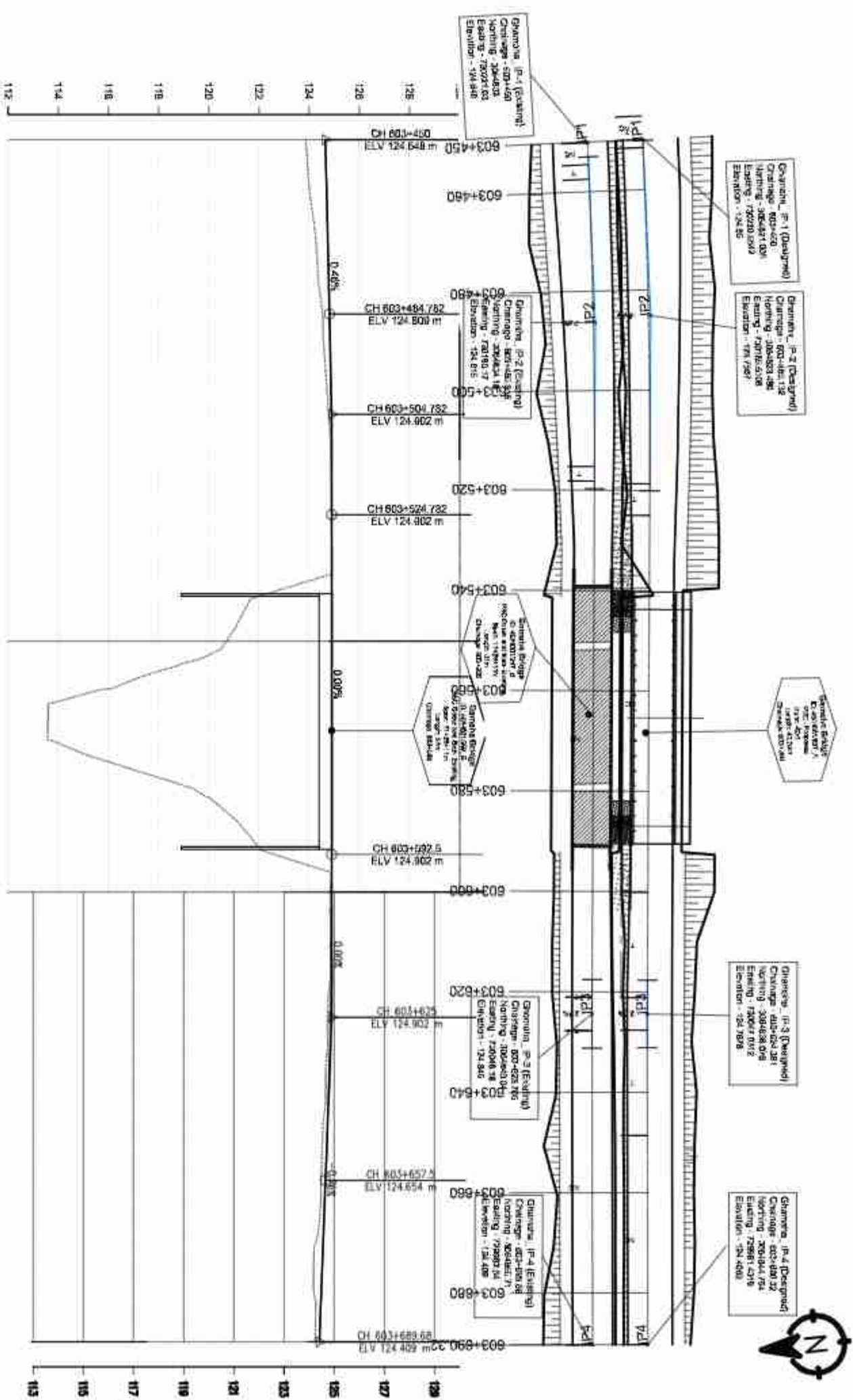
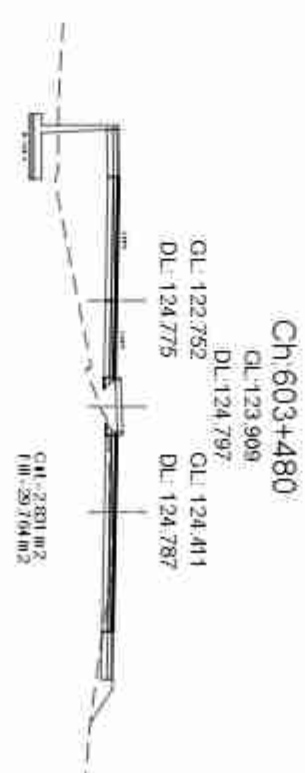
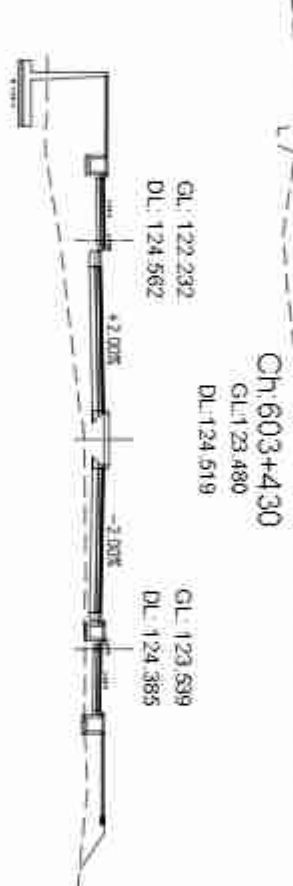
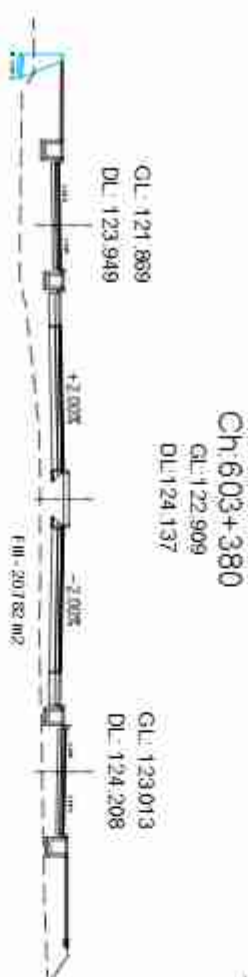
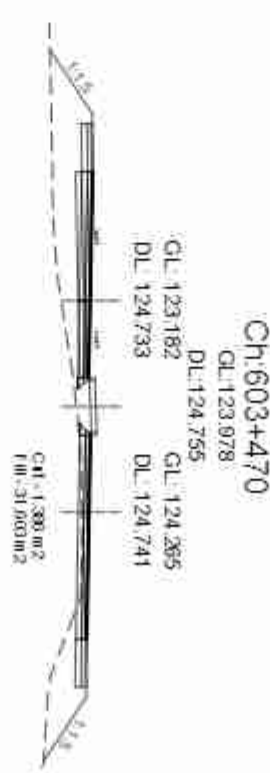
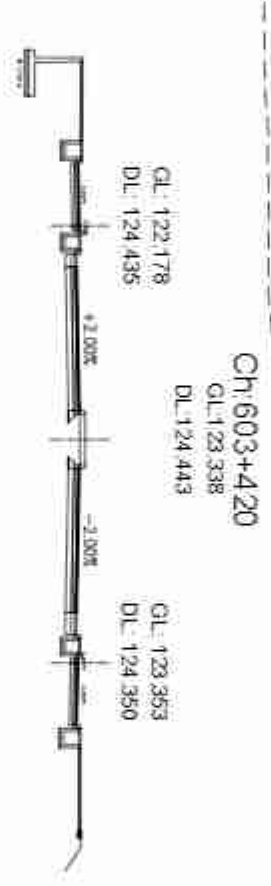
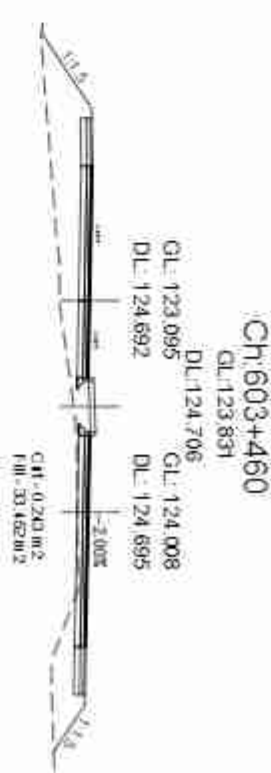
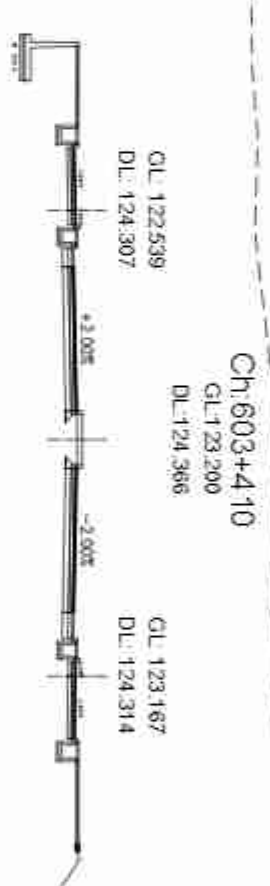
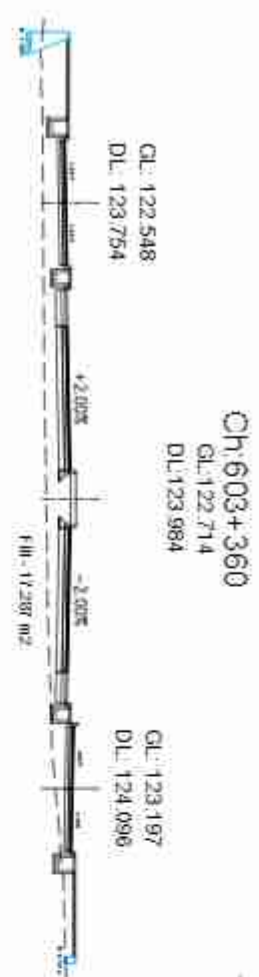
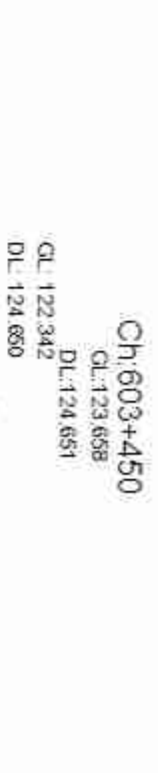
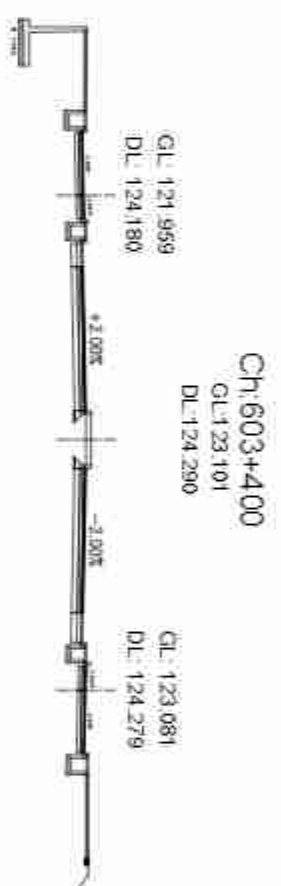
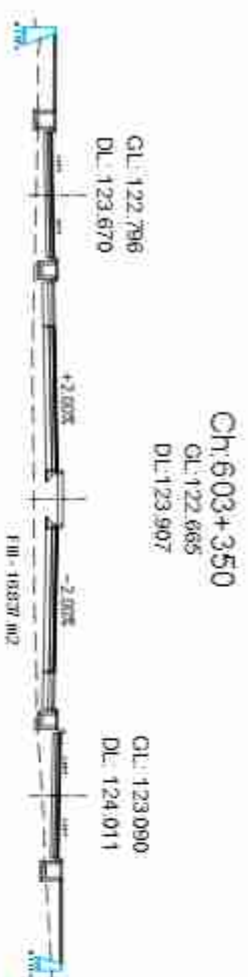




DESIGN LEVEL(m)	EXISTING LEVEL(m)	HORIZONTAL ALIGNMENT	
		RIGHT	LEFT
124.646	123.866	R=1400.00	
124.699	124.010		
124.741	124.267	R=1400.00	
124.787	124.416		
124.832	124.571	R=1400.00	
124.866	124.713		
124.889	124.806	R=1400.00	
124.901	124.883		
124.902	124.899	R=1400.00	
124.902	122.670		
124.902	120.887	R=1400.00	
124.902	119.432		
124.902	113.843	R=1400.00	
124.902	119.559		
124.902	121.805	R=1400.00	
124.899	124.830		
124.884	124.843	R=1400.00	
124.858	124.783		
124.820	124.735	R=1400.00	
124.770	124.659		
124.708	124.530	R=1400.00	
124.635	124.471		
124.559	124.251	R=1400.00	
124.483	124.202		
124.409	124.237	R=1400.00	
		R=1400.00	

Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP		CONSULTANT: Soosung Engineering Co., Ltd. Korea in association with ERM P (Ltd), Nepal and TSE-Tech Studio of Engineering		IMPLEMENTING AGENCY: DOR, DCID ROAD NAME: East West Highway (H01)		SHEET TITLE: Plan & Profile OF Ghana Existing Bridge 603+450 - 603+650		SCALE: Vertical Scale Horizontal Scale		DESIGNED BY: S.B. Shrestha		NAME		SIGNATURE		REV NO.		DESCRIPTION		DATE: November, 2022	
												CHECKED BY: P. Upadhyay								DWG. NO.: 297_Ghana	
												APPROVED BY: Dr. T.H. Chel								SHEET NO.: 24/28	



Ch:603+390
GL:123.015
DL:124.213

GL:123.040
DL:124.243



Ch:603+440
GL:123.620
DL:124.588

GL:123.656
DL:124.421

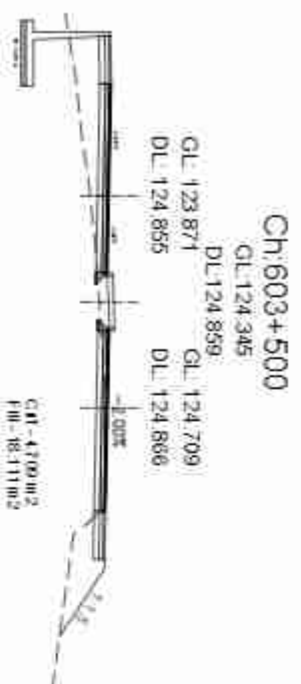


Ch:603+490
GL:123.807
DL:124.832

GL:122.513
DL:124.832



Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHP-PPC) ADB Loan No: 3722-NEP	CONSULTANT: Soosung Engineering Co. Ltd., Korea in association with ERM Co. P (Ltd), Nepal and TSE Tech Studio of Engineering	IMPLEMENTING AGENCY:		SHEET TITLE:		SCALE:		DESIGNED BY:		NAME		SIGNATURE		REVNO		DESCRIPTION		DATE:	
		DOR, DCID		Cross Section of Ch:603+350 - 603+490		Vertical 0 2 4 Horizontal 0 10 20 30m		CHECKED BY:		S.B. Shrestha								November, 2022	
		ROAD NAME: East West Highway (H01)								P. Upadhyaya		D: T.H.Chaudhary						DWG. NO.: 207/Ghamsaha	



Ch:603+510

GL:124.027
DL:124.880

GL:122.172
DL:124.884

GL:124.852
DL:124.889

GL:124.000 m2
FM:31.039 m2



Ch:603+520

GL:123.687
DL:124.894

GL:120.374
DL:124.902

GL:124.883
DL:124.901

GL:124.000 m2
FM:46.420 m2



Ch:603+530

GL:123.639
DL:124.901

GL:121.386
DL:124.910

GL:124.888
DL:124.902

GL:124.000 m2
FM:42.369 m2



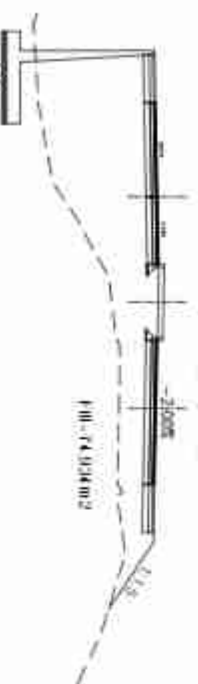
Ch:603+540

GL:122.530
DL:124.902

GL:119.860
DL:124.910

GL:122.906
DL:124.902

GL:124.000 m2
FM:14.924 m2



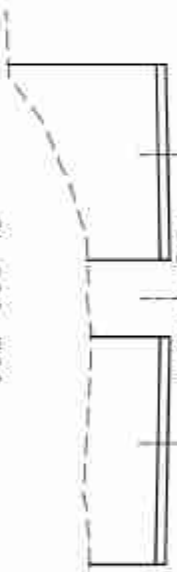
Ch:603+550

GL:120.670
DL:124.902

GL:119.918
DL:124.910

GL:120.745
DL:124.902

GL:124.000 m2
FM:0.5 m



Ch:603+560

GL:115.855
DL:124.902

GL:116.307
DL:124.910

GL:115.768
DL:124.902

GL:124.000 m2
FM:0.5 m



Ch:603+570

GL:113.564
DL:124.902

GL:113.617
DL:124.910

GL:113.568
DL:124.902

GL:124.000 m2
FM:0.5 m



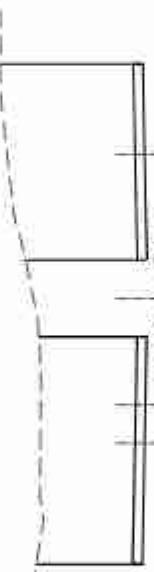
Ch:603+580

GL:119.073
DL:124.902

GL:117.934
DL:124.910

GL:119.454
DL:124.902

GL:124.000 m2
FM:0.5 m



Ch:603+590

GL:121.179
DL:124.902

GL:120.179
DL:124.910

GL:121.747
DL:124.902

GL:124.000 m2
FM:40.375 m2



Ch:603+600

GL:124.047
DL:124.901

GL:122.543
DL:124.910

GL:124.832
DL:124.899

GL:124.000 m2
FM:27.060 m2



Ch:603+610

GL:124.629
DL:124.889

GL:123.912
DL:124.897

GL:124.846
DL:124.884

GL:124.000 m2
FM:8.560 m2



Ch:603+620

GL:124.484
DL:124.866

GL:123.972
DL:124.868

GL:124.792
DL:124.858

GL:124.000 m2
FM:8.895 m2



Ch:603+630

GL:124.618
DL:124.831

GL:124.393
DL:124.821

GL:124.734
DL:124.820

GL:124.000 m2
FM:3.860 m2



Ch:603+640

GL:124.431
DL:124.784

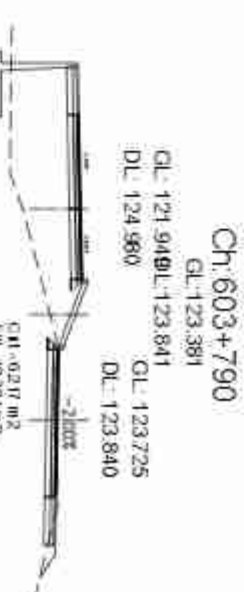
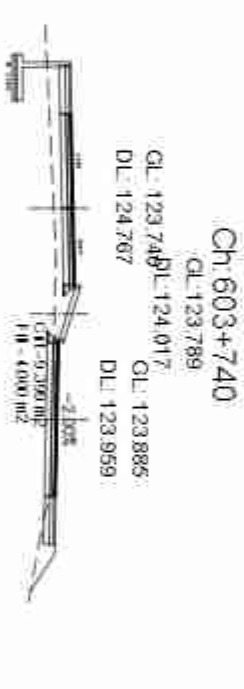
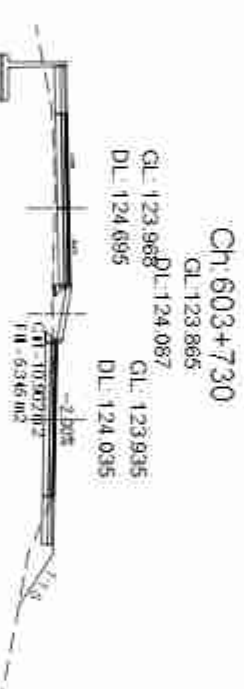
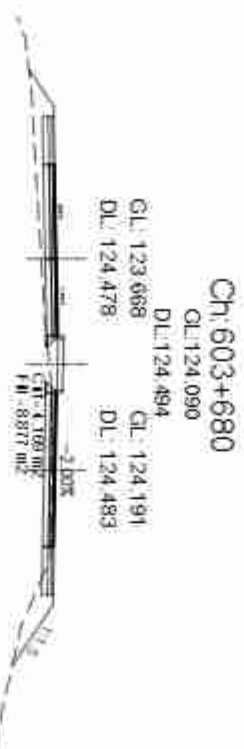
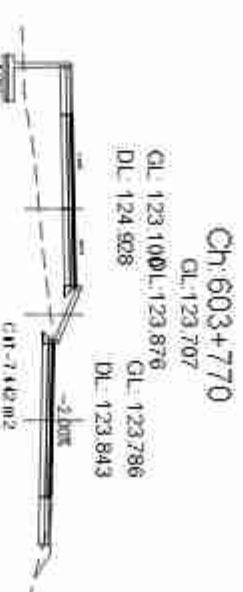
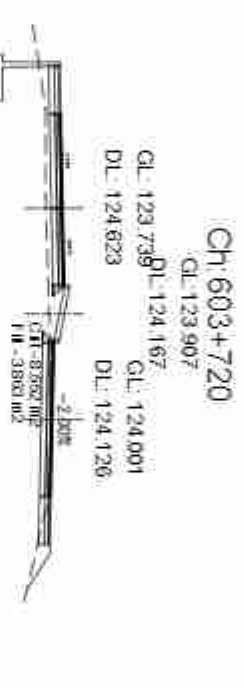
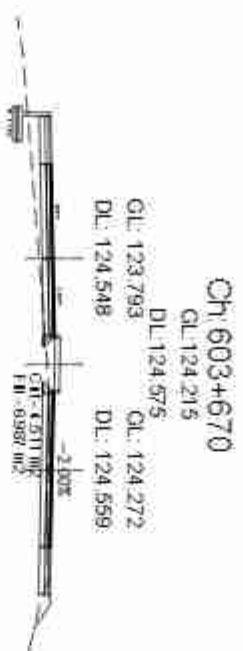
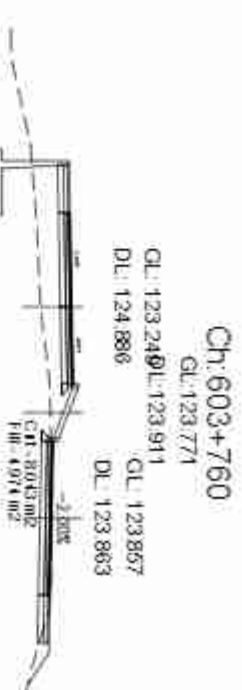
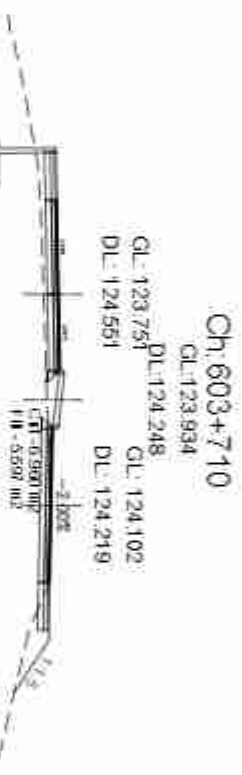
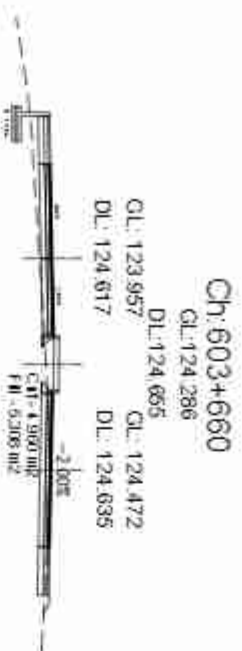
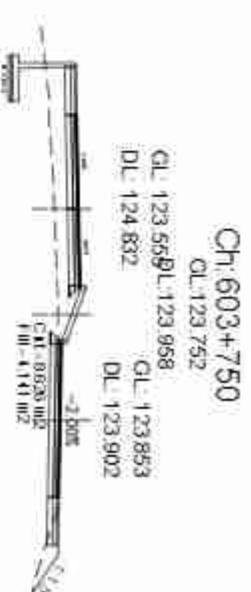
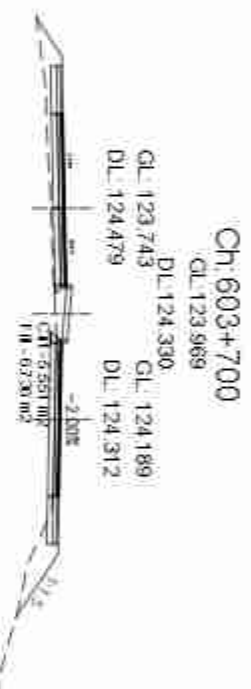
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DL:124.757

GL:124.659
DL:124.770

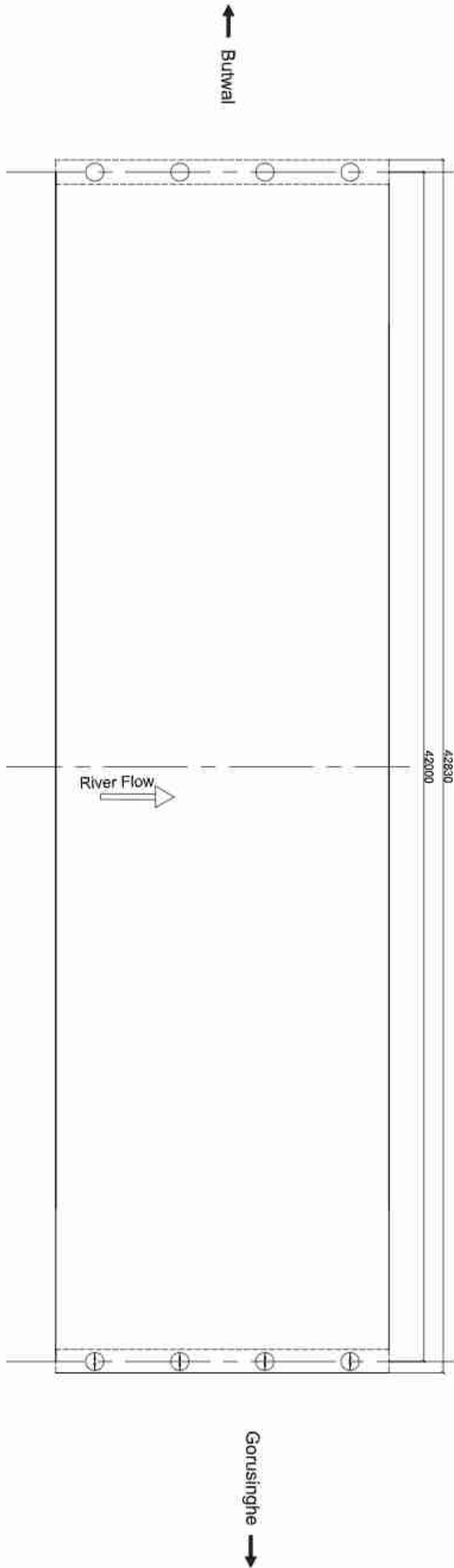
GL:124.000 m2
FM:10.201 m2



Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHP-PPC) ADB Loan No: 3722-NEP	CONSULTANT:		IMPLEMENTING AGENCY:		SHEET TITLE:		SCALE:		NAME		SIGNATURE		REVNO.		DESCRIPTION		DATE:	
	 Soosung Engineering Co. Ltd., Korea in association with  ERM Co. P (Ltd), Nepal and TSE Tech Studio of Engineering		DOR, DCID ROAD NAME: East West Highway (H01) Budhal - Gansinghe Section		Cross Section of Ch.603+600 - 603+640  Vertical Scale  Horizontal Scale		DESIGNED BY S.B. Shrestha 		CHECKED BY P. Upadhyaya 		APPROVED BY Dr. T.H. Choudhary 		DWG. NO.: 297_Ghamsaha SHEET NO.: 042/20					



Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHP-PPC) ADB Loan No: 3722-NEP	CONSULTANT:		IMPLEMENTING AGENCY:		SHEET TITLE:		SCALE:		NAME		SIGNATURE	REVNO	DESCRIPTION	DATE: November, 2022 DWG. NO.: 207/Ghama SHEET NO.: 043/20
	Soosung Engineering Co. Ltd., Korea in association with ERM Co. P (Ltd), Nepal and TSE Tech Studio of Engineering		DOR, DCID		Cross Section of Ch: 603+650 - 603+790		0 2 4 6 8 10 20 30m Vertical Scale 0 10 20 30m Horizontal Scale		S.B. Shrestha					
	ROAD NAME:		East West Highway (H01)						P. Upadhyaya					
	Butwal - Gansingh Section								D. T. H. Chid					



Layout of Bearing
Scale:-1:150

Legend

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

Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP	CONSULTANT:		IMPLEMENTING AGENCY:	SHEET TITLE:	SCALE:		NAME	SIGNATURE	REV NO.	DESCRIPTION	DATE:	
	 Soosung Engineering Co. Ltd.		DOR, DCID	Layout Plan of Ghatmaha Bridge (46/H001/297_A)	As Shown		Saroj Bhattarai				November, 2022	
	Korea											
	In association with ERMCo P (Ltd)											
	and J99%-Tech Studio of Engineering Nepal											
ROAD NAME:		East West Highway (H01)					Checked by:	P. Upadhyaya				DWG. NO.:
Butwal - Gorusinghe Section							Approved by:	Dr. T.H.Choi				SHEET NO.:
												257_Ghatmaha
												26/20

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

Tulbuliya Bridge(46-H001-298_A)

St. Ch : 603+804.40 ~ End Ch : 603+847.60

Detailed Drawing

Butwal - Gorusinghe Sector

November, 2022

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5.	Detail of Superstructure.	7	1
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7.	Prestressing Details of Main Girder .	9	1
8.	Anchorage Details.	10	1
9.	Untensioned Reinforcement Details of Girder.	11	1
10.	Bar Bending Schedule of Slab & Main Girder.	12	1
11.	Reinforcement Details of Intermediate Cross Girder.	13	1
12.	Reinforcement Details of End Cross Girder.	14	1
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15.	Reinforcement Detail of Wingwall Left.	17	1
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17.	Plan of Abutment Right.	19	1
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19.	Reinforcement Detail of Wingwall Right.	21	1
20.	Reinforcement Details of Abutment Pile Right.	22	1
21.	Reinforcement Details of approach Slab.	23	1
22.	Miscellaneous Details.	24-25	2
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25.	Cross Section.	28.1-28.2	2
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- ### 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 placed 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.

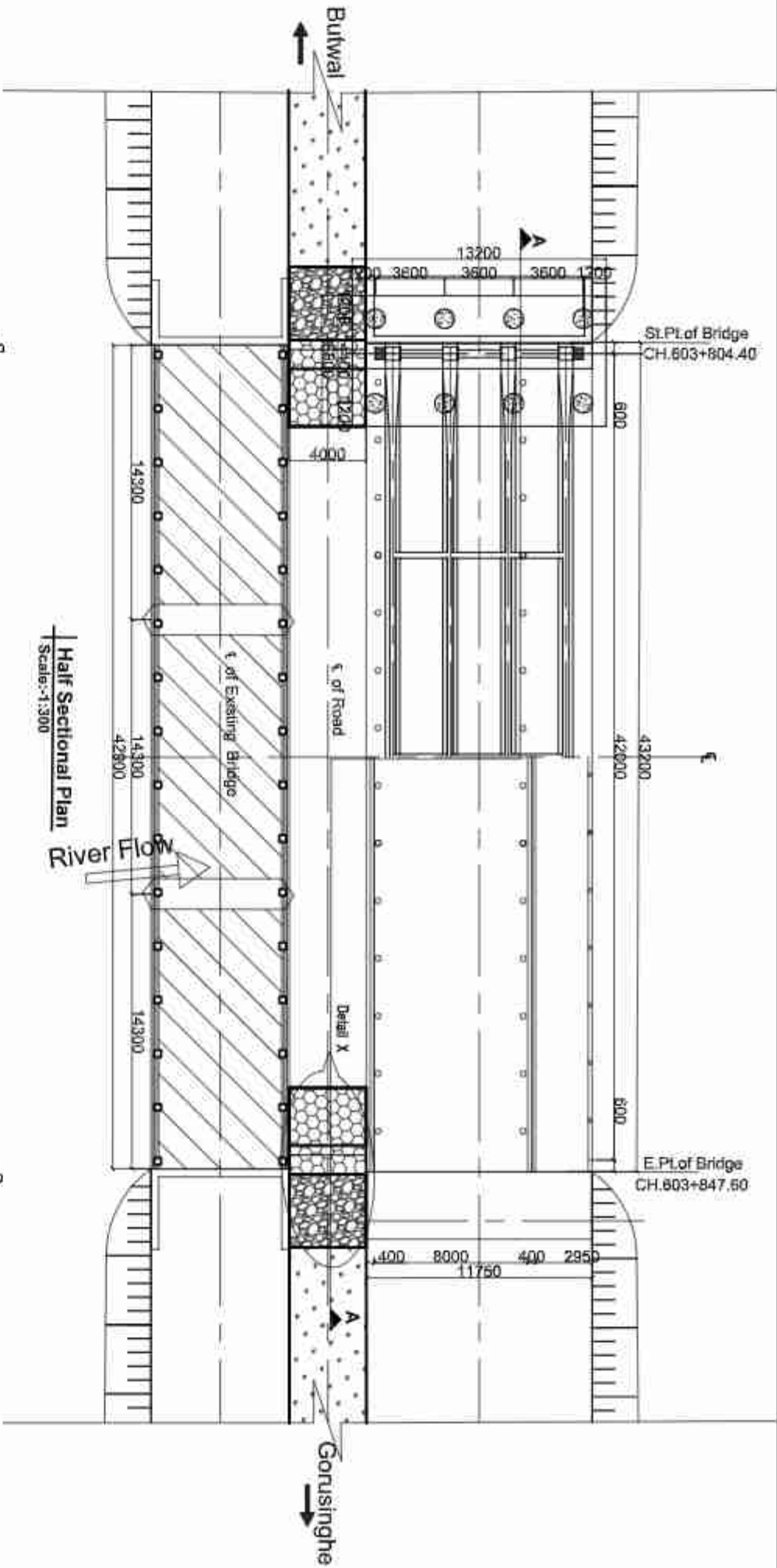
General Note: (For all Pile Foundation)

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

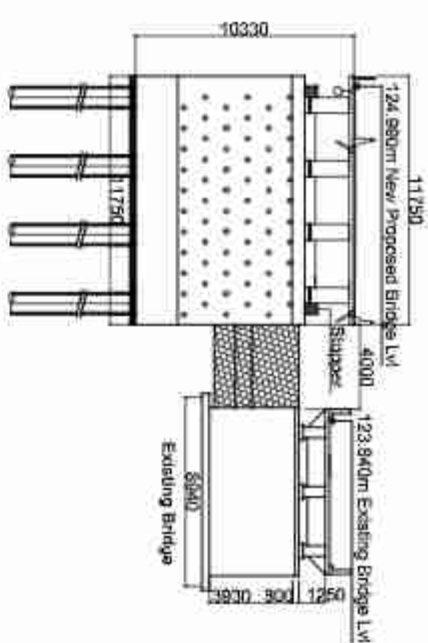
Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NP	CONSULTANT:	 Soosung Engineering Co. Ltd, Korea in association with  ERIMC P (Ltd), Nepal and  3878-Tech Studio of Engineering	
	IMPLEMENTING AGENCY:	DOR, DCID	
	SHEET TITLE:	General Notes of Tulbuliya Bridge (46/100/1/788_A)	
	SCALE:	As Shown	
	NAME	Siganture	REVISION
DESIGNED BY:	Saroj Bhattarai		November , 2022
CHECKED BY:	P. Upadhyaya		DWG NO.: 298_Tulbuliya
APPROVED BY:	Dr. T.H.Choi		SHEET NO.: (2/30)



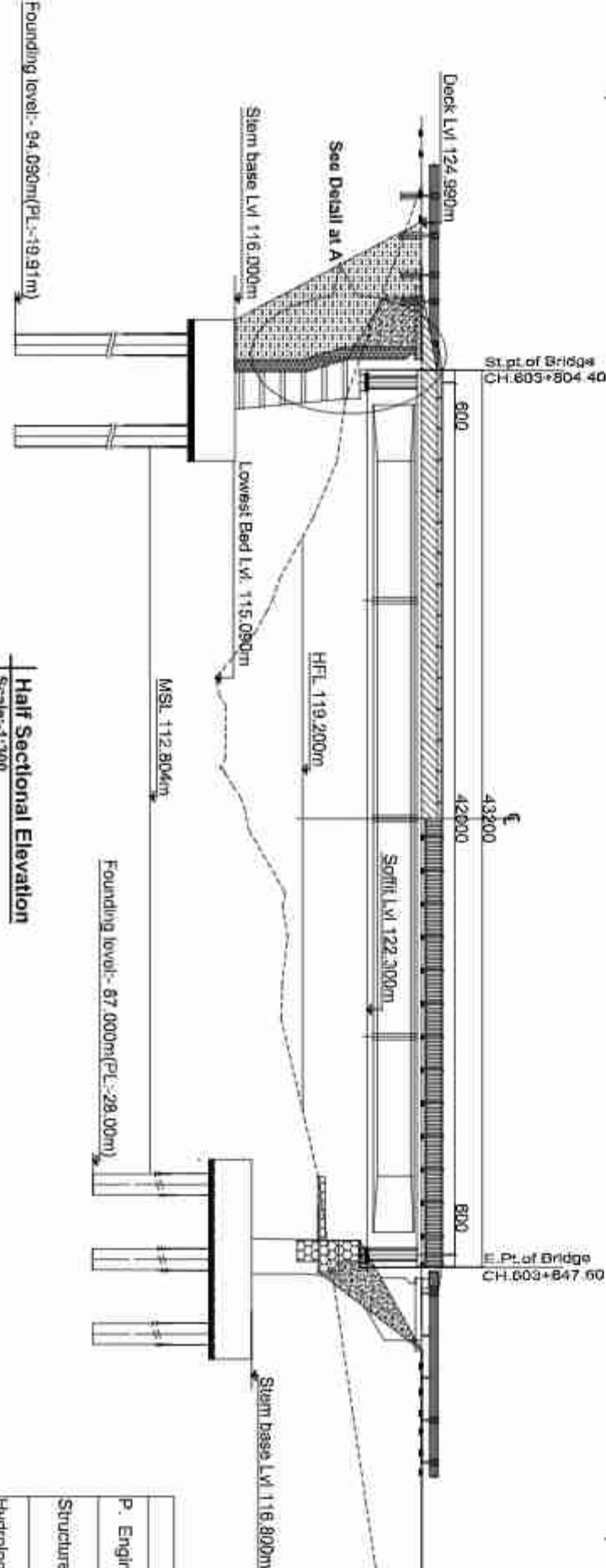
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										Saroj Bhattacharai					November, 2022
										P. Upadhyaya					DWG. NO.: 298_Tulbulya
										Dr. T.H. Choi					SHEET NO.: 3/30



Half Sectional Plan
Scale:-1:300



Elevation of Abutment
Scale:-1:300

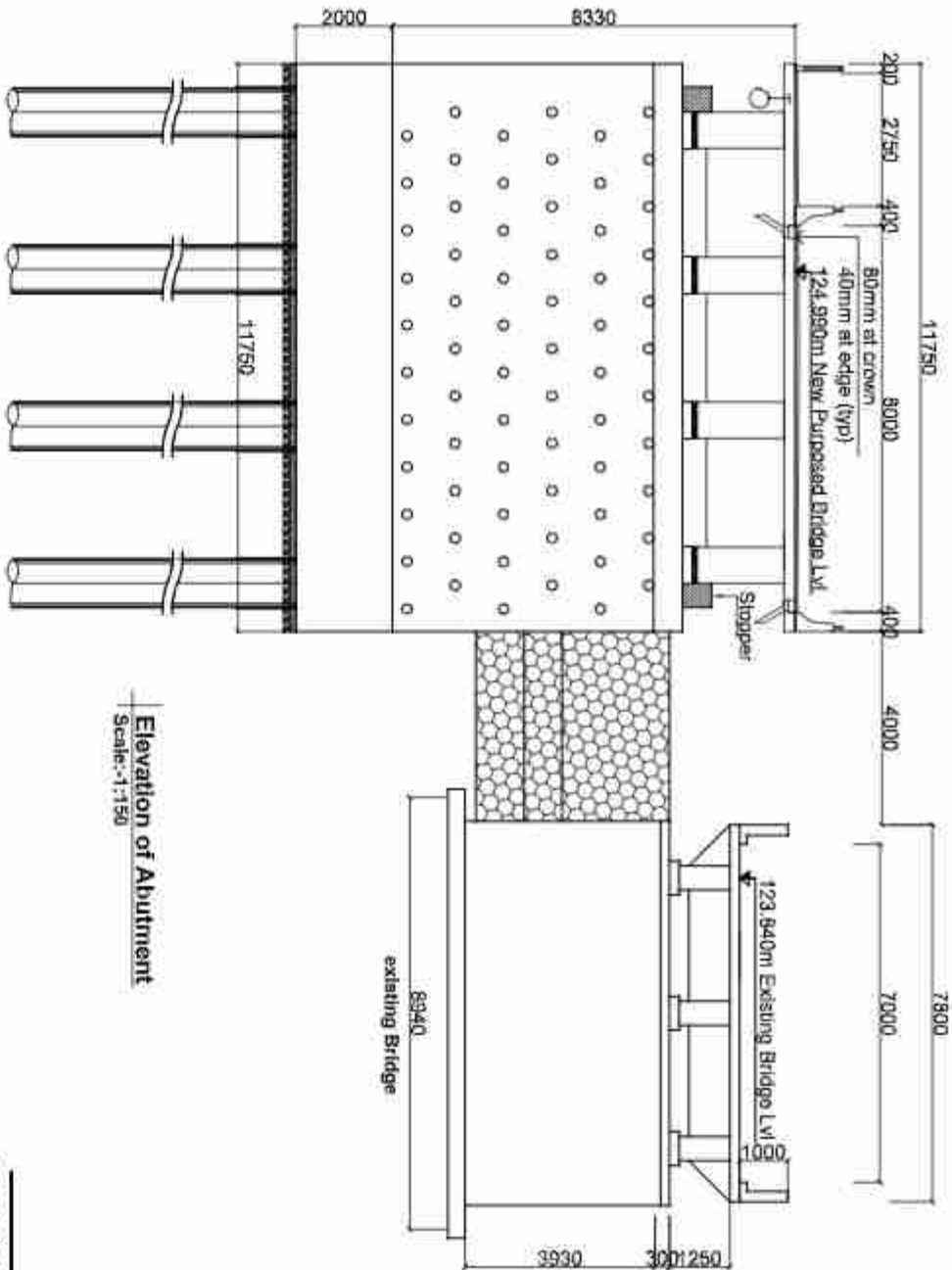


Half Sectional Elevation
Scale:-1:300

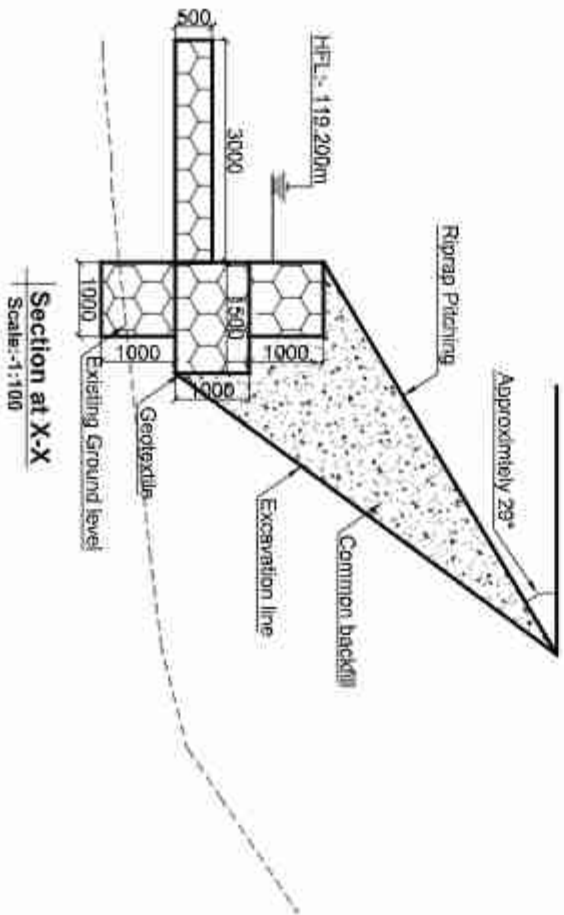
Note :-
MSL :- Maximum Scour Level
HFL :- High Flood Level
LBL :- Lowest Bed Level
RL :- Reduced Level
PL :- Pile Length

Name(NEC Number)		Signature
P. Engineer	P. Upadhyaya (Civil A 675)	
Structure Engineer	K.P. Wagle(Civil A 127) / P. Suresh(Civil A 676) / S. Bhattacharj (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	

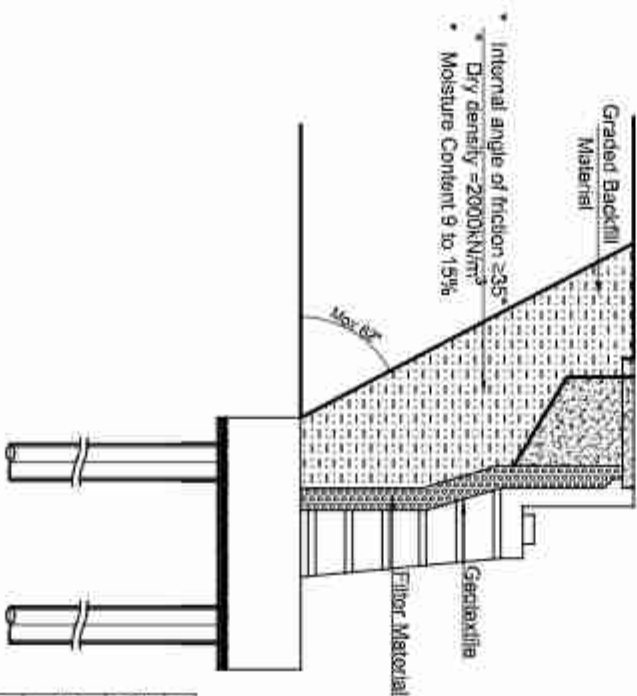
Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP	CONSULTANT:  Soosung Engineering Co. Ltd. Korea In association with ERMPC P (Ltd) and  JSP-Tech Studio of Engineering Nepal	IMPLEMENTING AGENCY: DOR, DCID		SHEET TITLE: General Arrangement of Tubular Bridge (46/H-001/298_A)	SCALE: 1:300	NAME Saroj Bhattachari	SIGNATURE 	REV NO.	DESCRIPTION	DATE: November, 2022				
		ROAD NAME: East West Highway (H01)									DESIGNED BY: Saroj Bhattachari	CHECKED BY: P. Upadhyaya		DWG. NO.: 298_Tubular
		Butwal - Gorusinghe Section												



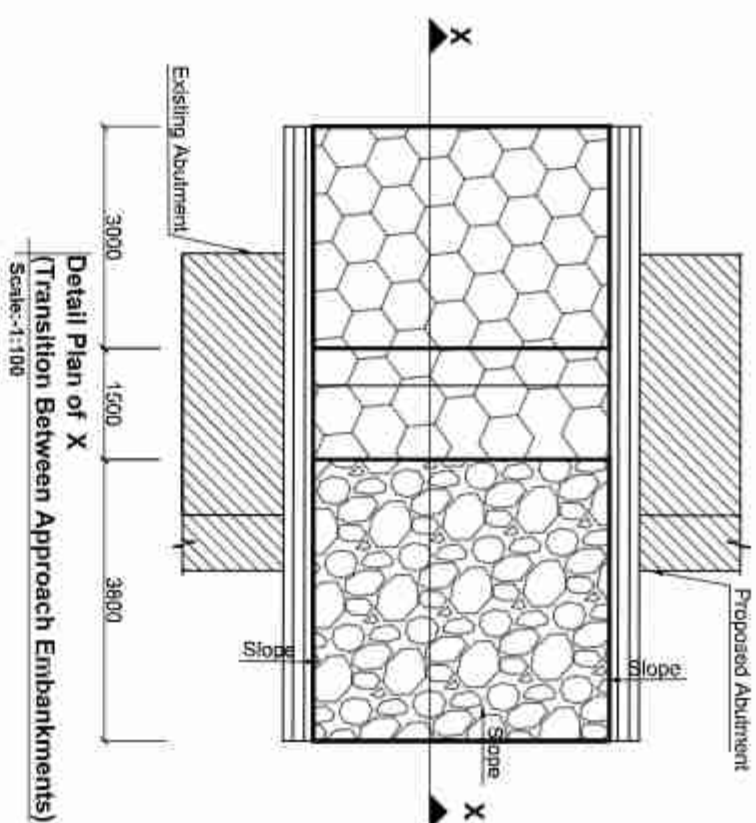
Elevation of Abutment
Scale:-1:150



Section at X-X
Scale:-1:100



Detail of A
Scale:-1:200



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

Name/(NEC Number)		Signature
P. Engineer	P. Upadhyaya (Civil A 875)	
Structure Engineer	K.P. Wagle(Civil A 1427) / P. Shrestha(Civil A 878) / S. Bhattarai (Civil A 904)	
Hydrologist	Dr. P.C. Jha(Civil A 188) / S. Adhikari (Civil A 408)	
Geotechnical Engineer	A. Adhikari(ka 199) / Dr. V. R. S. Shahi	

Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP	CONSULTANT:		IMPLEMENTING AGENCY:		SHEET TITLE:		SCALE:				NAME		SIGNATURE		REV NO.		DESCRIPTION		DATE:		
	Soosung Engineering Co. Ltd. Korea		DOR, DCID		General Arrangement of		1:300				Saroj Bhattarai		[Signature]						November, 2022		
	In association with ERM/C P (Ltd)		ROAD NAME:		Tubuliyanga Bridge						P. Upadhyaya		[Signature]						DWG. NO.:		
	and J&T - Tech Studio of Engineering Nepal		East West Highway (H01)		(46/H-001/298_A)						Checked by:		[Signature]						298_Tubuliyanga		
			Butwal - Gorusinghe Section								Approved by:		Dr. T.H. Chai		[Signature]						SHEET NO.:
																				5/30	



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

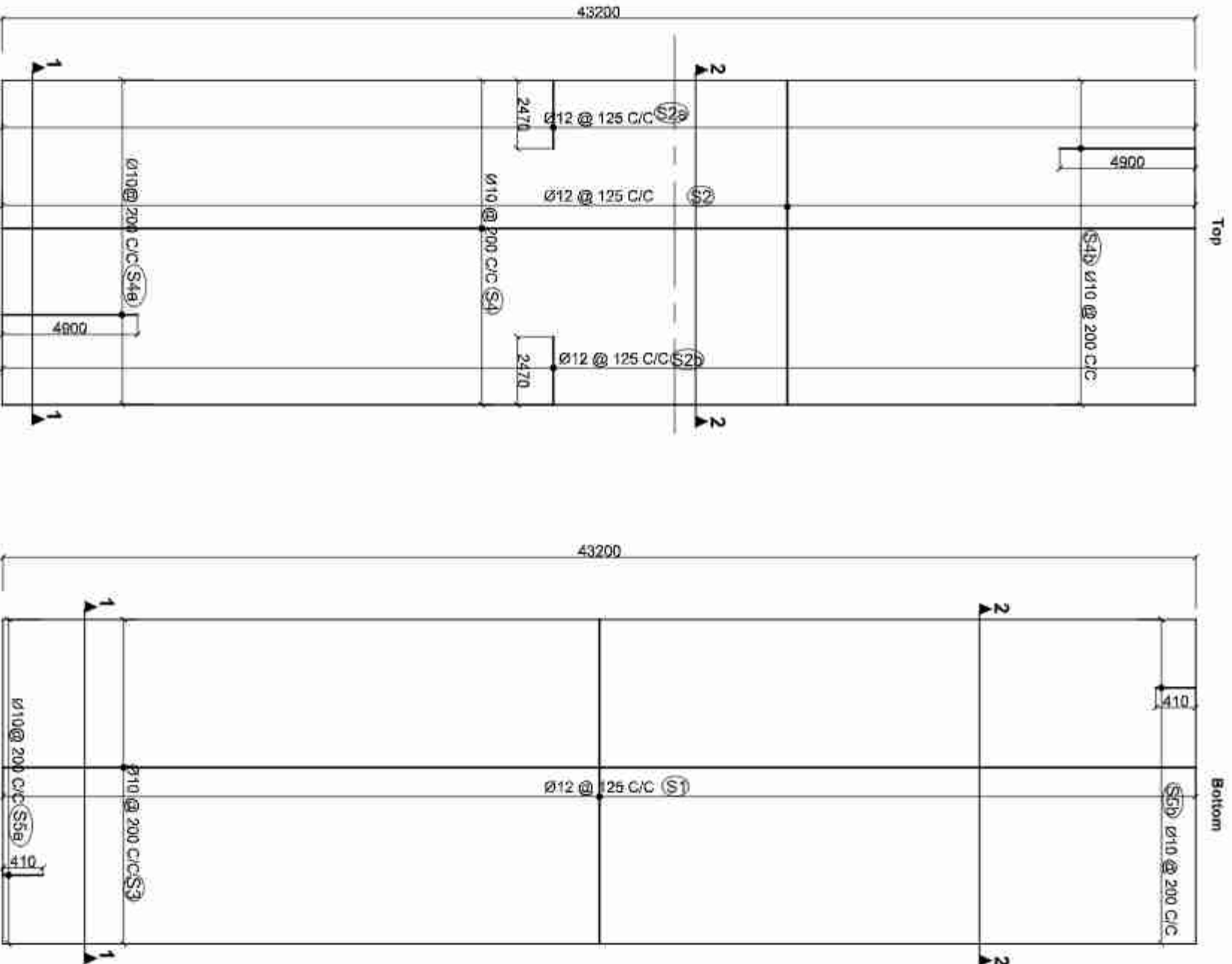


	Name(NEC Number)	Signature
P. Engineer	P. Upadhyaya (Civil A 675)	
Structure Engineer	K.P. Wagle (Civil A 127) / P. Shrestha (Civil A 676) / S. Bhattacharya (Civil A 904)	 
Hydrologist	Dr. P. C. Jha (Civil A 166) / S. Adhikari (Civil A 406)	 
Geotechnical Engineer	A. Adhikari (Ka 199) / Dr. V. R. S. Shahi	 

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 case)kn	Allowable Bearing Capacity on pile (Soil case) kn	Allowable Bearing Capacity of the Pile (Non Soil case)kn
Right side Abutment	28.00	2236	2683	2711
Left side Abutment	19.81	2463	4766	5902

Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP		CONSULTANT:  Soosung Engineering Co. Ltd. Korea In association with  ERMIC P (Ltd) and  JSTP Tech Studio of Engineering Nepal		IMPLEMENTING AGENCY: DOR, DCID ROAD NAME: East West Highway (H01) Birtawal - Gorurginghe Section		SHEET TITLE: Bore Log of Tubulye Bridge (dR/H001/298_A)		SCALE: As Shown		NAME		SIGNATURE		REV NO.		DESCRIPTION		DATE: November , 2022	
										Saroj Bhattachai								DWG NO.: 298_Tubulya	
										P. Upadhyaya								SHEET NO.:	
										Dr. T.H.Choi								e/o	

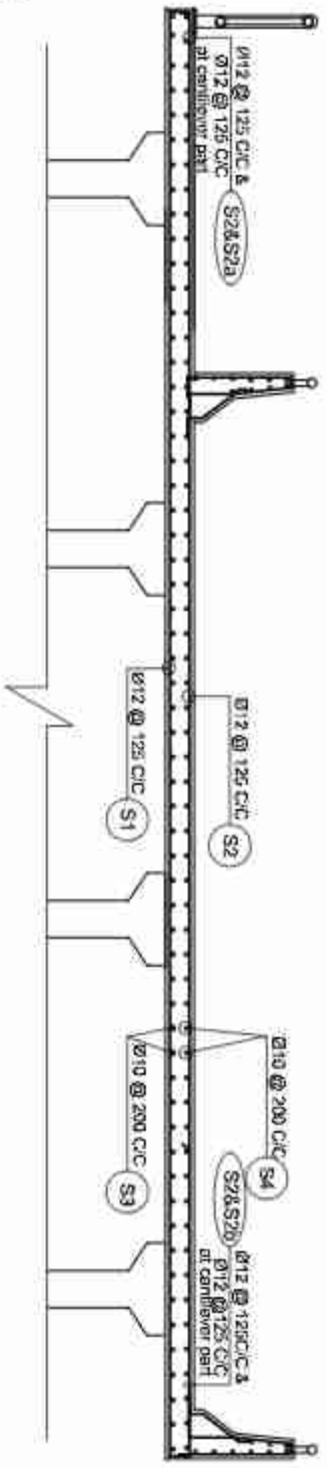


Reinforcement Details Of Deck Slab(Top Face)

Reinforcement Details Of Deck Slab(Bottom Face)

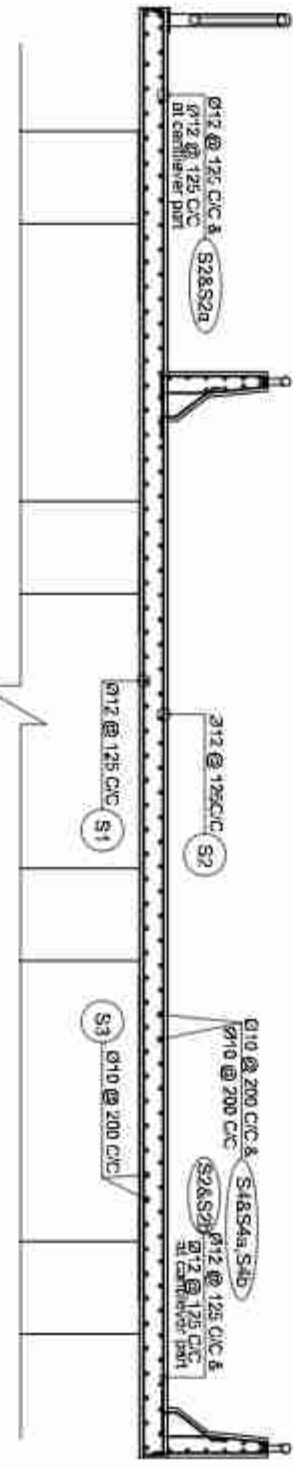
Scale:-1:200

Scale:-1:200



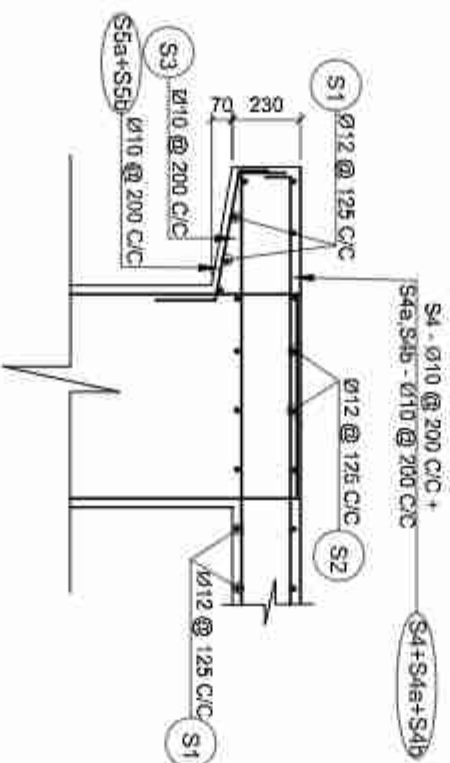
Section At 2-2

Scale:-1:50



Section At 1-1

Scale:-1:50



Reinforcement Details At Deck Extension
Between The Main Girder

NOTE:
1. On Shear Connection:
The transverse bars of the deck slab(S2) shall be tied to vertical stirrups of the longitudinal girders.
2. Top Surface of the Main Girder:
Surface to be roughened by wire brush immediately after initial setting. The surface shall be properly cleaned by pressure blower prior to casting of the deck concrete
3. On Wearing Course:
The level of wearing course along the longitudinal direction shall be kept horizontal throughout the length of the deck. The thickness of wearing course towards the ends along the deck shall be increased suitably to compensate for the slope due to hogging of the girder by pre stress.

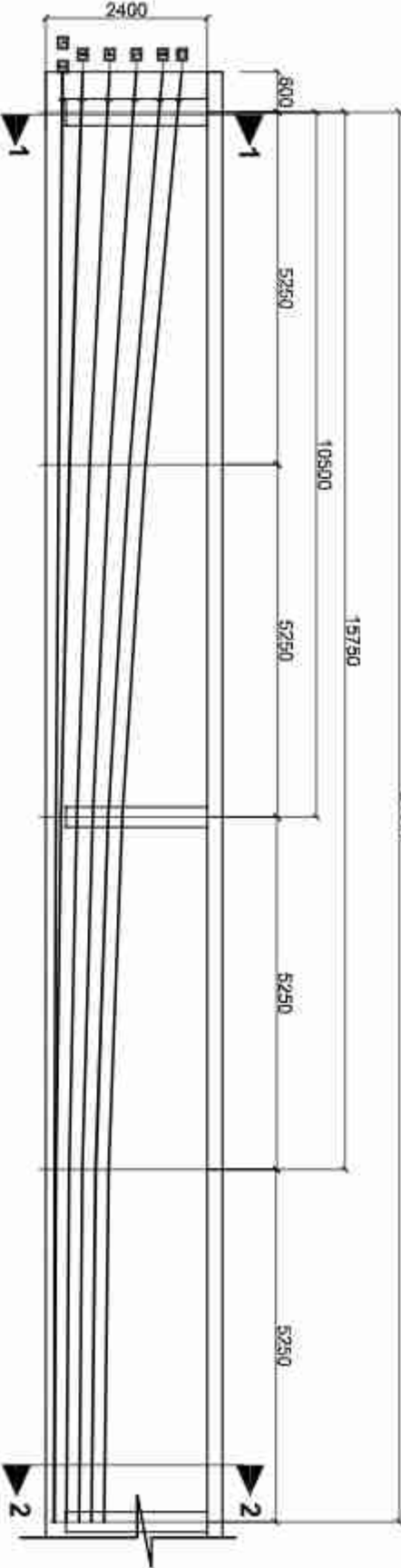
Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP	CONSULTANT:  Soosung Engineering Co. Ltd, Korea In association with  ERM/C P (Ltd), Nepal and  80% Tech Studio of Engineering	IMPLEMENTING AGENCY: DOR, DCID ROAD NAME: East West Highway (H01) Butwal - Gaurungthe Section	SHEET TITLE: Reinforcement Details of Slab of Tubuliyu Bridge (46/H001/298_A)	SCALE: As Shown	DESIGNED BY:	NAME	SIGNATURE	REV NO.	DESCRIPTION	DATE:
					CHECKED BY:	P. Upadhyaya				DWG. NO.: 298_Tubuliyu
					APPROVED BY:	Dr. T.H. Choi				SHEET NO.: 8/30

Tendon Layout Data

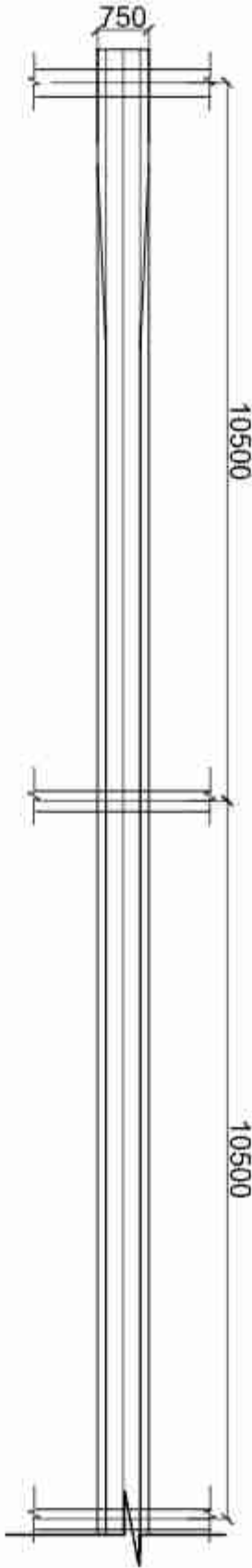
Anchor face	Bearing centerline		Intermediate sections								Mid span	
	-800	0	5250	10500	15750	21000						
TENDON	Y	Z	Y	Z	Y	Z	Y	Z	Y	Z	Y	Z
1	250	-176	243	-176	191	-180	155	-183	132	-185	125	-185
2	250	175	243	176	191	180	155	183	132	185	125	185
3	650	0	627	0	351	0	228	0	150	0	125	0
4	850	0	815	0	650	0	461	0	348	0	310	0
5	1350	0	1303	0	850	0	697	0	546	0	495	0
6	1740	0	1682	0	1244	0	931	0	743	0	680	0
Dummy 2025	0	1982	0	1482	0	1139	0	934	0	865	0	0

Y = Elevation of the tendon center from the girder soffit

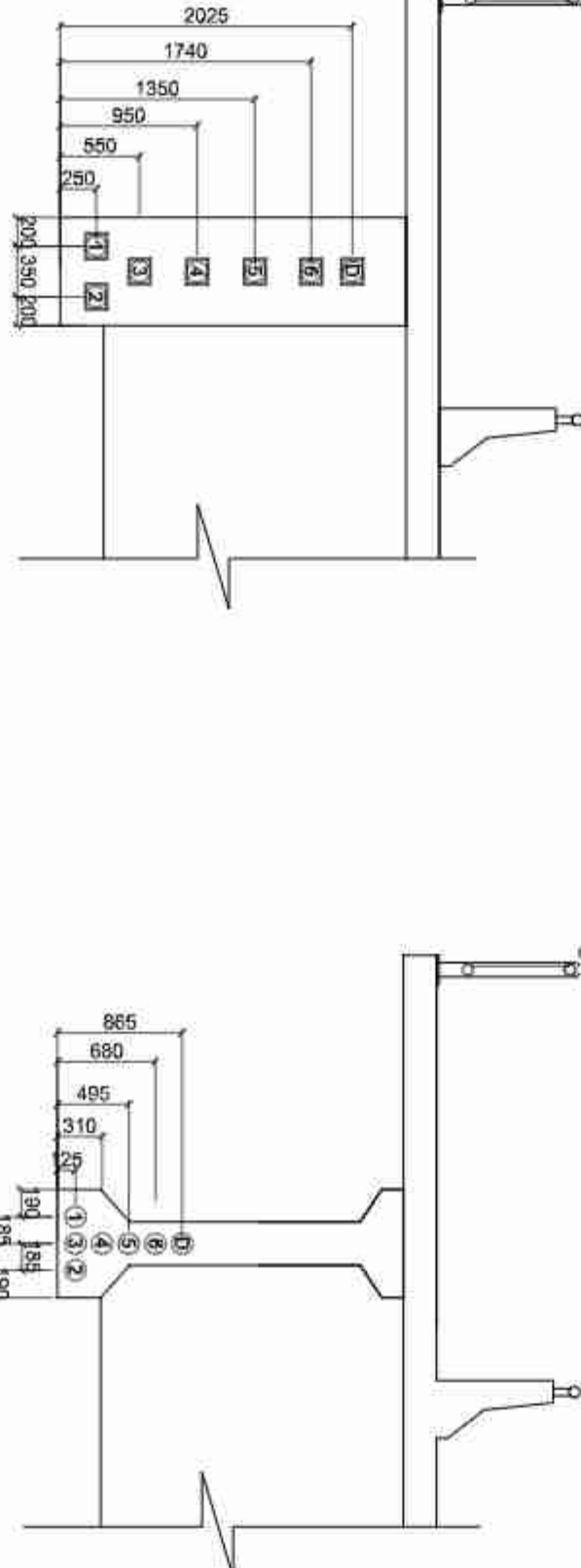
Z = Horizontal distance of the tendon center from the centerline of the girder



Longitudinal Section Of Main Girder
Scale:-1:100



Plan Of Main Girder
Scale:-1:100



View 1-1
Scale:-1:50

View 2-2
Scale:-1:50

Tendon Elongation and Emergence Angles			
TENDON	Total Jacking Force KN	Total Extension of both sides	Emergence angle degree
1	2800	305	0.662
2	2800	305	0.662
3	2800	303	2.255
4	2800	303	3.382
5	2800	302	4.526
6	2800	301	5.808
Dummy			6.130

NOTES ON PRE STRESSING:

- All the prestressing operation shall commence after 28 days of casting confirming that the cube specimen has achieved 100% of the prescribed compressive strength(M45) No Early prestressing allowed.
- Each prestressing Tendon shall be multi-strand cable comprising of 19 strands each strand of 12.7mm diameter (19x12.7) by low relaxation Class II, High Tensile Steel conforming IS 14268-2017 Maximum allowed total jacking force 27.13KN
- Prestressing tendon shall be done in 2 stages as follows.

Stage 1

Precast girder only After 28days of Casting.

Tendons to be stressed in stage 1 shall be in the following Sequence:

6	5	4	3	-	-	-	-
---	---	---	---	---	---	---	---

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

Stage 2

After 14 days of Casting of deck slab

Tendons to be stressed in stage 2 shall be in the following Sequence:

2	1	-	-	-	-	-	-
---	---	---	---	---	---	---	---

Total Jacking Force to each tendon in stage 2= 2600KN

- Casting of footpath, crash barriers and wearing course will done only after second stage prestressing.
- Jacking of tendons shall be done from both ends. All the prestress losses(natural and long term) have been already considered in the design.
- The composite action is considered only for live loads. There shall be no false-work or prop to the girder during 2nd stage of prestressing. The formwork for deck slab can be supported on the main precast girders.
- The cable elongation at their jacking ends, mentioned are based on the assumption that the Modulus of Elasticity of the cable steel is 1.85x10⁵ Mpa. The manufacturer's specification shall be followed if provided.
- The tendon ducts shall be properly secured to the rebar to maintain the profile throughout concreting process.
- The specified profile and alignment of the tendon shall be strictly maintained, if required the reinforcement bars can be suitably repositioned or slightly bent to accommodate the tendons as per the engineer's instruction.

NOTES ON DUMMY CABLE

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

Government of Nepal

Ministry of Physical Infrastructure and Transport

Department of Roads

Project Directorate Office (ADB)

SASEC Highway Improvement Project-

Project Preparatory Consultant (SHIP-PPC)

ADB Loan No: 3722-NEP

CONSULTANT:

Soosung Engineering Co. Ltd,

Korea In association with

ERM/C P (Ltd), Nepal

and

3095-Tech Studio of Engineering

IMPLEMENTING AGENCY:

DOR, DCID

ROAD NAME:

East West Highway (H01)

Butwal - Gorusinghe Section

SHEET TITLE:

Prestressing Details of Main

Girder of

Tubular Bridge

(46/H001/298_A)

SCALE:

As Shown

NAME

Saroj Dhital

SIGNATURE

[Signature]

REV NO.

1

DESCRIPTION

1

DATE:

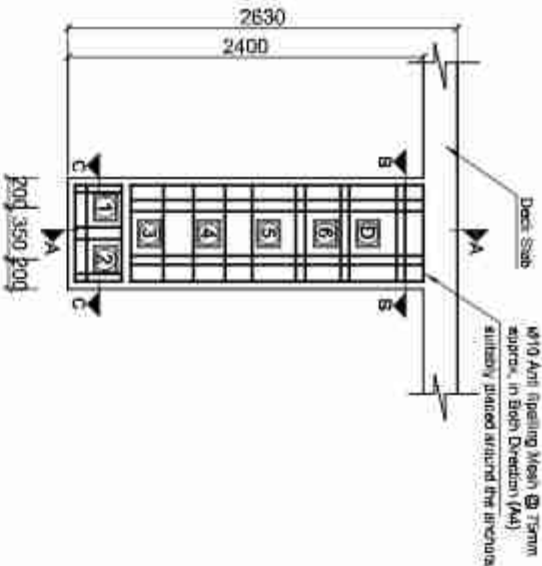
November, 2022

DWG. NO.:

298_Tubular

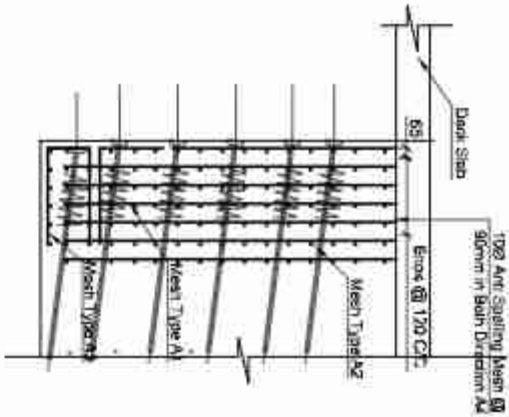
SHEET NO.:

9/30



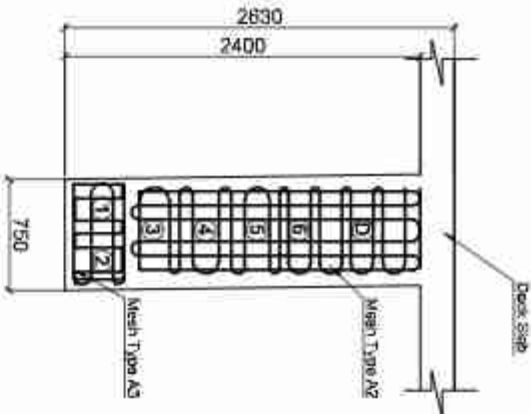
Anti Spalling Reinforcement

Scale:-1:50



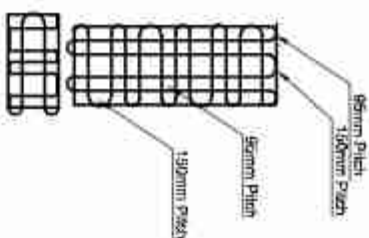
Section A-A

Scale:-1:50



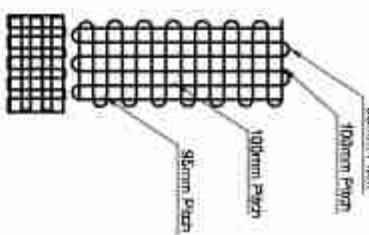
Section A-D

Scale:-1:50



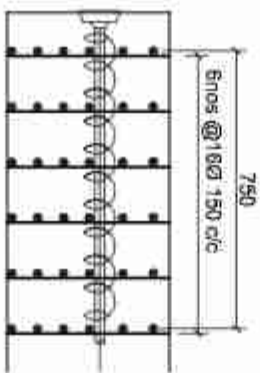
Mesh Type A2a

Scale:-1:50 (Near the Anchor Plate)



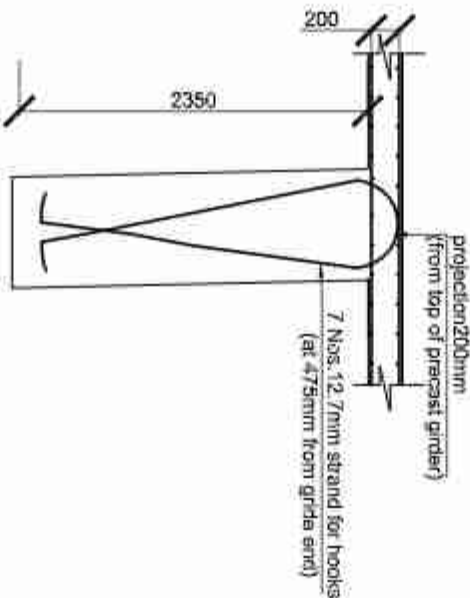
Mesh Type A2b

Scale:-1:50(Away From Anchor Plate)



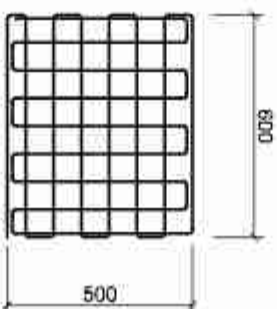
Section A-B

Scale:-1:20



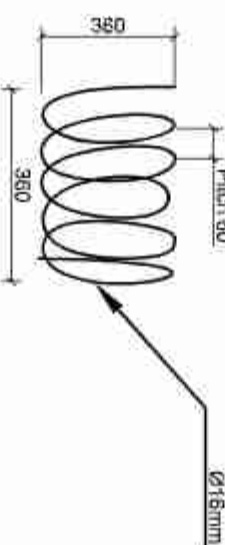
Hook Details At Both Ends Of Grille

Scale:-1:50



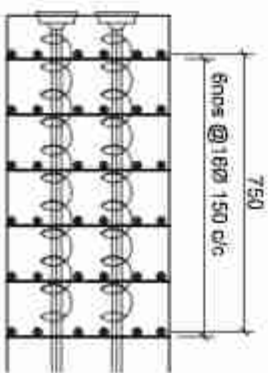
Mesh Type A3

Scale:-1:20



Typical Detail Of Spiral reinforcement A1

Scale:-1:20

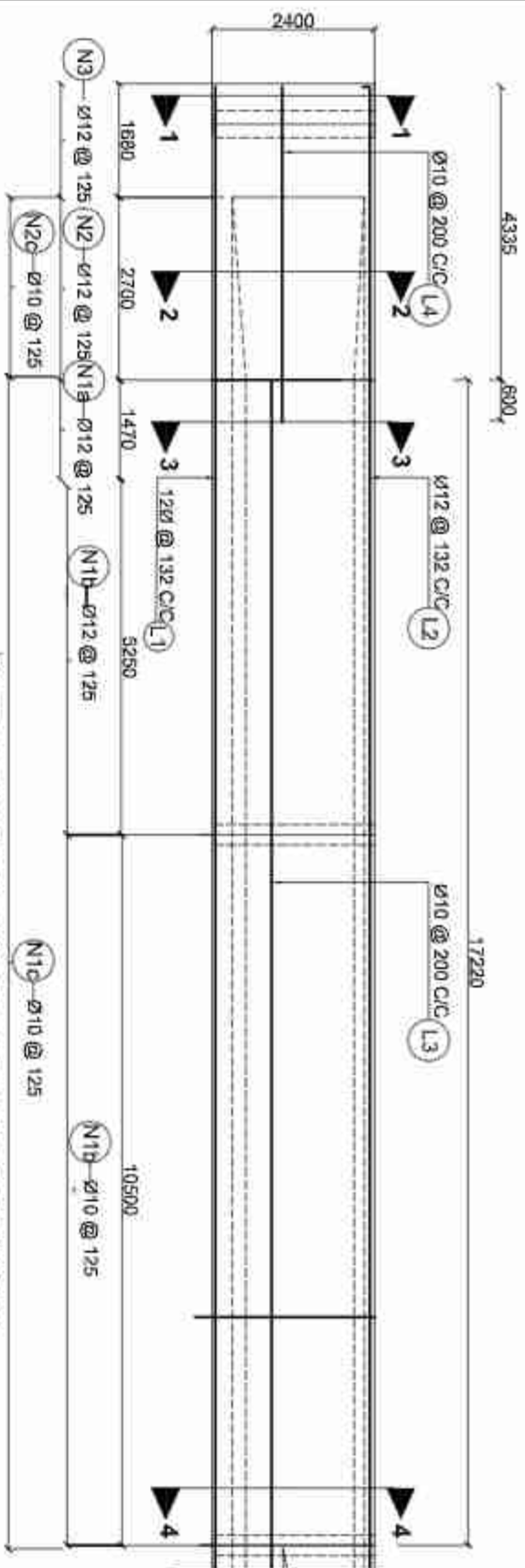


Section A-C

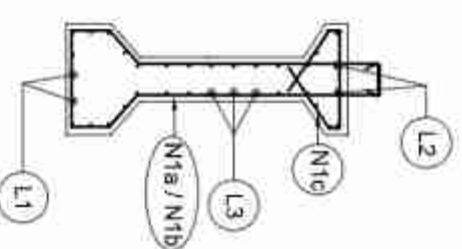
Scale:-1:20

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

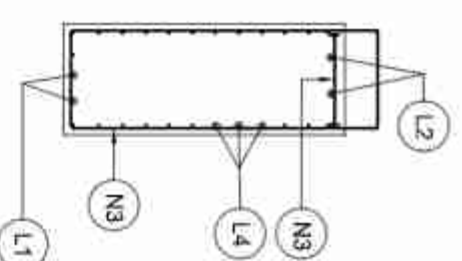
Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP	CONSULTANT:  Soosung Engineering Co. Ltd, Korea in association with  ERM&C P (Ltd), Nepal and  3095-Tech Studio of Engineering	IMPLEMENTING AGENCY:	SHEET TITLE:	SCALE:	NAME	SIGNATURE	REV NO.	DESCRIPTION	DATE:		
		DOR, DCID	Anchorage Details of Tubuliyia Bridge (46/H-001/298_A)	As Shown					November , 2022		
		ROAD NAME:			DESIGNED BY:	Saroj Bhattarai				DWG. NO.:	
		East West Highway (H01)			CHECKED BY:	P. Upadhyaya				298_Tubuliyia	
		Birtwal - Gorusingha Section			APPROVED BY:	Dr. T.H.Choi					SHEET NO.:
										10/30	



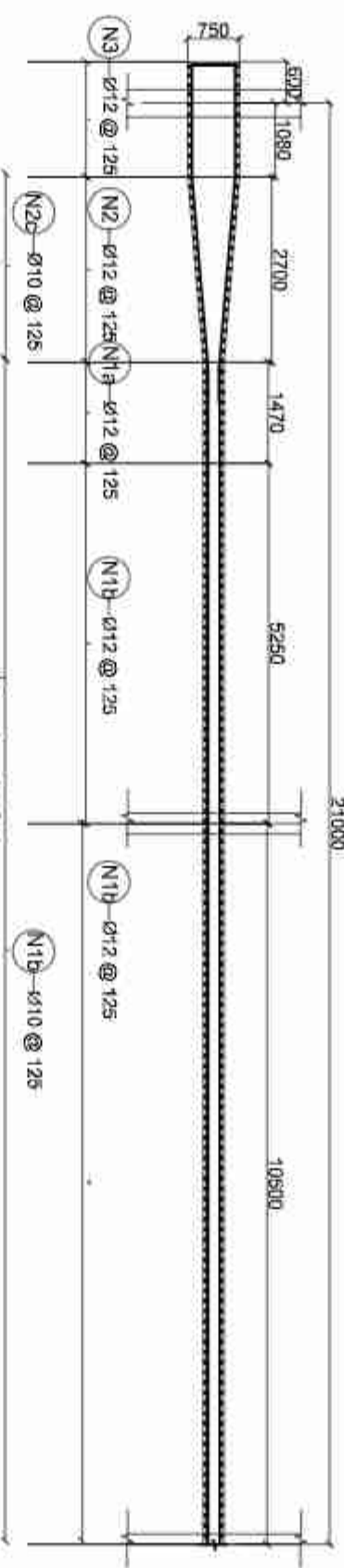
Reinforcement Details At Sectional Elevation Of Main Girder
Scale:-1:100



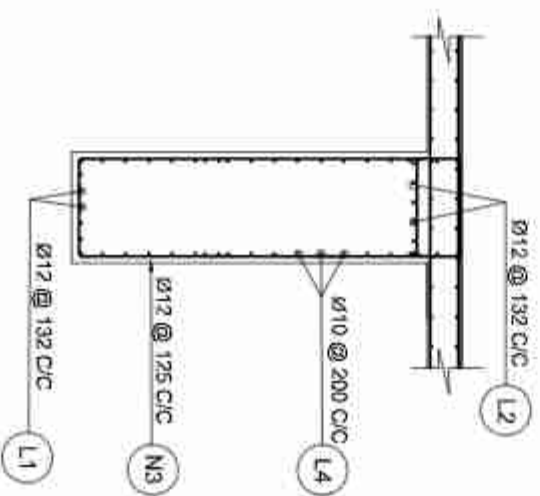
Typical Reinforcement
of Precast Girder at Center



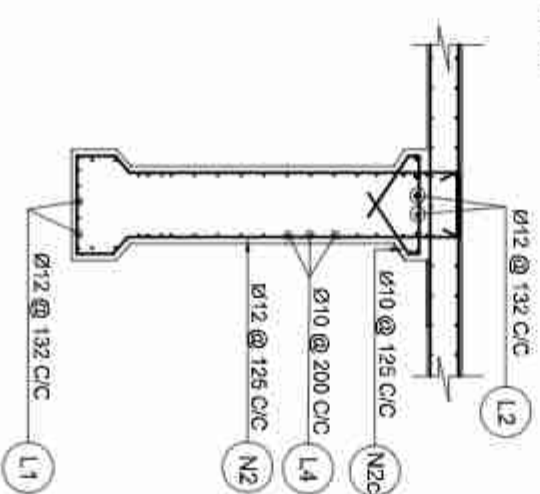
Typical Reinforcement
of Precast Girder at End



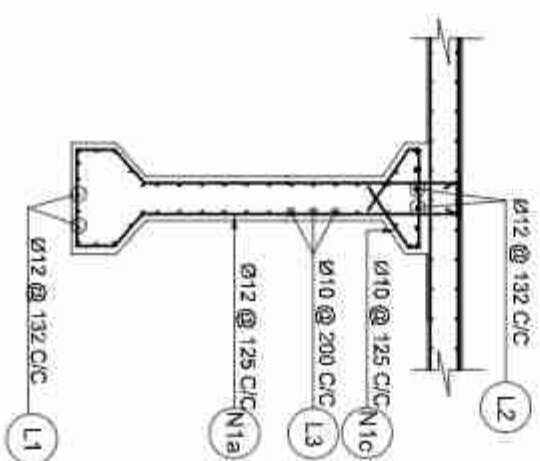
Section A-A
Scale:-1:100



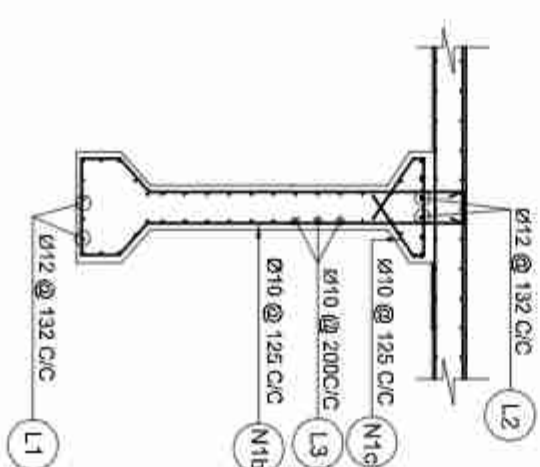
Section At 1-1
Scale:-1:30



Section At 2-2
Scale:-1:30



Section At 3-3
Scale:-1:30



Section At 4-4
Scale:-1:30

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

Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP	CONSULTANT:  Soosung Engineering Co. Ltd, Korea in association with  ERM/C P (Ltd), Nepal and  J&S-Tech Studio of Engineering	IMPLEMENTING AGENCY:		SHEET TITLE: Undersized Reinforcement Details of Girder of Tubular Bridge (46/H001/298_A)	SCALE: As Shown	NAME		SIGNATURE	REV NO.	DESCRIPTION	DATE: November, 2022
		DOR, DCID				DESIGNED BY: Saroj Bhattarai					
		ROAD NAME: East West Highway (H01)				CHECKED BY: P. Upadhyaya					
		Butwal - Gorusinghe Section				APPROVED BY: Dr. T.H.Choi					
						DWG. NO.: 298_Tubulars					
		SHEET NO.: 11/30									

BAR BENDING SCHEDULE OF MAIN GIRDER						
BAR ID	SHAPE OF BAR IN mm (NOT TO SCALE)	SPACING (MM)	# OF BARS (mm)	NO. OF BARS	LENGTH (m)	WEIGHT/LENGTH (kg/m)
N1a		VARIES	12	125	6.510	0.868
N1b		VARIES	10	125	6.510	0.817
N1c		VARIES AS PER N1	10	125	1.760	0.517
N2		VARIES AS PER N1	10	125	1.760	0.517
N2c		VARIES AS PER N1	10	125	1.760	0.517
N3		VARIES AS PER N1	10	125	1.760	0.517
L1		VARIES AS PER N1	10	125	1.760	0.517
L2		VARIES AS PER N1	10	125	1.760	0.517
L3		VARIES AS PER N1	10	125	1.760	0.517
L4		VARIES AS PER N1	10	125	1.760	0.517
A1		VARIES AS PER N1	10	125	1.760	0.517
A2		VARIES AS PER N1	10	125	1.760	0.517

BAR BENDING SCHEDULE OF MAIN GIRDER						
BAR ID	SHAPE OF BAR IN mm (NOT TO SCALE)	SPACING (MM)	# OF BARS (mm)	NO. OF BARS	LENGTH (m)	WEIGHT/LENGTH (kg/m)
A3		VARIES	10	4	10.200	0.817
TOTAL IN ONE GIRDER						3783.961
TOTAL IN ONE GIRDER (IN METRIC TON)						3.784

BAR BENDING SCHEDULE OF DECK SLAB						
BAR ID	SHAPE OF BAR IN mm (NOT TO SCALE)	SPACING (MM)	# OF BARS (mm)	NO. OF BARS	LENGTH (m)	WEIGHT/LENGTH (kg/m)
S1		VARIES	10	4	10.200	0.817
S2		VARIES	10	4	10.200	0.817
S2a		VARIES	10	4	10.200	0.817
S2b		VARIES	10	4	10.200	0.817
S3		VARIES	10	4	10.200	0.817
S4		VARIES	10	4	10.200	0.817
S4a		VARIES	10	4	10.200	0.817
S4b		VARIES	10	4	10.200	0.817
S5		VARIES	10	4	10.200	0.817
S5a		VARIES	10	4	10.200	0.817
S5b		VARIES	10	4	10.200	0.817
TOTAL EXCLUDING FOOTPATHS KG						12822.908
TOTAL WEIGHT IN METRIC TON						12.823

Government of Nepal

Ministry of Physical Infrastructure and Transport

Department of Roads

Project Directorate Office (ADB)

SASEC Highway Improvement Project-

Project Preparatory Consultant (SHIP-PPC)

ADB Loan No: 3722-NEP

CONSULTANT:

Soosung Engineering Co., Ltd.

Korea in association with

ERM&C P (Ltd), Nepal

and

80% Tech Studio of Engineering

IMPLEMENTING AGENCY:

DOR, DCID

ROAD NAME:

East West Highway (H01)

Butwal - Gorusinghe Section

SHEET TITLE:

B.B.S. of Slab & Main Girder

of

Tubular Bridge

(46/1001/288_A)

SCALE:

As Shown

DESIGNED BY:

Saroj Bhatnagar

CHECKED BY:

P. Upadhyaya

APPROVED BY:

Dr. T.H. Choi

NAME

SIGNATURE

REV NO.

DESCRIPTION

DATE:

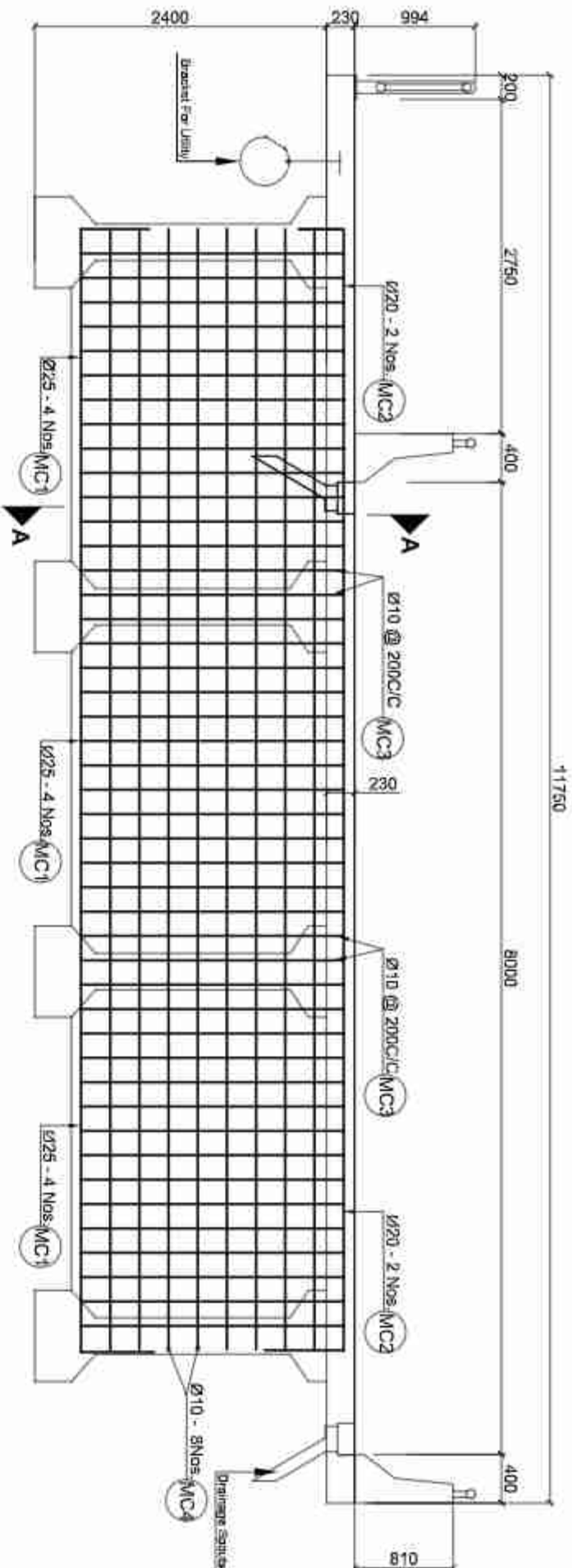
November, 2022

DWG. NO.:

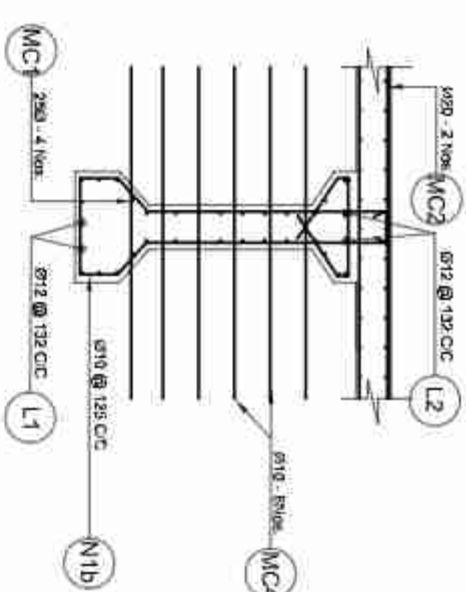
298_Tubular

SHEET NO.:

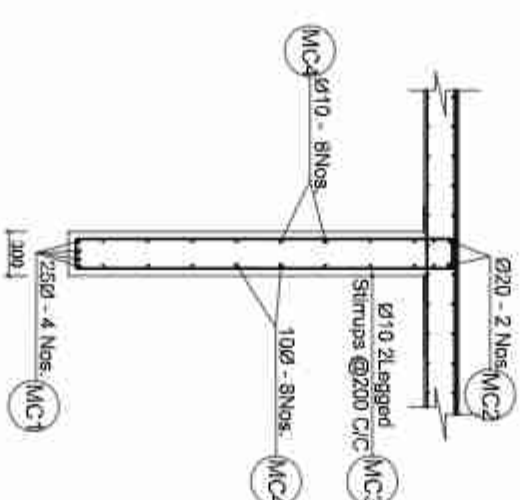
1230



Intermediate Cross Girders
Scale:-1:50



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

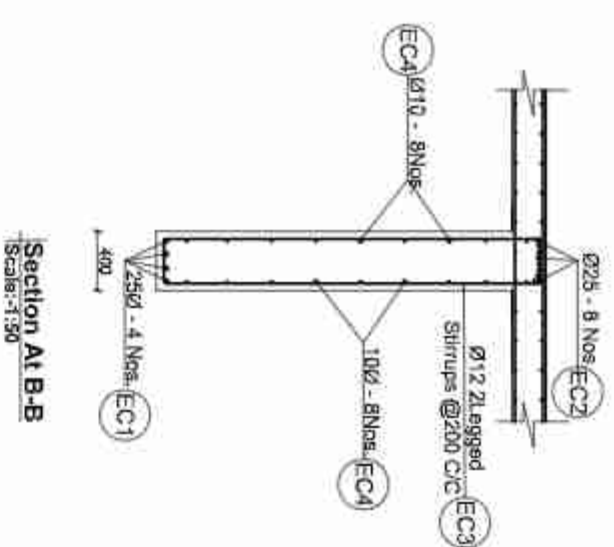
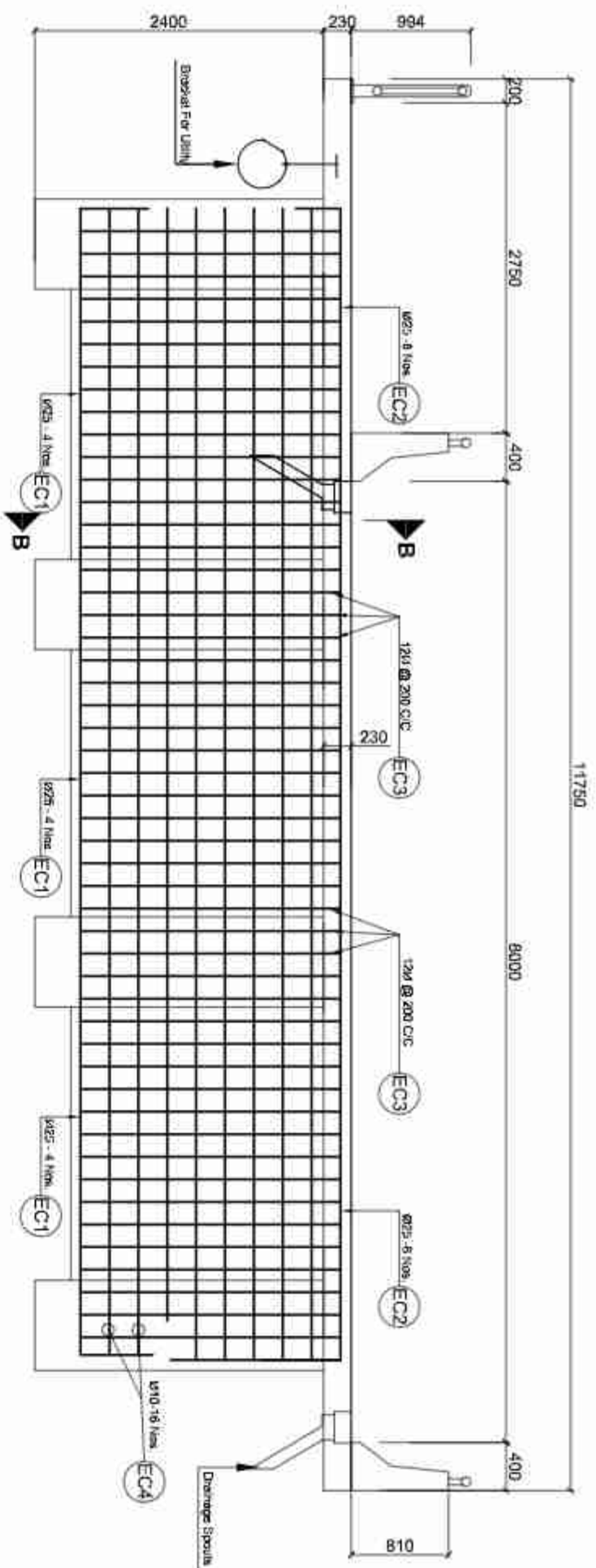


Section A-A
Scale:-1:50

EAR BENDING SCHEDULE OF INTERMEDIATE CROSS GIRDER						
BAR ID	SHAPE OF BAR IN mm (NOT TO SCALE)	SPACING (mm)	N ^o OF BARS (mm)	N ^o OF BARS	LENGTH (m)	WEIGHT/LENGTH (kg/m)
MC1		3645	25	4	10.445	3.853
MC2		3645	20	2	10.445	2.468
MC3		200	10	45	5.020	0.617
MC4		300	10	16	9.220	0.617
TOTAL IN ONE GIRDER						442.740
TOTAL NUMBER OF GIRDER AND TOTAL WEIGHT (IN METRIC TON)						3

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

Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP	CONSULTANT:		IMPLEMENTING AGENCY:		SHEET TITLE:		SCALE:		NAME		SIGNATURE	REV NO.	DESCRIPTION	DATE:
	Soosong Soosung Engineering Co. Ltd, Korea in association with ERM/C P (Ltd), Nepal and 80% Tech Studio of Engineering		DOR, DCID		Reinforcement Details of Intermediate Cross Girder of Tubular Bridge (46/H001/298_A)		As Shown		Saroj Bhattarai					November, 2022
			ROAD NAME:						P. Upadhyaya					DWG. NO.:
			East West Highway (H01)						Dr. T.H.Choi					298_Tubulars SHEET NO.:



Section At B-B
Scale: 1:50

End Cross Girders

Scale: 1:50

BAR BENDING SCHEDULE OF END CROSS GIRDER									
BAR ID	SHAPE OF BAR (IN mm) (NOT TO SCALE)	SPACING (MM)	N OF BARS (mm)	N.O. OF BARS	LENGTH (m)	WEIGHT/LENGTH H (kg/m)	TOTAL WEIGHT (kg)		
EC1				25	4	10.445	3.853	150.994	
EC2				25	8	10.445	3.853	321.567	
EC3				200	12	5.242	0.888	232.597	
ECA				300	10	15	9.320	0.517	91.838
TOTAL IN ONE GIRDER								807.615	
TOTAL NUMBER OF GIRDER AND TOTAL WEIGHT (IN METRIC TON)								2	1.615

Dowel bar of End Cross Girder

Scale: 1:30

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 corresponding bars.

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 Preparation Consultant (SHIP-PPC) ADB Loan No.: 3722-NP			CONSULTANT:		
 Soosung Engineering Co., Ltd, Korea in association with  ERMC P (Ltd), Nepal and  2878 - Tech Studio of Engineering			IMPLEMENTING AGENCY:		
DOR, DCID			SHEET TITLE:		
ROAD NAME:			SCALE:		
East West Highway (H01)			Reinforcement Details of End Cross Girder of Tubuliya Bridge (4E/H01/298_A)		
Butwal - Gorusinghe Section			As Shown		
DESIGNED BY:		NAME		SIGNATURE	REV NO.
CHECKED BY:		Saroj Bhatnagar			
APPROVED BY:		P. Upadhyaya			
		Dr. T.H.Chal			
DATE: November , 2022					
DWG. NO.: 298_Tubuliya					
SHEET NO.: 14/3					

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

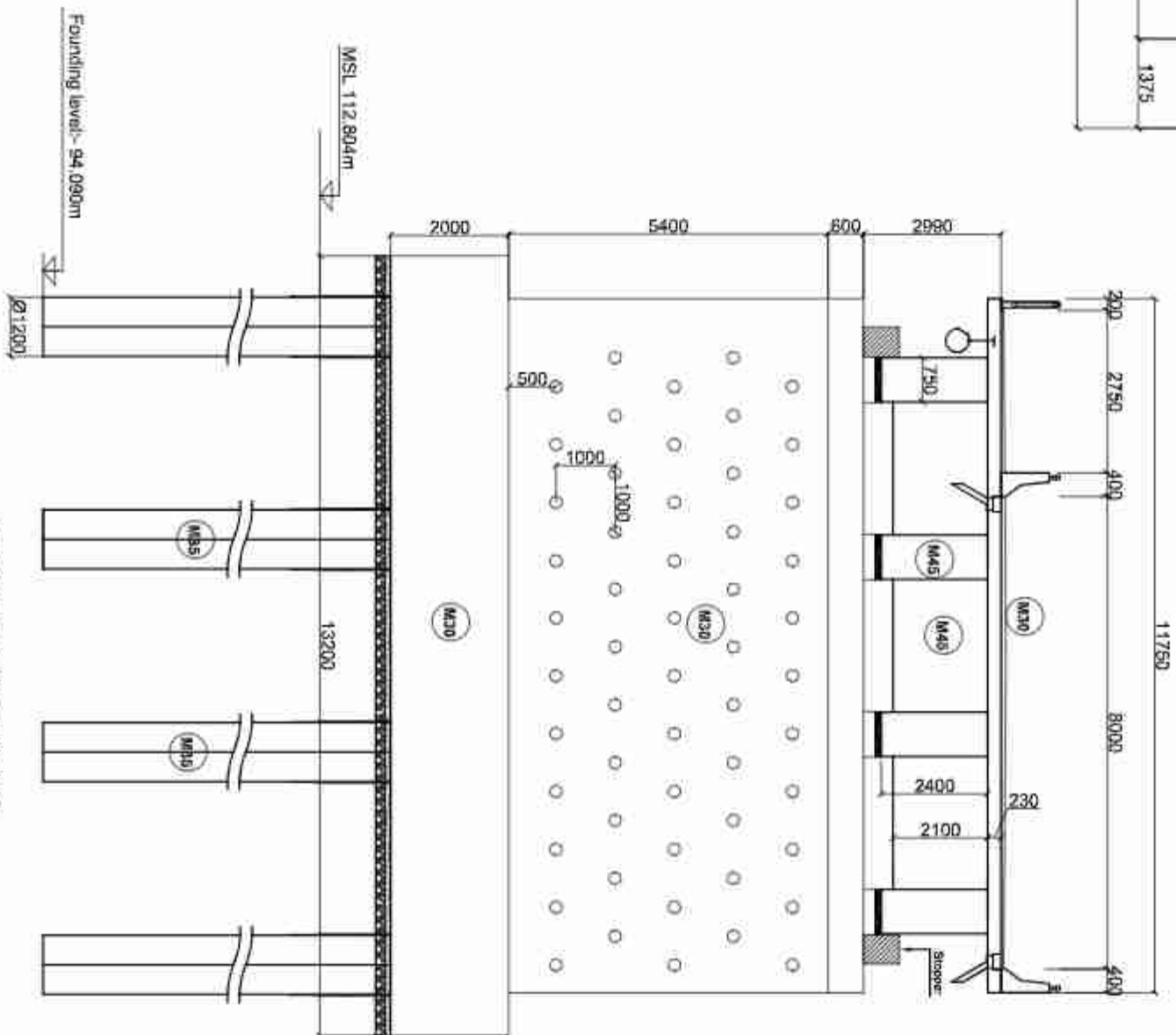
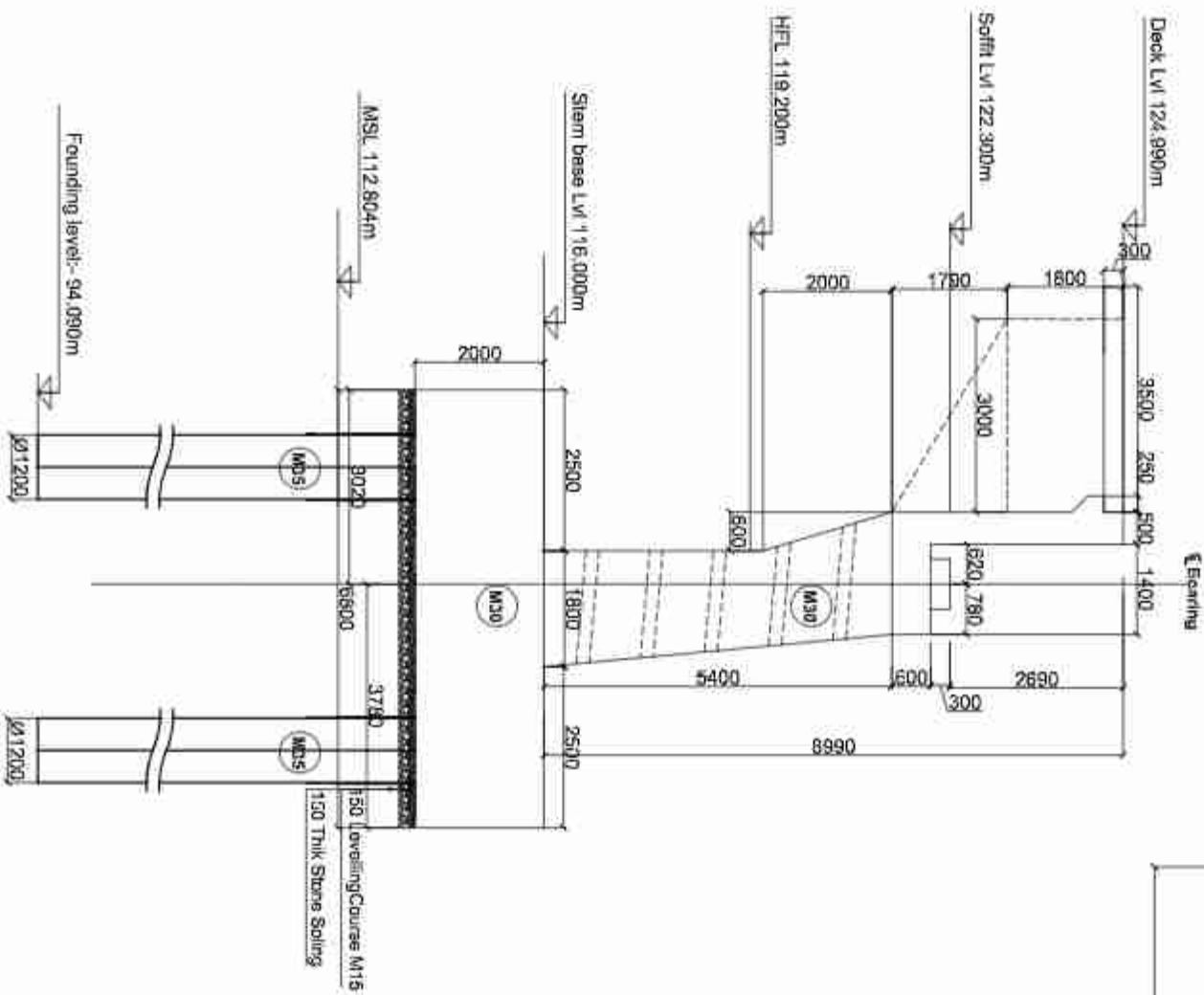
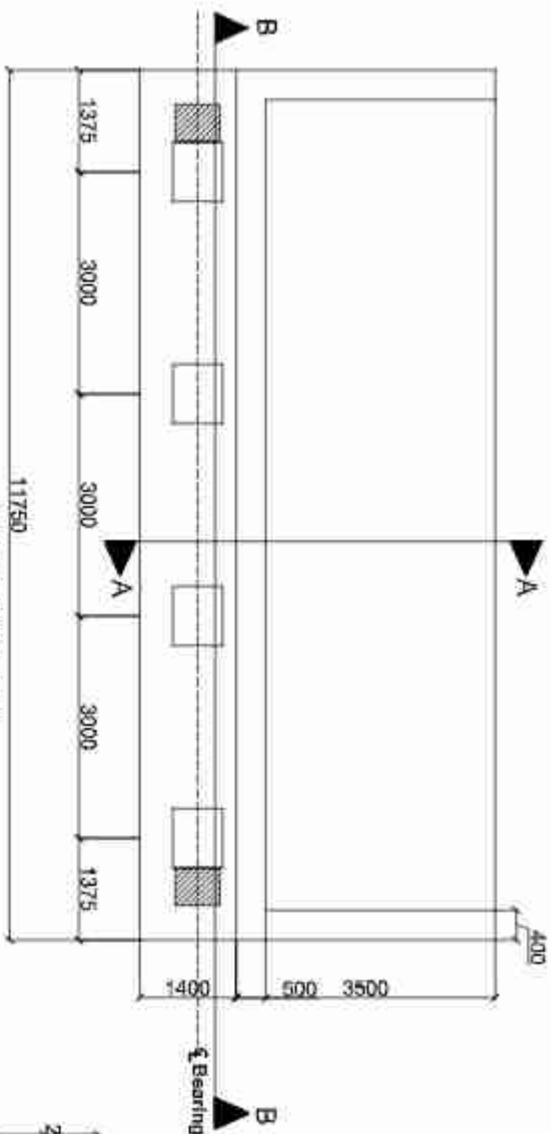
Tulbuliya Bridge(Left Side)

St. Ch : 603+804.40 ~ End Ch : 603+847.60

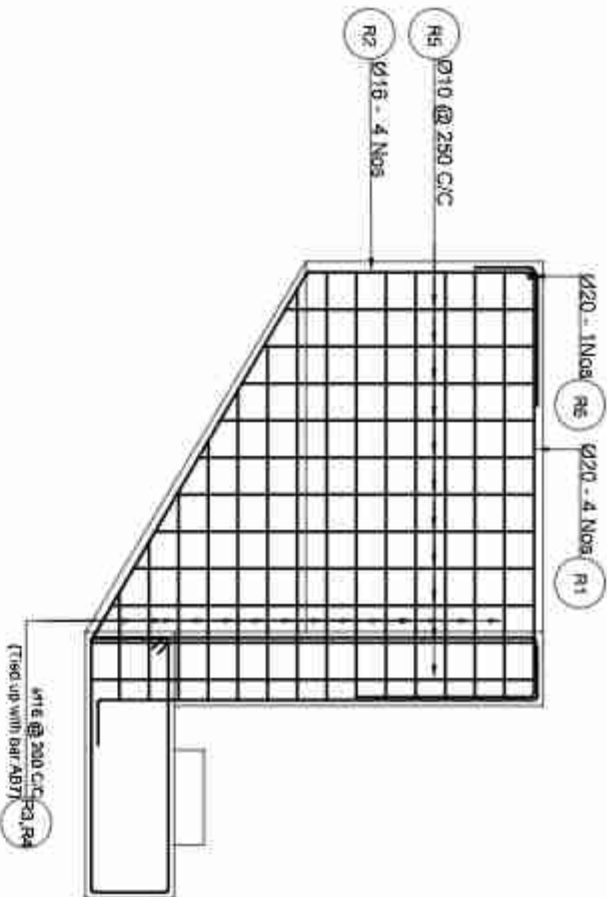
Detailed Drawing

Butwal - Gorusinghe Sector

November,2022

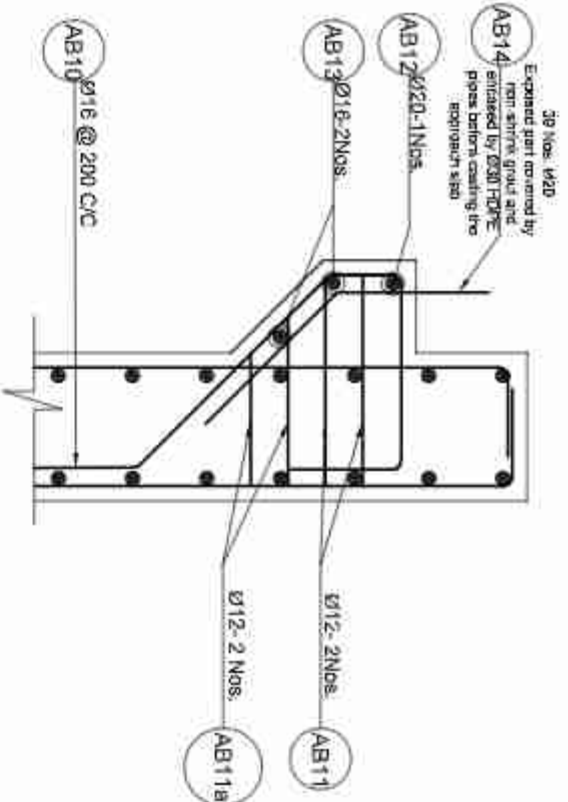


Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP		CONSULTANT: Soosung Engineering Co., Ltd, Korea in association with ERM&C P (Ltd), Nepal and J&K Tech Studio of Engineering		IMPLEMENTING AGENCY: DOR, DCID ROAD NAME: East West Highway (H01) Butwal - Gorusinghe Section		SHEET TITLE: Details of Abutment Left of Tubular Bridge (46/H001/298_A)		SCALE: As Shown		NAME		SIGNATURE		REV NO.		DESCRIPTION		DATE:	
										DESIGNED BY: Saroj Bhattarai								November, 2022	
										CHECKED BY: P. Upadhyaya								DWG. NO.: 298_Tubulars	
										APPROVED BY: Dr. T.H.Choi								SHEET NO.: 15/30	



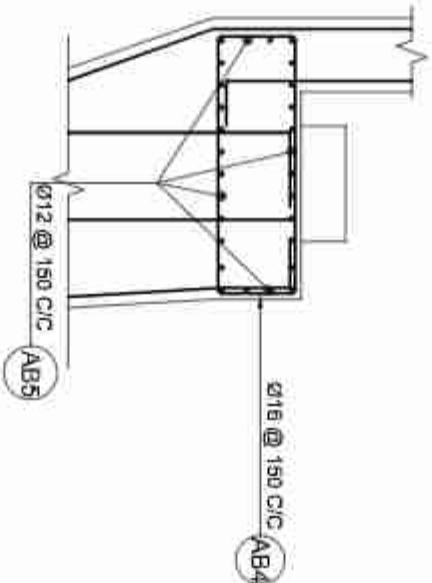
Reinforcement Details Of Wingwall

Scale: 1:50



Detail At A

Scale: 1:20



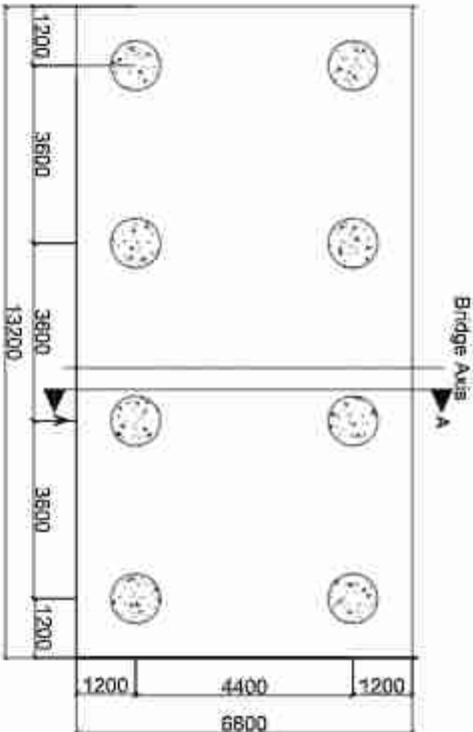
Reinforcement Details Of Abutment

Scale: 1:50

BAR BENDING SCHEDULE FOR WINGWALL						
BAR ID	SHAPE OF BAR (IN mm (NOT TO SCALE))	SPACING (mm)	NO. OF BARS	LENGTH (m)	WEIGHT/LENGTH (kg/m)	TOTAL WEIGHT (kg)
R1		0	20	5.007	2.455	98.794
R2		0	16	5.502	1.578	69.472
R3		200	16	7.356	1.576	206.965
R4		200	16	3.928	1.576	111.596
R5		250	10	6.050	0.617	36.862
R6		0	20	0.307	2.455	1.514
R7		0	10	3.400	0.617	0.000
R8		0	10	1.320	0.617	0.000
TOTAL IN 2 WINGWALL IN ONE ABUTMENT						587.332
TOTAL WEIGHT (IN METRIC TON)						0.587

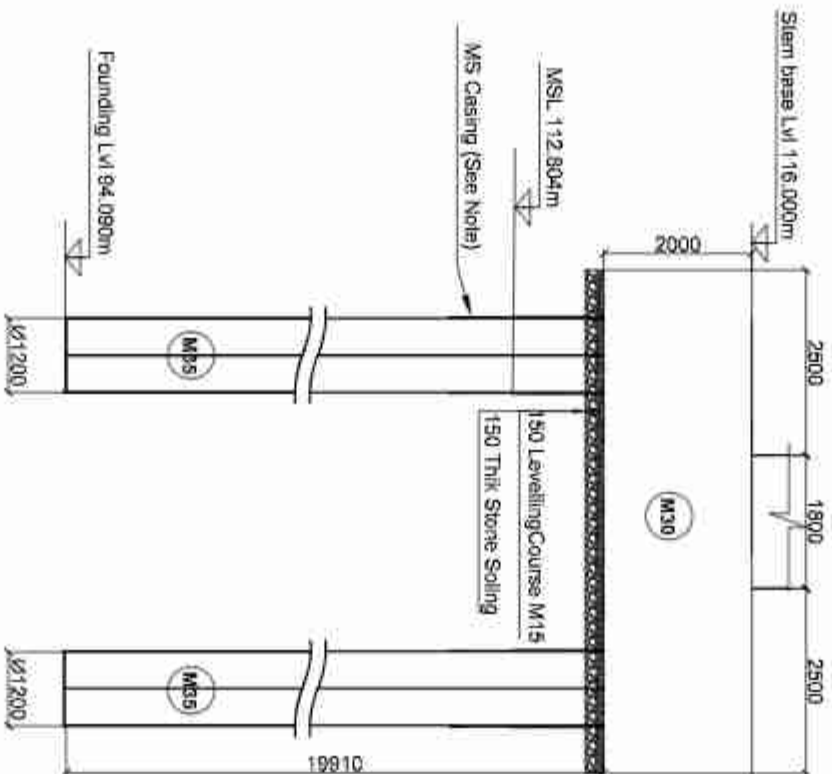
BAR BENDING SCHEDULE OF ABUTMENT						
BAR ID	SHAPE OF BAR (IN mm (NOT TO SCALE))	SPACING (mm)	NO. OF BARS	LENGTH (m)	WEIGHT/LENGTH (kg/m)	TOTAL WEIGHT (kg)
AB1		200 mm c/c	32	5.565	0.575	2190.391
AB1a		-	-	-	-	-
AB2		200 mm c/c	25	0.756	3.853	3985.424
AB2a		At exposure 200 mm c/c	19	0.256	1.576	158.540
AB3		200 mm c/c	16	62	75.370	1.576
AB3a		At exposure 200 mm c/c	16	62	75.370	1.576
AB4		150 mm c/c	16	4.700	1.576	193.416
AB5		150 mm c/c	12	20	11.800	0.886
AB6		150 mm c/c	16	14.6	1.833	1.576
AB7		200 mm c/c	16	99	4.240	1.576
AB8		200 mm c/c	16	59	6.253	1.576
AB8a		200 mm c/c	16	11.800	0.817	0.817
AB9		200 mm c/c	10	15	23.650	0.617
AB10		200 mm c/c	16	54	1.847	1.576
AB11		120	110	1.000	0.886	97.680
AB11a		200	110	0.700	0.886	90.362
AB12		20	1	11.800	2.456	26.807
AB13		16	2	11.800	1.576	36.617
AB14		20	32	0.800	7.496	88.562
TOTAL WEIGHT ABUTMENT KG.						12921.922
TOTAL WEIGHT (IN METRIC TON)						12.922

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:		DATE:	
	Soosung Engineering Co. Ltd, Korea in association with ERM/C P (Ltd), Nepal and Tech Studio of Engineering		DOR, DCID		Reinforcement Details of Wingwall Left of Tubulaya Bridge (AB/H001/298_A)		As Shown		November, 2022	
	ROAD NAME:		East West Highway (H01)						DWG. NO.: 298_Tubulaya	
	Butwal - Gorusinghe Section								SHEET NO.: 17/30	



Plan Of Abutment Piles

Scale:-1:150



Piles Section At A-A

Scale:-1:100

BAR BENDING SCHEDULE OF ABUTMENT PILECAP						
BAR ID	SHAPE OF BAR IN mm (NOT TO SCALE)	SPACING (mm)	Ø OF BARS (mm)	NO. OF BARS	LENGTH (m)	WEIGHT/LENGTH (kg/m)
APC1	1080 6618	160	32	88	9.018	6.313
APC2	1080 6618	160	32	88	9.018	6.313
APC3	1080 13025	200	25	46	15.426	3.853
APC4	980 13025	200	25	46	15.426	3.853
APC5	1170 13025	200	25	46	15.426	3.853
APC6	13050 6630	200	25	46	15.426	3.853
TOTAL IN PILE CAP OF ONE ABUTMENT						
TOTAL WEIGHT IN METRIC TON						17013.354

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	200	32	17	21.890	6.313	2349.380
AP1b	14400 Bundled Bars	200	32	17	14.600	6.313	1688.978
AP2	200 Dia 1034 Pile 125 12.5m From Bottom of Pile Cap	200	32	1	327.210	1.578	516.449
AP3	200 Dia 1034 Pile 150 inside pile cap 150 bridge critical zone	200	32	1	203.730	0.888	180.875
TOTAL IN ONE PILE							4613.690
TOTAL (IN METRIC TON)							4.614
TOTAL IN EIGHT PILES OF ONE ABUTMENT (IN METRIC TON)							36.910

Location	Design Pile Length m	Design Working load on pile (non - seismic cases)kn	Allowable Bearing Capacity on pile (Seismic cases) kn	Allowable Bearing Capacity of the Pile (Non Seismic cases)kn
Abutment	19.81	2463	4786	5922
Pier	0.0	0	0	0

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

For Construction Methodology and Sequence Please See General Notes.

Government of Nepal

Ministry of Physical Infrastructure and Transport

Department of Roads

Project Directorate Office (ADB)

SASSEC Highway Improvement Project-

Project Preparatory Consultant (SHIP-PPC)

ADB Loan No: 3722-NEP

CONSULTANT:

Soosung Engineering Co. Ltd,

Korea In association with

ERM&C P (Ltd), Nepal

and

3095-Tech Studio of Engineering

IMPLEMENTING AGENCY:

DOR, DCID

ROAD NAME:

East West Highway (H01)

Butwal - Gorusinghe Section

SHEET TITLE:

Reinforcement Details of Abutment Piles Left of Tubular Bridge (46/H001/298_A)

SCALE:

As Shown

NAME

Seroj Bhattacharj

SIGNATURE

REV NO.

DESCRIPTION

DATE:

November, 2022

DWG. NO.:

298_Tubulars

SHEET NO.:

1830

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

Tulbuliya Bridge(Right Side)

St. Ch : 603+804.40 ~ End Ch : 603+847.60

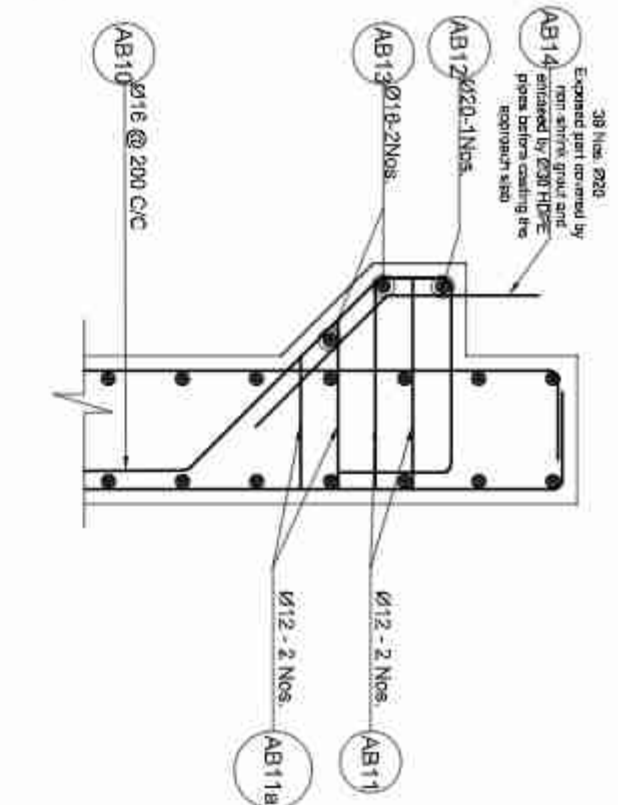
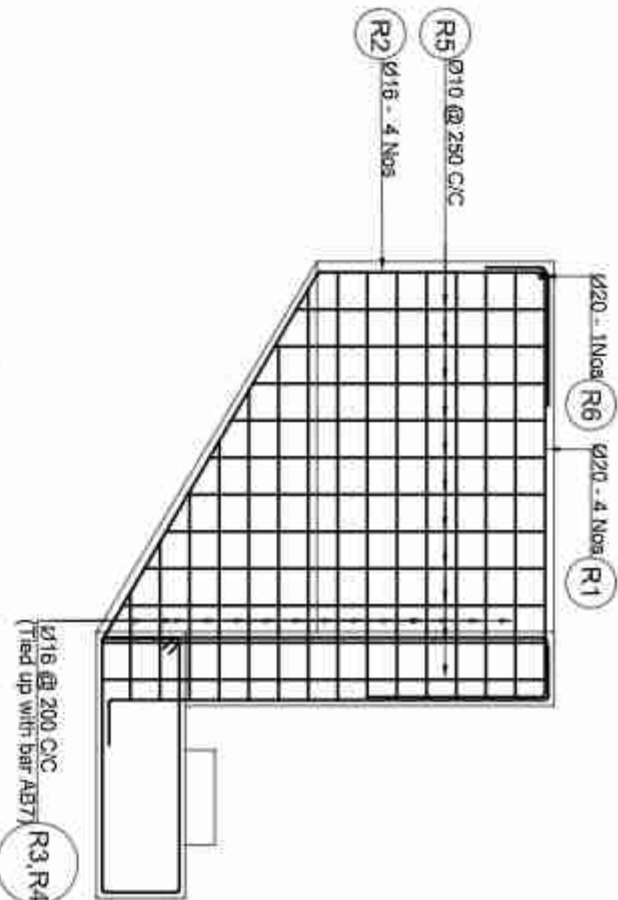
Detailed Drawing

Butwal - Gorusinghe Sector

November,2022

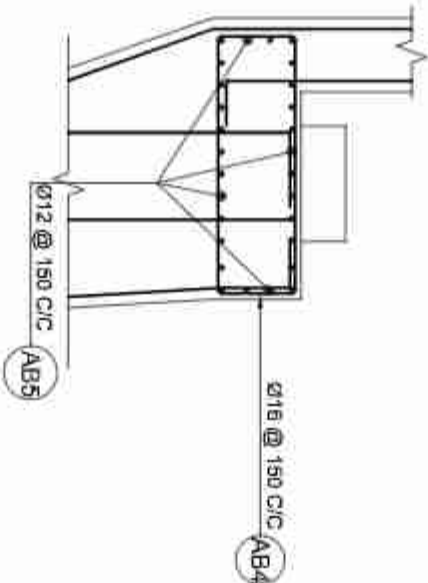


Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparation Consultant (SHIP-PPC) ADB Loan No: 3722-NEP	CONSULTANT:		IMPLEMENTING AGENCY:		SHEET TITLE:		SCALE:				NAME		SIGNATURE		REV NO.		DESCRIPTION		DATE:	
	 Sooosung Engineering Co. Ltd, Korea in association with  ERMC P (Ltd), Nepal and  378c-Tech Studio of Engineering		DOR, DCID ROAD NAME: East West Highway (H01) Buwral - Gorusinghe Section		Reinforcement Details Of Abutment Right of Tulbulya Bridge (4B/H001/288_A)		As Shown		DESIGNED BY:		Saroj Bhattarai								November, 2022	
									CHECKED BY:		P. Upadhyaya								DWG NO.: 313_Tulbulya	
									APPROVED BY:		Dr. T.H.Choi								SHEET NO.: 2030	



Reinforcement Details Of Wingwall

Detail At A

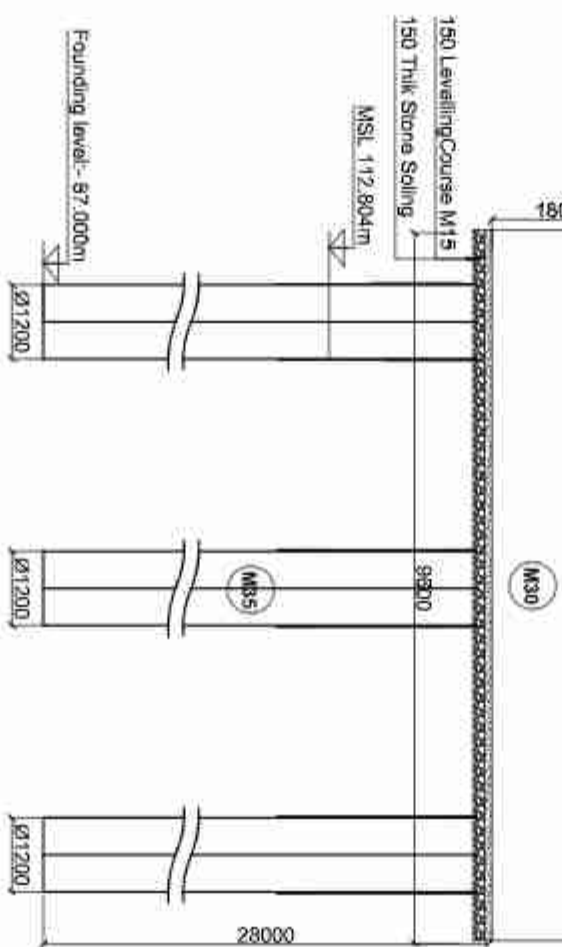
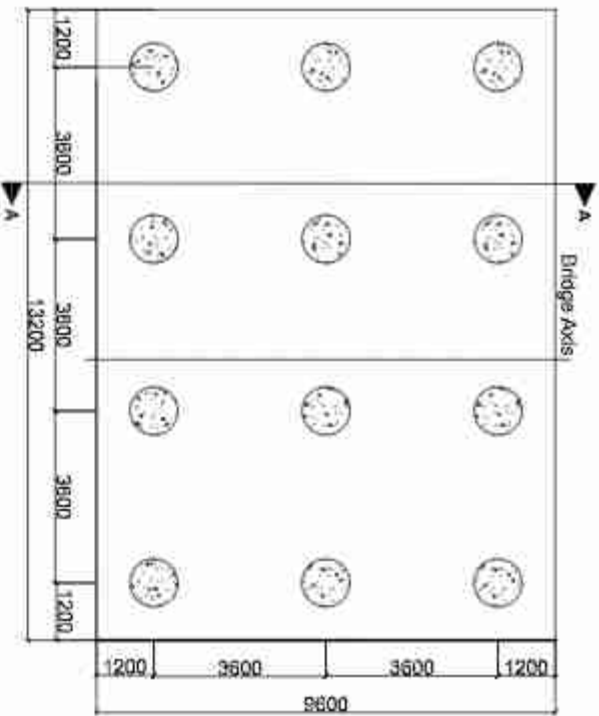


Reinforcement Details Of Abutment

BAR BENDING SCHEDULE FOR WINGWALL						
BAR ID	SHAPE OF BAR IN mm (NOT TO SCALE)	SPACIN G (mm)	# OF BARS (mm)	NO. OF BARS	LENGTH (m)	WEIGHT/LENGTH (kg/m)
R1		0	20	8	5.007	2.466
R2		0	16	8	5.502	1.678
R3		200	16	16	7.356	1.678
R4		200	16	16	3.928	1.678
R5		250	10	26	6.050	0.617
R6		20	20	2	0.307	2.466
R7		10	0	0	3.400	0.617
R8		10	0	0	1.220	0.617
TOTAL IN 2 WINGWALL IN ONE ABUTMENT						587.332
TOTAL WEIGHT (IN METRIC TON)						0.587

BAR BENDING SCHEDULE OF ABUTMENT						
BAR ID	SHAPE OF BAR IN mm (NOT TO SCALE)	SPACIN G (mm)	# OF BARS (mm)	NO. OF BARS	LENGTH (m)	WEIGHT/LENGTH (kg/m)
AB1		180 mm	25	88	7.586	3.852
AB1a		180 mm	25	88	7.586	3.852
AB2		180 mm	32	68	7.766	5.313
AB2a		180 mm	32	68	7.766	5.313
AB3		180 mm	16	12	7.290	1.678
AB3a		180 mm	16	12	7.290	1.678
AB4		180 mm	16	48	75.270	1.678
AB5		180 mm	12	20	11.800	0.886
AB6		180 mm	16	144	1.833	1.678
AB7		180 mm	16	66	4.240	1.678
AB8		180 mm	16	66	6.176	1.678
AB8a		180 mm	16	12	11.800	0.817
AB9		180 mm	10	16	23.650	0.617
AB10		180 mm	16	56	1.847	1.678
AB11		180 mm	12	110	1.000	0.886
AB11a		180 mm	12	110	0.700	0.886
AB12		180 mm	20	1	11.800	2.466
AB13		180 mm	16	2	11.800	1.678
AB14		180 mm	20	32	0.800	7.496
TOTAL WEIGHT ABUTMENT KG.						10420.945
TOTAL WEIGHT (IN METRIC TON)						10.421

Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP		CONSULTANT: Soosung Engineering Co. Ltd, Korea in association with ERM/C P (Ltd), Nepal and Tech Studio of Engineering		IMPLEMENTING AGENCY: DOR, DCID ROAD NAME: East West Highway (H01) Butwal - Gorusinghe Section		SHEET TITLE: Reinforcement Details of Wingwall Right of Tubulaya Bridge (46/H001/298_A)		SCALE: As Shown		DESIGNED BY: Saroj Dhital		CHECKED BY: P. Upadhyaya		APPROVED BY: Dr. T.H. Choi		DATE: November, 2022		DWG. NO.: 298_Tubulaya		SHEET NO.: 21/30	
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BAR BENDING SCHEDULE OF ABUTMENT PILECAP						
BAR ID	SHAPE OF BAR (H/mm (NOT TO SCALE))	SPACING (mm)	Ø OF BARS (mm)	NO. OF BARS	LENGTH (m)	WEIGHT/LENGTH (kg/m)
AP-C1	1080 9425	160	25	67	11.585	3.853
AP-C2	1080 9425	150	25	67	11.585	3.853
AP-C3	1090 13025	200	20	49	15.190	2.466
AP-C4	980 13025	200	20	49	15.190	2.466
AP-C5	1170 1770 Curve length 251 Curve radius 40 Hook length 80	along axis @300 across axis	18	374	2.232	1.578
AP-C6	13050 6630	@300 approx	18	5	45.000	1.578
TOTAL IN PILE CAP OF ONE ABUTMENT					11325.774	
TOTAL WEIGHT IN METRIC TON					11.328	

BAR BENDING SCHEDULE FOR ABUTMENT PILES

BAR ID	SHAPE OF BAR (H/mm (NOT TO SCALE))	SPACING (mm)	Ø OF BARS (mm)	NO. OF BARS	LENGTH (m)	WEIGHT/LENGTH (kg/m)	TOTAL WEIGHT (kg)
AP-1a	Full Length Bars 200 25395 bundle of 2 bars	0	25	20	28.800	3.853	2286.508
AP-1b	Curtailed Bars 200 Bundled Bars	0	25	20	14.900	3.853	1148.304
AP-2	200 Dia: 10x4 Pile: 150 13m From Bottom of pile cap	200	16	1	284.460	1.578	449.006
AP-3	200 Dia: 10x4 Pile: 200 inside pile cap, 200 below critical zone	200	12	1	276.270	0.888	245.277
TOTAL IN ONE PILE					4139.195		
TOTAL (IN METRIC TON)					4.139		
TOTAL IN 12 PILES OF ONE ABUTMENT (IN METRIC TON)					49.670		

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

For Construction Methodology and Sequence Please See General Notes.

Location	Design Pile Length m	Design Working load on pile (non - seismic cases) kn	Allowable Bearing Capacity on pile (Seismic cases) kn	Allowable Bearing Capacity of the Pile (Non Seismic cases) kn
Abutment	28.00	2236	2633	2711
Pier	00.0	0	0	0

Government of Nepal

Ministry of Physical Infrastructure and Transport

Department of Roads

Project Directorate Office (ADB)

SASEC Highway Improvement Project-

Project Preparatory Consultant (SHIP-PPC)

ADB Loan No: 3722-NEP

CONSULTANT:

Soosung Engineering Co., Ltd.

Korea In association with

ERM&C P (Ltd), Nepal

and

3095-Tech Studio of Engineering

IMPLEMENTING AGENCY:

DOR, DCID

ROAD NAME:

East West Highway (H01)

Butwal - Gaurasingha Section

SHEET TITLE:

Reinforcement Details of Abutment Piles of Right Tubular Bridge (46/H-001/298_A)

SCALE:

As Shown

NAME

Saroj Dhital

SIGNATURE

REV NO.

DESCRIPTION

DATE:

November, 2022

DWG. NO.:

298_Tubulars

CHECKED BY:

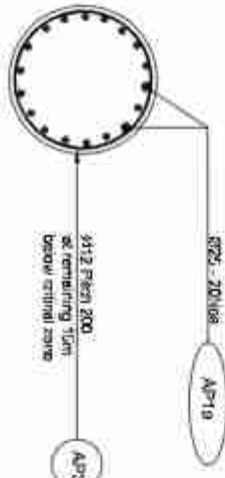
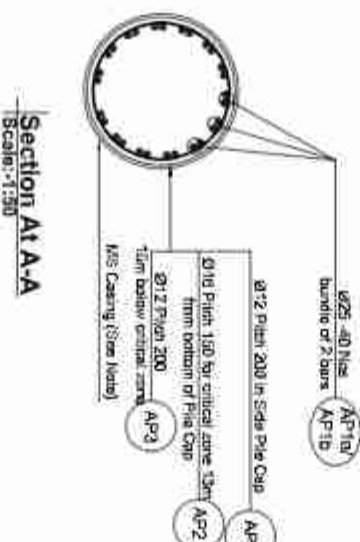
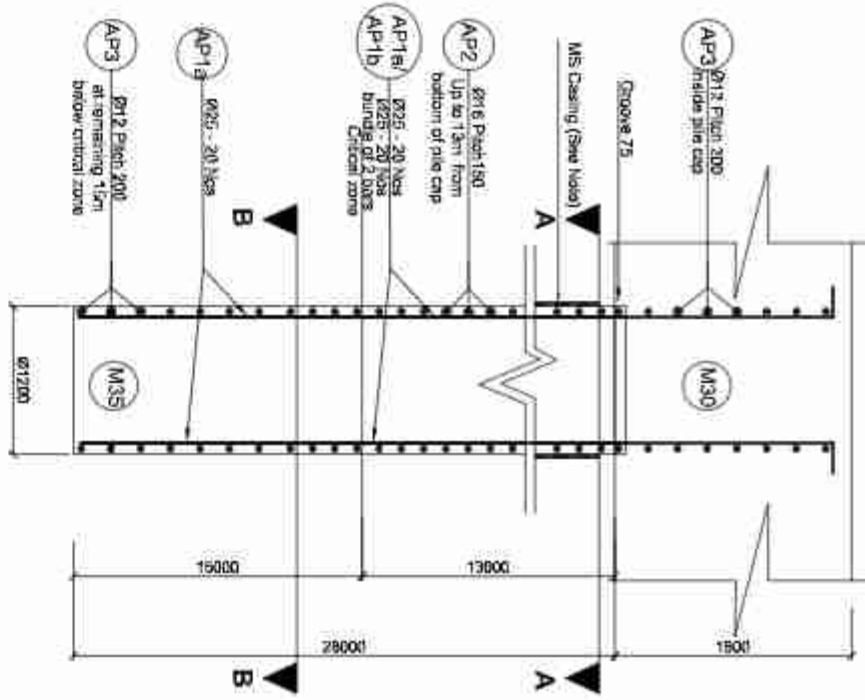
P. Upadhyaya

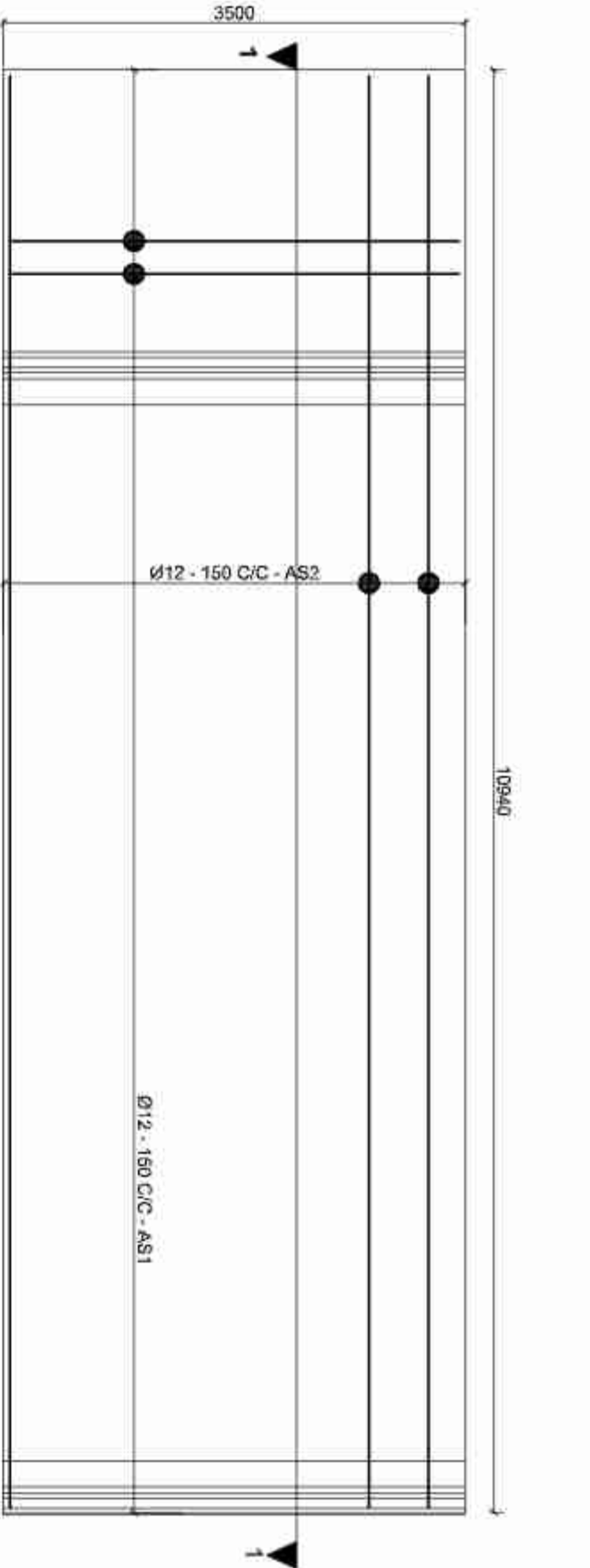
APPROVED BY:

Dr. T.H. Choi

SHEET NO.:

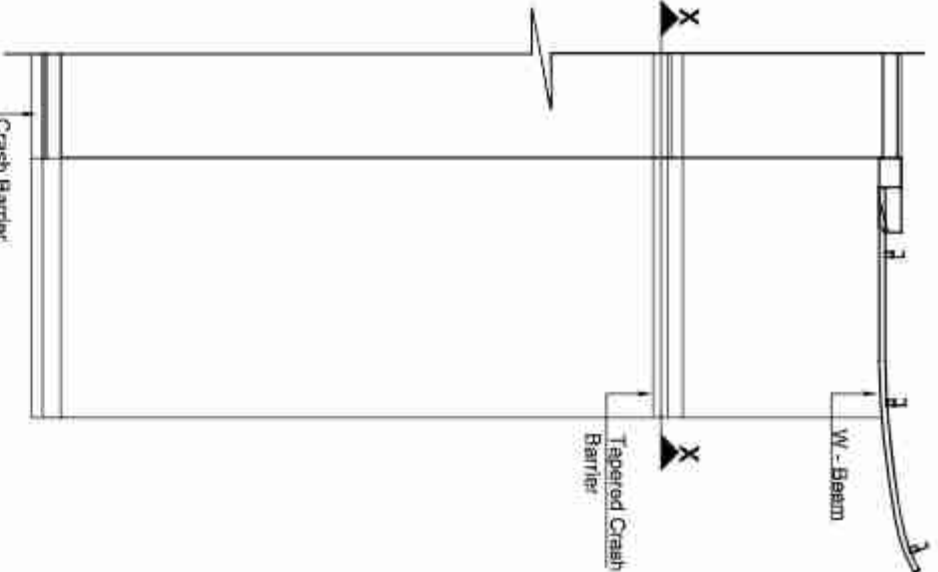
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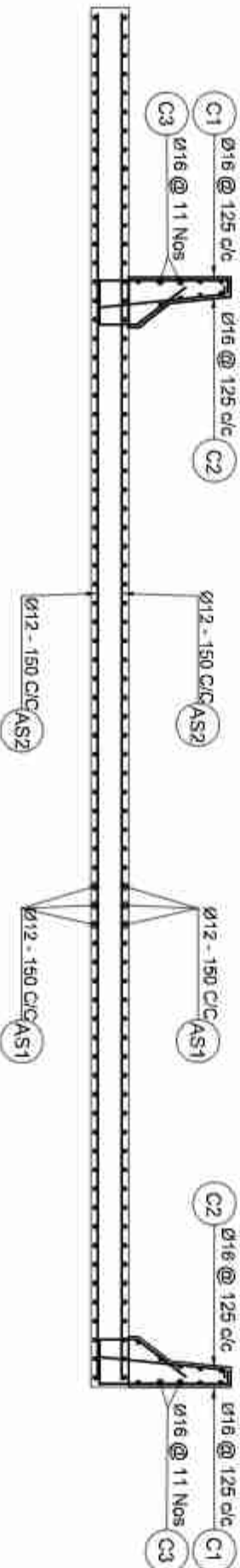
Plan of Reinforcement Details of Approach Slab

Scale:-1:50



Plan of Approach Slab

Not to Scale



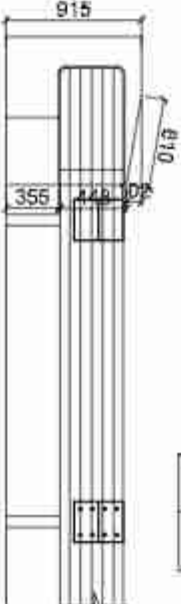
Section at 1-1

Scale:-1:50

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 (kg/m)
AS1	3400	12	148	3.400	0.888
AS2	10850	12	48	10.850	0.888
TOTAL IN ONE APPROACH SLAB					808.124
TOTAL WEIGHT IN METRIC TON					0.808

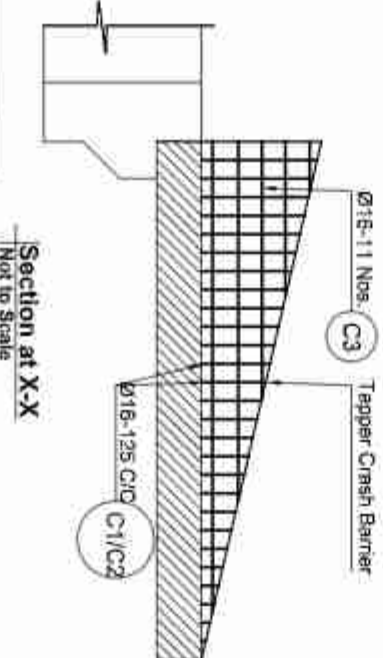
End Block Part Details

Scale:-1:50



Elevation

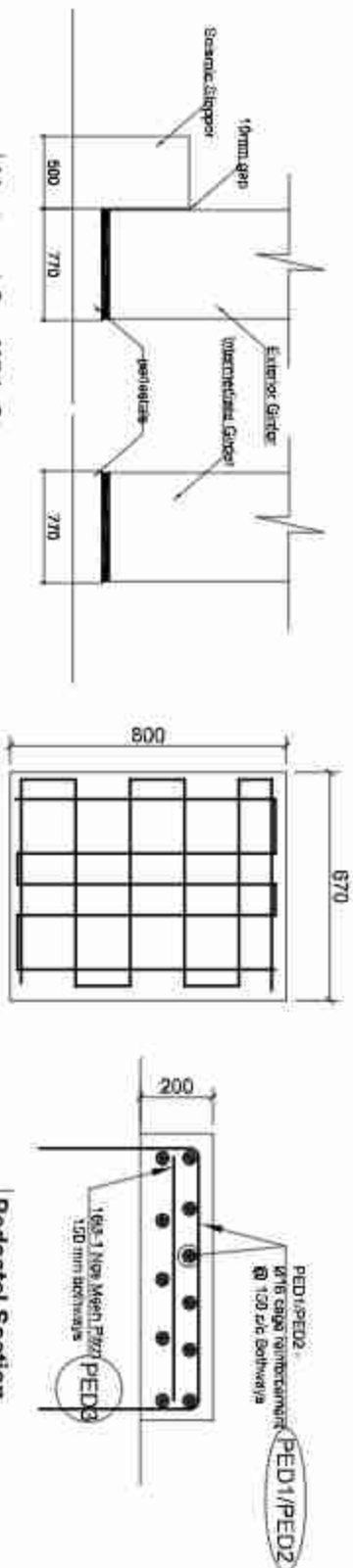
Scale:-1:50



Section at X-X

Not to Scale

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 Soosung Engineering Co., Ltd, Korea in association with		DOR, DCID		Reinforcement Details of Approach Slab of Tulbuliya Bridge (46/H-001/298_A)		As Shown		Saroj Bhattarai								November, 2022		
	ERMIC P (Ltd), Nepal and		ROAD NAME:						P. Upadhyaya								DWG. NO.:		
	80% Tech Studio of Engineering		East West Highway (H01)						CHECKED BY:								298_Tulbuliya		
	Butwal - Gorusinghe Section								APPROVED BY:		Dr. T.H. Choi								
																	SHEET NO.:		
																		2930	



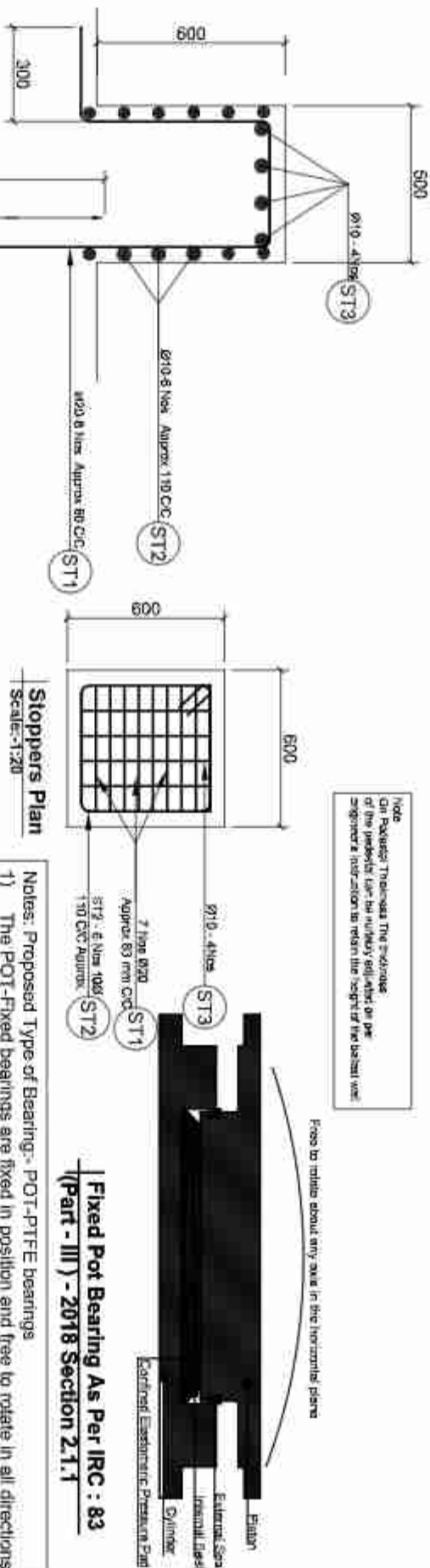
Abutment Cap With Stopper

Scale:-1:50

Pedestal Plan

Scale:-1:20

BAR BENDING SCHEDULE OF PEDESTAL						
BAR ID	SHAPE OF BAR IN mm (NOT TO SCALE)	SPACING G (mm)	# OF BARS (mm)	NO. OF BARS	LENGTH (m)	TOTAL WEIGHT (kg)
PED1		200	16	5	2.960	1.676
PED2		200	16	6	2.830	1.576
PED3		150	16	1	7.540	1.576
TOTAL BAR BENDING SCHEDULE OF PEDESTAL					62.060	
TOTAL WEIGHT (IN METRIC TON)					0.062	



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:

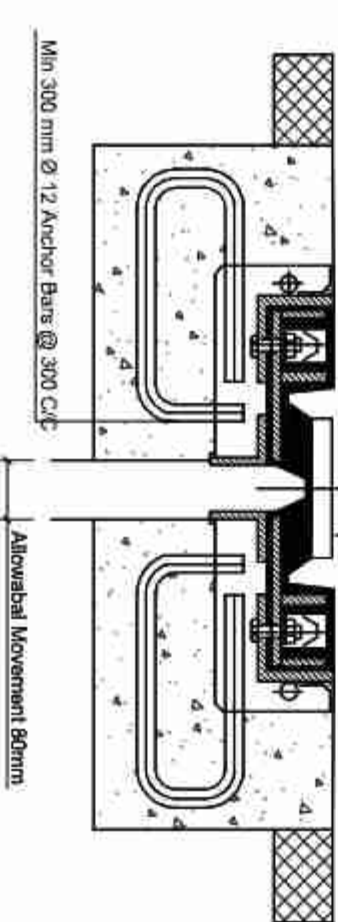
EQ = Earthquake condition
V = Vertical load

HL = Horizontal force along the bridge axis
HT = Horizontal force transverse to bridge axis
 θ = Rotation about transverse axis
 Δ = Maximum longitudinal movement allow

Stoppers Details

Scale:-1:20

Reinforced Elastomeric Pad Assembly as Specified in IRC : SP. 89-2011 (Section 5.2.3)



Reinforced Elastomeric Joint

Scale:-1:10

Design Data for Bearings (POT Bearing)

Load Condition	Items	Load / Displacement/ Moment	
		POT Fixed Bearing	POT PTFE Free Bearing
Under DL only	V, kN	No EQ EQ	1280 1446
	HL, kN	No EQ EQ	66 768
	HT, kN	No EQ EQ	0 346
	θ , rad	No EQ EQ	0.0000 0.0000
	Δ , mm	No EQ EQ	1990 2258
	Under Maximum Live Load	No EQ EQ	208 835
	HL, kN	No EQ EQ	99 113
	HT, kN	No EQ EQ	0 497
	θ , rad	No EQ EQ	0.0003 0.0003
	Δ , mm	No EQ EQ	1990 2258

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

CONSULTANT:

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

Soosung Engineering Co., Ltd.,
Korea in association with
ERMIC P (Ltd), Nepal
and
3095-Tech Studio of Engineering

IMPLEMENTING AGENCY:

DOR, DCID
ROAD NAME:
East West Highway (H01)

Miscellaneous Details-Z
of
Tubulys Bridge
(46/H-001/298_A)

SCALE:

As Shown

Butwal - Gorusinghe Section

NAME

Seraj Bhattacharj

SIGNATURE

REV NO.

1

DATE:

November, 2022

DWG. NO.:

298_Tubulys

CHECKED BY:

P. Upadhyaya

APPROVED BY:

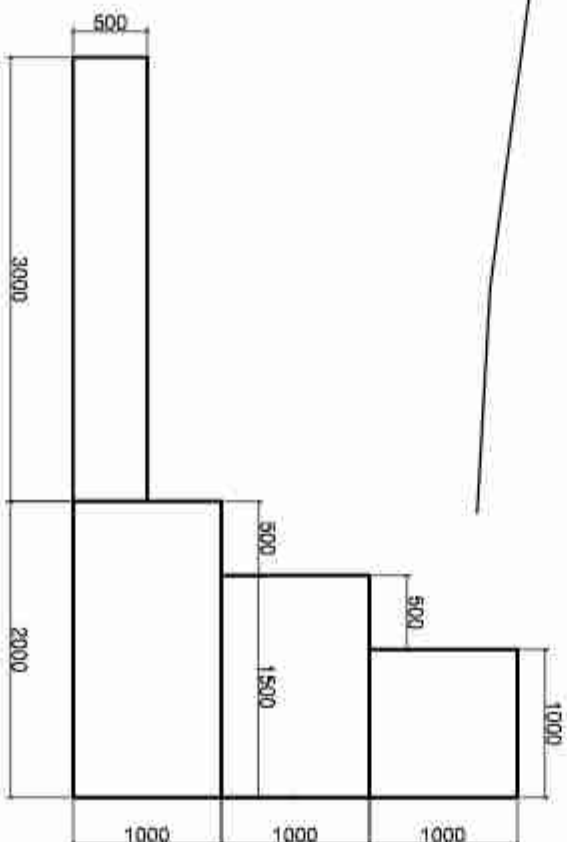
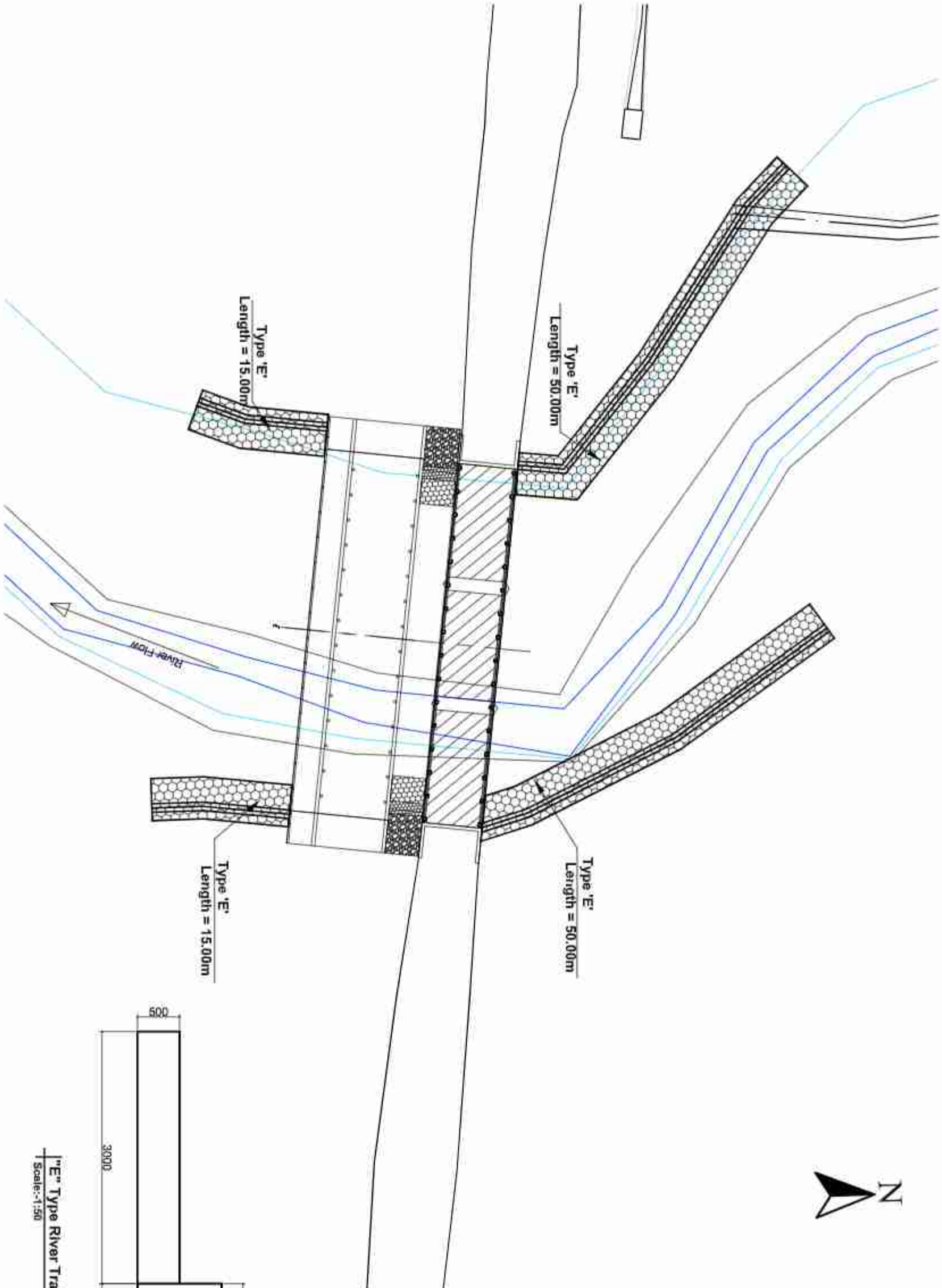
Dr. T.H. Choi

SHEET NO.:

26/30

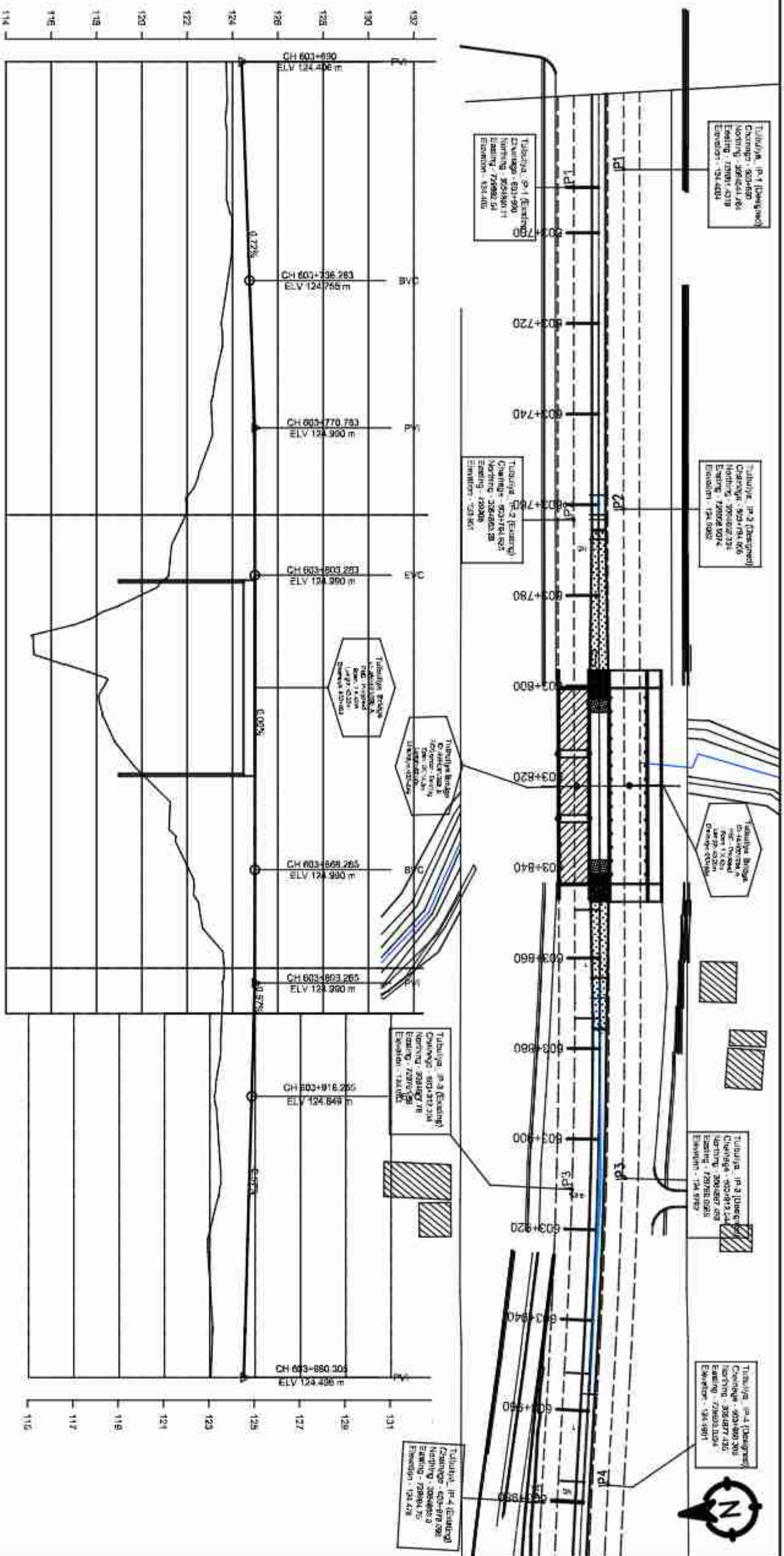
Guided Pot Bearing(For free Bearing) Movement Allowed in to longitudinal Direction As Per IRC : 83 (Part - III) - 2018 Section 2.1.3





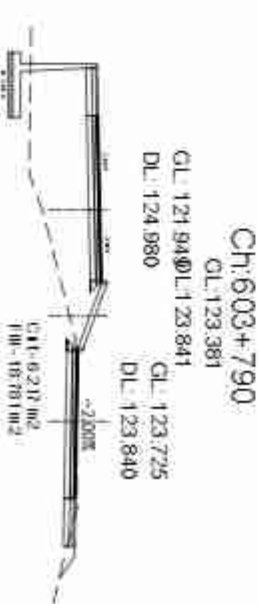
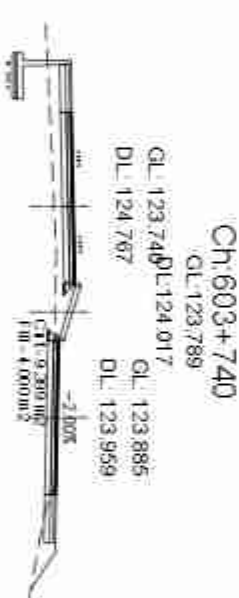
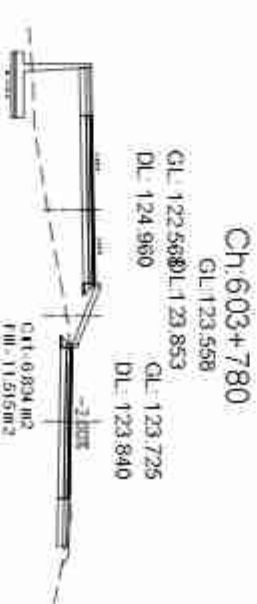
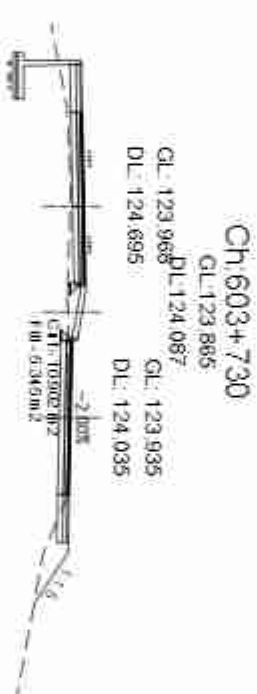
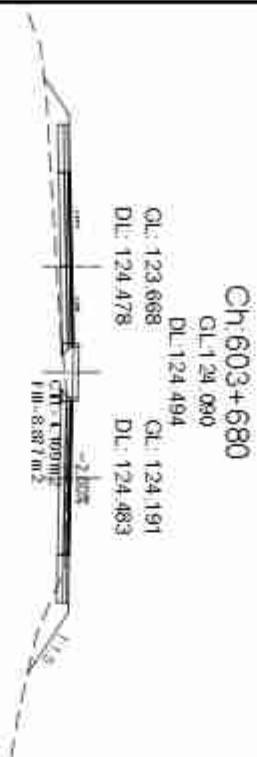
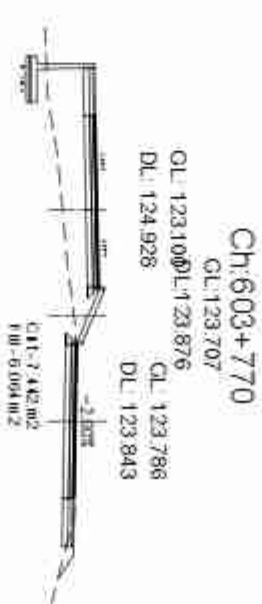
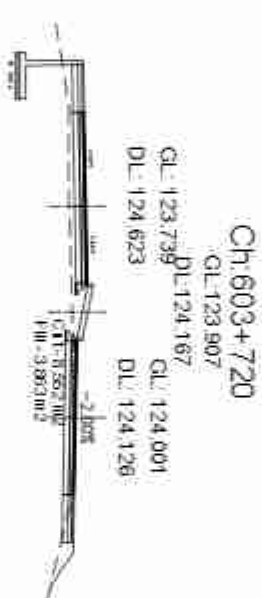
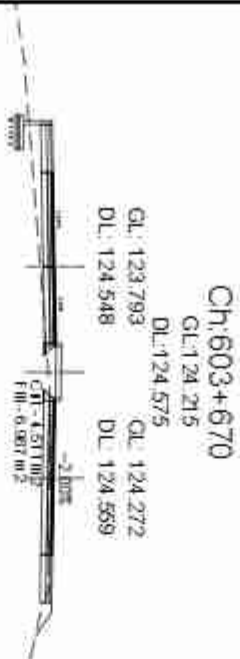
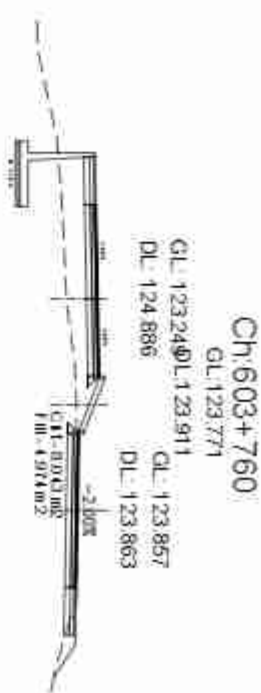
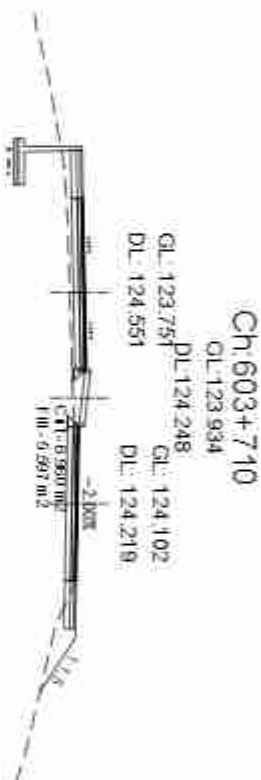
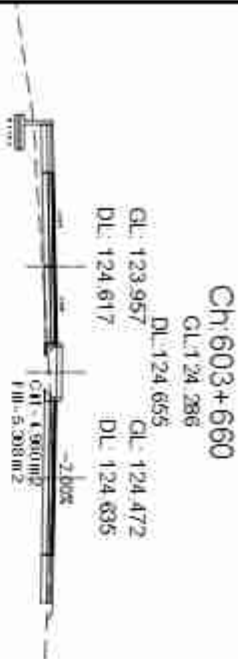
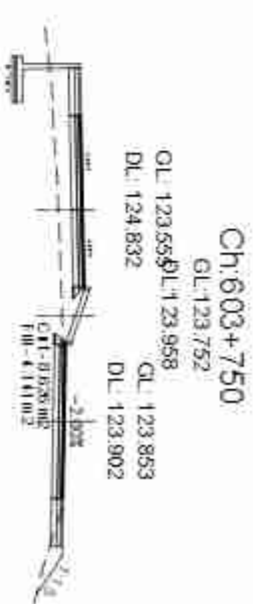
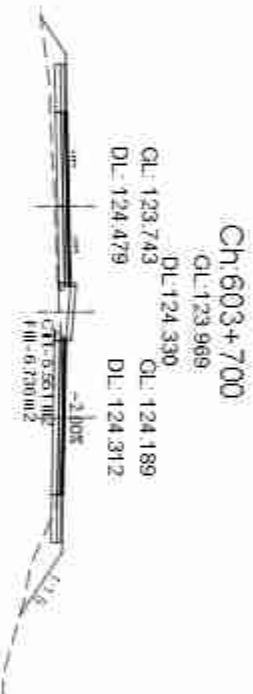
"E" Type River Training Structure
Scale:-1:50

Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP	CONSULTANT:  Soosung Engineering Co. Ltd, Korea in association with ERM&C P (Ltd), Nepal and  J&S Tech Studio of Engineering	IMPLEMENTING AGENCY: DOR, DCID	SHEET TITLE: River Training Work of Tubuliyas Bridge (46/H-001/298_A)	SCALE: As Shown	DESIGNED BY:	Saroj Bhatnagar	SIGNATURE 	REV NO.	DESCRIPTION	DATE:	November , 2022
					CHECKED BY:	P. Upadhyaya				DWG. NO.:	298_Tubuliyas
					APPROVED BY:	Dr. T.H. Choi				SHEET NO.:	26/30

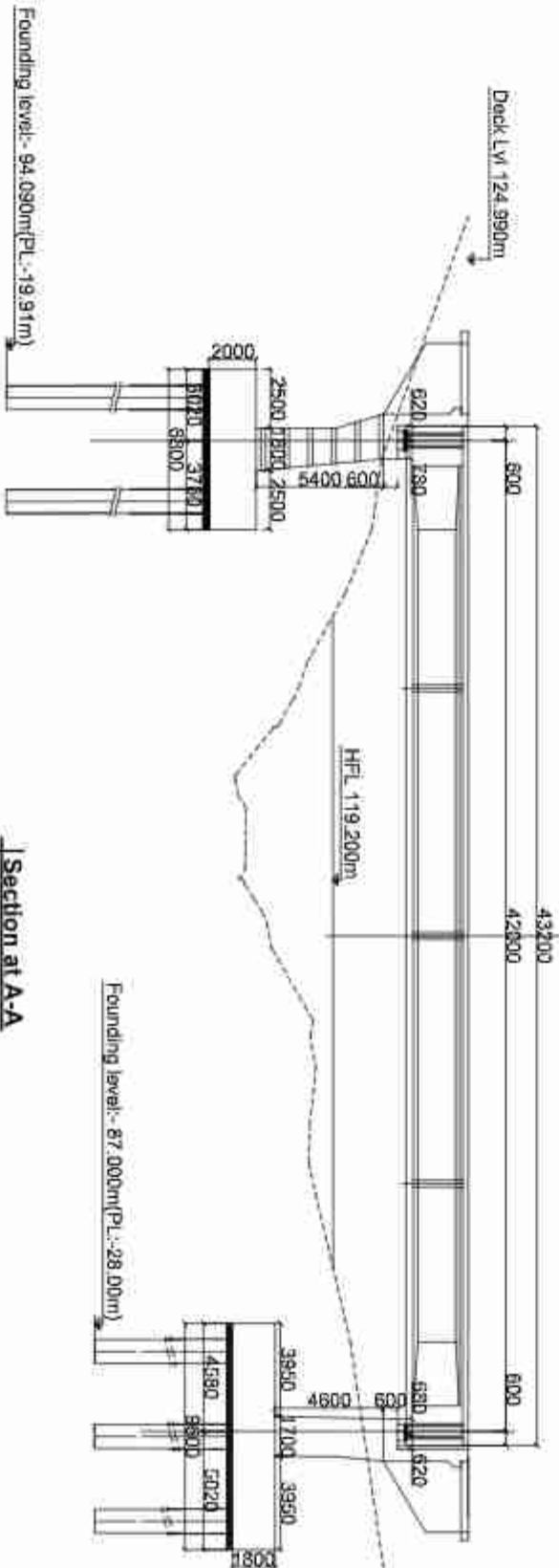
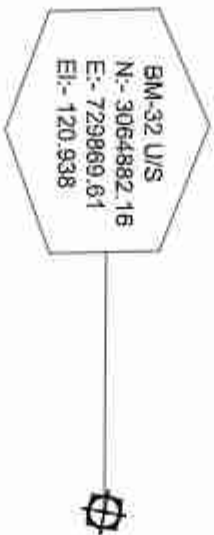
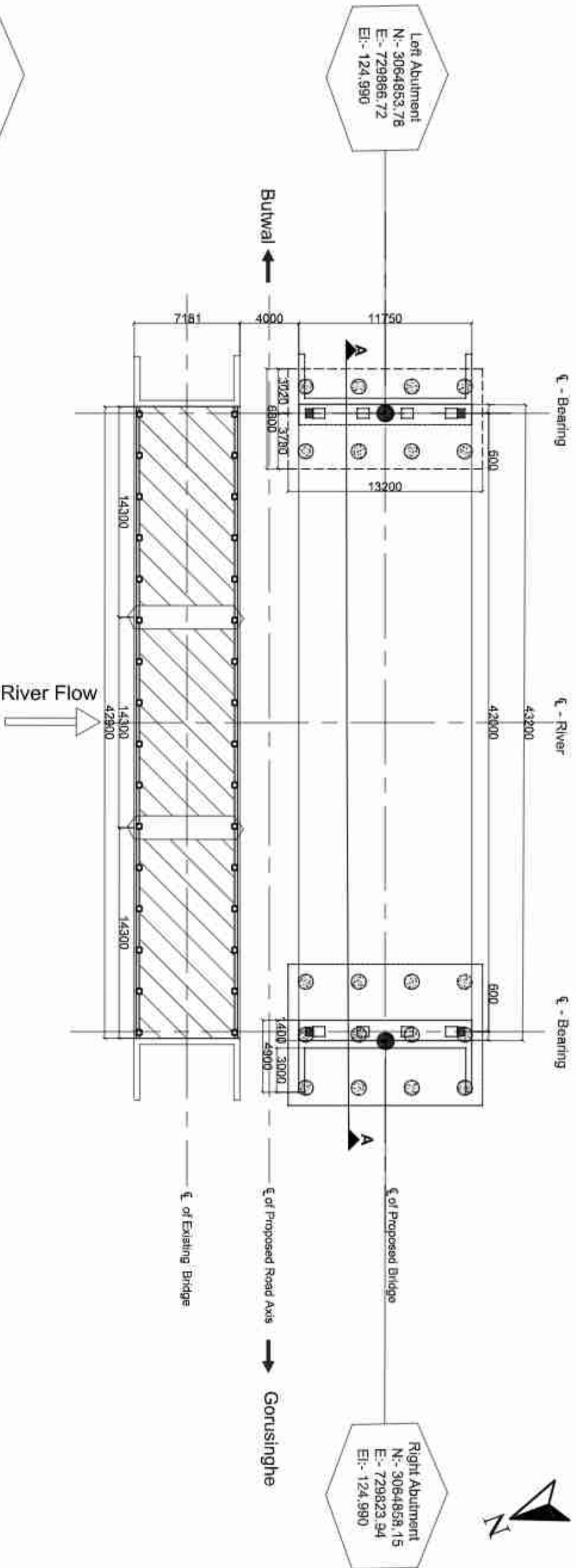


DESIGN LEVEL(m)	EXISTING LEVEL(m)	HORIZONTAL ALIGNMENT		SUPER ELEVATION	CHAINAGE(Km)
		RIGHT	LEFT		
124.408	123.723	R=180.00	R=180.00	NC	603+680
124.478	123.743				603+700
124.551	123.751				603+710
124.523	123.738				603+720
124.595	123.888				603+730
124.767	123.740				603+740
124.832	123.555				603+750
124.536	123.249				603+760
124.928	123.100				603+770
124.980	122.587				603+780
124.988	121.947	R=180.00	R=180.00	NC	603+790
124.990	121.245				603+800
124.990	118.996				603+810
124.990	115.234				603+820
124.990	115.093				603+830
124.990	116.803				603+840
124.990	120.586				603+850
124.990	121.326				603+860
124.990	122.249				603+870
124.962	122.840				603+880
124.983	123.643	R=180.00	R=180.00	NC	603+890
124.983	123.734				603+900
124.592	123.446				603+910
124.599	123.248				603+920
124.782	123.416				603+930
124.728	123.401				603+940
124.589	122.908				603+950
124.813	123.011				603+960
124.558	123.128				603+970
124.408	123.477				603+980

Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP		CONSULTANT: Soosung Engineering Co., Ltd. Korea in association with ERM P (Ltd), Nepal and TSE-Tech Studio of Engineering		IMPLEMENTING AGENCY: DOR, DCID ROAD NAME: East West Highway (H01) Butwal - Gorunagile Section		SHEET TITLE: Plan & Profile of Tubuliyu Bridge 603+680-603+980		SCALE: Vertical Scale: 1:1000 Horizontal Scale: 1:1000		DESIGNED BY: Saroj Bhudhara	SIGNATURE	REV NO.	DESCRIPTION	DATE: November, 2022
										CHECKED BY: P. Upadhyaya				DWG. NO.: 298 - Tubuliyu
										APPROVED BY: Dr. T.H. Choi				SHEET NO.: 27/30



Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHP-PPC) ADB Loan No: 3722-NEP	CONSULTANT:  Soosung Engineering Co. Ltd., Korea in association with ERM Co. P (Ltd), Nepal and  TSE Tech Studio of Engineering	IMPLEMENTING AGENCY: DOR, DQAD	SHEET TITLE: Cross Section of Ch 603+650 - 603+790	SCALE:  Vertical Scale  Horizontal Scale	DESIGNED BY:	NAME	SIGNATURE	REV. NO.	DESCRIPTION	DATE:
					SAJOI BHATTARAI				November, 2022	
					CHECKED BY:	P. Upadhyaya				DWG. NO.: 208_ Tubuliyva
					APPROVED BY:	Dr. T.H. Chel				SHEET NO. 28.100



Section at A-A
Scale:-1:300

Layout Plan
Scale:-1:300

Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP	CONSULTANT:  Soosung Engineering Co. Ltd. Korea In association with ERMCo P (Ltd) and JSP- Tech Studio of Engineering Nepal	IMPLEMENTING AGENCY: DOR, DCID	SHEET TITLE:	SCALE:																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																</
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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

Marthirwa Bridge(46-H001-299_A)

St. Ch : 604+673.15 ~ End Ch : 604+690.85

Detailed Drawing

Butwal - Gorusinghe Sector

November, 2022

CONTENTS

S.No.	DESCRIPTION	DWG. NO	NO. OF SHEETS
1.	General Notes.	1 - 2	2
2.	Topographic Map.	3	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:

For raised footpaths:

For main girders and cross girders of superstructure with PSC girders:

For main girders and cross girders of superstructure with RCC girders:

For substructure: Abutment stem, ballast wall, stoppers, bearing pedestals,

pier cap, pier stem and pile caps:

For bored and cast in situ piles:

For leveling course:

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:

Prestressing ducts or strands in superstructure:

All components of abutment, pier, pile caps and piles

(except stoppers and bearing pedestals):

Bearing pedestals and Stoppers:

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

Notes on Reinforcement

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

Notes on Prestressing

- Prestressing strands shall be Class-2, uncoated 7 ply, low relaxation type with ultimate tensile stress 1862 N/mm², conforming to IS:14268.
- The diameter of strands, their number in a tendon and the total jacking force to be applied is specified in the respective drawing sheet. All the initial and long term losses are already incorporated in design.
- Corrugated HDPE Sheathing ducts shall be used with the minimum internal diameter not less than three times the cross sectional area of the tendon. The wall thickness and other properties of the sheathing shall be as per IRC:112-2020, clause 13.4.3
- The specified profile and the alignment of the ducts shall be strictly maintained by properly securing the ducts to the re-bars. If required, pieces of re-bars can be added or the re-bars slightly repositioned or bent to maintain the profile and alignment, with approval of the engineer-in-charge.
- The jacking equipment shall be fitted with appropriate force measuring device and shall be regularly checked and calibrated as prescribed by the manufacturer.
- Jacking shall be done from both ends simultaneously and gradually, recording the elongation both sides. The expected final elongation mentioned in the respective drawings sheet is based on modulus of elasticity of the strands (Es) equal to 1.95X10⁵ MPa. If the Es of supplied strands is different then the elongation values shall be recalculated by multiplying the Design values of elongation by the ratio of Design Es / Actual Es.
- In case the total elongation is not achieved at the prescribed jacking force, the jacking operation can be continued until the force reaches the maximum allowable value. If the required elongation is achieved at jacking force lower than the prescribed value, the jacking operation shall continue until the prescribed force is reached, provided the Sum of the additional elongations thus achieved is not more than 5% of the sum of the prescribed elongations.
- In adverse condition to any of the cases above, the jacking operation shall be stopped, the tendons removed and this matter reported to the engineer-in-charge for further instruction. The jacking force should NEVER exceed the Maximum allowable value.

Grouting

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

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					DOR, DCID						
					ROAD NAME:						
		East West Highway (H01)		general note of Marthawa Bridge (48+1001/299_A)	As Shown	Designed by:					DWG NO.: 299_Marthawa
		Checked by:				P. Upadhyaya					
		Approved by:				Dr. T.H.Choi					
		Butwal - Goruinghe Section									

- 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-PTE bearings, as the case applies.

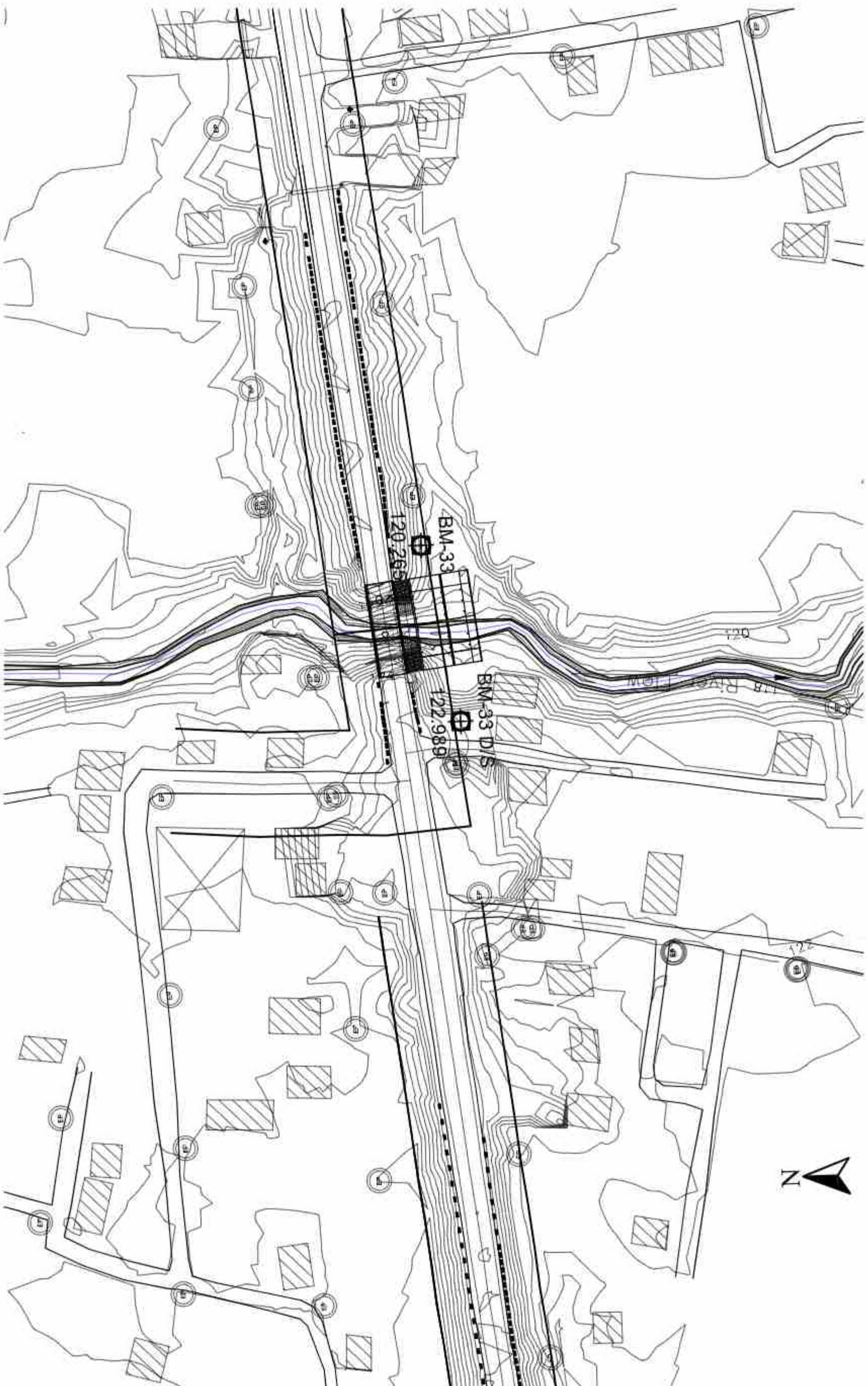
Notes on Foundation and Substructure

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

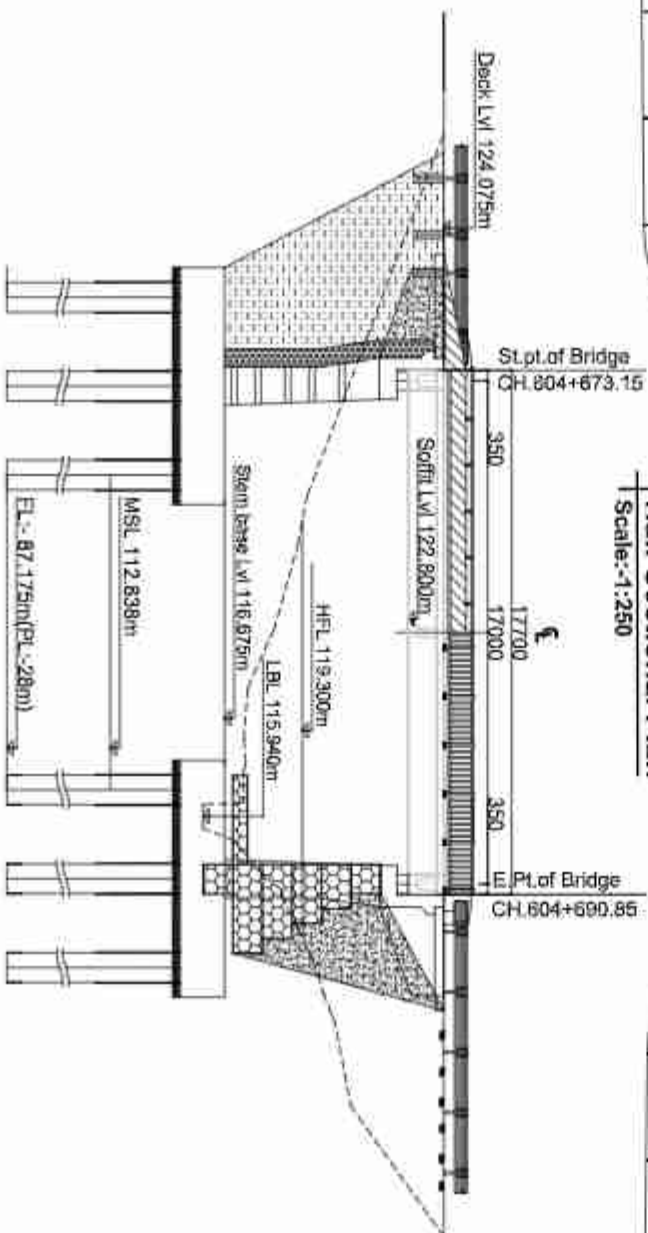
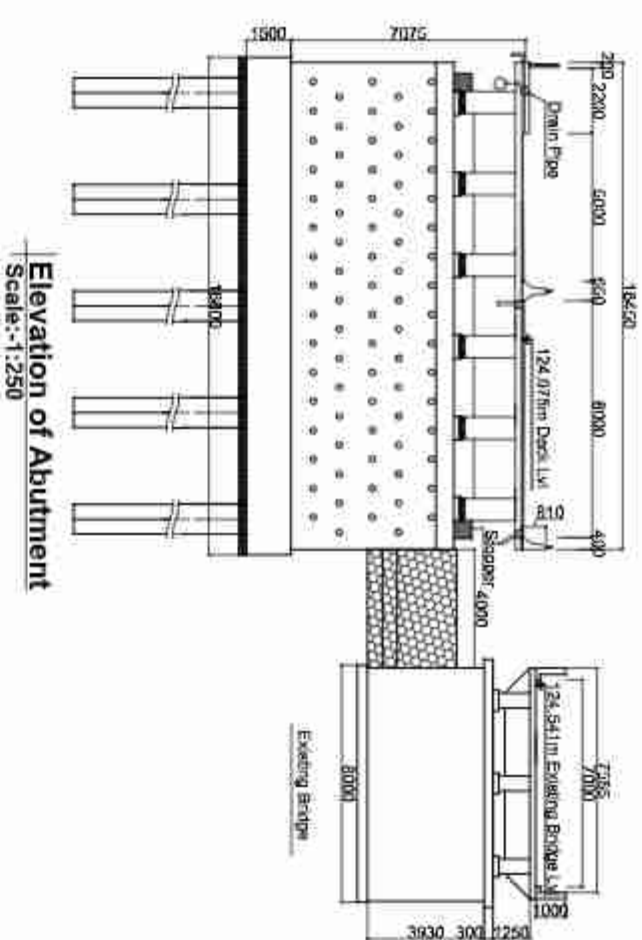
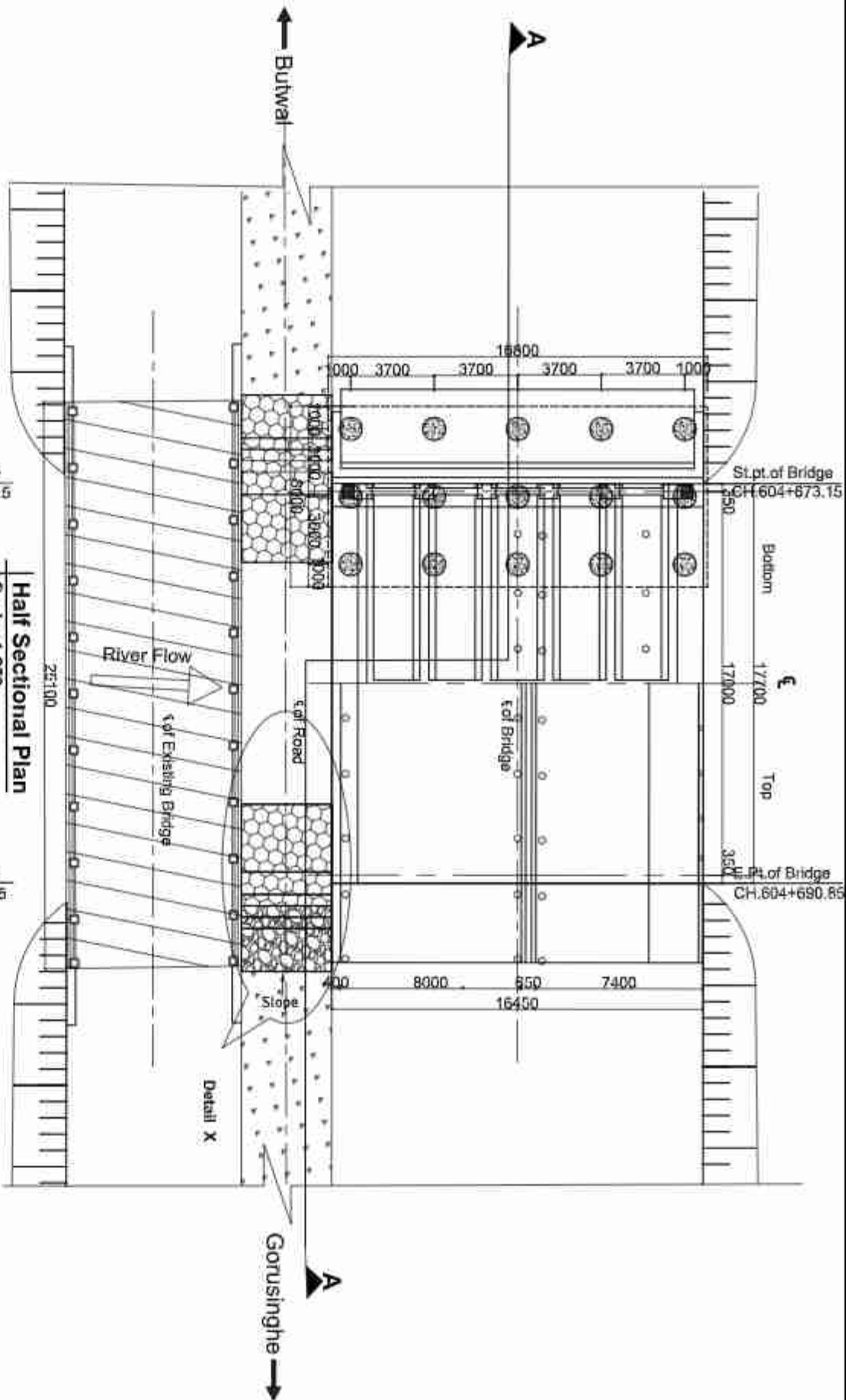
General Note: (For all Pile Foundation)

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

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		DOR, DCID	General Notes: of Marthawa Bridge (48/H001/299_A)	As Shown	Designed by:	Seroj Bhattacharai					November , 2022	
		ROAD NAME:			Checked by:	P. Upadhyaya					DWG. NO.:	
		East West Highway (H01)			Approved by:	Dr. T.H. Choi					299_Marthawa	
		Butwal - Gorusinghe Section									SHEET NO.:	
												02/23



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ROAD NAME: East West Highway (H01)		Butwal - Gorusinghe Section		Designed by: Sernj Bhettarel		Checked by: P. Upadhyaya		Approved by: Dr. T.H.Chel		DWG.NO.: 298_Marthwa		SHEET NO.: 03/23			



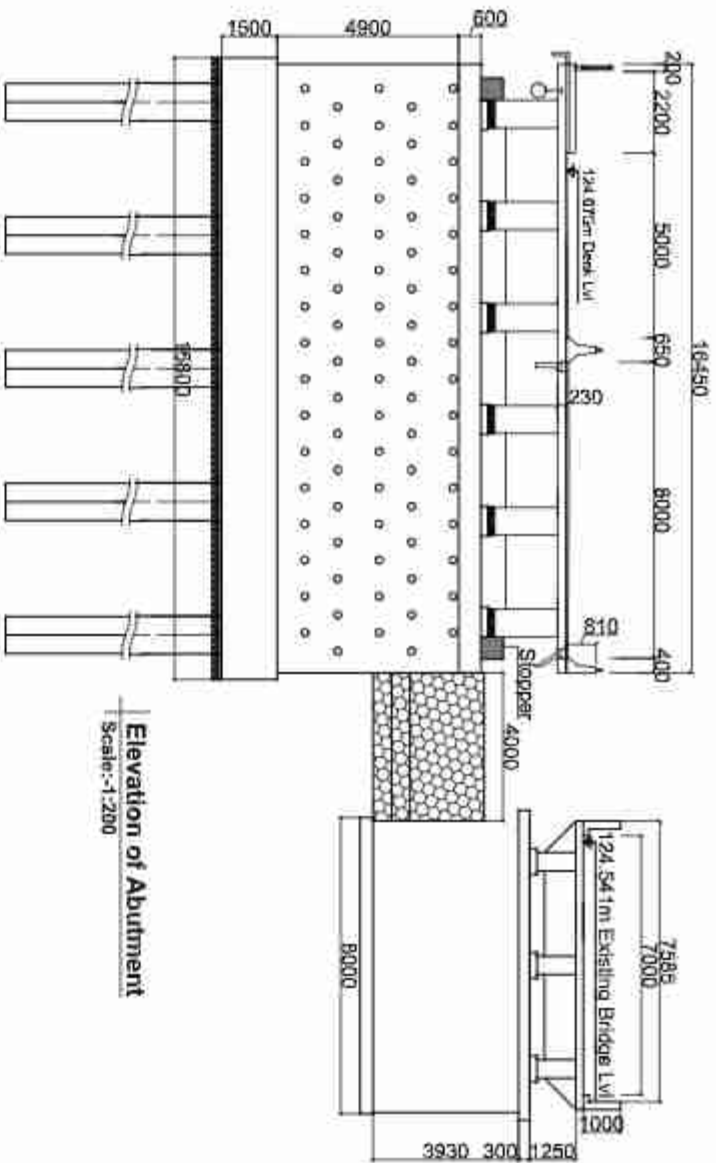
Note :-
MSL :- Maximum Scour Level
HFL :- High Flood Level
LBL :- Lowest Bed Level
RL :- Reduced Level
PL :- Pile Length
FL :- Founding Level

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 804)	
Hydrologist	Dr. P.C. Jha (Civil A 166) / S. Adhikari (Civil A 408)	
Geotechnical Engineer	A. Adhikari (A 199) / Dr. V. R. S. Shahi	

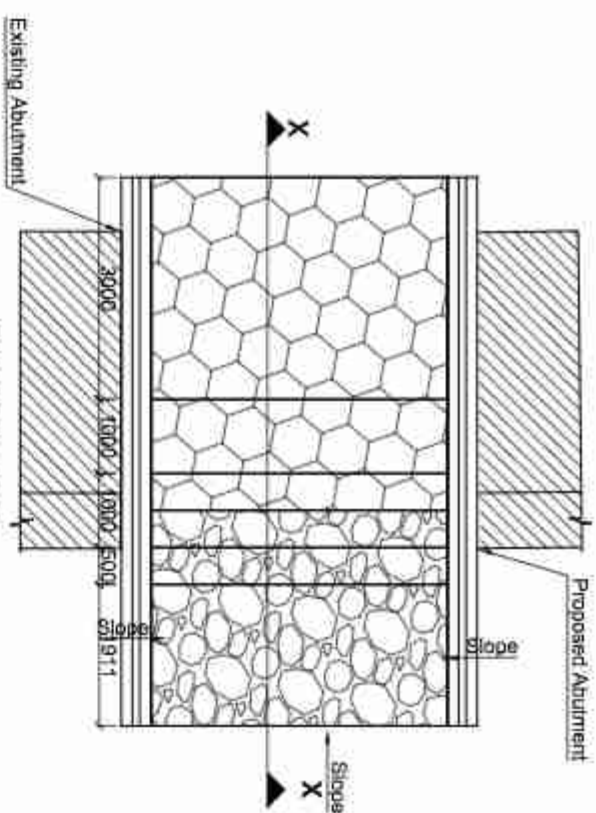
Half Sectional Elevation

Scale: 1:250

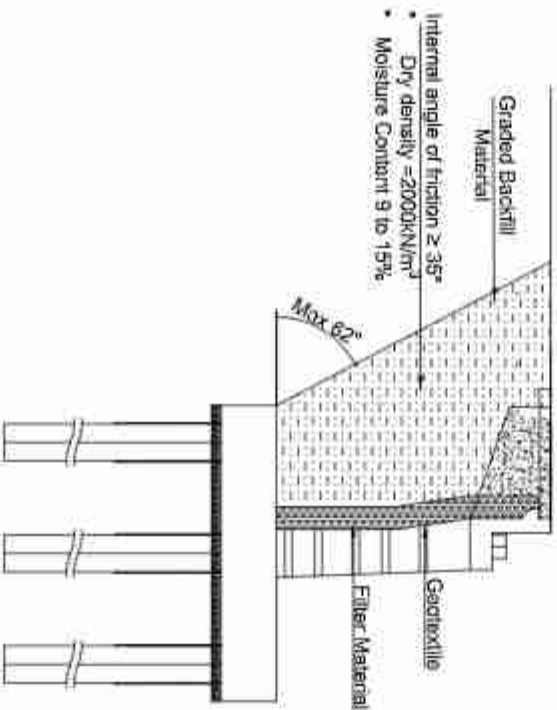
Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP		CONSULTANT: Soosung Engineering Co. Ltd. In association with ERMPC P (Ltd) and JSP- Tech Studio of Engineering Nepal		IMPLEMENTING AGENCY: DOR, DCID ROAD NAME: East West Highway (H01) Butwal - Gorusinghe Section		SHEET TITLE: General Arrangement of Marthiya Bridge (46/H001/299_A)		SCALE: 1:300		NAME		SIGNATURE		REV NO.		DESCRIPTION		DATE: November, 2022		DWG. NO.: 299_Marthiya		SHEET NO.: 04/23	
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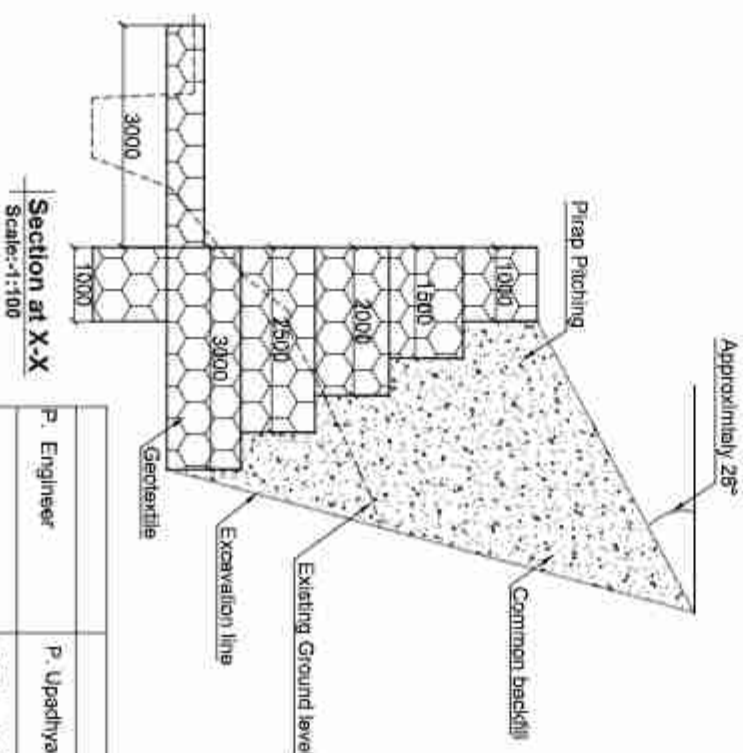
Elevation of Abutment
Scale: 1:200



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



Detail of A
Scale: 1:200



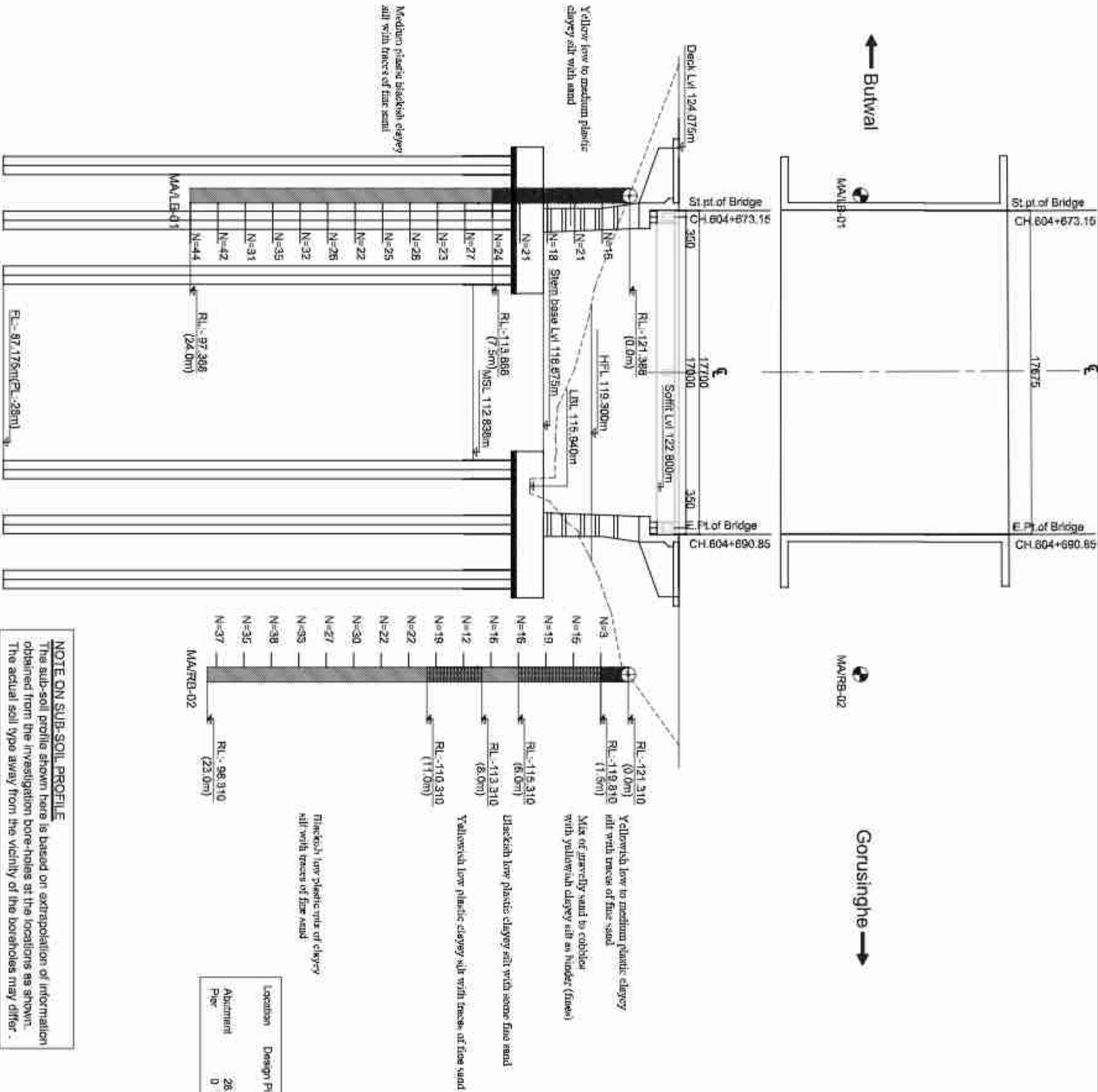
Section at X-X
Scale: 1:100

Name/(NEC Number)		Signature
P. Engineer	P. Upadhyaya (Civil A 675)	
Structure Engineer	K.P. Wagle/Civil A 127 / P. Shrestha/Civil A 675 / S. Bhattarai (Civil A 904)	
Hydrologist	Dr. P.C. Jha/Civil A 165 / S. Adhikari (Civil A 405)	
Geotechnical Engineer	A. Adhikari (Ka 159) / Dr. V. R. S. Shahi	

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									Designed by:		Saroj Bhattarai						November, 2022	
									Checked by:		P. Upadhyaya						DWG. NO.:	
									Approved by:		Dr. T.H. Choi						SHEET NO.:	

Borehole No : MA/LB-1
Easting : 83° 19' 19.85"
Northing : 27° 41' 17.85"
Elevation, m : 121.388
Borehole No : MA/RB-2
Easting : 83° 19' 18.89"
Northing : 27° 41' 17.92"
Elevation, m : 121.310

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

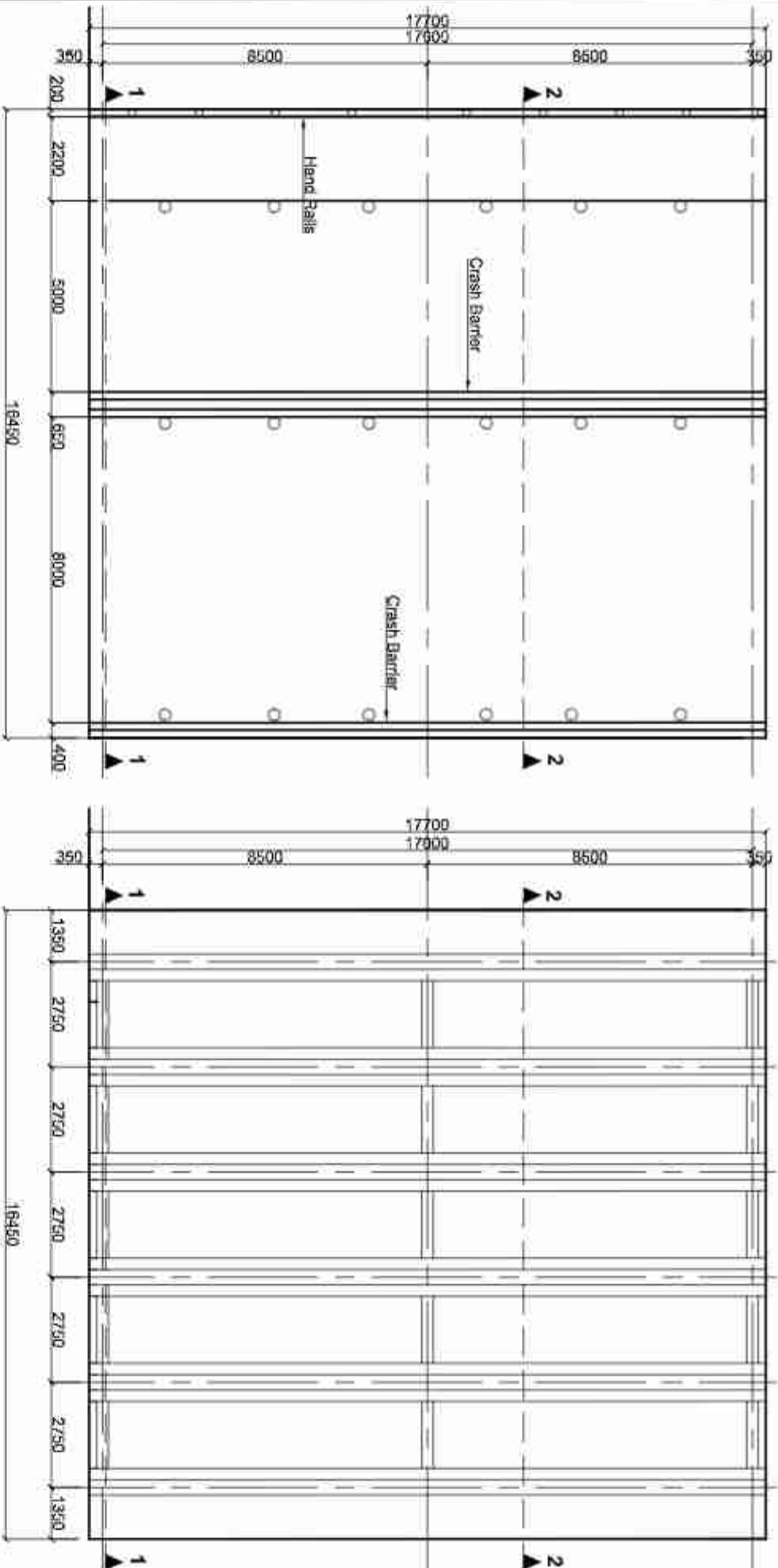


NOTE ON SUB-SOIL PROFILE
The sub-soil profile shown here is based on extrapolation of information obtained from the investigation bore-holes at the locations as shown. The actual soil type away from the vicinity of the boreholes may differ.

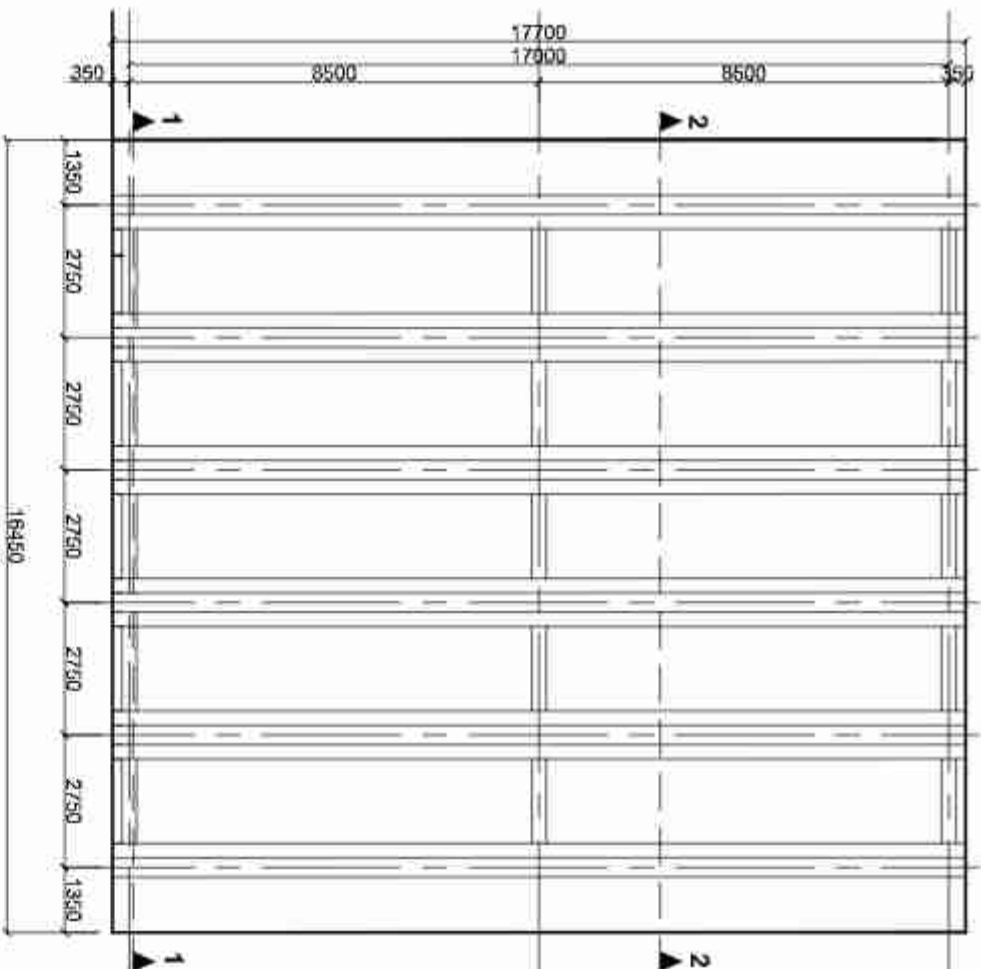
Location	Design Pile Length m	Design Working load on pile (non - seismic case) kn	Allowable Bearing Capacity on pile (Scour case) kn	Allowable Bearing Capacity of the Pile (Non Scour case) kn
Abutment	26.0	1482	1852	1850
Pier	0	0	0	0

	Name(NEC Number)	Signature
P. Engineer	P. Upadhyaya (Civil A 675)	
Structure Engineer	K.P. Wagle(Civil A 127) / P. Shrestha(Civil A 675) / S. Bhattacharjee (Civil A 904)	
Hydrologist	Dr. P. C. Jha(Civil A 168) / S. Adhikari (Civil A 408)	
Geotechnical Engineer	A. Adhikari(ka 199) / Dr. V. R. S. Shahi	

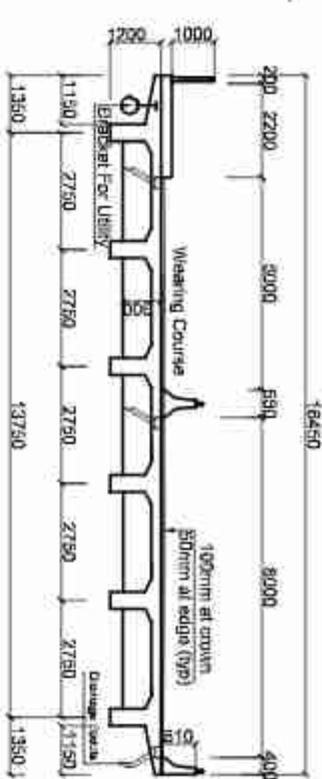
Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP	CONSULTANT: Soosung Engineering Co. Ltd. In association with ERM Co. P (Ltd) and JSPC - Tech Studio of Engineering Nepal		IMPLEMENTING AGENCY: DOR, DCID ROAD NAME: East West Highway (H01) Butwal - Gorasinghe Section		SHEET TITLE: Bore Log of Marthawa Bridge (46/H001/299_A)		SCALE: 1:250		NAME: Saroj Bhattacharjee Checked by: P. Upadhyaya Approved by: Dr. T.H. Chel		SIGNATURE: [Signature] [Signature] [Signature] [Signature]		REV NO.:		DESCRIPTION:		DATE: November, 2022		DWG. NO.: 299_Marthawa		SHEET NO.: 06/23	
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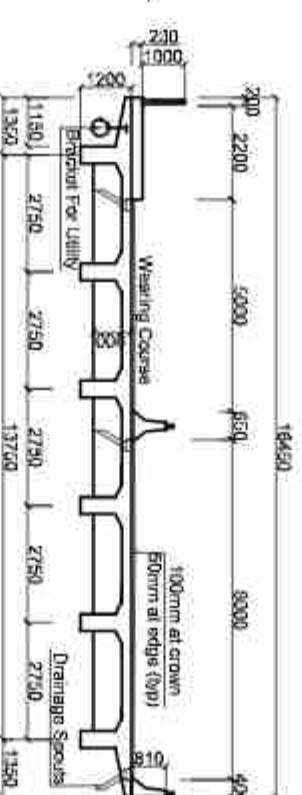
Plan of Deck
Scale:-1:150



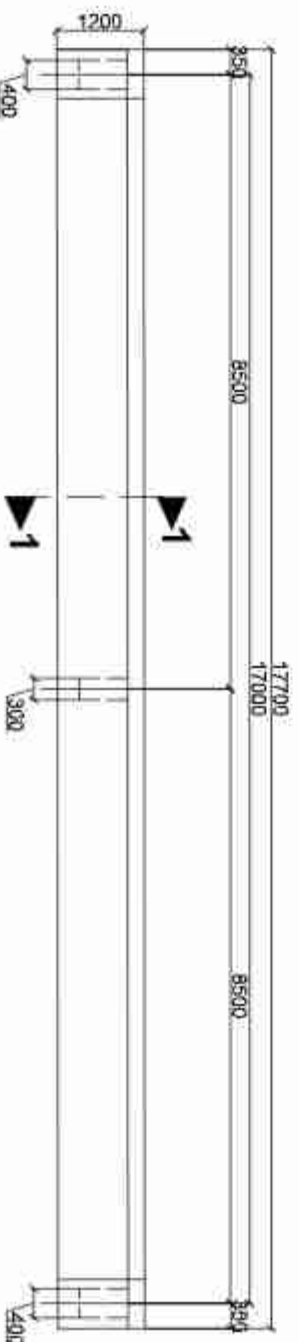
Plan of Girder
Scale:-1:150



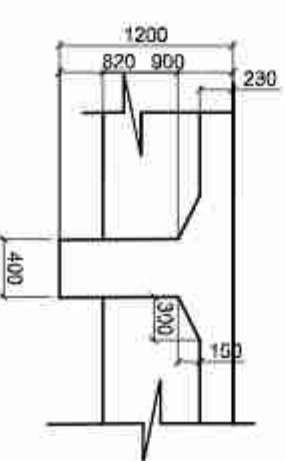
Section At 1-1
Scale:-1:150



Section At 2-2
Scale:-1:1100



Longitudinal Sectional Elevation
Scale:-1:100

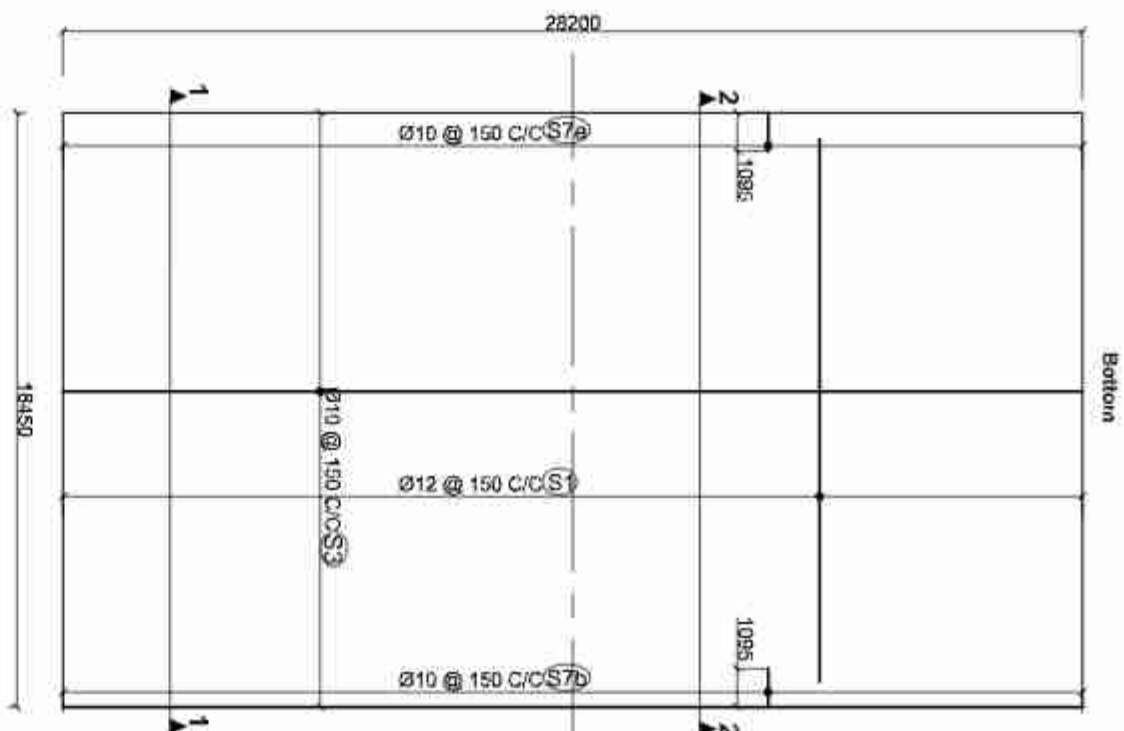
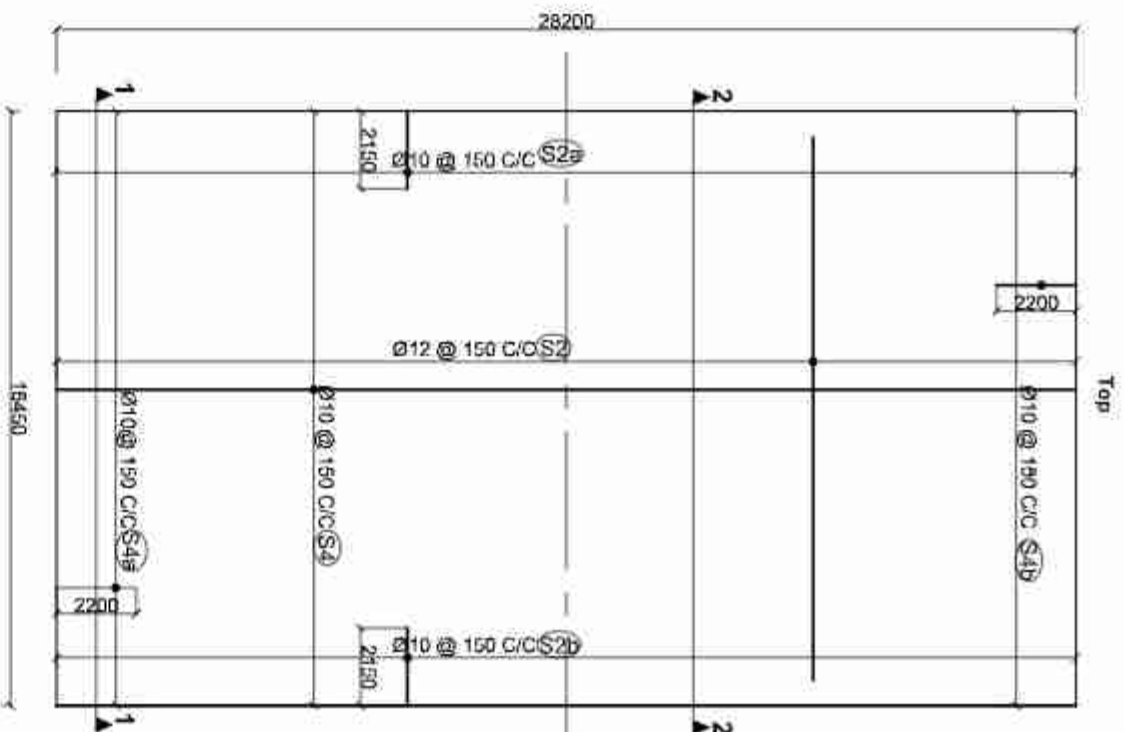


Section 1-1 Main Girder
Scale:-1:50

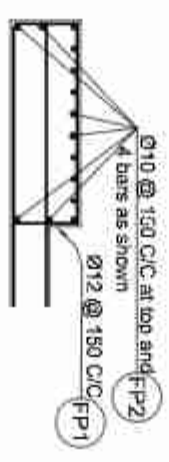
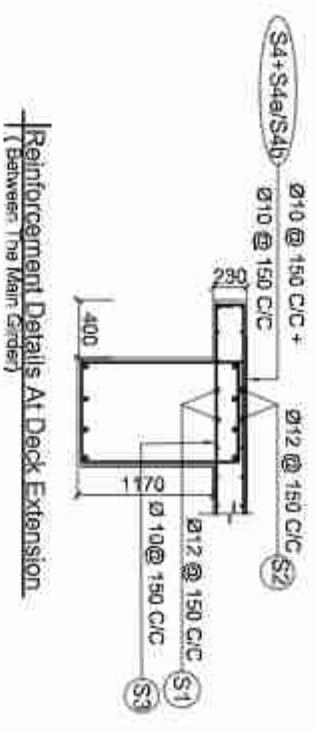
NOTES:
Dowel bars similar to the longitudinal bars of the cross section girders shall be placed in the precast main girder before casting. The longitudinal bars of the cross girder shall be lapped to the dowel bars, which shall have a lap length of 60 dia. of the corresponding bars.

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

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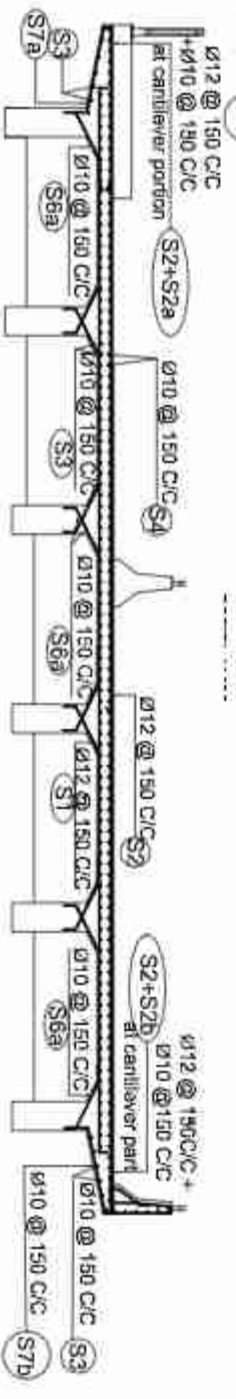
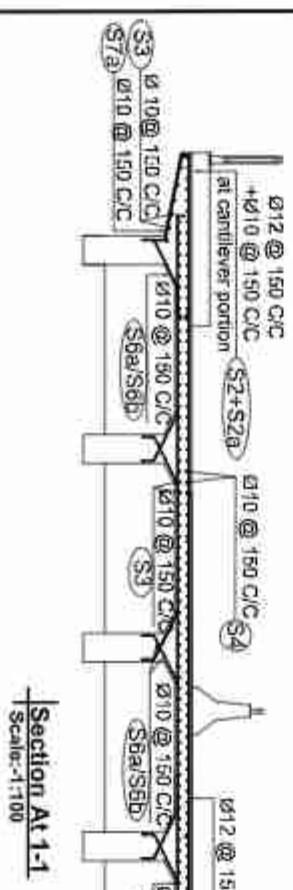
- NOTES:**
- 1.ON SHEAR CONNECTION:**
The transverse bars of the deck slab(S2) shall be tied to vertical stirrups of the longitudinal girders.
 - 2.TOP SURFACE OF THE MAIN GIRDER:**
Surface to be roughened by wire brush immediately after initial setting.
The surface shall be properly cleaned by pressure 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.



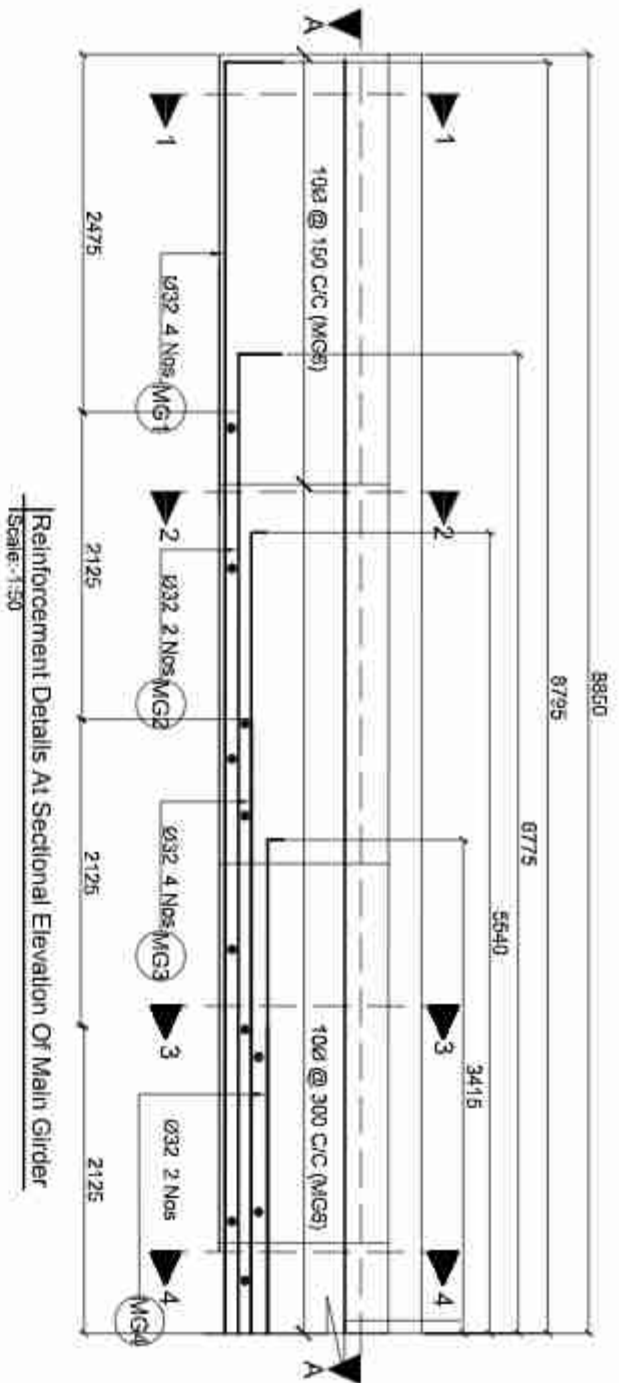
Reinforcement Details Of Deck Slab(Top Face)
Scale:-1:200

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

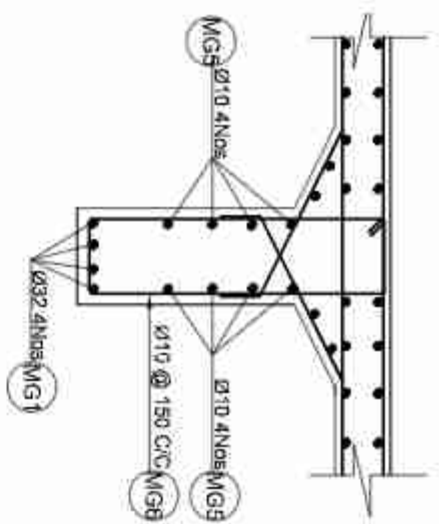
Reinforcement Details At Footpath
Scale:-1:50



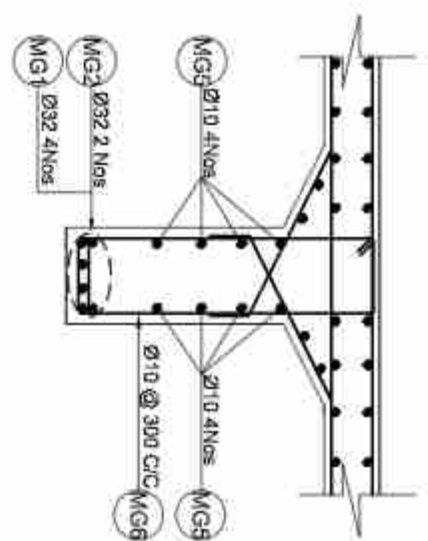
Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP	CONSULTANT:		IMPLEMENTING AGENCY:		SHEET TITLE:		SCALE:		NAME		SIGNATURE	REV NO.	DESCRIPTION	DATE:
	Soosung Engineering Co. Ltd. In association with ERM/C P (Ltd) and Nepal Tech Studio of Engineering		DOR, DCID ROAD NAME: East West Highway (H01) Butwal - Goruingthe Section		Reinforcement Details of Slab of Marthawa Bridge (48+100/1299_A)		As Shown		Designed by: Seroj Bhattachai					November, 2022
									Checked by: P. Upadhyaya					DWG.NO.: 299_Marthawa
									Approved by: Dr. T.H.Choi					SHEET NO.: 02/23



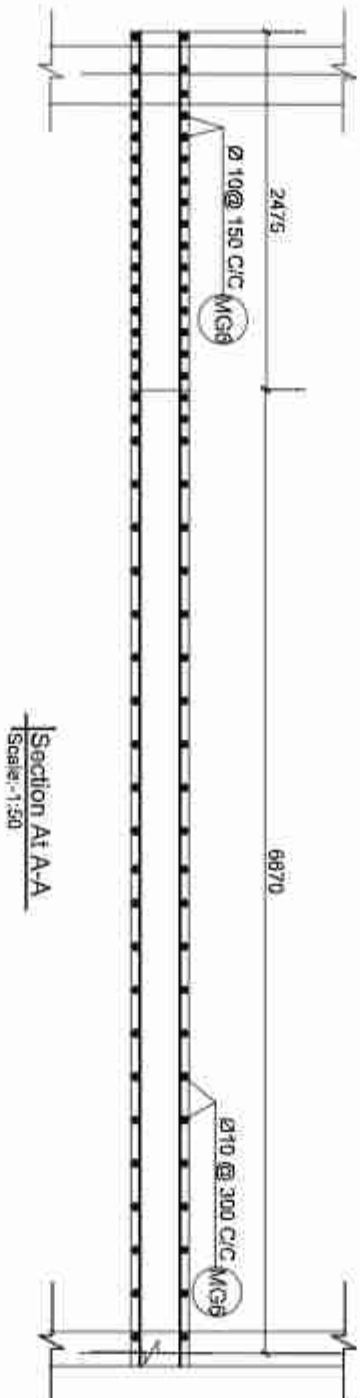
Reinforcement Details At Sectional Elevation Of Main Girder
Scale: 1:50



Section at 1-1
Scale: 1:30



Section at 2-2
Scale: 1:30



Section At A-A
Scale: 1:50

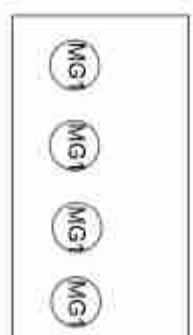


Diagram of Bar Position
Section at 1-1

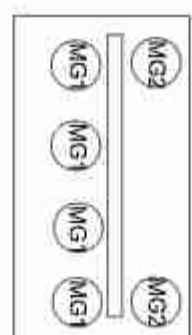
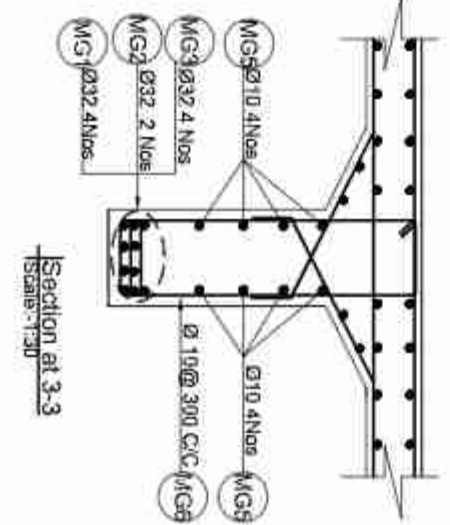
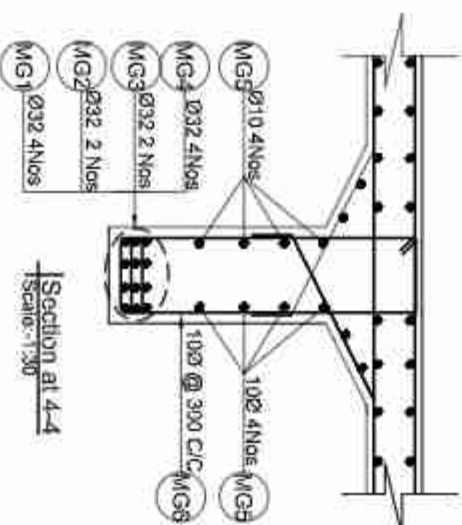


Diagram of Bar Position
Section at 2-2



Section at 3-3
Scale: 1:30



Section at 4-4
Scale: 1:30

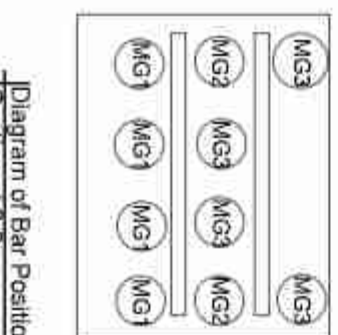


Diagram of Bar Position
Section at 3-3

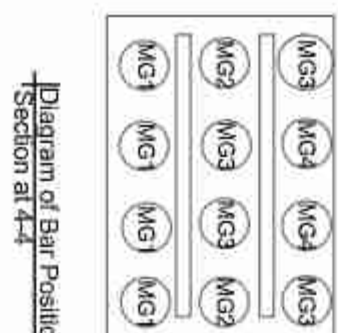
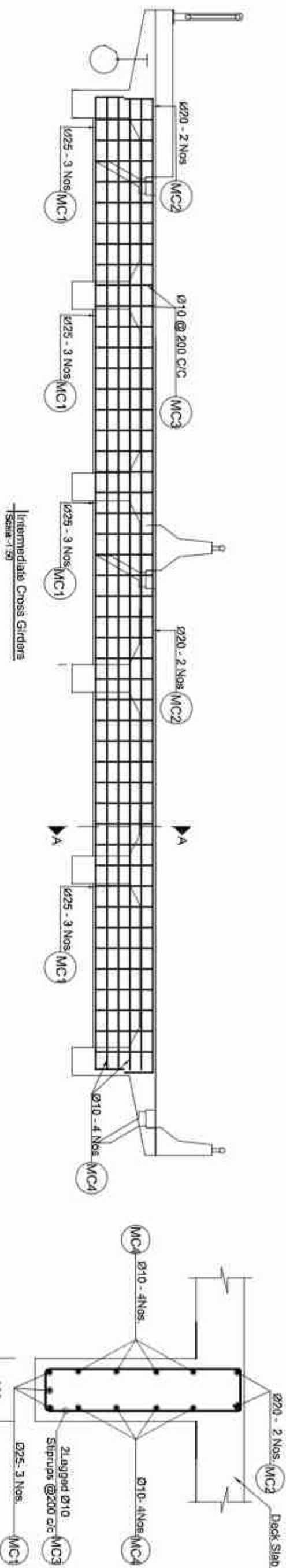
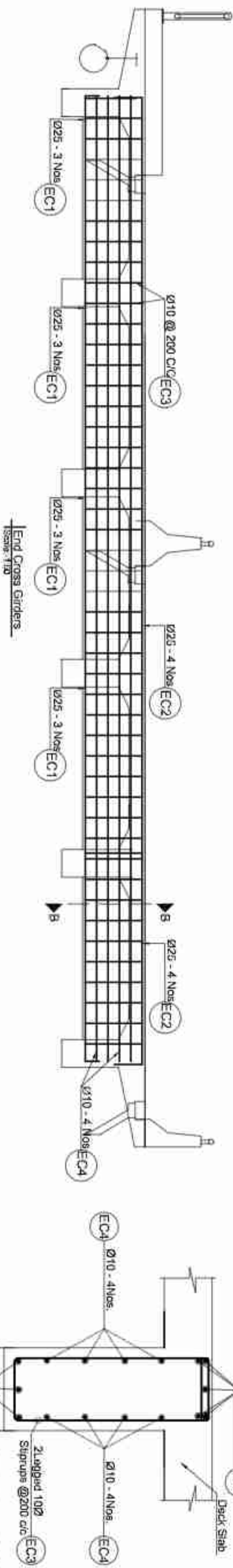


Diagram of Bar Position
Section at 4-4

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-NRP	CONSULTANT:  Soosung Engineering Co. Ltd, Korea In association with ERM/C P (Ltd) and  Tech Studio of Engineering Nepal	IMPLEMENTING AGENCY: DOR, DCID	SHEET TITLE:	SCALE:		NAME	SIGNATURE	REV NO.	DESCRIPTION	DATE: November, 2022													
											ROAD NAME: East West Highway (H01)	Reinforcement Details of Main Girder of Marthawa Bridge (48+100/1299_A)	As Shown	Designed by: Saroj Bhattacharai				DWG NO.: 299_Marthawa					
																			Checked by: P. Upadhyaya				SHEET NO.: 06/23



Section At A-A
Scale: 1:20



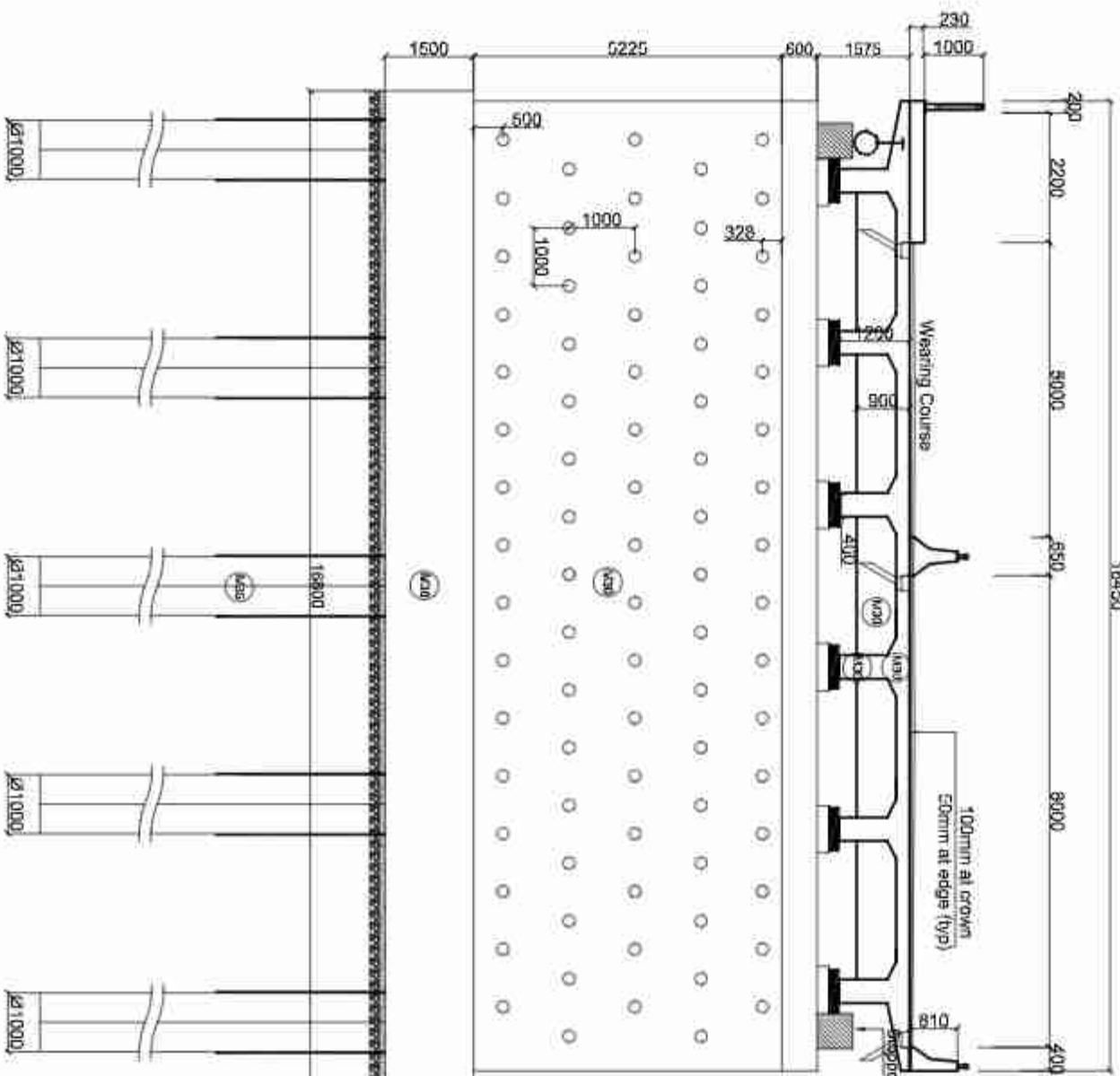
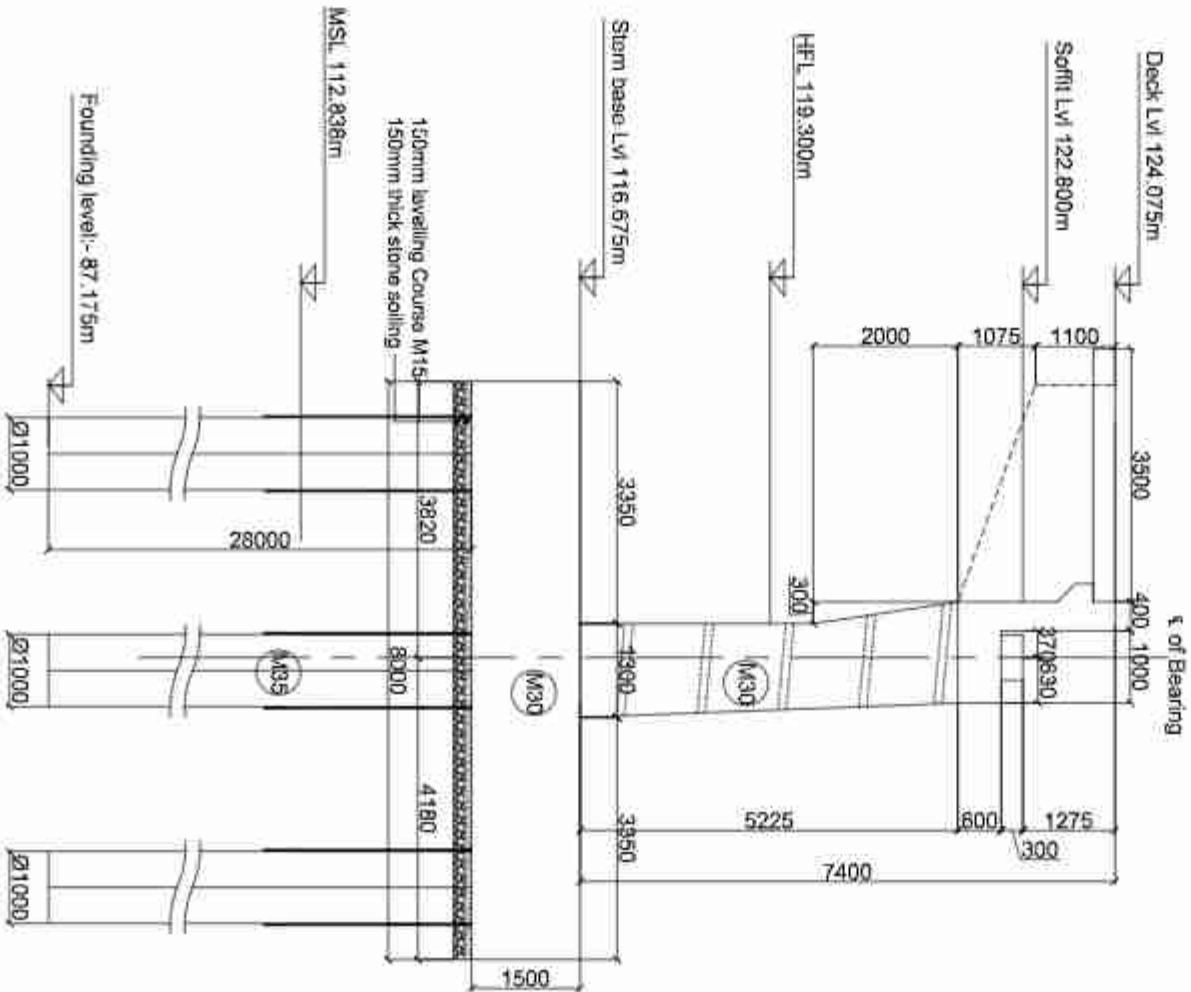
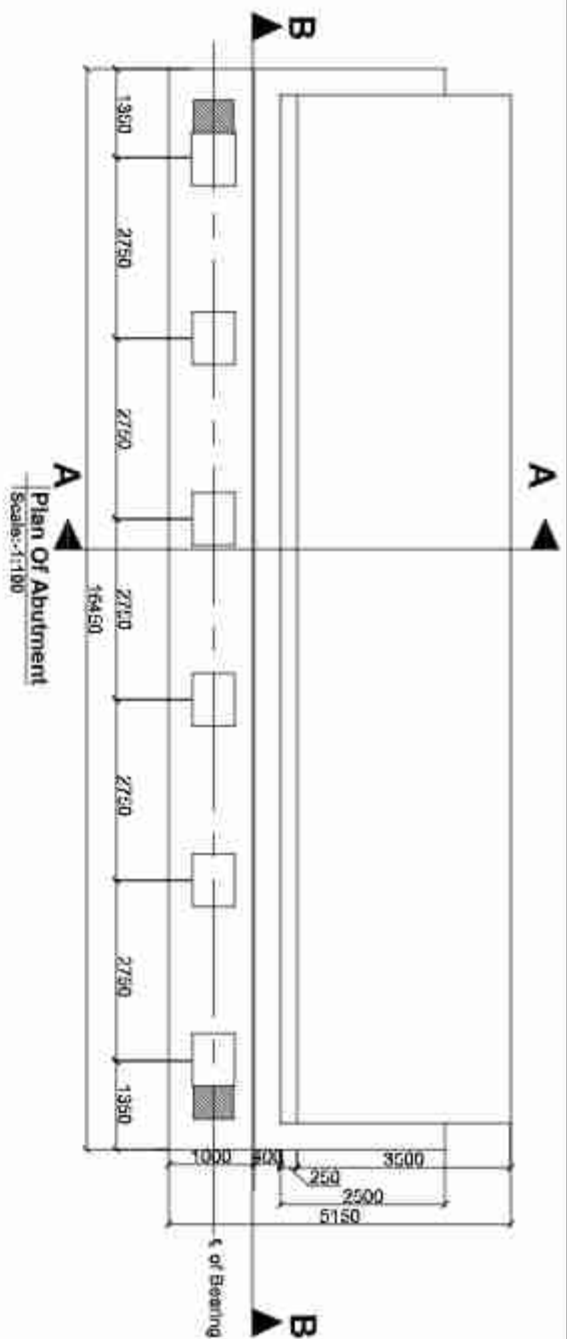
Section At B-B
Scale: 1:20

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 ERMCo P (Ltd) and  Tech Studio of Engineering Nepal	IMPLEMENTING AGENCY:	SHEET TITLE:	SCALE:			NAME	SIGNATURE	REV NO.	DESCRIPTION	DATE: November , 2022
					DOR, DCID						
					ROAD NAME:						
					East West Highway (H01)						
					Bulwal - Gorusinghe Section						
Rathorconali Dahan of Cross Girders or Marthawa Bridge (48/H001/299_A)		As Shown		Designed by:	Saroj Bhattacharai					DWG. NO. : 299_Marthawa	
		Checked by:	P. Upadhyaya					SHEET NO. : 10/23			
		Approved by:	Dr. T.H. Choi								

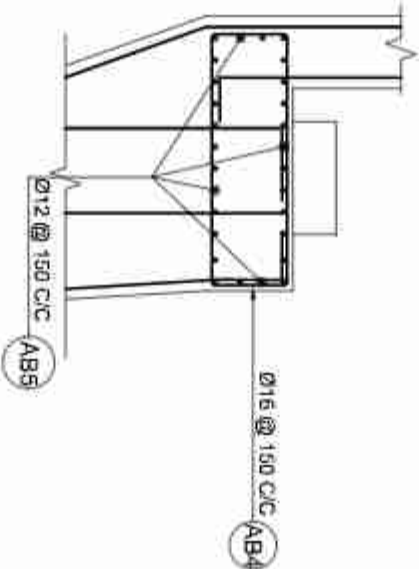
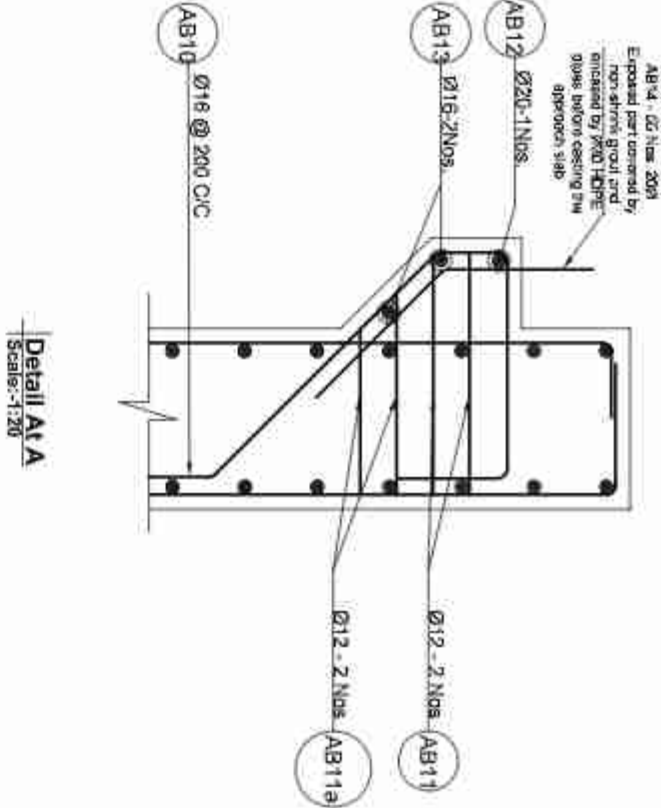
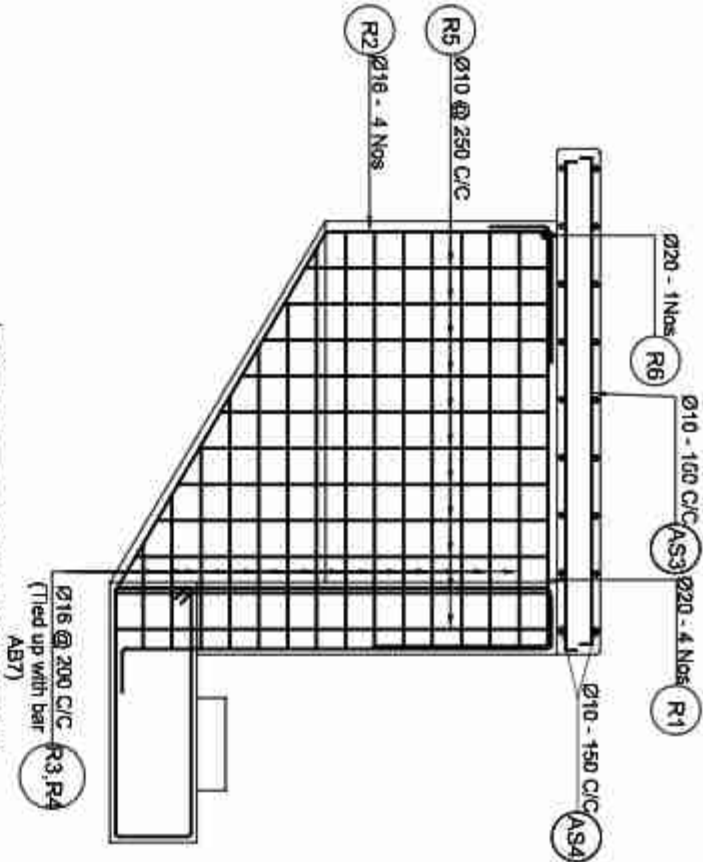
BAR BENDING SCHEDULE OF DECK SLAB							BAR BENDING SCHEDULE FOR RCC MAIN GIRDER							BAR BENDING SCHEDULE FOR INTERMEDIATE CROSS GIRDERS										
BAR ID	SKETCH (mm)	SPACING (mm)	Ø OF BARS (mm)	NO. OF BARS	LENGTH (m)	WEIGHT/LENGTH (kg/m)	TOTAL WEIGHT (kg)	BAR ID	SKETCH (mm)	SPACING (mm)	Ø OF BARS (mm)	NO. OF BARS	LENGTH (m)	WEIGHT/LENGTH (kg/m)	TOTAL WEIGHT (kg)	BAR ID	SKETCH (mm)	SPACING (mm)	Ø OF BARS (mm)	NO. OF BARS	LENGTH (m)	WEIGHT/LENGTH (kg/m)	TOTAL WEIGHT (kg)	
S1		150 / 7 Nos meter	12	119	14.970	0.888	1573.488	MG1		@ 300 c/c	32	4	18.380	6.313	484.411	MC1		@ 175 c/c	25	3	14.745	3.853	170.454	
S2		150 / 7 Nos meter	12	119	16.560	0.898	1749.566	MG2		@ 300 c/c	32	2	13.900	6.313	176.143	MC2		@ 175 c/c	20	2	14.745	2.486	72.727	
S2a		150 in Between S2	10	119	2.250	0.617	165.076	MG3		@ 300 c/c	32	4	11.480	6.313	289.808	MC3		@ 175 c/c	10	68	2.180	0.617	91.889	
S2b		150 in Between S2	10	119	2.250	0.617	165.076	MG4		@ 300 c/c	32	2	7.230	6.313	91.291	MC4		TOTAL WEIGHT IN GIRDER (n kg)						403.874
S3		Mid Deck 150	10	100	17.920	0.617	1104.838	MG5		@ 201 c/c	10	8	17.620	0.617	86.807	TOTAL NUMBER OF GIRDERS AND TOTAL WEIGHT 1 (IN METRIC TON)						0.404		
		Left Cantilever 150	10	10	17.920	0.617	110.484	MG6		vertical @ 200 c/c at support	10	84	2.890	0.617	154.850	TOTAL WEIGHT IN GIRDER (n kg)						1330.079		
Right Cantilever 150	10	10	17.920	0.617	110.484	TOTAL NUMBER OF GIRDERS AND TOTAL WEIGHT (IN METRIC TON)										1.320								
S4		150 / 7 Nos Per Meter	10	111	17.920	0.617	1226.370	MG7		-	32	28	0	0.313	56.566	BAR BENDING SCHEDULE OF RAISED FOOTPATH								
S4a		150 in Between S4	10	111	2.355	0.617	161.166	TOTAL EXCLUDING FOOTPATHS (n kg)														7487.118	DATE: November , 2022	
S4b		150 in Between S4	10	111	2.355	0.617	161.166	TOTAL WEIGHT (IN METRIC TON)														7.487	DWG NO.: 299_Mathliwa	
S6a		150	8	1100 (100x10)	1.250	0.385	542.524	BAR BENDING SCHEDULE FOR END CROSS GIRDERS															SHEET NO.: 11/23	
		150 / 7 Nos Per Meter	10	228	1.400	0.617	205.431	BAR ID	SKETCH (mm)	SPACING (mm)	Ø OF BARS (mm)	NO. OF BARS	LENGTH (m)	WEIGHT/LENGTH (kg/m)	TOTAL WEIGHT (kg)	TOTAL WEIGHT IN METRIC TON						0.424		
S7a		150 / 7 Nos Per Meter	10	228	1.400	0.617	205.431	EC1		@ 92 c/c	25	3	14.845	3.853	171.610	ONE SIDE						623.669		
S7b		150 / 7 Nos Per Meter	10	228	1.400	0.617	205.431	EC2		vertical @ 138 c/c @ 276 c/c	25	4	14.845	3.853	226.813	TOTAL WEIGHT IN METRIC TON						0.424		
TOTAL EXCLUDING FOOTPATHS (n kg)							7487.118	EC3		@ 310	10	72	2.360	0.617	104.762	TOTAL NUMBER OF GIRDERS AND TOTAL WEIGHT 2 (IN METRIC TON)						1.148		
TOTAL WEIGHT (IN METRIC TON)							7.487	EC4		@ 300 c/c	10	8	14.070	0.617	68.388									

CONSULTANT:				IMPLEMENTING AGENCY:				SHEET TITLE:				SCALE:			
Government of Nepal Ministry of Physical Infrastructure and Transport Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NP				Soosung Engineering Co. Ltd. Korea In association with ERM&P (Ltd) and Tech Studio of Engineering Nepal				ROAD NAME: East West Highway (H01) Burwal - Goruinghe Section				Detail of barbending of Marthawa Bridge (48+100/1299_A) As Shown			
Designed by:				Checked by:				Approved by:				DATE:			
Saroj Shattari				P. Upadhyaya				Dr. T.H.Choi				November , 2022			
												SHEET NO.: 299_Mathliwa			
												11/23			

Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHP-PPC) ADB Loan No: 3722-NP				CONSULTANT:  Soosung Engineering Co. Ltd. In association with ERM/C P (Ltd) and  399c-Tech Studio of Engineering Nepal				IMPLEMENTING AGENCY: DOR, DCID ROAD NAME: East West Highway (H01) Butwal - Gorunaghe Section				SHEET TITLE: Detail of barbending of Marthawa Bridge (48+100/1299_A)				SCALE: As Shown							
Designed by:				NAME				SIGNATURE				REV NO.				DESCRIPTION				DATE:			
Checked by:				Saroj Bhattacharj																November, 2022			
Approved by:				P. Upadhyaya																DWG NO.: 299_Marhawa			
				Dr. T.H. Choi																SHEET NO.: 11/23			



Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NP	CONSULTANT:  Soosung Engineering Co. Ltd. Korea In association with ERM/C P (Ltd) and  Tech Studio of Engineering Nepal	IMPLEMENTING AGENCY: DOR, DCID	SHEET TITLE: Abutment Details of Marthawa Bridge (48/1001/299_A)	SCALE: As Shown	Designed by:	NAME	SIGNATURE	REV NO.	DESCRIPTION	DATE:
					Checked by:	P. Upadhyaya				DWG NO.: 299_Marthawa
					Approved by:	Dr. T.H. Choi				SHEET NO.: (12/2)



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		2500	20	6	4.407	2.466	80.947
R2		1000	16	8	4.052	1.676	60.911
R3		2150	16	12	6.156	1.576	116.569
R4		1350	16	12	3.428	1.576	64.927
R5		1650	16	22	3.940	0.617	53.442
R6		2000	20	2	0.307	2.466	1.014
R7		2800	10	4	2.900	0.617	6.905
R8		3500	10	16	1.320	0.617	12.207
TOTAL IN 2 WING WALL IN ONE ABUTMENT							393.449
TOTAL WEIGHT IN METRIC TON							0.393

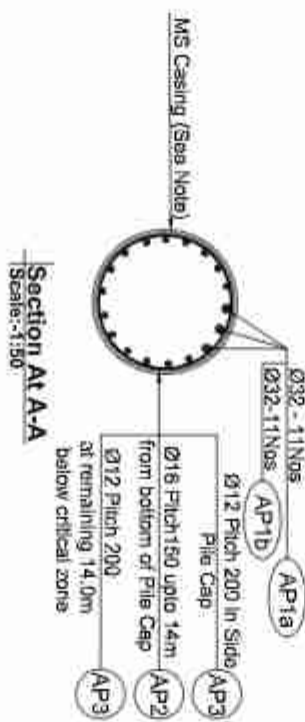
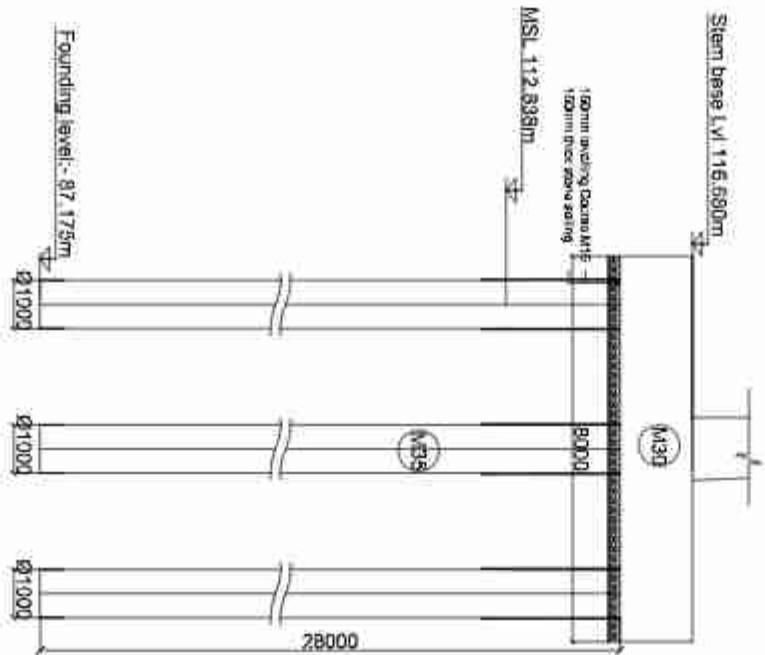
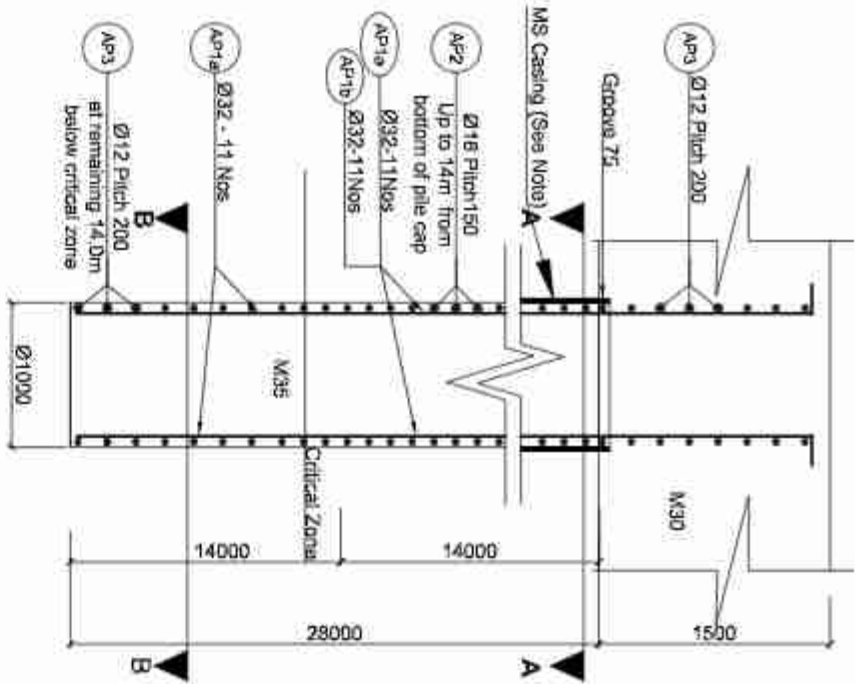
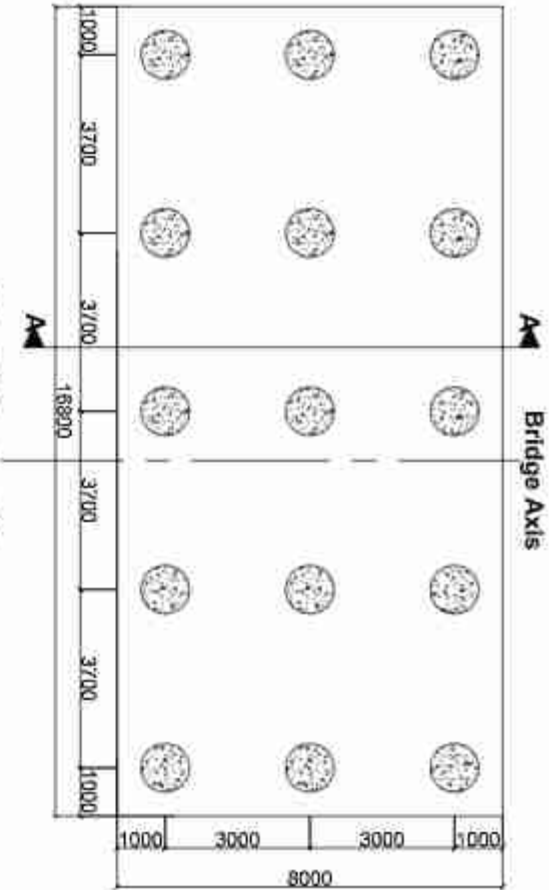
BAR BENDING SCHEDULE OF ABUTMENT

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		2000	16	20	6.5	2.466	161.956
AB2		1000	16	32	6.110	6.313	424.712
AB3		1600	20	6	7.610	1.576	96.090
AB4		1200	16	111	3.700	1.576	646.224
AB5		1650	16	56	34.270	1.576	3029.024
AB6		1600	16	24	16.300	0.586	347.314
AB7		2100	16	69	2.725	1.576	366.981
AB8		2022	16	83	4.672	1.576	612.042
AB9		1650	20	10	16.300	0.917	126.085
AB10		1650	20	9	33.116	0.617	183.768
AB11		500	16	70	1.747	1.576	217.631
AB12		200	12	166	0.900	0.586	126.247
AB13		1650	16	12	0.650	0.586	81.178
AB14		1650	20	1	16.300	2.466	40.196
AB15		1650	16	2	16.300	1.576	51.454
AB16		1650	20	56	0.900	2.466	122.075
TOTAL WEIGHT IN ONE ABUTMENT							7230.874
TOTAL WEIGHT IN METRIC TON							12.352

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.		Barbardin Schedule of Marthawa Bridge (48+1001/299_A)	As Shown	DATE: November, 2022
	DOR, DCID					
	ROAD NAME:	East West Highway (H01)				
	Burwal - Gorusinghe Section					

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

DWG NO.: 299_Marhawa	SHEET NO.: 14/23
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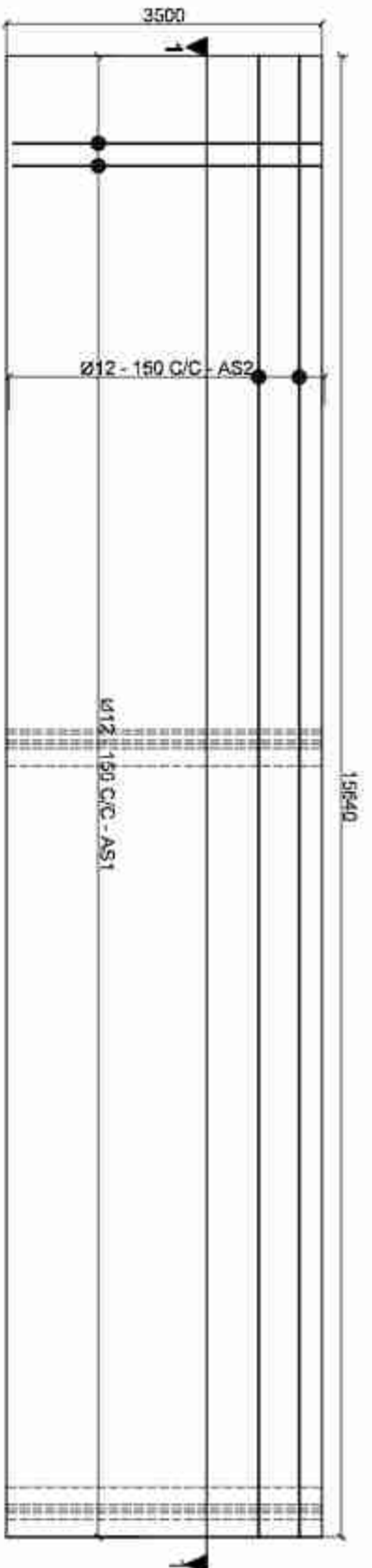
Reinforcement Details Of Pile

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)	TOTAL WEIGHT (kg)
APC1	900 7825		25	85	9.625	3152.537
APC2	900 7825		25	85	9.625	3152.537
APC3	900 16634		18	41	16.434	1192.900
APC4	900 16634		18	41	16.434	1192.900
APC5	1270 Curve length 251 Curve radius 40 Hook length 80		16	387	1.932	1180.099
APC6	16550 7850		16	4	49.000	308.305
TOTAL IN PILE CAP OF ONE ABUTMENT						10190.325
TOTAL WEIGHT IN METRIC TON						10.190

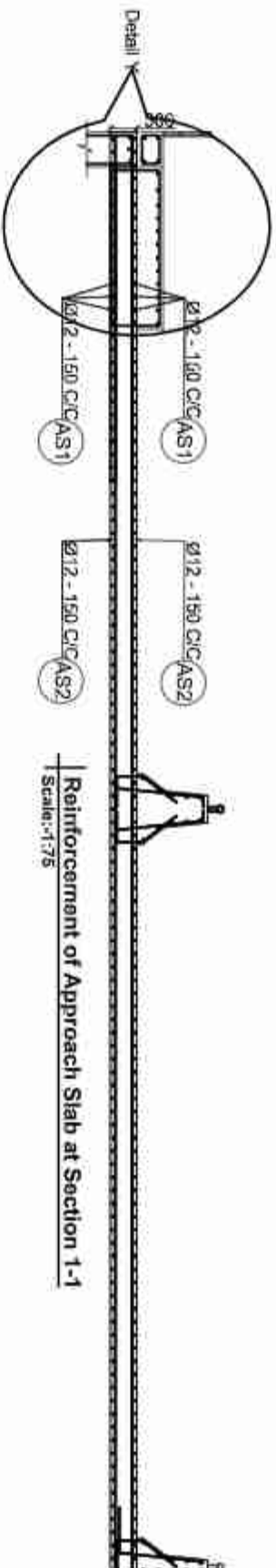
BAR BENDING SCHEDULE OF ABUTMENT PILE						
BAR ID	SHAPE OF BAR IN mm (NOT TO SCALE)	SPACING (mm)	Ø OF BARS (mm)	NO OF BARS	LENGTH (m)	TOTAL WEIGHT (kg)
AP1a	Single bar 200		32	11	28.500	2048.885
AP1b	15400 Curved bars		32	11	15.000	1083.372
AP2	16534 Pitch 150 from bottom of pile cap		16	1	245.470	392.170
AP3	16534 Pitch 200 below critical zone		12	1	207.470	184.185
TOTAL IN ONE PILE						3708.423
TOTAL IN FIFTEEN PILES OF ONE ABUTMENT (IN METRIC TON)						55.626

For Construction Methodology and Sequence Please See General Notes.

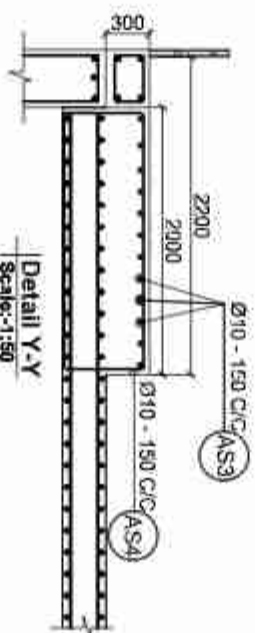
Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NP		CONSULTANT: Soosung Engineering Co. Ltd. In association with ERM/C P (Ltd) and Tech Studio of Engineering Nepal		IMPLEMENTING AGENCY: DOR, DCID ROAD NAME: East West Highway (H01) Butwal - Gorunghhe Section		SHEET TITLE: Reinforcement Details of Abutment Piles of Marthawa Bridge (48+100/1299_A)		SCALE:		DATE: November, 2022	
Location: Design Pile Length in Abutment Pier		Design Working level on pile (Non-saline casing) in Allowable Bearing Capacity of the Pile (Non-saline casing) in		Design Pile Length in Abutment Pier		Design Working level on pile (Non-saline casing) in Allowable Bearing Capacity of the Pile (Non-saline casing) in		Designed by: Saroj Bhattacharj		Checked by: P. Upadhyay	
28.0		1498		28.0		1498		Signature		Signature	
0		0		0		0		Rev No.		Description	
0		0		0		0		DWG NO:		SHEET NO:	
								299_Marhawa		15/23	



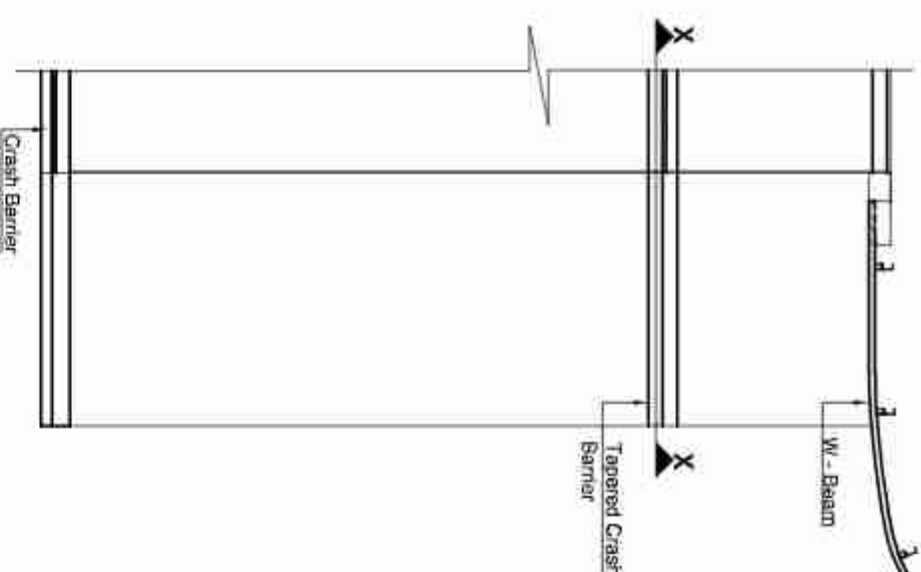
Plan of Reinforcement Details of Approach Slab
Scale:-1:75



Reinforcement of Approach Slab at Section 1-1
Scale:-1:75

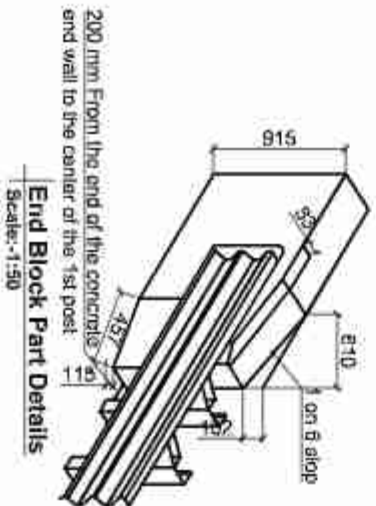


Detail Y-Y
Scale:-1:50

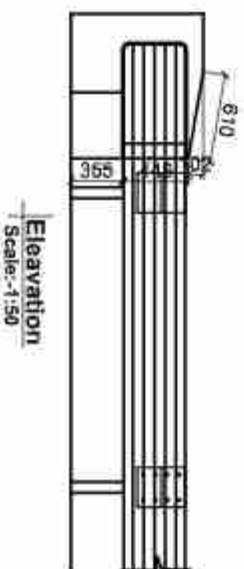


Plan of Approach Slab
Not to Scale

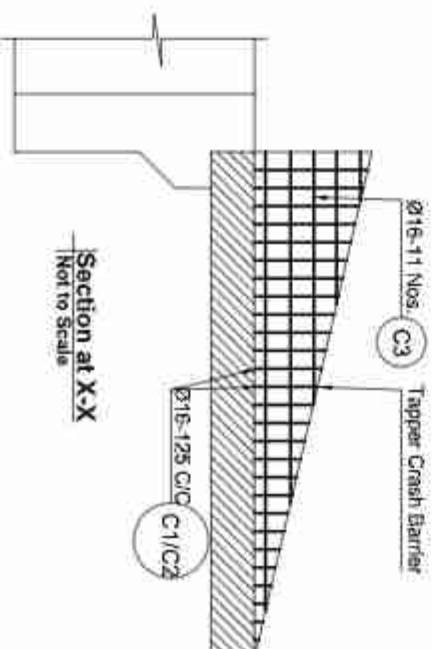
BAR BENDING SCHEDULE OF APPROACH SLAB						
BAR ID	SHAPE OF BAR (IN mm) (NOT TO SCALE)	BSPACING (mm)	NO OF BARS	NO OF BARS	LENGTH (m)	WEIGHT (kg)
AS1	3400	12	210	3.400	0.688	653.001
AS2	16100	12	48	19.500	0.688	662.888
AS3	3400	10	13	3.400	0.617	31.443
AS4	1620	10	18	5.000	0.617	25.488
TOTAL IN ONE APPROACH SLAB						1393.499
TOTAL WEIGHT IN METRIC TON						1.393



End Block Part Details
Scale:-1:50

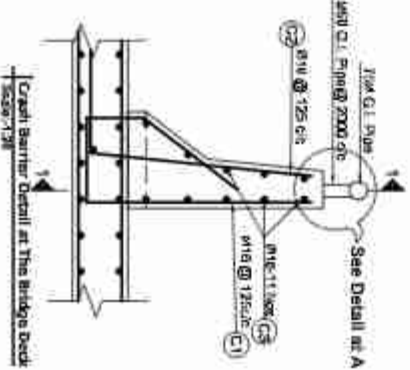
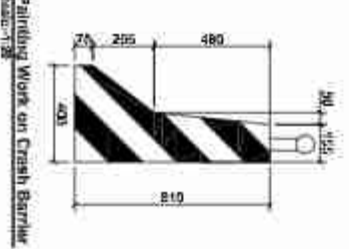
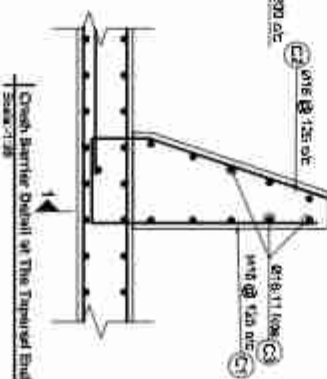
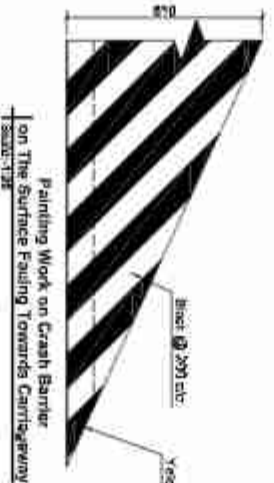
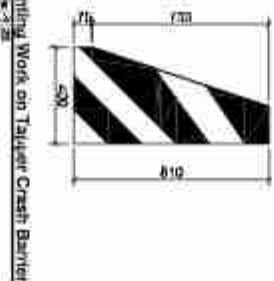
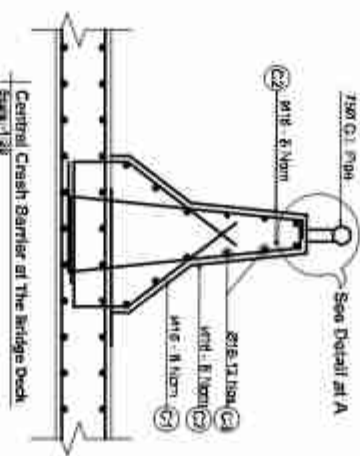
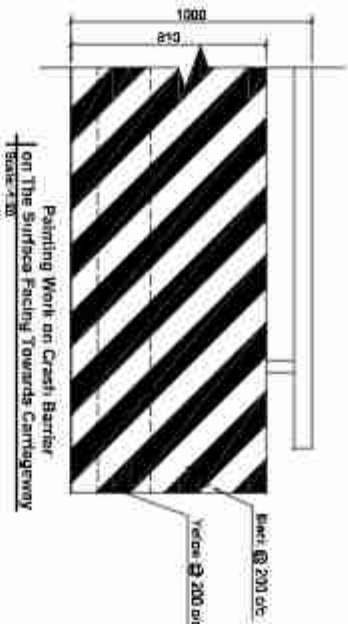
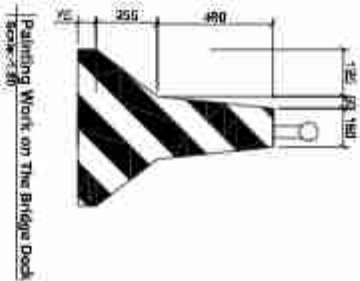
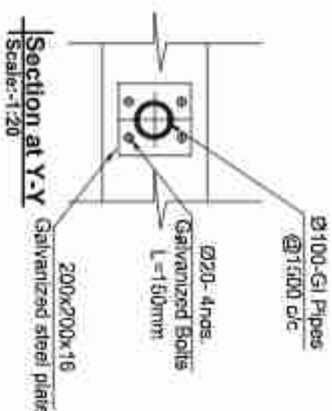
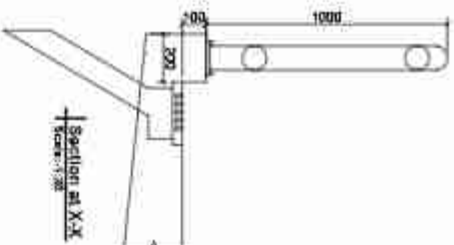
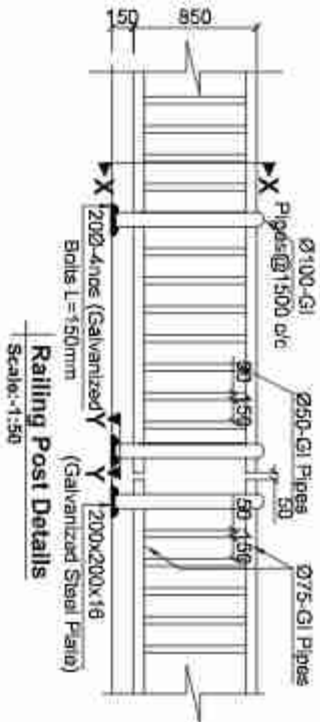


Elevation
Scale:-1:50



Section at X-X
Not to Scale

Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NP	CONSULTANT:  Seosung Engineering Co. Ltd. Korea In association with ERM/C P (Ltd) and  399%- Tech Studio of Engineering Nepal	IMPLEMENTING AGENCY: DOR, DCID	SHEET TITLE: Approach Slab of Marthawa Bridge (48+1001/299_A)	SCALE: As Shown		NAME	SIGNATURE	REV NO.	DESCRIPTION	DATE:	
						Designed by:	Saroj Bhattacharj				November , 2022
						Checked by:	P. Upadhyaya				DWG NO.: 299_Marthawa
						Approved by:	Dr. T.H. Choi				SHEET NO.: (18/2)



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 CENTRAL CRASH BARRIER						
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)
C1		125	16	8	2.210	1.578
C2		125	16	16	1.845	1.578
C3		16	11	0.960	1.578	16.567
TOTAL FOR 1M						85.114
TOTAL FOR 1.0M IN MT						0.086

BAR BENDING SCHEDULE OF CRASH BARRIER						
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)
C1		125	16	8	2.030	1.578
C2		125	16	8	1.415	1.578
C3		16	11	0.960	1.578	16.567
TOTAL FOR 1M						30.168
TOTAL FOR 1.0M IN MT						0.006

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

CONSULTANT:
Soosung Engineering Co. Ltd.
In association with
ERMC P (Ltd)
and
Tech Studio of Engineering
Nepal

IMPLEMENTING AGENCY:
DOR, DCID
ROAD NAME:
East West Highway (H01)
Butwal - Goruaghe Section

SHEET TITLE:
Miscellaneous Details - 1
of
Marthawa Bridge
(48+001/299_A)

SCALE:
As Shown

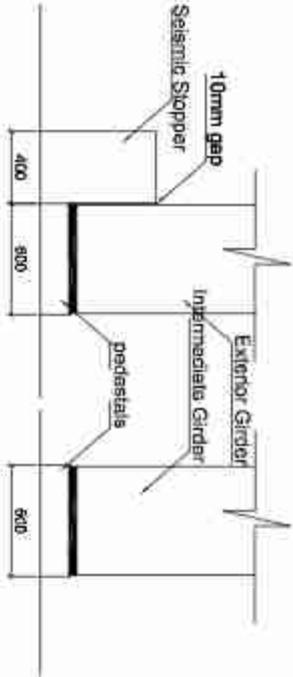
DESIGNED BY:
Saroj Bhattacharj

CHECKED BY:
P. Upadhyay

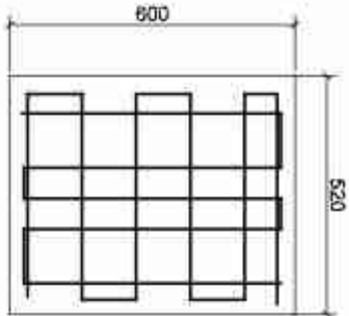
APPROVED BY:
Dr. T.H. Choi

SIGNATURE
REV NO.
DESCRIPTION

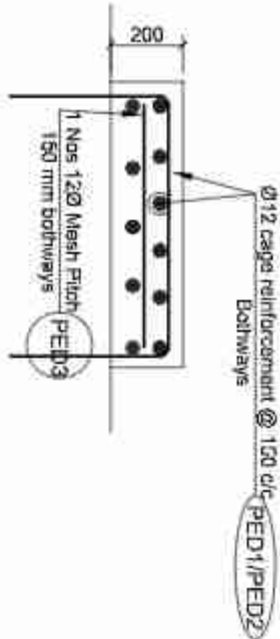
DATE:
November, 2022
DWG. NO.:
299_Marthawa
SHEET NO.:
17/23



Abutment Cap With Stopper
Scale:-1:30

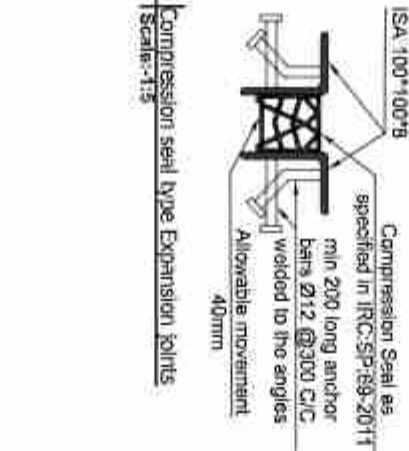


Pedestal Plan
Scale:-1:20

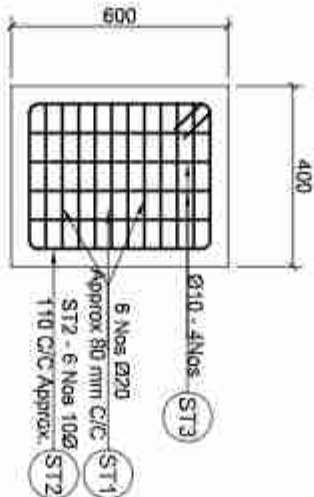


Pedestal Section
Scale:-1:20

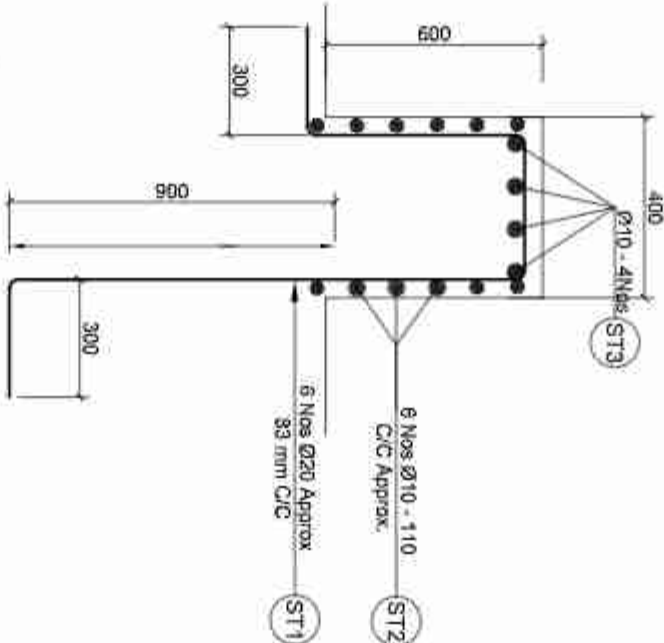
NOTE:
To match the height of ballast work, the pedestal thickness shall be suitably modified.



Compression seal type Expansion Joints
Scale:-1:5



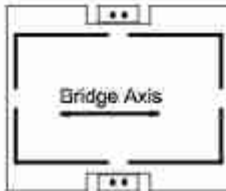
Stoppers Plan
Scale:-1:20



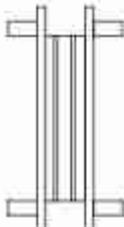
Stoppers Details
Scale:-1:20



Elastomeric Bearing
(Partially free at longitudinal direction
Fixed at Transverse direction)



Elastomeric Bearing
Scale:-1:25



Section Y-Y
Scale:-1:25



Section X-X
Scale:-1:25

BAR BENDING SCHEDULE OF PEDESTAL						
BAR ID	SHAPE OF BAR IN mm (NOT TO SCALE)	SPACING (mm)	# OF BARS	NO. OF BARS	LENGTH (m)	TOTAL WEIGHT (kg)
PED1		120	12	4	2.250	6.007
PED2		120	12	5	2.250	9.786
PED3		120	12	1	4.600	4.084
TOTAL WEIGHT IN KG						21.847
TOTAL WEIGHT IN MT						0.022

BAR BENDING SCHEDULE OF STOPPER						
BAR ID	SHAPE OF BAR IN mm (NOT TO SCALE)	SPACING (mm)	# OF BARS	NO. OF BARS	LENGTH (m)	TOTAL WEIGHT (kg)
ST1		120	20	6	3.000	2.486
ST2		120	10	6	1.940	0.617
ST3		120	10	4	0.400	0.617
TOTAL WEIGHT IN KG						31.444
TOTAL WEIGHT IN MT						0.031

Design Data for Bearings (Elastomeric Bearing)		All Loads Unfactored	
Maximum permanent and superimposed dead loads	330 kN	Maximum permanent and superimposed dead loads	330 kN
Maximum load from surfacing (wearing course)	24 kN	Maximum load from surfacing (wearing course)	24 kN
Maximum live load reaction (including impact)	416 kN	Maximum live load reaction (including impact)	416 kN
Maximum horizontal seismic force	59 kN	Maximum horizontal seismic force	59 kN
Maximum braking force	88.6 kN	Maximum braking force	88.6 kN
Total Maximum elongation of the dock	6 mm	Total Maximum elongation of the dock	6 mm
Maximum Rotation due to dead load	0.0022rad	Maximum Rotation due to dead load	0.0022rad
Rotation due to dead load + live load	0.0039 rad	Rotation due to dead load + live load	0.0039 rad
Concrete for superstructure	M30	Concrete for superstructure	M30
Concrete for substructure	M25/M30	Concrete for substructure	M25/M30
Width of girder at bearing	400mm	Width of girder at bearing	400mm
Length of bearing along bridge axis (Assumed length)	320mm	Length of bearing along bridge axis (Assumed length)	320mm

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

CONSULTANT:
Soosung Engineering Co. Ltd.
Korea
In association with
ERM/C P (Ltd)
and
Tech Studio of Engineering
Nepal

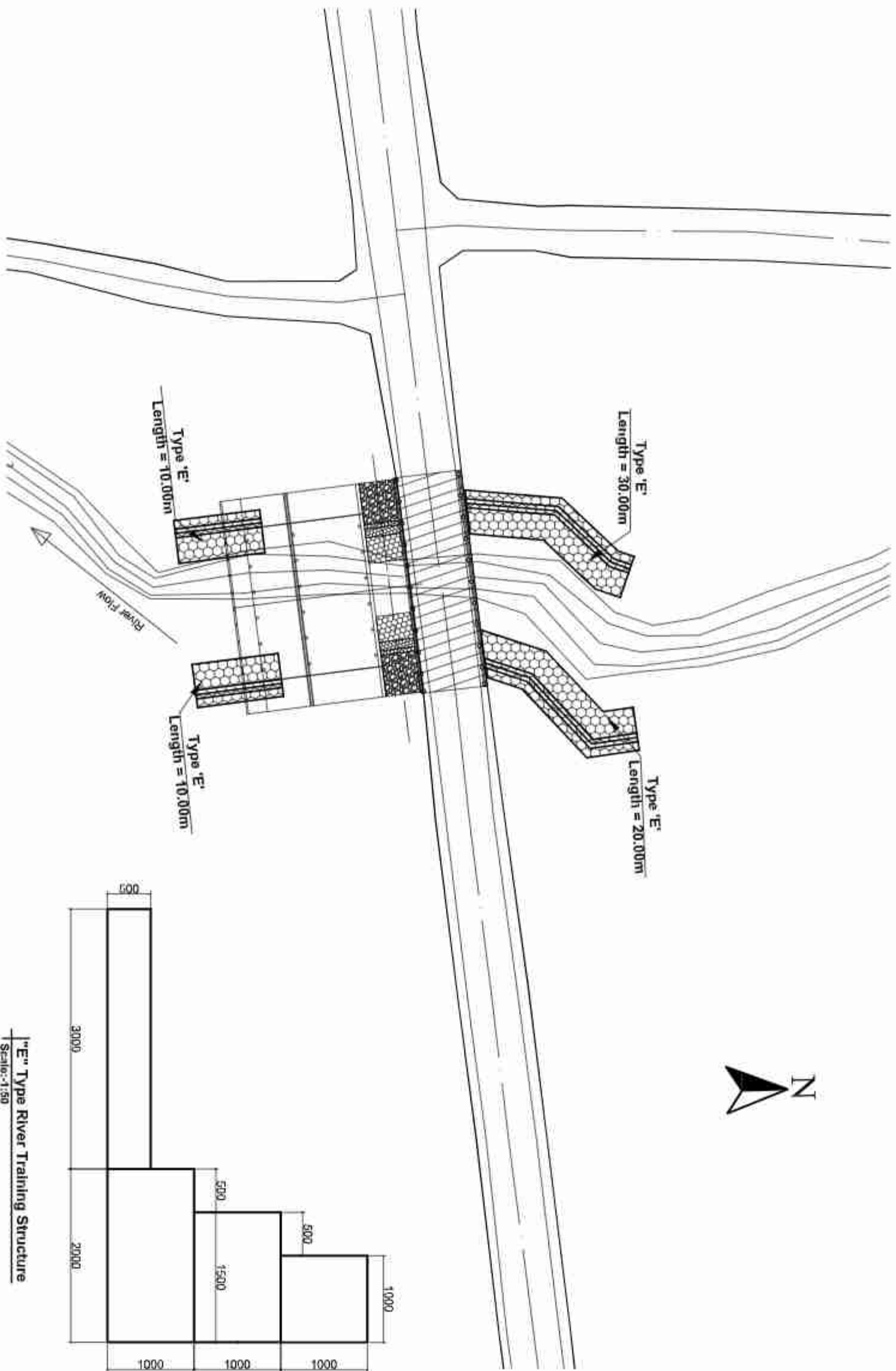
IMPLEMENTING AGENCY:
DOR, DCID
ROAD NAME:
East West Highway (H01)
Buwai - Goruinghe Section

SHEET TITLE:
Miscellaneous Details - 2
of
Maithewa Bridge
(48+100/1299_A)

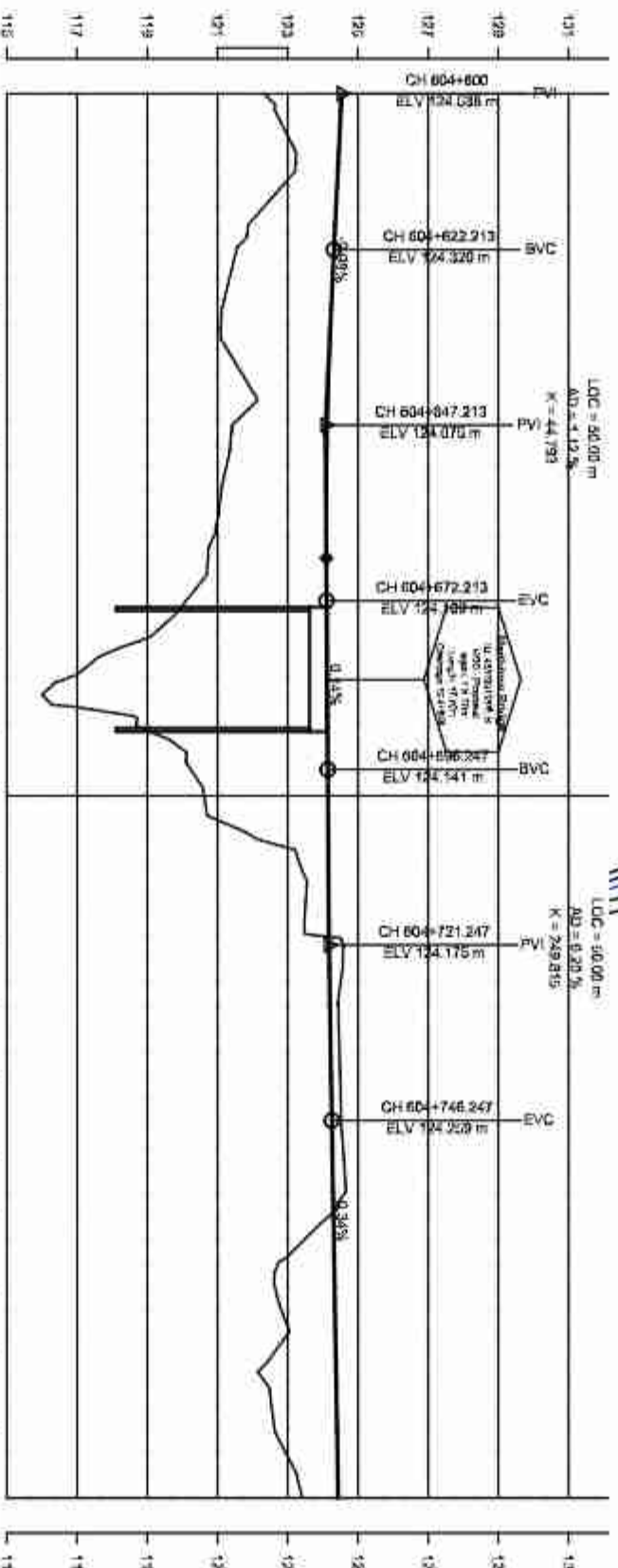
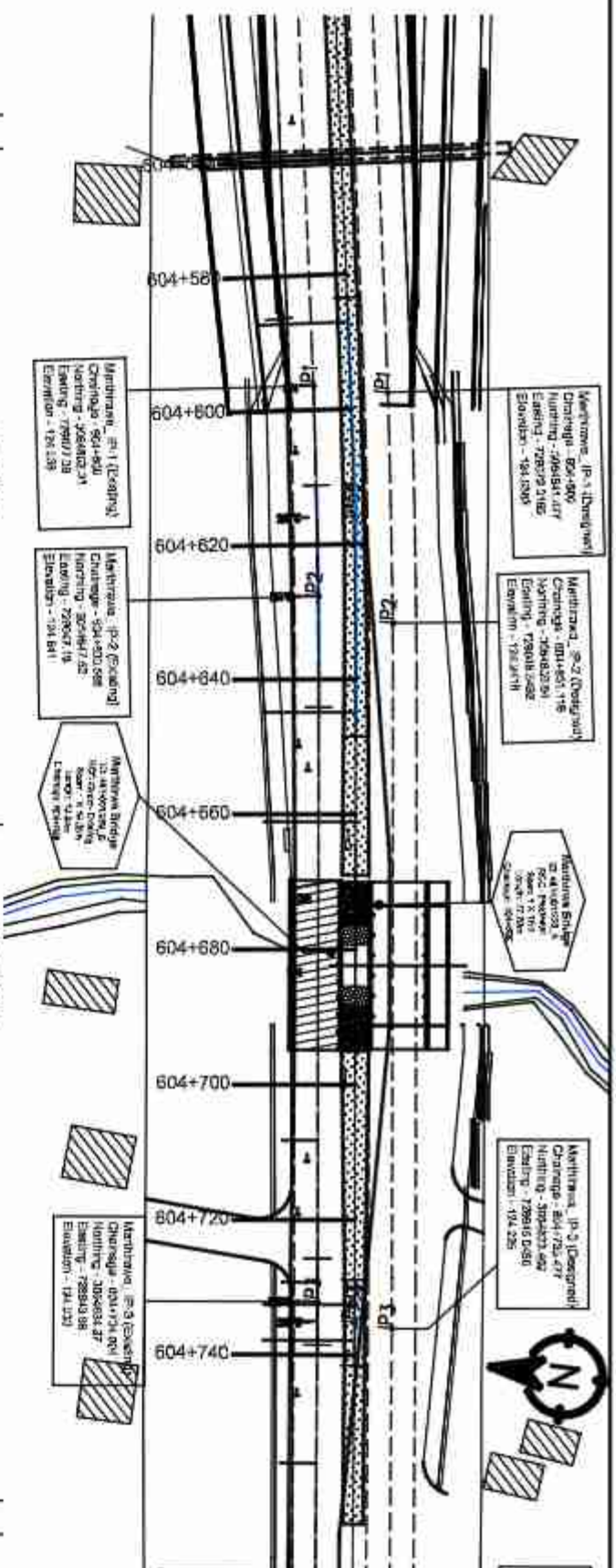
SCALE:
As Shown

NAME	SIGNATURE	REV NO.	DESCRIPTION	DATE:
Saroj Bhattarai				November, 2022
P. Upadhyaya				
Dr. T.H. Choi				

DWG. NO.: 299_Maithewa
SHEET NO.: 18/23

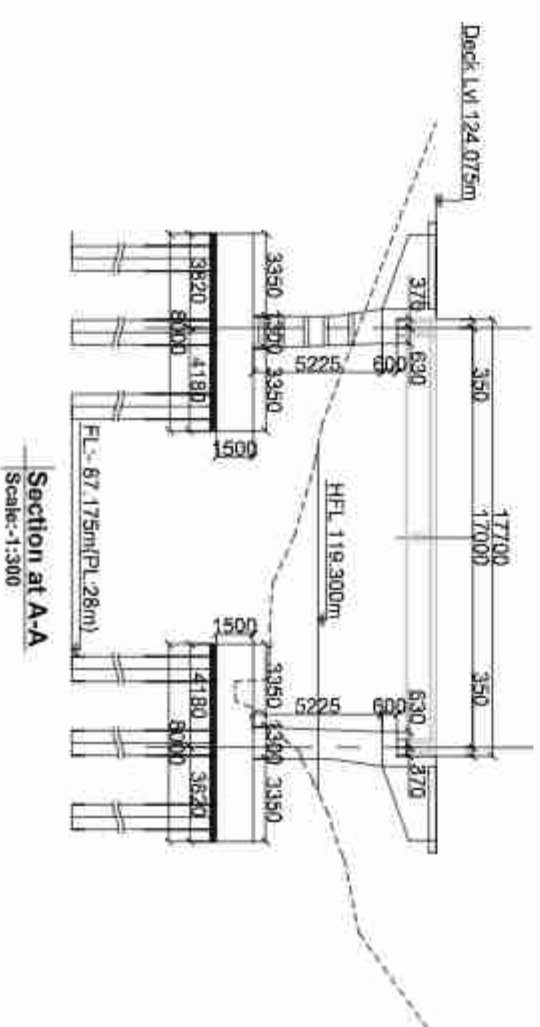
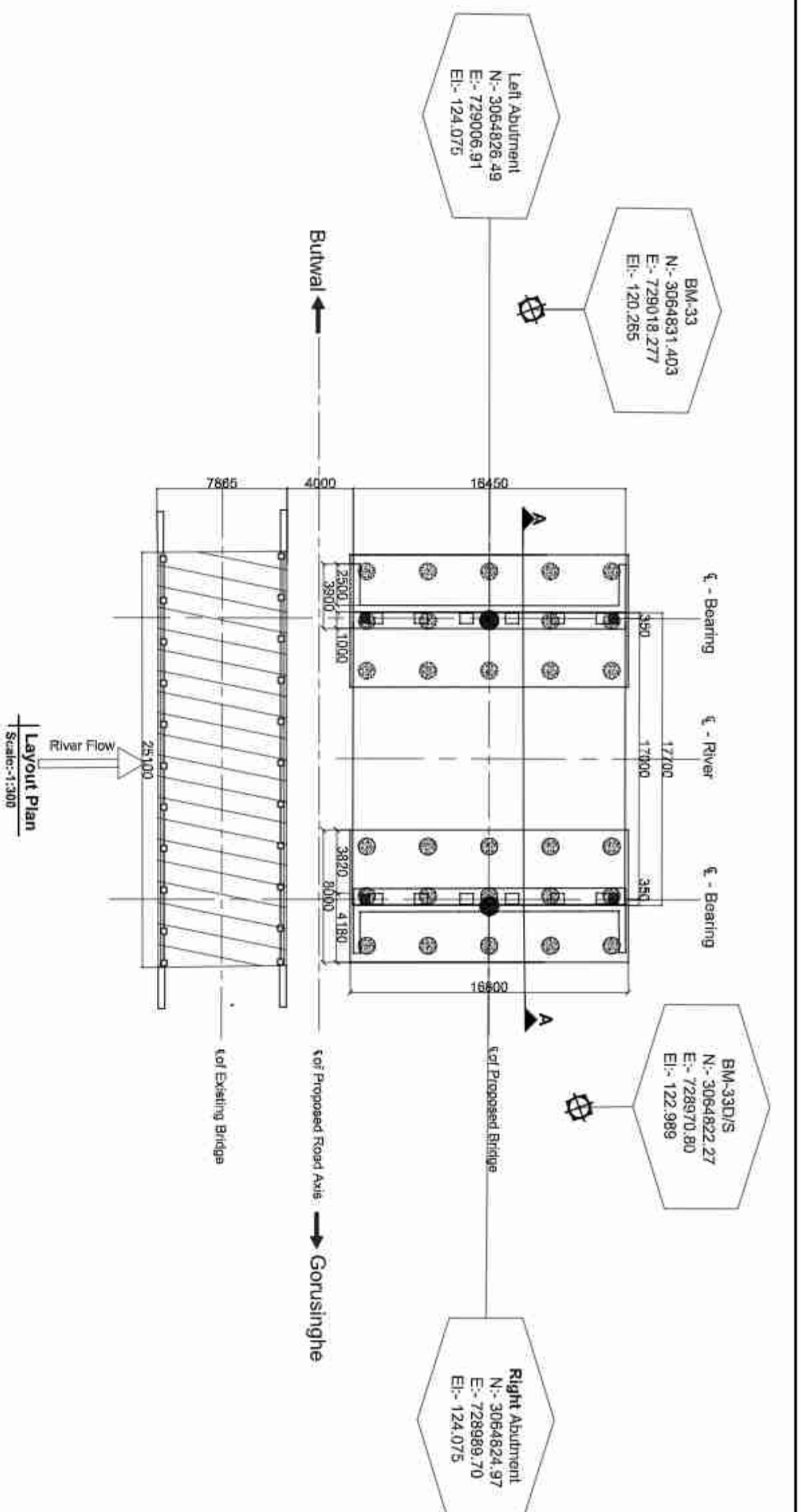


Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP	CONSULTANT:  Soosung Engineering Co. Ltd. Korea In association with ERM/C P (Ltd) and  Tech Studio of Engineering Nepal	IMPLEMENTING AGENCY:		SHEET TITLE:	SCALE:	NAME	SIGNATURE	REV NO.	DESCRIPTION	DATE:		
		DOR, DCID									Designed by:	Saroj Bhattachai
		ROAD NAME:										
		East West Highway (H01)										
		Butwal - Goruaghe Section										
		River Training Work of Marthawa Bridge (48/H-001/299_A)										
As Shown		Checked by:	P. Upadhyaya									
Approved by:				Dr. T.H. Choi								
									November , 2022			
								DWG NO.: 299_Marthawa				
								SHEET NO.: 18/23				

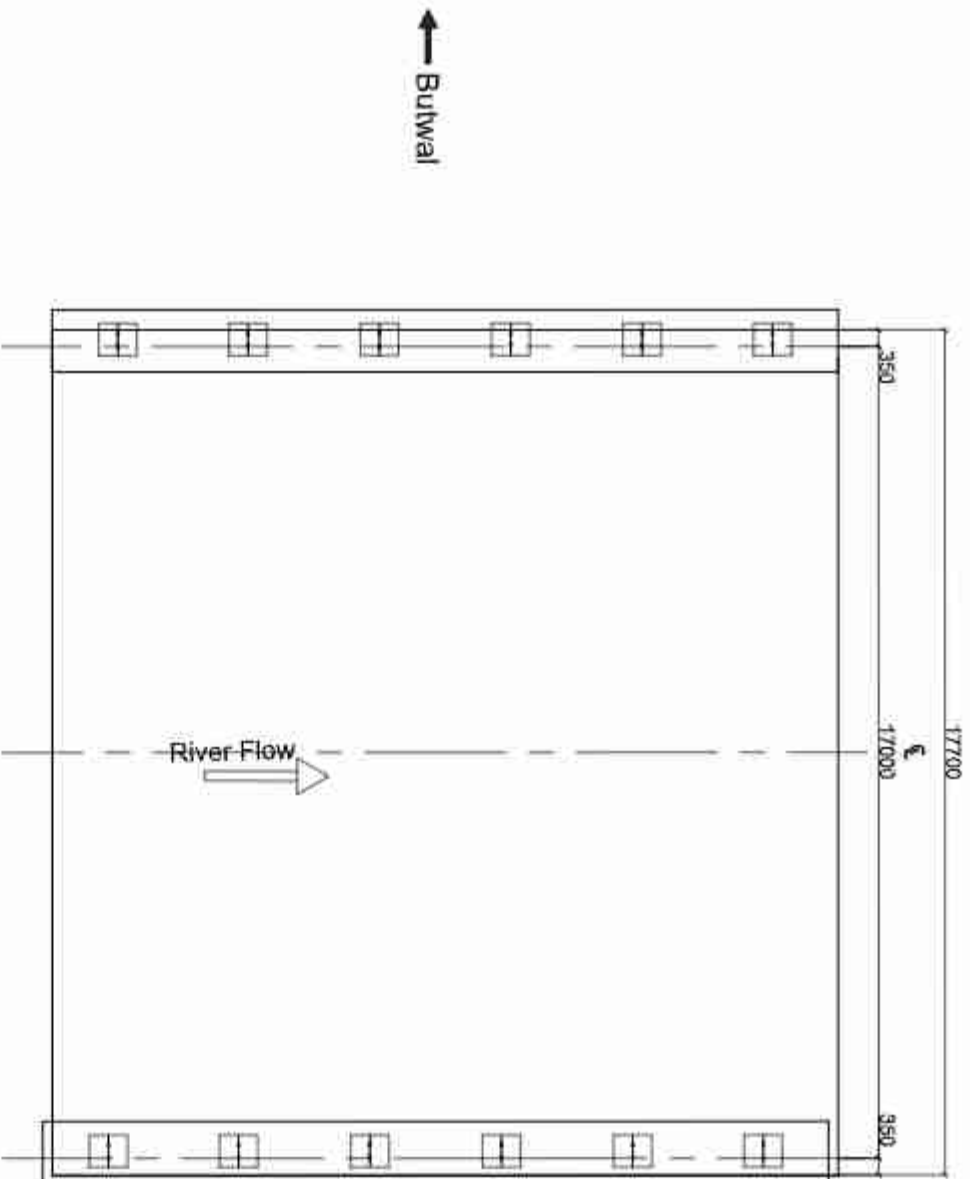


CHAINAGE(Km)	SUPER ELEVATION	HORIZONTAL ALIGNMENT		EXISTING LEVEL(m)	DESIGN LEVEL(m)
		RIGHT	LEFT		
604+600	604+600	NC	NC	122.318	124.538
604+610	604+610	T	T	123.228	124.440
604+620	604+618.217	T	T	121.851	124.342
604+630	604+618.217	T	T	121.158	124.261
604+640	604+618.217	T	T	121.710	124.181
604+650	604+618.217	T	T	121.308	124.134
604+660	604+618.217	T	T	121.032	124.109
604+670	604+618.217	T	T	120.452	124.106
604+680	604+618.217	T	T	117.710	124.118
604+690	604+618.217	T	T	118.983	124.133
604+700	604+618.217	T	T	120.620	124.147
604+710	604+618.217	T	T	123.368	124.164
604+720	604+618.217	T	T	124.042	124.165
604+730	604+618.217	T	T	124.442	124.210
604+740	604+618.217	T	T	124.483	124.235
604+750	604+618.217	T	T	124.577	124.271
604+760	604+618.217	T	T	124.144	124.306
604+770	604+618.217	T	T	122.642	124.338
604+780	604+618.217	T	T	122.520	124.372
604+790	604+618.217	T	T	122.621	124.405
604+800	604+618.217	T	T	123.413	124.438

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Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP		CONSULTANT:  Soosung Engineering Co. Ltd. Korea In association with ERMCo P (Ltd) and  JRS - Tech Studio of Engineering (Nepal)		IMPLEMENTING AGENCY: DOR, DCID ROAD NAME: East West Highway (H01) Butwal - Gorusinghe Section		SHEET TITLE: Layout Plan of Marthiwa Bridge (46/H001/299_A)		SCALE: As Shown		NAME Saroj Bhattarai P. Upadhyaya Dr. T.H.Chol		SIGNATURE   		REV NO.		DESCRIPTION		DATE: November, 2022 DWG NO.: 299_Marthiwa SHEET NO.: 22/23	
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Layout of Bearing
Scale:-1:150

Legend

-  Elastomeric bearing.
Partial movement allowed in longitudinal direction.
Restrained to transverse movement.Free to rotate in any direction.
-  Fixed Pot-bearing.
Restrained to lateral movement,Free to rotate in any direction.
-  Free Pot-bearing.
Partial movement allowed in longitudinal direction.
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 ERM Co. P (Ltd) and J&K - Tech Studio of Engineering Nepal		IMPLEMENTING AGENCY: DOR, DCID ROAD NAME: East West Highway (H01) Butwal - Gorusinghe Section		SHEET TITLE: Layout Plan of Marthiya Bridge (46/H001/299_A)		SCALE: As Shown		NAME		SIGNATURE		REV NO.		DESCRIPTION		DATE: November, 2022	
										Designed by:		Saroj Bhattarai							
										Checked by:		P. Upadhyaya						DWG. NO.:	
										Approved by:		Dr. T.H.Choi						299_Marthiya	
																		SHEET NO.:	
																		2823	

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

Meghawa Bridge(46-H001-300_A)

St. Ch : 604+964.15 ~ End Ch : 604+986.85

Detailed Drawing

Butwal - Gorusinghe Sector

November, 2022

CONTENTS

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6.	Reinforcement Details of Slab.	8	1
7.	Reinforcement Details of Main Girder.	9	1
8.	Reinforcement Details of Cross Girder.	10	1
9.	Bar Bending Schedule of Slab & Main Girder.	11	1
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11.	Reinforcement Details of Abutment.	13	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:

For raised footpaths:

For main girders and cross girders of superstructure with PSC girders:

For main girders and cross girders of superstructure with RCC girders:

For substructure: Abutment stem, ballast wall, stoppers, bearing pedestals,

pier cap, pier stem and pile caps:

For bored and cast in situ piles:

For levelling course:

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:

Prestressing ducts or strands in superstructure:

All components of abutment, pier, pile caps and piles

(except stoppers and bearing pedestals):

Bearing pedestals and Stoppers:

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

Notes on Reinforcement

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

Notes on Prestressing

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

Grouting

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

Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP	 SooSung Engineering Co. Ltd. In association with ERMG P (Ltd) and .89%-Tech Studio of Engineering Nepal	CONSULTANT:		IMPLEMENTING AGENCY:		SHEET TITLE:		SCALE:		NAME		SIGNATURE		REV NO.		DESCRIPTION		DATE:	
		DOR, DCID		ROAD NAME:		General Notes - 1 of Maghawa bridge (46/H001/300_A)		As Shown		Designed by:		Saroj Bhattacharj						November, 2022	
		East West Highway (H01)								Checked by:		P. Upadhyaya						DWG. NO.: 300_Maghawa	
		Butwal - Gorusinghe Section								Approved by:		Dr. T.H.Choi						SHEET NO.: 01/23	

- ### 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 to 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-proped 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
Castling 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
Castling 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-life 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.

- 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 Pol-PTFE bearings, as the case applies.

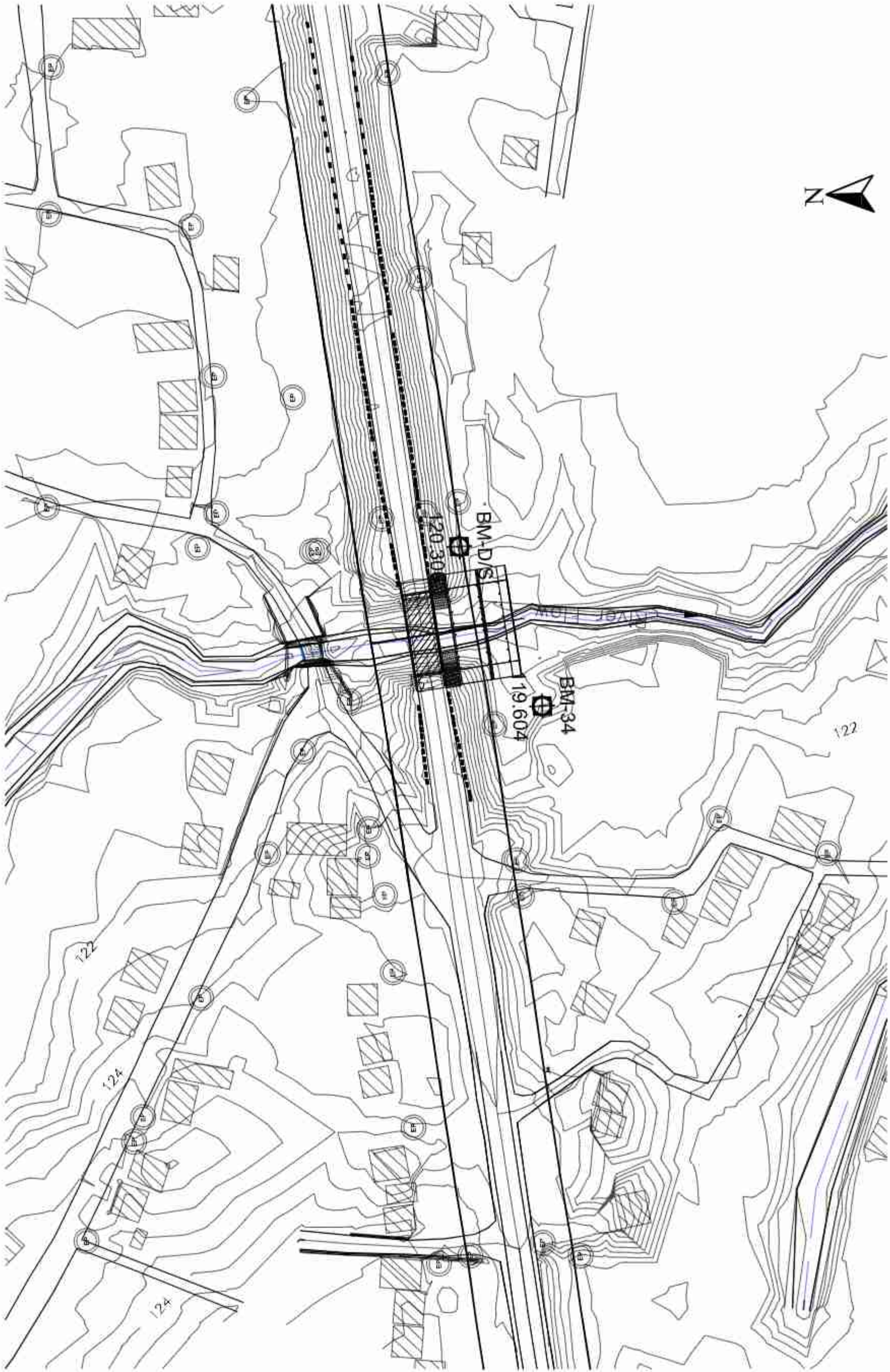
Notes on Foundation and Substructure

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

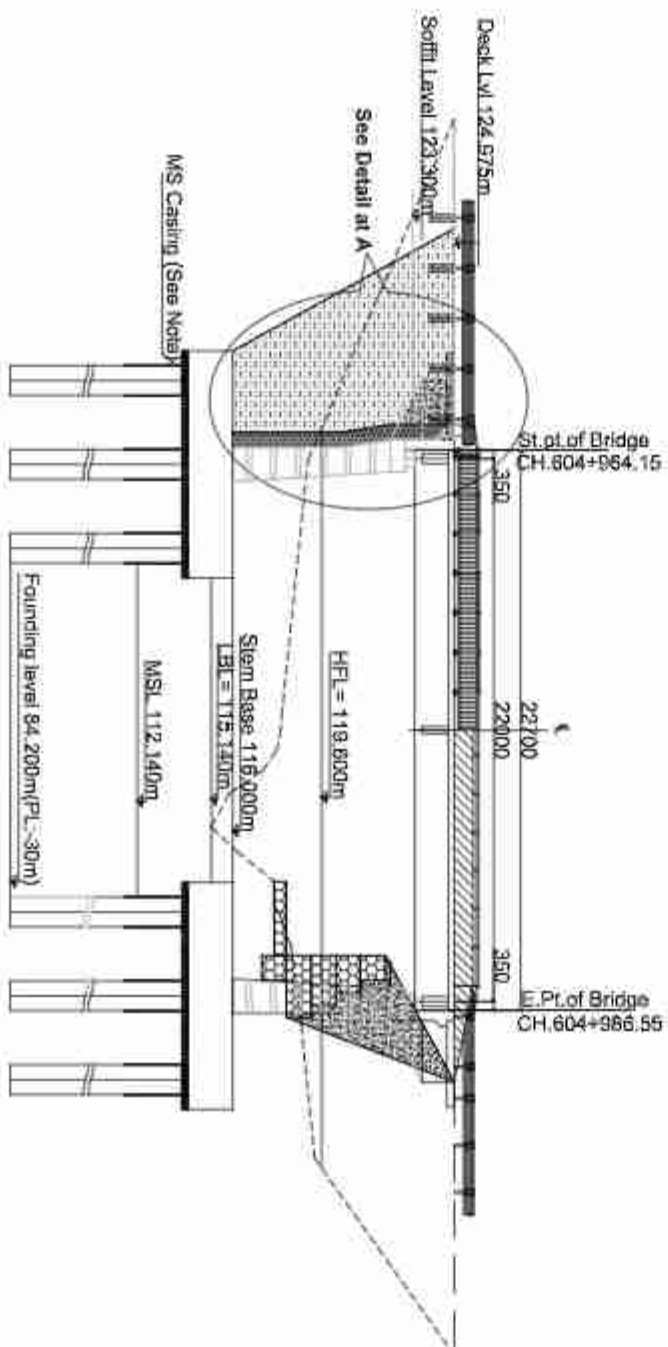
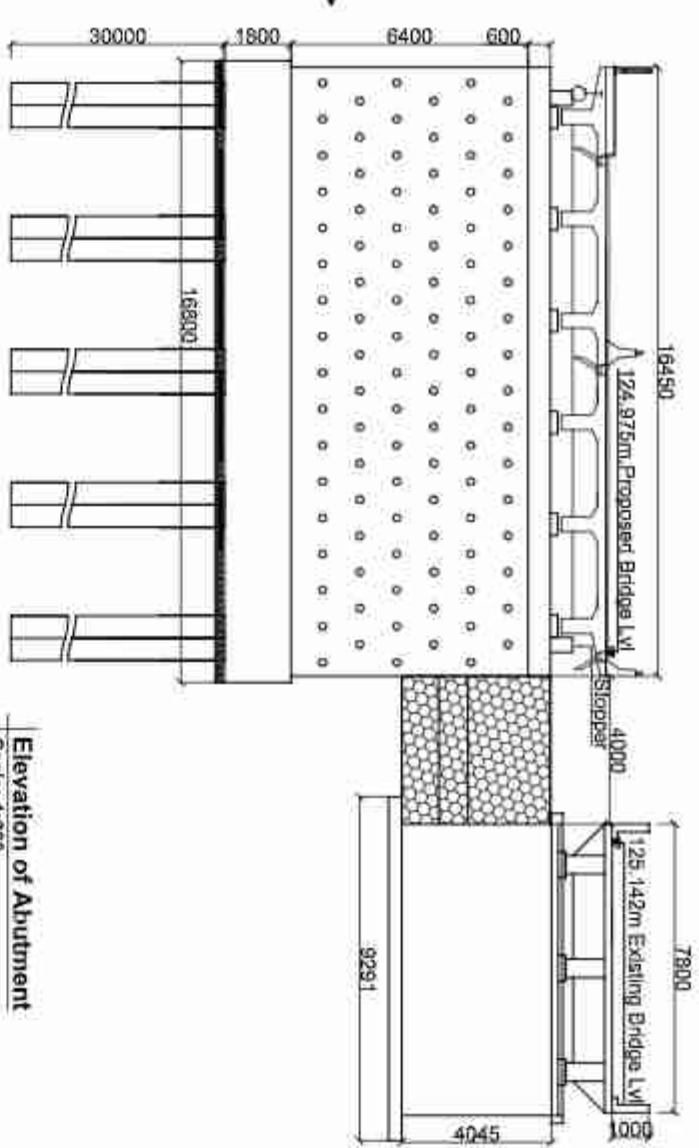
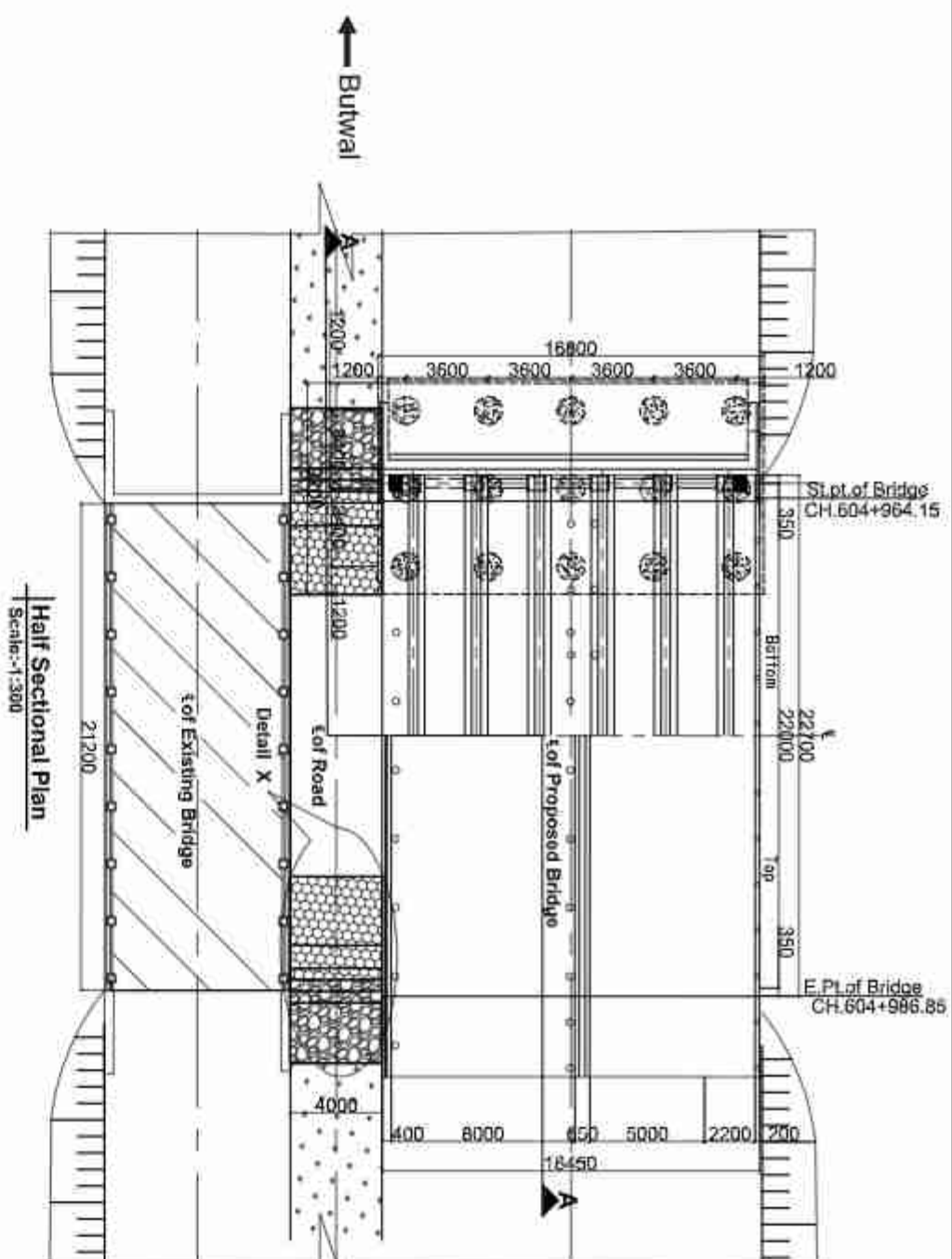
General Note: (For all Pile Foundation)

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

Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP		CONSULTANT:  Soosung Engineering Co. Ltd. Korea In association with ERMIC P (Ltd) and  JRS - Tech Studio of Engineering Nepal		IMPLEMENTING AGENCY: DOR, DCID ROAD NAME: East West Highway (H01) Butwal - Gorusinghe Section		SHEET TITLE: General Notes - 2 of Meghwa bridge (46/H001/300_A)		SCALE: As Shown		NAME Saroj Bhattarai P. Upadhyaya Dr. T.H.Chol		SIGNATURE   		REV NO.		DESCRIPTION		DATE: November , 2022 DWG NO.: 300_MeghwaB SHEET NO.: (02/23)	
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										Designed by: Seroj Bhattacharj								DWG NO.: 300_Maghwa	
										Checked by: P. Upadhyaya								SHEET NO.: 0923	
										Approved by: Dr. T.H.Chel									



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.Bhatnagar (Civil A 904)	  
Hydrologist	Dr. P.C. Jha(Civil A 156) / S. Adhikari (Civil A 406)	 
Geotechnical Engineer	A. Adhikari(Ka 189) / Dr. V. R. S. Shahi	 

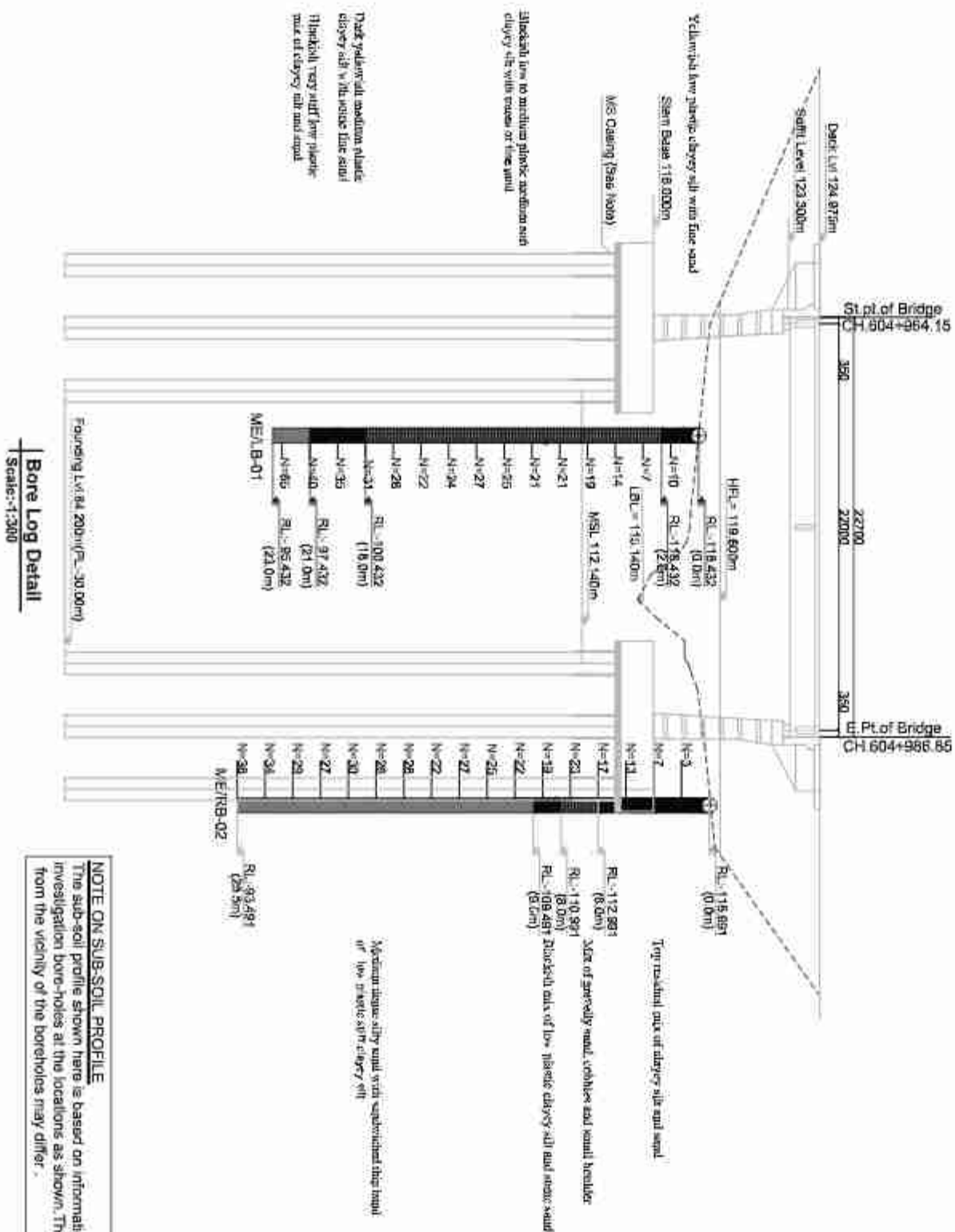
Half Sectional Elevation
Scale: 1:300

[illegible]



Borehole No : ME/LB-1
Easting : 83° 19' 8.98"
Northing : 27° 41' 16.78"
Elevation, m : 118.432
Borehole No : ME/RB-2
Easting : 83° 19' 8.33"
Northing : 27° 41' 16.58"
Elevation, m : 118.991

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

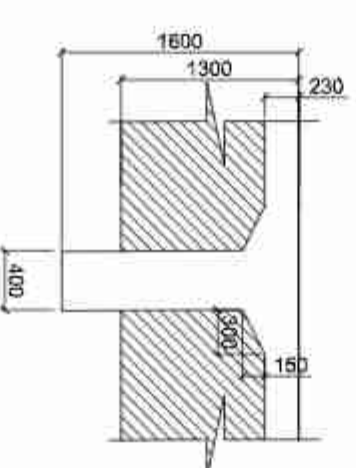
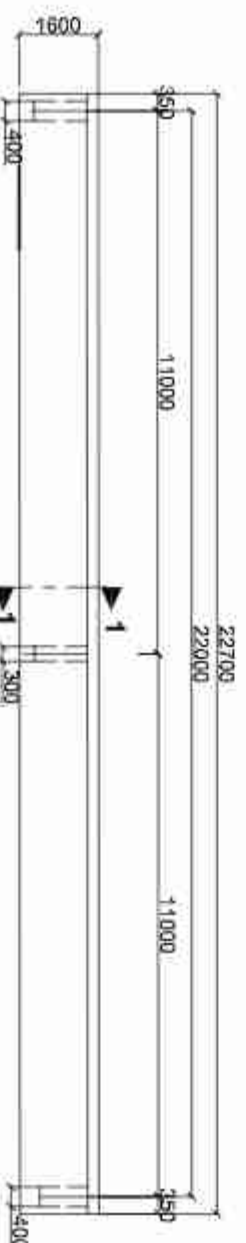
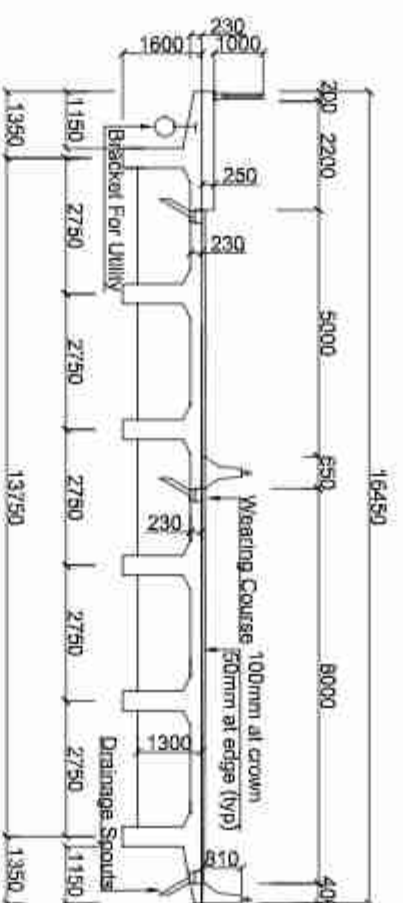
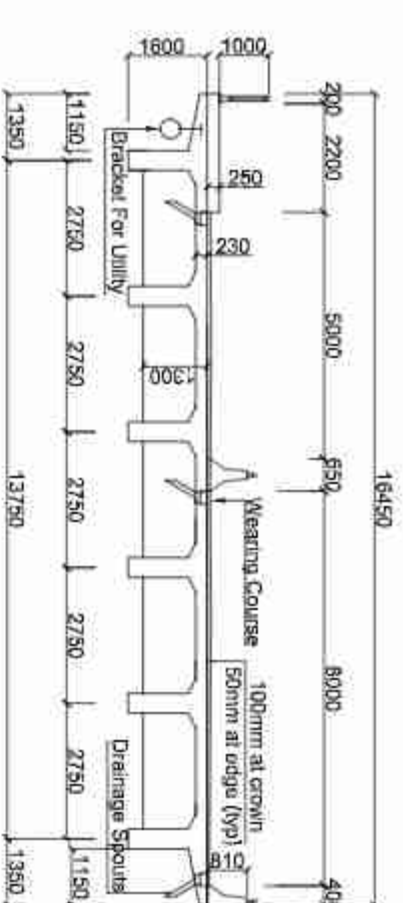
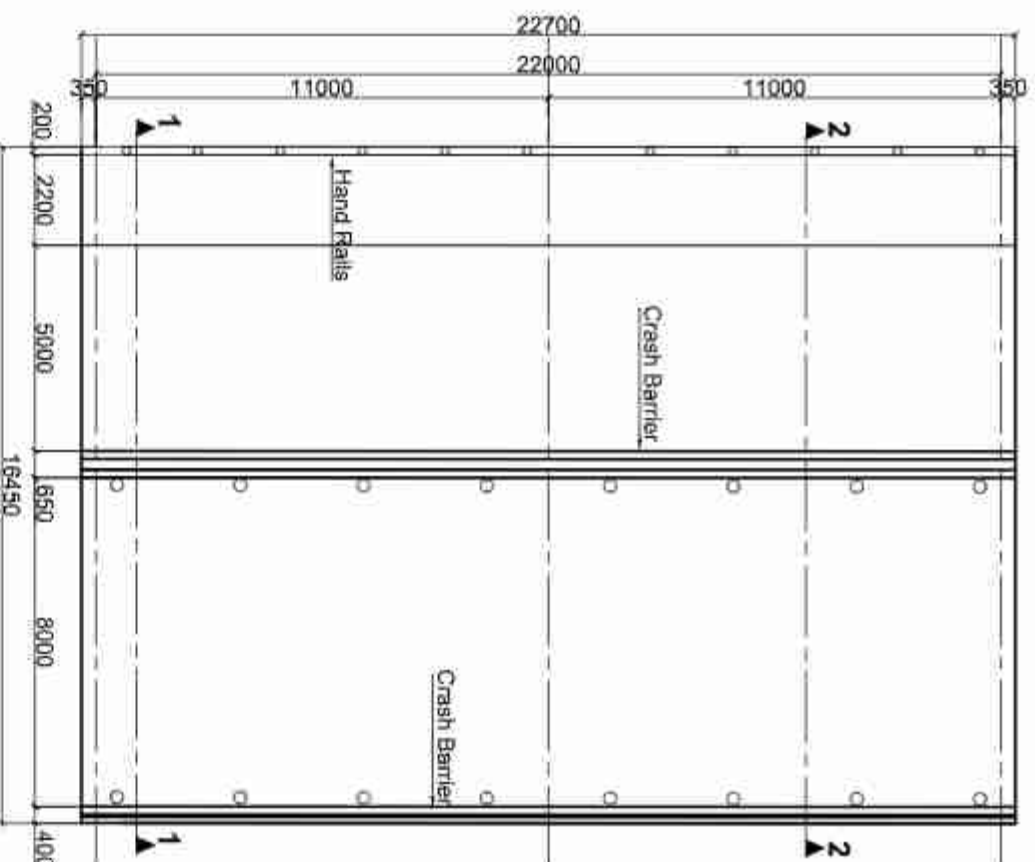
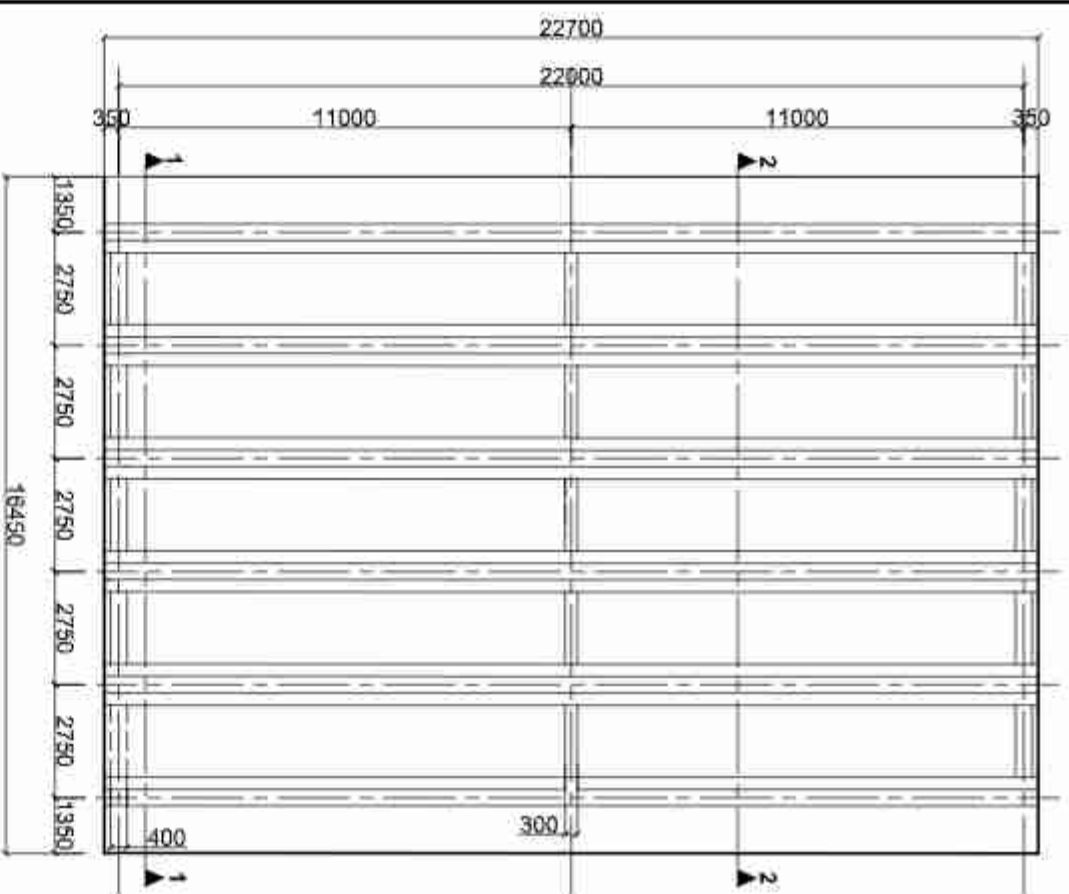


NOTE ON SUB-SOIL PROFILE
The sub-soil profile shown here is based on information obtained from the investigation bore-holes at the locations as shown. The actual soil type away from the vicinity of the boreholes may differ.

Location	Design Pile Length (m)	Design Working load on pile (from - seismic cases) (kn)	Allowable Bearing Capacity on pile (from Scour cases) (kn)	Allowable Bearing Capacity of the pile (from Scour cases) (kn)
As per	30.00	2012	2492	2639

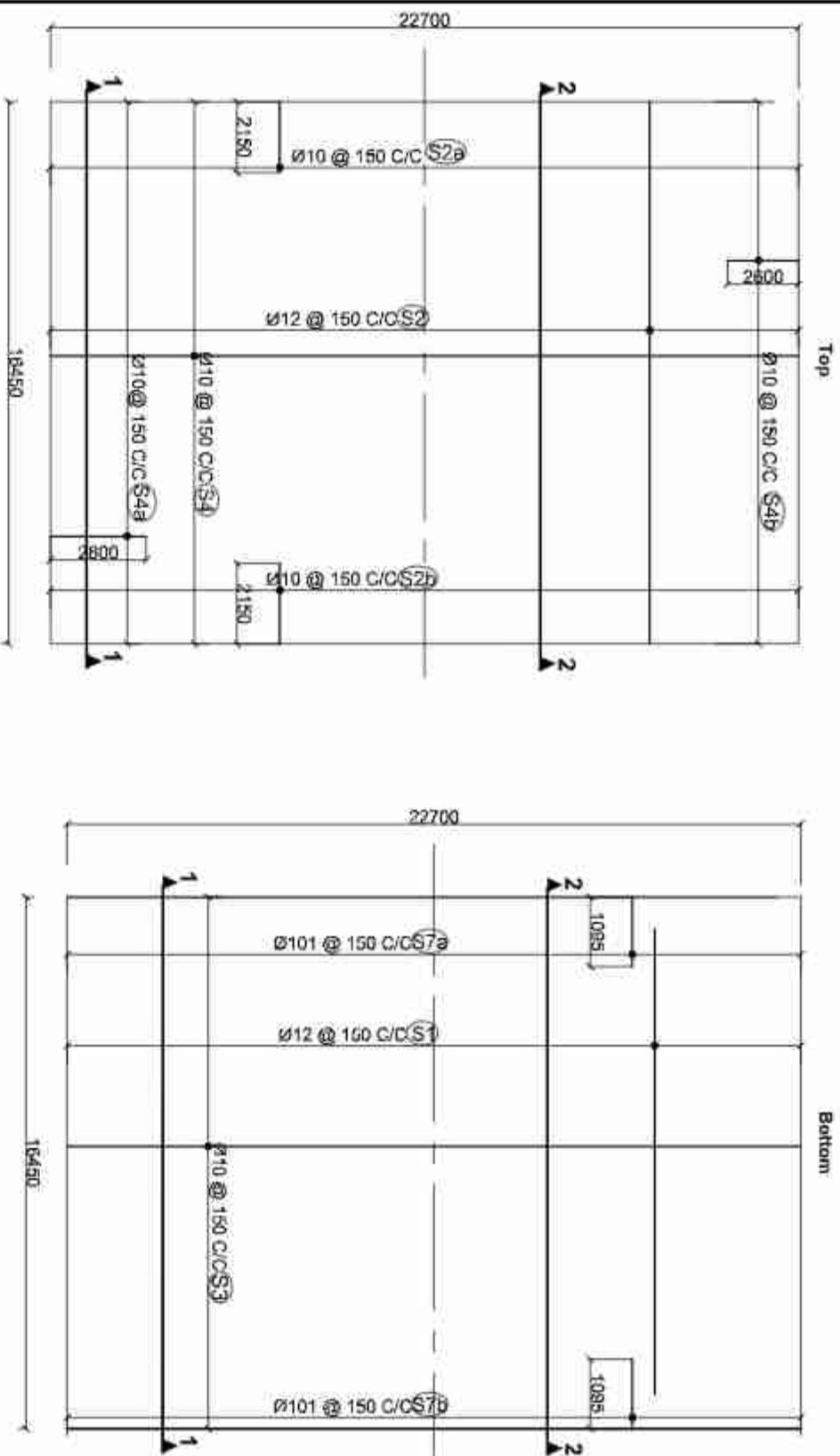
P. Engineer	P. Upadhyaya (Civil A 675)	Signature
Structure Engineer	K. P. Wagle (Civil A 127) / P. Shrestha (Civil A 678) / S. Bhattacharjee (Civil A 904)	Signature
Hydrologist	Dr. P. C. Jha (Civil A 188) / S. Adhikari (Civil A 408)	Signature
Geotechnical Engineer	A. Adhikari (Civil A 189) / Dr. V. R. S. Shahi	Signature

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. In association with ERM P (Ltd) and JSP- Tech Studio of Engineering Nepal	IMPLEMENTING AGENCY: DOR, DCID ROAD NAME: East West Highway (H01) Butwal - Goringha Section	SHEET TITLE: Bore Log of Meghawa Bridge (46/H-001/300_A)	SCALE: As Shown	DESIGNED BY: Saroj Bhattacharjee	CHECKED BY: P. Upadhyaya	APPROVED BY: Dr. T. H. Chai	DATE: November, 2022	DWG. NO.: 300_Meghawa	SHEET NO.: 0623
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NOTE
The bridge has been designed to safely carry three driving lanes. If required in future the footpath can be used as driving lane, moving the crash barrier to the location of the hand-rails.

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. In association with ERMPC P (Ltd) and JSP- Tech Studio of Engineering Nepal		IMPLEMENTING AGENCY: DOR, DCID ROAD NAME: East West Highway (H01) Butwal - Gorusinghe Section		SHEET TITLE: Details of Superstructure of Maghwa bridge (46/H001/300_A)		SCALE: As Shown		NAME		SIGNATURE	REV NO.	DESCRIPTION	DATE: November, 2022
									Designed by: Saroj Bhatnari					DWG. NO.: 300_Maghwa
									Checked by: P. Upadhyaya					
									Approved by: Dr. T.H.Choi					SHEET NO.: 07/23

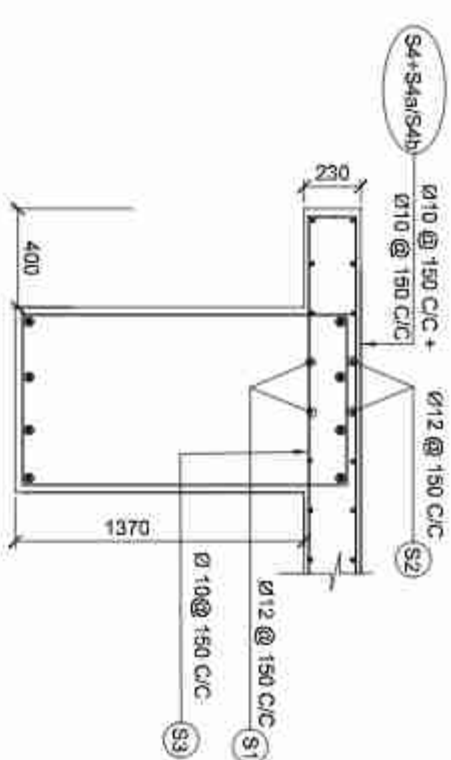
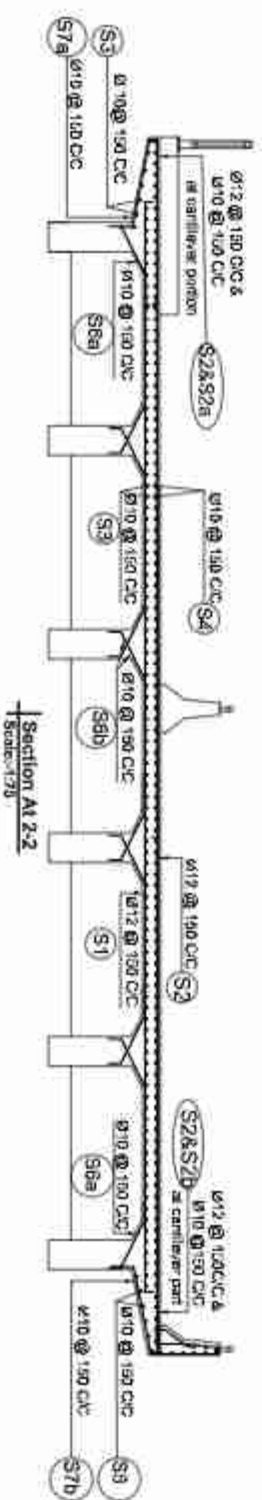
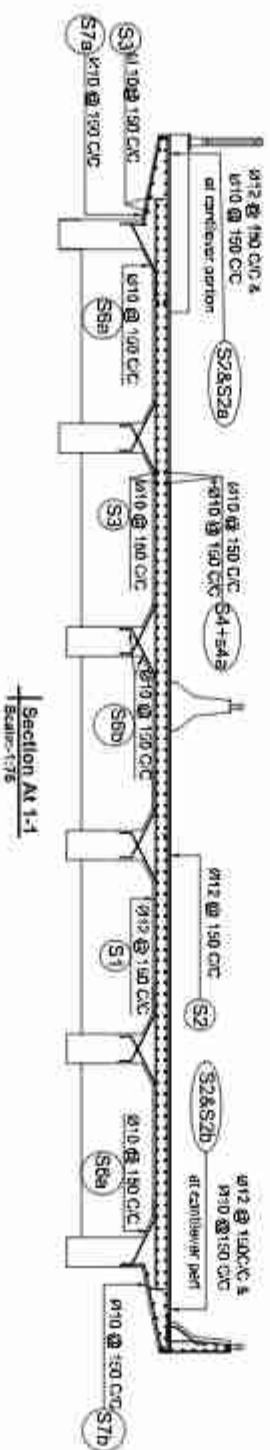


Reinforcement Details Of Deck Slab(Top Face)

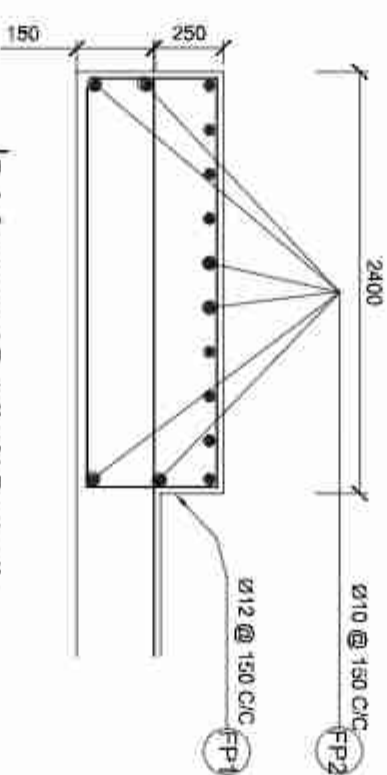
Reinforcement Details Of Deck Slab(Bottom Face)

Scale:-1:200

Scale:-1:200



Reinforcement Details At Deck Extension Between The Main Girder



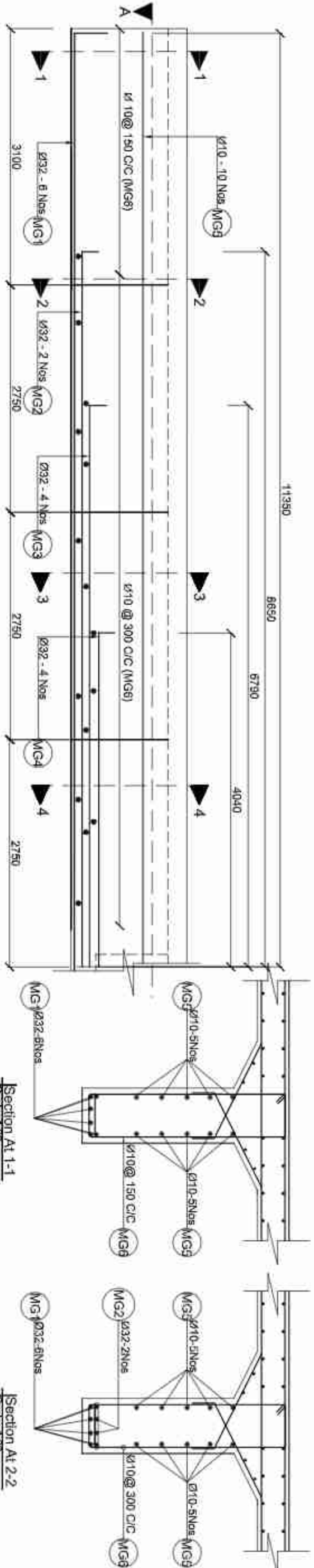
Reinforcement Details At Footpath

Scale:-1:25

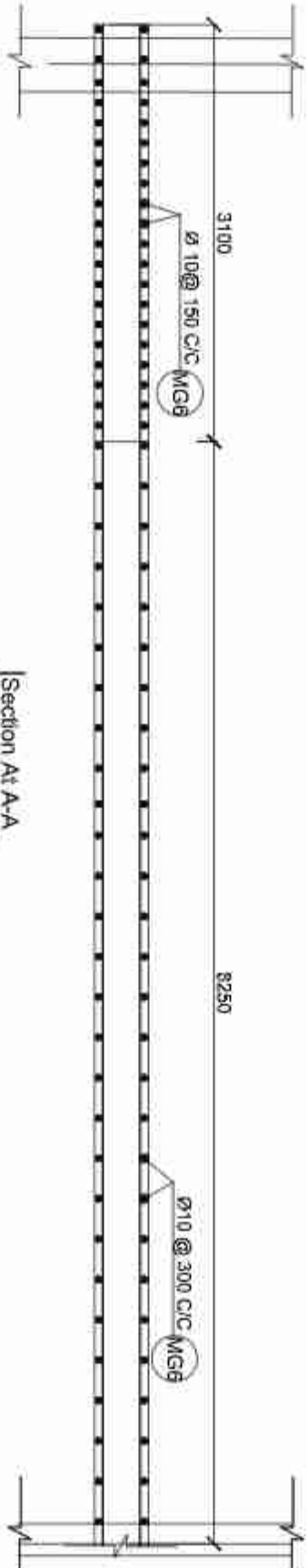
NOTE:

1. On Shear Connection: The transverse bars of the deck slab(S2) shall be tied to vertical stirrups of the longitudinal girders.
2. Top Surface of the Main Girder: Surface to be roughened by wire brush immediately after initial setting. The surface shall be properly cleaned by pressure blower prior to casting of the deck concrete.
3. On Wearing Course: The level of wearing course along the longitudinal direction shall be kept horizontal throughout the length of the deck. The thickness of wearing course towards the ends along the deck shall be increased suitably to compensate for the slope due to hogging of the girder by pre stress.

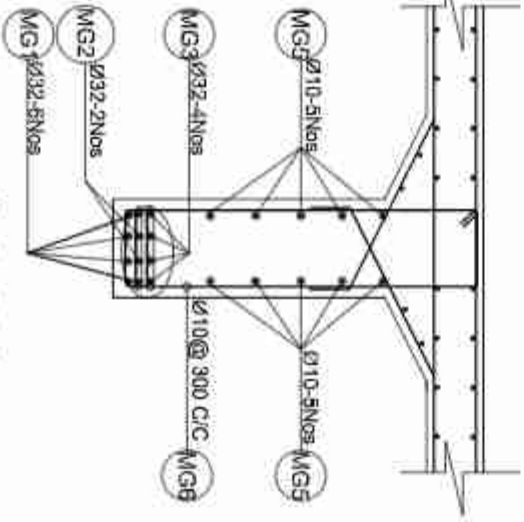
Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (ADB) SASEC Highway Improvement Project- Project Preparatory Consultant (SHIP-PPC) ADB Loan No: 3722-NEP	CONSULTANT:		IMPLEMENTING AGENCY:		SHEET TITLE:		SCALE:		NAME		SIGNATURE		REV NO.		DESCRIPTION		DATE:	
	Soosung Engineering Co. Ltd.		DOR, DCID		Reinforcement Details of Slab of		As Shown		Saroj Bhatnagar								November, 2022	
	In association with		ROAD NAME:		Maghwa bridge				P. Upadhyaya								DWG. NO.:	
	ERMPC P (Ltd) and		East West Highway (H01)		(46/H001/300_A)				Dr. T.H.Choi								300_Maghwa	
		JSP- Tech Studio of Engineering Nepal	Butwal - Gorusinghe Section														SHEET NO.:	
																	08/23	



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

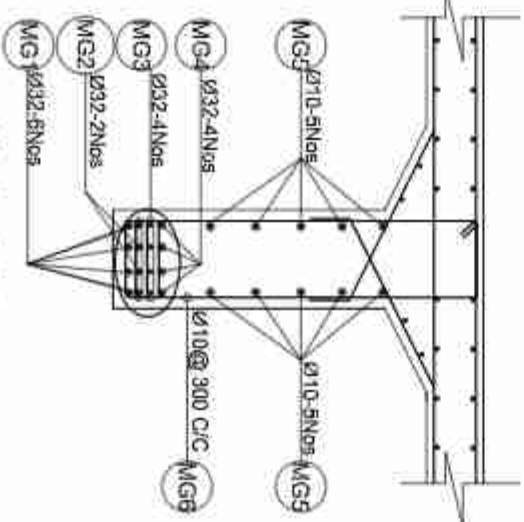


Section At A-A
Scale: 1:50



Section At 3-3
Scale: 1:50

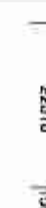
MG4	MG4	MG4	MG4
MG3	MG3	MG3	MG3
MG1	MG2	MG2	MG1
MG1	MG1	MG1	MG1

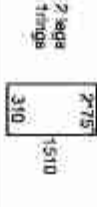


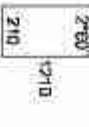
Section At 4-4
Scale: 1:30

MG4	MG4	MG4	MG4
MG3	MG3	MG3	MG3
MG1	MG2	MG2	MG1
MG1	MG1	MG1	MG1

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. In association with ERM Co. P (Ltd) and J&K - Tech Studio of Engineering Nepal	IMPLEMENTING AGENCY: DOR, DCID ROAD NAME: East West Highway (H01) Butwal - Gorusinghe Section	SHEET TITLE: Reinforcement Details of Main Girder of Maghwa bridge (46/H001/300_A)	SCALE: As Shown	DESIGNED BY: Saroj Bhattacharjee	SIGNATURE	REV NO.	DESCRIPTION	DATE: November, 2022
					CHECKED BY: P. Upadhyaya				
					APPROVED BY: Dr. T.H. Chel				SHEET NO.: 03/23

BAR BENDING SCHEDULE OF DECK SLAB						
BAR ID	SKETCH (mm)	SPACING (mm)	# OF BARS	NO. OF BARS	LENGTH (m)	WEIGHT/LENGTH (kg/m) TOTAL WEIGHT (kg)
S1		150 mm	12	102	14.920	0.888 2017.473
S2		150 mm	12	102	16.060	0.888 2234.740
S2a		150 mm	10	152	2.260	0.817 210.856
S2b		150 mm	10	152	2.250	0.817 210.856
S2c		150 mm	10	152	2.250	0.817 210.856
S3		150 mm	10	110	22.920	0.817 141.311
S4		150 mm	10	111	22.920	0.817 158.646
S4a		150 mm	10	111	2.755	0.817 108.541
S4b		150 mm	10	111	2.755	0.817 108.541
S5a		150 mm	10	1410	1.380	0.817 1189.862
S5b		150 mm	10	206	1.400	0.817 264.125
S7a		150 mm	10	206	1.400	0.817 264.125
S7b		150 mm	10	206	1.400	0.817 264.125
TOTAL EXCLUDING FOOTPATHS (in kg)						10043.198
TOTAL WEIGHT (IN METRIC TON)						10.043

BAR BENDING SCHEDULE FOR RCC MAIN GIRDER						
BAR ID	SHAPE OF BAR IN mm (NOT TO SCALE)	# OF BARS (mm)	# OF BARS	LENGTH (m)	WEIGHT/LENGTH (kg/m)	TOTAL WEIGHT (kg)
MG1		32	6	23.390	6.313	886.077
MG2		32	2	17.700	6.313	223.483
MG3		32	4	13.880	6.313	353.043
MG4		32	4	8.480	6.313	214.149
MG5		10	10	22.620	6.317	139.461
MG6		10	104	3.780	6.317	243.076
MG7		32	36	0.320	6.313	78.770
TOTAL WEIGHT IN GIRDER						2135.949
TOTAL NUMBER OF GIRDERS AND TOTAL WEIGHT (IN METRIC TON)						2.136

BAR BENDING SCHEDULE FOR INTERMEDIATE CROSS GIRDERS							
BAR ID	SKETCH (mm)	SPACING (mm)	# OF BARS (mm)	NO. OF BARS	LENGTH (m)	WEIGHT/LENGTH (kg/m)	TOTAL WEIGHT (kg)
MC1		25	4	14.745	3.853	227.272	
MC2		20	2	14.745	2.488	72.727	
MC3		10	69	2.960	6.317	125.822	
MC4		10	10	13.970	6.317	88.190	
TOTAL WEIGHT IN GIRDER (in kg)						512.051	
TOTAL NUMBER OF GIRDERS AND TOTAL WEIGHT 1 (IN METRIC TON)						0.512	

BAR BENDING SCHEDULE FOR END CROSS GIRDERS							
BAR ID	SKETCH (mm)	SPACING (mm)	# OF BARS	NO. OF BARS	LENGTH (m)	WEIGHT/LENGTH (kg/m)	TOTAL WEIGHT (kg)
EC1		25	4	14.845	3.853	228.813	
EC2		20	5	14.845	3.853	288.018	
EC3		10	72	3.160	6.317	140.275	
EC4		10	10	14.070	6.317	88.747	
TOTAL WEIGHT IN GIRDER(in kg)						741.851	
TOTAL NUMBER OF GIRDERS AND TOTAL WEIGHT 2 (IN METRIC TON)						1.484	

BAR BENDING SCHEDULE OF FOOTPATH						
BAR ID	SHAPE OF BAR IN mm (NOT TO SCALE)	SPACING (mm)	# OF BARS	NO. OF BARS	LENGTH (m)	WEIGHT/LENGTH (kg/m) TOTAL WEIGHT (kg)
FP1		100	12	132	6.840	0.568 761.107
FP2		150	10	21	22.810	0.617 292.739
ONE SIDE						1053.846
TOTAL WEIGHT IN METRIC TON						1.054

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										Designed by:								November, 2022	
										Checked by:								DWG. NO.:	
										Approved by:								500/Magphawa	
																		SHEET NO.:	
																		10/23	