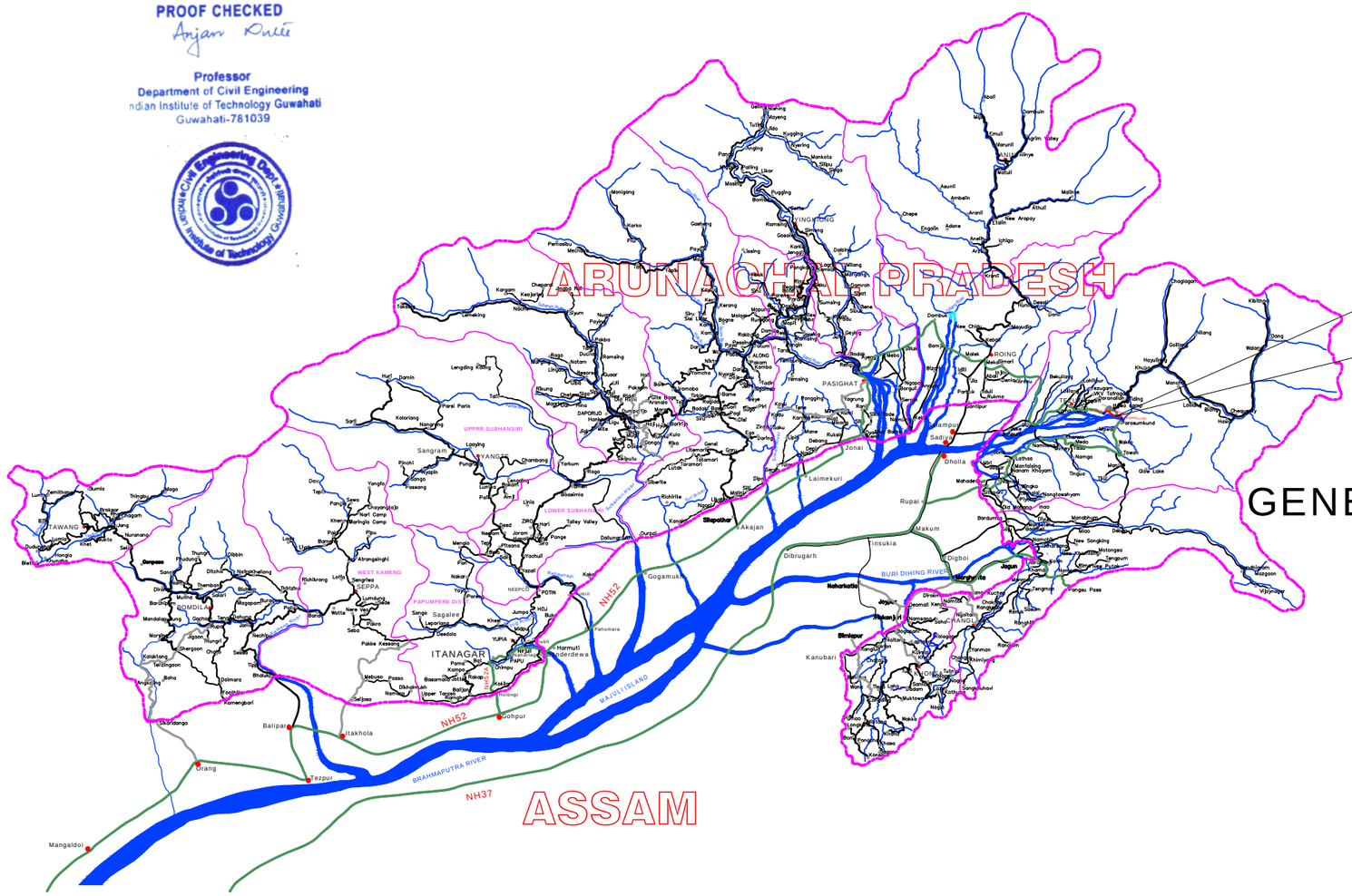
राष्ट्रीय राजमार्ग एवं अवसंरचना विकास निगम लिमिटेड
National Highways & Infrastructure Development Corporation Limited

BUILDING INFRASTRUCTURE - BUILDING THE NATION

CONSTRUCTION OF TWO LANING WITH HARD SHOULDERS OF DEMWE - BRAHMKUND SECTION OF NH-13 FROM CH. 0.000 TO CH 18.464 IN THE STATE OF ARUNACHAL PRADESH ON EPC MODE UNDER NH(O)-NE

PROOF CHECKED
Anjan Patel
Professor
Department of Civil Engineering
Indian Institute of Technology Guwahati
Guwahati-781039



GENERAL ARRANGEMENT DRAWING AT CH-2+085

FEBRUARY - 2022

Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED, 3rd Floor, PTI Building,4-Parliament Street, New Delhi-110001	*Authority Engineer :* **Glabal Infra Solutions**, E-8/11A,F-2, Global Tower , Trilanga Main Road , Akashganga Colony, Shahpura, Bhopal (462039), Tel.-0755-4045216	*EPC Contractor :* **Valecha Engineering Ltd**, Valecha Chambers, 4th Floor, Plot No B-6, New Link Road, Andheri West, Mumbai - 400053	*Safety Consultant :* SUVADRA CONSULTANTS (An ISO 9001 : 2008 Certified), (Soil Testing Laboratory & Engineering Consultant) Approved By Govt. of Orissa Regd. No. 11 of 2004-05, PP-97, Tankapani Road, BBSR-18, Odisha	*Proof Consultant :* SHAMBHAVI TECHNO SOLUTIONS PVT.LTD., E-82, Rajesh Kumar Path, S.k.Puri, Boring Road, Patna-800001	*Design Consultant :* **SPS Technocrats Pvt. Ltd.**, # 510 & 511, Fifth Floor, JMD Megapolis, Sector 48, Gurgaon, Haryana 122018

PROOF CHECKED
Anjan Dutta
Professor
Department of Civil Engineering
Indian Institute of Technology Guwahati
Guwahati-781039

LIST OF DRAWING

SR. NO.	DRAWING NAME	DRAWING NO.	NO. OF SHEET
1.	LIST OF DRAWING	VLE/DE-BR/STR/MJB/LOD/001	01
2.	GENERAL ARRANGEMENT DRAWING	VLE/DE-BR/STR/MJB/2+085/GAD/101	02
3.	CO-ORDINATE DRAWING	VLE/DE-BR/STR/MJB/2+085/COD/102	01
4.	SUB-STRUCTURE (ABUTMENT A1 & A2)	VLE/DE-BR/STR/MJB/SUB/2+085/200 TO 204	06
5.	SUB-STRUCTURE (PIER P1)	VLE/DE-BR/STR/MJB/SUB/250 TO 253	04
6.	SUB-STRUCTURE (PIER P2 & P3)	VLE/DE-BR/STR/MJB/SUB/254 TO 257	04
7.	SUB-STRUCTURE (PIER P4)	VLE/DE-BR/STR/MJB/SUB/258 TO 261	04
8.	SUB-STRUCTURE (PIER P5 TO P7)	VLE/DE-BR/STR/MJB/SUB/262 TO 265	04
9.	SUPER-STRUCTURE- SSC(50m)	VLE/DE-BR/STR/MJB/SUP/301 TO 307	08
10.	SUPER-STRUCTURE- RCC (25m)	VLE/DE-BR/STR/MJB/SUP/25M/RCC/301 TO 306	06
11.	MISCELLANEOUS	VLE/DE-BR/STR/MJB/MISC/401 TO 402	02

Rev.	Date	Description
R0	JAN.-22	FOR APPROVAL

Client :
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED
3rd Floor, PTI Building,4-Parliament Street, New Delhi-110001

Authority Engineer :
Glabal Infra Solutions
E-8/11A,F-2, Global Tower , Trilanga Main Road , Akashganga Colony, Shahpura, Bhopal (462039)
Tel.-0755-4045216

EPC Contractor :
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Safety Consultant :
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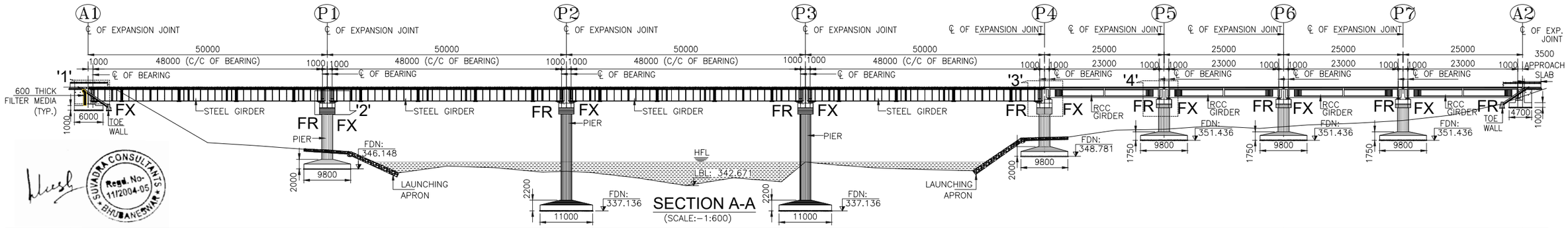
Project:
DEMWE - BRAHMKUND (NH-13)
CONSTRUCTION OF TWO LANING WITH HARD SHOULDERS OF DEMWE - BRAHMKUND SECTION OF NH-13 FROM CH. 0.000 TO CH 18.464 IN THE STATE OF ARUNACHAL PRADESH ON EPC MODE UNDER NH(O)-NE

Drawn	MS
Designed	GPV
Checked	AV
Date:	JAN-2022

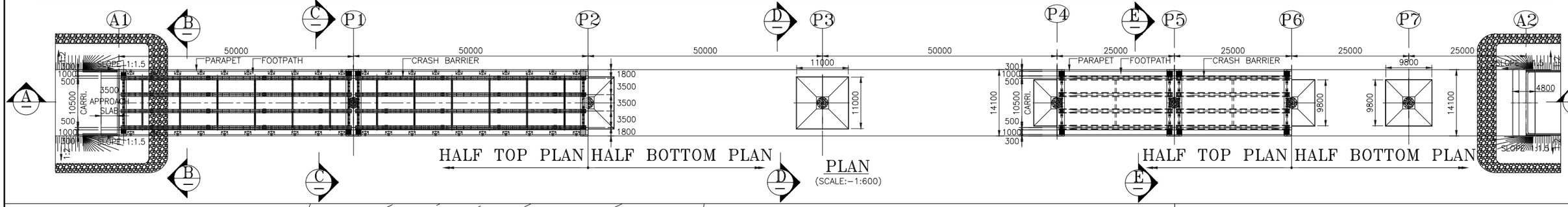
Title: **LIST OF DRAWING**
Scale: AS SHOWN — 1 OF 1 — *Rev:* R0
Drg. No: VLE/DE-BR/STR/MJB/LOD/001

DEMWE

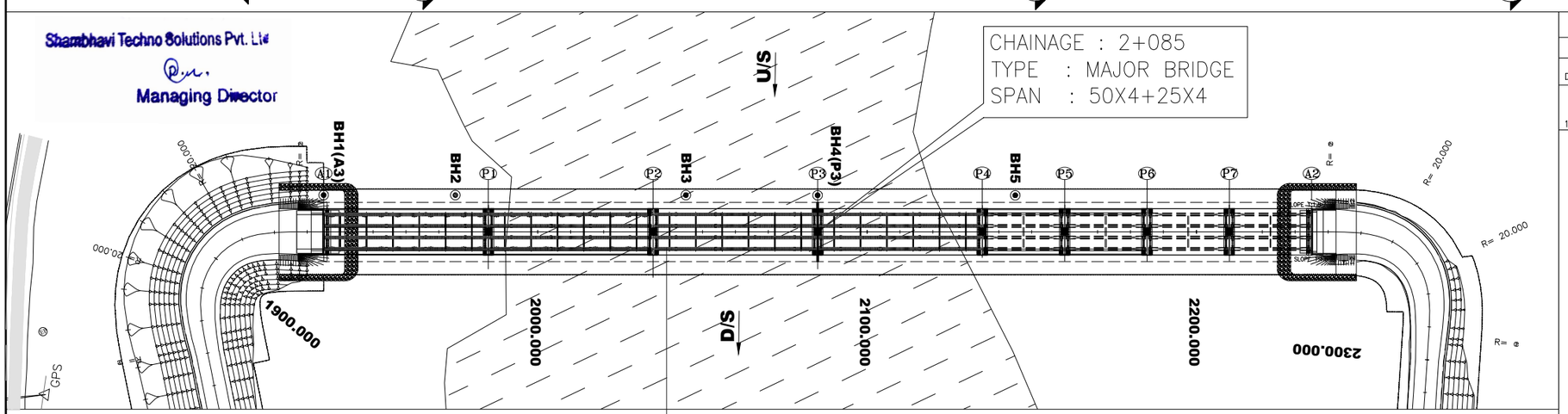
BRAHMAKUND



FRL	363.215	363.215	363.215	363.215	363.215	363.215	363.215	363.215	363.215
GROUND LEVEL (IN M) ⟵	363.215	350.148	345.671	347.613	352.781	354.436	354.964	356.238	361.270
CHAINAGE IN (IN Km)	1+935	1+985	2+035	2+085	2+135	2+160	2+185	2+210	2+235



Shambhavi Techno Solutions Pvt. Ltd
Managing Director



KEY PLAN

NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS UNLESS NOTED OTHERWISE.
2. DIMENSIONS ARE NOT TO BE SCALED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
3. FOR LOCATION OF BRIDGE REFER RELEVANT HIGHWAY DRAWING.
4. THE STRUCTURE IS DESIGNED TO CATER THE MAXIMUM OF;-
   a). THREE LANE OF CLASS A
   b). ONE LANE OF 70R WHEEL+ONE LINE OF CLASS A
   c). SPECIAL VEHICLE LOADING
5. CONCRETE SHALL BE OF DESIGN MIX AND SHALL HAVE MINIMUM 28 DAYS CHARACTERISTIC CUBE STRENGTH AS FOLLOWS
   a) CRASH BARRIER -M40
   b) PEDESTALS -M45
   c) APPROACH SLAB -M30
   d) PCC -M15
   e) SUB STRUCTURE (EXCEPT P2 & P3) -M35
   f) FOUNDATION LEVELING COURSE -M15
   g) COMPOSITE SUPERSTRUCTURE RCC DECK -M35
6. STEEL GRADE
   a) GRADE OF REINFORCEMENT SHALL BE Fe-500D CONFORMING TO IS:1786.
   b) STRUCTURAL STEEL-HIGH STRENGTH STEEL, GRADE (E-450) CONFIRMING TO IS 2062
7. DESIGN IS CLEAR COVER
   a). FOUNDATION - 75mm
   b). SUB STRUCTURE NON EARTH FACE - 50mm. & EARTH FACE - 75mm.
   c). SUPERSTRUCTURE RCC DECK SLAB - 40 mm.
8. WEARING COAT - 65 MM THK. WITH ONE LAYER OF ASPHALTIC CONCRETE OF THICKNESS OF 40mm OVER ONE LAYER OF 25mm THK. MASTIC ASPHALT.
9. EXPANSION JOINTS - STRIP SEAL.
10. BEARINGS TYPE - POT/PTFE
11. SOFT AND LOOSE PATCHES IN THE BEARING AREA ARE TO BE REPLACED BY COMPACTED GRANULAR FILLS WITH LAYERS NOT EXCEEDING 300mm.
12. ALL CONSTRUCTION SHALL CONFIRM TO CONTRACT SPECIFICATIONS.
13. COMPACTED EARTH SHOULD CONFORM TO CLAUSE 305.2.1.5 OF MORTH SPECIFICATIONS.
14. PROTECTION WORK SHALL BE PROVIDED AS PER SITE REQUIREMENT.
15. REFER MISCELLANEOUS DRAWINGS FOR CRASH BARRIER AND EXP. JOINT DETAILS.
16. SEISMIC ZONE V AS PER IRC6:2017

NOTES:-

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REFERENCE DRAWING:-

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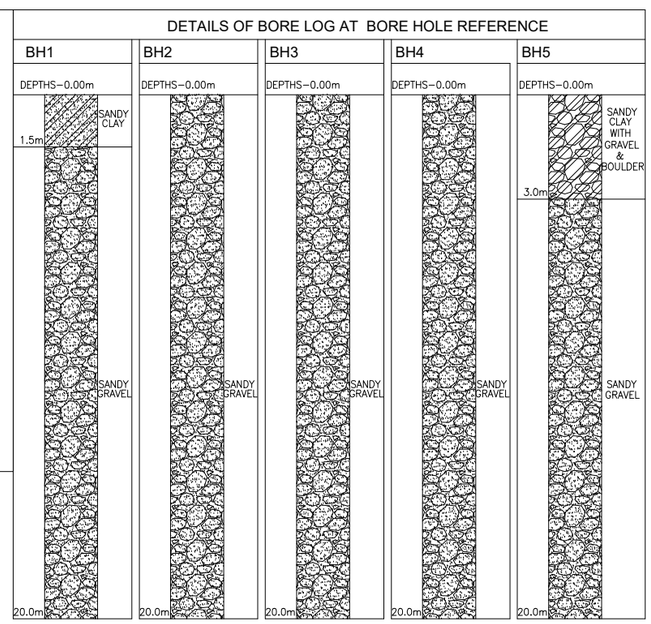
4. DIMENSION DETAILS OF PIER P2 & P3. VLE/DE-BR/STR/MJB/SUB/254-257
5. DIMENSION DETAILS OF PIER P4. VLE/DE-BR/STR/MJB/SUB/258-261
6. DIMENSION DETAILS OF PIER P5 TO P7. VLE/DE-BR/STR/MJB/SUB/262-265
7. DIMENSION DETAILS SUPERSTRUCTURE. VLE/DE-BR/STR/MJB/SUP/301-307

PROOF CHECKED
Anjan Dutta
Professor
Department of Civil Engineering
Indian Institute of Technology Guwahati
Guwahati-781039

DESIGN DIRECTOR

DETAILS OF BORE LOG AT BORE HOLE REFERENCE



SC (SANDY CLAY) SANDY GRAVEL SANDY CLAY WITH GRAVEL & BOULDER

HYDROLOGYICAL DATA

HFL	347.60m
DISCHARGE	1039.113 cumecs
VELOCITY	7.39 m/s

Rev.	Date	Description
R4	FEB-22	AE COMMENTS INCORPORATED
R3	JAN-22	STRUCTURE PROPOSAL REVISED
R2	SEPT. - 21	AS PER AE COMMENTS
R1	JULY 21	INSPECTION PLATFORM DETAILS INCLUDED
R0	JUNE 21	FOR APPROVAL

Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED
3rd Floor, PTI Building,4-Parliament Street, New Delhi-110001

Authority Engineer : Glabal Infra Solutions
E-8/11A,F-2, Global Tower , Trilanga Main Road , Akashganga Colony, Shahpura, Bhopal (462039) Tel.-0755-4045216

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Safety Consultant : SUVADRA CONSULTANTS (An ISO 9001 : 2008 Certified) Soil Testing Laboratory & Engineering Consultant) Approved By Govt. of Orissa Regd. No. 11 of 2004-05
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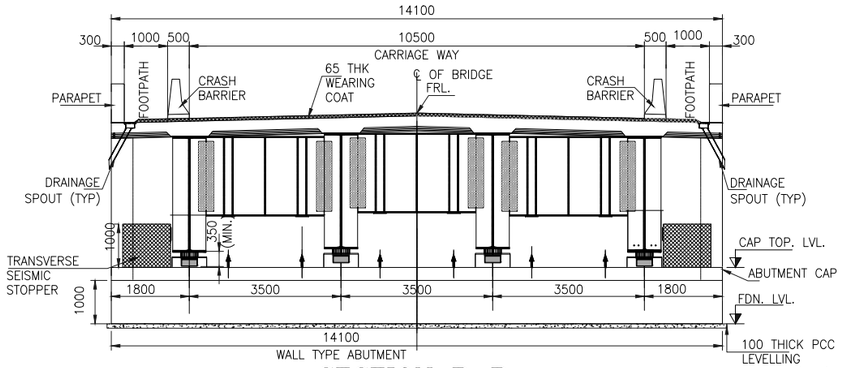
Drawn	MP
Designed	GPV
Checked	AK
Date:	JANUARY-21

Title: GENERAL ARRANGEMENT DRAWING OF MAJOR BRIDGE AT 2+085 (300 M SPAN)
Scale: AS SHOWN (1 OF 2) Rev: R4
Drg. No: VLE/DE-BR/STR/MJR/2+085/GAD/101



SECTION B–B

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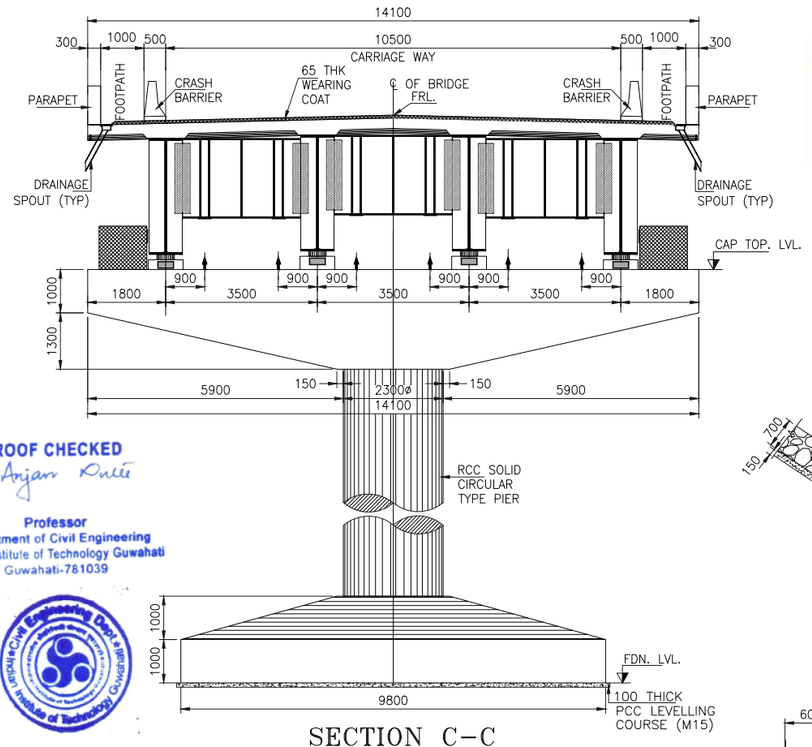
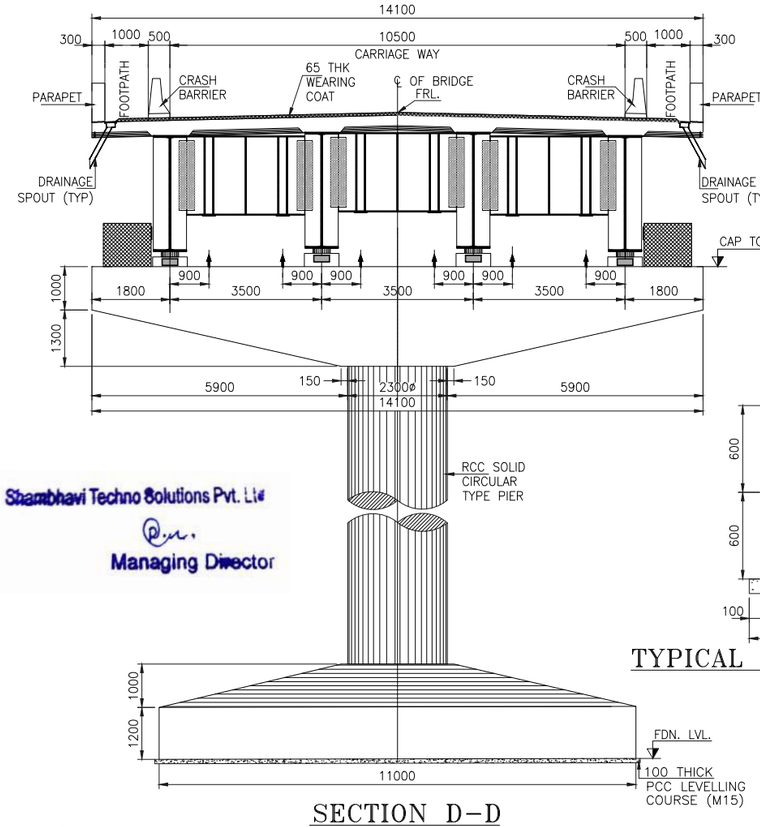


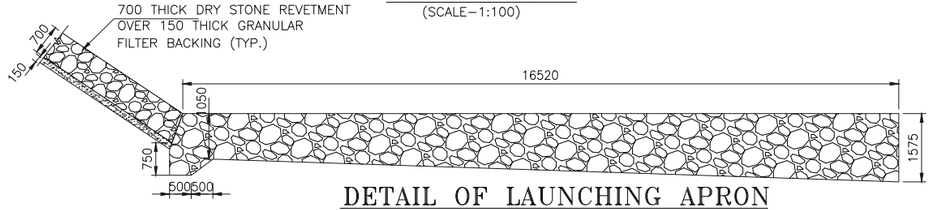
SECTION C–C

(SCALE–1:100)



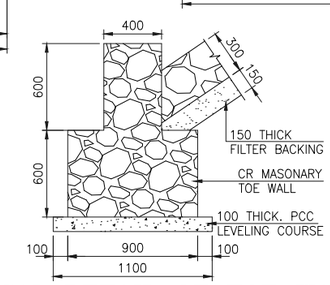
SECTION D–D

(SCALE–1:100)



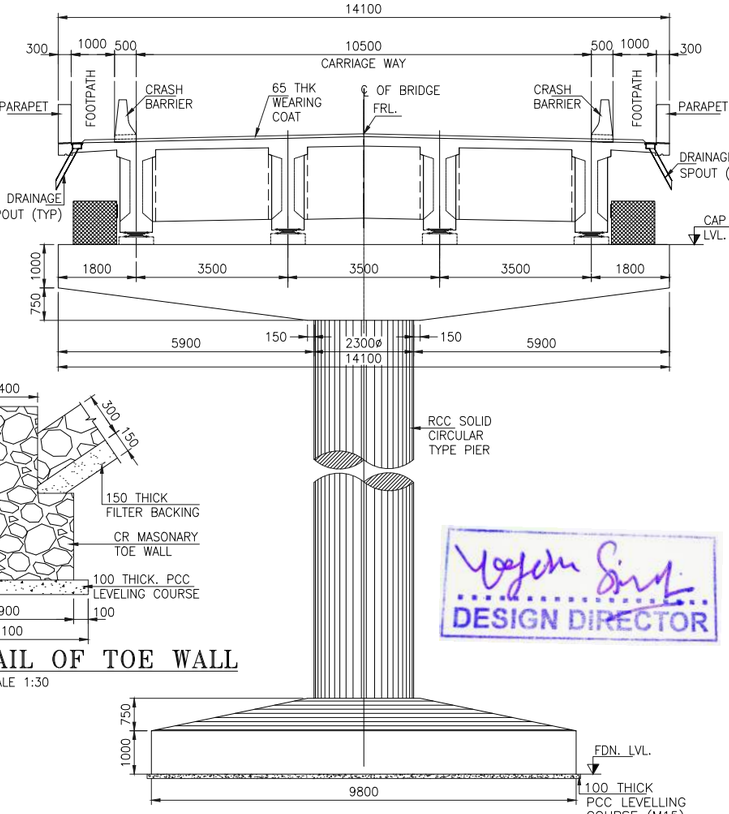
DETAIL OF LAUNCHING APRON

(SCALE–1:100)



TYPICAL DETAIL OF TOE WALL

SCALE 1:30

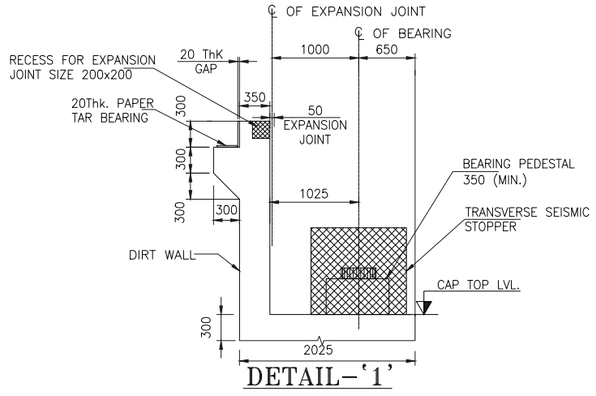


SECTION E–E

(SCALE–1:100)

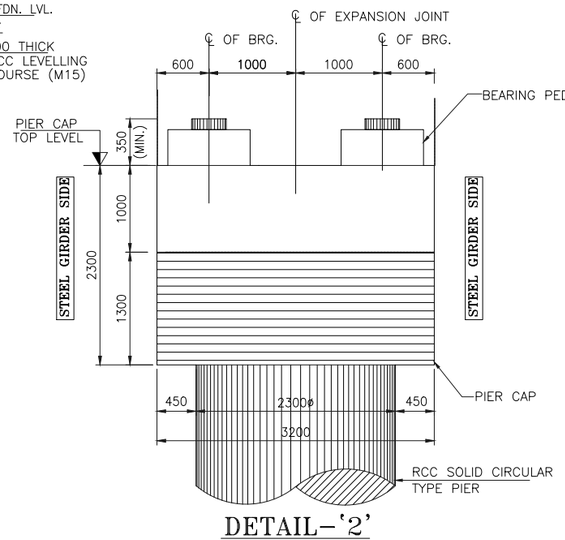
SECTION C–C

(SCALE–1:100)



DETAIL–'1'

(SCALE–1:50)



DETAIL–'2'

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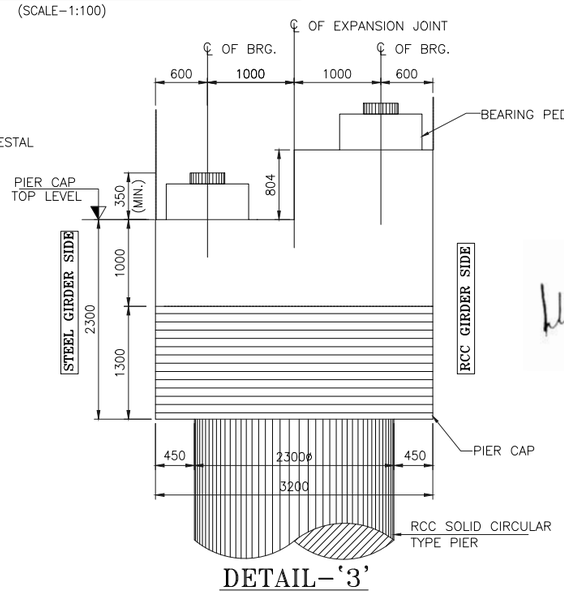
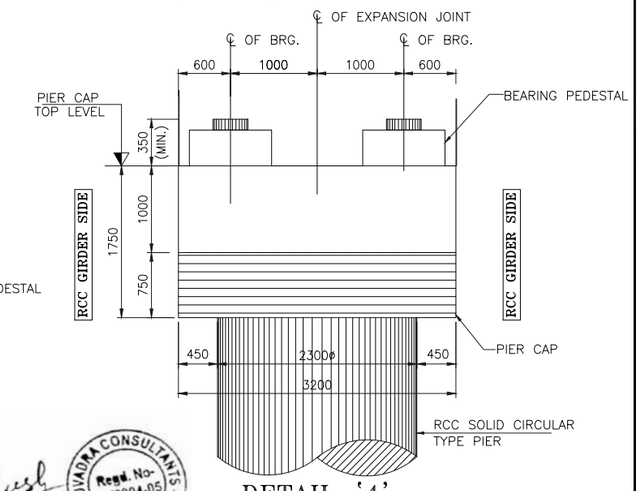


DETAIL–'3'

(SCALE–1:50)



DETAIL–'4'

(SCALE–1:50)

REFERENCE DRAWING:-

1. GENERAL ARRANGEMENT DRAWING. VLE/DE–BR/STR/MJB/2+085/GAD/101 (SH. 2 OF 2)
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Shambhavi Techno Solutions Pvt. Ltd.
Managing Director

PROOF CHECKED
Anjan Dutta
Professor
Department of Civil Engineering
Indian Institute of Technology Guwahati
Guwahati-781039

Yogesh Singh
DESIGN DIRECTOR

SUVADRA CONSULTANTS Regd. No-11/2004-05 BHUBANESWAR

Rev.	Date	Description
R4	FEB-22	AE COMMENTS INCORPORATED
R3	JAN-22	STRUCTURE PROPOSAL REVISED
R2	SEPT. - 21	AS PER AE COMMENTS
R1	JULY 21	INSPECTION PLATFORM DETAILS INCLUDED
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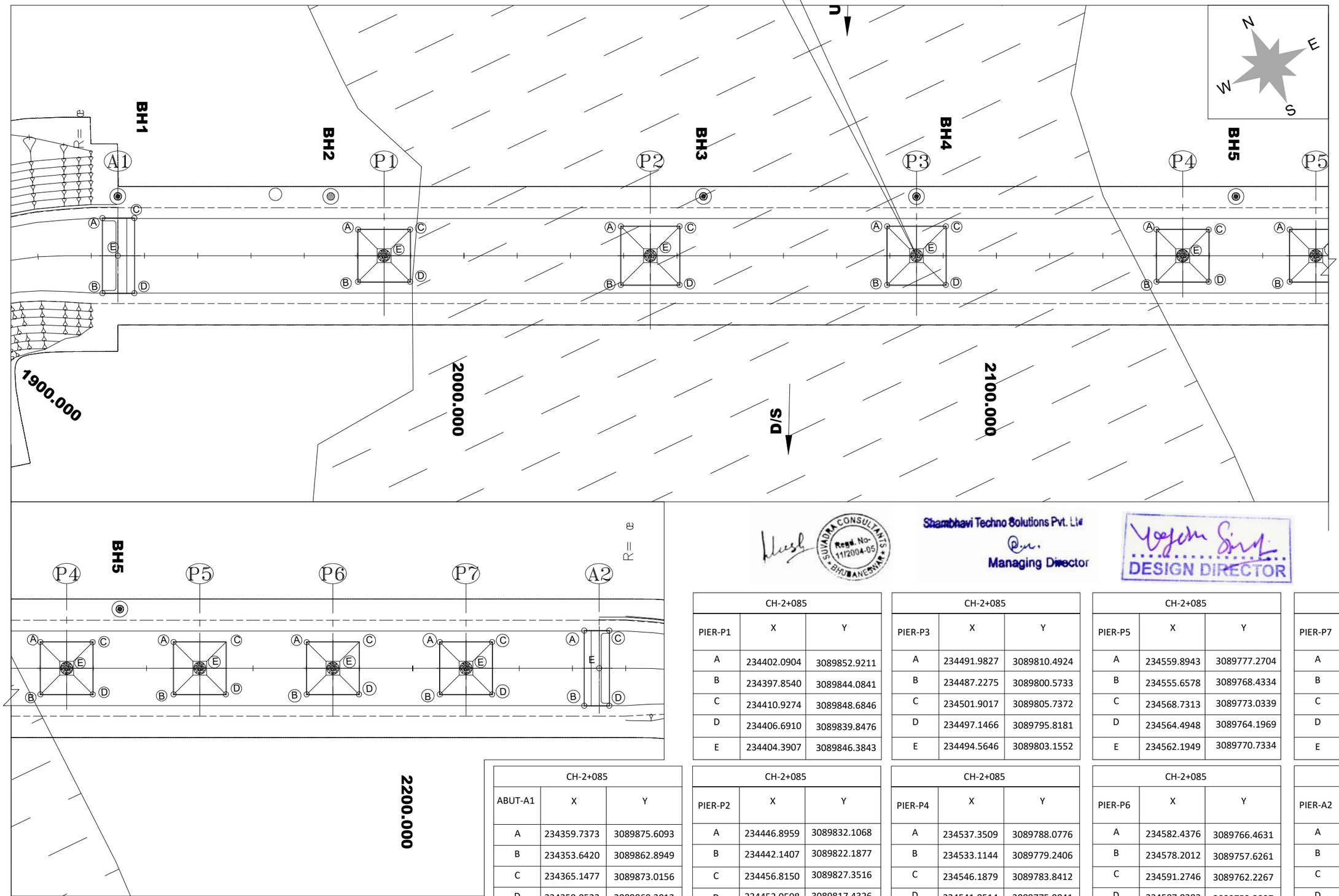
Scale: AS SHOWN (2 OF 2) Rev: R4
Drg. No: VLE/DE-BR/STR/MJR/2+085/GAD/101

CO-ORDINATE

DEMWE

PROPOSED CH.- 2+085

BRAHMAKUND



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PROOF CHECKED
Anjan Rath
Professor
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Indian Institute of Technology Guwahati
Guwahati-781039

SUVADRA CONSULTANTS Regd. No- 11/2004-05 BHUBANESWAR

Shambhavi Techno Solutions Pvt. Ltd
Managing Director

DESIGN DIRECTOR

CH-2+085		
PIER-P1	X	Y
A	234402.0904	3089852.9211
B	234397.8540	3089844.0841
C	234410.9274	3089848.6846
D	234406.6910	3089839.8476
E	234404.3907	3089846.3843

CH-2+085		
PIER-P3	X	Y
A	234491.9827	3089810.4924
B	234487.2275	3089800.5733
C	234501.9017	3089805.7372
D	234497.1466	3089795.8181
E	234494.5646	3089803.1552

CH-2+085		
PIER-P5	X	Y
A	234559.8943	3089777.2704
B	234555.6578	3089768.4334
C	234568.7313	3089773.0339
D	234564.4948	3089764.1969
E	234562.1949	3089770.7334

CH-2+085		
PIER-P7	X	Y
A	234604.9808	3089755.6560
B	234600.7444	3089746.8190
C	234613.8178	3089751.4196
D	234609.5814	3089742.5826
E	234607.2814	3089749.1194

CH-2+085		
ABUT-A1	X	Y
A	234359.7373	3089875.6093
B	234353.6420	3089862.8949
C	234365.1477	3089873.0156
D	234359.0523	3089860.3012
E	234359.3046	3089867.9985

CH-2+085		
PIER-P2	X	Y
A	234446.8959	3089832.1068
B	234442.1407	3089822.1877
C	234456.8150	3089827.3516
D	234452.0598	3089817.4326
E	234449.4779	3089824.7697

CH-2+085		
PIER-P4	X	Y
A	234537.3509	3089788.0776
B	234533.1144	3089779.2406
C	234546.1879	3089783.8412
D	234541.9514	3089775.0041
E	234539.6517	3089781.5411

CH-2+085		
PIER-P6	X	Y
A	234582.4376	3089766.4631
B	234578.2012	3089757.6261
C	234591.2746	3089762.2267
D	234587.0382	3089753.3897
E	234584.7383	3089759.9262

CH-2+085		
PIER-A2	X	Y
A	234630.3630	3089745.8721
B	234624.2678	3089733.1576
C	234634.6012	3089743.8404
D	234628.5059	3089731.1259
E	234629.8402	3089738.3045

Rev.	Date	Description
R1	FEB- 22	ADD PIER P2 & P3
R0	JAN- 22	FOR APPROVAL

Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED
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E-82, Rajesh Kumar Path, S.k.Puri, Boring Road, Patna-800001

Design Consultant : SPS Technocrats Pvt. Ltd.
510 & 511, Fifth Floor, JMD Megapolis, Sector 48, Gurgaon, Haryana 122018

Project: DEMWE - BRAHMKUND (NH-13)
CONSTRUCTION OF TWO LANING WITH HARD SHOULDERS OF DEMWE - BRAHMKUND SECTION OF NH-13 FROM CH. 0.000 TO CH 18.464 IN THE STATE OF ARUNACHAL PRADESH ON EPC MODE UNDER NH(O)-NE

Drawn	MP
Designed	GPV
Checked	SS
Date:	JAN - 22

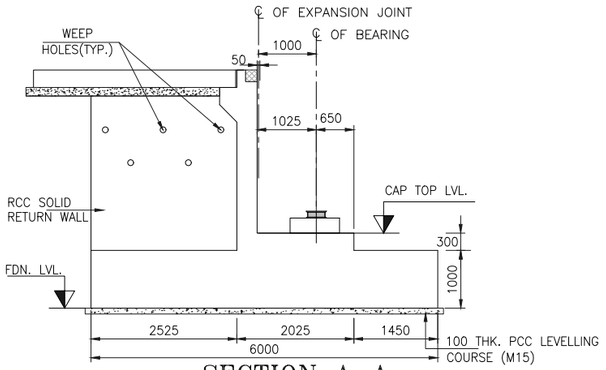
Title: COORDINATE PLAN FOR MAJOR BRIDGE AT AT 2+085 (300 M SPAN)

Scale: AS SHOWN (1 OF1) *Rev:* R1

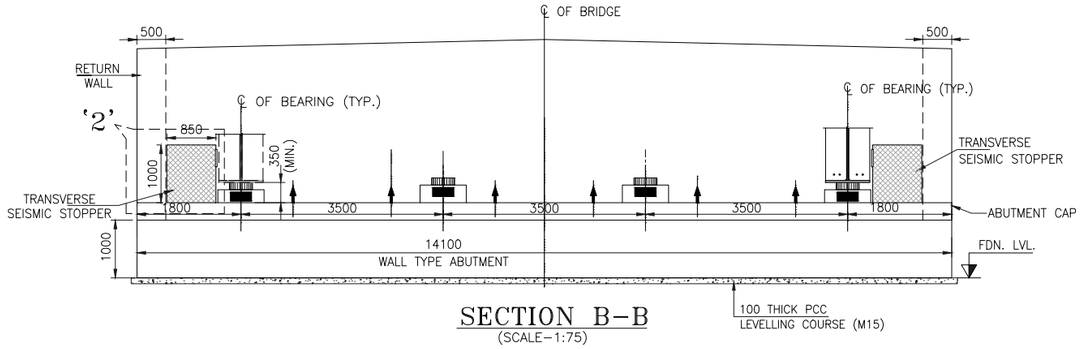
Drg. No: VLE/DE-BR/STR/MJB/2+085/COD/102

SUBSTRUCTURE

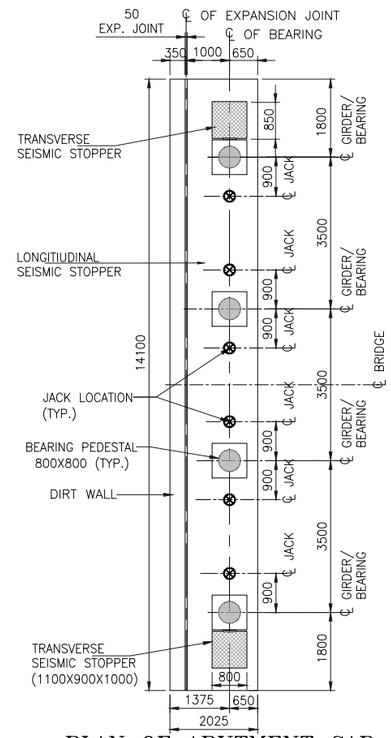
ABUTMENT A1 & A2



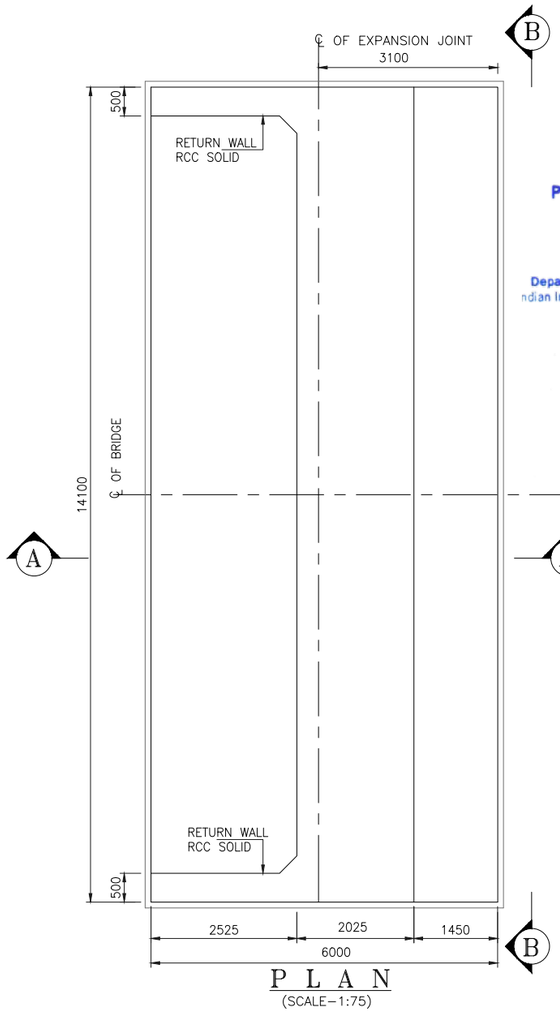
SECTION A–A
(SCALE–1:75)



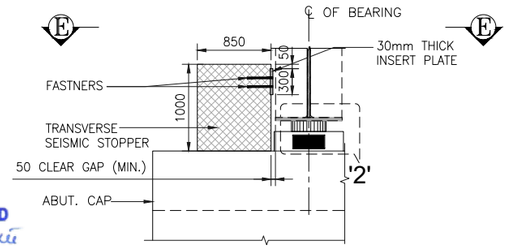
SECTION B–B
(SCALE–1:75)



PLAN OF ABUTMENT CAP
(SCALE 1:100)

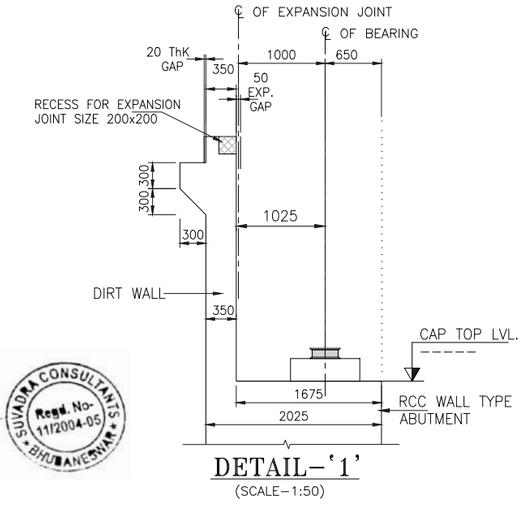


PLAN
(SCALE–1:75)

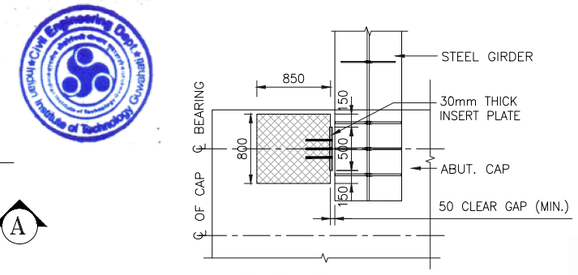


DETAIL OF TRANSVERSE SEISMIC STOPPER
(SCALE–1:50)

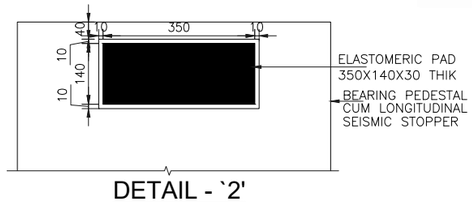
ABUTMENT	FRL	CAP TOP LVL	FOUNDING LVL
A1	363.215	359.625	358.314



DETAIL–'1'
(SCALE–1:50)



SECTION E–E
(SCALE–1:50)



DETAIL - `2'
(SCALE–1:10)

PROOF CHECKED
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Guwahati-781039

Shambhavi Techno Solutions Pvt. Ltd.
Managing Director

SUVADRA CONSULTANTS Regd. No-11/2004-05 BHUBANESWAR

DESIGN DIRECTOR

REFERENCE DRAWINGS:-

1. GENERAL ARRANGEMENT DRAWING.
   VEL/DE–BR/STR/MJB/GAD/2+085/100 (SH–01 OF 02)
2. DIMENSION DETAILS OF ABUTMENT (A2).
   VEL/DE–BR/STR/MJB/SUB/2+085/201 (SH–01 OF 01)
3. REINF. DETAILS OF ABUTMENT FOOTING & SHAFT.
   VEL/DE–BR/STR/MJB/SUB/2+085/202 (SH–01 OF 01)
4. REINF. DETAILS OF RETURN WALL, ABUT. CAP AND DIRT WALL (ABT).
   VEL/DE–BR/STR/MJB/SUB/2+085/203 (SH–01 OF 01)
5. DIM. AND REINF. DETAILS OF SEISMIC STOPPER AND BEARING PEDESTAL (ABT).
   VEL/DE–BR/STR/MJB/SUB/2+085/204 (SH–01 OF 02)
   VEL/DE–BR/STR/MJB/SUB/2+085/204 (SH–02 OF 02)

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 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) SUBSTRUCTURE M35
   b) OPEN FOUNDATION M35
   c) PCC LEVELING COURSE M15
   d) BEARING PEDESTAL M45
   e) SEISMIC STOPPER M40
3. REINFORCEMENT BAR SHALL BE CONFORMING TO IS:1786–1985 OF GRADE Fe–500 D.
4. MINIMUM COVER TO ANY REINFORCEMENT SHALL BE AS FOLLOW:
   a) FOUNDATION 75mm
   b) ABUTMENT CAP & SEISMIC STOPPER 50mm
   c) SUB STRUCTURE:–
      i) EARTH FACE 75mm
      ii) OTHER FACE 50mm
5. 100ø WEEP HOLES SPACED AT 1000 C/C BOTH HORIZONTALLY AND VERTICALLY SHALL BE PROVIDED IN A STAGGERED MANNER IN ABUTMENT WALLS AND RETURN WALLS, ABOVE GROUND LEVEL.
6. 600 THICK FILTER MEDIA SHALL BE PROVIDED AS PER ''MORTH'' SPECIFICATION.
7. "FRL, CROSS–SECTION AND CAMBER etc. SHOWN IN THIS DRAWING SHALL BE VERIFIED WITH CORRESPONDING APPROVED PLAN & PROFILE DRAWING BEFORE EXECUTION. IF THERE IS ANY VARIATION BETWEEN THIS DRAWING AND APPROVED PLAN & PROFILE DRAWING THE SAME SHALL BE BROUGHT TO THE NOTICE OF ENGINEER FOR THE FOR HIS FINAL DECISION".
8. THE NET SBC CONSIDERED IN DESIGN AT FOUNDING LEVEL OF ABUTMENT IS 28T/m².
9. ⊗ SHOWN JACK LOCATION IN PLAN AND ↑ SHOWN JACK LOCATION IN ELEVATION, OTHERWISE MENTIONED.

Rev.	Date	Description
R1	JAN-22	STRUCTURE PROPOSAL REVISED
R0	JUNE-21	FOR APPROVAL

Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED
3rd Floor, PTI Building,4-Parliament Street, New Delhi-110001

Authority Engineer : Glabal Infra Solutions
E-8/11A,F-2, Global Tower , Trilanga Main Road , Akashganga Colony, Shahpura, Bhopal (462039) Tel.-0755-4045216

EPC Contractor : Valecha Engineering Ltd
Valecha Chambers, 4th Floor, Plot No B-6, New Link Road, Andheri West, Mumbai - 400053

Safety Consultant : SUVADRA CONSULTANTS (An ISO 9001 : 2008 Certified) (Soil Testing Laboratory & Engineering Consultant) Approved By Govt. of Orissa Regd. No. 11 of 2004-05
PP-97, Tankapani Road, BBSR-18, Odisha

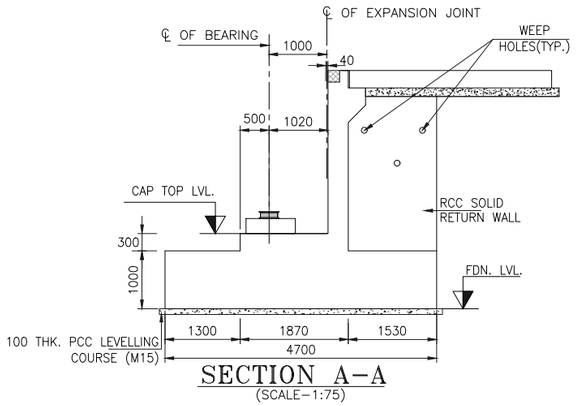
Proof Consultant : SHAMBHAVI TECHNO SOLUTIONS PVT.LTD.
E-82, Rajesh Kumar Path, S.k.Puri, Boring Road, Patna-800001

Design Consultant : SPS Technocrats Pvt. Ltd.
510 & 511, Fifth Floor, JMD Megapolis, Sector 48, Gurgaon, Haryana 122018

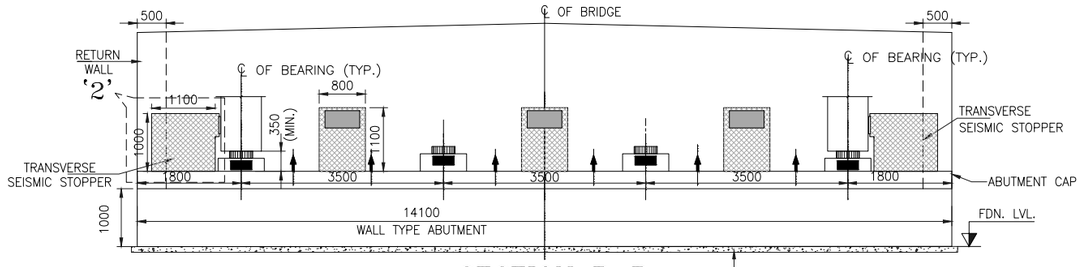
Project: DEMWE - BRAHMKUND (NH-13)
CONSTRUCTION OF TWO LANING WITH HARD SHOULDERS OF DEMWE - BRAHMKUND SECTION OF NH-13 FROM CH. 0.000 TO CH 18.464 IN THE STATE OF ARUNACHAL PRADESH ON EPC MODE UNDER NH(O)-NE

Drawn	MP
Designed	G.P.V
Checked	S.S
Date:	JUNE-2021

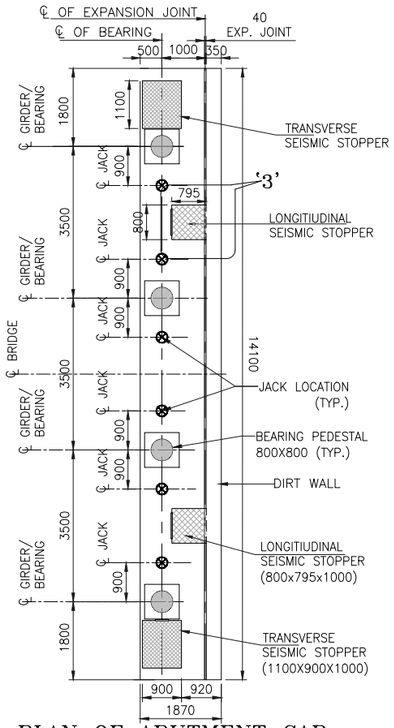
Title: DIMENSION DETAILS OF ABUTMENT (A1) FOR MAJOR BRIDGE AT CH-2+085
Scale: AS SHOWN — 01 OF 01 — Rev: R1
Drg. No: VLE/DE-BR/STR/MJB/SUB/2+085/200



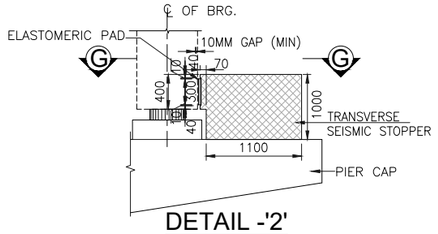
SECTION A–A
(SCALE–1:75)



SECTION B–B
(SCALE–1:75)

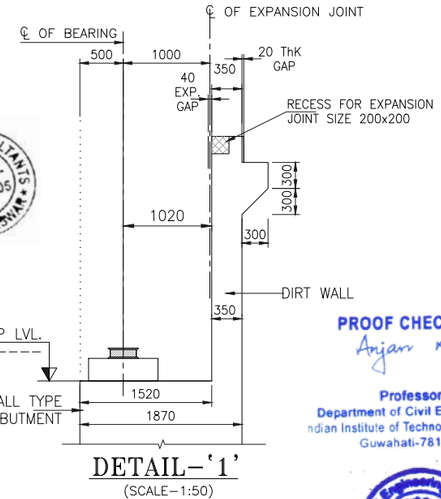


PLAN OF ABUTMENT CAP
(SCALE 1:100)

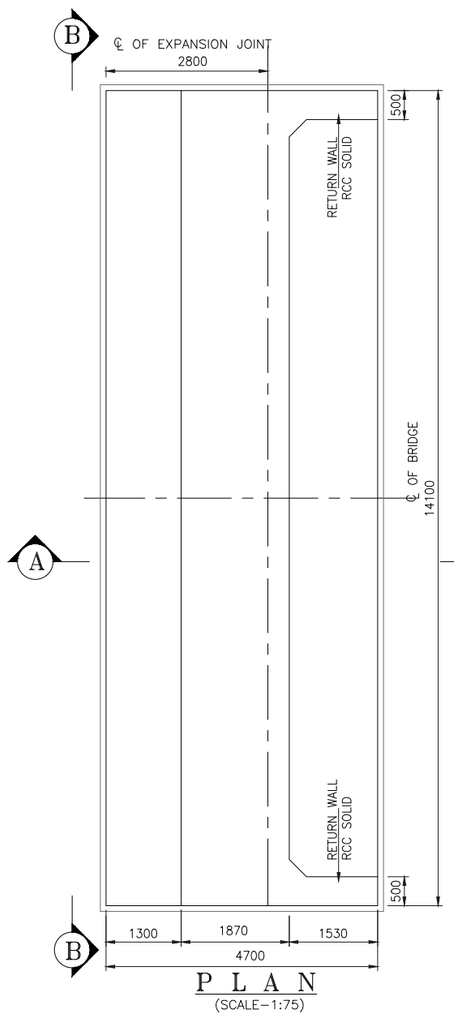


DETAIL -'2'
(AT RCC GIRDER SIDE)
(SCALE–1:50)

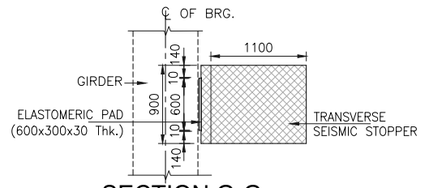
ABUTMENT	FRL	CAP TOP LVL	FOUNDING LVL
A2	363.215	360.429	359.122



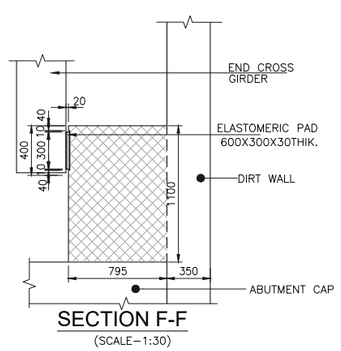
DETAIL–'1'
(SCALE–1:50)



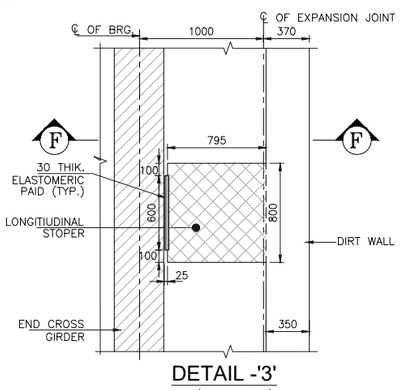
P L A N
(SCALE–1:75)



SECTION G-G
(AT RCC GIRDER SIDE)
(SCALE–1:50)



SECTION F-F
(SCALE–1:30)



DETAIL -'3'
(SCALE–1:30)

REFERENCE DRAWINGS:-

1. GENERAL ARRANGEMENT DRAWING.
   VEL/DE–BR/STR/MJB/GAD/2+085/100 (SH–01 OF 02)
2. DIMENSION DETAILS OF ABUTMENT (A1).
   VEL/DE–BR/STR/MJB/SUB/2+085/200 (SH–01 OF 01)
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   VEL/DE–BR/STR/MJB/SUB/2+085/202 (SH–01 OF 01)
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   VEL/DE–BR/STR/MJB/SUB/2+085/204 (SH–02 OF 02)

NOTES:-

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2. 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:
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8. THE SBC CONSIDERED IN DESIGN AT FOUNDING LEVEL OF ABUTMENT IS 27T/m².
9. ⊗ SHOWN JACK LOCATION IN PLAN AND ↕ SHOWN JACK LOCATION IN ELEVATION, OTHERWISE MENTIONED.

SUVADRA CONSULTANTS Regd. No- 11/2004-05 BHUBANESWAR

PROOF CHECKED
Anjan Dutta
Professor
Department of Civil Engineering
Indian Institute of Technology Guwahati
Guwahati-781039

Shambhavi Techno Solutions Pvt. Ltd.
Managing Director

DESIGN DIRECTOR

Rev.	Date	Description
R1	JAN-22	STRUCTURE PROPOSAL REVISED
R0	JUNE-21	FOR APPROVAL

Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED
3rd Floor, PTI Building,4-Parliament Street, New Delhi-110001

Authority Engineer : Glabal Infra Solutions
E-8/11A,F-2, Global Tower , Trilanga Main Road , Akashganga Colony, Shahpura, Bhopal (462039)
Tel.-0755-4045216

EPC Contractor : Valecha Engineering Ltd
Valecha Chambers, 4th Floor, Plot No B-6, New Link Road, Andheri West, Mumbai - 400053

Safety Consultant : SUVADRA CONSULTANTS (An ISO 9001 : 2008 Certified) (Soil Testing Laboratory & Engineering Consultant) Approved by Govt. of Orissa Regd. No. 11 of 2004-05
PP-97, Tankapani Road, BBSR-18, Odisha

Proof Consultant : SHAMBHAVI TECHNO SOLUTIONS PVT.LTD.
E-82, Rajesh Kumar Path, S.k.Puri, Boring Road, Patna-800001

Design Consultant : SPS Technocrats Pvt. Ltd.
510 & 511, Fifth Floor, JMD Megapolis, Sector 48, Gurgaon, Haryana 122018

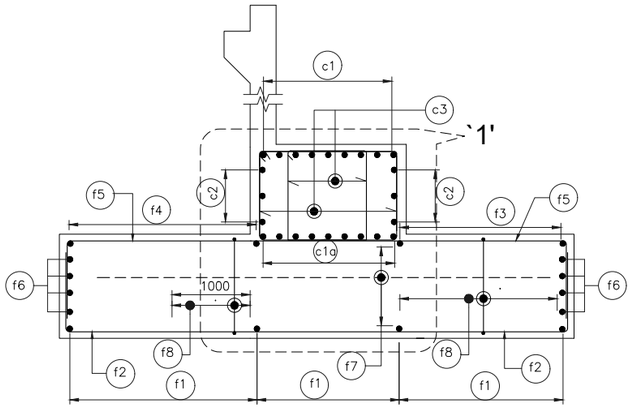
Project: DEMWE - BRAHMKUND (NH-13)
CONSTRUCTION OF TWO LANING WITH HARD SHOULDERS OF DEMWE - BRAHMKUND SECTION OF NH-13 FROM CH. 0.000 TO CH 18.454 IN THE STATE OF ARUNACHAL PRADESH ON EPC MODE UNDER NH(O)-NE

Drawn	MP
Designed	G.P.V
Checked	S.S
Date:	JUNE-2021

Title: DIMENSION DETAILS OF ABUTMENT (A2) FOR MAJOR BRIDGE AT CH-2+085

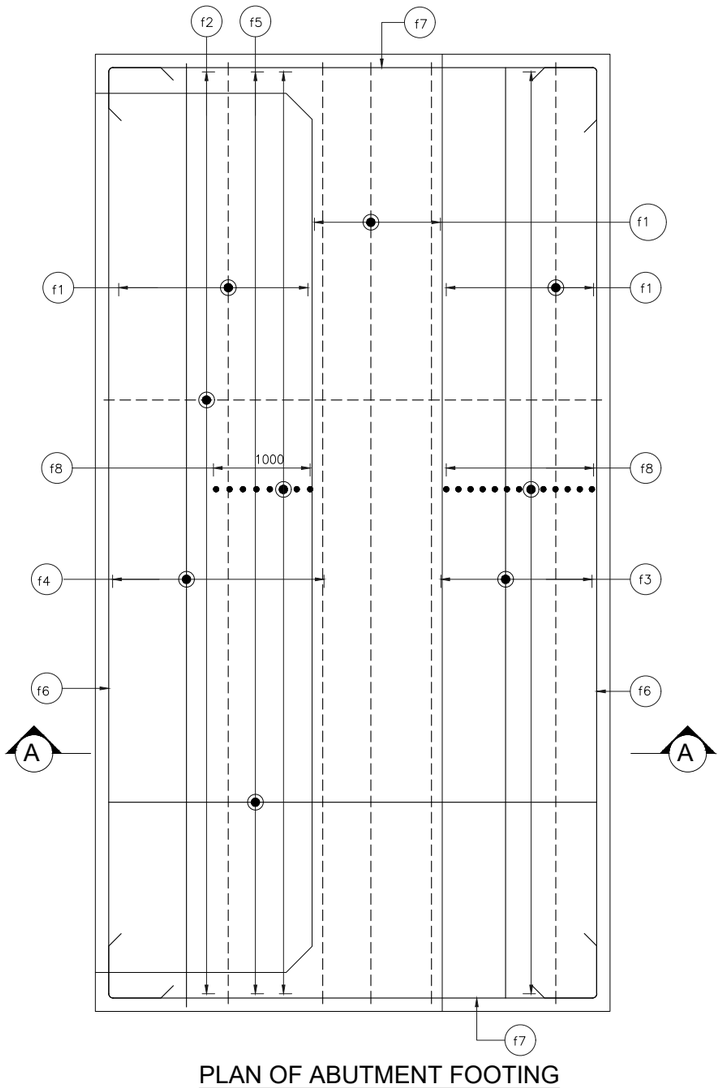
Scale: AS SHOWN — 01 OF 01 — *Rev:* R1

Drg. No: VLE/DE-BR/STR/MJB/SUB/2+085/201

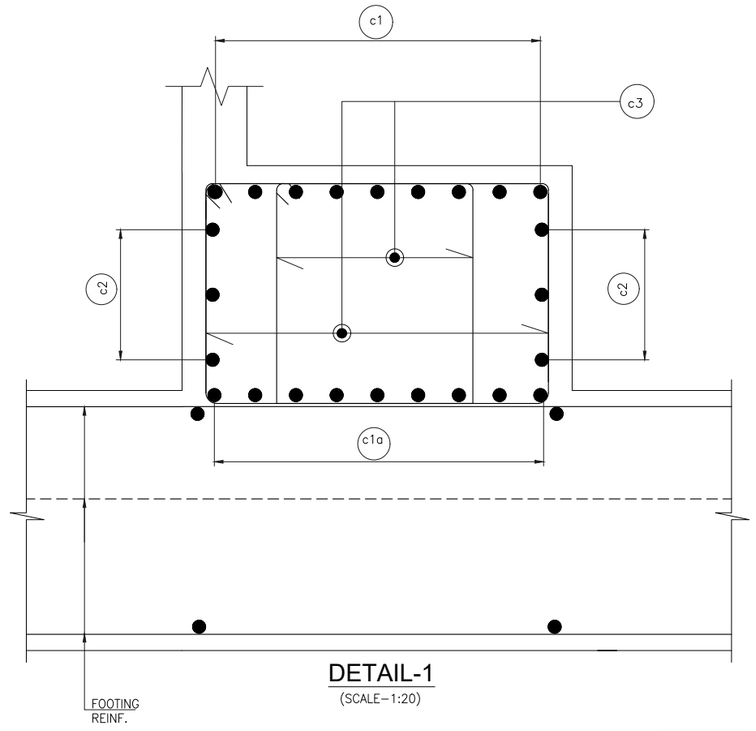


SECTION A-A
(SCALE–1:50)

TRAFFIC DIRECTION



PLAN OF ABUTMENT FOOTING
(SHOWING ONLY FOOTING REINFORCEMENT)
(SCALE–1:50)



DETAIL-1
(SCALE–1:20)

REINFORCEMENT SCHEDULE:-

BAR MKD.	BAR DIA.	SPACING/NOS.	SHAPE
ABUTMENT FOOTING:-			
f1	10	200 C/C	300 300
f2	16	120 C/C	300 300
f3	10	200 C/C	300 300
f4	10	200 C/C	300 300
f5	16	120 C/C	300 300
f6	10	2x4 NOS.	
f7	10	100 C/C	
f8	8	200 C/C IN LONGITUDINAL 240 C/C IN TRANSVERSE DIRECTION	
ABUTMENT CAP:-			
c1	12	9 NOS.	
c1a	12	9 NOS.	
c2	12	2x3 NOS.	
c3	10	4 LEGGED @ 240 C/C IN TRANSVERSE DIRECTION	

PROOF CHECKED
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Guwahati-781039

Shambhavi Techno Solutions Pvt. Ltd.
Managing Director

DESIGN DIRECTOR

SUVADRA CONSULTANTS Regd. No-11/2004-05 BHUBANESWAR

LEGENDS

REINF. AT ,FAR FACE AND TOP FACE	———
REINF. AT,NEAR FACE AND BOTTOM FACE	– – – – – – – –
B/F	BOTH FACE
STP.	STIRRUP

REFERENCE DRAWINGS:-

1. GENERAL ARRANGEMENT DRAWING.
   VEL/DE–BR/STR/MJB/GAD/2+085/100 (SH–01 OF 02)
2. DIMENSION DETAILS OF ABUTMENT (A1).
   VEL/DE–BR/STR/MJB/SUB/2+085/200 (SH–01 OF 01)
3. DIMENSION DETAILS OF ABUTMENT (A2).
   VEL/DE–BR/STR/MJB/SUB/2+085/201 (SH–01 OF 01)
4. REINF. DETAILS OF RETURN WALL, ABUT. CAP AND DIRT WALL (ABT).
   VEL/DE–BR/STR/MJB/SUB/2+085/203 (SH–01 OF 01)
5. DIM. AND REINF. DETAILS OF SEISMIC STOPPER AND BEARING PEDESTAL (ABT).
   VEL/DE–BR/STR/MJB/SUB/2+085/204 (SH–01 OF 02)
   VEL/DE–BR/STR/MJB/SUB/2+085/204 (SH–02 OF 02)

NOTES:-

1. ALL DIMENSION ARE IN MILLIMETERS, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSION TO BE FOLLOWED.
2. REINFORCING STEEL SHALL ONLY BE TMT BARS (GRADE DESIGNATION Fe:500D) CONFORMING TO IS:1786.
3. LAPPING SHALL BE STAGGERED, BARS SHALL BE LAPPED IN SUCH A WAY THAT NOT MORE THEN 50% OF THE BARS ARE LAPPED AT ANY SECTION. LAP LENGTH SHALL BE PROVIDED AS "X*D" MENTIONED IN THE TABLE BELOW. WHERE 'D' IS THE DIA OF THE SMALLER BAR UNLESS OTHERWISE SPECIFIED..

FAVOURABLE BOND CONDITION					
GRADE OF CONCRETE	PERCENTAGE OF LAPPED BARS	<25%	33%	50%	>50%
M30	X	40	46	56	60
M35		36	41	50	54
M40		34	39	48	51
M45		32	37	45	48
M50		29	33	41	44
UNFAVOURABLE BOND CONDITION					
GRADE OF CONCRETE	PERCENTAGE OF LAPPED BARS	<25%	33%	50%	>50%
M30	X	58	67	81	87
M35		53	61	74	80
M40		50	58	70	75
M45		47	54	66	71
M50		42	48	59	63

FAVORABLE ZONE :–
a. RAFT/SLAB BOTTOM MAIN BAR.
UNFAVOURABLE ZONE :–
a. RAFT/SLAB TOP MAIN BAR.
B. WALL/COLUMN MAIN BAR.

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

Rev.	Date	Description
R1	JAN-22	STRUCTURE PROPOSAL REVISED
R0	JUNE-21	FOR APPROVAL

Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED
3rd Floor, PTI Building,4-Parliament Street, New Delhi-110001

Authority Engineer : Global Infra Solutions
E-8/11A,F-2, Global Tower , Trilanga Main Road , Aashganga Colony, Shahpura, Bhopal (462039)
Tel.-0755-4045216

EPC Contractor : Valecha Engineering Ltd
Valecha Chambers, 4th Floor, Plot No B-6, New Link Road, Andheri West, Mumbai - 400053

Safety Consultant : SUVADRA CONSULTANTS (An ISO 9001 : 2008 Certified) (Soil Testing Laboratory & Engineering Consultant) Approved by Govt. of Orissa Regd. No. 11 of 2004-05
PP-97, Tankapani Road, BBSR-18, Odisha

Proof Consultant : SHAMBHAVI TECHNO SOLUTIONS PVT.LTD.
E-82, Rajesh Kumar Path, S.k.Puri, Boring Road, Patna-800001

Design Consultant : SPS Technocrats Pvt. Ltd.
510 & 511, Fifth Floor, JMD Megapolis, Sector 48, Gurgaon, Haryana 122018

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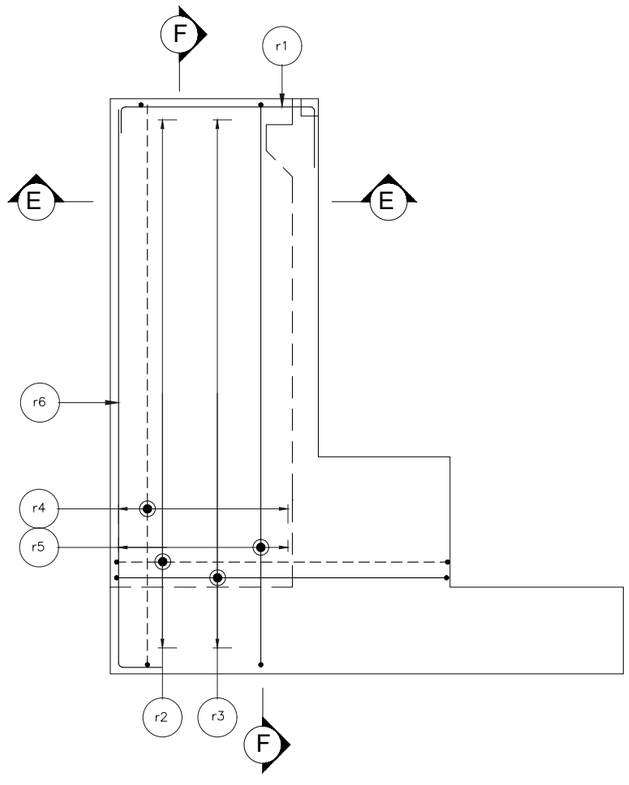
CONSTRUCTION OF TWO LANING WITH HARD SHOULDERS OF DEMWE - BRAHMKUND SECTION OF NH-13 FROM CH. 0.000 TO CH 18.464 IN THE STATE OF ARUNACHAL PRADESH ON EPC MODE UNDER NH(O)-NE

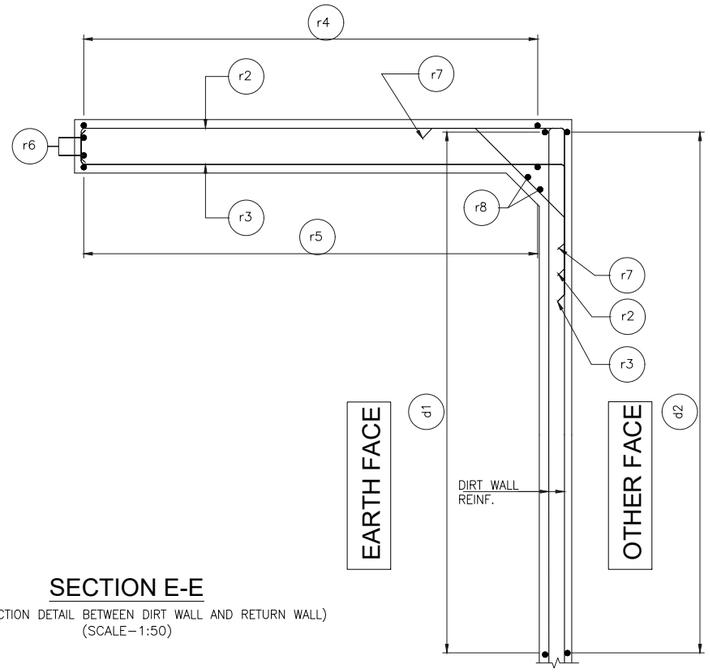
Drawn	MP
Designed	G.P.V
Checked	S.S
Date:	JUNE-2021

Title: REINFORCEMENT DETAILS OF ABUTMENT (A1 & A2) FOOTING & SHAFT DRAWING FOR MAJOR BRIDGE AT CH-2+085
Scale: AS SHOWN — 01 OF 01 — Rev: R1
Drg. No: VLE/DE-BR/STR/MJB/SUB/2+085/202



ELEVATION SHOWING REINF.
DETAILS OF RETURN WALL

(SCALE–1:50)



SECTION E-E

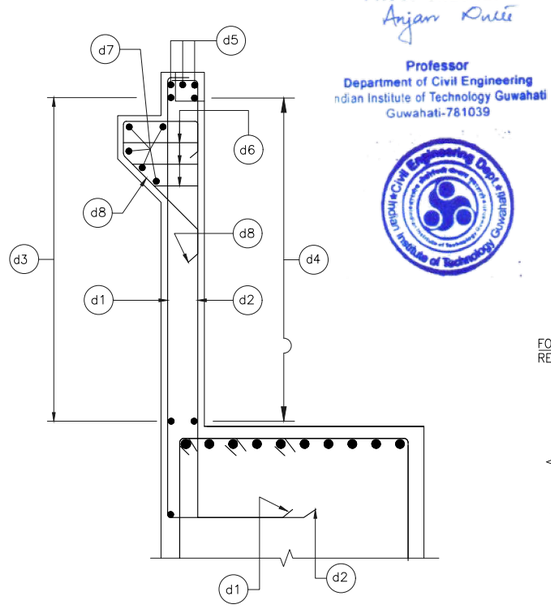
(JUNCTION DETAIL BETWEEN DIRT WALL AND RETURN WALL)
(SCALE–1:50)

Shambhavi Techno Solutions Pvt. Ltd.
Managing Director

SUVADRA CONSULTANTS Regd. No- 11/2004-05 BHUBANESWAR

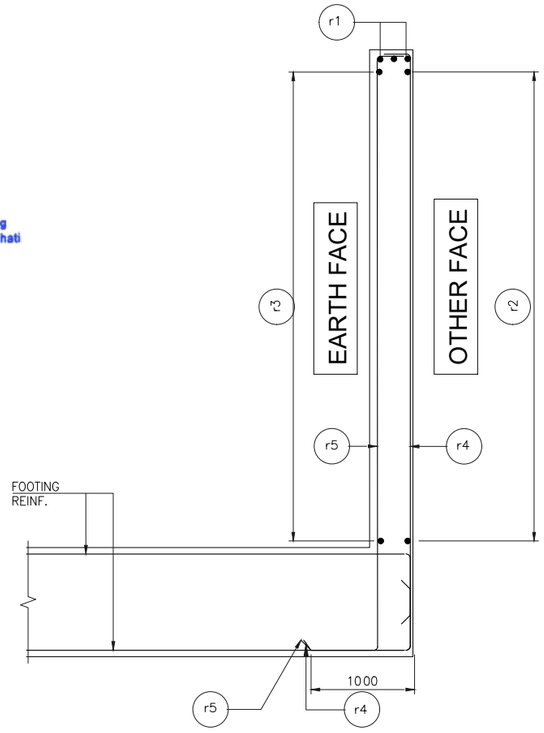
DESIGN DIRECTOR

PROOF CHECKED
Anjan Dutta
Professor
Department of Civil Engineering
Indian Institute of Technology Guwahati
Guwahati-781039



DETAIL-`2'

SHOWING REINF. DETAILS OF
ABUTMENT CAP AND DIRT WALL
(SCALE–1:30)



SECTION F-F

(SCALE–1:50)

REINFORCEMENT SCHEDULE:-

BAR MKD.	BAR DIA.	SPACING/NOS.	SHAPE
DIRT WALL:-			
d1	16	100 C/C	1500
d2	12	100 C/C	1500
d3	10	150 C/C	
d4	10	150 C/C	
d5	10	3 NOS.	
d6	10ø 2 LEGGED STIRRUPS @ 200 C/C TRANS. (3 LAYERS IN VERTICALLY IN STAGGERED MANNER		200 100
d7	10	5 NOS.	
d8	12	100 C/C	
RETURN WALL :-			
r1	10	2 NOS.	
r2	10	200 C/C	
r3	12	200 C/C	
r4	10	200 C/C	
r5	12	100 C/C	
r6	10	2 NOS.	
r7	8	200 C/C	
r8	8	2 NOS.	

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. GENERAL ARRANGEMENT DRAWING.
   VEL/DE–BR/STR/MJB/GAD/2+085/100 (SH–01 OF 02)
2. DIMENSION DETAILS OF ABUTMENT (A1).
   VEL/DE–BR/STR/MJB/SUB/2+085/200 (SH–01 OF 01)
3. DIMENSION DETAILS OF ABUTMENT (A2).
   VEL/DE–BR/STR/MJB/SUB/2+085/201 (SH–01 OF 01)
4. DIM. AND REINF. DETAILS OF SEISMIC STOPPER AND BEARING PEDESTAL (ABT).
   VEL/DE–BR/STR/MJB/SUB/2+085/204 (SH–01 OF 02)
   VEL/DE–BR/STR/MJB/SUB/2+085/204 (SH–02 OF 02)

LEGENDS	
REINF. AT OTHER FACE,TOP FACE	———
REINF. AT EARTH FACE,AND BOTTOM FACE	– – – – – – – –
B/F	BOTH FACE
STP.	STIRRUP

Rev.	Date	Description
R1	JAN-22	STRUCTURE PROPOSAL REVISED
R0	JUNE-21	FOR APPROVAL

Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED
3rd Floor, PTI Building,4-Parliament Street, New Delhi-110001

Authority Engineer : Global Infra Solutions
E-5/11A,F-2, Global Tower , Trilanga Main Road , Akashganga Colony, Shahpura, Bhopal (462039)
Tel.-0755-4045216

EPC Contractor : Valecha Engineering Ltd
Valecha Chambers, 4th Floor, Plot No B-6, New Link Road, Andheri West, Mumbai - 400053

Safety Consultant : SUVADRA CONSULTANTS (An ISO 9001 : 2008 Certified)
(Soil Testing Laboratory & Engineering Consultant) approved by Govt. of Orissa Regd. No. 11 of 2004-05
PP-97, Tankapani Road, BBSR-18, Odisha

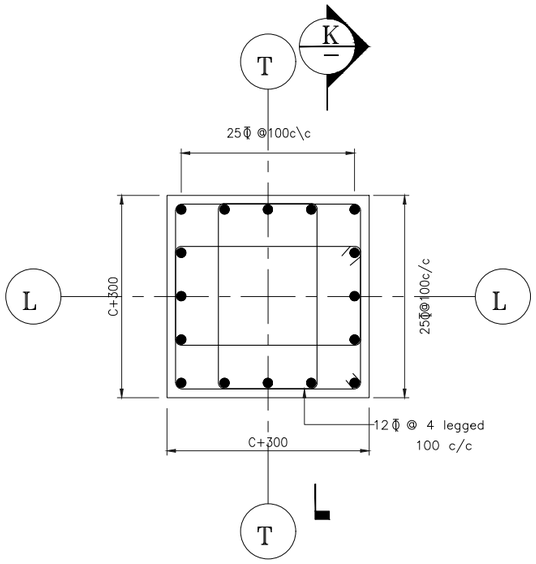
Proof Consultant : SHAMBHAVI TECHNO SOLUTIONS PVT.LTD.
E-82, Rajesh Kumar Path, S.k.Puri, Boring Road, Patna-800001

Design Consultant : SPS Technocrats Pvt. Ltd.
510 & 511, Fifth Floor, JMD Megapolis, Sector 48, Gurgaon, Haryana 122018

Project: DEMWE - BRAHMKUND (NH-13)
CONSTRUCTION OF TWO LANING WITH HARD SHOULDERS OF DEMWE - BRAHMKUND SECTION OF NH-13 FROM CH. 0.000 TO CH 18.464 IN THE STATE OF ARUNACHAL PRADESH ON EPC MODE UNDER NH(O)-NE

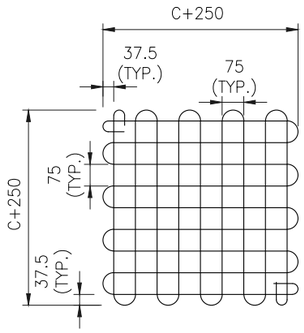
Drawn	MP
Designed	G.P.V
Checked	S.S
Date:	JUNE-2021

Title: REIN. DETAILS OF RETURN WALL, ABUTMENT CAP & DIRT WALL (A1 7 A2) DRAWING FOR MAJOR BRIDGE AT CH-2+085
Scale: AS SHOWN — 01 OF 01 — Rev: R1
Drg. No: VLE/DE-BR/STR/MJB/SUB/2+085/203



PLAN SHOWING TYPICAL REINF. DETAILS OF BEARING PEDESTAL

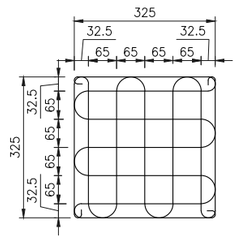
(SCALE 1:15)



8 ϕ MESH m1

(AT EACH PEDESTAL LOCATION)

(SCALE 1:15)



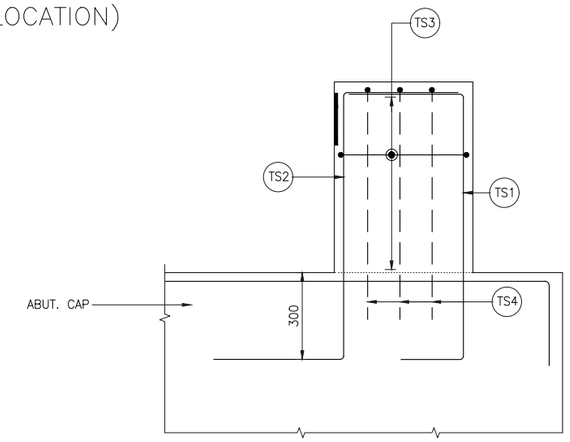
DETAIL OF 8 ϕ MESH TYPE ''m2''

(IN TWO LAYERS AT JACK LOCATION)

(SCALE 1:10)

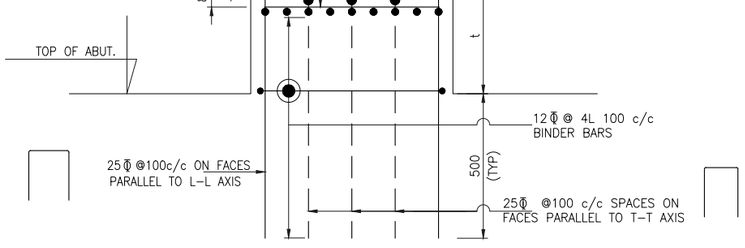
REINFORCEMENT DETAILS:-

BAR MKD.	BAR DIA.	NO./SPACING	SHAPE
TRANSVERSE SEISMIC STOPPER:-			
TS1	16	8 NOS.	200
TS2	25	8 NOS.	1500
TS3	6 LEGGED 12ø STIRRUPS TIED TO VERTICALLY BARS @ 150 C/C VERTICALLY		
TS4	2 LEGGED 3 NOS. 12 DIA STIRRUPS		



SECTION J–J

(SCALE 1:25)



SECTION K–K

(C+300)X(C+300) PEDESTAL

(SCALE 1:15)

PLAN SIZE OF PEDESTAL
SHALL BE (C+300) X (C+300)

WHERE ''C'' IS THE DIA OF BEARING (MAX 700MM)

t = HEIGHT OF PEDESTAL (MAX 500MM)
= H–BEARING HEIGHT

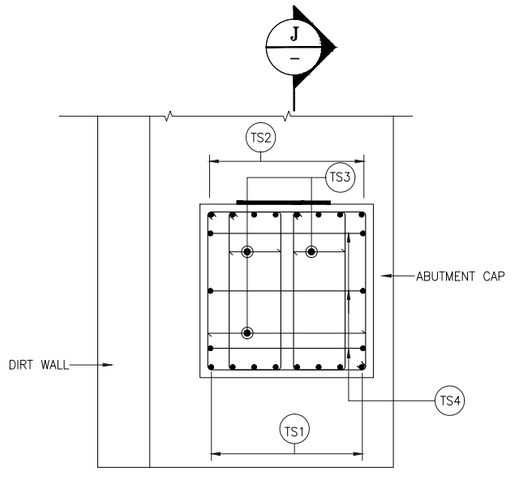
H = HEIGHT BEARING+PEDESTAL

PROOF CHECKED
Anjan Dutta
Professor
Department of Civil Engineering
Indian Institute of Technology Guwahati
Guwahati-781039

Shambhavi Techno Solutions Pvt. Ltd.
Managing Director

SUVADRA CONSULTANTS Regd. No-11/2004-05 BHUBANESWAR

DESIGN DIRECTOR



TRAFFIC DIRECTION

PLAN SHOWING REINF. DETAILS OF TRANSVERSE SEISMIC STOPPER ON ABUTMENT CAP (A1)

(SCALE 1:25)

NOTES:-

1. ALL DIMENSION ARE IN MILLIMETERS, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSION TO BE FOLLOWED.
2. MESH TYPE M1' SHALL BE PROVIDED IN PIER CAP AT BEARING LOCATIONS AND MESH TYPE 'M2' SHALL BE PROVIDED AT JACK LOCATION IN TWO LAYER AT 20mm AND AT 100mm FROM TOP OF CONCRETE.
3. REINFORCING STEEL SHALL ONLY BE TMT BARS (GRADE DESIGNATION Fe:500) CONFORMING TO IS:1786 WITH MINIMUM TOTAL ELONGATIONS OF 12%.
   ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:–

FAVOURABLE BOND CONDITION					
GRADE OF CONCRETE	PERCENTAGE OF LAPPED BARS	<25%	33%	50%	>50%
M30	X	40	46	56	60
M35		36	41	50	54
M40		34	39	48	51
M45		32	37	45	48
M50		29	33	41	44
UNFAVOURABLE BOND CONDITION					
GRADE OF CONCRETE	PERCENTAGE OF LAPPED BARS	<25%	33%	50%	>50%
M30	X	58	67	81	87
M35		53	61	74	80
M40		50	58	70	75
M45		47	54	66	71
M50		42	48	59	63

5. BARS SHOWN IN THE DRAWING ARE NOT TO BE COUNTED, ONLY WRITTEN DATA SHALL BE FOLLOWED.
6. PEDESTAL HEIGHT TO BE AS PER SITE REQUIREMENT.

REFERENCE DRAWINGS:-

1. GENERAL ARRANGEMENT DRAWING.
   VEL/DE–BR/STR/MJB/GAD/2+085/100 (SH–01 OF 02)
2. DIMENSION DETAILS OF ABUTMENT (A1).
   VEL/DE–BR/STR/MJB/SUB/2+085/200 (SH–01 OF 01)
3. DIMENSION DETAILS OF ABUTMENT (A2).
   VEL/DE–BR/STR/MJB/SUB/2+085/201 (SH–01 OF 01)
4. REINF. DETAILS OF RETURN WALL, ABUT. CAP AND DIRT WALL (ABT).
   VEL/DE–BR/STR/MJB/SUB/2+085/203 (SH–01 OF 01)
5. DIM. AND REINF. DETAILS OF SEISMIC STOPPER AND BEARING PEDESTAL (ABT).
   VEL/DE–BR/STR/MJB/SUB/2+085/204 (SH–02 OF 02)

Rev.	Date	Description
R1	JAN-22	STRUCTURE PROPOSAL REVISED
R0	JUNE-21	FOR APPROVAL

Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED, 3rd Floor, PTI Building,4-Parliament Street, New Delhi-110001

Authority Engineer : Glabal Infra Solutions, E-8/11A,F-2, Global Tower , Trilanga Main Road , Akashganga Colony, Shahpura, Bhopal (462039), Tel.-0755-4045216

EPC Contractor : Valecha Engineering Ltd, Valecha Chambers, 4th Floor, Plot No B-6, New Link Road, Andheri West, Mumbai - 400053

Safety Consultant : SUVADRA CONSULTANTS (An ISO 9001 : 2008 Certified), Soil Testing Laboratory & Engineering Consultant, Approved By Govt. of Orissa Regd. No. 11 of 2004-05, PP-97, Tankapani Road, BBSR-18, Odisha

Proof Consultant : SHAMBHAVI TECHNO SOLUTIONS PVT.LTD., E-82, Rajesh Kumar Path, S.k.Puri, Boring Road, Patna-800001

Design Consultant : SPS Technocrats Pvt. Ltd., # 510 & 511, Fifth Floor, JMD Megapolis, Sector 48, Gurgaon, Haryana 122018

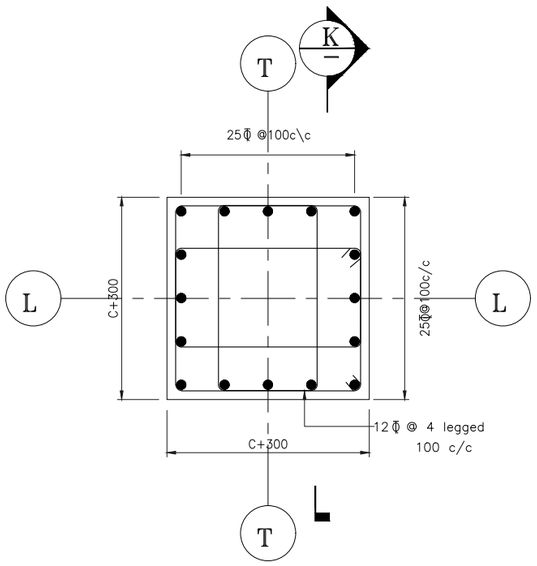
Project: DEMWE - BRAHMKUND (NH-13), CONSTRUCTION OF TWO LANING WITH HARD SHOULDERS OF DEMWE - BRAHMKUND SECTION OF NH-13 FROM CH. 0.000 TO CH 18.464 IN THE STATE OF ARUNACHAL PRADESH ON EPC MODE UNDER NH(O)-NE

Drawn	MP
Designed	G.P.V
Checked	S.S
Date:	JUNE-2021

Title: DIM. & REINF. DETAILS OF SEISMIC STOPPER AND BEARING PEDESTAL DRAWING A1 FOR MAJOR BRIDGE AT CH-2+085

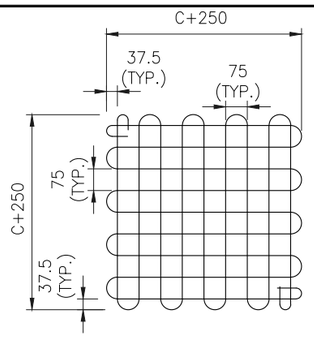
Scale: AS SHOWN — 01 OF 02 — Rev: R1

Drg. No: VLE/DE-BR/STR/MJB/SUB/2+085/204



PLAN SHOWING TYPICAL REINF. DETAILS OF BEARING PEDESTAL

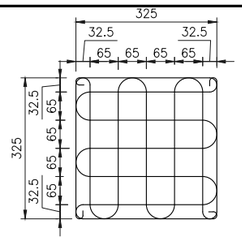
(SCALE 1:15)



8 Φ MESH m1

(AT EACH PEDESTAL LOCATION)

(SCALE 1:15)



DETAIL OF 8 Φ MESH TYPE "m2"

(IN TWO LAYERS AT JACK LOCATION)

(SCALE 1:10)

REINFORCEMENT DETAILS:-

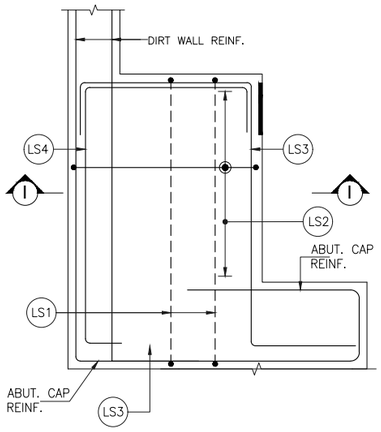
BAR MKD.	BAR DIA.	NO./SPACING	SHAPE
TRANSVERSE SEISMIC STOPPER:-			
TS1	16	8 NOS.	200
TS2	25	8 NOS.	1500
TS3	6 LEGGED 12ø STIRRUPS TIED TO VERTICALLY BARS @ 150 C/C VERTICALLY		
TS4	2 LEGGED 3 NOS. 12 DIA STIRRUPS		
LONGITUDINAL SEISMIC STOPPER:-			
LS1	2 LEGGED 1 NOS. 12 DIA STIRRUPS		
LS2	6 LEGGED 12Φ STIRRUPS 150 C/C		
LS3	20	8 NOS.	300, 1000
LS4	12	8 NOS.	300, 500

NOTES:-

1. ALL DIMENSION ARE IN MILLIMETERS, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSION TO BE FOLLOWED.
2. MESH TYPE M1' SHALL BE PROVIDED IN PIER CAP AT BEARING LOCATIONS AND MESH TYPE 'M2' SHALL BE PROVIDED AT JACK LOCATION IN TWO LAYER AT 20mm AND AT 100mm FROM TOP OF CONCRETE.
3. REINFORCING STEEL SHALL ONLY BE TMT BARS (GRADE DESIGNATION Fe:500) CONFORMING TO IS:1786 WITH MINIMUM TOTAL ELONGATIONS OF 12%.
   ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:–

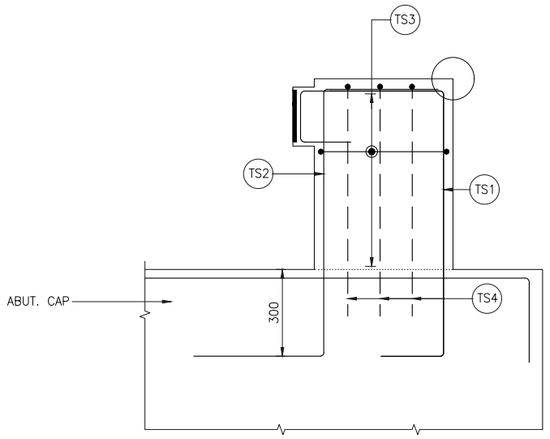
FAVOURABLE BOND CONDITION					
GRADE OF CONCRETE	PERCENTAGE OF LAPPED BARS	<25%	33%	50%	>50%
M30	X	40	46	56	60
M35		36	41	50	54
M40		34	39	48	51
M45		32	37	45	48
M50		29	33	41	44
UNFAVOURABLE BOND CONDITION					
GRADE OF CONCRETE	PERCENTAGE OF LAPPED BARS	<25%	33%	50%	>50%
M30	X	58	67	81	87
M35		53	61	74	80
M40		50	58	70	75
M45		47	54	66	71
M50		42	48	59	63

5. BARS SHOWN IN THE DRAWING ARE NOT TO BE COUNTED, ONLY WRITTEN DATA SHALL BE FOLLOWED.
6. PEDESTAL HEIGHT TO BE AS PER SITE REQUIREMENT.



ELEVATION SHOWING REINF. DETAILS OF LONGITUDINAL SEISMIC STOPPER ON ABUTMENT CAP

(SCALE–1:25)



SECTION J–J

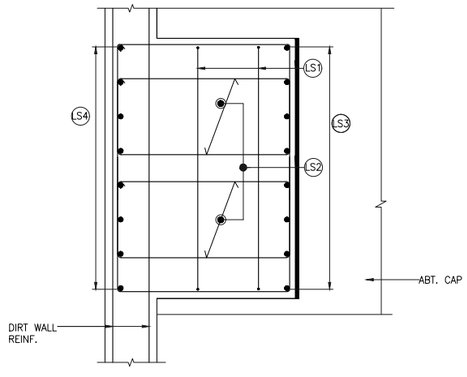
(SCALE 1:25)

SECTION K–K (C+300)X(C+300) PEDESTAL

(SCALE 1:15)

PLAN SIZE OF PEDESTAL
SHALL BE (C+300) X (C+300)
WHERE "C" IS THE DIA OF BEARING (MAX 700MM)

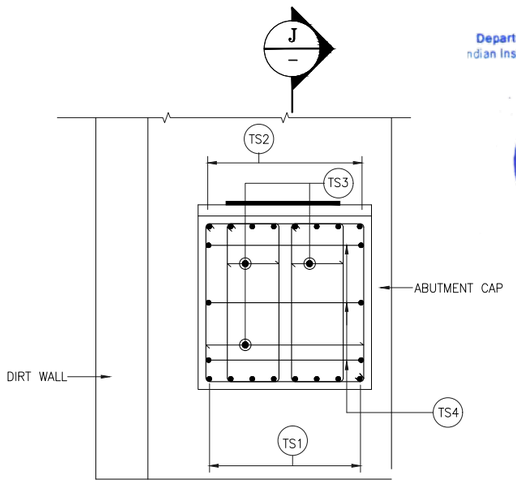
t = HEIGHT OF PEDESTAL (MAX 500MM)
= H–BEARING HEIGHT
H = HEIGHT BEARING+PEDESTAL



SECTION I-I

(REINF. DETAILS OF LONG. SEISMIC STOPPER)

(SCALE–1:25)



TRAFFIC DIRECTION

PLAN SHOWING REINF. DETAILS OF TRANSVERSE SEISMIC STOPPER ON ABUTMENT CAP (A1)

(SCALE 1:25)

PROOF CHECKED
Anjan Dutta
Professor
Department of Civil Engineering
Indian Institute of Technology Guwahati
Guwahati-781039

REFERENCE DRAWINGS:-

1. GENERAL ARRANGEMENT DRAWING.
   VEL/DE–BR/STR/MJB/GAD/2+085/100 (SH–01 OF 02)
2. DIMENSION DETAILS OF ABUTMENT (A1).
   VEL/DE–BR/STR/MJB/SUB/2+085/200 (SH–01 OF 01)
3. DIMENSION DETAILS OF ABUTMENT (A2).
   VEL/DE–BR/STR/MJB/SUB/2+085/201 (SH–01 OF 01)
4. REINF. DETAILS OF RETURN WALL, ABUT. CAP AND DIRT WALL (ABT).
   VEL/DE–BR/STR/MJB/SUB/2+085/203 (SH–01 OF 01)
5. DIM. AND REINF. DETAILS OF SEISMIC STOPPER AND BEARING PEDESTAL (ABT).
   VEL/DE–BR/STR/MJB/SUB/2+085/204 (SH–01 OF 02)

SUVADRA CONSULTANTS Regd. No- 11/2004-05 BHUBANESWAR

Shambhavi Techno Solutions Pvt. Ltd.
Managing Director

DESIGN DIRECTOR

Rev.	Date	Description
R1	JAN-22	STRUCTURE PROPOSAL REVISED
R0	JUNE-21	FOR APPROVAL

Client: NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED
3rd Floor, PTI Building,4-Parliament Street, New Delhi-110001

Authority Engineer: Glabal Infra Solutions
E-9/11A,F-2, Global Tower , Trilanga Main Road , Akashganga Colony, Shahpura, Bhopal (462039) Tel.-0755-4045216

EPC Contractor: Valecha Engineering Ltd
Valecha Chambers, 4th Floor, Plot No B-6, New Link Road, Andheri West, Mumbai - 400053

Safety Consultant: SUVADRA CONSULTANTS (An ISO 9001 : 2008 Certified) (Soil Testing Laboratory & Engineering Consultant) Approved By Govt. of Orissa Regd. No. 11 of 2004-05
PP-97, Tankapani Road, BBSR-18, Odisha

Proof Consultant: SHAMBHAVI TECHNO SOLUTIONS PVT.LTD.
E-82, Rajesh Kumar Path, S.k.Puri, Boring Road, Patna-800001

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510 & 511, Fifth Floor, JMD Megapolis, Sector 48, Gurgaon, Haryana 122018

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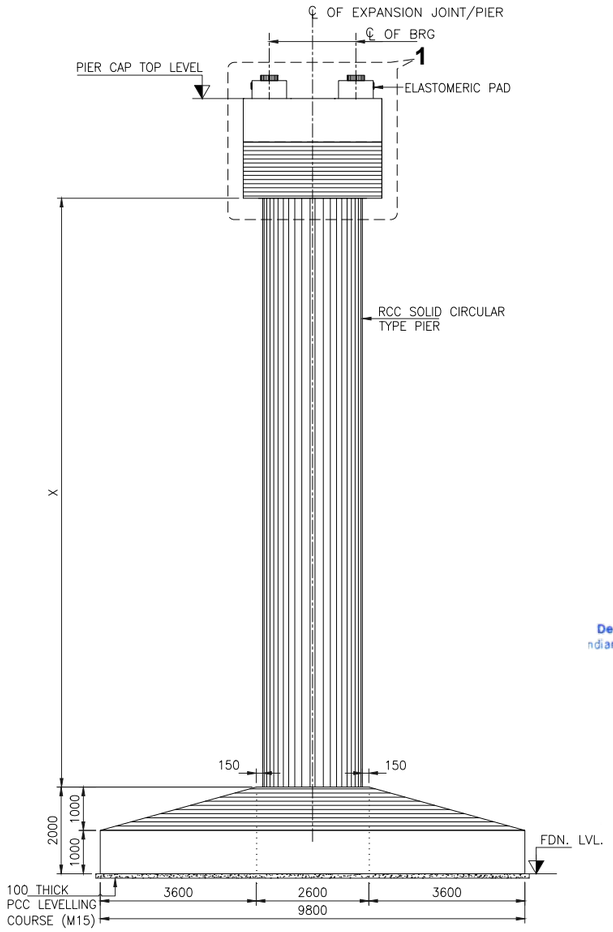
Drawn	MP
Designed	G.P.V
Checked	S.S
Date:	JUNE-2021

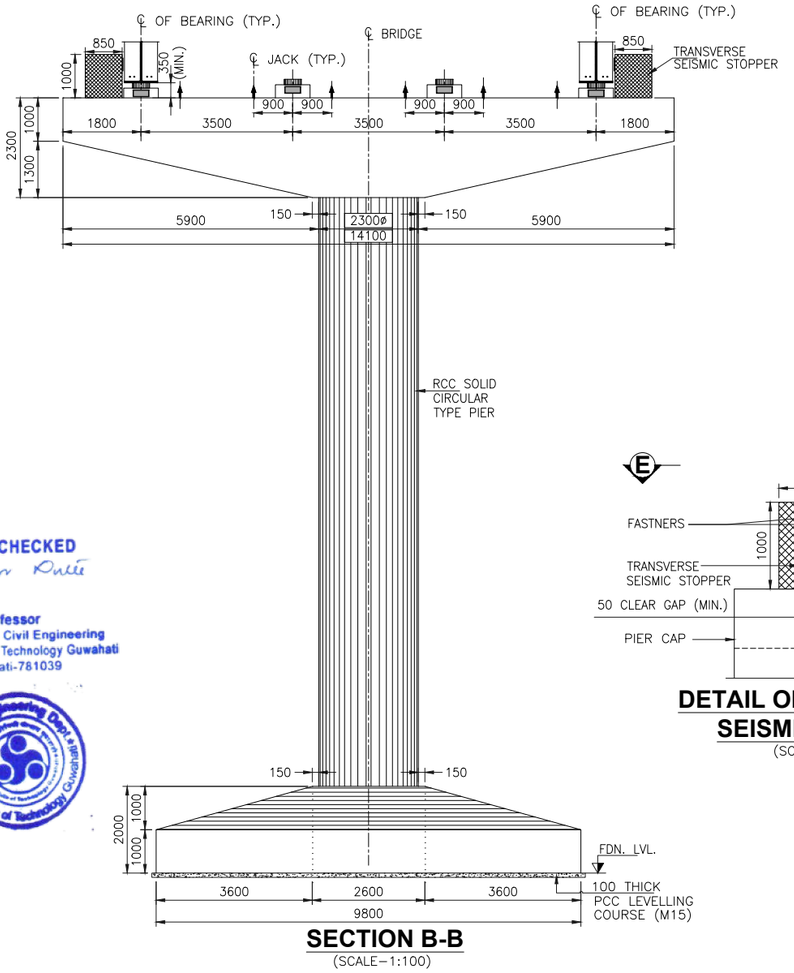
Title: DIM. & REINF. DETAILS OF SEISMIC STOPPER AND BEARING PEDESTAL DRAWING A2 FOR MAJOR BRIDGE AT CH-2+085
Scale: AS SHOWN
02 OF 02
Rev: R1
Drg. No: VLE/DE-BR/STR/MJB/SUB/2+085/204

SUBSTRUCTURE

PIER P1



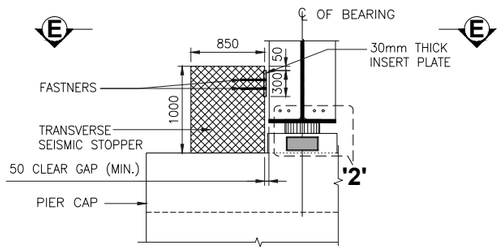
SECTION A-A
(SCALE–1:100)



SECTION B-B
(SCALE–1:100)

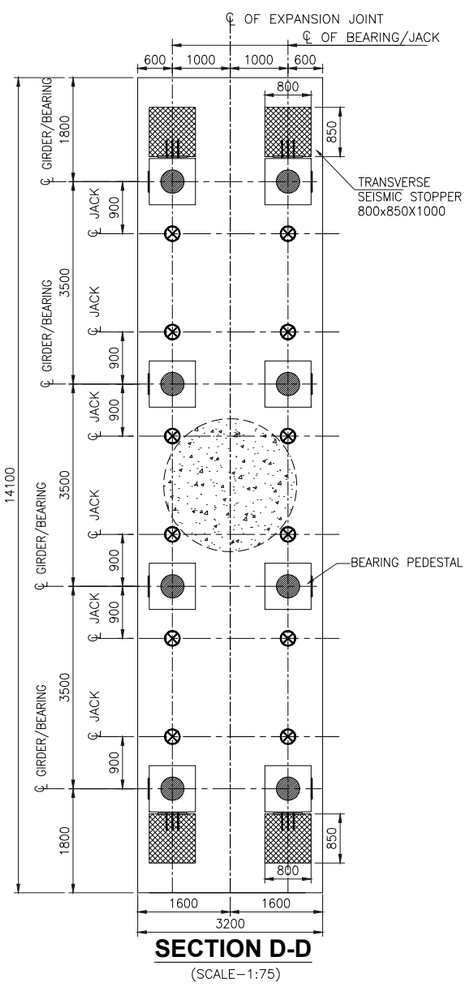
PROOF CHECKED
Anjan Dutta
Professor
Department of Civil Engineering
Indian Institute of Technology Guwahati
Guwahati-781039

Yogesh Singh
DESIGN DIRECTOR
Shambhavi Techno Solutions Pvt. Ltd
Managing Director

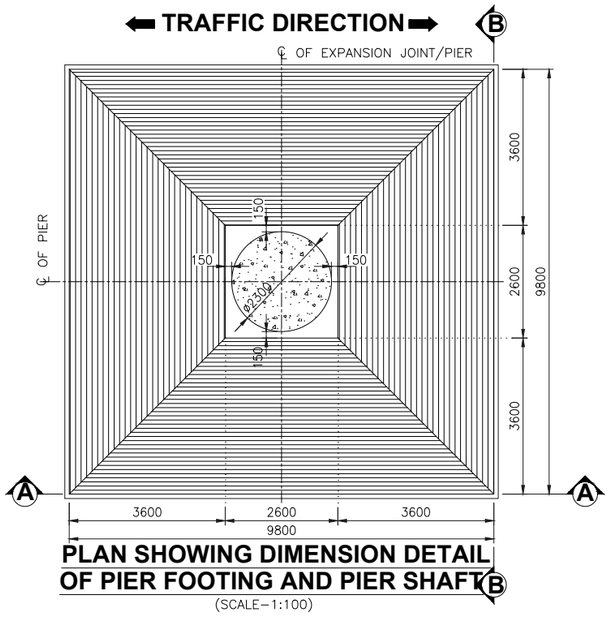


DETAIL OF TRANSVERSE SEISMIC STOPPER
(SCALE–1:50)

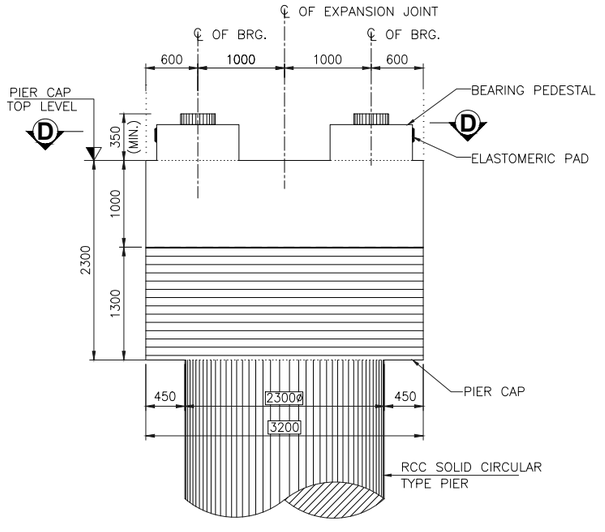
SUVADRA CONSULTANTS Regd. No-11/2004-05 BHUBANESWAR



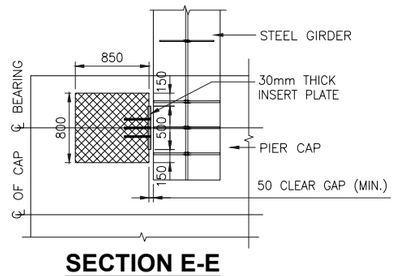
SECTION D-D
(SCALE–1:75)



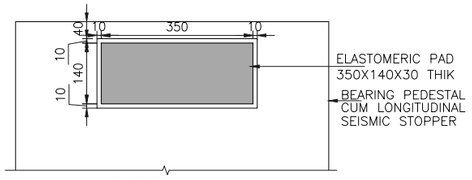
PLAN SHOWING DIMENSION DETAIL OF PIER FOOTING AND PIER SHAFT
(SCALE–1:100)



DETAIL - `1'
(SCALE–1:50)



SECTION E-E
(SCALE–1:50)



DETAIL - `2'
(SCALE–1:10)

PIER	CAP TOP LVL.	FOUNDING LVL.	HEIGHT OF SHAFT "X"
P1	359.625	346.148	9.177m

REFERENCE DRAWINGS:-

1. GENERAL ARRANGEMENT DRAWING. VEL/DE–BR/STR/MJB/GAD/2+085/100 (SH–01 OF 02)
2. REINFORCEMENT DETAILS OF PIER P1. VLE/DE–BR/STR/MJB/SUB/251 VLE/DE–BR/STR/MJB/SUB/252 VLE/DE–BR/STR/MJB/SUB/253

NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS IN METERS, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS TO BE FOLLOWED.
2. 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) PCC LEVELING COURSE M15
   b) FOUNDATION M35
   c) SUBSTRUCTURE M35
   d) BEARING PEDESTAL M45
   e) SEISMIC STOPPER M40
3. REINFORCING STEEL SHALL ONLY BE TMT BARS (GRADE DESIGNATION Fe:500D) CONFORMING TO IS:1786 WITH MINIMUM TOTAL ELONGATIONS OF 12%.
4. MINIMUM COVER TO ANY REINFORCEMENT SHALL BE AS FOLLOW:
   a) FOUNDATION 75mm
   b) PIER CAP & SEISMIC STOPPER 50mm
   c) SUB STRUCTURE:– 50mm
5. ⊗ SHOWN JACK LOCATION IN PLAN AND ↕ SHOWN JACK LOCATION IN ELEVATION, OTHERWISE MENTIONED.
6. SAFE BEARING CAPACITY CONSIDERED IN DESIGN AT PROPOSED FOUNDING LEVEL IS 38T/Sqm.

Rev.	Date	Description
R1	JAN-22	STRUCTURE PROPOSAL REVISED
R0	JUNE-21	FOR APPROVAL

Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED
3rd Floor, PTI Building,4-Parliament Street, New Delhi-110001

Authority Engineer : Glabal Infra Solutions
E-8/11A,F-2, Global Tower , Trilanga Main Road , Akashganga Colony, Shahpura, Bhopal (462039) Tel.-0755-4045216

EPC Contractor : Valecha Engineering Ltd
Valecha Chambers, 4th Floor, Plot No B-6, New Link Road, Andheri West, Mumbai - 400053

Safety Consultant : SUVADRA CONSULTANTS (An ISO 9001 : 2008 Certified) (Soil Testing Laboratory & Engineering Consultant) Approved By Govt. of Orissa Regd. No. 11 of 2004-05
PP-97, Tankapani Road, BBSR-18, Odisha

Proof Consultant : SHAMBHAVI TECHNO SOLUTIONS PVT.LTD.
E-82, Rajesh Kumar Path, S.k.Puri, Boring Road, Patna-800001

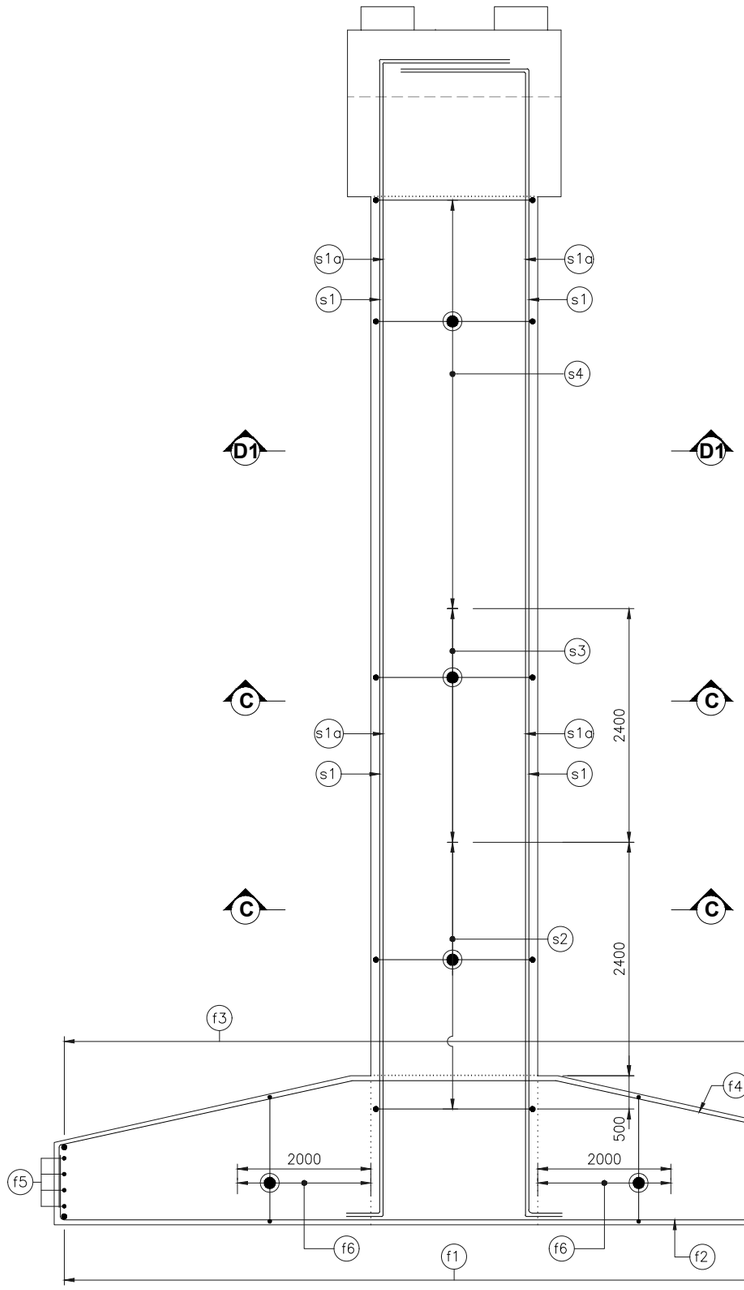
Design Consultant : SPS Technocrats Pvt. Ltd.
510 & 511, Fifth Floor, JMD Megapolis, Sector 48, Gurgaon, Haryana 122018

Project: DEMWE - BRAHMKUND (NH-13)
CONSTRUCTION OF TWO LANING WITH HARD SHOULDERS OF DEMWE - BRAHMKUND SECTION OF NH-13 FROM CH. 0.000 TO CH 18.464 IN THE STATE OF ARUNACHAL PRADESH ON EPC MODE UNDER NH(O)-NE

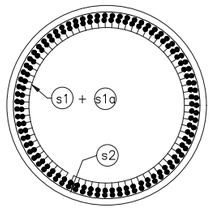
Drawn	MP
Designed	GPV
Checked	AV
Date:	JUNE -2021

Title: DIMENSION DETAILS OF PIER P1 FOR MAJOR BRIDGE AT CH-2+085
Scale: AS SHOWN 1 OF 1 Rev: R1
Drg. No: VLE/DE-BR/STR/MJB/SUB/250

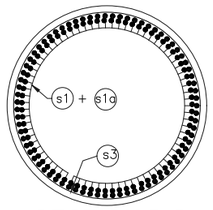
Y:\01_SPS PROJECT\156_DEMWE-BRAHMAKUND\01_ Drawings\01_Major Bridge\SUB STRUCTURE\PIER AS PER 14.1M DECK\PIER P1 - R0\VLE-DE-BR-STR-MJB-2+085-SUB-250.dwg 7-Jan-22



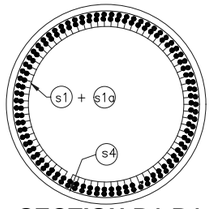
SECTION A-A
(SCALE–1:60)



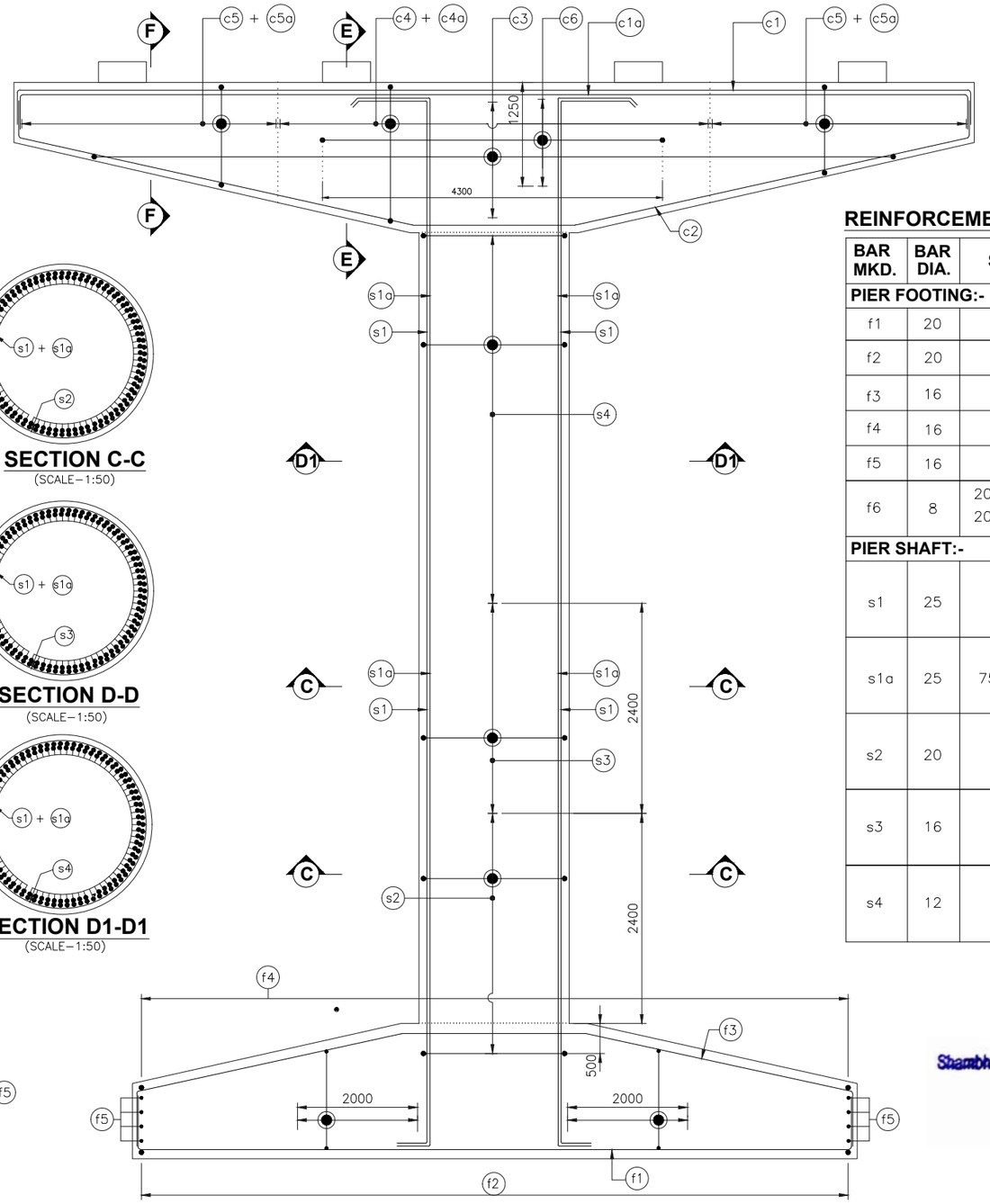
SECTION C-C
(SCALE–1:50)



SECTION D-D
(SCALE–1:50)



SECTION D1-D1
(SCALE–1:50)



SECTION B-B
(SCALE–1:60)

REINFORCEMENT SCHEDULE:-

BAR MKD.	BAR DIA.	SPACING/NOS.	SHAPE
PIER FOOTING:-			
f1	20	100 C/C	800 — 800
f2	20	100 C/C	800 — 800
f3	16	100 C/C	800 — 800
f4	16	100 C/C	800 — 800
f5	16	4x8 NOS.	300 — 300
f6	8	200 C/C LONGITUDINAL AND 200 C/C TRANSCEIVER	
PIER SHAFT:-			
s1	25	75 NOS.	1000 / 500
s1a	25	75 NOS.(BUNDLED WITH S1)	1000 / 500
s2	20	90 C/C	300 (MIN. LAP)
s3	16	110 C/C	300 (MIN. LAP)
s4	12	110 C/C	300 (MIN. LAP)

LEGEND:-

REINFORCEMENT AT TOP FACE	———
REINFORCEMENT AT BOTTOM FACE	– – – – – – – – – –

NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETERS, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS TO BE FOLLOWED.

REFERENCE DRAWINGS:-

1. GENERAL ARRANGEMENT DRAWING. VEL/DE–BR/STR/MJB/GAD/2+085/100 (SH–01 OF 02)
2. DIMENSION DETAILS OF PIER P1. VLE/DE–BR/STR/MJB/SUB/250
2. REINFORCEMENT DETAILS OF PIER P1. VLE/DE–BR/STR/MJB/SUB/252 VLE/DE–BR/STR/MJB/SUB/253

PROOF CHECKED
Anjan Rucci
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Shambhavi Techno Solutions Pvt. Ltd
Managing Director

SUVADRA CONSULTANTS Regd. No-11/2004-05 BHUBANESWAR

DESIGN DIRECTOR

Rev.	Date	Description
R1	JAN-22	STRUCTURE PROPOSAL REVISED
R0	JUNE-21	FOR APPROVAL

Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED
3rd Floor, PTI Building,4-Parliament Street, New Delhi-110001

Authority Engineer : **Glabal Infra Solutions**
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Tel.-0755-4045216

EPC Contractor : **Valecha Engineering Ltd**
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Safety Consultant : SUVADRA CONSULTANTS (An ISO 9001 : 2008 Certified) (Soil Testing Laboratory & Engineering Consultant) approved by Govt. of Orissa Regd. No. 11 of 2004-05
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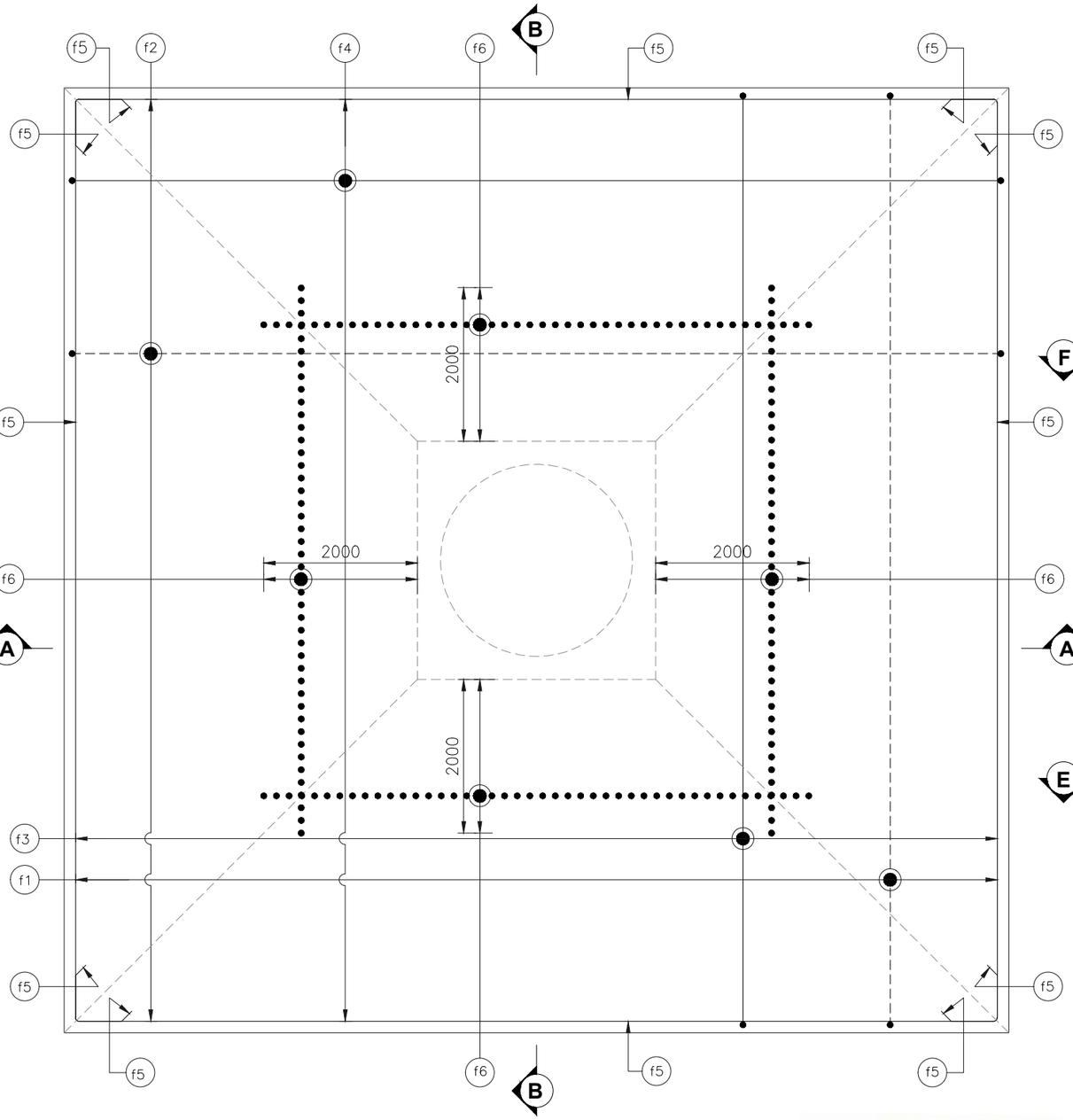
Design Consultant : **SPS Technocrats Pvt. Ltd.**
510 & 511, Fifth Floor, JMD Megapolis, Sector 48, Gurgaon, Haryana 122018

Project: **DEMWE - BRAHMKUND (NH-13)**
CONSTRUCTION OF TWO LANING WITH HARD SHOULDERS OF DEMWE - BRAHMKUND SECTION OF NH-13 FROM CH. 0.000 TO CH 18.464 IN THE STATE OF ARUNACHAL PRADESH ON EPC MODE UNDER NH(O)-NE

Drawn	**MP**
Designed	**GPV**
Checked	**AV**
Date:	**JUNE -2021**

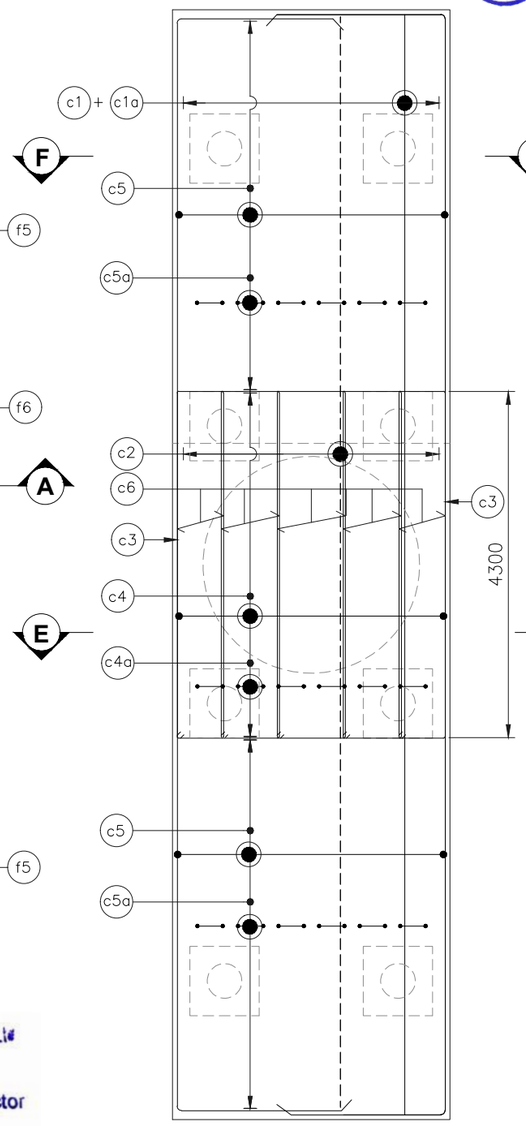
Title: REINFORCEMENT DETAILS OF PIER P1 MAJOR BRIDGE AT CH-2+085.
Scale: **AS SHOWN** **1 OF 1** *Rev:* **R1**
Drg. No: **VLE/DE-BR/STR/MJB/SUB/251**

Y:\01_SPS PROJECT\56_DEMWE-BRAHMAKUND\01_ Drawings\01_Major Bridge\CH 2+085\2.SUB STRUCTURE\PIER AS PER 14.1M DECK\PIER P1 - R0\VLE-DE-BR-STR-MJB-2+085-SUB-251.dwg 27-Jan-22



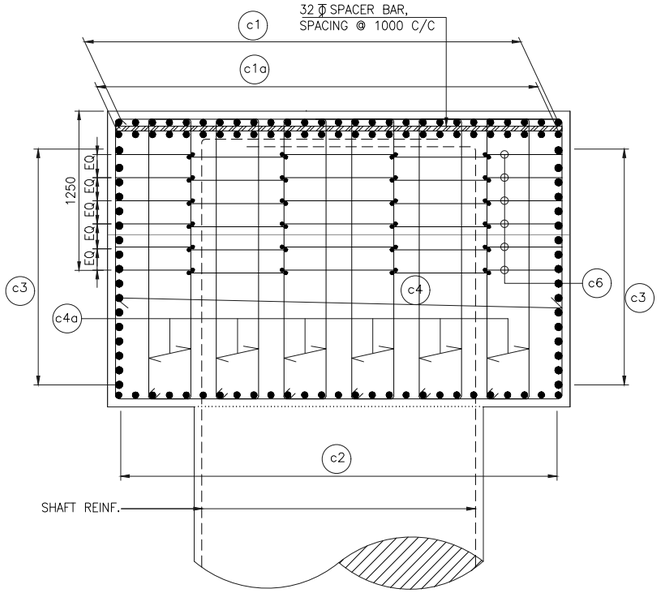
PLAN SHOWING REINFORCEMENT DETAIL OF PIER FOOTING

(SCALE–1:50)



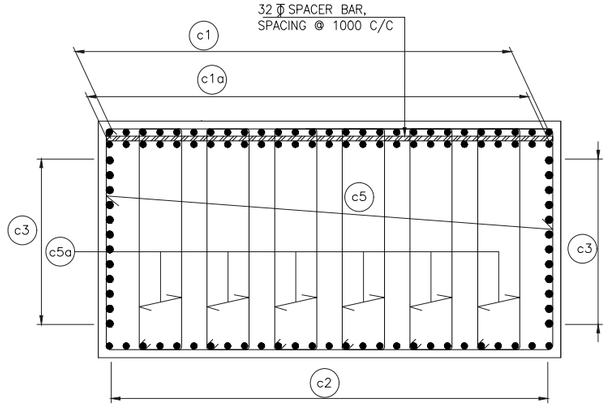
PLAN SHOWING REINFORCEMENT DETAIL OF PIER CAP

(SCALE–1:50)



SECTION E-E

(SCALE–1:30)



SECTION F-F

(SCALE–1:30)

PIER CAP:-			
c1	32	27 NOS. (IN FIRST LAYER)	800 ⌐ ¬ 800
c1a	25	27 NOS. (IN SECOND LAYER)	800 ⌐ ¬ 800
c2	20	27 NOS.	500 ⌐ ⌐ 500
c3	20	100 C/C	1750 ⌐ ¬ 1750 LENGTH VARIES
c4	16 ϕ 2 LEGGED STIRRUP @ 110 C/C		▭
c4a	12 ϕ 12 LEGGED STIRRUPS @ 110 C/C		▯▯▯▯▯▯
c5	16 ϕ 2 LEGGED STIRRUP @ 110 C/C		▭
c5a	12 ϕ 12 LEGGED STIRRUPS @ 110 C/C		▯▯▯▯▯▯
c6	16 ϕ 10 LEGGED STIRRUPS @ 6 LAYERS		▯▯▯▯▯

NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETERS, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS TO BE FOLLOWED.

REFERENCE DRAWINGS:-

1. GENERAL ARRANGEMENT DRAWING. VEL/DE–BR/STR/MJB/GAD/2+085/100 (SH–01 OF 02)
2. DIMENSION DETAILS OF PIER P1. VLE/DE–BR/STR/MJB/SUB/250
3. REINFORCEMENT DETAILS OF PIER P1. VLE/DE–BR/STR/MJB/SUB/251 VLE/DE–BR/STR/MJB/SUB/253

LEGEND:-

REINFORCEMENT AT TOP FACE	———
REINFORCEMENT AT BOTTOM FACE	– – – – – – – – – – –

PROOF CHECKED
Anjan Dutta
Professor
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Guwahati-781039

Shambhavi Techno Solutions Pvt. Ltd
Managing Director

DESIGN DIRECTOR

SUVADRA CONSULTANTS Regd. No- 11/2004-05 BHUBANESWAR

Rev.	Date	Description
R1	JAN-22	STRUCTURE PROPOSAL REVISED
R0	JUNE-21	FOR APPROVAL

Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED
3rd Floor, PTI Building,4-Parliament Street, New Delhi-110001

Authority Engineer : Glabal Infra Solutions
E-8/11A,F-2, Global Tower , Trilanga Main Road , Akashganga Colony, Shahpura, Bhopal (462039) Tel.-0755-4045216

EPC Contractor : Valecha Engineering Ltd
Valecha Chambers, 4th Floor, Plot No B-6, New Link Road, Andheri West, Mumbai - 400053

Safety Consultant : SUVADRA CONSULTANTS (An ISO 9001 : 2008 Certified) Soil Testing Laboratory & Engineering Consultants Approved By Govt. of Orissa Regd. No. 11 of 2004-05
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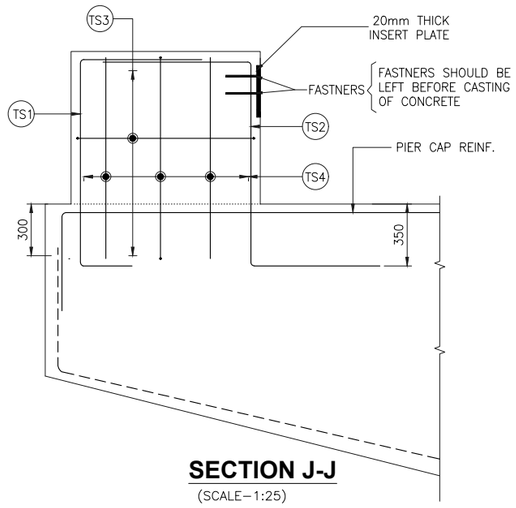
Drawn	MP
Designed	GPV
Checked	AV
Date:	JUNE -2021

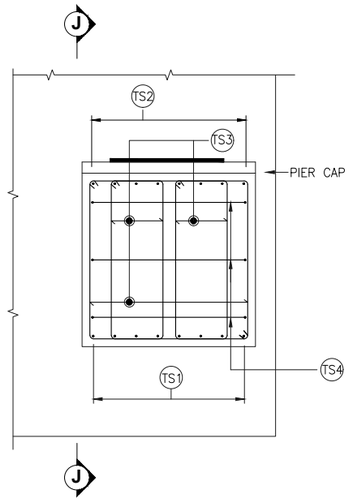
Title: REINFORCEMENT DETAILS OF PIER P1 MAJOR BRIDGE AT CH-2+085.
Scale: AS SHOWN 1 OF 1
Rev: R1
Drg. No: VLE/DE-BR/STR/MJB/SUB/252

Y:\01_SPS PROJECT\56_DEMWE-BRAHMAKUND\01_ Drawings\01_Major Bridge\CH 2+085\2.SUB STRUCTURE\PIER AS PER 14.1M DECK\PIER P1 - R0\VLE-DE-BR-STR-MJB-2+085-SUB-251.dwg 27-Jan-22



SECTION J-J

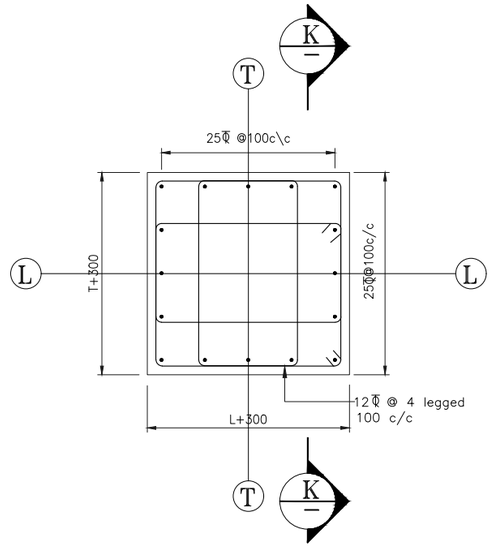
(SCALE–1:25)



TRAFFIC DIRECTION

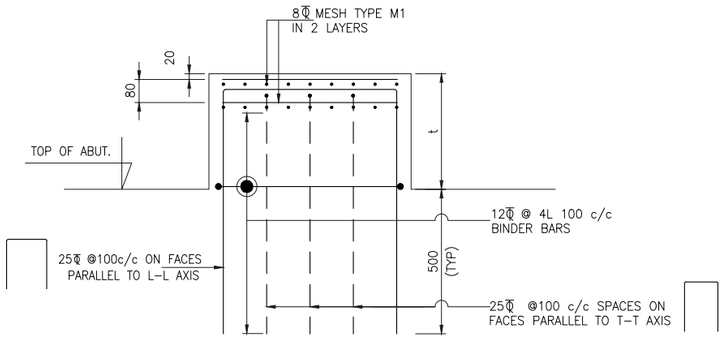
PLAN SHOWING REINF. DETAILS OF TRANSVERSE SEISMIC STOPPER ON PIER CAP

(SCALE–1:25)



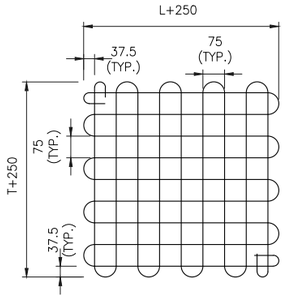
PLAN SHOWING TYPICAL REINF. DETAILS OF BEARING PEDESTAL

(SCALE 1:15)



SECTION K–K
(L+300)X(T+300) PEDESTAL

(SCALE 1:15)



8 ϕ MESH m1

(AT EACH PEDESTAL LOCATION)

(SCALE 1:15)

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Professor
Department of Civil Engineering
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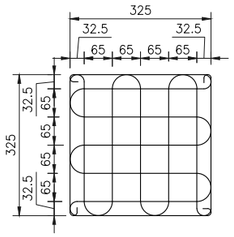
Guwahati-781039



DETAIL OF 8 ϕ MESH TYPE ''m2''

(IN TWO LAYERS AT JACK LOCATION)

(SCALE 1:10)

NOTES:-

1. ALL DIMENSION ARE IN MILLIMETERS, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSION TO BE FOLLOWED.
2. MESH TYPE M1' SHALL BE PROVIDED IN PIER CAP AT BEARING LOCATIONS AND MESH TYPE 'M2' SHALL BE PROVIDED AT JACK LOCATION IN TWO LAYER AT 20mm AND AT 100mm FROM TOP OF CONCRETE.
3. REINFORCING STEEL SHALL ONLY BE TMT BARS (GRADE DESIGNATION Fe:500) CONFORMING TO IS:1786 WITH MINIMUM TOTAL ELONGATIONS OF 12%.
4. LAP/SPLICES SHALL BE PROVIDED AS PER CLAUSE NO. 15.2.5. LAP LENGTH SHALL NOT BE LESS THAN 72ø.

   ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:–

FAVOURABLE BOND CONDITION					
GRADE OF CONCRETE	PERCENTAGE OF LAPPED BARS	<25%	33%	50%	>50%
M30	X	40	46	56	60
M35		36	41	50	54
M40		34	39	48	51
M45		32	37	45	48
M50		29	33	41	44
UNFAVOURABLE BOND CONDITION					
GRADE OF CONCRETE	PERCENTAGE OF LAPPED BARS	<25%	33%	50%	>50%
M30	X	58	67	81	87
M35		53	61	74	80
M40		50	58	70	75
M45		47	54	66	71
M50		42	48	59	63

5. BARS SHOWN IN THE DRAWING ARE NOT TO BE COUNTED, ONLY WRITTEN DATA SHALL BE FOLLOWED.
6. PEDESTAL HEIGHT TO BE AS PER SITE REQUIREMENT.

REFERENCE DRAWINGS:-

1. GENERAL ARRANGEMENT DRAWING. VEL/DE–BR/STR/MJB/GAD/2+085/100 (SH–01 OF 02)
2. DIMENSION DETAILS OF PIER P1. VLE/DE–BR/STR/MJB/SUB/250
3. REINFORCEMENT DETAILS OF PIER P1. VLE/DE–BR/STR/MJB/SUB/251 VLE/DE–BR/STR/MJB/SUB/252

Shambhavi Techno Solutions Pvt. Ltd.
Managing Director

SIZE OF BEARING PEDESTAL SHALL BE (L+300) x (T+300) WHERE ``L'' AND ``T'' ARE LENGTH OF BEARING IN LONGITUDINAL AND TRANSVERSE DIRECTION RESPECTIVELY

t = HEIGHT OF PEDESTAL

SUVADRA CONSULTANTS Regd. No-11/2004-05 BHUBANESWAR

DESIGN DIRECTOR

REINFORCEMENT DETAILS:–

BAR MKD.	BAR DIA.	NO./SPACING	SHAPE
TRANSVERSE SEISMIC STOPPER:–			
TS1	16	8 NOS.	200
TS2	25	8 NOS.	1500
TS3	6 LEGGED 12ø STIRRUPS TIED TO VERTICALLY BARS @ 150 C/C VERTICALLY		
TS4	2 LEGGED 3 NOS. 12 DIA STIRRUPS		

Rev.	Date	Description
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R0	JUNE-21	FOR APPROVAL

Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED
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Drawn	MP
Designed	GPV
Checked	AV
Date:	JUNE -2021

Title: REINFORCEMENT STOPPER DETAILS OF PIER P1 MAJOR BRIDGE AT CH-2+085.

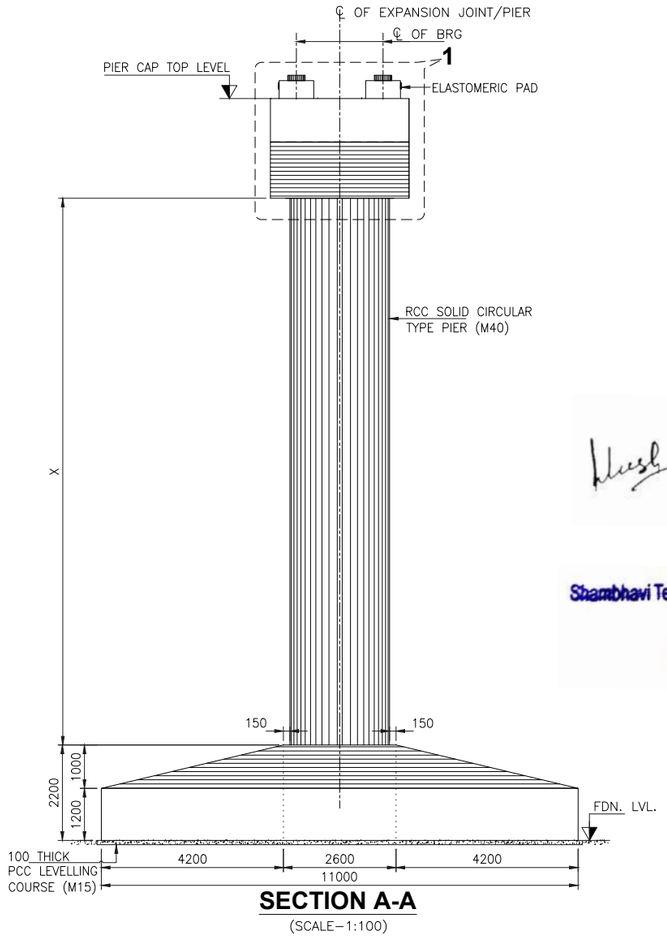
Scale: AS SHOWN — 1 OF 1 — *Rev:* R1

Drg. No: VLE/DE-BR/STR/MJB/SUB/253

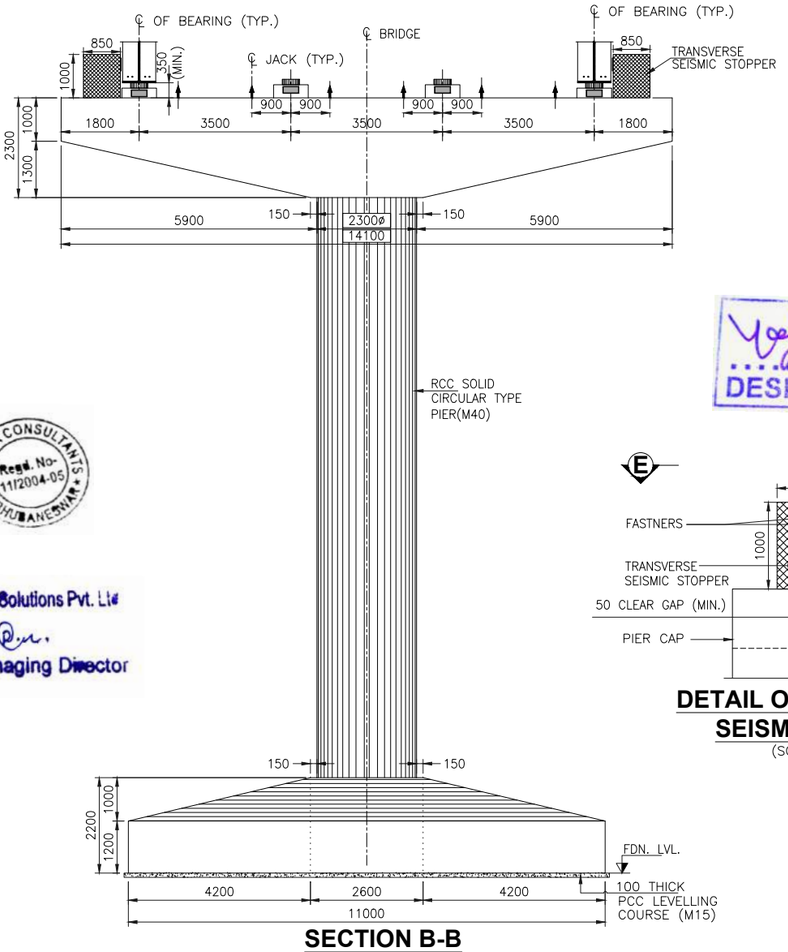
Y:\01_SPS PROJECT\56_DEMWE-BRAHMKUND\01_ Drawings\01_Major Bridge\SUB STRUCTURE\PIER AS PER 14.1M DECK\PIER P1 - R0\VLE-DE-BR-STR-MJB-2+085-SUB-251.dwg 7-Jan-22

SUBSTRUCTURE

PIER P2 AND P3



SECTION A-A
(SCALE–1:100)



SECTION B-B
(SCALE–1:100)

PROOF CHECKED
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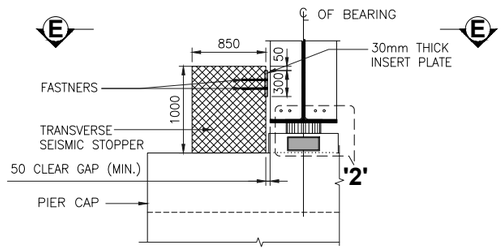
Professor
Department of Civil Engineering
Indian Institute of Technology Guwahati
Guwahati-781039

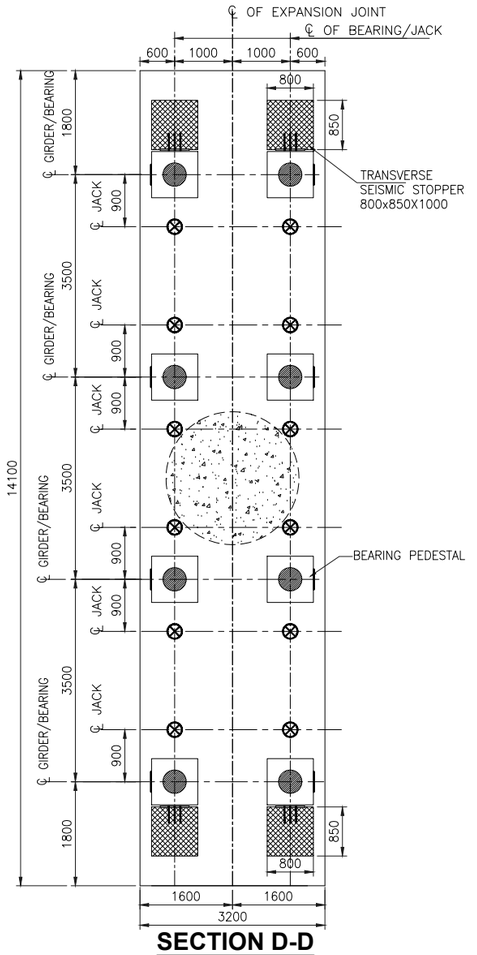
Yogesh Singh
DESIGN DIRECTOR

SUVADRA CONSULTANTS Regd. No- 11/2004-05 BHUBANESWAR

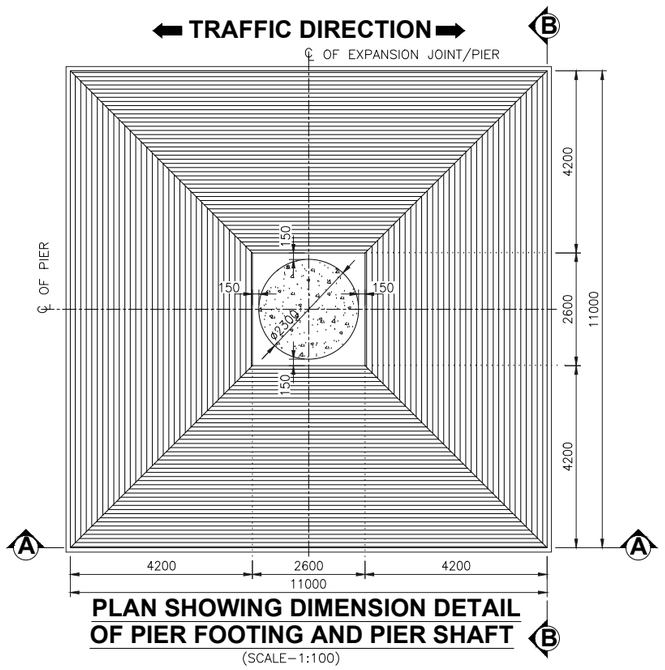
Shambhavi Techno Solutions Pvt. Ltd
Managing Director



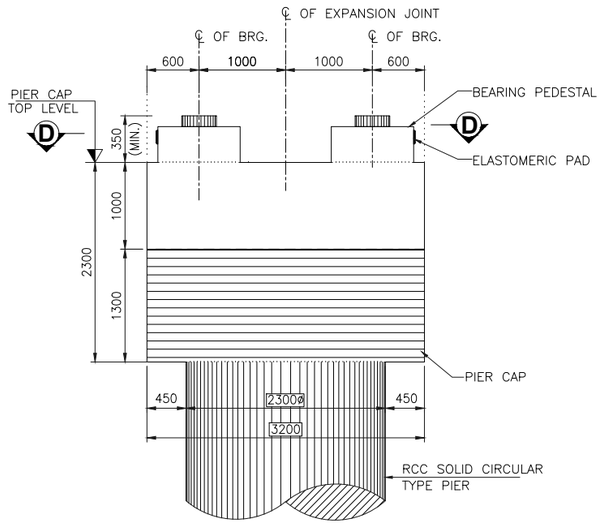
DETAIL OF TRANSVERSE SEISMIC STOPPER
(SCALE–1:50)



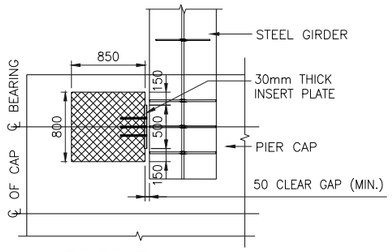
SECTION D-D
(SCALE–1:75)



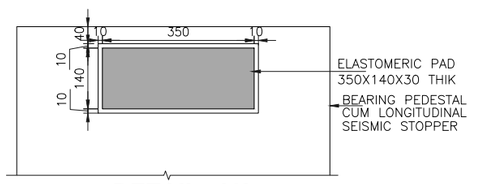
PLAN SHOWING DIMENSION DETAIL OF PIER FOOTING AND PIER SHAFT
(SCALE–1:100)



DETAIL - `1'
(SCALE–1:50)



SECTION E-E
(SCALE–1:50)



DETAIL - `2'
(SCALE–1:10)

PIER	CAP TOP LVL.	FOUNDING LVL.	HEIGHT OF SHAFT "X"
P2 & P3	359.625	337.136	17.990m

REFERENCE DRAWINGS:-

1. GENERAL ARRANGEMENT DRAWING.
   VEL/DE–BR/STR/MJB/GAD/2+085/100 (SH–01 OF 02)
2. REINFORCEMENT DETAILS OF PIER P2 & P3.
   VLE/DE–BR/STR/MJB/SUB/255
   VLE/DE–BR/STR/MJB/SUB/257
   VLE/DE–BR/STR/MJB/SUB/258

NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS IN METERS, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS TO BE FOLLOWED.
2. 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) PCC LEVELING COURSE M15
   b) FOUNDATION M35
   c) SUBSTRUCTURE
      i) PIER SHAFT M40
      ii) PIER CAP M35
   d) BEARING PEDESTAL M45
   e) SEISMIC STOPPER M40
3. REINFORCING STEEL SHALL ONLY BE TMT BARS (GRADE DESIGNATION Fe:500D) CONFORMING TO IS:1786 WITH MINIMUM TOTAL ELONGATIONS OF 12%.
4. MINIMUM COVER TO ANY REINFORCEMENT SHALL BE AS FOLLOW:
   a) FOUNDATION 75mm
   b) PIER CAP & SEISMIC STOPPER 50mm
   c) SUB STRUCTURE:– 50mm
5. ⊗ SHOWN JACK LOCATION IN PLAN AND ↑ SHOWN JACK LOCATION IN ELEVATION, OTHERWISE MENTIONED.
6. SAFE BEARING CAPACITY CONSIDERED IN DESIGN AT PROPOSED FOUNDING LEVEL IS 55T/Sqm.

Rev.	Date	Description
R0	FEB-22	FOR APPROVAL

Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED
3rd Floor, PTI Building,4-Parliament Street, New Delhi-110001

Authority Engineer : Glabal Infra Solutions
E-8/11A,F-2, Global Tower , Trilanga Main Road , Akashganga Colony, Shahpura, Bhopal (462039)
Tel.-0755-4045216

EPC Contractor : Valecha Engineering Ltd
Valecha Chambers, 4th Floor, Plot No B-6, New Link Road, Andheri West, Mumbai - 400053

Safety Consultant : SUVADRA CONSULTANTS (An ISO 9001 : 2008 Certified) (Soil Testing Laboratory & Engineering Consultants) Approved by Govt. of Orissa Regd. No. 11 of 2004-05
PP-97, Tankapani Road, BBSR-18, Odisha

Proof Consultant : SHAMBHAVI TECHNO SOLUTIONS PVT.LTD.
E-82, Rajesh Kumar Path, S.K.Puri, Boring Road, Patna-800001

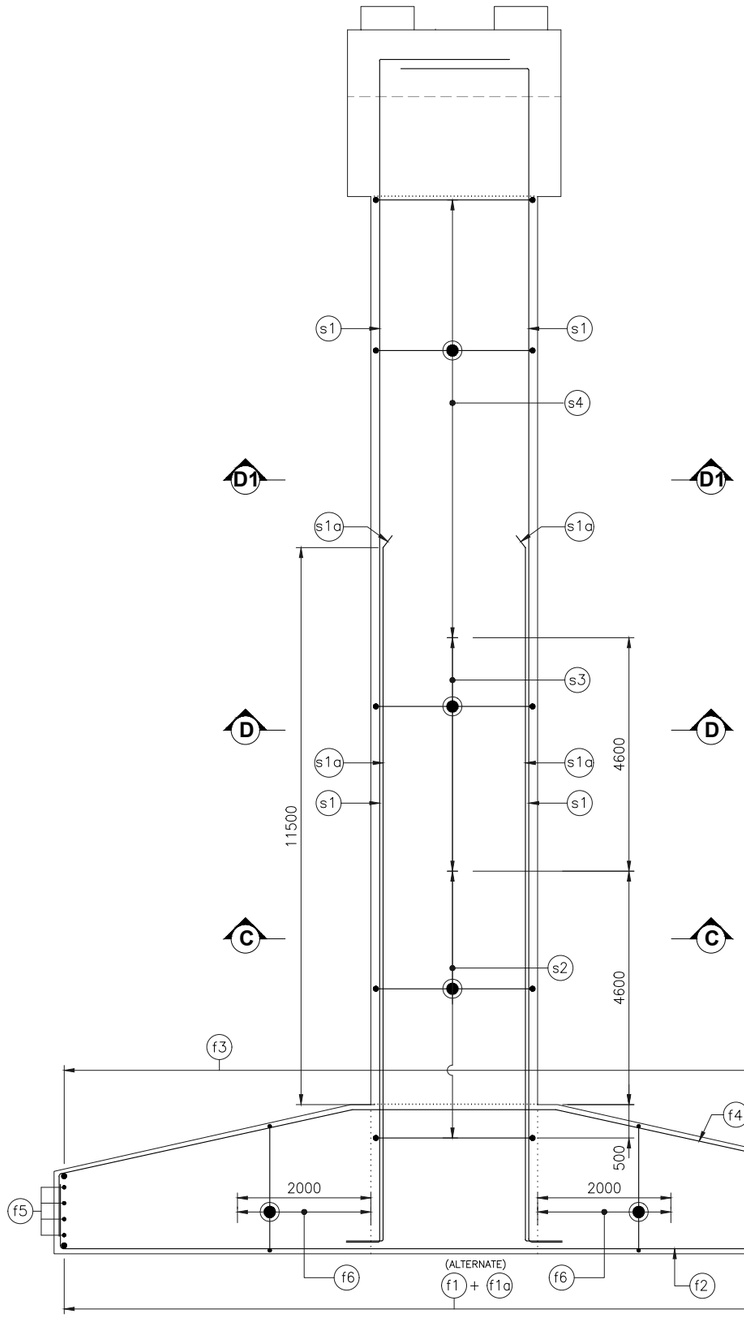
Design Consultant : SPS Technocrats Pvt. Ltd.
510 & 511, Fifth Floor, JMD Megapolis, Sector 48, Gurgaon, Haryana 122018

Project: DEMWE - BRAHMKUND (NH-13)
CONSTRUCTION OF TWO LANING WITH HARD SHOULDERS OF DEMWE - BRAHMKUND SECTION OF NH-13 FROM CH. 0.000 TO CH 18.464 IN THE STATE OF ARUNACHAL PRADESH ON EPC MODE UNDER NH(O)-NE

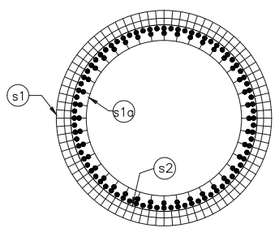
Drawn	MP
Designed	GPV
Checked	AV
Date:	FEBRUARY -2021

Title: DIMENSION DETAILS OF PIER P2 & P3 FOR MAJOR BRIDGE AT CH-2+085
Scale: AS SHOWN 1 OF 1 Rev: R0
Drg. No: VLE/DE-BR/STR/MJB/SUB/254

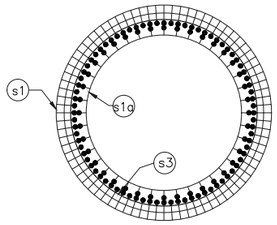
Y:\01_SPS PROJECT\56_DEMWE-BRAHMAKUND\01_ Drawings\01_Major Bridge\CH 2+085\2.SUB STRUCTURE\PIER AS PER 14.1M DECK\PIER P2 AND P3 - R0\VLE-DE-BR-STR-MJB-2+085-SUB-254.dwg 22-Feb-22



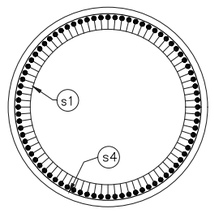
SECTION A-A
(SCALE–1:60)



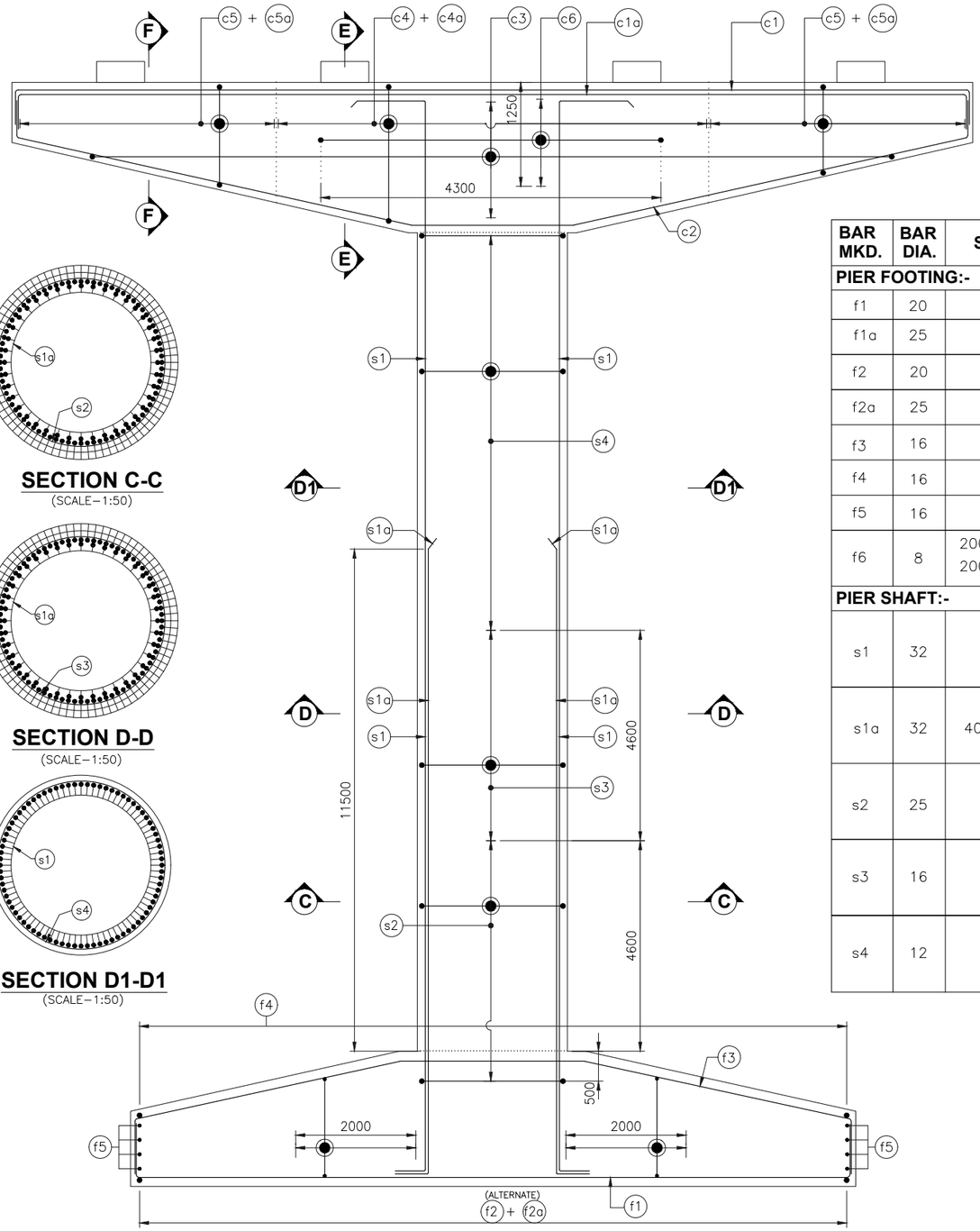
SECTION C-C
(SCALE–1:50)



SECTION D-D
(SCALE–1:50)



SECTION D1-D1
(SCALE–1:50)



SECTION B-B
(SCALE–1:60)

BAR MKD.	BAR DIA.	SPACING/NOS.	SHAPE
PIER FOOTING:-			
f1	20	200 C/C (ALTERNATE)	800 — 800
f1a	25	200 C/C (ALTERNATE)	800 — 800
f2	20	200 C/C (ALTERNATE)	800 — 800
f2a	25	200 C/C (ALTERNATE)	800 — 800
f3	16	100 C/C	800 — 800
f4	16	100 C/C	800 — 800
f5	16	4x8 NOS.	300 — 300
f6	8	200 C/C LONGITUDINAL AND 200 C/C TRANSCEIVER	
PIER SHAFT:-			
s1	32	80 NOS.	500 — 1000
s1a	32	40 NOS.(BUNDLED WITH S1)	500 — 1000
s2	25	120 C/C	300 (MIN. LAP)
s3	16	120 C/C	300 (MIN. LAP)
s4	12	120 C/C	300 (MIN. LAP)

PROOF CHECKED
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Professor
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Guwahati-781039

DESIGN DIRECTOR

LEGEND:-

REINFORCEMENT AT TOP FACE	———
REINFORCEMENT AT BOTTOM FACE	– – – – – – – – – – –

Shambhavi Techno Solutions Pvt. Ltd.
Managing Director

SUVADRA CONSULTANTS Regd. No- 11/2004-05 BHUBANESWAR

NOTES:-
1. ALL DIMENSIONS ARE IN MILLIMETERS, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS TO BE FOLLOWED.

REFERENCE DRAWINGS:-
1. GENERAL ARRANGEMENT DRAWING. VEL/DE–BR/STR/MJB/GAD/2+085/100 (SH–01 OF 02)
2. DIMENSION DETAILS OF PIER P4 & P5. VLE/DE–BR/STR/MJB/SUB/254
2. REINFORCEMENT DETAILS OF PIER P4 & P5. VLE/DE–BR/STR/MJB/SUB/256 VLE/DE–BR/STR/MJB/SUB/257

Rev.	Date	Description
R0	FEB. -2022	FOR APPROVAL

Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED
3rd Floor, PTI Building,4-Parliament Street, New Delhi-110001

Authority Engineer : Global Infra Solutions
E-8/11A,F-2, Global Tower , Trilanga Main Road , Akashganga Colony, Shahpura, Bhopal (462039) Tel.-0755-4045216

EPC Contractor : Valecha Engineering Ltd
Valecha Chambers, 4th Floor, Plot No B-6, New Link Road, Andheri West, Mumbai - 400053

Safety Consultant : SUVADRA CONSULTANTS (An ISO 9001 : 2008 Certified) (Soil Testing Laboratory & Engineering Consultant) Approved By Govt. of Orissa Regd. No. 11 of 2004-05
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Design Consultant : SPS Technocrats Pvt. Ltd.
510 & 511, Fifth Floor, JMD Megapolis, Sector 48, Gurgaon, Haryana 122018

Project: **DEMWE - BRAHMKUND (NH-13)**
CONSTRUCTION OF TWO LANING WITH HARD SHOULDERS OF DEMWE - BRAHMKUND SECTION OF NH-13 FROM CH. 0.000 TO CH 18.464 IN THE STATE OF ARUNACHAL PRADESH ON EPC MODE UNDER NH(O)-NE

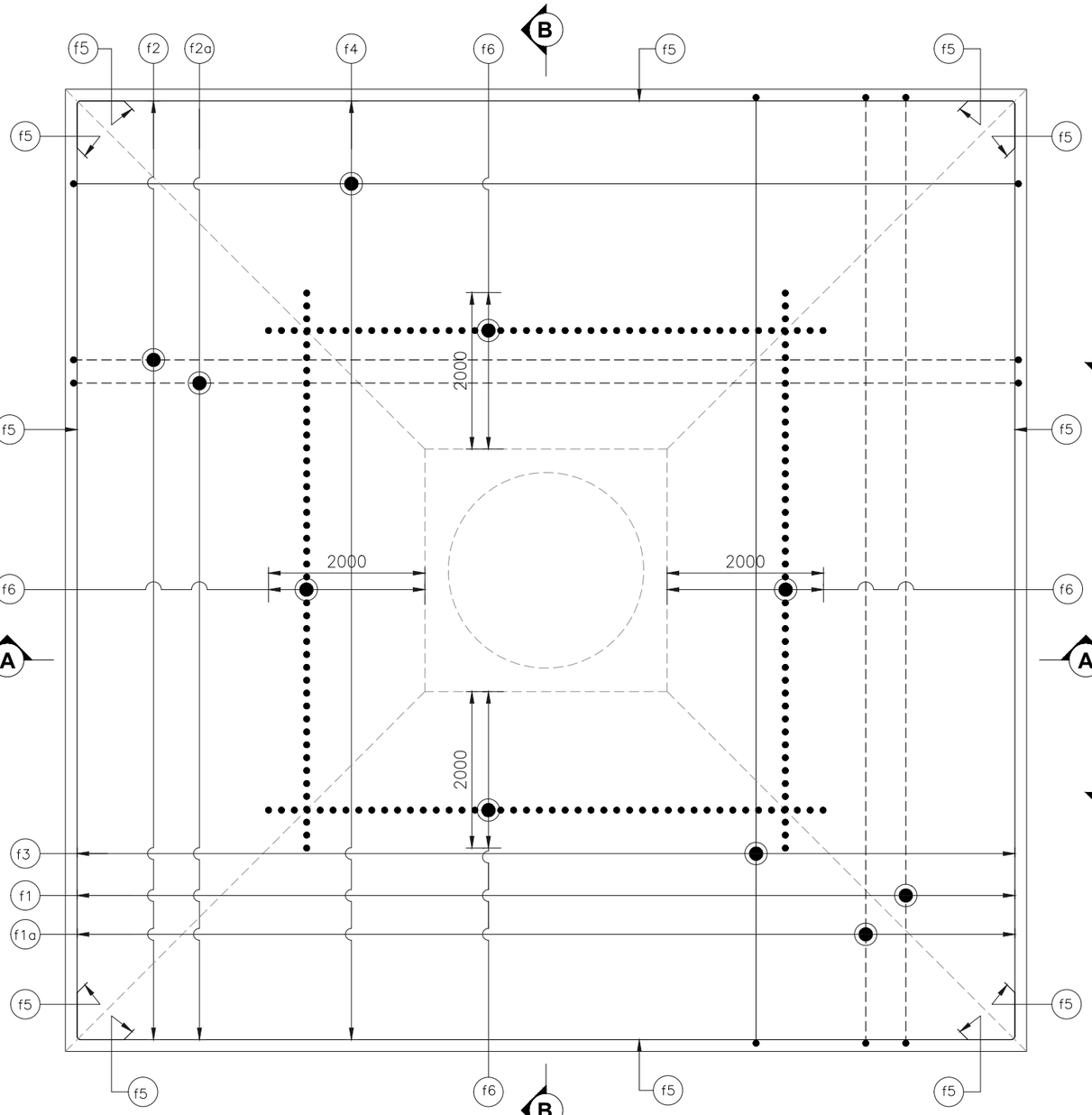
Drawn	MP
Designed	GPV
Checked	AV
Date:	FEB. -2022

Title: REINFORCEMENT DETAILS OF PIER P2 & P3 MAJOR BRIDGE AT CH-2+085.

Scale: AS SHOWN — 1 OF 1 — *Rev:* R0

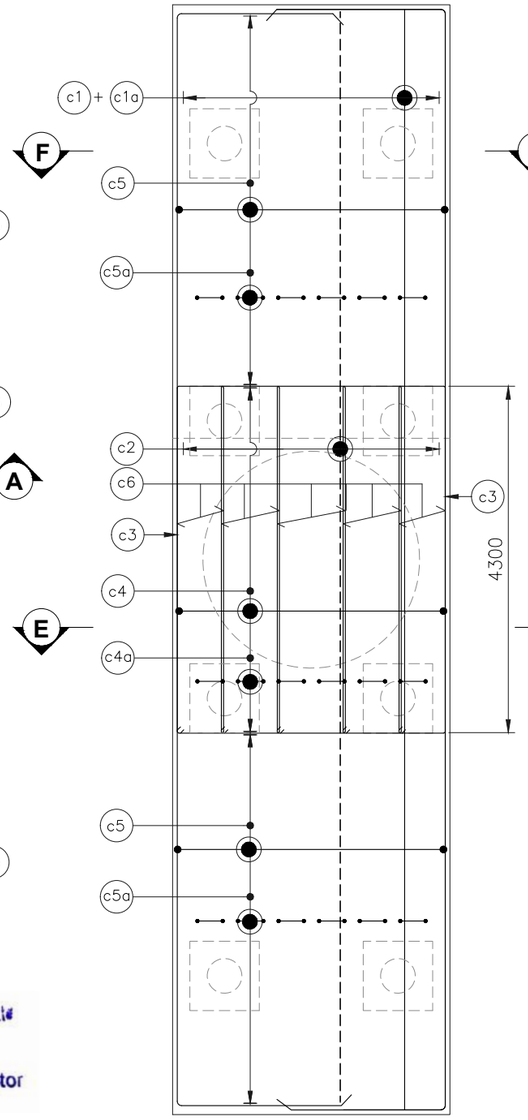
Drg. No: VLE/DE-BR/STR/MJB/SUB/255

Y:\01_SPS PROJECT\56_DEMWE-BRAHMAKUND\01_ Drawings\01_Major Bridge\CH 2+085\2.SUB STRUCTURE\PIER AS PER 14.1M DECK\PIER P2 AND P3 - R0\VLE-DE-BR-STR-MJB-2+085-SUB-255.dwg 21-Feb-22



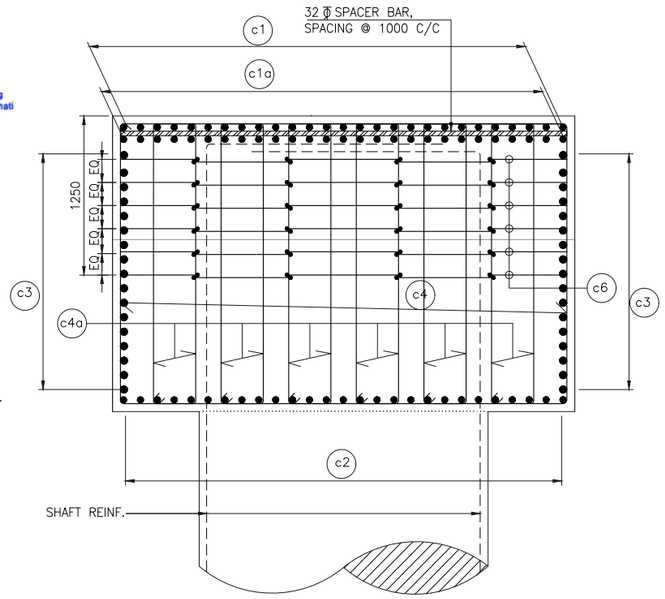
PLAN SHOWING REINFORCEMENT DETAIL OF PIER FOOTING

(SCALE–1:50)



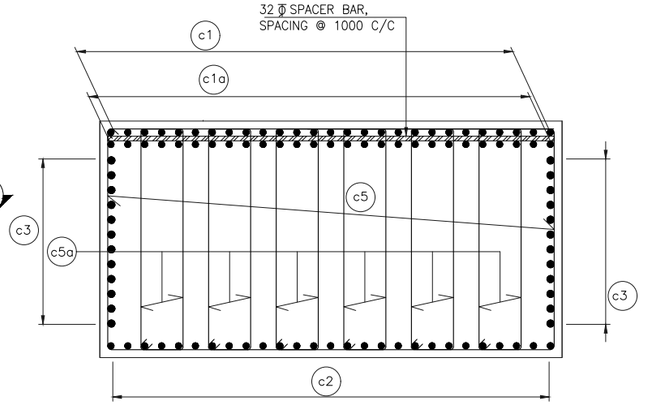
PLAN SHOWING REINFORCEMENT DETAIL OF PIER CAP

(SCALE–1:50)



SECTION E-E

(SCALE–1:30)



SECTION F-F

(SCALE–1:30)

PIER CAP:-

c1	32	27 NOS. (IN FIRST LAYER)	800 ⌐ ¬ 800
c1a	25	27 NOS. (IN SECOND LAYER)	800 ⌐ ¬ 800
c2	20	27 NOS.	500 ⌐ ¬ 500
c3	20	100 C/C	1750 ⌐ ¬ 1750 LENGTH VARIES
c4	16 Φ 2 LEGGED STIRRUP @ 110 C/C		
c4a	12 Φ 12 LEGGED STIRRUPS @ 110 C/C		
c5	16 Φ 2 LEGGED STIRRUP @ 110 C/C		
c5a	12 Φ 12 LEGGED STIRRUPS @ 110 C/C		
c6	16 Φ 10 LEGGED STIRRUPS @ 6 LAYERS		

NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETERS, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS TO BE FOLLOWED.

REFERENCE DRAWINGS:-

1. GENERAL ARRANGEMENT DRAWING. VEL/DE–BR/STR/MJB/GAD/2+085/100 (SH–01 OF 02)
2. DIMENSION DETAILS OF PIER P4 & P5. VLE/DE–BR/STR/MJB/SUB/254
3. REINFORCEMENT DETAILS OF PIER P4 & P5. VLE/DE–BR/STR/MJB/SUB/255 VLE/DE–BR/STR/MJB/SUB/257

LEGEND:-

REINFORCEMENT AT TOP FACE	———
REINFORCEMENT AT BOTTOM FACE	– – – – – – – – – –

PROOF CHECKED
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Shambhavi Techno Solutions Pvt. Ltd
Managing Director

SUVADRA CONSULTANTS Regd. No- 111/2004-05 BHUBANESWAR

DESIGN DIRECTOR

Rev.	Date	Description
R0	FEB. -2022	FOR APPROVAL

Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED
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Authority Engineer : Glabal Infra Solutions
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Safety Consultant : SUVADRA CONSULTANTS (An ISO 9001 : 2008 Certified) (Soil Testing Laboratory & Engineering Consultant) Approved By Govt. of Orissa Regd. No. 11 of 2004-05
PP-97, Tankapani Road, BBSR-18, Odisha

Proof Consultant : SHAMBHAVI TECHNO SOLUTIONS PVT.LTD.
E-82, Rajesh Kumar Path, S.k.Puri, Boring Road, Patna-800001

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510 & 511, Fifth Floor, JMD Megapolis, Sector 48, Gurgaon, Haryana 122018

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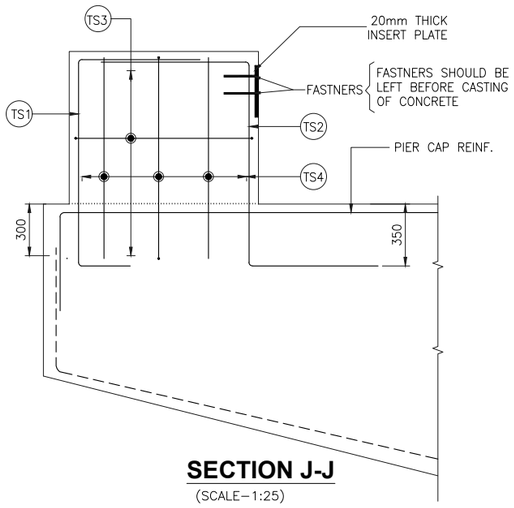
Drawn	**MP**
Designed	**GPV**
Checked	**AV**
Date:	**FEB. -2022**

Title: REINFORCEMENT DETAILS OF PIER P2 & P3 MAJOR BRIDGE AT CH-2+085.

Scale: **AS SHOWN** **1 OF 1** *Rev:* **R0**

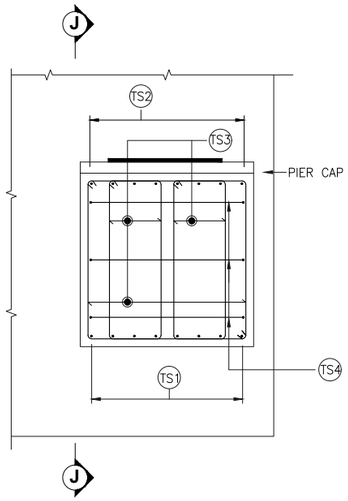
Drg. No: **VLE/DE-BR/STR/MJB/SUB/256**

Y:\01_SPS PROJECT\56_DEMWE-BRAHMAKUND\01_ Drawings\01_Major Bridge\CH 2+085\2.SUB STRUCTURE\PIER AS PER 14.1M DECK\PIER P2 AND P3 - R0\VLE-DE-BR-STR-MJB-2+085-SUB-255.dwg 21-Feb-22



SECTION J-J

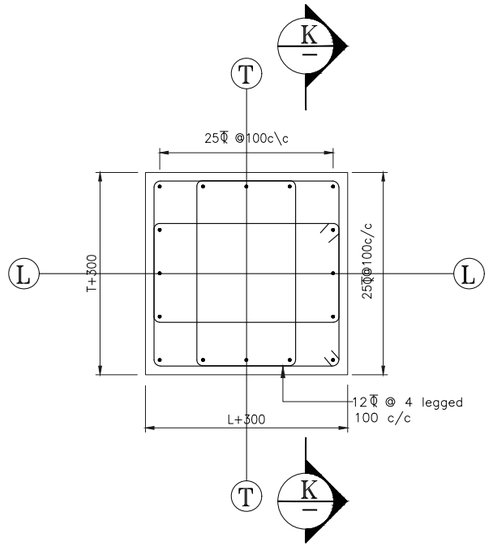
(SCALE–1:25)



TRAFFIC DIRECTION

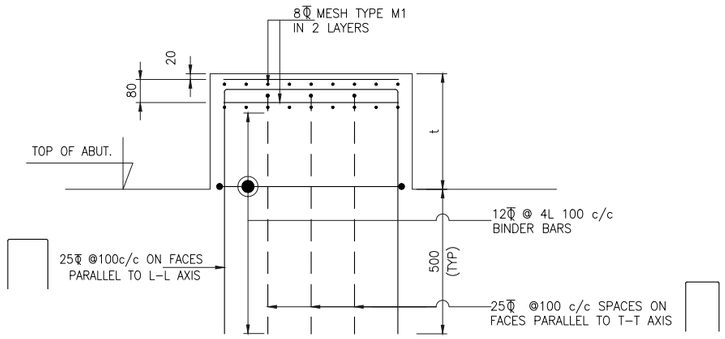
PLAN SHOWING REINF. DETAILS OF TRANSVERSE SEISMIC STOPPER ON PIER CAP

(SCALE–1:25)



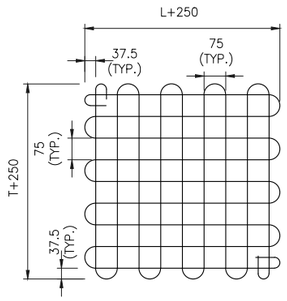
PLAN SHOWING TYPICAL REINF. DETAILS OF BEARING PEDESTAL

(SCALE 1:15)



SECTION K–K
(L+300)X(T+300) PEDESTAL

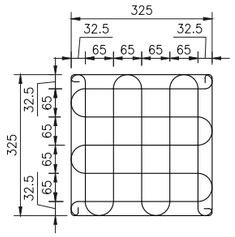
(SCALE 1:15)



8 Φ MESH m1

(AT EACH PEDESTAL LOCATION)

(SCALE 1:15)



DETAIL OF 8 Φ MESH TYPE ''m2''

(IN TWO LAYERS AT JACK LOCATION)

(SCALE 1:10)

SIZE OF BEARING PEDESTAL SHALL BE (L+300) x (T+300) WHERE ``L" AND ``T" ARE LENGTH OF BEARING IN LONGITUDINAL AND TRANSVERSE DIRECTION RESPECTIVELY

t = HEIGHT OF PEDESTAL

Shambhavi Techno Solutions Pvt. Ltd
Managing Director

PROOF CHECKED
Professor
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Indian Institute of Technology Guwahati
Guwahati-781039

SUVADRA CONSULTANTS Regd. No- 11/2004-05 BHUBANESWAR

DESIGN DIRECTOR

REINFORCEMENT DETAILS:–

BAR MKD.	BAR DIA.	NO./SPACING	SHAPE
TRANSVERSE SEISMIC STOPPER:–			
TS1	16	8 NOS.	200 / 1500
TS2	25	8 NOS.	
TS3		6 LEGGED 12ø STIRRUPS TIED TO VERTICALLY BARS @ 150 C/C VERTICALLY	
TS4		2 LEGGED 3 NOS. 12 DIA STIRRUPS	

NOTES:-

1. ALL DIMENSION ARE IN MILLIMETERS, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSION TO BE FOLLOWED.
2. MESH TYPE M1' SHALL BE PROVIDED IN PIER CAP AT BEARING LOCATIONS AND MESH TYPE 'M2' SHALL BE PROVIDED AT JACK LOCATION IN TWO LAYER AT 20mm AND AT 100mm FROM TOP OF CONCRETE.
3. REINFORCING STEEL SHALL ONLY BE TMT BARS (GRADE DESIGNATION Fe:500) CONFORMING TO IS:1786 WITH MINIMUM TOTAL ELONGATIONS OF 12%.
4. LAP/SPLICES SHALL BE PROVIDED AS PER CLAUSE NO. 15.2.5. LAP LENGTH SHALL NOT BE LESS THAN 72ø.

   ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:–

FAVOURABLE BOND CONDITION					
GRADE OF CONCRETE	PERCENTAGE OF LAPPED BARS	<25%	33%	50%	>50%
M30	X	40	46	56	60
M35		36	41	50	54
M40		34	39	48	51
M45		32	37	45	48
M50		29	33	41	44
UNFAVOURABLE BOND CONDITION					
GRADE OF CONCRETE	PERCENTAGE OF LAPPED BARS	<25%	33%	50%	>50%
M30	X	58	67	81	87
M35		53	61	74	80
M40		50	58	70	75
M45		47	54	66	71
M50		42	48	59	63

5. BARS SHOWN IN THE DRAWING ARE NOT TO BE COUNTED, ONLY WRITTEN DATA SHALL BE FOLLOWED.
6. PEDESTAL HEIGHT TO BE AS PER SITE REQUIREMENT.

REFERENCE DRAWINGS:-

1. GENERAL ARRANGEMENT DRAWING. VEL/DE–BR/STR/MJB/GAD/2+085/100 (SH–01 OF 02)
2. DIMENSION DETAILS OF PIER P4 & P5. VLE/DE–BR/STR/MJB/SUB/254
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Rev.	Date	Description
R0	FEB. -2022	FOR APPROVAL

Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED
3rd Floor, PTI Building,4-Parliament Street, New Delhi-110001

Authority Engineer : Glabal Infra Solutions
E-8/11A,F-2, Global Tower , Trilanga Main Road , Akashganga Colony, Shahpura, Bhopal (462039) Tel.-0755-4045216

EPC Contractor : Valecha Engineering Ltd
Valecha Chambers, 4th Floor, Plot No B-6, New Link Road, Andheri West, Mumbai - 400053

Safety Consultant : SUVADRA CONSULTANTS (An ISO 9001 : 2008 Certified) (Soil Testing Laboratory & Engineering Consultant) Approved By Govt. of Orissa Regd. No. 11 of 2004-05
PP-97, Tankapani Road, BBSR-18, Odisha

Proof Consultant : SHAMBHAVI TECHNO SOLUTIONS PVT.LTD.
E-82, Rajesh Kumar Path, S.k.Puri, Boring Road, Patna-800001

Design Consultant : SPS Technocrats Pvt. Ltd.
510 & 511, Fifth Floor, JMD Megapolis, Sector 48, Gurgaon, Haryana 122018

Project: DEMWE - BRAHMKUND (NH-13)
CONSTRUCTION OF TWO LANING WITH HARD SHOULDERS OF DEMWE - BRAHMKUND SECTION OF NH-13 FROM CH. 0.000 TO CH 18.464 IN THE STATE OF ARUNACHAL PRADESH ON EPC MODE UNDER NH(O)-NE

Drawn	MP
Designed	GPV
Checked	AV
Date:	FEB. -2022

Title: REINFORCEMENT STOPPER DETAILS OF PIER P2 & P3 MAJOR BRIDGE AT CH-2+085.

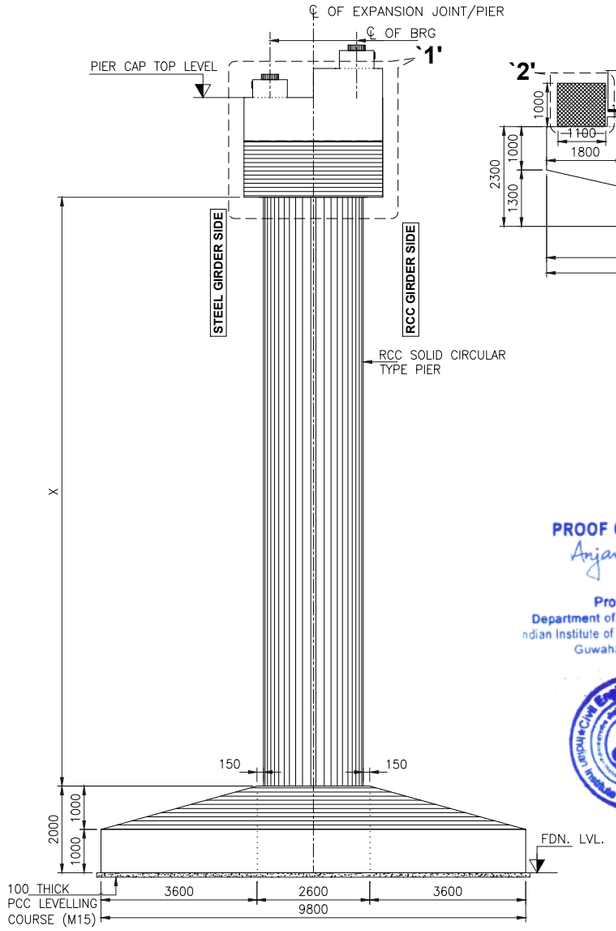
Scale: AS SHOWN — 1 OF 1 — *Rev:* R0

Drg. No: VLE/DE-BR/STR/MJB/SUB/257

Y:\01_SPS PROJECT\56_DEMWE-BRAHMAKUND\01_ Drawings\01_Major Bridge\CH 2+085\2.SUB STRUCTURE\PIER AS PER 14.1M DECK\PIER P2 AND P3 - R0\VLE-DE-BR-STR-MJB-2+085-SUB-255.dwg 21-Feb-22

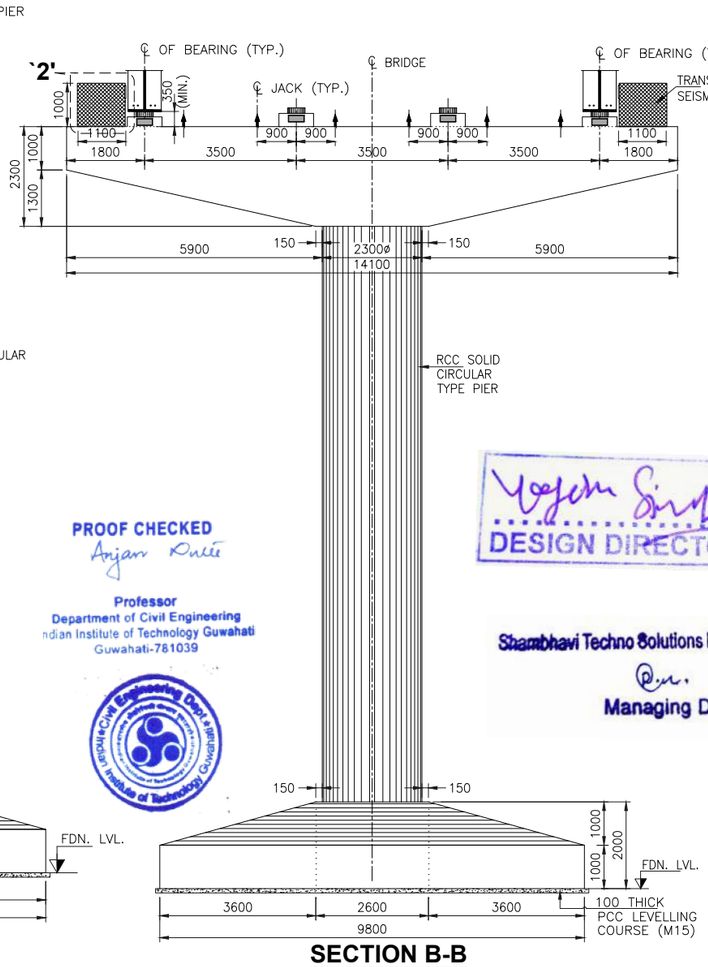
SUBSTRUCTURE

PIER- P4



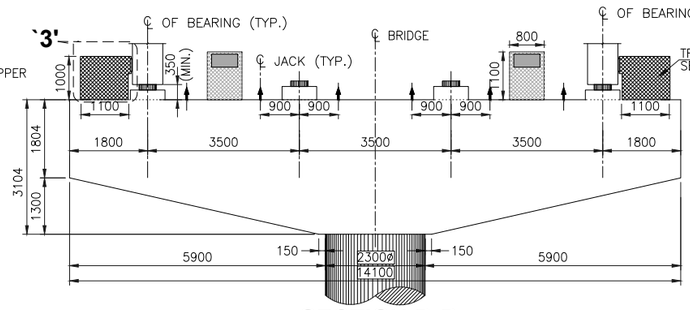
SECTION A-A

(SCALE–1:100)



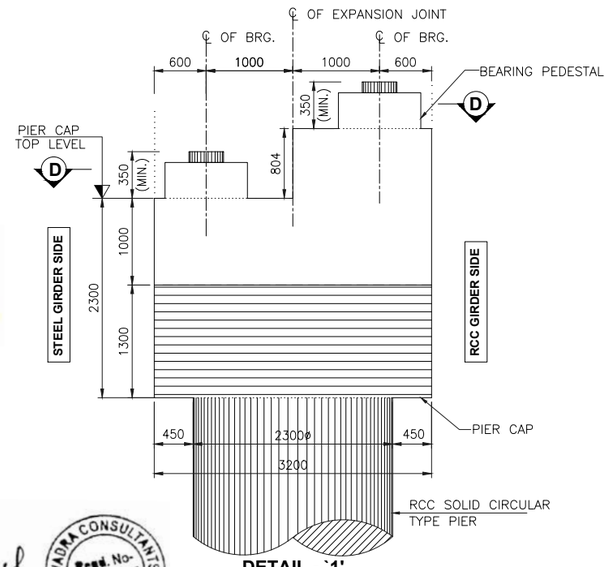
SECTION B-B

(AT STEEL GIRDER SIDE)
(SCALE–1:100)



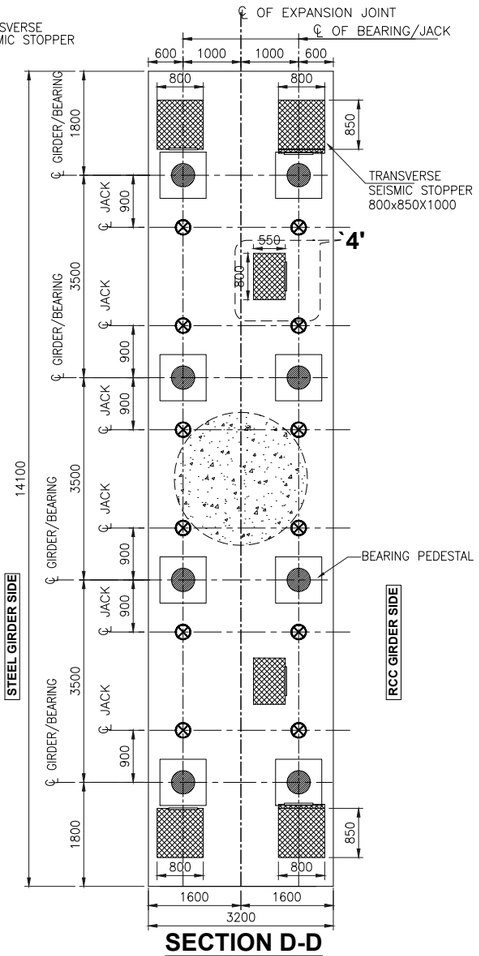
SECTION B-B

(AT RCC GIRDER SIDE)
(SCALE–1:100)



DETAIL - `1'

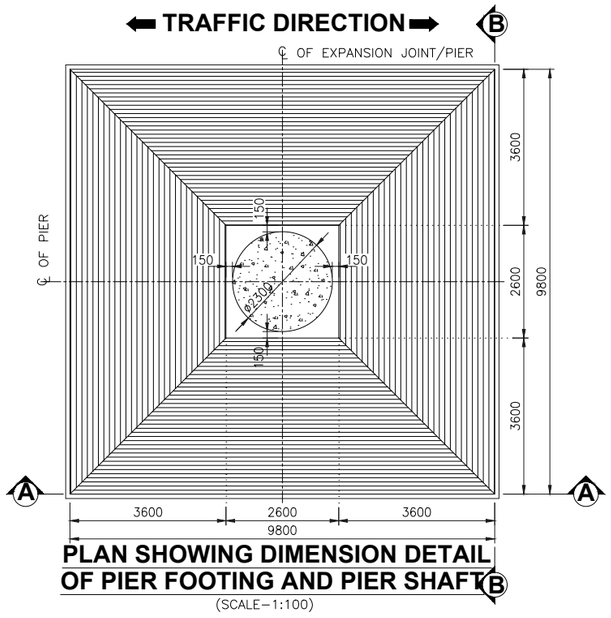
(SCALE–1:50)



SECTION D-D

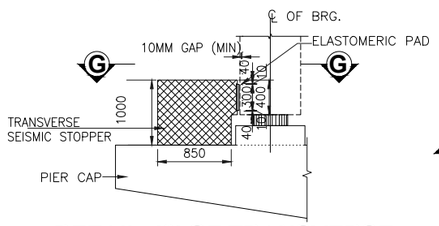
(SCALE–1:75)

PIER	CAP TOP LVL.	FOUNDING LVL.	HEIGHT OF SHAFT "X"
P4	359.625	348.781	6.544m



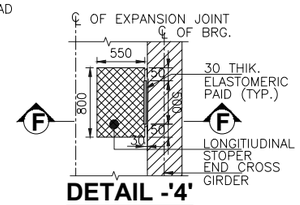
PLAN SHOWING DIMENSION DETAIL OF PIER FOOTING AND PIER SHAFT

(SCALE–1:100)



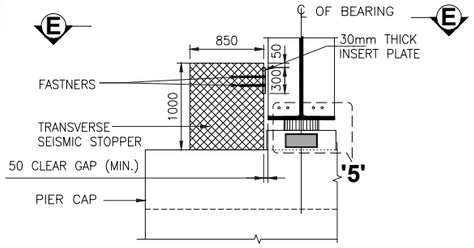
DETAIL -'3' OF TRANSVERSE SEISMIC STOPPER

(AT RCC GIRDER SIDE)
(SCALE–1:50)



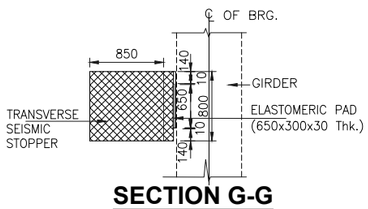
DETAIL -'4'

(AT RCC GIRDER SIDE)
(SCALE–1:50)



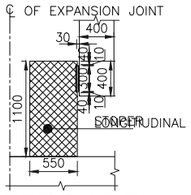
DETAIL -'2' OF TRANSVERSE SEISMIC STOPPER

(SCALE–1:50)



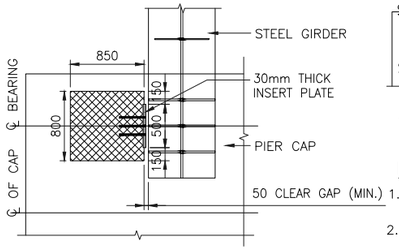
SECTION G-G

(AT RCC GIRDER SIDE)
(SCALE–1:50)



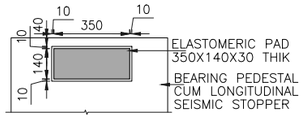
SECTION F-F

(AT RCC GIRDER SIDE)
(SCALE–1:50)



SECTION E-E

(SCALE–1:50)



DETAIL - `5'

(SCALE–1:20)

REFERENCE DRAWINGS:-

1. GENERAL ARRANGEMENT DRAWING. VEL/DE–BR/STR/MJB/GAD/2+085/100
2. REINFORCEMENT DETAILS OF PIER P4. VLE/DE–BR/STR/MJB/SUB/259 VLE/DE–BR/STR/MJB/SUB/260 VLE/DE–BR/STR/MJB/SUB/261

NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS IN METERS, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS TO BE FOLLOWED.
2. 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) PCC LEVELING COURSE M15
   b) FOUNDATION M35
   c) SUBSTRUCTURE M35
   d) BEARING PEDESTAL M45
   e) SEISMIC STOPPER M40
3. REINFORCING STEEL SHALL ONLY BE TMT BARS (GRADE DESIGNATION Fe:500D) CONFORMING TO IS:1786 WITH MINIMUM TOTAL ELONGATIONS OF 12%.
4. MINIMUM COVER TO ANY REINFORCEMENT SHALL BE AS FOLLOW:
   a) FOUNDATION 75mm
   b) PIER CAP & SEISMIC STOPPER 50mm
   c) SUB STRUCTURE:– 50mm
5. ⊗ SHOWN JACK LOCATION IN PLAN AND ⧫ SHOWN JACK LOCATION IN ELEVATION, OTHERWISE MENTIONED.
6. SAFE BEARING CAPACITY CONSIDERED IN DESIGN AT PROPOSED FOUNDING LEVEL IS 32T/Sqm.

PROOF CHECKED
Anjan Dutta
Professor
Department of Civil Engineering
Indian Institute of Technology Guwahati
Guwahati-781039

DESIGN DIRECTOR

Shambhavi Techno Solutions Pvt. Ltd.
Managing Director

SUVADRA CONSULTANTS Regd. No-11/12004-05 BHUBANESWAR

Rev.	Date	Description
R1	JAN-22	STRUCTURE PROPOSAL REVISED
R0	JUNE-21	FOR APPROVAL

Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED
3rd Floor, PTI Building,4-Parliament Street, New Delhi-110001

Authority Engineer : Global Infra Solutions
E-8/11A,F-2, Global Tower , Trilanga Main Road , Akashganga Colony, Shahpura, Bhopal (462039) Tel.-0755-4045216

E/PC Contractor : Valecha Engineering Ltd
Valecha Chambers, 4th Floor, Plot No B-6, New Link Road, Andheri West, Mumbai - 400053

Safety Consultant : SUVADRA CONSULTANTS (An ISO 9001 : 2008 Certified) (Soil Testing Laboratory & Engineering Consultancy) approved by Govt. of Orissa Regd. No. 11 of 2004-05
PP-97, Tankapani Road, BBSR-18, Odisha

Proof Consultant : SHAMBHAVI TECHNO SOLUTIONS PVT.LTD.
E-82, Rajesh Kumar Path, S.k.Puri, Boring Road, Patna-800001

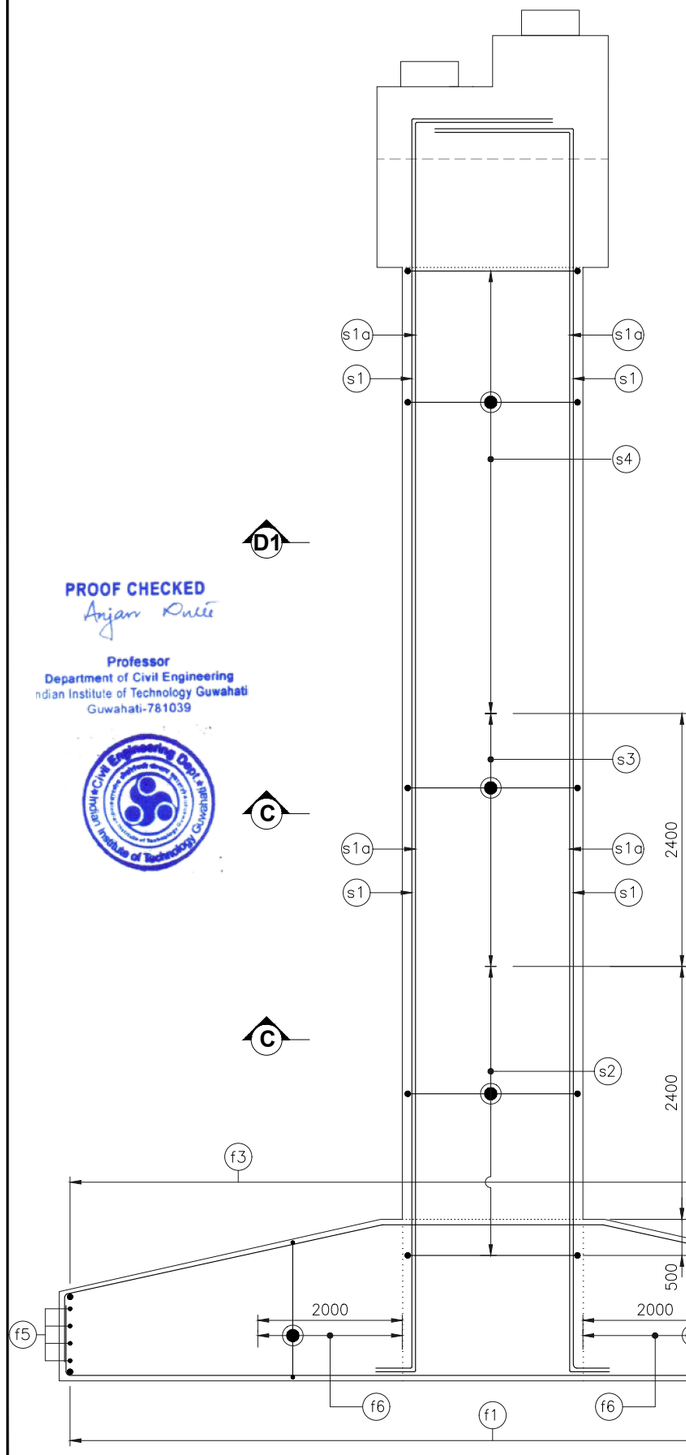
Design Consultant : SPS Technocrats Pvt. Ltd.
510 & 511, Fifth Floor, JMD Megapolis, Sector 48, Gurgaon, Haryana 122018

Project: DEMWE - BRAHMKUND (NH-13)
CONSTRUCTION OF TWO LANING WITH HARD SHOULDERS OF DEMWE – BRAHMKUND SECTION OF NH-13 FROM CH. 0.000 TO CH 18.464 IN THE STATE OF ARUNACHAL PRADESH ON EPC MODE UNDER NH(O)-NE

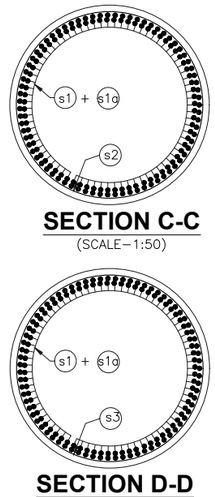
Drawn	MP
Designed	GPV
Checked	AV
Date:	JUNE -2021

Title: DIMENSION DETAILS OF PIER P4 FOR MAJOR BRIDGE AT CH-2+085
Scale: AS SHOWN 1 OF 1
Rev: R1
Drg. No: VLE/DE-BR/STR/ MJB/SUB/258

Y:\01_SPS PROJECT\56_DEMWE-BRAHMAKUND\01_ Drawings\01_Major Bridge\SUB STRUCTURE\PIER AS PER 14.1M DECK\PIER P4 - R0\VLE-DE-BR-STR-MJB-2+085-SUB-258.dwg 7-Jan-22

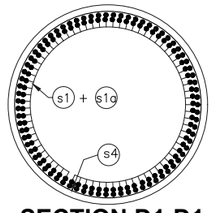


SECTION A-A
(SCALE–1:60)

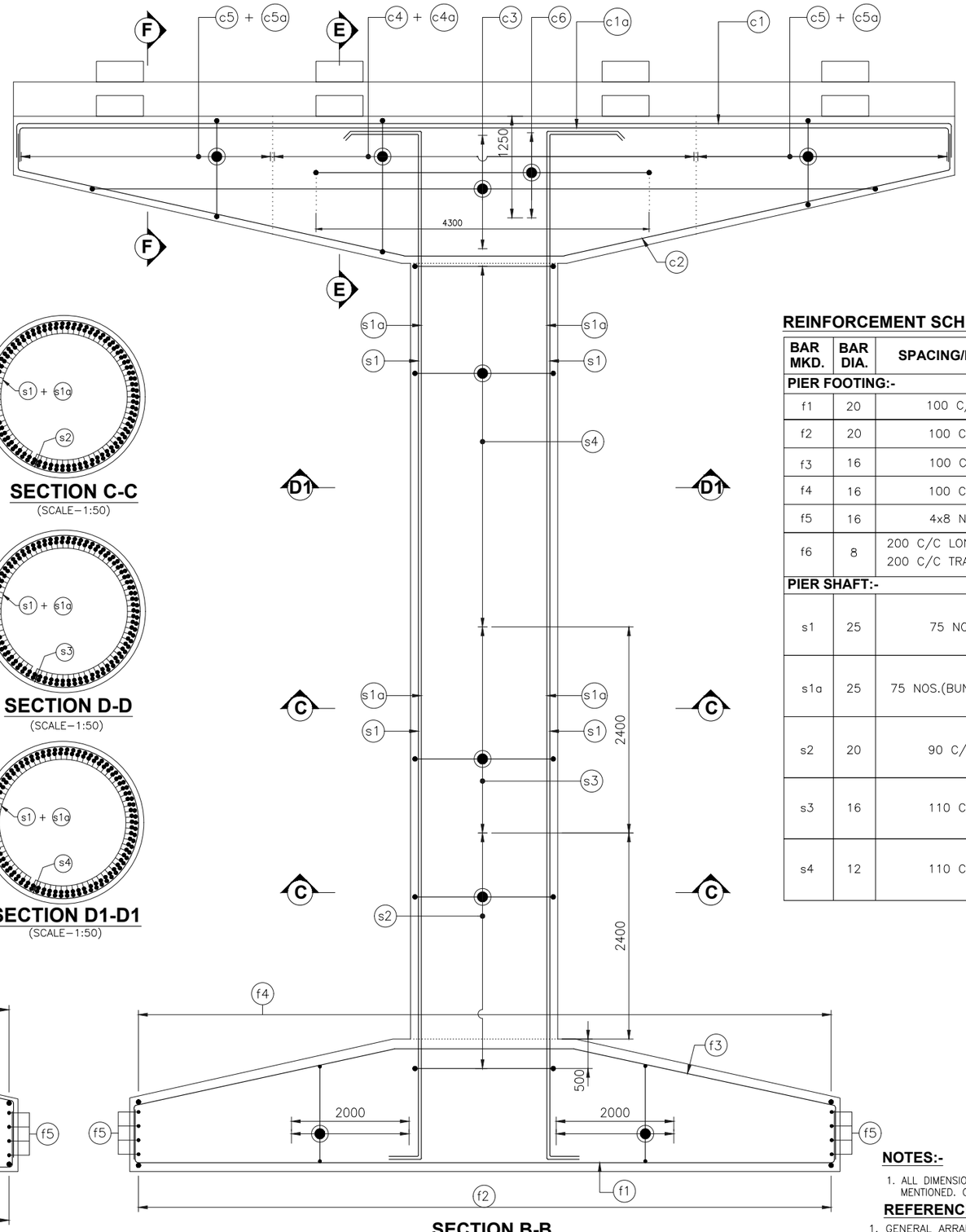


SECTION C-C
(SCALE–1:50)

SECTION D-D
(SCALE–1:50)



SECTION D1-D1
(SCALE–1:50)



SECTION B-B
(SCALE–1:60)

REINFORCEMENT SCHEDULE:-

BAR MKD.	BAR DIA.	SPACING/NOS.	SHAPE
PIER FOOTING:-			
f1	20	100 C/C	800 — 800
f2	20	100 C/C	800 — 800
f3	16	100 C/C	800 — 800
f4	16	100 C/C	800 — 800
f5	16	4x8 NOS.	300 — 300
f6	8	200 C/C LONGITUDINAL AND 200 C/C TRANSCEIVER	
PIER SHAFT:-			
s1	25	75 NOS.	1000 / 500
s1a	25	75 NOS.(BUNDLED WITH S1)	1000 / 500
s2	20	90 C/C	300 (MIN. LAP)
s3	16	110 C/C	300 (MIN. LAP)
s4	12	110 C/C	300 (MIN. LAP)

LEGEND:-

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

NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETERS, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS TO BE FOLLOWED.

REFERENCE DRAWINGS:-

1. GENERAL ARRANGEMENT DRAWING. VEL/DE–BR/STR/MJB/GAD/2+085/100 (SH–01 OF 02)
2. DIMENSION DETAILS OF PIER P4. VLE/DE–BR/STR/MJB/SUB/258
3. REINFORCEMENT DETAILS OF PIER P4. VLE/DE–BR/STR/MJB/SUB/260 VLE/DE–BR/STR/MJB/SUB/261

SUVADRA CONSULTANTS Regd. No-11/2004-05 BHUBANESWAR

Shambhavi Techno Solutions Pvt. Ltd. Managing Director

PROOF CHECKED
Professor
Department of Civil Engineering
Indian Institute of Technology Guwahati
Guwahati-781039

DESIGN DIRECTOR

Rev.	Date	Description
R1	JAN-22	STRUCTURE PROPOSAL REVISED
R0	JUNE-21	FOR APPROVAL

Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED
3rd Floor, PTI Building,4-Parliament Street, New Delhi-110001

Authority Engineer : Glabal Infra Solutions
E-8/11A,F-2, Global Tower , Trilanga Main Road , Akashganga Colony, Shahpura, Bhopal (462039) Tel.-0755-4045216

EPC Contractor : Valecha Engineering Ltd
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Safety Consultant : SUVADRA CONSULTANTS (An ISO 9001 : 2008 Certified) (Soil Testing Laboratory & Engineering Consultant) Approved By Govt. of Orissa Regd. No. 11 of 2004-05
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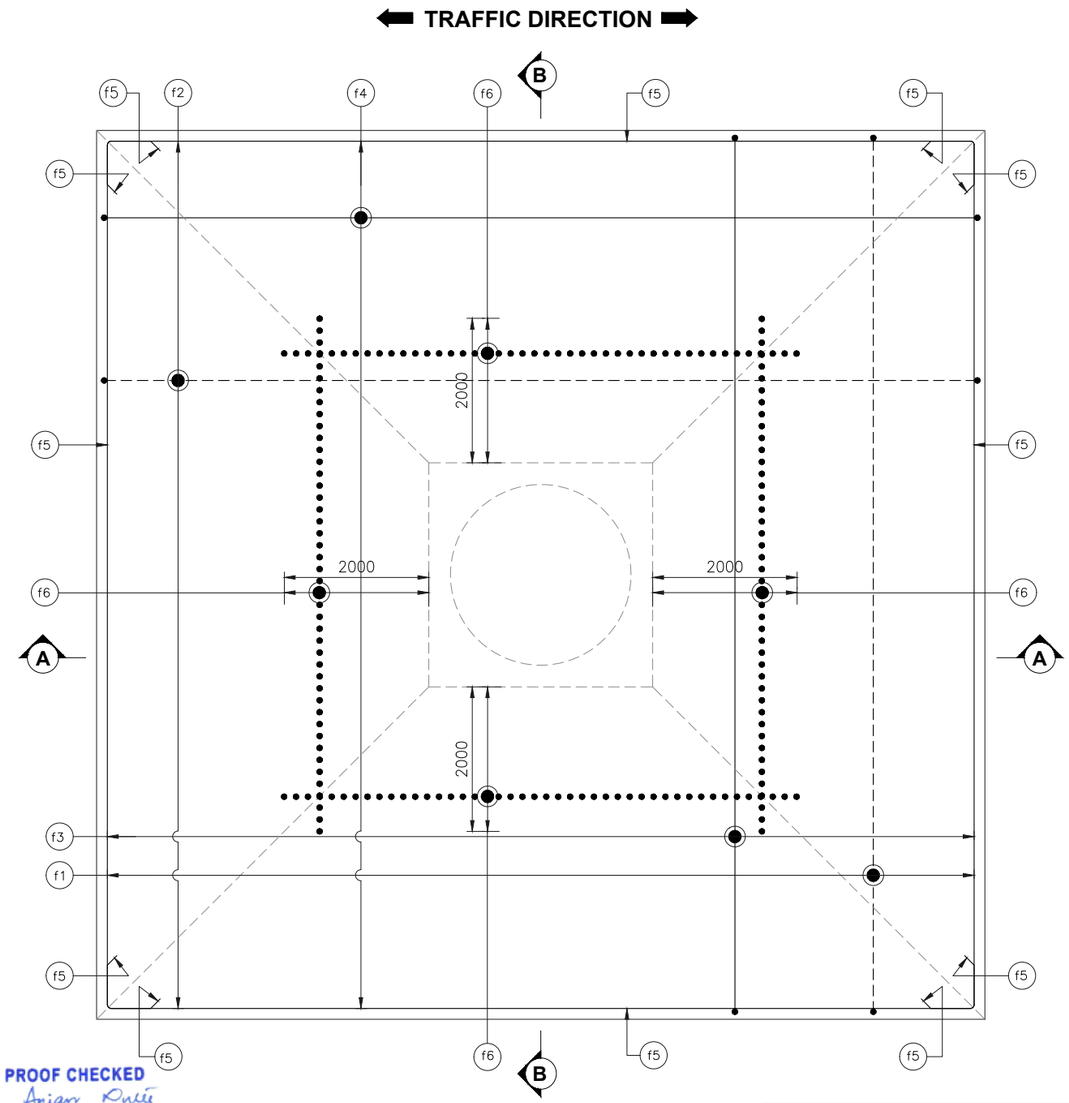
Proof Consultant : SHAMBHAVI TECHNO SOLUTIONS PVT.LTD.
E-82, Rajesh Kumar Path, S.k.Puri, Boring Road, Patna-800001

Design Consultant : SPS Technocrats Pvt. Ltd.
510 & 511, Fifth Floor, JMD Megapolis, Sector 48, Gurgaon, Haryana 122018

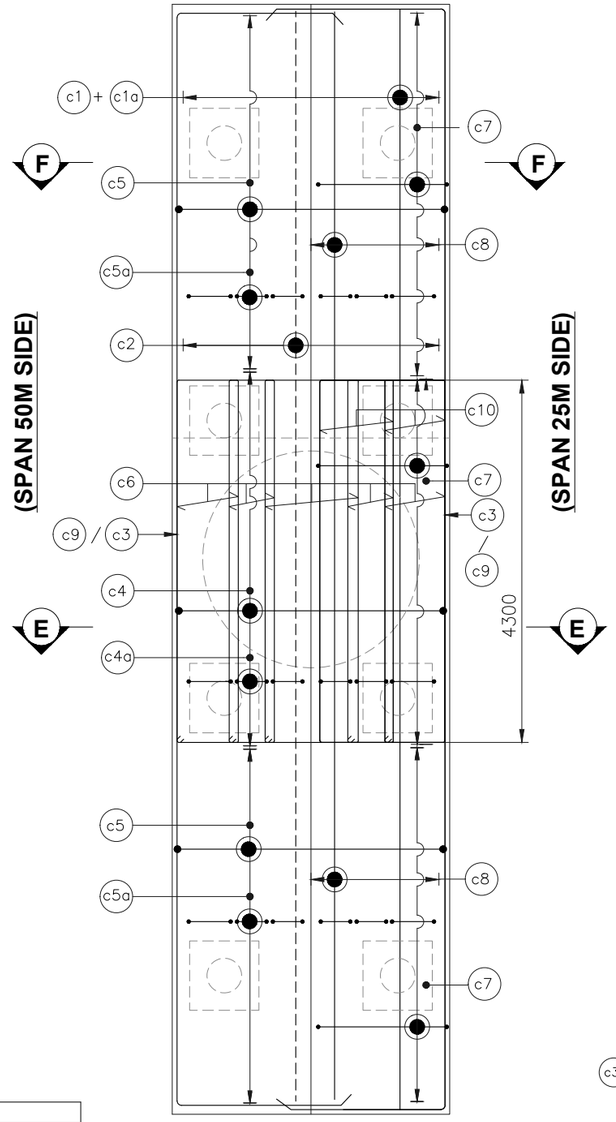
Project: DEMWE - BRAHMKUND (NH-12)
CONSTRUCTION OF TWO LANING WITH HARD SHOULDERS OF DEMWE - BRAHMKUND SECTION OF NH-13 FROM CH. 0.000 TO CH 18.464 IN THE STATE OF ARUNACHAL PRADESH ON EPC MODE UNDER NH(O)-NE

Drawn	MP
Designed	GPV
Checked	AV
Date:	JUNE -2021

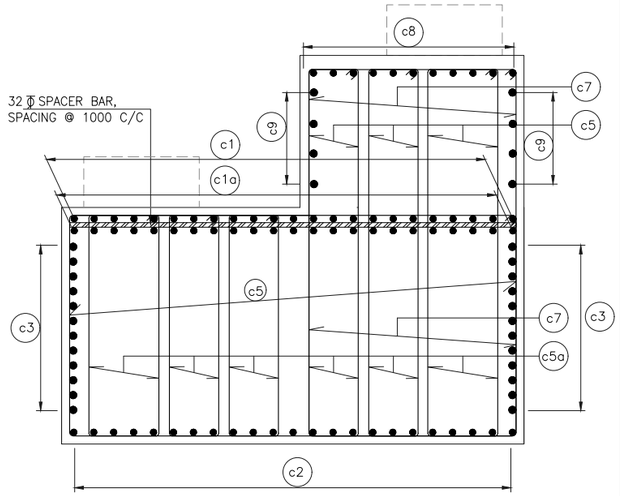
Title: **DIMENSION DETAILS OF PIER (P4) FOR AT CH 2+085.**
Scale: AS SHOWN — 1 OF 1 — *Rev:* R1
Drg. No: VLE/DE-BR/STR/MJB/SUB/259



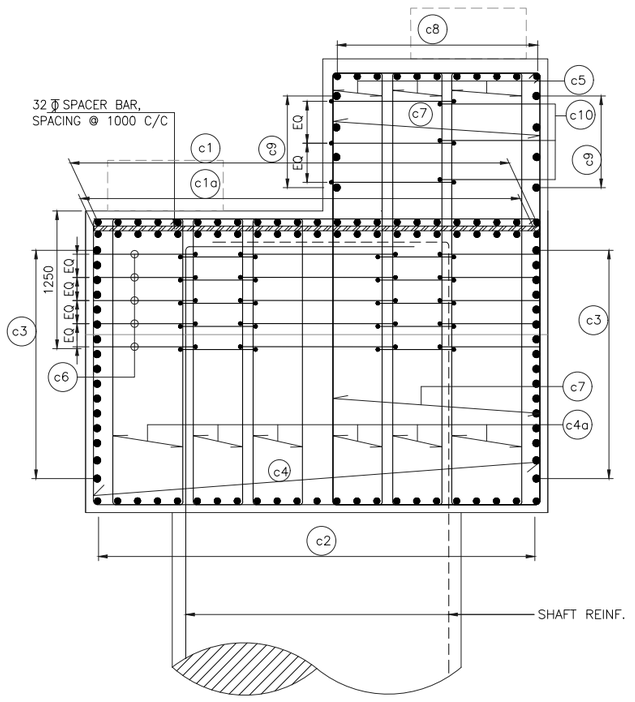
PLAN SHOWING REINFORCEMENT
DETAIL OF PIER FOOTING
(SCALE–1:50)



PLAN SHOWING REINFORCEMENT
DETAIL OF PIER CAP
(SCALE–1:50)



SECTION F-F
(SCALE–1:30)



SECTION E-E
(SCALE–1:30)

PIER CAP:-			
c1	32	23 NOS. (IN FIRST LAYER)	800 — 800
c1a	25	23 NOS. (IN SECOND LAYER)	800 — 800
c2	20	23 NOS.	800 — 800
c3	20	100 C/C	1750 — 1750 LENGTH VARIES
c4	16 Ø	2 LEGGED VERTICAL STIRRUP @ 110 C/C	LENGTH VARIES
c4a	12 Ø	12 LEGGED VERTICAL STIRRUPS @ 110 C/C	LENGTH VARIES
c5	16 Ø	2 LEGGED VERTICAL STIRRUP @ 100 C/C	VARIES
c5a	12 Ø	12 LEGGED VERTICAL STIRRUPS @ 110 C/C	LENGTH VARIES
c6	16 Ø	12 LEGGED HORIZONTAL STIRRUPS @ 5 LAYERS	LENGTH VARIES
c7	12 Ø	2 LEGGED VERTICAL STIRRUP @ 100 C/C	LENGTH VARIES
c8	16	12 NOS.	500 — 500
c9	12	4 NOS. (BOTH FACE)	500 — 500
c10	12 Ø	4 LEGGED HORIZONTAL STIRRUPS @ 3 LAYERS	LENGTH VARIES

NOTES:-
1. ALL DIMENSIONS ARE IN MILLIMETERS, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS TO BE FOLLOWED.

REFERENCE DRAWINGS:-
1. GENERAL ARRANGEMENT DRAWING. VEL/DE–BR/STR/MJB/GAD/2+085/100 (SH–01 OF 02)
2. DIMENSION DETAILS OF PIER P4. VLE/DE–BR/STR/MJB/SUB/258
3. REINFORCEMENT DETAILS OF PIER P4. VLE/DE–BR/STR/MJB/SUB/259 VLE/DE–BR/STR/MJB/SUB/261

LEGEND:-

REINFORCEMENT AT TOP FACE	———
REINFORCEMENT AT BOTTOM FACE	– – – – – – – – – –

PROOF CHECKED
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Professor
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Guwahati-781039

Shambhavi Techno Solutions Pvt. Ltd
Managing Director

SUVADRA CONSULTANTS Regd. No-111/2004-05 BHUBANESWAR

DESIGN DIRECTOR

Rev.	Date	Description
R1	JAN-22	STRUCTURE PROPOSAL REVISED
R0	JUNE-21	FOR APPROVAL

Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED
3rd Floor, PTI Building,4-Parliament Street, New Delhi-110001

Authority Engineer : Global Infra Solutions
E-8/11A,F-2, Global Tower , Trilanga Main Road , Akashganga Colony, Shahpura, Bhopal (462039)
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EPC Contractor : Valecha Engineering Ltd
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Safety Consultant : SUVADRA CONSULTANTS
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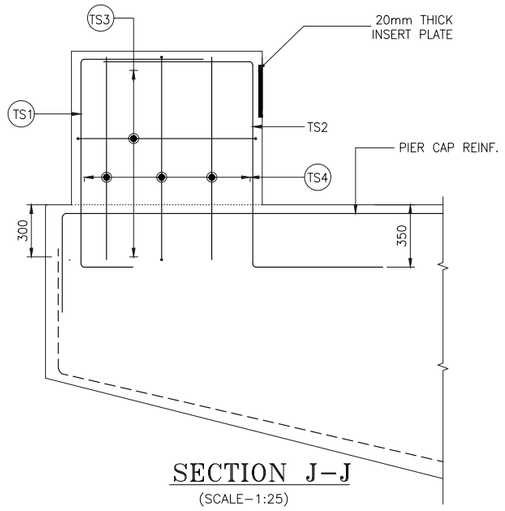
Proof Consultant : SHAMBHAVI TECHNO SOLUTIONS PVT.LTD.
E-82, Rajesh Kumar Path, S.k.Puri, Boring Road, Patna-800001

Design Consultant : SPS Technocrats Pvt. Ltd.
510 & 511, Fifth Floor, JMD Megapolis, Sector 48, Gurgaon, Haryana 122018

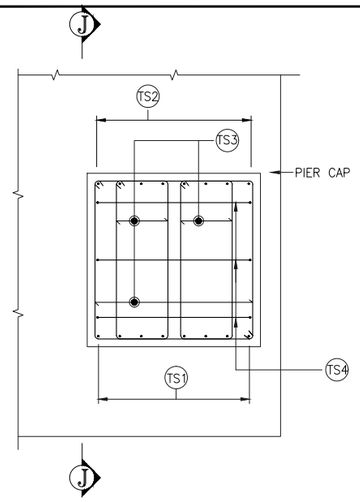
Project: DEMWE - BRAHMKUND (NH-13)
CONSTRUCTION OF TWO LANING WITH HARD SHOULDERS OF DEMWE – BRAHMKUND SECTION OF NH-13 FROM CH. 0.000 TO CH 18.454 IN THE STATE OF ARUNACHAL PRADESH ON EPC MODE UNDER NH(O)-NE

Drawn	MP
Designed	GPV
Checked	AV
Date:	JUNE -2021

Title: DIMENSION DETAILS OF PIER (P4) AT CH 2+085.
Scale: AS SHOWN — 1 OF 1
Rev: R1
Drg. No: VLE/DE-BR/STR/ MJB/SUB/260



SECTION J–J
(SCALE–1:25)

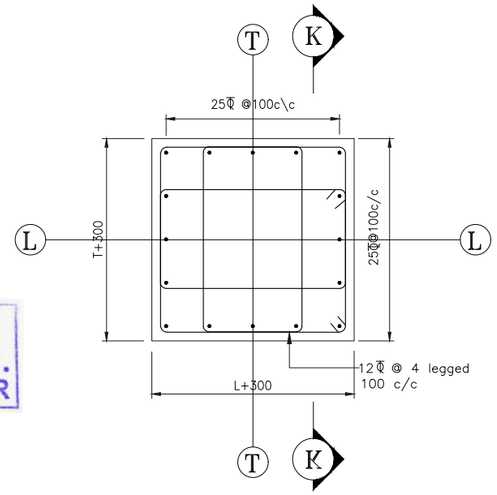


TRAFFIC DIRECTION

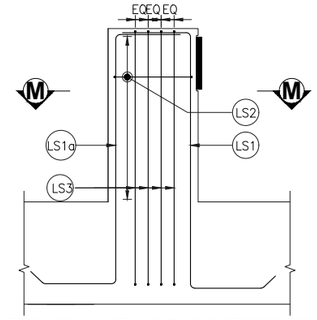
PLAN SHOWING REINF. DETAILS OF TRANSVERSE SEISMIC STOPPER ON PIER CAP (50M SPAN SIDE)
(SCALE–1:25)

Shambhavi Techno Solutions Pvt. Ltd.
Managing Director

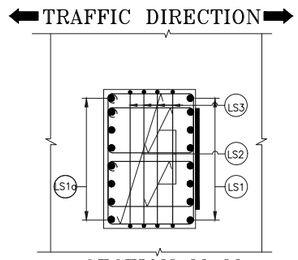
DESIGN DIRECTOR



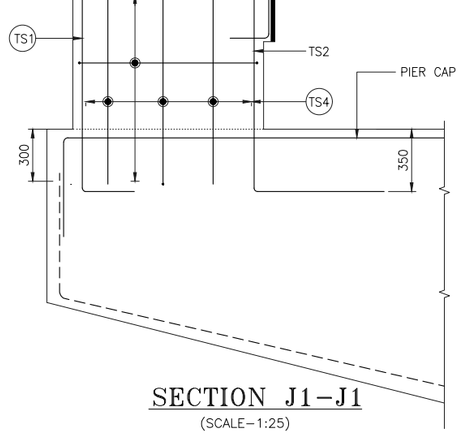
PLAN SHOWING TYPICAL REINF. DETAILS OF BEARING PEDESTAL
(SCALE 1:15)



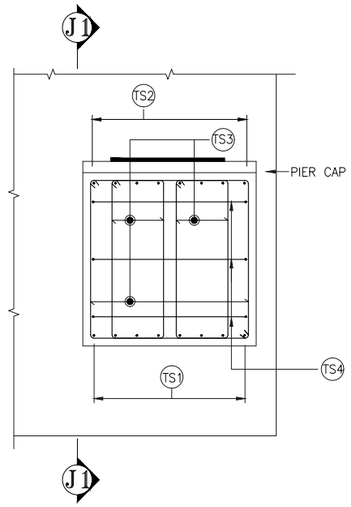
DETAIL AT LONGITUDINAL SEISMIC STOPPER
(SCALE–1:25)



SECTION M–M
(SCALE–1:20)



SECTION J1–J1
(SCALE–1:25)



TRAFFIC DIRECTION

PLAN SHOWING REINF. DETAILS OF TRANSVERSE SEISMIC STOPPER ON PIER CAP (25M SPAN SIDE)
(SCALE–1:25)

PROOF CHECKED
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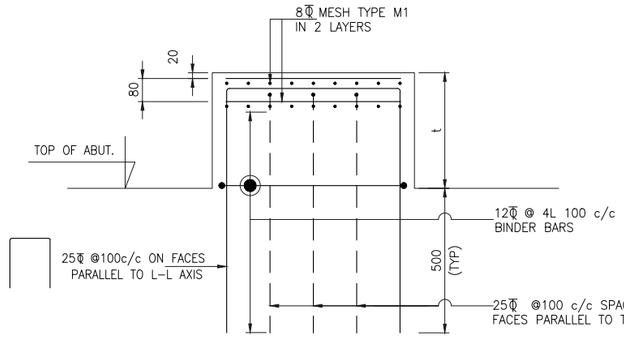
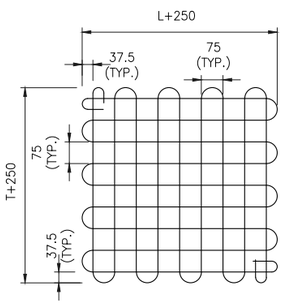


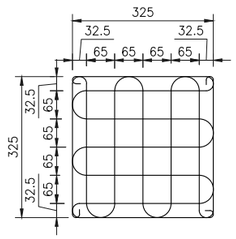
SECTION K–K
(L+300)X(T+300) PEDESTAL
(SCALE 1:15)

t = HEIGHT OF PEDESTAL

SIZE OF BEARING PEDESTAL SHALL BE (L+300) x (T+300) WHERE ``L" AND ``T" ARE LENGTH OF BEARING IN LONGITUDINAL AND TRANSVERSE DIRECTION RESPECTIVELY



8 ϕ MESH m1
(AT EACH PEDESTAL LOCATION)
(SCALE 1:15)



DETAIL OF 8 ϕ MESH TYPE ``m2"
(IN TWO LAYERS AT JACK LOCATION)
(SCALE 1:10)

REINFORCEMENT DETAILS:–
(STEEL/RCC GIRDER SIDE)

BAR MKD.	BAR DIA.	NO./SPACING	SHAPE
TRANSVERSE SEISMIC STOPPER:–			
TS1	16	8 NOS.	200
TS2	25	8 NOS.	1500
TS3		6 LEGGED 12ø STIRRUPS TIED TO VERTICALLY BARS @ 150 C/C VERTICALLY	
TS4		2 LEGGED 3 NOS. 12 DIA STIRRUPS	

REINFORCEMENT DETAILS:–
(RCC GIRDER SIDE)

BAR MKD.	BAR DIA.	NO./SPACING	SHAPE
LONGITUDINAL SEISMIC STOPPER:–			
LS1	32	8 NOS.	1000
LS1a	16	8 NOS.	800
LS2		6 LEGGED 12 ø STIRRUPS @ 120 c/c.	
LS3		2 LEGGED 4 NOS. 12 DIA	300 300

NOTES:-

1. ALL DIMENSION ARE IN MILLIMETERS, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSION TO BE FOLLOWED.
2. MESH TYPE M1' SHALL BE PROVIDED IN PIER CAP AT BEARING LOCATIONS AND MESH TYPE 'M2' SHALL BE PROVIDED AT JACK LOCATION IN TWO LAYER AT 20mm AND AT 100mm FROM TOP OF CONCRETE.
3. REINFORCING STEEL SHALL ONLY BE TMT BARS (GRADE DESIGNATION Fe:500) CONFORMING TO IS:1786 WITH MINIMUM TOTAL ELONGATIONS OF 12%.
4. LAP/SPLICES SHALL BE PROVIDED AS PER CLAUSE NO. 15.2.5. LAP LENGTH SHALL NOT BE LESS THAN 72ø.
   ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:–

FAVOURABLE BOND CONDITION					
GRADE OF CONCRETE	PERCENTAGE OF LAPPED BARS	<25%	33%	50%	>50%
M30	X	40	46	56	60
M35		36	41	50	54
M40		34	39	48	51
M45		32	37	45	48
M50		29	33	41	44
UNFAVOURABLE BOND CONDITION					
GRADE OF CONCRETE	PERCENTAGE OF LAPPED BARS	<25%	33%	50%	>50%
M30	X	58	67	81	87
M35		53	61	74	80
M40		50	58	70	75
M45		47	54	66	71
M50		42	48	59	63

5. BARS SHOWN IN THE DRAWING ARE NOT TO BE COUNTED, ONLY WRITTEN DATA SHALL BE FOLLOWED.
6. PEDESTAL HEIGHT TO BE AS PER SITE REQUIREMENT.

REFERENCE DRAWINGS:-

1. GENERAL ARRANGEMENT DRAWING. VEL/DE–BR/STR/MJB/GAD/2+085/100 (SH–01 OF 02)
2. DIMENSION DETAILS OF PIER P4. VLE/DE–BR/STR/MJB/SUB/258
3. REINFORCEMENT DETAILS OF PIER P4. VLE/DE–BR/STR/MJB/SUB/259 VLE/DE–BR/STR/MJB/SUB/260

Rev.	Date	Description
R1	JAN-22	STRUCTURE PROPOSAL REVISED
R0	JUNE-21	FOR APPROVAL

Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED, 3rd Floor, PTI Building,4-Parliament Street, New Delhi-110001

Authority Engineer : Global Infra Solutions, E-8/11A,F-2, Global Tower , Trilanga Main Road , Akashganga Colony, Shahpura, Bhopal (462039) Tel.-0755-4045216

EPC Contractor : Valecha Engineering Ltd, Valecha Chambers, 4th Floor, Plot No B-6, New Link Road, Andheri West, Mumbai - 400053

Safety Consultant : SUVADRA CONSULTANTS (An ISO 9001 : 2008 Certified) Soil Testing Laboratory & Engineering Consultancy approved By Govt. of Orissa Regd. No. 11 of 2004-05, PP-97, Tankapani Road, BBSR-18, Odisha

Proof Consultant : SHAMBHAVI TECHNO SOLUTIONS PVT.LTD., E-82, Rajesh Kumar Path, S.k.Puri, Boring Road, Patna-800001

Design Consultant : SPS Technocrats Pvt. Ltd., # 510 & 511, Fifth Floor, JMD Megapolis, Sector 48, Gurgaon, Haryana 122018

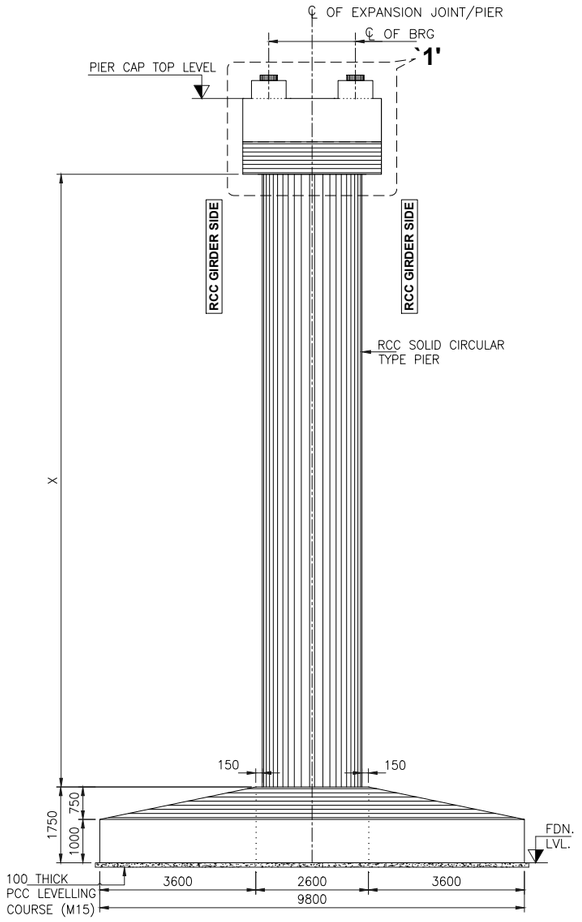
Project: DEMWE - BRAHMKUND (NH-13)
CONSTRUCTION OF TWO LANING WITH HARD SHOULDERS OF DEMWE – BRAHMKUND SECTION OF NH-13 FROM CH. 0.000 TO CH 18.464 IN THE STATE OF ARUNACHAL PRADESH ON EPC MODE UNDER NH(O)-NE

Drawn	MP
Designed	GPV
Checked	AV
Date:	JUNE -2021

Title: REINFORCEMENT STOPPER DETAILS OF PIER P4 MAJOR BRIDGE AT CH-2+085.
Scale: AS SHOWN — 1 OF 1
Rev: R1
Drg. No: VLE/DE-BR/STR/ MJB/SUB/261

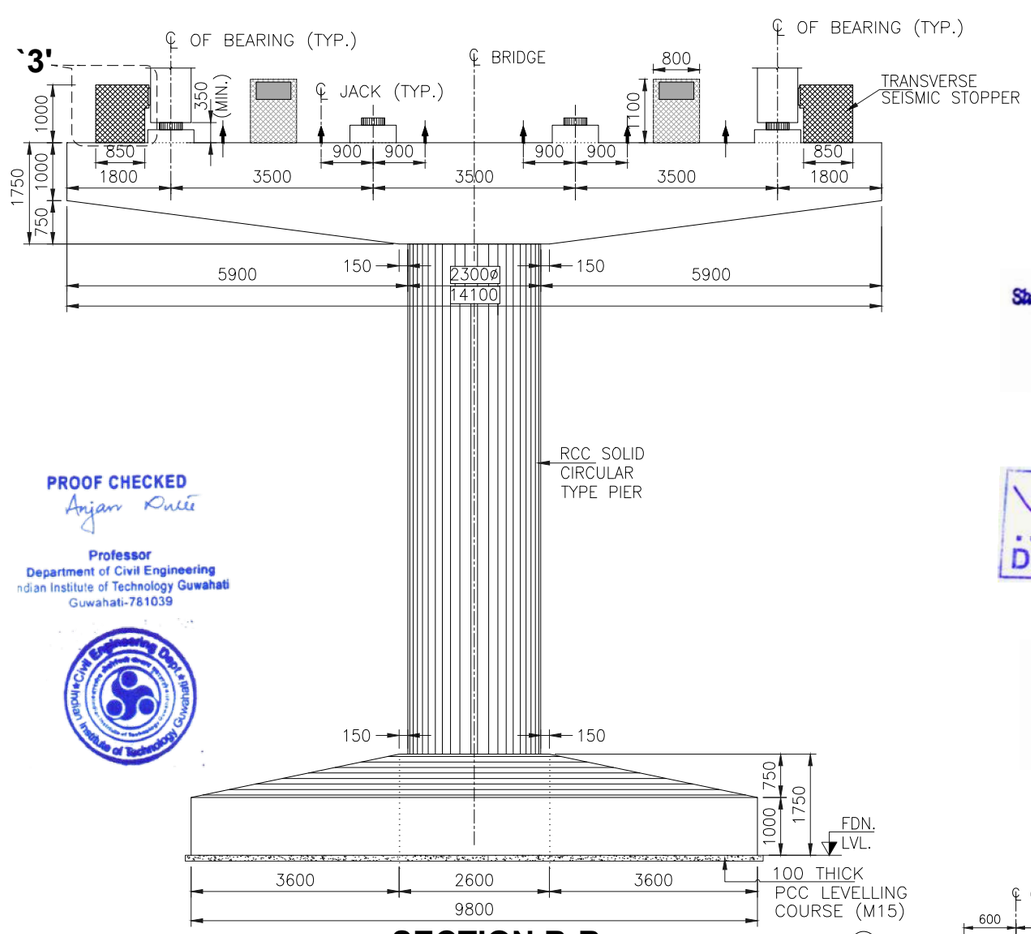
SUBSTRUCTURE

PIER- P5 TO P7



SECTION A-A

(SCALE–1:100)



SECTION B-B

(AT STEEL GIRDER SIDE)
(SCALE–1:100)

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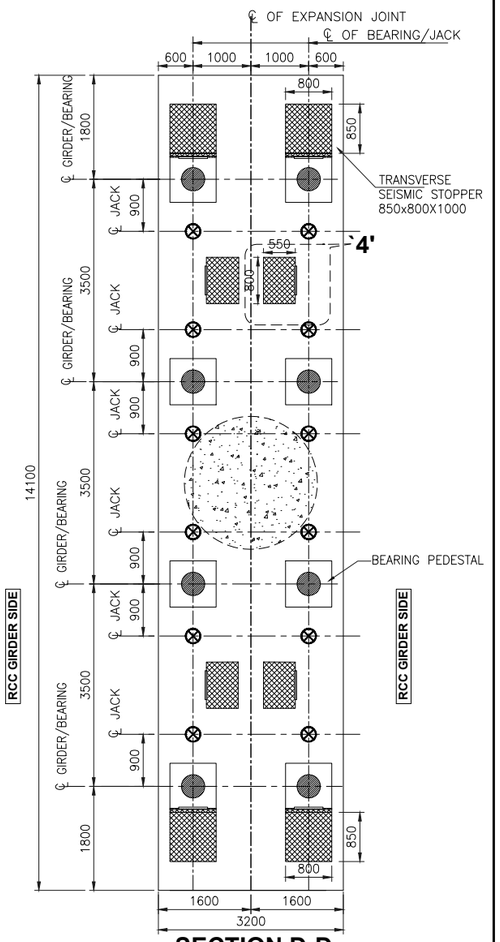
Guwahati-781039

Shambhavi Techno Solutions Pvt. Ltd
Managing Director

DESIGN DIRECTOR

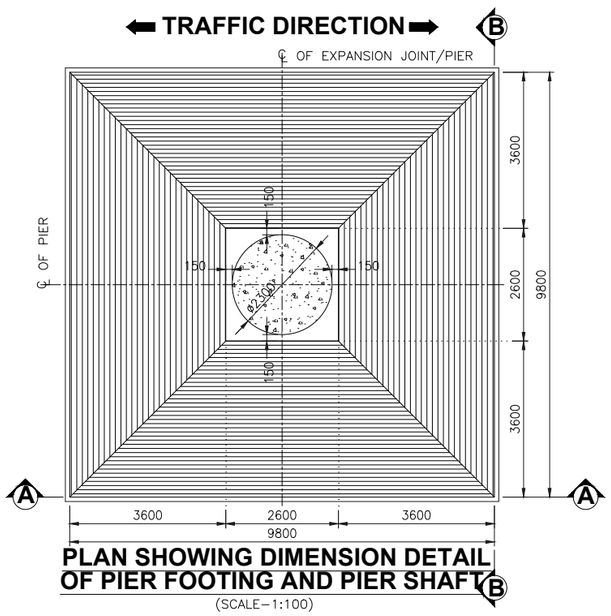
SUVADRA CONSULTANTS Regd. No-11/2004-05 BHUBANESWAR



SECTION D-D

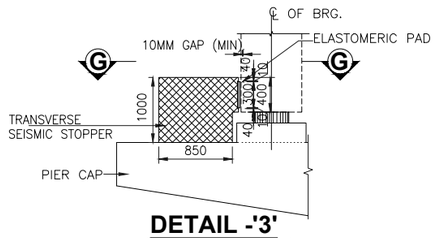
(SCALE–1:75)

⬅ TRAFFIC DIRECTION ➡



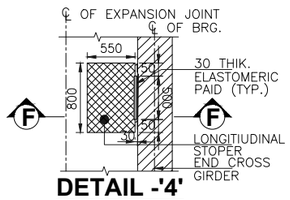
PLAN SHOWING DIMENSION DETAIL OF PIER FOOTING AND PIER SHAFT

(SCALE–1:100)



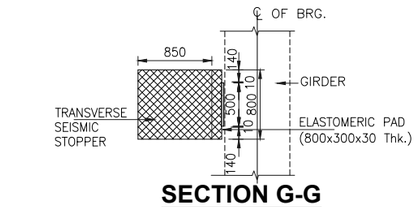
DETAIL -'3'

(AT RCC GIRDER SIDE)
(SCALE–1:50)



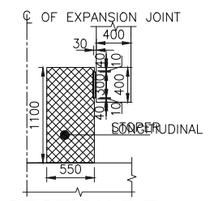
DETAIL -'4'

(AT RCC GIRDER SIDE)
(SCALE–1:50)



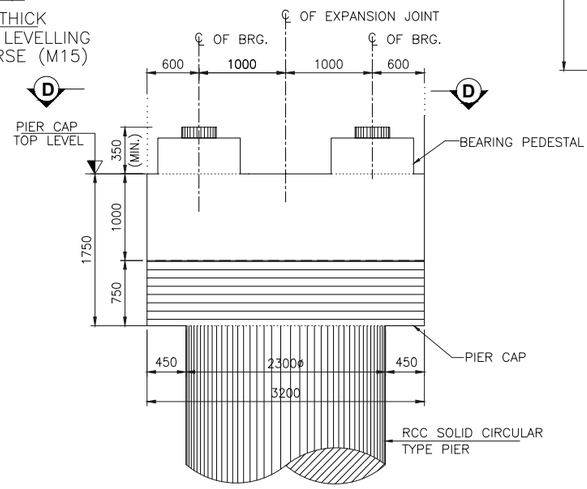
SECTION G-G

(AT RCC GIRDER SIDE)
(SCALE–1:50)



SECTION F-F

(AT RCC GIRDER SIDE)
(SCALE–1:50)



DETAIL - `1'

(SCALE–1:50)

PIER	CAP TOP LVL.	FOUNDING LVL.	HEIGHT OF SHAFT "X"
P5	360.429	351.436	5.493m
P6	360.429	351.436	5.493m
P7	360.429	351.436	5.493m

REFERENCE DRAWINGS:-

1. GENERAL ARRANGEMENT DRAWING.
   VEL/DE–BR/STR/MJB/GAD/2+085/100
2. REINFORCEMENT DETAILS OF PIER P5 TO P7.
   VLE/DE–BR/STR/MJB/SUB/263
   VLE/DE–BR/STR/MJB/SUB/265
   VLE/DE–BR/STR/MJB/SUB/265

NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS IN METERS, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS TO BE FOLLOWED.
2. 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) PCC LEVELING COURSE M15
   b) FOUNDATION M35
   c) SUBSTRUCTURE M35
   d) BEARING PEDESTAL M45
   e) SEISMIC STOPPER M40
3. REINFORCING STEEL SHALL ONLY BE TMT BARS (GRADE DESIGNATION Fe:500D) CONFORMING TO IS:1786 WITH MINIMUM TOTAL ELONGATIONS OF 12%.
4. MINIMUM COVER TO ANY REINFORCEMENT SHALL BE AS FOLLOW:
   a) FOUNDATION 75mm
   b) PIER CAP & SEISMIC STOPPER 50mm
   c) SUB STRUCTURE:– 50mm
5. ⊗ SHOWN JACK LOCATION IN PLAN AND ⧫ SHOWN JACK LOCATION IN ELEVATION, OTHERWISE MENTIONED.
6. SAFE BEARING CAPACITY CONSIDERED IN DESIGN AT PROPOSED FOUNDING LEVEL IS 24T/Sqm.

Rev.	Date	Description
R1	JAN-22	STRUCTURE PROPOSAL REVISED
R0	JUNE-21	FOR APPROVAL

Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED
3rd Floor, PTI Building,4-Parliament Street, New Delhi-110001

Authority Engineer : Global Infra Solutions
E-8/11A,F-2, Global Tower , Trilanga Main Road , Akashganga Colony, Shahpura, Bhopal (462039)
Tel.-0755-4045216

EPC Contractor : Valecha Engineering Ltd
Valecha Chambers, 4th Floor, Plot No B-6, New Link Road, Andheri West, Mumbai - 400053

Safety Consultant : SUVADRA CONSULTANTS (An ISO 9001 : 2008 Certified) (Soil Testing Laboratory & Engineering Consultancy) approved by Govt. of Orissa Regd. No. 11 of 2004-05
PP-97, Tankapani Road, BBSR-18, Odisha

Proof Consultant : SHAMBHAVI TECHNO SOLUTIONS PVT.LTD.
E-82, Rajesh Kumar Path, S.k.Puri, Boring Road, Patna-800001

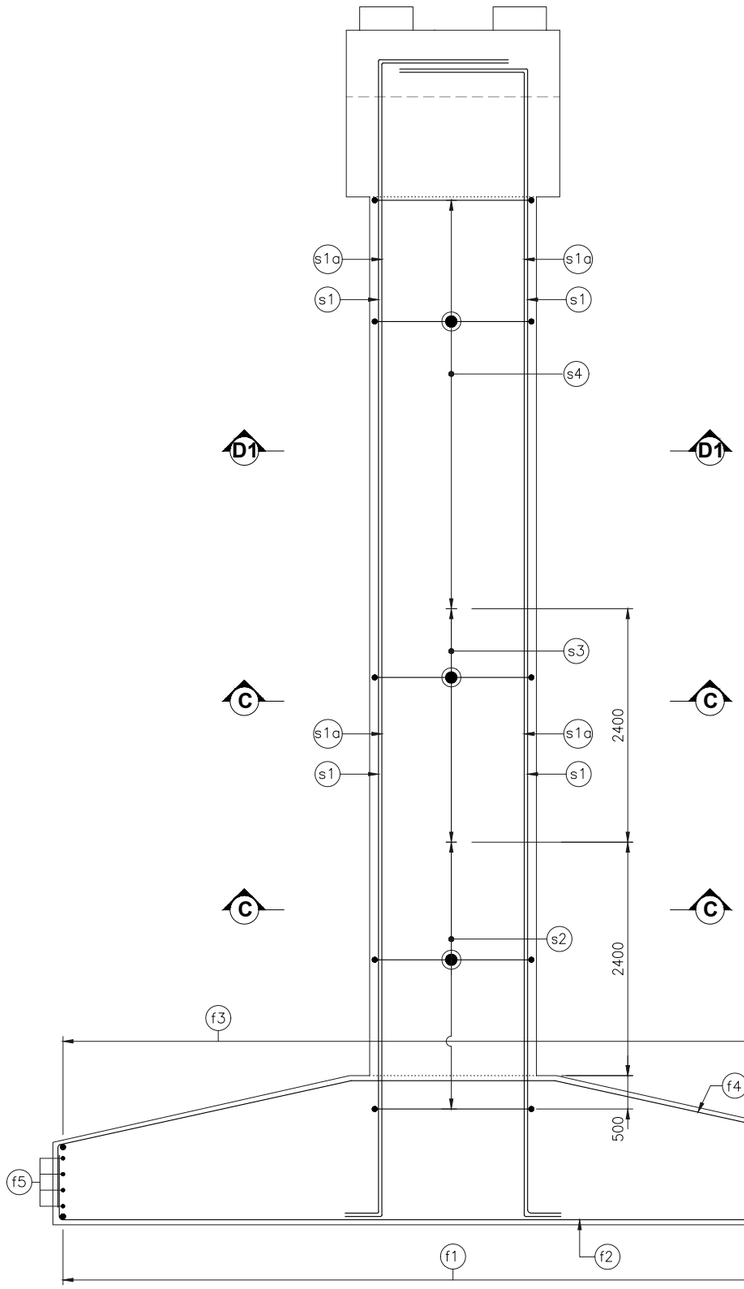
Design Consultant : SPS Technocrats Pvt. Ltd.
510 & 511, Fifth Floor, JMD Megapolis, Sector 48, Gurgaon, Haryana 122018

Project: DEMWE - BRAHMKUND (NH-13)
CONSTRUCTION OF TWO LANING WITH HARD SHOULDERS OF DEMWE – BRAHMKUND SECTION OF NH-13 FROM CH. 0.000 TO CH 18.464 IN THE STATE OF ARUNACHAL PRADESH ON EPC MODE UNDER NH(O)-NE

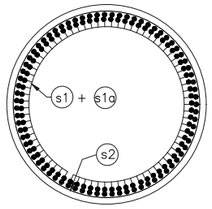
Drawn	MP
Designed	GPV
Checked	AV
Date:	JUNE -2021

Title: DIMENSION DETAILS OF PIER P5 TO P7 FOR MAJOR BRIDGE AT CH-2+085
Scale: AS SHOWN — 1 OF 1 — Rev: R1
Drg. No: VLE/DE-BR/STR/MNB/SUB/262

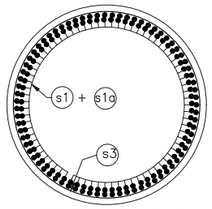
Y:\01_SPS PROJECT\56_DEMWE-BRAHMAKUND\01_ Drawings\01_Major Bridge\SUB STRUCTURE\PIER AS PER 14.1M DECK\PIER P5 TP P7 - R0\VLE-DE-BR-STR-MJB-2+085-SUB-266.dwg 7-Jan-22



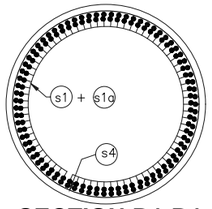
SECTION A-A
(SCALE–1:60)



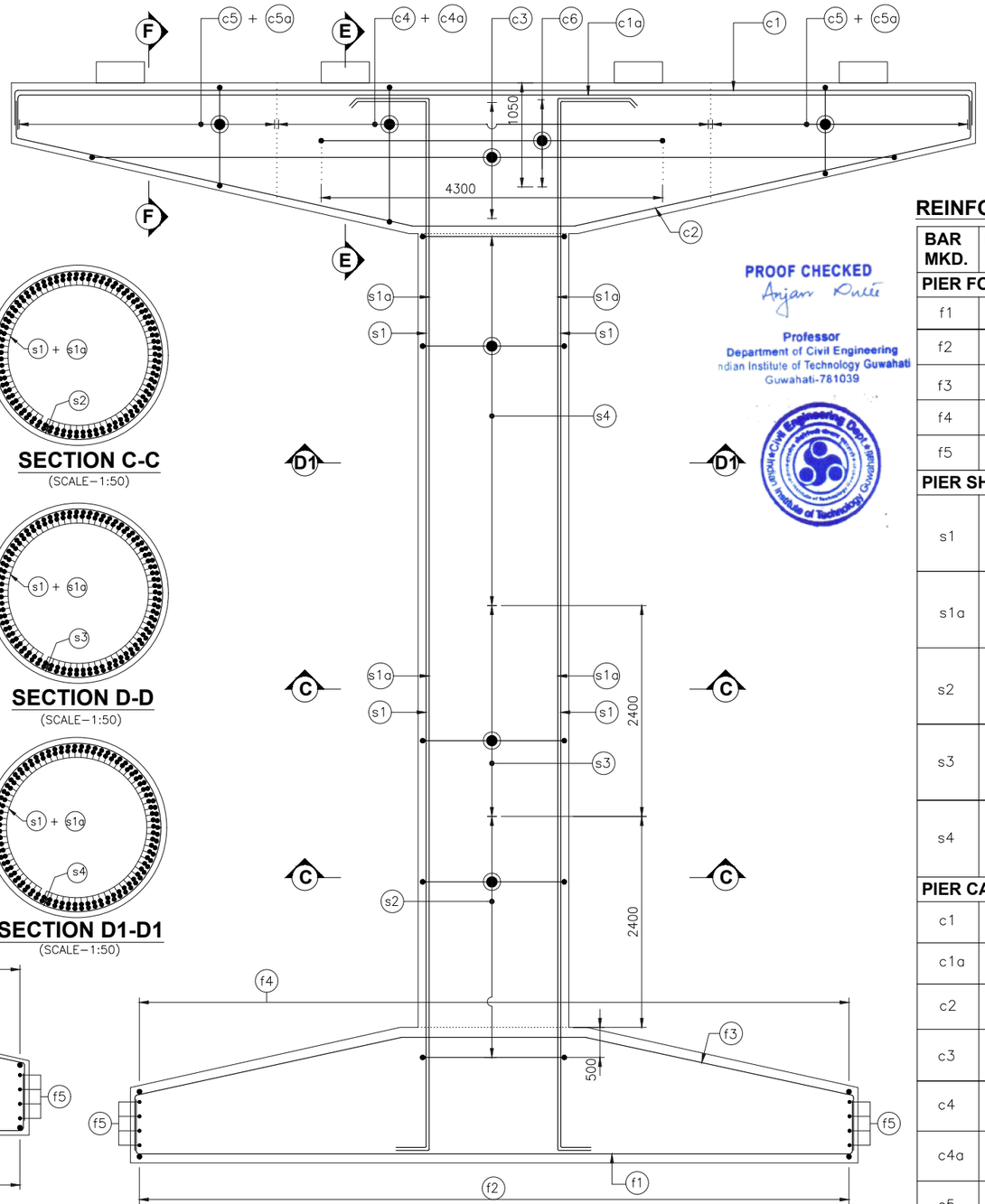
SECTION C-C
(SCALE–1:50)



SECTION D-D
(SCALE–1:50)



SECTION D1-D1
(SCALE–1:50)



SECTION B-B
(SCALE–1:60)

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Guwahati-781039

Shambhavi Techno Solutions Pvt. Ltd.
Managing Director

Vijay Singh
DESIGN DIRECTOR

SUVADRA CONSULTANTS Regd. No-11/2004-05 BHUBANESWAR

LEGEND:-

REINFORCEMENT AT TOP FACE	———
REINFORCEMENT AT BOTTOM FACE	– – – – – – – – – – –

REFERENCE DRAWINGS:-

1. GENERAL ARRANGEMENT DRAWING.
   VEL/DE–BR/STR/MJB/GAD/2+085/100 (SH–01 OF 02)
2. DIMENSION DETAILS OF PIER P5 TO P7.
   VLE/DE–BR/STR/MJB/SUB/262
2. REINFORCEMENT DETAILS OF PIER P5 TO P7.
   VLE/DE–BR/STR/MJB/SUB/264
   VLE/DE–BR/STR/MJB/SUB/265

NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETERS, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS TO BE FOLLOWED.

REINFORCEMENT SCHEDULE:-

BAR MKD.	BAR DIA.	SPACING/NOS.	SHAPE
PIER FOOTING:-			
f1	20	110 C/C	800 ⌊ 800
f2	20	110 C/C	800 ⌊ 800
f3	16	110 C/C	800 ⌒ 800
f4	16	110 C/C	800 ⌒ 800
f5	16	4x8 NOS.	300 ⌊ 300
PIER SHAFT:-			
s1	25	60 NOS.	1000 / 500
s1a	25	60 NOS.(BUNDLED WITH S1)	1000 / 500
s2	20	90 C/C	○ 300 (MIN. LAP)
s3	16	110 C/C	○ 300 (MIN. LAP)
s4	12	110 C/C	○ 300 (MIN. LAP)
PIER CAP:-			
c1	32	27 NOS. (IN FIRST LAYER)	800 ⌊ 800
c1a	25	27 NOS. (IN SECOND LAYER)	800 ⌊ 800
c2	20	27 NOS.	500 ⌒ 500
c3	20	100 C/C	1750 ⌊ 1750 LENGTH VARIES
c4	16 Ø 2 LEGGED STIRRUP @ 100 C/C		▭
c4a	12 Ø 12 LEGGED STIRRUPS @ 100 C/C		▯▯▯▯▯▯
c5	16 Ø 2 LEGGED STIRRUP @ 100 C/C		▭
c5a	12 Ø 12 LEGGED STIRRUPS @ 100 C/C		▯▯▯▯▯▯
c6	16 Ø 10 LEGGED STIRRUPS @ 5 LAYERS		▯▯▯▯▯

Rev.	Date	Description
R1	JAN-22	STRUCTURE PROPOSAL REVISED
R0	JUNE-21	FOR APPROVAL

Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED
3rd Floor, PTI Building,4-Parliament Street, New Delhi-110001

Authority Engineer : Global Infra Solutions
E-8/11A,F-2, Global Tower , Trilanga Main Road , Akashganga Colony, Shahpura, Bhopal (462039)
Tel.-0755-4045216

EPC Contractor : Valecha Engineering Ltd
Valecha Chambers, 4th Floor, Plot No B-6, New Link Road, Andheri West, Mumbai - 400053

Safety Consultant : SUVADRA CONSULTANTS (An ISO 9001 : 2008 Certified) (Soil Testing Laboratory & Engineering Consultant) Approved By Govt. of Orissa Regd. No. 11 of 2004-05
PP-97, Tankapani Road, BBSR-18, Odisha

Proof Consultant : SHAMBHAVI TECHNO SOLUTIONS PVT.LTD.
E-82, Rajesh Kumar Path, S.k.Puri, Boring Road, Patna-800001

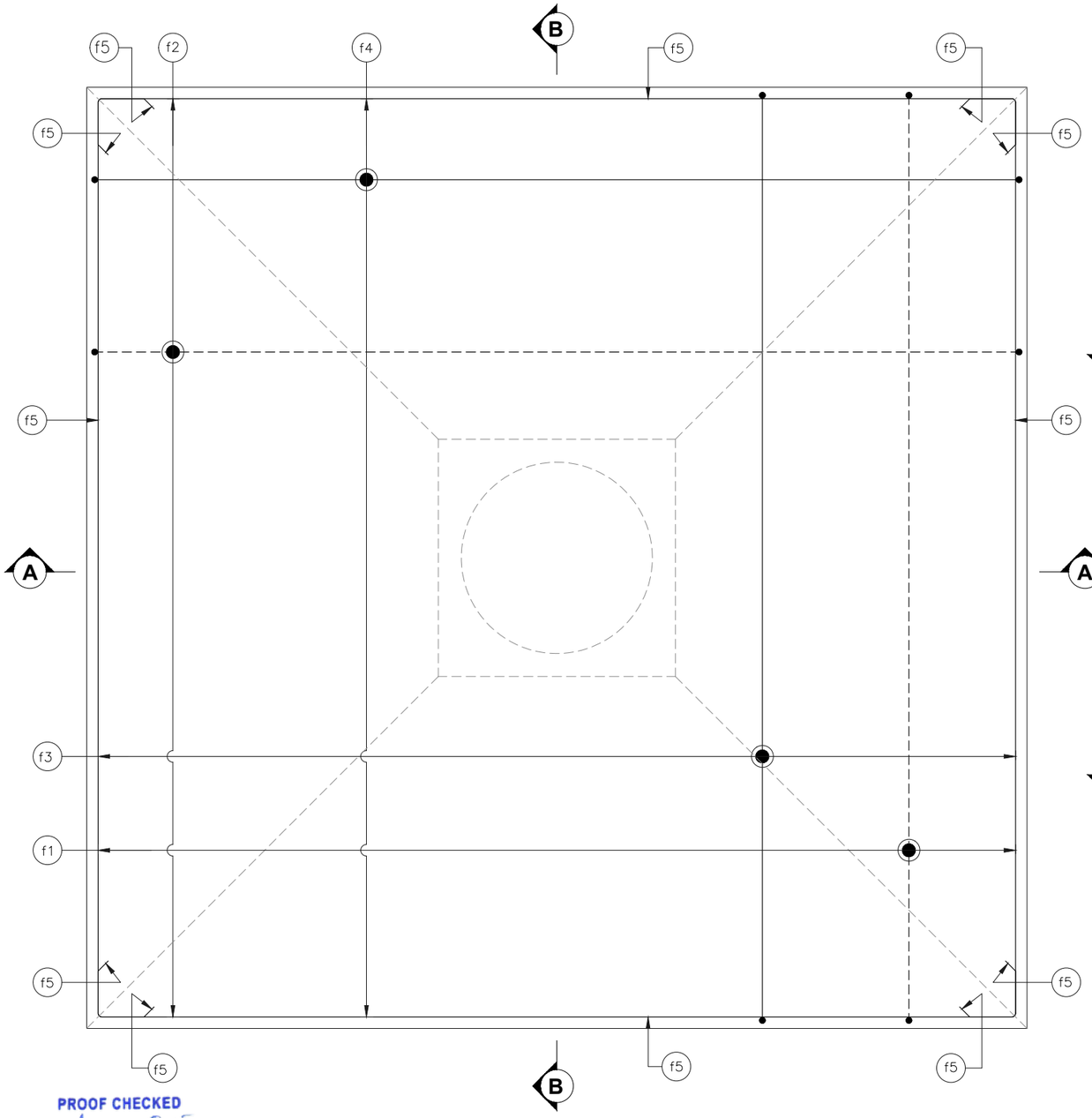
Design Consultant : SPS Technocrats Pvt. Ltd.
510 & 511, Fifth Floor, JMD Megapolis, Sector 48, Gurgaon, Haryana 122018

Project: DEMWE - BRAHMKUND (NH-13)
CONSTRUCTION OF TWO LANING WITH HARD SHOULDERS OF DEMWE - BRAHMKUND SECTION OF NH-13 FROM CH. 0.000 TO CH 18.464 IN THE STATE OF ARUNACHAL PRADESH ON EPC MODE UNDER NH(O)-NE

Drawn	MP
Designed	GPV
Checked	AV
Date:	JUNE -2021

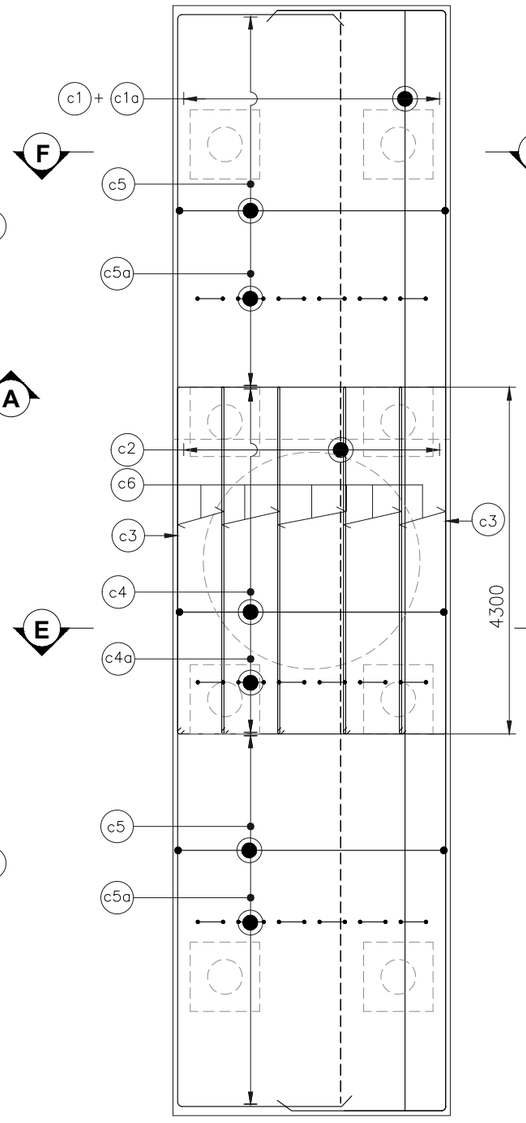
Title: REINFORCEMENT DETAILS OF PIER P5-P7 MAJOR BRIDGE AT CH-2+085.
Scale: AS SHOWN — 1 OF 1 — *Rev:* R1
Drg. No: VLE/DE-BR/STR/MNB/SUB/263

Y:\01_SPS PROJECT\56_DEMWE-BRAHMAKUND\01_ Drawings\01_Major Bridge\SUB STRUCTURE\PIER AS PER 14.1M DECK\PIER P5 TP P7 - R0\VLE-DE-BR-STR-MJB-2+085-SUB-267-269.dwg 27-Jan-22



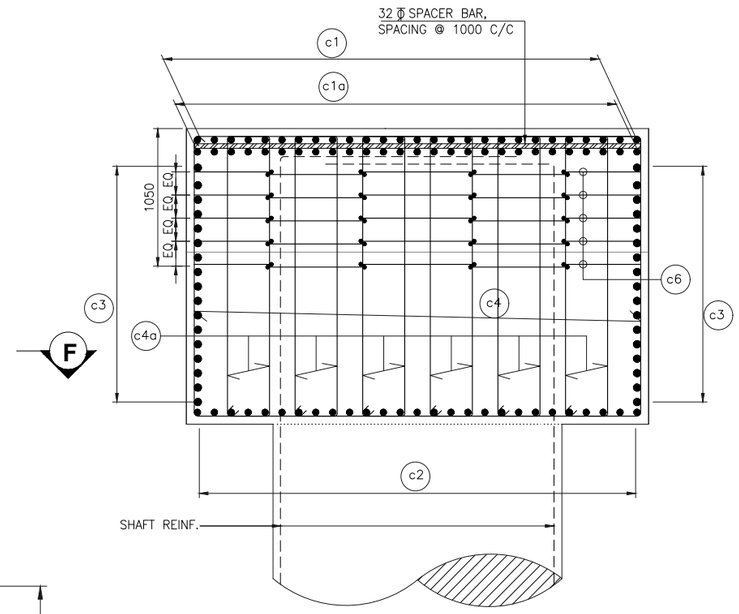
PLAN SHOWING REINFORCEMENT
DETAIL OF PIER FOOTING

(SCALE–1:50)



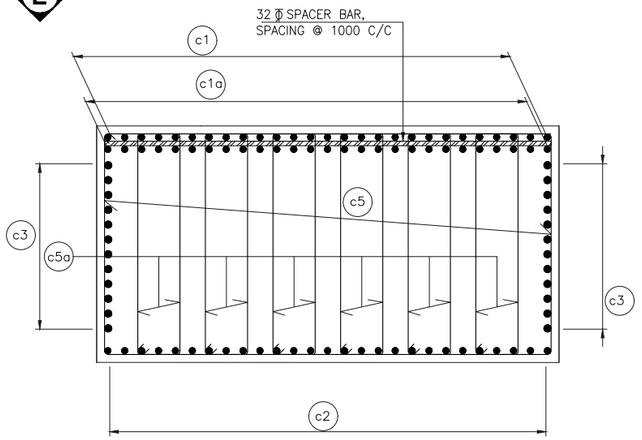
PLAN SHOWING REINFORCEMENT
DETAIL OF PIER CAP

(SCALE–1:50)



SECTION E-E

(SCALE–1:30)



SECTION F-F

(SCALE–1:30)

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Indian Institute of Technology Guwahati
Guwahati-781039

Shambhavi Techno Solutions Pvt. Ltd.
Managing Director

LEGEND:-

REINFORCEMENT AT TOP FACE	————
REINFORCEMENT AT BOTTOM FACE	– – – – – – – – – – – –

SUVADRA CONSULTANTS Regd. No- 11/2004-05 BHUBANESWAR

DESIGN DIRECTOR

NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETERS, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS TO BE FOLLOWED.

REFERENCE DRAWINGS:-

1. GENERAL ARRANGEMENT DRAWING. VEL/DE–BR/STR/MJB/GAD/2+085/100 (SH–01 OF 02)
2. DIMENSION DETAILS OF PIER P5 TO P7. VLE/DE–BR/STR/MJB/SUB/262
2. REINFORCEMENT DETAILS OF PIER P5 TO P7. VLE/DE–BR/STR/MJB/SUB/263 VLE/DE–BR/STR/MJB/SUB/265

Rev.	Date	Description
R1	JAN-22	STRUCTURE PROPOSAL REVISED
R0	JUNE-21	FOR APPROVAL

Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED
3rd Floor, PTI Building,4-Parliament Street, New Delhi-110001

Authority Engineer : Glabal Infra Solutions
E-8/11A,F-2, Global Tower , Trilanga Main Road , Akashganga Colony, Shahpura, Bhopal (462039) Tel.-0755-4045216

EPC Contractor : Valecha Engineering Ltd
Valecha Chambers, 4th Floor, Plot No B-6, New Link Road, Andheri West, Mumbai - 400053

Safety Consultant : SUVADRA CONSULTANTS (An ISO 9001 : 2008 Certified) (Soil Testing Laboratory & Engineering Consultant) Approved By Govt. of Orissa Regd. No. 11 of 2004-05
PP-97, Tankapani Road, BBSR-18, Odisha

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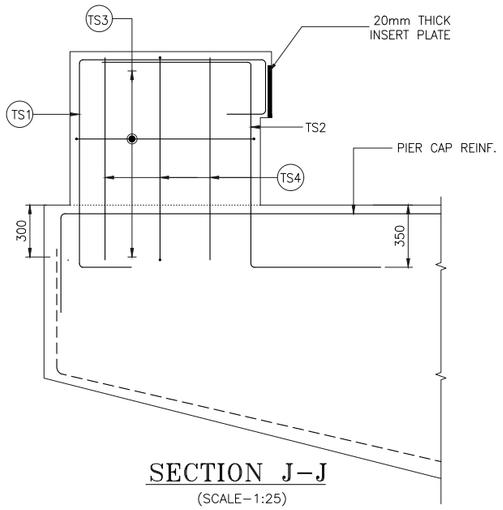
Project: DEMWE - BRAHMKUND (NH-13)
CONSTRUCTION OF TWO LANING WITH HARD SHOULDERS OF DEMWE - BRAHMKUND SECTION OF NH-13 FROM CH. 0.000 TO CH 18.464 IN THE STATE OF ARUNACHAL PRADESH ON EPC MODE UNDER NH(O)-NE

Drawn	MP
Designed	GPV
Checked	AV
Date:	JUNE -2021

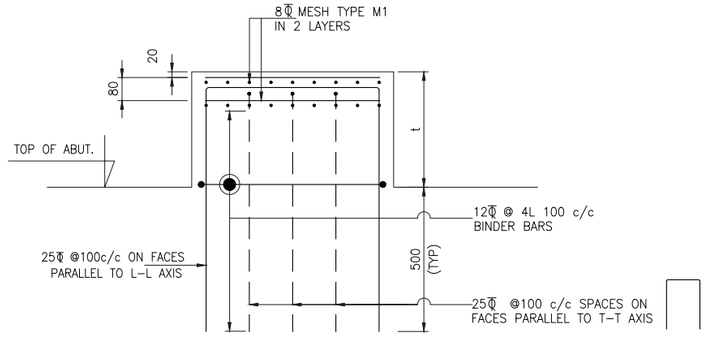
Title: REINFORCEMENT DETAILS OF PIER P1 MAJOR BRIDGE AT CH-2+085.
Scale: AS SHOWN — 1 OF 1 — Rev: R1
Drg. No: VLE/DE-BR/STR/MNB/SUB/264

Y:\01_SPS PROJECT\56_DEMWE-BRAHMAKUND\01_ Drawings\01_Major Bridge\SUB STRUCTURE\PIER AS PER 14.1M DECK\PIER P5 TP P7 - R0\VLE-DE-BR-STR-MJB-2+085-SUB-267-269.dwg 27-Jan-22



SECTION J–J

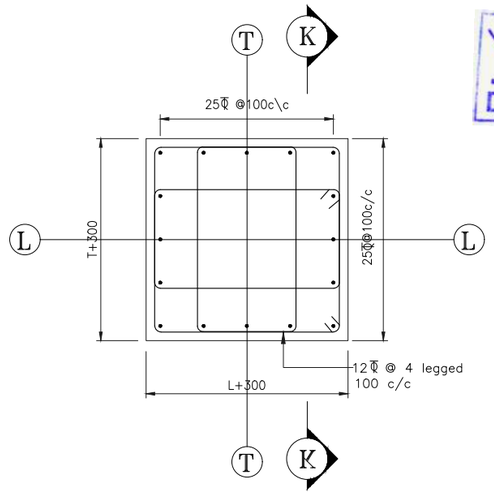
(SCALE–1:25)



SECTION K–K

(L+300)X(T+300) PEDESTAL

(SCALE 1:15)



PLAN SHOWING TYPICAL REINF.

DETAILS OF BEARING PEDESTAL

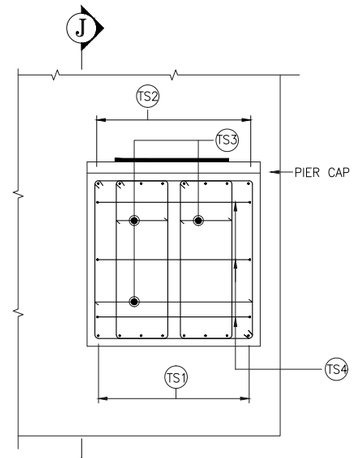
(SCALE 1:15)

DESIGN DIRECTOR

SUVADRA CONSULTANTS Regd. No-11/2004-05 BHUBANESWAR

Shambhavi Techno Solutions Pvt. Ltd

Managing Director



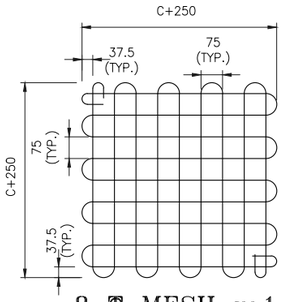
TRAFFIC DIRECTION

PLAN SHOWING REINF. DETAILS OF

TRANSVERSE SEISMIC STOPPER

ON PIER CAP

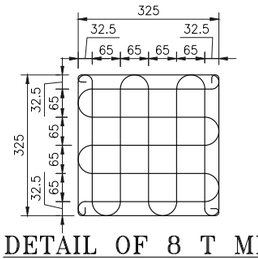
(SCALE–1:25)



8 ϕ MESH m1

(AT EACH PEDESTAL LOCATION)

(SCALE 1:15)



DETAIL OF 8 T MESH

TYPE ``m2''

(IN TWO LAYERS AT JACK LOCATION)

(SCALE 1:10)

PROOF CHECKED

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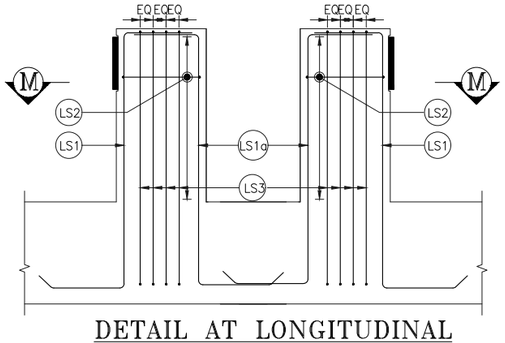


DETAIL AT LONGITUDINAL

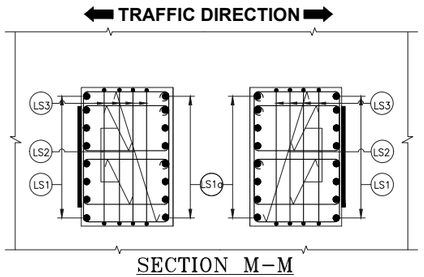
SEISMIC STOPPER

(SCALE–1:25)

SIZE OF BEARING PEDESTAL SHALL BE (L+300) x (T+300) WHERE ``L'' AND ``T'' ARE LENGTH OF BEARING IN LONGITUDINAL AND TRANSVERSE DIRECTION RESPECTIVELY

t = HEIGHT OF PEDESTAL

TRAFFIC DIRECTION



SECTION M–M

(SCALE–1:20)

REINFORCEMENT DETAILS:–

(STEEL/RCC GIRDER SIDE)

BAR MKD.	BAR DIA.	NO./SPACING	SHAPE
TRANSVERSE SEISMIC STOPPER:–			
TS1	16	8 NOS.	200
TS2	25	8 NOS.	1500
TS3		6 LEGGED 12ø STIRRUPS TIED TO VERTICALLY BARS @ 150 C/C VERTICALLY	
TS4		2 LEGGED 3 NOS. 12 DIA STIRRUPS	
LONGITUDINAL SEISMIC STOPPER:–			
LS1	32	8 NOS.	1000
LS1a	16	8 NOS.	800
LS2		6 LEGGED 12 ø STIRRUPS @ 120 c/c.	
LS3		2 LEGGED 4 NOS. 12 DIA	300 300

NOTES:-

1. ALL DIMENSION ARE IN MILLIMETERS, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSION TO BE FOLLOWED.
2. MESH TYPE M1' SHALL BE PROVIDED IN PIER CAP AT BEARING LOCATIONS AND MESH TYPE 'M2' SHALL BE PROVIDED AT JACK LOCATION IN TWO LAYER AT 20mm AND AT 100mm FROM TOP OF CONCRETE.
3. REINFORCING STEEL SHALL ONLY BE TMT BARS (GRADE DESIGNATION Fe:500) CONFORMING TO IS:1786 WITH MINIMUM TOTAL ELONGATIONS OF 12%.
4. LAP/SPLICES SHALL BE PROVIDED AS PER CLAUSE NO. 15.2.5. LAP LENGTH SHALL NOT BE LESS THAN 72ø.

   ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:–

FAVOURABLE BOND CONDITION					
GRADE OF CONCRETE	PERCENTAGE OF LAPPED BARS	<25%	33%	50%	>50%
M30	X	40	46	56	60
M35		36	41	50	54
M40		34	39	48	51
M45		32	37	45	48
M50		29	33	41	44
UNFAVOURABLE BOND CONDITION					
GRADE OF CONCRETE	PERCENTAGE OF LAPPED BARS	<25%	33%	50%	>50%
M30	X	58	67	81	87
M35		53	61	74	80
M40		50	58	70	75
M45		47	54	66	71
M50		42	48	59	63

5. BARS SHOWN IN THE DRAWING ARE NOT TO BE COUNTED, ONLY WRITTEN DATA SHALL BE FOLLOWED.
6. PEDESTAL HEIGHT TO BE AS PER SITE REQUIREMENT.

REFERENCE DRAWINGS:-

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Drawn	MP
Designed	GPV
Checked	AV
Date:	JUNE -2021

Title: REINFORCEMENT STOPPER DETAILS OF PIER P5 TO P7 MAJOR BRIDGE AT CH-2+085.

Scale: AS SHOWN — 1 OF 1 — Rev: R1

Drg. No: VLE/DE-BR/STR/MNB/SUB/265

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SUPER-STRUCTURE 50M STEEL

STRUCTURAL STEEL

1. MATERIALS

1.1 STEEL MEMBERS SHALL BE FREE FROM IMPERFECTIONS (i.e. MILL SCALE, SLAG INTRUSION, LAMINATION, PITTING, RUST ETC.) THAT MAY IMPAIR STRENGTH, DURABILITY AND APPEARANCE. ALL MATERIALS SHALL BE OF TESTED QUALITY.

1.2 STRUCTURAL STEEL SHALL CONFORM TO GRADE E450 (BO) OF IS: 2062–2011 UNLESS OTHERWISE SPECIFIED. SECONDARY MEMBERS LIKE INTERMEDIATE CROSS BRACINGS SHALL BE OF E250 GRADE.

1.3 HIGH STRENGTH BOLTS SHALL BE M–24 & M–20 FOR PROPOSED CLASS 10.9

1.4 ALL STRUCTURAL STEEL FABRICATION WORK SHALL BE CARRIED OUT AS PER RELEVANT INDIAN STANDARDS AND MORT&H SPECIFICATIONS.

1.5 HEADED STUDS SHALL BE OF FOLLOWING SPECIFICATIONS AS PER IRC : 22
CHARACTERISTIC TENSILE STRENGTH = 495MPa
CHARACTERISTIC YIELD STRENGTH = 385MPa
MINIMUM ELONGATION = 18%

2. FABRICATION

2.1 EDGE PREPARATION

2.1.1 EDGE PREPARATION FOR WELDING SHALL BE DONE BY MACHINE CONTROLLED FLAME CUTTING WITH EDGES FREE FROM BURRS, CLEAN AND STRAIGHT IN ACCORDANCE WITH IS:9595.

2.1.2 MATERIAL SHALL BE CUT TO SIZE BY OXY ACETYLENE FLAME CUTTING OR SAWING. ALL FLAME CUT EDGES SHALL BE GROUND/MACHINED TO CLEAN, SQUARE & TRUE EDGES. DRAG LINES OBTAINED SHALL BE REMOVED.

2.2 BOLTING

2.2.1 HOLES FOR BOLTS SHALL BE DRILLED CONFORMING TO CLAUSE 10 OF IS:7215. PUNCHING OF HOLES SHALL NOT BE PERMITTED. ALL HOLES EXCEPT AS STATED HEREUNDER SHALL BE DRILLED TO 3mm LESS THAN REQUIRED SIZE AND REAMED THEREAFTER TO THE REQUIRED SIZE. ALL MATCHING HOLES FOR BOLTS SHALL BE REGISTERED WITH EACH OTHER SO THAT A GAUGE OF 0.8mm LESS THAN HOLE DIA CAN PASS FREELY THROUGH THE MEMBERS ASSEMBLED FOR BOLTING IN THE DIRECTION AT RIGHT ANGLE TO SUCH MEMBERS.

2.2.2 ALL PERMANENT BOLTS SHALL BE HSFG M24, EXCEPT THOSE USED IN INTERMEDIATE CROSS GIRDER, WHERE HSFG M20 HAS BEEN USED.

2.2.3 HOLES FOR BOLTS SHALL BE AS FOLLOWS UNLESS OTHERWISE STATED:

i) FOR PERMANENT (HSFG) BOLTS & ERECTION BOLTS : DIAMETER + 1.5mm.

2.2.4 ALL PERMANENT BOLTS SHALL BE HIGH STRENGTH FRICTION GRIP TYPE. SURFACE PREPARATION FOR CONNECTIONS USING HSFG BOLT MUST CONFORM TO IS: 4000:1992 TO ATTAIN A SLIP FACTOR OF 0.30.

2.3 WELDING

2.3.1 SAMPLES OF WELDED COMPONENTS AND TESTS ON THEM SHALL BE GOT APPROVED BY THE INSPECTING AGENCY OR ITS NOMINATED AGENCY PRIOR TO COMMENCING FULL SCALE FABRICATION OF THE RELATED COMPONENTS.

2.3.2 BUTT WELDING OF THE COMPONENTS SHALL BE AVOIDED AS FAR AS POSSIBLE UNLESS SHOWN IN THE DRAWINGS. IF CARRIED OUT, SHALL BE OF MINIMUM NUMBER WITH THE APPROVAL OF THE ENGINEER–IN–CHARGE.

2.3.3 WELDING OF STRUCTURES SHALL BE DONE BY MEANS OF METAL ARC WELDING.

2.3.4 ALL ACCESSIBLE EDGES IN CONTACT AT A JOINT SHALL BE WELDED UNLESS OTHERWISE SPECIFIED.

2.3.5 WELDING PROCEDURE SHALL CONFORM TO IS: 814, IS:816 AND IS:9595.

2.3.6 CRITERIA FOR WELD TEST AND ACCEPTANCE SHALL BE STRICTLY FOLLOWED AS PER MORT&H SPECIFICATIONS.

2.3.7 THE CONTINUOUS WELDING FOR FABRICATING I–SECTIONS SHALL BE SUBMERGED ARC WELDING OR GAS METAL ARC WELDING (MIG) AND NECESSARY TESTS SHALL BE DONE AND REPORTS PREPARED & SCRUTINIZED BY COMPETENT AUTHORITY.

2.3.8 THE ELECTRODES USED FOR WELDING SHALL CONFORM TO IS:814.

2.4 FABRICATION AND ERECTION

2.4.1 FABRICATION, ERECTION, INSPECTION OF STEEL STRUCTURE SHALL BE DONE AS PER RELEVANT INDIAN SPECIFICATION, UNLESS OTHERWISE SPECIFIED IN MORT&H SPECIFICATIONS WHICH SHALL OVERRIDE CORRESPONDING PROVISIONS IN INDIAN SPECIFICATION.

2.4.2 ALL HOLES NECESSARY FOR ERECTION BOLTS SHALL BE PLUGGED FULLY AFTER SUCCESSFUL COMPLETION OF ERECTION WORK.

2.5 ASSEMBLY AT WORKSHOP

2.5.1 THE STEEL WORK SHALL BE TEMPORARILY SHOP ASSEMBLED AS INSTRUCTED BY THE ENGINEER–IN–CHARGE SO THAT THE ACCURACY OF THE FITTINGS ARE CHECKED BEFORE DESPATCH FROM FABRICATION SHOP. SHOP ASSEMBLY SHALL BE EFFECTED WITH SUFFICIENT NUMBER OF PARALLEL DRIFTS TO BRING AND KEEP THE PARTS IN PLACE.

2.5.2 MATCH DRILLING SHALL BE DONE, WHEREVER POSSIBLE. ALL MEMBERS, GUSSET PLATES ETC. SHALL BE CUT AFTER FULL SCALE SHOP LAYOUT.

3. TOLERANCE

3.1 FABRICATION OF STEEL WORKS SHALL BE DONE WITHIN THE SPECIFIED TOLERANCE LIMIT OF IS:7215 AND AS PER CLAUSE 1904.11 OF MORT&H SPECIFICATIONS.

4. INSPECTION & TESTING

4.1 FOR DETAILED INSPECTION AND TESTING OF STEEL WORKS, REFER IRC:24 AND MORT&H SPECIFICATIONS. ALL STEEL STRUCTURE SHALL BE INSPECTED IN THE FABRICATION SHOP, PRIOR TO DISPATCH FROM FABRICATION SHOP. NECESSARY TEST CERTIFICATES SHALL BE SUPPLIED DURING INSPECTION OR AS DIRECTED BY ENGINEER–IN–CHARGE.

5. PAINTING

5.1 ALL STRUCTURAL STEEL WORK SHALL BE CLEANED AND PAINTED AS PER PAINTING SPECIFICATION, CONFORMING TO IRC:24–2010 ANNEXURE–D WITH COATING SYSTEM '4' AND CLAUSE 1906 OF MORT&H SPECIFICATIONS.

5.2 PAINT DELIVERED TO THE FABRICATION SHOP/SITE SHALL BE READY MIXED IN ORIGINAL SEALED CONTAINER AS PACKED BY THE APPROVED PAINT MANUFACTURE. NO THINNER SHALL BE ADDED. PAINT SHALL BE STIRRED FREQUENTLY TO KEEP THE PIGMENT IN SUSPENSION.

5.3 SURFACES TO BE EMBEDDED IN CONCRETE SHALL HAVE NO PAINT APPLIED.

5.4 HOT–DIP GALVANIZED COATINGS FOR SECTIONS NOT LESS THAN 5mm THICKNESS SHALL HAVE A MINIMUM MEAN ZINC COATING WEIGHT OF 610mg/m² EQUIVALENT TO A COATING THICKNESS OF 85 MICRONS.

6. TRANSPORT TO SITE & STORAGE

6.1 STORAGE AT SITE SHOULD BE DONE ON A RAISED PLATFORM TO AVOID RUSTING/DAMAGE.

6.2 TRANSPORTATION OF ALL FABRICATED STRUCTURAL STEEL MATERIALS FROM SITE STORAGE YARD, HANDLING, ASSEMBLING, BOLTING, WELDING AND INSTALLATION AT APPROPRIATE LOCATION SHALL BE DONE ACCORDING TO APPROVED ERECTION DRAWING.

7. ERECTION

7.1 EACH FABRICATED MEMBER, WHETHER ASSEMBLED PRIOR TO DISPATCH FROM FABRICATION SHOP OR NOT, SHALL BEAR AN ERECTION MARK, WHICH WILL HELP TO IDENTIFY THE MEMBER AND ITS POSITION WITH RESPECT OF THE WHOLE STRUCTURE TO FACILITATE RE–ERECTION AT SITE.

7.2 NO REAMING SHALL BE CARRIED OUT WITHOUT PRIOR PERMISSION OF THE ENGINEER–IN–CHARGE.

7.3 THE CONTRACTOR SHALL SUBMIT THE QUALITY ASSURANCE PLAN, WELDING SEQUENCE AND WELDING PROCEDURE FOR FABRICATION AND ERECTION.

8. SYMBOLS AND ABBREVIATIONS

8.1 WELDING SYMBOL ARE AS PER IS: 813.

8.2 PERMANENT BOLT SHOWN THUS ---- ⊕

PROOF CHECKED
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Professor
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Indian Institute of Technology Guwahati
Guwahati-781039

9. TESTING NOTES FOR STUD SHEAR CONNECTOR

(A) APPEARANCE TEST

1. THE WELD TO A STUD SHEAR CONNECTOR SHOULD FORM A COMPLETE COLLAR AROUND THE SHANK AND FREE FROM CRACKS, EXCESSIVE SPLASHES OF WELD MATERIAL, FREE FROM INJURIOUS LAPS, FINE, SEAMS, TWIST, BENDS OR OTHER INJURIOUS DEFECTS.
2. WELD MATERIAL SHOULD HAVE A 'STEEL BLUE' APPEARANCE.

(B) TEST TO CHECK THE FIXING OF SHEAR STUDS

ALL STUDS NEED TO BE CHECKED BY A RING TEST.

1. RING TEST:– INVOLVES STRIKING THE SIDE OF THE HEAD OF THE STUD WITH A 2 KG HAMMER. A RINGING TONE ACHIEVED AFTER STRIKING INDICATED GOOD FUSION WHEREAS DULL TONE INDICATES A LACK OF FUSION (BS 5400–6).
2. BEND TEST:– TEST REQUIRED THE HEAD OF A STUD TO BE DISPLACED LATEALLY BY APPROXIMATE 25% OF ITS HEIGHT USING 6 KG HAMMER
   * THE WELD SHOULD THEN BE CHECKED FOR SIGNS OF CRACKING OR LACK FUSION.
   * STUD SHOULD NOT BE BENT BACK AS THIS IS LIKELY TO DAMAGE THE WELD
   * THE TESTING RATE SHOULD BE 1 IN 50 (BS 5400–6).

(C) GENERAL NOTES

1. THE STUD SHEAR CONNECTOR DESIGN IS BASED ON IRC: 22–2015.
2. THE WELDING OF STUD SHEAR CONNECTORS SHALL BE DONE BY ''DRAWN ARC STUD WELDING WITH CERAMIC FERRULE" TECHNIQUE.
3. THE STUD SHEAR CONNECTOR AND CERAMIC FERRULES SHALL CONFORM TO TYPE SD1/UF AS PER BS EN ISO: 13918–2008.
4. MECHANICAL PROPERTIES OF STUD SHEAR CONNECTORS SHALL BE AS PER ISO 6892/BS EN ISO: 13918–2008.
5. SHAPE OF TIP OF STUD SHEAR CONNECTORS MAY BE CHOSEN BY MANUFACTURER. THE STUD TIP SHALL BE SUPPLIED WITH FLUX IN THE FROM OF PRESS FITTED ALUMINUM BALL OR ALUMINUM SPRAY COATING.
6. THE DIAMETER OF CERAMIC FERRULE D7 AD PER FIGURE 13/TABLE 18 OF BS EN ISO: 13918. SHALL BE 26mm $^{+0.5mm}_{-0.5mm}$.

10. NOTES FOR INTERMEDIATE CROSS GIRDER

10.1 ALL HOLES ARE 21.5 DIA. FOR 20 DIA. HSFG BOLTS.

10.2 CO2 WELDING SHALL BE PREFERRED OVER MANUAL METAL ARC WELDING FOR DIAPHRAGM FABRICATION.

10.3 ALL WELDS SHALL BE MADE BY USING APPROVED WELDING PROCEDURE ONLY. WELDER QUALIFIED FOR A PARTICULAR WELD POSITION, WELDING TECHNIQUE AND SIZE ONLY SHALL MAKE THE WELD.

10.4 MINIMUM CLEARANCE AT JACKING POINT FROM TOP OF PIER SHALL BE 400mm.

Shambhavi Techno Solutions Pvt. Ltd
Managing Director

DESIGN DIRECTOR

SUVADRA CONSULTANTS Regd. No- 11/2004-05 BHUBANESWAR

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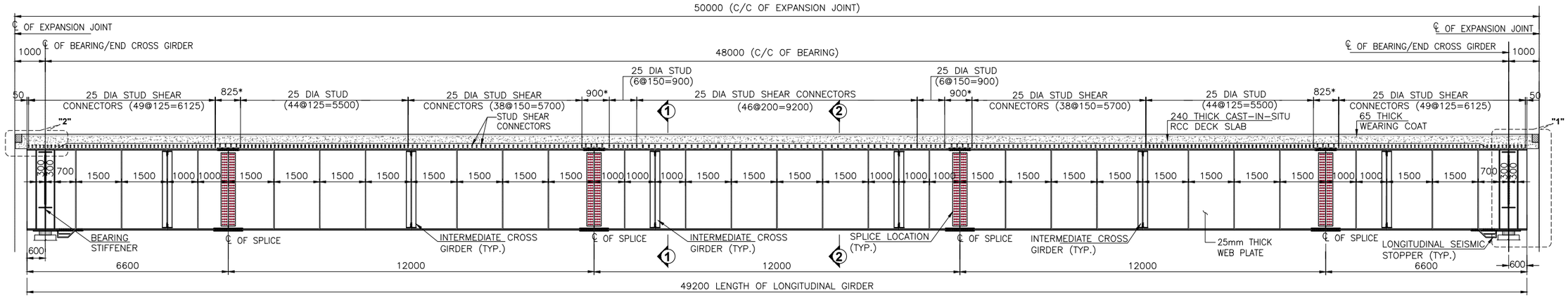
Drawn	MS
Designed	SS
Checked	AV
Date:	JUNE-2021

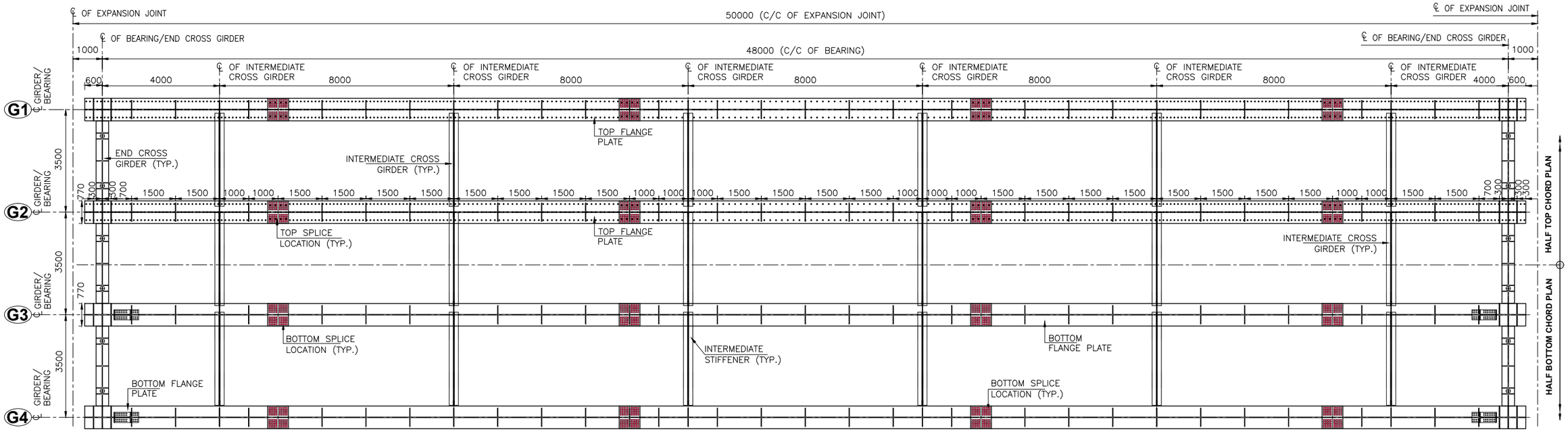
Title: GENERAL NOTES FOR SUPERSTRUCTURE
Scale: AS SHOWN (01 OF 01)
Rev.: R1
Drg. No: VLE/DE-BR/STR/MJB/SUP/301



LONGITUDINAL SECTIONAL ELEVATION

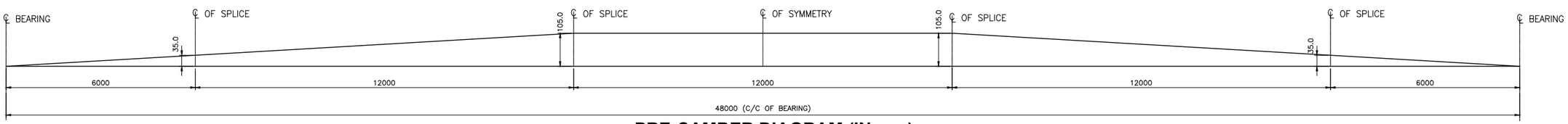
(SCALE–1:100)

*** SPACING OF STUD SHEAR CONNECTORS ABOVE TOP FLANGE SPLICE PLATE PLEASE REFER SEPARATE DRAWING, DETAILS OF SPLICE JOINT AND STUD SHEAR CONNECTOR**



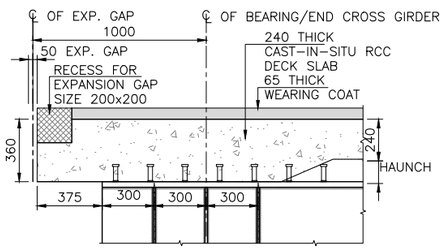
PLAN

(SCALE–1:100)



PRE-CAMBER DIAGRAM (IN mm)

(N.T.S.)



DETAIL-``2"

(SCALE 1:25)

PROOF CHECKED
Anjan Dutta
Professor
Department of Civil Engineering
Indian Institute of Technology Guwahati
Guwahati-781039

DESIGN DIRECTOR

Shambhavi Techno Solutions Pvt. Ltd.
Managing Director

SUVADRA CONSULTANTS Regd. No-111/2004-05 BHUBANESWAR

NOTES:-

1. ALL DIMENSIONS ARE IN mm AND CHAINAGES ARE IN Km, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NO DIMENSION IS TO BE SCALED.
2. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL RELEVANT DRAWINGS.
3. GENERAL NOTES FOR SUPERSTRUCTURE REFER SEPARATE DRAWING NO. VLE/DE–BR/STR/MJB/SUP/301

Rev.	Date	Description
R1	JAN.-22	AE COMMENTS INCORPORATED
R0	JUNE-21	FOR APPROVAL

Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED
3rd Floor, PTI Building,4-Parliament Street, New Delhi-110001

Authority Engineer : Global Infra Solutions
E-8/11A,F-2, Global Tower , Trilanga Main Road , Akashganga Colony, Shahpura, Bhopal (462039)
Tel.-0755-4045216

EPC Contractor : Valecha Engineering Ltd
Valecha Chambers, 4th Floor, Plot No B-6, New Link Road, Andheri West, Mumbai - 400053

Safety Consultant : SUVADRA CONSULTANTS (An ISO 9001 : 2008 Certified) Soil Testing Laboratory & Engineering Consultancy approved By Govt. of Orissa Regd. No. 11 of 2004-05
PP-97, Tankapani Road, BBSR-18, Odisha

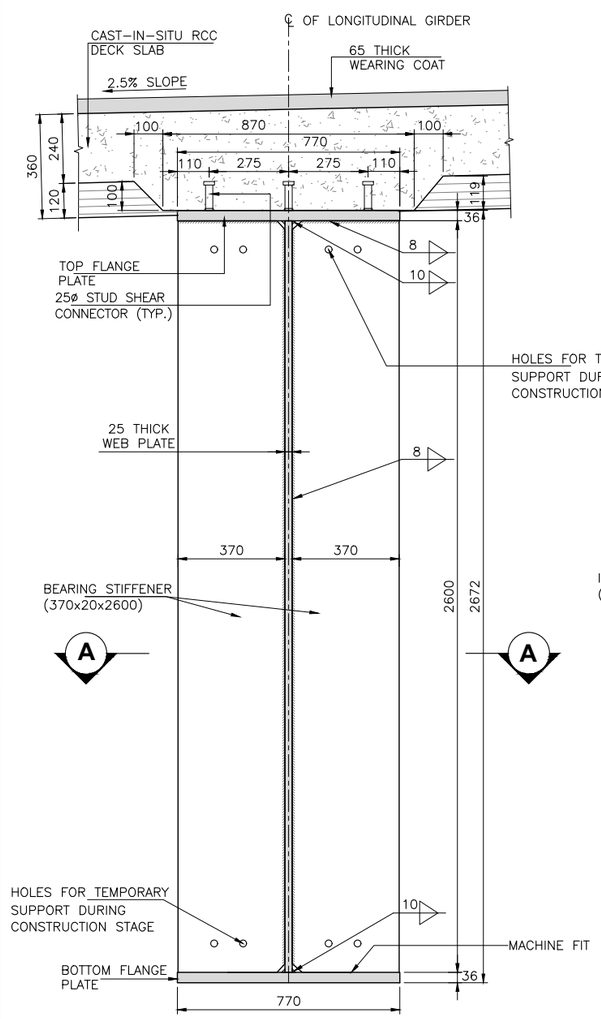
Proof Consultant : SHAMBHAVI TECHNO SOLUTIONS PVT.LTD.
E-82, Rajesh Kumar Path, S.k.Puri, Boring Road, Patna-800001

Design Consultant : SPS Technocrats Pvt. Ltd.
510 & 511, Fifth Floor, JMD Megapolis, Sector 48, Gurgaon, Haryana 122018

Project: DEMWE - BRAHMKUND (NH-13)
CONSTRUCTION OF TWO LANING WITH HARD SHOULDERS OF DEMWE – BRAHMKUND SECTION OF NH-13 FROM CH. 0.000 TO CH 18.464 IN THE STATE OF ARUNACHAL PRADESH ON EPC MODE UNDER NH(O)-NE

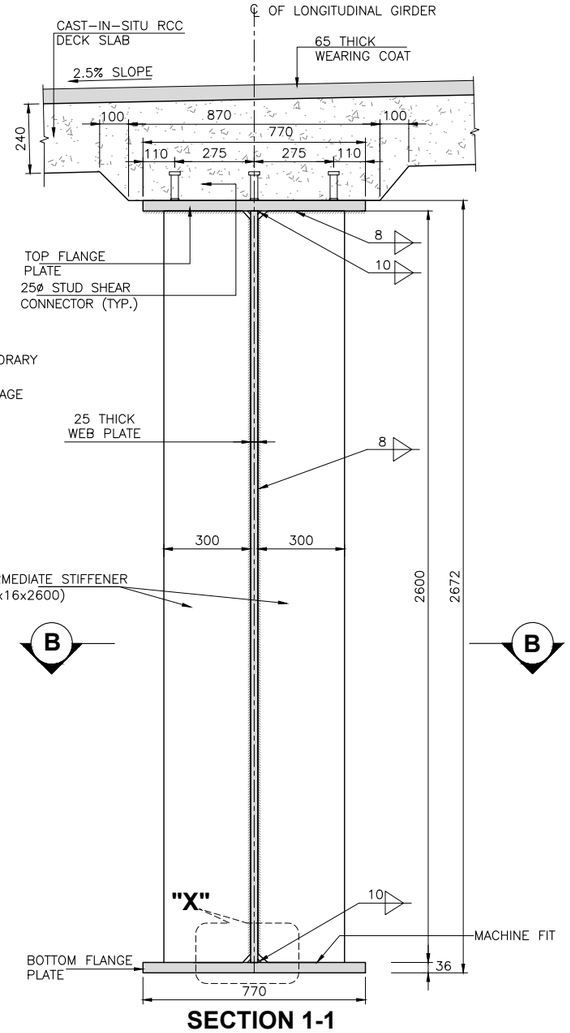
Drawn	MS
Designed	SS
Checked	AV
Date:	JUNE-2021

Title: DETAILS OF LONGITUDINAL GIRDER SPAN 1X50 EJ TO EJ
Scale: AS SHOWN (01 OF 02) *Rev:* R1
Drg. No: VLE/DE-BR/STR/MJB/SUP/302



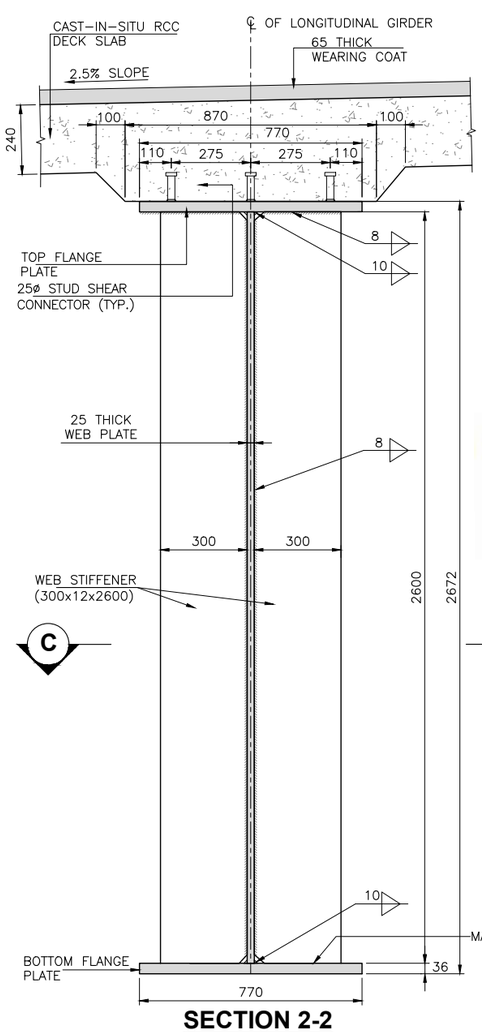
TYPICAL SECTION OF GIRDER AT BEARING STIFFENER LOCATION

(SCALE 1:15)



SECTION 1-1 (TYPICAL SECTION OF GIRDER AT INTERMEDIATE STIFFENER LOCATION)

(SCALE 1:15)

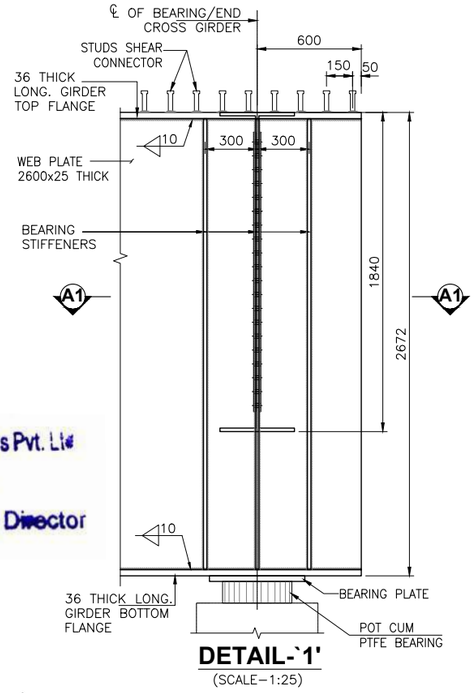


SECTION 2-2 (TYPICAL SECTION OF GIRDER AT OTHER LOCATION)

(SCALE 1:15)

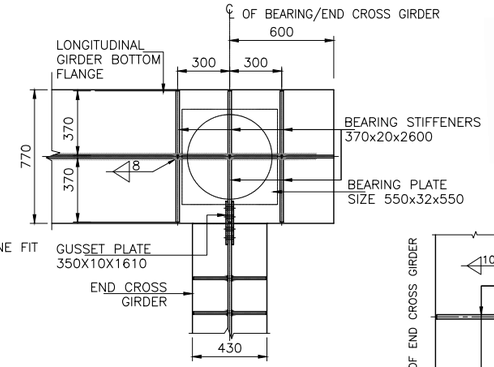
PROOF CHECKED
Anjan Dutta
Professor
Department of Civil Engineering
Indian Institute of Technology Guwahati
Guwahati-781039

Shambhavi Techno Solutions Pvt. Ltd.
Managing Director



DETAIL-`1'

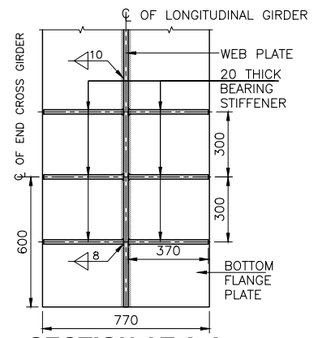
(SCALE-1:25)



SECTION A1-A1

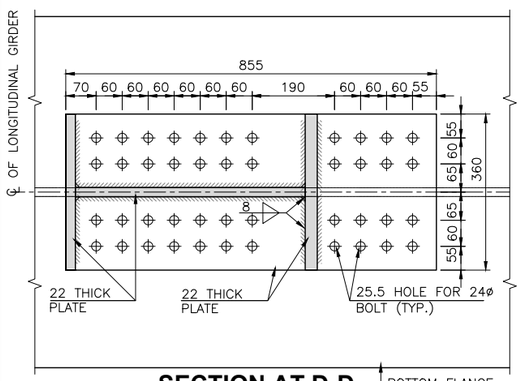
(SCALE:-1:25)

SUVADRA CONSULTANTS Regd. No- 11/2004-05 BHUBANESWAR



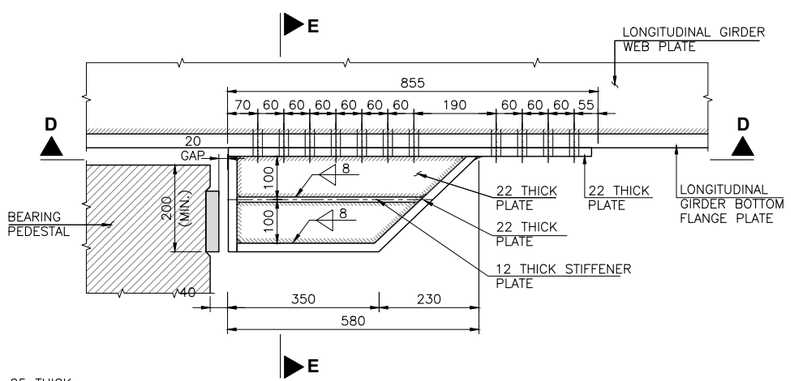
SECTION AT A-A

(SCALE 1:15)



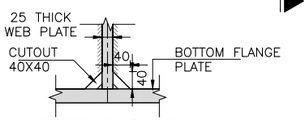
SECTION AT D-D

(SCALE 1:10)



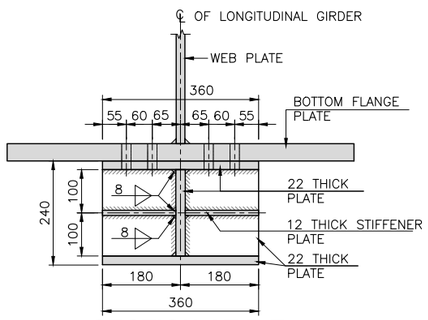
DETAIL-``X" SHOWING DETAIL OF LONGITUDINAL SEISMIC STOPPER

(SCALE 1:10)



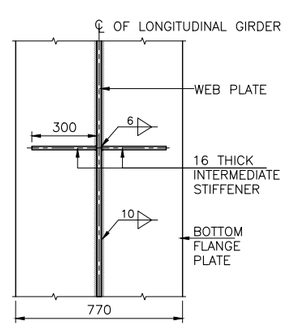
DETAILS 'X'

(SCALE 1:10)



SECTION AT E-E

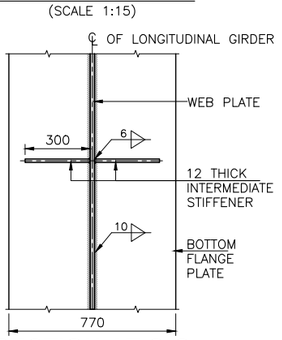
(SCALE 1:10)



SECTION AT B-B

(SCALE 1:15)

Yogesh Singh
DESIGN DIRECTOR



SECTION AT C-C

(SCALE 1:15)

Rev.	Date	Description
R1	JAN.-22	AE COMMENTS INCORPORATED
R0	JUNE-21	FOR APPROVAL

Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED
3rd Floor, PTI Building,4-Parliament Street, New Delhi-110001

Authority Engineer : Glabal Infra Solutions
E-8/11A,F-2, Global Tower , Trilanga Main Road , Akashganga Colony, Shahpura, Bhopal (462039)
Tel.-0755-4045216

EPC Contractor : Valecha Engineering Ltd
Valecha Chambers, 4th Floor, Plot No B-6, New Link Road, Andheri West, Mumbai - 400053

Safety Consultant : SUVADRA CONSULTANTS (An ISO 9001 : 2008 Certified) (Soil Testing Laboratory & Engineering Consultant) Approved By Govt. of Orissa Regd. No. 11 of 2004-05
PP-97, Tankapani Road, BBSR-18, Odisha

Proof Consultant : SHAMBHAVI TECHNO SOLUTIONS PVT.LTD.
E-82, Rajesh Kumar Path, S.k.Puri, Boring Road, Patna-800001

Design Consultant : SPS Technocrats Pvt. Ltd.
510 & 511, Fifth Floor, JMD Megapolis, Sector 48, Gurgaon, Haryana 122018

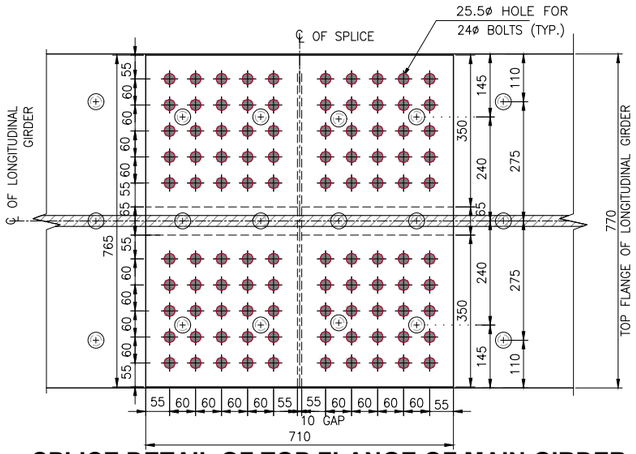
Project: DEMWE - BRAHMKUND (NH-13)
CONSTRUCTION OF TWO LANING WITH HARD SHOULDERS OF DEMWE - BRAHMKUND SECTION OF NH-13 FROM CH. 0.000 TO CH 18.464 IN THE STATE OF ARUNACHAL PRADESH ON EPC MODE UNDER NH(O)-NE

Drawn	MS
Designed	SS
Checked	AV
Date:	JUNE-2021

Title: DETAILS OF LONGITUDINAL GIRDER FOR SPAN 1X50 EJ TO EJ

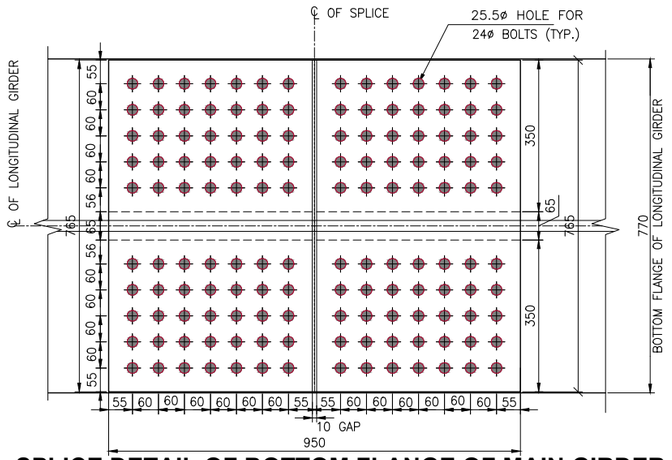
Scale: AS SHOWN (02 OF 02) *Rev:* R1

Drg. No: VLE/DE-BR/STR/MJR/SUP/302



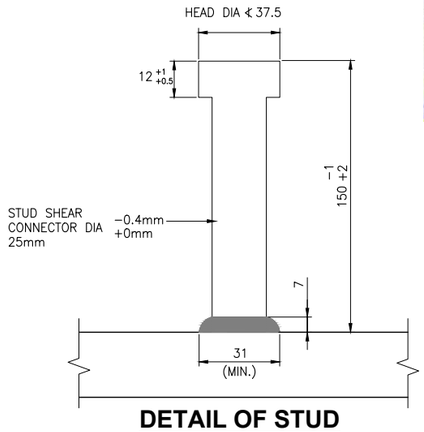
SPLICE DETAIL OF TOP FLANGE OF MAIN GIRDER

(SCALE–1:10)



SPLICE DETAIL OF BOTTOM FLANGE OF MAIN GIRDER

(SCALE–1:10)

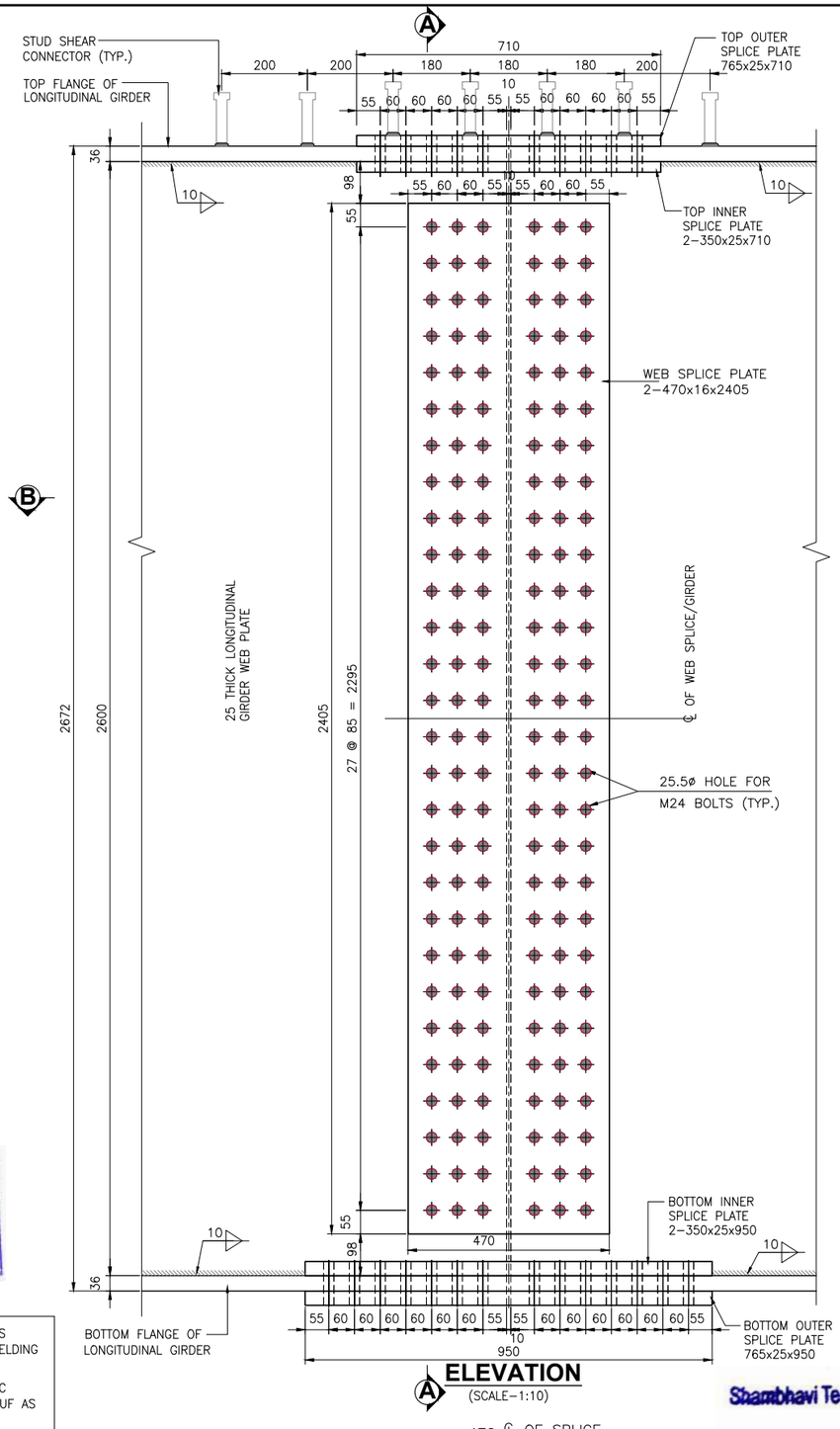


DETAIL OF STUD SHEAR CONNECTOR

(SCALE 1:2)

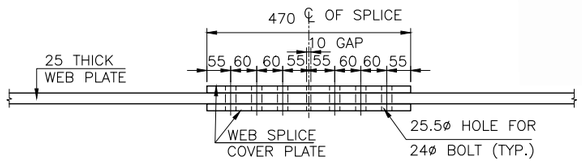
DESIGN DIRECTOR

1. THE WELDING OF STUD SHEAR CONNECTORS SHALL BE DONE BY "DRAWN ARC STUD WELDING WITH CERAMIC FERRULE" TECHNIQUE.
2. THE STUD SHEAR CONNECTOR AND CERAMIC FERRULES SHALL CONFORM TO TYPE SD3/UF AS PER BS EN ISO 13918–2008.
3. MECHANICAL PROPERTIES OF STUD SHEAR CONNECTORS SHALL BE AS PER ISO 6892/BS EN ISO 13918–2008.
4. SHAPE OF TIP OF STUD SHEAR CONNECTORS MAY BE CHOSEN BY MANUFACTURER. THE STUD TIP SHALL BE SUPPLIED WITH FLUX IN THE FORM OF PRESS–FITTED ALUMINIUM BALL OR ALUMINIUM SPRAY COATING.
5. THE DIAMETER OF CERAMIC FERRULE 07 AS PER FIGURE 13/TABLE 18 OF BS EN ISO 13918 SHALL BE 26 +0.5 –0.



ELEVATION

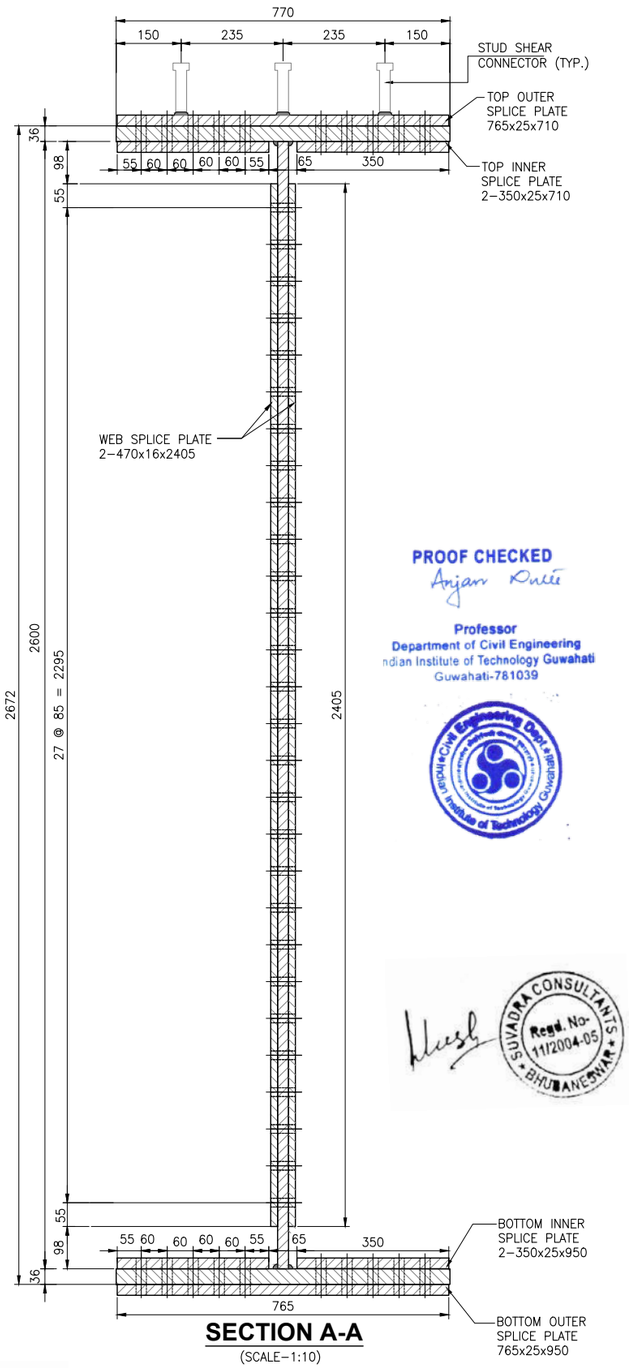
(SCALE–1:10)



SECTION AT B-B

(SCALE 1:10)

Shambhavi Techno Solutions Pvt. Ltd.
Managing Director



SECTION A-A

(SCALE–1:10)

PROOF CHECKED
Anjan Dutta
Professor
Department of Civil Engineering
Indian Institute of Technology Guwahati
Guwahati-781039

SUVADRA CONSULTANTS Regd. No- 11/2004-05 BHUBANESWAR

NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETRES, UNLESS OTHERWISE MENTIONED.
2. ONLY WRITTEN DIMENSIONS TO BE FOLLOWED.
3. BOLTS USED IS M–24 (GRADE 10.9HSGF).
4. ALL STRUCTURAL STEEL SHALL CONFORM TO HIGH STRENGTH STEEL E–450 AS PER IS: 2062–2011.
5. GENERAL NOTES FOR SUPERSTRUCTURE REFER SEPARATE DRAWING NO. VLE/DE–BR/STR/MJB/SUP/301

Rev.	Date	Description
R1	JAN.-22	AE COMMENTS INCORPORATED
R0	JUNE-21	FOR APPROVAL

Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED
3rd Floor, PTI Building,4-Parliament Street, New Delhi-110001

Authority Engineer : Glabal Infra Solutions
E-8/11A,F-2, Global Tower , Trilanga Main Road , Akashganga Colony, Shahpura, Bhopal (462039) Tel.-0755-4045216

EPC Contractor : Valecha Engineering Ltd
Valecha Chambers, 4th Floor, Plot No B-6, New Link Road, Andheri West, Mumbai - 400053

Safety Consultant : SUVADRA CONSULTANTS (An ISO 9001 : 2008 Certified) (Soil Testing Laboratory & Engineering Consultant) Approved By Govt. of Orissa Regd. No. 11 of 2004-05
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Proof Consultant : SHAMBHAVI TECHNO SOLUTIONS PVT.LTD.
E-82, Rajesh Kumar Path, S.k.Puri, Boring Road, Patna-800001

Design Consultant : SPS Technocrats Pvt. Ltd.
510 & 511, Fifth Floor, JMD Megapolis, Sector 48, Gurgaon, Haryana 122018

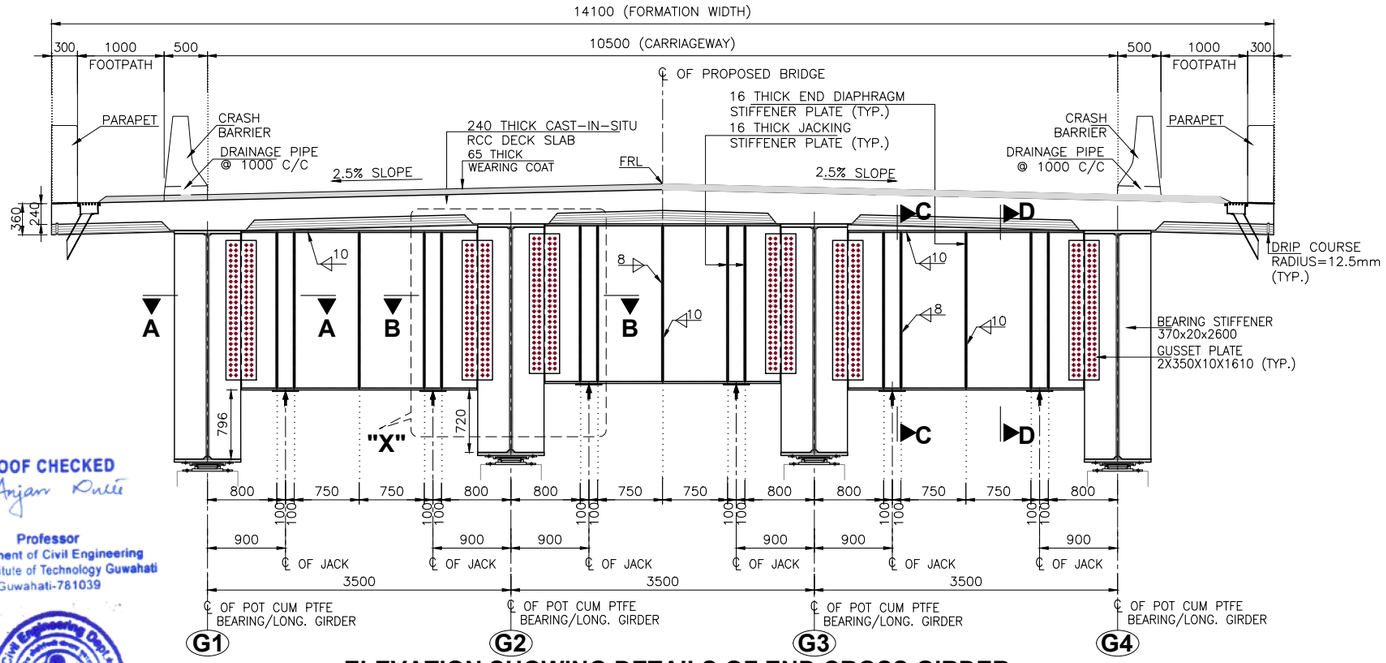
Project: DEMWE - BRAHMKUND (NH-13)
CONSTRUCTION OF TWO LANING WITH HARD SHOULDERS OF DEMWE - BRAHMKUND SECTION OF NH-13 FROM CH. 0.000 TO CH 18.464 IN THE STATE OF ARUNACHAL PRADESH ON EPC MODE UNDER NH(O)-NE

Drawn	MS
Designed	SS
Checked	AV
Date:	JUNE-2021

Title: DETAILS OF SPLICE JOINT AND STUD SHEAR CONNECTOR AT OUTER SPLICES FOR SPAN 1X50 EJ TO EJ

Scale: AS SHOWN — 1 OF 1 — *Rev:* R1

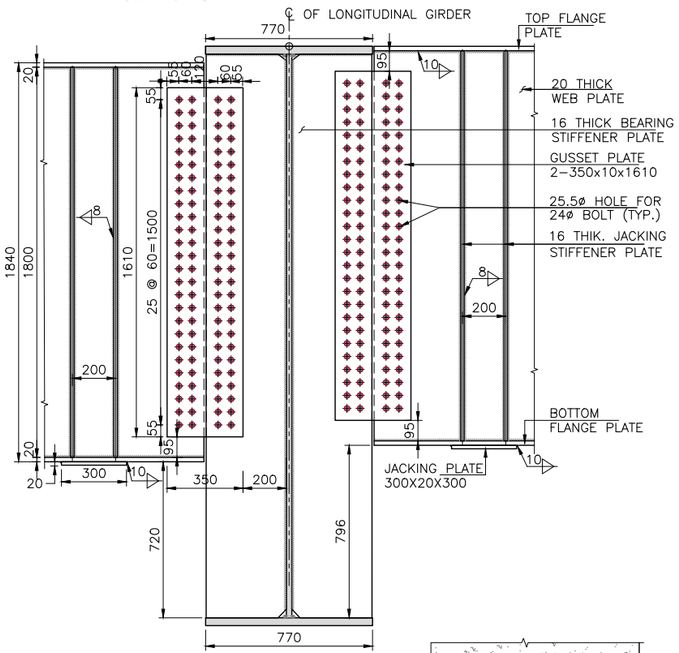
Drg. No: VLE/DE-BR/STR/MJB/SUP/303



ELEVATION SHOWING DETAILS OF END CROSS GIRDER

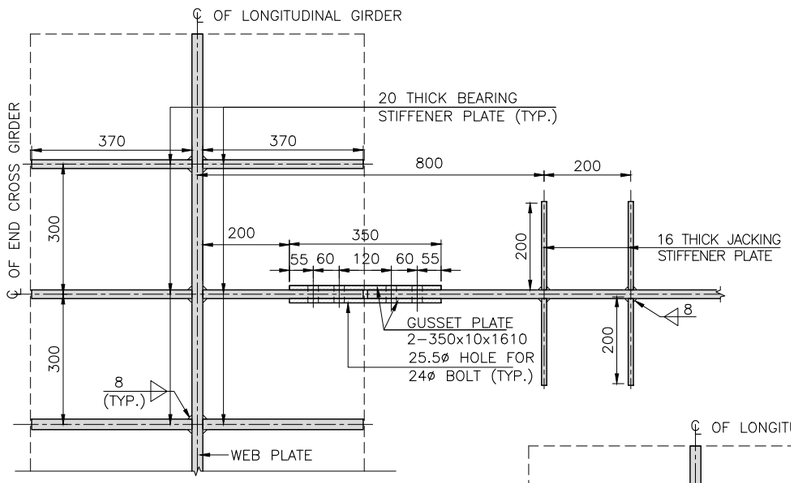
(SCALE 1:50)

PROOF CHECKED
Anjan Dutta
Professor
Department of Civil Engineering
Indian Institute of Technology Guwahati
Guwahati-781039



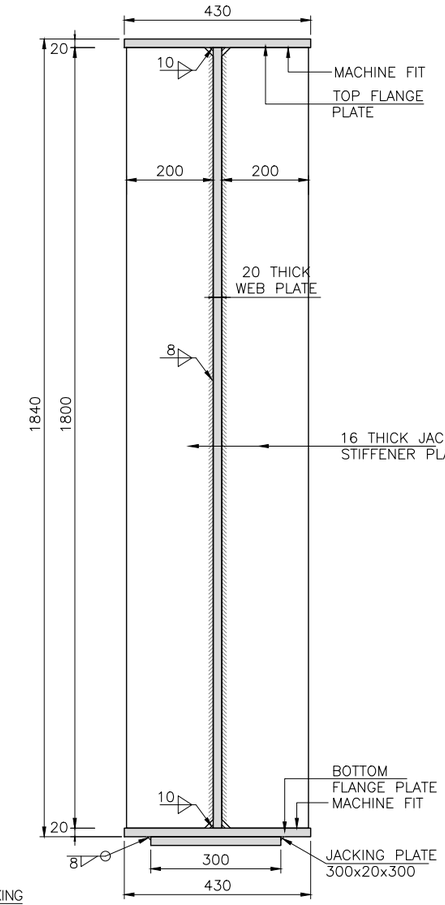
DETAIL-``X"

(SCALE 1:20)



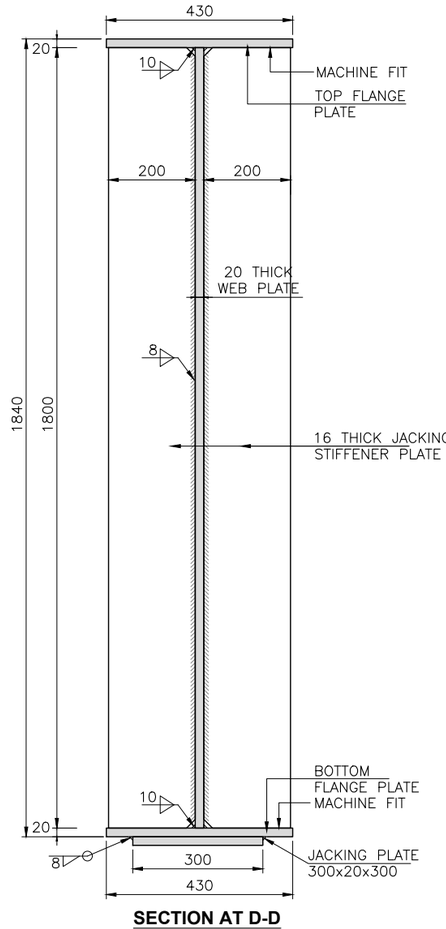
SECTION AT A-A

(SCALE 1:10)



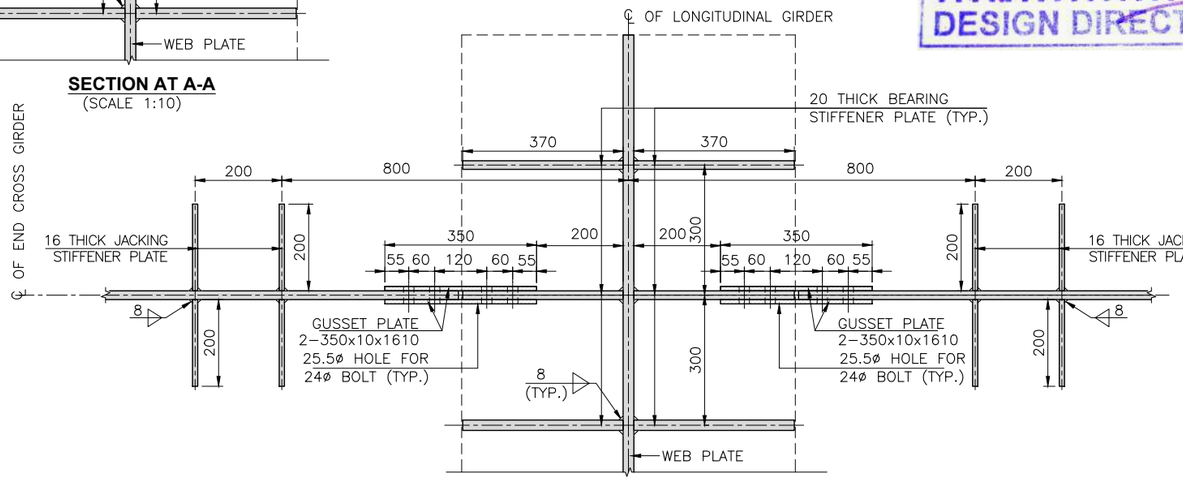
SECTION AT C-C

(SCALE 1:10)



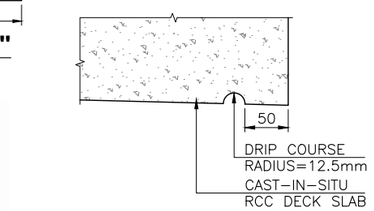
SECTION AT D-D

(SCALE 1:10)



SECTION AT B-B

(SCALE 1:10)



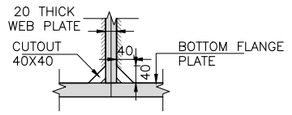
DETAIL OF DRIP COURSE

(SCALE 1:5)

Shambhavi Techno Solutions Pvt. Ltd
Managing Director

DESIGN DIRECTOR

SUVADRA CONSULTANTS Regd. No- 11/2004-05 BHUBANESWAR



TYP. OPENING DETAILS

(SCALE 1:10)

NOTES:-

1. ALL DIMENSIONS ARE IN mm AND CHAINAGES ARE IN Km, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NO DIMENSION IS TO BE SCALED.
2. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL RELEVANT DRAWINGS.
3. GENERAL NOTES FOR SUPERSTRUCTURE REFER SEPARATE DRAWING NO. VLE/DE–BR/STR/MJB/SUP/301
4. MINIMUM JACKING CAPACITY 96T/M^2.

Rev.	Date	Description
R1	JAN.-22	AE COMMENTS INCORPORATED
R0	JUNE-21	FOR APPROVAL

Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED
3rd Floor, PTI Building,4-Parliament Street, New Delhi-110001

Authority Engineer : Global Infra Solutions
E-8/11A,F-2, Global Tower , Trilanga Main Road , Akashganga Colony, Shahpura, Bhopal (462039)
Tel.-0755-4045216

EPC Contractor : Valecha Engineering Ltd
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Safety Consultant : SUVADRA CONSULTANTS (An ISO 9001 : 2008 Certified) (Soil Testing Laboratory & Engineering Consultant) Approved By Govt. of Orissa Regd. No. 11 of 2004-05
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Proof Consultant : SHAMBHAVI TECHNO SOLUTIONS PVT.LTD.
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Design Consultant : SPS Technocrats Pvt. Ltd.
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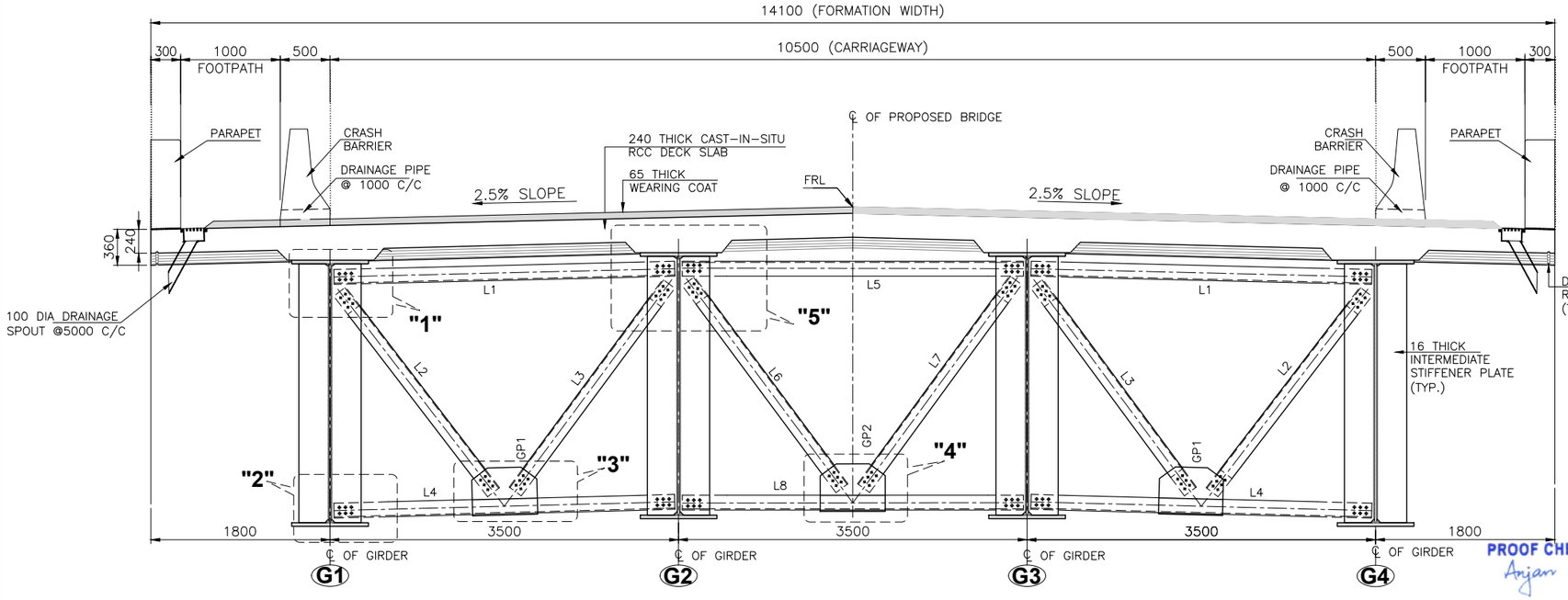
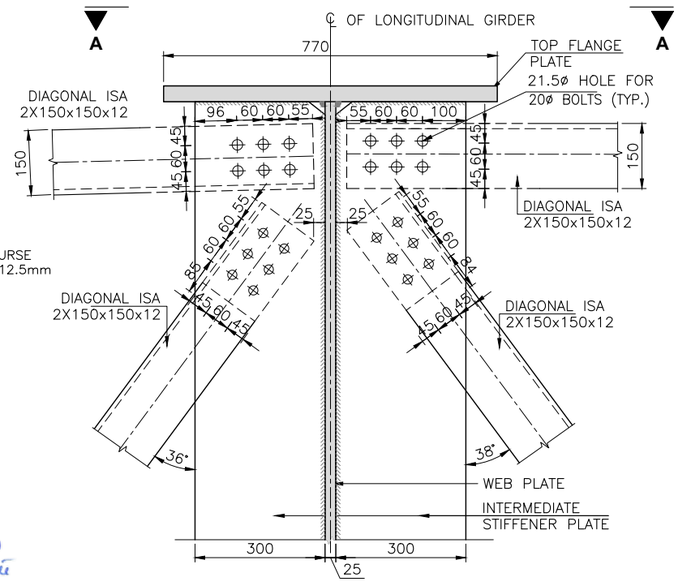
Drawn	MS
Designed	SS
Checked	AV
Date:	JUNE-2021

Title: DETAILS OF END CROSS GIRDER FOR SPAN 1X50 EJ TO EJ

Scale: AS SHOWN (01 OF 01) *Rev.:* R1

Drg. No: VLE/DE-BR/STR/MJB/SUP/304



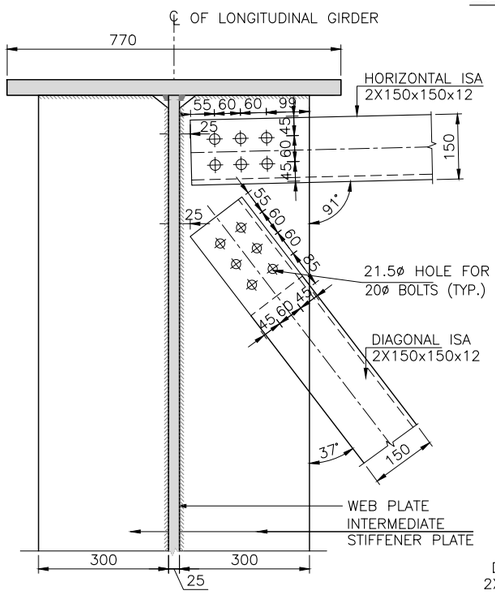


DETAIL-``5"
(SCALE 1:10)

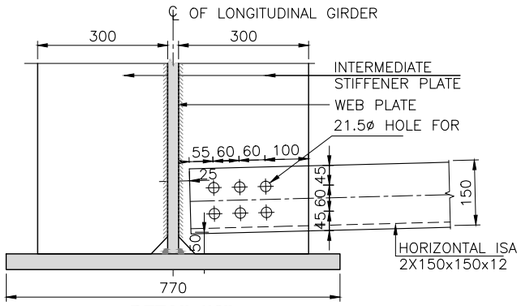
ELEVATION SHOWING DETAILS OF INTERMEDIATE CROSS GIRDER

(SCALE 1:40)

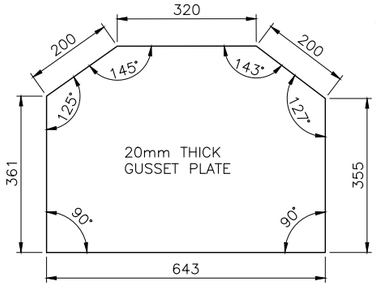
PROOF CHECKED
Anjan Dutta
Professor
Department of Civil Engineering
Indian Institute of Technology Guwahati
Guwahati-781039



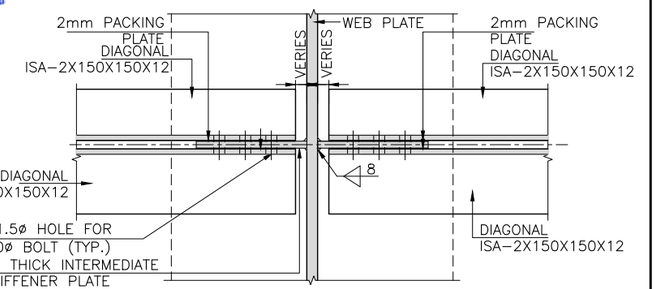
DETAIL-``1"
(SCALE 1:10)



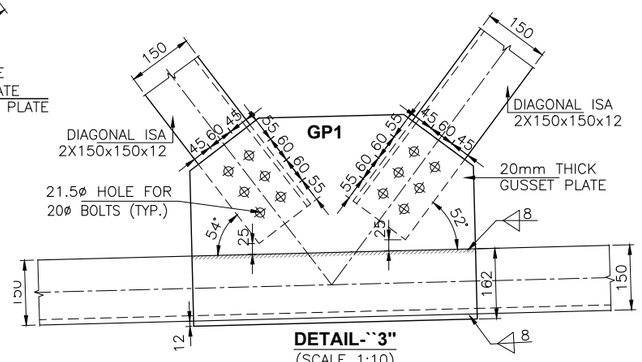
DETAIL-``2"
(SCALE 1:10)



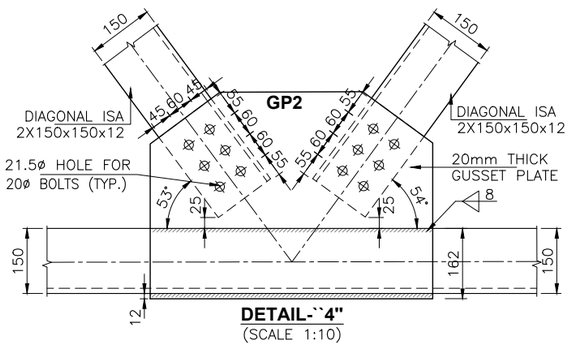
GUSSET PLATE-GP1
(SCALE 1:10)



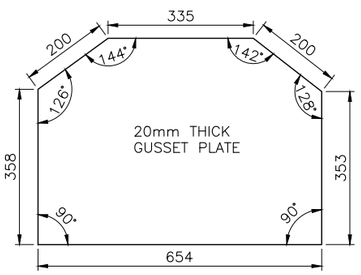
SECTION AT A-A
(SCALE 1:10)



DETAIL-``3"
(SCALE 1:10)

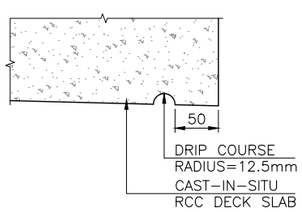


DETAIL-``4"
(SCALE 1:10)



GUSSET PLATE-GP2
(SCALE 1:10)

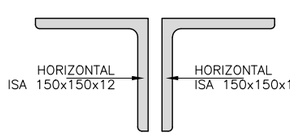
ANGLE MARKING	LENGTH (IN MM)
L1	3422
L2	2540
L3	2595
L4	3422
L5	3425
L6	2588
L7	2588
L8	3425



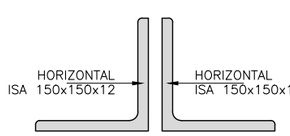
DETAIL OF DRIP COURSE
(SCALE 1:5)

Shambhavi Techno Solutions Pvt. Ltd.
Managing Director

DESIGN DIRECTOR



SECTION AT X-X
(SCALE 1:5)



SECTION AT Y-Y
(SCALE 1:5)

SUVADRA CONSULTANTS Regd. No- 11/2004-05 BHUBANESWAR

NOTES:-

1. ALL DIMENSIONS ARE IN mm AND CHAINAGES ARE IN Km, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NO DIMENSION IS TO BE SCALED.
2. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL RELEVANT DRAWINGS.
3. GENERAL NOTES FOR SUPERSTRUCTURE REFER SEPARATE DRAWING NO. VLE/DE-BR/STR/MJB/SUP/301

Rev.	Date	Description
R1	JAN.-22	AE COMMENTS INCORPORATED
R0	JUNE-21	FOR APPROVAL

Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED
3rd Floor, PTI Building,4-Parliament Street, New Delhi-110001

Authority Engineer : Global Infra Solutions
E-8/11A,F-2, Global Tower , Trilanga Main Road , Akashganga Colony, Shahpura, Bhopal (462039)
Tel.-0755-4045216

EPC Contractor : Valecha Engineering Ltd
Valecha Chambers, 4th Floor, Plot No B-6, New Link Road, Andheri West, Mumbai - 400053

Safety Consultant : SUVADRA CONSULTANTS (An ISO 9001 : 2008 Certified) (Soil Testing Laboratory & Engineering Consultant) Approved By Govt. of Orissa Regd. No. 11 of 2004-05
PP-97, Tankapani Road, BBSR-18, Odisha

Proof Consultant : SHAMBHAVI TECHNO SOLUTIONS PVT.LTD.
E-82, Rajesh Kumar Path, S.k.Puri, Boring Road, Patna-800001

Design Consultant : SPS Technocrats Pvt. Ltd.
510 & 511, Fifth Floor, JMD Megapolis, Sector 48, Gurgaon, Haryana 122018

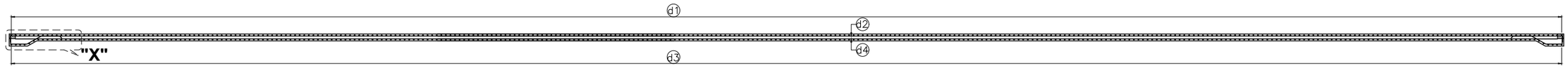
Project: DEMWE - BRAHMKUND (NH-13)
CONSTRUCTION OF TWO LANING WITH HARD SHOULDERS OF DEMWE - BRAHMKUND SECTION OF NH-13 FROM CH. 0.000 TO CH 18.464 IN THE STATE OF ARUNACHAL PRADESH ON EPC MODE UNDER NH(O)-NE

Drawn	MS
Designed	SS
Checked	AV
Date:	JUNE-2021

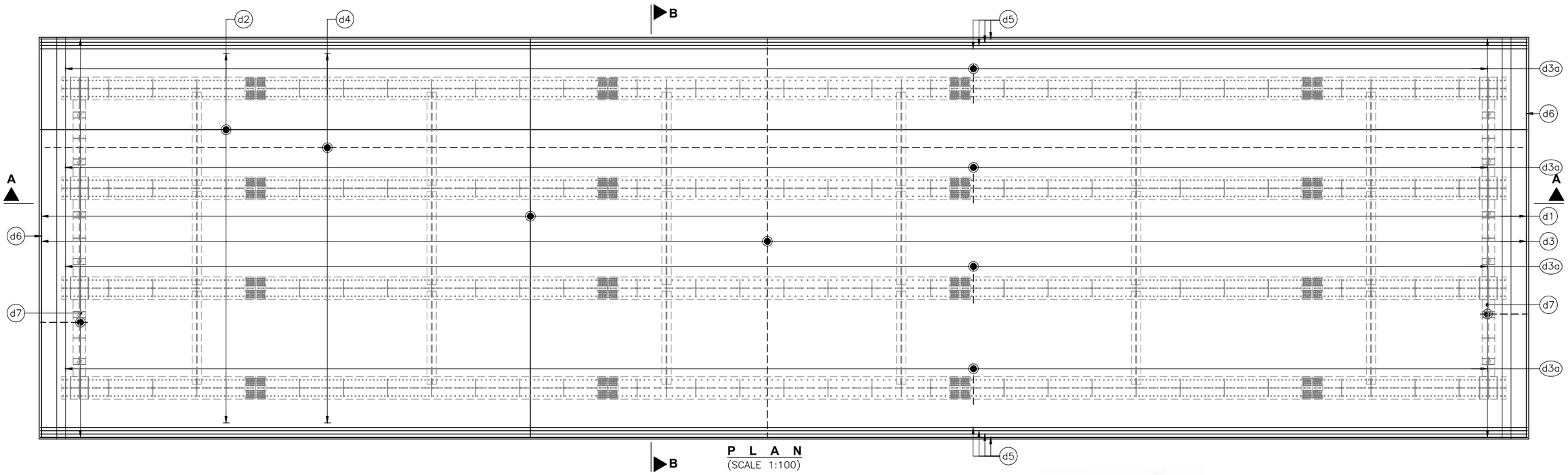
Title: DETAILS OF INTERMEDIATE CROSS GIRDER FOR SPAN 1X50 EJ TO EJ

Scale: AS SHOWN (01 OF 01) *Rev:* R1

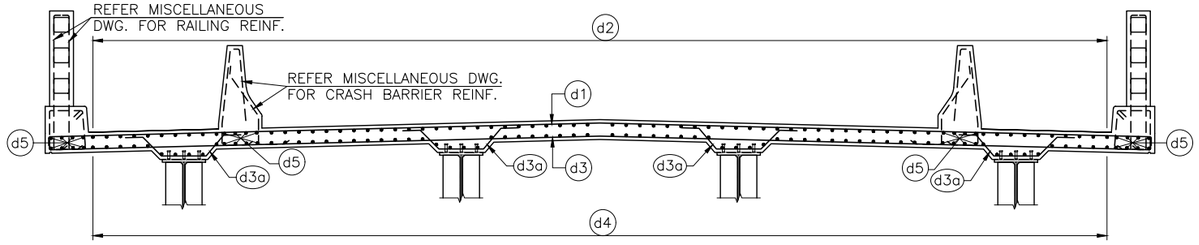
Drg. No: VLE/DE-BR/STR/MJB/SUP/305



SECTION AT A-A
(SCALE 1:100)



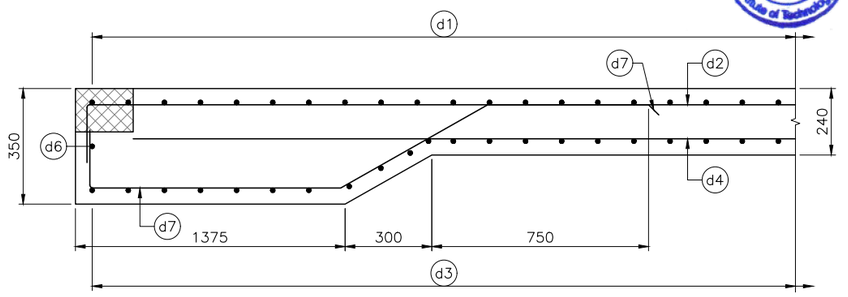
P L A N
(SCALE 1:100)



SECTION AT B-B
(SCALE 1:50)

SCHEDULE OF REINFORCEMENT		
BAR MKD.	BAR DIA & SPACING/NOS.	BAR SHAPE
d1	16 ϕ @ 120 C/C	150 — 150
d2	10 ϕ @ 200 C/C	200 — 200
d3	16 ϕ @ 120 C/C	150 — 150
d3a	12 ϕ @ 100 C/C	200 — 200
d4	10 ϕ @ 200 C/C	
d5	12 ϕ 4x2x4 NOS.	100 — 100
d6	12 ϕ 2x1 NOS.	
d7	10 ϕ @ 100 C/C	200

LEGEND:-	
TOP BAR	———
BOTTOM BAR OTHERWISE MENTIONED	– – – – – – – – – – – –



DETAIL-``X"
(SCALE 1:15)

DESIGN DIRECTOR

Shambhavi Techno Solutions Pvt. Ltd.
Managing Director

SUVADRA CONSULTANTS Regd. No- 111/2004-05 BHUBANESWAR

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Professor
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Indian Institute of Technology Guwahati
Guwahati-781039

Indian Institute of Technology Guwahati Civil Engineering Dept.

NOTES:-

1. ALL DIMENSIONS ARE IN mm AND CHAINAGES ARE IN Km, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NO DIMENSION IS TO BE SCALED.
2. THE REINFORCEMENT SHALL BE OF HYSD BARS (GRADE DESIGNATION Fe–500D) CONFORMING TO IS: 1786.
3. GRADE OF CONCRETE SHALL BE AS BELOW:–
   RCC DECK SLAB M35
4. CLEAR COVER TO OUTERMOST STEEL SHALL BE AS BELOW:–
   RCC DECK SLAB 40mm
5. SPLICING OF REINFORCEMENT SHALL BE DONE EITHER BY OVERLAPPING OR BY USING MECHANICAL COUPLER.
6. LAPPING SHALL BE STAGGERED, BARS SHALL BE LAPPED IN SUCH A WAY THAT NOT MORE THAN 50% OF THE BARS ARE LAPPED AT ANY SECTION. LAP LENGTH SHALL BE PROVIDED AS ``X*D'' MENTIONED IN THE TABLE BELOW, WHERE 'D' IS THE DIA OF THE SMALLER BAR UNLESS OTHERWISE SPECIFIED.

FAVOURABLE BOND CONDITION					
GRADE OF CONCRETE	PERCENTAGE OF LAPPED BARS	<25%	33%	50%	>50%
M35	X	36	41	50	54

UNFAVOURABLE BOND CONDITION					
GRADE OF CONCRETE	PERCENTAGE OF LAPPED BARS	<25%	33%	50%	>50%
M35	X	53	61	74	80

FAVOURABLE ZONE:-
a. RAFT/SLAB BOTTOM MAIN BAR.
UNFAVOURABLE ZONE:-
a. RAFT/SLAB TOP MAIN BAR.
b. WALL/COLUMN MAIN BAR.

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

Rev.	Date	Description
R1	JAN.-22	AE COMMENTS INCORPORATED
R0	JUNE-21	FOR APPROVAL

Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED
3rd Floor, PTI Building,4-Parliament Street, New Delhi-110001

Authority Engineer : Glabal Infra Solutions
E-8/11A,F-2, Global Tower , Trilanga Main Road , Akashganga Colony, Shahpura, Bhopal (462039)
Tel.-0755-4045216

EPC Contractor : Valecha Engineering Ltd
Valecha Chambers, 4th Floor, Plot No B-6, New Link Road, Andheri West, Mumbai - 400053

Safety Consultant : SUVADRA CONSULTANTS (An ISO 9001 : 2008 Certified) (Soil Testing Laboratory & Engineering Consultant) Supervised By Govt. of Orissa Regd. No. 11 of 2004-05
PP-97, Tankapani Road, BBSR-18, Odisha

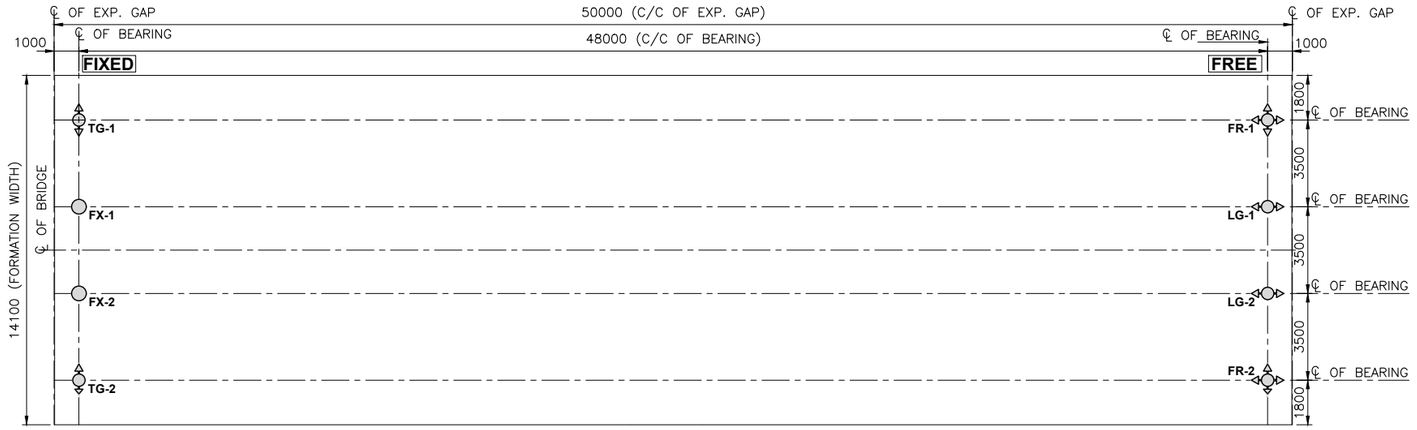
Proof Consultant : SHAMBHAVI TECHNO SOLUTIONS PVT.LTD.
E-82, Rajesh Kumar Path, S.k.Puri, Boring Road, Patna-800001

Design Consultant : SPS Technocrats Pvt. Ltd.
510 & 511, Fifth Floor, JMD Megapolis, Sector 48, Gurgaon, Haryana 122018

Project: DEMWE - BRAHMKUND (NH-13)
CONSTRUCTION OF TWO LANING WITH HARD SHOULDERS OF DEMWE – BRAHMKUND SECTION OF NH-13 FROM CH. 0.000 TO CH 18.464 IN THE STATE OF ARUNACHAL PRADESH ON EPC MODE UNDER NH(O)-NE

Drawn	MS
Designed	SS
Checked	AV
Date:	JUNE-2021

Title: REINFORCEMENT DETAILS OF DECK SLAB FOR SPAN 1X50 EJ TO EJ
Scale: AS SHOWN (01 OF 01)
Rev: R1
Drg. No: VLE/DE-BR/STR/MJB/SUP/306



BEARING LAYOUT PLAN

(SCALE 1:175)

A.1 Typical Load Data Format

1.	***Bearing Identification mark***			⊗	⊹	⊸	⌽
	Type of Bearing			Fixed Bearing	Free Bearing	Long Guided	Trans Guided
2.	***Number Off***			2	2	2	2
3.	***Seating Material and Character Strength***		*Upper Surface*	Structural steel	Structural steel	Structural steel	Structural steel
			Lower Surface	Concrete	Concrete	Concrete	Concrete
4.	***Allowable contact Pressure (N/sqmm)***	Upper Surface	*Serviceability*	356	356	356	356
			Ultimate	450	450	450	450
		Lower Surface	*Serviceability*	20.1	20.1	20.1	20.1
			Ultimate	45	45	45	45
5.	***Design Load (kN)***	*Serviceability Limit State (SLS)*	*Vertical (EXCL. SV loading)*	*Max*	2382	2382	2382	2382
				Permanent	1550	1550	1550	1550
				Min	1198	1198	1198	1198
			Horizontal (EXCL. SV loading)	*Longitudinal*	144	0	0	144
				Transverse	0	0	0	0
			Vertical (SV loading)	*Max*	2807	2807	2807	2807
				Permanent	1550	1550	1550	1550
				Min	1183	1183	1183	1183
			Horizontal (SV loading)	*Longitudinal*	0	0	0	0
				Transverse	0	0	0	0
		Ultimate Limit State (ULS)	*Vertical (EXCL. SV loading)*	*Max*	4314	4314	4314	4314
				Permanent	2119	2119	2119	2119
				Min	88	88	88	88
			Horizontal (EXCL. SV loading)	*Longitudinal*	2148	0	0	2148
				Transverse	2327	0	2327	0
			Vertical (SV loading)	*Max*	3564	3564	3564	3564
				Permanent	2119	2119	2119	2119
				Min	1628	1628	1628	1628
			Horizontal (SV loading)	*Longitudinal*	0	0	**0**	0
				Transverse	0	0	0	**0**
6.	***Displacement (mm)***	*Serviceability Limit State (SLS)*	*Irreversible*	*Longitudinal*	-	15.0	15.0	-
				Transverse	-	1.7	-	1.7
			Reversible	*Longitudinal*	-	16.6	16.6	-
				Transverse	-	1.8	-	1.8
		Ultimate Limit State (ULS)	*Irreversible*	*Longitudinal*	-	20.2	20.2	-
				Transverse	-	2.2	-	2.2
			Reversible	*Longitudinal*	-	22.4	22.4	-
				Transverse	-	2.5	-	2.5
7.	***Rotation (Radians)***	*Serviceability Limit State (SLS)*	*Irreversible*	*Longitudinal*	0.0152	0.0152	0.0152	0.0152
				Transverse	0.0000	0.0000	0.0000	0.0000
			Reversible	*Longitudinal*	0.0039	0.0039	0.0039	0.0039
				Transverse	0.0000	0.0000	0.0000	0.0000
8.	***Maximum Bearing Dimensions (mm), if restricted***	*Upper Surface*		*Longitudinal*	770	770	770	770
				Transverse	770	770	770	770
		Lower Surface		*Longitudinal*	800	800	800	800
				Transverse	800	800	800	800
		Overall Height (Bearing + Pedestal) (mm)			350	350	350	350
9.	***Maximum acceptable reaction to rotation under Serviceability Limit State (kN x m), if restricted***			*Longitudinal*	NA	NA	NA	NA
				Transverse	NA	NA	NA	NA
10.	***Type of Fixing Required***			*Upper Surface*	BEARING PLATE	BEARING PLATE	BEARING PLATE	BEARING PLATE
				Lower Surface	DOWEL/STUD	DOWEL/STUD	DOWEL/STUD	DOWEL/STUD

LEGEND

SYMBOL	DESCRIPTION
○	FIXED BEARING (FX)
⌽	TRANS GUIDED (TG)
⊸	LONG GUIDED (LG)
⊹	FREE BEARING (FB)
TYPE OF BEARING -POT PTFE BEARING	

NOTES:-

1. MATERIAL MODIFICATIONS IN THE STRUCTURE DETAIL e.g. PEDESTAL ETC. FOR COMPATIBILITY WITH THE BEARING DETAIL AS PER MANUFACTURER'S REQUIREMENT SHALL BE PERMITTED SUBJECTED TO APPROVAL OF THE ENGINEER.
2. SPECIFICATION FOR BEARINGS SHALL BE AS PER LATEST TECHNICAL SPECIFICATIONS AND IRC: 83 PART–III.
3. THE TESTING OF RAW MATERIALS, METALLIC COMPONENTS, ELASTOMER, PTFE AND ACCEPTANCE TEST ON BEARING SHALL CONFORM TO MORTH SPECIFICATIONS.
4. MANUFACTURER SHALL SUBMIT THE CERTIFICATE FOR LOAD TESTING AND DIMENSIONS OF BEARINGS.
5. THE GROUT BEDDING MORTAR SHALL BE OF HIGH STRENGTH FREE FLOWING NON SHRINK TYPE.
6. BEARING PLANES SHALL BE MADE TRULY HORIZONTAL ALONG WITH PEDESTAL BY PROPER MECHANISM TO TAKE CARE OF GRADIENT EFFECT.
7. GRADE OF CONCRETE :–
   a. BEARING PEDESTAL M45
8. STRUCTURE IS LOCATED IN SEISMIC ZONE–V.
9. PRECAUTIONS TO BE TAKEN BY THE SITE ENGINEER DURING CONSTRUCTION OF STRUCTURES TILL THE GIRDER ARE BRACED BY DIAPHRAGMS/SLAB.
10. COMPREHENSIVE DATA IN TABLE, COMPRISING OF MAXIMUM/MINIMUM AND CORRESPONDING COEXISTING LOADS, FORCES, MOVEMENT AND ROTATION SHALL BE PROVIDED FOR EACH LOAD CONDITION AND CASE.
11. LEGEND :–
    MOVEMENT + EXPANSION
    – CONTRACTION

PROOF CHECKED
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Professor
Department of Civil Engineering
Indian Institute of Technology Guwahati
Guwahati-781039

DESIGN DIRECTOR

Shambhavi Techno Solutions Pvt. Ltd
Managing Director

SUVADRA CONSULTANTS Regd. No- 11/2004-05 BHUBANESWAR

Rev.	Date	Description
R2	JAN.-22	BEARING TABLE REVISED
R1	JAN.-22	AE COMMENTS INCORPORATED
R0	JUNE-21	FOR APPROVAL

Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED
3rd Floor, PTI Building,4-Parliament Street, New Delhi-110001

Authority Engineer : Global Infra Solutions
E-8/11A,F-2, Global Tower , Trilanga Main Road , Akashganga Colony, Shahpura, Bhopal (462039)
Tel.-0755-4045216

EPC Contractor : Valecha Engineering Ltd
Valecha Chambers, 4th Floor, Plot No B-6, New Link Road, Andheri West, Mumbai - 400053

Safety Consultant : SUVADRA CONSULTANTS (An ISO 9001 : 2008 Certified) (Soil Testing Laboratory & Engineering Consultant) Approved by Govt. of Orissa Regd. No. 11 of 2004-05
PP-97, Tankapani Road, BBSR-18, Odisha

Proof Consultant : SHAMBHAVI TECHNO SOLUTIONS PVT.LTD.
E-82, Rajesh Kumar Path, S.k.Puri, Boring Road, Patna-800001

Design Consultant : SPS Technocrats Pvt. Ltd.
510 & 511, Fifth Floor, JMD Megapolis, Sector 48, Gurgaon, Haryana 122018

Project: DEMWE - BRAHMKUND (NH-13)
CONSTRUCTION OF TWO LANING WITH HARD SHOULDERS OF DEMWE - BRAHMKUND SECTION OF NH-13 FROM CH. 0.000 TO CH 18.464 IN THE STATE OF ARUNACHAL PRADESH ON EPC MODE UNDER NH(O)-NE

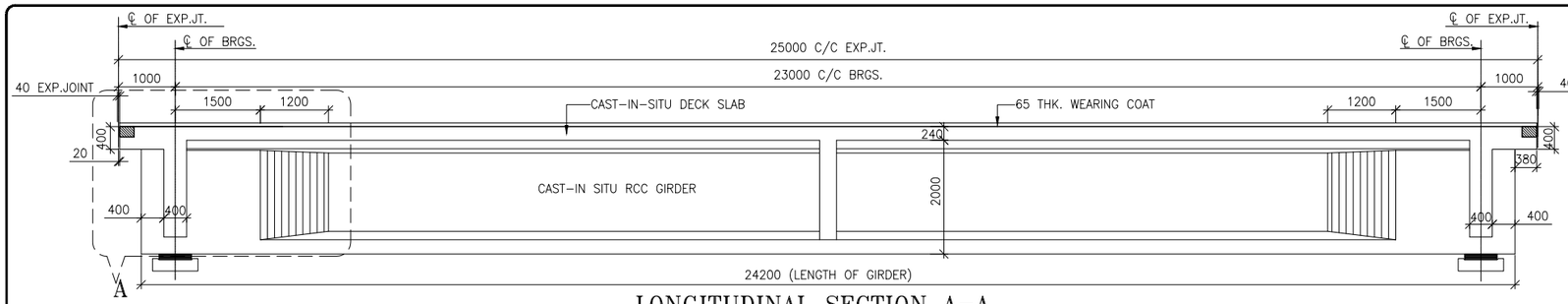
Drawn	MS
Designed	SS
Checked	AV
Date:	JUNE-2021

Title: DETAIL OF POT CUM PTFE BEARING LAYOUT FOR SPAN 1X50 EJ TO EJ

Scale: AS SHOWN (01 OF 01) *Rev:* R2

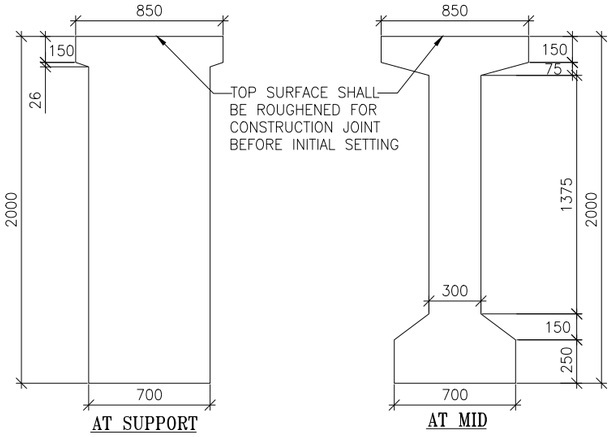
Drg. No: VLE/DE-BR/STR/MJB/SUP/307

SUPER STRUCTURE 25M RCC

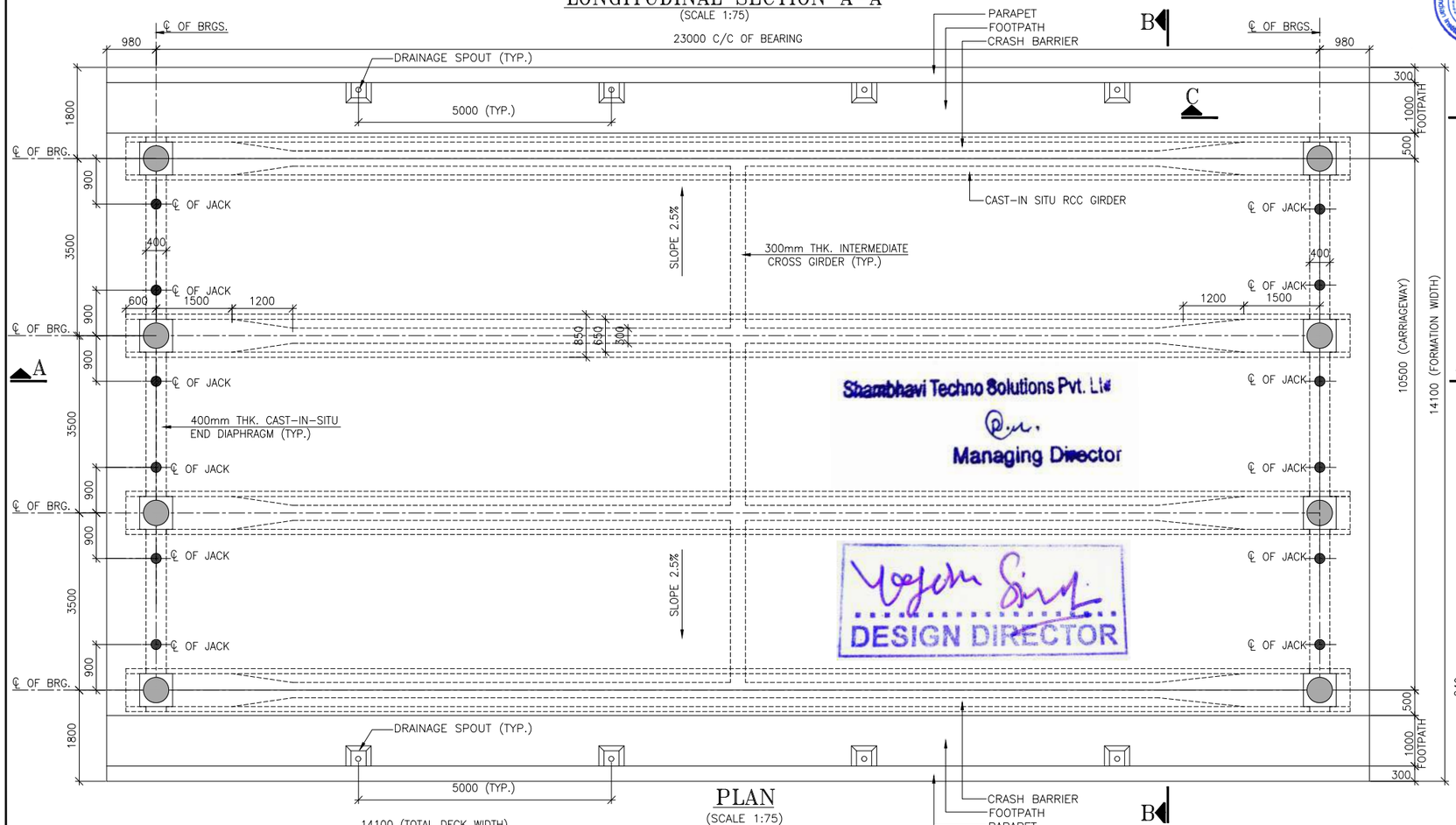


LONGITUDINAL SECTION A–A
(SCALE 1:75)

PROOF CHECKED
Anjan Dutta
Professor
Department of Civil Engineering
Indian Institute of Technology Guwahati
Guwahati-781039



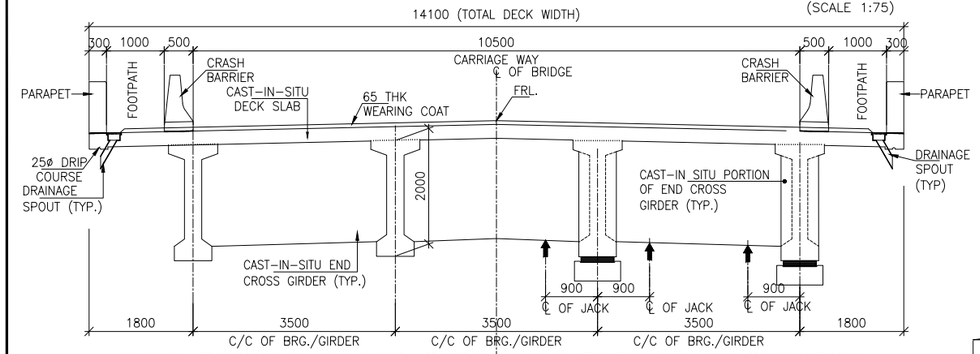
DETAILS OF RCC GIRDER
(SCALE 1:25)



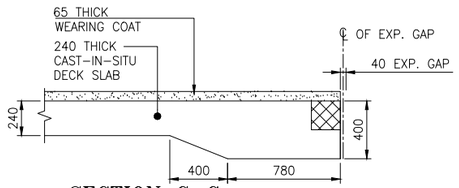
Shambhavi Techno Solutions Pvt. Ltd.
Managing Director

DESIGN DIRECTOR

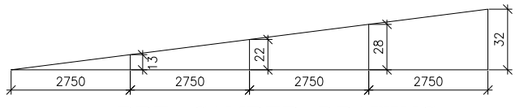
PLAN
(SCALE 1:75)



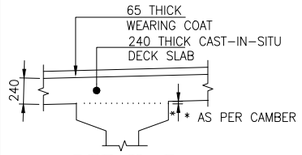
HALF SECTION AT MID SAPN, HALF SECTION AT SUPPORT
SECTION B–B
(SCALE 1:75)



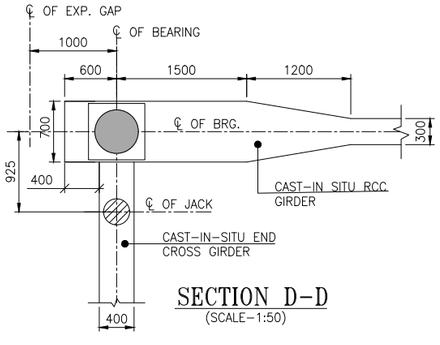
SECTION C–C
(SCALE–1:30)



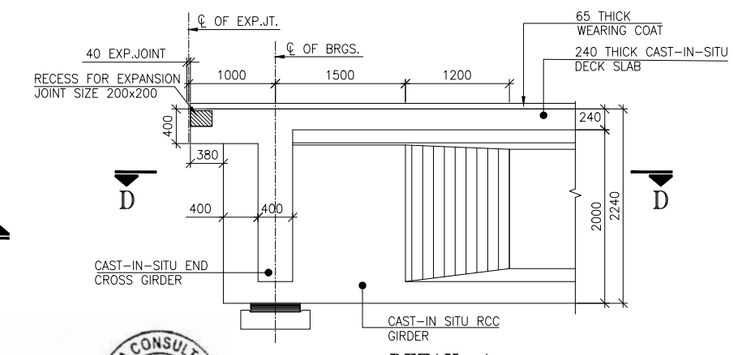
PRE–CAMBER DRAWING
(SCALE 1:100)



DETAIL–B
(SCALE–1:40)



SECTION D–D
(SCALE–1:50)



DETAIL–A
(SCALE–1:50)

SUVADRA CONSULTANTS Regd. No- 11/2004-05 BHUBANESWAR

CONSTRUCTION SEQUENCE:-

I) GIRDER SHALL BE CAST IN SITU SHALL BE CASTED ON STAGING.
II) THE TOP SURFACE OF THE PRECAST GIRDER SHALL BE ROUGHENED BEFORE INITIAL SETTING.
III) GIRDER SHALL BE CASTED AT PERMANENT BEARING AT ABUTMENT AND PIER LOCATION.
IV) DIAPHRAGM AND DECK SHALL BE CAST AT MINIMUM 7 DAYS AFTER CASTING OF RCC GIRDER.
V) SIDL SHALL BE PLACED AT MINIMUM 28 DAYS AFTER CASTING OF DECK SLAB.
VI) THE BRIDGE SHALL BE OPEN FOR SERVICE MINIMUM 28 DAYS AFTER PLACING OF SIDL.

NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETERS, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
2. ⊗ SHOWN JACK LOCATION IN PLAN , SHOWN TEMPERORY SUPPORT LOCATION IN PLAN AND SHOWN JACK LOCATION IN ELEVATION.
3. CONC.GRADE FOR GIRDER & DECK SLAB SHALL BE M–35. CROSS GIRDER M–35
4. DRAWING SHALL BE READ IN CONJUNCTION WITH GAD & REINF.DETAIL DRAWING.
5. R/F SHALL BE HYSD BARS OF FE 500D GRADE CONFORMING TO IS1786.
6. THE FOLLOWING LOADS HAVE BEEN CONSIDERED IN THE DESIGN:–
   a. THREE LANE OF CLASS A
   b. TWO LANE OF CLASS A
7. 65mm THICK WEARING COAT. BITUMINOUS CONCRETE 40mm THICK OVERLAID WITH 25mm THICK MASTIC ASPHALT.
8. JACK CAPACITY SHOULD NOT BE LESS THEN 80MT.
9. EXPOSURE CONDITION SEVERE.

REFERENCE DRAWINGS:-

i). GENERAL ARRANGEMENT DRAWING.
VLE/DE–BR/STR/MJB/2+085/GAD/100 (SH. 1 OF 2)
VLE/DE–BR/STR/MJB/2+085/GAD/100 (SH. 2 OF 2)
ii). REINF. DETAILS OF SUPER STRUCTURE (LONGITUDINAL GIRDER)
VLE/DE–BR/STR/SUP/25M/RCC/302. (SH.1 OF 1)
iii). REINF. DETAILS OF SUPER STRUCTURE (END CROSS GIRDER)
VLE/DE–BR/STR/SUP/25M/RCC/303. (SH. 1 OF 1)
iv). REINF.DETAILS OF SUPER STRUCTURE(INTERMEDIATE CROSS GIRDER)
VLE/DE–BR/STR/SUP/25M/RCC/304.
v). REINF. DETAILS OF SUPER STRUCTURE (DECK SLAB)
VLE/DE–BR/STR/SUP/25M/RCC/305. (SH. 1 OF 1)

Rev.	Date	Description
R0	DEC. 2021	FOR APPROVAL

Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED
3rd Floor, PTI Building,4-Parliament Street, New Delhi-110001

Authority Engineer : Global Infra Solutions
E-8/11A,F-2, Global Tower , Trilanga Main Road , Akashganga Colony, Shahpura, Bhopal (462039)
Tel.-0755-4045216

EPC Contractor : Valecha Engineering Ltd
Valecha Chambers, 4th Floor, Plot No B-6, New Link Road, Andheri West, Mumbai - 400053

Safety Consultant : SUVADRA CONSULTANTS
(An ISO 9001 : 2008 Certified) (Soil Testing Laboratory & Engineering Consultant) Approved By Govt. of Orissa Regd. No. 11 of 2004-05
PP-97, Tankapani Road, BBSR-18, Odisha

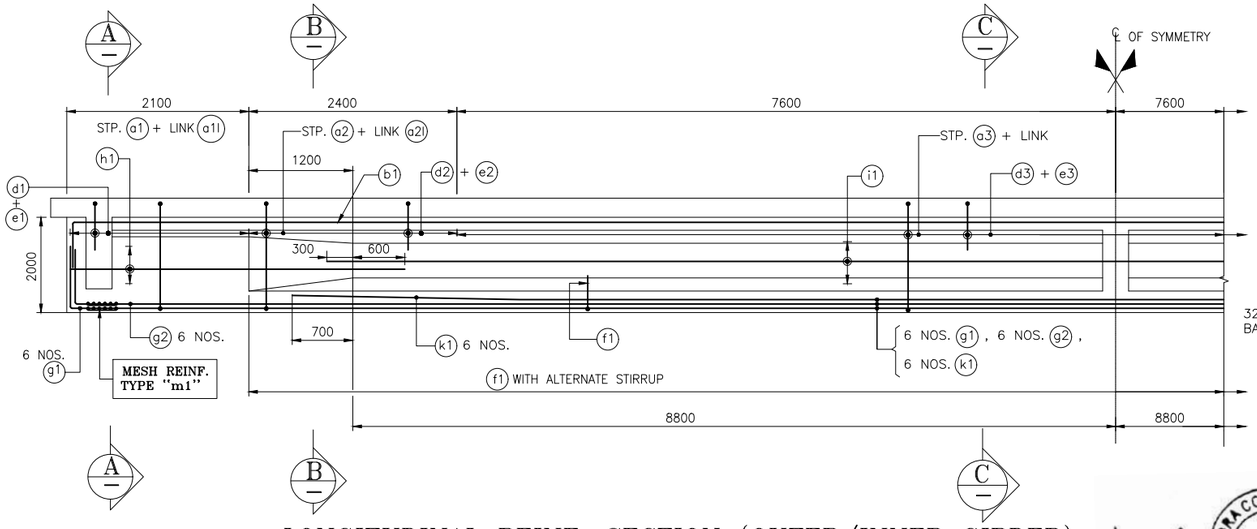
Proof Consultant : SHAMBHAVI TECHNO SOLUTIONS PVT.LTD.
E-82, Rajesh Kumar Path, S.k.Puri, Boring Road, Patna-800001

Design Consultant : SPS Technocrats Pvt. Ltd.
510 & 511, Fifth Floor, JMD Megapolis, Sector 48, Gurgaon, Haryana 122018

Project: DEMWE - BRAHMKUND (NH-13)
CONSTRUCTION OF TWO LANING WITH HARD SHOULDERS OF DEMWE - BRAHMKUND SECTION OF NH-13 FROM CH. 0.000 TO CH 18.464 IN THE STATE OF ARUNACHAL PRADESH ON EPC MODE UNDER NH(O)-NE

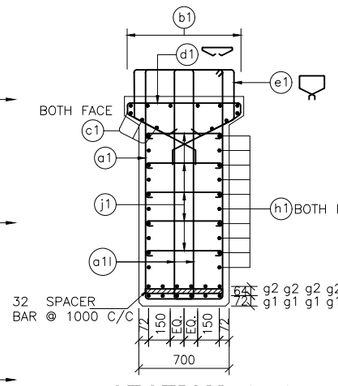
Drawn	MP
Designed	G.P.V
Checked	A.V
Date:	DEC. 2021

Title: DIMENSION DETAILS OF SUPER STRUCTURE 25M SPAN RCC GIRDER
Scale: AS SHOWN
Rev: R0
01 OF 06
Drg. No: VLE/DE-BR/STR/SUP/25M/RCC/301



LONGITUDINAL REINF. SECTION (OUTER/INNER GIRDER)

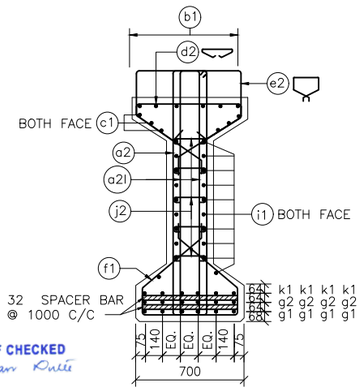
(SCALE–1:50)



SECTION A–A

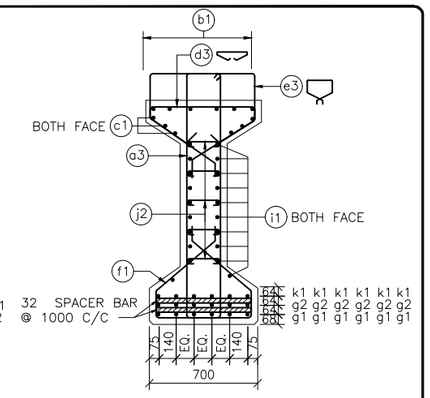
(SCALE 1:30)

PROOF CHECKED
Anjan Dutta
Professor
Department of Civil Engineering
Indian Institute of Technology Guwahati
Guwahati-781039



SECTION B–B

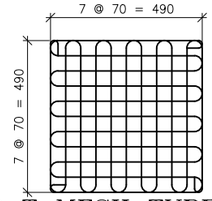
(SCALE 1:25)



SECTION C–C

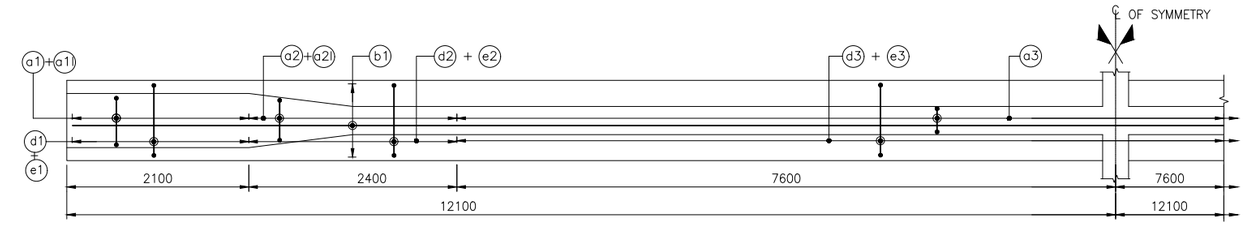
(SCALE 1:25)

Shambhavi Techno Solutions Pvt. Ltd.
Managing Director



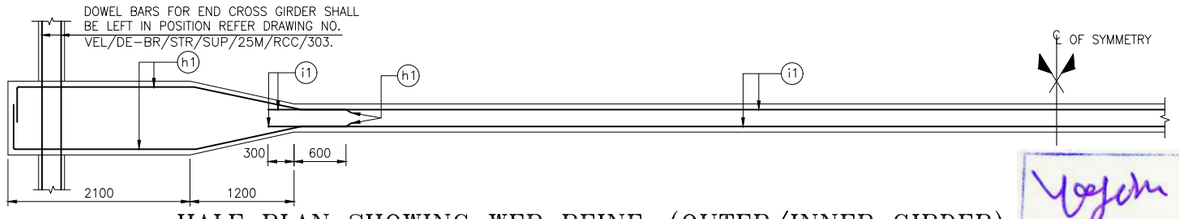
10 ℄ MESH TYPE "M1"

(IN TWO LAYERS ABOVE BEARING)
(SCALE 1:20)



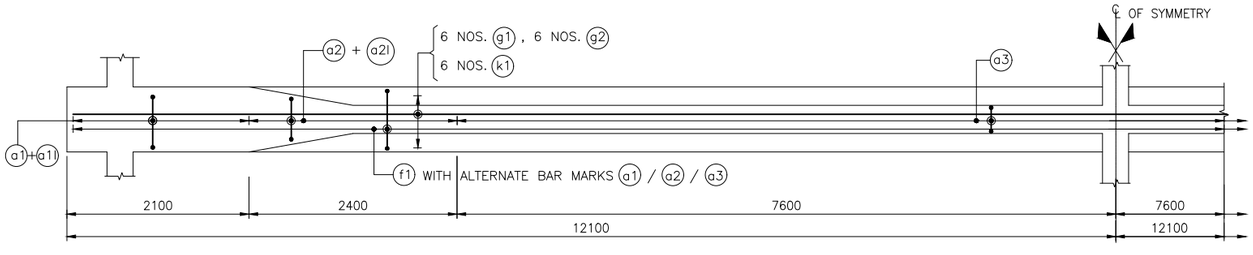
HALF PLAN SHOWING TOP FLANGE REINF. (OUTER/INNER GIRDER)

(SCALE–1:50)



HALF PLAN SHOWING WEB REINF. (OUTER/INNER GIRDER)

(SCALE–1:50)



HALF PLAN SHOWING BOTTOM FLANGE REINF. (OUTER/INNER GIRDER)

(SCALE–1:50)

SUVADRA CONSULTANTS Regd. No- 11/2004-05 BHUBANESWAR

DESIGN DIRECTOR

REINF. SCHEDULE:–

BAR MKD.	DIA (mm)	SPACING (mm)	SHAPE
a1	2 LEGGED 12℄ STIRRUP @ 120 C/C		
a2	2 LEGGED 12℄ STIRRUP @ 120 C/C		
a3	2 LEGGED 12℄ STIRRUP @ 130 C/C		
a1l	12℄ LINKS @ 120 C/C		
a2l	12℄ LINKS @ 120 C/C		
a3l	NOT IN USED		
b1	16	6 NOS.	900 900
c1	12	2x3 NOS.	
d1	12	120 C/C	
d2	12	120 C/C	
d3	12	130 C/C	
e1	12	120 C/C	100
e2	12	120 C/C	100
e3	12	130 C/C	100
f1	12ø WITH ALTERNATE BAR MARKS a1 , a2 , a3		100
g1	32	6 NOS.	900 900
g2	32	6 NOS.	900 900
h1	12	2x10 NOS.	400
i1	12	2x10 NOS.	400
j1	10 ℄ LINKS–5 NOS. WITH EVERY 5th STIRRUP (STAGGERD)		
j2	10 ℄ LINKS–5 NOS. WITH EVERY 5th STIRRUP (STAGGERD)		
k1	32	6 NOS.	100 700 700 100

NOTES:–

1. ALL DIMENSIONS ARE IN MILLIMETERS, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
2. MESH TYPE 'M1' & 'M2' SHALL BE PROVIDED IN SUPER STRUCTURE ABOVE PIN/METALLIC GUIDED BEARING LOCATION & JACK LOCATION, IN TWO LAYER, AT 20mm AND AT 100mm FROM OUTER FACE OF GIRDER.
3. CLEAR COVER FOR REINF. 40MM
4. REINF. FOR CRASH BARRIER SHOULD BE PROPERLY ANCHORED IN DECK SLAB BE FORE CASTING THE SLAB.
3. LAPPING SHALL BE STAGGERED, BARS SHALL BE LAPPED IN SUCH A WAY THAT NOT MORE THEN 50% OF THE BARS ARE LAPPED AT ANY SECTION. LAP LENGTH (Lp) SHALL BE PROVIDED AS "X*D" MENTIONED IN THE TABLE BELOW. WHERE 'D' IS THE DIA OF THE SMALLER BAR UNLESS OTHERWISE SPECIFIED..

FAVOURABLE BOND CONDITION					
GRADE OF CONCRETE	PERCENTAGE OF LAPPED BARS	<25%	33%	50%	>50%
M30	X	40	46	56	60
M35		36	41	50	54
M40		34	39	48	51
M45		32	37	45	48
M50		29	33	41	44
UNFAVOURABLE BOND CONDITION					
GRADE OF CONCRETE	PERCENTAGE OF LAPPED BARS	<25%	33%	50%	>50%
M30	X	58	67	81	87
M35		53	61	74	80
M40		50	58	70	75
M45		47	54	66	71
M50		42	48	59	63

FAVORABLE ZONE :–
a. RAFT/SLAB BOTTOM MAIN BAR.
UNFAVOURABLE ZONE :–
a. RAFT/SLAB TOP MAIN BAR.
B. WALL/COLUMN MAIN BAR.

REFERENCE DRAWINGS:–

i). GENERAL ARRANGEMENT DRAWING.
VLE/DE–BR/STR/MJB/2+085/GAD/100 (SH. 1 OF 2)
VLE/DE–BR/STR/MJB/2+085/GAD/100 (SH. 2 OF 2)
ii). DIMENSION DETAILS OF SUPER STRUCTURE DRAWING.
VLE/DE–BR/STR/SUP/25M/RCC/301. (SH. 1 OF 1)
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VLE/DE–BR/STR/SUP/25M/RCC/303.(SH. 1 OF 1)
iv). REINF. DETAILS OF SUPER STRUCTURE(INTERMEDIATE CROSS GIRDER)
VLE/DE–BR/STR/SUP/25M/RCC/304. (SH. 1 OF 1)
v). REINF. DETAILS OF SUPER STRUCTURE (DECK SLAB)
VLE/DE–BR/STR/SUP/25M/RCC/305. (SH. 1 OF 1)

Rev.	Date	Description
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Tel.-0755-4045216

EPC Contractor : Valecha Engineering Ltd
Valecha Chambers, 4th Floor, Plot No B-6, New Link Road, Andheri West, Mumbai - 400053

Safety Consultant : SUVADRA CONSULTANTS (An ISO 9001 : 2008 Certified) (Soil Testing Laboratory & Engineering Consultant) approved by Govt. of Orissa Regd. No. 11 of 2004-05
PP-97, Tankapani Road, BBSR-18, Odisha

Proof Consultant : SHAMBHAVI TECHNO SOLUTIONS PVT.LTD.
E-82, Rajesh Kumar Path, S.k.Puri, Boring Road, Patna-800001

Design Consultant : SPS Technocrats Pvt. Ltd.
510 & 511, Fifth Floor, JMD Megapolis, Sector 48, Gurgaon, Haryana 122018

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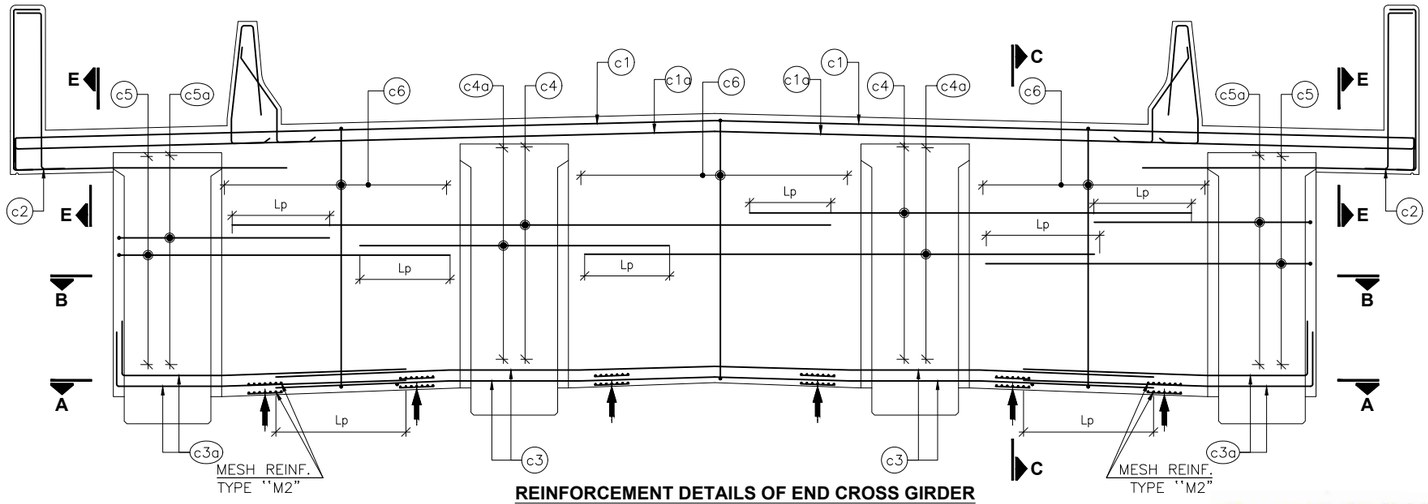
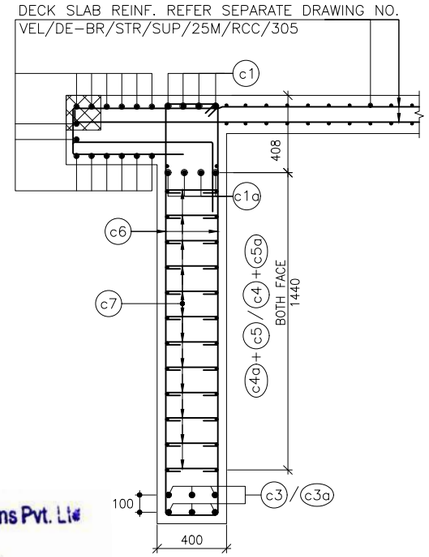
Drawn	MP
Designed	G.P.V
Checked	A.V
Date:	DEC. 2021

Title: REINF. DETAILS OF SUPER STRUCTURE (LONGITUDINAL GIRDER) FOR 25M RCC GIRDER.
Scale: AS SHOWN
02 OF 06
Rev: R0
Drg. No: VLE/DE-BR/STR/SUP/25M/RCC/302



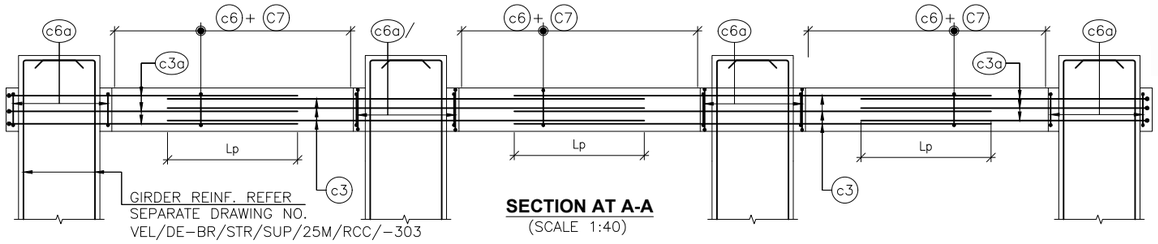
REINFORCEMENT DETAILS OF END CROSS GIRDER
(SCALE 1:40)



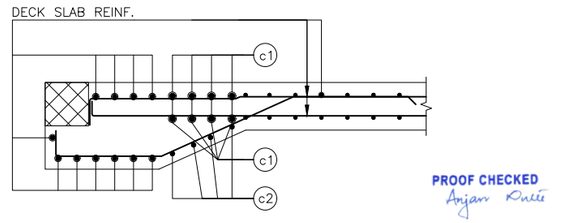
SECTION AT C-C
(SCALE 1:25)

Shambhavi Techno Solutions Pvt. Ltd.
Managing Director

REINFORCEMENT DETAILS		
BAR MKD.	**BAR DIA & SPACING/NOS.**	**BAR SHAPE**
END CROSS GIRDER:-		
c1	16 ϕ 4 NOS.	100 — 100
c2	12 ϕ 4 NOS.	200
c1a	16 @ 4 NOS.	100 — 100
c3	20 ϕ 2x3 NOS. (EQ. IN 2 LAYERS)	
c3a	20 ϕ 2x3 NOS. (EQ. IN 2 LAYERS)	500
c4	16 ϕ @ 120 C/C (ALTERNATE WITH c4a AND c5)	
c4a	16 ϕ @ 120 C/C (ALTERNATE WITH c4 AND c5a)	
c5	16 ϕ @ 120 C/C (ALTERNATE WITH c4 AND c5a)	300
c5a	16 ϕ @ 120 C/C (ALTERNATE WITH c4a AND c5)	300
c6	2L-12 ϕ STIRRUPS @ 150 C/C HORIZONTALLY	
c6a	2L-12 ϕ 2x1 NOS. STIRRUPS EACH GIRDER	
c7	10 ϕ LINKS TIED TO ALTERNATE HORIZONTAL BARS @ 120 C/C HORIZONTALLY IN STAGGERED MANNER	

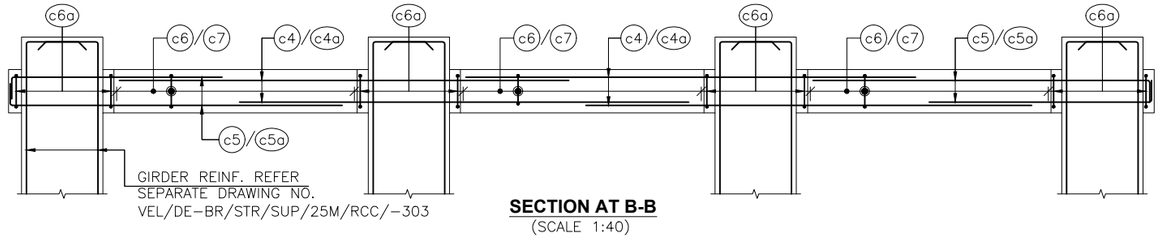


SECTION AT A-A
(SCALE 1:40)



SECTION AT E-E
(SCALE 1:25)

PROOF CHECKED
Anjan Rath
Professor
Department of Civil Engineering
Indian Institute of Technology Guwahati
Guwahati-781039



SECTION AT B-B
(SCALE 1:40)

SUVADRA CONSULTANTS Regd. No- 11/2004-05 BHUBANESWAR

NOTES:-

1. ALL DIMENSION ARE IN MILLIMETERS, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSION TO BE FOLLOWED.
2. REINFORCING STEEL SHALL ONLY BE TMT BARS (GRADE DESIGNATION Fe:500D) CONFORMING TO IS:1786.
3. LAPPING SHALL BE STAGGERED, BARS SHALL BE LAPPED IN SUCH A WAY THAT NOT MORE THEN 50% OF THE BARS ARE LAPPED AT ANY SECTION. LAP LENGTH (Lp) SHALL BE PROVIDED AS "X*D" MENTIONED IN THE TABLE BELOW. WHERE 'D' IS THE DIA OF THE SMALLER BAR UNLESS OTHERWISE SPECIFIED..

FAVOURABLE BOND CONDITION					
GRADE OF CONCRETE	PERCENTAGE OF LAPPED BARS	<25%	33%	50%	>50%
M30	X	40	46	56	60
M35		36	41	50	54
M40		34	39	48	51
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M50		29	33	41	44
UNFAVOURABLE BOND CONDITION					
GRADE OF CONCRETE	PERCENTAGE OF LAPPED BARS	<25%	33%	50%	>50%
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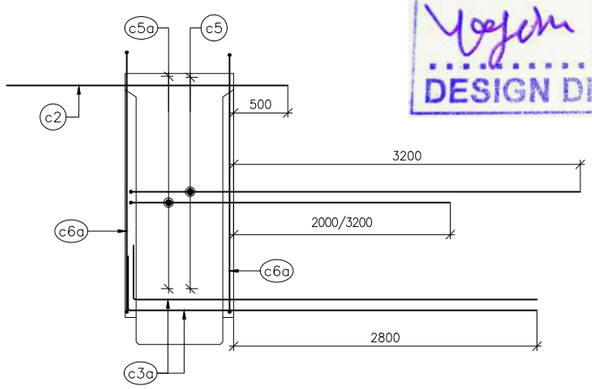
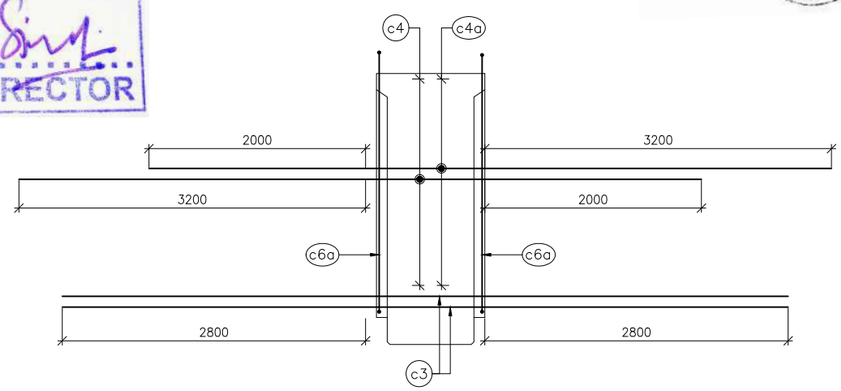
M35		53	61	74	80
M40		50	58	70	75
M45		47	54	66	71
M50		42	48	59	63

FAVORABLE ZONE :-
a. RAFT/SLAB BOTTOM MAIN BAR.
UNFAVOURABLE ZONE :-
a. RAFT/SLAB TOP MAIN BAR.
B. WALL/COLUMN MAIN BAR.

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



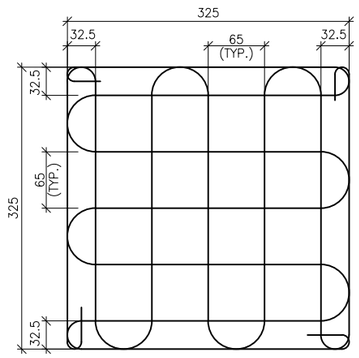
(OUTER GIRDER)



(INNER GIRDER)

Vajeh Singh
DESIGN DIRECTOR

DETAILS OF DOWELS BAR FOR END CROSS GIRDER
(SCALE 1:40)



DETAIL OF 8 ϕ MESH TYPE "M2"
(IN TWO LAYERS AT JACK LOCATION)
(SCALE 1:5)

REFERENCE DRAWINGS:-

i). GENERAL ARRANGEMENT DRAWING.
VLE/DE-BR/STR/MJB/2+085/GAD/100 (SH. 1 OF 2)
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ii). DIMENSION DETAILS OF SUPER STRUCTURE DRAWING.
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Authority Engineer : Glabal Infra Solutions
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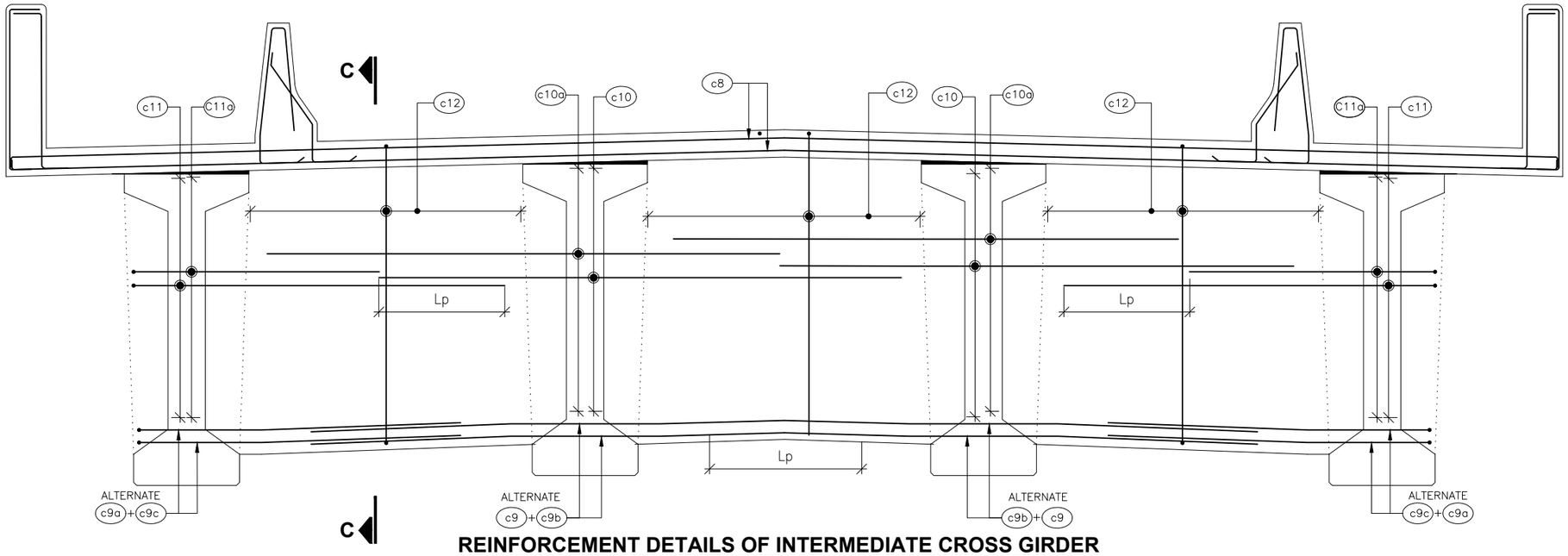
Drawn	MP
Designed	G.P.V
Checked	A.V
Date:	DEC. 2021

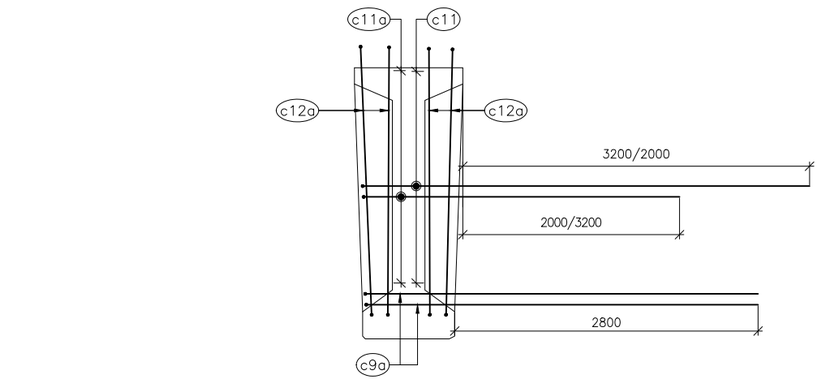
Title: REINF. DETAILS OF END CROSS GIRDER FOR 25M RCC GIRDER
Scale: AS SHOWN
03 OF 06
Rev: R0
Drg. No: VLE/DE-BR/STR/SUP/25M/RCC/303



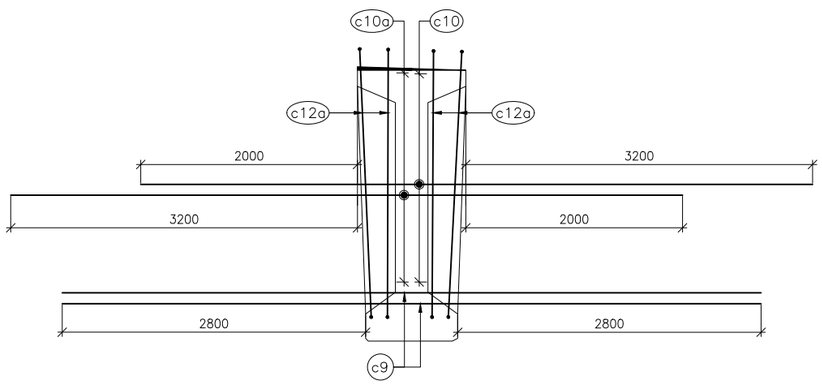
REINFORCEMENT DETAILS OF INTERMEDIATE CROSS GIRDER

(SCALE 1:30)

REINFORCEMENT DETAILS		
BAR MKD.	**BAR DIA & SPACING/NOS.**	**BAR SHAPE**
INTERMEDIATE CROSS GIRDER:-		
c8	20 ϕ 1X3 NOS. (EQ. IN 1st LAYER)	100 — 100
c8a	20 ϕ 1x3 NOS. (EQ. IN 2nd LAYERS)	100 — 100
c9	25 ϕ 1x3 NOS. (EQ. IN 1st LAYERS)	—
c9a	25 ϕ 1x3 NOS. (EQ. IN 1st LAYERS)	200
c9b	25 ϕ 1x3 NOS. (EQ. IN 2nd LAYERS)	200
c9c	25 ϕ 1x3 NOS. (EQ. IN 2nd LAYERS)	200
c10	16 ϕ @ 100 C/C (ALTERNATE WITH c10a AND c11a)	—
c10a	16 ϕ @ 100 C/C (ALTERNATE WITH c10 AND c11)	—
c11	16 ϕ @ 100 C/C (ALTERNATE WITH c10a AND c11a)	200
c11a	16 ϕ @ 100 C/C (ALTERNATE WITH c10 AND c11)	200
c12	2L–10 ϕ STIRRUPS @ 160 C/C HORIZONTALLY	
c12a	2L–12 ϕ 2x2 NOS. STIRRUPS EACH GIRDER	
c13	10 ϕ LINKS TIED TO ALTERNATE HORIZONTAL BARS @ 150 C/C HORIZONTALLY IN STAGGERED MANNER	



(OUTER GIRDER)

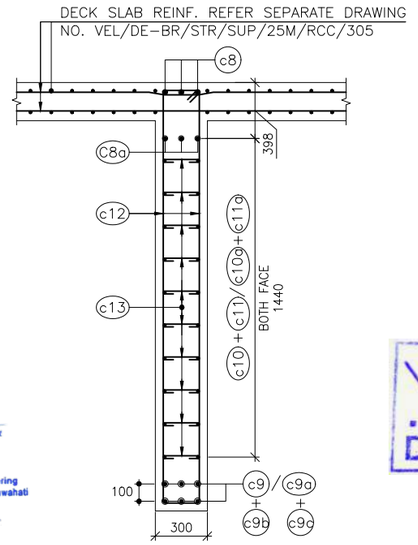


(INNER GIRDER)

DETAILS OF DOWELS BAR FOR INTERMEDIATE CROSS GIRDER

(SCALE 1:40)

Shambhavi Techno Solutions Pvt. Ltd.
Managing Director



SECTION AT F-F

(SCALE 1:25)

PROOF CHECKED
Anjan Dutta
Professor
Department of Civil Engineering
Indian Institute of Technology Guwahati
Guwahati-781039

SUVADRA CONSULTANTS Regd. No. 11/2004-05 BHUBANESWAR

DESIGN DIRECTOR

NOTES:-

1. ALL DIMENSION ARE IN MILLIMETERS, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSION TO BE FOLLOWED.
2. REINFORCING STEEL SHALL ONLY BE TMT BARS (GRADE DESIGNATION Fe:500D) CONFORMING TO IS:1786.
3. LAPPING SHALL BE STAGGERED, BARS SHALL BE LAPPED IN SUCH A WAY THAT NOT MORE THEN 50% OF THE BARS ARE LAPPED AT ANY SECTION. LAP LENGTH (Lp) SHALL BE PROVIDED AS "X*D" MENTIONED IN THE TABLE BELOW. WHERE 'D' IS THE DIA OF THE SMALLER BAR UNLESS OTHERWISE SPECIFIED..

FAVOURABLE BOND CONDITION					
GRADE OF CONCRETE	PERCENTAGE OF LAPPED BARS	<25%	33%	50%	>50%
M30	X	40	46	56	60
M35		36	41	50	54
M40		34	39	48	51
M45		32	37	45	48
M50		29	33	41	44
UNFAVOURABLE BOND CONDITION					
GRADE OF CONCRETE	PERCENTAGE OF LAPPED BARS	<25%	33%	50%	>50%
M30	X	58	67	81	87
M35		53	61	74	80
M40		50	58	70	75
M45		47	54	66	71
M50		42	48	59	63

FAVORABLE ZONE :–
a. RAFT/SLAB BOTTOM MAIN BAR.
UNFAVOURABLE ZONE :–
a. RAFT/SLAB TOP MAIN BAR.
B. WALL/COLUMN MAIN BAR.

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

REFERENCE DRAWINGS:-

i). GENERAL ARRANGEMENT DRAWING.
VLE/DE–BR/STR/MJB/2+085/GAD/100 (SH. 1 OF 2)
VLE/DE–BR/STR/MJB/2+085/GAD/100 (SH. 2 OF 2)
ii). DIMENSION DETAILS OF SUPER STRUCTURE DRAWING.
VLE/DE–BR/STR/SUP/25M/RCC/301. (SH. 1 OF 1)
iii). REINF. DETAILS OF SUPER STRUCTURE (END CROSS GIRDER)
VLE/DE–BR/STR/SUP/25M/RCC/303.(SH. 1 OF 1)
iv). REINF. DETAILS OF SUPER STRUCTURE(INTERMEDIATE CROSS GIRDER)
VLE/DE–BR/STR/SUP/25M/RCC/304. (SH. 1 OF 1)
v). REINF. DETAILS OF SUPER STRUCTURE (DECK SLAB)
VLE/DE–BR/STR/SUP/25M/RCC/305. (SH. 1 OF 1)

Rev.	Date	Description
R0	DEC. 2021	FOR APPROVAL

Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED
3rd Floor, PTI Building,4-Parliament Street, New Delhi-110001

Authority Engineer : Global Infra Solutions
E-8/11A,F-2, Global Tower , Trilanga Main Road , Akashganga Colony, Shahpura, Bhopal (462039)
Tel.-0755-4045216

EPC Contractor : Valecha Engineering Ltd
Valecha Chambers, 4th Floor, Plot No B-6, New Link Road, Andheri West, Mumbai - 400053

Safety Consultant : SUVADRA CONSULTANTS (An ISO 9001 : 2008 Certified) (Soil Testing Laboratory & Engineering Consultant) Approved By Govt. of Orissa Regd. No. 11 of 2004-05
PP-97, Tankapani Road, BBSR-18, Odisha

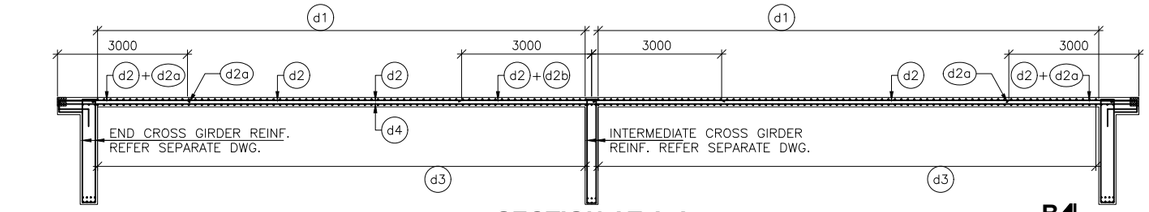
Proof Consultant : SHAMBHAVI TECHNO SOLUTIONS PVT.LTD.
E-82, Rajesh Kumar Path, S.K.Puri, Boring Road, Patna-800001

Design Consultant : SPS Technocrats Pvt. Ltd.
510 & 511, Fifth Floor, JMD Megapolis, Sector 48, Gurgaon, Haryana 122018

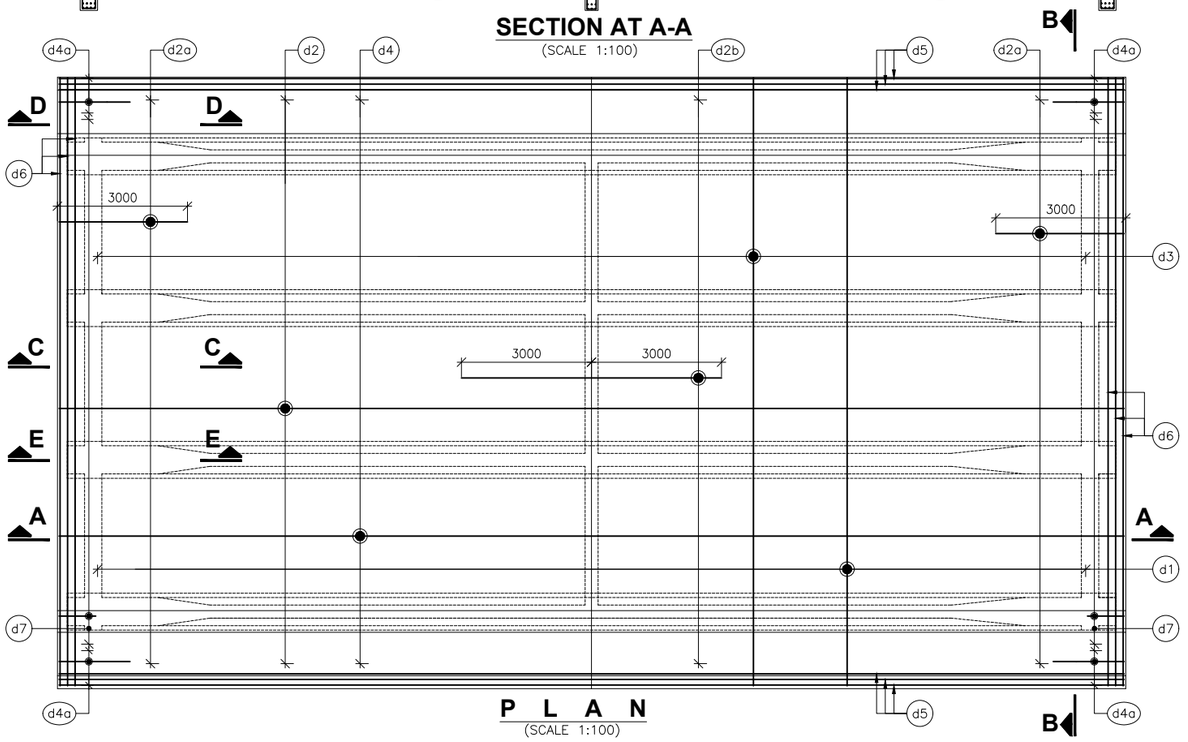
Project: DEMWE - BRAHMKUND (NH-13)
CONSTRUCTION OF TWO LANING WITH HARD SHOULDERS OF DEMWE - BRAHMKUND SECTION OF NH-13 FROM CH. 0.000 TO CH 18.464 IN THE STATE OF ARUNACHAL PRADESH ON EPC MODE UNDER NH(O)-NE

Drawn	MP
Designed	G.P.V
Checked	A.V
Date:	DEC. 2021

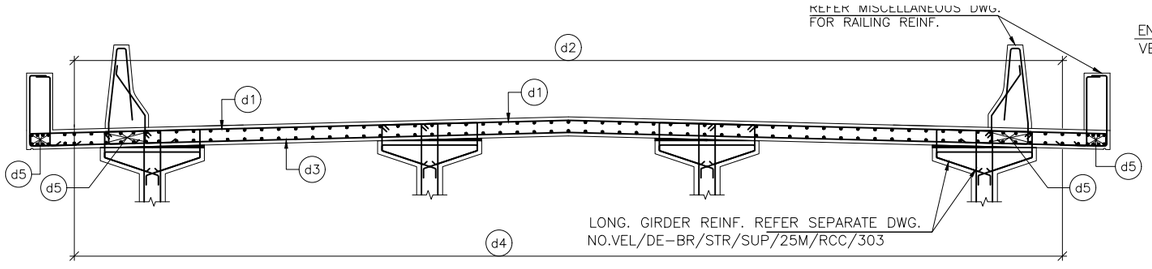
Title: REINF. DETAILS OF INTERMEDIATE CROSS GIRDER FOR 25M RCC GIRDER
Scale: AS SHOWN
04 OF 06
Rev: R0
Drg. No: VLE/DE-BR/STR/SUP/25M/RCC/304



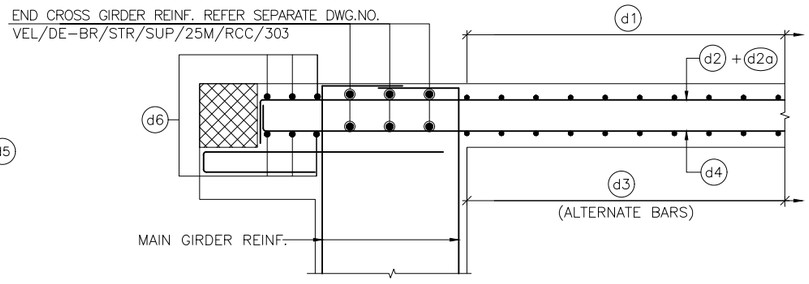
SECTION AT A-A
(SCALE 1:100)



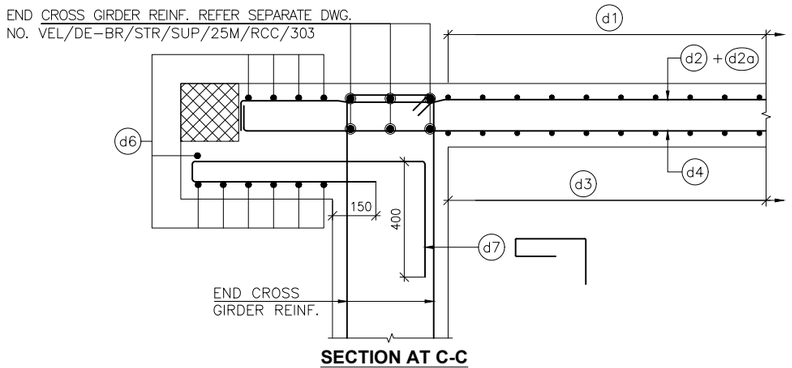
P L A N
(SCALE 1:100)



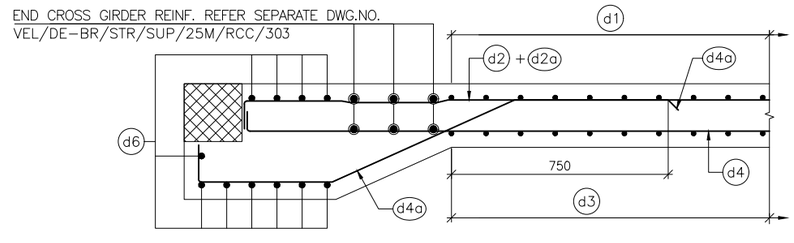
SECTION AT B-B
(SCALE 1:50)



SECTION AT E-E
(SCALE 1:15)



SECTION AT C-C
(SCALE 1:15)



SECTION AT D-D
(SCALE 1:15)

Shambhavi Techno Solutions Pvt. Ltd.
Managing Director

SUVADRA CONSULTANTS BHUBANESWAR Regd. No- 11/2004-05

Yogesh Singh
DESIGN DIRECTOR

PROOF CHECKED
Arijan Dutta
Professor
Department of Civil Engineering
Indian Institute of Technology Guwahati
Guwahati-781039

REINFORCEMENT DETAILS

BAR MKD.	BAR DIA & SPACING/NOS.	BAR SHAPE
d1	16 ϕ @ 150 C/C	100 ⌐ 100
d2	10 ϕ @ 200 C/C	200 ⌐ 200
d2a	10 ϕ @ 200 C/C	200 ⌐
d2b	10 ϕ @ 200 C/C	—
d3	16 ϕ @ 150 C/C	100 ⌐ 100
d4	10 ϕ @ 200 C/C	100 ⌐ 100
d4a	10 ϕ @ 200 C/C	200 ⌐
d5	12 ϕ 2x3 NOS.	100 □ 100
d6	12 ϕ @ 100 C/C	200 □ 200
d7	12 ϕ @ 200 C/C	⌐ OR ⌐

NOTES:-

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M45		47	54	66	71
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a. RAFT/SLAB BOTTOM MAIN BAR.
UNFAVOURABLE ZONE :-
a. RAFT/SLAB TOP MAIN BAR.
B. WALL/COLUMN MAIN BAR.

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

REFERENCE DRAWINGS:-

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VLE/DE-BR/STR/MJB/2+085/GAD/100 (SH. 1 OF 2)
VLE/DE-BR/STR/MJB/2+085/GAD/100 (SH. 2 OF 2)
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VLE/DE-BR/STR/SUP/25M/RCC/301. (SH. 1 OF 1)
iii). REINF. DETAILS OF SUPER STRUCTURE (END CROSS GIRDER)
VLE/DE-BR/STR/SUP/25M/RCC/303.(SH. 1 OF 1)
iv). REINF. DETAILS OF SUPER STRUCTURE(INTERMEDIATE CROSS GIRDER)
VLE/DE-BR/STR/SUP/25M/RCC/304. (SH. 1 OF 1)
v). REINF. DETAILS OF SUPER STRUCTURE (DECK SLAB)
VLE/DE-BR/STR/SUP/25M/RCC/305. (SH. 1 OF 1)

LEGEND:-

TOP BAR	———
BOTTOM BAR OTHERWISE MENTIONED	———
LAP LENGTH	Lp

Rev.	Date	Description
R0	DEC. 2021	FOR APPROVAL

Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED
3rd Floor, PTI Building,4-Parliament Street, New Delhi-110001

Authority Engineer : Glabal Infra Solutions
E-8/11A,F-2, Global Tower , Trilanga Main Road , Akashganga Colony, Shahpura, Bhopal (462039) Tel.-0755-4045216

EPC Contractor : Valecha Engineering Ltd
Valecha Chambers, 4th Floor, Plot No B-6, New Link Road, Andheri West, Mumbai - 400053

Safety Consultant : SUVADRA CONSULTANTS (An ISO 9001 : 2008 Certified) (Soil Testing Laboratory & Engineering Consultant) approved by Govt. of Orissa Regd. No. 11 of 2004-05
PP-97, Tankapani Road, BBSR-18, Odisha

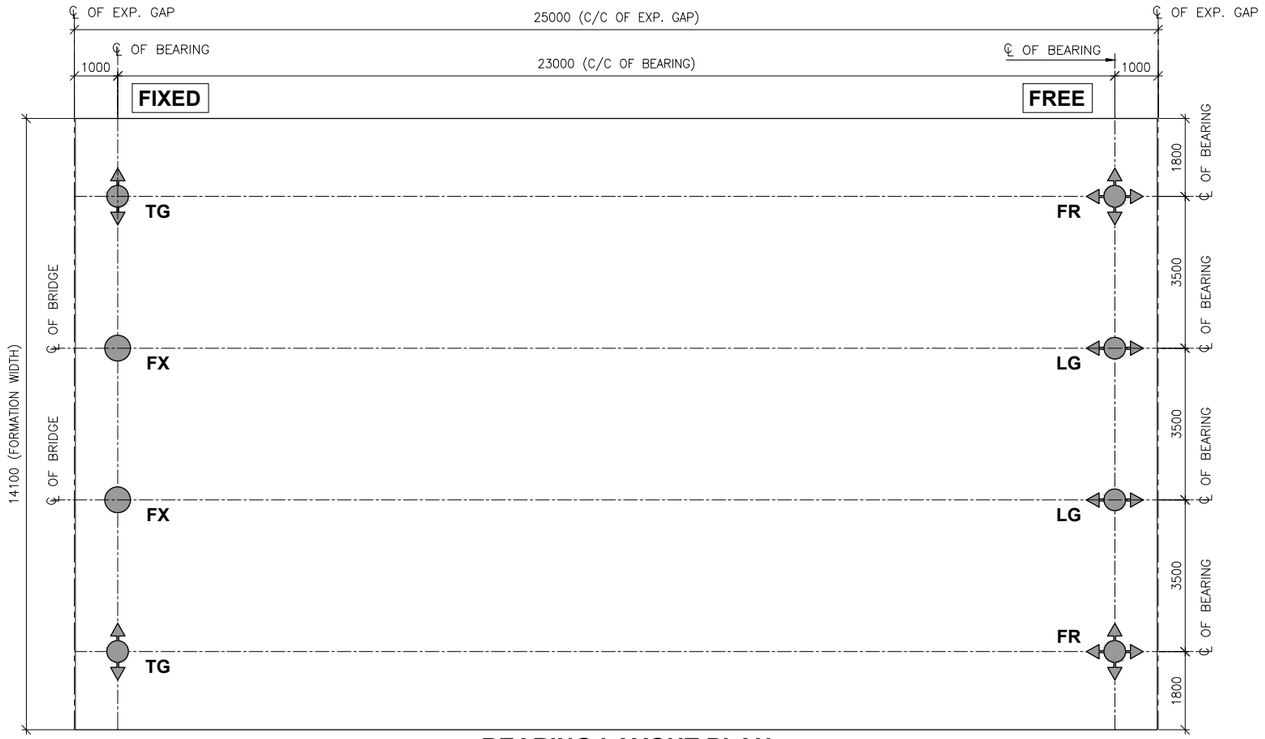
Proof Consultant : SHAMBHAVI TECHNO SOLUTIONS PVT.LTD.
E-82, Rajesh Kumar Path, S.k.Puri, Boring Road, Patna-800001

Design Consultant : SPS Technocrats Pvt. Ltd.
510 & 511, Fifth Floor, JMD Megapolis, Sector 48, Gurgaon, Haryana 122018

Project: DEMWE - BRAHMKUND (NH-13)
CONSTRUCTION OF TWO LANING WITH HARD SHOULDERS OF DEMWE - BRAHMKUND SECTION OF NH-13 FROM CH. 0.000 TO CH 18.464 IN THE STATE OF ARUNACHAL PRADESH ON EPC MODE UNDER NH(O)-NE

Drawn	MP
Designed	G.P.V
Checked	A.V
Date:	DEC. 2021

Title: REINFORCEMENT DETAILS OF DECK SLAB FOR 25M RCC GIRDER
Scale: AS SHOWN
05 OF 06
Rev: R0
Drg. No: VLE/DE-BR/STR/SUP/25M/RCC/305



BEARING LAYOUT PLAN

(SCALE 1:100)

LEGEND

SYMBOL	DESCRIPTION
○	FIXED BEARING (FX)
↕	TRANS GUIDED (TG)
↔	LONG GUIDED (LG)
✥	FREE BEARING (FB)
TYPE OF BEARING -POT PTFE BEARING	

A.1 Typical Load Data Format

1	*Bearing Identification mark*					
	Type of Bearing			Fixed Bearing	Free Bearing	Long Guided	Trans Guided
2	*Number Off*			2	2	2	2
3	*Seating Material and Character Strength*		*Upper Surface*	M35	M35	M35	M35
			Lower Surface	M40	M40	M40	M40
4	*Design Load (kN)*	*Serviceability Limit State (SLS)*	*Vertical (Excl. SV loading)*	*Max*	1482	1482	1482	1482
				Permanent	791	791	791	791
				Min	624	624	624	624
			Horizontal (Excl. SV loading)	*Longitudinal*	100	0	0	100
				Transverse	0	**0**	0	**0**
			Vertical (SV loading)	*Max*	1512	1512	1512	1512
				Permanent	791	791	791	791
				Min	646	646	646	646
			Horizontal (SV loading)	*Longitudinal*	0	0	0	0
				Transverse	0	**0**	0	**0**
		Ultimate Limit State (ULS)	*Vertical (Excl. SV loading)*	*Max*	2141	2141	2141	2141
				Permanent	1076	1076	1076	1076
				Min	143	143	143	143
			Horizontal (Excl. SV loading)	*Longitudinal*	1162	0	0	1162
				Transverse	1278	**0**	1278	**0**
			Vertical (SV loading)	*Max*	1905	1905	1905	1905
				Permanent	1076	1076	1076	1076
				Min	883	883	883	883
			Horizontal (SV loading)	*Longitudinal*	0	0	0	0
				Transverse	0	**0**	0	**0**
5	*Displacement (mm)*	*Serviceability Limit State (SLS)*	*Irreversible*	*Longitudinal*	-	7.2	7.2	-
				Transverse	-	0.6	-	0.6
			Reversible	*Longitudinal*	-	7.9	7.9	-
				Transverse	-	0.6	-	0.6
		Ultimate Limit State (ULS)	*Irreversible*	*Longitudinal*	-	9.7	9.7	-
				Transverse	-	0.8	-	0.8
			Reversible	*Longitudinal*	-	10.7	10.7	-
				Transverse	-	0.8	-	0.8
6	*Rotation (Radians)*	*Serviceability Limit State (SLS)*	*Irreversible*	*Longitudinal*	0.0065	0.0065	0.0065	0.0065
				Transverse	0.0001	0.0001	0.0001	0.0001
			Reversible	*Longitudinal*	0.0077	0.0077	0.0077	0.0077
				Transverse	0.0037	0.0037	0.0037	0.0037

Shambhavi Techno Solutions Pvt. Ltd.
Managing Director

PROOF CHECKED
Anjan Dutta
Professor
Department of Civil Engineering
Indian Institute of Technology Guwahati
Guwahati-781039

SUVADRA CONSULTANTS Regd. No- 11/2004-05 BHUBANESWAR

DESIGN DIRECTOR

Rev.	Date	Description
R2	JAN.-22	BEARING TABLE REVISED
R0	DEC. 2021	FOR APPROVAL

Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED
3rd Floor, PTI Building,4-Parliament Street, New Delhi-110001

Authority Engineer : **Global Infra Solutions**
E-8/11A,F-2, Global Tower , Trilanga Main Road , Akashganga Colony, Shahpura, Bhopal (462039) Tel.-0755-4045216

EPC Contractor : **Valecha Engineering Ltd**
Valecha Chambers, 4th Floor, Plot No B-6, New Link Road, Andheri West, Mumbai - 400053

Safety Consultant : SUVADRA CONSULTANTS (An ISO 9001 : 2008 Certified) (Soil Testing Laboratory & Engineering Consultant) approved by Govt. of Orissa Regd. No. 11 of 2004-05
PP-97, Tankapani Road, BBSR-18, Odisha

Proof Consultant : SHAMBHAVI TECHNO SOLUTIONS PVT.LTD.
E-82, Rajesh Kumar Path, S.k.Puri, Boring Road, Patna-800001

Design Consultant : **SPS Technocrats Pvt. Ltd.**
510 & 511, Fifth Floor, JMD Megapolis, Sector 48, Gurgaon, Haryana 122018

Project: **DEMWE - BRAHMKUND (NH-13)**
CONSTRUCTION OF TWO LANING WITH HARD SHOULDERS OF DEMWE – BRAHMKUND SECTION OF NH-13 FROM CH. 0.000 TO CH 18.464 IN THE STATE OF ARUNACHAL PRADESH ON EPC MODE UNDER NH(O)-NE

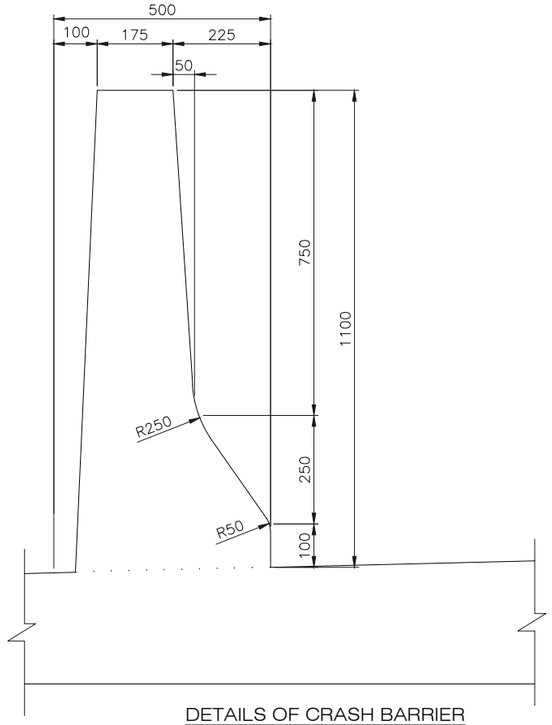
Drawn	MP
Designed	G.P.V
Checked	A.V
Date:	DEC. 2021

Title: DETAIL OF POT CUM PTFE BEARING LAYOUT FOR SPAN 1x25.0 EJ TO EJ

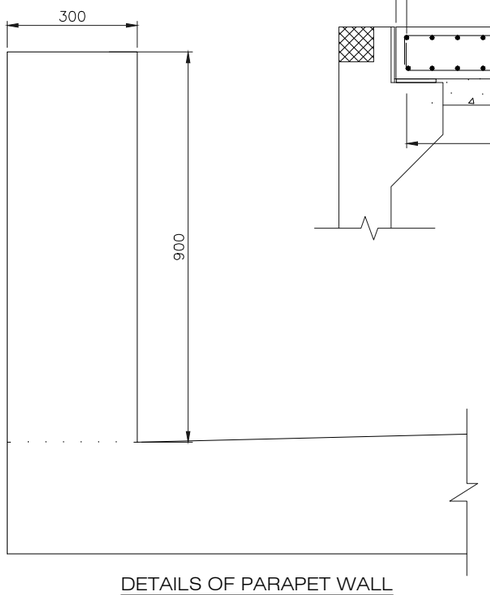
Scale: AS SHOWN — 06 OF 06 — *Rev:* R1

Drg. No: VLE/DE-BR/STR/SUP/25M/RCC/306

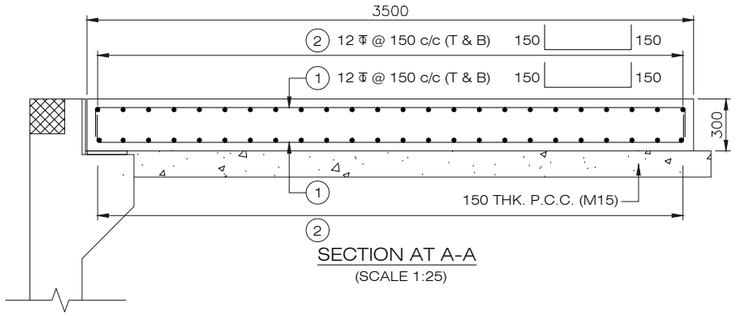
MISCELLANEOUS



DETAILS OF CRASH BARRIER
(SCALE 1:10)



DETAILS OF PARAPET WALL
(SCALE 1:10)



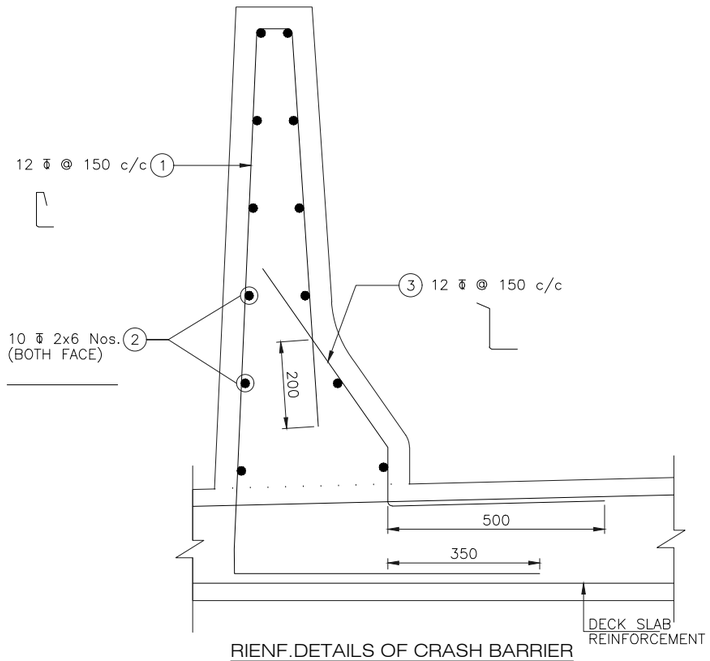
SECTION AT A-A
(SCALE 1:25)

NOTES:-

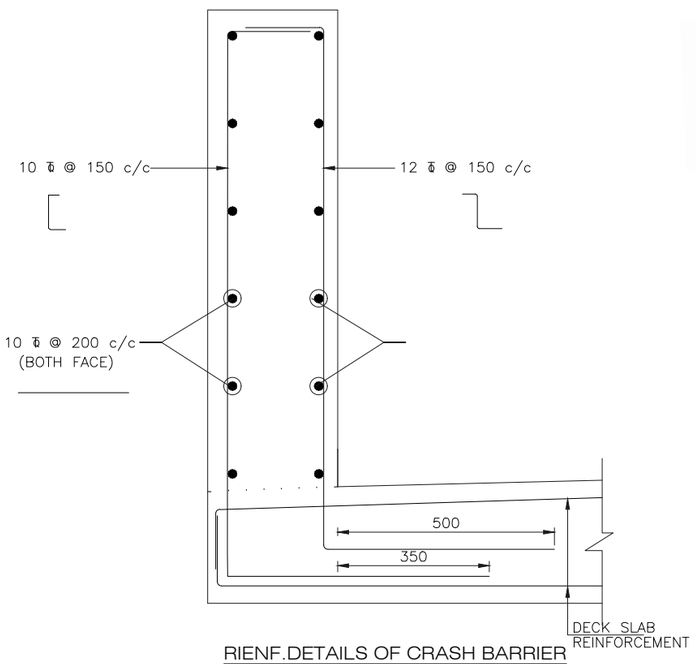
1. ALL DIMENSIONS ARE IN MM.
2. DO NOT SCALE THE DIMENSIONS. ONLY WRITTEN DIMENSIONS SHALL TO BE FOLLOWED.
3. GRADE OF CONCRETE AS INDICATED BELOW:–
   - i) CRASH BARRIER ---------- M40
   - ii) APPROACH SLAB ---------- M30
   - iii) PARAPET WALL ---------- M35
   - iv) PCC LEVELING COURSE ---------- M15
4. GRADE OF REINFORCEMENT STEEL IS HYSD BARS CONFORMING TO IS 1786 WITH Fe–500D.
5. CLEAR COVER TO ANY REINFORCEMENT:
   BASE RAFT = 75mm.
   ALL OTHER COMPONENTS = 50mm.
6. NOT MORE THAN 50% OF BAR SHALL BE LAPPED AT A SECTION AND LAPPING SHALL BE STAGGERED. LAP LENGTH SHALL BE MINIMUM 63 TIMES DIA OF BAR.

DESIGN DIRECTOR

Shambhavi Techno Solutions Pvt. Ltd
Managing Director



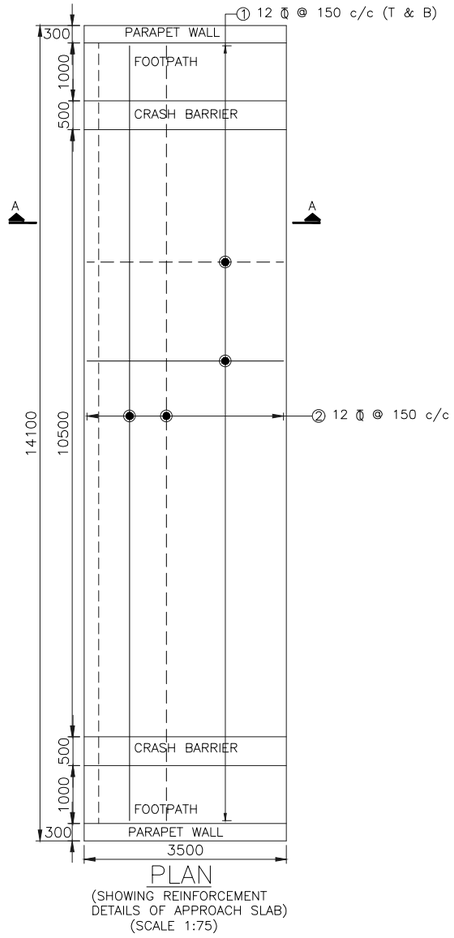
RIENF.DETAILS OF CRASH BARRIER
(SCALE 1:10)



RIENF.DETAILS OF CRASH BARRIER
(SCALE 1:10)

SUVADRA CONSULTANTS Regd. No- 11/2004-05 BHUBANESWAR

PROOF CHECKED
Anjan Rakshit
Professor
Department of Civil Engineering
Indian Institute of Technology Guwahati
Guwahati-781039



PLAN
(SHOWING REINFORCEMENT DETAILS OF APPROACH SLAB)
(SCALE 1:75)

Rev.	Date	Description
R0	JAN.-22	FOR APPROVAL

Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED
3rd Floor, PTI Building,4-Parliament Street, New Delhi-110001

Authority Engineer : Global Infra Solutions
E-8/11A,F-2, Global Tower , Trilanga Main Road , Akashganga Colony, Shahpura, Bhopal (462039)
Tel.-0755-4045216

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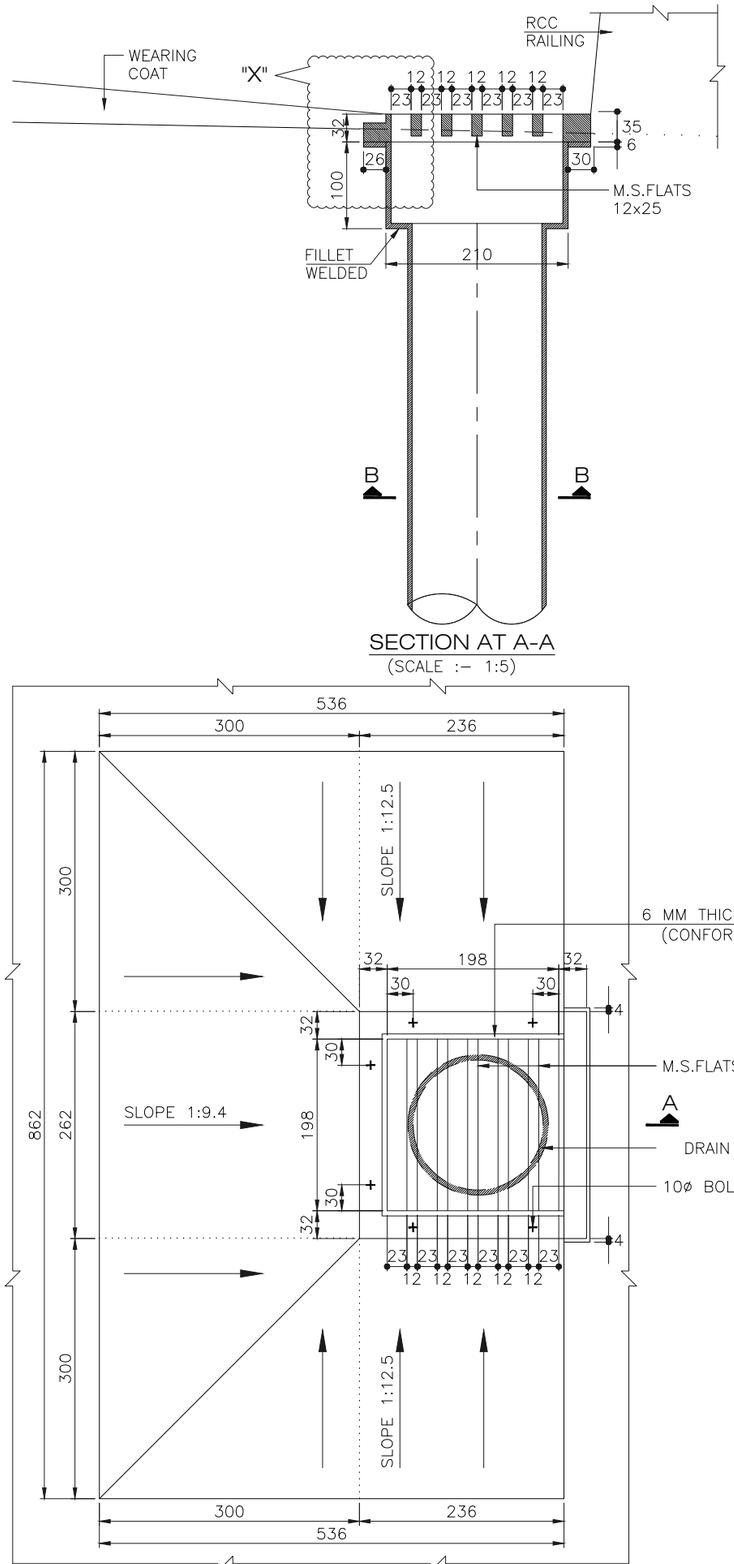
Project: DEMWE - BRAHMKUND (NH-13)
CONSTRUCTION OF TWO LANING WITH HARD SHOULDERS OF DEMWE - BRAHMKUND SECTION OF NH-13 FROM CH. 0.000 TO CH 18.464 IN THE STATE OF ARUNACHAL PRADESH ON EPC MODE UNDER NH(O)-NE

Drawn	MS
Designed	GPV
Checked	AV
Date:	JAN-2022

Title: DIMENSION & REINFORCEMENT DETAILS OF CRASH BARRIER, PARAPET WALL & APPROACH SLAB

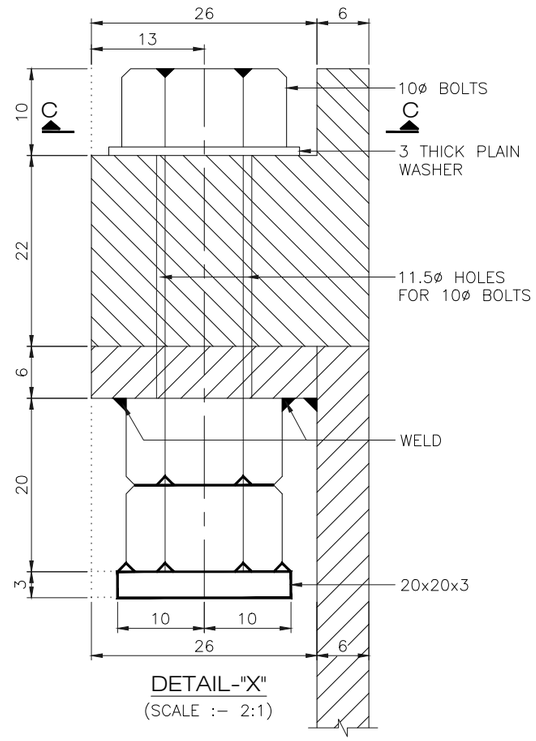
Scale: AS SHOWN — 1 OF 1 — *Rev:* R0

Drg. No: VLE/DE-BR/STR/MJB/MISC/401

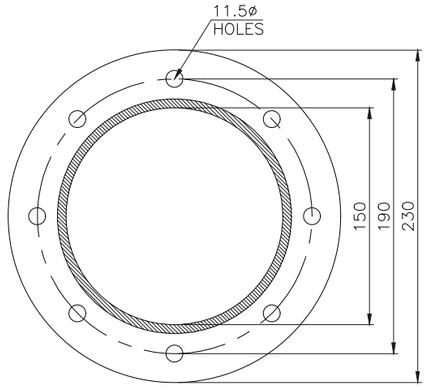


SECTION AT A-A
(SCALE :– 1:5)

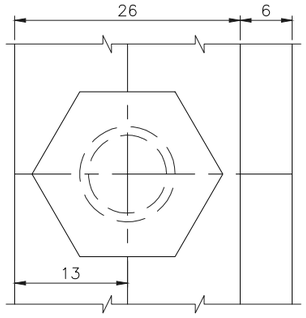
PLAN
(DETAILS OF DRAINAGE SPOUT AND COLLECTION PIT)
(SCALE :– 1:5)



DETAIL-"X"
(SCALE :– 2:1)



SECTION AT B-B
(SCALE :– 1:3)



SECTION AT C-C
(SCALE :– 2:1)

Shambhavi Techno Solutions Pvt. Ltd.
Managing Director

DESIGN DIRECTOR

SUVADRA CONSULTANTS Regd. No- 11/2004-05 BHUBANESWAR

PROOF CHECKED
Professor
Department of Civil Engineering
Indian Institute of Technology Guwahati
Guwahati-781039

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Rev.	Date	Description
R0	JAN.-22	FOR APPROVAL

Client : NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED
3rd Floor, PTI Building,4-Parliament Street, New Delhi-110001

Authority Engineer : Glabal Infra Solutions
E-8/11A,F-2, Global Tower , Trilanga Main Road , Akashganga Colony, Shahpura, Bhopal (462039)
Tel.-0755-4045216

EPC Contractor : Valecha Engineering Ltd
Valecha Chambers, 4th Floor, Plot No B-6, New Link Road, Andheri West, Mumbai - 400053

Safety Consultant : SUVADRA CONSULTANTS (An ISO 9001 : 2008 Certified) (Soil Testing Laboratory & Engineering Consultant) Approved By Govt. of Orissa Regd. No. 11 of 2004-05
PP-97, Tankapani Road, BBSR-18, Odisha

Proof Consultant : SHAMBHAVI TECHNO SOLUTIONS PVT.LTD.
E-82, Rajesh Kumar Path, S.k.Puri, Boring Road, Patna-800001

Design Consultant : SPS Technocrats Pvt. Ltd.
510 & 511, Fifth Floor, JMD Megapolis, Sector 48, Gurgaon, Haryana 122018

Project: DEMWE - BRAHMKUND (NH-13)
CONSTRUCTION OF TWO LANING WITH HARD SHOULDERS OF DEMWE - BRAHMKUND SECTION OF NH-13 FROM CH. 0.000 TO CH 18.464 IN THE STATE OF ARUNACHAL PRADESH ON EPC MODE UNDER NH(O)-NE

Drawn	MS
Designed	GPV
Checked	AV
Date:	JAN-2022

Title: DIMENSION DETAILS OF DRAINAGE SPOUT
Scale: AS SHOWN — 1 OF 1
Rev: R0
Drg. No: VLE/DE-BR/STR/MJB/LOD/402