

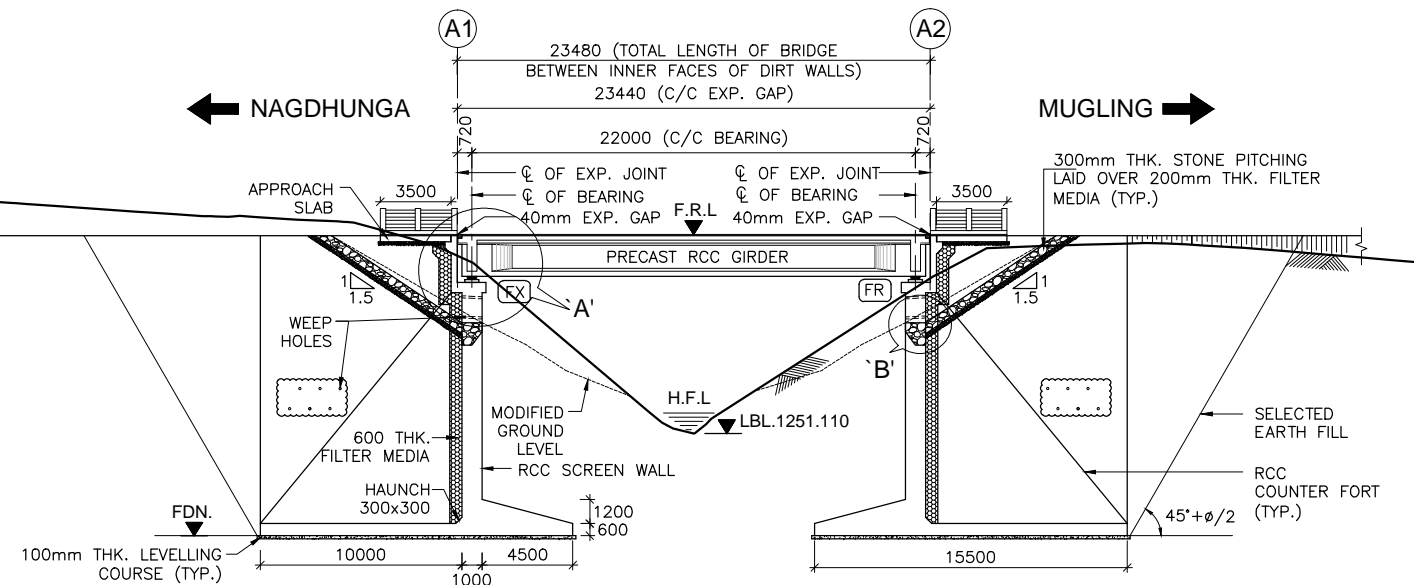
Detailed Project Report of Kathmandu (Nagdhunga) - Naubise - Mugling Road and Bridges Nepal India Regional Trade and Transport Project (NIRTP) (IDA CREDIT No. 5273 - NEP)

DRAWINGS INDEX FOR BRIDGES (PACKAGE-I)

Sl. No.	TITLE	DRAWING NO.	DATE OF ISSUE OF ORIGINAL DRAWING (R0)	REVISION STATUS & DATE	PAGE No.
BRIDGE OVER KHATRIPAUWA KHOLA AT CH: 4+140					
1	GENERAL ARRANGEMENT DRAWING	NIRTP/NAG-MUG/KHATRIPAUWA/GAD (Sheet 1 & 2)	,JUNE-2018	R0	01-02
2	SUBSTRUCTURE				
2.1	DIMENSIONAL DETAILS OF COUNTER FORT TYPE ABUTMENT & ITS COMPONENTS	NIRTP/NAG-MUG/KHATRIPAUWA/SUB-01	,JUNE-2018	R0	03
2.2	REINFORCEMENT DETAILS OF COUNTER FORT TYPE ABUTMENT & ITS COMPONENTS, DIRT WALL, RETURN WALL, PEDESTAL AND SEISMIC STOPPER	NIRTP/NAG-MUG/KHATRIPAUWA/SUB-02 (Sheet 1 TO 3)	,JUNE-2018	R0	04-06
3	SUPERSTRUCTURE (SPAN: 1X22.00M C/C OF BEARINGS)				
3.1	DIMENSIONAL DETAILS OF PRECAST RCC GIRDER & CAST-IN-SITU SLAB SUPERSTRUCTURE	NIRTP/NAG-MUG/KHATRIPAUWA/RCC-G/22m/01 (Sheet 1 & 2)	,JUNE-2018	R0	07-08
3.2	REINFORCEMENT DETAILS OF LONGITUDINAL GIRDER	NIRTP/NAG-MUG/KHATRIPAUWA/RCC-G/22m/02	,JUNE-2018	R0	09
3.3	REINFORCEMENT DETAILS OF END CROSS GIRDER	NIRTP/NAG-MUG/KHATRIPAUWA/RCC-G/22m/03	,JUNE-2018	R0	10
3.4	REINFORCEMENT DETAILS OF RCC DECK SLAB	NIRTP/NAG-MUG/KHATRIPAUWA/RCC-G/22m/04 (Sheet 1 & 2)	,JUNE-2018	R0	11-12
3.5	DETAILS OF LOAD AND FORCES FOR POT/PTFE BEARINGS	NIRTP/NAG-MUG/KHATRIPAUWA/RCC-G/22m/05	,JUNE-2018	R0	13
BRIDGE OVER NAUBISE KHOLA AT CH: 12+328					
1	GENERAL ARRANGEMENT DRAWING	NIRTP/NAG-MUG/NAUBISE/GAD (Sheet 1 & 2)	,JUNE-2018	R0	14-15
2	SUBSTRUCTURE				
2.1	DIMENSIONAL DETAILS OF ABUTMENT AND FOUNDATION	NIRTP/NAG-MUG/NAUBISE/SUB-01	,JUNE-2018	R0	16
2.2	REINFORCEMENT DETAILS OF ABUTMENT, DIRT WALL, RETURN WALL, PEDESTAL AND SEISMIC STOPPER:	NIRTP/NAG-MUG/NAUBISE/SUB-02 (Sheet 1 & 2)	,JUNE-2018	R0	17-18
3	SUPERSTRUCTURE (SPAN: 1X22.00M C/C OF BEARINGS)				
3.1	DIMENSIONAL DETAILS OF PRECAST RCC GIRDER & CAST-IN-SITU SLAB SUPERSTRUCTURE	NIRTP/NAG-MUG/NAUBISE/RCC-G/22m/01 (Sheet 1 & 2)	,JUNE-2018	R0	19-20
3.2	REINFORCEMENT DETAILS OF LONGITUDINAL GIRDER	NIRTP/NAG-MUG/NAUBISE/RCC-G/22m/02	,JUNE-2018	R0	21
3.3	REINFORCEMENT DETAILS OF END CROSS GIRDER	NIRTP/NAG-MUG/NAUBISE/RCC-G/22m/03	,JUNE-2018	R0	22
3.4	REINFORCEMENT DETAILS OF RCC DECK SLAB	NIRTP/NAG-MUG/NAUBISE/RCC-G/22m/04 (Sheet 1 & 2)	,JUNE-2018	R0	23-24
3.5	DETAILS OF LOAD AND FORCES FOR POT/PTFE BEARINGS	NIRTP/NAG-MUG/NAUBISE/RCC-G/22m/05	,JUNE-2018	R0	25
1	MISCELLANEOUS DRAWINGS				
1.1	DETAILS OF APPROACH SLAB	NIRTP/NAG-MUG/PACKAGE-I/MISC.-01	,JUNE-2018	R0	26
1.2	DETAILS OF DRAINAGE SPOUT & WEARING COAT	NIRTP/NAG-MUG/PACKAGE-I/MISC.-02	,JUNE-2018	R0	27
1.3	DIMENSIONAL & REINFORCEMENT DETAILS OF R.C.C CRASH BARRIER	NIRTP/NAG-MUG/PACKAGE-I/MISC.-03	,JUNE-2018	R0	28
1.4	DIMENSIONAL & REINFORCEMENT DETAILS OF R.C.C RAILING	NIRTP/NAG-MUG/PACKAGE-I/MISC.-04	,JUNE-2018	R0	29
1.5	DIMENSIONAL AND REINF. DETAILS OF R.C.C RETAINING WALL/MEDIAN WALL	NIRTP/NAG-MUG/PACKAGE-I/MISC.-05	,JUNE-2018	R0	30
1.6	DIMENSIONAL AND REINF. DETAILS OF R.C.C TOE WALL	NIRTP/NAG-MUG/PACKAGE-I/MISC.-06	,JUNE-2018	R0	31

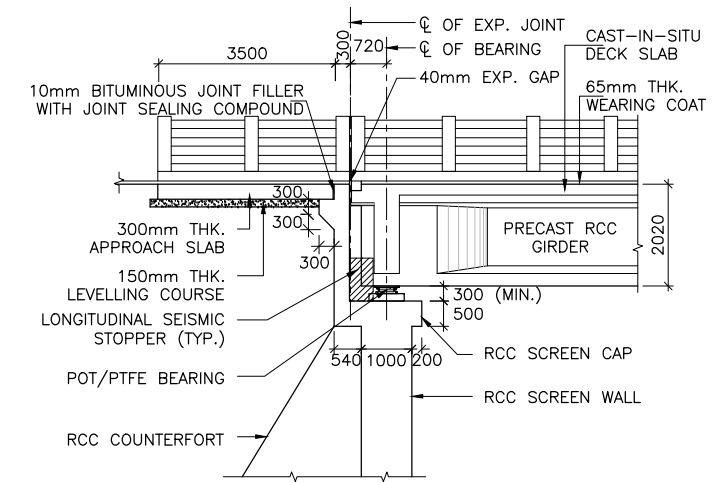
KHATRIPAUWA KHOLA BRIDGE

CHAINAGE : 4+140

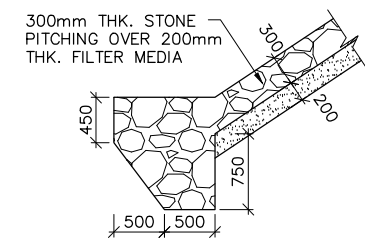


FINISHED ROAD LEVEL (m)	1261.800	1261.800	1261.800
GROUND LEVEL (m)	1260.416		1259.151
FOUNDING LEVEL (m)	1246.860		1246.860
CHAINAGE (m)	(-)11.000	0.000	11.000

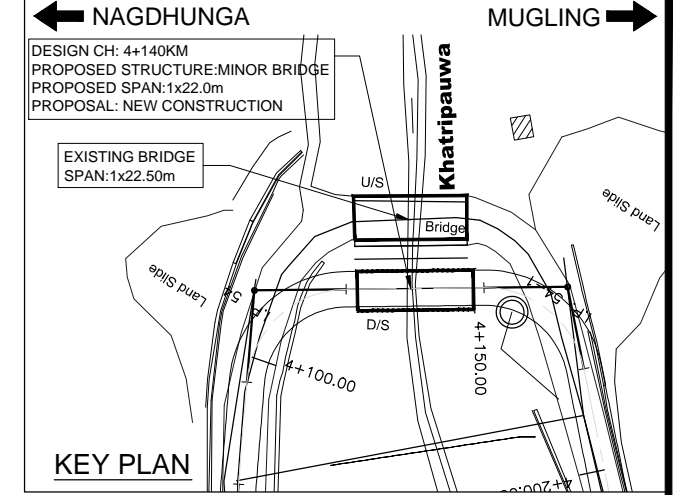
LONGITUDINAL ELEVATION OF PROPOSED BRIDGE CHAINAGE AT 0.000m IS 4+138KM
(SCALE 1:250)



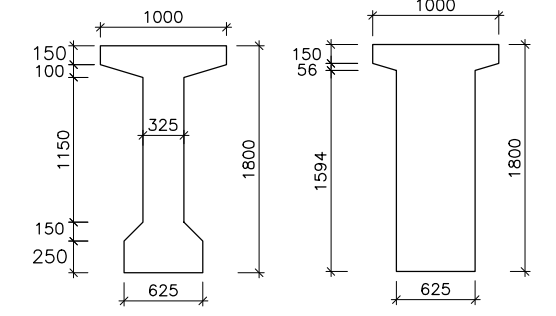
DETAIL-A'
(SCALE 1:100)



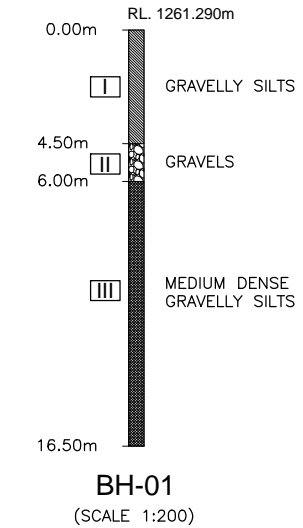
DETAIL-B'
SCALE-1:50



KEY PLAN



CROSS SECTION OF PRECAST RCC GIRDER FOR 22m SPAN
(SCALE 1:40)



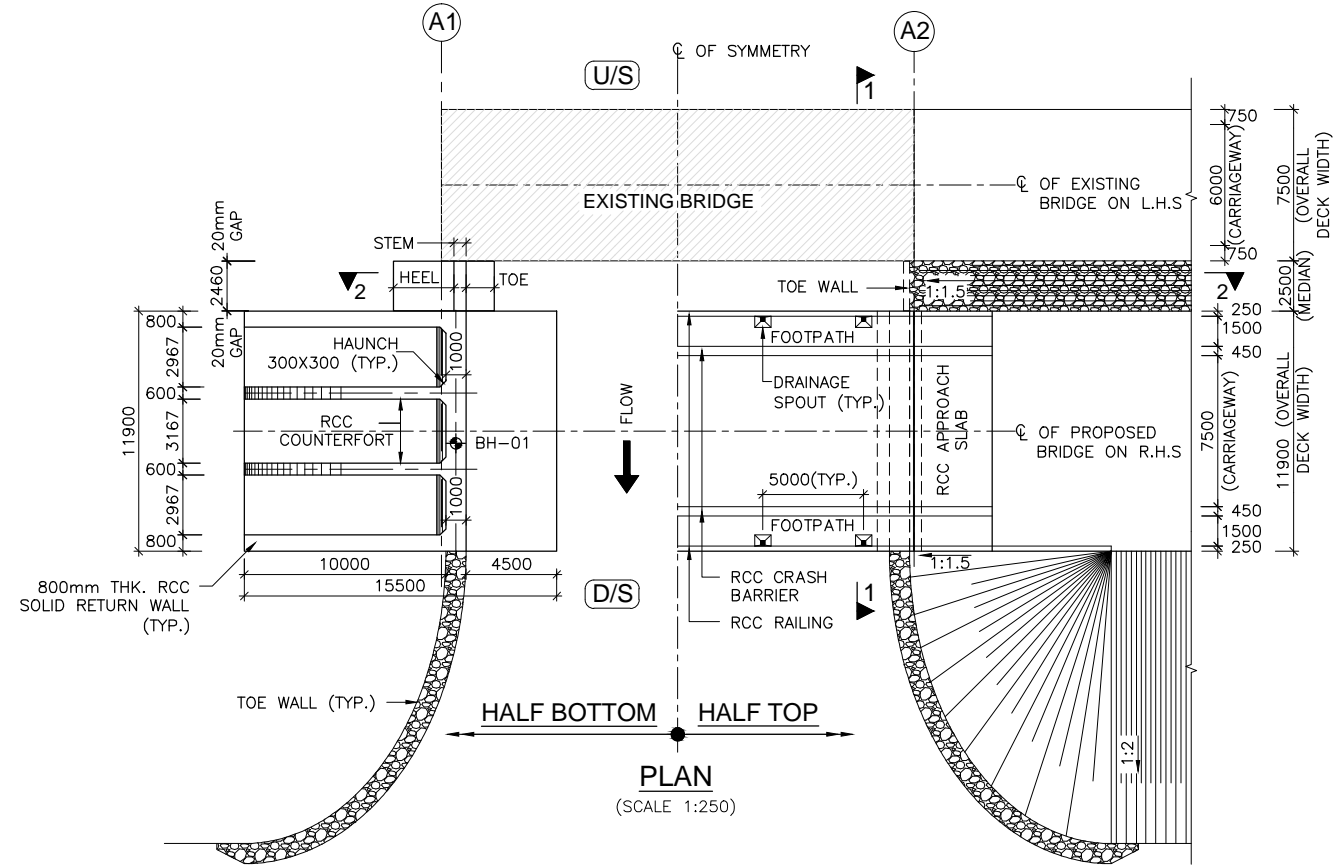
BH-01
(SCALE 1:200)

HYDRAULIC DATA:-

DISCHARGE	- 13cumec
VELOCITY	- 5.35m/s
H.F.L	- 1252.120m
M.S.L AT ABUTMENT	- 1248.860

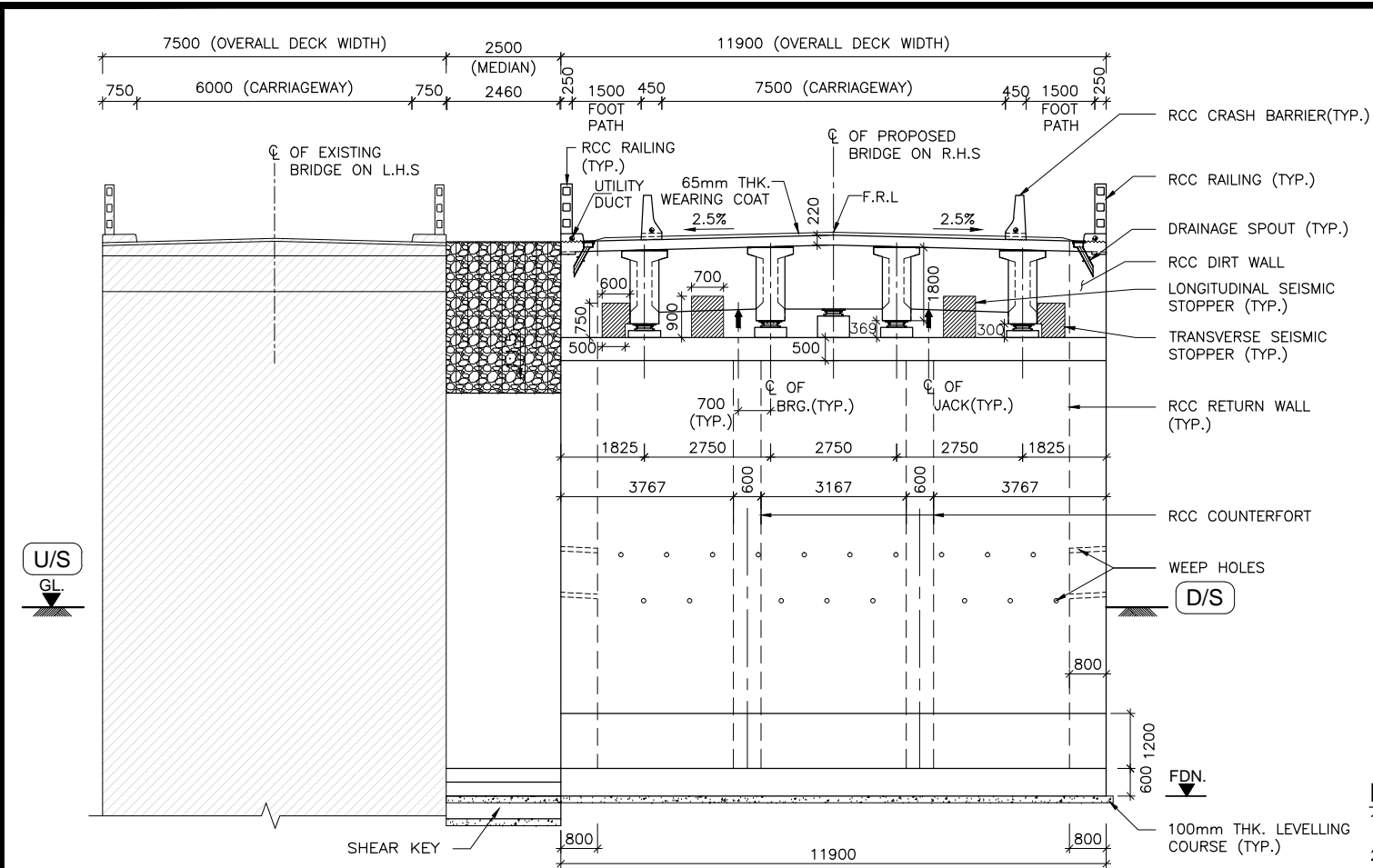
LEGEND:

F.R.L	: FINISHED ROAD LEVEL
H.F.L	: HIGH FLOOD LEVEL
CL	: CENTER LINE
LVL.	: LEVEL
RL	: REDUCED LEVEL
TYP.	: TYPICAL
THK.	: THICK
D/S	: DOWNSTREAM
U/S	: UPSTREAM
G.L	: GROUND LEVEL
L.B.L	: LOWEST BED LEVEL
FDN.	: FOUNDING LEVEL
FX	: FIX
FR	: FREE
EXISTING	: [Hatched Box]
PROPOSED	: [White Box]
BH	: BORE HOLE

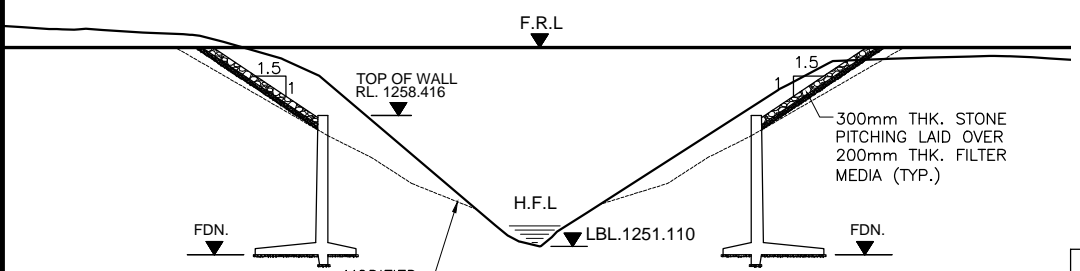


PLAN
(SCALE 1:250)

<p>EMPLOYER Government of Nepal Ministry of Physical Infrastructure and Transport, Department of Roads, Foreign Co-operation Branch</p>	<p>PROJECT Nepal India Regional Trade and Transport Project (NIRTP) (IDA CREDIT No. 5273 - NEP) Detailed Design of Kathmandu (Nagdhunga) - Naubise - Mugling Road and Bridges</p>	<p>DESIGN CONSULTANT Intercontinental Consultants & Technocrats Pvt.Ltd, A-8, Green Park, New Delhi - 110016 Ph : 4086-3000, Fax 2685-5252 In Joint Venture With Soosung Engineering Co. Ltd., South Korea</p>	Prepared By	M.L.GUPTA	<p>DRAWING TITLE: GENERAL ARRANGEMENT DRAWING FOR MINOR BRIDGE AT CH: 4+140KM OVER KHATRI PAUWA KHOLA (1x22.0m) PACKAGE-I (NAGDHUNGA-NAUBISE)</p>	Scale:	Date: JUNE-2018
			Designed By	V.CHAUDHARY			<p>Drawing No.: NIRTP/NAG-MUG/KHATRI PAUWA/GAD</p>
Checked By	P.K.KHAN	Approved By	B.N.SINGH				



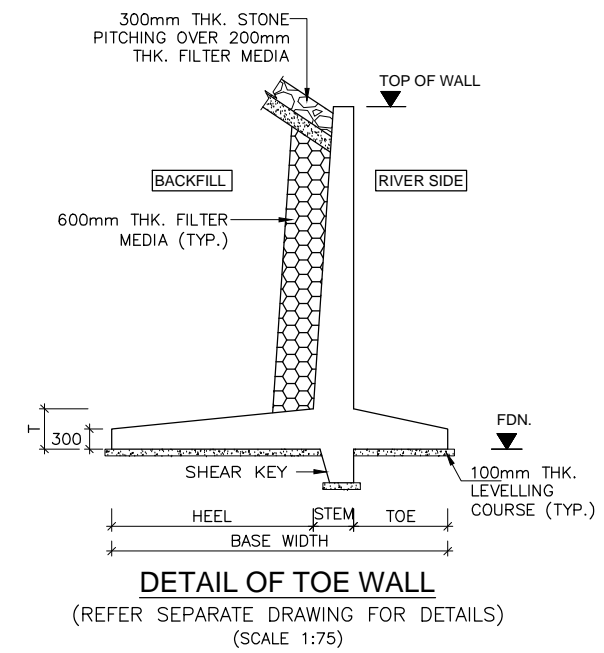
SECTION 1-1
(SCALE 1:100)



SECTION 2-2
(SCALE 1:250)

LEGEND:

F.R.L.	: FINISHED ROAD LEVEL
H.F.L.	: HIGH FLOOD LEVEL
CL	: CENTER LINE
LVL.	: LEVEL
RL.	: REDUCED LEVEL
TYP.	: TYPICAL
THK.	: THICK
D/S	: DOWNSTREAM
U/S	: UPSTREAM
G.L.	: GROUND LEVEL
L.B.L.	: LOWEST BED LEVEL
FDN.	: FOUNDING LEVEL
FX	: FIX
FR	: FREE
EXISTING	:
PROPOSED	:
BH	: BORE HOLE



DETAIL OF TOE WALL
(REFER SEPARATE DRAWING FOR DETAILS)
(SCALE 1:75)

NOTES:-

- ALL DIMENSIONS ARE IN MILLIMETER AND LEVELS ARE IN METER UNLESS OTHERWISE SPECIFIED.
- DIMENSIONS ARE NOT TO BE SCALED ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
- THE BRIDGE HAS BEEN DESIGNED FOR MOST SEVERE OF:
 - ONE LANE OF IRC CLASS 70R LOADING OR TWO LANES OF IRC CLASS A LOADING WHEN FOOTPATHS ARE IN POSITION.
 - ONE LANE OF IRC CLASS 70R LOADING +ONE LANE OF IRC CLASS A LOADING OR 3 LANES OF IRC CLASS A LOADING WHEN FOOTPATHS ARE REMOVED.
 - ONE LANE OF SV LOADING IN ACCORDANCE WITH CLAUSE 204.5 OF IRC-6:2017.
- MINIMUM CONCRETE COVER, GRADE OF CONCRETE, MINIMUM CEMENT CONTENT & MAXIMUM W/C RATIO SHALL BE AS PER 'MODERATE' CONDITION OF EXPOSURE.
- CONCRETE SHALL BE DESIGN MIX WITH A MINIMUM 28 DAYS CHARACTERISTIC STRENGTH ON 150MM CUBE AS FOLLOWS:
 - LEVELING COURSE (UNDER FOUNDATION) - M10
 - LEVELING COURSE (UNDER APPROACH SLAB) - M15
 - FOUNDATION - M30
 - PEDESTAL - M40
 - SEISMIC STOPPER - M40
 - SUBSTRUCTURE - M30
 - PRECAST RCC GIRDER - M35
 - RETURN/RETAINING WALL - M30
 - CRASH BARRIER - M40
 - APPROACH SLAB - M30
- UNTENSIONED REINFORCEMENT SHALL BE THERMO MECHANICALLY TREATED (TMT), HYSD BARS OF GRADE DESIGNATION FE-500D CONFORMING TO IS: 1786.
- POT/PTFE BEARINGS SHALL BE DESIGNED AS PER PROVISION OF IRC : 83 (PART-III 2002).
- STRIP SEAL TYPE EXPANSION JOINTS SHALL BE PROVIDED AS PER PROVISION OF IRC: SP-69-2011.
- 65mm THICK WEARING COURSE COMPRISING OF 40MM THICK ASPHALTIC CONCRETE OVERLAID WITH 25MM THICK MASTIC ASPHALT SHALL BE PROVIDED AS PER SECTION 500 OF MORT&H SPECIFICATION.
- 100MM DIA WEEP HOLES AT 1000MM C/C STAGGERED HORIZONTALLY AND VERTICALLY SHALL BE PROVIDED IN ONE OR TWO LAYERS ABOVE G.L IN VERTICAL WALLS OF ABUTMENT, RETURN/RETAINING WALLS AT A SLOPE OF 1 VERTICAL TO 20 HORIZONTAL TOWARDS THE DRAINING FACE.
- WATER TO BE USED IN CONCRETING AND CURING SHALL CONFIRM TO CLAUSE 18.4.5 OF IRC:112-2011.
- LAYING, COMPACTION AND EXTENT OF BACKFILL BEHIND ABUTMENTS AND RETURN/RETAINING WALLS SHALL CONSIST OF SELECTED EARTH CONFORMING TO APPENDIX:6 OF IRC:78-2014 HAVING PROPERTIES $c=0$, $\phi=35^\circ$, $\Delta=22.5^\circ$ & $\gamma_D = 20 \text{ KN/M}^3$.
- MINIMUM CLEAR COVER TO OUTER MOST REINFORCEMENT SHALL BE AS UNDER:-
 - SUPERSTRUCTURE - 40MM
 - SUBSTRUCTURE (EARTH FACE) - 75MM
 - SUBSTRUCTURE (NON EARTH FACE) - 50MM
 - FOUNDATION - 75MM
- THE BRIDGE IS DESIGNED FOR PROVISION OF SEISMIC ZONE-V AS PER CLAUSE 219 OF IRC:6:2017.
- SAFE BEARING CAPACITY CONSIDERED IN DESIGN AT PROPOSED FOUNDING LEVEL IS 50 T/M^2 . THIS SHALL BE ASCERTAINED BEFORE EXECUTION AT SITE BY CONFIRMATORY GEOTECHNICAL INVESTIGATIONS.
- FILTER MEDIA SHALL BE PROVIDED AS PER APPENDIX-6 OF IRC-78:2014.
- MINIMUM ANCHORAGE OF FOUNDATION IN SOFT ROCK SHALL BE 1.5M AND 0.6M IN HARD ROCK ANY DEVIATION IN ROCK LEVEL FROM DESIGN SHALL BE REPORTED TO ENGINEER FOR REQUIRED CHANGES IN DESIGN NO CHANGES REQUIRED FOR INCREASE HEIGHT UP TO 50 CM.
- WHERE FOUNDATIONS ARE PLACED ON ROCK, TRENCHES AROUND THE FOOTING SHALL BE FILLED UP WITH CONCRETE OF M15 GRADE UP TO TOP OF ROCK.
- THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH RELEVANT HIGHWAY PLAN AND PROFILE DRAWINGS.
- ALL CHAINAGES, FRL, GL SHALL BE CONFIRMED AT SITE PRIOR TO EXECUTION.
- FOR APPROACH SLAB, DRAINAGE SPOUTS, CRASH BARRIER, PROTECTION WORK, RETAINING WALL AND MEDIAN WALL DETAILS REFER SEPARATE DRAWINGS.
- WHEREVER THE COMPONENTS OF EXISTING BRIDGE INTERFERES WITH THE PROPOSED BRIDGE, THAT SHALL BE DISMANTLED UPTO FOUNDATION TOP.
- MINIMUM LONGITUDINAL GRADIENT OF 0.3% SHALL BE PROVIDED IN PROPOSED BRIDGE TO FACILITATE DRAINAGE OF DECK AS PER CLAUSE 105.3.6 OF IRC-5.
- SIZE OF EACH INDIVIDUAL STONE PITCHING AND LAUNCHING APRON SHALL NOT BE LESS THAN 30CM IN DIAMETER AND 40KG IN WEIGHT OR AS PER TABLE 5.1 & 5.2 OF IRC:89-1997. WHERE THE REQUIRED SIZE STONES ARE NOT ECONOMICALLY AVAILABLE, STONES IN WIRE CRATES MAY BE USED IN PLACE OF ISOLATED STONES OF EQUIVALENT WEIGHT.

REFERENCE DRAWINGS:-

- DIMENSIONAL DETAILS OF COUNTER FORT TYPE ABUTMENT & ITS COMPONENTS: -NIRTP/NAG-MUG/KHATRIPAUWA/SUB-01
- REINFORCEMENT DETAILS OF COUNTER FORT TYPE ABUTMENT & ITS COMPONENTS, DIRT WALL, RETURN WALL, PEDESTAL AND SEISMIC STOPPER: -NIRTP/NAG-MUG/KHATRIPAUWA/SUB-02(SHEET 1 TO 3)
- DIMENSIONAL DETAILS OF PRECAST RCC GIRDER & CAST-IN-SITU SLAB SUPERSTRUCTURE: -NIRTP/NAG-MUG/KHATRIPAUWA/RCC-G/22m/01
- REINFORCEMENT DETAILS OF LONGITUDINAL GIRDER: -NIRTP/NAG-MUG/KHATRIPAUWA/RCC-G/22m/02
- REINFORCEMENT DETAILS OF END CROSS GIRDER: -NIRTP/NAG-MUG/KHATRIPAUWA/RCC-G/22m/03
- REINFORCEMENT DETAILS OF RCC DECK SLAB: -NIRTP/NAG-MUG/KHATRIPAUWA/RCC-G/22m/04 (SHEET 1 & 2)
- DETAILS OF LOAD AND FORCES FOR POT/PTFE BEARINGS: -NIRTP/NAG-MUG/KHATRIPAUWA/RCC-G/22m/05

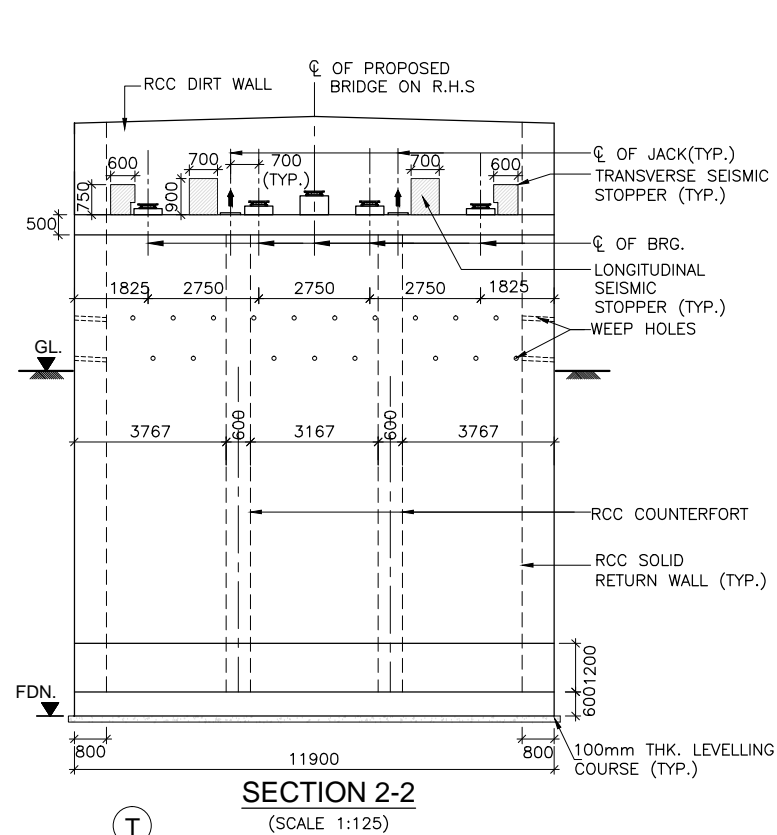
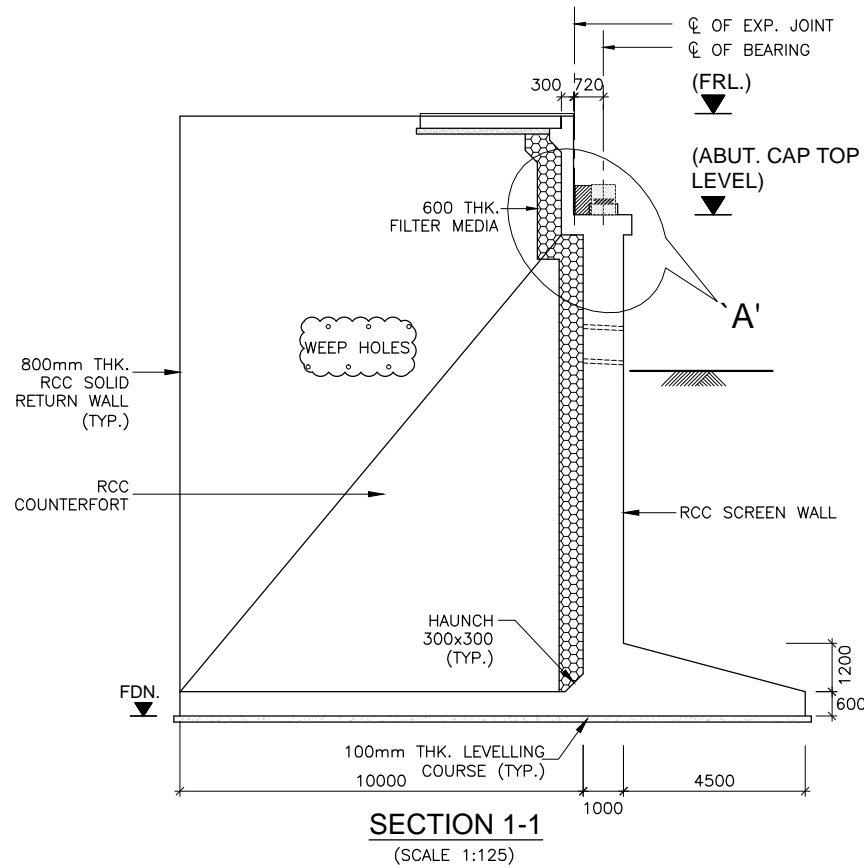
MISCELLANEOUS DRAWINGS:

- DETAILS OF APPROACH SLAB: -NIRTP/NAG-MUG/PACKAGE-I/MISC.-01
- DETAILS OF DRAINAGE SPOUT & WEARING COAT: -NIRTP/NAG-MUG/PACKAGE-I/MISC.-02
- DIMENSIONAL & REINF. DETAILS OF R.C.C CRASH BARRIER: -NIRTP/NAG-MUG/PACKAGE-I/MISC.-03
- DIMENSIONAL & REINF. DETAILS OF R.C.C RAILING: -NIRTP/NAG-MUG/PACKAGE-I/MISC.-04
- DIMENSIONAL AND REINFORCEMENT DETAILS OF RCC TOE WALL: -NIRTP/NAG-MUG/PACKAGE-I/MISC.-06

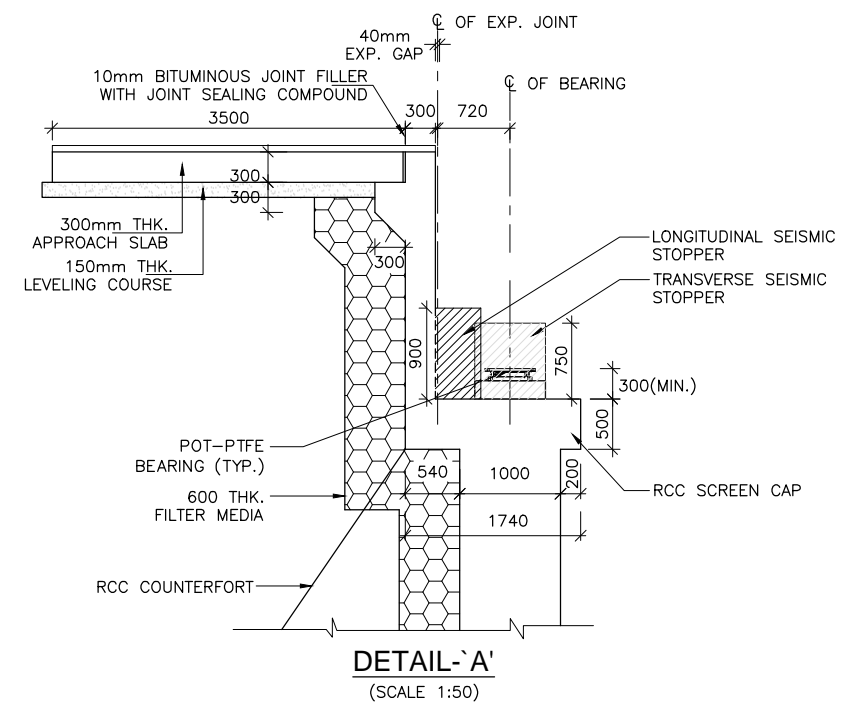
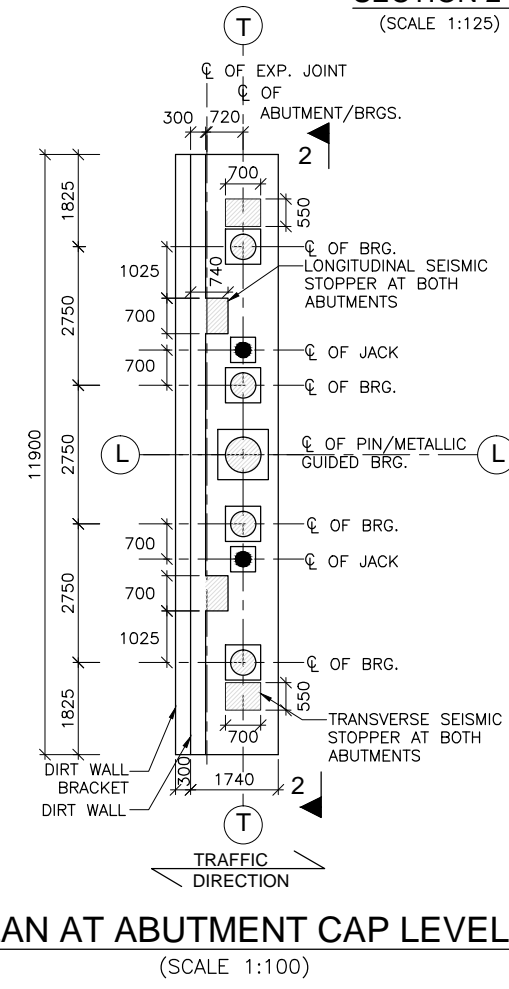
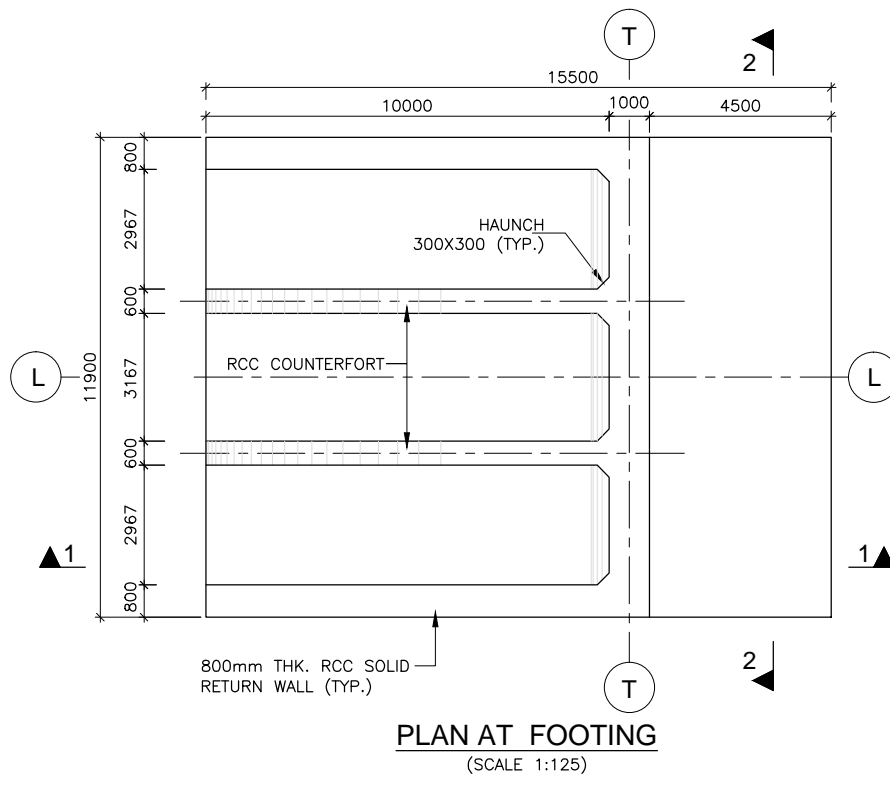
FACE OF OLD ABUTMENT SHALL BE MATCHED WITH PROPOSED BRIDGE ABUTMENT. IN CASE OF BIGGER SPAN IN PROPOSED SPAN, TOE WALL SHALL BE PROVIDED IN FLARED SHAPE TO ALLOW SMOOTH PASSAGE OF RIVER WATER.

ABUTMENT CAP SHALL BE CAST ONLY AFTER COMPLETING THE BACK FILLING WORK UP TO ABUTMENT SHAFT TOP LEVEL.

<p>EMPLOYER Government of Nepal Ministry of Physical Infrastructure and Transport, Department of Roads, Foreign Co-operation Branch</p>	<p>PROJECT Nepal India Regional Trade and Transport Project (NIRTPP) (IDA CREDIT No. 5273 - NEP) Detailed Design of Kathmandu (Nagdhunga) - Naubise - Mugling Road and Bridges</p>	<p>DESIGN CONSULTANT Intercontinental Consultants & Technocrats Pvt.Ltd, A-8, Green Park, New Delhi - 110016 Ph : 4086-3000, Fax 2685-5252 In Joint Venture With Soosung Engineering Co. Ltd., South Korea</p>	Prepared By		M.L.GUPTA	<p>DRAWING TITLE: GENERAL ARRANGEMENT DRAWING FOR MINOR BRIDGE AT CH: 4+140KM OVER KHATRIPAUWA KHOLA (1x22.0m) PACKAGE-I (NAGDHUNGA-NAUBISE)</p>	<p>Scale: As Shown</p>	<p>Date: JUNE-2018</p>
			Designed By		V.CHAUDHARY			
			Approved By		B.N.SINGH			(SHEET 2 OF 2)











- NOTES :-**
- ALL DIMENSIONS ARE IN MM, UNLESS OTHERWISE MENTIONED.
 - ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED AND NO DIMENSION SHALL BE SCALED.
 - CONCRETE SHALL BE DESIGN MIX WITH A MINIMUM 28 DAYS CHARACTERISTIC STRENGTH ON 150mm CUBE AS FOLLOWS:
 - a. LEVELING COURSE (UNDER FOUNDATION) - 10MPa
 - b. LEVELING COURSE (UNDER APPROACH SLAB) - 15MPa
 - c. FOUNDATION - 30MPa
 - d. SUBSTRUCTURE - 30MPa
 - e. APPROACH SLAB - 30MPa
 - f. PEDESTAL - 40MPa
 - g. SEISMIC STOPPER - 30MPa
 - UNTENSIONED REINFORCEMENT SHALL BE THERMO MECHANICALLY TREATED (TMT), HYSD BARS OF GRADE DESIGNATION Fe-500D CONFORMING TO IS: 1786.
 - MINIMUM CLEAR COVER TO OUTER MOST REINFORCEMENT SHALL BE AS UNDER
 - a. SUBSTRUCTURE (EARTH FACE) - 75MM
 - b. SUBSTRUCTURE (NON EARTH FACE) - 50MM
 - c. FOUNDATION - 75MM
 - LL REPRESENTS LONGITUDINAL AXIS OF BRIDGE AND TT REPRESENTS TRANSVERSE AXIS OF ABUTMENT/FOUNDATION.
 - SAFE BEARING CAPACITY AT THE PROPOSED FOUNDING LEVEL HAS BEEN CONSIDERED AS 63 T/M² ON THE BASIS OF SUB SURFACE EXPLORATION RESULTS. THIS SHALL GOT CONFIRMED BEFORE EXECUTION.
 - THE LOCATION OF JACKS FOR LIFTING UP THE SUPERSTRUCTURE SHALL BE DISTINCTLY ETCHED ON SOFFIT OF SUPERSTRUCTURE AND ON TOP OF ABUTMENT CAP.
 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE FOLLOWING DRGS.
 - GENERAL ARRANGEMENT DRAWING REFER: -NIRTP/NAG-MUG/KHATRIPAUWA/GAD
 - REINFORCEMENT DETAILS OF COUNTER FORT TYPE ABUTMENT & ITS COMPONENTS, DIRT WALL, RETURN WALL, PEDESTAL AND SEISMIC STOPPER REFER: -NIRTP/NAG-MUG/KHATRIPAUWA/SUB-02(SHEET 1 TO 3)

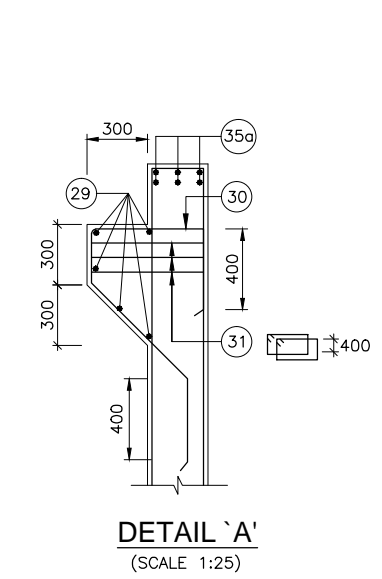
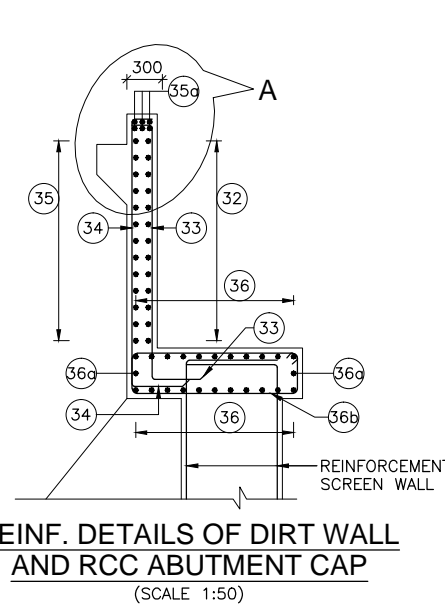
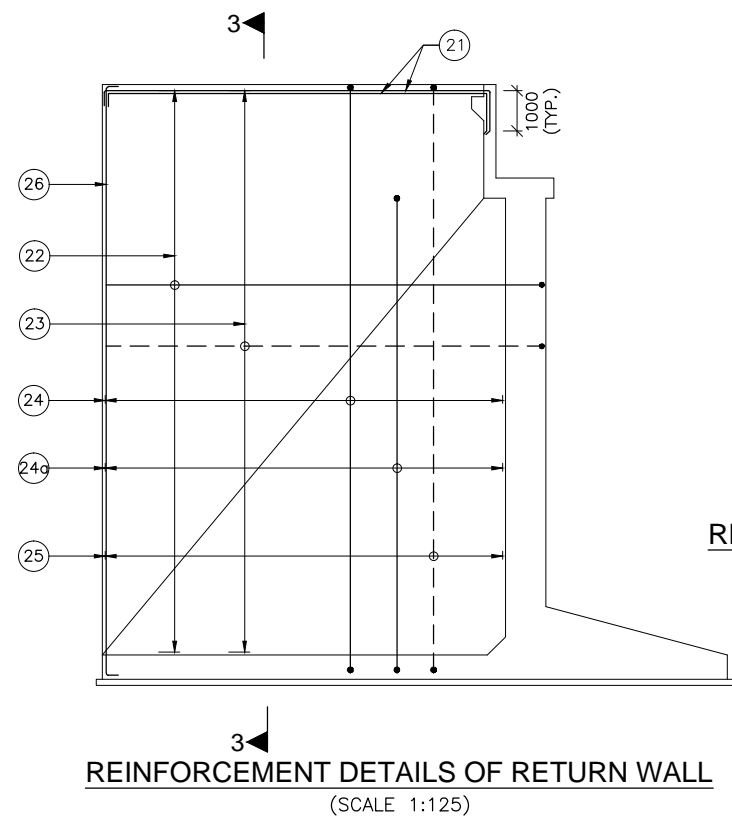
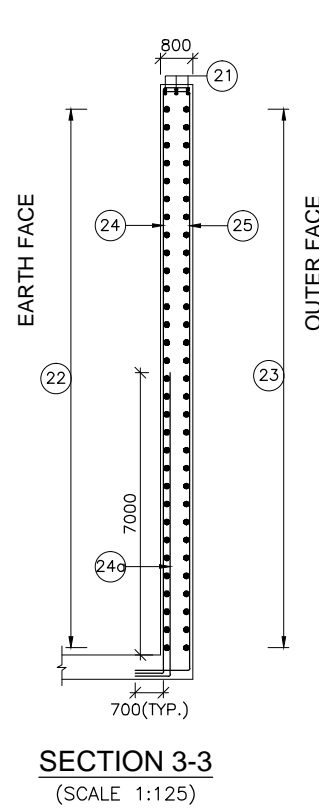
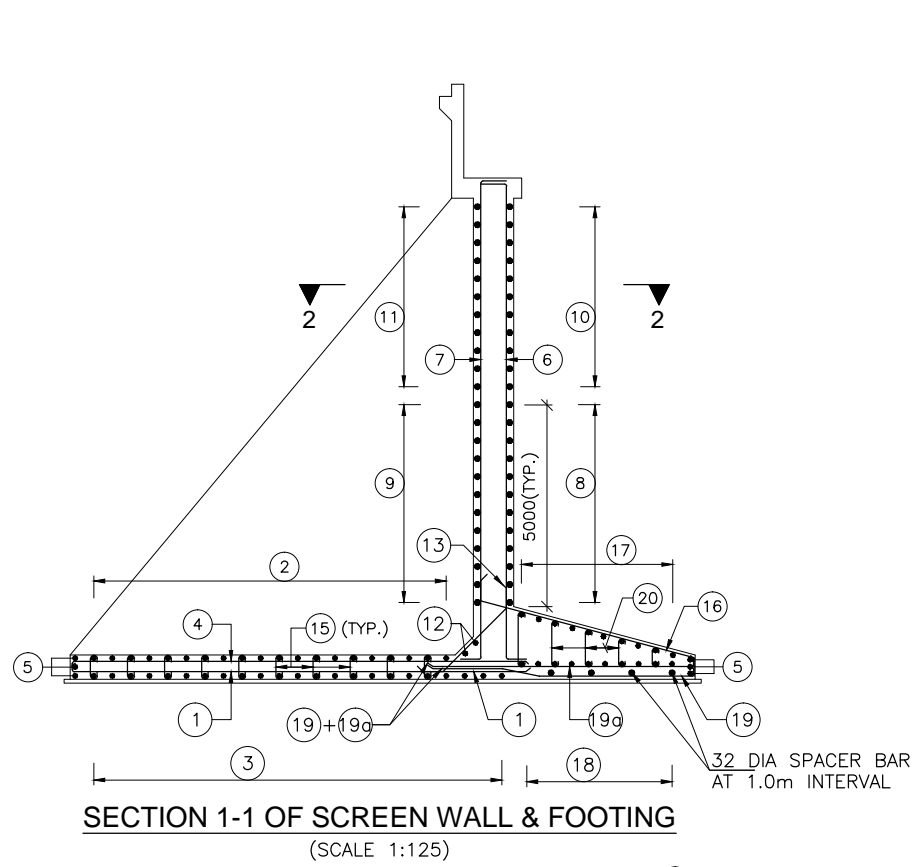


- LEGEND:-**
- - BEARING LOCATION IN PLAN
 - - JACK LOCATION IN PLAN
 - ↑ - JACK LOCATION IN ELEVATION

LEVEL SCHEDULE AT ABUTMENT

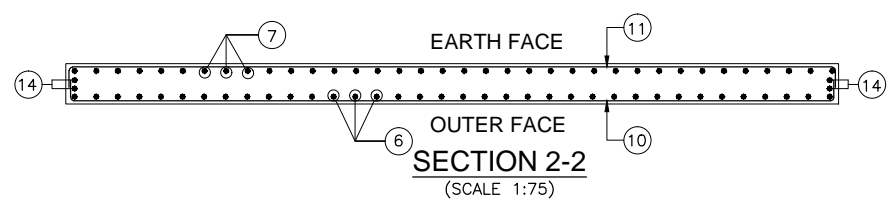
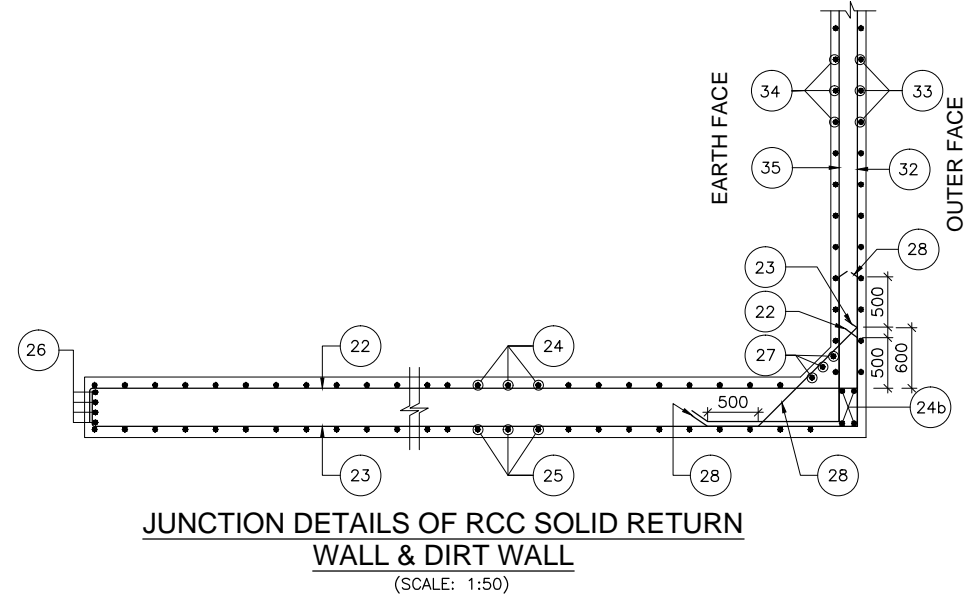
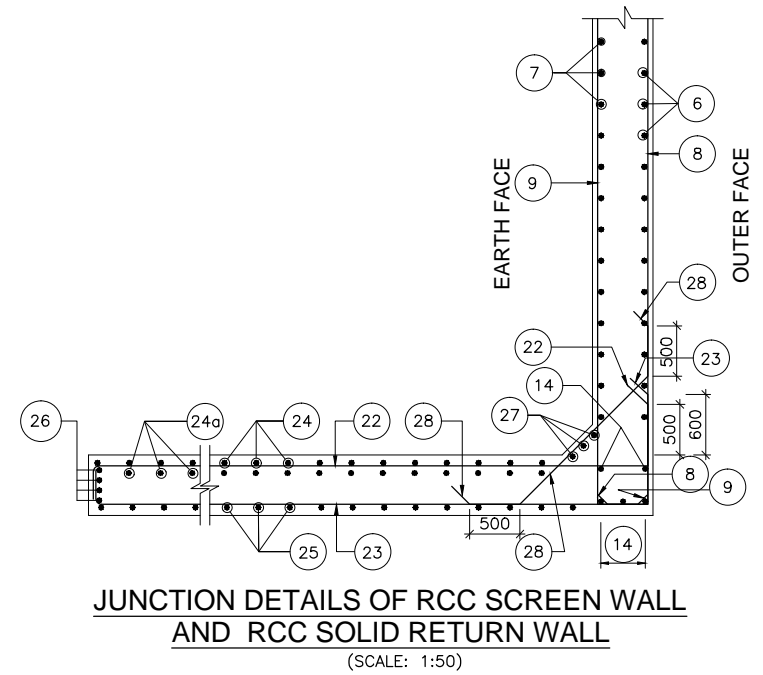
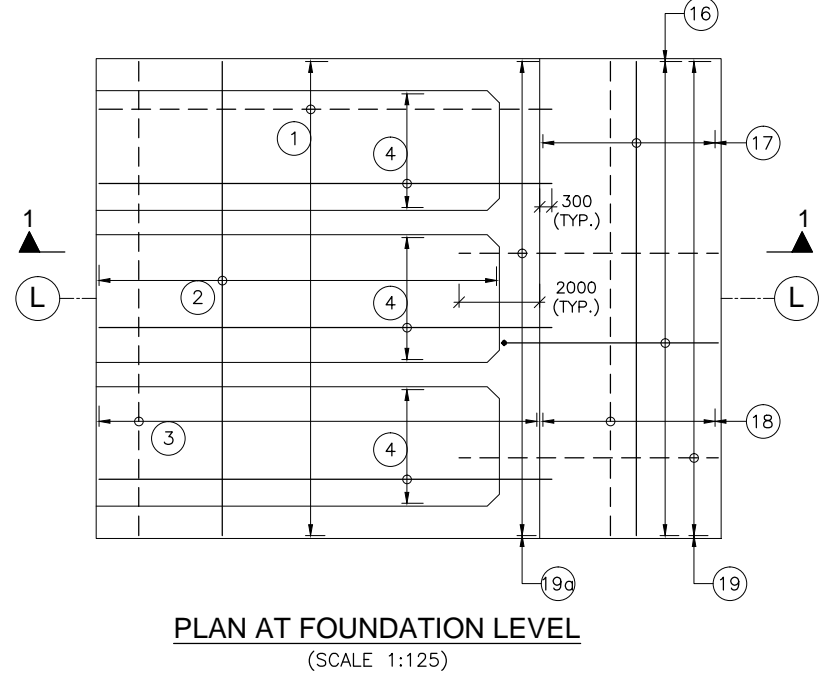
MARK	F.R.L(m)	ABUTMENT CAP TOP LVL. (m)		GR. LEVEL(m)		FDN. LEVEL (m)
		A1	A2	A1	A2	
ABUTMENT	1261.800	1258.760	1258.760	1260.416	1259.151	1246.860

 EMPLOYER Government of Nepal Ministry of Physical Infrastructure and Transport, Department of Roads, Foreign Co-operation Branch	PROJECT Nepal India Regional Trade and Transport Project (NIRTPP) (IDA CREDIT No. 5273 - NEP) Detailed Design of Kathmandu (Nagdhunga) - Naubise - Mugling Road and Bridges	DESIGN CONSULTANT  Intercontinental Consultants & Technocrats Pvt.Ltd, A-8, Green Park, New Delhi - 110016 Ph : 4086-3000, Fax 2685-5252 In Association With  Full Bright Consultancy (Pvt.) Ltd. 316, Baburam Acharya Sadak, Sinamangal, Kathmandu, GPO Box: 4970, Kathmandu, Nepal In Joint Venture With  Soosung Engineering Co. Ltd., South Korea	Prepared By:  M.L.GUPTA Designed By:  V.CHAUDHARY Checked By:  P.K.KHAN Approved By:  B.N.SINGH	DRAWING TITLE: DIMENSIONAL DETAILS OF COUNTERFORT TYPE ABUTMENT & ITS COMPONENTS, DIRT WALL, RETURN WALL, PEDESTAL AND SEISMIC ARRESTER MINOR BRIDGE AT CH- 4+140 OVER KHATRIPAUWA KHOLA (1x22.00m) PACKAGE-1 (NAGDHUNGA-NAUBISE) Drawing No.: NIRTPP/NAG-MUG/KHATRIPAUWA/SUB-01	Scale: As Shown Date: JUNE-2018
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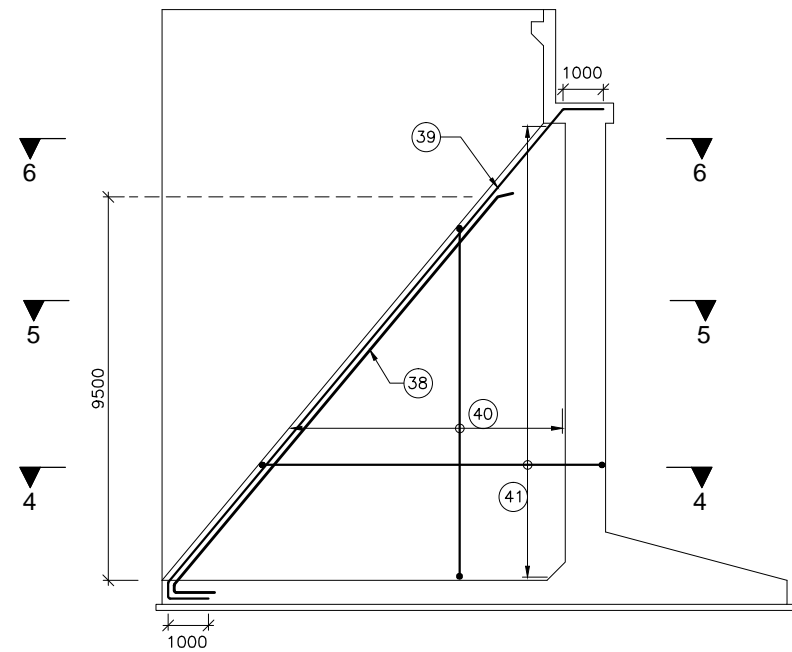


LEGEND

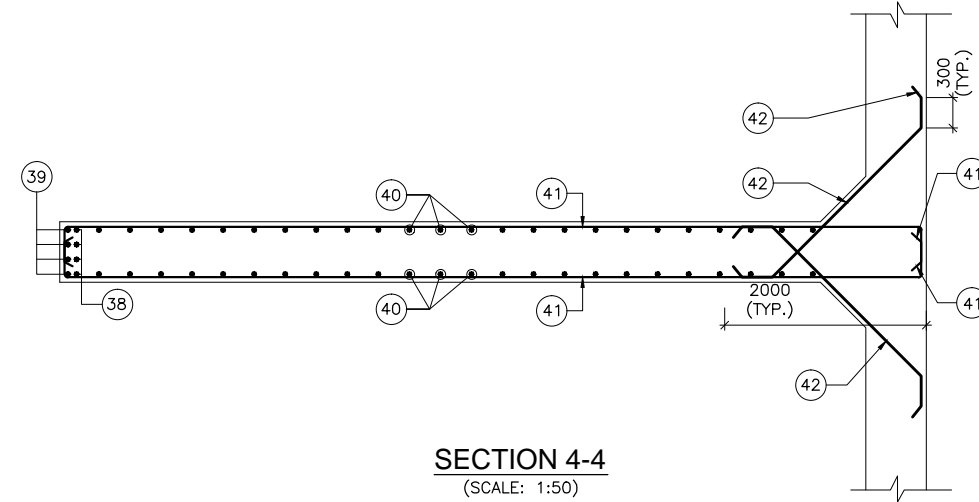
EARTH FACE/TOP FACE	—————
OUTER FACE/BOTTOM FACE	- - - - -



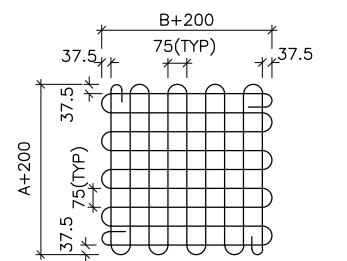
	EMPLOYER	PROJECT	DESIGN CONSULTANT	Prepared By	M.L.GUPTA	DRAWING TITLE: REINFORCEMENT DETAILS OF COUNTER FORT TYPE ABUTMENT & ITS COMPONENTS, DIRT WALL, RETURN WALL, PEDESTAL AND SEISMIC STOPPER FOR MINOR BRIDGE AT CH: 4+140 OVER KHATRIPAUWA KHOLA (1x22.00m) PACKAGE-1 (NAGDHUNGA-NAUBISE) Drawing No.: NIRTPP/NAG-MUG/KHATRIPAUWA/SUB-02	Scale:	Date: JUNE-2018	
	Government of Nepal Ministry of Physical Infrastructure and Transport, Department of Roads, Foreign Co-operation Branch	Nepal India Regional Trade and Transport Project (NIRTPP) (IDA CREDIT No. 5273 - NEP) Detailed Design of Kathmandu (Nagdhunga) - Naubise - Mugling Road and Bridges	Intercontinental Consultants & Technocrats Pvt.Ltd, A-8, Green Park, New Delhi - 110016 Ph : 4086-3000, Fax 2685-5252 In Joint Venture With Soosung Engineering Co. Ltd., South Korea	In Association With Full Bright Consultancy (Pvt.) Ltd. 316, Baburam Acharya Sadak, Sinamangal, Kathmandu, GPO Box: 4970, Kathmandu, Nepal	Designed By		V.CHAUDHARY	As Shown	(SHEET 1 OF 3)
	Checked By	P.K.KHAN	Approved By	B.N.SINGH					



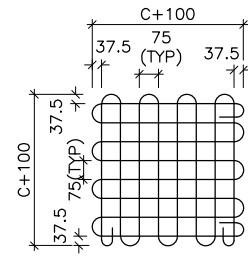
REINFORCEMENT DETAILS OF RCC COUNTERFORT
(SCALE 1:125)



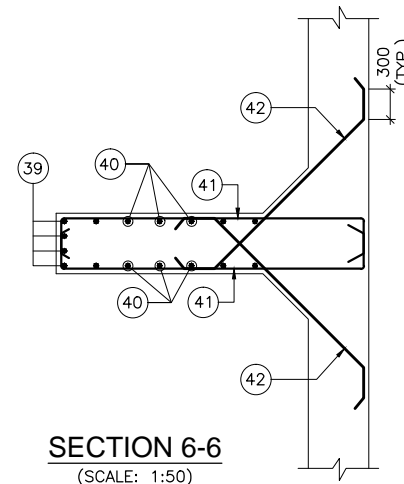
SECTION 4-4
(SCALE: 1:50)



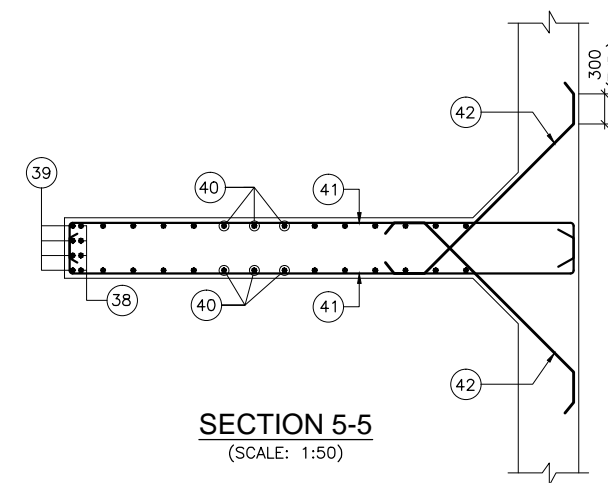
DETAIL OF MESH
TYPE "M1" 8 Φ
(IN PEDESTAL) (IN TWO LAYERS)
(SCALE 1:20)
(WHERE A & B SIZE OF BEARING)



DETAIL OF MESH
TYPE "M2" 8 Φ
(UNDER JACK LOCATION)
(IN TWO LAYERS)
(SCALE 1:20)
(WHERE C= DIA OF JACK)






SECTION 6-6
(SCALE: 1:50)

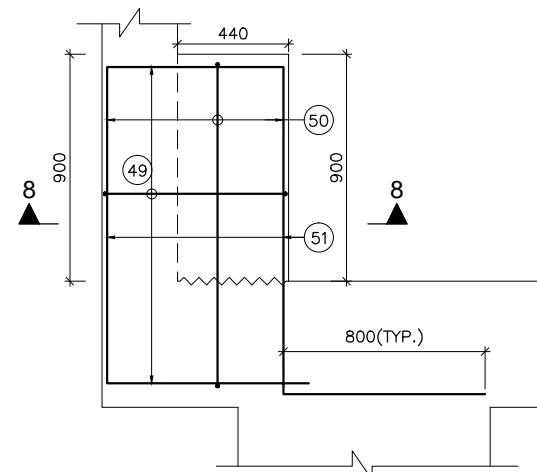


SECTION 5-5
(SCALE: 1:50)

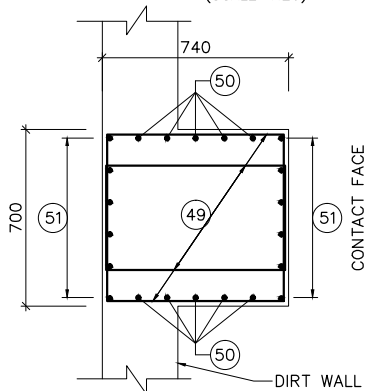
LEGEND

- TOP REINFORCEMENT BARS ———
- BOTTOM REINFORCEMENT BARS - - - - -

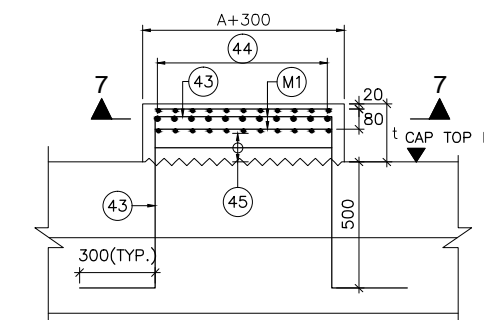
 <p>Government of Nepal Ministry of Physical Infrastructure and Transport, Department of Roads, Foreign Co-operation Branch</p>	<p>PROJECT Nepal India Regional Trade and Transport Project (NIRTP) (IDA CREDIT No. 5273 - NEP) Detailed Design of Kathmandu (Nagdhunga) - Naubise - Mugling Road and Bridges</p>	<p>DESIGN CONSULTANT Intercontinental Consultants & Technocrats Pvt.Ltd, A-8, Green Park, New Delhi - 110016 Ph : 4086-3000, Fax 2685-5252 In Joint Venture With Soosung Engineering Co. Ltd., South Korea</p> 	Prepared By	 M.L.GUPTA	<p>DRAWING TITLE: REINFORCEMENT DETAILS OF COUNTER FORT TYPE ABUTMENT & ITS COMPONENTS, DIRT WALL, RETURN WALL, PEDESTAL AND SEISMIC STOPPER FOR MINOR BRIDGE AT CH:- 4+140 OVER KHATRIPAUWA KHOLA (1x22.00m) PACKAGE-1 (NAGDHUNGA-NAUBISE)</p>	Scale:	Date: JUNE-2018
			Designed By	 V.CHAUDHARY			As Shown
Checked By	 P.K.KHAN	<p>Drawing No.: NIRTP/NAG-MUG/KHATRIPAUWA/SUB-02</p>					
Approved By	 B.N.SINGH						



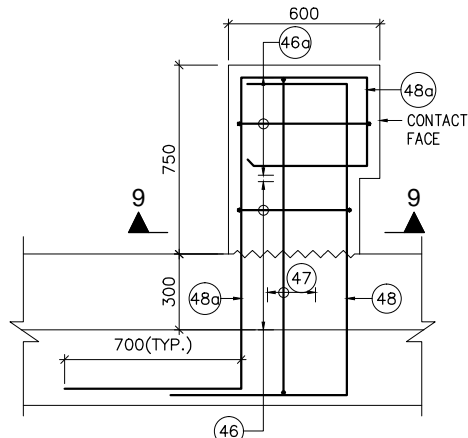
REIN. DETAILS OF LONGITUDINAL SEISMIC STOPPER
(DIRT WALL REINFORCEMENT NOT SHOWN FOR CLARITY)
(SCALE 1:20)



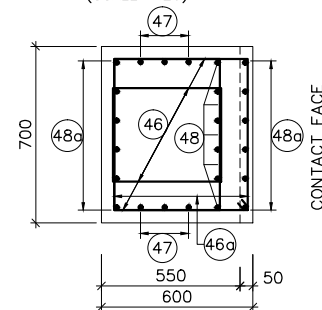
SECTION 8-8
(SCALE 1:20)
WHERE, A/B SIZE OF BEARING



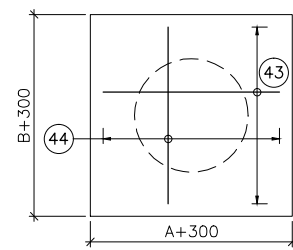
REIN. DETAILS OF PEDESTAL
(SCALE 1:20)
WHERE, A SIZE OF BEARING
AND t IS HEIGHT OF PEDESTAL



REIN. DETAILS OF TRANSVERSE SEISMIC STOPPER
(SCALE 1:20)



SECTION 9-9
(SCALE 1:20)



SECTION 7-7
(SCALE 1:20)
WHERE, A/B SIZE OF BEARING

BRACKET	29	12 Φ -5 Nos.	
	30	12 Φ @150 C/C	
	31	2L-10 Φ STIRRUPS @ 300 C/C (3 LAYERS)	
DIRT WALL	32	12 Φ @150 C/C	
	33	12 Φ @150 C/C	
	34	12 Φ @150 C/C	
	35	20 Φ @150 C/C	
	35a	20 Φ -3 Nos. (2 LAYERS)	
SCREEN CAP	36	16 Φ @150 C/C	
	36a	12 Φ @150 C/C	
	36b	16 Φ @150 C/C	
COUNTERFORT	37	NOT IN USED	
	38	32 Φ -4 Nos.	
	39	32 Φ -4 Nos.	
	40	16 Φ @150 C/C	
	41	16 Φ @150 C/C	
	42	16 Φ @150 C/C	
RCC PEDESTAL	43	12 Φ @ 75c/c	
	44	12 Φ @ 75c/c	
	45	2L-12 Φ @ 150c/c STRPS.	
TRANSVERSE SEISMIC STOPPER	46	4L-12 Φ @ 125c/c STRPS.	
	46a	2L-12 Φ @ 125c/c STRPS.	
	47	16 Φ -3 Nos. BOTH FACES	
LONG. SEISMIC STOPPER	48	32 Φ -6 Nos. BOTH FACES	
	48a	25 Φ -6 Nos. BOTH FACES	
	49	4L-12 Φ @ 150c/c STRPS.	
	50	16 Φ -5 Nos. BOTH FACES	
	51	32 Φ -6 Nos. BOTH FACES	

REINFORCEMENT SCHEDULE

MARKS	DESCRIPTION	SHAPE	
FOOTING & SCREEN WALL	1	16 Φ @150 C/C	
	2	16 Φ @150 C/C	
	3	16 Φ @150 C/C	
	4	12 Φ @150 C/C	
	5	12 Φ @150 C/C	
	6	16 Φ @150 C/C	
	7	16 Φ @150 C/C	
	8	16 Φ @150 C/C	
	9	12 Φ @150 C/C	
	10	12 Φ @150 C/C	
	11	12 Φ @150 C/C	
	12	10 Φ -2 Nos.	
	13	12 Φ @150 C/C	
	14	12 Φ -5 Nos.(ON EACH FACE)	
	15	12 Φ @150 C/C (LINK BAR)	
FOOTING (TOE SIDE)	16	16 Φ @150 C/C	
	17	2L-16 Φ @150 C/C	
	18	25 Φ @150 C/C	
	19	32 Φ @150 C/C	
	19a	32 Φ @150 C/C	
RETURN WALL	20	5L12 Φ @300 C/C	
	21	25 Φ -3 Nos. (2 LAYERS)	
	22	32 Φ @150 C/C	
	23	16 Φ @150 C/C	
	24	32 Φ @150 C/C	
	24a	32 Φ @150 C/C	
	24b	12 Φ -4 Nos.	
	25	16 Φ @150 C/C	
	26	20 Φ -4 Nos.	
	27	12 Φ -3 Nos.	
	28	12 Φ @150 C/C	

NOTES :-

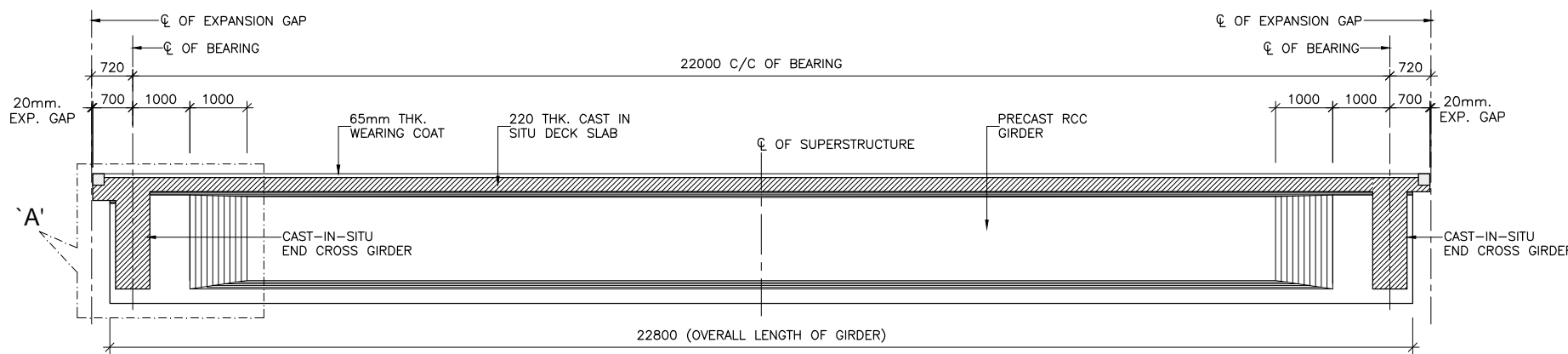
- ALL DIMENSIONS ARE IN MM, UNLESS OTHERWISE MENTIONED.
- ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED AND NO DIMENSION SHALL BE SCALED.
- CONCRETE SHALL BE DESIGN MIX WITH A MINIMUM 28 DAYS CHARACTERISTIC STRENGTH ON 150MM CUBE AS FOLLOWS:
 - a. LEVELING COURSE (UNDER FOUNDATION) - 10MPa
 - b. LEVELING COURSE (UNDER APPROACH SLAB) - 15MPa
 - c. FOUNDATION - 30MPa
 - d. SUBSTRUCTURE - 30MPa
 - e. APPROACH SLAB - 30MPa
 - f. PEDESTAL - 40MPa
 - g. SEISMIC STOPPER - 30MPa
- UNTENSIONED REINFORCEMENT SHALL BE THERMO MECHANICALLY TREATED (TMT), HYSD BARS OF GRADE DESIGNATION Fe-500D CONFORMING TO IS: 1786.
- MINIMUM CLEAR COVER TO OUTER MOST REINFORCEMENT SHALL BE AS UNDER:-
 - a. SUBSTRUCTURE (EARTH FACE) - 75MM
 - b. SUBSTRUCTURE (NON EARTH FACE) - 50MM
 - c. FOUNDATION - 75MM
- LL REPRESENTS LONGITUDINAL AXIS OF BRIDGE AND TT REPRESENTS TRANSVERSE AXIS OF ABUTMENT/FOUNDATION.
- MINIMUM ANCHORAGE LENGTH OF REINFORCEMENT FOR FAVOURABLE CONDITION SHALL BE AS UNDER:
 - CONCRETE GRADE - M-30 - 40 x DIA OF BAR
 - CONCRETE GRADE - M-40 - 34 x DIA OF BAR
 - (WHERE DIA OF BAR <= 32MM.)
 - FOR UNFAVOURABLE CONDITION THESE VALUES SHALL BE MULTIPLIED BY 1.43.
- MINIMUM LAP LENGTH OF REINFORCEMENT FOR FAVOURABLE CONDITION SHALL BE AS UNDER:
 - CONCRETE GRADE - M-30 - 56 x DIA OF BAR
 - CONCRETE GRADE - M-40 - 48 x DIA OF BAR
- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE FOLLOWING DRGS.
 - GENERAL ARRANGEMENT DRAWING REFER DRG. NO. : NIRTTP/NAG-MUG/KHATRIPAUWA/GAD
 - DIMENSIONAL DETAILS OF COUNTER FORT TYPE ABUTMENT & ITS COMPONENTS REFER DRG. NO. : NIRTTP/NAG-MUG/KHATRIPAUWA/SUB-01

LEGEND

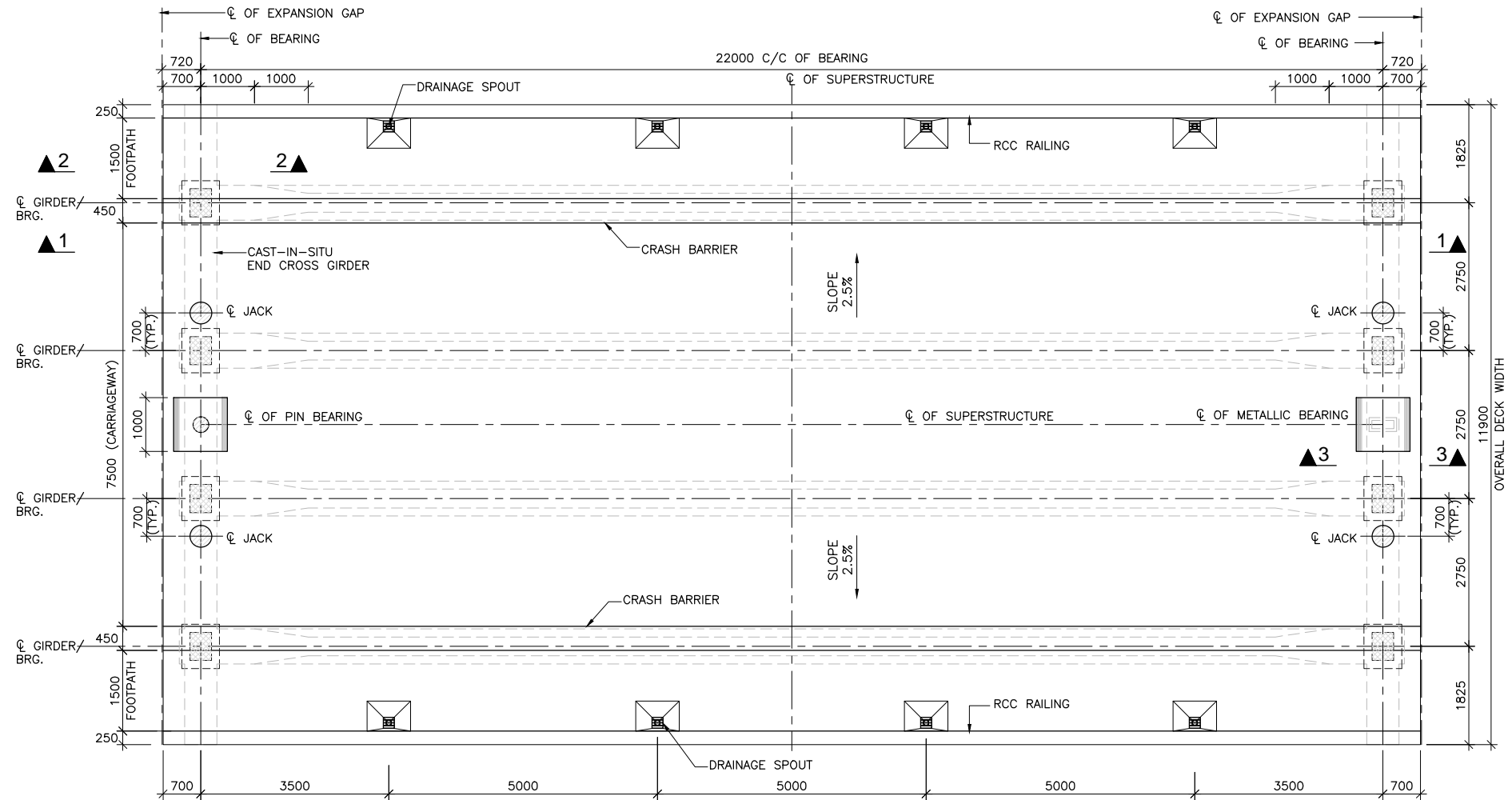
TOP REINFORCEMENT BARS

BOTTOM REINFORCEMENT BARS

<p>EMPLOYER Government of Nepal Ministry of Physical Infrastructure and Transport, Department of Roads, Foreign Co-operation Branch</p>	<p>PROJECT Nepal India Regional Trade and Transport Project (NIRTTP) (IDA CREDIT No. 5273 - NEP) Detailed Design of Kathmandu (Nagdhunga) - Naubise - Mugling Road and Bridges</p>	<p>DESIGN CONSULTANT Intercontinental Consultants & Technocrats Pvt.Ltd, A-8, Green Park, New Delhi - 110016 Ph : 4086-3000, Fax 2685-5252 In Joint Venture With Soosung Engineering Co. Ltd., South Korea</p> <p>In Association With Full Bright Consultancy (Pvt.) Ltd. 316, Baburam Acharya Sadak, Sinamangal, Kathmandu, GPO Box: 4970, Kathmandu, Nepal</p>	Prepared By		M.L.GUPTA	<p>DRAWING TITLE: REINFORCEMENT DETAILS OF COUNTER FORT TYPE ABUTMENT & ITS COMPONENTS, DIRT WALL, RETURN WALL, PEDESTAL AND SEISMIC STOPPER FOR MINOR BRIDGE AT CH- 4+140 OVER KHATRIPAUWA KHOLA (1x22.00m) PACKAGE-I (NAGDHUNGA-NAUBISE)</p>	Scale:	Date: JUNE-2018
			Designed By		V.CHAUDHARY		As Shown	(SHEET 3 OF 3)
			Checked By		P.K.KHAN	Drawing No.:		
			Approved By		B.N.SINGH	NIRTTP/NAG-MUG/KHATRIPAUWA/SUB-02		



SECTIONAL ELEVATION 1 - 1
(SCALE 1:75)



TOP PLAN OF DECK SLAB
(SCALE 1:75)

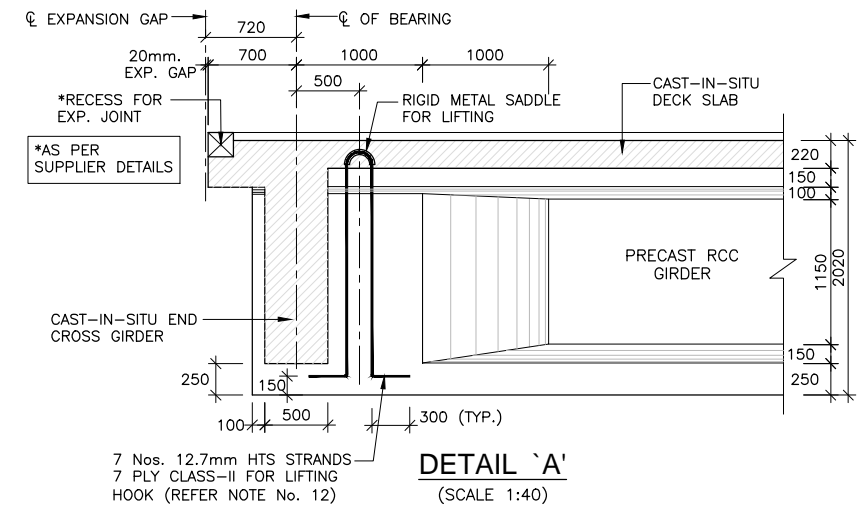
LEGEND:-

- NOTES:-**
- ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NO DIMENSIONS SHALL BE SCALED.
 - THE BRIDGE HAS BEEN DESIGNED FOR TWO LANE TRAFFIC FOR LIVE LOAD COMBINATIONS OF CLASS A AND 70R WITH FOOTPATH LIVE LOAD. OR IRC SV VEHICLE WITH FOOTPATH LIVE LOAD. OR THREE LANE TRAFFIC FOR LIVE LOAD COMBINATIONS OF CLASS A AND 70R WITHOUT FOOTPATH LIVE LOAD AS PER IRC:6-2017, WHICHEVER GOVERNS.
 - CONCRETE SHALL BE DESIGN MIX WITH A MINIMUM 28 DAYS CHARACTERISTIC STRENGTH ON 150mm CUBES AS FOLLOWS :-
 PRECAST RCC GIRDER + RCC CAST IN SITU DECK SLAB-35 MPa
 - THE REINFORCING BARS SHALL BE OF THERMO MECHANICALLY TREATED / CORROSION RESISTANT STEEL (TMT-CRS) (GRADE DESIGNATION Fe-500D) CONFORMING TO IS:1786 STANDARDS.
 - CLEAR COVER TO OUTER MOST STEEL SHALL BE AS UNDER:-
 FOR SUPER STRUCTURE-40mm.
 - 65mm. THK. WEARING COURSE COMPRISING OF 40mm THK. BITUMINOUS CONCRETE OVER LAID WITH 25mm THK. MASTIC ASPHALT SHALL BE PROVIDED AS PER SECTION 500 OF MORTH SPECIFICATIONS.
 - FOR LIFTING OF THE SUPERSTRUCTURE 2Nos. OF FREYSSINET JACKS OF CAPACITY 135t EACH MAY BE REQUIRED AT EACH END. THE LOCATION OF JACKS FOR LIFTING OF THE SUPERSTRUCTURES TO REPLACE BEARINGS ETC. IS SHOWN ↑ THUS THIS SHALL BE DISTINCTLY ETCHED FOR EASY IDENTIFICATION ON THE ABUTMENT CAPS
 - DURING THE LIFTING OPERATION OF SUPERSTRUCTURE ALL THE JACKS PLACED UNDER THE END DIAPHRAGM IN LINE WITH THE BEARINGS SHALL BE OPERATED SIMULTANEOUSLY USING SINGLE OPERATING CONSOLE, GROUPING THE PUMP AND CONTROL SYSTEM SO AS TO ENSURE THAT THE REACTIONS ON ALL THE JACKS ARE EQUAL AT ALL TIMES.
 - PRECAST GIRDERS SHALL BE CAST IN ONE CONCRETING OPERATION IN CASTING YARD WITHOUT ANY CONSTRUCTION JOINT.
 - EACH PRECAST GIRDER WILL BE LIFTED BY USING LIFTING STRANDS AT EITHER END. DURING LIFTING, GIRDER SHALL BE KEPT PLUMB AND UPRIGHT SELF WEIGHT OF GIRDER IS 545kN.

SEQUENCE OF CONSTRUCTION:-

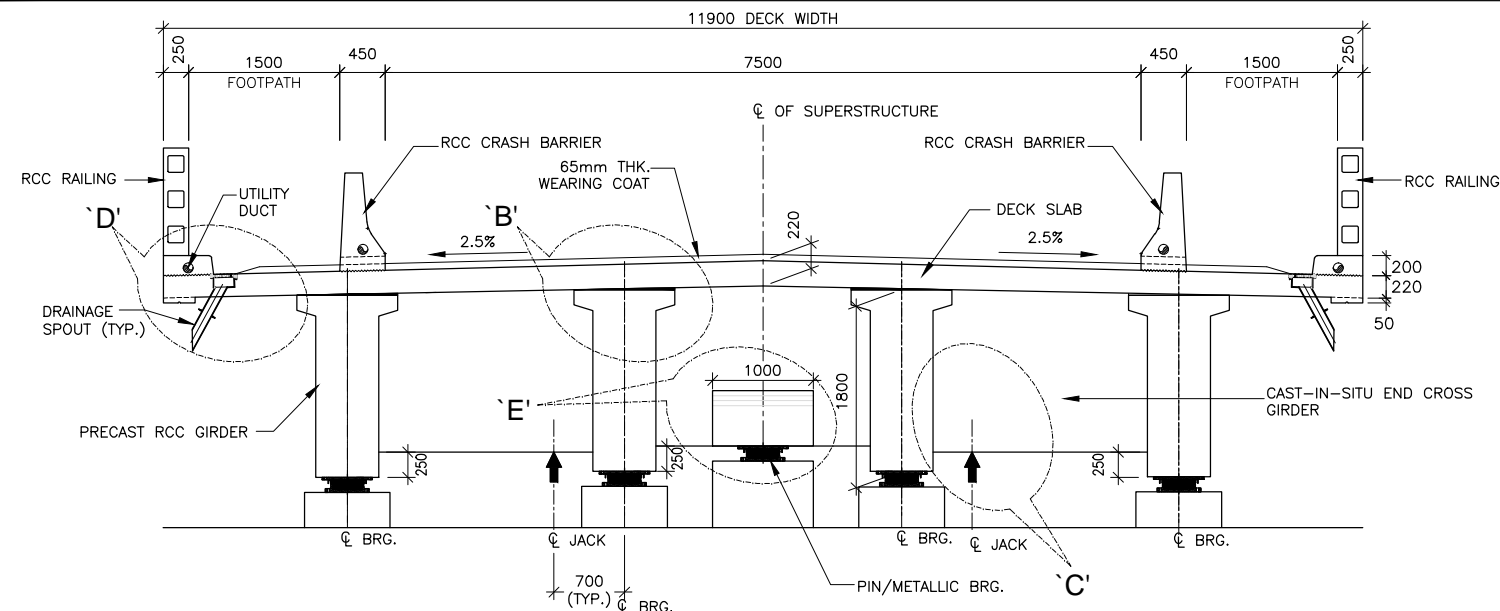
AGE OF GIRDER (IN DAYS)	ACTIVITY	STRENGTH OF CONC. (IN MPa)
0	CASTING OF LONGITUDINAL GIRDER AT CASTING YARD WITH PORTION OF DIAPHRAGM	-
14 to 28	POSITION OF LONGITUDINAL GIRDER ON TEMPORARY BRGS. AND HOLD THEM IN POSITION BY LATERAL BRACING. REINF. OF DECK SLAB & END DIAPHRAGM WILL BE FIXED IN POSITION	30
28	CASTING OF DECK SLAB ALONG WITH CROSS GIRDER	35
28 to 42	AVERAGE AGE OF GIRDER WHEN COMPOSITE ACTION TAKES PLACE	35
42 to 56	FIXING THE CRASH BARRIER AND LAYING OF WEARING COAT	35
56	AVERAGE AGE OF GIRDER WHEN SILD & CWL ON IT	35

- REFERENCE DRAWINGS:-**
- REINFORCEMENT DETAILS OF LONGITUDINAL GIRDER:
 -NIRTP/NAG-MUG/KHATRIPAUWA/RCC-G/22m/02
 - REINFORCEMENT DETAILS OF END CROSS GIRDER:
 -NIRTP/NAG-MUG/KHATRIPAUWA/RCC-G/22m/03
 - REINFORCEMENT DETAILS OF RCC DECK SLAB:
 -NIRTP/NAG-MUG/KHATRIPAUWA/RCC-G/22m/04(SHEET 1&2)
 - DETAILS OF LOAD AND FORCES FOR POT/P/TFE BEARINGS:
 -NIRTP/NAG-MUG/KHATRIPAUWA/RCC-G/22m/05

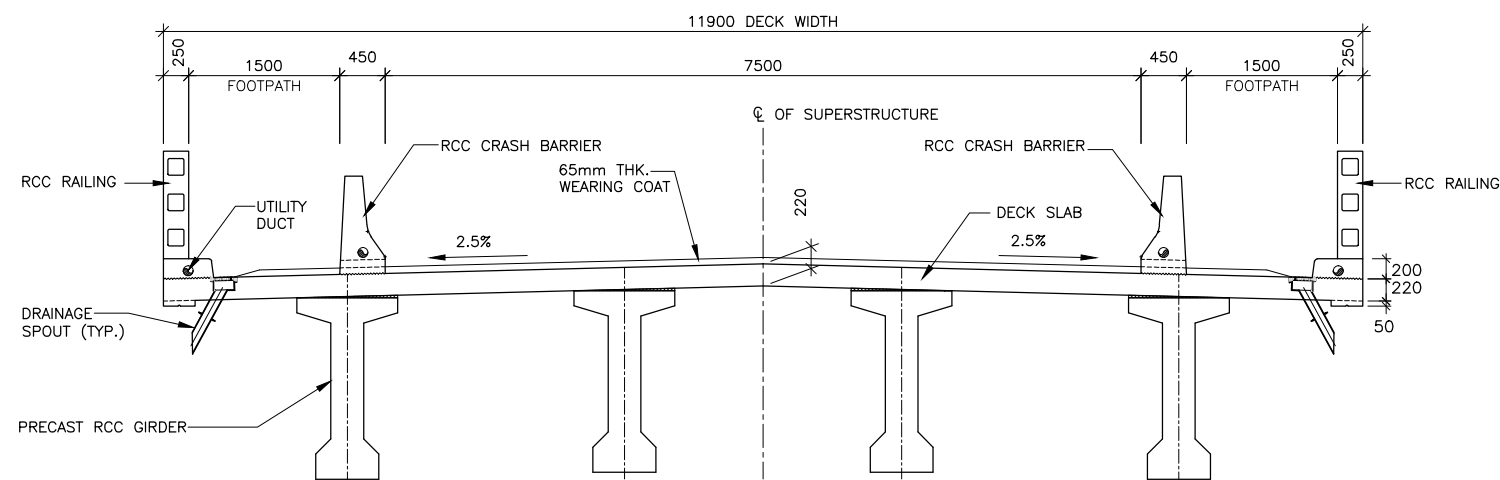


DETAIL 'A'
(SCALE 1:40)

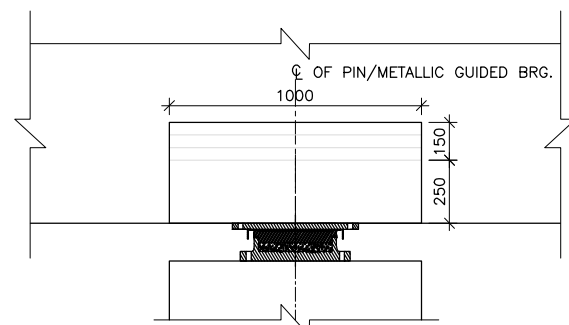
EMPLOYER	PROJECT	DESIGN CONSULTANT	Prepared By	Designed By	Checked By	Approved By	DRAWING TITLE:	Scale:	Date: JUNE-2018
Government of Nepal Ministry of Physical Infrastructure and Transport, Department of Roads, Foreign Co-operation Branch	Nepal India Regional Trade and Transport Project (NIRTP) (IDA CREDIT No. 5273 - NEP) Detailed Design of Kathmandu (Nagdhunga) - Naubise - Mugling Road and Bridges	Intercontinental Consultants & Technocrats Pvt.Ltd, A-8, Green Park, New Delhi - 110016 Ph : 4086-3000, Fax 2685-5252 In Association With Full Bright Consultancy (Pvt.) Ltd. 316, Baburam Acharya Sadak, Sinamangal, Kathmandu, GPO Box: 4970, Kathmandu, Nepal	K.M. JOHRI	V. CHAUDHARY	P. K. KHAN	B. N. SINGH	DIMENSION DETAILS OF PRECAST RCC GIRDER & CAST-IN-SITU SLAB SUPERSTRUCTURE EFFECTIVE SPAN : 22.00m Drawing No.: NIRTP/NAG-MUG/KHATRIPAUWA/RCC-G/22m/01	As Shown	(SHEET 1 OF 2)



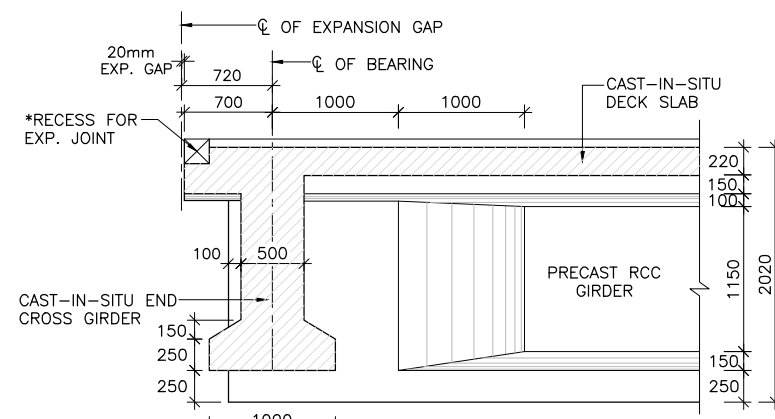
SECTION AT SUPPORT
(SCALE 1:50)



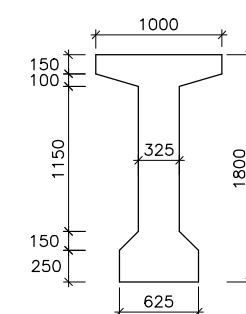
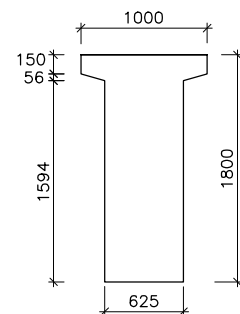
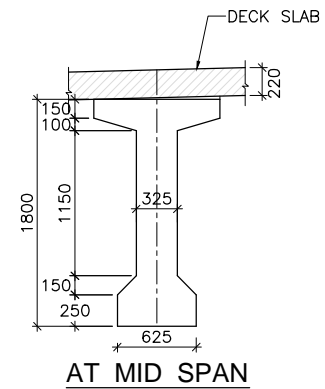
SECTION AT MID
(SCALE 1:50)



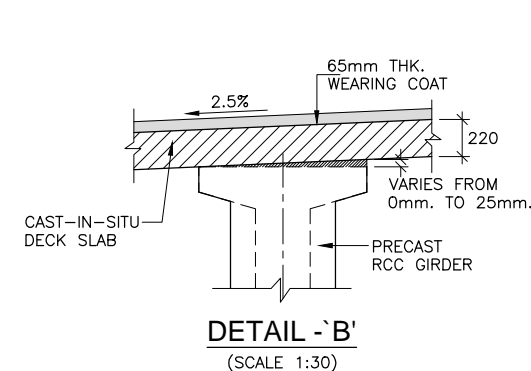
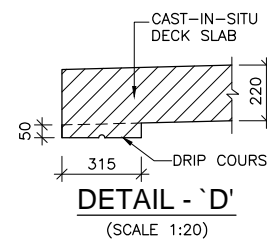
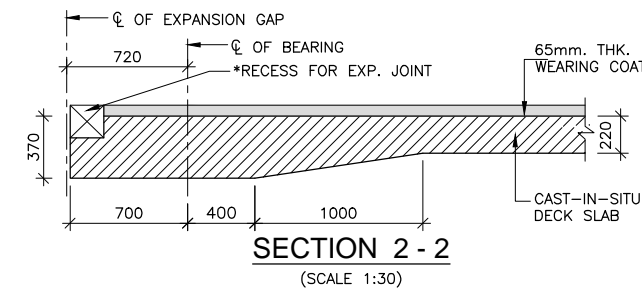
DETAIL - 'E'
(SCALE 1:20)



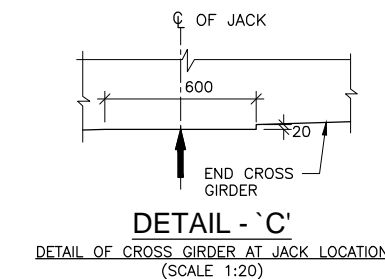
SECTION 3-3
(SCALE 1:40)



DETAILS OF PRECAST RCC GIRDER
(SCALE 1:40)

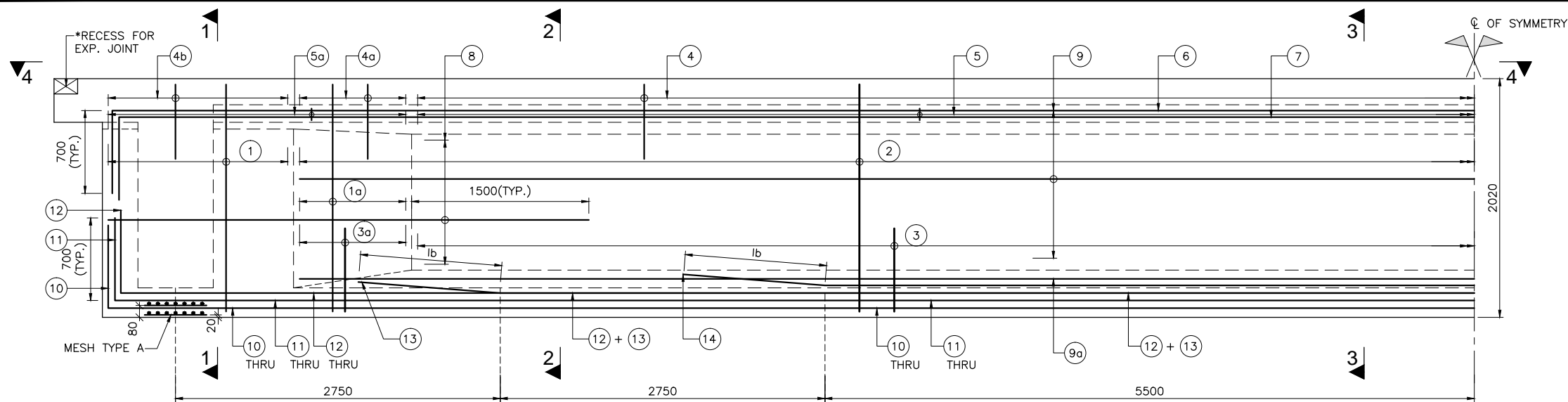


DETAIL - 'B'
(SCALE 1:30)



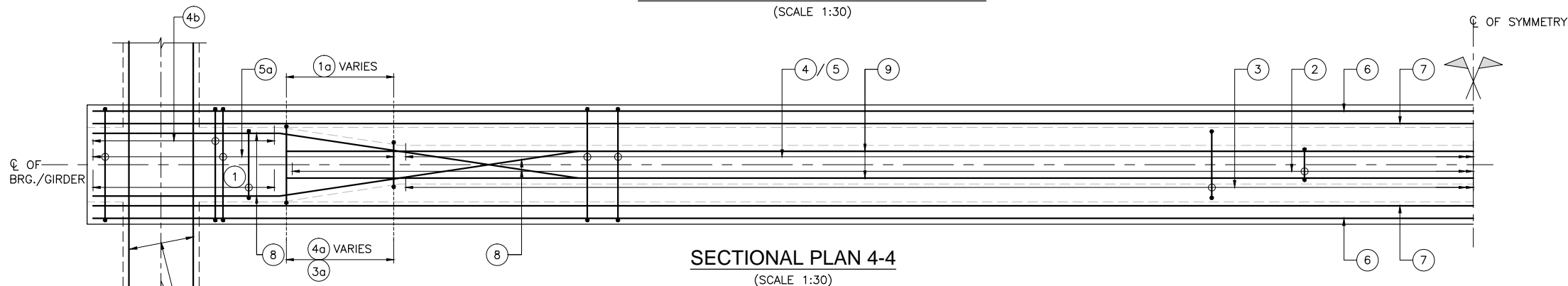
DETAIL - 'C'
DETAIL OF CROSS GIRDER AT JACK LOCATION
(SCALE 1:20)

	EMPLOYER	PROJECT	DESIGN CONSULTANT	Prepared By	K.M. JOHRI	DRAWING TITLE: DIMENSION DETAILS OF PRECAST RCC GIRDER & CAST-IN-SITU SLAB SUPERSTRUCTURE EFFECTIVE SPAN : 22.00m Drawing No.: NIRTPP/NAG-MUG/KHATRIPAUWA/RCC-G/22m/01	Scale:	Date: JUNE-2018	
	Government of Nepal Ministry of Physical Infrastructure and Transport, Department of Roads, Foreign Co-operation Branch	Nepal India Regional Trade and Transport Project (NIRTPP) (IDA CREDIT No. 5273 - NEP) Detailed Design of Kathmandu (Nagdhunga) - Naubise - Mugling Road and Bridges	 Intercontinental Consultants & Technocrats Pvt.Ltd, A-8, Green Park, New Delhi - 110016 Ph : 4086-3000, Fax 2685-5252  In Joint Venture With Soosung Engineering Co. Ltd., South Korea	In Association With Full Bright Consultancy (Pvt.) Ltd. 316, Baburam Acharya Sadak, Sinamangal, Kathmandu, GPO Box: 4970, Kathmandu, Nepal	Designed By		V. CHAUDHARY	As Shown	
				Checked By	P. K. KHAN				
					Approved By		B. N. SINGH	(SHEET 2 OF 2)	



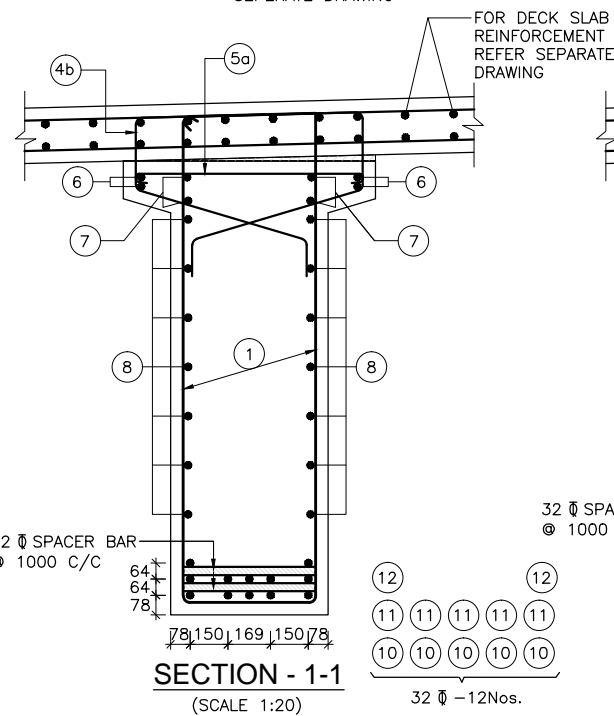
SECTIONAL ELEVATION OF GIRDER

(SCALE 1:30)

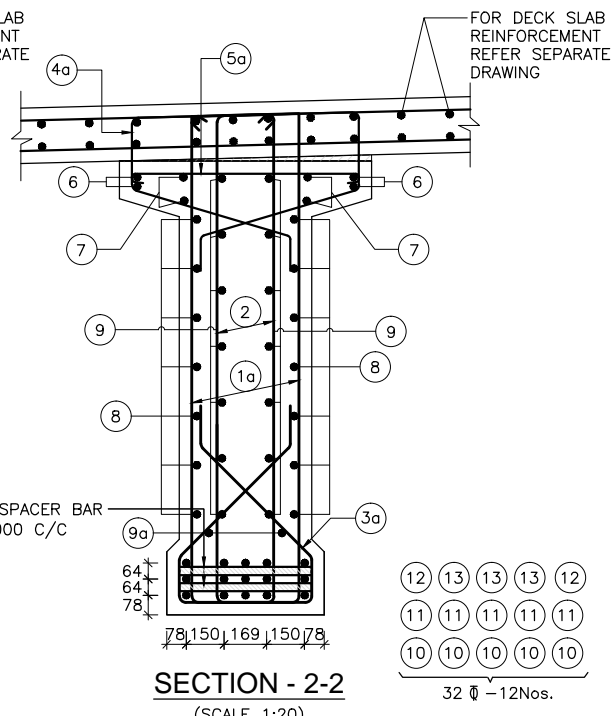


SECTIONAL PLAN 4-4

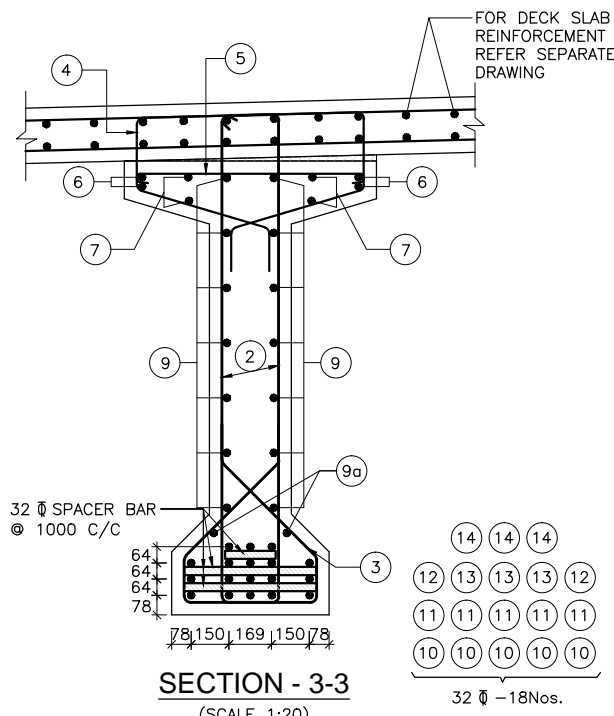
(SCALE 1:30)



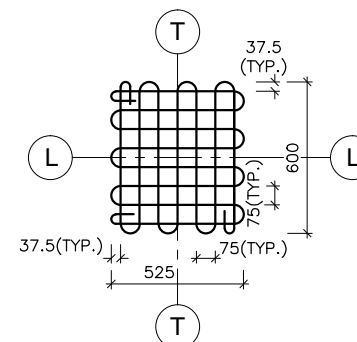
SECTION - 1-1
(SCALE 1:20)



SECTION - 2-2
(SCALE 1:20)



SECTION - 3-3
(SCALE 1:20)



DETAIL OF 8 Ø MESH
TYPE 'A'
(IN TWO LAYERS)
(SCALE = 1:20)

NOTES:-

- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS UNLESS OTHERWISE SPECIFIED.
- DIMENSIONS ARE NOT TO BE SCALED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
- THE REINFORCEMENT SHALL BE HYSD. BARS (GRADE DESIGNATION Fe-500D) CONFORMING TO IS:1786-2008. HAVING MINIMUM ELONGATION OF 16% AS PER TABLE:18.1 OF IRC:112-2011.
- CLEAR COVER TO THE OUTERMOST STEEL SHALL BE 40mm UNLESS OTHERWISE SPECIFIED.
- LAPPING OF REINFORCEMENT SHALL BE AVOIDED AS FAR AS POSSIBLE. IN CASE LAPPING OF BARS BECOMES UNAVOIDABLE, MINIMUM LAP LENGTH OF REINFORCEMENT BARS SHALL BE CALCULATED AS FOLLOWS WITH MAXIMUM ALLOWABLE LAPPING (p) OF 50% ONLY. (IRC:112-2011) (CLAUSE:15.2.5.1)
 $LAP LENGTH l_s = \alpha \cdot l_{bnet}$
 $\alpha = 1.0$ FOR $p \leq 25\%$
 $\alpha = 1.15$ FOR $25\% < p \leq 33\%$
 $\alpha = 1.4$ FOR $33\% < p \leq 50\%$
 (IRC:112-2011) (CLAUSE:15.2.3.3)
 $DEVELOPMENT LENGTH (l_{bnet})$
 $l_{bnet} = \alpha \cdot l_b$ ($\alpha = 1.0$)
 $l_b = k \phi$
 $k = 40$ FOR M30 (Fe500D)
 $k = 36$ FOR M35 (Fe500D)
 $k = 34$ FOR M40 (Fe500D)
 FOR UNFAVORABLE BOND CONDITION THE l_b SHOULD BE MULTIPLIED BY FACTOR OF 1.43. FOR $\phi > 32mm$ l_b SHOULD BE INCREASED BY MULTIPLYING FACTOR (1.25)

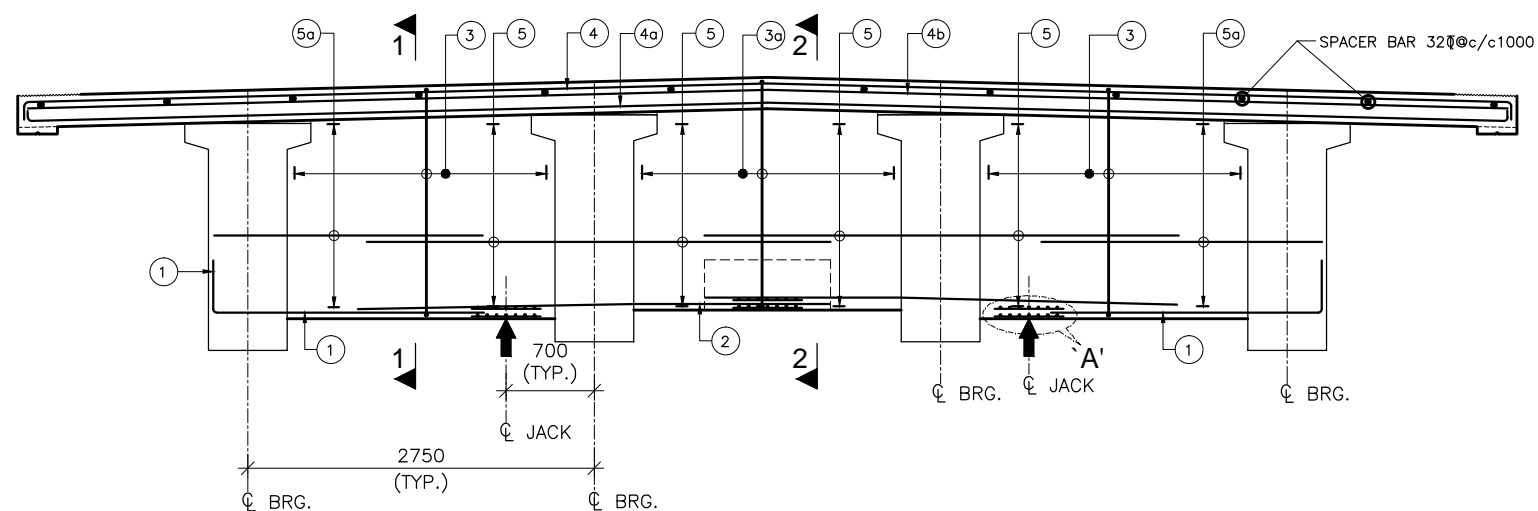
REFERENCE DRAWINGS:-

- DIMENSIONAL DETAILS OF PRECAST RCC GIRDER & CAST-IN-SITU SLAB SUPERSTRUCTURE:
-NIRTP/NAG-MUG/KHATRIPAUWA/RCC-G/22m/01
- REINFORCEMENT DETAILS OF END CROSS GIRDER:
-NIRTP/NAG-MUG/KHATRIPAUWA/RCC-G/22m/03
- REINFORCEMENT DETAILS OF RCC DECK SLAB:
-NIRTP/NAG-MUG/KHATRIPAUWA/RCC-G/22m/04(SHEET 1&2)
- DETAILS OF LOAD AND FORCES FOR POT/PTFE BEARINGS:
-NIRTP/NAG-MUG/KHATRIPAUWA/RCC-G/22m/05

SCHEDULE OF REINFORCEMENT

BAR MKD.	DESCRIPTION	SHAPE	REMARKS
1	2L-12 Ø125 C/C		STIRRUP
1a	2L-12 Ø125 C/C		STIRRUP (VARIES)
2	2L-12 Ø150 C/C		STIRRUP
3	10 Ø150 C/C		
3a	10 Ø125 C/C		(VARIES)
4	10 Ø150 C/C		
4a	10 Ø125 C/C		(VARIES)
4b	10 Ø125 C/C		
5	10 Ø150 C/C		LINKS
5a	10 Ø125 C/C		LINKS
6	12 Ø-4 Nos.		
7	12 Ø-4 Nos.		
8	10 Ø-7 Nos.		ON EACH FACE
9	10 Ø-7 Nos.		ON EACH FACE
9a	10 Ø-1 Nos.		ON EACH FACE
10	32 Ø-5 Nos.		
11	32 Ø-5 Nos.		
12	32 Ø-2 Nos.		
13	32 Ø-3 Nos.		
14	32 Ø-3 Nos.		

<p>EMPLOYER Government of Nepal Ministry of Physical Infrastructure and Transport, Department of Roads, Foreign Co-operation Branch</p>	<p>PROJECT Nepal India Regional Trade and Transport Project (NIRTPP) (IDA CREDIT No. 5273 - NEP) Detailed Design of Kathmandu (Nagdhunga) - Naubise - Mugling Road and Bridges</p>	<p>DESIGN CONSULTANT Intercontinental Consultants & Technocrats Pvt.Ltd, A-8, Green Park, New Delhi - 110016 Ph : 4086-3000, Fax 2685-5252 In Joint Venture With Soosung Engineering Co. Ltd., South Korea</p>	Prepared By	<i>K.M. JOHRI</i>	K.M. JOHRI	DRAWING TITLE: REINFORCEMENT DETAILS OF LONGITUDINAL GIRDER EFFECTIVE SPAN : 22.00m	Scale: As Shown	Date: JUNE-2018
			Designed By	<i>V. CHAUDHARY</i>	V. CHAUDHARY			
			Checked By	<i>P.K. KHAN</i>	P.K. KHAN			
			Approved By	<i>B.N. SINGH</i>	B.N. SINGH			



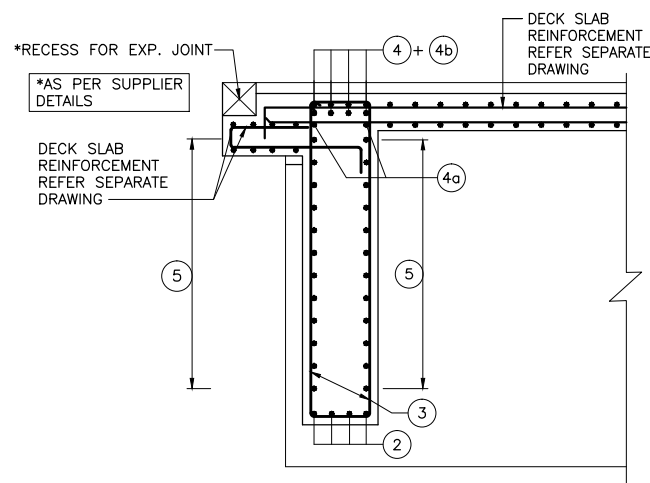
SECTIONAL ELEVATION OF END DIAPHRAGM
(SCALE 1:40)

NOTES:-

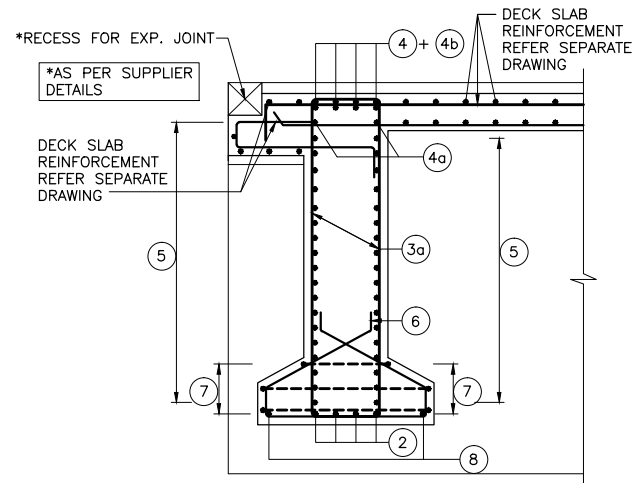
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- CLEAR COVER TO THE OUTERMOST STEEL SHALL BE 40mm UNLESS OTHERWISE SPECIFIED.
- LAPPING OF REINFORCEMENT SHALL BE AVOIDED AS FAR AS POSSIBLE. IN CASE LAPPING OF BARS BECOMES UNAVOIDABLE, MINIMUM LAP LENGTH OF REINFORCEMENT BARS SHALL BE CALCULATED AS FOLLOW WITH MAXIMUM ALLOWABLE LAPPING (p) OF 50% ONLY. (IRC:112-2011) (CLAUSE:15.2.5.1)
 $LAP LENGTH l_s = \alpha \cdot l_{bnet}$
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 $\alpha = 1.4$ FOR $33\% < p \leq 50\%$
 (IRC:112-2011) (CLAUSE:15.2.3.3)
 $DEVELOPMENT LENGTH (l_{bnet})$
 $l_{bnet} = \alpha \cdot l_b (\alpha = 1.0)$
 $l_b = k \phi$
 $k = 40$ FOR M30 (Fe500D)
 $k = 36$ FOR M35 (Fe500D)
 $k = 34$ FOR M40 (Fe500D)
 FOR UNFAVORABLE BOND CONDITION THE l_b SHOULD BE MULTIPLIED BY FACTOR OF 1.43. FOR $\phi > 32mm$ l_b , SHOULD BE INCREASED BY MULTIPLYING FACTOR (1.25)

REFERENCE DRAWINGS:-

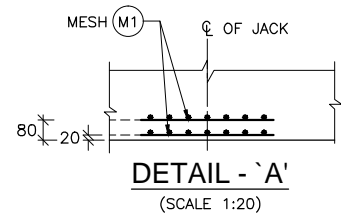
- DIMENSIONAL DETAILS OF PRECAST RCC GIRDER & CAST-IN-SITU SLAB SUPERSTRUCTURE:
-NIRTTP/NAG-MUG/KHATRIPAUWA/RCC-G/22m/01
- REINFORCEMENT DETAILS OF LONGITUDINAL GIRDER:
-NIRTTP/NAG-MUG/KHATRIPAUWA/RCC-G/22m/02
- REINFORCEMENT DETAILS OF RCC DECK SLAB:
-NIRTTP/NAG-MUG/KHATRIPAUWA/RCC-G/22m/04(SHEET 1&2)
- DETAILS OF LOAD AND FORCES FOR POT/PTFE BEARINGS:
-NIRTTP/NAG-MUG/KHATRIPAUWA/RCC-G/22m/05



SECTION 1-1
(SCALE 1:30)



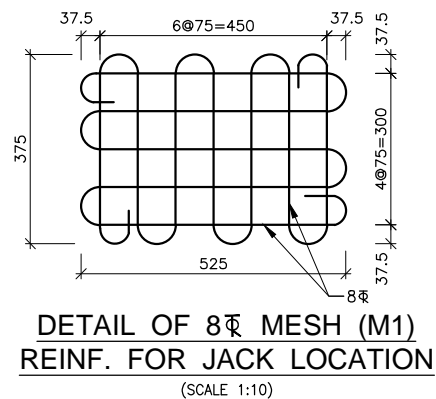
SECTION 2-2
(SCALE 1:30)



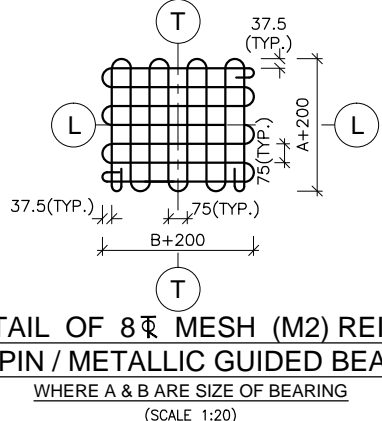
DETAIL - 'A'
(SCALE 1:20)

REINFORCEMENT SCHEDULE FOR END DIAPHRAGM

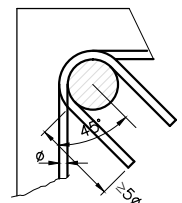
BAR MKD.	DESCRIPTION	SHAPE	REMARKS
1	25ϕ - 4 Nos.		
2	25ϕ - 4 Nos.		
3	25ϕ - 2L @125 c/c		
3a	25ϕ - 2L @125 c/c		
4	25ϕ - 4 Nos.		
4a	16ϕ - 2 Nos.		
4b	25ϕ - 4 Nos.		
5	25ϕ - 14 Nos.		(ON EACH FACE)
5a	16ϕ - 14 Nos.		(ON EACH FACE)
6	12ϕ - 7 Nos.		
7	12ϕ - 3 Nos.		
8	10ϕ - 2 Nos.		



DETAIL OF 8ϕ MESH (M1) REINF. FOR JACK LOCATION
(SCALE 1:10)

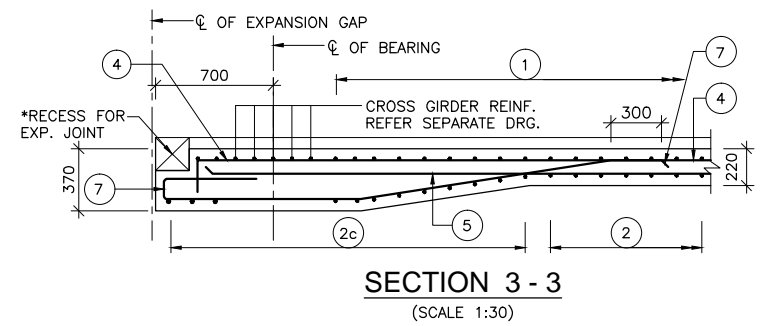
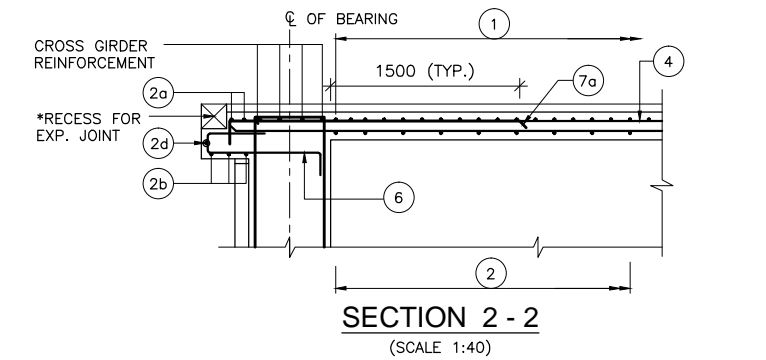
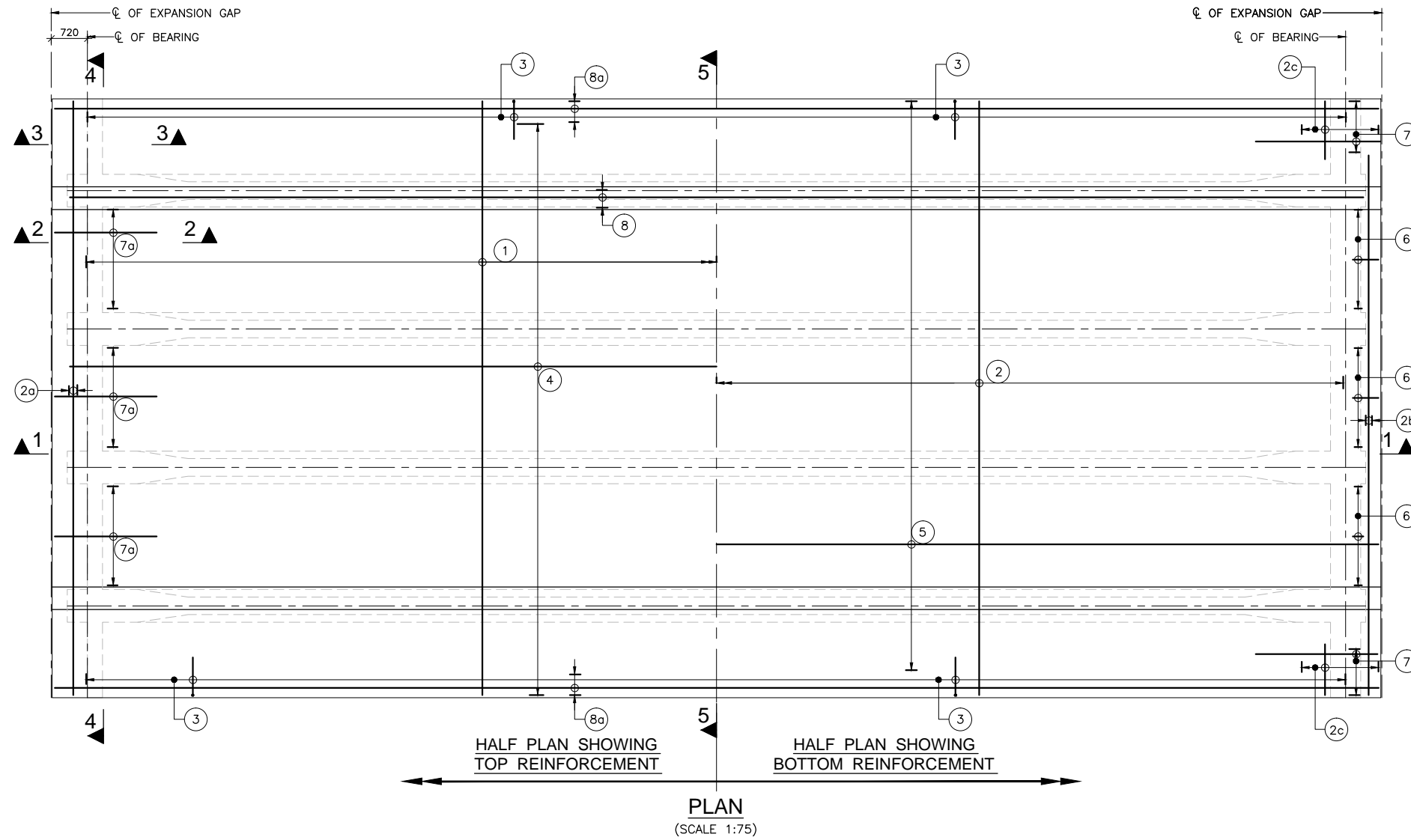
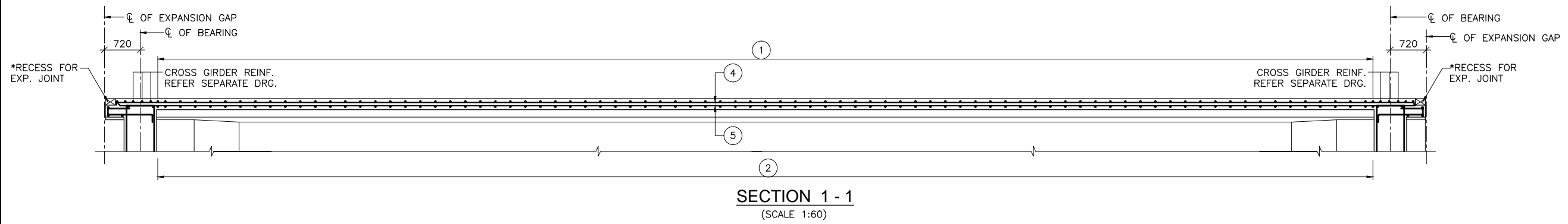





DETAIL OF 8ϕ MESH (M2) REINF. FOR PIN / METALLIC GUIDED BEARING
WHERE A & B ARE SIZE OF BEARING
(SCALE 1:20)

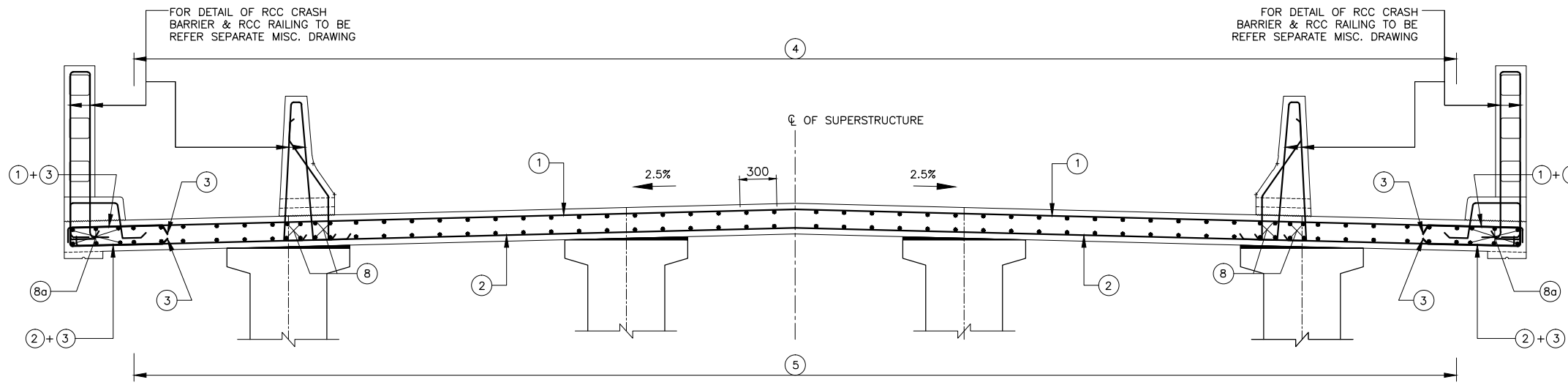


TYPICAL DETAIL INDICATING ANCHORAGE OF STIRRUP
(SCALE 1:30)

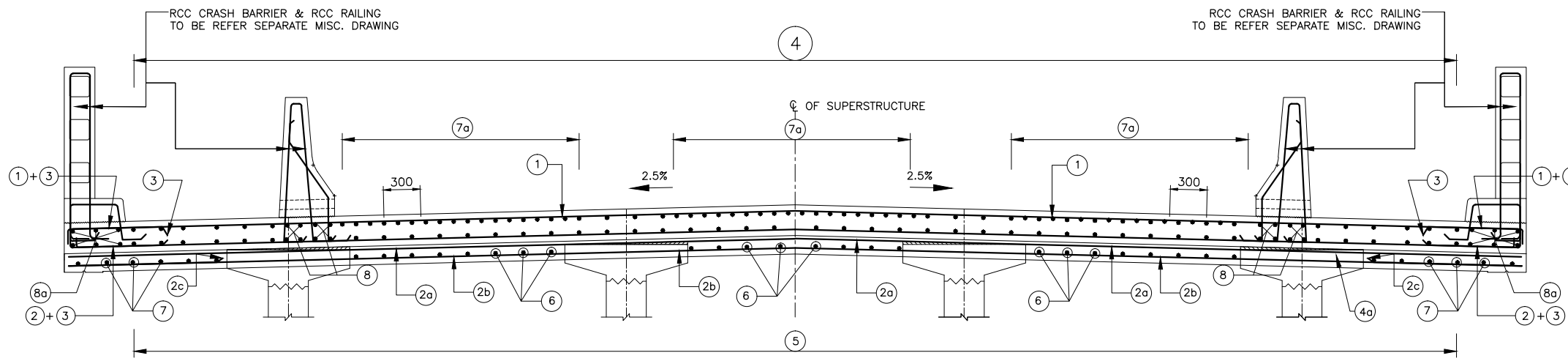
EMPLOYER	PROJECT	DESIGN CONSULTANT	Prepared By	Designed By	Checked By	Approved By	DRAWING TITLE:	Scale:	Date:
Government of Nepal Ministry of Physical Infrastructure and Transport, Department of Roads, Foreign Co-operation Branch	Nepal India Regional Trade and Transport Project (NIRTTP) (IDA CREDIT No. 5273 - NEP) Detailed Design of Kathmandu (Nagdhunga) - Naubise - Mugling Road and Bridges	Intercontinental Consultants & Technocrats Pvt.Ltd, A-8, Green Park, New Delhi - 110016 Ph : 4086-3000, Fax 2685-5252 In Joint Venture With Soosung Engineering Co. Ltd., South Korea In Association With Full Bright Consultancy (Pvt.) Ltd. 316, Baburam Acharya Sadak, Sinamangal, Kathmandu, GPO Box: 4970, Kathmandu, Nepal	K.M.JOHRRI	V.CHAUDHARY	P.K.KHAN	B.N.SINGH	REINFORCEMENT DETAILS OF END CROSS GIRDER EFFECTIVE SPAN : 22.00m Drawing No.: NIRTTP/NAG-MUG/KHATRIPAUWA/RCC-G/22m/03	As Shown	JUNE-2018



 <p>EMPLOYER Government of Nepal Ministry of Physical Infrastructure and Transport, Department of Roads, Foreign Co-operation Branch</p>	<p>PROJECT Nepal India Regional Trade and Transport Project (NIRTPP) (IDA CREDIT No. 5273 - NEP) Detailed Design of Kathmandu (Nagdhunga) - Naubise - Mugling Road and Bridges</p>	<p>DESIGN CONSULTANT  Intercontinental Consultants & Technocrats Pvt.Ltd, A-8, Green Park, New Delhi - 110016 Ph : 4086-3000, Fax 2685-5252  In Association With Full Bright Consultancy (Pvt.) Ltd. 316, Baburam Acharya Sadak, Sinamangal, Kathmandu, GPO Box: 4970, Kathmandu, Nepal</p>	Prepared By <i>Kempthi</i> K.M.JOHRU	<p>DRAWING TITLE: REINFORCEMENT DETAILS OF DECK SLAB EFFECTIVE SPAN : 22.00m</p>	<p>Scale: As Shown</p>	<p>Date: JUNE-2018</p>
			Designed By <i>Shrestha</i> V.CHAUDHARY			
			Approved By <i>B.N.Singh</i> B.N.SINGH			



SECTION AT 5-5 (MID SPAN)
(SCALE 1:30)



SECTION AT 4-4 (NEAR SUPPORT)
(SCALE 1:30)

FOR RCC CRASH BARRIER REINF.
REFER MISCELLANEOUS DRG.

NOTES:-

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3. THE REINFORCEMENT SHALL BE HYSD. BARS (GRADE DESIGNATION Fe-500D) CONFORMING TO IS:1786-2008. HAVING MIN. ELONGATION OF 16% AS PER TABLE:18.1 OF IRC:112-2011
4. CLEAR COVER TO THE OUTERMOST STEEL SHALL BE 40mm UNLESS OTHERWISE SPECIFIED.
5. LAPPING OF REINFORCEMENT SHALL BE AVOIDED AS FAR AS POSSIBLE. IN CASE LAPPING OF BARS BECOMES UNAVOIDABLE, MINIMUM LAP LENGTH OF REINFORCEMENT BARS SHALL BE CALCULATED AS FOLLOW WITH MAXIMUM ALLOWABLE LAPPING (p) OF 50% ONLY. (IRC:112-2011) (CLAUSE:15.2.5.1)
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 (IRC:112-2011) (CLAUSE:15.2.3.3)
 $DEVELOPMENT\ LENGTH\ (l_{bnet})$
 $l_{bnet} = \alpha \cdot l_b$ ($\alpha = 1.0$)
 $l_b = k \phi$
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 $k = 36$ FOR M35 (Fe500D)
 $k = 34$ FOR M40 (Fe500D)
 FOR UNFAVORABLE BOND CONDITION THE l_b SHOULD BE MULTIPLIED BY FACTOR OF 1.43. FOR $\phi > 32mm$ l_b , SHOULD BE INCREASED BY MULTIPLYING FACTOR $(\frac{100}{\phi})$
6. RECESS FOR EXPANSION JOINT, AS PER SUPPLIER DETAILS.

REFERENCE DRAWINGS:-

1. DIMENSIONAL DETAILS OF PRECAST RCC GIRDER & CAST-IN-SITU SLAB SUPERSTRUCTURE:
-NIRTP/NAG-MUG/KHATRIPAUWA/RCC-G/22m/01
2. REINFORCEMENT DETAILS OF LONGITUDINAL GIRDER:
-NIRTP/NAG-MUG/KHATRIPAUWA/RCC-G/22m/02
3. REINFORCEMENT DETAILS OF END CROSS GIRDER:
-NIRTP/NAG-MUG/KHATRIPAUWA/RCC-G/22m/03
4. DETAILS OF LOAD AND FORCES FOR POT/PTEF BEARINGS:
-NIRTP/NAG-MUG/KHATRIPAUWA/RCC-G/22m/05

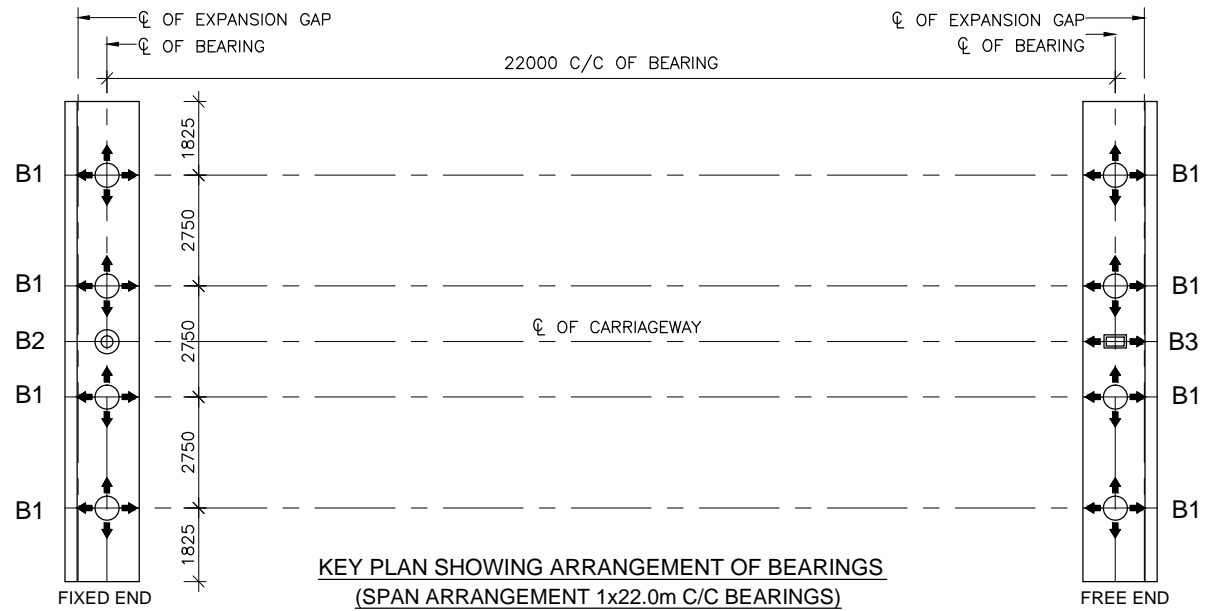
REINFORCEMENT SCHEDULE

BAR MKD.	DESCRIPTION	SHAPE	REMARKS
1	12ϕ @100 C/C	[Diagram]	
2	12ϕ @100 C/C	[Diagram]	
2a	12ϕ @100 C/C	[Diagram]	
2b	12ϕ @100 C/C	[Diagram]	
2c	12ϕ @100 C/C	[Diagram]	
2d	12ϕ -1 Nos.	[Diagram]	
3	12ϕ @100 C/C	[Diagram]	
4	10ϕ @200 C/C	[Diagram]	
5	10ϕ @200 C/C	[Diagram]	
6	12ϕ @200 C/C	[Diagram]	
7	12ϕ @200 C/C	[Diagram]	
7a	12ϕ @200 C/C	[Diagram]	
8	16ϕ -8 Nos.	[Diagram]	(ON EACH SIDE)
8a	16ϕ -6 Nos.	[Diagram]	(ON EACH SIDE)

<p>EMPLOYER Government of Nepal Ministry of Physical Infrastructure and Transport, Department of Roads, Foreign Co-operation Branch</p>	<p>PROJECT Nepal India Regional Trade and Transport Project (NIRTP) (IDA CREDIT No. 5273 - NEP) Detailed Design of Kathmandu (Nagdhunga) - Naubise - Mugling Road and Bridges</p>	<p>DESIGN CONSULTANT Intercontinental Consultants & Technocrats Pvt.Ltd, A-8, Green Park, New Delhi - 110016 Ph : 4086-3000, Fax 2685-5252 In Joint Venture With Soosung Engineering Co. Ltd., South Korea</p>	Prepared By <i>Kempthi</i> K.M.JOHRU	<p>DRAWING TITLE: REINFORCEMENT DETAILS OF DECK SLAB EFFECTIVE SPAN : 22.00m</p>	Scale: As Shown	Date: JUNE-2018
			Designed By <i>Dual</i> V.CHAUDHARY			
			Approved By <i>B.N.Singh</i> B.N.SINGH	(SHEET 2 OF 2)		

LEGEND:-

B1		FREE SLIDING POT-CUM-PTFE BEARING
B2		PIN BEARING
B3		METALLIC GUIDED BEARING



**KEY PLAN SHOWING ARRANGEMENT OF BEARINGS
(SPAN ARRANGEMENT 1x22.0m C/C BEARINGS)**

NOTES:-

- MATERIAL SPECIFICATIONS, DESIGN OF BEARINGS, ACCEPTANCE CRITERIA AND INSTALLATION MORTH SHALL BE IN ACCORDANCE WITH IRC:83 (PART III)-2002 AND MOSRTH SPECIFICATIONS (FOURTH REVISION).
- BEARINGS SHALL BE OBTAINED FROM MANUFACTURERS APPROVED BY MORTH.
- INSTALLATION OF BEARINGS SHALL BE UNDER THE SUPERVISION OF REPRESENTATIVE OF THE MANUFACTURER.
- FOR DESIGN LOADS AND ROTATIONS REFER TABLE IN THE DRAWING.
- FOR BEARINGS, DETAILED SHOP DRAWINGS SHALL BE PREPARED BY THE SUPPLIER AND BE DULY APPROVED BEFORE MANUFACTURE AND INSTALLATION.
- THE GROUT/BEDDING MORTAR SHALL BE HIGH STRENGTH FREE FLOWING NON SHRINK GROUT (80 MPa STRENGTH).
- ALL BEARING SHALL BE PLACED IN TRULY HORIZONTAL PLANE ONLY.
- FOR DESIGN OF POT BEARINGS, THE DESIGN HORIZONTAL FORCE SHALL, IN NO CASE BE LESS THAN 10% AND GREATER THAN 25% OF THE DESIGN VERTICAL LOAD.
- THE CONTRACTOR AND SUPPLIER OF BEARINGS SHALL BE FURNISH A MINIMUM TROUBLE FREE WARRANTY OF 10 YEARS AFTER OPENING OF THE BRIDGE.
- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH: DIMENSIONAL DETAILS OF PRECAST RCC GIRDER & CAST-IN-SITU SLAB SUPERSTRUCTURE
NIRTP/NAG-MUG/KHATRIPAUWA/RCC-G/22m/01(SHEET 1&2)

GENERAL DATA:

- STRUCTURE IS LOCATED IN SEISMIC ZONE : V
- GRADE OF CONCRETE
ABUTMENT CAP. M-30
PEDESTAL M-40

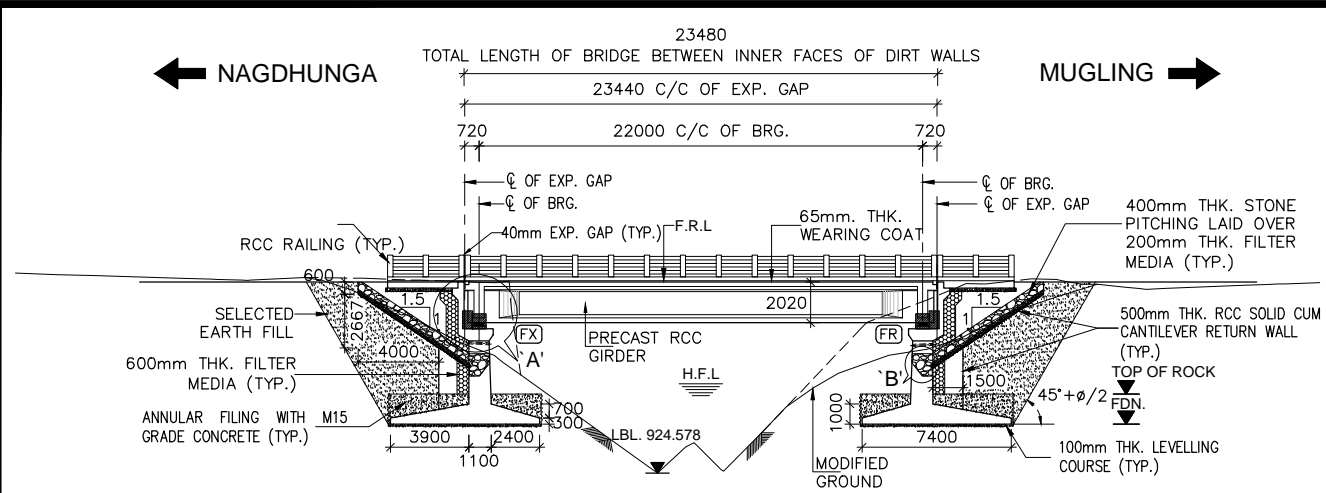
TABLE SHOWING DATA FOR DESIGN OF BEARINGS

SL. No.	BEARING TYPE	LOAD CONDITION	LOADS, FORCES, MOVEMENTS AND ROTATION DATA										BEARING (Nos.) PER SPAN
			VERTICAL LOAD (kN)		HORIZONTAL FORCE (kN)			ROTATION (RAD)		MOVEMENT (mm)			
			CASE	MAGNITUDE	LONGITUDINAL	TRANSVERSE	CASE	MAGNITUDE	LONGITUDINAL	TRANSVERSE			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
1.		NORMAL	MAXIMUM (WITH LIVE LOAD)	1516	COEXISTING	152	COEXISTING	-	COEXISTING	0.002	-16.5/16.2	4.70	8
			MINIMUM (WITH LIVE LOAD)	576	COEXISTING	58	COEXISTING	-	COEXISTING	0.002	-16.5/16.2	4.70	
			MINIMUM (WITHOUT LIVE LOAD)	440	COEXISTING	44	COEXISTING	-	COEXISTING	0.002	-16.5/16.2	4.70	
		SEISMIC (LONGITUDINAL)	MAXIMUM (WITH LIVE LOAD)	884	COEXISTING	-	COEXISTING	-	COEXISTING	0.002	-16.5/16.2	4.70	
			MINIMUM (WITH LIVE LOAD)	522	COEXISTING	-	COEXISTING	-	COEXISTING	0.002	-16.5/16.2	4.70	
			MINIMUM (WITHOUT LIVE LOAD)	487	COEXISTING	-	COEXISTING	-	COEXISTING	0.002	-16.5/16.2	4.70	
		SEISMIC (TRANSVERSE)	MAXIMUM (WITH LIVE LOAD)	884	COEXISTING	-	COEXISTING	-	COEXISTING	0.002	-16.5/16.2	4.70	
			MINIMUM (WITH LIVE LOAD)	522	COEXISTING	-	COEXISTING	-	COEXISTING	0.002	-16.5/16.2	4.70	
			MINIMUM (WITHOUT LIVE LOAD)	487	COEXISTING	-	COEXISTING	-	COEXISTING	0.002	-16.5/16.2	4.70	
2.		NORMAL	MAXIMUM (WITH LIVE LOAD)	-	COEXISTING	278	COEXISTING	-	COEXISTING	0.002	-	-	1
			MINIMUM (WITH LIVE LOAD)	-	COEXISTING	203	COEXISTING	-	COEXISTING	0.002	-	-	
			MINIMUM (WITHOUT LIVE LOAD)	-	COEXISTING	203	COEXISTING	-	COEXISTING	0.002	-	-	
		SEISMIC (LONGITUDINAL)	MAXIMUM (WITH LIVE LOAD)	-	COEXISTING	2469	COEXISTING	405	COEXISTING	0.002	-	-	
			MINIMUM (WITH LIVE LOAD)	-	COEXISTING	2469	COEXISTING	365	COEXISTING	0.002	-	-	
			MINIMUM (WITHOUT LIVE LOAD)	-	COEXISTING	2433	COEXISTING	365	COEXISTING	0.002	-	-	
		SEISMIC (TRANSVERSE)	MAXIMUM (WITH LIVE LOAD)	-	COEXISTING	766	COEXISTING	1349	COEXISTING	0.002	-	-	
			MINIMUM (WITH LIVE LOAD)	-	COEXISTING	766	COEXISTING	1216	COEXISTING	0.002	-	-	
			MINIMUM (WITHOUT LIVE LOAD)	-	COEXISTING	766	COEXISTING	811	COEXISTING	0.002	-	-	
3.		NORMAL	MAXIMUM (WITH LIVE LOAD)	-	COEXISTING	-	COEXISTING	-	COEXISTING	0.002	-16.5/16.2	-	1
			MINIMUM (WITH LIVE LOAD)	-	COEXISTING	-	COEXISTING	-	COEXISTING	0.002	-16.5/16.2	-	
			MINIMUM (WITHOUT LIVE LOAD)	-	COEXISTING	-	COEXISTING	-	COEXISTING	0.002	-16.5/16.2	-	
		SEISMIC (LONGITUDINAL)	MAXIMUM (WITH LIVE LOAD)	-	COEXISTING	-	COEXISTING	405	COEXISTING	0.002	-16.5/16.2	-	
			MINIMUM (WITH LIVE LOAD)	-	COEXISTING	-	COEXISTING	365	COEXISTING	0.002	-16.5/16.2	-	
			MINIMUM (WITHOUT LIVE LOAD)	-	COEXISTING	-	COEXISTING	365	COEXISTING	0.002	-16.5/16.2	-	
		SEISMIC (TRANSVERSE)	MAXIMUM (WITH LIVE LOAD)	-	COEXISTING	-	COEXISTING	1349	COEXISTING	0.002	-16.5/16.2	-	
			MINIMUM (WITH LIVE LOAD)	-	COEXISTING	-	COEXISTING	1216	COEXISTING	0.002	-16.5/16.2	-	
			MINIMUM (WITHOUT LIVE LOAD)	-	COEXISTING	-	COEXISTING	811	COEXISTING	0.002	-16.5/16.2	-	

	EMPLOYER	PROJECT	DESIGN CONSULTANT	Prepared By	K.M. JOHRI	DRAWING TITLE: DETAILS OF LOADS AND FORCES FOR POT/PTFE BEARINGS EFFECTIVE SPAN : 22.00m	Scale: As Shown	Date: JUNE-2018
	Government of Nepal Ministry of Physical Infrastructure and Transport, Department of Roads, Foreign Co-operation Branch	Nepal India Regional Trade and Transport Project (NIRTPP) (IDA CREDIT No. 5273 - NEP) Feasibility Study of Kathmandu (Nagdhunga) -Detailed Design of Kathmandu (Nagdhunga) -Nauvise - Mugling Road and Bridges	Intercontinental Consultants & Technocrats Pvt.Ltd, A-8, Green Park, New Delhi - 110016 Ph : 4086-3000, Fax 2685-5252 In Joint Venture With Soosung Engineering Co. Ltd., South Korea	Designed By	V. CHAUDHARY			
			In Association With Full Bright Consultancy (Pvt.) Ltd. 316, Baburam Acharya Sadak, Sinamangal, Kathmandu, GPO Box: 4970, Kathmandu, Nepal	Checked By	P.K. KHAN			
			Approved By	B.N. SINGH	Drawing No.: NIRTPP/NAG-MUG/KHATRIPAUWA/RCC-G/22m/05			

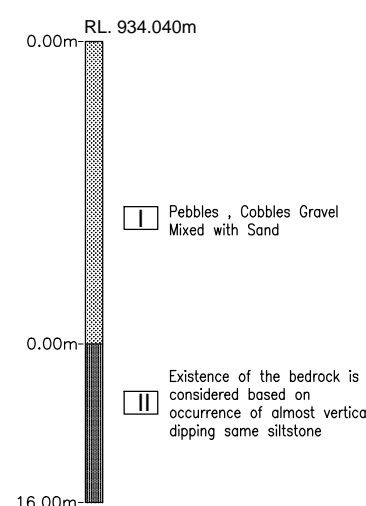
NAUBISE KHOLA BRIDGE

CHAINAGE : 12+328

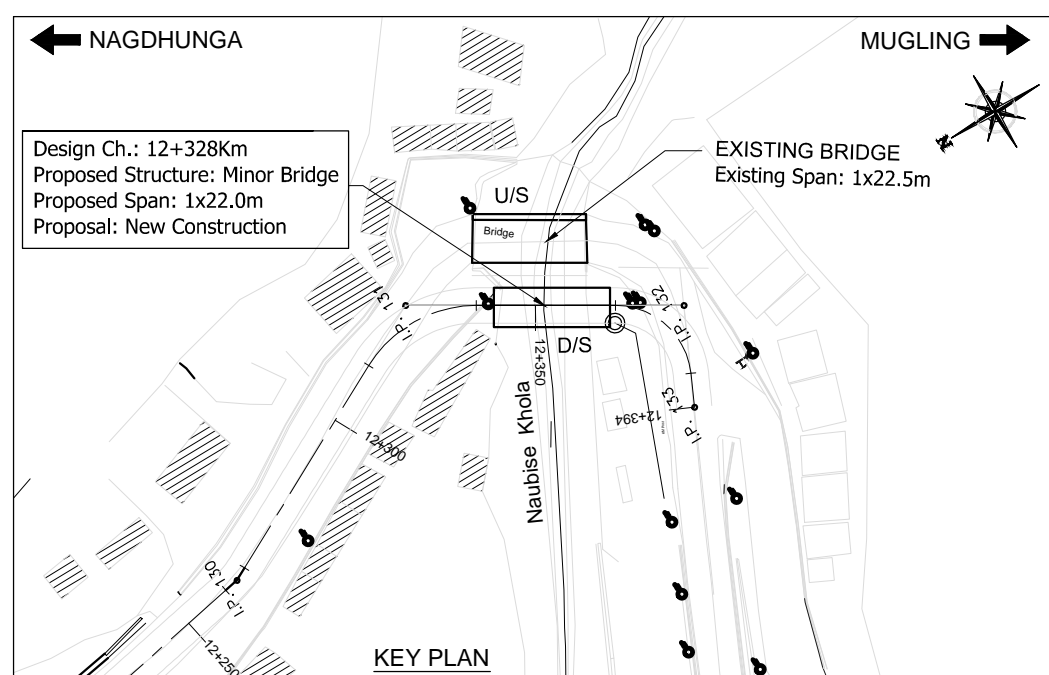


FINISHED ROAD LEVEL (m)	934.100	934.100	934.100	CHAINAGE AT 0.000m IS 12+352Km
GROUND LEVEL (m)	934.111	924.578	932.333	
FOUNDING LEVEL (m)	927.000		927.000	
CHAINAGE (m)	(-)11.00	0.000	11.00	

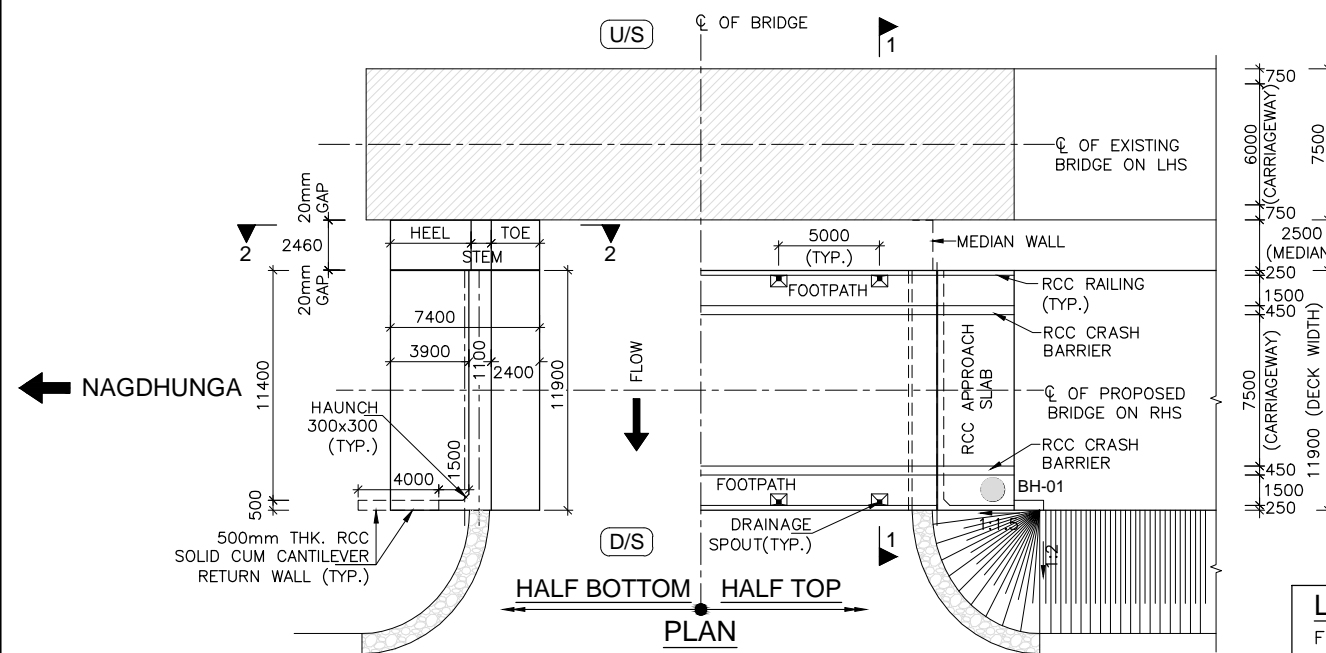
LONGITUDINAL ELEVATION OF PROPOSED BRIDGE
(SCALE 1:250)



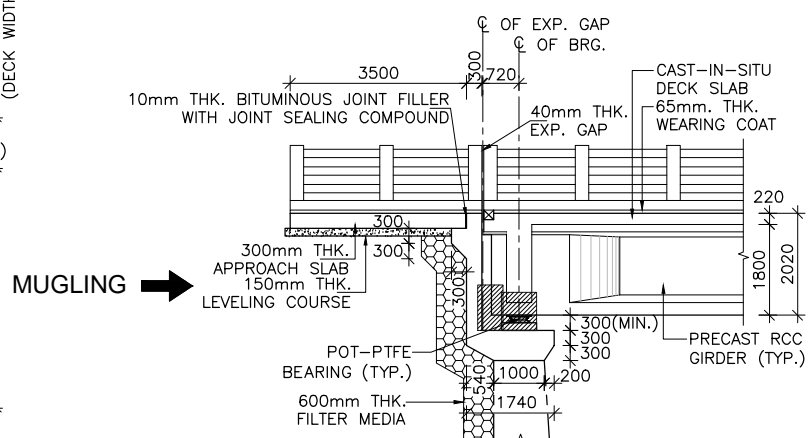
BH-01
(SCALE 1:175)



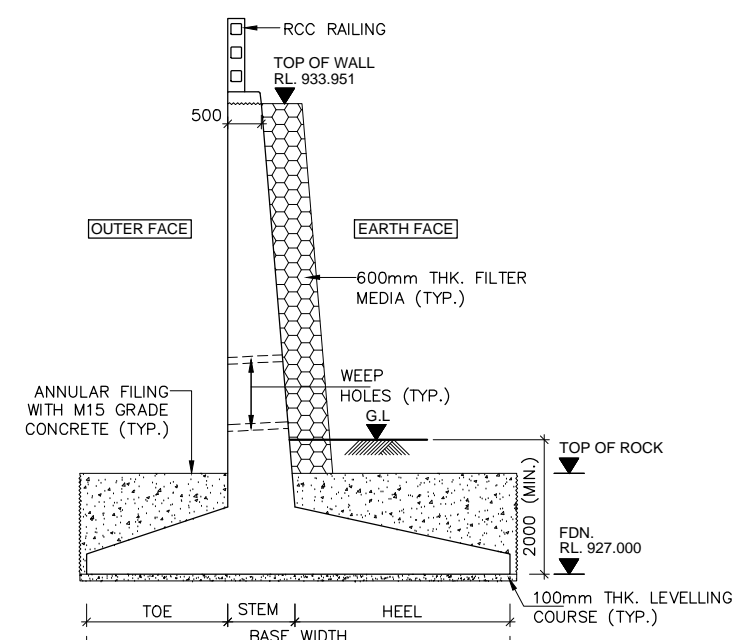
KEY PLAN



PLAN
(SCALE 1:250)



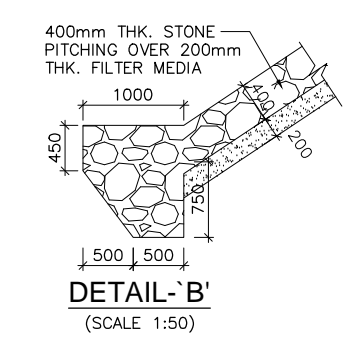
DETAIL-A
(SCALE 1:100)



SECTION 2-2
(REFER SEPARATE DRAWING FOR DETAILS)
(SCALE 1:75)

LEGEND:

- F.R.L : FINISHED ROAD LEVEL
- H.F.L : HIGH FLOOD LEVEL
- CL : CENTER LINE
- LVL : LEVEL
- RL : REDUCED LEVEL
- TYP. : TYPICAL
- THK. : THICK
- D/S : DOWNSTREAM
- U/S : UPSTREAM
- G.L : GROUND LEVEL
- L.B.L : LOWEST BED LEVEL
- FDN. : FOUNDING LEVEL
- FX : FIX
- FR : FREE
- EXISTING : [Hatched Box]
- PROPOSED : [White Box]
- BH : BORE HOLE

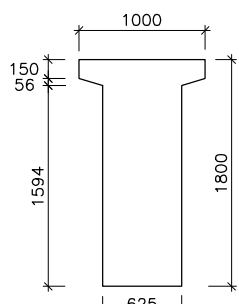
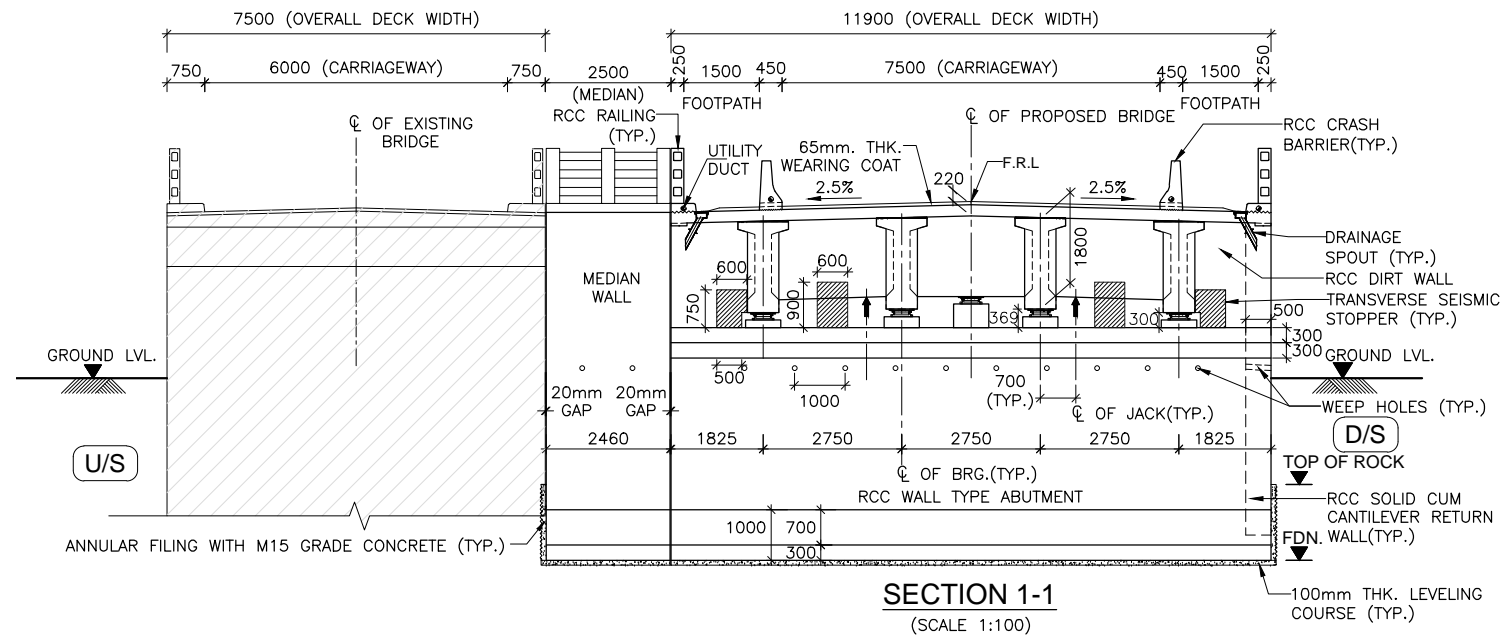


DETAIL-B
(SCALE 1:50)

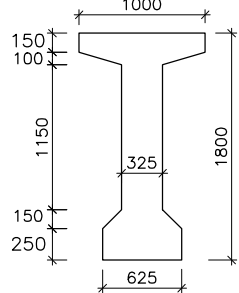
HYDRAULIC DATA:-

DISCHARGE	- 176 cumec
VELOCITY	- 4.74m/s
H.F.L	- 929.008m
ROCK TOP LVL.	- 929.040m

<p>EMPLOYER Government of Nepal Ministry of Physical Infrastructure and Transport, Department of Roads, Foreign Co-operation Branch</p>	<p>PROJECT Nepal India Regional Trade and Transport Project (NIRTP) (IDA CREDIT No. 5273 - NEP) Detailed Design of Kathmandu (Nagdhunga) - Naubise - Mugling Road and Bridges</p>	<p>DESIGN CONSULTANT Intercontinental Consultants & Technocrats Pvt.Ltd, A-8, Green Park, New Delhi - 110016 Ph : 4086-3000, Fax 2685-5252 In Joint Venture With Soosung Engineering Co. Ltd., South Korea</p>	Prepared By	M.L.GUPTA	<p>DRAWING TITLE: GENERAL ARRANGEMENT DRAWING FOR MINOR BRIDGE AT CH:- 12+328KM OVER NAUBISE KHOLA (1x22.00m) PACKAGE-I (NAGDHUNGA-NAUBISE)</p>	<p>Scale: As Shown</p>	Date: JUNE-2018
			Designed By	V.CHAUDHARY			Checked By
			Approved By	B.N.SINGH	Drawing No.:	NIRTP/NAG-MUG/NAUBISE/GAD	



AT SUPPORT



AT MID SPAN

CROSS SECTION OF PRECAST
RCC GIRDER
(SCALE 1:40)

LEGEND:	
F.R.L	: FINISHED ROAD LEVEL
H.F.L	: HIGH FLOOD LEVEL
CL	: CENTER LINE
LVL.	: LEVEL
RL.	: REDUCED LEVEL
TYP.	: TYPICAL
THK.	: THICK
D/S	: DOWNSTREAM
U/S	: UPSTREAM
G.L	: GROUND LEVEL
L.B.L	: LOWEST BED LEVEL
FDN.	: FOUNDING LEVEL
FX	: FIX
FR	: FREE
EXISTING	:
PROPOSED	:
BH	: BORE HOLE

REFERENCE DRAWINGS:-

- DIMENSIONAL DETAILS OF ABUTMENT AND FOUNDATION:
-NIRTP/NAG-MUG/NAUBISE/SUB-01
- REINFORCEMENT DETAILS OF ABUTMENT, DIRT WALL, RETURN WALL, PEDESTAL AND SEISMIC STOPPER:
-NIRTP/NAG-MUG/NAUBISE/SUB-02(SHEET1&2)
- DIMENSIONAL DETAILS OF PRECAST RCC GIRDER & CAST-IN-SITU SLAB SUPERSTRUCTURE:
-NIRTP/NAG-MUG/NAUBISE/RCC-G/22m/01
- REINFORCEMENT DETAILS OF LONGITUDINAL GIRDER:
-NIRTP/NAG-MUG/NAUBISE/RCC-G/22m/02
- REINFORCEMENT DETAILS OF END CROSS GIRDER:
-NIRTP/NAG-MUG/NAUBISE/RCC-G/22m/03
- REINFORCEMENT DETAILS OF RCC DECK SLAB:
-NIRTP/NAG-MUG/NAUBISE/RCC-G/22m/04(SHEET 1&2)
- DETAILS OF LOAD AND FORCES FOR POT/PTFE BEARINGS:
-NIRTP/NAG-MUG/NAUBISE/RCC-G/22m/05

MISCELLANEOUS DRAWINGS:

- DETAILS OF APPROACH SLAB:
-NIRTP/NAG-MUG/PACKAGE-I/MISC.-01
- DETAILS OF DRAINAGE SPOUT & WEARING COAT:
-NIRTP/NAG-MUG/PACKAGE-I/MISC.-02
- DIMENSIONAL & REINF. DETAILS OF R.C.C CRASH BARRIER:
-NIRTP/NAG-MUG/PACKAGE-I/MISC.-03
- DIMENSIONAL & REINF. DETAILS OF R.C.C RAILING:
-NIRTP/NAG-MUG/PACKAGE-I/MISC.-04
- DIMENSIONAL AND REINFORCEMENT DETAILS OF RCC RETAINING WALL/MEDIAN WALL:
-NIRTP/NAG-MUG/PACKAGE-I/MISC.-05

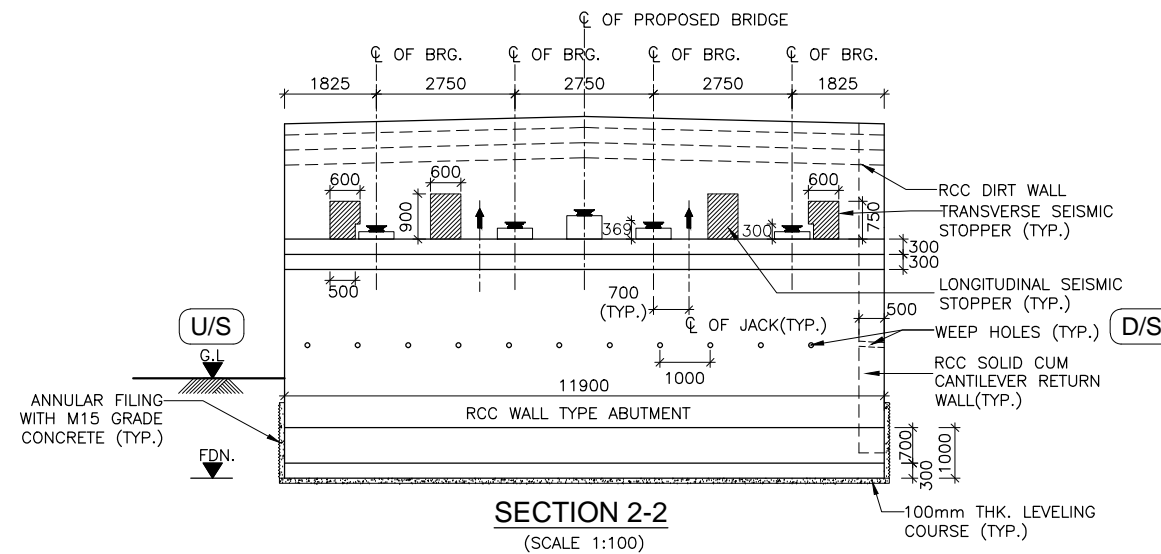
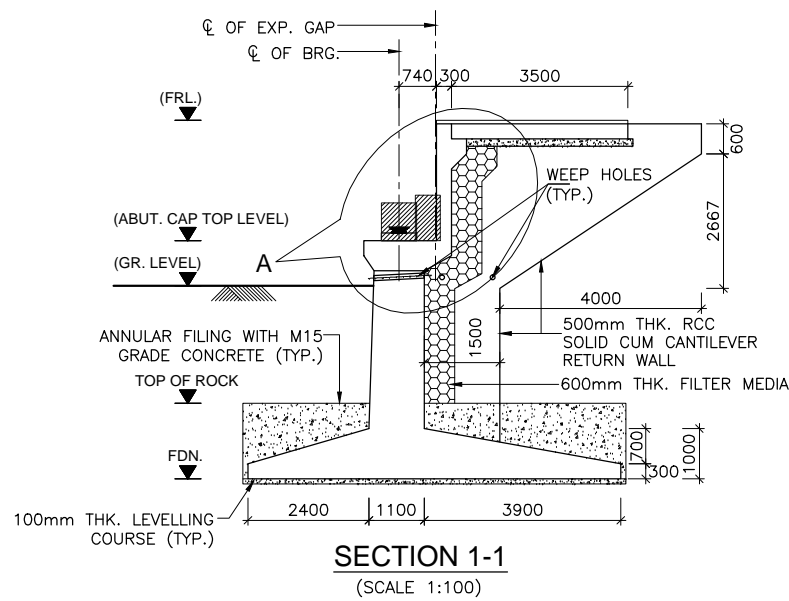
NOTES:-

- ALL DIMENSIONS ARE IN MILLIMETER AND LEVELS ARE IN METER UNLESS OTHERWISE SPECIFIED.
- DIMENSIONS ARE NOT TO BE SCALED ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
- THE BRIDGE HAS BEEN DESIGNED FOR MOST SEVERE OF:
 - ONE LANE OF IRC CLASS 70R LOADING OR TWO LANES OF IRC CLASS A LOADING WHEN FOOTPATHS ARE IN POSITION.
 - ONE LANE OF IRC CLASS 70R LOADING +ONE LANE OF IRC CLASS A LOADING OR 3 LANES OF IRC CLASS A LOADING WHEN FOOTPATHS ARE REMOVED.
 - ONE LANE OF SV LOADING IN ACCORDANCE WITH CLAUSE 204.5 OF IRC-6:2017.
- MINIMUM CONCRETE COVER, GRADE OF CONCRETE, MINIMUM CEMENT CONTENT & MAXIMUM W/C RATIO SHALL BE AS PER 'MODERATE' CONDITION OF EXPOSURE.
- CONCRETE SHALL BE DESIGN MIX WITH A MINIMUM 28 DAYS CHARACTERISTIC STRENGTH ON 150mm CUBE AS FOLLOWS:
 - LEVELING COURSE (UNDER FOUNDATION) - M10
 - LEVELING COURSE (UNDER APPROACH SLAB) - M15
 - FOUNDATION - M30
 - PEDESTAL - M40
 - SEISMIC STOPPER - M40
 - SUBSTRUCTURE - M30
 - SUPERSTRUCTURE - M35
 - RETURN/RETAINING WALL - M30
 - CRASH BARRIER - M40
 - APPROACH SLAB - M30
- UNTENSIONED REINFORCEMENT SHALL BE THERMO MECHANICALLY TREATED (TMT), HYSD BARS OF GRADE DESIGNATION Fe-500D CONFORMING TO IS: 1786.
- POT/PTFE BEARINGS SHALL BE DESIGNED AS PER PROVISION OF IRC : 83 (PART-III 2002).
- STRIP SEAL TYPE EXPANSION JOINTS SHALL BE PROVIDED AS PER PROVISION OF IRC: SP-69-2011.
- 65MM THICK WEARING COURSE COMPRISING OF 40MM THICK ASPHALTIC CONCRETE OVERLAID WITH 25MM THICK MASTIC ASPHALT SHALL BE PROVIDED AS PER SECTION 500 OF MORT&H SPECIFICATION.
- 100MM DIA WEEP HOLES AT 1000MM C/C STAGGERED HORIZONTALLY AND VERTICALLY SHALL BE PROVIDED IN ONE OR TWO LAYERS ABOVE G.L IN VERTICAL WALLS OF ABUTMENT, RETURN/RETAINING WALLS AT A SLOPE OF 1 VERTICAL TO 20 HORIZONTAL TOWARDS THE DRAINING FACE.
- WATER TO BE USED IN CONCRETING AND CURING SHALL CONFORM TO CLAUSE 18.4.5 OF IRC:112-2011.
- LAYING, COMPACTION AND EXTENT OF BACKFILL BEHIND ABUTMENTS AND RETURN/RETAINING WALLS SHALL CONSIST OF SELECTED EARTH CONFORMING TO APPENDIX-6 OF IRC:78-2014 HAVING PROPERTIES C=0, $\phi=35^\circ$, $\rho=22.5$ & $\gamma_d = 20 \text{ KN/M}^3$.
- MINIMUM CLEAR COVER TO OUTER MOST REINFORCEMENT SHALL BE AS UNDER-
 - SUPERSTRUCTURE - 40MM
 - SUBSTRUCTURE (EARTH FACE) - 75MM
 - SUBSTRUCTURE (NON EARTH FACE) - 50MM
 - FOUNDATION - 75MM
- THE BRIDGE IS DESIGNED FOR PROVISION OF SEISMIC ZONE-V AS PER CLAUSE 219 OF IRC:6:2017.
- SAFE BEARING CAPACITY CONSIDERED IN DESIGN AT PROPOSED FOUNDING LEVEL IS 43 T/M². THIS SHALL BE ASCERTAINED BEFORE EXECUTION AT SITE BY CONFIRMATORY GEOTECHNICAL INVESTIGATIONS.
- FILTER MEDIA SHALL BE PROVIDED AS PER APPENDIX-6 OF IRC-78:2014.
- MINIMUM ANCHORAGE OF FOUNDATION IN SOFT ROCK SHALL BE 1.5M AND 0.6M IN HARD ROCK. ANY DEVIATION IN ROCK LEVEL FROM DESIGN SHALL BE REPORTED TO ENGINEER FOR REQUIRED CHANGES IN DESIGN NO CHANGES REQUIRED FOR INCREASE HEIGHT UP TO 50 CM.
- WHERE FOUNDATIONS ARE PLACED ON ROCK, TRENCHES AROUND THE FOOTING SHALL BE FILLED UP WITH CONCRETE OF M15 GRADE UP TO TOP OF ROCK.
- THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH RELEVANT HIGHWAY PLAN AND PROFILE DRAWINGS.
- ALL CHAINAGES, FRL, GL SHALL BE CONFIRMED AT SITE PRIOR TO EXECUTION.
- FOR APPROACH SLAB, DRAINAGE SPOUTS, CRASH BARRIER, PROTECTION WORK, RETAINING WALL AND MEDIAN WALL DETAILS REFER SEPARATE DRAWINGS.
- WHEREVER THE COMPONENTS OF EXISTING BRIDGE INTERFERES WITH THE PROPOSED BRIDGE, THAT SHALL BE DISMANTLED UPTO FOUNDATION TOP.
- MINIMUM LONGITUDINAL GRADIENT OF 0.3% SHALL BE PROVIDED IN PROPOSED BRIDGE TO FACILITATE DRAINAGE OF DECK AS PER CLAUSE 105.3.6 OF IRC-5.
- SIZE OF EACH INDIVIDUAL STONE PITCHING AND LAUNCHING APRON SHALL NOT BE LESS THAN 30CM IN DIAMETER AND 40KG IN WEIGHT OR AS PER TABLE 5.1 & 5.2 OF IRC:89-1997. WHERE THE REQUIRED SIZE STONES ARE NOT ECONOMICALLY AVAILABLE, STONES IN WIRE CRATES MAY BE USED IN PLACE OF ISOLATED STONES OF EQUIVALENT WEIGHT.

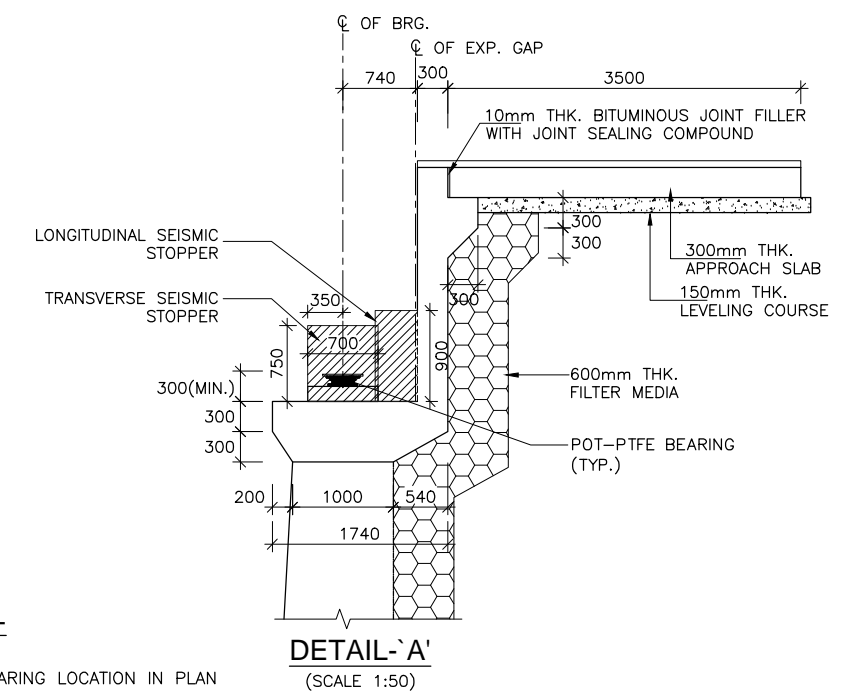
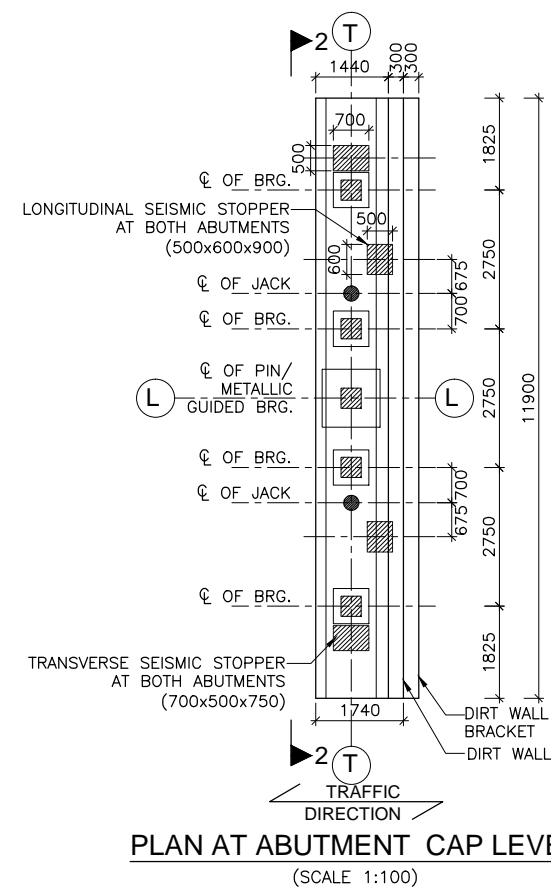
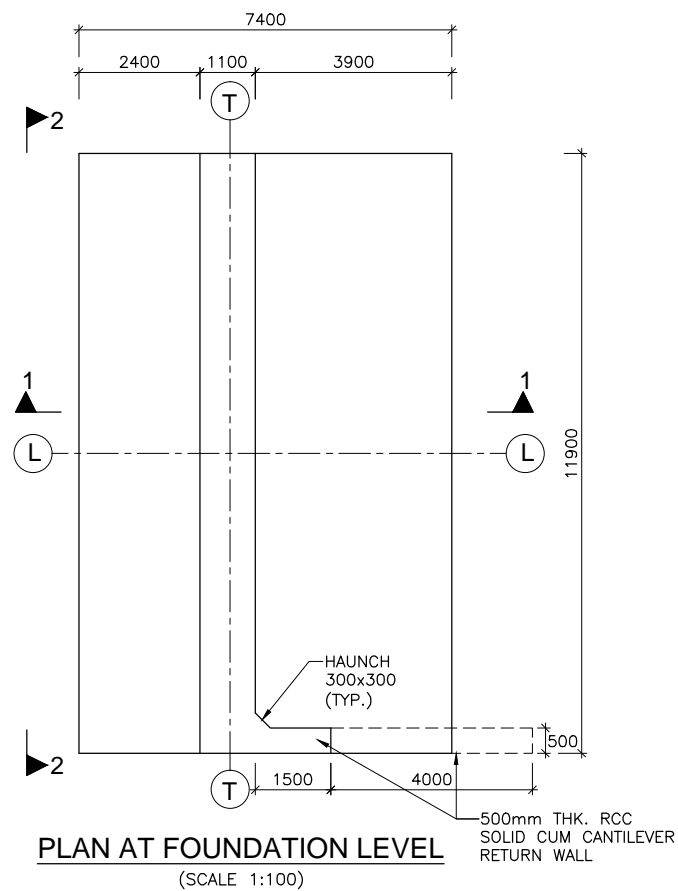
FACE OF OLD ABUTMENT SHALL BE MATCHED WITH PROPOSED BRIDGE ABUTMENT. IN CASE OF BIGGER SPAN IN PROPOSED SPAN, MEDIAN WALL SHALL BE PROVIDED IN FLARED SHAPE TO ALLOW SMOOTH PASSAGE OF RIVER WATER.

ABUTMENT CAP SHALL BE CAST ONLY AFTER COMPLETING THE BACK FILLING WORK UP TO ABUTMENT SHAFT TOP LEVEL.

EMPLOYER	PROJECT	DESIGN CONSULTANT	Prepared By	M.L.GUPTA	DRAWING TITLE:	Scale:	Date: JUNE-2018
<p>Government of Nepal Ministry of Physical Infrastructure and Transport, Department of Roads, Foreign Co-operation Branch</p>	<p>Nepal India Regional Trade and Transport Project (NIRTPP) (IDA CREDIT No. 5273 - NEP) Detailed Design of Kathmandu (Nagdhunga) - Naubise - Mugling Road and Bridges</p>	<p>Intercontinental Consultants & Technocrats Pvt.Ltd, A-8, Green Park, New Delhi - 110016 Ph : 4086-3000, Fax 2685-5252</p> <p>In Association With Full Bright Consultancy (Pvt.) Ltd. 316,Baburam Acharya Sadak, Sinamangal, Kathmandu, GPO Box: 4970, Kathmandu, Nepal</p>	Designed By	V.CHAUDHARY	<p>GENERAL ARRANGEMENT DRAWING FOR MINOR BRIDGE AT CH:- 12+328KM OVER NAUBISE KHOLA (1x22.00m) PACKAGE-I (NAGDHUNGA-NAUBISE)</p>	As Shown	(SHEET 2 OF 2)
			Checked By	P.K.KHAN			
			Approved By	B.N.SINGH	Drawing No.:	NIRTPP/NAG-MUG/NAUBISE/GAD	



- NOTES :-**
- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE MENTIONED.
 - ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED AND NO DIMENSION SHALL BE SCALED.
 - CONCRETE SHALL BE DESIGN MIX WITH A MINIMUM 28 DAYS CHARACTERISTIC STRENGTH ON 150MM CUBE AS FOLLOWS:
 - a. LEVELLING COURSE (UNDER FOUNDATION) - 10MPa
 - b. LEVELLING COURSE (UNDER APPROACH SLAB) - 15MPa
 - c. FOUNDATION - 30MPa
 - d. SUBSTRUCTURE - 30MPa
 - e. APPROACH SLAB - 30MPa
 - f. PEDESTAL - 40MPa
 - g. SEISMIC STOPPER - 30MPa
 - UNTENSIONED REINFORCEMENT SHALL BE THERMO MECHANICALLY TREATED (TMT), HYSD BARS OF GRADE DESIGNATION Fe-500D CONFORMING TO IS: 1786.
 - MINIMUM CLEAR COVER TO OUTER MOST REINFORCEMENT SHALL BE AS UNDER
 - a. SUBSTRUCTURE (EARTH FACE) - 75MM
 - b. SUBSTRUCTURE (NON EARTH FACE) - 50MM
 - c. FOUNDATION - 75MM
 - LL REPRESENTS LONGITUDINAL AXIS OF BRIDGE AND TT REPRESENTS TRANSVERSE AXIS OF ABUTMENT/FOUNDATION.
 - SAFE BEARING CAPACITY AT THE PROPOSED FOUNDING LEVEL HAS BEEN CONSIDERED AS 43 T/M² ON THE BASIS OF SUB SURFACE EXPLORATION RESULTS. THIS SHALL GOT CONFIRMED BEFORE EXECUTION.
 - THE LOCATION OF JACKS FOR LIFTING UP THE SUPERSTRUCTURE SHALL BE DISTINCTLY ETCHED ON SOFFIT OF SUPERSTRUCTURE AND ON TOP OF ABUTMENT CAP.
 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE FOLLOWING DRGS.
 - GENERAL ARRANGEMENT DRAWING REFER: -NIRTP/NAG-MUG/NAUBISE/GAD
 - REINFORCEMENT DETAILS OF ABUTMENT, DIRT WALL, RETURN WALL, PEDESTAL AND SEISMIC STOPPER REFER: -NIRTP/NAG-MUG/NAUBISE/SUB-02(SHEET1&2)



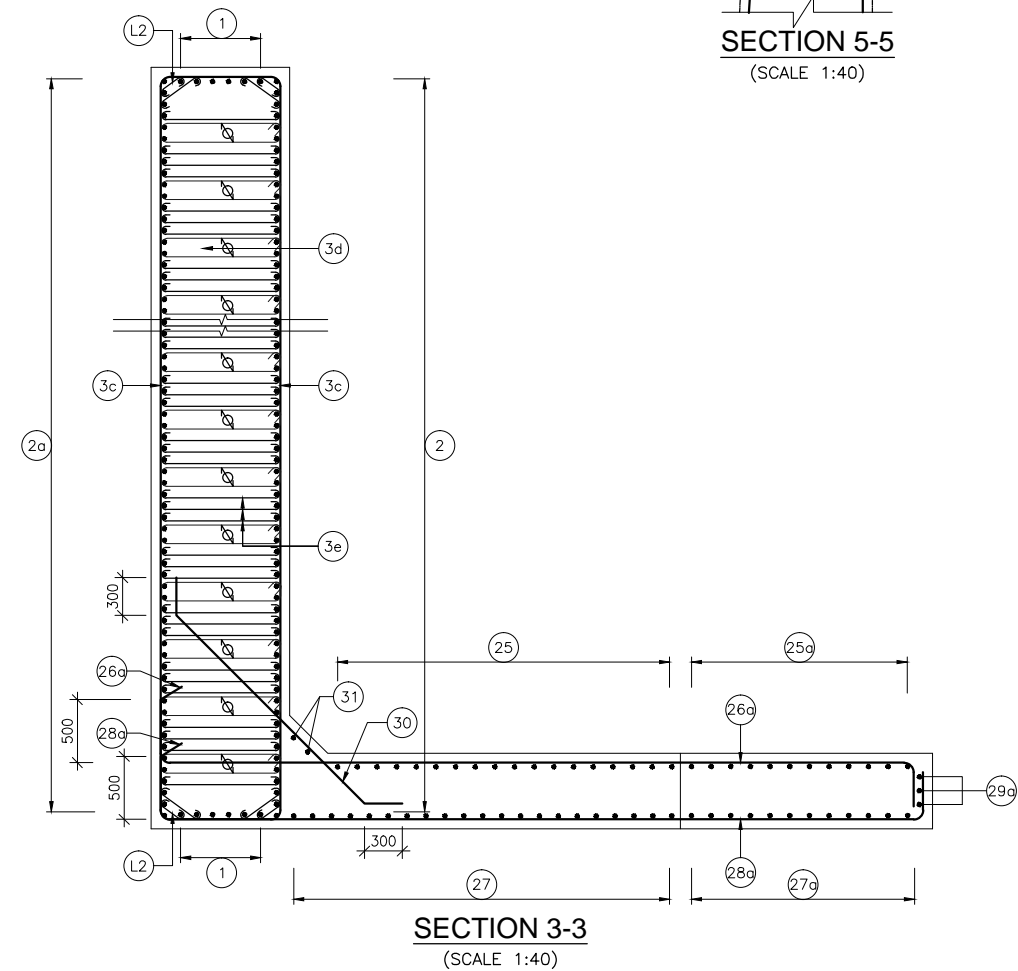
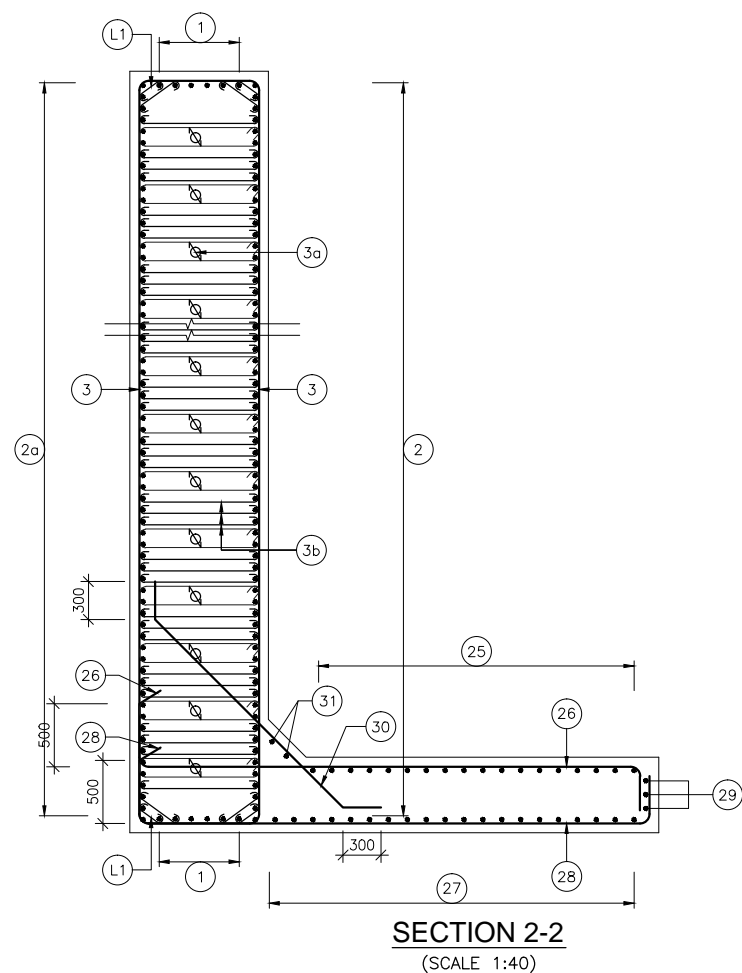
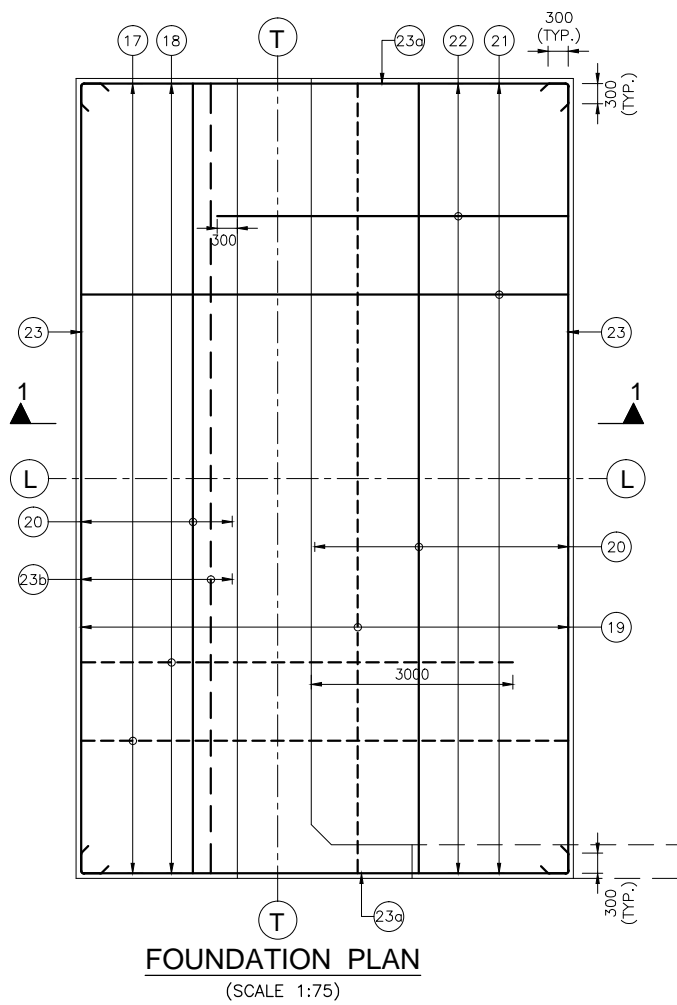
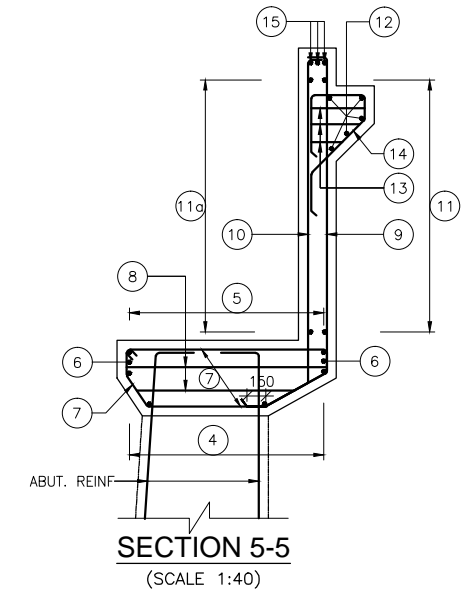
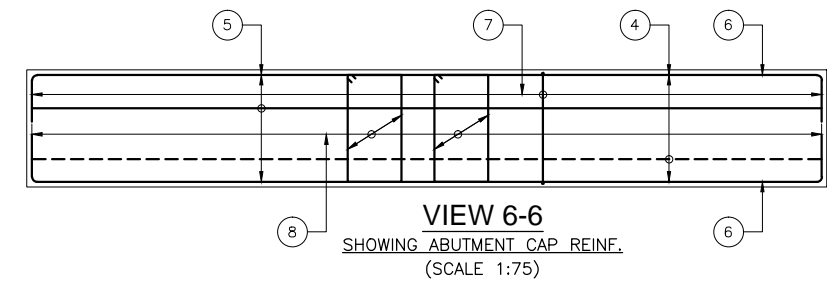
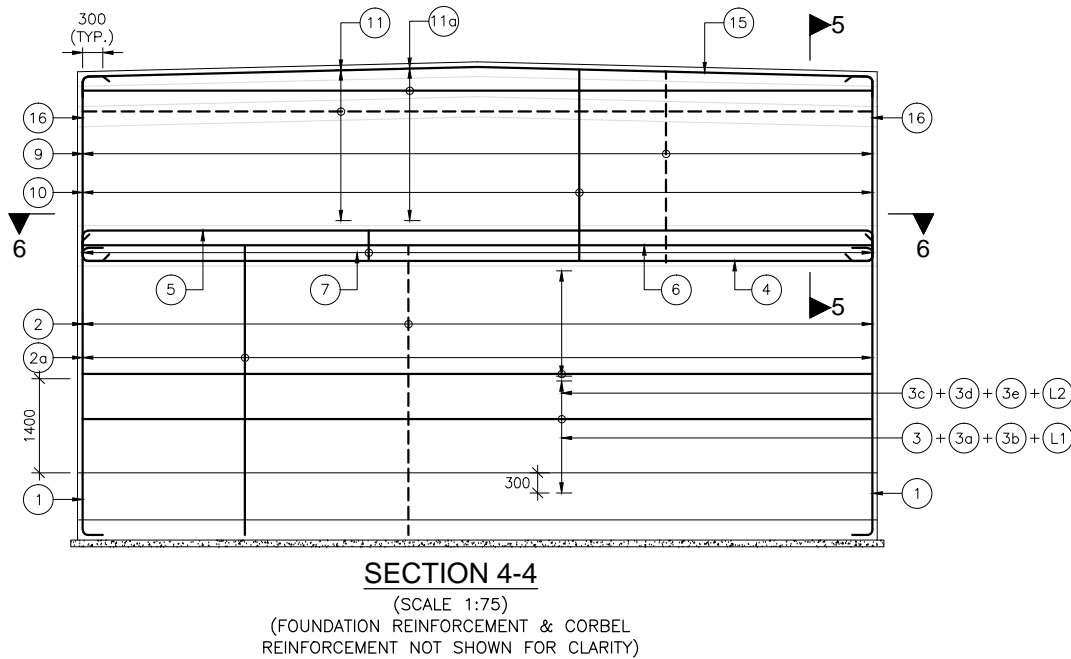
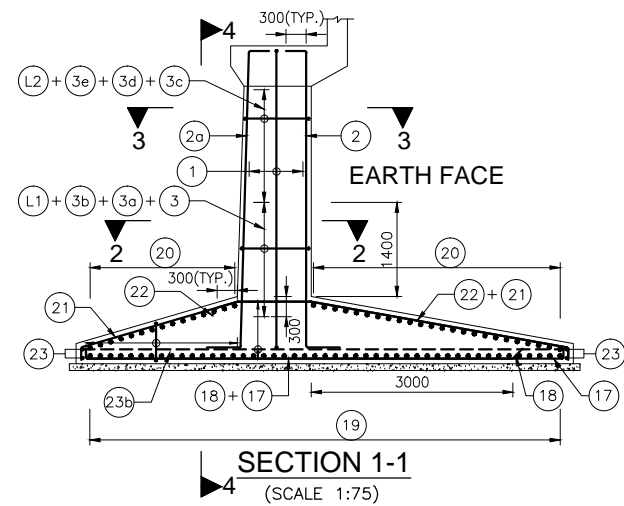
LEGEND:-

- BEARING LOCATION IN PLAN
- JACK LOCATION IN PLAN
- JACK LOCATION IN ELEVATION

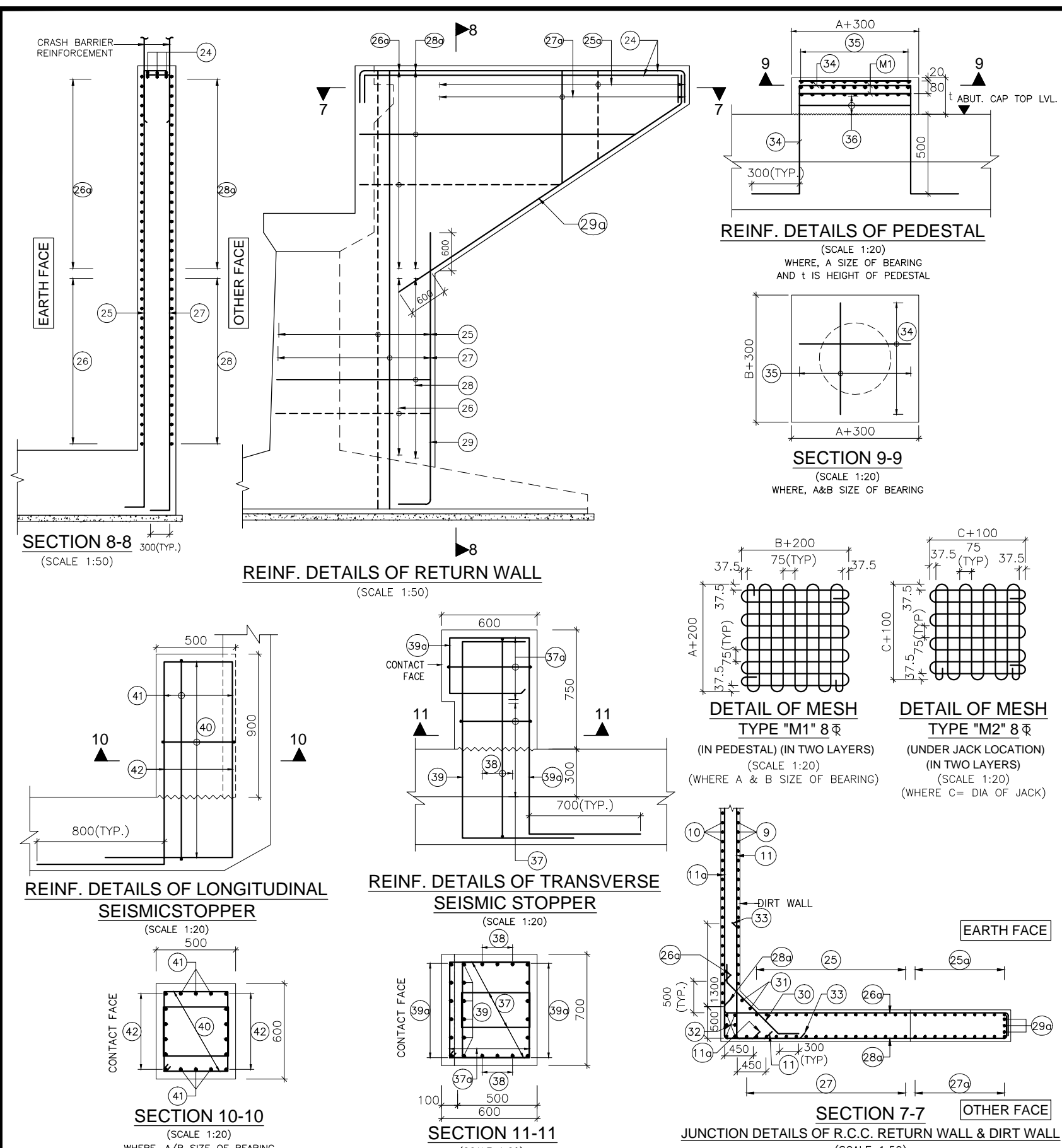
LEVEL SCHEDULE

MARK	FRL (m)	ABUTMENT CAP TOP LVL. (m)	GR. LEVEL (m)	FDN. LEVEL (m)
ABUTMENT A1	934.100	931.599	934.111	927.000
ABUTMENT A2	934.100	931.599	932.333	927.000

EMPLOYER	PROJECT	DESIGN CONSULTANT	Prepared By	M.L.GUPTA	DRAWING TITLE:	Scale:	Date: JUNE-2018
<p>Government of Nepal Ministry of Physical Infrastructure and Transport, Department of Roads, Foreign Co-operation Branch</p>	<p>Nepal India Regional Trade and Transport Project (NIRTPP) (IDA CREDIT No. 5273 - NEP) Detailed Design of Kathmandu (Nagdhunga) - Naubise - Mugling Road and Bridges</p>	<p>Intercontinental Consultants & Technocrats Pvt.Ltd, A-8, Green Park, New Delhi - 110016 Ph : 4086-3000, Fax 2685-5252 In Joint Venture With Soosung Engineering Co. Ltd., South Korea</p> <p>In Association With Full Bright Consultancy (Pvt.) Ltd. 316, Baburam Acharya Sadak, Sinamangal, Kathmandu, GPO Box: 4970, Kathmandu, Nepal</p>	Designed By	V.CHAUDHARY	<p>DIMENSIONAL DETAILS OF ABUTMENT AND FOUNDATION OF MINOR BRIDGE AT CH:- 12+328KM OVER NAUBISE KHOLA PACKAGE-I (NAGDHUNGA-NAUBISE)</p> <p>Drawing No.: NIRTPP/NAG-MUG/NAUBISE/SUB-01</p>	As Shown	
			Checked By	P.K.KHAN			
			Approved By	B.N.SINGH			



	EMPLOYER	PROJECT	DESIGN CONSULTANT	Prepared By	M.L.GUPTA	DRAWING TITLE: REINFORCEMENT DETAILS OF ABUTMENT, DIRT WALL, RETURN WALL, PEDESTAL AND SEISMIC STOPPER FOR MINOR BRIDGE AT CH- 12+328KM OVER NAUBISE KHOLA PACKAGE-I (NAGDHUNGA-NAUBISE) Drawing No.: NIRRTTP/NAG-MUG/NAUBISE /SUB-02	Scale:	Date: JUNE-2018
	Government of Nepal	Nepal India Regional Trade and Transport Project (NIRRTTP)	Intercontinental Consultants & Technocrats Pvt.Ltd,	Designed By	V.CHAUDHARY		As Shown	(SHEET 1 OF 2)
	Ministry of Physical Infrastructure and Transport,	(IDA CREDIT No. 5273 - NEP)	A-8, Green Park, New Delhi - 110016	Checked By	P.K.KHAN			
	Department of Roads, Foreign Co-operation Branch	Detailed Design of Kathmandu (Nagdhunga) - Naubise - Mugling Road and Bridges	Ph : 4086-3000, Fax 2685-5252	Approved By	B.N.SINGH			
			In Association With					
			Full Bright Consultancy (Pvt.) Ltd.					
			In Joint Venture With					
			Soosung Engineering Co. Ltd., South Korea					



NO.	DESCRIPTION	BAR SHAPE	REMARKS		
10	12 ϕ @ 100 c/c	150			
11	12 ϕ @ 100 c/c	150			
11a	12 ϕ @ 100 c/c	150			
12	12 ϕ -5 NOS.				
13	2L-12 ϕ @ 100c/c	400	(3 LAYERS)		
14	12 ϕ @ 100 c/c	300			
15	20 ϕ -3 NOS.		(2 LAYERS)		
16	12 ϕ -3 NOS.	300			
17	25 ϕ @ 200 c/c	1100	100		
18	25 ϕ @ 200 c/c	1100			
19	16 ϕ @ 150 c/c	LV.	LV		
20	16 ϕ @ 150 c/c	LV.	LV		
21	16 ϕ @ 200 c/c	100	100		
22	20 ϕ @ 200 c/c	1100			
23	12 ϕ -2 Nos.	300	300		
23a	12 ϕ @ 200 c/c	300	300		
23b	30L-10 ϕ @ 150c/c	360	400	360	STIRRUPS
24	25 ϕ -3 Nos.	500	500	IN 2 LAYERS	
25	20 ϕ @ 150c/c	300	300		
25a	16 ϕ @ 150c/c	300	300		
26	16 ϕ @ 100c/c	300	300		
26a	16 ϕ @ 100c/c	300	300		
27	12 ϕ @ 150c/c	300	300		
27a	12 ϕ @ 150c/c	300	300		
28	12 ϕ @ 100c/c	500	500		
28a	12 ϕ @ 100c/c	500	500		
29	12 ϕ -3 Nos.	300			
29a	12 ϕ -3 Nos.				
30	12 ϕ @ 200c/c				
31	12 ϕ -2 Nos.				
32	16 ϕ -6 Nos.				
33	32 ϕ @ 100c/c	1000	1000		
34	12 ϕ @ 75c/c				
35	12 ϕ @ 75c/c				
36	2L-12 ϕ @ 150c/c		STRPS.		
37	4L-12 ϕ @ 125c/c		STRPS.		
37a	2L-12 ϕ @ 125c/c		STRPS.		
38	16 ϕ -3 Nos.		BOTH FACES		
39	32 ϕ -6 Nos.		BOTH FACES		
39a	25 ϕ -6 Nos.		BOTH FACES		
40	4L-12 ϕ @ 100c/c		STRPS.		
41	16 ϕ -3 Nos.		BOTH FACES		
42	32 ϕ -6 Nos.		BOTH FACES		

- NOTES :-**
- ALL DIMENSIONS ARE IN MILLIMETER UNLESS OTHERWISE MENTIONED.
 - ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED AND NO DIMENSION SHALL BE SCALED.
 - CONCRETE SHALL BE DESIGN MIX WITH A MINIMUM 28 DAYS CHARACTERISTIC STRENGTH ON 150MM CUBE AS FOLLOWS:
 - a. LEVELING COURSE (UNDER FOUNDATION) - 10MPa
 - b. LEVELING COURSE (UNDER APPROACH SLAB) - 15MPa
 - c. FOUNDATION - 30MPa
 - d. SUBSTRUCTURE - 30MPa
 - e. APPROACH SLAB - 30MPa
 - f. PEDESTAL - 40MPa
 - g. SEISMIC STOPPER - 30MPa
 - UNTENSIONED REINFORCEMENT SHALL BE THERMO MECHANICALLY TREATED (TMT), HYSD BARS OF GRADE DESIGNATION Fe-500D CONFORMING TO IS: 1786.
 - MINIMUM CLEAR COVER TO OUTER MOST REINFORCEMENT SHALL BE AS UNDER:-
 - a. SUBSTRUCTURE (EARTH FACE) - 75MM
 - b. SUBSTRUCTURE (NON EARTH FACE) - 50MM
 - c. FOUNDATION - 75MM
 - LL REPRESENTS LONGITUDINAL AXIS OF BRIDGE AND TT REPRESENTS TRANSVERSE AXIS OF ABUTMENT/FOUNDATION.
 - MINIMUM ANCHORAGE LENGTH OF REINFORCEMENT FOR FAVOURABLE CONDITION SHALL BE AS UNDER:
 - CONCRETE GRADE - M-30 - 40 x DIA OF BAR
 - CONCRETE GRADE - M-40 - 34 x DIA OF BAR
 - (WHERE DIA OF BAR <= 32MM.)
 - FOR UNFAVOURABLE CONDITION THESE VALUES SHALL BE MULTIPLIED BY 1.43.
 - MINIMUM LAP LENGTH OF REINFORCEMENT FOR FAVOURABLE CONDITION SHALL BE AS UNDER:
 - CONCRETE GRADE - M-30 - 56 x DIA OF BAR
 - CONCRETE GRADE - M-40 - 48 x DIA OF BAR
 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE FOLLOWING DRGS.
 - GENERAL ARRANGEMENT DRAWING REFER DRG. NO. : NIRTP/NAG-MUG/NAUBISE/GAD
 - DIMENSIONAL DETAILS OF ABUTMENT AND FOUNDATION REFER DRG. NO. : NIRTP/NAG-MUG/NAUBISE/SUB-01

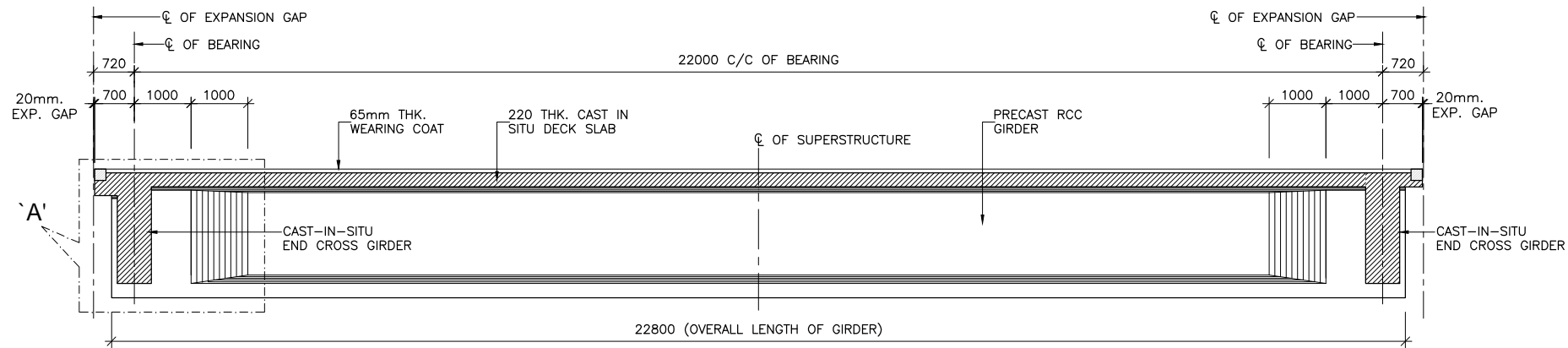
BAR SHAPE SCHEDULE

BAR MRKD.	DESCRIPTION	BAR SHAPE	REMARKS
1	16 ϕ -6 NOS.	300	EACH FACE
2	32 ϕ -80 NOS.	300	1st LAYER
2a	20 ϕ -80 NOS.	300	
3	12 ϕ @ 100c/c		
3a	30L-8 ϕ @ 100c/c		
3b	42LINK8 ϕ @ 100 c/c		
3c	12 ϕ @ 200c/c		
3d	30L-8 ϕ @ 200c/c		
3e	42LINK8 ϕ @ 200 c/c		
L1	8LINK8 ϕ @ 100 c/c		
L2	8LINK8 ϕ @ 200 c/c		
4	12 ϕ -10 NOS.	300	
5	12 ϕ -8 NOS.	500	500
6	12 ϕ -1 NO.	300	EACH FACE
7	2L-12 ϕ @ 150c/c		STIRRUPS
8	2L-12 ϕ @ 200c/c	300	IN 2 LAYERS
9	16 ϕ @ 100 c/c	150	

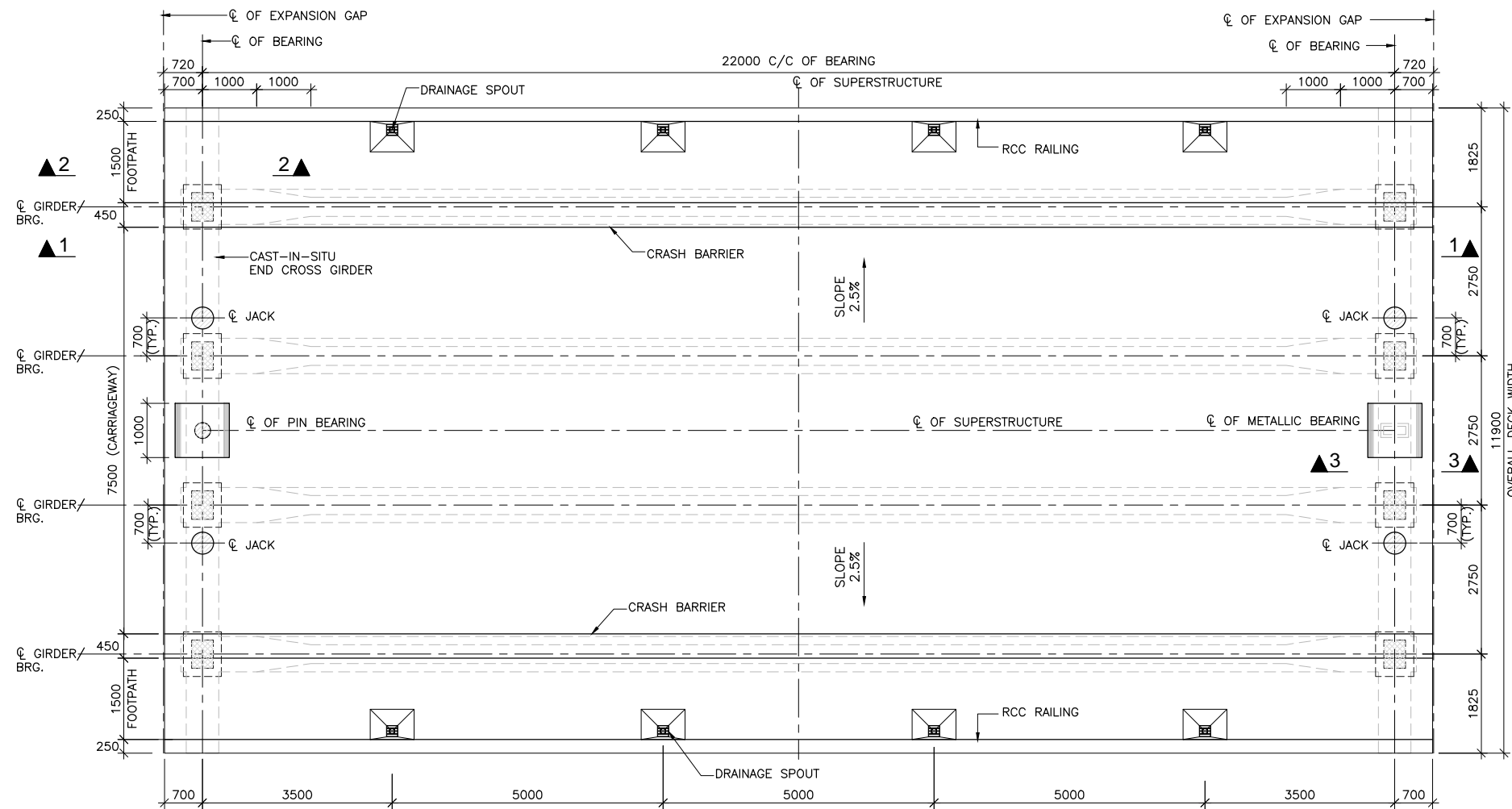
LEGEND

---	EARTH FACE/BOTTOM FACE
---	NON EARTH FACE/TOP FACE

<p>EMPLOYER Government of Nepal Ministry of Physical Infrastructure and Transport, Department of Roads, Foreign Co-operation Branch</p>	<p>PROJECT Nepal India Regional Trade and Transport Project (NIRTPP) (IDA CREDIT No. 5273 - NEP) Detailed Design of Kathmandu (Nagdhunga) - Naubise - Mugling Road and Bridges</p>	<p>DESIGN CONSULTANT Intercontinental Consultants & Technocrats Pvt.Ltd, A-8, Green Park, New Delhi - 110016 Ph : 4086-3000, Fax 2685-5252 In Joint Venture With Soosung Engineering Co. Ltd., South Korea</p>	Prepared By	M.L.GUPTA	<p>DRAWING TITLE: REINFORCEMENT DETAILS OF ABUTMENT, DIRT WALL, RETURN WALL, PEDESTAL AND SEISMIC STOPPER FOR MINOR BRIDGE AT CH- 12-328KM OVER NAUBISE KHOLA PACKAGE-I (NAGDHUNGA-NAUBISE)</p>	Scale:	Date: JUNE-2018
			Designed By	V.CHAUDHARY		As Shown	(SHEET 2 OF 2)
			Checked By	P.K.KHAN			
			Approved By	B.N.SINGH			



SECTIONAL ELEVATION 1 - 1
(SCALE 1:75)



TOP PLAN OF DECK SLAB
(SCALE 1:75)

LEGEND:-

- CAST-IN-SITU PORTION
- JACK LOCATION IN PLAN
- JACK LOCATION IN ELEVATION

NOTES:-

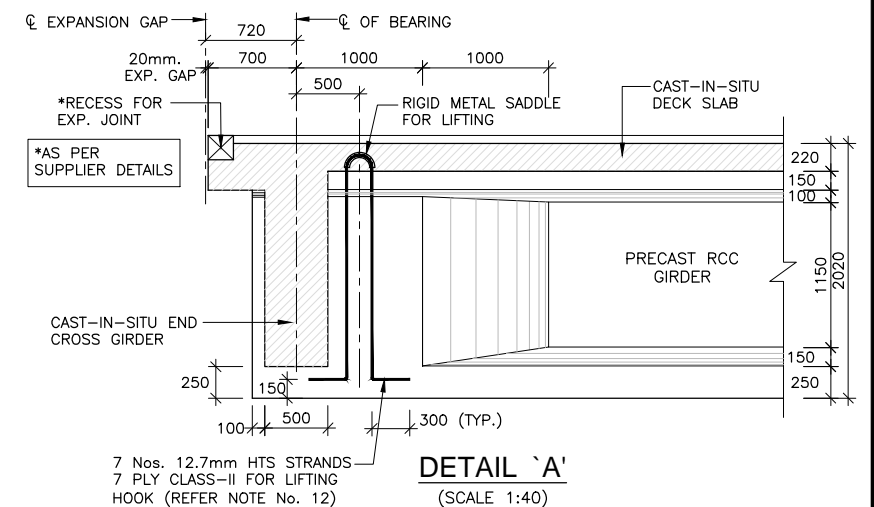
1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NO DIMENSIONS SHALL BE SCALED.
2. THE BRIDGE HAS BEEN DESIGNED FOR TWO LANE TRAFFIC FOR LIVE LOAD COMBINATIONS OF CLASS A AND 70R WITH FOOTPATH LIVE LOAD. OR IRC SV VEHICLE WITH FOOTPATH LIVE LOAD. OR THREE LANE TRAFFIC FOR LIVE LOAD COMBINATIONS OF CLASS A AND 70R WITHOUT FOOTPATH LIVE LOAD AS PER IRC:6-2017, WHICHEVER GOVERNS.
3. CONCRETE SHALL BE DESIGN MIX WITH A MINIMUM 28 DAYS CHARACTERISTIC STRENGTH ON 150mm CUBES AS FOLLOWS :-
PRECAST RCC GIRDER + RCC CAST IN SITU DECK SLAB-35 MPa
4. UNTENSIONED REINFORCEMENT SHALL BE THERMO MECHANICALLY TREATED (TMT), HYSD BARS OF GRADE DESIGNATION Fe-500D CONFORMING TO IS: 1786.
5. CLEAR COVER TO OUTER MOST STEEL SHALL BE AS UNDER:-
FOR SUPER STRUCTURE-40mm.
6. 65mm THK. WEARING COURSE COMPRISING OF 40mm THK. BITUMINOUS CONCRETE OVER LAID WITH 25mm THK. MASTIC ASPHALT SHALL BE PROVIDED AS PER SECTION 500 OF MORTH SPECIFICATIONS.
7. FOR LIFTING OF THE SUPERSTRUCTURE 2Nos. OF FREYSSINET JACKS OF CAPACITY 135t EACH MAY BE REQUIRED AT EACH END. THE LOCATION OF JACKS FOR LIFTING OF THE SUPERSTRUCTURES TO REPLACE BEARINGS ETC. IS SHOWN ↑ THUS THIS SHALL BE DISTINCTLY ETCHED FOR EASY IDENTIFICATION ON THE ABUTMENT CAPS
8. DURING THE LIFTING OPERATION OF SUPERSTRUCTURE ALL THE JACKS PLACED UNDER THE END DIAPHRAGM IN LINE WITH THE BEARINGS SHALL BE OPERATED SIMULTANEOUSLY USING SINGLE OPERATING CONSOLE, GROUPING THE PUMP AND CONTROL SYSTEM SO AS TO ENSURE THAT THE REACTIONS ON ALL THE JACKS ARE EQUAL AT ALL TIMES.
9. PRECAST GIRDERS SHALL BE CAST IN ONE CONCRETING OPERATION IN CASTING YARD WITHOUT ANY CONSTRUCTION JOINT.
10. EACH PRECAST GIRDER WILL BE LIFTED BY USING LIFTING STRANDS AT EITHER END. DURING LIFTING, GIRDER SHALL BE KEPT PLUMB AND UPRIGHT SELF WEIGHT OF GIRDER IS 545kN.

SEQUENCE OF CONSTRUCTION:-

AGE OF GIRDER (IN DAYS)	ACTIVITY	STRENGTH OF CONC. (IN MPa)
0	CASTING OF LONGITUDINAL GIRDER AT CASTING YARD WITH PORTION OF DIAPHRAGM	-
14 to 28	POSITION OF LONGITUDINAL GIRDER ON TEMPORARY BRGS. AND HOLD THEM IN POSITION BY LATERAL BRACING. REINF. OF DECK SLAB & END DIAPHRAGM WILL BE FIXED IN POSITION	30
28	CASTING OF DECK SLAB ALONG WITH CROSS GIRDER	35
28 to 42	AVERAGE AGE OF GIRDER WHEN COMPOSITE ACTION TAKES PLACE	35
42 to 56	FIXING THE CRASH BARRIER AND LAYING OF WEARING COAT	35
56	AVERAGE AGE OF GIRDER WHEN SILD & CWL ON IT	35

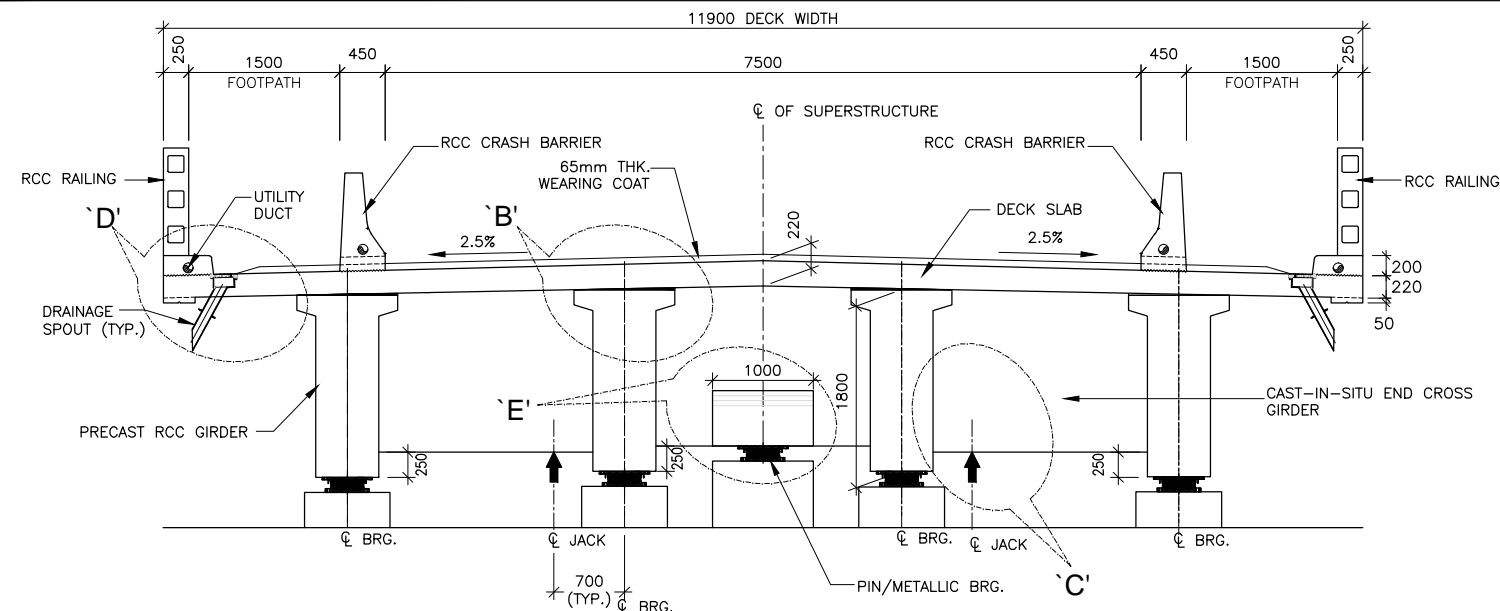
REFERENCE DRAWINGS:-

1. REINFORCEMENT DETAILS OF LONGITUDINAL GIRDER:
-NIRTP/NAG-MUG/NAUBISE/RCC-G/22m/02
2. REINFORCEMENT DETAILS OF END CROSS GIRDER:
-NIRTP/NAG-MUG/NAUBISE/RCC-G/22m/03
3. REINFORCEMENT DETAILS OF RCC DECK SLAB:
-NIRTP/NAG-MUG/NAUBISE/RCC-G/22m/04(SHEET 1&2)
4. DETAILS OF LOAD AND FORCES FOR POT/PTEF BEARINGS:
-NIRTP/NAG-MUG/NAUBISE/RCC-G/22m/05

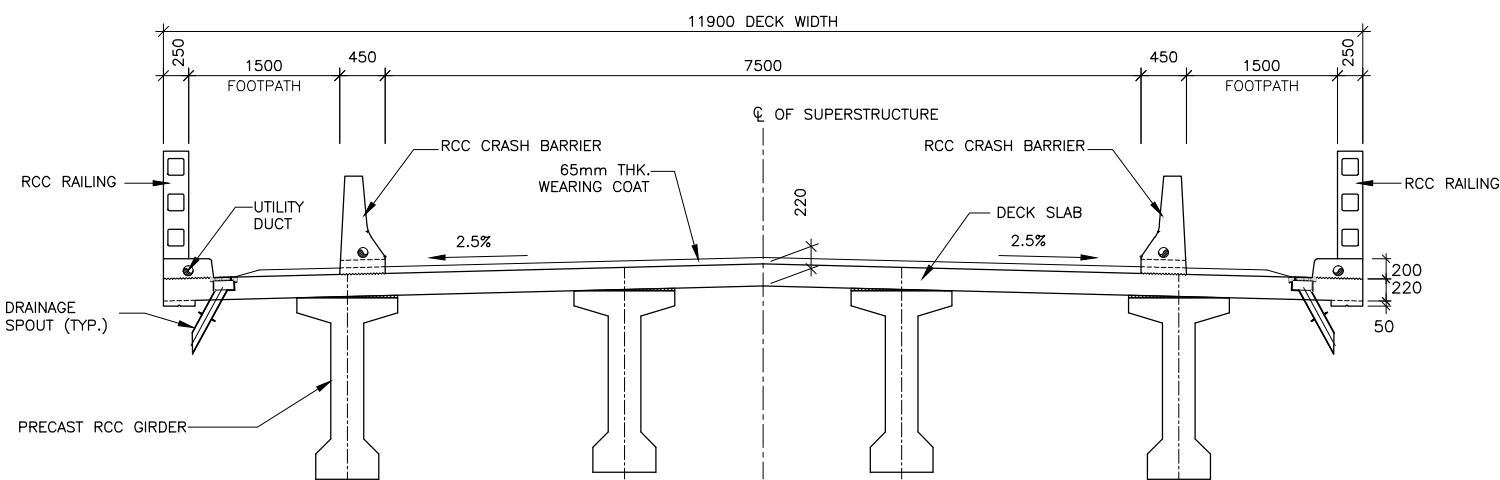


DETAIL 'A'
(SCALE 1:40)

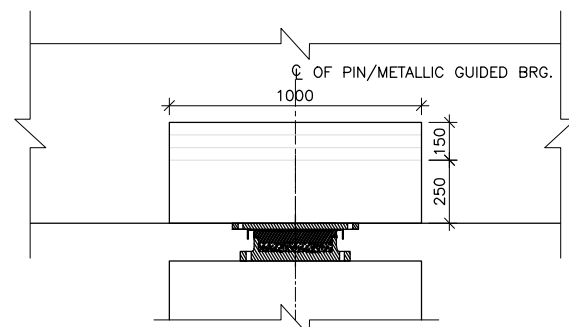
EMPLOYER	PROJECT	DESIGN CONSULTANT	Prepared By	Designed By	Checked By	Approved By	DRAWING TITLE:	Scale:	Date: JUNE-2018
<p>Government of Nepal Ministry of Physical Infrastructure and Transport, Department of Roads, Foreign Co-operation Branch</p>	<p>Nepal India Regional Trade and Transport Project (NIRTPP) (IDA CREDIT No. 5273 - NEP) Detailed Design of Kathmandu (Nagdhunga) - Naubise - Mugling Road and Bridges</p>	<p>Intercontinental Consultants & Technocrats Pvt.Ltd, A-8, Green Park, New Delhi - 110016 Ph : 4086-3000, Fax 2685-5252</p> <p>In Association With Full Bright Consultancy (Pvt.) Ltd. 316, Baburam Acharya Sadak, Sinamangal, Kathmandu, GPO Box: 4970, Kathmandu, Nepal</p>	K.M. JOHRI	V. CHAUDHARY	P. K. KHAN	B. N. SINGH	<p>DIMENSION DETAILS OF PRECAST RCC GIRDER & CAST-IN-SITU SLAB SUPERSTRUCTURE EFFECTIVE SPAN : 22.00m</p>	As Shown	
							Drawing No.:		(SHEET 1 OF 2)
							NIRTPP/NAG-MUG/NAUBISE/RCC-G/22m/01		



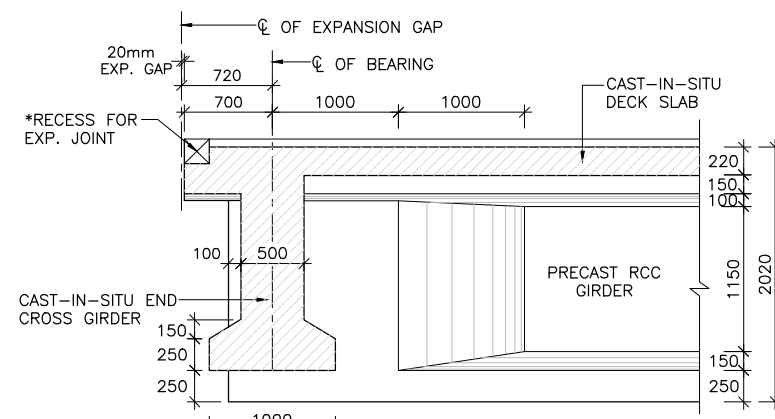
SECTION AT SUPPORT
(SCALE 1:50)



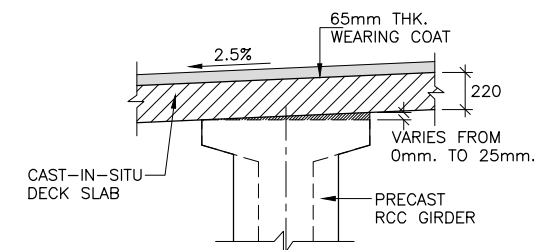
SECTION AT MID
(SCALE 1:50)



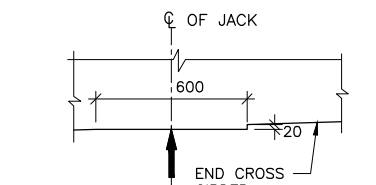
DETAIL - E
(SCALE 1:20)



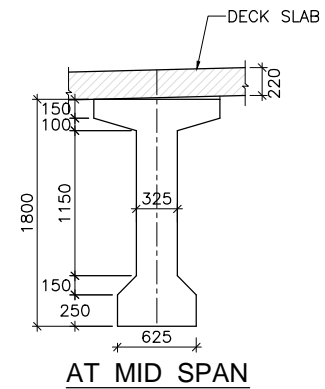
SECTION 3-3
(SCALE 1:40)



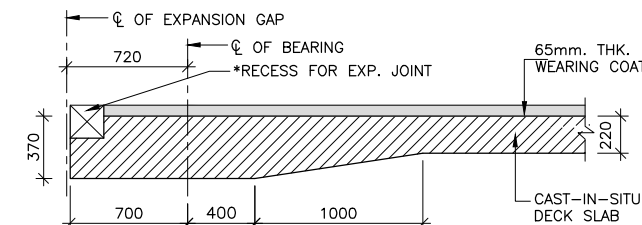
DETAIL - B'
(SCALE 1:30)



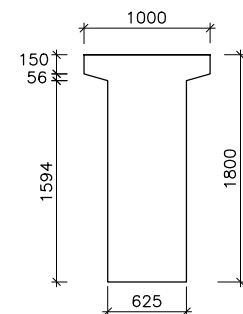
DETAIL - C'
DETAIL OF CROSS GIRDER AT JACK LOCATION
(SCALE 1:20)



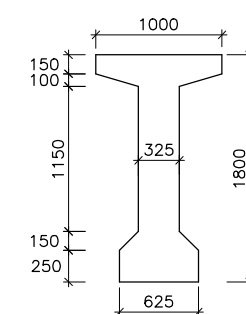
AT MID SPAN



SECTION 2-2
(SCALE 1:30)

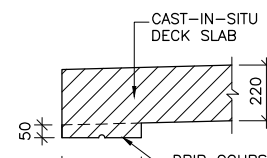


AT SUPPORT



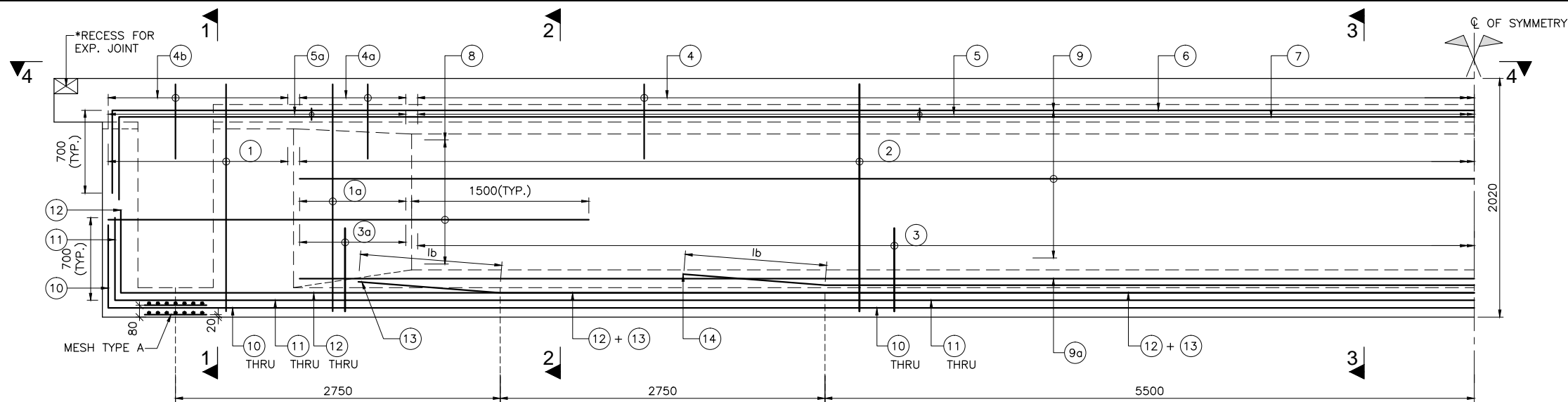
AT MID SPAN

**DETAILS OF PRECAST
RCC GIRDER**
(SCALE 1:40)



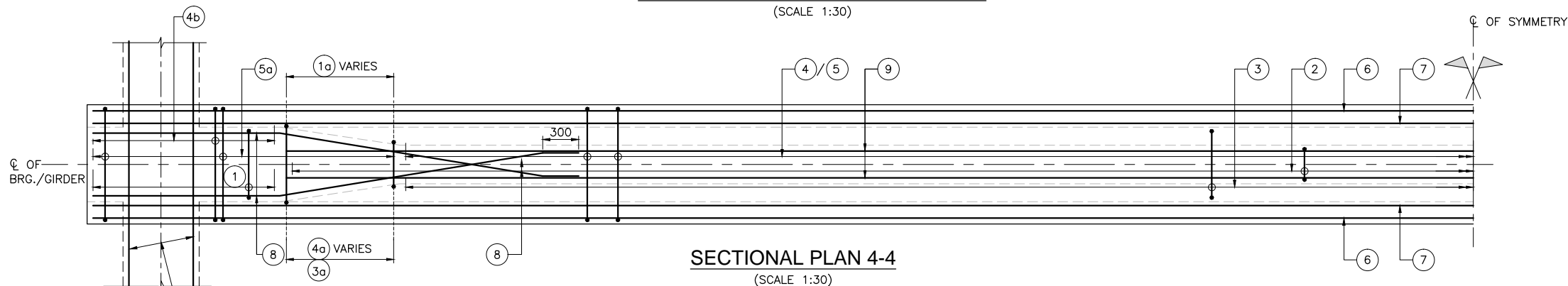
DETAIL - D'
(SCALE 1:20)

	EMPLOYER	PROJECT	DESIGN CONSULTANT	Prepared By	K.M. JOHRI	DRAWING TITLE: DIMENSION DETAILS OF PRECAST RCC GIRDER & CAST-IN-SITU SLAB SUPERSTRUCTURE EFFECTIVE SPAN : 22.00m Drawing No.: NIRTTP/NAG-MUG/NAUBISE/RCC-G/22m/01	Scale:	Date: JUNE-2018	
	Government of Nepal Ministry of Physical Infrastructure and Transport, Department of Roads, Foreign Co-operation Branch	Nepal India Regional Trade and Transport Project (NIRTTP) (IDA CREDIT No. 5273 - NEP) Detailed Design of Kathmandu (Nagdhunga) - Naubise - Mugling Road and Bridges	 Intercontinental Consultants & Technocrats Pvt.Ltd, A-8, Green Park, New Delhi - 110016 Ph : 4086-3000, Fax 2685-5252  In Joint Venture With Soosung Engineering Co. Ltd., South Korea	In Association With Full Bright Consultancy (Pvt.) Ltd. 316, Baburam Acharya Sadak, Sinamangal, Kathmandu, GPO Box: 4970, Kathmandu, Nepal	Designed By		V. CHAUDHARY	As Shown	
				Checked By	P. K. KHAN				
				Approved By	B. N. SINGH				
								(SHEET 2 OF 2)	



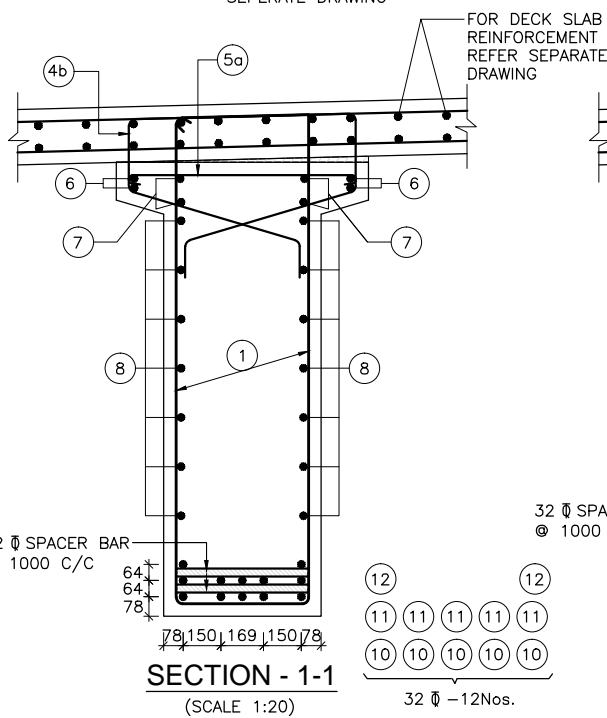
SECTIONAL ELEVATION OF GIRDER

(SCALE 1:30)

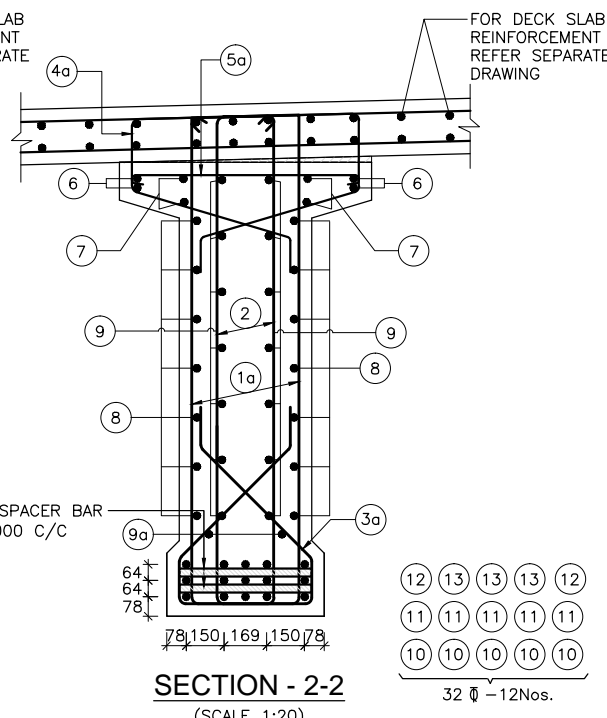


SECTIONAL PLAN 4-4

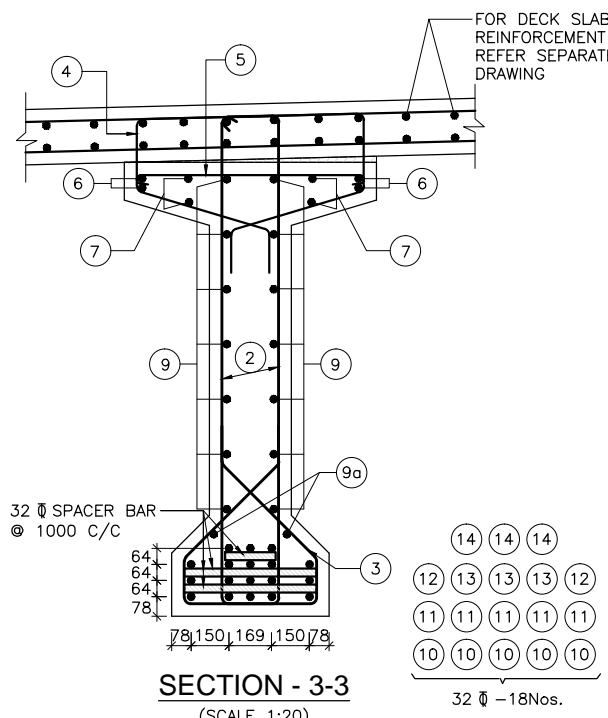
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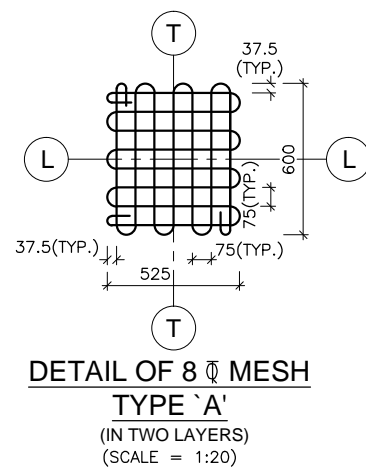
SECTION - 1-1
(SCALE 1:20)



SECTION - 2-2
(SCALE 1:20)



SECTION - 3-3
(SCALE 1:20)



DETAIL OF 8mm MESH
TYPE 'A'
(IN TWO LAYERS)
(SCALE = 1:20)

NOTES:-

- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS UNLESS OTHERWISE SPECIFIED.
- DIMENSIONS ARE NOT TO BE SCALED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
- UNTEMPERED REINFORCEMENT SHALL BE THERMO MECHANICALLY TREATED (TMT), HYSD BARS OF GRADE DESIGNATION Fe-500D CONFORMING TO IS: 1786.
- CLEAR COVER TO THE OUTERMOST STEEL SHALL BE 40mm UNLESS OTHERWISE SPECIFIED.
- LAPPING OF REINFORCEMENT SHALL BE AVOIDED AS FAR AS POSSIBLE. IN CASE LAPPING OF BARS BECOMES UNAVOIDABLE, MINIMUM LAP LENGTH OF REINFORCEMENT BARS SHALL BE CALCULATED AS FOLLOWS WITH MAXIMUM ALLOWABLE LAPPING (p) OF 50% ONLY. (IRC:112-2011) (CLAUSE:15.2.5.1)
 $LAP LENGTH l_s = \alpha \cdot l_{bnet}$
 $\alpha = 1.0$ FOR $p \leq 25\%$
 $\alpha = 1.15$ FOR $25\% < p \leq 33\%$
 $\alpha = 1.4$ FOR $33\% < p \leq 50\%$
 (IRC:112-2011) (CLAUSE:15.2.3.3)
 $DEVELOPMENT LENGTH (l_{bnet})$
 $l_{bnet} = \alpha \cdot l_b$ ($\alpha = 1.0$)
 $l_b = k \phi$
 $k = 40$ FOR M30 (Fe500D)
 $k = 36$ FOR M35 (Fe500D)
 $k = 34$ FOR M40 (Fe500D)
 FOR UNFAVORABLE BOND CONDITION THE l_b SHOULD BE MULTIPLIED BY FACTOR OF 1.43. FOR $\phi > 32mm$ l_b SHOULD BE INCREASED BY MULTIPLYING FACTOR $(\frac{1.43}{1.25})$

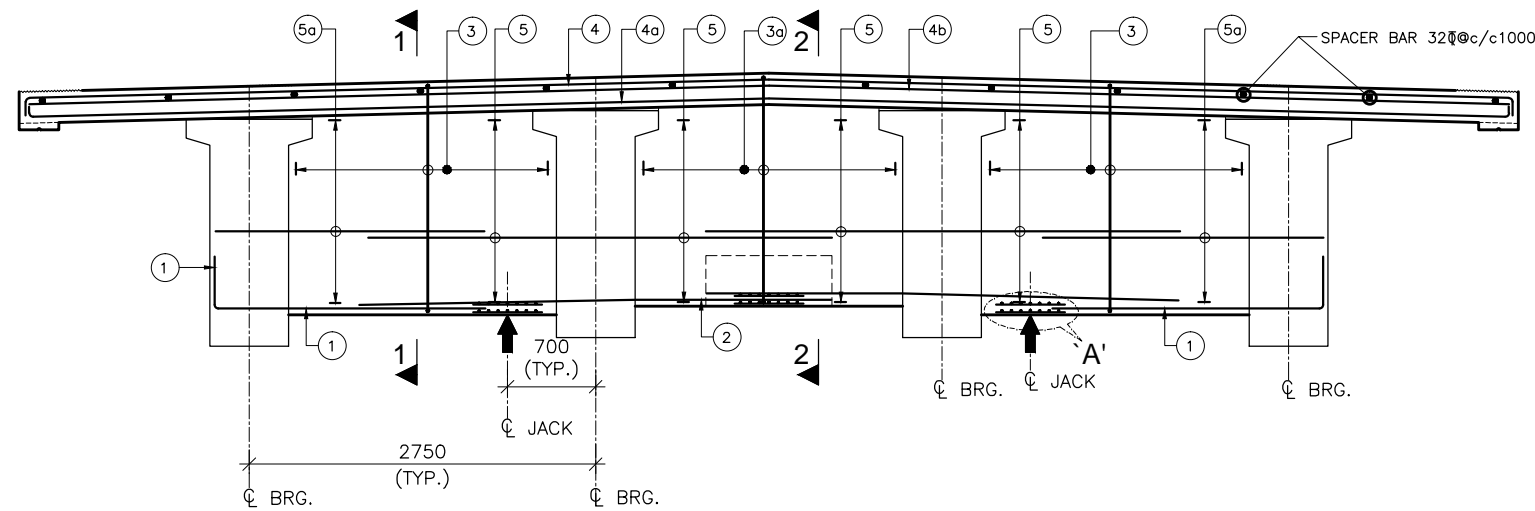
REFERENCE DRAWINGS:-

- DIMENSIONAL DETAILS OF PRECAST RCC GIRDER & CAST-IN-SITU SLAB SUPERSTRUCTURE:
-NIRTP/NAG-MUG/NAUBISE/RCC-G/22m/01
- REINFORCEMENT DETAILS OF END CROSS GIRDER:
-NIRTP/NAG-MUG/NAUBISE/RCC-G/22m/03
- REINFORCEMENT DETAILS OF RCC DECK SLAB:
-NIRTP/NAG-MUG/NAUBISE/RCC-G/22m/04(SHEET 1&2)
- DETAILS OF LOAD AND FORCES FOR POT/PTEF BEARINGS:
-NIRTP/NAG-MUG/NAUBISE/RCC-G/22m/05

SCHEDULE OF REINFORCEMENT

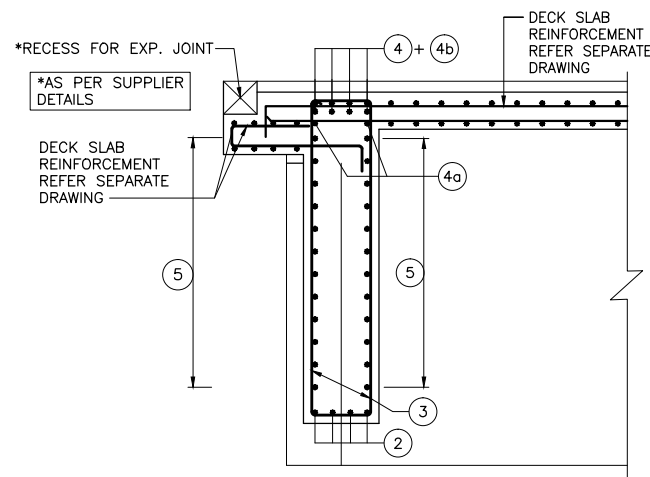
BAR MKD.	DESCRIPTION	SHAPE	REMARKS
1	2L-12 @ 125 C/C		STIRRUP
1a	2L-12 @ 125 C/C		STIRRUP (VARIES)
2	2L-12 @ 150 C/C		STIRRUP
3	10 @ 150 C/C		
3a	10 @ 125 C/C		(VARIES)
4	10 @ 150 C/C		
4a	10 @ 125 C/C		(VARIES)
4b	10 @ 125 C/C		
5	10 @ 150 C/C		LINKS
5a	10 @ 125 C/C		LINKS
6	12 @ -4 Nos.		
7	12 @ -4 Nos.		
8	10 @ -7 Nos.		ON EACH FACE
9	10 @ -7 Nos.		ON EACH FACE
9a	10 @ -1 Nos.		ON EACH FACE
10	32 @ -5 Nos.		
11	32 @ -5 Nos.		
12	32 @ -2 Nos.		
13	32 @ -3 Nos.		
14	32 @ -3 Nos.		

<p>EMPLOYER Government of Nepal Ministry of Physical Infrastructure and Transport, Department of Roads, Foreign Co-operation Branch</p>	<p>PROJECT Nepal India Regional Trade and Transport Project (NIRTPP) (IDA CREDIT No. 5273 - NEP) Detailed Design of Kathmandu (Nagdhunga) - Naubise - Mugling Road and Bridges</p>	<p>DESIGN CONSULTANT Intercontinental Consultants & Technocrats Pvt.Ltd, A-8, Green Park, New Delhi - 110016 Ph : 4086-3000, Fax 2685-5252 In Joint Venture With Soosung Engineering Co. Ltd., South Korea</p> <p>In Association With Full Bright Consultancy (Pvt.) Ltd. 316, Baburam Acharya Sadak, Sinamangal, Kathmandu, GPO Box: 4970, Kathmandu, Nepal</p>	Prepared By	<i>K.M. JOHRI</i>	K.M. JOHRI	DRAWING TITLE: REINFORCEMENT DETAILS OF LONGITUDINAL GIRDER EFFECTIVE SPAN : 22.00m	Scale: As Shown	Date: JUNE-2018
			Designed By	<i>V. CHAUDHARY</i>	V. CHAUDHARY			
			Checked By	<i>P.K. KHAN</i>	P.K. KHAN			
			Approved By	<i>B.N. SINGH</i>	B.N. SINGH			



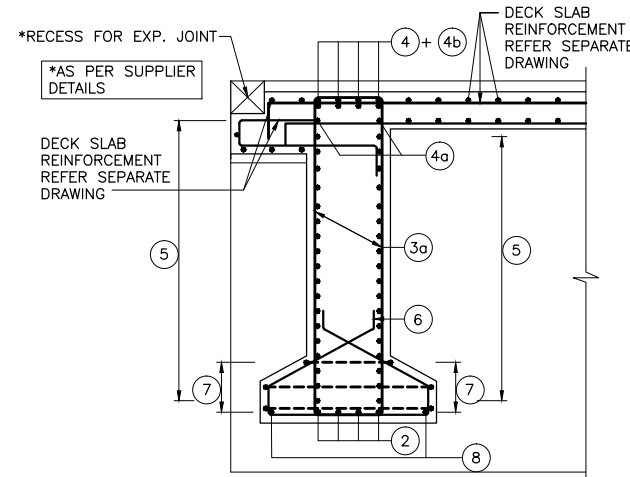
SECTIONAL ELEVATION OF END DIAPHRAGM

(SCALE 1:40)



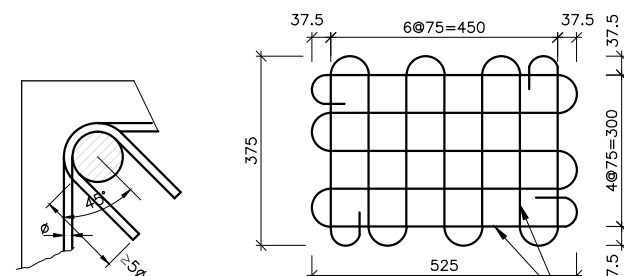
SECTION 1-1

(SCALE 1:30)



SECTION 2-2

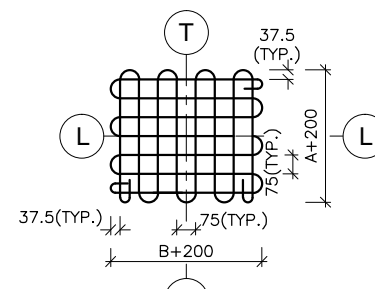
(SCALE 1:30)



TYPICAL DETAIL INDICATING DETAIL OF 8# MESH (M1) ANCHORAGE OF STIRRUP REINF. FOR JACK LOCATION

(SCALE 1:30)

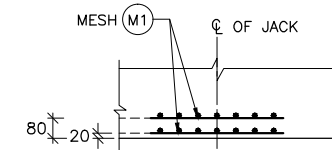
(SCALE 1:10)



DETAIL OF 8# MESH (M2) REINF. FOR PIN / METALLIC GUIDED BEARING

WHERE A & B ARE SIZE OF BEARING

(SCALE 1:20)



DETAIL - 'A'

(SCALE 1:20)

NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS UNLESS OTHERWISE SPECIFIED.
2. DIMENSIONS ARE NOT TO BE SCALED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
3. UNTENSIONED REINFORCEMENT SHALL BE THERMO MECHANICALLY TREATED (TMT), HYSD BARS OF GRADE DESIGNATION Fe-500D CONFORMING TO IS: 1786.
4. CLEAR COVER TO THE OUTERMOST STEEL SHALL BE 40mm UNLESS OTHERWISE SPECIFIED.
5. LAPPING OF REINFORCEMENT SHALL BE AVOIDED AS FAR AS POSSIBLE. IN CASE LAPPING OF BARS BECOMES UNAVOIDABLE, MINIMUM LAP LENGTH OF REINFORCEMENT BARS SHALL BE CALCULATED AS FOLLOWS WITH MAXIMUM ALLOWABLE LAPPING (p) OF 50% ONLY. (IRC:112-2011) (CLAUSE:15.2.5.1)
 $LAP LENGTH l_s = \alpha \cdot l_{bnet}$
 $\alpha = 1.0$ FOR $p \leq 25\%$
 $\alpha = 1.15$ FOR $25\% < p \leq 33\%$
 $\alpha = 1.4$ FOR $33\% < p \leq 50\%$
 (IRC:112-2011) (CLAUSE:15.2.3.3)
 DEVELOPMENT LENGTH (l_{bnet})
 $l_{bnet} = \alpha \cdot l_b$ ($\alpha = 1.0$)
 $l_b = k \cdot \phi$
 $k = 40$ FOR M30 (Fe500D)
 $k = 36$ FOR M35 (Fe500D)
 $k = 34$ FOR M40 (Fe500D)
 FOR UNFAVORABLE BOND CONDITION THE l_b SHOULD BE MULTIPLIED BY FACTOR OF 1.43. FOR $\phi > 32mm$ l_b SHOULD BE INCREASED BY MULTIPLYING FACTOR $(\frac{1.43 \cdot \phi}{32})$

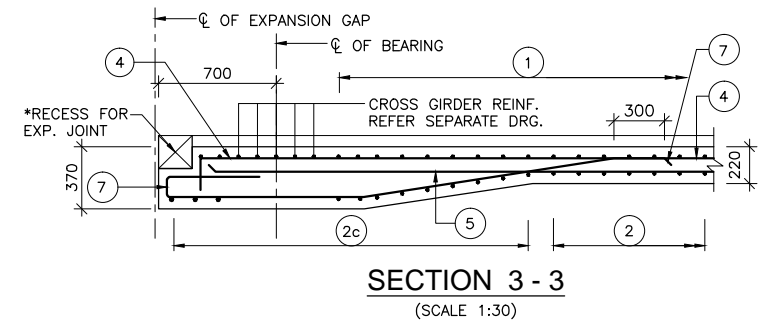
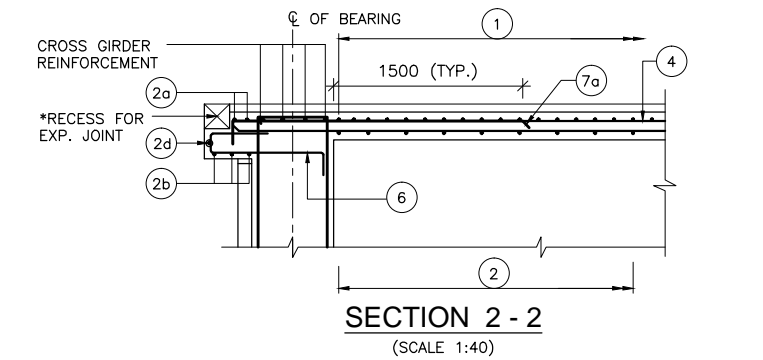
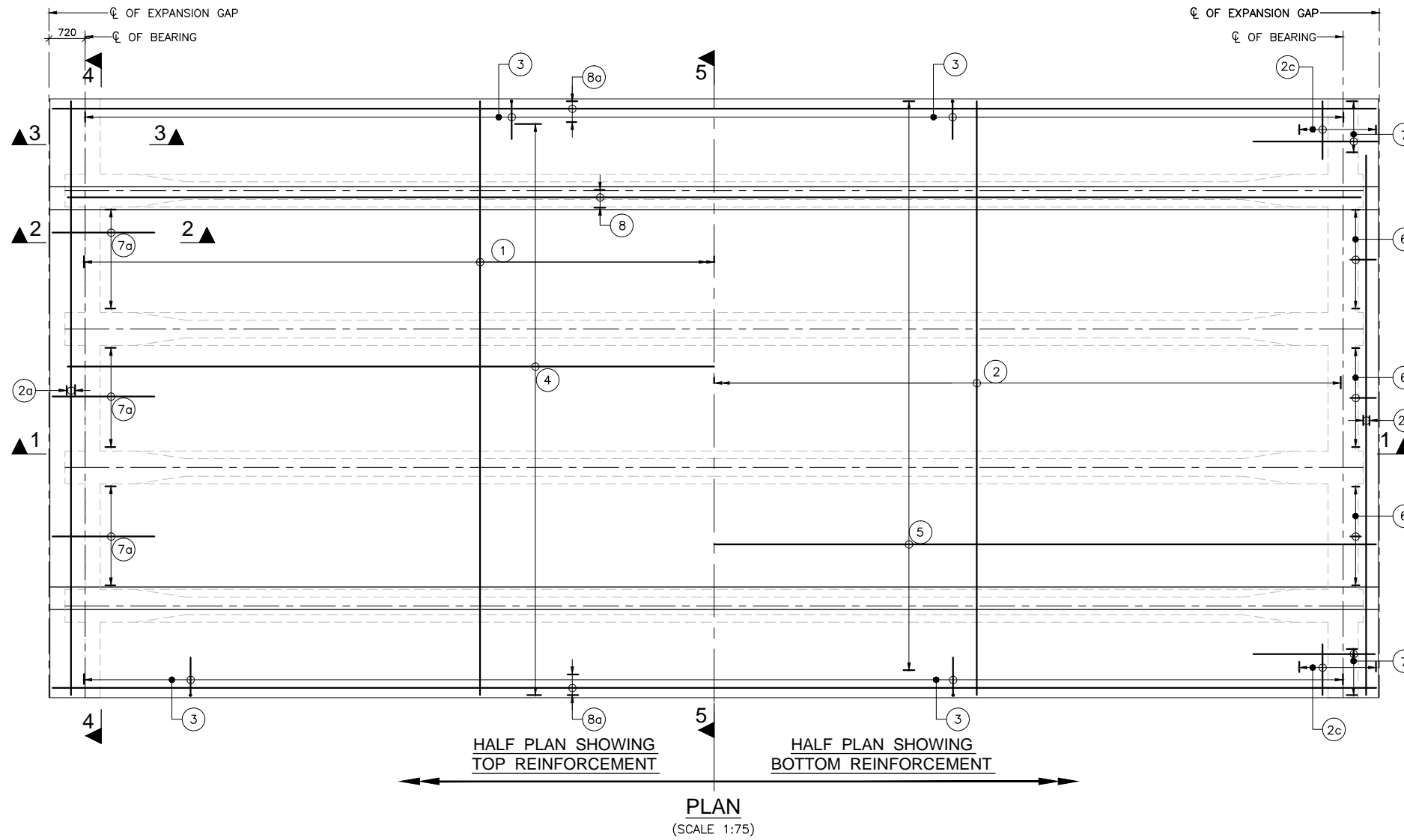
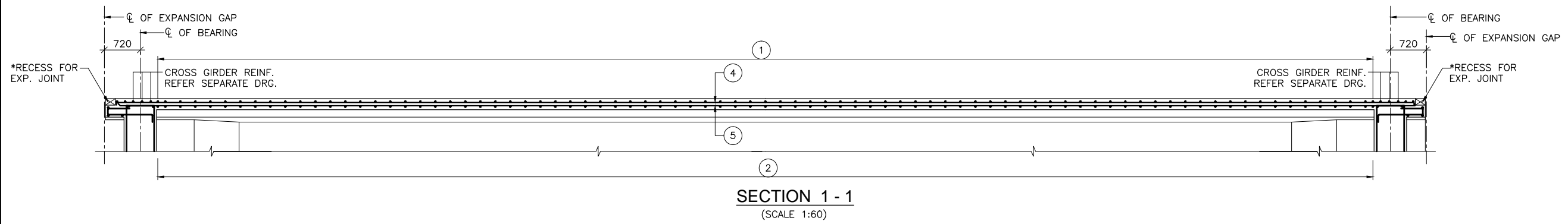
REFERENCE DRAWINGS:-




1. DIMENSIONAL DETAILS OF PRECAST RCC GIRDER & CAST-IN-SITU SLAB SUPERSTRUCTURE:
 -NIRTP/NAG-MUG/NAUBISE/RCC-G/22m/01
 -NIRTP/NAG-MUG/NAUBISE/RCC-G/22m/02
2. REINFORCEMENT DETAILS OF LONGITUDINAL GIRDER:
 -NIRTP/NAG-MUG/NAUBISE/RCC-G/22m/04(SHEET 1&2)
3. REINFORCEMENT DETAILS OF RCC DECK SLAB:
 -NIRTP/NAG-MUG/NAUBISE/RCC-G/22m/04(SHEET 1&2)
4. DETAILS OF LOAD AND FORCES FOR POT/PTE BEARINGS:
 -NIRTP/NAG-MUG/NAUBISE/RCC-G/22m/05

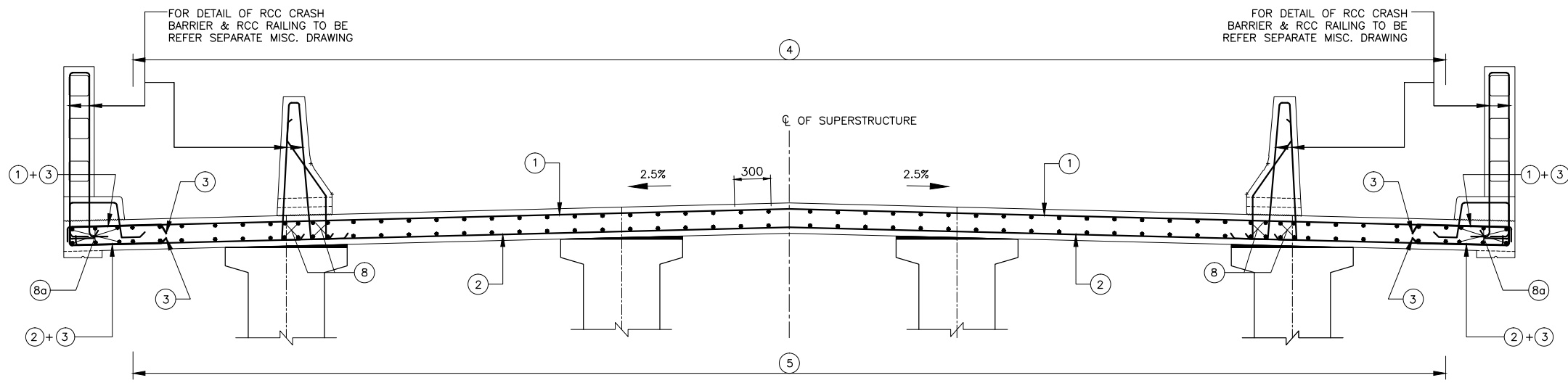
REINFORCEMENT SCHEDULE FOR END DIAPHRAGM

BAR MKD.	DESCRIPTION	SHAPE	REMARKS
1	25# -4 Nos.		
2	25# -4 Nos.		
3	25# -2L @125 c/c		
3a	25# -2L @125 c/c		
4	25# -4 Nos.		
4a	16# -2 Nos.		
4b	25# -4 Nos.		
5	25# -14 Nos.		(ON EACH FACE)
5a	16# -14 Nos.		(ON EACH FACE)
6	12# -7 Nos.		
7	12# -3 Nos.		
8	10# -2 Nos.		

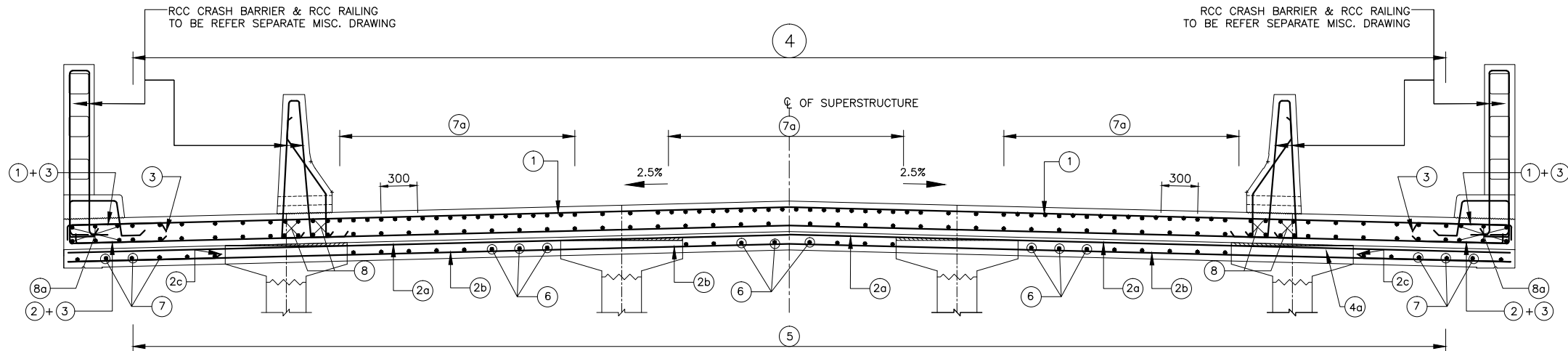
EMPLOYER	PROJECT	DESIGN CONSULTANT	Prepared By	Designed By	Checked By	Approved By	DRAWING TITLE:	Scale:	Date:
Government of Nepal Ministry of Physical Infrastructure and Transport, Department of Roads, Foreign Co-operation Branch	Nepal India Regional Trade and Transport Project (NIRTPP) (IDA CREDIT No. 5273 - NEP) Detailed Design of Kathmandu (Nagdhunga) - Naubise - Mugling Road and Bridges	Intercontinental Consultants & Technocrats Pvt.Ltd, A-8, Green Park, New Delhi - 110016 Ph : 4086-3000, Fax 2685-5252 In Joint Venture With Soosung Engineering Co. Ltd., South Korea	K.M. JOHRI	V. CHAUDHARY	P.K. KHAN	B.N. SINGH	REINFORCEMENT DETAILS OF END CROSS GIRDER EFFECTIVE SPAN : 22.00m Drawing No.: NIRTPP/NAG-MUG/NAUBISE/RCC-G/22m/03	As Shown	JUNE-2018



	EMPLOYER	PROJECT	DESIGN CONSULTANT	Prepared By	<i>Kempthi</i> K.M. JOHRI	DRAWING TITLE: REINFORCEMENT DETAILS OF DECK SLAB EFFECTIVE SPAN : 22.00m	Scale:	Date: JUNE-2018
	Government of Nepal Ministry of Physical Infrastructure and Transport, Department of Roads, Foreign Co-operation Branch	Nepal India Regional Trade and Transport Project (NIRTP) (IDA CREDIT No. 5273 - NEP) Detailed Design of Kathmandu (Nagdhunga) - Naubise - Mugling Road and Bridges	 Intercontinental Consultants & Technocrats Pvt. Ltd., A-8, Green Park, New Delhi - 110016 Ph : 4086-3000, Fax 2685-5252  In Association With Full Bright Consultancy (Pvt.) Ltd. 316, Baburam Acharya Sadak, Sinamangal, Kathmandu, GPO Box: 4970, Kathmandu, Nepal	Designed By <i>Shrestha</i> V. CHAUDHARY	Checked By <i>P.K. KHAN</i> P. K. KHAN		Approved By <i>B.N. SINGH</i> B. N. SINGH	As Shown
				Drawing No.: NIRTP/NAG-MUG/NAUBISE/RCC-G/22m/04				



SECTION AT 5-5 (MID SPAN)
(SCALE 1:30)



SECTION AT 4-4 (NEAR SUPPORT)
(SCALE 1:30)

FOR RCC CRASH BARRIER REINF. REFER MISCELLANEOUS DRG.

NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS UNLESS OTHERWISE SPECIFIED.
2. DIMENSIONS ARE NOT TO BE SCALED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
3. UNTENSIONED REINFORCEMENT SHALL BE THERMO MECHANICALLY TREATED (TMT), HYSD BARS OF GRADE DESIGNATION Fe-500D CONFORMING TO IS: 1786.
4. CLEAR COVER TO THE OUTERMOST STEEL SHALL BE 40mm UNLESS OTHERWISE SPECIFIED.
5. LAPPING OF REINFORCEMENT SHALL BE AVOIDED AS FAR AS POSSIBLE. IN CASE LAPPING OF BARS BECOMES UNAVOIDABLE, MINIMUM LAP LENGTH OF REINFORCEMENT BARS SHALL BE CALCULATED AS FOLLOW WITH MAXIMUM ALLOWABLE LAPPING (p) OF 50% ONLY. (IRC:112-2011) (CLAUSE:15.2.5.1)
 $LAP\ LENGTH\ l_s = \alpha l \cdot l_{bnet}$
 $\alpha l = 1.0$ FOR $p\% \leq 25\%$
 $\alpha l = 1.15$ FOR $25\% < p\% \leq 33\%$
 $\alpha l = 1.4$ FOR $33\% < p\% \leq 50\%$
 (IRC:112-2011) (CLAUSE:15.2.3.3)
 DEVELOPMENT LENGTH (l_{bnet})
 $l_{bnet} = \alpha \cdot l_b$ ($\alpha = 1.0$)
 $l_b = k \phi$
 $k = 40$ FOR M30 (Fe500D)
 $k = 36$ FOR M35 (Fe500D)
 $k = 34$ FOR M40 (Fe500D)
 FOR UNFAVORABLE BOND CONDITION THE l_b SHOULD BE MULTIPLIED BY FACTOR OF 1.43. FOR $\phi > 32mm$ l_b SHOULD BE INCREASED BY MULTIPLYING FACTOR $(\frac{100}{132})$
6. RECESS FOR EXPANSION JOINT, AS PER SUPPLIER DETAILS.

REFERENCE DRAWINGS:-

1. DIMENSIONAL DETAILS OF PRECAST RCC GIRDER & CAST-IN-SITU SLAB SUPERSTRUCTURE:
-NIRTTP/NAG-MUG/NAUBISE/RCC-G/22m/01
2. REINFORCEMENT DETAILS OF LONGITUDINAL GIRDER:
-NIRTTP/NAG-MUG/NAUBISE/RCC-G/22m/02
3. REINFORCEMENT DETAILS OF END CROSS GIRDER:
-NIRTTP/NAG-MUG/NAUBISE/RCC-G/22m/03
4. DETAILS OF LOAD AND FORCES FOR POT/PDFF BEARINGS:
-NIRTTP/NAG-MUG/NAUBISE/RCC-G/22m/05

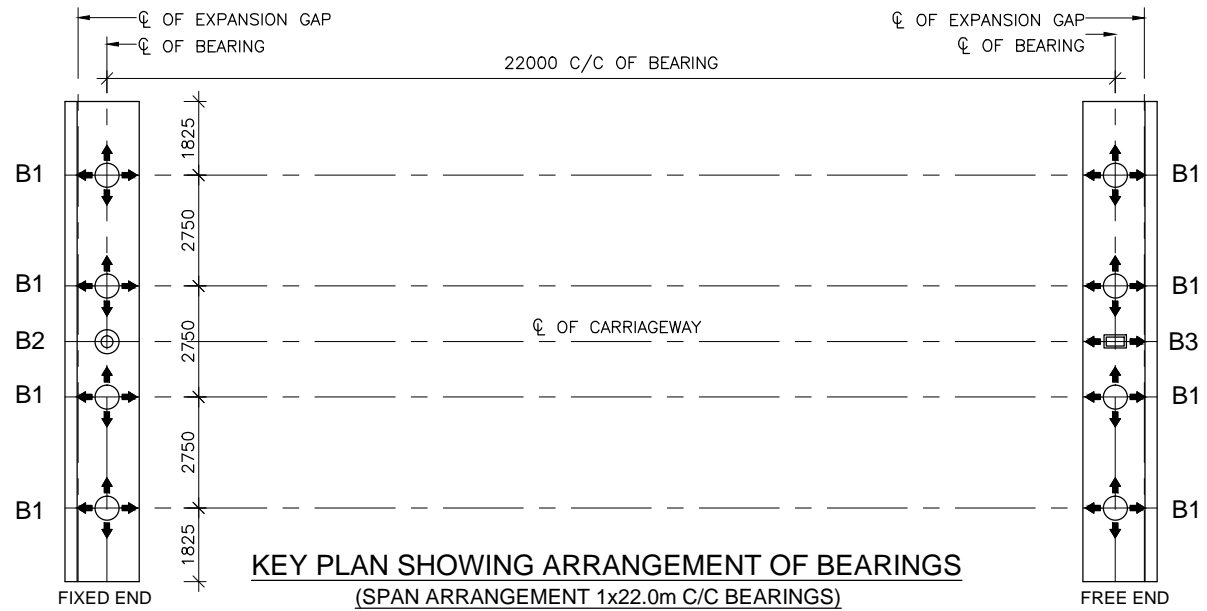
REINFORCEMENT SCHEDULE

BAR MKD.	DESCRIPTION	SHAPE	REMARKS
①	12ϕ @100 C/C	[Diagram]	
②	12ϕ @100 C/C	[Diagram]	
②a	12ϕ @100 C/C	[Diagram]	
②b	12ϕ @100 C/C	[Diagram]	
②c	12ϕ @100 C/C	[Diagram]	
②d	12ϕ -1 Nos.	[Diagram]	
③	12ϕ @100 C/C	[Diagram]	
④	10ϕ @200 C/C	[Diagram]	
⑤	10ϕ @200 C/C	[Diagram]	
⑥	12ϕ @200 C/C	[Diagram]	
⑦	12ϕ @200 C/C	[Diagram]	
⑦a	12ϕ @200 C/C	[Diagram]	
⑧	16ϕ -8 Nos.	[Diagram]	(ON EACH SIDE)
⑧a	16ϕ -6 Nos.	[Diagram]	(ON EACH SIDE)

<p>EMPLOYER Government of Nepal Ministry of Physical Infrastructure and Transport, Department of Roads, Foreign Co-operation Branch</p>	<p>PROJECT Nepal India Regional Trade and Transport Project (NIRTTP) (IDA CREDIT No. 5273 - NEP) Detailed Design of Kathmandu (Nagdhunga) - Naubise - Mugling Road and Bridges</p>	<p>DESIGN CONSULTANT Intercontinental Consultants & Technocrats Pvt.Ltd, A-8, Green Park, New Delhi - 110016 Ph : 4086-3000, Fax 2685-5252 In Joint Venture With Soosung Engineering Co. Ltd., South Korea</p>	Prepared By <i>K.M. JOHRI</i> K.M.JOHR	<p>DRAWING TITLE: REINFORCEMENT DETAILS OF DECK SLAB EFFECTIVE SPAN : 22.00m</p>	Scale: As Shown	Date: JUNE-2018
			Designed By <i>V. CHAUDHARY</i> V.CHAUDHARY			
			Approved By <i>B.N. SINGH</i> B.N.SINGH	(SHEET 2 OF 2)		

LEGEND:-

B1		FREE SLIDING POT-CUM-PTFE BEARING
B2		PIN BEARING
B3		METALLIC GUIDED BEARING



NOTES:-

- MATERIAL SPECIFICATIONS, DESIGN OF BEARINGS, ACCEPTANCE CRITERIA AND INSTALLATION MORTH SHALL BE IN ACCORDANCE WITH IRC:83 (PART III)-2002 AND MOSRTH SPECIFICATIONS (FOURTH REVISION).
- BEARINGS SHALL BE OBTAINED FROM MANUFACTURERS APPROVED BY MORTH.
- INSTALLATION OF BEARINGS SHALL BE UNDER THE SUPERVISION OF REPRESENTATIVE OF THE MANUFACTURER.
- FOR DESIGN LOADS AND ROTATIONS REFER TABLE IN THE DRAWING.
- FOR BEARINGS, DETAILED SHOP DRAWINGS SHALL BE PREPARED BY THE SUPPLIER AND BE DULY APPROVED BEFORE MANUFACTURE AND INSTALLATION.
- THE GROUT/BEDDING MORTAR SHALL BE HIGH STRENGTH FREE FLOWING NON SHRINK GROUT (80 MPa STRENGTH).
- ALL BEARING SHALL BE PLACED IN TRULY HORIZONTAL PLANE ONLY.
- FOR DESIGN OF POT BEARINGS, THE DESIGN HORIZONTAL FORCE SHALL, IN NO CASE BE LESS THAN 10% AND GREATER THAN 25% OF THE DESIGN VERTICAL LOAD.
- THE CONTRACTOR AND SUPPLIER OF BEARINGS SHALL BE FURNISH A MINIMUM TROUBLE FREE WARRANTY OF 10 YEARS AFTER OPENING OF THE BRIDGE.
- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH: DIMENSIONAL DETAILS OF PRECAST RCC GIRDER & CAST-IN-SITU SLAB SUPERSTRUCTURE
NIRTPP/NAG-MUG/NAUBISE/RCC-G/22m/01(SHEET 1&2)

GENERAL DATA:

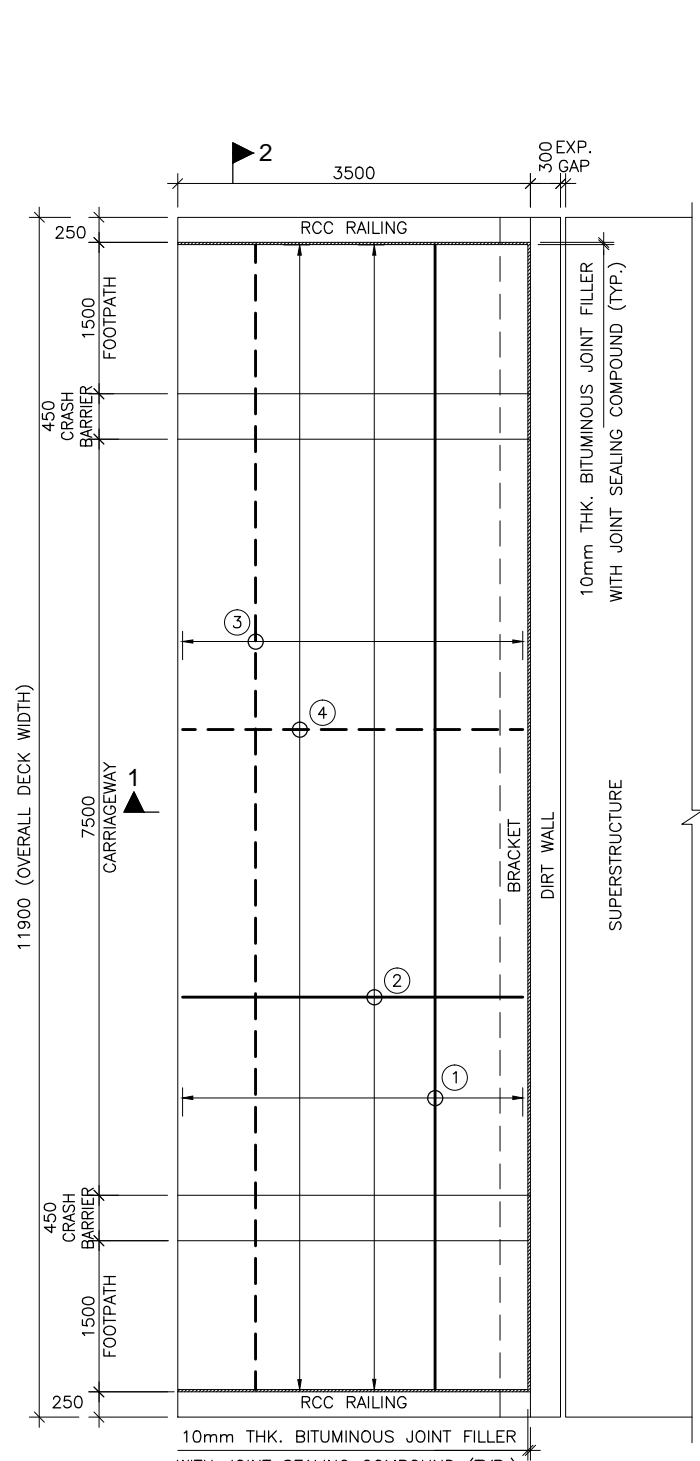
- STRUCTURE IS LOCATED IN SEISMIC ZONE : V
- GRADE OF CONCRETE
ABUTMENT CAP. M-30
PEDESTAL M-40

TABLE SHOWING DATA FOR DESIGN OF BEARINGS

SL. No.	BEARING TYPE	LOAD CONDITION	LOADS, FORCES, MOVEMENTS AND ROTATION DATA										BEARING (Nos.) PER SPAN
			VERTICAL LOAD (kN)		HORIZONTAL FORCE (kN)				ROTATION (RAD)		MOVEMENT (mm)		
			CASE	MAGNITUDE	LONGITUDINAL		TRANSVERSE		CASE	MAGNITUDE	LONGITUDINAL	TRANSVERSE	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
1.		NORMAL	MAXIMUM (WITH LIVE LOAD)	1516	COEXISTING	152	COEXISTING	-	COEXISTING	0.002	-16.5/16.2	4.70	8
			MINIMUM (WITH LIVE LOAD)	576	COEXISTING	58	COEXISTING	-	COEXISTING	0.002	-16.5/16.2	4.70	
			MINIMUM (WITHOUT LIVE LOAD)	440	COEXISTING	44	COEXISTING	-	COEXISTING	0.002	-16.5/16.2	4.70	
		SEISMIC (LONGITUDINAL)	MAXIMUM (WITH LIVE LOAD)	884	COEXISTING	-	COEXISTING	-	COEXISTING	0.002	-16.5/16.2	4.70	
			MINIMUM (WITH LIVE LOAD)	522	COEXISTING	-	COEXISTING	-	COEXISTING	0.002	-16.5/16.2	4.70	
			MINIMUM (WITHOUT LIVE LOAD)	487	COEXISTING	-	COEXISTING	-	COEXISTING	0.002	-16.5/16.2	4.70	
		SEISMIC (TRANSVERSE)	MAXIMUM (WITH LIVE LOAD)	884	COEXISTING	-	COEXISTING	-	COEXISTING	0.002	-16.5/16.2	4.70	
			MINIMUM (WITH LIVE LOAD)	522	COEXISTING	-	COEXISTING	-	COEXISTING	0.002	-16.5/16.2	4.70	
			MINIMUM (WITHOUT LIVE LOAD)	487	COEXISTING	-	COEXISTING	-	COEXISTING	0.002	-16.5/16.2	4.70	
2.		NORMAL	MAXIMUM (WITH LIVE LOAD)	-	COEXISTING	278	COEXISTING	-	COEXISTING	0.002	-	-	1
			MINIMUM (WITH LIVE LOAD)	-	COEXISTING	203	COEXISTING	-	COEXISTING	0.002	-	-	
			MINIMUM (WITHOUT LIVE LOAD)	-	COEXISTING	203	COEXISTING	-	COEXISTING	0.002	-	-	
		SEISMIC (LONGITUDINAL)	MAXIMUM (WITH LIVE LOAD)	-	COEXISTING	2469	COEXISTING	405	COEXISTING	0.002	-	-	
			MINIMUM (WITH LIVE LOAD)	-	COEXISTING	2469	COEXISTING	365	COEXISTING	0.002	-	-	
			MINIMUM (WITHOUT LIVE LOAD)	-	COEXISTING	2433	COEXISTING	365	COEXISTING	0.002	-	-	
		SEISMIC (TRANSVERSE)	MAXIMUM (WITH LIVE LOAD)	-	COEXISTING	766	COEXISTING	1349	COEXISTING	0.002	-	-	
			MINIMUM (WITH LIVE LOAD)	-	COEXISTING	766	COEXISTING	1216	COEXISTING	0.002	-	-	
			MINIMUM (WITHOUT LIVE LOAD)	-	COEXISTING	766	COEXISTING	811	COEXISTING	0.002	-	-	
3.		NORMAL	MAXIMUM (WITH LIVE LOAD)	-	COEXISTING	-	COEXISTING	-	COEXISTING	0.002	-16.5/16.2	-	1
			MINIMUM (WITH LIVE LOAD)	-	COEXISTING	-	COEXISTING	-	COEXISTING	0.002	-16.5/16.2	-	
			MINIMUM (WITHOUT LIVE LOAD)	-	COEXISTING	-	COEXISTING	-	COEXISTING	0.002	-16.5/16.2	-	
		SEISMIC (LONGITUDINAL)	MAXIMUM (WITH LIVE LOAD)	-	COEXISTING	-	COEXISTING	405	COEXISTING	0.002	-16.5/16.2	-	
			MINIMUM (WITH LIVE LOAD)	-	COEXISTING	-	COEXISTING	365	COEXISTING	0.002	-16.5/16.2	-	
			MINIMUM (WITHOUT LIVE LOAD)	-	COEXISTING	-	COEXISTING	365	COEXISTING	0.002	-16.5/16.2	-	
		SEISMIC (TRANSVERSE)	MAXIMUM (WITH LIVE LOAD)	-	COEXISTING	-	COEXISTING	1349	COEXISTING	0.002	-16.5/16.2	-	
			MINIMUM (WITH LIVE LOAD)	-	COEXISTING	-	COEXISTING	1216	COEXISTING	0.002	-16.5/16.2	-	
			MINIMUM (WITHOUT LIVE LOAD)	-	COEXISTING	-	COEXISTING	811	COEXISTING	0.002	-16.5/16.2	-	

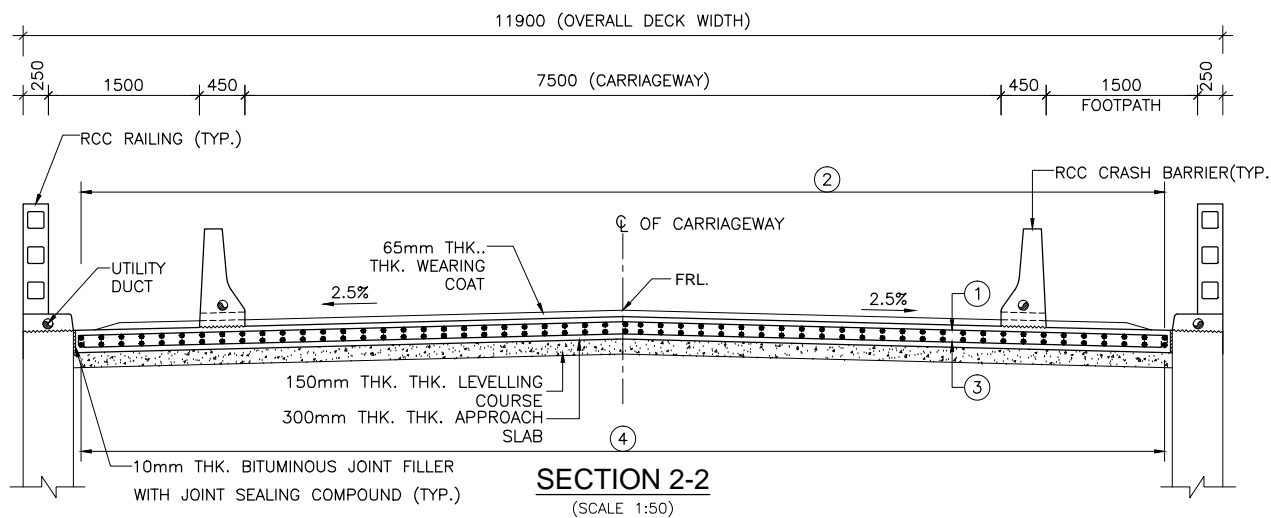
	EMPLOYER Government of Nepal Ministry of Physical Infrastructure and Transport, Department of Roads, Foreign Co-operation Branch	PROJECT Nepal India Regional Trade and Transport Project (NIRTPP) (IDA CREDIT No. 5273 - NEP) Feasibility Study of Kathmandu (Nagdhunga) -Detailed Design of Kathmandu (Nagdhunga) -Naubise - Mugling Road and Bridges	DESIGN CONSULTANT Intercontinental Consultants & Technocrats Pvt.Ltd, A-8, Green Park, New Delhi - 110016 Ph : 4086-3000, Fax 2685-5252 In Joint Venture With Soosung Engineering Co. Ltd., South Korea Full Bright Consultancy (Pvt.) Ltd. 316, Baburam Acharya Sadak, Sinamangal, Kathmandu, GPO Box: 4970, Kathmandu, Nepal	Prepared By K.M. JOHRI Designed By V. CHAUDHARY Checked By P.K. KHAN Approved By B.N. SINGH	DRAWING TITLE: DETAILS OF LOADS AND FORCES FOR POT/PTFE BEARINGS EFFECTIVE SPAN : 22.00m Drawing No.: NIRTPP/NAG-MUG/NAUBISE/RCC-G/22m/05	Scale: As Shown	Date: JUNE-2018	

MISCELLANEOUS DRAWINGS

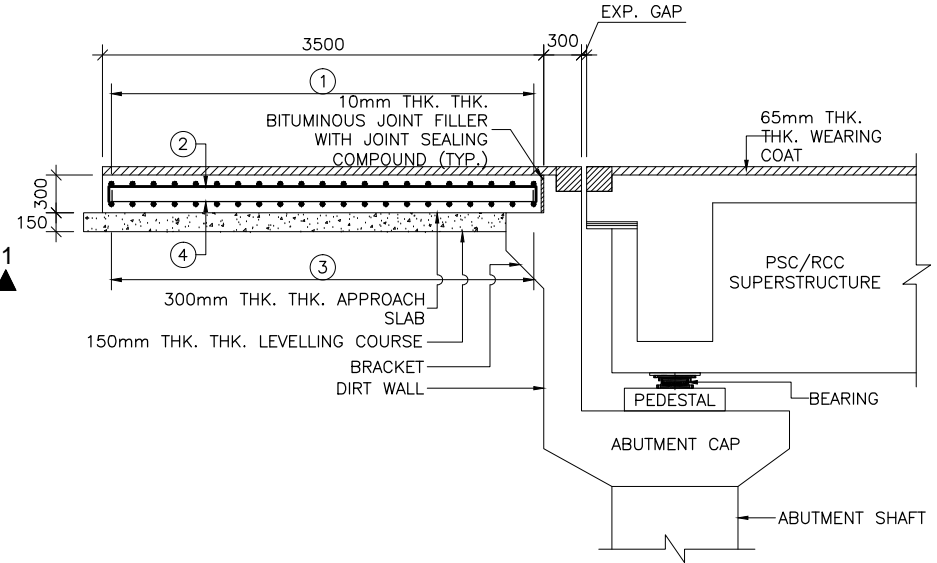


PLAN
(SCALE 1:50)

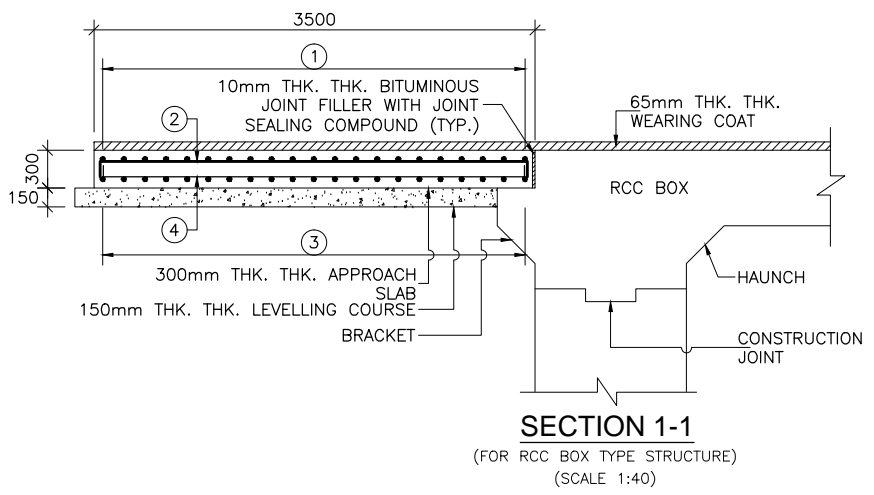
LEGEND:
 BOTTOM REINF. - - - - -
 TOP REINF. REINF. ————



SECTION 2-2
(SCALE 1:50)



SECTION 1-1
(FOR PSC/RCC SUPERSTRUCTURE)
(SCALE 1:40)



SECTION 1-1
(FOR RCC BOX TYPE STRUCTURE)
(SCALE 1:40)

NOTES:-

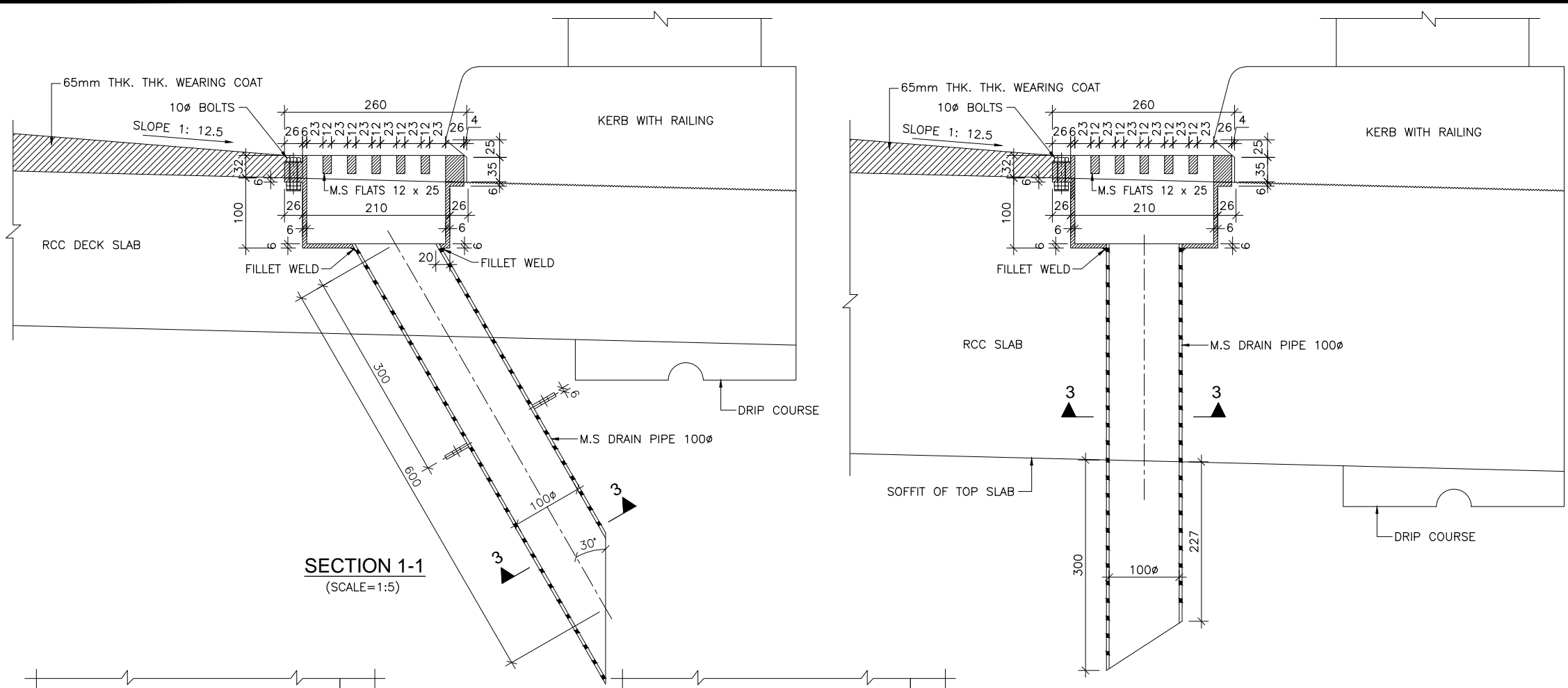
- ALL DIMENSIONS ARE IN MILLIMETER UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NO DIMENSION IS TO BE SCALED.
- CONCRETE GRADE SHALL BE DESIGN MIX WITH A MINIMUM 28 DAYS CHARACTERISTIC STRENGTH ON 150mm THK. CUBES AS FOLLOWS :-
 a. APPROACH SLAB - 30 MPa
 b. LEVelling COURSE - 15 MPa
- THE REINFORCING BARS SHALL BE OF THERMO MECHANICALLY TREATED (TMT) HYSD BARS (GRADE DESIGNATION Fe-500D), CONFORMING TO IS:1786 STANDARDS.
- CLEAR COVER TO OUTER MOST STEEL SHALL BE AS 50mm THK..
- 65mm THK. WEARING COAT COMPRISING OF 40mm THK. ASPHALTIC CONCRETE OVER LAID WITH 25mm THK. MASTIC ASPHALT SHALL BE PROVIDED AS PER SECTION 500 OF MORTH SPECIFICATIONS.
- FILLING BEHIND THE ABUTMENT AND PROPER COMPACTION OF THE EMBANKMENT BELOW THE APPROACH SLAB SHOULD BE CARRIED OUT BY THE CONTRACTOR WITH SELECTED MATERIAL AS PER THE SPECIFICATIONS GIVEN IN APPENDIX:6 OF IRC:78 (2014), HAVING SOIL PARAMETERS AS MENTIONED IN RESPECTIVE GADS OF BRIDGES.
- FOR REINFORCEMENT DETAILS OF RCC BRACKET SUPPORTING APPROACH SLAB REFER SEPARATE ABUTMENT DRAWINGS.
- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE GENERAL ARRANGEMENT DRAWING OF THE RESPECTIVE BRIDGES.

S.NO.	TYPE OF STRUCTURE	CHAINAGE
1	MINOR BRIDGE	25+025
2	MINOR BRIDGE	26+563
3	MINOR BRIDGE	33+250
4	MINOR BRIDGE	36+449
5	MINOR BRIDGE	38+620
6	MINOR BRIDGE	50+165

REINFORCEMENT SCHEDULE

BAR MARK	DESCRIPTION	SHAPE	REMARKS
①	12 ϕ@150c/c	□	
②	12 ϕ@150c/c	□	
③	12 ϕ@150c/c	□	
④	12 ϕ@150c/c	□	

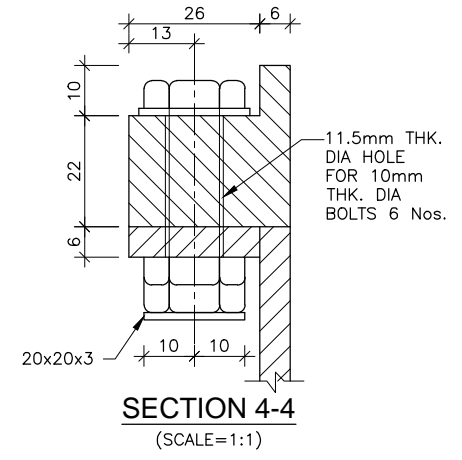
EMPLOYER	PROJECT	DESIGN CONSULTANT	Prepared By	Designed By	Checked By	Approved By	DRAWING TITLE:	Scale:	Date:
Government of Nepal Ministry of Physical Infrastructure and Transport, Department of Roads, Foreign Co-operation Branch	Nepal India Regional Trade and Transport Project (NIRTP) (IDA CREDIT No. 5273 - NEP) Detailed Design of Kathmandu (Nagdhunga) - Naubise - Mugling Road and Bridges	Intercontinental Consultants & Technocrats Pvt.Ltd, A-8, Green Park, New Delhi - 110016 Ph : 4086-3000, Fax 2685-5252 In Joint Venture With Soosung Engineering Co. Ltd., South Korea	K.M.JOHRI	AGNIMITA	P.K.KHAN	B.N.SINGH	DETAILS OF APPROACH SLAB PACKAGE-I (NAGDHUNGA-NAUBISE) Drawing No.: NIRTP/NAG-MUG/PACKAGE-I/MISC.-01	As Shown	JUNE-2018



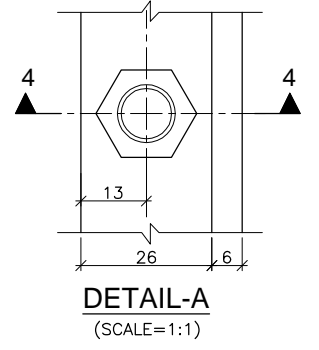
SECTION 1-1
(SCALE=1:5)

SECTION 2-2
(SCALE=1:5)

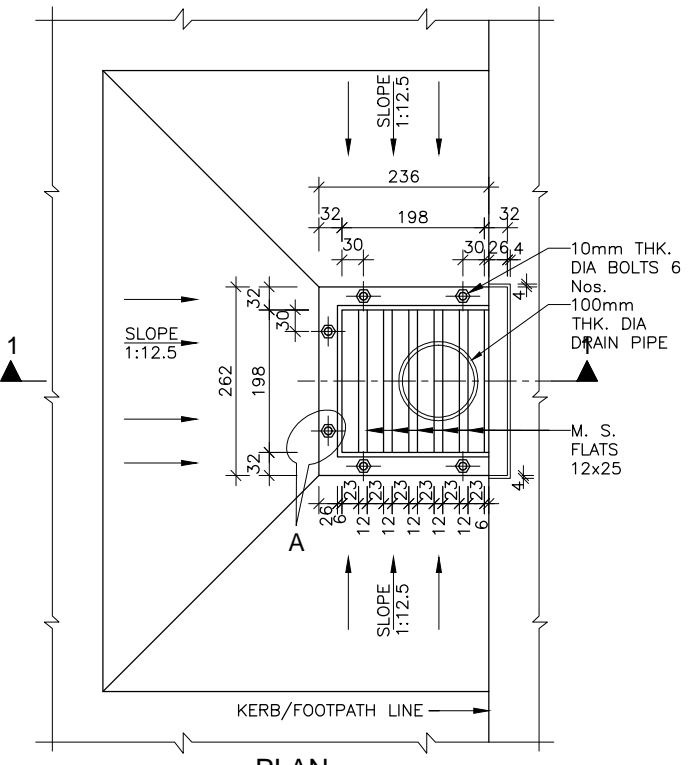
- NOTES:-**
1. ALL DIMENSIONS ARE IN MILLIMETER UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NO DIMENSION IS TO BE SCALED.
 2. DRAINAGE SPOUT AND COLLECTION PIT ASSEMBLY SHALL BE FABRICATED FROM MILD STEEL AND AFTER FABRICATION THE COMPLETE ASSEMBLY EXCEPT GRATING MILD STEEL AND AFTER FABRICATION THE COMPLETE ASSEMBLY EXCEPT GRATING SHALL BE GIVEN A HOT DIPPED GALVANISED COATING.
 3. SPACING OF DRAINAGE SPOUT SHALL NOT EXCEED 5000 CENTER TO CENTER.
 4. 65mm THK. THK. WEARING COAT COMPRISING OF 40mm THK. THK. ASPHALTIC CONCRETE OVER LAID WITH 25mm THK. THK. MASTIC ASPHALT SHALL BE PROVIDED AS PER SECTION 500 OF MORTH SPECIFICATIONS.
 5. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE GENERAL ARRANGEMENT DRAWING OF THE RESPECTIVE BRIDGES.



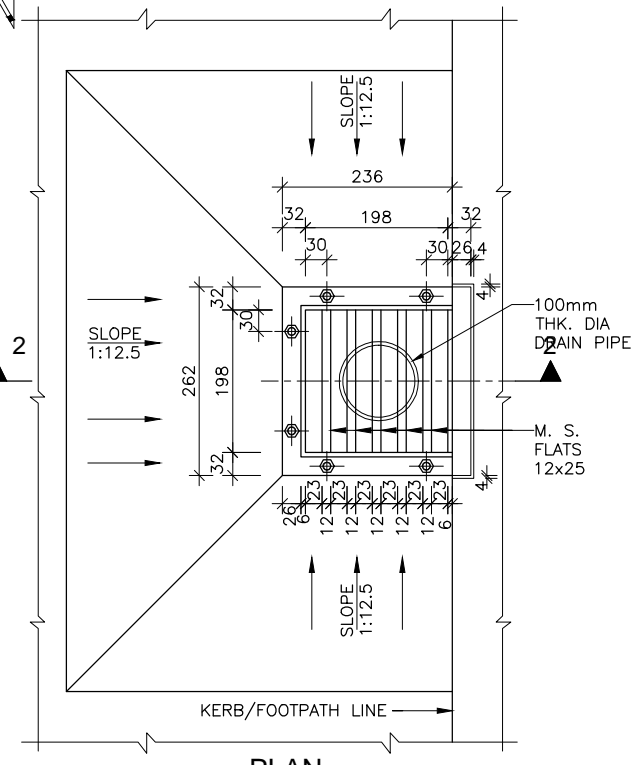
SECTION 4-4
(SCALE=1:1)



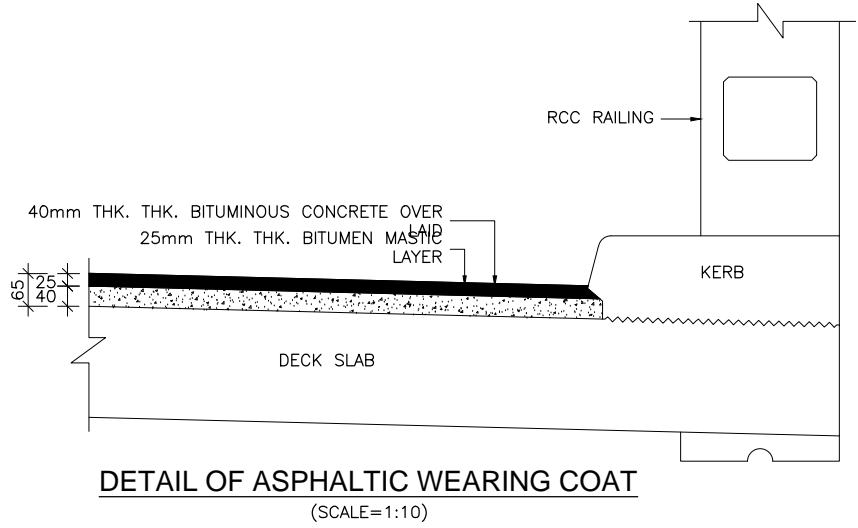
DETAIL-A
(SCALE=1:1)



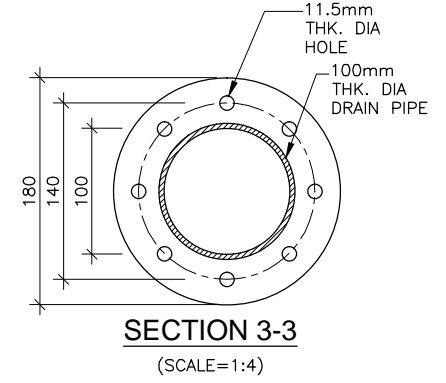
PLAN
DETAIL OF DRAINAGE SPOUT AND COLLECTION PIT
(FOR RCC AND PSC SUPERSTRUCTURE)
(SCALE=1:7)



PLAN
DETAIL OF DRAINAGE SPOUT AND COLLECTION PIT
(FOR RCC SOLID SLAB AND BOX STRUCTURE)
(SCALE=1:7)

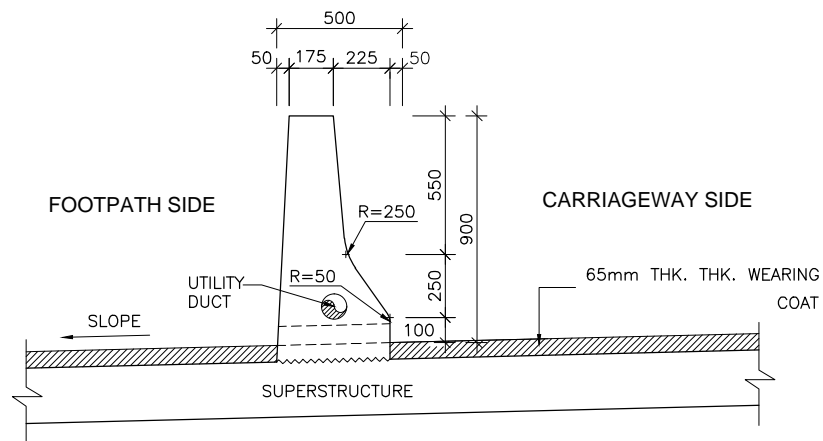


DETAIL OF ASPHALTIC WEARING COAT
(SCALE=1:10)

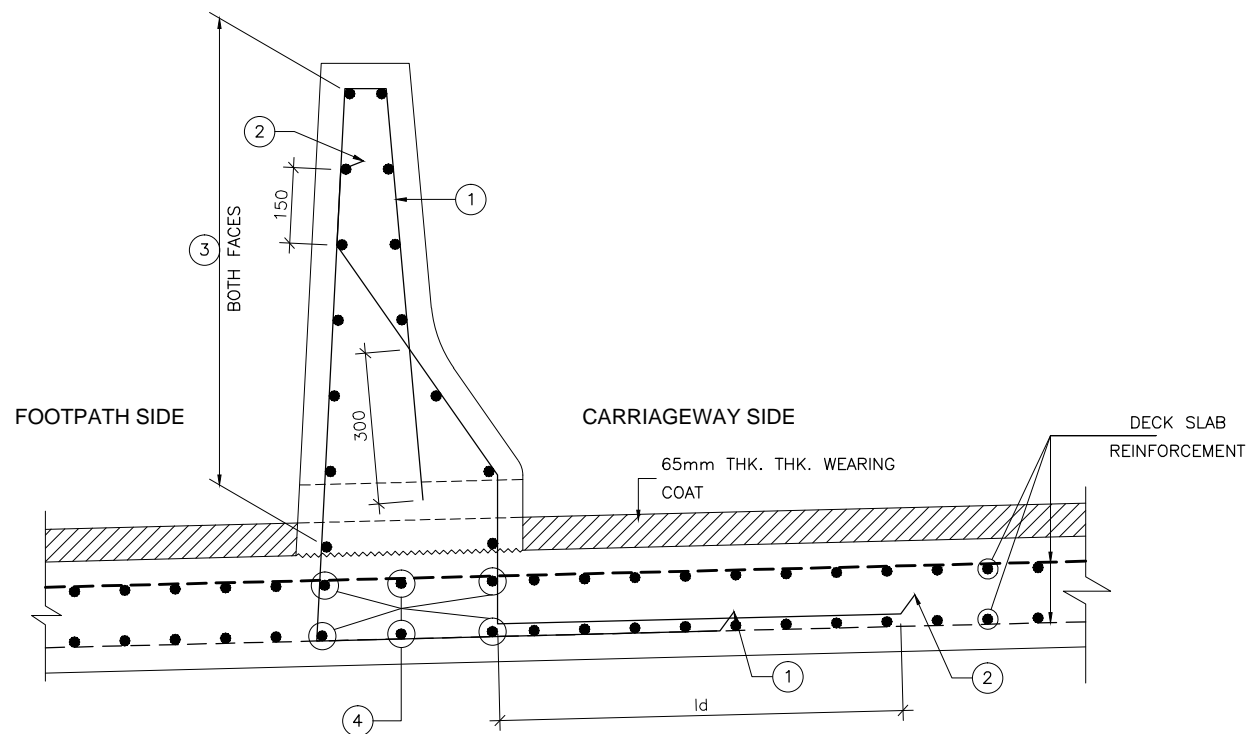


SECTION 3-3
(SCALE=1:4)

	EMPLOYER	PROJECT	DESIGN CONSULTANT		Prepared By	K.M. JOHRI	DRAWING TITLE:	Scale:	Date: JUNE-2018
	Government of Nepal Ministry of Physical Infrastructure and Transport, Department of Roads, Foreign Co-operation Branch	Nepal India Regional Trade and Transport Project (NIRTPP) (IDA CREDIT No. 5273 - NEP) Detailed Design of Kathmandu (Nagdhunga) - Naubise - Mugling Road and Bridges	Intercontinental Consultants & Technocrats Pvt.Ltd. A-8, Green Park, New Delhi - 110016 Ph : 4086-3000, Fax 2685-5252 In Association With Full Bright Consultancy (Pvt.) Ltd. 316, Baburam Acharya Sadak, Sinamangal, Kathmandu, GPO Box: 4970, Kathmandu, Nepal In Joint Venture With Soosung Engineering Co. Ltd., South Korea 	Designed By	AGNIMITA	DETAILS OF DRAINAGE SPOUT AND WEARING COAT PACKAGE-I (NAGDHUNGA-NAUBISE)		As Shown	
	Checked By	P.K.KHAN	Drawing No.:						
	Approved By	B.N.SINGH		NIRTPP/NAG-MUG/PACKAGE-I/MISC.-02					



DIMENSIONAL DETAILS OF INTERMEDIATE CRASH BARRIER
(SCALE 1:20)



REINFORCEMENT DETAILS OF INTERMEDIATE CRASH BARRIER
(SCALE 1:10)

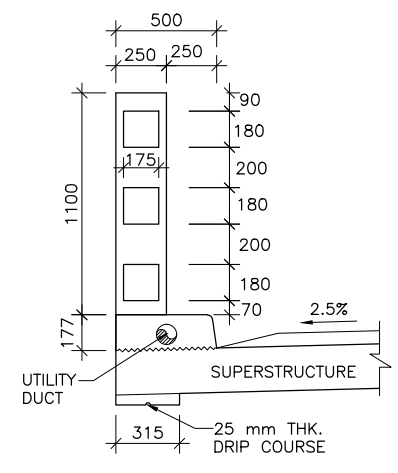
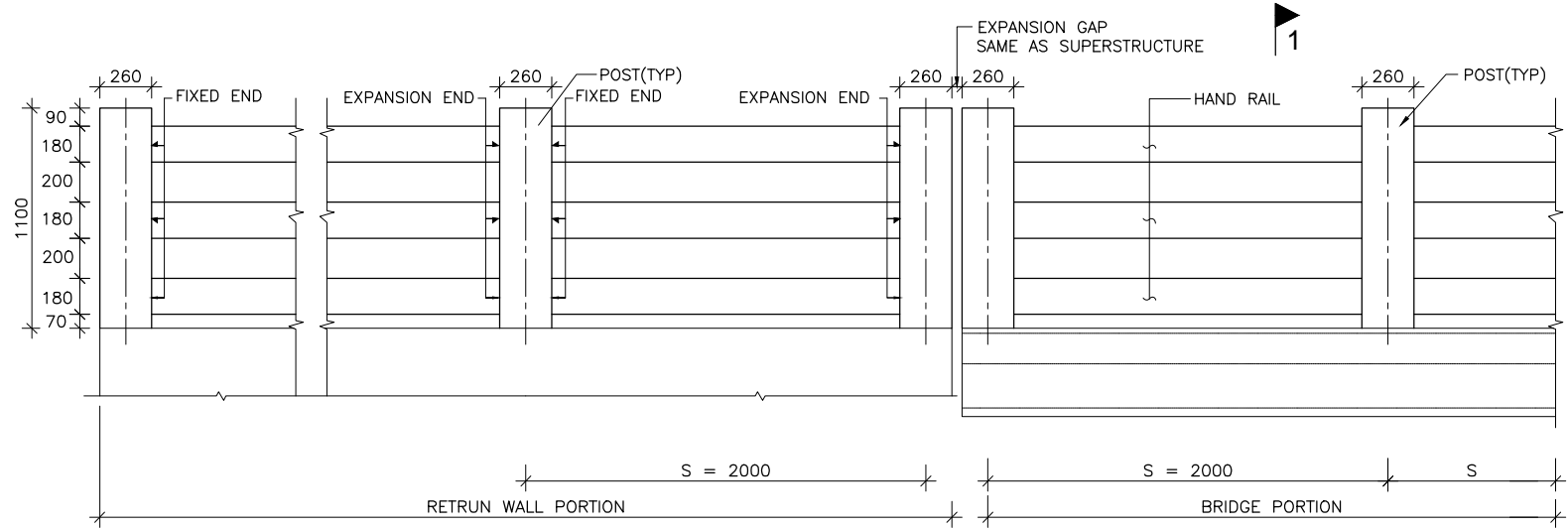
NOTES:-

- ALL DIMENSIONS ARE IN MILLIMETER UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NO DIMENSION IS TO BE SCALED.
- THE CRASH BARRIER DESIGN HAS BEEN ADOPTED AS PER CLAUSE 115.4.1 OF IRC:5-1998.
- THE CONCRETE GRADE SHALL BE M40.
- THE REINFORCING STEEL SHALL BE TMT DEFORMED BARS (GRADE DESIGNATION Fe:500D) CONFORMING TO IS:1786.
- CLEAR COVER TO OUTERMOST STEEL IS 50mm THK..
- DOWEL BARS OF THE CRASH BARRIER SHALL BE PROPERLY ANCHORED INTO THE DECK SLAB.
- SUITABLE REFLECTIVE (LUMINOUS) DEVICES SHALL BE PROVIDED ON THE TRAFFIC FACE OF THE BARRIER AT SUITABLE INTERVAL TO ENSURE ADEQUATE VISIBILITY DURING NIGHT AND FOGGY CONDITIONS.
- LAPPING OF REINFORCEMENT SHALL BE AVOIDED AS FAR AS POSSIBLE. IN CASE LAPPING OF BARS BECOMES UNAVOIDABLE, MINIMUM LAP LENGTH OF REINFORCEMENT BARS SHALL BE CALCULATED AS FOLLOW WITH MAXIMUM ALLOWABLE LAPPING (p) OF 50% ONLY.
(IRC:112-2011) (CLAUSE:15.2.5.1)
LAP LENGTH $l_s = \alpha \cdot l_{bnet}$
 $\alpha 1 = 1.0$ FOR $p \leq 25\%$
 $\alpha 1 = 1.15$ FOR $25\% \leq p \leq 33\%$
 $\alpha 1 = 1.4$ FOR $33\% \leq p \leq 50\%$
IN THE CASE OF BUNDLED BARS
LAP LENGTH = $1.3 \times l_s$ (CLAUSE:15.2.7.3)
(IRC:112-2011) (CLAUSE:15.2.3.3)
DEVELOPMENT LENGTH (l_{bnet})
 $l_{bnet} = \alpha \cdot l_b$ ($\alpha = 1.0$)
 $l_b = k \phi$
 $k = 40$ FOR M30 (Fe500D)
 $k = 36$ FOR M35 (Fe500D)
 $k = 34$ FOR M40 (Fe500D)
FOR UNFAVORABLE BOND CONDITION THE l_b SHOULD BE MULTIPLIED BY FACTOR OF 1.43.
FOR $\phi > 32$ mm THK. l_b SHOULD BE INCREASED BY MULTIPLYING FACTOR $(\frac{100}{\phi})$
- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE GENERAL ARRANGEMENT DRAWING OF THE RESPECTIVE BRIDGES.

REINFORCEMENT SCHEDULE

BAR MARK	DESCRIPTION	SHAPE	REMARKS
①	16 Φ @150c/c		
②	16 Φ @150c/c		
③	12 Φ @150c/c		
④	16 Φ - 6 Nos.		

EMPLOYER	PROJECT	DESIGN CONSULTANT	Prepared By	Designed By	Checked By	Approved By	DRAWING TITLE:	Scale:	Date:
<p>Government of Nepal Ministry of Physical Infrastructure and Transport, Department of Roads, Foreign Co-operation Branch</p>	<p>Nepal India Regional Trade and Transport Project (NIRTPP) (IDA CREDIT No. 5273 - NEP) Detailed Design of Kathmandu (Nagdhunga) - Naubise - Mugling Road and Bridges</p>	<p>Intercontinental Consultants & Technocrats Pvt.Ltd, A-8, Green Park, New Delhi - 110016 Ph : 4086-3000, Fax 2685-5252 <p>In Joint Venture With Soosung Engineering Co. Ltd., South Korea</p> </p>	K.M. JOHRI	AGNIMITA	P.K.KHAN	B.N.SINGH	<p>DIMENSIONAL AND REINFORCEMENT DETAILS OF CRASH BARRIER PACKAGE-I (NAGDHUNGA-NAUBISE)</p> <p>Drawing No.: NIRTPP/NAG-MUG/PACKAGE-I/MISC.-03</p>	As Shown	JUNE-2018

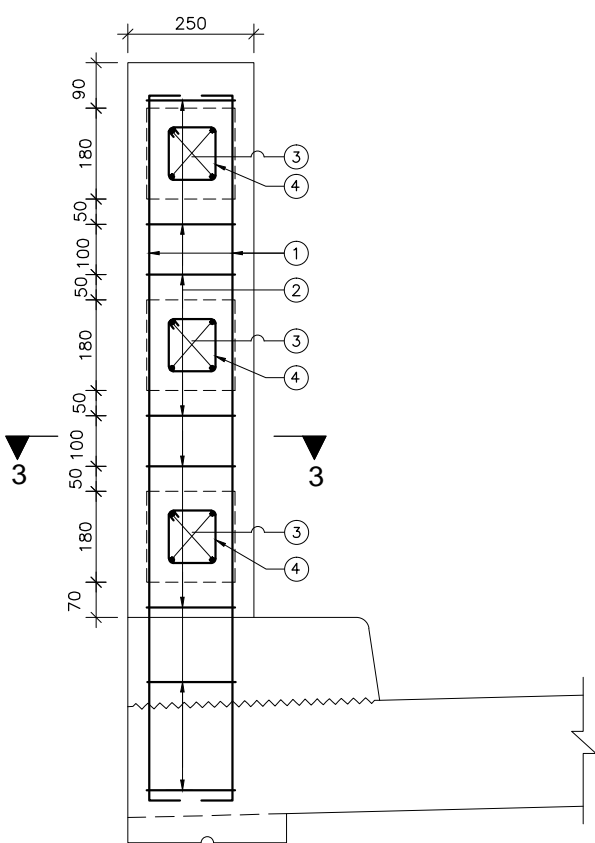


NOTES:-

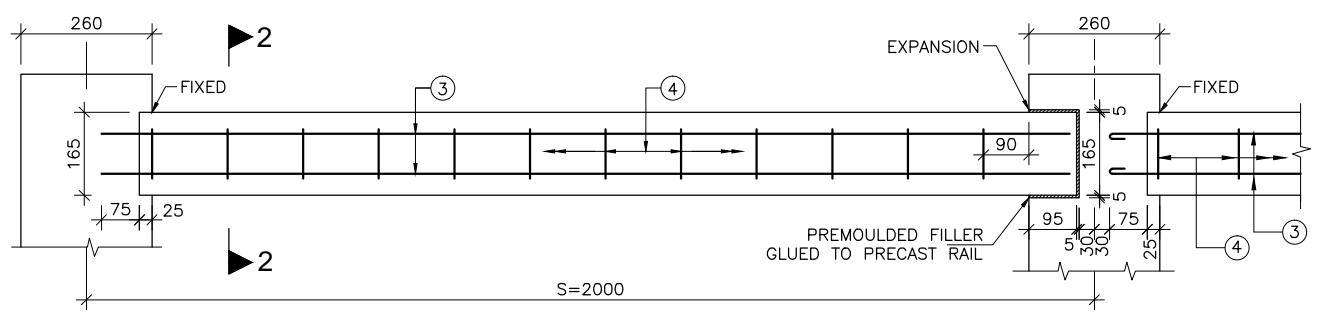
- ALL DIMENSIONS ARE IN MILLIMETER UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NO DIMENSION IS TO BE SCALED.
- THE CONCRETE GRADE SHALL BE M30.
- THE REINFORCING STEEL SHALL BE TMT DEFORMED BARS (GRADE DESIGNATION Fe:500D) CONFORMING TO IS:1786.
- CLEAR COVER TO OUTERMOST STEEL IS 50mm THK..
- CENTRE TO CENTRE SPACING 'S' BETWEEN SUCCESSIVE VERTICAL POSTS SHOWN IN THE ELEVATION SHALL BE ADJUSTED TO SUIT THE LENGTH OF THE BRIDGE SPAN FOR WHICH THE RAILING IS USED BUT IN NO CASE ITS SHALL EXCEED 2000mm THK..
- CASTING OF THE POST SHALL BE DONE IN SINGLE POUR AFTER ACCURATELY POSITIONING THE PRECAST HANDRAILS.
- LAPPING OF REINFORCEMENT SHALL BE AVOIDED AS FAR AS POSSIBLE. IN CASE LAPPING OF BARS BECOMES UNAVOIDABLE, MINIMUM LAP LENGTH OF REINFORCEMENT BARS SHALL BE CALCULATED AS FOLLOW WITH MAXIMUM ALLOWABLE LAPPING (p) OF 50% ONLY.
 (IRC:112-2011) (CLAUSE:15.2.5.1)
 $LAP LENGTH l_s = \alpha \cdot l_{bnet}$
 $\alpha = 1.0$ FOR $p\% \leq 25\%$
 $\alpha = 1.15$ FOR $25\% < p\% \leq 33\%$
 $\alpha = 1.4$ FOR $33\% < p\% \leq 50\%$
 IN THE CASE OF BUNDLED BARS
 $LAP LENGTH = 1.3 \times l_s$ (CLAUSE:15.2.7.3)
 (IRC:112-2011) (CLAUSE:15.2.3.3)
 $DEVELOPMENT LENGTH (l_{bnet})$
 $l_{bnet} = \alpha \cdot l_b$ ($\alpha = 1.0$)
 $l_b = k \phi$
 $k = 40$ FOR M30 (Fe500D)
 $k = 36$ FOR M35 (Fe500D)
 $k = 34$ FOR M40 (Fe500D)
 FOR UNFAVORABLE BOND CONDITION THE l_b SHOULD BE MULTIPLIED BY FACTOR OF 1.43.
 FOR $\phi > 32$ mm THK. l_b SHOULD BE INCREASED BY MULTIPLYING FACTOR (1.39-1.43)
- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE GENERAL ARRANGEMENT DRAWING OF THE RESPECTIVE BRIDGES.

GENERAL ELEVATION
(SCALE 1:25)

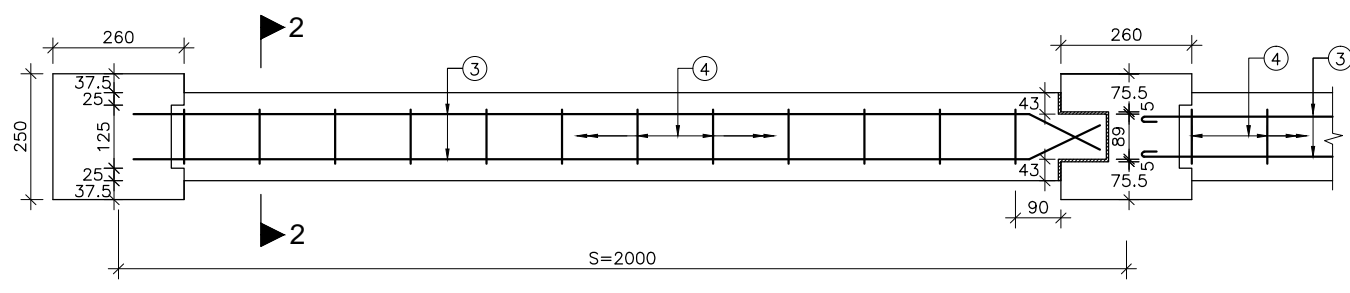
SECTION 1-1
(SCALE 1:25)



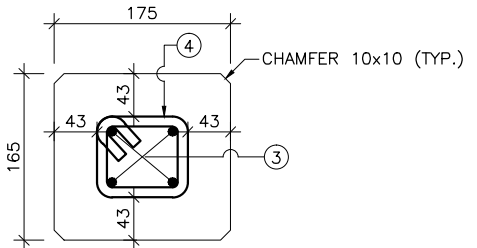
REINFORCING DETAILS OF RAILING POST
(SCALE 1:10)



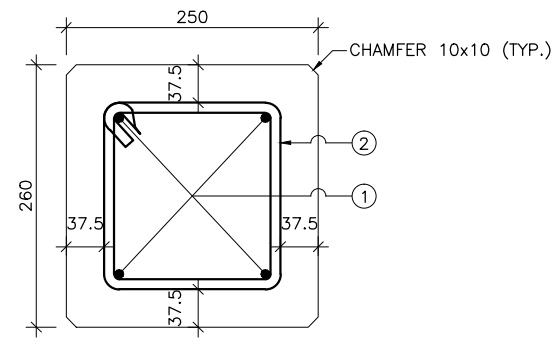
ELEVATION
(SCALE 1:10)



PLAN REINFORCING DETAILS OF HANDRAIL (Precast)
(SCALE 1:10)



SECTION 2-2
(SCALE 1:5)

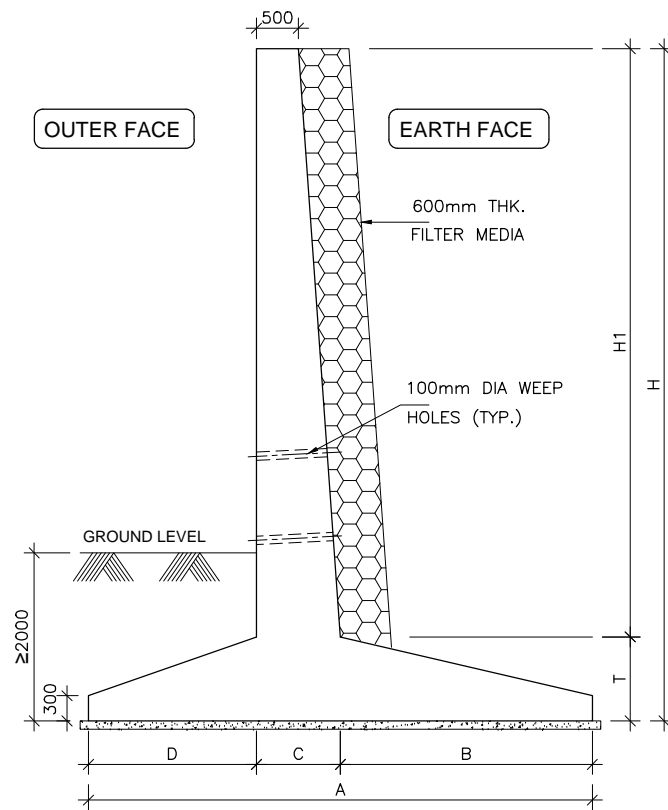


SECTION 3-3
(SCALE 1:5)

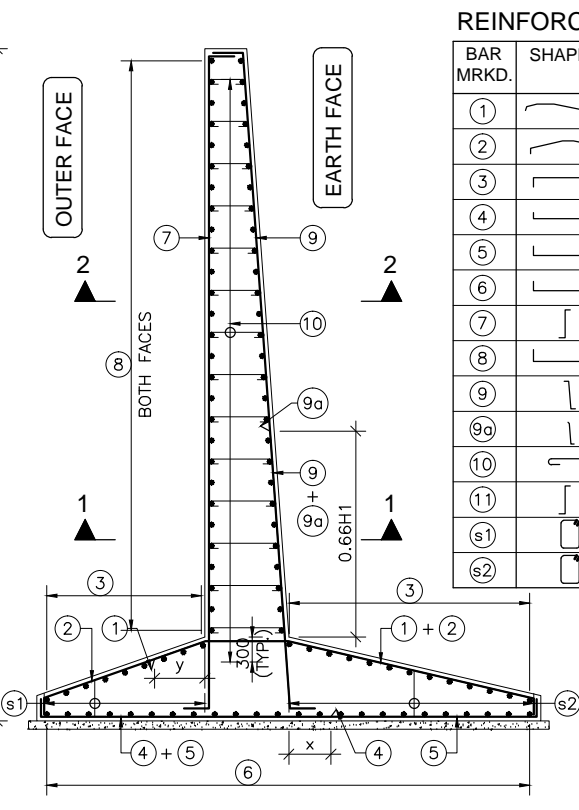
REINFORCEMENT SCHEDULE

BAR MARK	DESCRIPTION	SHAPE	REMARKS
①	12 Φ -4 Nos.		
②	10 Φ -8 Nos.		STIRRUPS
③	10 Φ -4 Nos.		
④	8 Φ Φ 150 c/c		STIRRUPS

EMPLOYER	PROJECT	DESIGN CONSULTANT	Prepared By	Designed By	Checked By	Approved By	DRAWING TITLE:	Scale:	Date:
Government of Nepal Ministry of Physical Infrastructure and Transport, Department of Roads, Foreign Co-operation Branch	Nepal India Regional Trade and Transport Project (NIRTPP) (IDA CREDIT No. 5273 - NEP) Detailed Design of Kathmandu (Nagdhunga) - Naubise - Mugling Road and Bridges	Intercontinental Consultants & Technocrats Pvt.Ltd, A-8, Green Park, New Delhi - 110016 Ph : 4086-3000, Fax 2685-5252 In Joint Venture With Soosung Engineering Co. Ltd., South Korea Full Bright Consultancy (Pvt.) Ltd. 316, Baburam Acharya Sadak, Sinamangal, Kathmandu, GPO Box: 4970, Kathmandu, Nepal	K.M.JOHRI	AGNIMITA	P.K.KHAN	B.N.SINGH	DIMENSIONAL AND REINFORCEMENT DETAILS OF RCC RAILING PACKAGE-I (NAGDHUNGA-NAUBISE) Drawing No.: NIRTPP/NAG-MUG/PACKAGE-I/MISC.-04	As Shown	JUNE-2018

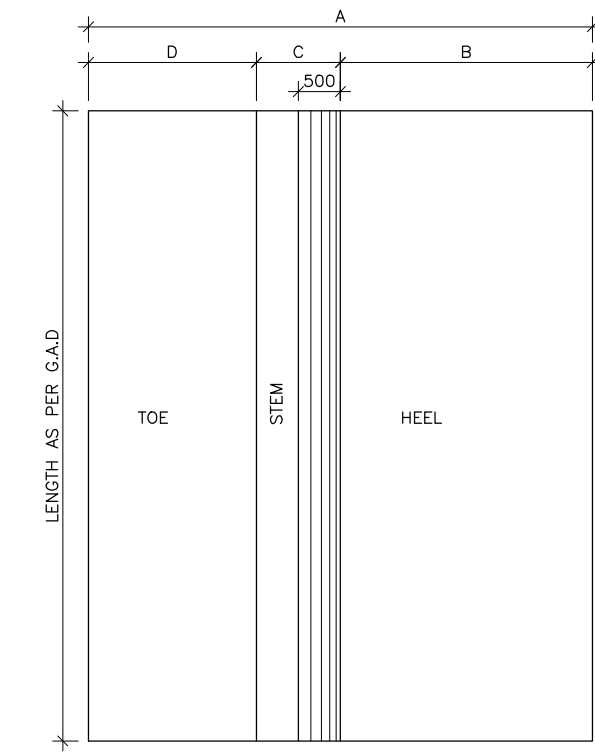


TYPICAL SECTION OF RETAINING WALL (DIMENSIONAL DETAILS) (SCALE 1:60)

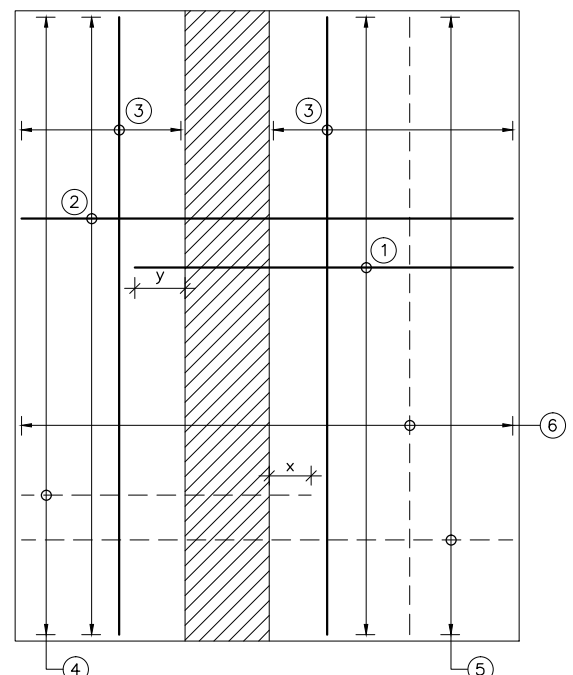


TYPICAL SECTION OF RETAINING WALL (REINFORCEMENT DETAILS) (SCALE 1:60)

$x = Ld$ or $B/3$ WHICHEVER IS MAXIMUM
 $y = Ld$ or $D/3$ WHICHEVER IS MAXIMUM



TYPICAL PLAN OF RETAINING WALL (DIMENSIONAL DETAILS) (SCALE 1:60)



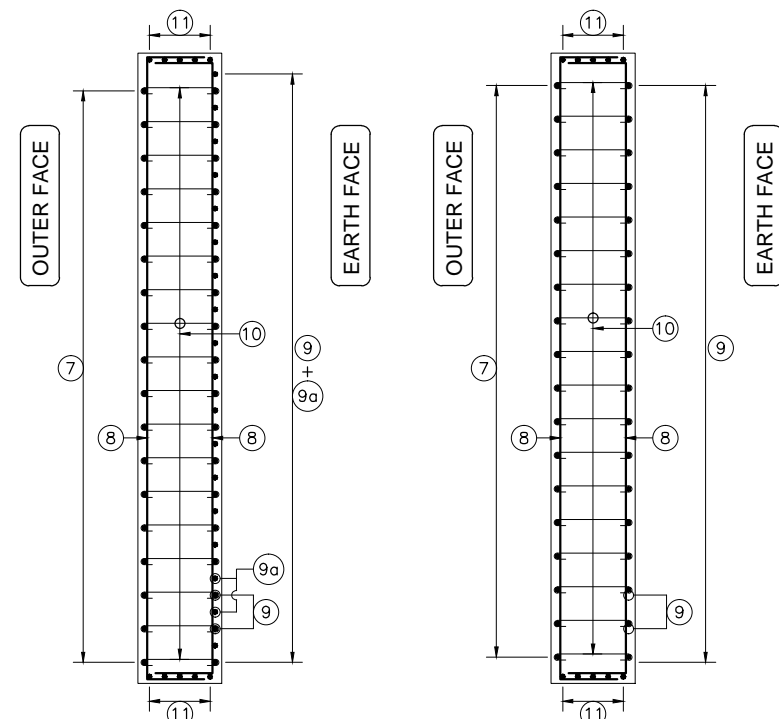
TYPICAL PLAN OF RETAINING WALL (REINFORCEMENT DETAILS) (SCALE 1:60)

BAR MRKCD.	SHAPE	TOTAL 6.0m HEIGHT	TOTAL 7.0m HEIGHT	TOTAL 8.0m HEIGHT	TOTAL 9.0m HEIGHT	TOTAL 10.0m HEIGHT	TOTAL 11.0m HEIGHT	TOTAL 12.0m HEIGHT	TOTAL 13.0m HEIGHT	TOTAL 14.0m HEIGHT	TOTAL 15.0m HEIGHT
1		16 Φ 200c/c	25 Φ 220c/c	20 Φ 200c/c	25 Φ 200c/c	25 Φ 180c/c	25 Φ 250c/c	25 Φ 250c/c	25 Φ 200c/c	25 Φ 200c/c	25 Φ 200c/c
2		16 Φ 200c/c	16 Φ 220c/c	20 Φ 200c/c	20 Φ 200c/c	20 Φ 180c/c	20 Φ 250c/c	20 Φ 250c/c	20 Φ 200c/c	20 Φ 200c/c	20 Φ 200c/c
3		12 Φ 200c/c	12 Φ 150c/c	12 Φ 150c/c	16 Φ 150c/c	16 Φ 150c/c	16 Φ 200c/c	16 Φ 200c/c	16 Φ 200c/c	16 Φ 200c/c	16 Φ 200c/c
4		20 Φ 200c/c	25 Φ 220c/c	25 Φ 200c/c	32 Φ 200c/c	32 Φ 180c/c	32 Φ 200c/c	32 Φ 200c/c	32 Φ 200c/c	32 Φ 200c/c	32 Φ 170c/c
5		16 Φ 200c/c	20 Φ 220c/c	25 Φ 200c/c	25 Φ 200c/c	25 Φ 180c/c	25 Φ 200c/c	25 Φ 200c/c	25 Φ 200c/c	25 Φ 170c/c	25 Φ 170c/c
6		12 Φ 200c/c	12 Φ 150c/c	16 Φ 150c/c	16 Φ 150c/c	16 Φ 100c/c	16 Φ 100c/c	16 Φ 100c/c	16 Φ 100c/c	16 Φ 100c/c	16 Φ 100c/c
7		16 Φ 220c/c	16 Φ 200c/c	16 Φ 200c/c	16 Φ 200c/c	20 Φ 200c/c	20 Φ 200c/c	20 Φ 180c/c	25 Φ 180c/c	25 Φ 170c/c	25 Φ 170c/c
8		12 Φ 200c/c	16 Φ 200c/c	16 Φ 200c/c	16 Φ 150c/c	16 Φ 150c/c	16 Φ 150c/c	16 Φ 125c/c	16 Φ 125c/c	16 Φ 125c/c	16 Φ 125c/c
9		16 Φ 220c/c	20 Φ 200c/c	25 Φ 200c/c	32 Φ 200c/c	32 Φ 200c/c	32 Φ 200c/c	32 Φ 180c/c	32 Φ 180c/c	32 Φ 170c/c	32 Φ 170c/c
9a		25 Φ 200c/c	32 Φ 200c/c	32 Φ 200c/c	32 Φ 200c/c	32 Φ 200c/c	32 Φ 200c/c	32 Φ 180c/c	32 Φ 180c/c	32 Φ 170c/c	32 Φ 170c/c
10		8 Φ 400c/c	8 Φ 400c/c	8 Φ 400c/c	8 Φ 300c/c	8 Φ 300c/c	8 Φ 300c/c	8 Φ 250c/c	8 Φ 250c/c	8 Φ 250c/c	8 Φ 250c/c
11		16 Φ 150c/c	16 Φ 150c/c	16 Φ 150c/c	16 Φ 150c/c	16 Φ 150c/c	16 Φ 150c/c	16 Φ 150c/c	16 Φ 150c/c	16 Φ 150c/c	16 Φ 150c/c
s1		-	-	-	-	-	-	-	-	-	-
s2		-	-	-	-	-	-	2L-12 Φ 200c/c	2L-12 Φ 200c/c	2L-12 Φ 200c/c	2L-12 Φ 200c/c

SCHEDULE OF SECTIONAL DIMENSIONS OF RETAINING WALLS OF DIFFERENT HEIGHTS

SR. NO.	TOTAL HEIGHT (H)	6.0m	7.0m	8.0m	9.0m	10.0m	11.0m	12.0m	13.0m	14.0m	15.0m	
1	BASE WIDTH	A	5.1	5.9	7.05	8.0	9.2	9.4	10	11.1	12.5	13.1
2	HEEL	B	2.8	3.1	3.5	3.9	4.3	4.7	5.1	5.5	5.7	
3	STEM	C	0.6	0.6	0.75	0.8	1.0	1.2	1.3	1.5	1.7	2
4	TOE	D	1.7	2.2	2.8	3.3	3.9	4	4.5	5.3	5.4	
5	BASE THK.	T	0.6	0.6	0.75	0.8	1.0	1.2	1.3	1.5	1.7	2
6	BASE PRESSURE		18T/m ²				25T/m ²					

(DIMENSIONS GIVEN IN THE TABLE ARE IN METRES)



SECTION 1-1 (SCALE 1:60)

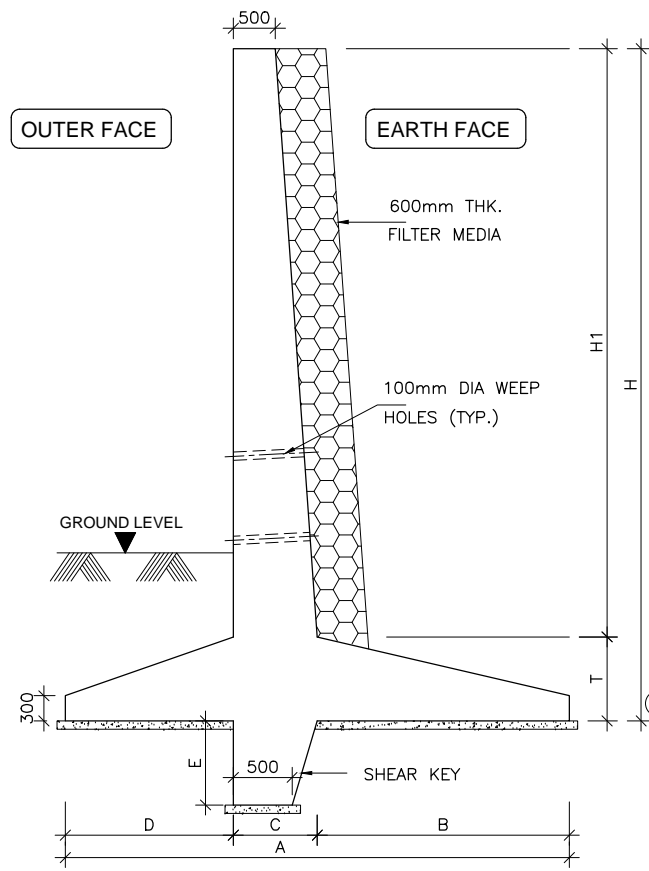
SECTION 2-2 (SCALE 1:60)

NOTES:-

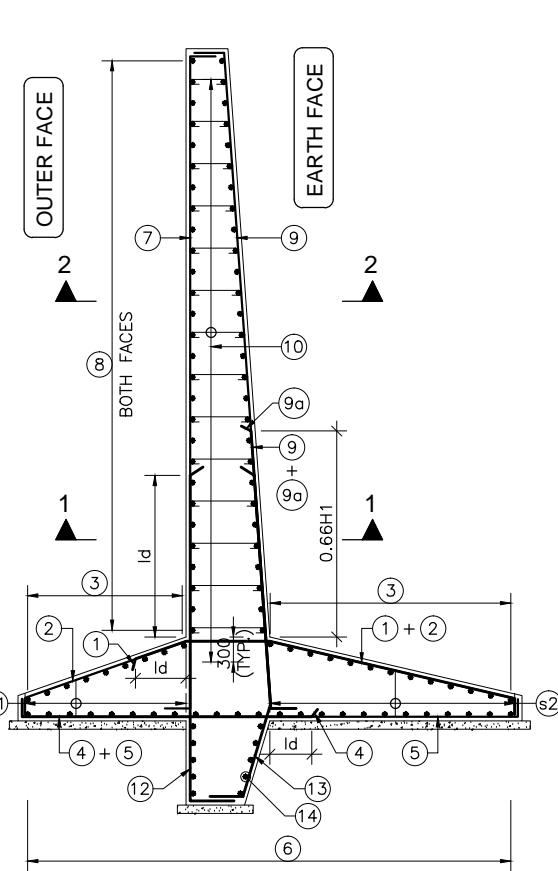
- ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NO DIMENSION IS TO BE SCALED.
- THE CONCRETE GRADE SHALL BE M30.
- UNTENSIONED REINFORCEMENT SHALL BE THERMO MECHANICALLY TREATED (TMT), HYSD BARS OF GRADE DESIGNATION Fe-500D CONFORMING TO IS: 1786.
- CLEAR COVER TO OUTER MOST STEEL SHALL BE AS UNDER:-
 i) EARTH FACE -75mm.
 ii) NON EARTH FACE -50mm.
- 100mm DIA WEEP HOLES AT 1000mm C/C STAGGERED HORIZONTALLY AND VERTICALLY SHALL BE PROVIDED IN TWO LAYERS ABOVE G.L IN VERTICAL WALLS OF RETAINING WALLS.
- LAYING, COMPACTION AND EXTENT OF BACKFILL BEHIND MEDIAN WALLS/ RETAINING WALLS SHALL CONSIST OF SELECTED EARTH CONFORMING TO APPENDIX:6 OF IRC:78-2014 HAVING PROPERTIES $C=0$, $\phi=35^\circ$, $\delta=22.5^\circ$ & $\gamma_d = 20$ KN/M³.
- LAPPING OF REINFORCEMENT SHALL BE AVOIDED AS FAR AS POSSIBLE. IN CASE LAPPING OF BARS BECOMES UNAVOIDABLE, MINIMUM LAP LENGTH OF REINFORCEMENT BARS SHALL BE CALCULATED AS eFOLLOW WITH MAXIMUM ALLOWABLE LAPPING (p) OF 50% ONLY.
 (IRC:112-2011) (CLAUSE:15.2.5.1)
 LAP LENGTH $l_s = \alpha \cdot l_{bnet}$
 $\alpha = 1.0$ FOR $p \leq 25\%$
 $\alpha = 1.15$ FOR $25\% < p \leq 33\%$
 $\alpha = 1.4$ FOR $33\% < p \leq 50\%$
 IN THE CASE OF BUNDLED BARS
 LAP LENGTH $l_s = 1.3 \cdot l_s$ (CLAUSE:15.2.7.3)
 (IRC:112-2011) (CLAUSE:15.2.3.3)
 DEVELOPMENT LENGTH (l_{bnet} OR L_d)
 $l_{bnet} = \alpha \cdot l_b$ ($\alpha = 1.0$)
 $l_b = k \phi$
 $k = 40$ FOR M30 (Fe500D)
 FOR UNFAVORABLE BOND CONDITION THE l_b SHOULD BE MULTIPLIED BY FACTOR OF 1.43.
 FOR $\phi > 32$ mm l_b SHOULD BE INCREASED BY MULTIPLYING FACTOR $(\frac{100}{\phi})$
- SAFE BEARING CAPACITY OF SOIL AT FOUNDATION LEVEL SHALL NOT BE LESS THAN THAT GIVEN IN THE TABLE.
- TO COUNTER FOR THE DEFLECTION RETAINING WALL SHALL BE CONSTRUCTED TILTED BACK BY 1 IN 100.
- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE GENERAL ARRANGEMENT DRAWING OF THE RESPECTIVE BRIDGES.

SURFACE BAR SHALL BE PROVIDED IN FOOTING AT 12 Φ @ 150c/c WHEREVER REQUIRED

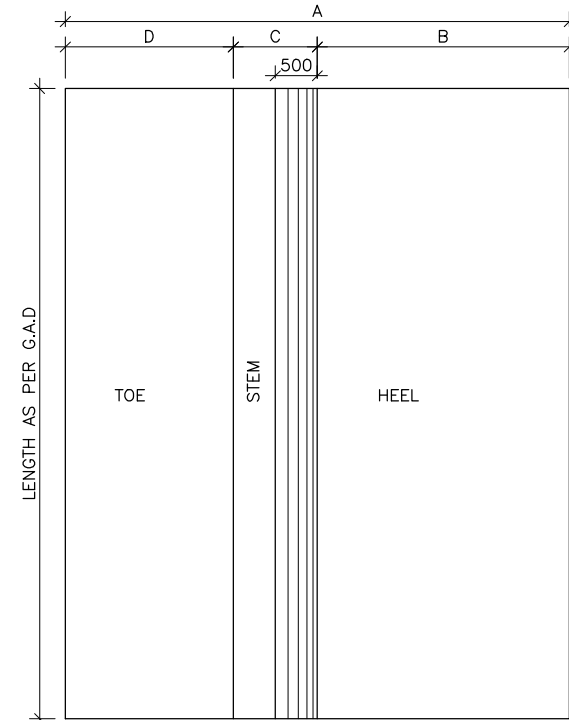
<p>EMPLOYER Government of Nepal Ministry of Physical Infrastructure and Transport, Department of Roads, Foreign Co-operation Branch</p>	<p>PROJECT Nepal India Regional Trade and Transport Project (NIRTPP) (IDA CREDIT No. 5273 - NEP) Detailed Design of Kathmandu (Nagdhunga) - Naubise - Mugling Road and Bridges</p>	<p>DESIGN CONSULTANT Intercontinental Consultants & Technocrats Pvt.Ltd, A-8, Green Park, New Delhi - 110016 Ph : 4086-3000, Fax 2685-5252 In Joint Venture With Soosung Engineering Co. Ltd., South Korea</p>	Prepared By	K.M. JOHRI	DRAWING TITLE: DIMENSIONAL AND REINFORCEMENT DETAILS OF RCC RETAINING WALL PACKAGE-I (NAGDHUNGA-NAUBISE)	Scale: As Shown	Date: JUNE-2018
			Designed By	NISHITA S.			
			Checked By	P.K.KHAN	Drawing No.: NIRTPP/NAG-MUG/PACKAGE-I/MISC.-05		
			Approved By	B.N.SINGH			



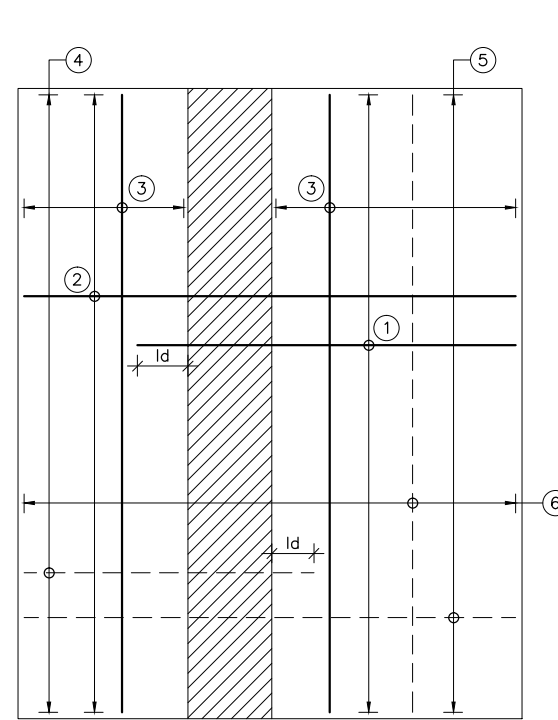
TYPICAL SECTION OF TOE WALL (DIMENSIONAL DETAILS)
(SCALE 1:60)



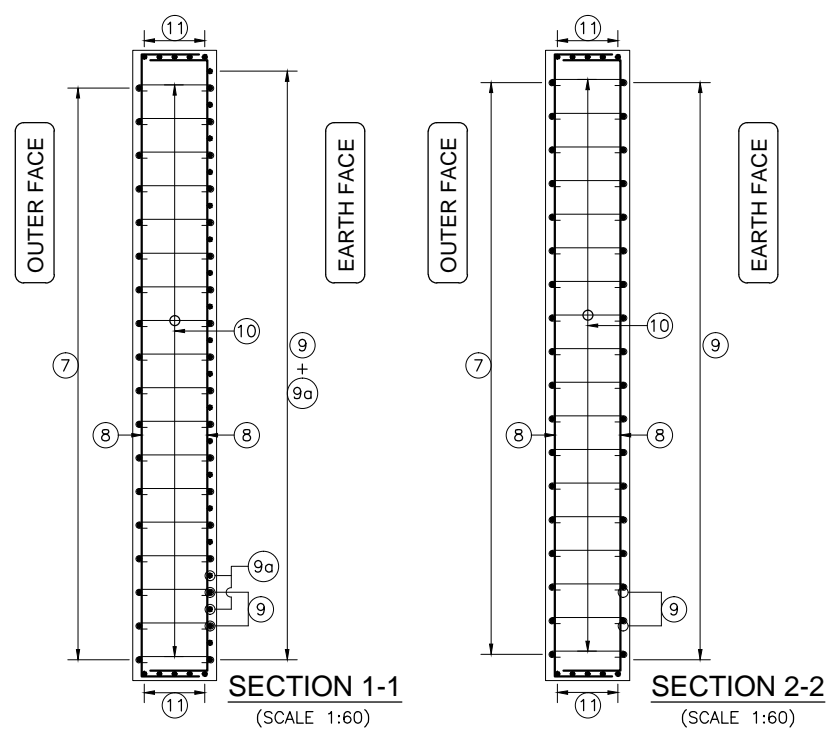
TYPICAL SECTION OF TOE WALL (REINFORCEMENT DETAILS)
(SCALE 1:60)



TYPICAL PLAN OF TOE WALL (DIMENSIONAL DETAILS)
(SCALE 1:60)



TYPICAL PLAN OF TOE WALL (REINFORCEMENT DETAILS)
(SCALE 1:60)



SCHEDULE OF SECTIONAL DIMENSIONS OF TOE WALLS OF DIFFERENT HEIGHTS

SR. NO.	TOTAL HEIGHT (H)		6.0m	7.0m	8.0m	9.0m	10.0m	11.0m
1	BASE WIDTH	A	5.20	6.20	7.00	7.70	8.50	9.30
2	HEEL	B	3.00	3.60	3.80	4.00	4.30	4.40
3	STEM	C	1.00	1.00	1.10	1.20	1.20	1.40
4	TOE	D	1.20	1.60	2.10	2.50	3.00	3.50
5	KEY	E	0.60	0.70	1.00	1.00	1.20	1.40
6	BASE THK.	T	1.00	1.00	1.10	1.20	1.20	1.20
7	MAX. BASE PRESSURE (kN/m) AS PER DESIGN		240.19	261.87	260.62	295.24	310.18	316.57

(DIMENSIONS GIVEN IN THE TABLE ARE IN METRES)

REINFORCEMENT SCHEDULE TOE WALLS

BAR MRKD.	SHAPE	TOTAL 6.0m HEIGHT	TOTAL 7.0m HEIGHT	TOTAL 8.0m HEIGHT	TOTAL 9.0m HEIGHT	TOTAL 10.0m HEIGHT	TOTAL 11.0m HEIGHT
①		16 ϕ@200c/c	16 ϕ@200c/c	16 ϕ@200c/c	16 ϕ@200c/c	16 ϕ@200c/c	16 ϕ@200c/c
②		12 ϕ@200c/c	12 ϕ@200c/c	12 ϕ@200c/c	12 ϕ@200c/c	12 ϕ@200c/c	16 ϕ@200c/c
③		10 ϕ@150c/c	10 ϕ@150c/c	10 ϕ@150c/c	10 ϕ@150c/c	10 ϕ@150c/c	12 ϕ@150c/c
④		12 ϕ@200c/c	16 ϕ@180c/c	12 ϕ@200c/c	16 ϕ@200c/c	16 ϕ@200c/c	20 ϕ@200c/c
⑤		12 ϕ@200c/c	12 ϕ@180c/c	12 ϕ@200c/c	12 ϕ@200c/c	12 ϕ@200c/c	16 ϕ@200c/c
⑥		10 ϕ@150c/c	10 ϕ@150c/c	10 ϕ@150c/c	10 ϕ@150c/c	10 ϕ@150c/c	12 ϕ@150c/c
⑦		16 ϕ@100c/c	16 ϕ@100c/c	16 ϕ@100c/c	16 ϕ@100c/c	16 ϕ@100c/c	16 ϕ@90c/c
⑧		12 ϕ@150c/c	12 ϕ@150c/c	12 ϕ@150c/c	12 ϕ@125c/c	16 ϕ@150c/c	16 ϕ@125c/c
⑨		12 ϕ@200c/c	16 ϕ@200c/c	16 ϕ@200c/c	25 ϕ@200c/c	32 ϕ@200c/c	32 ϕ@180c/c
⑨a		16 ϕ@200c/c	16 ϕ@200c/c	25 ϕ@200c/c	25 ϕ@200c/c	32 ϕ@200c/c	32 ϕ@180c/c
⑩		8 ϕ@300c/c	8 ϕ@300c/c	8 ϕ@300c/c	8 ϕ@300c/c	8 ϕ@300c/c	8 ϕ@300c/c
⑪		16 ϕ@150c/c	16 ϕ@150c/c	16 ϕ@150c/c	16 ϕ@150c/c	16 ϕ@150c/c	16 ϕ@150c/c
⑫		16 ϕ@100c/c	16 ϕ@100c/c	16 ϕ@100c/c	16 ϕ@100c/c	16 ϕ@100c/c	16 ϕ@90c/c
⑬		12 ϕ@100c/c	16 ϕ@200c/c	16 ϕ@200c/c	25 ϕ@200c/c	32 ϕ@200c/c	32 ϕ@180c/c
⑭		12 ϕ@150c/c	12 ϕ@150c/c	12 ϕ@150c/c	12 ϕ@125c/c	16 ϕ@150c/c	16 ϕ@125c/c
Ⓢ1		-	-	-	-	2L-12 ϕ@150c/c	2L-12 ϕ@150c/c

NOTES:-

- ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NO DIMENSION IS TO BE SCALED.
- THE CONCRETE GRADE SHALL BE M30.
- THE REINFORCING BARS SHALL BE OF THERMO MECHANICALLY TREATED/CORROSION RESISTANT STEEL (TMT-CRS) (GRADE DESIGNATION Fe-500D) CONFORMING TO IS:1786 STANDARDS.
- CLEAR COVER TO OUTER MOST STEEL SHALL BE AS UNDER:-
i) EARTH FACE -75mm.
ii) NON EARTH FACE -50mm.
- 100mm DIA WEEP HOLES AT 1000mm C/C STAGGERED HORIZONTALLY AND VERTICALLY SHALL BE PROVIDED IN TWO LAYERS ABOVE G.L IN VERTICAL WALLS OF RETAINING WALLS.
- LAYING, COMPACTION AND EXTENT OF BACKFILL BEHIND TOE WALLS SHALL CONSIST OF SELECTED EARTH CONFORMING TO APPENDIX:6 OF IRC:78-2014 HAVING PROPERTIES C=0, φ≥30° AND DENSITY= 20KN/m³.
- LAPPING OF REINFORCEMENT SHALL BE AVOIDED AS FAR AS POSSIBLE. IN CASE LAPPING OF BARS BECOMES UNAVOIDABLE, MINIMUM LAP LENGTH OF REINFORCEMENT BARS SHALL BE CALCULATED AS eFOLLOW WITH MAXIMUM ALLOWABLE LAPPING (p) OF 50% ONLY.
(IRC:112-2011) (CLAUSE:15.2.5.1)
LAP LENGTH $l_s = \alpha \cdot l_{bnet}$
 α = 1.0 FOR $p \leq 25\%$
 α = 1.15 FOR $25\% \leq p \leq 33\%$
 α = 1.4 FOR $33\% \leq p \leq 50\%$
IN THE CASE OF BUNDLED BARS
LAP LENGTH = $1.3 \times l_s$ (CLAUSE:15.2.7.3)
(IRC:112-2011) (CLAUSE:15.2.3.3)
DEVELOPMENT LENGTH (l_{bnet} OR L_d)
 $l_{bnet} = \alpha \cdot l_b$ ($\alpha = 1.0$)
 $l_b = k \phi$
 $k = 40$ FOR M30 (Fe500D)
 $k = 36$ FOR M35 (Fe500D)
 $k = 34$ FOR M40 (Fe500D)
FOR UNFAVORABLE BOND CONDITION THE l_b SHOULD BE MULTIPLIED BY FACTOR OF 1.43.
FOR $\phi > 32mm$ l_b SHOULD BE INCREASED BY MULTIPLYING FACTOR $(\frac{100}{132-\phi})$
- SAFE BEARING CAPACITY OF SOIL AT FOUNDATION LEVEL SHALL NOT BE LESS THAN 18T/m².
- TO COUNTER FOR THE DEFLECTION TOE WALL SHALL BE CONSTRUCTED TILTED BACK BY 1 IN 100.
- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE GENERAL ARRANGEMENT DRAWING OF THE RESPECTIVE BRIDGES.

SURFACE BAR SHALL BE PROVIDED IN FOOTING AT 12 ϕ @150c/c WHEREVER REQUIRED

<p>EMPLOYER Government of Nepal Ministry of Physical Infrastructure and Transport, Department of Roads, Foreign Co-operation Branch</p>	<p>PROJECT Nepal India Regional Trade and Transport Project (NIRTP) (IDA CREDIT No. 5273 - NEP) Detailed Design of Kathmandu (Nagdhunga) - Naubise - Mugling Road and Bridges</p>	<p>DESIGN CONSULTANT Intercontinental Consultants & Technocrats Pvt.Ltd, A-8, Green Park, New Delhi - 110016 Ph : 4086-3000, Fax 2685-5252 In Joint Venture With Soosung Engineering Co. Ltd., South Korea</p>	Prepared By	M.L.GUPTA	<p>DRAWING TITLE: DIMENSIONAL AND REINFORCEMENT DETAILS OF RCC TOE WALL PACKAGE-I (NAGDHUNGA-NAUBISE)</p>	Scale:	Date: JUNE-2018
			Designed By	NEELAM N.		As Shown	
			Checked By	P.K.KHAN	Drawing No.:		
			Approved By	B.N.SINGH	NIRTP/NAG-MUG/PACKAGE-I/MISC-06		