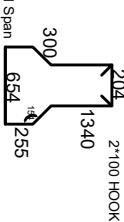
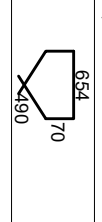
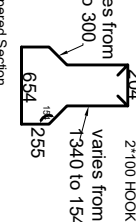
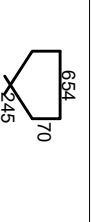
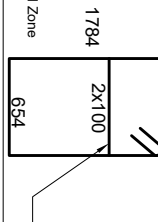
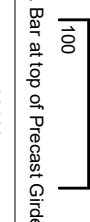
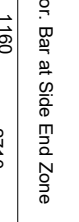
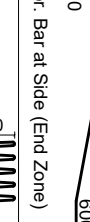
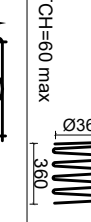
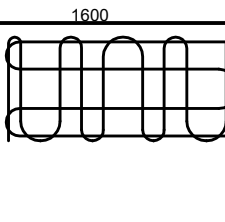
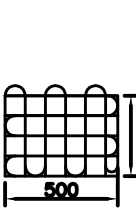
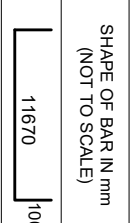
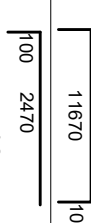
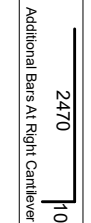
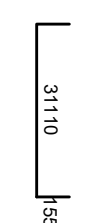
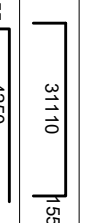
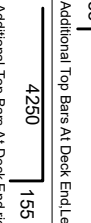
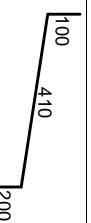
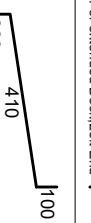
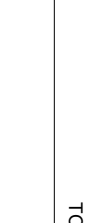
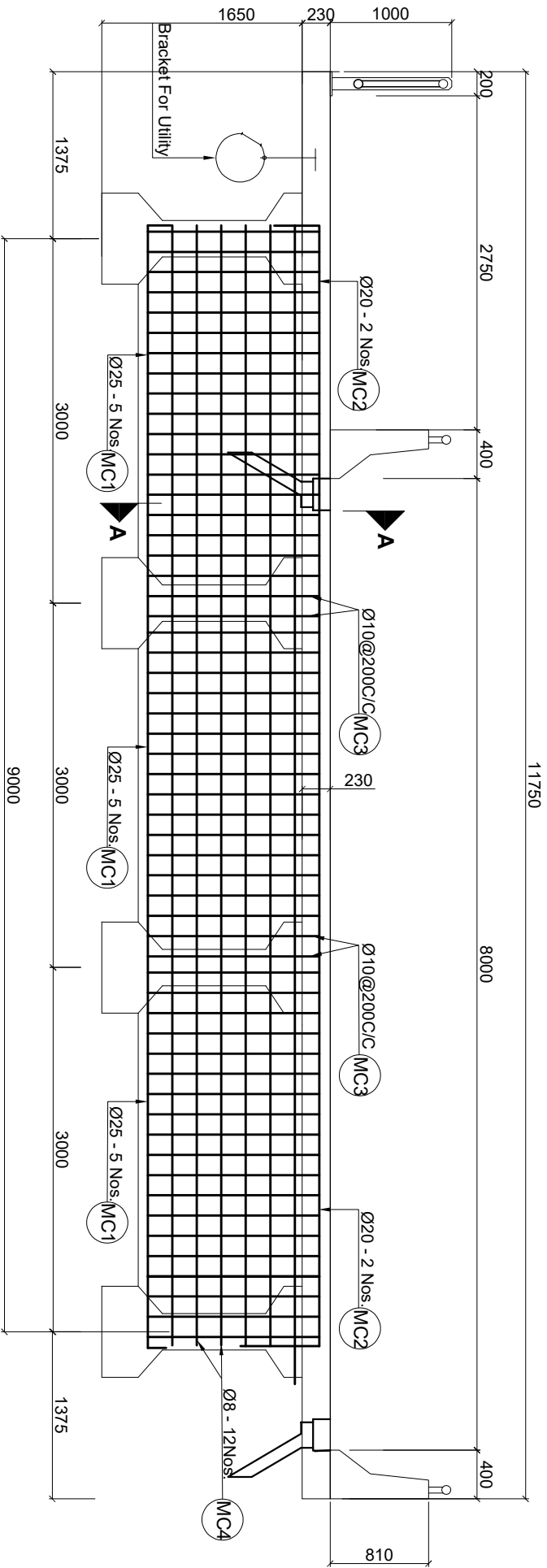


BAR BENDING SCHEDULE OF MAIN GIRDER						
BAR ID	SHAPE OF BAR IN mm (NOT TO SCALE)	SPACING (MM)	Ø OF BARS (mm)	NO. OF BARS	LENGTH (m)	WEIGHT/LENGTH (KG/m)
N1a		VARIES	16	68	5.050	1.578
N1b		VARIES	10	120	5.050	0.617
N1c		VARIES AS PER N1	10	125	1.770	0.617
N2		125	16	44	5.400	1.578
N2c		125	10	44	1.280	0.617
N3		125	16	20	5.080	1.578
		125	10	20	0.774	0.617
L1	Hor. Bar at Bottom 	165	12	5	31.120	0.888
L2	Hor. Bar at top of Precast Girder 	220	10	4	31.320	0.617
L3	Hor. Bar at Side End Zone 	200	10	22	23.400	0.617
L4	Hor. Bar at Side (End Zone) 	200	10	44	5.120	0.617
A1		VARIES	16	10	7.930	1.578
		(Use Manufacturer's specifications if available)				
A2		150	16	12	18.110	1.578
		(Use Manufacturer's specifications if available) The Sketch shown here is indicative, for he purpose of estimate only. The pitch of the bars to be adjusted as per the tendon's size and positions				

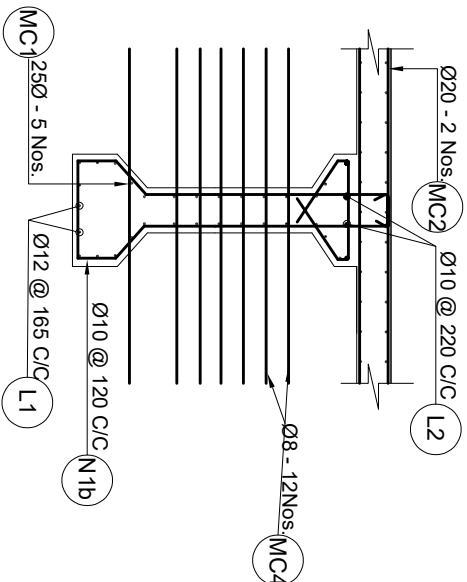
BAR BENDING SCHEDULE OF MAIN GIRDER					
BAR ID	SHAPE OF BAR IN mm (NOT TO SCALE)	SPACING (MM)	Ø OF BARS (mm)	NO. OF BARS	LENGTH (m)
A3		VARIES	10	4	10.200
TOTAL IN ONE GIRDER					2796.669
TOTAL IN ONE GIRDER (IN METRIC TON)					2.797

BAR BENDING SCHEDULE OF DECK SLAB						
BAR ID	SHAPE OF BAR IN mm (NOT TO SCALE)	SPACING (MM)	Ø OF BARS (mm)	NO. OF BARS	LENGTH (m)	WEIGHT/LENGTH (KG/m)
S1		125	12	257	11.870	0.888
S2		125	12	250	11.870	0.888
S2a	Additional Bars At Left Cantilever 	125	12	250	2.570	0.888
S2b	Additional Bars At Right Cantilever 	125	12	250	2.570	0.888
S3		MID DECK 200	10	60	31.420	0.617
		LEFT CANT. 200	10	6	31.420	0.617
S4		200	10	60	31.420	0.617
S4a	Additional Top Bars At Deck End Left 	200	12	60	4.405	0.888
S4b	Additional Top Bars At Deck End Right 	200	12	60	4.405	0.888
S5a	For extended Deck Left End 	200	10	50	0.710	0.617
S5b	For extended Deck Right End 	200	10	50	0.710	0.617
TOTAL EXCLUDING FOOTPATHS KG						9553.934
TOTAL WEIGHT IN METRIC TON						9.554

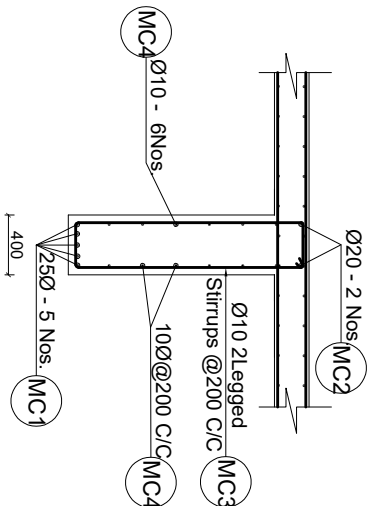
Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No.: 3722-NEP		CONSULTANT: Soosung Engineering Co. Ltd, Korea in association with ERM C P (Ltd), Nepal and JYK - Tech Studio of Engineering		IMPLEMENTING AGENCY: DOR, DCID ROAD NAME: East West Highway (H01) Butwal - Gorusinghe Section		SHEET TITLE: B.B.S of Slab & Main Girder of Banganga Bridge(left Side) (46/H001/309_A)		SCALE:		NAME		SIGNATURE		REV NO.		DESCRIPTION		DATE: November 2022	
										Saroj Bhattarai								DWG.NO.: 309_Banganga	
										P. Upadhyaya								SHEET NO.: 18/61	
										D.R. T.H. Choi									



Intermediate Cross Girders
Scale:-1:50



Dowel bar of Intermediate Cross Girder
Scale:-1:50

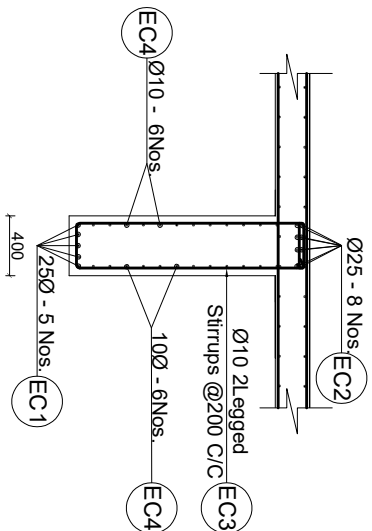
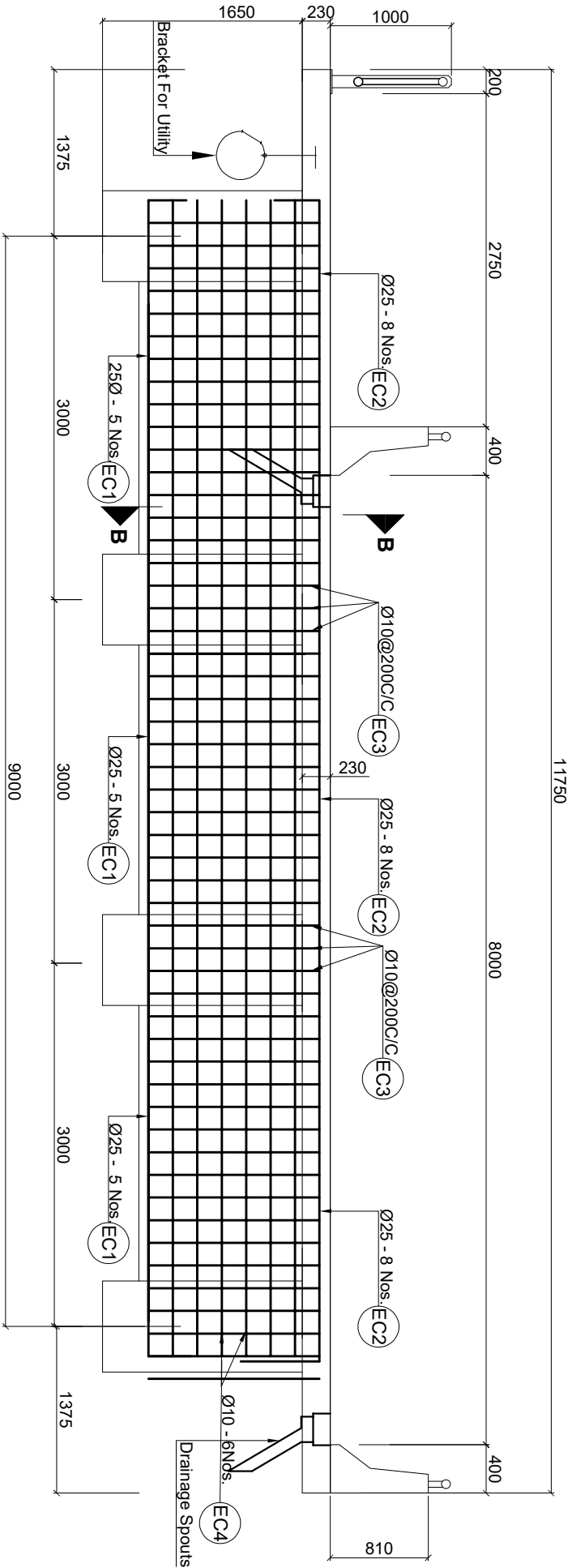


Section At A-A
Scale:-1:50

BAR BENDING SCHEDULE OF INTERMEDIATE CROSS GIRDER						
BAR ID	SHAPE OF BAR IN mm (NOT TO SCALE)	SPACING (MM)	Ø OF BARS (mm)	NO. OF BARS	LENGTH (m)	WEIGHT/LENGTH (KG/m)
MC1			25	5	10.445	3.853
MC2		0	20	2	10.445	2.466
MC3		200	10	45	3.520	0.617
MC4		300	10	12	9.220	0.617
TOTAL IN ONE GIRDER						418.634
TOTAL IN 2 GIRDER (IN METRIC TON)						0.837

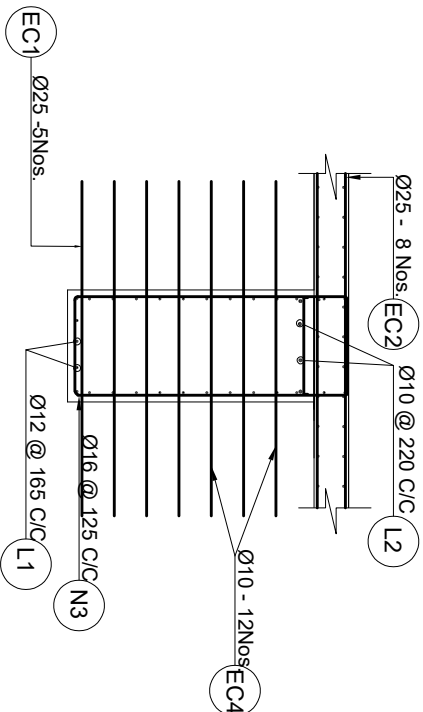
NOTE:
Dowel bars similar to the longitudinal bars of the cross girders shall be pre-installed in the precast main girder before casting. The longitudinal bars of the cross girder shall be lapped to the dowel bars, which shall have a lap length of 60 dia. of the corresponding bars.

Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP	CONSULTANT:		IMPLEMENTING AGENCY:		SHEET TITLE:		SCALE:		NAME	SIGNATURE	REV NO.	DESCRIPTION	DATE:
	Soosung Engineering Co. Ltd, Korea in association with ERM P (Ltd), Nepal and Tech Studio of Engineering		DOR, DCID		Reinforcement Details of Intermediate Cross Girder of Banganga Bridge(Left Side) (46/H001/309_A)		As Shown		Saroj Bhatarai				November, 2022
			ROAD NAME:						P. Upadhyaya				DWG. NO.: 309_Banganga
			Butwal - Gorusinghe Section						Dr. T.H. Choi				SHEET NO.: 19/61



Section A-A-B
Scale:-1:50

End Cross Girders
Scale:-1:50



Dowel bar of End Cross Girder
Scale:-1:50

BAR BENDING SCHEDULE OF END CROSS GIRDER						
BAR ID	SHAPE OF BAR IN mm (NOT TO SCALE)	SPACING (MM)	Ø OF BARS (mm)	NO. OF BARS	LENGTH (m)	WEIGHT/LENGTH H (kg/m)
EC1			25	5	10.445	3.853
EC2		0	25	8	10.445	3.853
EC3		200	10	50	3.720	0.617
EC4		300	10	12	9.320	0.617
TOTAL IN ONE GIRDER						706.860
TOTAL IN 2 GIRDER (IN METRIC TON)						1.414

NOTE:
Dowel bars similar to the longitudinal bars of the cross girders shall be pre-installed in the precast main girder before casting. The longitudinal bars of the cross girder shall be lapped to the dowel bars, which shall have a lap length of 60 dia. of the corresponding bars.

Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP	 CONSULTANT: Soosung Engineering Co. Ltd, Korea in association with ERM C P (Ltd), Nepal and  Jyoti-Tech Studio of Engineering	IMPLEMENTING AGENCY:	SHEET TITLE: Reinforcement Details of End Cross Girder of Banganga Bridge(Left Side) (46/H001/309_A)	SCALE: As Shown	NAME	SIGNATURE 	REV NO.	DESCRIPTION	DATE: November,2022	DWG.NO.: 309_Banganga	SHEET NO.: 20/6
		ROAD NAME: East West Highway (H01)			DESIGNED BY: Saroj Bhattacharai						
		Butwal - Gorusinghe Section			CHECKED BY: P. Upadhyaya						
					APPROVED BY: Dr. T.H.Choi						

Government of Nepal

Ministry of Physical Infrastructure and Transport

Department of Roads

Project Directorate (ADB)

Implementing Agency : DOR, DCID

Project Preparatory Consultants

Under

SASEC Highway Improvement Project (SHIP-PPC)

(ADB Loan No: 3722 Nep)

Contract No. SHIP/PPC/2020/02

Banganga Bridge (Left Side)

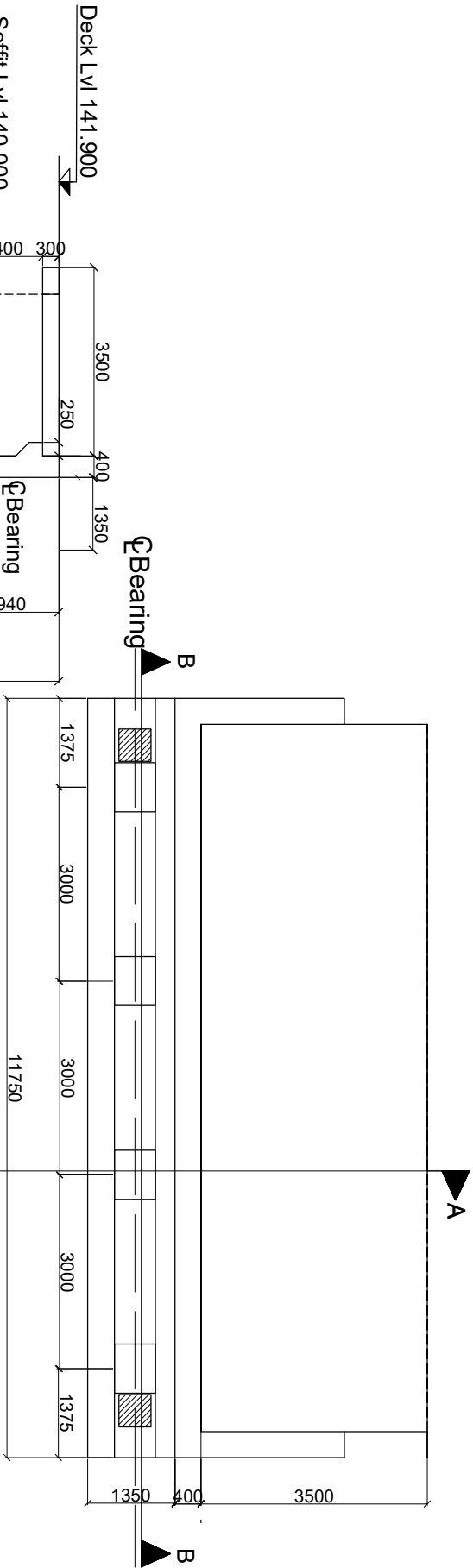
Left Abutment Pier (P1,P2,P3,P4)

St. Ch : 621+863.91 ~ End Ch : 622+176.09

Detailed Drawing

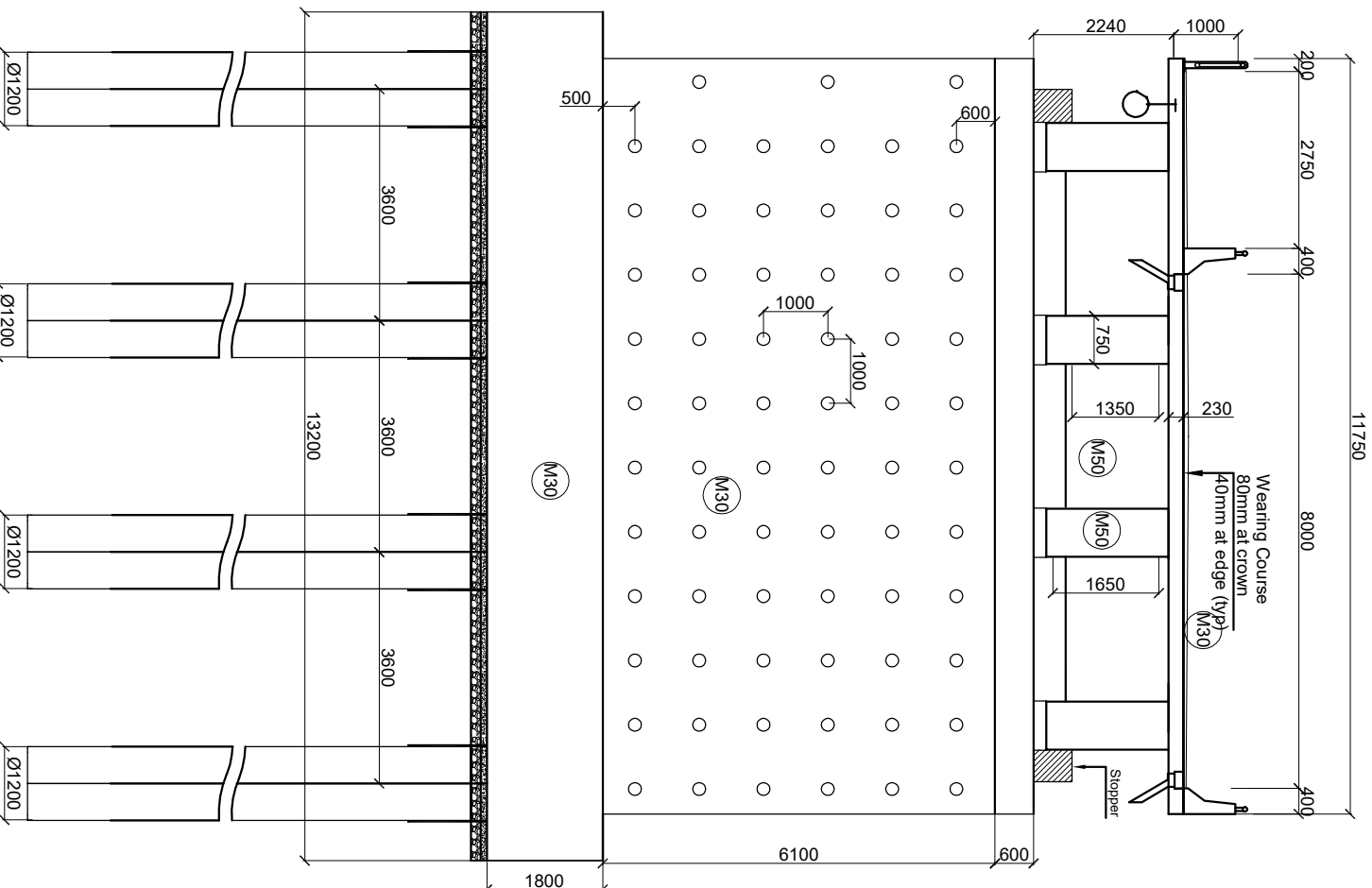
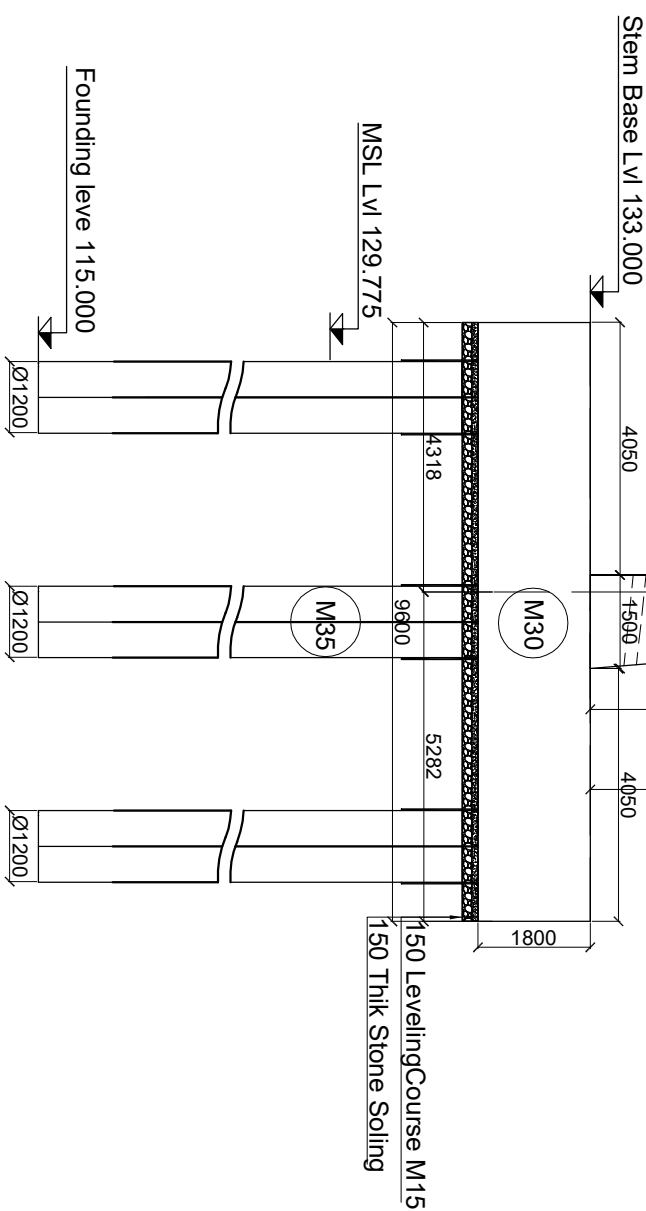
Butwal - Gorusinghe Sector

November, 2022

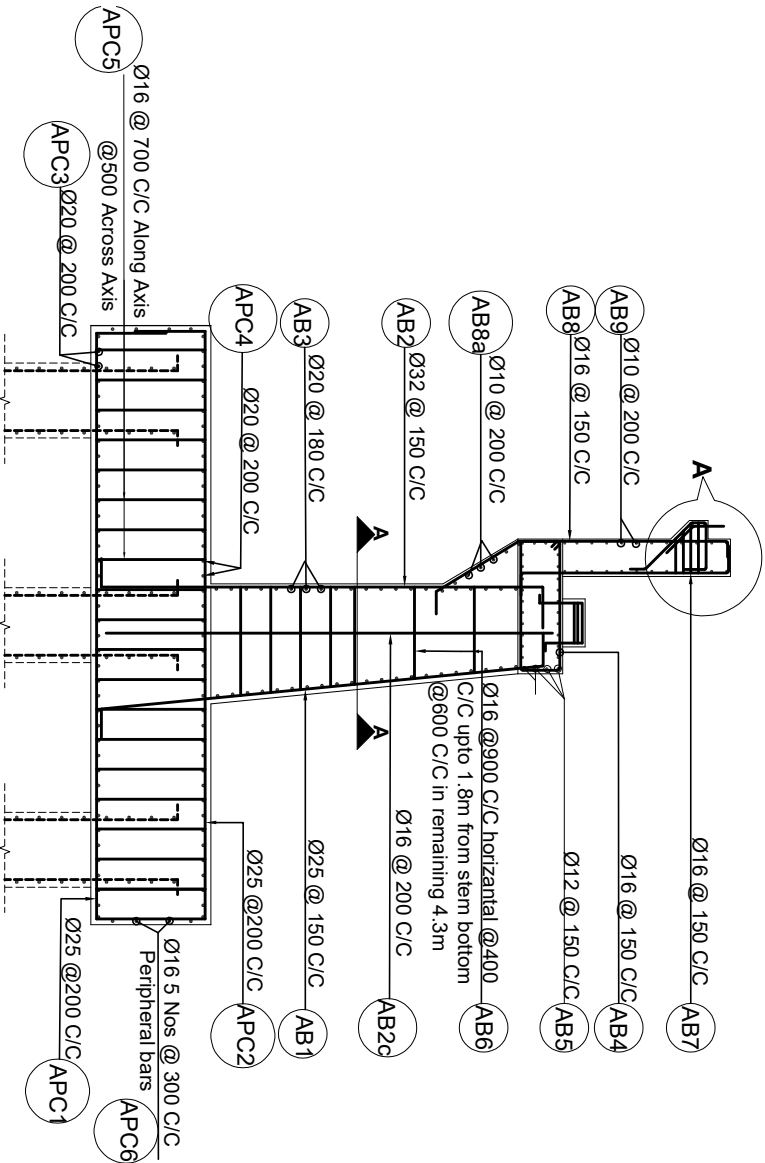


Plan of Abutment

Scale:-1:100

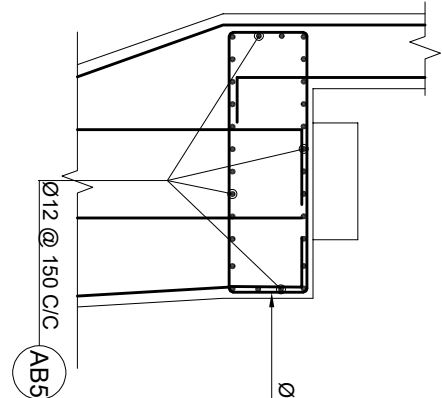


Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No. 3722-NEP		CONSULTANT: Soosung Engineering Co. Ltd, Korea in association with ERM C P (Ltd), Nepal and JYK -Tech Studio of Engineering		IMPLEMENTING AGENCY: DOR, DCID		SHEET TITLE: Abutment Details of Banganga Bridge(Left Side) (46/H001/309_A)		SCALE: As Shown		NAME		SIGNATURE	REV NO.	DESCRIPTION	DATE: November,2022
				ROAD NAME: East West Highway (H01)						DESIGNED BY: Saroj Bhattacharai					DWG.NO.: 309_Banganga
				Butwal - Gorusinghe Section						CHECKED BY: P. Upadhyaya					SHEET NO.: 21/61
										APPROVED BY: Dr. T.H. Choi					



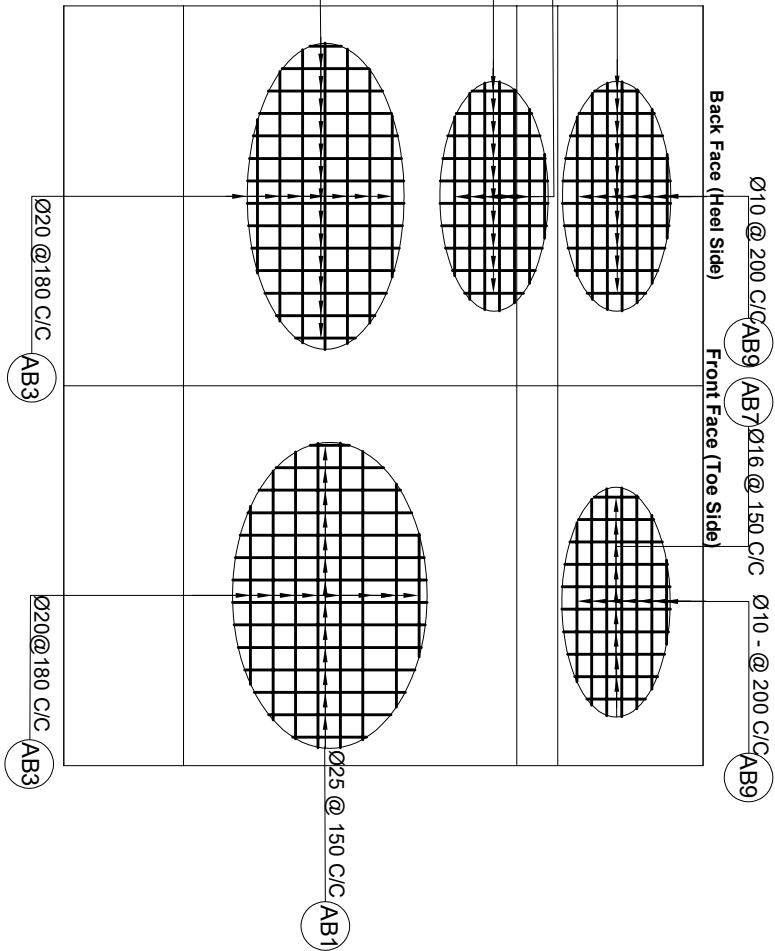
Reinforcement Details Of Abutment

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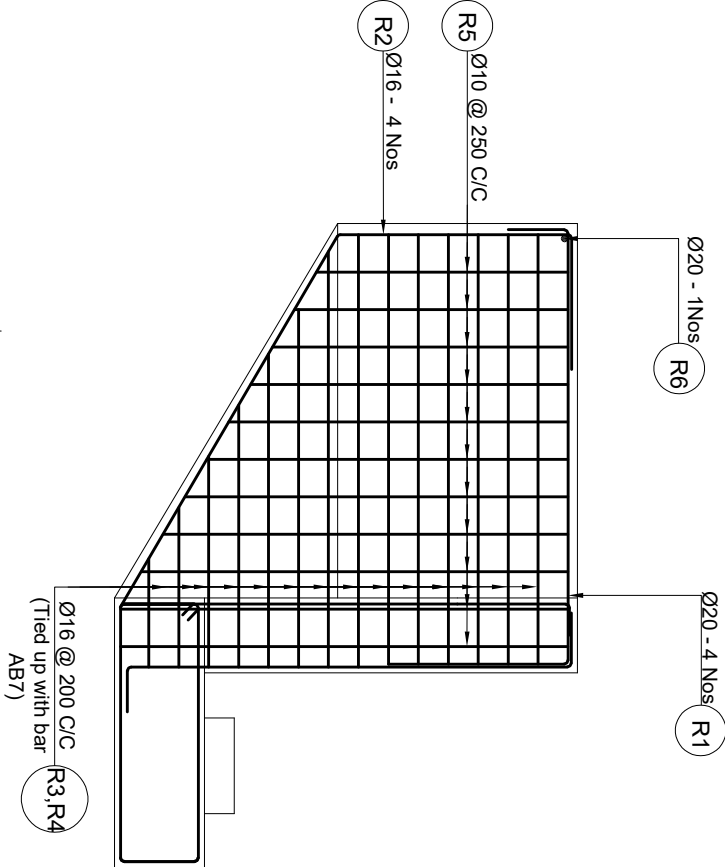
Reinforcement Details Of Abutment

Scale:-1:50



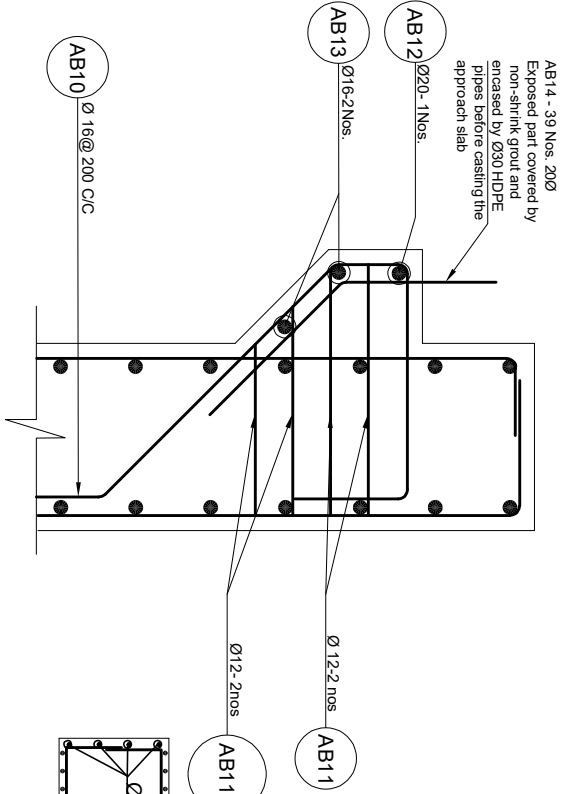
Reinforcement Details Of Abutment

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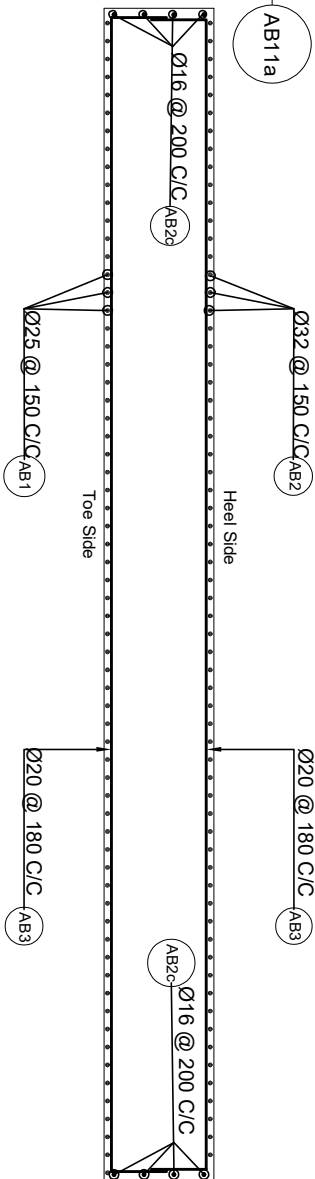
Reinforcement Details Of Wingwall

Scale:-1:50



Detail At A

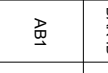
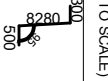
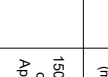
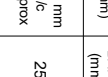
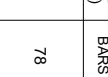
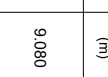
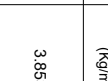
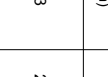
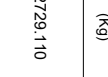
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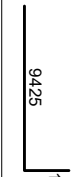
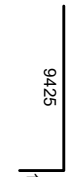
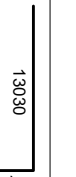
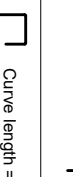
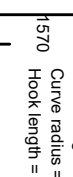
Section at A-A

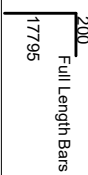
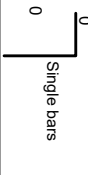
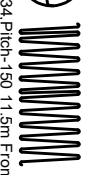
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Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP	CONSULTANT:  Soosung Engineering Co. Ltd, Korea in association with  ERMIC P (Ltd), Nepal and  3722-Tech Studio of Engineering	IMPLEMENTING AGENCY:	SHEET TITLE:	SCALE:		NAME	SIGNATURE	REV NO.	DESCRIPTION	DATE:		
		DOR, DCID	Reinforcement Details Of Abutment of Banganga Bridge(left Side) (46/H001/309_A)	As Shown	DESIGNED BY:	Saroj Bhattarai					November,2022	
					ROAD NAME:							DWG.NO.:
					East West Highway (H01)						309_Banganga	
					Butwal - Gorusinghe Section						SHEET NO.:	
					APPROVED BY:	Dr. T.H. Choi				(22/6/1)		

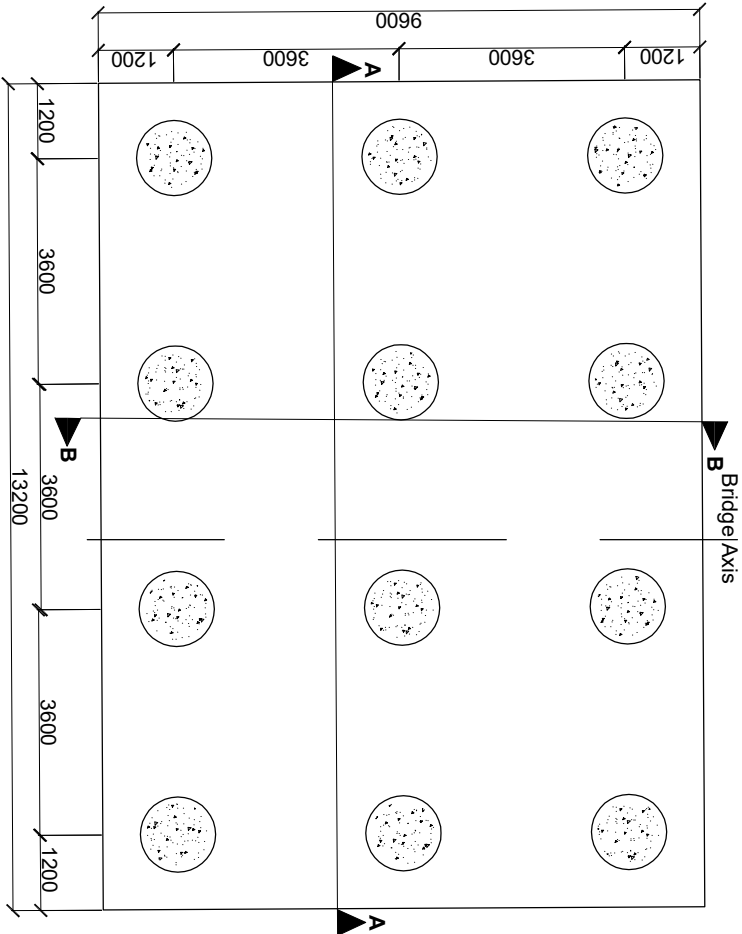
BAR BENDING SCHEDULE OF ABUTMENT							
BAR ID	SHAPE OF BAR IN mm (NOT TO SCALE)	SPACING (mm)	Ø OF BARS (mm)	NO. OF BARS	LENGTH (m)	WEIGHT/LENGTH (kg/m)	TOTAL WEIGHT (kg)
AB1		150 mm c/c Approx	25	78	9.080	3.853	2729.110
AB1a		-	-	-	-	-	-
AB2		150 mm c/c Approx	32	78	9.280	6.313	4569.862
AB2c		At side face 200mm c/c	16	10	8.780	1.578	138.578
AB3		180 mm c/c Approx	20	70	25.070	2.466	4327.857
AB4		150 mm c/c Approx	16	80	4.400	1.578	555.576
AB5		150 mm c/c Approx	12	28	11.600	0.888	288.363
AB6		Hook Length 900 mm C/C horizontal 400 mm C/C vertical upto 1.5m from stem bottom 600 mm C/C vertical at remaining 4.3 m	16	170	1.533	1.578	411.331
AB7		150 mm c/c Approx	16	79	3.390	1.578	422.695
AB8		150 mm c/c Approx	16	79	5.451	1.578	679.679
AB8a		200 mm c/c Approx	10	12	11.600	0.617	85.822
AB9		200mm c/c Approx	10	12	23.716	0.617	175.462
AB10		200 mm c/c Approx	16	55	1.747	1.578	151.655
AB11		12	110	0.900	0.888	87.894	
AB11a		12	110	0.650	0.888	63.479	
AB12		20	1	11.600	2.466	28.607	
AB13		16	2	11.600	1.578	36.617	
AB14		20	39	0.900	2.466	86.562	
TOTAL WEIGHT ABUTMENT KG					14839.150		
TOTAL WEIGHT (IN METRIC TON)					14.839		

BAR BENDING SCHEDULE FOR WINGWALL							
BAR ID	SHAPE OF BAR IN mm (NOT TO SCALE)	SPACING (mm)	Ø OF BARS (mm)	NO. OF BARS	LENGTH (m)	WEIGHT/LENGTH (kg/m)	TOTAL WEIGHT (kg)
R1		0	20	8	4.907	2.466	96.811
R2		0	16	8	4.937	1.578	62.338
R3		200	16	14	7.156	1.578	158.124
R4		200	16	16	3.928	1.578	99.196
R5		250	10	26	4.900	0.617	78.547
R6		0	20	2	0.307	2.466	1.514
R7		0	10	0	3.300	0.617	0.000
R8		0	10	0	1.320	0.617	0.000
TOTAL IN 2 WINGWALL IN ONE ABUTMENT							496.531
TOTAL WEIGHT (IN METRIC TON)							0.497

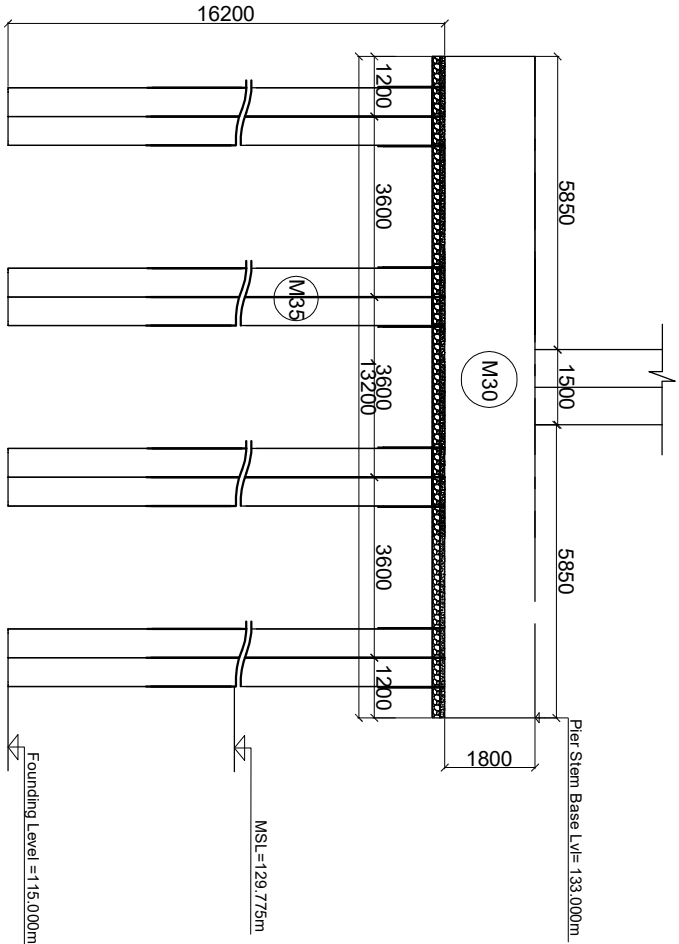
BAR BENDING SCHEDULE FOR ABUTMENT PILECAP							
BAR ID	SHAPE OF BAR IN mm (NOT TO SCALE)	SPACIN G (mm)	Ø OF BARS (mm)	NO. OF BARS	LENGTH (m)	WEIGHT/LENGTH (kg/m)	TOTAL WEIGHT (kg)
APC1		150	25	67	11.585	3.853	2990.966
APC2		150	25	67	11.585	3.853	2990.966
APC3		150	20	49	15.190	2.466	1835.585
APC4		150	20	49	15.190	2.466	1835.585
APC5		150	16	400	2.232	1.578	1409.142
APC6		300	16	5	45.000	1.578	355.126
TOTAL IN PILE OF ONE ABUTMENT							11417.369
TOTAL WEIGHT (IN METRIC TON)							11.417

BAR BENDING SCHEDULE FOR ABUTMENT PILES							
BAR ID	SHAPE OF BAR IN mm (NOT TO SCALE)	SPACIN G (mm)	Ø OF BARS (mm)	NO. OF BARS	LENGTH (m)	WEIGHT/LENGTH (kg/m)	TOTAL WEIGHT (kg)
AP1a			25	26	18.000	3.853	1803.377
AP1b			0	0	13.300	0.000	0.000
AP2		150	16	1	251.650	1.578	397.189
AP3		200	12	1	105.880	0.888	94.002
TOTAL IN ONE PILE							2294.568
TOTAL (IN METRIC TON)							2.295
TOTAL IN 12 PILES OF ONE ABUTMENT (IN METRIC TON)							27.535

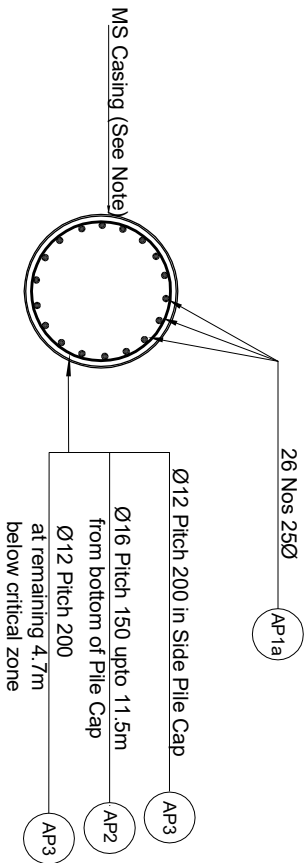
Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP	CONSULTANT:	IMPLEMENTING AGENCY:		SHEET TITLE:	SCALE:		NAME	SIGNATURE	REV NO.	DESCRIPTION	DATE:
	 Soosung Engineering Co. Ltd, Korea in association with	ROAD NAME: East West Highway (H01)		Reinforcement Details of Banganga Bridge (left Side) (46/H001/309_A)	As Shown	DESIGNED BY:	Saroj Bhattacharai				November, 2022
						CHECKED BY:	P. Upadhyaya				DWG.NO. : 309_Banganga
						APPROVED BY:	Dr. T.H. Choi				SHEET NO. : 236/1
	 JYoti-Tech Studio of Engineering	Butwal - Gorusinghe Section									



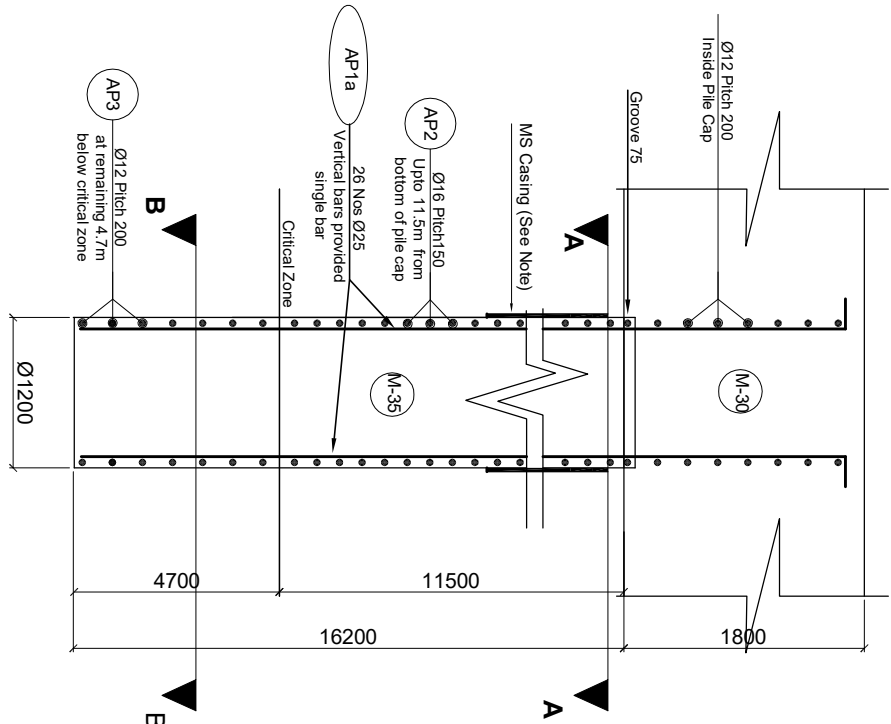
Plan Of Abutment Piles
Scale:-1:200



Piles Section At B-B
Scale:-1:150



Section At A-A
Scale:-1:50



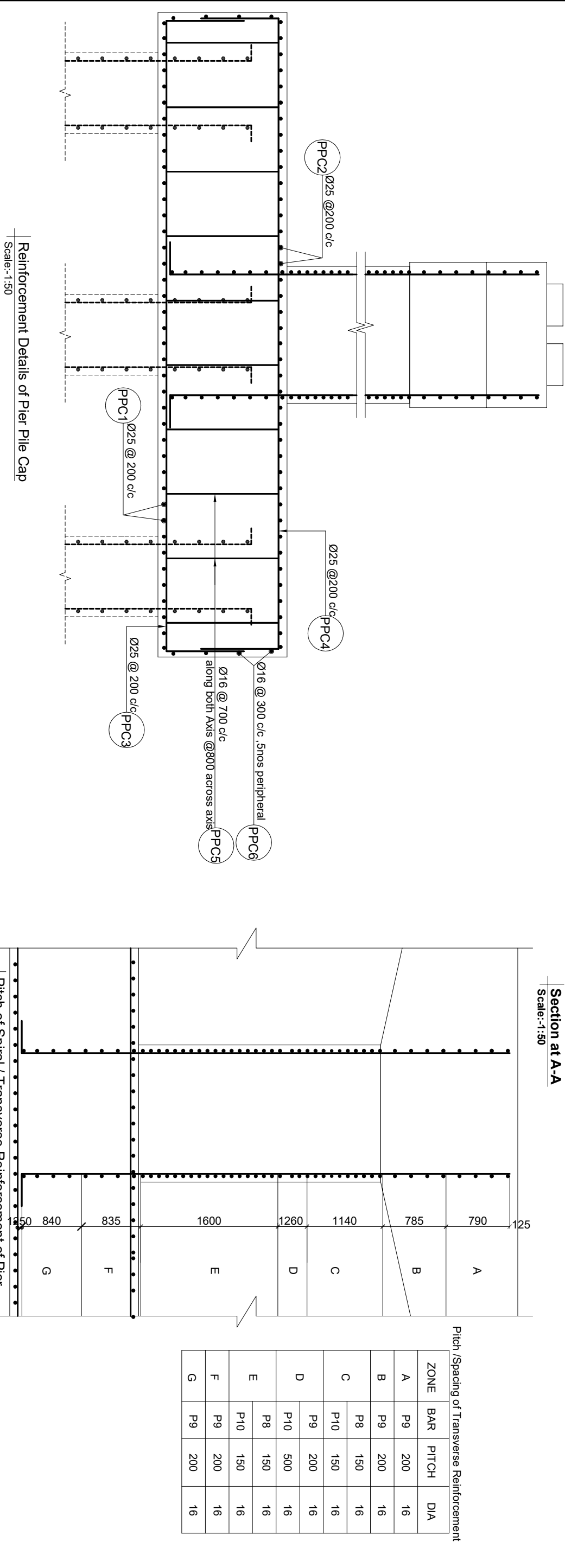
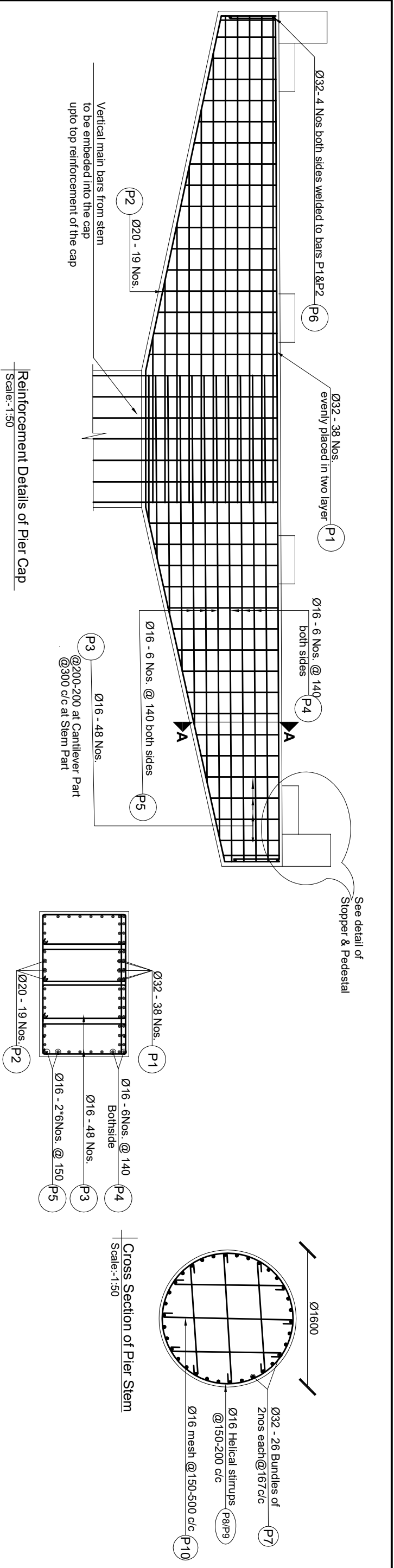
Reinforcement Details Of Pile
Scale:-1:50

Location	Design Pile Length m	Design Working load on pile (non - seismic case)kn	Allowable Bearing Capacity on pile (Scour case) kn	Allowable Bearing Capacity of the Pile (Non Scour case)kn
Abutment	16.2	2275	1218	1279
Pier	17.2	988	1564	1843

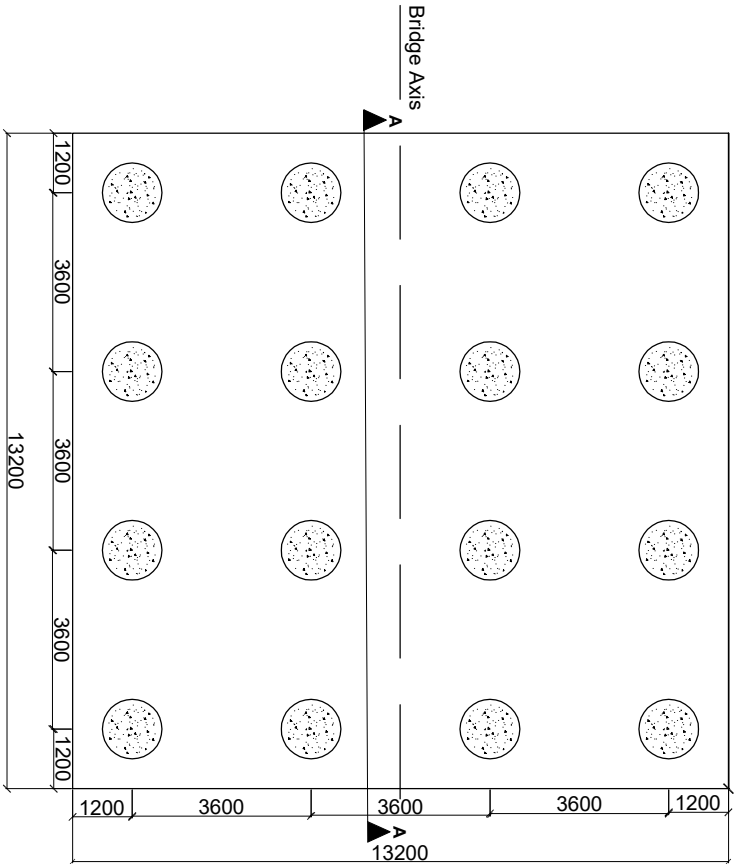
Note On MS permanent casing on piles: In case piling works are done without temporary casing, the piles shall be lined with 6mm thick MS steel permanent casing up to 1.5 m or 0.5m below MSL, whichever is larger (Subject to instruction and approval by the Engineer)

For Construction Methodology and Sequence Please See General Notes.

Government of Nepal Ministry of Physical Infrastructure and Transport Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP	CONSULTANT:  Soosung Engineering Co. Ltd, Korea in association with  ERM C P (Ltd), Nepal and  378-Tech Studio of Engineering	IMPLEMENTING AGENCY: DOR, DCID		SHEET TITLE: Reinforcement Details of Abutment Piles of Banganga Bridge(Left Side) (46/H001/309_A)		SCALE: As Shown		NAME		SIGNATURE		REV NO.		DESCRIPTION		DATE: November,2022	
		ROAD NAME: East West Highway (H01)														DWG.NO.: 309_Banganga	
		Burwal - Gorusinghe Section															
																SHEET NO.: 24/61	

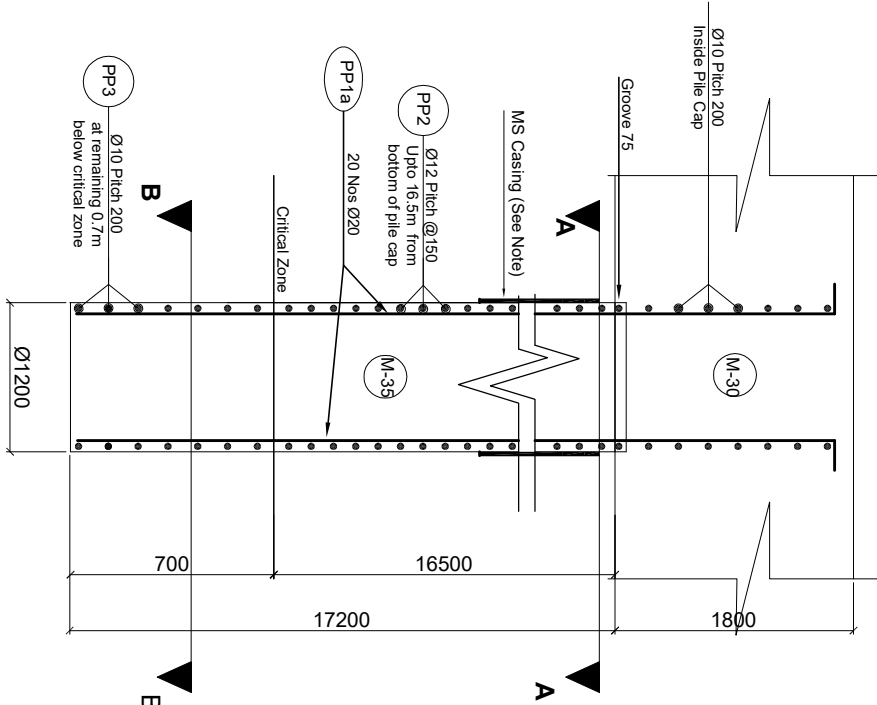
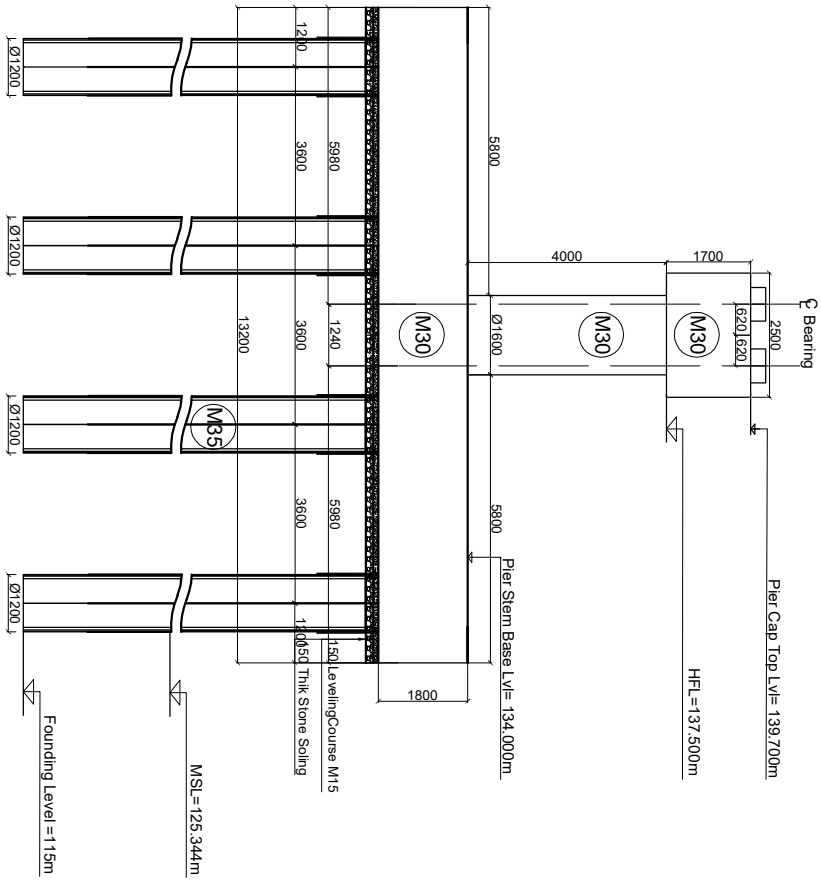


Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP	CONSULTANT:  Soosung Engineering Co. Ltd, Korea in association with  ERM/C P (Ltd), Nepal and  Jyoti - Tech Studio of Engineering	IMPLEMENTING AGENCY:	SHEET TITLE:	SCALE:		NAME	SIGNATURE	REV NO.	DESCRIPTION	DATE:	
		DOR, DCID	Reinforcement Details of pier Banganga Bridge(Left Side) (46/H001/309_A)	As Shown	DESIGNED BY:	Saroj Bhattarai				DWG.NO.:	November, 2022
					CHECKED BY:	P. Upadhyaya				309_Banganga	
					APPROVED BY:	Dr. T.H. Choi				SHEET NO.:	
					Butwal - Gorusinghe Section					26/61	



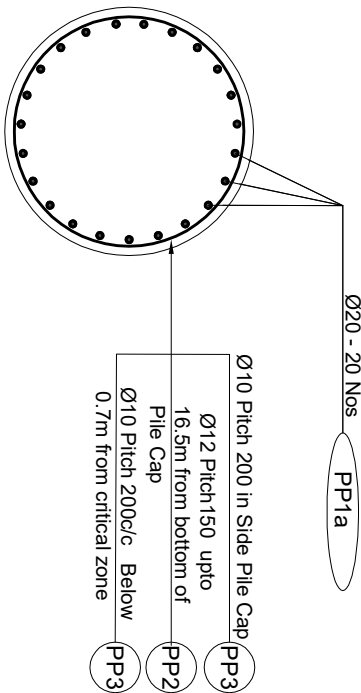
Plan Of Pier piles

Scale:-1:150



Reinforcement Details Of Pile

Scale:-1:50



Section at A-A

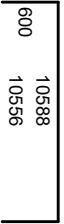
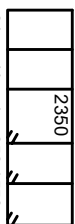
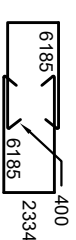
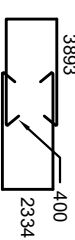
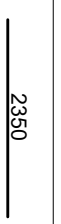
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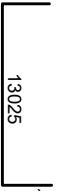
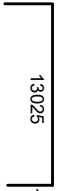
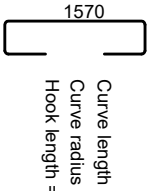
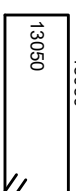
BAR BENDING SCHEDULE FOR PIER PILES						
BAR ID	SHAPE OF BAR IN mm (NOT TO SCALE)	SPACIN G (mm)	Ø OF BARS (mm)	NO. OF BARS	LENGTH (m)	WEIGHT/LENGTH (kg/m)
PP1a	Full length bars	0	20	20	18.990	2.466
PP1b	Curtailed bars	0	0	0	0.000	0.000
PP2	150	12	1	362.400	0.888	321.745
PP3	200	10	1	39.850	0.617	24.569
TOTAL IN ONE PILE						
TOTAL (IN METRIC TON)						
TOTAL FOR 16 PILES IN ONE PIER (IN METRIC TON)						
1.283						
20.527						

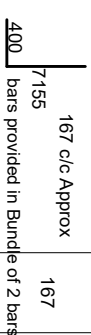
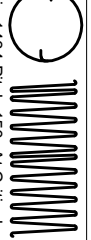
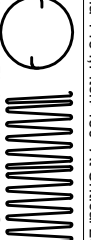
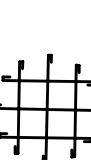
Location	Design Pile Length m	Design Working load on pile (non - seismic case)kn	Allowable Bearing Capacity on pile (Scour case) kn	Allowable Bearing Capacity of the pile (Non Scour case)kn
Abutment	16.2	2275	1218	1279
Pier	17.2	988	1564	1843

For Construction Methodology and Sequence Please See General Notes.

Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP	 CONSULTANT: Soosung Engineering Co. Ltd, Korea in association with ERMCo P (Ltd), Nepal and <i>JYoti</i> - Tech Studio of Engineering 	IMPLEMENTING AGENCY:	SHEET TITLE: Reinforcement of pier of Banganga Bridge(Left Side) (46/H001/309_A)	SCALE: As Shown	NAME	SIGNATURE	REV NO.	DESCRIPTION	DATE: November, 2022	DWG. NO.: 309_Banganga
										ROAD NAME: East West Highway (H01)
										Butwal - Gorusinghe Section
										DESIGNED BY: Saroj Bhattacharai
										CHECKED BY: P. Upadhyaya
APPROVED BY: Dr. T.H. Choi					SHEET NO.: 27/61					

BAR BENDING SCHEDULE FOR PIER CAP						
BAR ID	SHAPE OF BAR IN mm (NOT TO SCALE)	SPACIN (mm)	Ø OF BARS (mm)	NO. OF BARS	LENGTH (m)	WEIGHT/LENGTH (kg/m) TOTAL WEIGHT (kg)
P1		131 Approx In 2layers	32	19	11.788	6.313 1414.016
P2		131	20	19	12.250	2.466 573.998
P3		200	16	54	10.020	1.578 854.008
P4		140	16	12	15.504	1.578 293.647
P5		140	16	12	10.920	1.578 206.826
P6			32	4	2.350	6.313 59.346
TOTAL IN ONE PIER CAP						4812.017
TOTAL WEIGHT (IN METRIC TON)						4.812

BAR BENDING SCHEDULE FOR PIER PILE CAP							
BAR ID	SHAPE OF BAR IN mm (NOT TO SCALE)	SPACIN G (mm)	Ø OF BARS (mm)	NO. OF BARS	LENGTH (m)	WEIGHT/LENGTH (kg/m)	TOTAL WEIGHT (kg)
PPC1		180	25	67	15.185	3.853	3920.398
PPC2		180	25	67	15.185	3.853	3920.398
PPC3		180	25	67	15.185	3.853	3920.398
PPC4		180	25	67	15.185	3.853	3920.398
PPC5		500	16	360	2.232	1.578	1268.228
		700 C/C along axis 800 C/C across axis					
PPC6		300	16	5	52.200	1.578	411.947
TOTAL IN PILE CAP OF ONE ABUTMENT							17361.767
TOTAL WEIGHT (IN METRIC TON)							17.362

BAR BENDING SCHEDULE FOR PIER STEM						
BAR ID	SHAPE OF BAR IN mm (NOT TO SCALE)	SPACIN G (mm)	Ø OF BARS (mm)	NO. OF BARS	LENGTH (m)	WEIGHT/LENGTH (kg/m) TOTAL WEIGHT (kg)
P7		167	32	52	7.555	6.313 2480.266
P8		150	16	1	83.340	1.578 131.539
P9		200	16	1	103.170	1.578 162.837
P10		150-500	16	22	8.710	1.578 302.441
TOTAL IN ONE PIER STEM						3077.084
TOTAL (IN METRIC TON)						3.077

Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP	CONSULTANT:		IMPLEMENTING AGENCY:		SHEET TITLE:		SCALE:		NAME		SIGNATURE	REV NO.	DESCRIPTION	DATE:	
	Soosung Engineering Co. Ltd, Korea in association with		DOR, DCID		Bar Bending of		As Shown		Saroj Bhattarai					November, 2022	
	ERMCo P (Ltd), Nepal and		ROAD NAME:		Banganga Bridge(Left Side)				P. Upadhyaya					DWG.NO.: 309_Banganga	
	Jyoti-Tech Studio of Engineering		East West Highway (H01)		(46/H001/309_A)				Dr. T.H.Choi					SHEET NO.:	
			Butwal - Gorusinghe Section											28/61	

Government of Nepal

Ministry of Physical Infrastructure and Transport

Department of Roads

Project Directorate (ADB)

Implementing Agency : DOR, DCID

Project Preparatory Consultants

Under

SASEC Highway Improvement Project (SHIP-PPC)

(ADB Loan No: 3722 Nep)

Contract No. SHIP/PPC/2020/02

Banganga Bridge (Right Side)

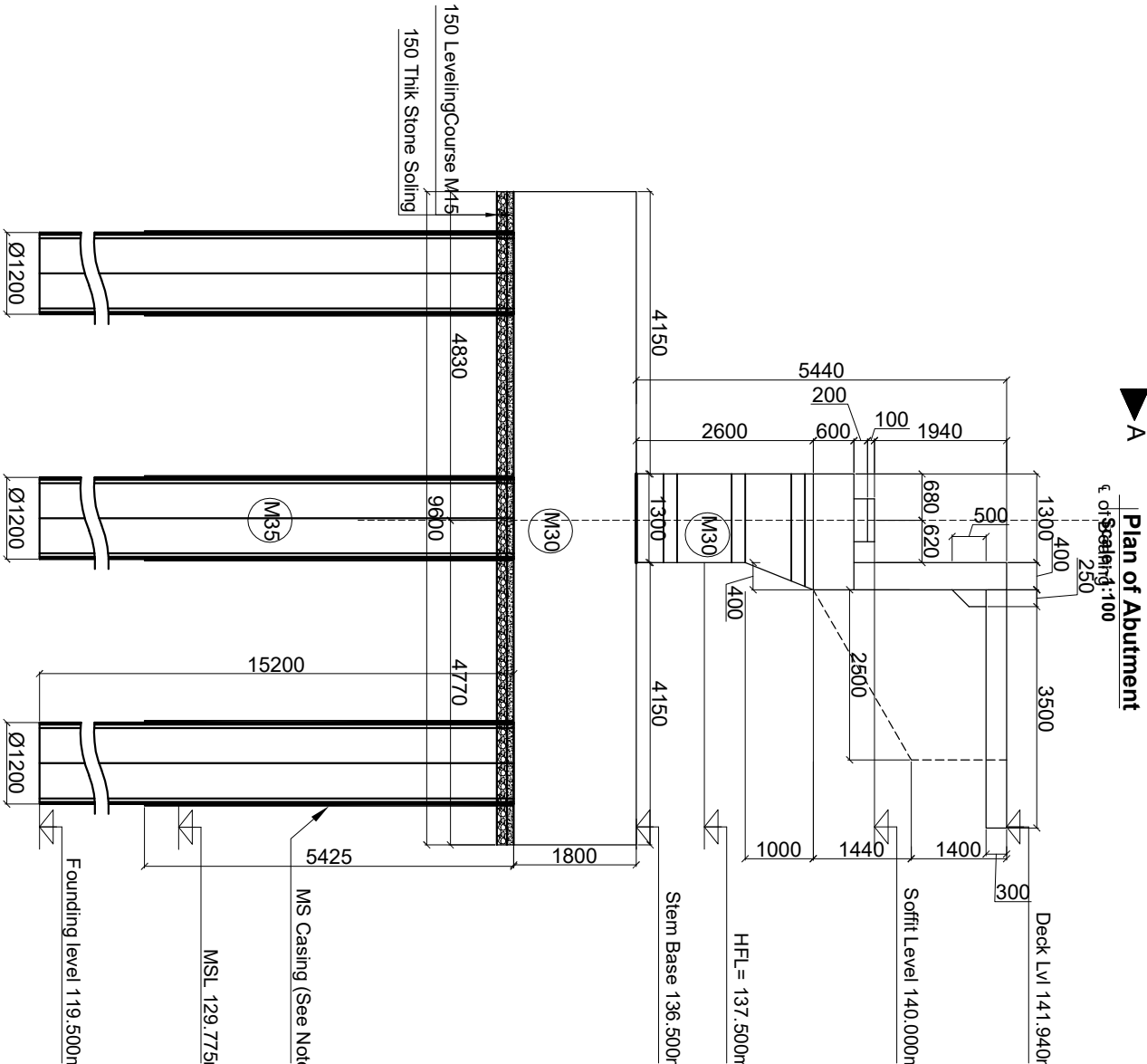
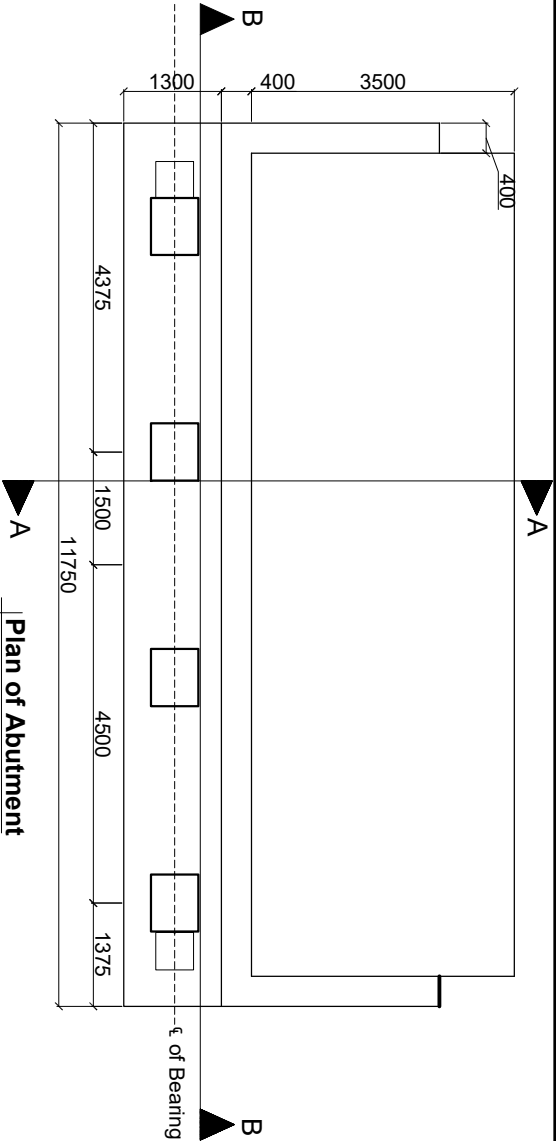
Right Abutment Pier (P5,P6,P7)

St. Ch : 621+863.91 ~ End Ch : 622+176.09

Detailed Drawing

Butwal - Gorusinghe Sector

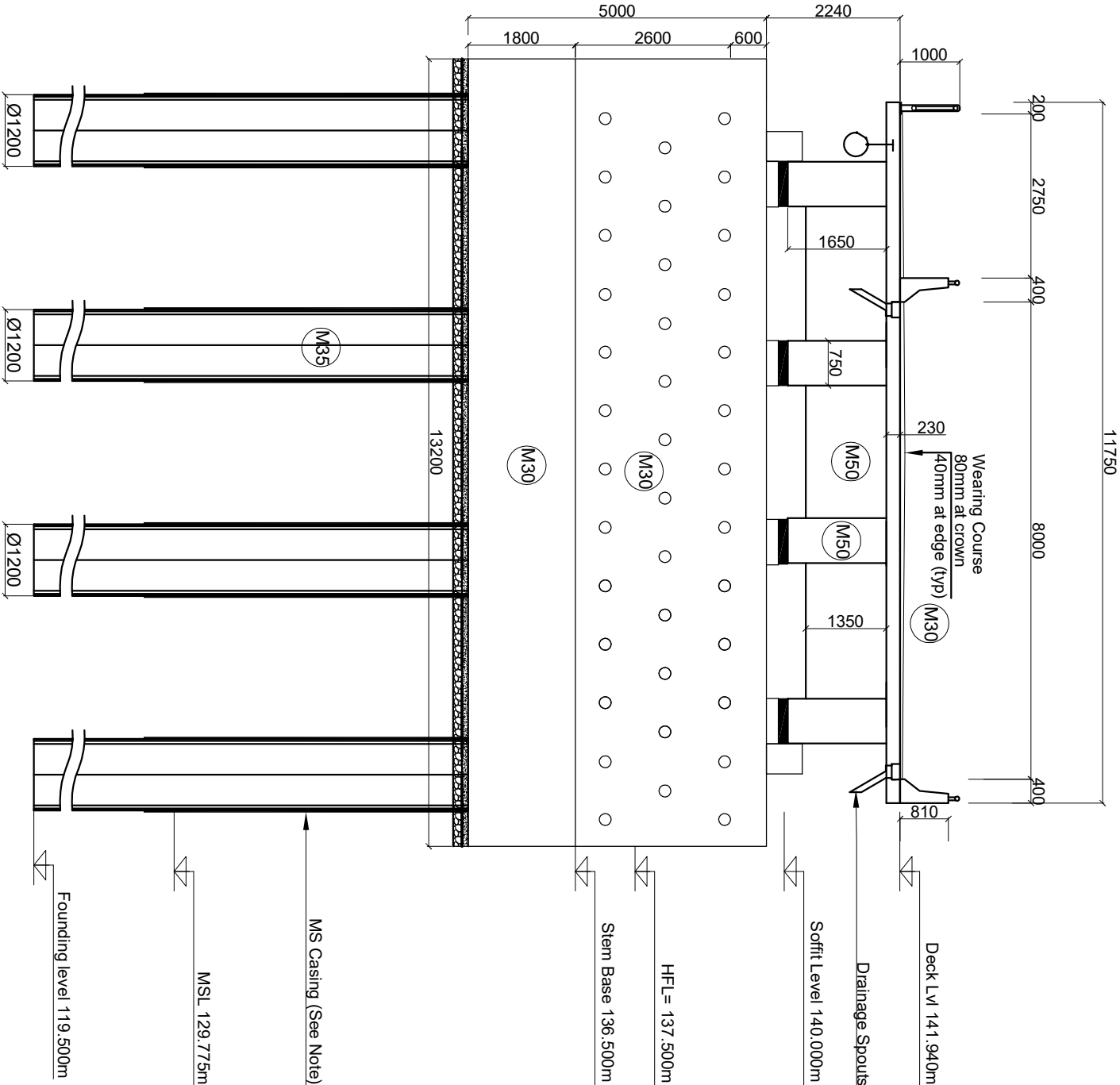
November,2022



For Piers P5,P6,P7

Section of Abutment At (A-A)

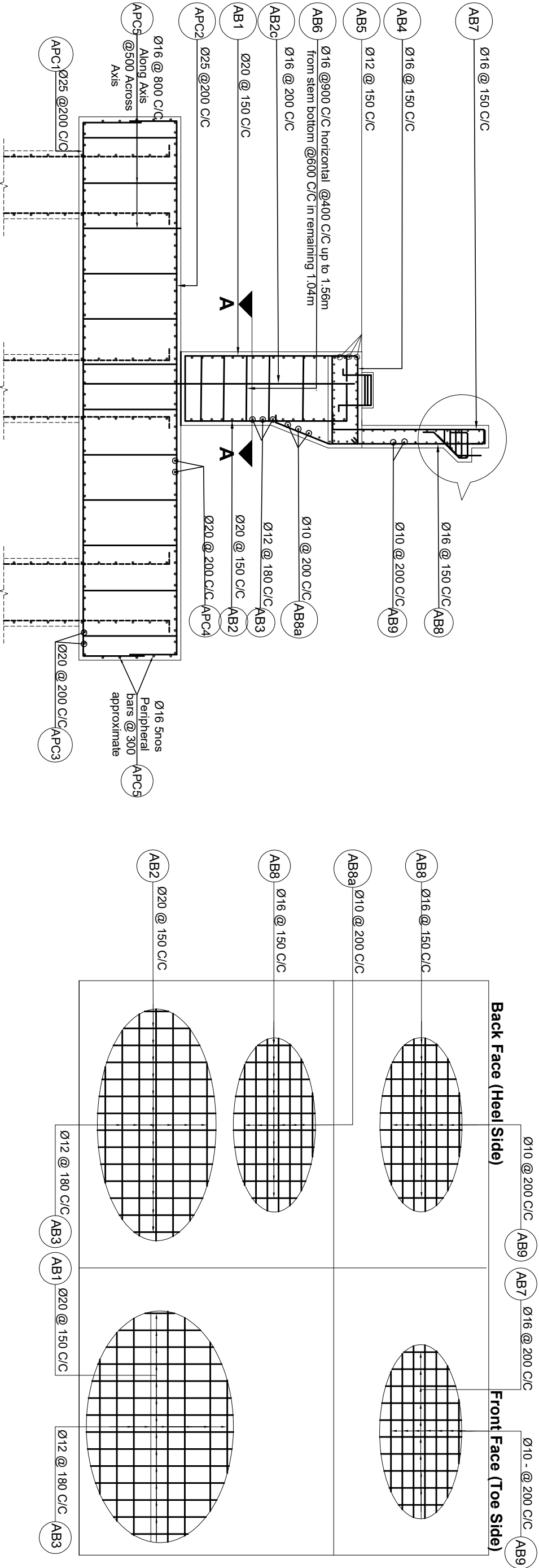
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Section of Abutment At (B-B)

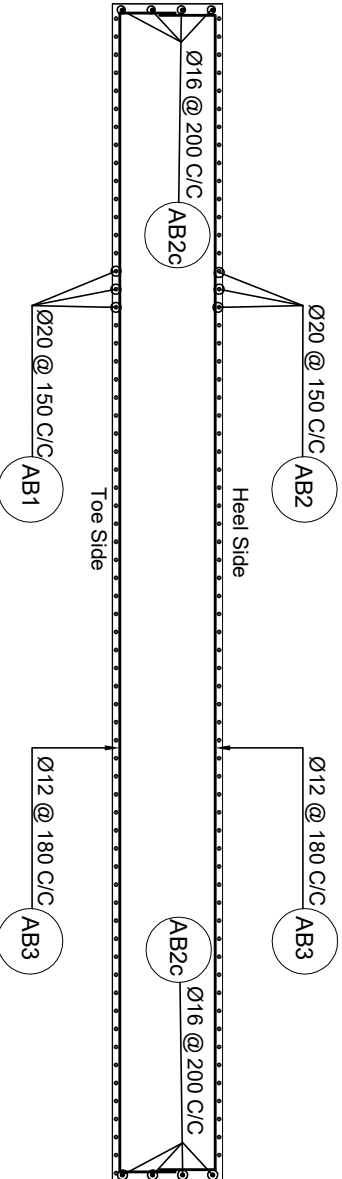
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Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP	 CONSULTANT:	 Soosung Engineering Co. Ltd, Korea in association with ERM C P (Ltd), Nepal and <i>JGC</i> -Tech Studio of Engineering				IMPLEMENTING AGENCY:	DOR, DCID	SHEET TITLE:	SCALE:	Abutment Details of Banganga Bridge(Right Side) (46/H001/309_A)	As Shown	DESIGNED BY:	NAME	SIGNATURE	REV NO.	DESCRIPTION	DATE: November, 2022
												CHECKED BY:	P. Upadhyaya				
												APPROVED BY:	Dr. T.H.Choi				
												DWG.NO.: 309_Banganga					
												SHEET NO.: 29/61					



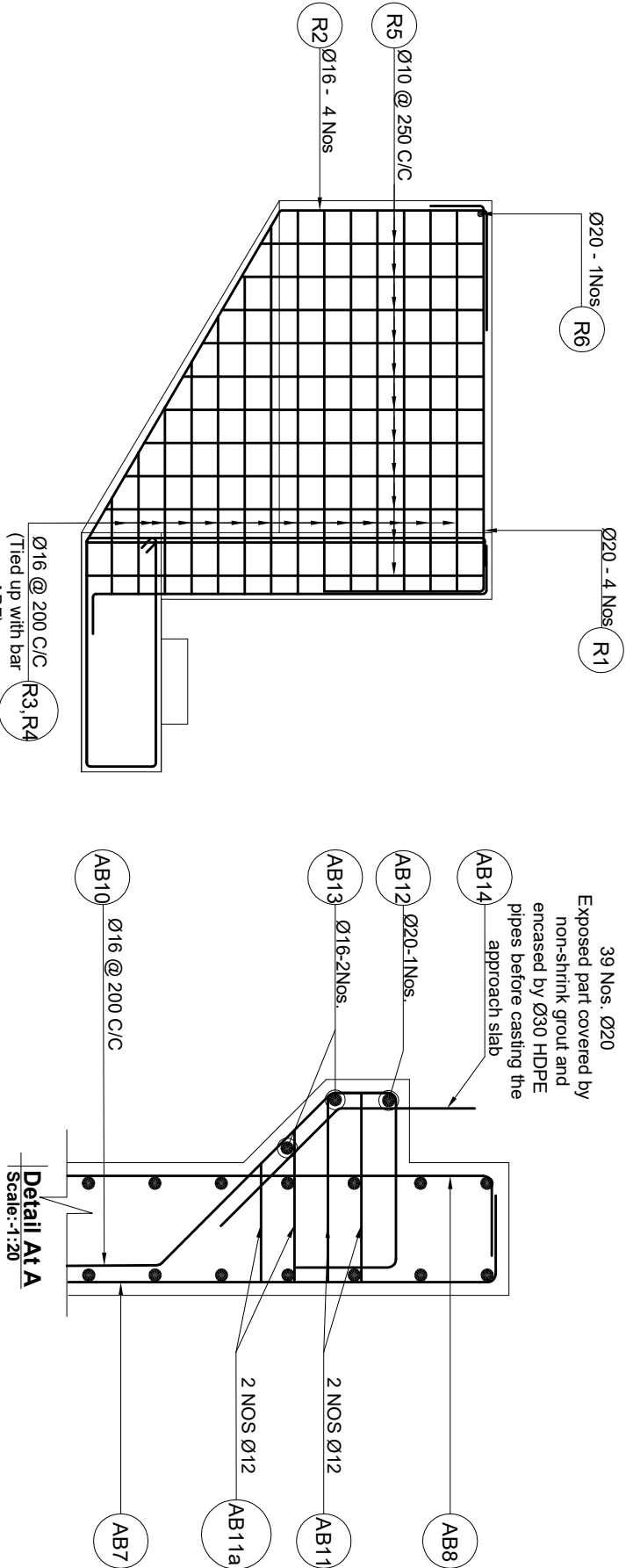
Reinforcement Details Of Abutment
Scale:-1:75

Reinforcement Details Of Abutment
Scale:-1:75



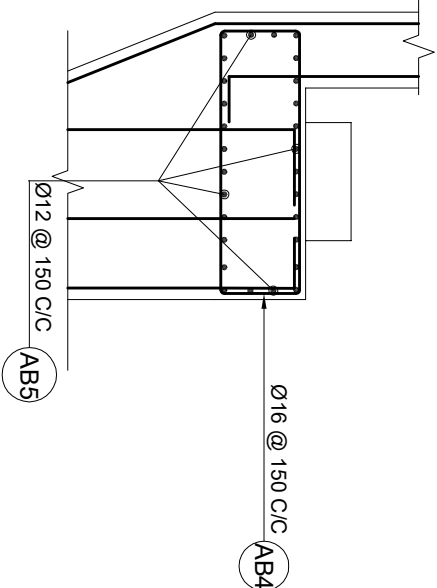
Section at A-A
Scale:-1:75

Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP	CONSULTANT:  Soosung Engineering Co. Ltd, Korea in association with ERM C P (Ltd), Nepal and  JGC-Tech Studio of Engineering	IMPLEMENTING AGENCY:		SHEET TITLE:		SCALE:		NAME		SIGNATURE		REV NO.		DESCRIPTION		DATE:	
		DOR, DCID		Reinforcement Details Of Abutment of		As Shown		Saroj Bhattacharai								November, 2022	
		ROAD NAME:		East West Highway (H01)				P. Upadhyaya								309_Banganga	
		Butwal - Goringhinge Section		Banganga Bridge(Right Side) (46/H001/309_A)				Dr. T.H.Choi								SHEET NO.: 30/61	



Reinforcement Details Of Wingwall

Scale:-1:50



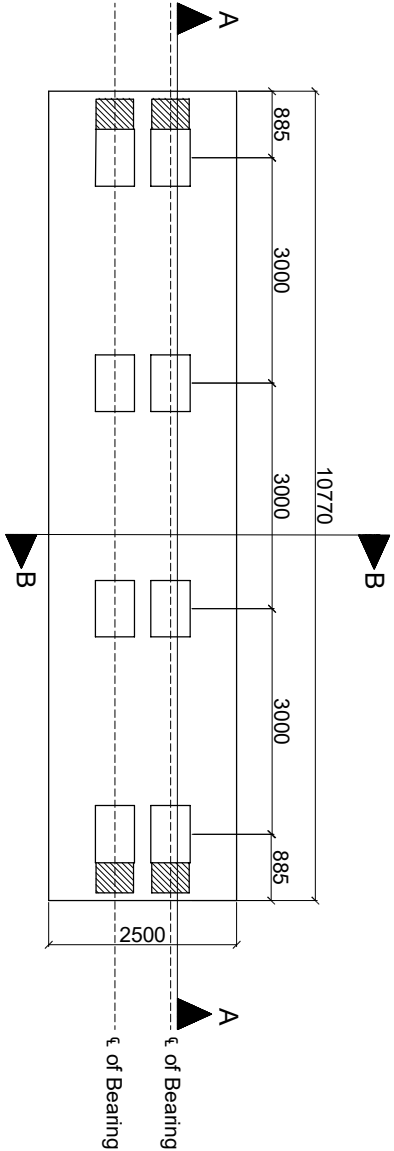
Reinforcement Details Of Abutment

Scale:-1:50

BAR BENDING SCHEDULE FOR WINGWALL							
BAR ID	SHAPE OF BAR IN mm (NOT TO SCALE)	SPACIN G (mm)	Ø OF BARS (mm)	NO. OF BARS	LENGTH (m)	WEIGHT/LENGTH (Kg/m)	TOTAL WEIGHT (kg)
R1			20	8	4.407	2.466	86.947
R2		0	16	8	4.497	1.578	56.782
R3		200	16	14	6.156	1.578	136.028
R4		200	16	16	3.428	1.578	86.569
R5		250	10	22	4.900	0.617	66.463
R6		0	20	2	0.307	2.466	1.514
R7		0	10	0	2.800	0.617	0.000
R8		0	10	0	1.320	0.617	0.000
TOTAL IN 2 WINGWALL IN ONE ABUTMENT							434.303
TOTAL WEIGHT (IN METRIC TON)							0.434

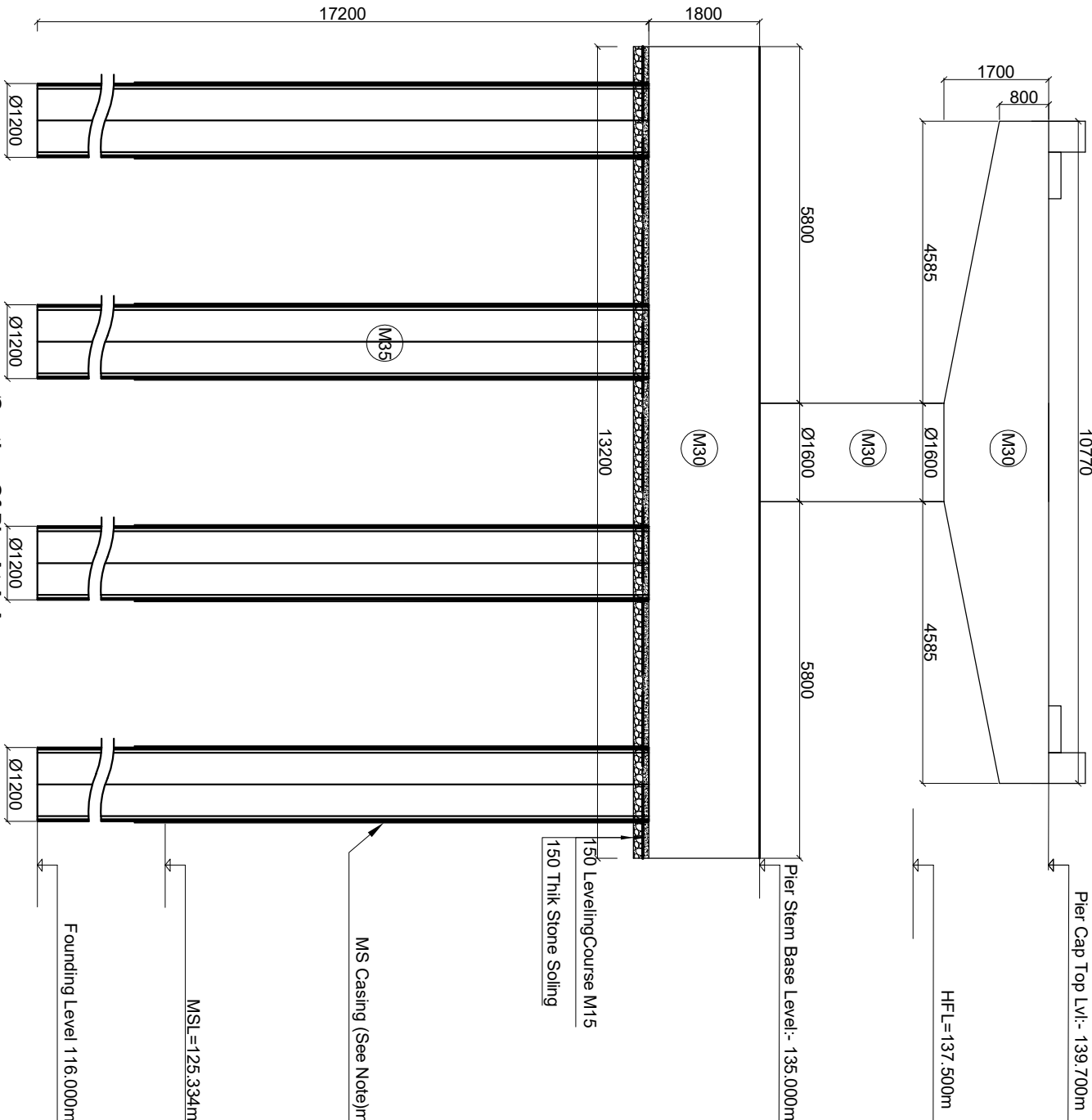
BAR BENDING SCHEDULE OF ABUTMENT							
BAR ID	SHAPE OF BAR IN mm (NOT TO SCALE)	SPACING (mm)	Ø OF BARS (mm)	NO. OF BARS	LENGTH (m)	WEIGHT/LENGTH (kg/m)	TOTAL WEIGHT (kg)
AB1		150 mm c/c Approx	20	79	5.580	2.466	1087.131
AB1a		-	-	-	-	-	-
AB2		150 mm c/c Approx	20	79	5.780	2.466	1126.096
AB2c		At sideface 200mm c/c	16	10	5.280	1.578	83.336
AB3		180 mm c/c Approx	12	32	24.880	0.888	706.844
AB4		150 mm c/c Approx	16	80	4.300	1.578	542.949
AB5		150 mm c/c Approx	12	28	11.600	0.888	288.363
AB6		900 mm C/C horizontal 400 mm C/C vertical upto 1.56m from stem bottom 600 mm C/C vertical at remaining 1.04 m	16	79	1.583	1.578	197.382
AB7		150 mm c/c Approx	16	79	3.390	1.578	422.695
AB8		150 mm c/c Approx	16	79	4.392	1.578	547.633
AB8a		200 mm c/c Approx	10	7	11.600	0.617	50.063
AB9		200mm c/c Approx	10	12	23.716	0.617	175.462
AB10		200 mm c/c Approx	16	55	1.747	1.578	151.655
AB11			12	110	0.900	0.888	87.894
AB11a			12	110	0.650	0.888	63.479
AB12			20	1	11.600	2.466	28.607
AB13			16	2	11.600	1.578	36.617
AB14			20	39	0.900	2.466	86.562
TOTAL WEIGHT ABUTMENT KG							5682.769
TOTAL WEIGHT (IN METRIC TON)							5.683

Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NBP		CONSULTANT: Soosung Engineering Co. Ltd, Korea in association with ERMCo P (Ltd), Nepal and JYR - Tech Studio of Engineering		IMPLEMENTING AGENCY: DOR, DCID ROAD NAME: East West Highway (H01) Butwal - Gorusinghe Section		SHEET TITLE: Reinforcement Details of Wingwall of Bhanganga Bridge(Right Side) (46/H001/309_A)		SCALE: As Shown		NAME Saroj Bhattacharai CHECKED BY: P. Upadhyaya APPROVED BY: Dr. T.H.Choi		SIGNATURE [Signature] [Signature]		REV NO.		DESCRIPTION		DATE: November,2022 DWG.NO.: 309_Bhanganga SHEET NO.: (31/61)	
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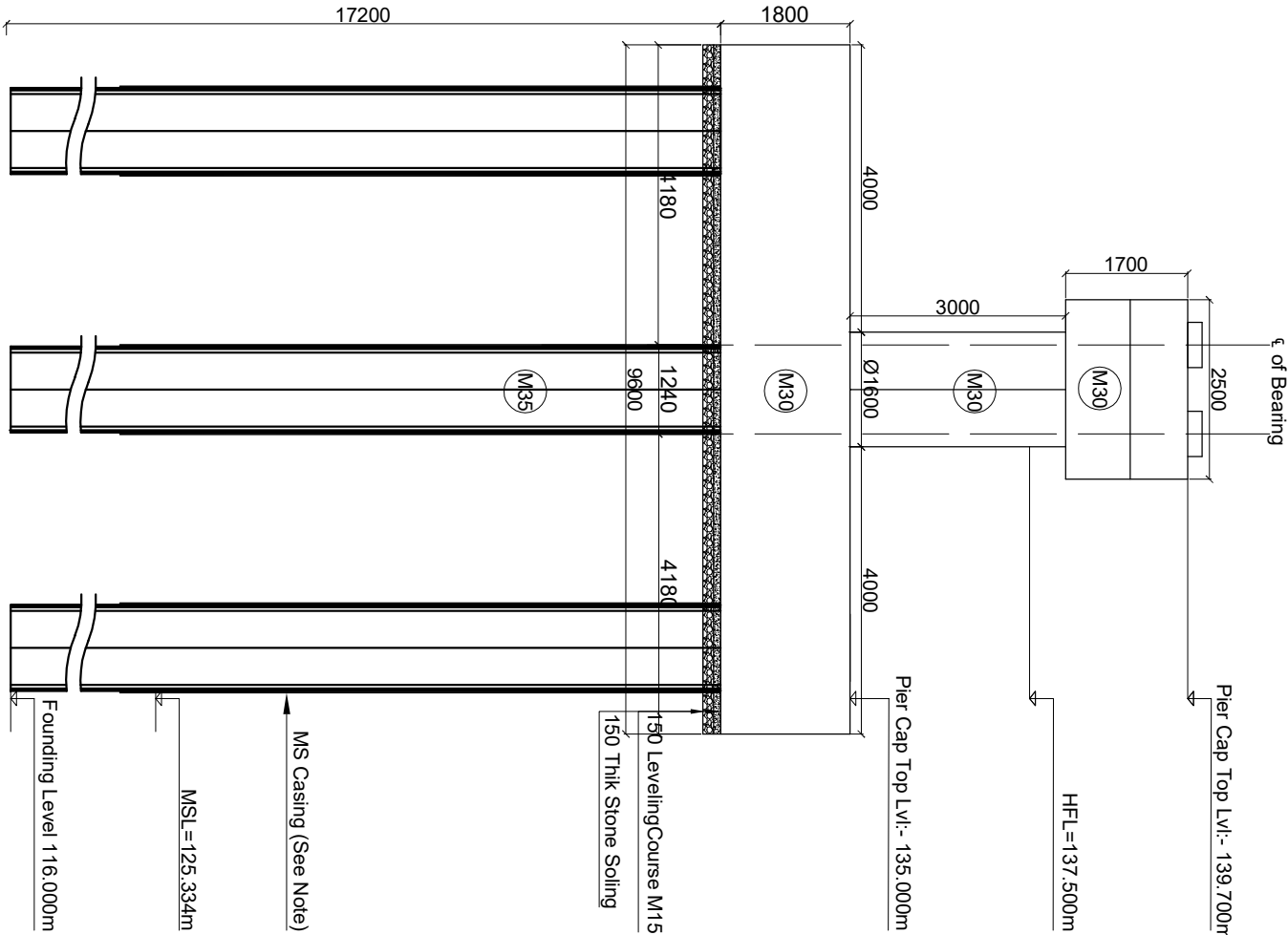
Plan of Pier

Scale:-1:100



Section Of Pier At A-A

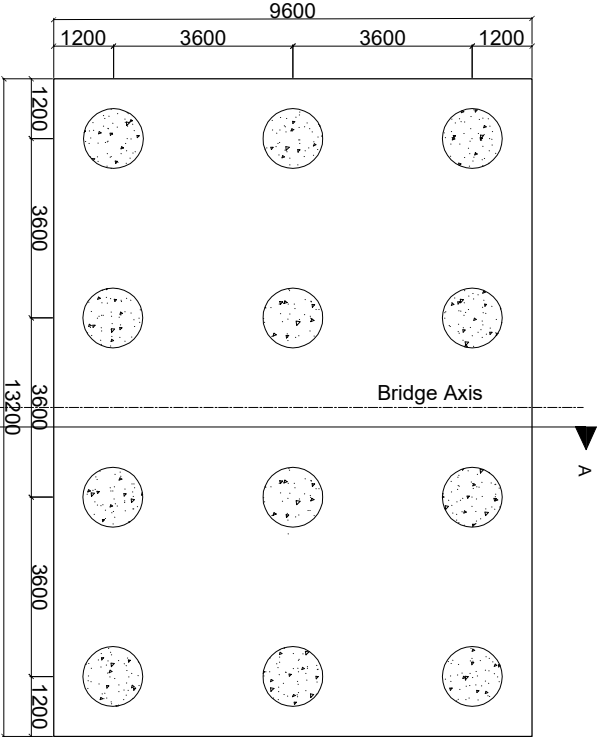
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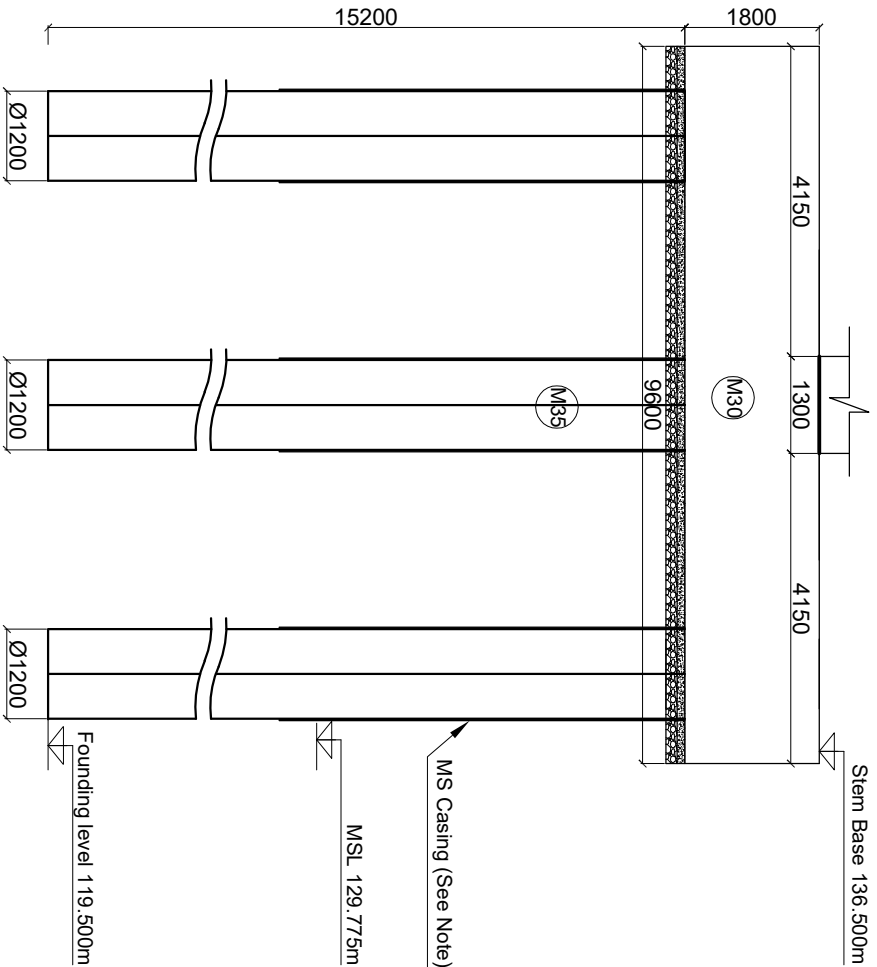
Section Of Pier at A-A

Scale:-1:100

Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP	CONSULTANT:  Soosung Engineering Co. Ltd, Korea in association with  ERMC P (Ltd), Nepal and  JYEE - Tech Studio of Engineering	IMPLEMENTING AGENCY:	SHEET TITLE:	SCALE:		NAME	SIGNATURE	REV NO.	DESCRIPTION	DATE:	
		DOR, DCID	Plan of Pier of Banganga Bridge(Right Side) (46/H001/309_A)	As Shown	DESIGNED BY:	Saroj Bhattarai					November, 2022
					CHECKED BY:	P. Upadhyaya					DWG.NO.: 309_Banganga
					APPROVED BY:	Dr. T.H. Choi					SHEET NO.: 
		Butwal - Goringhthe Section									



Plan Of Abutment Piles
Scale:-1:150

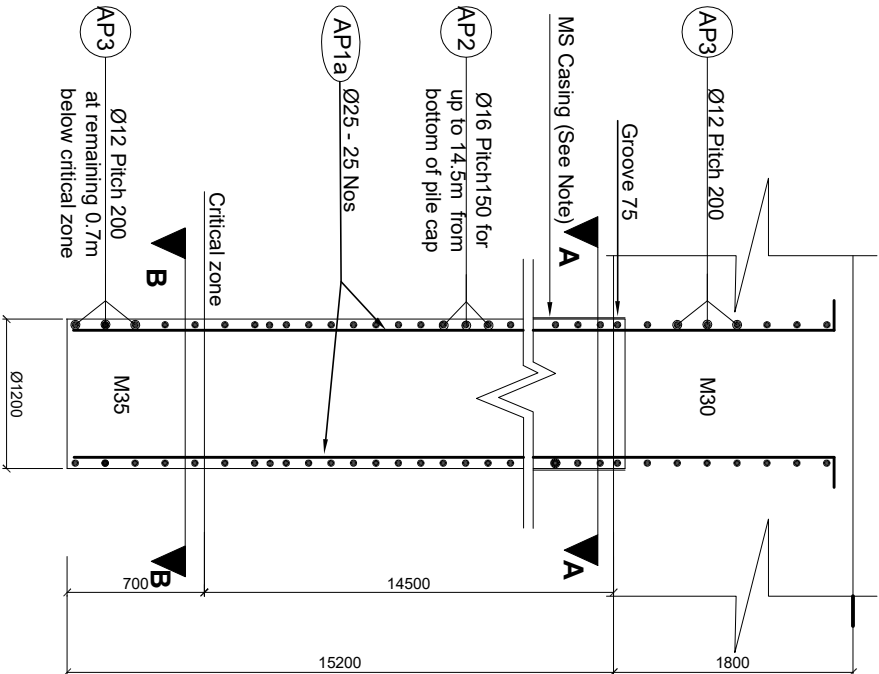


Section of Abutment Pile At (A-A)
Scale:-1:100

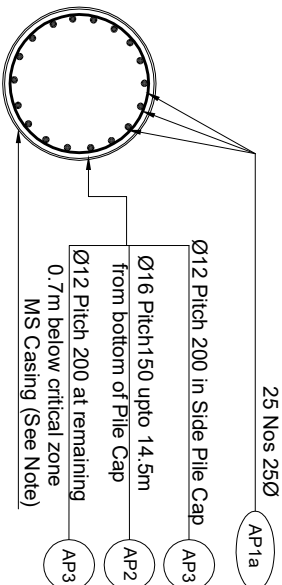
Location	Design Pile Length m	Design Working Load on pile (non - seismic case)kn	Allowable Bearing Capacity on pile (Scour case) kn	Allowable Bearing Capacity of the Pile (Non Scour case)kn
Abutment	15.2	1797	2354	2603
Pier	17.2	1220	1811	2250

BAR BENDING SCHEDULE OF ABUTMENT PILECAP						
BAR ID	SHAPE OF BAR IN mm (NOT TO SCALE)	SPACING (mm)	Ø OF BARS (mm)	NO. OF BARS	LENGTH (m)	WEIGHT/LENGTH (kg/m)
APC1	1080 9425	200	25	67	11.585	3.853
APC2	1080 9425	200	25	67	11.585	3.853
APC3	1080 13030	200	20	49	15.190	2.466
APC4	1080 13030	200	20	49	15.190	2.466
APC5	1570 1570 Curve length 251 Curve radius 40 Hook length 80	along axis @300 across axis	16	360	2.232	1.578
APC6	13050 9450	@300 approx	16	5	45.000	1.578
TOTAL IN PILE CAP OF ONE ABUTMENT						11276.454
TOTAL WEIGHT IN METRIC TON						11.276

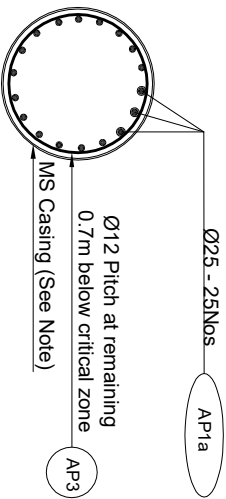
BAR BENDING SCHEDULE FOR ABUTMENT PILES						
BAR ID	SHAPE OF BAR IN mm (NOT TO SCALE)	SPACIN G (mm)	Ø OF BARS (mm)	NO. OF BARS	LENGTH (m)	WEIGHT/LENGTH (Kg/m)
AP1a	200 16795 Full Length Bars	0	25	25	17.000	3.853
AP1b	0 0 Single Bars No curtailment	0	0	0	0.000	0.000
AP2	150 16 Dia- 1034 Pitch-150 14.5m From Bottom of pile cap	150	16	1	317.300	1.578
AP3	200 12 Dia=1034 Pitch=200 inside pilecap, 200 below critical zone	200	12	1	39.700	0.888
TOTAL IN ONE PILE						2173.735
TOTAL (IN METRIC TON)						2.174
TOTAL IN TWELVE PILES OF ONE ABUTMENT (IN METRIC TON)						26.085



Reinforcement Details Of Pile
Scale:-1:50



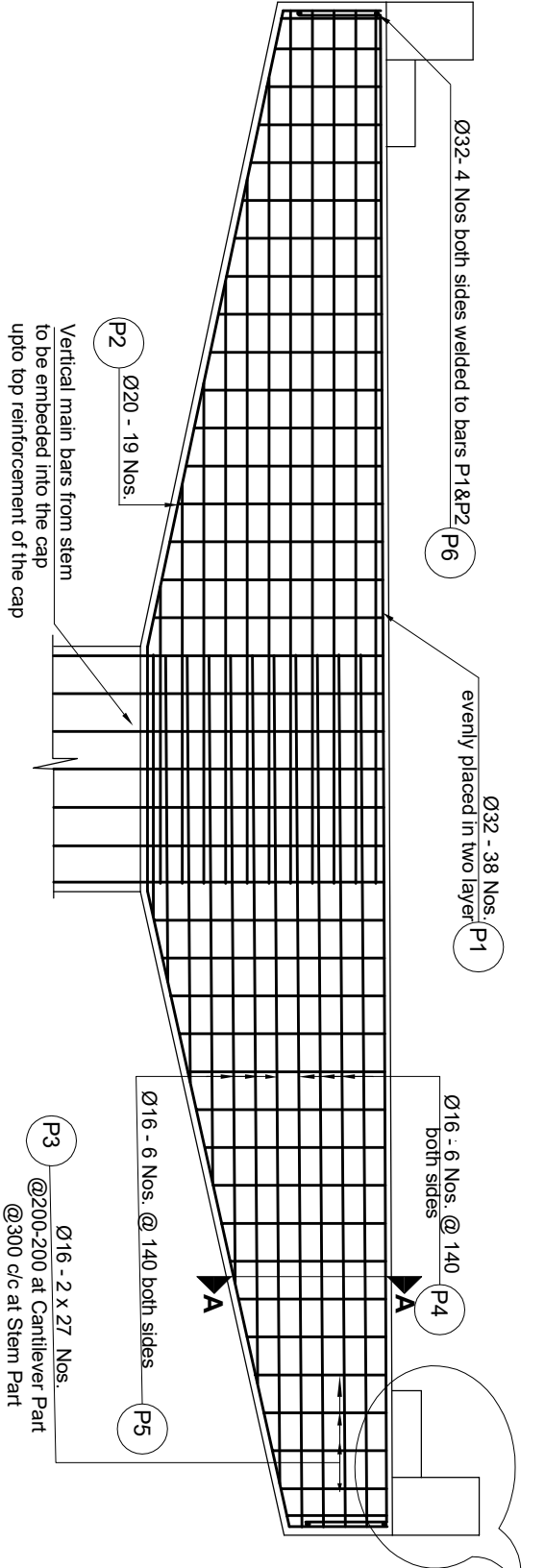
Section At A-A
Scale:-1:50



Section At B-B
Scale:-1:50

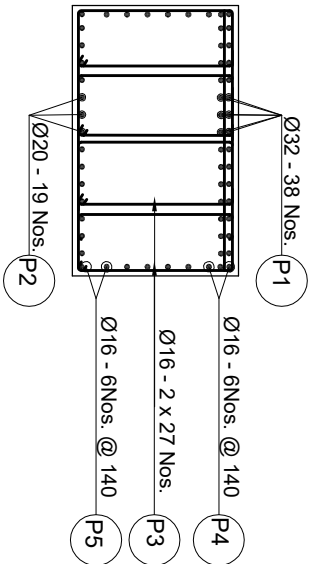
For Construction Methodology and Sequence Please See General Notes.

Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP		CONSULTANT: Soosung Engineering Co. Ltd, Korea in association with ERMCo P (Ltd), Nepal and JSC-Tech Studio of Engineering		IMPLEMENTING AGENCY: DOR, DCID ROAD NAME: East West Highway (H01) Butwal - Gorusinghe Section		SHEET TITLE: Reinforcement Details of Abutment Piles of Banganga Bridge(Right Side) (46/H001/309_A)		SCALE:		NAME		SIGNATURE		REV NO.		DESCRIPTION		DATE:	
										Saroj Bhattacharai								November, 2022	
										P. Upadhyaya								DWG. NO.:	
																		309_Banganga	
										Dr. T.H.Choi								SHEET NO.:	
																		(336)	

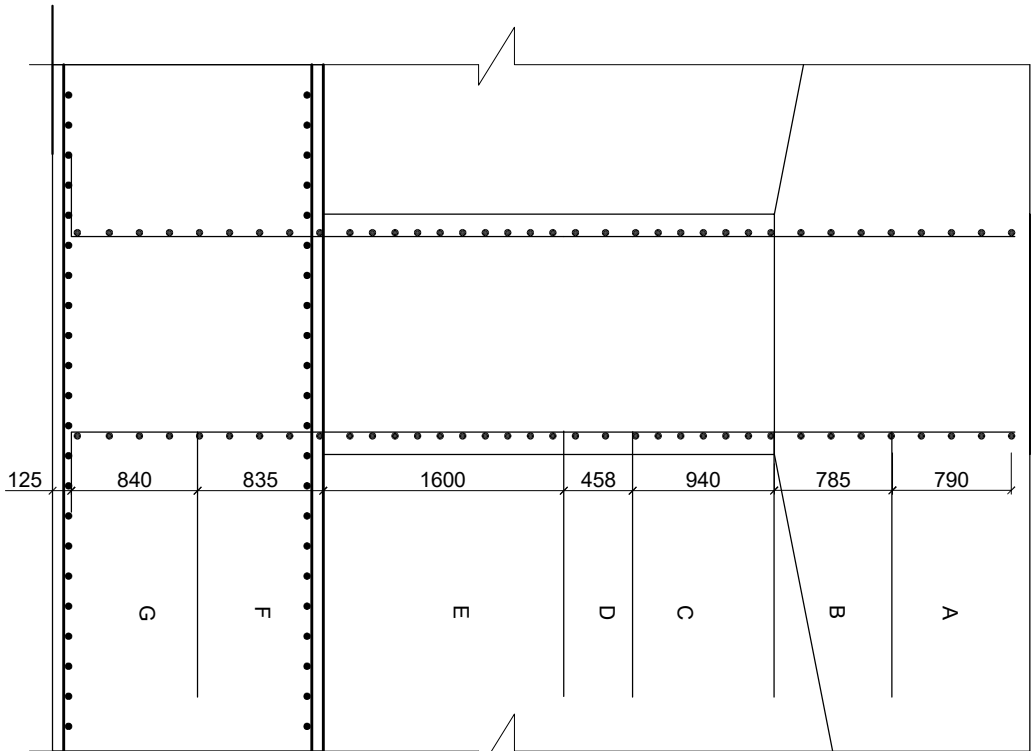


See detail of
Stopper & Pedestal

Reinforcement Details of Pier Cap
Scale:-1:50

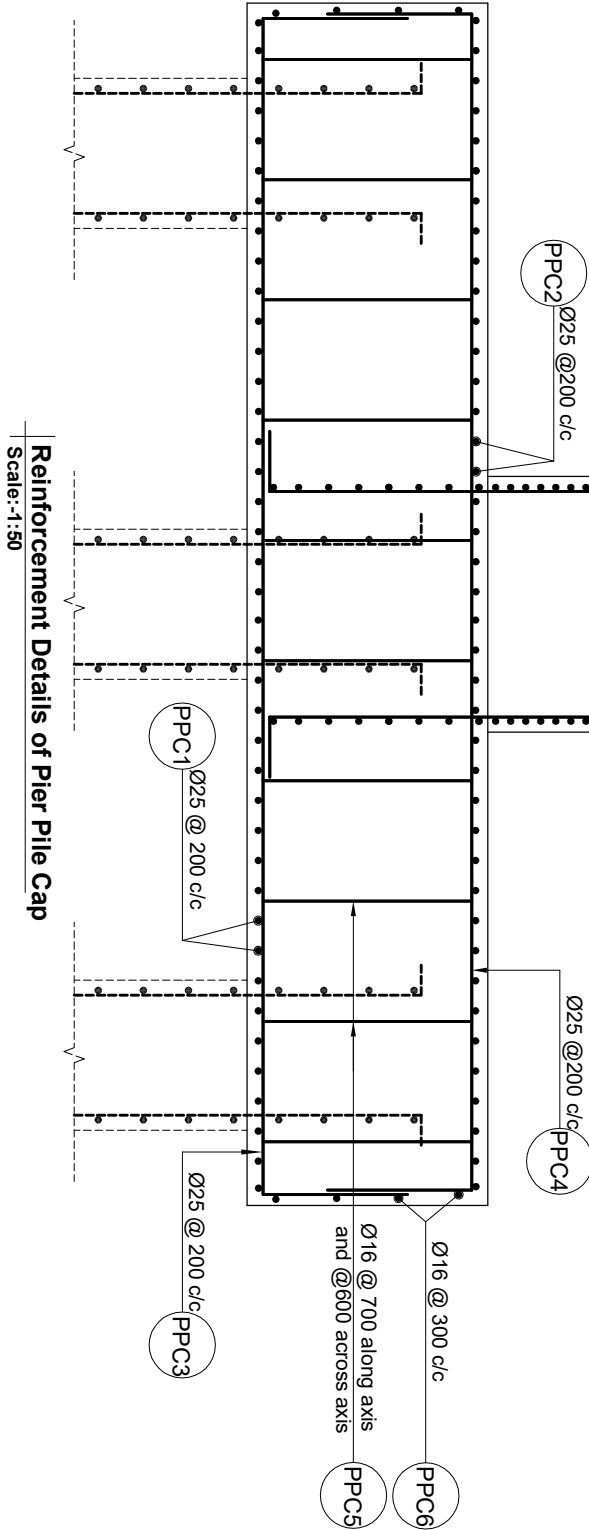


Section at A-A
Scale:-1:50

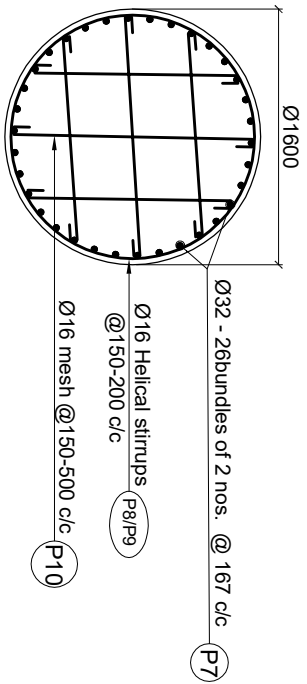


Pitch of Spiral / Transverse Reinforcement of Pier
Scale:-1:50

Pitch /Spacing of Transverse Reinforcement			
ZONE	BAR	PITCH	DIA
A	P9	200	16
	P9	200	16
B	P8	150	16
	P10	150	16
C	P9	200	16
	P10	500	16
E	P8	150	16
	P10	150	16
F	P9	200	16
	P9	200	16

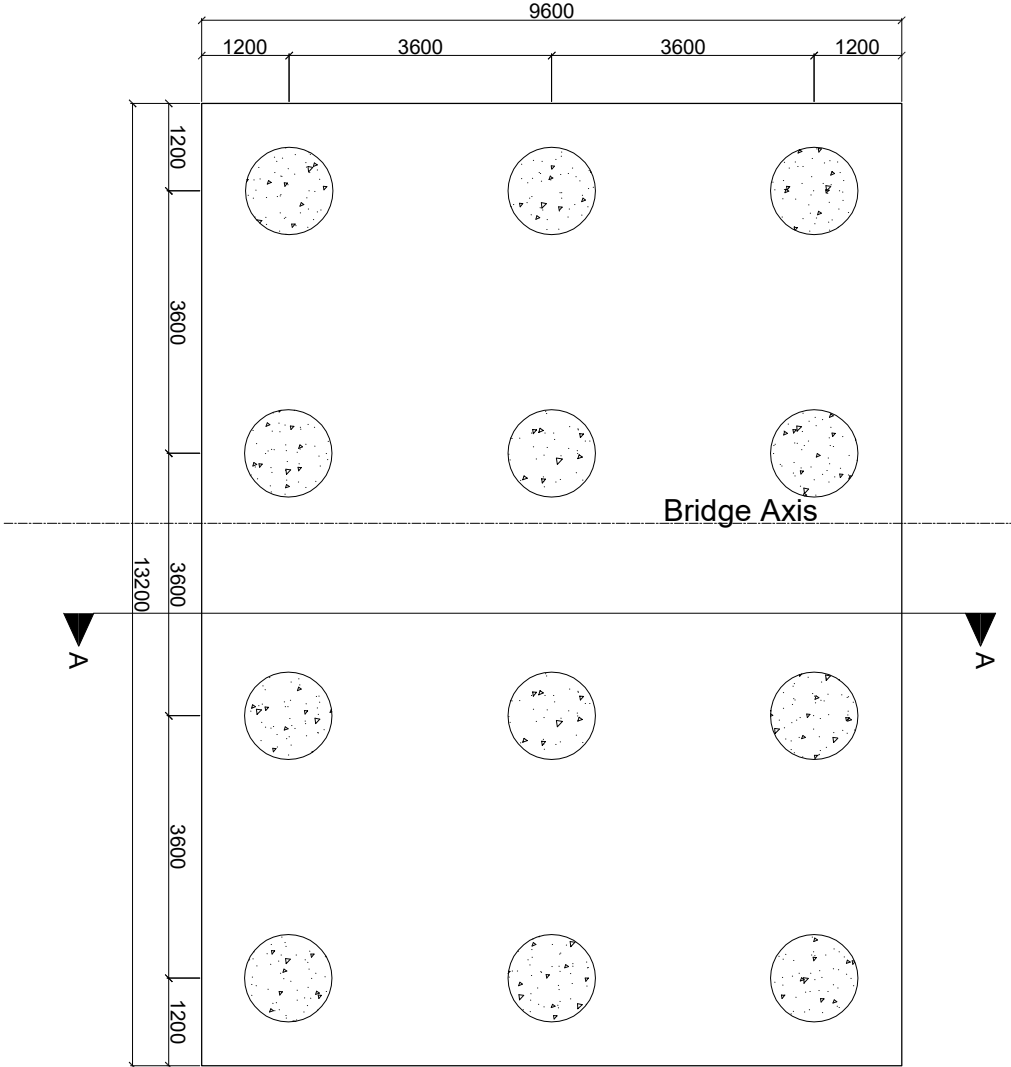


Reinforcement Details of Pier Pile Cap
Scale:-1:50

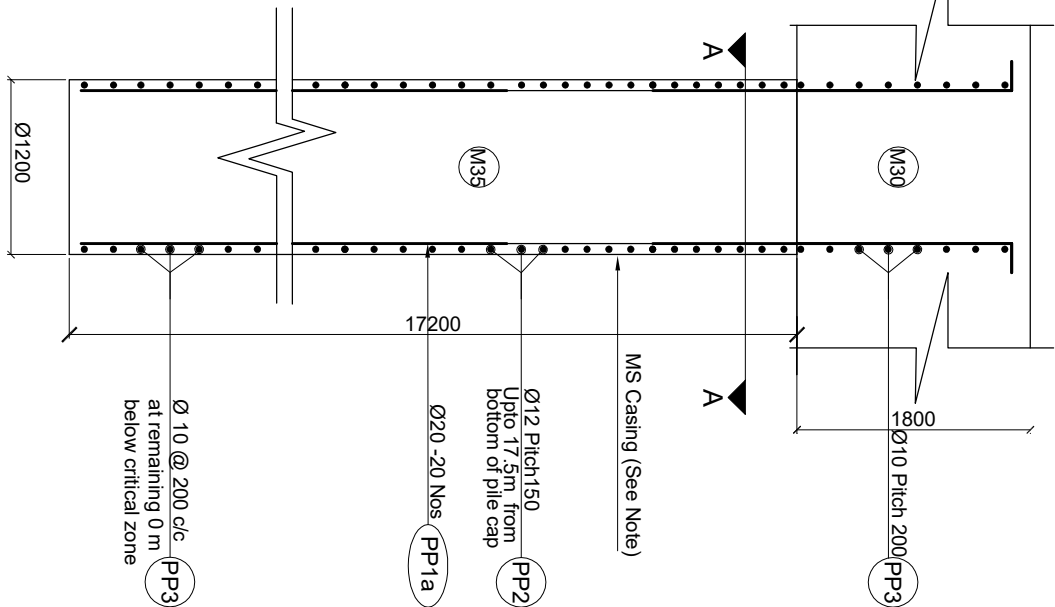


Cross Section of Pier Stem
Scale:-1:50

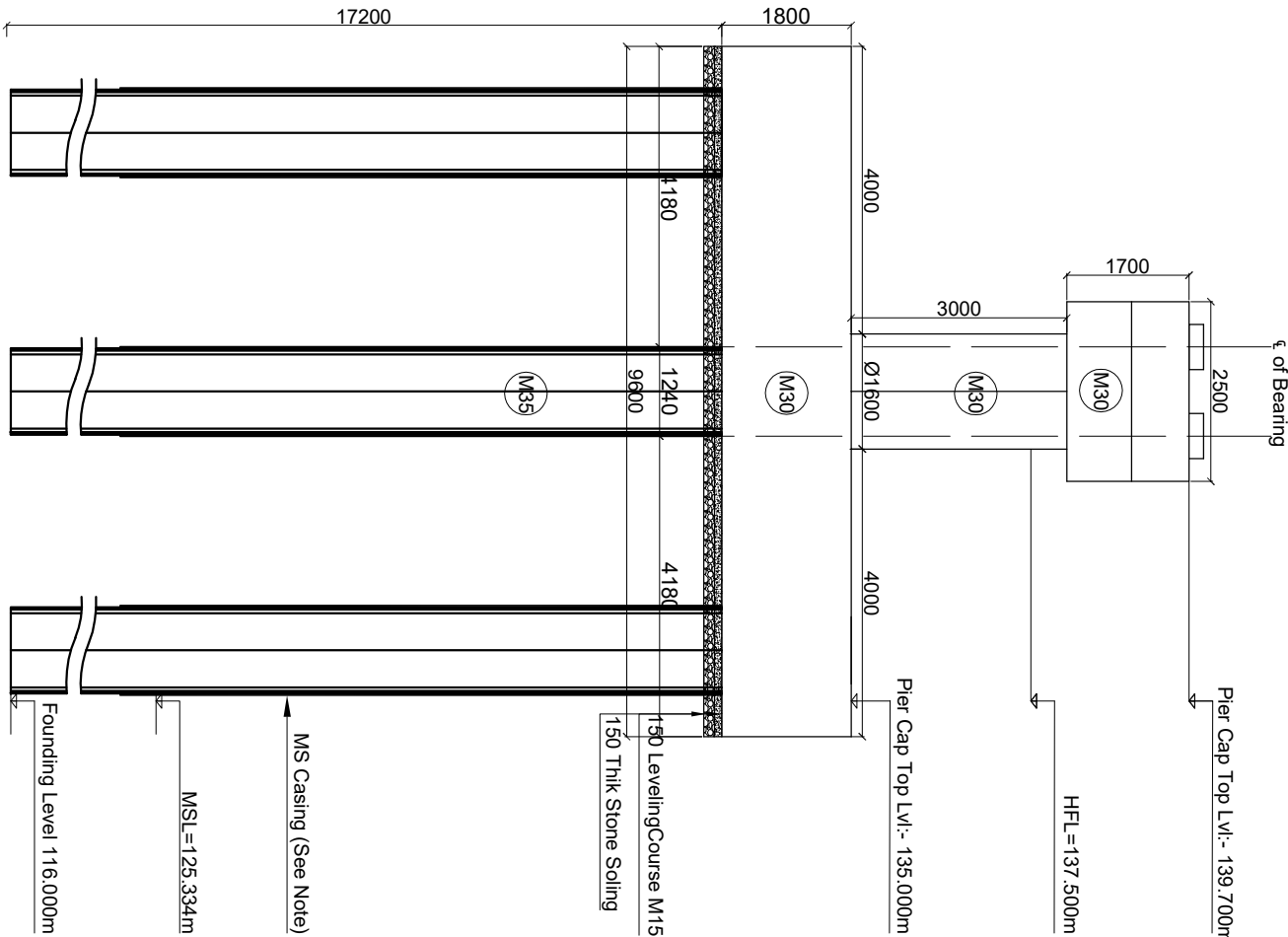
Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP	CONSULTANT: Soosung Engineering Co. Ltd, Korea in association with ERMCo P (Ltd), Nepal and JTK-Tech Studio of Engineering	IMPLEMENTING AGENCY:		SHEET TITLE:		SCALE:		NAME		SIGNATURE		REV NO.		DESCRIPTION		DATE:	
		DOR, DCID		Reinforcement Details of pier		As Shown		Saroj Bhattacharai		[Signature]						November, 2022	
		ROAD NAME:		East West Highway (H01)				P. Upadhyaya		[Signature]						309, Banganga	
		Butwal - Gorusinghe Section		Banganga Bridge(Right Side) (46/H001/309_A)				Dr. T.H. Choi		[Signature]						SHEET NO.: 34/61	



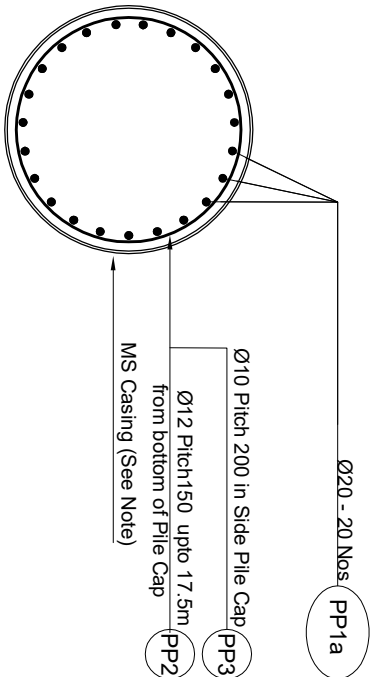
Plan of Pier Piles
Scale:-1:100



Reinforcement Details of Pile
Scale:-1:50



Section Of Pier at A-A
Scale:-1:100



Section at A-A
Scale:-1:30

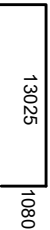
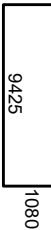
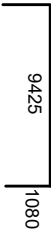
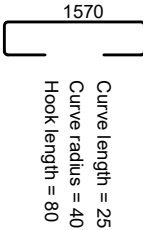
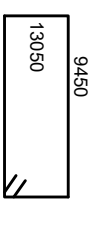
Note On MS permanent casing on piles: In case piling works are done without temporary casing, the piles shall be lined with 6mm thick MS steel permanent casing up to 1.5 m or 0.5m below MSL whichever is larger (Subject to instruction and approval by the Engineer)

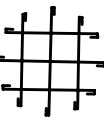
Location	Design Pile Length m	Design Working load on pile (non - seismic case) kn	Allowable Bearing Capacity on pile (Scour case) kn	Allowable Bearing Capacity of the Pile (Non Scour case) kn
Abutment	15.2	1797	2354	2603
Pier	17.2	1220	1811	2250

For Construction Methodology and Sequence Please See General Notes.

Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP	CONSULTANT:		IMPLEMENTING AGENCY:		SHEET TITLE:		SCALE:		NAME		SIGNATURE	REV NO.	DESCRIPTION	DATE:
	Soosung Engineering Co. Ltd, Korea in association with ERMCO P (Ltd), Nepal and Jyoti-Tech Studio of Engineering		DOR, DCID		Reinforcement of piles of Banganga Bridge(Right Side) (46/H001/309_A)		As Shown		DESIGNED BY:		Saroj Bhattarai			November 2022
			ROAD NAME:						CHECKED BY:		P. Upadhyaya			
			East West Highway (H01)						APPROVED BY:		Dr. T.H.Choi			
	Butwal - Gorusinghe Section													DWG.NO.: 309_Banganga SHEET NO.: 35/61

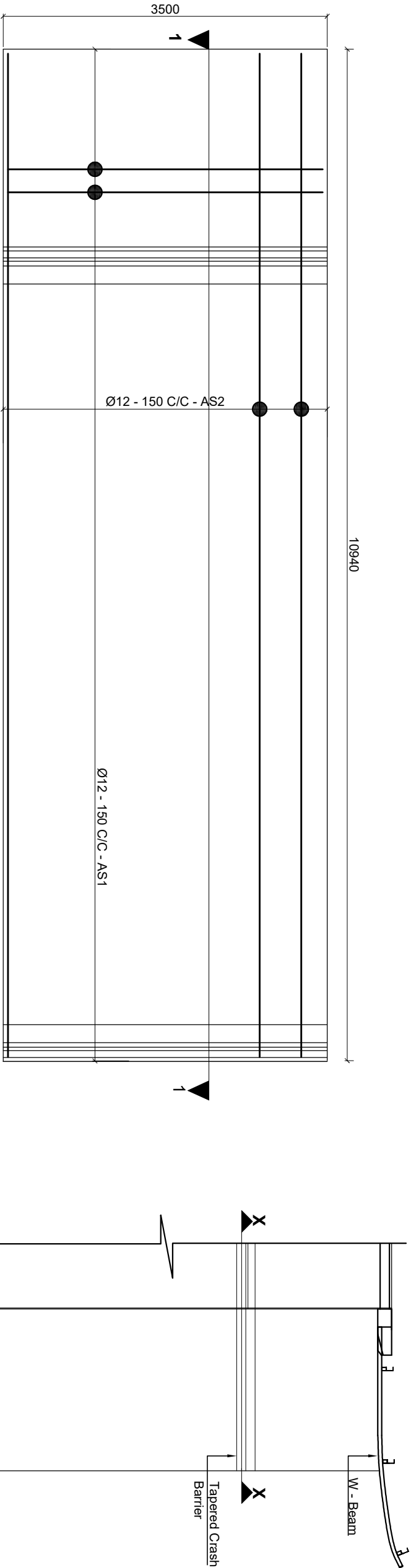
BAR BENDING SCHEDULE FOR PIER CAP							
BAR ID	SHAPE OF BAR IN mm (NOT TO SCALE)	SPACING (mm)	Ø OF BARS (mm)	NO. OF BARS	LENGTH (m)	WEIGHT/LENGTH (kg/m)	TOTAL WEIGHT (kg)
P1		131 Approx In 2layers	32	19	11.788	6.313	1414.016
			32	19	11.756	6.313	1410.177
P2		131	20	19	12.250	2.466	573.998
P3	 6 legs H varies 650 1650	200	16	54	10.020	1.578	854.008
P4	 2334	140	16	12	15.504	1.578	293.647
P5	 Average 2334 Average 3893	140	16	12	10.920	1.578	206.826
P6			32	4	2.350	6.313	59.346
TOTAL IN ONE PIER CAP							4812.017
TOTAL WEIGHT (IN METRIC TON)							4.812

BAR BENDING SCHEDULE FOR PIER PILE CAP							
BAR ID	SHAPE OF BAR IN mm (NOT TO SCALE)	SPACIN G (mm)	Ø OF BARS (mm)	NO. OF BARS	LENGTH (m)	WEIGHT/LENGTH (kg/m)	TOTAL WEIGHT (kg)
PPC1		200	25	49	15.185	3.853	2867.157
PPC2		200	25	49	15.185	3.853	2867.157
PPC3		200	25	67	11.585	3.853	2990.966
PPC4		200	25	67	11.585	3.853	2990.966
PPC5		500	16	345	2.232	1.578	1215.385
PPC6		300	16	5	45.000	1.578	355.126
TOTAL IN PILE CAP OF ONE ABUTMENT							13286.756
TOTAL WEIGHT (IN METRIC TON)							13.287

BAR BENDING SCHEDULE FOR PIER STEM							
BAR ID	SHAPE OF BAR IN mm (NOT TO SCALE)	SPACIN G (mm)	Ø OF BARS (mm)	NO. OF BARS	LENGTH (m)	WEIGHT/LENGTH (kg/m)	TOTAL WEIGHT (kg)
P7	 167 c/c Approx 6155 400	167	32	52	6.555	6.313	2151.972
P8	 Dia-1434, Pitch-150 At Critical zone	150	16	1	77.300	1.578	122.006
P9	 Dia-1434, Pitch-200 At Non-Critical zone	200	16	1	84.980	1.578	134.127
P10	 150 C/C at critical zone 500 C/C at non-critical zone	150-500	16	19	8.710	1.578	261.199
TOTAL IN ONE PIER STEM						2689.304	
TOTAL (IN METRIC TON)						2.669	

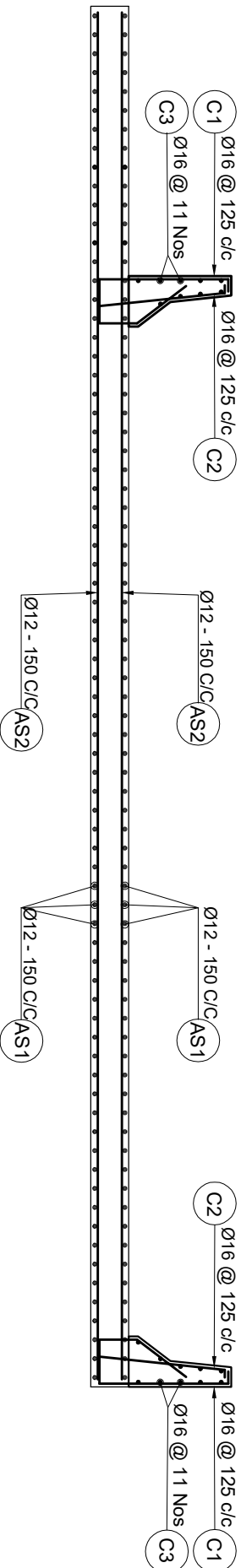
BAR BENDING SCHEDULE FOR PIER PILES							
BAR ID	SHAPE OF BAR IN mm (NOT TO SCALE)	SPACIN G (mm)	Ø OF BARS (mm)	NO. OF BARS	LENGTH (m)	WEIGHT/LENGTH (kg/m)	TOTAL WEIGHT (kg)
PP1a	 Full length bars 200 18790			20	18.990	2.466	936.646
PP1b	 Curtailed bars 200 0			0	0.000	0.000	0.000
PP2	 Dia-1038, Pitch-150 17.5m from bottom of pile cap	150	12	1	384.400	0.888	341.277
PP3	 Dia-1038, Pitch-200 inside Pile Cap 200-below critical zone	200	10	1	23.250	0.617	14.335
TOTAL IN ONE PILE							1292.257
TOTAL (IN METRIC TON)							1.292
TOTAL FOR 12 PILES IN ONE PIER (IN METRIC TON)							15.507

Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No. 3722-NEP	CONSULTANT:  Soosung Engineering Co. Ltd, Korea in association with  ERMC P (Ltd), Nepal and  JWC - Tech Studio of Engineering	IMPLEMENTING AGENCY: DOR, DCID ROAD NAME: East West Highway (H01)	SHEET TITLE: Bar Bending of Banganga Bridge(Right Side) (46/H001/309_A)	SCALE: As Shown	DESIGNED BY:	NAME	SIGNATURE	REV NO.	DESCRIPTION	DATE: November, 2022
					CHECKED BY:	P. Upadhyaya				DWG. NO.: 309_Banganga
					APPROVED BY:	Dr. T.H. Choi				SHEET NO.: 3661



Plan of Reinforcement Details of Approach Slab

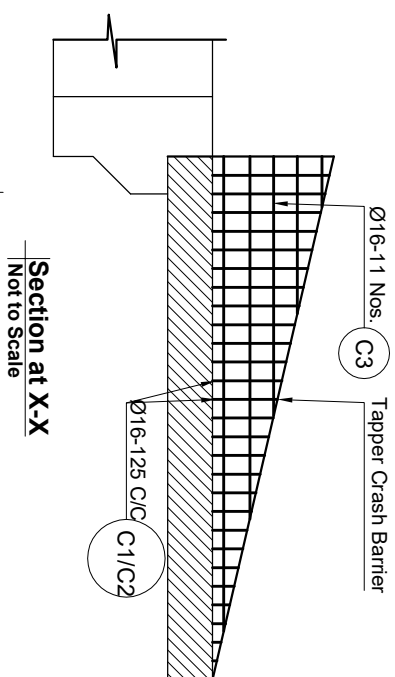
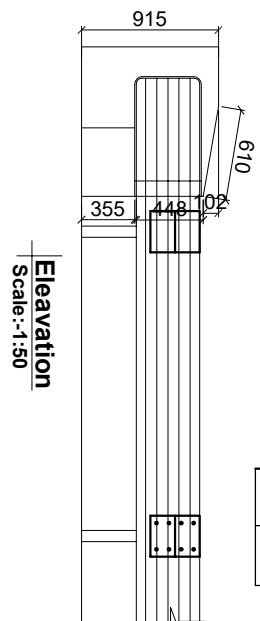
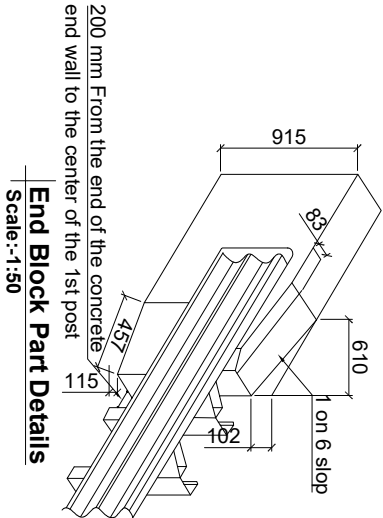
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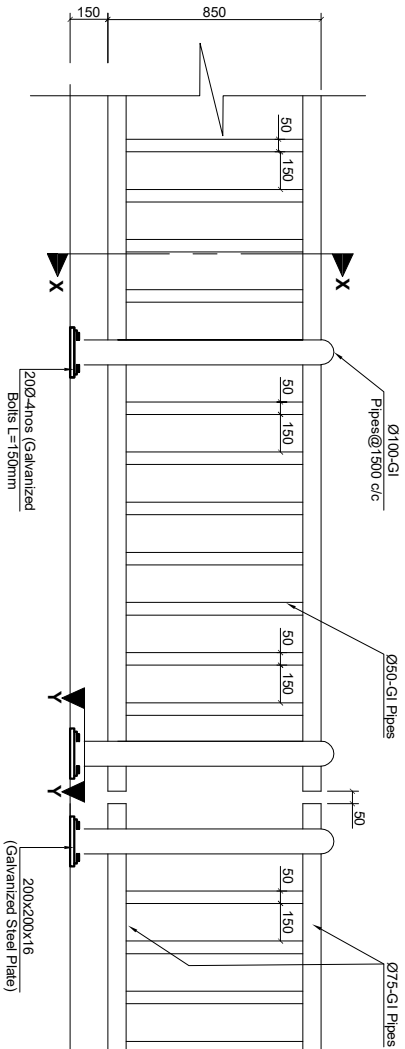
Plan of Approach Slab

Not to Scale

BAR BENDING SCHEDULE OF APPROACH SLAB					
BAR ID	SHAPE OF BAR IN mm (NOT TO SCALE)	Ø OF BARS (mm)	NO. OF BARS	LENGTH (m)	WEIGHT/LENGTH TOTAL WEIGHT (kg/m) (kg)
AS1	3400	12	148	3.400	0.888 446.749
AS2	10850	12	48	10.850	0.888 462.375
TOTAL IN ONE APPROACH SLAB					909.124
TOTAL WEIGHT IN METRIC TON					0.909

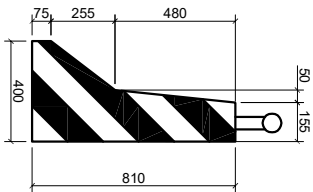


Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP	CONSULTANT:		IMPLEMENTING AGENCY:		SHEET TITLE:		SCALE:		NAME		SIGNATURE	REV NO.	DESCRIPTION	DATE: November,2022 DWG.NO.: 309_Banganga SHEET NO.: (37/6)
	Soosung Engineering Co. Ltd, Korea in association with		DOR, DCID		Reinforcement Details of Approach Slab of		As Shown		Saroj Bhatarai					
	ERM C P (Ltd), Nepal and		ROAD NAME:		Banganga Bridge(Left Side)				P. Upadhyaya					
	Jyoti-Tech Studio of Engineering		East West Highway (H01)		(46/H001/309_A)				Dr. T.H.Chol					
			Butwal - Gorusinghe Section											



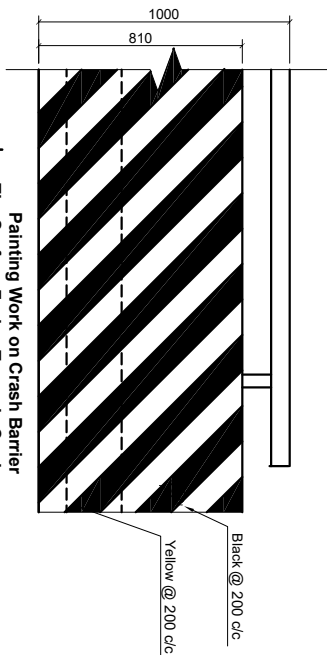
Railing Post Details

Scale:-1:20



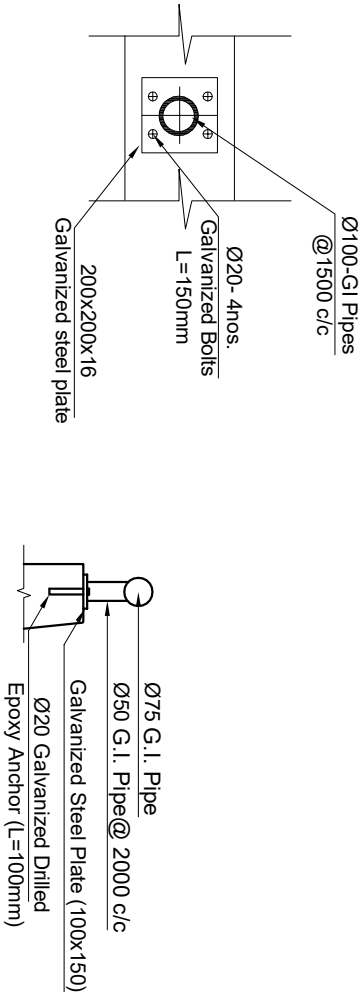
Painting Work on Crash Barrier

Scale:-1:20



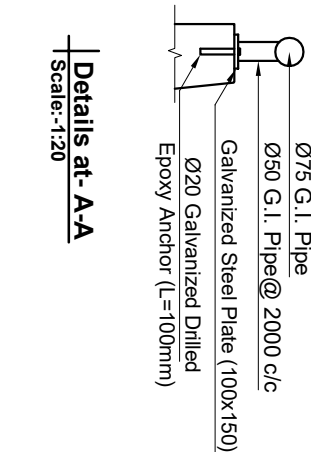
Painting Work on Crash Barrier
on The Surface Facing Towards Carriageway

Scale:-1:20



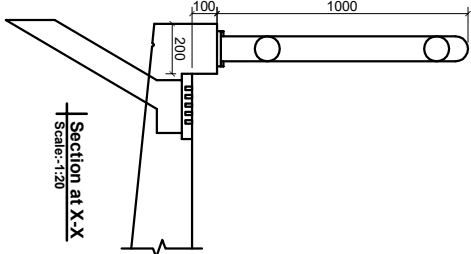
Section at Y-Y

Scale:-1:20



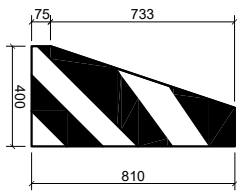
Details at- A-A

Scale:-1:20



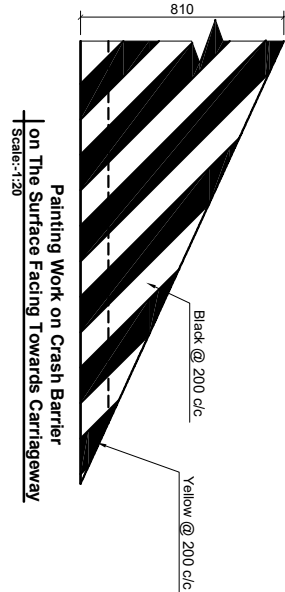
Section at X-X

Scale:-1:20



Painting Work on Tapper Crash Barrier

Scale:-1:20

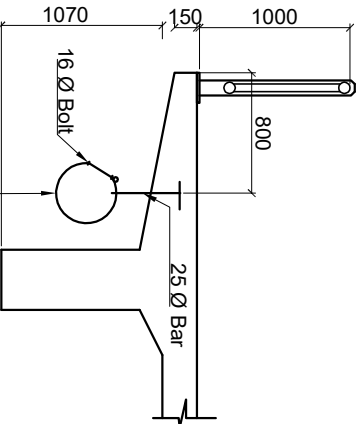


Painting Work on Crash Barrier
on The Surface Facing Towards Carriageway

Scale:-1:20

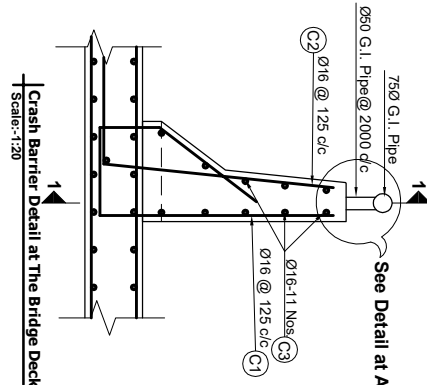
NOTES:
The crash barrier shall be sloped at both ends of the bridge as shown and the reinforcement shall be adjusted according to the slope.

BAR BENDING SCHEDULE OF CRASH BARRIER (For each 1m)					
BAR ID	SHAPE OF BAR IN mm (NOT TO SCALE)	SPACING (mm)	Ø OF BARS (mm)	NO. OF BARS	LENGTH (m)
C1		150 Approximate	16	8	2.030
C2		150 Approximate	16	8	1.415
C3		16	11	0.960	1.578
TOTAL FOR 1 M					60.166
TOTAL FOR 1.0M (IN METRIC TON)					0.060



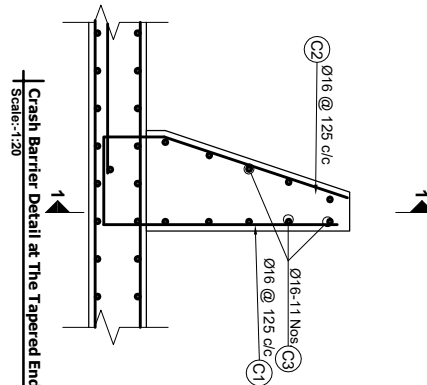
Utility hanger Detail

Scale:-1:50



Crash Barrier Detail at The Bridge Deck

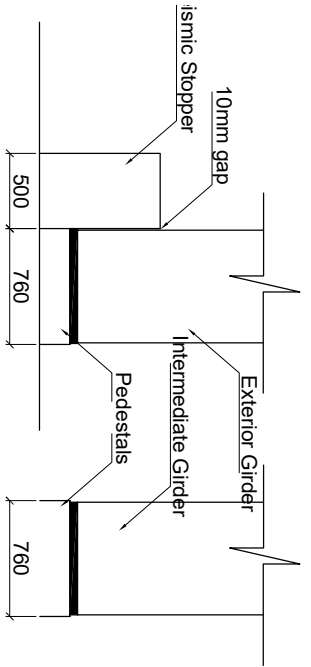
Scale:-1:20



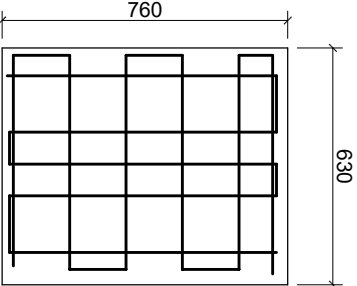
Crash Barrier Detail at The Tapered End

Scale:-1:20

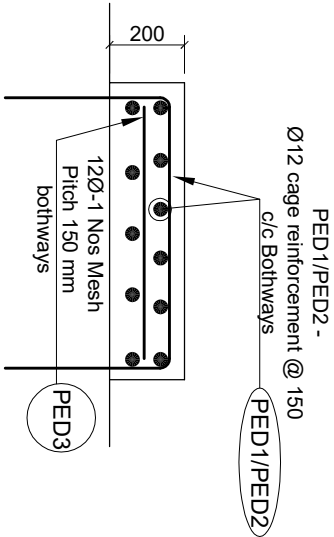
Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP	CONSULTANT: Soosung Engineering Co. Ltd, Korea in association with ERM P (Ltd), Nepal and Jyoti - Tech Studio of Engineering	IMPLEMENTING AGENCY:		SHEET TITLE:		SCALE:		NAME		SIGNATURE		REV NO.		DESCRIPTION		DATE:	
		DOR, DCID		Miscellaneous Details-1 of Banganga Bridge (46/H001/309_A)		As Shown		Saroj Bhattarai								November 2022	
		ROAD NAME:						P. Upadhyaya								309_Banganga	
		Butwal - Gorusinghe Section						Dr. T.H. Choi								SHEET NO.: 38/61	



Abutment Cap With Stopper
Scale:-1:50

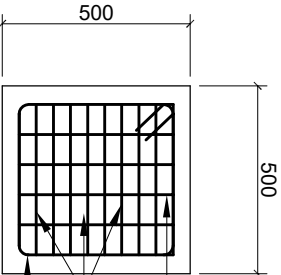
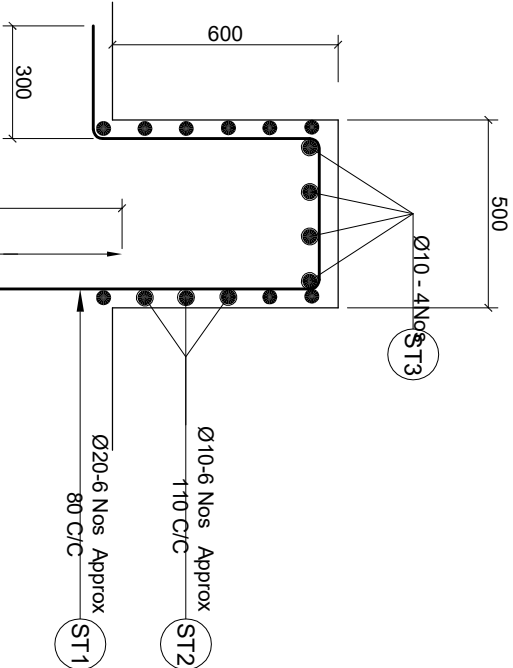


Pedestal Plan
Scale:-1:20

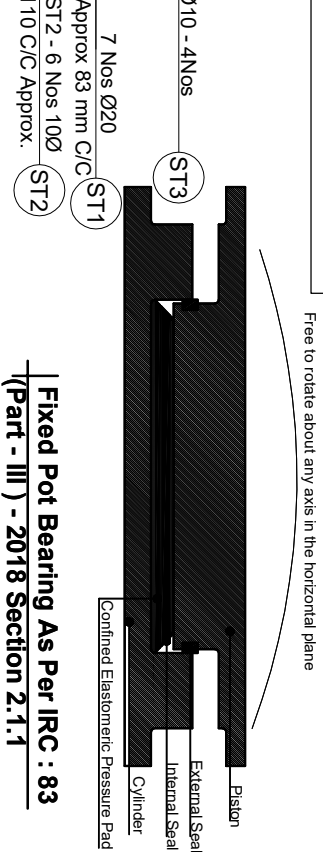


Pedestal Section
Scale:-1:20

Note
On Pedestal Thickness The thickness of the pedestal can be suitably adjusted as per engineer's instruction to retain the height of the ballast wall



Stoppers Plan
Scale:-1:20



Fixed Pot Bearing As Per IRC : 83
(Part - III) - 2018 Section 2.1.1

- Notes: Proposed Type of Bearing:- POT-PTFE bearings
- 1) The POT-Fixed bearings are fixed in position and free to rotate in all directions
 - 2) The POT-PTFE Free bearings are free to rotate in all direction, Free to slide along the the bridge axis and Fixed in position in transverse direction
 - 3) The coefficient of friction, μ for PTFE free bearings is taken as 0.05

ULegends:
EQ = Earthquake condition
V = Vertical load
HL = Horizontal force along the bridge axis
HT = Horizontal force transverse to bridge axis
 θ = Rotation about transverse axis
 Δ = Maximum longitudinal movement allowed

Design Data for Bearings (POT Bearing)

Load Condition	Items	Load / Displacement/ Moment	
		POT Fixed Bearing	POT_PTFE Free Bearing
Under DL only	V, kN	No EQ EQ	787 889
	HL, kN	No EQ EQ	41 41
	HT, kN	No EQ EQ	472 47
	θ , rad	No EQ EQ	0 213
	Δ , mm	No EQ EQ	0.0000 0.0000
	Δ , mm	No EQ EQ	1431 1624
Under Maximum Live Load	V, kN	No EQ EQ	1431 1624
	HL, kN	No EQ EQ	170 72
	HT, kN	No EQ EQ	672 81
	θ , rad	No EQ EQ	0 358
	Δ , mm	No EQ EQ	0.0003 0.0003
	Δ , mm	No EQ EQ	1431 1624

The Contractor Shall Provide and Supply POT - PTFE Bearings According to Provided load and Deformation.

BAR BENDING SCHEDULE OF PEDESTAL

BAR ID	SHAPE OF BAR IN mm (NOT TO SCALE)	SPACIN G (mm)	Ø OF BARS (mm)	NO. OF BARS	LENGTH (m)	WEIGHT/LENGTH (Kg/m)	TOTAL WEIGHT (Kg)
PED1	680 200	200	12	5	2.440	0.888	10.831
PED2	550 200	200	12	6	2.310	0.888	12.305
PED3	668 538 200	150	12	1	7.110	0.888	6.312

TOTAL BAR BENDING SCHEDULE OF PEDESTAL

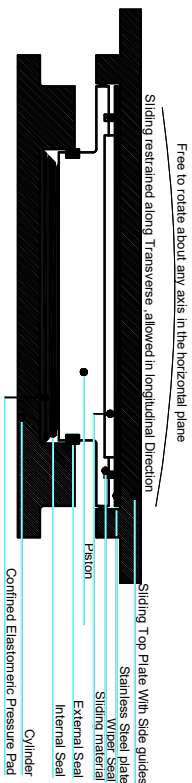
TOTAL WEIGHT (IN METRIC TON)

BAR BENDING SCHEDULE OF STOPPER

BAR ID	SHAPE OF BAR IN mm (NOT TO SCALE)	SPACIN G (mm)	Ø OF BARS (mm)	NO. OF BARS	LENGTH (m)	WEIGHT/LENGTH (Kg/m)	TOTAL WEIGHT (Kg)
ST1	400 150 300	80	20	6	3.100	2.466	45.871
ST2	420 400 100	110	10	6	1.840	0.617	6.807
ST3	400 400	0	10	4	0.400	0.617	0.986

TOTAL BAR BENDING SCHEDULE OF STOPPER

TOTAL WEIGHT (IN METRIC TON)



Guided Pot Bearing(For free Bearing) Movement Allowed in to longitudinal Direction As Per IRC : 83 (Part - III) - 2018 Section 2.1.3

Government of Nepal

Ministry of Physical Infrastructure and Transport

Department of Roads

Project Directorate Office (ADB)

SASEC Highway Improvement Project-

Project Preparatory Consultant (SHIP-PPC)

ADB Loan No: 3722-NP

CONSULTANT:

Soosung Engineering Co. Ltd,

Korea in association with

ERM P (Ltd), Nepal

and

JGC-Tech Studio of Engineering

IMPLEMENTING AGENCY:

DOR, DCID

ROAD NAME:

East West Highway (H01)

Butwal - Goringhne Section

SHEET TITLE:

Miscellaneous Details-2

of

Banganga Bridge

(46/H001/309_A)

SCALE:

As Shown

DATE:

November, 2022

DESIGNED BY:

Saroj Bhattacharai

SIGNATURE

REV NO.

DESCRIPTION

DWG. NO.:

309_Banganga

CHECKED BY:

P. Upadhyaya

SIGNATURE

REV NO.

DESCRIPTION

SHEET NO.:

39/61

APPROVED BY:

Dr. T.H.Choi

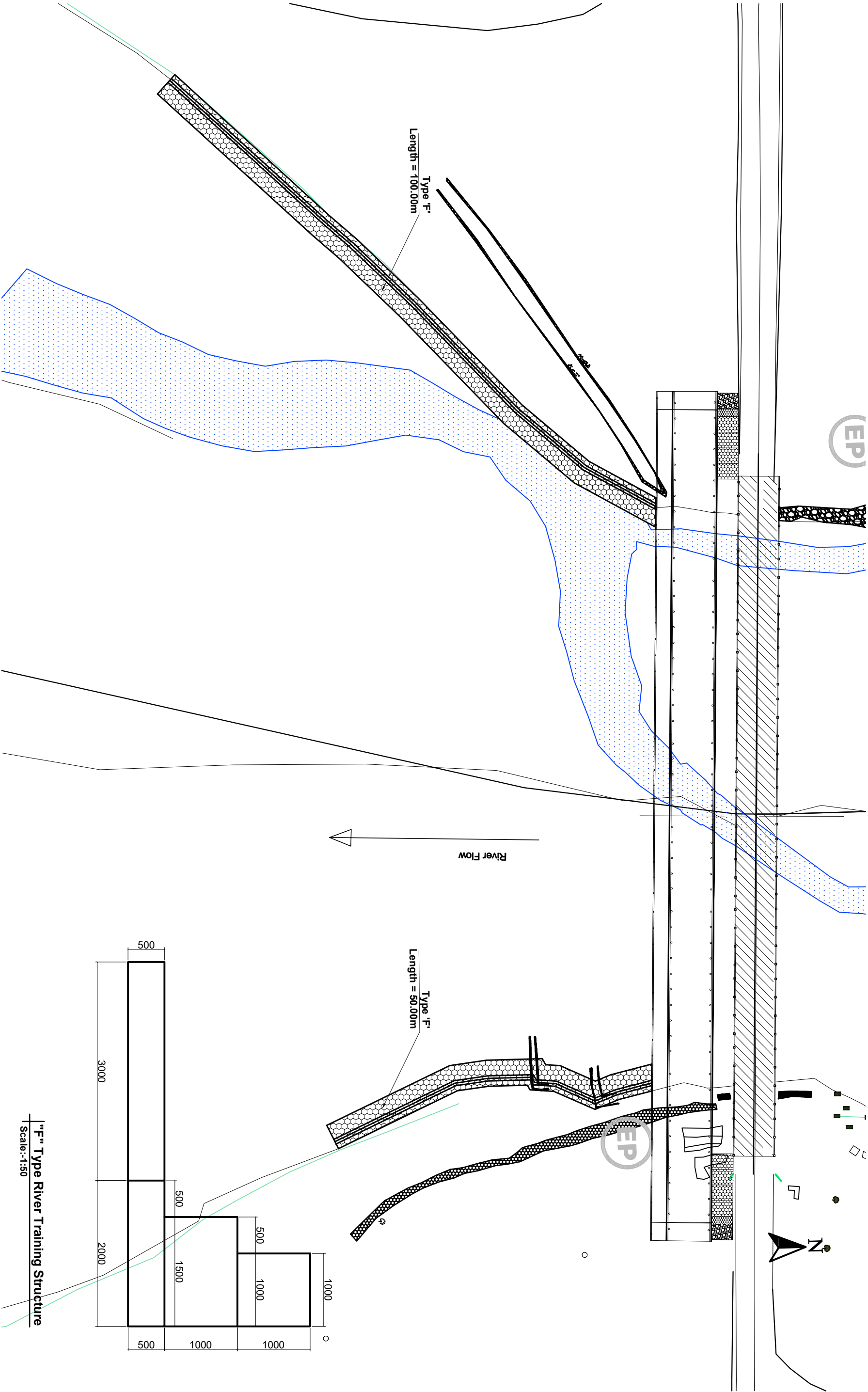
SIGNATURE

REV NO.

DESCRIPTION

SHEET NO.:

39/61



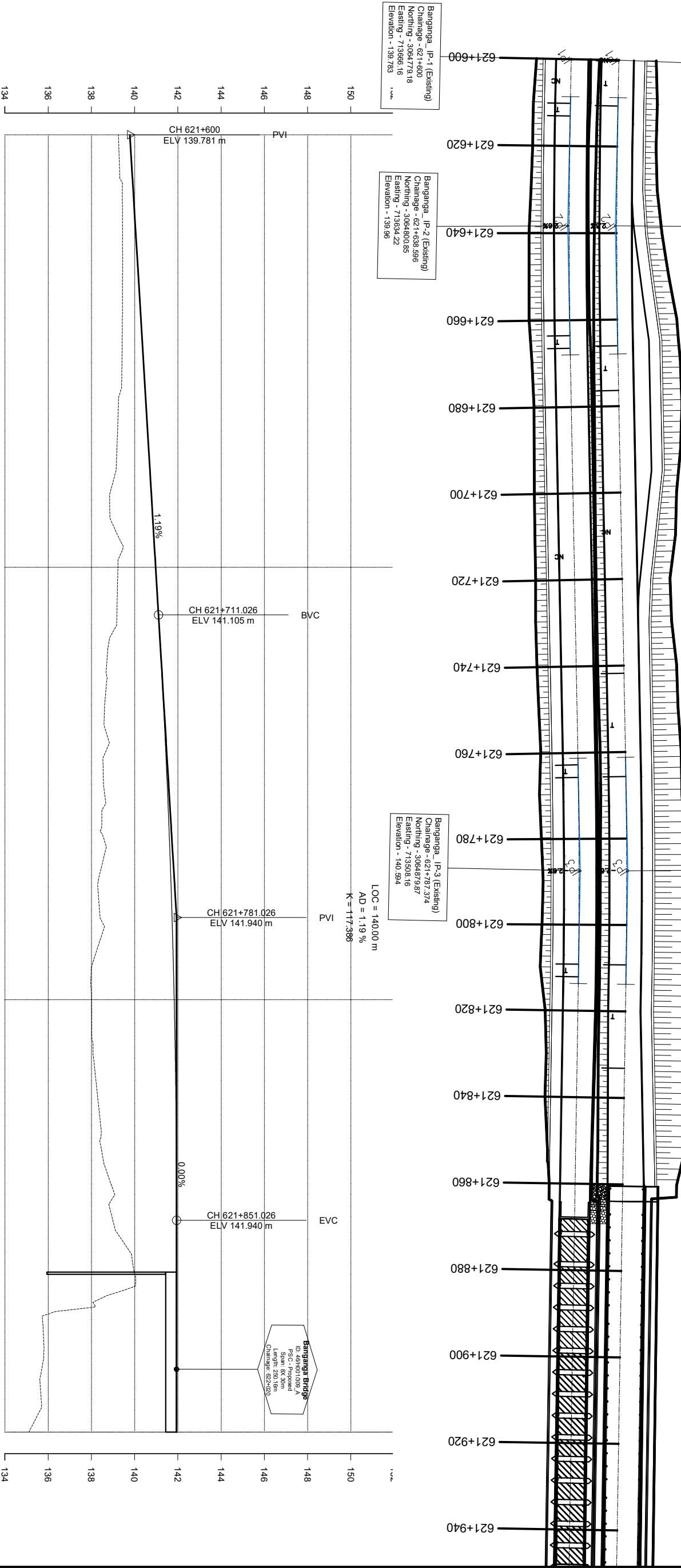
"F" Type River Training Structure
Scale:-1:50

Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP		CONSULTANT: Soosung Engineering Co. Ltd, Korea in association with ERM/C P (Ltd), Nepal and JST®-Tech Studio of Engineering		IMPLEMENTING AGENCY: DOR, DCID ROAD NAME: East West Highway (H01) Butwal - Gorusinghe Section		SHEET TITLE: River Training Work of Banganga Bridge (46/H001/309_A)		SCALE: As Shown			NAME	SIGNATURE	REV NO.	DESCRIPTION	DATE: November,2022
										DESIGNED BY:	Saroj Bhattarai				DWG.NO.: 309_Banganga
										CHECKED BY:	P. Upadhyaya				
										APPROVED BY:	Dr. T.H.Choi				SHEET NO.: 40/61

Banganga_IP-1 (Designed)
Chainage - 621+600
Northing - 306470.074
Easting - 713659.994
Elevation - 139.734

Banganga_IP-2 (Designed)
Chainage - 621+638.397
Northing - 3064791.427
Easting - 713628.0732
Elevation - 140.155

Banganga_IP-3 (Designed)
Chainage - 621+787.135
Northing - 3064870.764
Easting - 713502.2533
Elevation - 141.6253



DESIGN LEVEL(m)	EXISTING LEVEL(m)	HORIZONTAL ALIGNMENT		SUPER ELEVATION	CHAINAGE(Km)
		RIGHT	LEFT		
139.781	139.251	IP-1 R=0.00	IP-2 R=1494.50	NC	621+600
139.900	139.316				621+610
140.020	139.441	IP-2 R=1494.50	IP-3 R=1305.50	T	621+620
140.139	139.445				621+630
82.0258	139.439	IP-3 R=1305.50	IP-4 R=1305.50	T	621+640
140.258	139.421				621+650
140.377	139.305	IP-4 R=1305.50	IP-5 R=1305.50	T	621+660
140.497	139.201				621+670
140.616	139.015	IP-5 R=1305.50	IP-6 R=1305.50	T	621+680
140.735	138.980				621+690
140.854	139.226	IP-6 R=1305.50	IP-7 R=1305.50	T	621+700
140.974	139.183				621+710
141.093	138.743	IP-7 R=1305.50	IP-8 R=1305.50	T	621+720
141.209	138.646				621+730
141.316	138.795	IP-8 R=1305.50	IP-9 R=1305.50	T	621+740
141.415	138.560				621+750
141.505	138.479	IP-9 R=1305.50	IP-10 R=1305.50	T	621+760
141.587	138.434				621+770
141.660	138.386	IP-10 R=1305.50	IP-11 R=1305.50	T	621+780
141.725	138.159				621+790
141.781	138.011	IP-11 R=1305.50	IP-12 R=1305.50	T	621+800
141.829	138.075				621+810
141.868	138.238	IP-12 R=1305.50	IP-13 R=1305.50	T	621+820
141.899	138.450				621+830
141.921	138.722	IP-13 R=1305.50	IP-14 R=1305.50	T	621+840
141.935	138.940				621+850
141.940	139.885	IP-14 R=1305.50	IP-15 R=1305.50	T	621+860
141.940	138.079				621+870
141.940	135.806	IP-15 R=1305.50	IP-16 R=1305.50	T	621+880
141.940	135.645				621+890
141.940	135.111	IP-16 R=1305.50	IP-17 R=1305.50	T	621+900
141.940	135.111				621+910

Government of Nepal

Ministry of Physical Infrastructure and Transport

Department of Roads

Project Directorate Office (ADB)

SASEC Highway Improvement Project-

Project Preparatory Consultant (SHIP-P/PC)

ADB Loan No: 3722-NEP

CONSULTANT:

Soosung Engineering Co. Ltd,

Korea in association with

ERM P (Ltd), Nepal

and

TSE-Tech Studio of Engineering

IMPLEMENTING AGENCY:

DOR, DCID

ROAD NAME:

East West Highway (H01)

Butwal - Gorusinghe Section

SHEET TITLE:

Plan & Profile

OF

Banganga Bridge

621+600-622+900

SCALE:

Vertical Scale

Horizontal Scale

DESIGNED BY:

Checked By:

APPROVED BY:

Saroj Bhattacharai

P. Upadhyaya

Dr. T.H. Choi

SIGNATURE

REV NO.

DESCRIPTION

DATE:

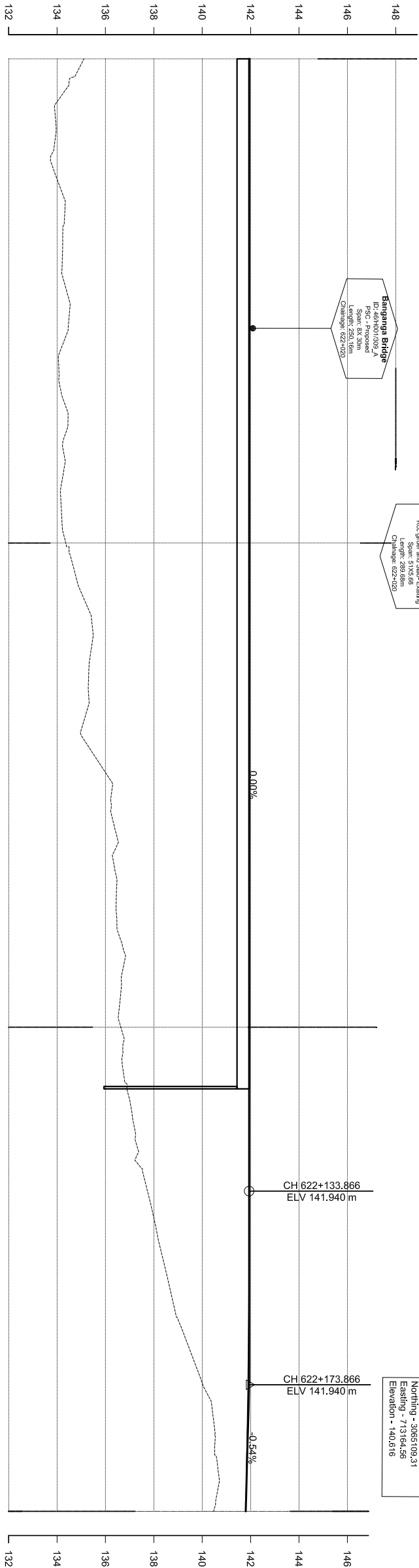
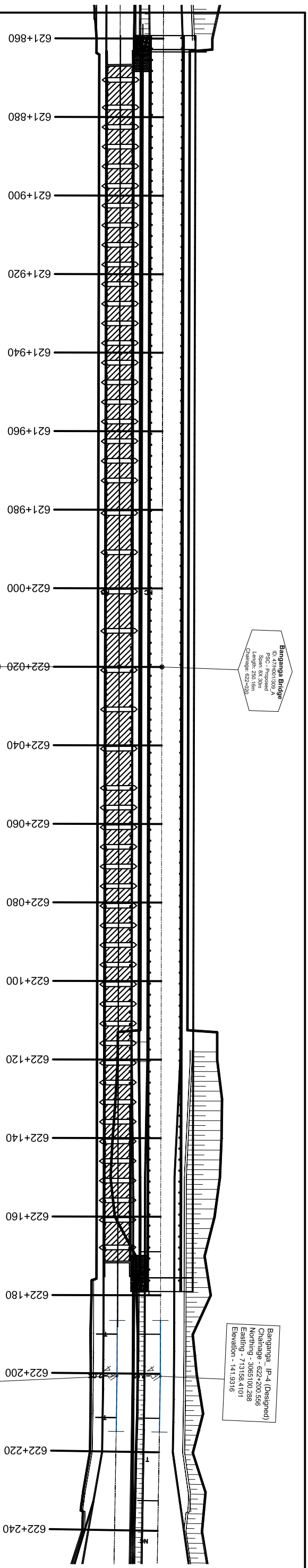
DWG.NO.:

SHEET NO.:

November, 2022

309_Banganga

41/61



DESIGN LEVEL(m)	HORIZONTAL ALIGNMENT		SUPER ELEVATION	CHAINAGE(Km)
	RIGHT	LEFT		
141.940	135.111			621+900
141.940	133.892			621+910
141.940	133.745			621+920
141.940	134.335			621+930
141.940	134.226			621+940
141.940	134.509			621+950
141.940	134.156			621+960
141.940	134.229			621+970
141.940	134.224			621+980
141.940	134.145			621+990
141.940	134.361			622+000
141.940	134.979			622+010
141.940	135.471			622+020
141.940	135.289			622+030
141.940	135.030			622+040
141.940	136.296			622+050
141.940	136.440			622+060
141.940	136.474			622+070
141.940	136.489			622+080
141.940	136.656			622+090
141.940	136.636			622+100
141.940	136.761			622+110
141.940	137.166			622+120
141.940	137.544			622+130
141.939	138.026			622+140
141.931	138.481			622+150
141.917	138.967			622+160
141.896	139.740			622+170
141.868	140.440			622+180
141.834	140.620			622+190
141.793	140.472			622+200

Government of Nepal

Ministry of Physical Infrastructure and Transport

Department of Roads

Project Directorate Office (ADB)

SASEC Highway Improvement Project-

Project Preparatory Consultant (SHIP-PPC)

ADB Loan No: 3722-NEP

CONSULTANT:

Soosung Engineering Co. Ltd,

Korea in association with

ERM C P (Ltd), Nepal

and

TSE-Tech Studio of Engineering

IMPLEMENTING AGENCY:

DOR, DCID

ROAD NAME:

East West Highway (H01)

Butwal - Gorusinghe Section

SHEET TITLE:

Plan & Profile

OF

Banganga Bridge

621+900-622+200

SCALE:

Vertical Scale

Horizontal Scale

NAME

SIGNATURE

REV NO.

DESCRIPTION

DESIGNED BY:

Saroj Bhattarai

CHECKED BY:

P. Upadhyaya

APPROVED BY:

Dr. T.H.Choi

DATE:

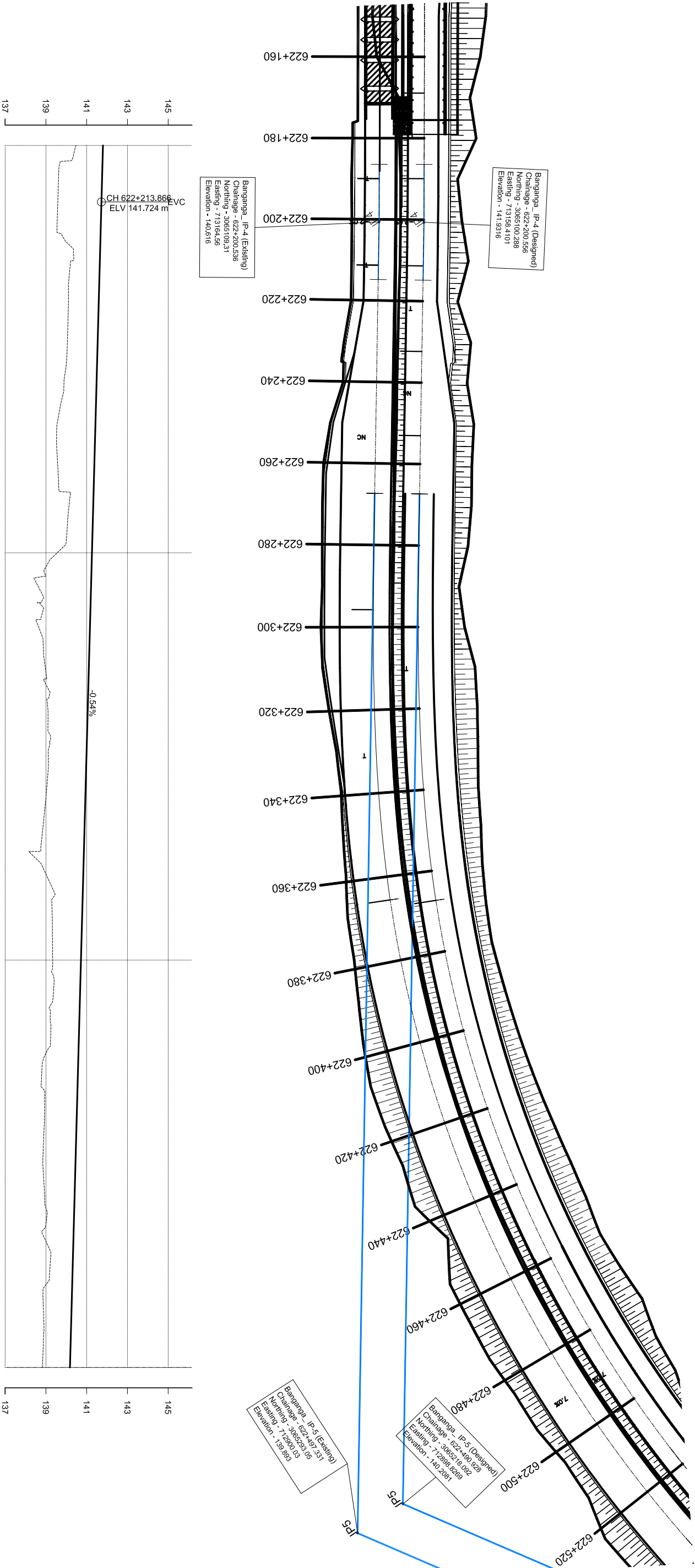
November,2022

DWG.NO.:

309_Banganga

SHEET NO.:

42/61



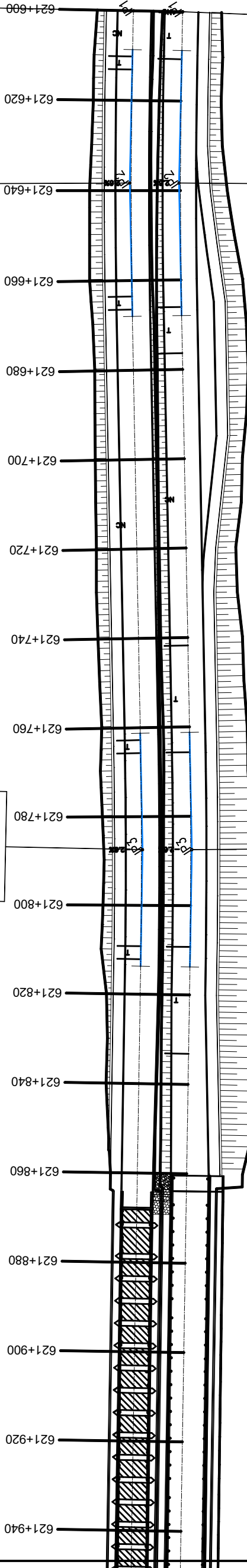
DESIGN LEVEL(m)	EXISTING LEVEL(m)	HORIZONTAL ALIGNMENT		SUPER ELEVATION	CHAINAGE(Km)
		RIGHT	LEFT		
141.793	140.472	IP-4 R=2005.50		622+200	622+200
141.745	139.608			622+211.341	-2
141.691	139.547		T		
141.638	140.181			622+232.341	
141.584	140.100				NC
141.530	140.044			622+253.031	
141.476	139.879				
141.422	139.530				
141.368	139.597				
141.314	140.102				
141.260	139.555				
141.206	138.805				T
141.153	138.781				
141.099	139.018				
141.045	139.105				
140.991	139.117				
140.937	139.005				
140.883	138.803			622+367.317	
140.829	139.106				
140.775	139.316				
140.721	139.334				
140.668	139.332				
140.614	139.227				
140.560	138.776				7
140.506	138.924				
140.452	138.849				
140.398	138.948				
140.344	139.092				
140.290	138.958				
140.236	138.908				
140.183	138.831	IP-5 R=294.50		622+500	

Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP		CONSULTANT: Soosung Engineering Co. Ltd, Korea in association with ERMC P (Ltd), Nepal and TSE-Tech Studio of Engineering		IMPLEMENTING AGENCY: DOR, DCID ROAD NAME: East West Highway (H01) Butwal - Gorusinghe Section		SHEET TITLE: Plan & Profile OF Existing Banganga Bridge 622+200-622+500		SCALE: Vertical Scale Horizontal Scale		NAME DESIGNED BY: CHECKED BY: APPROVED BY:		SIGNATURE REV NO.		DESCRIPTION DATE: DWG.NO.: SHEET NO.:	
										Saroj Bhattacharai P. Upadhyaya Dr. T.H.Choi				November,2022 309_Banganga 43/61	

Banganga - IP-1 (Designed)
Chainage - 621+600
Northing - 3064770.074
Easting - 713659.864
Elevation - 139.724

Banganga - IP-2 (Designed)
Chainage - 621+638.397
Northing - 3064791.427
Easting - 713628.0732
Elevation - 140.155

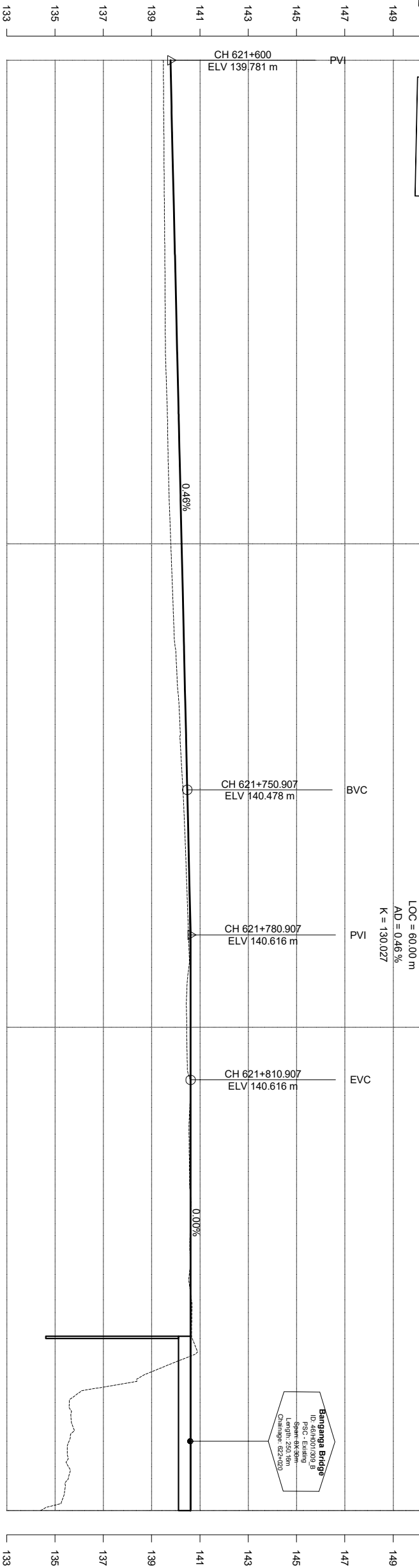
Banganga - IP-3 (Designed)
Chainage - 621+787.135
Northing - 3064870.764
Easting - 713502.2633
Elevation - 141.6253



Banganga - IP-1 (Existing)
Chainage - 621+600
Northing - 3064779.18
Easting - 713656.16
Elevation - 139.783

Banganga - IP-2 (Existing)
Chainage - 621+638.596
Northing - 3064800.85
Easting - 713634.22
Elevation - 139.96

Banganga - IP-3 (Existing)
Chainage - 621+787.374
Northing - 3064879.87
Easting - 713508.16
Elevation - 140.594



Banganga Bridge
IP-3 - Existing
Span: 8x30m
Length: 240.00m
Chainage: 621+787.135

DESIGN LEVEL(m)	EXISTING LEVEL(m)	HORIZONTAL ALIGNMENT		SUPER ELEVATION	CHAINAGE(Km)
		RIGHT	LEFT		
139.781	139.489	IP-1 R=0.00	IP-2 R=1505.50	NC	621+600
139.827	139.491				621+610
139.873	139.514				621+620
139.919	139.529				621+630
139.966	139.548				621+640
140.012	139.560	IP-3 R=1494.50	NC	NC	621+650
140.058	139.572				621+660
140.104	139.634				621+670
140.150	139.677				621+680
140.196	139.724				621+690
140.243	139.796	IP-3 R=1494.50	NC	NC	621+700
140.289	139.870				621+710
140.335	139.947				621+720
140.381	140.080				621+730
140.427	140.171				621+740
140.473	140.290	IP-3 R=1494.50	NC	NC	621+750
140.516	140.380				621+760
140.552	140.452				621+770
140.579	140.522				621+780
140.599	140.485				621+790
140.611	140.452	IP-3 R=1494.50	NC	NC	621+800
140.616	140.542				621+810
140.616	140.550				621+820
140.616	140.568				621+830
140.616	140.612				621+840
140.616	140.587	IP-3 R=1494.50	NC	NC	621+850
140.616	140.665				621+860
140.616	139.627				621+870
140.616	135.664				621+880
140.616	135.457				621+890
140.616	134.400	IP-3 R=1494.50	NC	NC	621+900
140.616	134.400				621+910
140.616	134.400				621+920
140.616	134.400				621+930
140.616	134.400				621+940

Government of Nepal
Ministry of Physical Infrastructure and Transport
Department of Roads
Project Directorate Office (ADB)
SASEC Highway Improvement Project-
Project Preparatory Consultant (SHIP-PPC)
ADB Loan No: 3722-NEP

Soosung Engineering Co. Ltd,
Korea in association with
ERM C P (Ltd), Nepal
and
TSE-Tech Studio of Engineering

IMPLEMENTING AGENCY:

DOR, DCID

ROAD NAME:
East West Highway (H01)

Butwal - Gorusinghe Section

SHEET TITLE:

Plan & Profile
OF
Existing Banganga Bridge
621+600-621+900

SCALE:

0 2 4 6m
Vertical Scale

0 10 20 30m
Horizontal Scale

NAME

SIGNATURE

REV NO.

DESCRIPTION

DESIGNED BY:

CHECKED BY:

APPROVED BY:

DATE:

DWG.NO.:

SHEET NO.:

Saroj Bhattacharai

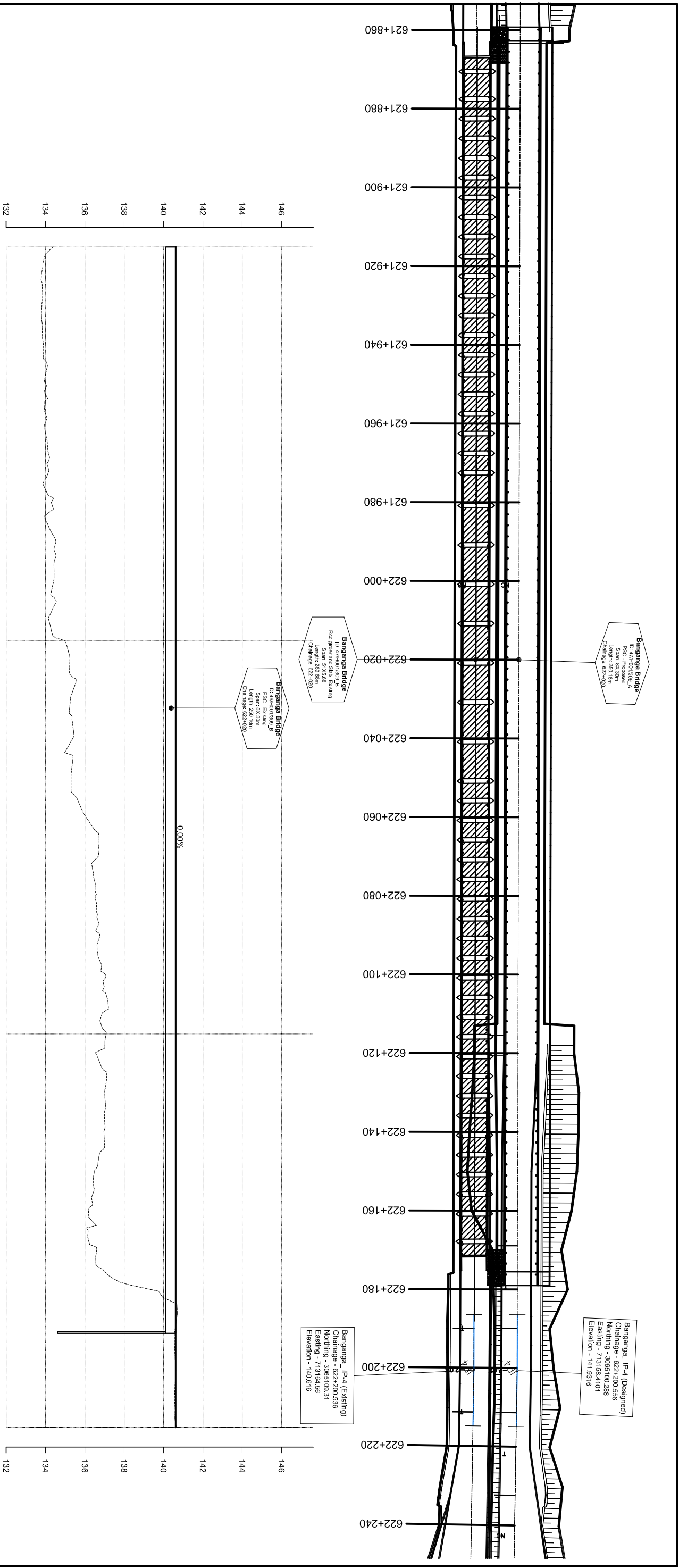
P. Upadhyaya

Dr. T.H.Choi

November, 2022

309_Banganga

44/61



DESIGN LEVEL(m)	EXISTING LEVEL(m)	HORIZONTAL ALIGNMENT		SUPER ELEVATION	CHAINAGE(Km)
		RIGHT	LEFT		
140.616	134.400				621+900
140.616	133.839				621+910
140.616	133.848				621+920
140.616	134.098				621+930
140.616	133.931				621+940
140.616	134.093				621+950
140.616	133.885				621+960
140.616	134.065				621+970
140.616	134.450				621+980
140.616	134.540				621+990
140.616	134.950				622+000
140.616	135.594				622+010
140.616	135.349				622+020
140.616	135.396				622+030
140.616	135.589				622+040
140.616	136.680				622+050
140.616	136.444				622+060
140.616	136.626				622+070
140.616	136.668				622+080
140.616	137.081				622+090
140.616	137.080				622+100
140.616	137.120				622+110
140.616	136.994				622+120
140.616	136.772				622+130
140.616	136.451				622+140
140.616	136.171				622+150
140.616	136.940				622+160
140.617	140.713				622+170
140.617	140.567				622+180
140.617	140.578				622+190
140.617	140.648				622+200

IP-4

R=1994.50

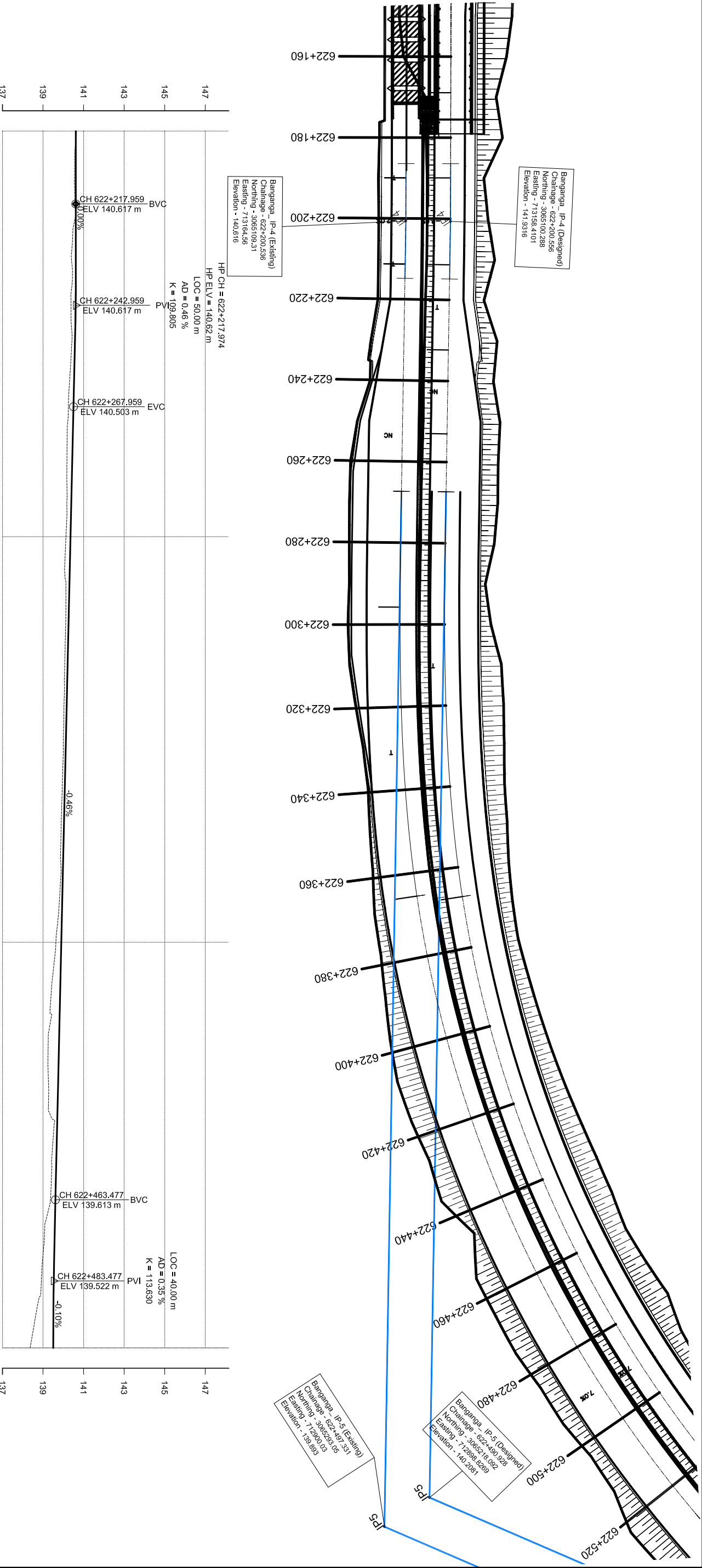
622+189.969

622+200

T

-2

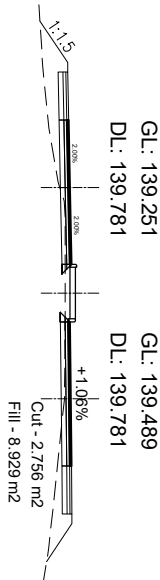
Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP		 Soosung Engineering Co. Ltd, Korea in association with ERM C P (Ltd), Nepal and TSE-Tech Studio of Engineering		<table><tr><td colspan="2">IMPLEMENTING AGENCY:</td></tr><tr><td colspan="2">DOR, DCID</td></tr><tr><td colspan="2">ROAD NAME:</td></tr><tr><td colspan="2">East West Highway (H01)</td></tr><tr><td colspan="2">Butwal - Gorusinghe Section</td></tr></table>		IMPLEMENTING AGENCY:		DOR, DCID		ROAD NAME:		East West Highway (H01)		Butwal - Gorusinghe Section		SHEET TITLE: Plan & Profile OF Existing Banganga Bridge 621+900-622+200		<table><tr><td colspan="2">SCALE:</td></tr><tr><td colspan="2"> 0246m Vertical Scale 0102030m Horizontal Scale </td></tr><tr><td colspan="2"></td><td colspan="2"><table><tr><td>DESIGNED BY:</td><td>NAME</td><td>SIGNATURE</td><td>REV NO.</td><td>DESCRIPTION</td></tr><tr><td>CHECKED BY:</td><td>P. Upadhyaya</td><td></td><td></td><td></td></tr><tr><td>APPROVED BY:</td><td>Dr. T.H.Choi</td><td></td><td></td><td></td></tr></table></td><td colspan="2"><table><tr><td colspan="2">DATE: November,2022</td></tr><tr><td colspan="2">DWG.NO.: 309_Banganga</td></tr><tr><td colspan="2">SHEET NO.: (45/61)</td></tr></table></td></tr></table>		SCALE:		0246m Vertical Scale 0102030m Horizontal Scale				<table><tr><td>DESIGNED BY:</td><td>NAME</td><td>SIGNATURE</td><td>REV NO.</td><td>DESCRIPTION</td></tr><tr><td>CHECKED BY:</td><td>P. Upadhyaya</td><td></td><td></td><td></td></tr><tr><td>APPROVED BY:</td><td>Dr. T.H.Choi</td><td></td><td></td><td></td></tr></table>		DESIGNED BY:	NAME	SIGNATURE	REV NO.	DESCRIPTION	CHECKED BY:	P. Upadhyaya				APPROVED BY:	Dr. T.H.Choi				<table><tr><td colspan="2">DATE: November,2022</td></tr><tr><td colspan="2">DWG.NO.: 309_Banganga</td></tr><tr><td colspan="2">SHEET NO.: (45/61)</td></tr></table>		DATE: November,2022		DWG.NO.: 309_Banganga		SHEET NO.: (45/61)	
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DWG.NO.: 309_Banganga																																																		
SHEET NO.: (45/61)																																																		



DESIGN LEVEL(m)		
	RIGHT	LEFT
EXISTING LEVEL(m)		
	RIGHT	LEFT
HORIZONTAL ALIGNMENT		
	RIGHT	LEFT
SUPER ELEVATION		
	RIGHT	LEFT
CHAINAGE(Km)		
	RIGHT	LEFT
622+200	140.617	140.648
622+210	140.617	140.559
622+220	140.616	140.596
622+230	140.610	140.409
622+240	140.594	140.385
622+250	140.570	140.429
622+260	140.536	140.331
622+270	140.494	140.247
622+280	140.448	140.182
622+290	140.402	140.189
622+300	140.357	140.133
622+310	140.311	140.089
622+320	140.266	140.125
622+330	140.220	140.079
622+340	140.175	140.044
622+350	140.129	140.006
622+360	140.084	139.958
622+370	140.038	139.903
622+380	139.993	139.872
622+390	139.947	139.805
622+400	139.902	139.635
622+410	139.856	139.439
622+420	139.811	139.353
622+430	139.765	139.242
622+440	139.720	139.266
622+450	139.674	139.475
622+460	139.629	139.401
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622+500	139.505	138.366

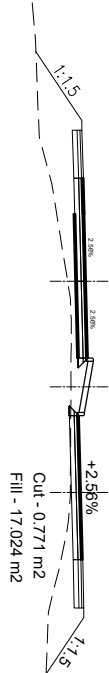
Government of Nepal		Ministry of Physical Infrastructure and Transport		Department of Roads		Project Directorate Office (ADB)		SASEC Highway Improvement Project-		Project Preparatory Consultant (SHIP-PPC)		ADB Loan No: 3722-NEP	
CONSULTANT:		Soosung Engineering Co. Ltd,		Korea in association with		ERMC P (Ltd), Nepal		and		TSE-Tech Studio of Engineering			
IMPLEMENTING AGENCY:		DOR, DCID		ROAD NAME:		East West Highway (H01)		Butwal - Goringhne Section					
SHEET TITLE:		Plan & Profile		OF		Existing Banganga Bridge		622+200-622+500					
SCALE:		Vertical Scale		Horizontal Scale									
DESIGNED BY:		Saroj Bhattacharai		CHECKED BY:		P. Upadhyaya		APPROVED BY:		Dr. T.H.Choi			
NAME		SIGNATURE		REV NO.		DESCRIPTION							
DATE:		November,2022		DWG.NO.:		309_Banganga		SHEET NO.:		(46/61)			

Ch:621+600
GL:139.536
DL:139.781



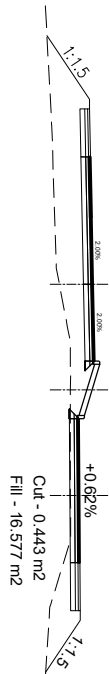
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DL: 139.781

Ch:621+650
GL:139.591
DL:140.011



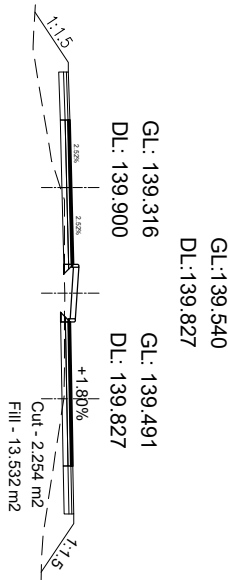
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Ch:621+700



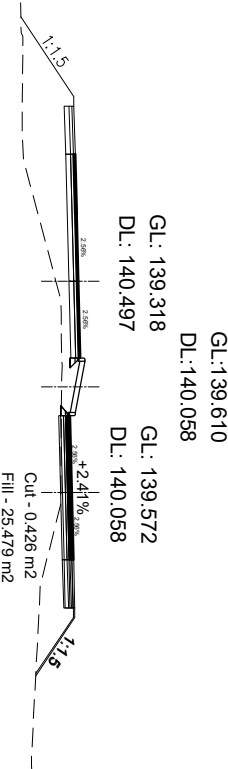
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Ch:621+610



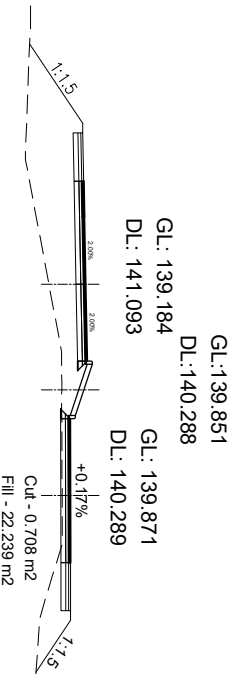
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DL: 139.900

Ch:621+660



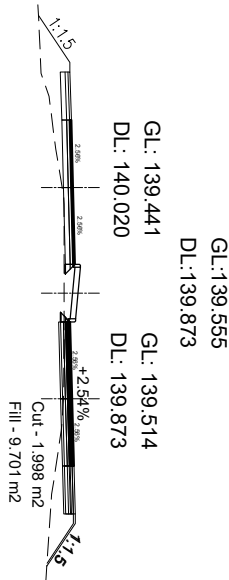
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Ch:621+710



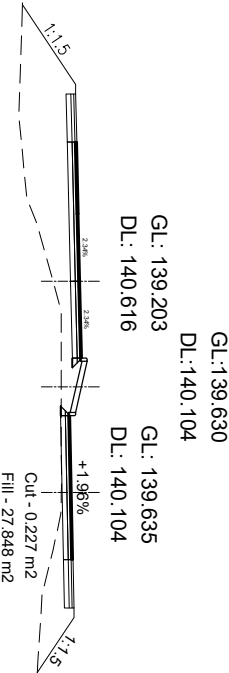
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DL: 141.093

Ch:621+620



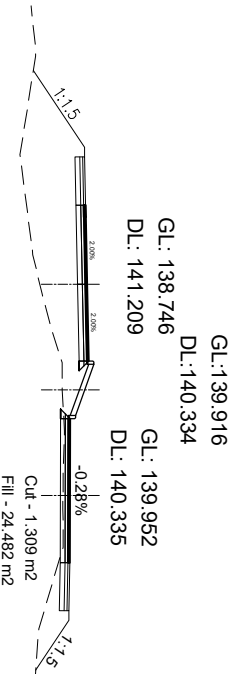
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Ch:621+670



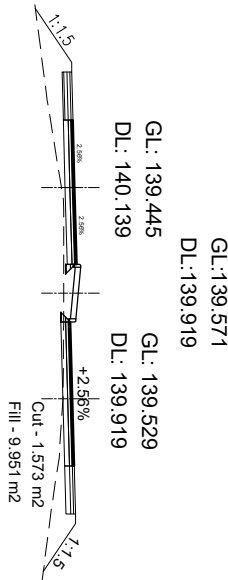
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DL: 140.616

Ch:621+720



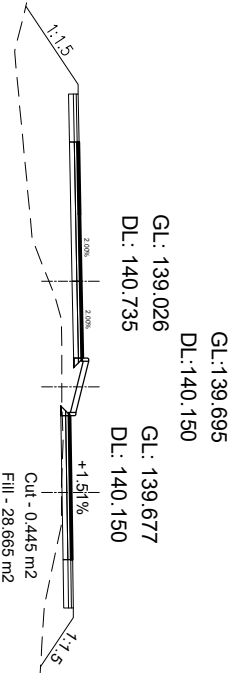
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DL: 141.209

Ch:621+630



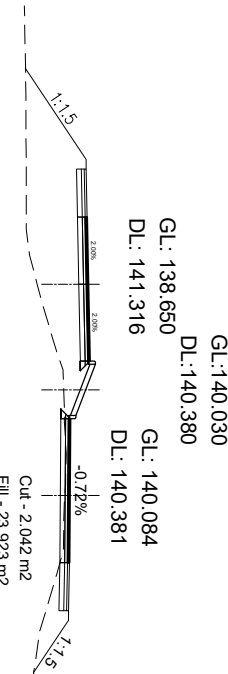
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DL: 140.139

Ch:621+680



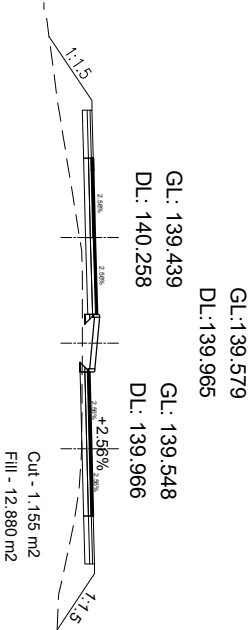
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DL: 140.735

Ch:621+730



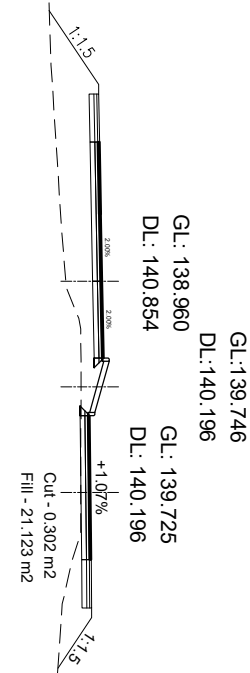
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Ch:621+640



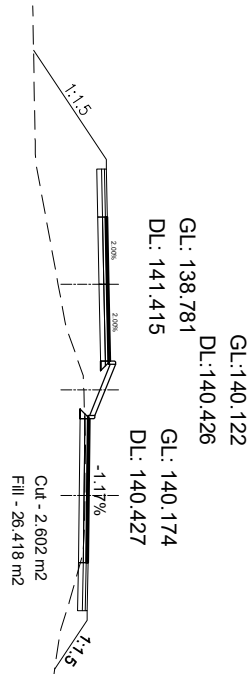
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Ch:621+690



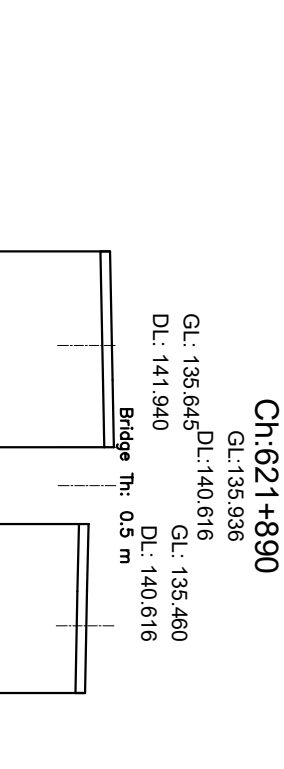
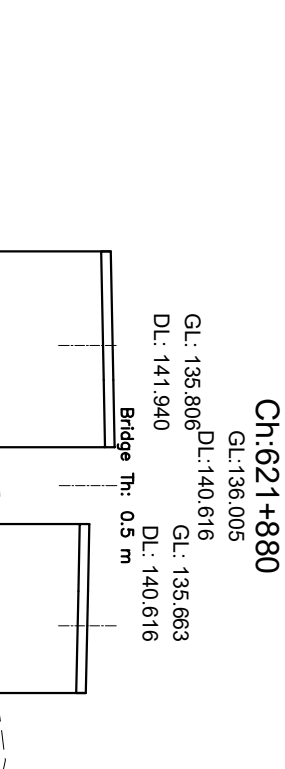
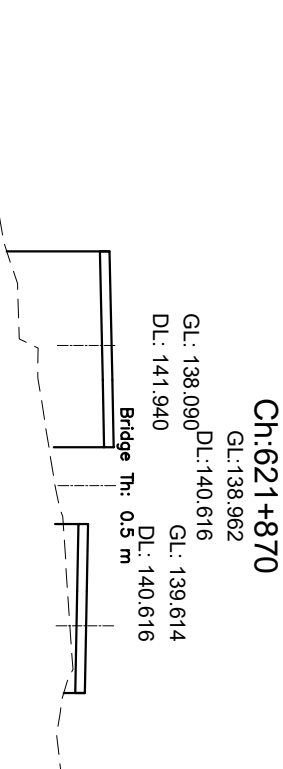
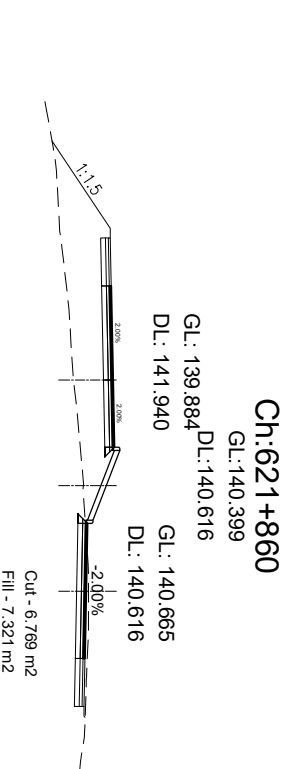
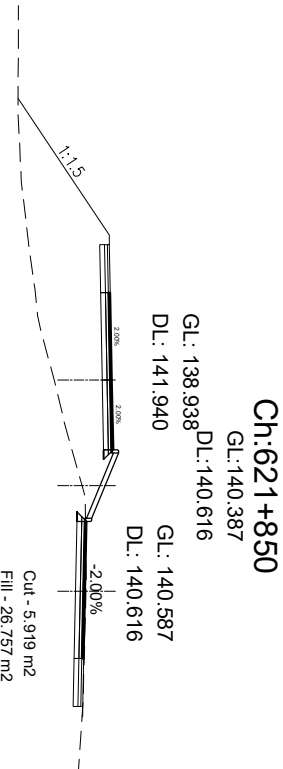
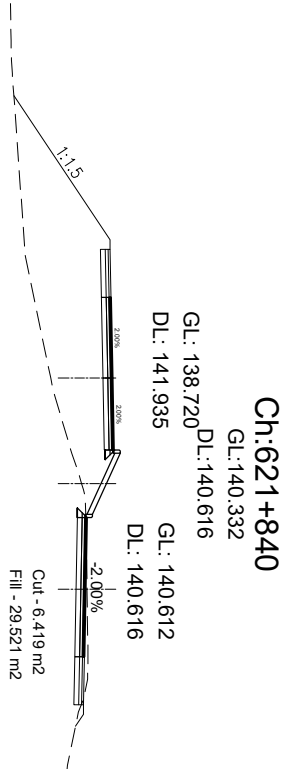
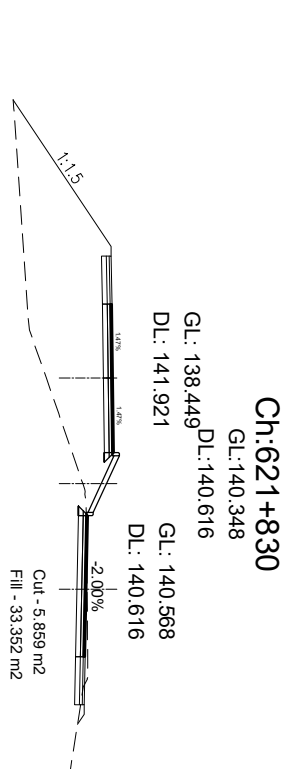
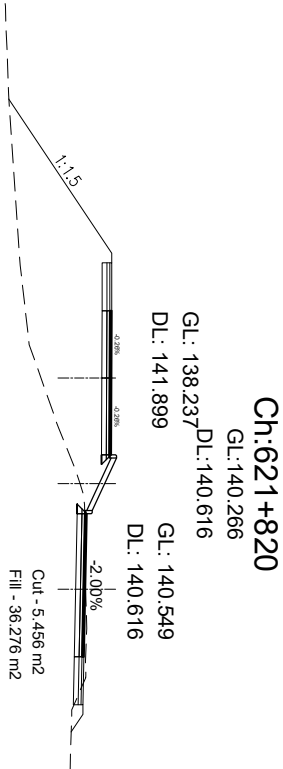
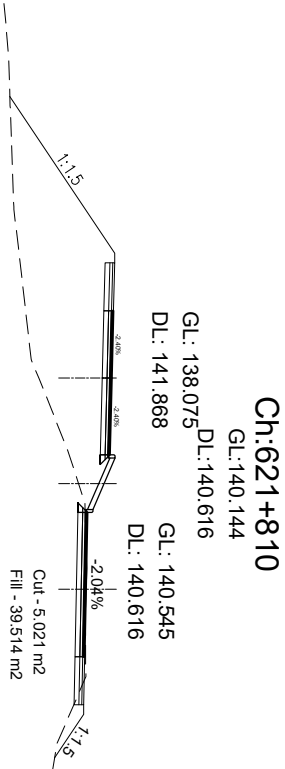
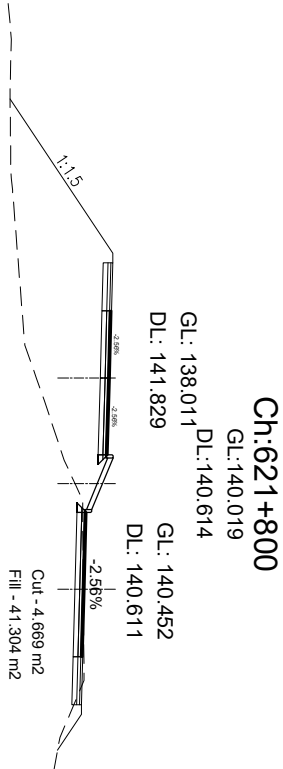
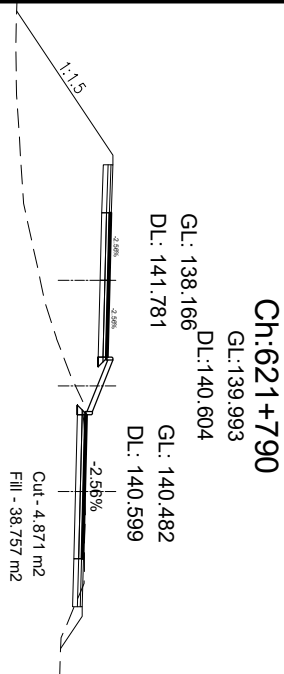
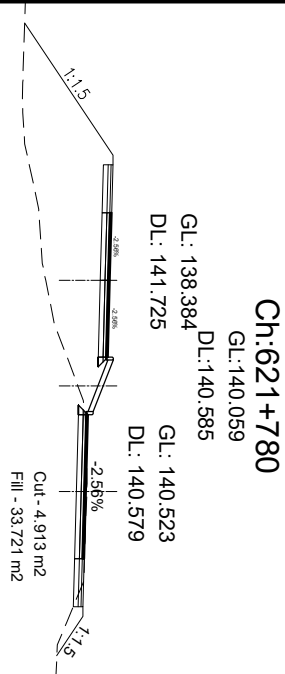
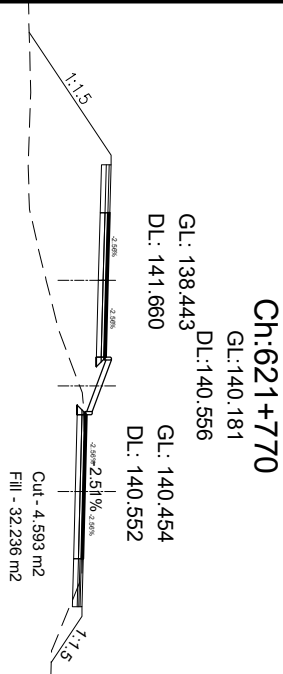
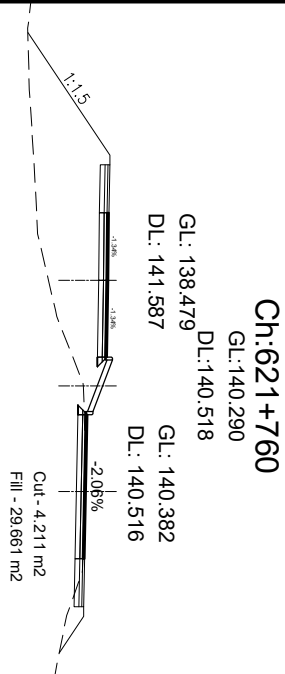
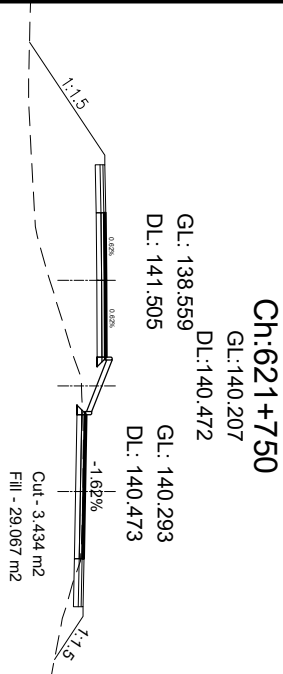
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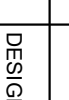
Ch:621+740

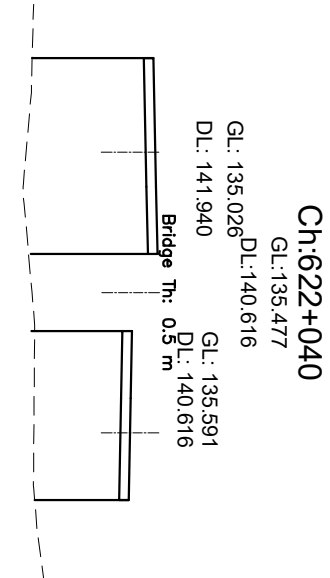
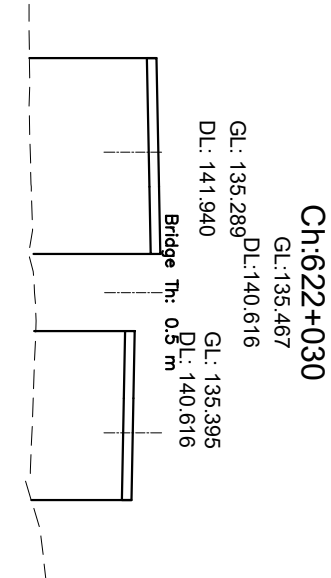
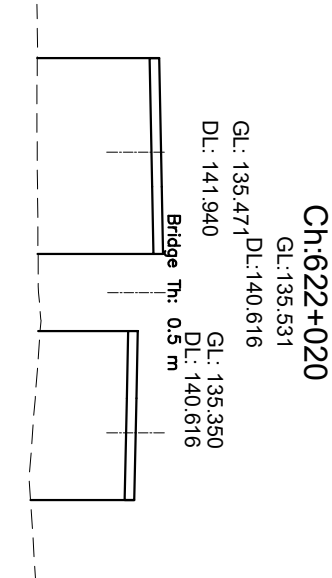
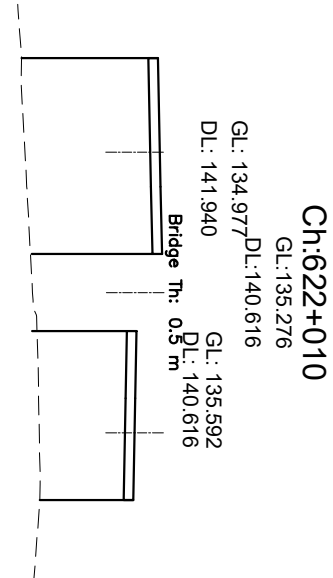
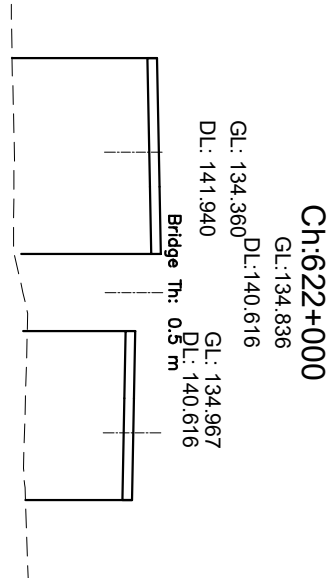
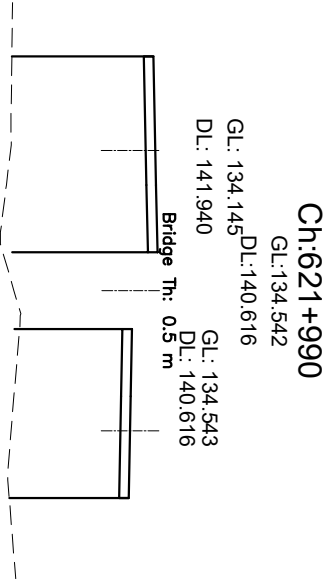
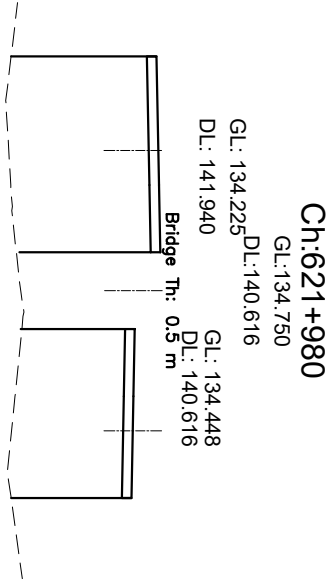
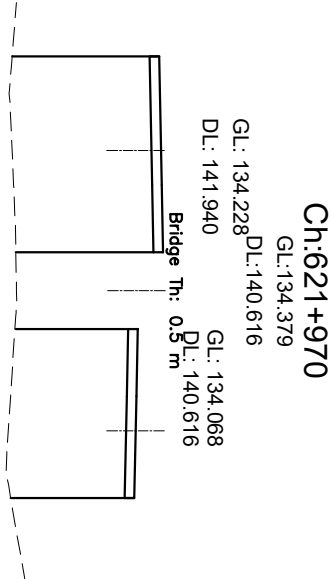
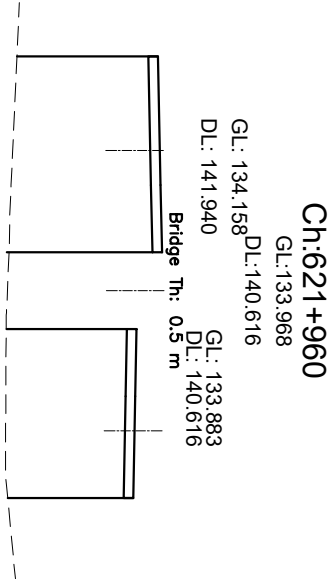
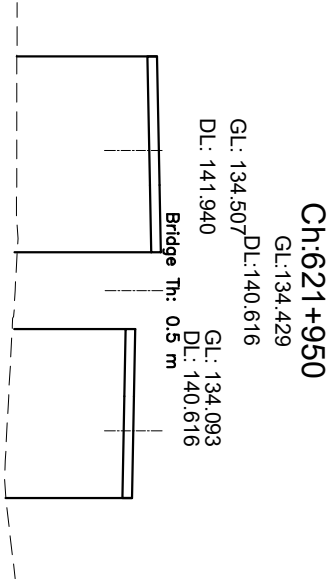
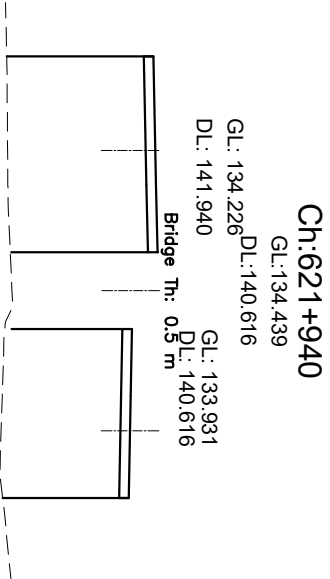
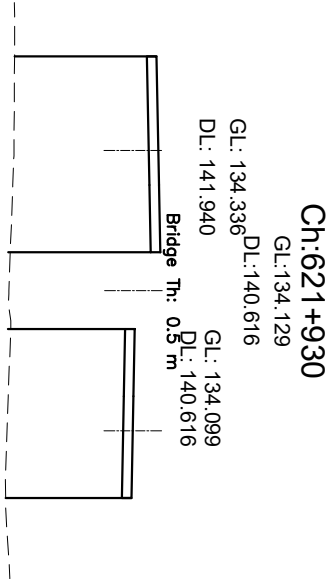
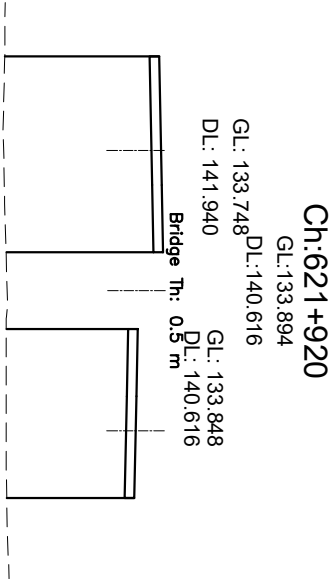
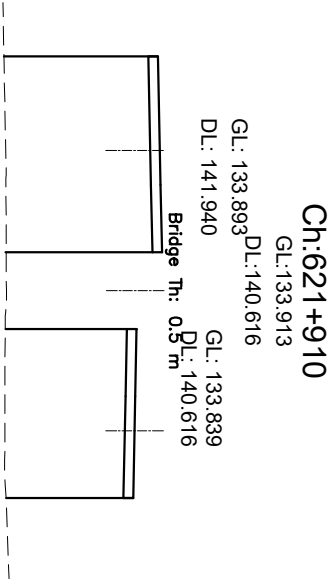
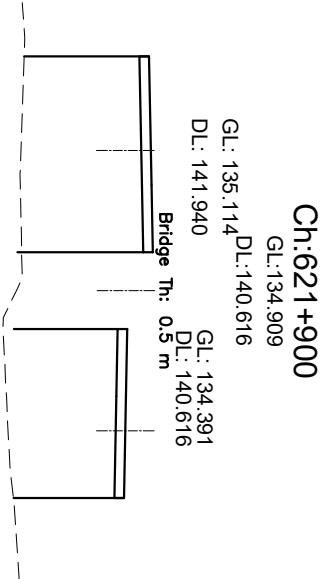


GL: 138.781
DL: 141.415

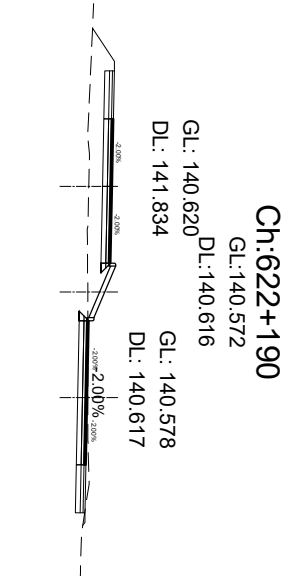
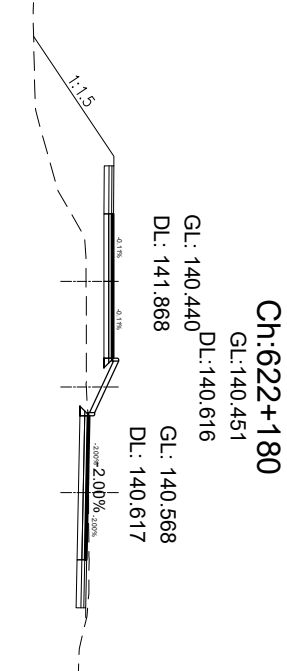
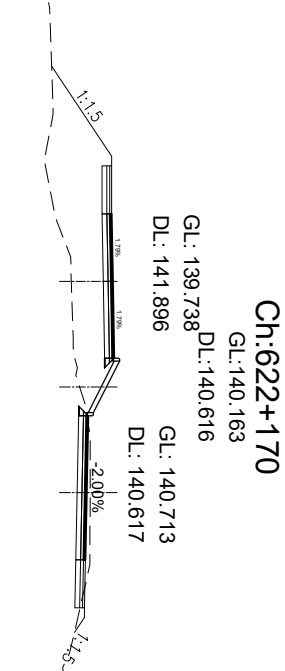
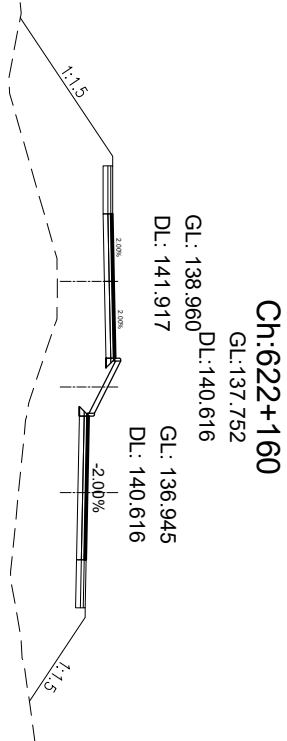
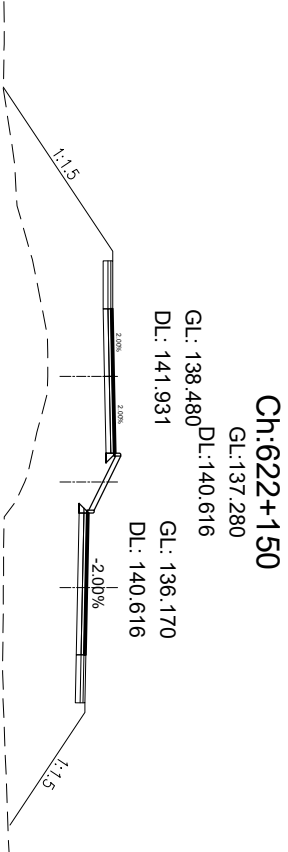
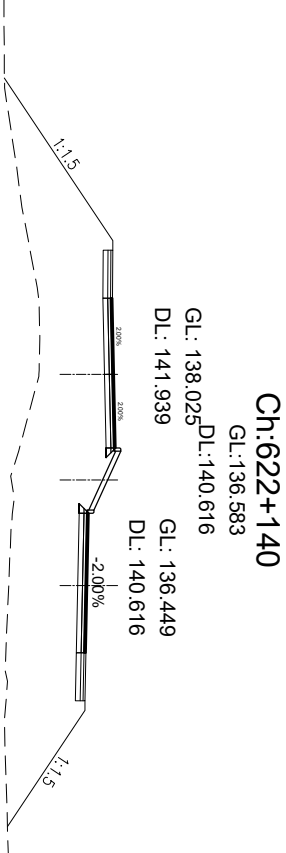
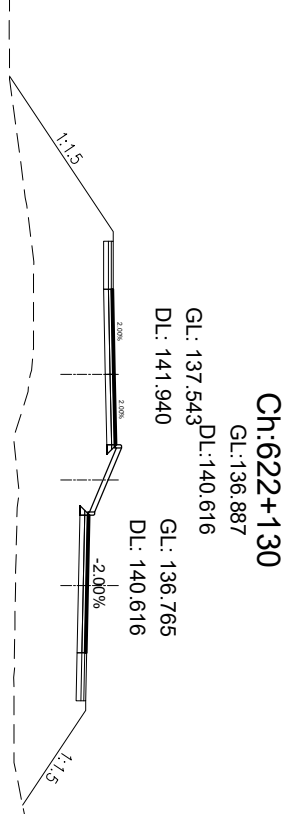
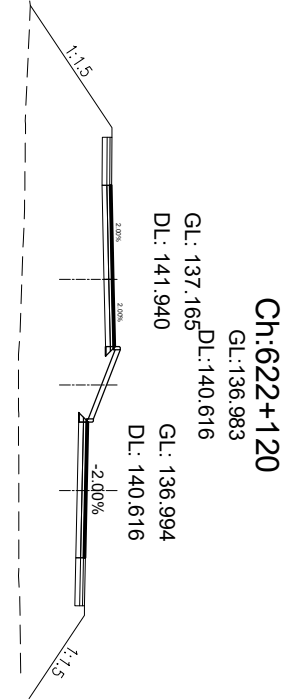
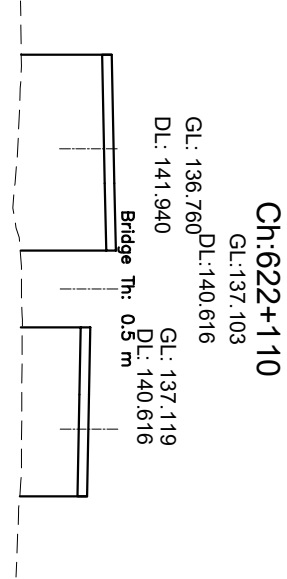
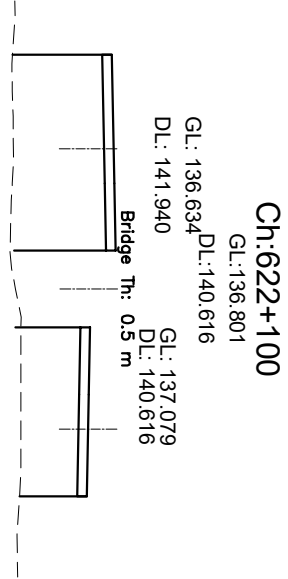
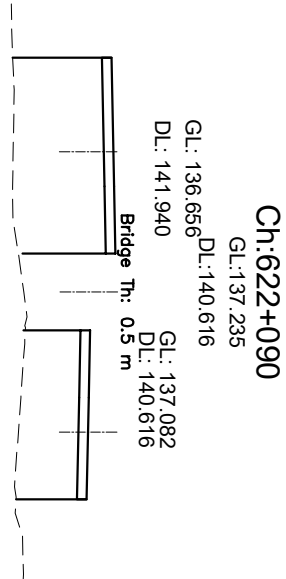
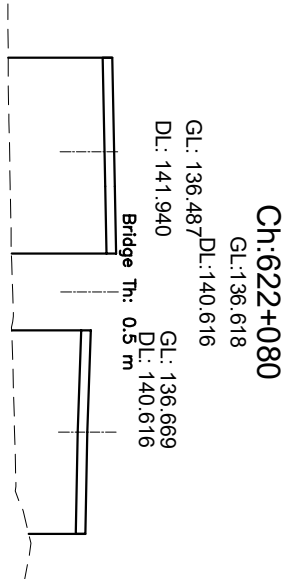
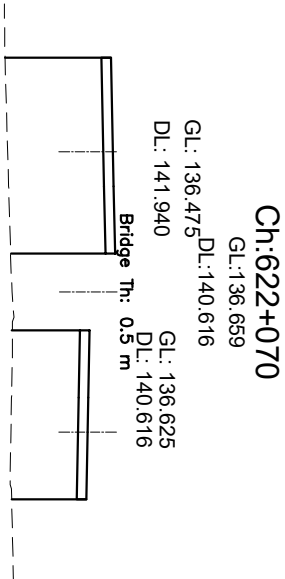
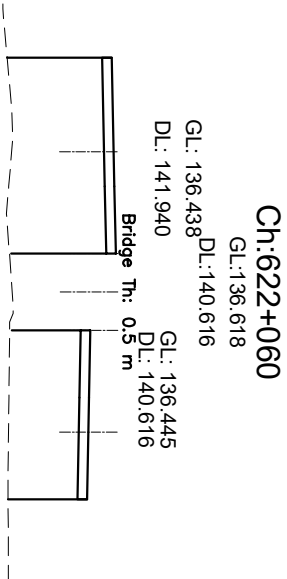
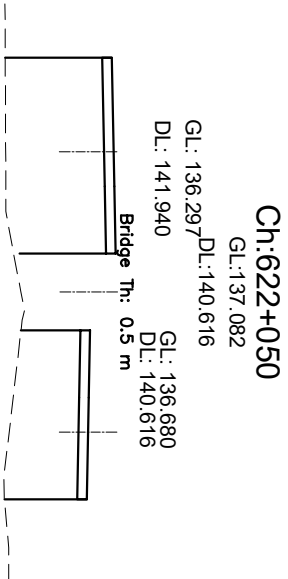
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	 Soosung Engineering Co. Ltd, Korea in association with ERM C P (Ltd), Nepal and TSE-Tech Studio of Engineering		DOR, DCID		Cross Section of Ch:621+600 - 621+740		0 2 4 6m Vertical Scale 0 10 20 30m Horizontal Scale		Saroj Bhattacharai								November, 2022		
		ROAD NAME:						CHECKED BY:								DWG.NO.: 309_Banganga			
		East West Highway (H01)						P. Upadhyaya											
		Butwal - Gorusinghe Section						APPROVED BY:		Dr. T.H.Choi								SHEET NO.: (47/61)	



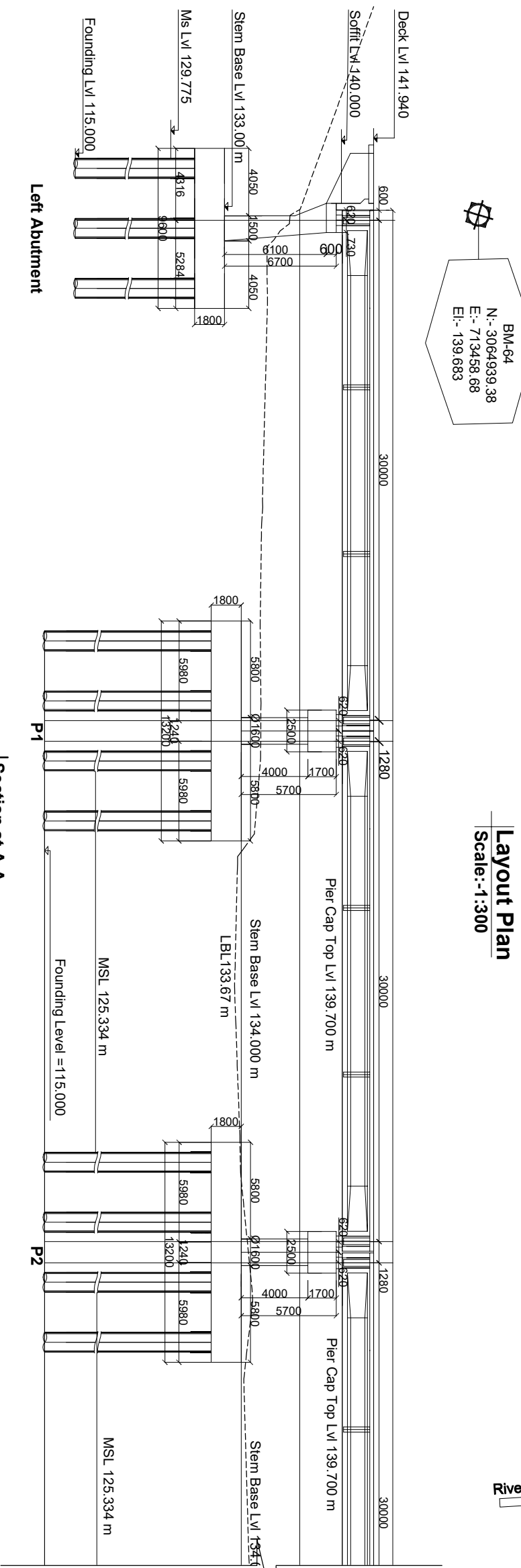
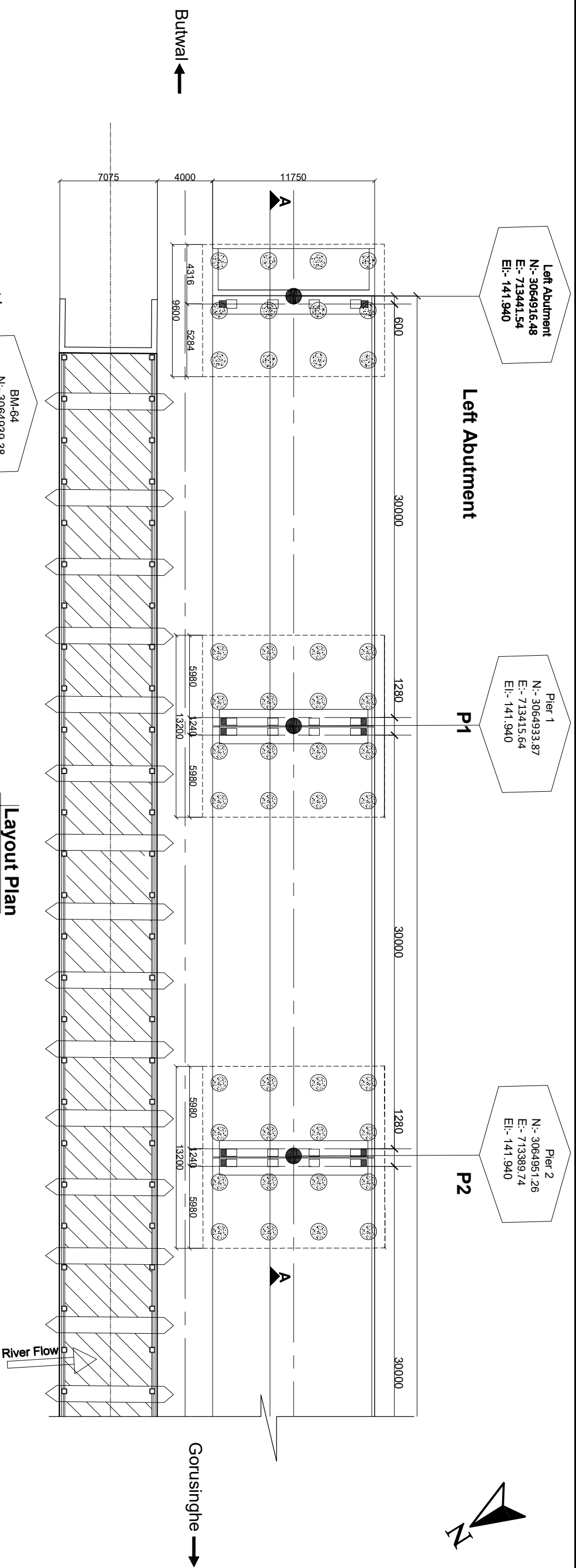
Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP	CONSULTANT:  Soosung Engineering Co. Ltd, Korea in association with  ERM P (Ltd), Nepal and TSE-Tech Studio of Engineering	IMPLEMENTING AGENCY: DOR, DCID ROAD NAME: East West Highway (H01) Butwal - Gorusinghe Section	SHEET TITLE: Cross Section of Ch:621+750 - 621+890	SCALE: 0 2 4 6m Vertical Scale 0 10 20 30m Horizontal Scale	DESIGNED BY:	Saroj Bhattacharai	SIGNATURE	REV NO.	DESCRIPTION	DATE:
					CHECKED BY:	P. Upadhyaya				November, 2022
					APPROVED BY:	Dr. T.H.Choi				
										DWG.NO.:
										309_Banganga
					SHEET NO.:					
					(48/61)					



Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP	 Soosung Engineering Co., Ltd, Korea in association with ERMCo P (Ltd), Nepal and TSE-Tech Studio of Engineering	CONSULTANT:		IMPLEMENTING AGENCY:		SHEET TITLE:		SCALE:				NAME		SIGNATURE		REV NO.		DESCRIPTION		DATE:	
																				November, 2022	
																				DWG.NO.:	
																				309_Banganga	
																				SHEET NO.:	
																				(49/61)	



Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP	CONSULTANT:		IMPLEMENTING AGENCY:		SHEET TITLE:		SCALE:		NAME		SIGNATURE		REV NO.		DESCRIPTION		DATE:		
	Soosung Engineering Co. Ltd,		DOR, DCID		Cross Section		Vertical Scale		Saroj Bhattacharai								November, 2022		
	Korea in association with		ROAD NAME:		of		Horizontal Scale		P. Upadhyaya								309_Banganga		
	ERM C P (Ltd), Nepal		East West Highway (H01)		Ch:622+050 - 622+190				Dr. T.H.Choi								SHEET NO.: 50/61		
	and		Butwal - Gorusinghe Section																
TSE-Tech Studio of Engineering																			



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				DOR, DCID		Layout Plan of Banganga Bridge (47/H001/309_A)		As Shown		Designed by:		Saroj Bhattacharai								DWG.NO.: 309_Banganga	
		ROAD NAME:		East West Highway (H01)						Checked by:		P. Upadhyaya								SHEET NO.: (51/61)	
		Butwal - Gorusingha Section								Approved by:		Dr. T.H. Choi									



Pier 3
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El:- 141.940

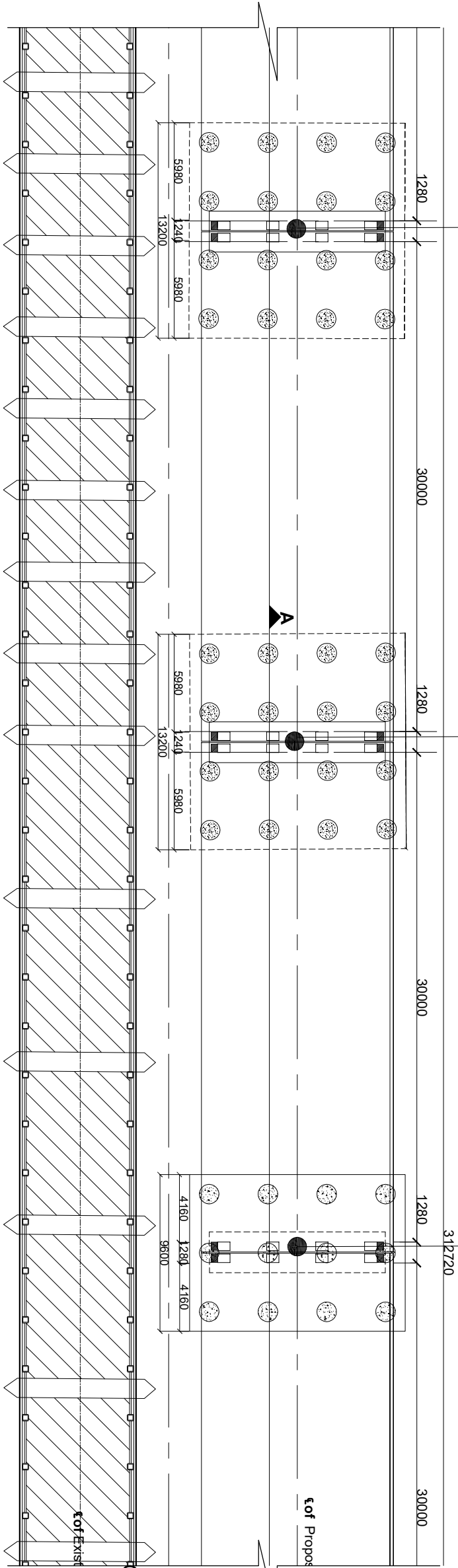
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Pier 5
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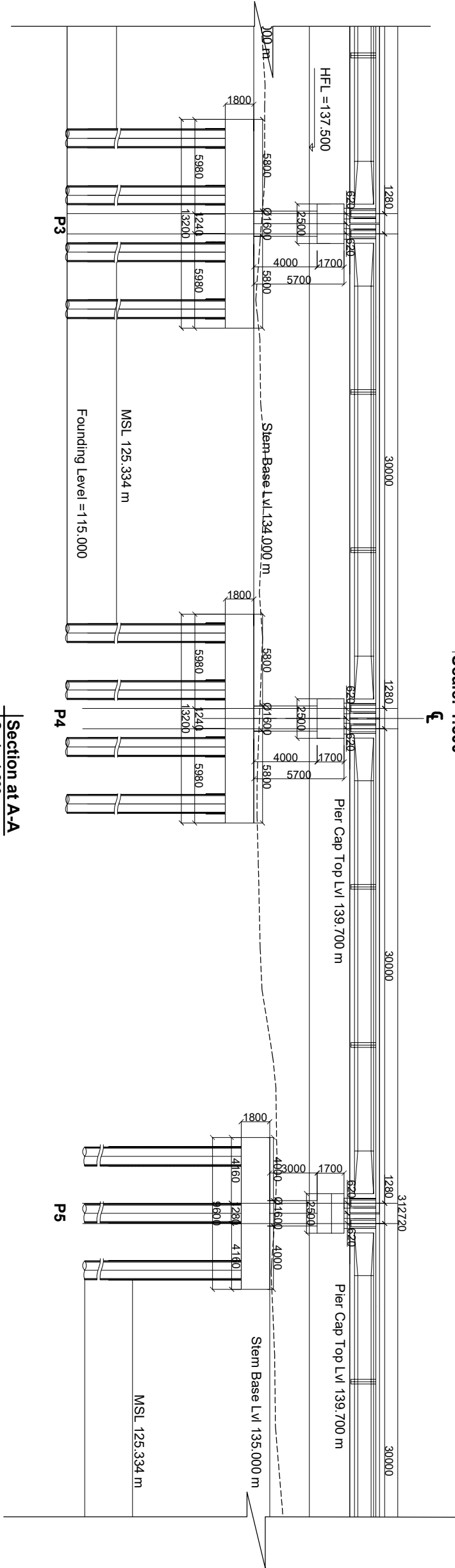


Butwal ←

→ Gorusinghe

Layout Plan

Scale:-1:300



Section at A-A

Scale:-1:300

Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP	CONSULTANT: Soosung Engineering Co. Ltd,  Soosung Engineering Co. Ltd, Korea in association with ERM C P (Ltd) and JYK - Tech Studio of Engineering Nepal		IMPLEMENTING AGENCY:		SHEET TITLE:		SCALE:		NAME		SIGNATURE	REV NO.	DESCRIPTION	DATE: November, 2022 DWG. NO.: 309_Banganga SHEET NO.: (52/61)
	DOR, DCID		ROAD NAME:		Layout Plan of Banganga Bridge (47/H001/309_A)		As Shown		Designed by:		Saroj Bhattacharai			
			East West Highway (H01)						Checked by:		P. Upadhyaya			
	Butwal - Gorusinghe Section								Approved by:		Dr. T.H.Choi			



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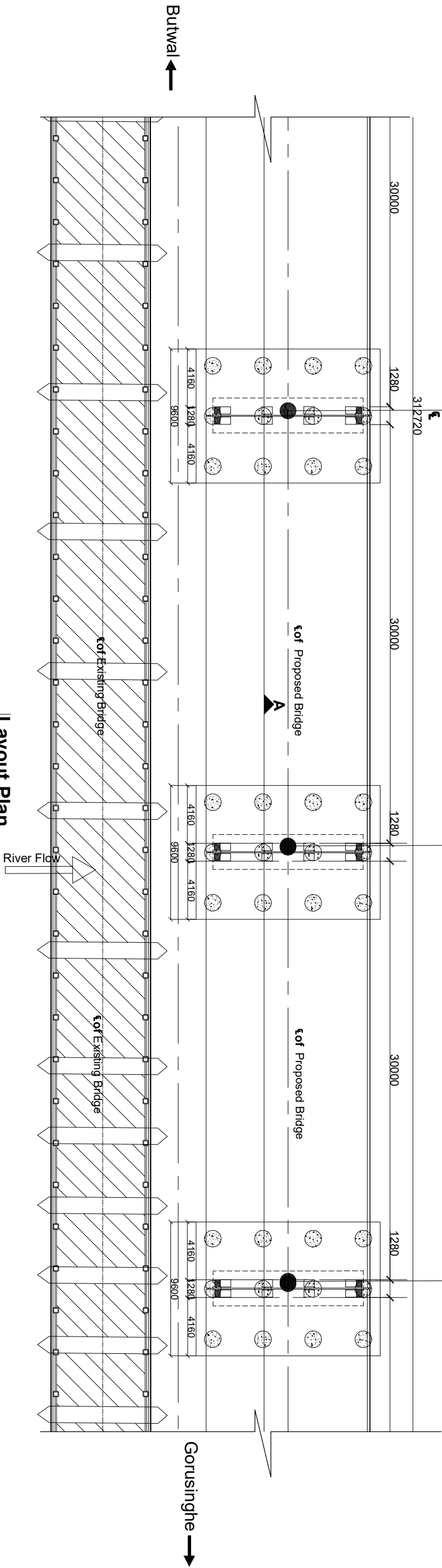
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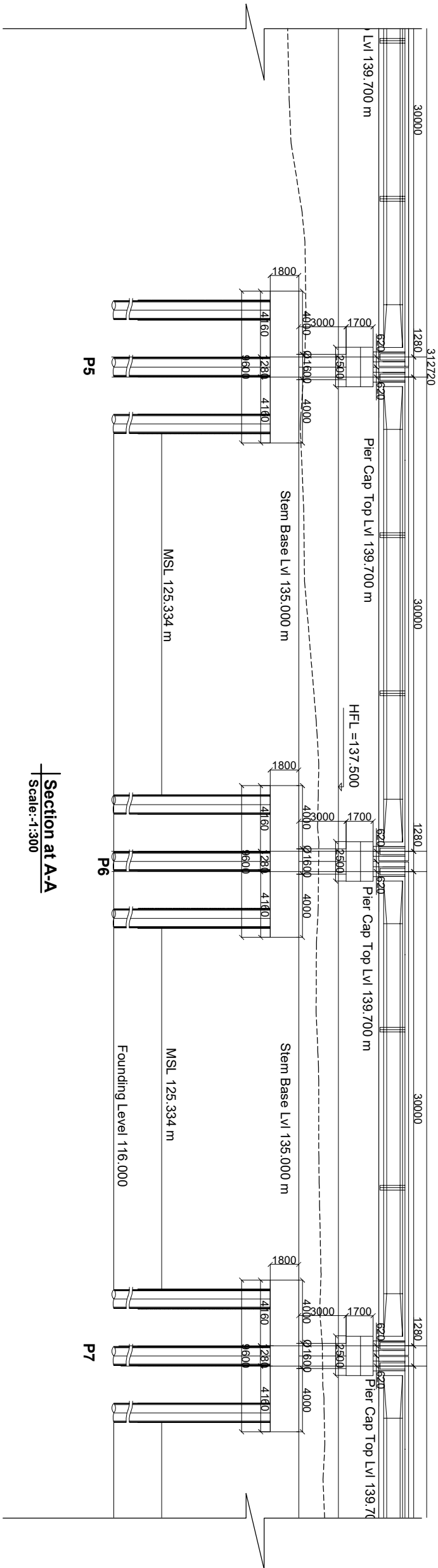
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Pier 7
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P7



Layout Plan
Scale:-1:300



Section at A-A
Scale:-1:300

Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP	CONSULTANT:		IMPLEMENTING AGENCY:		SHEET TITLE:		SCALE:		NAME		SIGNATURE	REV NO.	DESCRIPTION	DATE: November,2022 DWG.NO.: 309_Banganga SHEET NO.: (53/67)
	Soosung Engineering Co. Ltd,		DOR, DCID		Layout Plan of Banganga Bridge (47/H001/309_A)		As Shown		Saroj Bhattacharai					
	In association with ERM P (Ltd) and Jyoti-Tech Studio of Engineering Nepal		ROAD NAME:						Checked by:					
			East West Highway (H01)						P. Upadhyaya					
			Butwal - Gorusinghe Section						Approved by:					

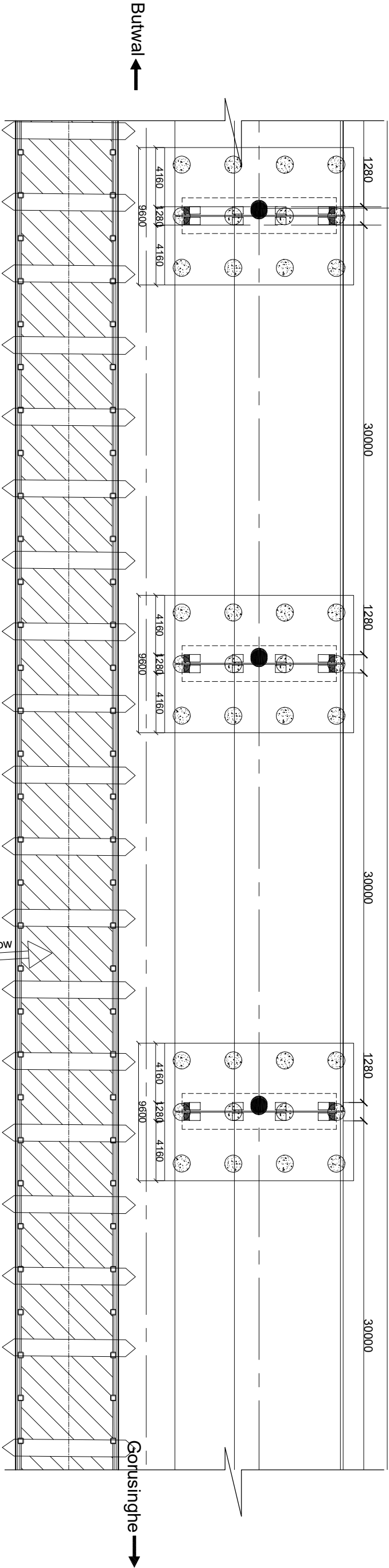
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P7

P8

P9

Right Abut



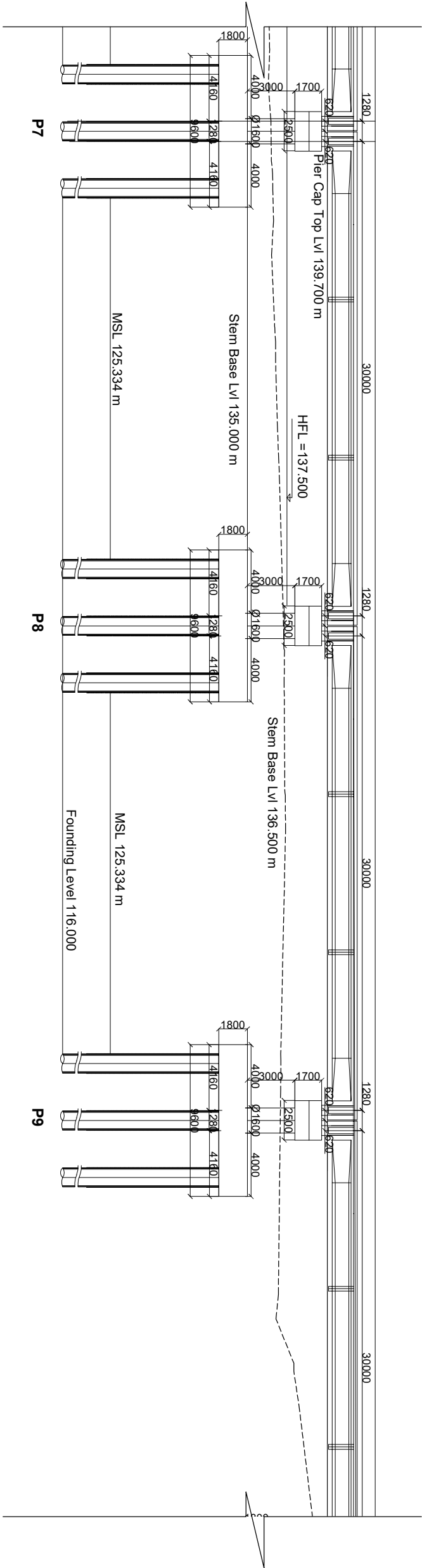
Butwal ←

Gorusinghe →

River Flow

Layout Plan

Scale:-1:300



P7

P8

P9

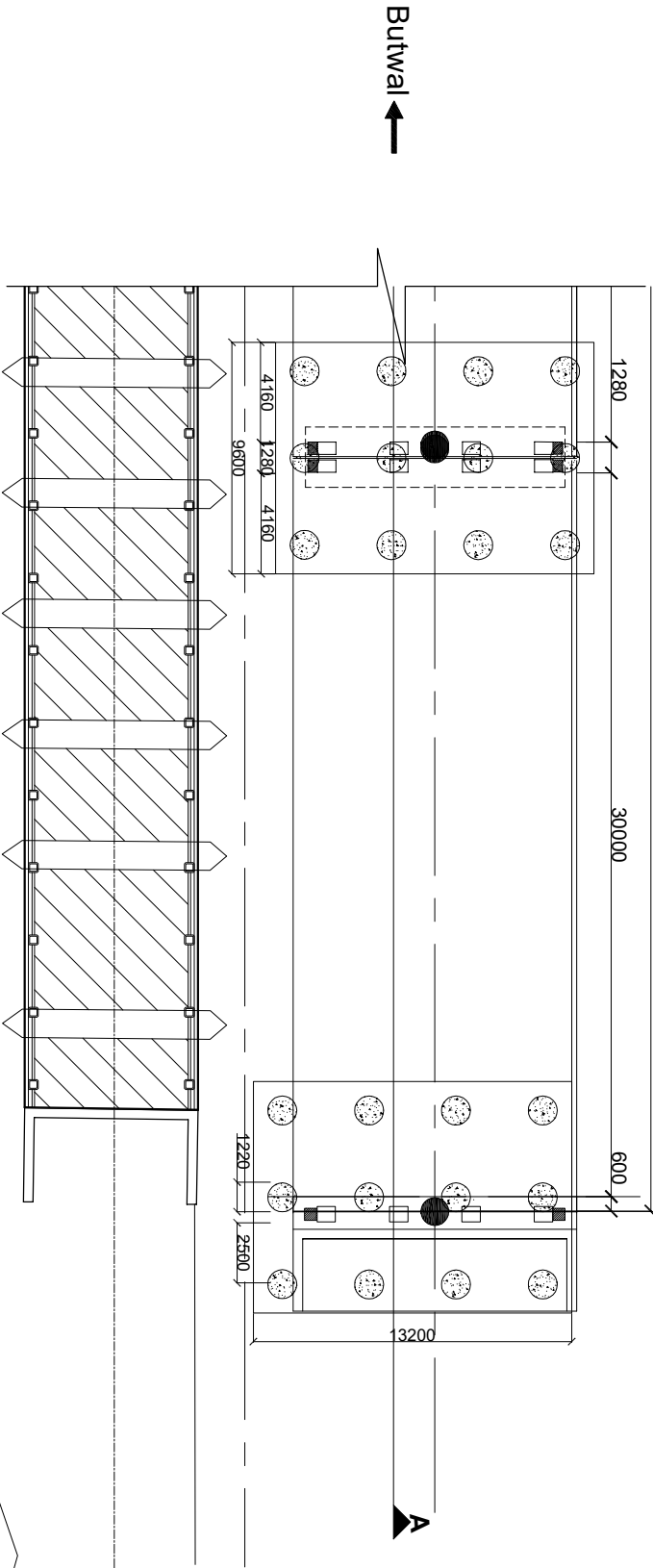
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ROAD NAME: East West Highway (H01)		Butwal - Gorusinghe Section		Designed by: Saraj Bhattacharai		Checked by: P. Upadhyaya		Approved by: Dr. T.H. Choi		DWG.NO.: 309_Banganga		SHEET NO.: (54/61)			



Right Abutment
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P9

Right Abutment

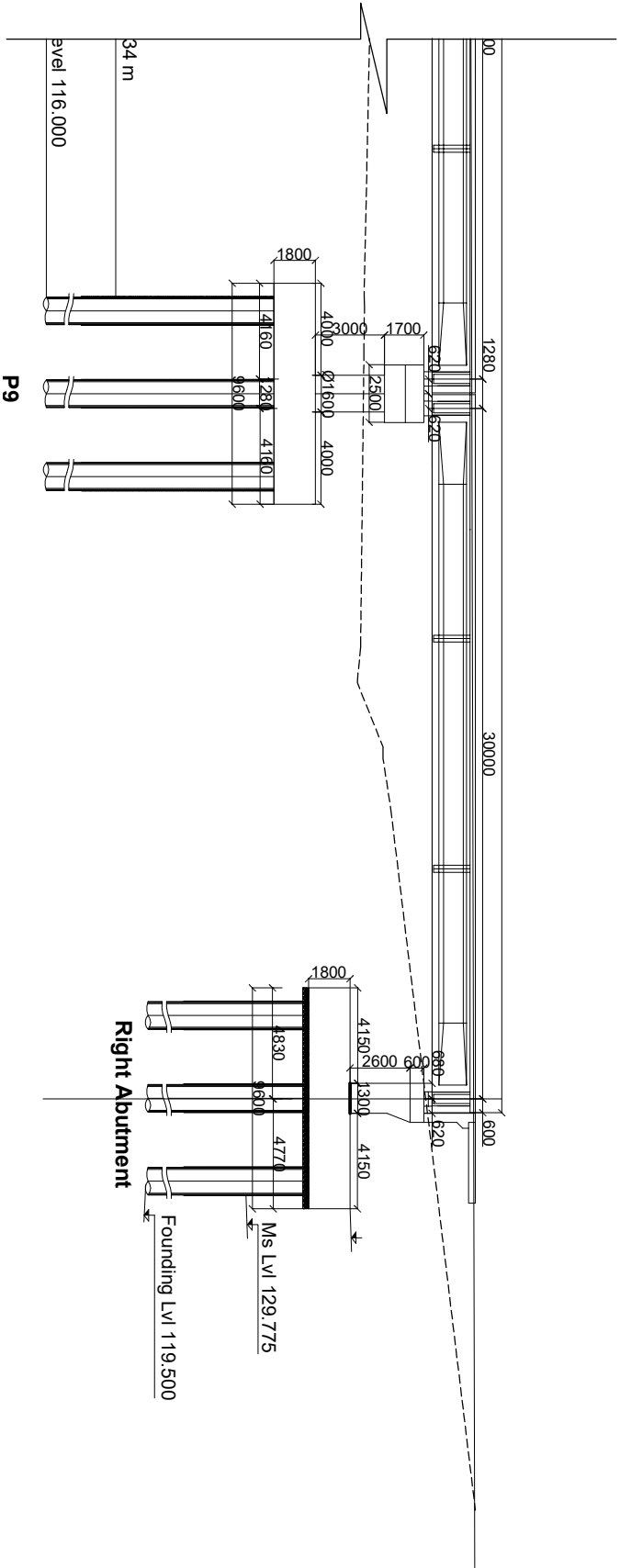


Layout Plan



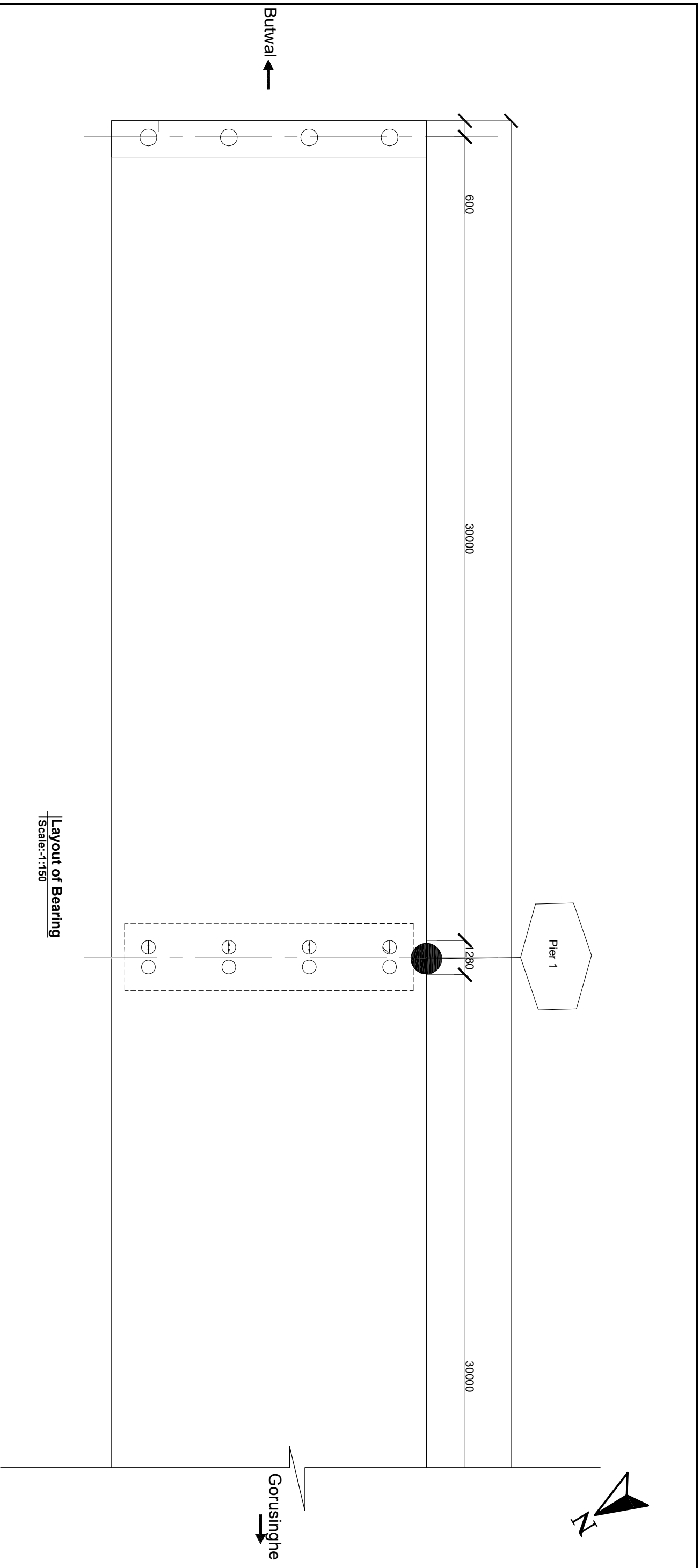
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Scale:-1:300



Right Abutment

Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP	CONSULTANT:  Soosung Engineering Co. Ltd, Korea in association with ERMIC P (Ltd) and  Jyoti-Tech Studio of Engineering Nepal	IMPLEMENTING AGENCY:		SHEET TITLE: Layout Plan of Banganga Bridge (47/H001/309_A)	SCALE: As Shown	NAME	SIGNATURE	REV NO.	DESCRIPTION	DATE: November, 2022
		DOR, DCID								
		ROAD NAME:								
		East West Highway (H01)								
		Butwal - Gorusinghe Section								
		Designed by:	Saroj Bhattarai				DWG.NO.: 309_Banganga			
		Checked by:	P. Upadhyaya							
		Approved by:	Dr. T.H. Choi					SHEET NO.: 		



Legend

Elastomeric bearing.

Partial movement allowed in longitudinal direction.

Restrained to transverse movement. Free to rotate in any direction.

Fixed Pot-bearing.

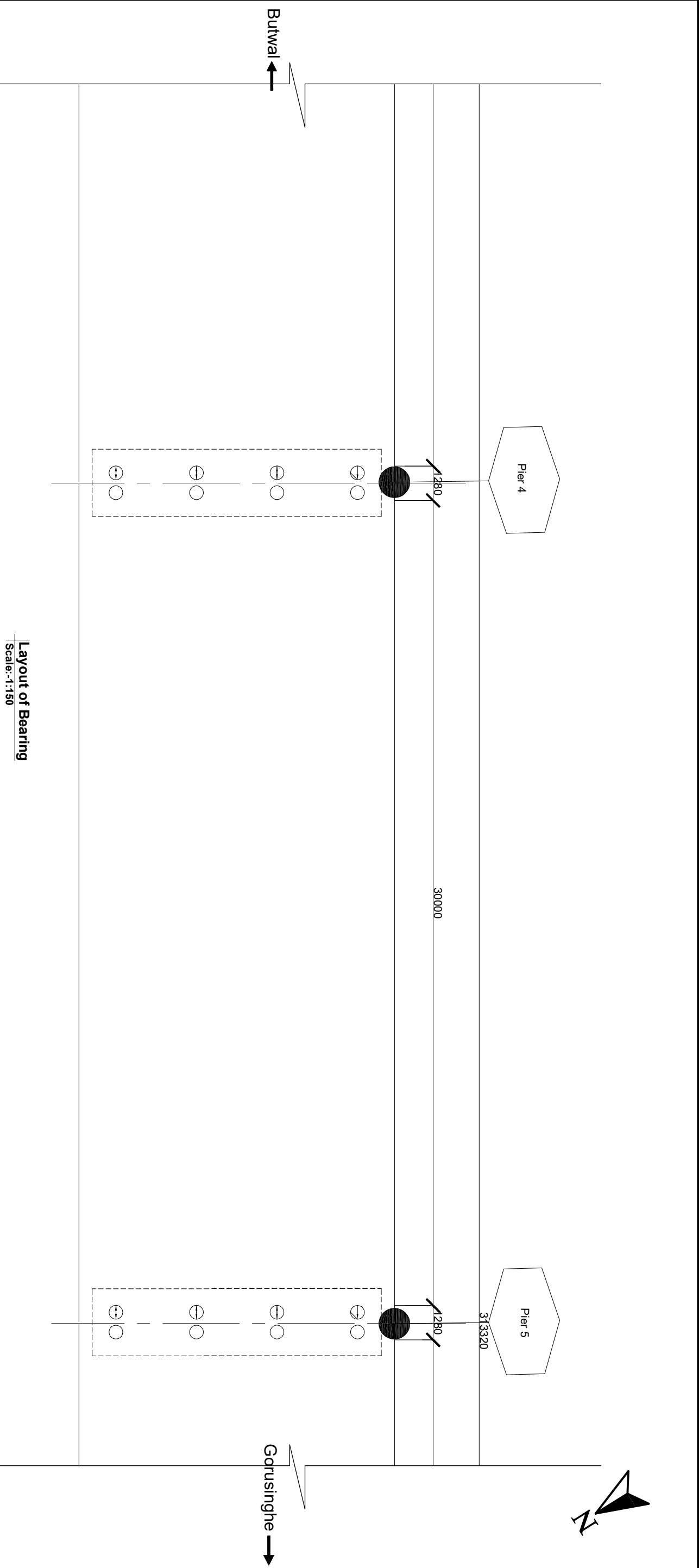
Restrained to lateral movement, Free to rotate in any direction.

Free Pot-bearing.

Partial movement allowed in longitudinal direction.

Restrained to transverse movement. Free to rotate in any direction.

Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP		CONSULTANT:  Soosung Engineering Co. Ltd, Korea in association with ERMCo P (Ltd) and  JSE- Tech Studio of Engineering Nepal		IMPLEMENTING AGENCY:		SHEET TITLE:		SCALE:		NAME		SIGNATURE		REV NO.		DESCRIPTION		DATE:	
				DOR, DCID		Layout Plan of Banganga Bridge (47/H001/309_A)		As Shown		Designed by:								November, 2022	
				ROAD NAME:						Checked by:								DWG.NO.: 309_Banganga	
				East West Highway (H01)						Approved by:								SHEET NO.: 56/61	
				Butwal - Gorurunghe Section						Dr. T.H. Choi									

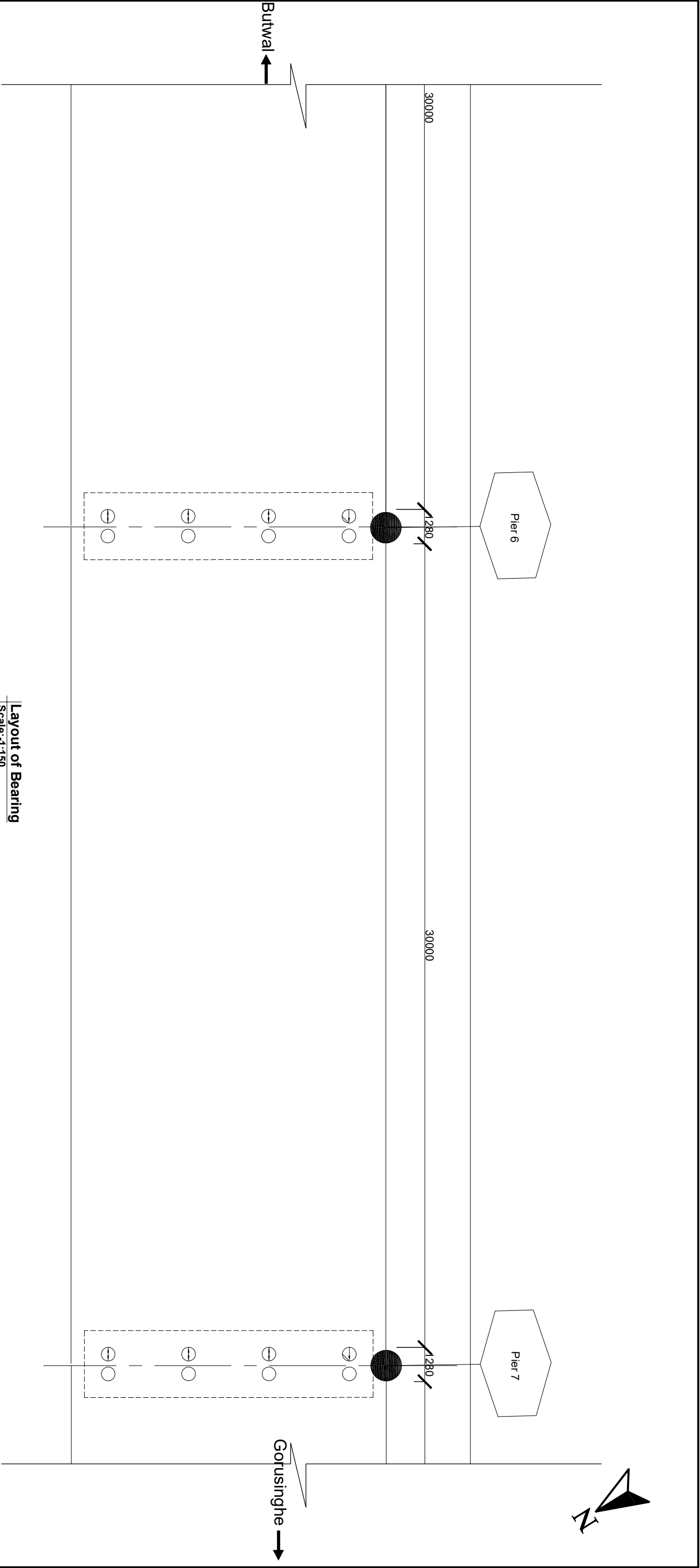


Layout of Bearing
Scale:-1:150

Legend

-  Elastomeric bearing.
Partial movement allowed in longitudinal direction.
Restrained to transverse movement.Free to rotate in any direction.
-  Fixed Pot-bearing.
Restrained to lateral movement,Free to rotate in aney direction.
-  Free Pot-bearing.
Partial movement allowed in longitudinal direction.
Restrained to transverse movement.Free to rotate in any direction.

Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP	CONSULTANT:		IMPLEMENTING AGENCY:		SHEET TITLE:		SCALE:				NAME		SIGNATURE		REV NO.		DESCRIPTION		DATE:		
	Soosung Engineering Co. Ltd. Korea in association with ERM/C P (Ltd) and JYK-Tech Studio of Engineering Nepal		DOR, DCID		Layout Plan of Banganga Bridge (47/H001/309_A)		As Shown		Designed by:		Saroj Bhattacharai								November, 2022		
	ROAD NAME:								Checked by:		P. Upadhyaya								DWG.NO.:		
	East West Highway (H01)								Approved by:		Dr. T.H.Choi								309_Banganga		
	Butwal - Gorusinghe Section																		SHEET NO.:		
																				(58/61)	

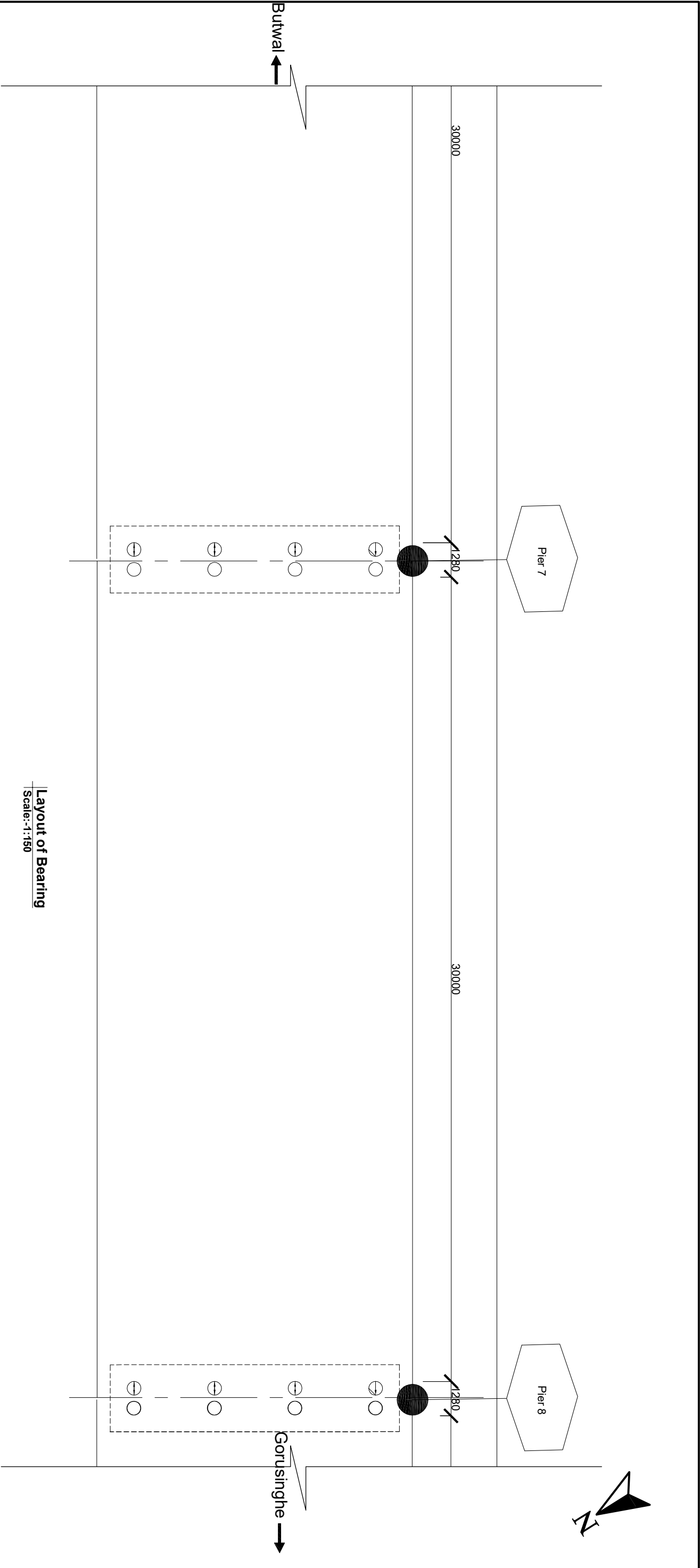


Layout of Bearing
Scale:-1:150

Legend

-  Elastomeric bearing.
Partial movement allowed in longitudinal direction.
Restrained to transverse movement.Free to rotate in any direction.
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Restrained to lateral movement,Free to rotate in aney direction.
-  Free Pot-bearing.
Partial movement allowed in longitudinal direction.
Restrained to transverse movement.Free to rotate in any direction.

Government of Nepal Ministry of Physical Infrastructure and Transport		CONSULTANT:		SHEET TITLE:		SCALE:		DATE:	
Department of Roads		Soosung Engineering Co. Ltd,		DOR, DCID		As Shown		November,2022	
Project Directorate Office (ADB)		Korea		ROAD NAME:		Banganga Bridge		DWG.NO.:	
SASEC Highway Improvement Project-		in association with		East West Highway (H01)		(47/H001/309_A)		309_Banganga	
Project Preparatory Consultant (SHIP-PPC)		ERM/C P (Ltd)		Butwal - Gorusinghe Section				SHEET NO.:	
ADB Loan No. :3722-NEP		and						(59/61)	
		JYK - Tech Studio of Engineering							
		Nepal							

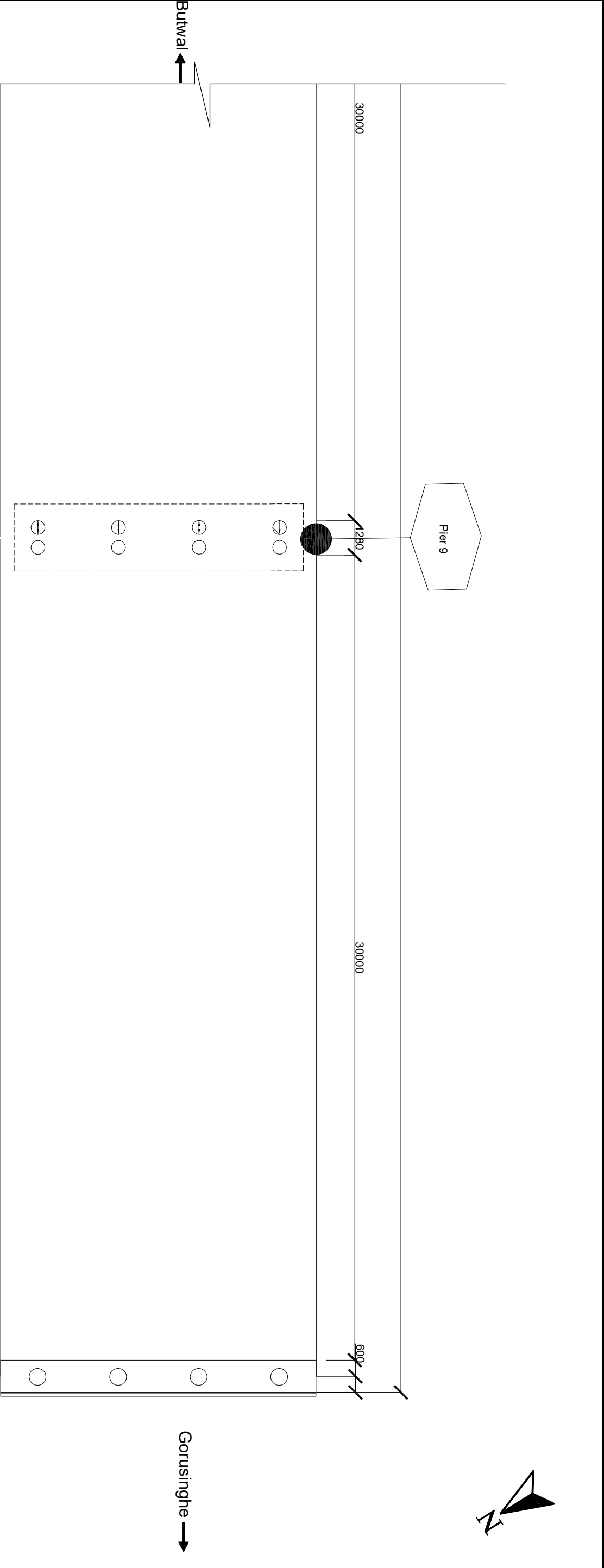


Layout of Bearing
Scale:-1:150

Legend

-  Elastomeric bearing.
Partial movement allowed in longitudinal direction.
Restrained to transverse movement.Free to rotate in any direction.
-  Fixed Pot-bearing.
Restrained to lateral movement,Free to rotate in any direction.
-  Free Pot-bearing.
Partial movement allowed in longitudinal direction.
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Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP		CONSULTANT:  Soosung Engineering Co. Ltd, Korea in association with ERM C P (Ltd) and JYK - Tech Studio of Engineering Nepal		IMPLEMENTING AGENCY: DOR, DCID		ROAD NAME: East West Highway (H01)		SHEET TITLE: Layout Plan of Banganga Bridge (47/H001/309_A)		SCALE: As Shown		NAME		SIGNATURE		REV NO.		DESCRIPTION		DATE: November,2022	
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				Butwal - Gorusinghe Section								Checked by: P. Upadhyaya								SHEET NO.: (60/61)	
												Approved by: Dr. T.H.Choi									



Legend

-  Elastomeric bearing.
Partial movement allowed in longitudinal direction.
Restrained to transverse movement.Free to rotate in any direction.
-  Fixed Pot-bearing.
Restrained to lateral movement,Free to rotate in aney direction.
-  Free Pot-bearing.
Partial movement allowed in longitudinal direction.
Restrained to transverse movement.Free to rotate in any direction.

Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP	CONSULTANT:		IMPLEMENTING AGENCY:		SHEET TITLE:		SCALE:				NAME		SIGNATURE		REV NO.		DESCRIPTION		DATE:	
	 Soosung Engineering Co. Ltd. Korea in association with ERMC P (Ltd) and  JYK Tech Studio of Engineering Nepal		DOR, DCID		Layout Plan of Banganga Bridge (47/H001/309_A)		As Shown		Designed by:		Saroj Bhattacharai								November, 2022	
									Checked by:		P. Upadhyaya								DWG.NO.: 309_Banganga	
									Approved by:		Dr. T.H. Choi								SHEET NO.: (61/61)	
									Butwal - Gorusinghe Section											

Government of Nepal
Ministry of Physical Infrastructure and Transport
Department of Roads
Project Directorate (ADB)
Implementing Agency : DOR, DCID

Project Preparatory Consultants
Under
SASEC Highway Improvement Project (SHIP-PPC)
(ADB Loan No: 3722 Nep)
Contract No. SHIP/PPC/2020/02

Kaila Bridge(47-H001-310_A)

St. Ch : 627+094.18 ~ End Ch : 627+193.82

Detailed Drawing

Butwal - Gorusinghe Sector

November,2022

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5.	Detail of Superstructure.	6	1
6.	Reinforcement Details of Slab.	7	1
7.	Prestressing Details of Main Girder .	8	1
8.	Anchorage Details.	9	1
9.	Untensioned Reinforcement Details of Girder.	10	1
10.	Bar Bending Schedule of Slab & Main Girder.	11	1
11.	Reinforcement Details of Intermediate Cross Girder.	12	1
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13.	Abutment Details.	14	1
14.	Reinforcement Details of Abutment.	15	1
15.	BBS & Reinforcement Detail.	16	1
16.	Reinforcement Details of Abutment Pile.	17	1
17.	Plan of Pier.	18	1
18.	Reinforcement Detail of Pier.	19	1
19.	Reinforcement of Pier.	20	1
20.	Bar Bending of Pier.	21	1
21.	Reinforcement Detail of Approach Slab.	22	1
22.	Miscellaneous Detail.	23-24	2
23.	River Training Work.	25	1
24.	Plan & Profile.	26-27	2
25.	Cross Section.	27a-27b	2
26.	Layout Plan.	28-29	2

GENERAL NOTES

General

- Metric system of measurement is used in all drawings. Elevation and Stations are shown in Meter and all other dimensions are in Millimeters, except indicated otherwise.
- In case of contradictions, specific notes on respective sheet shall supersede the General Notes
- No dimensions shall be scaled from the drawings. Only written dimensions shall be followed. Any doubtful matter in the drawings shall be brought to the attention of the engineer-in-charge for any corrections before the execution of the works.

Design Notes

The design codes followed:
For RCC and PSC concrete - IRC:112-2020
For loads and stresses - IRC:6-2017
For substructure and foundations - IRC:78-2014
For seismic design - IRC:SP:114-2018. Seismic zone V. Importance factor 1.2

Design live loads:

For urban area bridges
Case 1 - 3 lanes of class A + pedestrians; 1 lane of class A + 1 lane of class 70R + pedestrians
Case 2 - 4 lanes or class A; 2 lanes of class A + 1 lane of class 70R. No pedestrians
For non-urban area bridges
Case 1 - 2 lanes of class A + pedestrians; 1 lane of class 70R + pedestrians
Case 2 - 3 lanes of class A; 1 lane of class A + 1 lane of class 70R. No pedestrians.

Notes on Concrete

In General the grade of concrete to be used shall be as follows:

(unless otherwise specified in the respective drawing sheets)

For superstructure deck slab, wearing course, crash barriers:	M30
For raised footpaths:	M25
For main girders and cross girders of superstructure with PSC girders:	M45
For main girders and cross girders of superstructure with RCC girders:	M30
For substructure: Abutment stem, ballast wall, stoppers, bearing pedestals, pier cap, pier stem and pile caps:	M30
For bored and cast in situ piles:	M35
For leveling course:	M15

The maximum size of aggregate shall be as per IRC:112-2020, clause 18.4.4.2

Admixture to the concrete

To improve workability and/or increase initial setting time of concrete and cement grout, admixture conforming to IS:9103 and ASTM C-494, (Type F - High Range Water Reducing admixture) can be added in appropriate dosage, subject to their satisfactory proven use.

Clear Cover to reinforcement (unless otherwise specified in the respective drawing sheets)

Reinforcement bars of all components of the superstructure:	40mm
Prestressing ducts or strands in superstructure:	75mm

All components of abutment, pier, pile caps and piles

(except stoppers and bearing pedestals): 75mm

Bearing pedestals and Stoppers: 50mm

Cover shall be ensured with the use of properly sized cement concrete blocks which can be secured to the re-bars or other devices approved by the engineer-in-charge. Use of loose stones or wooden pieces is not permitted.

Notes on Reinforcement

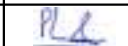
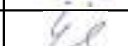
- All reinforcing steel bars shall be High Strength Deformed bars with grade Fe500 conforming to IS:1786
- Laps and Splices shall conform to IRC:112-2020, Clause 15.2.5. Use of mechanical coupler is permitted upon approval by the engineer.

Notes on Prestressing

- Prestressing strands shall be Class-2, uncoated 7 ply, low relaxation type with ultimate tensile stress 1862 N/mm², conforming to IS:14268.
- The diameter of strands, their number in a tendon and the total jacking force to be applied is specified in the respective drawing sheet. All the initial and long term losses are already incorporated in design.
- Corrugated HDPE Sheathing ducts shall be used with the minimum internal diameter not less than three times the cross sectional area of the tendon. The wall thickness and other properties of the sheathing shall be as per IRC:112-2020, clause 13.4.3
- The specified profile and the alignment of the ducts shall be strictly maintained by properly securing the ducts to the re-bars. If required, pieces of re-bars can be added or the re-bars slightly repositioned or bent to maintain the profile and alignment, with approval of the engineer-in-charge.
- The jacking equipment shall be fitted with appropriate force measuring device and shall be regularly checked and calibrated as prescribed by the manufacturer.
- Jacking shall be done from both ends simultaneously and gradually, recording the elongation both sides. The expected final elongation mentioned in the respective drawings sheet is based on modulus of elasticity of the strands (Es) equal to 1.95x10⁵ MPa. If the Es of supplied strands is different then the elongation values shall be recalculated by multiplying the Design values of elongation by the ratio of Design Es / Actual Es.
- In case the total elongation is not achieved at the prescribed jacking force, the jacking operation can be continued until the force reaches the maximum allowable value. If the required elongation is achieved at jacking force lower than the prescribed value, the jacking operation shall continue until the prescribed force is reached, provided the Sum of the additional elongations thus achieved is not more than 5% of the sum of the prescribed elongations.
- In adverse condition to any of the cases above, the jacking operation shall be stopped, the tendons removed and this matter reported to the engineer-in-charge for further instruction. The jacking force should NEVER exceed the Maximum allowable value.

Grouting

- The tendons which satisfy the above conditions shall be grouted properly, ensuring the duct is free of any foreign material and there is no leak or damage around the joints between the anchors and the ducts. Grouting can be normally done immediately after successful completion of tensioning operations and shall not be delayed by more than 5 days of tensioning of the cables.
- The grout shall be prepared with Ordinary Portland cement with suitable expansive admixture approved by the engineer. Admixture containing chloride and nitrate are not permitted. The water/cement ratio shall not be more than 0.48. Retempering of the grout shall not be permitted. The grout shall be mixed with mechanical mixers and shall be continuously kept agitated until pumped in.

Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP	CONSULTANT:	IMPLEMENTING AGENCY:	SHEET TITLE:	SCALE:		NAME	SIGNATURE	REV NO.	DESCRIPTION	DATE:
	 Soosung Engineering Co. Ltd, Korea in association with  ERM P (Ltd), Nepal and  JPE-Tech Studio of Engineering	DOR, DCID	General Notes of Kaila Bridge (47/H001/310_A)	As Shown	DESIGNED BY:	Saroj Bhattarai				November,2022
		ROAD NAME:			CHECKED BY:	P. Upadhyaya				DWG.NO.:
		East West Highway (H01)			APPROVED BY:	Dr. T.H.Choi				310_Kaila
		Butwal - Gorusinghe Section								SHEET NO.:
										01/29

Stages and sequence of prestressing

- The Precast composite girders shall be prestressed in two stages **Unless otherwise prescribed in the respective drawing sheets**. The specified number of the tendons shall be tensioned in the prescribed sequence shown in the respective drawing sheet.
- The remaining tendons shall be tensioned after specified days after casting of the deck slab, in the sequence shown in the respective drawing sheet.
- The prestressing of the precast girder shall be started only after confirming that the cube specimen has achieved 100% of the prescribed compressive strength. No early prestressing allowed.

Construction methodology and sequence for Precast Prestressed Composite superstructure

- The main girders are be precast near the bridge site at suitable location (approach road or dry river bed, if available) on well prepared casting yard. The choice of location also depends upon the equipment available for lifting or launching the girders. After completion of the prestressing works the girders are either lifted by suitable cranes or pushed/launched with the help of rails and jacks or launching girders and placed carefully over the already completed substructure. Care shall be taken that all the preparatory works for the bearings are done properly before the launching/placing of the girders.
- Lifting shall be done only by the hooks provided at both ends. In case of jacking the jacking points shall be only just under the location of the hooks. No support, lifting or jacking is allowed at any other section of the girder
- After placing all the main girders and finishing the works on the bearings, the formwork for deck slab and cross girders are prepared. All the formwork for deck slab and cross girders shall be supported by the main girders. The main girders shall remain **un-propped** during casting of the deck slab. Similarly there shall be no false-work or props from the ground or part of substructure during casting of the deck slab.
- The Contractor shall ensure stability of the girders during all stages of construction.
- Dimensional tolerances for the precast girders shall be as per IRC:SP:71-2018, Clause 4.10. If not prescribed otherwise, transportation and handling operation shall follow the guidelines in Clause 4.9 of the same documents.
- The prescribed time-line for construction of the superstructure with **multi-stage prestressing** is as follows.

Prestressing of Precast Girder only (Stage 1)	After 28 days of casting or confirming 100% compressive strength of concrete
Lifting/Launching of the Girder	Within 14 days of first stage prestressing
Casting of the Deck Slab	Within 14 days of placing of girder over substructure
Casting of Footpath, Crash Barrier, Wearing Course etc	Preferably within 7 days but not later than 14 days of Second stage prestressing

Construction methodology for Cast-in-situ RCC superstructure

- Construction of Monolithic cast in situ RCC superstructure shall follow the standard practices. The falsework for the girders and deck slab are supported on the ground and removed after specified time

Notes on Bearings

- The contractor shall supply, provide and install the bearings designed according to the loadings and other relevant information provided in the drawings or BOQ.
- The dimension and number of layers of the Elastomeric bearings shown in the drawings are tentative. The bearings shall be designed, fabricated, tested and installed as per IRC:83 - 2018, Part-2 for elastomeric bearing and Part-3 for Pot-PTFE bearings, as the case applies.

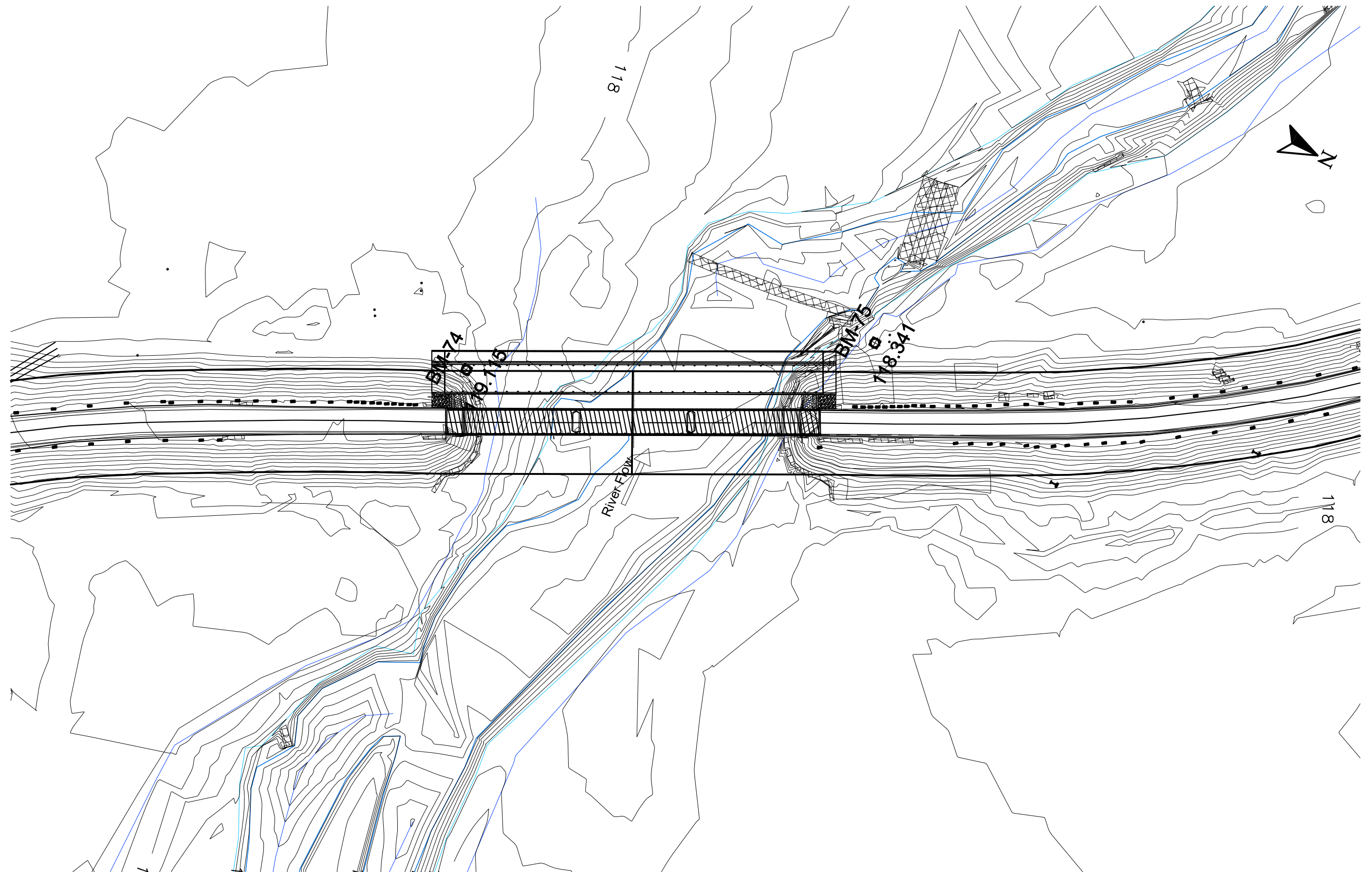
Notes on Foundation and Substructure

- Standard Specifications and Special provisions to the Standard Specifications (if any) and specific notes on the drawings shall be followed for the construction of the abutments, piers and foundations.
- Backfill behind the abutment shall be places only after the concrete has achieved full 28 days strength. Heavy compaction equipment weighing more than 10 Ton shall not be used within 2.0 meters from the back of the abutment until all the works on superstructure is completed.
- The graded backfill behind the abutment shall be at a slope not steeper than 62 degrees, starting from the back of the footing. The back fill material dry density shall be within 1900 to 2200 kN/m³ and moisture content between 9 to 15%
- In case of new bridge adjacent to the existing bridge, care shall be taken not to render any damage to the elements of the existing bridge. Particular attention shall be paid to the foundation of the existing bridge. The contractor shall ensure that excavation for the foundation of the new bridge does not cause instability or settlement of the foundation of the existing bridge.
- If the existing bridge has a shallow foundation, the contractor shall protect the existing foundation by sheet piling or any other suitable means to the satisfaction of the engineer, before excavating for the foundation of the new bridge.

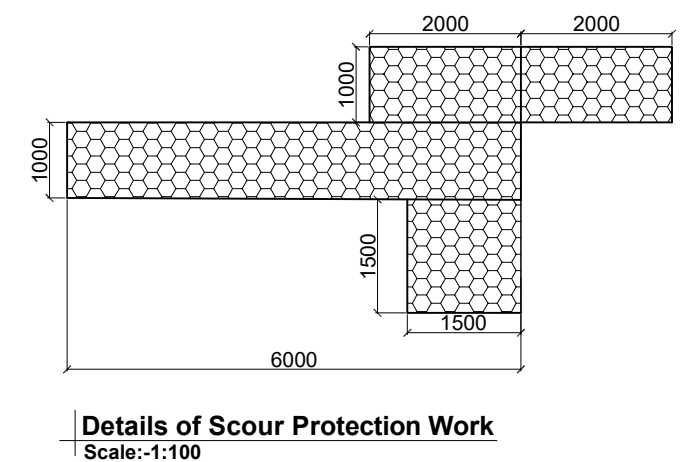
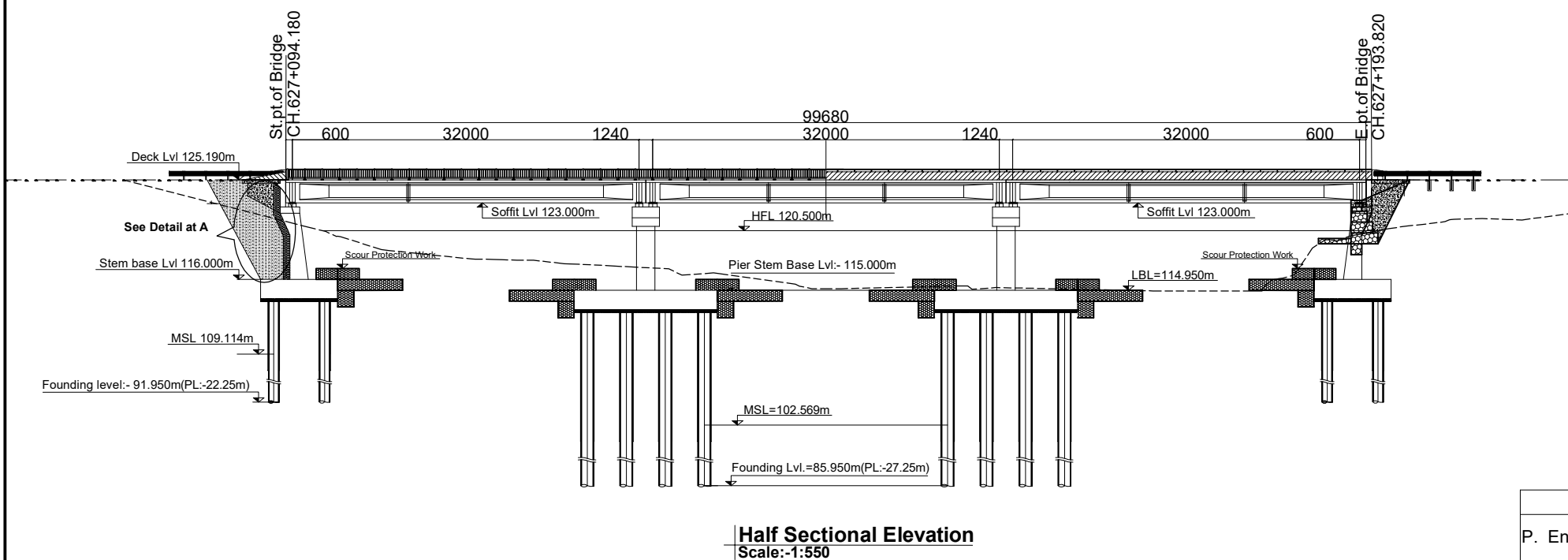
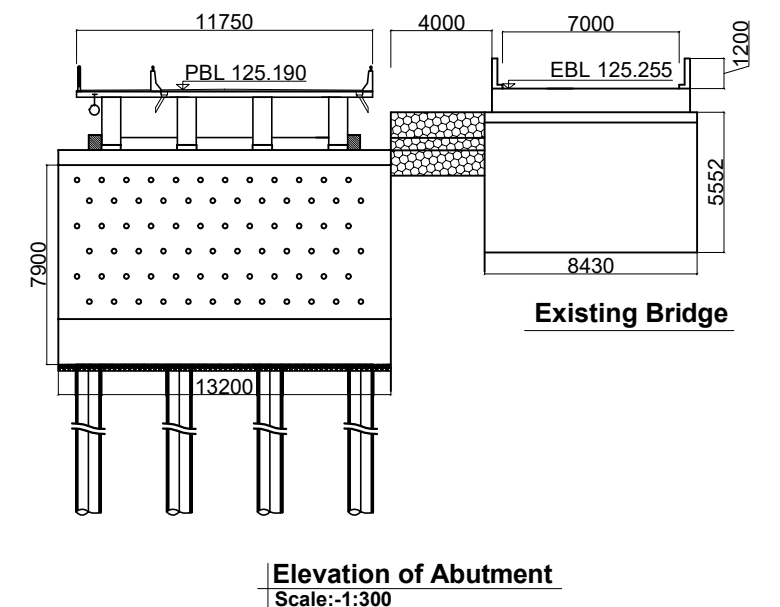
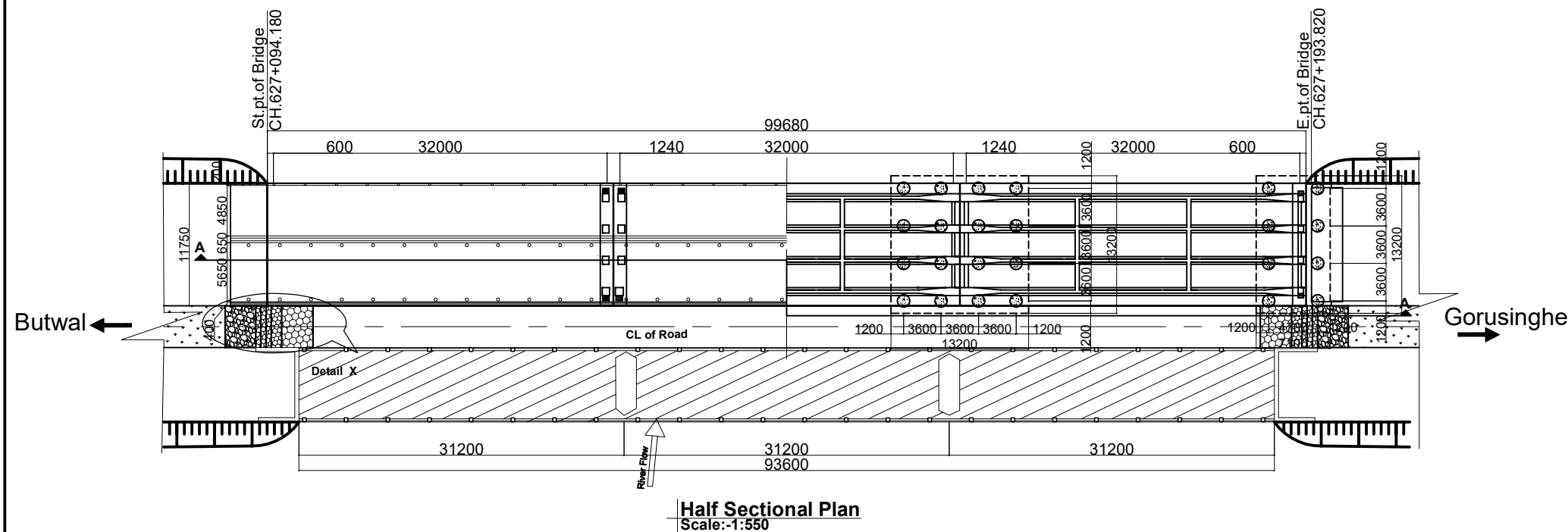
General Note: (For all Pile Foundation)

- Drilling/Boring works for pile is allowed only with rotary or oscillator type drilling equipment.No percussion method is allowed .Stability of borehole shall be ensured by the use of temporary casing.Use of other methods of borehole stability is subject to approval by the engineer, but in such case use of water/air/chemical jetting for boring process shall not be allowed.
- In case of drilling/boring without temporary casing,the contractor should ensure the stability and uniformity of the borehole before lowering the reinforcement cage and during concreting.
- Boring/Drilling of the piles is preferred in a staggered pattern.Boring/Drilling for any pile shall not commence before 24 hours of completion of concreting of any pile within a radius of 6 meters from its center.
- In case of drilling/boring without temporary casing , the pile shall be lined with 6mm thick permanent casing from the bottom of the pile cap down to 0.5 m below the maximum scour depth or 1.5 m whichever is larger.

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					DESIGNED BY:	Saroj Bhattarai				DWG.NO.: 310_Kaila
					CHECKED BY:	P. Upadhyaya				SHEET NO.: 02/29
					APPROVED BY:	Dr. T.H.Choi				



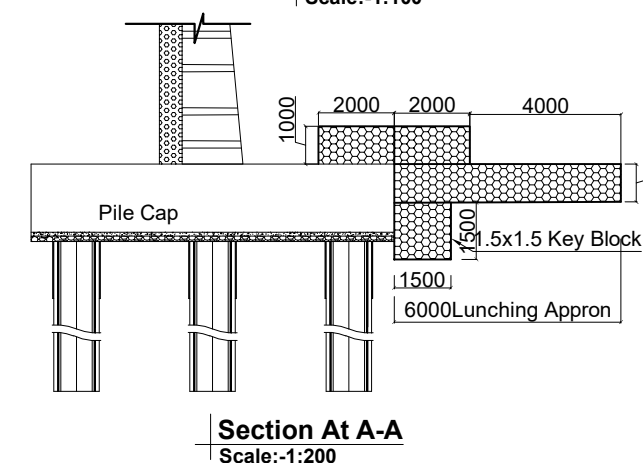
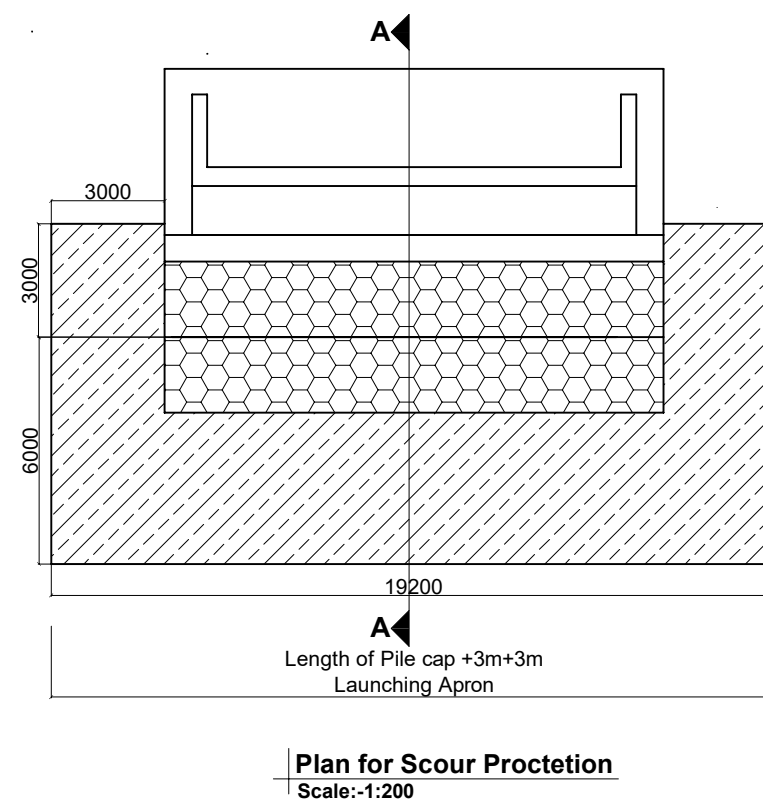
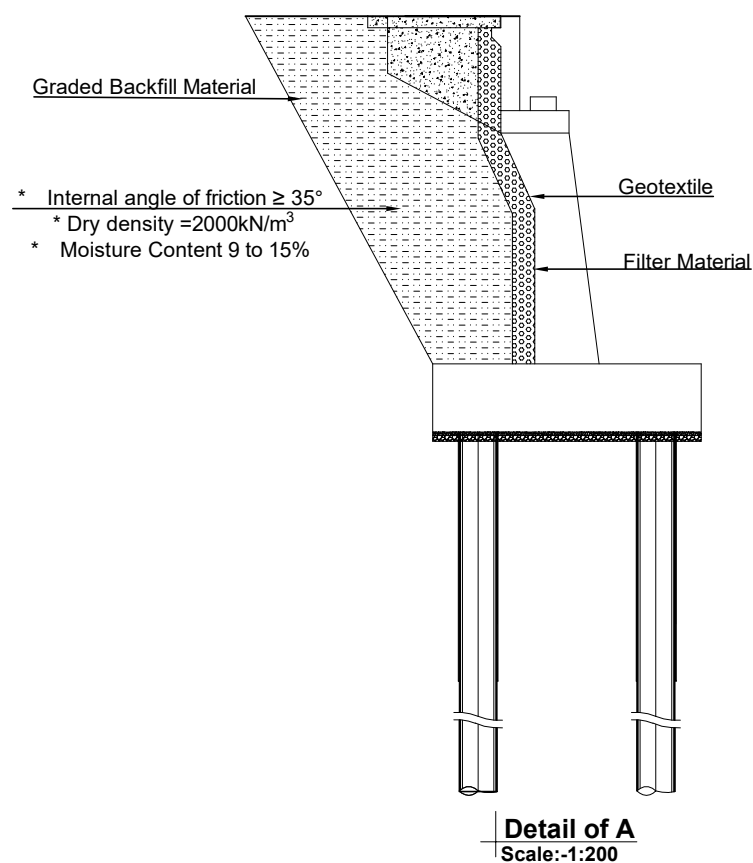
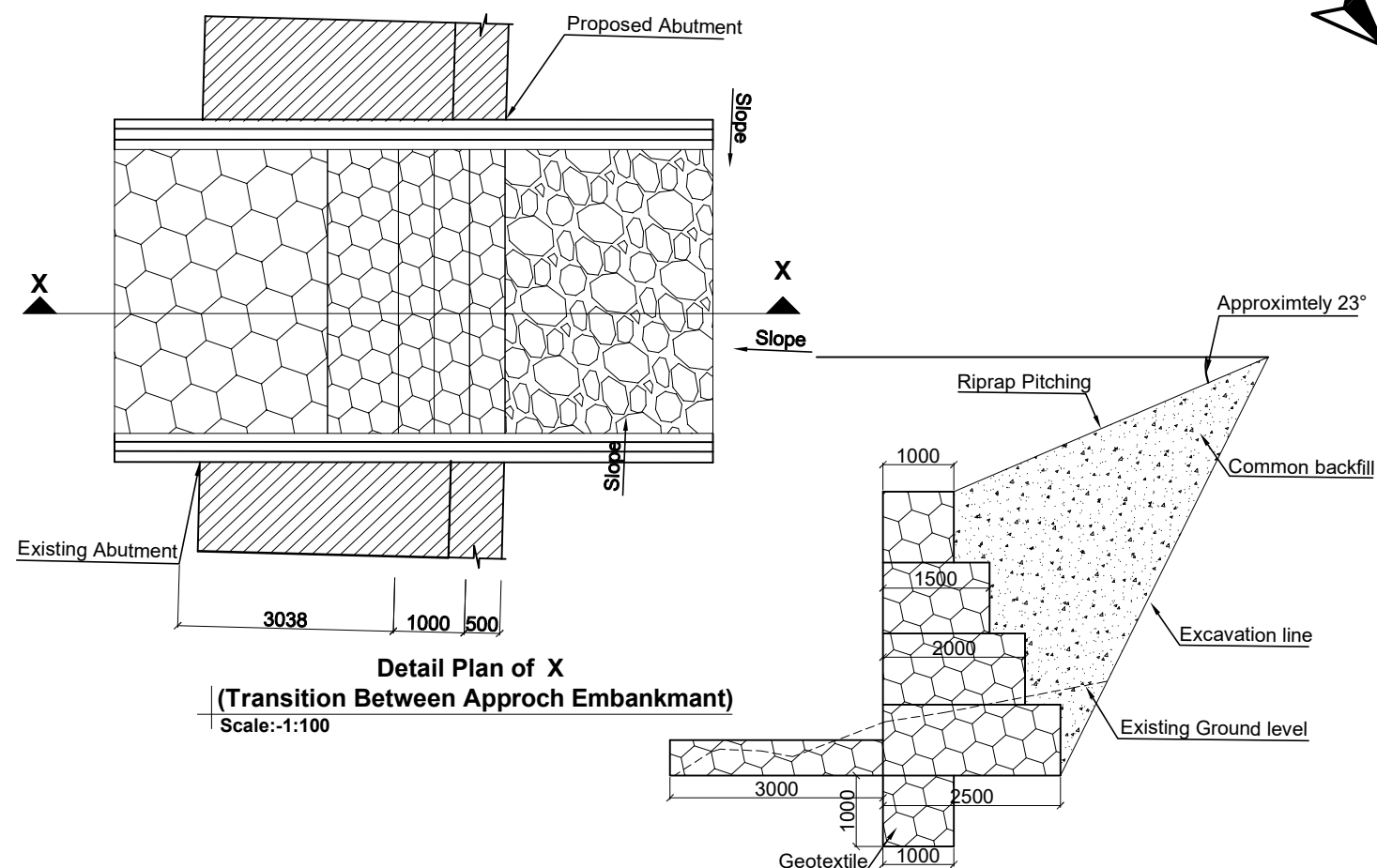
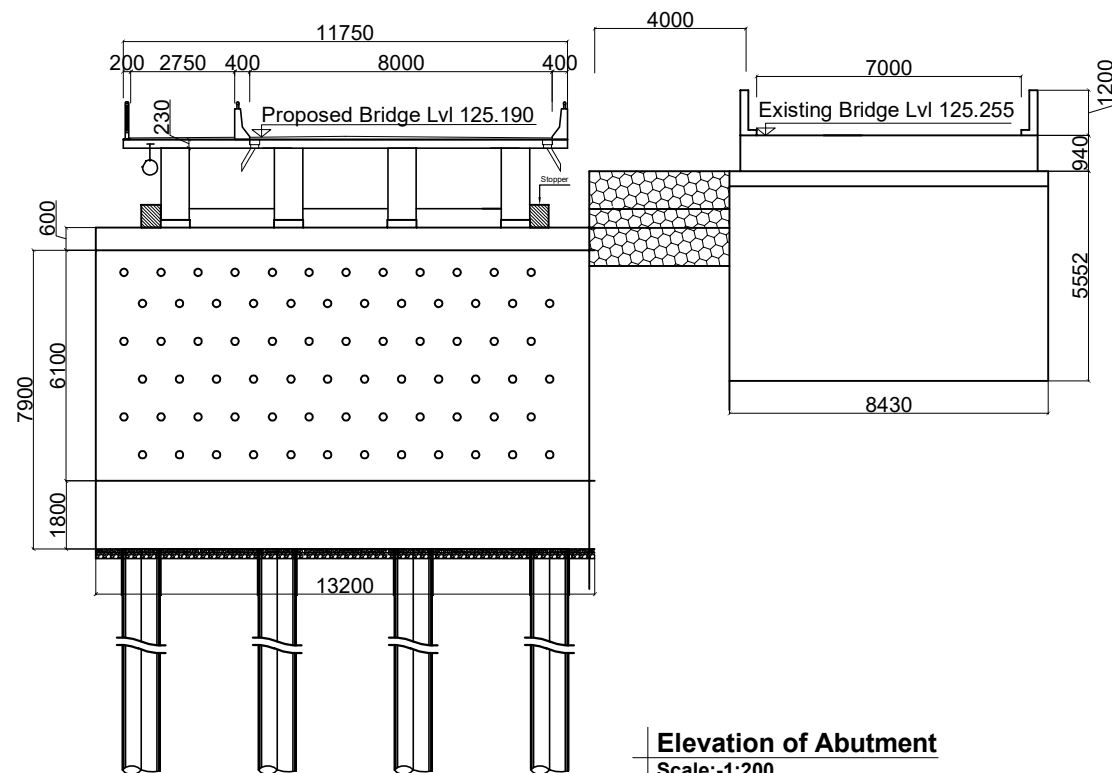
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	 Soosung Engineering Co. Ltd, Korea in association with ERM P (Ltd) and  TSE-Tech Studio of Engineering Nepal	DOR, DCID	Topographic Map of Kaila Bridge (47/H001/310_A)	1:1		Designed by:	Saroj Bhattarai				November , 2022	
		ROAD NAME:				Checked by:	P. Upadhyaya				DWG.NO.:	310_Kaila
		East West Highway (H01)				Approved by:	Dr. T.H.Choi				SHEET NO.:	2.1/29
		Butwal - Gorusinghe Section										



Notes:-
HFL= High Flood Level
MSL =Maximum Scour Level
LBL =Lowest Bed Level
SBL =Stem Base Level
PSBL =Pier Stem Base Level
FL =Founding Level
PL =Pile Length

	Name(NEC Number)	Signature
P. Engineer	P. Upadhyaya (Civil A 675)	
Structure Engineer	K.P.Wagle(Civil A 127) / P.Shrestha(Civil A 676) / S.Bhattarai (Civil A 904)	
Hydrologist	Dr. P.C. Jha(Civil A 166) / S. Adhikari (Civil A 408)	
Geotechnical Engineer	A. Adhikari(ka 199) / Dr. V . R. S. Shahi	

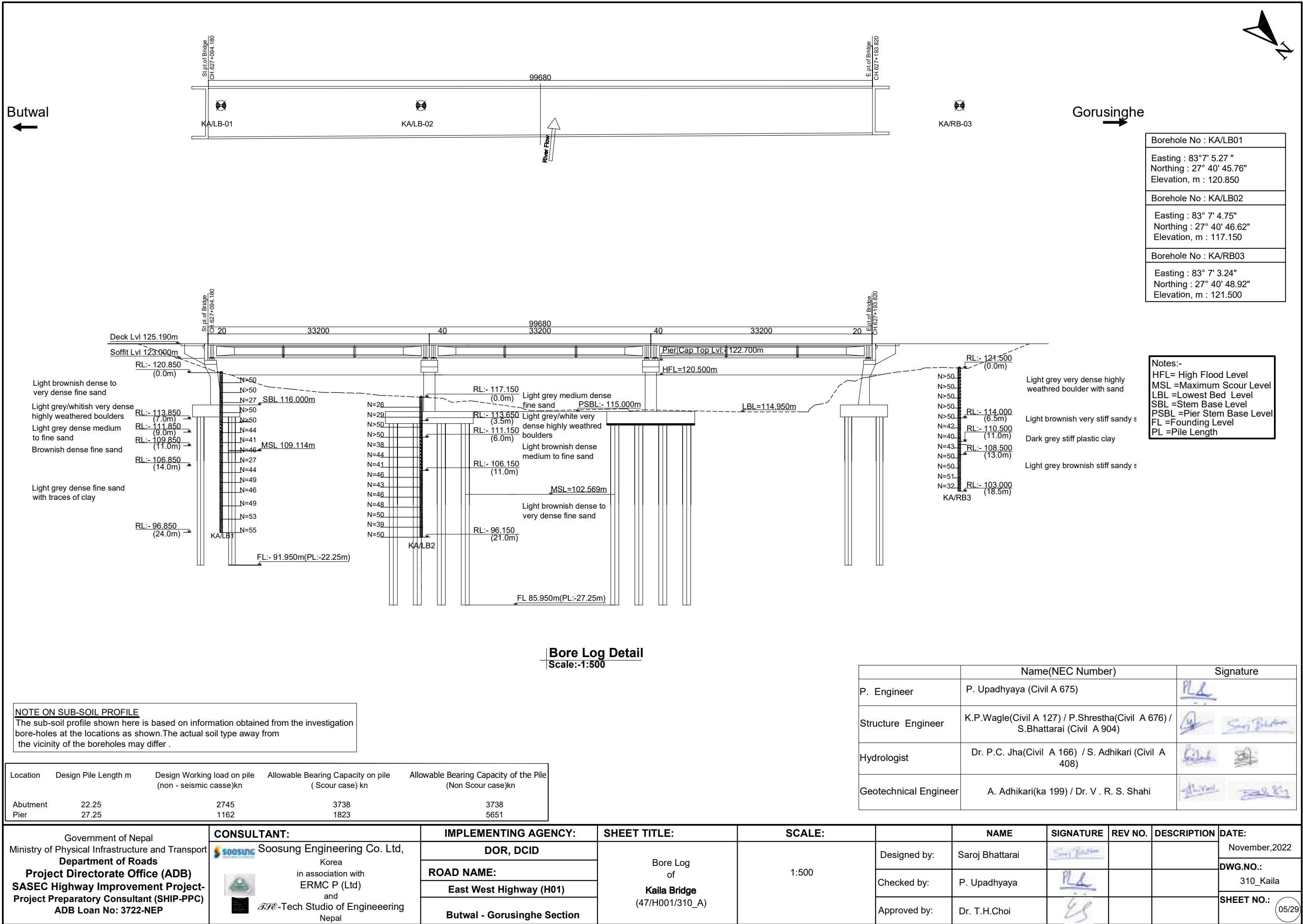
Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP	CONSULTANT:		IMPLEMENTING AGENCY:	SHEET TITLE:	SCALE:		NAME	SIGNATURE	REV NO.	DESCRIPTION	DATE:
	 Soosung Engineering Co. Ltd, Korea in association with  ERM P (Ltd) and  JPE-Tech Studio of Engineering Nepal	DOR, DCID	General Arrangement of Kaila Bridge (47/H001/310_A)	As Shown	Designed by:	Saroj Bhattarai					November,2022
		ROAD NAME:			Checked by:	P. Upadhyaya					DWG.NO.:
		East West Highway (H01)			Approved by:	Dr. T.H.Choi					310_Kaila
		Butwal - Gorusinghe Section									SHEET NO.:
											03/29

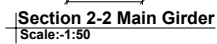
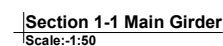
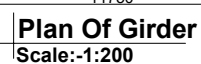
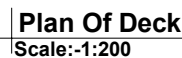


	Name(NEC Number)	Signature
P. Engineer	P. Upadhyaya (Civil A 675)	
Structure Engineer	K.P.Wagle(Civil A 127) / P.Shrestha(Civil A 676) / S.Bhattarai (Civil A 904)	 
Hydrologist	Dr. P.C. Jha(Civil A 166) / S. Adhikari (Civil A 408)	 
Geotechnical Engineer	A. Adhikari(ka 199) / Dr. V . R. S. Shahi	 

Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP	CONSULTANT:		IMPLEMENTING AGENCY:	SHEET TITLE:	SCALE:		NAME	SIGNATURE	REV NO.	DESCRIPTION	DATE:
	 Soosung Engineering Co. Ltd, Korea in association with ERMC P (Ltd) and TTE-Tech Studio of Engineering Nepal	DOR, DCID		General Arrangement of Kaila Bridge (47/H001/310_A)	As Shown	Designed by:	Saroj Bhattarai				November,2022
		ROAD NAME:				Checked by:	P. Upadhyaya				DWG.NO.:
		East West Highway (H01)				Approved by:	Dr. T.H.Choi				SHEET NO.:
		Butwal - Gorusinghe Section									

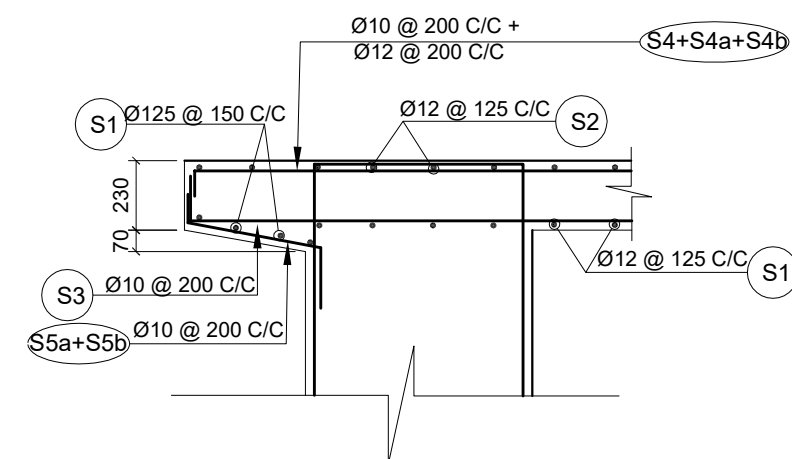
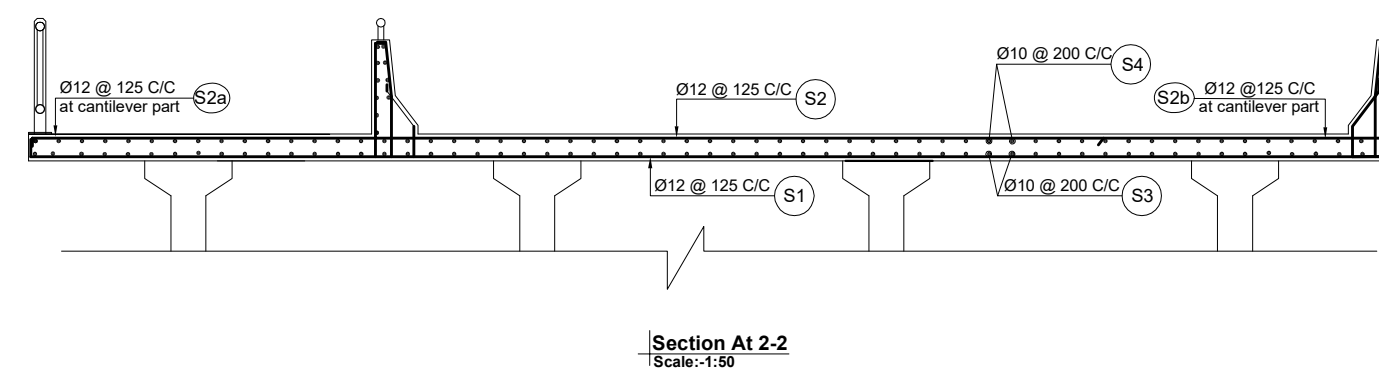
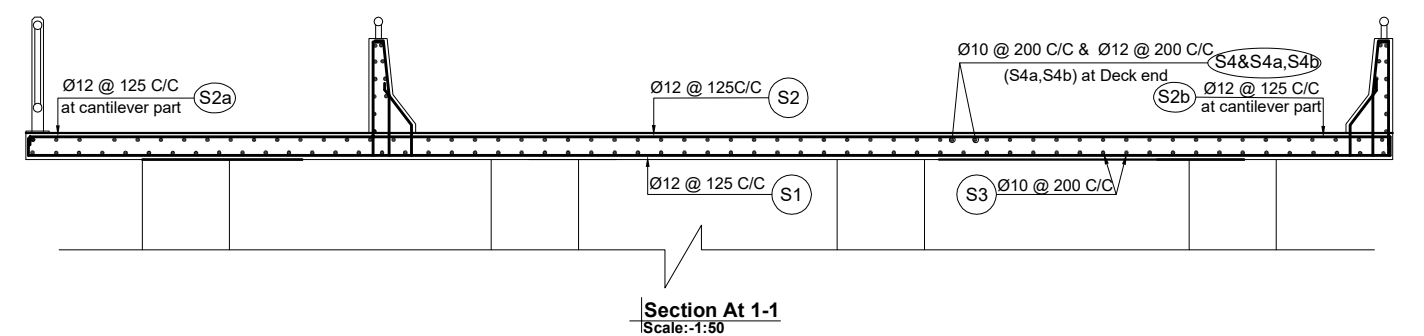
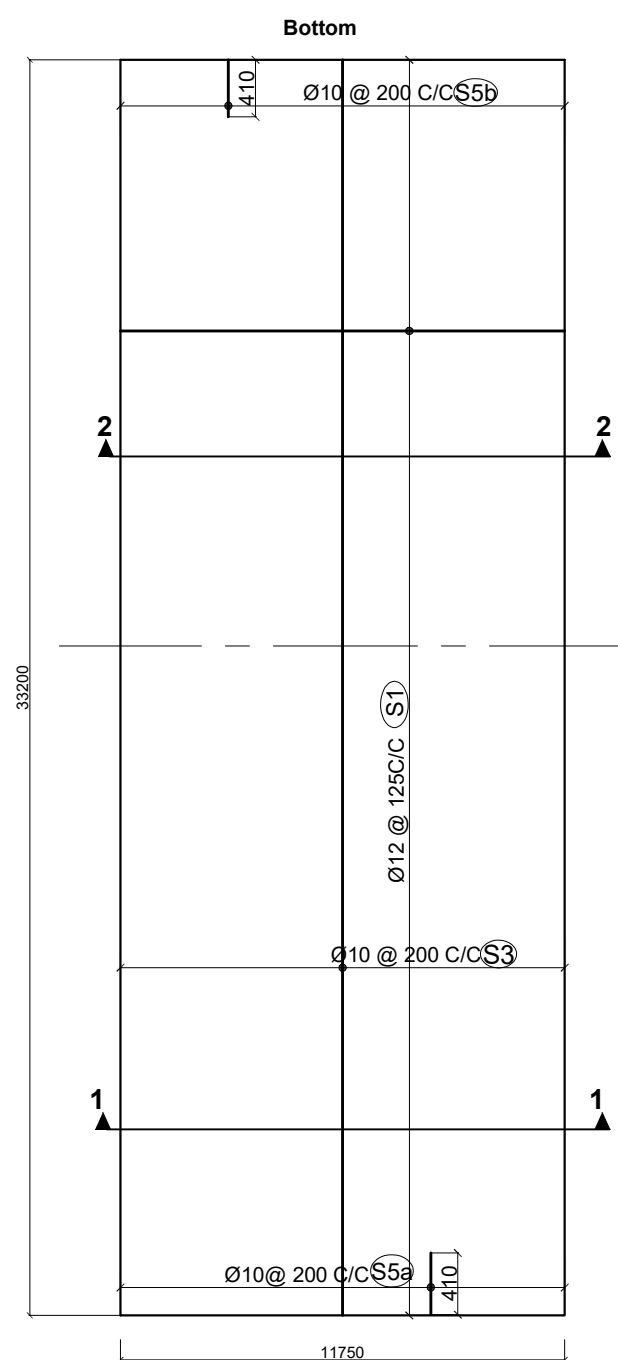
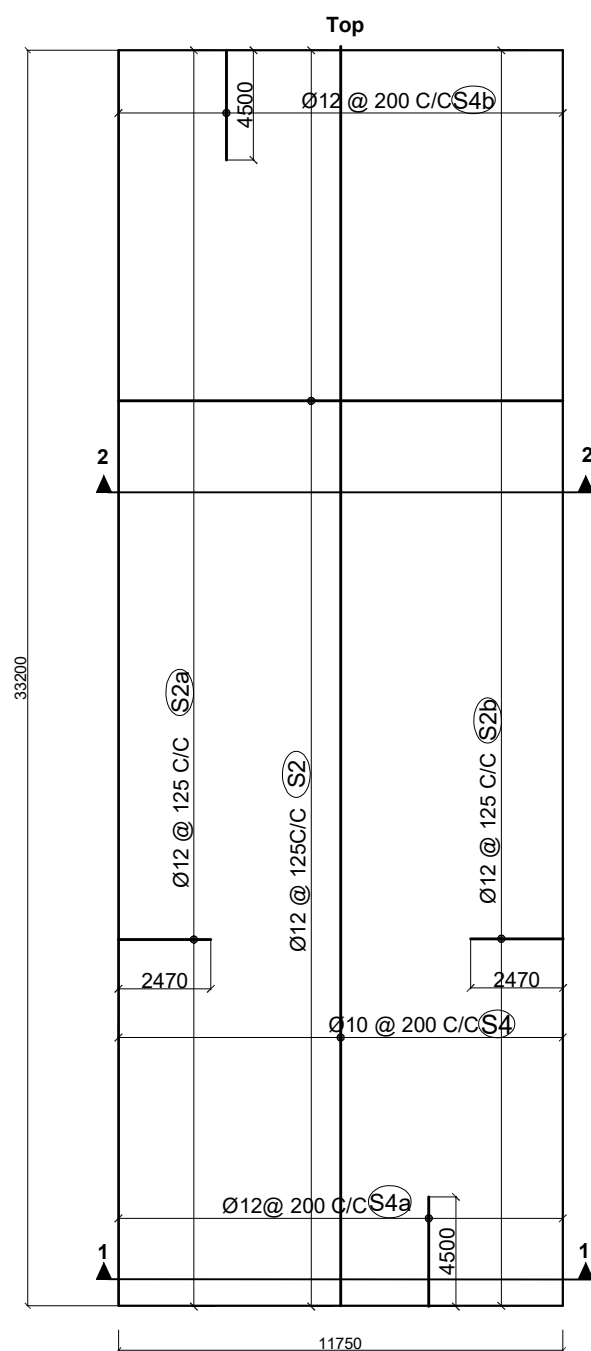
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NOTE:
For maintenance, the deck shall be simultaneously jacked up at the locations marked "J"

Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP	CONSULTANT:		IMPLEMENTING AGENCY:	SHEET TITLE:	SCALE:		NAME	SIGNATURE	REV NO.	DESCRIPTION	DATE:	
	 Soosung Engineering Co. Ltd, Korea in association with  ERMC P (Ltd), Nepal and  TPE-Tech Studio of Engineering	DOR, DCID		Detaill of Superstructure of Kaila Bridge (47/H001/310_A)	As Shown	DESIGNED BY:	Saroj Bhattarai				November,2022	
		ROAD NAME:				CHECKED BY:	P. Upadhyaya					DWG.NO.:
		East West Highway (H01)				APPROVED BY:	Dr. T.H.Choi					SHEET NO.:
		Butwal - Gorusinghe Section										06/29



NOTE:

NOTE.
1.On Shear Connection:

The transverse bars of the deck slab(S2) shall be tied to vertical stirrups of the longitudinal girders.

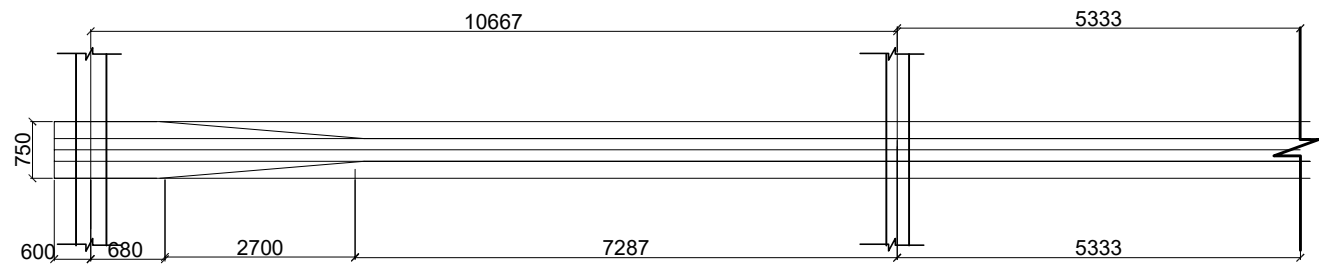
2. Top Surface of the Main Girder:

Surface to be roughened by wire brush immediately after initial setting. The surface shall be properly cleaned by pressure blower prior to casting of the deck concrete

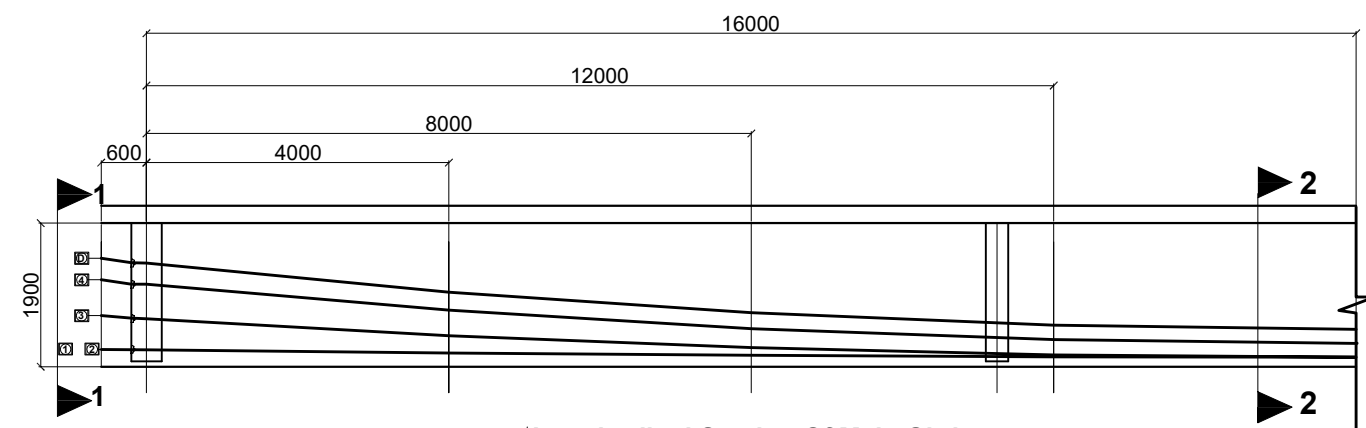
3. On Wearing Course:

The level of wearing course along the longitudinal direction shall be kept horizontal throughout the length of the deck. The thickness of wearing course towards the ends along the deck shall be increased suitably to compensate for the slope due to hogging of the girder by pre stress.

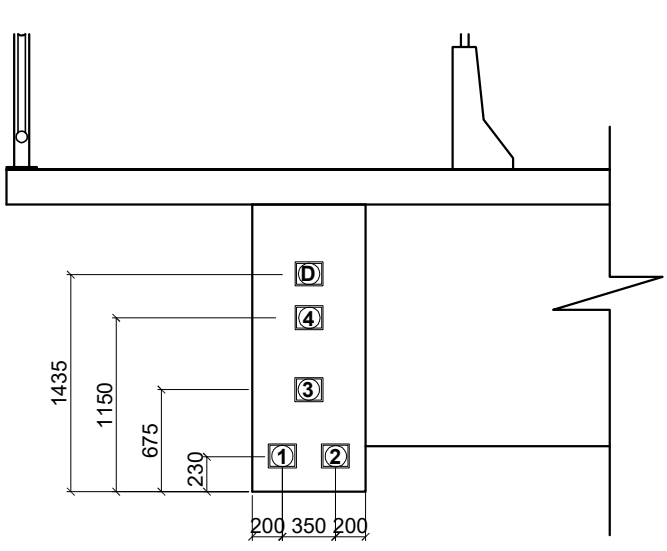
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	 Soosung Engineering Co. Ltd, Korea in association with  ERMC P (Ltd), Nepal and  TPE-Tech Studio of Engineering	DOR, DCID		Reinforcement Details of Slab of Kaila Bridge (47/H001/310_A)	As Shown	DESIGNED BY:	Saroj Bhattarai				November,2022	
		ROAD NAME:				CHECKED BY:	P. Upadhyaya				DWG.NO.:	310_Kaila
		East West Highway (H01)				APPROVED BY:	Dr. T.H.Choi				SHEET NO.:	07/21
		Butwal - Gorusinghe Section										



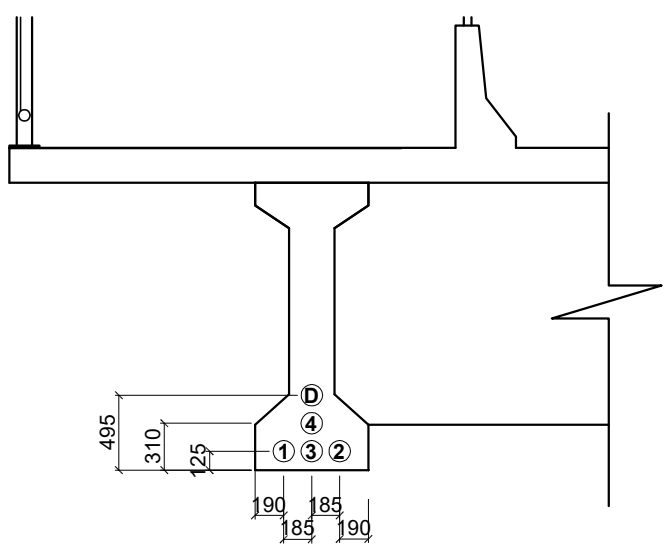
Plan Of Main Girder
Scale:-1:100



Longitudinal Section Of Main Girder
Scale:-1:100



View 1-1
Scale:-1:50



View 2-2
Scale:-1:50

Tendon Layout Data

	Anchor face		Bearing centerline		Intermediate sections						Mid span	
	-600		0		4000		8000		12000		16000	
TENDON	Y	Z	Y	Z	Y	Z	Y	Z	Y	Z	Y	Z
1	230	-175	223	-176	180	-180	150	-183	131	-185	125	-185
2	230	175	223	176	180	180	150	183	131	185	125	185
3	675	0	636	0	412	0	253	0	157	0	125	0
4	1150	0	1090	0	749	0	505	0	359	0	310	0
Dummy	1435	0	1370	0	987	0	714	0	550	0	495	0

Y = Elevation of the tendon center from the girder soffit
Z = Horizontal distance of the tendon center from the centerline of the girder

Tendon Elongation and Emergence Angles

TENDON	Total Jacking Force KN	Total Extension of both sides	Emergence angle degree
1	2600	234	0.728
2	2600	234	0.728
3	2600	232	3.791
4	2600	231	5.776
Dummy			6.461

NOTES ON PRE STRESSING:

- All the prestressing operation shall commence after 28 days of casting,confirming that the cube specimen has achieved 100% of the prescribed compressive strength(M50) No Early Prestressingallowed.
- Each prestressing Tendon shall be,multistrand cable comprising of 19 strands,each strand of 12.7mm diameter (19K13),7 ply low relaxation,Class-II,High Tensile Steel conforming IS:14268-2017. Maximum allowed total jacking force = 2733kN
- Prestressings tendon shall be done in 1 stages as follows:
Stage1
Precast girder only. After 28days of Casting.
Tendons to be stressed in stage 1 shall be in the following Sequence:

3	1	2	4	-	-	-	-
---	---	---	---	---	---	---	---

Total Jacking Force to each tendon in stage 1= 2600KN

Stage2 - Not applicable
After 14 days of Casting of desk slab.
Tendons to be stressed in stage 2 shall be in the following Sequence:

-	-	-	-	-	-	-	-
---	---	---	---	---	---	---	---

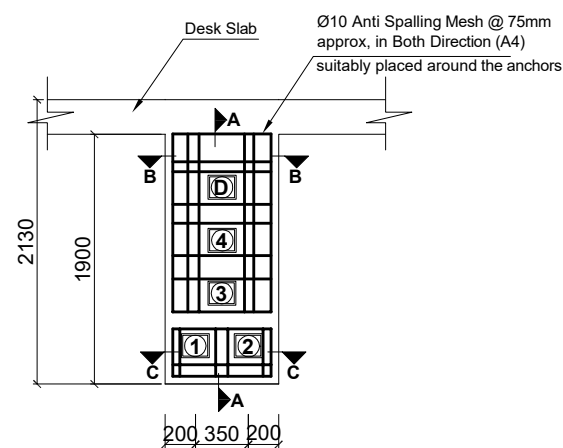
Total Jacking Force to each tendon in stage 2= N/A KN

Casting of footpath,crash barriers and wearing course will done only after second stage prestressing. Not applicable
- Jacking of tendons shall be done from both ends. All the prestress losses(instant and long term) have been already considered in the design.
- The composite action is considered only for live loads. There shall be no false-work or props to the girder during 2nd stage of prestressing.The formwork for deck slab can be supported on the main precast girders.
- The cable elongation at their jacking ends,mentioned are based on the assumption that the Modulus of Elasticity of the cable steel is 1.95x10^5 Mpa.The manufacturers specification shallbe followed if provided.
- The tendon ducts shall be properly secured to the rebars to maintain the profile throughout concreting process.
- Thespecified profile and alignments of the tendon shall be strictly maintained.If required,the reinforcement bars can be suitably repositioned or slightly bent to accommodate the tendons as per the engineers instruction.

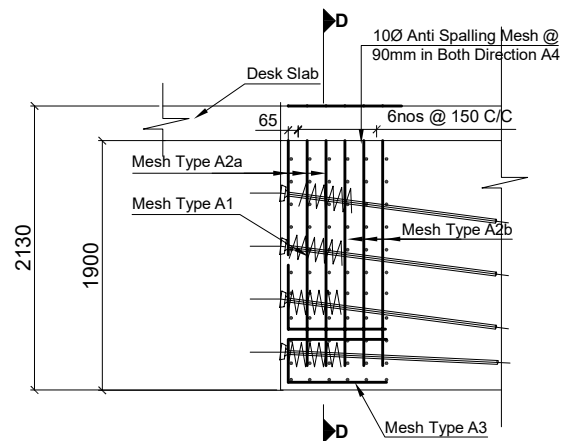
NOTES ON DUMMY CABLE

The cable marked "D" is for future tensioning or in case of emergency or excessive prestress loss. No tendon shall be provided during construction but the sheating,anchorage block ,brusting reinforcement similar to the other tendons shall be properly installed. The duct shall be left hollow ensuring it is free of debris inside. The anchorage should be capped suitably to keep it free from ingress of foreign material and marked "D" to identify in future

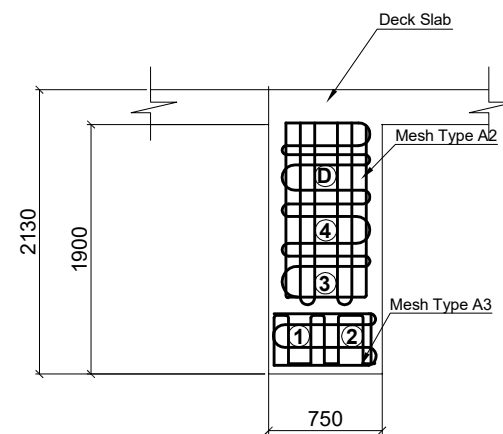
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	 Soosung Engineering Co. Ltd, Korea in association with  ERM P (Ltd), Nepal and  JPE-Tech Studio of Engineering	DOR, DCID		Prestressing Details of Main Girder of Kaila Bridge (47/H001/310_A)	As Shown	DESIGNED BY:	Saroj Bhattarai				November,2022
		ROAD NAME:				CHECKED BY:	P. Upadhyaya				DWG.NO.:
		East West Highway (H01)				APPROVED BY:	Dr. T.H.Choi				310_Kaila
		Butwal - Gorusinghe Section									SHEET NO.:
											08/29



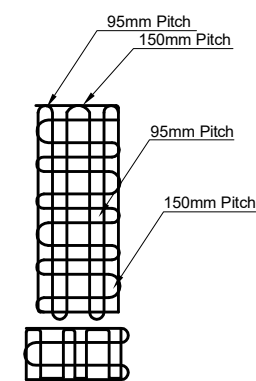
Anti Spalling Reinforcement
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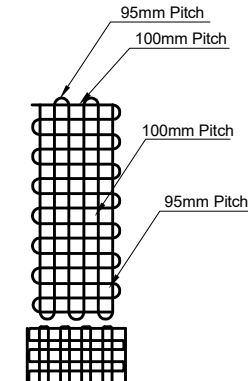
Section At A-A
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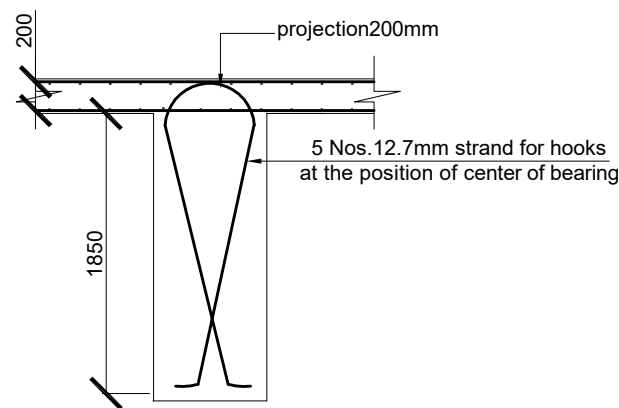
Section At D-D
Scale:-1:50



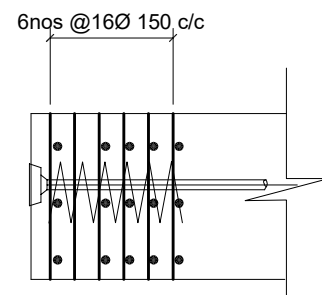
Mesh Type A2a
Scale:-1:50



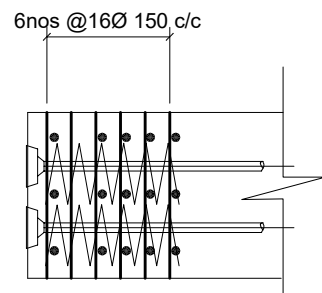
Mesh Type A2b
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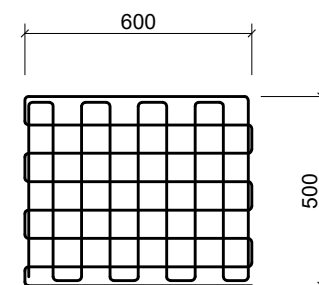
Hook Details at Both Ends Of Grider
Scale:-1:50



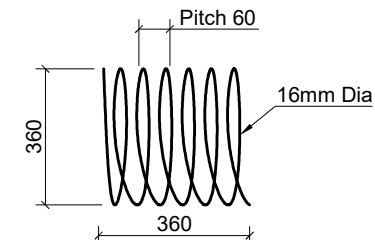
Section At B-B
Scale:-1:20



Section At C-C
Scale:-1:20



Mesh Type A3
Scale:-1:20



Typical Detail Of Spiral reinforcement A1
Scale:-1:20

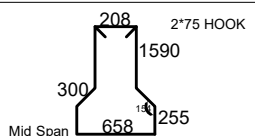
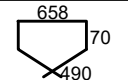
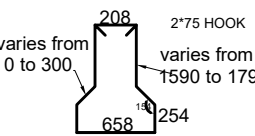
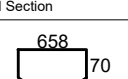
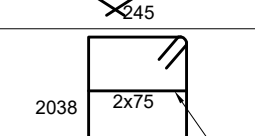
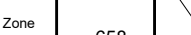
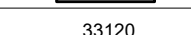
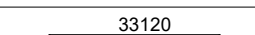
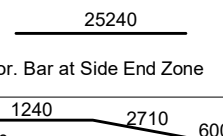
NOTE:
1. The pitch of the mesh should be adjusted to accommodate the anchors and to maintain the duct profile.
2. The spiral and mesh reinforcement shown is indicative, use the anchorage manufacturer's specification if provided.

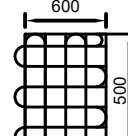
Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP	CONSULTANT:		IMPLEMENTING AGENCY:	SHEET TITLE:	SCALE:		NAME	SIGNATURE	REV NO.	DESCRIPTION	DATE:
	 Soosung Engineering Co. Ltd, Korea in association with  ERM P (Ltd), Nepal and  JPE-Tech Studio of Engineering	DOR, DCID		Anchorage Details of Kaila Bridge (47/H001/310_A)	As Shown	DESIGNED BY:	Saroj Bhattarai				November,2022
		ROAD NAME:				CHECKED BY:	P. Upadhyaya				DWG.NO.:
		East West Highway (H01)				APPROVED BY:	Dr. T.H.Choi				310_Kaila
		Butwal - Gorusinghe Section									SHEET NO.:
										09/29	

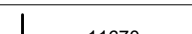
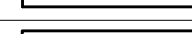
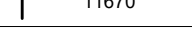
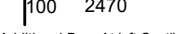
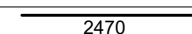
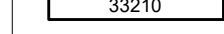
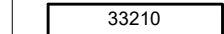


NOTE:
The vertical stirrups of the main girder to be tied to the transverse reinforcement of the slab.

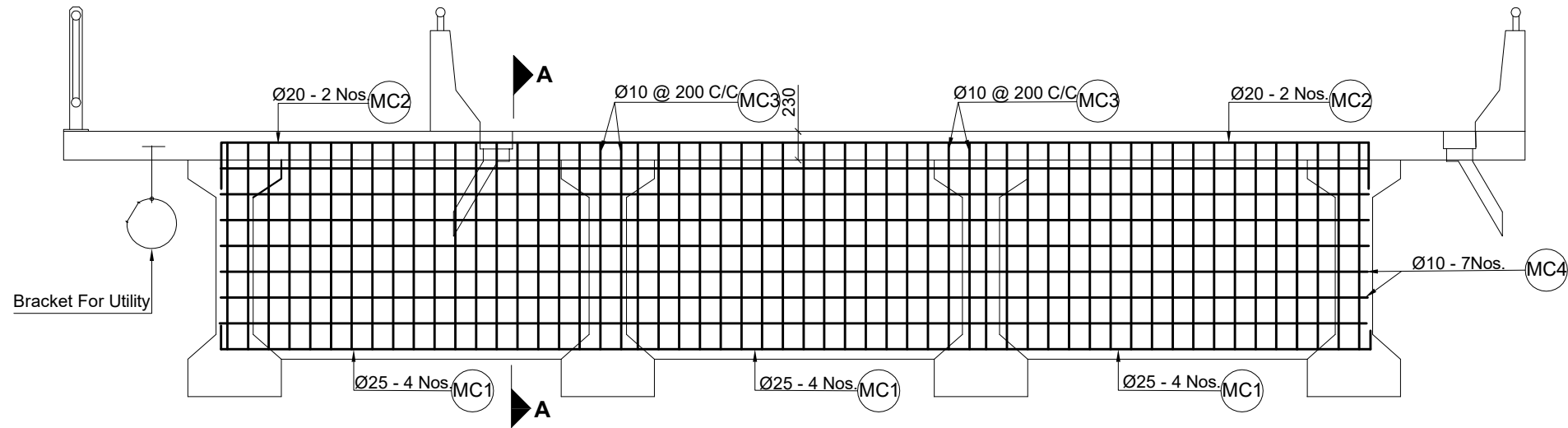
Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP	CONSULTANT:		IMPLEMENTING AGENCY:	SHEET TITLE:	SCALE:		NAME	SIGNATURE	REV NO.	DESCRIPTION	DATE:
	 Soosung Engineering Co. Ltd, Korea in association with  ERMC P (Ltd), Nepal and  TPE-Tech Studio of Engineering	DOR, DCID		Untensioned Reinforcement Details of Girder of Kaila Bridge (47/H001/310_A)	As Shown	DESIGNED BY:	Saroj Bhattarai				November,2022
		ROAD NAME:				CHECKED BY:	P. Upadhyaya				DWG.NO.:
		East West Highway (H01)				APPROVED BY:	Dr. T.H.Choi				310_Kaila
		Butwal - Gorusinghe Section									SHEET NO.: 10/29

BAR BENDING SCHEDULE OF MAIN GIRDER							
BAR ID	SHAPE OF BAR IN mm (NOT TO SCALE)	SPACING (MM)	Ø OF BARS (mm)	NO. OF BARS	LENGTH (m)	WEIGHT/LENGTH (kg/m)	TOTAL WEIGHT (kg)
N1a		VARIES	12	74	5.510	0.888	361.998
N1b		VARIES	10	128	5.510	0.617	434.833
N1c		VARIES AS PER N1	10	202	1.780	0.617	221.683
N2		125	12	44	5.860	0.888	228.915
N2c		125	10	44	1.290	0.617	34.995
N3		125	12	22	5.540	0.888	108.207
		125	10	22	0.774	0.617	10.498
L1		165	12	5	33.120	0.888	147.022
L2		220	10	4	33.320	0.617	82.172
L3		200	10	24	25.240	0.617	373.475
L4		200	10	48	5.200	0.617	153.888
A1		VARIES	16	10	7.930	1.578	125.162
(Use Manufacturer's specifications if available)							
A2		150	16	12	20.790	1.578	393.764
		(Use Manufacturer's specifications if available) The Sketch shown here is indicative, for he purpose of estimate only. The pitch of the bars to be adjusted as per the tendon's size and positions					

BAR BENDING SCHEDULE OF MAIN GIRDER							
BAR ID	SHAPE OF BAR IN mm (NOT TO SCALE)	SPACING (MM)	Ø OF BARS (mm)	NO. OF BARS	LENGTH (m)	WEIGHT/LENGTH (kg/m)	TOTAL WEIGHT (kg)
A3	PITCH=75 both way 	VARIES	10	4	10.200	0.617	25.155
TOTAL IN ONE GIRDER							2701.767
TOTAL IN ONE GIRDER (IN METRIC TON)							2.702

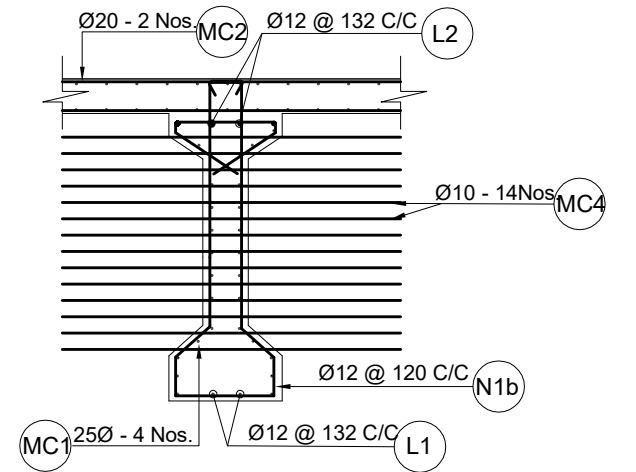
BAR BENDING SCHEDULE OF DECK SLAB							
BAR ID	SHAPE OF BAR IN mm (NOT TO SCALE)	SPACING (MM)	Ø OF BARS (mm)	NO. OF BARS	LENGTH (m)	WEIGHT/LENGTH (kg/m)	TOTAL WEIGHT (kg)
S1		125	12	274	11.870	0.888	2887.516
S2		125	12	267	11.870	0.888	2813.747
S2a		125	12	267	2.570	0.888	609.211
S2b		125	12	267	2.570	0.888	609.211
S3		MID DECK 200	10	60	33.520	0.617	1239.983
		LEFT CANT. 200	10	6	33.520	0.617	123.998
		RIGHT CANT. 200	10	6	33.520	0.617	123.998
S4		200	10	60	33.520	0.617	1239.983
S4a		200	12	60	4.655	0.888	247.967
S4b		200	12	60	4.655	0.888	247.967
S5a		200	10	50	0.710	0.617	21.887
S5b		200	10	50	0.710	0.617	21.887
TOTAL EXCLUDING FOOTPATHS KG							10187.355
TOTAL WEIGHT IN METRIC TON							10.187

Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP	CONSULTANT:		IMPLEMENTING AGENCY:		SHEET TITLE:		SCALE:		NAME	SIGNATURE	REV NO.	DESCRIPTION	DATE:
	 Soosung Engineering Co. Ltd, Korea in association with  ERMC P (Ltd), Nepal and  TPE-Tech Studio of Engineering		DOR, DCID ROAD NAME: East West Highway (H01) Butwal - Gorusinghe Section		B.B.S of Slab & Main Girder of Kaila Bridge (47/H001/310_A)		As Shown		DESIGNED BY:	Saroj Bhattarai			November,2022
									CHECKED BY:	P. Upadhyaya			DWG.NO.: 310_Kaila
									APPROVED BY:	Dr. T.H.Choi			SHEET NO.: 11/29

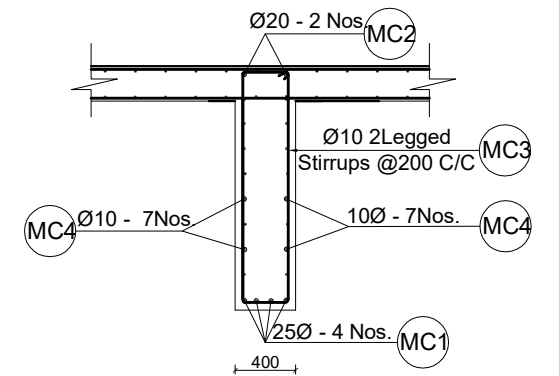


Intermediate Cross Girders
Scale:-1:50

BAR BENDING SCHEDULE OF INTERMEDIATE CROSS GIRDER							
BAR ID	SHAPE OF BAR IN mm (NOT TO SCALE)	SPACING (MM)	Ø OF BARS (mm)	NO. OF BARS	LENGTH (m)	WEIGHT/LENGTH (kG/m)	TOTAL WEIGHT (kG)
MC1			25	4	10.445	3.853	160.994
MC2		0	20	2	10.445	2.466	51.518
MC3		200	10	45	4.020	0.617	111.532
MC4		300	10	14	9.220	0.617	79.583
TOTAL IN ONE GIRDER							403.627
TOTAL NUMBER OF GIRDER AND TOTAL WEIGHT (IN METRIC TON) 2							0.807



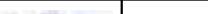
Dowel bar of Intermediate Cross Girder
Scale:-1:50



Section At A-A
Scale:-1:50

NOTE:

Dowel bars similar to the longitudinal bars of the cross girders shall be pre-installed in the precast main girder before casting. The longitudinal bars of the cross girder shall be lapped to the dowel bars, which shall have a lap length of 60 dia. of the corresponding bars.

Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP	CONSULTANT:		IMPLEMENTING AGENCY:	SHEET TITLE:	SCALE:		NAME	SIGNATURE	REV NO.	DESCRIPTION	DATE:	
		Soosung Engineering Co. Ltd, Korea in association with	DOR, DCID	Reinforcement Details of Intermediate Cross Girder of Kaila Bridge (47/H001/310_A)	As Shown	DESIGNED BY:	Saroj Bhattarai				November,2022	
		ERMC P (Ltd), Nepal and	ROAD NAME:			CHECKED BY:	P. Upadhyaya				DWG.NO.:	310_Kaila
		JPE-Tech Studio of Engineering	East West Highway (H01)			APPROVED BY:	Dr. T.H.Choi				SHEET NO.:	12/29
			Butwal - Gorusinghe Section									