



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- DHOLAN
Volume-2
Detailed Drawing

June,2023

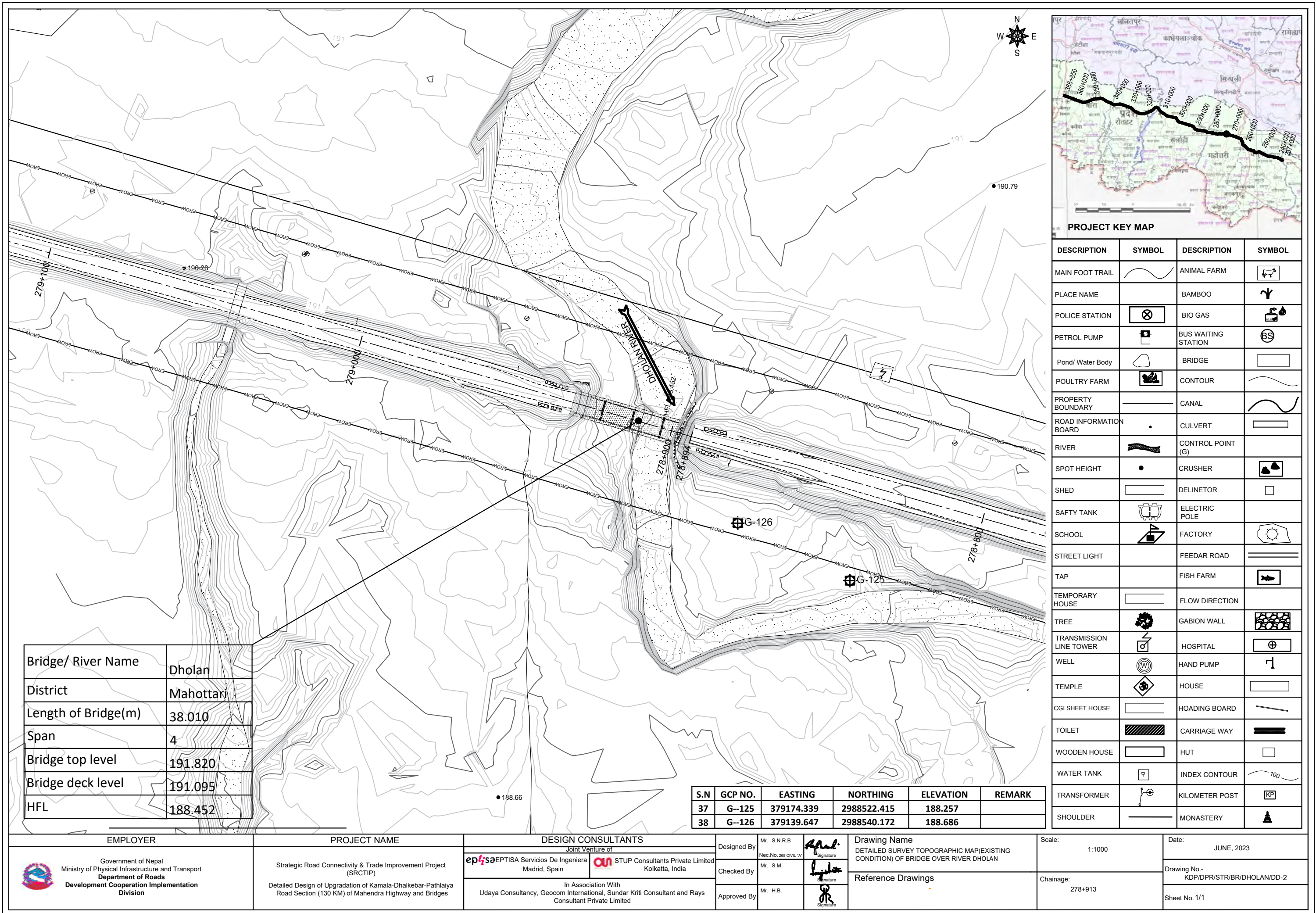
Joint Venture of:

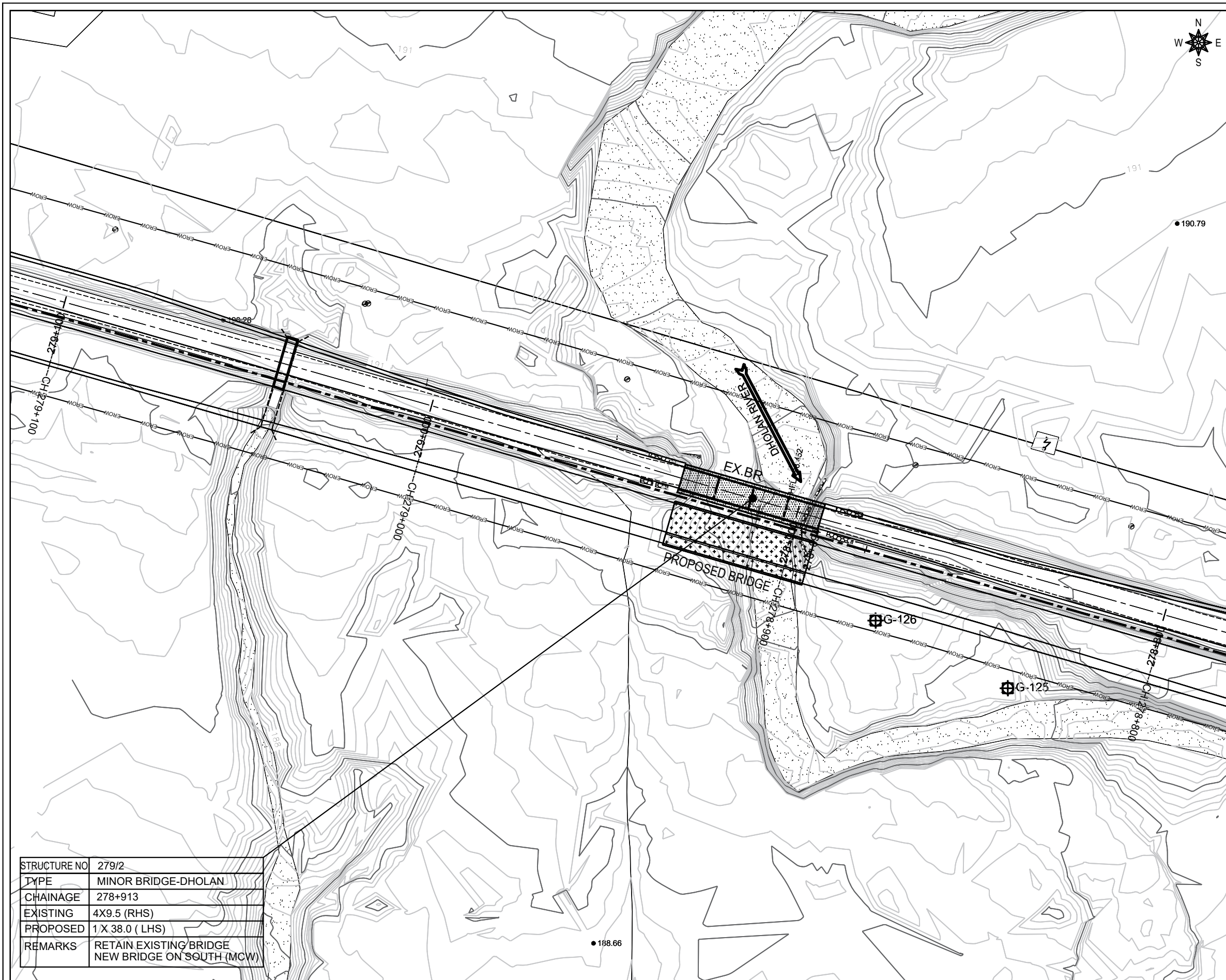
eptisa EPTISA Servicios De Ingenieria
Madrid, Spain

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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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	

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)	Joint Venture of		Designed By	Mr. S.N.R.B. Nec.No. 265 CIVIL "A"	 Signature	DETAILED SURVEY TOPOGRAPHIC MAP(WITH PROPOSED BRIDGE) OF BRIDGE OVER RIVER DHOLAN	1:1000	JUNE, 2023	
		ep _{sa} EPTISA Servicios De Ingenieria 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.					
		Reference Drawings		Chainage:						
						278+913				
							Drawing No.- KDP/DPR/STR/BR/DHOLAN/DD-3			
							Sheet No. 1/1			

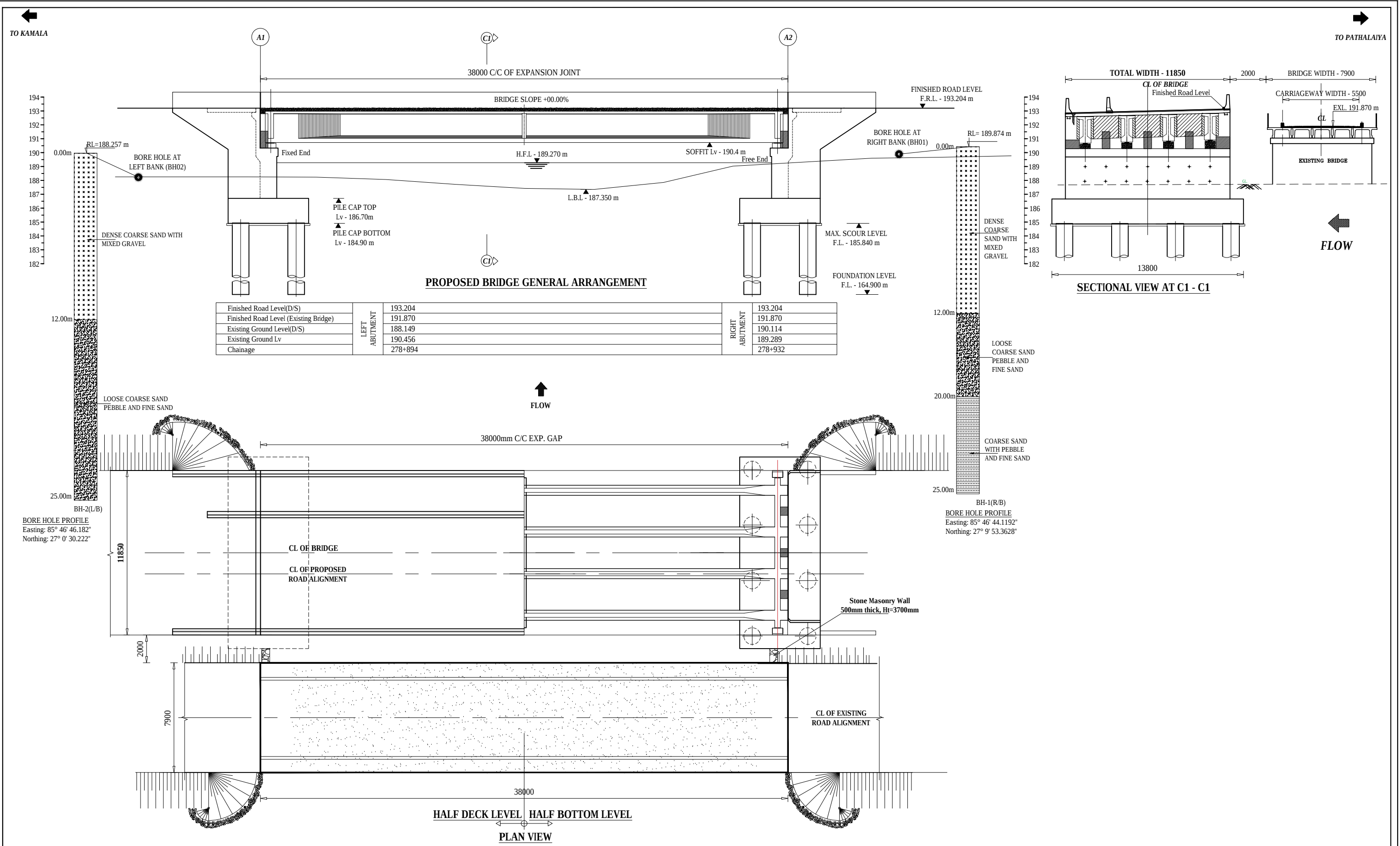
- A. GENERAL
1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS UNLESS NOTED OTHERWISE.
 2. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. DIMENSIONS ARE NOT TO BE SCALED.
 3. THE LAYOUT OF THE BRIDGE/CULVERT SHALL BE SET AS PER RELEVANT HIGHWAY PLAN AND PROFILE DRAWING.
 4. THE FORMATION LEVEL 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.
- 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.
4. 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) - 56.280 CUMecs
 2. HFL - 189.270 m
 3. FREE BOARD (MINIMUM) - 1.000 m
 4. MAXIMUM SCOUR LEVEL:
ABUTMENT - 185.840 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: 1 X 38 = 38 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 - 2837 kN(NON SEISMIC), 4190 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. RETURN WALL.....M35
 - f. 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 : 57.2Ø
 - b) FOR M 35 GRADE CONCRETE : 51.48Ø
 - c) FOR M 40 GRADE CONCRETE : 48.62Ø
 - d) FOR M 45 GRADE CONCRETE : 45.70Ø
 - e) FOR M 50 GRADE CONCRETE : 42.00Ø
- (WHERE Ø 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%	57.20Ø	51.48Ø	48.62Ø	45.70Ø	42.00Ø
25%≤ LAPPED BAR <33%	65.78Ø	59.50Ø	55.91Ø	52.60Ø	48.00Ø
33%≤ LAPPED BAR <50%	80.08Ø	72.07Ø	68.07Ø	64.00Ø	59.00Ø
50%≤ LAPPED BAR	85.80Ø	77.22Ø	72.93Ø	68.60Ø	63.00Ø

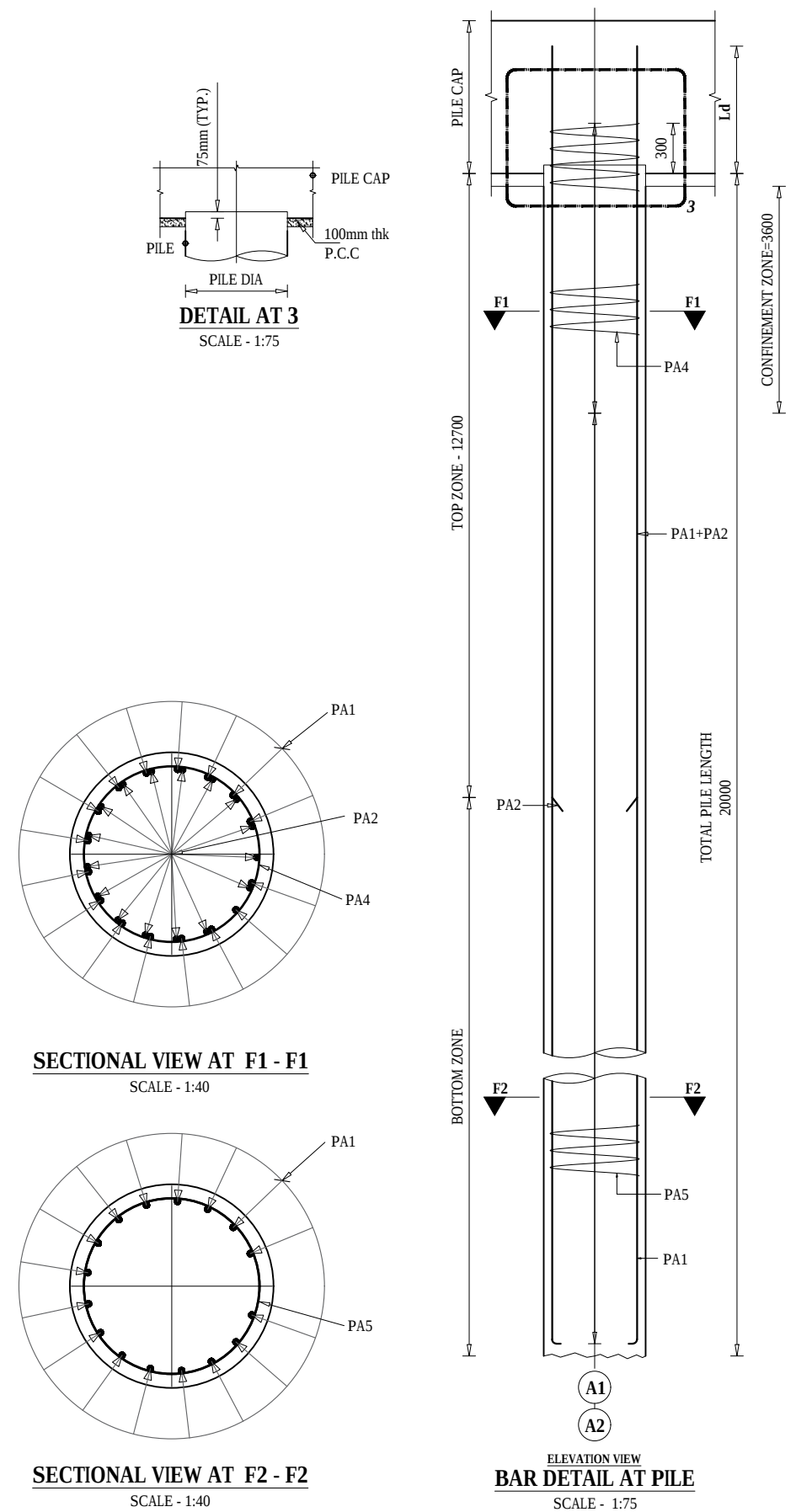
16. THE LAP LENGTH SHALL BE STAGGERED BY MINIMUM DISTANCE OF 1.3 TIMES THE LAP LENGTH.
17. HELICAL REINFORCEMENT SHALL BE LAPPED BY 1.5 TURNS.
18. INSTEAD OF LAPPING SPLICING OF REINFORCEMENT CAN BE DONE WITH WELDED JOINT AS PER CL. 15.2.5.2 OF IRC 112-2020. WELD LENGTH SHALL NOT BE LESS THAN 18D.
19. SHARP EDGES OF CONCRETE TO BE CHAMFERED MINIMUM 50 X 50
20. LONGITUDINAL AND TRANSVERSE STOPPER SHOULD BE KEPT AT +10MM FROM EXPANSION.

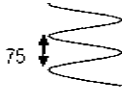
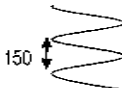
EMPLOYER	PROJECT NAME	DESIGN CONSULTANTS	Designed By	Mr. S.N.R.B Nec.No. 265 Civil "A"		Drawing Name	Scale:	Date:
 Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Development Cooperation Implementation Division	Strategic Road Connectivity & Trade Improvement Project (SRCTIP) Detailed Design of Upgradation of Kamala-Dhalkebar-Pathlaiya Road Section (130 KM) of Mahendra Highway and Bridges	Joint Venture of  EPTISA Servicios De Ingeniera Madrid, Spain  STUP Consultants Private Limited Kolkata, India	Checked By	Mr. S.M. Nec.No.		GENERAL NOTES OF BRIDGE OVER RIVER DHOLAN	AS SHOWN	JUNE, 2023
			Approved By	Mr. H.B. Nec.No.		Reference Drawings	Chainage:	Drawing No.- KDP/DPR/STR/BR/DHOLAN/DD -4
		In Association With Udaya Consultancy, Geocom International, Sundar Kriti Consultant and Rays Consultant Private Limited					278+913	Sheet No. 1 / 1



BRIDGE - DHOLAN
(SCALE 1 :250 @ 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-Pathlaiya Road Section (130 KM) of Mahendra Highway and Bridges	DESIGN CONSULTANTS		Designed By Mr. S.N.R.B. Nec.No. 265 Civil "A" 	Drawing Name GENERAL ARRANGEMENT OF BRIDGE OVER RIVER DHOLAN	Scale: AS SHOWN	Date: JUNE, 2023
		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. Nec.No. 	Reference Drawings	Chainage: 278+913	Drawing No.- KDP/DPR/STR/BR/DHOLAN/DD -5
				Approved By Mr. H.B. Nec.No. 			

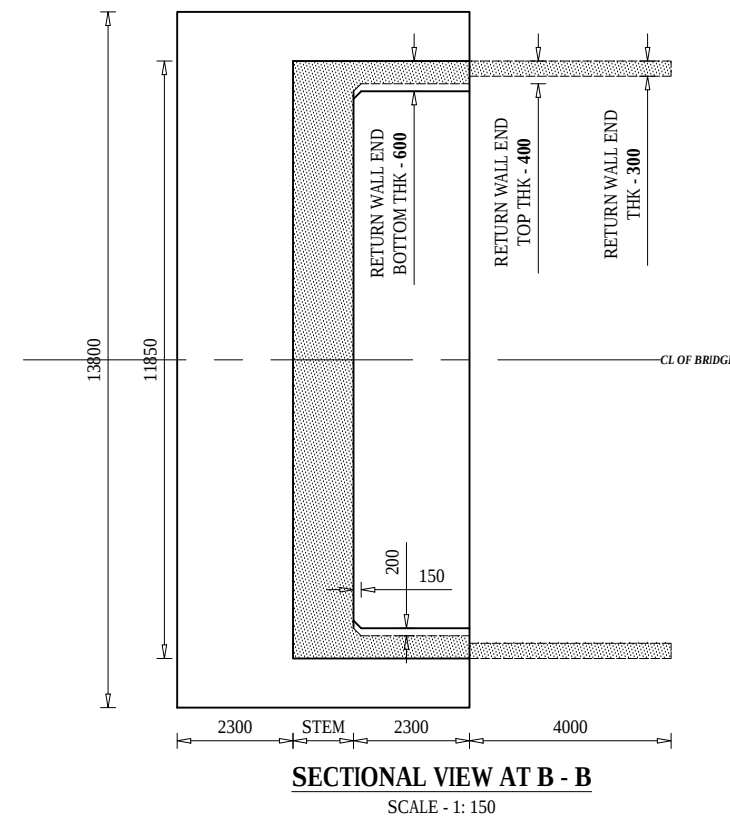
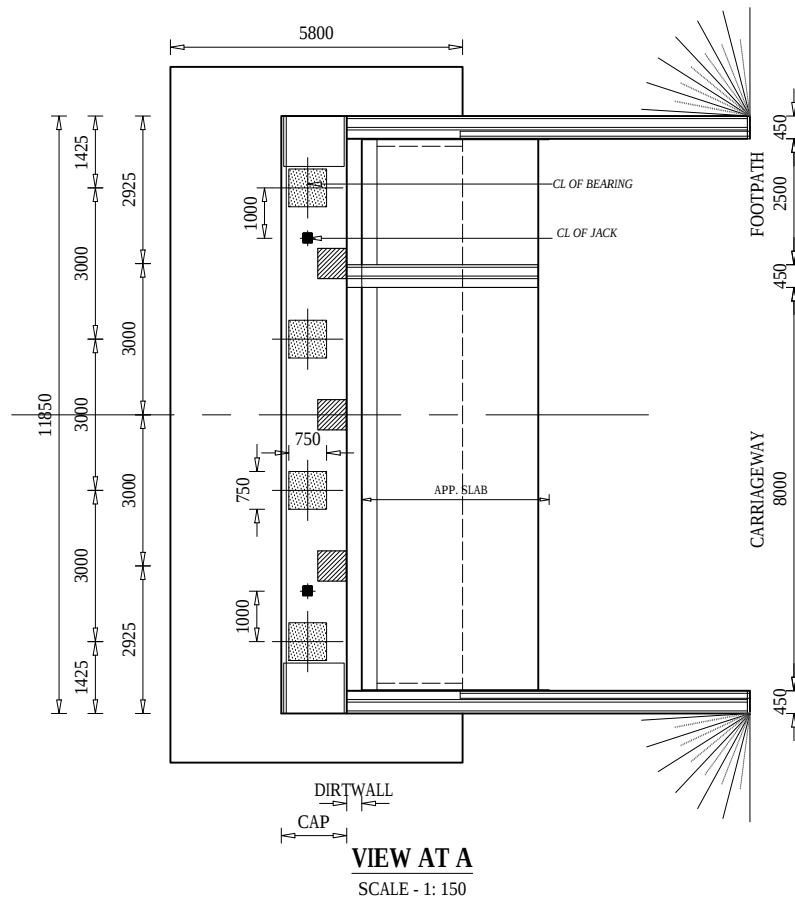
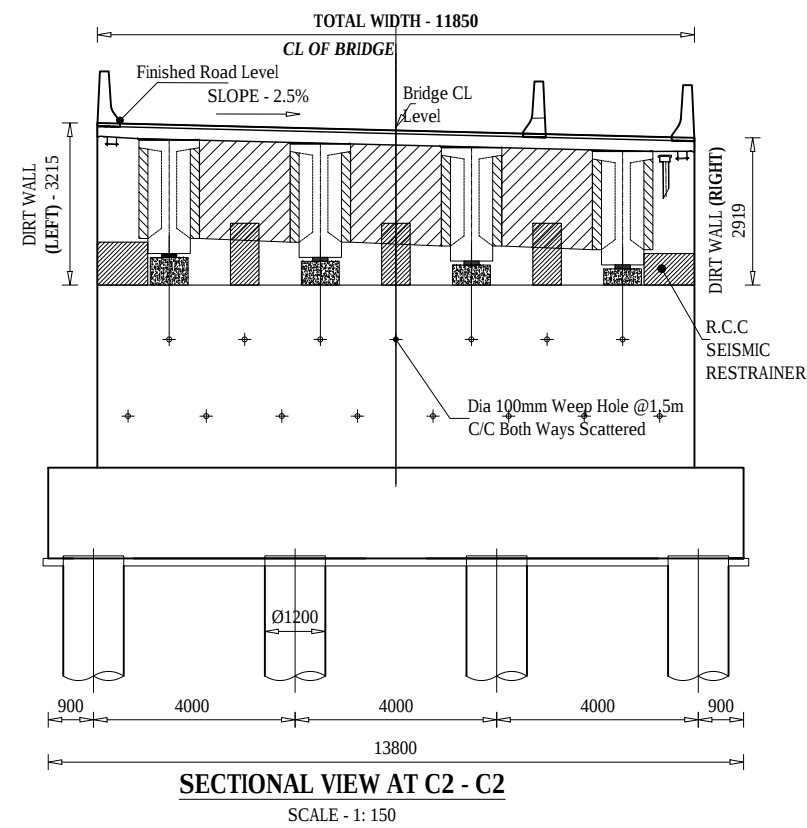
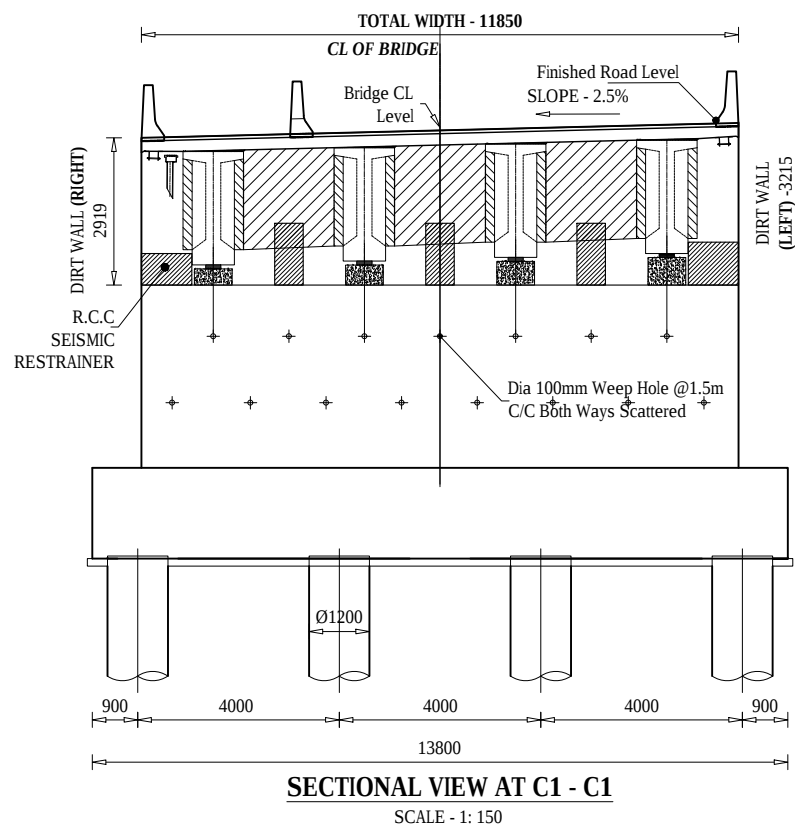
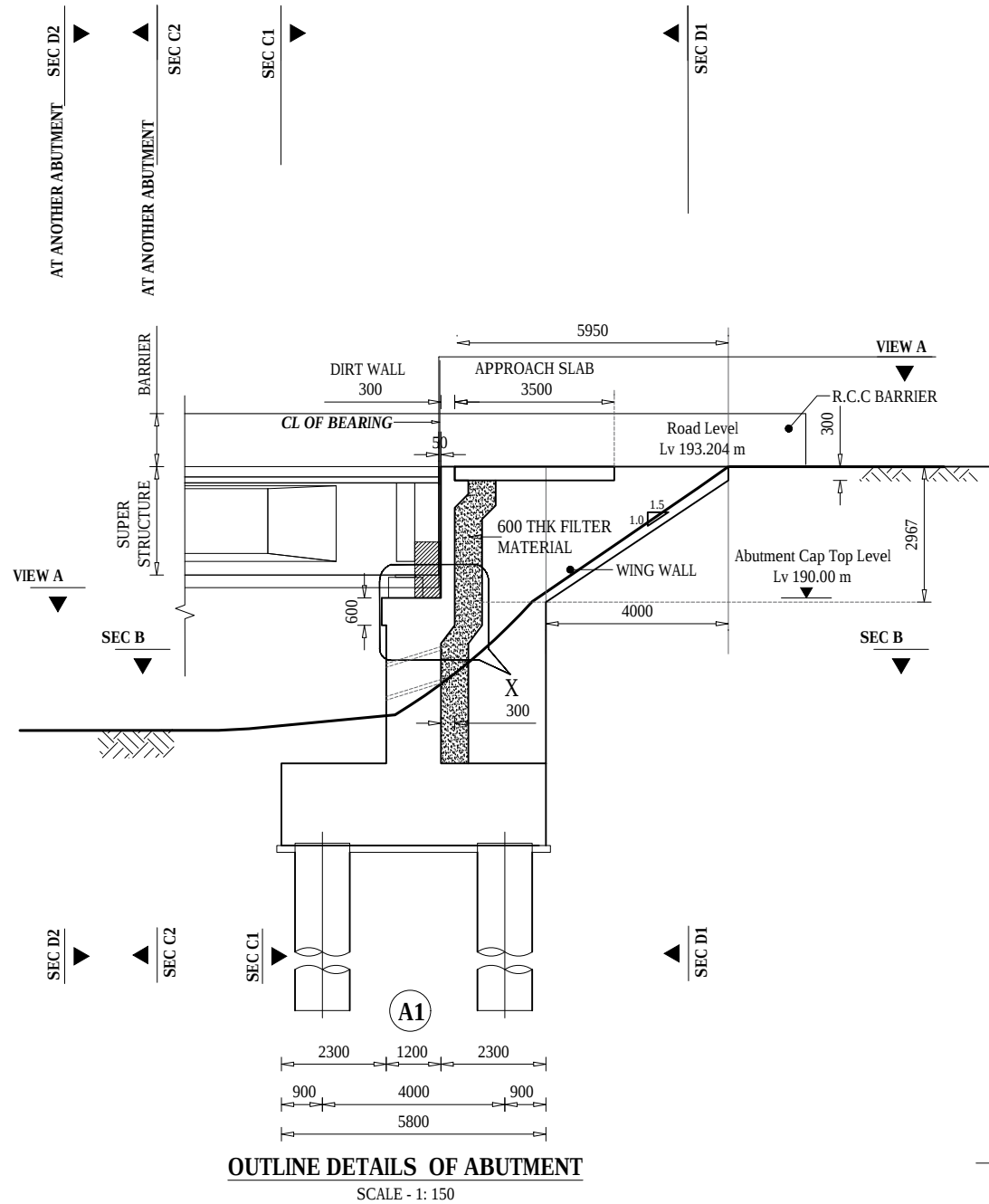


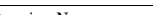
S.No.	BAR MARK	DESCRIPTION OF BAR	BAR DIA.(MM)	SPACING (MM)	BAR LENGTH (M)	No.OF BARS	UNIT WEIGHT (Kg/m)	TOTAL WEIGHT (Kg)
1	PA1	 21650 300	32		21.950	16	6.321	2219.93
2	PA2	 14425 25	25		14.425	16	3.858	890.4321
4	PA4	 155.965 75	16	75	155.965	1	1.580	246.46
5	PA5	 355.538 150	16	150	355.538	1	1.580	561.84
TOTAL (KG) :								3918.66
No. of Pile per abutment								8.00
TOTAL WEIGHT (KG) :								31349.31

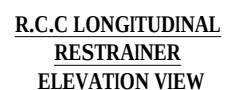
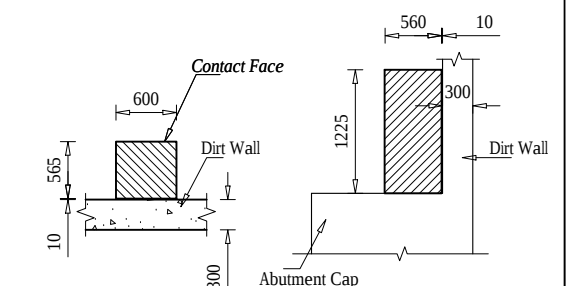
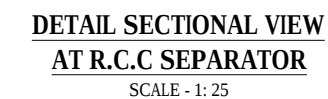
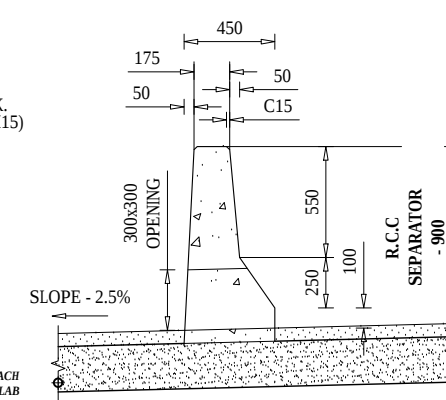
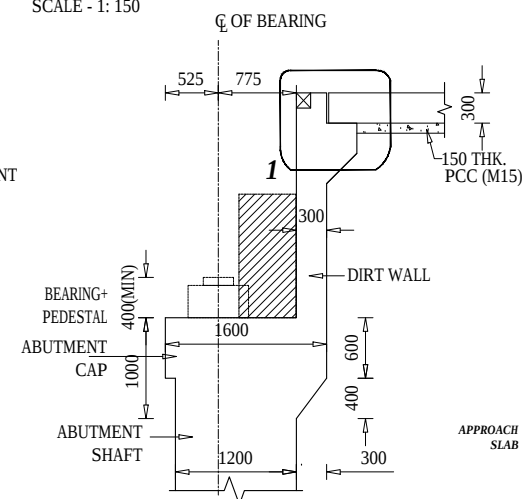
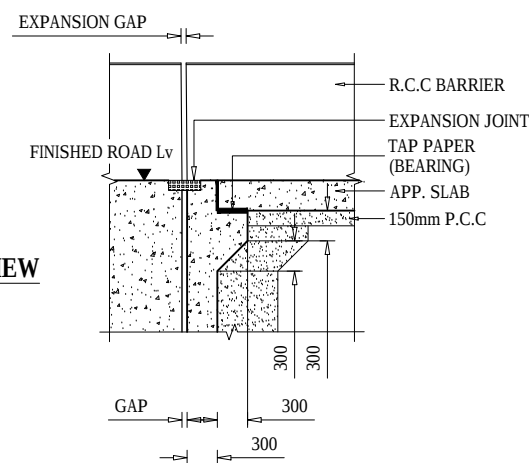
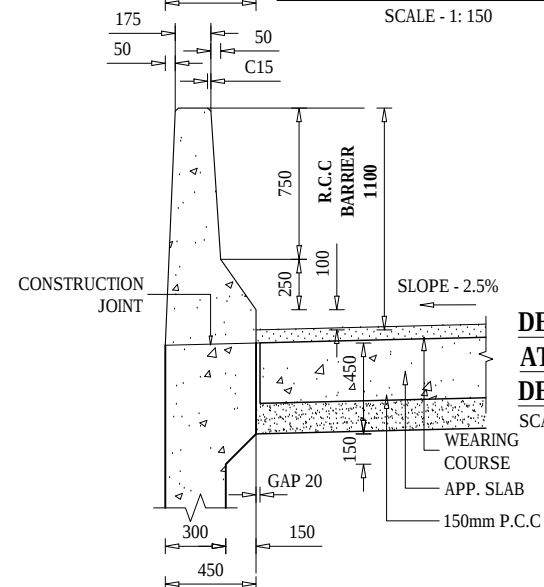
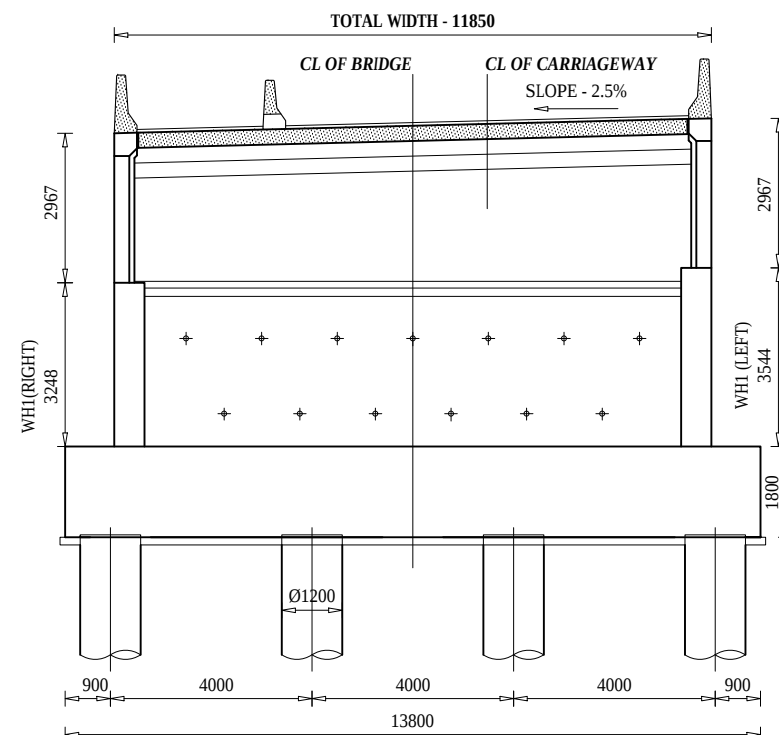
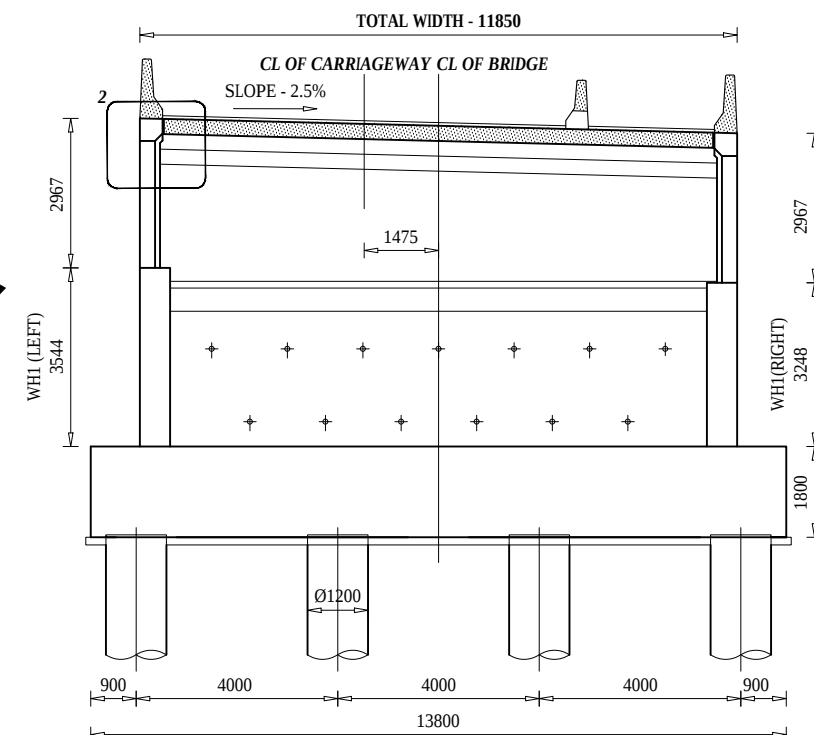
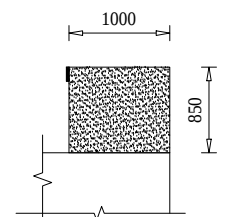
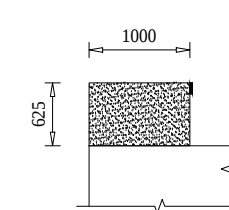
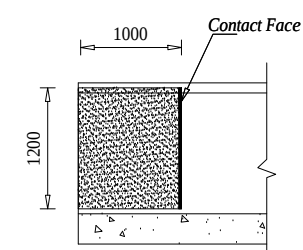
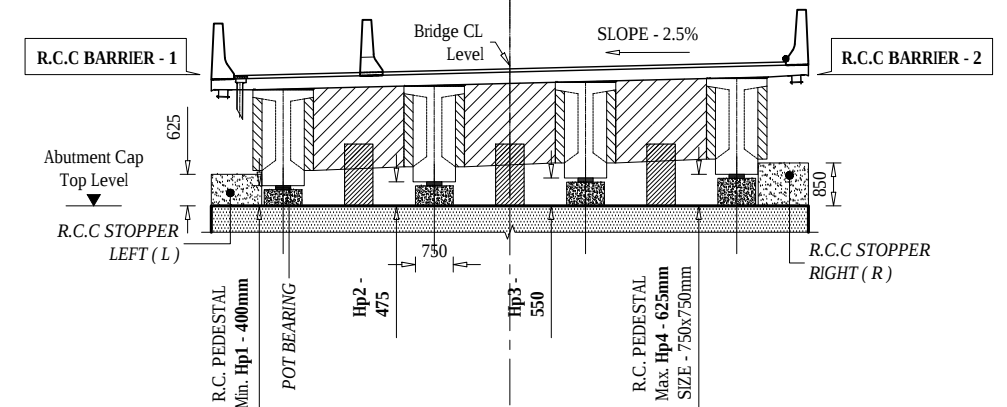
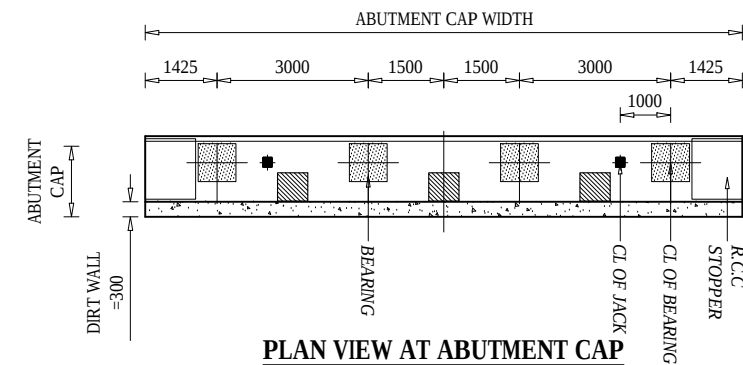
PILE CAPACITY ABUT. (INDIVIDUAL)			
S.N.	DIA (mm)	DEMAND (kN)	
1	1200	SEISMIC	NON SEISMIC
		4190	2837

<u>CO ORDINATES OF PILE LOCATION OF PROPOSED BRIDGE</u>			
S.N.	ABUTMENT/PIER	EASTING(X)	NORTHING(Y)
		UTM-45R	
1	ABUTMENT(A1)	379121.289	2988555.163
2	ABUTMENT(A2)	379085.953	2988565.619

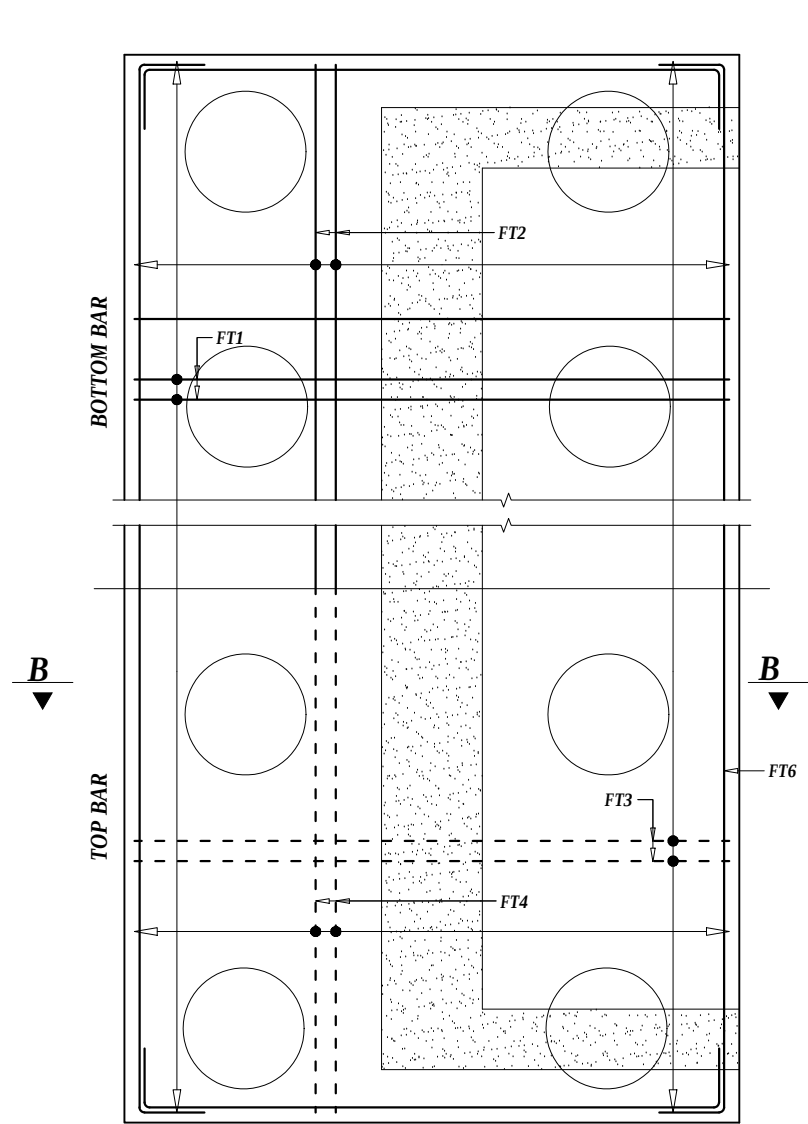
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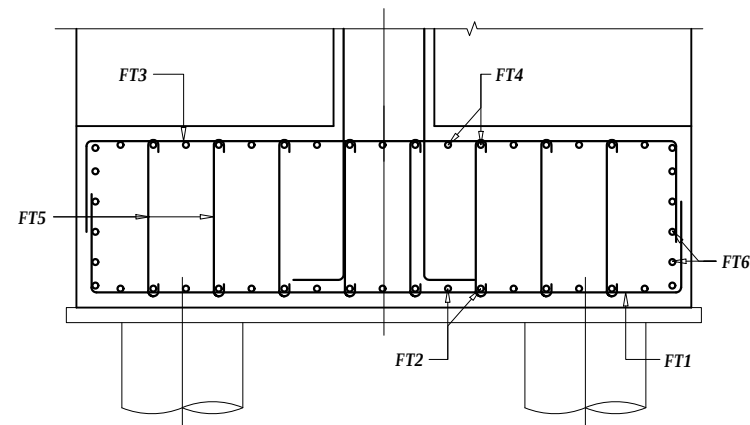
EMPLOYER	PROJECT NAME	DESIGN CONSULTANTS		Designed By	Mr. S.N.R.B Nec.No. 265 Civil 'A' 	Drawing Name ABUTMENT DETAILS OF BRIDGE OVER RIVER DHOLAN	Scale: AS SHOWN	Date: JUNE, 2023
 Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Development Cooperation Implementation 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						
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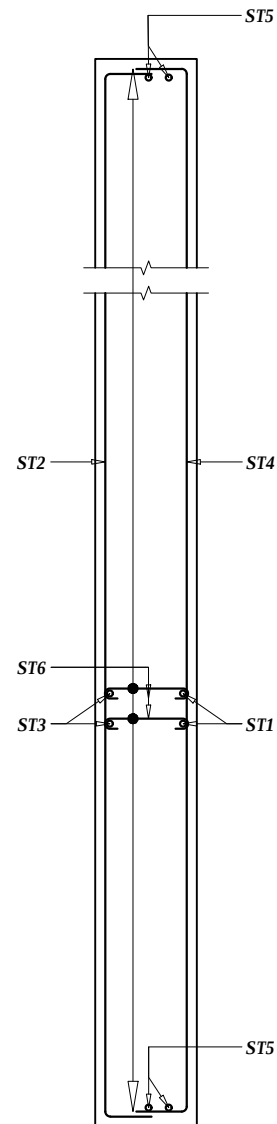
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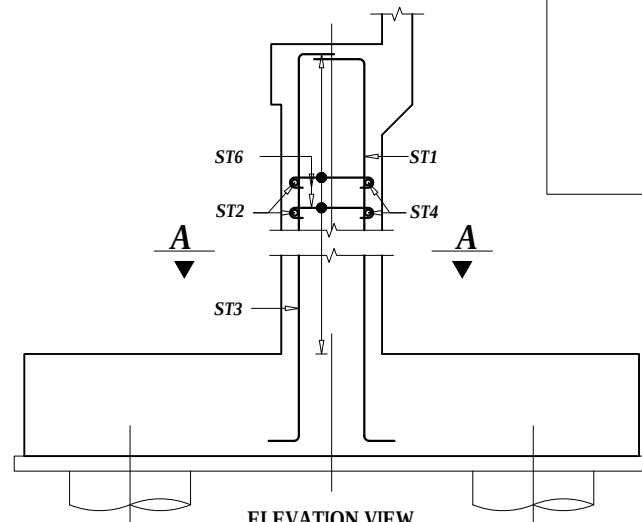
PLAN VIEW OF PILE CAP



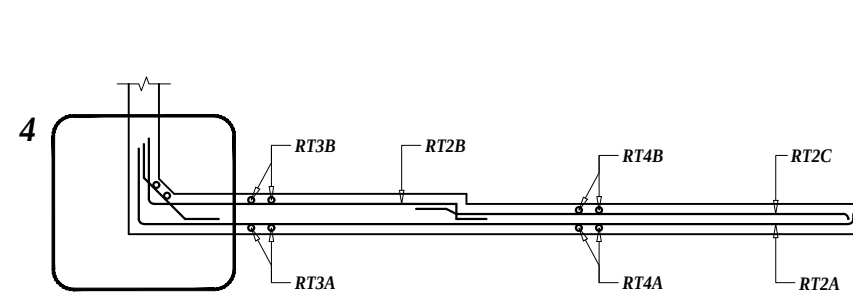
SECTIONAL AT B-B
BAR DETAIL OF PILE CAP
SCALE - 1 : 75



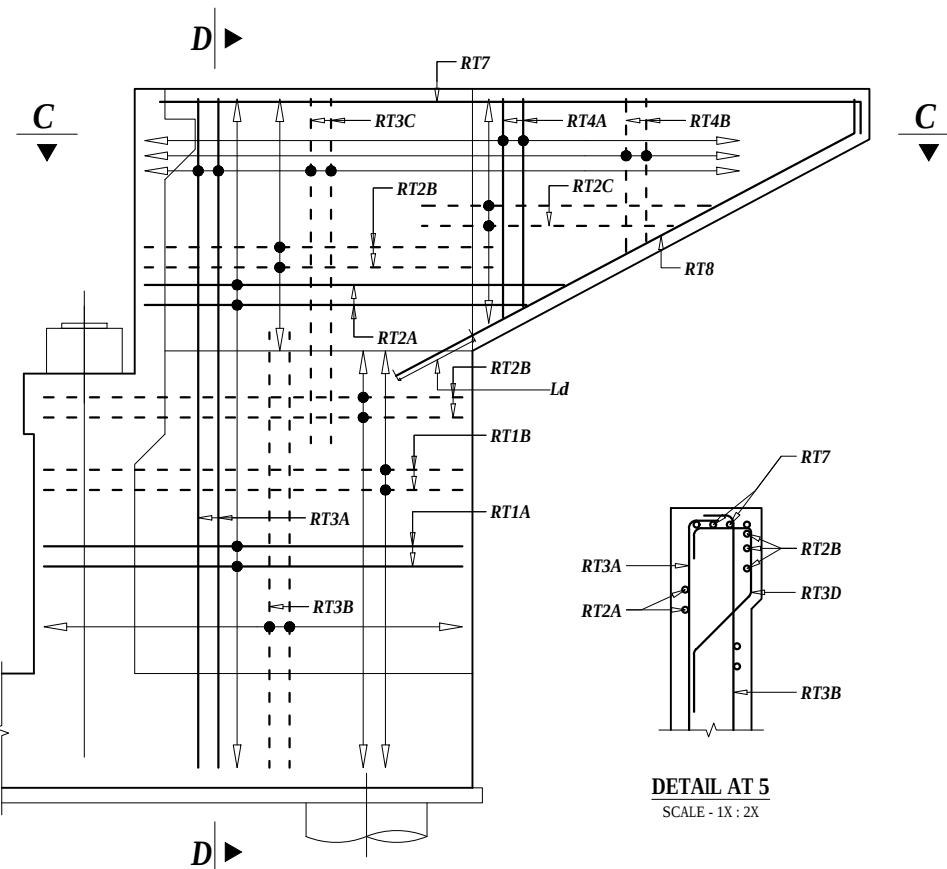
SECTIONAL AT A-A



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

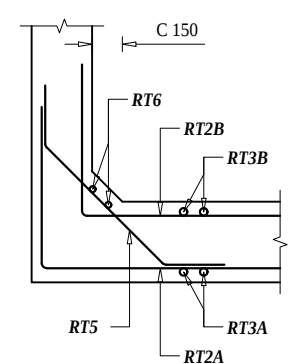


SECTIONAL PLAN VIEW AT C-C

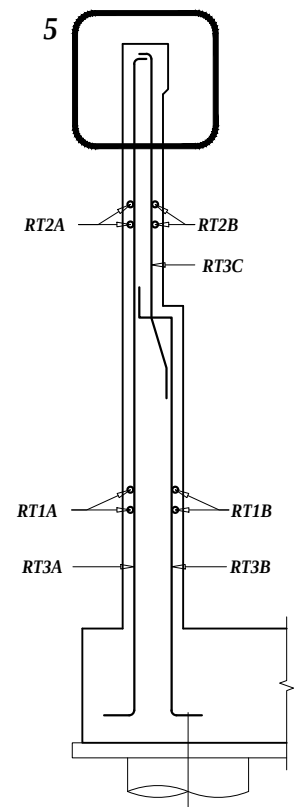


ELEVATION VIEW

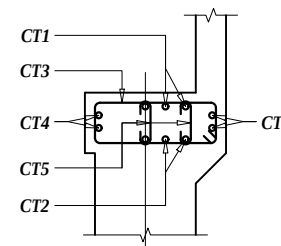
BAR DETAIL AT RETURN WALL
SCALE - 1 : 75



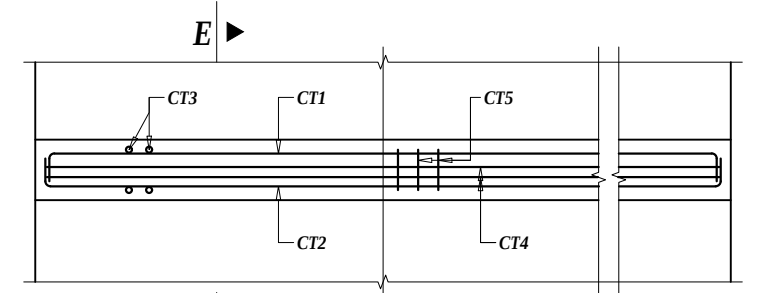
DETAILS AT 4



SECTIONAL SIDE VIEW AT D-D



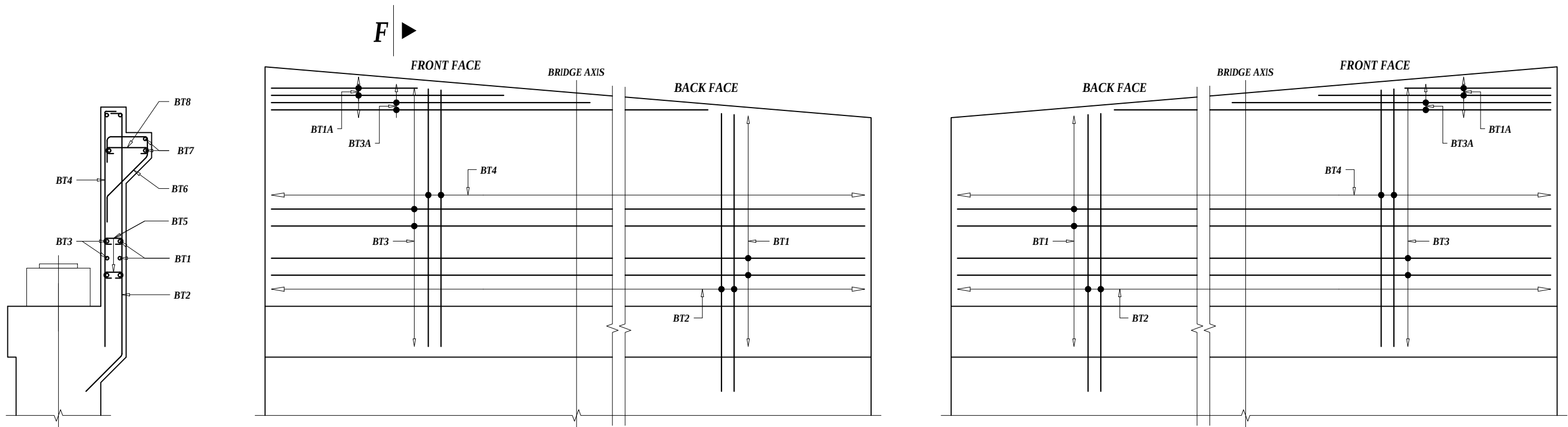
SECTION VIEW AT E-E



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	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 CS 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.	ABUTMENT REINFORCEMENT DETAILS OF BRIDGE OVER RIVER DHOLAN	AS SHOWN	JUNE, 2023
			Mr. S.M.	Reference Drawings	Chainage:	Drawing No.- KDP/DPR/STR/BR/DHOLAN/DD -8
			Mr. H.B.	KDP/DPR/STR/BR/DHOLAN/DD -9	278+913	Sheet No. 1/2



SECTIONAL VIEW AT F-F

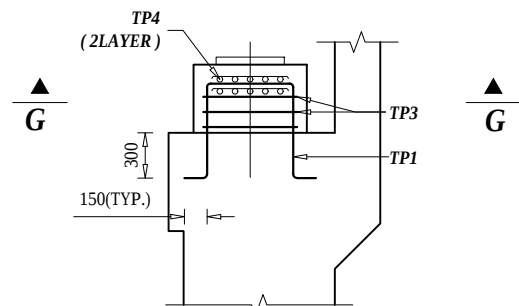


ELEVATION VIEW / VIEW AT D1

BAR DETAIL AT DIRT WALL

SCALE - 1 : 50

ELEVATION VIEW / VIEW AT D2

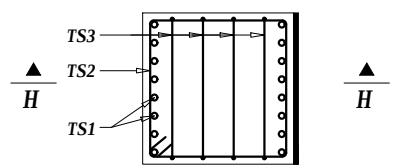


SECTIONAL SIDE VIEW

SECTIONAL PLAN VIEW AT G-G

BAR DETAIL AT PEDESTAL

SCALE - 1 : 50

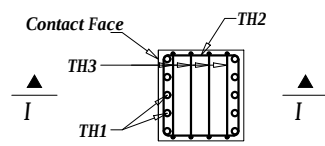


SECTIONAL PLAN VIEW

SECTIONAL VIEW AT H-H

R.C.C STOPPER LEFT
ELEVATION VIEW

SCALE - 1 : 50

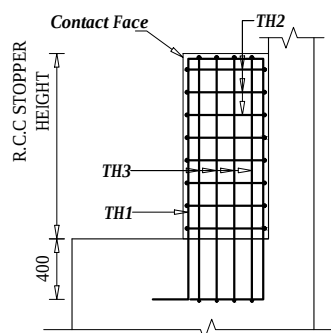


SECTIONAL PLAN VIEW

SECTIONAL VIEW AT I - I

R.C.C LONGITUDINAL
STOPPER SECTION

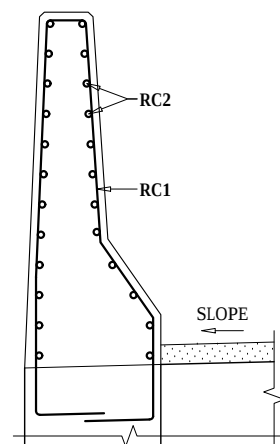
SCALE - 1 : 50



SECTIONAL VIEW AT I - I

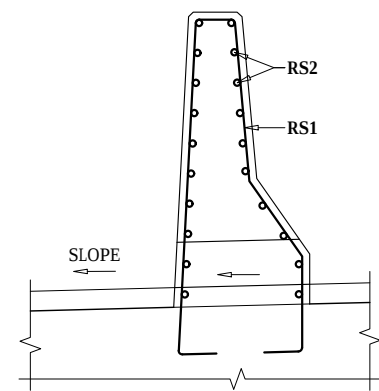
R.C.C LONGITUDINAL
STOPPER SECTION

SCALE - 1 : 50



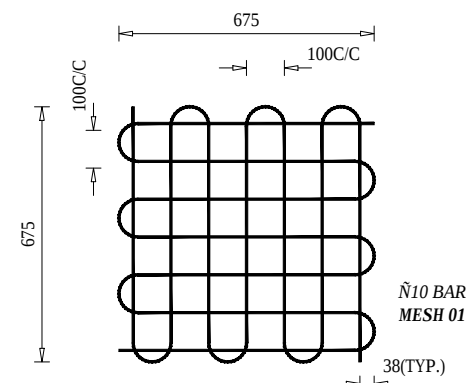
REINFORCEMENT DETAILS OF
R.C.C BARRIER (B)- SECTIONAL VIEW

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 In Association With Udaya Consultancy, Geocom International, Sundar Kriti Consultant and Rays Consultant Private Limited	Mr. S.N.R.B Nec.No. 265 Civil 'A' Signature Mr. S.M. Nec.No. Signature Mr. H.B. Nec.No. Signature	Mr. S.N.R.B Nec.No. 265 Civil 'A' Signature Mr. S.M. Nec.No. Signature Mr. H.B. Nec.No. Signature	ABUTMENT REINFORCEMENT DETAILS OF BRIDGE OVER RIVER DHOLAN Reference Drawings KDP/DPR/STR/BR/DHOLAN/DD -9	AS SHOWN Chainage: 278+913	JUNE, 2023 Drawing No.- KDP/DPR/STR/BR/DHOLAN/DD-8 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	B11	150 11700 150	12	150	12000	26	0.889	277.33	
2	B11A	150 15850 150	12	150	6000	3	0.889	16.00	
3	B12	150 3500 450 3500 450	16	150	4150	53	1.580	616.07	
4	B13	150 11700 150	12	150	12000	22	0.889	234.67	
5	B13A	150 15850 150	12	150	6000	3	0.889	16.00	
6	B14	150 3500 450 3500 450	12	150	3742	53	0.889	309.34	
7	B15	100 200 100	12	450	0400	180	0.889	67.20	
8	B16	200 450 200 200 750	16	150	1826	53	1.580	208.36	
9	B17	11700	12	5 Nos	11700	5	0.889	50.00	
10	B18	100 450 100	12	150	0650	108	0.889	91.26	
TOTAL (KG) :									1948.25

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	C1	300 11700 300	16	150	12300	12	1.580	233.24	
2	C12	300 11700 300	16	150	12300	12	1.580	233.24	
3	C13	450 1450 100	16	150	4000	80	1.580	505.68	
4	C14	300 11700 300	12	150	12000	8	0.889	65.33	
5	C15	450 100 Long 150 Trans 300	12	150	3550	422	0.889	243.62	
TOTAL (KG) :									1301.32

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 4946 900	25	120	6.146	100	3.858	2371.14	
2	ST2	600 11700 600	16	200	12.900	14	1.580	285.39	
3	ST3	300 4946 900	20	120	6.146	100	2.469	1517.53	
4	ST4	600 11700 600	16	200	12.900	14	1.580	285.39	
5	ST5	300 4946 900	16	200	6.146	14	1.580	135.97	
6	ST6	100 1050 100 Ver. 450 Hor. 450	16	1250	1.250	162	1.580	320.00	
TOTAL (KG) :									4915.43

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 5650 900	32	150	7.450	92	6.321	4332.40	
2	FT2	900 13650 900	20	200	15.450	29	2.469	1106.30	
3	FT3	900 5650 900	25	150	7.450	92	3.858	2644.29	
4	FT4	900 13650 900	15	150	15.450	39	1.580	952.18	
5	FT5	1650 150	16	450	1.950	403	1.580	1241.84	
6	FT6	5586 13610	15	200	38.592	10	1.580	611.43	
TOTAL (KG) :									10688.44

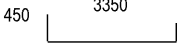
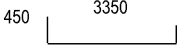
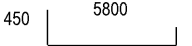
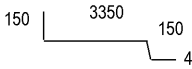
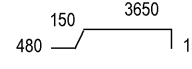
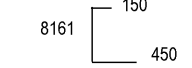
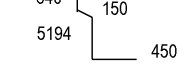
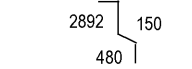
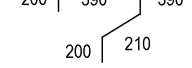
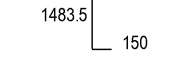
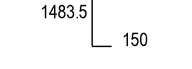
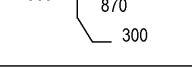
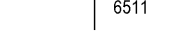
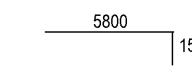
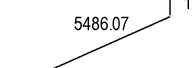
BAR BENDING SCHEDULE OF PEDESTAL									
S.No	BAR MARK	DESCRIPTION OF BAR	BAR DIA.(MM)	SPACING (MM)	BAR LENGTH (M)	No. OF BARS	UNIT WEIGHT (Kg/m)	TOTAL WEIGHT (Kg)	
1	TP1	150 700 800	16	150	2.600	6	1.580	24.65	
1	TP2	150 700 800	16	150	2.600	6	1.580	24.65	
2	TP3	700 700 100	16	150	3.000	4	1.580	18.96	
1	TP4	650 650 100	10	2 Nos.	10.500	2	0.617	12.96	
TOTAL (KG) :									81.23
TOTAL NOS OF PEDESTAL :									4.00
TOTAL WEIGHT (KG) :									324.92

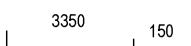
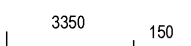
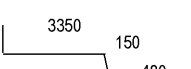
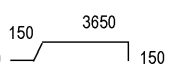
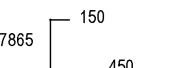
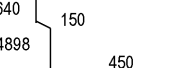
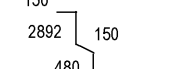
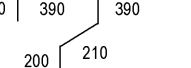
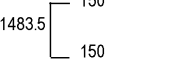
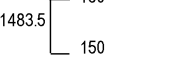
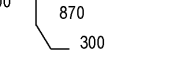
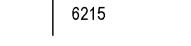
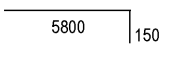
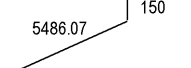
BAR BENDING SCHEDULE OF RCC SEISMIC RESTRAINER - LEFT									
S.No	BAR MARK	DESCRIPTION OF BAR	BAR DIA.(MM)	SPACING (MM)	BAR LENGTH (M)	No. OF BARS	UNIT WEIGHT (Kg/m)	TOTAL WEIGHT (Kg)	
1	TS1-L	975 900 850 850	32		4.550	11	6.321	316.37	
2	TS2-L	900 1100 100	16	150	4.200	5	1.580	33.19	
3	TS3-L	975 1100 100	16	100	4.350	10	1.580	68.74	
TOTAL (KG) :									418.29

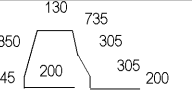
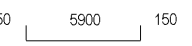
BAR BENDING SCHEDULE OF RCC SEISMIC RESTRAINER - RIGHT									
S.No	BAR MARK	DESCRIPTION OF BAR	BAR DIA.(MM)	SPACING (MM)	BAR LENGTH (M)	No. OF BARS	UNIT WEIGHT (Kg/m)	TOTAL WEIGHT (Kg)	
1	TS1-R	1200 900 850 850	32		5.000	11	6.321	347.65	
2	TS2-R	900 1100 100	16	150	4.200	6	1.580	39.82	
3	TS3-R	1200 1100 100	16	100	4.800	10	1.580	75.85	
TOTAL (KG) :									463.33

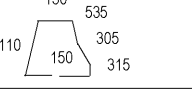
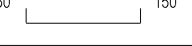
BAR BENDING SCHEDULE OF RCC LONGITUDINAL RESTRAINER									
S.No	BAR MARK	DESCRIPTION OF BAR	BAR DIA.(MM)	SPACING (MM)	BAR LENGTH (M)	No. OF BARS	UNIT WEIGHT (Kg/m)	TOTAL WEIGHT (Kg)	
1	TR1	1580 475 550 550	32	100	5.350	6	6.321	202.33	
2	TR2	550 475 100	16	150	2.100	3	1.580	27.45	
3	TR3	1580 550 100	25	150	4.350	4	3.858	67.55	
TOTAL (KG) :									297.33
TOTAL NOS OF LONGITUDINAL RESTRAINER :									3.00
TOTAL WEIGHT (KG) :									852.98

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		Mr. S.N.R.B		ABUTMENT BAR BENDING SCHEDULE OF BRIDGE OVER RIVER DHOLAN		AS SHOWN		JUNE, 2023	
				EPTISA Servicios De Ingenieria Madrid, Spain		Mr. S.M.		Reference Drawings		Chainage:		Drawing No.-	
				STUP Consultants Private Limited Kolkata, India		Mr. H.B.		278+913		KDP/DPR/STR/BR/DHOLAN/DD-9		Sheet No. 1/2	
				In Association With		Udaya Consultancy, Geocom International, Sundar Kirti Consultant and Rays Consultant Private Limited							

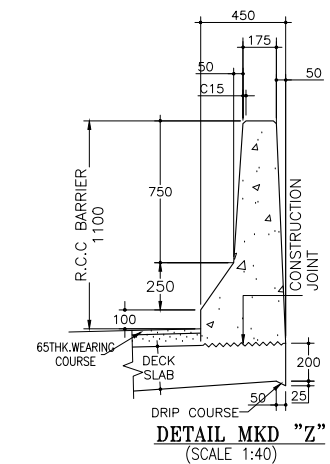
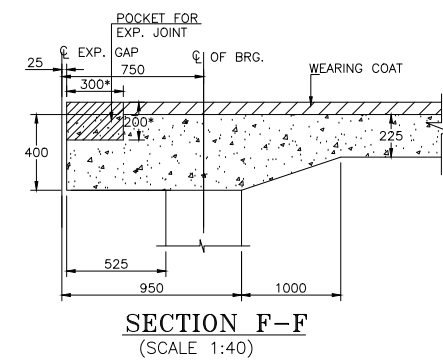
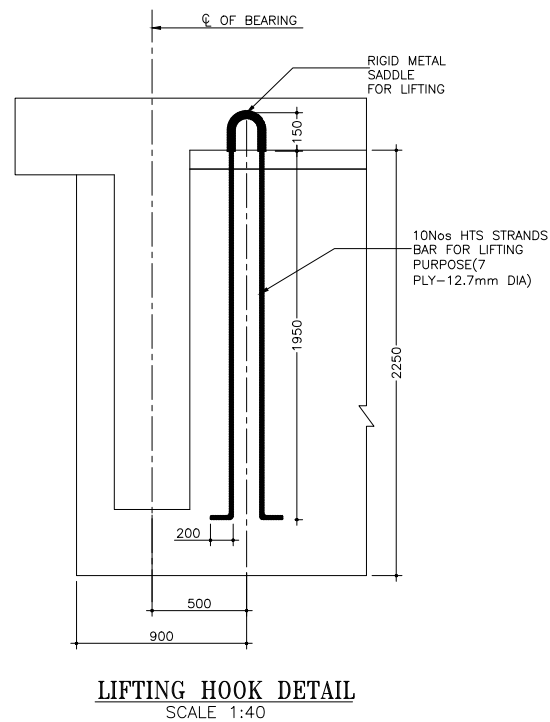
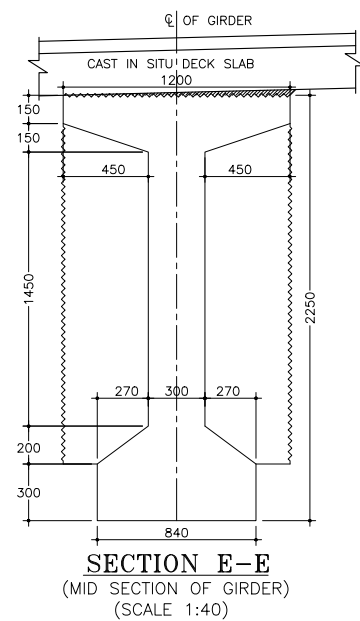
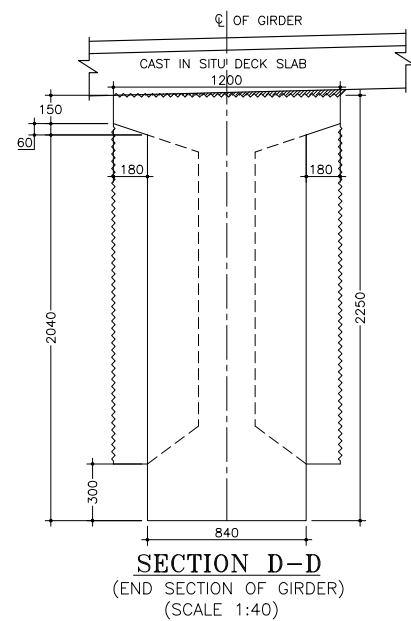
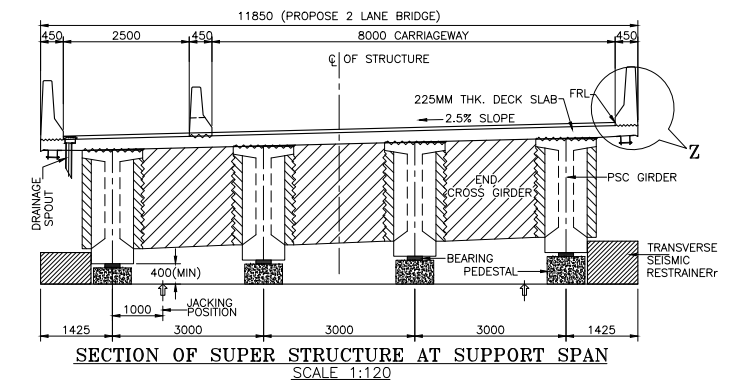
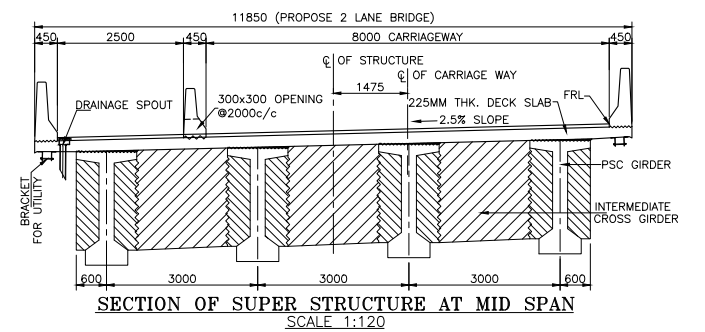
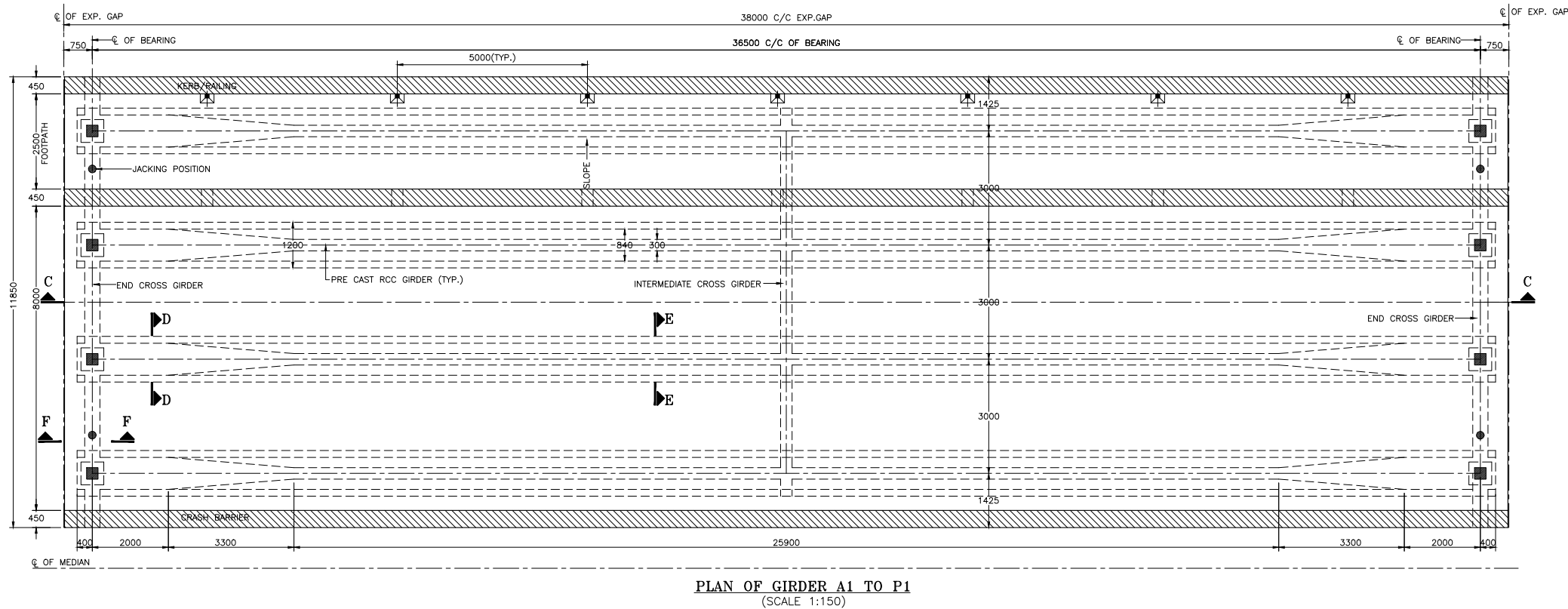
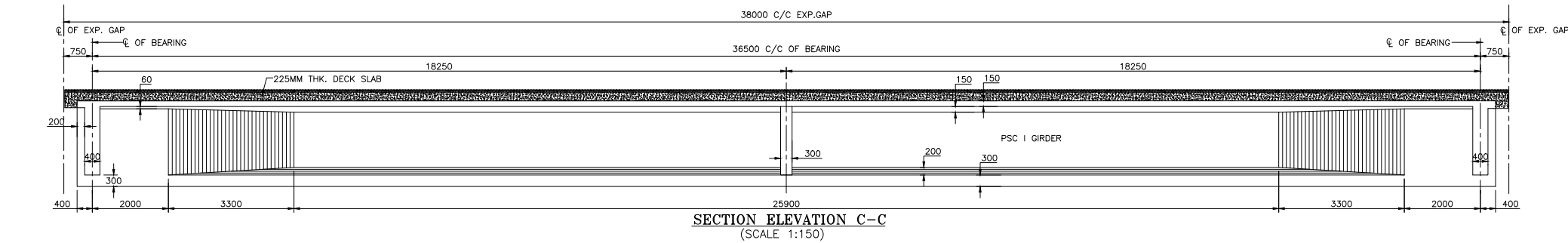
BAR BENDING SCHEDULE OF RETURN WALL - LEFT								
S.No.	BAR MARK	DESCRIPTION OF BAR	BAR DIA(MM)	SPACING (MM)	BAR LENGTH (M)	No. OF BARS	UNIT WEIGHT (Kg/m)	TOTAL WEIGHT (Kg)
1	RT1A		12	150	3.950	44	0.889	154.49
2	RT1B		16	150	3.950	44	1.580	274.65
3	RT2A		12	150	6.400	21	0.889	119.47
3	RT2B		12	150	4.130	21	0.889	77.09
4	RT2C		12	150	4.430	21	0.889	82.69
5	RT3A		12	150	8.761	17	0.889	132.39
6	RT3B		16	150	6.434	17	1.580	172.84
7	RT3C		12	150	3.672	17	0.889	55.49
8	RT3D		12	150	1.390	41	0.889	50.66
9	RT4A		12	150	1.784	25	0.889	39.63
10	RT4B		12	150	1.784	25	0.889	39.63
11	RT5		12	150	1.470	65	0.889	84.93
12	RT6		12	2 Nos.	6.511	2	0.889	11.58
13	RT7		20		5.950	4	2.469	58.77
14	RT8		12		5.636	4	0.889	20.04
TOTAL (KG) :								1374.35

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	3.950	42	0.889	147.47
2	RT1B		16	150	3.950	42	1.580	262.16
3	RT2A		12	150	6.400	21	0.889	119.47
4	RT2B		12	150	4.130	21	0.889	77.09
5	RT2C		12	150	4.430	21	0.889	82.69
6	RT3A		12	150	8.465	17	0.889	127.92
7	RT3B		16	150	6.138	17	1.580	164.89
8	RT3C		12	150	3.672	17	0.889	55.49
9	RT3D		12	150	1.390	41	0.889	50.66
10	RT4A		12	150	1.784	25	0.889	39.63
11	RT4B		12	150	1.784	25	0.889	39.63
12	RT5		12	150	1.470	65	0.889	84.93
12	RT6		12	2 Nos.	6.215	2	0.889	11.05
13	RT7		20		5.950	4	2.469	58.77
14	RT8		12		5.636	4	0.889	20.04
TOTAL (KG) :								1341.89

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		16	150	3.170	41	1.580	205.38
2	RC-B2		10	150	6.200	20	0.617	76.54
TOTAL (KG) :								281.93

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

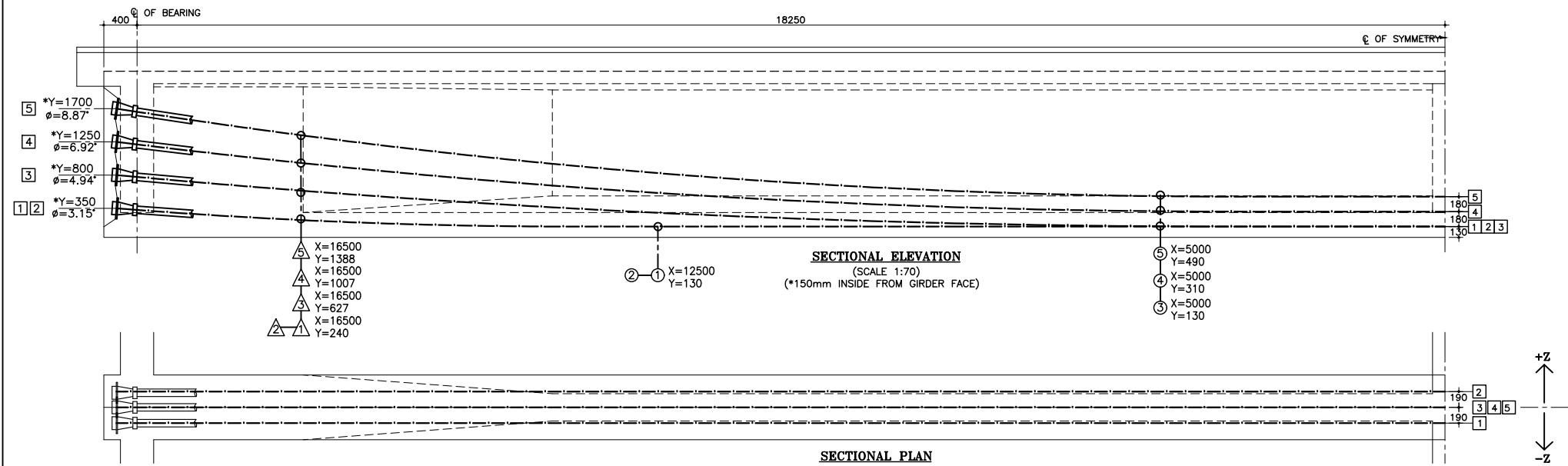
EMPLOYER		PROJECT NAME		DESIGN CONSULTANTS		Drawing Name		Scale:		Date:	
	Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Development Cooperation Implementation Division	Strategic Road Connectivity & Trade Improvement Project (SRCTIP) Detailed Design of Upgradation 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'	AS SHOWN	AS SHOWN	JUNE, 2023		
			 EPTISA Servicios De Ingenieria Madrid, Spain	 STUP Consultants Private Limited Kolkatta, India	Checked By	Mr. S.M. Nec.No.				Reference Drawings	
					In Association With Udaya Consultancy, Geocom International, Sundar Kriti Consultant and Rays Consultant Private Limited		Approved By	Mr. H.B. Nec.No.	Chainage: 278+913		Drawing No.- KDP/DPR/STR/BR/DHOLAN/DD -9
						—		Sheet No. 2/ 2			



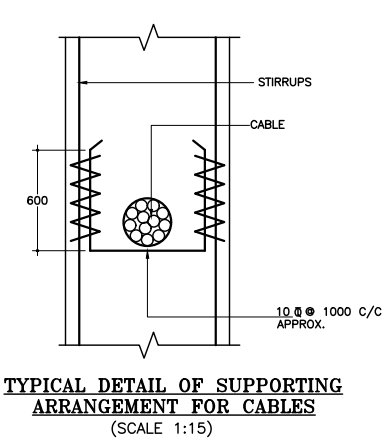
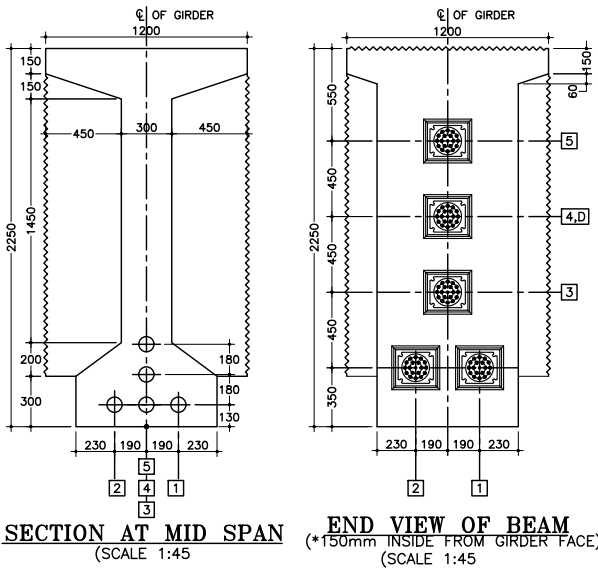
NOTES:

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	Mr.S.N.R.B. NEC NO. 265 CIVIL A Signature	SUPER STRUCTURE DETAILS OF BRIDGE OVER RIVER DHOLAN	AS NOTED	JUNE, 2023
		In Association With Udaya Consultancy, Geocom International, Sundar Kriti Consultant and Rays Consultant Private Limited	Checked By Mr.S.M. Signature			
			Approved By Mr.H.B. Signature			
				Reference Drawings:	Chainage:	Drawing No.:
					278+913	KDP/DPR/STR/BR/DHOLAN /DD -10
						Sheet No.:
						Sheet No. 1/1



cable no	at X =	18500		18500		18500		18500		18500		18500		18500		18500		18500		18500		18500		18500		18500	
		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		1700	0	1388	0	1169	0	980	0	823	0	695	0	599	0	532	0	497	0	490	0	490	0	490	0	490	0
C4(Dummy)		1250	0	1007	0	837	0	691	0	568	0	470	0	394	0	343	0	315	0	310	0	310	0	310	0	310	0
C3		800	0	627	0	506	0	402	0	314	0	244	0	190	0	153	0	134	0	130	0	130	0	130	0	130	0
C2		350	190	240	190	173	190	137	190	130	190	130	190	130	190	130	190	130	190	130	190	130	190	130	190	130	190
C1		350	-190	240	-190	173	-190	137	-190	130	-190	130	-190	130	-190	130	-190	130	-190	130	-190	130	-190	130	-190	130	-190



X=HORIZONTAL DISTANCE FROM MID SPAN SECTION ALONG LENGTH OF GIRDER
Y=VERTICAL DISTANCE TO CABLE CENTRE FROM SOFFIT OF WEB
Z=HORIZONTAL DISTANCE OF CABLE FROM CENTRE OF WEB

LEGEND:

- — INDICATES END OF CABLE
- — INDICATE CABLE NUMBER
- * — ORDINATE AT ANCHORAGE END
- — INDICATES START OF CURVE IN ELEVATION
- △ — INDICATES END OF CUVRE 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

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.
5. 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
- $$\text{REVISED EXTENSION} = \frac{(195 \times 10^{-5}) \times \text{ORIGINAL EXTENSION}}{(\text{NEW MODULUS})} \times \frac{\text{OLD AREA OF STRANDS}}{\text{NEW AREA}}$$

- EXTENSION OF CABLE SHALL BE VERIFIED FOR A FEW CABLES AT SITE. IN CASE OF VALUE OF μ AND k 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:-
$$\text{NEW EXTENSIONS} = \text{EX} + \text{EX} \times (\text{GRIP} - 750) / (\text{LENGTH})$$

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:

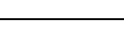
- DIMENSIONS ARE IN MILLIMETERS, CHANGES & LEVELS ARE IN METER,UNLESS NOTED OTHERWISE.
- CHAINAGE & LEVEL SHALL BE VERIFIED WITH THE RELEVANT PLAN & PROFILE DRAWING VARIATION (IF ANY) SHALL BE REPORTED TO ENGINEER FOR MODIFICATION.
- CHAINAGE OF THE STRUCTURE IS AT THE CENTER LINE OF THE PROPOSED STRUCTURE.
- WHERE ABSOLUTELY NECESSARY THE UNTENSIONED REINFORCEMENT BARS/MESH MAY BE SUITABLY REPOSITIONED TO SUIT.

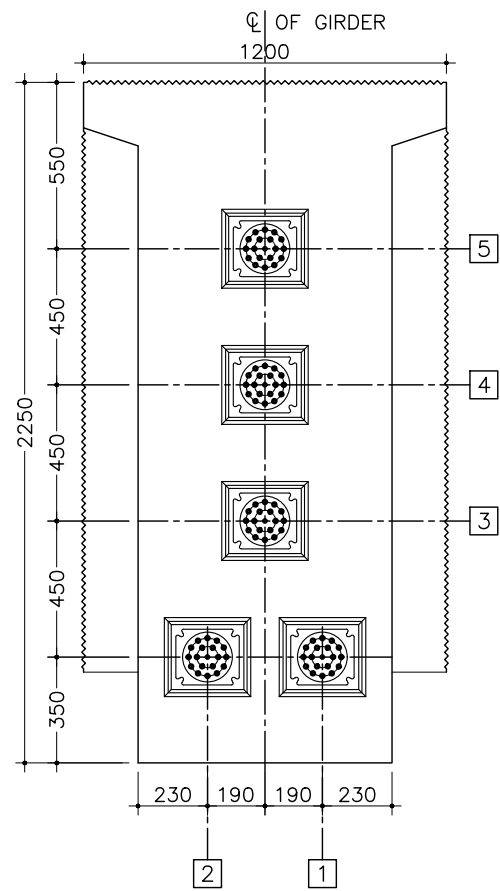
TABLE–3 SEQUENCE OF PRESTRESSING

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:

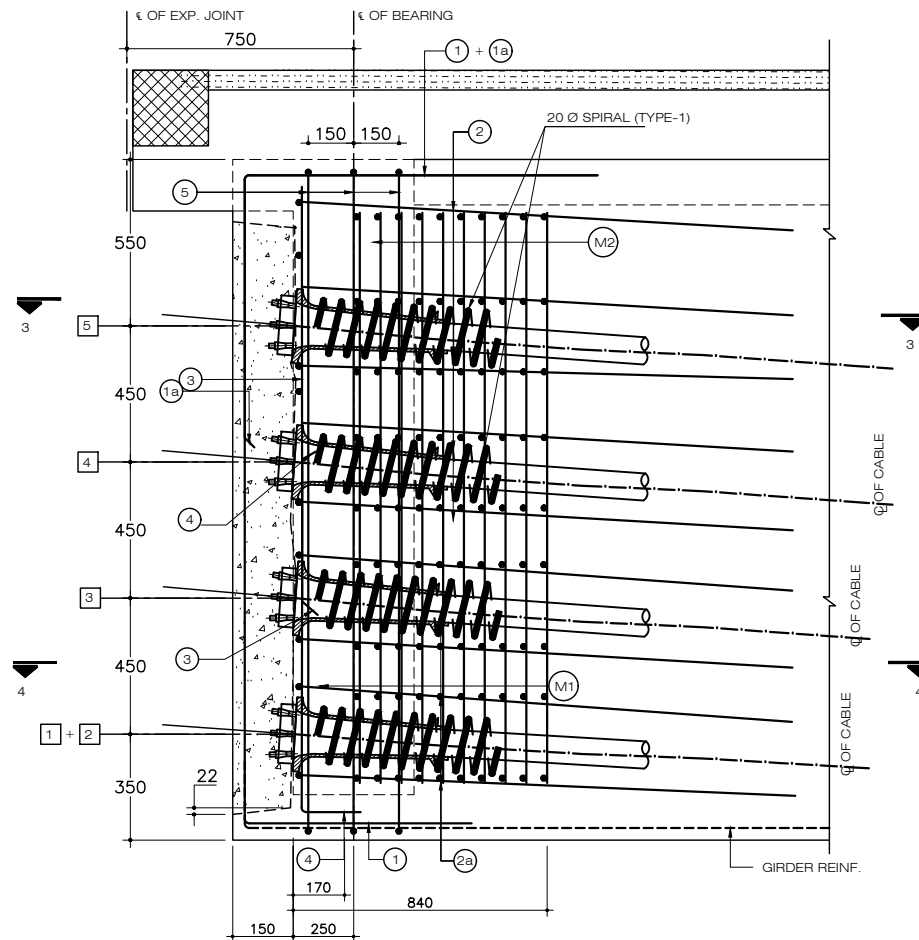
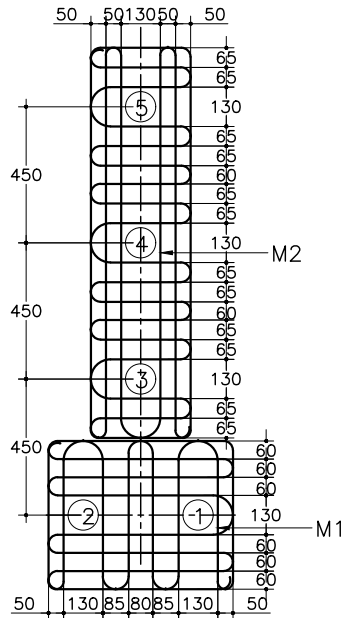
CABLE NO.	STAGE OF PRESTR-ESSING	ANCHORAGE TYPE	CABLE LENGTH CONSIDERING GRIP ADDITIONAL CUTTING LENGTH IN M.	CALCULATED ELONGATION CONSIDERING GRIP LENGTH (MM)	JACKING FORCE (KN)	NUMBER OF STRANDS TO BE STRESSED
5	PS II	19 T 15	39.041	133.04	3694	19
3		19 T 15	38.943	133.60	3694	19
2	PS I	19 T 15	38.910	133.64	2722	14
1		19 T 15	38.910	133.64	2722	14
CABLE 4 is dummy cable						

EMPLOYER	PROJECT	DESIGN CONSULTANT			Designed By	Mr.S.N.R.B NEC NO. 205 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	MAIN GIRDER DETAILS OF BRIDGE OVER RIVER DHOLAN	AS NOTED	Drawing No.: KDP/DPR/STR/BR/DHOLAN /DD -11
		 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								
				Approved By	Mr.H.B	 Signature	Reference Drawings:	Chainage: 278+913	Sheet No.: Sheet No. 1/1	

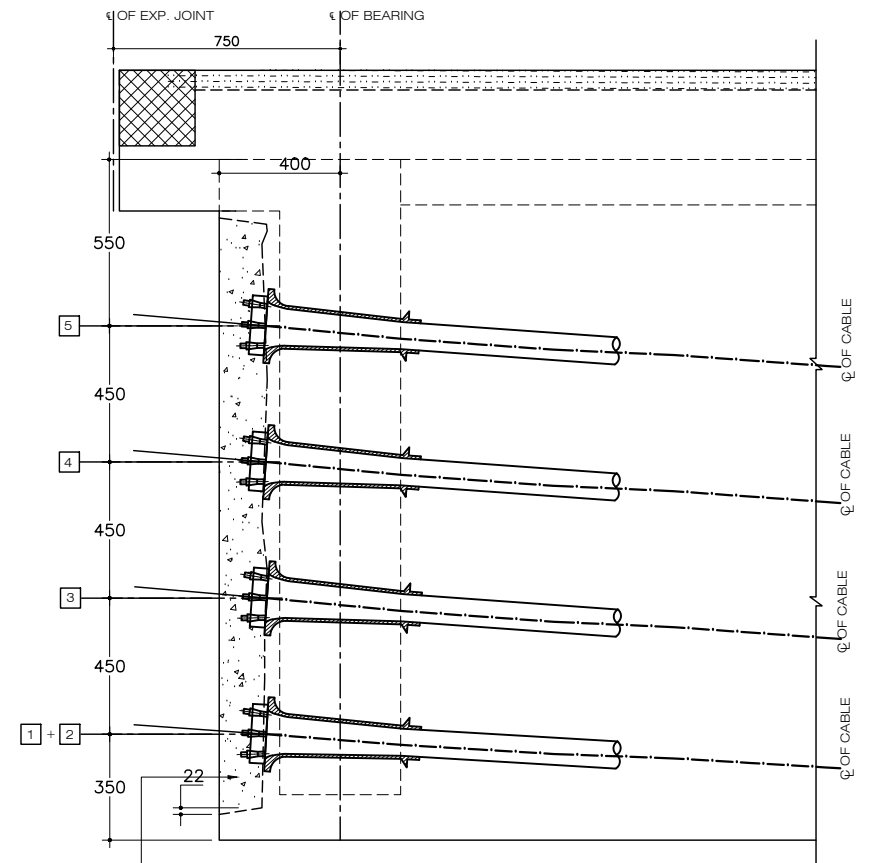


END VIEW OF BEAM

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



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



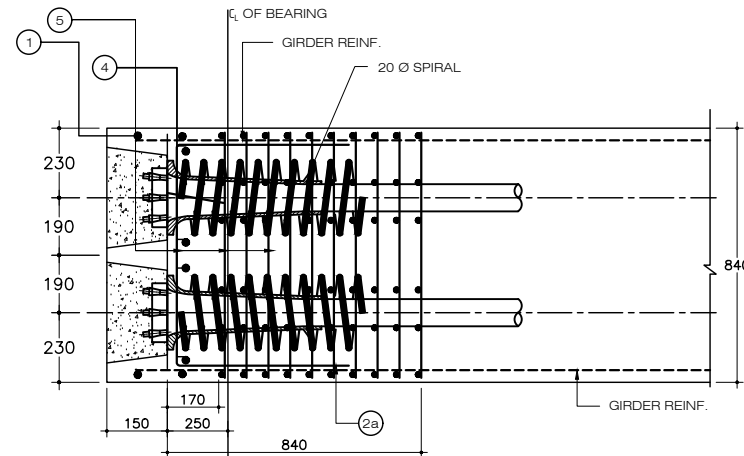
(SECTION SHOWING ANCHORAGE DIMENSION DETAIL)
(SCALE 1:30)

ANCHORAGE BLOCK
DIMENSION SHOULD BE AS PER
MANUFACTURING AGENCY

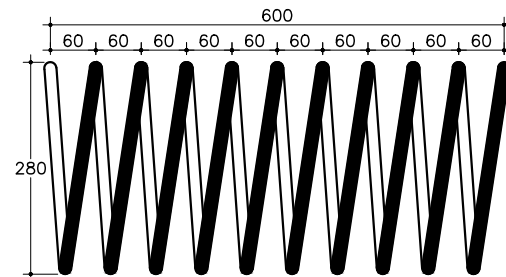
REINFORCEMENT SCHEDULE		
BAR MKD.	BAR DIA & SPACING/NOS.	BAR SHAPE
1	16 Ø 2 Nos.	700
1a	16 Ø 2 Nos.	700
2	20 Ø 4 Nos.	800
2a	20 Ø 3 Nos.	800
3	12 Ø 2 Nos.	
4	12 Ø 4 Nos.	
5	2L-20 Ø 6 NOS. STIRRUPS	

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)

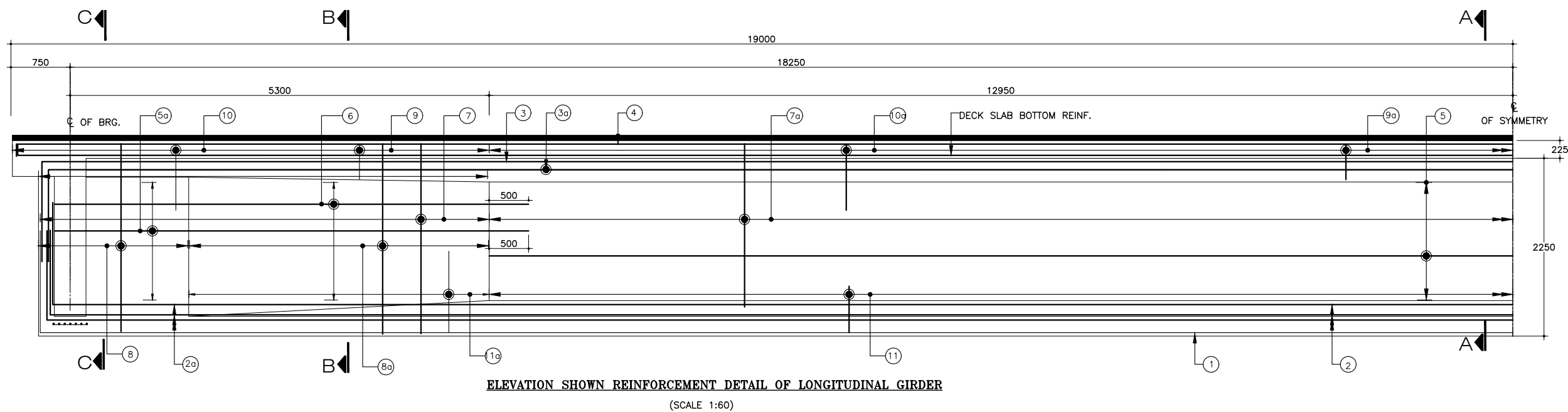
FAVORABLE BOND CONDITION					
GRADE OF CONCRETE	PERCENTAGE OF LAPPED BARS	<25%	33%	50%	>50%
M50	X	29	33	41	44
M45	X	33	38	47	50

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

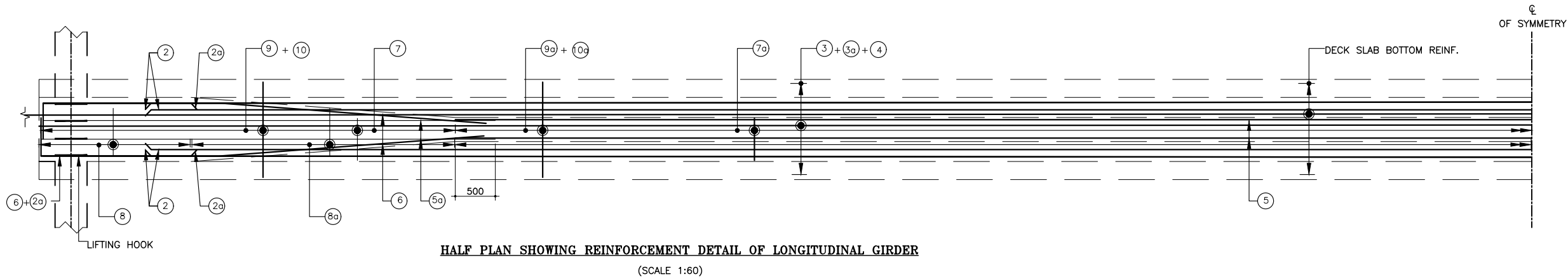
FAVORABLE ZONE:
a. RAFT/SLAB BOTTOM MAIN BAR.
UNFAVORABLE ZONE:
a. RAFT/SLAB BOTTOM MAIN BAR.
b. WALL/COLUMN MAIN BAR.

MANUFACTURER'S SPECIFICATION,

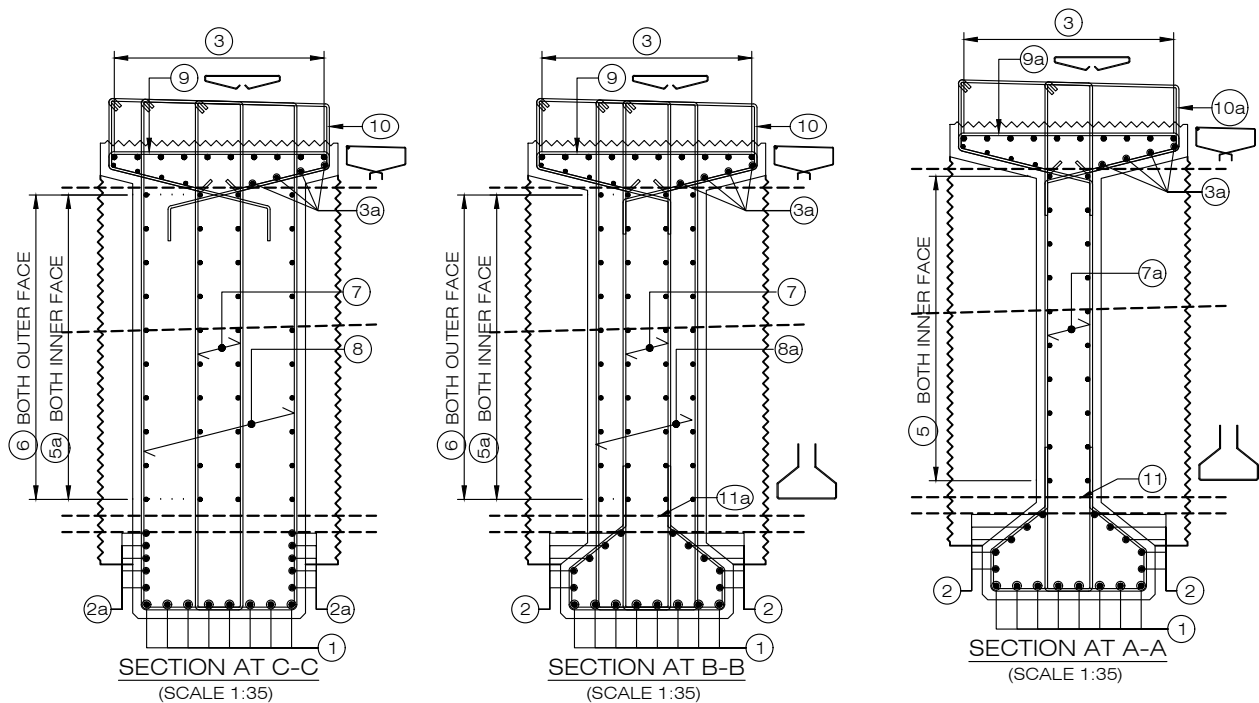
EMPLOYER	PROJECT	DESIGN CONSULTANT	Designed By	Drawing Name:	Scale:	Date:
Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Development Cooperation Implementation Division	Strategic Road Connectivity & Trade Improvement Project (SRCTIP) Detailed Design of Upgradation 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 Mr.S.M Signature Mr.H.B Signature	MAIN GIRDER REINFORCEMENT DETAILS OF BRIDGE OVER RIVER DHOLAN	AS NOTED	JUNE, 2023
				Reference Drawings: KDP/DPR/STR/BR/DHOLAN /DD -15	Chainage: 278+913	Drawing No.: KDP/DPR/STR/BR/DHOLAN /DD -12 Sheet No.: Sheet No. 1/2



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



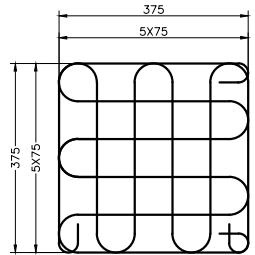
HALF PLAN SHOWING REINFORCEMENT DETAIL OF LONGITUDINAL GIRDER
(SCALE 1:60)



SECTION AT C-C
(SCALE 1:35)

SECTION AT B-B
(SCALE 1:35)

SECTION AT A-A
(SCALE 1:35)



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	
g	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	

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:
 - CAST-IN-SITU DECK SLAB.....M45
 - PRECAST PSC GIRDER.....M50
 - CROSS GIRDER.....M45
- CLEAR COVER TO OUTERMOST STEEL SHALL BE AS BELOW:
 - CAST-IN-SITU SUPERSTRUCTURE).....45mm
 - 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,

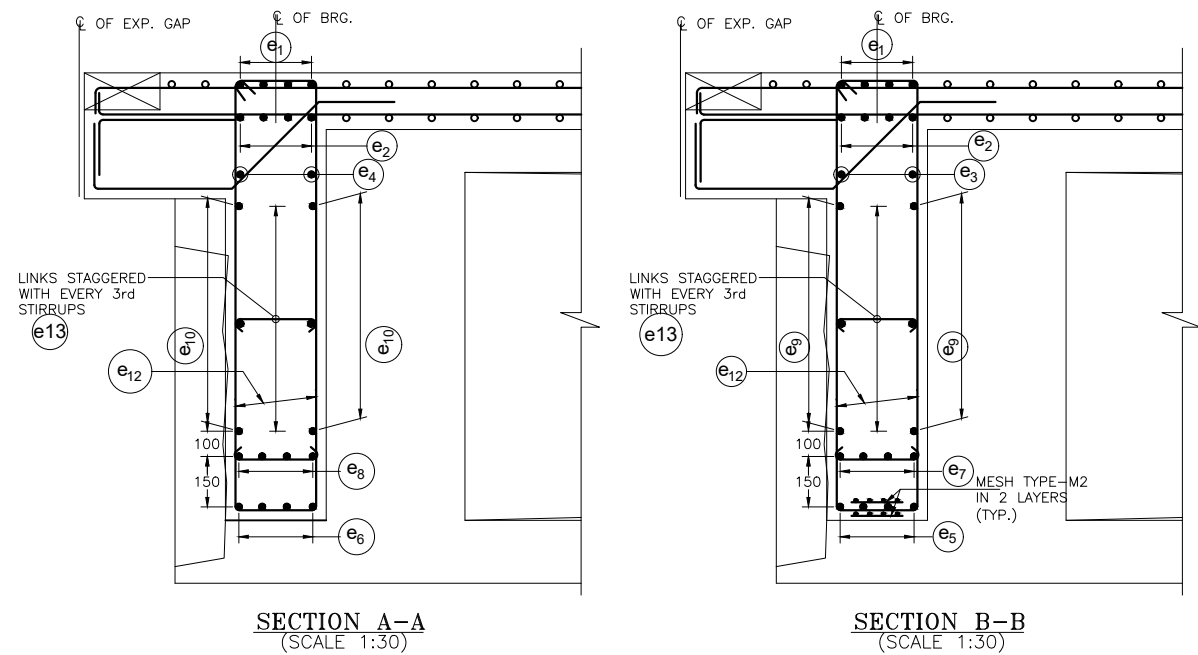
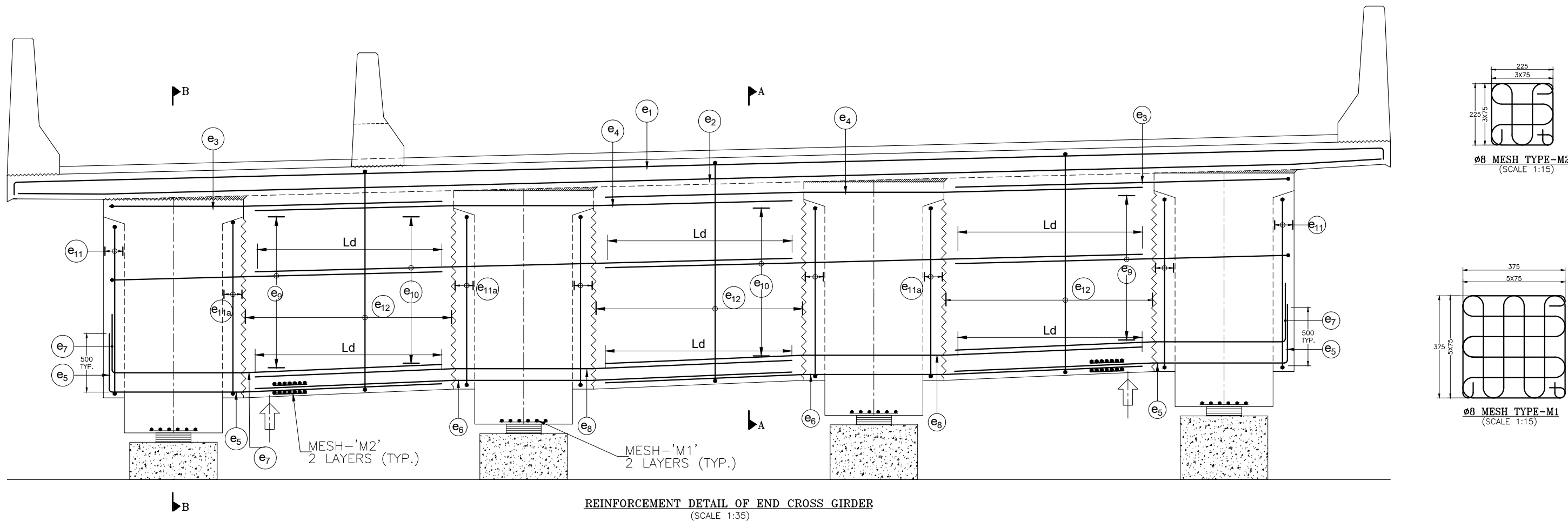
13. LAPPING SHALL BE STAGGERED, BARS SHALL BE LAPPED IN SUCH A WAY THAT NOT MORE THAN 50% OF THE BARS ARE LAPPED AT ANY SECTION, LAP LENGTH SHALL BE PROVIDED AS "X*d" MENTIONED IN THE TABLE BELOW, WHERE 'd' IS THE SMALLER BAR UNLESS OTHERWISE SPECIFIED.

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	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. NEC NO. 265 CIVIL A Signature	MAIN GIRDER REINFORCEMENT DETAILS OF BRIDGE OVER RIVER DHOLAN	AS NOTED	JUNE, 2023
			Mr.S.M Signature	Reference Drawings:	Chainage:	Drawing No.: KDP/DPR/STR/BR/DHOLAN /DD -12
			Mr.H.B Signature	KDP/DPR/STR/BR/DHOLAN /DD -15	278+913	Sheet No.: Sheet No. 2/2



NOTES:-

1. ALL DIMENSIONS ARE IN mm AND LEVELS ARE IN METER, DIMENSIONS ARE NOT TO BE SCALED, ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
2. CONCRETE GRADE FOR CROSS-GIRDER & DECK SLAB M45.
3. SUITABLE HOLES SHALL BE LEFT IN PRECAST GIRDER FOR SUPPORTING THE DECK SLAB SHUTTERING.
4. SUITABLE PROVISION FOR HANDLING & LIFTING HOOKS ETC TO BE PROVIDED.
5. BEAMS SHALL BE KEPT UPRIGHT AT ALL TIMES AND TO BE CLEARLY MARKED INDICATING SPAN LOCATION & RESPECTIVE ENDS BEFORE REMOVAL FROM CASTING BED.
6. TOP SURFACE OF PRECAST BEAM & VERTICAL EDGES OF END TO BE LEFT ROUGHENED FOR EFFECTIVE BONDING.
7. 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.
8. ALL REINFORCING BARS SHALL BE THERMO MECHANICALLY TREATED (TMT) BARS (GRADE DESIGNATE Fe500D) CONFORMING TO IS-1786 STANDARDS.
9. 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:

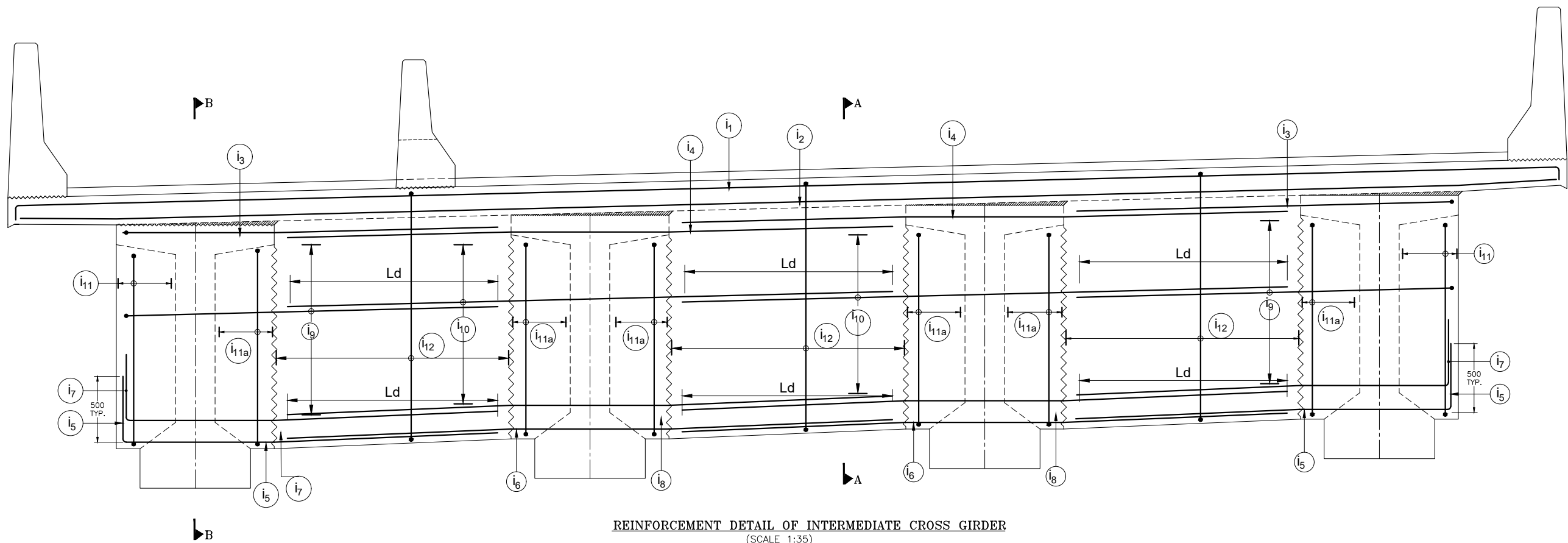
a. RAFT/SLAB BOTTOM MAIN BAR.

b. WALL/COLUMN MAIN BAR.

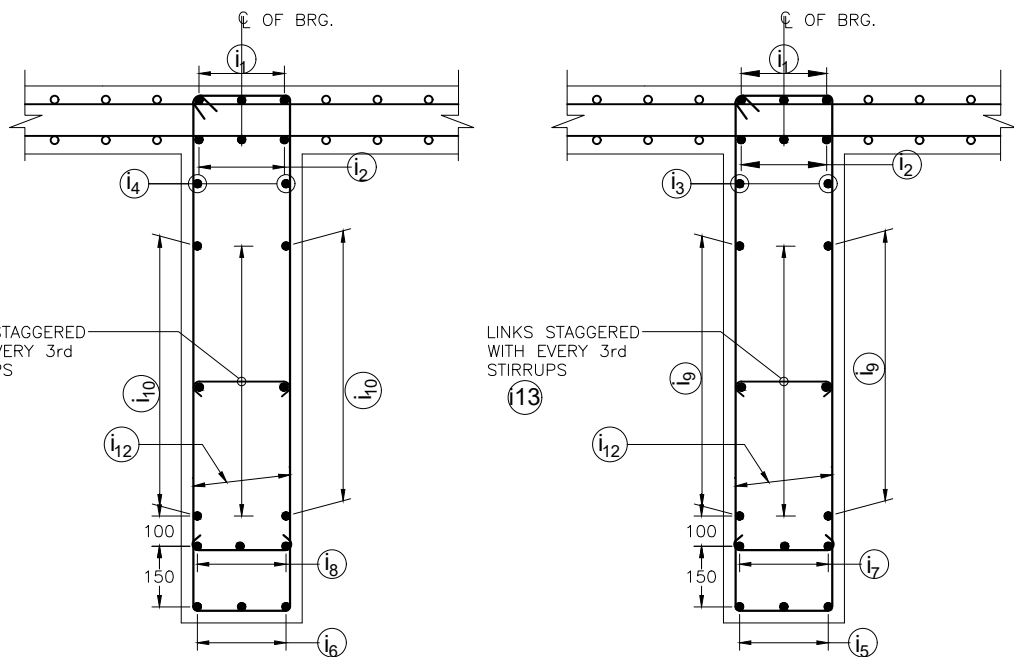
SCHEDULE OF REINFORCEMENT (END CROSS GIRDERS TYP. EACH)

BAR MKD.	DESCRIPTION	SHAPE
e1	20 Ø 4 nos	150
e2	20 Ø 4 nos	150
e3	20 Ø 4x2 Nos	150
e4	20 Ø 4x2 Nos	
e5	20 Ø 4 nos	
e6	20 Ø 4 nos	
e7	20 Ø 4 nos	300
e8	20 Ø 4 nos	
e9	16 Ø 6x2 Nos	150
e10	16 Ø 6x2 Nos	
e11	2L-20 Ø @ 150c/c	
e11a	2L-20 Ø @ 150c/c	
e12	2L-20 Ø @ 150c/c	
e13	12Ø Linked Every 3rd Layer	
MESH-M1	8Ø @ 75 x 75	
MESH-M2	8Ø @ 75 x 75	

EMPLOYER	PROJECT	DESIGN CONSULTANT			Designed By	Mr.S.N.R.B. NIE NO. 265 CIVIL-A	 Signature	Drawing Name: CROSS GIRDER REINFORCEMENT DETAILS OF BRIDGE OVER RIVER DHOLAN	Scale: AS NOTED	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)	Joint Venture of		Checked By						
	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		Approved By	Mr.H.B	 Signature	Sheet No.: Sheet No. 1/2		
		In Association With Udaya Consultancy, Geocom International, Sundar Kriti Consultant and Rays Consultant Private Limited								



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	150
i2	16 Φ 3 nos	150
i3	12 Φ 3x2 Nos	150
i4	12 Φ 3x2 Nos	
i5	20 Φ 3 Nos	
i6	20 Φ 3 Nos	
i7	20 Φ 3 Nos	300
i8	20 Φ 3 Nos	
i9	12 Φ 6x2 Nos	150
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.

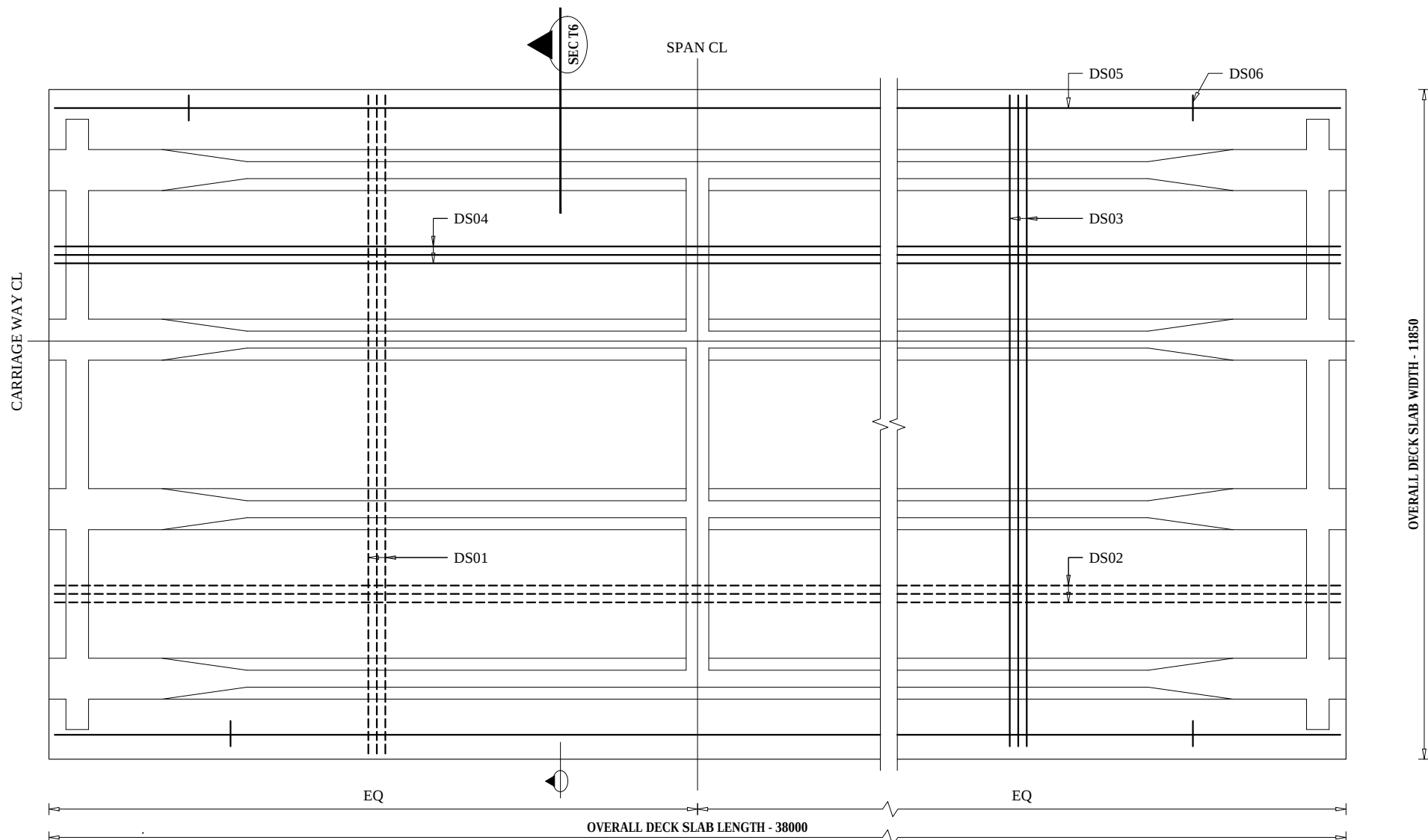
FAVORABLE BOND CONDITION					
GRADE OF CONCRETE	PERCENTAGE OF LAPPED BARS	<25%	33%	50%	>50%
M45	X	33	38	47	50

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.

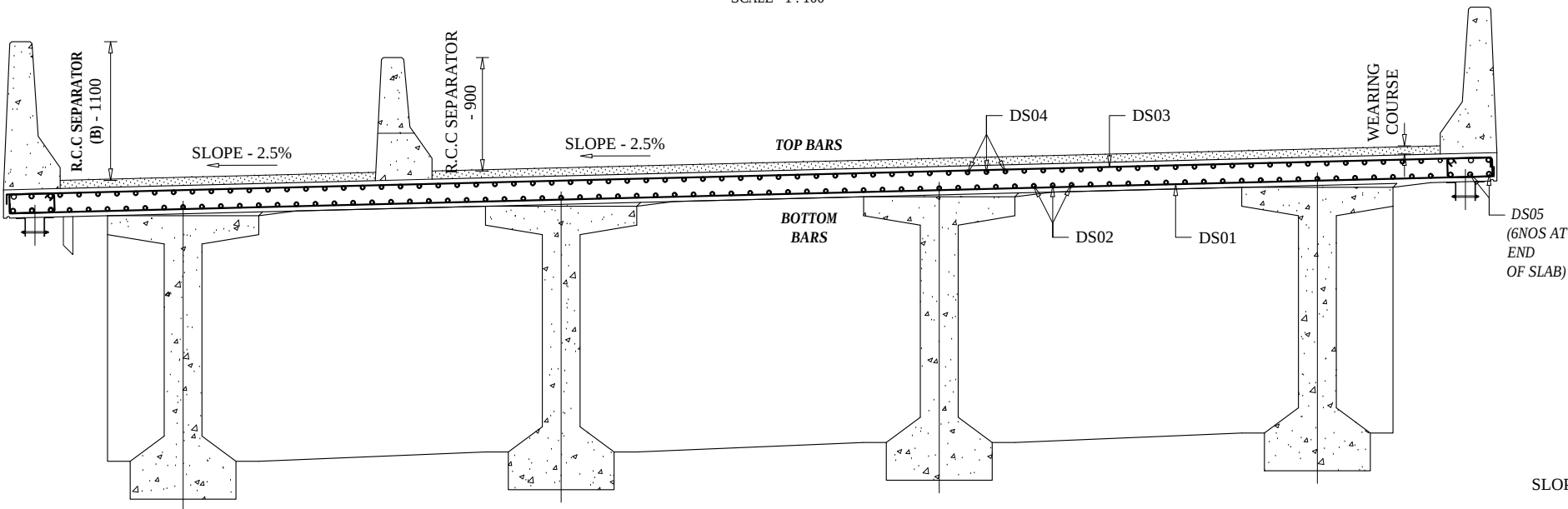
UNFAVORABLE ZONE:
a. RAFT/SLAB BOTTOM MAIN BAR.
b. WALL/COLUMN MAIN BAR.

EMPLOYER	PROJECT	DESIGN CONSULTANT	Designed By	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	CROSS GIRDER REINFORCEMENT DETAILS OF BRIDGE OVER RIVER DHOLAN Reference Drawings: KDP/DPR/STR/BR/DHOLAN /DD -15	AS NOTED Chainage: 278+913	JUNE, 2023 Drawing No.: KDP/DPR/STR/BR/DHOLAN /DD -13 Sheet No.: Sheet No. 2/2
			Checked By	Mr.S.M			
			Approved By	Mr.H.B			



REINFORCEMENT DETAILS OF DECK SLAB - PLAN VIEW

SCALE - 1 : 100



REINFORCEMENT DETAILS OF DECK SLAB - SECTIONAL VIEW AT T6

SCALE - 1 : 50

BAR MARK	SHAPE	BAR DIA & SPACING/Nos.
DS01		16Ø @ 150 C/C
DS02		12Ø @ 150 C/C
DS03		16Ø @ 150 C/C
DS04		12Ø @ 150 C/C
DS05		(3+3) 6Nos Ø16
DS06		2L-Ø10 @300 C/C

LEGEND FOR REINFORCEMENT BAR

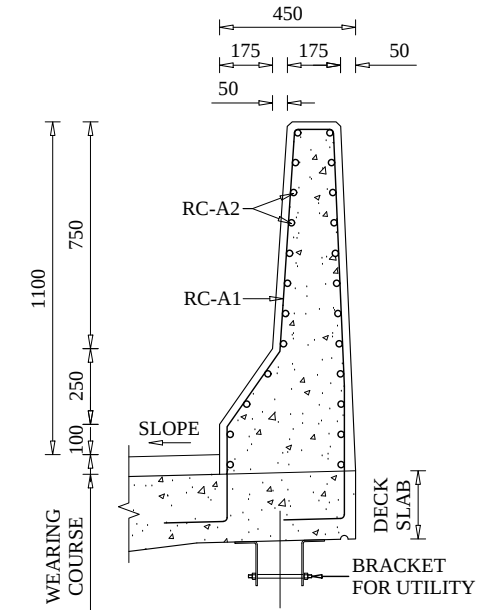
AB (M / E) 02 @ 250C/C

SPACING OF BARS (mm)
BAR SHAPE MARK
MID OR EDGE
SUPERSTRUCTURE
SHORT FORM

CODE FULL FORM

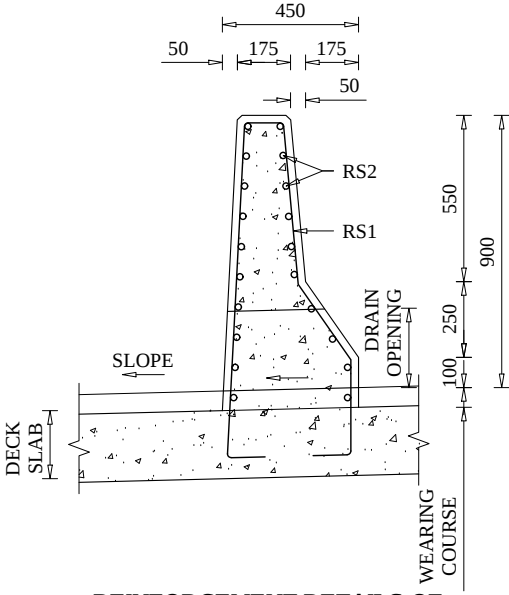
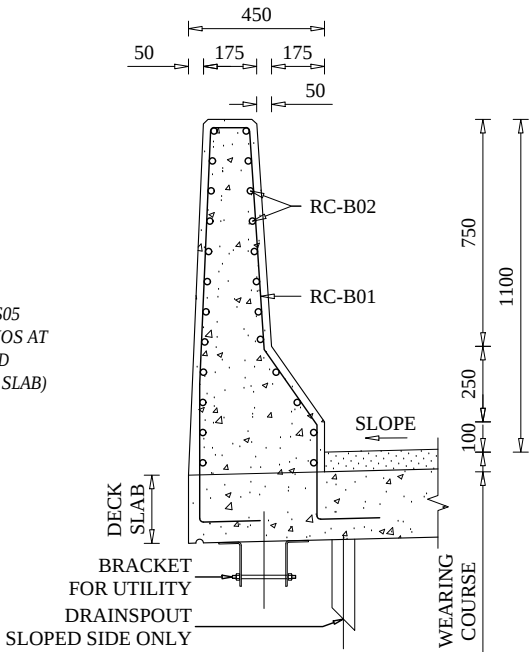
DS - DECK SLAB CG - CROSS GIRDER
RB - R.C.C BARRIER AS - APPROACH SLAB
RS - R.C.C SEPARATOR ST - STOPPER
MG - MAIN GIRDER ** - ***

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



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

SCALE - 1 : 25



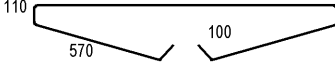
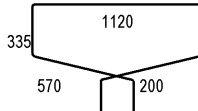
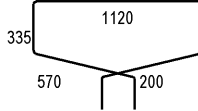
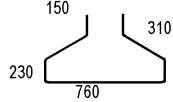
REINFORCEMENT DETAILS OF R.C.C SEPARATOR - SECTIONAL VIEW

SCALE - 1 : 25

EMPLOYER	PROJECT	DESIGN CONSULTANT			Designed By	Mr.S.N.R.B NEC NO. 265 CIVIL A		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		DECK SLAB DETAILS OF BRIDGE OVER RIVER DHOLAN	AS NOTED	Drawing No.: KDP/DPR/STR/BR/DHOLAN/DD -14
		 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		Reference Drawings: KDP/DPR/STR/BR/DHOLAN /DD -15	Chainage: 278+913	Sheet No.: Sheet No. 1/1

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				16	150	255	12.07	3077.85	1.578	4857.88
2	DS02	150				12	150	79	38.17	3015.43	0.89	2677.14
3	DS03	150				16	150	255	12.07	3077.85	1.578	4857.88
4	DS04	150				12	150	79	38.17	3015.43	0.888	2677.14
5	DS05	150				16		12	38.17	458.04	1.578	722.94
6	DS06	145  75				10	300	254	1.26	320.04	0.617	197.32
Total Weight of Deck Slab (kg)												15990.30

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				16		10	37.42	374.2	1.578	590.61
2	2	100				16		12	33.20	398.4	1.578	628.81
3	2a	100				16		24	3.10	74.4	1.578	117.43
4	3	100				16		14	37.40	523.6	1.578	826.42
5	3a				16		12	37.20	446.4	1.578	704.57	
6	5				12		24	25.90	621.6	0.888	551.87	
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	130	5.43	705.9	0.888	626.71	
10	7				12	150	78	5.43	423.54	0.888	376.02	
11	8a				12	150	46	Average 5.97	274.62	0.888	243.81	
12	8				12	150	34	6.51	221.34	0.888	196.51	

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		12	150	249	2.68	667.3636808	0.89	592.49	
14	10		12	150	78	3.33	259.7536832	0.89	230.61	
15	10a		12	200	131	3.33	436.2529807	0.89	387.31	
16	11&11a		12	150	217	2.14	464.38	0.89	412.28	
Total Weight for One Longitudinal Beam (kg)									7013.9	
Total Weight for Four webs (kg) = 7013.8 X 4=									28055.5	

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	4.02	16.08	2.466	39.66	
12	e11a				20	150	12	4.02	48.24	2.466	118.97	
13	e12				20	150	39	5.03	196.17	2.466	483.78	

EMPLOYER		PROJECT		DESIGN CONSULTANT			Designed By	Mr.S.N.R.B	 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 DHOLAN		Reference Drawings:	AS NOTED	Chainage: 278+913
		 EPTISA Servicios De Ingeniera Madrid, Spain	 STUP Consultants Private Limited Kolkatta, India	Approved By	Mr.H.B	 Signature			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		12	300	18	0.52	9.36	0.888	8.31	
15	Mesh-M1		8		4	2.17	8.7	0.4	13.7	
16	Mesh-M2		8		4	5.24	21.0	0.4	33.1	
Total Weight for 1 Cross Girder (kg)									1838.29	
Total Weight for 2 Cross Girder (kg)									3676.59	

Bar bending schedule for Webs								
S.N	Bar Label		Bar Dia (mm)	No. of bars	Length(m)	Total Length(m)	Unit Weight (kg/m)	Weight (kg)
1	M1	MESH TYPE M1	16	20	14.632	292.64	1.58	461.88
2	M2	MESH TYPE M2	16	20	9.452	189.04	1.58	298.37
3	SPIRAL	SPIRAL REINFORCEMENT (10 TURNS EACH);	20	8	5.6	44.8	2.47	110.48
4	1		16	4	3.57	14.28	1.58	22.54
5	1a		16	4	1.785	7.14	1.58	11.27
6	2		20	8	1.945	15.56	2.47	38.37
7	2a		20	6	2.33	13.98	2.47	34.48
8	3		12	4	1.085	4.34	0.89	3.85
9	4		12	8	1.785	14.28	0.89	12.68
10	5		20	12	6	72	2.47	177.56
Sub-Total								1171.49
Total Weight for Four webs (kg) = 1171.4 X 4=								4685.95

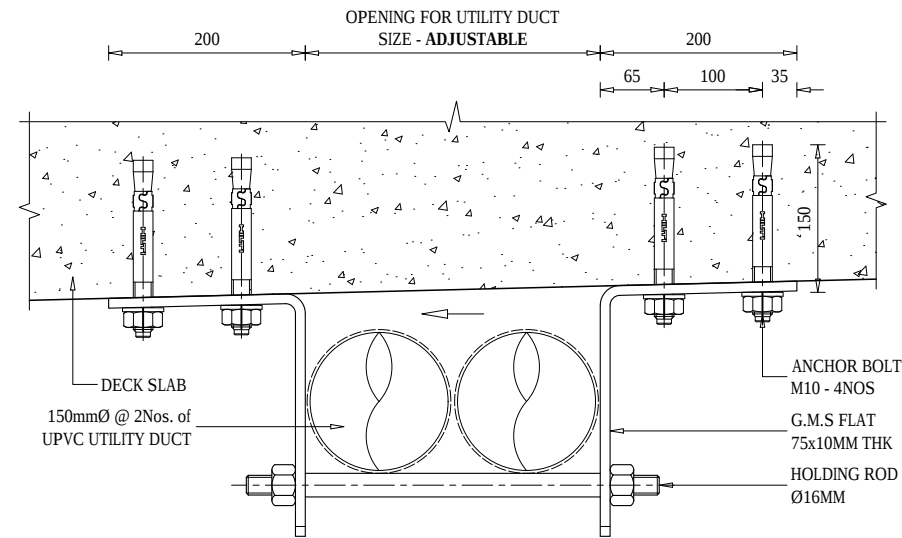
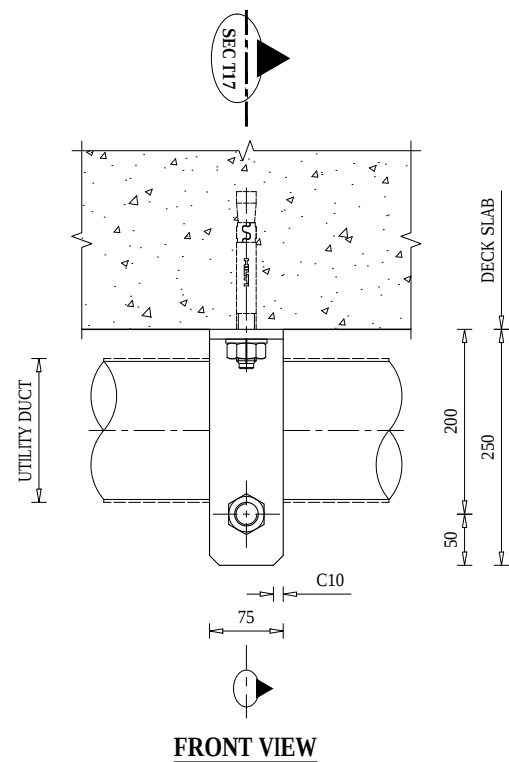
Bar bending schedule for Approach Slab									
S.N	Bar Label	Bar Shape	Bar Dia (mm)	Bar spacing	No. of bars	Length	Total length	Unit Weight (kg/m)	Weight (kg)
1	1601		16	150	148	3.62	535.76	1.578	845.61
2	1201		12	150	48	11.17	536.16	0.888	476.01
Total Weight for one approach Slab (Kg)									1,321.62
Total Weight for one Sapn 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		16		3	12.07	36.21	1.578	57.15	
2	i2		16		3	12.07	36.21	1.578	57.15	
3	i3		12		12	3.01	36.12	0.888	32.07	
4	i4		12		12	4.6	55.2	0.888	49.01	
5	i5		20		6	3.36	20.16	2.466	49.72	
6	i6		20		6	4.6	27.6	2.466	68.07	
7	i7		20		6	3.36	20.16	2.466	49.72	
8	i8		20		6	4.6	27.6	2.466	68.07	
9	i9		12		24	3.01	72.24	0.888	64.14	
10	i10		12		24	4.6	110.4	0.888	98.01	
11	i11		20	150	4	3.73	14.92	2.466	36.79	
12	i11a		20	150	12	3.73	44.76	2.466	110.38	
13	i12		16	150	39	4.83	188.37	1.578	297.31	
14	i13		12	300	18.00	0.42	7.56	0.888	6.71	
Total Weight for 1 Cross Girder (kg)									1044.30	

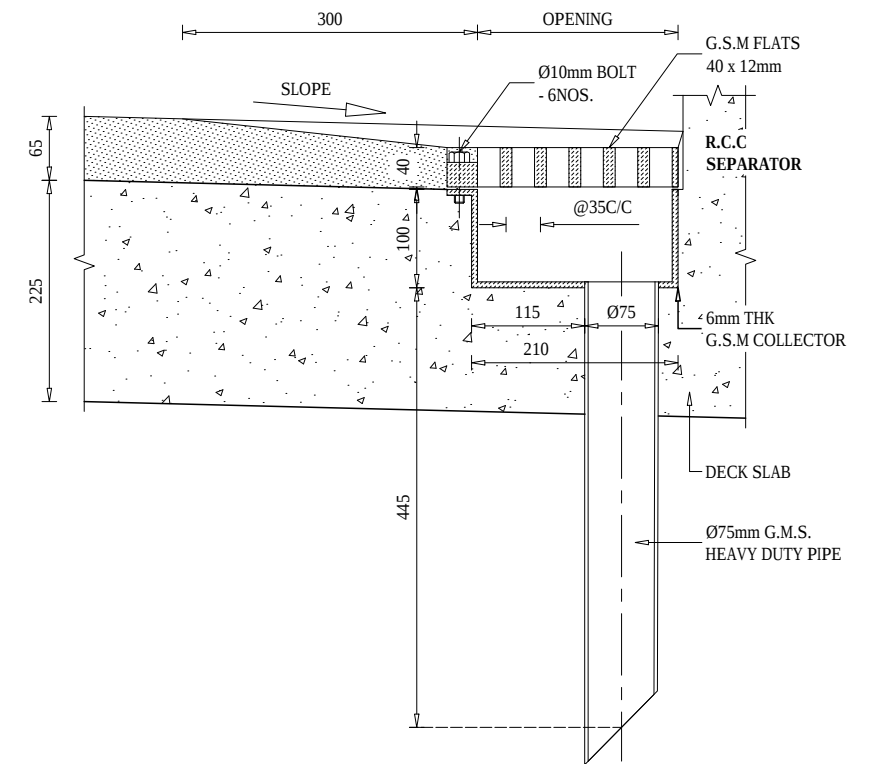
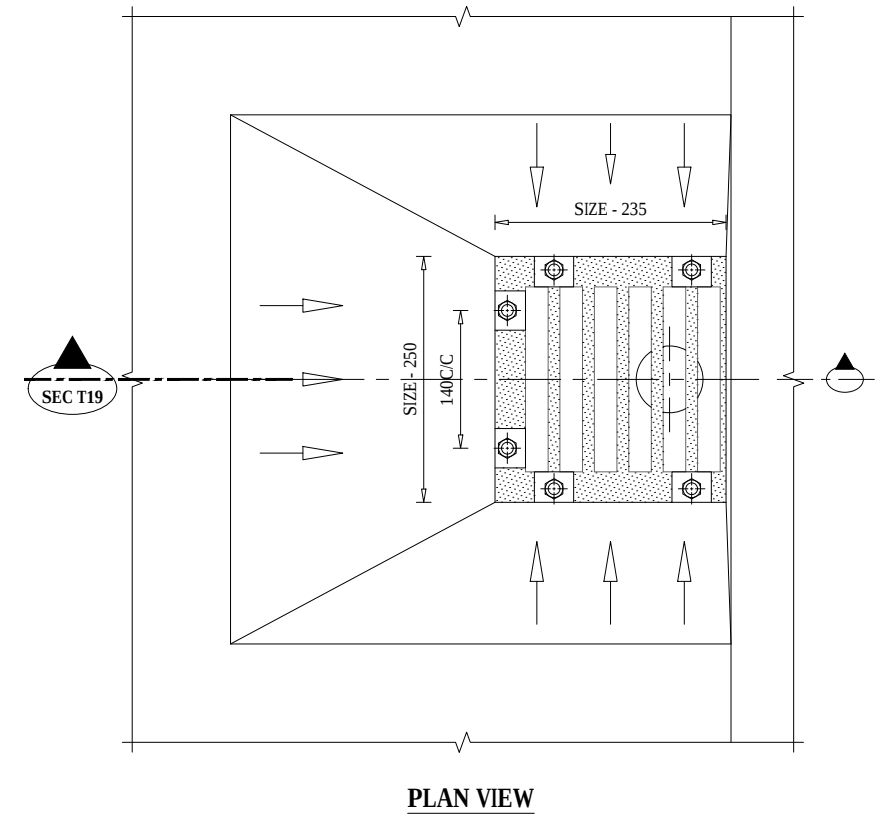
BAR BENDING SCHEDULE OF R.C.C BARRIER									
S.N	Bar Label	Bar Shape	Bar Dia (mm)	Bar spacing	No. of bars	Length	Total length	Unit Weight (kg/m)	Weight (kg)
1	RC-A1		16	150	253	3.17	802.01	1.58	1265.84
2	RC-A2		10	150	20	38.07	761.4	0.62	469.43
Total Weight (Kg)									1,735.27

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		16	150	253	2.695	681.835	1.58	1076.16
2	RS2		10	150	17	38.07	647.19	0.62	399.02
Total Weight (Kg)									1,475.18

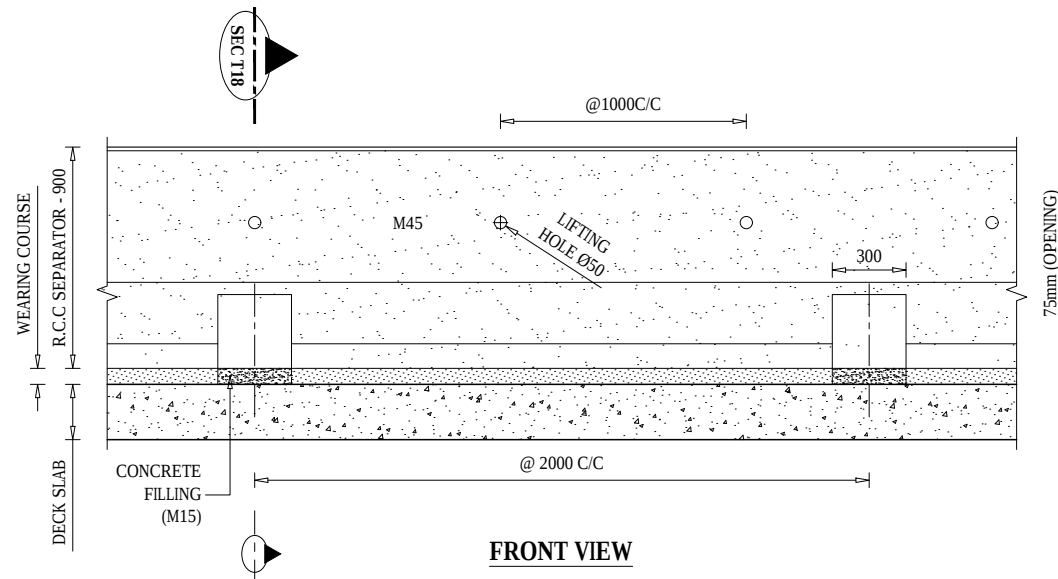
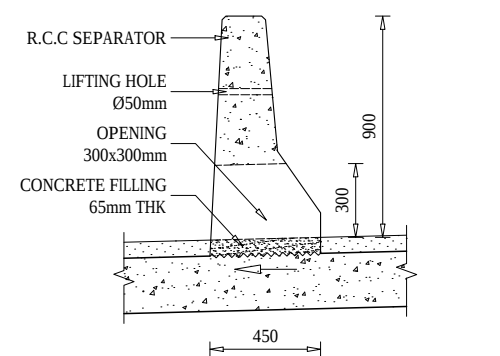
EMPLOYER		PROJECT		DESIGN CONSULTANT		Designed By		Drawing Name:		Scale:		Date:	
 Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Development Cooperation Implementation Division		Strategic Road Connectivity & Trade Improvement Project (SRCTIP) Detailed Design of Upgradation of Kamala-Dhalkebar-Pathlaiya Road Section (130 KM) of Mahendra Highway and Bridges		Joint Venture of		Mr.S.N.R.B		SUPERSTRUCTURE BAR BENDING SCHEDULE OF BRIDGE OVER RIVER DHOLAN		AS NOTED		JUNE, 2023	
				EPTISA Servicios De Ingeniera Madrid, Spain		Mr.S.M						Drawing No.: KDP/DPR/STR/BR/DHOLAN/DD -15	
				In Association With Udaya Consultancy, Geocom International, Sundar Kriti Consultant and Rays Consultant Private Limited		Mr.H.B		Reference Drawings:		Chainage: 278+913		Sheet No.: Sheet No. 2/2	



**DETAILS OF GALVANIZED MILD STEEL (G.M.S)
UTILITY DUCT CLAMP**
SCALE - 1 : 10



**DETAILS OF GALVANIZED MILD STEEL (G.M.S)
DRAINAGE SPOUT**
SCALE - 1 : 10



**DETAIL ELEVATION VIEW AT R.C.C SEPARATOR
& IT'S DRAIN OPENING**
SCALE - 1 : 40

EMPLOYER	PROJECT NAME	DESIGN CONSULTANTS			Designed By	Mr. S.N.R.B Nec.No. 265 Civil "A"	 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 Kamaia-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	Approved By	Mr. H.B.	 Signature	278+913	Sheet No. 1 / 2	



SCALE - 1 : 10 @ A3 PAPER



- SEAL TYPE

SCALE - NON



SCALE - 1 : 100 @ A3 PAPER



SCALE - 1 : 40 @ A3 PAPER

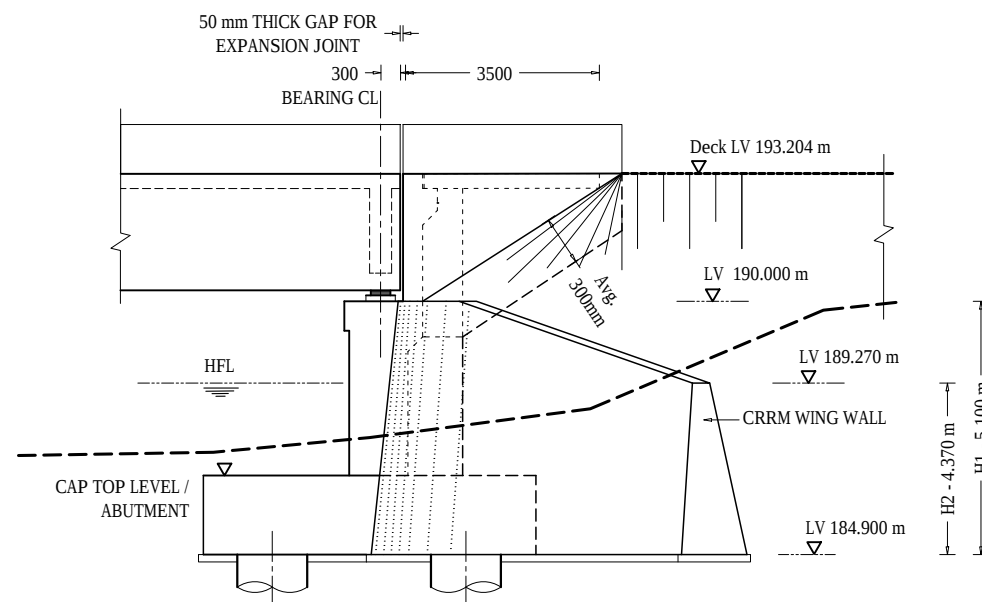
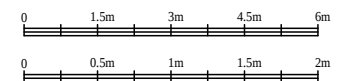
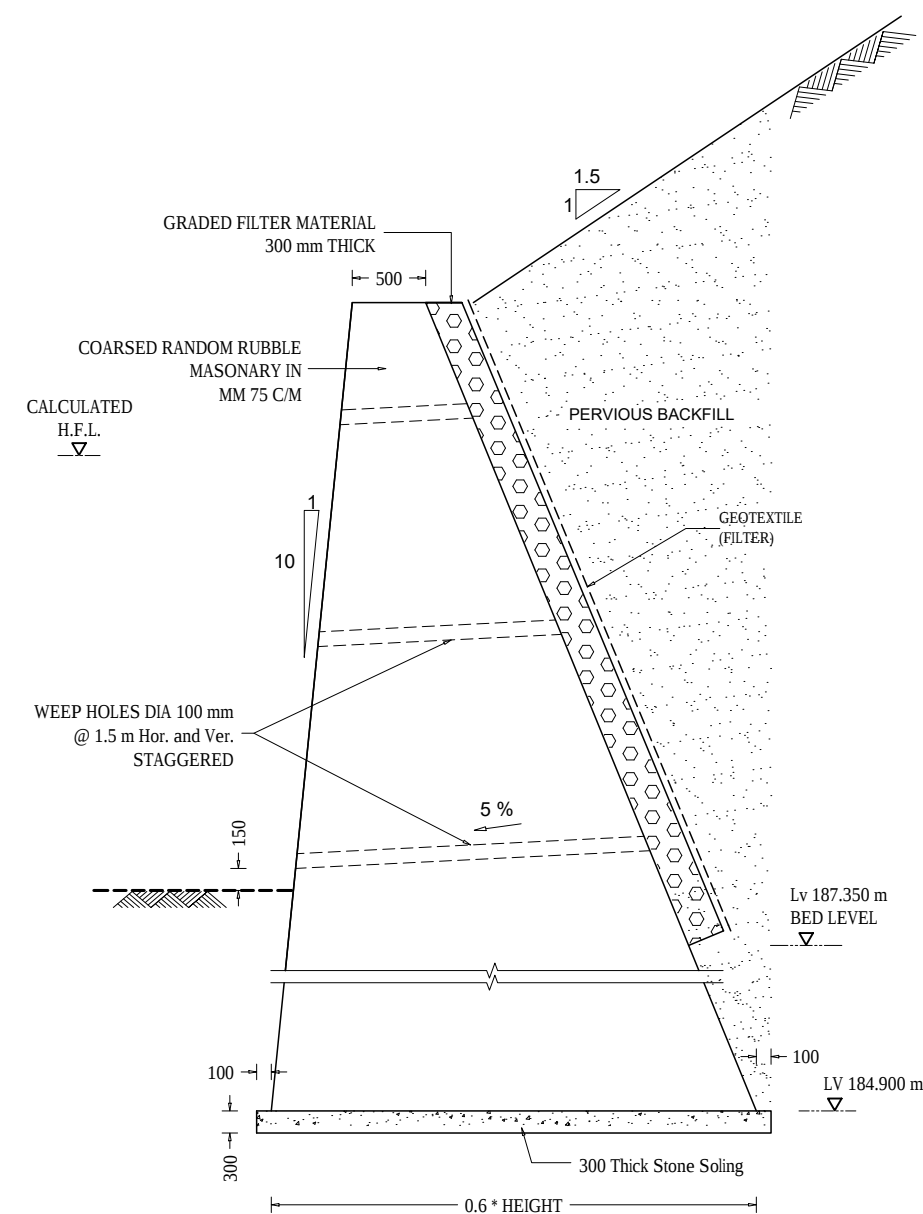


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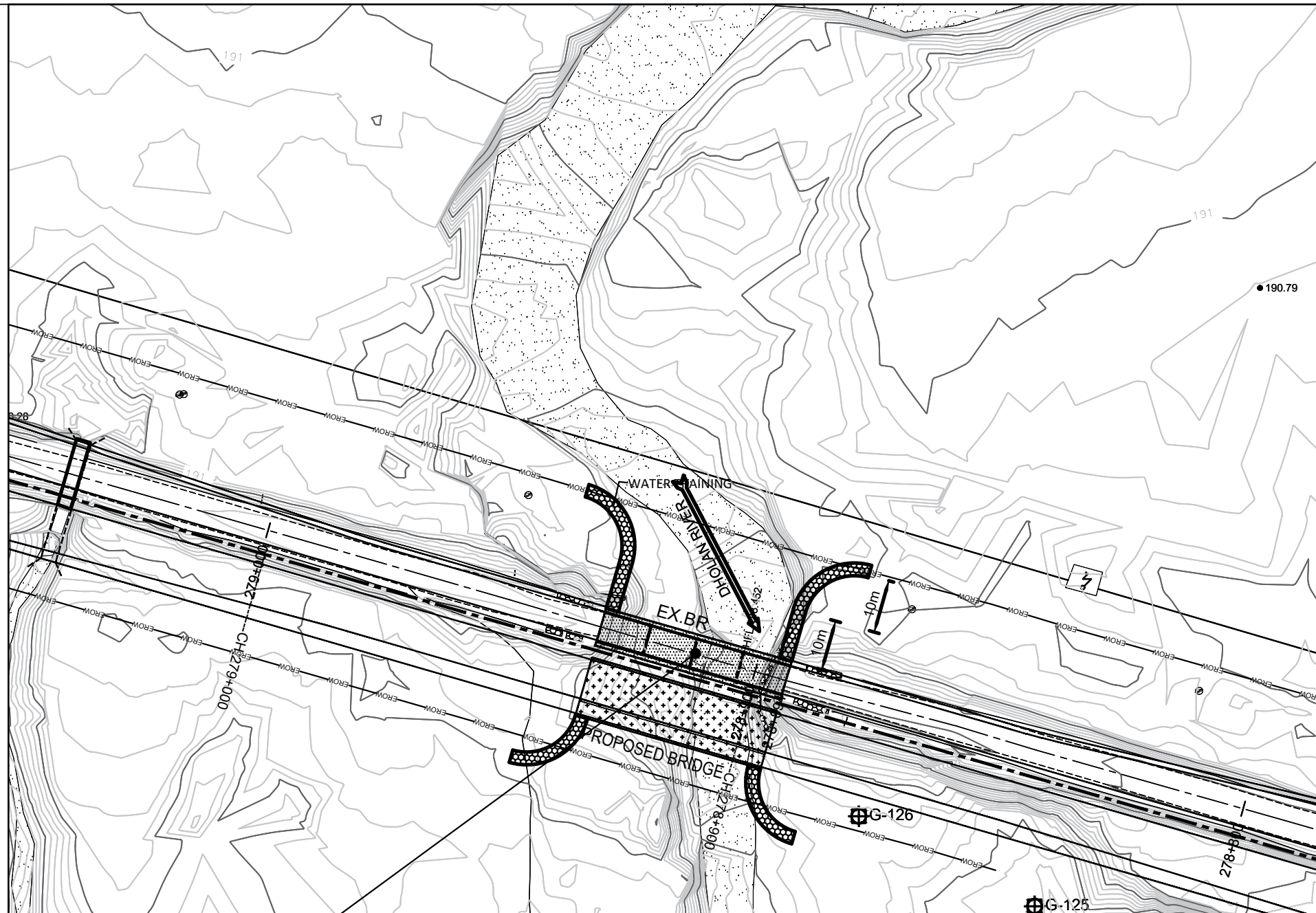


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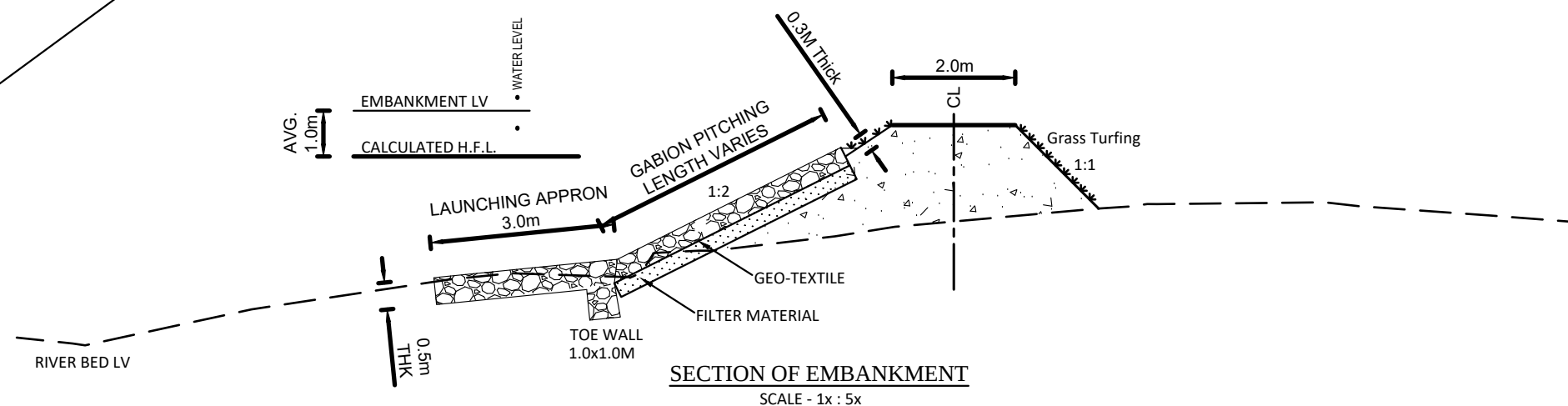
EMPLOYER	PROJECT NAME	DESIGN CONSULTANTS	Designed By Mr. S.N.R.B. Nec.No. 265 Civil 'A'		Drawing Name MISCELLANEOUS DETAILS OF BRIDGE OVER RIVER DHOLAN	Scale: AS SHOWN	Date: JUNE,, 2023				
 Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Development Cooperation 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.		Reference Drawings KDP/DPR/STR/BR/DHOLAN/DD-15	Chainage: 278+913
		 EPTISA Servicios De Ingenieria Madrid, Spain  STUP Consultants Private Limited Kolkata, India									
			Approved By	Mr. H.B.			Sheet No. 2 / 2				



EMPLOYER	PROJECT NAME	DESIGN CONSULTANTS		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	Designed By	Mr. S.N.R.B.		 <td>WING WALL DETAILS OF BRIDGE OVER RIVER DHOLAN</td> <td>AS SHOWN</td> <td>JUNE., 2023</td>	WING WALL DETAILS OF BRIDGE OVER RIVER DHOLAN	AS SHOWN	JUNE., 2023
		 EPTISA Servicios De Ingenieria Madrid, Spain  STUP Consultants Private Limited Kolkatta, India	Checked By	Mr. S.M.			Reference Drawings		Drawing No.- KDP/DPR/STR/BR/DHOLAN/DD-17
		In Association With Udaya Consultancy, Geocom International, Sundar Knti Consultant and Rays Consultant Private Limited	Approved By	Mr. H.B.			Chainage: 278+913	Sheet No. 1 / 1	

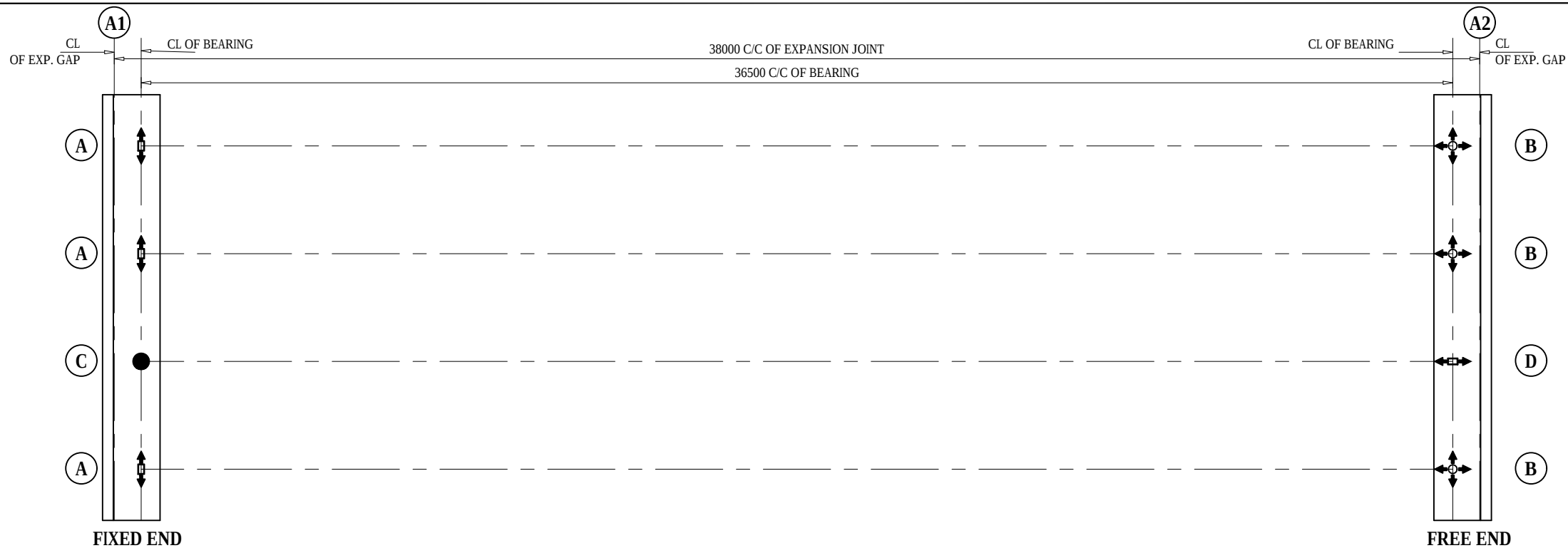


TOPOGRAPHIC MAP



STRUCTURE NO	279/2
TYPE	MINOR BRIDGE-DHOLAN
CHAINAGE	278+913
EXISTING	4X9.5 (RHS)
PROPOSED	1 X 38.0 (LHS)
REMARKS	RETAIN EXISTING BRIDGE NEW BRIDGE ON SOUTH (MCW)

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 Kriti Consultant and Rays Consultant Private Limited	Mr. S.N.R.B. Nec.No. 265 CIVIL 'A' 	RIVER TRAINING WORK OF BRIDGE OVER RIVER DHOLAN	1:1000	JUNE, 2023
			Checked By Mr. S.M. 	Reference Drawings	Chainage: 278+913	Drawing No.- KDP/DPR/STR/BR/DHOLAN/DD-18
			Approved By Mr. H.B. 			Sheet No. 1/1



KEY PLAN SHOWING THE ARRANGEMENT OF BEARING

SCALE - 1: 150

TABLE SHOWING DATA FOR DESIGN OF BEARINGS

	Structure Reference							
1	Bearing Identification mark				A	B	C	D
	Type of Bearing				Guided Bearing in transverse Direction	Free Bearing	Fixed Bearing	Guided Bearing in Longitudinal Direction
2	Seating Material and characteristic strength	Upper Surface			M35	M35	M35	M35
		Lower Surface			M35	M35	M35	M35
3	Design Load (KN)	Serviceability Limit state (SLS Rare)	Vertical	max (LL)	163.20 T	123.38 T	163.20 T	123.38 T
				min (NO LL)	115.40 T	115.40 T	115.40 T	115.40 T
			Transverse					
				Longitudinal	max (LL)	22.88 T	6.97 T	22.88 T
			min (NO LL)		5.77 T	5.77 T	5.77 T	5.77 T
			Serviceability Limit state (SLS Frequent)	Vertical	max (LL)	151.25 T	121.38 T	151.25 T
		min (NO LL)			115.40 T	115.40 T	115.40 T	115.40 T
		Transverse						
				Longitudinal	max (LL)	16.79 T	6.67 T	16.79 T
		min (NO LL)			5.77 T	5.77 T	5.77 T	5.77 T
		Ultimate Limit state (ULS Basic)		Vertical	max (LL)	228.49 T	168.75 T	228.49 T
			min (NO LL)		156.78 T	156.78 T	156.78 T	156.78 T
			Transverse					
				Longitudinal	max (LL)	34.81 T	9.63 T	34.81 T
			min (NO LL)		7.84 T	7.84 T	7.84 T	7.84 T
			Ultimate Limit state (ULS Seismic)	Vertical	max (LL)	274.82 T	230.66 T	274.82 T
min (NO LL)	218.28 T	218.28 T			218.28 T	218.28 T		
Transverse		69.59 T		69.59 T	69.59 T	69.59 T		
	Longitudinal	max (LL)		185.73 T	9.48 T	185.73 T	9.48 T	
min (NO LL)		179.77 T		7.84 T	179.77 T	7.84 T		
4	Displacement (mm)	SLS		Transverse		3.20 mm	3.20 mm	
			Longitudinal			47.69 mm		47.69 mm
		ULS	Transverse		4.80 mm	4.80 mm		
				Longitudinal		71.54 mm		
5	Rotation (Radians)	SLS	Rare	max (LL)	0.00336 radian			
				min (NO LL)	0.00241 radian			
		ULS	Basic	max (LL)	0.00470 radian			
				min (NO LL)	0.00328 radian			

- NOTE:
- MATERIAL SPECIFICATIONS, DESIGN OF BEARINGS ACCEPTANCE CRITERIA AND INSTALLATION SHALL BE IN ACCORDANCE WITH IRC:83 (PART 3)-2018.
 - BEARINGS SHALL BE OBTAINED FROM MANUFACTURERS.
 - INSTALLATION OF BEARINGS SHALL BE UNDER THE SUPERVISION OF REPRESENTATIVE OF THE MANUFACTURER.
 - FOR DESIGN LOADS AND ROTATIONS REFER TABLE IN THE DRAWING.
 - FOR BEARINGS, DETAILED SHOP DRAWINGS SHALL BE PREPARED BY THE SUPPLIER AND BE DULY APPROVED BEFORE MANUFACTURE AND INSTALLATION.
 - THE GROUT/BEDDING MORTAR SHALL BE HIGH STRENGTH FREE FLOWING NON SHRINK GROUT (80 MPa STRENGTH).
 - ALL BEARING SHALL BE PLACED IN TRULY HORIZONTAL PLANE ONLY.
 - FOR DESIGN OF POT BEARINGS, THE DESIGN HORIZONTAL FORCE SHALL, IN NO CASE BE LESS THAN 10% AND GREATER THAN 25% OF THE DESIGN VERTICAL LOAD.
 - THE CONTRACTOR AND SUPPLIER OF BEARINGS SHALL BE FURNISH A MINIMUM TROUBLE FREE WARRANTY OF 10 YEARS AFTER OPENING OF THE BRIDGE.

LEGEND

	A Guided Bearing in transverse Direction
	B Free Bearing
	C Fixed Bearing
	D Guided Bearing in Longitudinal Direction

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	Joint Venture of						
				 EPTISA Servicios De Ingenieria Madrid, Spain	 STUP Consultants Private Limited Kolkata, India					
								In Association With		Approved By
				Udaya Consultancy, Geocom International, Sundar Kriti Consultant and Rays Consultant Private Limited		278+913	Sheet No. 1 / 1			