



Government of Nepal
Ministry of Physical Infrastructure and Transport
Department of Roads
Development Cooperation Implementation Division
Strategic Road Connectivity & Trade Improvement Project
(SRCTIP)

**Detailed Design of Upgradation of Kamala- Dhalkebar- Pathlaiya
Road Section (130km) of Mahendra Highway and Bridges**

Final Design Report
Volume IV
Design Report & Drawing of Bridges

Bridge Name- Maraha
Volume-2
Detailed Drawing

April, 2023

Joint Venture of:

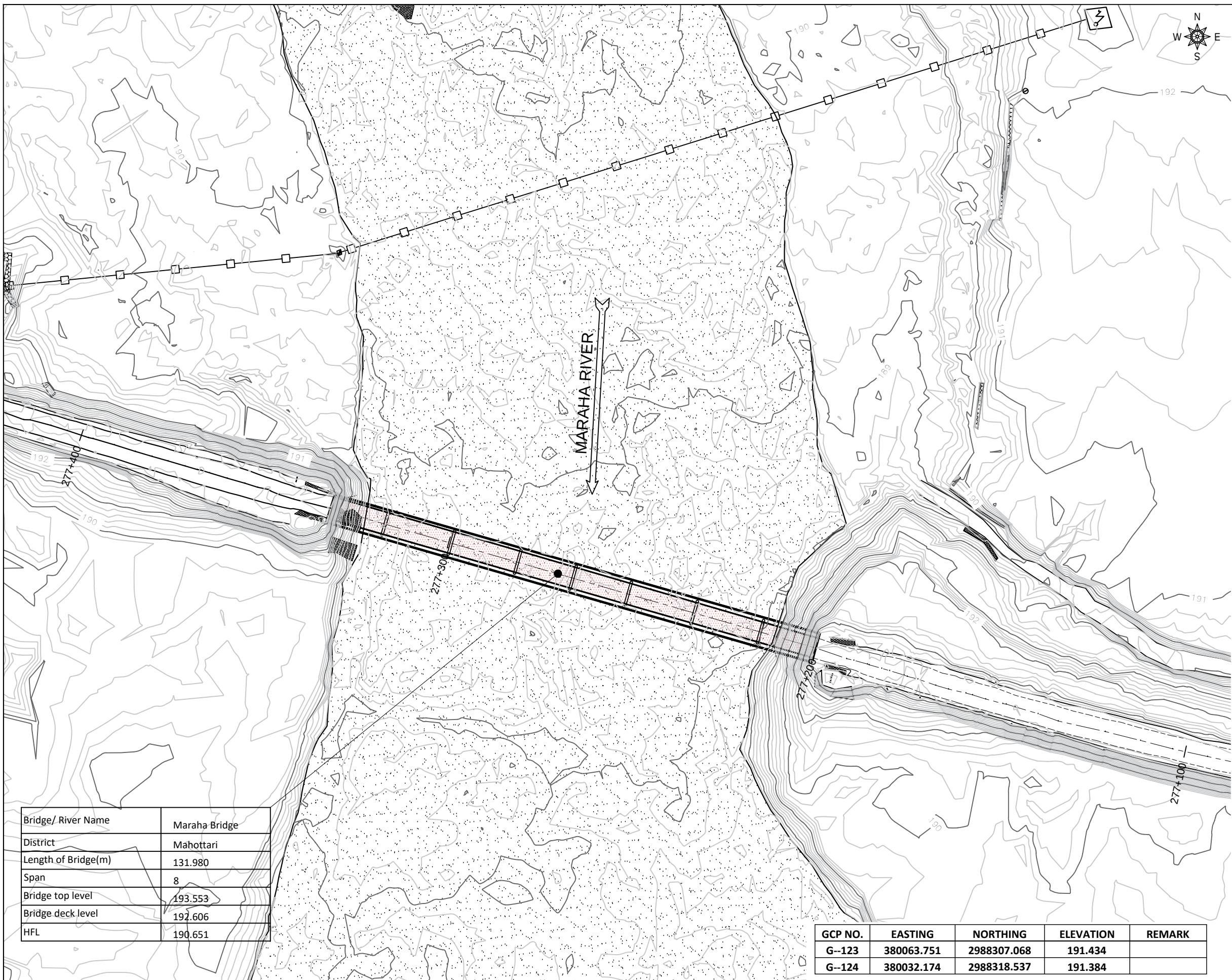
eptisa EPTISA Servicios De Ingenieria
Madrid, Spain

STUP STUP Consultants Private Limited
India

In Association With
Udaya Consultancy, Geocom International, Sundar Kriti Consultant and Rays Consultant Private Limited

TABLE OF CONTENTS:

S.No.	DRAWING NAME	DRAWING No.	SHEET No.
1	LOCATION MAP OF BRIDGE OVER RIVER MARAHA	KDP/DPR/STR/BR/MARAH/DD -1	1
2	DETAILED SURVEY TOPOGRAPHIC MAP (EXISTING CONDITION) OF BRIDGE OVER RIVER MARAHA	KDP/DPR/STR/BR/MARAH/DD -2	1
3	DETAILED SURVEY TOPOGRAPHIC MAP (WITH PROPOSED BRIDGE) OF BRIDGE OVER RIVER MARAHA	KDP/DPR/STR/BR/MARAH/DD -3	1
4	GENERAL NOTES OF BRIDGE OVER RIVER MARAHA	KDP/DPR/STR/BR/MARAH/DD -4	1
5	GENERAL ARRANGEMENT OF BRIDGE OVER RIVER MARAHA	KDP/DPR/STR/BR/MARAH/DD -5	1
6	LAYOUT AND DETAIL OF PILE FOUNDATION OF BRIDGE OVER RIVER MARAHA	KDP/DPR/STR/BR/MARAH/DD -6	1
7	ABUTMENT DETAILS OF BRIDGE OVER RIVER MARAHA	KDP/DPR/STR/BR/MARAH/DD -7	2
8	ABUTMENT REINFORCEMENT DETAILS OF BRIDGE OVER RIVER MARAHA	KDP/DPR/STR/BR/MARAH/DD -8	2
9	ABUTMENT BAR BENDING SCHEDULE OF BRIDGE OVER RIVER MARAHA	KDP/DPR/STR/BR/MARAH/DD -9	2
10	PIER DETAILS OF BRIDGE OVER RIVER MARAHA	KDP/DPR/STR/BR/MARAH/DD -10	1
11	PIER REINFORCEMENT DETAILS OF BRIDGE OVER RIVER MARAHA	KDP/DPR/STR/BR/MARAH/DD -11	1
12	PIER BAR BENDING SCHEDULE OF BRIDGE OVER RIVER MARAHA	KDP/DPR/STR/BR/MARAH/DD -12	1
13	SUPERSTRUCTURE DETAILS OF BRIDGE OVER RIVER MARAHA	KDP/DPR/STR/BR/MARAH/DD -13	1
14	MAIN GIRDER DETAILS OF BRIDGE OVER RIVER MARAHA	KDP/DPR/STR/BR/MARAH/DD -14	1
15	MAIN GIRDER REINFORCEMENT DETAILS OF BRIDGE OVER RIVER MARAHA	KDP/DPR/STR/BR/MARAH/DD -15	2
16	CROSS GIRDER REINFORCEMENT DETAILS OF BRIDGE OVER RIVER MARAHA	KDP/DPR/STR/BR/MARAH/DD -16	2
17	DECK SLAB DETAILS OF BRIDGE OVER RIVER MARAHA	KDP/DPR/STR/BR/MARAH/DD -17	1
18	SUPERSTRUCTURE BAR BENDING SCHEDULE OF BRIDGE OVER RIVER MARAHA	KDP/DPR/STR/BR/MARAH/DD -18	2
19	MISCELLANEOUS DETAILS OF BRIDGE OVER RIVER MARAHA	KDP/DPR/STR/BR/MARAH/DD -19	2
20	WING WALL DETAILS OF BRIDGE OVER RIVER MARAHA	KDP/DPR/STR/BR/MARAH/DD -20	1
21	RIVER TRAINING WORKS OF BRIDGE OVER RIVER MARAHA	KDP/DPR/STR/BR/MARAH/DD -21	1
22	BEARING DATA OF BRIDGE OVER RIVER MARAHA	KDP/DPR/STR/BR/MARAH/DD -22	1



DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL
MAIN FOOT TRAIL		ANIMAL FARM	
PLACE NAME		BAMBOO	
POLICE STATION		BIO GAS	
PETROL PUMP		BUS WAITING STATION	
Pond/ Water Body		BRIDGE	
POULTRY FARM		CONTOUR	
PROPERTY BOUNDARY		CANAL	
ROAD INFORMATION BOARD		CULVERT	
RIVER		CONTROL POINT (G)	
SPOT HEIGHT		CRUSHER	
SHED		DELINETOR	
SAFTY TANK		ELECTRIC POLE	
SCHOOL		FACTORY	
STREET LIGHT		FEEDAR ROAD	
TAP		FISH FARM	
TEMPORARY HOUSE		FLOW DIRECTION	
TREE		GABION WALL	
TRANSMISSION LINE TOWER		HOSPITAL	
WELL		HAND PUMP	
TEMPLE		HOUSE	
CGI SHEET HOUSE		HOADING BOARD	
TOILET		CARRIAGE WAY	
WOODEN HOUSE		HUT	
WATER TANK		INDEX CONTOUR	
TRANSFORMER		KILOMETER POST	
SHOULDER		MONASTERY	

Bridge/ River Name	Maraha Bridge
District	Mahottari
Length of Bridge(m)	131.980
Span	8
Bridge top level	193.553
Bridge deck level	192.606
HFL	190.651

GCP NO.	EASTING	NORTHING	ELEVATION	REMARK
G--123	380063.751	2988307.068	191.434	
G--124	380032.174	2988318.537	191.384	

EMPLOYER		PROJECT NAME		DESIGN CONSULTANTS		Designed By	Mr. S.N.R.B Nec.No.265 CIVIL "A" 	Drawing Name DETAILED SURVEY TOPOGRAPHIC MAP(WITH PROPOSED BRIDGE) OF BRIDGE OVER RIVER MARAHA	Scale: 1:1000	Date: JUNE, 2023
	Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Development Cooperation Implementation Division	Strategic Road Connectivity & Trade Improvement Project (SRCTIP) Detailed Design of Upgradation of Kamala-Dhalkebar-Pathlaiya Road Section (130 KM) of Mahendra Highway and Bridges	Joint Venture of		Checked By					
			 EPTISA Servicios De Ingeniera Madrid, Spain	 STUP Consultants Private Limited Kolkatta, India						
					In Association With Udaya Consultancy, Geocom International, Sundar Kriti Consultant and Rays Consultant Private Limited		Approved By	Mr. H.B. 	Sheet No. 1/1	

A. GENERAL

1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS UNLESS NOTED OTHERWISE.
2. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. DIMENSIONS ARE NOT TO BE SCALED.
3. THE LAYOUT OF THE BRIDGE/CULVERT SHALL BE SET AS PER RELEVANT HIGHWAY PLAN AND PROFILE DRAWING.
4. THE FORMATION LEVEL GIVEN IN THIS DRAWING SHALL BE VERIFIED FROM THE RELEVANT HIGHWAY DRAWING. IN CASE OF ANY DISCREPANCY THE HIGHWAY DRAWING SHALL BE CONSIDERED CORRECT.

B. DESIGN CRITERIA

1. THE DESIGN HAS BEEN PREPARED BASED ON THE FOLLOWING CODES:
 - a) NEPAL ROAD STANDARD 2070
 - b) IRC-5 2015
 - c) IRC-6 2017
 - d) IRC-78 2014
 - e) IRC-112 2020
 - f) IRC SP-13 2022
2. TOTAL WIDTH OF THE BRIDGE DECK: 11.85 M (8 M WIDE CARRIAGEWAY + 2.5 M WIDE FOOTPATH) HOWEVER THIS BRIDGE IS DESIGNED FOR THE FOLLOWING CARRIAGEWAY LIVE LOADS AS PER IRC:6-2017
 - a) ONE LANE OF IRC CLASS 70R (WHEELED) FOR TWO LANES + ONE LANE OF IRC CLASS A
 - b) THREE LANES OF IRC CLASS A
3. SEISMIC ZONE CONSIDERED IN THE DESIGN IS ZONE-V.
4. LAYING, COMPACTION, & EXTENT OF BACKFILL BEHIND ABUTMENT & RETURN/RETAINING WALLS SHALL CONSIST OF SELECTED EARTH CONFORMING TO THE APPENDIX-6 OF IRC:78-2014 HAVING PROPERTIES C=0, $\phi=30^\circ$ & DENSITY=20KN/m3.
5. 100mm DIA WEEP HOLES AT 1000mm C/C BOTH HORIZONTALLY AND VERTICALLY SHALL BE PROVIDED IN STAGGERED MANNER IN VERTICAL WALLS OF THE ABUTMENT AND RETURN WALL ABOVE GL. IN ONE OR TWO LAYERS AT A SLOPE OF 1 VERTICAL TO 20 HORIZONTAL TOWARDS THE DRAINING FACE.

C. HYDRAULIC DATA: -

- | | | |
|-----------------------------|---|---------------|
| 1. DESIGN DISCHARGE, (Q100) | - | 511.66 CUMecs |
| 2. HFL | - | 190.12 m |
| 3. FREE BOARD (MINIMUM) | - | 1.500 m |
| 4. MAXIMUM SCOUR LEVEL: | | |
| ABUTMENT | - | 184.06 m |
| PIER | - | 180.65 m |

SCOUR LEVELS WERE CALCULATED AS PER IRC 78:2014 CL 703 WITH APPROPRIATELY INCREASED DESIGN DISCHARGE

D. STRUCTURAL AND OTHER DATA: -

1. SPAN ARRANGEMENT: 5 x 33 = 165 m
2. SUPERSTRUCTURE:
PRECAST PSC LONGITUDINAL GIRDERS & CAST-IN-SITU RCC CROSS GIRDERS AND DECK SLAB.
3. SUBSTRUCTURE
 - A) ABUTMENTS - RCC WALL TYPE
4. FOUNDATIONS
 - A) ABUTMENT - 1200 DIA BORED CAST-IN-SITU PILE
VERTICAL PILE DEMAND - 2334 kN (NON SEISMIC), 3251 kN (SEISMIC)
 - B) PIER - 1200 DIA BORED CAST-IN-SITU PILE
VERTICAL PILE DEMAND - 1968 kN (NON SEISMIC), 2822 kN (SEISMIC)RCC BORED PILES SHOULD BE CONSTRUCTED AS PER IS: 2911(PART 1/SEC 2)-2010.
5. BEARINGS
POT BEARINGS
6. WEARING COAT:
65 MM THICK ASPHALTIC CONCRETE WEARING COAT AS PER STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE WORKS (2073) ,
DEPARTMENT OF ROADS
7. EXPANSION JOINT -
SLAB SEAL TYPE EXPANSION JOINT OF PROVEN QUALITY SHALL BE PROVIDED IN ACCORDANCE WITH IRC:SP-69-2005 (GUIDELINES AND SPECIFICATIONS OF EXPANSION JOINT)
8. DRAINAGE SPOUTS - AS PER STANDARD SPECIFICATION FOR ROAD & BRIDGE WORKS 2073
9. RAILINGS/CRASH BARRIER:
RCC CRASH BARRIER AT EDGES OF CARRIAGEWAY AND FOOTPATH

10. FOOTPATH

2.5m WIDE FOOTPATH AT OUTER EDGE OF DECK

11. CONCRETE: -

- a. PILE..... M35 (CEMENT CONTENT AS PER SPECIFICATION)
- b. PILE CAP.....M35
- c. BEARING PEDESTALS.....M40
- d. ABUTMENTM35
- e. PIERM35
- f. RETURN WALL.....M35
- g. LEVELING COURSE: I) BELOW APPROACH SLAB.....M15
II) BELOW PILE CAP.....M15
- g. APPROACH SLABM30
- h. CAST-IN-SITU CRASH BARRIERM40
- i. KERBM35
- j. DECK SLAB FOR PSC GIRDERS.....M45
- k. PRECAST PSC GIRDERSM50
- l. CAST-IN-SITU CROSS GIRDER FOR PSC GIRDERS.....M45

12. REINFORCEMENT STEEL: -

- a. H.Y.S.D. BARS - GRADE 500 CONFORMING TO IS 1786
- b. REINFORCEMENT WHERE EVER NECESSARY SHALL BE LOCALLY BENT OR ADJUSTED TO ENSURE PROPER CONCRETING.

13. CONCRETE COVER

- a. DECK SLAB, GIRDER, PEDESTAL, CAP : 40 MM
- b. SUBSTRUCTURE AND FOUNDATION : 75 MM

14. LAPS (Ls) ARE TO BE STAGGERED AND MINIMUM LAP LENGTH ARE TO BE AS FOLLOWS:

- | | |
|----------------------------|----------------|
| a) FOR M 30 GRADE CONCRETE | : 57.2 ϕ |
| b) FOR M 35 GRADE CONCRETE | : 51.48 ϕ |
| c) FOR M 40 GRADE CONCRETE | : 48.62 ϕ |
| d) FOR M 45 GRADE CONCRETE | : 45.70 ϕ |
| e) FOR M 50 GRADE CONCRETE | : 42.00 ϕ |

(WHERE ϕ IS THE DIAMETER OF THE BAR)

15. LAP LENGTH SHALL BE INCREASED BY A FACTOR BASED ON THE PERCENTAGE OF LAPPED BAR RELATIVE TO THE TOTAL CROSS SECTIONAL AREA. LAP LENGTH FOR DIFFERENT GRADE OF CONCRETE AS WELL AS DIFFERENT PERCENTAGE OF LAP LENGTH ARE AS FOLLOWS:

GRADE OF CONCRETE	M30	M35	M40	M45	M50
LAPPED BAR <25%	57.20 ϕ	51.48 ϕ	48.62 ϕ	45.70 ϕ	42.00 ϕ
25% $\leq$ LAPPED BAR <33%	65.78 ϕ	59.50 ϕ	55.91 ϕ	52.60 ϕ	48.00 ϕ
33% $\leq$ LAPPED BAR <50%	80.08 ϕ	72.07 ϕ	68.07 ϕ	64.00 ϕ	59.00 ϕ
50% $\leq$ LAPPED BAR	85.80 ϕ	77.22 ϕ	72.93 ϕ	68.60 ϕ	63.00 ϕ

16. THE LAP LENGTH SHALL BE STAGGERED BY MINIMUM DISTANCE OF 1.3 TIMES THE LAP LENGTH.

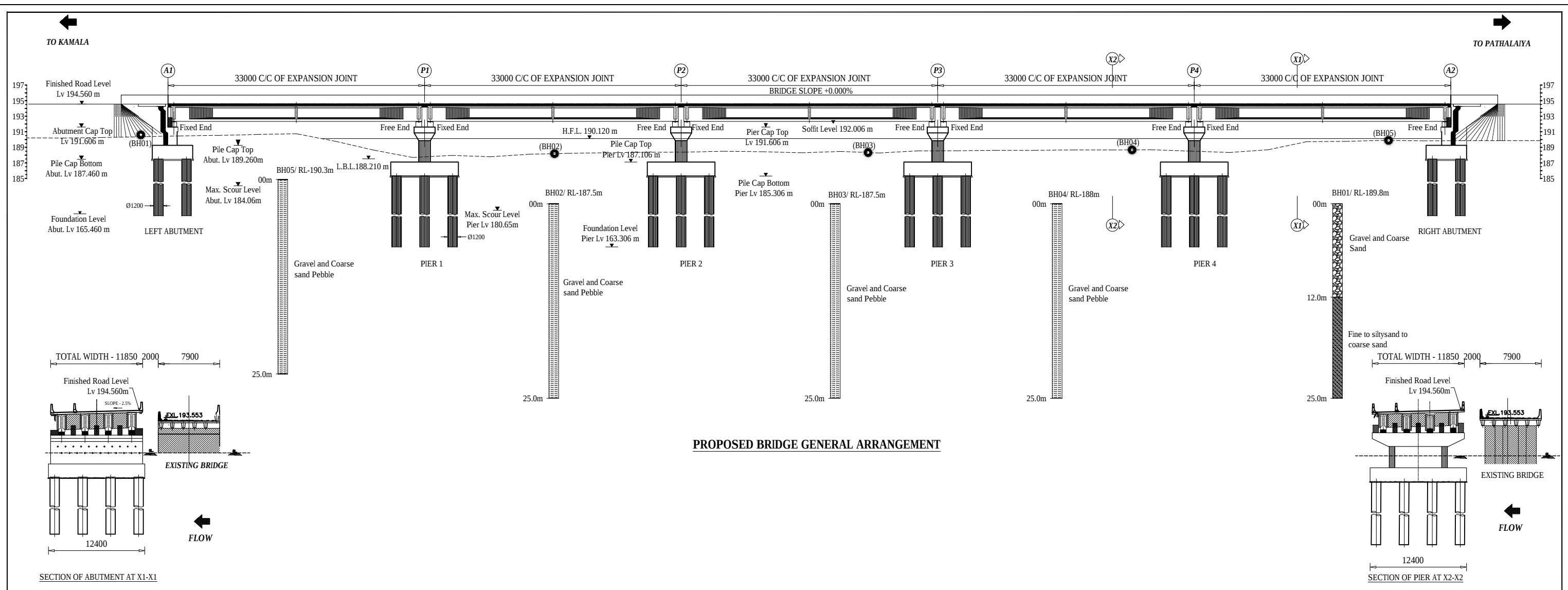
17. HELICAL REINFORCEMENT SHALL BE LAPPED BY 1.5 TURNS.

18. INSTEAD OF LAPPING SPLICING OF REINFORCEMENT CAN BE DONE WITH WELDED JOINT AS PER CL. 15.2.5.2 OF IRC 112-2020. WELD LENGTH SHALL NOT BE LESS THAN 18D.

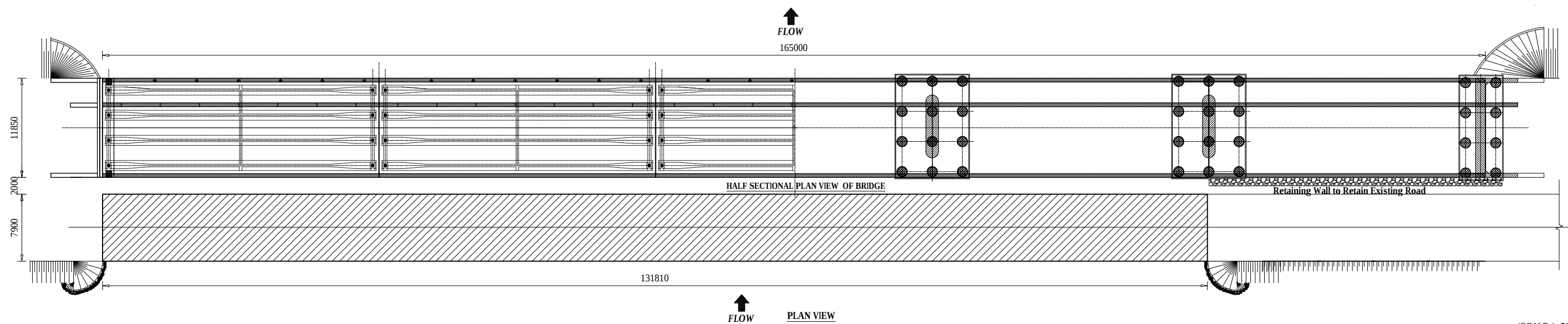
19. SHARP EDGES OF CONCRETE TO BE CHAMFERED MINIMUM 50 X 50

20. LONGITUDINAL AND TRANSVERSE STOPPER SHOULD BE KEPT AT +10MM FROM EXPANSION.

EMPLOYER	PROJECT NAME	DESIGN CONSULTANTS	Designed By	Mr. S.N.R.B Nec.No. 265 Civil "A"		Drawing Name	Scale:	Date:
 Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Development Cooperation Implementation Division	Strategic Road Connectivity & Trade Improvement Project (SRCTIP) Detailed Design of Upgradation of Kamala-Dhalkebar-Pathlaiya Road Section (130 KM) of Mahendra Highway and Bridges	 EPTISA Servicios De Ingeniera Madrid, Spain  STUP Consultants Private Limited Kolkatta, India	Checked By	Mr. S.M.		GENERAL NOTES OF BRIDGE OVER RIVER MARAHA	AS SHOWN	JUNE, 2023
			Approved By	Mr. H.B.		Reference Drawings	Chainage:	Drawing No.- KDP/DPR/STR/BR/MARAH/ DD -4
							277+266	Sheet No. 1 / 1

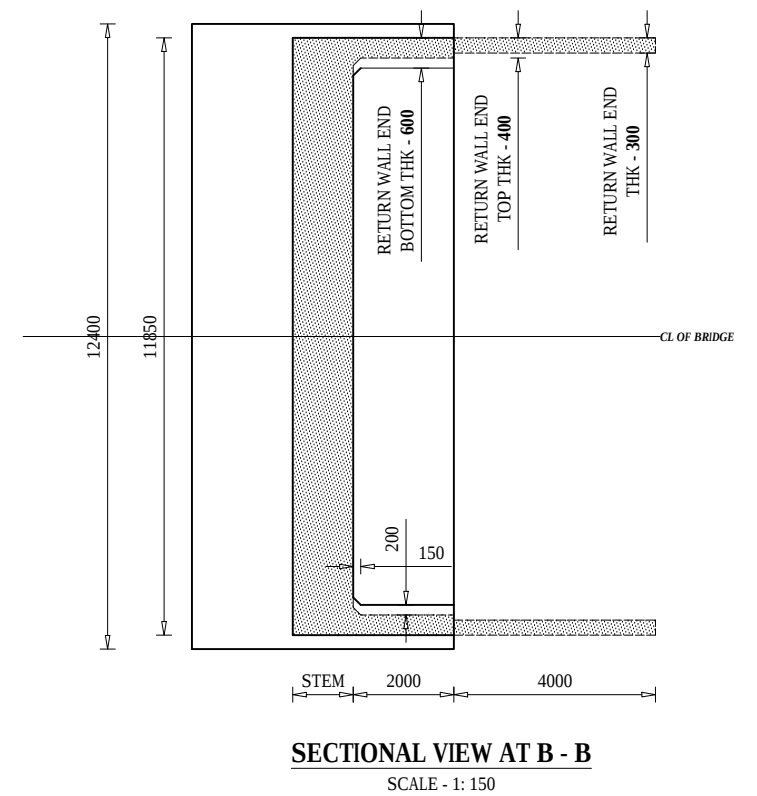
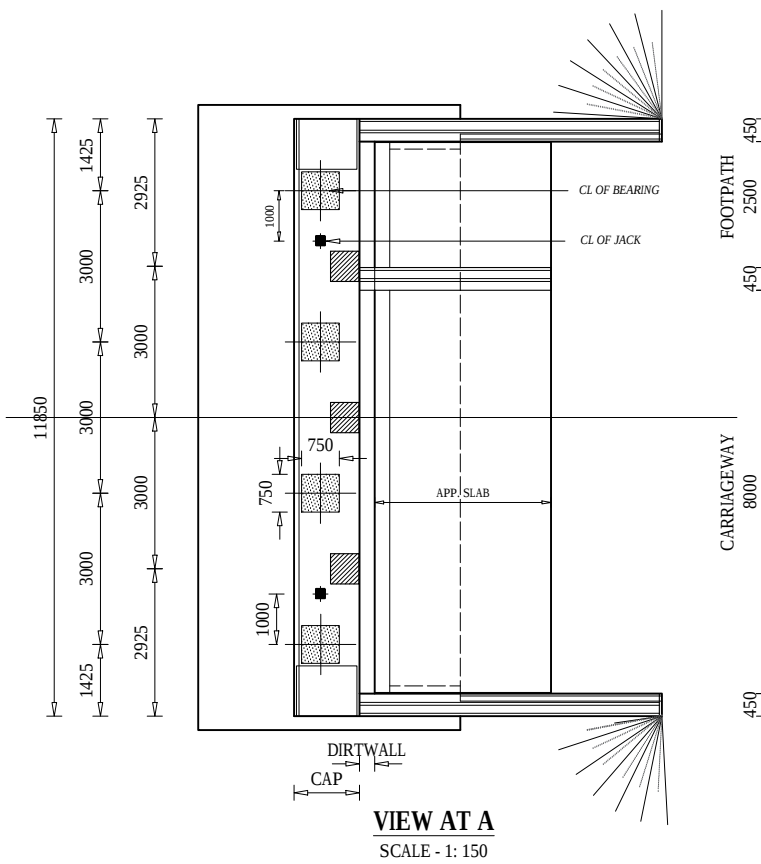
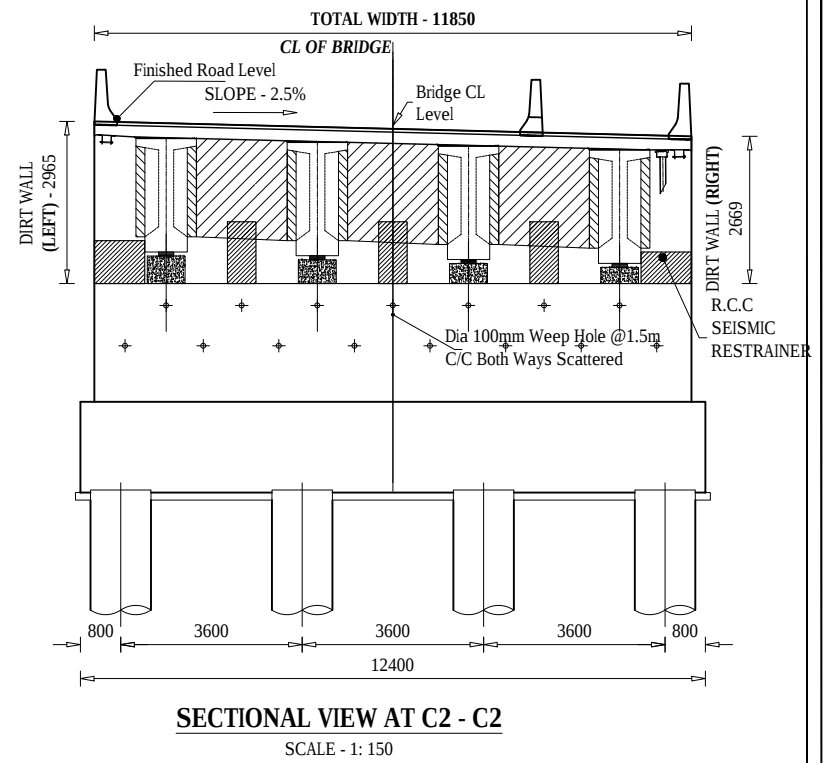
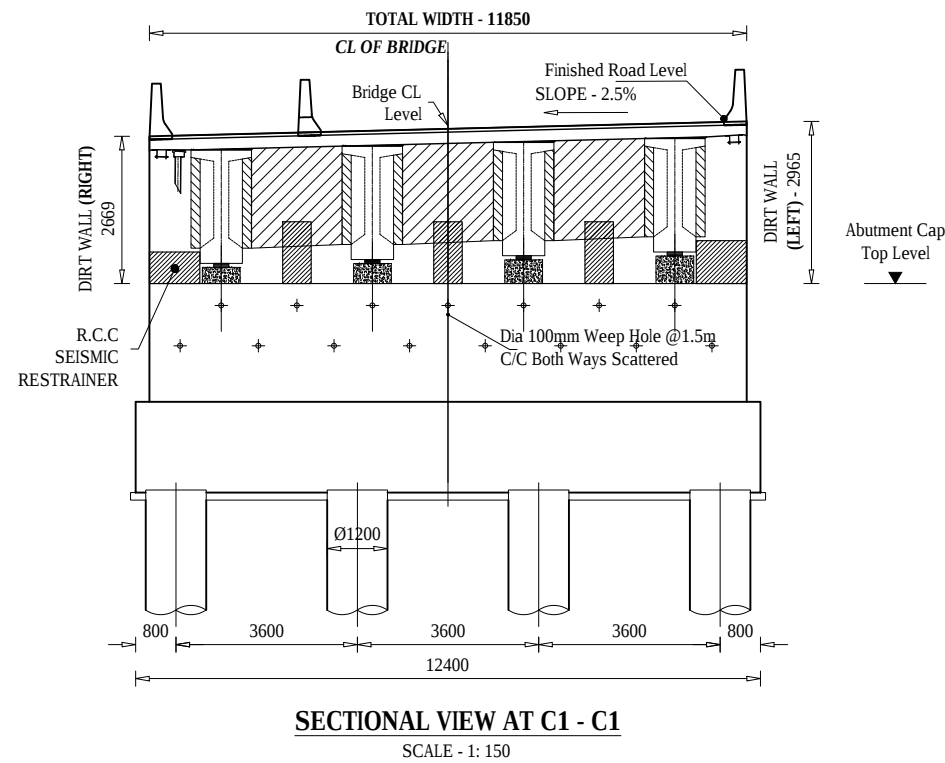
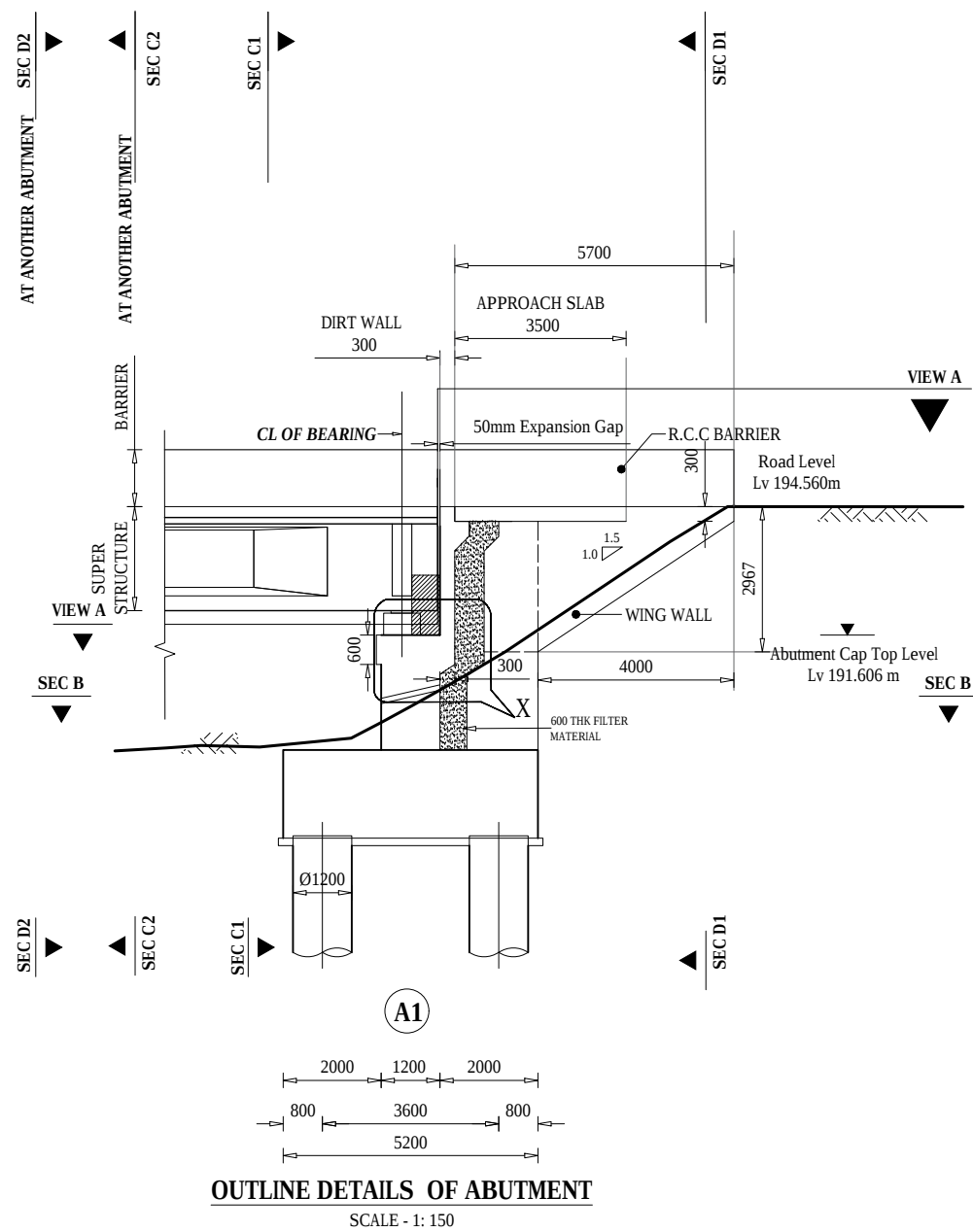


Finished Road Level(D/S)	LEFT ABUTMENT	194.560	PIER 1	194.560	PIER 2	194.560	PIER 3	194.560	PIER 4	194.560	RIGHT ABUTMENT	194.560
Finished Road Level (Existing Bridge)		193.553		193.553		193.553		193.553		193.553		193.553
Existing Ground Level(D/S)		190.360		187.963		188.401		188.544		188.350		189.860
Existing Ground Lvl		193.340		188.106		188.530		188.660		188.270		193.810
Chainage		227+183.5		227+216.5		227+249.5		227+282.5		227+315.5		227+348.5

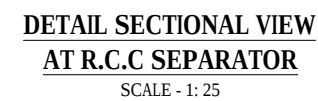
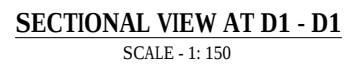
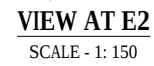


(SCALE 1 :500 @ A3)

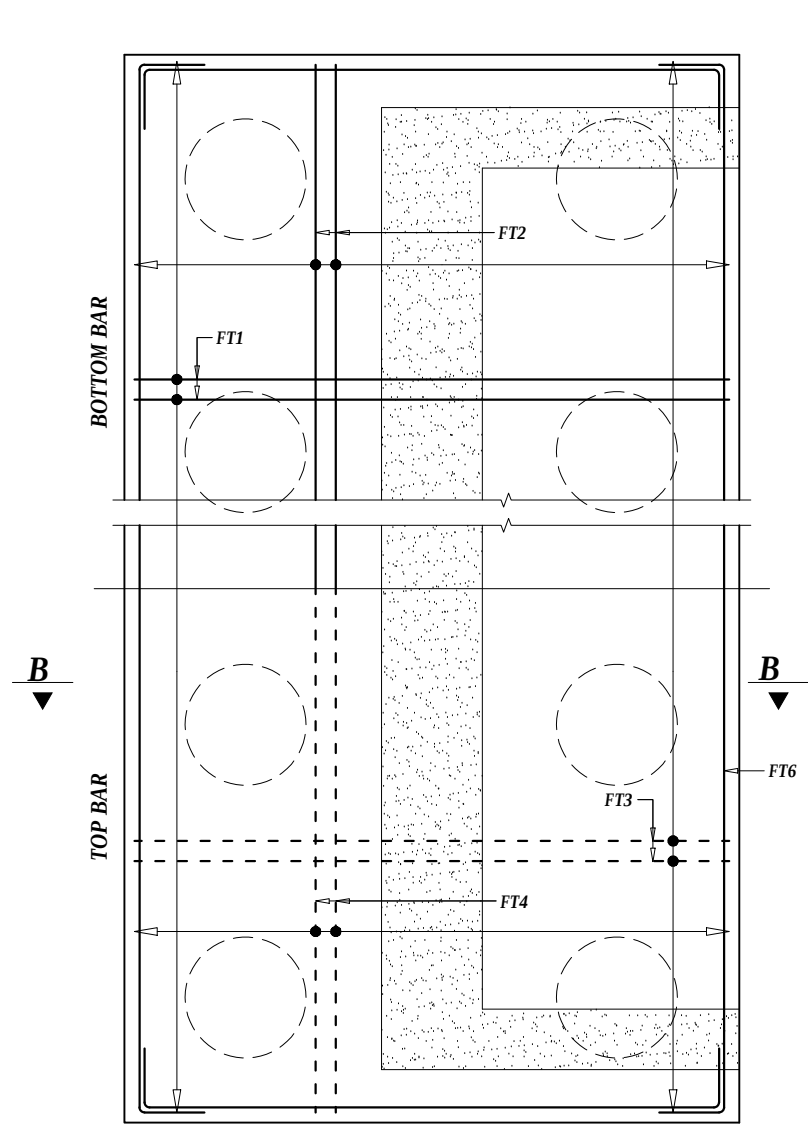
 Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Development Cooperation Implementation Division	PROJECT NAME Strategic Road Connectivity & Trade Improvement Project (SRCTIP) Detailed Design of Upgradation of Kamala-Dhalkebar-Pathalaya Road Section (130 KM) of Mahendra Highway and Bridges	DESIGN CONSULTANTS Joint Venture of  EPTISA Servicios De Ingeniera Madrid, Spain  STUP Consultants Private Limited Kolkata, India In Association With Udaya Consultancy, Geocom International, Sundar Kirti Consultant and Rays Consultant Private Limited	Designed By Mr. S.N.R.B. Nec.No. 265 Civil "A" 	Drawing Name PIER DETAILS OF BRIDGE OVER RIVER MARAHA	Scale: AS SHOWN	Date: JUNE, 2023
			Checked By Mr. S.M. 	Reference Drawings	Chainage: 277+266	Drawing No.- KDP/DPR/STR/BR/MARAHA/DD -5
			Approved By Mr. H.B. 			Sheet No. 1/1



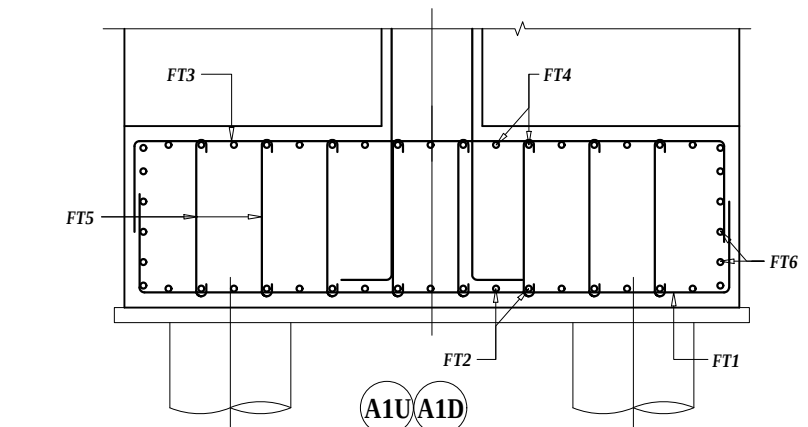
EMPLOYER	PROJECT NAME	DESIGN CONSULTANTS	Designed By	Drawing Name	Scale:	Date:
 Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Development Cooperation Implementation Division	Strategic Road Connectivity & Trade Improvement Project (SRCTIP) Detailed Design of Upgradation of Kamala-Dhalkebar-Pathlaiya Road Section (130 KM) of Mahendra Highway and Bridges	Joint Venture of ep4sa EPTISA Servicios De Ingenieria Madrid, Spain STUP STUP Consultants Private Limited Kolkata, India	Mr. S.N.R.B. Nec.No. 265 Civil 'A'	ABUTMENT DETAILS OF BRIDGE OVER RIVER MARAHA Reference Drawings	AS SHOWN Chainage: 277+266	JUNE, 2023
		In Association With Udaya Consultancy, Geocom International, Sundar Kriti Consultant and Rays Consultant Private Limited	Checked By Mr. S.M.			Drawing No.- KDP/DPR/STR/BR/MARAHA/DD -7
			Approved By Mr. H.B.			Sheet No. 1 / 2



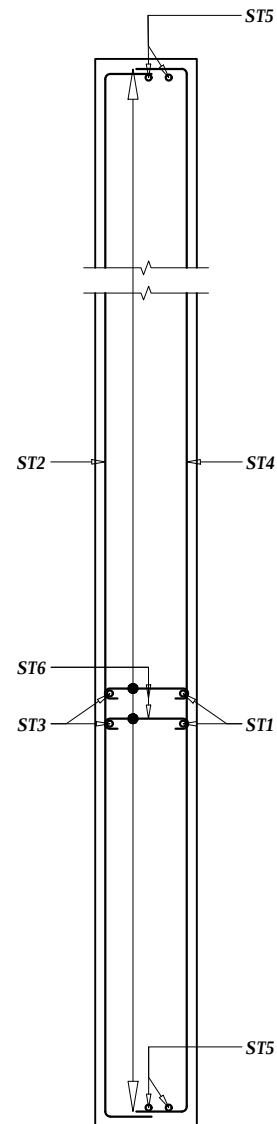
 Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Development Cooperation Implementation Division	PROJECT NAME Strategic Road Connectivity & Trade Improvement Project (SRCTIP) Detailed Design of Upgradation of Kamala-Dhalkebar-Pathlaiya Road Section (130 KM) of Mahendra Highway and Bridges	DESIGN CONSULTANTS		Designed By	Mr. S.N.R.B. Nec.No. 265 Civil "A"  Signature	Drawing Name ABUTMENT DETAILS OF BRIDGE OVER RIVER MARAHA	Scale: AS SHOWN	Date: JUNE, 2023
		Joint Venture of						
		 EPTISA Servicios De Ingenieria Madrid, Spain	 STUP Consultants Private Limited Kolkatta, India					
		In Association With Udaya Consultancy, Geocom International, Sundar Kriti Consultant and Rays Consultant Private Limited						
				Checked By	Mr. S.M.  Signature	Reference Drawings	Chainage: 277+266	Drawing No.- KDP/DPR/STR/BR/MARAH/DD -7
				Approved By	Mr. H.B.  Signature			Sheet No. 2 / 2



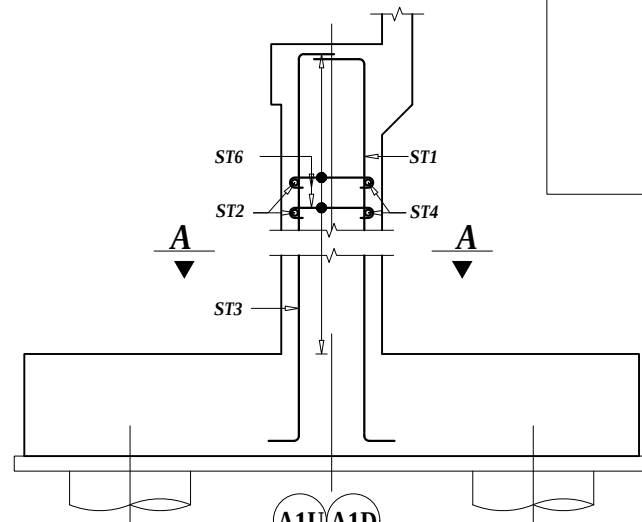
PLAN VIEW OF PILE CAP



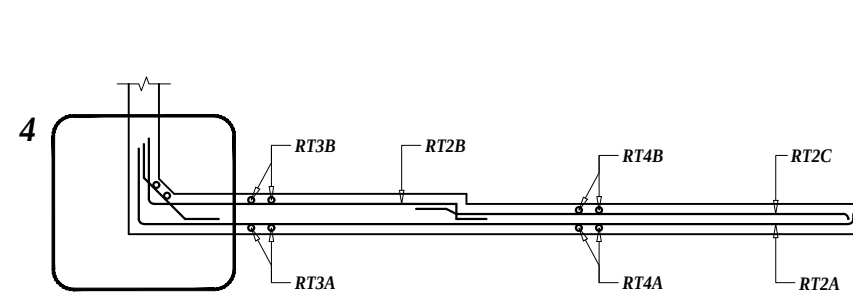
SECTIONAL AT B-B
BAR DETAIL OF PILE CAP
SCALE - 1 : 75



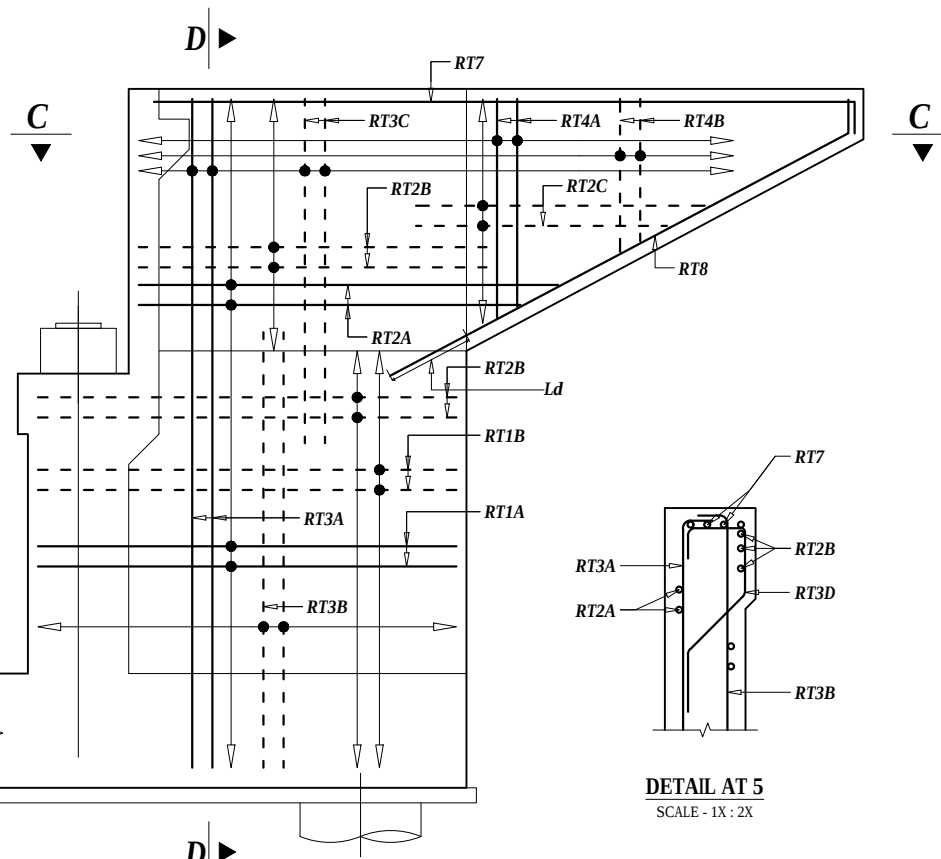
SECTIONAL AT A-A



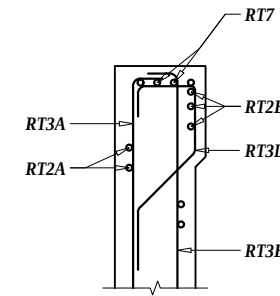
ELEVATION VIEW
BAR DETAIL AT ABUTMENT STEM
SCALE - 1 : 75



SECTIONAL PLAN VIEW AT C-C

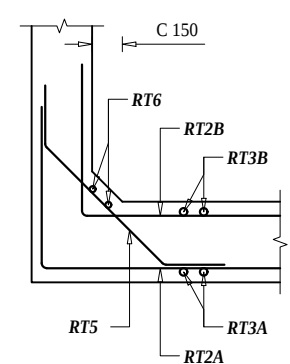


ELEVATION VIEW
A1U A1D

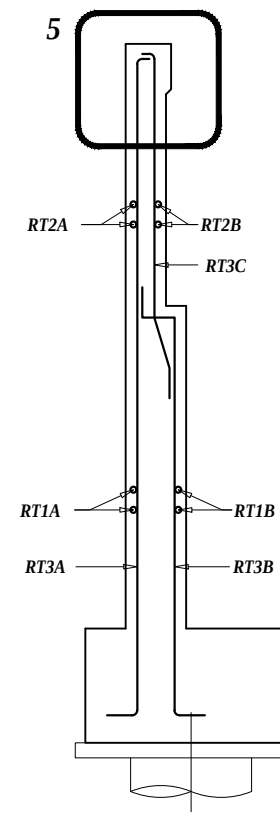


DETAIL AT 5
SCALE - 1X : 2X

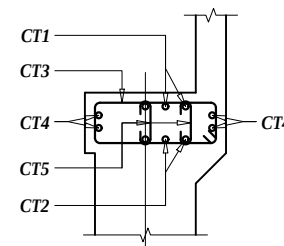
BAR DETAIL AT RETURN WALL
SCALE - 1 : 75



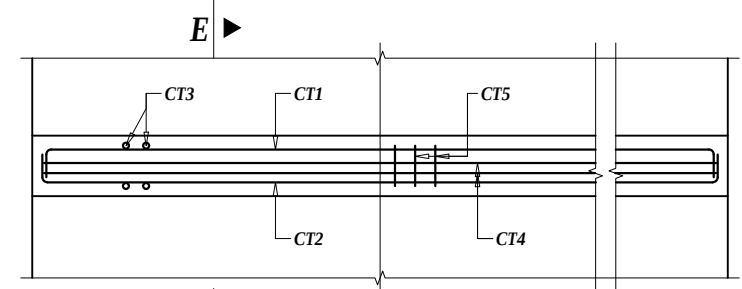
DETAILS AT 4



SECTIONAL SIDE VIEW AT D-D



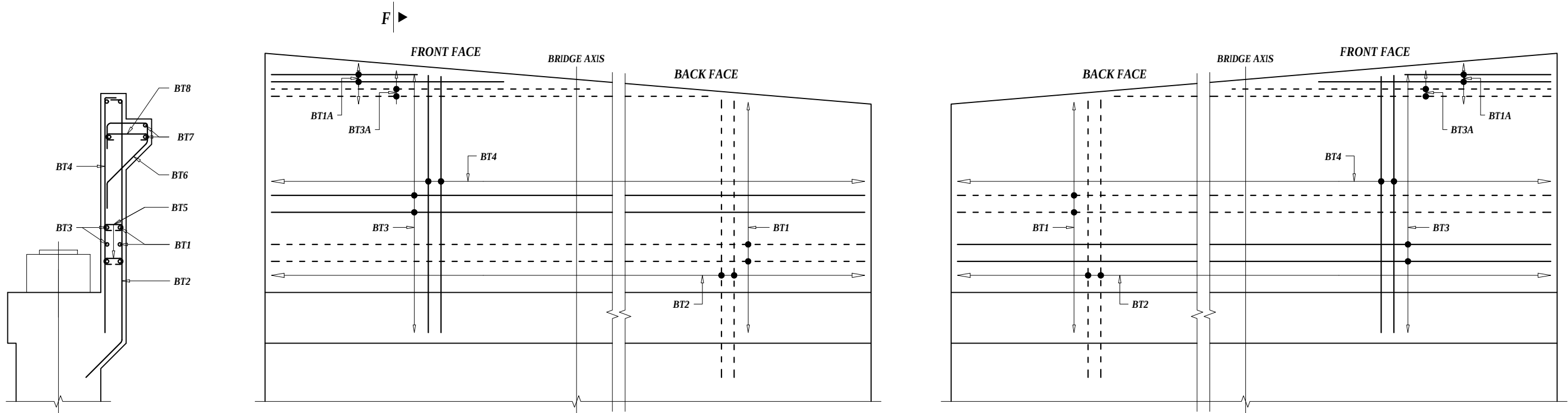
SECTION VIEW AT E-E



FRONT VIEW
BAR DETAIL AT ABUTMENT CAP
SCALE - 1 : 75

--- TOP BAR/NEAR FACE/
EARTH FACE REINFORCEMENT
--- BOTTOM BAR/ FAR FACE/
OTHER FACE REINFORCEMENT

EMPLOYER	PROJECT NAME	DESIGN CONSULTANTS	Designed By	Mr. S.N.R.B.	Drawing Name	Scale:	Date:
 Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Development Cooperation Implementation Division	Strategic Road Connectivity & Trade Improvement Project (SRCTIP) Detailed Design of Upgradation of Kamala-Dhalkebar-Pathlaiya Road Section (130 KM) of Mahendra Highway and Bridges	Joint Venture of  EPTISA Servicios De Ingenieria Madrid, Spain	Mr. S.N.R.B. Nec.No. 265 Civil 'A'		ABUTMENT REINFORCEMENT DETAILS OF BRIDGE OVER RIVER MARAHA Reference Drawings KDP/DPR/STR/BR/MARAH/DD -9	AS SHOWN Chainage: 277+266	JUNE, 2023
		 STUP Consultants Private Limited Kolkatta, India	Checked By Mr. S.M.				Drawing No.- KDP/DPR/STR/BR/MARAH/DD -8
		In Association With Udaya Consultancy, Geocom International, Sundar Kriti Consultant and Rays Consultant Private Limited	Approved By Mr. H.B.				Sheet No. 1/2



SECTIONAL VIEW AT F-F

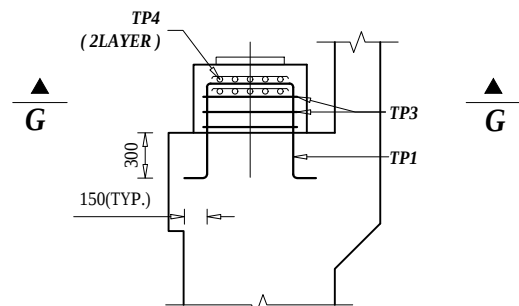


ELEVATION VIEW / VIEW AT D1

BAR DETAIL AT DIRT WALL

SCALE - 1 : 50

ELEVATION VIEW / VIEW AT D2

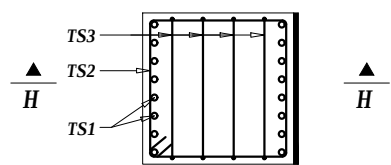


SECTIONAL SIDE VIEW

SECTIONAL PLAN VIEW AT G-G

BAR DETAIL AT PEDESTAL

SCALE - 1 : 50

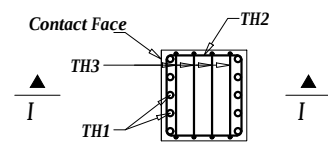


SECTIONAL PLAN VIEW

SECTIONAL VIEW AT H-H

R.C.C STOPPER LEFT
ELEVATION VIEW

SCALE - 1 : 50

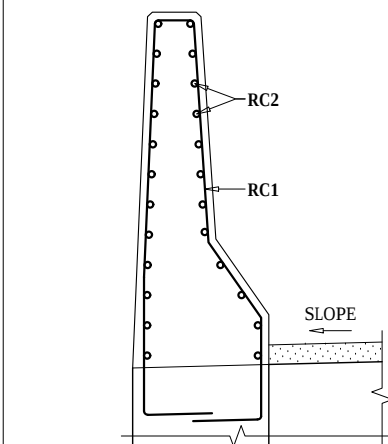


SECTIONAL PLAN VIEW

SECTIONAL VIEW AT I - I

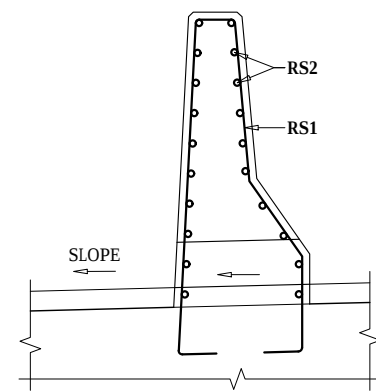
R.C.C LONGITUDINAL
STOPPER SECTION

SCALE - 1 : 50



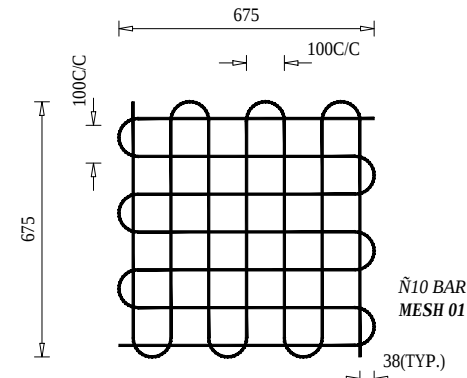
REINFORCEMENT DETAILS OF
R.C.C BARRIER (B)- SECTIONAL VIEW

SCALE - 1 : 25



REINFORCEMENT DETAILS OF
R.C.C SEPARATOR - SECTIONAL VIEW

SCALE - 1 : 25



REINFORCEMENT DETAILS OF
BEARING MESH

SCALE - 1 : 50

--- TOP BAR OR
NEAR FACE REINFORCEMENT
--- BOTTOM BAR OR
FAR FACE REINFORCEMENT

EMPLOYER	PROJECT NAME	DESIGN CONSULTANTS	Designed By	Mr. S.N.R.B.	Drawing Name	Scale:	Date:
 Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Development Cooperation Implementation Division	Strategic Road Connectivity & Trade Improvement Project (SRCTIP) Detailed Design of Upgradation of Kamala-Dhalkebar-Pathlaiya Road Section (130 KM) of Mahendra Highway and Bridges	 EPTISA Servicios De Ingenieria Madrid, Spain  STUP Consultants Private Limited Kolkatta, India	Mr. S.N.R.B. Nec.No. 265 Civil "A"		ABUTMENT REINFORCEMENT DETAILS OF BRIDGE OVER RIVER MARAHA	AS SHOWN	JUNE, 2023
		In Association With Udaya Consultancy, Geocom International, Sundar Kriti Consultant and Rays Consultant Private Limited	Checked By	Mr. S.M.	Reference Drawings	Chainage:	Drawing No.- KDP/DPR/STR/BR/MARAH/DD-8
			Approved By	Mr. H.B.	KDP/DPR/STR/BR/MARAH/DD -9	277+266	Sheet No. 2 / 2

BAR BENDING SCHEDULE OF DIRT WALL								
S.No.	BAR MARK	DESCRIPTION OF BAR	BAR DIA.(MM)	SPACING (MM)	BAR LENGTH (M)	No. OF BARS	UNIT WEIGHT (Kg/m)	TOTAL WEIGHT (Kg)
1	BT1		12	150	12.000	24	0.889	258.00
2	BT1A		12	150	6.000	3	0.889	16.00
3	BT2		16	150	4.015	80	1.580	507.58
4	BT3		12	150	12.000	20	0.889	213.33
5	BT3A		12	150	6.000	3	0.889	16.00
6	BT4		12	150	4.090	80	0.889	290.84
7	BT5		12	450	0.350	162	0.889	50.40
8	BT6		16	150	1.826	80	1.580	230.84
9	BT7		12	5 Nos.	11.700	5	0.889	52.00
10	BT8		12	150	0.550	632	0.889	365.16
TOTAL (KG) :								1998.13

BAR BENDING SCHEDULE OF ABUTMENT CAP								
S.No.	BAR MARK	DESCRIPTION OF BAR	BAR DIA.(MM)	SPACING (MM)	BAR LENGTH (M)	No. OF BARS	UNIT WEIGHT (Kg/m)	TOTAL WEIGHT (Kg)
1	CT1		16	150	12.300	12	1.580	233.24
2	CT2		16	150	12.300	12	1.580	233.24
3	CT3		16	150	2.000	80	1.580	252.84
4	CT4		12	150	12.300	8	0.889	87.47
5	CT5		12	Long-150 Trans-300	0.650	422	0.889	243.82
TOTAL (KG) :								1050.62

BAR BENDING SCHEDULE OF ABUTMENT STEM								
S.No.	BAR MARK	DESCRIPTION OF BAR	BAR DIA.(MM)	SPACING (MM)	BAR LENGTH (M)	No. OF BARS	UNIT WEIGHT (Kg/m)	TOTAL WEIGHT (Kg)
1	ST1		25	150	5.196	80	3.858	1803.70
2	ST2		16	150	12.900	12	1.580	244.62
3	ST3		20	150	5.196	80	2.469	1026.37
4	ST4		16	150	12.900	12	1.580	244.62
5	ST5		16	200	5.196	14	1.580	114.95
6	ST6		16	Ver. 450 Hor. 450	1.250	108	1.580	213.33
TOTAL (KG) :								3447.61

BAR BENDING SCHEDULE OF PILE CAP								
S.No.	BAR MARK	DESCRIPTION OF BAR	BAR DIA.(MM)	SPACING (MM)	BAR LENGTH (M)	No. OF BARS	UNIT WEIGHT (Kg/m)	TOTAL WEIGHT (Kg)
1	FT1		25	110	6.850	112	3.858	2958.88
2	FT2		20	200	14.050	26	2.469	901.98
3	FT3		20	110	6.850	112	2.469	1894.32
4	FT4		16	200	14.050	26	1.580	577.26
5	FT5		16	Long-450 Trans-450	1.950	336	1.580	1035.38
6	FT6		16	200	34.900	8	1.580	441.20
TOTAL (KG) :								7810.02

BAR BENDING SCHEDULE OF PEDESTAL								
S.No.	BAR MARK	DESCRIPTION OF BAR	BAR DIA.(MM)	SPACING (MM)	BAR LENGTH (M)	No. OF BARS	UNIT WEIGHT (Kg/m)	TOTAL WEIGHT (Kg)
1	P1		16	150	2.500	6	1.580	23.70
1	P2		16	150	2.500	6	1.580	23.70
2	P3		16	150	3.000	4	1.580	18.96
1	P4		16	2 Nos	1.0500	2	0.817	12.96
TOTAL (KG) :								79.33
TOTAL NOS OF PEDESTAL :								4.00
TOTAL WEIGHT (KG) :								317.33

BAR BENDING SCHEDULE OF RCC SEISMIC RESTRAINER - LEFT								
S.No.	BAR MARK	DESCRIPTION OF BAR	BAR DIA.(MM)	SPACING (MM)	BAR LENGTH (M)	No. OF BARS	UNIT WEIGHT (Kg/m)	TOTAL WEIGHT (Kg)
1	TS1-L		32		4.550	1	6.321	216.37
2	TS2-L		12	120	4.200	6	0.889	22.40
3	TS3-L		16	110	4.350	10	1.580	63.74
TOTAL (KG) :								407.51

BAR BENDING SCHEDULE OF RCC SEISMIC RESTRAINER - RIGHT								
S.No.	BAR MARK	DESCRIPTION OF BAR	BAR DIA.(MM)	SPACING (MM)	BAR LENGTH (M)	No. OF BARS	UNIT WEIGHT (Kg/m)	TOTAL WEIGHT (Kg)
1	TS1-R		32		5.850	11	6.321	406.76
2	TS2-R		12	120	4.200	8	0.889	29.87
3	TS3-R		16	110	4.800	10	1.580	75.85
TOTAL (KG) :								512.47

BAR BENDING SCHEDULE OF RCC LONGITUDINAL RESTRAINER								
S.No.	BAR MARK	DESCRIPTION OF BAR	BAR DIA.(MM)	SPACING (MM)	BAR LENGTH (M)	No. OF BARS	UNIT WEIGHT (Kg/m)	TOTAL WEIGHT (Kg)
1	TL1		32	100	6.338	6	6.321	222.53
2	TL2		16	150	2.170	3	1.580	27.43
3	TL3		25	150	4.380	4	3.858	27.69
TOTAL (KG) :								257.66
TOTAL NOS OF LONGITUDINAL RESTRAINER :								3.00
TOTAL WEIGHT (KG) :								882.08

EMPLOYER  Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Development Cooperation Implementation Division		PROJECT NAME Strategic Road Connectivity & Trade Improvement Project (SRCTIP) Detailed Design of Upgradation of Kamala-Dhalkebar-Pathlaiya Road Section (130 KM) of Mahendra Highway and Bridges		DESIGN CONSULTANTS Joint Venture of  EPTISA Servicios De Ingenieria Madrid, Spain  STUP Consultants Private Limited Kolkata, India In Association With Udaya Consultancy, Geocom International, Sundar Knti Consultant and Rays Consultant Private Limited		Designed By Mr. S.N.R.B. Nec.No. 265 Civil 'A'  Checked By Mr. S.M.  Approved By Mr. H.B. 	Drawing Name ABUTMENT BAR BENDING SCHEDULE OF BRIDGE OVER RIVER MARAHA Reference Drawings 	Scale: AS SHOWN Chainage: 277+266	Date: JUNE, 2023 Drawing No.- KDP/DPR/STR/BR/MARAHA/DD-9 Sheet No. 1/2
---	--	---	--	--	--	--	--	--	--

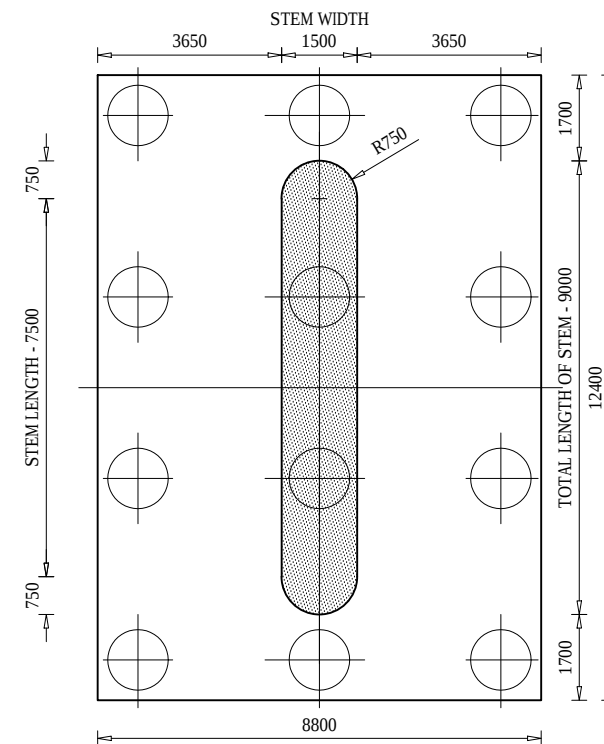
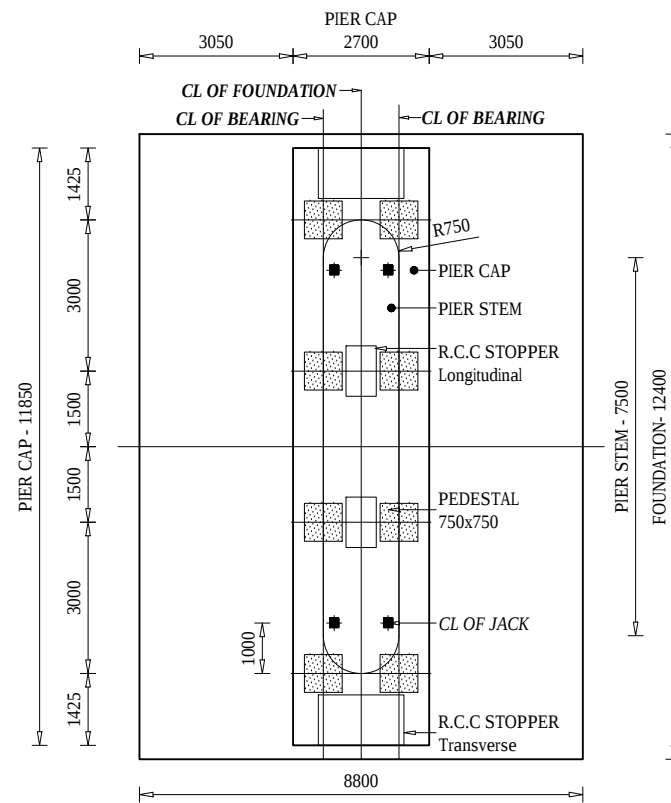
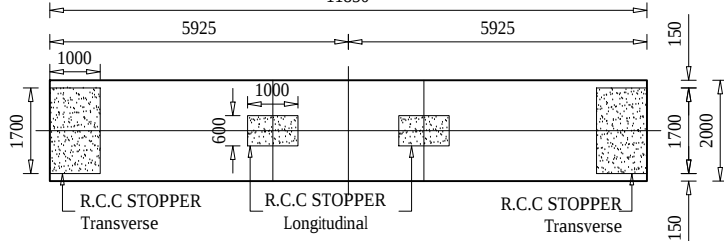
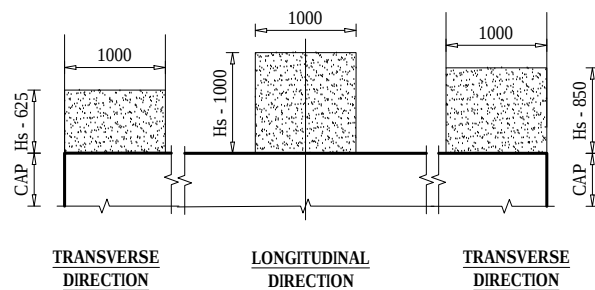
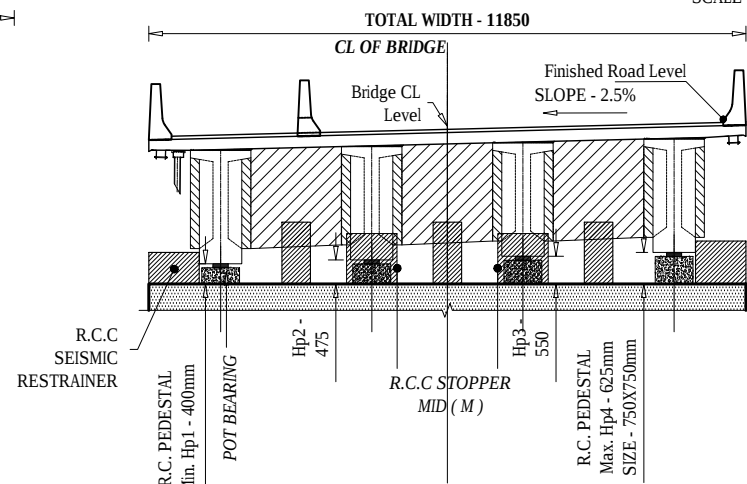
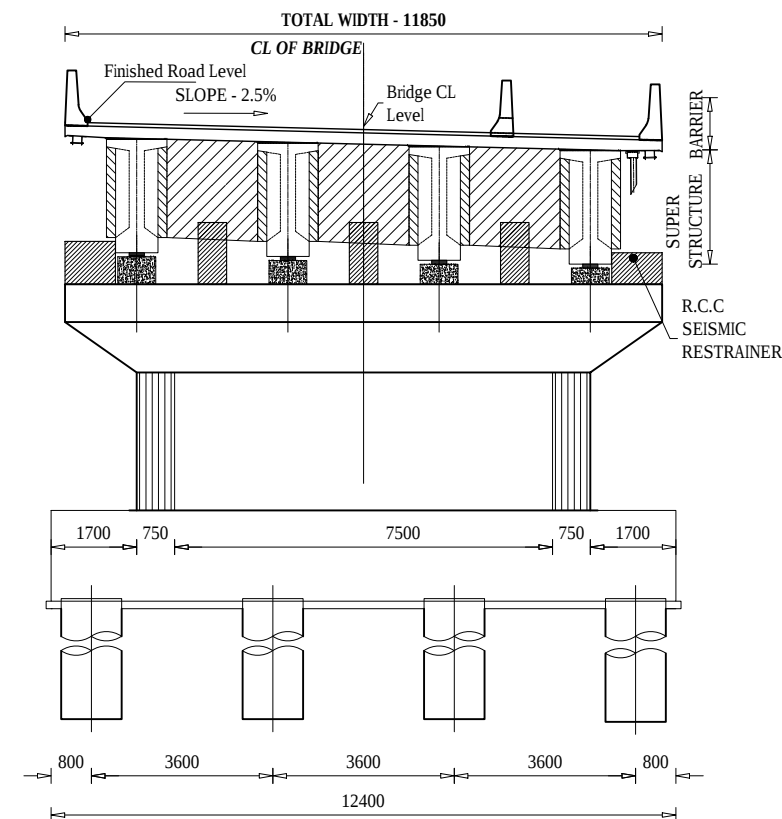
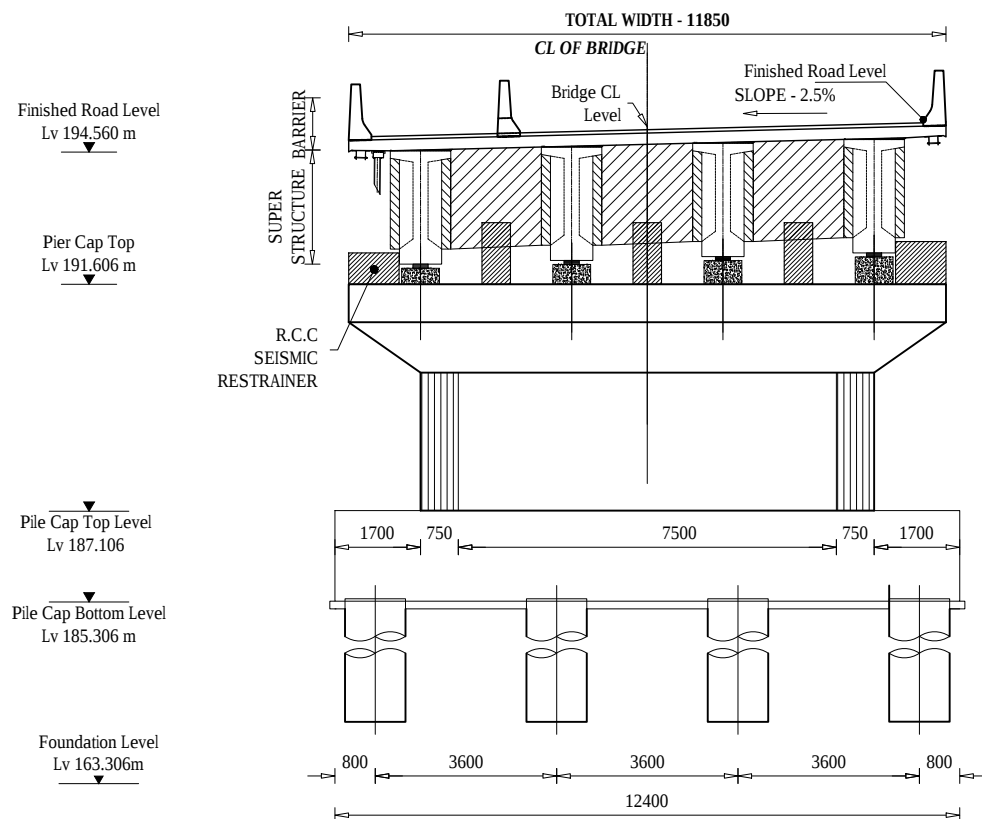
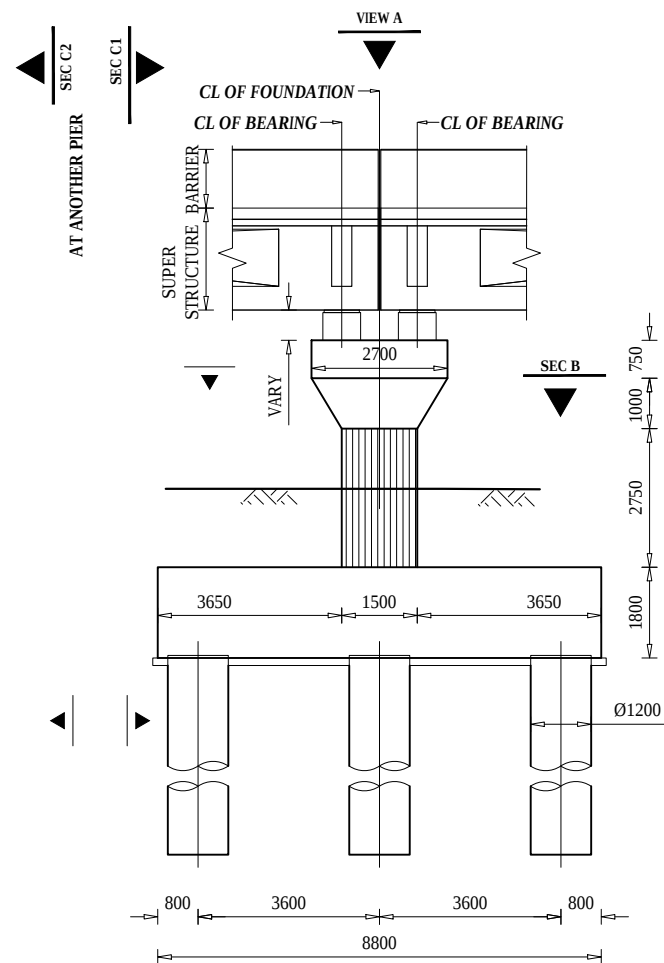
BAR BENDING SCHEDULE OF RETURN WALL - LEFT								
S.No.	BAR MARK	DESCRIPTION OF BAR	BAR DIA.(MM)	SPACING (MM)	BAR LENGTH (M)	No. OF BARS	UNIT WEIGHT (Kg/m)	TOTAL WEIGHT (Kg)
1	RT1A	450 3050 150	12	150	3.650	37	0.889	120.04
2	RT1B	450 3050 150	16	150	3.650	37	1.580	213.41
3	RT2A	450 5620 150	12	150	6.220	21	0.889	116.11
3	RT2B	150 3050 150 480	12	150	3.830	21	0.889	71.49
4	RT2C	480 150 3700 150	12	150	4.480	21	0.889	83.63
5	RT3A	7074 150 450	12	150	7.674	15	0.889	102.32
6	RT3B	640 150 4107 450	16	150	5.347	15	1.580	126.74
7	RT3C	150 2892 150 480	12	150	3.672	15	0.889	48.96
8	RT3D	200 390 390 200 210	12	150	1.390	39	0.889	48.19
9	RT4A	1483.5 150 150	12	150	1.784	25	0.889	39.63
10	RT4B	1483.5 150 150	12	150	1.784	25	0.889	39.63
11	RT5	300 870 300	12	150	1.470	57	0.889	74.48
12	RT6	5424	12	2 Nos.	5.424	2	0.889	9.64
13	RT7	5620 150	16		5.770	4	1.580	36.47
14	RT8	5527.59 150	12		5.678	4	0.889	20.19
TOTAL (KG) :								1150.94

BAR BENDING SCHEDULE OF RETURN WALL - RIGHT								
S.No.	BAR MARK	DESCRIPTION OF BAR	BAR DIA.(MM)	SPACING (MM)	BAR LENGTH (M)	No. OF BARS	UNIT WEIGHT (Kg/m)	TOTAL WEIGHT (Kg)
1	RT1A	450 3050 150	12	150	3.650	35	0.889	113.56
2	RT1B	450 3050 150	16	150	3.650	35	1.580	201.88
3	RT2A	450 5620 150	12	150	6.220	21	0.889	116.11
4	RT2B	150 3050 150 480	12	150	3.830	21	0.889	71.49
5	RT2C	480 150 3700 150	12	150	4.480	21	0.889	83.63
6	RT3A	6777 150 450	12	150	7.377	15	0.889	98.36
7	RT3B	640 150 3810 450	16	150	5.050	15	1.580	119.70
8	RT3C	150 2892 150 480	12	150	3.672	15	0.889	48.96
9	RT3D	200 390 390 200 210	12	150	1.390	39	0.889	48.19
10	RT4A	1483.5 150 150	12	150	1.784	25	0.889	39.63
11	RT4B	1483.5 150 150	12	150	1.784	25	0.889	39.63
12	RT5	300 870 300	12	150	1.470	57	0.889	74.48
12	RT6	5127	12	2 Nos.	5.127	2	0.889	9.11
13	RT7	5620 150	16		5.770	4	1.580	36.47
14	RT8	5527.59 150	12		5.678	4	0.889	20.19
TOTAL (KG) :								1121.39

BAR BENDING SCHEDULE OF R.C.C BARRIER								
S.No	BAR MARK	DESCRIPTION OF BAR	BAR DIA.(MM)	SPACING (MM)	BAR LENGTH (M)	No. OF BARS	UNIT WEIGHT (Kg/m)	TOTAL WEIGHT (Kg)
1	RC-B1	850 130 735 305 445 200 305 200	16	150	3.170	39	1.580	195.37
2	RC-B2	150 5650 150	10	150	5.950	20	0.617	73.46
TOTAL (KG) :								268.82

BAR BENDING SCHEDULE OF R.C.C SEPARATOR								
S.No	BAR MARK	DESCRIPTION OF BAR	BAR DIA.(MM)	SPACING (MM)	BAR LENGTH (M)	No. OF BARS	UNIT WEIGHT (Kg/m)	TOTAL WEIGHT (Kg)
1	RS1	130 535 1110 150 305 315	16	150	2.695	25	1.580	106.47
2	RS2	150 3500 150	10	150	3.800	17	0.617	39.88
TOTAL (KG) :								146.35

EMPLOYER		PROJECT NAME		DESIGN CONSULTANTS		Drawing Name		Scale:		Date:	
	Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Development Cooperation Implementation Division	Strategic Road Connectivity & Trade Improvement Project (SRCTIP) Detailed Design of Upgradation of Kamala-Dhalkebar-Pathlaiya Road Section (130 KM) of Mahendra Highway and Bridges	Joint Venture of		Designed By	Mr. S.N.R.B Nec.No. 265 Civil 'A' 	ABUTMENT BAR BENDING SCHEDULE OF BRIDGE OVER RIVER MARAHA	AS SHOWN	JUNE, 2023		
			 EPTISA Servicios De Ingenieria Madrid, Spain	 STUP Consultants Private Limited Kolkatta, India	Checked By	Mr. S.M. 				Drawing No.- KDP/DPR/STR/BR/MARAHADD -9	
			In Association With Udaya Consultancy, Geocom International, Sundar Kriti Consultant and Rays Consultant Private Limited		Approved By	Mr. H.B. 	Reference Drawings	Chainage: 277+266	Sheet No. 2 / 2		



NOTE
READ THIS DRAWING IN CONJUNCTION WITH
DRG NO. KDP/DPR/STR/BR/MARAHA/DD-4

EMPLOYER	PROJECT NAME	DESIGN CONSULTANTS	Designed By	Drawing Name	Scale:	Date:
 Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Development Cooperation Implementation Division	Strategic Road Connectivity & Trade Improvement Project (SRCTIP) Detailed Design of Upgradation of Kamala-Dhalkebar-Pathlaiya Road Section (130 KM) of Mahendra Highway and Bridges	Joint Venture of ep4sa EPTISA Servicios De Ingenieria Madrid, Spain STUP Consultants Private Limited Kolkata, India In Association With Udaya Consultancy, Geocom International, Sundar Kirti Consultant and Rays Consultant Private Limited	Mr. S.N.R.B. Nec.No. 265 Civil "A" 	PIER DETAILS OF BRIDGE OVER RIVER MARAHA Reference Drawings KDP/DPR/STR/BR/MARAHA/DD-12	AS SHOWN Chainage: 277+266	JUNE, 2023
			Checked By Mr. S.M. 			Drawing No.- KDP/DPR/STR/BR/MARAHADD -10
			Approved By Mr. H.B. 			Sheet No. 1/1

BAR BENDING SCHEDULE OF PIER CAP								
S.No	BAR MARK	DESCRIPTION OF BAR	BAR DIA.(MM)	SPACING (MM)	BAR LENGTH (M)	No. OF BARS	UNIT WEIGHT (Kg/m)	TOTAL WEIGHT (Kg)
1	CT1		32		3.300	60	6.321	1251.56
2	CT2		20		12.450	30	2.469	922.22
3	CT3		32		3.300	15	6.321	312.89
4	CT4		32		12.450	30	6.321	2360.89
5	CT5		16	200	28.700	5	1.580	226.77
6	CT6		16		0.850	663	1.580	890.55
7	CT7		16	150	0.800	141	1.580	178.25
8	CT8		16		302.550	5 Layer	1.580	2390.52
TOTAL (KG):								8533.64

BAR BENDING SCHEDULE OF PILE CAP								
S.No	BAR MARK	DESCRIPTION OF BAR	BAR DIA.(MM)	SPACING (MM)	BAR LENGTH (M)	No. OF BARS	UNIT WEIGHT (Kg/m)	TOTAL WEIGHT (Kg)
1	FT1		32	150	10.450	83	6.321	5482.51
2	FT2		32	150	14.050	59	6.321	5239.78
3	FT3		20	200	10.450	62	2.469	1599.75
4	FT4		20	200	14.050	44	2.469	1526.42
5	FT5		16		1.85	2650	1.580	7747.16
6	FT6		16	200	41.844	8	1.580	528.99
TOTAL (KG):								22124.62

BAR BENDING SCHEDULE OF RCC STOPPER - TRANSVERSE (LEFT)								
S.No	BAR MARK	DESCRIPTION OF BAR	BAR DIA.(MM)	SPACING (MM)	BAR LENGTH (M)	No. OF BARS	UNIT WEIGHT (Kg/m)	TOTAL WEIGHT (Kg)
1	TS1-L		16	150	4.550	12	1.580	86.28
2	TS2-L		16	150	5.200	5	1.580	41.09
3	TS3-L		16	200	5.350	5	1.580	42.27
TOTAL (KG):								169.64

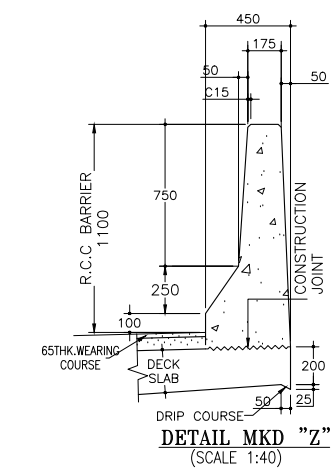
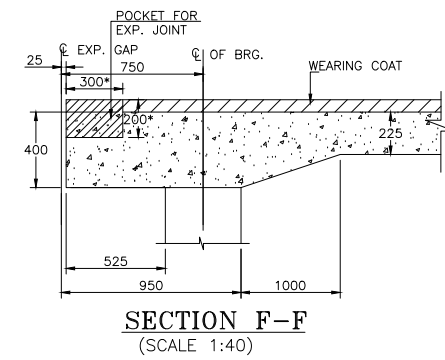
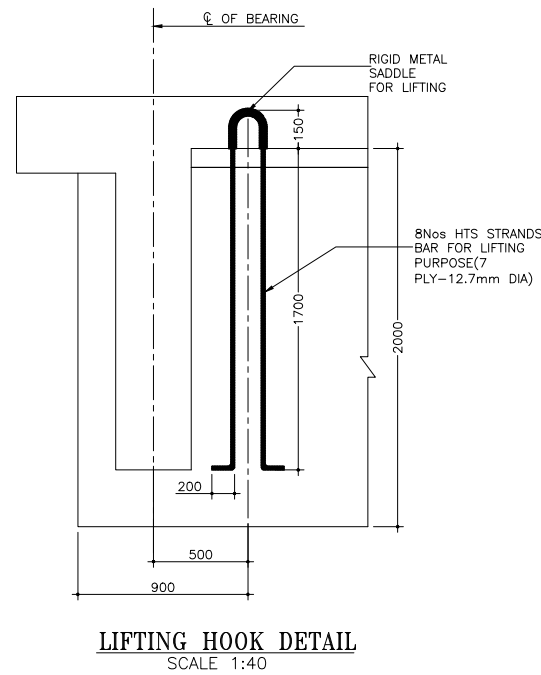
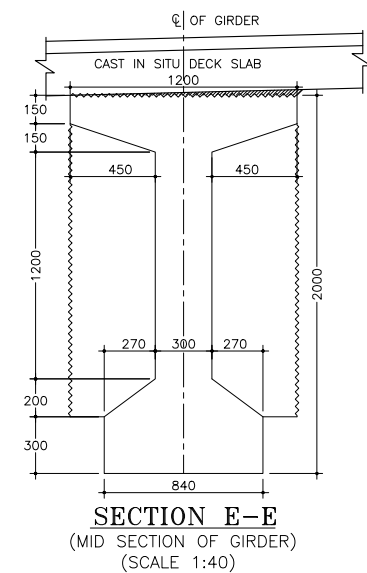
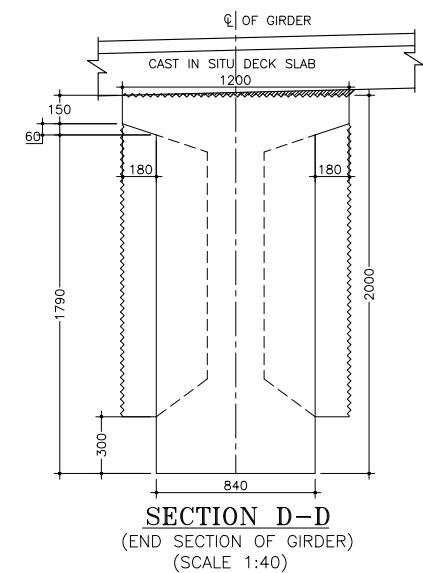
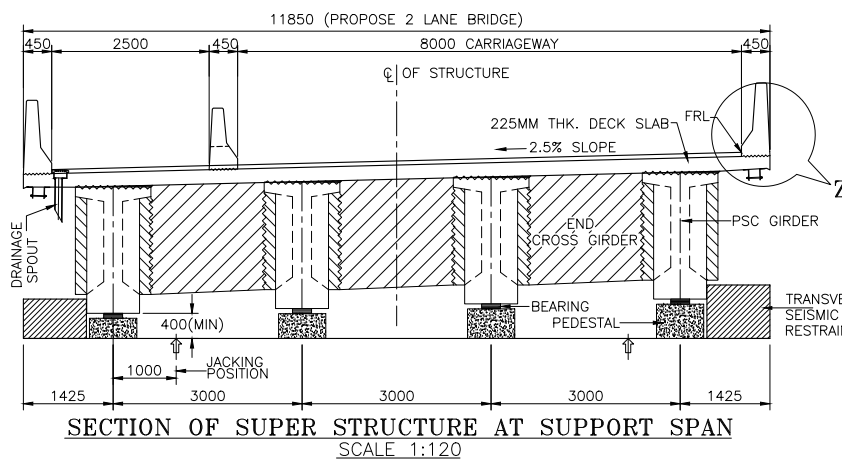
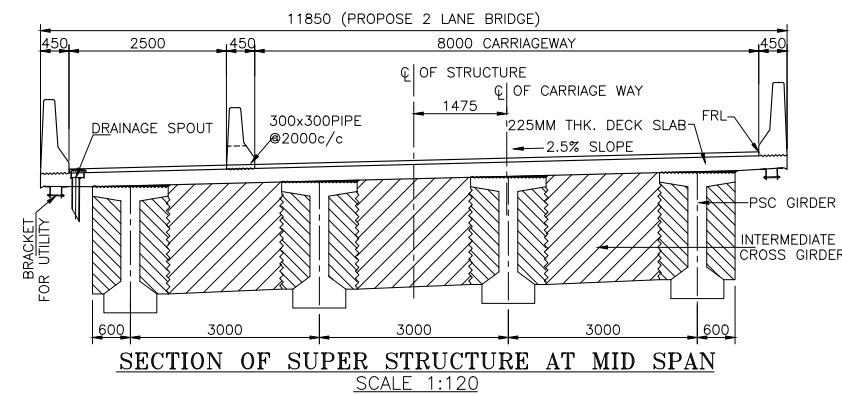
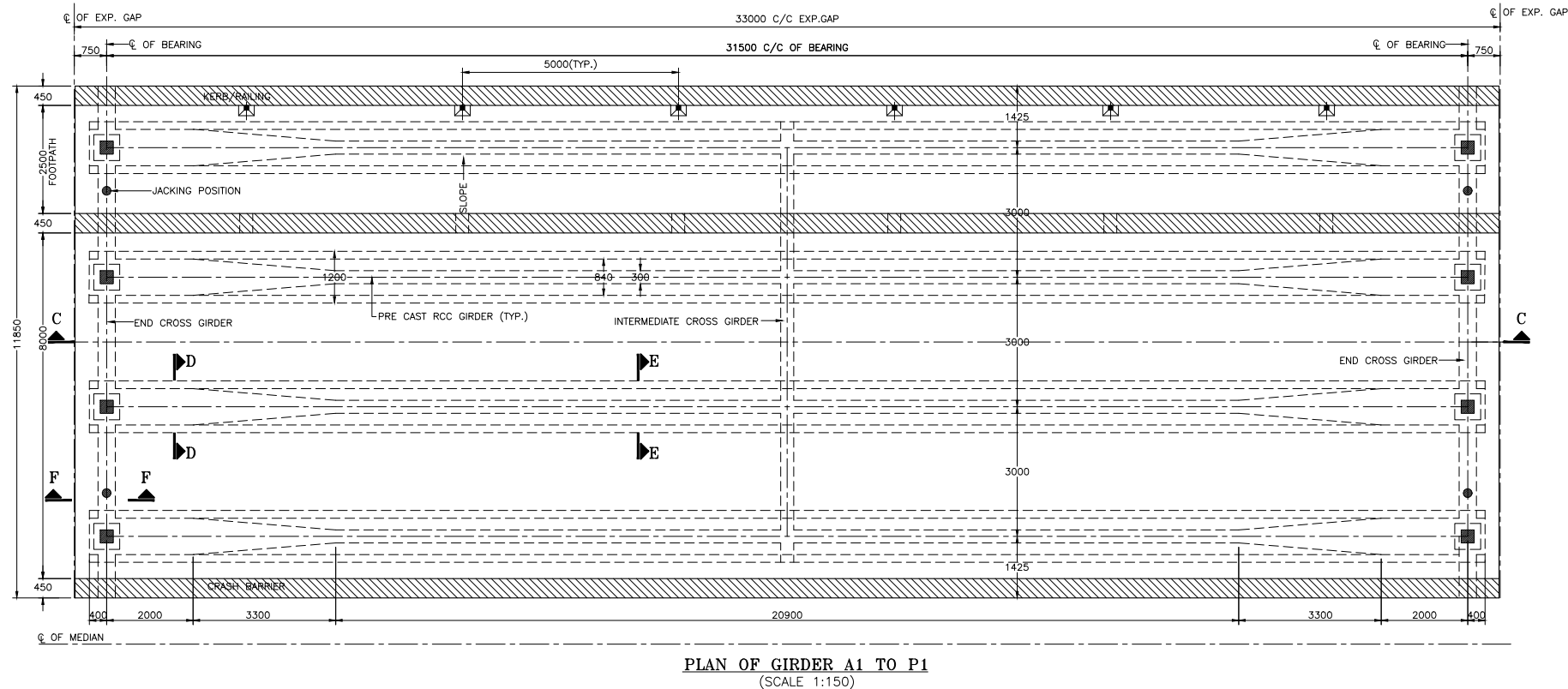
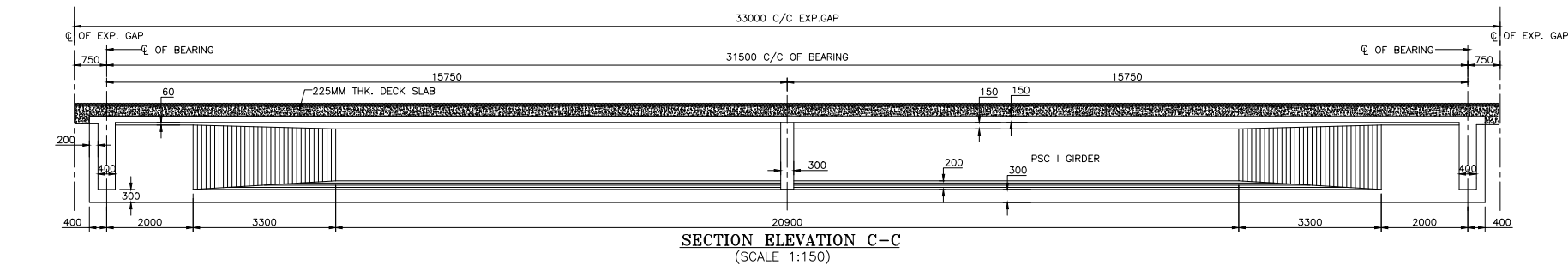
BAR BENDING SCHEDULE OF RCC STOPPER - TRANSVERSE (RIGHT)								
S.No	BAR MARK	DESCRIPTION OF BAR	BAR DIA.(MM)	SPACING (MM)	BAR LENGTH (M)	No. OF BARS	UNIT WEIGHT (Kg/m)	TOTAL WEIGHT (Kg)
1	TS1-R		16	150	5.000	12	1.580	94.81
2	TS2-R		16	150	5.200	6	1.580	49.30
3	TS3-R		16	200	5.800	5	1.580	45.83
TOTAL (KG):								189.95

BAR BENDING SCHEDULE OF PIER STEM								
S.No	BAR MARK	DESCRIPTION OF BAR	BAR DIA.(MM)	SPACING (MM)	BAR LENGTH (M)	No. OF BARS	UNIT WEIGHT (Kg/m)	TOTAL WEIGHT (Kg)
1	ST1		32		7.575	65	6.321	3112.30
2	ST2		20	160	7.550	24	2.469	447.41
3	ST3		32		7.575	65	6.321	3112.30
4	ST4		20	160	7.550	24	2.469	447.41
5	ST5		32		7.575	20	6.321	957.63
5	ST6		20	160	4.157	48	2.469	492.68
6	ST7		20		1.550	696	2.469	2663.70
TOTAL (KG):								11233.42

BAR BENDING SCHEDULE OF PEDESTAL								
S.No	BAR MARK	DESCRIPTION OF BAR	BAR DIA.(MM)	SPACING (MM)	BAR LENGTH (M)	No. OF BARS	UNIT WEIGHT (Kg/m)	TOTAL WEIGHT (Kg)
1	TP1		16	150	2.520	6	1.580	23.89
2	TP2		16	150	2.520	6	1.580	23.89
3	TP3		16	150	3.000	4	1.580	18.96
4	TP4		10		13.275	2	0.617	16.39
TOTAL (KG):								83.14
TOTAL NOS OF PEDESTAL:								8.00
TOTAL WEIGHT (KG):								665.11

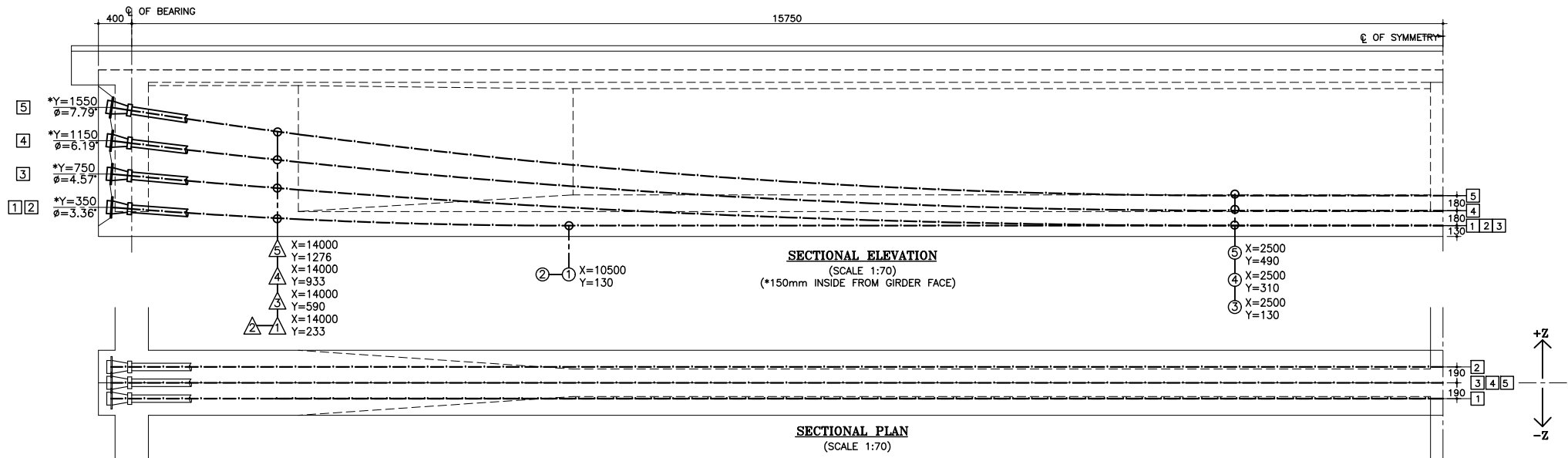
BAR BENDING SCHEDULE OF RCC STOPPER - LONGITUDINAL (2 Nos.)								
S.No	BAR MARK	DESCRIPTION OF BAR	BAR DIA.(MM)	SPACING (MM)	BAR LENGTH (M)	No. OF BARS	UNIT WEIGHT (Kg/m)	TOTAL WEIGHT (Kg)
1	TS1		16	150	4.900	7	1.580	54.20
2	TS2		16	150	3.000	7	1.580	33.19
3	TS3		12	150	4.700	4	0.889	16.71
TOTAL (KG) 2 Nos:								208.20

EMPLOYER		PROJECT NAME		DESIGN CONSULTANTS		Drawing Name		Scale:		Date:	
		Strategic Road Connectivity & Trade Improvement Project (SRCTIP) Detailed Design of Upgradation of Kamala-Dhalkebar-Pathlaiya Road Section (130 KM) of Mahendra Highway and Bridges		Joint Venture of ep4sa EPTISA Servicios De Ingenieria Madrid, Spain STUP Consultants Private Limited Kolkatta, India		PIER BAR BENDING SCHEDULE OF BRIDGE OVER RIVER MARAHA		AS SHOWN		JUNE, 2023	
				In Association With Udaya Consultancy, Geocom International, Sundar Kriti Consultant and Rays Consultant Private Limited		Reference Drawings		Chainage:		KDP/DPR/STR/BR/MARAHADD -12	
						-		277+266		Sheet No. 1/1	

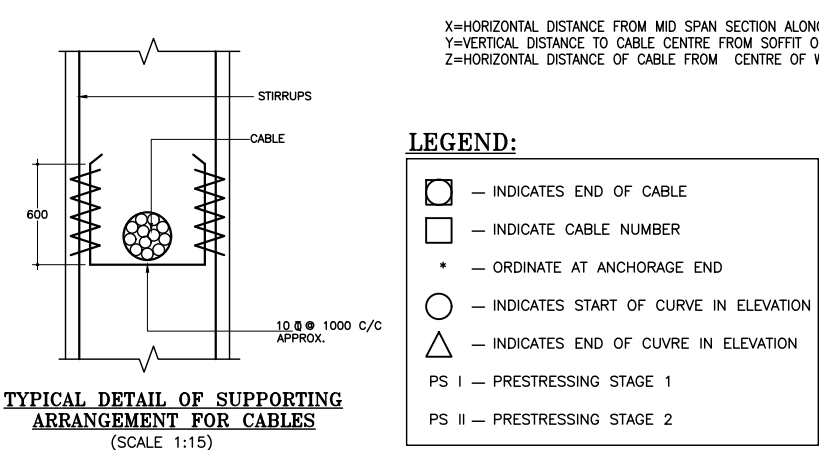
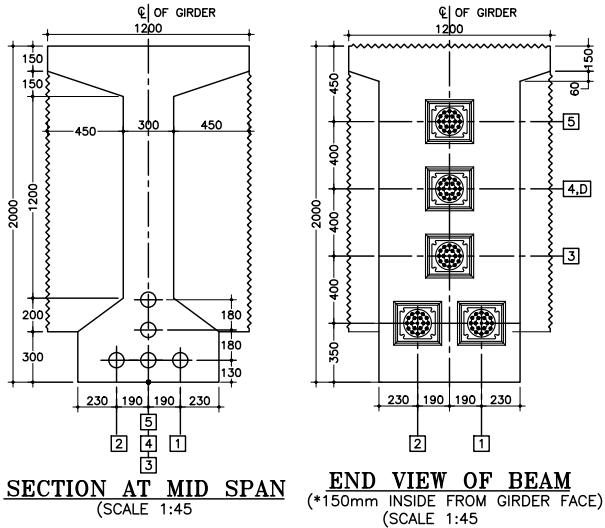


- NOTES:**
1. DIMENSIONS ARE IN MILLIMETERS, CHANGES & LEVELS ARE IN METER, UNLESS NOTED OTHERWISE.
 2. CHAINAGE & LEVEL SHALL BE VERIFIED WITH THE RELEVANT PLAN & PROFILE DRAWING VARIATION (IF ANY) SHALL BE REPORTED TO ENGINEER FOR MODIFICATION.
 3. CHAINAGE OF THE STRUCTURE IS AT THE CENTER LINE OF THE PROPOSED STRUCTURE.
 4. EACH PRECAST GIRDER WILL BE LIFTED BY USING LIFTING STRAND AT EITHER END DURING LIFTING GIRDER SHALL BE KEPT PLUMB AND UPRIGHT.

EMPLOYER	PROJECT	DESIGN CONSULTANT	Designed By	Drawing Name:	Scale:	Date:
 Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Development Cooperation Implementation Division	Strategic Road Connectivity & Trade Improvement Project (SRCTIP) Detailed Design of Upgradation of Kamala-Dhalkebar-Pathlaiya Road Section (130 KM) of Mahendra Highway and Bridges	Joint Venture of  EPTISA Servicios De Ingenieria Madrid, Spain  STUP Consultants Private Limited Kolkatta, India In Association With Udaya Consultancy, Geocom International, Sundar Kriti Consultant and Rays Consultant Private Limited	Mr.S.N.R.B. Signature	SUPER STRUCTURE DETAILS OF BRIDGE OVER RIVER MARAHA	AS NOTED	JUNE, 2023
			Checked By Mr.S.M Signature			Drawing No.: KDP/DPR/STR/BR/MARAH/ DD -13
			Approved By Mr.H.B Signature		Chainage: 277+266	Sheet No.: Sheet No. 1/1



cable no	at X =	16000		14300		13000		11700		10400		9100		7800		6500		5200		3900		2600		1300		0	
		y	z	y	z	y	z	y	z	y	z	y	z	y	z	y	z	y	z	y	z	y	z	y	z	y	z
C5		1550	0	1317	0	1146	0	993	0	861	0	749	0	657	0	585	0	533	0	502	0	490	0	490	0	490	0
C4 (Dummy)		1150	0	966	0	830	0	709	0	604	0	515	0	442	0	385	0	344	0	319	0	310	0	310	0	310	0
C3		750	0	614	0	513	0	424	0	347	0	282	0	228	0	186	0	155	0	137	0	130	0	130	0	130	0
C2		350	190	250	190	182	190	142	190	130	190	130	190	130	190	130	190	130	190	130	190	130	190	130	190	130	190
C1		350	-190	250	-190	182	-190	142	-190	130	-190	130	-190	130	-190	130	-190	130	-190	130	-190	130	-190	130	-190	130	-190



LEGEND:

- — INDICATES END OF CABLE
- — INDICATE CABLE NUMBER
- * — ORDINATE AT ANCHORAGE END
- — INDICATES START OF CURVE IN ELEVATION
- △ — INDICATES END OF CVURE IN ELEVATION
- PS I — PRESTRESSING STAGE 1
- PS II — PRESTRESSING STAGE 2

NOTES FOR PRESTRESSING:

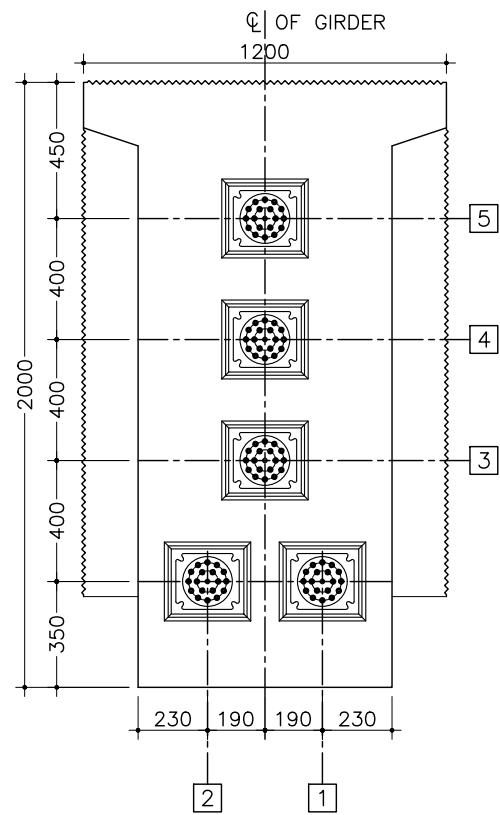
- ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE SPECIFIED.
- DIMENSIONS NOT BE SCALED, ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
- SEQUENCE OF CONSTRUCTION AND PRESTRESSING SHALL BE AS FOLLOWS:
 - STAGE 1 CABLES SHALL BE STRESSED WHEN THE BEAM CONCRETE ATTAINS A MINIMUM STRENGTH OF 35Mpa OR AFTER 7 DAYS OF CASTING WHICHEVER IS LATER.
 - ALL REMAINING CABLES SHALL BE STRESSED TO 100% OF JACKING FORCE WHEN THE BEAM CONCRETE IS 21 DAYS OLD WITH MINIMUM CONCRETE STRENGTH OF 48Mpa.
 - IN CASE OF EMERGENCY OR SHORTFALL THE REMAINING STRANDS OF CABLE NO 4 MAY BE STRESSED

TABLE-3 SEQUENCE OF PRESTRESSING		
SL. NO.	LOADING CASES	DAY NO.
1.	Casting of Girder	0
2.	1st stage Prestressing	7
3.	2nd stage Prestressing	21
4.	Launching of Girder	24
5.	Casting of Deck slab	28
6.	Removal of Deck shuttering	56
7.	Casting of Crash barrier	56
8.	Laying of Wearing Coat and Allowing Live load	63

TABLE-1:						
CABLE NO.	STAGE OF PRESTR-ESSING	ANCHORAGE TYPE	CABLE LENGTH CONSIDERING GRIP ADDITIONAL CUTTING LENGTH IN M.	CALCULATED ELONGATION CONSIDERING GRIP LENGTH (MM)	JACKING FORCE (KN)	NUMBER OF STRANDS TO BE STRESSED
5	PS II	19 T 15	34.009	116.39	3694	19
3		19 T 15	33.937	116.71	3694	19
2	PS I	19 T 15	33.912	116.54	2333	12
1		19 T 15	33.912	116.54	2333	12
CABLE 4 is dummy cable						

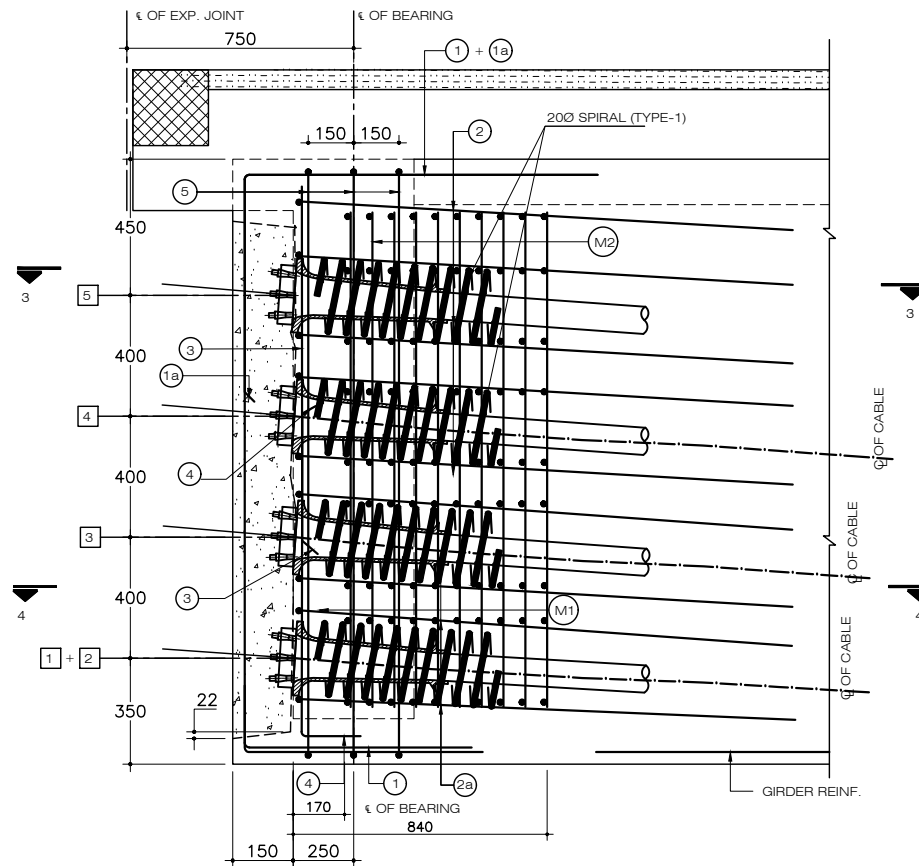
- ### 3. PRESTRESSING SYSTEM
- ALL PRESTRESSING STRANDS SHALL HAVE 7 PLY UNCOATED STRESS RELIEVED HIGH TENSILE STRANDS OF 15.2mm DIA CONFORMING TO CLASS 2 OF IS 14268-1995.
 - HDPE SHEATHING SHALL BE USED.
 - THE PARAMETERS ADOPTED FOR DESIGN ARE AS FOLLOLWS:
 - ANCHORAGE TYPE.....19 T 15
 - SLIP AT EACH END.....10mm
 - SHEATH DIA100mm.
 - SHEATH THICKNESS.....±3mm
 - CO-EFFICIENT OF FRICTION.....0.17
 - WOBBLE CO-EFFICIENT.....0.002/m
 - NOMINAL AREA OF EACH STRAND.....140 mm²
 - NOMINAL ULTIMATE BREAKING LOAD OF EACH STRAND.....260.7KN
 - MODULUS OF ELASTICITY OF HIGH TENSILE STEEL.....1.95X10⁵ MPa
 - ALL THE DESIGN PARAMETERS ADOPTED SHALL BE VERIFIED AT SITE.
 - ALL PRESTRESSING ACCESSORIES BEING PATENTED ITEMS SHALL BE OBTAINED FROM AUTHORISED MANUFACTURERS ONLY.
- ### 4. PRESTRESSING OPERATIONS
- STRESSING OPERATION SHALL BE DONE AS PER PROCEDURE GIVEN IN MORTH'S SPECIFICATIONS.
 - CABLE LENGTHS MENTIONED IN THE DRAWING ARE INCLUSIVE OF 950 MM. EXTRA AT EACH END. THE TOTAL LENGTH OF CABLE SHALL BE VERIFIED AT SITE.
 - STAGES OF PRESTRESSING SHALL BE AS IN TABLE-1&3.
 - STRESSING OF CABLES SHALL BE CARRIED OUT SIMULTANEOUSLY FROM BOTH ENDS & ALL STRANDS IN A CABLE SHALL BE TENSIONED SIMULTANEOUSLY. ONLY MULTI PULL JACKS SHALL BE USED FOR STRESSING.
 - GROUTING OF CABLES SHALL BE DONE IN SAME SEQUENCE AS STRESSING AND SHALL CONFORM TO IRC:112-2011.
 - ANCHORAGE POCKET SHALL BE FILLED WITH PREPACKED NON-SHRINK MORTAR, END FACES OF GIRDERS TO BE COATED WITH TWO COATS OF EPOXY.
 - EXTENSIONS SHALL BE RECHECKED AT 24 HOURS AFTER ANCHORING TO OBSERVE SLOW SLIPPAGE. THE MATTER SHALL BE REPORTED FOR EXCESSIVE SLIPPAGE IF ANY.
 - INITIAL SLACKNESS IN CABLES SHALL BE REMOVED BY APPLYING SMALL TENSION. THE INITIAL TENSION REQUIRED TO REMOVE SLACKNESS SHALL BE TAKEN AS THE STARTING POINT FOR MEASURING ELONGATION & CORRECTION SHALL BE APPLIED AS PER CL. 12.2.1.3 OF IS:1343- 198
 - IN CASE THE CALCULATED ELONGATION AND THE JACK PRESSURE ARE NOT ACHIEVED SIMULTANEOUSLY DURING PRESTRESSING OPERATION STRESSING SHALL BE CONTINUED/ DISCONTINUED AS PER NOTE NO. 8 GIVEN BELOW.
 - THE EXTENSIONS GIVEN IN TABLE NO.-1 SHALL BE MODIFIED AT SITE IN CASE ACTUAL VALUE OF AREA OF STRANDS 'A' & MODULUS OF ELASTICITY 'E' VARIES FROM THOSE ASSUMED IN DESIGN, REVISED EXTENSION SHALL BE CALCULATED AS UNDER
REVISED EXTENSION = $\frac{(195 \times 10^5) \times \text{ORIGINAL EXTENSION}}{(\text{NEW MODULUS}) \times \text{OLD AREA OF STRANDS NEW AREA}}$
 - EXTENSION OF CABLE SHALL BE VERIFIED FOR A FEW CABLES AT SITE. IN CASE OF VALUE OF μ AND ARE FOUND TO BE DIFFERENT THAN THOSE CONSIDERED FOR DESIGN, EXTENSION SHALL BE SUITABLY MODIFIED AFTER APPROVAL OF DESIGN OFFICE
 - THE GRIP LENGTH FROM ANCHORAGE FACE UP TO GRIPPING POINT IN JACK ASSUMED IN EXTENSION IS 750MM & THE ADDITIONAL LENGTH TAKEN FOR CUTTING IS 200MM. IF GRIP LENGTH VARIES THAN THOSE CONSIDERED, THE EXTENSIONS SHALL BE MODIFIED AS UNDER:-
NEW EXTENSIONS=EX+EX (GRIP-750)/(LENGTH)
WHERE, EX IS EXTENSION AS SPECIFIED IN RESPECTIVE DRAWING.
- ### 5. SPECIAL NOTE FOR PRESTRESSING
- IF THE CALCULATED ELONGATION IS REACHED BEFORE THE CALCULATED GAUGE PRESSURE IS OBTAINED, CONTINUE TENSIONING TILL ATTAINING, THE CALCULATED GAUGE PRESSURE PROVIDED THE ELONGATION DOES NOT EXCEED 1.05 TIMES THE CALCULATED ELONGATION.
 - IF THE CALCULATED ELONGATION HAS NOT BEEN REACHED CONTINUE TENSIONING IN INTERVALS OF 5 kg/sqcm UNTILL THE CALCULATED ELONGATION IS REACHED PROVIDED THE GAUGE PRESSURE DOES NOT EXCEED 1.05 TIMES THE CALCULATED GAUGE PRESSURE.
 - IF THE ELONGATION AT 1.05 TIMES THE CALCULATED GAUGE PRESSURE IS LESS THAN 95 TIMES THE CALCULATED ELONGATION THE FOLLOWING MEASURES MUST BE TAKEN:
 - RECALIBRATE THE PRESSURE GAUGE
 - CHECK THE CORRECT FUNCTIONING OF THE JACK PUMP & LEADS
 - DETENSION THE CABLE SLIDE IT IN ITS DUCT TO CHECK THAT IT IS NOT BLOCKED BY MORTAR WHICH HAS ENTERED THROUGH HOLES IN THE SHEATH. RETENSION THE CABLE IF FREE.
 - IF THE REQUIRED ELONGATION IS NOT OBTAINED FURTHER FINISHING OPERATION SUCH AS CUTTING OR SEALING SHOULD NOT BE UNDER TAKEN WITHOUT THE APPROVAL OF THE DESIGN OFFICE
 - THE GAUGE PRESSURE FOR PRESTRESSING SHALL BE WORKED OUT PRIOR TO ANY STRESSING OPERATION DULY TAKING IN TO ACCOUNT THE RAM AREA OF THE JACK & THE JACK EFFICIENCY. THE STRESSING EQUIPMENTS SHALL BE WELL MAINTAINED AND THE CALIBRATION CHARTS SHALL BE AVAILABLE AT SITE.AFTER APPROVAL OF CLIENT.
 - IF CABLE NUMBER 4 (DUMMY CABLE) IS NOT IN USE, IT IS GROUTED BEFORE SLAB CASTING.
 - THIS DRAWING IS APPLICABLE FOR BOTH INNER AND OUTER GIRDER.
- ### NOTES:
- DIMENSIONS ARE IN MILLIMETERS, CHANGES & LEVELS ARE IN METER,UNLESS NOTED OTHERWISE.
 - CHAINAGE & LEVEL SHALL BE VERIFIED WITH THE RELEVANT PLAN & PROFILE DRAWING VARIATION (IF ANY) SHALL BE REPORTED TO ENGINEER FOR MODIFICATION.
 - CHAINAGE OF THE STRUCTURE IS AT THE CENTER LINE OF THE PROPOSED STRUCTURE.
 - WHERE ABSOLUTELY NECESSARY THE UNTENSIONED REINFORCEMENT BARS/MESH MAY BE SUITABLY REPOSITIONED TO SUIT.

EMPLOYER		PROJECT		DESIGN CONSULTANT			Designed By	Mr.S.N.R.B NEC NO. 265 CIVIL A	 Signature	Drawing Name:	Scale:	Date: JUNE, 2023
 Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Development Cooperation Implementation Division	Strategic Road Connectivity & Trade Improvement Project (SRCTIP) Detailed Design of Upgradation of Kamala-Dhalkebar-Pathlaiya Road Section (130 KM) of Mahendra Highway and Bridges	Joint Venture of		 EPTISA Servicios De Ingeniera Madrid, Spain	 STUP Consultants Private Limited Kolkatta, India	MAIN GIRDER DETAILS OF BRIDGE OVER RIVER MARAHA				AS NOTED	Drawing No.: KDP/DPR/STR/BR/MARAHA /DD -14	
		In Association With Udaya Consultancy, Geocom International, Sundar Kriti Consultant and Rays Consultant Private Limited				Reference Drawings:	Chainage: 277+266	Sheet No.: Sheet No. 1/1				
				Checked By	Mr.S.M	 Signature	Approved By	Mr.H.B	 Signature			

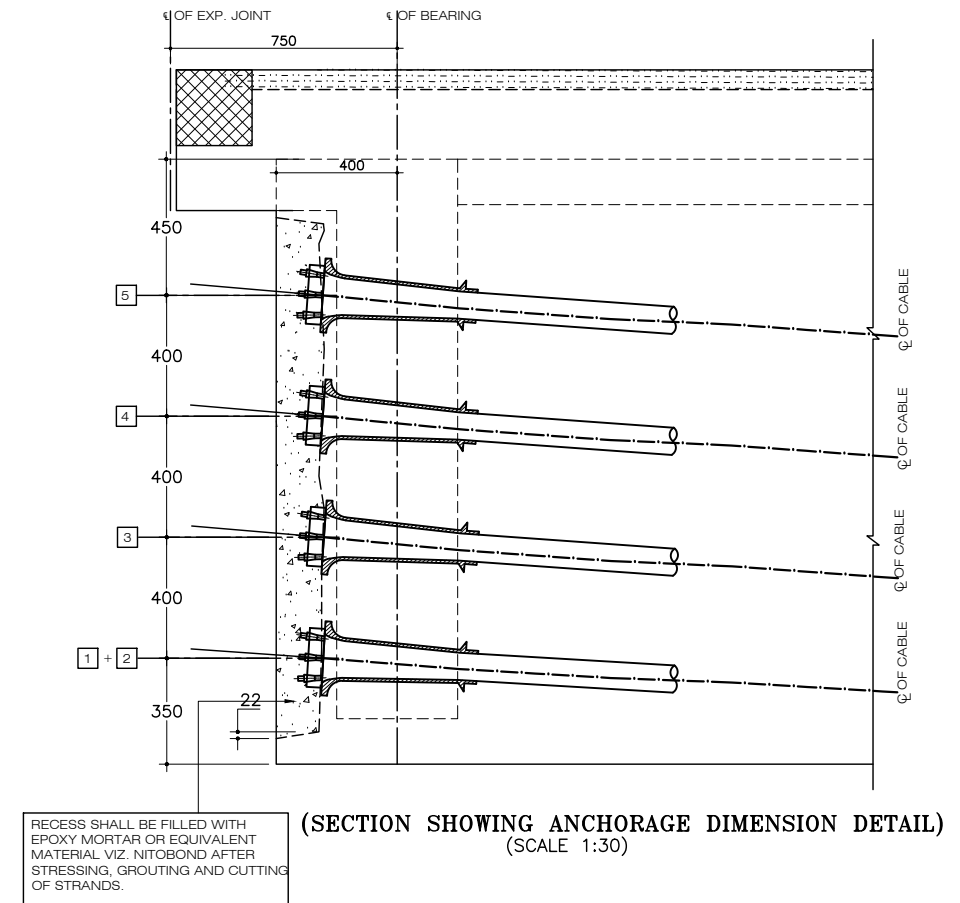


END VIEW OF BEAM

DETAILS OF 16 MESH
TYPE M1 & M2 IN 10 LAYERS
AT EQUAL SPACING
(SCALE 1:20)



(SECTION SHOWING ANCHORAGE REINF. DETAIL)
(SCALE 1:30)



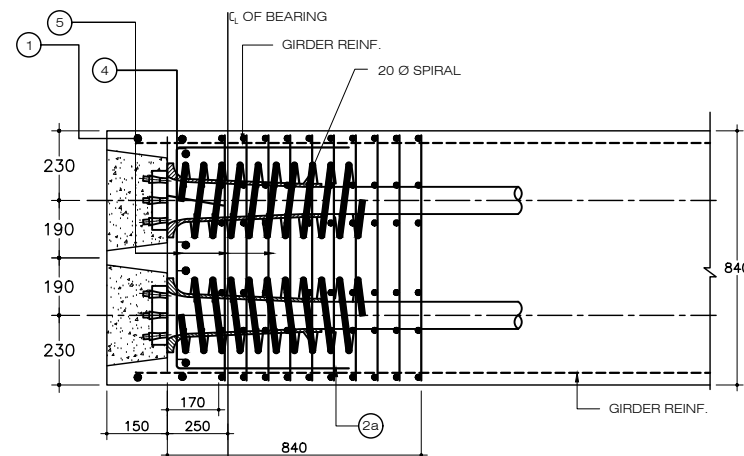
(SECTION SHOWING ANCHORAGE DIMENSION DETAIL)
(SCALE 1:30)

ANCHORAGE BLOCK
DIMENSION SHOULD BE AS PER
MANUFACTURING AGENCY

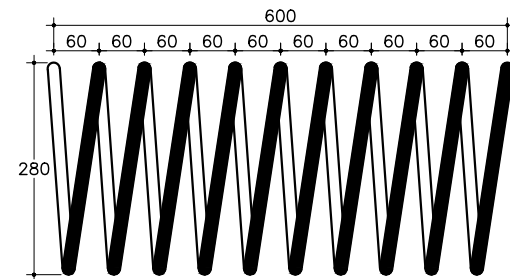
REINFORCEMENT SCHEDULE		
BAR MKD.	BAR DIA & SPACING/NOS.	BAR SHAPE
1	16 Ø 2 Nos.	700
1a	16 Ø 2 Nos.	700
2	20 Ø 4 Nos.	800
2a	20 Ø 3 Nos.	800
3	12 Ø 2 Nos.	
4	12 Ø 4 Nos.	
5	2L-20 Ø 6 NOS. STIRRUPS	

NOTES:

1. ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE SPECIFIED.
2. DIMENSIONS ARE NOT BE SCALED, ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
3. WHEREVER REINFORCEMENT IS FOUND TO BE FOULING WITH THE PRESTRESSED CABLE, ANCHORAGE , LOCAL ADJUSTMENT IN REINFORCEMENT DETAIL CAN BE DONE WITH APPROVAL OF THE ENGINEER. NO CHANGE SHALL BE PERMITTED ON PRESTRESS CABLE ALIGNMENT UNDER ANY CIRCUMSTANCE.
4. THIS DRAWING IS APPLICABLE FOR BOTH INNER & OUTER GIRDER.
5. FIRST LAYER OF MESH TYPE-A AS SHOWN ABOVE SHALL BE PLACED AS CLOSE AS POSSIBLE TO THE FACE OF ANCHORAGE.
6. LAPPING SHALL BE STAGGERED, 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 PROVIDED AS "X*D" MENTIONED IN THE TABLE BELOW, WHERE 'd' IS THE SMALLER BAR UNLESS OTHERWISE SPECIFIED.



SECTION AT 4-4
(SCALE 1:30)



*TYPICAL DETAIL OF 20Ø SPIRAL REINFORCEMENT
(To be conformed with supplier specification)
(SCALE 1:10)

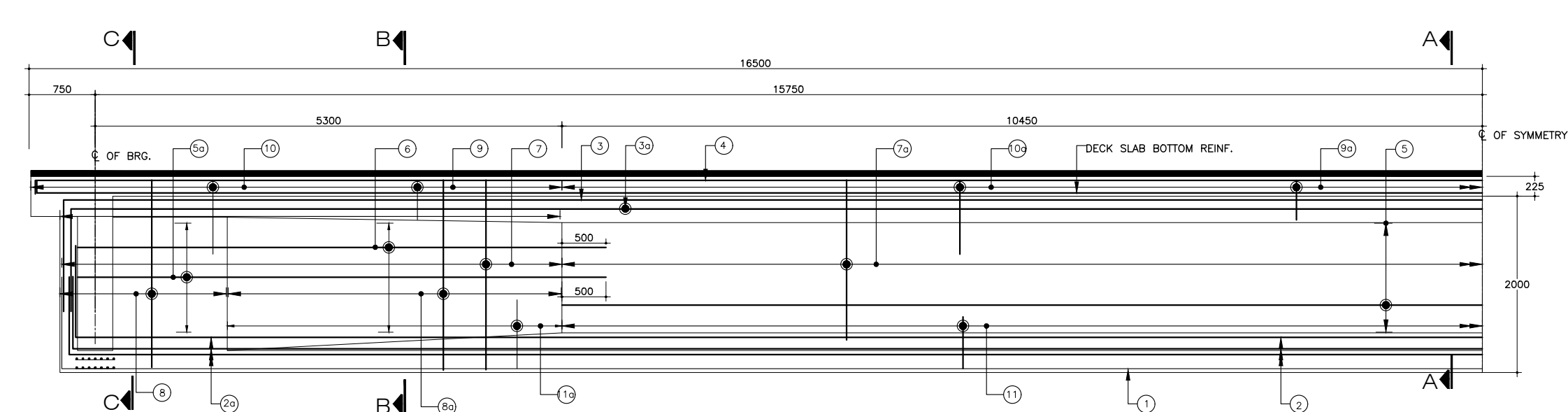
FAVORABLE BOND CONDITION					
GRADE OF CONCRETE	PERCENTAGE OF LAPPED BARS	<25%	33%	50%	>50%
M50	X	29	33	41	44
M45	X	33	38	47	50

UNFAVORABLE BOND CONDITION					
GRADE OF CONCRETE	PERCENTAGE OF LAPPED BARS	<25%	33%	50%	>50%
M50	X	42	48	59	63
M45	X	45.7	52.6	64	68.6

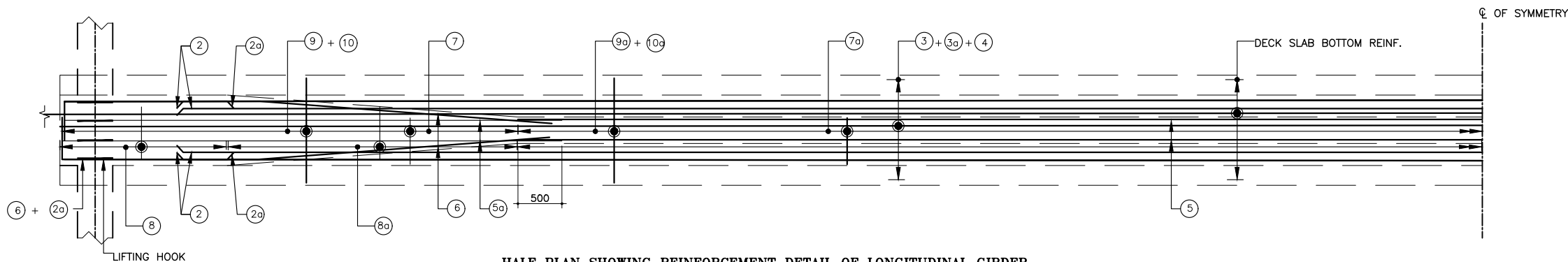
FAVORABLE ZONE:
a. RAFT/SLAB BOTTOM MAIN BAR.
UNFAVORABLE ZONE:
a. RAFT/SLAB BOTTOM MAIN BAR.
b. WALL/COLUMN MAIN BAR.

MANUFACTURER'S SPECIFICATION,

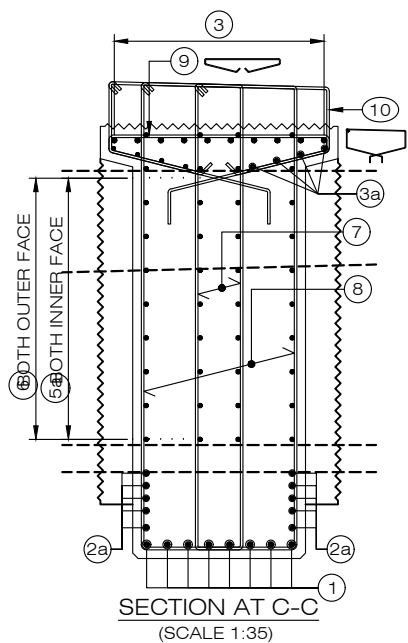
EMPLOYER	PROJECT	DESIGN CONSULTANT	Designed By	Mr.S.N.R.B	Drawing Name:	Scale:	Date:
 Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Development Cooperation Implementation Division	Strategic Road Connectivity & Trade Improvement Project (SRCTIP) Detailed Design of Upgradation of Kamala-Dhalkebar-Pathlaiya Road Section (130 KM) of Mahendra Highway and Bridges	Joint Venture of  EPTISA Servicios De Ingeniera Madrid, Spain  STUP Consultants Private Limited Kolkatta, India In Association With Udaya Consultancy, Geocom International, Sundar Kriti Consultant and Rays Consultant Private Limited	Signature	Mr.S.N.R.B	MAIN GIRDER REINFORCEMENT DETAILS OF BRIDGE OVER RIVER MARAHA Reference Drawings: KDP/DPR/STR/BR/MARAHA /DD -18	AS NOTED Chainage: 277+266	JUNE, 2023 Drawing No.: KDP/DPR/STR/BR/MARAHA /DD -15 Sheet No.: Sheet No. 1/2
			Signature	Mr.S.M			
			Signature	Mr.H.B			



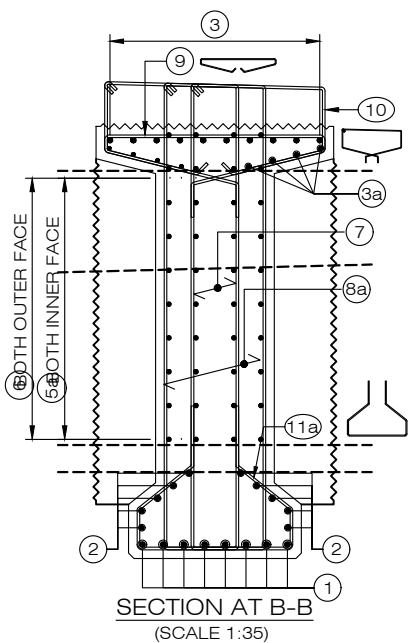
ELEVATION SHOWN REINFORCEMENT DETAIL OF LONGITUDINAL GIRDER
(SCALE 1:60)



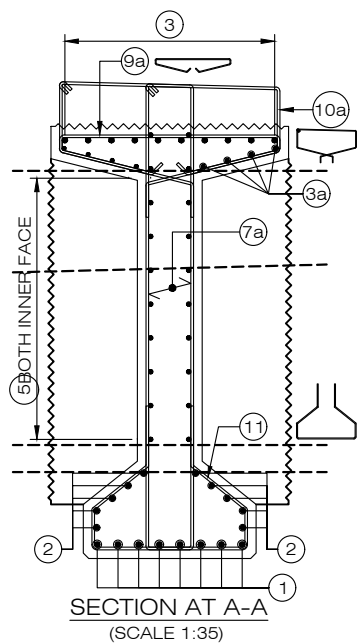
HALF PLAN SHOWING REINFORCEMENT DETAIL OF LONGITUDINAL GIRDER
(SCALE 1:60)



SECTION AT C-C
(SCALE 1:35)



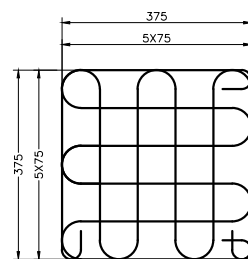
SECTION AT B-B
(SCALE 1:35)



SECTION AT A-A
(SCALE 1:35)

NOTES:

- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE MENTIONED,
- DIMENSIONS ARE NOT TO BE SCALED, ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED,
- GRADE OF CONCRETE SHALL BE AS BELOW:
a) CAST-IN-SITU DECK SLAB.....M45
b) PRECAST PSC GIRDER.....M50
c) CROSS GIRDER.....M45
- CLEAR COVER TO OUTERMOST STEEL SHALL BE AS BELOW:
a. CAST-IN-SITU SUPERSTRUCTURE).....45mm
b. PRECAST PSC GIRDER.....40mm
- REINFORCING STEEL SHALL BE HYSD (TMT) BARS (GRADE DESIGNATION Fe 500DD) CONFORMING TO TABLE 18 1 OF IRC: 112-2020,
- ⊗ SHOWN JACK LOCATION IN PLAN AND ↑ SHOWN JACK LOCATION IN ELEVATION OTHERWISE MENTIONED,
- CURING OF THE GIRDERS SHALL BE CARRIED OUT IN ACCORDANCE WITH THE MORTH SPECIFICATIONS,
- GIRDERS SHALL BE SECURELY SUPPORTED AT ALL TIMES BY BRACING TO PREVENT BEAMS TOPPLING OVER,
- EACH GIRDER SHALL BE INDEPENDENTLY BRACED AGAINST OVERTURNING PRIOR TO RELEASE BY THE CRANE OR LIFTING DEVICE,
- LIFTING LOOPS SHALL BE PLACED WITH THE PLANE OF THE LOOP PERPENDICULAR TO THE LONGITUDINAL AXIS OF THE GIRDER,
- SHIFTING THE PSC GIRDERS TO SITE SHALL BE AS PER 1811 OF MORT & H REV-V,SECTION
- RECESS FOR EXPANSION JOINT SHALL BE LEFT AS PER MANUFACTURER'S SPECIFICATION,



Ø8 MESH REINF. AT BRG. LOCATIONS
SCALE 1:15

REINFORCEMENT DETAILS		
BAR MKD.	BAR DIA & SPACING/NOS	BAR SHAPE
1	16 Ø 10 Nos.	
2	16 Ø 6 Nos. Each Side	
2a	16 Ø 6 Nos. Each Side	
3	16 Ø 14 Nos.	
3a	16 Ø 12 Nos.	
4	DECK REINFORCEMENT	
5	12 Ø 12 Nos. Each side	
5a	12 Ø 12 Nos. Each Side	
6	12 Ø 12 Nos. Each side	
7	2L-12 Ø @150c/c STIRRUP	
7a	2L-12 Ø @200c/c STIRRUP	
8	2L-12 Ø @150c/c STIRRUP	
8a	2L-12 Ø @150c/c STIRRUP	
9	12 Ø @ 150c/c	
9a	12 Ø @ 200/c	
10	12 Ø @ 150c/c	
10a	12 Ø @ 200c/c	
11	12 Ø @ 150c/c	
11a	12 Ø @ 150c/c	

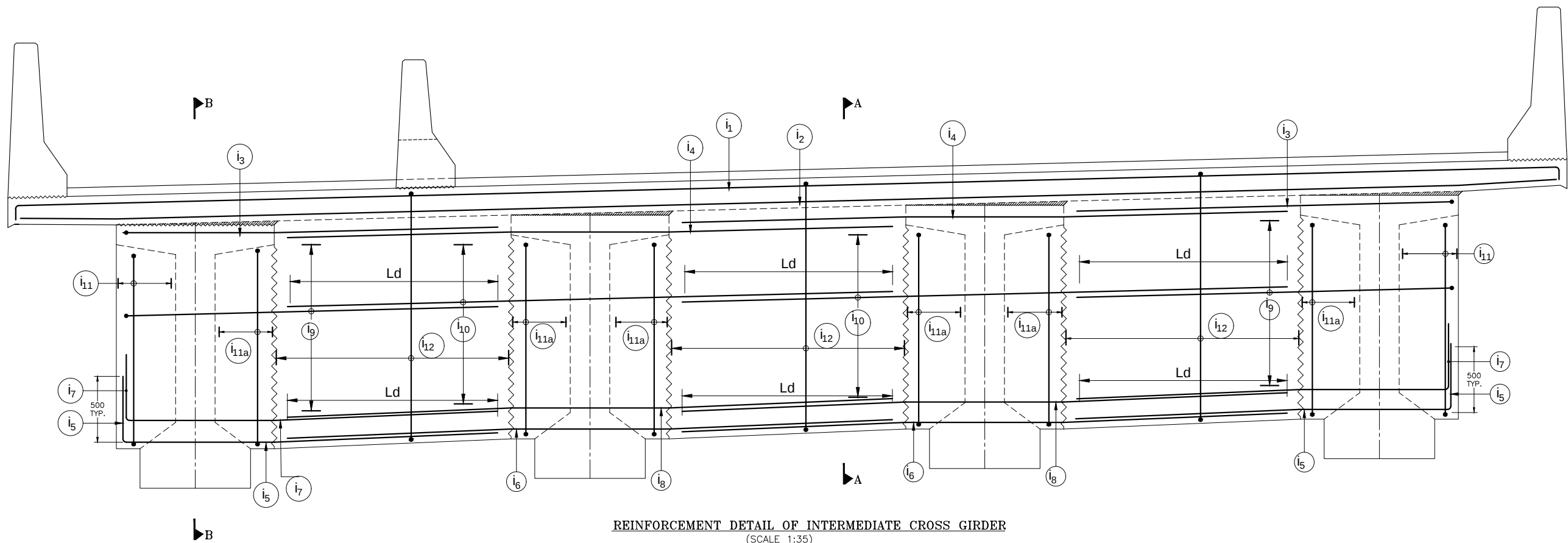
13. LAPPING SHALL BE STAGGERED, BARS SHALL BE LAPPED IN SUCH A WAY THAT NOT MORE THAN 50% OF THE BARS ARE LAPPED AT ANY SECTION, LAP LENGTH SHALL BE PROVIDED AS "X*d" MENTIONED IN THE TABLE BELOW, WHERE 'd' IS THE SMALLER BAR UNLESS OTHERWISE SPECIFIED.

FAVORABLE BOND CONDITION					
GRADE OF CONCRETE	PERCENTAGE OF LAPPED BARS	<25%	33%	50%	>50%
M50	X	29	33	41	44

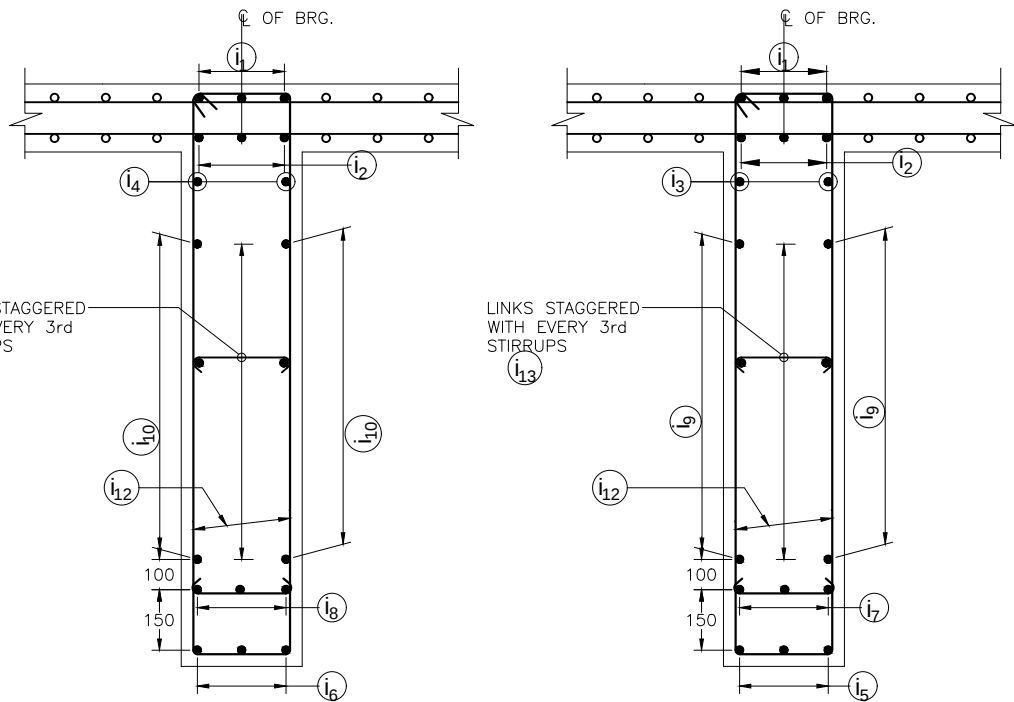
UNFAVORABLE BOND CONDITION					
GRADE OF CONCRETE	PERCENTAGE OF LAPPED BARS	<25%	33%	50%	>50%
M50	X	42	48	59	63

- FAVORABLE ZONE:
a. RAFT/SLAB BOTTOM MAIN BAR.
- UNFAVORABLE ZONE:
a. RAFT/SLAB BOTTOM MAIN BAR.
b. WALL/COLUMN MAIN BAR.

EMPLOYER	PROJECT	DESIGN CONSULTANT	Designed By	Mr.S.N.R.B	Drawing Name:	Scale:	Date:
 Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Development Cooperation Implementation Division	Strategic Road Connectivity & Trade Improvement Project (SRCTIP) Detailed Design of Upgradation of Kamala-Dhalkebar-Pathlaiya Road Section (130 KM) of Mahendra Highway and Bridges	Joint Venture of  EPTISA Servicios De Ingeniera Madrid, Spain  STUP Consultants Private Limited Kolkatta, India In Association With Udaya Consultancy, Geocom International, Sundar Kriti Consultant and Rays Consultant Private Limited	Signature	Signature	MAIN GIRDER REINFORCEMENT DETAILS OF BRIDGE OVER RIVER MARAHA Reference Drawings: KDP/DPR/STR/BR/MARAHA /DD -18	AS NOTED Chainage: 277+266	JUNE, 2023 Drawing No.: KDP/DPR/STR/BR/MARAHA /DD -15 Sheet No.: Sheet No. 2/2
			Checked By	Mr.S.M			
			Approved By	Mr.H.B			



REINFORCEMENT DETAIL OF INTERMEDIATE CROSS GIRDER
(SCALE 1:35)



SECTION A-A
(SCALE 1:25)

SECTION B-B
(SCALE 1:25)

SCHEDULE OF REINFORCEMENT
(INTERMEDIATE CROSS GIRDERS TYP. EACH)

BAR MKD.	DESCRIPTION	SHAPE
i1	16 Φ 3 nos	
i2	16 Φ 3 nos	
i3	12 Φ 3x2 Nos	
i4	12 Φ 3x2 Nos	
i5	20 Φ 3 Nos	
i6	20 Φ 3 Nos	
i7	20 Φ 3 Nos	
i8	20 Φ 3 Nos	
i9	12 Φ 6x2 Nos	
i10	12 Φ 6x2 Nos	
i11	2L-20 Φ @ 150c/c	
i11a	2L-20 Φ @ 150c/c	
i12	2L-16 Φ @ 150c/c	
i13	12 Φ Linked Every 3rd Layer	

NOTES:-

- ALL DIMENSIONS ARE IN mm AND LEVELS ARE IN METER, DIMENSIONS ARE NOT TO BE SCALED, ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
- CONCRETE GRADE FOR CROSS-GIRDER & DECK SLAB M45.
- SUITABLE HOLES SHALL BE LEFT IN PRECAST GIRDER FOR SUPPORTING THE DECK SLAB SHUTTERING.
- SUITABLE PROVISION FOR HANDLING & LIFTING HOOKS ETC TO BE PROVIDED.
- BEAMS SHALL BE KEPT UPRIGHT AT ALL TIMES AND TO BE CLEARLY MARKED INDICATING SPAN LOCATION & RESPECTIVE ENDS BEFORE REMOVAL FROM CASTING BED.
- TOP SURFACE OF PRECAST BEAM & VERTICAL EDGES OF END TO BE LEFT ROUGHENED FOR EFFECTIVE BONDING.
- ALL SURFACES, COMING IN CONTACT WITH DECK SLAB/DIAPHRAGM SHALL BE ADEQUATELY PREPARED BY GREEN CUTTING. USING SURFACE RETARDERS OR BY MECHANICAL MEANS(SUCH AS 100% HACKING) TO ENSURE THAT COARSE AGGREGATES ARE JUST EXPOSED.
- ALL REINFORCING BARS SHALL BE THERMO MECHANICALLY TREATED (TMT) BARS (GRADE DESIGNATE Fe500D) CONFORMING TO IS-1786 STANDARDS.
- LAPPING SHALL BE STAGGERED, 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 PROVIDED AS "x*d" MENTIONED IN THE TABLE BELOW, WHERE 'd' IS THE SMALLER BAR UNLESS OTHERWISE SPECIFIED.

FAVORABLE BOND CONDITION					
GRADE OF CONCRETE	PERCENTAGE OF LAPPED BARS	<25%	33%	50%	>50%
M45	X	33	38	47	50

UNFAVORABLE BOND CONDITION					
GRADE OF CONCRETE	PERCENTAGE OF LAPPED BARS	<25%	33%	50%	>50%
M45	X	45.7	52.6	64	68.6

- FAVORABLE ZONE:
a. RAFT/SLAB BOTTOM MAIN BAR.
- UNFAVORABLE ZONE:
a. RAFT/SLAB BOTTOM MAIN BAR.
b. WALL/COLUMN MAIN BAR.

EMPLOYER	PROJECT	DESIGN CONSULTANT	Designed By	Drawing Name:	Scale:	Date:
 Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Development Cooperation Implementation Division	Strategic Road Connectivity & Trade Improvement Project (SRCTIP) Detailed Design of Upgradation of Kamala-Dhalkebar-Pathlaiya Road Section (130 KM) of Mahendra Highway and Bridges	Joint Venture of EPTISA Servicios De Ingeniera Madrid, Spain STUP Consultants Private Limited Kolkatta, India In Association With Udaya Consultancy, Geocom International, Sundar Kriti Consultant and Rays Consultant Private Limited	Mr.S.N.R.B Signature	CROSS GIRDER REINFORCEMENT DETAILS OF BRIDGE OVER RIVER MARAHA	AS NOTED	JUNE, 2023
			Checked By Mr.S.M Signature	Reference Drawings: KDP/DPR/STR/BR/MARAHA /DD -18	Chainage: 277+266	Drawing No.: KDP/DPR/STR/BR/MARAHA /DD -16
			Approved By Mr.H.B Signature			Sheet No.: Sheet No. 2/2



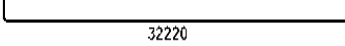
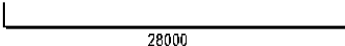
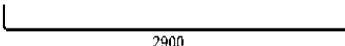
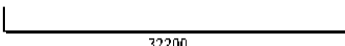
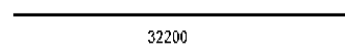
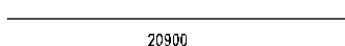
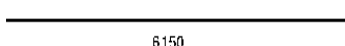
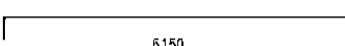
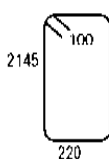
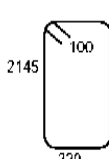
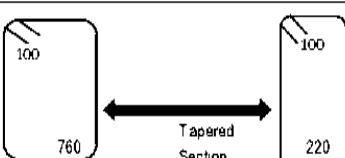
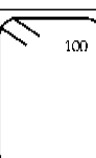
SCALE - 1 : 100



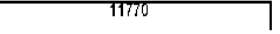
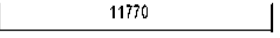
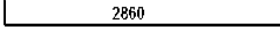
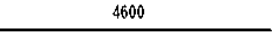
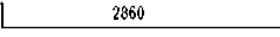
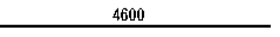
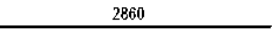
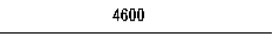
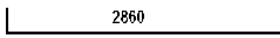
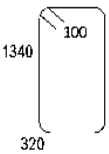
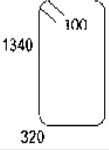
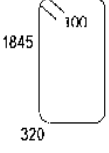
SCALE - 1 : 50

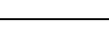
EMPLOYER	PROJECT	DESIGN CONSULTANT				Drawing Name:	Scale:	Date:	
 Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Development Cooperation Implementation Division	Strategic Road Connectivity & Trade Improvement Project (SRCTIP) Detailed Design of Upgradation of Kamala-Dhalkebar-Pathlaiya Road Section (130 KM) of Mahendra Highway and Bridges	Joint Venture of			Designed By	Mr.S.N.R.B. 	DECK SLAB DETAILS OF BRIDGE OVER RIVER MARAHA	AS NOTED	JUNE, 2023
		 EPTISA Servicios De Ingeniera Madrid, Spain	 STUP Consultants Private Limited Kolkatta, India	Checked By	Mr.S.M 	Signature			
		In Association With Udaya Consultancy, Geocom International, Sundar Kriti Consultant and Rays Consultant Private Limited			Approved By	Mr.H.B 	Signature	Reference Drawings: KDP/DPR/STR/BR/MARAHA /DD -18	Chainage: 277+266

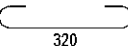
Bar bending schedule for Deck Slab										
S.N	Bar Label	Bar Shape		Bar Dia (mm)	Bar spacing (mm)	No. of bars	Length (m)	Total Length(m)	Unit Weight (kg/m)	Weight (kg)
1	DS01	150		150	16	150	12.07	2619.19	1.578	4133.96
2	DS02	150		150	12	150	32.445	2563.155	0.89	2275.61
3	DS03	150		150	16	150	12.07	2619.19	1.578	4133.96
4	DS04	150		150	12	150	32.45	2563.155	0.888	2275.61
5	DS05	150		150	16		12	389.34	1.578	614.51
6	DS06	175			10	300	1.3	280.8	0.617	173.12
Total Weight of Deck Slab (kg)										13606.77

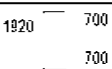
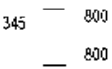
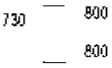
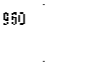
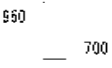
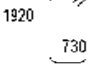
Bar bending schedule for Longitudinal Girder											
S.N	Bar Label	Bar Shape			Bar Dia (mm)	Bar spacing	No. of bars	Length	Total Length(m)	Unit Weight (kg/m)	Weight (kg)
1	1	100		100	16		10	32.42	324.2	1.578	511.70
2	2	100		100	16		12	28.20	338.4	1.578	534.11
3	2a	100		100	16		24	3.10	74.4	1.578	117.43
4	3	100		100	16		14	32.40	453.6	1.578	715.93
5	3a				16		12	32.20	386.4	1.578	609.87
6	5				12		24	20.90	501.6	0.888	445.33
7	5a				12		48	6.15	295.2	0.888	262.08
8	6	100			12		48	6.25	300	0.888	266.34
9	7a				12	200	105	4.93	517.65	0.888	459.58
10	7				12	150	78	4.93	384.54	0.888	341.40
11	8a	2145			12	150	46	Average 5.47	251.62	0.888	223.39
12	8				12	150	34	6.01	204.34	0.888	181.42

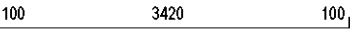
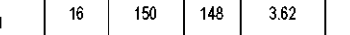
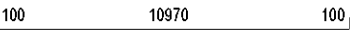
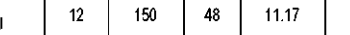
Bar bending schedule for Longitudinal Girder										
S.N	Bar Label	Bar Shape		Bar Dia (mm)	Bar spacing	No. of bars	Length	Total Length(m)	Unit Weight (kg/m)	Weight (kg)
13	9&9a	110		12	150	216	2.68	578.9178918	0.89	513.97
14	10	335		12	150	72	3.33	239.7726306	0.89	212.87
15	10a	335		12	200	109	3.33	362.9891213	0.89	322.27
16	11&11a	150		12	150	184	2.14	393.76	0.89	349.59
Total Weight for One Longitudinal Beam (kg)										6067.3
Total Weight for Four webs (kg) = 6067.2 X 4=										24269.1

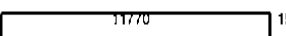
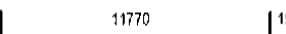
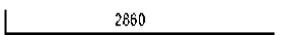
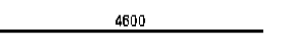
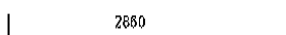
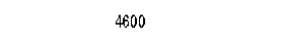
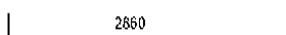
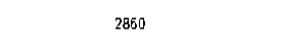
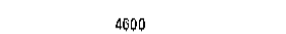
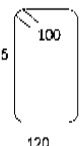
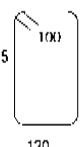
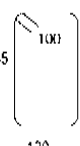
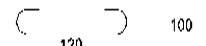
Bar bending schedule for Cross Girder at support										
S.N	Bar Label	Bar Shape		Bar Dia (mm)	Bar spacing	No. of bars	Length	Total Length(m)	Unit Weight (kg/m)	Weight (kg)
1	e1	150		20		4	12.07	48.28	2.466	119.07
2	e2	150		20		4	12.07	48.28	2.466	119.07
3	e3	150		20		16	3.01	48.16	2.466	118.77
4	e4			20		16	4.6	73.6	2.466	181.51
5	e5	500		20		8	3.36	26.88	2.466	66.29
6	e6			20		8	4.6	36.8	2.466	90.75
7	e7	500		20		8	3.36	26.88	2.466	66.29
8	e8			20		8	4.6	36.8	2.466	90.75
9	e9	150		16		24	3.01	72.24	1.578	114.02
10	e10			16		24	4.6	110.4	1.578	174.25
11	e11			20	150	4	3.52	14.08	2.466	34.72
12	e11a			20	150	12	3.52	42.24	2.466	104.17
13	e12			20	150	39	4.53	176.67	2.466	435.69

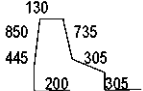
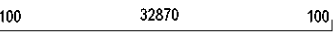
EMPLOYER		PROJECT		DESIGN CONSULTANT			Designed By	Mr.S.N.R.B NEC. NO. 265 CIVIL A	 Signature	Drawing Name:	Scale:	Date: JUNE, 2023
 Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Development Cooperation Implementation Division	Strategic Road Connectivity & Trade Improvement Project (SRCTIP) Detailed Design of Upgradation of Kamala-Dhalkebar-Pathlaiya Road Section (130 KM) of Mahendra Highway and Bridges	Joint Venture of			Checked By	Mr.S.M						
		 EPTISA Servicios De Ingeniera Madrid, Spain	 STUP Consultants Private Limited Kolkatta, India	Approved By			Mr.H.B	 Signature	277+266	Sheet No.: Sheet No. 1/2		
		In Association With Udaya Consultancy, Geocom International, Sundar Kriti Consultant and Rays Consultant Private Limited										

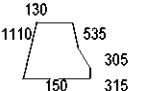
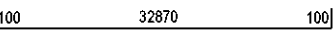
Bar bending schedule for Cross Girder at support										
S.N	Bar Label	Bar Shape	Bar Dia (mm)	Bar spacing	No. of bars	Length	Total Length(m)	Unit Weight (kg/m)	Weight (kg)	
14	e13	100  100 320	12	300	15	0.52	7.8	0.888	6.92	
15	Mesh-M1		8		4	2.17	8.7	0.4	13.7	
1	Mesh-M2		8		4	5.24	21.0	0.4	33.1	
Total Weight for 1 Cross Girder (kg)									1769.09	
Total Weight for 2 Cross Girder (kg)									3538.18	

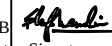
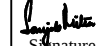
Bar bending schedule for Webs										
S.N	Bar Label	Bar Shape	Bar Dia (mm)	No. of bars	Length(m)	Total Length(m)	Unit Weight (kg/m)	Weight (kg)		
1	M1	MESH TYPE M1	16	20	13.710	274.2	1.58	432.78		
2	M2	MESH TYPE M2	16	20	7.037	140.74	1.58	222.14		
3	SPIRAL	SPIRAL REINFORCEMENT {14 TURNS EACH}	16	8	7	56	1.58	88.39		
4	1	1920  700 700	16	4	3.32	13.28	1.58	20.96		
5	1a	960  700	16	4	1.66	6.64	1.58	10.48		
6	2	345  800 800	20	8	1.945	15.56	2.47	38.37		
7	2a	730  800 800	20	6	2.33	13.98	2.47	34.48		
8	3	960 	12	8	0.95	7.68	0.88	6.82		
9	4	960  700	12	16	1.66	26.56	0.88	23.58		
10	5	1920  730 730	20	12	5.5	66	2.47	162.77		
Sub-Total									1,040.76	
Total Weight for Four webs (kg) = 1040.7 X 4=									4163.03	

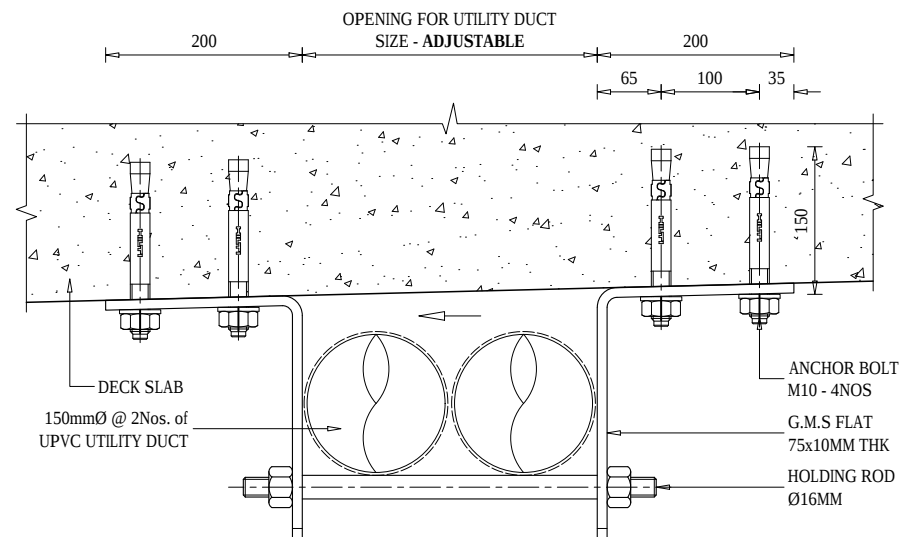
Bar bending schedule for Approach Slab										
S.N	Bar Label	Bar Shape	Bar Dia (mm)	Bar spacing	No. of bars	Length	Total length	Unit Weight (kg/m)	Weight (kg)	
1	1601	100  3420  100	16	150	148	3.62	535.76	1.578	845.61	
2	1201	100  10970  100	12	150	48	11.17	536.16	0.888	476.01	
Total Weight for one approach Slab (Kg)									1,321.62	
Total Weight for one Span of bridge (Kg)									2,643.24	

Bar bending schedule for Cross Girder at Mid										
S.N	Bar Label	Bar Shape	Bar Dia (mm)	Bar spacing	No. of bars	Length	Total Length(m)	Unit Weight (kg/m)	Weight (kg)	
1	i1	150  150	16		3	12.07	36.21	1.578	57.15	
2	i2	150  150	16		3	12.07	36.21	1.578	57.15	
3	i3	150  2860	12		12	3.01	36.12	0.888	32.07	
4	i4	 4600	12		12	4.6	55.2	0.888	49.01	
5	i5	500  2860	20		6	3.36	20.16	2.466	49.72	
6	i6	 4600	20		6	4.6	27.6	2.466	68.07	
7	i7	500  2860	20		6	3.36	20.16	2.466	49.72	
8	i8	 4600	20		6	4.6	27.6	2.466	68.07	
9	i9	 2860	12		24	2.86	68.64	0.888	60.94	
10	i10	 4600	12		24	4.6	110.4	0.888	98.01	
11	i11	1295  100 120	20	150	4	3.03	12.12	2.466	29.89	
12	i11a	1295  100 120	20	150	12	3.03	36.36	2.466	89.67	
13	i12	1845  100 120	16	150	39	4.13	181.07	1.578	284.22	
14	i13	100  100 120	12	300	15.00	0.32	4.8	0.888	4.26	
Total Weight for 1 Cross Girder (kg)									967.94	

BAR BENDING SCHEDULE OF R.C.C BARRIER										
S.N	Bar Label	Bar Shape	Bar Dia (mm)	Bar spacing	No. of bars	Length	Total length	Unit Weight (kg/m)	Weight (kg)	
1	RC-A1	130  735 445 305 200 305	16	150	220	3.17	697.4	1.58	1100.73	
2	RC-A2	100  32870  100	10	150	20	33.07	661.4	0.62	407.78	
Total Weight (Kg)									1,508.51	

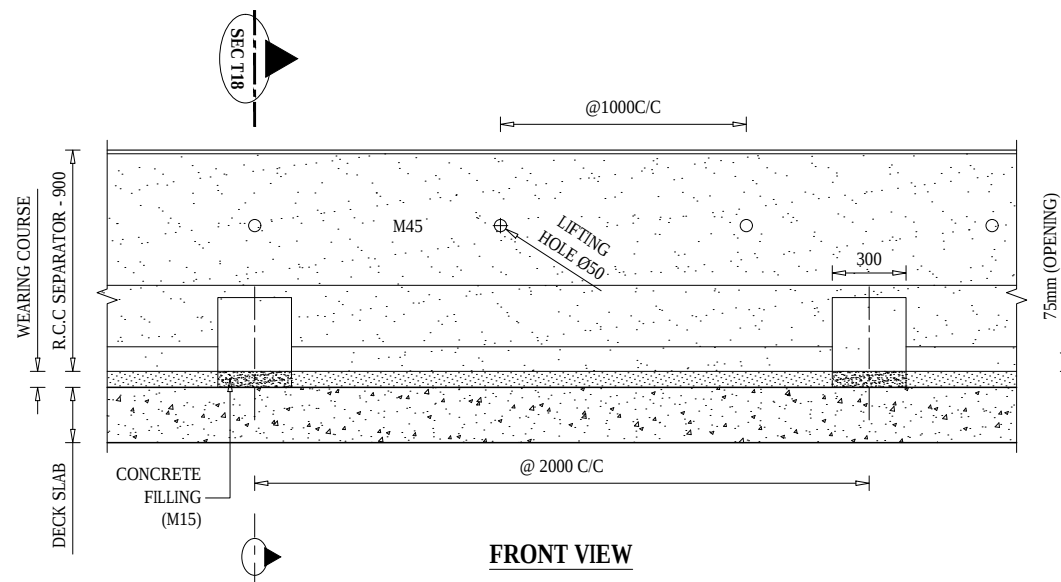
BAR BENDING SCHEDULE OF R.C.C SEPARATOR										
S.N	Bar Label	Bar Shape	Bar Dia (mm)	Bar spacing	No. of bars	Length	Total length	Unit Weight (kg/m)	Weight (kg)	
1	RS1	130  535 1110 305 150 315	16	150	220	2.695	592.9	1.58	935.80	
2	RS2	100  32870  100	10	150	17	33.07	562.19	0.62	346.61	
Total Weight (Kg)									1,282.41	

EMPLOYER	PROJECT	DESIGN CONSULTANT			Designed By Mr.S.N.R.B NEC NO. 265 CIVIL A  Signature	Drawing Name:	Scale:	Date: JUNE, 2023	
 Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Development Cooperation Implementation Division	Strategic Road Connectivity & Trade Improvement Project (SRCTIP) Detailed Design of Upgradation of Kamala-Dhalkebar-Pathlaiya Road Section (130 KM) of Mahendra Highway and Bridges	Joint Venture of				Checked By Mr.S.M  Signature	SUPERSTRUCTURE BAR BENDING SCHEDULE OF BRIDGE OVER RIVER MARAHA	AS NOTED	Drawing No.: KDP/DPR/STR/BR/MARAH/DD -18
		 EPTISA Servicios De Ingeniera Madrid, Spain	 STUP Consultants Private Limited Kolkatta, India						
		In Association With Udaya Consultancy, Geocom International, Sundar Kriti Consultant and Rays Consultant Private Limited				Approved By Mr.H.B  Signature	Reference Drawings:	Chainage: 277+266	Sheet No.: Sheet No. 2/2



SECTIONAL ELEVATION VIEW AT SEC T17

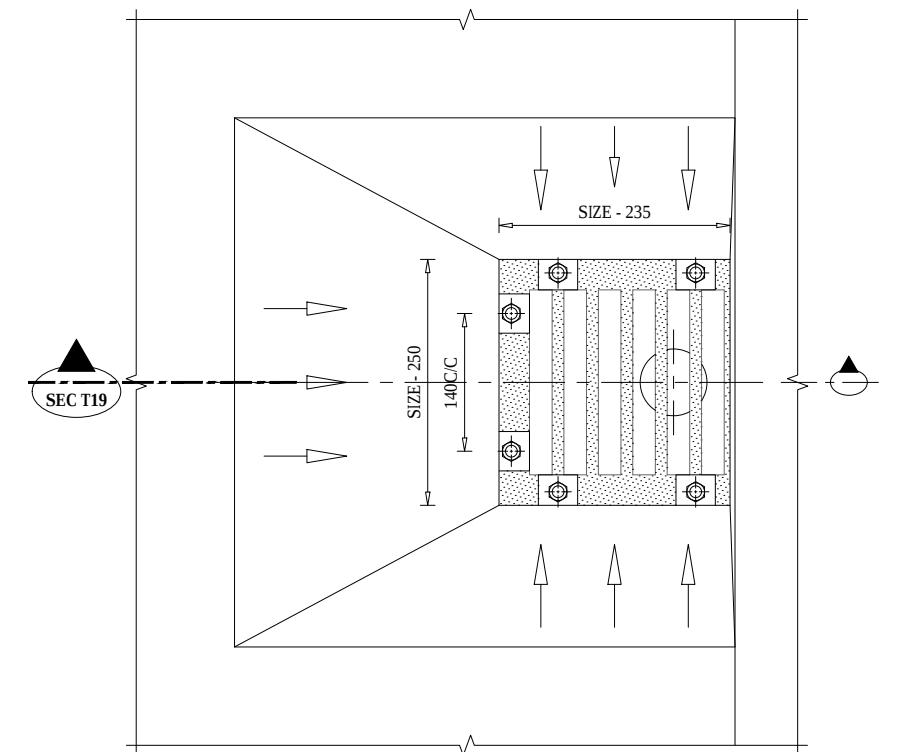
SCALE - 1 : 10



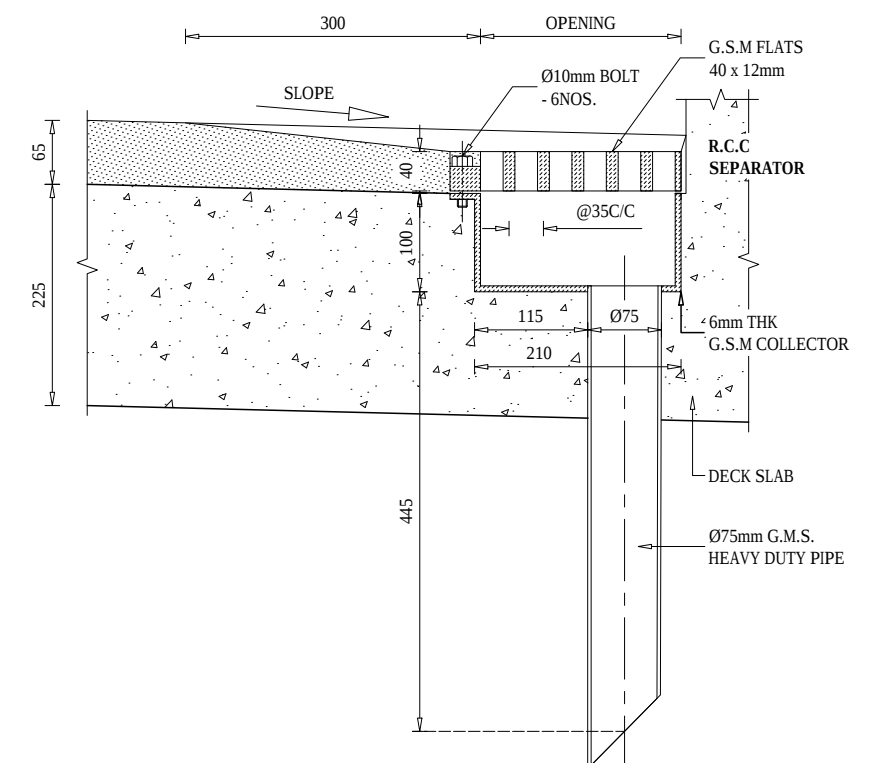
SECTIONAL ELEVATION VIEW AT SEC T18

DETAIL ELEVATION VIEW AT R.C.C SEPARATOR
& IT'S DRAIN OPENING

SCALE - 1 : 40



PLAN VIEW

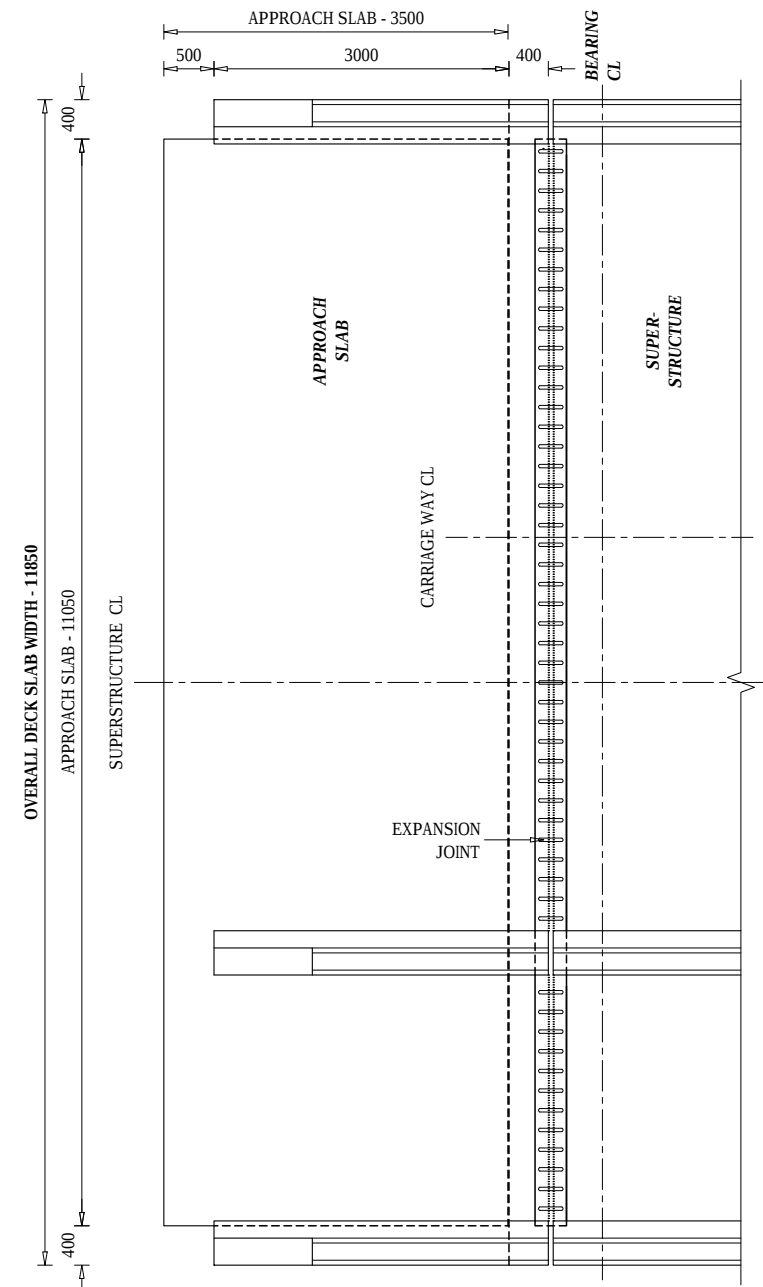


SECTIONAL ELEVATION VIEW AT SEC T19

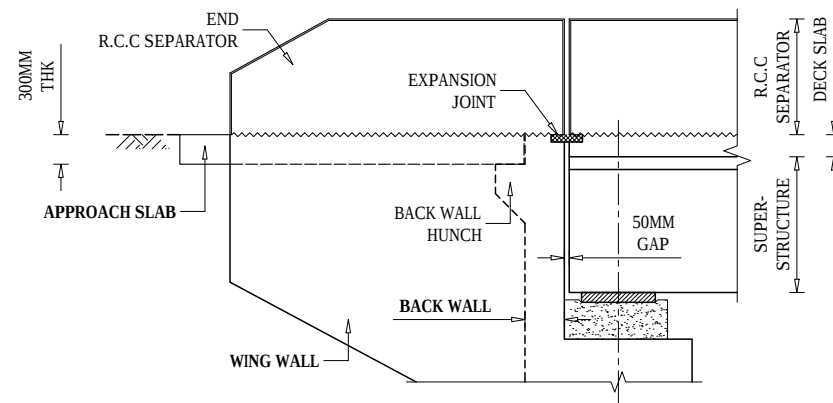
DETAILS OF GALVANIZED MILD STEEL (G.M.S)
DRAINAGE SPOUT

SCALE - 1 : 10

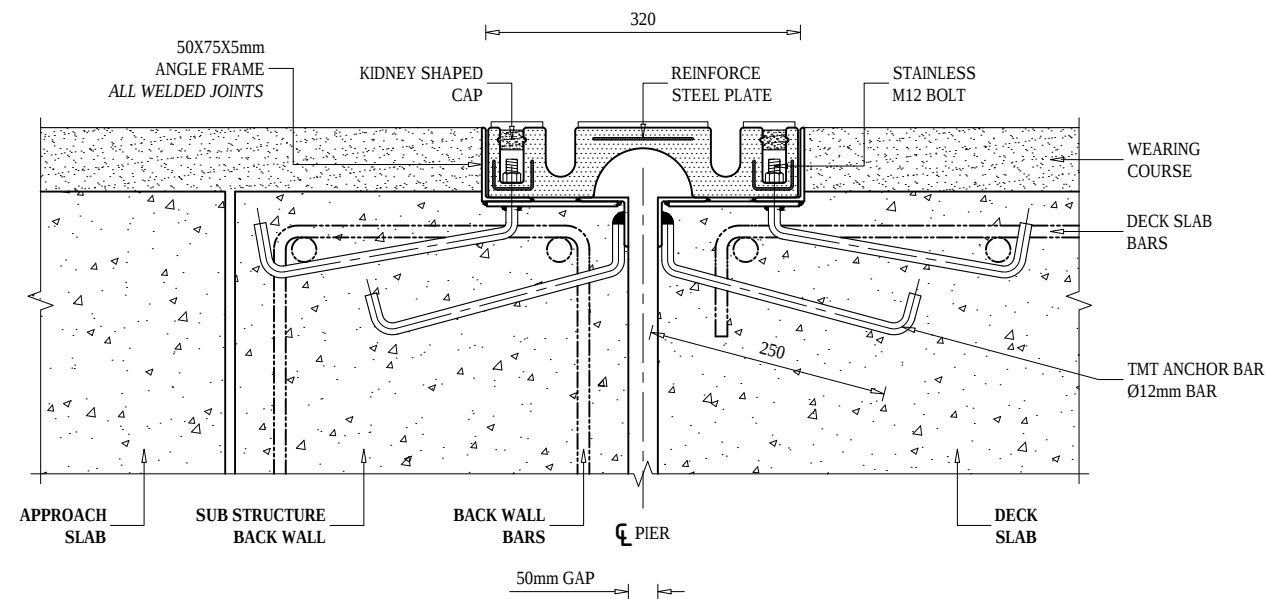
EMPLOYER	PROJECT NAME	DESIGN CONSULTANTS			Drawing Name	Scale:	Date:
 Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Development Cooperation Implementation Division	Strategic Road Connectivity & Trade Improvement Project (SRCTIP) Detailed Design of Upgradation of Kamala-Dhalkebar-Pathlaiya Road Section (130 KM) of Mahendra Highway and Bridges	Joint Venture of	Designed By	Mr. S.N.R.B. Nec.No. 265 Civil "A" 	MISCELLANEOUS DETAILS OF BRIDGE OVER RIVER MARAHA	AS SHOWN	APRIL 2023
		 EPTISA Servicios De Ingenieria Madrid, Spain  STUP Consultants Private Limited Kolkatta, India	Checked By	Mr. S.M. 			Drawing No.- KDP/DPR/STR/BR/MARAHA /DD-16
		In Association With Udaya Consultancy, Geocom International, Sundar Kriti Consultant and Rays Consultant Private Limited	Approved By	Mr. H.B. 	Reference Drawings	Chainage: 277+266	Sheet No. 1 / 2



PLAN VIEW AT EXPANSION JOINT, END R.C.C SEPARATOR & APPROACH SLAB

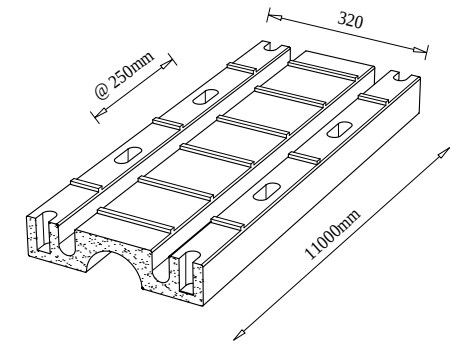


ELEVATION VIEW



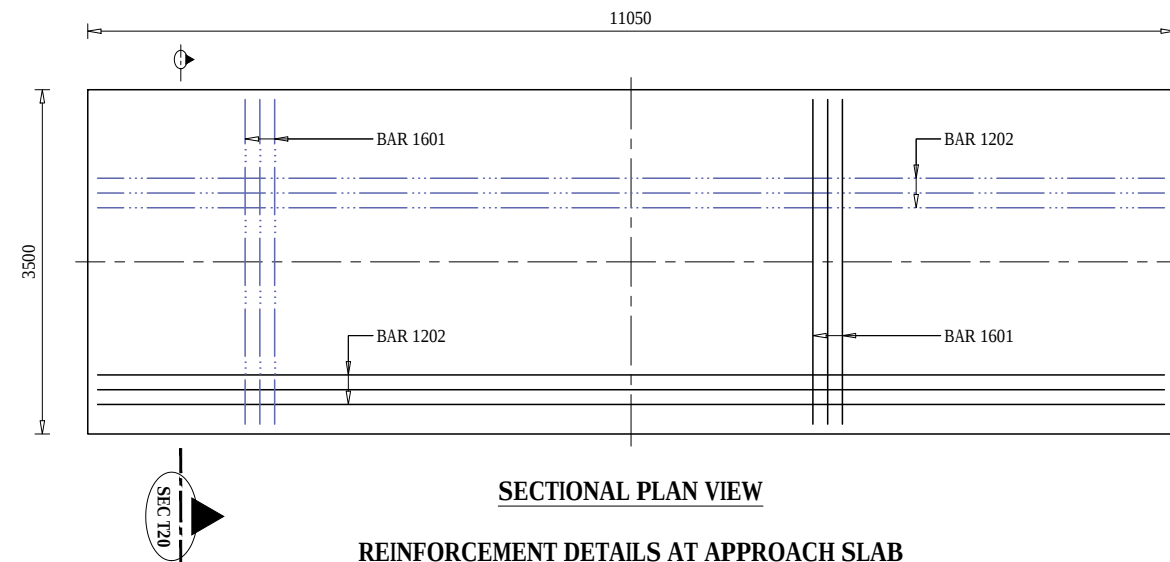
SLAB SEAL TYPE EXPANSION JOINTS ARRANGEMENT IN A CARRIAGEWAY

SCALE - 1 : 10 @ A3 PAPER



EXPANSION JOINT ISOMETRIC VIEW

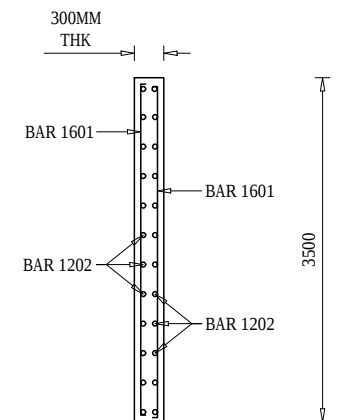
- SEAL TYPE
SCALE - NON



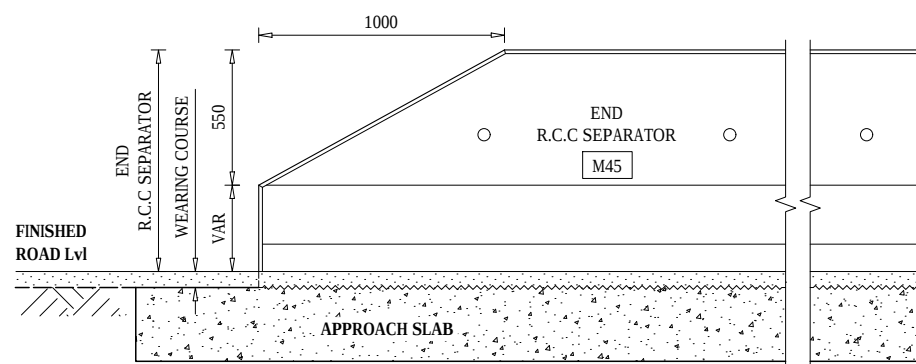
SECTIONAL PLAN VIEW

REINFORCEMENT DETAILS AT APPROACH SLAB

SCALE - 1 : 100 @ A3 PAPER

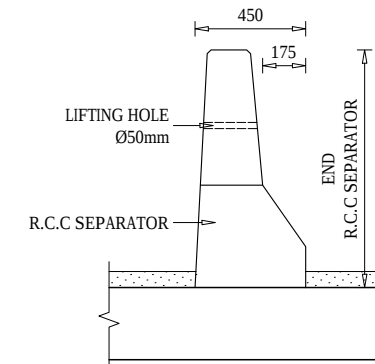


SECTIONAL ELEVATION VIEW AT SEC T20



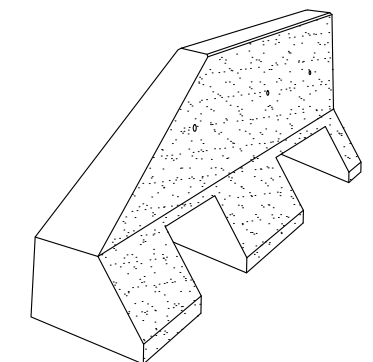
ELEVATION VIEW OF END R.C.C SEPARATOR

SCALE - 1 : 40 @ A3 PAPER



SIDE VIEW

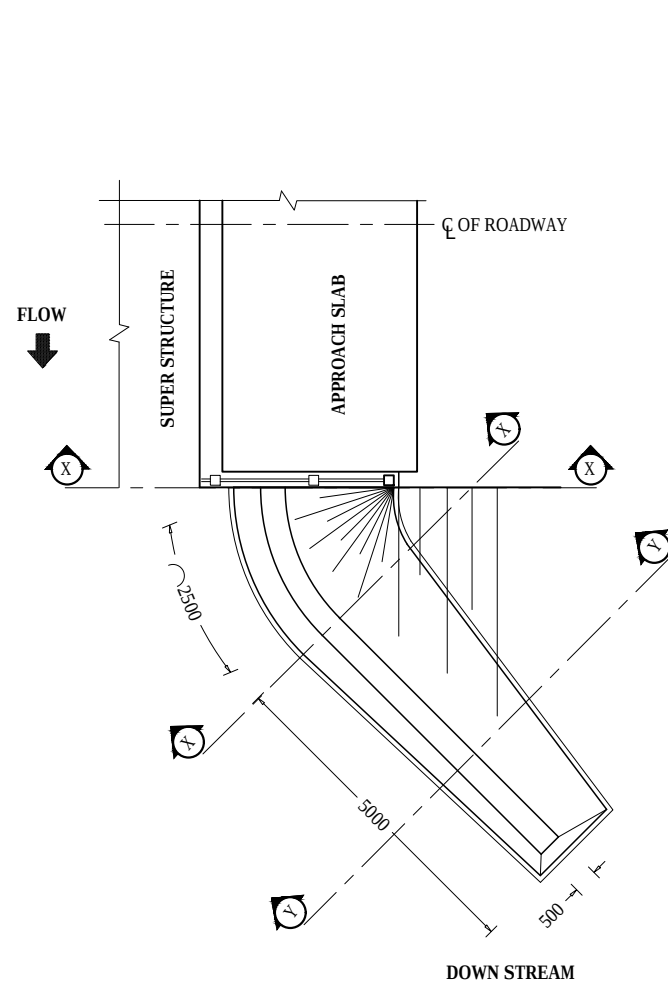
SCALE - 1 : 40 @ A3 PAPER



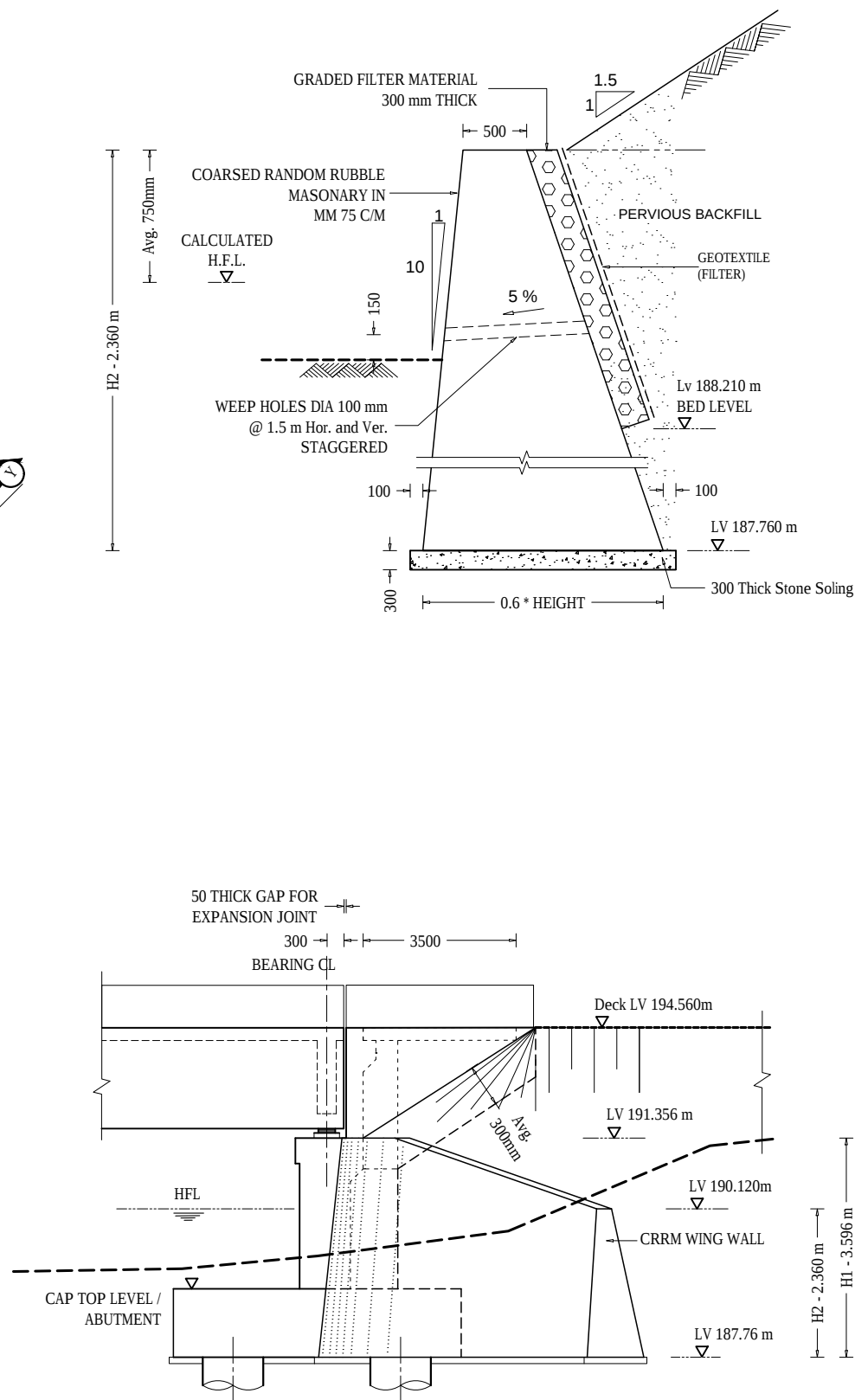
END R.C.C SEPARATOR ISOMETRIC VIEW

SCALE - NON

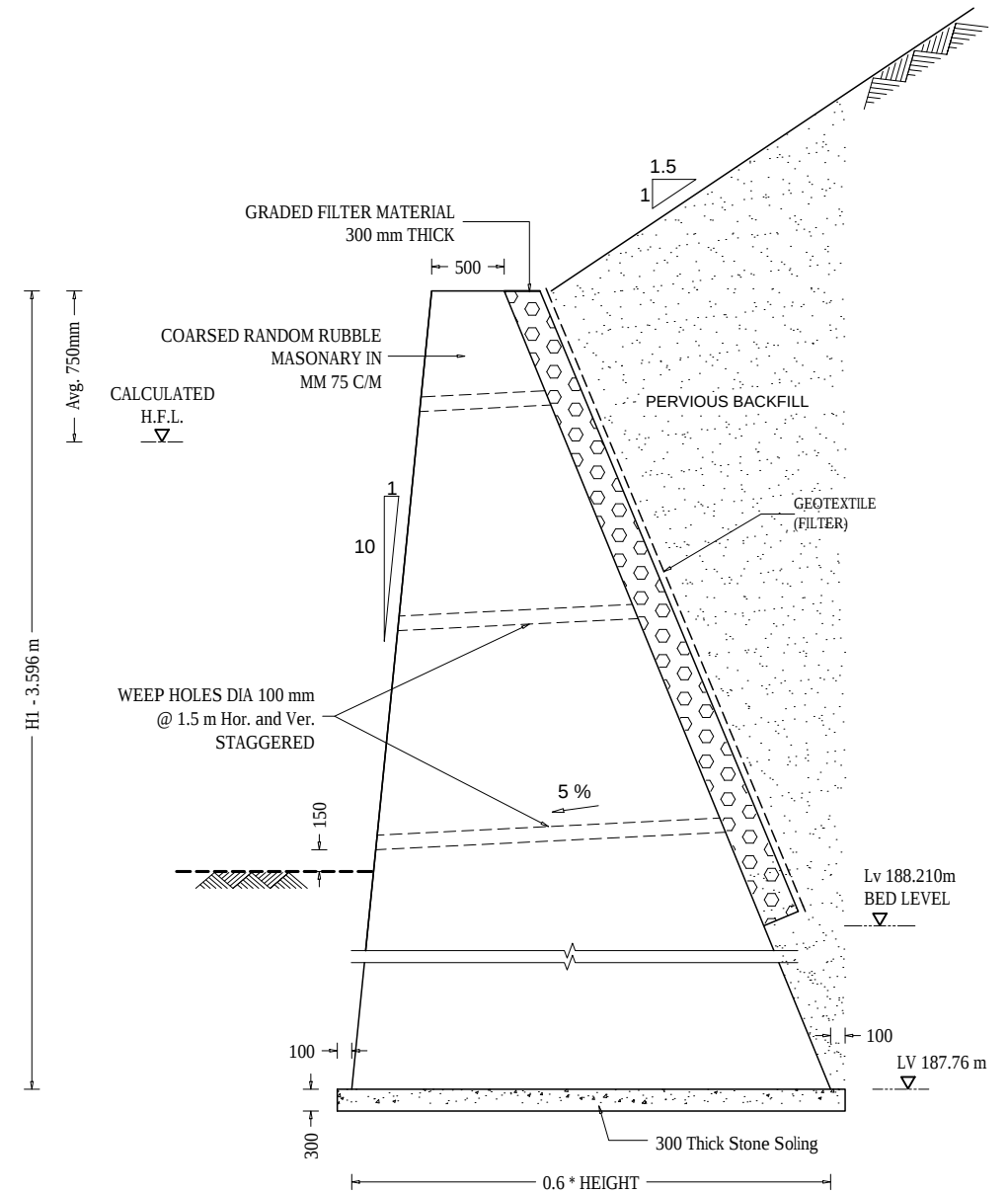
EMPLOYER	PROJECT NAME	DESIGN CONSULTANTS	Designed By	Miscellaneous Details of Bridge over River Maraha	Scale:	Date:
Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Development Cooperation Implementation Division	Strategic Road Connectivity & Trade Improvement Project (SRCTIP) Detailed Design of Upgradation of Kamala-Dhalkebar-Pathlaiya Road Section (130 KM) of Mahendra Highway and Bridges	Joint Venture of EPTISA Servicios De Ingeniera Madrid, Spain STUP Consultants Private Limited Kolkata, India In Association With Udaya Consultancy, Geocom International, Sundar Kirti Consultant and Rays Consultant Private Limited	Mr. S.N.R.B. Nec.No. 265 Civil 'A' Mr. S.M. Mr. H.B.	Signature Signature Signature	AS SHOWN	APRIL 2023
				Reference Drawings KDP/DPR/STR/BR/MARAH/ DD-18	Chainage: 277+266	Drawing No.- KDP/DPR/STR/BR/MARAH/ DD-19
						Sheet No. 2 / 2



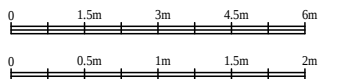
NOTE : AT DOWN STREAM ONLY



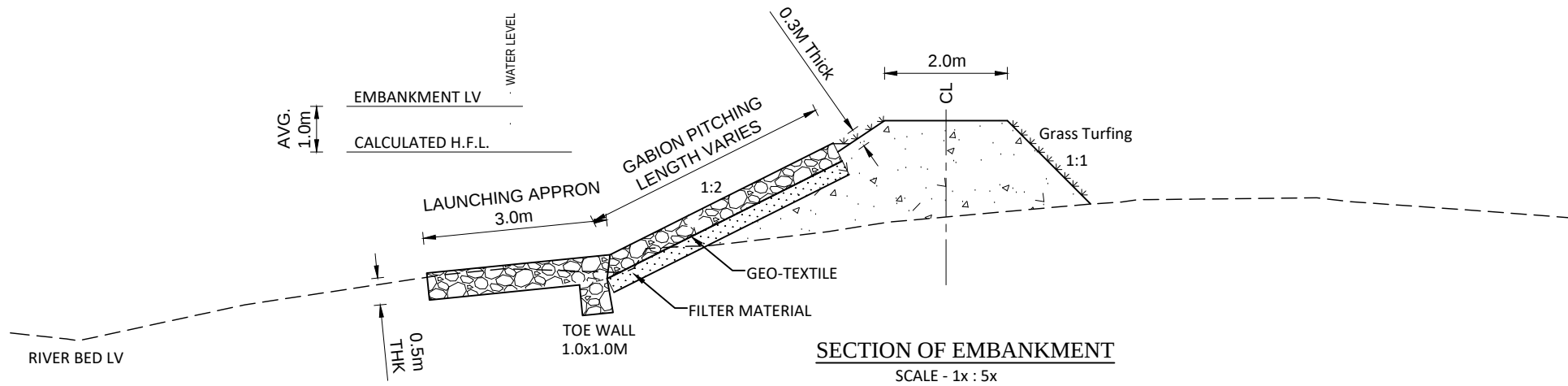
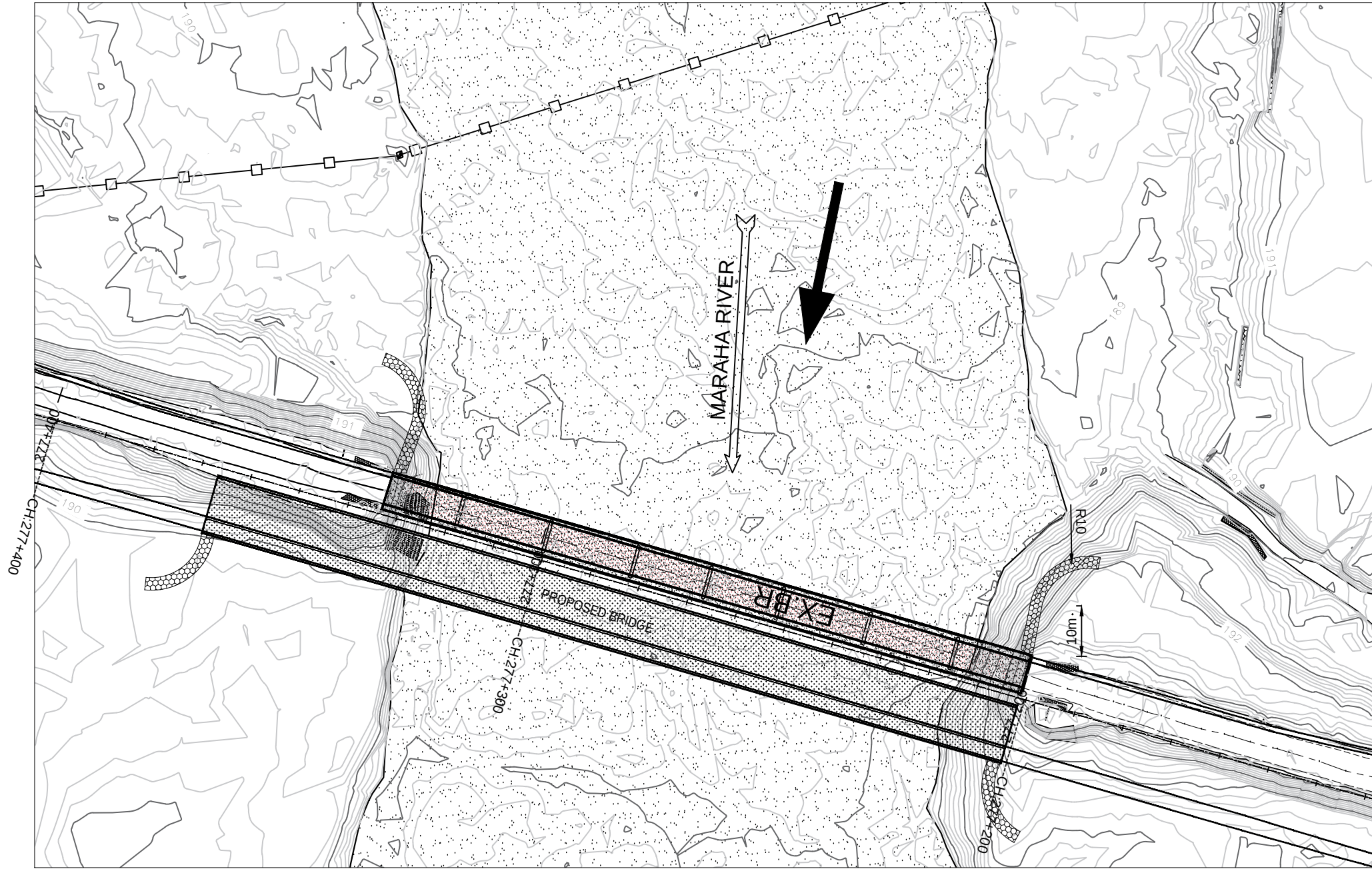
WING WALL ELEVATION

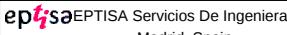


STONE MASONRY WING WALL SECTION X - X



EMPLOYER	PROJECT NAME	DESIGN CONSULTANTS	Designed By	Drawing Name	Scale:	Date:
 Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Development Cooperation Implementation Division	Strategic Road Connectivity & Trade Improvement Project (SRCTIP) Detailed Design of Upgradation of Kamala-Dhalkebar-Pathaiya Road Section (130 KM) of Mahendra Highway and Bridges	Joint Venture of ep4sa EPTISA Servicios De Ingeniera Madrid, Spain cu STUP Consultants Private Limited Kolkata, India In Association With Udaya Consultancy, Geocom International, Sundar Kriti Consultant and Rays Consultant Private Limited	Mr. S.N.R.B.	WING WALL DETAILS OF BRIDGE OVER RIVER MARAHA	AS SHOWN	APRIL 2023
			Checked By Mr. S.M.			Drawing No.-
			Approved By Mr. H.B.			KDP/DPR/STR/BR/MARAHA /DD-20
				Reference Drawings	Chainage:	Sheet No. 1 / 1
					277+266	



EMPLOYER	PROJECT NAME	DESIGN CONSULTANTS	Designed By	Mr. S.N.R.B.	Signature	Drawing Name	Scale:	Date:
 Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Development Cooperation Implementation Division	Strategic Road Connectivity & Trade Improvement Project (SRCTIP) Detailed Design of Upgradation of Kamala-Dhalkebar-Pathlaiya Road Section (130 KM) of Mahendra Highway and Bridges	Joint Venture of  EPTISA Servicios De Ingenieria Madrid, Spain  STUP Consultants Private Limited Kolkatta, India In Association With Udaya Consultancy, Geocom International, Sundar Kriti Consultant and Rays Consultant Private Limited	Checked By	Mr. S.M.	Signature	RIVER TRAINING WORK OF BRIDGE OVER RIVER MARAHA	1:1000	JUNE, 2023
			Approved By	Mr. H.B.	Signature	Reference Drawings	Chainage: 277+266	Drawing No.- KDP/DPR/STR/BR/TERHAKILO/DD-21
								Sheet No.1/1

