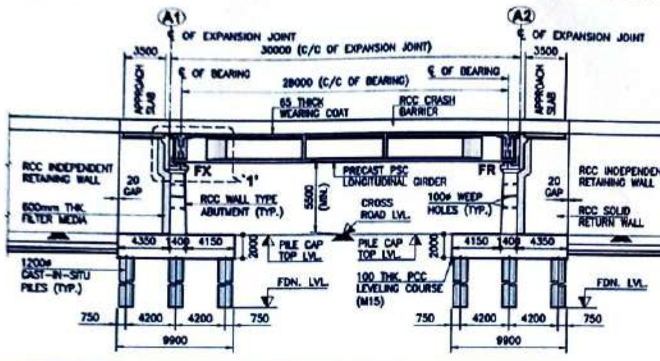
DRAWING INDEX

DRAWING INDEX

FLYOVER AT DESIGN CH.- 579+800

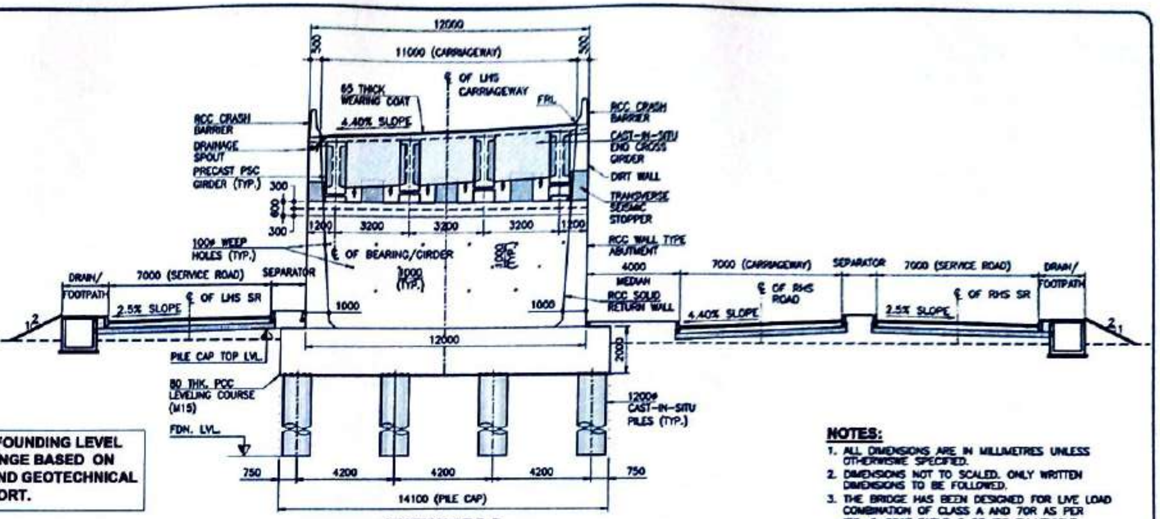
SR. No.	DRAWING TITLE	DRAWING NUMBER
1	GENERAL ARRANGEMENT DRAWING	NHIDCL/MB/JOR-DIB/ST/FLY/579+800/101 (SHEET 1 OF 1)
2	KEY PLAN	NHIDCL/MB/JOR-DIB/ST/FLY/579+800/102 (SHEET 1 OF 1)
3	DIMENSION DETAILS OF ABUTMENT & FOUNDATION FOR A1 & A2	NHIDCL/MB/JOR-DIB/ST/FLY/579+800/201 (SHEET 1 OF 1)
4	REINFORCEMENT DETAILS OF FOUNDATION FOR A1 & A2	NHIDCL/MB/JOR-DIB/ST/FLY/579+800/202 (SHEET 1 OF 1)
5	REINFORCEMENT DETAILS OF ABUTMENT FOR A1 & A2	NHIDCL/MB/JOR-DIB/ST/FLY/579+800/203 (2 SHEETS)
6	DIMENSION DETAILS OF SUPER STRUCTURE	NHIDCL/MB/JOR-DIB/ST/FLY/579+800/301 (2 SHEETS)
7	CABLE & PRESTRESSING DETAILS	NHIDCL/MB/JOR-DIB/ST/FLY/579+800/302 (SHEET 1 OF 1)
8	REINFORCEMENT DETAILS OF LONGITUDINAL GIRDER	NHIDCL/MB/JOR-DIB/ST/FLY/579+800/303 (SHEET 1 OF 1)
9	DETAILS OF END BLOCK AND ANCHORAGES	NHIDCL/MB/JOR-DIB/ST/FLY/579+800/304 (SHEET 1 OF 1)
10	GENERAL NOTES FOR PRESTRESSING GIRDER	NHIDCL/MB/JOR-DIB/ST/FLY/579+800/305 (SHEET 1 OF 1)
11	REINFORCEMENT DETAILS OF END CROSS GIRDER	NHIDCL/MB/JOR-DIB/ST/FLY/579+800/306 (SHEET 1 OF 1)
12	REINFORCEMENT DETAILS OF INTERMEDIATE CROSS GIRDER	NHIDCL/MB/JOR-DIB/ST/FLY/579+800/307 (SHEET 1 OF 1)
13	REINFORCEMENT DETAILS OF RCC DECK SLAB	NHIDCL/MB/JOR-DIB/ST/FLY/579+800/308 (SHEET 1 OF 1)
14	DETAILS OF LOADS FOR POT CUM PTFE BEARING	NHIDCL/MB/JOR-DIB/ST/FLY/579+800/309 (SHEET 1 OF 1)
15	DETAILS OF CRASH BARRIER	NHIDCL/MB/JOR-DIB/ST/FLY/579+800/401 (SHEET 1 OF 1)
16	ARRANGEMENT OF U-TYPE WALL AND RETAINING WALL	NHIDCL/MB/JOR-DIB/ST/FLY/579+800/402 (4 SHEETS)
17	REINFORCEMENT DETAILS OF OF U-TYPE WALL	NHIDCL/MB/JOR-DIB/ST/FLY/579+800/403 (SHEET 1 OF 1)
18	DETAILS OF RETAINING WALL	NHIDCL/MB/JOR-DIB/ST/FLY/579+800/404 (SHEET 1 OF 1)


TO JHORHAT
TO DIBRUGARH
A1
A2
℄ OF EXPANSION JOINT
30000 (C/C OF EXPANSION JOINT)
℄ OF BEARING
28000 (C/C OF BEARING)
65 THICK WEARING COAT
RCC CRASH BARRIER
APPROACH SLAB
RCC INDEPENDENT RETAINING WALL
600mm THK. FILTER MEDIA
20 GAP
FX
FR
'1'
RCC WALL TYPE ABUTMENT (TYP.)
PRECAST PSC LONGITUDINAL GIRDER
100φ WEEP HOLES (TYP.)
CROSS ROAD LVL.
RCC SOLID RETURN WALL
PILE CAP TOP LVL.
100 THK. PCC LEVELING COURSE (M15)
FDN. LVL.
1200φ CAST-IN-SITU PILES (TYP.)
3500
5500 (MIN.)
9900

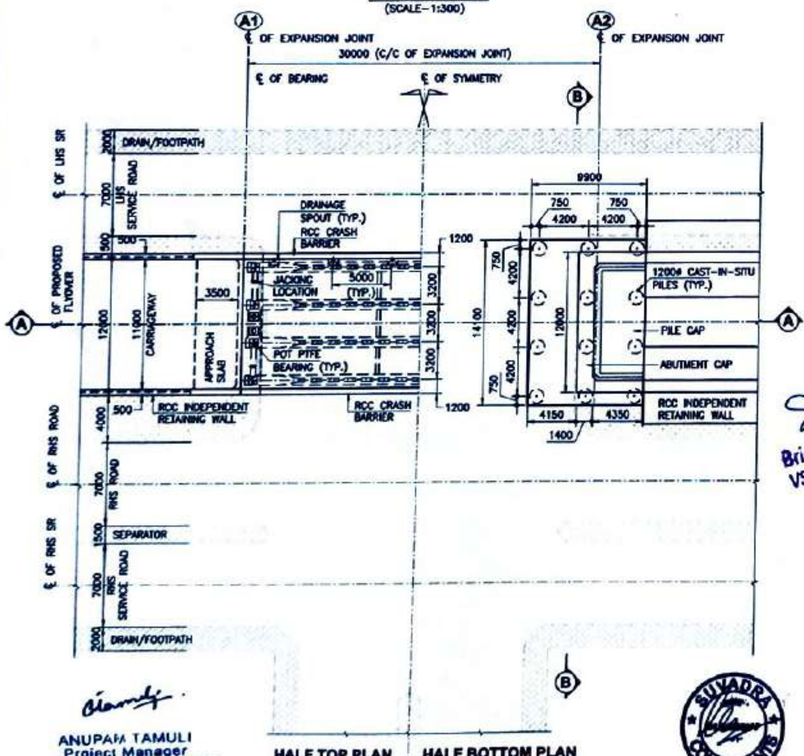
PROPOSED FRL AT LME (IN m)	93.700	93.700	93.700
GROUND LEVEL AT RME (IN m)	85.046	85.006	84.965
CROSS ROAD LEVEL (IN m)		85.000	
CHAINAGE (IN Km)	579+865	579+800	579+895

SECTION AT A-A
(SCALE-1:300)

*** ALL DIMENSION & FOUNDING LEVEL SUBJECTED TO CHANGE BASED ON DETAILED DESIGN AND GEOTECHNICAL INVESTIGATION REPORT.**

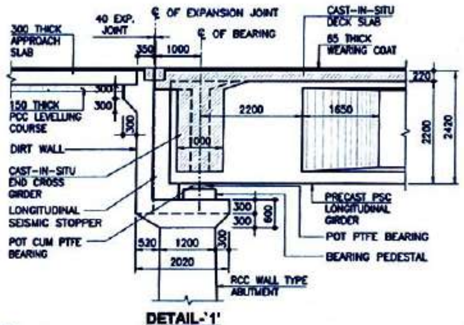

12000
11000 (CARRIAGEWAY)
℄ OF LHS CARRIAGEWAY
65 THICK WEARING COAT
4.40% SLOPE
FRL
RCC CRASH BARRIER
DRAINAGE SPOUT
PRECAST PSC GIRDER (TYP.)
CAST-IN-SITU END CROSS GIRDER
DIRT WALL
TRANSVERSE SEISMIC STOPPER
RCC WALL TYPE ABUTMENT
100φ WEEP HOLES (TYP.)
℄ OF BEARING/GIRDER
SEPARATOR
DRAIN/FOOTPATH
7000 (SERVICE ROAD)
℄ OF LHS SR
2.5% SLOPE
MEDIAN
RCC SOLID RETURN WALL
7000 (CARRIAGEWAY)
℄ OF RHS ROAD
℄ OF RHS SR
PILE CAP TOP LVL.
80 THK. PCC LEVELING COURSE (M15)
FDN. LVL.
1200φ CAST-IN-SITU PILES (TYP.)
14100 (PILE CAP)

SECTION AT B-B
(SCALE-1:150)

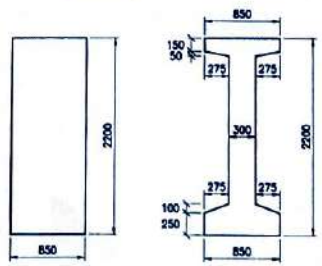

A1
A2
℄ OF EXPANSION JOINT
30000 (C/C OF EXPANSION JOINT)
℄ OF BEARING
℄ OF SYMMETRY
B
A
DRAIN/FOOTPATH
LHS SERVICE ROAD
℄ OF LHS SR
℄ OF PROPOSED FLYOVER
DRAINAGE SPOUT (TYP.)
RCC CRASH BARRIER
JACKING LOCATION
POT PTFE BEARING (TYP.)
APPROACH SLAB
CARRIAGEWAY
RCC INDEPENDENT RETAINING WALL
1200φ CAST-IN-SITU PILES (TYP.)
PILE CAP
ABUTMENT CAP
RHS ROAD
℄ OF RHS ROAD
SEPARATOR
RHS SERVICE ROAD
℄ OF RHS SR

HALF TOP PLAN | **HALF BOTTOM PLAN**

PLAN
(SCALE-1:300)


300 THICK APPROACH SLAB
40 EXP. JOINT
℄ OF EXPANSION JOINT
℄ OF BEARING
CAST-IN-SITU DECK SLAB
65 THICK WEARING COAT
150 THICK PCC LEVELLING COURSE
DIRT WALL
CAST-IN-SITU END CROSS GIRDER
LONGITUDINAL SEISMIC STOPPER
POT CUM PTFE BEARING
PRECAST PSC LONGITUDINAL GIRDER
POT PTFE BEARING
BEARING PEDESTAL
RCC WALL TYPE ABUTMENT

DETAIL-'1'
(SCALE-1:75)



SECTION AT SUPPORT **SECTION AT MID**

DETAILED FOR PRECAST PSC GIRDER
(SCALE-1:40)

LEGEND:-

FRL	FINISHED ROAD LEVEL
GL	GROUND LEVEL
FDN. LVL.	FOUNDING LEVEL
FX	FIXED END
FR	FREE END
LHS	LEFT HAND SIDE
RHS	RIGHT HAND SIDE
SR	SERVICE ROAD

LEVELS:-

ABUTMENT DESIGNATION	PILE CAP TOP LEVEL	FOUNDING LEVEL
A1 AND A2	85.100m	53.150m

DETAILS OF BORE HOLES

BH-A1	BH-A2
RL-83.233	RL-83.072
80.233	78.572
74.233	74.072
58.233	58.072

LEGEND OF BORE LOG

	SILTY CLAYEY SAND (SM-SC)
	SILTY FINE SAND (ML-SM)
	FINE SAND WITH OCCASIONAL GRAVEL SOIL (SM-GP)

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISWE SPECIFIED.
2. DIMENSIONS NOT TO SCALED. ONLY WRITTEN DIMENSIONS TO BE FOLLOWED.
3. THE BRIDGE HAS BEEN DESIGNED FOR LIVE LOAD COMBINATION OF CLASS A AND 70R AS PER IRC: 6-2017 TABLE-2 OR IRC SV VEHICLE WHICHEVER GOVERN.
4. MODERATE CONDITION OF EXPOSURE HAS BEEN CONSIDERED IN DESIGN.
5. CONCRETE SHALL BE DESIGN MIX WITH A MINIMUM 28 DAYS CHARACTERISTIC STRENGTH OF 150mm CUBE AS FOLLOWS:
   a) SUPERSTRUCTURE ____ M45
   b) SUBSTRUCTURE & FOUNDATION ____ M35
   c) CRASH BARRIER ____ M40
   d) APPROACH SLAB AND RAILING ____ M30
   e) PCC LEVELING ____ M15
   F) PEDESTAL & STOPPER ____ M40
6. MINIMUM COVER TO ANY REINFORCEMENT SHALL BE AS INDICATED BELOW:
   a) SUPERSTRUCTURE ____ 40mm
   b) SUBSTRUCTURE (EARTH FACE) ____ 75mm
   c) SUBSTRUCTURE (OPEN FACE) ____ 50mm
   d) FOUNDATION ____ 75mm
7. REINFORCEMENT BAR SHALL CONFORMING TO IS: 1786-1985 OF GRADE Fe-500D.
8. 65mm THK. WEARING COURSE COMPRESSING OF 40mm THICK ASPHALTIC CONCRETE OVER LAID WITH 25mm THK. MASTIC ASPHALT SHALL BE PROVIDED AS PER SECTION 2700 OF MORT&H.
9. 100mm DIA WEEP HOLES AT 1000mm C/C HORIZONTALLY AND VERTICALLY SHALL BE PROVIDED IN VERTICAL WALL OF BOX AND RETAINING WALL.
10. 600 THICK FILTER MEDIA BEHIND BOX AND RETAINING WALL SHALL BE PROVIDED AS PER "MoRT&H" SPECIFICATION.
11. MINIMUM ANCHORAGE LENGTH SHALL BE AS UNDER:
    CONCRETE GRADE - M-30 - 40 x DIA OF BAR
    CONCRETE GRADE - M-35 - 36 x DIA OF BAR
    CONCRETE GRADE - M-40 - 34 x DIA OF BAR
    FOR UNFAVOURABLE BOND CONDITION THE ABOVE VALUES SHOULD BE MULTIPLIED BY FACTOR OF 1.43.
12. WATER TO BE USED IN CONCRETING AND CURING SHALL CONFIRM TO CLAUSE 18.4.5 OF IRC:112-2011.
13. LAYING, COMPACTION AND EXTEND OF BACKFILL BEHIND BOX SHALL CONSIST OF SELECTED EARTH CONFORMING TO APPENDIX: 6 OF IRC: 78-2014 HAVING PROPERTIES C=0, φ=30°, δ=20° & γd=20KN/m³.
14. FILLER TYPE EXPANSION JOINTS SHALL BE PROVIDED AS PER PROVISION OF SP-69.
15. THE PROPOSED STRUCTURE LIES IN SEISMIC ZONE-v.
16. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH CONJUNCTION WITH RELEVANT PLAN AND PROFILE DRAWING.
17. ALL CHAINAGE, FRL, GL SHALL BE CONFIRMED AT SITE PRIOR TO EXECUTION.
18. FOR APPROACH SLAB, DRAINAGE SPOUT, CRASH BARRIER AND RAILING REFER SEPARATE DRAWINGS.

ANUPAM TAMULI
Project Manager
M/S Manuranjan Brahma
Moran Bypass to Bogibeel Junction
(NHIDCL, 4-Lane Project)

Bridge Engineer
VSPL, Sivasagar

SUVADRA CONSULTANTS

REV. NO	DATE	DESCRIPTION
R0	MAR, 2020	INITIAL SUBMISSION

CLIENT: NHIDCL

AUTHORITY ENGINEER: VOYANTS SOLUTIONS PVT. LTD.

EPC CONTRACTOR: M/S MANARANJAN BRAHMA

SAFETY CONSULTANT: ARKITECHNO CONSULTANTS (INDIA) PVT. LTD.

PROOF CONSULTANT: INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI

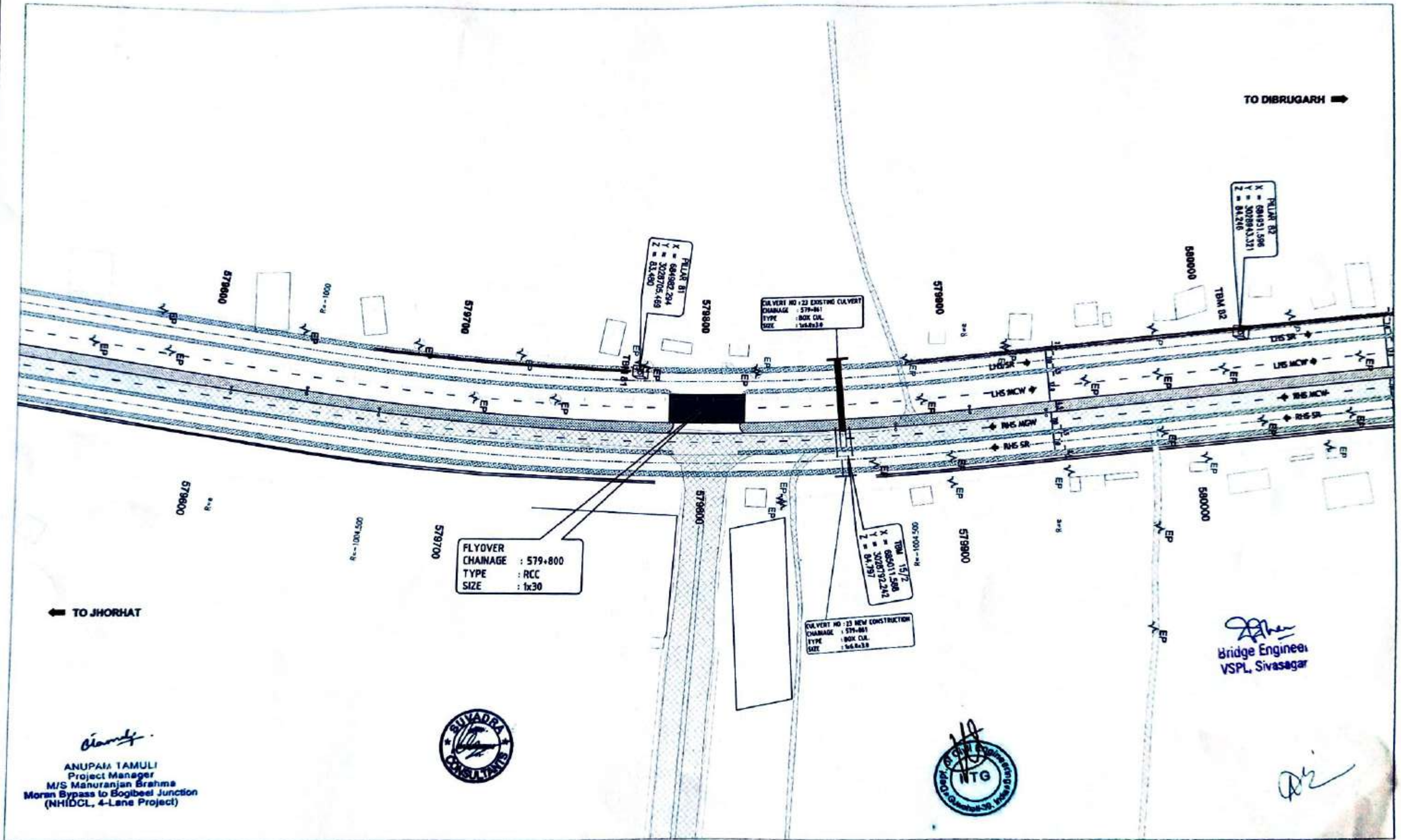
PROJECT: **MORAN BYPASS ROAD (NH-37)**
FOUR LANING OF NH-37 FROM END OF MORAN BYPASS (KM [illegible]) TO BOGIBEEL JUNCTION NEAR LAPETKATA (KM [illegible]) IN THE STATE OF ASSAM UNDER SARDP-NE, PHASE 'A' ON EPC MODE- BALANCE WORK.

DRAWN	S.S.
DESIGNED	M.K.
CHECKED	B.D.
DATE	MAR, 2020

TITLE: GENERAL ARRANGEMENT DRAWING FOR FLYOVER AT DESIGN CH. 579+800

SCALE: AS SHOWN

Team Leader
Voyants Solutions Pvt. Ltd.
Sivasagar, Assam



KEY PLAN

REFERENCE DRAWING:-

1. GENERAL ARRANGEMENT DRAWING NHIDCL/JOR-DIB/ST/FLY/579+800/101 (SH. 1 OF 1)

REV. NO	DATE	DESCRIPTION
R0	FEB, 2020	INITIAL SUBMISSION

CLIENT: NHIDCL

AUTHORITY ENGINEER: VOYANTS SOLUTIONS PVT. LTD

Team Leader
Voyants Solutions Pvt. Ltd.
Sivasagar, Assam

EPC CONTRACTOR: M/S MANURANJAN BRAHMA, WARD NO.4, DEPOT ROAD, KOKRAJHAR, DIST KOKRAJHAR, PIN 783370, ASSAM

SAFETY CONSULTANT: ARKITECHNO CONSULTANTS (INDIA) PVT. LTD.

PROOF CONSULTANT: INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI

PROJECT: **MORAN BYPASS ROAD (NH-37)**
FOUR LANING OF NH-37 FROM END OF MORAN BYPASS (KM 582.520) TO BOGIBEEL JUNCTION NEAR LAPETKETA (KM 581.700) IN THE STATE OF ASSAM UNDER SARDP-NE, PHASE 'A' ON EPC MODE- BALANCE WORK.

DRAWN	G.S.
DESIGNED	M.K.
CHECKED	B.O.
DATE:	FEB, 2020

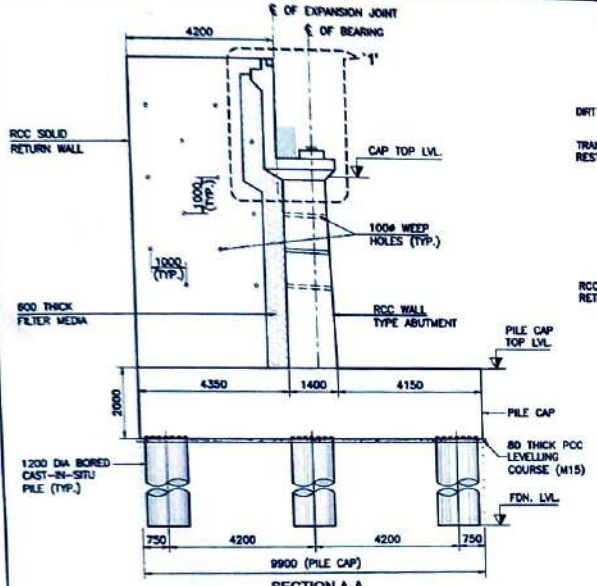
TITLE: KEY PLAN FOR FLYOVER AT DESIGN CH. 579+800

SCALE: AS SHOWN

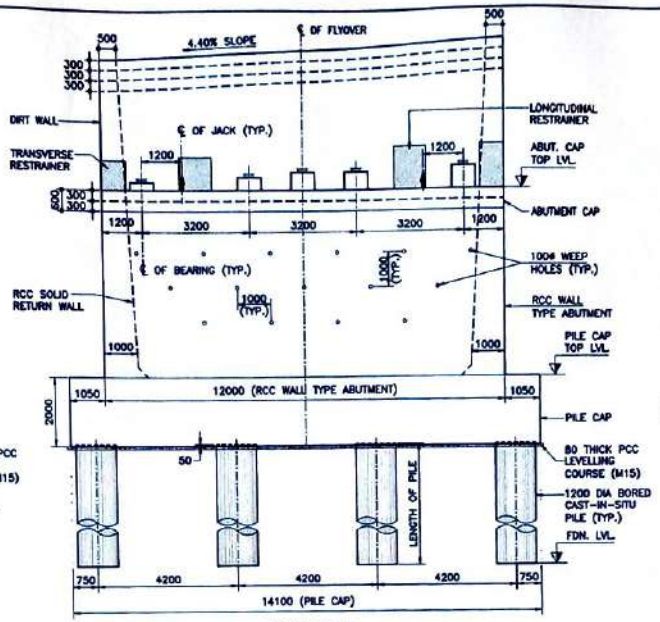
DWG. NO: NHIDCL/JOR-DIB/ST/FLY/579+800/100

DESIGN DIRECTOR:

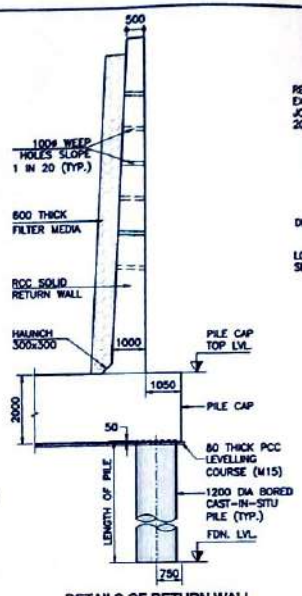
REVISION: R0



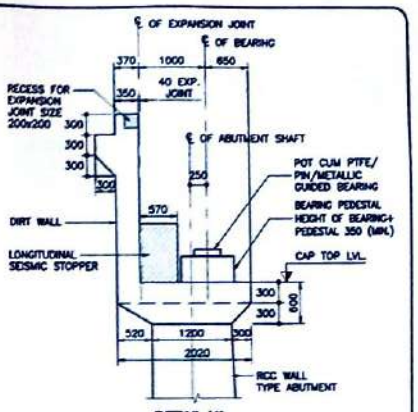
SECTION A-A
(SCALE-1:100)



SECTION B-B
(SCALE-1:100)

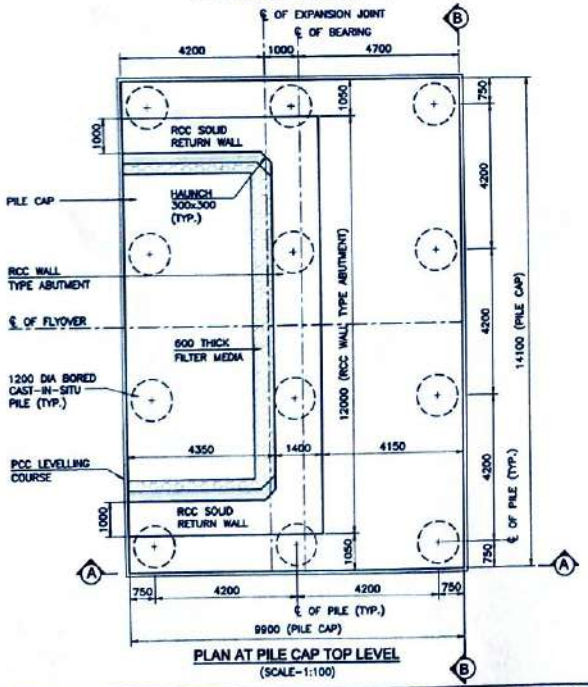


DETAILS OF RETURN WALL
(SCALE-1:100)

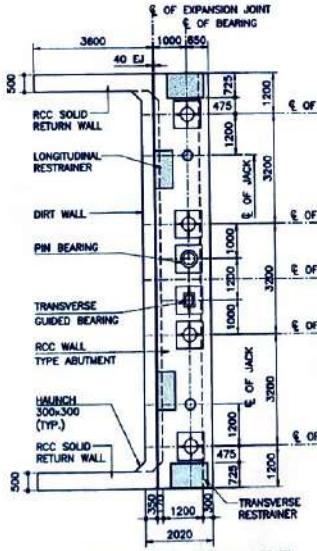


DETAIL-'1'
(SCALE-1:50)

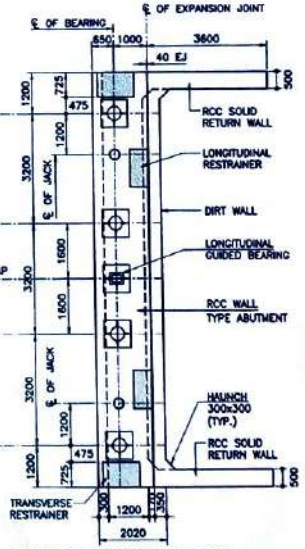
TRAFFIC DIRECTION



PLAN AT PILE CAP TOP LEVEL
(SCALE-1:100)



PLAN AT ABUTMENT CAP LEVEL
(SCALE-1:100)



PLAN AT ABUTMENT CAP LEVEL
(SCALE-1:100)

ANUPAM TAMULI
Project Manager
M/S Manuranjan Brahma
Moran Bypass to Boglbeel Junction
(NHIDCL, 4-Lane Project)

Bridge Engineer
VSPL, Sivasagar

LEVELS:-

ABUTMENT DESIGNATION	PILE CAP TOP LEVEL	FOUNDING LEVEL
A1 AND A2	85.100m	53.150m

NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETERS, LEVELS ARE IN METERS UNLESS OTHERWISE MENTIONED.
2. NO DIMENSION SHALL BE MEASURED FROM THE DRAWINGS. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
3. THE REINFORCEMENT SHALL BE HYSD BARS OF GRADE DESIGNATION Fe 500D CONFORMING TO IS 1786-2008.
4. CONCRETE SHALL BE DESIGN MIX WITH A MINIMUM 28 DAYS CHARACTERISTIC CUBE STRENGTH FOR DIFFERENT ELEMENTS AS FOLLOWS:
   a. RCC ABUT. & ABUT. CAP — M35
   b. RCC PILE & PILE CAP — M35
   c. RCC CRASH BARRIER — M40
   d. PCC LEVELING COURSE — M15
   e. RCC PEDESTALS AND RESTRAINER — M40
5. CLEAR COVER TO OUTER STEEL SHALL BE AS FOLLOWS:-
   a. RCC ABUT. STEM EARTH SIDE — 75mm
   b. RCC ABUT. OUTER SIDE — 40mm
   c. RCC ABUT. CAP — 40mm
   d. RCC RESTRAINERS — 40mm
   e. RCC PILE & PILE CAP — 75mm
   f. RCC CRASH BARRIER — 40mm
   g. RCC PEDESTAL — 40mm
6. 600MM THICK FILTER MEDIA SHALL BE PROVIDED BEHIND SOLID ABUTMENT WALL & RETURN WALLS.
7. BACK FILLING BEHIND WALLS/ABUTMENT SHALL CONSISTS OF SELECTED EARTH CONFORMING TO APPENDIX 6 OF IRC:78-2014 HAVING PROPERTIES C=0, ϕ>=30°, γ=2.0t/cu.m.
8. ALL SOLID WALLS RETAINING THE EARTH SHALL BE PROVIDED WITH WEEP HOLES (100MM DIA AND SLOPE 1V:20H) STARTING 150MM ABOVE THE GROUND LEVEL AND SPACED 1000MM C/C BOTH HORIZONTALLY AND VERTICALLY IN STAGGERED MANNER.
9. PERMANENT STEEL LINER 6MM THK. SHALL BE PROVIDED UPTO MAX. SCOUR LEVEL.
10. LAPPING OF REINFORCEMENT SHALL BE AVOIDED AS FAR AS POSSIBLE. IN CASE LAPPING OF BARS BECOME UNAVOIDABLE, LAP LENGTH SHALL BE PROVIDED AS PER CLAUSE 15.2.5 IRC:112-2011:
    * αx36ϕ (GRADE M35) FAVOURABLE CONDITION
    * αx1.43x36ϕ (GRADE M35) UNFAVOURABLE CONDITION

PERCENTAGE OF LAPPED BARS RELATIVE TO TOTAL CROSS-SECTIONAL AREA	<25%	33%	50%	>50%
α	1	1.15	1.4	1.5

11. ANCHORAGE LENGTH SHALL BE AS PER CLAUSE 15.2.3 & 15.2.4, IRC:112-2011:
    * 36ϕ (GRADE M35) FAVORABLE CONDITION
    * 1.43x36ϕ (GRADE M35) UNFAVORABLE CONDITION

REFERENCE DRAWING:-

1. GENERAL ARRANGEMENT DRAWING NHIDCL/MB/JOR-DIB/ST/FLY/579+800/101 (SH. 1 OF 1)
2. REINFORCEMENT DETAILS OF FOUNDATION FOR ABUTMENT A1 & A2 NHIDCL/MB/JOR-DIB/ST/FLY/579+800/202 (SH. 1 OF 1)
3. REINFORCEMENT DETAILS OF ABUTMENT A1 & A2 NHIDCL/MB/JOR-DIB/ST/FLY/579+800/203 (2 SHEETS)

REV. NO	DATE	DESCRIPTION
R0	FEB, 2020	INITIAL SUBMISSION

CLIENT: NHIDCL

AUTHORITY ENGINEER: VOYANTS SOLUTIONS PVT. LTD.

EPC CONTRACTOR: M/S MANARANJAN BRAHMA

SAFETY CONSULTANT: ARKITECHNO CONSULTANTS (INDIA) PVT. LTD.

PROOF CONSULTANT: INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI

PROJECT: MORAN BYPASS ROAD (NH-37)
FOUR LANING OF NH-37 FROM END OF MORAN BYPASS (KM 562.500) TO BOGIBEEL JUNCTION NEAR LAPETKETA (KM 581.700) IN THE STATE OF ASSAM UNDER BARGE-ME, PHASE 'A' ON EPC MODE-BALANCE WORK.

DRAWN	S.S.
DESIGNED	M.K.
CHECKED	B.D.
DATE: FEB, 2020	

TITLE: DIMENSION DETAILS OF ABUTMENT & FOUNDATION FOR A1 & A2 FOR FLYOVER AT CH. 579+800

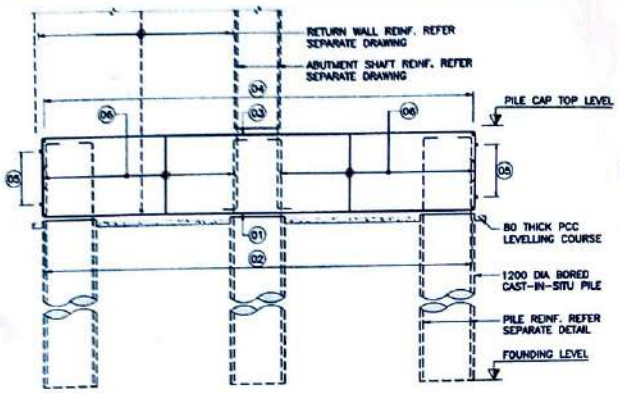
SCALE: AS SHOWN

DRG. NO: NHIDCL/MB/JOR-DIB/ST/FLY/579+800/201

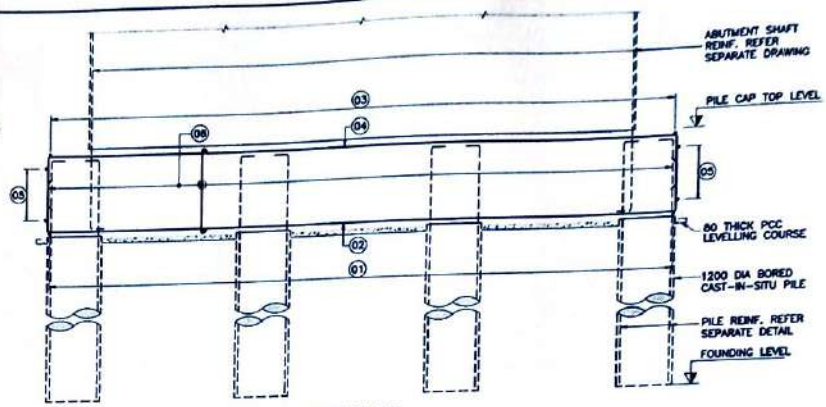
DESIGN DIRECTOR:

REVISION: R0

Team Leader
Voyants Solutions Pvt. Ltd.
Sivasagar, Assam



SECTION A-A
(SCALE-1:75)



SECTION B-B
(SCALE-1:75)

REINFORCEMENT SCHEDULE:-

BAR MKD.	BAR DIA.	SPACING/NOS.	SHAPE
PILE CAP:-			
01	32	100 C/C	1000 — 1000
02	32	100 C/C	1000 — 1000
03	20	100 C/C	1000 — 1000
04	16	100 C/C	1000 — 1000
05	12	5 NOS.	
06	12	1L-@100 IN TRANSV. DIRECTION @200c/c IN LONG. DIRECTION	
PILE:-			
07	32	19 NOS. (1st LAYER)	300
7a	32	19 NOS. (2nd LAYER)	300
08	16	100 C/C	
8a	16	120 C/C	

IMPORTANT NOTE:

1. REINFORCEMENT DETAILS TO BE REFERRED ONLY FROM TABLE.
2. BARS SHALL BE PROVIDED IN BUNDLES WHEREVER REQUIRED TO ENSURE PROPER COMPACTION OF CONCRETE.
3. IN CASE OF BUNDLED BARS ø SHALL BE REPLACED WITH øn FOR LAP LENGTH & ANCHORAGE LENGTH CALCULATION. (øn = ø √n; WHERE ø = DIA. OF BAR BEING BUNDLED & n=NO. OF BARS IN BUNDLE)

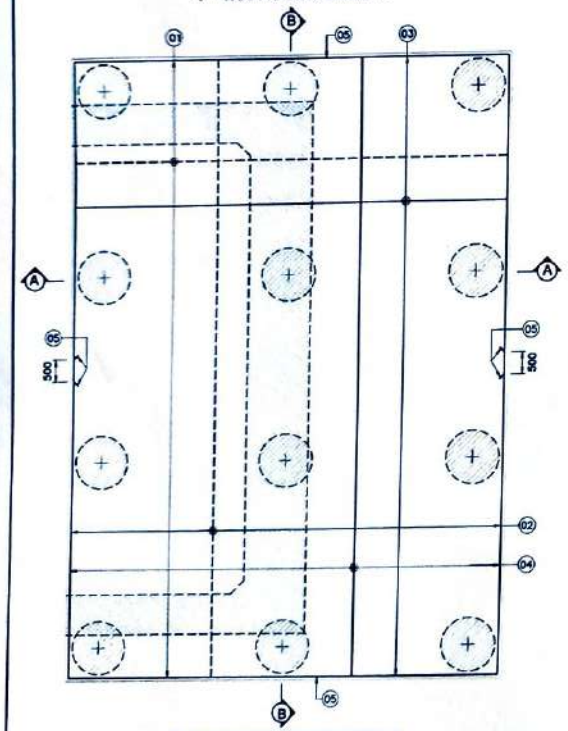
LEGEND:-

BAR ON TOP FACE
BAR ON BOTTOM FACE

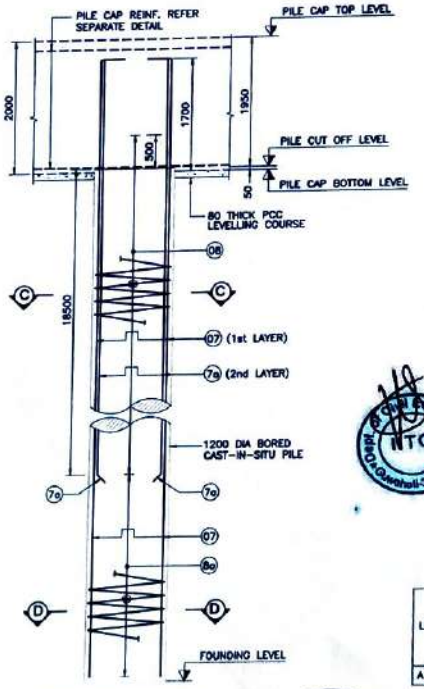
REFERENCE DRAWING:-

1. DIMENSION DETAILS OF ABUTMENT & FOUNDATION FOR A1 & A2 NHIDCL/MB/JOR-DIB/ST/FLY/579+800/201 (SHEET 1 OF 1)

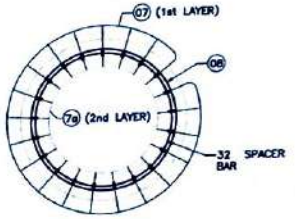
TRAFFIC DIRECTION



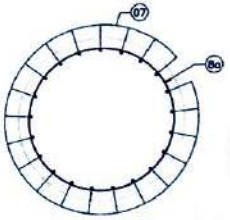
PLAN SHOWING REINFORCEMENT DETAIL OF PILE CAP
(SCALE-1:75)



REINF. DETAIL OF PILE
(SCALE-1:50)

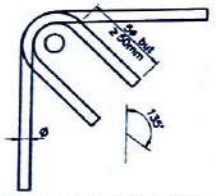


SECTION C-C
(SCALE-1:25)



SECTION D-D
(SCALE-1:25)

TYPICAL DETAIL INDICATING ANCHORAGE OF LINK
(SCALE-1:2)



TYPICAL DETAIL INDICATING ANCHORAGE OF STIRRUP
(SCALE-1:2)

LOCATION	LENGTH OF PILE (m)	DESIGN MAX. VERTICAL LOAD (t)		VERTICAL LOAD CARRYING CAPACITY (t) (AS PER GEOTECH REPORT)		LATERAL DEFLECTION OF PILE AT SCOUR LEVEL (PILE CAP BTM. LVL.) (mm)	PERMISSIBLE LATERAL DEFLECTION OF PILE AT SCOUR LEVEL (PILE CAP BTM. LVL.) (mm)
		NORMAL	SEISMIC	NORMAL	SEISMIC		
A1 & A2	30.000	226.000	445.000	467.000	583.750	5.0	20.0

LEGEND:-

REINFORCEMENT AT TOP FACE	———
REINFORCEMENT AT BOTTOM FACE	- - - - - - - - - -

ANUPAM TAMULI
Project Manager
M/S Manuranjan Brahma
Moran Bypass to Bogibeel Junction
(NHIDCL, 4-Lane Project)

Bridge Engineer
VSPL, Sivasagar

REV. NO	DATE	DESCRIPTION
R0	FEB, 2020	INITIAL SUBMISSION

CLIENT: NHIDCL

AUTHORITY ENGINEER : VOYANTS SOLUTIONS PVT. LTD.

EPC CONTRACTOR: M/S MANURANJAN BRAHMA

SAFETY CONSULTANT: ARKITECHNO CONSULTANTS (INDIA) PVT. LTD

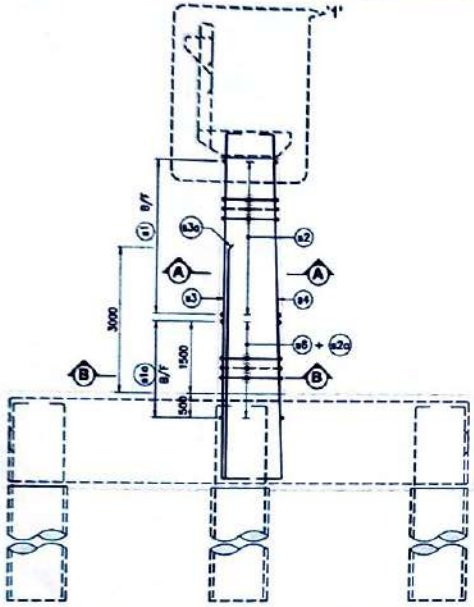
PROOF CONSULTANT: INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI

PROJECT: MORAN BYPASS ROAD (NH-37)
FOUR LANING OF NH-37 FROM END OF MORAN BYPASS (KM 562.525) TO BOGIBEEL JUNCTION NEAR LAPETKETA (KM 581.700) IN THE STATE OF ASSAM UNDER BANP-NE, PHASE 'A' ON EPC MODE- BALANCE WORK

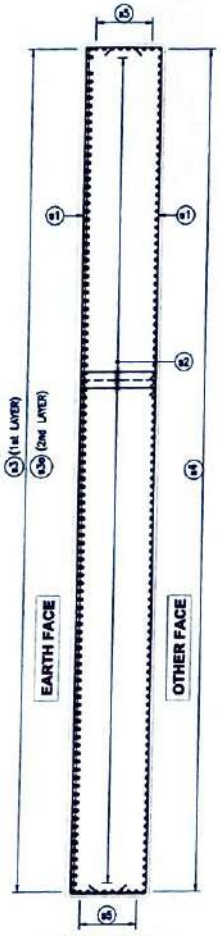
DRAWN	S.S.
DESIGNED	M.K.
CHECKED	S.G.
DATE: FEB, 2020	

TITLE: REINFORCEMENT DETAILS OF FOUNDATION FOR A1 & A2 FOR FLYOVER AT CH. 579+800
SCALE: AS SHOWN
DRG. NO: NHIDCL/MB/JOR-DIB/ST/FLY/579+800/202
DESIGN DIRECTOR:
REVISION: R0

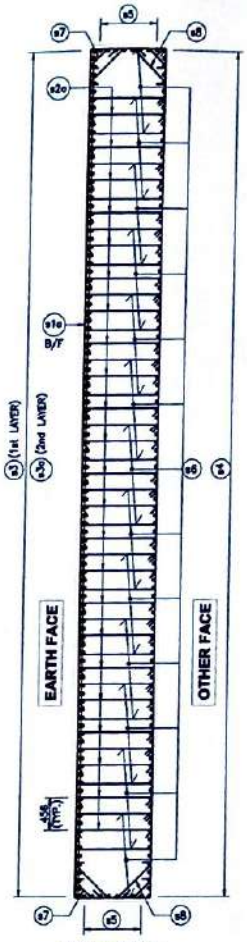
Team Leader
Voyants Solutions Pvt. Ltd.
Sivasagar, Assam



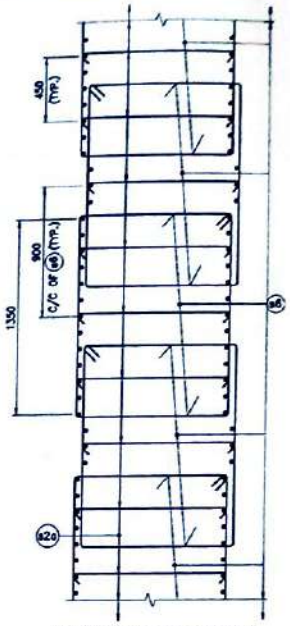
REINFORCEMENT DETAILS OF ABUTMENT
(SCALE-1:75)



SECTION A-A
(SCALE-1:50)



SECTION B-B
(SCALE-1:50)

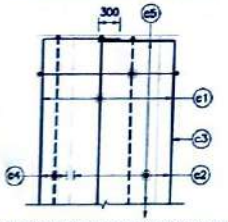


ENLARGE DETAILS OF BAR MARK NO. s2a AND s6
(SCALE-1:25)

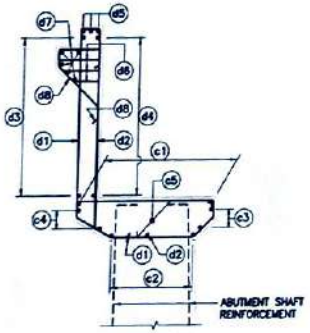
REINFORCEMENT SCHEDULE:-

BAR MKD.	BAR DIA.	SPACING/NOS.	SHAPE
ABUTMENT SHAFT:-			
s1	16	100 C/C	550 … 550
s1a	16	100 C/C	550 … 550
s2	10	LINKS TIED TO ALTERNATE VERTICAL BARS 200 C/C VERTICALLY	
s2a	10	LINKS TIED AT EVERY 400 mm (HORZ.) VERTICALLY AT 200mm C/C	
s3	32	100 NOS.	500 / 500
s3a	32	100 NOS.	500
s4	16	100 NOS.	500 … 500
s5	16	8 NOS.	500 / 500
s6	10	2 LEGGED STIRRUPS PLACED 200 C/C VERTICALLY (CLOSED OVER LAPPING STIRRUPS)	SIZE VARIES
s7	12	200 C/C IN VERTICAL DIRECTION	
s8	12	200 C/C IN VERTICAL DIRECTION	
ABUTMENT CAP:-			
c1	12	18 NOS.	250 … 250
c2	12	12 NOS.	400 … 400
c3	12	8 NOS.	
c4	12	10 NOS.	
c5	16	2 LEGGED STIRRUPS @ 100 C/C	
c6	12	2 LEGGED STIRRUPS @ 400 C/C (TRANS.) IN 5 LAYERS VERTICALLY	
DIRT WALL:-			
d1	25	120 C/C	200 / 500
d2	16	150 C/C	200 … 500
d3	10	200 C/C	
d4	10	200 C/C	
d5	16	3 NOS.	300 … 300
d6		2 LEGGED STIRRUPS @ 400 C/C TRANS. (3 LAYERS IN VERTICALLY IN STAGGERED MANNER	100 / 200
d7	12	5 NOS.	
d8	12	100 C/C	200 … 200

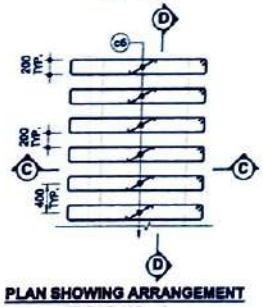
TRAFFIC DIRECTION



PLAN SHOWING REINFORCEMENT ARRANGEMENT IN ABUTMENT CAP
* BAR MARKS (s6) NOT SHOWN FOR CLARITY
(SCALE-1:50)

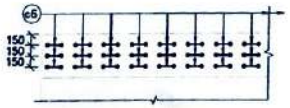


DETAIL-'1'
SHOWING REINF. DETAILS OF ABUTMENT CAP AND DIRT WALL
(SCALE-1:50)



PLAN SHOWING ARRANGEMENT OF BAR NO. c6
(SCALE-1:50)

SECTION C-C
(SCALE-1:50)



SECTION D-D
(SCALE-1:50)

LEGENDS	
REINF. AT TOP FACE	———
REINF. AT BOTTOM FACE	– – – –
B/F	BOTH FACE

NTG

SUVADRA CONSULTANTS

Bridge Engineer
VSPL, Sivasagar

ANUPAM TAMULI
Project Manager
M/S Manuranjan Brahma
Moran Bypass to Boglbeel Junction
(NHIDCL, 4-Lane Project)

NOTES:-

1. ALL DIMENSION ARE IN MILLIMETERS, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSION TO BE FOLLOWED.
2. GRADE OF REINFORCING STEEL SHALL BE Fe-5000 CONFORMING TO IS: 1786.

REFERENCE DRAWINGS:-

1. REINFORCEMENT DETAILS OF ABUTMENT AND FOUNDATION FOR A1 AND A2.
   NHIDCL/MB/JOR-DIB/ST/FLY/579+800/201 (SH. 1 OF 1)
1. REINFORCEMENT DETAILS OF ABUTMENT A1 AND A2.
   NHIDCL/MB/JOR-DIB/ST/FLY/579+800/203 (SH. 2 OF 2)

REV. NO	DATE	DESCRIPTION
R0	FEB, 2020	INITIAL SUBMISSION

CLIENT: NHIDCL

AUTHORITY ENGINEER: VOYANTS SOLUTIONS PVT. LTD.

EPC CONTRACTOR: M/S MANARANJAN BRAHMA
WARD NO.4, DEPOT ROAD, KOKRAJHAR, DIST: KOKRAJHAR, PIN: 783370, ASSAM

SAFETY CONSULTANT: ARKITECHNO CONSULTANTS (INDIA) PVT. LTD.

PROOF CONSULTANT: INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI

PROJECT: MORAN BYPASS ROAD (NH-37)
FOUR LANING OF NH-37 FROM END OF MORAN BYPASS (KM 552.000) TO BOGIBEEL JUNCTION NEAR LAPETHETA (KM 561.700) IN THE STATE OF ASSAM UNDER BANDHE, PHASE 'A' ON EPC MODE- BALANCE WORK.

DRAWN	S.S.
DESIGNED	M.K.
CHECKED	B.G.
DATE:	FEB, 2020

TITLE: REINFORCEMENT DETAILS OF ABUTMENT A1 & A2 FOR FLYOVER AT CH. 579+800

SCALE: AS SHOWN

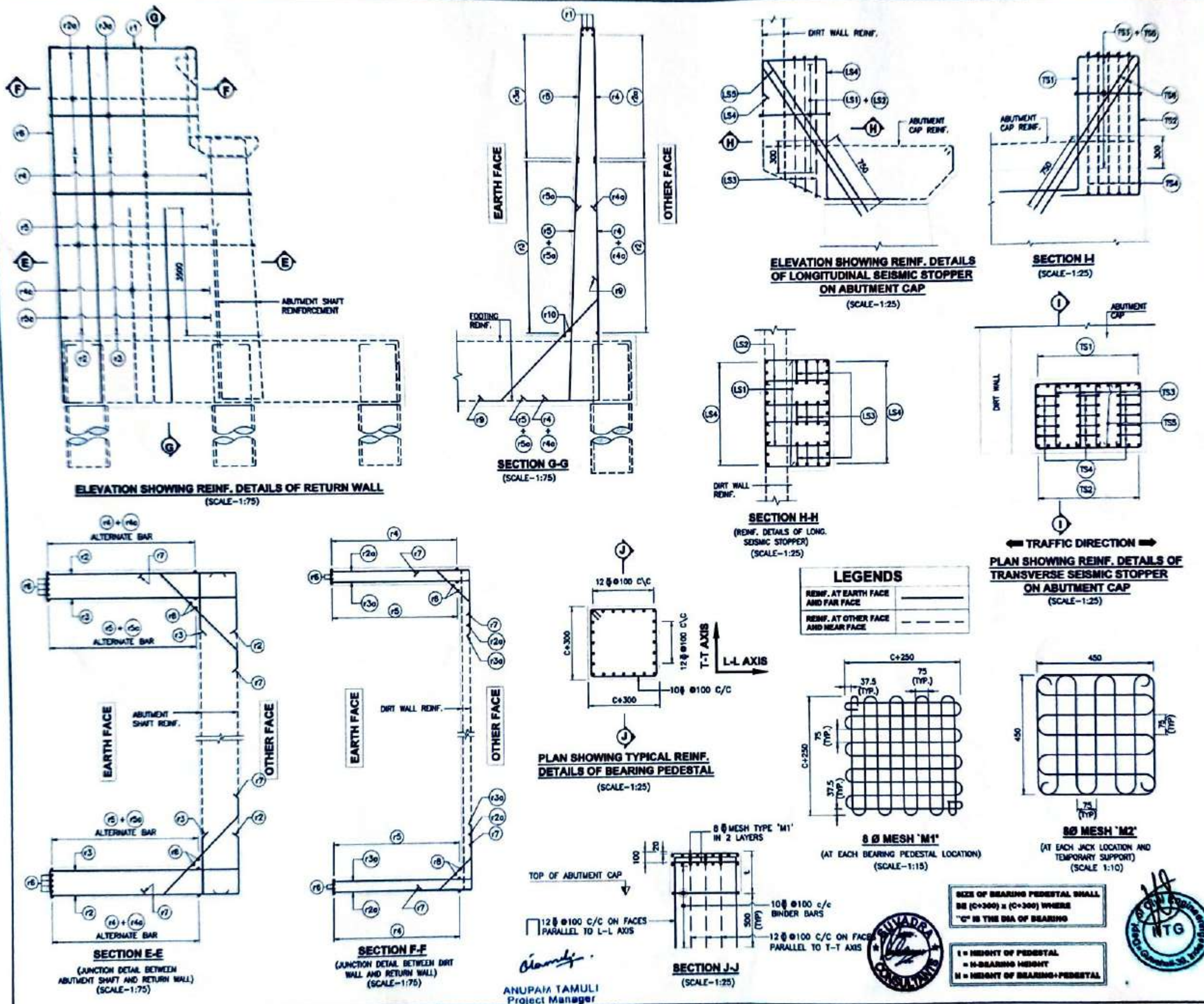
DRG. NO.: NHIDCL/MB/JOR-DIB/ST/FLY/579+800/203

DESIGN DIRECTOR:

REVISION: R0

SHEET NO.: 2 OF 2

Team Leader
Voyants Solutions Pvt. Ltd.
Sivasagar, Assam


ELEVATION SHOWING REINF. DETAILS OF RETURN WALL
(SCALE-1:75)
ABUTMENT SHAFT REINFORCEMENT
SECTION G-G
(SCALE-1:75)
EARTH FACE
OTHER FACE
FOOTING REINF.
ELEVATION SHOWING REINF. DETAILS OF LONGITUDINAL SEISMIC STOPPER ON ABUTMENT CAP
(SCALE-1:25)
DIRT WALL REINF.
ABUTMENT CAP REINF.
SECTION I-I
(SCALE-1:25)
SECTION H-H
(REINF. DETAILS OF LONG. SEISMIC STOPPER)
(SCALE-1:25)
PLAN SHOWING REINF. DETAILS OF TRANSVERSE SEISMIC STOPPER ON ABUTMENT CAP
(SCALE-1:25)
TRAFFIC DIRECTION
SECTION E-E
(JUNCTION DETAIL BETWEEN ABUTMENT SHAFT AND RETURN WALL)
(SCALE-1:75)
ALTERNATE BAR
ABUTMENT SHAFT REINF.
SECTION F-F
(JUNCTION DETAIL BETWEEN DIRT WALL AND RETURN WALL)
(SCALE-1:75)
DIRT WALL REINF.
PLAN SHOWING TYPICAL REINF. DETAILS OF BEARING PEDESTAL
(SCALE-1:25)
12 Ø @100 C\C
10Ø @100 C/C
T-T AXIS
L-L AXIS
LEGENDS
REINF. AT EARTH FACE AND FAR FACE
REINF. AT OTHER FACE AND NEAR FACE
8 Ø MESH 'M1'
(AT EACH BEARING PEDESTAL LOCATION)
(SCALE-1:15)
8Ø MESH 'M2'
(AT EACH JACK LOCATION AND TEMPORARY SUPPORT)
(SCALE 1:10)
SECTION J-J
(SCALE-1:25)
TOP OF ABUTMENT CAP
8 Ø MESH TYPE 'M1' IN 2 LAYERS
10Ø @100 c/c BINDER BARS
12 Ø @100 C/C ON FACES PARALLEL TO L-L AXIS
12 Ø @100 C/C ON FACES PARALLEL TO T-T AXIS

SIZE OF BEARING PEDESTAL SHALL BE (C+300) x (C+300) WHERE "C" IS THE DIA OF BEARING

t = HEIGHT OF PEDESTAL
= H-BEARING HEIGHT
H = HEIGHT OF BEARING+PEDESTAL

REINFORCEMENT SCHEDULE:-

BAR MKD.	BAR DIA.	SPACING/NOS.	SHAPE
RETURN WALL:-			
r1	32	3 NOS.	300 700
r2	16	150 C/C	300 1500
r2a	16	150 C/C	300 1500
r3	20	150 C/C	300 1500
r3a	20	150 C/C	300 1500
r4	16	200 C/C (ALTERNATE)	300 1500
r4a	16	200 C/C (ALTERNATE)	1500
r5	20	200 C/C (ALTERNATE)	300 1500
r5a	20	200 C/C (ALTERNATE)	1500
r6	16	2 NOS.	500
r7	10	300 C/C	500 500
r8	12	2 NOS.	
r9	10	300 C/C	500 500
r10	12	2 NOS.	

REINFORCEMENT SCHEDULE:-

BAR MKD.	BAR DIA.	SPACING/NOS.	SHAPE
LONGITUDINAL SEISMIC STOPPER:-			
LS1	2 LEGGED 16 Ø STIRRUPS @ 200 C/C VERTICALLY		
LS2	16 Ø LINKS TIED TO ALTERNATE VERTICAL BARS SPACED @ 200 C/C VERTICALLY		
LS3	3 LAYERS OF 16 Ø 6 LEGGED STIRRUPS		
LS4	32	11 NOS.	300 500
LS5	25 Ø 22 NOS. IN 2 LAYERS		
TRANSVERSE SEISMIC STOPPER:-			
TS1	25	11 NOS.	750
TS2	12	11 NOS.	750
TS3	16 Ø LINKS TIED TO ALTERNATE VERTICAL BARS SPACED @ 200 C/C VERTICALLY		
TS4	5 LAYERS OF 16 Ø 6 LEGGED STIRRUPS		
TS5	2 LEGGED 16 Ø STIRRUPS @ 200 C/C VERTICALLY		
TS6	25 Ø 22 NOS. IN 2 LAYERS		

NOTES:-

1. ALL DIMENSION ARE IN MILLIMETERS, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSION TO BE FOLLOWED.
2. FOR OTHER NOTES REFER SHEET NO. 1 OF 3 OF THIS DRAWING.

REFERENCE DRAWINGS:-

1. REINFORCEMENT DETAILS OF ABUTMENT A1 AND A2. NHIDCL/MB/JOR-DIB/ST/FLY/579+800/203 (SH. 1 OF 2)

Bridge Engineer
VSPL, Sivasagar

ANUPAM TAMULI
Project Manager

Team Leader
Voyants Solutions Pvt. Ltd.
Sivasagar, Assam

REV. NO	DATE	DESCRIPTION
R0	FEB, 2020	INITIAL SUBMISSION

CLIENT: NHIDCL

AUTHORITY ENGINEER: VOYANTS SOLUTIONS PVT. LTD.

EPC CONTRACTOR: ACTION CONSULTANT: ARKITECHNO CONSULTANTS (INDIA) PVT. LTD.

PROOF CONSULTANT: INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI

PROJECT: MORAN BYPASS ROAD (NH-37)
FOUR LANING OF NH-37 FROM END OF MORAN BYPASS (KM 562.525) TO BOGIBEEL JUNCTION NEAR LAPETKATA (KM 581.700) IN THE STATE OF ASSAM UNDER SARDP-NE, PHASE 'A' ON EPC MODE- BALANCE WORK

DRAWN	S.S.
DESIGNED	M.K.
CHECKED	B.G.
DATE:	FEB, 2020

TITLE: REINFORCEMENT DETAILS OF ABUTMENT A1 & A2 FOR FLYOVER AT CH. 579+800

SCALE: AS SHOWN

DRG. NO: NHIDCL/MB/JOR-DIB/ST/FLY/579+800/203

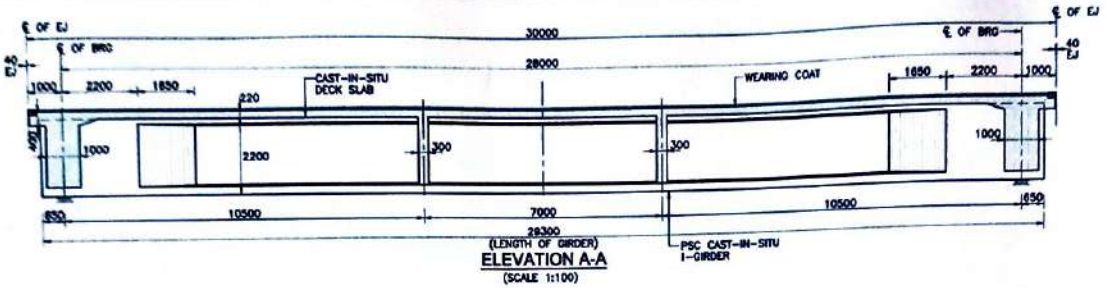
DESIGN DIRECTOR:

REVISION: R0

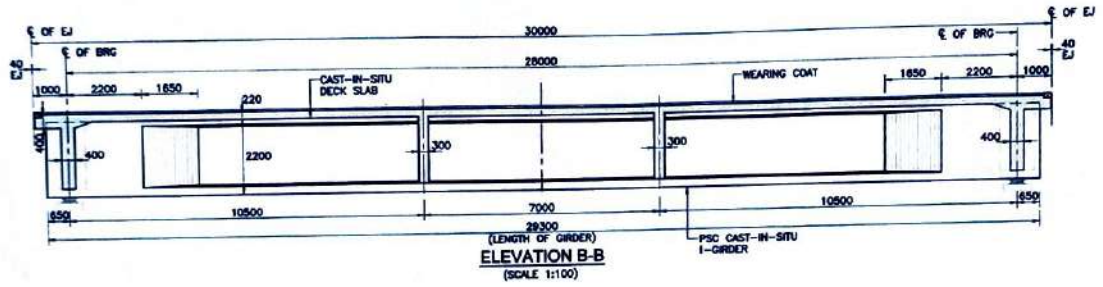
SHEET: 2 OF 2

REFERENCE DRAWING:-

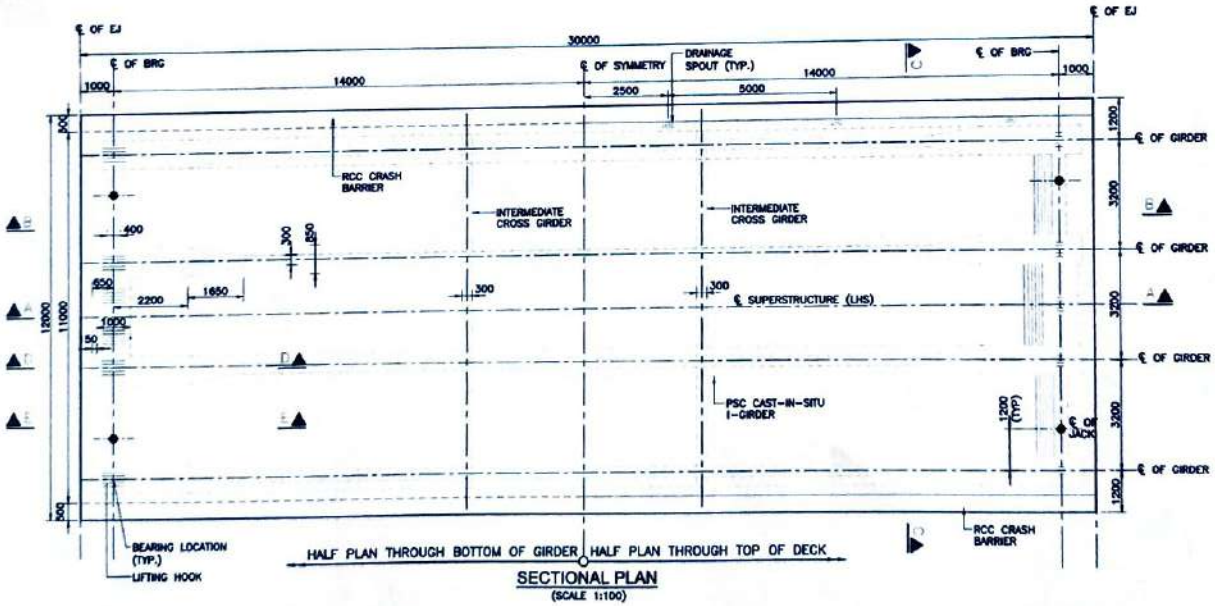
1. GENERAL ARRANGEMENT DRAWING NHIDCL/MB/JOR-DIB/ST/FLY/579+800/101 (SH. 1 OF 1)
2. DIMENSION DETAILS OF SUPER STRUCTURE NHIDCL/MB/JOR-DIB/ST/FLY/579+800/301 (SH. 2 OF 2)
3. GENERAL NOTES FOR PRESTRESSING GIRDER NHIDCL/MB/JOR-DIB/ST/FLY/579+800/305 (SH. 1 OF 1)



ELEVATION A-A
(SCALE 1:100)



ELEVATION B-B
(SCALE 1:100)



SECTIONAL PLAN
(SCALE 1:100)

NTG

Bridge Engineer
VSPL, Sivasagar

SUVADRA CONSULTANTS

ANUPAM TAMULI
Project Manager
M/S Manuranjan Brahma
Moran Bypass to Bogibeel Junction
(NHIDCL, 4-Lane Project)

REV. NO	DATE	DESCRIPTION
R0	MAR, 2020	INITIAL SUBMISSION

CLIENT: NHIDCL

AUTHORITY ENGINEER : VOYANTS SOLUTIONS PVT. LTD.

EPC CONTRACTOR: M/S MANARANJAN BRAHMA

SAFETY CONSULTANT: ARKITECHNO CONSULTANTS (INDIA) PVT. LTD.

PROOF CONSULTANT: INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI

PROJECT: MORAN BYPASS ROAD (NH-37)
FOUR LANING OF NH-37 FROM END OF MORAN BYPASS (KM 592.500) TO BOGIBEEL JUNCTION NEAR LAPETKETA (KM 661.700) IN THE STATE OF ASSAM UNDER BARGP-NE, PHASE 'A' ON EPC MODE- BALANCE WORK.

DRAWN	S.S.
DESIGNED	M.K.
CHECKED	B.G.
DATE: MAR. 2020	

TITLE: DIMENSION DETAILS OF SUPER STRUCTURE FOR FLYOVER AT DESIGN CH. 579+800

SCALE: AS SHOWN

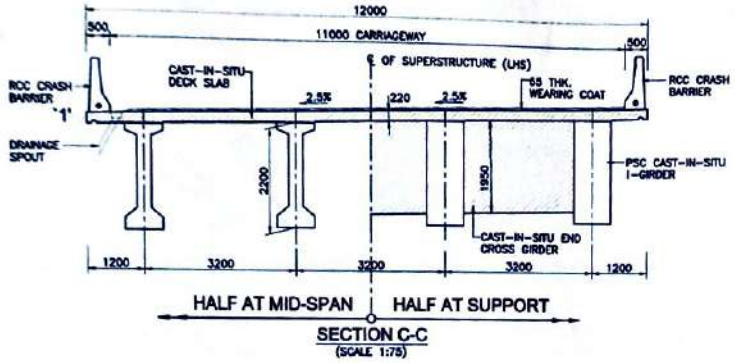
DWG. NO.: NHIDCL/MB/JOR-DIB/ST/FLY/579+800/301

DESIGN DIRECTOR:

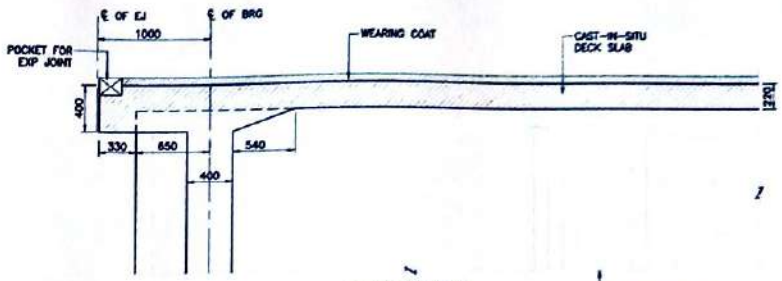
REVISION: R0

SHEET: 2 OF 2

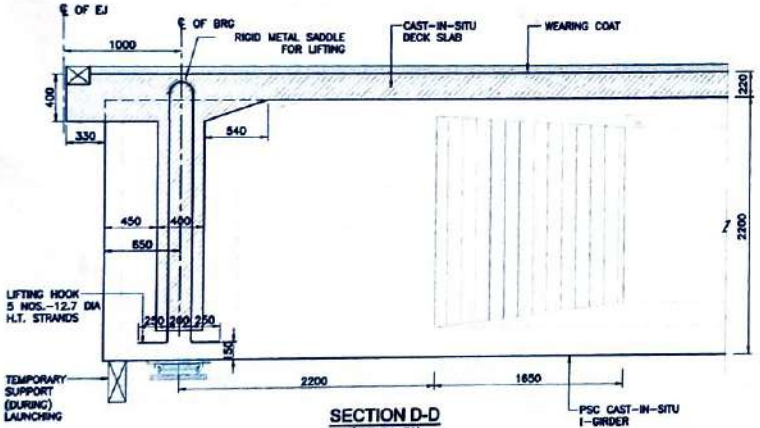
Team Leader
Voyants Solutions Pvt. Ltd.
Sivasagar, Assam



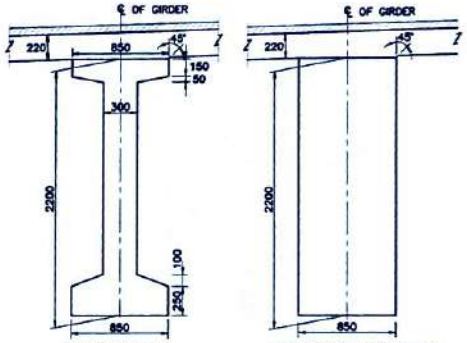
SECTION C-C
(SCALE 1:75)



SECTION E-E
(SCALE 1:30)



SECTION D-D
(SCALE 1:30)



MID SECTION
(SCALE 1:30)

SUPPORT SECTION
(SCALE 1:30)

CROSS SECTION OF PSC CAST-IN-SITU I-GIRDER
(30.0m SPAN)

DETAIL-'1'
SHOWING DRIP COURSE
(SCALE 1:10)

REFERENCE DRAWING:-

1. DIMENSION DETAILS OF SUPER STRUCTURE
   NHIDCL/MB/JOR-DIB/ST/FLY/579+800/301 (SH. 1 OF 2)

Bridge Engineer
VSPL, Sivasagar

ANUPAM TAMULI
Project Manager
M/S Manuranjan Brahma
Moran Bypass to Bogibeel Junction
(NHIDCL, 4-Lane Project)

REV. NO	DATE	DESCRIPTION
R0	MAR. 2020	INITIAL SUBMISSION

CLIENT: NHIDCL

AUTHORITY ENGINEER : VOYANTS SOLUTIONS PVT. LTD.

EPC CONTRACTOR: M/S MANURANJAN BRAHMA

SAFETY CONSULTANT: ARKITECHNO CONSULTANTS (INDIA) PVT. LTD.

PROOF CONSULTANT: INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI

PROJECT: MORAN BYPASS ROAD (NH-37)
FOUR LANING OF NH-37 FROM END OF MORAN BYPASS (KM 552.525) TO BOGIBEEL JUNCTION NEAR LAPETKETA (KM 581.700) IN THE STATE OF ASSAM UNDER BARPNE, PHASE 'A' ON EPC MODE- BALANCE WORK.

DRAWN	S.S.
DESIGNED	M.K.
CHECKED	B.G.
DATE: MAR. 2020	

TITLE: DIMENSION DETAILS OF SUPER STRUCTURE FOR FLYOVER AT DESIGN CH. 579+800

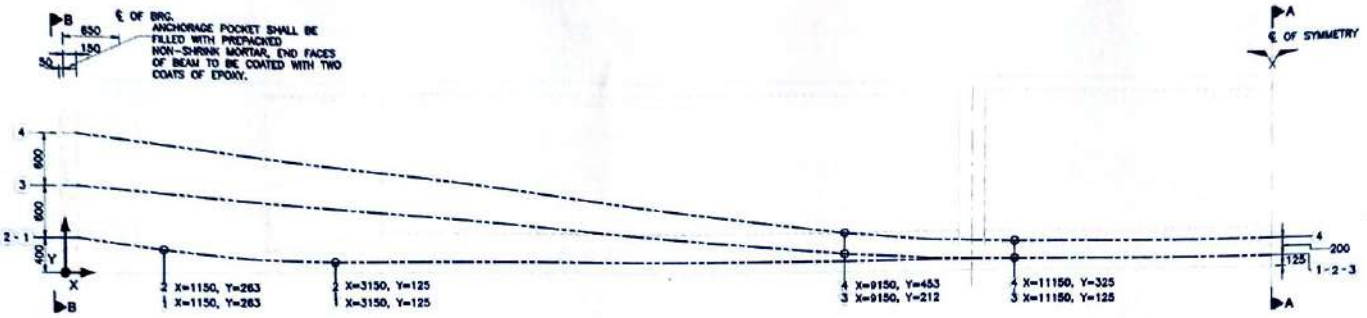
SCALE: AS SHOWN

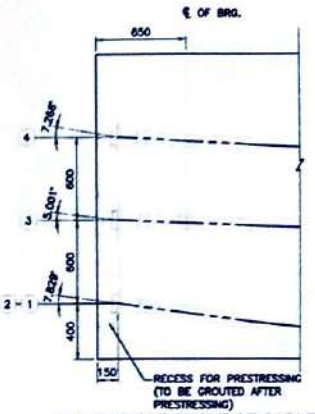
DWG. NO.: NHIDCL/MB/JOR-DIB/ST/FLY/579+800/301

DESIGN DIRECTOR:

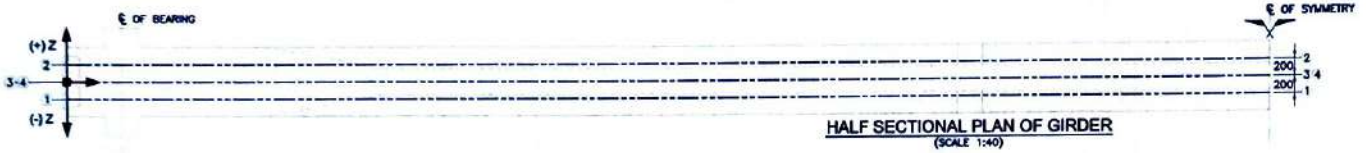
REVISION: R0

Team Leader
Voyants Solutions Pvt. Ltd.
Sivasagar, Assam





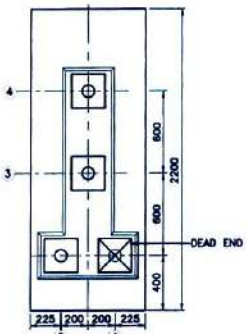
EMERGENCE ANGLE OF CABLE
(SCALE 1:25)



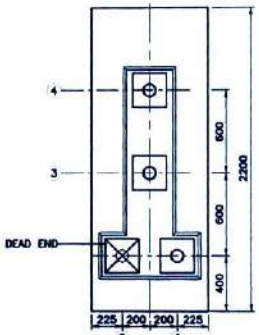
HALF SECTIONAL PLAN OF GIRDER
(SCALE 1:40)

LEGEND :-

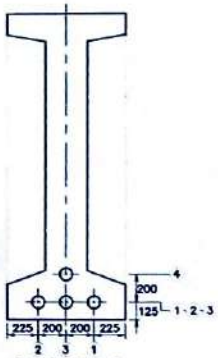
- INDICATED START OF CURVE IN ELEVATION
- INDICATED END OF CURVE IN ELEVATION
- INDICATED END OF CABLE
- INDICATED CABLE NUMBER



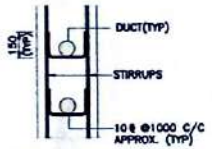
VIEW B-B (LEFT END BLOCK)
(SCALE 1:25)



VIEW B-B (RIGHT END BLOCK)
(SCALE 1:25)



SECTION A-A
(SCALE 1:25)



TYPICAL SUPPORTING ARRANGEMENT FOR CABLE
(SCALE 1:20)

TABLE 2: DETAILS OF JACKING FORCE & TENDON ELONGATION

CABLE NO.	EXTENSION AT STRESSING (mm)	EMERGENCE ENDS ANGLE (θ) (Degree)	JACKING FORCE (t)	NOS. OF STRANDS	NOS. OF DUMMY STRANDS	TOTAL LENGTH OF CABLE(m)	STAGE OF PRE-STRESSING	STRESSING OPERATION
1	195.2	7.829	151.8	11	8	31.028	2	ONE END STRESSING (SIMULTANEOUSLY) (FROM OPPOSITE ENDS)
2	195.2	7.829	151.8	11	8	31.028	2	
3	106.5	5.001	262.2	19	–	31.073	1	BOTH END STRESSING
4	106.5	7.266	262.2	19	–	31.154	1	BOTH END STRESSING

TABLE 1: DETAILS OF CABLE CO-ORDINATE

CABLE NO.	ORDINATES AT DISTANCE 'X' FROM END OF GIRDER																												MID OF GIRDER	
	150		1150		2150		3150		4150		5150		6150		7150		8150		9150		10150		11150		12150		13150			
	Y	Z	Y	Z	Y	Z	Y	Z	Y	Z	Y	Z	Y	Z	Y	Z	Y	Z	Y	Z	Y	Z	Y	Z	Y	Z	Y	Z	Y	Z
1	400	-200	263	-200	160	-200	125	-200	125	-200	125	-200	125	-200	125	-200	125	-200	125	-200	125	-200	125	-200	125	-200	125	-200	125	-200
2	400	200	263	200	160	200	125	200	125	200	125	200	125	200	125	200	125	200	125	200	125	200	125	200	125	200	125	200	125	200
3	1000	0	913	0	825	0	758	0	650	0	563	0	475	0	388	0	300	0	212	0	147	0	125	0	125	0	125	0	125	0
4	1600	0	1973	0	1345	0	1218	0	1090	0	963	0	835	0	708	0	580	0	453	0	357	0	325	0	325	0	325	0	325	0

REFERENCE DRAWING:-

1. GENERAL ARRANGEMENT DRAWING NHIDCL/MB/JOR-DIB/ST/FLY/579+800/101 (SH. 1 OF 1)
2. DIMENSION DETAILS OF SUPER STRUCTURE NHIDCL/MB/JOR-DIB/ST/FLY/579+800/301 (2 SHEETS)

ANUPAM TAMULI
Project Manager
M/S Manuranjan Brahma
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REV. NO	DATE	DESCRIPTION
R0	MAR. 2020	INITIAL SUBMISSION

CLIENT: NHIDCL

AUTHORITY ENGINEER : VOYANTS SOLUTIONS PVT. LTD.

EPC CONTRACTOR: M/S MANARANJAN BRAHMA

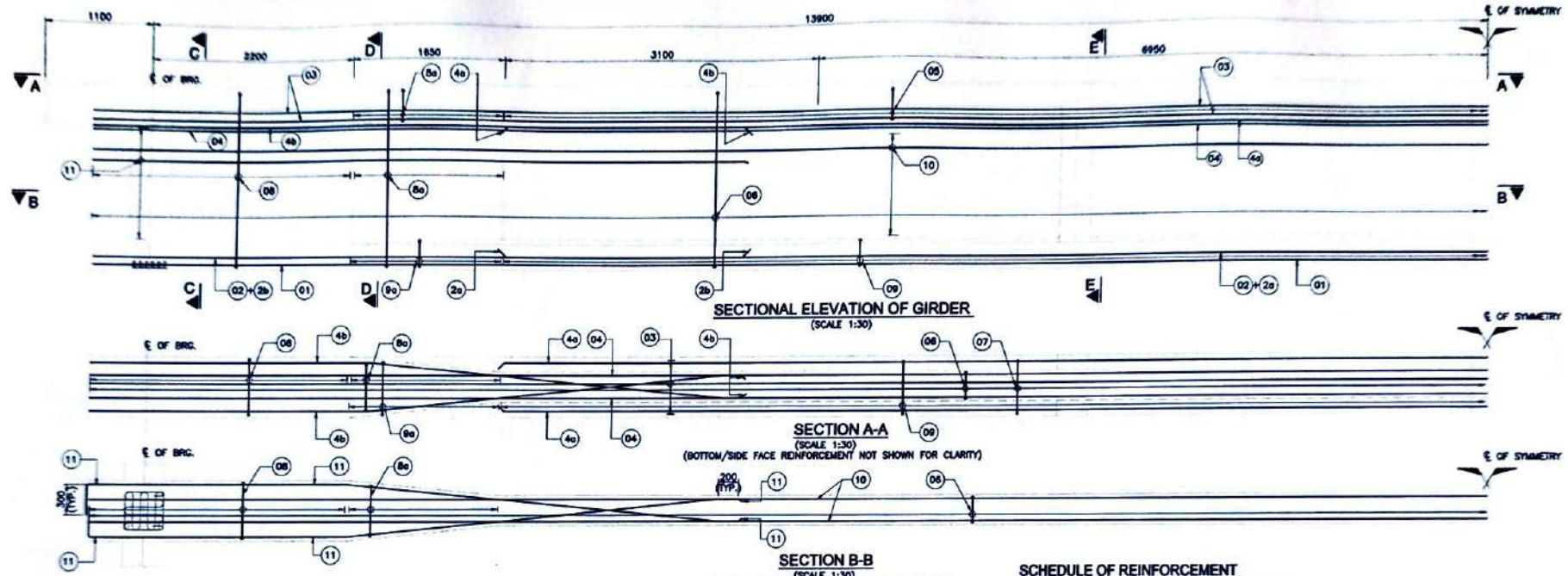
SAFETY CONSULTANT: ARKITECHNO CONSULTANTS (INDIA) PVT. LTD.

PROOF CONSULTANT: INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI

PROJECT: MORAN BYPASS ROAD (NH-37)
FOUR LANING OF NH-37 FROM END OF MORAN BYPASS (KM 562.525) TO BOGIBEEL JUNCTION NEAR LAPETKETA (KM 581.700) IN THE STATE OF ASSAM UNDER BANDP-NE, PHASE 'A' ON EPC MODE- BALANCE WORK.

DRAWN	S.S.
DESIGNED	M.K.
CHECKED	B.G.
DATE: MAR. 2020	

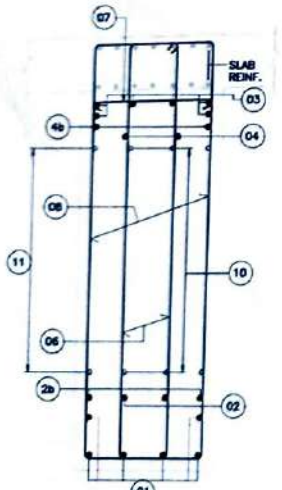
TITLE: CABLE & PRESTRESSING DETAILS FOR FLYOVER AT DESIGN CH. 579+800
SCALE: AS SHOWN
DRG. NO: NHIDCL/MB/JOR-DIB/ST/FLY/579+800/302
DESIGN DIRECTOR:
REVISION: R0
SHEET: 1 OF 1



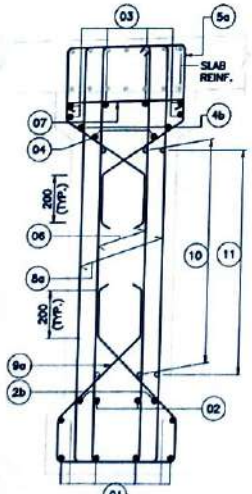
SECTIONAL ELEVATION OF GIRDER
(SCALE 1:30)

SECTION A-A
(SCALE 1:30)
(BOTTOM/SIDE FACE REINFORCEMENT NOT SHOWN FOR CLARITY)

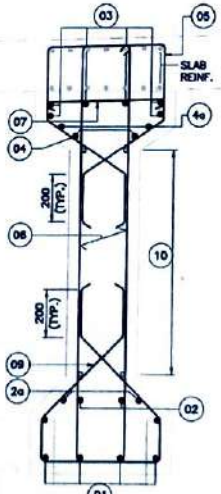
SECTION B-B
(SCALE 1:30)
(BOTTOM REINFORCEMENT NOT SHOWN FOR CLARITY)



SECTION C-C
(SCALE 1:15)



SECTION D-D
(SCALE 1:15)



SECTION E-E
(SCALE 1:15)

SCHEDULE OF REINFORCEMENT

BAR MARK	SHAPE	DIA	SPACING/ NOS.	REMARKS
01		12ϕ	6 Nos.	
02		12ϕ	2 Nos.	
2a		12ϕ	2 Nos.	
2b		12ϕ	2 Nos.	
03		12ϕ	6 Nos.	
04		12ϕ	2 Nos.	
4a		12ϕ	2 Nos.	
4b		12ϕ	2 Nos.	
05		12ϕ	120c/c	
5a		12ϕ	120c/c	
06		2L-12ϕ@120c/c		
07		10ϕ	240c/c	
08		2L-16ϕ@120c/c		
8a		2L-16ϕ@120c/c		
09		12ϕ	120c/c	
9a		12ϕ	120c/c	
10		12ϕ	2X16 Nos.	
11		12ϕ	2X16 Nos.	

REFERENCE DRAWING:-

1. GENERAL ARRANGEMENT DRAWING NHIDCL/MB/JCR-DIB/ST/FLY/579+800/101 (SH. 1 OF 1)
2. DIMENSION DETAILS OF SUPER STRUCTURE NHIDCL/MB/JCR-DIB/ST/FLY/579+800/301 (2 SHEETS)

BUKADRA CONSULTANTS

ITG

Bridge Engineer
VSPL, Sivasagar

ANUPAM TAMULI
Project Manager
M/S Manuranjan Brahma
Moran Bypass to Bogibeel Junction
(NHIDCL, 4-Lane Project)

REV. NO	DATE	DESCRIPTION
R0	MAR. 2020	INITIAL SUBMISSION

CLIENT: NHIDCL

AUTHORITY ENGINEER: VOYANTS SOLUTIONS PVT. LTD.

Team Leader
Voyants Solutions Pvt. Ltd.
Sivasagar, Assam

EPC CONTRACTOR: M/S MANURANJAN BRAHMA

SAFETY CONSULTANT: ARKITECHNO CONSULTANTS (INDIA) PVT. LTD.

PROOF CONSULTANT: INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI

PROJECT: MORAN BYPASS ROAD (NH-37)
FOUR LANING OF NH-37 FROM END OF MORAN BYPASS (KM 552.525) TO BOGIBEEL JUNCTION NEAR LAPETAETA (KM 561.700) IN THE STATE OF ASSAM UNDER BARPETA, PHASE 'A' ON EPC MODE- BALANCE WORK

DRAWN	S.B.
DESIGNED	M.K.
CHECKED	B.G.
DATE: MAR. 2020	

TITLE: REINFORCEMENT DETAILS OF LONGITUDINAL GIRDER FOR FLYOVER AT DESIGN CH. 579+800

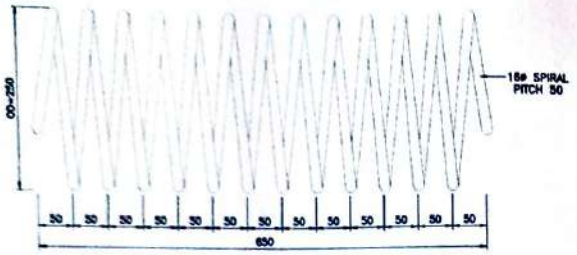
SCALE: AS SHOWN

DRG. NO: NHIDCL/MB/JCR-DIB/ST/FLY/579+800/303

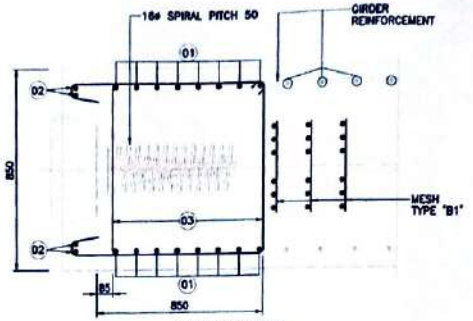
DESIGN DIRECTOR:

REVISION: R0

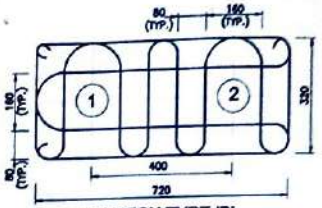
SHEET: 1 OF 1



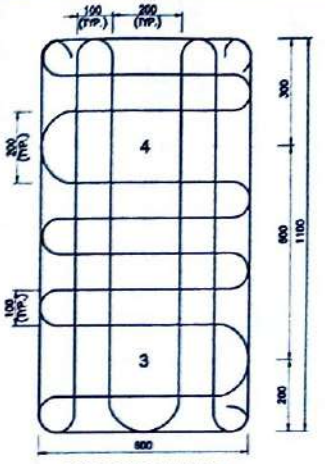
16ø SPIRAL REINFORCEMENT FOR CABLE (TYP)
(SCALE 1:5)



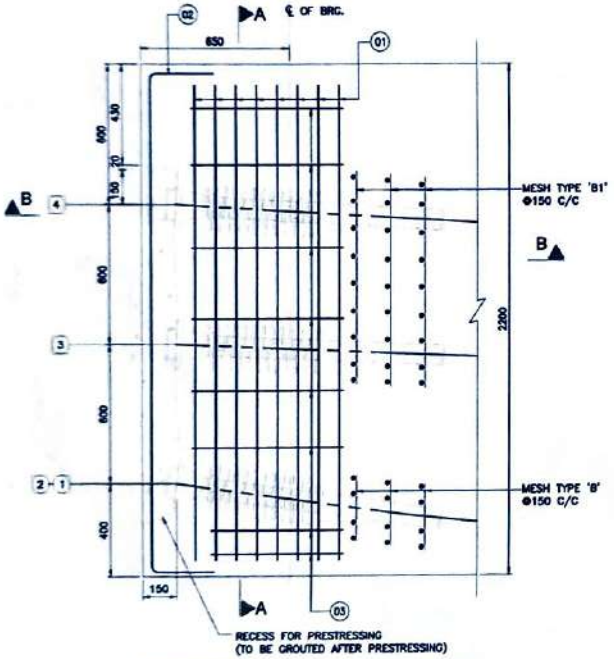
SECTON B-B
(SCALE 1:15)



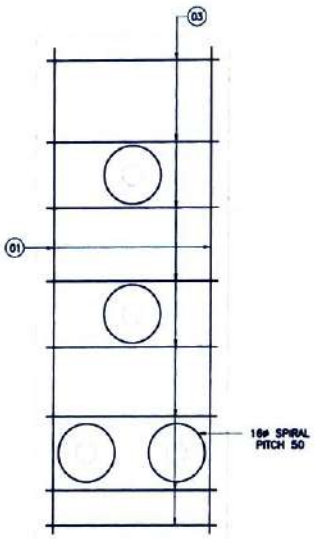
8Ø MESH TYPE-'B'
(SCALE 1:10)



8Ø MESH TYPE-'B1'
(SCALE 1:10)



SECTIONAL ELEVATION OF END - BLOCK
(SCALE 1:15)



SECTION A-A
(SCALE 1:15)

IMPORTANT NOTES:

- ANCHORAGE RECESSES SHALL BE SEALED WITH PREPACKAGED NON-SHRINK MORTAR. END FACES OF GIRDERS TO BE COATED WITH TWO COATES OF EPOXY.
- THE ANCHORAGE DETAILS SHALL BE CONFIRMED WITH PRESTRESSING AGENCY.

LEGEND:-

OD – OUTER DIAMETER

SCHEDULE OF REINFORCEMENT

(FOR EACH ANCHORAGE END)

BAR MKD.	BAR DIA.	NO./SPACING	SHAPE
01	20	8 NOS.	
02	16	2x2 NOS.	
03	20	8 NOS.	

REFERENCE DRAWING:-

1. GENERAL ARRANGEMENT DRAWING NHIDCL/MB/JOR-DIB/ST/FLY/579+800/101 (SH. 1 OF 1)
2. DIMENSION DETAILS OF SUPER STRUCTURE NHIDCL/MB/JOR-DIB/ST/FLY/579+800/301 (2 SHEETS)

ANUPAM TAMULI
Project Manager
M/S Manuranjan Brahma
Moran Bypass to Bogibeel Junction
(NHIDCL, 4-Lane Project)

Bridge Engineer
VSPL, Sivasagar

REV. NO	DATE	DESCRIPTION
R0	MAR. 2020	INITIAL SUBMISSION

CLIENT: NHIDCL

AUTHORITY ENGINEER : VOYANTS SOLUTIONS PVT. LTD.

EPC CONTRACTOR: M/S MANURANJAN BRAHMA

SAFETY CONSULTANT: ARKITECHNO CONSULTANTS (INDIA) PVT. LTD.

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PROJECT: MORAN BYPASS ROAD (NH-37)
FOUR LANING OF NH-37 FROM END OF MORAN BYPASS (KM 562.525) TO BOGIBEEL JUNCTION NEAR LAPETKETA (KM 581.700) IN THE STATE OF ASSAM UNDER SARDP-NE, PHASE 'A' ON EPC MODE- BALANCE WORK

DRAWN	S.S.
DESIGNED	M.K.
CHECKED	B.O.
DATE: MAR. 2020	

TITLE: DETAILS OF END BLOCK AND ANCHORAGES FOR FLYOVER AT DESIGN CH. 579+800

SCALE: AS SHOWN

DRG. NO: NHIDCL/MB/JOR-DIB/ST/FLY/579+800/304

DESIGN DIRECTOR:

REVISION: R0

SHEET: 1 OF 1

Team Leader
Voyants Solutions Pvt. Ltd.
Sivasagar, Assam

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS, LEVELS ARE IN METERS UNLESS OTHERWISE MENTIONED.
2. NO DIMENSIONS SHALL BE MEASURED FROM THE DRAWINGS. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
3. CONCRETE SHALL BE DESIGN MIX WITH A MINIMUM 28 DAYS CHARACTERISTIC CUBE STRENGTH FOR DIFFERENT ELEMENTS AS FOLLOWS:
   a. PRECAST GIRDER - M45
   b. RCC CAST-IN-SITU DECK SLAB - M35
   c. RCC CAST-IN-SITU END CROSS GIRDER - M35
4. SUITABLE HOLES SHALL BE LEFT IN PRECAST GIRDER FOR SUPPORTING THE DECK SLAB SHUTTERING.
5. THE REINFORCEMENT OF CRASH BARRIER SHALL BE PROPERLY ANCHORED IN THE DECK SLAB BEFORE CASTING THE DECK SLAB.
6. BEAMS SHALL BE KEPT UPRIGHT AT ALL TIMES AND TO BE CLEARLY MARKED INDICATING SPAN LOCATION & RESPECTIVE ENDS BEFORE REMOVAL FROM CASTING BED.
7. TOP SURFACE OF PRECAST BEAM & VERTICAL EDGES OF END TO BE LEFT ROUGHENED FOR EFFECTIVE BONDING.
8. THE REINFORCING STEEL SHALL BE HYSD BARS (GRADE DESIGNATION Fe-500D) CONFORMING TO IS:1786-2008.
9. 65MM THK. WEARING COAT (50MM BITUMINOUS CONCRETE + 25MM ASPHALTIC ASPHALT) SHALL BE PROVIDED ABOVE THE DECK SLAB.
10. LAPPING OF REINFORCEMENT SHALL BE AVOIDED AS FAR AS POSSIBLE. IN CASE LAPPING OF BARS BECOME UNAVOIDABLE, LAP LENGTH SHALL BE PROVIDED AS PER CLAUSE 15.2.5 IRC:112-2011:
   - αx32ø (GRADE M45) FAVOURABLE CONDITION
   - αx1.43x32ø (GRADE M45) UNFAVOURABLE CONDITION
   - αx29ø (GRADE M50) FAVOURABLE CONDITION
   - αx1.43x29ø (GRADE M50) UNFAVOURABLE CONDITION

PERCENTAGE OF LAPPED BARS RELATIVE TO TOTAL CROSS-SECTIONAL AREA	<25%	33%	50%	>50%
α	1	1.15	1.4	1.5

11. ANCHORAGE LENGTH SHALL BE AS PER CLAUSE 15.2.3 & 15.2.4, IRC:112-2011:
   - 32ø (GRADE M45) FAVORABLE CONDITION
   - 1.43x32ø (GRADE M45) UNFAVORABLE CONDITION
   - 36ø (GRADE M35) FAVORABLE CONDITION
   - 1.43x36ø (GRADE M35) UNFAVORABLE CONDITION
12. PRESTRESSING SYSTEM
   a. ALL PRESTRESSING STRANDS SHALL HAVE 7 PLY UNCOATED STRESS RELIEVED LOW RELAXATION HIGH TENSILE STRANDS OF 12.7MM DIA. CONFORMING TO CLASS 2 OF IS 14268-1995.
   b. THE PARAMETERS ADOPTED FOR DESIGN ARE AS FOLLOWS:-
      - ANCHORAGE TYPE - 19-T-13
      - SLIP AT EACH END (ASSUMED) - 6MM
      - CO-EFFICIENT OF FRICTION(μ) - 0.17/RADIAN
      - WOBBLE CO-EFFICIENT (K) - 0.0020/M
      - NOMINAL AREA OF EACH STRAND - 98.8 sq.MM
      - NOMINAL ULT. BREAKING LOAD OF EACH STRAND - 183.7KN
      - MODULUS OF ELASTICITY OF HIGH TENSILE STEEL - 1.95X10^5 MPa
      - SHEATHING THICKNESS - 2.5 MM
   c. CORRUGATED HDPE SHEATHING DUCT OF 85MM DIA (INTERNAL) SHALL BE USED FOR ALL CABLES CONFORMING TO CODAL STANDARDS.
   d. ALL THE DESIGN PARAMETERS ADOPTED SHALL BE VERIFIED AT SITE.
13. PRESTRESSING OPERATIONS
   a. ALL CABLES SHALL BE LAID IN SMOOTH PROFILE PASSING THROUGH THE GIVEN ORDINATES. FIRM SUPPORT SHALL BE INSTALLED AT EVERY METRE AS SHOWN.
   b. CABLE LENGTHS MENTIONED IN THE DRAWING ARE INCLUSIVE OF 1000 MILLIMETRE EXTRA AT EACH END. THE TOTAL LENGTH OF CABLE SHALL BE VERIFIED AT SITE.
   c. ABSCISSA (DISTANCE "X") OF CABLE GIVEN IN THE DRAWING ARE EVALUATED WITH REFERENCE TO END OF GIRDER. ORDINATES DISTANCE 'Y' ARE WITH REFERENCE TO SOFFIT OF THE GIRDER.
   d. EXTRA LENGTH OF STRAND PROJECTING BEYOND END BLOCK SHALL NOT BE CUT JUST AFTER THE STRESSING. THESE SHALL BE CUT ONLY AFTER INSTRUCTIONS OF GROUTING ARE ISSUED BY THE ENGINEER.
   e. GROUTING OF CABLES SHALL BE DONE IN SAME SEQUENCE AS STRESSING AND SHALL CONFIRM TO TECHNICAL SPECIFICATIONS. ANCHORAGE POCKET SHALL BE FILLED WITH EPOXY MORTAR AFTER STRESSING & GROUTING.
   f. TIME LAG BETWEEN STRESSING OF EACH CABLE SHALL BE AVOIDED.
   g. EXTENSIONS SHALL BE RECHECKED AT 24 HOURS AFTER ANCHORING TO OBSERVE SLOW SLIPPAGE. IN CASE OF EXCESSIVE SLIPPAGE THE MATTER SHALL BE REPORTED TO THE ENGINEER-IN-CHARGE.
   h. EXTENSIONS ARE GIVEN FOR HALF CABLE LENGTHS INCLUSIVE OF 600 MILLIMETER GRIP LENGTH AT EACH END. LOSS UPTO 6mm DUE TO SLIP OF ANCHORAGES ARE NOT TO BE COMPENSATED DURING SITE OPERATIONS. JACK PRESSURE AND EXTENSIONS OF CABLES AT EACH END GIVEN IN THE DRAWING SHALL BE VERIFIED AT SITE.
   i. INITIAL SLACKNESS IN CABLES SHALL BE REMOVED BY APPLYING SMALL TENSION. THE INITIAL TENSION REQUIRED TO REMOVE SLACKNESS SHALL BE TAKEN AS THE STARTING POINT FOR MEASURING ELONGATION AND CORRECTION SHALL BE APPLIED AS PER CL. 12.2.1.3 OF IS:1343-1980.
   j. IN CASE THE CALCULATED ELONGATION AND THE JACK PRESSURE ARE NOT ACHIEVED SIMULTANEOUSLY DURING PRESTRESSING OPERATION STRESSING SHALL BE CONTINUED / DISCONTINUED AS PER NOTE NO. 17 GIVEN BELOW.
   k. EXCESS/DUMMY STRANDS AS SHOWN IN TABLE-2 SHALL BE STRESSED IF ANY SHORTFALL IN PRESTRESSING.
14. THE EXTENSIONS GIVEN IN TABLE SHALL BE MODIFIED AT SITE IN CASE ACTUAL VALUE OF AREA OF STRANDS 'A' AND MODULUS OF ELASTICITY 'E' VARIES FROM THOSE ASSUMED IN DESIGN, (AS MENTIONED IN NOTE NO. 12 ABOVE) REVISED EXTENSION SHALL BE CALCULATED AS UNDER:
   REVISED EXTENSION = (98.8 X 195 X 10^5) / (NEW AREA X NEW MODULUS) x ORIGINAL EXTENSION.
15. EXTENSION OF CABLE SHALL BE VERIFIED FOR A FEW CABLES AT SITE. IN CASE OF VALUE OF μ AND K ARE FOUND TO BE DIFFERENT THAN THOSE CONSIDERED FOR DESIGN, EXTENSION SHALL BE SUITABLY MODIFIED AFTER APPROVAL OF DESIGN OFFICE.
16. THE GRIP LENGTH FROM ANCHORAGE FACE UPTO GRIPPING POINT IN JACK ASSUMED IN EXTENSION CALCULATIONS IS 600MM AND THE ADDITIONAL LENGTH TAKEN FOR CUTTING IS 400MM. IN CASE GRIP LENGTH VARIES THAN THOSE CONSIDERED, THE EXTENSIONS SHALL BE MODIFIED AS UNDER:
   Ex(NEW) = Ex(OLD) + JACK FORCE x (GRIP LENGTH - 600)/(AREA x Es)
17. SPECIAL NOTE FOR PRESTRESSING
   IF THE CALCULATED ELONGATION IS REACHED BEFORE THE CALCULATED GAUGE PRESSURE IS OBTAINED, CONTINUE TENSIONING TILL ATTAINING THE CALCULATED GAUGE PRESSURE PROVIDED THE ELONGATION DOES NOT EXCEED 1.05 TIMES THE CALCULATED ELONGATION. IF THE CALCULATED ELONGATION HAS NOT BEEN REACHED CONTINUE TENSIONING IN INTERVALS OF 5 kg/sqcm UNTIL THE CALCULATED ELONGATION IS REACHED PROVIDED THE GAUGE PRESSURE DOES NOT EXCEED 1.05 TIMES THE CALCULATED GAUGE PRESSURE. IF THE ELONGATION AT 1.05 TIMES THE CALCULATED GAUGE PRESSURE IS LESS THAN 0.95 TIMES THE CALCULATED ELONGATION THE FOLLOWING MEASURES MUST BE TAKEN :
   a. RECALIBRATE THE PRESSURE GAUGE
   b. CHECK THE CORRECT FUNCTIONING OF THE JACK PUMP AND LEADS
   c. DE-TENSION THE CABLE SLIDE IT IN ITS DUCT TO CHECK THAT IT IS NOT BLOCKED BY MORTAR WHICH HAS ENTERED THROUGH THE SHEATHING. RE-TENSION THE CABLE IF FREE. IF THE REQUIRED ELONGATION IS NOT OBTAINED FURTHER FINISHING OPERATION SUCH AS CUTTING OR SEALING SHOULD NOT BE UNDERTAKEN WITHOUT THE APPROVAL OF THE ENGINEER-IN-CHARGE.
18. THE GAUGE PRESSURE FOR PRESTRESSING SHALL BE WORKED OUT PRIOR TO ANY STRESSING OPERATION DULY TAKING IN TO ACCOUNT THE RAM AREA OF THE JACK AND THE JACK EFFICIENCY. THE STRESSING EQUIPMENTS SHALL BE WELL MAINTAINED AND THE CALIBRATION CHARTS SHALL BE AVAILABLE AT SITE.
19. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS.

LEGENDS

- FRL - FINISHED ROAD LEVEL
- GL - GROUND LEVEL
- LVL - LEVEL
- IL - INVERT LEVEL
- EJ - EXPANSION JOINT
- BRG. - BEARING
- CAST-IN-SITU PORTION
- PRECAST PORTION

CONSTRUCTION SEQUENCE OF GIRDERS

1. AT '0'TH DAY, GIRDER SHALL BE CASTED ON CASTING BED.
2. STRESSING SHALL BE CARRIED OUT IN TWO STAGES. BOTH THE STAGES SHALL BE ON GROUND (BEFORE PLACING ON ABUTMENT/PIER CAP).
3. FIRST STAGE PRE-STRESSING:
   3.1. CABLE NO. 3 & 4 SHALL BE STRESSED AT 7TH DAY OR WHEN CONCRETE CUBE STRENGTH IS 35MPa WHICHEVER IS LATER.
   3.2. ALL STRANDS OF CABLES SHALL BE STRESSED FROM BOTH ENDS SIMULTANEOUSLY. THE RATE OF INCREASE OF STRESS IN THE TENDON AT BOTH ENDS SHALL BE EQUAL. ONLY MULTIPLE JACKS SHALL BE USED FOR STRESSING.
4. SECOND STAGE PRE-STRESSING:
   4.1. CABLE NO. 1 & 2 SHALL BE STRESSED AT 28TH DAY OR WHEN CONCRETE CUBE STRENGTH IS 45 MPa, WHICHEVER IS LATER.
   4.2. STRANDS OF CABLE NO. 1 & 2 SHALL BE STRESSED FROM ONE END ONLY. HOWEVER, BOTH CABLES SHALL BE STRESSED FROM OPPOSITE ENDS SIMULTANEOUSLY TO AVOID BENDING OF GIRDER IN PLAN.
5. GIRDERS SHALL THEN BE PLACED ON TEMPORARY SUPPORT ON PIER CAP.
6. PERMANENT BEARING SHALL BE INSTALLED ON PEDESTALS.
7. STEEL WEDGE SHALL BE FIXED UNDER GIRDER AT BEARING LOCATION AS PER RELEVANT WEDGE DETAILS.
8. TEMPORARY SUPPORTS SHALL BE REMOVED SO THAT GIRDER CAN BE PLACED OVER PERMANENT BEARINGS.
9. DECK SLAB SHALL THEN BE CAST AFTER 28 DAYS OF CASTING OF GIRDER.
10. CRASH BARRIER/RAILING SHALL BE ERECTED/CAST 3 DAYS AFTER CASTING THE DECK SLAB. THE DECK CANTILEVER SHUTTERING MAY BE OPENED AFTER THE DECK SLAB ATTAINS A STRENGTH OF 25MPa.
11. WEARING COAT MAY BE LAID AFTER REMOVAL OF SHUTTERING OF DECK 14 DAYS AFTER CASTING DECK SLAB OR WHEN DECK ATTAINS CONCRETE CUBE STRENGTH OF 35MPa.

REFERENCE DRAWING:-

1. GENERAL ARRANGEMENT DRAWING
   NHIDCL/MB/JOR-DIB/ST/FLY/579+800/101 (SH. 1 OF 1)
2. DIMENSION DETAILS OF SUPER STRUCTURE
   NHIDCL/MB/JOR-DIB/ST/FLY/579+800/301 (2 SHEETS)

SUVADRA CONSULTANTS

ANUPAM TAMULI
Project Manager
M/S Manuranjan Brahma
Moran Bypass to Bogibeel Junction
(NHIDCL, 4-Lane Project)

Bridge Engineer
VSPL, Sivasagar

REV. NO	DATE	DESCRIPTION
R0	MAR. 2020	INITIAL SUBMISSION

CLIENT: NHIDCL

AUTHORITY ENGINEER : VOYANTS SOLUTIONS PVT. LTD.

Team Leader
Voyants Solutions Pvt. Ltd.
Sivasagar, Assam

EPC CONTRACTOR: M/S MANURANJAN BRAHMA, WARD NO. 4, DEPOT ROAD, KOKRAJHAR, DIST. KOKRAJHAR, PIN : 783370, ASSAM

SAFETY CONSULTANT: ARKITECHNO CONSULTANTS (INDIA) PVT. LTD.

PROOF CONSULTANT: INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI

PROJECT: MORAN BYPASS ROAD (NH-37)
FOUR LANING OF NH-37 FROM END OF MORAN BYPASS (KM 562.628) TO BOGIBEEL JUNCTION NEAR LAPETKETA (KM 581.700) IN THE STATE OF ASSAM UNDER SARDP-NE, PHASE 'A' ON EPC MODE- BALANCE WORK

DRAWN	S.S.
DESIGNED	M.K.
CHECKED	B.O.
DATE:	MAR. 2020

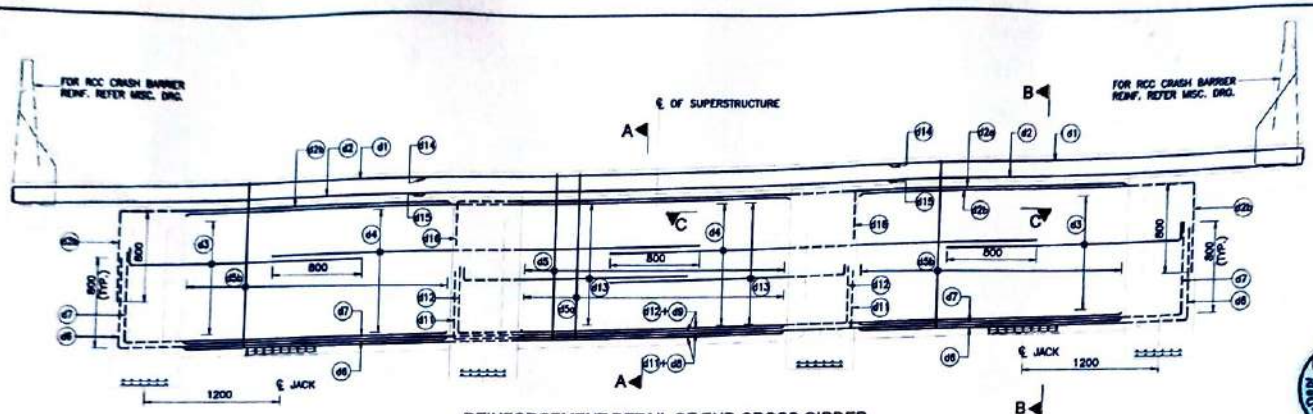
TITLE: GENERAL NOTES FOR PRESTRESSING GIRDER FOR FLYOVER AT DESIGN CH. 579+800

SCALE: AS SHOWN

DRG.NO: NHIDCL/MB/JOR-DIB/ST/FLY/579+800/305

DESIGN DIRECTOR:

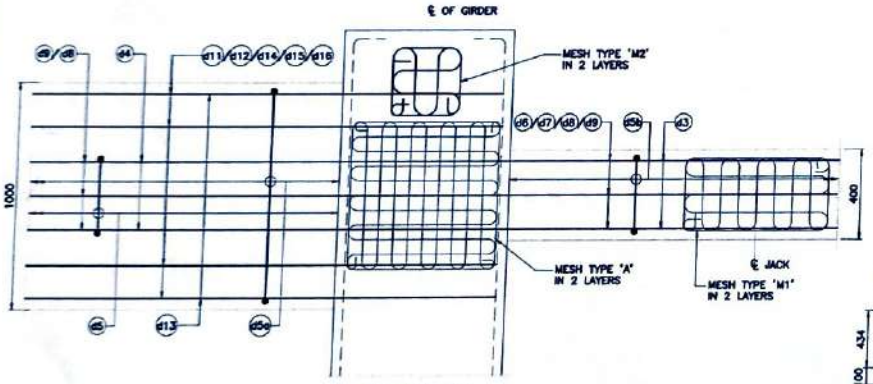
REVISION: R0 | Sheet: 1 OF 1



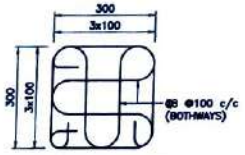
REINFORCEMENT DETAIL OF END CROSS GIRDER
(SCALE 1:30)

SCHEDULE OF REINFORCEMENT

BAR MARK	SHAPE	BAR DIA & SPACING/Nos.
d1		25ϕ-3 Nos.
d2		25ϕ-2 Nos.
d2a		25ϕ-2 Nos.
d2b		25ϕ-2 Nos.
d3		12ϕ-5 Nos. (EACH FACE)
d4		12ϕ-5 Nos. (EACH FACE)
d5		2L-12ϕ@120c/c
d5a		2L-12ϕ@120c/c
d5b		2L-16ϕ@120c/c
d6		25ϕ-3 Nos.
d7		25ϕ-3 Nos.
d8		25ϕ-3 Nos.
d9		25ϕ-3 Nos.
d10		10ϕ-5 Nos. (VERTICALLY)
d10a		10ϕ-5 Nos. (VERTICALLY)
d11		12ϕ-4 Nos.
d12		12ϕ-4 Nos.
d13		12ϕ-8 Nos. (EACH FACE)
d14		12ϕ-4 Nos.
d15		12ϕ-4 Nos.
d16		12ϕ-4 Nos.



SECTION C-C
(SCALE 1:15)



8ϕ MESH TYPE-M2
(SCALE 1:10)

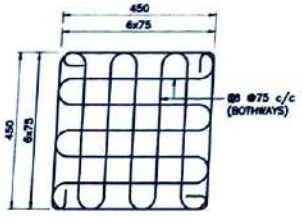
IMPORTANT NOTES:

- SUITABLE DOWEL BARS SHALL BE PLACED IN LONGITUDINAL GIRDER (WHILE CASTING IN YARD) FOR CAST-IN-SITU CROSS GIRDER.

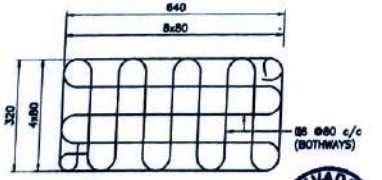
REFERENCE DRAWING:-

1. GENERAL ARRANGEMENT DRAWING NHIDCL/MB/JOR-DIB/ST/FLY/579+800/101 (SH. 1 OF 1)
2. DIMENSION DETAILS OF SUPER STRUCTURE NHIDCL/MB/JOR-DIB/ST/FLY/579+800/301 (2 SHEETS)

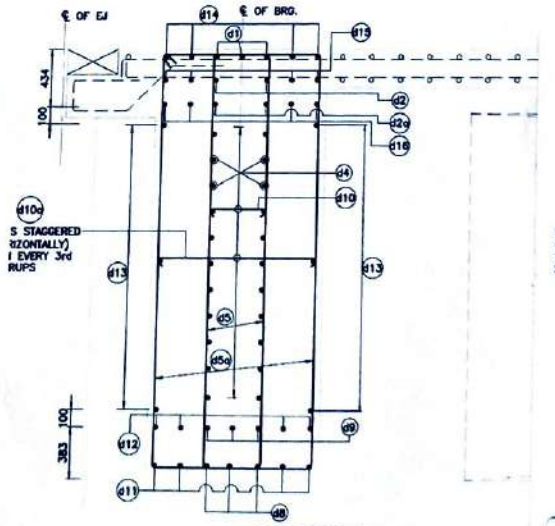
Bridge Engineer
VSPL, Sivasagar



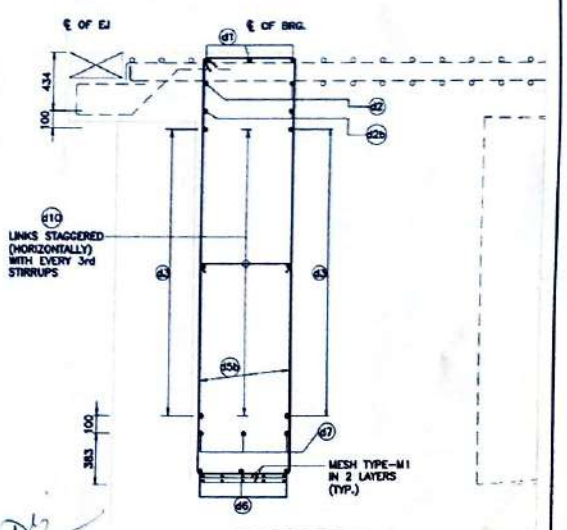
8ϕ MESH TYPE-A
(AT BEARING LOCATION TWO LAYERS ONE AT 20MM & ANOTHER AT 100MM FROM BOTTOM)
(SCALE: 1:10)



8ϕ MESH TYPE-M1
(AT JACK LOCATION TWO LAYERS ONE AT 20MM & ANOTHER AT 100MM FROM BOTTOM)
(SCALE 1:10)



SECTION A-A
(SCALE 1:20)



SECTION B-B
(SCALE 1:20)

REV. NO	DATE	DESCRIPTION
R0	MAR,2020	INITIAL SUBMISSION

CLIENT: NHIDCL

AUTHORITY ENGINEER : VOYANTS SOLUTIONS PVT. LTD.

SAFETY CONSULTANT: ARKITECHNO CONSULTANTS (INDIA) PVT. LTD.

PROOF CONSULTANT: INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI

PROJECT: MORAN BYPASS ROAD (NH-37)
FOUR LANING OF NH-37 FROM END OF MORAN BYPASS (KM 662.638) TO BOGIBEEL JUNCTION NEAR LAPETHETA (KM 661.700) IN THE STATE OF ASSAM UNDER BHOP-NE, PHASE 'A' ON EPC MODE- BALANCE WORK.

DRAWN	S.S.
DESIGNED	M.K.
CHECKED	B.C.
DATE: MAR,2020	

TITLE: REINFORCEMENT DETAILS OF END CROSS GIRDER FOR FLYOVER AT DESIGN CH. 579+000

SCALE: AS SHOWN

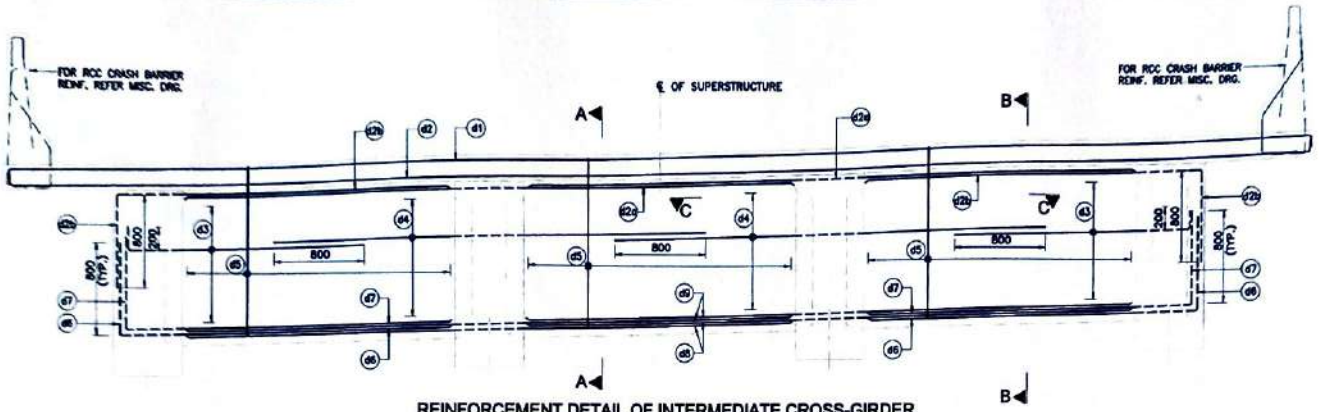
DRG.NO: NHIDCL/MB/JOR-DIB/ST/FLY/579+800/308

DESIGN DIRECTOR:

REVISION: R0

Sheet: 1 OF 1

Team Leader
Voyants Solutions Pvt. Ltd.
Sivasagar, Assam



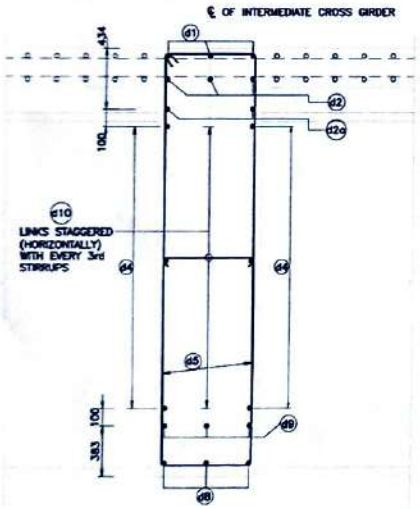
REINFORCEMENT DETAIL OF INTERMEDIATE CROSS-GIRDER
(SCALE 1:30)

SCHEDULE OF REINFORCEMENT

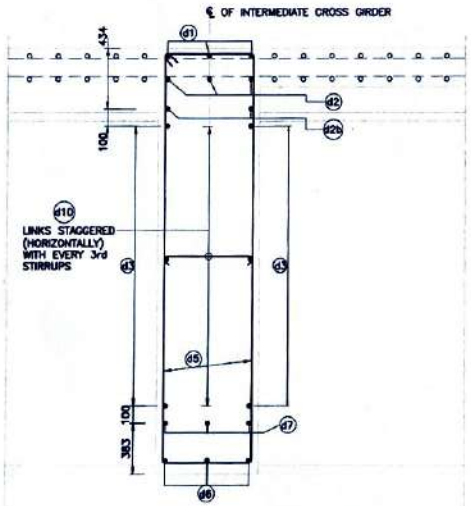
BAR MARK	SHAPE	BAR DIA & SPACING/Nos.
d1		20ϕ-3 Nos.
d2		20ϕ-3Nos.
d2a		20ϕ-2 Nos.
d2b		20ϕ-2 Nos.
d3		12ϕ-5 Nos. (EACH FACE)
d4		12ϕ-5 Nos. (EACH FACE)
d5		2L-12ϕ@150 C/C
d6		25ϕ-3 Nos.
d7		25ϕ-3 Nos.
d8		25ϕ-3 Nos.
d9		25ϕ-3 Nos.
d10		10ϕ-5 Nos. (VERTICALLY)

IMPORTANT NOTES:

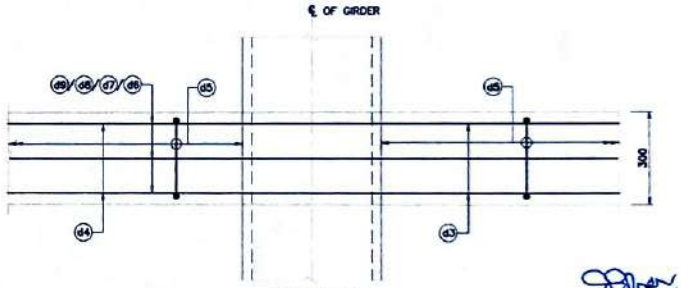
- SUITABLE DOWEL BARS SHALL BE PLACED IN LONGITUDINAL GIRDER (WHILE CASTING IN YARD) FOR CAST-IN-SITU CROSS GIRDER.



SECTION A-A
(SCALE 1:20)



SECTION B-B
(SCALE 1:20)



SECTION C-C
(SCALE 1:15)

Bridge Engineer
VSPL, Sivasagar

REFERENCE DRAWING:-

1. GENERAL ARRANGEMENT DRAWING
   NHIDCL/MB/JOR-DIB/ST/FLY/579+800/101 (SH. 1 OF 1)
2. DIMENSION DETAILS OF SUPER STRUCTURE
   NHIDCL/MB/JOR-DIB/ST/FLY/579+800/301 (2 SHEETS)

ANUPAM TAMULI
Project Manager
M/S Manuranjan Brahma
Moran Bypass to Bogibeel Junction
(NHIDCL, 4-Lane Project)

REV. NO	DATE	DESCRIPTION
R0	MAR. 2020	INITIAL SUBMISSION

CLIENT: NHIDCL

AUTHORITY ENGINEER: VOYANTS SOLUTIONS PVT. LTD.

EPC CONTRACTOR: M/S MANURANJAN BRAHMA, WARD NO.4, DEPOT ROAD, KOKRAJHAR, DIST. KOKRAJHAR, PIN: 783370, ASSAM

SAFETY CONSULTANT: ARKITECHNO CONSULTANTS (INDIA) PVT. LTD.

PROOF CONSULTANT: INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI, NEAR INDIA BOMDILA ROAD, AMINGAON, NORTH GUWAHATI, GUWAHATI, ASSAM, PIN: 781039

PROJECT: MORAN BYPASS ROAD (NH-37)
FOUR LANING OF NH-37 FROM END OF MORAN BYPASS (KM 562.525) TO BOGIBEEL JUNCTION NEAR LAPETAETA (KM 581.700) IN THE STATE OF ASSAM UNDER BANDP-NE, PHASE 'A' ON EPC MODE- BALANCE WORK.

DRAWN	S.S.
DESIGNED	M.K.
CHECKED	B.G.
DATE: MAR. 2020	

TITLE: REINFORCEMENT DETAILS OF INTERMEDIATE CROSS GIRDER FOR FLYOVER AT DESIGN CH. 579+800

SCALE: AS SHOWN

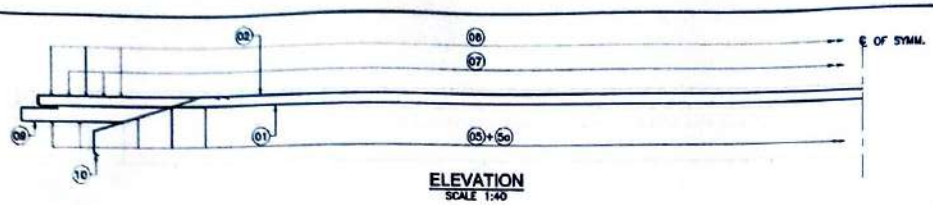
DWG. NO: NHIDCL/MB/JOR-DIB/ST/FLY/579+800/307

DESIGN DIRECTOR:

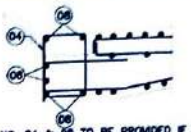
REVISION: R0

Sheet: 1 OF 1

Team Leader
Voyants Solutions Pvt. Ltd.
Sivasagar, Assam



ELEVATION
SCALE 1:40

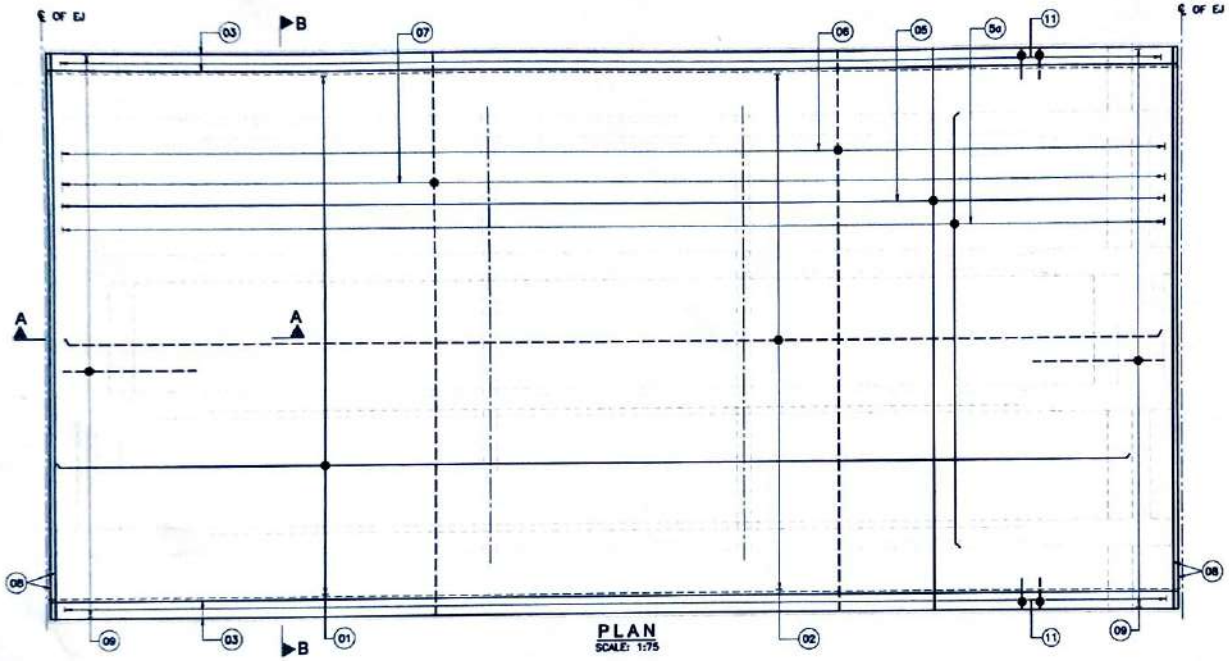


(BAR NO. 04 & 08 TO BE PROVIDED IF REQUIRED. SPACING OF THIS REINFORCEMENT SHALL BE VERIFIED FROM SUPPLIER OF EXPANSION JOINT)

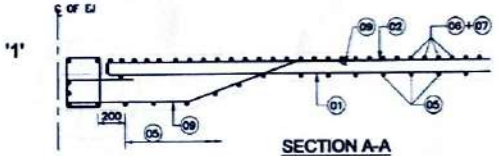
DETAIL - '1'
(SCALE 1:20)

SCHEDULE OF REINFORCEMENT

BAR MARK	SHAPE	BAR DIA & SPACING/Nos.
01	100 100	12 ϕ @ 200c/c
02	100 100	12 ϕ @ 200c/c
03	100 400	2x(16ϕ-4NOS.)
04		2L-10ϕ@200c/c
05	100 100	12 ϕ @ 200c/c
5a	100 100	16 ϕ @ 200c/c
06	100 100	12 ϕ @ 200c/c
07	100 100	12 ϕ @ 200c/c
08		12ϕ-2x6 NOS.
09		12 ϕ @ 200c/c
10		10 ϕ @ 200c/c
11	500 500	12 ϕ @ 200c/c

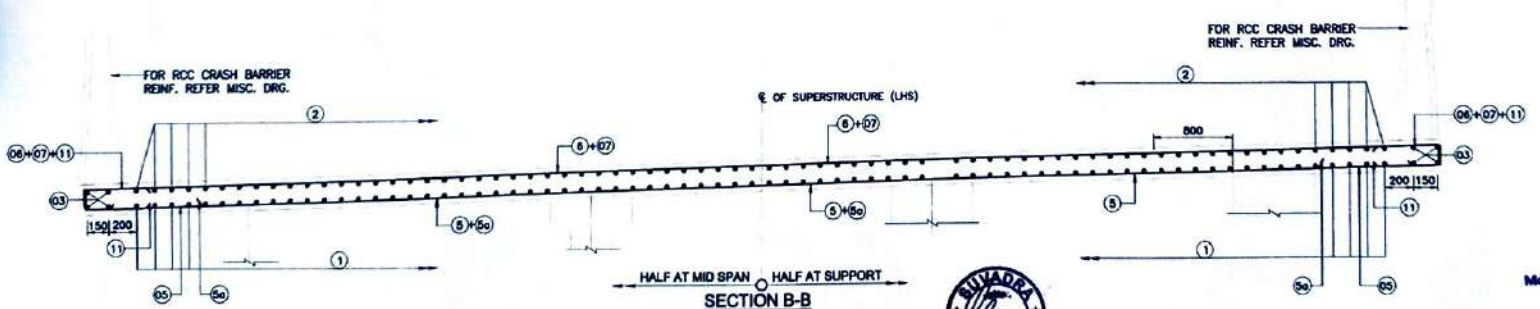


PLAN
SCALE: 1:75



SECTION A-A
SCALE 1:25

LEGEND:-
——— ON BOTTOM FACE
- - - - - - - ON TOP FACE



SECTION B-B
(SCALE 1:25)

REFERENCE DRAWING:-

1. GENERAL ARRANGEMENT DRAWING NHIDCL/MB/JOR-DIB/ST/FLY/579+800/101 (SH. 1 OF 1)
2. DIMENSION DETAILS OF SUPER STRUCTURE NHIDCL/MB/JOR-DIB/ST/FLY/579+800/301 (2 SHEETS)

Bridge Engineer
VSPL, Sivasagar

ANUPAM TAMULI
Project Manager
M/S Manuranjan Brahma
Moran Bypass to Bogibeel Junction
(NHIDCL, 4-Lane Project)

REV. NO	DATE	DESCRIPTION
R0	MAR. 2020	INITIAL SUBMISSION

CLIENT: NHIDCL

AUTHORITY ENGINEER: VOYANT'S SOLUTIONS PVT. LTD.

EPC CONTRACTOR: M/S MANARANJAN BRAHMA

SAFETY CONSULTANT: ARKITECHNO CONSULTANTS (INDIA) PVT. LTD.

PROOF CONSULTANT: INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI

PROJECT: MORAN BYPASS ROAD (NH-37)
FOUR LANING OF NH-37 FROM END OF MORAN BYPASS (KM 560.228) TO BOGIBEEL JUNCTION NEAR LAPETKETA (KM 581.700) IN THE STATE OF ASSAM UNDER BHARAT-NE PHASE 'A' ON EPC MODE- BALANCE WORK.

DRAWN	S.S.
DESIGNED	M.K.
CHECKED	B.G.
DATE: MAR. 2020	

TITLE: REINFORCEMENT DETAILS OF RCC DECK SLAB FOR FLYOVER AT DESIGN CH. 579+800

SCALE: AS SHOWN

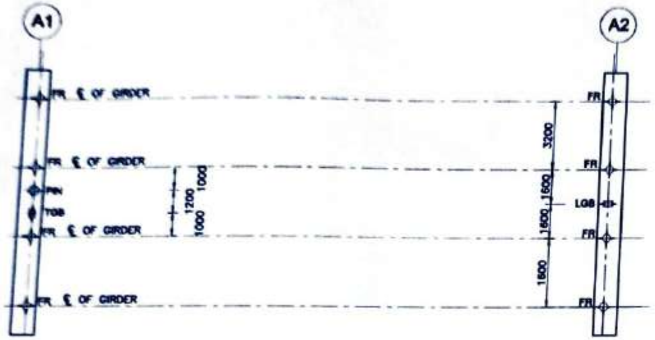
DRG. NO: NHIDCL/MB/JOR-DIB/ST/FLY/579+800/305

DESIGN DIRECTOR:

REVISION: R0

SHEET: 1 OF 1

Team Leader
Voyant Solutions Pvt. Ltd.
Sivasagar, Assam



TYPE OF BEARING		NORMAL CASE VERTICAL LOAD (t)	NORMAL CASE LONG. FORCE (t)	NORMAL CASE TRANS. FORCE (t)	SEISMIC LONG. CASE VERTICAL LOAD (t)	SEISMIC LONG. CASE LONG. FORCE (t)	SEISMIC LONG. CASE TRANS. FORCE (t)	SEISMIC TRANS. CASE VERTICAL LOAD (t)	SEISMIC TRANS. CASE LONG. FORCE (t)	SEISMIC TRANS. CASE TRANS. FORCE (t)	*LONG. MOVEMENT (mm)	DESIGN ROTATION (RADIAN)	TOTAL NO. OF BEARINGS PER SPAN
PIN	PIN	0	20	0	0	220	27	0	78	91	0	0.01	1
TRANS. GUIDED	TGB	0	20	0	0	220	0	0	78	0	0	0.01	1
LONG. GUIDED	LGB	0	0	0	0	0	27	0	0	91	-38/+19	0.01	1
FREE	FR	204	21.0	0	204	21.0	0	204	21.0	0	-38/+19	0.01	8

*SIGN "–" INDICATES CONTRACTION, SIGN "+" INDICATES EXPANSION

LEGENDS:

PIN — RESISTS NO VERTICAL LOAD, RESTRAINED IN BOTH DIRECTION & ROTATION PERMITTED.

FR — RESISTS VERTICAL LOAD; FREE IN BOTH DIRECTION AND ROTATION PERMITTED.

LGB — LONGITUDINAL GUIDED BEARING; RESISTS NO VERTICAL LOAD FREE IN LONGITUDINAL DIRECTION, RESTRAINED IN TRANSVERSE DIRECTION AND ROTATION PERMITTED.

NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
2. THIS DWG. SHOWS THE DESIGN LOADS AND PARAMETERS OF POT/POT CUM PTFE BEARING, THE WORKING DRAWING SHALL BE SUPPLIED BY THE MANUFACTURER.
3. THE BEARING SHALL BE POT/POT CUM PTFE ONLY AND MANUFACTURED, TESTED AND INSTALLED AS PER IRC:83 (PART III)/MOST SPECIFICATION.
4. MATERIALS SHALL CONFORM TO CLAUSE 925 OF IRC : 83 (PART III) - 2002.
5. WELDING :- WELDING SHALL CONFORM TO IS:9595 USING ELECTRODES OF SUITABLE GRADE AS PER IS:814 PRE HEATING AND POST WELD STRESS RELIEVING TO BE DONE AS PER IS:9595.
6. NON WORKING SURFACES OF STEEL ELEMENTS SHALL BE GIVEN TWO COATS OF EPOXY PRIMER. AND ONE OR MORE COAT EACH OF EPOXY INTERMEDIATE AND FINISH PAINT WITH TOTAL DRY FILM THICKNESS NOT LESS THAN 150 MICRONS AFTER SUITABLE SURFACE PREPARATION MATING SURFACES OF PISTON AND CYLINDER SHALL BE HARDENED BY METALLURGICAL PROCESSING.
7. SILICON GREASE SHALL BE APPLIED AT THE PTFE STAINLESS STEEL INTERFACE IN THE FACTORY AFTER TESTING.
8. TOLERANCES :- FOR ALL PARTS SHALL BE AS PER CLAUSE No.927.1 & 930 OF IRC : 83 (PART III)-2002. PLAN DIMENSIONS 0 TO +5mm. OVERALL HEIGHT 0 TO +3mm HEIGHT OF ANY STEEL COMPONENT
   a. MACHINED 0 TO +1mm.
   b. UNMACHINED CLASS 2 OF IS-4897
9. THE STAINLESS STEEL PLATES SHALL BE WELDED ON THE BACKING PLATES.
10. ALL BEARINGS SHALL BE LOAD TESTED IN THE FACTORY TO 1.1 TIMES THE DESIGN LOAD INCLUDING SEISMIC FORCE. TWO BEARINGS SELECTED AT RANDOM WILL BE TESTED FOR PERMISSIBLE ROTATION. PAIR OF BEARINGS SELECTED AT RANDOM SHALL BE TESTED FOR CO-EFFICIENT OF FRICTION. CO-EFFICIENT OF FRICTION SHALL BE 0.05 AT THE DESIGN LOAD.
11. CERTIFICATE FOR ACCEPTANCE TEST ON BEARINGS SHALL BE FURNISHED.
12. SUITABLE ERECTION CLAMPS FOR SAFE TRANSPORTATION AND HANDLING ALONG WITH TEMPLATE FOR ALIGNMENT SHALL BE PROVIDED BY THE MANUFACTURER. THESE SHALL BE REMOVED AFTER INSTALLATION AT AN APPROPRIATE TIME.
13. THE BEARING CYLINDER BASE PLATE SHALL BE OF CAST STEEL OF GRADE 280-520 W OF IS:1030-1989 AND THE MATERIAL AND FINISHED PRODUCT SHALL SATISFY ALL THE RELEVANT "IS" TEST & "IS" SPECIFICATIONS SUCH AS:-
   a. THE SURFACE HARDNESS SHALL BE TO BRINELL HARDNESS NUMBER MINIMUM 350 BHN AS PER MOST SPECIFICATION (4th.REVISION 2001). TOP PLATE AND PISTON WILL BE AS PER IS: 2062 GRADE B - 1992.
   b. CASTING TAPER FILLETS ROUNDING OFF OF EDGES TO MATCHING ALLOWANCE TO BE AS PER STANDARD PRACTICE.
   c. TESTING SPECIFIED IN IS:1030 i.e, TENSILE TEST IMPACT TEST AND BOND TEST SHALL BE CONDUCTED.
   d. CASTING SHALL BE ULTRASONICALLY TESTED AND CERTIFICATES SHALL BE SUBMITTED.
   e. QUALITY LEVEL OF CASTING AS PER IS:9565 SHALL BE LEVEL 3.
   f. RECERTIFICATION OF CASTING BY WELDING SHALL BE DONE AS PER IS:1030 AND IS:5530.
14. THE GROUT/BEDDING MORTAR SHALL BE A HIGH STRENGTH FREE FLOWING NON SHRINK GROUT.
15. THE PTFE MAY BE PROVIDED AS SINGLE DIMPLED SHEET OR WITH SMALLER MODULES IN INDIVIDUAL POCKETS WITH 10mm.GAP BETWEEN MODULES FILLED WITH SILICON GREASE.THE PTFE SHALL BE OF UNFILLED PURE VIRGIN QUALITY (MOST SPECIFICATION 2001)
16. SUITABLE TAPER FOR THE PRESS FIT GUIDE KEY AS REQUIRED MAY BE PROVIDED BY THE MANUFACTURER.
17. BEARING SHOULD BE PROCURED FROM THE MANUFACTURER AND APPROVED BY ENGINEER.
18. THE DESIGN LATERAL LOAD:-
   a. SHALL NOT BE LESS THAN 10% OF DESIGN VERTICAL LOAD AS PER CLAUSE 926.1.4 OF IRC 83 PART-III 2002.
   b. SHALL NOT BE MORE THAN 25% OF DESIGN VERTICAL LOAD AS PER CLAUSE 926.1.4 OF IRC 83 PART-III 2002.
19. PROCEDURE FOR BEARING INSTALLATION SHALL BE FURNISHED BY BEARING MANUFACTURER.
20. GRADE OF CONCRETE ARE AS FOLLOW:-
    PSC I-GIRDER M45
    RCC PEDESTAL M40
21. SIZE OF PEDESTAL ARE AS FOLLOW:-
    FREE BEARINGS 800x800
    PIN/GUIDED BEARING 1000X1000

REFERENCE DRAWING:-

1. GENERAL ARRANGEMENT DRAWING
   NHIDCL/MB/JOR-DIB/ST/FLY/579+800/101 (SH. 1 OF 1)
2. DIMENSION DETAILS OF SUPER STRUCTURE
   NHIDCL/MB/JOR-DIB/ST/FLY/579+800/301 (2 SHEETS)

ANUPAM TAMULI
Project Manager
M/S Manuranjan Brahma
Moran Bypass to Bogibeel Junction
(NHIDCL, 4-Lane Project)

SUVADRA CONSULTANTS

NTG

Bridge Engineer
VSPL, Sivasagar

REV. NO	DATE	DESCRIPTION
R0	MAR. 2020	INITIAL SUBMISSION

CLIENT: NHIDCL

AUTHORITY ENGINEER: VOYANTS SOLUTIONS PVT. LTD.
Team Leader
Voyants Solutions Pvt. Ltd.

EPC CONTRACTOR: M/S MANARANJAN BRAHMA, WARD NO. 4, DEPOT ROAD, KOKRAJHAR, DIST. KOKRAJHAR, PIN: 783370, ASSAM

SAFETY CONSULTANT: ARKITECHNO CONSULTANTS (INDIA) PVT. LTD.

PROOF CONSULTANT: INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI

PROJECT: MORAN BYPASS ROAD (NH-37)
FOUR LANING OF NH-37 FROM END OF MORAN BYPASS (KM 562.525) TO BOGIBEEL JUNCTION NEAR LAPETKETA (KM 581.700) IN THE STATE OF ASSAM UNDER SARDP-NE, PHASE 'A' ON EPC MODE- BALANCE WORK

DRAWN	S.S.
DESIGNED	M.K.
CHECKED	B.O.
DATE: MAR. 2020	

TITLE: DETAILS OF LOADS FOR POT CUM PTFE BEARING FLYOVER AT DESIGN CH. 579+800

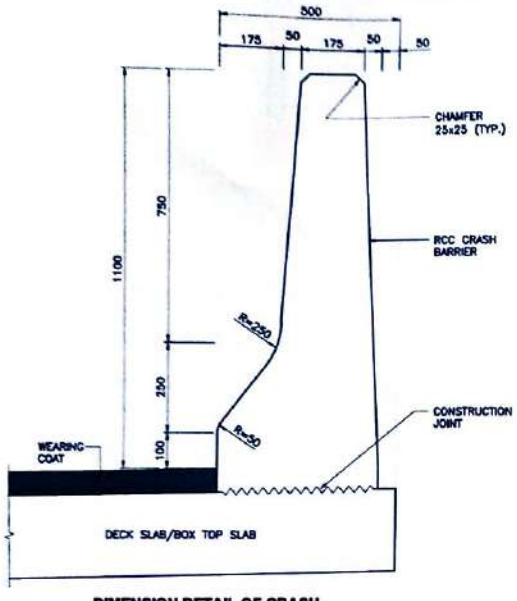
SCALE: AS SHOWN

DWG.NO: NHIDCL/MB/JOR-DIB/ST/FLY/579+800/309

DESIGN DIRECTOR:

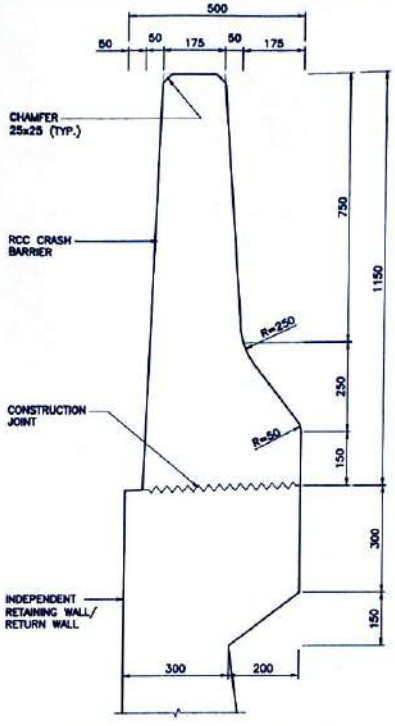
REVISION: R0

Sheet: 1 OF 1



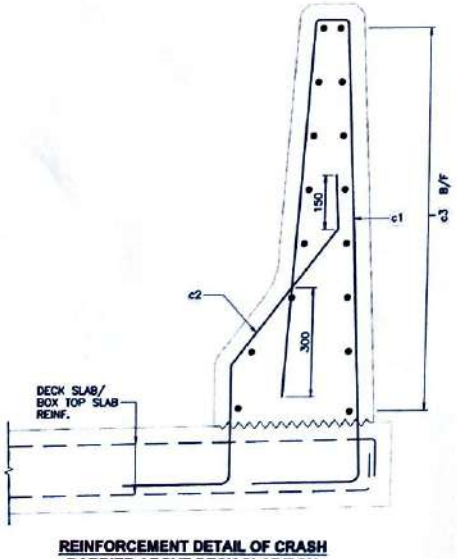
DIMENSION DETAIL OF CRASH BARRIER ABOVE DECK SLAB/BOX TOP SLAB (TYPE-1)

(SCALE–1:10)



DIMENSION DETAIL OF CRASH BARRIER ABOVE RCC INDEPENDENT RETAINING WALL/RETURN WALL

(SCALE–1:10)

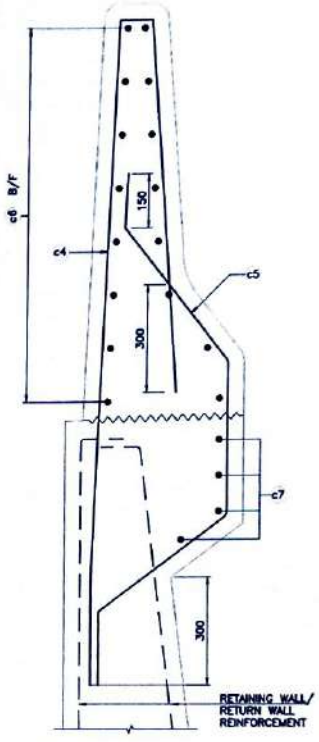


REINFORCEMENT DETAIL OF CRASH BARRIER ABOVE DECK SLAB/BOX TOP SLAB (TYPE-1)

(SCALE–1:10)

REINFORCEMENT SCHEDULE (TYPE-1):-

BAR MKD.	DIA (mm)	SPACING/NOS.	SHAPE
c1	12	150 C/C	300
c2	16	150 C/C	300
c3	12	150 C/C	—
c4	12	150 C/C	
c5	16	150 C/C	
c6	12	150 C/C	—
c7	12	4 NOS.	—



REINFORCEMENT DETAIL OF CRASH BARRIER ABOVE RCC INDEPENDENT RETAINING WALL/RETURN WALL

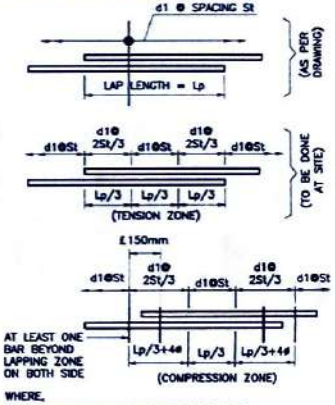
(SCALE–1:10)

NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE MENTIONED.
2. DIMENSIONS ARE NOT TO BE SCALED, ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
3. GRADE OF CONCRETE SHALL BE AS BELOW:–
   a) CRASH BARRIER M40
4. CLEAR COVER TO OUTERMOST STEEL SHALL BE AS BELOW:–
   a) CRASH BARRIER 45mm
5. REINFORCEMENT BAR SHALL CONFORMING TO IS: 1786–1985 OF GRADE Fe–500D.
6. MINIMUM ANCHORAGE LENGTH SHALL BE AS UNDER:
   CONCRETE GRADE – M–30 – 40 x DIA OF BAR
   CONCRETE GRADE – M–35 – 36 x DIA OF BAR
   CONCRETE GRADE – M–40 – 34 x DIA OF BAR
   FOR UNFAVOURABLE BOND CONDITION THE ABOVE VALUES SHOULD BE MULTIPLIED BY FACTOR OF 1.43.
7. SPLICING OF REINFORCEMENT SHALL BE DONE EITHER BY OVERLAPPING OR BY USING MECHANICAL COUPLER.
8. AS PER CLAUSE NO. 15.2.5 OF IRC: 112–2011. OVERLAPPING FOR SPLICING OF REINFORCEMENT SHALL BE AS FOLLOWS:

PERCENTAGE LAPPED BAR RELATIVE TO TOTAL CROSS SECTION AREA	LAP LENGTH Lp
≤ 25%	48ϕ
33%	56ϕ
50%	60ϕ
> 50%	72ϕ

ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP LAP ZONE SHALL BE AS FOLLOW:–



WHERE,
d1 = DIA OF TRANSVERSE REINFORCEMENT.
St = SPACING OF TRANSVERSE REINFORCEMENT.

9. BARS SHOWN IN THE DRAWING ARE NOT TO BE COUNTED, ONLY WRITTEN DATA SHALL BE FOLLOWED.

SUVADRA CONSULTANTS

ITG

Bridge Engineer
VSPL, Sivasagar

ANUPAM TAMULI
Project Manager
M/S Manuranjan Brahma
Moran Bypass to Bogibeel Junction
(NHIDCL) 4 Lane Project

Team Leader
Voyants Solutions Pvt. Ltd,
Sivasagar, Assam

REV. NO	DATE	DESCRIPTION
R0	FEB, 2021	INITIAL SUBMISSION

CLIENT: NHIDCL

AUTHORITY ENGINEER: VOYANTS SOLUTIONS PVT. LTD.

EPC CONTRACTOR: M/S MANARANJAN BRAHMA, WARD NO.-4, DEPOT ROAD, KOKRAJHAR, DIST: KOKRAJHAR, PH: 75357X, ASSAM

SAFETY CONSULTANT: ARKITECHNO CONSULTANTS (INDIA) PVT. LTD.

PROOF CONSULTANT: INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI, NEAR BOLA, GUWAHATI, ASSAM, PH: 781039

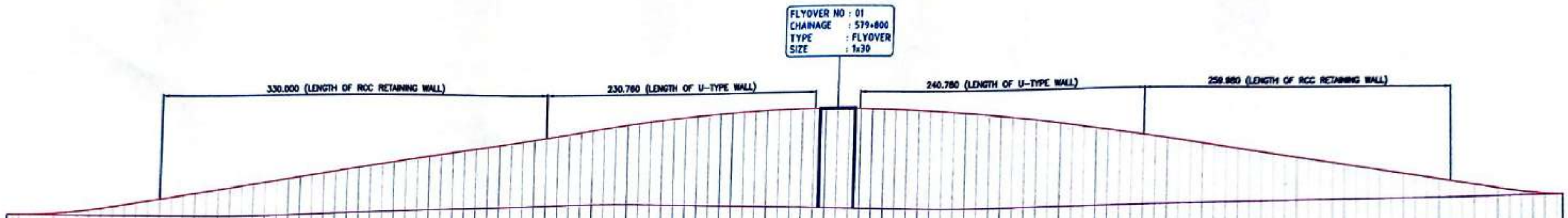
PROJECT: MORAN BYPASS ROAD (NH-37)
FOUR LANING OF NH-37 FROM END OF MORAN BYPASS (KM 352.525) TO BOGIBEEL JUNCTION NEAR LAPETHETA (KM 361.700) IN THE STATE OF ASSAM UNDER SARDP-NE, PHASE 'A' ON EPC MODE- BALANCE WORK.

DRAWN	S.S.
DESIGNED	M.K.
CHECKED	B.G.
DATE: FEB, 2021	

TITLE: DETAILS OF CRASH BARRIER
SCALE: AS SHOWN
DRG.NO: NHIDCL/MB/JOR-DIB/ST/FLY/579+609/401
DESIGN DIRECTOR:
REVISION: R0
Sheet: 1 OF 1

TO JHORHAT

TO DIBRUGARH



CHAINAGE (m)	PROP. ROAD LEVELS AT (PME) (m)	PROP. ROAD LEVELS AT (LME) (m)
579110	84.690	84.693
579120	84.680	84.704
579130	84.670	84.737
579140	84.660	84.791
579150	84.651	84.867
579160	84.641	84.964
579170	84.631	85.083
579180	84.621	85.223
579190	84.611	85.382
579200	84.602	85.543
579210	84.592	85.705
579220	84.582	85.866
579230	84.572	86.028
579240	84.562	86.189
579250	84.553	86.351
579260	84.543	86.512
579270	84.533	86.674
579280	84.525	86.835
579290	84.524	86.997
579300	84.529	87.158
579310	84.543	87.320
579320	84.563	87.481
579330	84.591	87.643
579340	84.624	87.804
579350	84.657	87.966
579360	84.691	88.127
579370	84.724	88.289
579380	84.758	88.450
579390	84.792	88.612
579400	84.825	88.774
579410	84.859	88.935
579420	84.892	89.097
579430	84.926	89.258
579440	84.959	89.420
579450	84.993	89.581
579460	85.027	89.743
579470	85.060	89.904
579480	85.094	90.066
579490	85.127	90.227
579500	85.161	90.389
579510	85.194	90.550
579520	85.228	90.712
579530	85.261	90.873
579540	85.295	91.035
579550	85.329	91.196
579560	85.362	91.358
579570	85.396	91.519
579580	85.429	91.681
579590	85.455	91.842
579600	85.471	92.004
579610	85.477	92.164
579620	85.473	92.318
579630	85.459	92.463
579640	85.435	92.600
579650	85.408	92.729
579660	85.381	92.851
579670	85.355	92.964
579680	85.328	93.069
579690	85.301	93.166
579700	85.274	93.255
579710	85.247	93.335
579720	85.220	93.408
579730	85.194	93.473
579740	85.167	93.529
579750	85.140	93.578
579760	85.113	93.618
579770	85.086	93.650
579780	85.059	93.675
579790	85.032	93.691
579800	85.006	93.699
579810	84.979	93.699
579820	84.952	93.691
579830	84.925	93.675
579840	84.898	93.651
579850	84.871	93.618
579860	84.845	93.578
579870	84.818	93.530
579880	84.791	93.473
579890	84.769	93.409
579900	84.754	93.336
579910	84.746	93.255
579920	84.746	93.166
579930	84.752	93.070
579940	84.766	92.965
579950	84.781	92.852
579960	84.797	92.731
579970	84.813	92.601
579980	84.829	92.464
579990	84.845	92.319
580000	84.860	92.165
580010	84.876	92.005
580020	84.892	91.843
580030	84.908	91.682
580040	84.923	91.520
580050	84.939	91.359
580060	84.955	91.197
580070	84.971	91.036
580080	84.987	90.874
580090	85.002	90.713
580100	85.018	90.551
580110	85.034	90.390
580120	85.050	90.228
580130	85.066	90.067
580140	85.081	89.905
580150	85.097	89.744
580160	85.113	89.582
580170	85.129	89.421
580180	85.144	89.259
580190	85.160	89.098
580200	85.176	88.936
580210	85.192	88.775
580220	85.208	88.613
580230	85.223	88.452
580240	85.239	88.290
580250	85.255	88.129
580260	85.271	87.967
580270	85.286	87.806
580280	85.302	87.644
580290	85.318	87.483
580300	85.334	87.321
580310	85.350	87.160
580320	85.369	86.998
580330	85.390	86.837
580340	85.413	86.675
580350	85.438	86.514
580360	85.466	86.352
580370	85.495	86.191
580380	85.525	86.034
580390	85.554	85.899
580400	85.583	85.790
580410	85.613	85.706
580420	85.642	85.647

LEVEL PROFILE

REFERENCE DRAWING:-

1. ARRANGEMENT OF U-TYPE WALL AND RETAINING WALL
   NHIDCL/MB/JOR-DIB/ST/FLY/579+800/402 (SH. 2 OF 4)
   NHIDCL/MB/JOR-DIB/ST/FLY/579+800/402 (SH. 3 OF 4)
   NHIDCL/MB/JOR-DIB/ST/FLY/579+800/402 (SH. 4 OF 4)

ANUPAM TAMULI
Project Manager
M/S Manuranjan Brahma
Moran Bypass to Bogibeel Junction
(NHIDCL, 4-Lane Project)

Bridge Engineer
VSPL, Sivasagar

REV. NO	DATE	DESCRIPTION
R1	FEB.2021	AS PER AE COMMENTS AND SITE CONDITION

CLIENT: NHIDCL

AUTHORITY ENGINEER: VOYANTS SOLUTIONS PVT. LTD.

Team Leader
Voyants Solutions Pvt. Ltd.

EPC CONTRACTOR: M/S MANARANJAN BRAHMA, WARD NO.4, DEPOT ROAD, KOKRAJHAR, DIST. KOKRAJHAR, PIN: 783370, ASSAM

SAFETY CONSULTANT: ARKITECHNO CONSULTANTS (INDIA) PVT. LTD.

PROOF CONSULTANT: INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI

PROJECT: MORAN BYPASS ROAD (NH-37)
FOUR LANING OF NH-37 FROM END OF MORAN BYPASS (KM 562.525) TO BOGIBEEL JUNCTION NEAR LAPETKETA (KM 561.700) IN THE STATE OF ASSAM UNDER BARDP-NE, PHASE 'A' ON EPC MODE- BALANCE WORK.

DRAWN: B.B. DESIGNED: M.K. CHECKED: B.D. DATE: FEB, 2021

TITLE: ARRANGEMENT OF U-TYPE WALL AND RETAINING WALL FOR FLYOVER AT DESIGN CH. 579+800

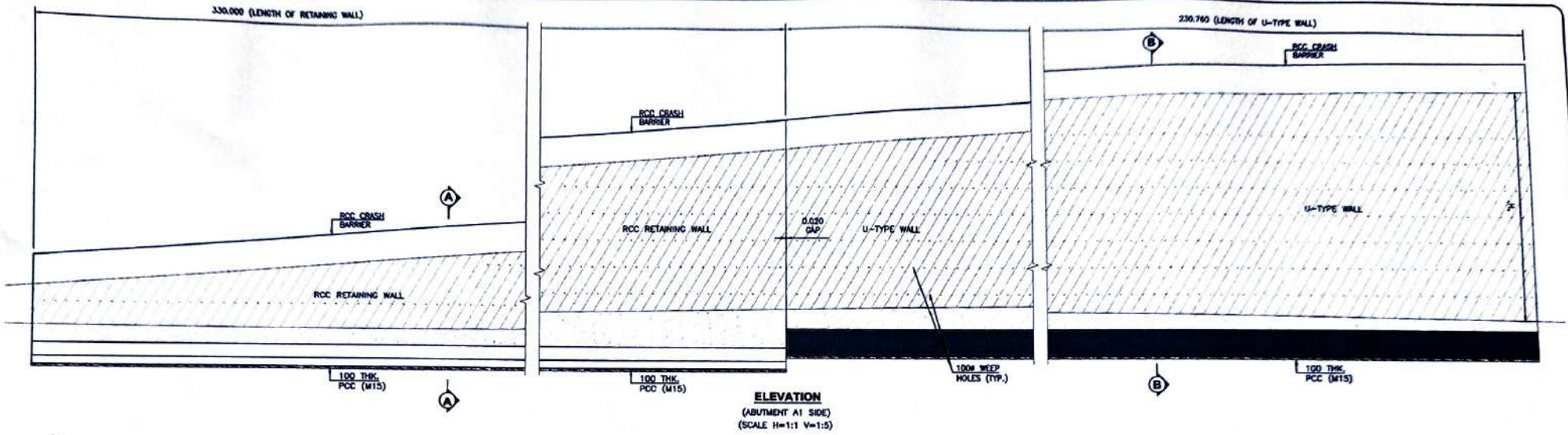
SCALE: AS SHOWN

DRG.NO: NHIDCL/MB/JOR-DIB/ST/FLY/579+800/402

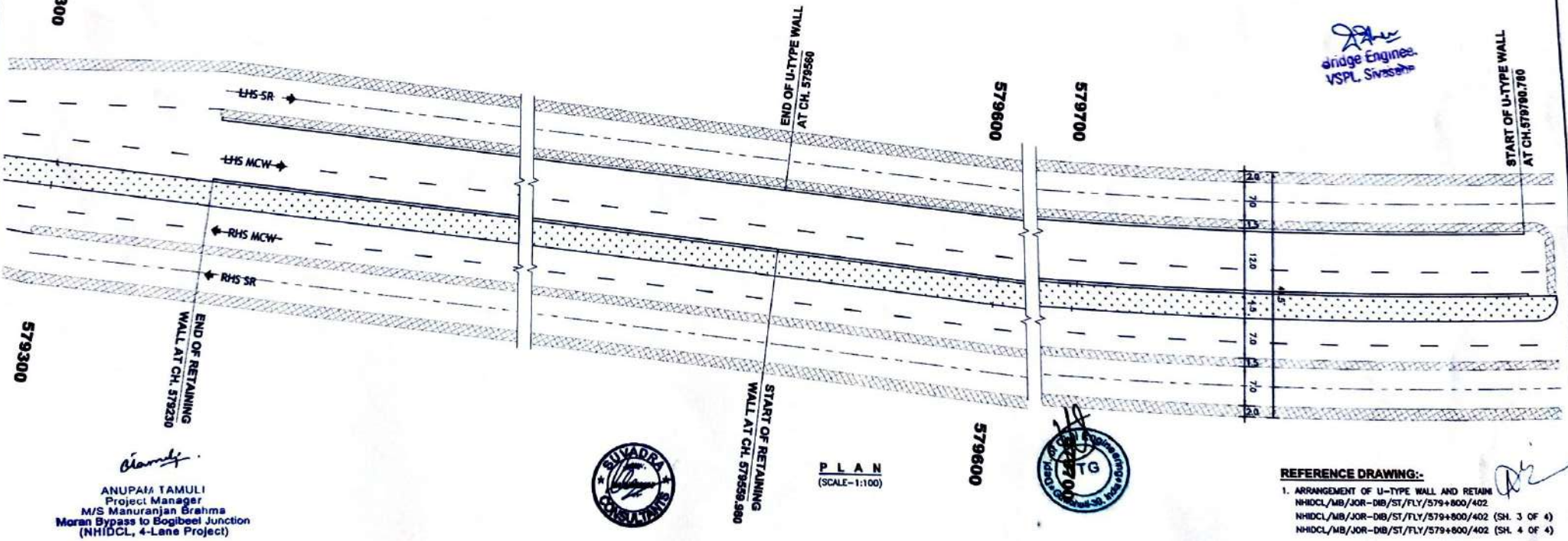
DESIGN DIRECTOR:

REVISION: R1

Sheet: 1 OF 4



ELEVATION
(ABUTMENT A1 SIDE)
(SCALE H=1:1 V=1:5)



PLAN
(SCALE-1:100)

ANUPAM TAMULI
Project Manager
M/S Manuranjan Brahma
Moran Bypass to Bogibeel Junction
(NHIDCL, 4-Lane Project)

Bridge Engineer
VSPL, Sivasagar

REFERENCE DRAWING:-

1. ARRANGEMENT OF U-TYPE WALL AND RETAINI
   NHIDCL/MB/JOR-DIB/ST/FLY/579+800/402
   NHIDCL/MB/JOR-DIB/ST/FLY/579+800/402 (SH. 3 OF 4)
   NHIDCL/MB/JOR-DIB/ST/FLY/579+800/402 (SH. 4 OF 4)

REV. NO	DATE	DESCRIPTION
R1	FEB. 2021	AS PER AE COMMENTS AND SITE CONDITION

CLIENT: NHIDCL

AUTHORITY ENGINEER: VOYANTS SOLUTIONS PVT. LTD.

EPC CONTRACTOR: M/S MANURANJAN BRAHMA
WARD NO.-4, DEPOT ROAD, KOKRAJHAR, DIST. KOKRAJHAR
PH: 783370, ASSAM

SAFETY CONSULTANT: ARKITECHNO CONSULTANTS (INDIA) PVT. LTD.

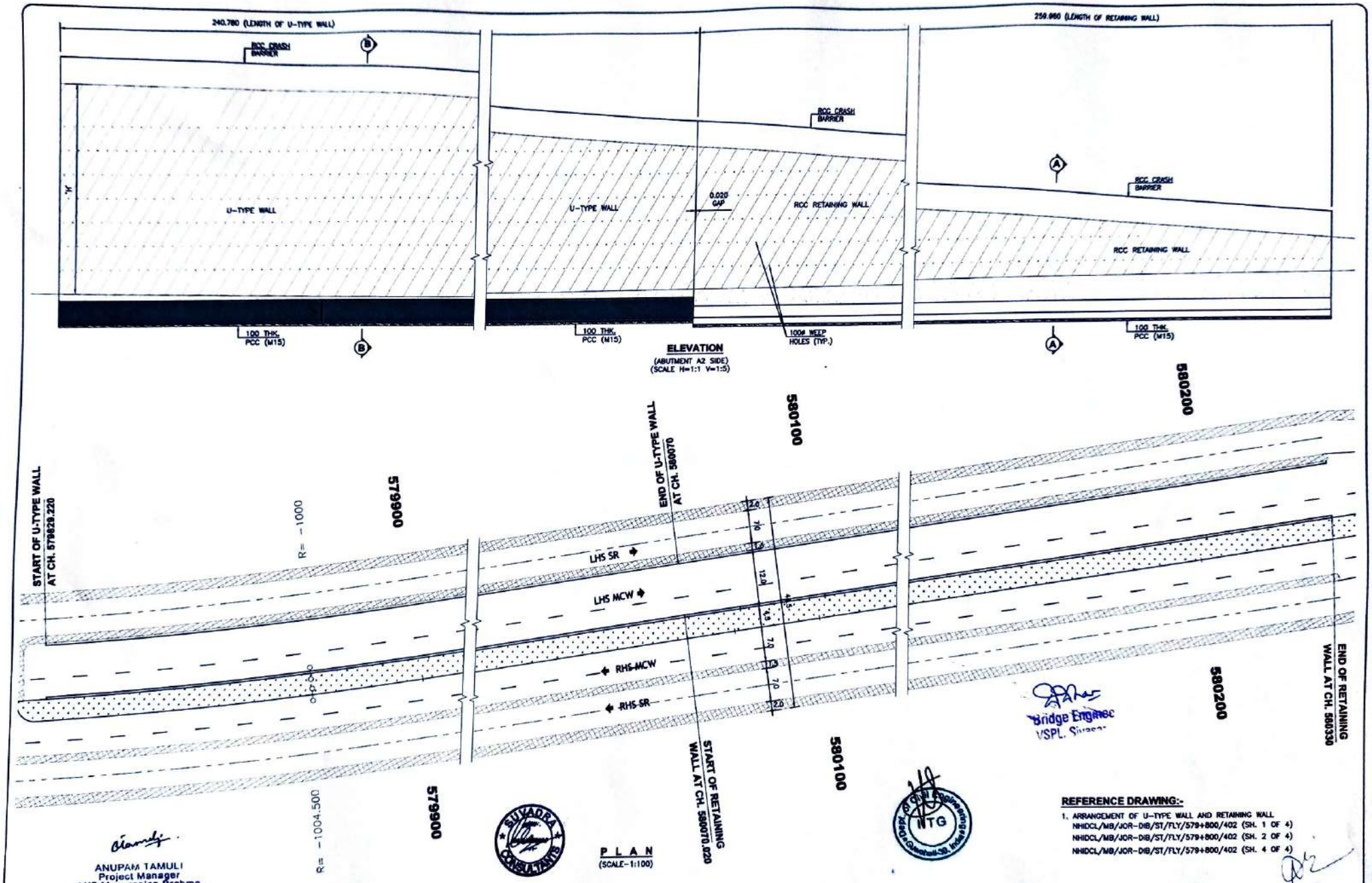
PROOF CONSULTANT: INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
NEAR IIOAS, GOSWAMI ROAD, AMINGAON, NORTH GUWAHATI, GUWAHATI, ASSAM.
PH: 781039

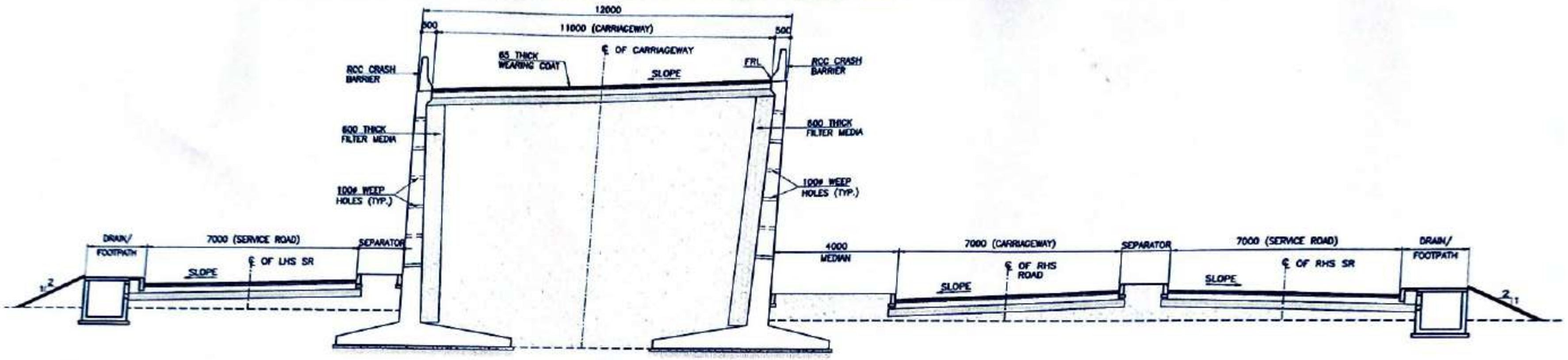
PROJECT: **MORAN BYPASS ROAD (NH-37)**
FOUR LANING OF NH-37 FROM END OF MORAN BYPASS (KM 562.525) TO BOGIBEEL JUNCTION NEAR LAPETKETA (KM 581.700) IN THE STATE OF ASSAM UNDER BHCP-NE, PHASE 'A' ON EPC MODE- BALANCE WORK.

DRAWN	S.S.
DESIGNED	M.K.
CHECKED	B.G.
DATE: FEB, 2021	

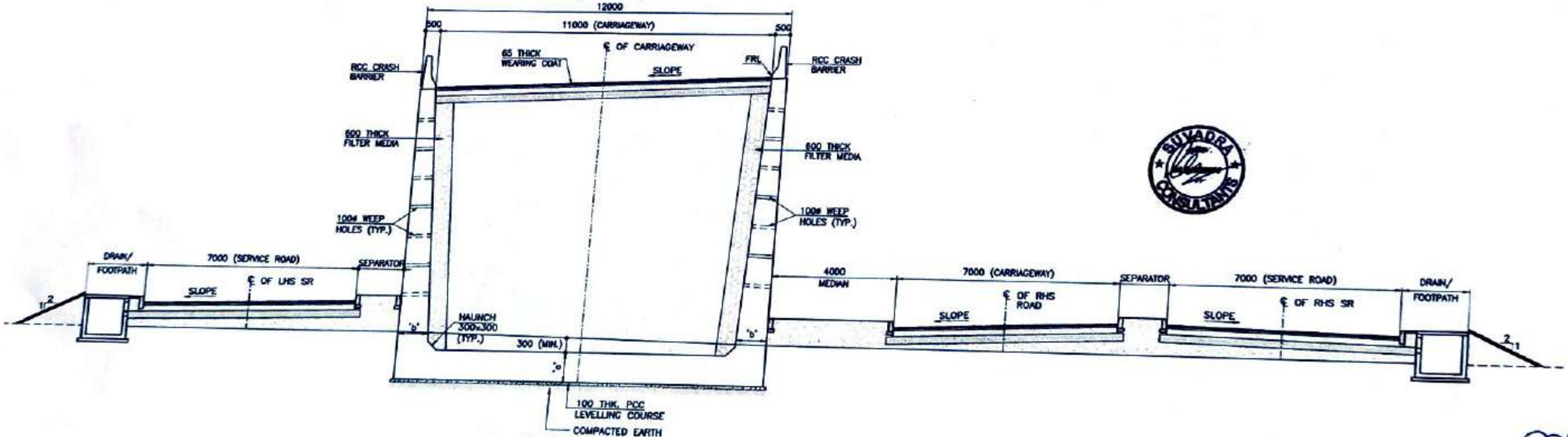
TITLE: ARRANGEMENT OF U-TYPE WALL AND RETAINING WALL FOR FLYOVER AT DESIGN CH. 579+800
SCALE: AS SHOWN
DRG. NO: NHIDCL/MB/JOR-DIB/ST/FLY/579+800/402
DESIGN DIRECTOR:
REVISION: R1
SHEET: 2 OF 4

Sivasagar, Assam


240.780 (LENGTH OF U-TYPE WALL)
259.950 (LENGTH OF RETAINING WALL)
RCC CRASH BARRIER
U-TYPE WALL
0.020 GAP
RCC RETAINING WALL
100 THK. PCC (M15)
100ø WEEP HOLES (TYP.)
ELEVATION
(ABUTMENT A2 SIDE)
(SCALE H=1:1 V=1:5)
START OF U-TYPE WALL AT CH. 579629.220
END OF U-TYPE WALL AT CH. 580070
START OF RETAINING WALL AT CH. 580070.920
END OF RETAINING WALL AT CH. 580330
579900
580100
580200
R= -1000
R= -1004.500
LHS SR
LHS MCW
RHS MCW
RHS SR
PLAN
(SCALE-1:100)
REFERENCE DRAWING:-
1. ARRANGEMENT OF U-TYPE WALL AND RETAINING WALL
NHIDCL/MB/JOR-DIB/ST/FLY/579+800/402 (SH. 1 OF 4)
NHIDCL/MB/JOR-DIB/ST/FLY/579+800/402 (SH. 2 OF 4)
NHIDCL/MB/JOR-DIB/ST/FLY/579+800/402 (SH. 4 OF 4)
Bridge Engineer
VSPL, Sivasagar
ANUPAM TAMULI
Project Manager
M/S Manuranjan Brahma
Moran Bypass to Bogibeel Junction
(NHIDCL, 4-Lane Project)
SUVADRA CONSULTANTS
NTG
REV. NO | DATE | DESCRIPTION
R1 | FEB, 2021 | AS PER AE COMMENTS AND SITE CONDITION
CLIENT:
AUTHORITY ENGINEER :
VOYANTS SOLUTIONS PVT. LTD.
EPC CONTRACTOR:
M/S MANARANJAN BRAHMA
SAFETY CONSULTANT:
ARKITECHNO CONSULTANTS (INDIA) PVT. LTD.
PROOF CONSULTANT:
INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
PROJECT:
MORAN BYPASS ROAD (NH-37)
FOUR LANING OF NH-37 FROM END OF MORAN BYPASS (KM 552.880) TO BOGIBEEL JUNCTION NEAR LAPETKHETA (KM 581.700) IN THE STATE OF ASSAM UNDER BARGE-ME, PHASE 'A' ON EPC MODE- BALANCE WORK.
DRAWN: S.S.
DESIGNED: M.K.
CHECKED: S.G.
DATE: FEB, 2021
TITLE: ARRANGEMENT OF U-TYPE WALL AND RETAINING WALL FOR FLYOVER AT DESIGN CH. 579+800
SCALE: AS SHOWN
DRG. NO: NHIDCL/MB/JOR-DIB/ST/FLY/579+800/402
DESIGN DIRECTOR:
REVISION: R1
Sheet: 3 OF 4
Team Leader
Voyants Solutions Pvt. Ltd.
Sivasagar, Assam


12000
500
11000 (CARRIAGEWAY)
500
65 THICK WEARING COAT
℄ OF CARRIAGEWAY
SLOPE
FRL
RCC CRASH BARRIER
RCC CRASH BARRIER
600 THICK FILTER MEDIA
600 THICK FILTER MEDIA
100ø WEEP HOLES (TYP.)
100ø WEEP HOLES (TYP.)
DRAIN/ FOOTPATH
7000 (SERVICE ROAD)
SEPARATOR
℄ OF LHS SR
SLOPE
4000 MEDIAN
7000 (CARRIAGEWAY)
℄ OF RHS ROAD
SLOPE
SEPARATOR
7000 (SERVICE ROAD)
℄ OF RHS SR
SLOPE
DRAIN/ FOOTPATH

SECTION AT A-A
(SCALE-1:150)


12000
500
11000 (CARRIAGEWAY)
500
65 THICK WEARING COAT
℄ OF CARRIAGEWAY
SLOPE
FRL
RCC CRASH BARRIER
RCC CRASH BARRIER
600 THICK FILTER MEDIA
600 THICK FILTER MEDIA
100ø WEEP HOLES (TYP.)
100ø WEEP HOLES (TYP.)
DRAIN/ FOOTPATH
7000 (SERVICE ROAD)
SEPARATOR
℄ OF LHS SR
SLOPE
HAUNCH 300x300 (TYP.)
300 (MIN.)
'b'
'a'
100 THK. PCC LEVELLING COURSE
COMPACTED EARTH
4000 MEDIAN
7000 (CARRIAGEWAY)
℄ OF RHS ROAD
SLOPE
SEPARATOR
7000 (SERVICE ROAD)
℄ OF RHS SR
SLOPE
DRAIN/ FOOTPATH

SECTION AT B-B
(SCALE-1:150)

HIEGHT OF WALL (IN mm)	THICKNESS OF BOTTOM SLAB (a) (IN mm)	THICKNESS OF WALL AT BASE (b) (IN mm)
6000	800	800
7000	1000	1000
8000	1100	1100
9000	1250	1250
10500	1350	1350

ANUPAM TAMULI
Project Manager
M/S Manuranjan Brahma
Moran Bypass to Bogibeel Junction
(NHIDCL, 4-Lane Project)

Bridge Engineer
VSPL, Sivasagar

SUVADRA CONSULTANTS

IITG Dept. of Civil Engineering, Guwahati-39, India

REFERENCE DRAWING:-

1. ARRANGEMENT OF U-TYPE WALL AND RETAINING WALL
NHIDCL/MB/JOR-DIB/ST/FLY/579+800/402 (SH. 1 OF 4)
NHIDCL/MB/JOR-DIB/ST/FLY/579+800/402 (SH. 2 OF 4)
NHIDCL/MB/JOR-DIB/ST/FLY/579+800/402 (SH. 3 OF

REV. NO	DATE	DESCRIPTION
R1	FEB. 2021	AS PER AS COMMENTS AND SITE CONDITION

CLIENT: NHIDCL

AUTHORITY ENGINEER: VOYANTS SOLUTIONS PVT. LTD.
Team Leader
Voyants Solutions Pvt. Ltd.
Sivasagar, Assam

EPC CONTRACTOR: M/S MANARANJAN BRAHMA, WARD NO.4, DEPOT ROAD, KOKRAJHAR, DIST. KOKRAJHAR, PIN: 783370, ASSAM

SAFETY CONSULTANT: ARKITECHNO CONSULTANTS (INDIA) PVT. LTD.

PROOF CONSULTANT: INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI

PROJECT: **MORAN BYPASS ROAD (NH-37)**
FOUR LANING OF NH-37 FROM END OF MORAN BYPASS (KM 562.525) TO BOGIBEEL JUNCTION NEAR LAPETKETA (KM 581.700) IN THE STATE OF ASSAM UNDER SARDP-NE, PHASE 'A' ON EPC MODE- BALANCE WORK

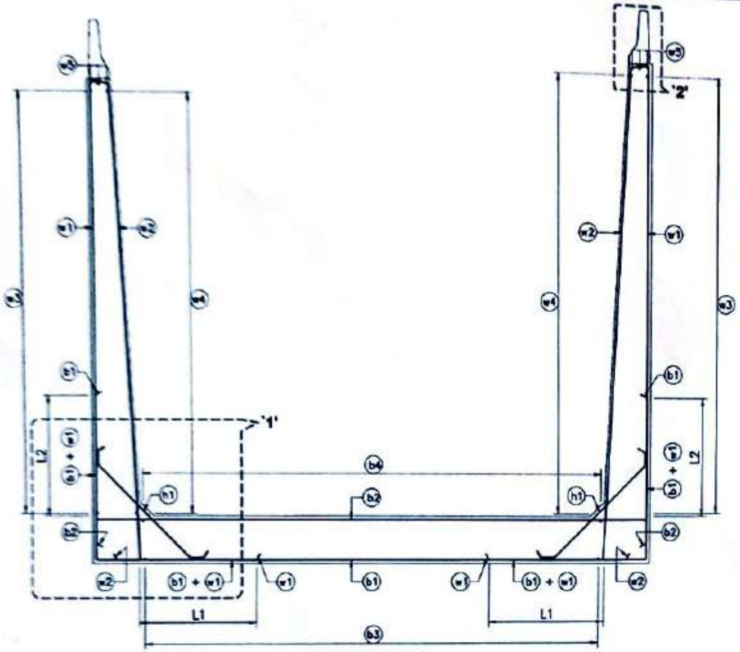
DRAWN	S.S.
DESIGNED	M.K.
CHECKED	B.O.

TITLE: ARRANGEMENT OF U-TYPE WALL AND RETAINING WALL FOR FLYOVER AT DESIGN CH. 579+800

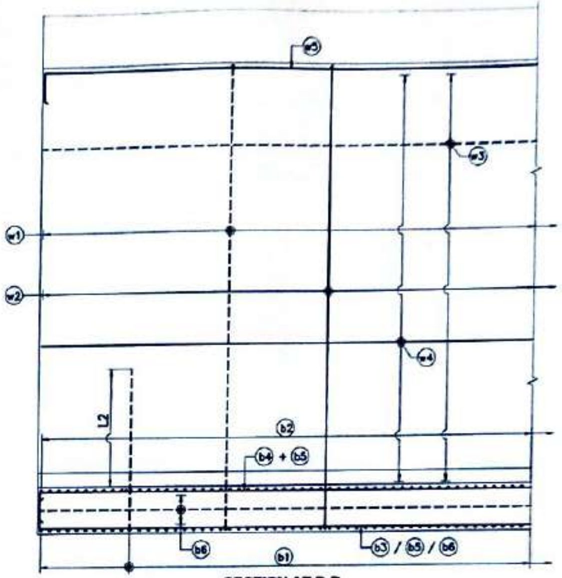
SCALE: AS SHOWN

DESIGN DIRECTOR:

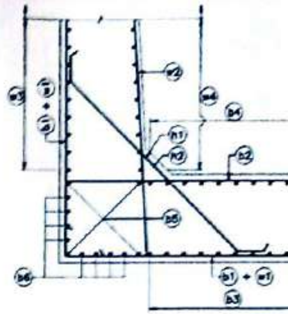
REVISION:



SECTION AT A-A
(SCALE-1:75)

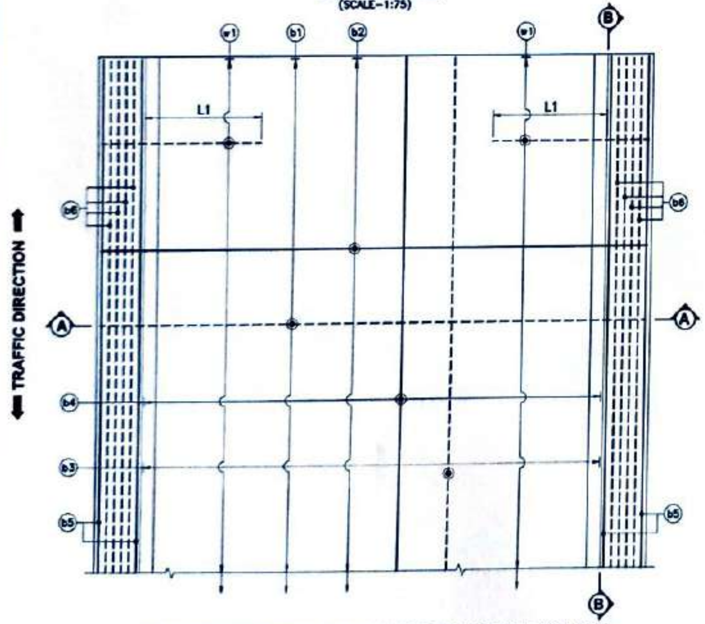


SECTION AT B-B
(SCALE-1:75)



DETAIL-'1'
(SCALE-1:25)

DETAIL-'2'
(SCALE-1:25)



PLAN SHOWING BOTTOM SLAB REINF. DETAILS OF U-TYPE WALL
(HAUNCH REINF. NOT SHOWN FOR CLARITY)
(SCALE-1:75)

REINFORCEMENT TABLE :-

HIEGHT (H)		6.0m		7.0m		8.0m		9.0m		10.5.0m	
BAR MKD.	SHAPE	DIA (mm)	SPACING (mm)	DIA (mm)	SPACING (mm)	DIA (mm)	SPACING (mm)	DIA (mm)	SPACING (mm)	DIA (mm)	SPACING (mm)
b1		20	150 C/C	25	150 C/C	25	150 C/C	25	100 C/C	32	100 C/C
b2		20	150 C/C	20	150 C/C	20	150 C/C	20	100 C/C	20	100 C/C
b3		10	150 C/C	10	150 C/C	10	150 C/C	12	150 C/C	12	150 C/C
b4		10	150 C/C	10	150 C/C	10	150 C/C	12	150 C/C	12	150 C/C
b5		12	2x4 NOS.	12	2x4 NOS.	12	2x4 NOS.	12	2x4 NOS.	12	2x4 NOS.
b6		12	2x2x4 NOS.	12	2x2x5 NOS.	12	2x2x6 NOS.	12	2x2x7 NOS.	12	2x2x8 NOS.
w1		20	150 C/C	25	150 C/C	25	150 C/C	25	100 C/C	25	100 C/C
w2		12	150 C/C	12	150 C/C	12	150 C/C	16	100 C/C	16	100 C/C
w3		10	150 C/C	12	150 C/C	12	150 C/C	12	150 C/C	12	150 C/C
w4		10	150 C/C	12	150 C/C	12	150 C/C	12	150 C/C	12	150 C/C
w5		12	3 NOS.	12	3 NOS.	12	3 NOS.	12	3 NOS.	12	3 NOS.
h1		10	200 C/C	10	200 C/C	10	200 C/C	10	200 C/C	10	200 C/C
h2		10	4x1 NOS.	10	4x1 NOS.	10	4x1 NOS.	10	4x1 NOS.	10	4x1 NOS.

BAR CURTAILMENT SCHEDULE IN mm.

L1	L*0.3
L2	H*0.3

LEGEND:-

REINFORCEMENT AT TOP FACE/NEAR FACE	————
REINFORCEMENT AT BOTTOM FACE/FAR FACE	- - - - - -

NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METRES, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
2. CONCRETE SHALL BE DESIGN MIX WITH A MINIMUM 28 DAYS CHARACTERISTIC ON 150MM CUBE AS FOLLOWS:
   a) RCC BOX CELL ———— M35
3. MINIMUM COVER TO ANY REINFORCEMENT SHALL BE AS FOLLOW:
   a) TOP SLAB (BOTH FACE) ———— 40mm
   b) VERTICAL WALL (EARTH FACE) ———— 75mm
   c) VERTICAL WALL (OPEN FACE) ———— 50mm
   d) BOTTOM SLAB (BOTH FACE) ———— 75mm
4. REINFORCEMENT BAR SHALL CONFORMING TO IS: 1786-1985 OF GRADE Fe-500D.
5. SPLICING OF REINFORCEMENT SHALL BE DONE EITHER BY OVERLAPPING OR BY USING MECHANICAL COUPLER.
6. AS PER CLAUSE NO. 15.2.5 OF IRC: 112-2011. OVERLAPPING FOR SPLICING OF REINFORCEMENT SHALL BE AS FOLLOWS:-

PERCENTAGE LAPPED BAR RELATIVE TO TOTAL CROSS SECTION AREA	LAP LENGTH Lp
<25%	52ø
33%	60ø
50%	72ø
>50%	78ø

7. BARS SHOWN IN THE DRAWING ARE NOT TO BE COUNTED. ONLY WRITTEN DATA SHALL BE FOLLOWED.

REFERENCE DRAWING:-

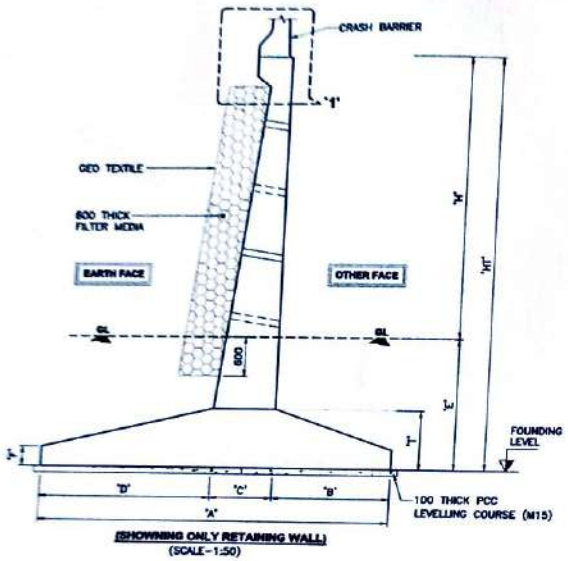
1. ARRANGEMENT OF U-TYPE WALL AND RETAINING WALL NHIDCL/MB/JOR-DIB/ST/FLY/579+800/402 (4 SHEETS)

Bridge Engineer
VSPL, Siva...

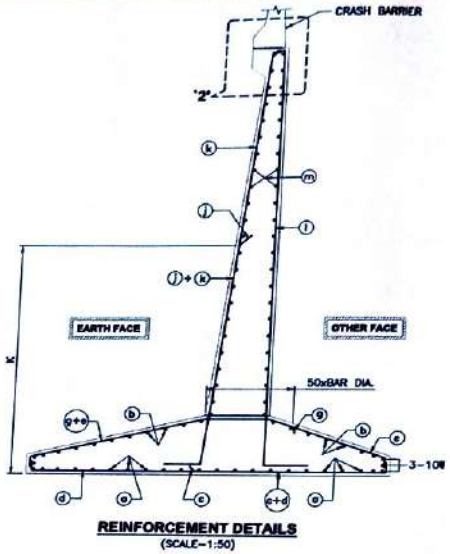
ANUPAM TAMULI
Project Manager
M/S Manoranjan Brahma
Moran Bypass to Bogibeel Junction
(NHIDCL 4-Lane Project)

CLIENT: NHIDCL	AUTHORITY ENGINEER : VOYANTS SOLUTIONS PVT. LTD.	EPC CONTRACTOR: M/S MANARANJAN BRAHMA, WARD NO.4, DEPOT ROAD, KOKRAJHAR, DIST. KOKRAJHAR, PIN: 783370, ASSAM	SAFETY CONSULTANT: ARKITECHNO CONSULTANTS (INDIA) PVT. LTD.
PROOF CONSULTANT: INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI	PROJECT: MORAN BYPASS ROAD (NH-37) FOUR LANING OF NH-37 FROM END OF MORAN BYPASS (KM 562.520) TO BOGIBEEL JUNCTION NEAR LAPETKATA (KM 561.700) IN THE STATE OF ASSAM UNDER SARDP-NE, PHASE 'A' ON EPC MODE- BALANCE WORK.	DRAWN: S.S. DESIGNED: M.K. CHECKED: B.D. DATE: FEB, 2021	TITLE: REINFORCEMENT DETAILS OF U-TYPE WALL FOR FLYOVER AT DESIGN CH. 579+800 SCALE: AS SHOWN DRG. NO: NHIDCL/MB/JOR-DIB/ST/FLY/579+800/403
DESIGN DIRECTOR:	REVISION: R1	Sheet: 1 OF 1	

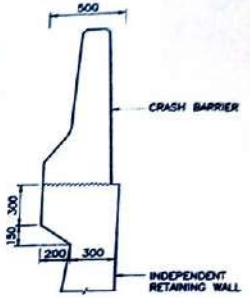
Team Leader
Voyants Solutions Pvt. Ltd.
Sivasagar, Assam



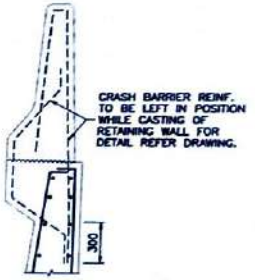
(SHOWNING ONLY RETAINING WALL)
(SCALE-1:50)



REINFORCEMENT DETAILS
(SCALE-1:50)



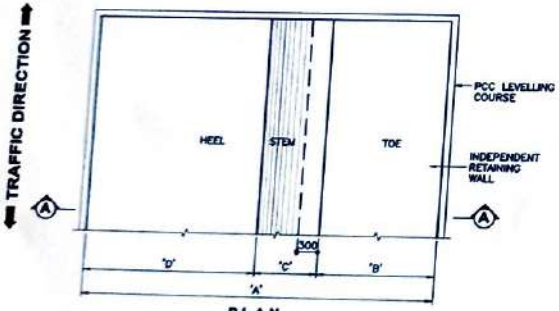
DETAIL-'1'
(SCALE-1:25)



DETAIL-'2'
(SCALE-1:25)

NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETERS, UNLESS OTHERWISE MENTIONED.
2. DIMENSIONS ARE NOT TO BE SCALED, ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
3. CONCRETE SHALL BE DESIGN MIX UNLESS OTHERWISE SPECIFIED IN DETAILED DRAWINGS, AND SHALL HAVE MINIMUM 28 DAYS CHARACTERISTIC STRENGTH ON 150mm CUBES FOR ALL ELEMENTS OF STRUCTURES AS INDICATED BELOW:
   a) RCC RETAINING WALL M30
4. REINFORCING STEEL SHALL BE OF HYSD (TMT) BARS. (GRADE DESIGNATION Fe 5000) CONFORMING TO TABLE 18.1 OF IRC: 112-2011.
5. MINIMUM COVER TO ANY REINFORCEMENT SHALL BE AS
   a) STEM 75mm
   b) FOOTING 75mm
6. SAFE BEARING CAPACITY SHALL NOT BE LESS THAN THAT MENTIONED IN DRAWING. INCASE ALLOWABLE SOIL BEARING CAPACITY IS FOUND TO BE LESS THAN THE REQUIRD BEARING CAPACITY, THE SOIL SHOULD BE STABILISED TO ACHIEVE THE SAME. FOR THIS PURPOSE THE WEAK SOIL LAYER SHALL BE REMOVED & REFILLED WITH COMPACTED GRAVEL.
7. 100ø WEEP HOLES SPACED AT 1000 C/C BOTH HORIZONTALLY AND VERTICALLY SHALL BE PROVIDED IN A STAGGERED MANNER IN EARTH RETAINING VERTICAL WALLS ABOVE GROUND LEVEL.
8. BACK FILLING BEHIND EARTH RETAINING WALL CONSIST OF SELECTED EARTH CONFORMING TO APPENDIX 6 OF IRC: 78-2014 HAVING PROPERTIES C=0, ϕ=30° AND γ = 2.0 T/m³
9. TO COUNTER FOR THE DEFLECTION RETAINING WALL SHALL BE CONSTRUCTED TILTED BACK BY 1 IN 100.



PLAN
(SCAL-1:50)

DIMENSION DETAILS OF RCC RETAINING WALL

S.NO.	TOTAL HEIGHT (HT)	3.0	4.0	5.0	6.0	7.0	8.0
1	H	1.00	2.00	3.00	4.00	5.00	6.00
2	A	2.90	3.50	4.50	5.20	6.00	7.00
3	B	0.60	0.80	1.10	1.50	1.80	2.15
4	C	0.50	0.50	0.60	0.70	0.90	1.25
5	D	1.80	2.20	2.80	3.00	3.30	3.60
6	E	2.00	2.00	2.00	2.00	2.00	2.00
7	F	0.30	0.30	0.30	0.30	0.30	0.50
8	K	0.00	0.00	2.50	3.00	3.80	4.00
9	T	0.40	0.50	0.60	0.70	0.90	1.10
10	MAX. BASE PRESSURE--AS PER DESIGN	9.0	11	12	13	14	16

(DIMENSIONS GIVEN IN THE TABLE ARE IN METRES)

REINFORCEMENT DETAILS OF RCC RETAINING WALL

SL. NO.	BAR MARKED AS	TOTAL HEIGHT 3.0 M	TOTAL HEIGHT 4.0 M	TOTAL HEIGHT 5.0 M	TOTAL HEIGHT 6.0 M	TOTAL HEIGHT 7.0 M	TOTAL HEIGHT 8.0 M
1	a	10mm dia @ 200mm c/c	10mm dia @ 200mm c/c	10mm dia @ 200mm c/c	10mm dia @ 200mm c/c	12mm dia @ 200mm c/c	12mm dia @ 200mm c/c
2	b	10mm dia @ 200mm c/c	10mm dia @ 200mm c/c	10mm dia @ 200mm c/c	10mm dia @ 200mm c/c	12mm dia @ 200mm c/c	12mm dia @ 200mm c/c
3	c	not used	not used	10mm dia @ 200mm c/c	12mm dia @ 200mm c/c	16mm dia @ 200mm c/c	16mm dia @ 220mm c/c
4	d	10mm dia @ 150mm c/c	12mm dia @ 125mm c/c	12mm dia @ 200mm c/c	12mm dia @ 200mm c/c	12mm dia @ 200mm c/c	16mm dia @ 220mm c/c
5	e	10mm dia @ 150mm c/c	12mm dia @ 125mm c/c	12mm dia @ 200mm c/c	16mm dia @ 200mm c/c	16mm dia @ 200mm c/c	16mm dia @ 220mm c/c
6	g	not used	not used	12mm dia @ 200mm c/c	12mm dia @ 200mm c/c	12mm dia @ 200mm c/c	16mm dia @ 220mm c/c
7	j	not used	not used	10mm dia @ 200mm c/c	16mm dia @ 200mm c/c	20mm dia @ 200mm c/c	12mm dia @ 200mm c/c
8	k	12mm dia @ 150mm c/c	12mm dia @ 125mm c/c	16mm dia @ 200mm c/c	16mm dia @ 220mm c/c	12mm dia @ 200mm c/c	20mm dia @ 200mm c/c
9	l	10mm dia @ 200mm c/c	10mm dia @ 125mm c/c	10mm dia @ 200mm c/c	10mm dia @ 200mm c/c	12mm dia @ 200mm c/c	12mm dia @ 200mm c/c
10	m	10mm dia @ 200mm c/c	10mm dia @ 200mm c/c	10mm dia @ 200mm c/c	10mm dia @ 200mm c/c	12mm dia @ 200mm c/c	12mm dia @ 200mm c/c

REV. NO	DATE	DESCRIPTION
01	FEB. 2021	AS PER AE COMMENTS AND SITE CONDITION

CLIENT: NHIDCL

AUTHORITY ENGINEER: VOYANTS SOLUTIONS PVT. LTD.

EPC CONTRACTOR: M/S MANURANJAN BRAHMA

SAFETY CONSULTANT: ARKITECHNO CONSULTANTS (INDIA) PVT. LTD.

PROOF CONSULTANT: INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI

PROJECT: MORAN BYPASS ROAD (NH-37)

FOUR LANING OF NH-37 FROM END OF MORAN BYPASS (KM 662.525) TO BOGIBEEL JUNCTION NEAR LAPETAKETA (KM 661.700) IN THE STATE OF ASSAM UNDER BHOOP-RE, PHASE 'A'

DRAWN	S.S.
DESIGNED	M.K.
CHECKED	B.G.

TITLE: DETAILS OF RETAINING WALL FOR FLYOVER AT DESIGN CH. 579+800

SCALE: AS SHOWN

DESIGN DIRECTORATE

Team Leader
Voyants Solutions Pvt. Ltd.
Sivasagar, Assam

ANUPAM TAMULI
Project Manager
M/S Manuranjan Brahma
Moran Bypass to Bogibeel Junction
(NHIDCL, 4-Lane Project)

Bridge Engineer.
VSPL, Sivasagar