

Gemma







402

PROJECT:-

FOUR LANING OF JHANJHI TO DEMOW SECTION OF NH-37 FROM EXISTING CH. K 491+050 TO KM 535+250 (DESIGN CH. KM 490+800 TO KM 534+800) IN THE STATE OF ASSAM UNDER EPC MODE.

SUPERSTRUCTURE AT CH. 508+454 (41.550m PSC GIRDER)

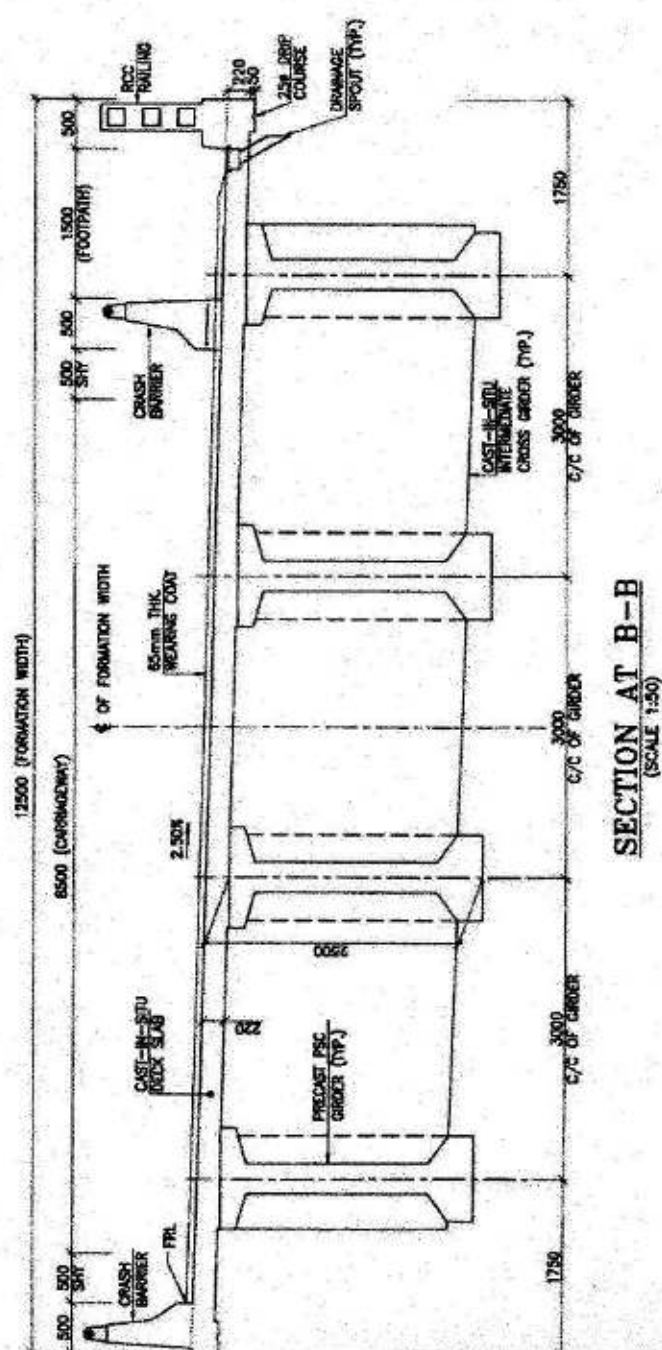
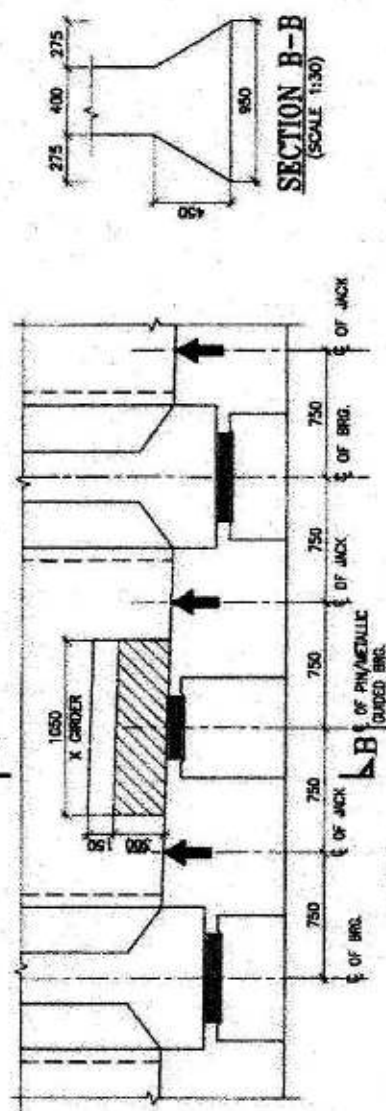
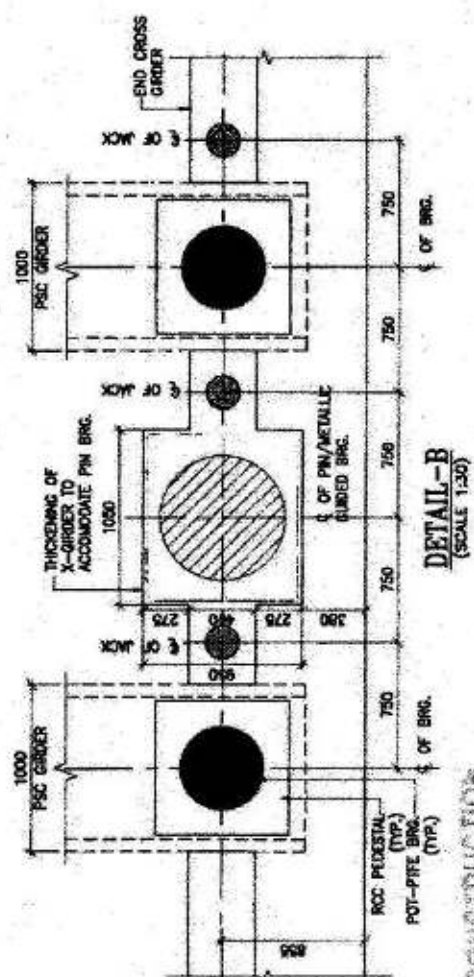
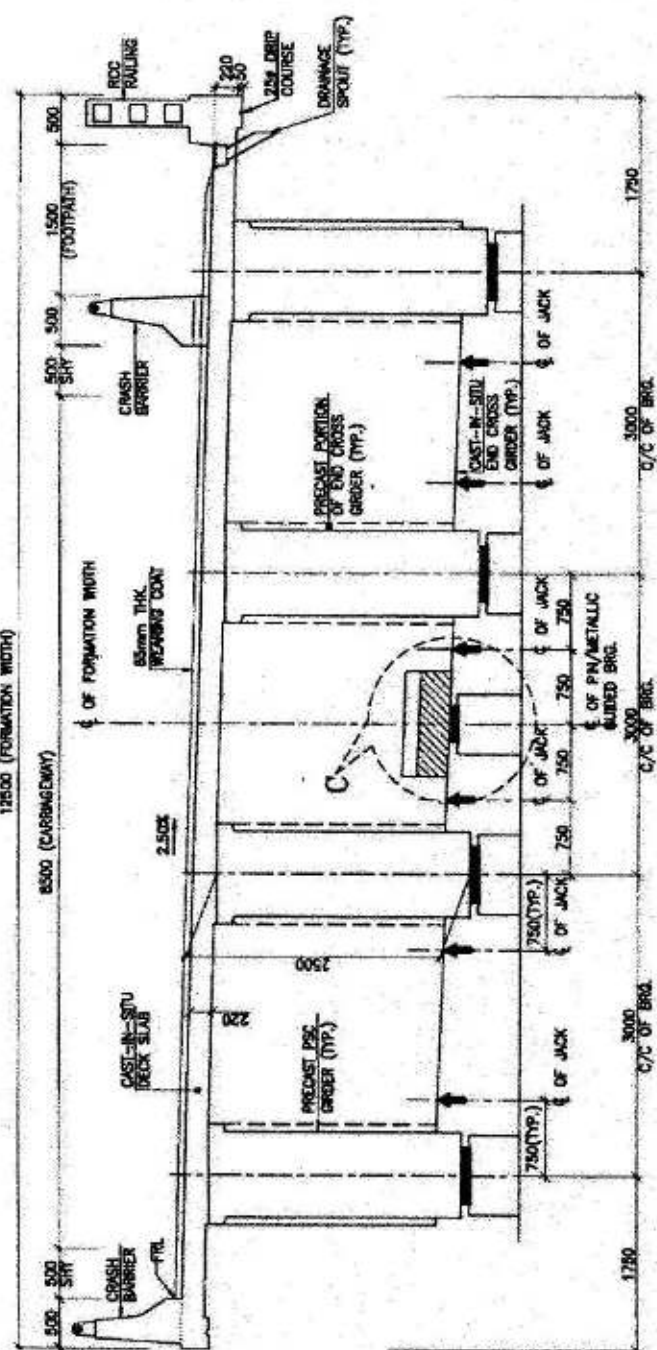
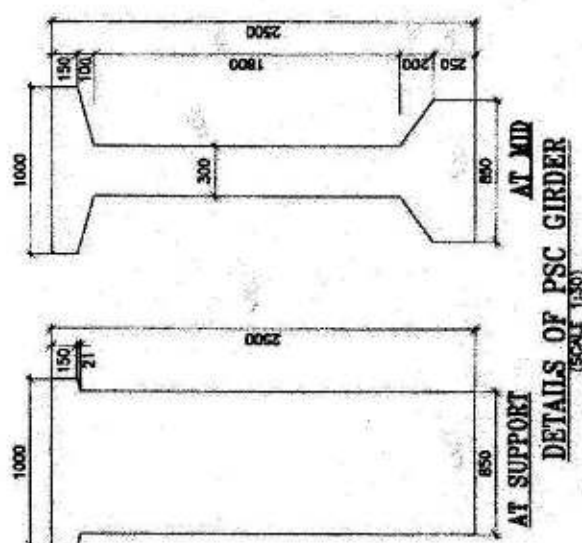
GOOD FOR CONSTRUCTION

CLIENT:  MDEL MINISTRY OF ROAD TRANSPORT & HIGHWAYS GOVERNMENT OF INDIA	NATIONAL HIGHWAYS INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 3RD FLOOR, PTI BUILDING, 4 PARLIAMENT STREET, NEW DELHI-110001)	CONTRACTOR  GANNON DUNKERLEY & CO. LTD 88A, TOPSIA ROAD (SOUTH) HAUTE STREET, 7th FLOOR KOLKATA-700046	DESIGN CONSULTANT  TECSTATIC ENGINEERING CONSULTANTS PRIVATE LIMITED SCO 103 HUDA SHOPPING CENTRE, GURGOAN, SECTOR 55, GURUGRAM, HARYANA 122003
AUTHORITY ENGINEER:  VOYANTS	VOYANTS SOLUTIONS PVT. LTD. 403, 4TH FLOOR, BPTP PARK CENTRA, BLOCK A, JAL VAYU VIHAR SECTOR 30 GURGOAN, HARYANA 122001	SAFETY CONSULTANT:  G-ENG Advisory Services ISO 9001:2008 Certified Company CONSULTANT: G-ENG ADVISORY SERVICES PVT. LTD. SCO-102, HUDA SHOPPING CENTER, SECTOR-56 GURGOAN-122002, HARYANA. TEL:- +91-124-4295802, 4296803 EMAIL: INFO@G-ENG.IN WEB: WWW.G-ENG.IN	PROOF CONSULTANT:  MARC TECHNOCRATS PVT. LTD. MARC HOUSE, SECTOR-6-7 (DIVIDING ROAD), OPPOSITE DEVI LAL PARK, BAHADURGARH, HARYANA 124507

NOTES:-

1. ALL DIMENSIONS ARE IN mm. UNLESS OTHERWISE MENTIONED.
2. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED AND NO DIMENSION SHALL BE SCALED.
3. THE PROPOSED FLYOVER IS DESIGNED FOR THE LIVE LOAD COMBINATIONS GIVEN IN IRC 62014. THE COVERING CONCRETE SHALL BE CONSIDERED FOR DESIGN.
4. CONCRETE SHALL BE DESIGN MIX AND HAVE MINIMUM 28 DAYS CHARACTERISTIC STRENGTH ON 150mm CUBES:--
FOR CAST-IN-SITU DECK SLAB - 40MPa
FOR END & INTERMEDIATE CROSS GIRDER - 40MPa
5. THE REINFORCING STEEL SHALL BE OF HYSD BARS (GRADE DESIGNATION Fe 500D) CONFORMING TO IS:1786.
6. CLEAR COVER TO OUTERMOST STEEL IS 50mm.
7. DURING JACKING OPERATION, JACKS PLACED UNDER ONE END CROSS-GIRDERS SHALL BE OPERATED SIMULTANEOUSLY USING STRESS CONTROL SYSTEM SO AS TO ENSURE THAT THE REACTION ON ALL THE JACKS IS EQUAL AT ALL TIMES.
8. CABLES CONSISTING OF 19 Nos. 12.7mm DIA. 7 PLY CLASS II STRANDS, AS PER IS-14289 SHALL BE USED FOR PRESTRESSING.
9. BEAM SHALL BE KEPT UPRIGHT AT ALL TIMES AND TO BE CLEARLY MARKED INDICATING SPAN, LOCATION, AND RESPECTIVE ENDS BEFORE REMOVAL FROM THE CASTING BED.
10. TOP SURFACE OF GIRDER SHALL BE ROUGHED FOR EFFECTIVE BONDING.
11. ALL THE LENGTHS OF GIRDER & LAYOUT SHALL BE VERIFIED AT SITE BEFORE EXECUTION & ANY DISCREPANCIES MUST BE BROUGHT TO THE NOTICE OF THE CONSULTANT.
12. FOR LIFTING OF THE SUPERSTRUCTURE @ Nos. JACKS AT EACH SIDE OF SPAN SHALL BE USED AS SHOWN IN PLAN. THE CAPACITY OF EACH JACK SHALL BE 200 TON.

REFERENCE DRAWINGS:-



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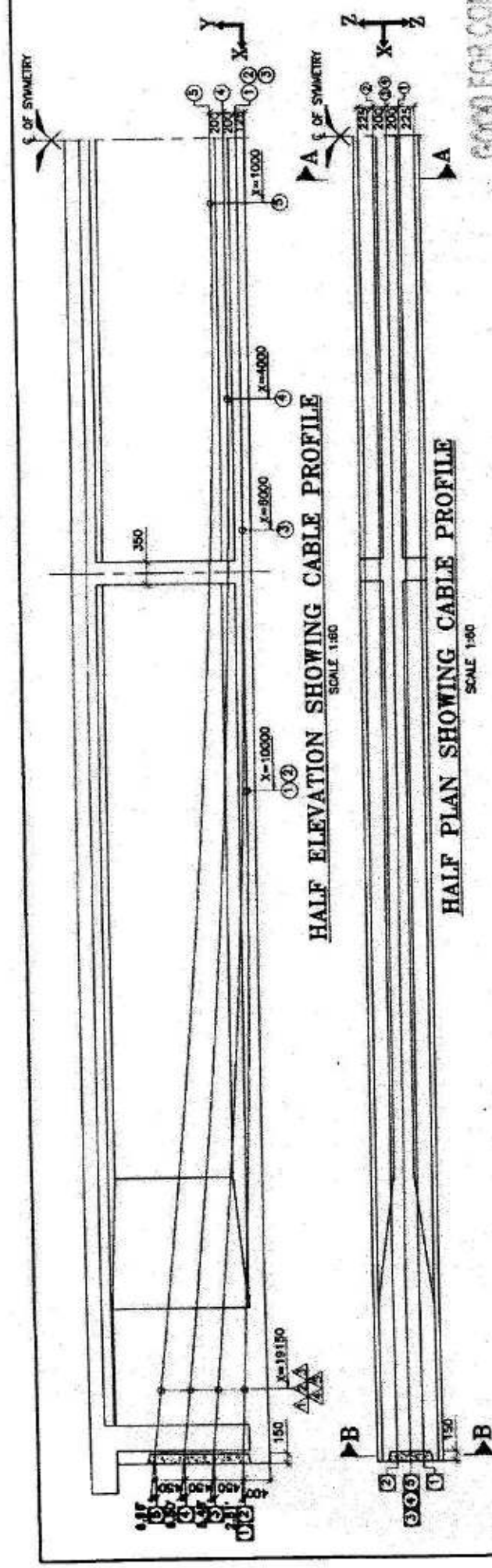


TABLE - I (CABLE CO - ORDINATES)

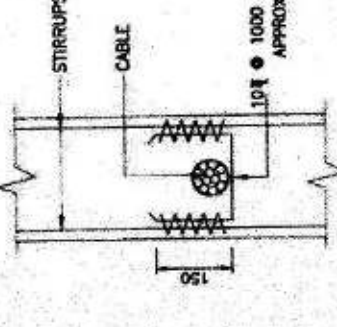
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1	125	200	125	200	125	200	125	200	125	200	125	200	125	200	125	200	125	200	125	200	125	200
2	125	200	125	200	125	200	125	200	125	200	125	200	125	200	125	200	125	200	125	200	125	200
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4	325	0	325	0	325	0	325	0	325	0	325	0	325	0	325	0	325	0	325	0	325	0
5	525	0	525	0	525	0	525	0	525	0	525	0	525	0	525	0	525	0	525	0	525	0

TABLE II -

CABLE NO.	THEORETICAL ELONGATION AT EACH END ΔL (mm)	EMERGENCE ANGLE OF CABLE (°)	NO. OF STRANDS	JACKING FORCE (Tonne)	SEQUENCE OF STRESSING	EMERGENCY OF STRANDS	TOTAL LENGTH OF CABLE
1	153.543	2.81	19	272.428	3	-	42.310
2	153.543	2.81	19	272.428	3	-	42.310
3	153.077	5.48	19	272.428	1	-	42.349
4	153.047	8.57	19	272.428	2	-	42.378
5	153.260	8.88	16	220.413	4	3	42.404

LEGENDS:

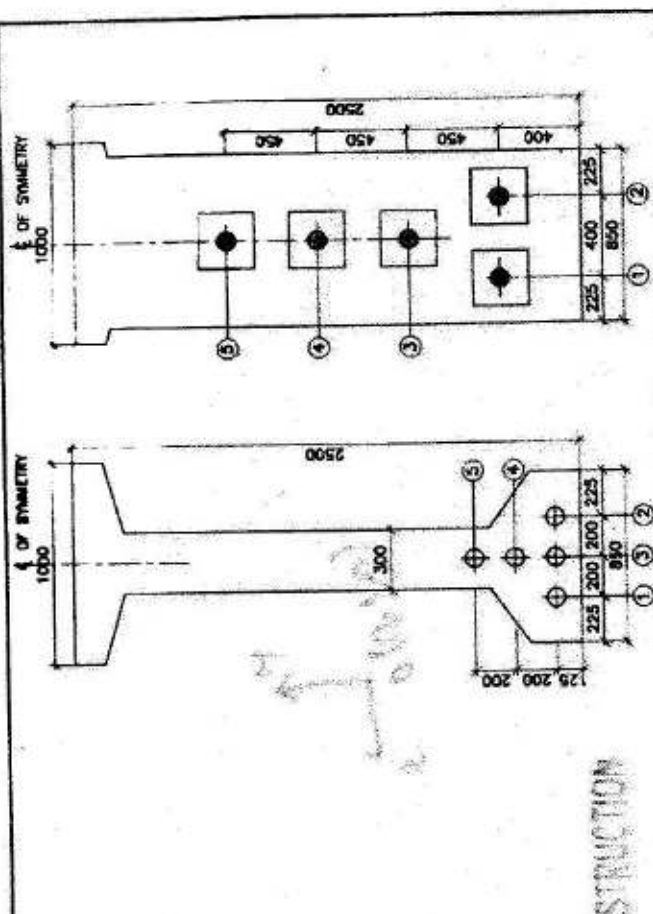
△	INDICATES END OF CURVE IN ELEVATION
○	INDICATES START OF CURVE IN ELEVATION
□	INDICATES START/END OF CABLE
◇	INDICATES CABLE NUMBER
◇	INDICATES END OF CURVE IN PLAN



TYPICAL DETAIL OF SUPPORTING ARRANGEMENT FOR CABLES

NOTES :-

- ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.
- THE PRESTRESSING TENDONS FOR PRESTRESSED CONCRETE SHALL BE 19 NOS. OF 12.7mm DIA 7-PLY CLASS 2 STRANDS AS PER IS:14288-1985, UNLESS OTHERWISE SPECIFIED IN THE DRAWING.
- THE FOLLOWING PROPERTIES HAVE BEEN ASSUMED IN DESIGN:
 - 1) NOMINAL SIZE - 12.7mm DIA 7-PLY LOW RELAXATION STRANDS CONFORMING TO CLASS 2 OF IS:14288-1985
 - 2) AREA - 98.7 mm² PER STRAND
 - 3) ULTIMATE LOAD - 163.7 kN PER STRAND
 - 4) MODULUS OF ELASTICITY - 1.95 x 10⁵ MPa
 - 5) COEFFICIENT OF FRICTION - 0.002
 - 6) ANCHORAGE SLIP - 0.17/radian
- THE PRESTRESSING STEEL AND ACCESSORIES SHALL BE SUBMITTED TO AN ACCEPTANCE TEST PRIOR TO THEIR ACTUAL USE ON THE WORKS (GUIDANCE MAY BE TAKEN FROM BE:4447). ONLY MULTISTRAND JACK SHALL BE USED FOR TENSIONING OF CABLES, DIRECT AND INDIRECT FORCE MEASUREMENT DEVICE (e.g. PRESSURE GAUGE) SHALL BE ATTACHED IN CONSULTATION WITH SYSTEM MANUFACTURER.
- THE SHEATHING SHALL BE OF 90mm ID HOPE. IT SHALL BE TESTED AS PER APPENDIX 1833/1 OF MOST SPECIFICATION FOR ROAD & BRIDGE WORKS. THE JOINTS OF ALL SHEATHING SHALL BE WATERTIGHT AND CONFORM TO SECTION 13 OF IRC:112-2011.
- CONSTRUCTION SEQUENCE:
 - DAY 14: STRESSING OF 1ST STAGE CABLE NOS. 3 & 4 FROM BOTH ENDS UPTO 100%.
 - DAY 21: STRESSING OF 2ND STAGE CABLE NOS. 1, 2 & 5 FROM BOTH ENDS. CABLE NO.1 SHALL BE STRESSED FIRST UPTO 50% OF JACKING FORCE. CABLE NO.2 SHALL BE STRESSED FIRST UPTO 50% OF JACKING FORCE. THEREAFTER CABLE NOS. 1 & 2 SHALL BE STRESSED UPTO 100% OF JACKING FORCE. CABLE NO. 5 SHALL BE STRESSED UPTO 100% OF JACKING FORCE.
 - DAY 28: CASTING OF CROSS BEAMS AND DECK SLAB.
 - DAY 45: INSTALLATION OF EXPANSION JOINT AND CASTING/LAYING OF WEARING COAT AND CRASH BARRIER.
- STRESSING OF 1ST STAGE CABLES CAN BE DONE ON CONCRETE ACHIEVING A STRENGTH OF 45 MPa OR AFTER 14 DAYS WHICHEVER IS LATER.
- STRESSING OF 2ND STAGE CABLES CAN BE DONE ON CONCRETE ACHIEVING A STRENGTH OF 50 MPa OR AFTER 21 DAYS WHICHEVER IS LATER.
- IN CASE OF EMERGENCY OR SHORTFALL THE REMAINING STRANDS OF CABLE NO. 5 MAY BE STRESSED UPTO 100% OF JACKING FORCE.
- MINIMUM STRENGTH OF CONCRETE AT THE TIME OF TENSIONING OF STAGE II CABLES SHALL BE 50 MPa.
- GROUTING OF CABLES SHALL BE CARRIED OUT AS PER GUIDELINES IN IRC:112-2011.



SECTION A-A

SECTION B-B

- THE LENGTH OF TENDONS SHOWN IN THE TABLE ALONG THEIR PROFILE BETWEEN ANCHORAGES. THE LENGTH INCLUDES DRIPPING LENGTH (600mm) & EXTRA LENGTH (400mm) APPROX. REQUIRED FOR CUTTING.
- ANY SUITABLE MULTISTRAND JACK CAPABLE OF STRESSING TO ATLEAST 10% HIGHER THAN THE REQUIRED JACKING FORCE SHALL BE USED FOR STRESSING OF CABLES.
- END FACES OF RECESSES IN THE PSC ORDER TO BE COATED WITH TWO COATS OF EPOXY.
- ANCHORAGE RECESSES TO BE SEALED WITH PREPARED NON SHRINK EPOXY MORTAR.
- IF ACTUAL VALUES OF X-SECTIONAL AREA (A') AND/OR MODULUS OF ELASTICITY (E') OF HIGH TENSILE STRANDS ARE DIFFERENT FROM ASSUMED VALUES, THEORETICAL ELONGATION IS MODIFIED AS BELOW:

$$\Delta L' = \Delta L \times \frac{A \times E}{A' \times E'}$$
 WHERE ΔL IS THEORETICAL ELONGATION MENTIONED IN TABLE-II, A & E ARE VALUES ASSUMED IN DESIGN WHILE A' & E' ARE ACTUAL VALUES OF THE STEEL USED.
- THE WORK OF PRESTRESSING SHALL BE CARRIED OUT BY PRESSURE SYSTEM OR ANY OTHER RECOGNIZED SYSTEM AFTER CARRYING OUT NECESSARY MODIFICATION IN THE DRAWING WITH THE APPROVAL OF ENGINEER-IN-CHARGE. ALL PRESTRESSING AND GROUTING WORK BE UNDERTAKEN BY TRAINED PERSONNEL ONLY. A REPRESENTATIVE OF THE SUPPLIER OF THE PRESTRESSING SYSTEM SHALL BE PRESENT DURING ALL TENSIONING AND GROUTING OPERATIONS AND SHALL ENSURE, MONITOR AND CERTIFY THEIR CORRECTNESS. EXTENSIVE SUPPLY THE MATTER SHALL BE REPORTED TO THE ENGINEER-IN-CHARGE.
- INITIAL SLACKNESS IN CABLES SHALL BE REMOVED BY APPLYING SMALL TENSION. THE INITIAL TENSION REQUIRED TO REMOVE SLACKNESS SHALL BE TAKEN AS THE STARTING POINT FOR MEASURING ELONGATION AND CORRECTION SHALL BE APPLIED AS PER CL. 12.2.1.3 OF IS:1343-1980.
- GROUTING OF CABLES SHALL BE DONE IN SAME SEQUENCE AS STRESSING AND SHALL CONFORM TO TECHNICAL SPECIFICATIONS. ANCHORAGE POCKET SHALL BE FILLED WITH EPOXY MORTAR AFTER STRESSING & GROUTING.

SPECIAL NOTES FOR PRESTRESSING:-

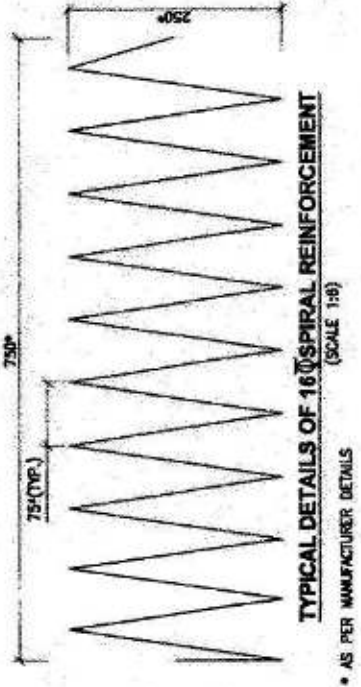
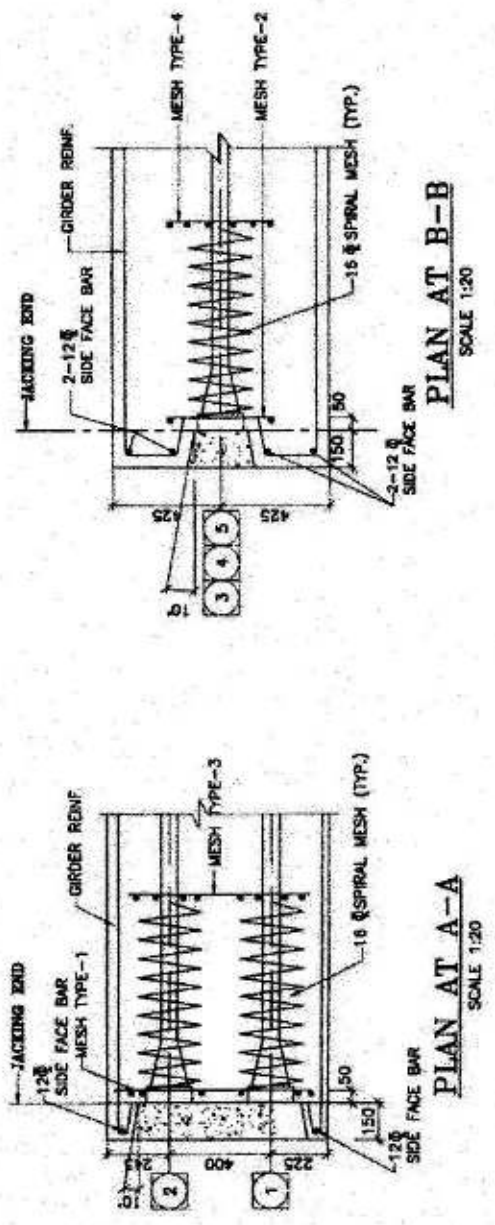
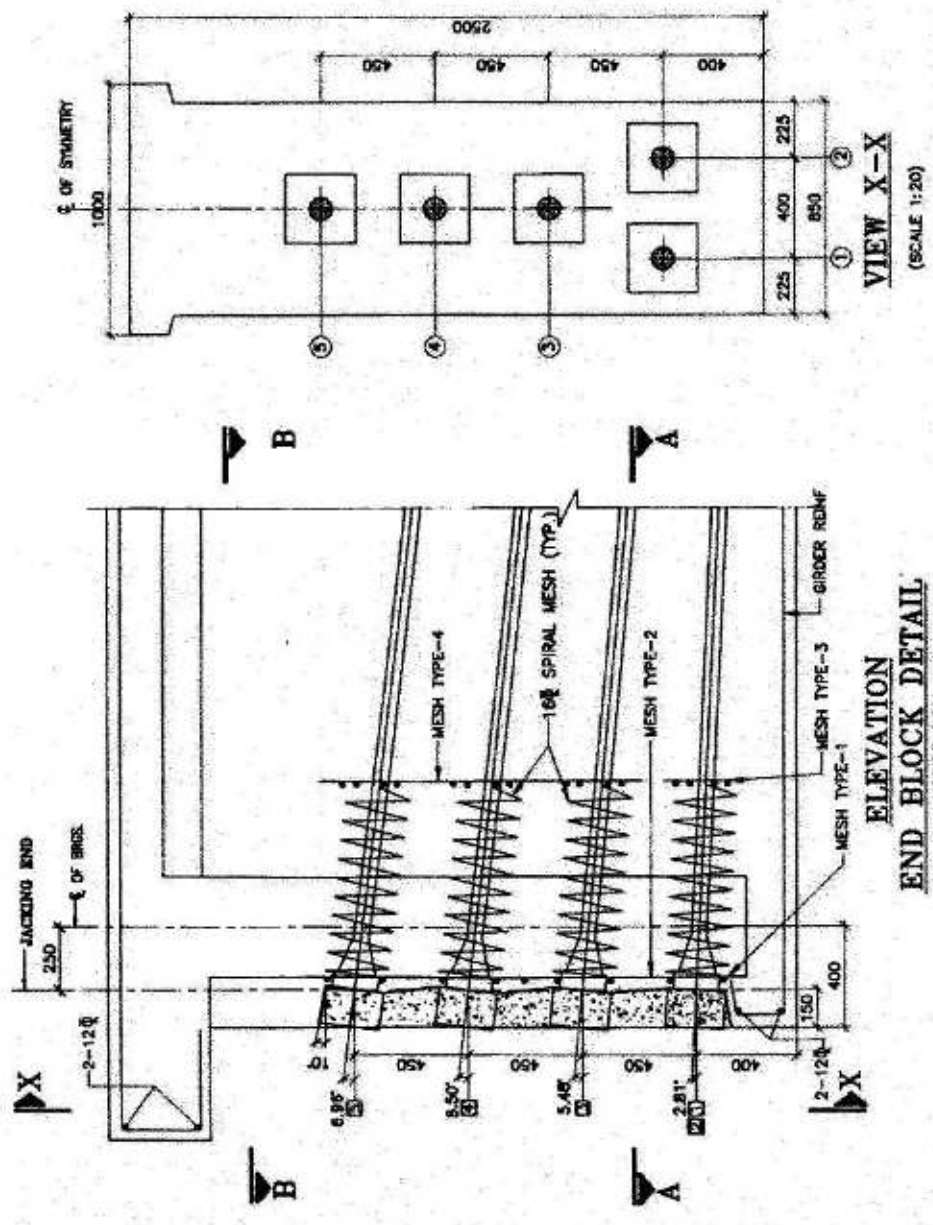
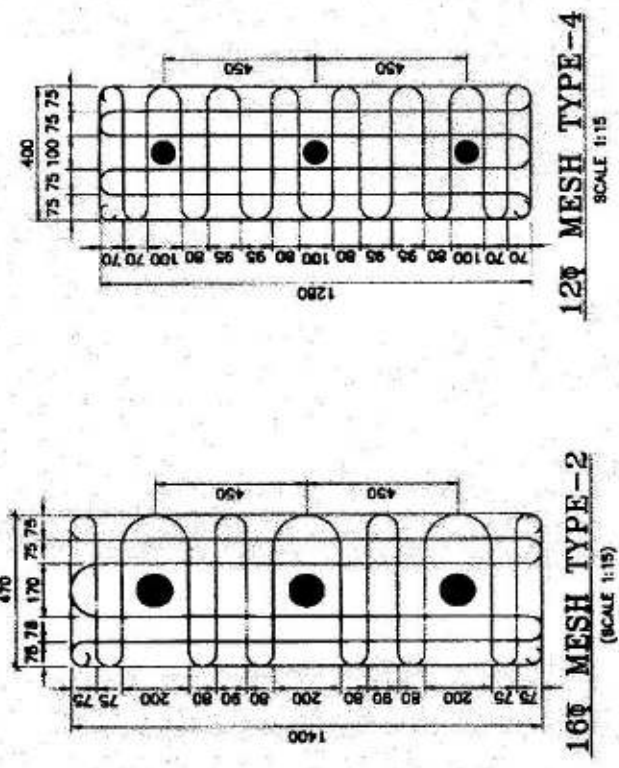
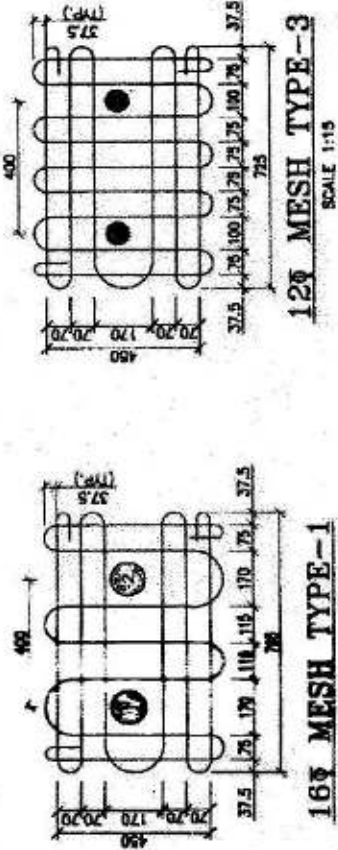
- FOR A PROVEN AND EFFECTIVE PRESTRESSING SYSTEM THE REQUIRED EXTENSIONS SHOULD NORMALLY BE ACHIEVED AT THE SPECIFIED FORCES AT STRESSING ENDS. HOWEVER, IN CASE THE REQUIRED EXTENSIONS ARE NOT ACHIEVED AT THE SPECIFIED JACKING FORCES THEN THE FOLLOWING MEASURES MAY BE TAKEN:
 - i) STRESSING SHOULD BE CONTINUED (WHERE POSSIBLE) TILL THE REQUIRED EXTENSIONS ARE OBTAINED SUBJECT TO THAT THE JACKING FORCES ARE NOT EXCEEDING 70.3% OF THE ULTIMATE TENSILE FORCE VALUES OF THE TENDONS.
 - ii) SHOULD THE REQUIRED EXTENSIONS ARE OBTAINED AT JACKING END FORCES LOWER THAN THE SPECIFIED VALUES THEN THE STRESSING SHOULD BE CONTINUED TILL THE SPECIFIED STRESSING-END FORCES ARE REACHED, PROVIDED THE ADDITIONAL EXTENSIONS ARE NOT MORE THAN ABOUT 5% OF THE SPECIFIED EXTENSIONS.
 - iii) TENDONS SATISFYING THESE PROVISIONS SHOULD BE LOCKED (I.E. ANCHORED).
 - iv) IF THE STRESSING END FORCES IN TENDONS ARE STILL LOWER THAN THE SPECIFIED VALUES DESPITE THE 5% INCREASE IN THE SPECIFIED EXTENSIONS THEN THE PARTICULARS OF SUCH TENDONS SHOULD BE REPORTED TO THE DESIGNER FOR FURTHER INSTRUCTIONS. ('LOCKING' BUT NOT 'GROUTING' THESE TENDONS TILL RECEIPT OF INSTRUCTIONS).
- ALL TENDONS WHICH SATISFY THE PROVISIONS OF ITEMS (A) (EXCEPT IV) ABOVE SHOULD BE GROUTED IMMEDIATELY, TAKING CARE THAT THE TENDONS NOT YET STRESSED ARE NOT ACCIDENTALLY BLOCKED DUE TO GROUT LEAK.
- THE PRESTRESSING JACKS AND THEIR GAUGES SHOULD BE REGULARLY CALIBRATED FOR CORRECTNESS AND REMOVAL OF ZERO-EFFECT.
- NO SLIP AT ANCHORAGE IS CONSIDERED IN DESIGN.

PROJECT: FOUR LANE OF JHARKHATI TO DEMOW SECTION OF NH-37 FROM EXISTING CH. K. 491+400 TO KM 534+250 (DESIGN CH. KM 490+800 TO KM 534+800) IN THE STATE OF ASSAM UNDER EPC MODE.		TITLE: DETAILS OF CABLE PROFILE FOR PRECAST PSC GIRDER AT CH. 508+454	
APPROVED BY: S.S.	CHECKED BY: S.B.	DESIGNED BY: N.S.	UPON BY: U.S.
DATE: JAN 2020		SCALE: AS SHOWN	
PROJECT CONSULTANT: ECSTATIC ENGINEERING CONSULTANTS PRIVATE LIMITED, SCO 103 MEDA SHOPPING COMPLEX, CUTCHAL, SECTION 8, GURGAON, HARYANA 122009		PROOF CONSULTANT: MARC TECHNICIANS PVT. LTD., MARC HOUSE, SECTOR-43 PROVIDING ROAD, OPPOSITE DEVI LAL PARK, BANAHOURGARI, HARYANA 124607	
CONTRACTOR: GANNON DUNKERLEY & CO. LTD., 7th FLOOR, ROAD NO. 10, HUDA STREET, 7th FLOOR, KOLKATA-700016		SAFETY CONSULTANT: Q-ENG, 405, 3RD FLOOR, 8TH PARK, SECTOR-10, HARYANA 122001	
CLIENT: NATIONAL HIGHWAYS INFRASTRUCTURE DEVELOPMENT CORPORATION LTD., 6RD FLOOR, P.T. BUILDING, 1 PARLIAMENT STREET, NEW DELHI-110001		AUTHORITY ENGINEER: NOVATIS SOLUTIONS PVT. LTD., 405, 3RD FLOOR, 8TH PARK, SECTOR-10, HARYANA 122001	
DATE: 20.01.2020	REV: 30	ISSUED FOR APPROVAL	DESCRIPTION OF REVISIONS

NOTES:-

1. ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED NO DIMENSIONS SHALL BE SCALED.
2. GRADE OF CONCRETE FOR SUPERSTRUCTURE SHALL BE M30.
3. PRESTRESSING CABLES 10 T 13 HAVING LOW RELAXATION STRANDS CONFORMING TO IS:14268.
4. THE REINFORCING STEEL SHALL BE OF TMT BARS (GRADE DESIGNATION Fe 500) CONFORMING TO IS:1786. THE WORK OF PRESTRESSING SHALL BE CARRIED OUT BY ANY RECOGNIZED SYSTEM AFTER CARRYING OUT NECESSARY MODIFICATION IN THE DRAWING WITH THE APPROVAL OF ENGINEER-IN-CHARGE. ALL PRESTRESSING AND GROUTING WORK BE UNDERTAKEN BY TRAINED PERSONNEL ONLY. A REPRESENTATIVE OF THE SUPPLIER OF THE PRESTRESSING SYSTEM SHALL BE PRESENT DURING ALL TENSIONING AND GROUTING OPERATIONS AND SHALL ENSURE, MONITOR AND THEIR CORRECTNESS.

GOOD FOR CONSTRUCTION



DATE	REV	DESCRIPTION OF REVISIONS	BY
20.01.2020	00	ISSUED FOR APPROVAL	

CLIENT:	NATIONAL HIGHWAYS INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. (OLD FLOOR, P.T. BUILDING, 4th FLOOR, STREET, NEW DELHI 110001)
CONTRACTOR:	GANNON DUNKERLEY & CO. LTD. 80A, TOPPERS ROAD, SOUTH MAITE STREET, 7th FLOOR, KOLKATA-700006
DESIGN CONSULTANT:	ECSTATIS ENGINEERING CONSULTANTS PRIVATE LIMITED 800, MIDC, SHOPPING CENTRE, HARVANA, KOLKATA-700015
PROOF CONSULTANT:	MARC TECHNOCRATS PVT. LTD. MARCO HOUSE, SECTION-47 (INDIANO ROAD), OPPOSITE DEW LAI, BANGALORE, KARNATAKA 560007
SAFETY CONSULTANT:	Q-ENG ADVISORY SERVICES PVT. LTD. 8th FLOOR, 10th CROSS, 10th STREET, HARVANA, KOLKATA-700015
AUTHORITY ENGINEER:	VOYANTS SOLUTIONS PVT. LTD. 8th FLOOR, 10th CROSS, 10th STREET, HARVANA, KOLKATA-700015

PROJECT:	FOUR LANE OF JHARKH TO DEMOW SECTION OF NH-37 FROM EXISTING CH. K 491+050 TO KM 534+250 (DESIGN CH. KM 490+800 TO KM 534+800) IN THE STATE OF ASSAM UNDER EPC MODE.
TITLE:	ANCHORAGE DETAILS OF PSC GIRDER AT CIL 508+454
DRG NO.	BEC-NH-37-ID-SUP-CEL-508+454-303
DATE:	JAN 2020
SCALE:	AS SHOWN
APPROVED BY:	S.S.
CHECKED BY:	S.B.
DESIGNED BY:	N.S.
DRAWN BY:	U.S.

SHEET NO.	01 OF 01
REV.	R0

NOTES

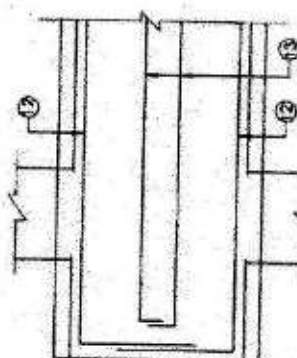
1. ALL DIMENSIONS ARE IN mm, UNLESS OTHERWISE MENTIONED.
2. DO NOT SCALE THE DIMENSIONS. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
3. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH SHEET 1 OF 2 OF THIS DRAWING.

REINFORCEMENT DETAIL

BAR NO.	BAR DIA.	NO. OF BAR	SPACING OR	SHAPE
1	10	-	2L-150 C/C	□
2	10	-	2L-150 C/C	□
3	10	-	2L-150 C/C	□
3a	10	-	2L-150 C/C	□
4	12	6	-	-
4a	10	4	-	-
5	10	-	150 C/C	180
5a	10	-	150 C/C	180
6	10	-	150 C/C	□
7	10	-	150 C/C	□
8	10	-	150 C/C	178
8a	10	-	150 C/C	178
9	12	2	-	-
9a	10	2x2	-	300
9b	10	2	-	-
10	12	2	-	-
11	12	2	-	-
12	10	-	150 C/C	300 / 180
13	10	-	150 C/C	-

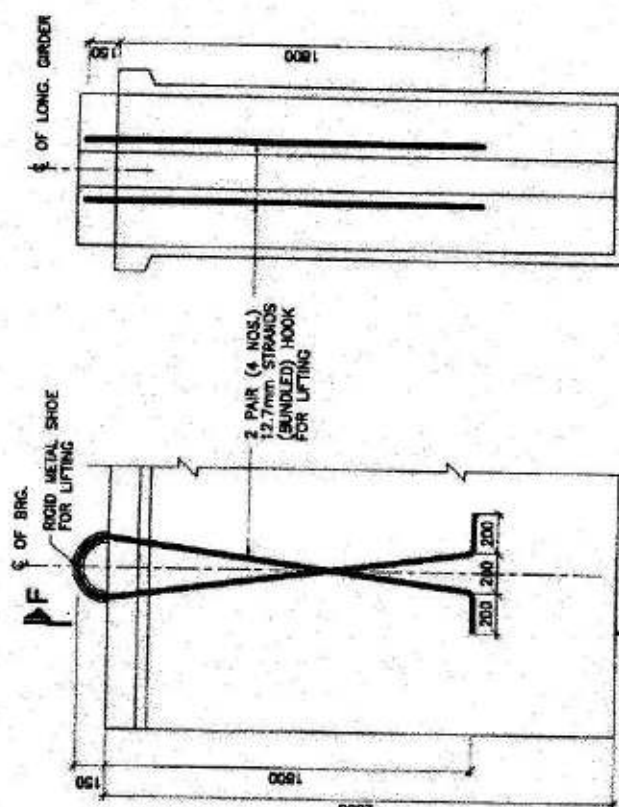
LEGENDS:

STP.	STIRRUPS
9/F	BAR ON BOTH FACES
LV.	LENGTH VARIES

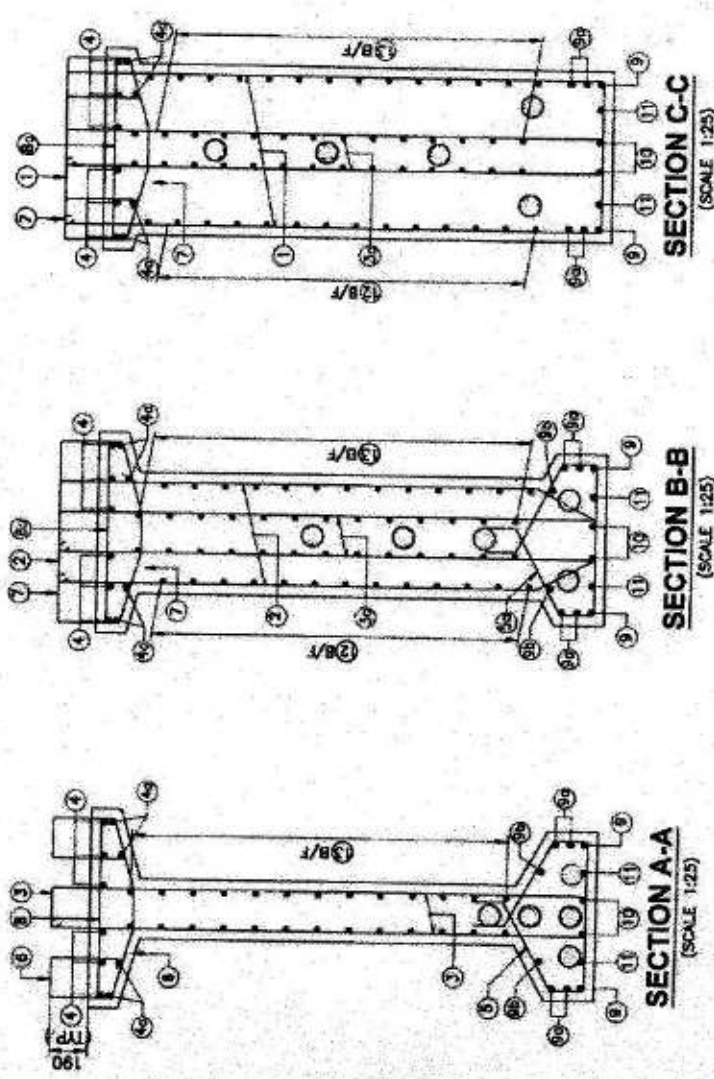


80 MESH M1
(BEARING LOCATION)
(SCALE 1:20)

DETAIL-1
(SHOWING BAR MARK 12 AT NON ANCHORAGE LOCATION)
(SCALE 1:25)



SECTION F-F
(SCALE 1:25)



SECTION C-C
(SCALE 1:25)

SECTION B-B
(SCALE 1:25)

SECTION A-A
(SCALE 1:25)

HALF LONGITUDINAL SECTION OF GIRDER
SCALE 1:50

SECTION D-D
SCALE 1:50

SECTION E-E
SCALE 1:50

DATE	REV	DESCRIPTION OF REVISIONS	BY
20.01.2020	00	ISSUED FOR APPROVAL	

CLIENT:	NATIONAL HIGHWAYS INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. (3RD FLOOR, P.T. BUILDING, 4th FLOOR, STREET, NEW DELHI-110001)
CONTRACTOR:	GANNON DUNKERLEY & CO. LTD. 80A, TOPSIA ROAD (SOUTH) NAUTIC STREET, 7th FLOOR NEW DELHI-110001
DESIGN CONSULTANT:	ECOSTATIC ENGINEERING CONSULTANTS PRIVATE LIMITED 800 (3RD FLOOR), SECTOR-27, GURGAON, HARYANA-124007
PROOF CONSULTANT:	MAHC TECHNOCRATS PVT. LTD. MAHC HOUSE, SECTOR-27, GURGAON, HARYANA-124007
SAFETY CONSULTANT:	G-ENG ADVISORY SERVICES PVT. LTD. G-001, 1ST FLOOR, SECTOR-27, GURGAON, HARYANA-124007
AUTHORITY ENGINEER:	MOYAN'S SOLUTIONS PVT. LTD. 4th FLOOR, 80TH PARK CENTRA, BLOCK A, JAL WAHU SECTOR 24, GURGAON, HARYANA-124001

PROJECT:	FOUR LANE OF JHANJI TO DEMOW SECTION OF NH-37 FROM EXISTING CH. K 481+050 TO KM 536+250 (DESIGN CH. KM 490+800 TO KM 534+800) IN THE STATE OF ASSAM UNDER EPC MODE.
TITLE:	REINFORCEMENT DETAILS OF LONGITUDINAL GIRDER OF PSC GIRDER AT CH. 508+454
DWG NO.:	EBC-NH-37-JD-SUP-CH-508+454-304
DATE:	JAN. 2020
AS BROWN	AS BROWN
APPROVED BY:	S.S.
CHECKED BY:	S.B.
DESIGNED BY:	N.S.
DRAWN BY:	U.S.

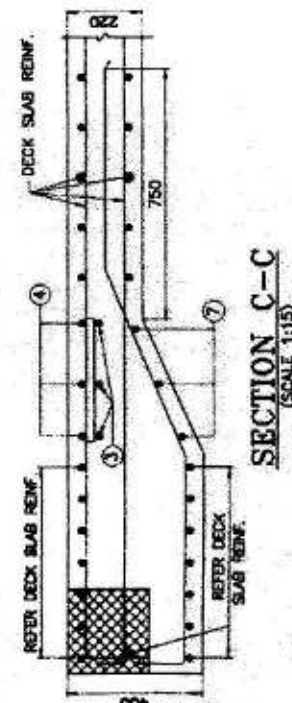
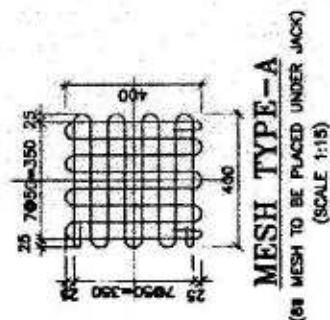
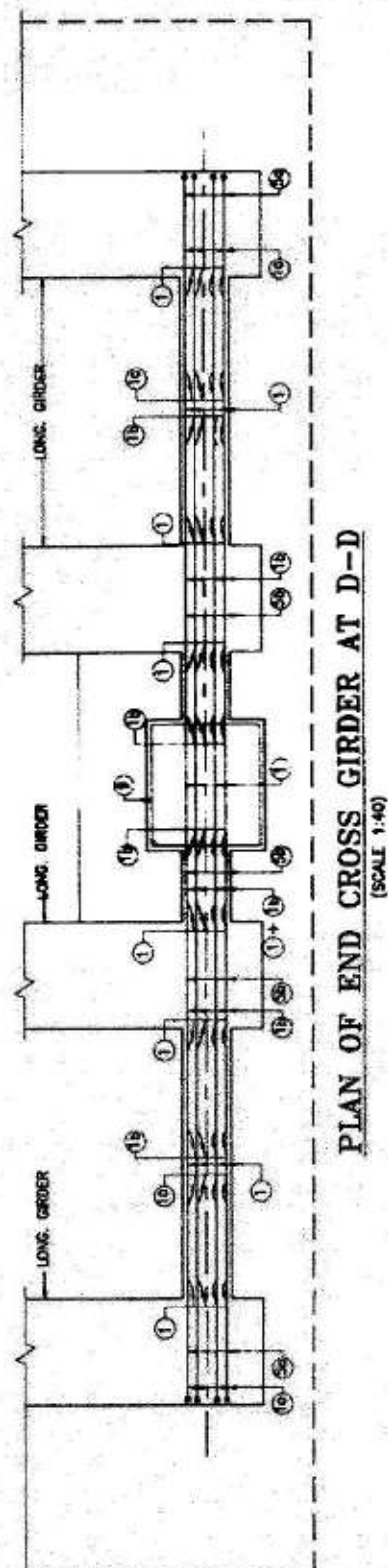
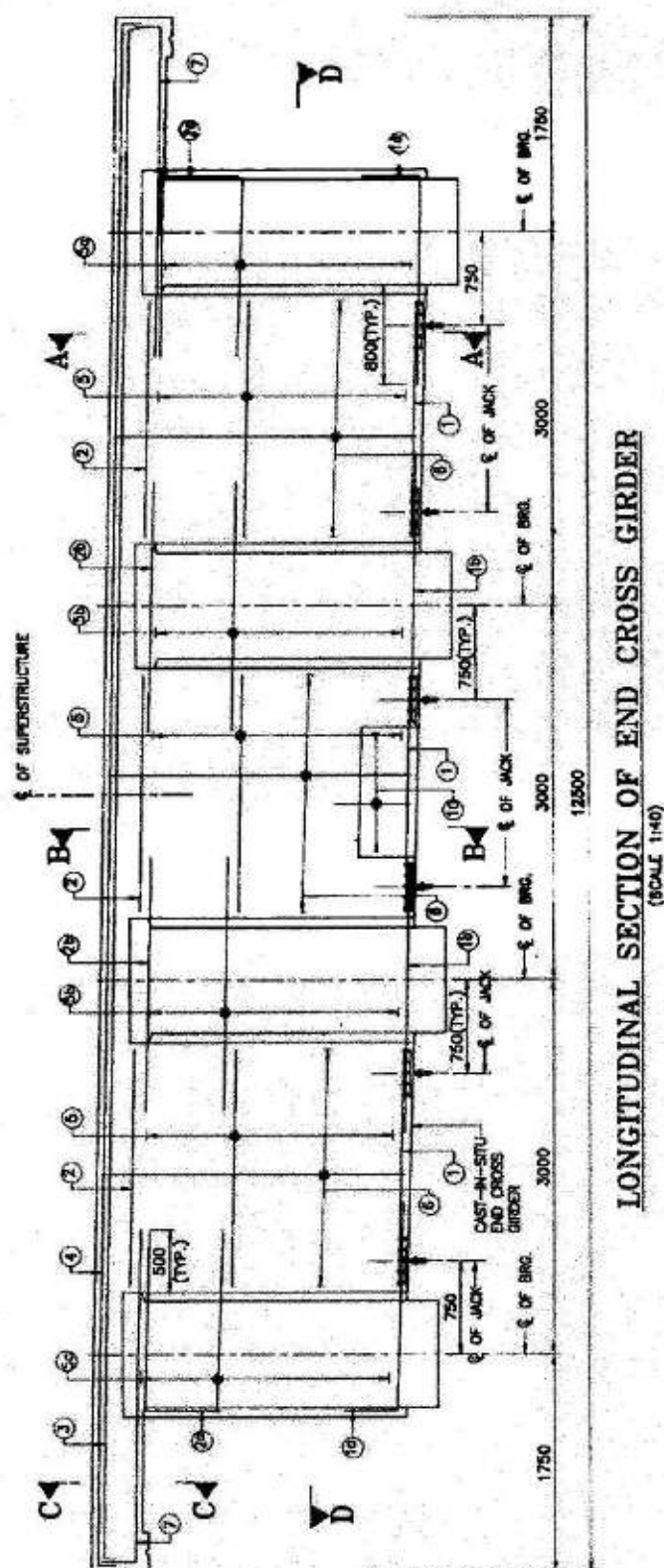
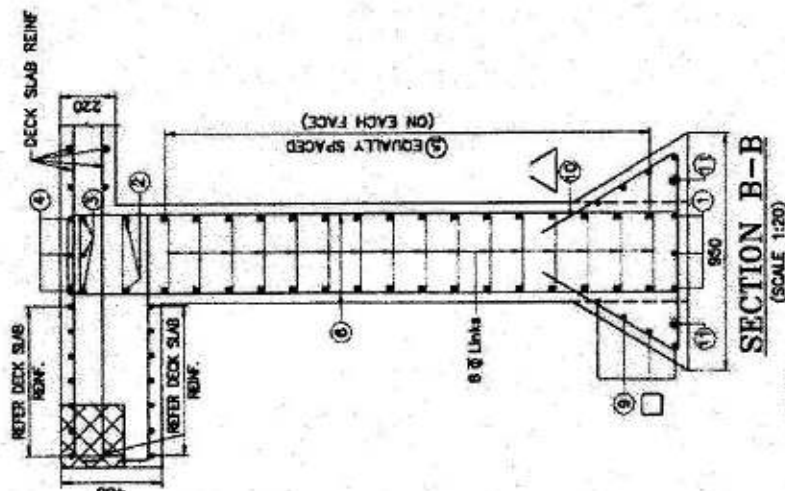
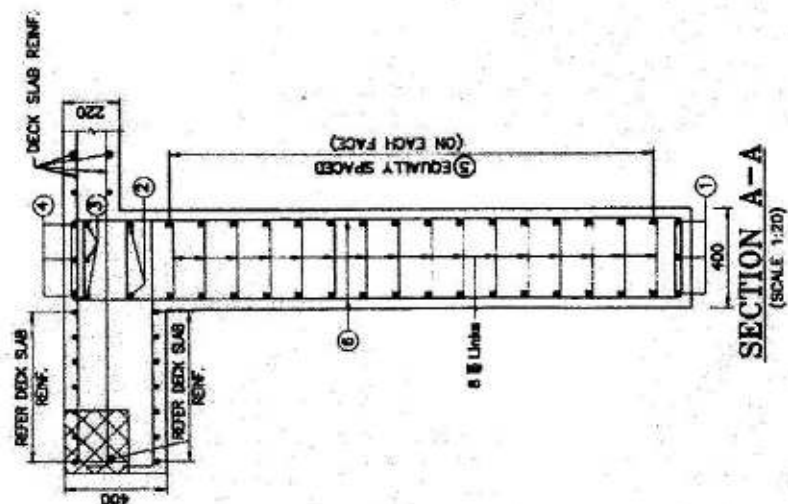
REV	NO
01	OF 01
01	OF 01

REFER DECK SLAB







BAR MKD.	BAR DIA.	NO./SPACING	SHAPE
1	32	3X3 NOS.	—
1a	32	2X3 NOS.	650
1b	32	2X3 NOS.	—
2	12	3X2 NOS.	—
2a	12	2X2 NOS.	650
2b	12	2X2 NOS.	—
3	32	3 NOS.	150
4	32	3 NOS.	150
5	20	2X16 NOS.	—
5a	20	2X16 NOS.	—
5b	20	2X16 NOS.	—
6	12	150 g/c	2-LEGGED
7	12	2X3 NOS.	200
8		NOT USED	
9	10	4 NOS.	□
10	16	8 NOS.	△
11	12	2 NOS.	—

NOTES:—

1. ALL DIMENSIONS ARE IN MM AND LEVELS IN METERS.
2. DO NOT SCALE THE DIMENSIONS. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
3. GRADE OF CONC. FOR R.C.C. WORKS = M-40
4. THE REINFORCING STEEL SHALL BE OF TMT BARS (GRADE DESIGNATION Fe 500D) CONFORMING TO IS:1786.
5. CLEAR COVER TO REINFORCEMENT SHALL BE 50mm.
6. NOT MORE THAN 50% OF BARS SHALL BE LAPPED AT A SECTION AND LAPPING SHALL BE STAGGERED. MINIMUM LAP LENGTH SHALL BE 75 TIMES DIA OF BAR.



DATE	BY	DESCRIPTION OF REVISIONS
01.10.2020	RD	ISSUED FOR APPROVAL
	REV	

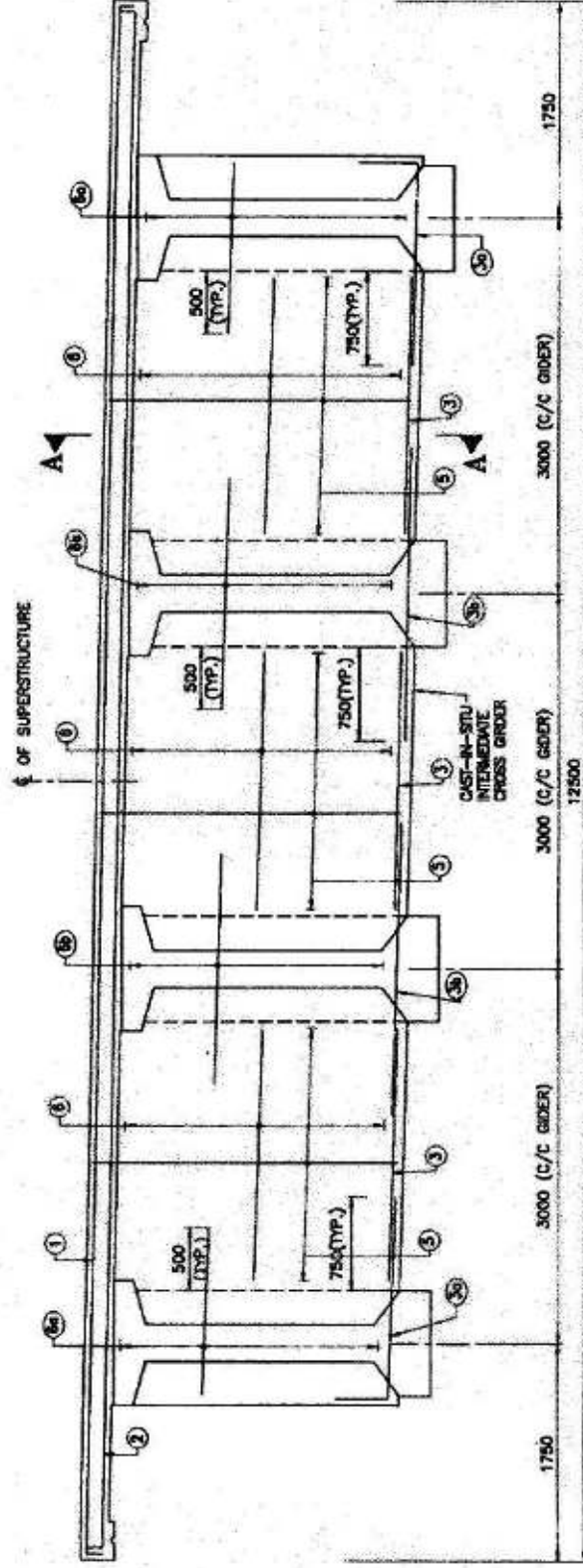
<p>CLIENT:</p>  <p>NATIONAL HIGHWAYS INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. (RED FLOOR, 3RD FLOOR, 4 PARLIAMENT HOUSE, NEW DELHI 110001)</p> <p>AUTHORITY ENGINEER:</p>  <p>INFANTS</p>	<p>CONTRACTOR</p>  <p>GANNONG DUNKERLE & CO. LTD. 88A, TOPSIA ROAD (OPPOSITE NAUTIC STREET), 7TH FLOOR KOLKATA 700044</p> <p>SAFETY CONSULTANT:</p>  <p>G-ENG ADVISORY CONSULTANT, LTD. SECTOR-14, GURGAON (HIGHLIGHTS) LTD. TELE:- 0124-4331001, 0124-4331002 EMAIL:- info@gea.co.in, gannong@gea.co.in</p>	<p>DESIGN CONSULTANT:</p>  <p>ECSTASY DESIGN CONSULTANTS PRIVATE LIMITED BCD 30 TITAN SECTOR-7, CENTRE, HARYANA, PIN CODE-136005 (GATEWAY), HARYANA, 136005</p> <p>PROOF CONSULTANT:</p>  <p>MARC TECHNICRATS PVT. LTD. MARC HOUSE, SECTOR-14, GURGAON (HIGHLIGHTS) OPPOSITE DEVAL PARK, SAHAYDURG, HARYANA 124007</p>	<p>APPROVED BY:</p> <p>S.S</p> <p>CHECKED BY:</p> <p>S.B</p> <p>DESIGNED BY:</p> <p>N.S</p> <p>DRAWN BY:</p> <p>U.S</p> <p>DATE:</p> <p>JAN. 2020</p> <p>AS SETOWN</p>	<p>PROJECT:</p> <p>FOUR LANE OF JHANGHI TO DEMOW SECTION OF NH-37 FROM EXISTING CH. K 481+050 TO KM 355+250 (DESIGN CH. KM 490+800 TO KM 534+800) IN THE STATE OF ASSAM UNDER EPC MODE.</p> <p>TITLE:</p> <p>REINFORCEMENT DETAILS END CROSS CROSSER AT CH. 508+454</p>	<p>DRAW NO.:</p> <p>REC-NH-37-ID-SUP-CH-508-454-305</p> <p>REV.</p> <p>R0</p> <p>SHEET NO.</p> <p>01 OF 01</p>
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NOTES:-

1. ALL DIMENSIONS ARE IN MM AND LEVELS IN METERS.
2. DO NOT SCALE THE DIMENSIONS. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
3. GRADE OF CONC. FOR R.C.C. WORKS = M-40
4. THE REINFORCING STEEL SHALL BE OF TMT BARS (GRADE DESIGNATION Fe 500D) CONFORMING TO IS-1786.
5. CLEAR COVER TO REINFORCEMENT SHALL BE 50mm.
6. NOT MORE THAN 50% OF BARS SHALL BE LAPPED AT A SECTION AND LAPPING SHALL BE STAGGERED. MINIMUM LAP LENGTH SHALL BE 75 TIMES DIA OF BAR.

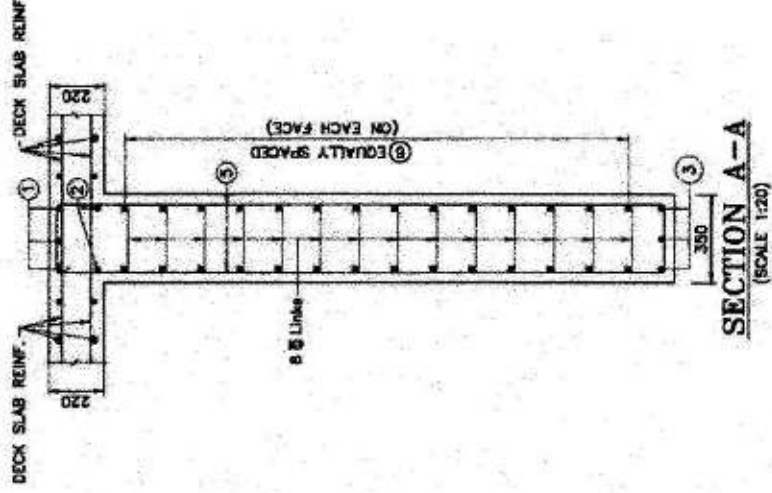
REINF. DETAILS

BAR NO.	BAR DIA.	NO./SPACING	SHAPE
1	25	3 NOS.	150
2	25	2 NOS.	150
3	32	3X3 NOS.	—
3a	32	2X3 NOS.	650
3b	32	2X3 NOS.	—
4	—	NOT USED	—
5	12	150 C/C	2-LEGGED
6	10	3X14 NOS.	—
6a	10	2X14 NOS.	—
6b	10	2X14 NOS.	—



LONGITUDINAL SECTION OF INTERMEDIATE CROSS GIRDER

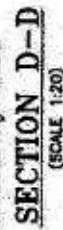
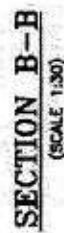
(SCALE 1:40)









12000 FOR CONSTRUCTION

CLIENT:	NATIONAL HIGHWAYS INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. (100 FLOOR, 100 BUILDING, 4 PARLIAMENT STREET, NEW DELHI 110001)	CONTRACTOR:	GANNON DUNN & CO. LTD. 100, TOWER ROAD, NEW DELHI 110001	DESIGN CONSULTANT:	ECSTATIC ENGINEERING CONSULTANTS PRIVATE LIMITED 500 100, TOWER ROAD, NEW DELHI 110001	APPROVED BY:	S.S.	PROJECT:	FOUR LANE OF JHARKH TO DEMOW SECTION OF NH-37 FROM EXISTING CH. K 491+050 TO KM 535+250 (DESIGN CH. KM 490+800 TO KM 534+800) IN THE STATE OF ASSAM UNDER EPC MODE.
AUTHORITY ENGINEER:	MAHESH SOLUTIONS PVT. LTD. 100, TOWER ROAD, NEW DELHI 110001	SAFETY CONSULTANT:	G-ENG 100, TOWER ROAD, NEW DELHI 110001	PROOF CONSULTANT:	MARC TECHNICIANS PVT. LTD. 100, TOWER ROAD, NEW DELHI 110001	CHECKED BY:	S.B.	TITLE:	REINFORCEMENT DETAILS OF INTERMEDIATE CROSS GIRDER AT CH. 508+154
DATE:	10/01/2024	SCALE:	1:20	PROJECT NO.:	EC/24/01/001	DESIGNED BY:	N.S.	DRG NO.:	01
						DRAWN BY:	U.S.		

1. ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE MENTIONED.
2. DO NOT SCALE THE DIMENSIONS. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
3. GRADE OF CONCRETE = M40
4. REINFORCEMENT SHALL BE CORROSION RESISTANT HYSD BARS OF GRADE FE-500DD WITH MINIMUM ELONGATION 14.5% CONFORMING TO IS-1786
5. CLEAR COVER TO REINFORCEMENT SHALL BE 50mm.
6. NOT MORE THAN 50% OF BARS SHALL BE LAPPED AT A SECTION AND LAPPING SHALL BE STAGGERED. MINIMUM LAP LENGTH SHALL BE 76 TIMES DIA OF BAR.






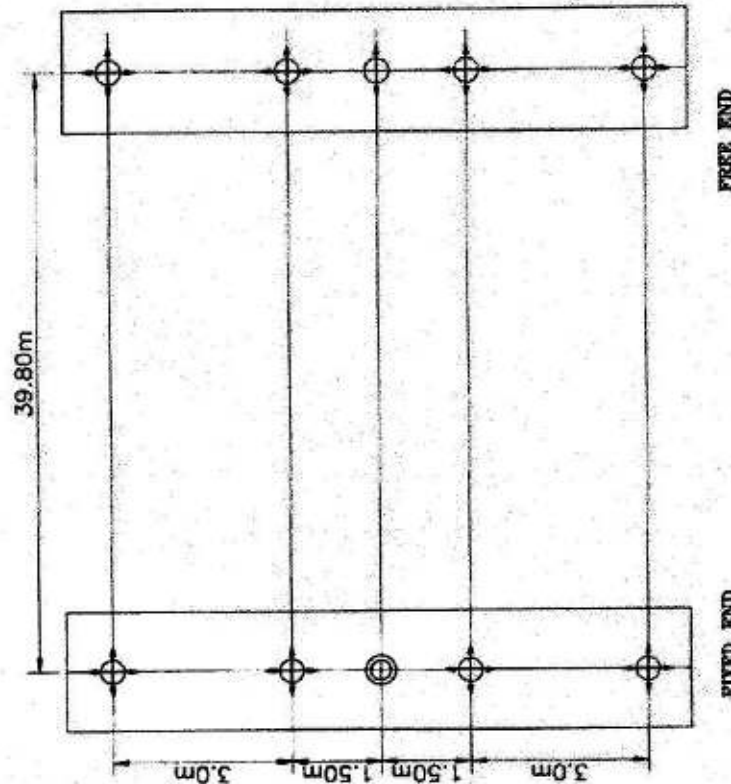
BAR MKD.	BAR DIA.	NO. SPACING	SHAPE	REMARKS
1	12	150 C/C	 120	BAR NOS. ① & ② ARE ALTERNATE BARS
2	12	150 C/C	_____	
3	12	150 O/C	 120	BAR NOS. ③ & ④ ARE ALTERNATE BARS
4	12	150 C/C	120 _____	
4a	12	150 C/C	_____	
5	10	150 C/C	 120	
5a	16	2x3 NOS.	_____	
5b	10	150 C/C	 120	
6	10	150 C/C	 120	
6a	16	2x3 NOS.	_____	
7	12	2x7 NOS.	_____	
8	12	150 C/C	 400	
8a	12	150 C/C	200 _____	

GOOD FOR CRYSTALINITY

[illegible]

TABLE SHOWING DATA FOR DESIGN OF POT-PTE BEARINGS

SL. No.	SYMBOL	RESISTANCE TO VERTICAL LOAD	LOAD CONDITION	EXISTING LOADS, FORCES, MOVEMENTS, & ROTATION DATA										QTY. (Nos.) PER SPAN
				VERTICAL LOAD (KN)		HORIZONTAL FORCES (KN)				ROTATION (Rad)		MOVEMENT		
				CASE	MAGNITUDE	LONGITUDINAL		TRANSVERSE		CASE	MAGNITUDE	LONGITUDINAL (mm)	TRANSVERSE (mm)	
						CASE	MAGNITUDE	CASE	MAGNITUDE					
1		PIN	NORMAL	MAXIMUM	-	COEXISTING	278	COEXISTING	-	MAXIMUM	0.01		-	1
				MINIMUM	-	COEXISTING	463	COEXISTING	-					
				PERMANENT	-	COEXISTING	463	COEXISTING	-					
				MAXIMUM	-	COEXISTING	5800	COEXISTING	-					
				MINIMUM	-	COEXISTING	5840	COEXISTING	-					
			SEISMIC (LONGITUDINAL)	PERMANENT	-	COEXISTING	5840	COEXISTING	-	MAXIMUM	0.01		-	1
				MAXIMUM	-	COEXISTING	278	COEXISTING	2881					
				MINIMUM	-	COEXISTING	313	COEXISTING	3045					
				PERMANENT	-	COEXISTING	313	COEXISTING	3045					
				MAXIMUM	-	COEXISTING	-	COEXISTING	-					
2		GUIDED SLIDING	NORMAL	MAXIMUM	-	COEXISTING	-	COEXISTING	-	MAXIMUM	0.01	41	-	1
				MINIMUM	-	COEXISTING	-	COEXISTING	-					
				PERMANENT	-	COEXISTING	-	COEXISTING	-					
				MAXIMUM	-	COEXISTING	-	COEXISTING	-					
				MINIMUM	-	COEXISTING	-	COEXISTING	-					
			SEISMIC (LONGITUDINAL)	PERMANENT	-	COEXISTING	-	COEXISTING	-	MAXIMUM	0.01		-	1
				MAXIMUM	-	COEXISTING	-	COEXISTING	2881					
				MINIMUM	-	COEXISTING	-	COEXISTING	3045					
				PERMANENT	-	COEXISTING	-	COEXISTING	3045					
				MAXIMUM	-	COEXISTING	-	COEXISTING	-					
3		FREE SLIDING	NORMAL	MAXIMUM	1445	COEXISTING	-	COEXISTING	-	MAXIMUM	0.01	41	5	3
				MINIMUM	1885	COEXISTING	-	COEXISTING	-					
				PERMANENT	1885	COEXISTING	-	COEXISTING	-					
				MAXIMUM	1885	COEXISTING	-	COEXISTING	-					
				MINIMUM	2115	COEXISTING	-	COEXISTING	-					
			SEISMIC (LONGITUDINAL)	PERMANENT	2115	COEXISTING	-	COEXISTING	-	MAXIMUM	0.01		-	3
				MAXIMUM	1885	COEXISTING	-	COEXISTING	-					
				MINIMUM	2115	COEXISTING	-	COEXISTING	-					
				PERMANENT	1885	COEXISTING	-	COEXISTING	-					
				MAXIMUM	2115	COEXISTING	-	COEXISTING	-					



KEY PLAN
SHOWING ARRANGEMENT OF BEARINGS





NOTES:-

1. CONCRETING OF PEDESTALS SHALL BE DONE ONLY AFTER LEAVING POCKETS FOR PLACING THE SLEEVES FOR THE ANCHOR BARS OF BRACINGS. THE LOCATION AND SIZE OF THE SLEEVES ARE TO BE SUPPLIED BY THE MANUFACTURER.
2. DIMENSIONS OF PEDESTALS TO BE FIXED BEFORE CASTING THE SAME AFTER OBTAINING THE SIZE OF BEARINGS FROM THE MANUFACTURER.
3. BEARING SHALL CONFORM TO IRC AND NORTH SPECIFICATIONS AND SHOULD BE PROCURED FROM NORTH APPROVED LIST OF EMANELLED SUPPLIER.
4. PERMISSIBLE STRESSES SHOULD BE INCREASED AS PER TABLE-10F IRC-6-2014.

GENERAL DATA:

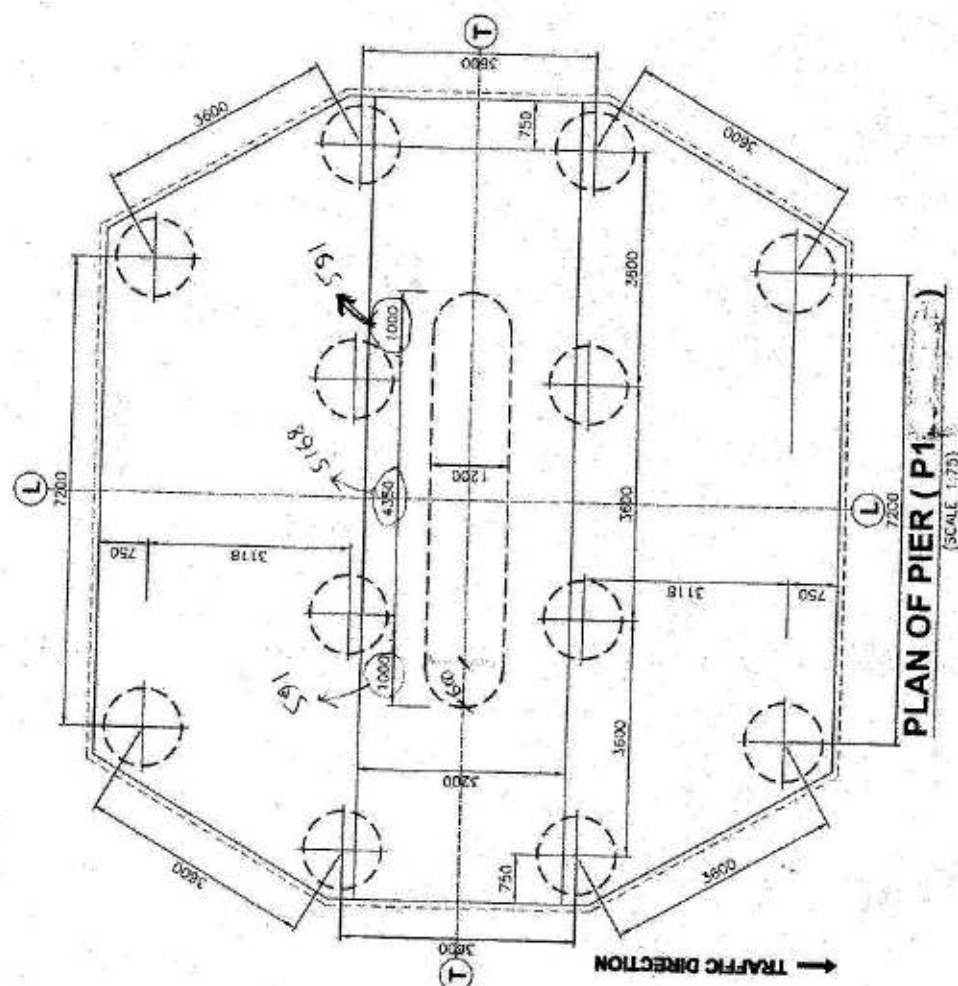
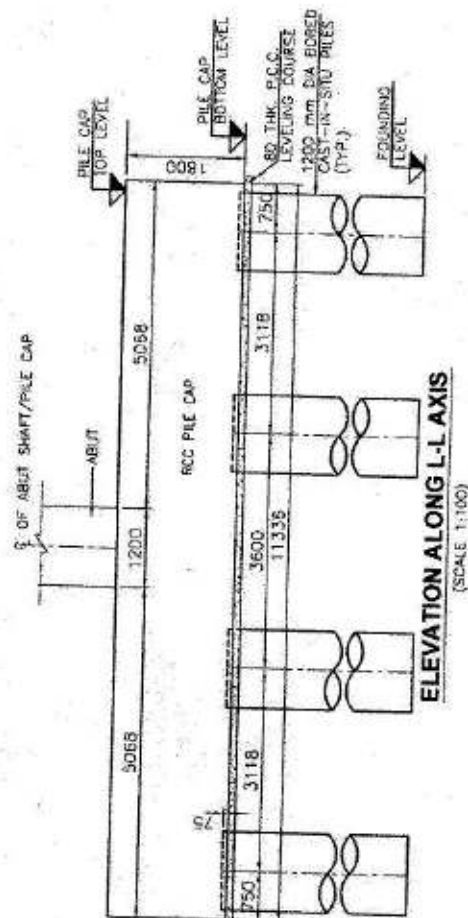
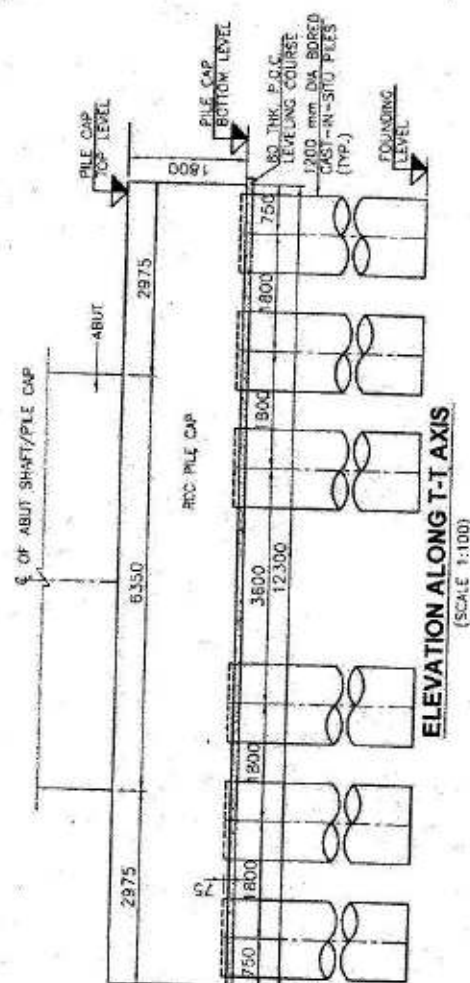
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2. MATERIAL FOR SUBSTRUCTURE : M35
3. MATERIAL FOR SUPERSTRUCTURE : M50

GOOD FOR CONSTRUCTION

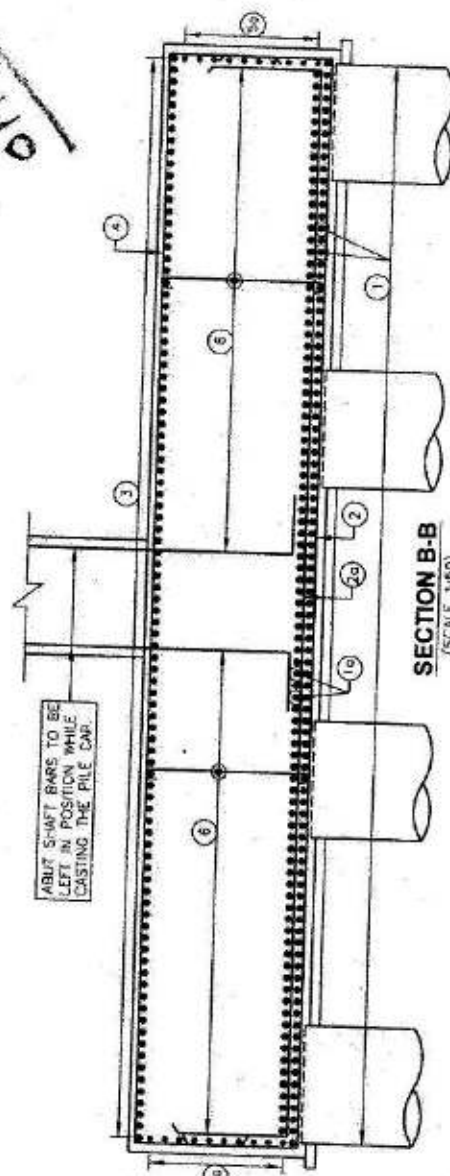
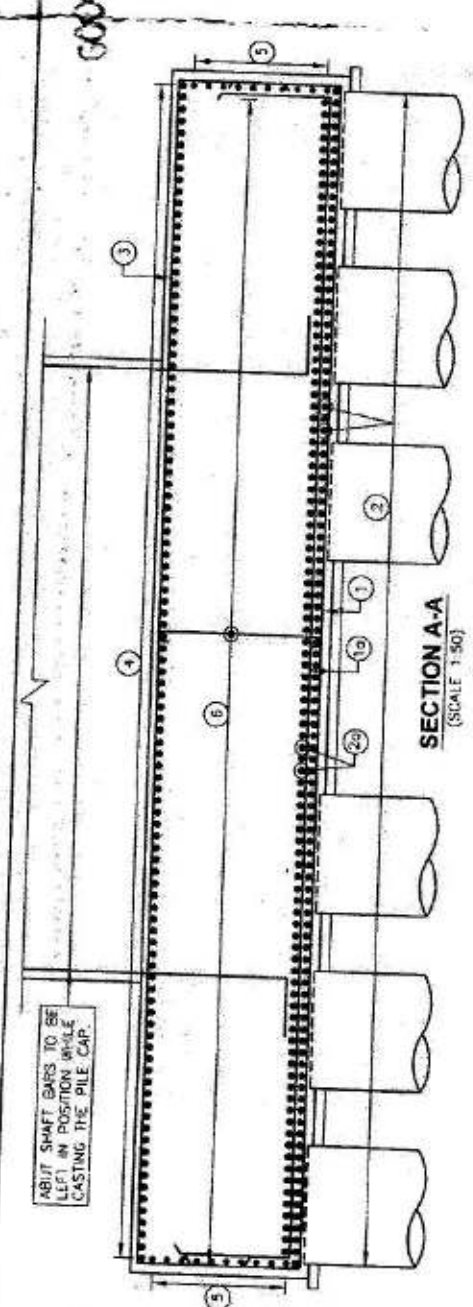
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GOOD FOR CONSTRUCTION

Orlando

[illegible]

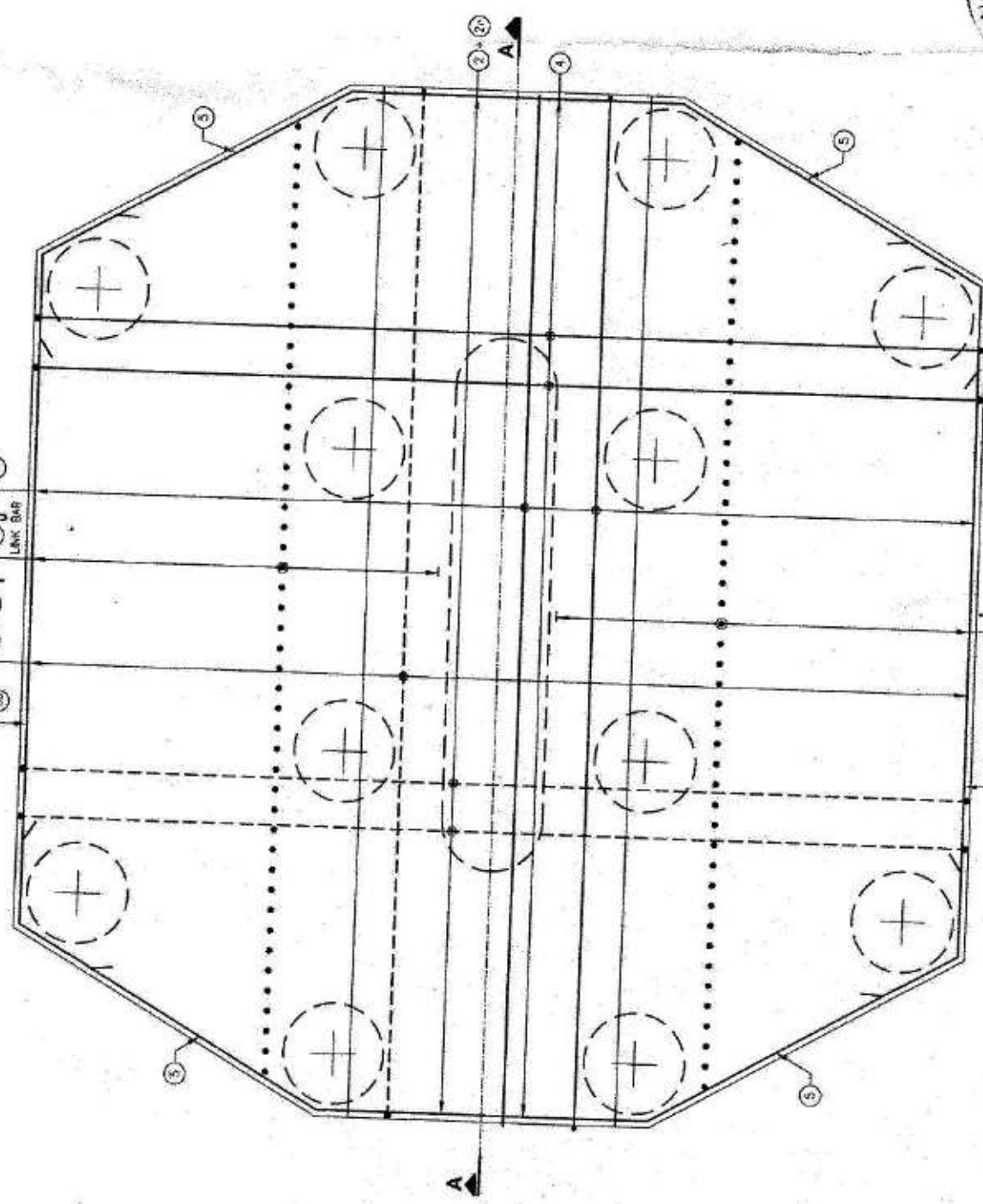
ABUT SHAFT BARS TO BE LEFT IN POSITION WHILE CASTING THE PILE CAP.



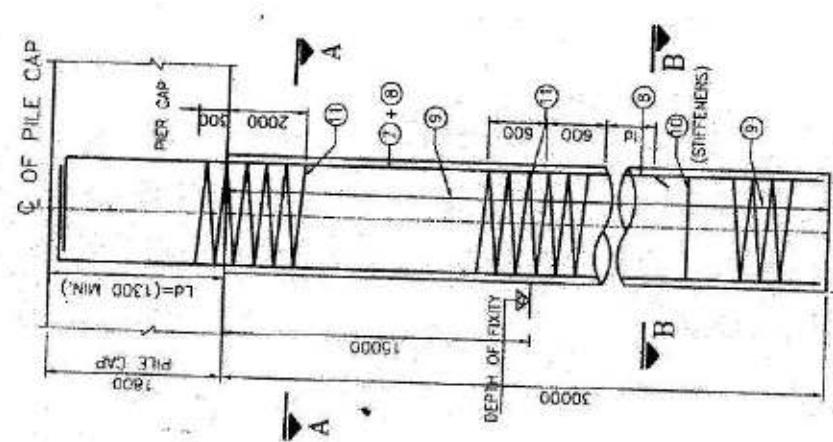
SECTION A-A
(SCALE 1:50)

SECTION B-B
(SEE PAGE 100)

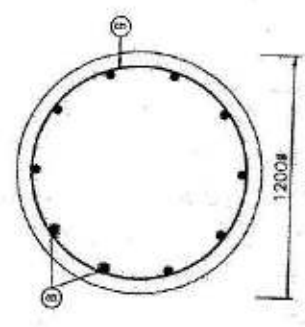
BAR MKD.	DIA (mm)	SPACING/No.s	SHAPE	REMARKS
1	32	100 C/C		
1a	16	100 C/C		
2	32	100 C/C		
2a	16	100 C/C		
3	20	100 C/C		
4	20	100 C/C		
5	16	100 C/C		BOTH FACES
5a	16	100 C/C		BOTH FACES
6	12	LONGITUDINALS 100 TRANSVERSE @ 100		
7	32	10 nos.		
8	32	10 nos.		
9	16	150 C/C		
10	20	120 C/C		
11	20	120 C/C		



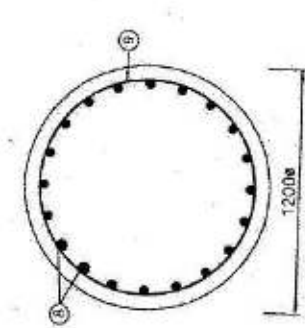
REINF. DETAILS OF PILE CAP
(SCALE 1:50)



SECTIONAL DETAILS OF PILE
(SCALE 1:50)

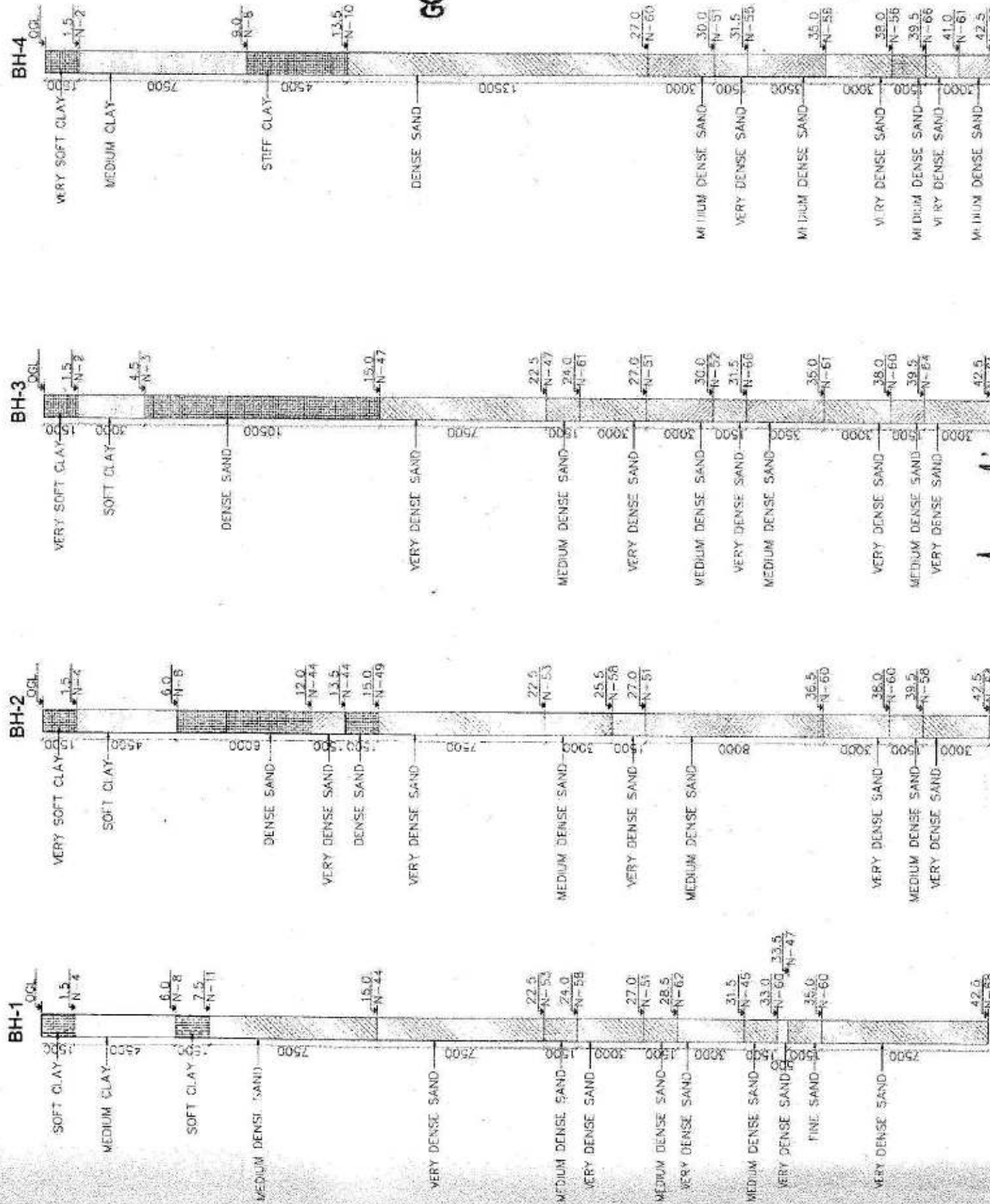


SECTION B-B
(SCALE 1/25)



SECTION A-A
(SCALE 1:25)

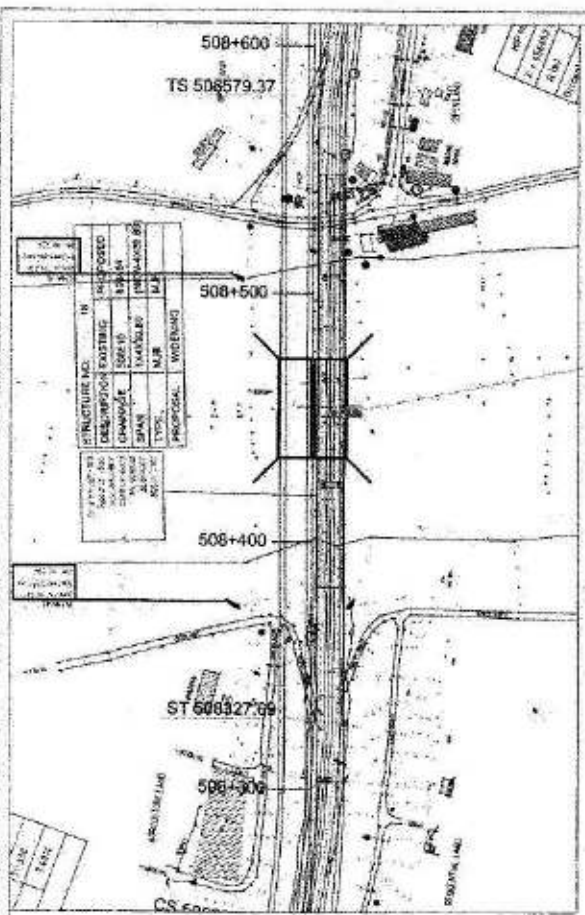
[illegible]



DESIGN DIRECTOR
Vijay Kumar Dwivedi

HIGH FLOOD LEVEL : 90.530m
DISCHARGE : 2004 cumecs
MAX SCOUR LVL. AT ABUTMENT : 82.874m
MAX SCOUR LVL. AT PIER : 78.474m

DESIGN DIRECTOR
Vasanth Kumar T.H.



KEY PLAN

MAJOR BRIDGE @ 508+454

GOOD FOR CONSTRUCTION

NOTES:

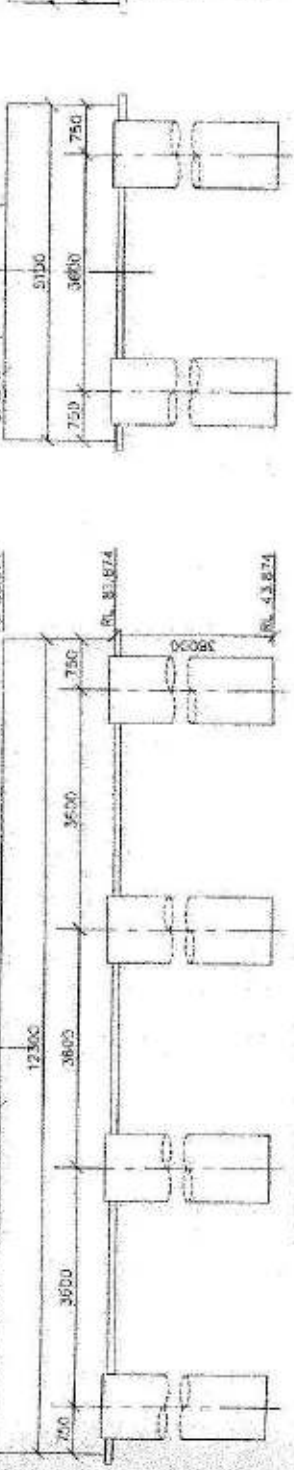
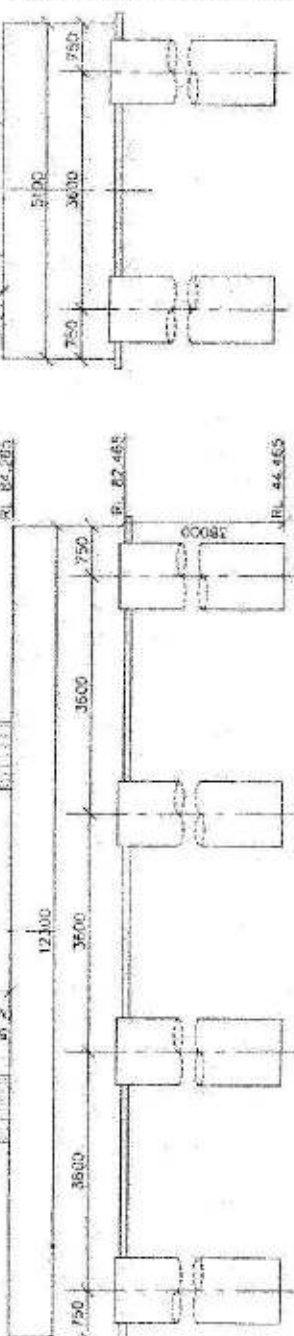
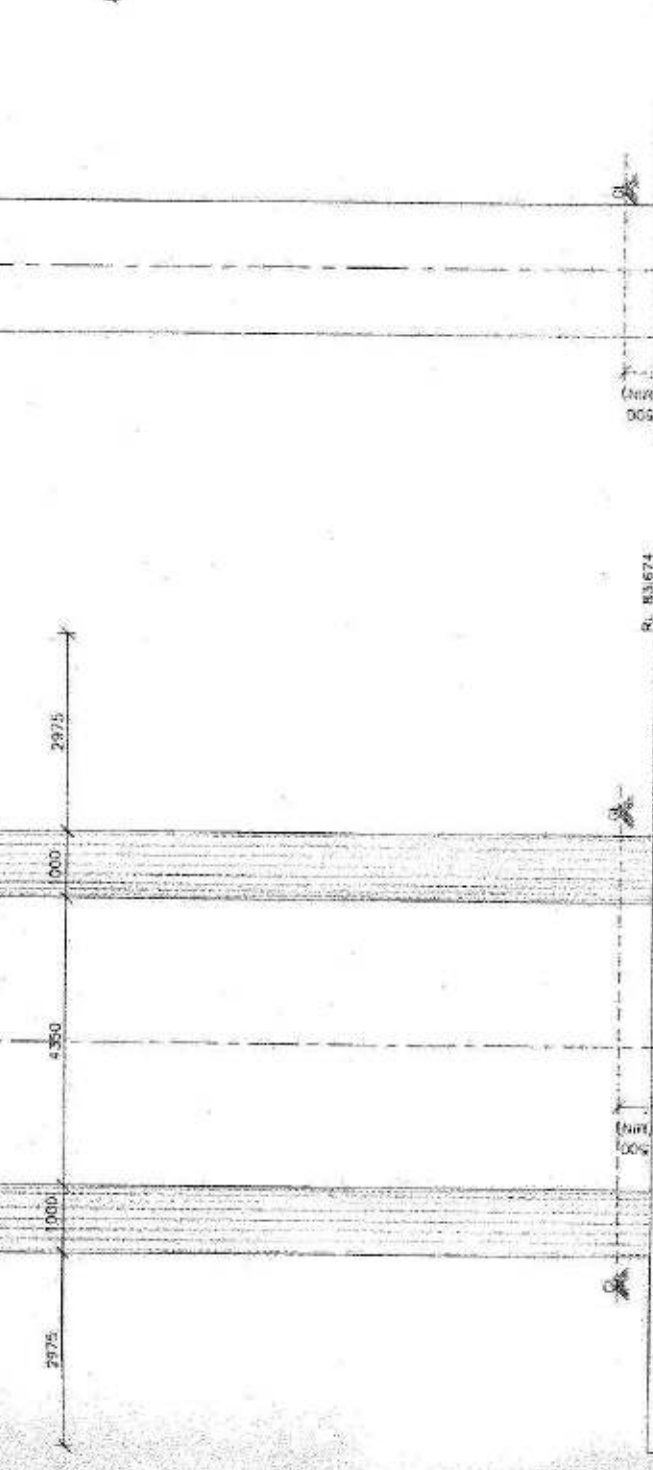
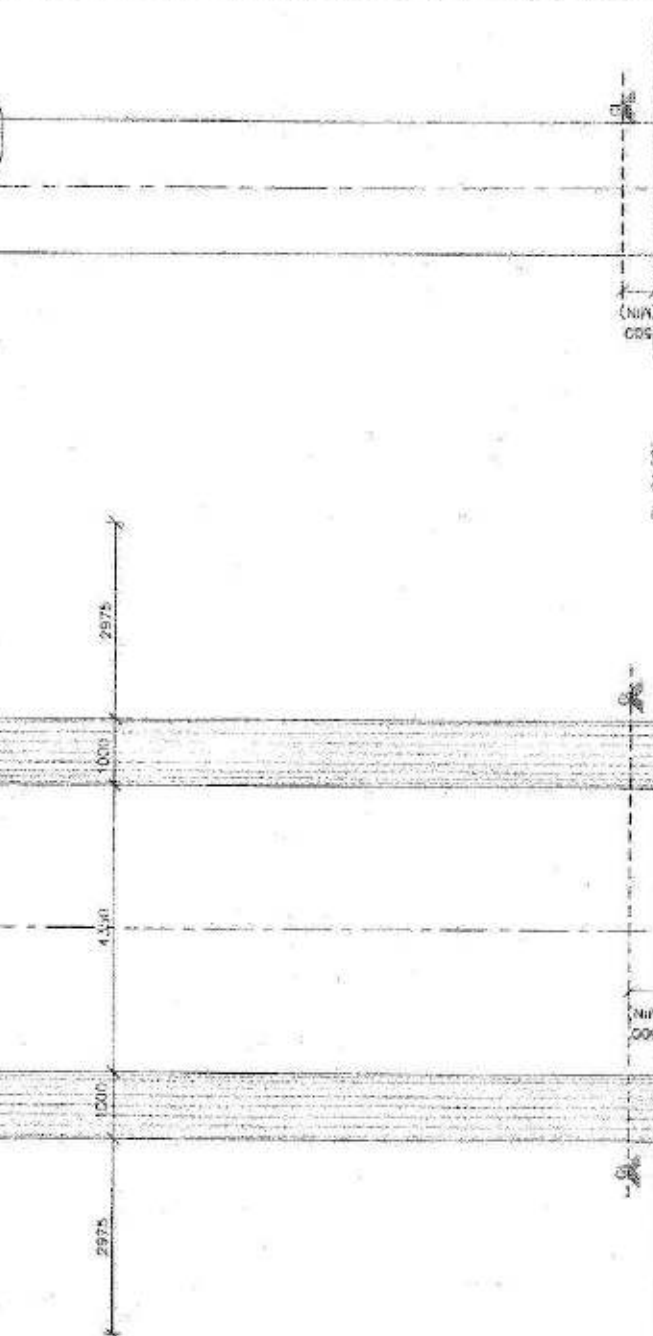
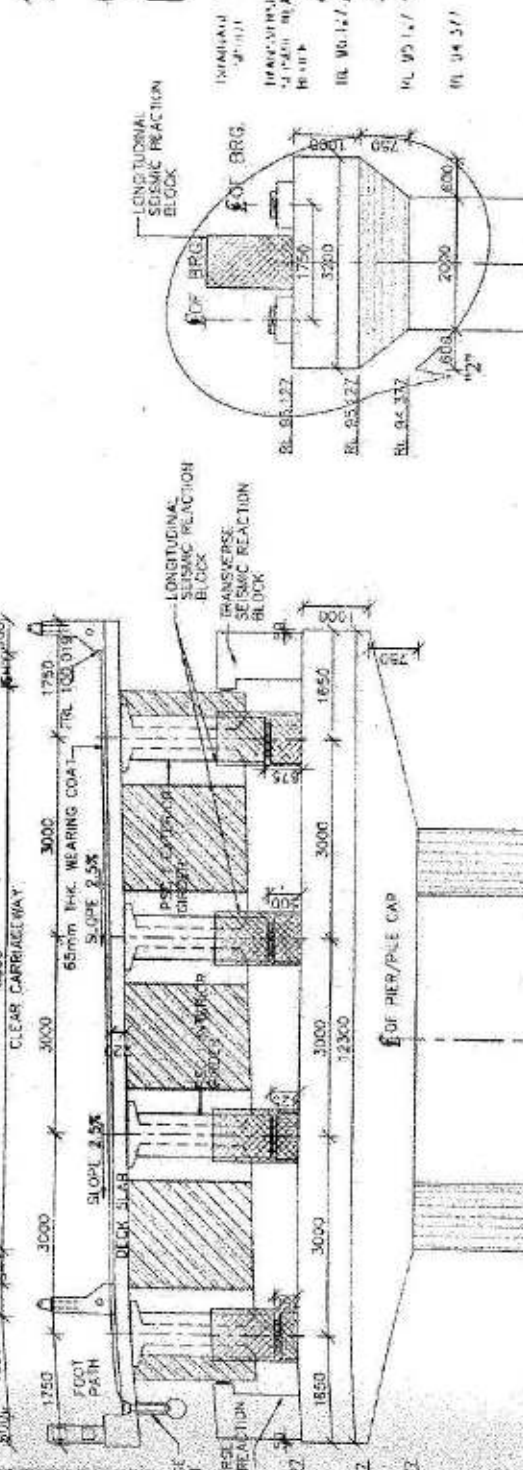
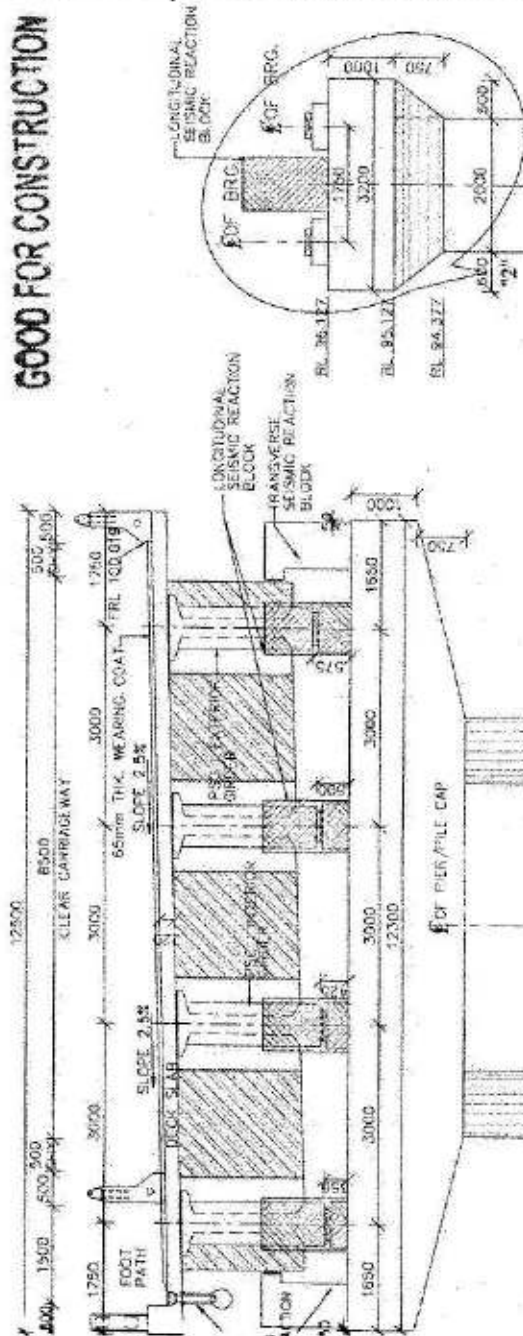
1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS.
2. UNLESS OTHERWISE STATED, THE DRAWING SHALL NOT BE SCALED.
3. FILL MEASURED AT MEDIAN EDGE OF CARRIAGE WAY AND CHANINAGE AT BRIDGE CENTER.
4. THE BRIDGE IS DESIGNED FOR ONE LANE OF IRC CLASS FOR ONE LANE OF IRC CLASS A OR THREE LANE OF IRC CLASS A LOADING.
5. CONCRETE SHALL BE DESIGN MIX WITH A MINIMUM 28 DAYS CHARACTERISTIC STRENGTH ON 150mm CUBE AS UNDER:
 - a) RCC DECK SLAB - M35
 - b) PRECAST PSC GIRDER - M35
 - c) APPROACH SLAB - M30
 - d) CRASH BARRIER - M35
 - e) PEDESTAL - M35
 - f) RETAIN WALL - M35
 - g) PIER & PER CAP - M35
 - h) LEVELING COURSE - M15
6. CLEAR COVER TO OUTER MOST STEEL IS:
 - a) SUPER STRUCTURE - 40mm
 - b) FOUNDATION - 40mm
 - c) ABUTMENT DIRT WALL & RETAIN WALL - EARTH SIDE - 75mm
 - d) ABUTMENT - 40mm
 - e) PIER STEW - 40mm
 - f) PIER CAP - 50mm
7. GRADE OF STEEL SHALL BE Fe500 CONFORMING TO IS 1786.
8. LAYING COMPACT AND EXTENT OF BACK FILL BEHIND ABUTMENT SHALL CONFORM TO APPENDIX-B OF IRC 78-2014.
9. WEARING COURSE SHALL BE 65mm THK. CONSISTING OF 40mm ASPHALTIC CONCRETE AND 25mm MASTIC ASPHALT.
10. BACK FILLING BEHIND ABUTMENT SHALL BE CONSIST OF SELECTED EARTH CONFORMING TO APPENDIX-B OF IRC - 78 HAVING PROPERTIES: C=0, $\phi=30^\circ$, $\sigma_{vc}=20$ kN/m².
11. TYPE OF STRUCTURE & CONSTRUCTION METHODOLOGY CONSIDERED IN DESIGN IS:
 - a) FOUNDATION - PILE FOUNDATION
 - b) SUPER STRUCTURE - PRECAST PSC GIRDER & CAST-IN-SITU SLAB
 - c) WEARING COAT - 65mm THK. WITH ONE LAYER OF 25mm THK. MASTIC ASPHALT OVER 40mm THK. OF ASPHALTIC CONCRETE.
 - d) BEARING - POT ON PILE
 - e) ALL STRUCTURAL DIMENSION SHOWN ARE BASED ON FINAL DESIGN SHALL BE AS PER IRC-78-2014.
 - f) APPROACH SLAB DRAINAGE SPOUT & CRASH BARRIER DETAIL REFER MISCELLANEOUS DWG - PC/IN/HA/37/2014/STRUCT/00000001.
 - 12. SEISMIC ZONE - IV - AS PER IS 1893-2002.
 - 13. 40mm STRIP SEAL TYPE EXPANSION JOINT SHALL BE PROVIDED AS PER IRC SP-69-2011 GUIDELINE AND SPECIFICATION FOR EXPANSION JOINT.
 - 14. FOR KEY PLAN PROPOSED CHANINAGE & LOCATION REFER LATEST HIGHWAY APPROVED PLAN & PROFILE DWG.
 - 15. PEDESTAL HEIGHT SHALL BE ADJUSTED TO MAINTAIN TRANSVERSE SLOPE.
 - 16. WEIR HOLES OF 1000 @ 1000mm/c IS PROVIDED STAGGERED BOTH VERTICALLY AND HORIZONTALLY IN SIDE WALLS & RETAINING / RETURN WALLS.
 - 17. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST SPECIFICATIONS.
 - 18. CONSTRUCTED EARTH SHOULD CONFORM TO CLAUSE 305.2.1.5 OF MORTH SPECIFICATIONS.
 - 19. FIVE CUMBER EXISTING ROADS WITH TO BE MATCHED WITH HIGHWAY ALIGNMENT DRAWING AND DRASTIC VARIATIONS IS TO BE INFORMED TO THIS OFFICE IMMEDIATELY.
 - 20. VERTICAL CAPACITY UNDER EACH ABUTMENT PILE SHALL BE 200T & HORIZONTAL CAPACITY SHALL BE 25T.
 - 21. VERTICAL CAPACITY UNDER EACH PIER PILE SHALL BE 450T & HORIZONTAL CAPACITY SHALL BE 25T.
 - 22. FOR BEARING MAINTENANCE, ALL GROUND TO BE LIFTED AT A TIME NO DIFFERENTIAL LIFTING TO BE ALLOWED.
 - 23. HYDRAULIC DATA CORRESPONDS TO HYDROLOGY REPORT.

Md. HARBHARAN SING
Team Leader (VSPL)
Authority Engineer (NHIBCL)

Bridge Engineer
VSPL, Srinagar

PROJECT	CLIENT	EPC CONTRACTOR	DESIGN CONSULTANT	PROOF CONSULTANT	SAFETY CONSULTANT	NATIONAL INSTITUTE OF TECHNOLOGY
NAME OF PROJECT: JHARKHAND TO DEMOW CONTRACT FROM EXISTING CH. Km TO Km 55+250 (DESIGN CH. Km TO Km 55+400) IN THE STATE OF ASSAM UNDER EPC MODE.	National Highways Infrastructure Development Corporation Ltd. Ministry of Road Transport & Highways, Government of India Branch office: House No. 1, Park Road, Ambikapur Nagar, Zor Road, Guwahati-781005	Ganpati Engineering & Co. Pvt. Ltd. Plot No. 1, Phase I, Road No. 1, Sector 1, Block 1, P.O. Box 1, Kolkata - 700 005	Professional Civil Infra Pvt. Ltd. Plot No. 1, Phase I, Road No. 1, Sector 1, Block 1, P.O. Box 1, Kolkata - 700 005	Chelani Infra Tech Consultants (P) Ltd. Plot No. 1, Phase I, Road No. 1, Sector 1, Block 1, P.O. Box 1, Kolkata - 700 005	Smart Safety Services Plot No. 1, Phase I, Road No. 1, Sector 1, Block 1, P.O. Box 1, Kolkata - 700 005	National Institute of Technology, Kharagpur, West Bengal - 721302
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DATE: 15/05/2019	DATE: 15/05/2019	DATE: 15/05/2019	DATE: 15/05/2019	DATE: 15/05/2019	DATE: 15/05/2019	DATE: 15/05/2019
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DATE: 15/05/2019	DATE: 15/05/2019	DATE: 15/05/2019	DATE: 15/05/2019	DATE: 15/05/2019	DATE: 15/05/2019	DATE: 15/05/2019
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DATE: 15/05/2019	DATE: 15/05/2019	DATE: 15/05/2019	DATE: 15/05/2019	DATE: 15/05/2019	DATE: 15/05/2019	DATE: 15/05/2019
BY: [Signature]	BY: [Signature]	BY: [Signature]	BY: [Signature]	BY: [Signature]	BY: [Signature]	BY: [Signature]
FOR APPROVAL	FOR APPROVAL	FOR APPROVAL	FOR APPROVAL	FOR APPROVAL	FOR APPROVAL	FOR APPROVAL
DATE: 15/05/2019	DATE: 15/05/2019	DATE: 15				

GOOD FOR CONSTRUCTION



ROSS SECTION OF PIER (P2)

LONGITUDINAL SECTION OF PIER (P2)

CROSS SECTION OF PIER (P1)

LONGITUDINAL SECTION OF PIER (P1)
(SCALE 1:75)

vetted unseriously

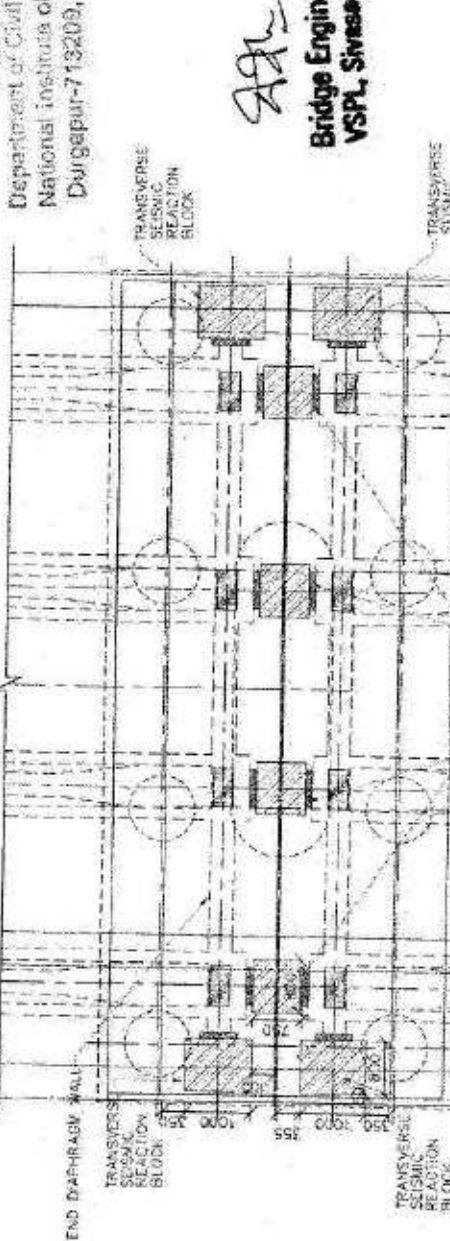
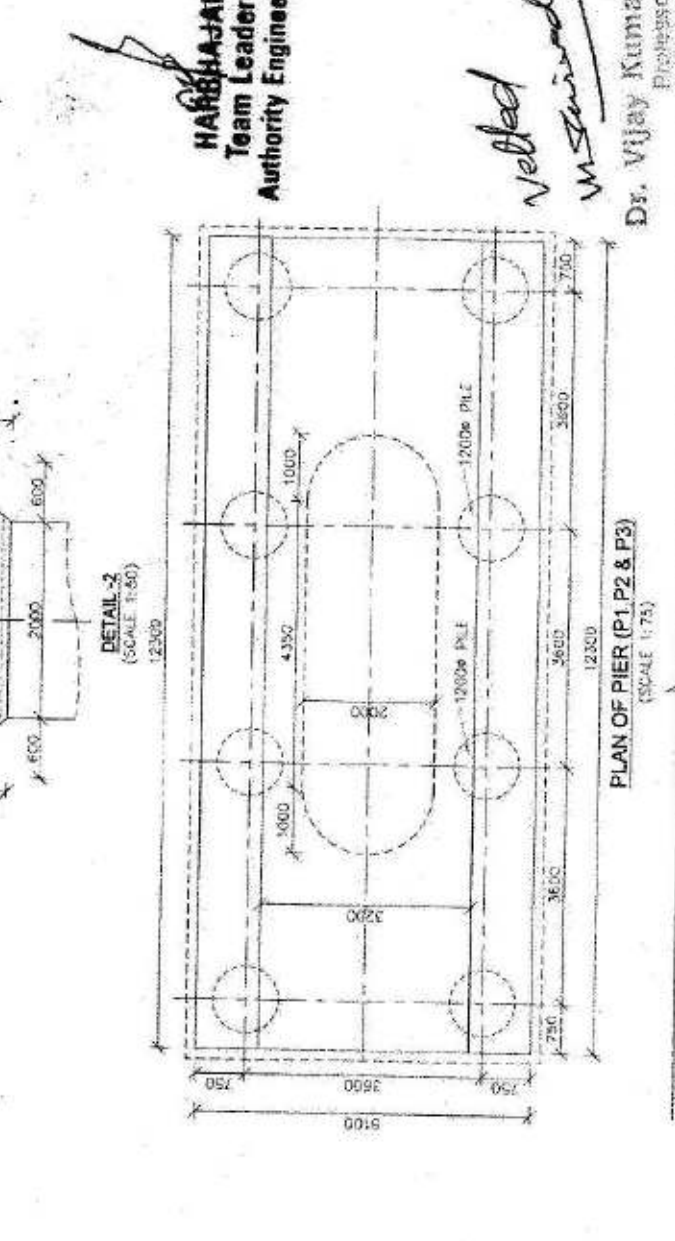
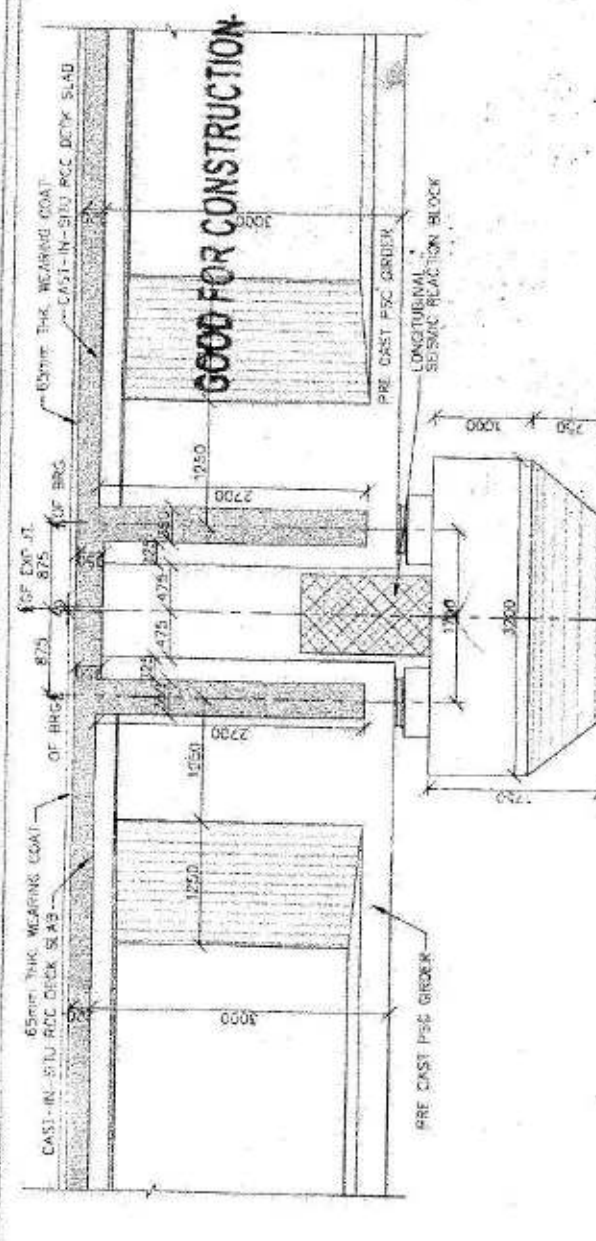
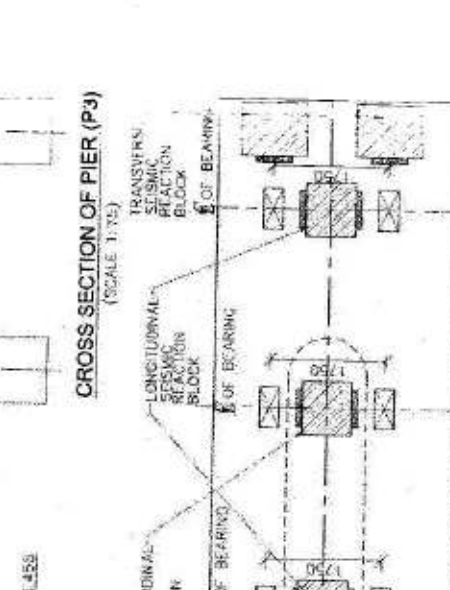
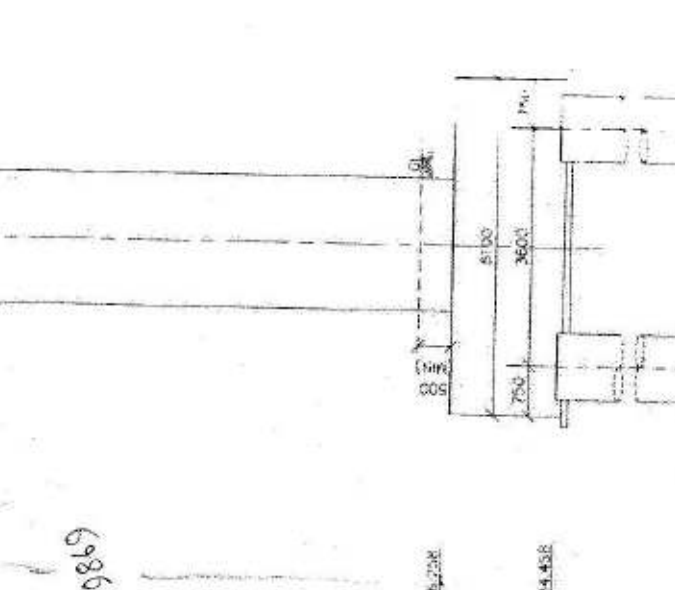
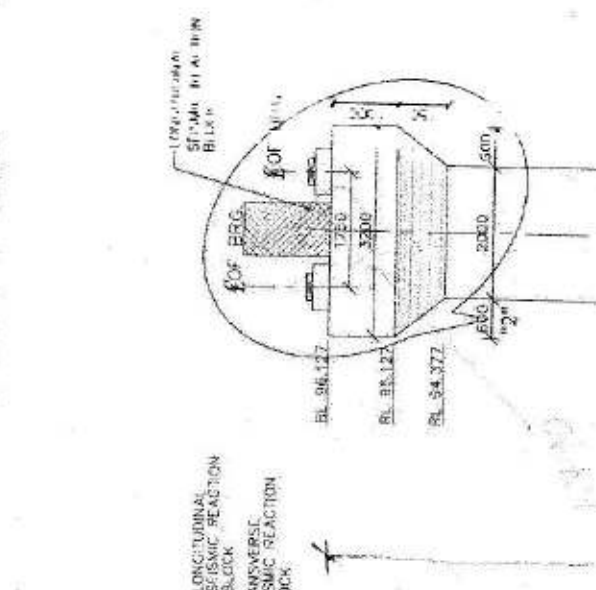
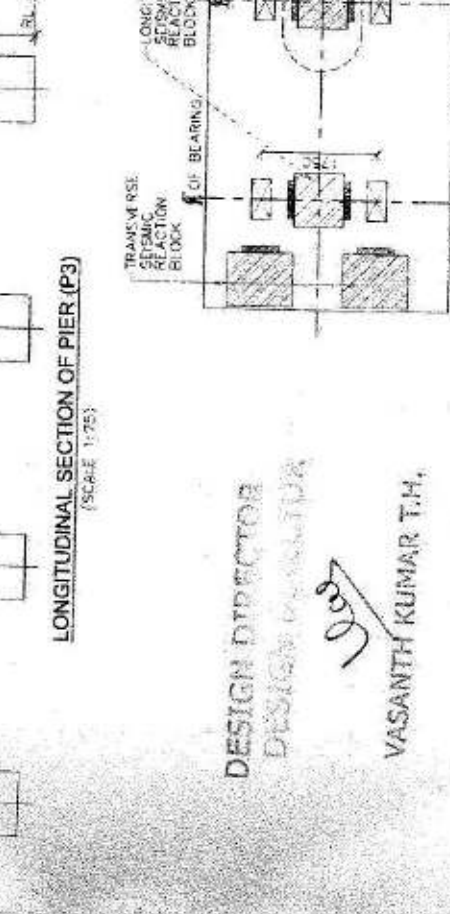
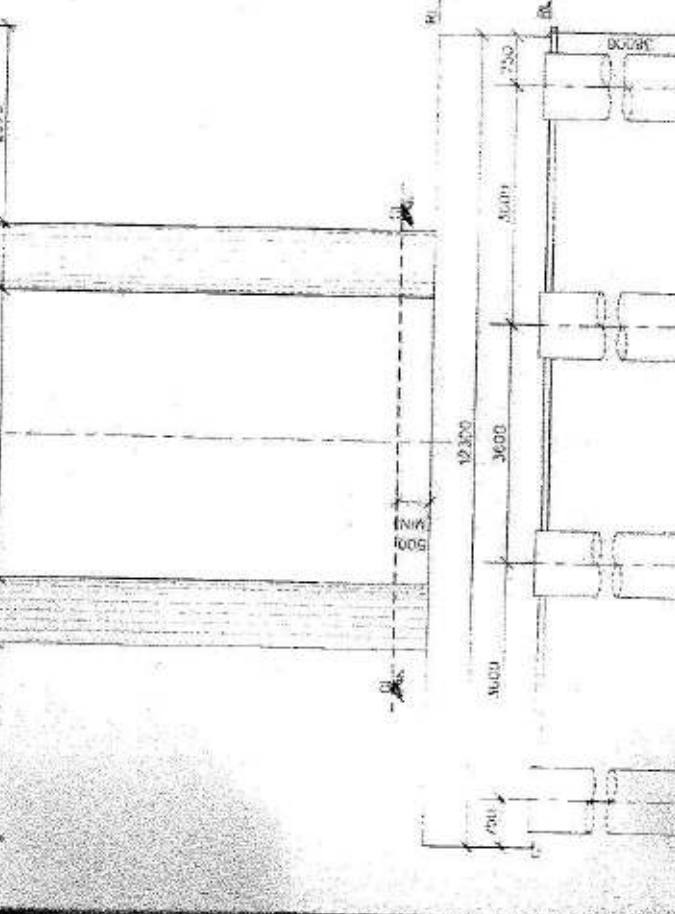
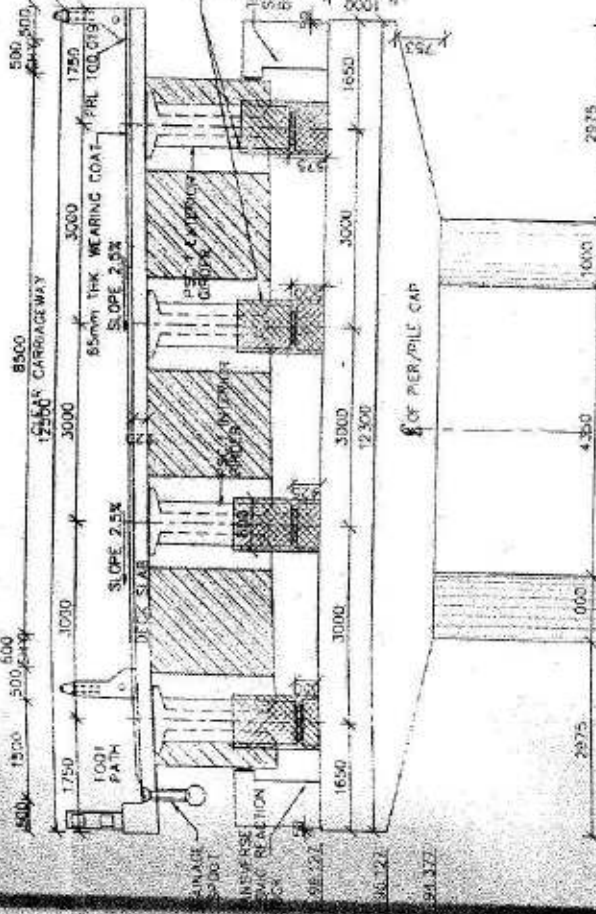
DESIGN DIRECTOR

HARBHANJAM SING
Team Leader (VSPL)
Authority Engineer (NHIDCL)

Dr. Vijay Kumar Dutt

Professor
Department of Civil Engineering
National Institute of Technology
Durgapur-713009, W.B., India

[illegible]



GOOD FOR CONSTRUCTION

DETAIL - 2
(SCALE 1:50)
12300

PLAN OF PIER (P1, P2 & P3)
(SCALE 1:75)
12300

DESIGN DIRECTOR
V. KUMAR T.H.

DESIGN DIRECTOR
V. KUMAR T.H.

DESIGN DIRECTOR
V. KUMAR T.H.

HARISHANKAR
Team Leader (VSPL)
Authority Engineer (NHIDCL)

Dr. Vijay Kumar Dwivedi
Professor
Department of Civil Engineering
National Institute of Technology
Durgapur-713209, W.B., India

Bridge Engineer
VSPL, Sivrasagar

PROOF CONSULTANT
National Institute of Technology

PROOF CONSULTANT
National Institute of Technology

PROOF CONSULTANT
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(1) Third copy
JAN 1968

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w/insider

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M5S 1A5
Tel: 416-978-2092
Fax: 416-978-2090
E-mail: vijay.dhillon@utoronto.ca


Bridge Engineer
VSPL, Sivasagar

DESIGN DIRECTOR

Das
VASANTH KUMAR T.H.

**REINFORCEMENT DETAILS
OF ABUTMENT CAP**
(SCALE: 1:30)

CLIENT
National
Development

CLIENT
National Highways Infrastructure
Development Corporation Ltd.
Ministry of Road Transport & Highways
Government of India
Branch office: House No. 1, Park Road,
Ambalga Nagar, 200 road,

EPC CONTRACTOR
Garrison Dunkenly & Co.

DESIGN CONSULTANT
Professional Civil Infra Pvt.
10/10, Ground Floor,
1st Flr, Mahaveerapally Lane,
Nagavara, Bangalore - 560 064

PROOF CONSULTANT SAFETY CONSULTANT
Chung Infra-Tech
Siddhartha (P) Ltd.
8-5-97, Mittata
Narasimhaiah
Co., Hyderabad
8-5-97, Mittata
Narasimhaiah
Co., Hyderabad

**National Institute of
Technology.**

TITLE	REINFORCING OF MAIN BEAMS	DWG NO.	AHM V	DATE
AS PER NIT COMMENTS	FEB 2019			
FOR APPROVAL	AUG 2018			

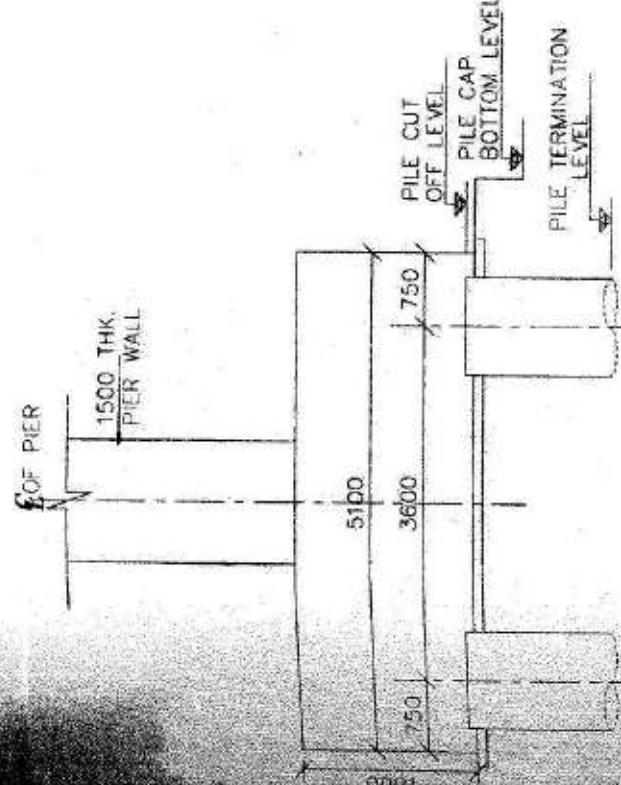
FOR APPROVAL	CEMENT DETAILS OF ABUTMENT				SHEET SIZE
	FOR BRIDGE AT CH. 508+454				
	CHK.	APP.	SCALE	A5 SHOWN	A2
	WAS	PSA			

SCHEDULE OF REINFORCEMENT			
BAR MARK	SHAPE OF BARS (NOT TO SCALE)	BAR DIA in mm.	SPACING in mm. (s)
01		32	54 NOS.
02		16	64 NOS.
03		32	8 NOS ON EACH FACE
04		25	100
05		10	300
06			NOT USED
07		20	12 NOS.
08		16	12 NOS.
09		16	200
10		16	150
11		16	6L @ 50 C/C
12		12	7 NOS.
13		12	7 NOS.
14		12	3 NOS.
15		16	100
16		12	150
17		12	150

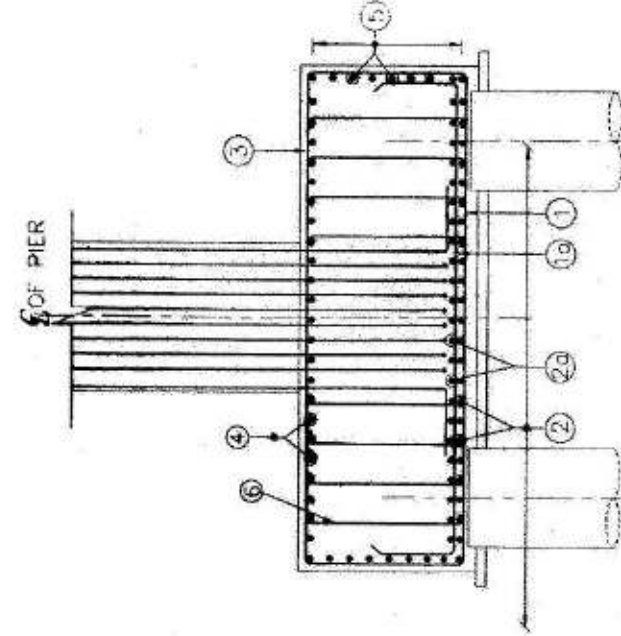
(18)		12	150
(19)		12	5 NOS.
(20)		32	10 NOS.
(21)		32	10 NOS.
(22)		10	175
(23)		16	1000
(24)		20	50

GOOD FOR CONSTRUCTION

BAR NO.	BAR START	BAR STOP	BAR NO.
1			32
2			32
3			20
4			20
5			10
6			32
7			32
8			20
9			20
10			32
11			32
12			20
13			20
14			32
15			32
16			20
17			20
18			32
19			32
20			20
21			20
22			32
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459			32
46			



CROSS SECTION OF PIER PILE CAP
(SCALE 1:40)



REINFORCEMENT DETAILS OF PIER PILE CAP
(SCALE 1:40)

BAR NO	BAR SHAPE	BAR DIA	SPACING mm/Nos
1	[Diagram]	#32	100
1A	[Diagram]	#16	100
2	[Diagram]	#32	100
2A	[Diagram]	#16	100
3	[Diagram]	#16	100
4	[Diagram]	#16	100
5	[Diagram]	#16	100
6	[Diagram]	#12	300x300 Shear link bar @ both direction

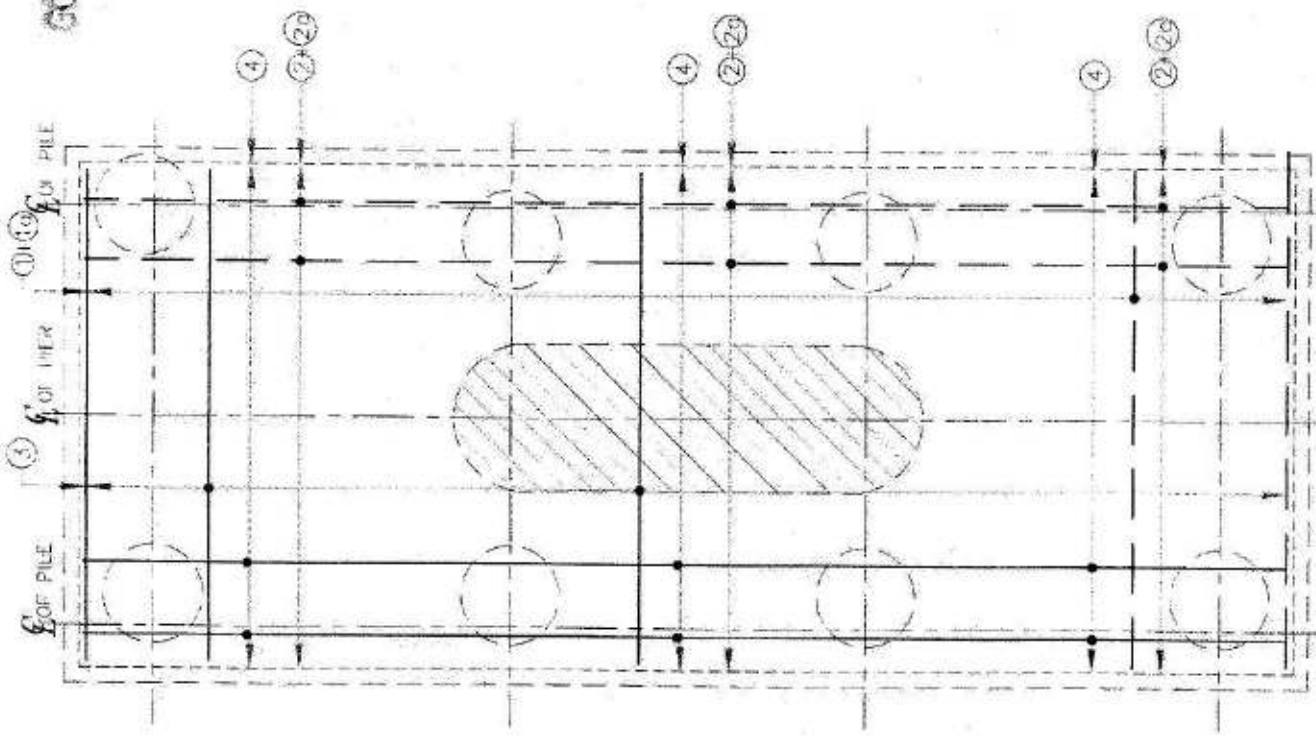
NOTES

- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS IN METERS UNLESS OTHERWISE MENTIONED.
- ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED. NO DRAWING SHALL NOT BE SCALED.
- THE GRADE OF CONCRETE FOR PILE AND PILECAP : M35
- CLEAR COVER TO REINFORCEMENT FOR PILE AND PILE CAP: 75mm
- BOTTOM OF PILE CAP COVER SHOULD BE 1 BAR DIA ABOVE THE PILE CUTOFF LEVEL.
- REINFORCEMENT BAR SHALL BE T.M.T BARS (DENOTED AS #) DESIGNED Fe - 500 AND CONFORMING TO IS-1786 : 2000
- LAPS SHALL BE STAGGERED, MINIMUM LAP LENGTH AND ANCHORAGE LENGTH SHALL BE AS PER CLAUSE 304.6 OF IRC:112-2011.
- THE BAR BENDING DIAGRAM SHOWN ARE FOR THE GUIDANCE ONLY. THE CONTRACTOR SHOULD PREPARE THE BAR BENDING SCHEDULES SUBJECT TO THE APPROVAL OF THE ENGINEER-IN-CHARGE.

HARBHARAN SING
Team Leader (VSPL)
Authority Engineer (NHIDCL)

LEGEND:

TOP BARS / OUTER FACE
BOTTOM BARS / EARTH FACE



REINFORCEMENT DETAILS OF PILE CAP (PLAN)
(SCALE 1:40)

GOOD FOR CONSTRUCTION

vetted
V. Srinivasulu

Dr. Vijay Kumar Dulvedi
Professor
Department of Civil Engineering
National Institute of Technology
Durgapur-713206, W.B., India

DESIGN DIRECTOR

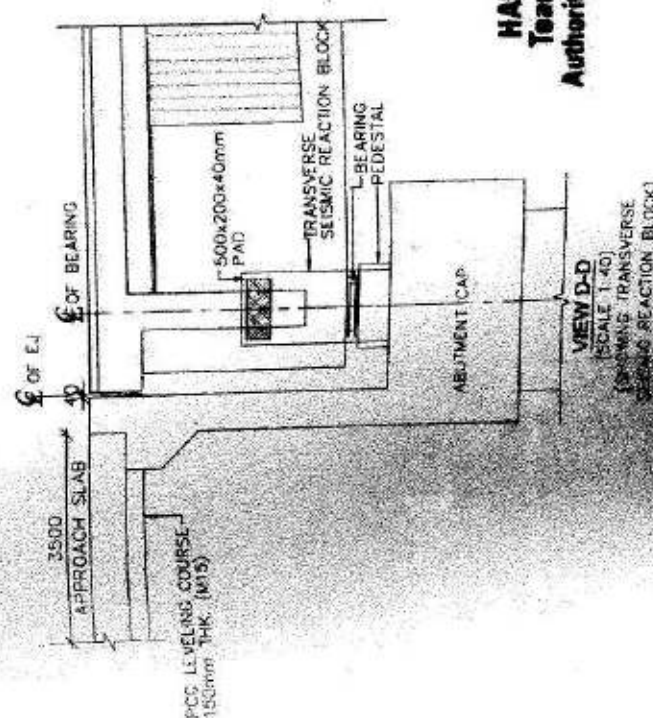
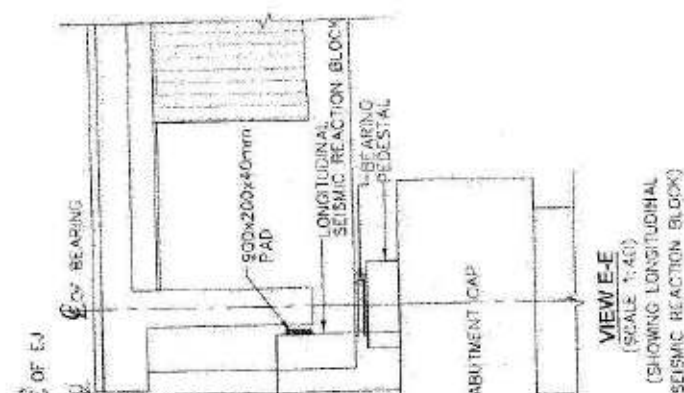
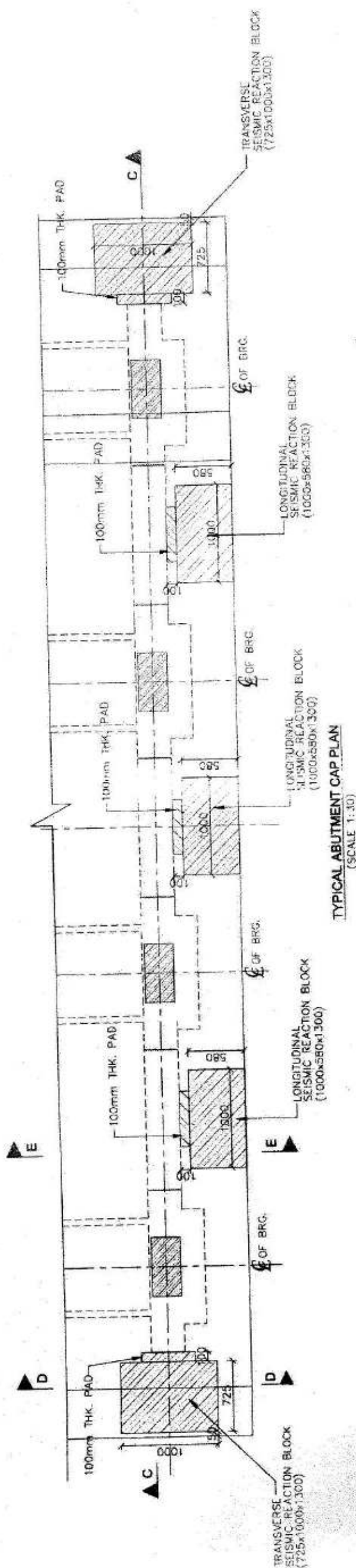
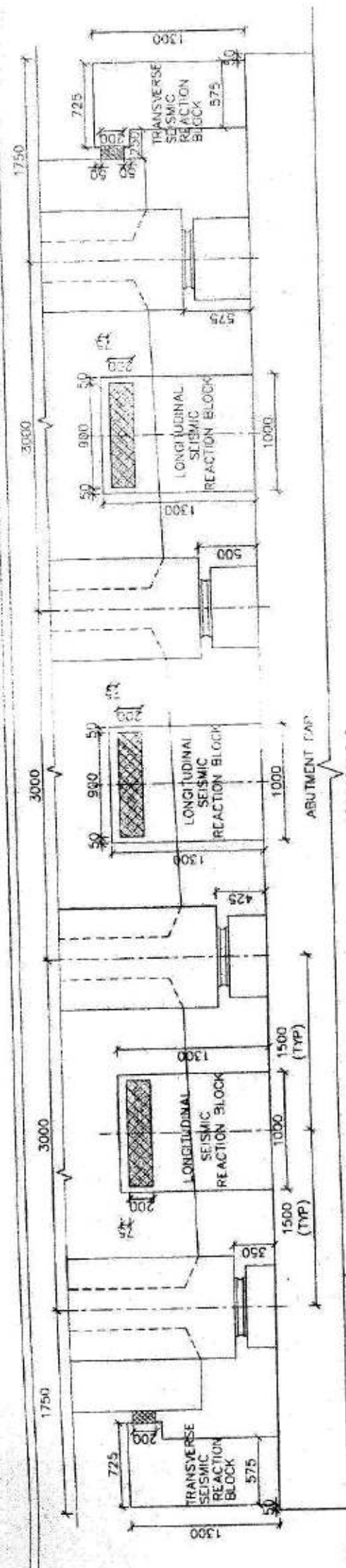
Yes

VASANTH KUMAR T.M.

[Signature]
Bridge Engineer
VSPL, Sivamangar

CLIENT NATIONAL HIGHWAYS INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. Ministry of Road Transport & Highways, Government of India Branch office : House No. 1, Pandurath, Ambabai Nagar, 2nd road, Guwahati-781004		EPC CONTRACTOR GARUDA INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. 10/1, 1st Floor, 89th Ave, Anna Nagar, Chennai-600062		AUTHORITY ENGINEER NHIDCL		DESIGN CONSULTANT PROFESSIONAL CONSULTANTS PVT. LTD. 10/1, 1st Floor, 89th Ave, Anna Nagar, Chennai-600062		PROOF CONSULTANT CHETAN INFRA-TECH CONSULTANTS (P) LTD. 10/1, 1st Floor, 89th Ave, Anna Nagar, Chennai-600062		SAFETY CONSULTANT SMART SAFETY SERVICES 10/1, 1st Floor, 89th Ave, Anna Nagar, Chennai-600062		NATIONAL INSTITUTE OF TECHNOLOGY DURGAPUR WEST CAMPUS DURGAPUR, WEST BENGAL-713206		FOR APPROVAL PILE CAP DIMENSION & REINFORCEMENT OF PIER PILE, MAJOR BRIDGE AT CH-500+450 SCALE: SHEET 3/25 DWG. CHA. A01 DES. CHA. A01 DATE: AUG 2018 DRAWING NO. DSA/CH-500+450/15 OF 18	
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SECTION C-C
(SCALE 1:30)



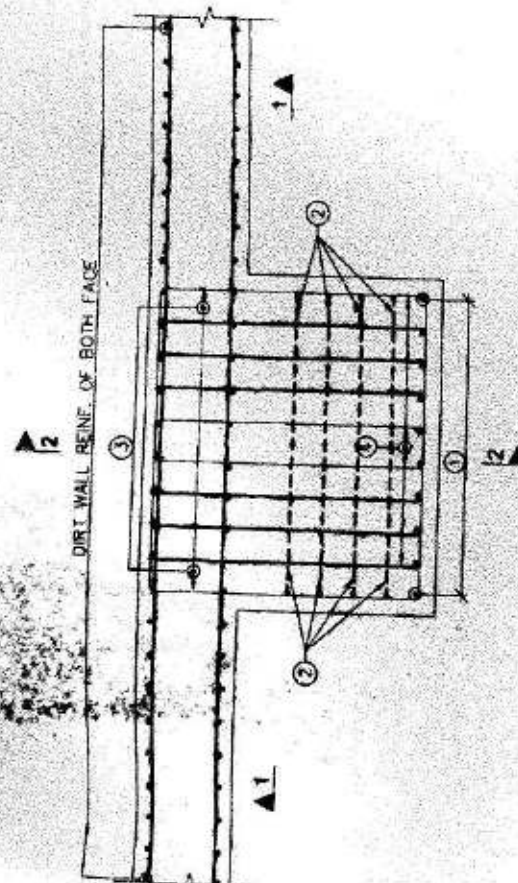
Dr. Vijay Kumar Dwivedi
Professor
Department of Civil Engineering
National Institute of Technology
Surat-395 015, India
E-mail: vijaydwivedi@nitssr.ac.in

DESIGN DIRECTOR *guy*

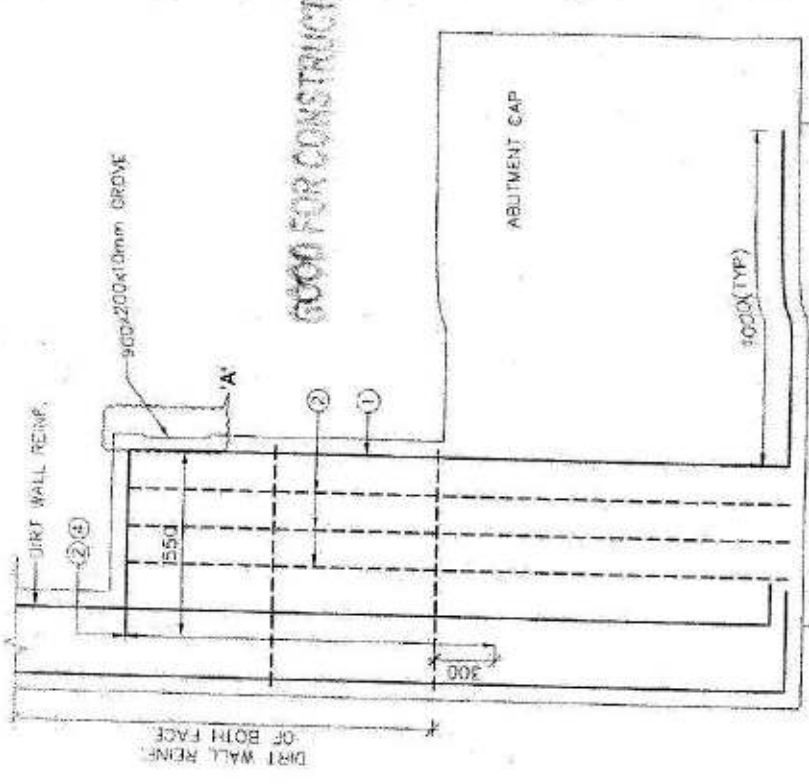

Bridge Engineer
VSPL, Sivasagar

HARBHARAN SINGH
Team Leader (VSPL)
Authority Engineer (NHIDCL)

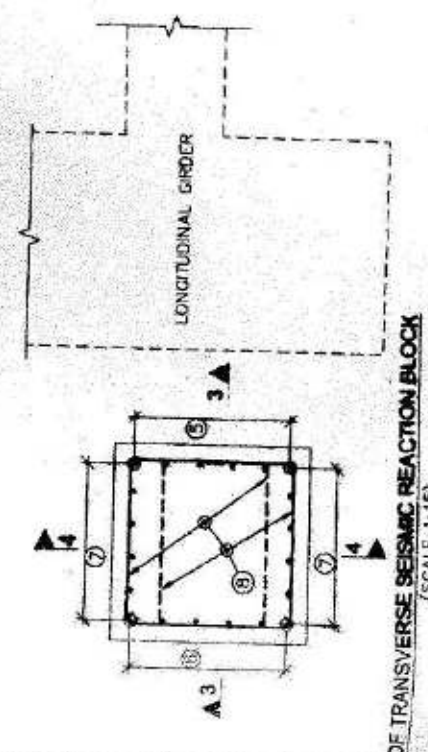
[illegible]



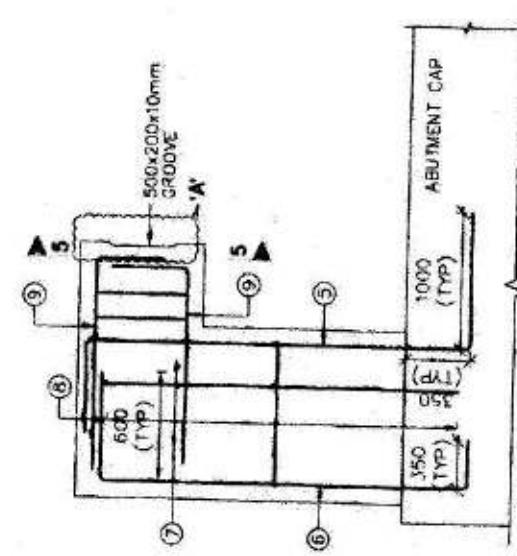
PLAN OF LONGITUDINAL SEISMIC REACTION BLOCK
(SCALE 1:15)



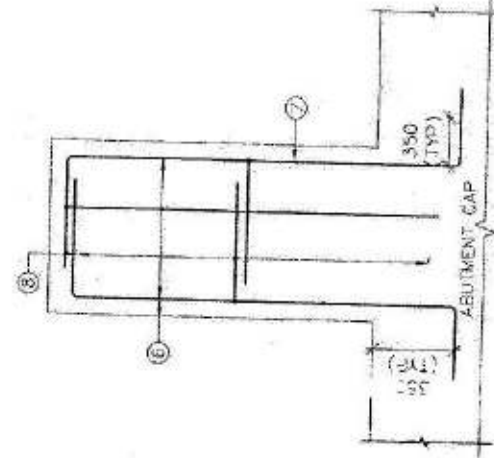
SECTION 1-1
(SCALE 1:15)



SECTION 3-3
(SCALE 1:15)



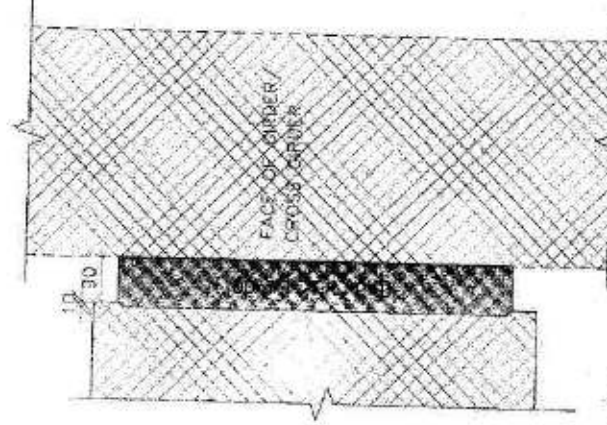
SECTION 4-4
(SCALE 1:15)



SECTION 2-2
(SCALE 1:15)

SL. NO.	BAR SHAPE	BAR DIA.	Nos. / Spacing
1	[Diagram]	25#	10 Nos.
2	[Diagram]	16#	04 Nos.
3	[Diagram]	12#	4L-150 C/C
4	[Diagram]	10#	6-LINKS VERTICALLY IN EACH LAYER WITH 3
5	[Diagram]	25#	10 Nos.
6	[Diagram]	25#	10 Nos.
7	[Diagram]	12#	7/2=14 Nos.
8	[Diagram]	12#	4L-150 C/C
9	[Diagram]	25#	10 Nos.
10	[Diagram]	10#	4L-150 C/C

SCHEDULE OF REINFORCEMENT



DETAIL-A
(SCALE 1:10)

DESIGN DIRECTOR
Dr. Vijay Kumar Dwivedi
Professor
Department of Civil Engineering
National Institute of Technology
Durgapur-713209, W.B., India

Team Leader (VSPL)
Authority Engineer (NHIDCL)
Bridge Engineer
VSPL, Swasagar

PROJECT
FOUR LANE OF 200M TO DEMON
SECTION OF NH-37 FROM EXISTING CH. Km
491+000 TO Km 492+200 DESIGN CH. Km
490+800 TO Km 491+400 IN THE STATE OF
ASSAM UNDER EPC MOD

CLIENT
National Highways Infrastructure
Development Corporation Ltd.
Ministry of Road Transport & Highways
Government of India
Regional Office: House No. 1, Pragathi
Ardhendu, New Delhi-110002

EPC CONTRACTOR
Ganesh Engineering & Construction
Pvt. Ltd.
13/3A, Easting Road,
Sir M. Viswambharan Layout,
Nagpur-465002

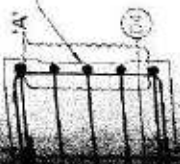
DESIGN CONSULTANT
Prakash Engineering & Infra Pvt. Ltd.
13/3A, Easting Road,
Sir M. Viswambharan Layout,
Nagpur-465002

PROOF CONSULTANT
Prakash Engineering & Infra Pvt. Ltd.
13/3A, Easting Road,
Sir M. Viswambharan Layout,
Nagpur-465002

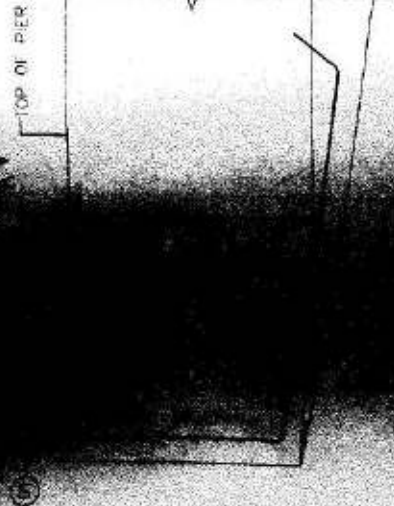
SAFETY CONSULTANT
Smart Safety Services
13/3A, Easting Road,
Sir M. Viswambharan Layout,
Nagpur-465002

FOR APPROVAL
TITLE: REINFORCEMENT DETAIL OF SEISMIC
REACTION BLOCK FOR ABUTMENT OF
MAJOR BRIDGE AT CH. 508+454
DATE: 10/01/2019 SCALE: SHEET SIZE
R1 AS PER NIT COMMENTS FEB 2019
D59/4C NIT DURGAPUR

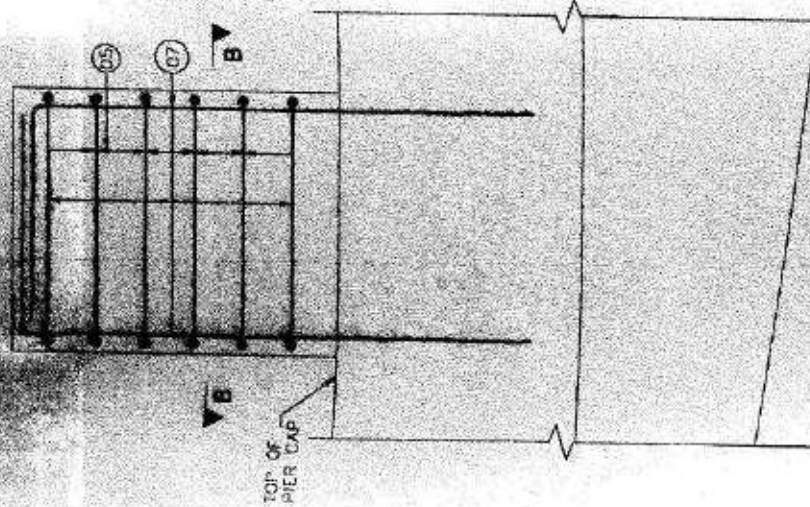
300x200x10mm GROVE



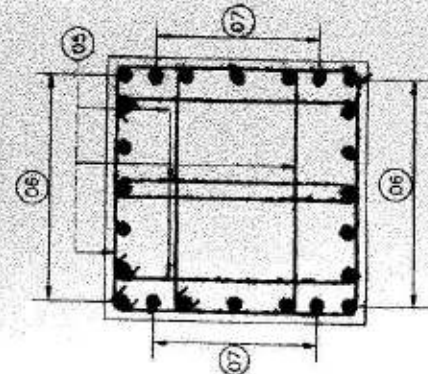
TOP OF PIER



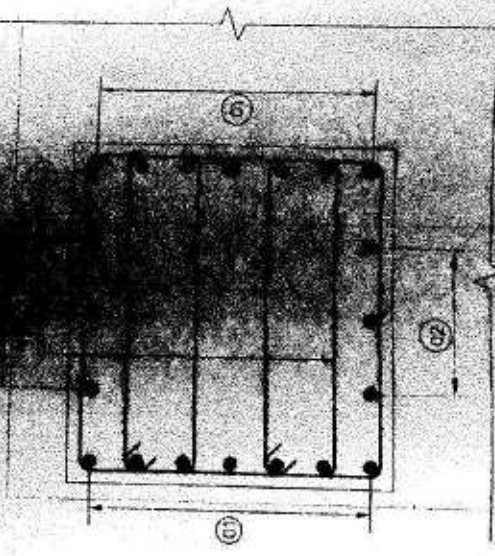
REINFORCEMENT
SEISMIC
TRANSVERSE



REINFORCEMENT DETAILS OF LONGITUDINAL
SEISMIC REACTION BLOCK
(SCALE 1:15)



SECTION-BB
(REINFORCEMENT DETAILS OF
LONGITUDINAL SEISMIC
REACTION BLOCK)
(SCALE 1:15)



SECTION-AA
(REINFORCEMENT DETAILS OF
TRANSVERSE SEISMIC
REACTION BLOCK)
(SCALE 1:15)

SCHEDULE OF REINFORCEMENT				
SL. NO	BAR SHAPE	BAR DIA	Nos. / Spacing	
1		25	9x2 =18 Nos.	
2		25	3x2 =6 Nos.	
3		16	100	
		16	100	
		15	100	
4		25	9 Nos.	
5		12	100	
		12	100	
		12	100	
6		25	9x2 =18 Nos.	
7		25	6x2 =12 Nos.	

GOOD FOR CONSTRUCTION

Handwritten signature

Dr. Vijay Kumar Dwivedi
Professor
Department of Civil Engineering
National Institute of Technology
Durgapur-713209, W.B., India

DESIGN DIRECTOR

Handwritten signature
VASANTH KUMAR T.H.

Handwritten signature
HARBHAJAN SING
Team Leader (VSPL)
Authority Engineer (NHIDCL)

Handwritten signature
Bridge Engineer
VSPL, Swasagar

PROJECT	OUR LAMING OF JHARKHAND TO DEMONSTRATION OF N-17 FROM EXISTING CH. Km 11.200 TO Km 13.250 DESIGN CH. Km 11.200 TO Km 13.250 IN THE STATE OF ASSAM UNDER EPC MODE.		CLIENT		National Highways Infrastructure Development Corporation Ltd.		EPC CONTRACTOR		Ganman Development & Co. Ltd.		AUTHORITY ENGINEER		VOI/AM'S SOLUTIONS PVT. LTD.		DESIGN CONSULTANT		Prof. Dr. B. K. Saha & Co. Pvt. Ltd.		PROOF CONSULTANT		Safety Engineering		SAFETY CONSULTANT		National Institute of Technology		FOR APPROVAL	
	REINFORCEMENT DETAIL OF SEISMIC REACTION BLOCK FOR PIER OF MAJOR BRIDGE AT CH. 508+454																											
	Rev		Description		Date		Rev		Description		Date		Rev		Description		Date		Rev		Description		Date		Rev		Description	
	0		FOR APPROVAL		AUG 2018		0		FOR APPROVAL		AUG 2018		0		FOR APPROVAL		AUG 2018		0		FOR APPROVAL		AUG 2018		0		FOR APPROVAL	