



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- Lakhandei
Volume-2
Detailed Drawing

June, 2023

Joint Venture of:

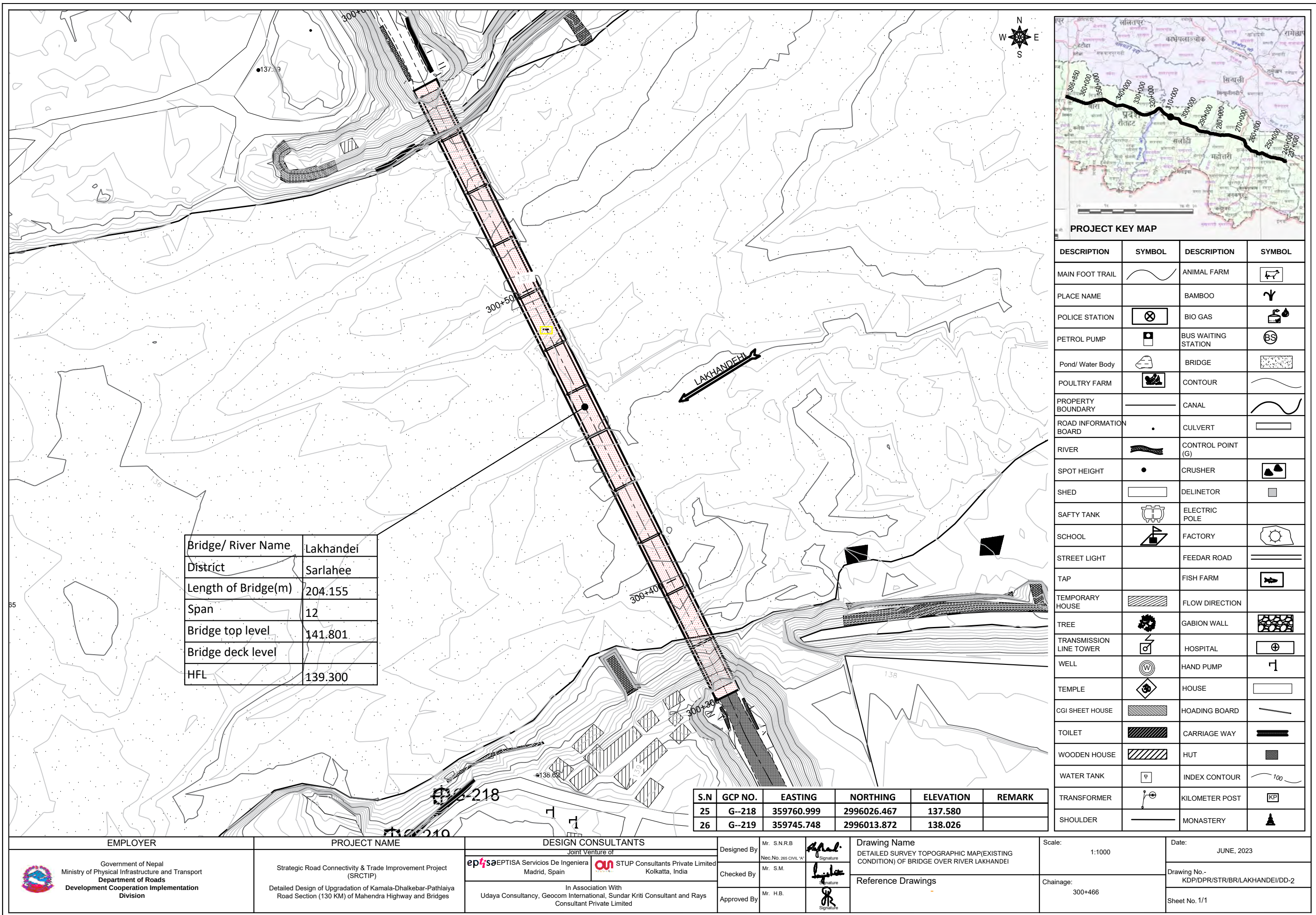
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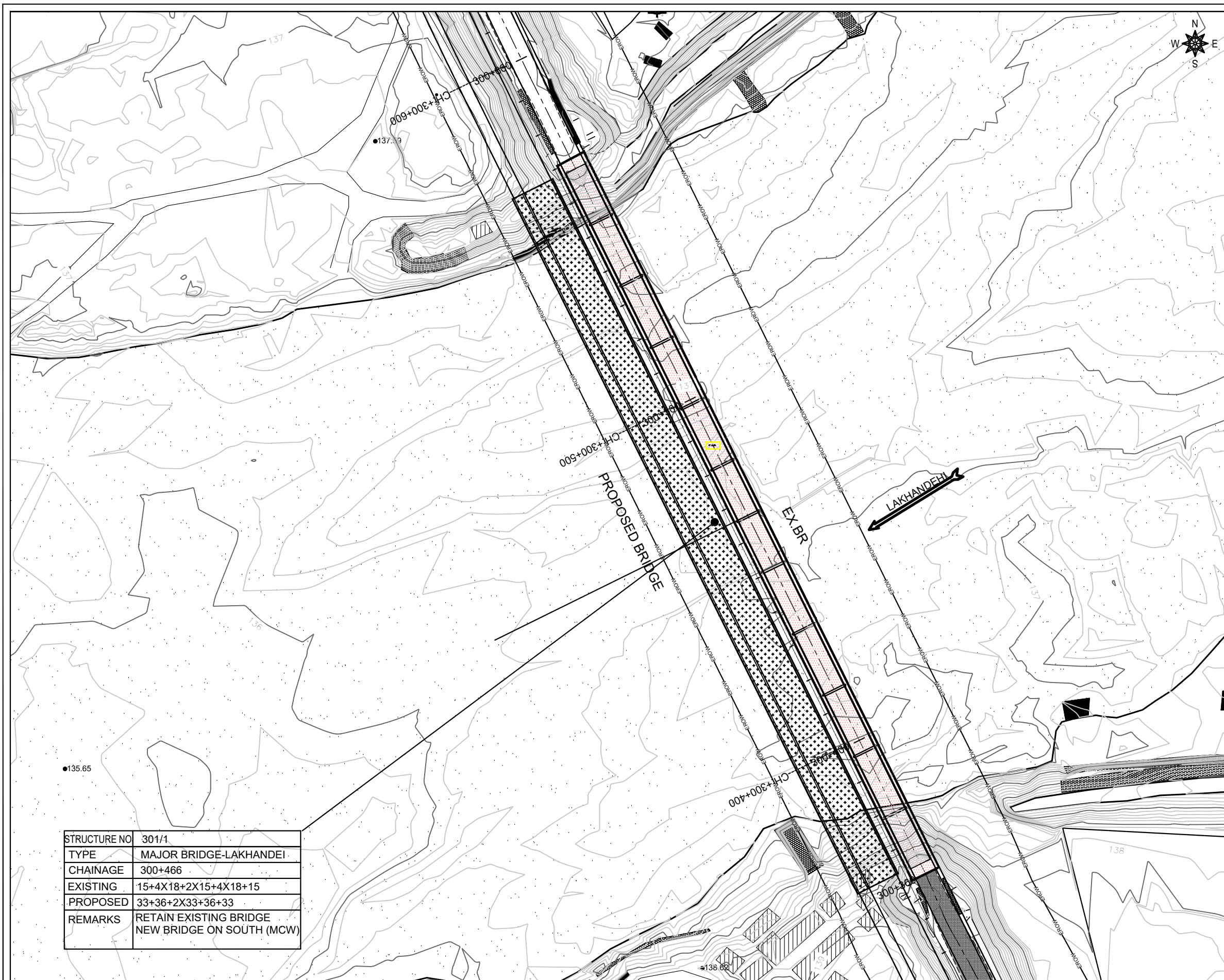
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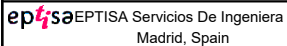
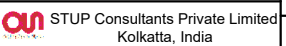
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DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL
MAIN FOOT TRAIL		ANIMAL FARM	
PLACE NAME		BAMBOO	
POLICE STATION		BIO GAS	
PETROL PUMP		BUS WAITING STATION	
Pond/ Water Body		BRIDGE	
POULTRY FARM		CONTOUR	
PROPERTY BOUNDARY		CANAL	
ROAD INFORMATION BOARD		CULVERT	
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) 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		Designed By Mr. S.N.R.B. Nec.No. 265 CIVIL 'A' Checked By Mr. S.M. Approved By Mr. H.B.		DETAILED SURVEY TOPOGRAPHIC MAP(WITH PROPOSED BRIDGE) OF BRIDGE OVER RIVER LAKHANDEI Reference Drawings		Chainage: 300+466	
				In Association With Udaya Consultancy, Geocom International, Sundar Kriti Consultant and Rays Consultant Private Limited		  				Drawing No.- KDP/DPR/STR/BR/LAKHANDEI/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.
4. LAYING, COMPACTION, & EXTENT OF BACKFILL BEHIND ABUTMENT & RETURN/RETAINING WALLS SHALL CONSIST OF SELECTED EARTH CONFORMING TO THE APPENDIX-6 OF IRC:78-2014 HAVING PROPERTIES C=0, $\phi=30^\circ$ & DENSITY=20KN/m3.
5. 100mm DIA WEEP HOLES AT 1000mm C/C BOTH HORIZONTALLY AND VERTICALLY SHALL BE PROVIDED IN STAGGERED MANNER IN VERTICAL WALLS OF THE ABUTMENT AND RETURN WALL ABOVE GL. IN ONE OR TWO LAYERS AT A SLOPE OF 1 VERTICAL TO 20 HORIZONTAL TOWARDS THE DRAINING FACE.

C. HYDRAULIC DATA: -

- | | | |
|-----------------------------|---|---------------|
| 1. DESIGN DISCHARGE, (Q100) | - | 814.40 CUMecs |
| 2. HFL | - | 138.66 m |
| 3. FREE BOARD (MINIMUM) | - | 1.500 m |
| 4. MAXIMUM SCOUR LEVEL: | | |
| ABUTMENT | - | 133.48 m |
| PIER | - | 130.43 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: 33+36+2x33+36+33 = 204 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
DESIGN WORKING LOAD ON PILE - 1790 kN (NON SEISMIC), 2552 kN (SEISMIC)
 - B) PIER - 1200 DIA BORED CAST-IN-SITU PILE
DESIGN WORKING LOAD ON PILE - 1995 kN (NON SEISMIC), 2853 kN (SEISMIC)

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

5. BEARINGS

POT BEARINGS

6. WEARING COAT:

65 MM THICK ASPHALTIC CONCRETE WEARING COAT AS PER STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE WORKS (2073) , DEPARTMENT OF ROADS.

7. EXPANSION JOINT -

SLAB SEAL TYPE EXPANSION JOINT OF PROVEN QUALITY SHALL BE PROVIDED IN ACCORDANCE WITH IRC:SP-69-2005 (GUIDELINES AND SPECIFICATIONS OF EXPANSION JOINT)

8. DRAINAGE SPOUTS - AS PER STANDARD SPECIFICATION FOR ROAD & BRIDGE WORKS 2073

9. RAILINGS/CRASH BARRIER:

RCC CRASH BARRIER AT EDGES OF CARRIAGEWAY AND FOOTPATH

10. FOOTPATH

2.5m WIDE FOOTPATH AT OUTER EDGE OF DECK

11. CONCRETE: -

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

12. REINFORCEMENT STEEL: -

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

13. CONCRETE COVER

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

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

- | | |
|----------------------------|----------|
| a) FOR M 30 GRADE CONCRETE | : 57.2Ø |
| 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.

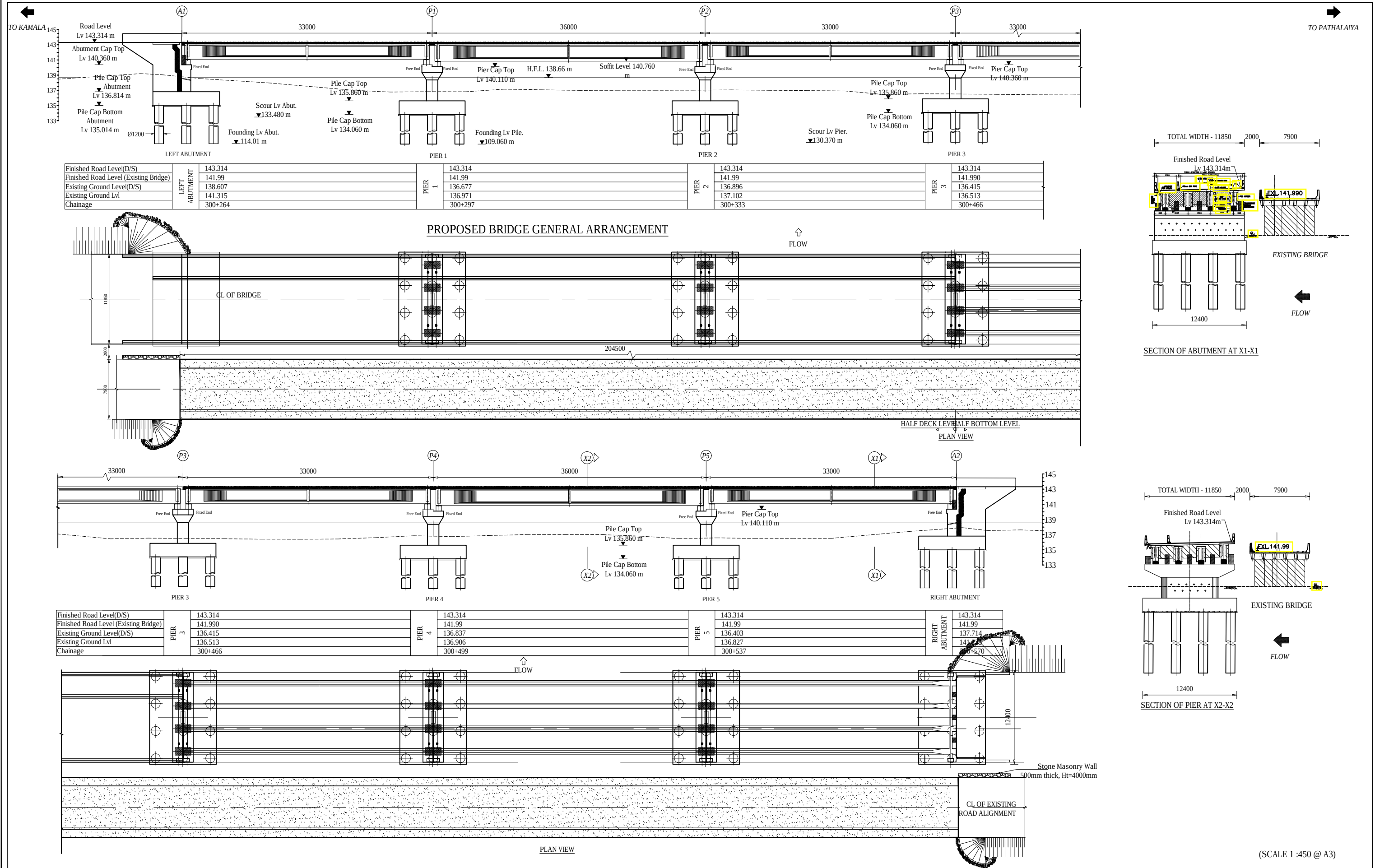
17. HELICAL REINFORCEMENT SHALL BE LAPPED BY 1.5 TURNS.

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.

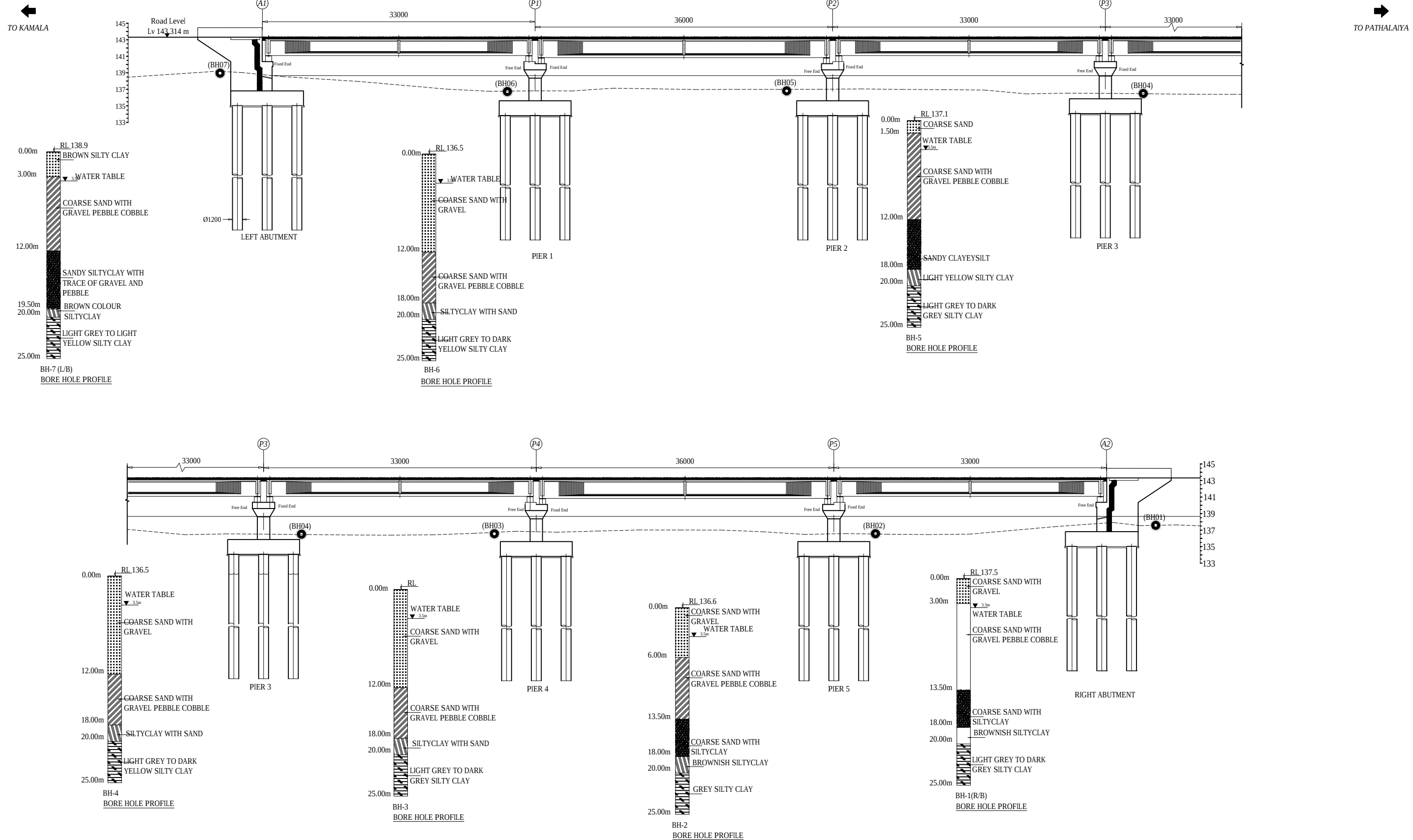
19. SHARP EDGES OF CONCRETE TO BE CHAMFERED MINIMUM 50 X 50

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	 EPTISA Servicios De Ingeniera Madrid, Spain	Checked By	Mr. S.M. Nec.No.		GENERAL NOTES OF BRIDGE OVER RIVER LAKHANDEI	AS SHOWN	JUNE, 2023
			Approved By	Mr. H.B. Nec.No.		Reference Drawings	Chainage: 300+466	Drawing No.- KDP/DPR/STR/BR/LAKHANDEI /DD -4
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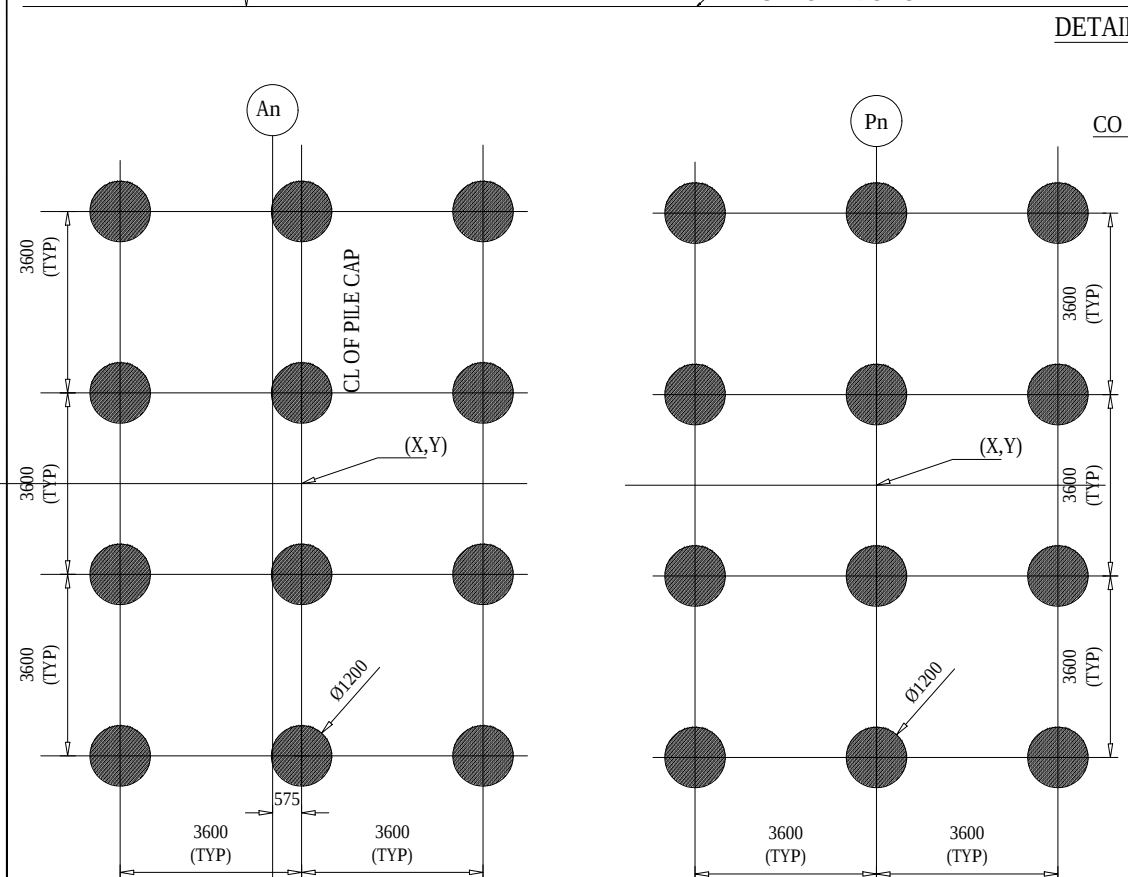
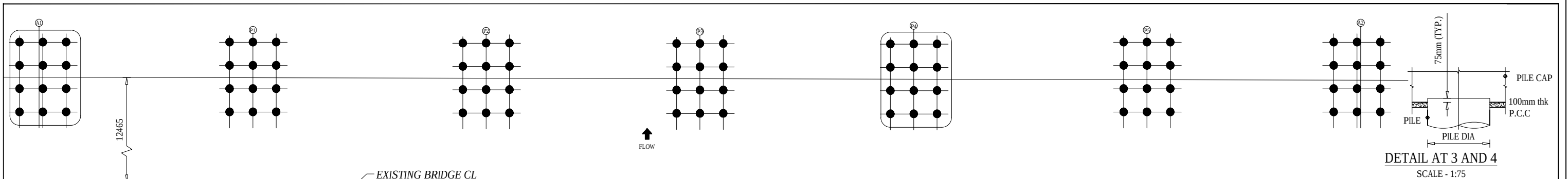
EMPLOYER	PROJECT NAME	DESIGN CONSULTANTS	Designed By	Drawing Name	Scale:	Date:
Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Development Cooperation Implementation Division	Strategic Road Connectivity & Trade Improvement Project (SRTCIP) Detailed Design of Upgradation of Kamala-Dhalkebar-Pathlaiya Road Section (130 KM) of Mahendra Highway and Bridges	Joint Venture of ep4sa EPTISA Servicios De Ingenieria Madrid, Spain CUN STUP Consultants Private Limited Kolkata, India In Association With Udaya Consultancy, Geocom International, Sundar Kirti Consultant and Rays Consultant Private Limited	Mr. S.N.R.B.	GENERAL ARRANGEMENT OF BRIDGE OVER RIVER LAKHANDEI	AS SHOWN	JUNE, 2023
			Nec.No. 265 Civil "A"			
			Mr. S.M.			
			Nec.No.			
			Mr. H.B.	Reference Drawings	Chainage:	KDP/DPR/STR/BR/LAKHANDEI/DD -5
			Nec.No.			
					300+466	Sheet No. 1 / 2



PROPOSED BRIDGE ELEVATION WITH BOREHOLE PROFILE

(SCALE 1 :450 @ A3)

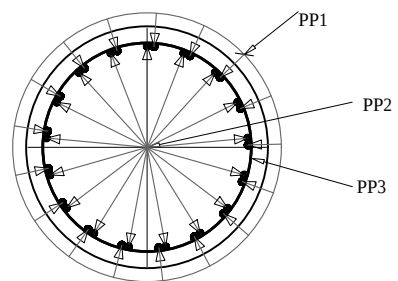
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			Approved By Mr. H.B. Nec.No. 			Sheet No. 2 / 2
					Chainage: 300+466	



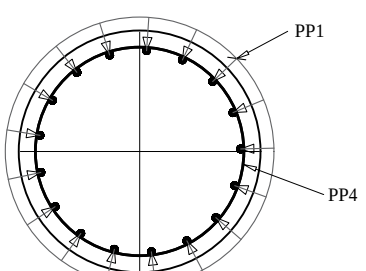
DETAILS AT PILE LAYOUT
SCALE - 1:600

CO ORDINATES OF PILE LOCATION OF PROPOSED BRIDGE

S.N.	ABUTMENT/PIER	EASTING (X)	NORTHING (Y)
1	ABUTMENT (A1)	359836.4615	2993055.7027
2	PIER (P1)	359822.2818	2993084.2222
3	PIER (P2)	359808.2545	2993116.4576
4	PIER (P3)	359791.5628	2993146.0036
5	PIER (P4)	359776.8711	2993175.5560
6	PIER (P5)	359760.8438	2993207.7214
7	ABUTMENT (A2)	359745.1521	2993237.3411



SECTIONAL VIEW AT G1 - G1
SCALE - 1:40



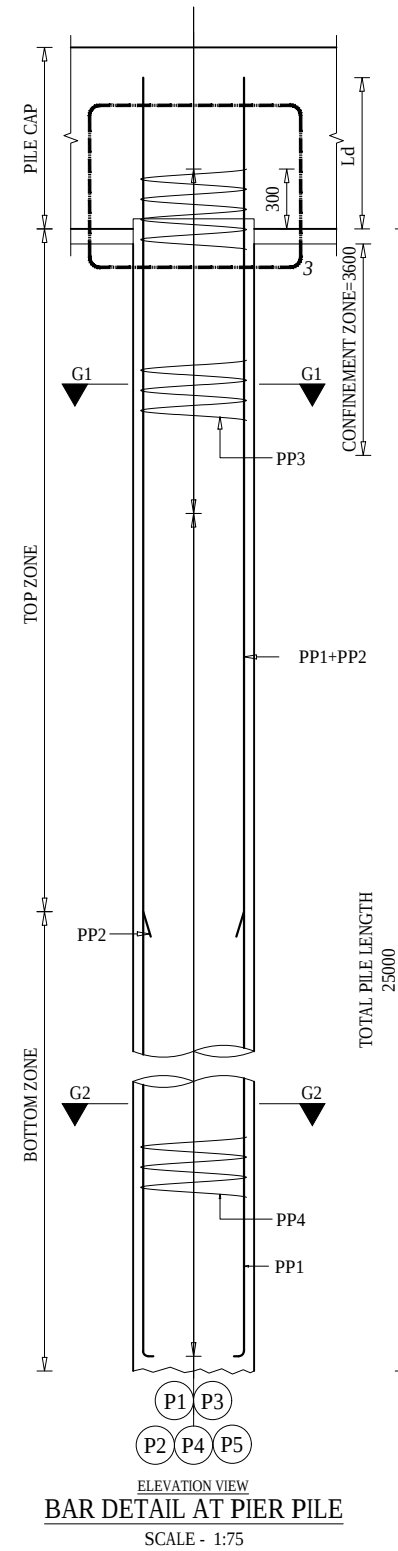
SECTIONAL VIEW AT G2 - G2
SCALE - 1:40

DETAILS AT A
SCALE - 1:150

DETAILS AT B
SCALE - 1:150

BAR BENDING SCHEDULE OF ABUTMENT PILE							
S.No	BAR MARK	DESCRIPTION OF BAR	BAR DIA.(MM)	SPACING (MM)	BAR LENGTH (M)	No. OF BARS	TOTAL WEIGHT (Kg)
1	PA1	22650	25	300	22.950	17	3.858
2	PA2	14425	25		14.425	17	3.858
4	PA4	75	16	75	155.965	1	1.580
5	PA5	150	16	150	377.217	1	1.580
TOTAL (KG) :							3293.85
No. of Pile Per Abutment :							12 (6)
TOTAL WEIGHT (KG) :							39526.22

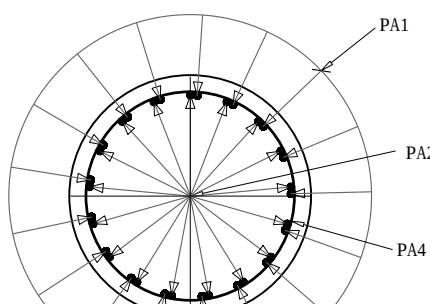
BAR BENDING SCHEDULE OF PIER PILE							
S.No	BAR MARK	DESCRIPTION OF BAR	BAR DIA.(MM)	SPACING (MM)	BAR LENGTH (M)	No. OF BARS	TOTAL WEIGHT (Kg)
1	PP1	22650	25	300	22.950	17	3.858
2	PP2	14425	25		14.425	17	3.858
3	PP3	75	16	75	155.965	1	1.580
4	PP4	150	16	150	377.217	1	1.580
TOTAL (KG) :							3516.34
No. of Pile :							12
TOTAL WEIGHT (KG) :							3516.34



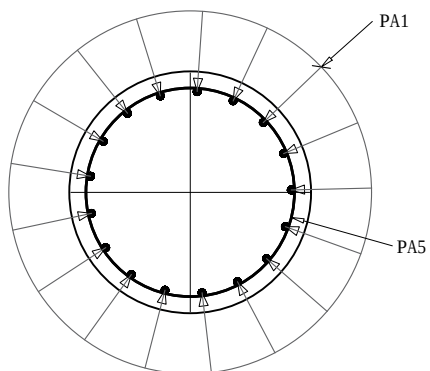
BAR DETAIL AT PIER PILE
SCALE - 1:75

PILE CAPACITY ABUT. (INDIVIDUAL)			
S.N.	DIA (mm)	DEMAND (kN)	
1	1200	SEISMIC	NON SEISMIC
		2552	1790

PILE CAPACITY PIER (INDIVIDUAL)			
S.N.	DIA (mm)	DEMAND (kN)	
		SEISMIC	NON SEISMIC
P1, P2, P4, P5	1200	2853	1995
P3	1200	2799	1909

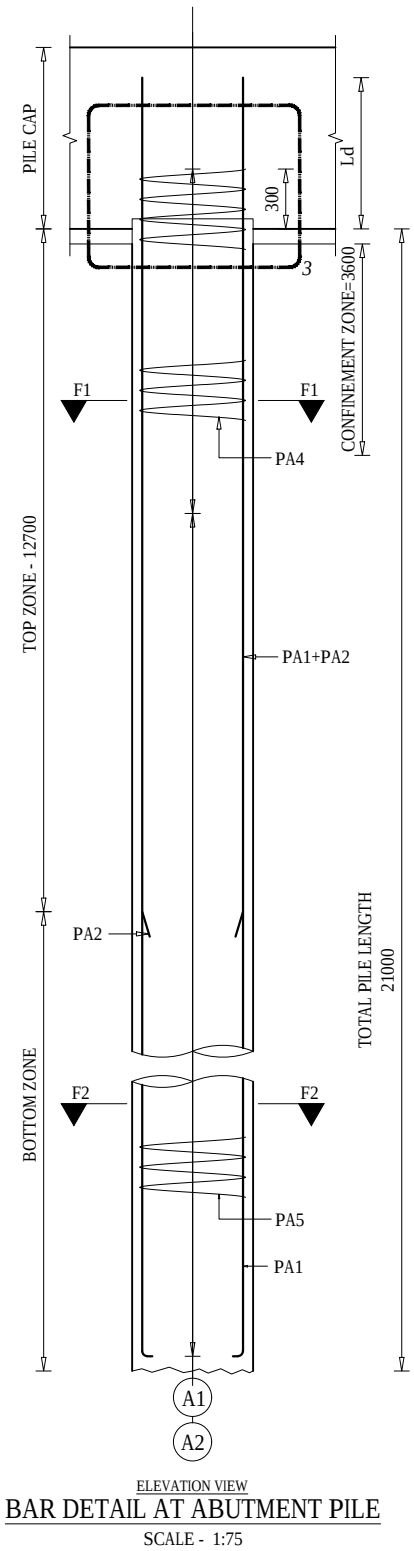


SECTIONAL VIEW AT F1 - F1
SCALE - 1:40



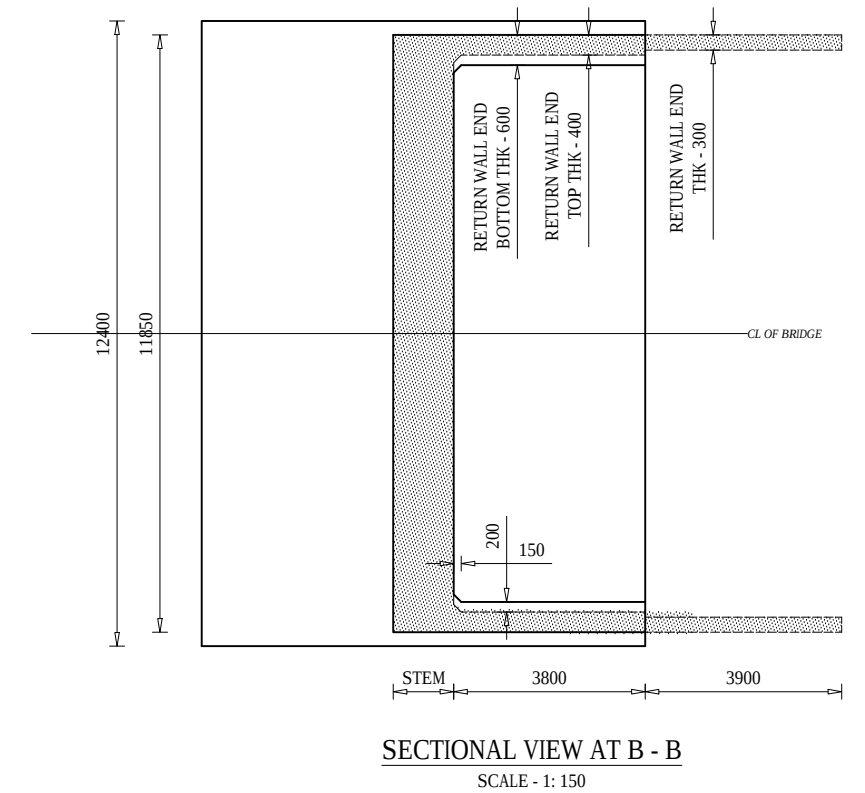
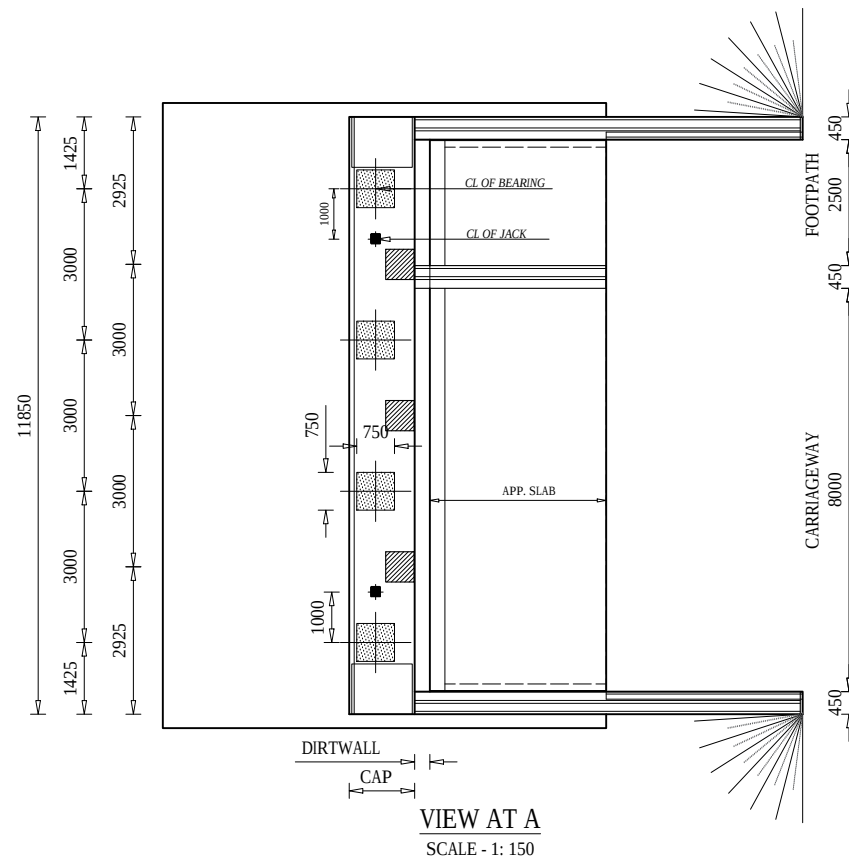
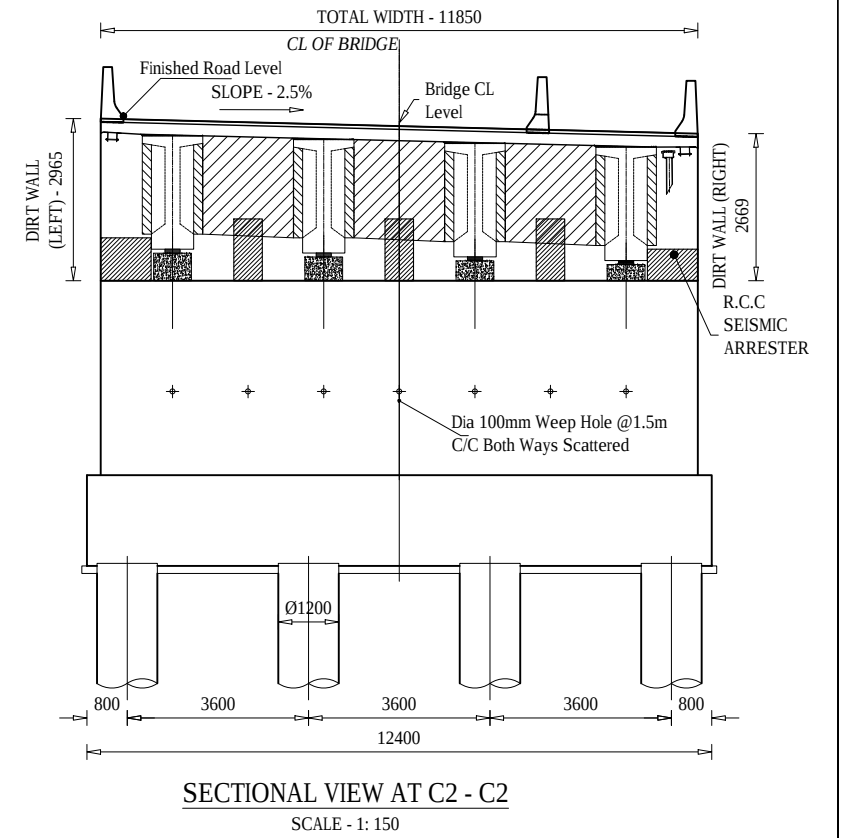
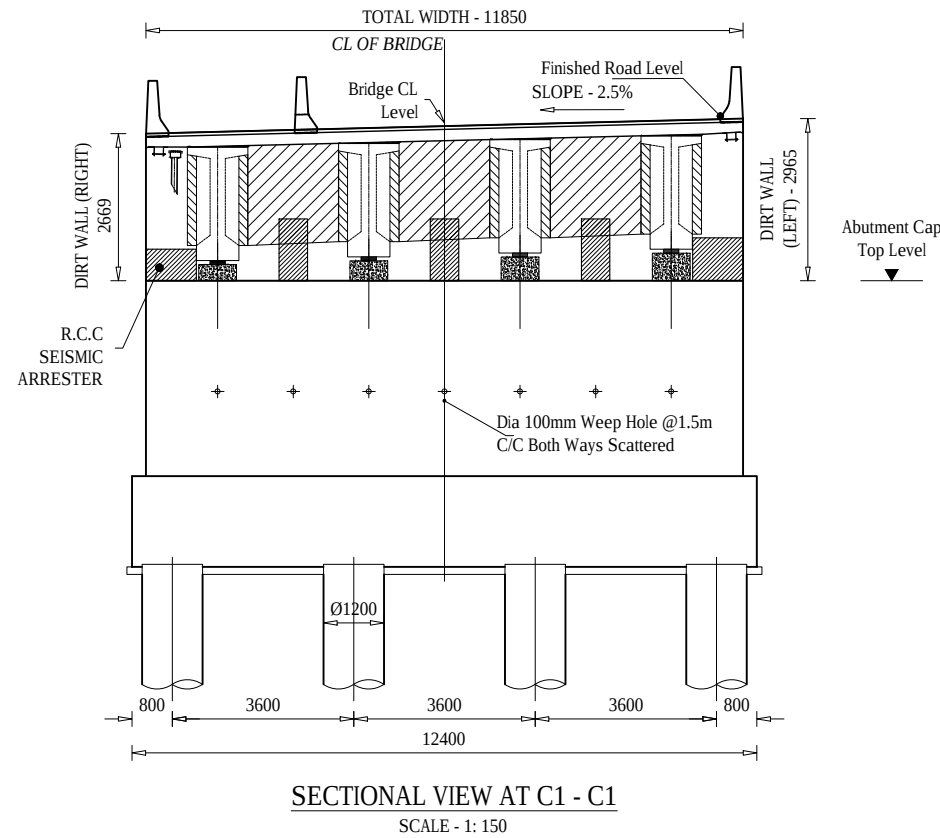
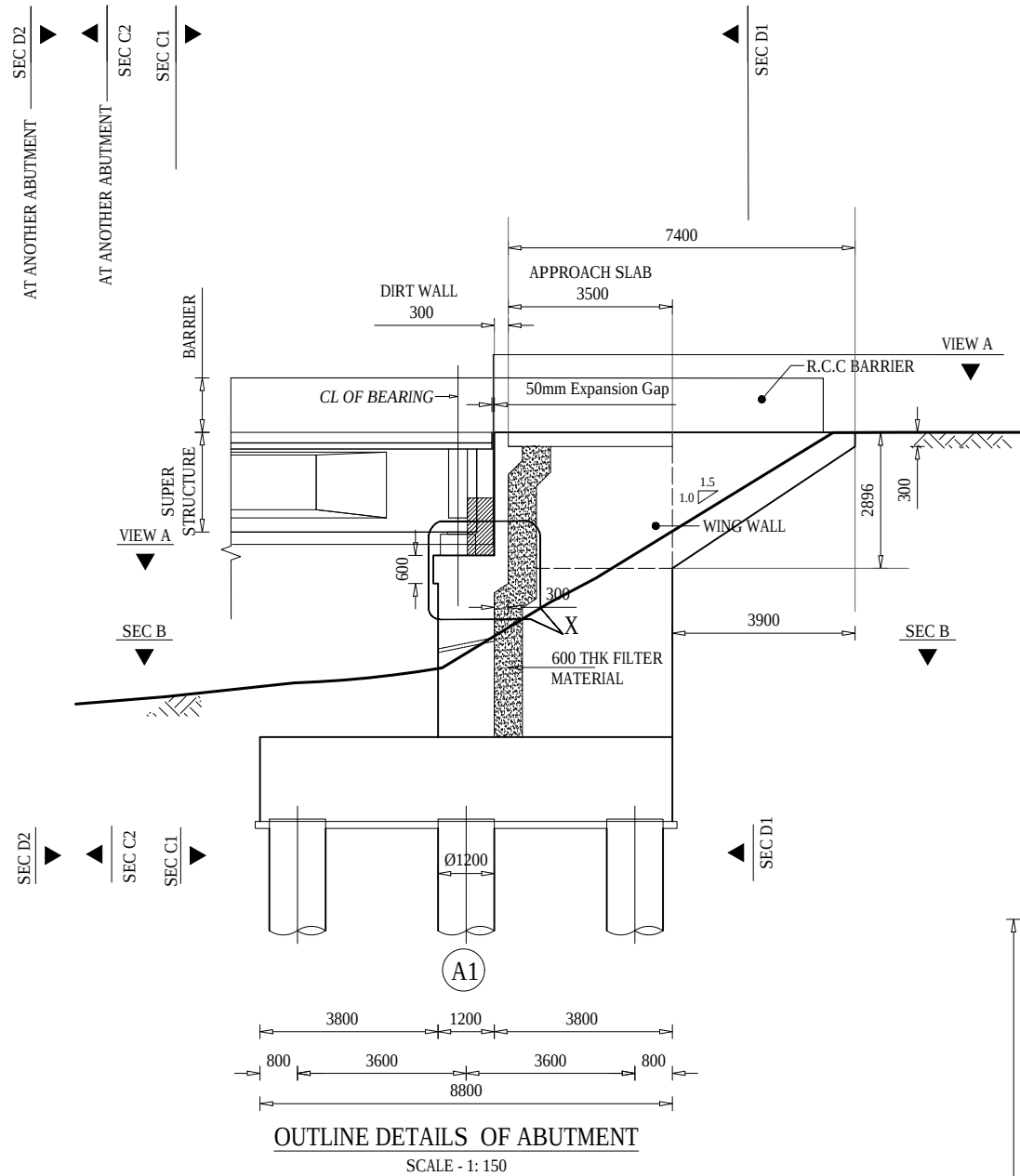
SECTIONAL VIEW AT F2 - F2
SCALE - 1:40

PILE NO:	TOP ZONE
P1,P2,P4, P5	11900
P3	15100

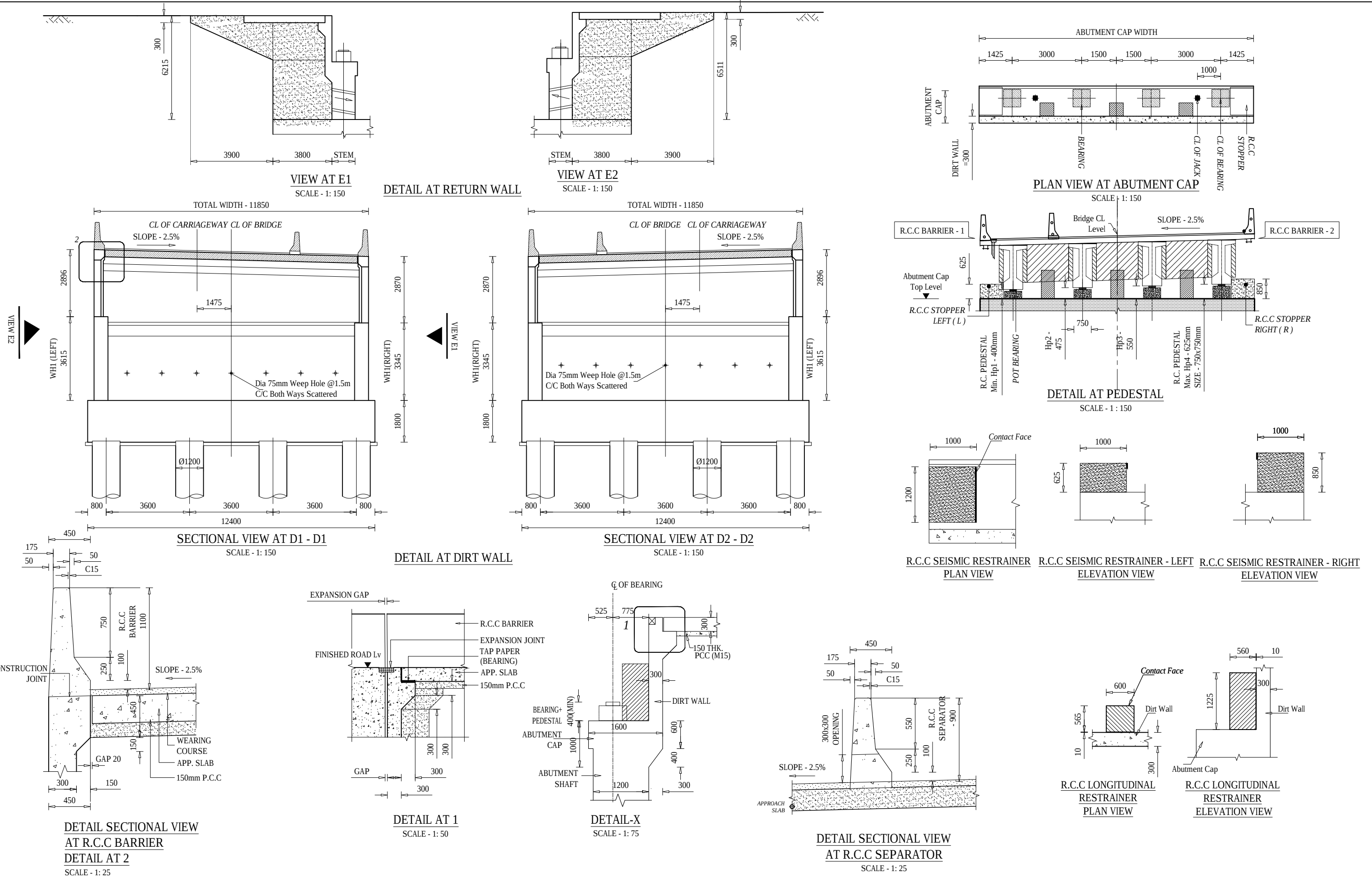


BAR DETAIL AT ABUTMENT PILE
SCALE - 1:75

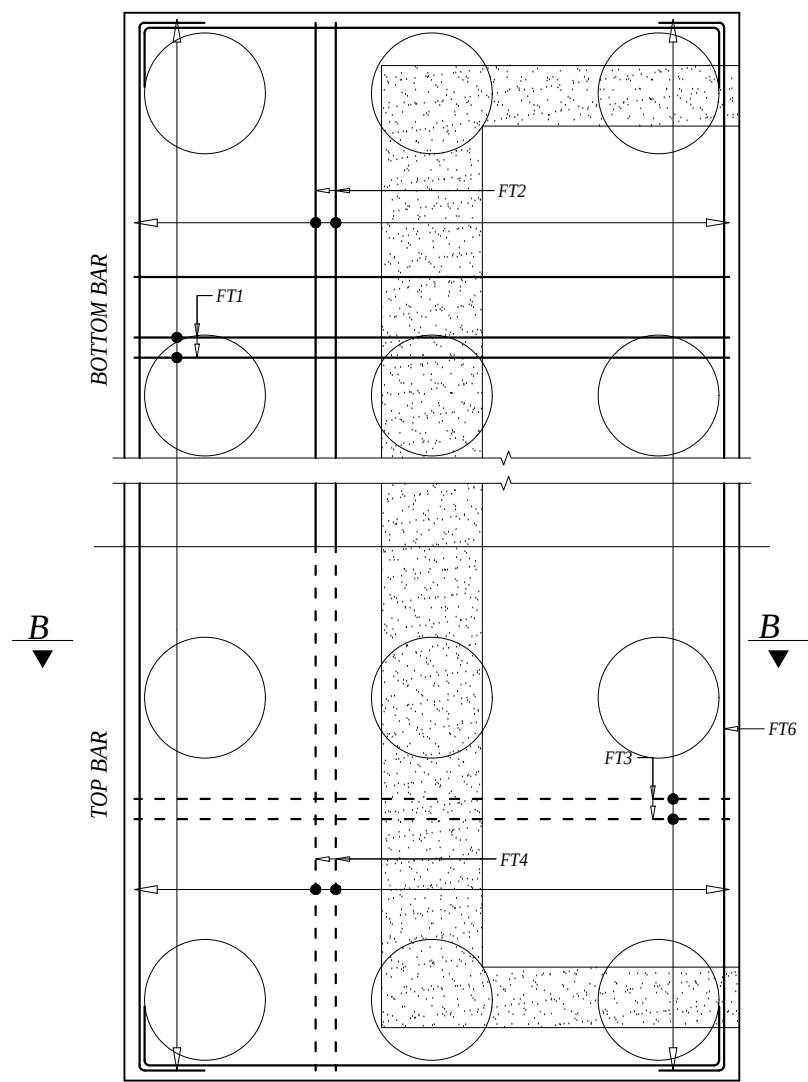
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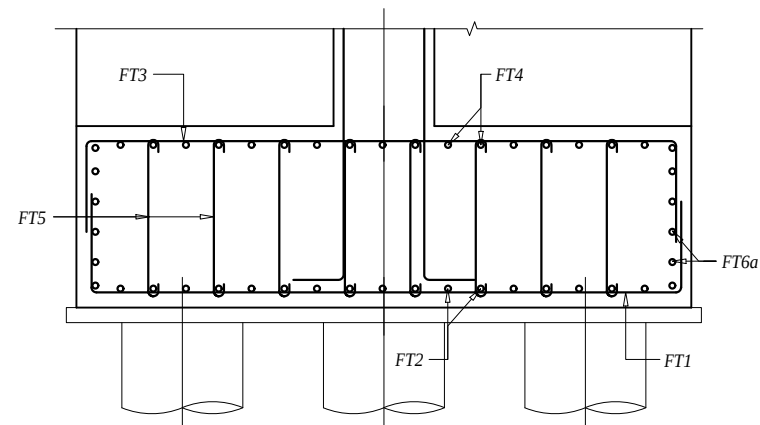
EMPLOYER	PROJECT NAME	DESIGN CONSULTANTS	Designed By	Drawing Name	Scale:	Date:
 Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Development Cooperation Implementation Division	Strategic Road Connectivity & Trade Improvement Project (SRCTIP) Detailed Design of 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. S.N.R.B. Nec.No. 265 Civil 'A' Signature	ABUTMENT DETAILS OF BRIDGE OVER RIVER LAKHANDEI Reference Drawings	AS SHOWN Chainage: 300+466	JUNE, 2023
		In Association With Udaya Consultancy, Geocom International, Sundar Kriti Consultant and Rays Consultant Private Limited	Checked By Mr. S.M. Nec.No. Signature			Drawing No.- KDP/DPR/STR/BR/LAKHANDEI/DD-7
			Approved By Mr. H.B. Nec.No. Signature			Sheet No. 1 / 2



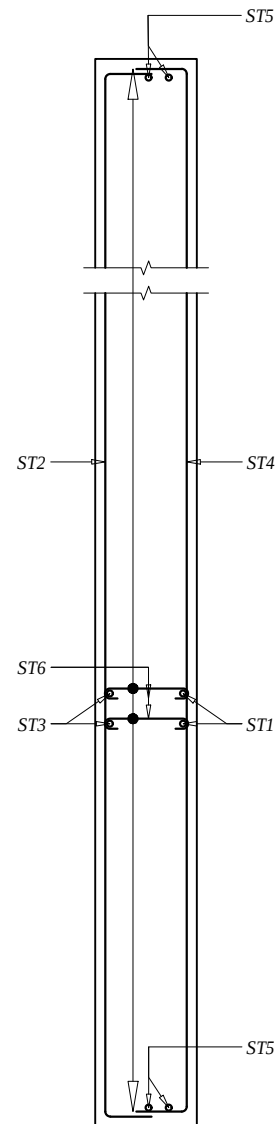
EMPLOYER	PROJECT NAME	DESIGN CONSULTANTS	Designed By	Drawing Name	Scale:	Date:
 Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Development Cooperation Implementation Division	Strategic Road Connectivity & Trade Improvement Project (SRCTIP) Detailed Design of Upgradation of Kamala-Dhalkebar-Pahlaiya 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 Krii Consultant and Rays Consultant Private Limited	Mr. S.N.R.B. Nec.No. 265 Civil "A"	ABUTMENT DETAILS OF BRIDGE OVER RIVER LAKHANDEI	AS SHOWN	JUNE, 2023
			Mr. S.M. Nec.No.	Reference Drawings	Chainage:	Drawing No.- KDP/DPR/STR/BR/LAKHANDEI/DD -7
			Mr. H.B. Nec.No.		300+466	Sheet No. 2 / 2



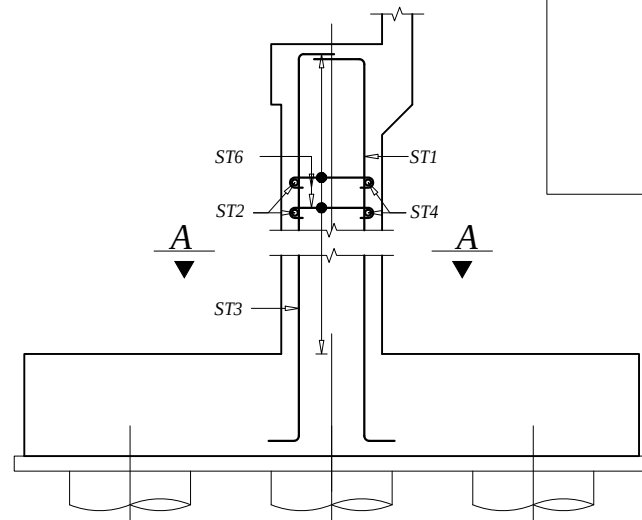
PLAN VIEW OF PILE CAP



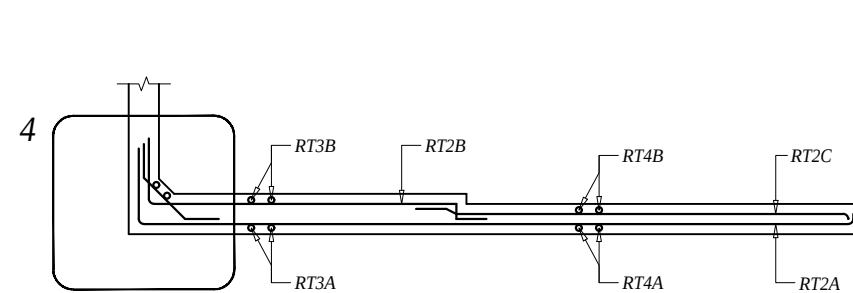
SECTIONAL AT B-B
BAR DETAIL OF PILE CAP
SCALE - 1 : 75



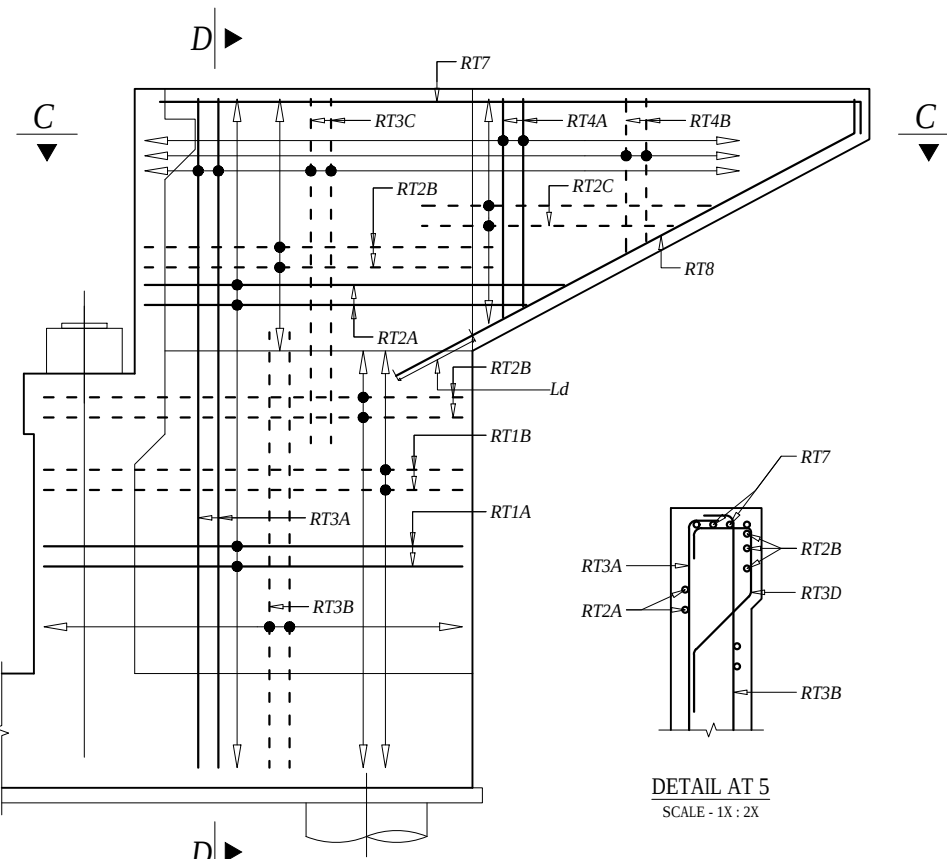
SECTIONAL AT A-A



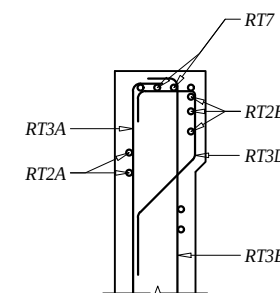
ELEVATION VIEW
BAR DETAIL AT ABUTMENT STEM
SCALE - 1 : 75



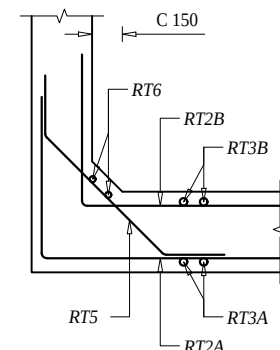
SECTIONAL PLAN VIEW AT C-C



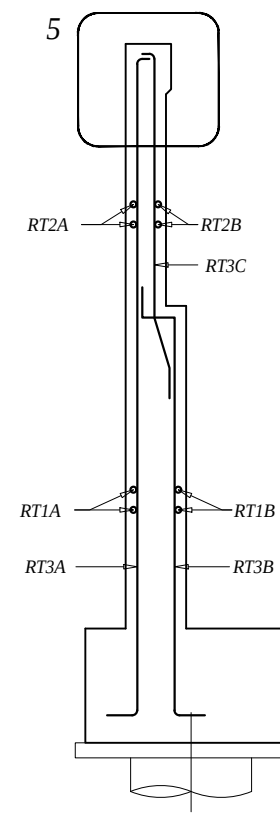
ELEVATION VIEW



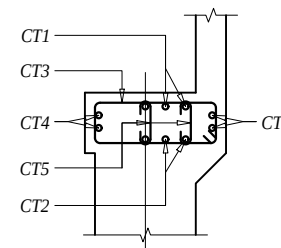
DETAIL AT 5
SCALE - 1X : 2X



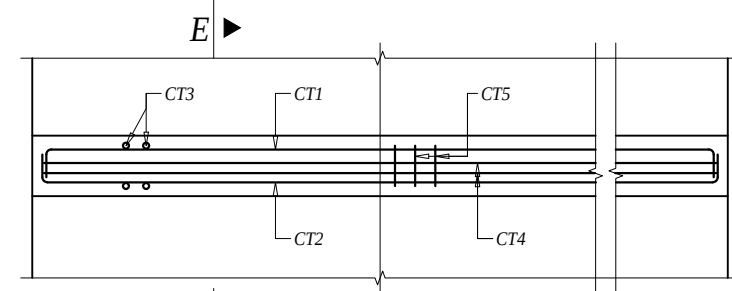
DETAILS AT 4



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  EPTISA Servicios De Ingenieria Madrid, Spain  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 LAKHANDEI Reference Drawings KDP/DPR/STR/BR/LAKHANDEI/DD -9	AS SHOWN	JUNE, 2023
			Mr. S.M.			
			Mr. H.B.			
			Mr. S.N.R.B.		Chainage:	Drawing No.- KDP/DPR/STR/BR/LAKHANDEI/DD -8
					300+466	Sheet No. 1/2

EMPLOYER		PROJECT NAME		DESIGN CONSULTANTS			Drawing Name		Scale:	Date:
 Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Development Cooperation Implementation Division	Strategic Road Connectivity & Trade Improvement Project (SRCTIP) Detailed Design of Upgradation of Kamala-Dhalkebar-Pathlaiya Road Section (130 KM) of Mahendra Highway and Bridges	Joint Venture of		Designed By	Mr. S.N.R.B. Nec.No. 265 CIVIL "A"		ABUTMENT REINFORCEMENT DETAILS OF BRIDGE OVER RIVER LAKHANDEI	AS SHOWN	JUNE, 2023	
		 EPTISA Servicios De Ingenieria Madrid, Spain	 STUP Consultants Private Limited Kolkatta, India	Checked By	Mr. S.M. Nec.No.					
		In Association With Udaya Consultancy, Geocom International, Sundar Kriti Consultant and Rays Consultant Private Limited		Approved By	Mr. H.B. Nec.No.		Reference Drawings KDP/DPR/STR/BR/LAKHANDEI/DD -9	Chainage: 300+466	Drawing No.- KDP/DPR/STR/BR/LAKHANDEI/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	BT1	150 11700 150	12	150	12.000	24	0.889	256.00	
2	BT1A	Avg. 5850 150	12	150	6.000	3	0.889	16.00	
3	BT2	150 3415 Avg. 450	16	150	4.015	80	1.580	507.53	
4	BT3	150 11700 150	12	150	12.000	20	0.889	213.33	
5	BT3A	Avg. 5850 150	12	150	6.000	3	0.889	16.00	
6	BT4	150 3490 Avg.	12	150	4.090	80	0.889	230.84	
7	BT5	100 150 100	12	450	0.350	162	0.889	50.40	
8	BT6	200 450 220 200 755	16	150	1.826	80	1.580	230.84	
9	BT7	11700	12	5 Nos.	11.700	5	0.889	52.00	
10	BT8	100 450 100	12	150	0.650	156	0.889	91.29	
TOTAL (KG) :								1724.26	

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	12	1.580	233.24	
2	CT2	300 11700 300	16	150	12.300	12	1.580	233.24	
3	CT3	450 1450 100	16	150	4.000	80	1.580	505.68	
4	CT4	300 11700 300	12	150	12.000	8	0.889	85.33	
5	CT5	450 100 100	12	Long. 150 Trans.300	0.650	422	0.889	243.82	
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 5525 900	25	130	6.725	92	3.858	2386.96	
2	ST2	600 11700 600	16	130	12.900	26	1.580	530.01	
3	ST3	300 5525 900	20	130	6.725	92	2.469	1527.65	
4	ST4	600 11700 600	16	130	12.900	26	1.580	530.01	
5	ST5	300 5525 900	16	200	6.725	14	1.580	148.78	
6	ST6	100 1675 100	16	Ver. 450 Hor. 450	1.250	216	1.580	426.67	
TOTAL (KG) :								5550.09	

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 8650 900	25	110	10.450	12	3.858	4515.43	
2	FT2	900 12250 900	20	200	14.550	44	2.469	1526.42	
3	FT3	900 8650 900	20	110	10.450	12	2.469	2889.88	
4	FT4	900 12250 900	16	200	14.550	44	1.580	976.91	
5	FT5	1580 150 150	16	Long. 450 Trans. 450	1.580	560	1.580	1752.18	
6	FT6	8500 12250 150	16	200	20.960	10	1.580	331.22	
TOTAL (KG) :								11992.03	

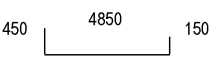
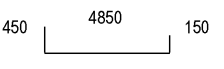
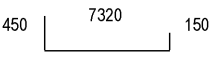
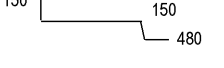
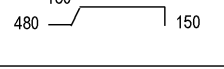
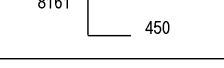
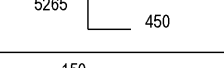
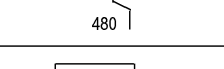
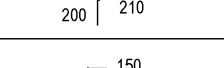
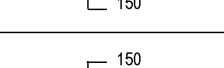
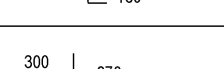
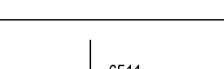
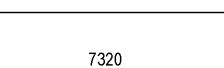
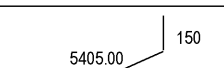
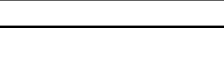
BAR BENDING SCHEDULE OF PEDESTAL									
S.No.	BAR MARK	DESCRIPTION OF BAR	BAR DIA.(MM)	SPACING (MM)	BAR LENGTH (M)	No. OF BARS	UNIT WEIGHT (Kg/m)	TOTAL WEIGHT (Kg)	
1	TP1	150 700 800 Avg.	16	150	2.500	6	1.580	24.65	
1	TP2	150 700 800 Avg.	16	150	2.500	6	1.580	24.65	
2	TP3	700 780 100	16	150	3.300	4	1.580	19.93	
1	TP4	550 650 100 @ 100	10	2 Nos	10.500	2	0.517	12.93	
TOTAL (KG) :								81.23	
TOTAL NOS OF PEDESTAL :								4.00	
TOTAL WEIGHT (KG) :								324.92	

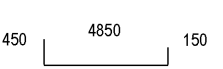
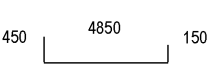
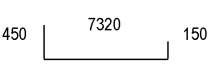
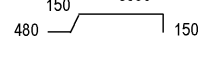
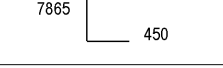
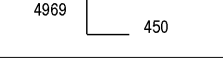
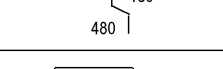
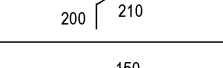
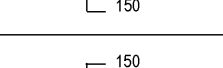
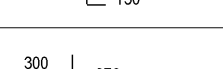
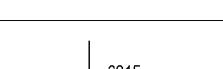
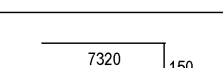
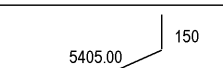
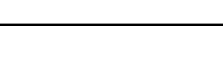
BAR BENDING SCHEDULE OF RCC SEISMIC RESTRAINER - LEFT									
S.No.	BAR MARK	DESCRIPTION OF BAR	BAR DIA.(MM)	SPACING (MM)	BAR LENGTH (M)	No. OF BARS	UNIT WEIGHT (Kg/m)	TOTAL WEIGHT (Kg)	
1	TS1-L	975 900 850	32		4.550	11	6.321	316.37	
2	TS2-L	900 1100 100	12	120	4.200	6	0.889	22.40	
3	TS3-L	975 1100 100	16	110	4.350	10	1.580	68.74	
TOTAL (KG) :								407.51	

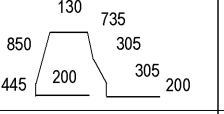
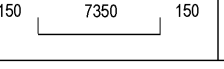
BAR BENDING SCHEDULE OF RCC SEISMIC RESTRAINER - RIGHT									
S.No.	BAR MARK	DESCRIPTION OF BAR	BAR DIA.(MM)	SPACING (MM)	BAR LENGTH (M)	No. OF BARS	UNIT WEIGHT (Kg/m)	TOTAL WEIGHT (Kg)	
1	TS1-R	1200 900 850	32		5.000	11	6.321	347.65	
2	TS2-R	900 1100 100	12	120	4.200	8	0.889	29.87	
3	TS3-R	1200 1100 100	16	110	4.800	10	1.580	75.85	
TOTAL (KG) :								453.37	

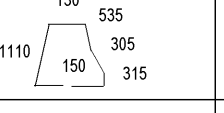
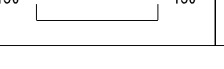
BAR BENDING SCHEDULE OF RCC LONGITUDINAL RESTRAINER									
S.No.	BAR MARK	DESCRIPTION OF BAR	BAR DIA.(MM)	SPACING (MM)	BAR LENGTH (M)	No. OF BARS	UNIT WEIGHT (Kg/m)	TOTAL WEIGHT (Kg)	
1	TL1	1580 850 850	32	100	5.335	6	6.321	202.65	
2	TL2	850 850 100	16	150	2.170	8	1.580	27.43	
3	TL3	1580 850 100	25	150	4.360	4	3.858	67.59	
TOTAL (KG) :								297.68	
TOTAL NOS OF LONGITUDINAL RESTRAINER :								3.00	
TOTAL WEIGHT (KG) :								892.28	

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-Pathlalya 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 LAKHANDEI	AS SHOWN	JUNE, 2023		
			EPTISA Servicios De Ingenieria Madrid, Spain				Nec.No. 265 CIVIL 'A'						
			In Association With		Udaya Consultancy, Geocom International, Sundar Kriti Consultant and Rays Consultant Private Limited		Checked By		Mr. S.M.		Reference Drawings	Chainage:	
				Approved By		Mr. H.B.			300+466	Sheet No. 1/2			

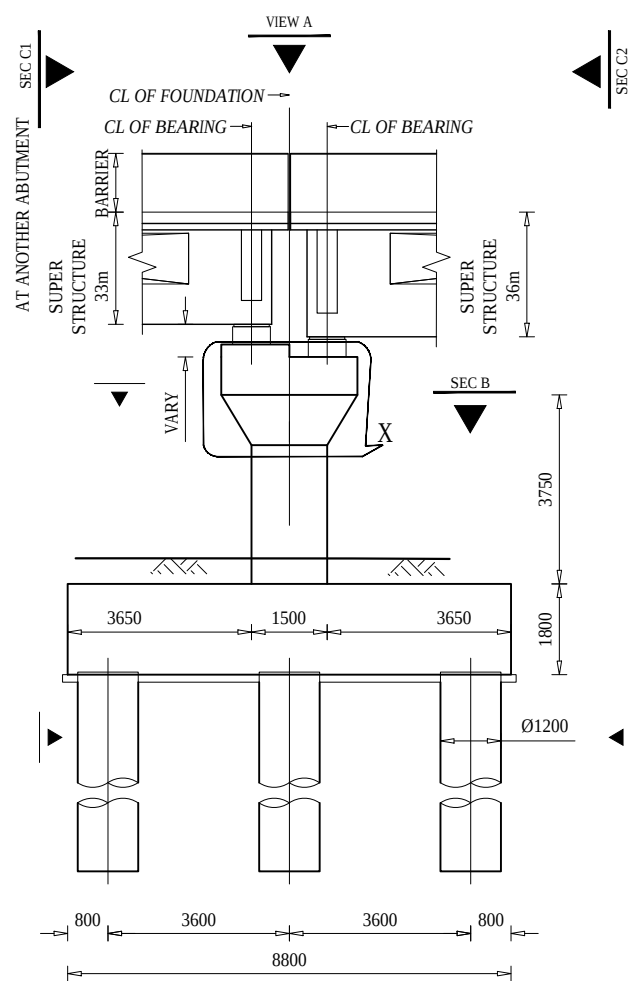
BAR BENDING SCHEDULE OF RETURN WALL - LEFT								
S.No.	BAR MARK	DESCRIPTION OF BAR	BAR DIA.(MM)	SPACING (MM)	BAR LENGTH (M)	No. OF BARS	UNIT WEIGHT (Kg/m)	TOTAL WEIGHT (Kg)
1	RT1A		12	150	5.450	44	0.889	213.16
2	RT1B		16	150	5.450	44	1.580	378.94
3	RT2A		12	150	7.920	21	0.889	147.84
3	RT2B		12	150	5.630	21	0.889	105.09
4	RT2C		12	150	4.380	21	0.889	81.76
5	RT3A		12	150	8.761	27	0.889	210.26
6	RT3B		16	150	6.505	27	1.580	277.55
7	RT3C		12	150	3.601	27	0.889	86.42
8	RT3D		12	150	1.390	51	0.889	63.01
9	RT4A		12	150	1.748	24	0.889	37.29
10	RT4B		12	150	1.748	24	0.889	37.29
11	RT5		12	150	1.470	64	0.889	83.63
12	RT6		12	2 Nos.	6.511	2	0.889	11.58
13	RT7		16		7.470	4	1.580	47.22
14	RT8		12		5.555	4	0.889	19.75
TOTAL (KG) :								1800.79

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	5.450	42	0.889	203.47
2	RT1B		16	150	5.450	42	1.580	361.72
3	RT2A		12	150	7.920	21	0.889	147.84
4	RT2B		12	150	5.630	21	0.889	105.09
5	RT2C		12	150	4.380	21	0.889	81.76
6	RT3A		12	150	8.465	27	0.889	203.16
7	RT3B		16	150	6.209	27	1.580	264.92
8	RT3C		12	150	3.601	27	0.889	86.42
9	RT3D		12	150	1.390	51	0.889	63.01
10	RT4A		12	150	1.748	24	0.889	37.29
11	RT4B		12	150	1.748	24	0.889	37.29
12	RT5		12	150	1.470	64	0.889	83.63
12	RT6		12	2 Nos.	6.215	2	0.889	11.05
13	RT7		16		7.470	4	1.580	47.22
14	RT8		12		5.555	4	0.889	19.75
TOTAL (KG) :								1753.62

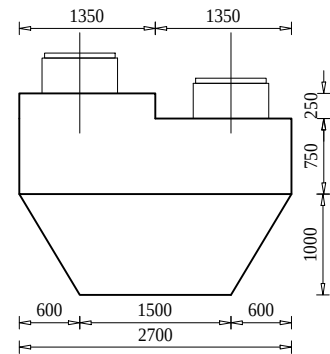
BAR BENDING SCHEDULE OF R.C.C BARRIER								
S.No.	BAR MARK	DESCRIPTION OF BAR	BAR DIA.(MM)	SPACING (MM)	BAR LENGTH (M)	No. OF BARS	UNIT WEIGHT (Kg/m)	TOTAL WEIGHT (Kg)
1	RC-B1		16	150	3.170	50	1.580	250.47
2	RC-B2		10	150	7.650	20	0.617	94.44
TOTAL (KG) :								344.91

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

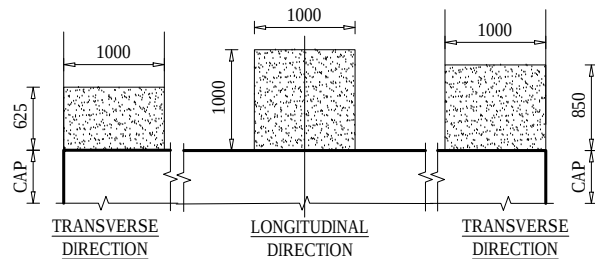
EMPLOYER		PROJECT NAME		DESIGN CONSULTANTS			Drawing Name		Scale:	Date:	
	Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Development Cooperation Implementation Division	Strategic Road Connectivity & Trade Improvement Project (SRCTIP) Detailed Design of Upgradation of Kamala-Dhalkebar-Pathlaiya Road Section (130 KM) of Mahendra Highway and Bridges	Joint Venture of			Designed By	Mr. S.N.R.B	AS SHOWN	JUNE, 2023		
			 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 Kriti Consultant and Rays Consultant Private Limited	Approved By	Mr. H.B.	Reference Drawings	Chainage:	300+466	Drawing No.- KDP/DPR/STR/BR/LAKHANDEI/DD -9
										Sheet No. 2 / 2	



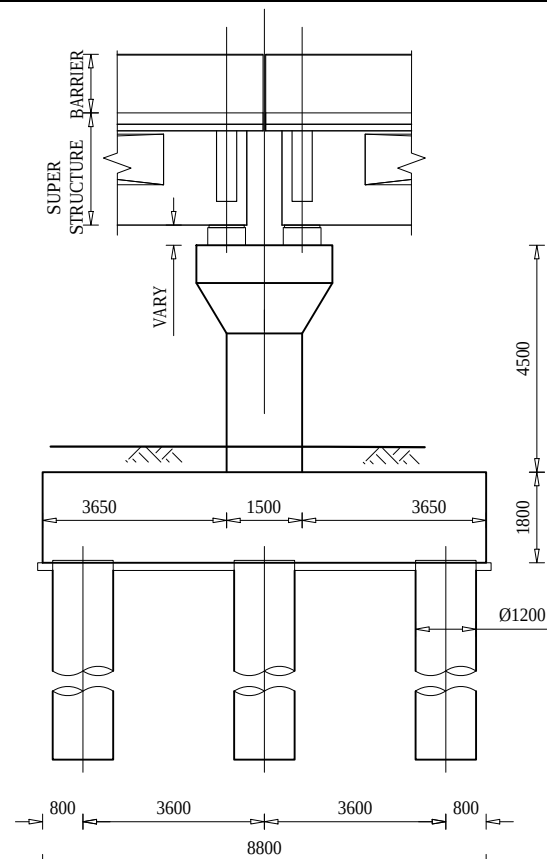
ELEVATION VIEW OF PIER (P1,P2,P4,P5)
SCALE - 1 : 150



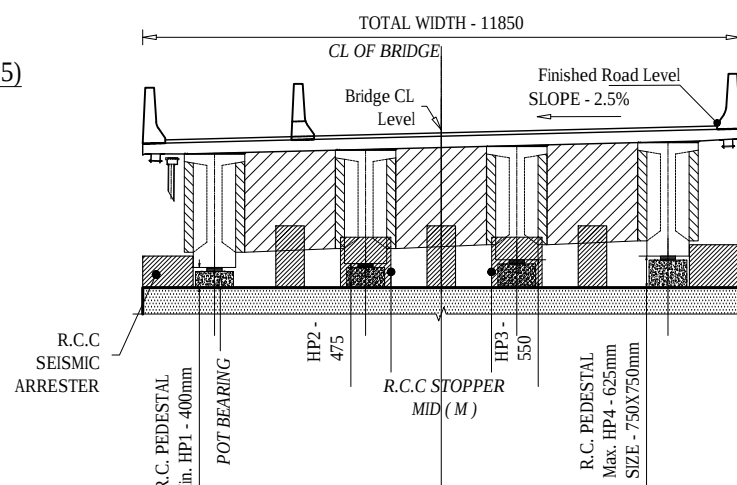
DETAIL AT X
SCALE - 1 : 75



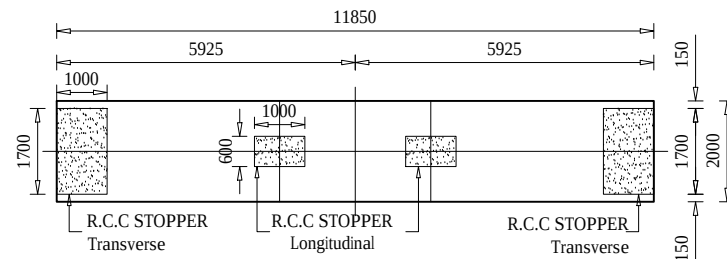
DETAIL OF RCC STOPPER AT PEDESTAL
SCALE - 1 : 75



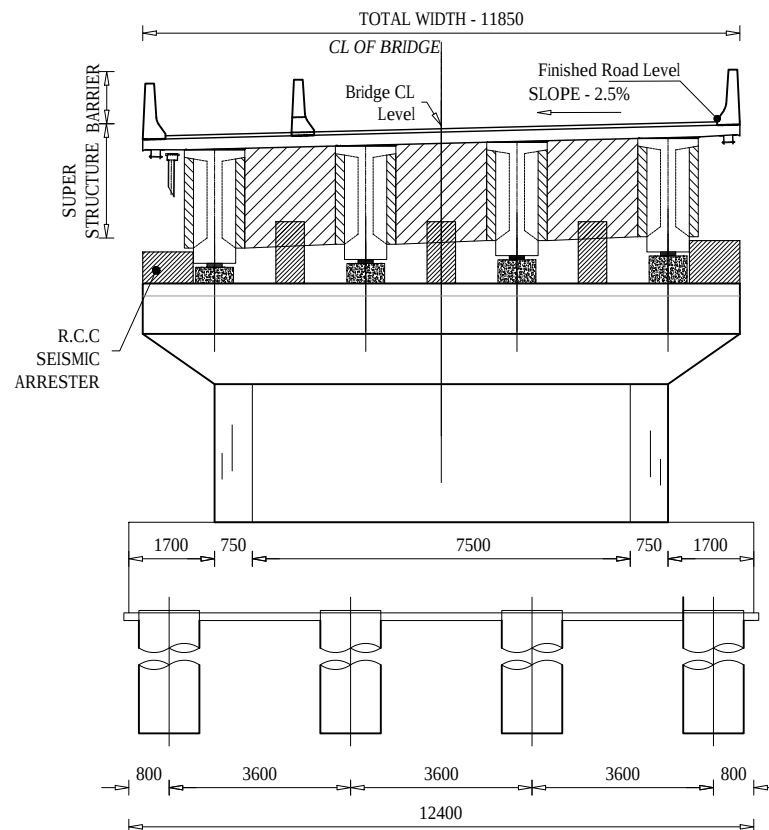
ELEVATION VIEW OF PIER (P3)
SCALE - 1 : 150



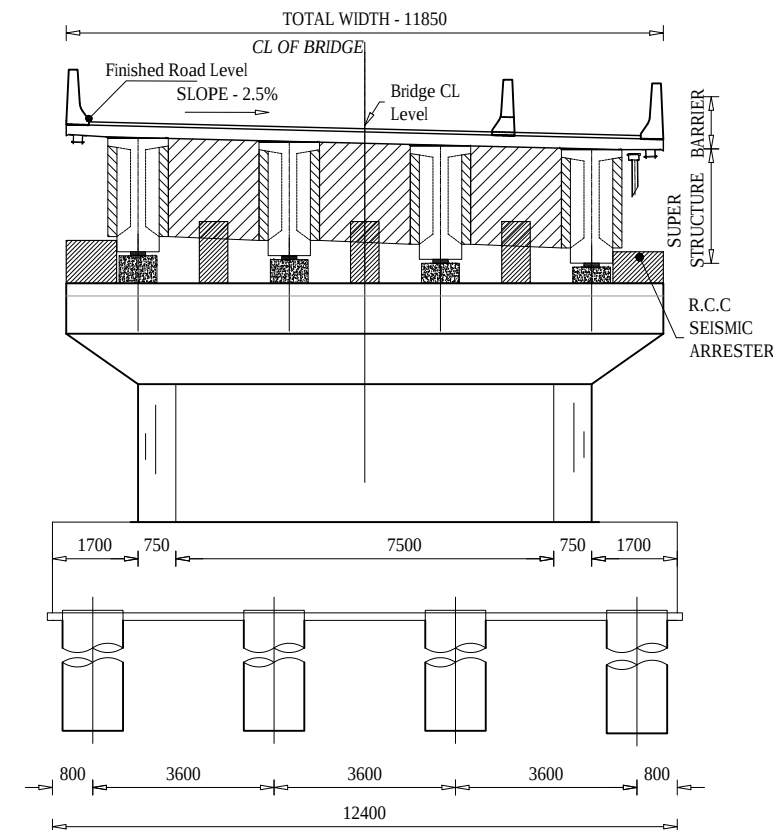
R.C.C. PEDESTAL - ELEVATION VIEW
SCALE - 1 : 150



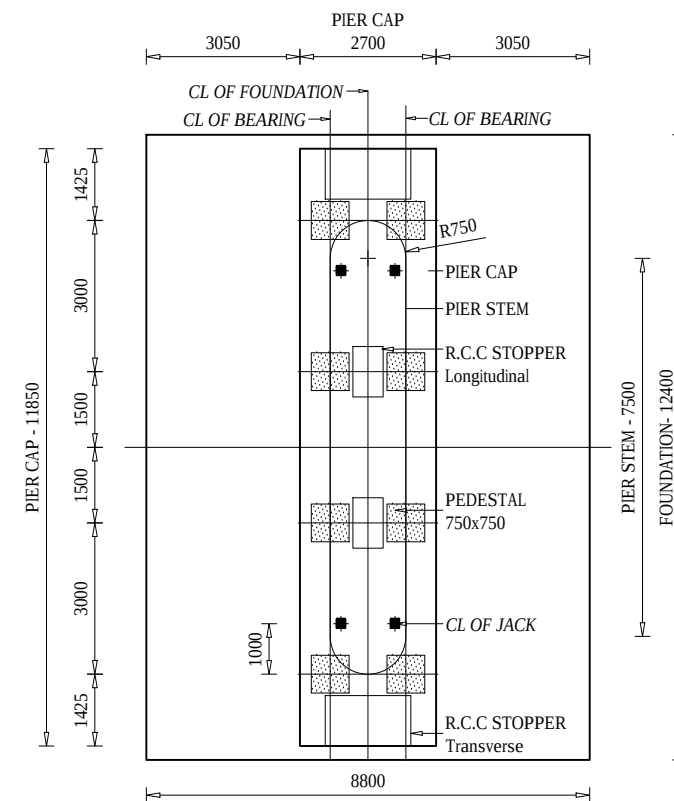
DETAIL AT R.C.C. SEISMIC ARRESTER
SCALE - 1 : 150



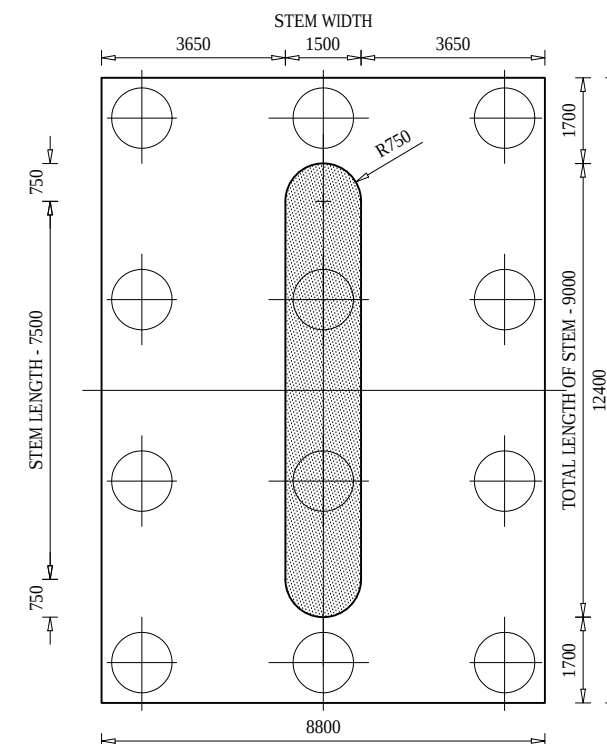
SECTIONAL VIEW AT C1 - C1
SCALE - 1 : 150



SECTIONAL VIEW AT C2 - C2
SCALE - 1 : 150

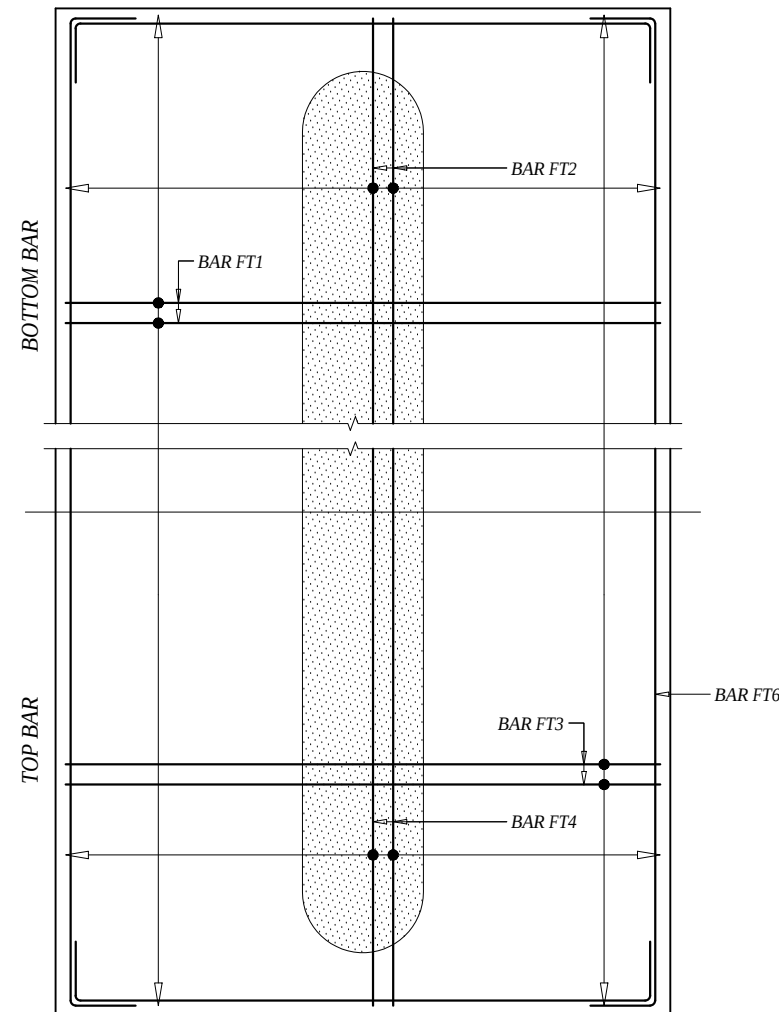


PLAN VIEW OF PIER (VIEW AT A)
SCALE - 1 : 150

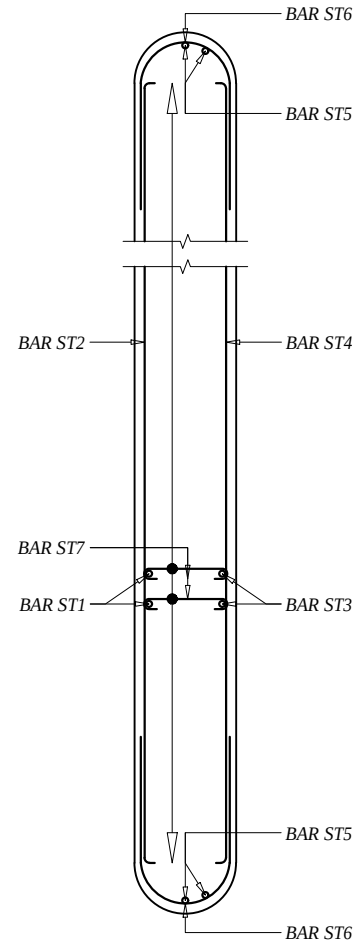


SECTIONAL VIEW AT B - B
SCALE - 1 : 150

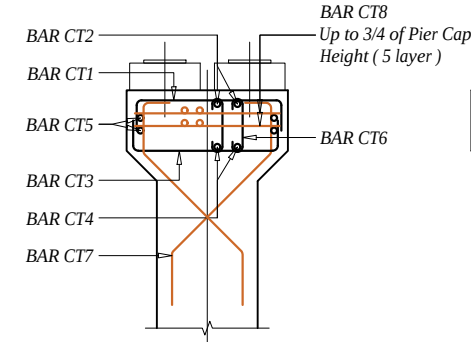
EMPLOYER	PROJECT NAME	DESIGN CONSULTANTS	Designed By	Drawing Name	Scale:	Date:
Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Development Cooperation Implementation Division	Strategic Road Connectivity & Trade Improvement Project (SRCTIP)	Joint Venture of ep4sa EPTISA Servicios De Ingenieria Madrid, Spain STUP Consultants Private Limited Kolkata, India	Mr. S.N.R.B. Nec.No. 265 Civil "A" Signature	PIER DETAILS OF BRIDGE OVER RIVER LAKHANDEI	AS SHOWN	JUNE, 2023
	Detailed Design of Upgradation of Kamala-Dhalkebar-Pathlaiya Road Section (130 KM) of Mahendra Highway and Bridges	In Association With Udaya Consultancy, Geocom International, Sundar Kirti Consultant and Rays Consultant Private Limited	Checked By Mr. S.M. Nec.No. Signature	Reference Drawings	Chainage: 300+466	Drawing No.- KDP/DPR/STR/BR/LAKHANDEI/DD-10
			Approved By Mr. H.B. Nec.No. Signature			Sheet No. 1/1



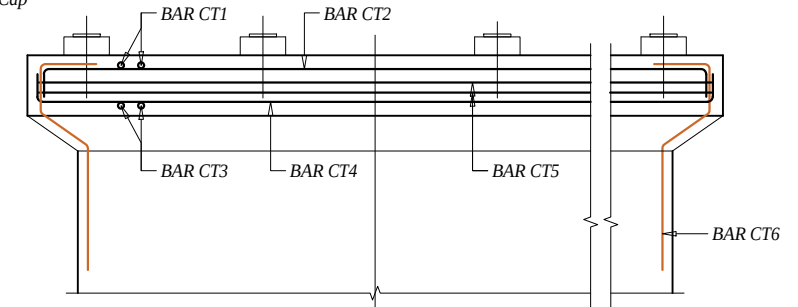
PLAN VIEW



PLAN VIEW



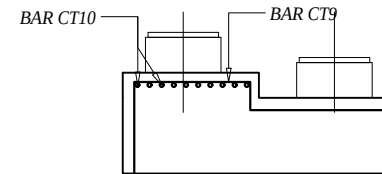
ELEVATION VIEW



FRONT VIEW

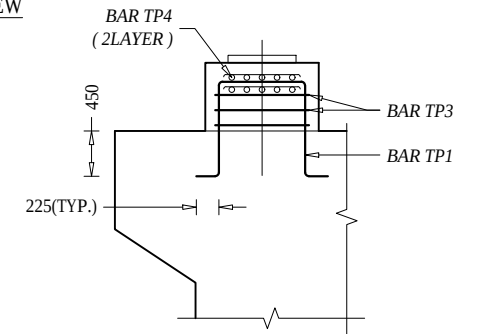
BAR DETAIL AT ABUTMENT CAP

SCALE - 1 : 75

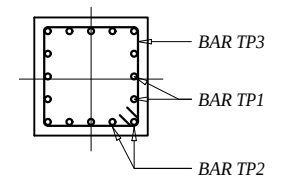


PIER CAP

SCALE - 1 : 40

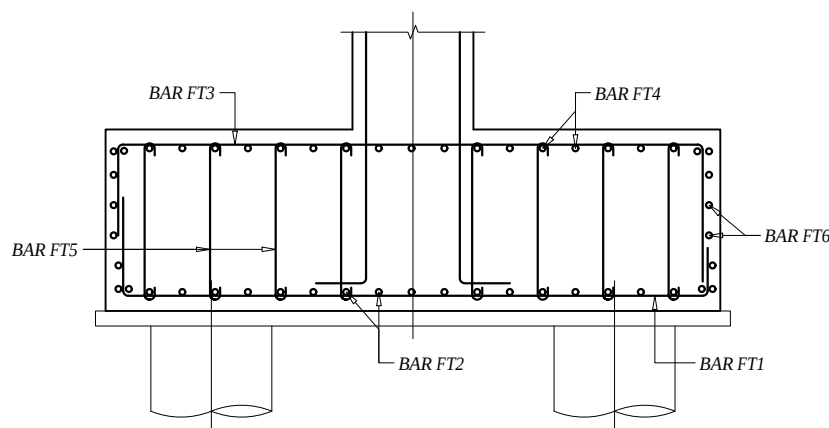


SECTIONAL SIDE VIEW



SECTIONAL PLAN VIEW
BAR DETAIL AT PEDESTAL

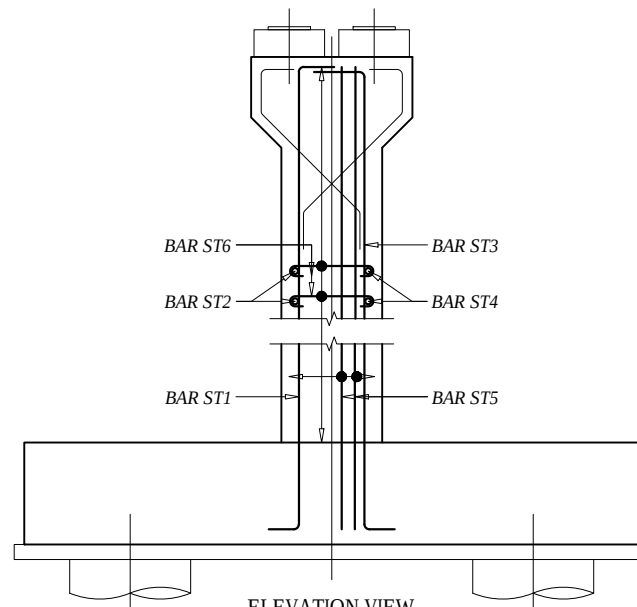
SCALE - 1 : 50



ELEVATION VIEW

BAR DETAIL OF FOUNDATION

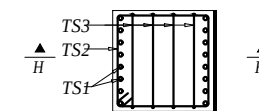
SCALE - 1 : 75



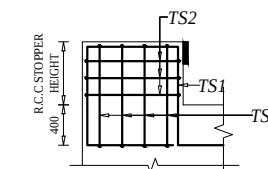
ELEVATION VIEW

BAR DETAIL AT ABUTMENT STEM

SCALE - 1 : 75



SECTIONAL PLAN VIEW

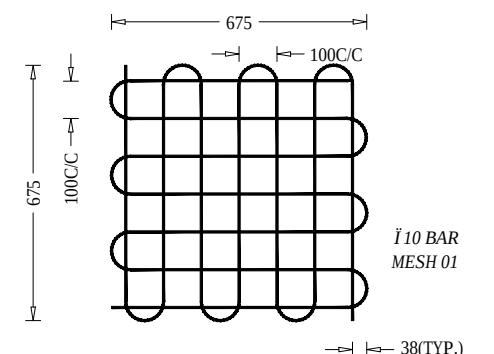


SECTIONAL VIEW AT H-H

R.C.C STOPPER LEFT

ELEVATION VIEW

SCALE - 1 : 50



REINFORCEMENT DETAILS OF
BEARING MESH

SCALE - 1 : 50

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/LAKHANDEI/DD-4

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)	Joint Venture of EPTISA Servicios De Ingeniera Madrid, Spain STUP Consultants Private Limited Kolkatta, India	Checked By	Mr. S.M. Nec.No.	PIER REINFORCEMENT DETAIL OF BRIDGE OVER RIVER LAKHANDEI	AS SHOWN	JUNE, 2023
	Detailed Design of Upgradation of Kamala-Dhalkebar-Pathlaiya Road Section (130 KM) of Mahendra Highway and Bridges	In Association With Udaya Consultancy, Geocom International, Sundar Kriti Consultant and Rays Consultant Private Limited	Approved By	Mr. H.B. Nec.No.	Reference Drawings KDP/DPR/STR/BR/LAKHANDEI/DD-12	Chainage:	Drawing No.- KDP/DPR/STR/BR/LAKHANDEI/DD-11
						300+466	Sheet No.1/1