



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- Batuwa
Volume-2
Detailed Drawing

April, 2023

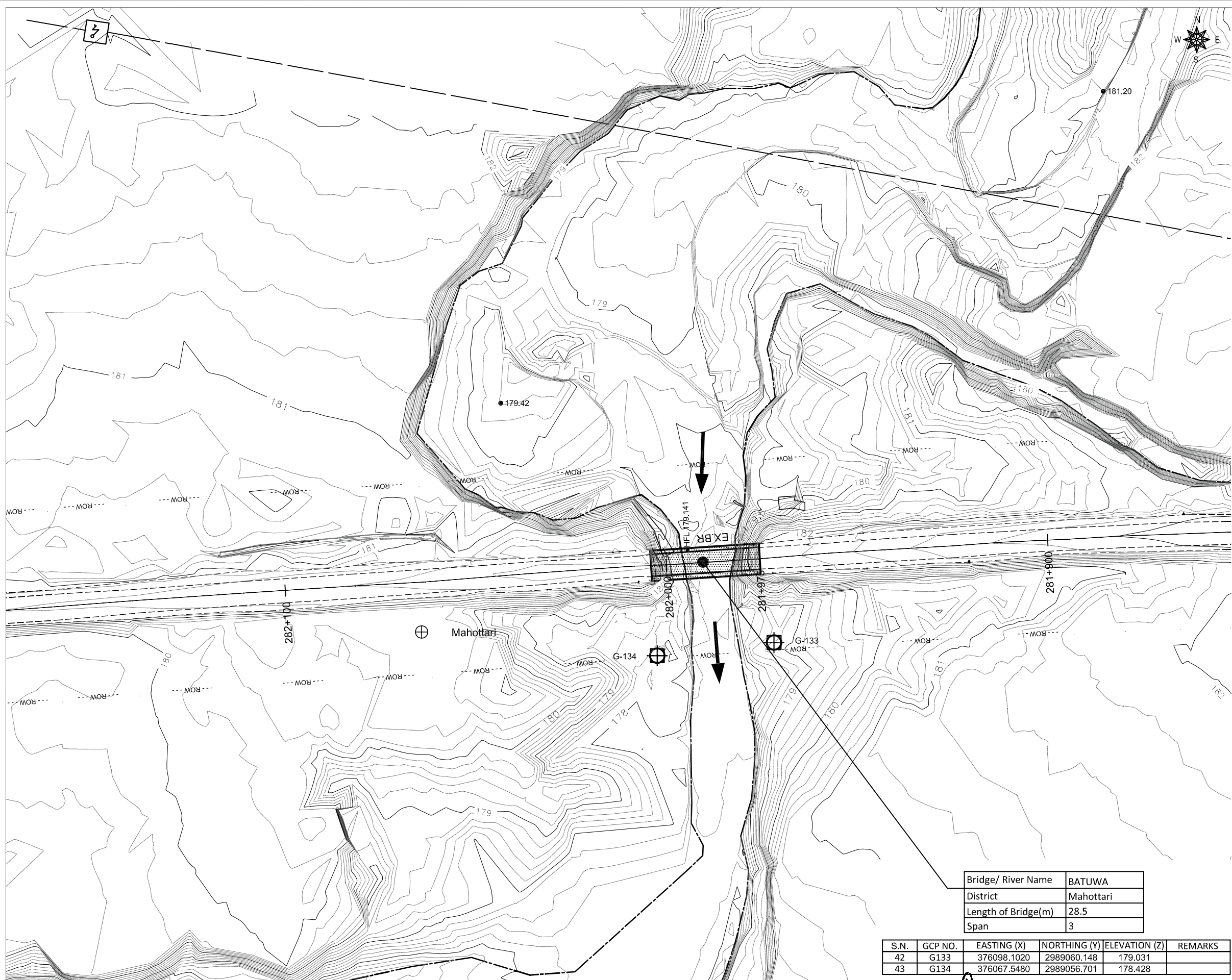
Joint Venture Of:

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

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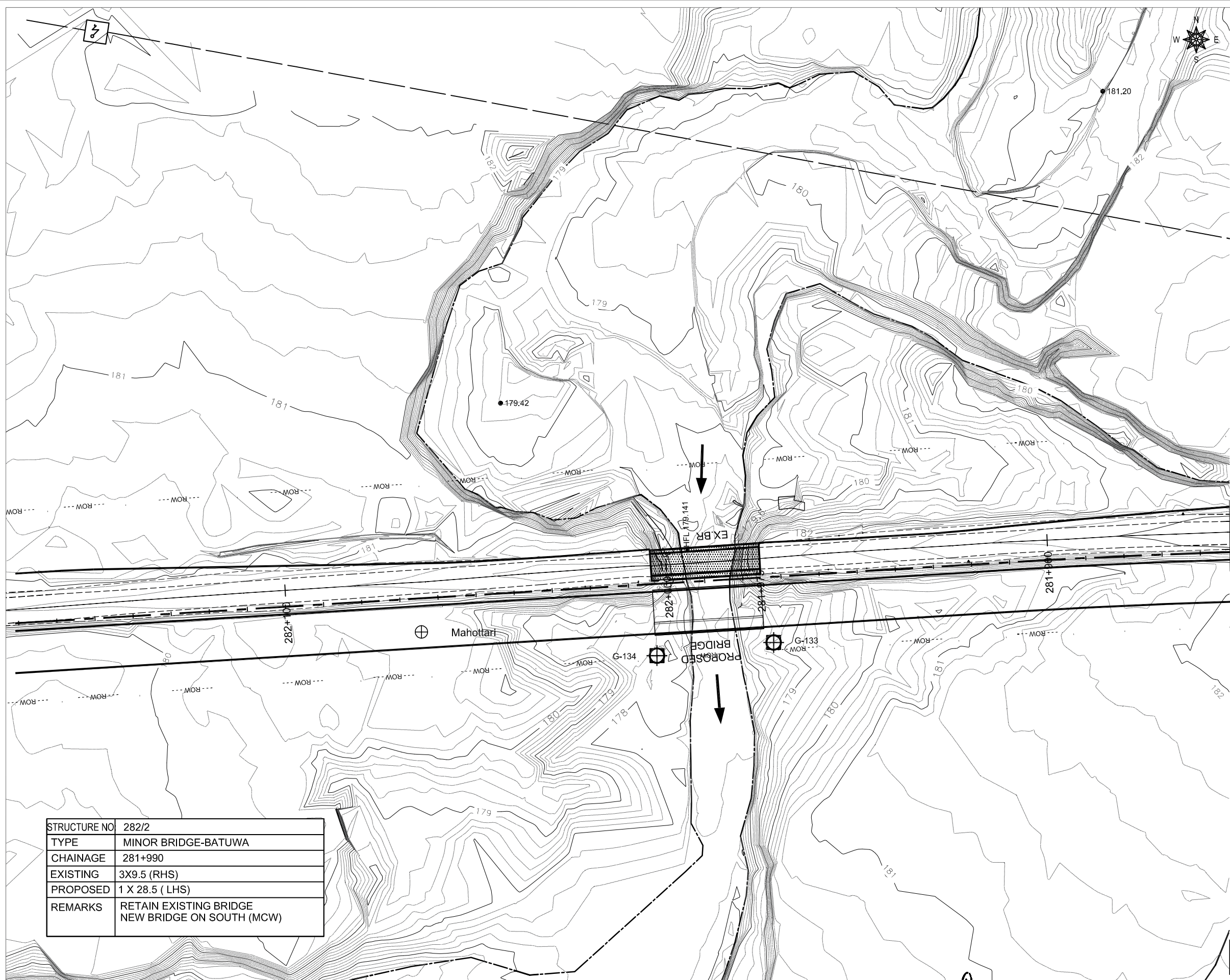
PROJECT KEY MAP

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)	
		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	BATUWA
District	Mahottari
Length of Bridge(m)	28.5
Span	3

S.N.	GCP NO.	EASTING (X)	NORTHING (Y)	ELEVATION (Z)	REMARKS
42	G133	376098.1020	2989060.148	179.031	
43	G134	376067.5480	2989056.701	178.428	

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 EPTISA Servicios De Ingenieria Madrid, Spain STUP Consultants Private Limited Kolkatta, India In Association With Udaya Consultancy, Geocom International, Sundar Kirti Consultant and Rays Consultant Private Limited	Mr. R.D. Nec.No.6489 CIVIL/2 Mr. S.M. Mr. H.B.	DETAILED SURVEY TOPOGRAPHICAL MAP (EXISTING CONDITION) OF BRIDGE OVER BATUWA Reference Drawings	1:1000 Chainage: 281+990	12.03.2023 Drawing No.- KDP/DPR/STR/BR/BATUWA/DD- 2 Sheet No. 1 / 1
			Checked By			
			Approved By			



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SHOULDER		MONASTERY	

EMPLOYER		PROJECT NAME		DESIGN CONSULTANTS		Designed By	Mr. R.D. 	Drawing Name DETAILED SURVEY TOPOGRAPHICAL MAP (WITH PROPOSED BRIDGE) OF BRIDGE OVER BATUWA	Scale: 1:1000	Date: 12.03.2023
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		 EPTISA Servicios De Ingenieria Madrid, Spain	 STUP Consultants Private Limited Kolkatta, India							
		In Association With Udaya Consultancy, Geocom International, Sundar Kirti Consultant and Rays Consultant Private Limited		Approved By	Mr. H.B. 	Reference Drawings		Chainage: 281+990	Drawing No.- KDP/DPR/STR/BR/BATUWA/DD- 3	
										Sheet No. 1 / 1

A. GENERAL

1. ALL DIMENSIONS ARE IN MILLIMETER 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

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, =30° & 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) - 91.06 CUMECs
2. HFL - 179.770M
3. FREE BOARD(MINIMUM) - 1M
4. MAXIMUM SCOUR LEVEL:
ABUTMENT - 172.910M

STRUCTURAL AND OTHER DATA:-

1. SPAN ARRANGEMENT: 1 x 28.5 = 28.5 M
2. SUPERSTRUCTURE:
PRECAST PSC LONGITUDINAL GIRDERS & CAST-IN-SITU RCC CROSS GIRDERS AND DECK SLAB.

3. SUBSTRUCTURE:

- A) ABUTMENT - RCC WALL TYPE

4. FOUNDATION

- A) ABUTMENT - 1200 DIA BORED CAST-IN-SITU PILE

DESIGN WORKING LOAD ON PILE - 229 TON

RCC BORED PILES SHOULD BE CONSTRUCTED AS PER IS: 2911(PART 1/SEC 2)-2010.

5. BEARINGS

FIXED 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. RETURN WALL.....M35
f. LEVELING COURSE: I) BELOW APPROACH SLAB.....M15
a. II) BELOW PILE CAP.....M15
i. APPROACH SLABM30
j. CAST-IN-SITU CRASH BARRIERM40
k. KERBM35
l. DECK SLAB FOR PSC GIRDERS.....M45
m.PRECAST PSC GIRDERSM50
n. 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. PRESTRESSING STRAND -

ALL PRESTRESSING STRANDS SHALL HAVE 7 PLY UNCOATED STRESS RELIEVED HIGH TENSILE STRAND OF 15.2 MM DIA CONFORMING TO CLASS 2 OF IS 14268-2017

14. CONCRETE COVER

1. DECK SLAB, GIRDER, PEDESTAL, CAP: 40 MM

2. SUBSTRUCTURE AND FOUNDATION: 75 MM

15. LAPS (Ls) ARE TO BE STAGGERED AND MINIMUM LAP LENGTH ARE TO BE AS FOLLOWS (UNLESS NOTED OTHERWISE):

- a) FOR M 30 GRADE CONCRETE : 57.2
b) FOR M 35 GRADE CONCRETE : 51.48
c) FOR M 40 GRADE CONCRETE : 48.62
d) FOR M 45 GRADE CONCRETE : 45.76
e) FOR M 50 GRADE CONCRETE : 41.47

(WHERE IS THE DIAMETER OF THE BAR)

16. 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%	57.2φ	51.48φ	48.62φ	45.76φ	41.47φ
25%<LAPPED BAR ≤33%	65.78φ	62.65φ	55.91φ	52.62φ	47.69φ
33%<LAPPED BAR ≤50%	80.08φ	72.07φ	68.07φ	64.06φ	58.06φ
50%<LAPPED BAR	85.8φ	77.22φ	72.93φ	68.64φ	62.21φ

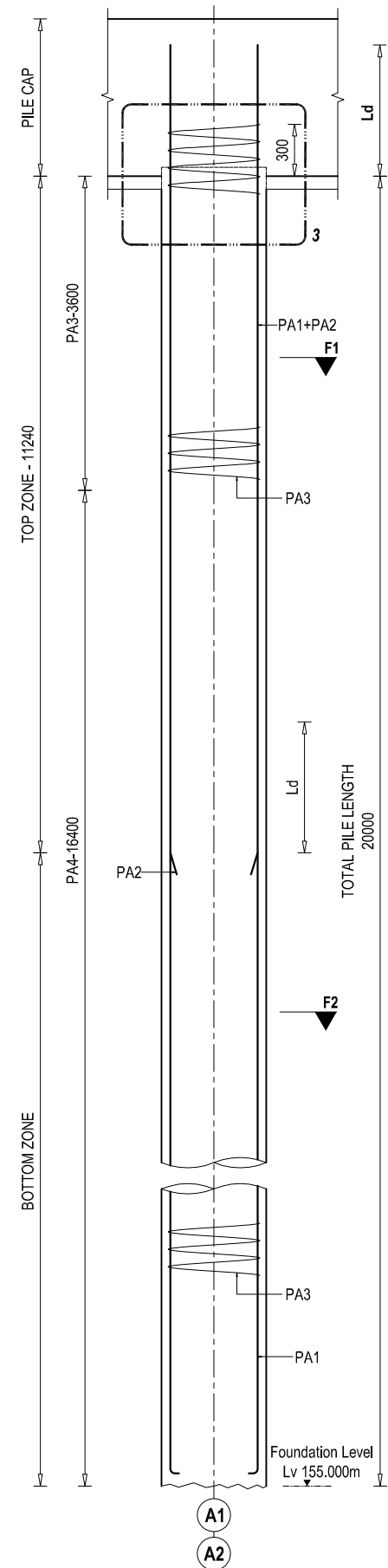
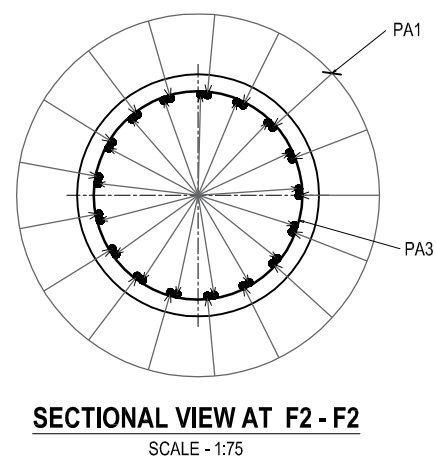
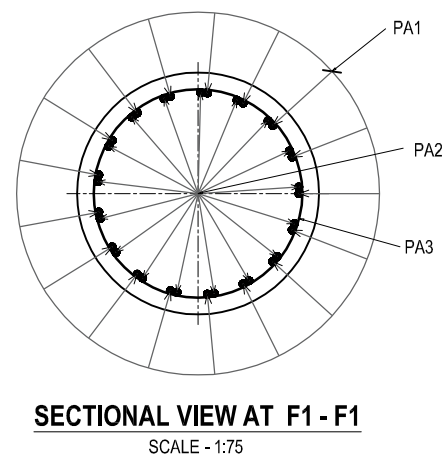
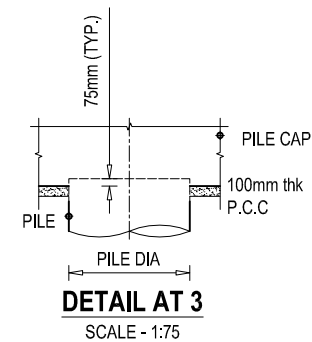
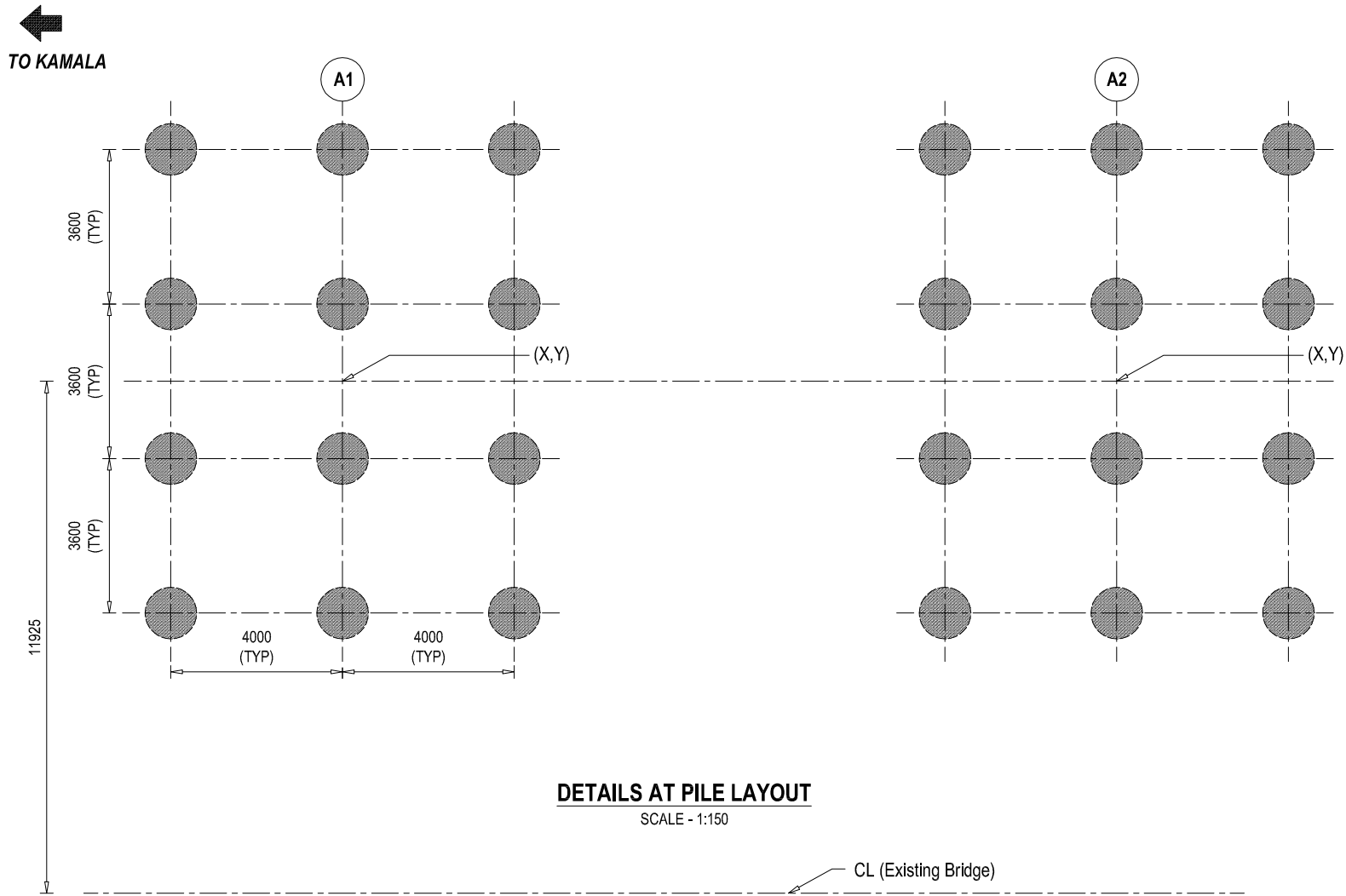
17. THE LAP LENGTH SHALL BE STAGGERED BY MINIMUM DISTANCE OF 1.3 TIMES THE LAP LENGTH.

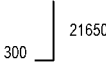
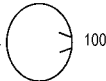
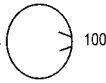
18. HELICAL REINFORCEMENT SHALL BE LAPPED BY 1.5 TURNS.

19. 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.

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

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		In Association With Udaya Consultancy, Geocom International, Sundar Krti Consultant and Rays Consultant Private Limited	Checked By	Mr. S.M.			Drawing No.- KDP/DPR/STR/BR/BATUWA/DD-4
			Approved By	Mr. H.B.	Reference Drawings -	Chainage: 281+990	Sheet No. 1 / 1



BAR BENDING SCHEDULE OF ABUTMENT PILE								
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	PA1		32		21.950	9	6.321	1248.71
2	PA2		32		14.466	9	6.321	822.955
3	PA3	Dia. 1034 	16	110	3.448	47	1.580	256.11
4	PA4	Dia. 1034 	12	110	3.448	136	0.889	416.86
TOTAL (KG) :								2744.64
No. of Pile								12.00
TOTAL WEIGHT (KG) :								32935.68

PILE CAPACITY (INDIVIDUAL)		
SN.	DIA (mm)	CAPACITY (Ton)
1	1200	229

CO ORDINATES OF PILE LOCATION OF PROPOSED BRIDGE

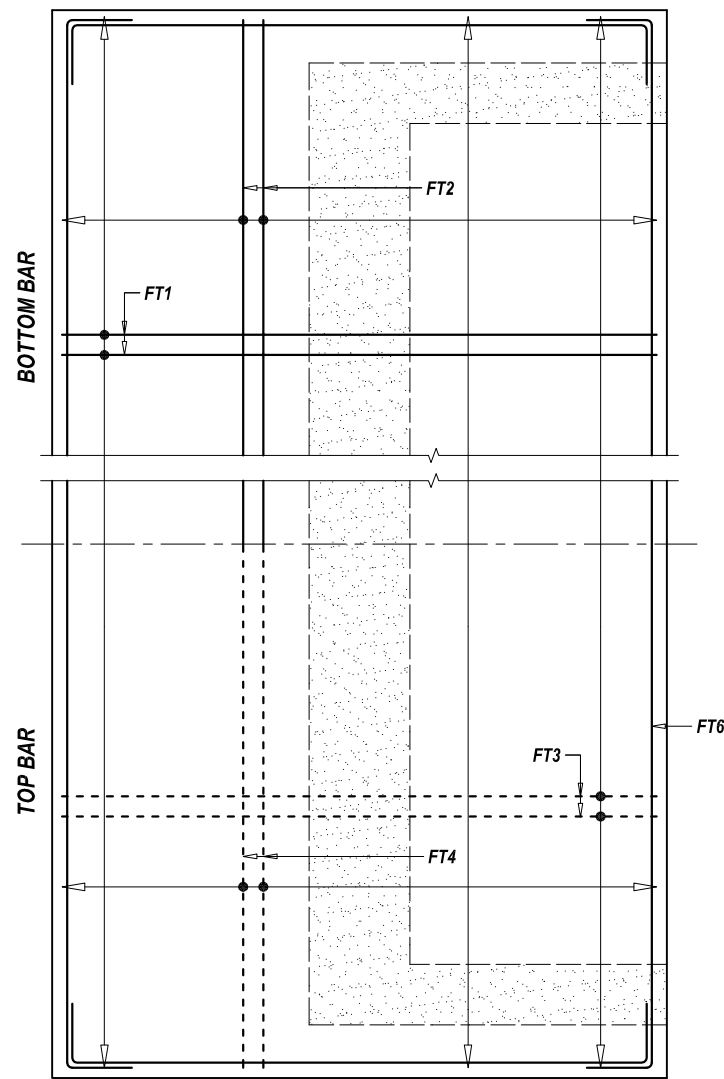
SN.	ABUTMENT/PIER	EASTING (X)	NORTHING (Y)
1	ABUTMENT (A1)	323283.3048	3006563.032
2	ABUTMENT (A2)	323243.5509	3006580.222

NOTE

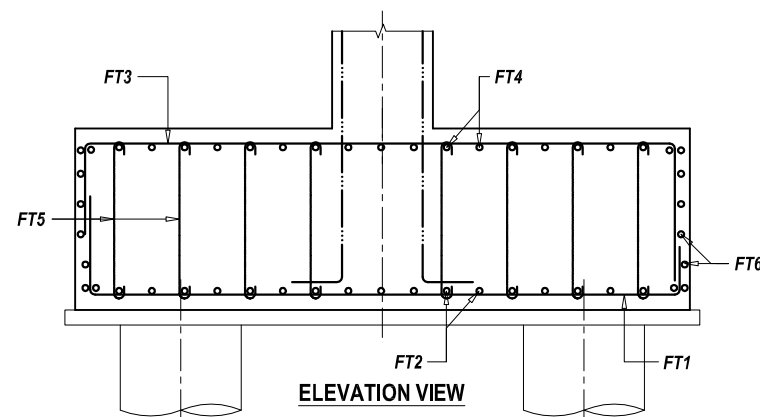
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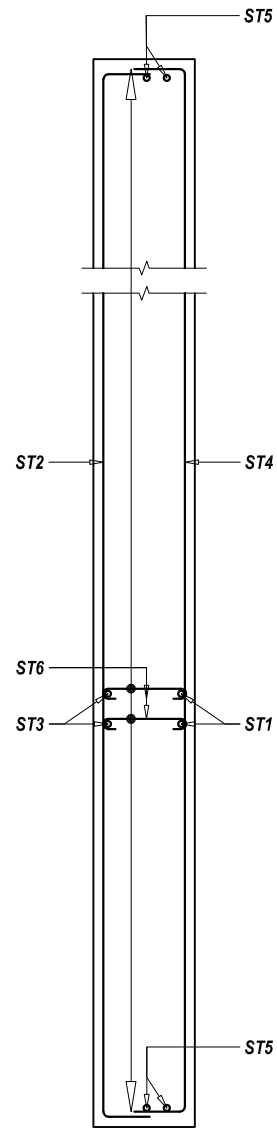
EMPLOYER		PROJECT NAME		DESIGN CONSULTANTS		Drawing Name		Scale:		Date:			
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					In Association With Udaya Consultancy, Geocom International, Sundar Kirti Consultant and Rays Consultant Private Limited								



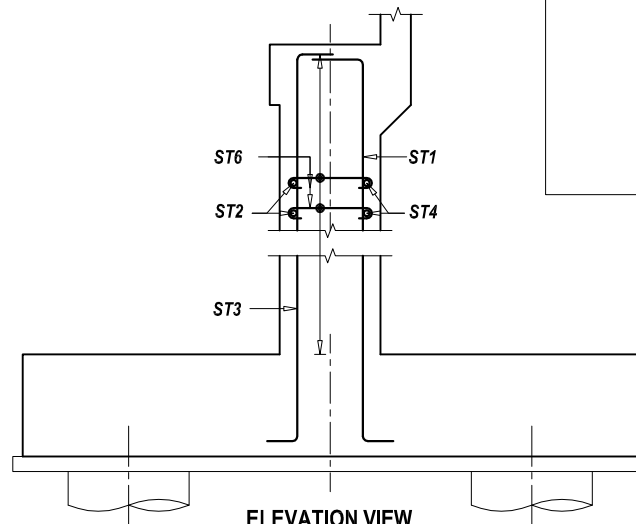
PLAN VIEW



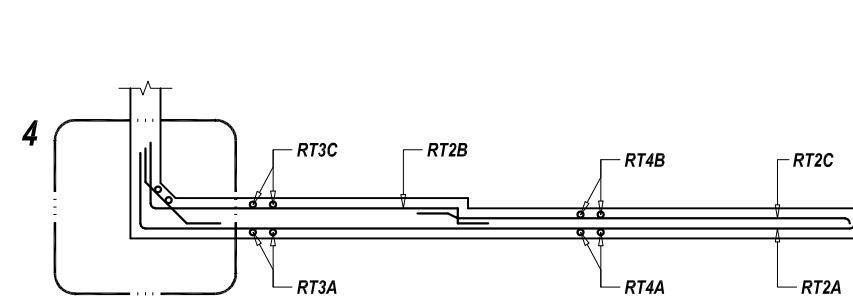
BAR DETAIL OF PILE CAP
SCALE - 1 : 75



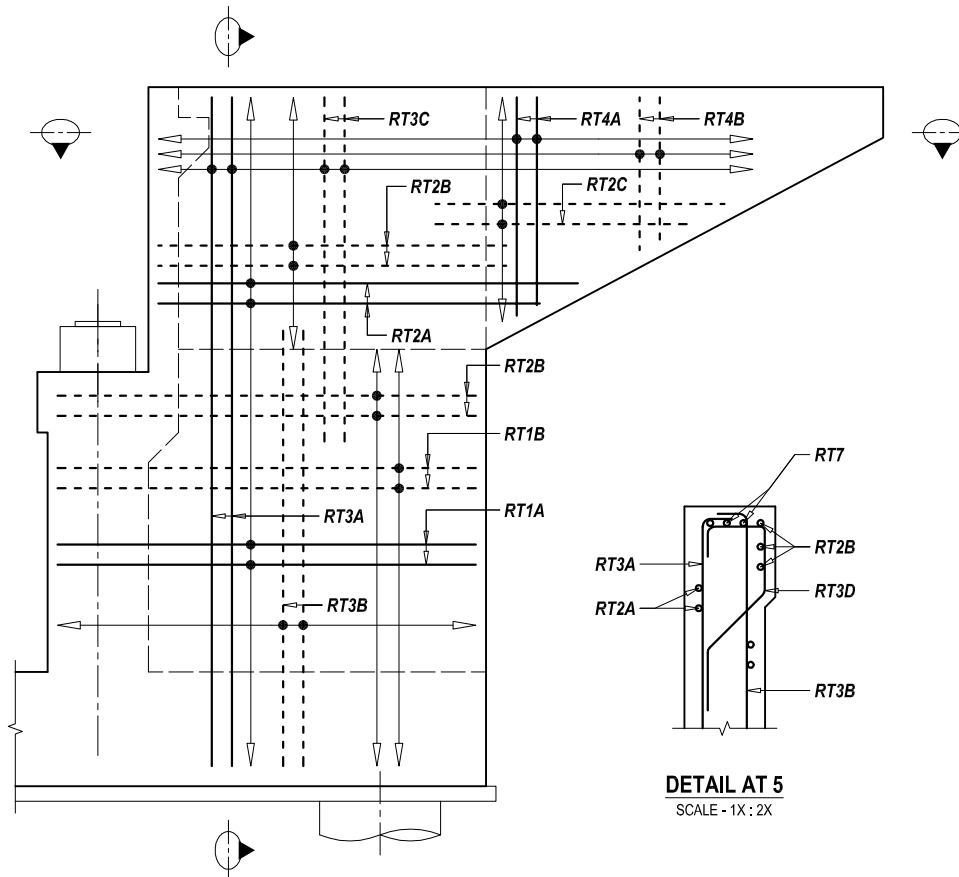
SECTIONAL PLAN VIEW



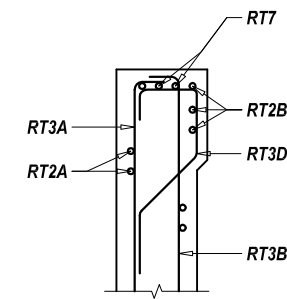
BAR DETAIL AT ABUTMENT STEM
SCALE - 1 : 75



SECTIONAL PLAN VIEW

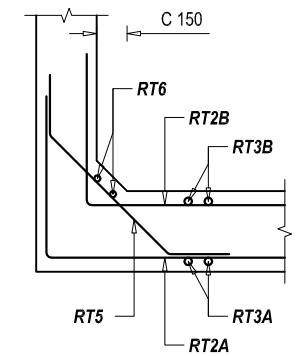


ELEVATION VIEW

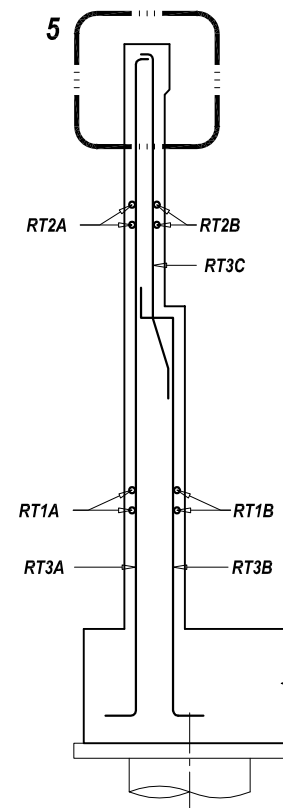


DETAIL AT 5
SCALE - 1X : 2X

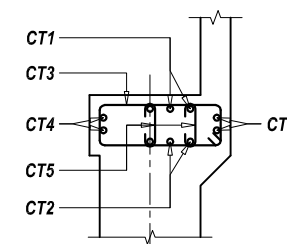
BAR DETAIL AT RETURN WALL
SCALE - 1 : 75



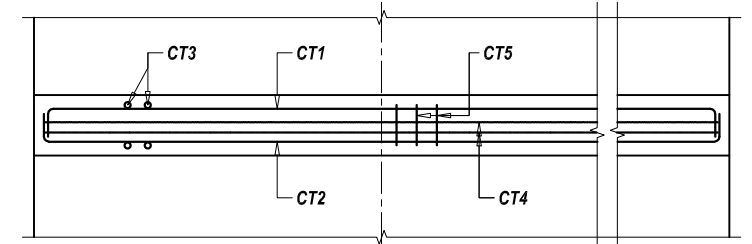
DETAILS AT 4



SECTIONAL SIDE VIEW



ELEVATION VIEW



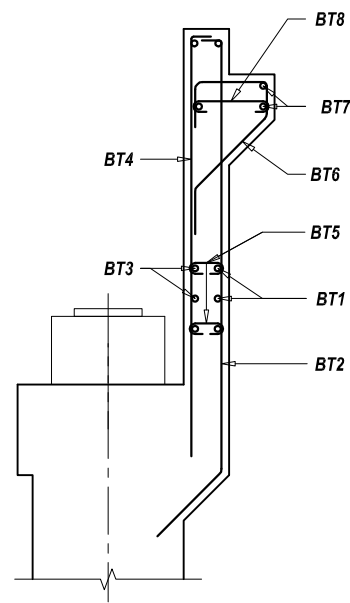
FRONT VIEW

BAR DETAIL AT ABUTMENT CAP
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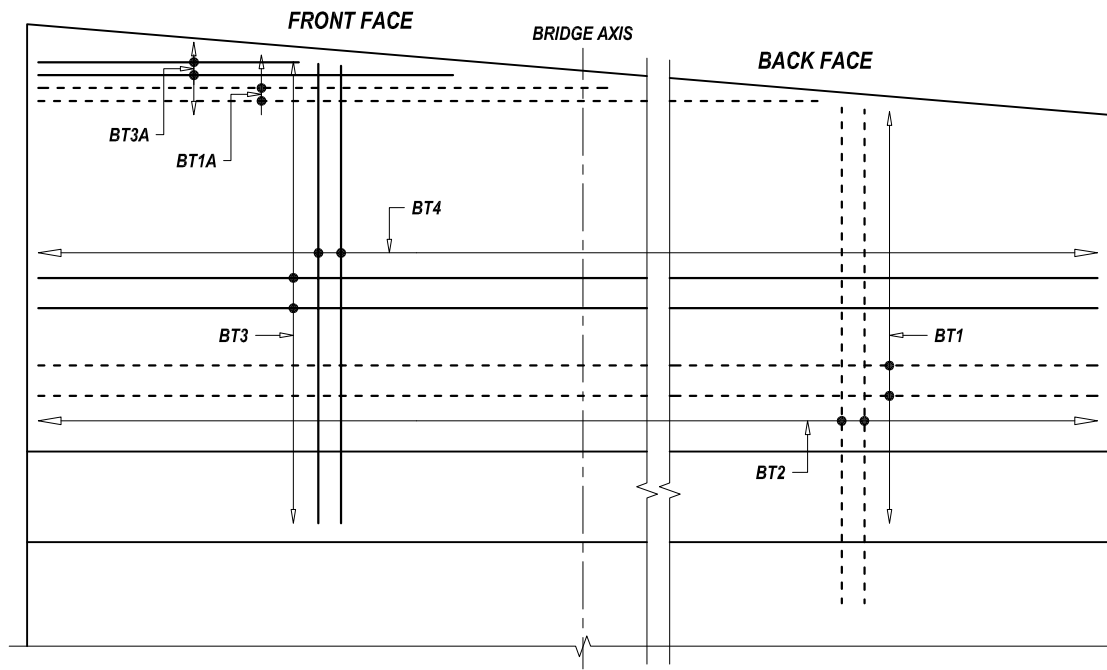
--- TOP BAR OR NEAR FACE REINFORCEMENT
--- BOTTOM BAR OR FAR FACE REINFORCEMENT

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

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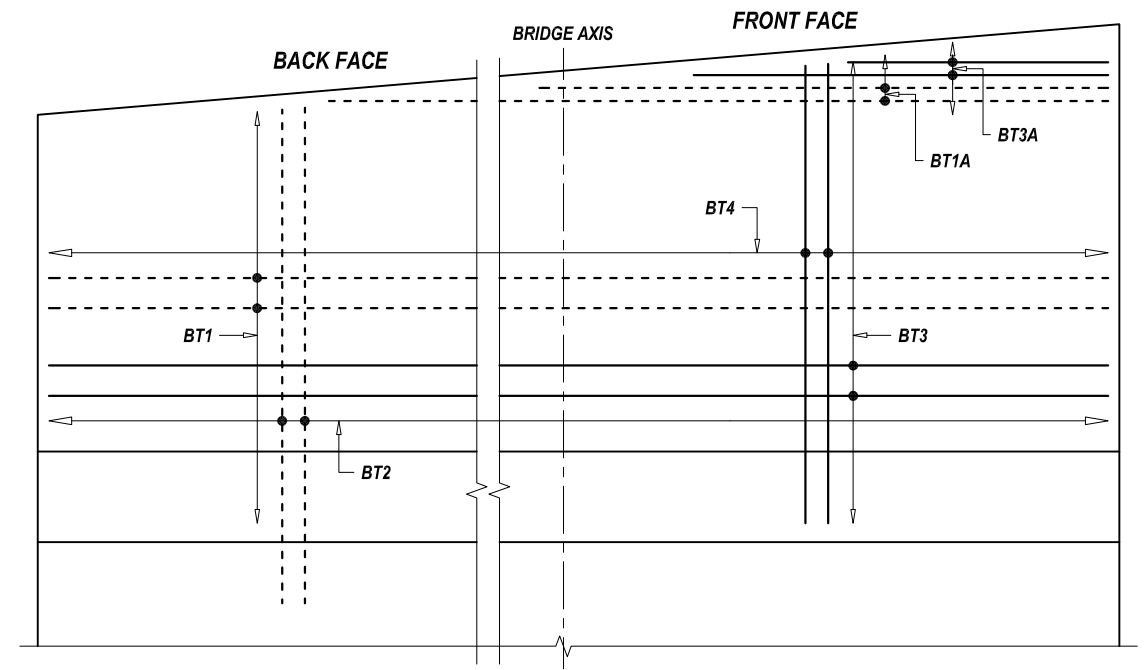
SECTIONAL SIDE VIEW



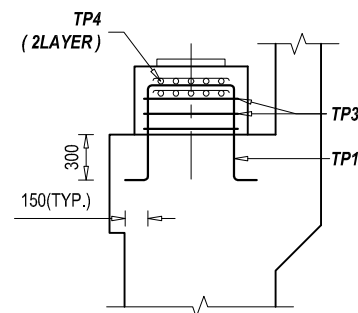
ELEVATION VIEW / VIEW AT D1

BAR DETAIL AT DIRT WALL

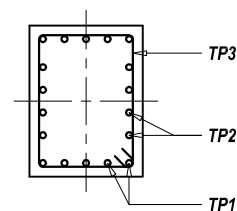
SCALE - 1 : 50



ELEVATION VIEW / VIEW AT D2

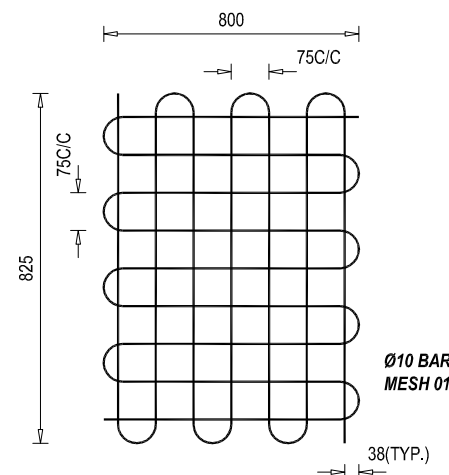


SECTIONAL SIDE VIEW



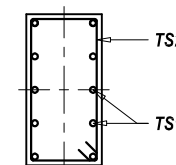
SECTIONAL PLAN VIEW
BAR DETAIL AT PEDESTAL

SCALE - 1 : 50

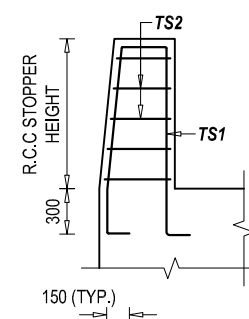


REINFORCEMENT DETAILS OF
BEARING MESH

SCALE - 1 : 50

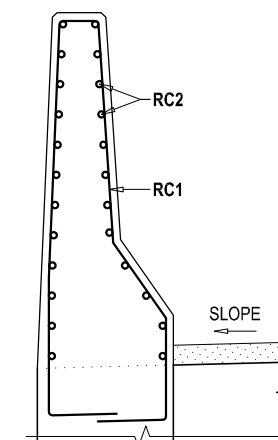


SECTIONAL PLAN VIEW



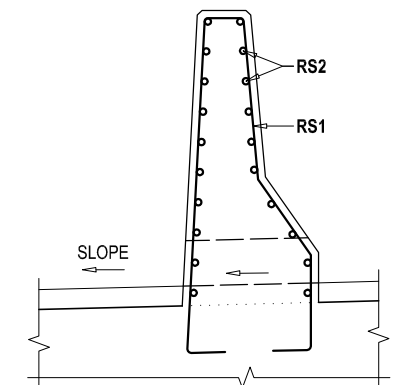
R.C.C STOPPER LEFT
ELEVATION VIEW

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

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

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

EMPLOYER	PROJECT NAME	DESIGN CONSULTANTS	Designed By	Mr. R.D.	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	Mr. S.M. Checked By	Mr. S.M. Signature	ABUTMENT REINFORCEMENT DETAILS OF BRIDGE OVER RIVER BATUWA Reference Drawings KDP/DPR/STR/BR/BATUWA/DD-9	AS SHOWN Chainage: 281+990	12.04.2023
		 STUP Consultants Private Limited Kolkatta, India	Mr. H.B. Approved By	Mr. H.B. Signature			Drawing No.- KDP/DPR/STR/BR/BATUWA/DD-8
		In Association With Udaya Consultancy, Geocom International, Sundar Kritt Consultant and Rays Consultant Private Limited					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	150 11700 150	16	200	12.000	18	1.580	341.33
2	BT1A	Avg. 5850 150	16	200	6.000	3	1.580	28.44
3	BT2	150 3103 Avg. 450	16	125	3.703	96	1.580	561.76
4	BT3	150 11700 150	16	200	12.000	14	1.580	265.48
5	BT3A	Avg. 5850 150	16	200	6.000	3	1.580	28.44
6	BT4	150 3178 Avg.	12	125	3.328	96	0.889	283.99
7	BT5	100 150 100	12	500	0.350	120	0.889	37.33
8	BT6	200 450 220 200 756	12	200	1.826	61	0.889	99.01
9	BT7	11700	16		11.700	5	1.580	92.44
10	BT8	100 450 100	12	200	0.650	120	0.889	69.33
TOTAL (KG) :								1807.57

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	300 11700 300	16	150	12.300	11	1.580	213.81
2	CT2	300 11700 300	16	150	12.300	11	1.580	213.81
3	CT3	450 1300 100	16	150	3.700	80	1.580	467.75
4	CT4	300 11700 300	12	150	12.300	8	0.889	87.47
5	CT5	450 100 100	12	Long. 150 Trans.300	0.650	382	0.889	220.71
TOTAL (KG) :								1203.55

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	300 5120 750	25		6.170	100	3.858	2380.40
2	ST2	500 11700 500	16	180	12.700	16	1.580	321.11
3	ST3	300 5120 750	25		6.170	100	3.858	2380.40
4	ST4	500 11700 500	16	180	12.700	16	1.580	321.11
5	ST5	300 5120 750	20		6.170	14	2.469	213.28
6	ST6	100 850 100	12	Ver. 180 Hor.240	1.050	800	0.889	746.67
TOTAL (KG) :								6362.97

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	900 9950 900	25		11.750	100	3.858	4533.18
2	FT2	900 12750 900	20		14.550	50	2.469	1796.30
3	FT3	900 9950 900	16		11.750	100	1.580	1856.79
4	FT4	900 12750 900	16		14.550	50	1.580	1149.63
5	FT5	100 1650 100	10	Long. 410 Trans.410	1.850	755	0.617	862.19
6	FT6	9900 12710 150	16	200	45.520	8	1.580	575.46
TOTAL (KG) :								10773.55

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	150 950 Avg. 650	16	150	2.850	6	1.580	27.02
1	TP2	150 700 Avg. 650	16	150	2.350	8	1.580	29.71
2	TP3	950 700 100	16	150	3.500	3	1.580	16.59
1	TP4	650 850 @ 100	8		13.400	2	0.395	10.59
TOTAL (KG) :								83.91
TOTAL NOS OF PEDESTAL :								4.00
TOTAL WEIGHT (KG) :								335.64

BAR BENDING SCHEDULE OF RCC SEISMIC ARRESTER - 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	1010 400 1270 300 150	16	150	3.280	6	1.580	31.10
2	TS2-L	400 700 100	12	150	2.400	7	0.889	14.93
TOTAL (KG) :								46.03

BAR BENDING SCHEDULE OF RCC SEISMIC ARRESTER - 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	1260 400 1525 300 150	16	150	3.785	6	1.580	35.89
2	TS2-R	400 700 100	12	150	3.400	9	0.889	27.20
TOTAL (KG) :								63.09

EMPLOYER		PROJECT NAME		DESIGN CONSULTANTS		Designed By	Mr. R.D.  Signature	Drawing Name	Scale:	AS SHOWN	Date:	12.04.2023					
 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 Kamata-Dhalkebar-Pathlaiya Road Section (130 KM) of Mahendra Highway and Bridges	Joint Venture of		Checked By	Mr. S.M.  Signature								Reference Drawings	Chainage:	281+990	Drawing No.- KDP/DPR/STR/BR/BATUWA /DD-9	Sheet No. 1 / 2
		 EPTISA Servicios De Ingeniera Madrid, Spain	 STUP Consultants Private Limited Kolkatta, India														

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		12	150	6.000	42	0.889	224.00
2	RT1B		12	150	6.000	42	0.889	224.00
3	RT2A		12	150	8.436	20	0.889	149.97
4	RT2B		12	150	6.300	20	0.889	112.00
5	RT2C		12	150	4.261	20	0.889	75.75
6	RT3A		12	150	8.486	32	0.889	241.38
7	RT3B		20	150	6.662	32	2.469	526.38
8	RT3C		20	150	4.049	32	2.469	319.92
9	RT3D		20	150	1.210	55	2.469	164.32
10	RT4A		12	150	1.712	46	0.889	70.00
11	RT4B		20	150	1.712	46	2.469	194.45
12	RT5		12	150	1.470	62	0.889	81.01
13	RT6		12		6.236	2	0.889	11.09
14	RT7		20		5.386	4	2.469	53.20
TOTAL (KG) :								2447.47

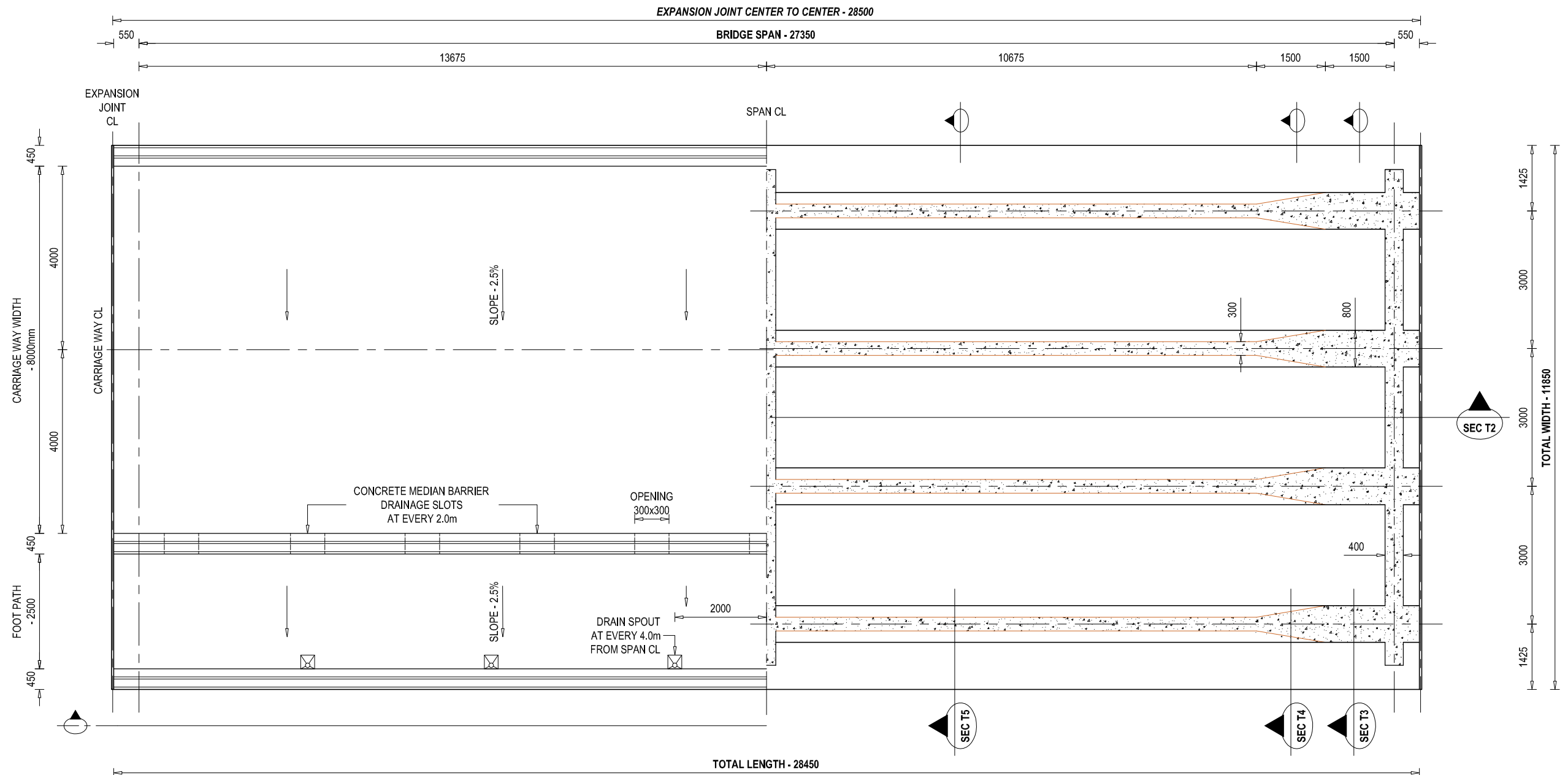
BAR BENDING SCHEDULE OF RETURN WALL - RIGHT								
S.No.	BAR MARK	DESCRIPTION OF BAR	BAR DIA(MM)	SPACING (MM)	BAR LENGTH (M)	No. OF BARS	UNIT WEIGHT (Kg/m)	TOTAL WEIGHT (Kg)
1	RT1A		12	150	6.000	40	0.889	213.33
2	RT1B		12	150	6.000	40	0.889	213.33
3	RT2A		12	150	8.436	20	0.889	149.97
4	RT2B		12	150	6.300	20	0.889	112.00
5	RT2C		12	150	4.261	20	0.889	75.75
6	RT3A		12	150	8.190	32	0.889	232.96
7	RT3B		20	150	6.366	32	2.469	502.99
8	RT3C		20	150	4.049	32	2.469	319.92
9	RT3D		20	150	1.210	55	2.469	164.32
10	RT4A		12	150	1.712	46	0.889	70.00
11	RT4B		20	150	1.712	46	2.469	194.45
12	RT5		12	150	1.470	62	0.889	81.01
13	RT6		12		5.940	2	0.889	10.56
14	RT7		20		5.386	4	2.469	53.20
TOTAL (KG) :								2393.81

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	RC1		16	150	3.170	54	1.580	270.51
2	RC2		10	150	8.186	20	0.617	101.06
TOTAL (KG) :								371.57

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		16	150	2.695	25	1.580	106.47
2	RS2		10	150	3.800	17	0.617	39.88
TOTAL (KG) :								146.35

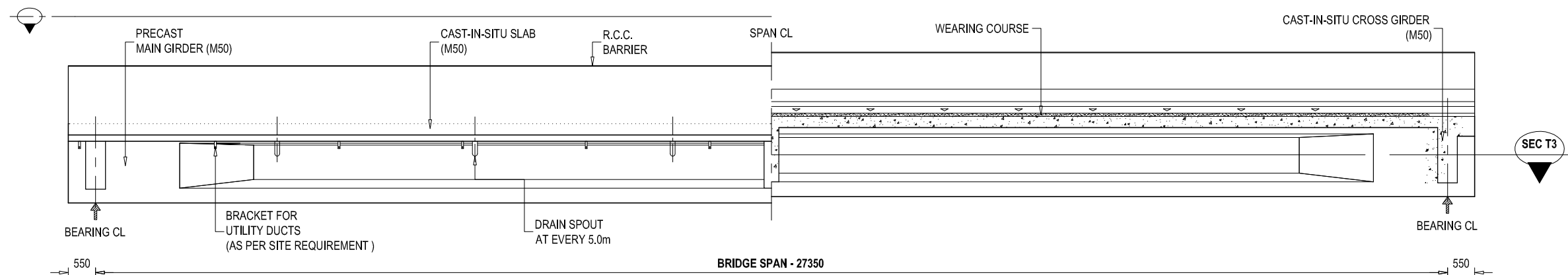
BAR BENDING SCHEDULE OF APPROACH SLAB								
S.No.	BAR MARK	DESCRIPTION OF BAR	BAR DIA(MM)	SPACING (MM)	BAR LENGTH (M)	No. OF BARS	UNIT WEIGHT (Kg/m)	TOTAL WEIGHT (Kg)
1	1601		16	150	11.170	48	1.580	847.27
2	1202		12	150	3.620	150	0.889	482.67
TOTAL (KG) :								1329.93

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. R.D.	AS SHOWN		12.04.2023	
				 EPTISA Servicios De Ingeniera Madrid, Spain	 STUP Consultants Private Limited Kolkatta, India	Checked By	Mr. S.M.			Drawing No.- KDP/DPR/STR/BR/BATUWA /DD-9	
						Approved By	Mr. H.B.			Sheet No. 2 / 2	



HALF SECTIONAL PLAN VIEW OF SUPERSTRUCTURE AT SEC T1

SCALE - 1 : 100 @ A3 PAPER

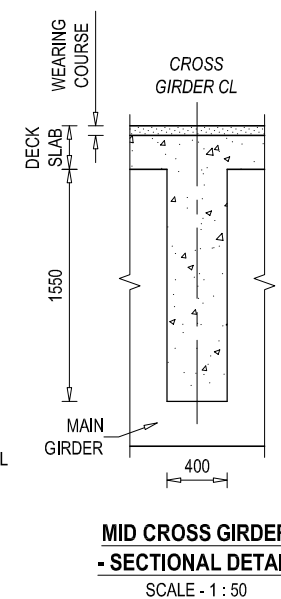
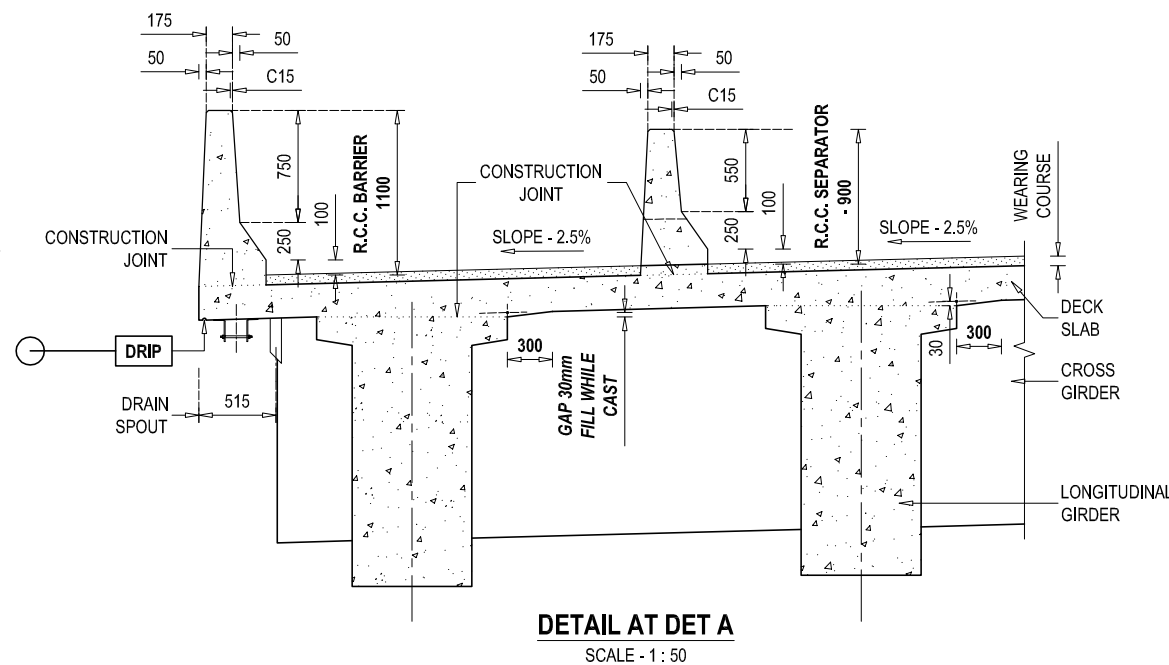
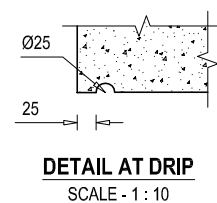
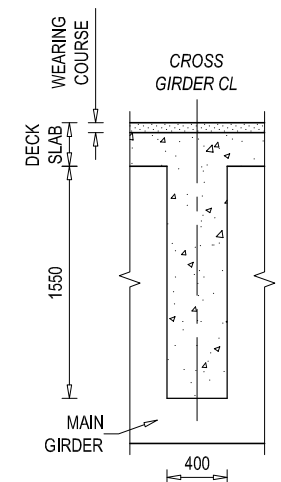
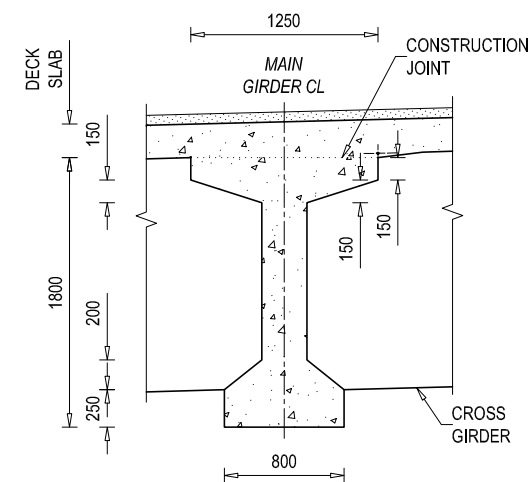
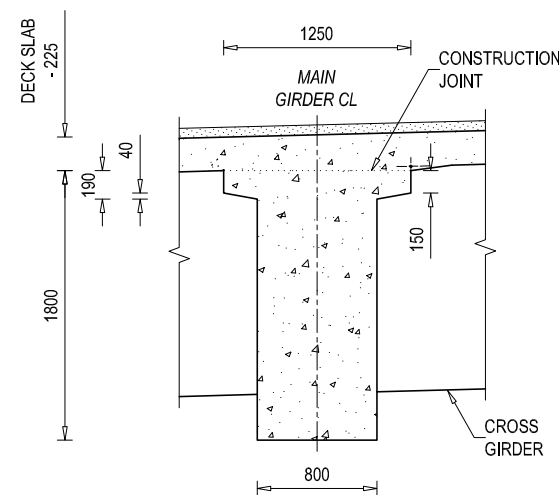
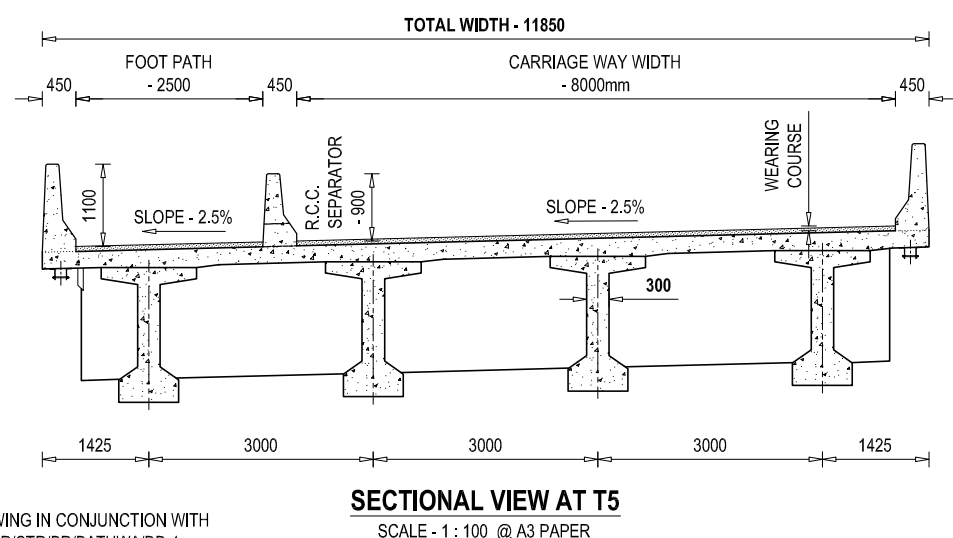
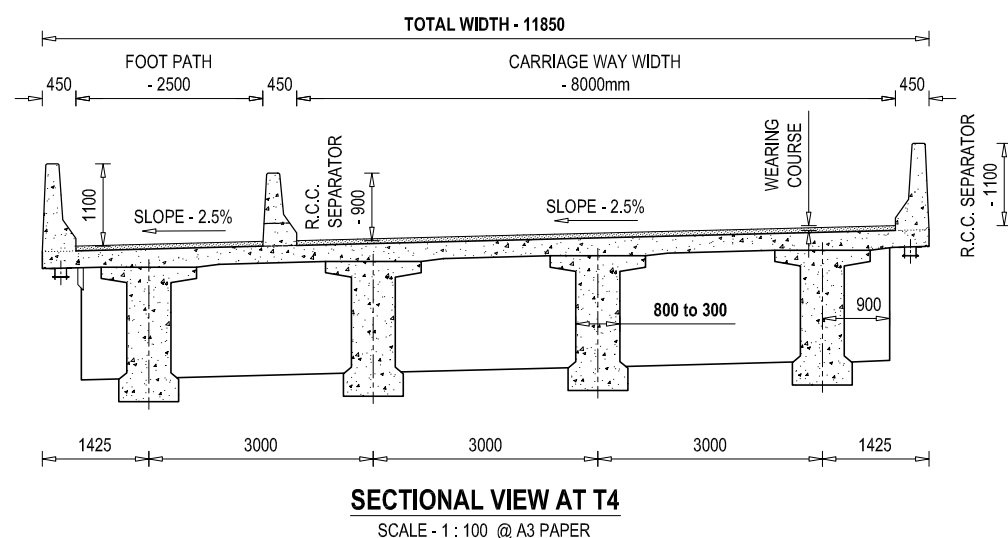
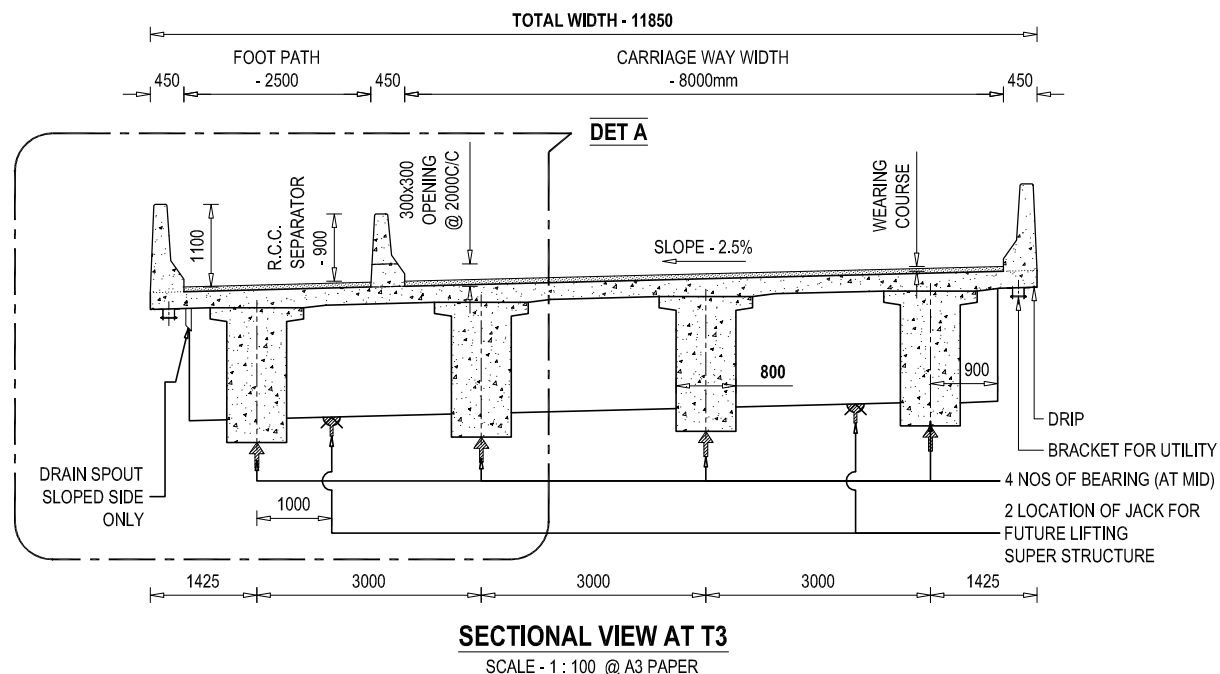


HALF ELEVATION SECTIONAL VIEW OF SUPERSTRUCTURE AT SEC T2

SCALE - 1 : 100 @ A3 PAPER

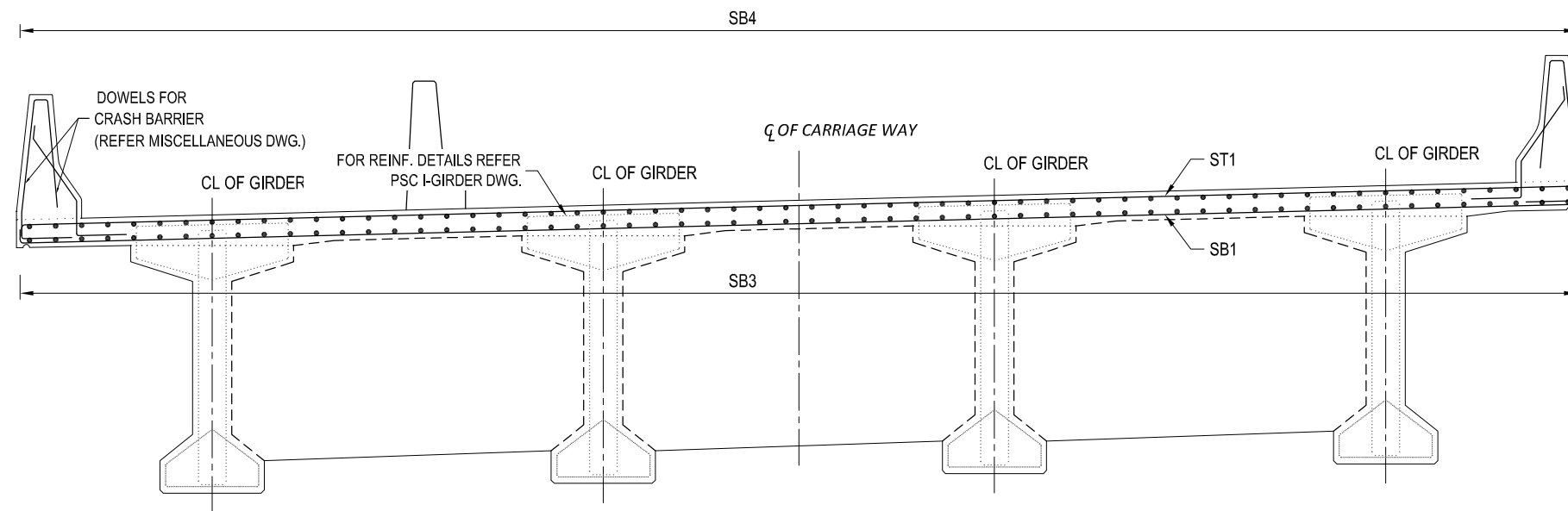
NOTE
READ THIS DRAWING IN CONJUNCTION WITH
DRG NO. KDP/DPR/STR/BR/BATUWA/DD-4

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-Patthaiya 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 Kriti Consultant and Rays Consultant Private Limited	Mr. R.D. Nec.No. 6489 CMU/V	SUPER STRUCTURE DETAILS OF BRIDGE OVER RIVER BATUWA Reference Drawings KDP/DPR/STR/BR/BATUWA/DD-14	SCALE: AS SHOWN Chainage: 281+990	16.04.2023
			Mr. S.M.			Drawing No. KDP/DPR/STR/BR/BATUWA/DD-10
			Mr. H.B.			Sheet No. 1 / 2



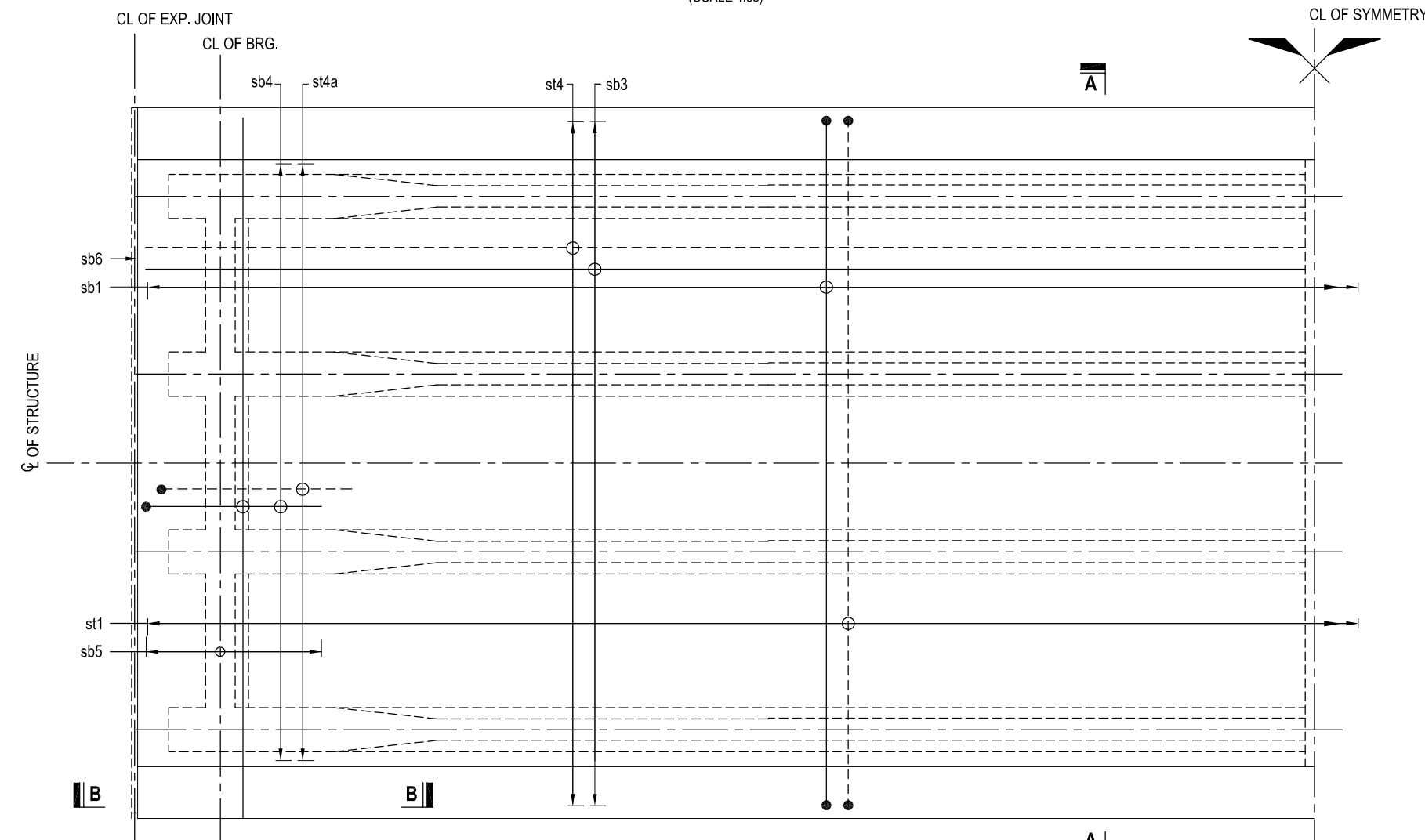
NOTE
READ THIS DRAWING IN CONJUNCTION WITH
DRG NO. KDP/DPR/STR/BR/BATUWA/DD-4

EMPLOYER	PROJECT NAME	DESIGN CONSULTANTS		Designed By	Mr. R.D.	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			Nec.No. 6489 CH/1/A"		Signature	SUPER STRUCTURE DETAILS OF BRIDGE OVER RIVER BATUWA	SCALE: AS SHOWN	16.04.2023
		 EPTISA Servicios De Ingeniera Madrid, Spain	 STUP Consultants Private Limited Kolkata, India		Mr. S.M.		Signature			Reference Drawings
		In Association With Udaya Consultancy, Geocom International, Sundar Krti Consultant and Rays Consultant Private Limited		Approved By	Mr. H.B.	KDP/DPR/STR/BR/BATUWA/DD-14		Sheet No. 2 / 2		



REINFORCEMENT DETAILS OF INTERMEDIATE CROSS GIRDER

(SCALE 1:35)

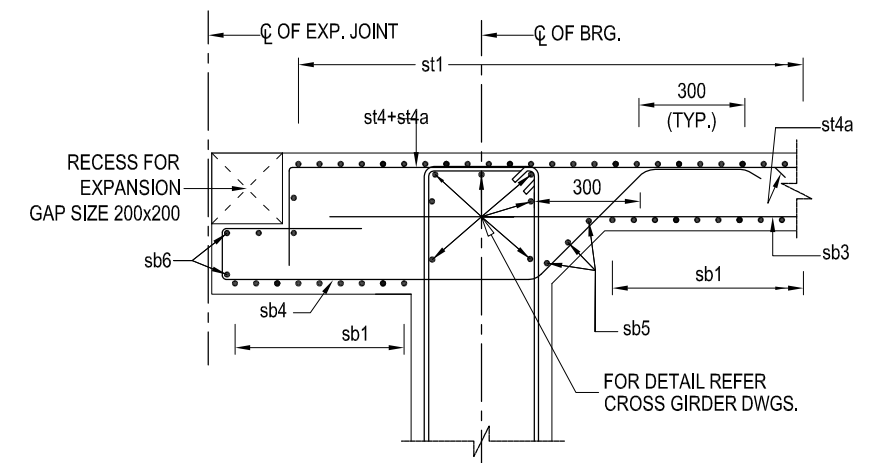


PLAN SHOWING DECK REINFORCEMENT DETAILS

(PLAN AT DECK TOP ONLY SHOWN)

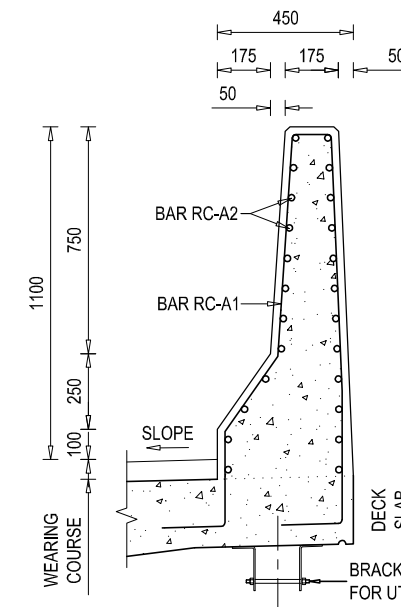
(SCALE 1:75)

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



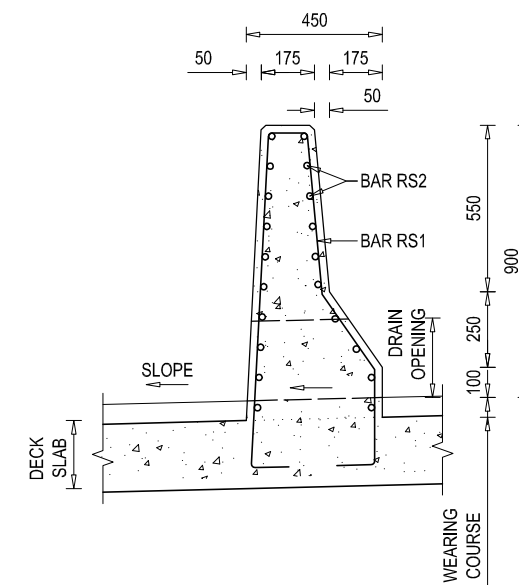
SECTION B-B

(SCALE - 1:25)



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

SCALE - 1 : 25



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

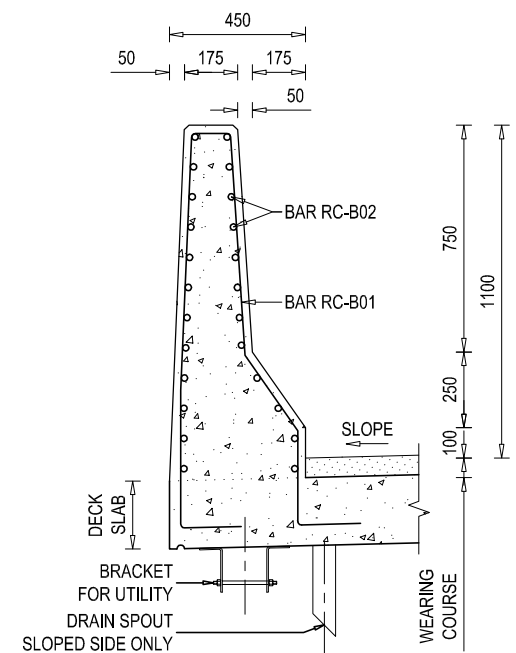
SCALE - 1 : 25

LEGEND :

TOP BARS SHOWN THUS 
BOTTOM BARS SHOWN THUS 

NOTES :

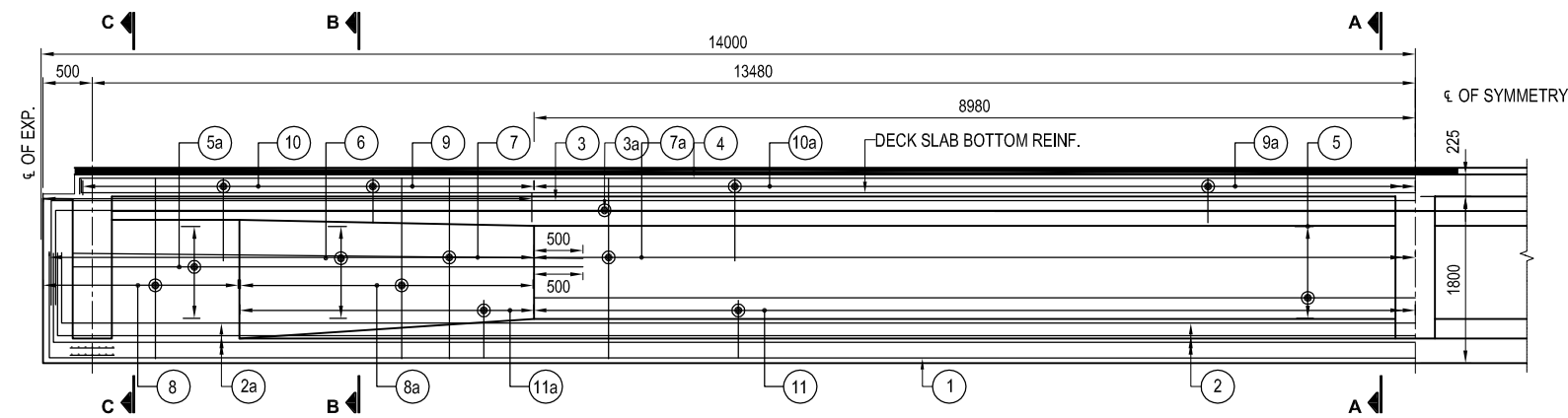
1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS IN METERS, UNLESS NOTED OTHERWISE.
2. DIMENSIONS ARE NOT TO BE SCALED, ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
3. CLEAR COVER FOR ALL REINFORCEMENT SHALL BE 40mm. UNLESS NOTED OTHERWISE.
4. FOR ALL OTHER NOTES REFER GENERAL ARRANGEMENT DRAWING.



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

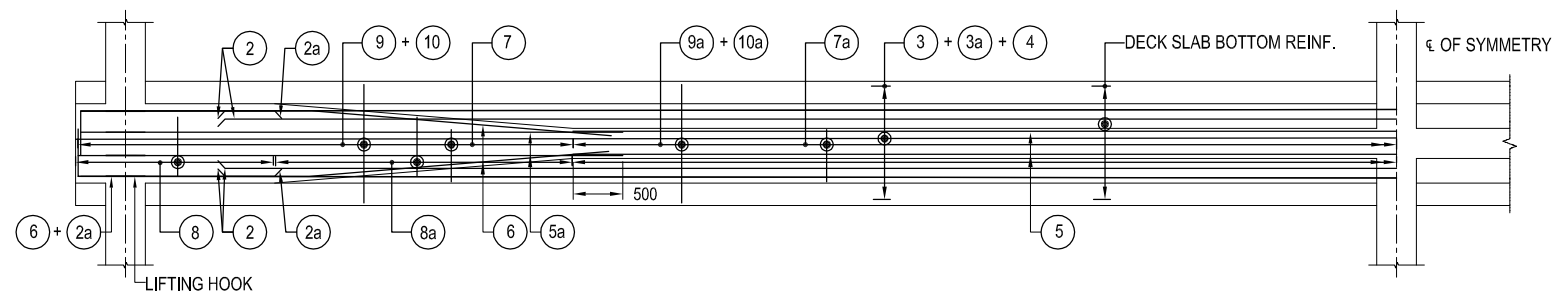
SCALE - 1 : 25

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 Ingeniera Madrid, Spain  STUP Consultants Private Limited Kolkata, India In Association With Udaya Consultancy, Geocom International, Sundar Kriti Consultant and Rays Consultant Private Limited	Designed By Mr. R.D. Nac.No. 6489 CIVIL/14 Checked By Mr. S.M. Approved By Mr. H.B.	Drawing Name DECK SLAB DETAILS OF BRIDGE OVER RIVER BATUWA Reference Drawings KDP/DPR/STR/BR/BATUWA/DD-14	Scale: SCALE: AS SHOWN Chainage: 281+990	Date: 16.04.2023 Drawing No. KDP/DPR/STR/BR/BATUWA/DD-11 Sheet No. 1 / 1
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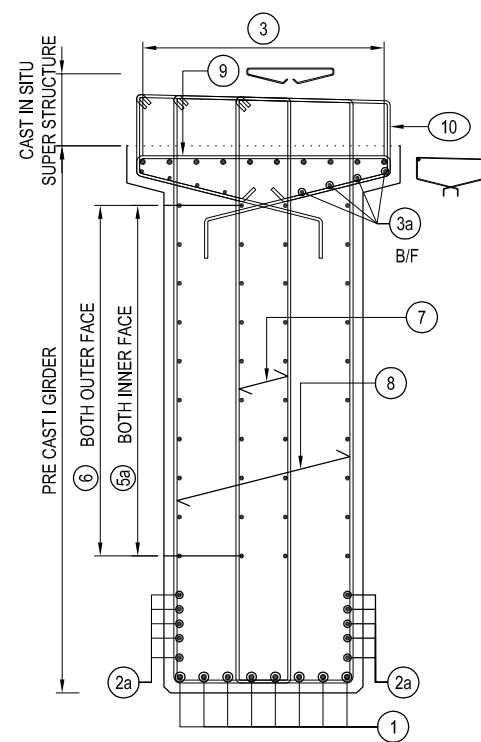
ELEVATION SHOWN REINFORCEMENT DETAIL OF LONGITUDINAL GIRDER

(SCALE 1:75)



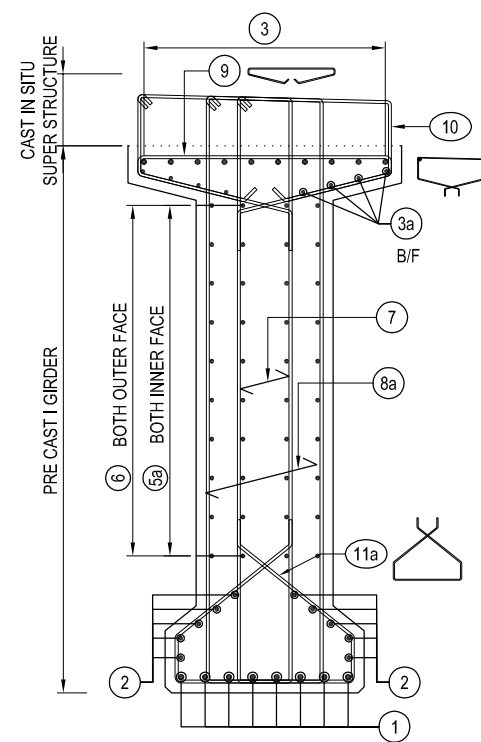
HALF PLAN SHOWING REINFORCEMENT DETAIL OF LONGITUDINAL GIRDER

(SCALE 1:75)



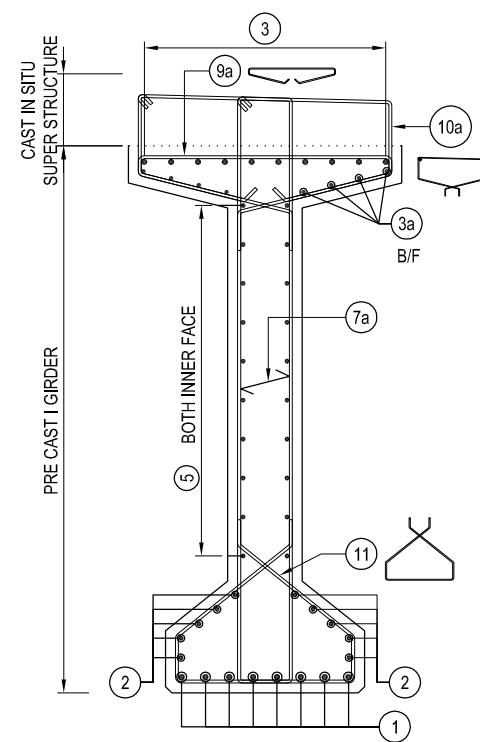
SECTION AT C-C

(SCALE 1:30)



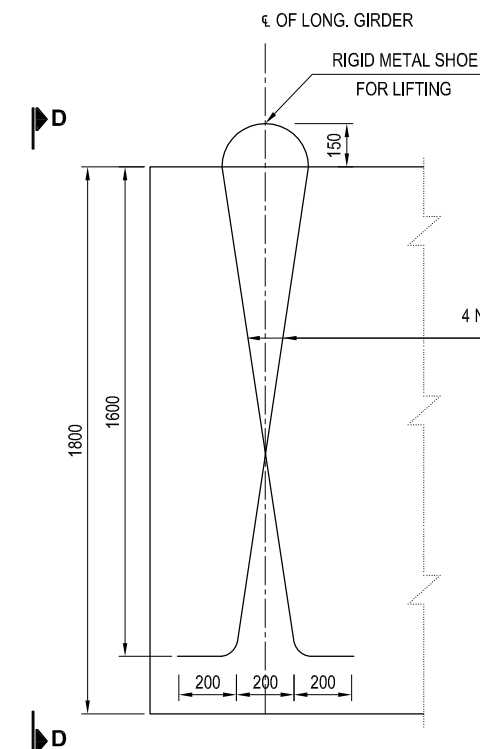
SECTION AT B-B

(SCALE 1:30)



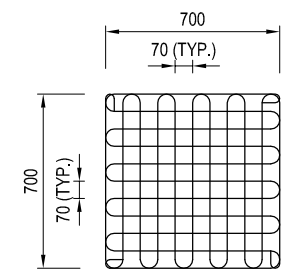
SECTION AT A-A

(SCALE 1:30)



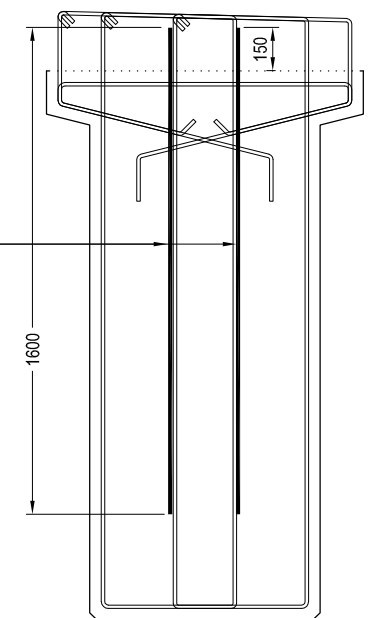
TYPICAL DETAIL OF LIFTING OF GIRDER AT EACH END OF THE GIRDER

(SCALE 1:30)



MESH TYPE "A"

8Ø MESH TO BE PLACED UNDER BEARING
(SCALE 1:30)



SECTION D-D

(SCALE 1:30)

NOTES :-

- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS.
- DO NOT SCALE THIS DRAWING. ONLY WRITTEN DIMENSION SHALL BE FOLLOWED.
- MATERIALS:-
CONCRETE : CONFORMING TO IS :456.
PSC GIRDERM-45
DECK SLAB & CROSS GIRDER M-40
- REINFORCEMENT: Fe 500D CONFORMING TO IS 1786
- CLEAR COVER TO ANY REINFORCEMENT: 40mm.
- LAP LENGTH OF THE BARS SHALL BE AS PER IRC 112:2011 NOT MORE THEN 50% OF BARS SHALL BE LAPPED AT ONE LOCATION.
- MESH 'A' SHALL BE PROVIDED IN GIRDER AT BEARING LOCATION IN TWO LAYERS AT 20MM & 100MM FORM SOFFIT OF GIRDER. ALL MESH REINFORCEMENT SHALL BE CENTRALLY PLACED W.R.T. BEARING.
- STRANDS SHALL BE OF SAME SPECIFICATION AS PROVIDED FOR STRESSING FOR GIRDER.
- BAR/STRANDS FOR LIFTING OF GIRDER SHALL BE PROVIDED IN SUCH A WAY SO AS TO ENSURE THAT LOAD IS TRANSFERRED ON ALL BAR/STRANDS SIMULTANEOUSLY.
- WHERE ANCHORAGE AND LAPS ARE USED THE MINIMUM ANCHORAGE AND LAP LENGTHS SHALL BE PROVIDED AS BELOW.

NOTE :

READ THIS DRAWING IN CONJUNCTION WITH
DRG NO. KDP/DPR/STR/BR/BATUWA/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  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. R.D.	MAIN GIRDER REINFORCEMENT DETAILS OF BRIDGE OVER RIVER BATUWA	SCALE: AS SHOWN	16.04.2023
			Checked By	Reference Drawings		Drawing No. KDP/DPR/STR/BR/BATUWA/DD-12
			Approved By	KDP/DPR/STR/BR/BATUWA/DD-14		Sheet No. 1 / 3

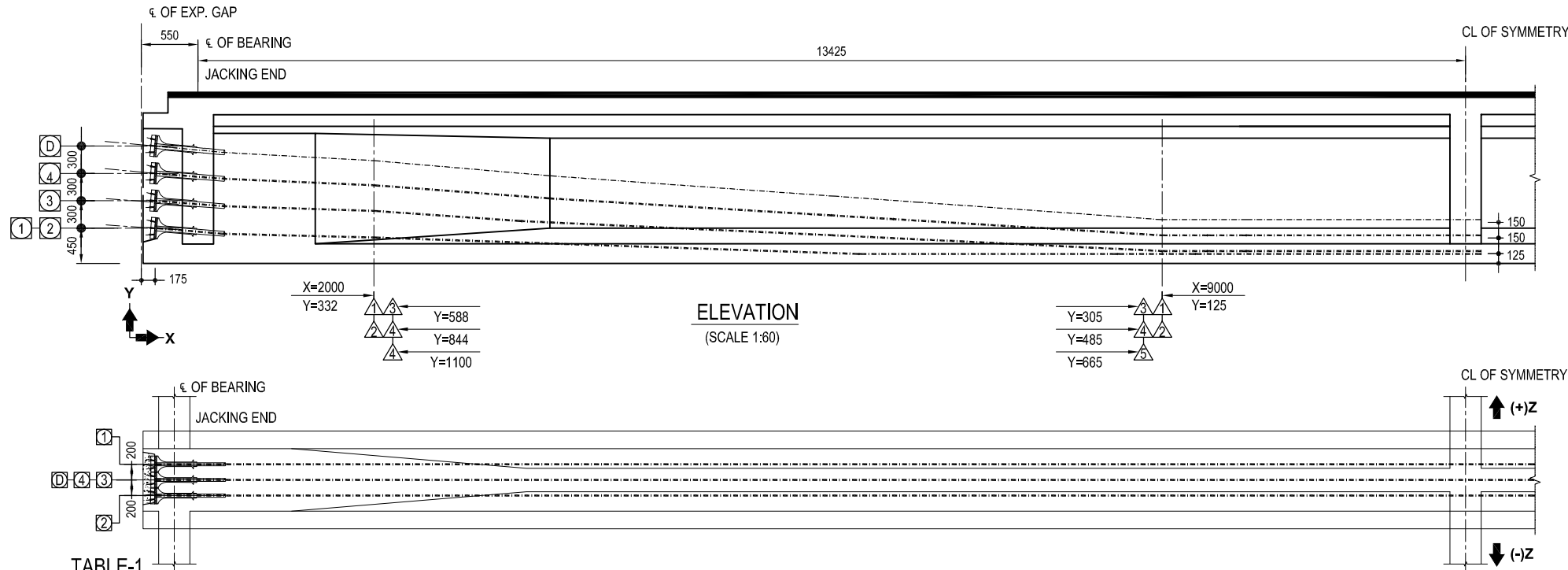


TABLE-1

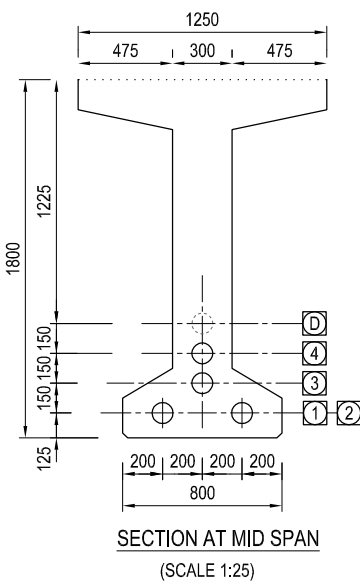
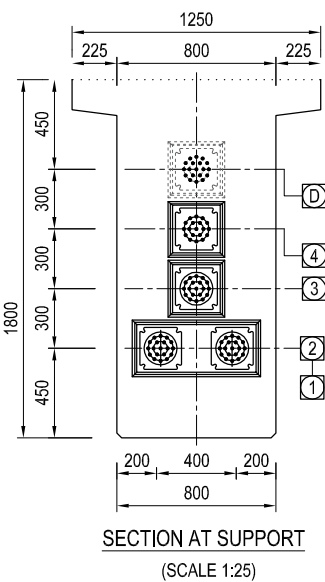
'Y' & 'Z' COORDINATES AT DISTANCE 'X' FROM END OF CABLE/DUCT IN mm.

Cable No.	X	150	500	1500	2000	3000	3500	5000	6500	7500	9000	10500	11000	11500	12000	12500	13000	13500	14075
1	Y	450	420	361	332	277	252	192	151	134	125	125	125	125	125	125	125	125	125
	Z	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
2	Y	450	420	361	332	277	252	192	151	134	125	125	125	125	125	125	125	125	125
	Z	-200	-200	-200	-200	-200	-200	-200	-200	-200	-200	-200	-200	-200	-200	-200	-200	-200	-200
3	Y	750	710	629	588	513	480	397	341	318	305	305	305	305	305	305	305	305	305
	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	Y	1050	999	896	844	749	707	602	531	501	485	485	485	485	485	485	485	485	485
	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	Y	1350	1288	1163	1100	984	933	807	720	685	665	665	665	665	665	665	665	665	665
	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TABLE-2

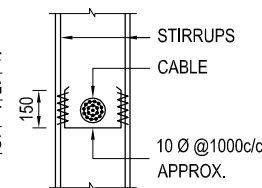
SCHEDULE OF TENDON FORCE AND EXTENSION:-

Cable No.	Total Length of Cable (mm)	Theoretical Elongation at Each End (mm)	Emergence Angle of Cable	No. of Strands	No. of Strands Left for Emergency	Jacking Force (T)	Stressing Type
1	30463	106.26	3.38	19	-	272.2	Both End
2	30463	107.09	3.38	19	-	272.2	Both End
3	30475	105.96	4.63	18	1	257.9	Both End
4	30490	105.79	5.88	18	1	257.9	Both End
5	Dummy		7.12				



TYPICAL DETAIL OF SUPPORTING ARRANGEMENT FOR CABLES (SCALE 1:20)

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



PLAN SHOWING STRESSING OF CABLE 1 & 2 (SCALE 1:25)

SEQUENCE OF STRESSING :-

* CABLES SHALL BE STRESSED IN THE FOLLOWING SEQUENCE

SL.NO.	CABLE NO.	SEQUENCE OF STRESSING
1.	③	AFTER 7 DAYS OF CASTING OR AFTER CONCRETE ATTAINS 37MPa CUBIC STRENGTH, WHICHEVER IS LATER (BOTH ENDS PRESTRESSING)
2.	① & ②	AFTER 21 DAYS OF CASTING GIRDER OR CONCRETE ATTAINS 48MPa CUBIC STRENGTH. CABLE 1 & 2 SHALL BE STRESSED FROM ONE END AS SHOWN IN PLAN SIMULTANEOUSLY FROM OPPOSITE ENDS TO EACH OTHER.
3.	④	STRESS CABLE 4 (BOTH ENDS PRESTRESSING)

SEQUENCE OF CONSTRUCTION :-

SL.NO.	LOADING CASES	TIME (DAYS)
1.	CASTING OF GIRDER	0 DAYS
2.	1 st STAGE PRESTRESSING	7 DAYS OR AFTER CONCRETE ATTAINS 37mpa WHICHEVER IS LATER.
3.	2 nd STAGE PRESTRESSING	21 DAYS OR AFTER CONCRETE ATTAINS 48mpa WHICHEVER IS LATER.
4.	CASTING OF DECK SLAB	28 DAYS
5.	REMOVAL OF DECK SHUTTERING	56 DAYS
6.	CASTING OF CRASH BARRIER	56 DAYS
7.	LAYING OF ASPHALT CONCRETE & ALLOWING LIVE LOAD	63 DAYS

NOTES:-

- ALL DIMENSIONS ARE IN MILLIMETERS, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
- DIMENSIONS ARE NOT TO BE SCALED, ONLY WRITTEN DIMENSIONS ARE NOT TO BE FOLLOWED.

3. PRESTRESSING SYSTEM

- ALL PRESTRESSING STRANDS SHALL HAVE 7 PLY UNCOATED STRESS RELIEVED HIGH TENSILE STRANDS (LOW RELAXATION) OF CONFIRMING TO CLASS 2 OF IS 14268-1983.
- CORRUGATED HDPE SHEATHING SHALL BE USED FOR ALL CABLES
- THE PARAMETERS ADOPTED FOR DESIGN ARE AS FOLLOWS-
 - SLIP AT EACH END-----6mm
 - MINIMUM SHEATH DIAMETER-----90mm (LD)-FOR 19T13
 - CO-EFFICIENT OF FRICTION----- $\mu=0.17$ RADIAN
 - WOBBLE CO-EFFICIENT----- $k=0.002/m$
 - NOMINAL AREA OF EACH STRANDS - $A=98.8mm^2$
 - NOMINAL ULTIMATE BREKING LOAD OF EACH STRANDS ----- $=183.71KN$
 - MODULUS OF ELASTICITY OF HIGH TENSILE STEEL ----- $E=1.95 \times 10^5 mpa$
- ALL THE DESIGN PARAMETERS SHALL BE VERIFIED AT SITE BEFORE USE.
- SYSTEM OF PRESTRESSING -19T13/12T13 (ISMAL)

4. PRESTRESSING OPERATION

- (ALL OPERATIONS TO BE SATISFY IRC AND MOST SPECIFICATION)
- ALL CABLES SHALL BE LAID IN SMOOTH CURVES PASSING THROUGH THE GIVEN ORDINATES AND SHALL BE SUPPORTED AT A SPACING NOT EXCEEDING 1000mm BY A 16mm DIA CROSS BAR / TACK WELDED SECURELY HELD IN POSITION WITH VERTICAL WEB REINFORCEMENT.
- CABLE LENGTHS MENTIONED IN THE TABLE-2 OF DRAWING ARE INCLUSIVE OF 1000mm EXTRA AT EACH ANCHORAGE. TOTAL LENGTH SHALL BE VERIFIED AT SITE.
- STRANDS OF CABLE NO. 1 & 2 SHALL BE STRESSED FROM ONE END SIMULTANEOUSLY FROM OPPOSITE ENDS TO EACH OTHER, STRANDS OF CABLE NO. 3 & 4 SHALL BE TENSIONED FROM BOTH ENDS SIMULTANEOUSLY. JACK USED FOR TENSIONING SHALL BE ISMAL 3000 RG / 4000 MG OR EQUIVALENT FOR 19T13 & J20/1000MG FOR 7T13, JACKING FORCES GIVEN IN TABLE-2 SHALL BE INCREASED BY RELEVANT PERCENTAGE TO ACCOUNT FOR ANCHORAGE AND JACK FRICTION & EFFICIENCY AS PER MANUFACTURE'S INSTRUCTIONS.
- GROUTING OF CABLES SHALL BE DONE IN SAME SEQUENCE AS STRESSING AND SHALL CONFORM WITH IRC:112-2011 AND ALSO TO MOST SPECIFICATION.
- ANCHORAGE POCKET SHALL BE FILLED ITH EPOXY MORTAR OR NON SHRINK CONCRETE AFTER STRESSING & GROUTING.
- EXTENSIONS SHALL BE RECHECKED AFTER 24 HOURS AFTER ANCHORING TO OBSERVE SLOW SLIPPAGE THE MATTER SHALL BE REPORTED FOR EXCESSIVE SLIPPAGE IF ANY.
- EXTENSIONS GIVEN IN TABLE-2 ARE FOR HALF CABLE LENGTHS (BOTH ENDS STRESSING) FULL CABLE LENGTH (ONE ENDS STRESSING) INCLUSIVE OF 750mm GRIP LENGTH AT EACH END LOSS UPTO 6mm DUE TO SLIP OF ANCHORAGES ARE NOT TO BE COMPENSATED DURING SITE OPERATIONS. JACK PRESSURE & EXTENSION OF CABLES AT EACH END GIVEN IN THE DRAWING SHALL BE VERIFIED AT SITE.
- INITIAL SLACKNESS IN THE PRESTRESSING SHALL BE REMOVED BY APPLYING SMALL TENSION. THE INITIAL TENSION REQUIRED TO REMOVE THE INITIAL SLACKNESS SHALL BE TAKEN AS THE STARTING POINT FOR MEASURING ELONGATION AND CORRECTION SHALL BE APPLIED AS PER CLAUSE 12.2.1.3 OF IS:1343-1980.
- 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 EXTENSION GIVEN IN TABLE-2 SHALL BE MODIFIED AT SITE IN CASE ACTUAL VALUE OF AREA OF STRAND "A" AND MODULUS OF ELASTICITY "E" VARIES FROM THOSE ASSUME IN DESIGN REVISED EXTENSION SHALL BE CALCULATED AS UNDER:

$$\text{ELONGATION} = \frac{98.7 \times 195000}{\text{NEW AREA} \times \text{NEW MODULUS}} \times \text{X ELONGATION GIVEN IN TABLE-2}$$

- THE EXTENSION OF CABLES SHALL BE VERIFIED FOR A FEW CABLES AT SITE. IN CASE THE VALUE OF AND ARE DIFFERENT THAN THOSE CONSIDERED, EXTENSION SHALL BE SUITABLY MODIFIED AFTER APPROVAL OF ENGINEER-IN-CHARGE.
- THE GRIP LENGTH FROM ANCHORAGE FACE TO GRIPPING POINT IN JACK ASSUMED IN TENSION CALCULATION IS 750mm AND THE ADDITIONAL LENGTH TAKEN FOR CUTTING IS 200mm. IF GRIP LENGTH VARIES THAN THOSE CONSIDERED, EXTENSIONS SHALL BE MODIFIED.

8. SPECIAL NOTES FOR PRESTRESSING:-

- IF THE CALCULATED ELONGATION IS REACHED BEFORE THE CALCULATED GAUGE PRESSURE IS OBTAINED CONTINUE TENSIONING TILL ATAINING THE CALCULATED GAUGE PRESSURE PROVIDED BY ELONGATION DOESNOT EXCEED 1.05 TIMES THE CALCULATED ELONGATION . IF THIS ELONGATION IS ACHIEVED BEFORE THE CALCULATED GAUGE PRESSURE IS ATTAINED STOP STRESSING & INFORM THE ENGINEER-IN-CHRG.
- IF THE CALCULATED ELONGATION HAS NOT BEEN REACHED CONTINUE TENSIONING BY INTERVALS OF 5KG/sq cm 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 THEN 0.95 TIMES THE CALCULATED ELONGATION, THE FOLLOWING MEASURES MUST BE TAKEN IN SUCCESSION TO DEFINE THE CAUSE OF THIS LACK OF ELONGATION
 - RECALIBRATE THE PRESSURE GAUGE.
 - CHECK THE CORRECT FUNCTIONING OF THE JACK PUMP AND LEADS.
 - DE-TENSION CABLE, SLIDE IT IN ITS DUCT TO CHECK THAT IT IS NOT BLOCKED BY MORTAR WHICH HAS INTERED THROUGH HOLES IN THE SHEATH, DETENSION THE CABLE IF FOUND FREE.
- IF THE ELONGATION IS NOT OBTAINED FURTHER FINISHING OPERATIONS SUCH AS CUTTING OR SEALING SHOULD NOT BE UNDERTAKEN WITHOUT THE APPROVAL OF ENGINEER-IN-CHARGE.
- FOR CO-ORDINATES REFER TABLE 1 OF THIS DRAWING.
- FORCE IN CABLE 1 & 2 IS TO BE KEPT SAME AND UNIFORM ALWAYS, THROUGHOUT THE WHOLE PRESTRESSING OPERATION.
- DO NOT MAKE GROUTING TILL THE LOAD VS ELONGATION VALUE IS FOUND IN CONFERMITY WITH THE FORCE VS ELONGATION TABLE. OTHERWISE, SHARE LOAD VS ELONGATION VALUE TO THE DESIGNER FOR FURTHER ACTION.



EMPLOYER

PROJECT NAME

DESIGN CONSULTANTS

Designed By

Mr. R.D.

Nec.No. 6489 CIVIL/14

Checked By

Mr. S.M.

Approved By

Mr. H.B.

Drawing Name

MAIN GIRDER REINFORCEMENT DETAILS OF BRIDGE OVER RIVER BATUWA

Reference Drawings

KDP/DPR/STR/BR/BATUWA/DD-14

Scale:

SCALE: AS SHOWN

Chainage:

281+990

Date:

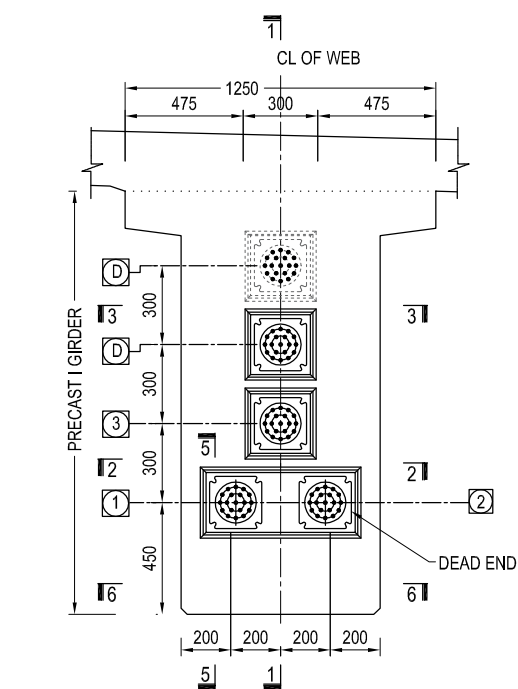
16.04.2023

Drawing No.

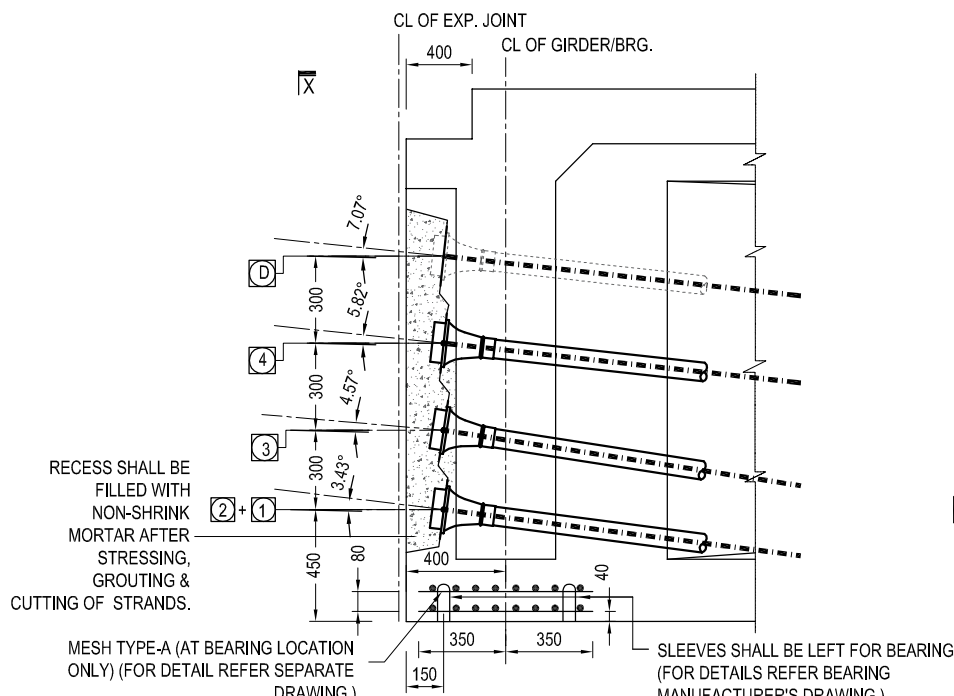
KDP/DPR/STR/BR/BATUWA/DD-12

Sheet No.

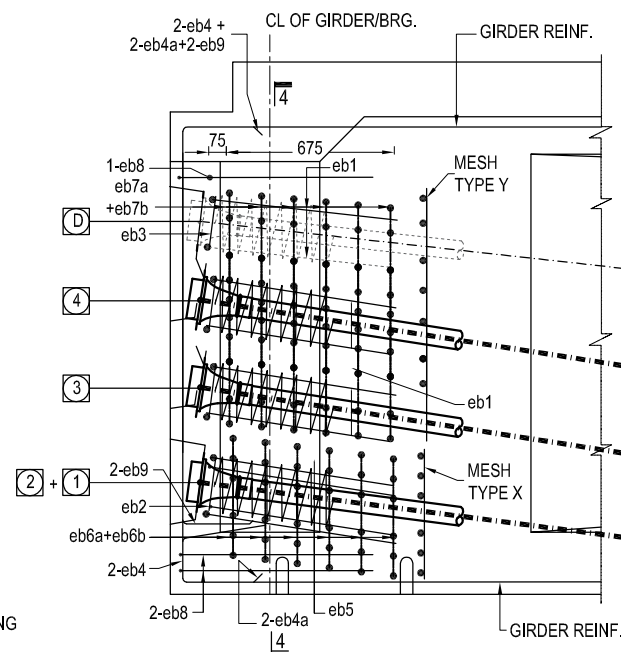
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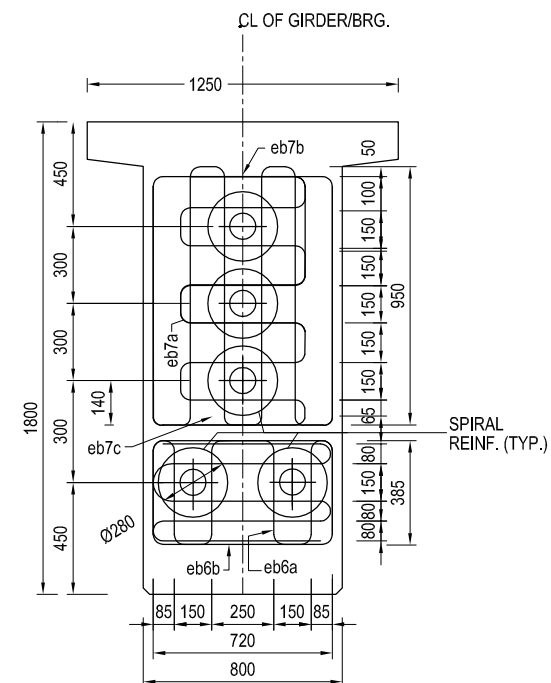
VIEW X-X
(CABLE 1 HAS A DEAD END ANCHOR AT THE OTHER END OF GIRDER)
(CABLE 2 HAS A JACKING ANCHOR AT THE OTHER END OF GIRDER)
(SCALE - 1:30)



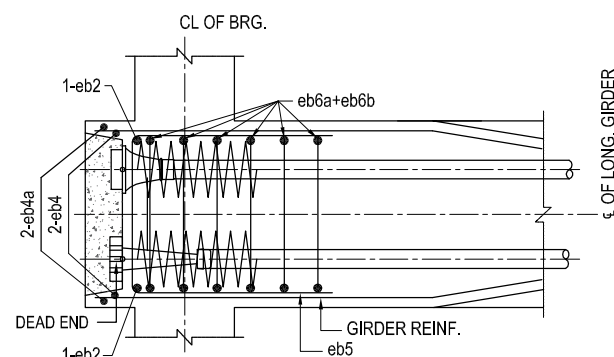
SECTION 1-1
(SHOWING DIMENSIONS ONLY)
(SCALE - 1:30)



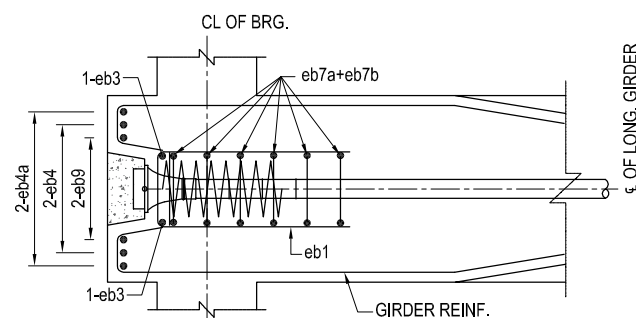
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(SHOWING REINFORCEMENT ONLY)
(SCALE - 1:30)



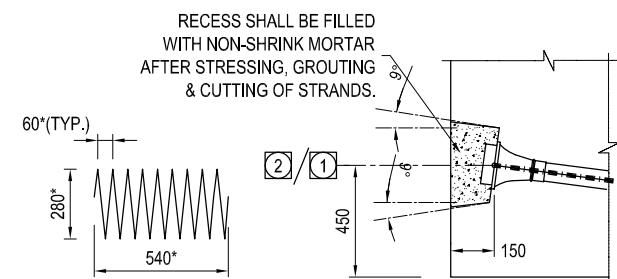
SECTION 4-4
(SCALE - 1:30)



SECTION 2-2
(SCALE - 1:30)

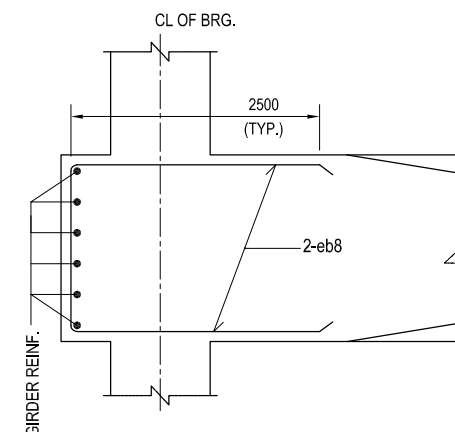


SECTION 3-3
(SCALE - 1:30)

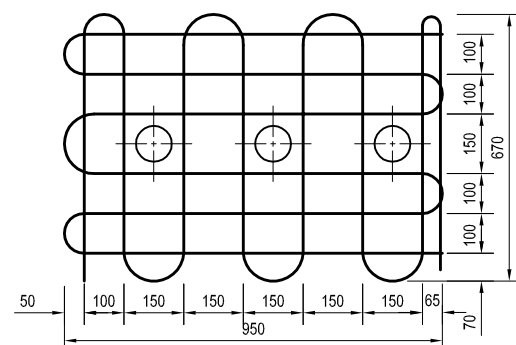


16 Ø SPIRAL
(FOR 19 T 13 CABLE)
* THE DETAIL TO BE VERIFIED AS PER THE
PRESTRESSING SYSTEM (SCALE - 1:30)

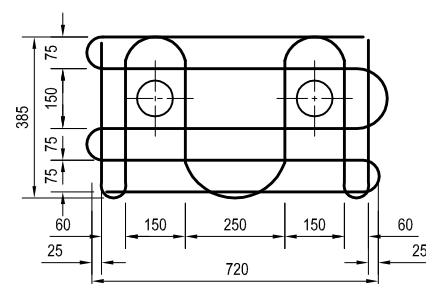
SECTION 5-5
(SHOWING DIMENSIONS ONLY)
(SCALE - 1:30)



SECTION 6-6
(SCALE - 1:30)



DETAIL OF 8mm MESH TYPE 'Y'
(SCALE 1:15)



DETAIL OF 8mm MESH TYPE 'X'
(SCALE 1:15)

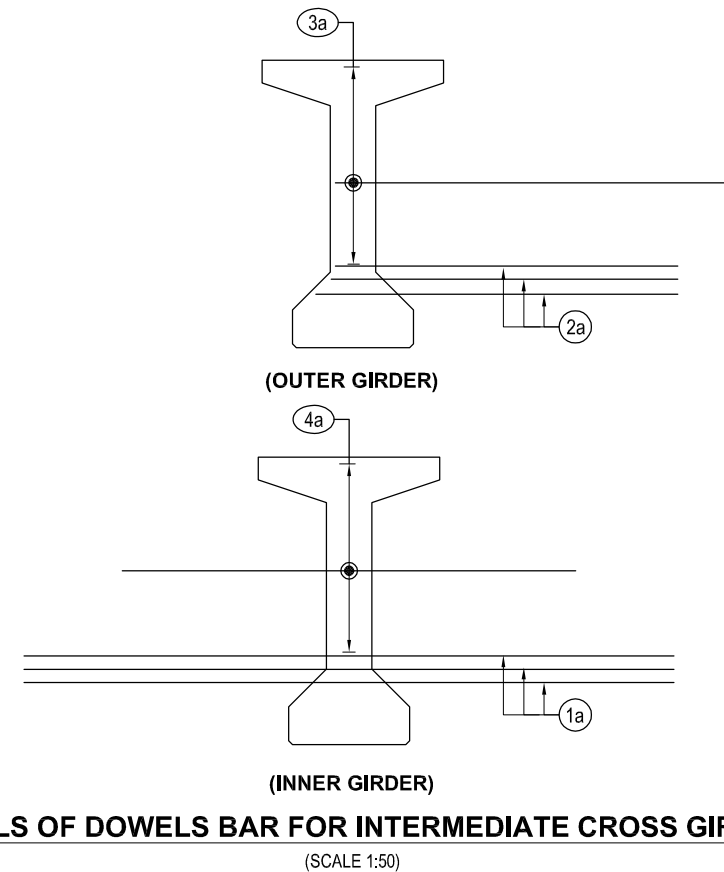
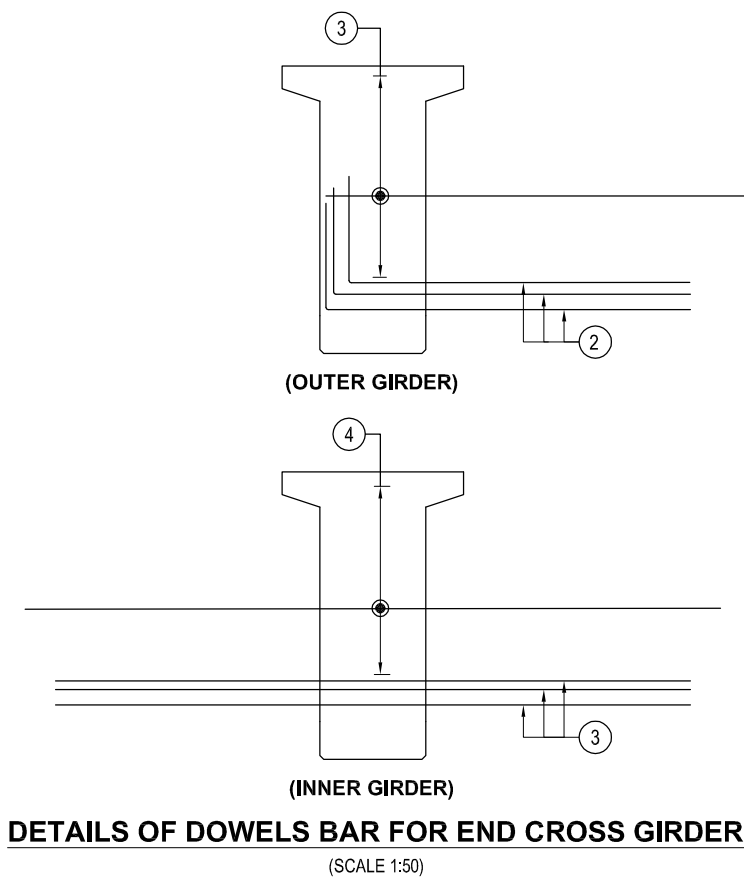
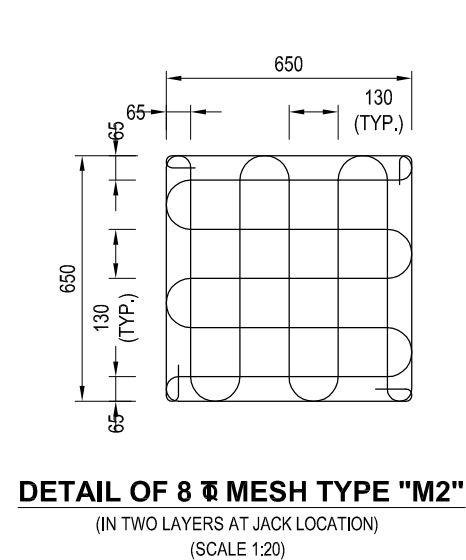
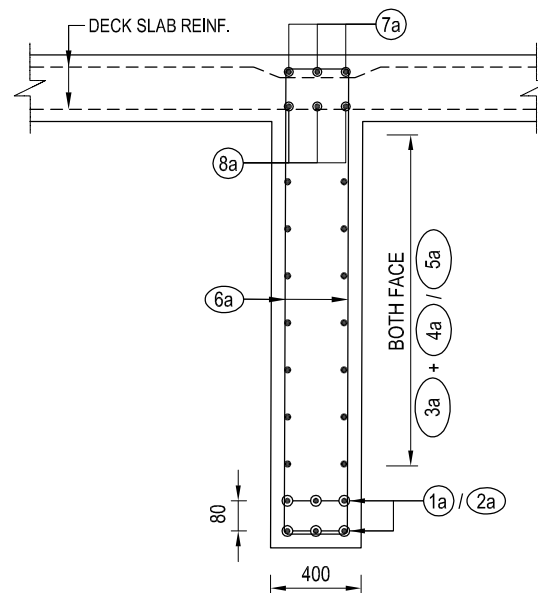
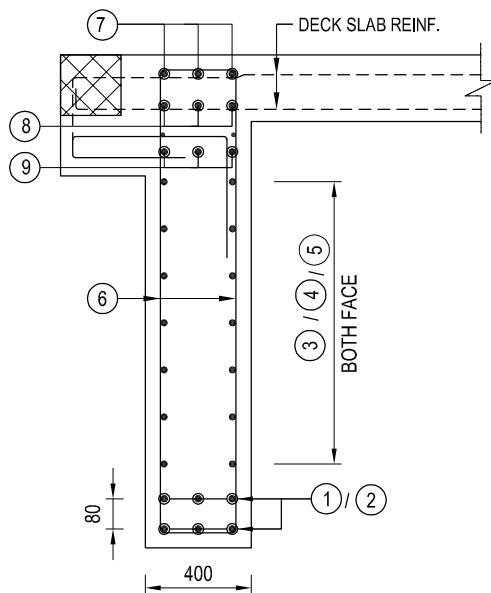
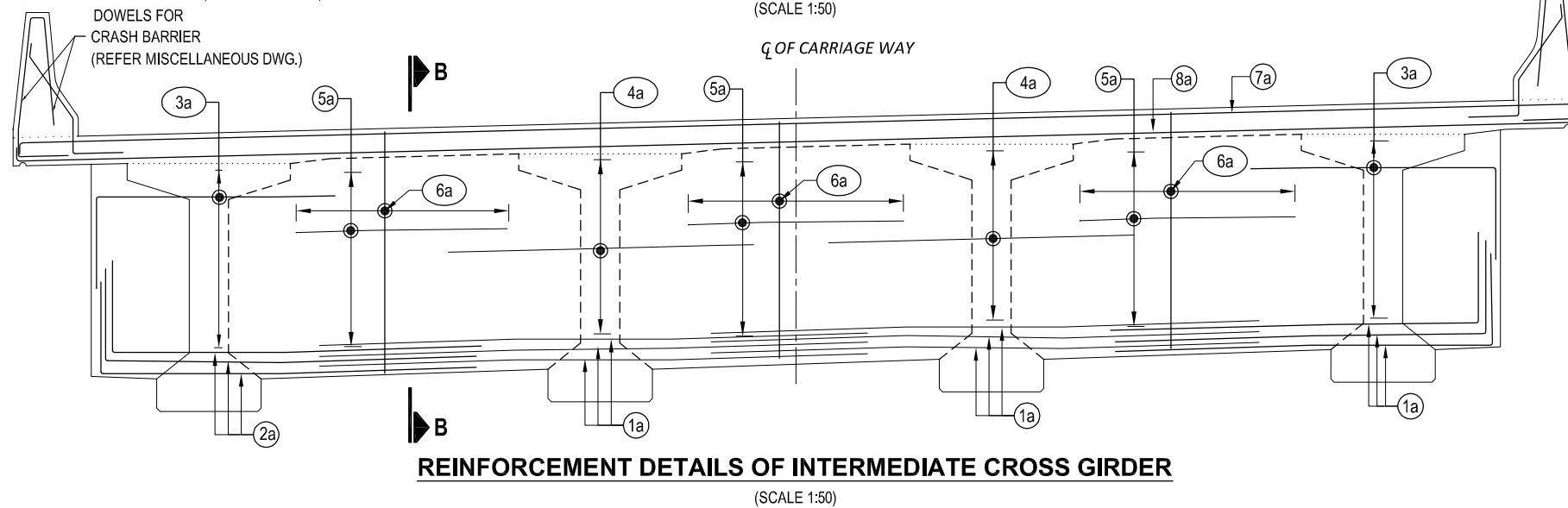
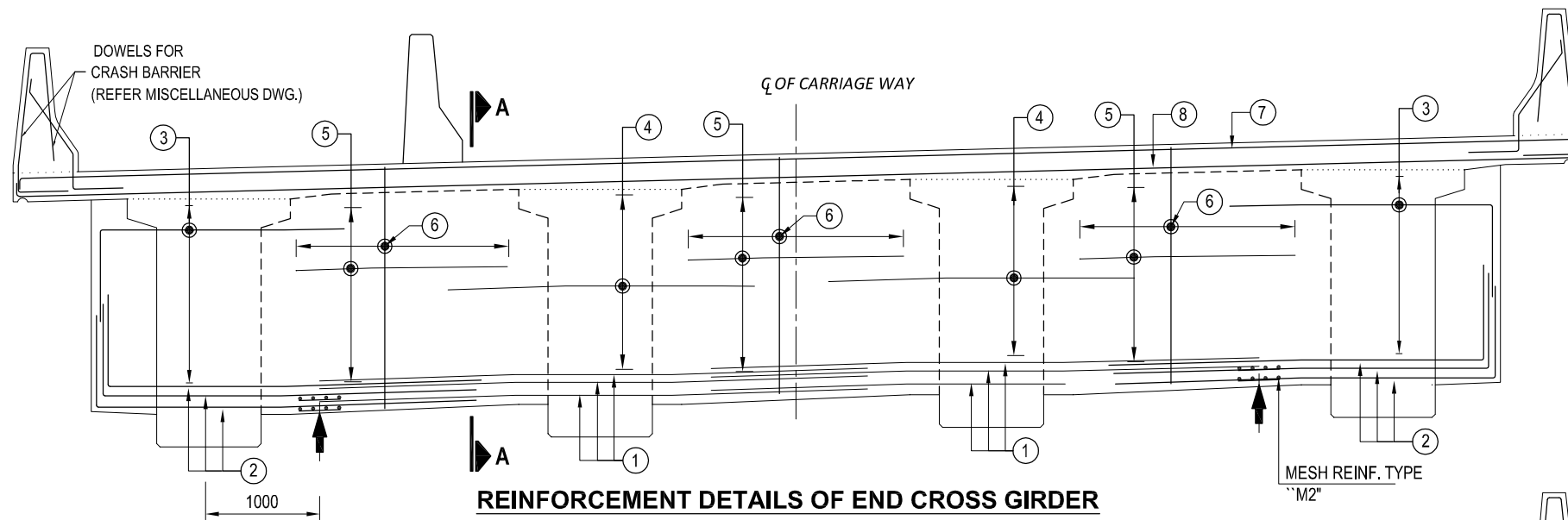
NOTES:

- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SPECIFIED
- DIMENSIONS ARE NOT TO BE SCALED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
- CLEAR COVER TO ANY REINFORCEMENT SHALL BE 40mm.
- ALL REINFORCING STEEL SHALL BE OF HIGH YIELD STRENGTH DEFORMED BARS (GRADE DESIGNATION Fe500D) CONFORMING TO IS : 1786.
- PORTION SHOWN THUS SHALL BE FILLED UP WITH PRE PACKED NON-SHRINK MORTAR AS PER SPECIFICATIONS. AFTER STRESSING & GROUTING IS COMPLETED.
- SLEEVES SHALL BE GROUTED WITH NON SHRINK FREE FLOW MORTAR AFTER PLACING OF LUGS FOR BEARING.

NOTE :

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

EMPLOYER	PROJECT NAME	DESIGN CONSULTANTS	Designed By	Mr. R.D.	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 Kamal-Dhalkebar-Pathalaya 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 Kriti Consultant and Rays Consultant Private Limited	Checked By	Mr. S.M.	MAIN GIRDER REINFORCEMENT DETAILS OF BRIDGE OVER RIVER BATUWA Reference Drawings KDP/DPR/STR/BR/BATUWA/DD-14	Chainage: 281+990	16.04.2023
			Approved By	Mr. H.B.			Drawing No. KDP/DPR/STR/BR/BATUWA/DD-12
							Sheet No. 3 / 3



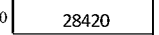
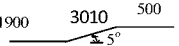
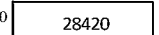
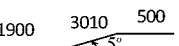
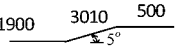
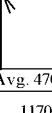
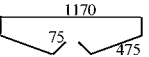
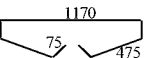
NOTE :
READ THIS DRAWING IN CONJUNCTION WITH
DRG NO. KDP/DPR/STR/BR/BATUWA/DD-4

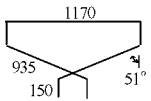
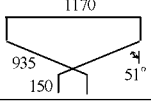
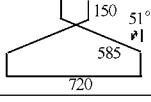
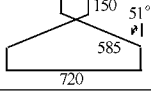
SECTION AT A-A
(SCALE 1:25)

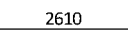
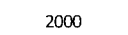
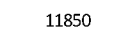
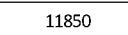
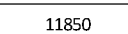
SECTION AT B-B
(SCALE 1:25)

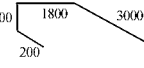
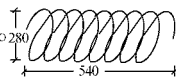
DETAILS OF DOWELS BAR FOR INTERMEDIATE CROSS GIRDER
(SCALE 1:50)

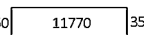
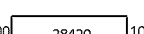
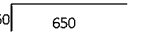
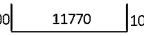
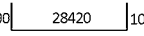
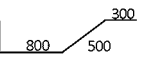
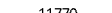
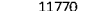
EMPLOYER Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Development Cooperation Implementation Division	PROJECT NAME Strategic Road Connectivity & Trade Improvement Project (SRCTIP) Detailed Design of Upgradation of Kamala-Dhalkebar-Pathlaiya Road Section (130 KM) of Mahendra Highway and Bridges	DESIGN CONSULTANTS Joint Venture of EPTISA Servicios De Ingenieria Madrid, Spain STUP Consultants Private Limited Kolkatta, India In Association With Udaya Consultancy, Geocom International, Sundar Kriti Consultant and Rays Consultant Private Limited	Designed By Mr. R.D. Nac.No. 6489 CH/134 Checked By Mr. S.M. Approved By Mr. H.B.	Drawing Name CROSS GIRDER REINFORCEMENT DETAILS OF BRIDGE OVER RIVER BATUWA Reference Drawings KDP/DPR/STR/BR/BATUWA/DD-14	Scale: SCALE: AS SHOWN Chainage: 281+990	Date: 16.04.2023 Drawing No. KDP/DPR/STR/BR/BATUWA/DD-13 Sheet No. 1 / 1
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BAR BENDING SCHEDULE OF GIRDER (1 NO)								
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	1	150  150	16		28.720	6	1.580	272.31
2	2	 28420	16		28.420	10	1.580	449.11
3	2a	1900  500	16		5.410	20	1.580	170.98
4	3	150  150	16		28.720	10	1.580	453.85
5	3a	 28420	16		28.420	8	1.580	359.28
6	4	SEE DECK REINFORCEMENT						
7	5	 28420	12		28.420	10	0.889	252.62
8	5a	1900  500	12		5.410	20	0.889	96.18
9	6	1900  500	12		5.410	20	0.889	96.18
10	7	100  1945	12	150	4.530	68	0.889	273.81
11	7a	100  1945	12	150	4.530	166	0.889	668.43
12	8	100  1945	12	150	5.530	28	0.889	137.64
13	8a	100  1945	12	150	5.030	42	0.889	187.79
14	9	 85	12	150	2.440	68	0.889	147.48
15	9a	 85	12	150	2.440	166	0.889	360.04

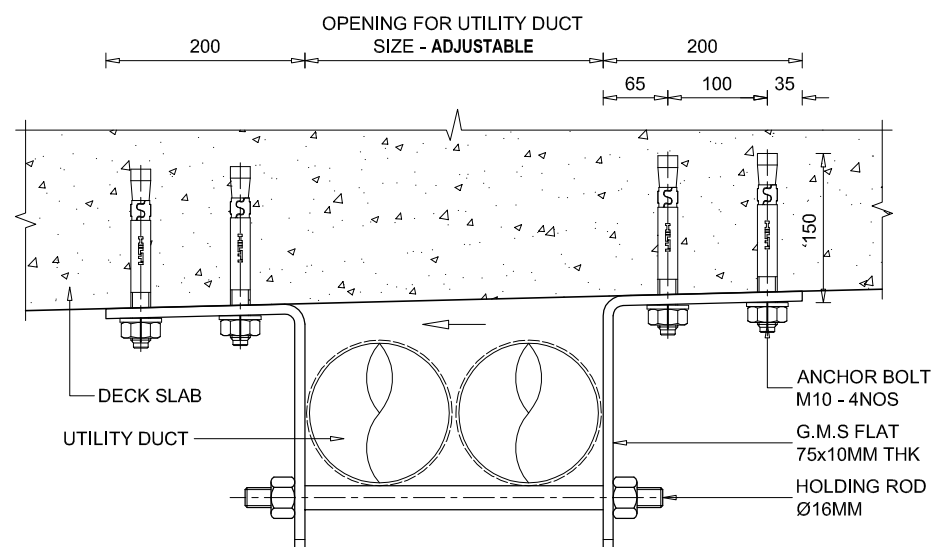
BAR BENDING SCHEDULE OF GIRDER (1 NO)								
S.No.	BAR MARK	DESCRIPTION OF BAR	BAR DIA.(MM)	SPACING (MM)	BAR LENGTH (M)	No. OF BARS	UNIT WEIGHT (Kg/m)	TOTAL WEIGHT (Kg)
16	10	290  51°	12	150	3.920	68	0.889	236.94
17	10a	290  51°	12	150	3.920	166	0.889	578.42
18	11	170  51°	12	150	2.530	68	0.889	152.92
19	11a	170  51°	12	150	2.530	166	0.889	373.32
20	12		16		4.000	4	1.580	25.28
TOTAL :							5292.57	
GRAND TOTAL (4 NO.S)							21170.29	

BAR BENDING SCHEDULE OF CROSS GIRDER (PER SPAN)								
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	1	 4200	20		4.200	60	2.469	622.22
2	2	700  2610	20		3.310	24	2.469	196.15
3	3	700  2000	12		2.700	24	0.889	57.60
4	4	 2400	12		2.400	60	0.889	128.00
5	5	 2000	12		2.000	72	0.889	128.00
6	6	100  1800	12	150	4.440	10	0.889	39.47
7	7	150  150	20		12.150	6	2.469	180.00
8	8	150  150	20		12.150	6	2.469	180.00
9	9	150  150	20		12.150	6	2.469	180.00
10	10		12		5.130	8	0.889	36.48
TOTAL :							1747.92	
GRAND TOTAL (3 NO.)							5243.75	

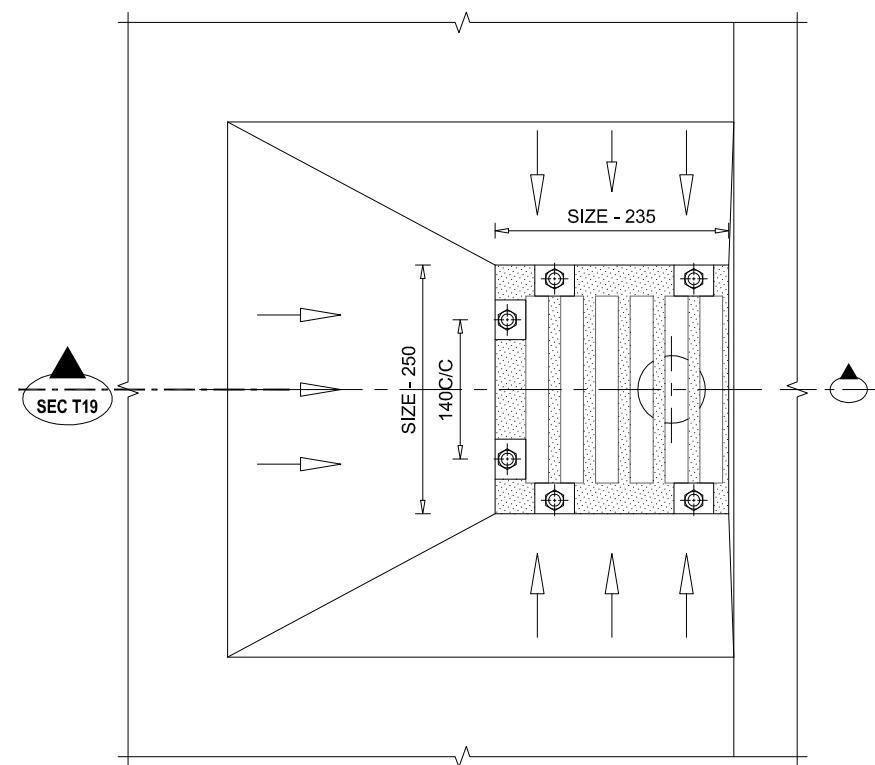
BAR BENDING SCHEDULE OF GRIDER END (1 NO)								
S.No.	BAR MARK	DESCRIPTION OF BAR	BAR DIA.(MM)	SPACING (MM)	BAR LENGTH (M)	No. OF BARS	UNIT WEIGHT (Kg/m)	TOTAL WEIGHT (Kg)
1	eb1		16		1.980	2	1.580	6.26
2	eb2	 1600	12		1.600	2	0.889	2.84
3	eb3	 1600	12		1.600	2	0.889	2.84
4	eb4 + eb4a	550  800	12		2.150	2	0.889	3.82
5	eb5		16		2.320	2	1.580	7.33
6	eb6	385 	16		10.310	6	1.580	97.75
7	eb7	670 	16		12.200	6	1.580	115.67
8	eb8		16		2.320	2	1.580	7.33
9	eb9	200  200	12		5.200	2	0.889	9.24
10	eb10		16		8.790	4	1.580	55.56
TOTAL :							308.67	
GRAND TOTAL (2 x 4 NO.S)							1234.67	

BAR BENDING SCHEDULE OF DECK (1 NO)								
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	350  350	16	100	12.470	285	1.580	5616.12
2	st4	100  100	10	150	28.620	79	0.617	1395.67
3	st4a	350  650	12	150	1.000	110	0.889	97.78
4	sb1	100  100	16	100	11.970	350	1.580	6620.44
5	sb3	100  100	12	150	28.620	110	0.889	2798.40
6	sb4	350  300	12	150	1.950	110	0.889	190.67
7	sb5	 11770	10		11.770	3	0.617	21.80
8	sb6	 11770	16		11.770	4	1.580	74.40
TOTAL :							16815.27	
GRAND TOTAL (1 NO.)							16815.27	

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 EPTISA Servicios De Ingeniera Madrid, Spain STUP Consultants Private Limited Kolkata, India	Designed By	Mr. R.D. Nac.No. 6489 CH/LV	SUPER STRUCTURE BAR BENDING SCHEDULE OF BRIDGE OVER RIVER BATUWA	Reference Drawings	SCALE: AS SHOWN	Chainage: 281+990	16.04.2023	
				Checked By	Mr. S.M.					Drawing No. KDP/DPR/STR/BR/BATUWA/DD-14	
				Approved By	Mr. H.B.					Sheet No. 1 /1	



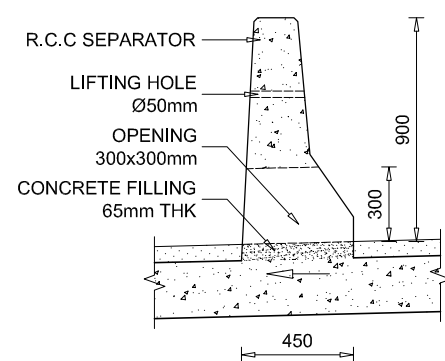
SECTIONAL ELEVATION VIEW AT SEC T17



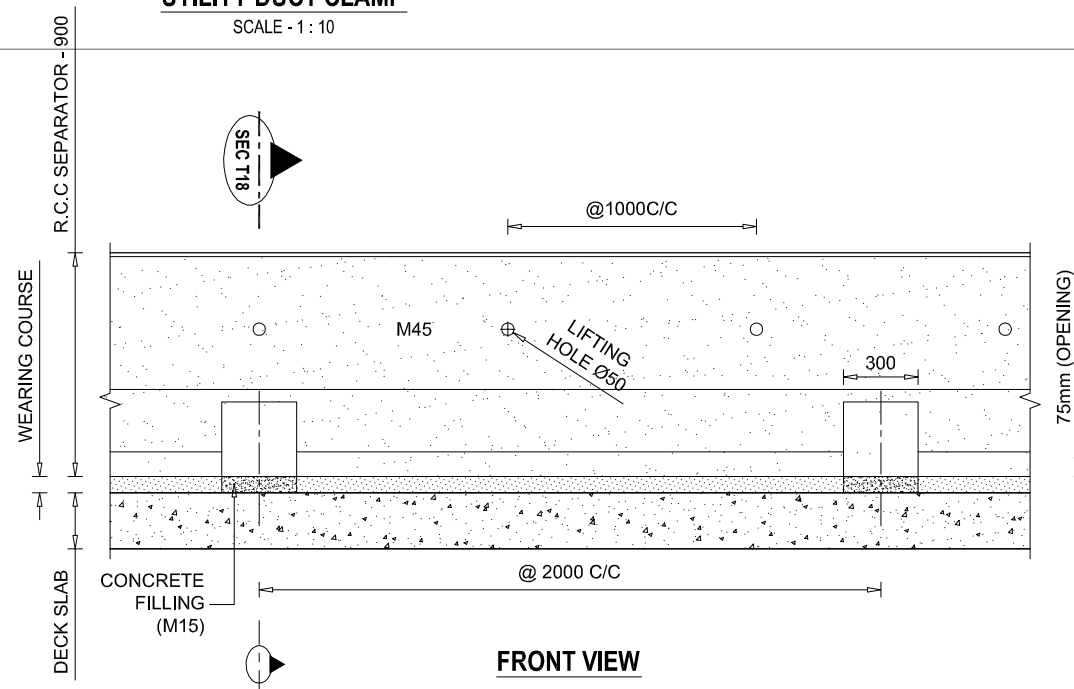
PLAN VIEW

UTILITY DUCT CLAMP

SCALE - 1 : 10



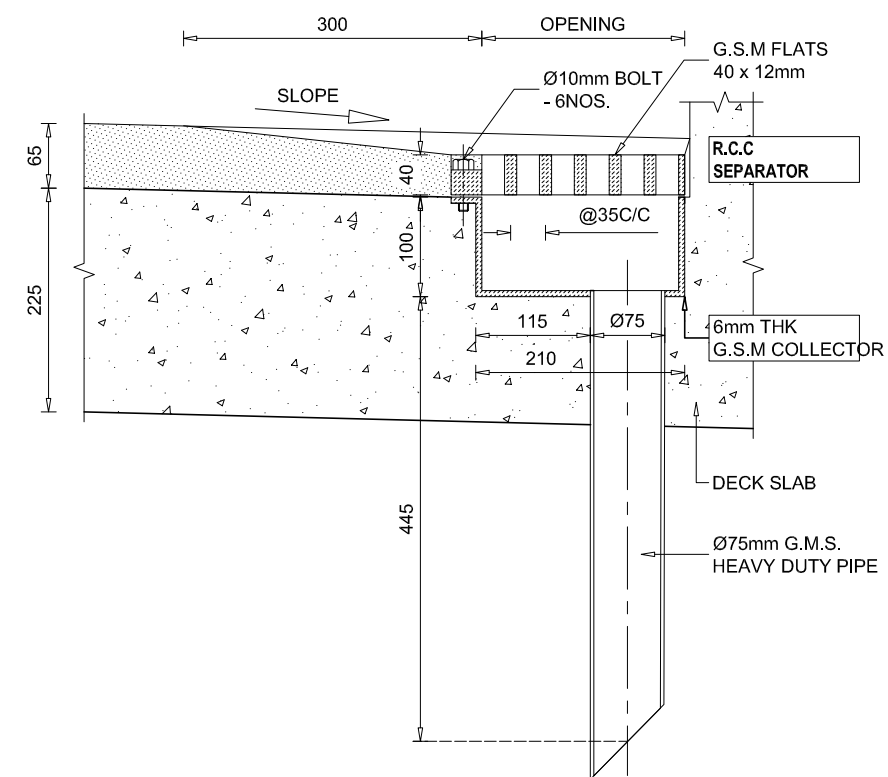
SECTIONAL ELEVATION VIEW AT SEC T18



FRONT VIEW

& IT'S DRAIN OPENING

SCALE - 1 : 40

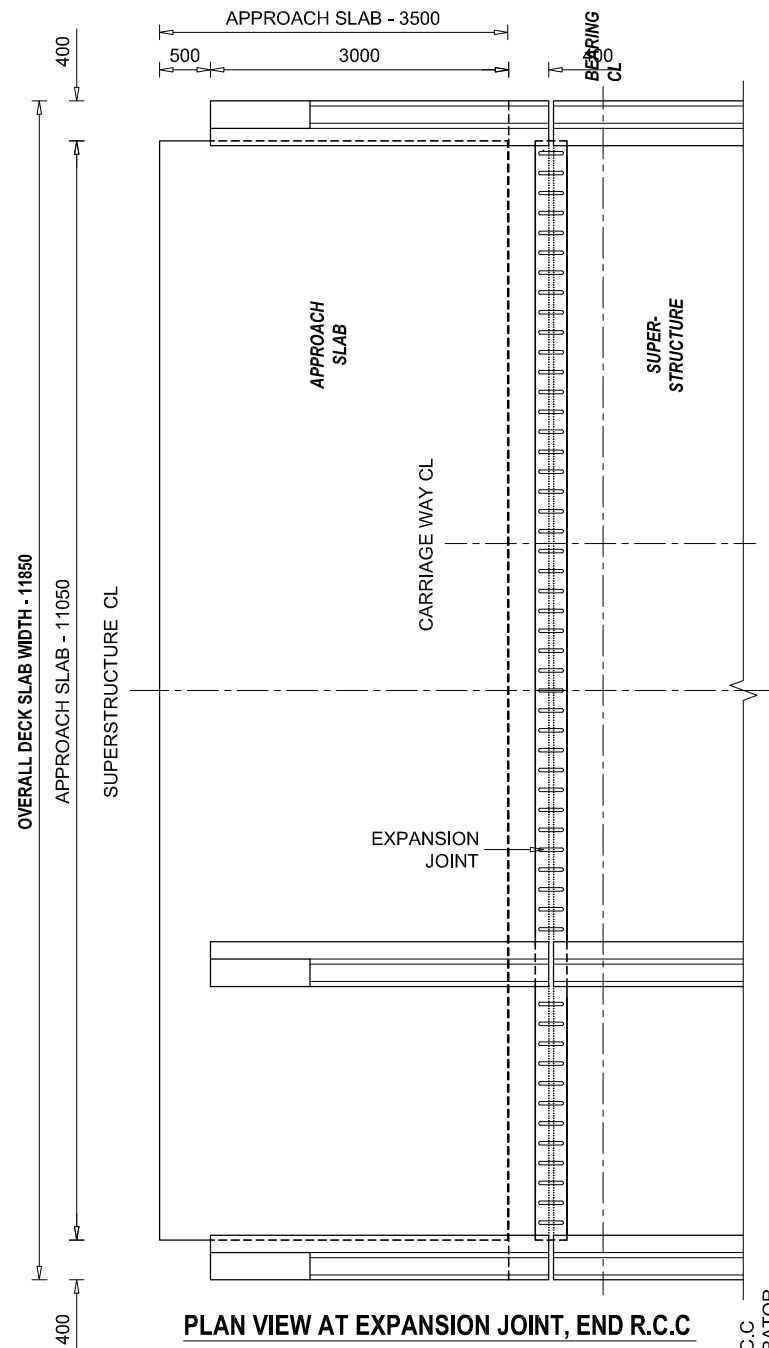


SECTIONAL ELEVATION VIEW AT SEC T19

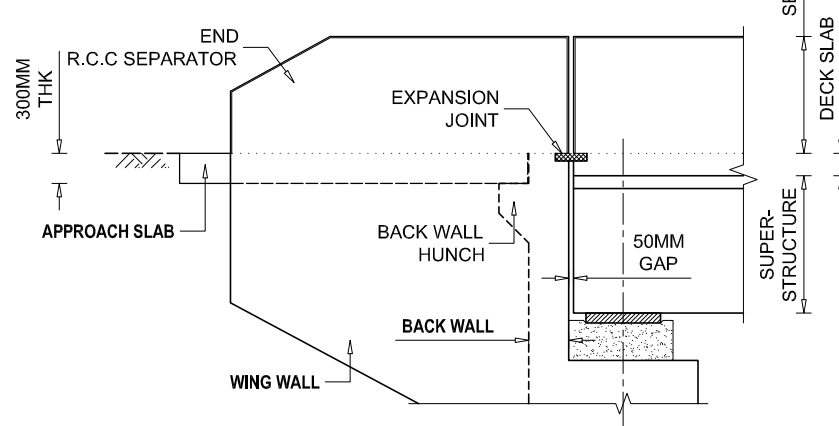
DRAINAGE SPOUT

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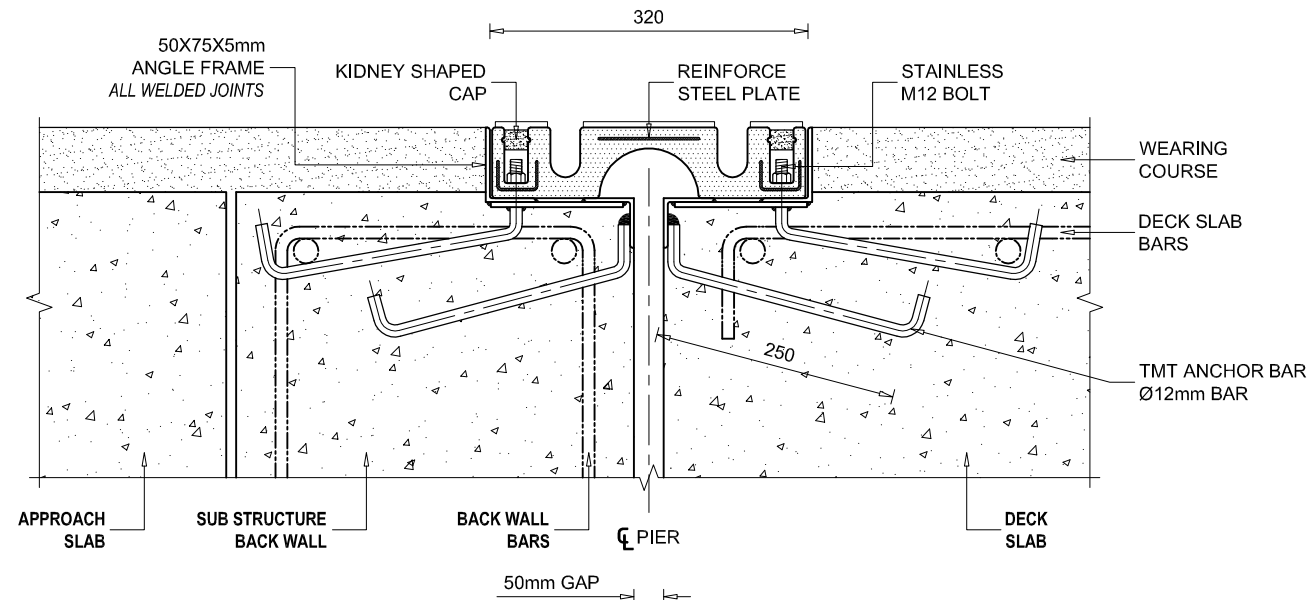
EMPLOYER	PROJECT NAME	DESIGN CONSULTANTS		Designed By	Mr.R.D.		Drawing Name	Scale:	Date:
 Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Development Cooperation Implementation Division	Strategic Road Connectivity & Trade Improvement Project (SRCTIP) Detailed Design of Upgradation of Kamala-Dhalkebar-Pathlaiya Road Section (130 KM) of Mahendra Highway and Bridges	Joint Venture of			Nec.No. 6489 CPVL/14				
		 EPTISA Servicios De Ingenieria Madrid, Spain	 STUP Consultants Private Limited Kolkatta, India	Checked By	Mr.S.M.				
		In Association With Udaya Consultancy, Geocom International, Sundar Krii Consultant and Rays Consultant Private Limited		Approved By	Mr.H.B.		Reference Drawings	Chainage:	
							MISCELLANEOUS DETAILS OF BRIDGE OVER RIVER BATUWA	AS SHOWN	16.04.2023
									Drawing No.- KDP/DPR/STR/BR/BATUWA /DD-15
								281+990	Sheet No.1 /2



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

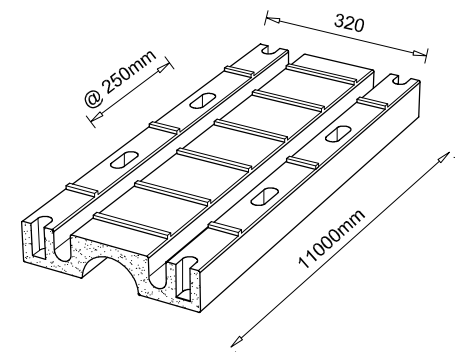


ELEVATION VIEW



SEAL TYPE EXPANSION JOINTS ARRANGEMENT IN A CARRIAGEWAY

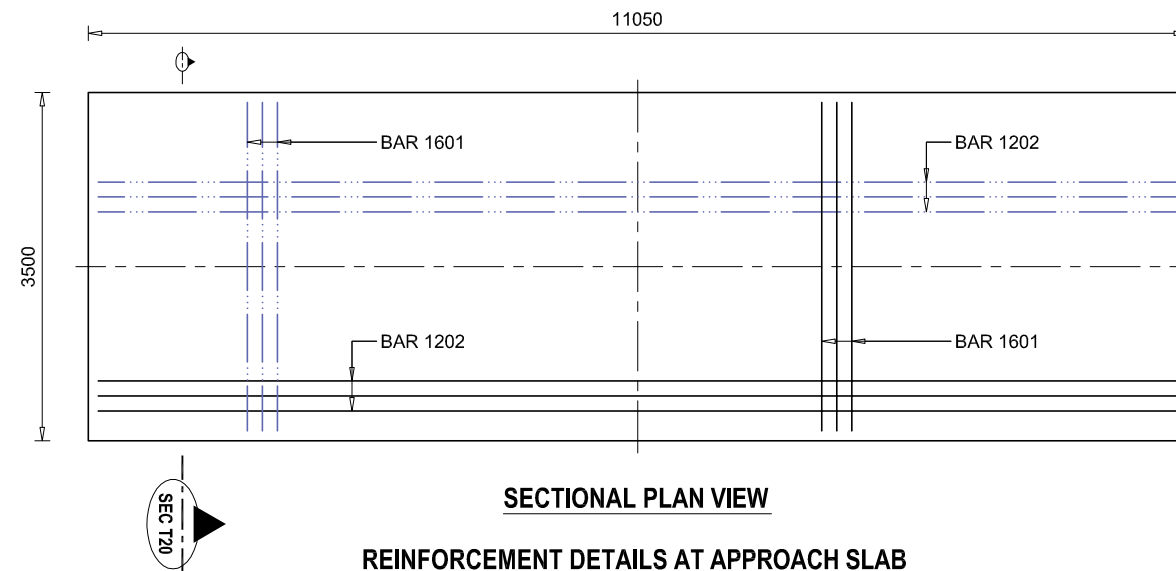
SCALE - 1 : 10 @ A3 PAPER



EXPANSION JOINT ISOMETRIC VIEW

- SEAL TYPE

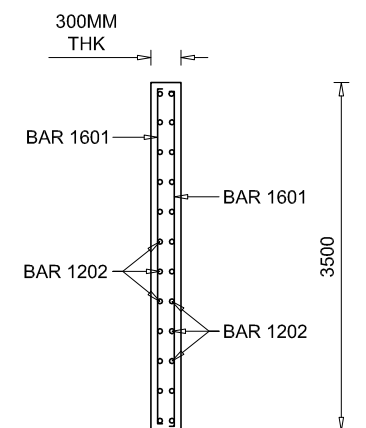
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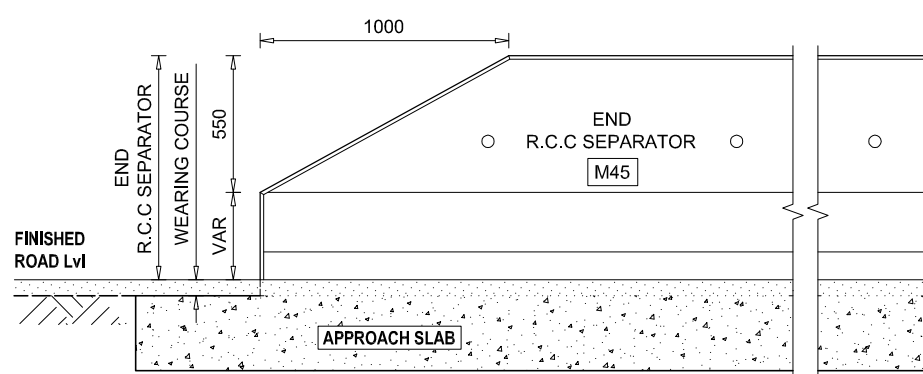
SECTIONAL PLAN VIEW

REINFORCEMENT DETAILS AT APPROACH SLAB

SCALE - 1 : 100 @ A3 PAPER

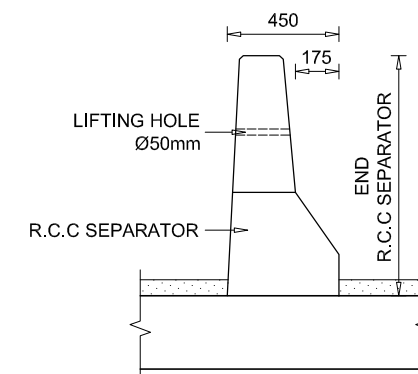


SECTIONAL ELEVATION VIEW AT SEC T20



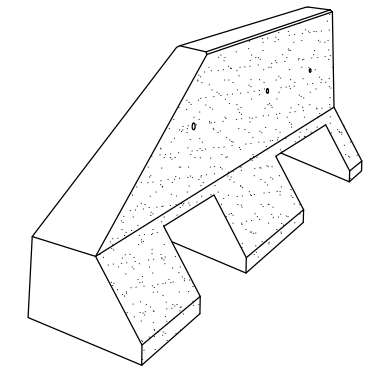
ELEVATION VIEW OF END R.C.C SEPARATOR

SCALE - 1 : 40 @ A3 PAPER



SIDE VIEW

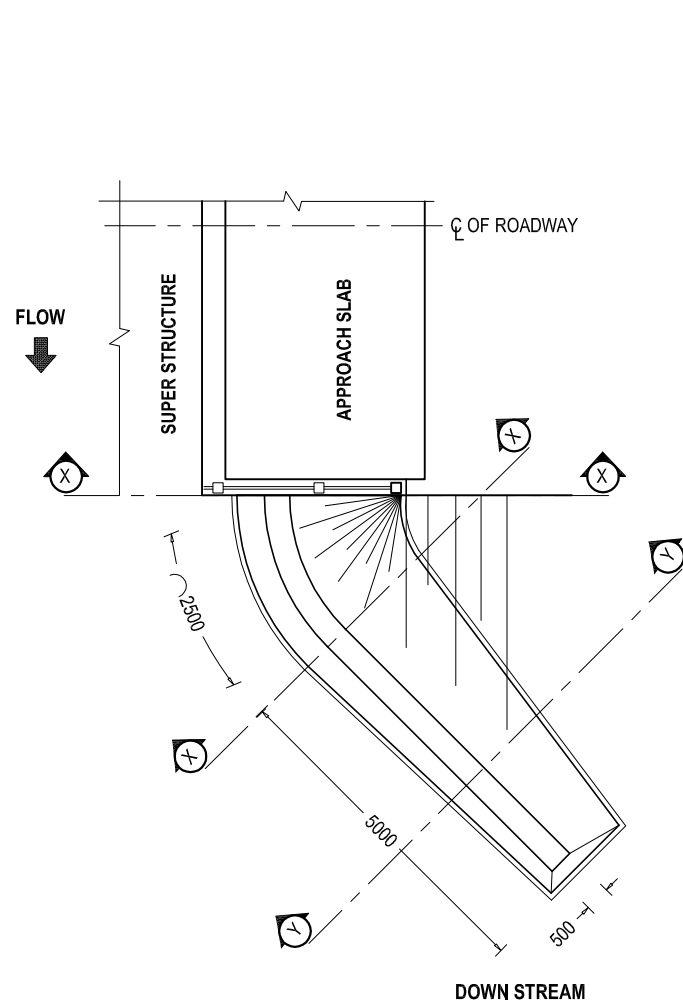
SCALE - 1 : 40 @ A3 PAPER



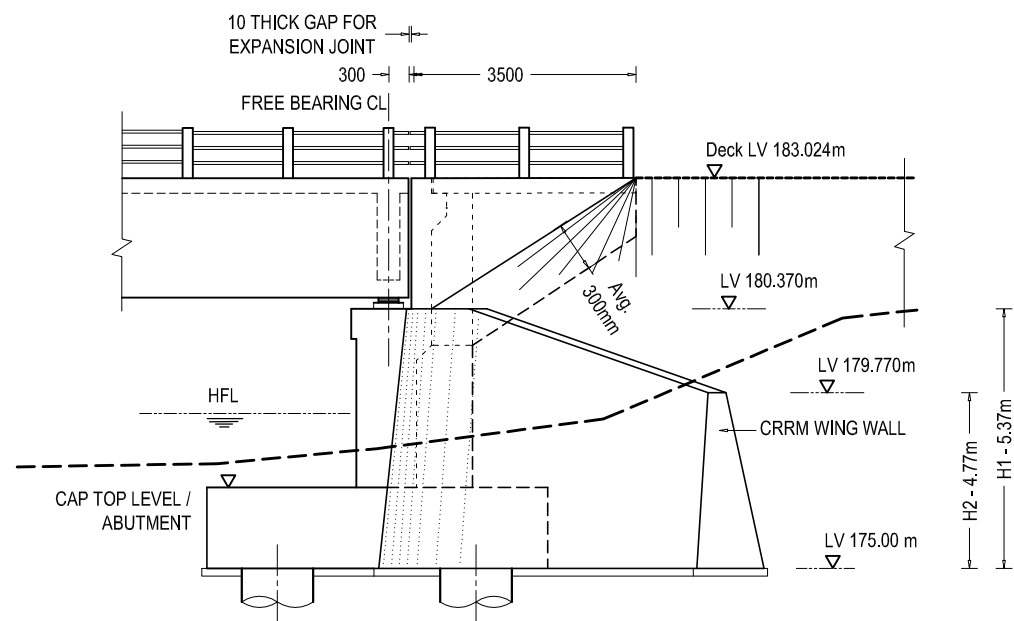
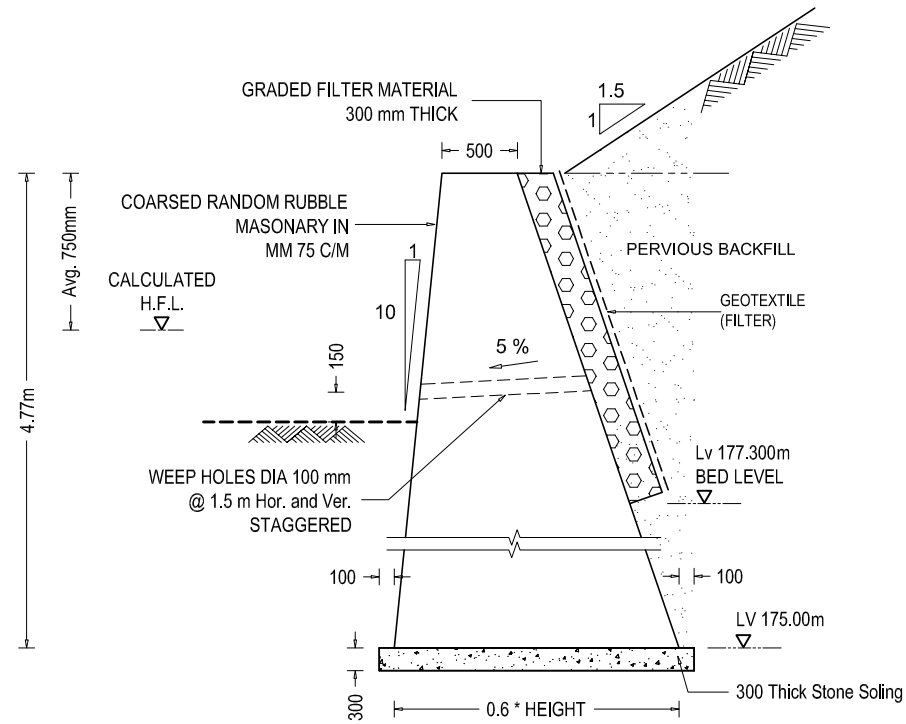
END R.C.C SEPARATOR ISOMETRIC VIEW

SCALE - NON

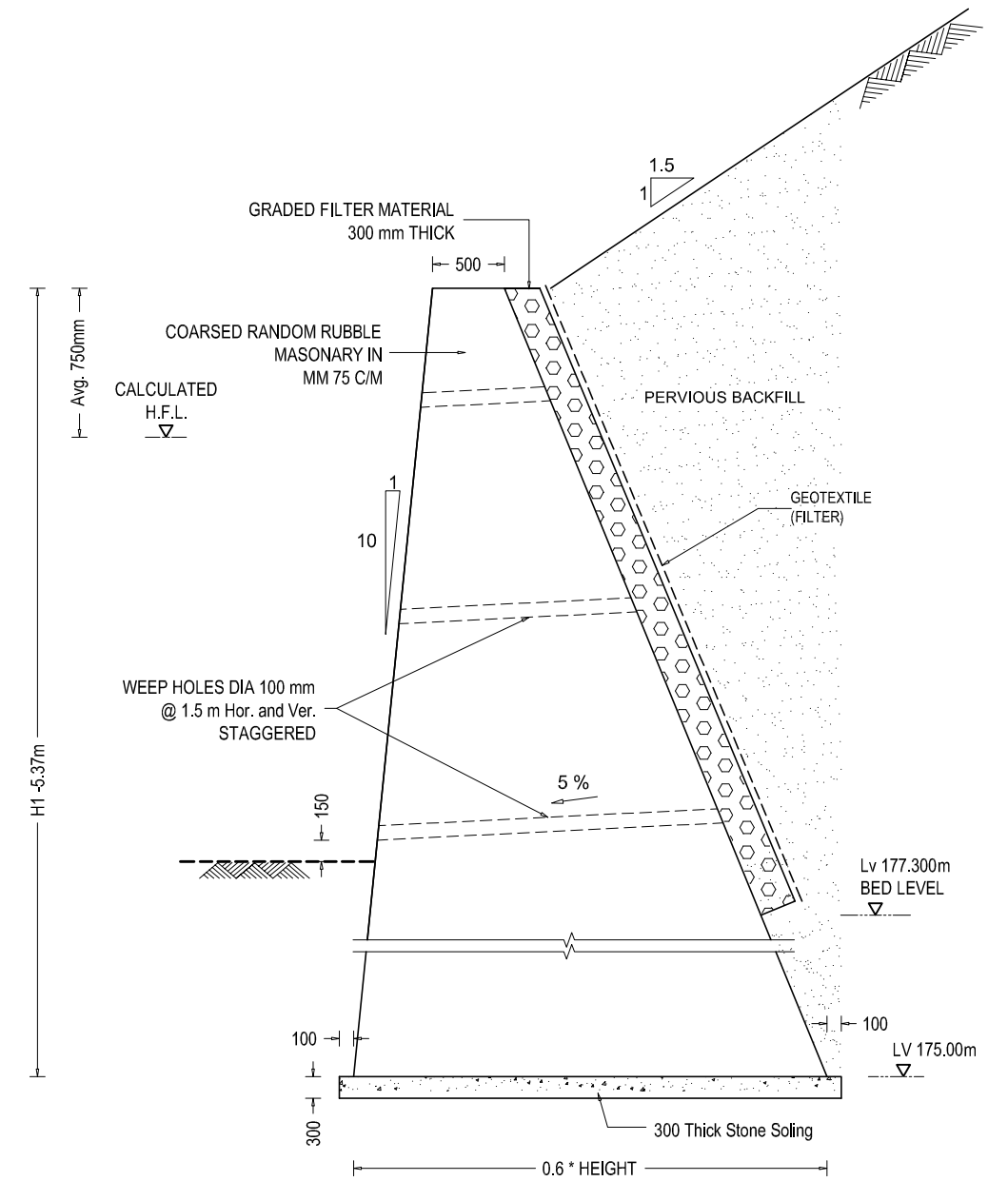
EMPLOYER	PROJECT NAME	DESIGN CONSULTANTS	Designed By	Drawing Name	Scale:	Date:
Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Development Cooperation Implementation Division	Strategic Road Connectivity & Trade Improvement Project (SRCTIP) Detailed Design of 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 Kolkata, India	Mr. R.D. Nec.No. 6489 CIVIL/10 Mr. S.M.	MISCELLANEOUS DETAILS OF BRIDGE OVER RIVER BATUWA	AS SHOWN	16.04.2023
		In Association With Udaya Consultancy, Geocom International, Sundar Kriti Consultant and Rays Consultant Private Limited	Checked By Mr. H.B.	Reference Drawings KDP/DPR/STR/BR/BATUWA /DD-9	Chainage: 281+990	Drawing No.- KDP/DPR/STR/BR/BATUWA /DD-15
			Approved By			Sheet No. 2/2



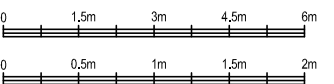
NOTE : AT DOWN STREAM ONLY



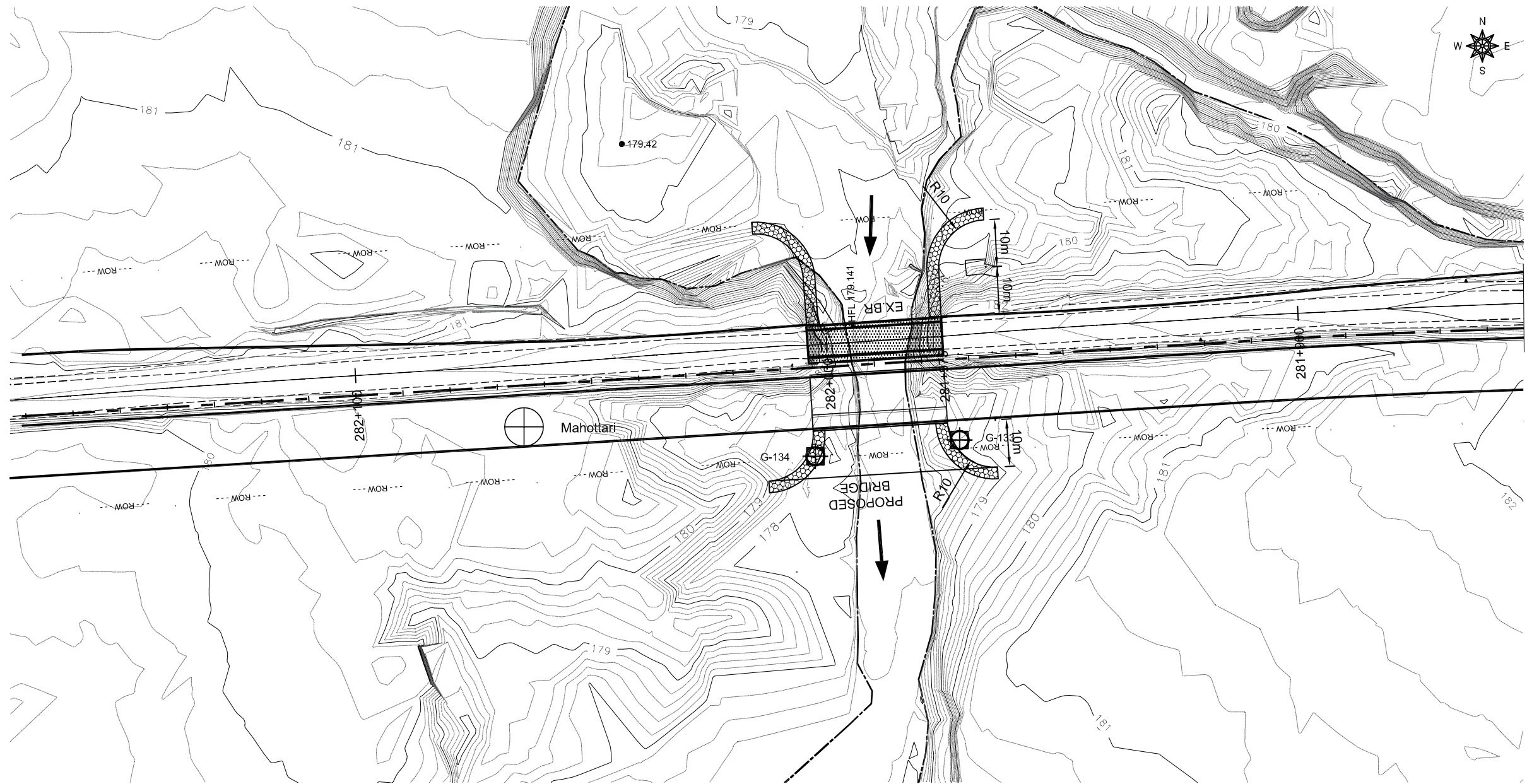
WING WALL ELEVATION



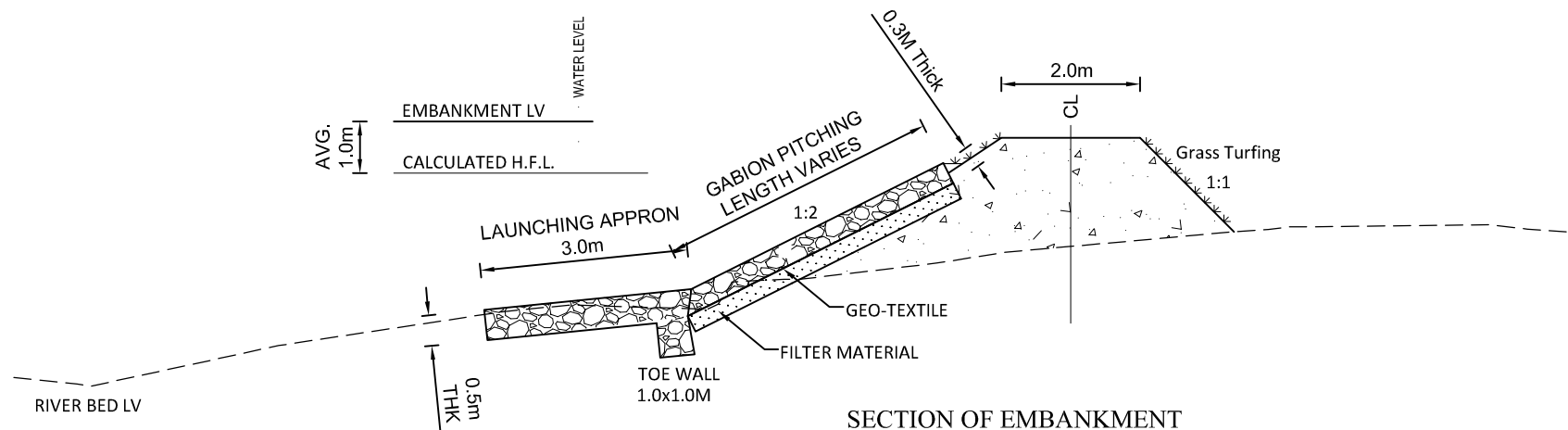
STONE MASONRY WING WALL SECTION X - X



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-Pathalya Road Section (130 KM) of Mahendra Highway and Bridges	DESIGN CONSULTANTS Joint Venture of ep4sa EPTISA Servicios De Ingeniera Madrid, Spain STUP Consultants Private Limited Kolkata, India In Association With Udaya Consultancy, Geocom International, Sundar Kriti Consultant and Rays Consultant Private Limited	Designed By Mr. R.D. Nec.No. 6489 CIVIL/1A/ Checked By Mr. S.M. Approved By Mr. H.B.	Drawing Name WING WALL DETAILS OF BRIDGE OVER RIVER BATUWA Reference Drawings -	Scale: AS SHOWN Chainage: 281+990	Date: 15.04.2023 Drawing No.- KDP/DPR/STR/BR/BATUWA/DD-16 Sheet No. 1 / 1
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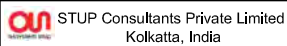


TOPOGRAPHIC MAP



SECTION OF EMBANKMENT

SCALE - 1x : 5x

EMPLOYER	PROJECT NAME	DESIGN CONSULTANTS	Designed By	Mr. R.D.	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 Kirti Consultant and Rays Consultant Private Limited	Checked By	Mr. S.M.	RIVER TRAINING WORKS OF BRIDGE OVER RIVER BATUWA	1:1000	12.03.2023
			Approved By	Mr. H.B.	Reference Drawings	Chainage: 281+990	Drawing No.- KDP/DPR/STR/BR/BATUWA/DD-17
							Sheet No. 1 / 1

Bearing Design Data for 28.5m Span and 11.85m width

Load Condition	Items	Under	On each Neoprene Bearing	Unit
Under No Live Load	V	NO EQ.	74.33	Ton
		EQ.	85.48	Ton
	H _L	NO EQ.	-	Ton
		EQ.	16.72	Ton
	H _T	NO EQ.	-	Ton
		EQ.	16.72	Ton
	θ	NO EQ.	0.00285	radian
		EQ.	0.00327	radian
	Δ		17.67	mm
Under Maximum Live Load	V	NO EQ.	117.24	Ton
		EQ.	129.68	Ton
	H _L	NO EQ.	-	Ton
		EQ.	0.00	Ton
	H _T	NO EQ.	-	Ton
		EQ.	0.00	Ton
	θ	NO EQ.	0.0042	radian
		EQ.	0.00486	radian
	Δ		29.13	mm

EMPLOYER	PROJECT NAME	DESIGN CONSULTANTS		Designed By	Mr. R.D.	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-Patrilaya Road Section (130 KM) of Mahendra Highway and Bridges	Joint Venture of			Nec.No. 6489 CHD/A'			
		 EPTISA Servicios De Ingenieria Madrid, Spain	 STUP Consultants Private Limited Kolkata, India	Signature				
		Checked By	Mr. S.M.	In Association With		Signature		
Approved By	Mr. H.B.	Udaya Consultancy, Geocom International, Sundar Kirti Consultant and Rays Consultant Private Limited		Signature	-	Chainage:	281+990	Sheet No. 1 / 1