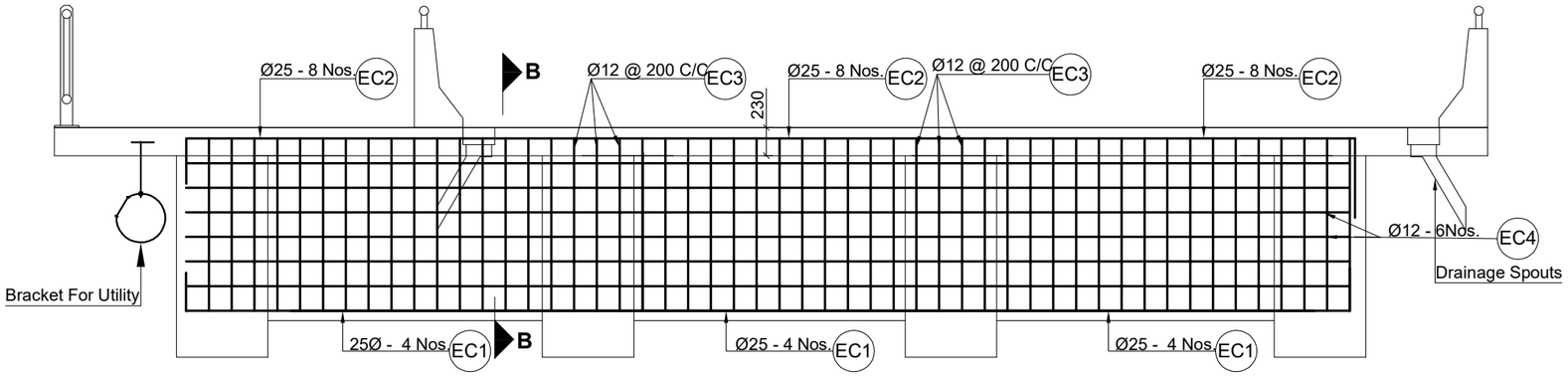
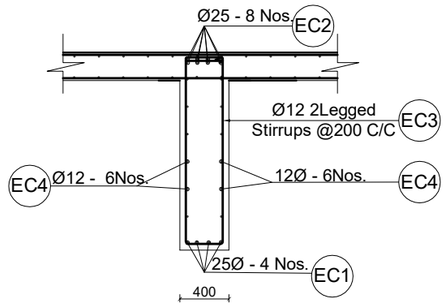
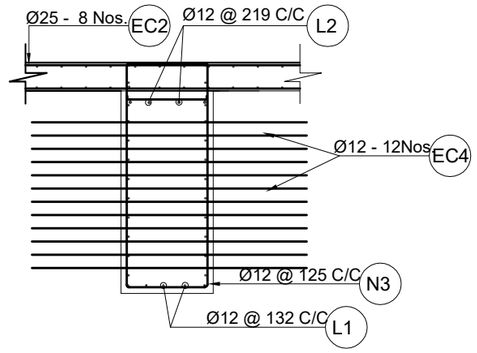


End Cross Girders
Scale:-1:50



Section At B-B
Scale:-1:50



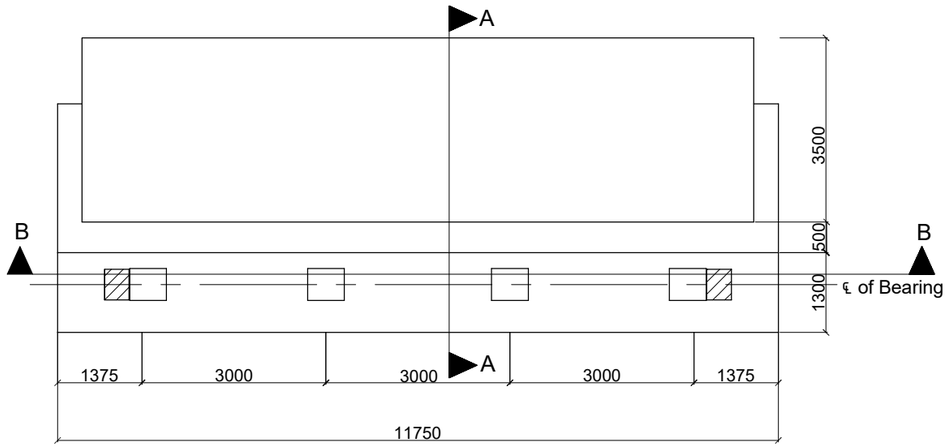
Dowel bar of End Cross Girder
Scale:-1:50

BAR BENDING SCHEDULE OF END CROSS GIRDER

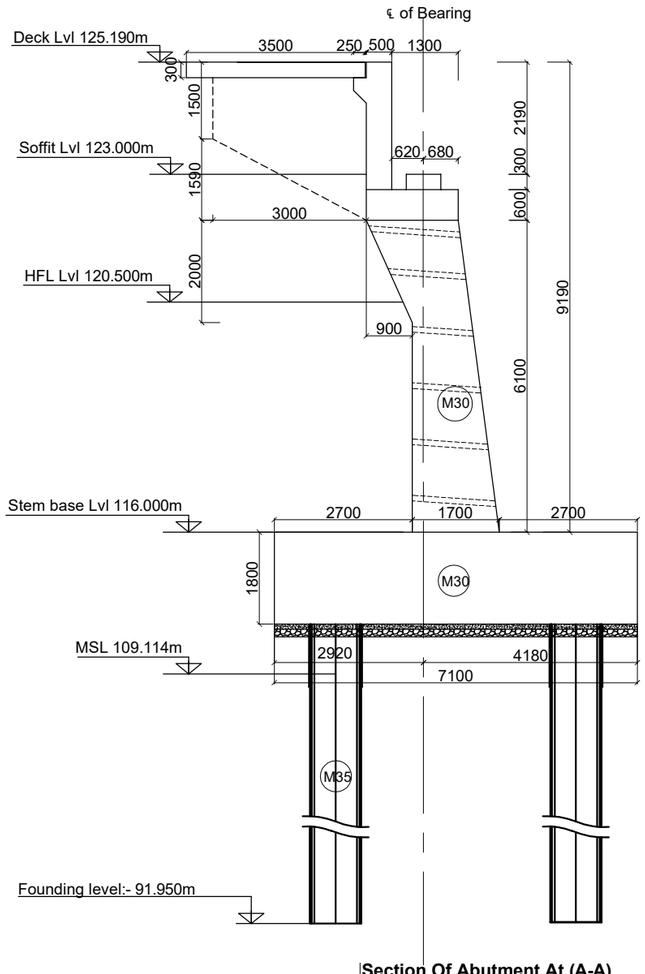
BAR ID	SHAPE OF BAR IN mm (NOT TO SCALE)	SPACING (MM)	Ø OF BARS (mm)	NO. OF BARS	LENGTH (m)	WEIGHT/LENGTH (kG/m)	TOTAL WEIGHT (kG)
EC1	400 400 9645		25	4	10.445	3.853	160.994
EC2	9645 400 400	0	25	8	10.445	3.853	321.987
EC3	2*75MM 1738 2 Legged @200MM C/C 408	200	10	50	4.220	0.617	130.090
EC4	9420 2X6 nos. each face	300	10	12	9.320	0.617	68.954
TOTAL IN ONE GIRDER							682.025
TOTAL NUMBER OF GIRDER AND TOTAL WEIGHT (IN METRIC TON) 2							1.364

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.

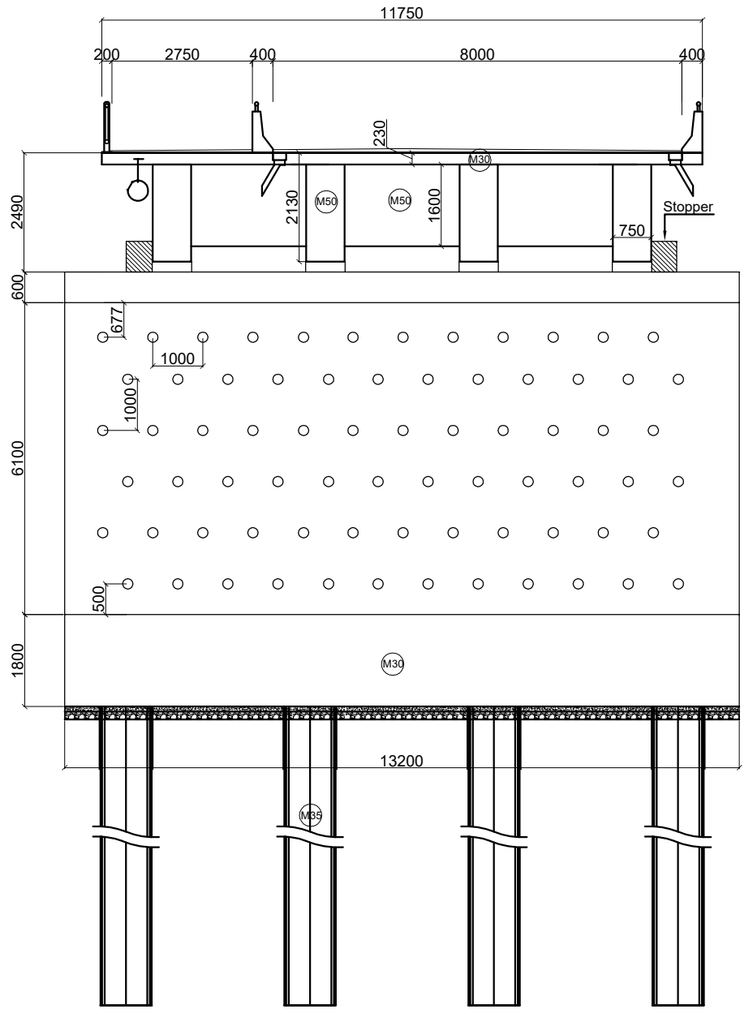
Government of Nepal Ministry of Physical Infrastructure and Transport **Department of Roads** **Project Directorate Office (ADB)** **SASEC Highway Improvement Project-** **Project Preparatory Consultant (SHIP-PPC)** **ADB Loan No: 3722-NEP**	**CONSULTANT:** Soosung Engineering Co. Ltd, Korea in association with ERMC P (Ltd), Nepal and TTE-Tech Studio of Engineeering	**IMPLEMENTING AGENCY:** **DOR, DCID** **ROAD NAME:** **East West Highway (H01)** **Butwal - Gorusinghe Section**	**SHEET TITLE:** Reinforcement Details of End Cross Girder of Kaila Bridge (47/H001/310_A)	**SCALE:** As Shown		**NAME**	**SIGNATURE**	**REV NO.**	**DESCRIPTION**	**DATE:** November,2022 **DWG.NO.:** 310_Kaila **SHEET NO.:** 13/29
					DESIGNED BY:	Saroj Bhattarai				
					CHECKED BY:	P. Upadhyaya				
					APPROVED BY:	Dr. T.H.Choi				



Plan of Abutment
Scale:-1:100

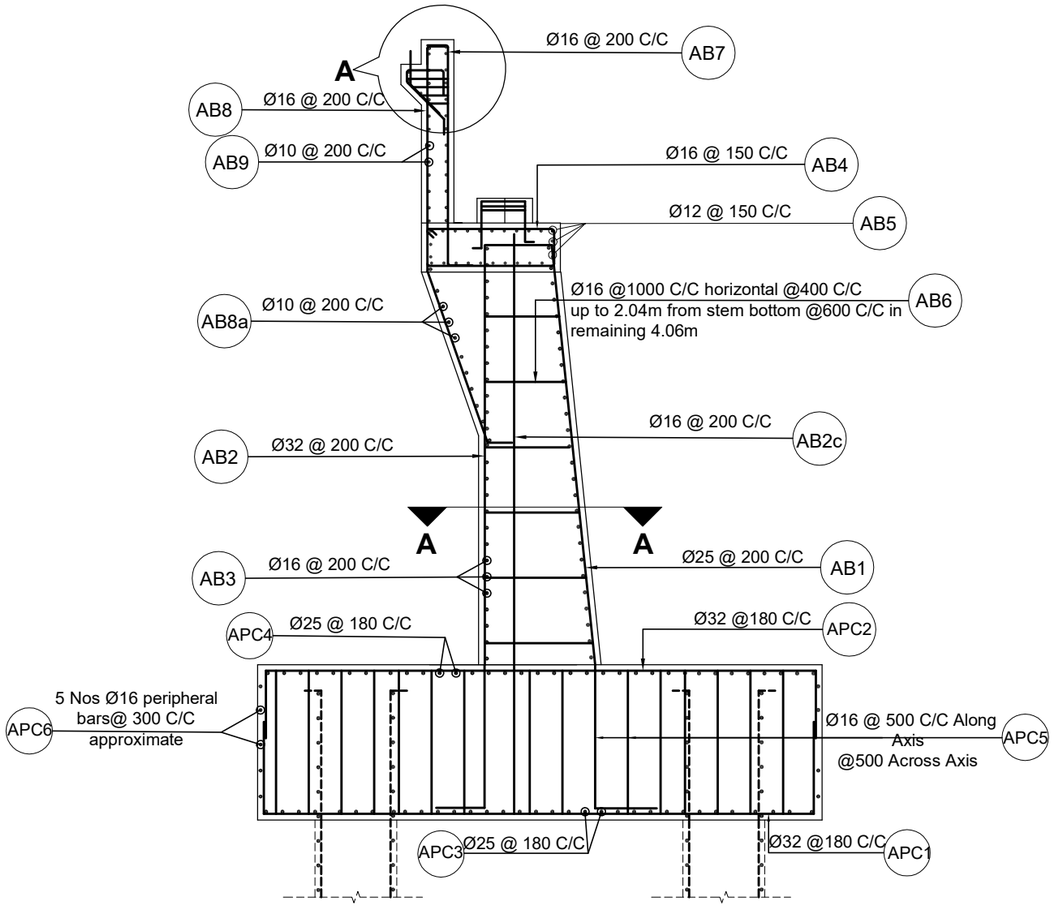


Section Of Abutment At (A-A)
Scale:-1:110

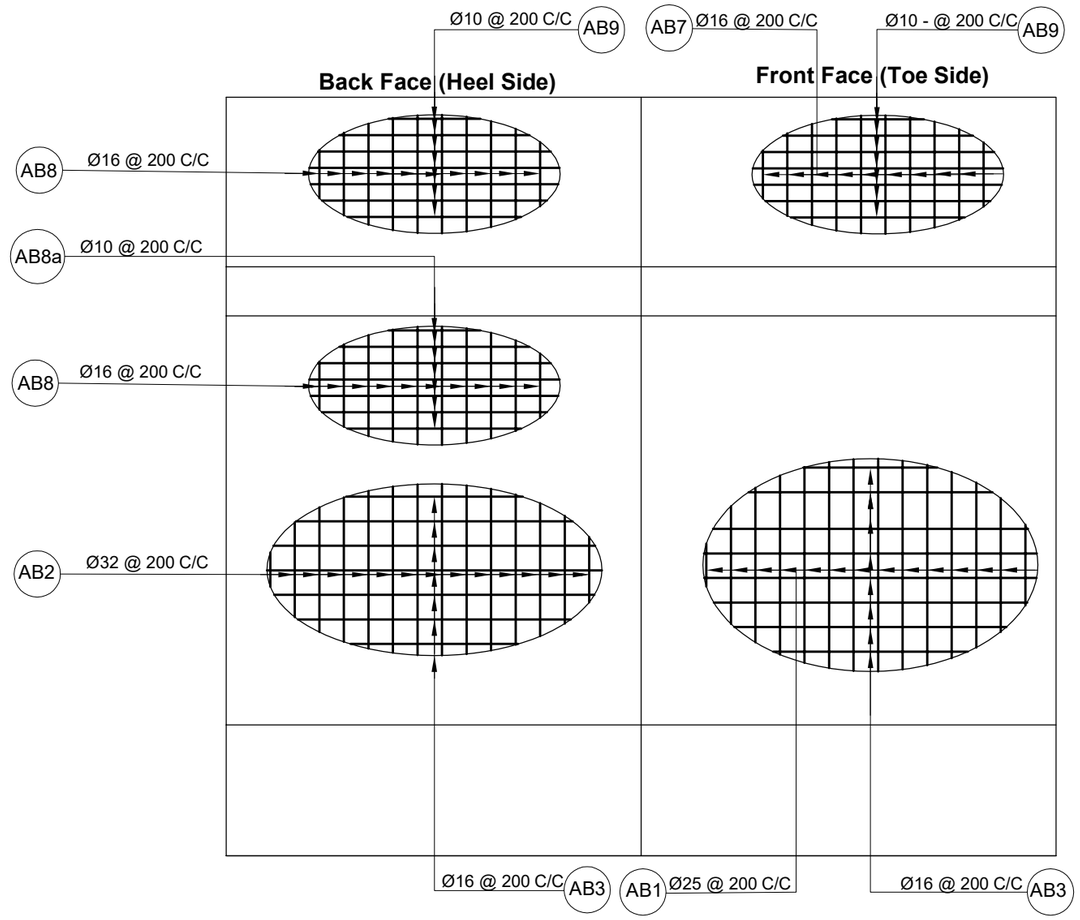


Section Of Abutment At (B-B)
Scale:-1:120

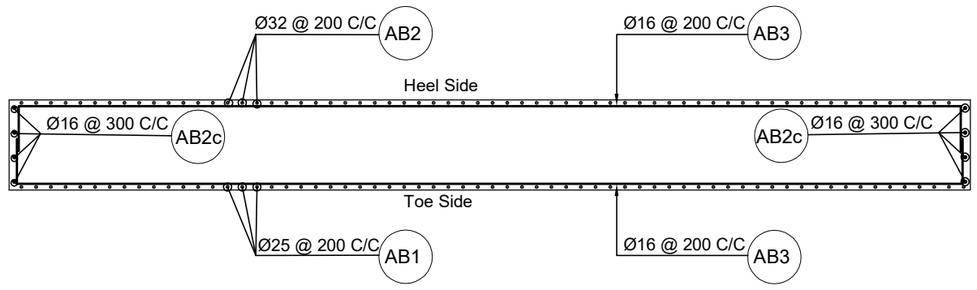
Government of Nepal Ministry of Physical Infrastructure and Transport **Department of Roads** **Project Directorate Office (ADB)** **SASEC Highway Improvement Project-** **Project Preparatory Consultant (SHIP-PPC)** **ADB Loan No: 3722-NEP**	**CONSULTANT:** Soosung Engineering Co. Ltd, Korea in association with ERMC P (Ltd), Nepal and TE-Tech Studio of Engineeering	**IMPLEMENTING AGENCY:** **DOR, DCID** **ROAD NAME:** **East West Highway (H01)** **Butwal - Gorusinghe Section**	**SHEET TITLE:** Abutment Details of Kaila Bridge (47/H001/310_A)	**SCALE:** As Shown		**NAME**	**SIGNATURE**	**REV NO.**	**DESCRIPTION**	**DATE:** November,2022
					DESIGNED BY:	Saroj Bhattarai				**DWG.NO.:** 310_Kaila
					CHECKED BY:	P. Upadhyaya				
					APPROVED BY:	Dr. T.H.Choi				**SHEET NO.:** 14/29



Reinforcement Details Of Abutment
Scale:-1:75

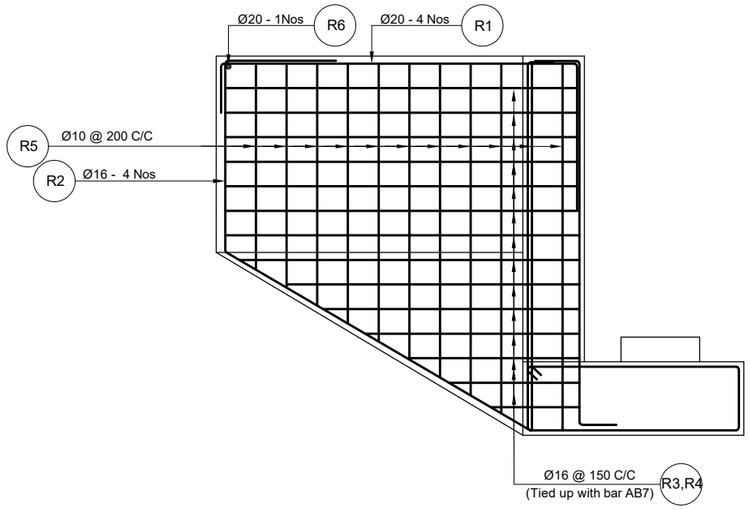


Reinforcement Details Of Abutment
Scale:-1:75

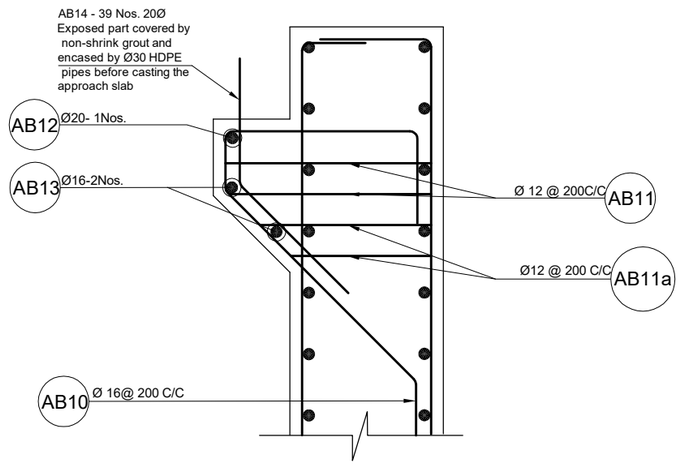


Section at A-A
Scale:-1:75

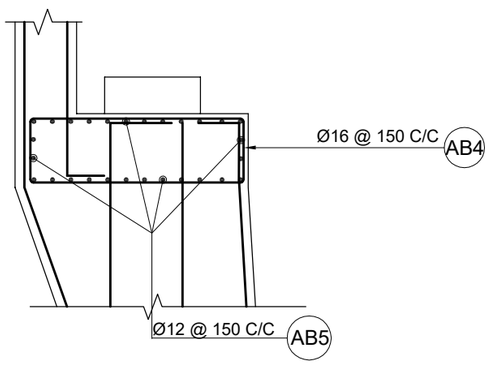
Government of Nepal Ministry of Physical Infrastructure and Transport **Department of Roads** **Project Directorate Office (ADB)** **SASEC Highway Improvement Project-** **Project Preparatory Consultant (SHIP-PPC)** **ADB Loan No: 3722-NEP**	**CONSULTANT:** Soosung Engineering Co. Ltd, Korea in association with ERMC P (Ltd), Nepal and TTE-Tech Studio of Engineeering	**IMPLEMENTING AGENCY:** **DOR, DCID** **ROAD NAME:** **East West Highway (H01)** **Butwal - Gorusinghe Section**	**SHEET TITLE:** Reinforcement Details Of Abutment of Kaila Bridge (47/H001/310_A)	**SCALE:** As Shown		**NAME**	**SIGNATURE**	**REV NO.**	**DESCRIPTION**	**DATE:** November,2022 **DWG.NO.:** 310_Kaila **SHEET NO.:** 15/29
					DESIGNED BY:	Saroj Bhattarai				
					CHECKED BY:	P. Upadhyaya				
					APPROVED BY:	Dr. T.H.Choi				



Reinforcement Details Of Wingwall
Scale:-1:50



Detail At A
Scale:-1:20



Reinforcement Details Of Abutment
Scale:-1:50

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	400 3407 1200	0	20	8	5.007	2.466	98.784
R2	1407 300 3400	0	16	8	5.107	1.578	64.485
R3	214 3314 2*150	200	16	20	7.356	1.578	232.205
R4	214 avg.1600 2*150	200	16	22	3.928	1.578	136.394
R5	182 avg.2295	250	10	32	5.250	0.617	103.579
R6	307	0	20	2	0.307	2.466	1.514
R7	3400	0	10	0	3.400	0.617	0.000
R8	350 260	0	10	0	1.320	0.617	0.000
TOTAL IN 2 WINGWALL IN ONE ABUTMENT							636.961
TOTAL WEIGHT (IN METRIC TON)							0.637

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	300 8265 500	200 mm c/c Approx	25	59	9.065	3.853	2060.916
AB1a	0 0	-	-	-	-	-	-
AB2	500 8265 500	200 mm c/c Approx	32	59	9.265	6.313	3451.103
AB2c	8265 500	At sideface 200 mm c/c	16	16	8.765	1.578	221.346
AB3	11585 avg.1050 11585	200 mm c/c Approx	16	64	25.270	1.578	2552.617
AB4	avg.1635 515 2*100	150 mm c/c Approx	16	80	4.500	1.578	568.202
AB5	11600	150 mm c/c Approx	12	29	11.600	0.888	298.661
AB6	1535-735 Hook Length 160 1000 mm C/C horizontal 400 mm C/C vertical upto 2.04m from stem bottom 600 mm C/C vertical at remaining 4.06 m		16	157	1.583	1.578	392.266
AB7	350 3090 300	200 mm c/c Approx	16	59	3.740	1.578	348.276
AB8	3015 350 2192 300	200 mm c/c Approx	16	59	5.858	1.578	545.509
AB8a	11600	200 mm c/c Approx	10	12	11.600	0.617	85.822
AB9	11590 335	200mm c/c Approx	10	14	23.850	0.617	205.862
AB10	100 600 300 147 200	200 mm c/c Approx	16	55	1.947	1.578	169.017
AB11	600 200		12	110	1.000	0.888	97.660
AB11a	300 Average 200		12	110	0.700	0.888	68.362
AB12	11600		20	1	11.600	2.466	28.607
AB13	11600		16	2	11.600	1.578	36.617
AB14	400 500		20	39	0.900	2.466	86.562
TOTAL WEIGHT ABUTMENT KG							11217.409
TOTAL WEIGHT (IN METRIC TON)							11.217

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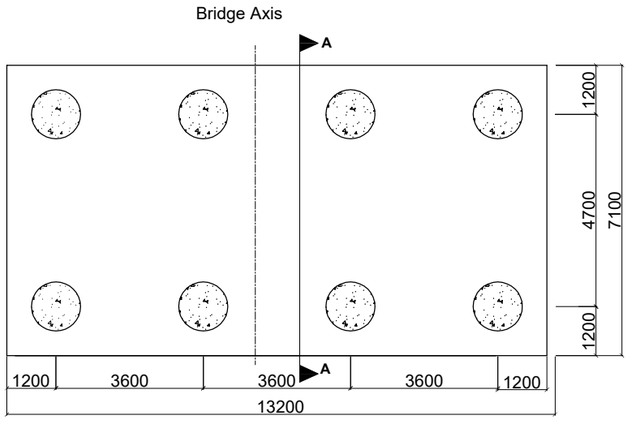
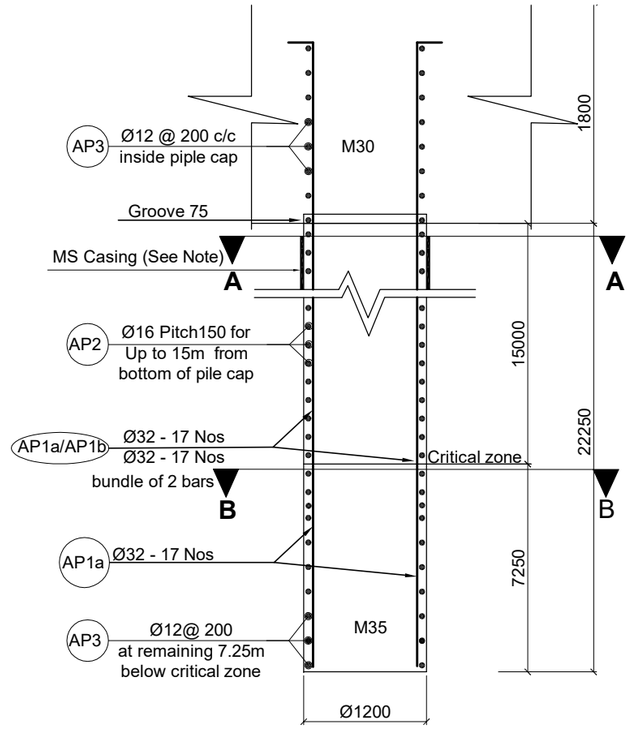
					DESIGNED BY:	Saroj Bhattarai				**DWG.NO.:** 310_Kaila
					CHECKED BY:	P. Upadhyaya				
					APPROVED BY:	Dr. T.H.Choi				**SHEET NO.:** 16/29



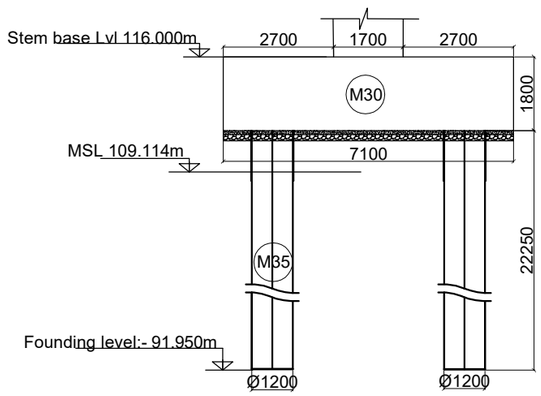
Plan Of Abutment Piles
Scale:-1:150

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)	TOTAL WEIGHT (Kg)
APC1	1080 6918	150	32	74	9.078	6.313	4241.138
APC2	1080 6918	150	32	74	9.078	6.313	4241.138
APC3	1080 13025	200	25	40	15.185	3.853	2340.536
APC4	1080 13025	200	25	40	15.185	3.853	2340.536
APC5	1570 Curve length 251 Curve radius 40 Hook length 80	@500 along axis @500 across axis	16	420	2.232	1.578	1479.599
APC6	13050 6950	@300 approx	16	5	40.000	1.578	315.668
TOTAL IN PILE CAP OF ONE ABUTMENT							14958.615
TOTAL WEIGHT IN METRIC TON							14.959



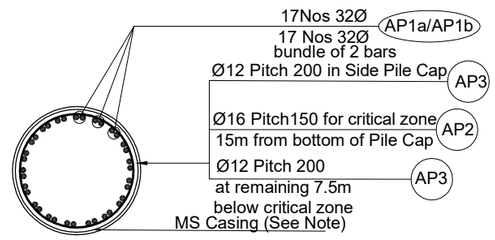
Reinforcement Details Of Pile
Scale:-1:50



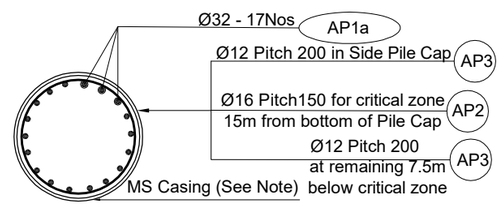
Piles Section At A-A
Scale:-1:150

BAR BENDING SCHEDULE FOR ABUTMENT PILES

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)
AP1a	200 Full Length Bars 23830	0	32	17	24.030	6.313	2579.070
AP1b	200 Bundled Bars 16750	0	32	17	16.950	6.313	1819.194
AP2	Dia-1034,Pitch-150 10.5m From Bottom of pile cap	150	16	1	328.240	1.578	518.074
AP3	Dia=1034,Pitch=200 inside pilecap,200 below critical zone	200	12	1	148.060	0.888	131.450
							5047.789
TOTAL (IN METRIC TON)							5.048
TOTAL IN EIGHT PILES OF ONE ABUTMENT (IN METRIC TON)							40.382



Section At A-A
Scale:-1:50



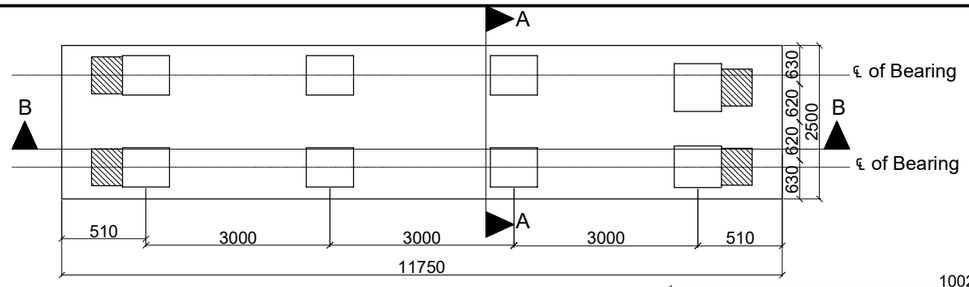
Section At B-B
Scale:-1:50

Location	Design Pile Length m	Design Working load on pile (non - seismic casse)kn	Allowable Bearing Capacity on pile (Scour case) kn	Allowable Bearing Capacity of the Pile (Non Scour case)kn
Abutment	22.25	2475	3738	3738
Pier	27.25	1162	1823	5651

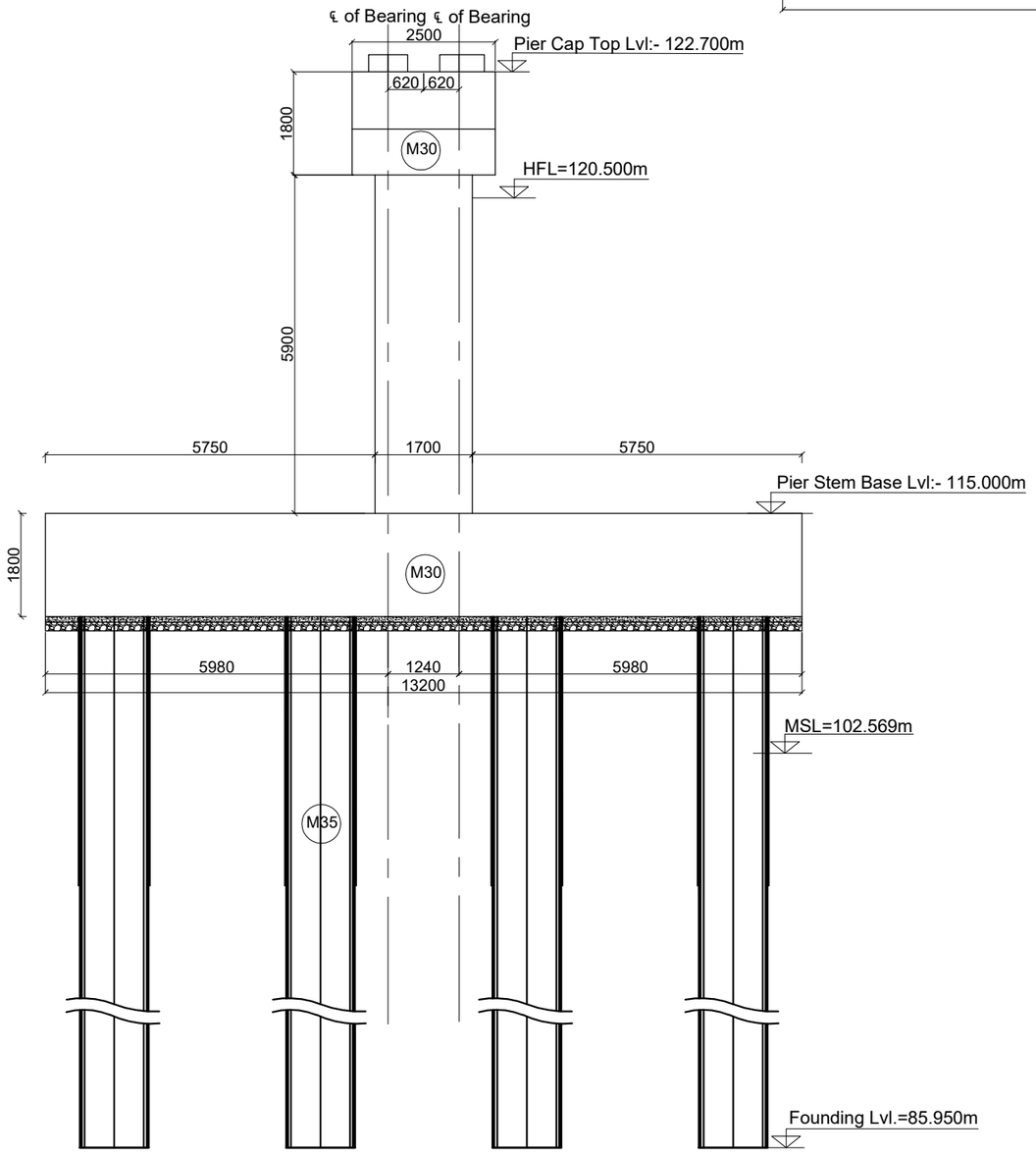
Note On MS permament casing on piles: In case piling works are done without temporary casing, the piles shall be lined with 6mm thick MS steel permanent casing up to 1.5 m or 0.5m below MSL whichever is larger (Subject to instruction and approval by the Engineer)

For Construction Methology and Sequence Please See General Notes.

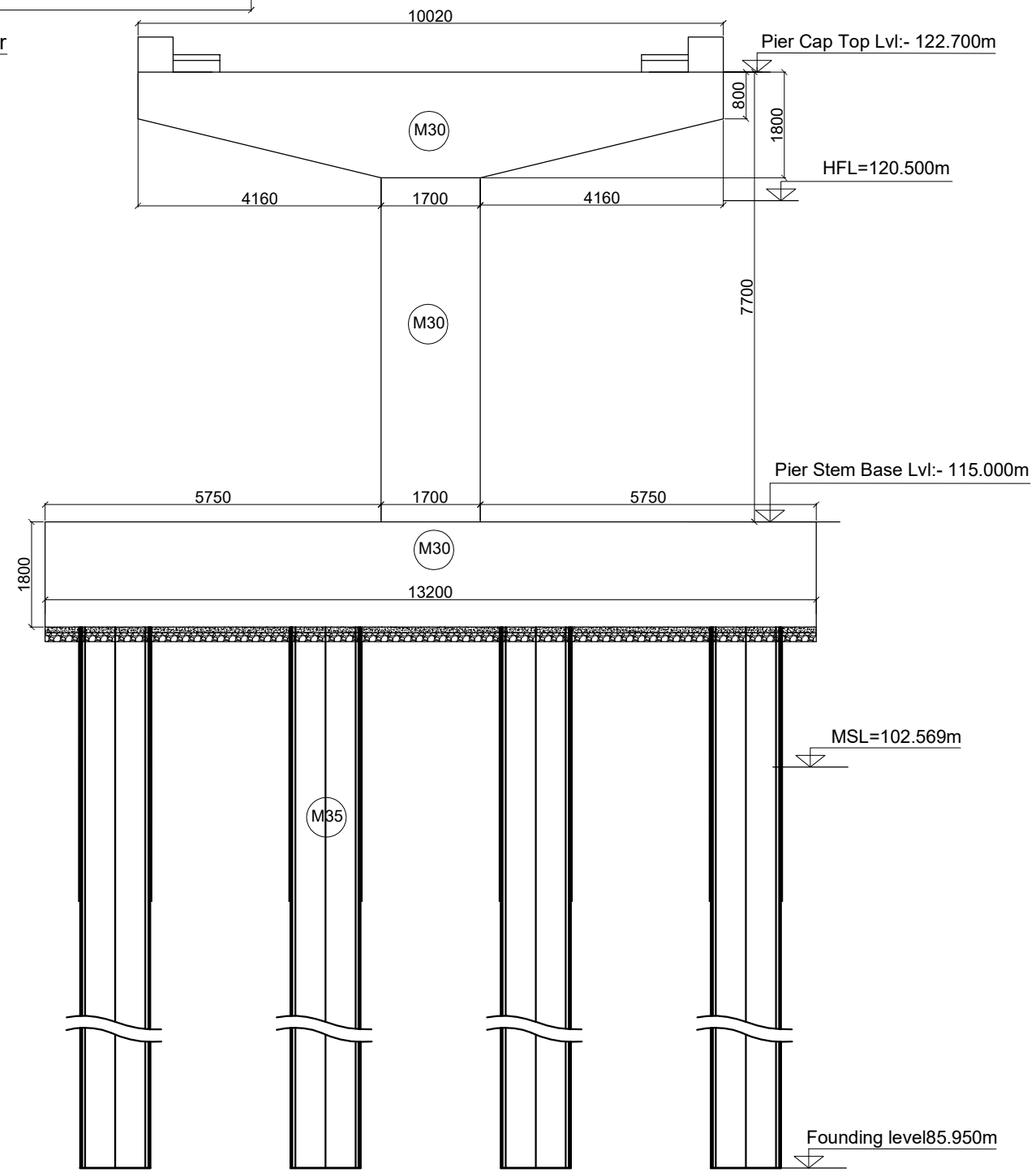
Government of Nepal Ministry of Physical Infrastructure and Transport **Department of Roads** **Project Directorate Office (ADB)** **SASEC Highway Improvement Project-** **Project Preparatory Consultant (SHIP-PPC)** **ADB Loan No: 3722-NEP**	**CONSULTANT:** Soosung Engineering Co. Ltd, Korea in association with ERMC P (Ltd), Nepal and TSE-Tech Studio of Engineeering	**IMPLEMENTING AGENCY:** **DOR, DCID** **ROAD NAME:** **East West Highway (H01)** **Butwal - Gorusinghe Section**	**SHEET TITLE:** Reinforcement Details of Abutment Piles of Kaila Bridge (47/H001/310_A)	**SCALE:** As Shown		**NAME**	**SIGNATURE**	**REV NO.**	**DESCRIPTION**	**DATE:** November,2022 **DWG.NO.:** 310_Kaila **SHEET NO.:** 17/29
					DESIGNED BY:	Saroj Bhattarai				
					CHECKED BY:	P. Upadhyaya				
					APPROVED BY:	Dr. T.H.Choi				



Plan of Pier
Scale:-1:100



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



Section Of Pier At B-B
Scale:-1:100

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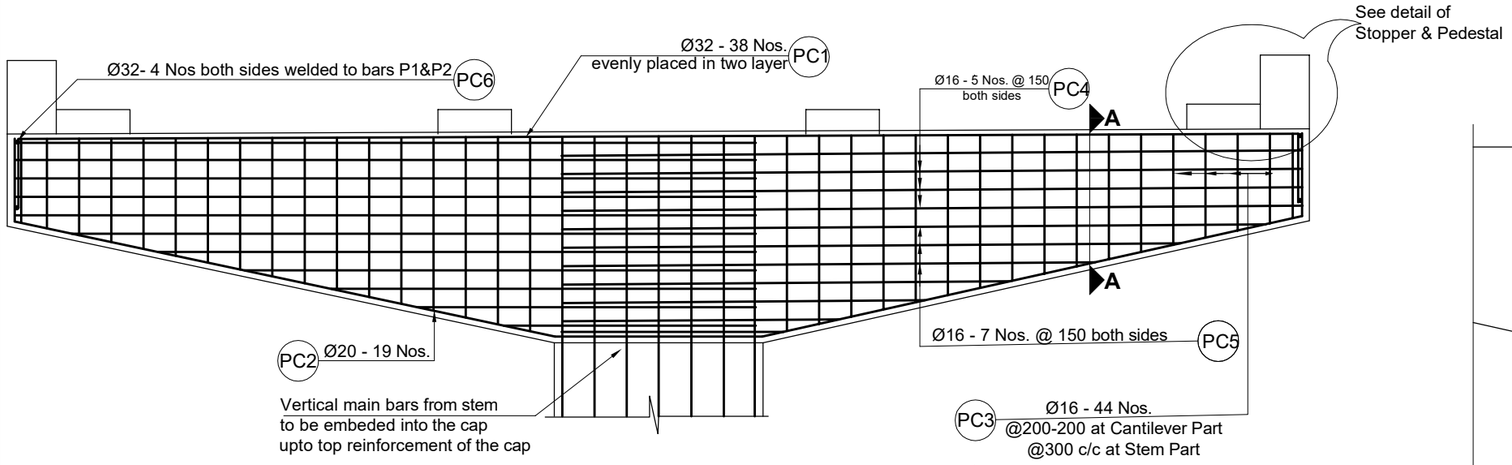
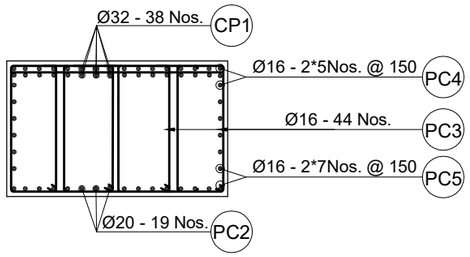
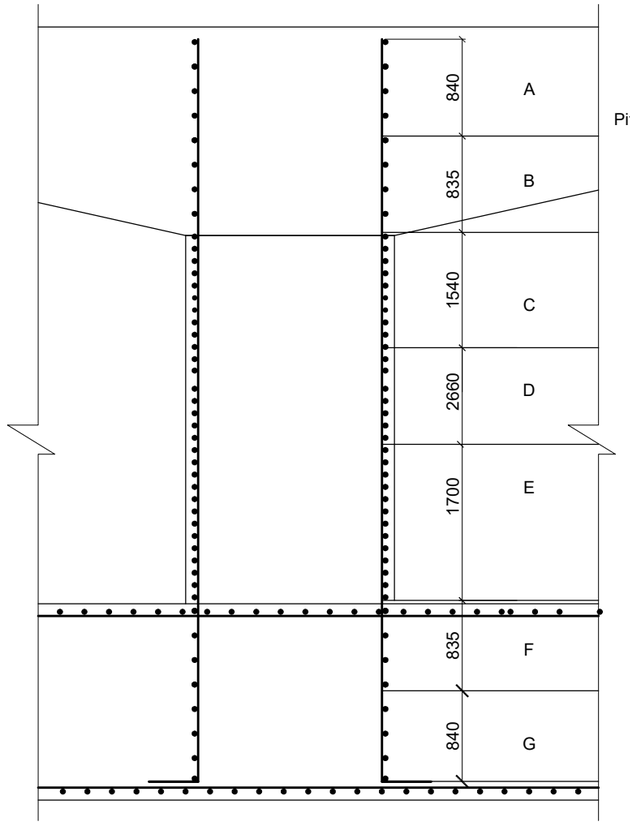
					DESIGNED BY:	Saroj Bhattarai				**DWG.NO.:** 310_Kaila
					CHECKED BY:	P. Upadhyaya				
					APPROVED BY:	Dr. T.H.Choi				**SHEET NO.:** 18/29



Reinforcement Details of Pier Cap
Scale:-1:50



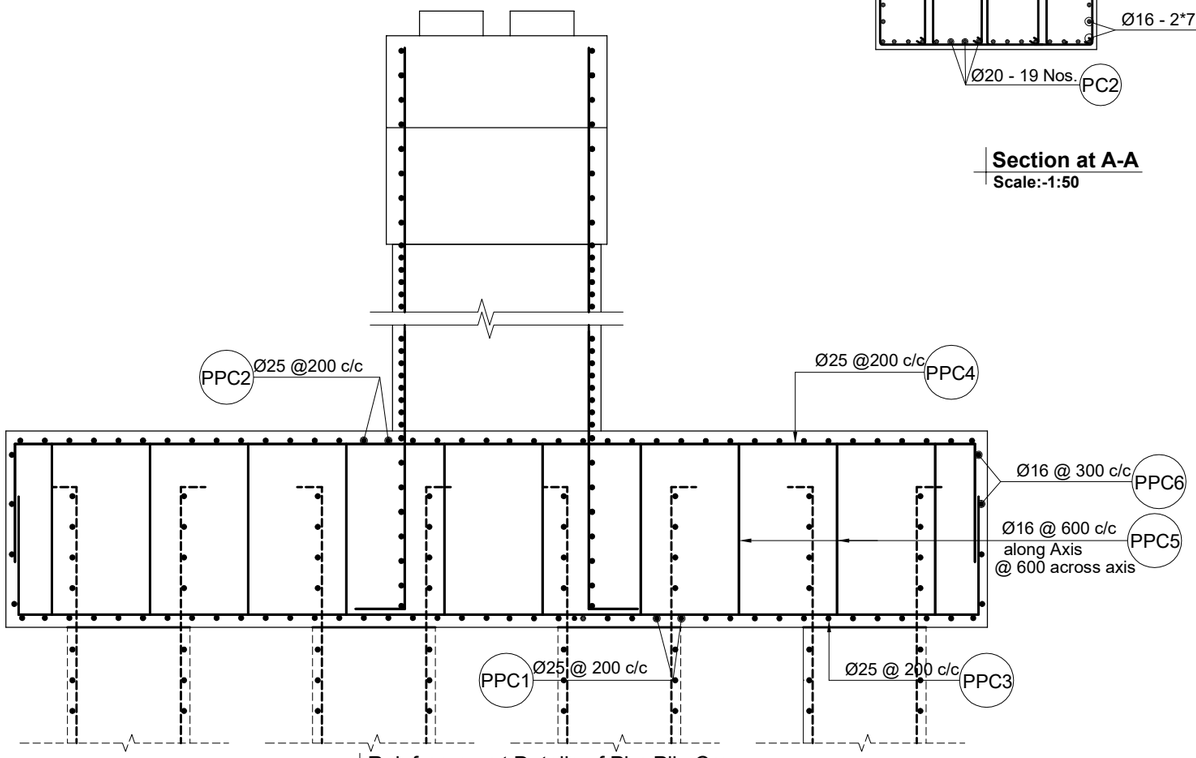
Section at A-A
Scale:-1:50



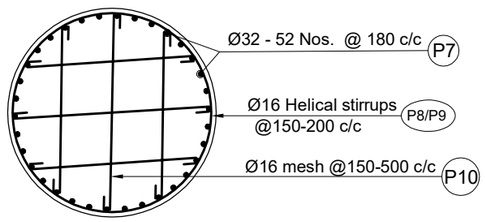
Pitch /Spacing of Transverse Reinforcement

ZONE	BAR	PITCH	DIA
A	P9	200	16
B	P9	200	16
C	P8	150	16
	P10	150	16
D	P9	200	16
	P10	500	16
E	P8	150	16
	P10	150	16
F	P9	200	16
G	P9	200	16

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



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



Cross Section of Pier Stem
Scale:-1:50

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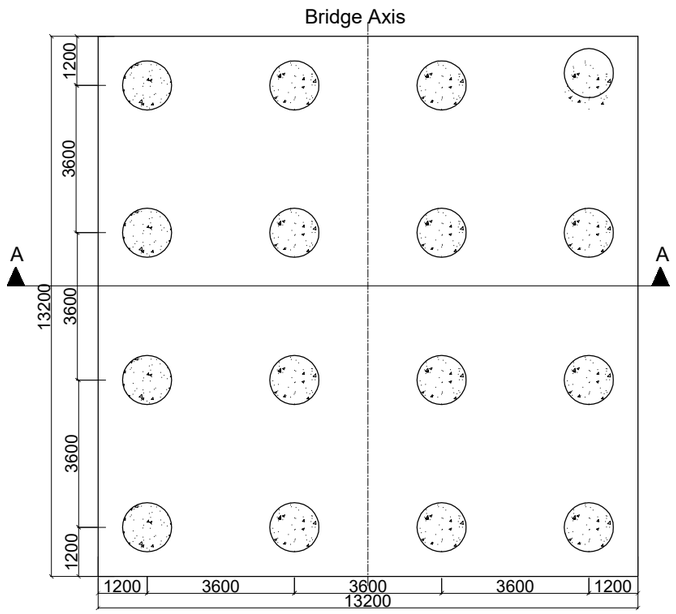
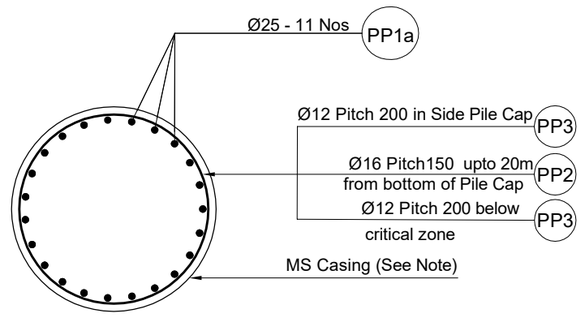
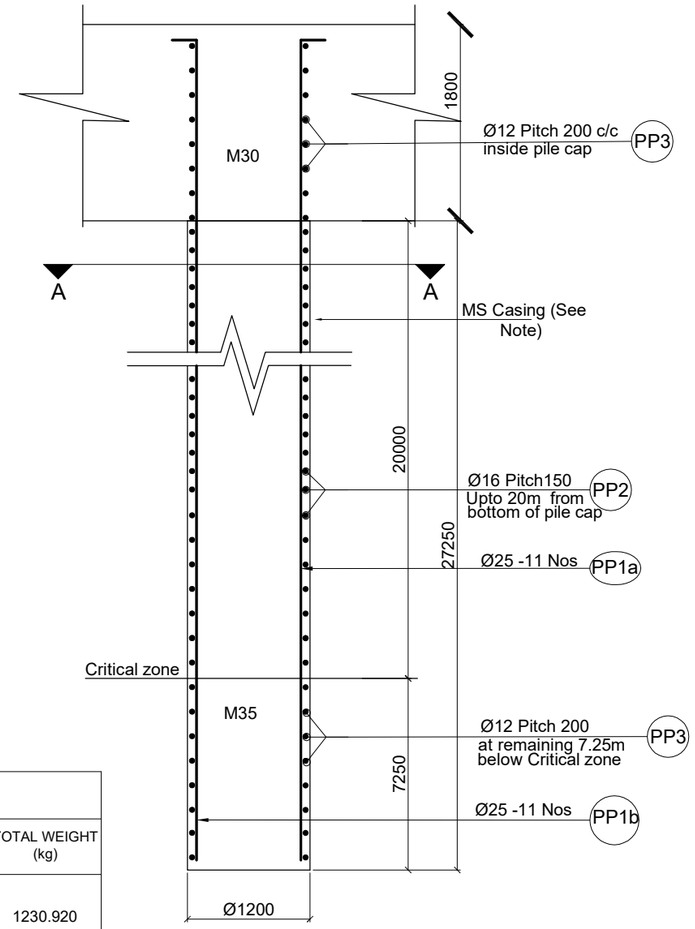
					DESIGNED BY:	Saroj Bhattarai				**DWG.NO.:** 310_Kaila
					CHECKED BY:	P. Upadhyaya				
					APPROVED BY:	Dr. T.H.Choi				**SHEET NO.:** 19/29



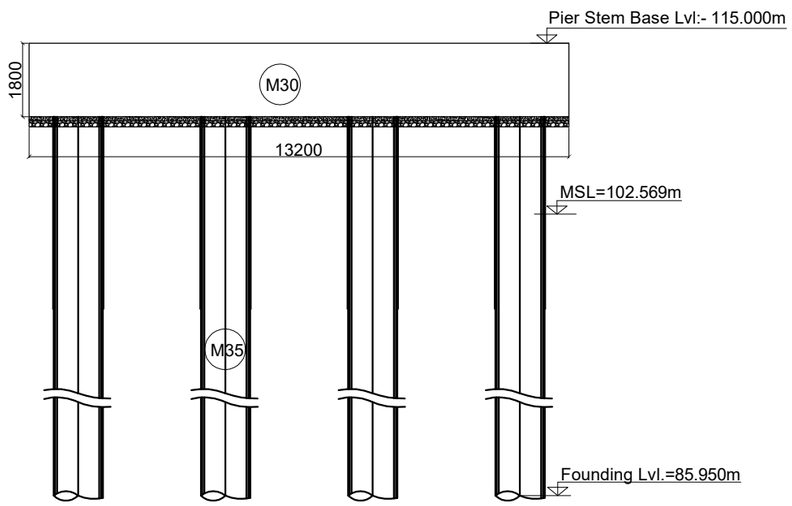
Plan of Pier Piles
Scale:-1:150



Section at A-A
Scale:-1:30



Reinforcement Details of Pile
Scale:-1:50



Section Of Pier at A-A
Scale:-1:150

BAR BENDING SCHEDULE FOR PIER PILES

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)
PP1a	200 Full length bars 28840		25	11	29.040	3.853	1230.920
PP1b	200 Curtailed bars 21700		25	11	21.900	3.853	928.277
PP2	Dia-1034,Pitch-150 20m from bottom of pile cap	150	16	1	437.700	1.578	690.839
PP3	Dia-1034,Pitch-200 inside Pile Cap 200-below critical zone	200	12	1	148.060	0.888	131.450
TOTAL IN ONE PILE							2981.486
TOTAL (IN METRIC TON)							2.981
TOTAL FOR 16 PILES IN ONE PIER (IN METRIC TON)							47.704

Note On MS permament 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 Methology and Sequence Please See General Notes.

Location	Design Pile Length m	Design Working load on pile (non - seismic casse)kn	Allowable Bearing Capacity on pile (Scour case) kn	Allowable Bearing Capacity of the Pile (Non Scour case)kn
Abutment	22.25	2475	3738	3738
Pier	27.25	1162	1823	5651

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 TE-Tech Studio of Engineeering	**IMPLEMENTING AGENCY:** **DOR, DCID** **ROAD NAME:** **East West Highway (H01)** **Butwal - Gorusinghe Section**	**SHEET TITLE:** Reinforcement of pier of Kaila Bridge (47/H001/310_A)	**SCALE:** As Shown		**NAME**	**SIGNATURE**	**REV NO.**	**DESCRIPTION**
					DESIGNED BY:	Saroj Bhattarai			
					CHECKED BY:	P. Upadhyaya			
					APPROVED BY:	Dr. T.H.Choi			

DATE: November,2022
DWG.NO.: 310_Kaila
SHEET NO.: 20/29

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	600 9839 9807	131 Approx In 2layers	32	19	11.039	6.313	1324.170
			32	19	11.007	6.313	1320.332
P2	725 725 1700 4205	131	20	19	11.560	2.466	541.667
P3	2350 6 legs H varies 650 1650	200	16	51	10.320	1.578	830.712
P4	5861 400 2334 5861	150	16	10	14.855	1.578	234.462
P5	Average 3780 400 2334 Average 3780	150	16	14	10.694	1.578	236.303
P6	2350		32	4	2.350	6.313	59.346
TOTAL IN ONE PIER CAP							4546.991
TOTAL WEIGHT (IN METRIC TON)							4.547

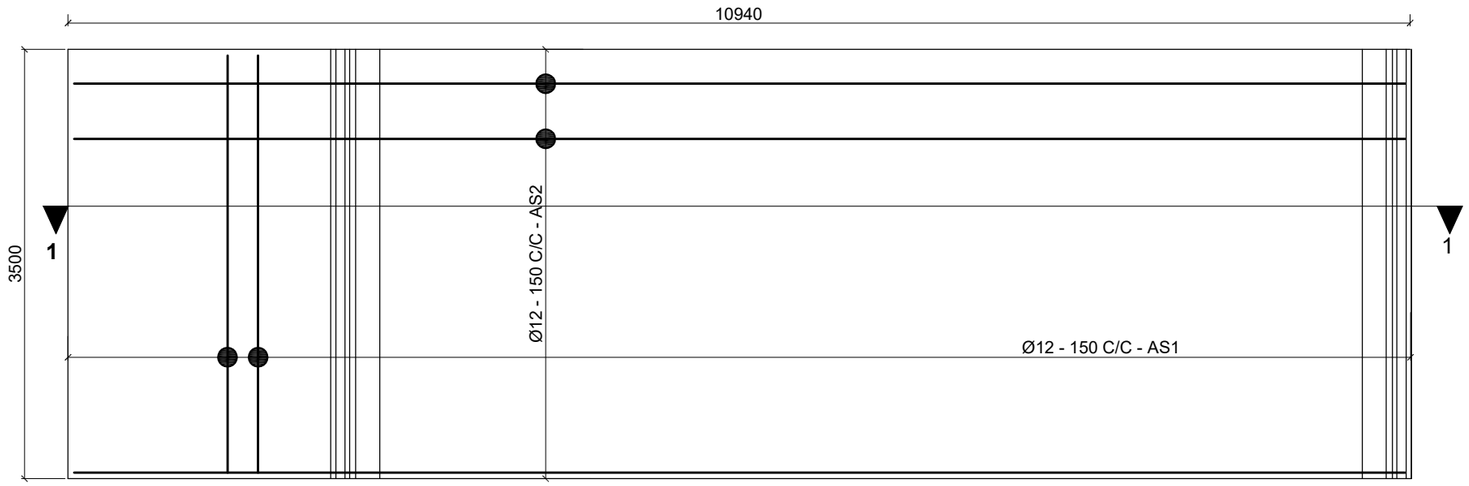
BAR BENDING SCHEDULE FOR PIER PILE CAP

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	13025 1080	180	25	67	15.185	3.853	3920.398
PPC2	13025 1080	180	25	67	15.185	3.853	3920.398
PPC3	13025 1080	180	25	67	15.185	3.853	3920.398
PPC4	13025 1080	180	25	67	15.185	3.853	3920.398
PPC5	1570 Curve length = 251 Curve radius = 40 Hook length = 80	600	16	529	2.232	1.578	1863.590
		600 C/C along/Across Axis					
PPC6	13050 13050	300	16	5	52.200	1.578	411.947
TOTAL IN PILE CAP OF ONE ABUTMENT							17957.129
TOTAL WEIGHT (IN METRIC TON)							17.957

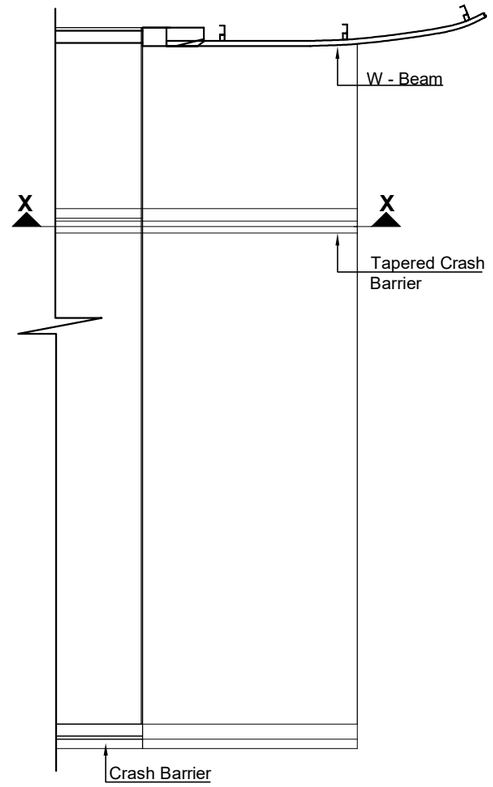
BAR BENDING SCHEDULE FOR PIER STEM

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	180 c/c Approx 9155 400	180	32	52	9.555	6.313	3136.856
P8	Dia-1534,Pitch-150 At Critical zone	150	16	1	105.190	1.578	166.026
P9	Dia-1534,Pitch-200 At Non-Critical zone	200	16	1	146.640	1.578	231.448
P10	150 C/C at critical zone 500 C/C at non-critical zone	150-500	16	28	9.210	1.578	407.022
TOTAL IN ONE PIER STEM							3941.351
TOTAL (IN METRIC TON)							3.941

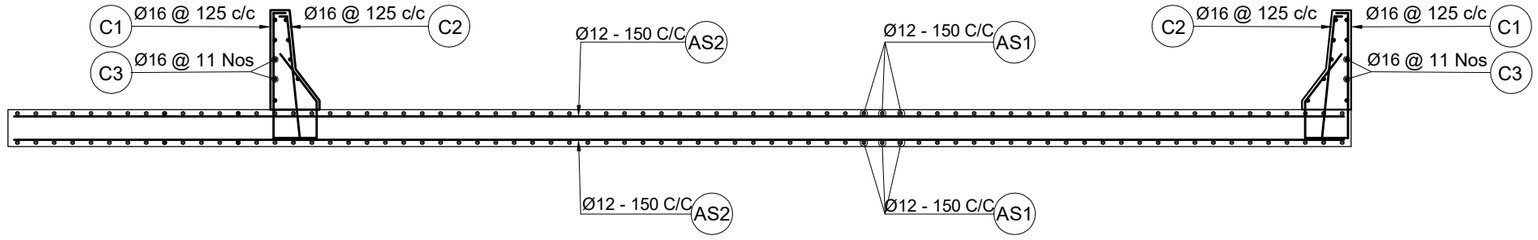
Government of Nepal Ministry of Physical Infrastructure and Transport **Department of Roads** **Project Directorate Office (ADB)** **SASEC Highway Improvement Project-** **Project Preparatory Consultant (SHIP-PPC)** **ADB Loan No: 3722-NEP**	**CONSULTANT:** Soosung Engineering Co. Ltd, Korea in association with ERMC P (Ltd), Nepal and TE-Tech Studio of Engineeering	**IMPLEMENTING AGENCY:** **DOR, DCID** **ROAD NAME:** **East West Highway (H01)** **Butwal - Gorusinghe Section**	**SHEET TITLE:** Bar Bending of Kaila Bridge (47/H001/310_A)	**SCALE:** As Shown		**NAME**	**SIGNATURE**	**REV NO.**	**DESCRIPTION**	**DATE:** November,2022
					DESIGNED BY:	Saroj Bhattarai				**DWG.NO.:** 310_Kaila
					CHECKED BY:	P. Upadhyaya				
					APPROVED BY:	Dr. T.H.Choi				**SHEET NO.:** 21/29



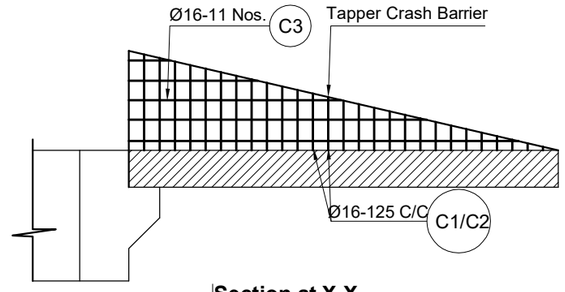
Plan of Reinforcement Details of Approach Slab
Scale:-1:50



Plan of Approach Slab
Not to Scale

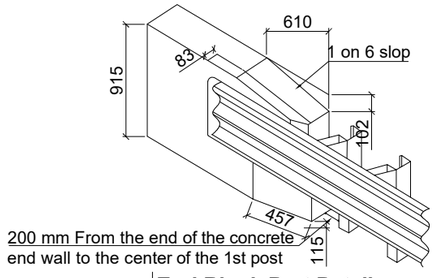


Section at 1-1
Scale:-1:50

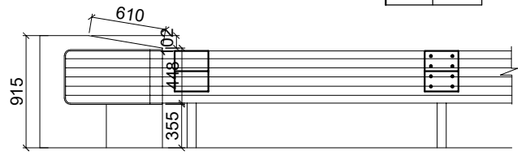


Section at X-X
Not to Scale

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 (Kg/m)	TOTAL WEIGHT (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

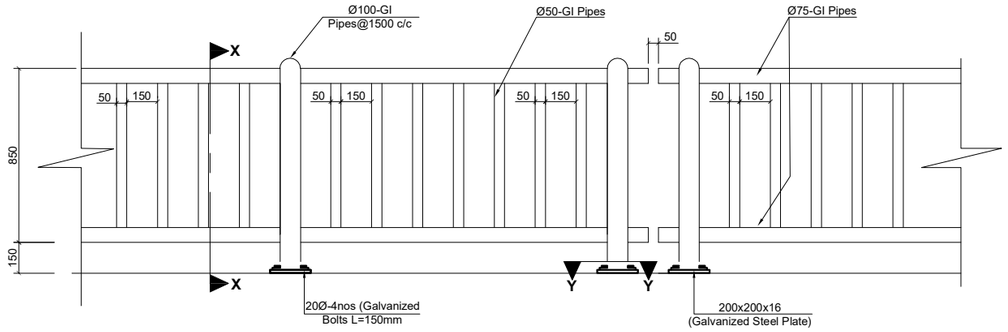


End Block Part Details
Scale:-1:50

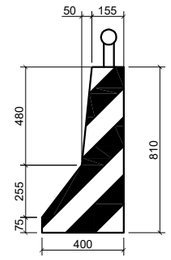


Eleavation
Scale:-1:50

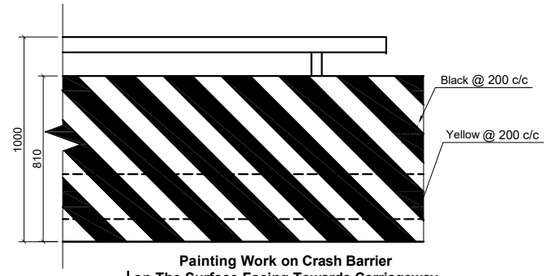
Government of Nepal Ministry of Physical Infrastructure and Transport **Department of Roads** **Project Directorate Office (ADB)** **SASEC Highway Improvement Project-** **Project Preparatory Consultant (SHIP-PPC)** **ADB Loan No: 3722-NEP**	**CONSULTANT:** Soosung Engineering Co. Ltd, Korea in association with ERMC P (Ltd), Nepal and TTE-Tech Studio of Engineeering	**IMPLEMENTING AGENCY:** **DOR, DCID** **ROAD NAME:** **East West Highway (H01)** **Butwal - Gorusinghe Section**	**SHEET TITLE:** Reinforcement Details of Approach Slab of **Kaila Bridge** (47/H001/310_A)	**SCALE:** As Shown		**NAME**	**SIGNATURE**	**REV NO.**	**DESCRIPTION**	**DATE:** November,2022 **DWG.NO.:** 310_Kaila **SHEET NO.:** 22/29
					DESIGNED BY:	Saroj Bhattarai				
					CHECKED BY:	P. Upadhyaya				
					APPROVED BY:	Dr. T.H.Choi				



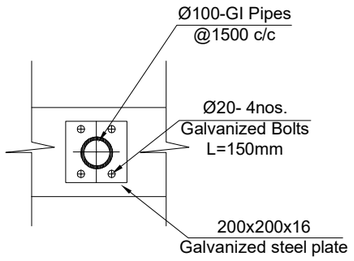
Railing Post Details
Scale:-1:20



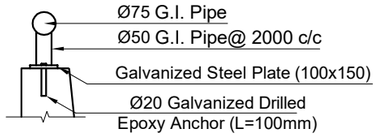
Painting Work on Crash Barrier
Scale:-1:20



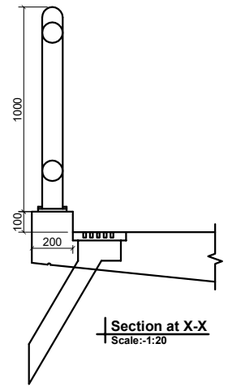
Painting Work on Crash Barrier on The Surface Facing Towards Carriageway
Scale:-1:20



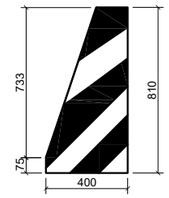
Section at Y-Y
Scale:-1:20



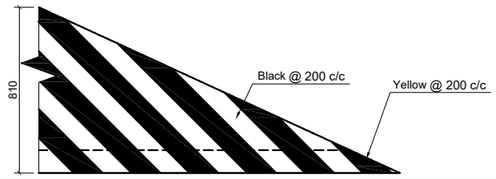
Details at- A-A
Scale:-1:20



Section at X-X
Scale:-1:20



Painting Work on Tapper Crash Barrier
Scale:-1:20

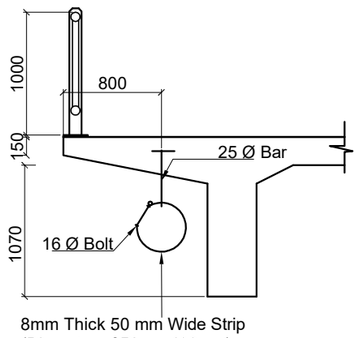


Painting Work on Crash Barrier on The Surface Facing Towards Carriageway
Scale:-1:20

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.

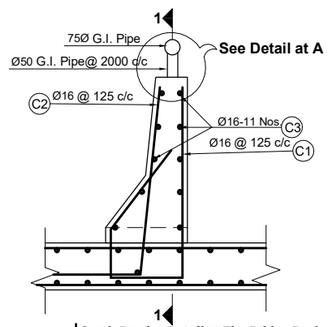
BAR BENDING SCHEDULE OF CRASH BARRIER (For eatch 10m)

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)
C1	575, 928, 225, 304	125 Approximate	16	81	2.030	1.578	259.526
C2	915, 500	125 Approximate	16	81	1.415	1.578	180.901
C3	960		16	11	0.960	1.578	16.667

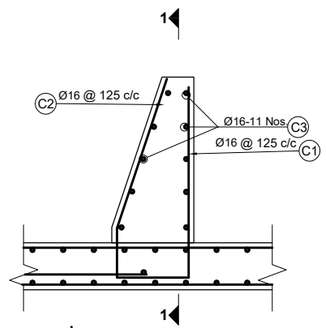


8mm Thick 50 mm Wide Strip
(Diameter of Ring =400mm)
Maximum Load allowed 250 kg/m

Utility hanger Detail
Scale:-1:50

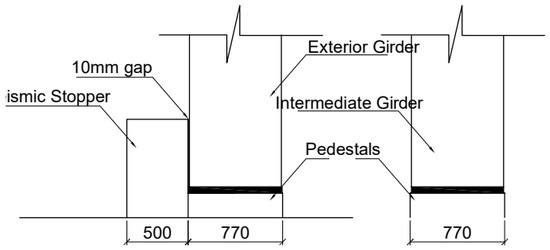


Crash Barrier Detail at The Bridge Deck
Scale:-1:20

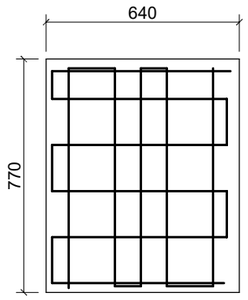


Crash Barrier Detail at The Tapered End
Scale:-1:20

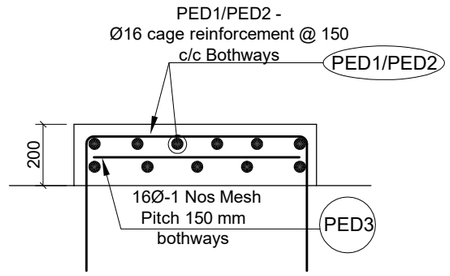
Government of Nepal Ministry of Physical Infrastructure and Transport **Department of Roads** **Project Directorate Office (ADB)** **SASEC Highway Improvement Project-** **Project Preparatory Consultant (SHIP-PPC)** **ADB Loan No: 3722-NEP**	**CONSULTANT:**	**IMPLEMENTING AGENCY:**	**SHEET TITLE:**	**SCALE:**		**NAME**	**SIGNATURE**	**REV NO.**	**DESCRIPTION**	**DATE:**
	Soosung Engineering Co. Ltd, Korea in association with	**DOR, DCID**	Miscellaneous Details-1 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
	TTE-Tech Studio of Engineeering	**East West Highway (H01)**			APPROVED BY:	Dr. T.H.Choi				**SHEET NO.:** 23/29
		Butwal - Gorusinghe Section								



Abutment Cap With Stopper
Scale:-1:50

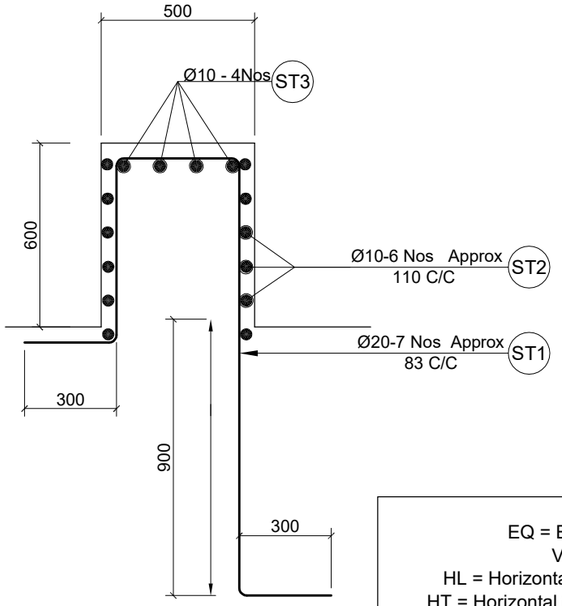


Pedestal Plan
Scale:-1:20

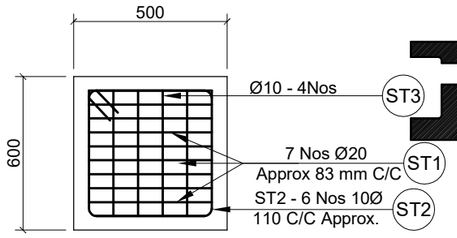


Pedestal Section
Scale:-1:20

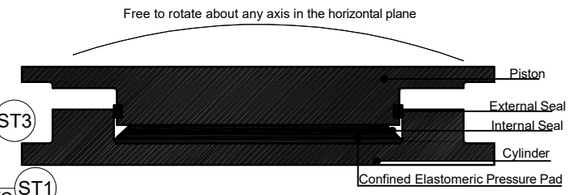
Note
On Pedestal Thickness The thickness
of the pedestal can be suitably adjusted as per
engineer's instruction to retain the height of the ballast wall



Stoppers Details
Scale:-1:20



Stoppers Plan
Scale:-1:20



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

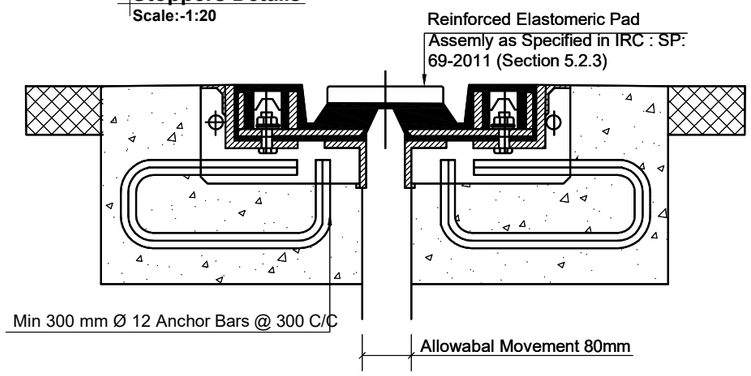
Notes: Proposed Type of Bearing:- POT-PTFE bearings
1) The POT-Fixed bearings are fixed in position and free to rotate in all directions
2) The POT-PTFE Free bearings are free to rotate in all direction, Free to slide along the the bridge axis and Fixed in position in transverse direction
3) The coefficient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

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

Design Data for Bearings (per Bearing)

Load Condiadtion	Items		Load / Displacement/ Moment	
			POT Fixed Bearing	POT_PTFE Free Bearing
Under DL only	V, kN	No EQ	874	874
		EQ	988	988
	HL, kN	No EQ	45	45
		EQ	525	52
	HT, kN	No EQ	0	0
		EQ	236	236
	θ, rad	No EQ	0.0000	0.0000
		EQ	0.0000	0.0000
	Δ, mm		N/A	64
Under Maximum Live Load	V, kN	No EQ	1540	1540
		EQ	1748	1748
	HL, kN	No EQ	178	77
		EQ	724	87
	HT, kN	No EQ	0	0
		EQ	385	385
	θ, rad	No EQ	0.0000	0.0000
		EQ	0.0000	0.0000
	Δ, mm		N/A	64

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



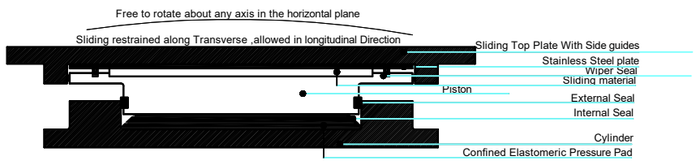
Reinforced Elastomeric Joint
Scale:-1:10

BAR BENDING SCHEDULE OF PEDESTAL

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)
PED1	690; 920; 200	150	16	5	2.930	1.578	23.123
PED2	560; 920; 200	150	16	6	2.800	1.578	26.516
PED3	674; 544; Pitch 150 bothway, 1 layer	150	16	1	7.180	1.578	11.332
TOTAL BAR BENDING SCHEDULE OF PEDESTAL							60.971
TOTAL WEIGHT (IN METRIC TON)							0.061

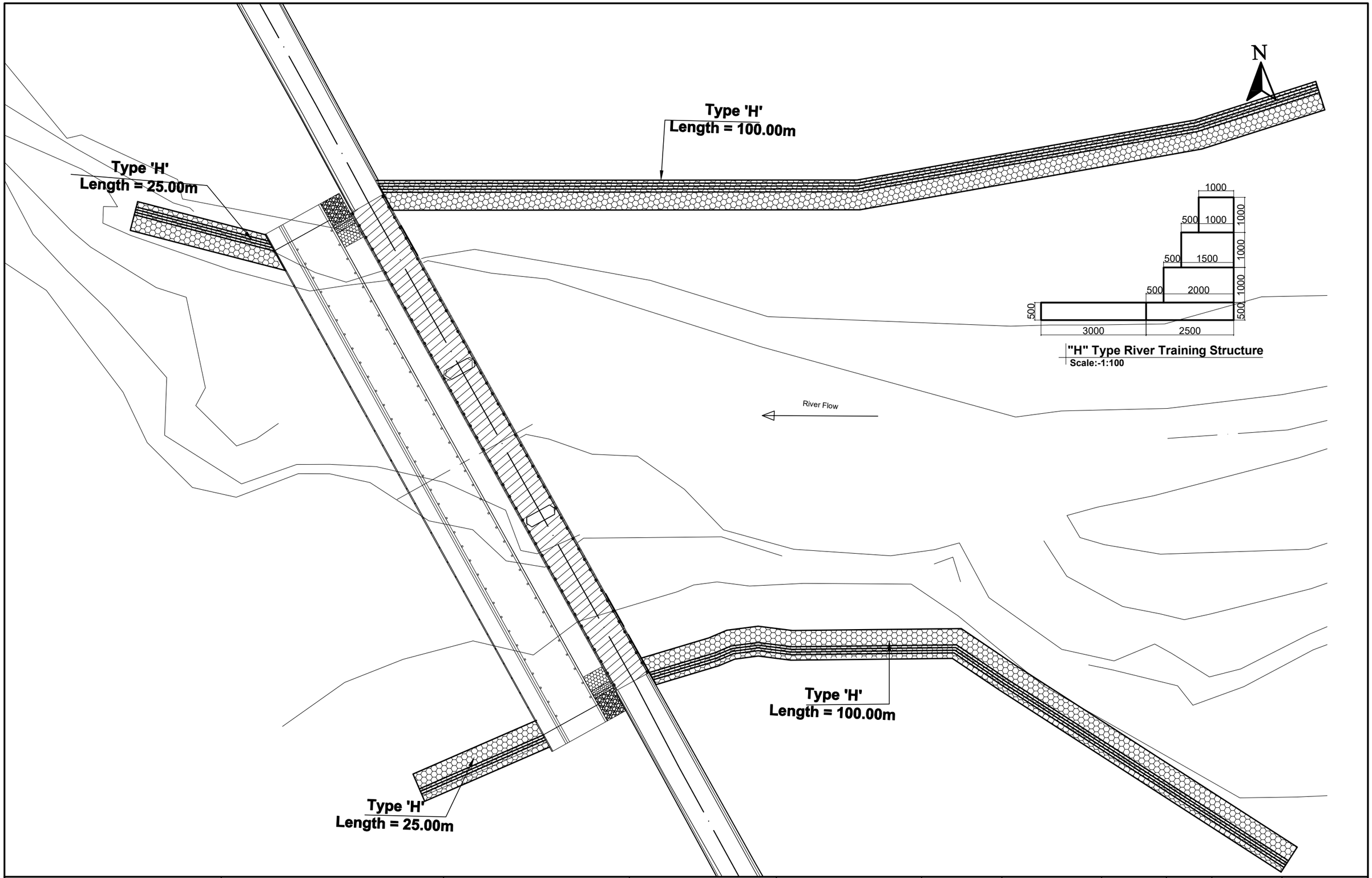
BAR BENDING SCHEDULE OF STOPPER

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)
ST1	400; 600; 1500; 300; 300	80	20	7	3.100	2.466	53.516
ST2	420; 100; 500	110	10	6	2.040	0.617	7.546
ST3	500	0	10	4	0.500	0.617	1.233
TOTAL BAR BENDING SCHEDULE OF STOPPER							62.295
TOTAL WEIGHT (IN METRIC TON)							0.062

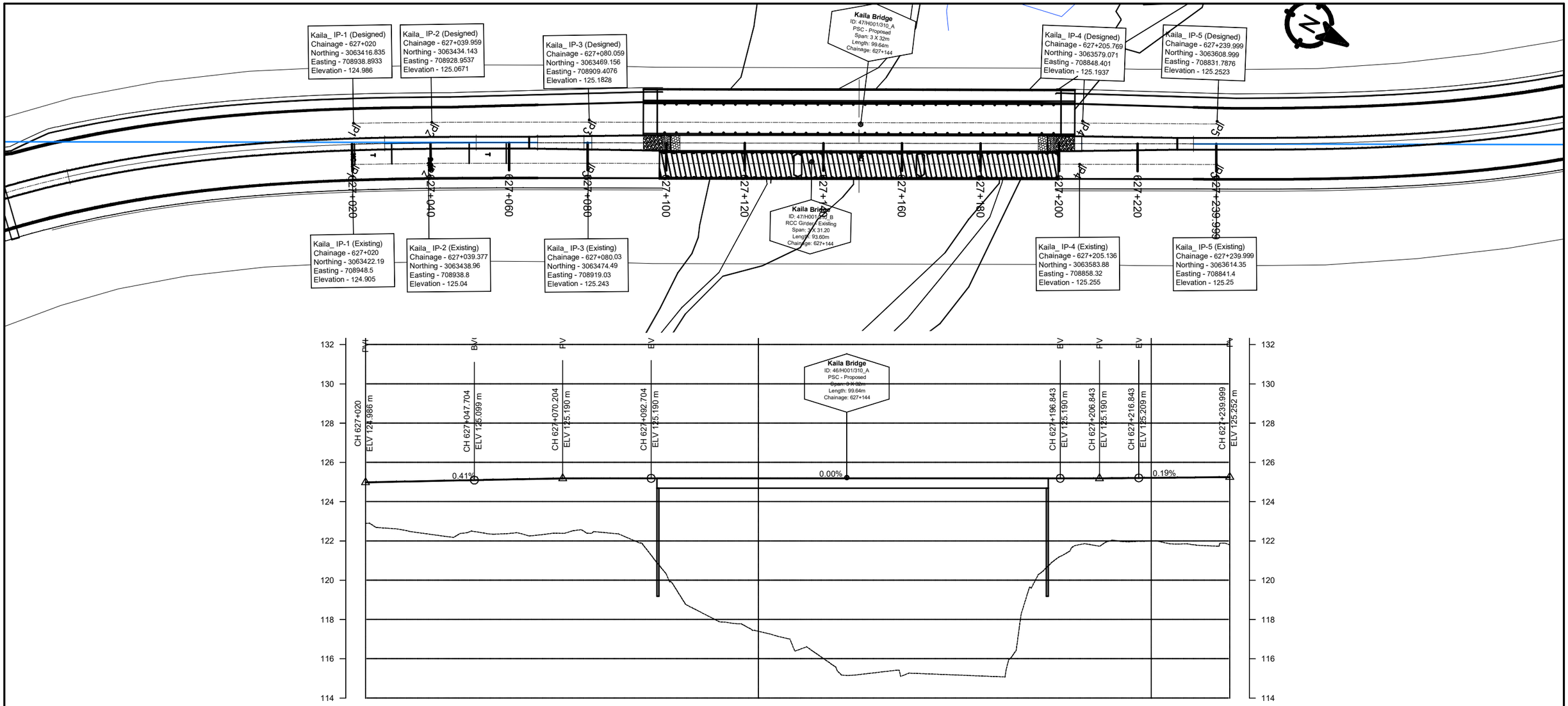


Guided Pot Bearing(For free Bearing) Movement Allowed in to longitudinal Direction As Per IRC : 83 (Part - III) - 2018 Section 2.1.3

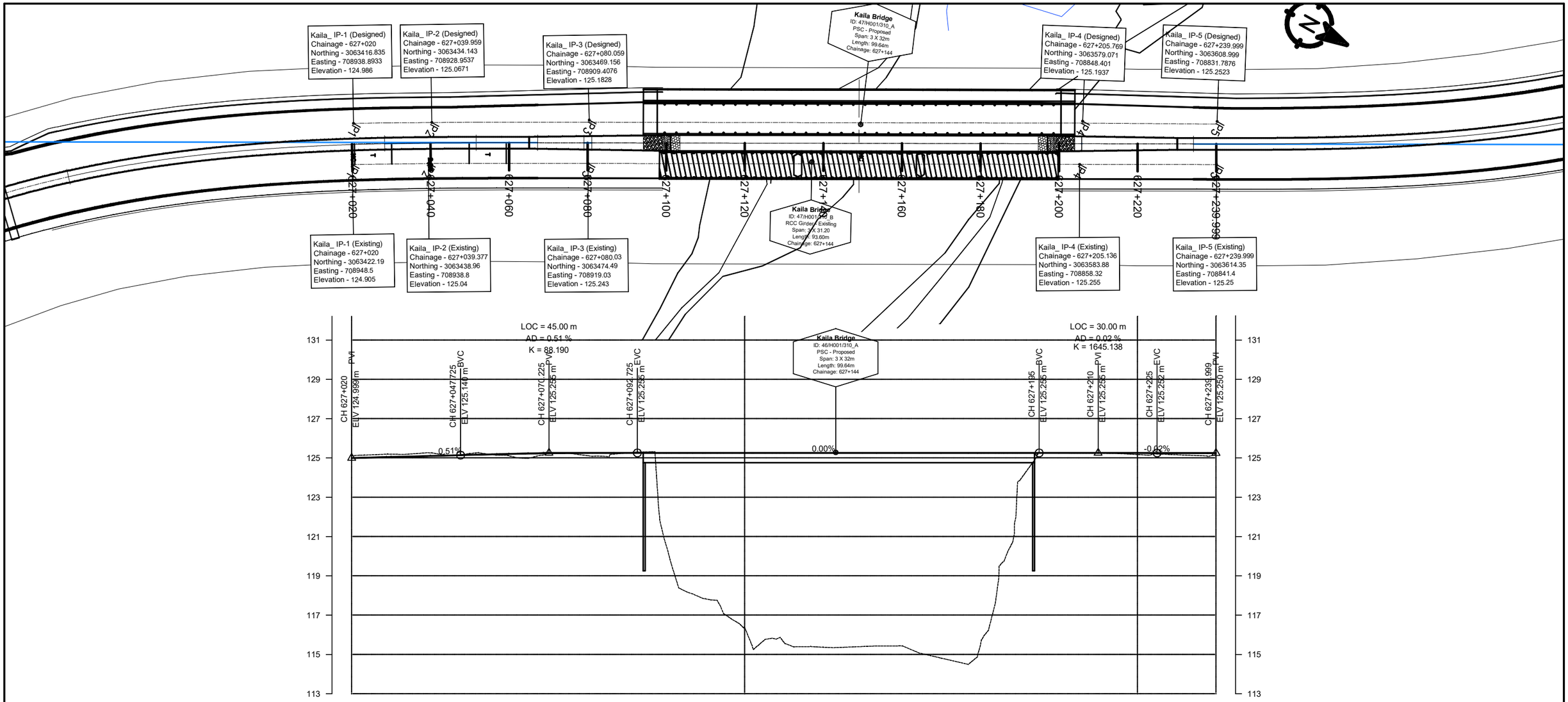
Government of Nepal Ministry of Physical Infrastructure and Transport **Department of Roads** **Project Directorate Office (ADB)** **SASEC Highway Improvement Project-** **Project Preparatory Consultant (SHIP-PPC)** **ADB Loan No: 3722-NEP**	**CONSULTANT:** Soosung Engineering Co. Ltd, Korea in association with ERMC P (Ltd), Nepal and TE-Tech Studio of Engineeering	**IMPLEMENTING AGENCY:** **DOR, DCID** **ROAD NAME:** **East West Highway (H01)** **Butwal - Gorusinghe Section**	**SHEET TITLE:** Miscellaneous Details-2 of Kaila Bridge (47/H001/310_A)	**SCALE:** As Shown		**NAME**	**SIGNATURE**	**REV NO.**	**DESCRIPTION**	**DATE:** November,2022 **DWG.NO.:** 310_Kaila **SHEET NO.:** 24/29
					DESIGNED BY:	Saroj Bhattarai				
					CHECKED BY:	P. Upadhyaya				
					APPROVED BY:	Dr. T.H.Choi				



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 TTE-Tech Studio of Engineeering	**IMPLEMENTING AGENCY:** **DOR, DCID** **ROAD NAME:** **East West Highway (H01)** **Butwal - Gorusinghe Section**	**SHEET TITLE:** River Training Work of Kaila Bridge (47/H001/310_A)	**SCALE:** 1:600		**NAME**	**SIGNATURE**	**REV NO.**	**DESCRIPTION**	**DATE:** November,2022 **DWG.NO.:** 310_Kaila **SHEET NO.:** 25/29
					DESIGNED BY:	Saroj Bhattarai				
					CHECKED BY:	P. Upadhyaya				
					APPROVED BY:	Dr. T.H.Choi				



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 Engineeering	**IMPLEMENTING AGENCY:** **DOR, DCID** **ROAD NAME:** **East West Highway (H01)** **Butwal - Gorusinghe Section**	**SHEET TITLE:** Plan & Profile of Kaila Bridge 627+020-627+230	**SCALE:** 0 2 4 6m Vertical Scale 0 10 20 30m Horizontal Scale		**NAME**	**SIGNATURE**	**REV NO.**	**DESCRIPTION**	**DATE:** November,2022 **DWG.NO.:** 310_Kaila **SHEET NO.:** 26/29
					DESIGNED BY:	Saroj Bhattarai				
					CHECKED BY:	P. Upadhyaya				
					APPROVED BY:	Dr. T.H.Choi				



DESIGN LEVEL(m)	124.999	125.050	125.101	125.152	125.194	125.226	125.246	125.255	125.255	125.255	125.255	125.255	125.255	125.255	125.255	125.255	125.255	125.255	125.255	125.254	125.253	125.251		
EXISTING LEVEL(m)	125.120	125.191	125.258	125.221	125.111	125.221	125.116	125.252	120.587	117.829	116.381	115.626	115.367	115.402	115.432	114.815	115.434	123.845	125.246	125.239	125.173	125.161		
HORIZONTAL ALIGNMENT RIGHT / LEFT	IP-1 R=0.00		IP-2 R=1500.00				IP-3 R=1500.00												IP-4 R=1500.00					
SUPER ELEVATION	NC	T	-3	T											NC									
	627+020	627+027.019	627+032.269	627+046.485	627+051.735																	627+239.999		
CHAINAGE(Km)	627+020	627+030	627+040	627+050	627+060	627+070	627+080	627+090	627+100	627+110	627+120	627+130	627+140	627+150	627+160	627+170	627+180	627+190	627+200	627+210	627+220	627+230		

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 Engineeering

IMPLEMENTING AGENCY:
DOR, DCID

ROAD NAME:
East West Highway (H01)
Butwal - Gorusinghe Section

SHEET TITLE:
Plan & Profile
of
Existing Kaila Bridge
627+020 - 627+230

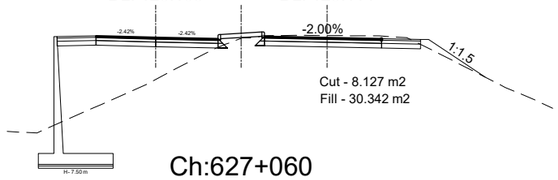
SCALE:
0 2 4 6m
Vertical Scale
0 10 20 30m
Horizontal Scale

	NAME	SIGNATURE	REV NO.	DESCRIPTION
DESIGNED BY:	Saroj Bhattarai			
CHECKED BY:	P. Upadhyaya			
APPROVED BY:	Dr. T.H.Choi			

DATE: November,2022
DWG.NO.: 310_Kaila
SHEET NO.: 27/29

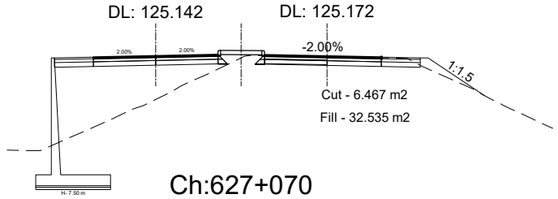
Ch:627+050
GL:125.043
DL:125.172

GL: 122.405 DL: 125.108 | GL: 125.221 DL: 125.114



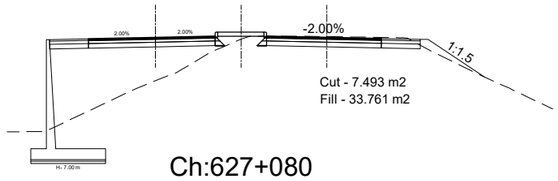
Ch:627+060
GL:125.015
DL:125.211

GL: 122.348 DL: 125.142 | GL: 125.111 DL: 125.172



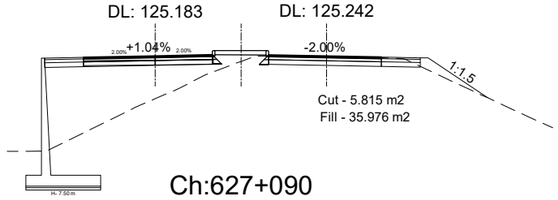
Ch:627+070
GL:125.058
DL:125.237

GL: 122.387 DL: 125.167 | GL: 125.221 DL: 125.215



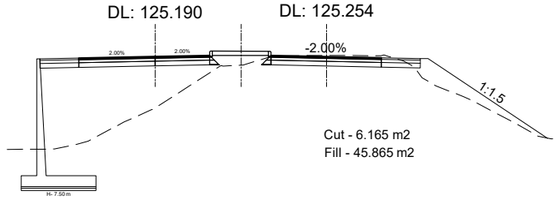
Ch:627+080
GL:124.837
DL:125.252

GL: 122.441 DL: 125.183 | GL: 125.116 DL: 125.242



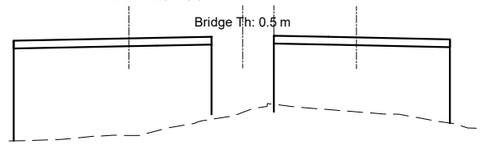
Ch:627+090
GL:124.634
DL:125.255

GL: 121.892 DL: 125.190 | GL: 125.252 DL: 125.254



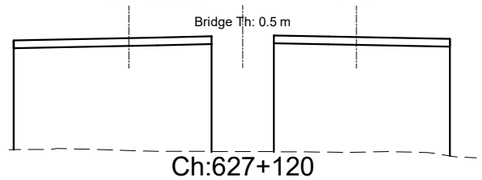
Ch:627+100
GL:120.406
DL:125.255

GL: 119.238 DL: 125.190 | GL: 120.594 DL: 125.255



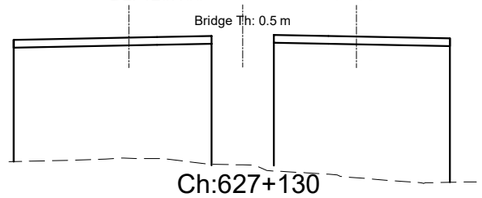
Ch:627+110
GL:117.870
DL:125.255

GL: 117.890 DL: 125.190 | GL: 117.830 DL: 125.255



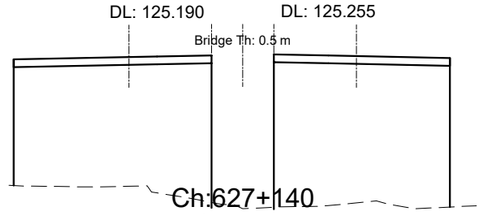
Ch:627+120
GL:116.988
DL:125.255

GL: 117.399 DL: 125.190 | GL: 116.385 DL: 125.255



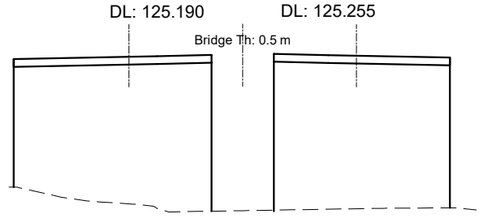
Ch:627+130
GL:115.431
DL:125.255

GL: 116.443 DL: 125.190 | GL: 115.628 DL: 125.255



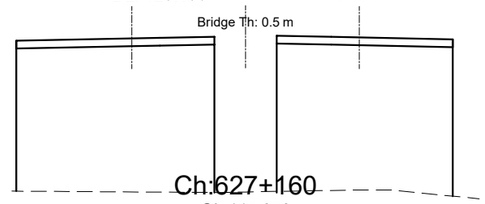
Ch:627+140
GL:115.273
DL:125.255

GL: 115.419 DL: 125.190 | GL: 115.367 DL: 125.255



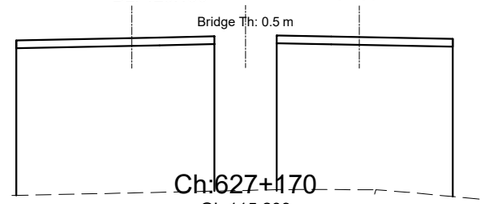
Ch:627+150
GL:115.305
DL:125.255

GL: 115.296 DL: 125.190 | GL: 115.402 DL: 125.255



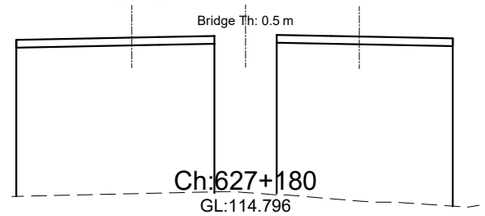
Ch:627+160
GL:115.378
DL:125.255

GL: 115.256 DL: 125.190 | GL: 115.432 DL: 125.255



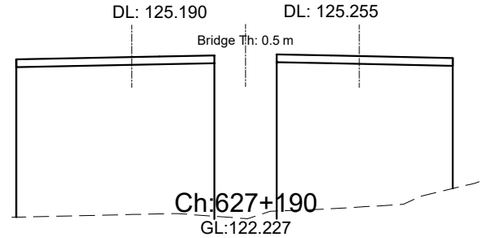
Ch:627+170
GL:115.209
DL:125.255

GL: 115.177 DL: 125.190 | GL: 114.815 DL: 125.255



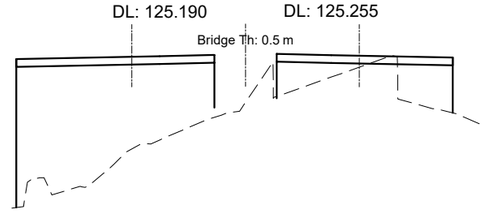
Ch:627+180
GL:114.796
DL:125.255

GL: 115.097 DL: 125.190 | GL: 115.423 DL: 125.255



Ch:627+190
GL:122.227
DL:125.255

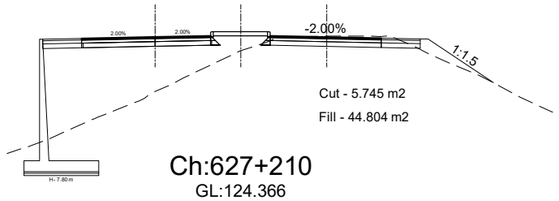
GL: 119.806 DL: 125.190 | GL: 123.844 DL: 125.255



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 Engineeering	**IMPLEMENTING AGENCY:** **DOR, DCID** **ROAD NAME:** **East West Highway (H01)** **Butwal - Gorusinghe Section**	**SHEET TITLE:** Plan & Profile of Ch:627+050 - 627+190	**SCALE:** 0 2 4 6m Vertical Scale 0 10 20 30m Horizontal Scale		**NAME**	**SIGNATURE**	**REV NO.**	**DESCRIPTION**	**DATE:** November,2022 **DWG.NO.:** 310_Kaila **SHEET NO.:** 27a/29
					DESIGNED BY:	Saroj Bhattarai				
					CHECKED BY:	P. Upadhyaya				
					APPROVED BY:	Dr. T.H.Choi				

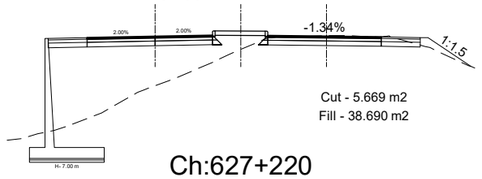
Ch:627+200
GL:124.314
DL:125.255

GL: 121.691 DL: 125.190 | GL: 125.246 DL: 125.255



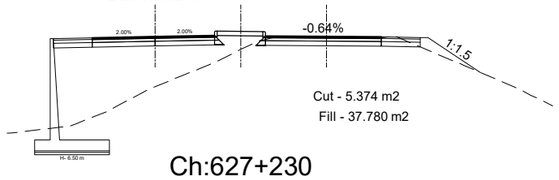
Ch:627+210
GL:124.366
DL:125.255

GL: 122.030 DL: 125.198 | GL: 125.239 DL: 125.254



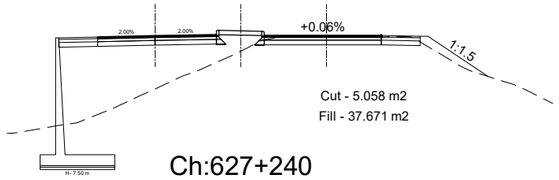
Ch:627+220
GL:124.399
DL:125.255

GL: 121.998 DL: 125.215 | GL: 125.173 DL: 125.253



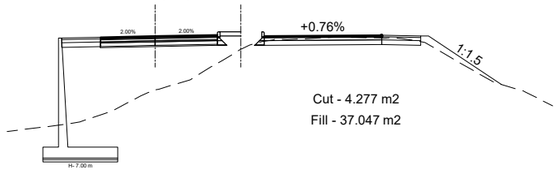
Ch:627+230
GL:124.259
DL:125.255

GL: 121.829 DL: 125.233 | GL: 125.161 DL: 125.251

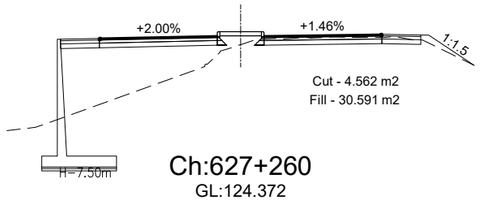


Ch:627+240
GL:124.410
DL:125.254

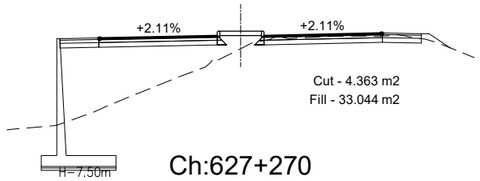
GL: 121.803
DL: 125.252



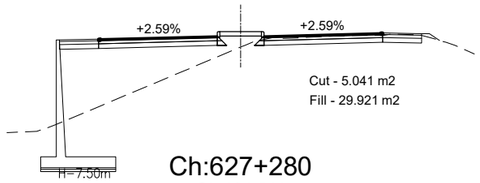
Ch:627+250
GL:124.693
DL:125.245



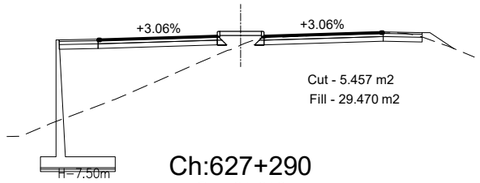
Ch:627+260
GL:124.372
DL:125.226



Ch:627+270
GL:124.489
DL:125.199



Ch:627+280
GL:124.541
DL:125.162



Ch:627+290
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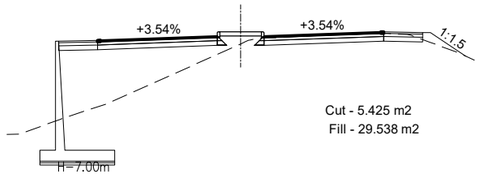
DL:125.116



Ch:627+300
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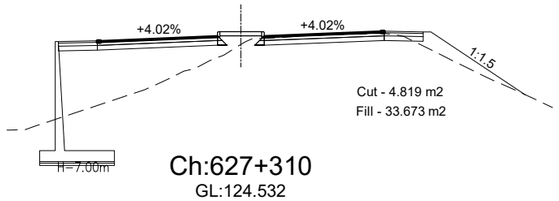
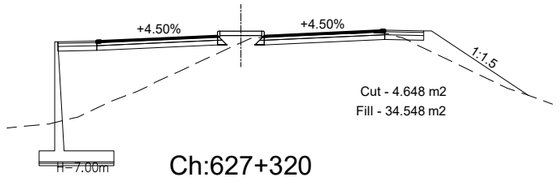
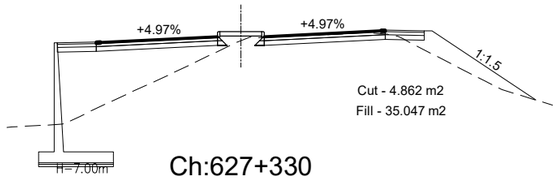
DL:125.062



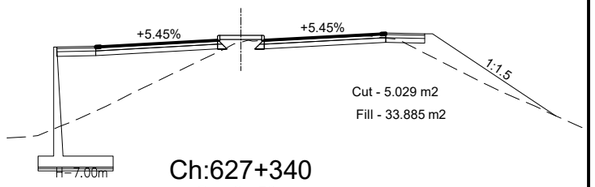
Ch:627+310
GL:124.532
DL:124.997



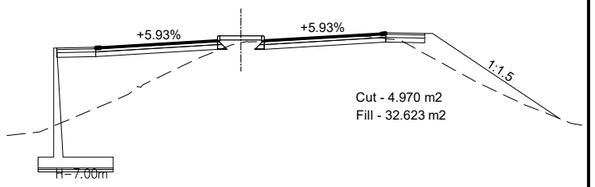
Ch:627+320
GL:124.621
DL:124.924



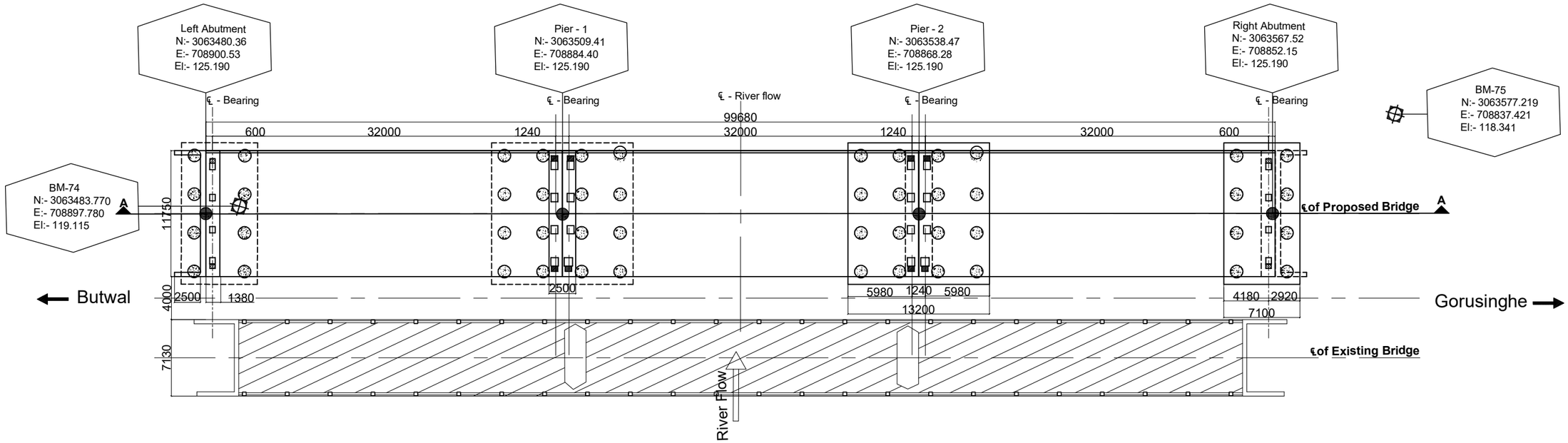
Ch:627+330
GL:124.669
DL:124.842



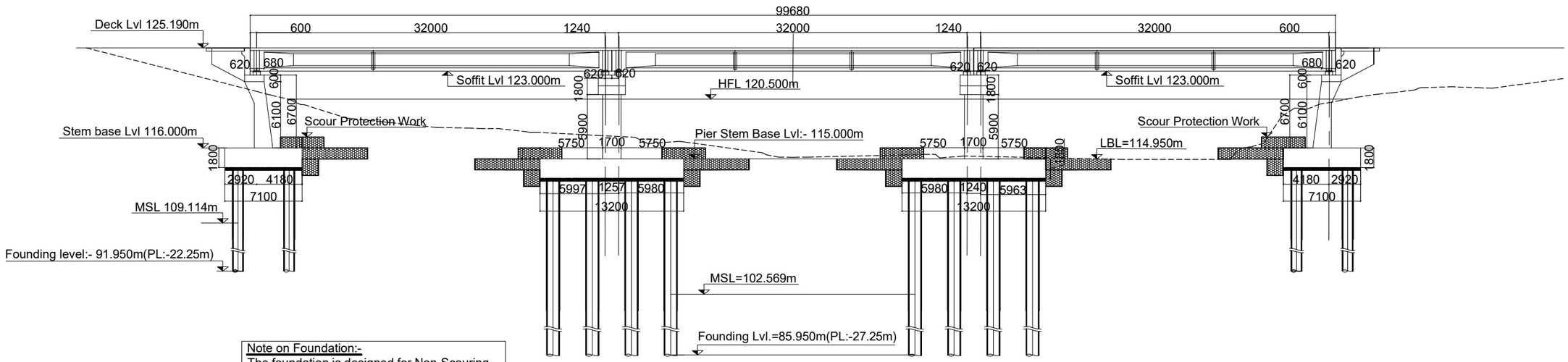
Ch:627+340
GL:124.581
DL:124.751



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 Engineeering	**IMPLEMENTING AGENCY:** **DOR, DCID** **ROAD NAME:** **East West Highway (H01)** **Butwal - Gorusinghe Section**	**SHEET TITLE:** Plan & Profile of Ch:627+200 - 627+340	**SCALE:** 0 2 4 6m Vertical Scale 0 10 20 30m Horizontal Scale		**NAME**	**SIGNATURE**	**REV NO.**	**DESCRIPTION**	**DATE:** November,2022 **DWG.NO.:** 310_Kaila **SHEET NO.:** 27b/29
					DESIGNED BY:	Saroj Bhattarai				
					CHECKED BY:	P. Upadhyaya				
					APPROVED BY:	Dr. T.H.Choi				



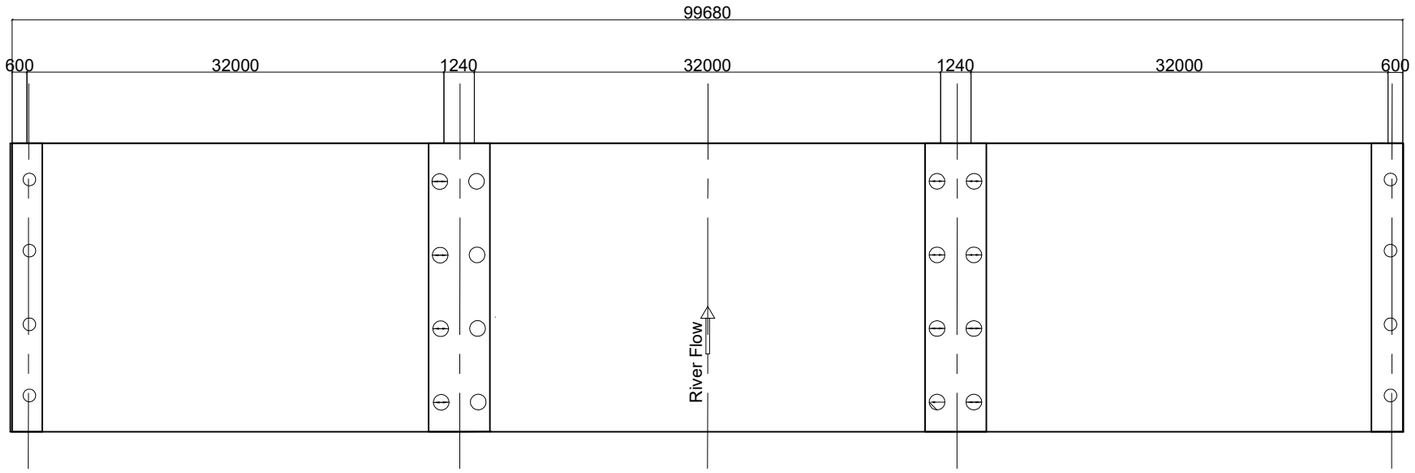
Layout Plan
Scale:-1:400



Note on Foundation:-
The foundation is designed for Non-Scouring condition.
The surrounding of the foundation shall be kept protected from scouring through its service life.

Section at A-A
Scale:-1:400

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) and TE-Tech Studio of Engineeering Nepal	**IMPLEMENTING AGENCY:** **DOR, DCID** **ROAD NAME:** **East West Highway (H01)** **Butwal - Gorusinghe Section**	**SHEET TITLE:** Layout Plan of **Kaila Bridge** (47/H001/310_A)	**SCALE:** As Shown		**NAME**	**SIGNATURE**	**REV NO.**	**DESCRIPTION**	**DATE:** November,2022 **DWG.NO.:** 310_Kaila **SHEET NO.:** 28/29
					Designed by:	Saroj Bhattarai				
					Checked by:	P. Upadhyaya				
					Approved by:	Dr. T.H.Choi				



Layout of Bearing
Scale:-1:250

Legend

Elastomeric bearing.
Partial movement allowed in longitudinal direction.
Restrained to transverse movement.Free to rotate in any direction.

Fixed Pot-bearing.
Restrainde 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:** Soosung Engineering Co. Ltd, Korea in association with ERMC P (Ltd) and TE-Tech Studio of Engineeering Nepal	**IMPLEMENTING AGENCY:** **DOR, DCID** **ROAD NAME:** **East West Highway (H01)** **Butwal - Gorusinghe Section**	**SHEET TITLE:** Layout Plan of **Kaila Bridge** (47/H001/310_A)	**SCALE:** As Shown		**NAME**	**SIGNATURE**	**REV NO.**	**DESCRIPTION**	**DATE:** November,2022 **DWG.NO.:** 310_Kaila **SHEET NO.:** 29/29
					Designed by:	Saroj Bhattarai				
					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

Balhundra Bridge(47-H001-311_A)

St. Ch : 629+414.65 ~ End Ch : 629+437.35

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.	Reinforcement Details of Main Girder.	8	1
8.	Reinforcement Details of Cross Girder.	9	1
9.	Bar Bending Schedule of Slab & Main Girder.	10	1
10.	Abutment Details.	11	1
11.	Reinforcement Details of Abutment.	12	1
12.	Reinforcement Details of Wingwall.	13	1
13.	Reinforcement Details of Abutment Piles.	14	1
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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 1.95x10^5 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.

Stages and sequence of Prestressing

- The Precast composite girders shall be prestressed in two stages. 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 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
Prestressing of Girder (Stage 2)	After 14 days of casting of deck slab
Casting of Footpath, Crash Barrier, Wearing Course etc	Preferably within 7 days but not later than 14 days of Second stage prestressing

Deviation from the above time-line is subject to approval by the engineer. No other vehicle except the concreting apparatus are allowed on the deck until the deck slab has attained its full specified strength.

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 period.

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.

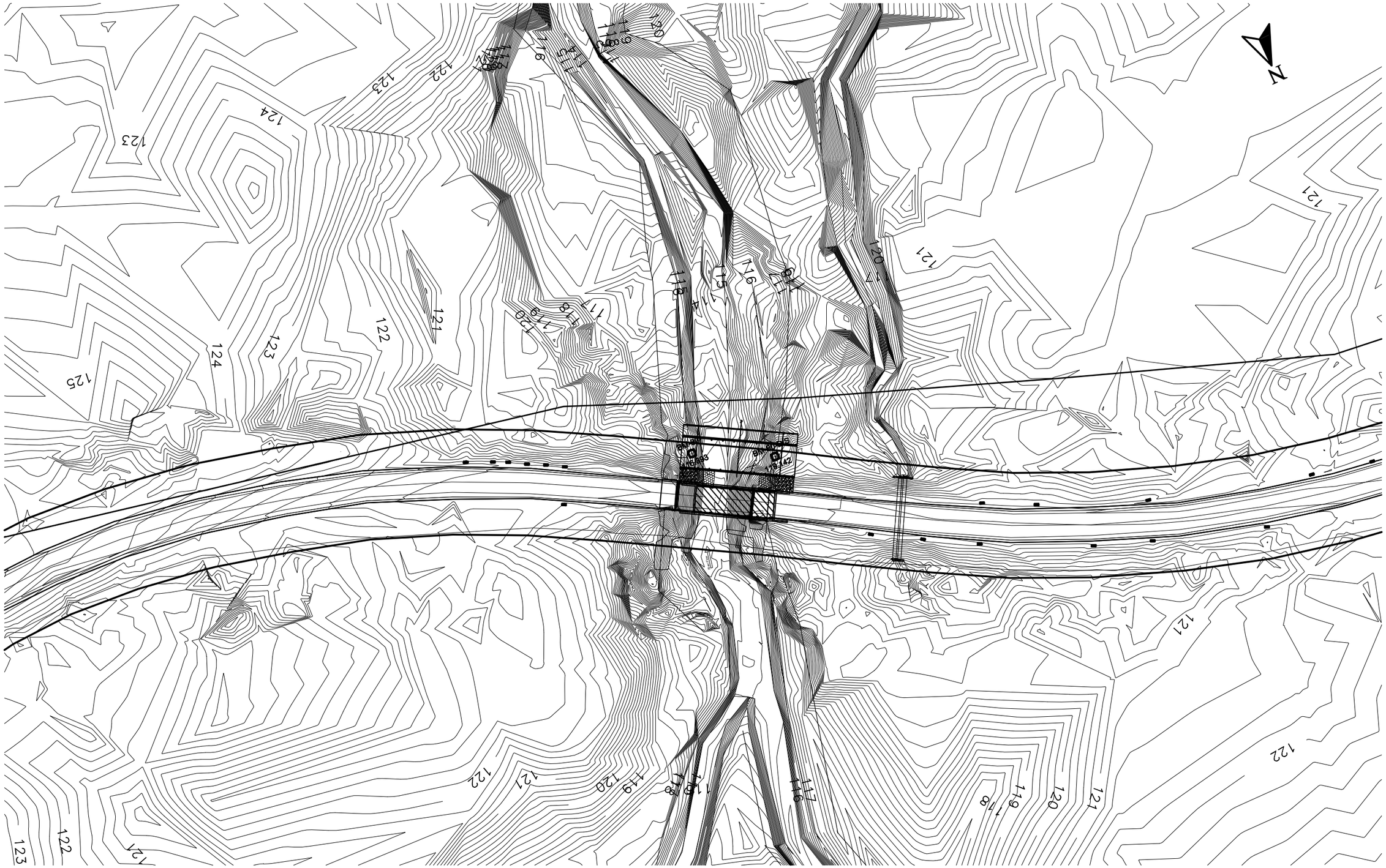
Notes on Foundation and Substructure

- 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 be commenced 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.

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) and TTE-Tech Studio of Engineeering Nepal	**IMPLEMENTING AGENCY:** **DOR, DCID** **ROAD NAME:** **East West Highway (H01)** **Butwal - Gorusinghe Section**	**SHEET TITLE:** General Notes of **Balhundra Bridge** (47/H001/311_A)	**SCALE:** As Shown		**NAME**	**SIGNATURE**	**REV NO.**	**DESCRIPTION**	**DATE:** November,2022 **DWG.NO.:** 311_Balhundra **SHEET NO.:** 02/21
					Designed by:	Saroj Bhattarai				
					Checked by:	P. Upadhyaya				
					Approved by:	Dr. T.H.Choi				



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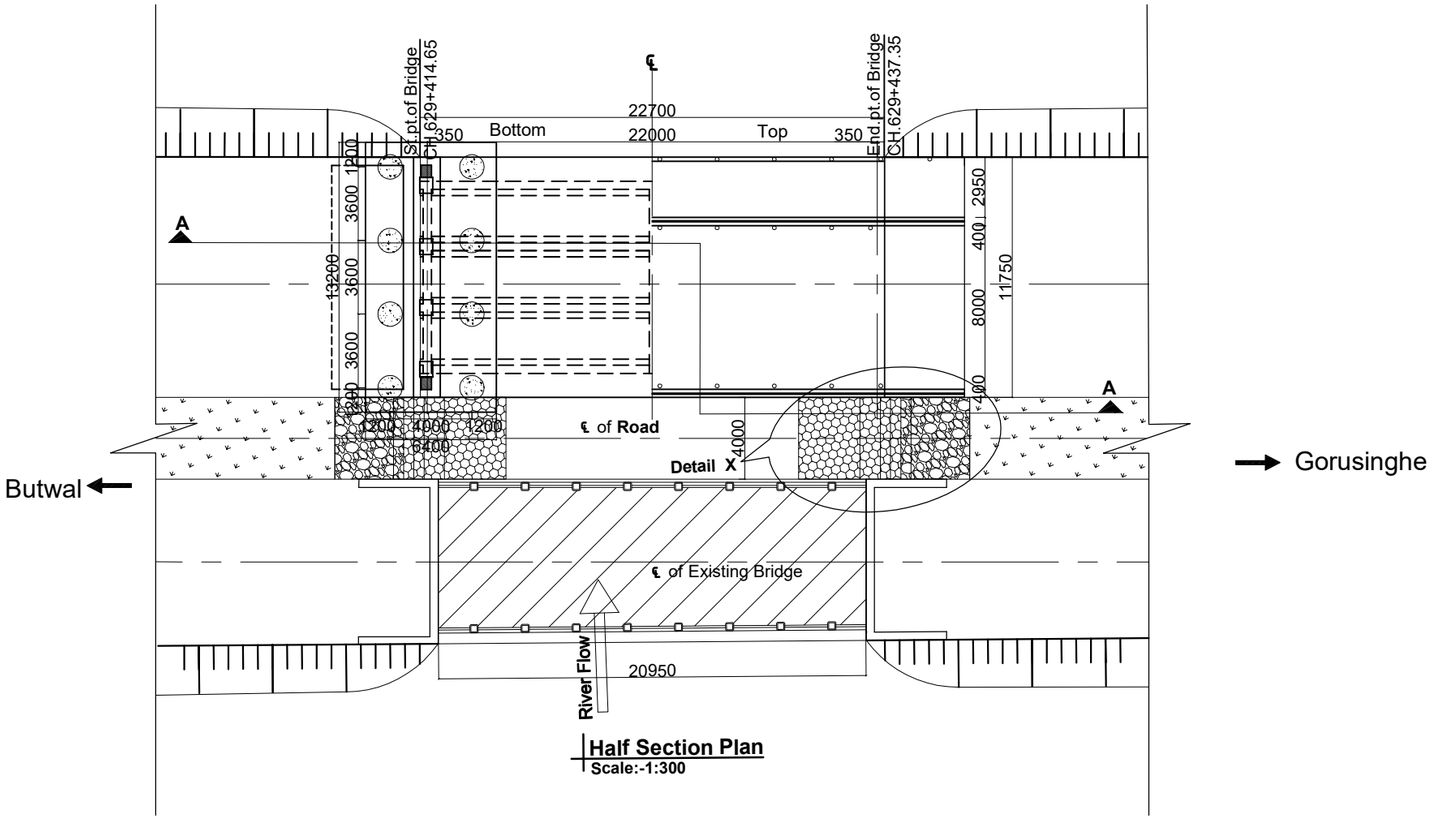
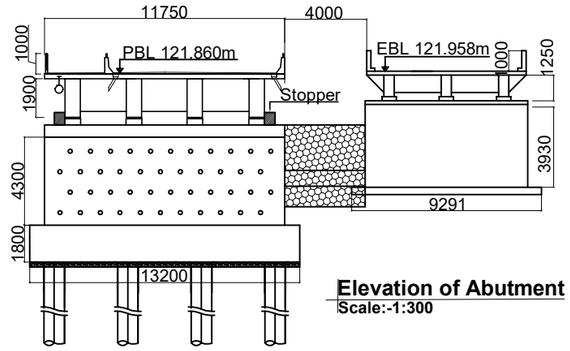
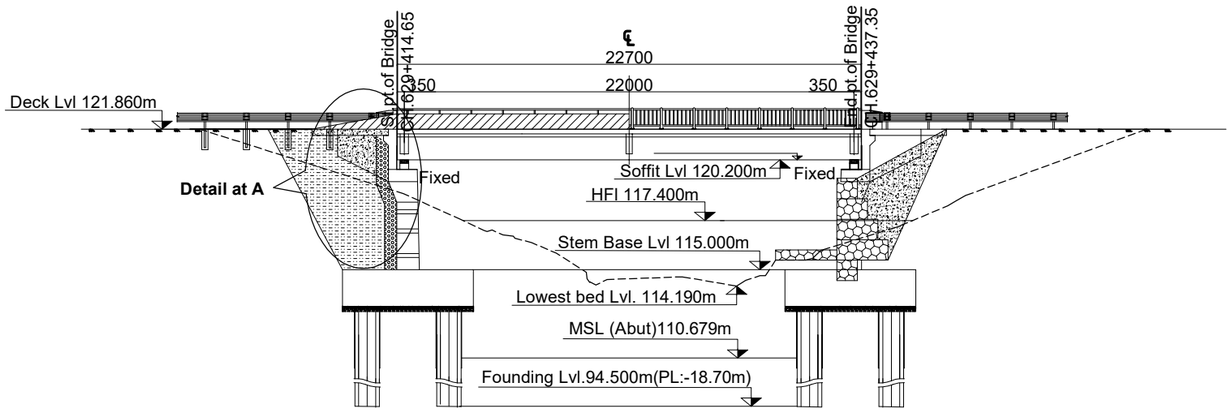
					Designed by:	Saroj Bhattarai				
					Checked by:	P. Upadhyaya				
					Approved by:	Dr. T.H.Choi				



Half Section Plan
Scale:-1:300



Elevation of Abutment
Scale:-1:300



Half Sectional Elevation
Scale:-1:300

Note :-
MSL :- Maximum Scour Level
HFL :- High Flood Level
LBL :- Lowest Bed Level
RL :- Reduced 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:
Soosung Engineering Co. Ltd,
Korea
in association with
ERMC P (Ltd)
and
TSE-Tech Studio of Engineeering
Nepal

IMPLEMENTING AGENCY:
DOR, DCID

ROAD NAME:
East West Highway (H01)

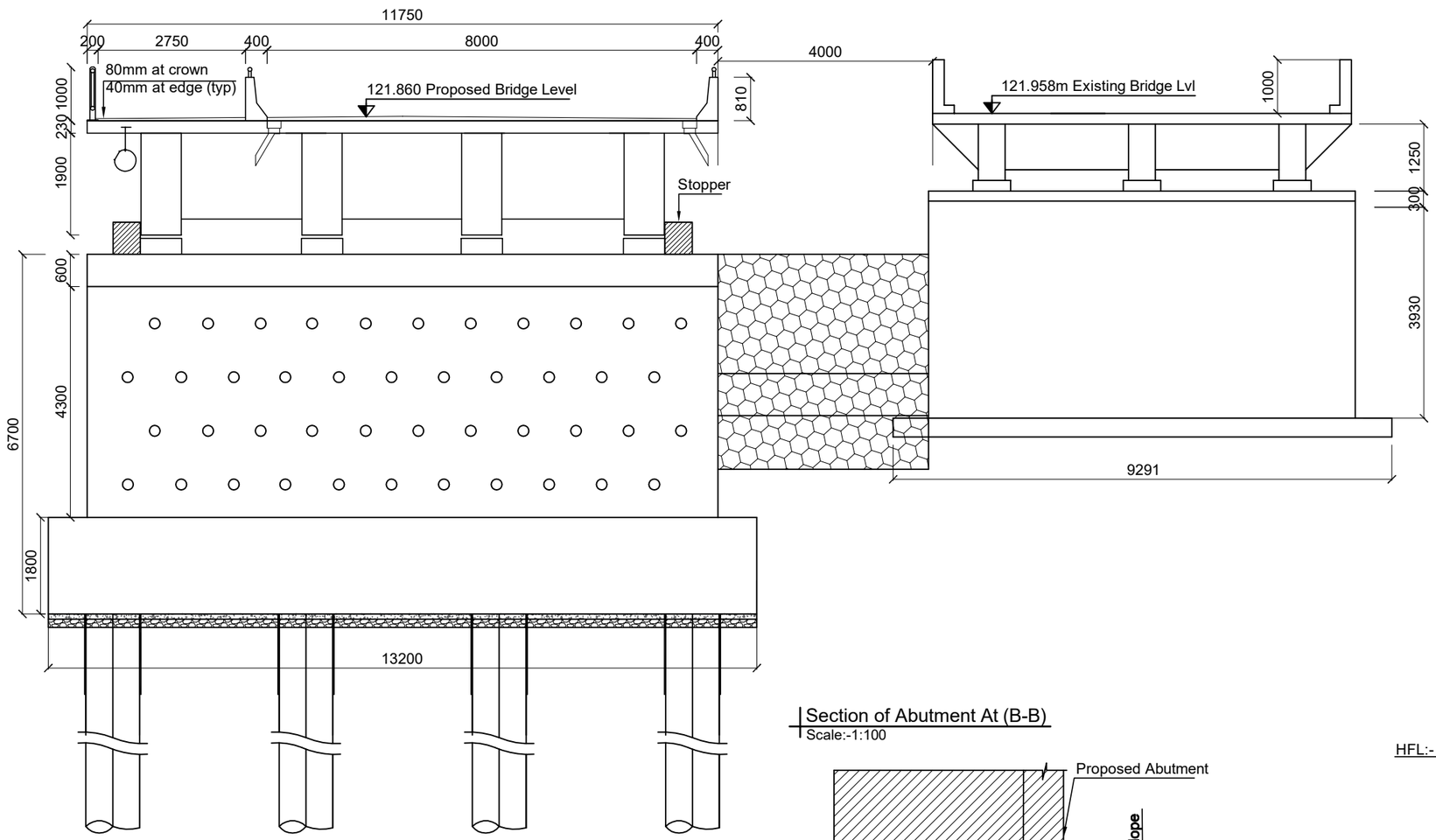
Butwal - Gorusinghe Section

SHEET TITLE:
General Arrangement
of
Balhudra Bridge
(47/H001/311_A)

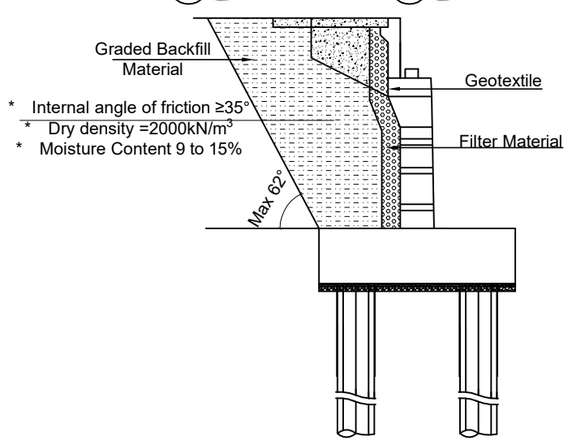
SCALE:
1:300

	NAME	SIGNATURE	REV NO.	DESCRIPTION
Designed by:	Saroj Bhattarai			
Checked by:	P. Upadhyaya			
Approved by:	Dr. T.H.Choi			

DATE: November,2022
DWG.NO.: 311_Balhundra
SHEET NO.: 03/21

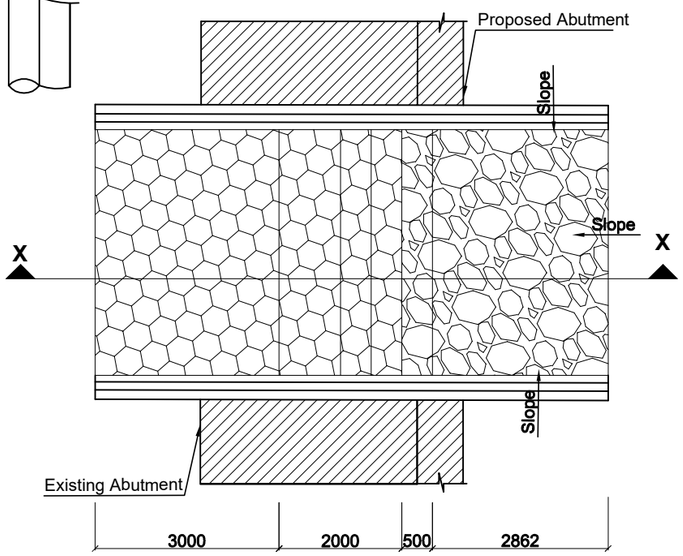


Section of Abutment At (B-B)
Scale:-1:100

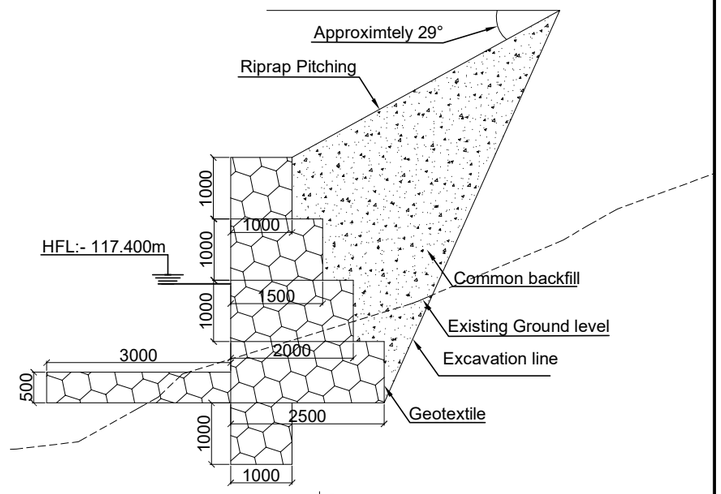


* Internal angle of friction ≥35°
* Dry density =2000kN/m³
* Moisture Content 9 to 15%

Detail of A
Scale:-1:200



Detail Plan of X
(Transition Between Approach Embankments)
Scale:-1:100



Section at X-X
Scale:-1:100

	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:
Soosung Engineering Co. Ltd, Korea
in association with
ERMC P (Ltd)
and
TTE-Tech Studio of Engineeering Nepal

IMPLEMENTING AGENCY:
DOR, DCID

ROAD NAME:
East West Highway (H01)

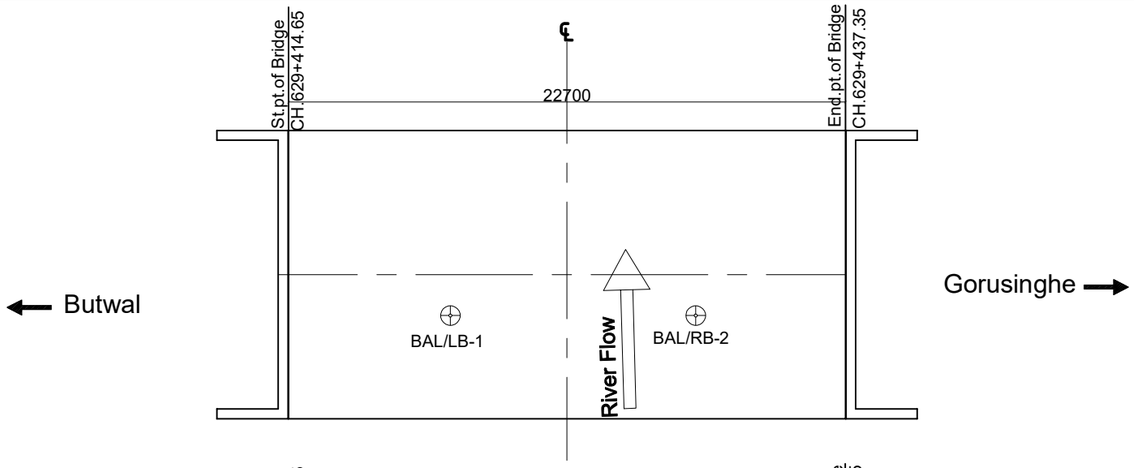
Butwal - Gorusinghe Section

SHEET TITLE:
General Arrangement of
Balhudra Bridge
(47/H001/311_A)

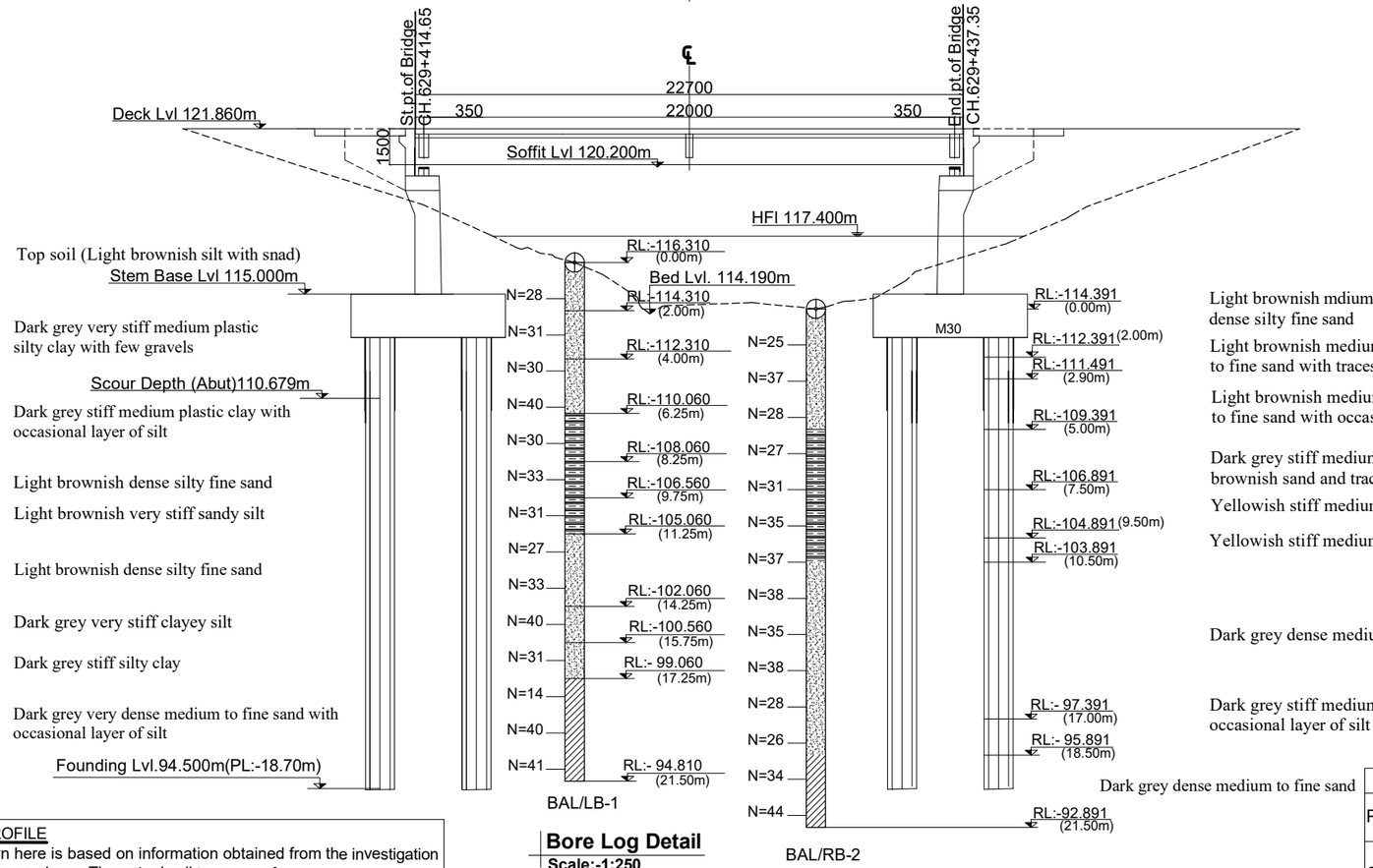
SCALE:
1:300

	NAME	SIGNATURE	REV NO.	DESCRIPTION
Designed by:	Saroj Bhattarai			
Checked by:	P. Upadhyaya			
Approved by:	Dr. T.H.Choi			

DATE: November,2022
DWG.NO.: 311_Balhundra
SHEET NO.: 04/21



Borehole No : BAL/LB-1
Easting : 83° 5' 53.28 " Northing : 27° 40' 34.76" Elevation, m : 116.310
Borehole No : BAL/RB-2
Easting : 83° 04' 38.01" Northing : 27° 40' 35.23" Elevation, m : 114.139



Bore Log Detail
Scale:-1:250

Note :-
MSL :- Maximum Scour Level
HFL :- High Flood Level
LBL :- Lowest Bed Level
RL :- Reduced Level
PL :- Pile Length

NOTE ON SUB-SOIL PROFILE
The sub-soil profile shown here is based on information obtained from the investigation bore-holes at the locations as shown.The actual soil type away from the vicinity of the boreholes may differ .

Location	Design Pile Length m	Design Working load on pile (non - seismic casse)kn	Allowable Bearing Capacity on pile (Scour case) kn	Allowable Bearing Capacity of the Pile (Non Scour case)kn
Abutment	18.70	1726	2169	2225
Pier	0.00	0	0	0

	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)	
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CONSULTANT:
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and
TTE-Tech Studio of Engineeering Nepal

IMPLEMENTING AGENCY:
DOR, DCID

ROAD NAME:
East West Highway (H01)

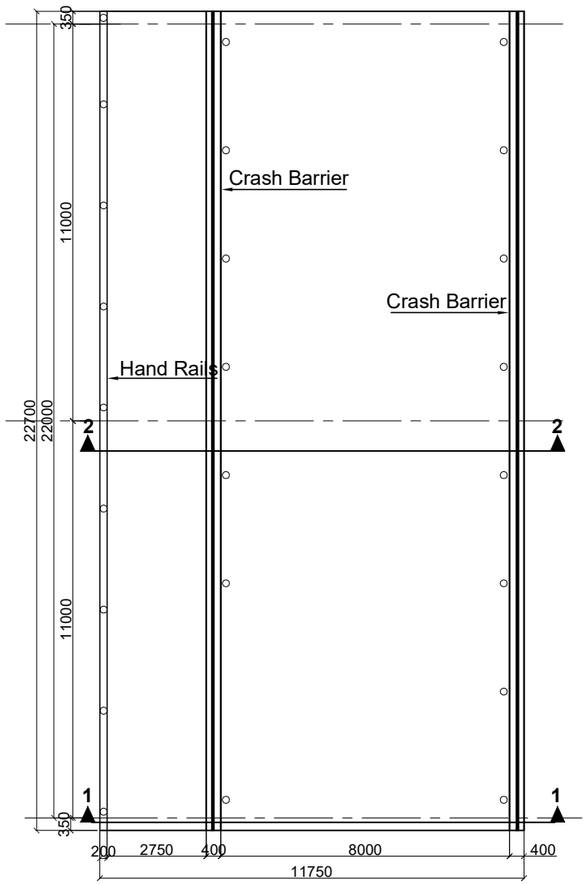
Butwal - Gorusinghe Section

SHEET TITLE:
Bore Log of **Balhudra Bridge** (47/H001/311_A)

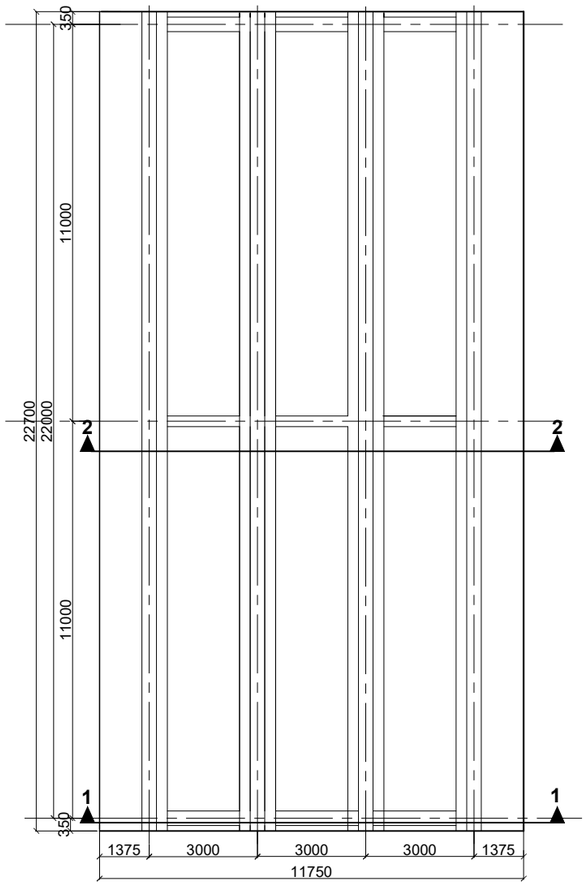
SCALE:
1:250

	NAME	SIGNATURE	REV NO.	DESCRIPTION
Designed by:	Saroj Bhattarai			
Checked by:	P. Upadhyaya			
Approved by:	Dr. T.H.Choi			

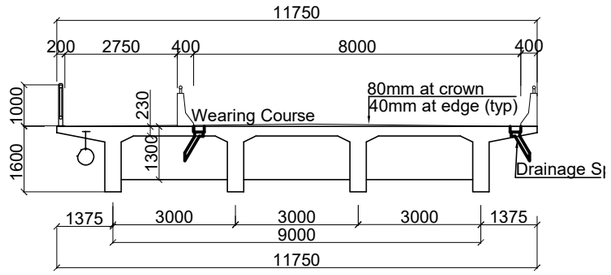
DATE: November,2022
DWG.NO.: 311_Balhundra
SHEET NO.: 05/21



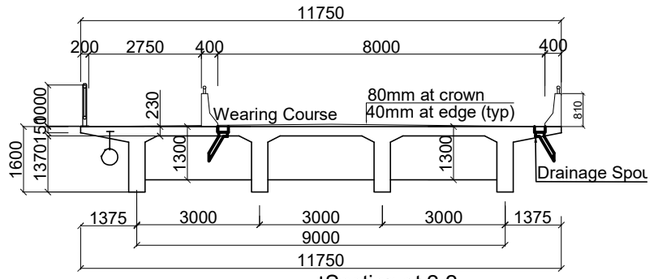
Plan Of Deck
Scale:-1:150



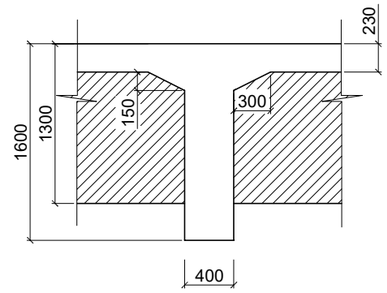
Plan Of Girder
Scale:-1:150



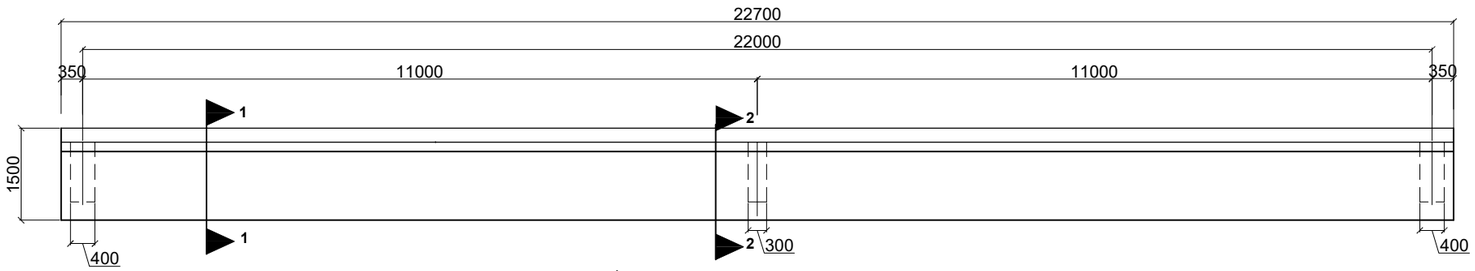
Section at 1-1
Scale:-1:150



Section at 2-2
Scale:-1:150



Section 1-1 Main Girder
Scale:-1:50

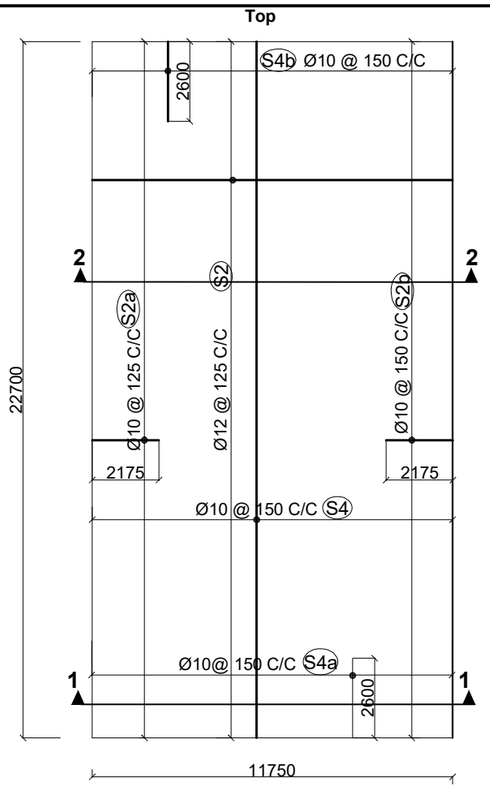


Longitudinal Sectional Elevation
Scale:-1:100

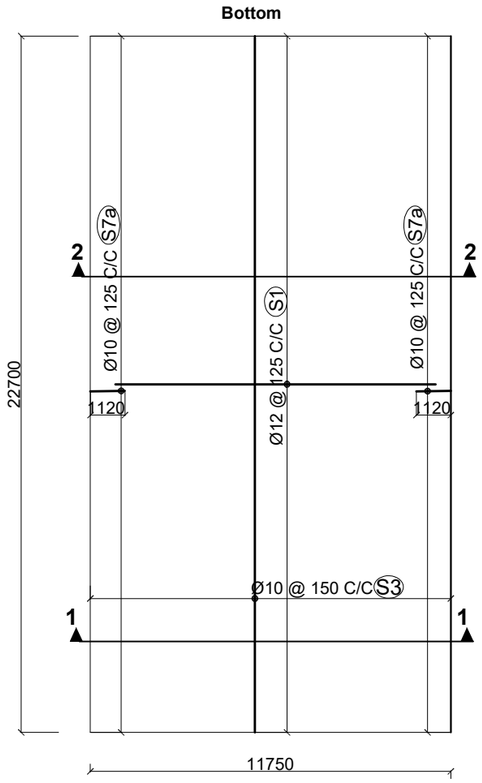
NOTES:
Dowel bars similar to the longitudional bars of the cross section girders shall be placed in the precast main girder before casting. The longitudional bars of the cross girder shall be lapped to the dowel bers, which shall have a lap length of 60 dia. of the corresponding bars.

NOTES:
To lift the deck for maintenance, the jacks shall be placed under the positions marked "J".

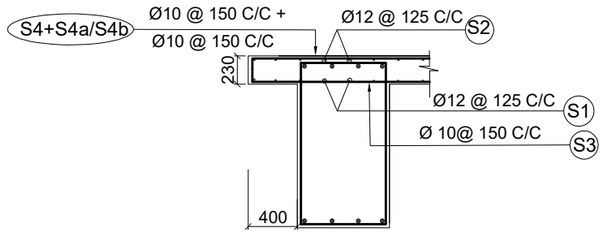
Government of Nepal Ministry of Physical Infrastructure and Transport **Department of Roads** **Project Directorate Office (ADB)** **SASEC Highway Improvement Project-** **Project Preparatory Consultant (SHIP-PPC)** **ADB Loan No: 3722-NEP**	**CONSULTANT:** Soosung Engineering Co. Ltd, Korea in association with ERMC P (Ltd) and TE-Tech Studio of Engineeering Nepal	**IMPLEMENTING AGENCY:** **DOR, DCID** **ROAD NAME:** **East West Highway (H01)** **Butwal - Gorusinghe Section**	**SHEET TITLE:** Detaill of Superstructure of **Balhudra Bridge** (47/H001/311_A)	**SCALE:** As Shown		**NAME**	**SIGNATURE**	**REV NO.**	**DESCRIPTION**	**DATE:** November,2022 **DWG.NO.:** 311_Balhundra **SHEET NO.:** 06/21
					Designed by:	Saroj Bhattarai				
					Checked by:	P. Upadhyaya				
					Approved by:	Dr. T.H.Choi				



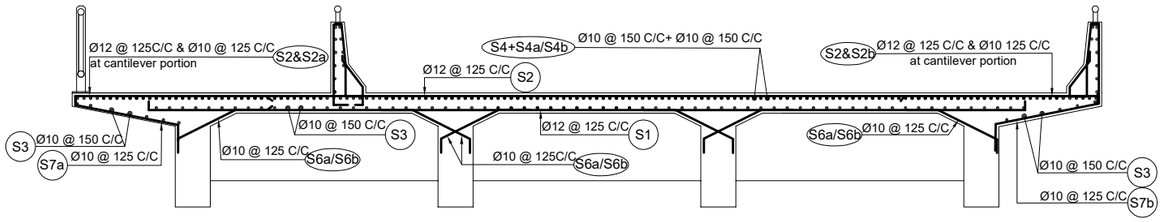
Reinforcement Details Of Deck Slab(Top Face)
Scale:-1:200



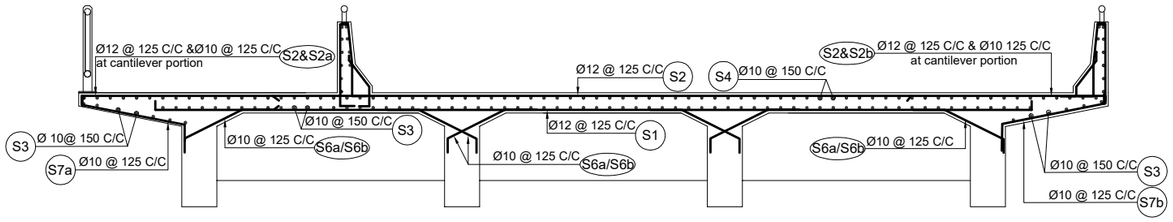
Reinforcement Details Of Deck Slab(Bottom Face)
Scale:-1:200



Reinforcement Details At Deck Extension
Between The Main Girder



Section at 1-1
Scale:-1:50



Section at 2-2
Scale:-1:50

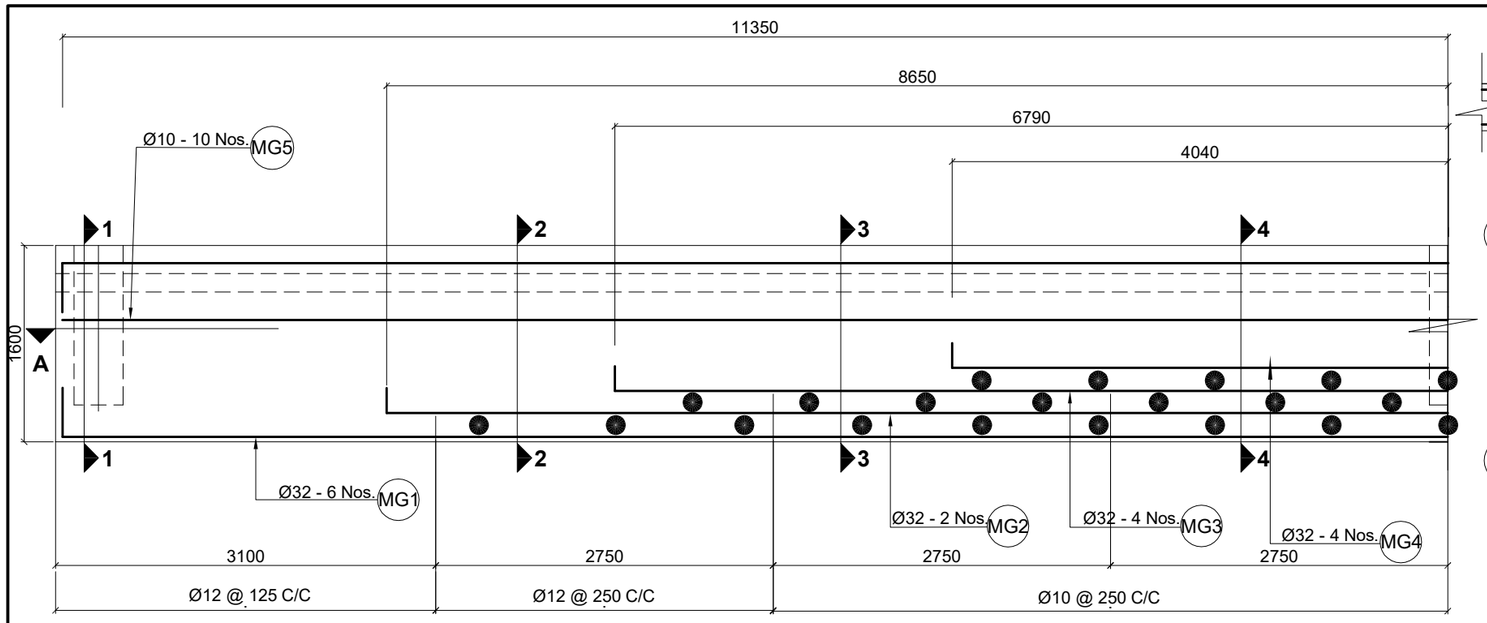
NOTES:

1.ON SHEAR CONNECTION:
The transverse bars of the deck slab(S2) shall be tied to vertical stirrups of the longitudinal girders.

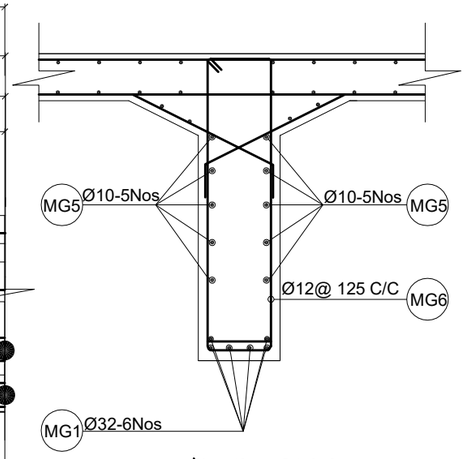
2.TOP SURFACE OF THE MAIN GIRDER:
Surface to be roughened by wire brush immediately after initial setting.
The surface shall be properly cleaned by pressure blower prior to casting of the deck concrete

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.

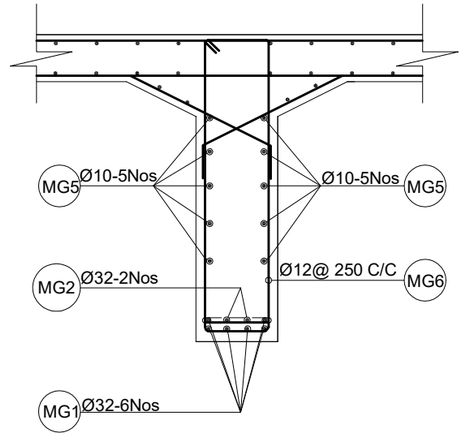
Government of Nepal Ministry of Physical Infrastructure and Transport **Department of Roads** **Project Directorate Office (ADB)** **SASEC Highway Improvement Project-** **Project Preparatory Consultant (SHIP-PPC)** **ADB Loan No: 3722-NEP**	**CONSULTANT:** Soosung Engineering Co. Ltd, Korea in association with ERMC P (Ltd) and TTE-Tech Studio of Engineeering Nepal	**IMPLEMENTING AGENCY:** **DOR, DCID** **ROAD NAME:** **East West Highway (H01)** **Butwal - Gorusinghe Section**	**SHEET TITLE:** Reinforcement Details of Slab of **Balhundra Bridge** (47/H001/311_A)	**SCALE:** As Shown		**NAME**	**SIGNATURE**	**REV NO.**	**DESCRIPTION**	**DATE:** November,2022
					Designed by:	Saroj Bhattarai				**DWG.NO.:** 311_Balhundra
					Checked by:	P. Upadhyaya				
					Approved by:	Dr. T.H.Choi				**SHEET NO.:** 07/21



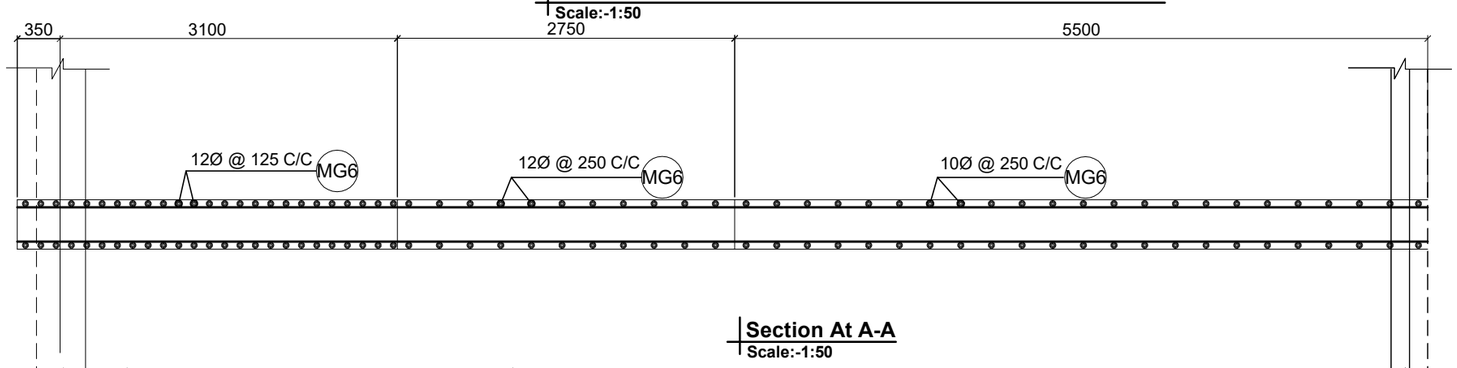
Reinforcement Details At Sectional Elevation Of Main Girder
Scale:-1:50



Section At 1-1
Scale:-1:30



Section At 2-2
Scale:-1:30



Section At A-A
Scale:-1:50

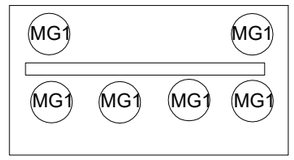


Diagram of Bar Position
Section at 1-1

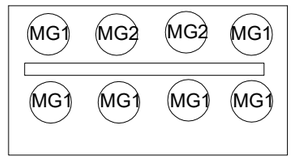
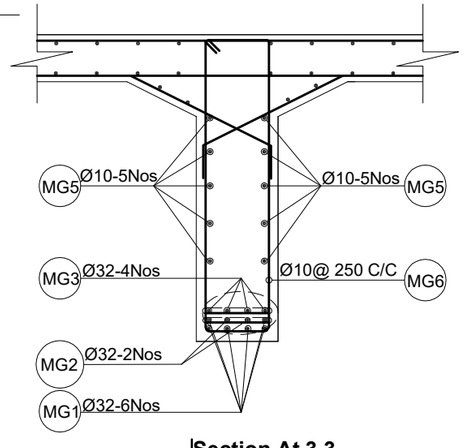
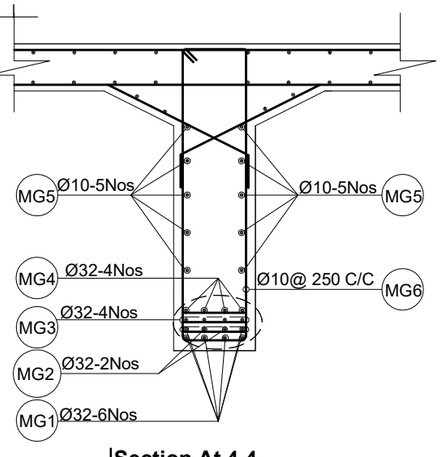


Diagram of Bar Position
Section at 2-2



Section At 3-3
Scale:-1:30

Diagram of Bar Position
Section at 3-3



Section At 4-4
Scale:-1:30

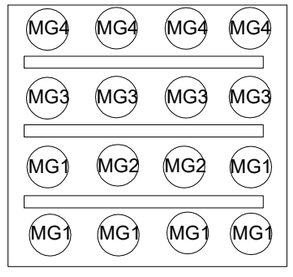
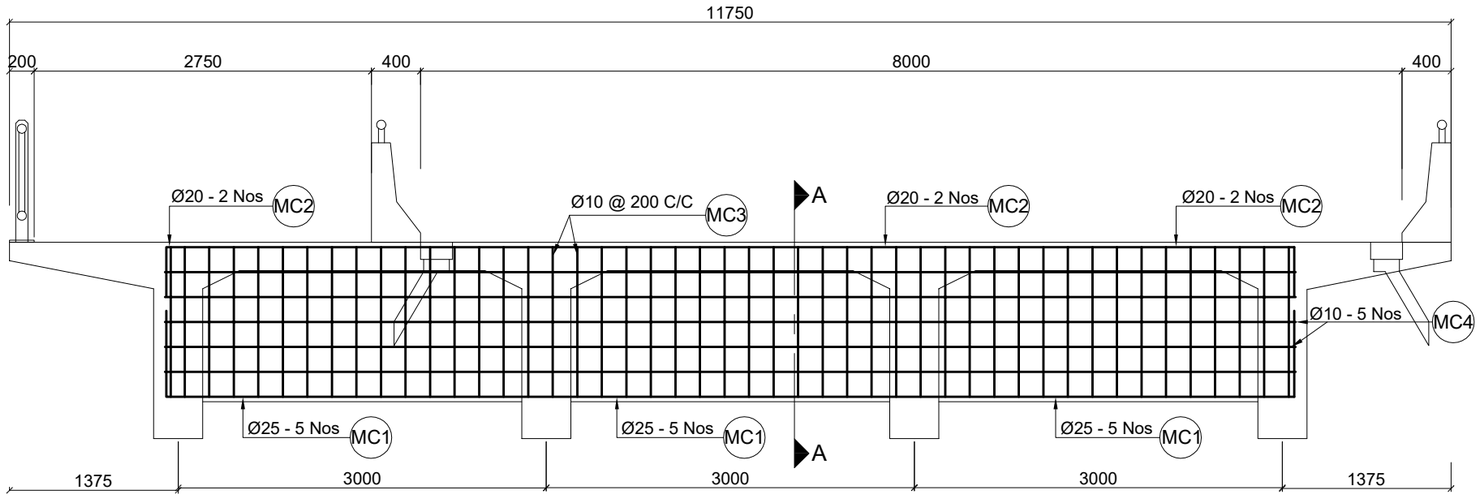
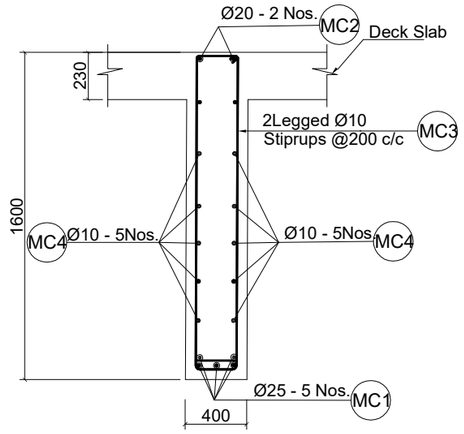


Diagram of Bar Position
Section at 4-4

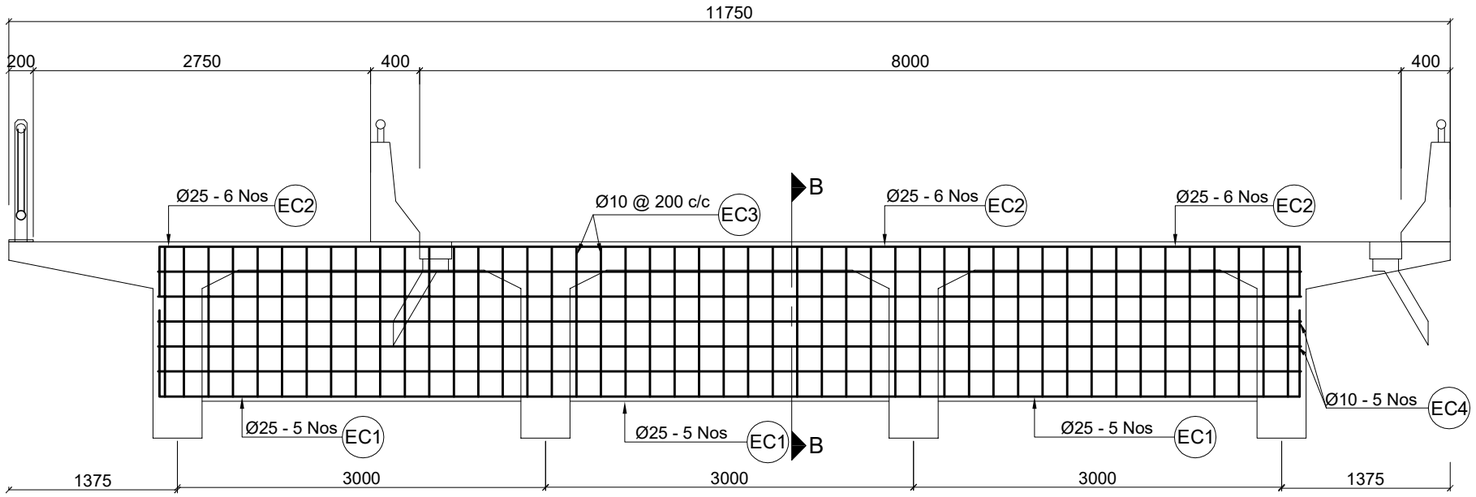
Government of Nepal Ministry of Physical Infrastructure and Transport **Department of Roads** **Project Directorate Office (ADB)** **SASEC Highway Improvement Project-** **Project Preparatory Consultant (SHIP-PPC)** **ADB Loan No: 3722-NEP**	**CONSULTANT:** Soosung Engineering Co. Ltd, Korea in association with ERMC P (Ltd) and TIE-Tech Studio of Engineeering Nepal	**IMPLEMENTING AGENCY:** **DOR, DCID** **ROAD NAME:** **East West Highway (H01)** **Butwal - Gorusinghe Section**	**SHEET TITLE:** Prestressing Details of Main Girder of **Balhundra Bridge** (47/H001/311_A)	**SCALE:** As Shown		**NAME**	**SIGNATURE**	**REV NO.**	**DESCRIPTION**	**DATE:** November,2022 **DWG.NO.:** 311_Balhundra **SHEET NO.:** 08/21
					Designed by:	Saroj Bhattarai				
					Checked by:	P. Upadhyaya				
					Approved by:	Dr. T.H.Choi				



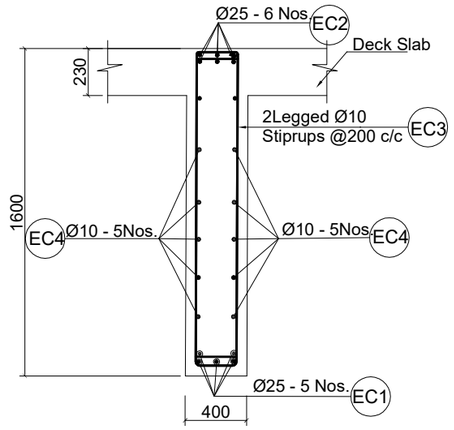
Intermediate Cross Girders
Scale:-1:50



Section at A-A
Scale:-1:30



End Cross Girders
Scale:-1:50



Section at B-B
Scale:-1:30

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) and JJE-Tech Studio of Engineeering Nepal	**IMPLEMENTING AGENCY:** **DOR, DCID** **ROAD NAME:** **East West Highway (H01)** **Butwal - Gorusinghe Section**	**SHEET TITLE:** Anchorage Details of **Balhundra Bridge** (47/H001/311_A)	**SCALE:** As Shown		**NAME**	**SIGNATURE**	**REV NO.**	**DESCRIPTION**	**DATE:** November,2022
					Designed by:	Saroj Bhattarai				**DWG.NO.:** 311_Balhundra
					Checked by:	P. Upadhyaya				
					Approved by:	Dr. T.H.Choi				**SHEET NO.:** 09/21

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	10000, 100	125 8Nos meter	12	182	10.200	0.888	1648.142
S2	11658, 100	125 8Nos meter	12	182	11.860	0.888	1916.369
S2a	2175, 100 Additional Bars At Left Cantilever	125 In Between S2	10	182	2.280	0.617	255.839
S2b	2175, 100 Additional Bars At Right Cantilever	125 In Between S2	10	182	2.280	0.617	255.839
S3	22610, 155	Med Deck 150	10	68	22.920	0.617	960.913
		Left Cantilever 150	10	10	22.920	0.617	141.311
		Left Cantilever 150	10	10	22.920	0.617	141.311
S4	22610, 155	150 7Nos Per Meter	10	79	22.920	0.617	1116.355
S4a	2600, 155 Additional Bars At DeckEnd,Left	150 In Between S4	10	79	2.755	0.617	134.187
S4b	2600, 155 Additional Bars At DeckEnd,Right	150 In Between S4	10	79	2.755	0.617	134.187
S6a	450, 732, 200	125	10	1014	1.380	0.617	862.735
S7a	100, 1120, 200 (Outer sides Left exterior girder)	125 8Nos Per Meter	10	366	1.420	0.617	320.428
S7b	1120, 100, 200 (Outer sides Right exterior girder)	125 8Nos Per Meter	10	366	1.420	0.617	320.428
TOTAL KG							8208.042
TOTAL WEIGHT (IN METRIC TON)							8.208

BAR BENDING SCHEDULE FOR RCC MAIN GIRDER

BAR ID	SHAPE OF BAR IN mm (NOT TO SCALE)	Ø OF BARS (mm)	NO. OF BARS	LENGTH (m)	WEIGHT/LENGTH (Kg/m)	TOTAL WEIGHT (Kg)
MG1	22585, 400	32	6	23.390	6.313	886.017
MG2	17300, 200	32	2	17.700	6.313	223.493
MG3	13580, 200	32	4	13.980	6.313	353.043
MG4	8080, 200	32	4	8.480	6.313	214.149
MG5	22620	10	10	22.620	0.617	139.461
MG6	2*75, 1510, 310	10	22	3.790	0.617	51.407
		12	94	3.790	0.888	316.293
MG7	320 Spacer Bar	32	38	0.320	6.313	76.770
TOTAL WEIGHT IN 1GIRDER						2260.634
TOTAL NUMBER OF GIRDERS AND TOTAL WEIGHT (IN METRIC TON)						2.261

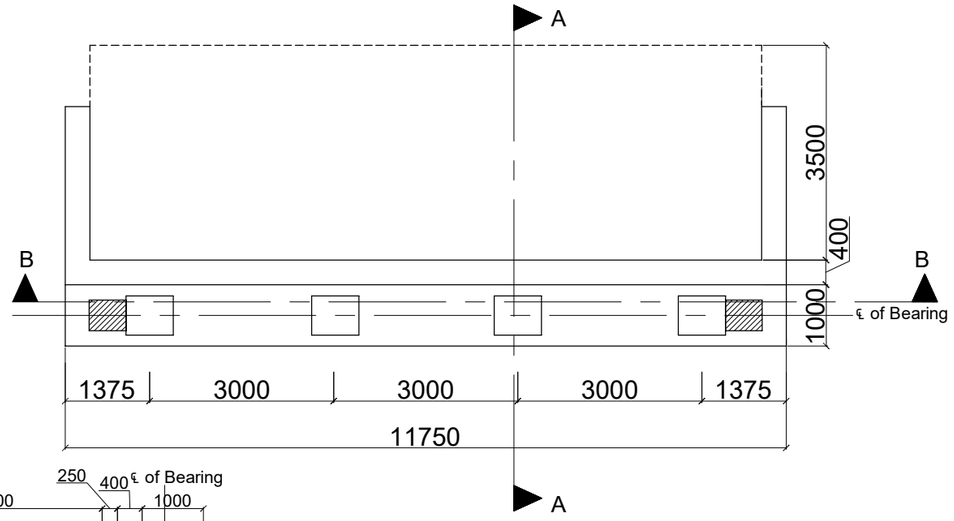
BAR BENDING SCHEDULE FOR END CROSS GIRDERS

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)
EC1	9295, 400	0	25	5	10.095	3.853	194.499
EC2	9295, 400	0	25	6	10.095	3.853	233.399
EC3	2*60, 1210, 310	200	10	48	3.160	0.617	93.517
EC4	9320 2X5 Nos each Face	300	10	10	9.320	0.617	57.461
TOTAL WEIGHT IN 1GIRDER							578.875
TOTAL NUMBER OF GIRDERS AND TOTAL WEIGHT 2 (IN METRIC TON)							1.158

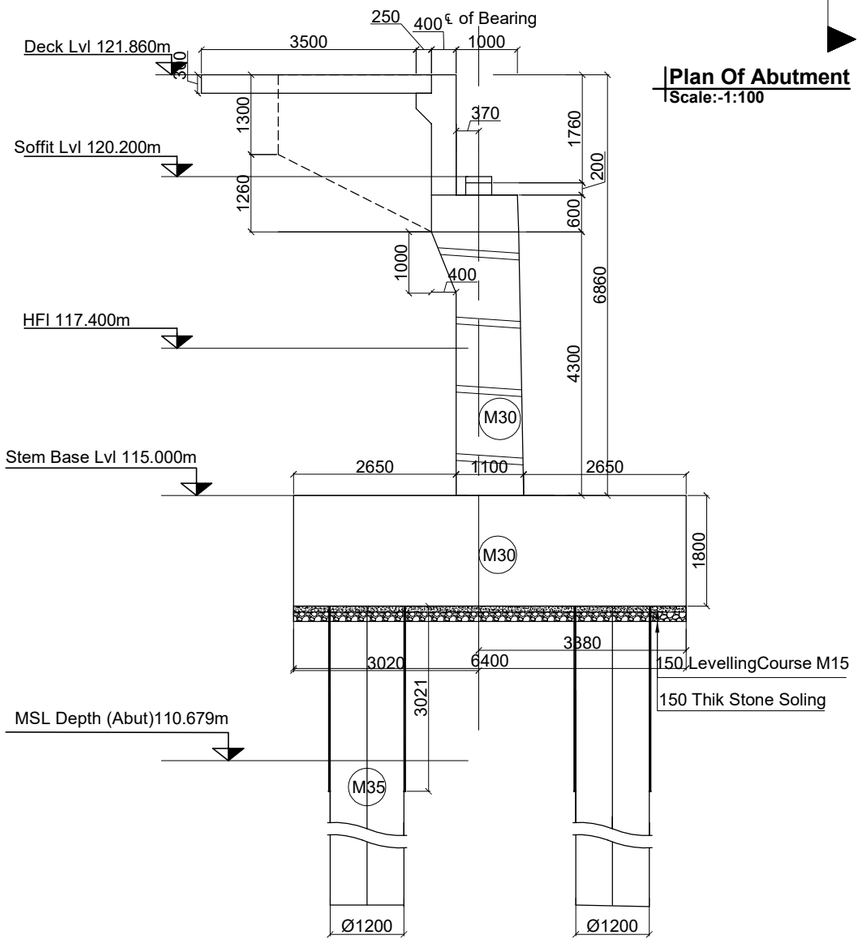
BAR BENDING SCHEDULE FOR INTERMEDIATE CROSS GIRDERS

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	9195, 400	0	25	5	9.995	3.853	192.572
MC2	9195, 400	0	20	2	9.995	2.466	49.298
MC3	2*60, 1210, 210	200	10	45	2.960	0.617	82.123
MC4	9220 2X5 Nos each Face	300	10	10	9.220	0.617	56.845
TOTAL WEIGHT IN 1GIRDER							380.838
TOTAL NUMBER OF GIRDERS AND TOTAL WEIGHT (IN METRIC TON)							0.381

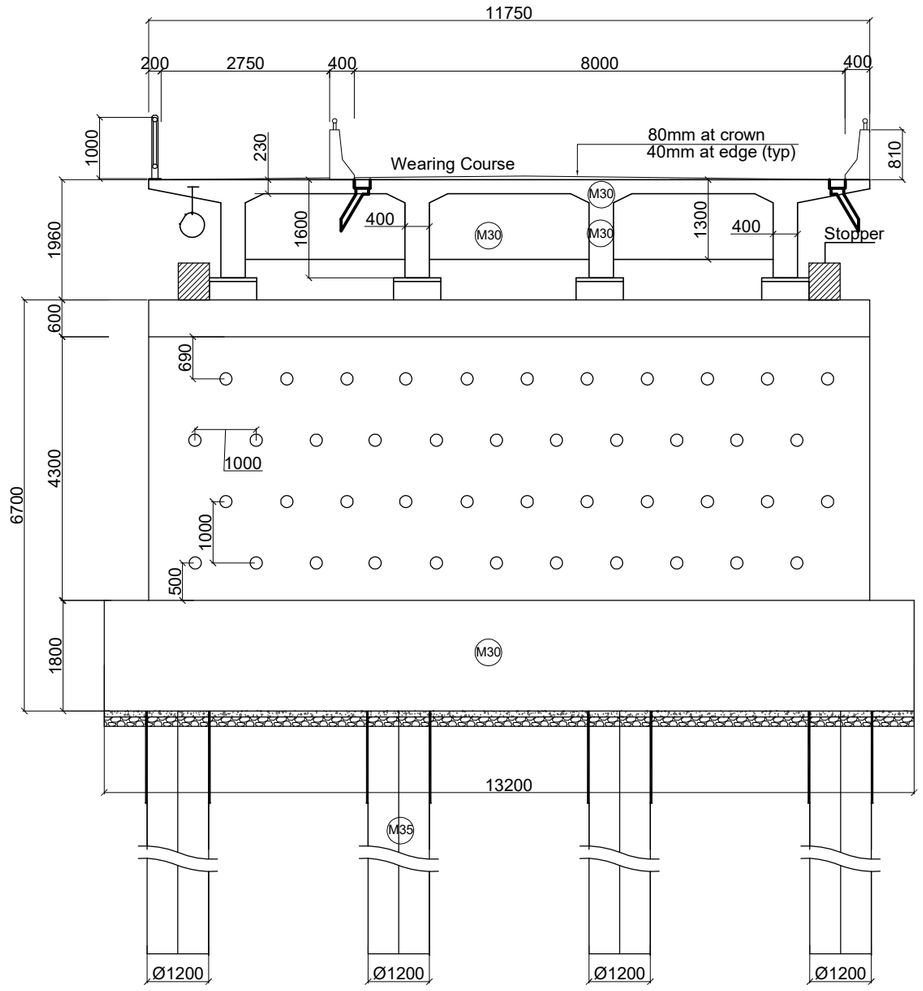
Government of Nepal Ministry of Physical Infrastructure and Transport **Department of Roads** **Project Directorate Office (ADB)** **SASEC Highway Improvement Project-** **Project Preparatory Consultant (SHIP-PPC)** **ADB Loan No: 3722-NEP**	**CONSULTANT:** Soosung Engineering Co. Ltd, Korea in association with ERMC P (Ltd) and TTE-Tech Studio of Engineeering Nepal	**IMPLEMENTING AGENCY:** **DOR, DCID** **ROAD NAME:** **East West Highway (H01)** **Butwal - Gorusinghe Section**	**SHEET TITLE:** B.B.S of Slab & Main Girder of **Balhundra Bridge** (47/H001/311_A)	**SCALE:** As Shown		**NAME**	**SIGNATURE**	**REV NO.**	**DESCRIPTION**	**DATE:** November,2022 **DWG.NO.:** 311_Balhundra **SHEET NO.:** 10/21
					Designed by:	Saroj Bhattarai				
					Checked by:	P. Upadhyaya				
					Approved by:	Dr. T.H.Choi				



Plan Of Abutment
Scale:-1:100

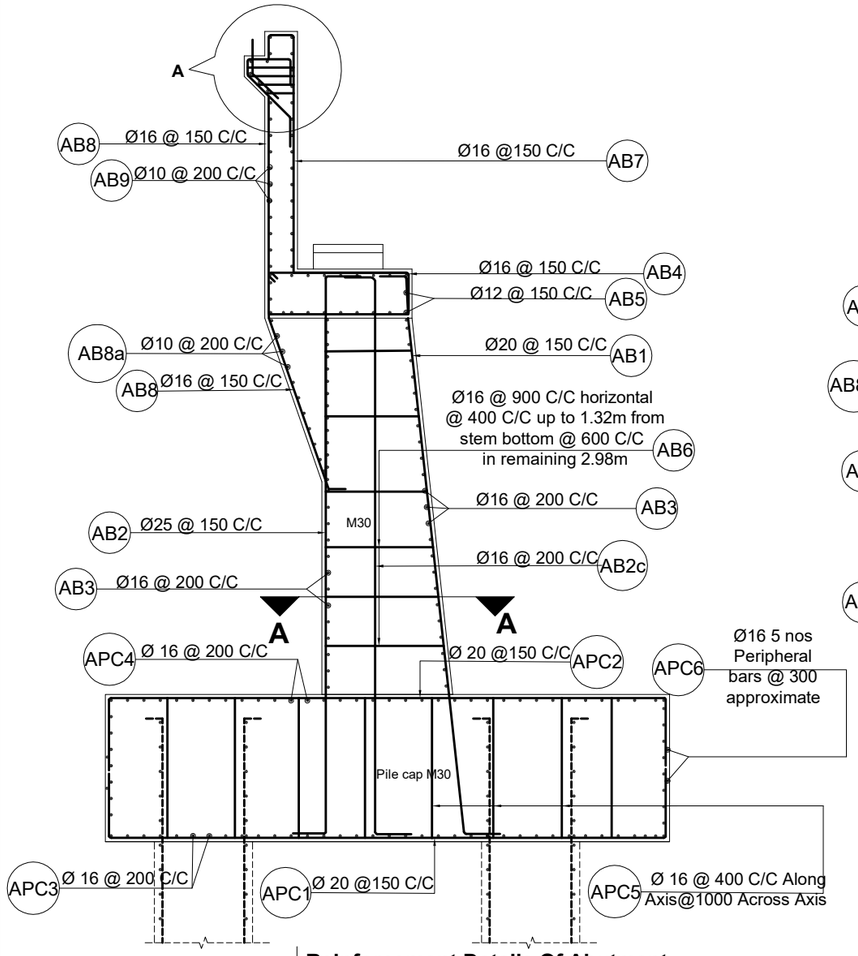


Section Of Abutment At (A-A)
Scale:-1:100

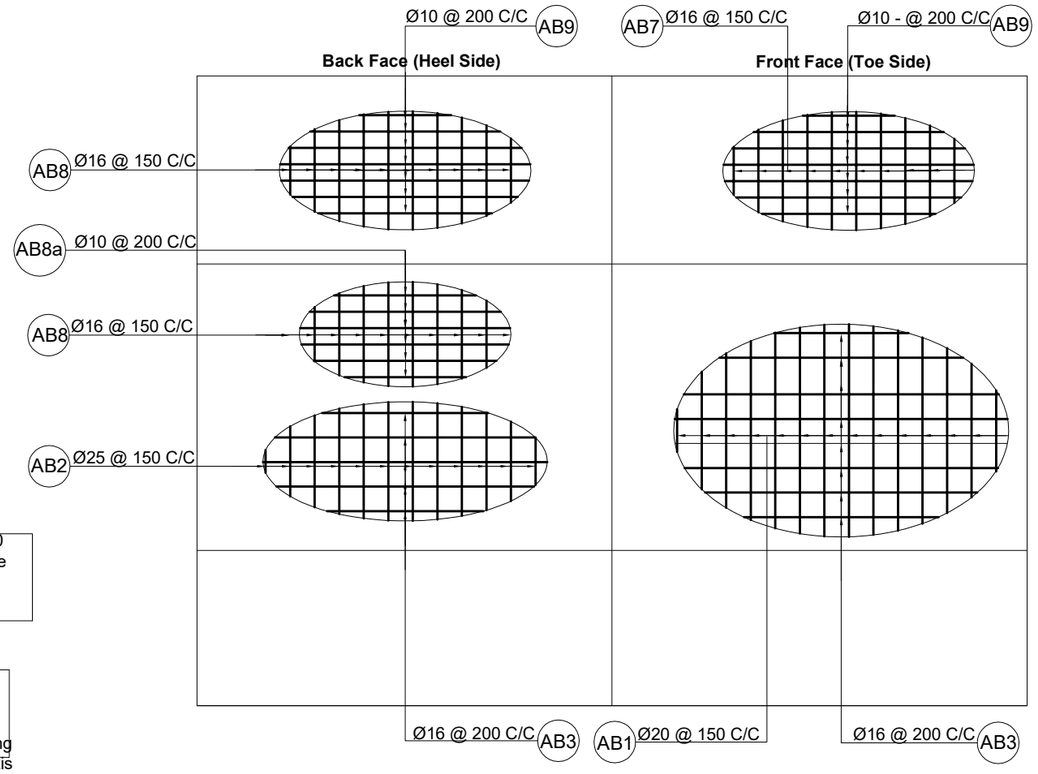


Section of Abutment At (B-B)
Scale:-1:100

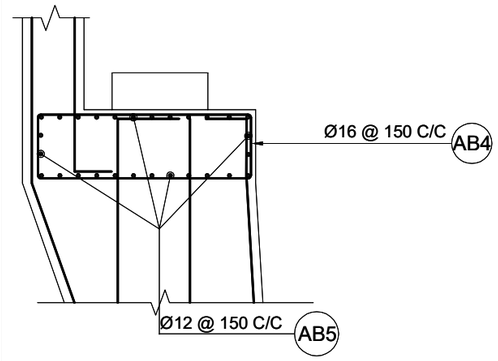
Government of Nepal Ministry of Physical Infrastructure and Transport **Department of Roads** **Project Directorate Office (ADB)** **SASEC Highway Improvement Project-** **Project Preparatory Consultant (SHIP-PPC)** **ADB Loan No: 3722-NEP**	**CONSULTANT:** Soosung Engineering Co. Ltd, Korea in association with ERMC P (Ltd) and TSE-Tech Studio of Engineeering Nepal	**IMPLEMENTING AGENCY:** **DOR, DCID** **ROAD NAME:** **East West Highway (H01)** **Butwal - Gorusinghe Section**	**SHEET TITLE:** Detail of Abutment of **Balhundra Bridge** (47/H001/311_A)	**SCALE:** As Shown		**NAME**	**SIGNATURE**	**REV NO.**	**DESCRIPTION**	**DATE:** November,2022 **DWG.NO.:** 311_Balhundra **SHEET NO.:** 11/21
					Designed by:	Saroj Bhattarai				
					Checked by:	P. Upadhyaya				
					Approved by:	Dr. T.H.Choi				



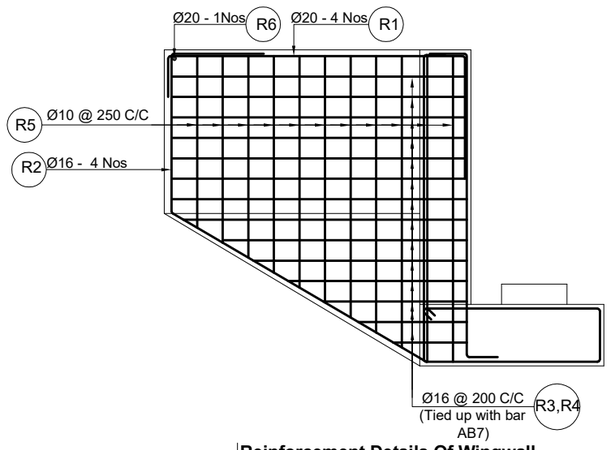
Reinforcement Details Of Abutment
Scale:-1:75



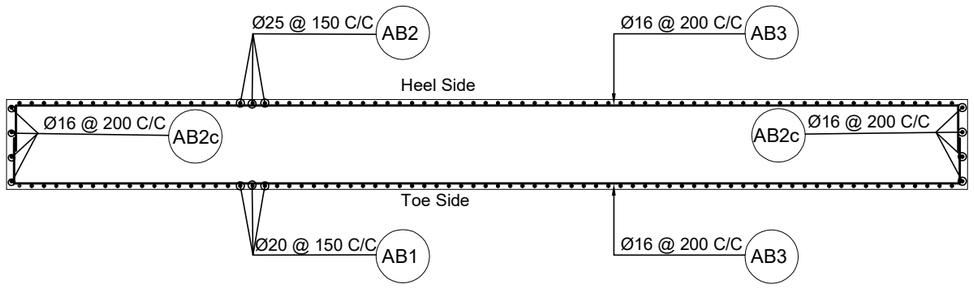
Reinforcement Details Of Abutment
Scale:-1:75



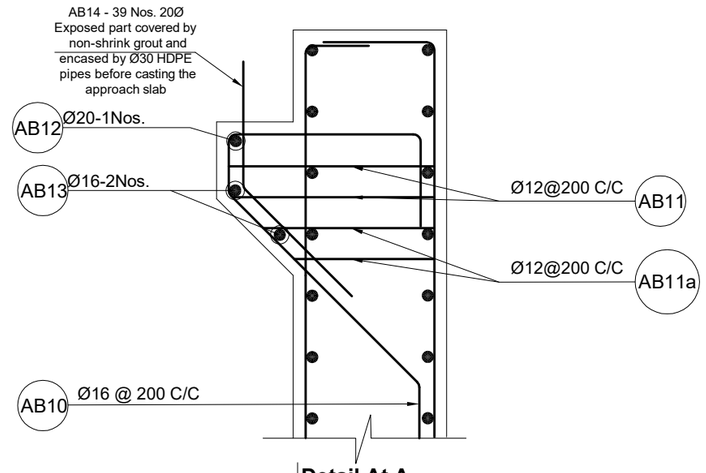
Reinforcement Details Of Abutment Cap
Scale:-1:50



Reinforcement Details Of Wingwall
Scale:-1:50



Section at A-A
Scale:-1:75



Detail At A
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 ERMC P (Ltd) and TE-Tech Studio of Engineeering Nepal	**IMPLEMENTING AGENCY:** **DOR, DCID** **ROAD NAME:** **East West Highway (H01)** **Butwal - Gorusinghe Section**	**SHEET TITLE:** Reinforcement Details of Abutment of **Balhundra Bridge** (47/H001/311_A)	**SCALE:** As Shown		**NAME**	**SIGNATURE**	**REV NO.**	**DESCRIPTION**	**DATE:** November,2022
					Designed by:	Saroj Bhattarai				**DWG.NO.:** 311_Balhundra
					Checked by:	P. Upadhyaya				
					Approved by:	Dr. T.H.Choi				**SHEET NO.:** 12/21

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	300; 6490; 500	150	20	78	7.290	2.466	1402.306
AB2	500; 6490; 500	150	25	78	7.490	3.853	2251.215
AB2c	6490; 500	200	16	12	6.990	1.578	132.391
AB3	11585; average 750; 11585	200	16	46	24.670	1.578	1791.132
AB4	2*100; 515; 1235	150	16	80	3.700	1.578	467.189
AB5	16300	150	12	24	11.600	0.888	247.168
AB6	935-835; Spacing; Hook Length 160; 900 C/C horizontal; 400 C/C vertical upto 1.32m from stem bottom; 600 C/C vertical at remaining 2.98m		16	118	1.333	1.578	248.263
AB7	250; 2505; 300	150	16	79	3.110	1.578	387.782
AB8	250; 2485; 1077; 300	150	16	79	4.112	1.578	512.721
AB8a	11600	200	10	7	11.600	0.617	50.063
AB9	11590; 268	200	10	11	23.716	0.617	160.840
AB10	500; 300; 100; 647; 200	200	16	55	1.747	1.578	151.655
AB11	500; 200; 200		12	110	0.900	0.888	87.894
AB11a	250 average; 200; 200		12	110	0.650	0.888	63.479
AB12	11600		20	1	11.600	2.466	28.607
AB13	11600		16	2	11.600	1.578	36.617
AB14	400; 500		20	39	0.900	2.466	86.562
TOTAL WEIGHT IN ONE ABUTMENT							8105.884
TOTAL WEIGHT IN METRIC TON							8.106

BAR BENDING SCHEDULE OF WING WALL

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	400; 2807; 1200		20	8	4.407	2.466	86.947
R2	300; 1207; 2800		16	8	4.307	1.578	54.383
R3	2714; 214; 2*150		16	14	6.156	1.578	136.028
R4	Avg 1350; 214; 2*150		16	14	3.428	1.578	75.748
R5	182; Avg 1930		10	22	4.520	0.617	61.309
R6	307		20	2	0.307	2.466	1.514
R7	2800		10	0	3.300	0.617	0.000
R8	350; 260		10	0	1.320	0.617	0.000
TOTAL IN 2 WING WALL IN ONE ABUTMENT							415.928
TOTAL WEIGHT IN METRIC TON							0.416

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)	TOTAL WEIGHT (kG)
APC1	1080; 6230; 1080		20	88	8.390	2.466	1820.812
APC2	6230; 1080; 1080		20	88	8.390	2.466	1820.812
APC3	1080; 13034; 1080		16	33	15.194	1.578	791.383
APC4	1080; 13034; 1080		16	33	15.194	1.578	791.383
APC5	1570; Curve length 251; Curve radius 40; Hook length 80	400 C/C along axis	16	272	2.232	1.578	958.216
		1000 c/c across axis					
APC6	13050; 6250		16	5	38.600	1.578	304.620
TOTAL IN PILE CAP OF ONE ABUTMENT							6487.226
TOTAL WEIGHT IN METRIC TON							6.487

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)
and
TTE-Tech Studio of Engineeering Nepal

IMPLEMENTING AGENCY: DOR, DCID

ROAD NAME: East West Highway (H01)

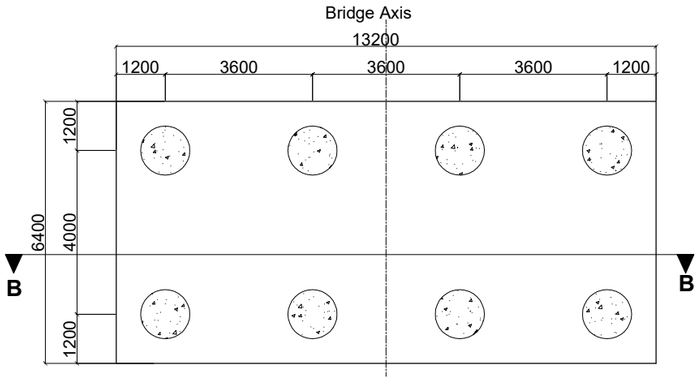
Butwal - Gorusinghe Section

SHEET TITLE: Reinforcement Details of Wingwall of Balhundra Bridge (47/H001/311_A)

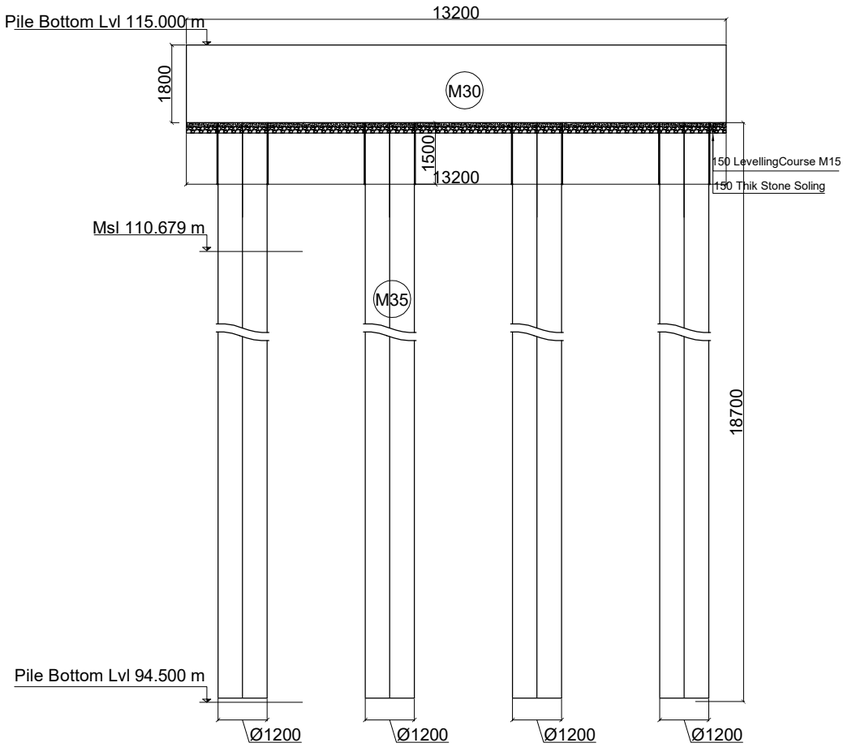
SCALE: As Shown

	NAME	SIGNATURE	REV NO.	DESCRIPTION
Designed by:	Saroj Bhattarai			
Checked by:	P. Upadhyaya			
Approved by:	Dr. T.H.Choi			

DATE: November,2022
DWG.NO.: 311_Balhundra
SHEET NO.: 13/21

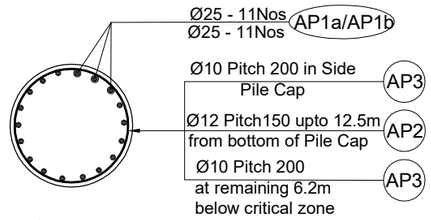


Plan Of Abutment Piles
Scale:-1:150

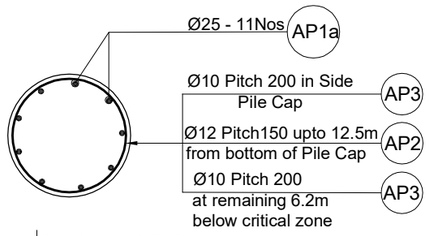


Note On MS permament casing on piles: In case piling works are done without temporary casing, the piles shall be lined with 6mm thick MS steel permanent casing up to 1.5 m or 0.5m below MSL whichever is larger (Subject to instruction and approval by the Engineer)

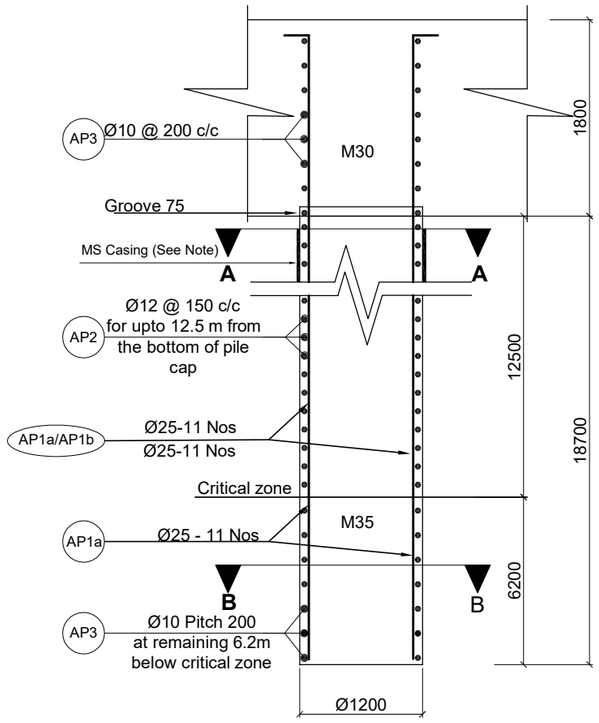
Piles Section At B-B
Scale:-1:150



Section at A-A
Scale:-1:50



Section at B-B
Scale:-1:50



Reinforcement Details Of Pile
Scale:-1:50

Location	Design Pile Length m	Design Working load on pile (non - seismic casse)kn	Allowable Bearing Capacity on pile (Scour case) kn	Allowable Bearing Capacity of the Pile (Non Scour case)kn
Abutment	18.70	1726	2169	2225
Pier	0.00	0.00	0.00	0.00

For Construction Methology and Sequence Please See General Notes.

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)	TOTAL WEIGHT (kG)
APC1	1080 6230 1080		20	88	8.390	2.466	1820.812
APC2	6230 1080 1080		20	88	8.390	2.466	1820.812
APC3	1080 13034 1080		16	33	15.194	1.578	791.383
APC4	1080 13034 1080		16	33	15.194	1.578	791.383
APC5	1570 Curve length 251 Curve radius 40 Hook length 80		16	272	2.232	1.578	958.216
		400 C/C along axis		1000 c/c across axis			
APC6	13050 6250		16	5	38.600	1.578	304.620
TOTAL IN PILE CAP OF ONE ABUTMENT							6487.226
TOTAL WEIGHT IN METRIC TON							6.487

BAR BENDING SCHEDULE FOR ABUTMENT PILES

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)
AP1a	200 20305 full length bars		25	11	20.510	3.853	869.359
AP1b	200 14200 Curtailed bars		25	11	14.400	3.853	610.374
AP2	Dia-1038, Pitch-150 12.5m from bottom of pile cap	150	12	1	274.570	0.888	243.768
AP3	Dia-1038, Pitch-200 inside Pile cap 200 Below Critical Zone	200	10	1	131.180	0.617	80.878
TOTAL WEIGHT IN KG							1804.377
TOTAL IN 8 PILE WEIGHT IN MT							144.350

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) and TTE-Tech Studio of Engineeering Nepal

IMPLEMENTING AGENCY: DOR, DCID

ROAD NAME: East West Highway (H01)

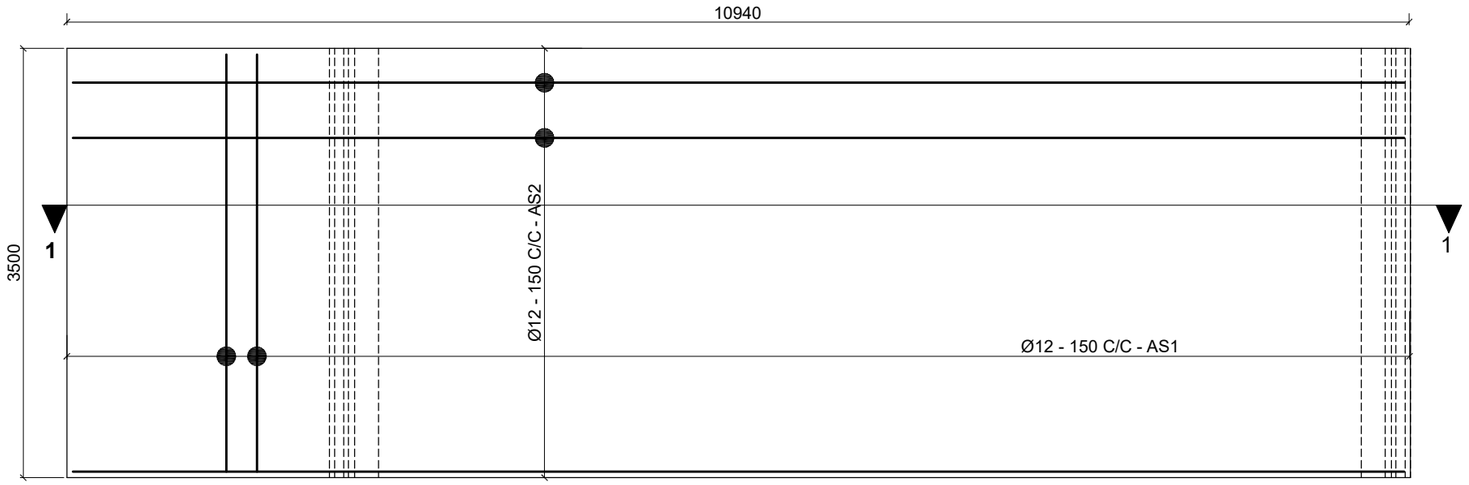
Butwal - Gorusinghe Section

SHEET TITLE: Reinforcement Details of Abutment Piles of **Balhundra Bridge** (47/H001/311_A)

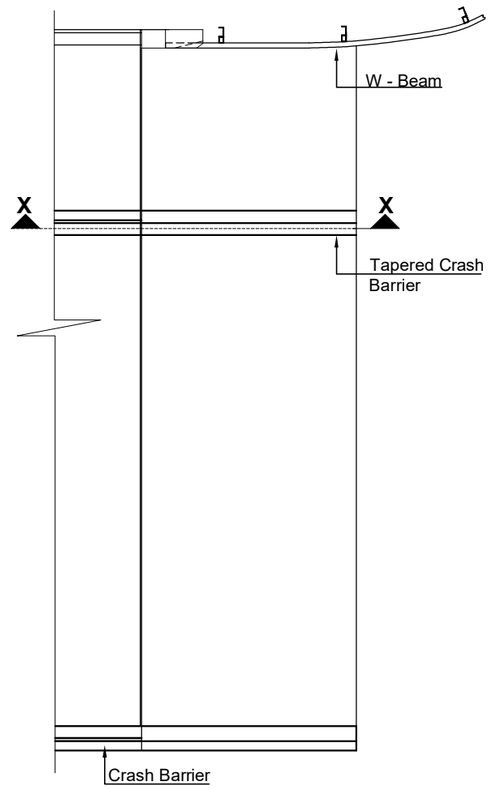
SCALE: As Shown

	NAME	SIGNATURE	REV NO.	DESCRIPTION
Designed by:	Saroj Bhattarai			
Checked by:	P. Upadhyaya			
Approved by:	Dr. T.H.Choi			

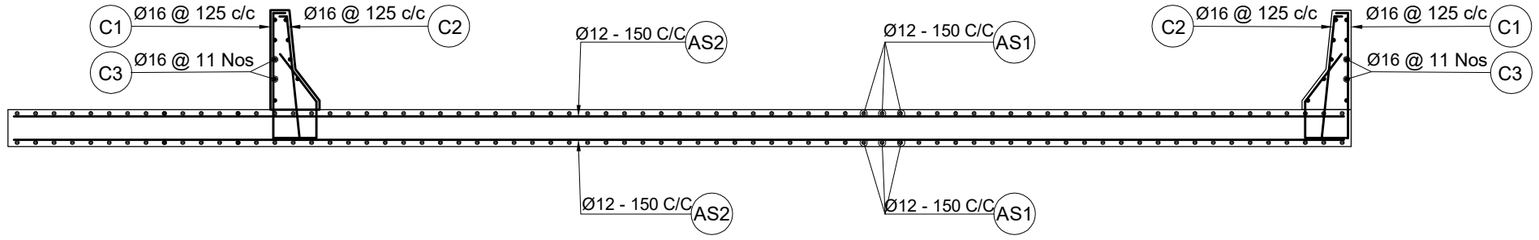
DATE: November,2022
DWG.NO.: 311_Balhundra
SHEET NO.: 14/21



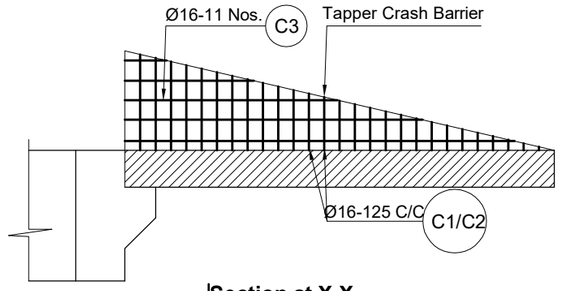
Plan of Reinforcement Details of Approach Slab
Scale:-1:50



Plan of Approach Slab
Not to Scale

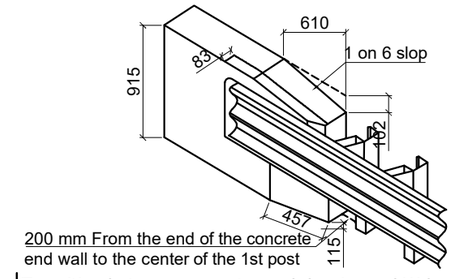


Section at 1-1
Scale:-1:50

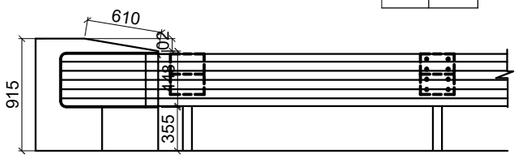


Section at X-X
Not to Scale

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 (Kg/m)	TOTAL WEIGHT (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

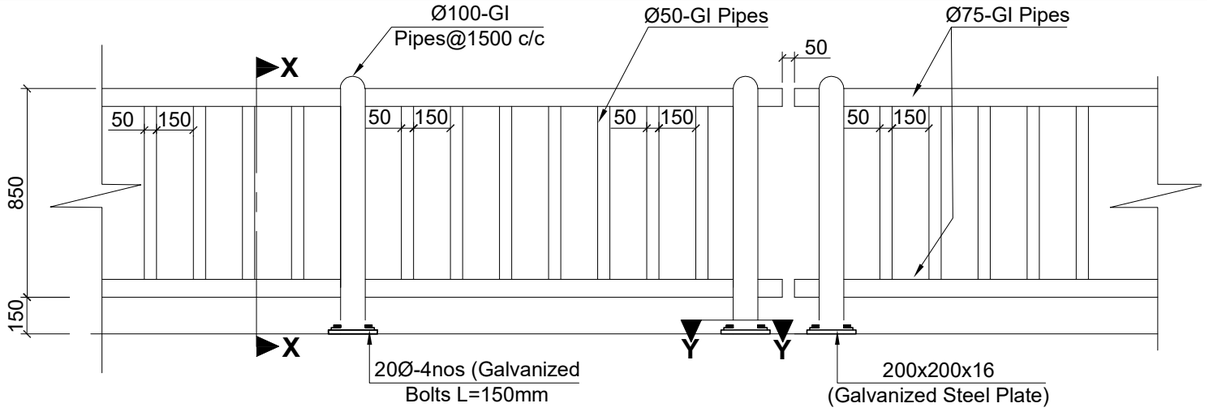


Transition between concrete crash barrier and W-bean
Scale:-1:50

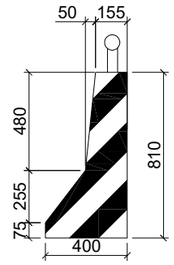


Eleavation
Scale:-1:50

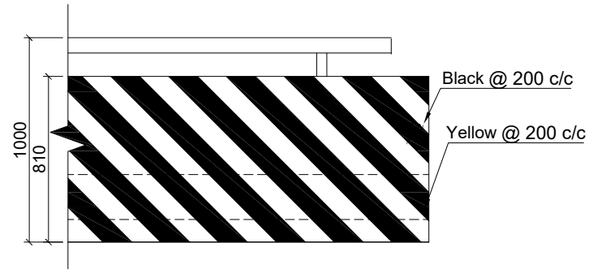
Government of Nepal Ministry of Physical Infrastructure and Transport **Department of Roads** **Project Directorate Office (ADB)** **SASEC Highway Improvement Project-** **Project Preparatory Consultant (SHIP-PPC)** **ADB Loan No: 3722-NEP**	**CONSULTANT:** Soosung Engineering Co. Ltd, Korea in association with ERMC P (Ltd) and TTE-Tech Studio of Engineeering Nepal	**IMPLEMENTING AGENCY:** **DOR, DCID** **ROAD NAME:** **East West Highway (H01)** **Butwal - Gorusinghe Section**	**SHEET TITLE:** Reinforcement Details of Approach Slab of **Balhundra Bridge** (47/H001/311_A)	**SCALE:** As Shown		**NAME**	**SIGNATURE**	**REV NO.**	**DESCRIPTION**	**DATE:** November,2022 **DWG.NO.:** 311_Balhundra **SHEET NO.:** 15/21
					Designed by:	Saroj Bhattarai				
					Checked by:	P. Upadhyaya				
					Approved by:	Dr. T.H.Choi				



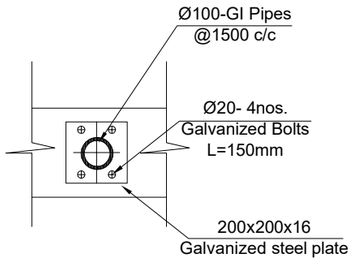
Railing Post Details
Scale:-1:30



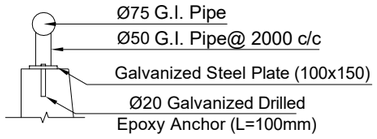
Painting Work on Crash Barrier
Scale:-1:30



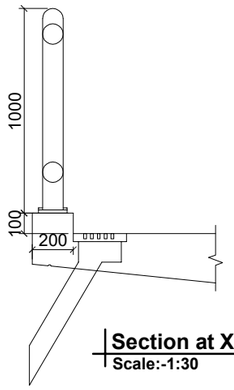
Painting Work on Crash Barrier on The Surface Facing Towards Carriageway
Scale:-1:30



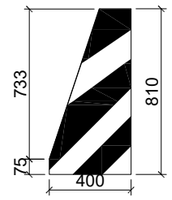
Section at Y-Y
Scale:-1:20



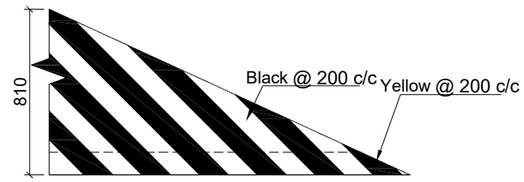
Details at- A-A
Scale:-1:20



Section at X-X
Scale:-1:30



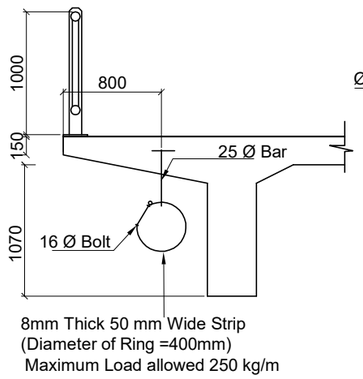
Painting Work on Tapper Crash Barrier
Scale:-1:30



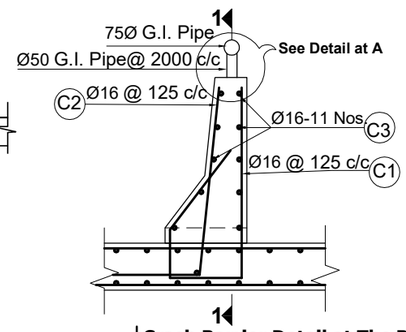
Painting Work on Crash Barrier on The Surface Facing Towards Carriageway
Scale:-1:30

BAR BENDING SCHEDULE OF CRASH BARRIER (For 1m)

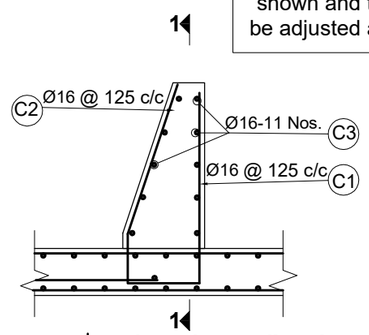
BAR ID	SHAPE OF BAR IN mm (NOT TO SCALE)	SPACING (MM)	Ø OF BARS (mm)	NO. OF BARS	LENGTH (m)	WEIGHT/LENGTH (kG/m)	TOTAL WEIGHT (kG)
C1	575, 928, 225, 304	125	16	8	2.030	1.578	25.632
C2	915, 500	125	16	8	1.415	1.578	17.867
C3	960		16	11	0.960	1.578	16.667
TOTAL FOR 1M							60.166
TOTAL FOR 1.0M IN MT							0.060



Utility hanger Detail
Scale:-1:50



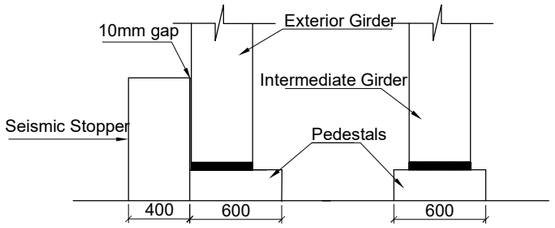
Crash Barrier Detail at The Bridge Deck
Scale:-1:30



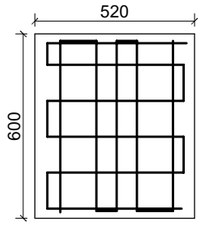
Crash Barrier Detail at The Tapered End
Scale:-1:30

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.

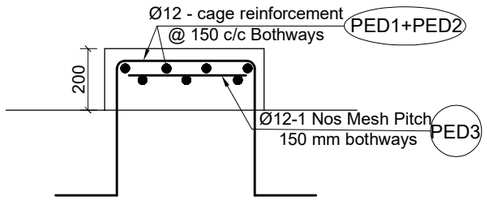
Government of Nepal Ministry of Physical Infrastructure and Transport **Department of Roads** **Project Directorate Office (ADB)** **SASEC Highway Improvement Project-** **Project Preparatory Consultant (SHIP-PPC)** **ADB Loan No: 3722-NEP**	**CONSULTANT:** Soosung Engineering Co. Ltd, Korea in association with ERMC P (Ltd) and TSE-Tech Studio of Engineeering Nepal	**IMPLEMENTING AGENCY:** **DOR, DCID** **ROAD NAME:** **East West Highway (H01)** **Butwal - Gorusinghe Section**	**SHEET TITLE:** Miscellaneous Details - 1 of **Balhundra Bridge** (47/H001/311_A)	**SCALE:** As Shown		**NAME**	**SIGNATURE**	**REV NO.**	**DESCRIPTION**	**DATE:** November,2022 **DWG.NO.:** 311_Balhundra **SHEET NO.:** 16/21
					Designed by:	Saroj Bhattarai				
					Checked by:	P. Upadhyaya				
					Approved by:	Dr. T.H.Choi				



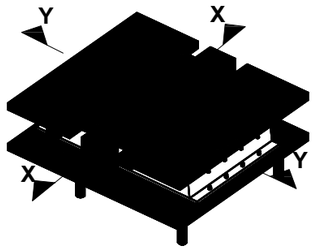
Abutment Cap With Stopper & Pedestal
Scale:-1:40



Pedestal Plan
Scale:-1:20



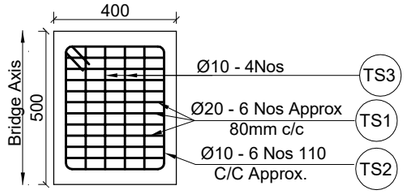
Pedestal Section
Scale:-1:20



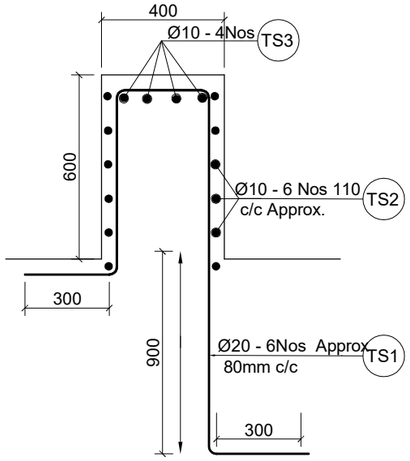
Elastrometric Bearing
(partially free at longitudal direction Fixed at Transverse direction)
Scale:-1:25

NOTE:

To match the height of ballast wall, the pedestal thickness shall be suitably modified.



Stoppers Plan
Scale:-1:20



Stoppers Details
Scale:-1:20

BAR BENDING SCHEDULE OF PEDESTAL

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)
PED1	520; 680; 200	150	12	4	2.280	0.888	8.097
PED2	440; 680; 200	150	12	5	1.960	0.888	8.701
PED3	510; 430; Pitch 150 bothway, 1 layer	150	10	2	4.620	0.617	5.697
TOTAL BAR BENDING SCHEDULE OF PEDESTAL							22.494
TOTAL WEIGHT (IN METRIC TON)							0.022

BAR BENDING SCHEDULE OF STOPPER

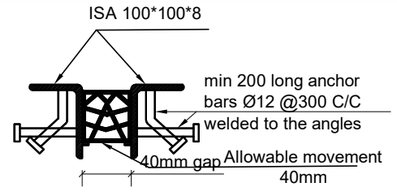
BAR ID	SHAPE OF BAR IN mm (NOT TO SCALE)	SPACING (mm)	Ø OF BARS (mm)	NO. OF BARS	LENGTH (m)	WEIGHT/LENGTH (Kg/m)	TOTAL WEIGHT (Kg)
ST1	300; 600; 300; 1500; 300		20	6	3.000	2.466	44.391
ST2	320; 100; 400		10	6	1.640	0.617	6.067
ST3	400		10	4	0.400	0.617	0.986
TOTAL BAR BENDING SCHEDULE OF STOPPER							51.444
TOTAL WEIGHT (IN METRIC TON)							0.051

Design Data For Bearing(Elastomeric Bearing)		All Loads Unfactored
1.	Maximum permanent and superimposed dead loads	450.4 KN
2.	Maximum load from surfacing (wearing course)	33.8 KN
3.	Non urban superstructure RCC	22m / Info / 61
4.	Maximum live load reaction (including impact)	598.2 KN
5.	Maximum horizontal seismic force	81 KN
6.	Maximum braking force	89.7 KN
7.	Total Maximum elongation of the deck	8 mm
8.	Maximum Rotation due to dead load _	0.0022 rad
9.	Maximum Rotation due to live load _	0.0016 rad
10.	Maximum rotation due to dead load + live load _	0.0038 rad
11.	Concrete for superstructure	M 30
12.	Concrete for substructure	M25/M30
13.	Width of girder at bearings	400 mm
14.	Length of bearing (along bridge axis) assumed	320 mm
15	Maximum ultimate compressive stress in concrete	13.4 N/mm²

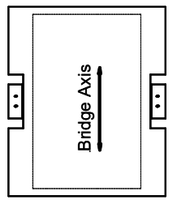
Lateral stiffness corresponding to overall area and total thickness of elastomer = 2286 N/mm

Notes on Elastomeric Bearings

The dimensions and properties of the bearings shown are tentative, based on IRC:83-2018, Part II, Table B2. The actual design shall be carried out by the manufacturer on the basis of provided load & deformation data. The effective stiffness shall not exceed the shown value.



Compression Seal Joint
Scale:-1:5

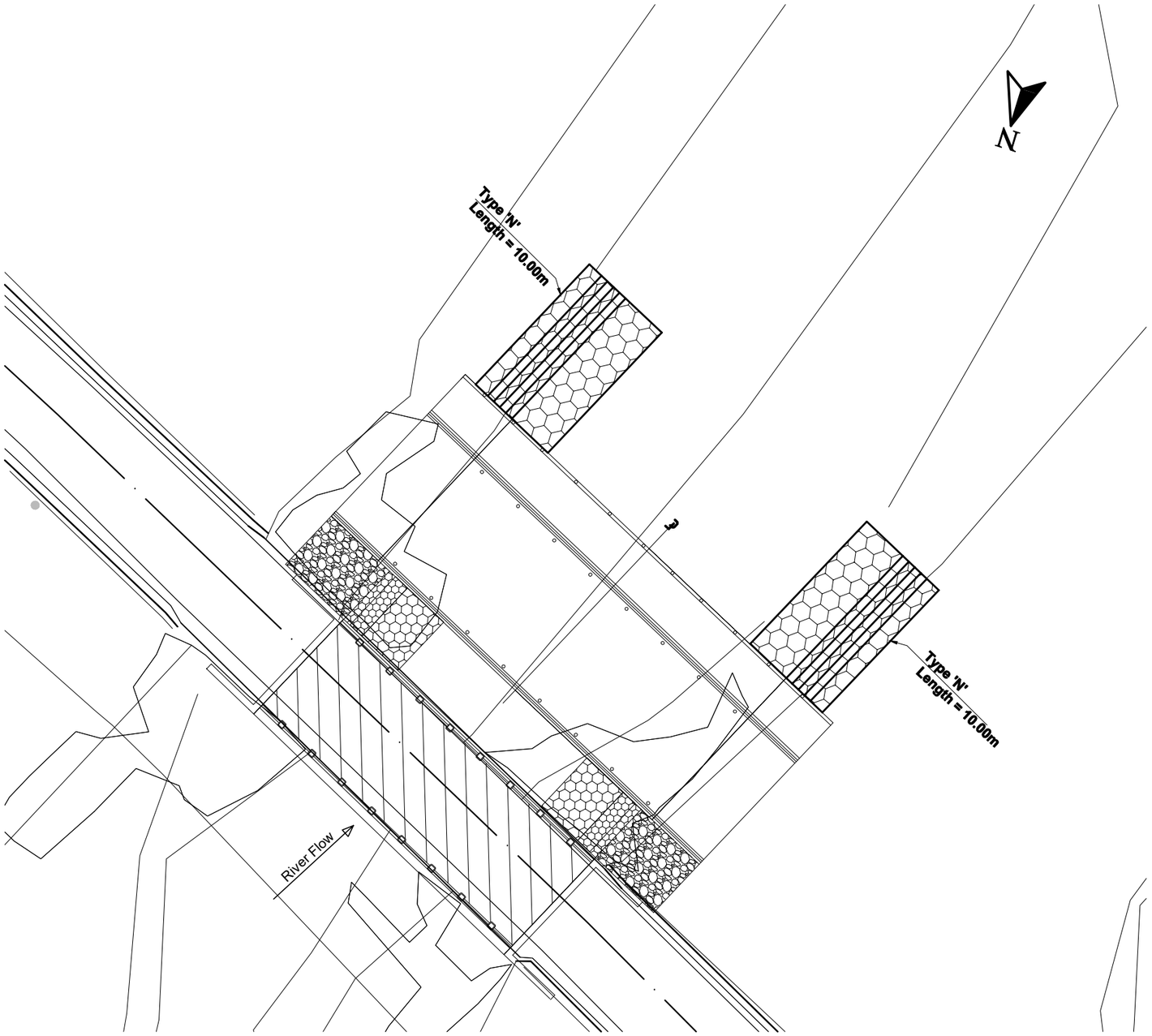


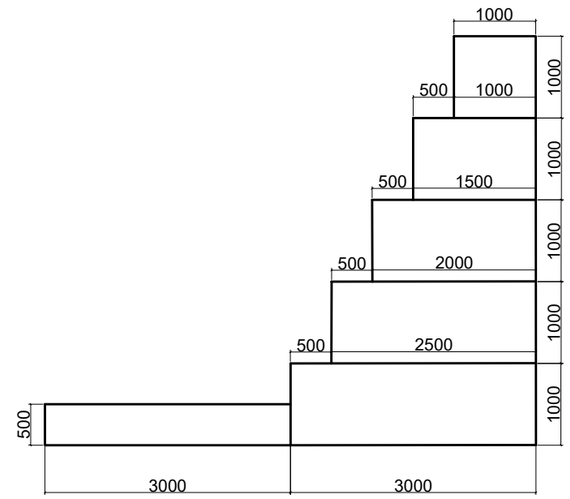
Elastomatric Longitudinal Bearing
Scale:-1:25

Section Y-Y
Scale:-1:25

Section X-X
Scale:-1:25

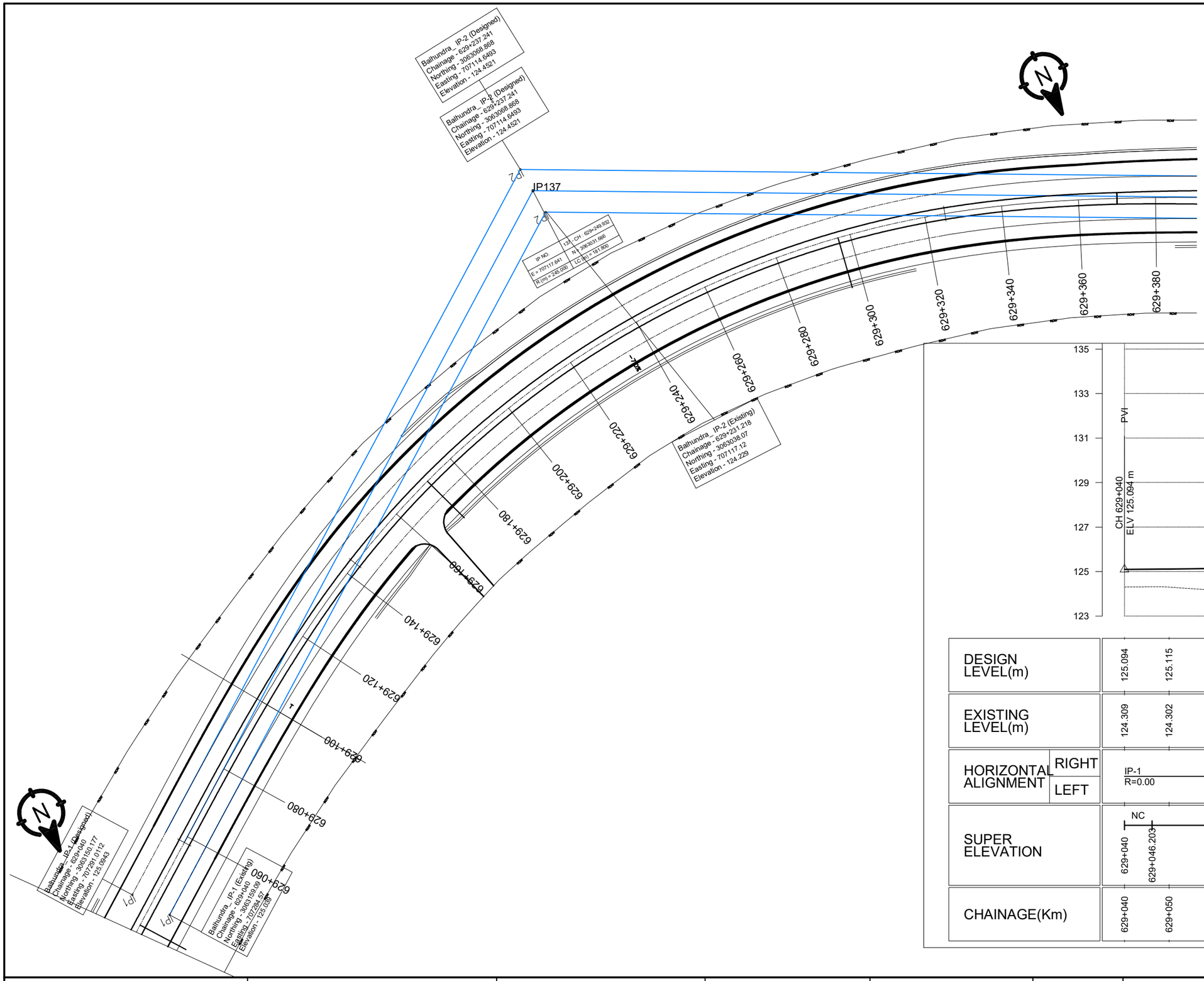
Government of Nepal Ministry of Physical Infrastructure and Transport **Department of Roads** **Project Directorate Office (ADB)** **SASEC Highway Improvement Project-** **Project Preparatory Consultant (SHIP-PPC)** **ADB Loan No: 3722-NEP**	**CONSULTANT:** Soosung Engineering Co. Ltd, Korea in association with ERMC P (Ltd) and TTE-Tech Studio of Engineeering Nepal	**IMPLEMENTING AGENCY:** **DOR, DCID** **ROAD NAME:** **East West Highway (H01)** **Butwal - Gorusinghe Section**	**SHEET TITLE:** Miscellaneous Details - 2 of **Balhundra Bridge** (47/H001/311_A)	**SCALE:** As Shown		**NAME**	**SIGNATURE**	**REV NO.**	**DESCRIPTION**	**DATE:** November,2022 **DWG.NO.:** 311_Balhundra **SHEET NO.:** 17/21
					Designed by:	Saroj Bhattarai				
					Checked by:	P. Upadhyaya				
					Approved by:	Dr. T.H.Choi				

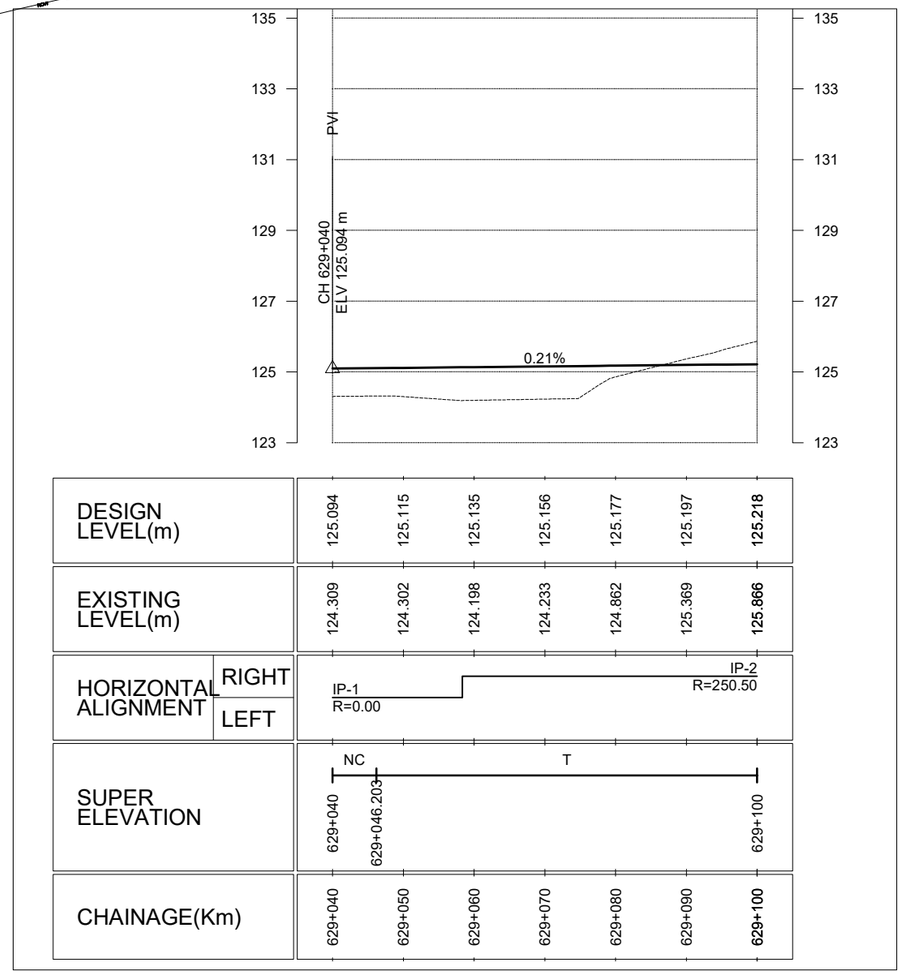




"N" Type River Training Structure
Scale:-1:75

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 ERMC P (Ltd) and TTE-Tech Studio of Engineeering Nepal	**IMPLEMENTING AGENCY:** **DOR, DCID** **ROAD NAME:** **East West Highway (H01)** **Butwal - Gorusinghe Section**	**SHEET TITLE:** River Training Work of **Balhundra Bridge** (47/H001/311_A)	**SCALE:** 1:1		**NAME**	**SIGNATURE**	**REV NO.**	**DESCRIPTION**	**DATE:** November,2022 **DWG.NO.:** 311_Balhundra **SHEET NO.:** 17.1/21
					Designed by:	Saroj Bhattarai				
					Checked by:	P. Upadhyaya				
					Approved by:	Dr. T.H.Choi				





DESIGN LEVEL(m)		125.094	125.115	125.135	125.156	125.177	125.197	125.218				
EXISTING LEVEL(m)		124.309	124.302	124.198	124.233	124.862	125.369	125.866				
HORIZONTAL ALIGNMENT	RIGHT	IP-1 R=0.00			IP-2 R=250.50							
	LEFT											
SUPER ELEVATION		NC		T								
		629+040	629+046.203					629+100				
CHAINAGE(Km)		629+040	629+050	629+060	629+070	629+080	629+090	629+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
TSE-Tech Studio of Engineeering

IMPLEMENTING AGENCY:
DOR, DCID

ROAD NAME:
East West Highway (H01)

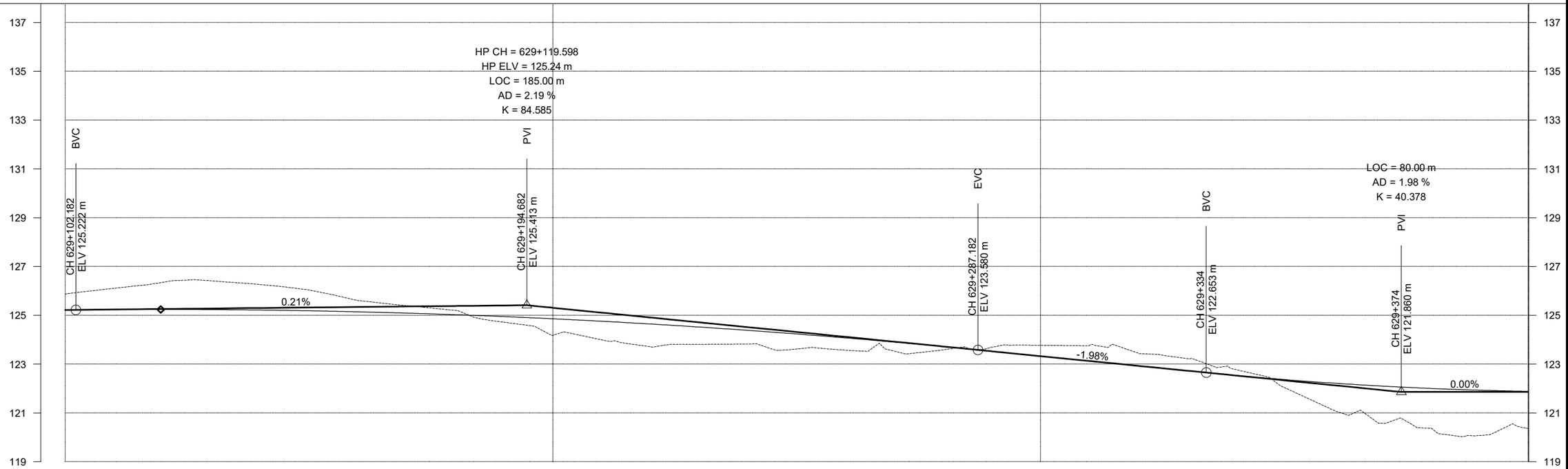
Butwal - Gorusinghe Section

SHEET TITLE:
Plan & Profile
OF
Balhundra Bridge
629+040-629+100

SCALE:
0 2 4 6m
Vertical Scale
0 10 20 30m
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.: 311_Balhundra
SHEET NO.: 18.1/21



DESIGN LEVEL(m)	125.218	125.235	125.240	125.234	125.216	125.186	125.144	125.090	125.025	124.947	124.858	124.757	124.644	124.520	124.383	124.235	124.075	123.903	123.719	123.524	123.326	123.128	122.930	122.732	122.538	122.367	122.221	122.100	122.003	121.931	121.884
EXISTING LEVEL(m)	125.866	126.106	126.353	126.412	126.261	126.037	125.608	125.394	125.201	124.717	124.176	123.996	123.711	123.809	123.824	123.620	123.571	123.532	123.585	123.691	123.770	123.761	123.453	123.229	122.779	122.043	121.120	120.577	120.372	120.073	120.362

HORIZONTAL ALIGNMENT

RIGHT: IP-2 R=250.50 — IP-2 R=250.50

LEFT:

SUPER ELEVATION: T (629+100 – 629+171.679), -7 (629+171.679 – 629+302.802), T (629+302.802 – 629+400)

CHAINAGE(Km)	629+100	629+110	629+120	629+130	629+140	629+150	629+160	629+170	629+180	629+190	629+200	629+210	629+220	629+230	629+240	629+250	629+260	629+270	629+280	629+290	629+300	629+310	629+320	629+330	629+340	629+350	629+360	629+370	629+380	629+390	629+400

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 Engineeering

IMPLEMENTING AGENCY:
DOR, DCID

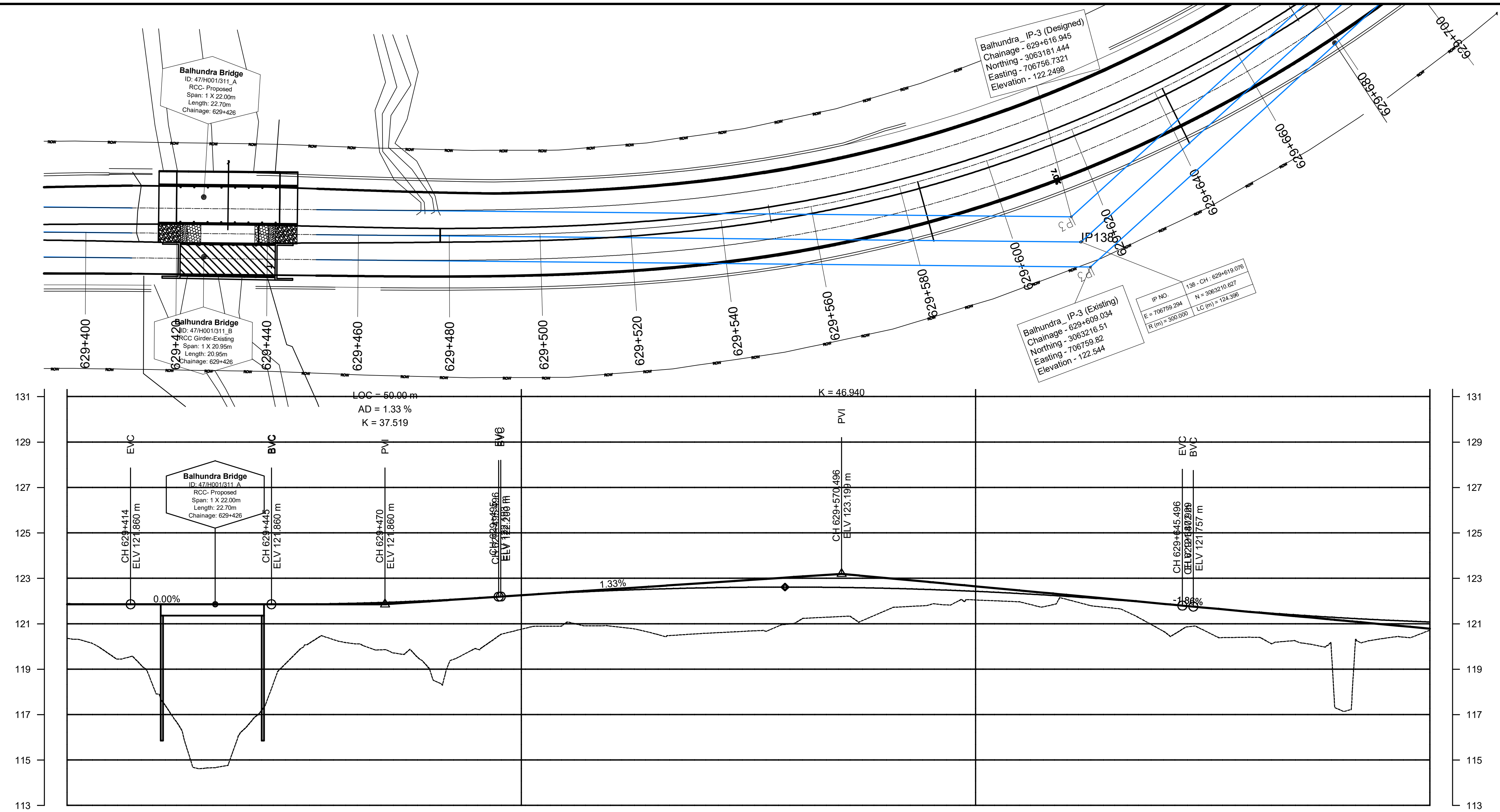
ROAD NAME:
East West Highway (H01)
Butwal - Gorusinghe Section

SHEET TITLE:
Plan & Profile
OF
Balhundra Bridge
629+100-629+400

SCALE:
0 2 4 6m — Vertical Scale
0 10 20 30m — 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.: 311_Balhundra
SHEET NO.: 18.2/21



629+400	121.884	120.362
629+410	121.862	119.571
629+420	121.860	117.904
629+430	121.860	114.633
629+440	121.860	116.578
629+450	121.863	119.623
629+460	121.890	120.226
629+470	121.943	119.860
629+480	122.023	118.878
629+490	122.130	119.901
629+500	122.258	120.761
629+510	122.371	121.068
629+520	122.462	120.891
629+530	122.533	120.528
629+540	122.582	120.577
629+550	122.610	120.679
629+560	122.616	121.010
629+570	122.601	121.318
629+580	122.565	121.567
629+590	122.508	121.844
629+600	122.429	122.049
629+610	122.329	121.952
629+620	122.208	122.077
629+630	122.065	121.696
629+640	121.901	120.819
629+650	121.719	120.738
629+660	121.548	120.409
629+670	121.398	120.260
629+680	121.270	117.227
629+690	121.164	120.364
629+700	121.079	120.714

IP-2 R=250.50 — IP-3 R=294.50

T: 629+400 – 629+428.278; NC: 629+428.278 – 629+442.518; T: 629+442.518 – 629+590.138; 7: 629+590.138 – 629+643.753; T: 629+643.753 – 629+700

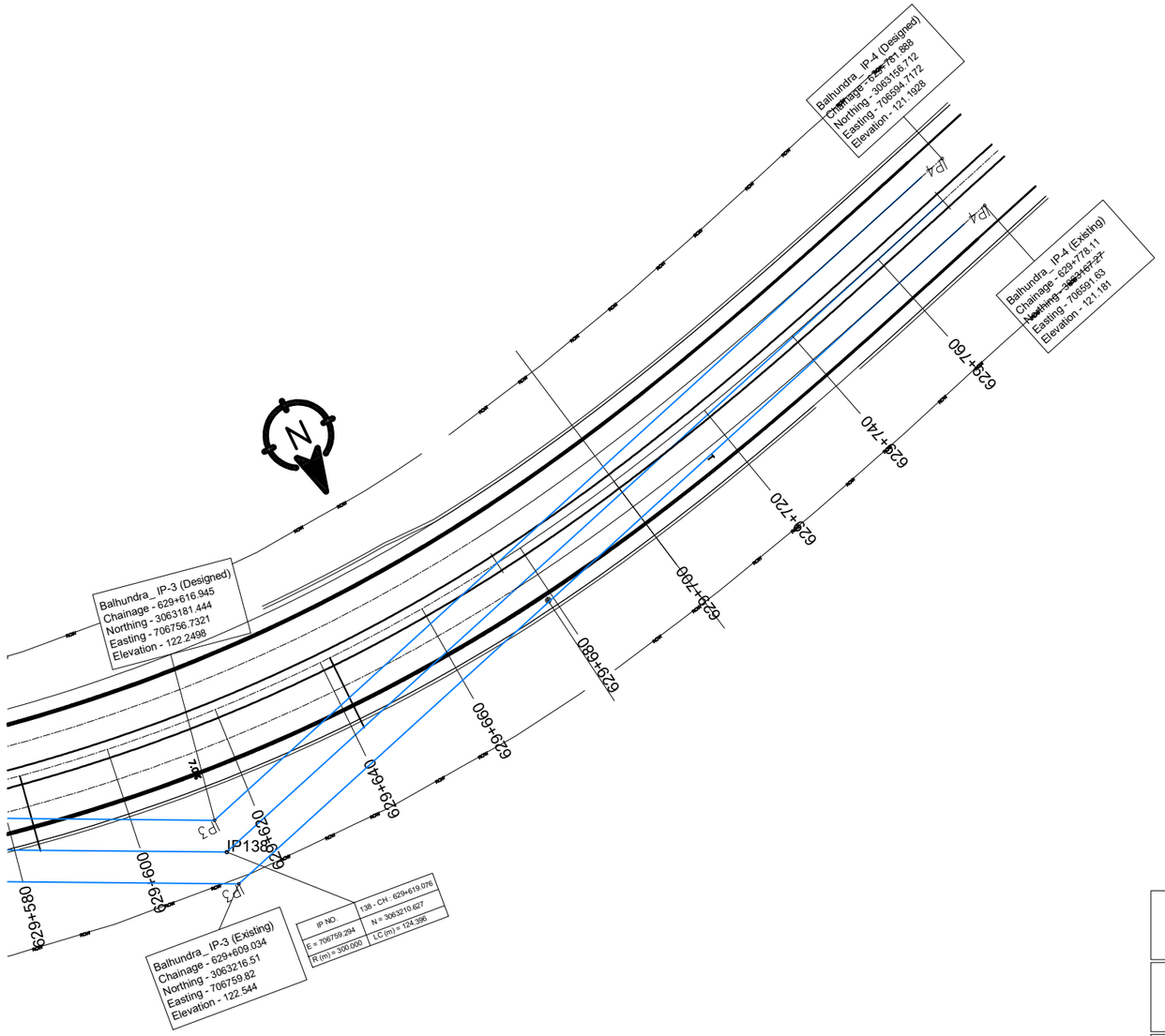
Government of Nepal Ministry of Physical Infrastructure and Transport **Department of Roads** **Project Directorate Office (ADB)** **SASEC Highway Improvement Project-** **Project Preparatory Consultant (SHIP-PPC)** **ADB Loan No: 3722-NEP**	**CONSULTANT:** Soosung Engineering Co. Ltd, Korea in association with ERMC P (Ltd), Nepal and TSE-Tech Studio of Engineeering	**IMPLEMENTING AGENCY:** **DOR, DCID** **ROAD NAME:** **East West Highway (H01)** **Butwal - Gorusinghe Section**	**SHEET TITLE:** Plan & Profile OF Balhundra Bridge 629+400-629+700	**SCALE:** 0 2 4 6m Vertical Scale 0 10 20 30m Horizontal Scale		**NAME**	**SIGNATURE**
					DESIGNED BY:	Saroj Bhattarai	
					CHECKED BY:	P. Upadhyaya	
					APPROVED BY:	Dr. T.H.Choi	

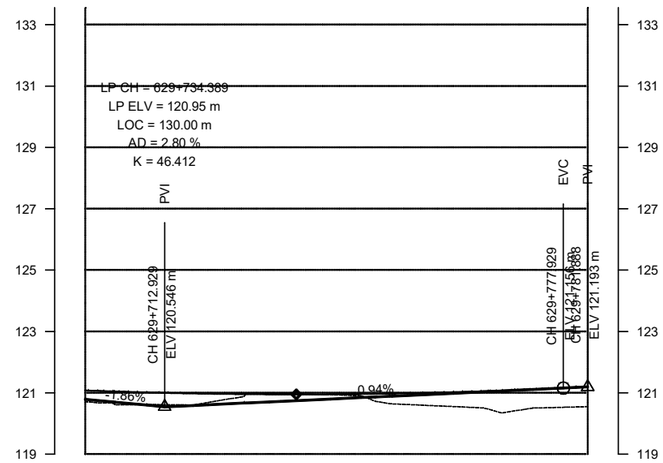
REV NO. **DESCRIPTION**

DATE: November,2022

DWG.NO.: 311_Balhundra

SHEET NO.: 18.3/21





DESIGN LEVEL(m)		121.079	121.016	120.974	120.954	120.955	120.978	121.022	121.088	121.175
EXISTING LEVEL(m)		120.714	120.619	120.688	120.986	120.938	120.641	120.555	120.414	120.541
HORIZONTAL ALIGNMENT	RIGHT								IP-4 R=0.00	
	LEFT	IP-3 R=294.50								
SUPER ELEVATION		629+700				T				629+781.888
CHAINAGE(Km)		629+700	629+710	629+720	629+730	629+740	629+750	629+760	629+770	629+780

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 Engineeering

IMPLEMENTING AGENCY:
DOR, DCID

ROAD NAME:
East West Highway (H01)

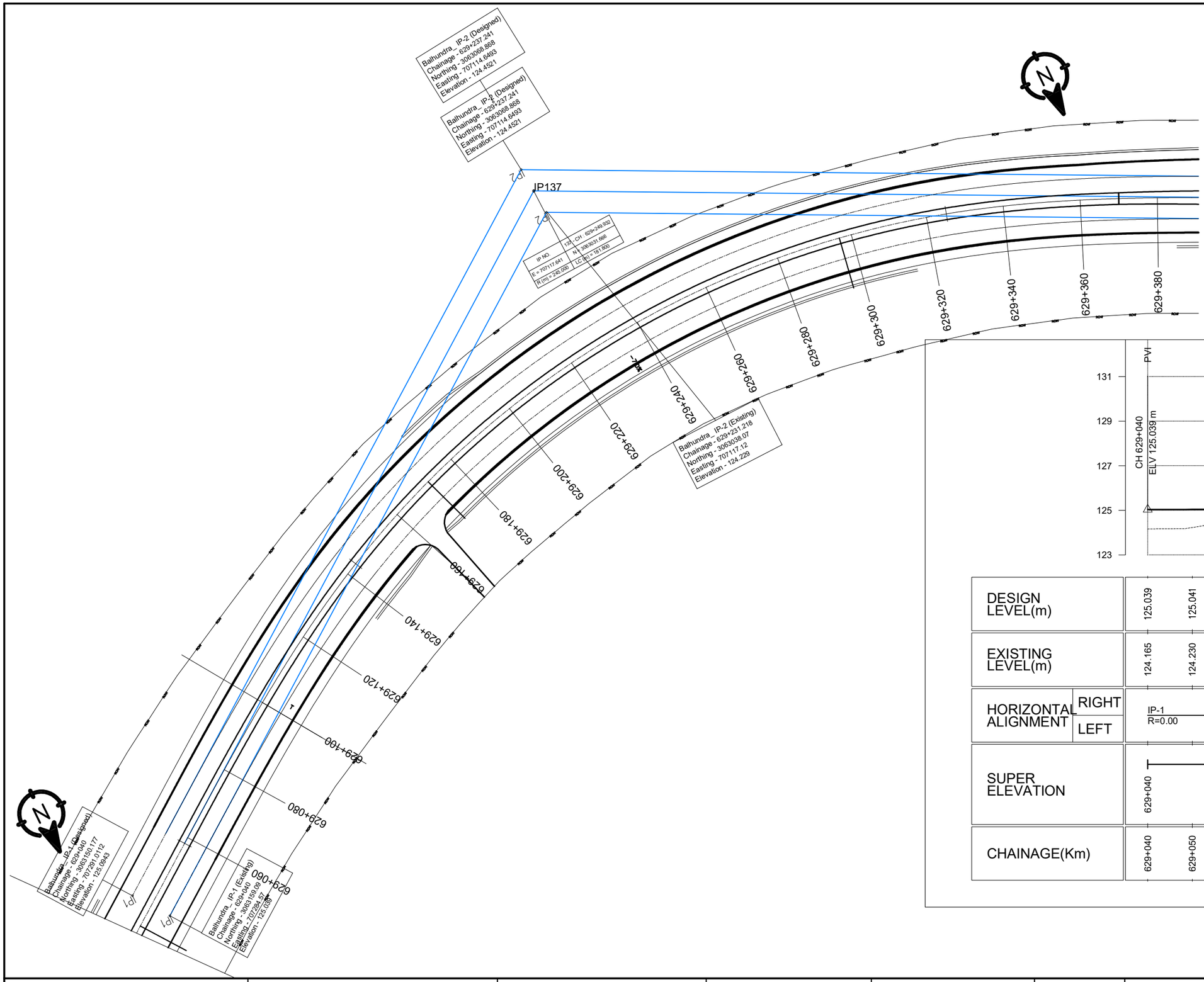
Butwal - Gorusinghe Section

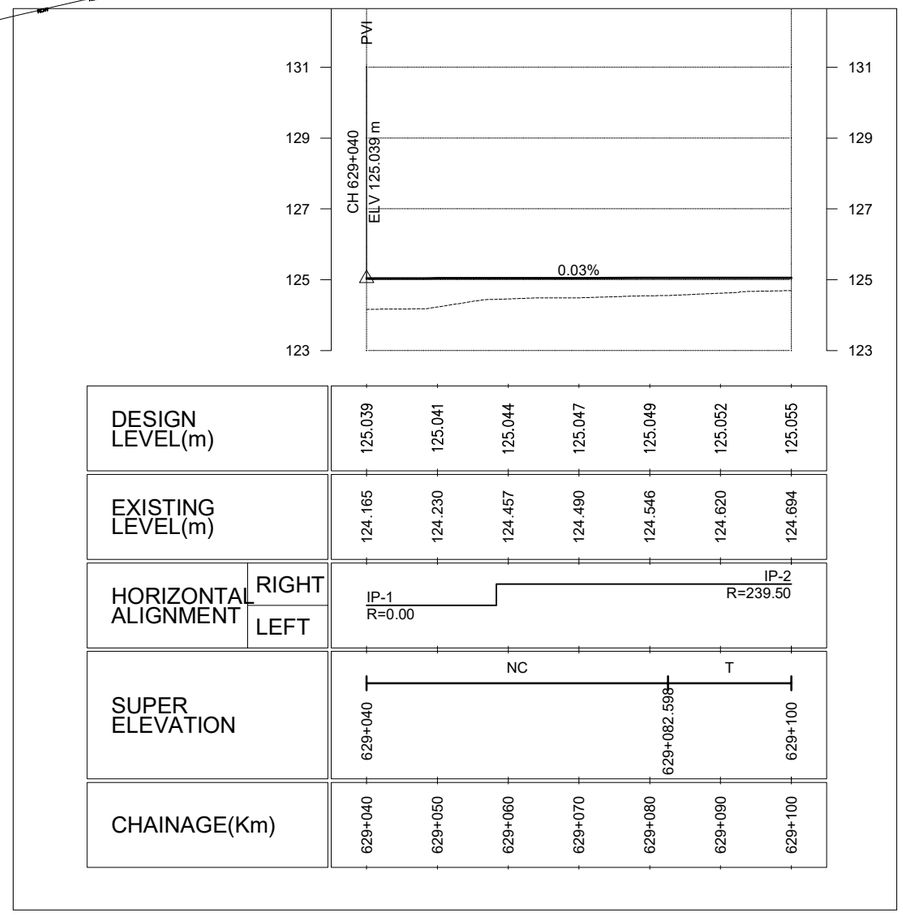
SHEET TITLE:
Plan & Profile
OF
Balhundra Bridge
629+700-629+760

SCALE:
0 2 4 6m
Vertical Scale
0 10 20 30m
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.: 311_Balhundra
SHEET NO.: 18.4/21



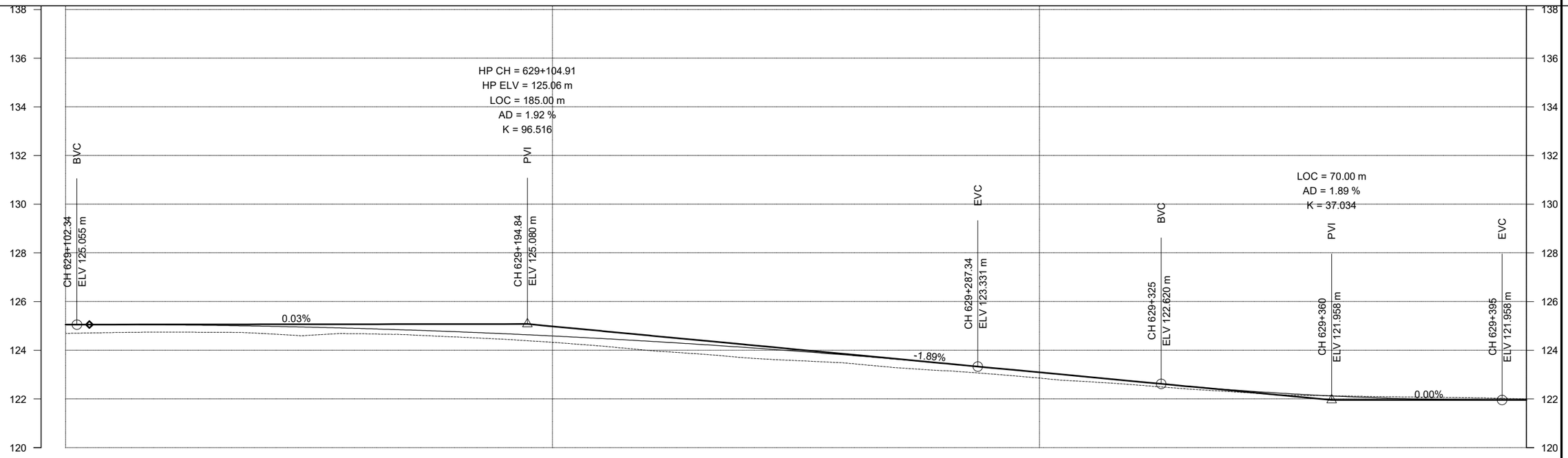


Government of Nepal Ministry of Physical Infrastructure and Transport **Department of Roads** **Project Directorate Office (ADB)** **SASEC Highway Improvement Project-** **Project Preparatory Consultant (SHIP-PPC)** **ADB Loan No: 3722-NEP**	**CONSULTANT:** Soosung Engineering Co. Ltd, Korea in association with ERMC P (Ltd), Nepal and TSE-Tech Studio of Engineeering	**IMPLEMENTING AGENCY:** **DOR, DCID** **ROAD NAME:** **East West Highway (H01)** **Butwal - Gorusinghe Section**	**SHEET TITLE:** Plan & Profile OF Balhundra Bridge 629+040-629+100	**SCALE:** 0 2 4 6m Vertical Scale 0 10 20 30m Horizontal Scale		**NAME**	**SIGNATURE**	**REV NO.**	**DESCRIPTION**
					DESIGNED BY:	Saroj Bhattarai			
					CHECKED BY:	P. Upadhyaya			
					APPROVED BY:	Dr. T.H.Choi			

DATE: November,2022

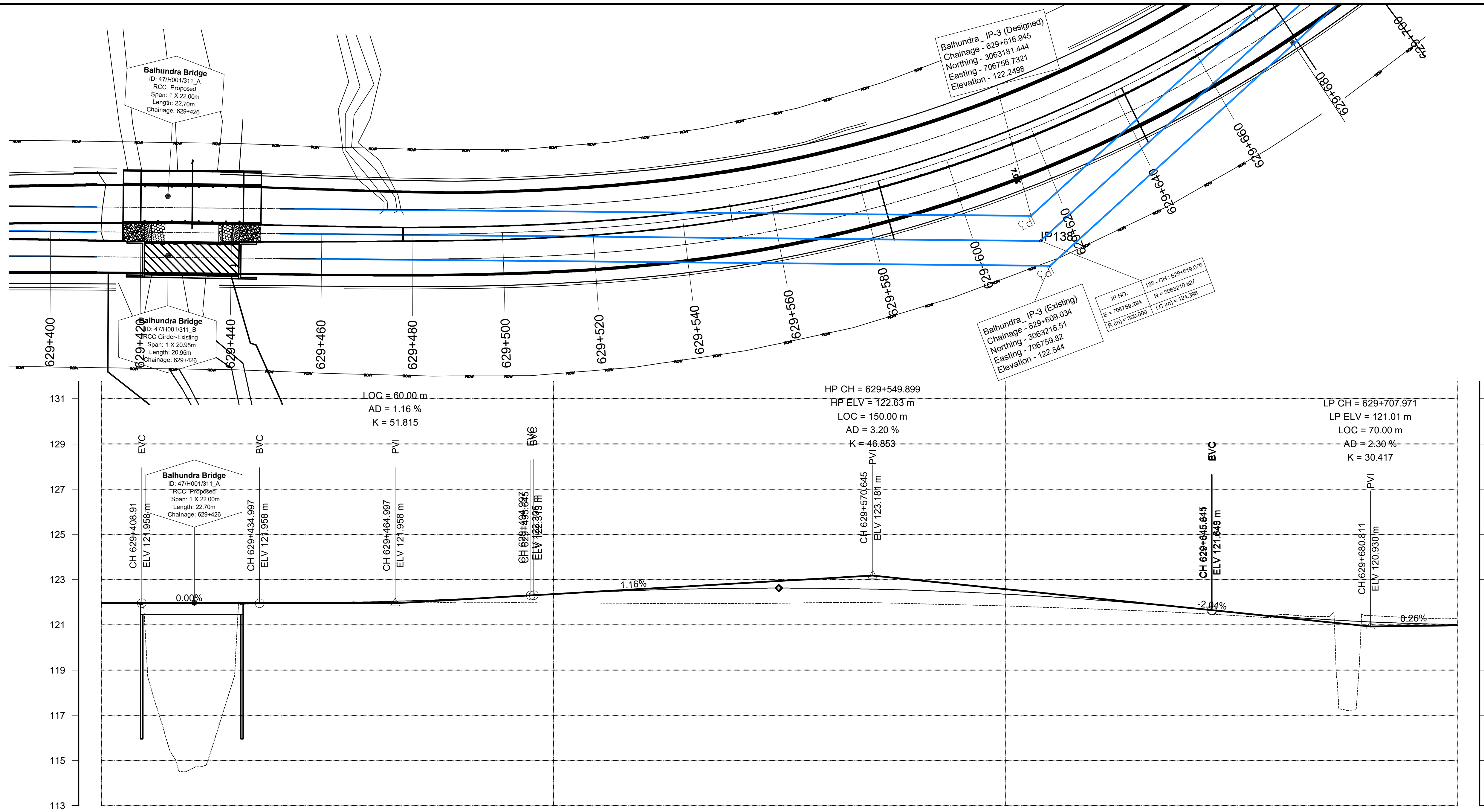
DWG.NO.: 311_Balhundra

SHEET NO.: 18.5/21



DESIGN LEVEL(m)	125.055	125.054	125.044	125.023	124.992	124.950	124.898	124.836	124.763	124.680	124.587	124.483	124.369	124.245	124.110	123.965	123.809	123.644	123.467	123.281	123.092	122.903	122.714	122.528	122.366	122.231	122.123	122.042	121.988	121.961	121.958
EXISTING LEVEL(m)	124.694	124.728	124.744	124.741	124.695	124.614	124.680	124.639	124.548	124.452	124.328	124.174	123.989	123.851	123.684	123.577	123.479	123.293	123.163	123.028	122.856	122.710	122.573	122.418	122.290	122.162	122.130	122.095	122.071	122.046	122.002
HORIZONTAL ALIGNMENT RIGHT	IP-2 R=239.50																														IP-2 R=239.50
HORIZONTAL ALIGNMENT LEFT																															
SUPER ELEVATION	T								-7														T							NC
SUPER ELEVATION	629+100							629+171.646												629+290.79									629+379.838		629+400
CHAINAGE(Km)	629+100	629+110	629+120	629+130	629+140	629+150	629+160	629+170	629+180	629+190	629+200	629+210	629+220	629+230	629+240	629+250	629+260	629+270	629+280	629+290	629+300	629+310	629+320	629+330	629+340	629+350	629+360	629+370	629+380	629+390	629+400

Government of Nepal	CONSULTANT:	IMPLEMENTING AGENCY:	SHEET TITLE:	SCALE:		NAME	SIGNATURE	REV NO.	DESCRIPTION	DATE:
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 ERMC P (Ltd), Nepal and TSE-Tech Studio of Engineeering	**DOR, DCID** **ROAD NAME:** **East West Highway (H01)** **Butwal - Gorusinghe Section**	Plan & Profile OF Balhundra Bridge 629+100-629+400	0 2 4 6m Vertical Scale 0 10 20 30m Horizontal Scale	DESIGNED BY: CHECKED BY: APPROVED BY:	Saroj Bhattarai P. Upadhyaya Dr. T.H.Choi				November,2022 **DWG.NO.:** 311_Balhundra **SHEET NO.:** 18.6/21



CHAINAGE(Km)	DESIGN LEVEL(m)	EXISTING LEVEL(m)
629+400	121.969	122.002
629+410	121.958	119.535
629+420	121.958	114.638
629+430	121.958	120.796
629+440	121.960	121.969
629+450	121.980	121.997
629+460	122.018	122.014
629+470	122.076	122.008
629+480	122.153	121.974
629+490	122.250	121.983
629+500	122.361	121.968
629+510	122.457	121.967
629+520	122.532	121.947
629+530	122.585	121.953
629+540	122.617	121.943
629+550	122.627	121.960
629+560	122.616	121.986
629+570	122.584	121.985
629+580	122.530	121.939
629+590	122.455	121.888
629+600	122.359	121.837
629+610	122.242	121.768
629+620	122.103	121.700
629+630	121.942	121.620
629+640	121.761	121.533
629+650	121.563	121.420
629+660	121.388	121.414
629+670	121.247	121.368
629+680	121.139	121.411
629+690	121.063	121.315
629+700	121.021	121.267

HORIZONTAL ALIGNMENT (RIGHT / LEFT): IP-2 R=239.50 … IP-3 R=305.50

SUPER ELEVATION: T 629+400 – 629+416.266; NC 629+416.266 – 629+430.493; T 629+430.493 – 629+578.112; 7 629+578.112 – 629+639.955; T 629+639.955 – 629+700

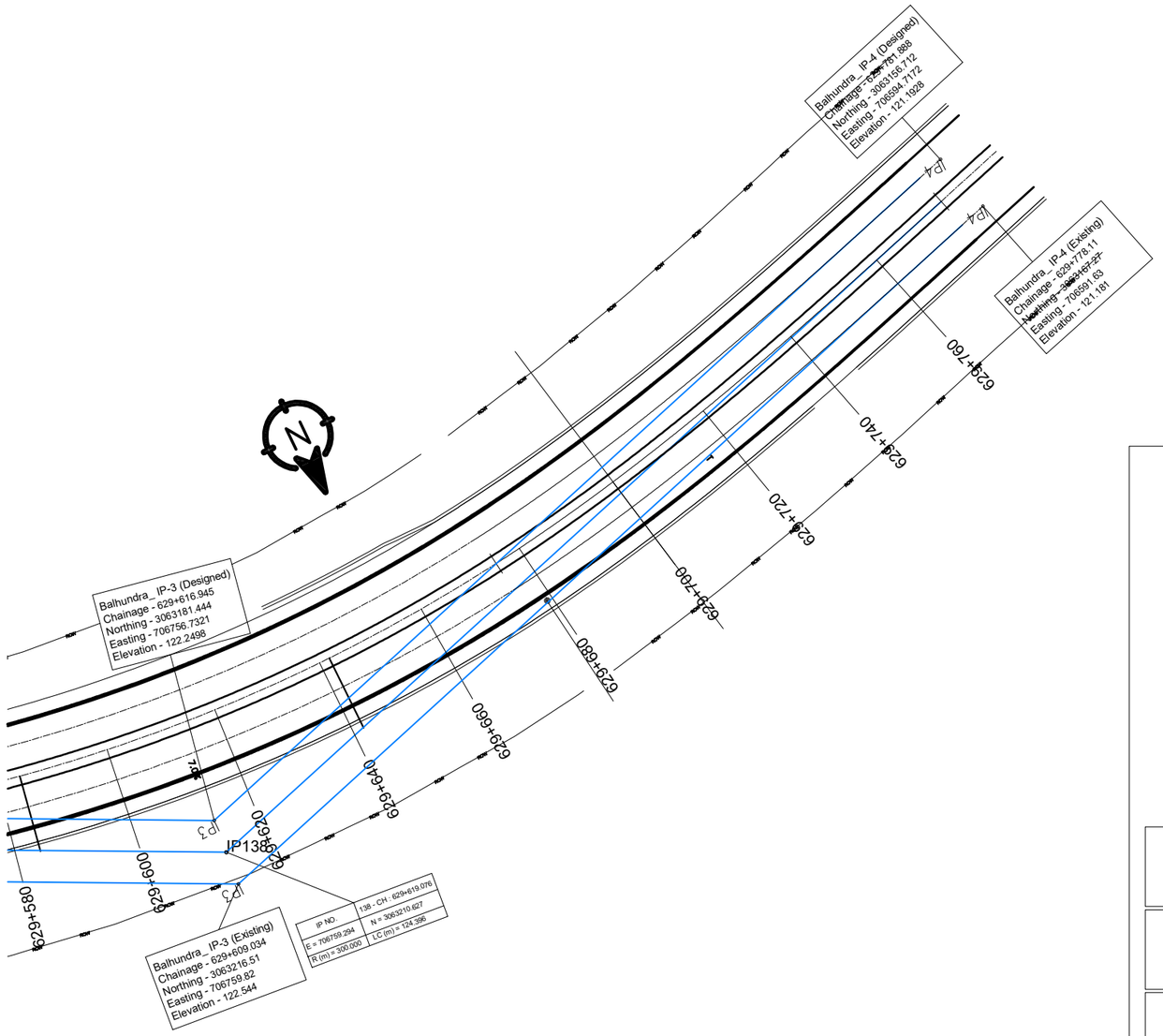
Government of Nepal Ministry of Physical Infrastructure and Transport **Department of Roads** **Project Directorate Office (ADB)** **SASEC Highway Improvement Project-** **Project Preparatory Consultant (SHIP-PPC)** **ADB Loan No: 3722-NEP**	**CONSULTANT:** Soosung Engineering Co. Ltd, Korea in association with ERMC P (Ltd), Nepal and TSE-Tech Studio of Engineeering
IMPLEMENTING AGENCY:	**DOR, DCID**
ROAD NAME:	**East West Highway (H01)** **Butwal - Gorusinghe Section**
SHEET TITLE:	Plan & Profile OF Existing Balhundra Bridge 629+400-629+700
SCALE:	Vertical Scale 0 2 4 6m Horizontal Scale 0 10 20 30m

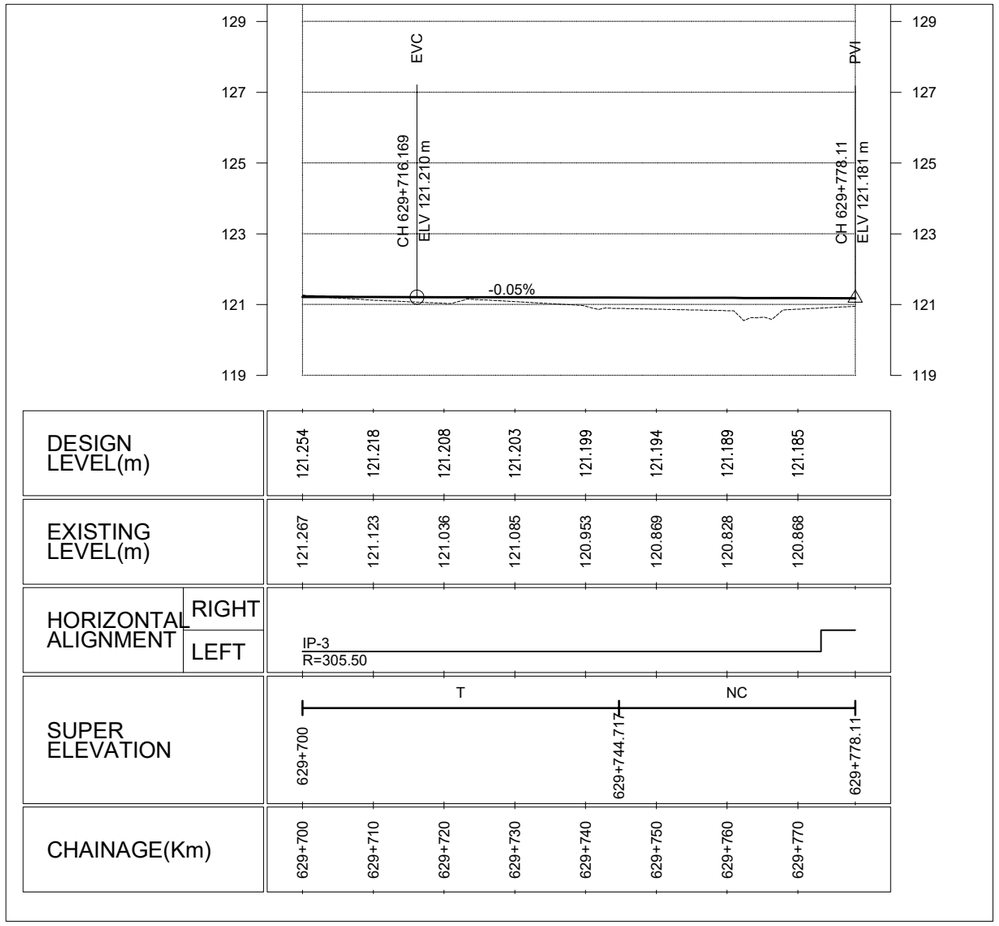
	NAME	SIGNATURE	REV NO.	DESCRIPTION
DESIGNED BY:	Saroj Bhattarai			
CHECKED BY:	P. Upadhyaya			
APPROVED BY:	Dr. T.H.Choi			

DATE: November,2022

DWG.NO.: 311_Balhundra

SHEET NO.: 18.7/21





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 Engineeering	**IMPLEMENTING AGENCY:** **DOR, DCID** **ROAD NAME:** **East West Highway (H01)** **Butwal - Gorusinghe Section**	**SHEET TITLE:** Plan & Profile OF Balhundra Bridge 629+700-629+770	**SCALE:** 0 2 4 6m Vertical Scale 0 10 20 30m Horizontal Scale		**NAME**	**SIGNATURE**	**REV NO.**	**DESCRIPTION**
					DESIGNED BY:	Saroj Bhattarai			
					CHECKED BY:	P. Upadhyaya			
					APPROVED BY:	Dr. T.H.Choi			

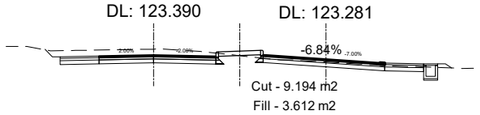
DATE: November,2022

DWG.NO.: 311_Balhundra

SHEET NO.: 18.8/21

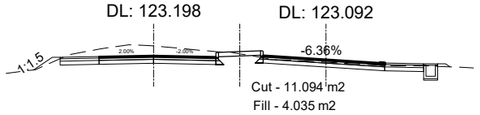
Ch:629+300
GL:123.342
DL:123.406

GL: 123.760 DL: 123.390 | GL: 122.937 DL: 123.281



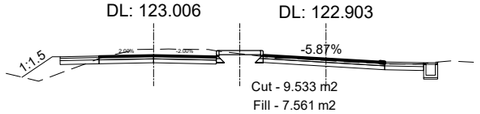
Ch:629+310
GL:123.302
DL:123.213

GL: 123.814 DL: 123.198 | GL: 122.762 DL: 123.092



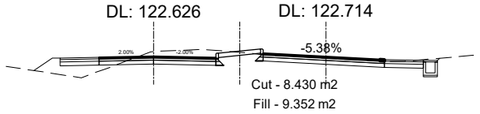
Ch:629+320
GL:123.086
DL:123.020

GL: 123.371 DL: 123.006 | GL: 122.646 DL: 122.903



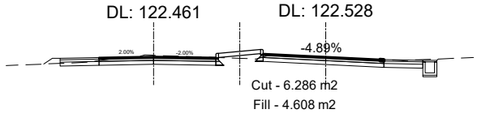
Ch:629+330
GL:122.882
DL:122.827

GL: 122.930 DL: 122.626 | GL: 122.497 DL: 122.714



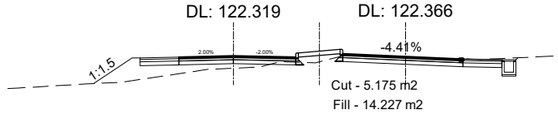
Ch:629+340
GL:122.332
DL:122.634

GL: 122.532 DL: 122.461 | GL: 122.357 DL: 122.528



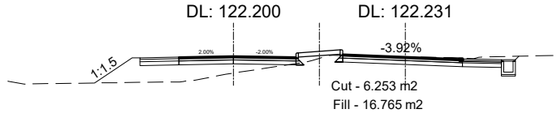
Ch:629+350
GL:121.939
DL:122.461

GL: 121.529 DL: 122.319 | GL: 122.231 DL: 122.366



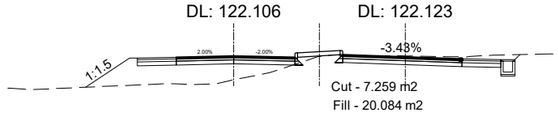
Ch:629+360
GL:122.050
DL:122.313

GL: 121.103 DL: 122.200 | GL: 122.149 DL: 122.231



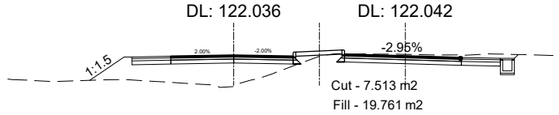
Ch:629+370
GL:122.081
DL:122.190

GL: 120.571 DL: 122.106 | GL: 122.115 DL: 122.123



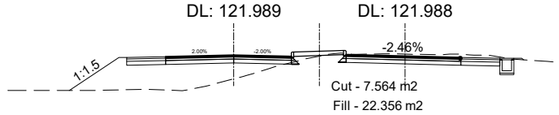
Ch:629+380
GL:121.969
DL:122.094

GL: 120.037 DL: 122.036 | GL: 122.085 DL: 122.042



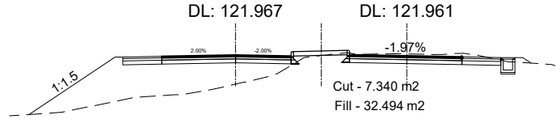
Ch:629+390
GL:121.921
DL:122.023

GL: 120.471 DL: 121.989 | GL: 122.062 DL: 121.988

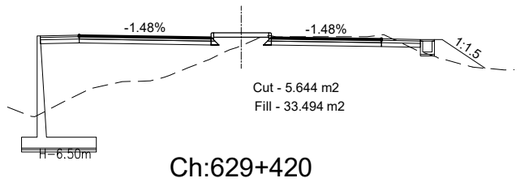


Ch:629+400
GL:121.918
DL:121.978

GL: 120.091 DL: 121.967 | GL: 122.030 DL: 121.961

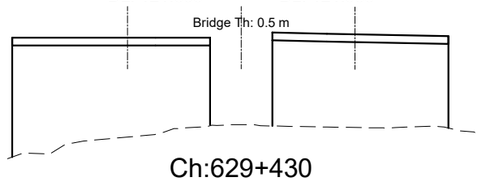


Ch:629+410
GL:121.419
DL:121.959



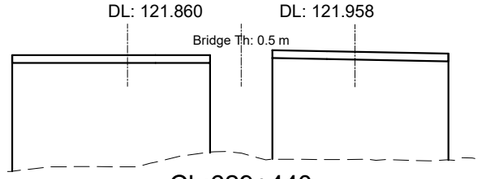
Ch:629+420
GL:116.377
DL:121.860

GL: 115.755 DL: 121.860 | GL: 116.227 DL: 121.958



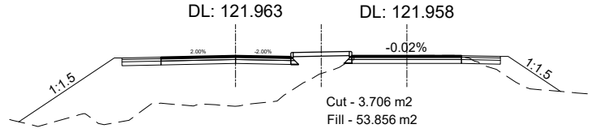
Ch:629+430
GL:115.670
DL:121.860

GL: 115.102 DL: 121.860 | GL: 115.267 DL: 121.958



Ch:629+440
GL:120.812
DL:121.959

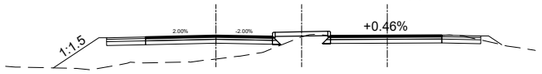
GL: 118.711 DL: 121.963 | GL: 121.947 DL: 121.958



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 Engineeering	**IMPLEMENTING AGENCY:** **DOR, DCID** **ROAD NAME:** **East West Highway (H01)** **Butwal - Gorusinghe Section**	**SHEET TITLE:** Cross Section of Ch:629+300 - 629+440	**SCALE:** 0 2 4 6m Vertical Scale 0 10 20 30m Horizontal Scale		**NAME**	**SIGNATURE**	**REV NO.**	**DESCRIPTION**	**DATE:** November,2022 **DWG.NO.:** 311_Balhundra **SHEET NO.:** 19.1/21
					DESIGNED BY:	Saroj Bhattarai				
					CHECKED BY:	P. Upadhyaya				
					APPROVED BY:	Dr. T.H.Choi				

Ch:629+450
GL:121.887
DL:121.974

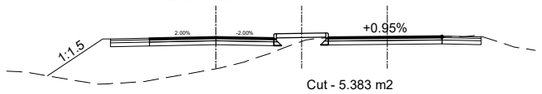
GL: 120.479 GL: 121.982
DL: 121.987 DL: 121.961



Cut - 5.645 m2
Fill - 18.163 m2

Ch:629+460
GL:121.737
DL:122.011

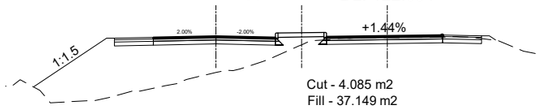
GL: 119.982 GL: 122.006
DL: 122.035 DL: 121.985



Cut - 5.383 m2
Fill - 26.827 m2

Ch:629+470
GL:121.548
DL:122.069

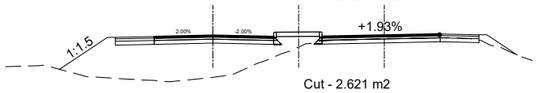
GL: 119.771 GL: 122.012
DL: 122.109 DL: 122.034



Cut - 4.085 m2
Fill - 37.149 m2

Ch:629+480
GL:121.449
DL:122.148

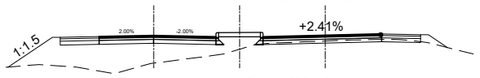
GL: 119.507 GL: 122.002
DL: 122.207 DL: 122.106



Cut - 2.621 m2
Fill - 28.421 m2

Ch:629+490
GL:121.450
DL:122.248

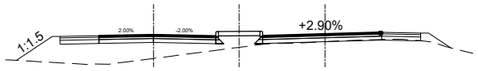
GL: 120.557 GL: 121.979
DL: 122.326 DL: 122.203



Cut - 1.286 m2
Fill - 18.154 m2

Ch:629+500
GL:121.615
DL:122.362

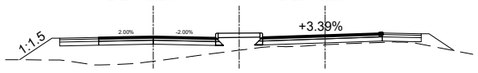
GL: 120.899 GL: 121.980
DL: 122.430 DL: 122.324



Cut - 0.201 m2
Fill - 14.541 m2

Ch:629+510
GL:121.619
DL:122.458

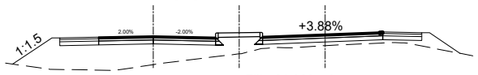
GL: 120.913 GL: 121.969
DL: 122.513 DL: 122.463



Fill - 15.320 m2

Ch:629+520
GL:121.433
DL:122.532

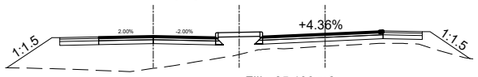
GL: 120.745 GL: 121.962
DL: 122.576 DL: 122.586



Fill - 21.930 m2

Ch:629+530
GL:121.422
DL:122.585

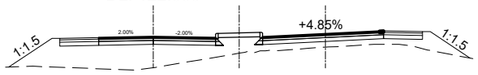
GL: 120.522 GL: 121.951
DL: 122.618 DL: 122.685



Fill - 25.133 m2

Ch:629+540
GL:121.563
DL:122.617

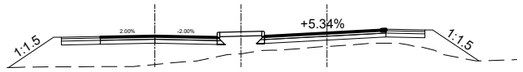
GL: 120.632 GL: 121.951
DL: 122.639 DL: 122.761



Fill - 23.970 m2

Ch:629+550
GL:121.463
DL:122.628

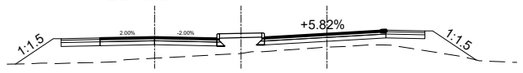
GL: 120.773 GL: 121.941
DL: 122.640 DL: 122.814



Fill - 24.823 m2

Ch:629+560
GL:121.570
DL:122.617

GL: 121.269 GL: 121.974
DL: 122.640 DL: 122.844



Fill - 18.858 m2

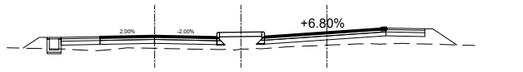
Ch:629+570
GL:121.656
DL:122.585

GL: 121.113 GL: 121.995
DL: 122.620 DL: 122.850

Fill - 17.436 m2

Ch:629+580
GL:121.700
DL:122.532

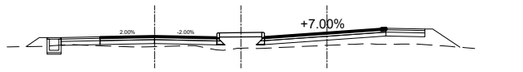
GL: 121.754 GL: 121.962
DL: 122.579 DL: 122.833



Cut - 0.852 m2
Fill - 9.049 m2

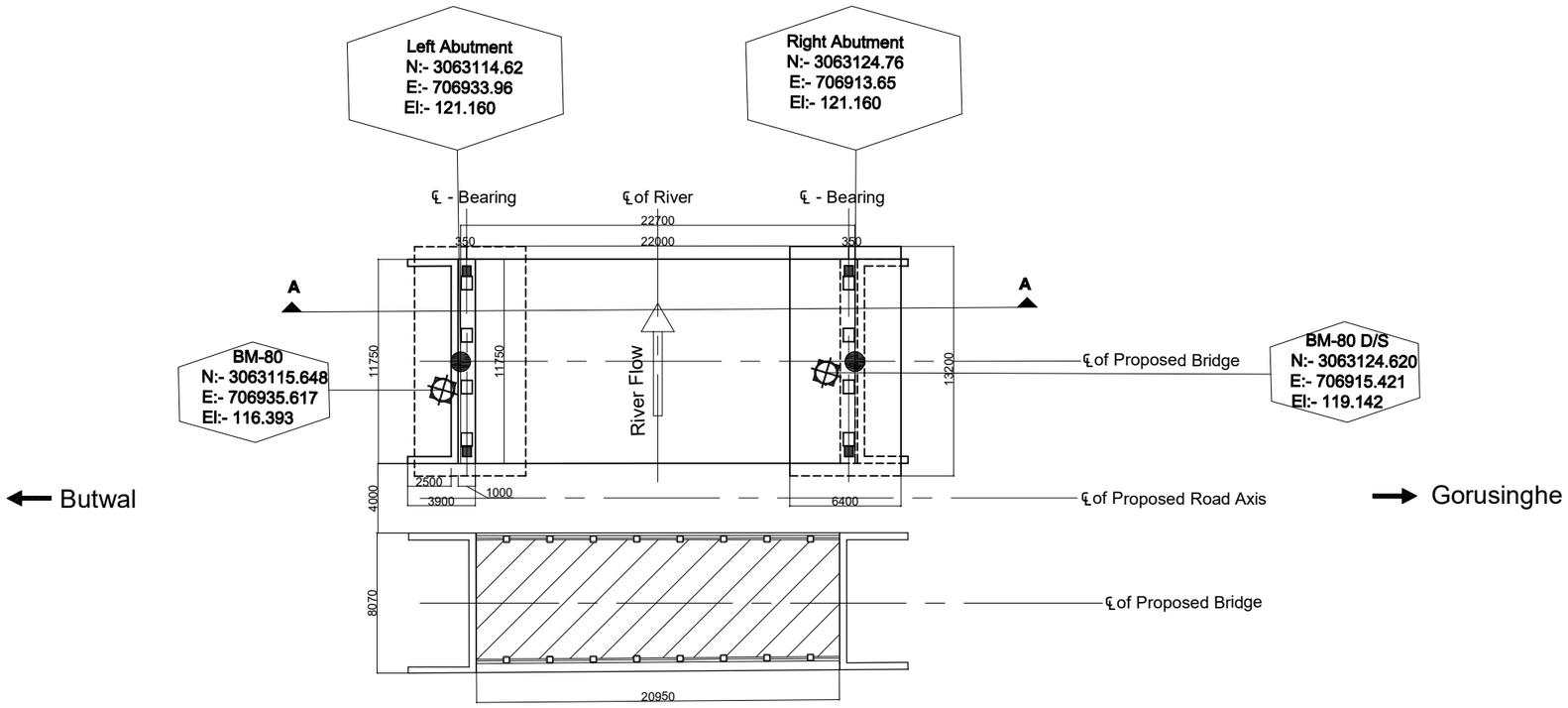
Ch:629+590
GL:121.723
DL:122.457

GL: 121.828 GL: 121.906
DL: 122.518 DL: 122.792

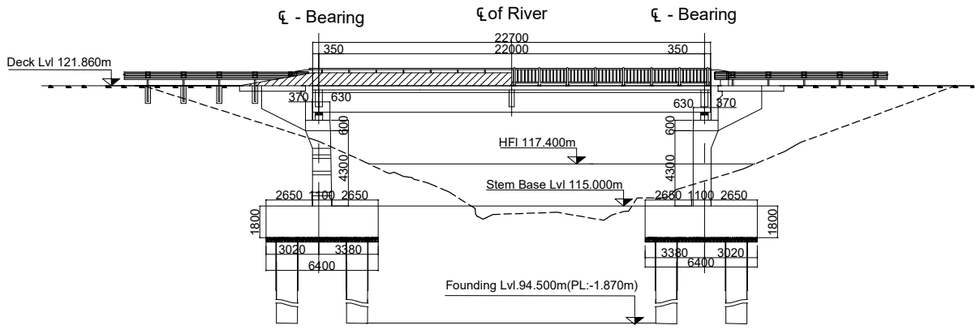


Cut - 2.735 m2
Fill - 8.298 m2

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 Engineeering	**IMPLEMENTING AGENCY:** **DOR, DCID** **ROAD NAME:** **East West Highway (H01)** **Butwal - Gorusinghe Section**	**SHEET TITLE:** Cross Section of Ch:629+450 - 629+590	**SCALE:** 0 2 4 6m Vertical Scale 0 10 20 30m Horizontal Scale		**NAME**	**SIGNATURE**	**REV NO.**	**DESCRIPTION**	**DATE:** November,2022 **DWG.NO.:** 311_Balhundra **SHEET NO.:** 19.2/21
					DESIGNED BY:	Saroj Bhattarai				
					CHECKED BY:	P. Upadhyaya				
					APPROVED BY:	Dr. T.H.Choi				

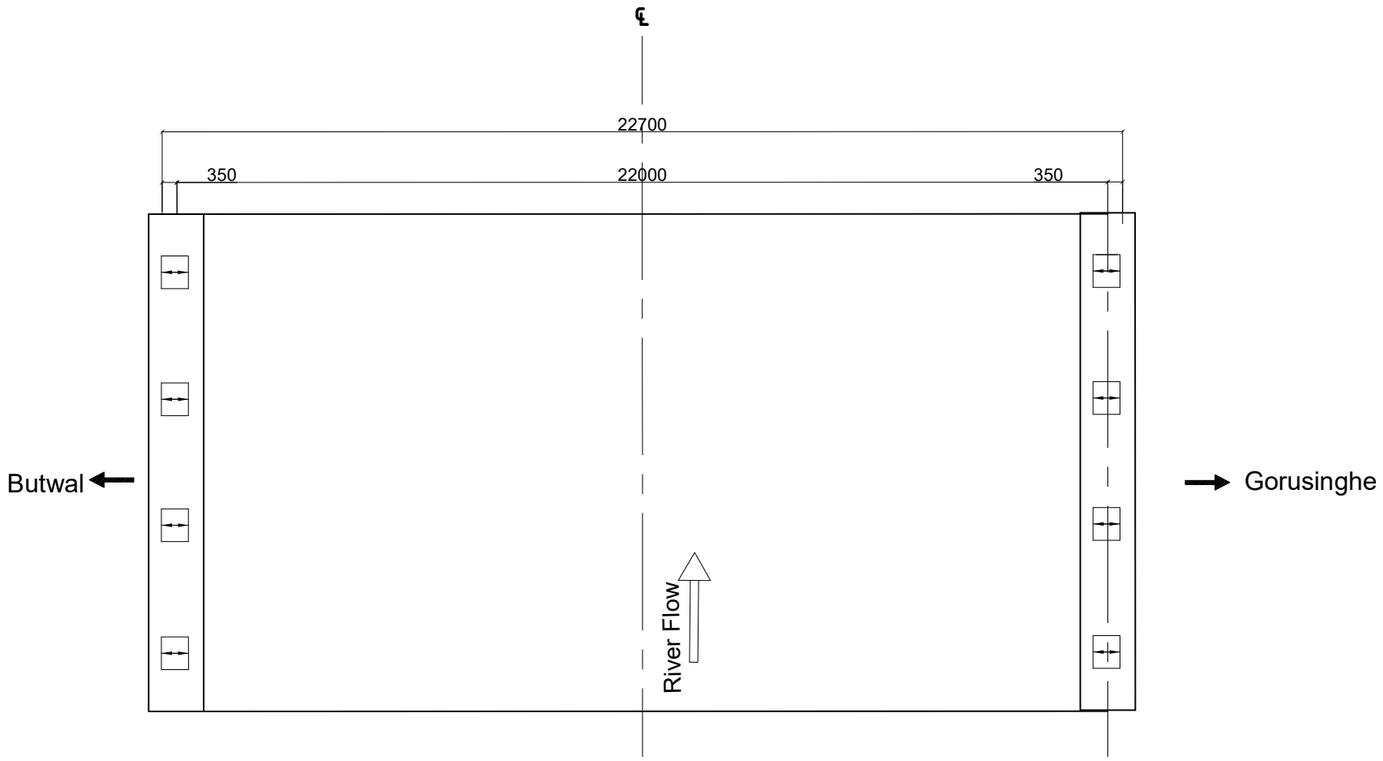


Layout Plan
Scale:-1:350



Section at A-A
Scale:-1:350

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) and TTE-Tech Studio of Engineeering Nepal	**IMPLEMENTING AGENCY:** **DOR, DCID** **ROAD NAME:** **East West Highway (H01)** **Butwal - Gorusinghe Section**	**SHEET TITLE:** Layout Plan of **Balhudra Bridge** (47/H001/311_A)	**SCALE:** As Shown		**NAME**	**SIGNATURE**	**REV NO.**	**DESCRIPTION**	**DATE:** November,2022 **DWG.NO.:** 311_Balhundra **SHEET NO.:** 20/21
					Designed by:	Saroj Bhattarai				
					Checked by:	P. Upadhyaya				
					Approved by:	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.
Restrainde 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:** Soosung Engineering Co. Ltd, Korea in association with ERMC P (Ltd) and TPE-Tech Studio of Engineeering Nepal	**IMPLEMENTING AGENCY:** **DOR, DCID** **ROAD NAME:** **East West Highway (H01)** **Butwal - Gorusinghe Section**	**SHEET TITLE:** Layout Plan of **Balhudra Bridge** (47/H001/311_A)	**SCALE:** As Shown		**NAME**	**SIGNATURE**	**REV NO.**	**DESCRIPTION**	**DATE:** November,2022 **DWG.NO.:** 311_Balhundra **SHEET NO.:** 21/21
					Designed by:					
					Checked by:					
					Approved by:					

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

Herkur Bridge(47-H001-312_A)

St. Ch : 631+586.65 ~ End Ch :631+609.35

Detailed Drawing

Butwal - Gorusinghe Sector

November,2022

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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 1.95x10^5 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.

Stages and sequence of Prestressing

- The Precast composite girders shall be prestressed in two stages. 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 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
Prestressing of Girder (Stage 2)	After 14 days of casting of deck slab
Casting of Footpath, Crash Barrier, Wearing Course etc	Preferably within 7 days but not later than 14 days of Second stage prestressing

Deviation from the above time-line is subject to approval by the engineer. No other vehicle except the concreting apparatus are allowed on the deck until the deck slab has attained its full specified strength.

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 period.

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.

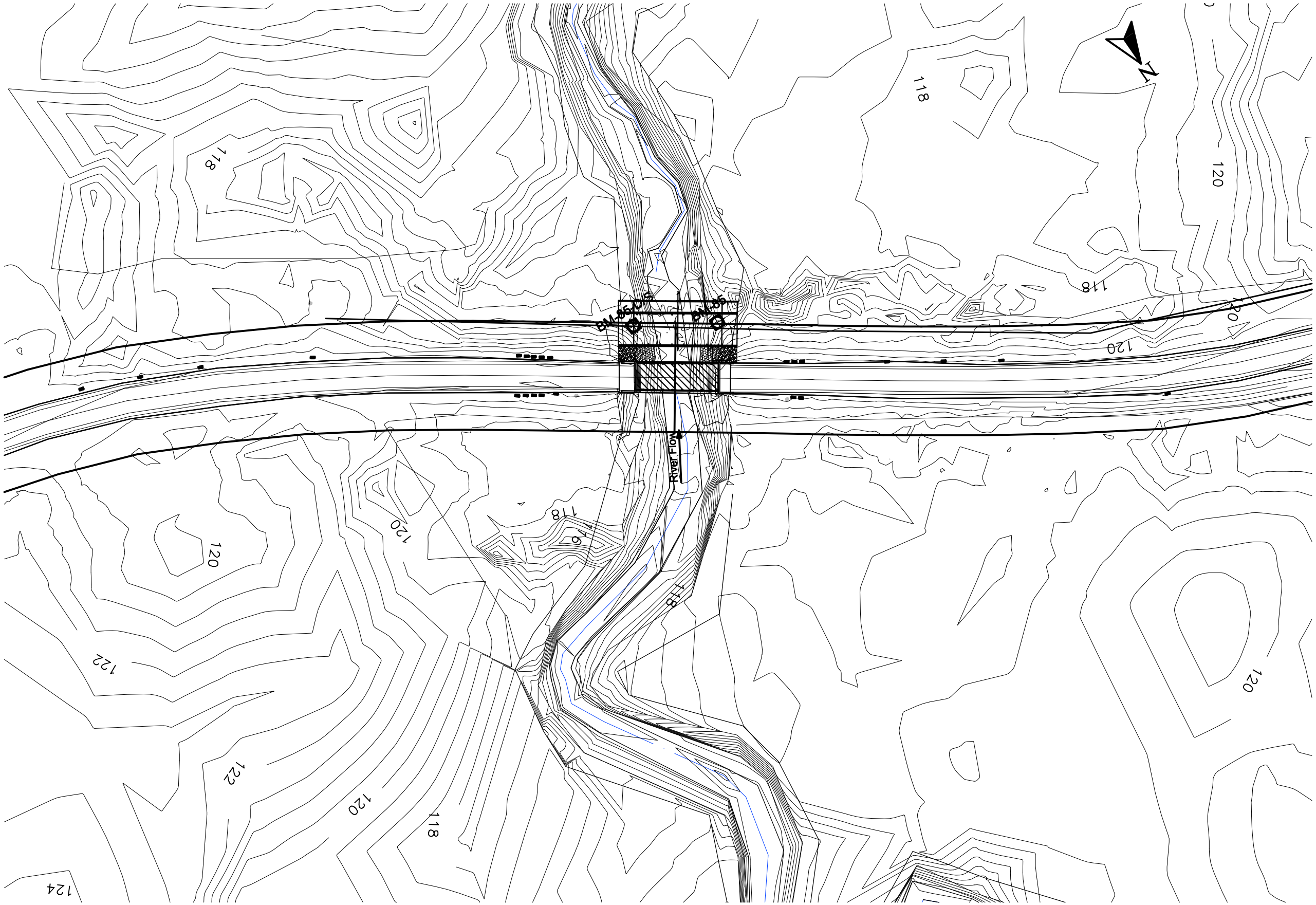
Notes on Foundation and Substructure

- 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 be commenced 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.

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 TTE-Tech Studio of Engineeering	**IMPLEMENTING AGENCY:** **DOR, DCID** **ROAD NAME:** **East West Highway (H01)** **Butwal - Gorusinghe Section**	**SHEET TITLE:** General Notes of Herkur Bridge (47/H001/312_A)	**SCALE:** As Shown		**NAME**	**SIGNATURE**	**REV NO.**	**DESCRIPTION**	**DATE:** November,2022
					DESIGNED BY:	Saroj Bhattarai				**DWG.NO.:** 312_Herkur
					CHECKED BY:	P. Upadhyaya				
					APPROVED BY:	Dr. T.H.Choi				**SHEET NO.:** 2/21



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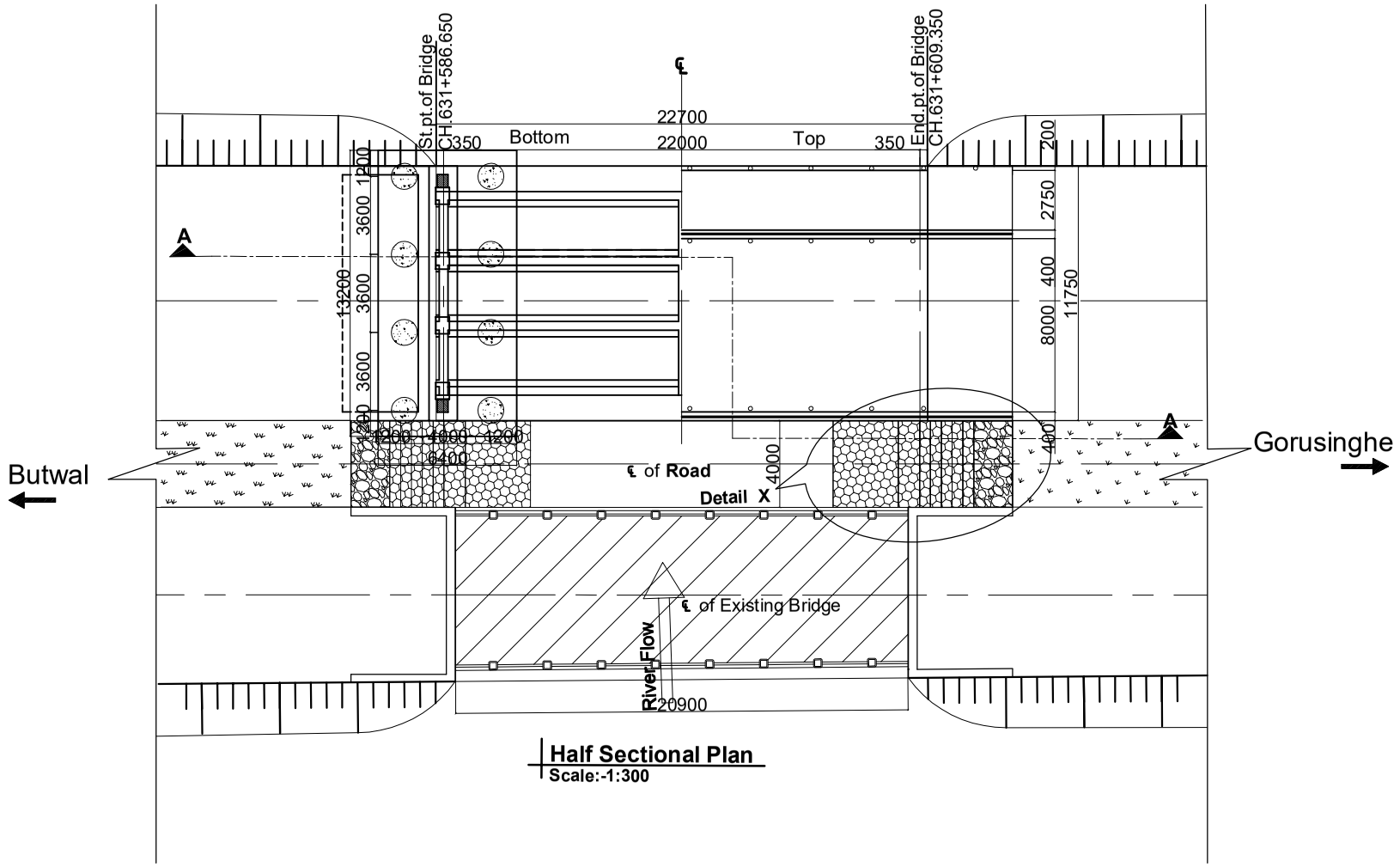
					Designed by:	Saroj Bhattarai				
					Checked by:	P. Upadhyaya				
					Approved by:	Dr. T.H.Choi				



Half Sectional Plan
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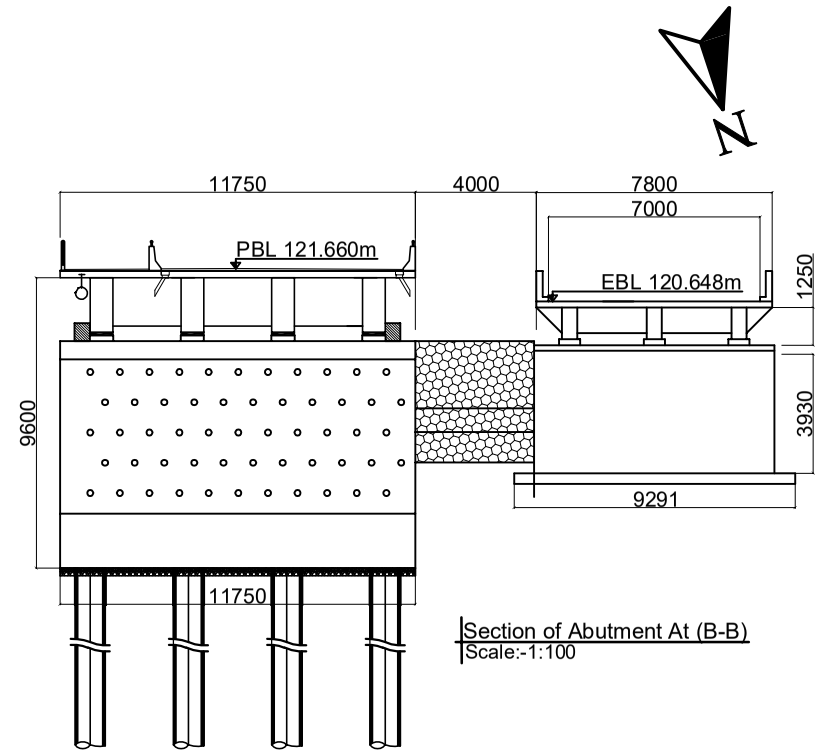
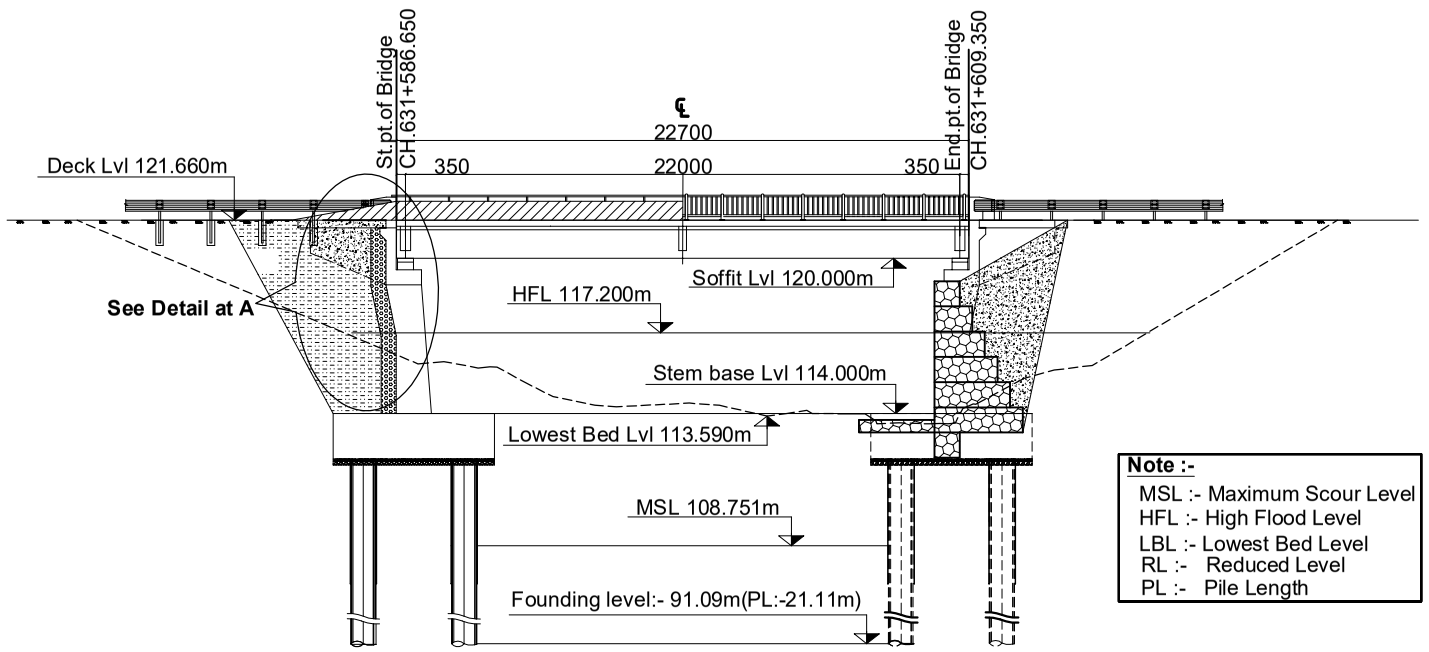


Section of Abutment At (B-B)
Scale:-1:100

Notes:-
PBL=Proposed Bridge Level
EBL =Existing Bridge Level
MSL =Maximum Scour Level

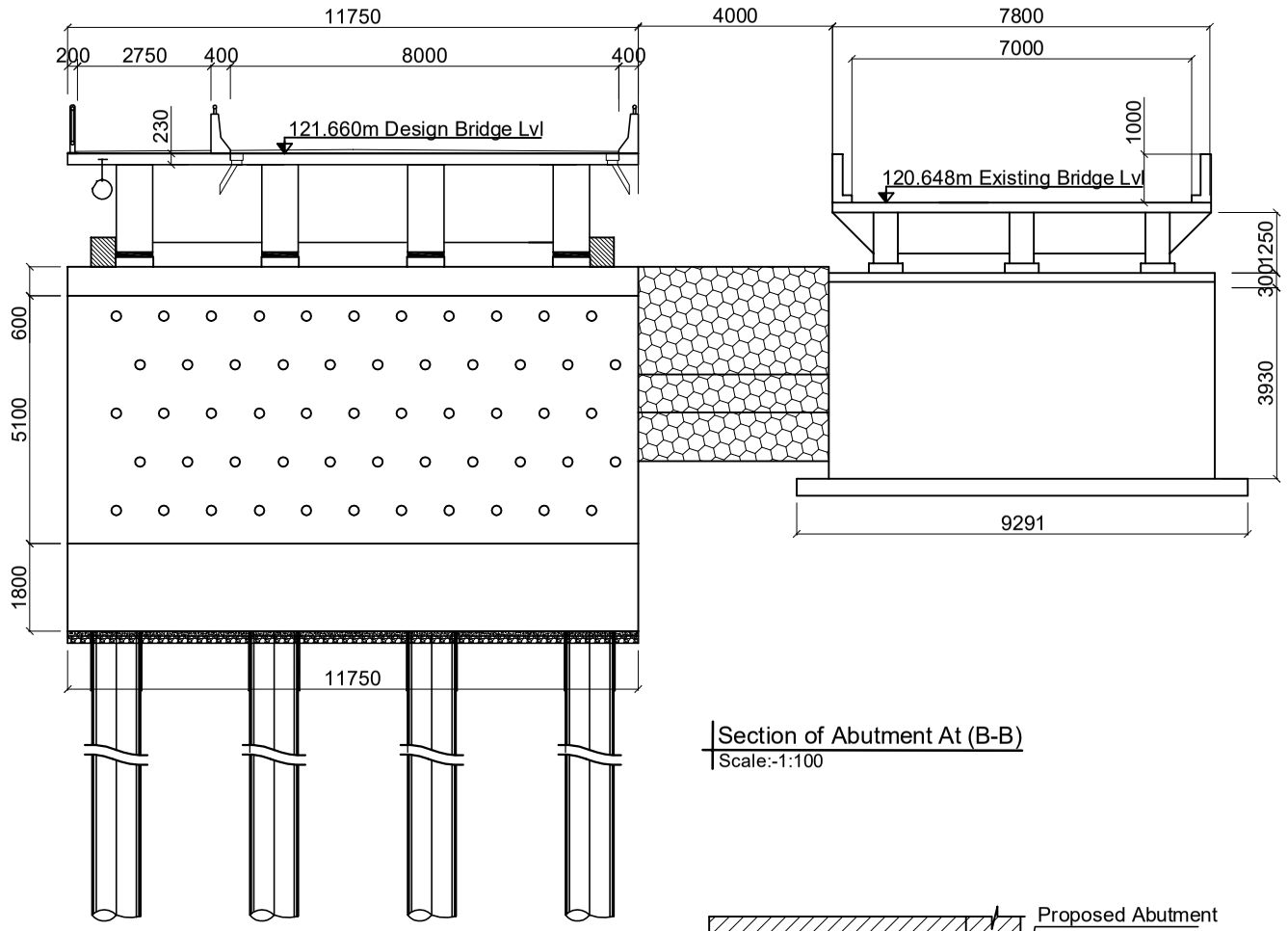


Half Sectional Elevation
Scale:-1:300

Note :-
MSL :- Maximum Scour Level
HFL :- High Flood Level
LBL :- Lowest Bed Level
RL :- Reduced 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:** Soosung Engineering Co. Ltd, Korea in association with ERMC P (Ltd) and TTE-Tech Studio of Engineeering Nepal	**IMPLEMENTING AGENCY:** **DOR, DCID** **ROAD NAME:** **East West Highway (H01)** **Butwal - Gorusinghe Section**	**SHEET TITLE:** General Arrangement of **Herkur Bridge** (47/H001/312_A)	**SCALE:** 1:300		**NAME**	**SIGNATURE**	**REV NO.**	**DESCRIPTION**	**DATE:** November,2022 **DWG.NO.:** 312_Herkur **SHEET NO.:** 03/21
					Designed by:	Saroj Bhattarai				
					Checked by:	P. Upadhyaya				
					Approved by:	Dr. T.H.Choi				



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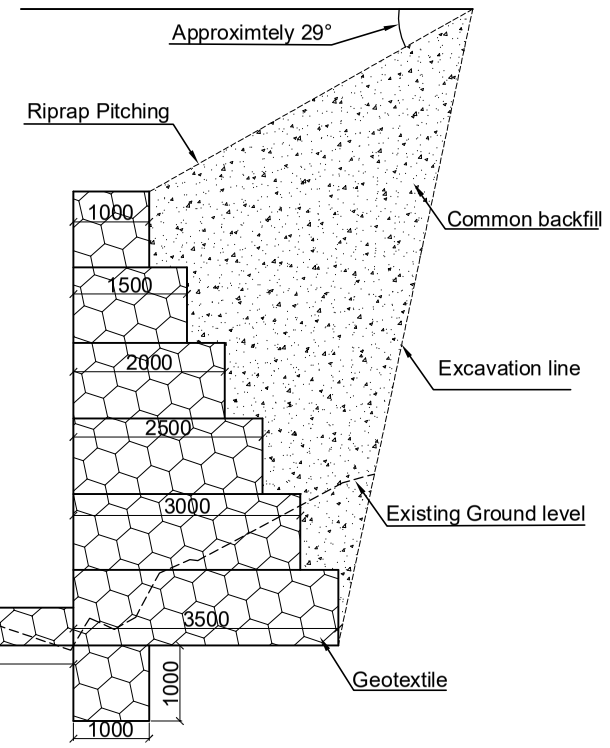

Section at X-X
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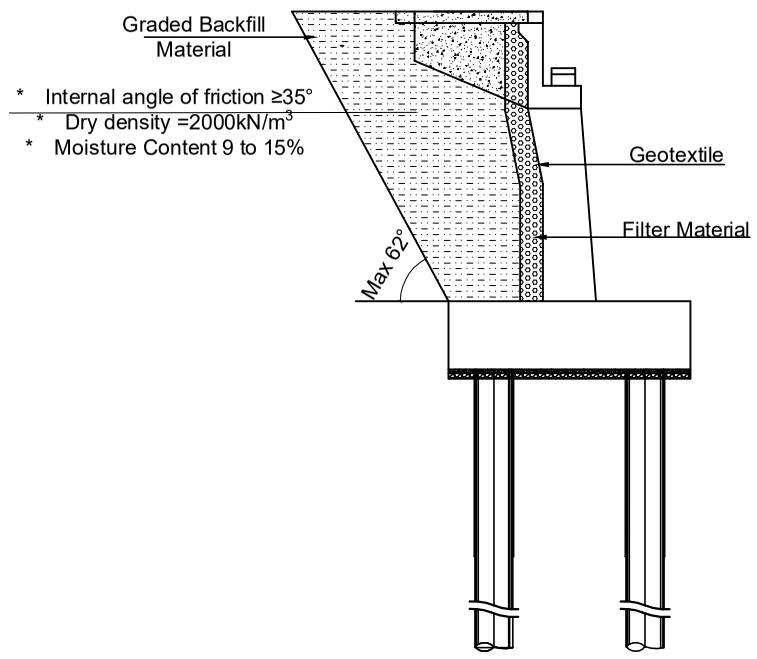

Detail of A
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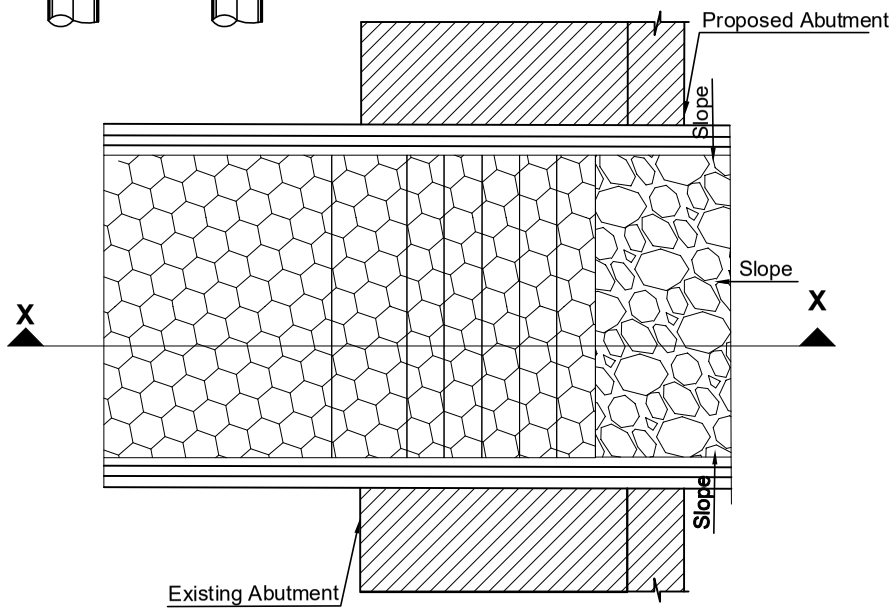

Detail Plan of X
(Transition Between Approach Embankments)
Scale:-1:100

	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
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SASEC Highway Improvement Project-
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ADB Loan No: 3722-NEP

CONSULTANT:
Soosung Engineering Co. Ltd, Korea
in association with
ERMC P (Ltd)
and
TTE-Tech Studio of Engineeering Nepal

IMPLEMENTING AGENCY:
DOR, DCID

ROAD NAME:
East West Highway (H01)

Butwal - Gorusinghe Section

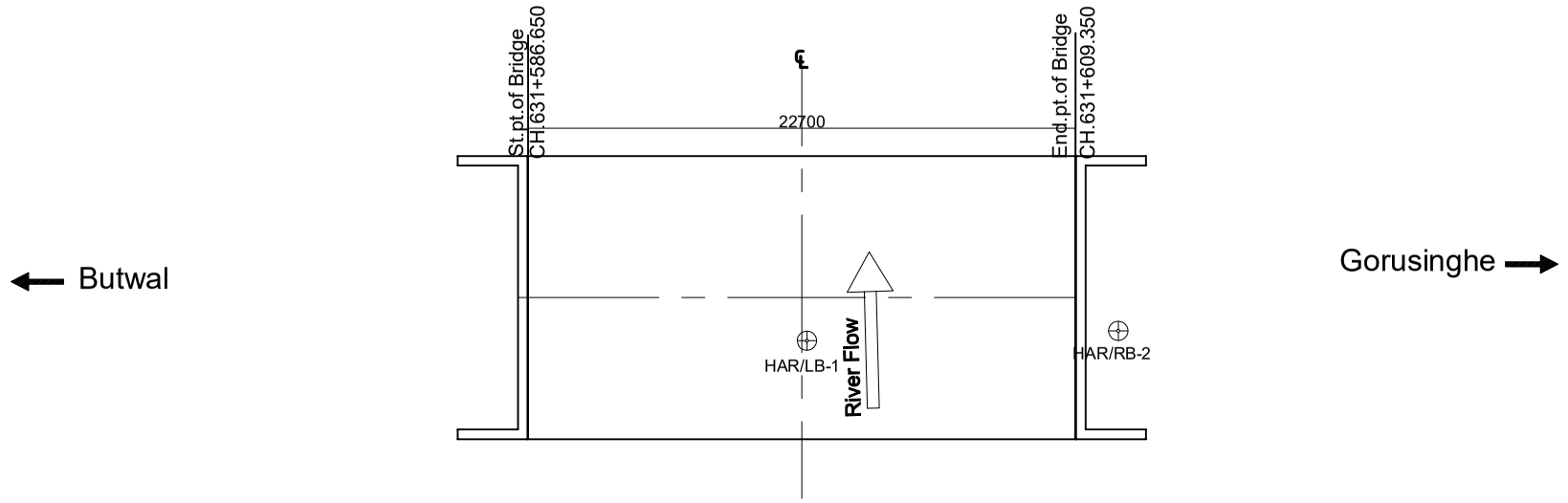
SHEET TITLE:
General Arrangement of **Herkur Bridge** (47/H001/312_A)

SCALE:
As Shown

	NAME	SIGNATURE	REV NO.	DESCRIPTION
Designed by:	Saroj Bhattarai			
Checked by:	P. Upadhyaya			
Approved by:	Dr. T.H.Choi			

DATE: November,2022
DWG.NO.: 312_Herkur
SHEET NO.: 04/21

Borehole No : HAR/LB-1
Easting : 83° 4' 38.17 " Northing : 27° 40' 22.8" Elevation, m : 114.412
Borehole No : HAR/RB-2
Easting : 83° 04' 38.01" Northing : 27° 40' 35.23" Elevation, m : 115.848

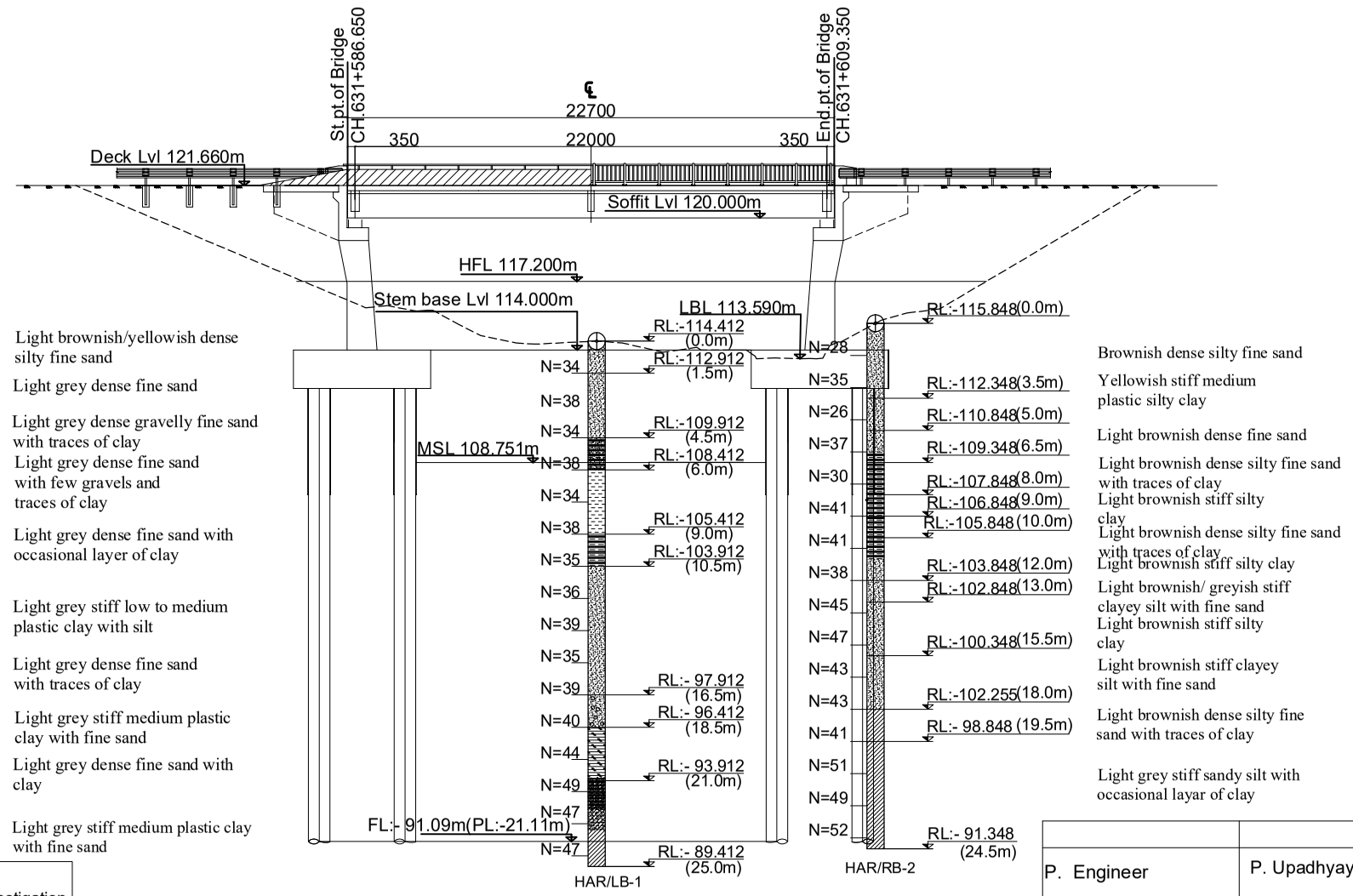


Notes:-

HFL= High Flood Level
MSL =Maximum Scour Level
RL =Reduced Level
LBL = Lowest Level

Note :-

MSL :- Maximum Scour Level
HFL :- High Flood Level
LBL :- Lowest Bed Level
RL :- Reduced Level
PL :- Pile Length



Bore Log Detail
Scale:-1:250

NOTE ON SUB-SOIL PROFILE
The sub-soil profile shown here is based on information obtained from the investigation bore-holes at the locations as shown.The actual soil type away from the vicinity of the boreholes may differ .

Location	Design Pile Length m	Design Working load on pile (non - seismic casse)kn	Allowable Bearing Capacity on pile (Scour case) kn	Allowable Bearing Capacity of the Pile (Non Scour case)kn
Abutment	21.11	1763	2711	4330
Pier	0	0	0	0

	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)	
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ADB Loan No: 3722-NEP

CONSULTANT:
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in association with
ERMC P (Ltd)
and
TSE-Tech Studio of Engineeering
Nepal

IMPLEMENTING AGENCY:
DOR, DCID

ROAD NAME:
East West Highway (H01)

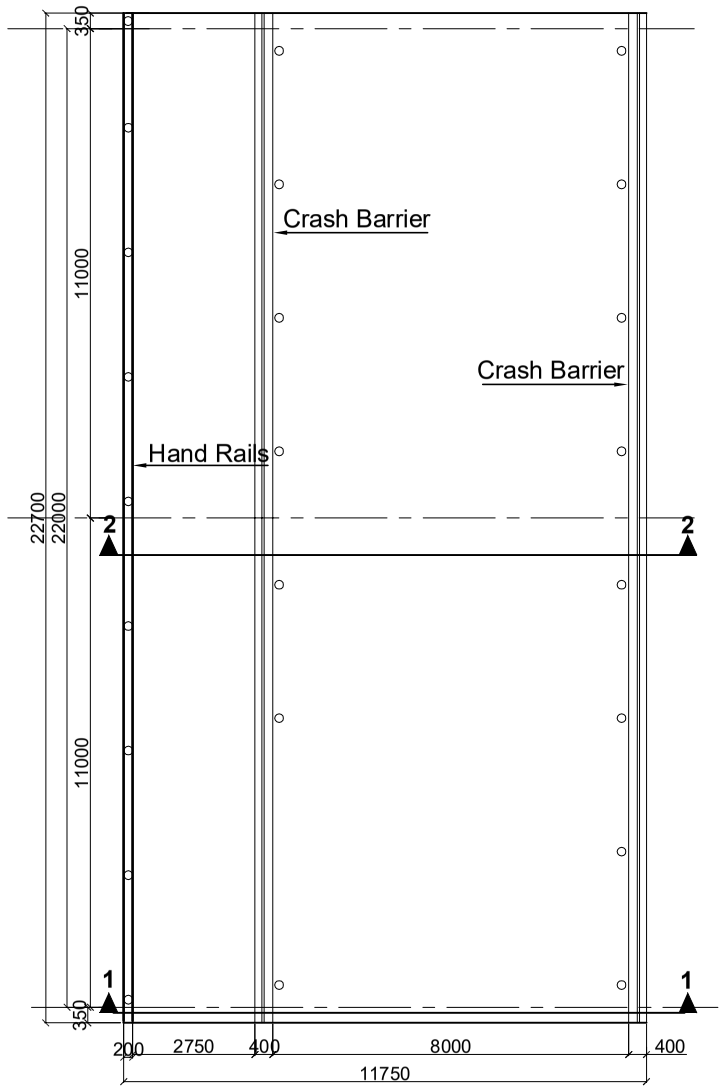
Butwal - Gorusinghe Section

SHEET TITLE:
Bore Log
of
Herkur Bridge
(47/H001/312_A)

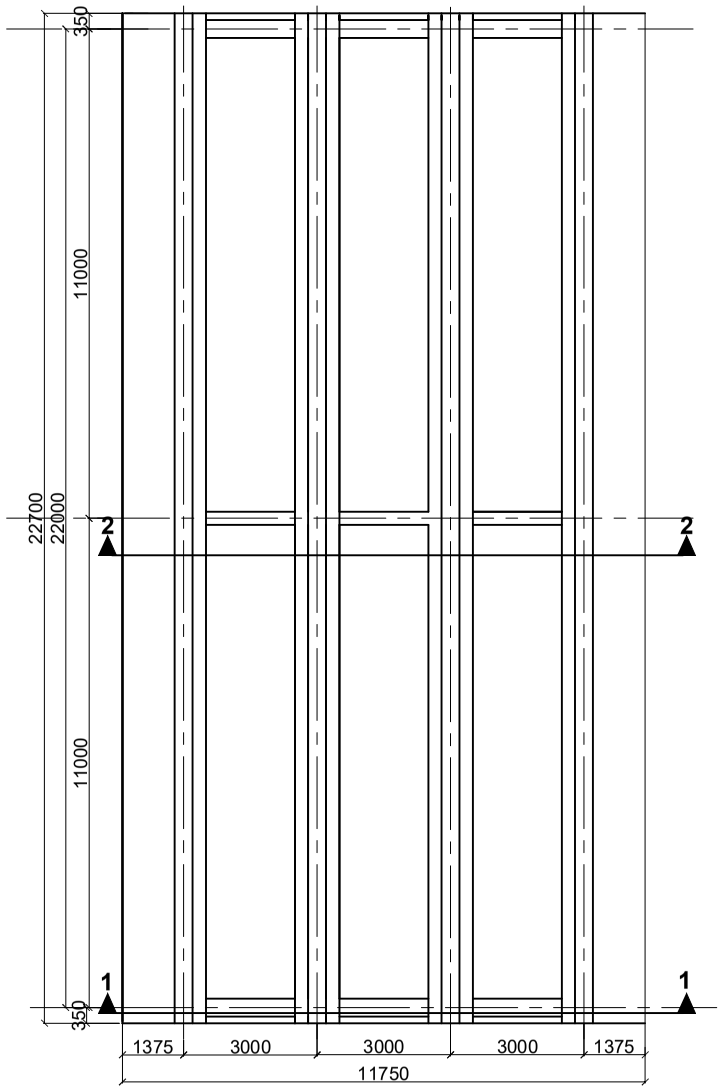
SCALE:
1:250

	NAME	SIGNATURE	REV NO.	DESCRIPTION
Designed by:	Saroj Bhattarai			
Checked by:	P. Upadhyaya			
Approved by:	Dr. T.H.Choi			

DATE: November,2022
DWG.NO.: 312_Herkur
SHEET NO.: 05/21



Plan Of Deck
Scale:-1:150



Plan Of Girder
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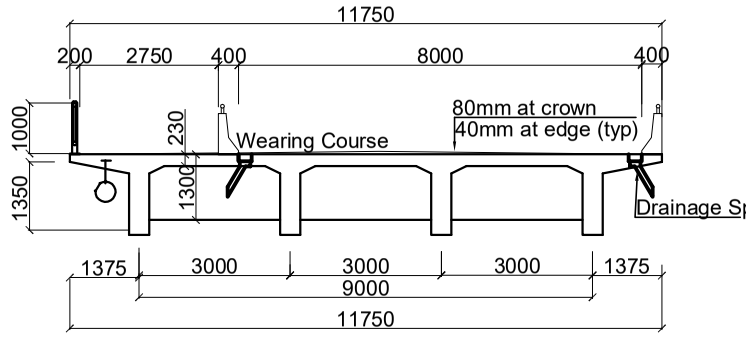

Section at 1-1
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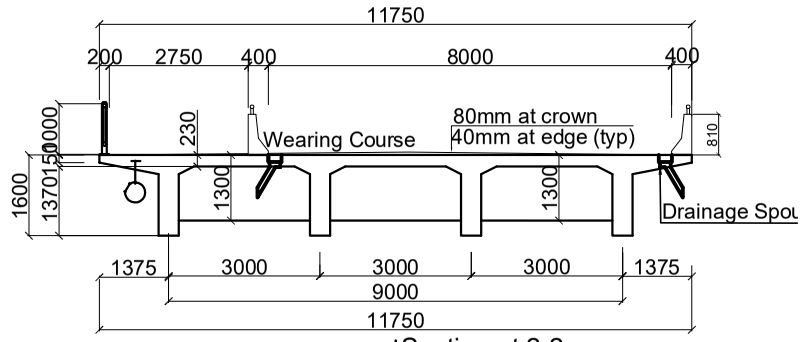

Section at 2-2
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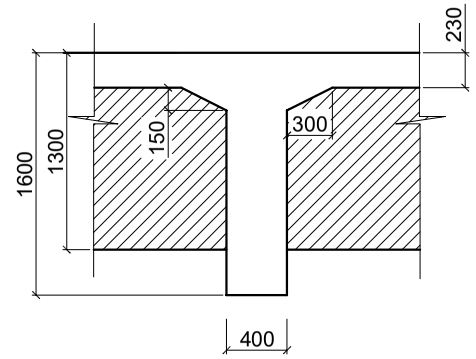
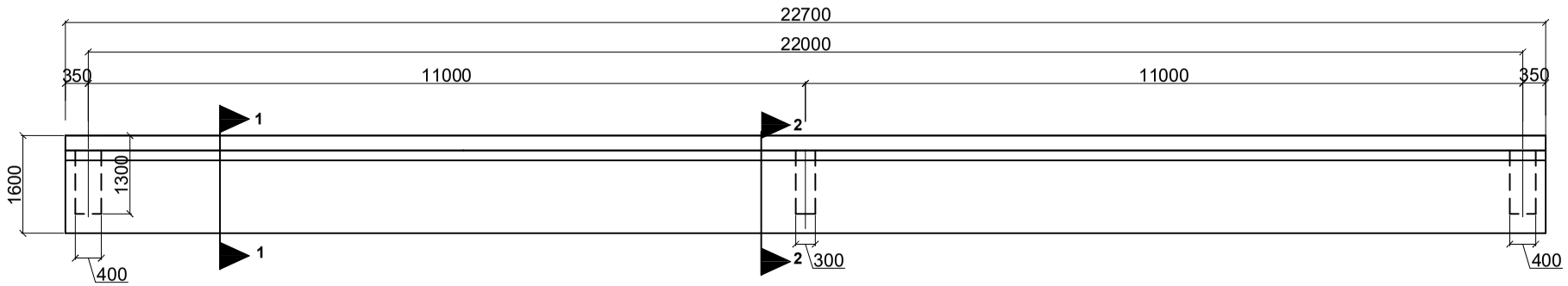


Section 1-1 Main Girder
Scale:-1:50



Longitudinal Sectional Elevation
Scale:-1:100

NOTES:
Dowel bars similar to the longitudional bars of the cross section girders shall be placed in the precast main girder before casting. The longitudional bars of the cross girder shall be lapped to the dowel bers, which shall have a lap length of 60 dia. of the corresponding bars.

NOTES:
To lift the deck for maintenance, the jacks shall be placed under the positions marked "J".

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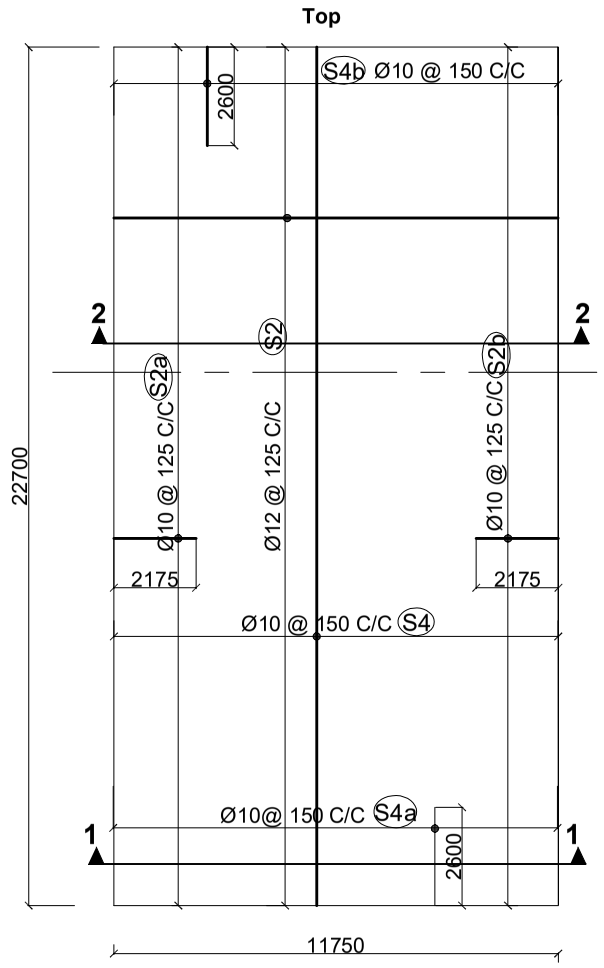
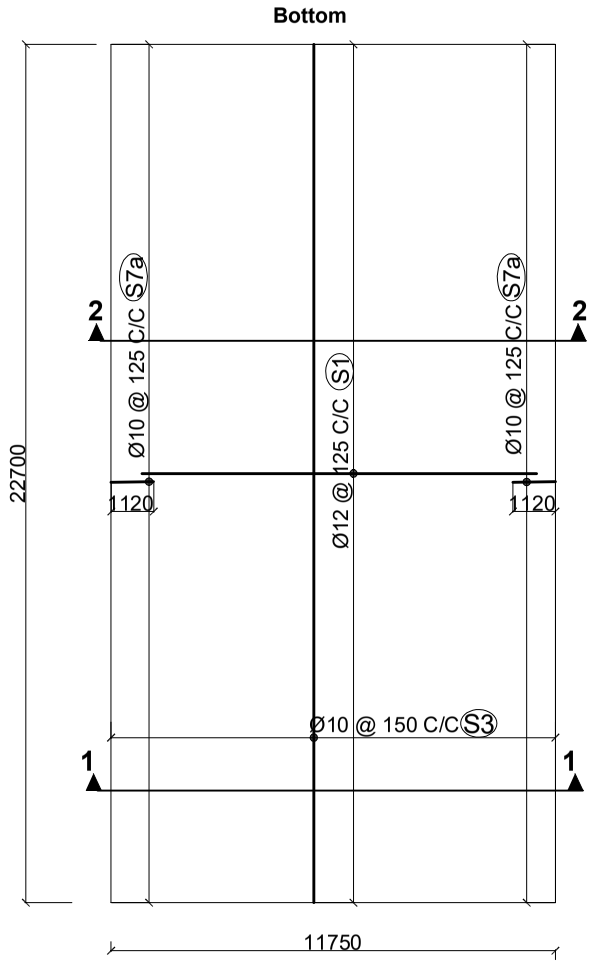
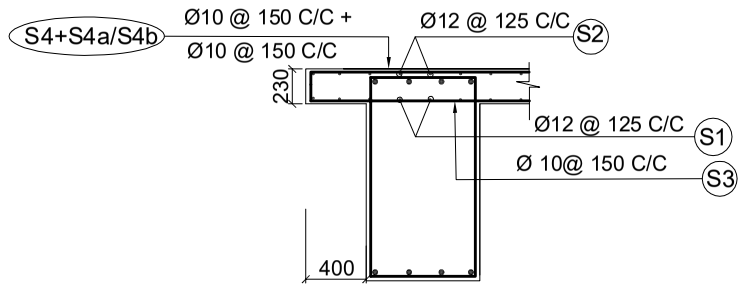
					DESIGNED BY:	Saroj Bhattarai				**DWG.NO.:** 312_Herkur
					CHECKED BY:	P. Upadhyaya				
					APPROVED BY:	Dr. T.H.Choi				**SHEET NO.:** 6/21



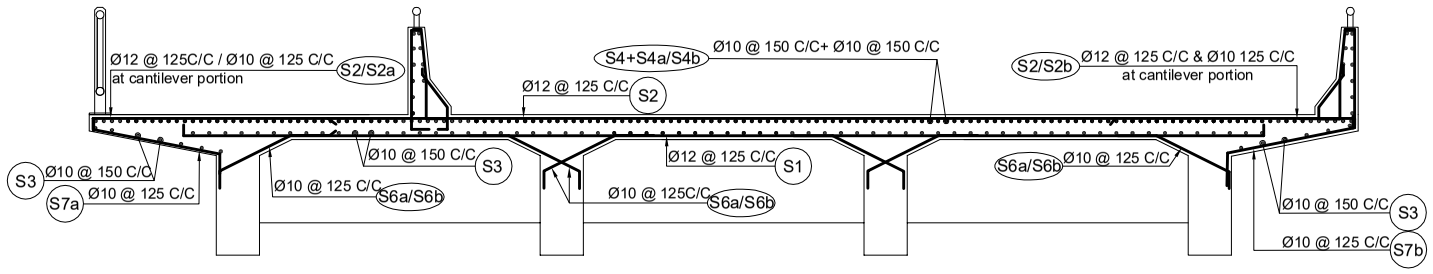
Reinforcement Details Of Deck Slab(Top Face)
Scale:-1:200



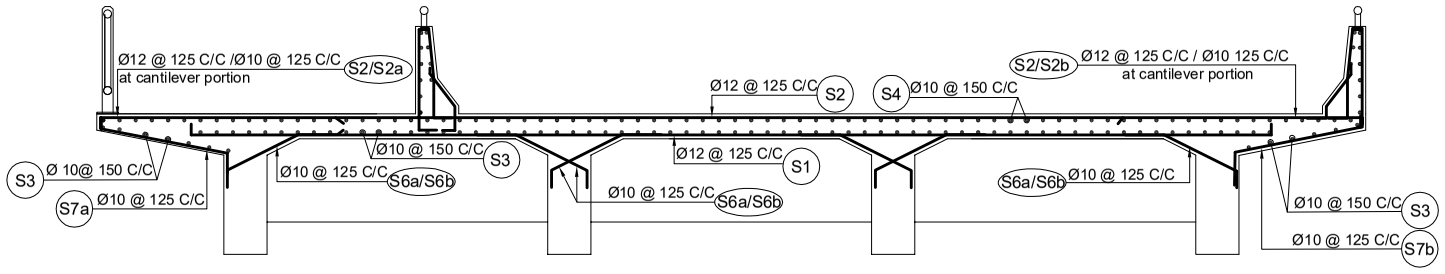
Reinforcement Details Of Deck Slab(Bottom Face)
Scale:-1:200



Reinforcement Details At Deck Extension
Between The Main Girder



Section at 1-1
Scale:-1:50



Section at 2-2
Scale:-1:50

NOTES:

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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