835.781	839.04	3.259	RET_1
852.343	854.638	2.295	RET_1
858.141	863.913	5.772	RET_2
867.926	869.031	1.165	RET_3
935.577	935.577	0	RET_1
941.872	941.872	0	RET_4
1016.126	1022.596	6.47	RET_2
1035.535	1037.368	1.833	RET_3
1040.424	1041.346	0.922	RET_2
1044.751	1044.751	0	RET_1
1047.724	1049.573	1.849	RET_2
1062.041	1092.283	30.242	RET_2
1095.487	1119.537	24.05	RET_1
1239.685	1239.685	0	RET_2
1241.955	1243.726	1.771	RET_3
1247.295	1249.06	1.765	RET_4
1252.65	1252.65	0	RET_3
1255.842	1262.983	7.141	RET_2
1266.438	1268.233	1.795	RET_1

Chainage (m)		Length	Type on Hill Side
From	To		
1274.493	1300.936	26.443	RET_1
1321.897	1323.1	1.203	RET_1
1350.185	1365.628	15.443	RET_1
1497.532	1498.679	1.147	RET_1
1636.492	1650.08	13.588	RET_1
1654.038	1662.354	8.316	RET_2
1665.383	1667.236	1.853	RET_1
1695.612	1709.09	13.478	RET_1
1751.221	1756.83	5.609	RET_2
1759.664	1760.46	0.796	RET_1
1775.258	1776.056	0.798	RET_1
1785.493	1785.493	0	RET_2
1794.425	1796.535	2.11	RET_2
1800.159	1800.159	0	RET_3
1870.685	1871.773	1.088	RET_3
1873.992	1875.078	1.086	RET_2
1882.29	1887.31	5.02	RET_4
1890.776	1892.426	1.65	RET_3
1896.024	1897.692	1.668	RET_4
1942.138	1942.138	0	RET_6
2194.353	2198.723	4.37	RET_1
2233.217	2248.222	15.005	RET_3
2254.112	2266.05	11.938	RET_1
2283.103	2284.2	1.097	RET_3
2315.628	2330.232	14.604	RET_1
2507.957	2509.672	1.715	RET_3
2517.761	2519.761	2	RET_1
2568.368	2571.133	2.765	RET_2
2573.417	2573.417	0	RET_3
2581.105	2582.948	1.843	RET_2
2589.902	2589.902	0	RET_2
2593.132	2593.132	0	RET_1
2595.454	2599.453	3.999	RET_3
2614.158	2619.156	4.998	RET_3
2634.253	2639.427	5.174	RET_2
2689.697	2700.697	11	RET_3
2712.214	2715.213	2.999	RET_2
2877.657	2879.861	2.204	RET_4
2883.62	2894.523	10.903	RET_2
2901.828	2903.548	7.72	RET_4
2920.578	2933.576	12.998	RET_3
2965.917	2970.273	4.356	RET_1
2978.719	2991.074	12.355	RET_1
3014.692	3015.897	1.205	RET_4
3019.708	3020.882	1.174	RET_1
3036.854	3043.854	7	RET_3
3064.81	3065.731	0.921	RET_2
3072.329	3077.83	5.501	RET_3
3080.735	3088.734	7.999	RET_2
3102.444	3113.666	11.222	RET_1

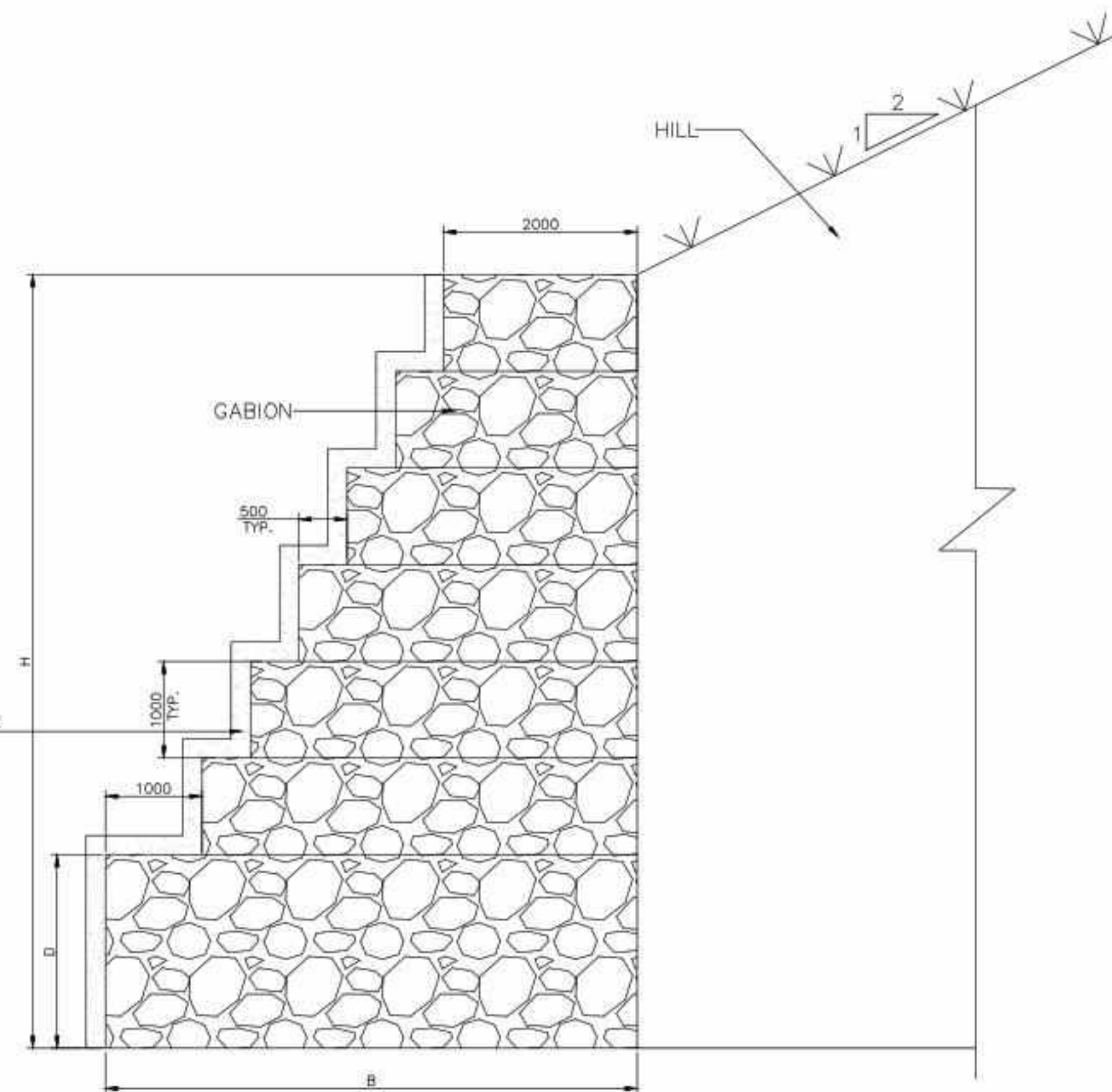
Chainage (m)		Length	Type on Hill Side
From	To		
3120.136	3131.024	10.888	RET_1
3183.992	3191.914	7.922	RET_4
3216.316	3216.316	0	RET_5
3262.589	3267.104	4.515	RET_2
3366.58	3366.58	0	RET_1
3372.738	3390.886	18.148	RET_1
3416.042	3434.841	18.799	RET_1
3446.837	3479.02	32.183	RET_1
3511.655	3511.655	0	RET_1
3519.764	3519.764	0	RET_2
3523.075	3525.204	2.129	RET_1
3597.323	3612.925	15.602	RET_1
3752.881	3767.88	14.999	RET_1
3775.026	3782.618	7.592	RET_1
3786.578	3788.754	2.176	RET_2
3795.911	3818.611	22.7	RET_2
3858.547	3850.351	1.814	RET_1
3863.624	3879.624	16	RET_2
3890.265	3894.576	4.311	RET_1
3939.967	3945.86	5.693	RET_4
3971.015	3976.965	5.95	RET_3
3996.858	3996.858	0	RET_5
4000.339	4000.339	0	RET_6
4160.946	4160.946	0	RET_3
4215.561	4216.672	1.111	RET_2
4218.889	4223.327	4.438	RET_2
4224.858	4225.968	1.11	RET_3
4280.903	4290.301	9.398	RET_4
4293.146	4293.146	0	RET_3
4297.377	4298.702	1.325	RET_4
4302.233	4303.57	1.337	RET_5
4306.983	4306.983	0	RET_6
4316.072	4316.072	0	RET_1
4318.582	4337.523	18.941	RET_1
4410.317	4413.828	3.511	RET_1
4416.165	4418.5	2.335	RET_1
4420.837	4420.837	0	RET_1
4423.174	4431.366	8.192	RET_1
4434.675	4439.895	5.22	RET_2
4464.181	4475.745	11.564	RET_1
4488.443	4502.443	14	RET_2
4506.732	4516.098	9.366	RET_1
4519.465	4519.465	0	RET_2
4538.651	4538.651	0	RET_1
4551.697	4552.521	0.824	RET_2
4560.154	4560.967	0.813	RET_3
4604.812	4604.812	0	RET_1
4615.806	4615.806	0	RET_2
4616.526	4616.753	0.227	RET_1
4620.993	4620.993	0	RET_4

Chainage (m)		Length	Type on Hill Side
From	To		
4621.045	4621.045	0	RET_1
4932.982	4932.982	0	RET_1
4937.243	4938.502	1.259	RET_1
4940.691	4941.948	1.257	RET_2
4947.774	4947.774	0	RET_4
4951.289	4951.289	0	RET_3
4956.602	4957.859	1.257	RET_1
4960.555	4979.554	18.999	RET_2
4991.931	4997.661	5.73	RET_4
5000.073	5001.465	1.392	RET_3
5004.524	5007.262	2.738	RET_2
5009.733	5009.733	0	RET_4
5030.403	5039.889	9.486	RET_1
5041.836	5042.696	0.86	RET_3
5052.017	5052.017	0	RET_2
5054.923	5054.923	0	RET_3
5068.955	5069.828	0.873	RET_1
5083.293	5085.129	1.836	RET_4
5089.144	5091.912	2.768	RET_3
5095.179	5100.745	5.566	RET_2
5108	5119.527	11.527	RET_2
5135.495	5159.495	24	RET_1
5167.662	5182.677	15.015	RET_2
5186.591	5187.736	1.145	RET_1
5207.834	5211.833	3.999	RET_4
5242.1	5247.935	5.835	RET_1
5314.75	5318.078	3.328	RET_1
5332.469	5341.209	8.74	RET_1
5346.154	5349.001	2.847	RET_2
5351.619	5354.473	2.854	RET_1
5431.002	5468.755	37.753	RET_2
5498.818	5512.277	13.459	RET_2
5518.983	5520.102	1.119	RET_2
5571.861	5573.973	2.112	RET_2
5590.056	5592.055	1.999	RET_1
5597.659	5602.161	4.502	RET_2
5625.089	5637.259	12.17	RET_1
5655.988	5657.462	1.474	RET_1
5659.714	5661.209	1.495	RET_2
5664.558	5673.967	9.409	RET_3
5700.395	5701.389	0.994	RET_5
5714.244	5719.334	5.09	RET_3
5721.783	5751.396	29.613	RET_2
5759.882	5759.882	0	RET_1
5763.226	5777.523	14.297	RET_2
5784.251	5790.251	6	RET_1
5794.289	5800.855	6.566	RET_2
5817.767	5828.272	10.505	RET_3
5830.18	5833.65	3.47	RET_2
6012.083	6012.618	0.535	RET_5

Chainage (m)		Length	Type on Hill Side
From	To		
6237.211	6237.211	0	RET_1
6240.871	6240.871	0	RET_2
6261.192	6264.361	3.169	RET_1
6360.198	6362.653	2.455	RET_2
6421.532	6427.532	6	RET_2
6433.452	6434.526	1.064	RET_2
6442.324	6444.453	2.129	RET_1
6522.52	6528.385	5.865	RET_1
6572.633	6580.281	7.648	RET_1
6587.307	6589.494	2.187	RET_1
6681.187	6682.342	1.155	RET_2
6685.866	6689.866	4	RET_3
6727.459	6732.475	5.016	RET_1
6741.115	6744.888	3.773	RET_1
6760.753	6765.749	4.996	RET_4
6770.072	6770.853	0.781	RET_1
6801.42	6807.151	5.731	RET_6
6807.966	6812.217	4.251	RET_4
6830.633	6833.417	2.784	RET_3
6835.731	6841.217	5.486	RET_2
6844.992	6844.992	0	RET_3
6861.397	6868.658	7.261	RET_1
6919.245	6919.245	0	RET_1
7086.04	7100.037	13.997	RET_2
7109.435	7110.243	0.808	RET_3
7113.114	7113.114	0	RET_2
7191.069	7194.56	3.491	RET_1
7199.39	7199.39	0	RET_1
7203.506	7213.504	9.998	RET_2
7217.51	7220.507	2.997	RET_3
7234.353	7245.351	10.998	RET_1
7266.426	7276.473	10.047	RET_3
7312.099	7312.099	0	RET_3
7340.081	7345.175	5.094	RET_1
7352.978	7366.229	13.251	RET_2
7376.328	7377.206	0.878	RET_2
7481.33	7482.584	1.254	RET_1
7978.451	8010.947	32.496	RET_1
8033.944	8037.935	3.991	RET_1
8055.216	8056.991	1.775	RET_1
8060.239	8066.417	6.178	RET_2
8080.862	8104.258	23.396	RET_1
8110.728	8113.92	3.192	RET_1
8130.457	8131.455	0.998	RET_2
8146.275	8147.274	0.999	RET_3
8240.153	8242.962	2.809	RET_1
8247.094	8249.89	2.796	RET_2
8385.485	8386.629	1.144	RET_1
8464.954	8467.156	2.202	RET_1
8480.07	8501.575	21.505	RET_1



PROPOSED GABION WALL AT VALLEY SIDE



PROPOSED GABION WALL AT HILL SIDE

Table Showing Dimensions of Gabion Retaining Wall

Sl No	Total height of retaining wall (H) (m)	Depth of Foundation (D) (m)	Base width of Retaining wall (B) (m)
1	3.0	2.00	5.00
2	4.0	2.00	5.00
3	5.0	2.00	6.00
4	6.0	2.00	7.00
5	7.0	2.00	8.00
6	8.0	2.00	9.00

NOTES:-

- ALL DIMENSIONS ARE IN METERS OTHERWISE SPECIFIED. NO DIMENSIONS ARE TO BE SCALED. ONLY WRITTEN DIMENSIONS TO BE FOLLOWED.
- NON WOVEN GEOTEXTILE IS TO BE PROVIDED WHICH ACT AS A FILTER
- BACKFILL SOIL IS TO BE WELL COMPACTED TO 95% MAXIMUM DRY DENSITY.
- COMPACTION TO BE DONE IN LAYERS.
- WORK SHALL BE CARRIED OUT STRICTLY AS PER GIVEN TECHNICAL SPECIFICATION IN ASSOCIATION WITH MORTH & RELEVANT IRC SPECIFICATIONS.
- ALL THE MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE ROAD DEVELOPMENT AUTHORITY AND TECHNICAL SPECIFICATION.
- DETAILED DESIGN, DRAWING AND CONSTRUCTION METHODOLOGY SHALL BE SUBMITTED BY THE CONTRACTOR TO THE ENGINEER FOR APPROVAL.

CLIENT :



Roads & Bridges Department
(Government of Sikkim)

PROJECT :

Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim

DESIGN CONSULTANT :

LEA ASSOCIATES SOUTH ASIA PVT. LTD.
B-1/E-27, Mohan Cooperative Industrial Estate,
Mathura Road, New Delhi-110044

DRAWING TITLE:-

TYPICAL DETAILS OF GABION RETAINING WALL

DRAWING No : 73806/LASA/STR/PROT-754

REV.

R0

SHEET

A2

DRAWN

A. DHAR

DESIGN

B. SARKAR

CHECKED

S. MONDAL

REVIEWED

J. K. DAS

DATE

JULY 2022

SCALE :

NTS

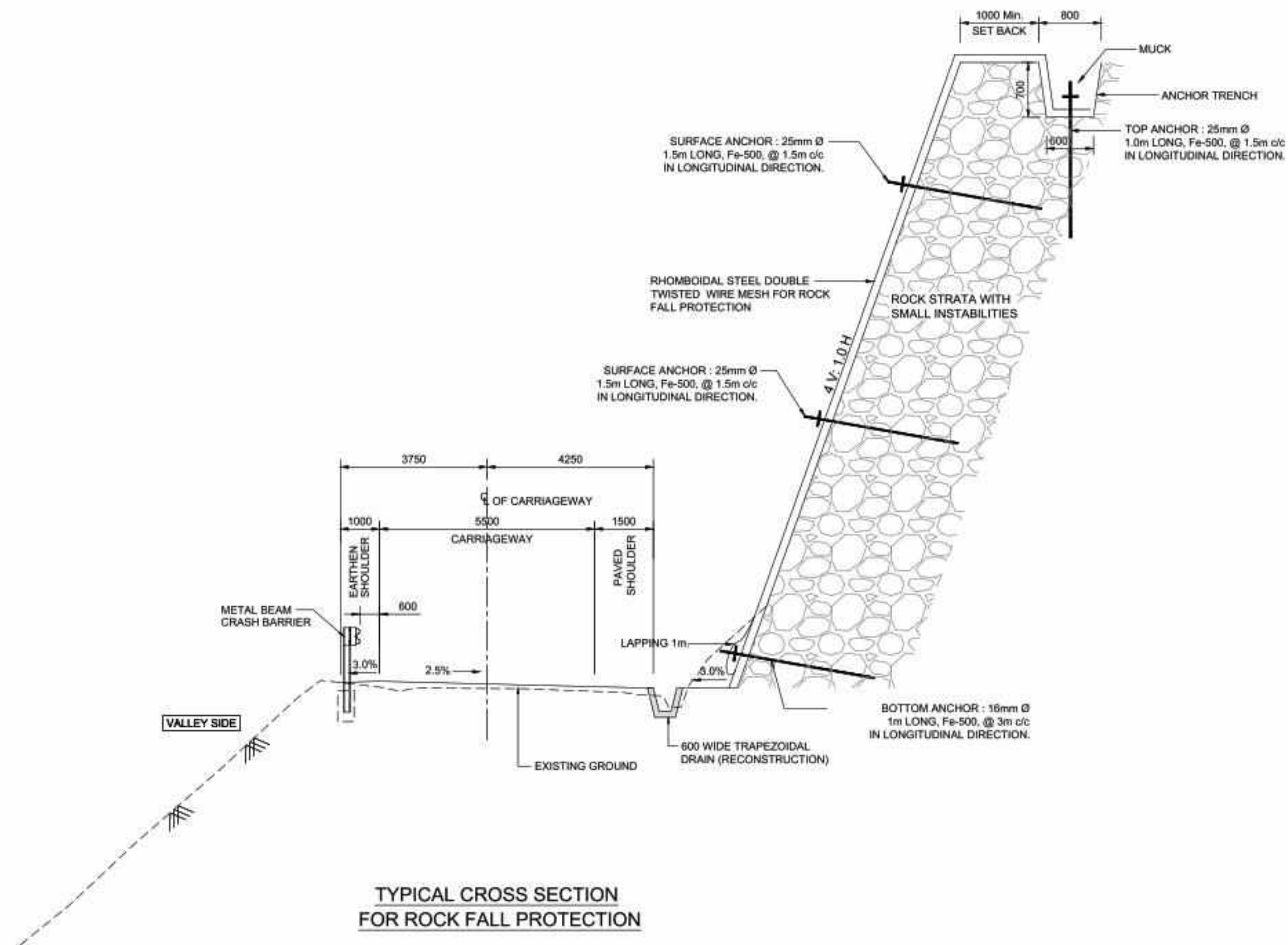
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TABLE 1
SIDE SLOPE FOR EMBANKMENT

MATERIAL	V:H
EMBANKMENT < 1m	1:4
EMBANKMENT 1m-2m	1:3
EMBANKMENT 2m-3m	1:2
EMBANKMENT >3m	1:1.5

TABLE 2
BACK SLOPE FOR CUTTINGS

MATERIAL	V:H
EARTH / SOIL < 1m	1:3
EARTH / SOIL 1m - 2m	1:2
EARTH / SOIL 2m - 10m	1:1.5
EARTH / SOIL > 10m	BENCHED SLOPE
ROCK (SOUND)	4:1
ROCK (WEATHERED)	2:1



TYPICAL CROSS SECTION
FOR ROCK FALL PROTECTION

GENERAL

1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.

MATERIAL SPECIFICATIONS

1. MONO ORIENTED WIRE MESH TYPE 10X12 WIRE DIA 2.7 WITH 8 MM WIRE ROPES INSERTED AT 1.5 M C/C SPACING IN LONGITUDINAL DIRECTION OF THE MECHANICALLY WOVEN HEXAGONAL SHAPE DOUBLE TWISTED MESH
2. ANCHORS SHALL BE OF 16 & 25 MM DIA, FE-500, AND SHALL BE EPOXY COATED.
3. MS BEARING PLATE SHALL BE EPOXY COATED AND OF SIZE 200X200X10MM.

CLIENT :



Roads & Bridges Department
(Government of Sikkim)

PROJECT :

**Consultancy Services for Feasibility Studies
and Preparation of Detailed Project Report
for Roads and Bridges in Sikkim**

DESIGN CONSULTANT :



LEA ASSOCIATES SOUTH ASIA PVT. LTD.
B-1/E-27, Mohan Cooperative Industrial Estate,
Mathura Road, New Delhi-110044

DRAWING TITLE:-

ROCK FALL PROTECTION

DRAWING No : 73806/LASA/STR/PROT-755

REV.

R0

SHEET

A2

DRAWN A. DHAR

CHECKED S. ROY

DESIGN SOUMENDU

REVIEWED J. K. DAS

DATE JULY 2022

SCALE : NTS

REV DATE DETAILS OF REVISION BY

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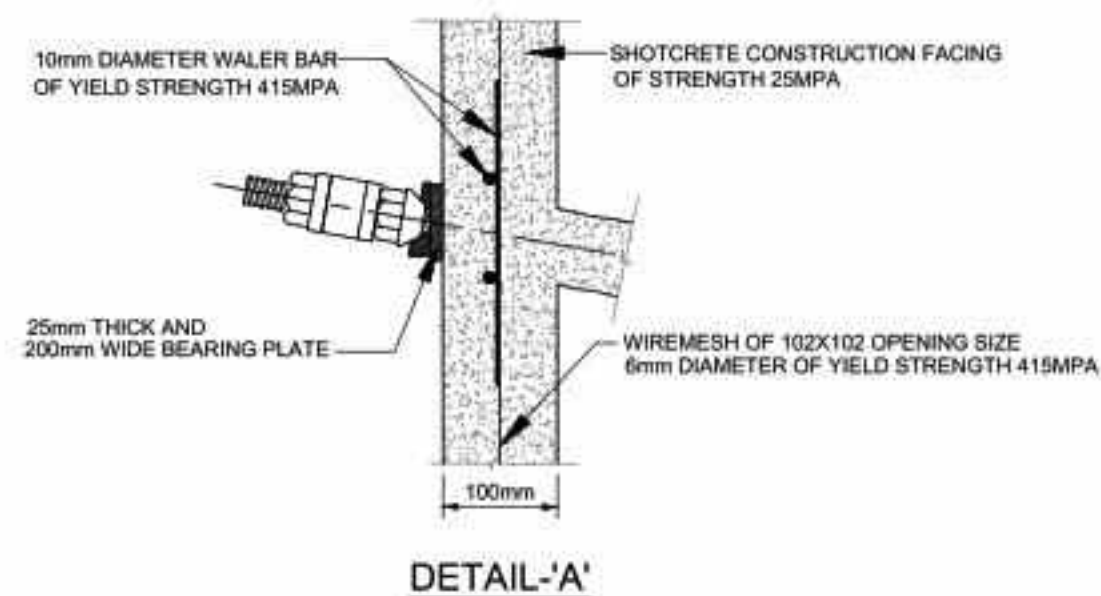
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DETAIL-'A'

TABLE 2
BACK SLOPE FOR CUTTINGS

MATERIAL	V:H
EARTH / SOIL < 1m	1:3
EARTH / SOIL 1m - 2m	1:2
EARTH / SOIL 2m - 10m	1:1.5
EARTH / SOIL > 10m	BENCHED SLOPE
ROCK (SOUND)	4:1
ROCK (WEATHERED)	2:1



PERFORATIONS 6MMØ APPROX
12 STAGGERED HOLES PER
RUNNING METRE/PER ROW

150MMØ SEMI PERFORATED PVC
PIPE WRAPPED WITH GEOTEXTILE

SECTION X-X

TOP PLAN AT SEMI PERFORATED PIPE

1. ALL DIMENSION ARE IN MILLIMETERS.
2. PAVEMENT THICKNESS WILL BE FINALIZED AFTER PAVEMENT DESIGN

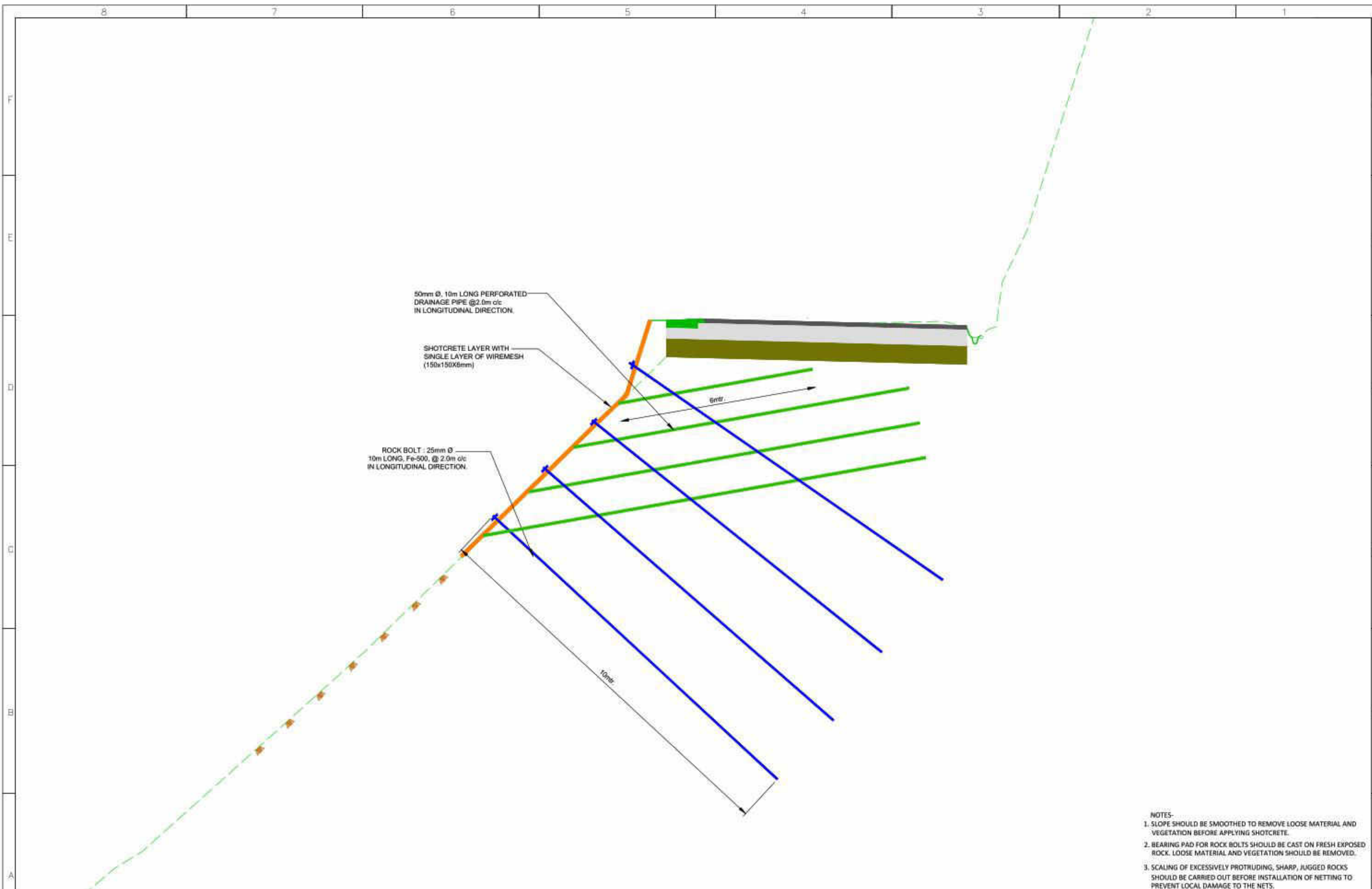
CLIENT :

 **Roads & Bridges Department**
(Government of Sikkim)

DESIGN CONSULTANT :

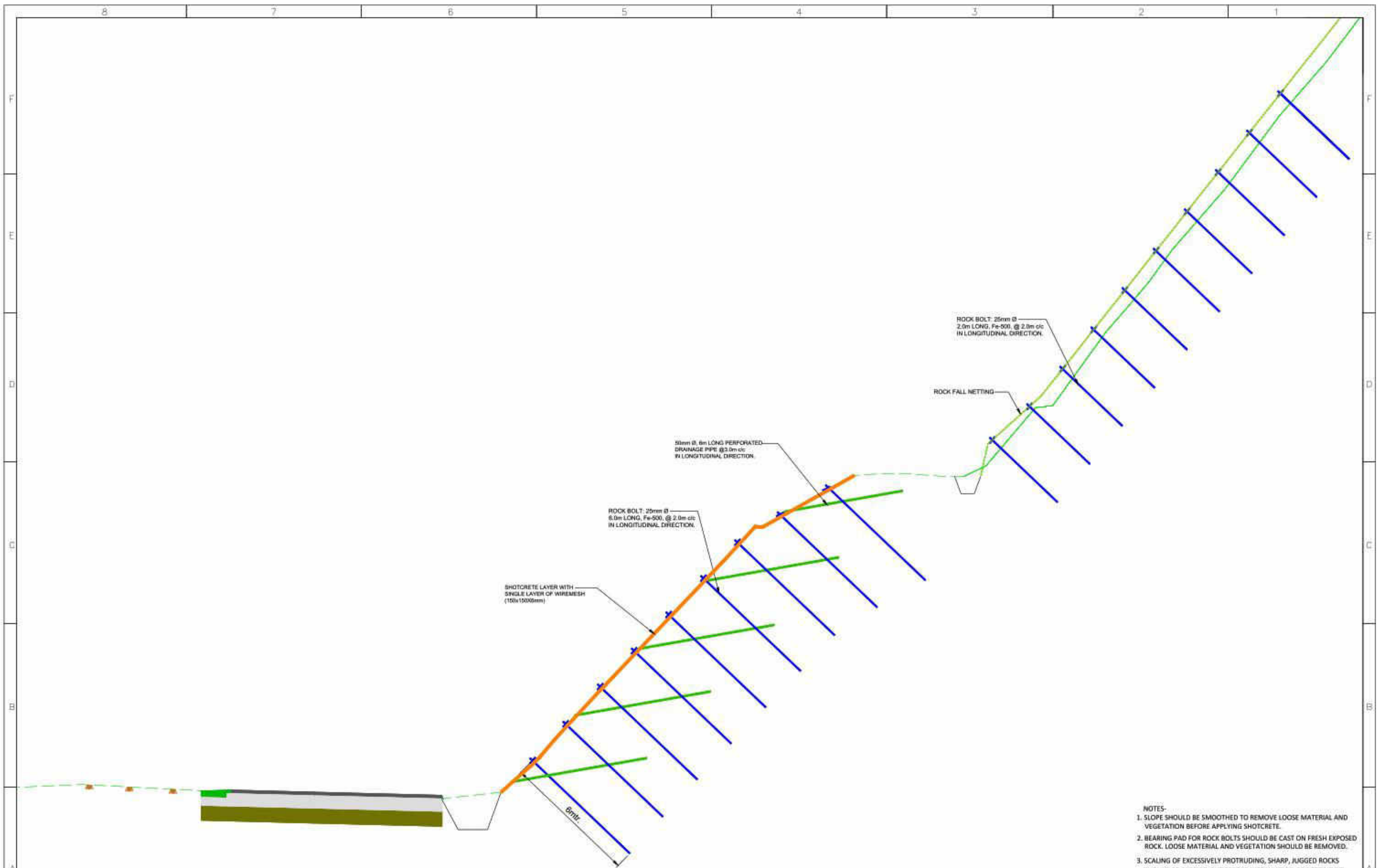
 **LEA ASSOCIATES SOUTH ASIA PVT. LTD.**
B-1/E-27, Mohan Cooperative Industrial Estate,
Mathura Road, New Delhi-110044



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	DESIGN	SOURMENDU	REVIEWED	J. K. DAS
	A2	DATE	JULY 2022	SCALE :

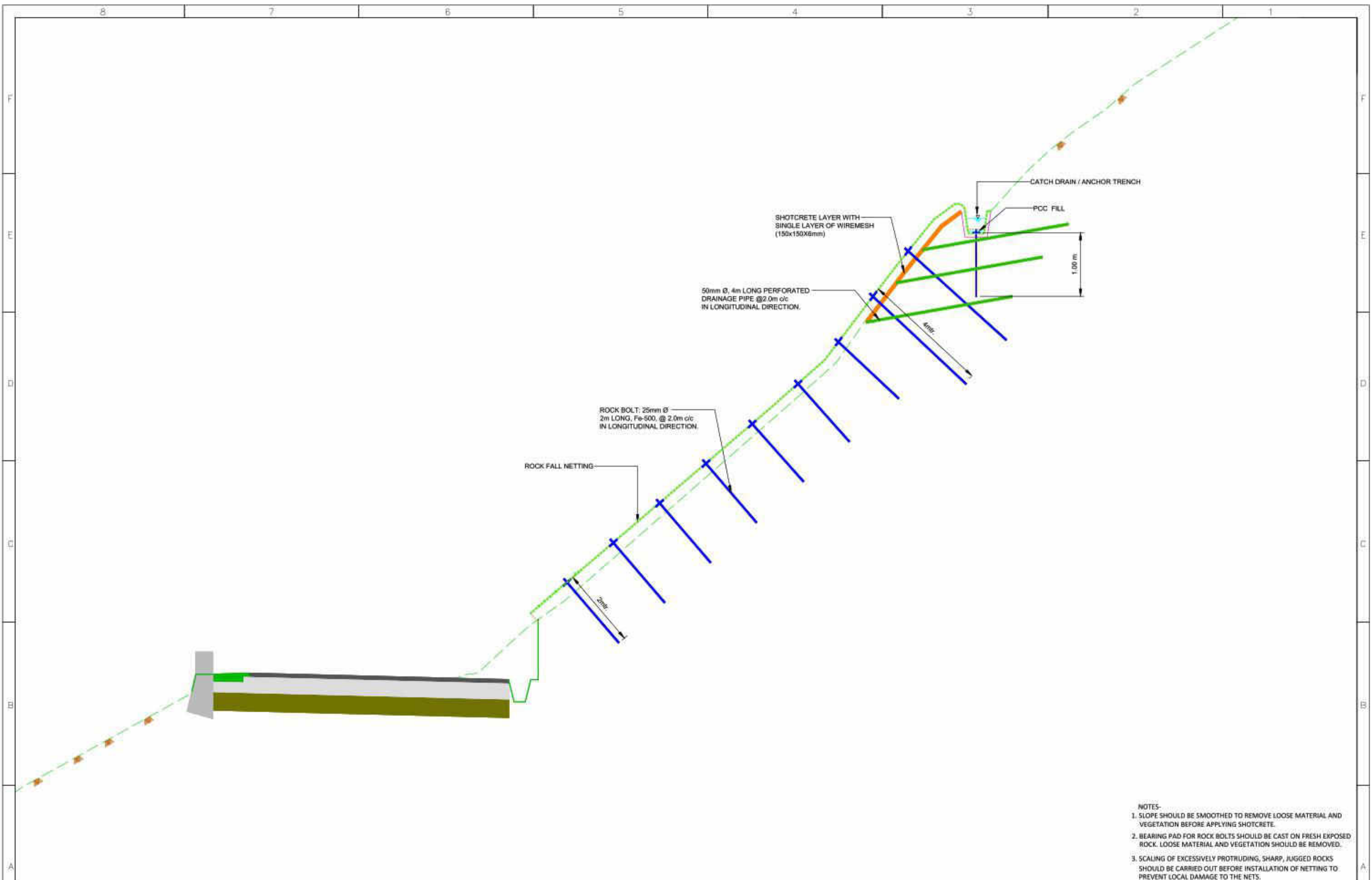




- NOTES-
1. SLOPE SHOULD BE SMOOTHED TO REMOVE LOOSE MATERIAL AND VEGETATION BEFORE APPLYING SHOTCRETE.
 2. BEARING PAD FOR ROCK BOLTS SHOULD BE CAST ON FRESH EXPOSED ROCK. LOOSE MATERIAL AND VEGETATION SHOULD BE REMOVED.
 3. SCALING OF EXCESSIVELY PROTRUDING, SHARP, JAGGED ROCKS SHOULD BE CARRIED OUT BEFORE INSTALLATION OF NETTING TO PREVENT LOCAL DAMAGE TO THE NETS.

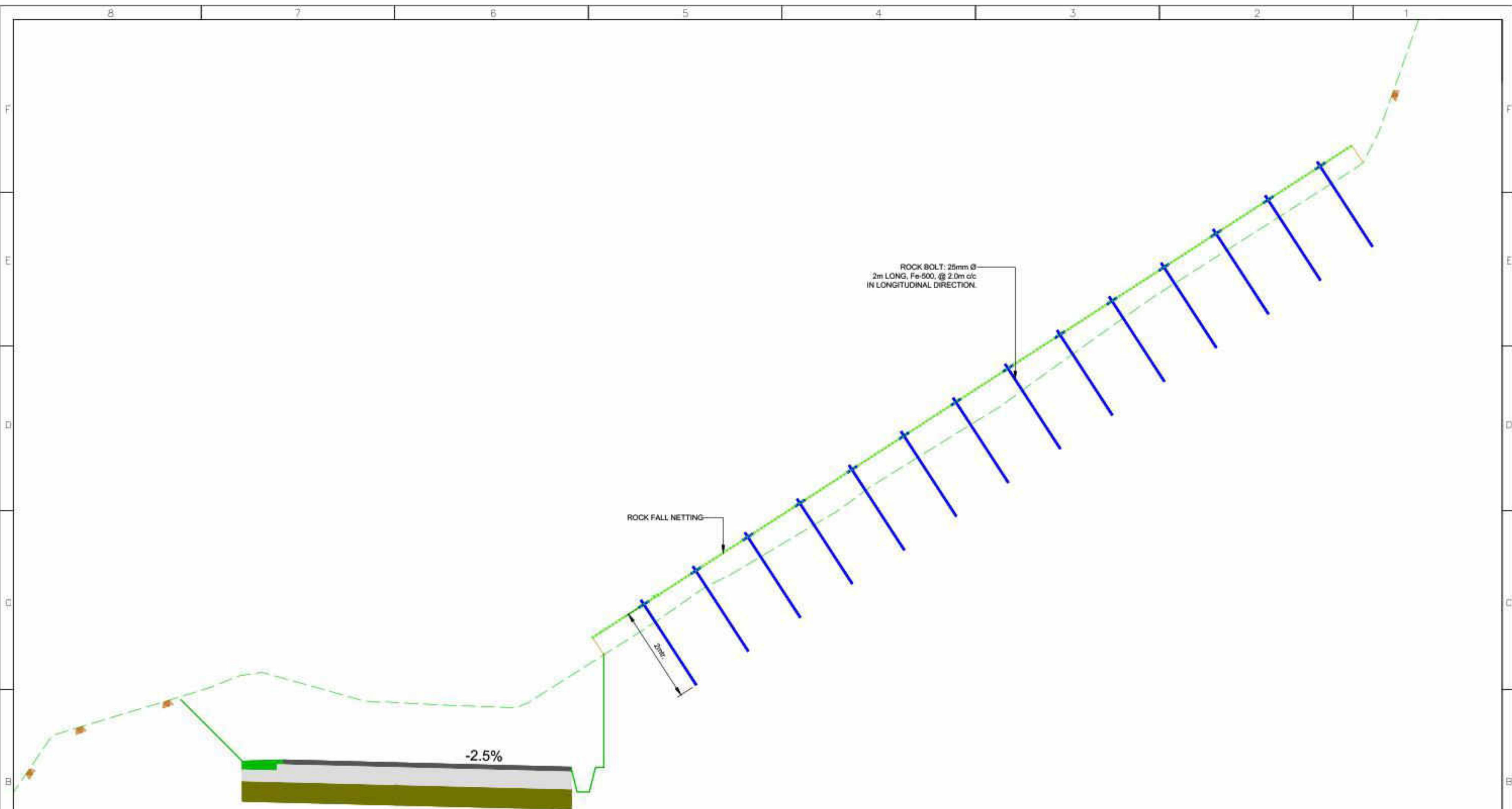
CLIENT :				PROJECT :				DESIGN CONSULTANT :				DRAWING TITLE:-				REV.	DRAWN	PRADEEP	CHECKED	SHASHANK
Roads & Bridges Department				Consultancy Services for Feasibility Studies				LEA ASSOCIATES SOUTH ASIA PVT. LTD.				VALLEY SLOPE PROTECTION				#0	DESIGN	KULDEEP	REVIEWED	SAILESH
(Government of Sikkim)				and Preparation of Detailed Project Report				B-1/E-27, Mohan Cooperative Industrial Estate,				From Ch. 0+420 To Ch. 0+510 Km				SHEET	DATE	JUNE 2023	SCALE :	
BY				for Roads and Bridges in Sikkim				Mathura Road, New Delhi-110044				DRAWING No : 73808/LASA/GEO/E1/PROT-782				A2				
REV	DATE	DETAILS OF REVISION																		



				CLIENT :  Roads & Bridges Department (Government of Sikkim)		PROJECT : Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim		DESIGN CONSULTANT :  LEA ASSOCIATES SOUTH ASIA PVT. LTD. B-1/E-27, Mohan Cooperative Industrial Estate, Mathura Road, New Delhi-110044		DRAWING TITLE:- HILL SLOPE PROTECTION E1 - RORATHANG TO RONGLI From Ch. 2+000 To Ch. 2+040 Km		REV. R0		DRAWN		PRADDEEP		CHECKED		SHASHANK	
REV				DATE		DETAILS OF REVISION		BY		SHEET		A2		DESIGN		KULDEEP		REVIEWED		SAILESH	
8				7		6		5		4		3		2		1					
Call File No: H:\3808\PROJECT\Working\Output\Phase II\FINAL\PROT-763\HILL SLOPE PROTECTION E1\PROT-763.dwg Plot Date: 17 July, 2023 9:44 AM																					



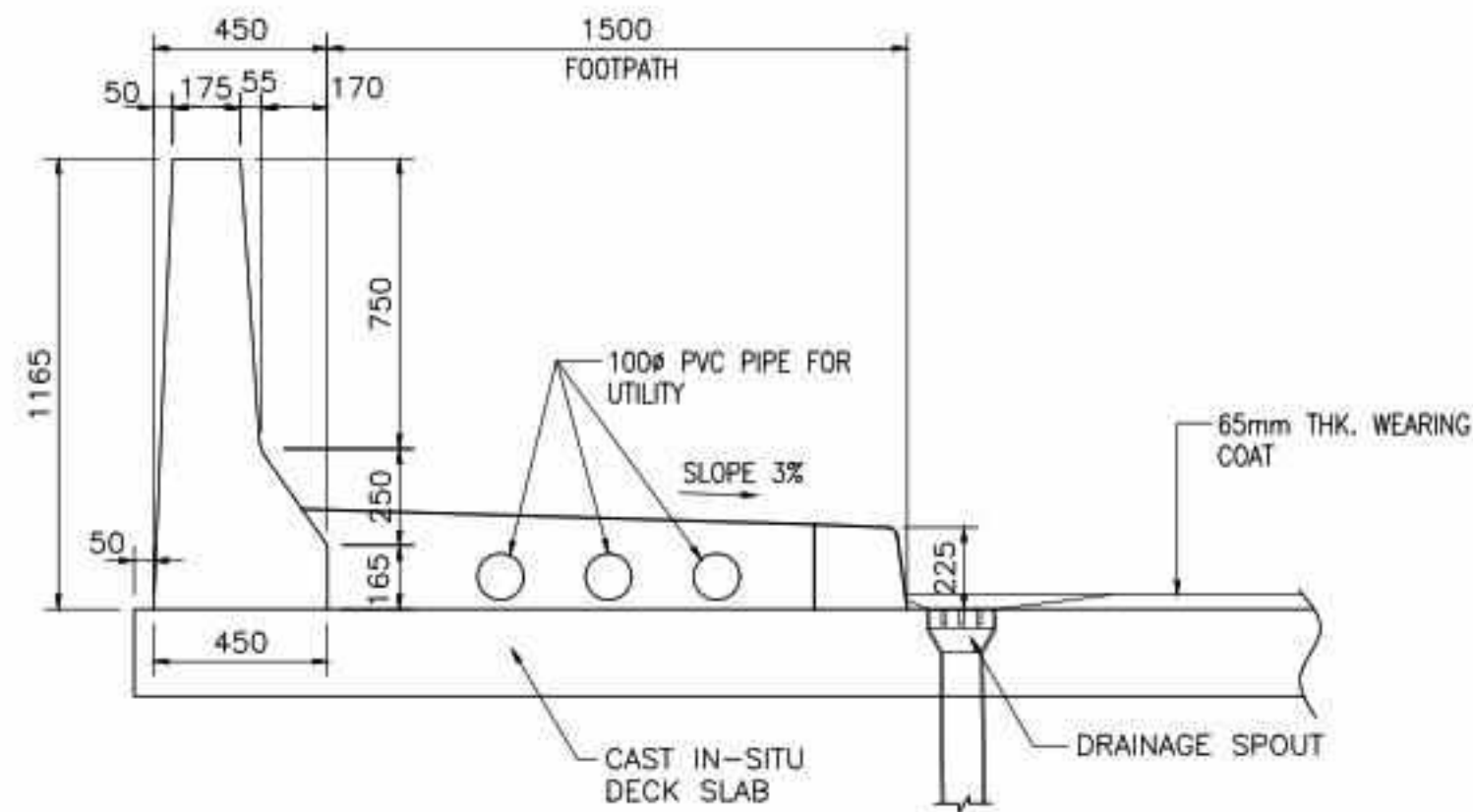
CLIENT :  Roads & Bridges Department (Government of Sikkim)				PROJECT : Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim				DESIGN CONSULTANT :  LEA ASSOCIATES SOUTH ASIA PVT. LTD. B-1/E-27, Mohan Cooperative Industrial Estate, Mathura Road, New Delhi-110044				DRAWING TITLE:- HILL SLOPE PROTECTION E1 - RORATHANG TO RONGLI From Ch. 2+980 To Ch. 3+050 Km				DRAWING No : 73808/LASA/GEO/E1/PROT-764			
REV	DATE	DETAILS OF REVISION	BY	REV	DATE	DETAILS OF REVISION	BY	REV	DATE	DETAILS OF REVISION	BY	REV	DATE	DETAILS OF REVISION	BY	REV	DATE	DETAILS OF REVISION	BY



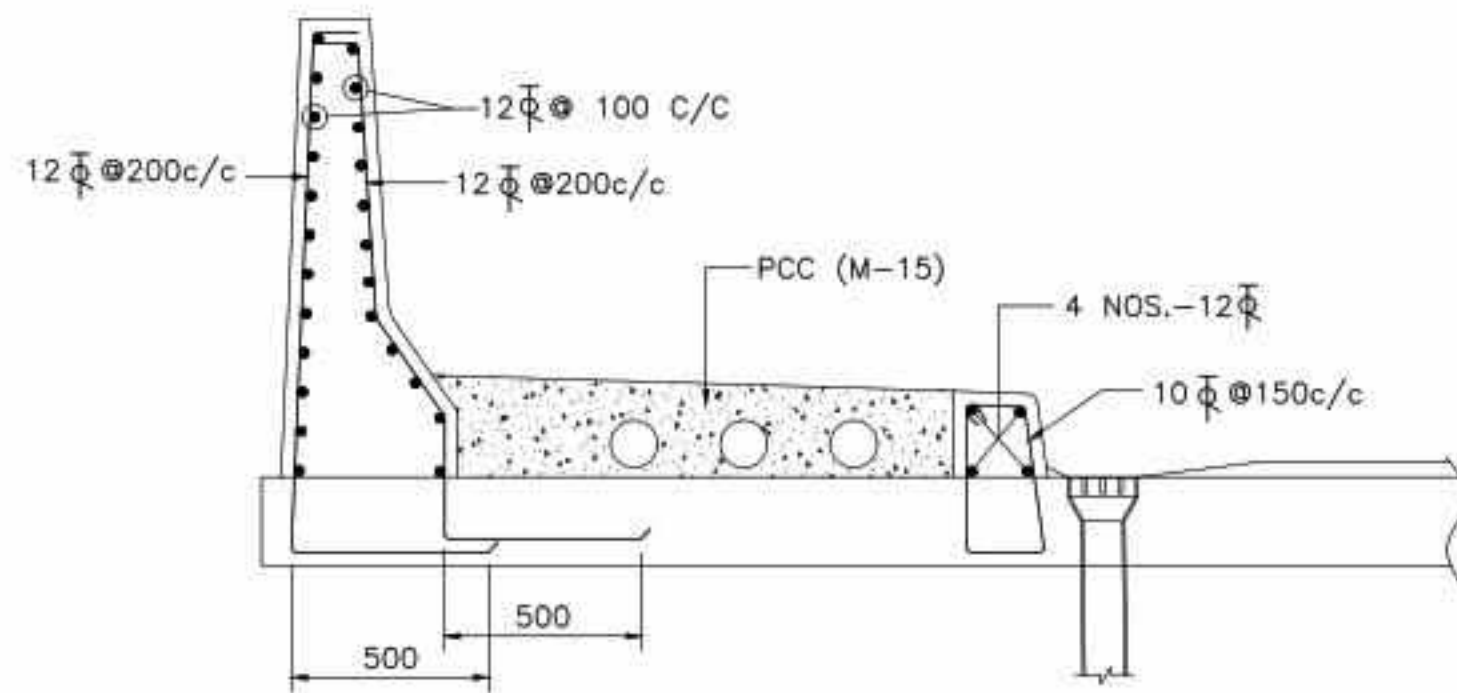
- NOTES-
1. SLOPE SHOULD BE SMOOTHED TO REMOVE LOOSE MATERIAL AND VEGETATION BEFORE APPLYING SHOTCRETE.
 2. BEARING PAD FOR ROCK BOLTS SHOULD BE CAST ON FRESH EXPOSED ROCK. LOOSE MATERIAL AND VEGETATION SHOULD BE REMOVED.
 3. SCALING OF EXCESSIVELY PROTRUDING, SHARP, JAGGED ROCKS SHOULD BE CARRIED OUT BEFORE INSTALLATION OF NETTING TO PREVENT LOCAL DAMAGE TO THE NETS.

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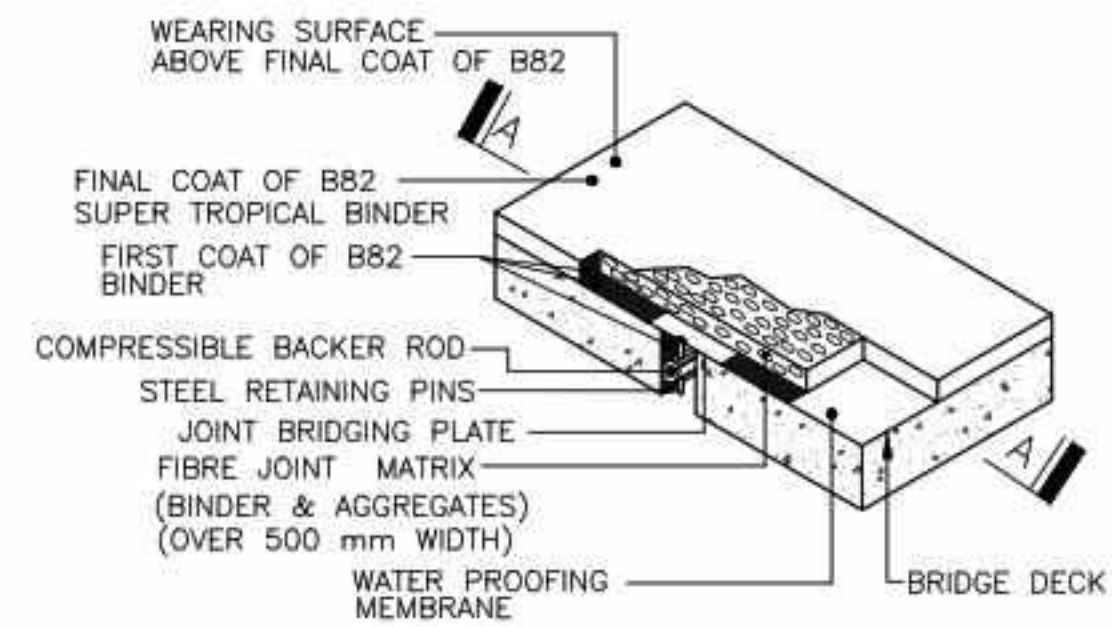
MISCELLANEOUS DRAWINGS



DETAILS OF CRASH BARRIER WITH FOOTPATH
(SCALE 1:25)

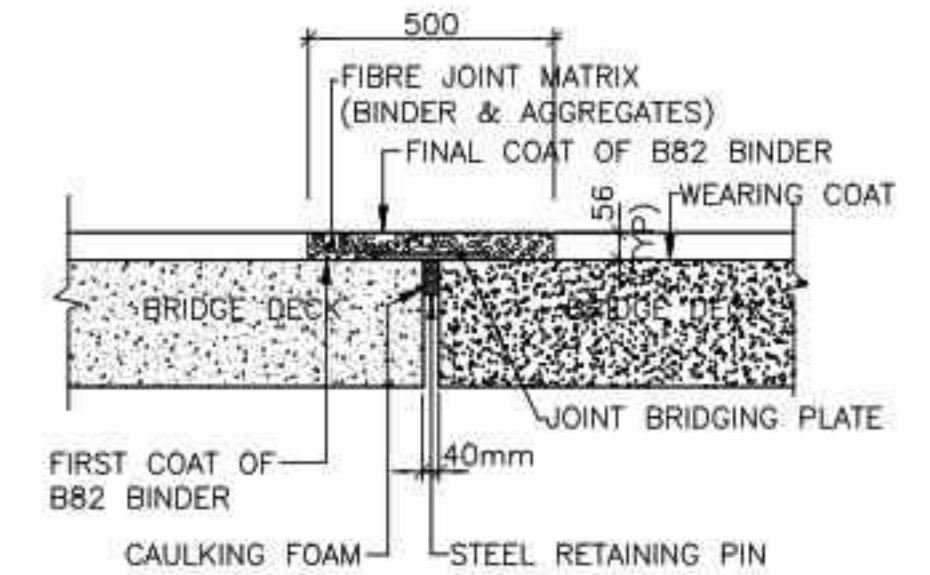


REINFORCEMENT DETAILS OF CRASH BARRIER WITH FOOTPATH
(SCALE 1:25)



ASHPALTIC PLUG JOINT

DETAILS OF ASPHALTIC PLUG TYPE EXPANSION JOINT
(FOR RCC T-GIRDER TYPE SUPERSTRUCTURE)
(SCALE 1:20)



SECTION A-A

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS MENTIONED OTHERWISE. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
2. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH RELEVANT G.A. & DETAIL DRAWINGS.
3. CLEAR COVER TO MAIN REINFORCEMENT SHALL BE 40mm.
4. RAILING, CRASH BARRIER & SAFETY KERB SHALL BE ERECTED ONLY AFTER THE STRUCTURAL CONCRETE OF SUPERSTRUCTURE HAS HARDENED AND SHUTTERING IS RELEASED.
5. JOINT FILLER (IF REQUIRED) SHALL CONFORM TO SPECIFICATION.

LEGEND:

TOP/FAR FACE BAR SHOWN THUS ————
BOTTOM/NEAR FACE BAR SHOWN THUS ————

CLIENT :



Roads & Bridges Department
(Government of Sikkim)

PROJECT :

Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim

DESIGN CONSULTANT :

LEA ASSOCIATES SOUTH ASIA PVT. LTD.
B-1/E-27, Mohan Cooperative Industrial Estate,
Mathura Road, New Delhi-110044

DRAWING TITLE:-

TYPICAL DETAILS OF CRASH BARRIER, FOOTPATH AND ASPHALT EXPANSION JOINT

DRAWING No : 73806/LASA/STR/MISC-801

REV.

R0

SHEET

A2

DRAWN

DESIGN

DATE

JULY 2022

A. DHAR

B. SARKAR

SCALE :

NTS

CHECKED

REVIEWED

SCALE :

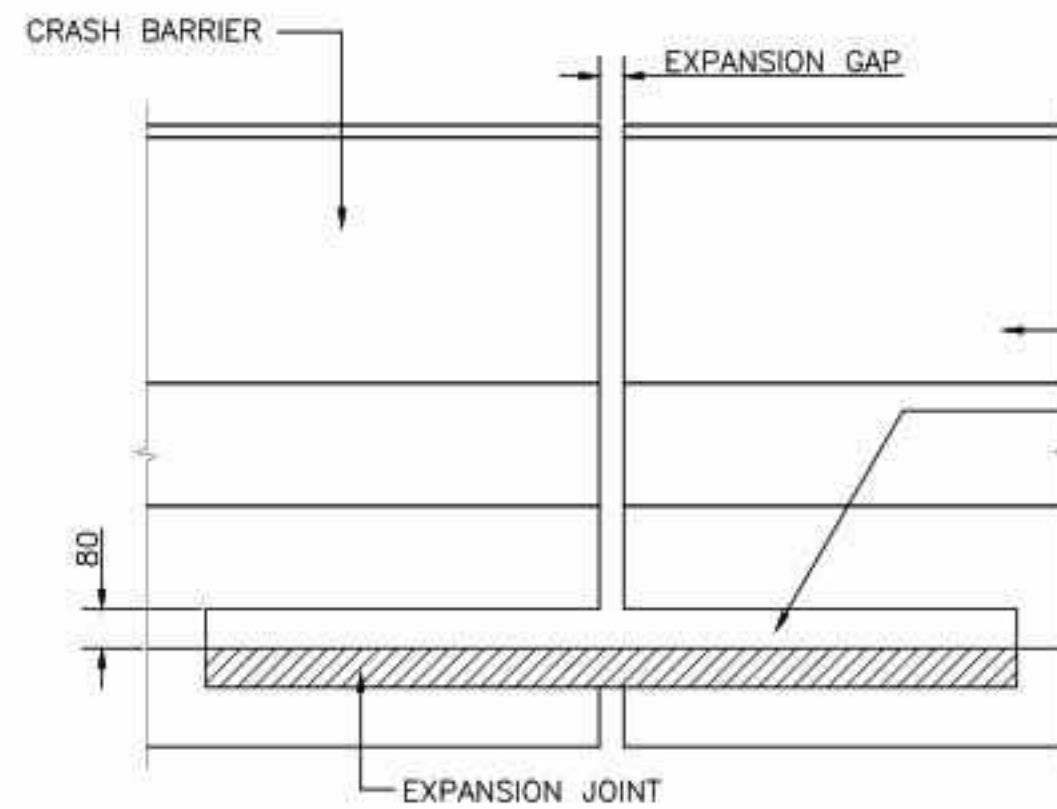
NTS

S. MONDAL

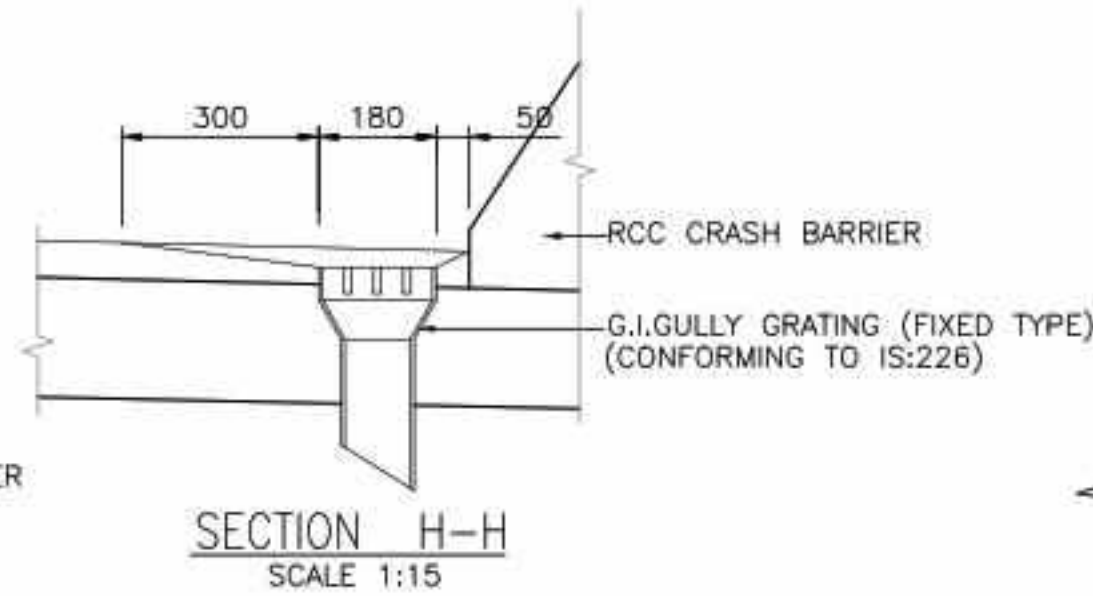
J. K. DAS

SCALE :

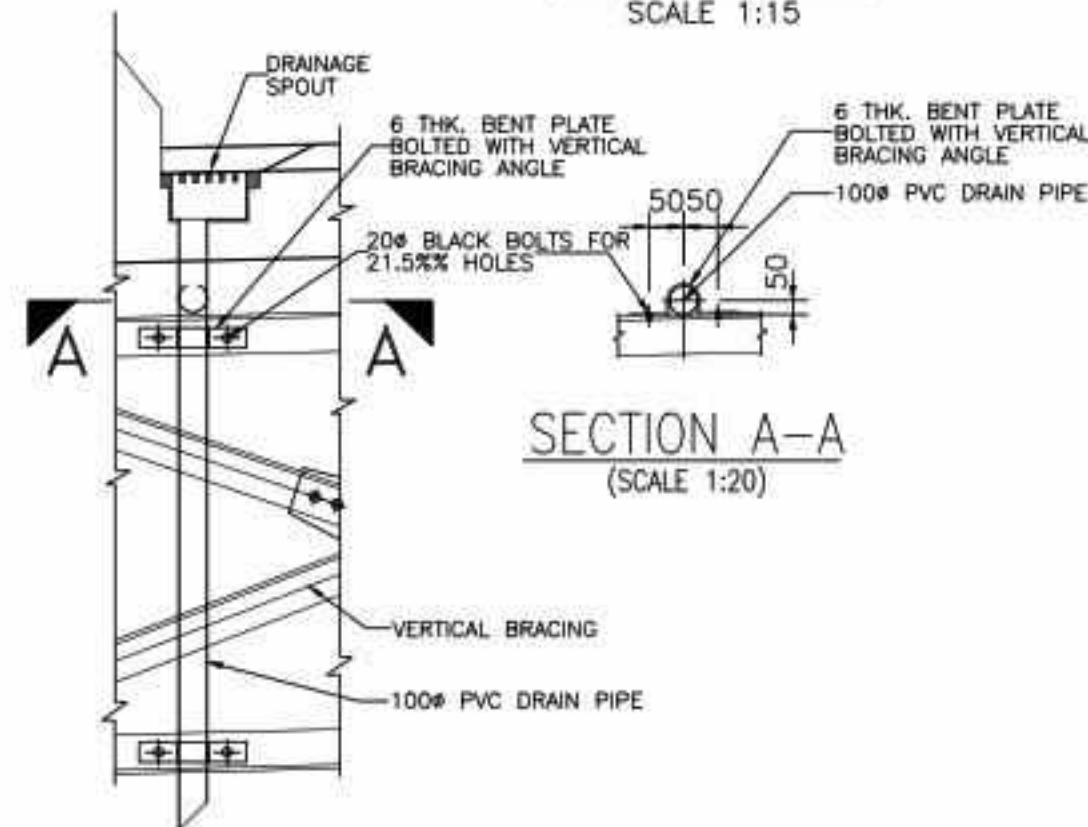
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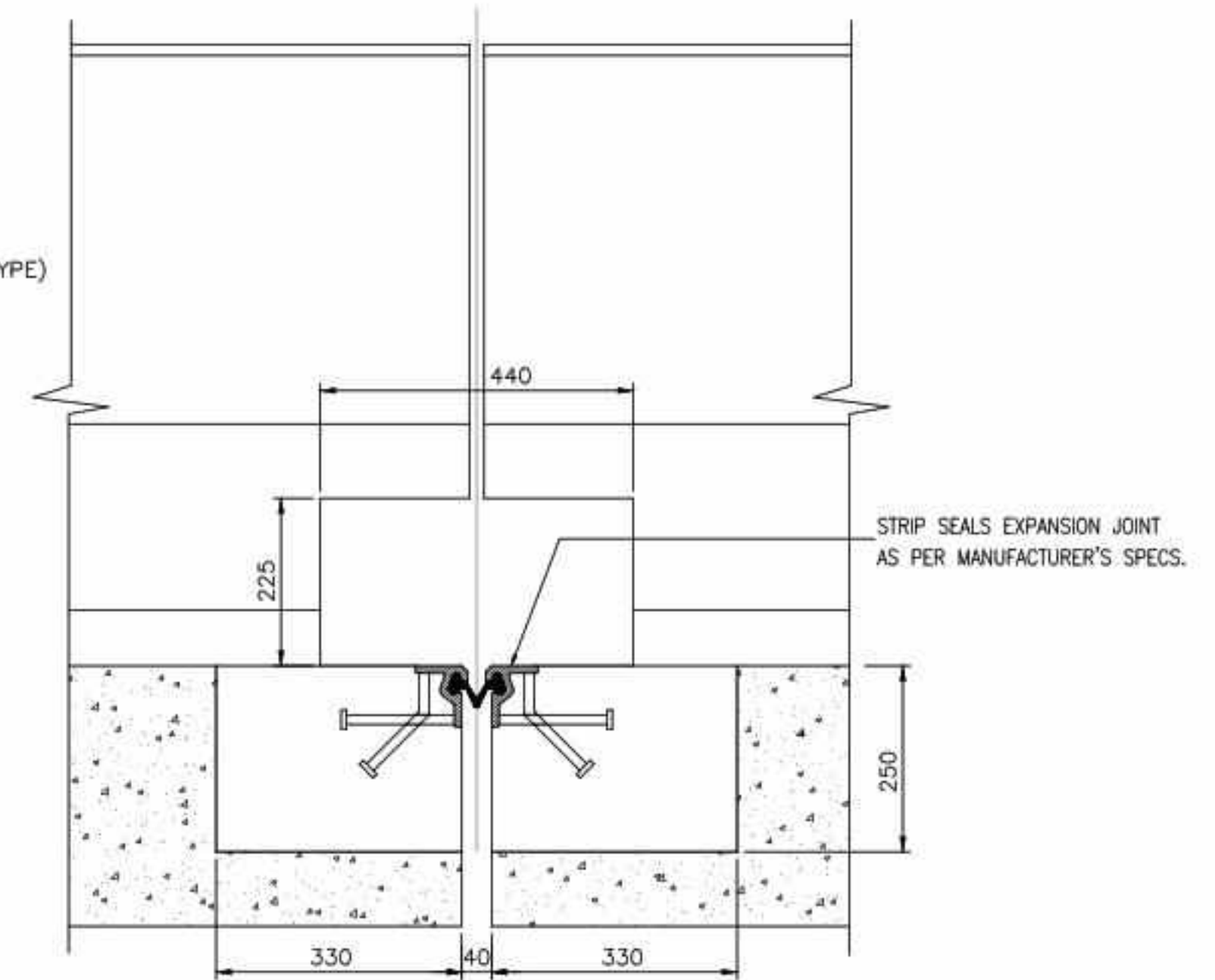
CROSS SECTION OF EXPANSION JOINT
SHOWING RECESS
(SCALE 1:20)



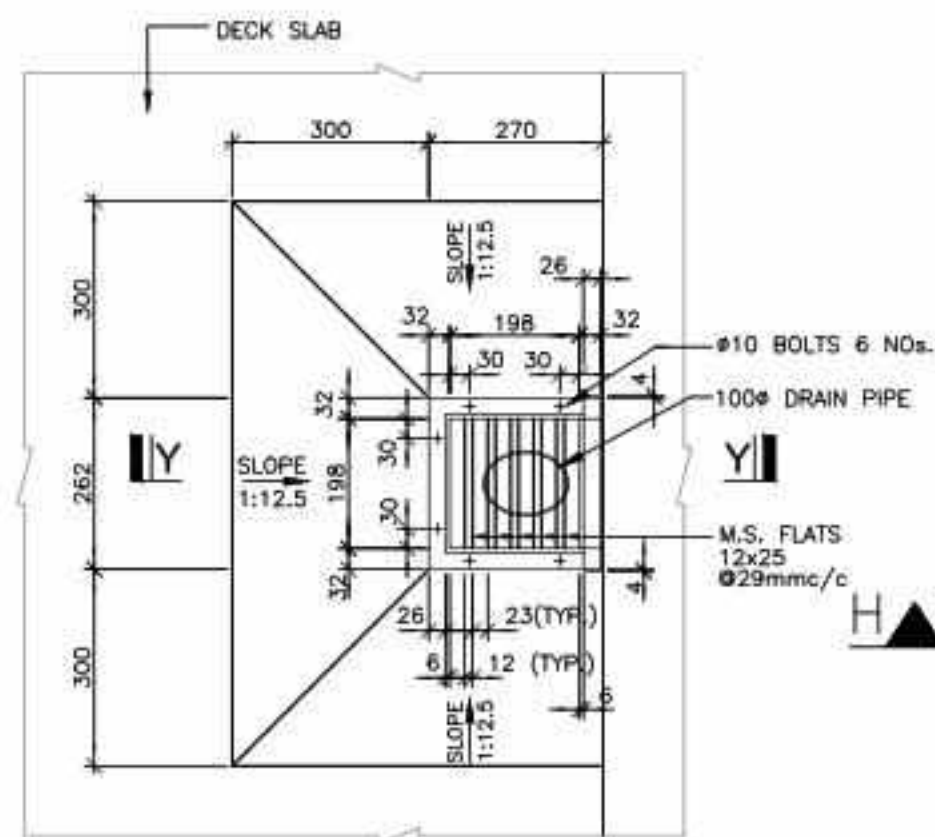
SECTION H-H
SCALE 1:15



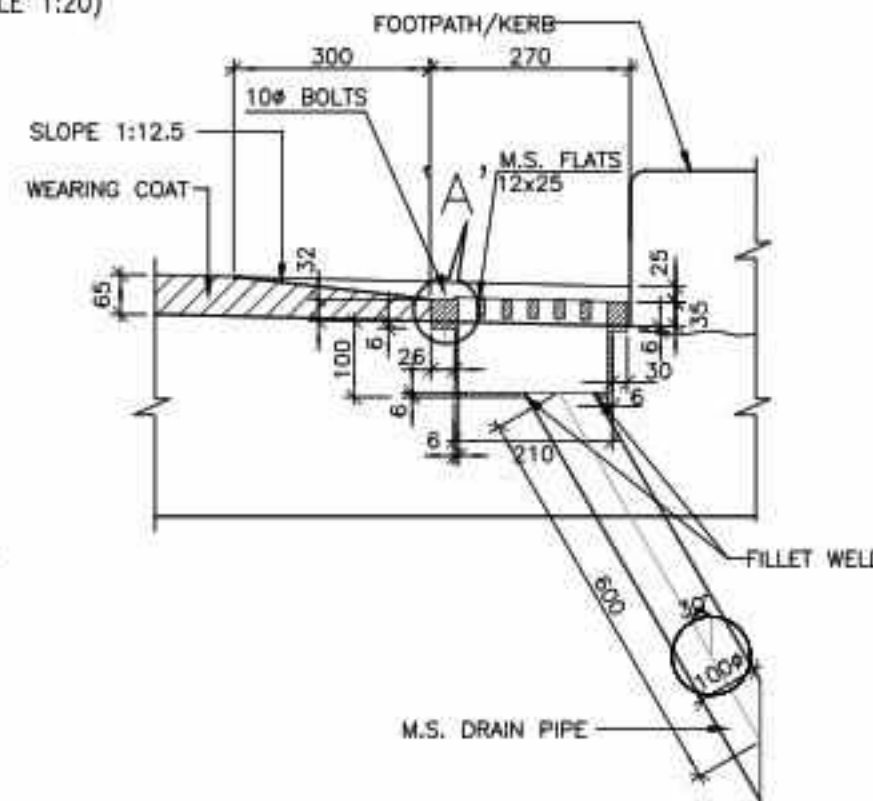
DETAIL SHOWING
DRAINAGE CONNECTION
(SCALE 1:20)



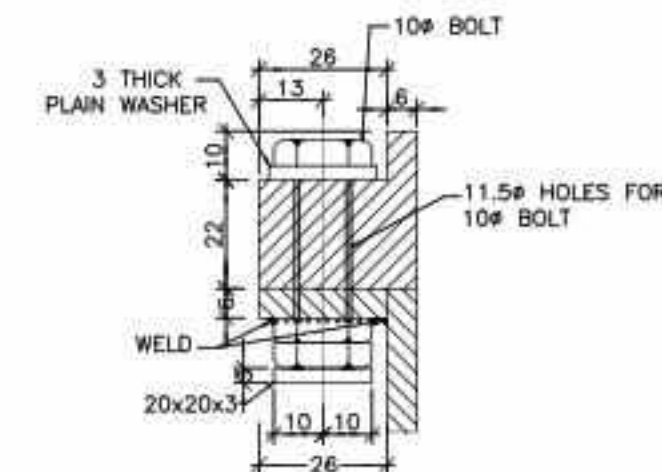
TYPICAL CROSS SECTION SHOWING STRIP SEAL
TYPE EXPANSION JOINT ARRANGEMENT
(SCALE 1:20)



PLAN
TYPICAL DETAIL OF DRAINAGE SPOUT
& COLLECTION PIT
TYPICAL DETAIL OF DRAINAGE SPOUT
SCALE 1:10






SECTION Y-Y
SCALE 1:10

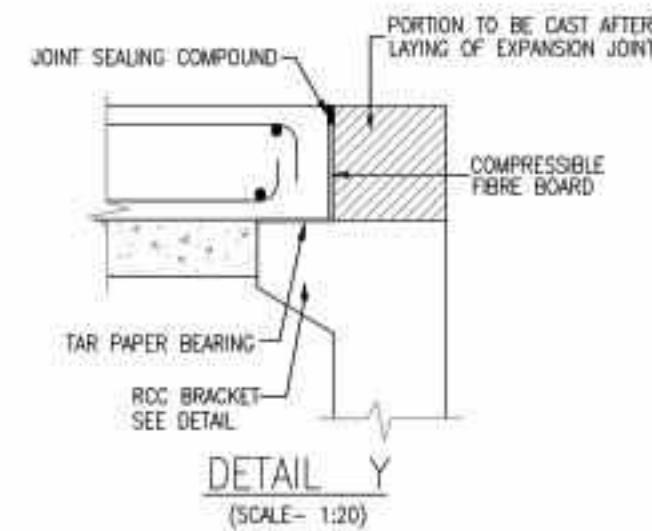
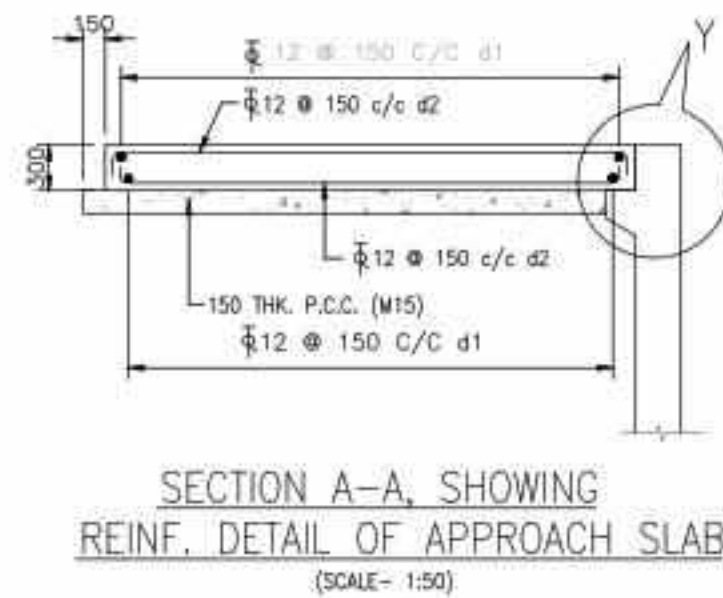
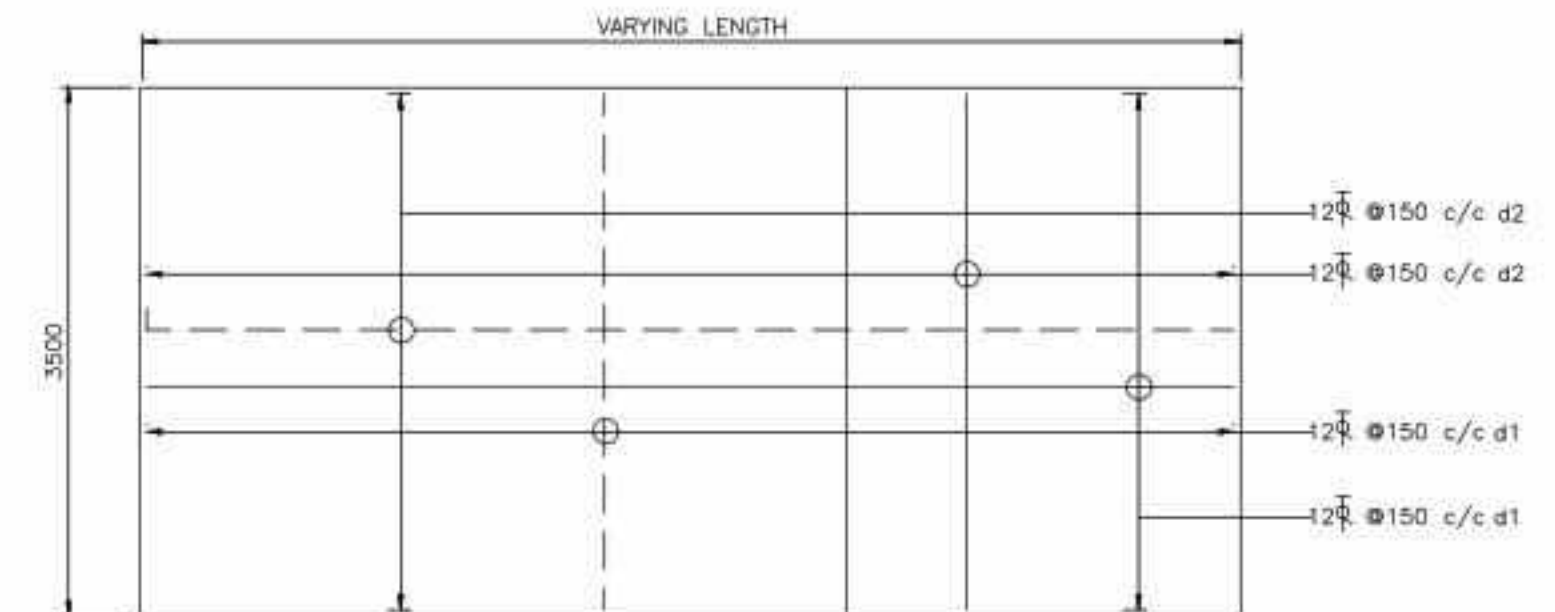
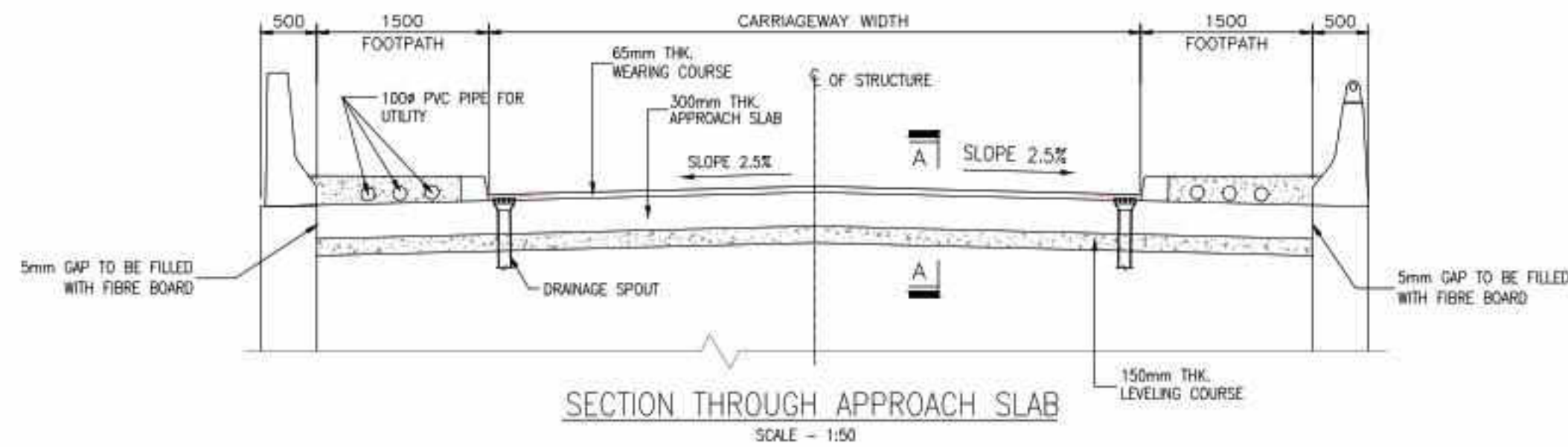


DETAIL 'A'
(SCALE 1:2)

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS MENTIONED OTHERWISE. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
2. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH RELEVANT G.A. & DETAIL DRAWINGS.
3. CLEAR COVER TO MAIN REINFORCEMENT SHALL BE 40mm.
4. RAILING, CRASH BARRIER & SAFETY KERB SHALL BE ERECTED ONLY AFTER THE STRUCTURAL CONCRETE OF SUPERSTRUCTURE HAS HARDENED AND SHUTTERING IS RELEASED.
5. JOINT FILLER (IF REQUIRED) SHALL CONFORM TO SPECIFICATION.

					CLIENT : Roads & Bridges Department (Government of Sikkim)	PROJECT : Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim	 LEA ASSOCIATES SOUTH ASIA PVT. LTD. B-1/E-27, Mohan Cooperative Industrial Estate, Mathura Road, New Delhi-110044	DESIGN CONSULTANT :  LEA ASSOCIATES SOUTH ASIA PVT. LTD. B-1/E-27, Mohan Cooperative Industrial Estate, Mathura Road, New Delhi-110044	DRAWING TITLE:- TYPICAL DETAILS OF DRAINAGE SPOUT AND STRIP SEAL EXPANSION JOINT	REV. R0 SHEET A2	DRAWN	A. DHAR	CHECKED	S. MONDAL
											DESIGN	B. SARKAR	REVIEWED	J. K. DAS
REV	DATE	DETAILS OF REVISION	BY								DATE	JULY 2022	SCALE :	NTS



NOTES:

- ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
- DIMENSIONS ARE NOT BE SCALED. ONLY WRITTEN DIMENSION SHALL BE FOLLOWED.
- GRADE OF CONCRETE SHALL BE USED AS FOLLOWS:
 - APPROACH SLAB.....M30
 - GUARD POST.....M20
- CLEAR COVER TO REINFORCEMENT SHALL BE 50mm.
- RAILING, CRASH BARRIER & SAFETY KERB SHALL BE ERECTED ONLY AFTER THE STRUCTURAL CONCRETE OF SUPERSTRUCTURE HAS HARDENED AND SHUTTERING IS RELEASED.
- JOINT FILLER (IF REQUIRED) SHALL CONFORM TO SPECIFICATION.

CLIENT :



Roads & Bridges Department
(Government of Sikkim)

PROJECT :

**Consultancy Services for Feasibility Studies
and Preparation of Detailed Project Report
for Roads and Bridges in Sikkim**

DESIGN CONSULTANT :



LEA ASSOCIATES SOUTH ASIA PVT. LTD.
B-1/E-27, Mohan Cooperative Industrial Estate,
Mathura Road, New Delhi-110044

DRAWING TITLE:-

TYPICAL DETAILS OF
APPROACH SLAB

DRAWING No : 73806/LASA/STR/MISC-803

REV.

R0

SHEET

A2

DRAWN

DESIGN

DATE

A. DHAR

B. SARKAR

JULY 2022

CHECKED

REVIEWED

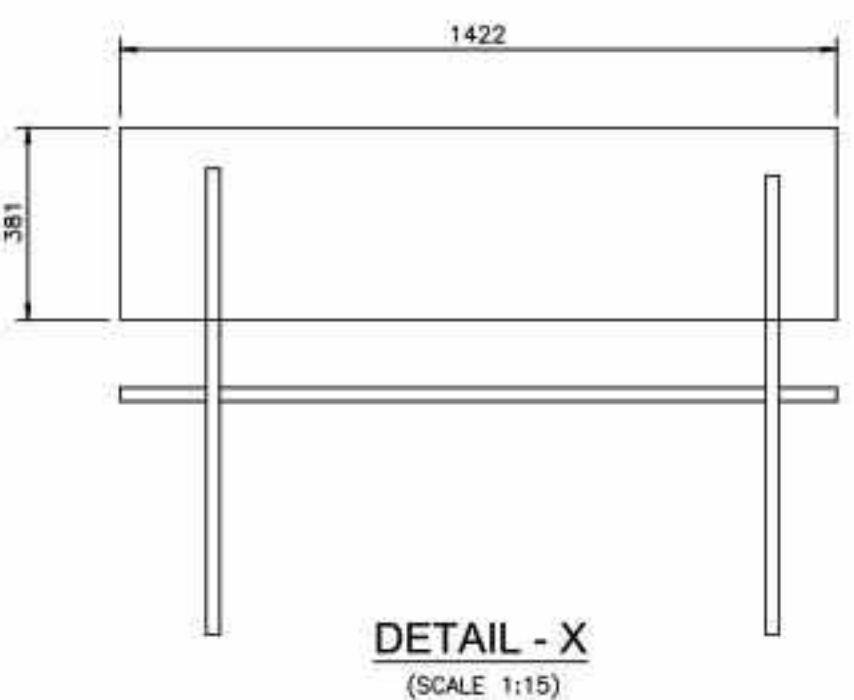
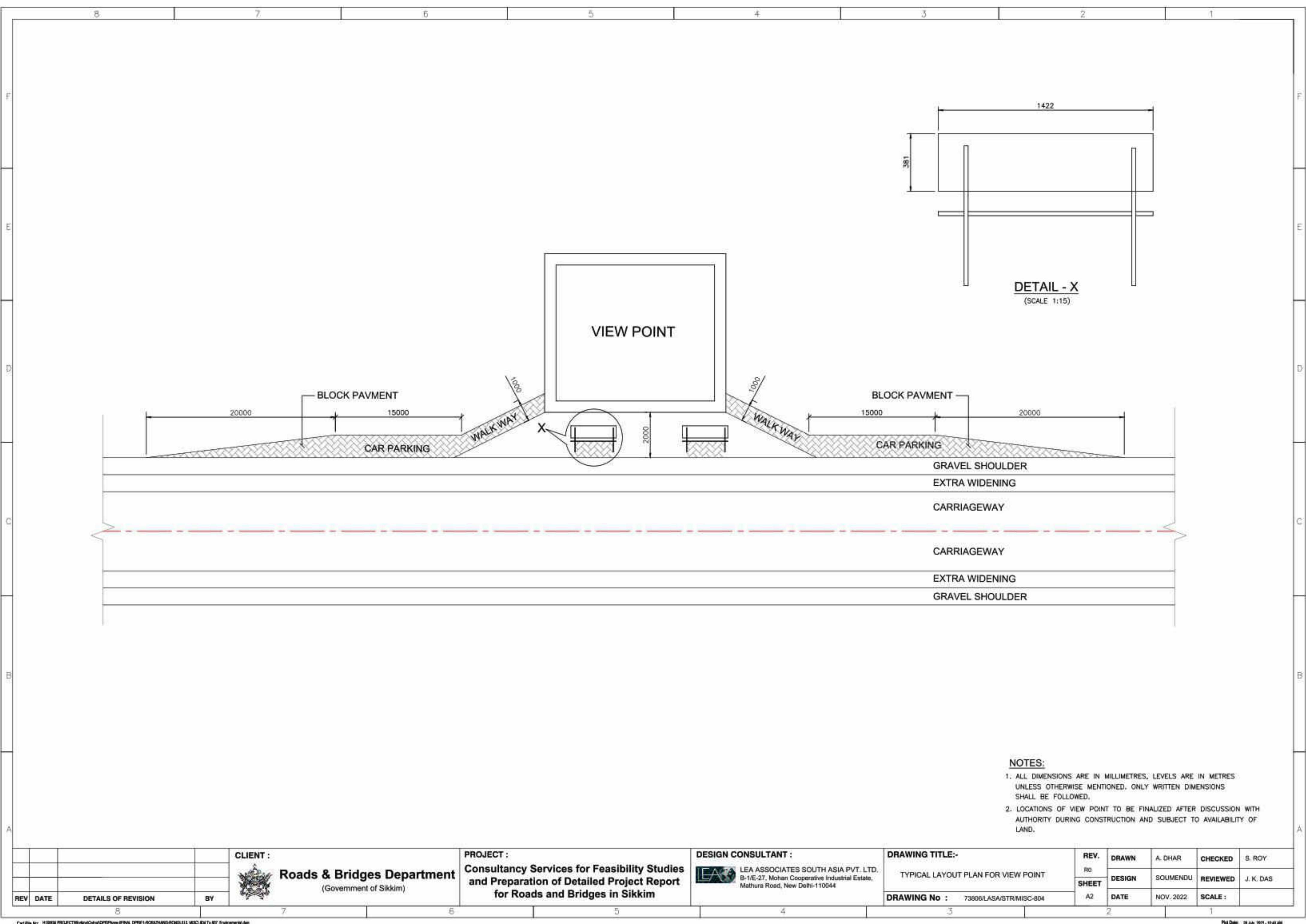
SCALE :

NTS

S. MONDAL

J. K. DAS

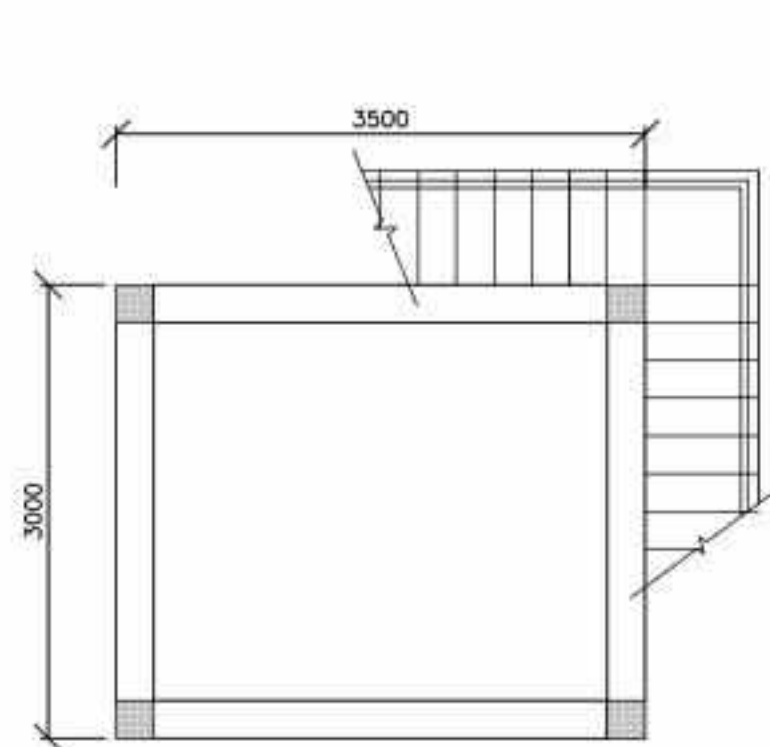
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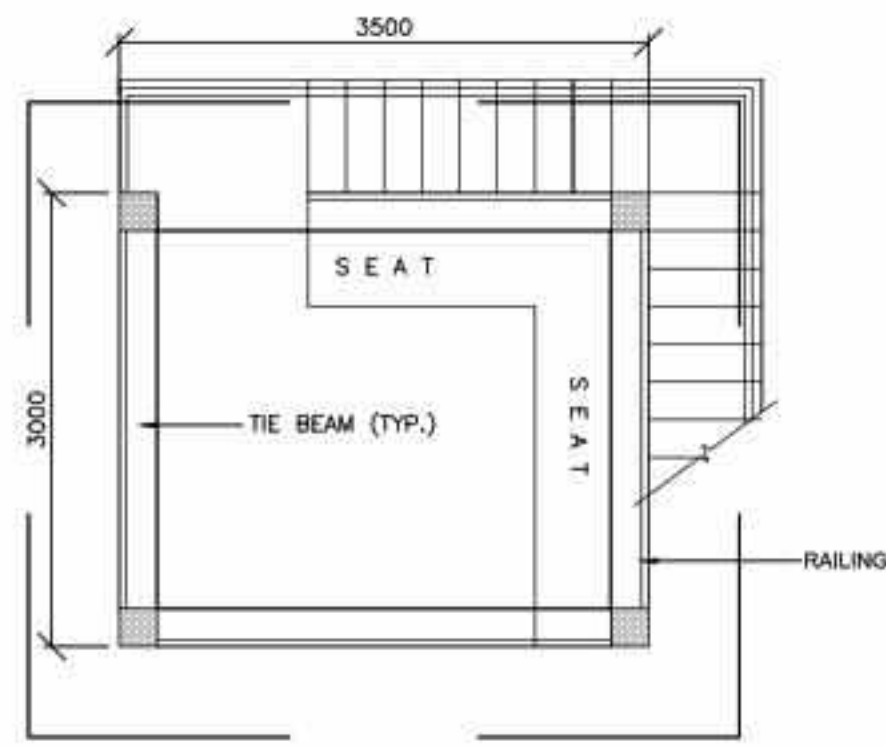
DETAIL - X
(SCALE 1:15)

- NOTES:**
- 1. ALL DIMENSIONS ARE IN MILLIMETRES, LEVELS ARE IN METRES UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
 - 2. LOCATIONS OF VIEW POINT TO BE FINALIZED AFTER DISCUSSION WITH AUTHORITY DURING CONSTRUCTION AND SUBJECT TO AVAILABILITY OF LAND.

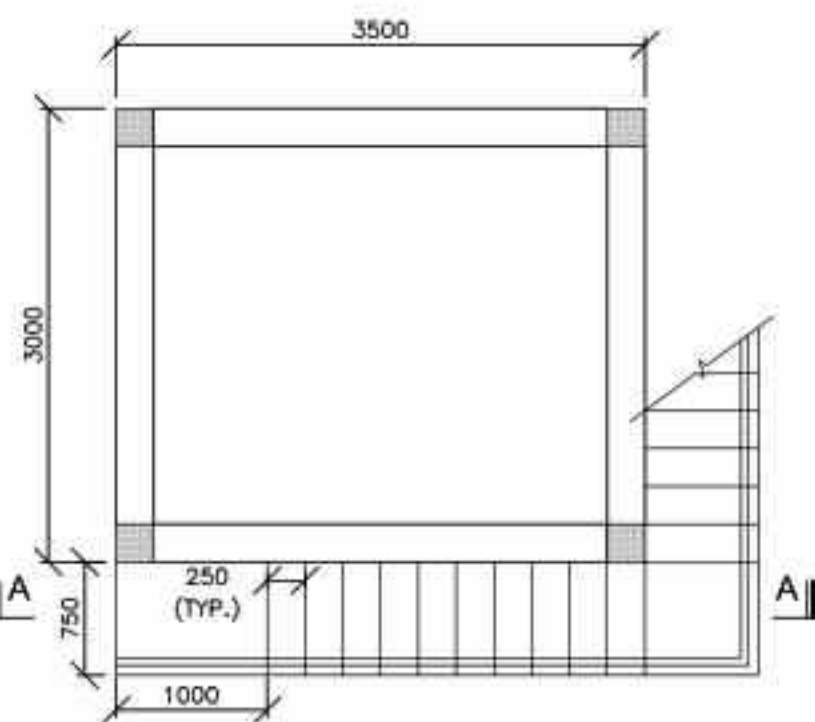
					CLIENT : Roads & Bridges Department (Government of Sikkim)	PROJECT : Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim	 DESIGN CONSULTANT : LEA ASSOCIATES SOUTH ASIA PVT. LTD. B-1/E-27, Mohan Cooperative Industrial Estate, Mathura Road, New Delhi-110044	DRAWING TITLE:- TYPICAL LAYOUT PLAN FOR VIEW POINT	DRAWING No : 73606/LASA/STR/MISC-804	REV.	DRAWN	A. DHAR	CHECKED	S. ROY
											DESIGN	SOLUMENDU	REVIEWED	J. K. DAS
REV	DATE	DETAILS OF REVISION	BY							SHEET	DATE	NOV. 2022	SCALE :	



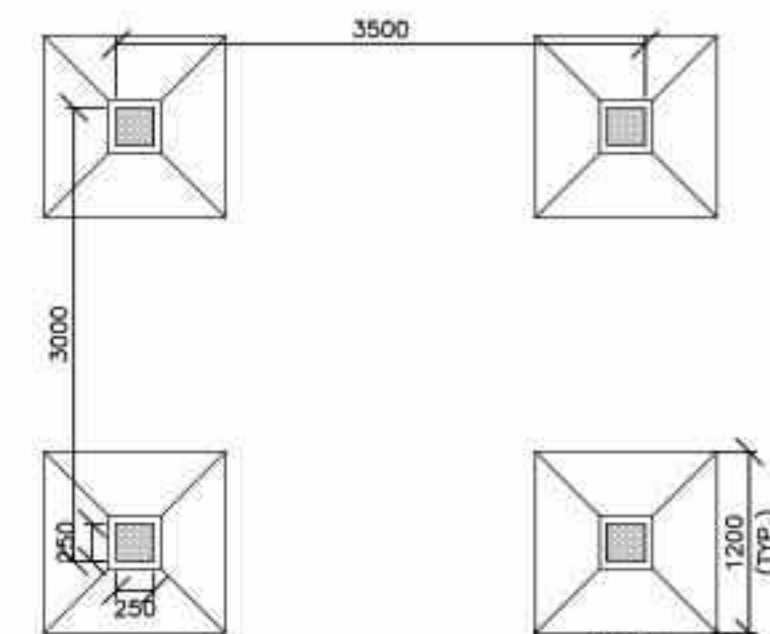
PLAN AT TIE BEAM LEVEL 2
(SCALE 1:50)



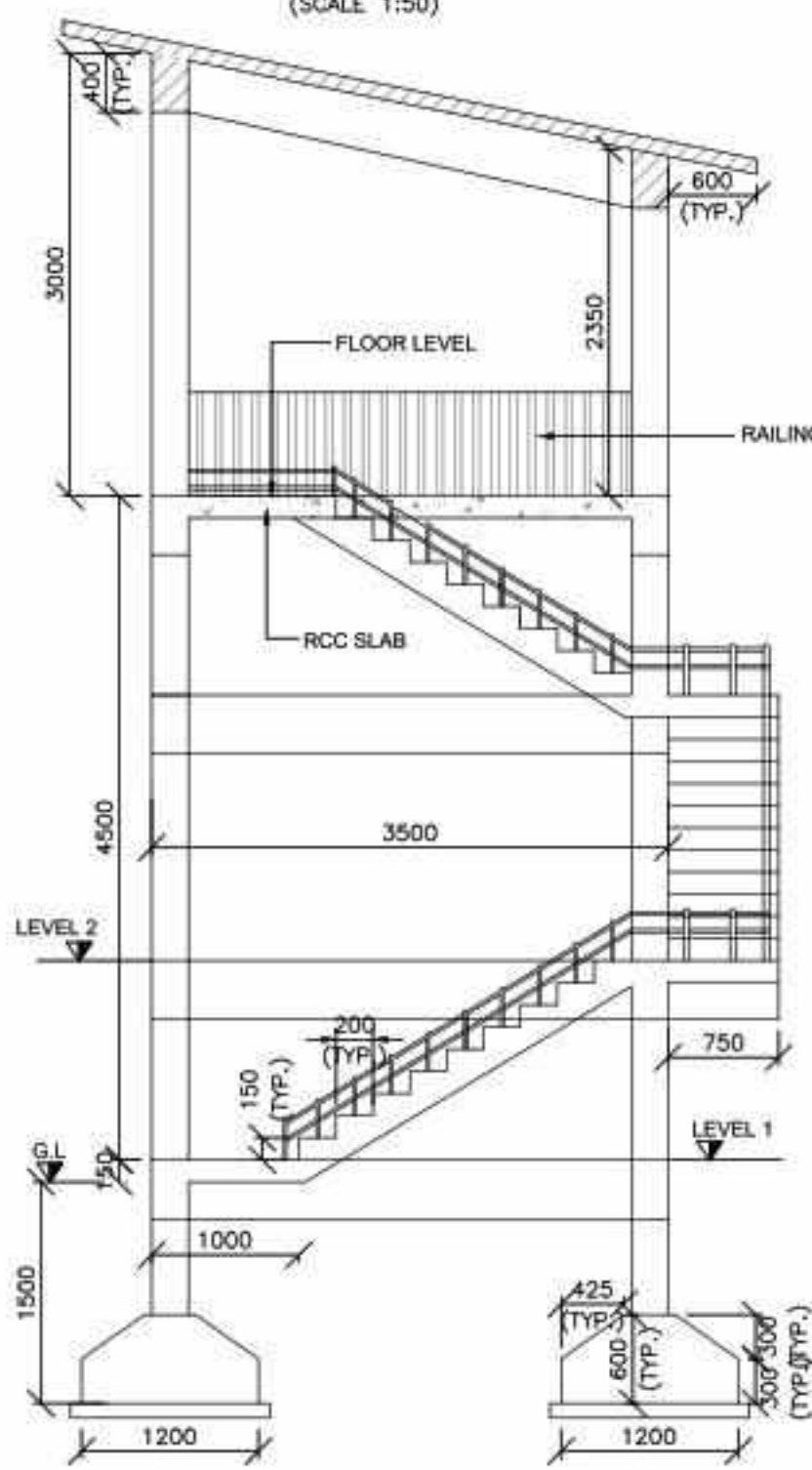
PLAN AT FLOOR LEVEL
(SCALE 1:50)



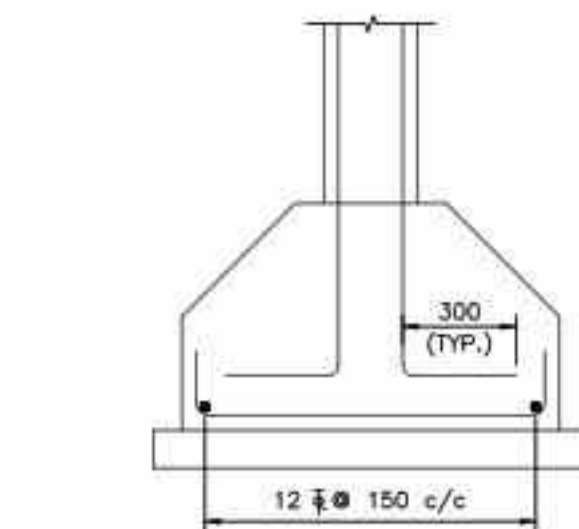
PLAN AT TIE BEAM LEVEL 1
(SCALE 1:50)



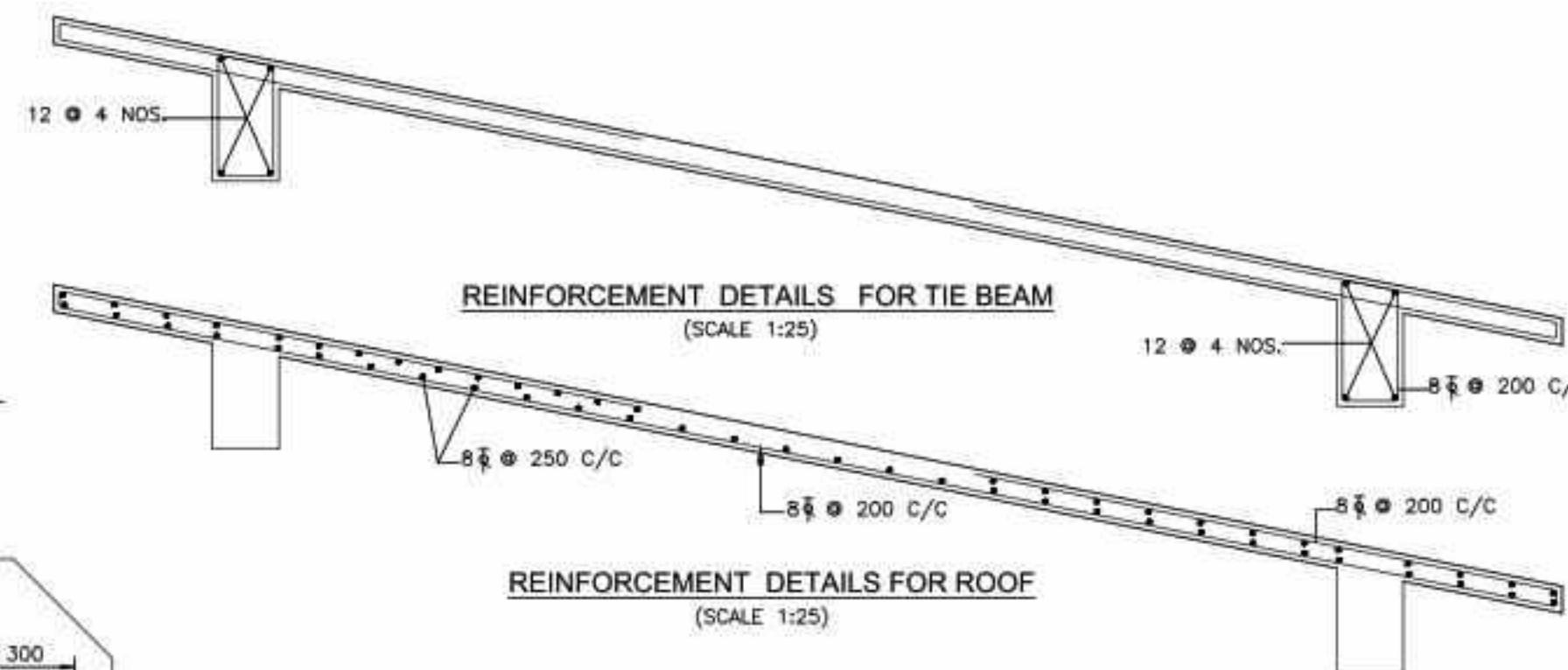
PLAN AT FOUNDING LEVEL
(SCALE 1:50)



SECTIONAL & ELEVATION A-A
(SCALE 1:50)

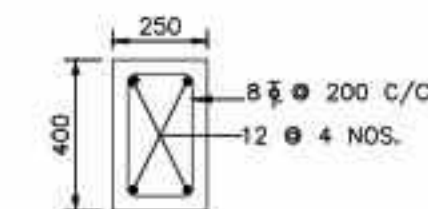


REINFORCEMENT DETAILS FOR FOUNDATION
(SCALE 1:15)



REINFORCEMENT DETAILS FOR TIE BEAM
(SCALE 1:25)

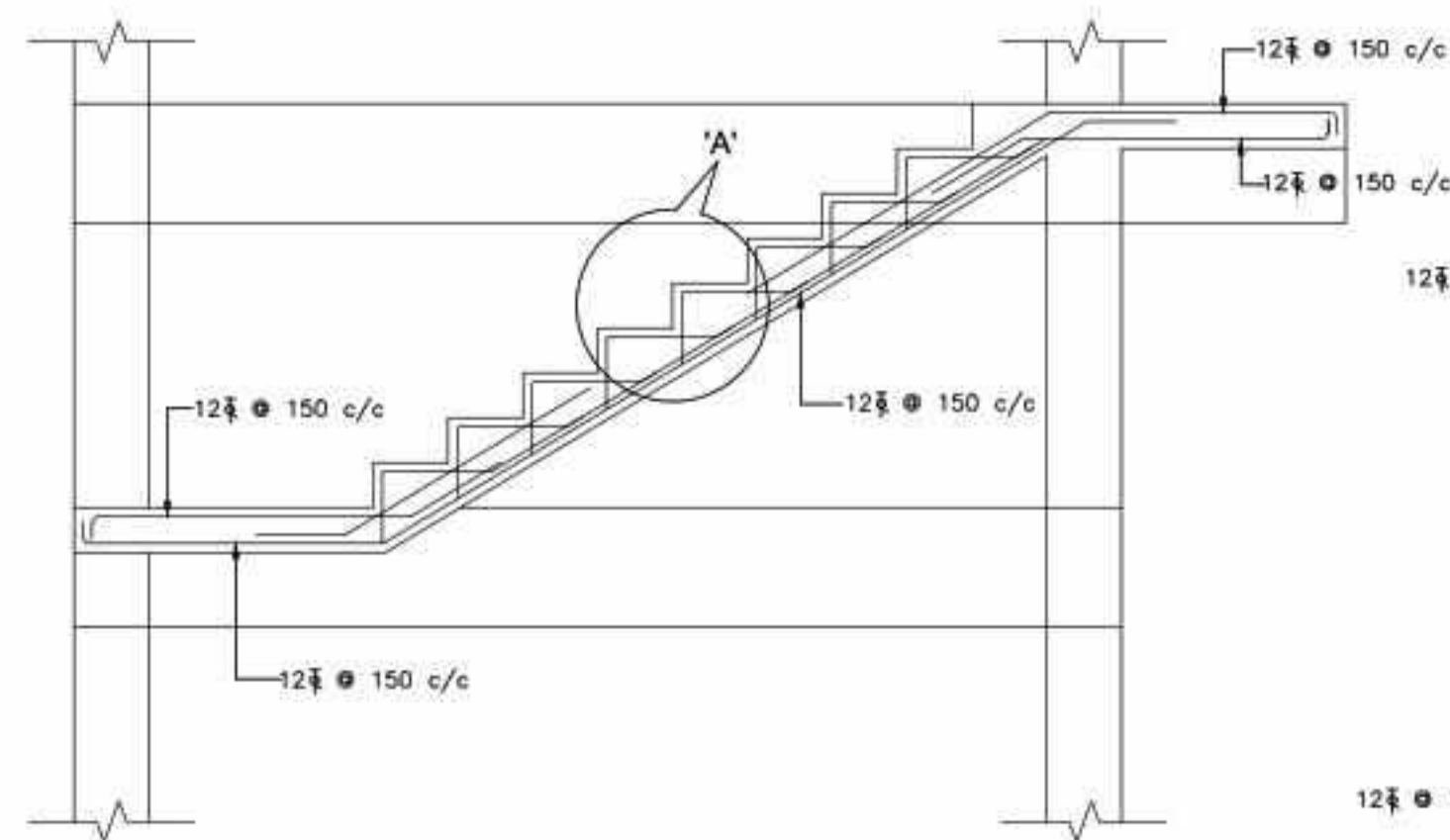
REINFORCEMENT DETAILS FOR ROOF
(SCALE 1:25)



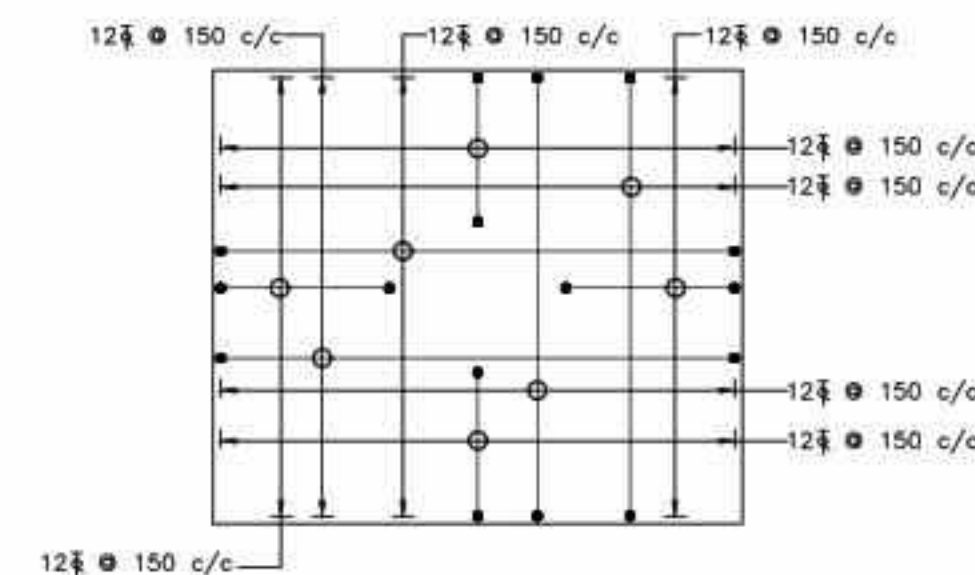
REINFORCEMENT DETAILS FOR TIE /
ROOF/FLOOR BEAM
(SCALE 1:20)



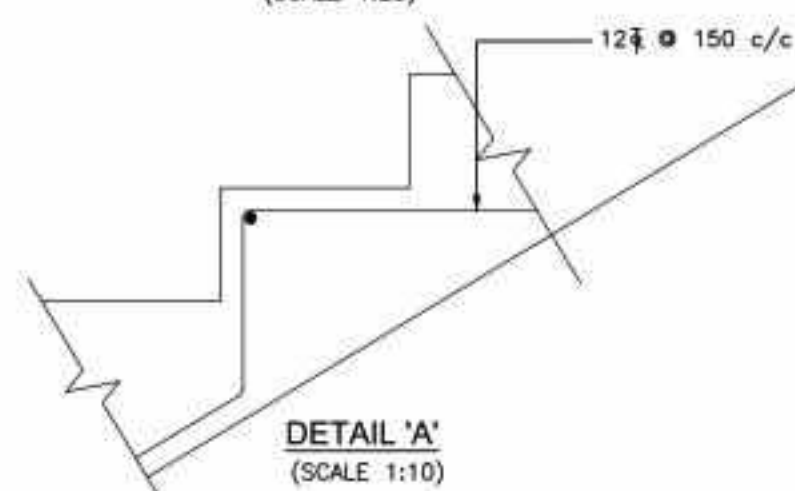
REINFORCEMENT DETAILS FOR COLUMN
(SCALE 1:5)



REINFORCEMENT DETAILS FOR STAIR CASE
(SCALE 1:25)



REINFORCEMENT DETAILS FOR SLAB
(SCALE 1:50)



DETAIL 'A'
(SCALE 1:10)

LEGEND:

TOP BAR SHOWN THUS
BOTTOM BAR SHOWN THUS

NOTES:

- ALL DIMENSIONS ARE IN MILLIMETRES, LEVELS ARE IN METRES UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
- LOCATIONS OF VIEW POINT TO BE FINALIZED AFTER DISCUSSION WITH AUTHORITY DURING CONSTRUCTION AND SUBJECT TO AVAILABILITY OF LAND.

CLIENT :



Roads & Bridges Department
(Government of Sikkim)

PROJECT :

**Consultancy Services for Feasibility Studies
and Preparation of Detailed Project Report
for Roads and Bridges in Sikkim**

DESIGN CONSULTANT :



LEA ASSOCIATES SOUTH ASIA PVT. LTD.
B-1/E-27, Mohan Cooperative Industrial Estate,
Mathura Road, New Delhi-110044

DRAWING TITLE:-

TYPICAL STRUCTURE DRAWING FOR VIEW POINT

DRAWING No : 73606/LASA/STR/MISC-005

REV.

R0

SHEET

A2

DRAWN

A. DHAR

DESIGN

NOV. 2022

CHECKED

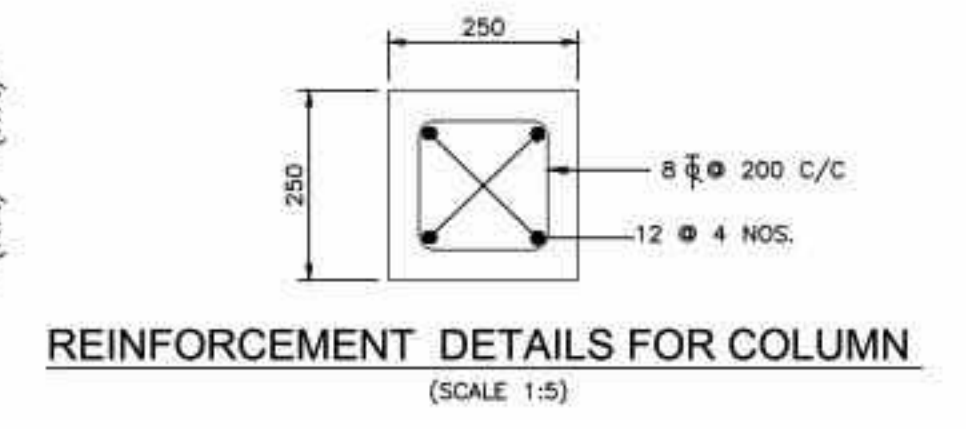
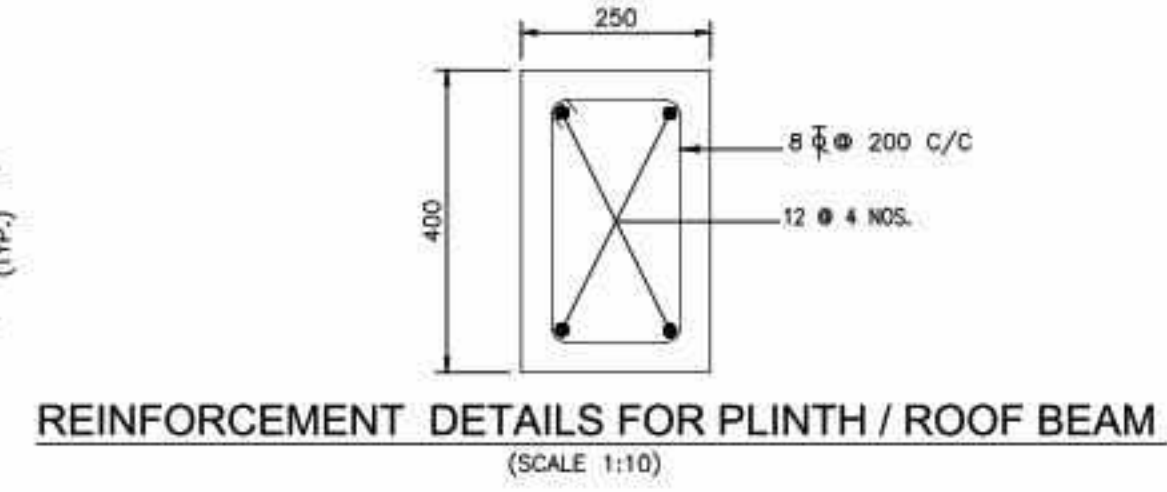
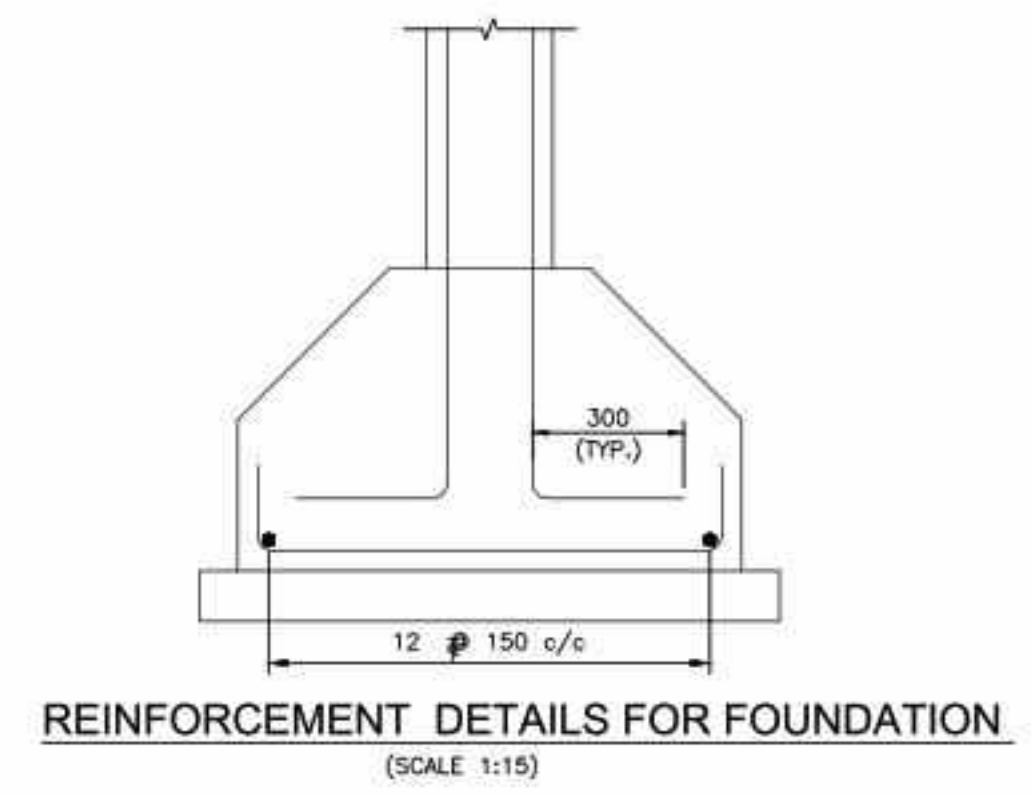
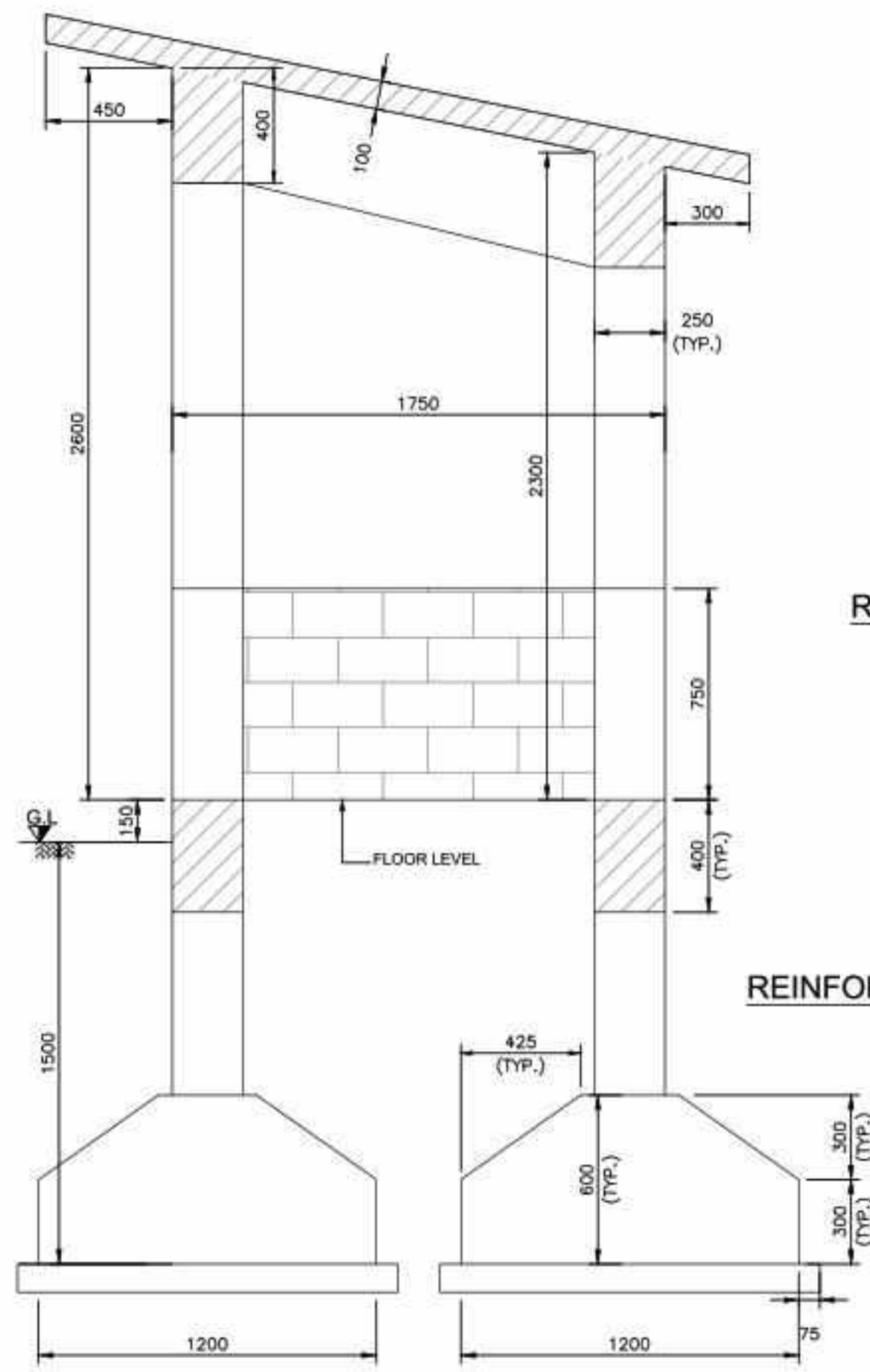
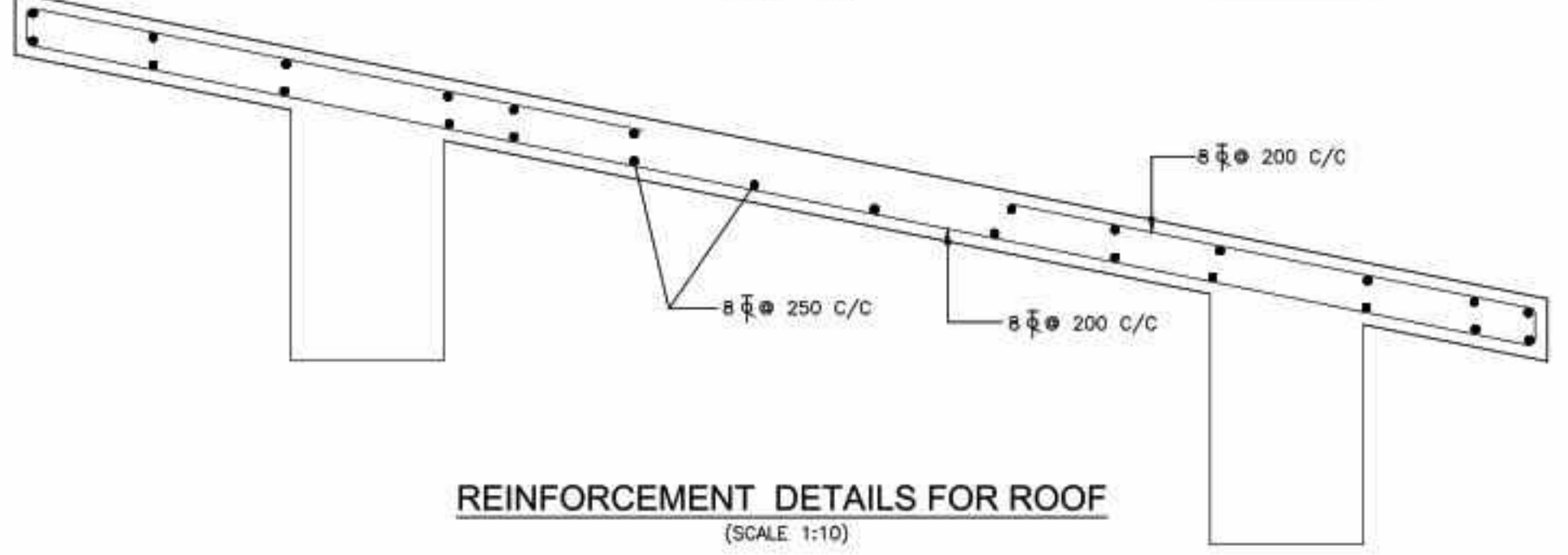
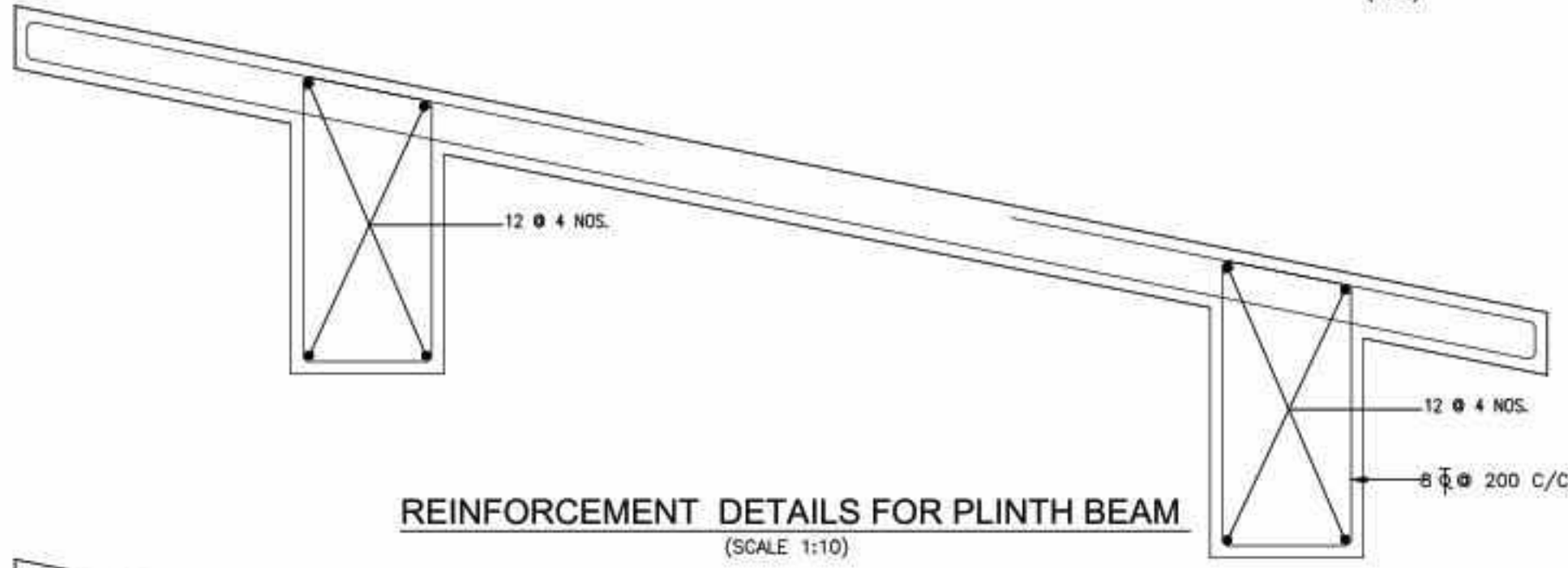
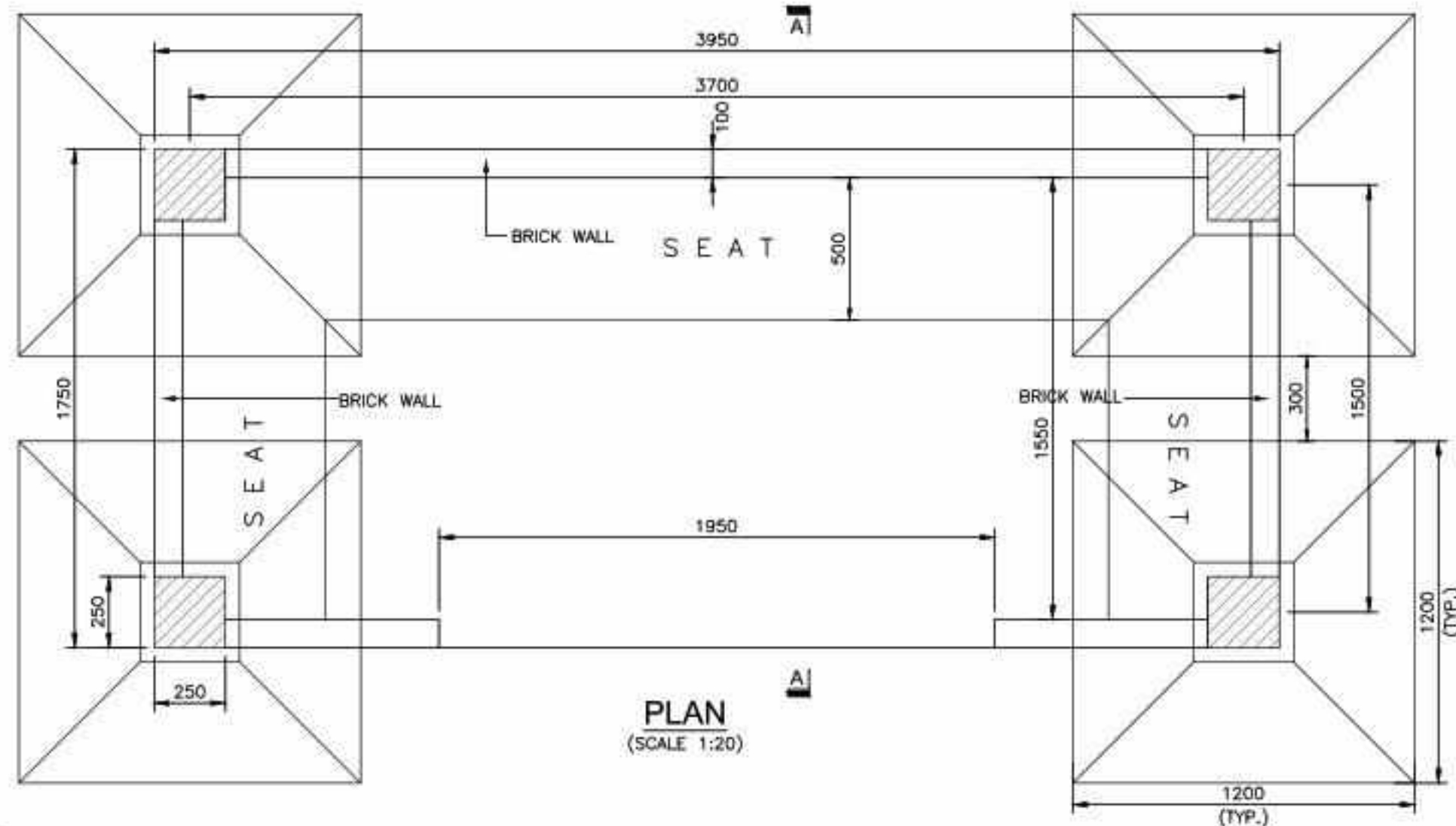
S. ROY

REVIEWED

J. K. DAS

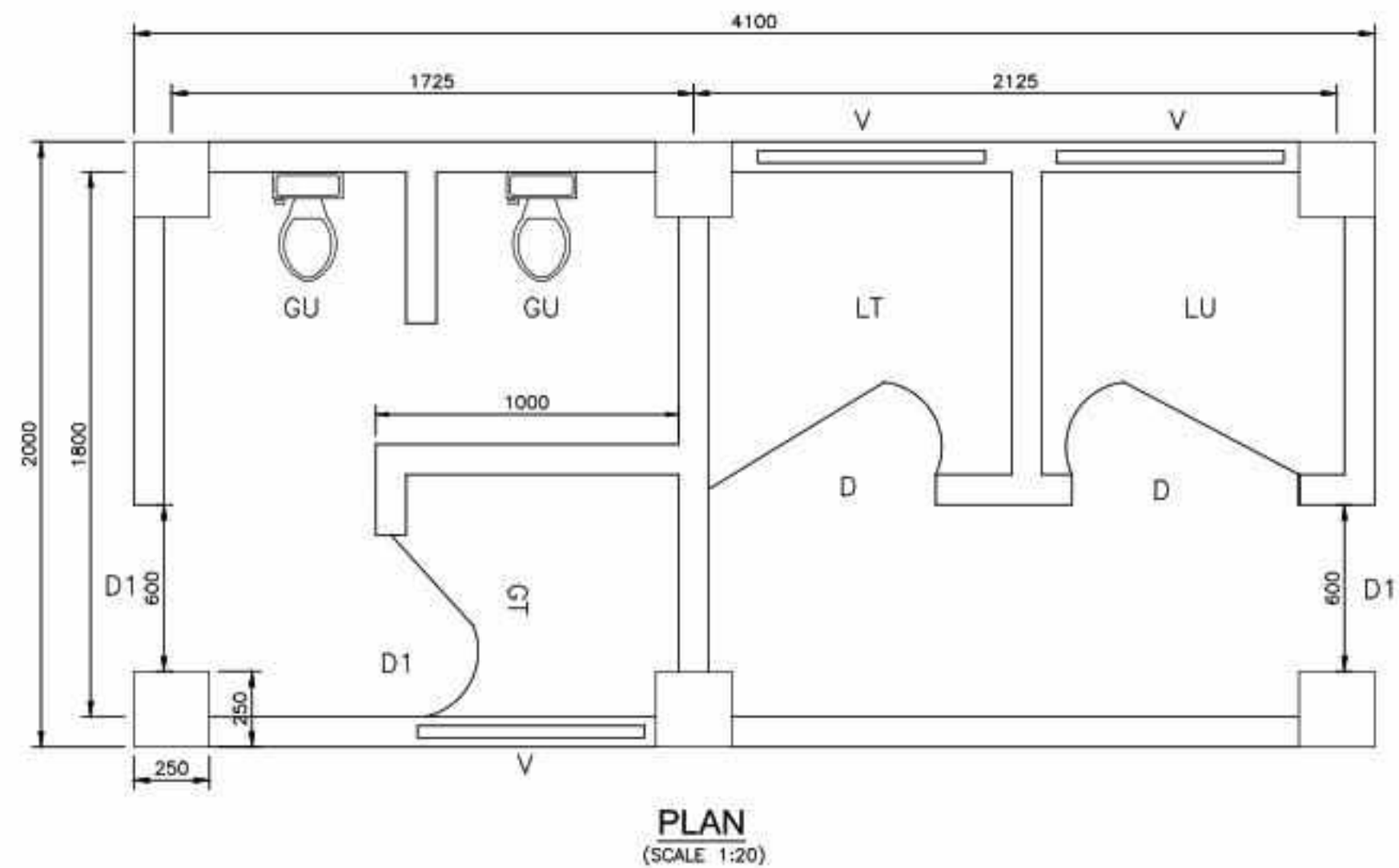
SCALE :

REV DATE DETAILS OF REVISION BY



- NOTES:**
1. ALL DIMENSIONS ARE IN MILLIMETRES, LEVELS ARE IN METRES UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
 2. LOCATIONS OF BUS SHELTER TO BE FINALIZED AFTER DISCUSSION WITH AUTHORITY DURING CONSTRUCTION AND SUBJECT TO AVAILABILITY OF LAND.

CLIENT :		PROJECT :		DESIGN CONSULTANT :		DRAWING TITLE:-		REV.	DRAWN	A. DHAR	CHECKED	S. ROY
Roads & Bridges Department		Consultancy Services for Feasibility Studies		LEA ASSOCIATES SOUTH ASIA PVT. LTD.		TYPICAL DRAWING FOR BUS WAITING SHED		R0	DESIGN	SOURMENDU	REVIEWED	J. K. DAS
(Government of Sikkim)		and Preparation of Detailed Project Report		B-1/E-27, Mohan Cooperative Industrial Estate,		DRAWING No : 73806/LASA/STR/MISC-806		SHEET	DATE	NOV. 2022	SCALE :	
		for Roads and Bridges in Sikkim		Mathura Road, New Delhi-110044				A2				
REV	DATE	DETAILS OF REVISION	BY									



SCHEDULED OF OPENINGS

S.NO.	ITEMS	SYMBOL	SIZES IN MM	NOS.
1	DOOR	D	750X1800	2
2	DOOR	D1	600X1800	3
3	VENTILATION	V	750X300	2
4	GENTS URINARY	GU	800X500	2
5	LADIES TOILET	LT	1000X1000	1
6	LADIES URINARY	LU	1000X1000	1
7	GENTS TOILET	GT	1000X800	1

NOTES:

- ALL DIMENSIONS ARE IN MILLIMETRES, LEVELS ARE IN METRES. UNLESS OTHERWISE MENTIONED, ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
- LOCATIONS OF PUBLIC TOILET TO BE FINALIZED AFTER DISCUSSION WITH AUTHORITY DURING CONSTRUCTION AND SUBJECT TO AVAILABILITY OF LAND.

CLIENT :



Roads & Bridges Department
(Government of Sikkim)

PROJECT :

**Consultancy Services for Feasibility Studies
and Preparation of Detailed Project Report
for Roads and Bridges in Sikkim**

DESIGN CONSULTANT :



LEA ASSOCIATES SOUTH ASIA PVT. LTD.
B-1/E-27, Mohan Cooperative Industrial Estate,
Mathura Road, New Delhi-110044

DRAWING TITLE:-

TYPICAL DRAWING FOR
PUBLIC TOILET AT BUS STOP
(SH. 1 OF 2)

DRAWING No : 73806/LASA/STR/MISC-807

REV.

R0

SHEET

A2

DRAWN

A. DHAR

DESIGN

SOURMENDU

CHECKED

S. ROY

REVIEWED

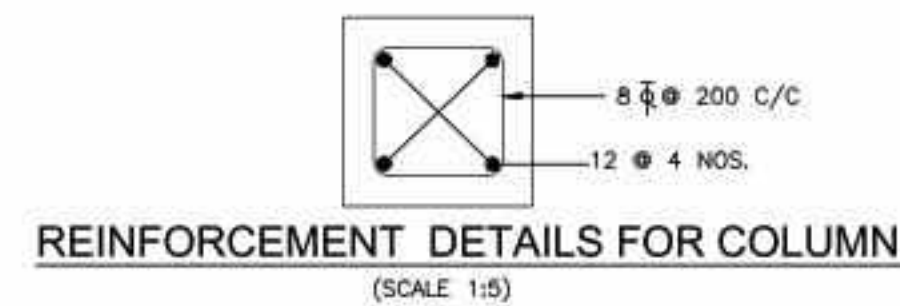
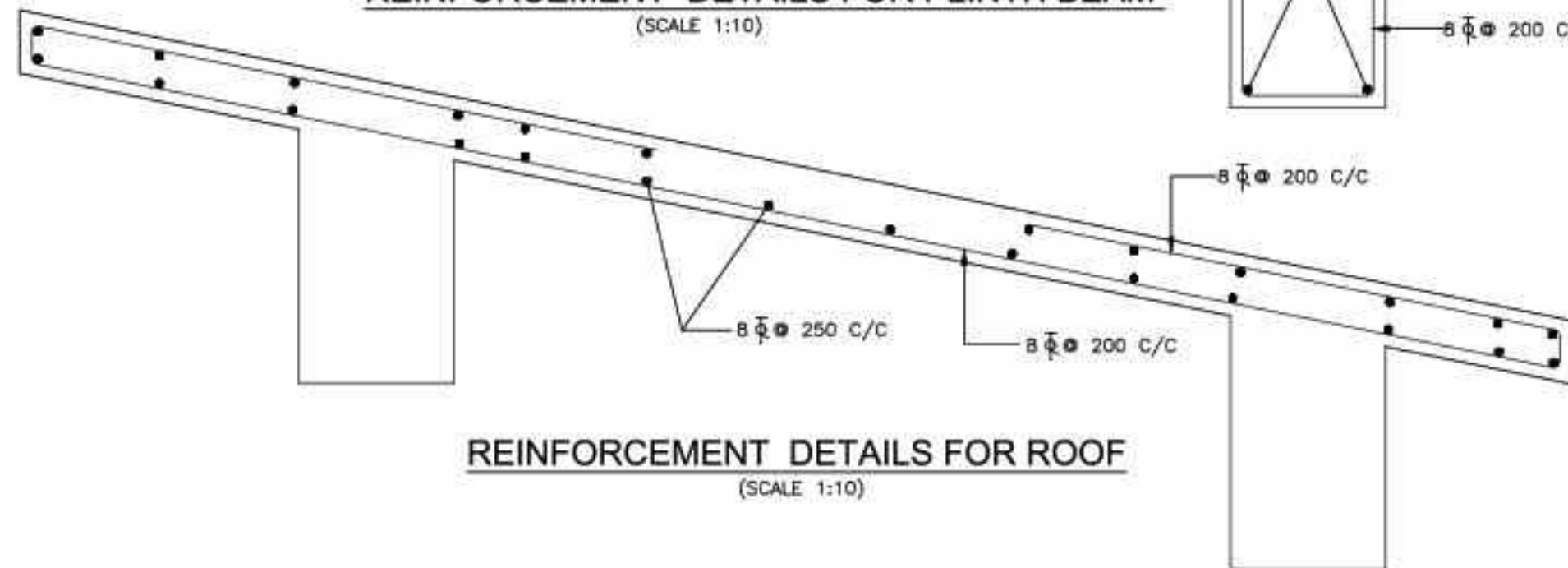
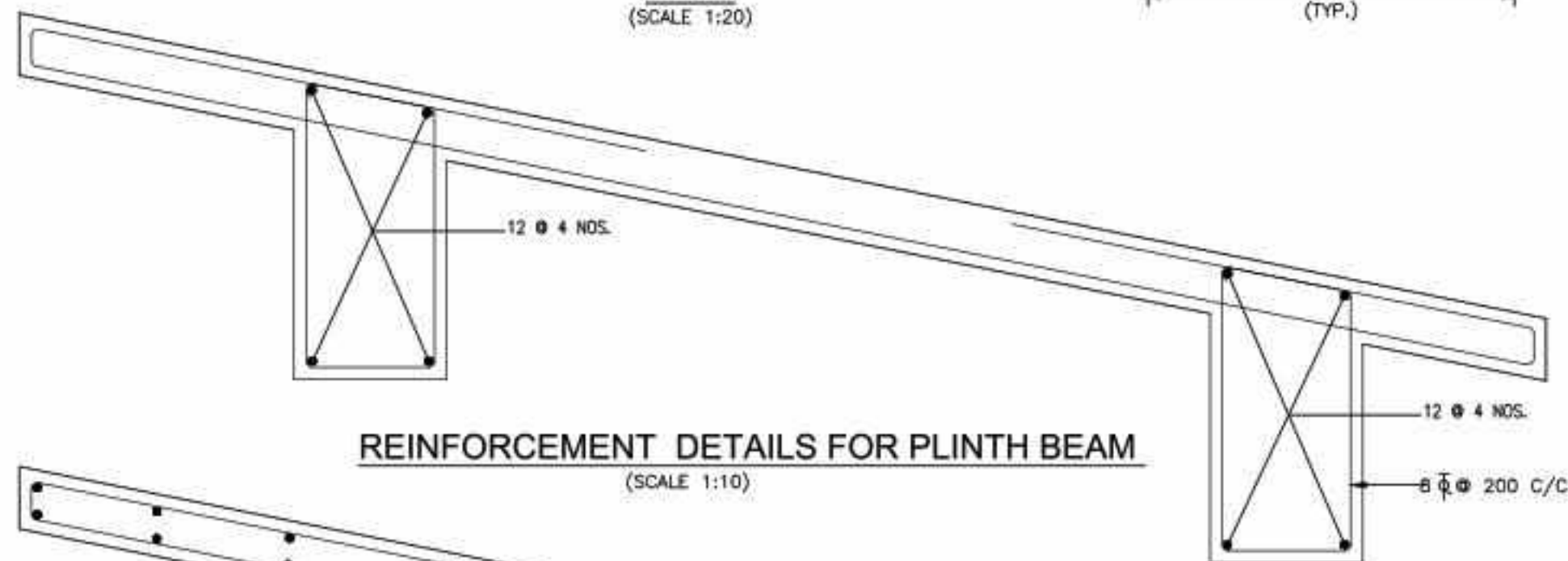
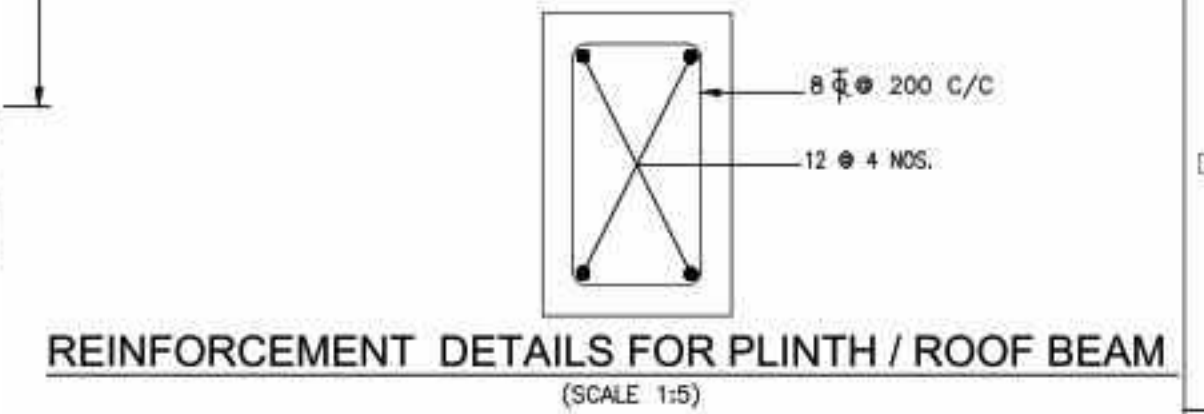
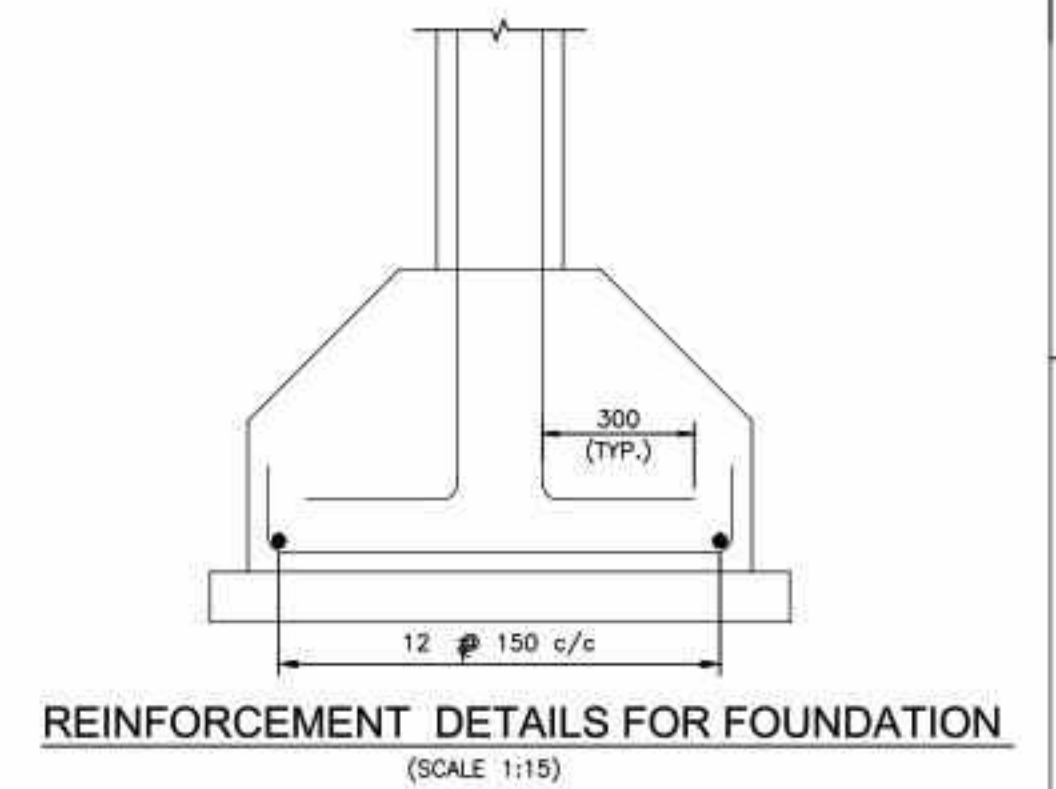
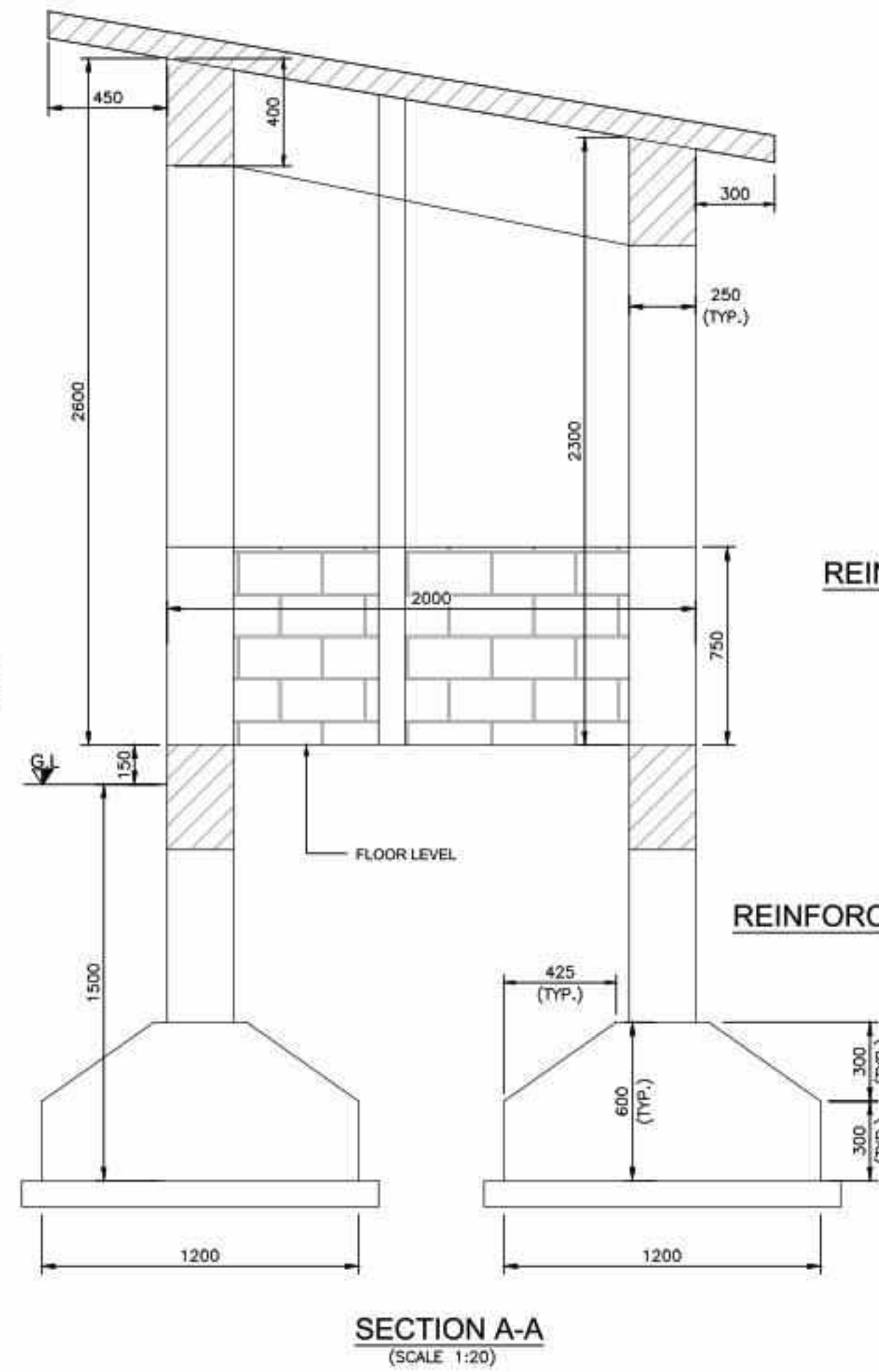
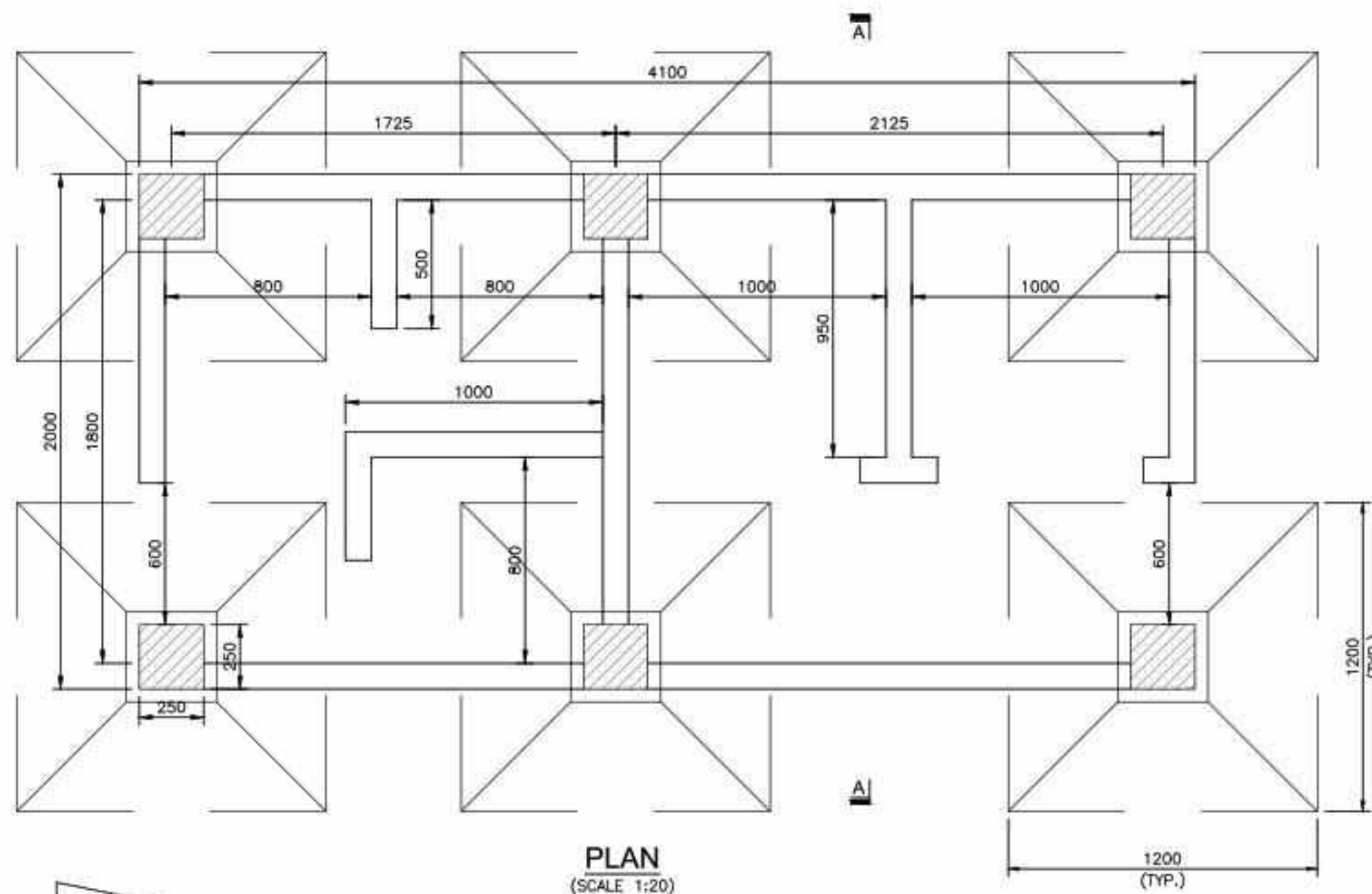
J. K. DAS

DATE

NOV. 2022

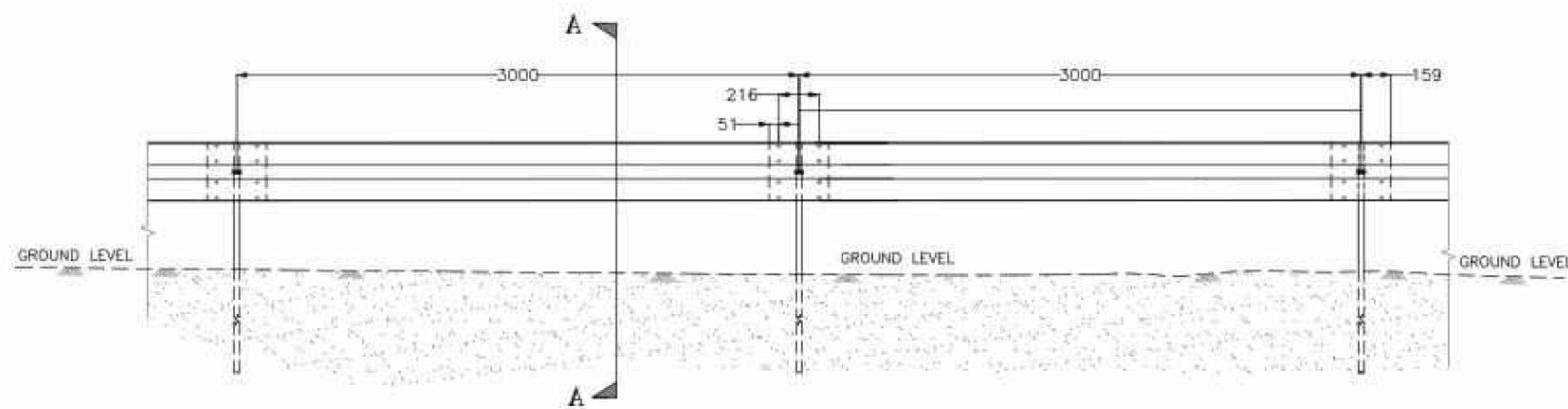
SCALE :

1

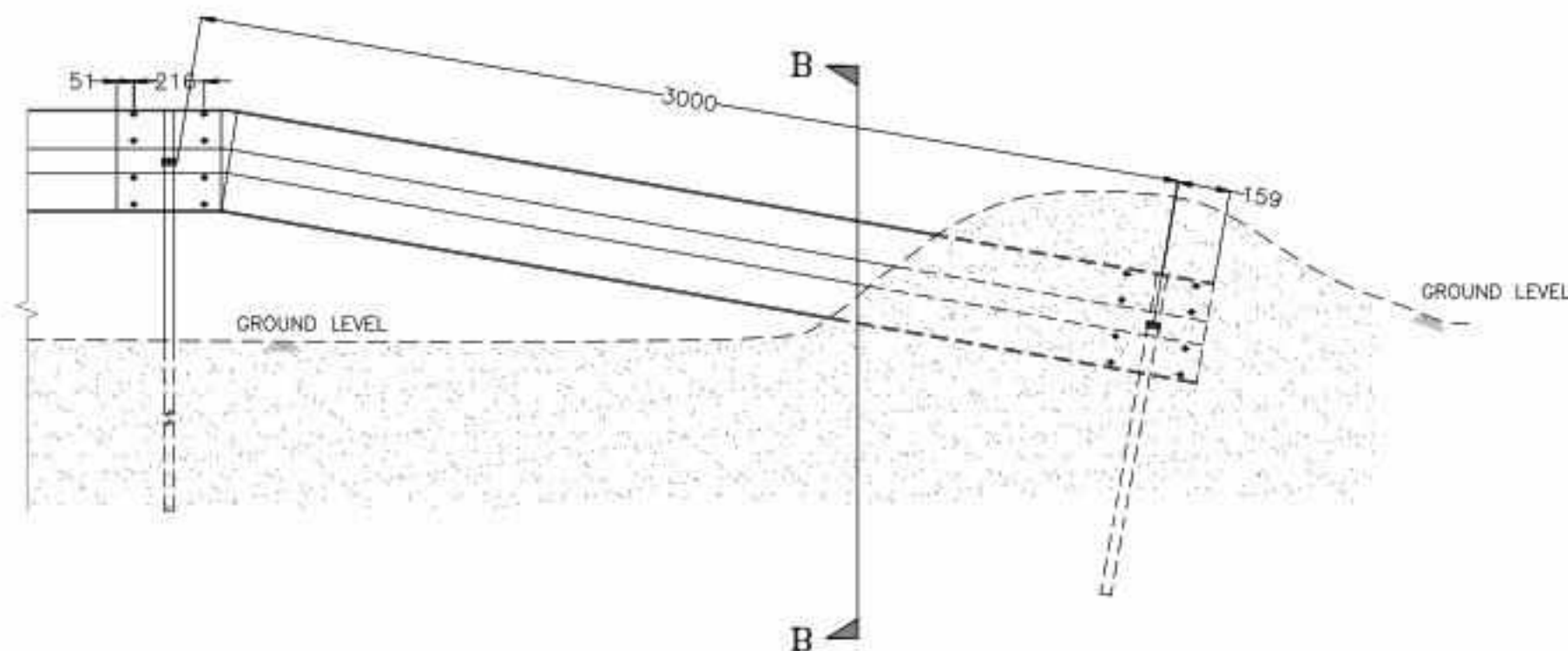


- NOTES:**
1. ALL DIMENSIONS ARE IN MILLIMETRES, LEVELS ARE IN METRES UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
 2. LOCATIONS OF PUBLIC TOILET TO BE FINALIZED AFTER DISCUSSION WITH AUTHORITY DURING CONSTRUCTION AND SUBJECT TO AVAILABILITY OF LAND.

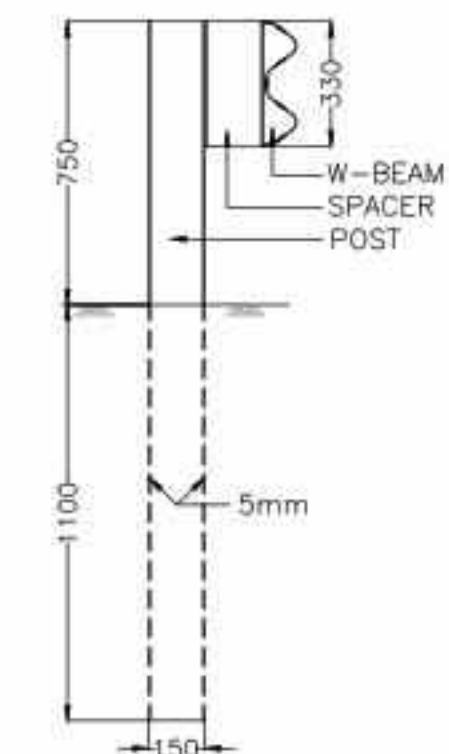
CLIENT :		PROJECT :		DESIGN CONSULTANT :		DRAWING TITLE:-		REV.	DRAWN	A. DHAR	CHECKED	S. ROY
Roads & Bridges Department		Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim		LEA ASSOCIATES SOUTH ASIA PVT. LTD.		TYPICAL DRAWING FOR PUBLIC TOILET AT BUS STOP (SH. 2 OF 2)		R0	DESIGN	SOURMENDU	REVIEWED	J. K. DAS
(Government of Sikkim)				B-1/E-27, Mohan Cooperative Industrial Estate, Mathura Road, New Delhi-110044		DRAWING No : 73606/LASA/STR/MISC-807		SHEET	DATE	NOV. 2022	SCALE :	
A2												



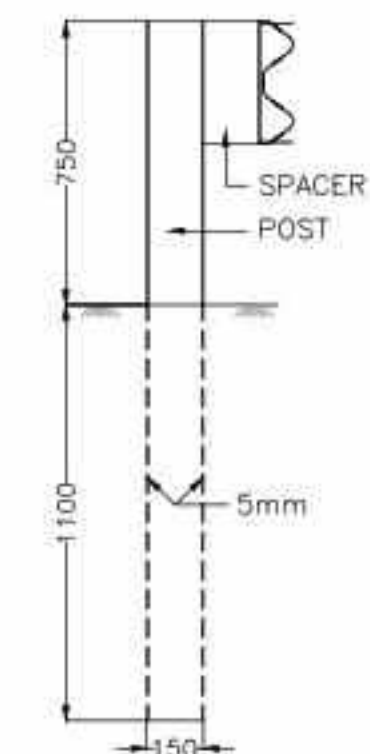
ELEVATION OF THE GUARD RAIL SYSTEM



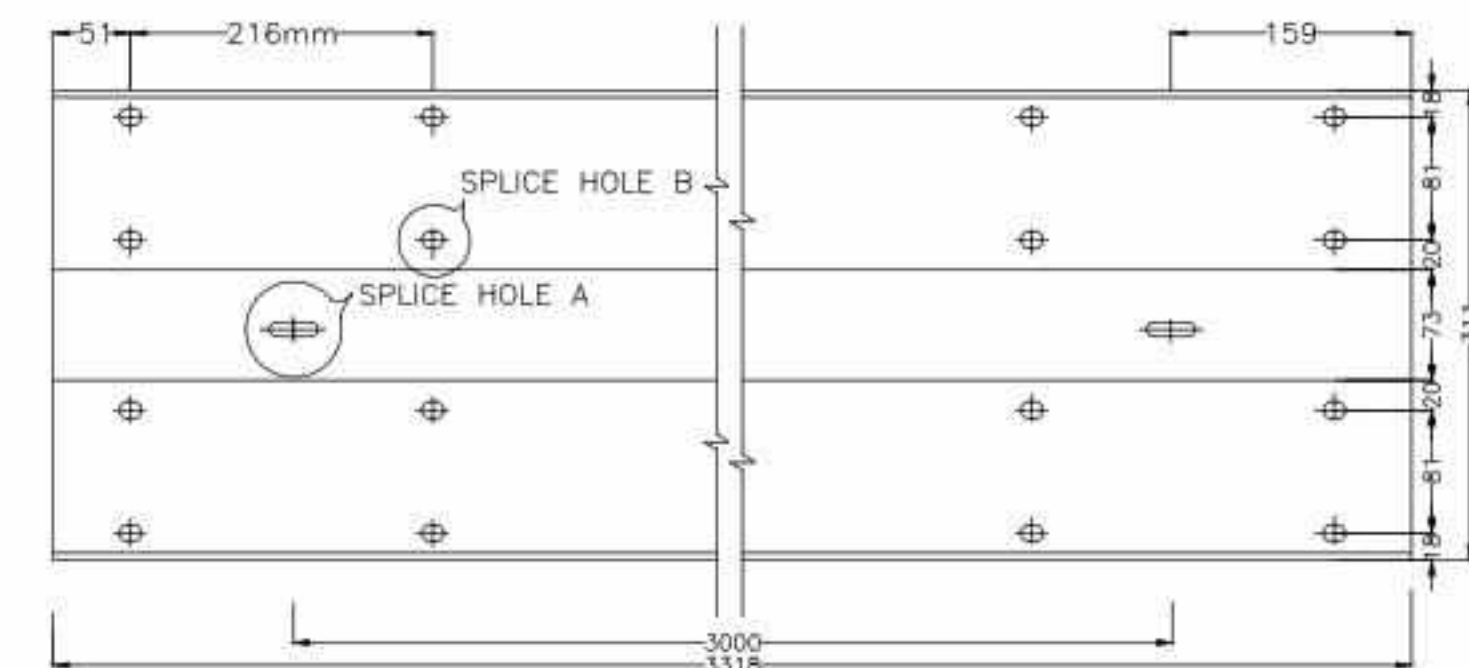
GROUND TERMINAL DETAILS OF GUARD RAIL



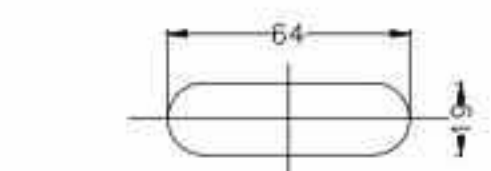
SECTION A-A



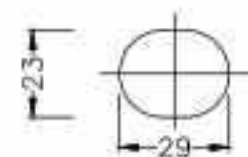
SECTION B-B



Elevation of W - Beam of Guard Rail

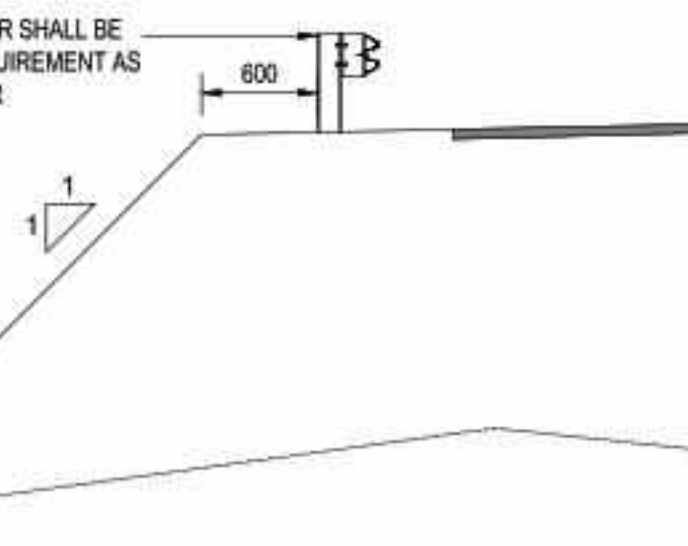


Dimensions of Splice Hole A



Dimensions of Splice Hole B

METAL BEAM CRASH BARRIER SHALL BE PROVIDED AS THE SITE REQUIREMENT AS DIRECTED BY THE ENGINEER



Notes

- Fastener Details
 - Bottom head bolts, M16 - 30 long with nut and washer at each splice location. 8 nos.
 - Bottom head bolts, M16 - 30 long with nut and washer
 - 1no. for connecting 'W' beam to spacer
 - 2nos. for connecting spacer to post.
- All members i.e. Post/Bolts/ Spacer/ 'W' Beam, shall be hot dipped galvanized and Zinc coated @ 550 g/Msq (min.), single spot.
- Base material for 'W' Guard Rails should have
 - Ultimate Tensile Strength (min.) 483 MPa
 - Yield Strength (min.) 345MPa
 - Elongation (min.) 12%
- Beams to be erected on a radius of 45m or less shall be Shop Curved to appropriate curvature of installation.
- 'W' Beam elements shall be formed from sheets having nominal width of 483.

Details

- 'W' Beam
 - 311mm x 83mm x 3mm W Section
 - Length: 3318mm
 - Cold Formed, Galvanised.
- Spacer Block
 - 150mm x 75mm x 5mm Channel Section
 - Length: 330mm
 - Cold Formed, Galvanised.
- Post Block
 - 150mm x 75mm x 5mm Channel Section
 - Length: 1850mm
 - Cold Formed, Galvanised.

9. 'W' Beam Details

Thickness = 3mm
Size = 311mm x 83mm

10. Spacer Details

150x75x5 Channel section, Cold Formed.

11. Post Details

150x75x5 Channel section, Cold Formed and Galvanised.

Length = 1850mm

Refer also Drg. No.

CLIENT :



Roads & Bridges Department
(Government of Sikkim)

PROJECT :

Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim

DESIGN CONSULTANT :



LEA ASSOCIATES SOUTH ASIA PVT. LTD.
B-1/E-27, Mohan Cooperative Industrial Estate,
Mathura Road, New Delhi-110044

DRAWING TITLE:-

TYPICAL DETAILS OF METALLIC CRASH BARRIER

DRAWING No : 73606/LASA/STR/MISC-808

REV.

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SHEET

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DRAWN

A. DHAR

CHECKED

S. ROY

DESIGN

SOURMENDU

REVIEWED

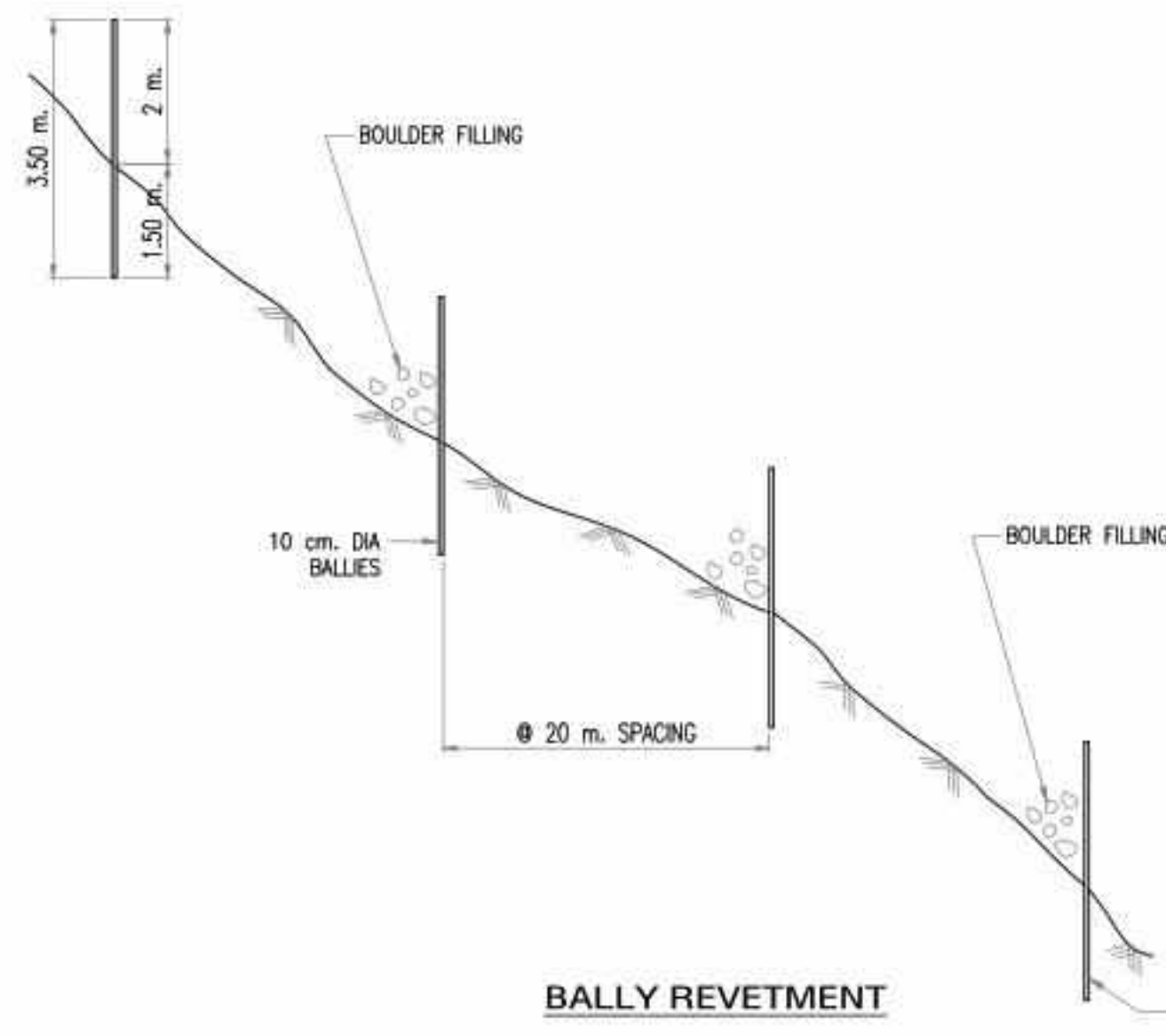
J. K. DAS

DATE

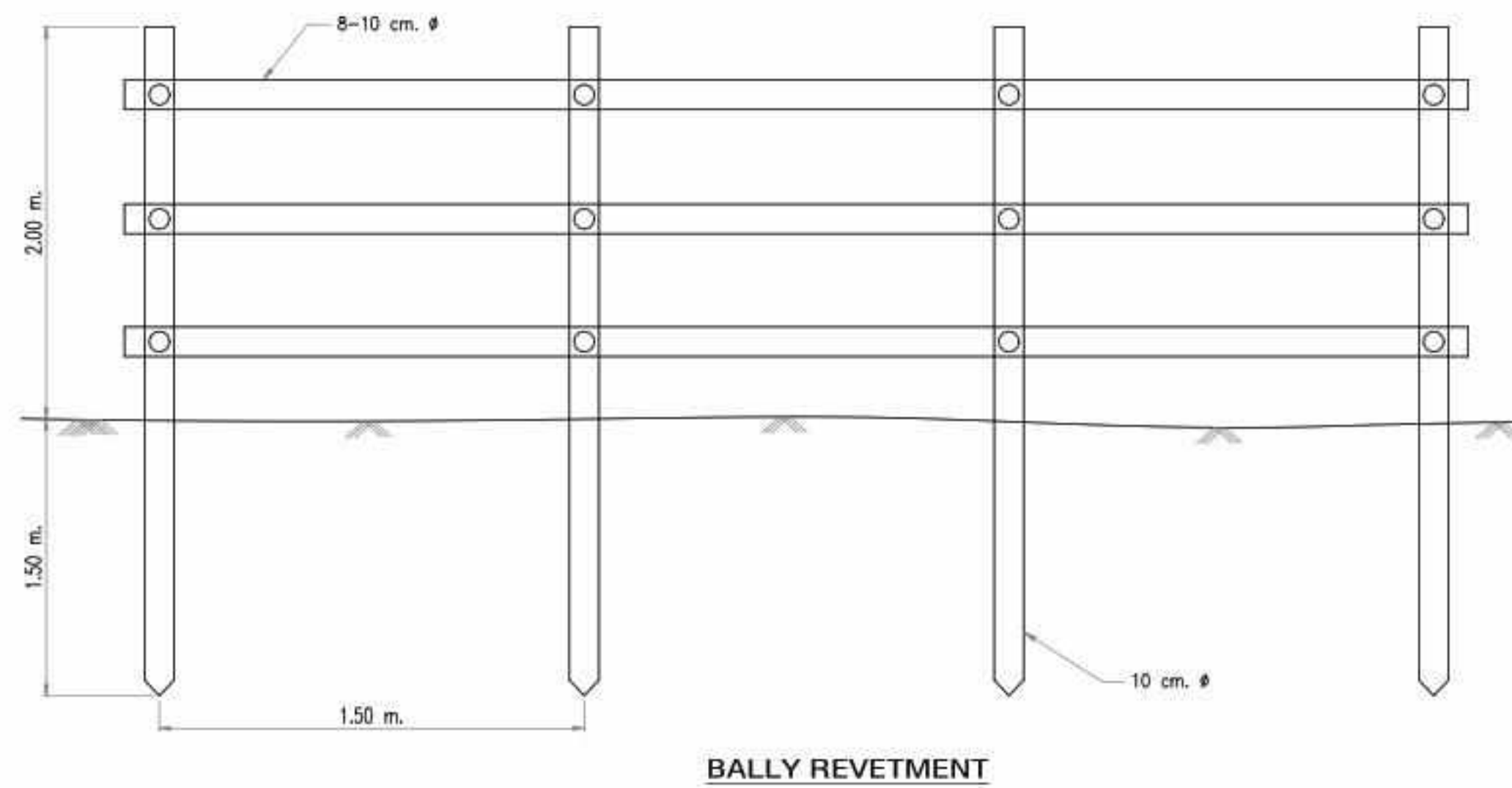
NOV. 2022

SCALE :

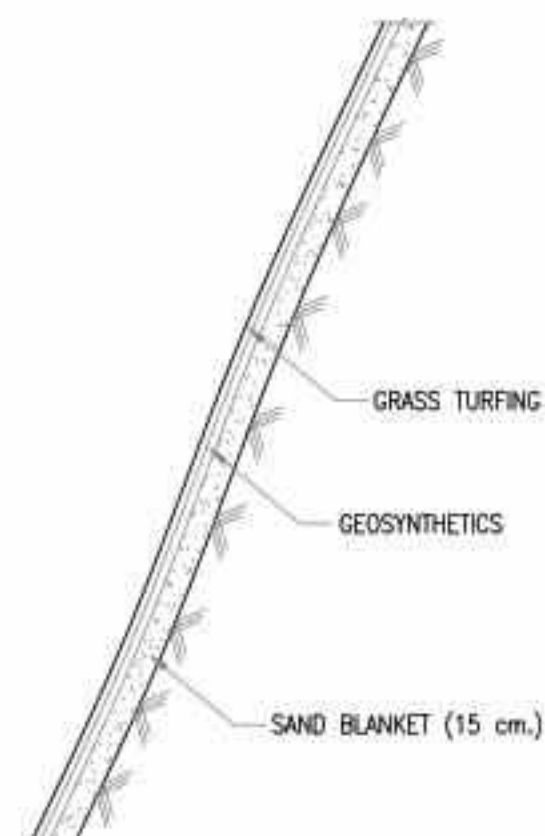
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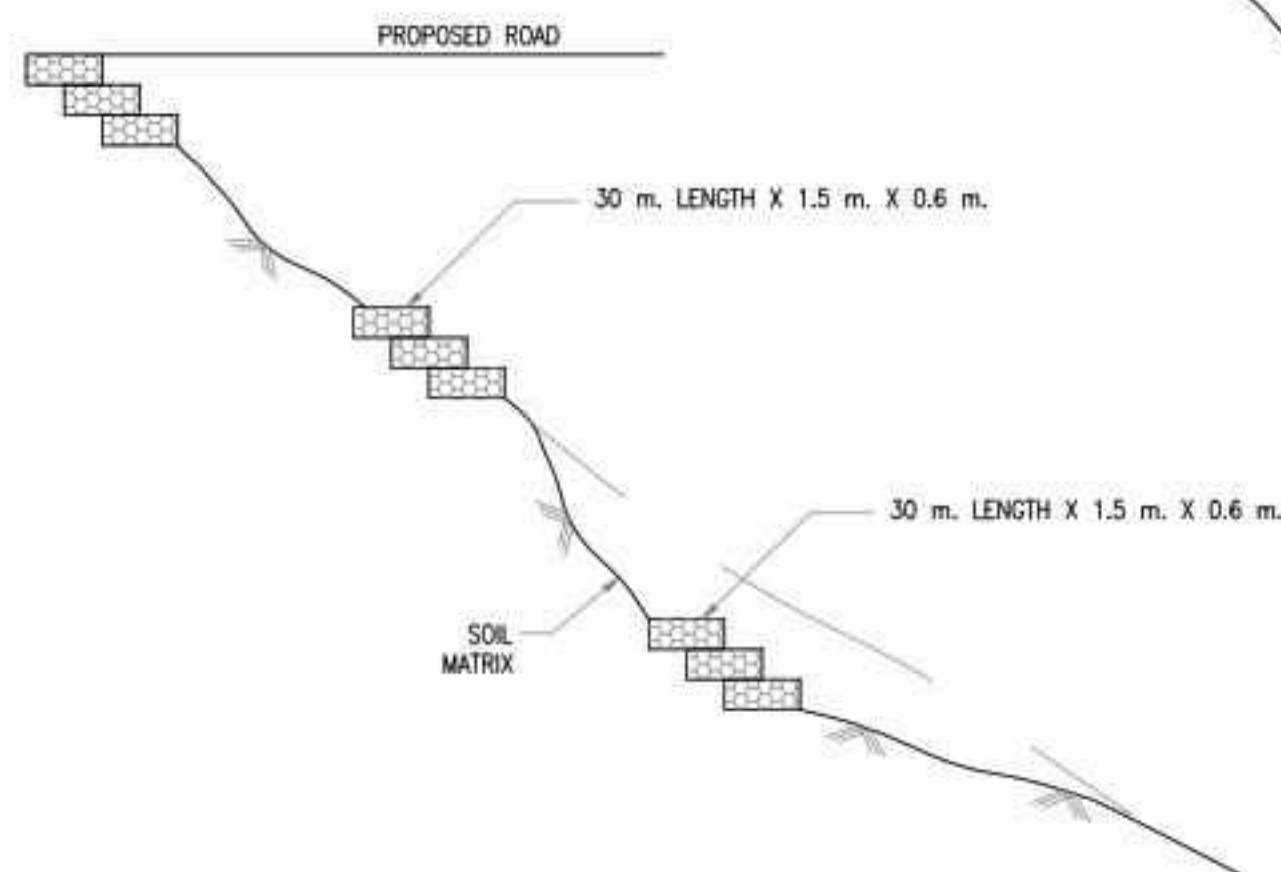
BALLY REVETMENT



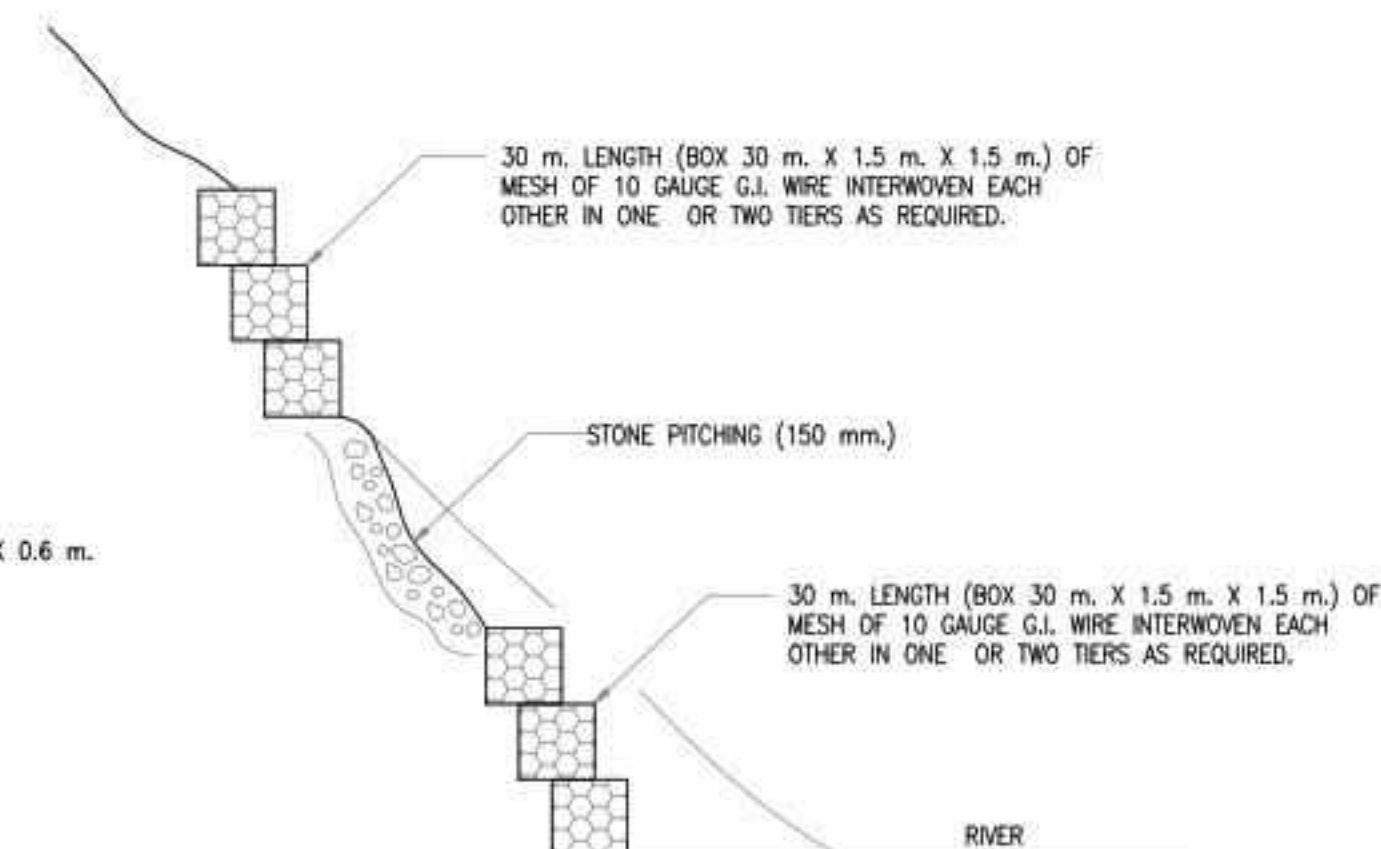
BALLY REVETMENT



SLOPE TREATMENT



GABBION : RR (DRY) MASONRY WITH GEO-SYNTHETIC OF COIR



WIRE CRATED MASONRY SLOPE PROTECTION

NOTES:

1) ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE SPECIFIED.

CLIENT :



Roads & Bridges Department
(Government of Sikkim)

PROJECT :

Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim

DESIGN CONSULTANT :



LEA ASSOCIATES SOUTH ASIA PVT. LTD.
B-1/E-27, Mohan Cooperative Industrial Estate,
Mathura Road, New Delhi-110044

DRAWING TITLE:-

DETAILS OF REHABILITATION WORKS
AT SLIDE LOCATION

DRAWING No : 73806/LASA/STR/MISC-809

REV.

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SHEET

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DRAWN

A. DHAR

DESIGN

DATE

CHECKED

S. ROY

REVIEWED

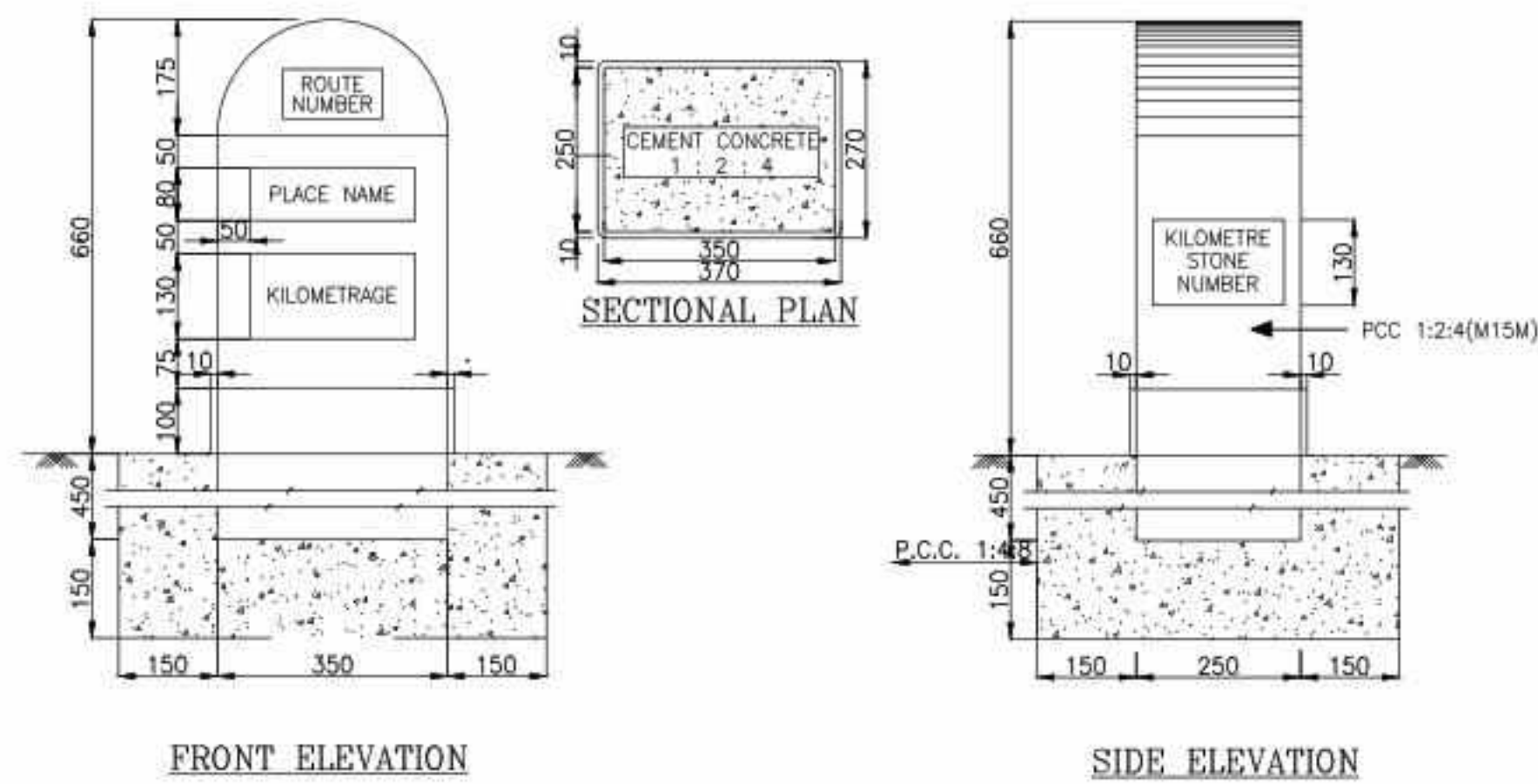
NOV. 2022

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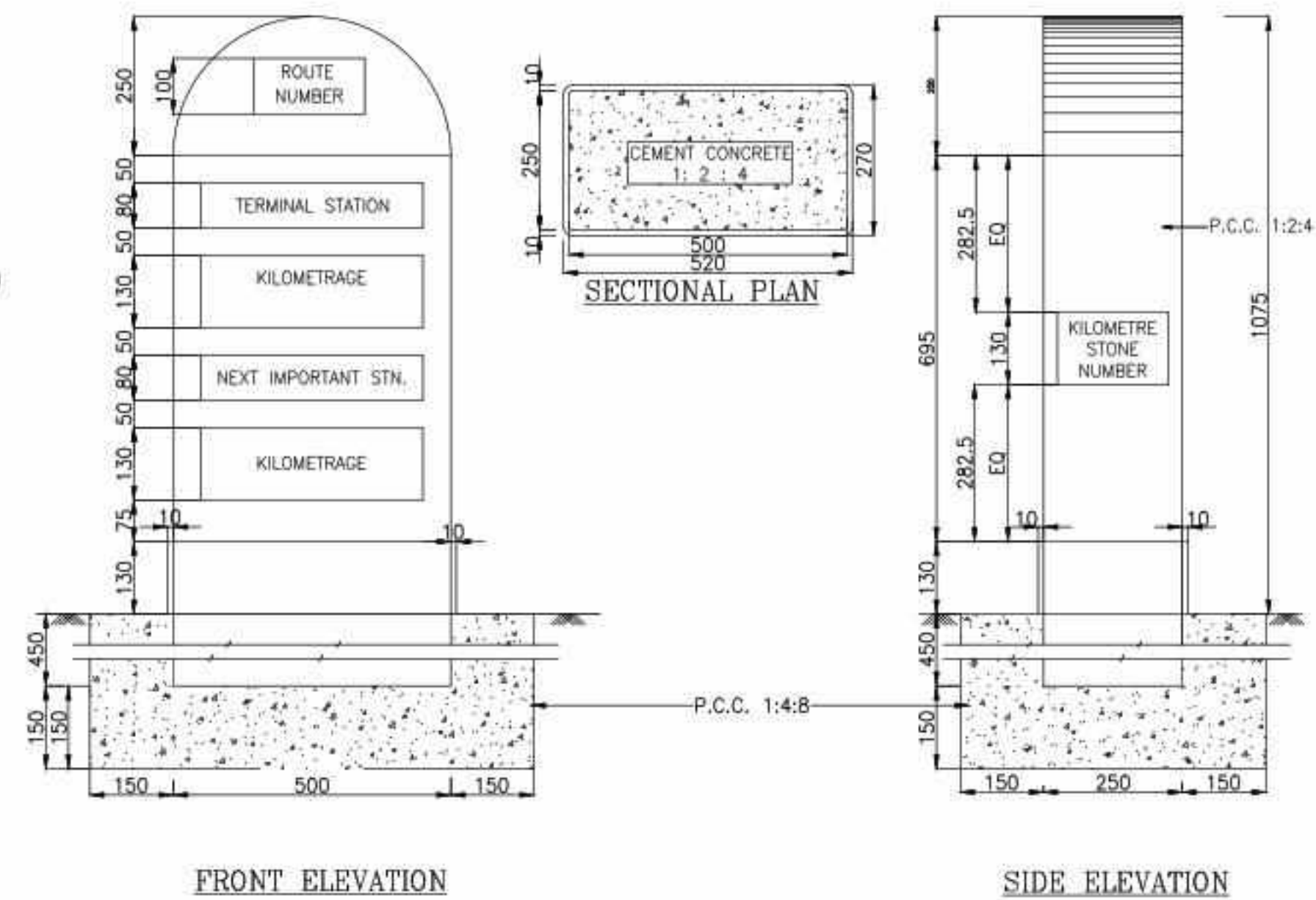
J. K. DAS

SCALE :

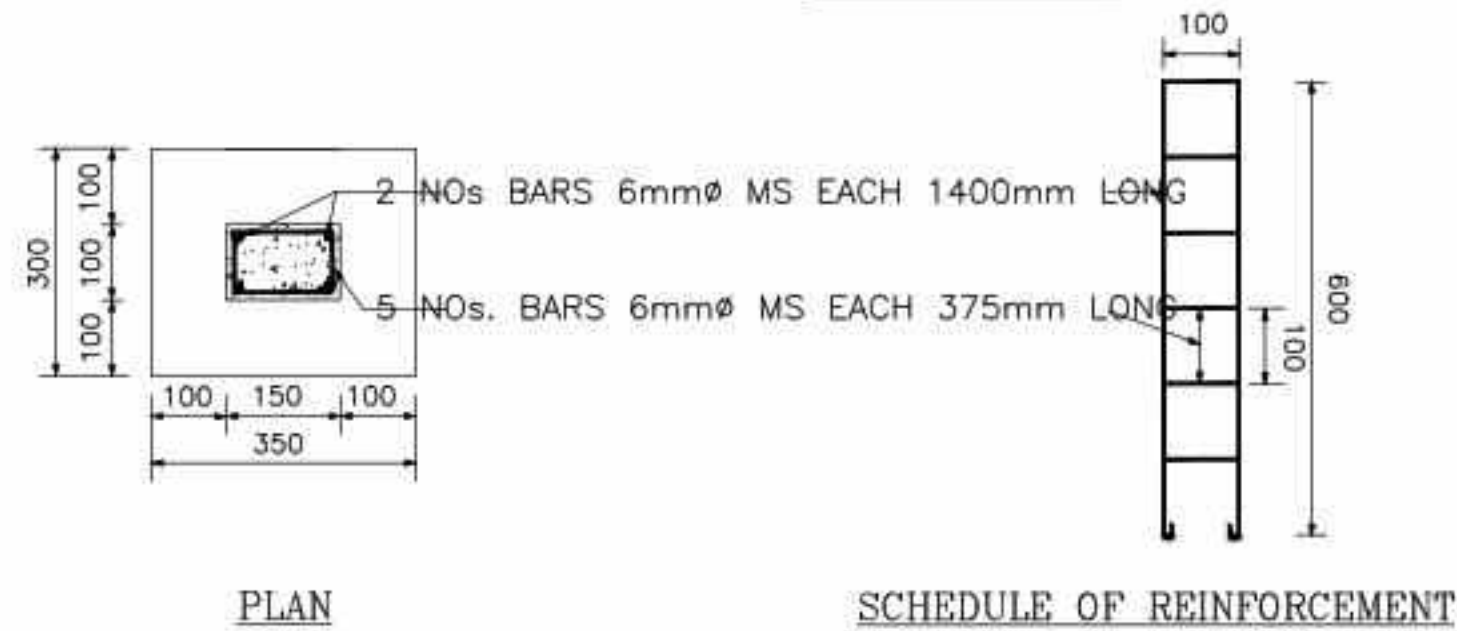
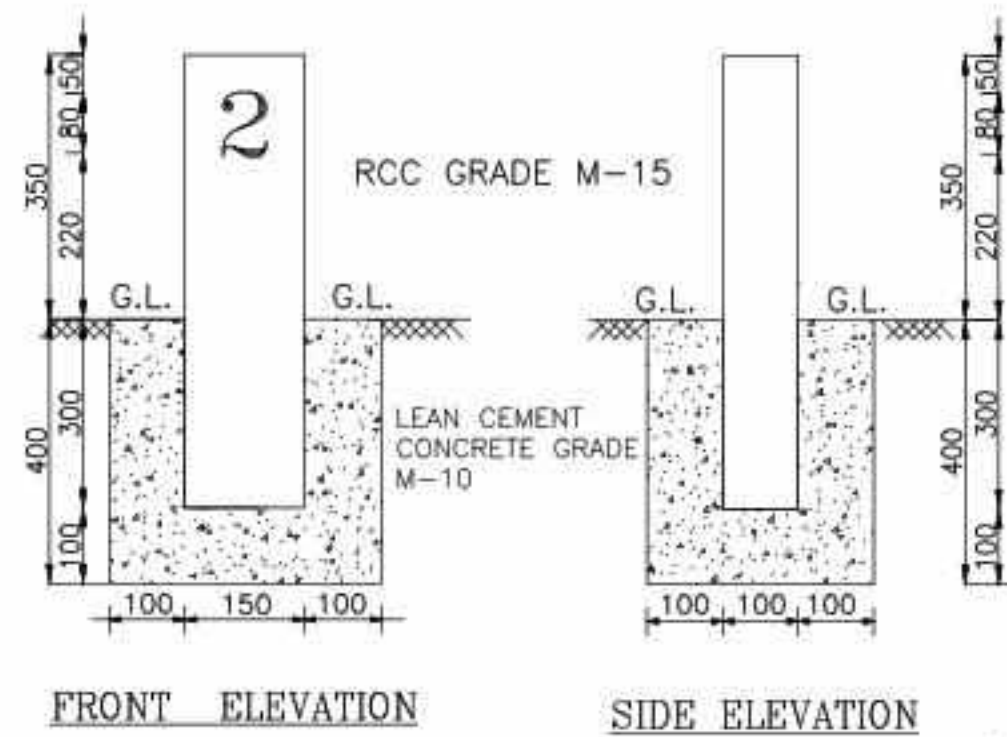
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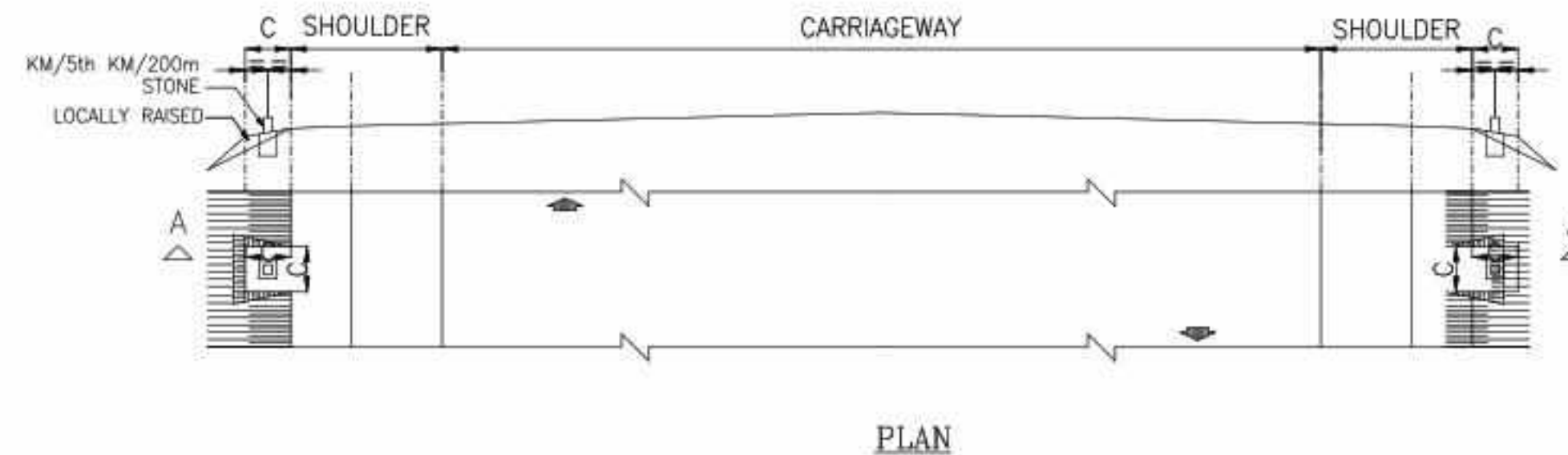
TYPICAL DETAILS OF ORDINARY KILOMETRE STONE



TYPICAL DETAILS OF FIFTH (5th) KILOMETRE STONE



TYPICAL DESIGN FOR 200 - METRE STONES



LOCATION OF KILOMETRE & 200 METRE STONE

NOTES:

- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS SHOWN OTHERWISE
- DIMENSIONS SHALL NOT BE SCALED FROM DRAWING. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
- DETAILS OF ORDINARY KM STONE AND 5th KM STONE ARE GENERALLY BASED ON IRC: 8-1980
- DETAILS OF 200m STONE ARE GENERALLY BASED ON IRC: 26-1967
- VALUE OF 'C' IS 1500mm FOR KM/5th KM STONE & 1000mm FOR 200m STONE

CLIENT :
Roads & Bridges Department
 (Government of Sikkim)

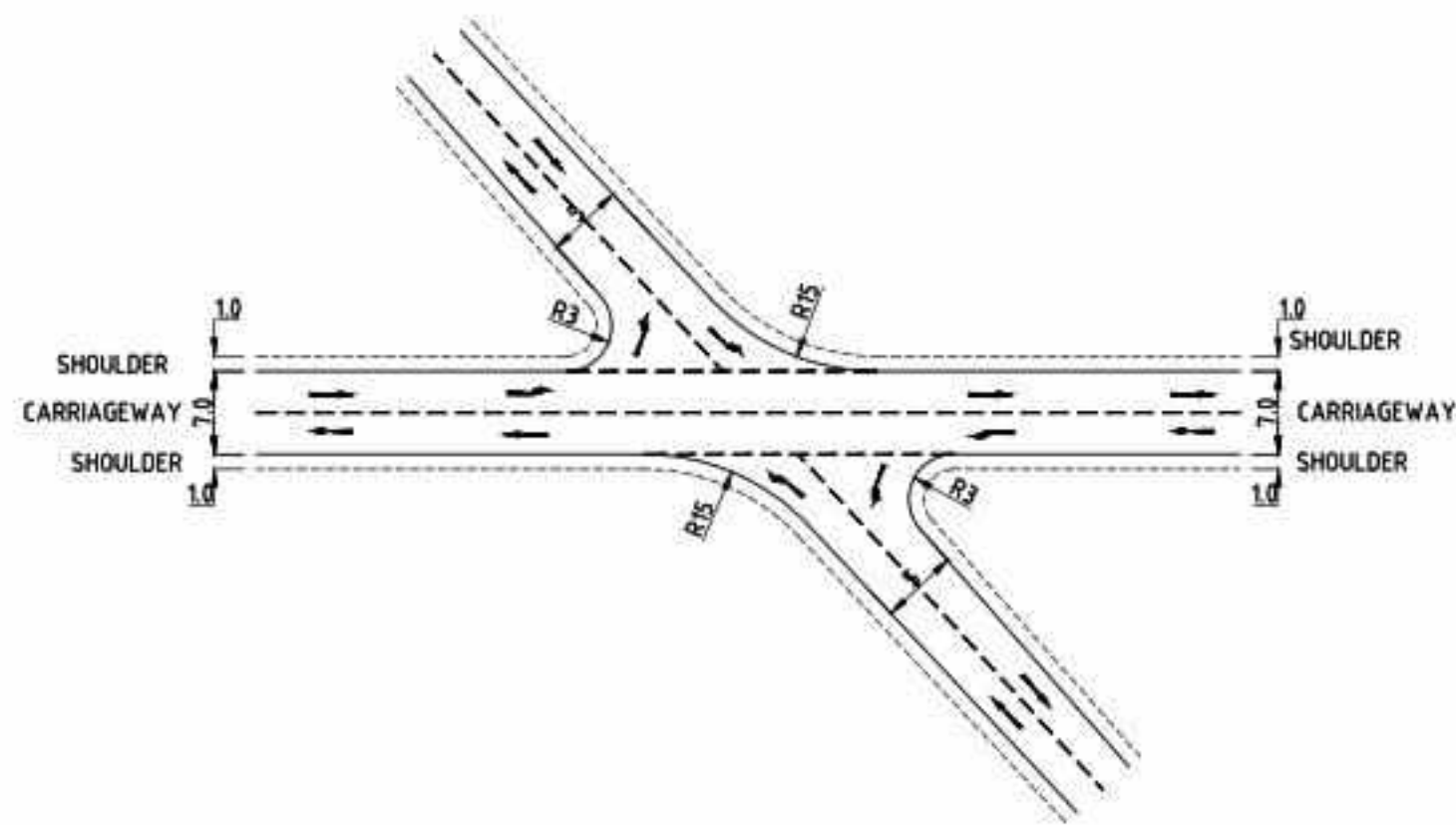
PROJECT :
Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim

DESIGN CONSULTANT :
LEA ASSOCIATES SOUTH ASIA PVT. LTD.
 B-1/E-27, Mohan Cooperative Industrial Estate,
 Mathura Road, New Delhi-110044

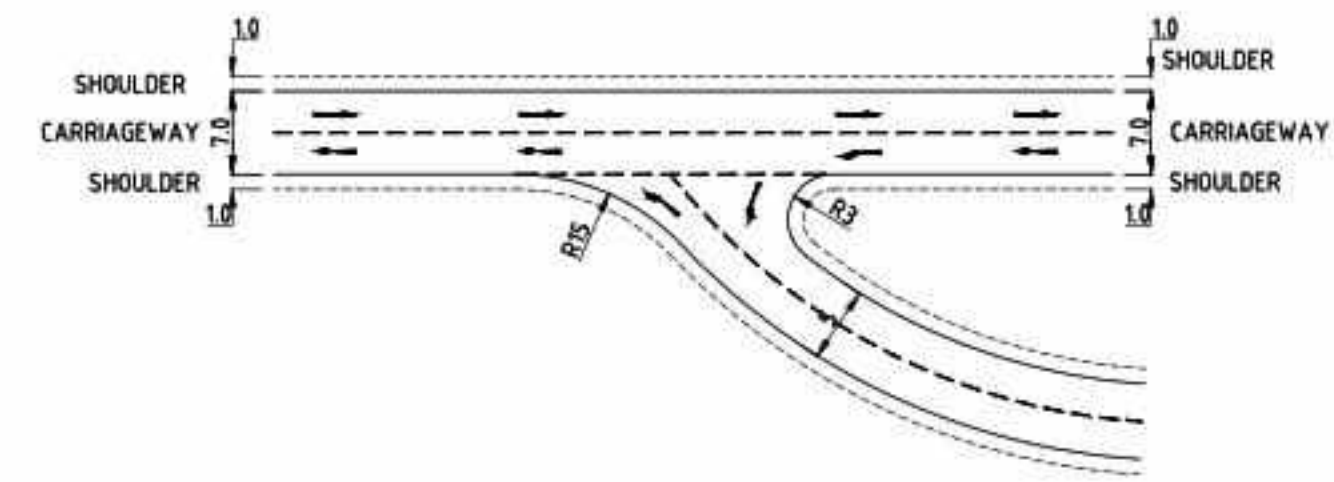
DRAWING TITLE:-
 TYPICAL DRAWING FOR KM STONE
DRAWING No : 73606/LASA/STR/MISC-810

REV.	DRAWN	A. DHAR	CHECKED	S. ROY
R0	DESIGN	SOURMENDU	REVIEWED	J. K. DAS
SHEET	DATE	NOV. 2022	SCALE :	
A2				

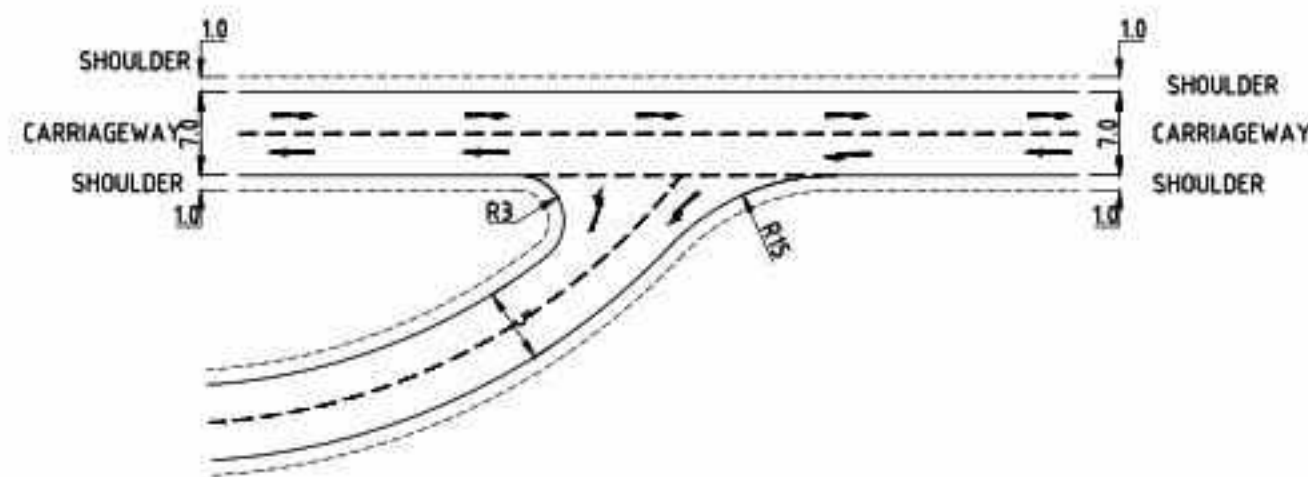
REV	DATE	DETAILS OF REVISION	BY



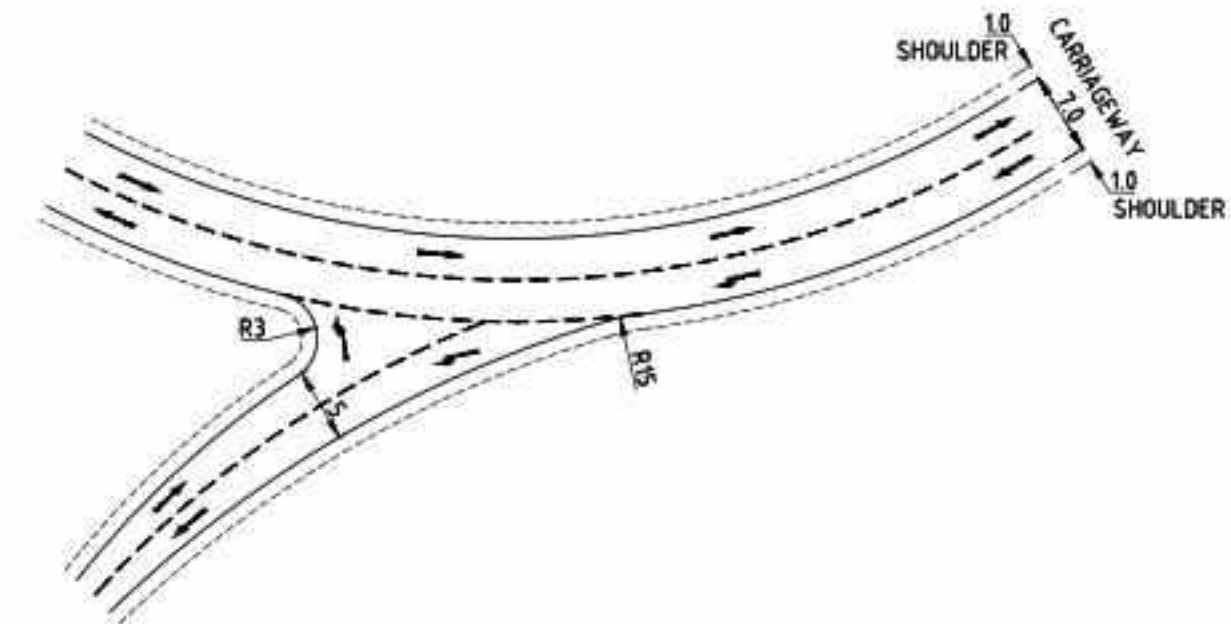
TYPICAL CROSS JUNCTION



TYPICAL Y- JUNCTION





TYPICAL Y- JUNCTION

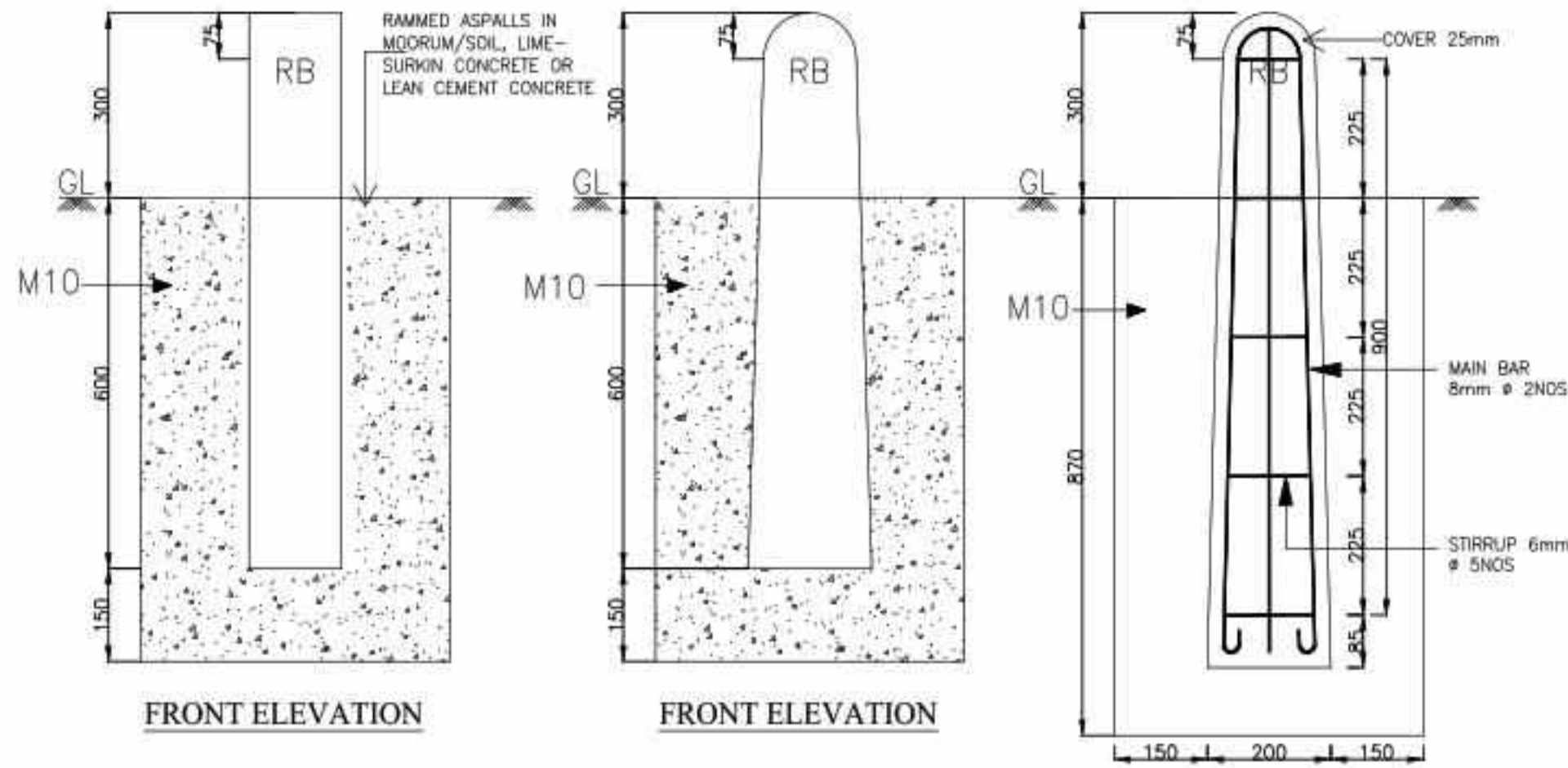


TYPICAL Y- JUNCTION ON CURV

NOTES

1. ALL DIMENSIONS ARE IN METER.

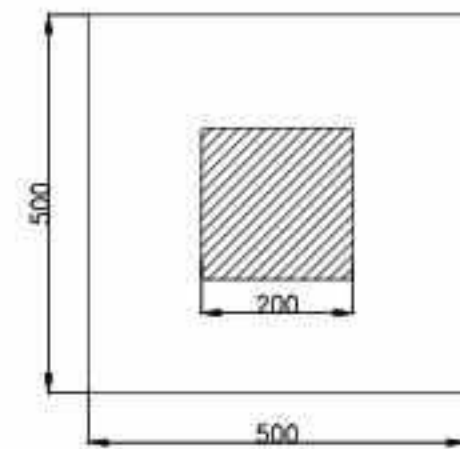
				<div><div>CLIENT : Roads & Bridges Department (Government of Sikkim)</div></div>	<div>PROJECT : Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim</div>	<div><div></div><div>DESIGN CONSULTANT : LEA ASSOCIATES SOUTH ASIA PVT. LTD. B-1/E-27, Mohan Cooperative Industrial Estate, Mathura Road, New Delhi-110044</div></div>	<div>DRAWING TITLE:- TYPICAL DETAILS FOR MINOR JUNCTION</div>	REV.	DRAWN	A. DHAR	CHECKED	S. ROY
R0	DESIGN	SOUMENDU	REVIEWED					J. K. DAS				
SHEET												
A2	DATE	NOV. 2022	SCALE :									
REV	DATE	DETAILS OF REVISION	BY				DRAWING No :	73806/LASA/STR/MISC-812				



FRONT ELEVATION

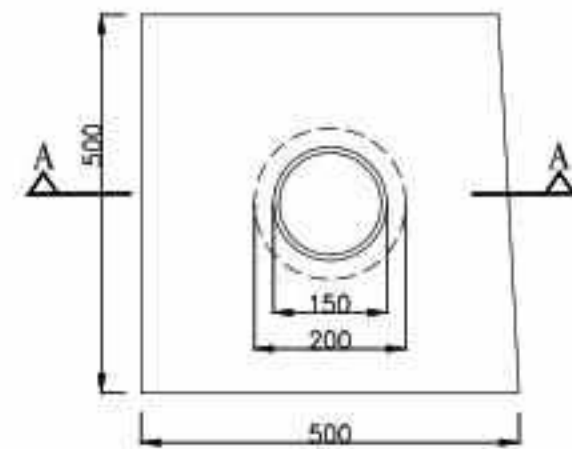
FRONT ELEVATION

SECTION AT A-A



PLAN

TYPE DESIGN WITH
STONE AS MATERIAL



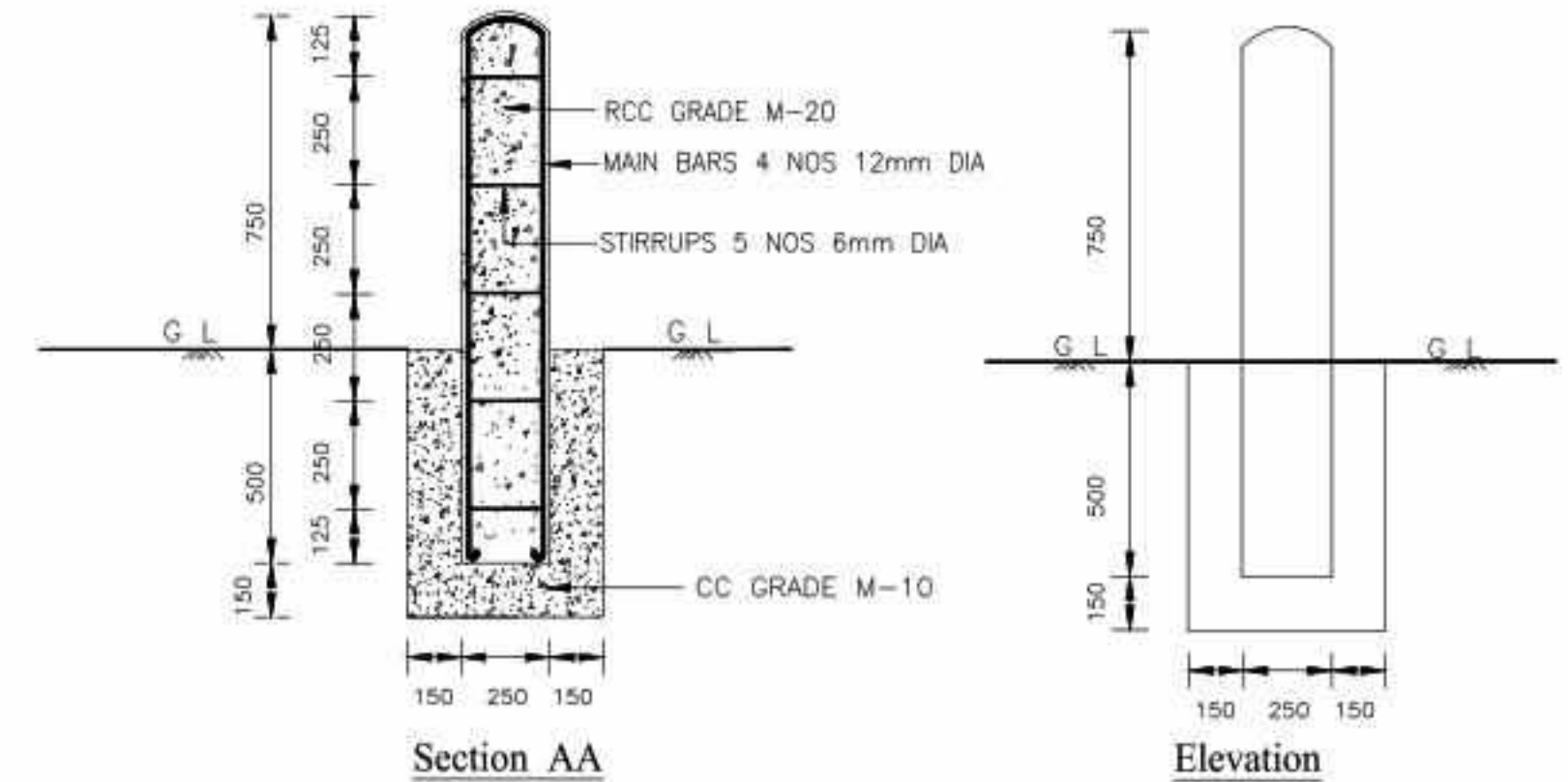
PLAN

TYPE DESIGN WITH
R.C.C. AS MATERIAL

BAR BENDING SCHEDULE

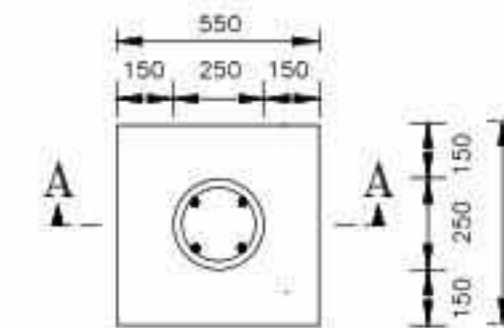
S.NO.	TYPE OF M.S BAR	NO. OF BARS	SHAPE OF BARS	DIA IN mm	LENTH OF BAR INCLUDING HOOKS
1	MAIN BARS	2		8mm	1.84m
2	TOPMOST STIRRUP	1		6mm	370mm
3	STIRRUP (FIRST FSDM TOP)	1		6mm	405mm
4	STIRRUP (SECOND FSDM TOP)	1		6mm	440mm
5	STIRRUP (THIRD FSDM TOP)	1		6mm	475mm
6	BOTTOM STIRRUP	1		6mm	810mm

TYPICAL DETAILS OF BOUNDARY STONE



Section AA

Elevation



Plan

TYPICAL DETAILS OF GUARD POST

Notes

1. All Dimensions Are In mm Except Where Otherwise Mentioned
2. Reinforcement – Mild Steel Bars Conforming To I.S.432/1966 Grade 1 Tested Steel
3. Concrete Mix –
Rcc : Grade M-20
Cc : Grade M-10

CLIENT :



Roads & Bridges Department
(Government of Sikkim)

PROJECT :

**Consultancy Services for Feasibility Studies
and Preparation of Detailed Project Report
for Roads and Bridges in Sikkim**

DESIGN CONSULTANT :

LEA ASSOCIATES SOUTH ASIA PVT. LTD.
B-1/E-27, Mohan Cooperative Industrial Estate,
Mathura Road, New Delhi-110044

DRAWING TITLE:-

**TYPICAL DRAWING FOR
GUARD POST & BOUNDARY STONE**

DRAWING No : 73806/LASA/STR/MISC-813

REV.

R0

SHEET

A2

DRAWN

A. DHAR

DESIGN

DATE

CHECKED

S. ROY

REVIEWED

J. K. DAS

SCALE :

REV DATE DETAILS OF REVISION BY

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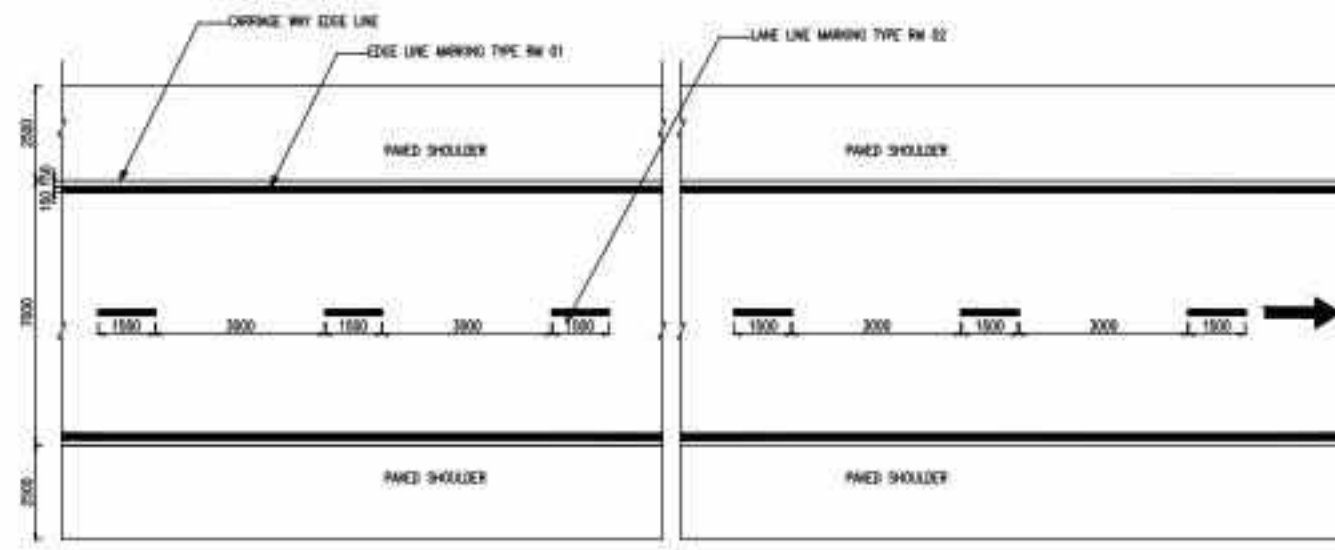
4

3

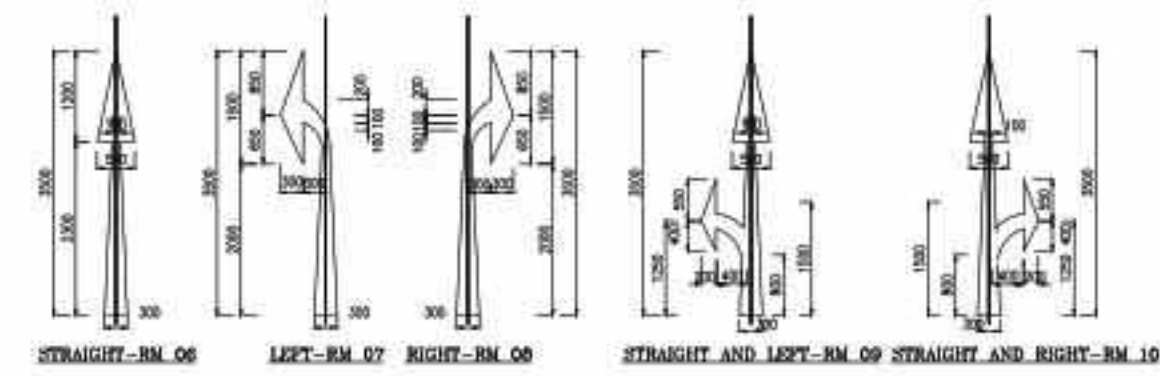
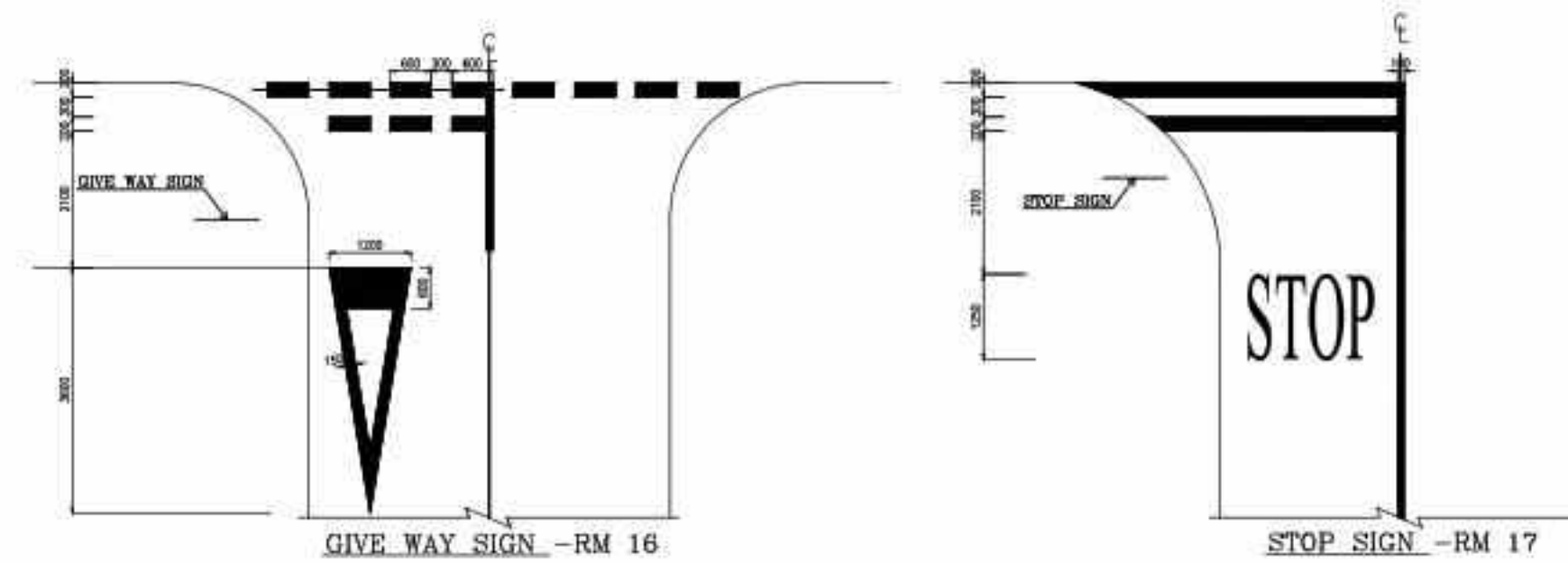
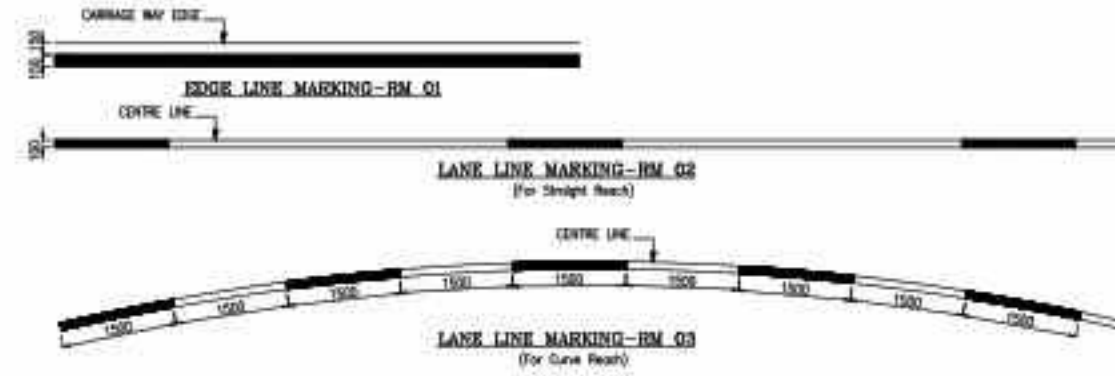
2

1

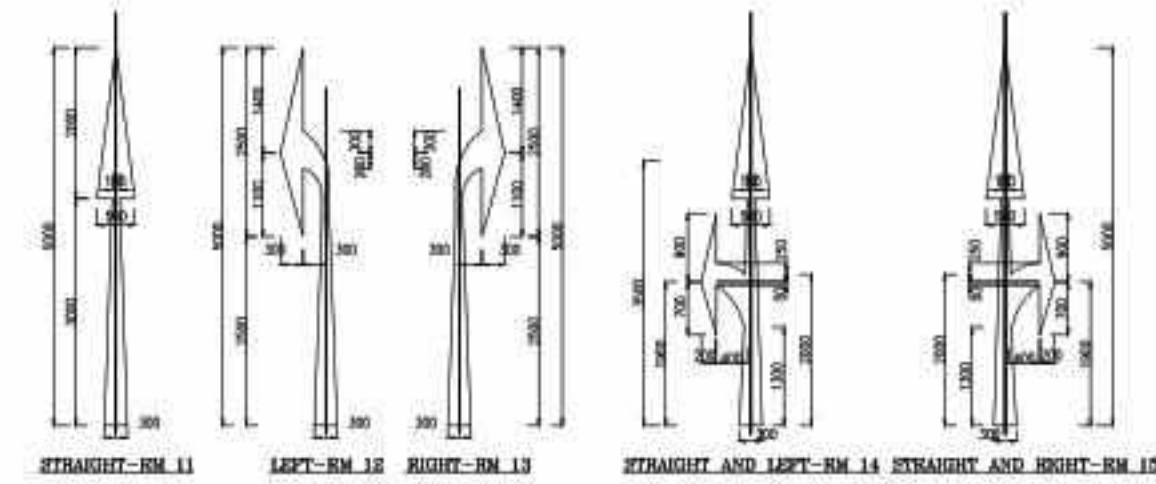
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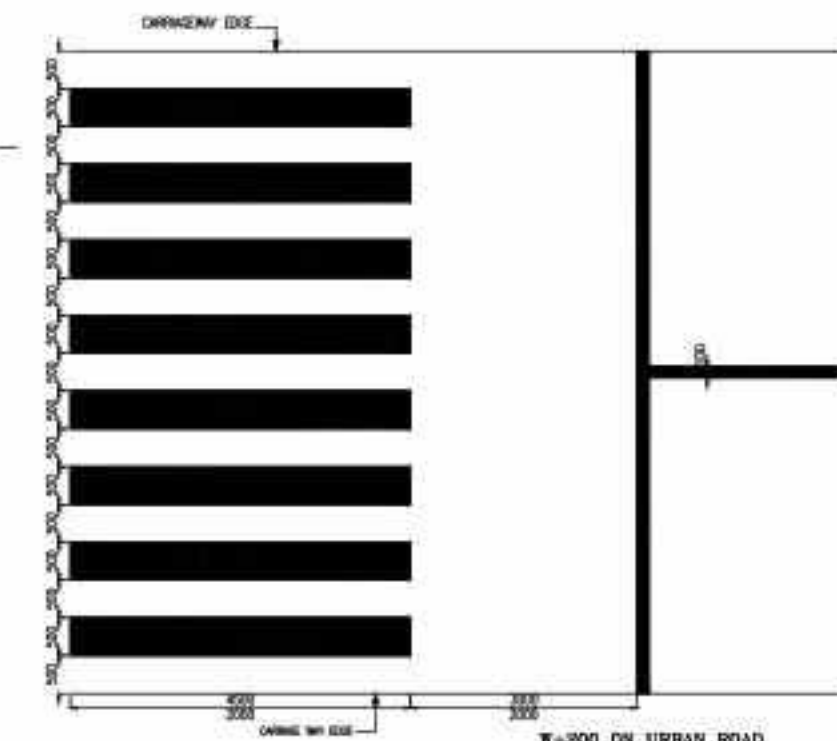
SECTION TYPE-1
TYPICAL LAYOUT OF ROAD MARKING
SECTION TYPE-2



ROUTE DIRECTIONAL ARROWS FOR ROADS WITH DESIGN SPEED UP TO 50 km/hr



ROUTE DIRECTIONAL ARROWS FOR ROADS WITH DESIGN SPEED MORE THAN 50 km/hr



PEDESTRIAN CROSSING-RM 04 & STOP LINE-RM 05

CLIENT :



Roads & Bridges Department
(Government of Sikkim)

PROJECT :

**Consultancy Services for Feasibility Studies
and Preparation of Detailed Project Report
for Roads and Bridges in Sikkim**

DESIGN CONSULTANT :



LEA ASSOCIATES SOUTH ASIA PVT. LTD.
B-1/E-27, Mohan Cooperative Industrial Estate,
Mathura Road, New Delhi-110044

DRAWING TITLE:-

TYPICAL DRAWING ROAD MARKING

DRAWING No : 73606/LASA/STR/MISC-814

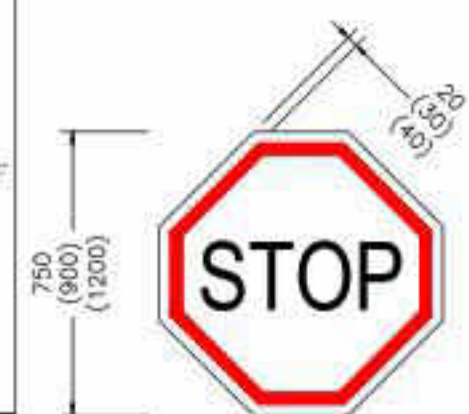
REV.

R0

SHEET

A2

DRAWN	A. DHAR	CHECKED	S. ROY
DESIGN	SOURMENDU	REVIEWED	J. K. DAS
DATE	NOV. 2022	SCALE :	



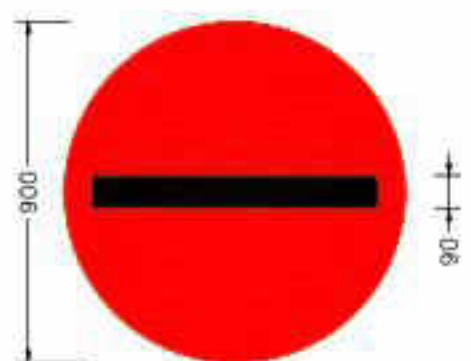
STOP

FIG 14.01



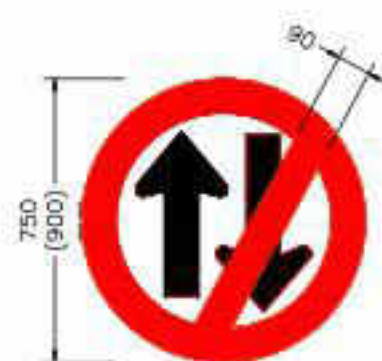
GIVE WAY

FIG 14.02



NO ENTRY

FIG 14.19



ONE WAY SIGN

FIG 14.20



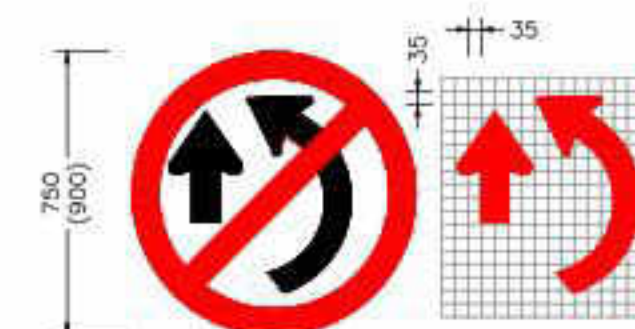
LEFT TURN PROHIBITED

FIG 14.21



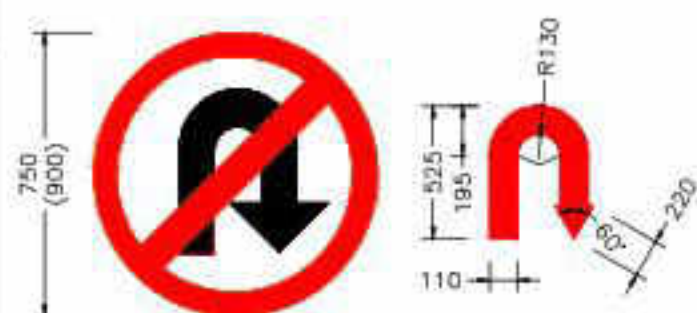
RIGHT TURN PROHIBITED

FIG 14.22



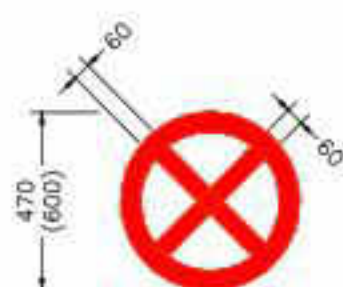
OVER TAKING PROHIBITED

FIG 14.23



U-TURN PROHIBITED

FIG 14.24



NO STOPPING
NO STANDING

FIG 14.28



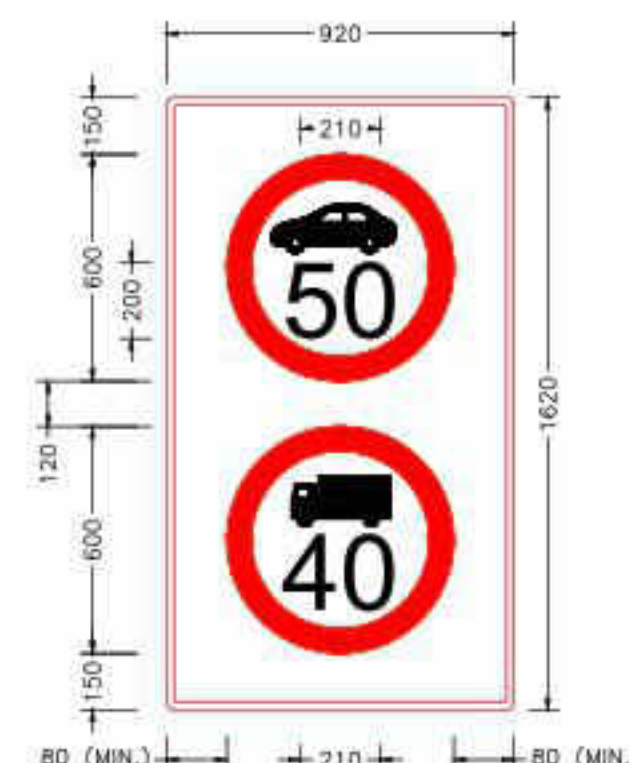
NO PARKING

FIG 14.29



MAXIMUM SPEED LIMIT

FIG 14.37



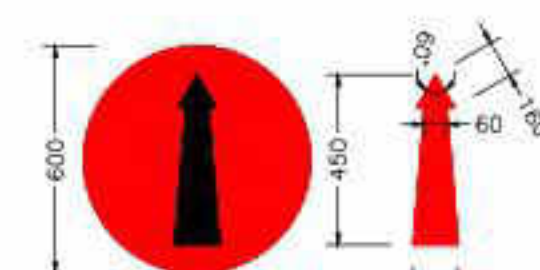
MAXIMUM SPEED LIMIT

FIG 14.38



RESTRICTION ENDS

FIG 14.40



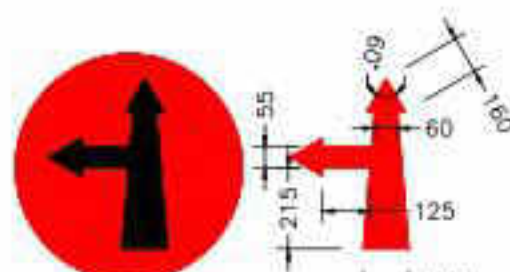
COMPULSORY AHEAD

FIG 14.41



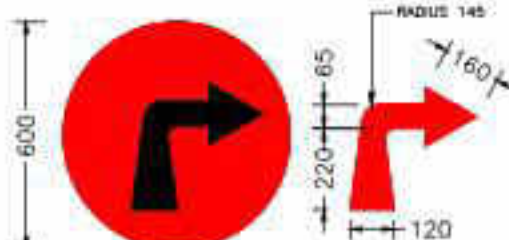
COMPULSORY AHEAD
OR TURN RIGHT

FIG 14.42



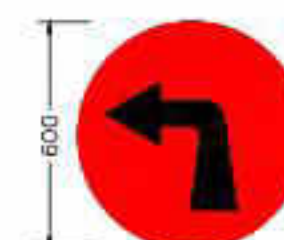
COMPULSORY AHEAD
OR TURN LEFT

FIG 14.43



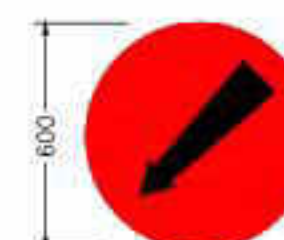
COMPULSORY TURN RIGHT

FIG 14.46



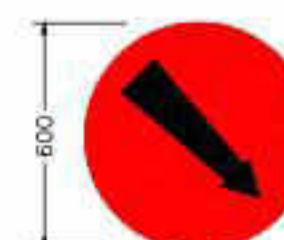
COMPULSORY TURN LEFT

FIG 14.47



COMPULSORY
KEEP LEFT

FIG 14.48





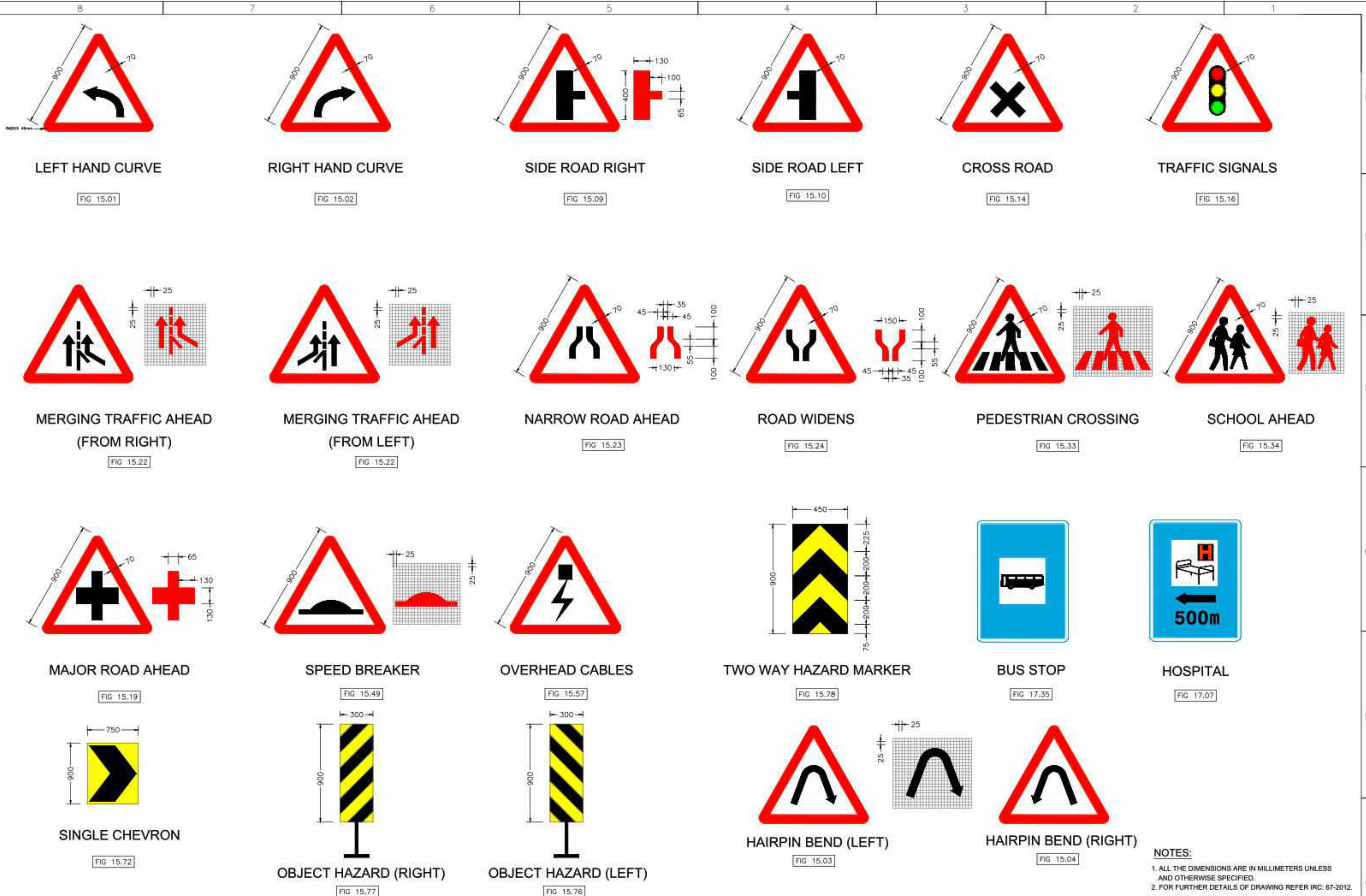
COMPULSORY
KEEP RIGHT

FIG 14.49

NOTES:

1. ALL THE DIMENSIONS ARE IN MILLIMETERS UNLESS AND OTHERWISE SPECIFIED.
2. FOR FURTHER DETAILS OF DRAWING REFER IRC: 67-2012.

				 CLIENT : Roads & Bridges Department (Government of Sikkim)	PROJECT : Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim	 DESIGN CONSULTANT : LEA ASSOCIATES SOUTH ASIA PVT. LTD. B-1/E-27, Mohan Cooperative Industrial Estate, Mathura Road, New Delhi-110044	DRAWING TITLE:- TYPICAL DETAILS OF ROAD SIGNS (SH. 1 OF 6)	REV.	DRAWN	A. DHAR	CHECKED	S. ROY
								SHEET	DESIGN	SUBARNA	REVIEWED	J. K. DAS
REV	DATE	DETAILS OF REVISION	BY					A2	DATE	SEP 2021	SCALE :	
							DRAWING No : 73606/LASA/STR/MISC-815					



NOTES:
1. ALL THE DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
2. FOR FURTHER DETAILS OF DRAWING REFER IRC: 67-2012.

		CLIENT :		PROJECT :		DESIGN CONSULTANT :		DRAWING TITLE:-		REV.	
		Roads & Bridges Department		Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim		LEA ASSOCIATES SOUTH ASIA PVT. LTD.		TYPICAL DETAILS OF ROAD SIGNS (SH. 2 OF 6)		R0	
		(Government of Sikkim)				8-1/E-27, Mohan Cooperative Industrial Estate, Mathura Road, New Delhi-110044				DESIGN	
										SHEET	
										A2	
										DATE	
										SEP 2021	
										SCALE :	
										1	



FLAG TYPE DIRECTION SIGN

PLACE IDENTIFICATION SIGN

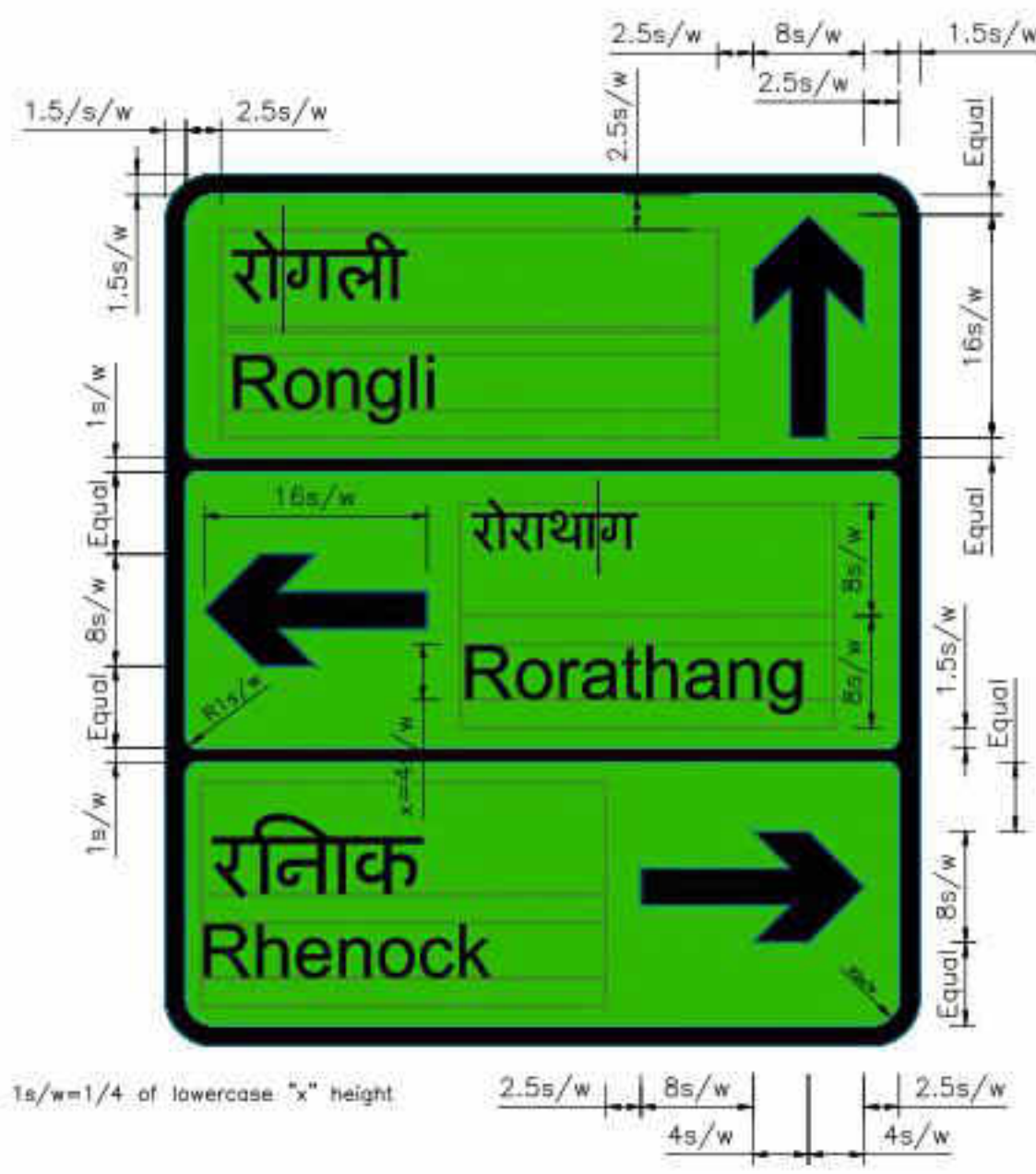
GANTRY MOUNTED ADVANCE DIRECTION SIGN
AHEAD OF A GRADE SEPARATED JUNCTION

Width of Chevron (W)
1 Line of Text=3.5s/w
2 Line of Text=4s/w
3 Line of Text=4.5s/w
4 Line of Text=5s/w

FIG 16.04

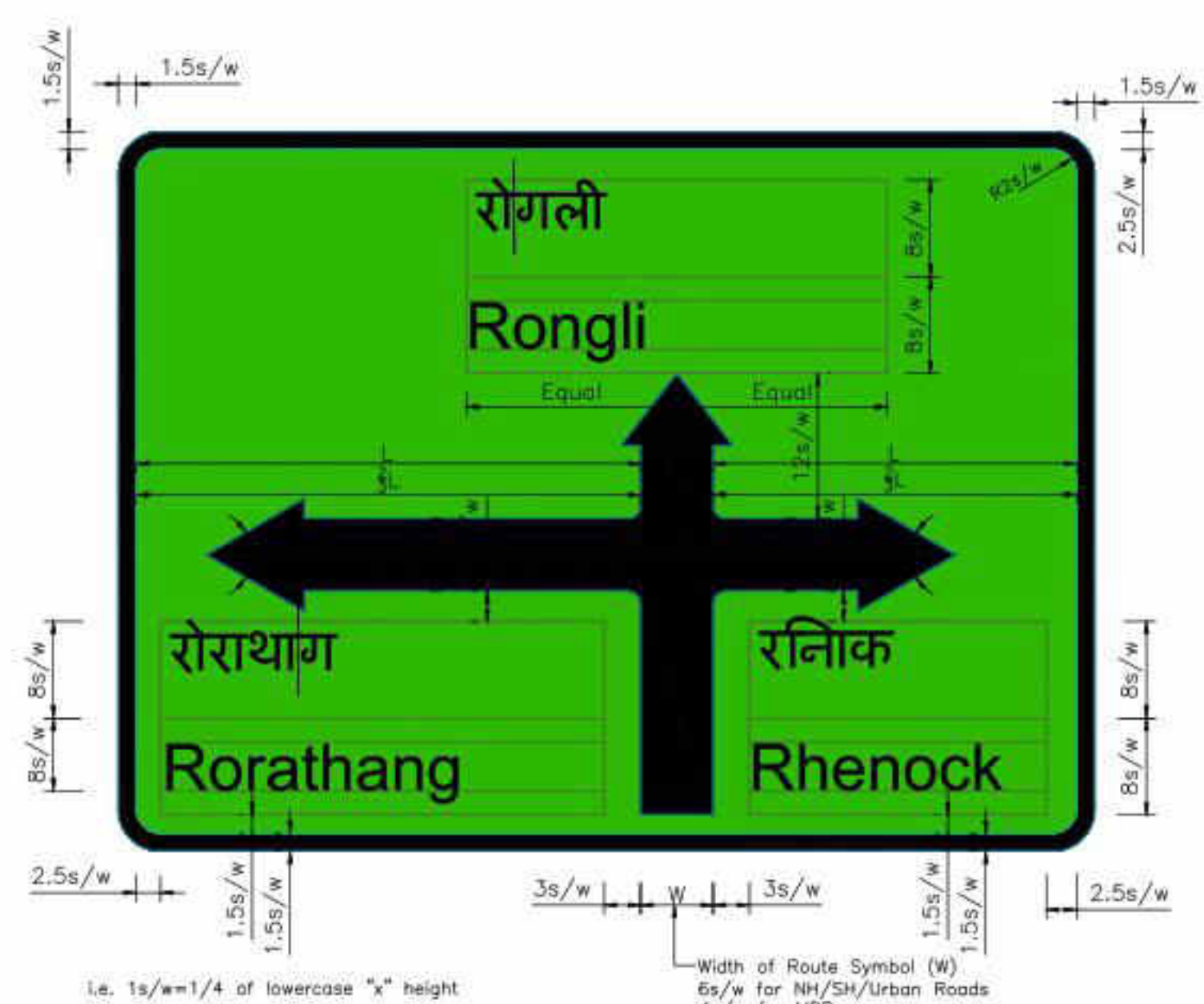
FIG 16.06

FIG 16.10



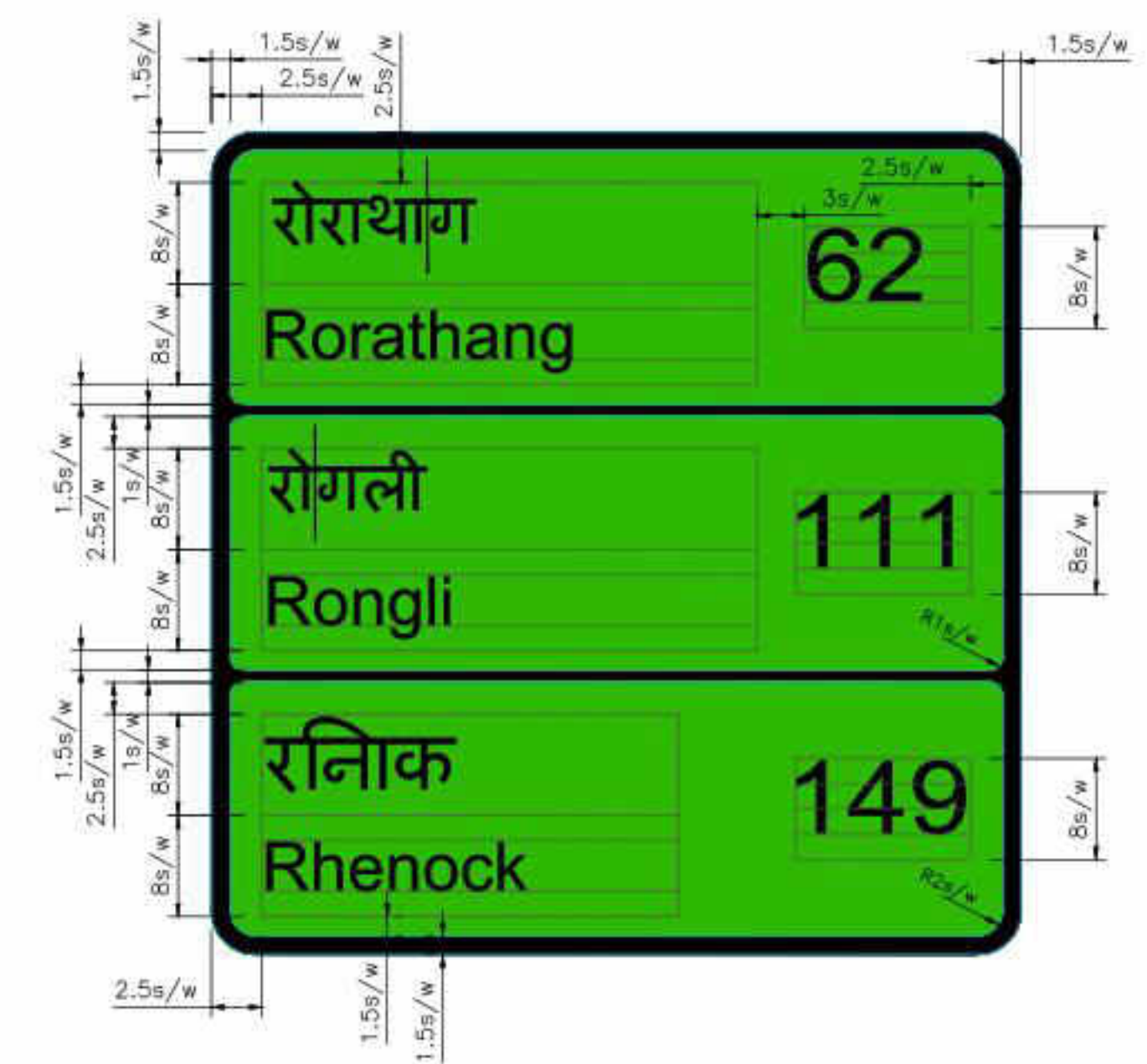
STACK TYPE ADVANCE DIRECTION
(SHOULDER MOUNTED)

FIG 16.01



MAP TYPE ADVANCE DIRECTION
(SHOULDER MOUNTED)

FIG 16.02



RE ASSURANCE SIGN

FIG 16.05

NOTES:

1. ALL THE DIMENSIONS ARE IN MILLIMETERS UNLESS AND OTHERWISE SPECIFIED.
2. FOR FURTHER DETAILS OF DRAWING REFER IRC: 67-2012.

CLIENT :
Roads & Bridges Department
(Government of Sikkim)

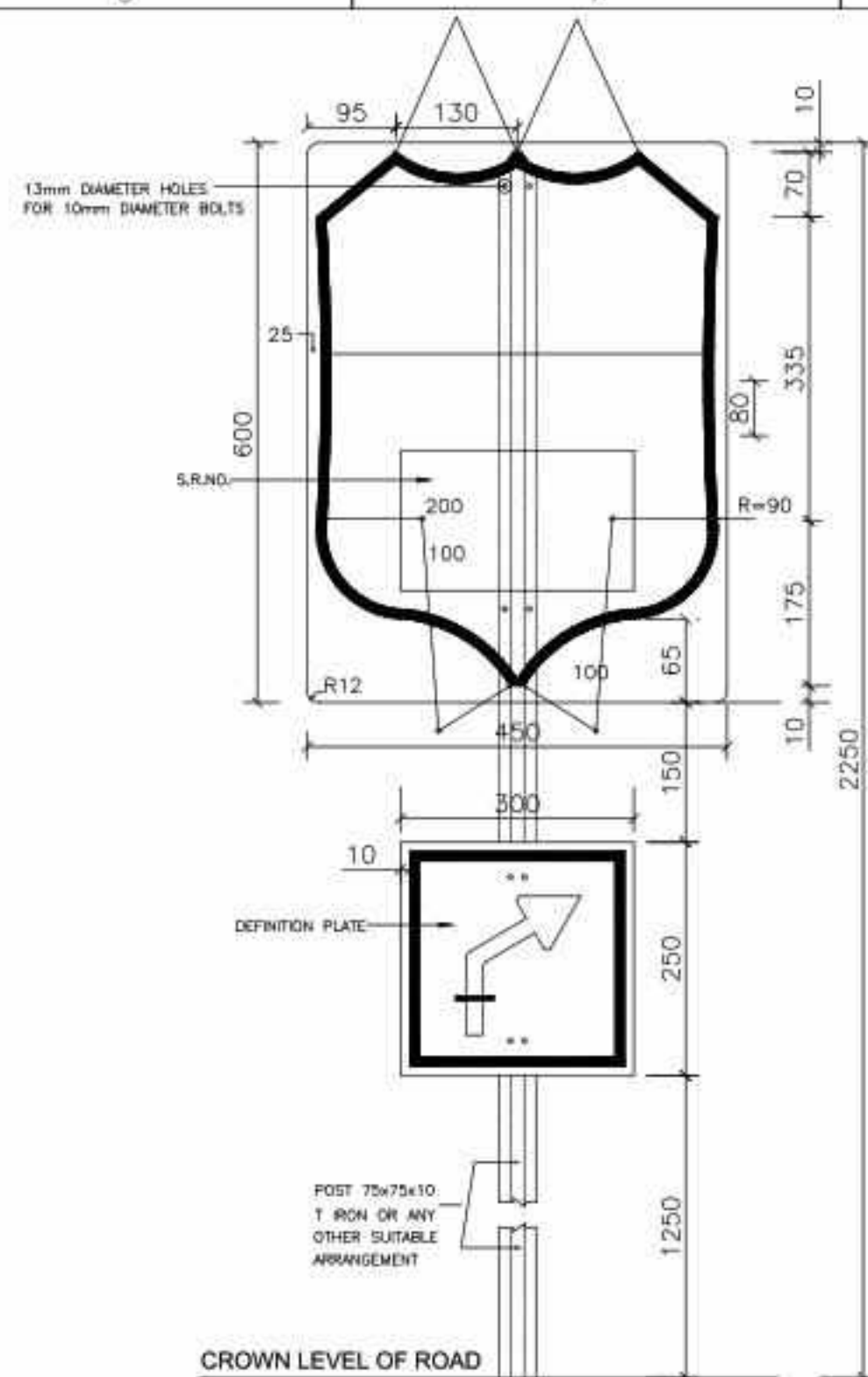
PROJECT :
**Consultancy Services for Feasibility Studies
and Preparation of Detailed Project Report
for Roads and Bridges in Sikkim**

DESIGN CONSULTANT :
LEA ASSOCIATES SOUTH ASIA PVT. LTD.
B-1/E-27, Mohan Cooperative Industrial Estate,
Mathura Road, New Delhi-110044

DRAWING TITLE:-
**TYPICAL DETAILS OF
ROAD SIGNS
(SH. 3 OF 6)**
DRAWING No : 73606/LASA/STR/MISC-815

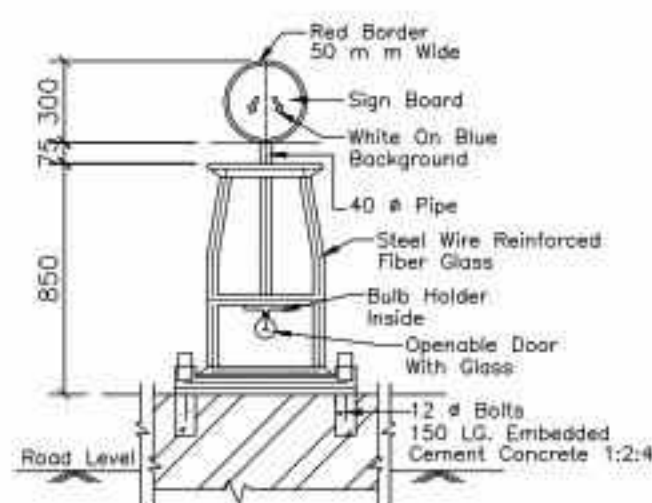
REV.	DRAWN	A. DHAR	CHECKED	S. ROY
R0	DESIGN	SUBARNA	REVIEWED	J. K. DAS
SHEET	DATE	SEP 2021	SCALE :	
A2				

REV	DATE	DETAILS OF REVISION	BY



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

S-16
S-23



TYPICAL DETAILS
OF LIGHTED BOLLARD

S-61



OBJECT HAZARD (LEFT)

FIG 15.76



OBJECT HAZARD (RIGHT)

FIG 15.77



ROAD CLOSED

S-35





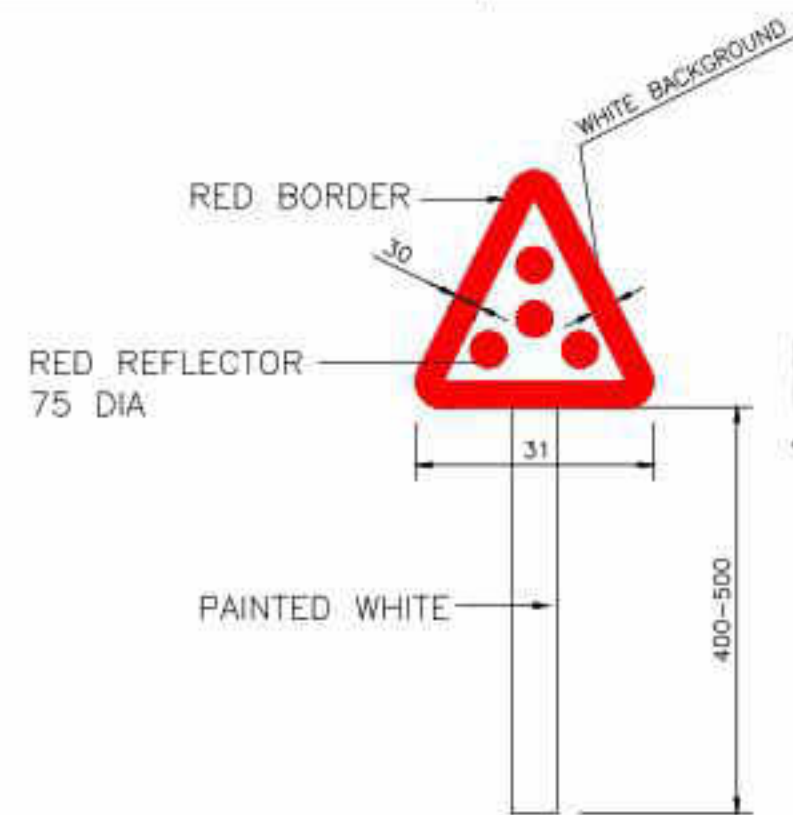
SERVICE ROAD AHEAD SIGN

S-63

NOTES:

1. ALL THE DIMENSIONS ARE IN MILLIMETERS UNLESS AND OTHERWISE SPECIFIED.
2. FOR FURTHER DETAILS OF DRAWING REFER IRC: 67-2012.

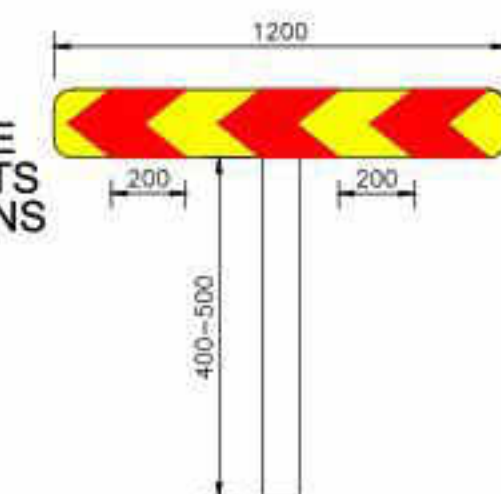
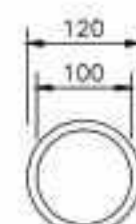
				CLIENT :  Roads & Bridges Department (Government of Sikkim)	PROJECT : Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim	DESIGN CONSULTANT :  LEA ASSOCIATES SOUTH ASIA PVT. LTD. B-1/E-27, Mohan Cooperative Industrial Estate, Mathura Road, New Delhi-110044	DRAWING TITLE:- TYPICAL DETAILS OF ROAD SIGNS (SH. 4 OF 6)	REV.	DRAWN	A. DHAR	CHECKED	S. ROY
								R0	DESIGN	SUBARNA	REVIEWED	J. K. DAS
REV	DATE	DETAILS OF REVISION	BY					SHEET	DATE	SEP 2021	SCALE :	
							DRAWING No : 73606/LASA/STR/MISC-815	A2				



CLUSTER OF RED REFLECTORS

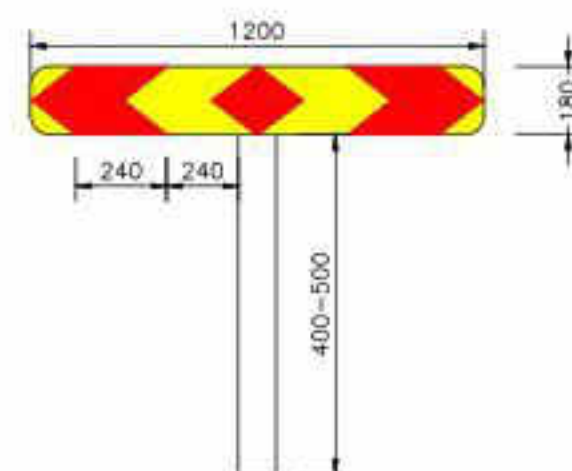
TA-1

RED REFLECTOR TO BE FIXED ON GUARD POSTS AT SUITABLE LOCATIONS



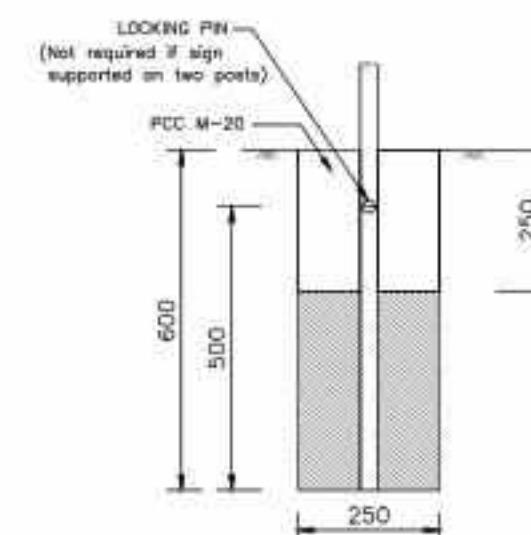
ONE-WAY HAZARD MARKER

TA-2

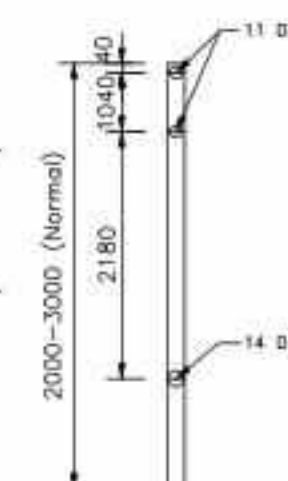


TWO-WAY HAZARD MARKER

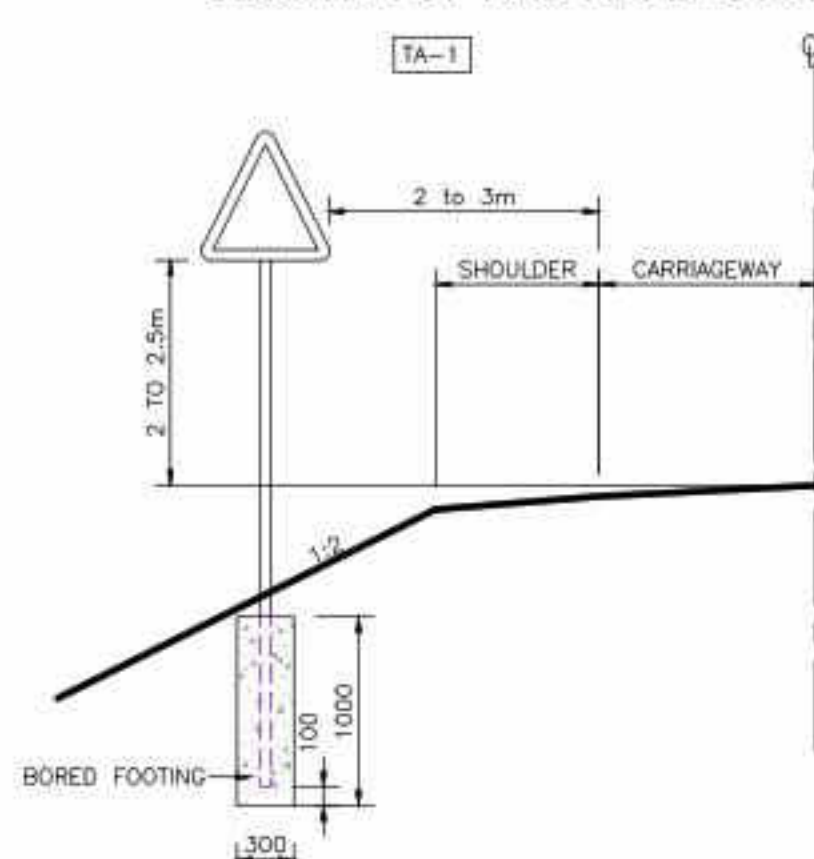
TA-3



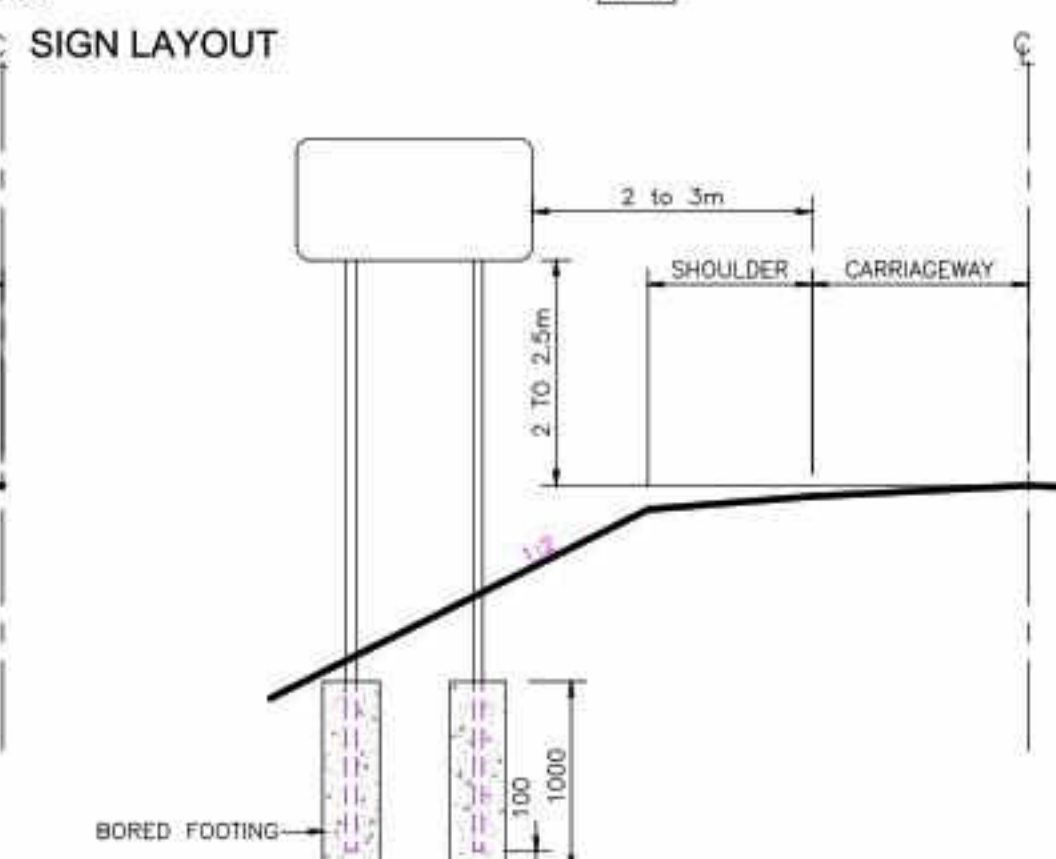
FOOTING DETAILS FOR SINGLE SIGN SUPPORT



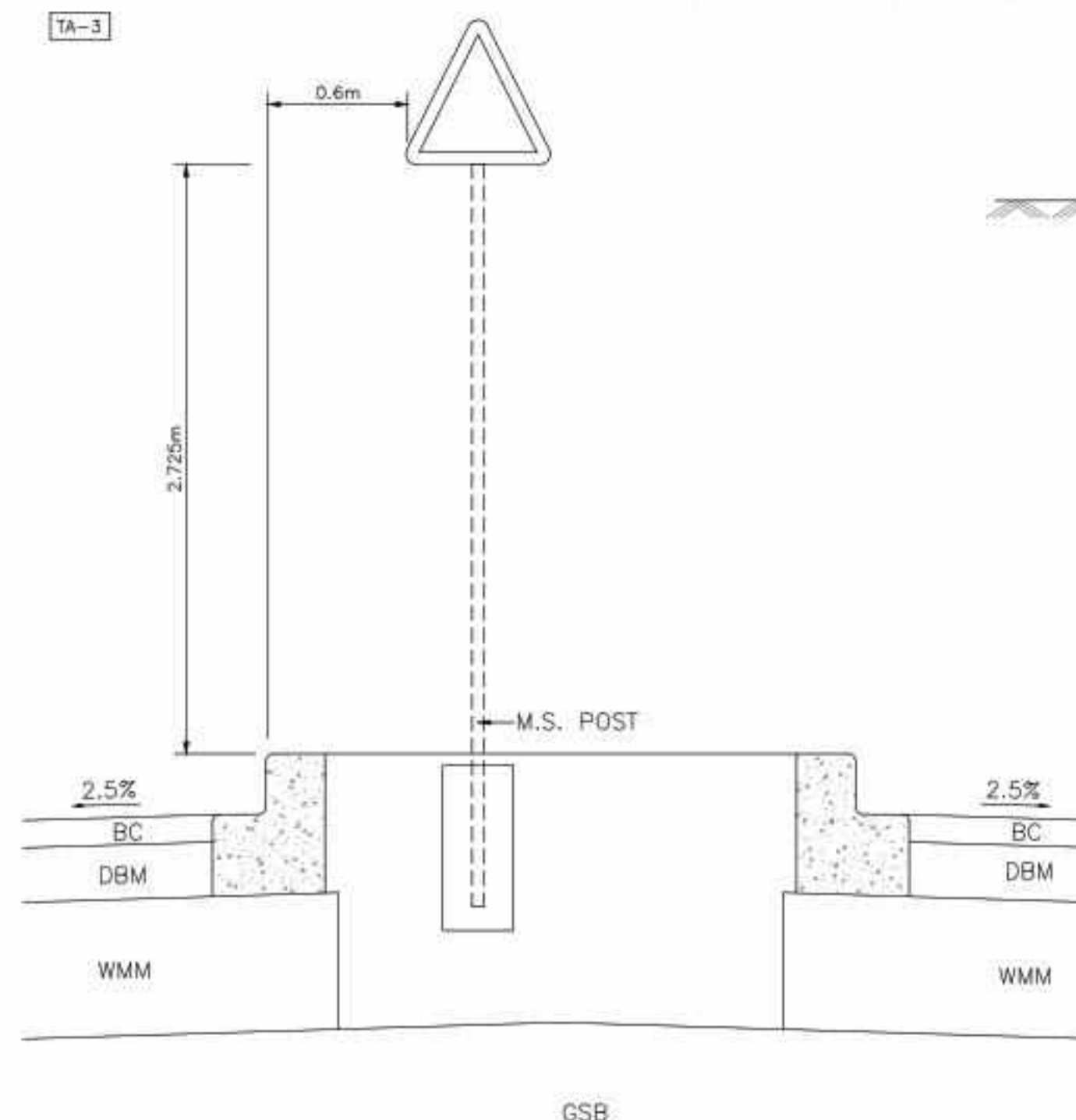
FOOTING DETAIL FOR SIGNS IN MEDIAN



SINGLE LEAF SIGN



DIRECTIONAL SIGN (WITH BORED FOOTING)



SIGN DETAILS IN MEDIAN

NOTES:

1. ALL THE DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
2. FOR FURTHER DETAILS OF DRAWING REFER IRC: 67-1997.

CLIENT :



Roads & Bridges Department
(Government of Sikkim)

PROJECT :

Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim

DESIGN CONSULTANT :

LEA ASSOCIATES SOUTH ASIA PVT. LTD.
B-1/E-27, Mohan Cooperative Industrial Estate,
Mathura Road, New Delhi-110044

DRAWING TITLE:-

TYPICAL DETAILS OF ROAD SIGNS (SH. 5 OF 6)

DRAWING No : 73806/LASA/STR/MISC-815

REV.

R0

SHEET

A2

DRAWN

A. DHAR

DESIGN

SUBARNA

DATE

SEP 2021

CHECKED

S. ROY

REVIEWED

J. K. DAS

SCALE :

1

RIGHT HAND CURVE (FIG. 15.02)

SL NO.	STATION	DESCRIPTION	SL NO.	STATION	DESCRIPTION	SL NO.	STATION	DESCRIPTION
1	72	LHS	34	2749	LHS	67	5865	LHS
2	159	LHS	35	2857	LHS	68	5935	LHS
3	212	LHS	36	2928	LHS	69	5981	LHS
4	325	LHS	37	2955	LHS	70	6038	LHS
5	360	LHS	38	2985	LHS	71	6077	LHS
6	407	LHS	39	3161	LHS	72	6236	LHS
7	518	LHS	40	3314	LHS	73	6296	LHS
8	579	LHS	41	3366	LHS	74	6408	LHS
9	643	LHS	42	3492	LHS	75	6522	LHS
10	721	LHS	43	3679	LHS	76	6643	LHS
11	802	LHS	44	3747	LHS	77	6707	LHS
12	832	LHS	45	3869	LHS	78	6807	LHS
13	911	LHS	46	3975	LHS	79	6952	LHS
14	972	LHS	47	4090	LHS	80	7005	LHS
15	1070	LHS	48	4181	LHS	81	7119	LHS
16	1121	LHS	49	4268	LHS	82	7201	LHS
17	1172	LHS	50	4390	LHS	83	7287	LHS
18	1282	LHS	51	4482	LHS	84	7425	LHS
19	1365	LHS	52	4594	LHS	85	7503	LHS
20	1433	LHS	53	4700	LHS	86	7663	LHS
21	1462	LHS	54	4740	LHS	87	7693	LHS
22	1543	LHS	55	4878	LHS	88	7817	LHS
23	1768	LHS	56	4908	LHS	89	8060	LHS
24	1846	LHS	57	4971	LHS	90	8127	LHS
25	1862	LHS	58	5144	LHS	91	8174	LHS
26	1921	LHS	59	5243	LHS	92	8293	LHS
27	1958	LHS	60	5270	LHS	93	8338	LHS
28	2089	LHS	61	5390	LHS	94	8441	LHS
29	2228	LHS	62	5464	LHS	95	8509	LHS
30	2342	LHS	63	5544	LHS	96	8567	LHS
31	2405	LHS	64	5635	LHS	97	8649	LHS
32	2599	LHS	65	5697	LHS	98	8770	LHS
33	2696	LHS	66	5797	LHS			

SL NO.	STATION	DESCRIPTION	SL NO.	STATION	DESCRIPTION	SL NO.	STATION	DESCRIPTION
1	20	RHS	32	3191	RHS	63	6221	RHS
2	120	RHS	33	3239	RHS	64	6326	RHS
3	172	RHS	34	3410	RHS	65	6355	RHS
4	284	RHS	35	3572	RHS	66	6454	RHS
5	463	RHS	36	3811	RHS	67	6495	RHS
6	550	RHS	37	3901	RHS	68	6605	RHS
7	621	RHS	38	3955	RHS	69	6677	RHS
8	752	RHS	39	4010	RHS	70	6746	RHS
9	866	RHS	40	4146	RHS	71	6785	RHS
10	928	RHS	41	4237	RHS	72	6841	RHS
11	991	RHS	42	4333	RHS	73	6896	RHS
12	1094	RHS	43	4450	RHS	74	7085	RHS
13	1208	RHS	44	4511	RHS	75	7169	RHS
14	1329	RHS	45	4574	RHS	76	7225	RHS
15	1397	RHS	46	4668	RHS	77	7250	RHS
16	1511	RHS	47	4805	RHS	78	7356	RHS
17	1624	RHS	48	4850	RHS	79	7554	RHS
18	1683	RHS	49	5016	RHS	80	7597	RHS
19	1735	RHS	50	5059	RHS	81	7751	RHS
20	1797	RHS	51	5191	RHS	82	7892	RHS
21	1944	RHS	52	5292	RHS	83	7941	RHS
22	2000	RHS	53	5325	RHS	84	8017	RHS
23	2173	RHS	54	5395	RHS	85	8209	RHS
24	2295	RHS	55	5519	RHS	86	8381	RHS
25	2455	RHS	56	5577	RHS	87	8486	RHS
26	2545	RHS	57	5732	RHS	88	8532	RHS
27	2655	RHS	58	5771	RHS	89	8591	RHS
28	2825	RHS	59	5829	RHS	90	8691	RHS
29	2941	RHS	60	5888	RHS	91	8723	RHS
30	3042	RHS	61	6007	RHS	92	8816	RHS
31	3086	RHS	62	6144	RHS			

DIRECTION BOARD MARKING FOR MINOR JUNCTION
(FIG. 16.04)

SL NO.	STATION	DESCRIPTION	DIRECTION
1	0+000	Rorathang	LEFT
2	0+890	Swiss Garnier Factory	LEFT
3	2+190	Wine factory	LEFT
4	8+869	Rongell	LEFT

SL NO.	STATION	DESCRIPTION	DIRECTION
1	1+045	LEFT	RIVER
2	2+075	RIGHT	UNDER CONSTRUCTION ROAD
3	2+960	LEFT	RIVER
4	3+772	RIGHT	AGRICULTURAL FIELD
5	5+385	LEFT	GATI INFRASTRUCTURE
6	7+870	LEFT	BDO OFFICE
7	8+220	RIGHT	HOUSE

SL NO.	STATION	DESCRIPTION
1	1+900	LHS
2	2+000	RHS

SL NO.	STATION	DESCRIPTION
1	0+000	LEFT & RIGHT
2	0+910	LEFT
3	2+210	LEFT
4	8+889	LEFT & RIGHT

SL NO.	STATION
1	0+890
2	1+960
3	1+980
4	2+190

SL NO.	STATION	DESCRIPTION
1	1397	RIGHT HP BEND
2	1862	LEFT HP BEND
3	1921	LEFT HP BEND
4	3191	RIGHT HP BEND
5	5635	LEFT HP BEND
6	6746	RIGHT HP BEND
7	8723	RIGHT HP BEND
8	8770	LEFT HP BEND

STOP SIGN MARKING (FIG. 14.01)

SL NO.	STATION	DESCRIPTION (ONE WAY HAZARD)	DIRECTION
1	0+950	MNBR	LEFT
2	0+990	MNBR	RIGHT
3	1+905	MNBR	LEFT
4	1+945	MNBR	RIGHT
5	4+045	MIBR	LEFT
6	4+110	MIBR	RIGHT
7	0+000	MAJOR JUNCTION	LEFT
8	0+000	MAJOR JUNCTION	RIGHT
9	0+900	MAJOR JUNCTION	LEFT
10	0+920	MAJOR JUNCTION	LEFT
11	2+200	MAJOR JUNCTION	LEFT
12	2+220	MAJOR JUNCTION	LEFT
13	8+869	MAJOR JUNCTION	LEFT
14	8+869	MAJOR JUNCTION	RIGHT

SL NO.	STATION	DESCRIPTION
1	0+000	LEFT & RIGHT
2	0+910	LEFT
3	2+210	LEFT
4	8+889	LEFT & RIGHT

SLNO.	STATION	DESCRIPTION
1	0+020	LHS
2	0+790	LHS
3	8+840	LHS

SL NO.	STATION	DESCRIPTION
1	0+000	LEFT & RIGHT
2	0+850	LEFT
3	2+190	LEFT
4	8+869	LEFT & RIGHT

SIDE ROAD RIGHT (FIG. 15.09)

SL NO.	STATION	DIRECTION
1	1+040	LHS
2	2+955	LHS
3	5+380	LHS
4	7+865	LHS

SL NO.	STATION	DIRECTION
1	2+070	RHS
2	3+767	RHS
3	8+215	RHS

CHEVRON MARKING (FIG. 15.72)

SL NO.	STATION	SL NO.	STATION	SL NO.	STATION	SL NO.	STATION	SL NO.	STATION
1	55	31	1889	61	4079	91	5453	121	7497
2	70	32	1910	62	4109	92	5670	122	7627
3	107	33	1950	63	4116	93	5685	123	7642
4	150	34	2078	64	4135	94	5686	124	7652
5	315	35	2162	65	4176	95	5824	125	7694
6	353	36	2205	66	4300	96	5861	126	7796
7	368	37	2487	67	4315	97	5921	127	7813
8	396	38	2502	68	4322	98	5963	128	7822
9	452	39	2534	69	4367	99	5978	129	7863
10	500	40	2738	70	4422	100	6133	130	7878
11	515	41	2814	71	4439	101	6210	131	7883
12	579	42	2917	72	4553	102	6354	132	7922
13	610	43	3015	73	4568	103	6481	133	8051
14	786	44	3031	74	4631	104	6496	134	8116
15	861	45	3150	75	4646	105	6673	135	8372
16	939	46	3234	76	4794	106	6735	136	8414
17	961	47	3249	77	4834	107	6783	137	8429
18	1059	48	3346	78	4849	108	6798	138	8536
19	1097	49	3361	79	4938	109	6839	139	8638
20	1153	50	3399	80	4953	110	6885	140	8681
21	1248	51	3481	81	4960	111	6926	141	8805
22	1263	52	3561	82	5006	112	6941	142	8845
23	1278	53	3668	83	5046	113	7074		
24	1312	54	3698	84	5061	114	7152		
25	1431	55	3712	85	5133	115	7279		
26	1492	56	3736	86	5177	116	7398		
27	1672	57	3990	87	5222	117	7413		
28	1765	58	3944	88	5237	118	7427		
29	1825	59	4004	89	5322	119	7481		
30	1840	60	4019	90	5369	120	7496		

CLIENT :  **Roads & Bridges Department**
(Government of Sikkim)

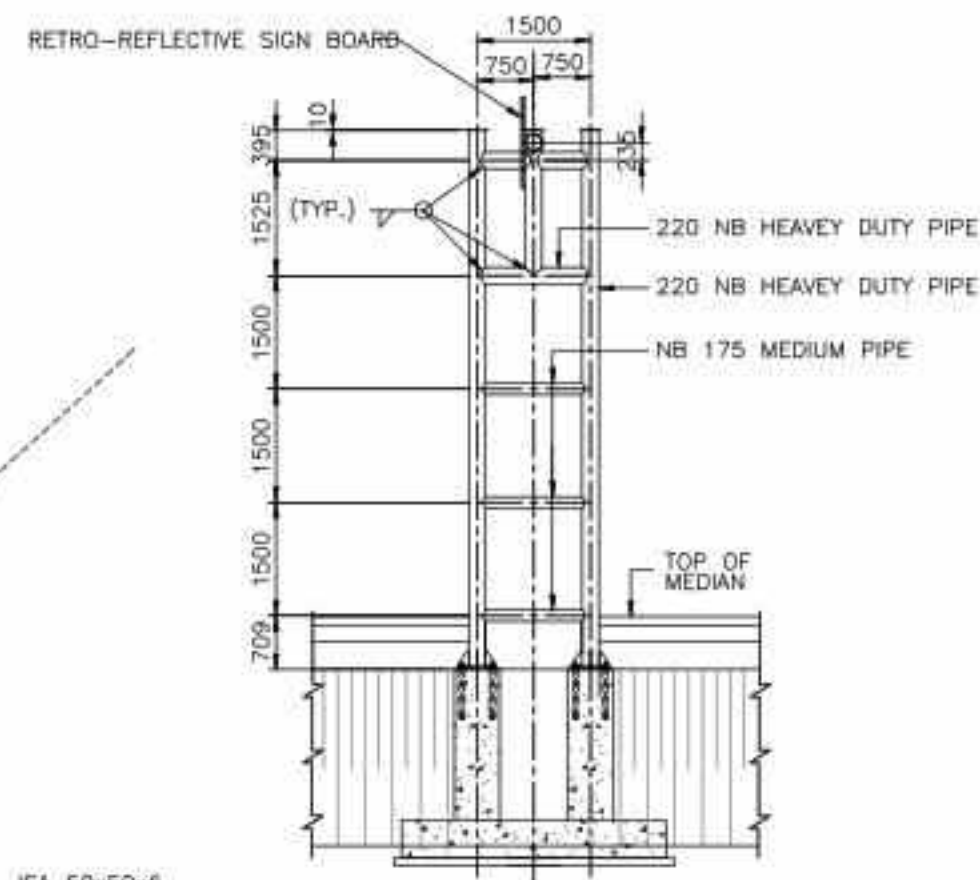
PROJECT :
**Consultancy Services for Feasibility Studies
and Preparation of Detailed Project Report
for Roads and Bridges in Sikkim**

DESIGN CONSULTANT :

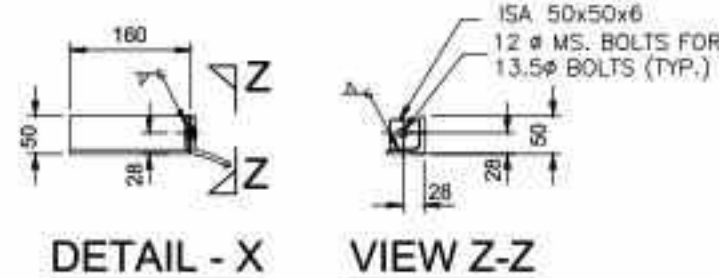
 **LEA ASSOCIATES SOUTH ASIA PVT. LTD.**
B-1/E-27, Mohan Cooperative Industrial Estate,
Mathura Road, New Delhi-110044

DRAWING TITLE:-	
SCHEDULE OF ROAD SIGNS MARKING (SH. 6 OF 6)	
DRAWING No :	73806/LASA/STR/MISC-815

REV. R0	DRAWN	A. DHAR	CHECKED	S. ROY
	DESIGN	SUBARNA	REVIEWED	J. K. DAS
SHEET A2	DATE	SEP 2021	SCALE :	

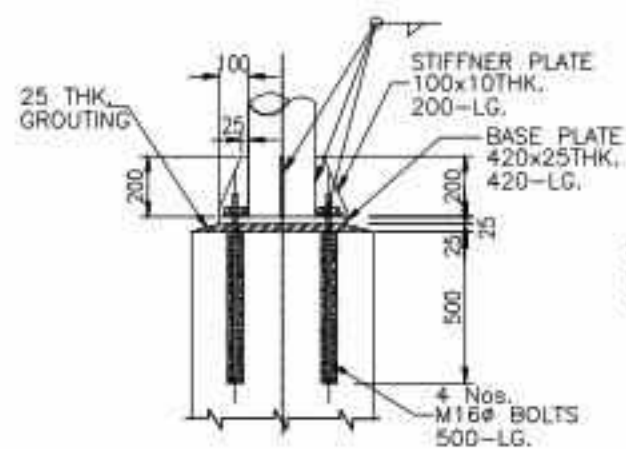


ELEVATION 1-1

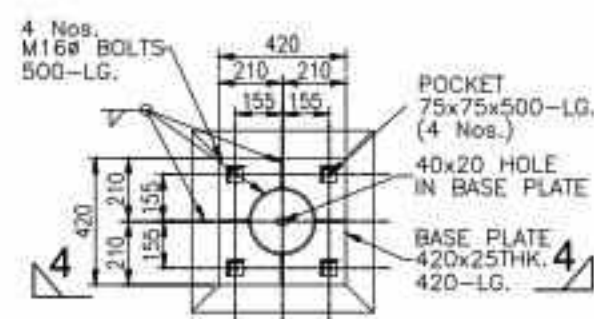


DETAIL - X

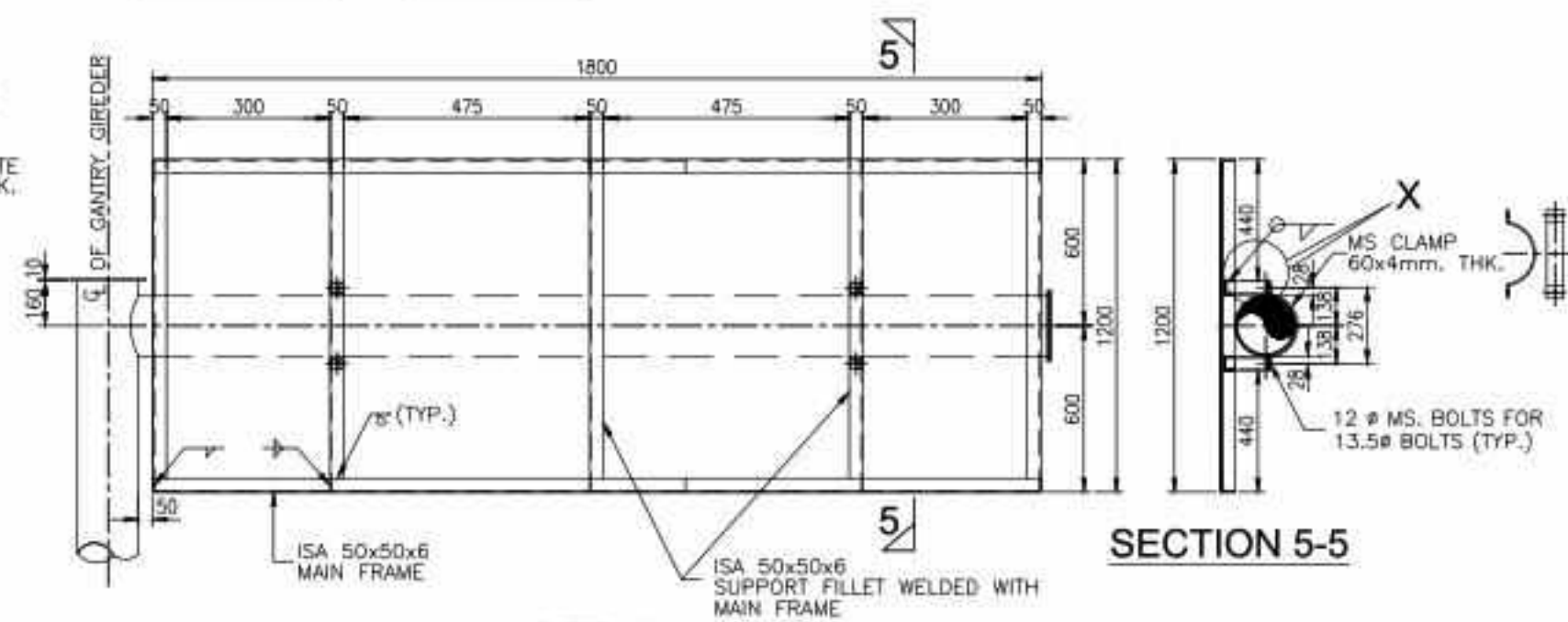
VIEW Z-Z



PLAN 4-4
(SHOWING BASE PLATE DETAILS)



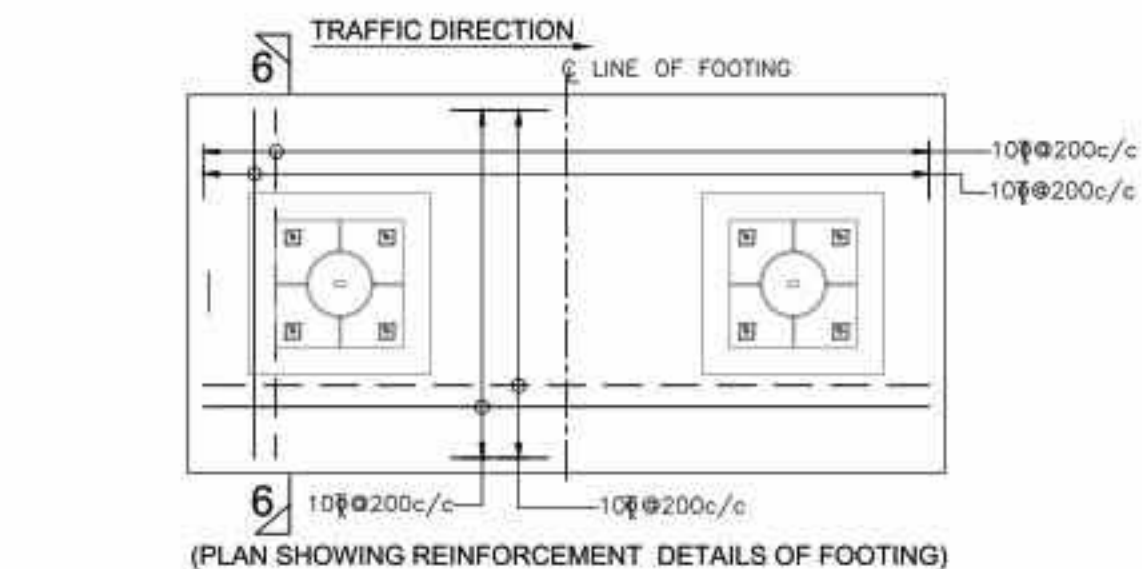
PLAN 3-3
(SHOWING BASE PLATE DETAILS)



DETAIL - A



DETAIL SHOWING SIGN BOARD

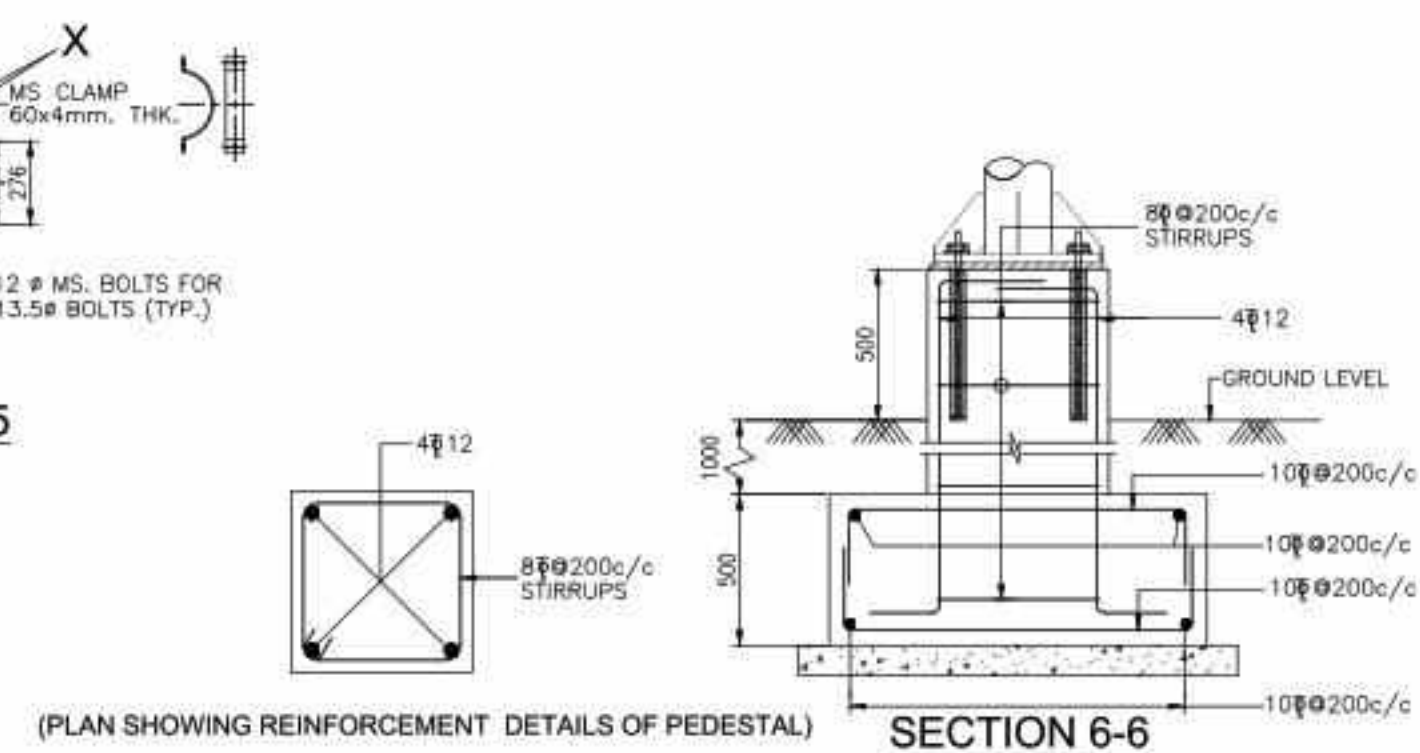


NOTES :-

1. ALL DIMENSION ARE IN MILLIMETRES, UNLESS OTHERWISE SPECIFIED.
2. READ THIS DRAWING IN CONJUNCTION WITH RELEVANT SHEETS.

LEGEND:-

TOP BARS / NEAR BARS
BOTTOM BARS / FAR BARS

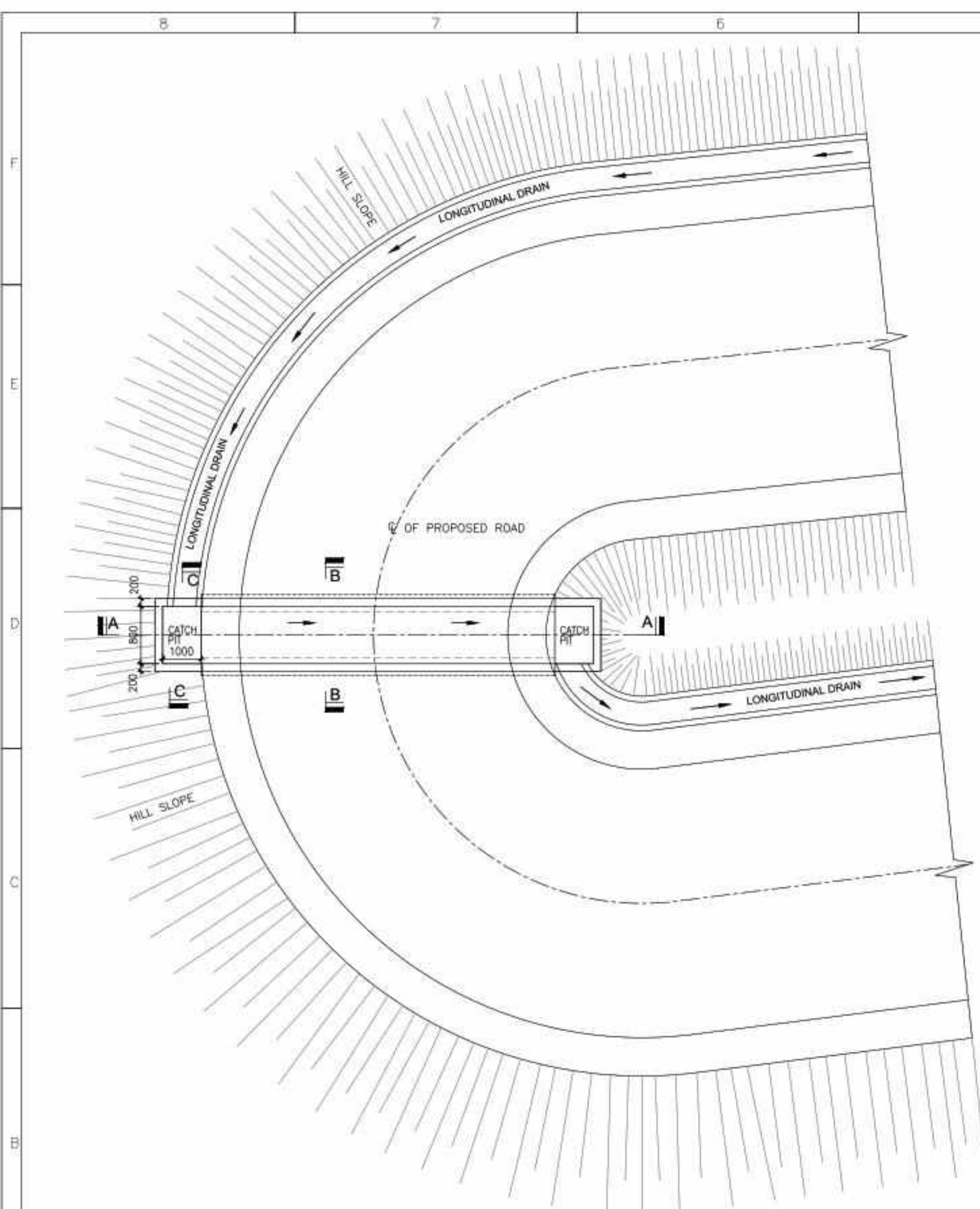


(PLAN SHOWING REINFORCEMENT DETAILS OF PEDESTAL)

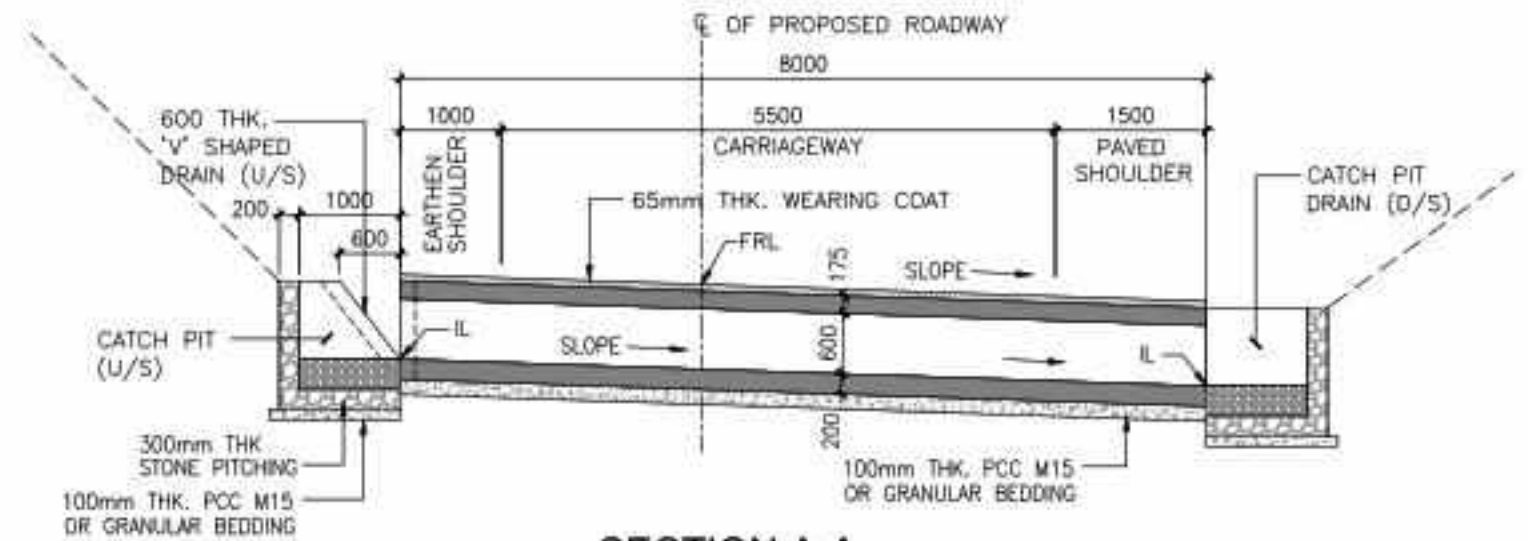
SECTION 6-6

THIS GANTRY SIGN BOARD USED AT CH. 0+895 Km & 2+195 Km

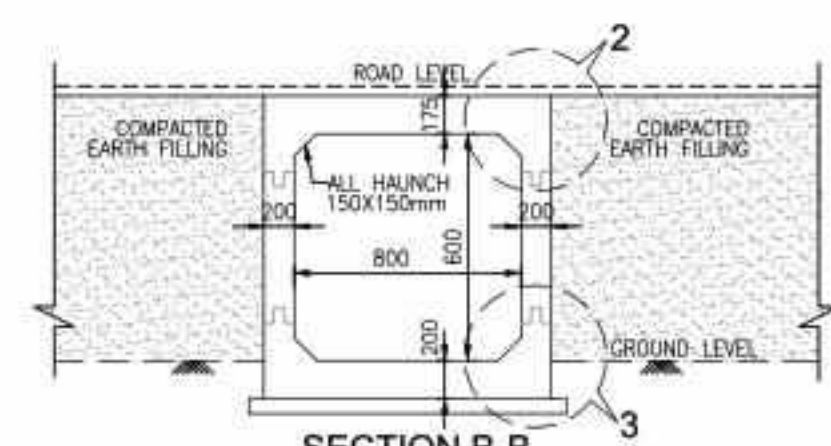
[illegible]



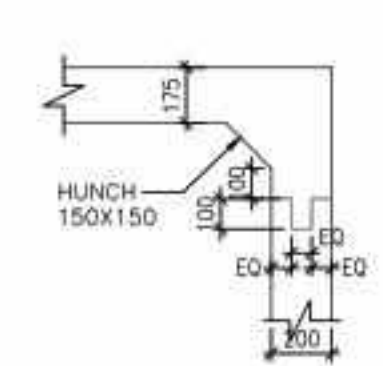
PLAN
(SCALE 1:100)



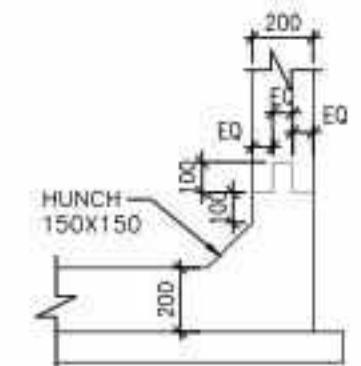
SECTION A-A
(SCALE 1:75)



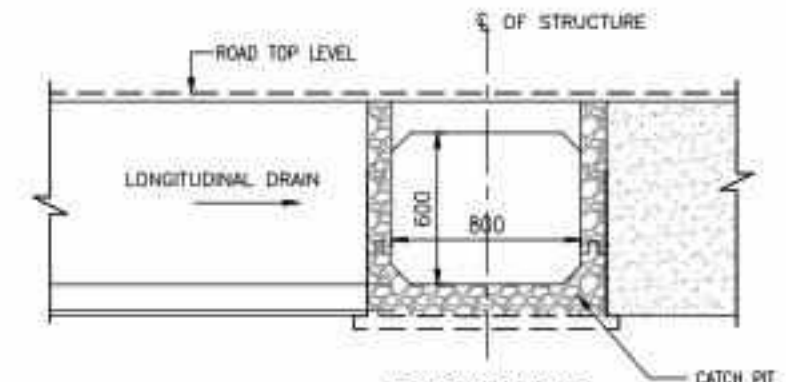
SECTION B-B
(SCALE 1:50)



DETAIL - 2
(SCALE 1:25)



DETAIL - 3
(SCALE 1:25)




SECTION C-C
(SCALE 1:30)

LEGENDS:
1. FRL - FINISHED ROAD LEVEL
2. IL - INVERT LEVEL

- NOTES:**
- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS AND CHAINAGE IN Km. UNLESS MENTIONED OTHERWISE.
 - DIMENSIONS ARE NOT TO BE SCALED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
 - FOR CONCRETE BEDDING.....M15.
FOR RCC BOX.....M25.
FOR CRASH BARRIER.....M40.
CATCH PIT/GUIDE WALL.....RR MASONRY.
 - CLEAR COVER:-
EARTH FACE BOX75mm.
OUTER FACE BOX50mm.
FOUNDATION75mm.
CRASH BARRIER40mm.
APPROACH SLAB40mm.
 - ALL ABBREVIATIONS USED IN THE DRAWING MUST BE REFERRED TO AGAINST THE LEGEND RESPECTIVELY.
 - DRAIN LEVELS WILL BE SUBMITTED SEPARATELY WITH DRAIN P&P.
 - ALL WORK SHALL BE CARRIED OUT AS PER RELEVANT CLAUSES IN IRC SP :13-2004
 - THE VARIOUS LEVELS(FRLs, INVERT LEVELS) AND SUPER ELEVATIONS SHOWN IN DRAWING SHALL BE VERIFIED WITH HIGHWAY PLAN AND PROFILE DRAWING PRIOR TO ACTUAL EXECUTION IN SITE.
 - THE STABILITY OF ROCK CUT/HILL CUT SHALL BE ENSURED AT SITE PRIOR TO EXECUTION.
 - SLOPE OF BOX 1:30(MIN.).
 - ALL REINFORCEMENT SHALL BE OF GRADE Fe 500 OR Fe 500D
 - BACK FILLING SHALL CONSIST OF SELECTED EARTH CONFORMING TO APPENDIX 6 OF IRC:78-2014 HAVING PROPERTIES C=0, $\phi > 32^\circ$, $\delta=21.33$ AND $\gamma_d=2 \text{ t/m}^3$.
 - 65mm THICK WEARING COAT SHALL BE PROVIDED ON TOP OF DECK.
 - THE DESIGN OF NEW STRUCTURES SHALL CONFORM TO FOLLOWING CODES:
• IRC : 78-2014 • IRC : 6-2017 • IRC : 112-2020
 - DESIGN OF CULVERT IS DONE FOR LIVE LOAD COMBINATION OF THREE LANES OF CLASS A OR 1 LANE OF 70R+1 LANE OF CLASS A WHICHEVER PRODUCES SEVERE EFFECT.

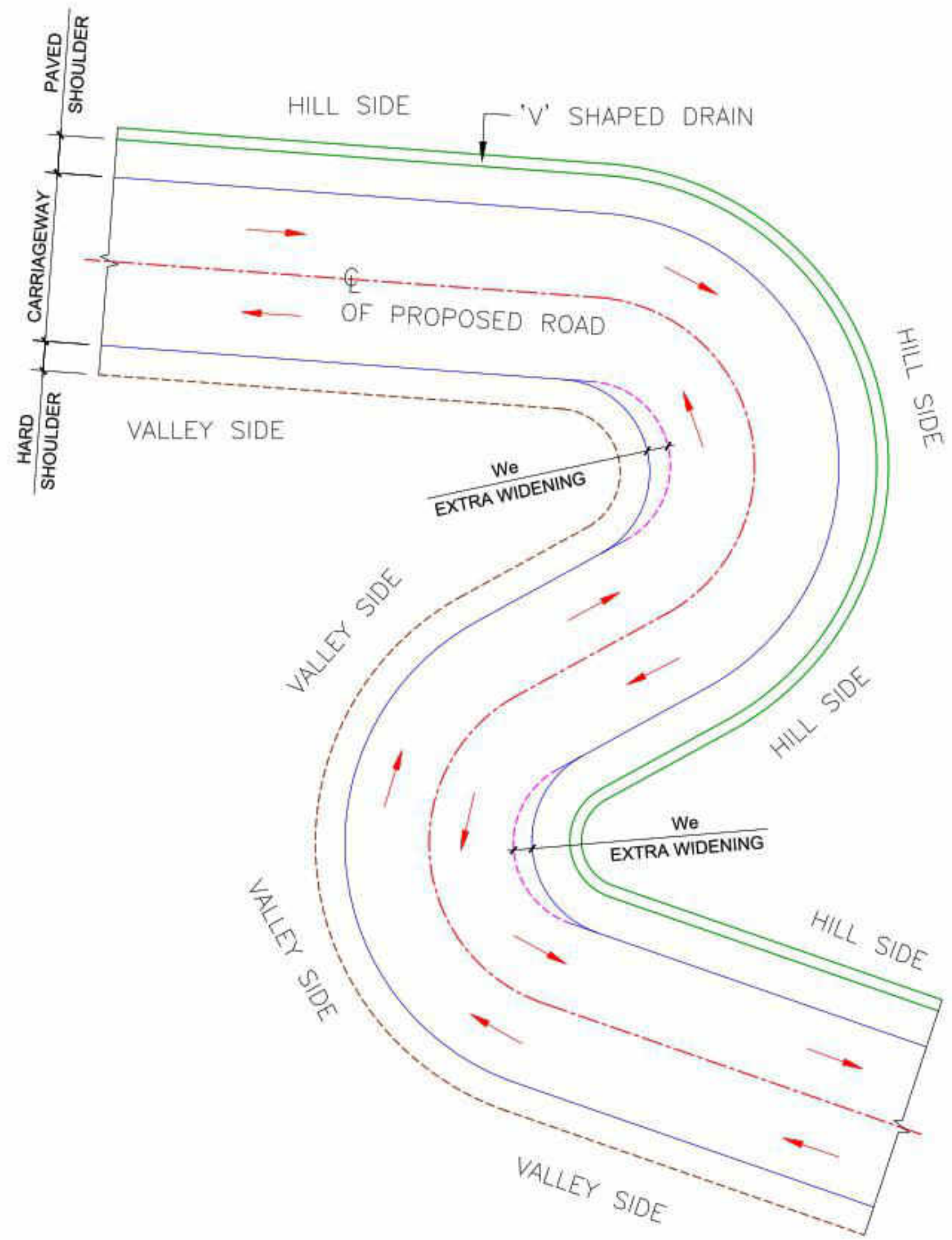
CLIENT :
 **Roads & Bridges Department**
(Government of Sikkim)

PROJECT :
Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim



DESIGN CONSULTANT :
 **LEA ASSOCIATES SOUTH ASIA PVT. LTD.**
B-1/E-27, Mohan Cooperative Industrial Estate,
Mathura Road, New Delhi-110044

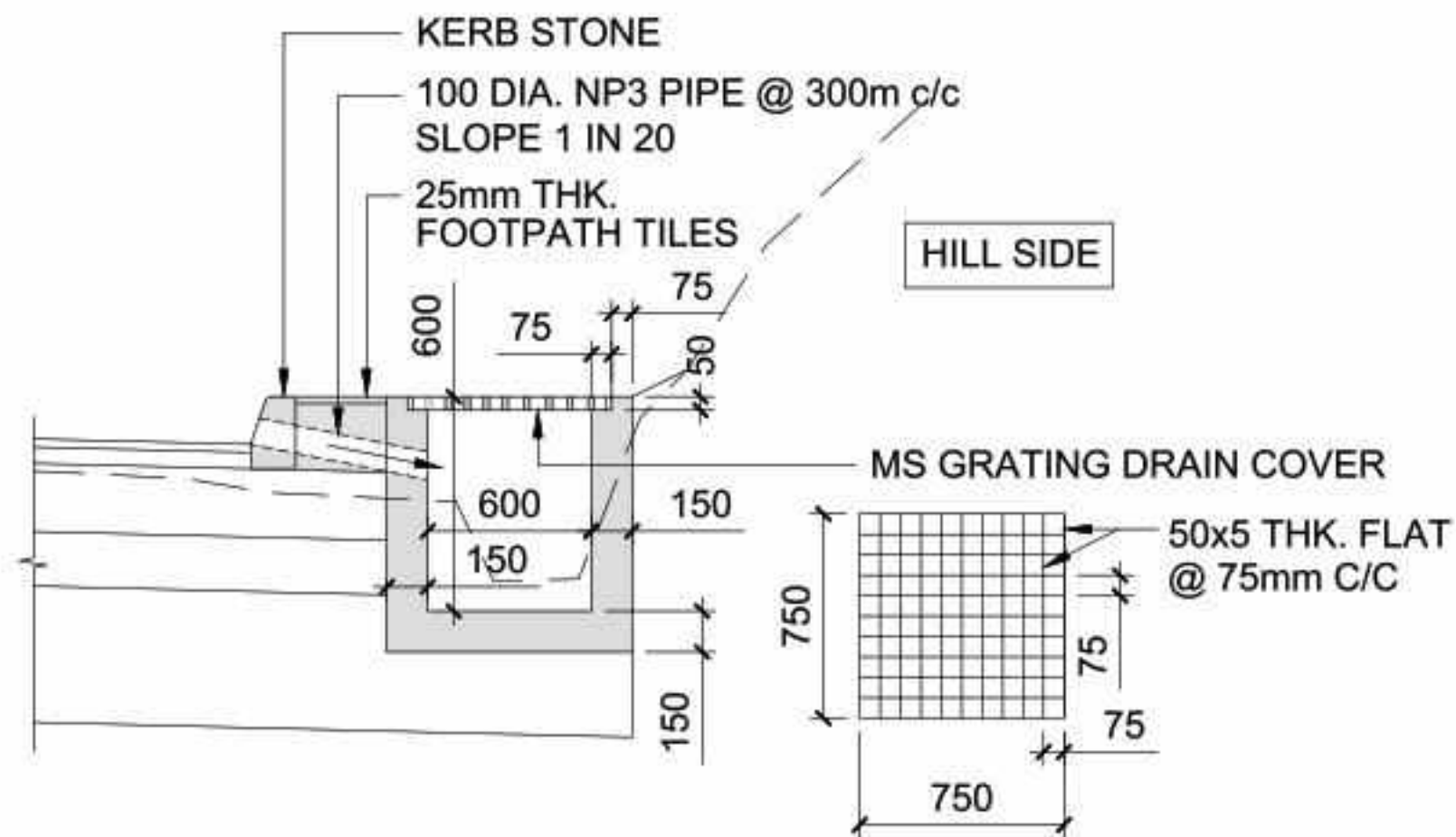
DRAWING TITLE:-
GENERAL ARRANGEMENT OF
SINGLE CELL BOX CULVERT & DRAINAGE LAYOUT
AT HAIR-PIN BEND LOCATION
DRAWING No : 73806/LASA/STR/MISC-817

REV.	DRAWN	A. DHAR	CHECKED	S. MONDAL
R0	DESIGN	B. SARKAR	REVIEWED	J. K. DAS
SHEET	DATE	JULY 2023	SCALE :	AS SHOWN
A2				

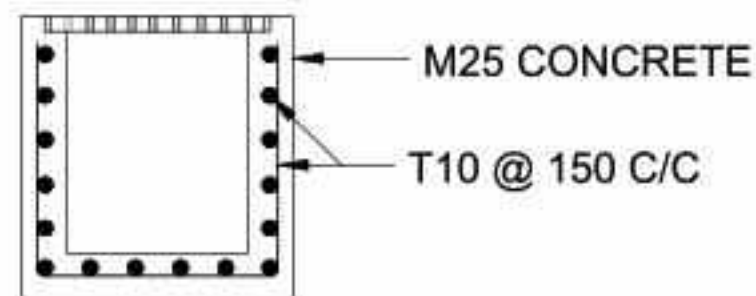


LEGEND:
1. We - EXTRA WIDENING

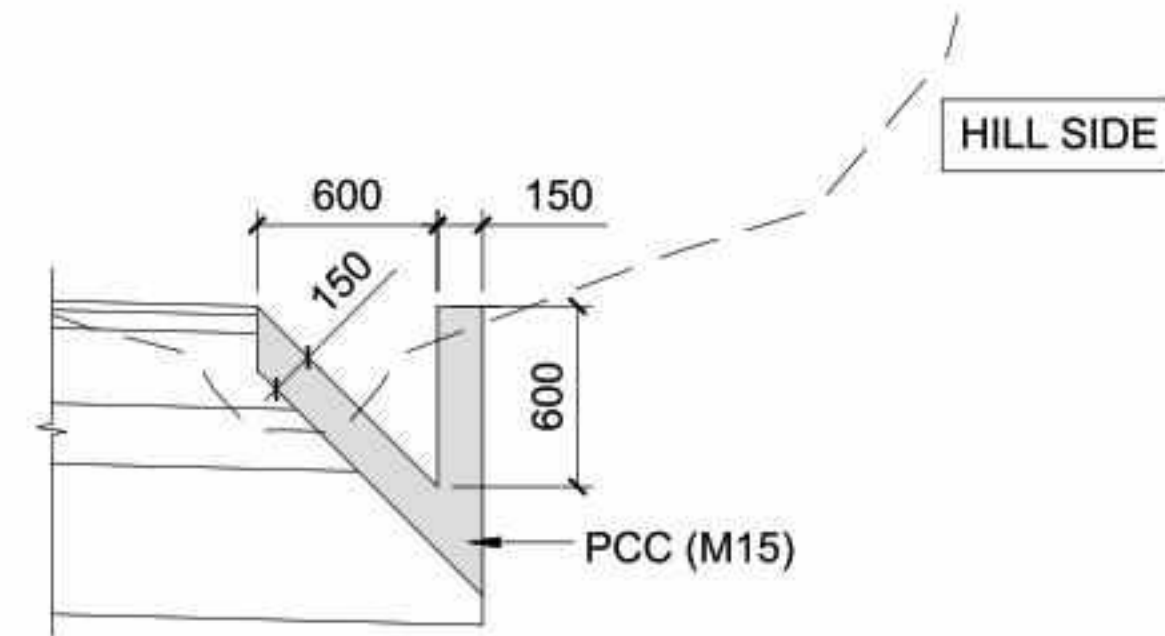
				 CLIENT : Roads & Bridges Department (Government of Sikkim)	PROJECT : Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim	 DESIGN CONSULTANT : LEA ASSOCIATES SOUTH ASIA PVT. LTD. B-1/E-27, Mohan Cooperative Industrial Estate, Mathura Road, New Delhi-110044	DRAWING TITLE:- TYPICAL DETAILS OF EXTRA WIDENING AT BEND LOCATION	REV.	DRAWN	A. DHAR	CHECKED	S. MONDAL
								R0	DESIGN	B. SARKAR	REVIEWED	J. K. DAS
REV	DATE	DETAILS OF REVISION	BY					SHEET	DATE	JULY 2023	SCALE :	AS SHOWN
							DRAWING No : 73606/LASA/STR/MISC-818	A2				



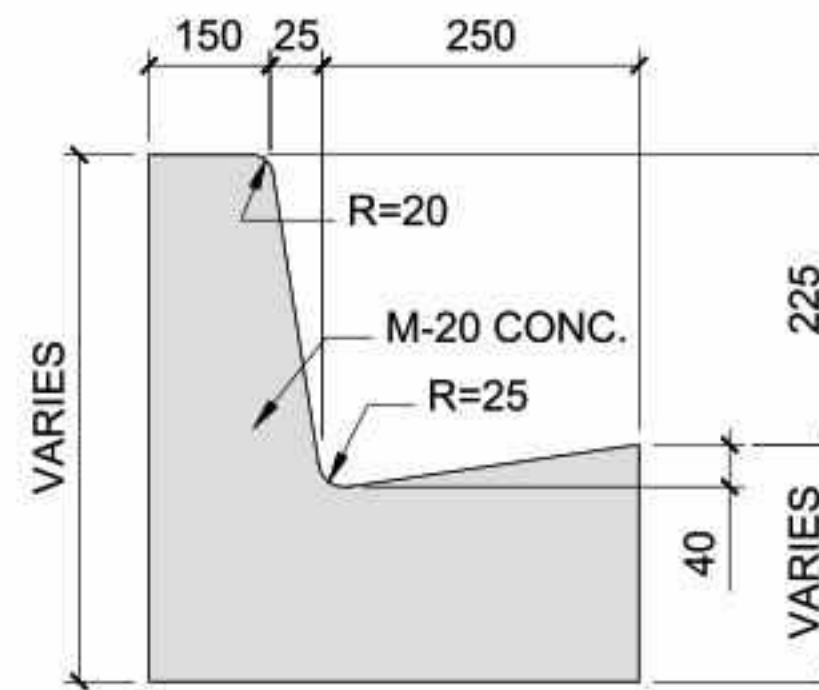
DETAIL OF BOX DRAIN



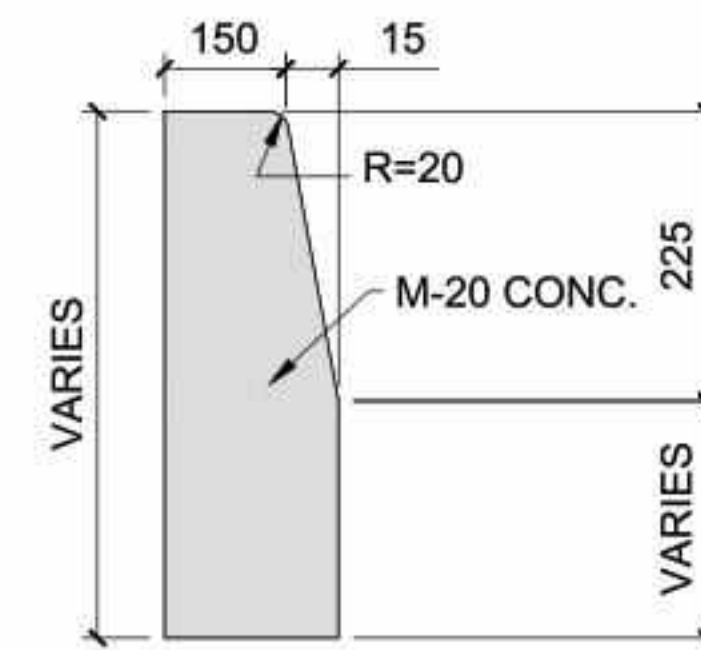
RC DETAIL OF BOX DRAIN



DETAIL 'V' SHAPED DRAIN



DETAIL OF L-KERB



DETAIL OF I-KERB

DETAIL OF KERB STONE

NOTES:-

1. ALL DIMENSIONS ARE IN MM.
2. DO NOT SCALE THE DIMENSIONS. ONLY WRITTEN DIMENSIONS SHALL TO BE FOLLOWED.

CLIENT :
Roads & Bridges Department
(Government of Sikkim)

PROJECT :
**Consultancy Services for Feasibility Studies
and Preparation of Detailed Project Report
for Roads and Bridges in Sikkim**

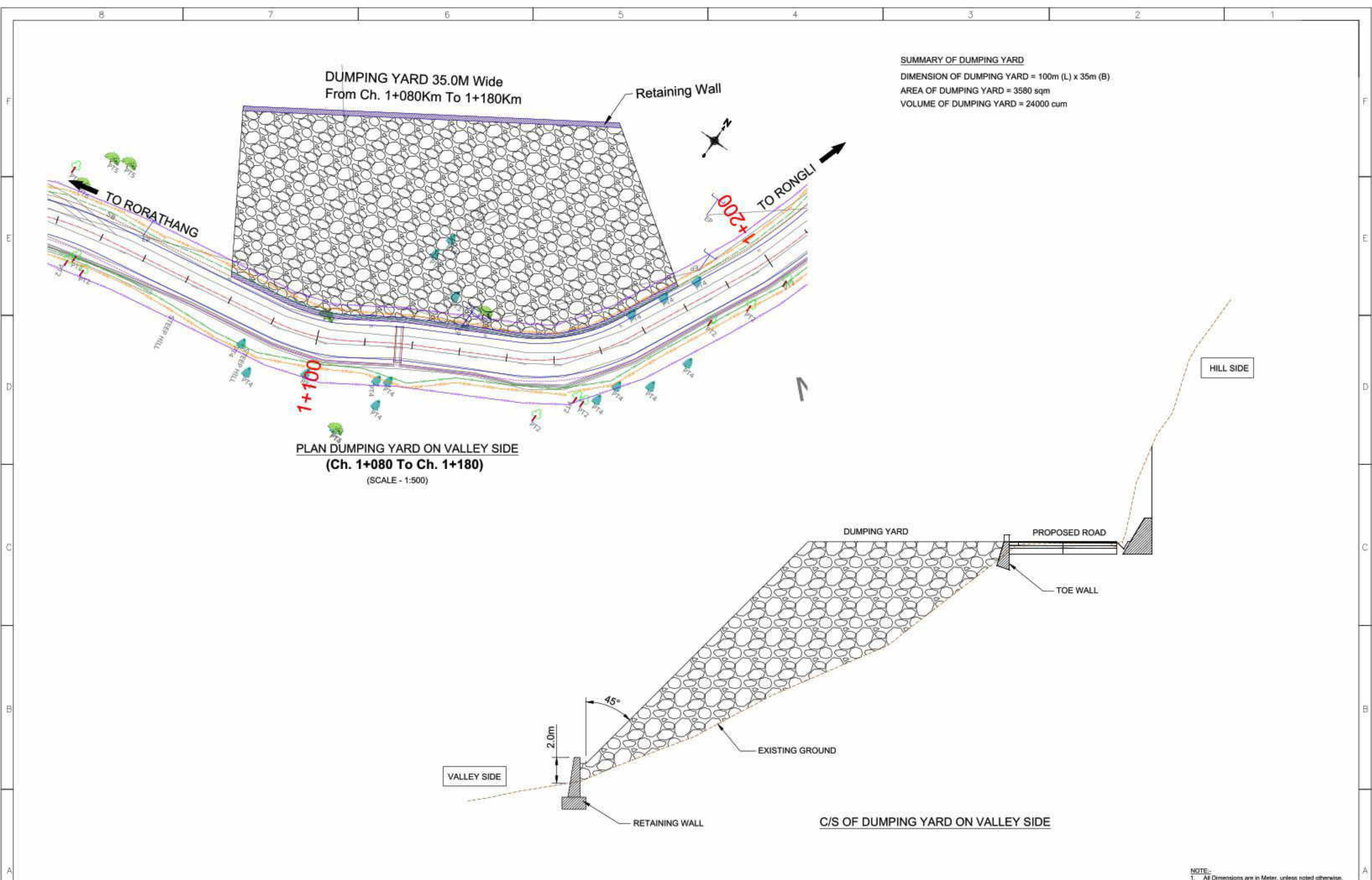
DESIGN CONSULTANT :
LEA ASSOCIATES SOUTH ASIA PVT. LTD.
B-1/E-27, Mohan Cooperative Industrial Estate,
Mathura Road, New Delhi-110044

DRAWING TITLE:-
**TYPICAL DETAILS OF
DRAIN AND KERB STONE**

DRAWING No : 73806/LASA/STR/MISC-819

REV.	DRAWN	CHECKED	S. MONDAL
R0	A. DHAR	B. SARKAR	J. K. DAS
SHEET	DATE	SCALE	AS SHOWN
A2	JULY 2023		

DUMPING YARD DRAWING



CLIENT :				PROJECT :				DESIGN CONSULTANT :				DRAWING TITLE:-				REV.			
Roads & Bridges Department				Consultancy Services for Feasibility Studies				LEA ASSOCIATES SOUTH ASIA PVT. LTD.				DUMPING YARD ON VALLEY SIDE				R0			
(Government of Sikkim)				and Preparation of Detailed Project Report				B-1/E-27, Mohan Cooperative Industrial Estate,				E1 - RORATHANG TO RONGLI				A2			
				for Roads and Bridges in Sikkim				Mathura Road, New Delhi-110044				From Ch. 1+080 Km To Ch. 1+180 Km				DATE			
REV				DATE				DRAWING No :				73806/LASA/HWY/E1/DY-001				MAY 2023			
DETAILS OF REVISION				BY								SCALE :				AS SHOWN			

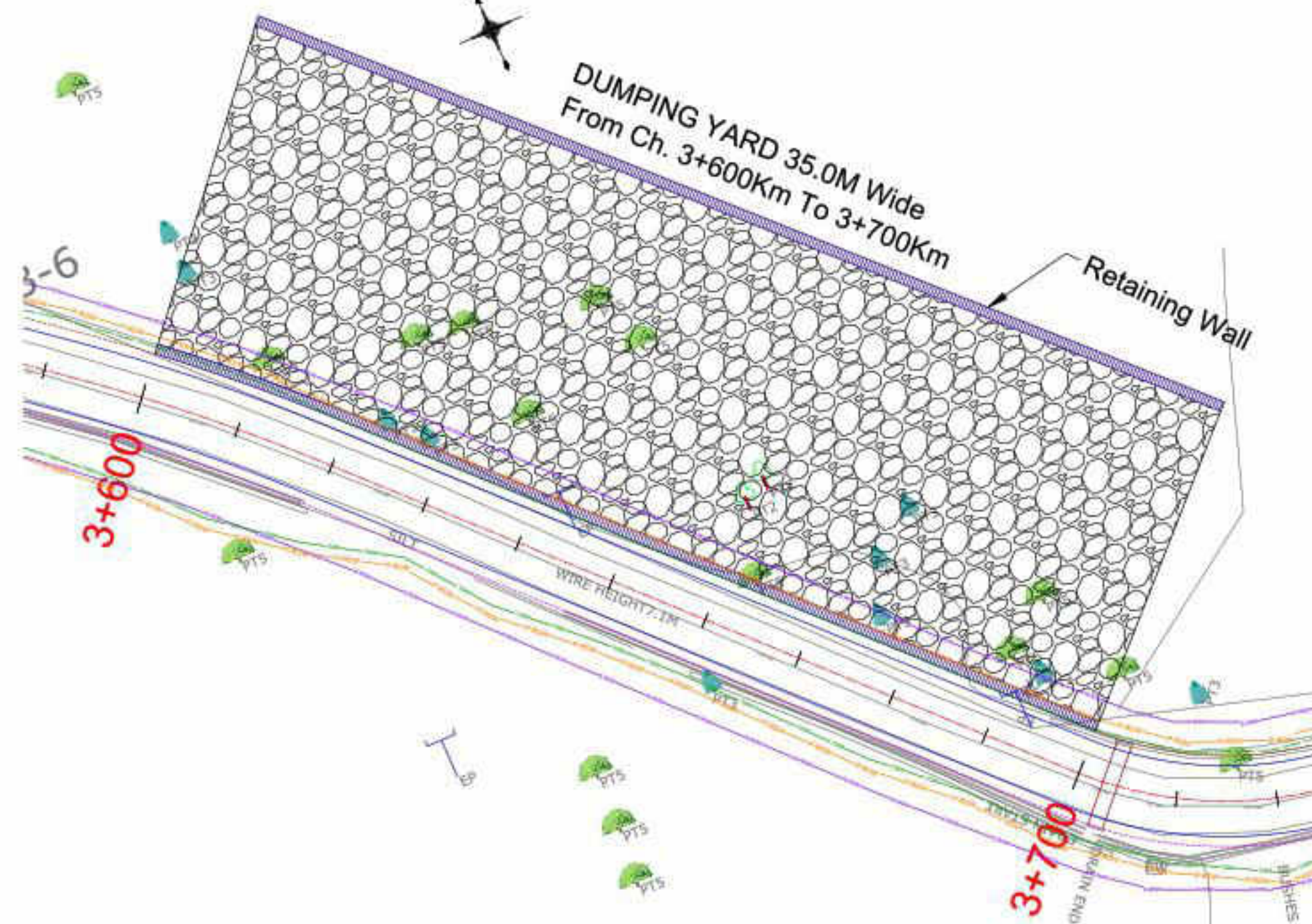


SUMMARY OF DUMPING YARD

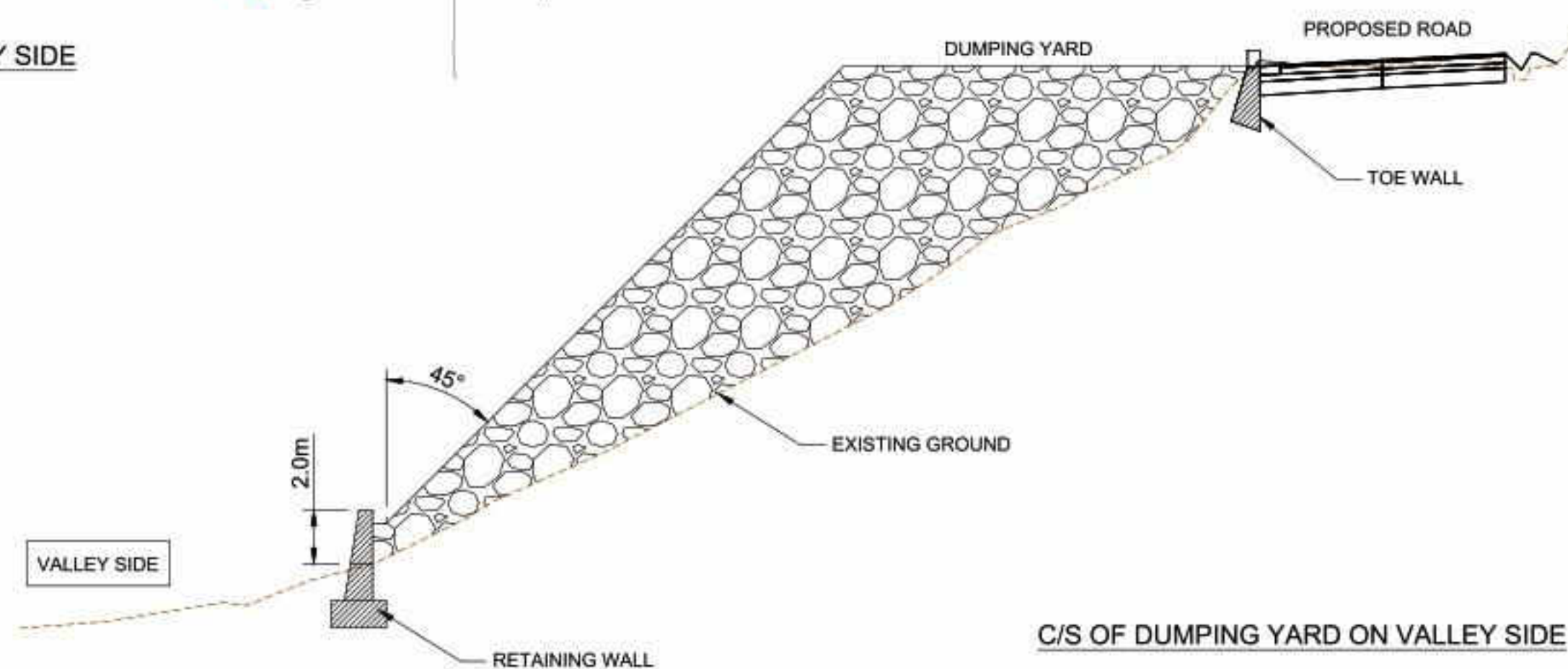
DIMENSION OF DUMPING YARD = 100m (L) x 35m (B)

AREA OF DUMPING YARD = 3310 sqm



VOLUME OF DUMPING YARD = 17000 cum



PLAN DUMPING YARD ON VALLEY SIDE
(Ch. 3+600 To Ch. 3+700)
(SCALE - 1:500)



NOTE:-
1. All Dimensions are in Meter, unless noted otherwise.

				<div></div> <div>CLIENT : Roads & Bridges Department (Government of Sikkim)</div>	<div>PROJECT : Consultancy Services for Feasibility Studies and Preparation of Detailed Project Report for Roads and Bridges in Sikkim</div>	<div>DESIGN CONSULTANT :  LEA ASSOCIATES SOUTH ASIA PVT. LTD. B-1/E-27, Mohan Cooperative Industrial Estate, Mathura Road, New Delhi-110044</div>	<div>DRAWING TITLE:- DUMPING YARD ON VALLEY SIDE E1 - RORATHANG TO RONGLI From Ch. 3+650 Km To Ch. 3+700 Km DRAWING No : 73606/LASA/HWY/E1/DY-002</div>	REV.	DRAWN	A. DHAR	CHECKED	S. ROY
R0	DESIGN	SOUJENDU	REVIEWED					J. K. DAS				
SHEET	DATE	MAY 2023	SCALE :					AS SHOWN				
REV	DATE	DETAILS OF REVISION		BY								

TO RORATHANG

TO RONGLI

SUMMARY OF DUMPING YARD

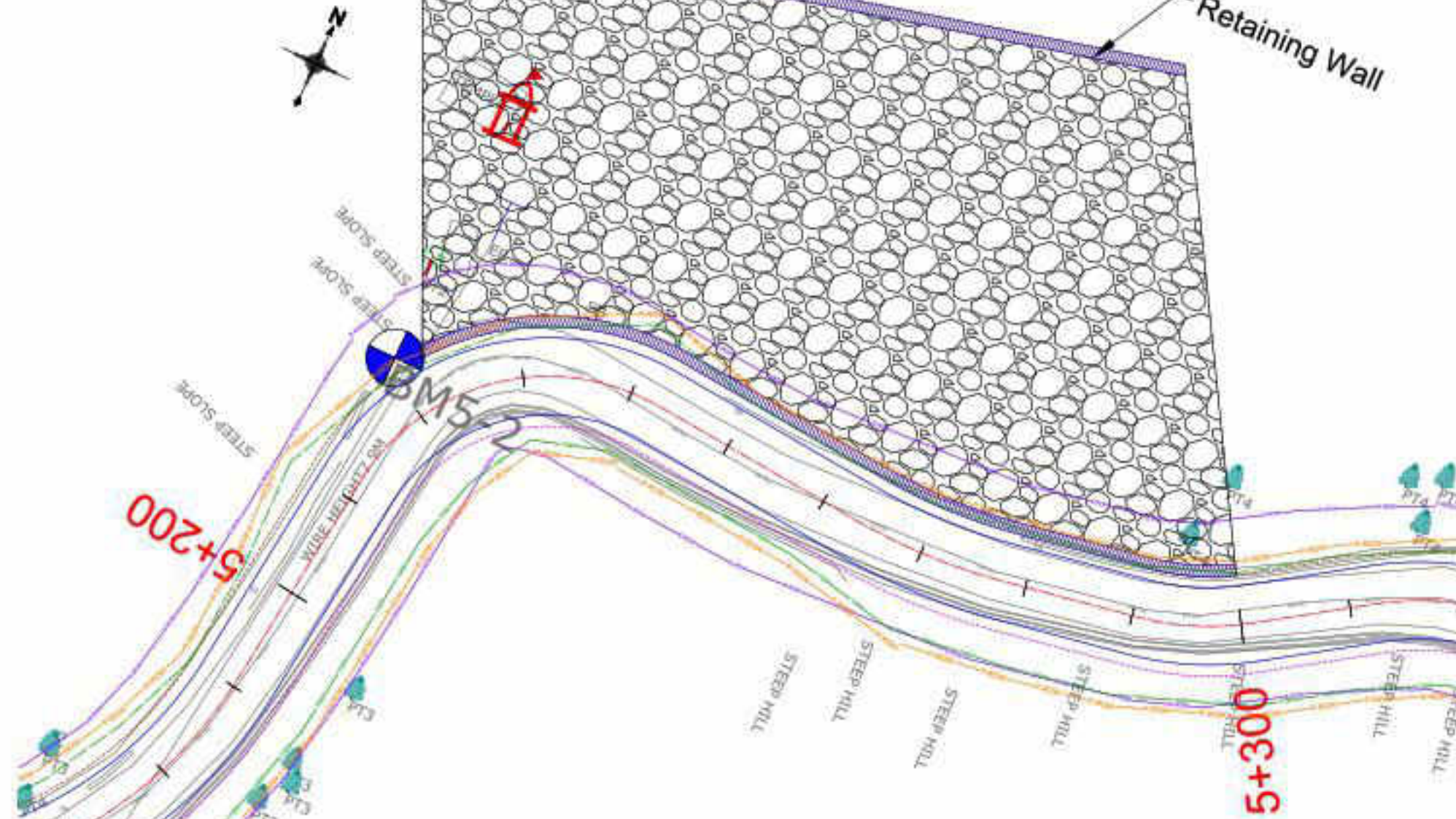
DIMENSION OF DUMPING YARD = 60m (L) x 45m (B)

AREA OF DUMPING YARD = 2760 sqm

VOLUME OF DUMPING YARD = 18000 cum

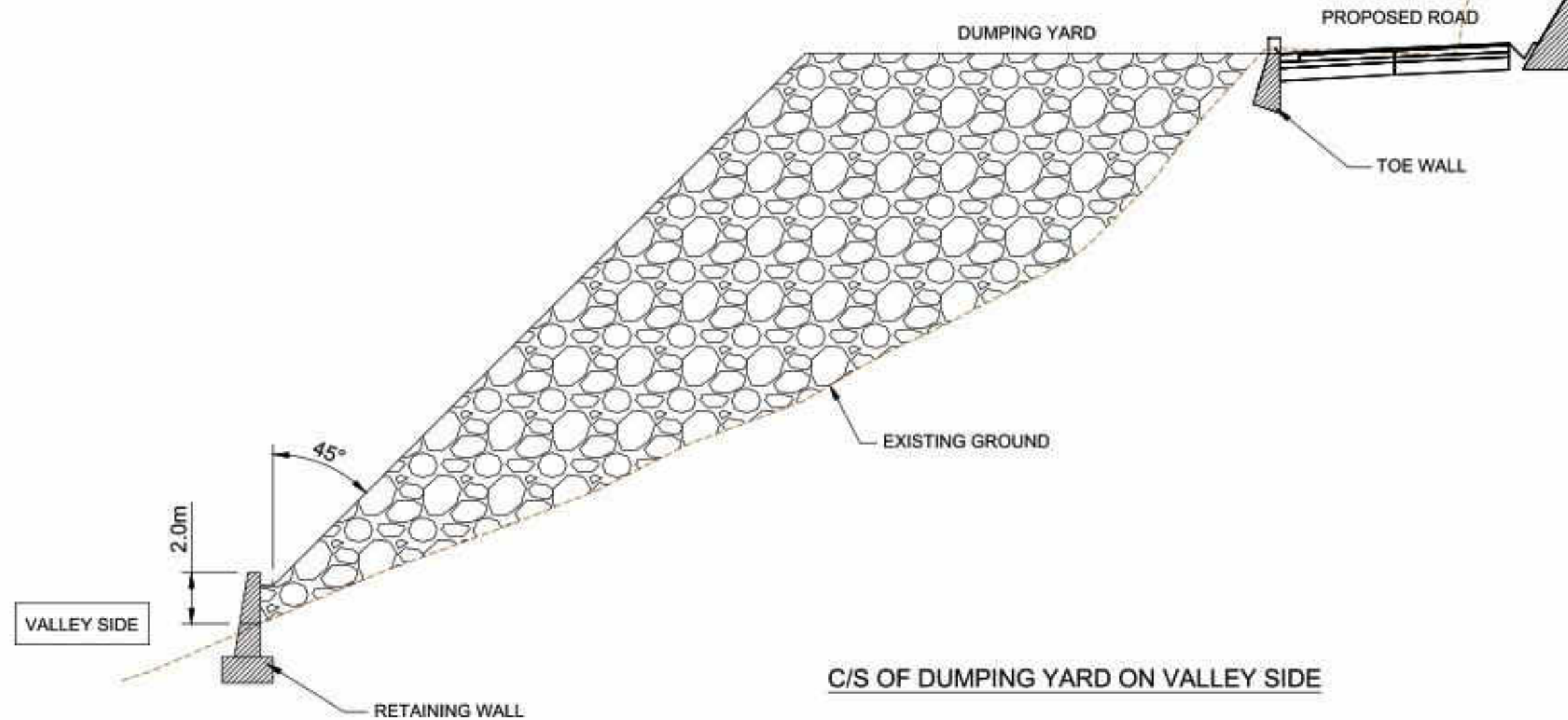
DUMPING YARD 45.0M Wide
From Ch. 5+240Km To 5+300Km

Retaining Wall



PLAN DUMPING YARD ON VALLEY SIDE
(Ch. 5+240 To Ch. 5+300)

(SCALE - 1:500)



C/S OF DUMPING YARD ON VALLEY SIDE

NOTE:-
1. All Dimensions are in Meter, unless noted otherwise.

CLIENT :



Roads & Bridges Department
(Government of Sikkim)

PROJECT :

**Consultancy Services for Feasibility Studies
and Preparation of Detailed Project Report
for Roads and Bridges in Sikkim**

DESIGN CONSULTANT :

LEA ASSOCIATES SOUTH ASIA PVT. LTD.
B-1/E-27, Mohan Cooperative Industrial Estate,
Mathura Road, New Delhi-110044

DRAWING TITLE:-

**DUMPING YARD ON VALLEY SIDE
E1 - RORATHANG TO RONGLI
From Ch. 5+240 Km To Ch. 5+300 Km**

DRAWING No : 73806/LASA/HWY/E1/DY-903

REV.

R0

SHEET

A2

DRAWN A. DHAR

CHECKED S. ROY

DESIGN SOUMENDU

REVIEWED J. K. DAS

DATE MAY 2023

SCALE : AS SHOWN

TO RORATHANG

TO RONGLI

DUMPING YARD 45.0M Wide
From Ch. 5+940Km To 5+980Km

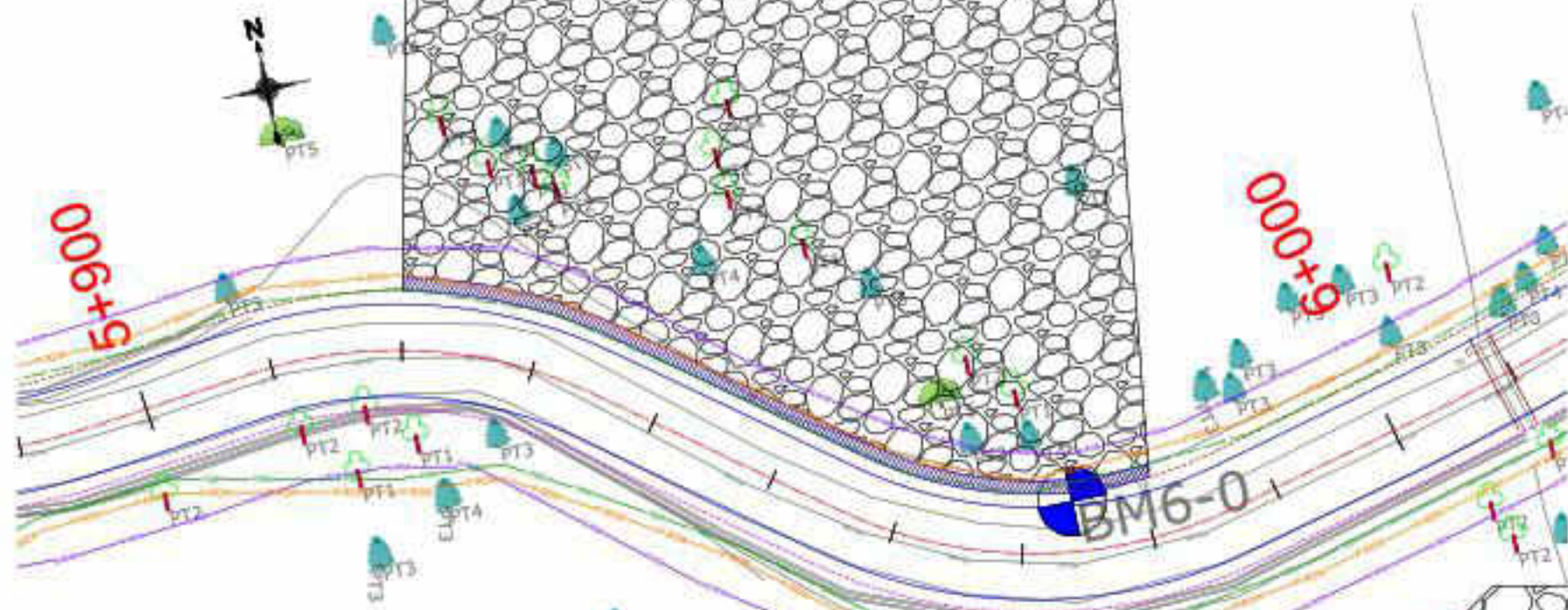
Retaining Wall

SUMMARY OF DUMPING YARD

DIMENSION OF DUMPING YARD = 40m (L) x 45m (B)

AREA OF DUMPING YARD = 2130 sqm

VOLUME OF DUMPING YARD = 4600 cum



PLAN DUMPING YARD ON VALLEY SIDE
(Ch. 5+940 To Ch. 5+980)
(SCALE - 1:500)

DUMPING YARD

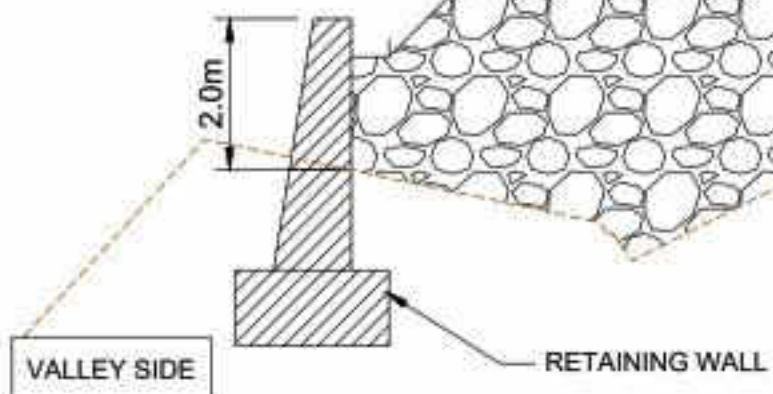
PROPOSED ROAD

TOE WALL

HILL SIDE

EXISTING GROUND

C/S OF DUMPING YARD ON VALLEY SIDE



NOTE:-
1. All Dimensions are in Meter, unless noted otherwise.

CLIENT :



Roads & Bridges Department
(Government of Sikkim)

PROJECT :

**Consultancy Services for Feasibility Studies
and Preparation of Detailed Project Report
for Roads and Bridges in Sikkim**

DESIGN CONSULTANT :

LEA ASSOCIATES SOUTH ASIA PVT. LTD.
B-1/E-27, Mohan Cooperative Industrial Estate,
Mathura Road, New Delhi-110044

DRAWING TITLE:-

**DUMPING YARD ON VALLEY SIDE
E1 - RORATHANG TO RONGLI
From Ch. 5+940 Km To Ch. 5+980 Km**

DRAWING No : 73806/LASA/HWY/E1/DY-004

REV.

R0

SHEET

A2

DRAWN A. DHAR

CHECKED S. ROY

DESIGN SOUMENDU

REVIEWED J. K. DAS

DATE MAY 2023

SCALE : AS SHOWN

REV DATE DETAILS OF REVISION BY

8

7

6

5

4

3

2

1

Print Date : 24 May 2023 - 2:28 PM

THANK YOU

DESIGN CONSULTANT :



LEA ASSOCIATES SOUTH ASIA PVT. LTD.,

B-1/E-27, Mohan Cooperative Industrial Estate,

Mathura Road, New Delhi-110044