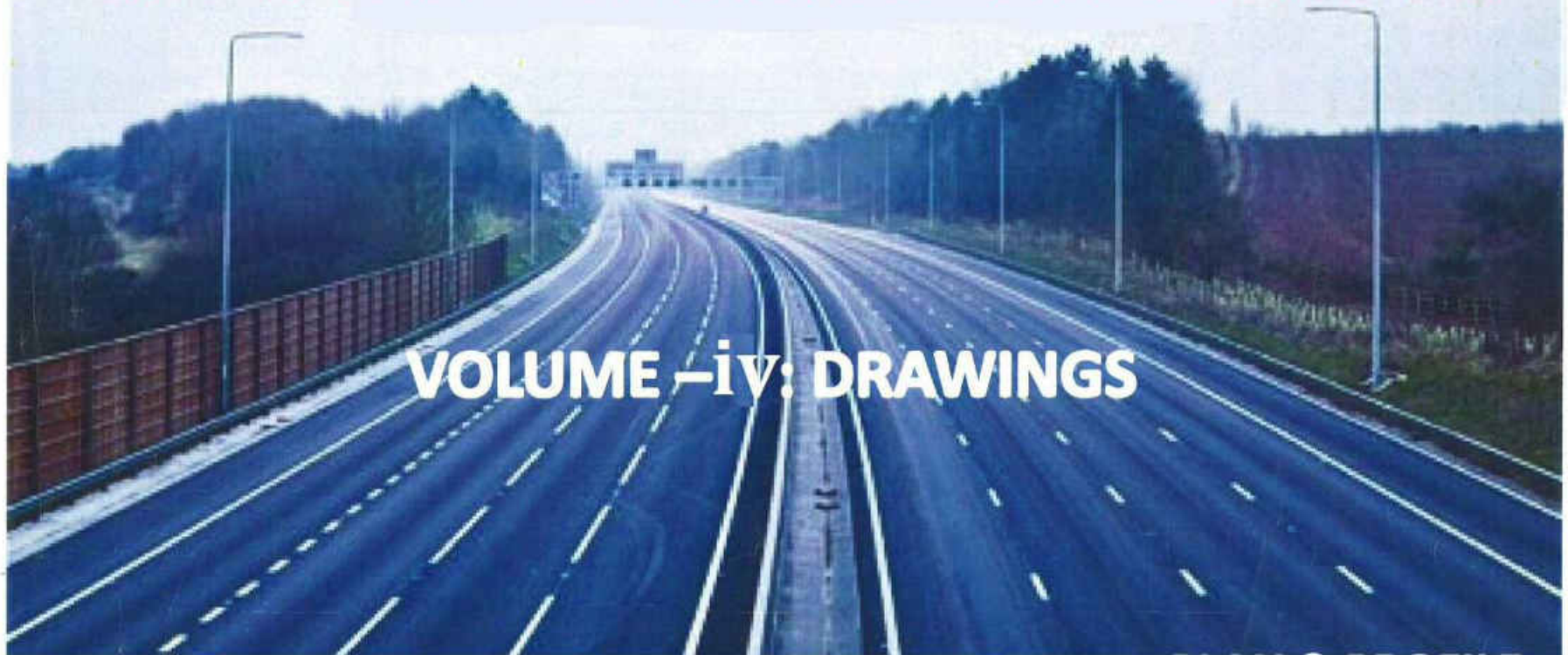


## **VOLUME -IV DRAWINGS**

**Rehabilitation and Upgradation of 2-Laning with Paved Shoulder of Chandrapur Re-Alignment section of New NH-153 (OLD NH-216) from km 25.600 to Km 31.160 in the state of Chhattisgarh on EPC basis under NHDP-IV.**

**Prepared by: Bloom Companies LLC**

**REHABILITATION OF UPGRADATION OF NEW NH-153 (OLD NH-216) FROM  
KM 25+600 TO KM 31+160 (CHANDRAPUR RE-ALIGNMENT) TO TWO LANES  
WITH PAVED SHOULDER IN THE STATE OF CHHATTISGARH UNDER NHDP-IV.**



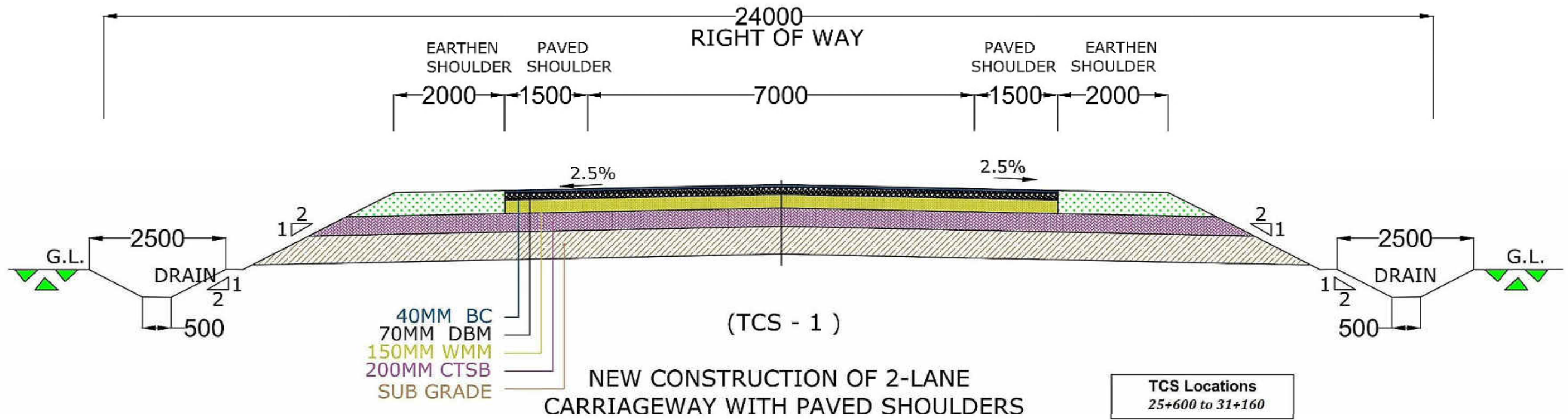
**NATIONAL HIGHWAY AUTHORITY OF INDIA**  
( MINISTRY OF SHIPPING TRANSPORT & HIGHWAYS )  
GOVERNMENT OF INDIA



INFRASTRUCTURE ENGINEERING LTD.



**SPECTRUM**  
Techno Consultants Pvt. Ltd.



CLIENT:-



Ministry of Road Transport and  
Highways

CONSULTANT:-



Bloom Companies, LLC

1105 B&C Welldone, Tech Park Sect. 48,  
Sohna Road Gurgaon H.R.- 122018  
Email id- info@bloom-india.com  
Phone:- 0124-4292105

PROJECT:-

Consultancy Services for Detailed Project Report  
Preparation Of Balance works for Rehabilitation and  
Up-gradation of NH-216 from KM 3.800 to 90.460 Raigarh  
to Saraipalli Section) in the State of Chhattisgarh to 2  
Lanes with Paved Shoulder Under NHPD- IV

SCALE :-  
NTS

TITLE:- TYPICAL CROSS SECTION

TCS-1A & TCS1

DRAWING No :

PAGE No :

DATE : FEB- 2024

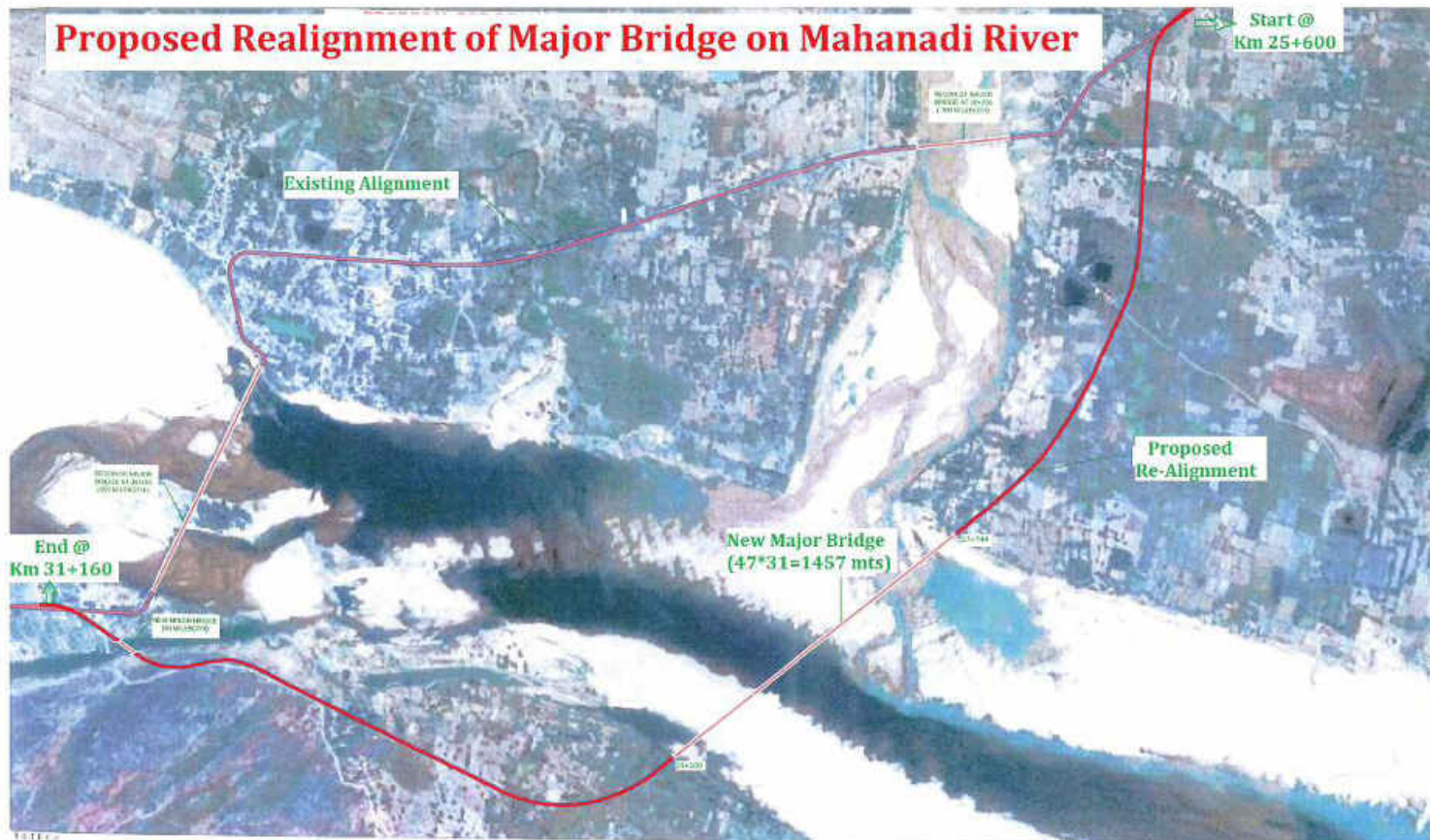
Revision: R0

PREPARED BY

CHECKED BY

**Proposed Realignment Plan & Profile from Km 25+600  
to Km 31+160 along with Major & Minor Bridges.**



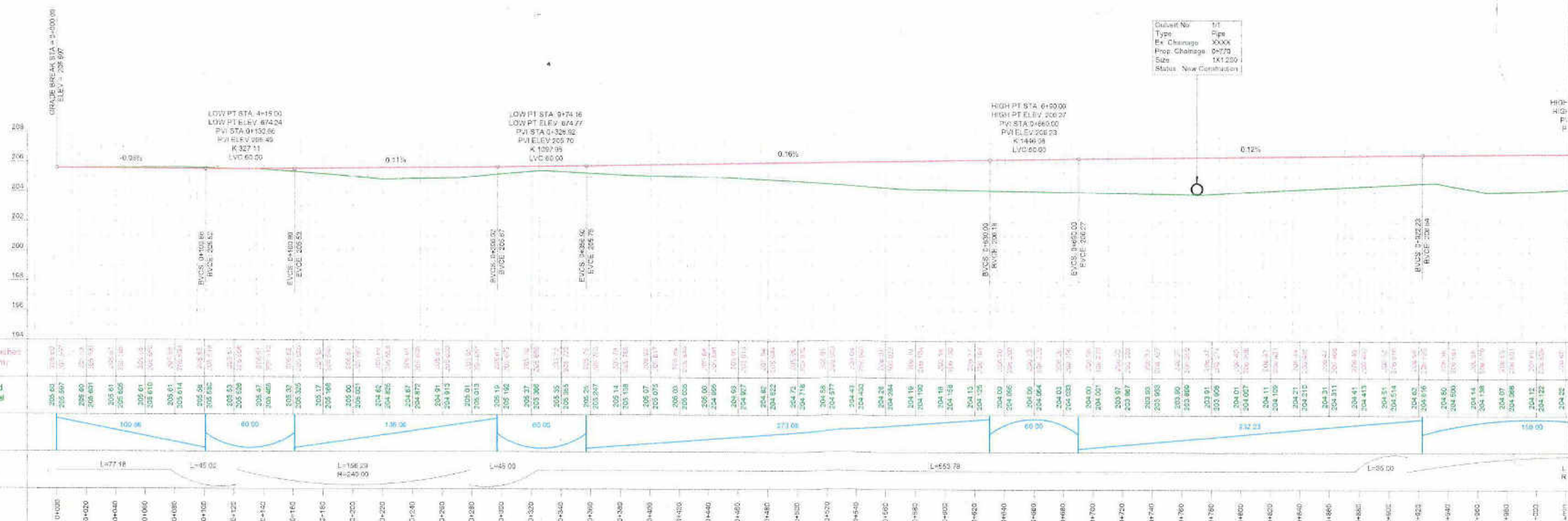
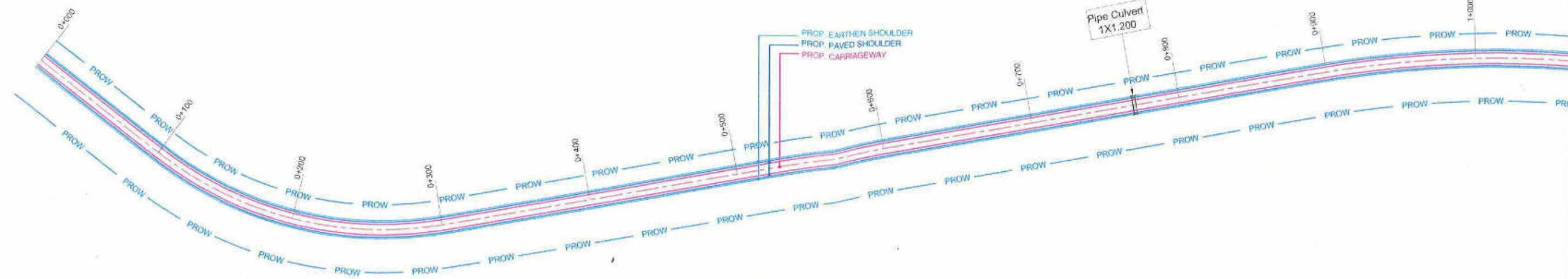


**Proposed Re-Alignment of Major Bridge on Mahanadi Rivier From Km 25+600 to Km 31+160 along with Major Bridge & Minor Bridge**



Raigarh

Saraipali



## NOTES:-

- All dimensions are in metre unless otherwise mentioned.
- All chainages marked are the proposed chainage.

MINISTRY OF ROAD  
TRANSPORT & HIGHWAYS



FEASIBILITY REPORT FOR TWO LANING WITH PAVED  
SHOULDER OF RAIGARH-SARANGAH-SARAIPALI SECTION  
OF NH-216 IN THE STATE OF CHATTISGARH THROUGH  
PUBLIC PRIVATE PARTNERSHIP ON DBFOT BASIS

Drg. Title: PLAN AND PROFILE

Drg. No.: GIFFORD/MORTH/R-S-S/P&amp;P/ 01

From Km.-0.0 to Km.-1.0

Scale:



Drawn by:

Designed by:

Checked by:

Revision No:

Date: FEB - 2014

Approved by  
(Signature with date)

Gifford  
(part of RAMBOLL)

GIFFORD INDIA PVT. LTD. (PART OF RAMBOLL)  
LEVEL - 17, TOWER - B, BUILDING NO. 5,  
DLF CYBER CITY, PHASE - III,  
GURGAON - 122002





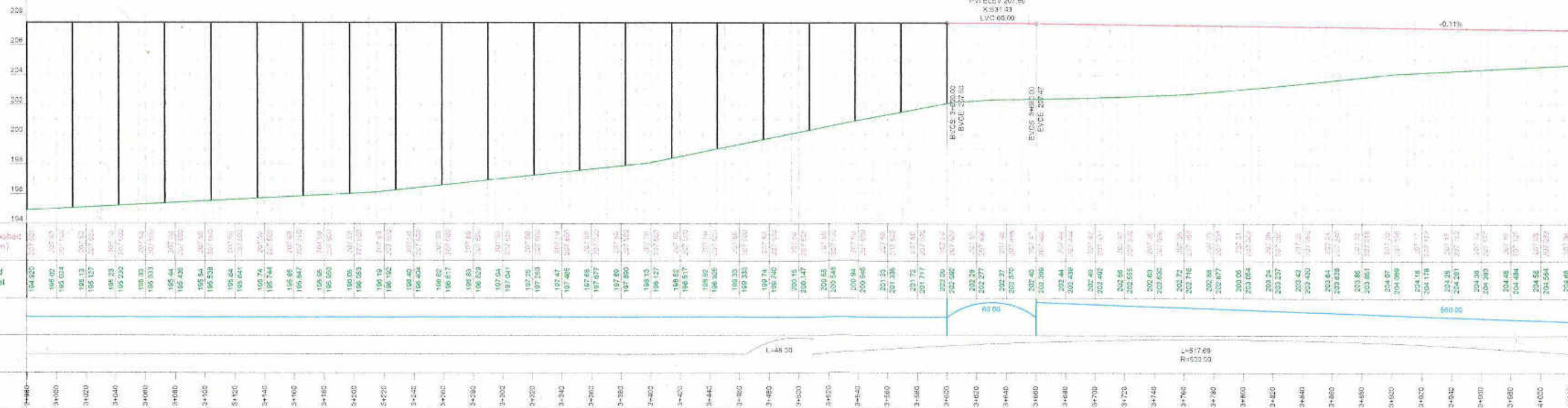
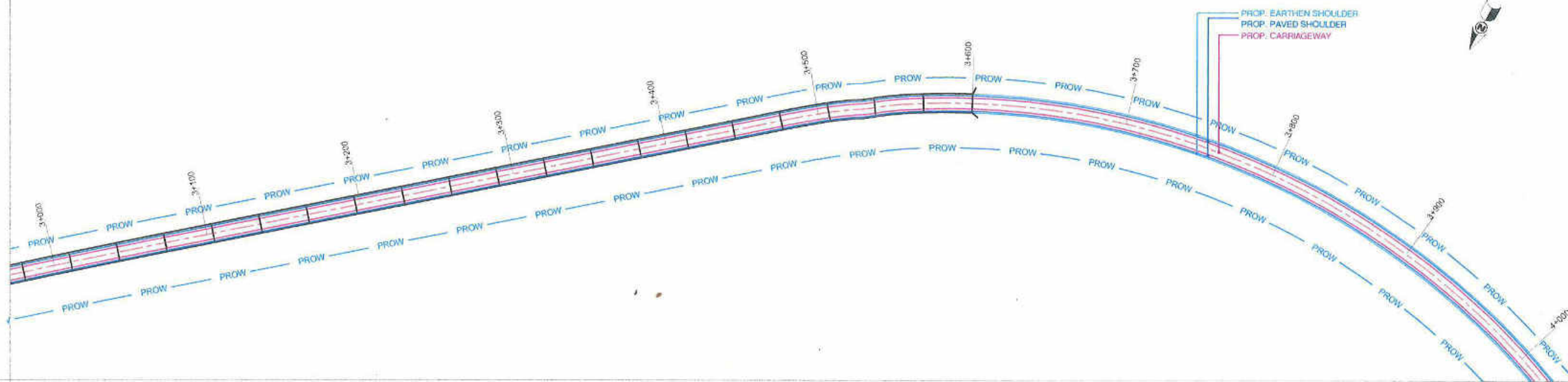






Raigarh

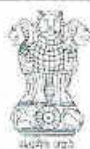
Saraipali



## NOTES:-

1. All dimensions are in metre unless otherwise mentioned.
2. All Chainages marked are the proposed chainage.

MINISTRY OF ROAD  
TRANSPORT & HIGHWAYS



FEASIBILITY REPORT FOR TWO LANING WITH PAVED  
SHOULDER OF RAIGARH-SARANGAH-SARAIPALI SECTION  
OF NH-216 IN THE STATE OF CHATTISGARH THROUGH  
PUBLIC PRIVATE PARTNERSHIP ON DBFOT BASIS

Org. Title : PLAN AND PROFILE

Org. No : GIFFORD/MORTH/R-S-S/P&amp;P/ 04

From Km.-3.0 to Km.-4.0

Scale :



Drawn by:

Designed by:

Checked by:

Revision No:

Date: FEB - 2014

Approved by  
(Signature with date)

Gifford  
(part of RAMBOLL)

GIFFORD INDIA PVT. LTD. (PART OF RAMBOLL)  
LEVEL - 17, TOWER - B, BUILDING NO. 5,  
DLF CYBER CITY, PHASE - III,  
GURGAON - 122002

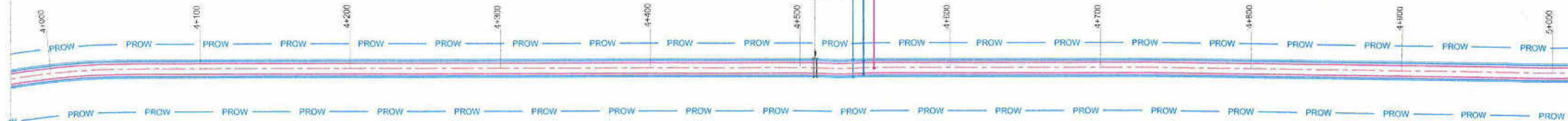


Raigarh

Saraipali

Pipe Culvert  
1X1.200

PROP. EARTHEN SHOULDER  
PROP. PAVED SHOULDER  
PROP. CARRIAGEWAY

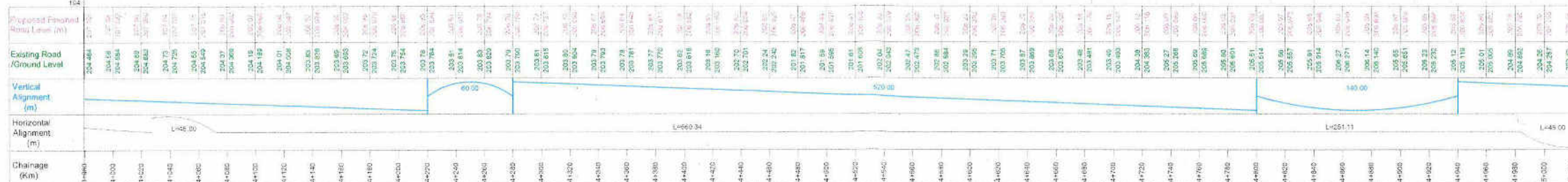


Culvert No. 5/1  
Type: Pipe  
Ex. Chaining: XXXX  
Prop. Chaining: 4+510  
Size: 1X1.200  
Status: New Construction

HIGH PT STA: 42+23.00  
HIGH PT ELEV: 206.83  
PVI STA: 42+50.00  
PVI ELEV: 206.98  
K: 1460.00  
LVC: 60.00

LOW PT STA: 46+07.25  
LOW PT ELEV: 205.27  
PVI STA: 46+50.00  
PVI ELEV: 205.50  
K: 3891.30  
LVC: 140.00

-0.15%



## NOTES:-

1. All dimensions are in metre unless otherwise mentioned.
2. All Chainages marked are the proposed chainage.

MINISTRY OF ROAD  
TRANSPORT & HIGHWAYS



FEASIBILITY REPORT FOR TWO LANING WITH PAVED  
SHOULDER OF RAIGARH-SARANGAH-SARAIPALI SECTION  
OF NH-216 IN THE STATE OF CHATTISGARH THROUGH  
PUBLIC PRIVATE PARTNERSHIP ON DBFOT BASIS

Drg. Title: PLAN AND PROFILE

Drg. No: GIFFORD/MORTH/R-S-S/P&amp;P/ 05

From Km.-4.0 to Km.-5.0

Scale: 1:1000  
0 10 20 30 40 50 60  
m

Drawn by:

Designed by:

Checked by:

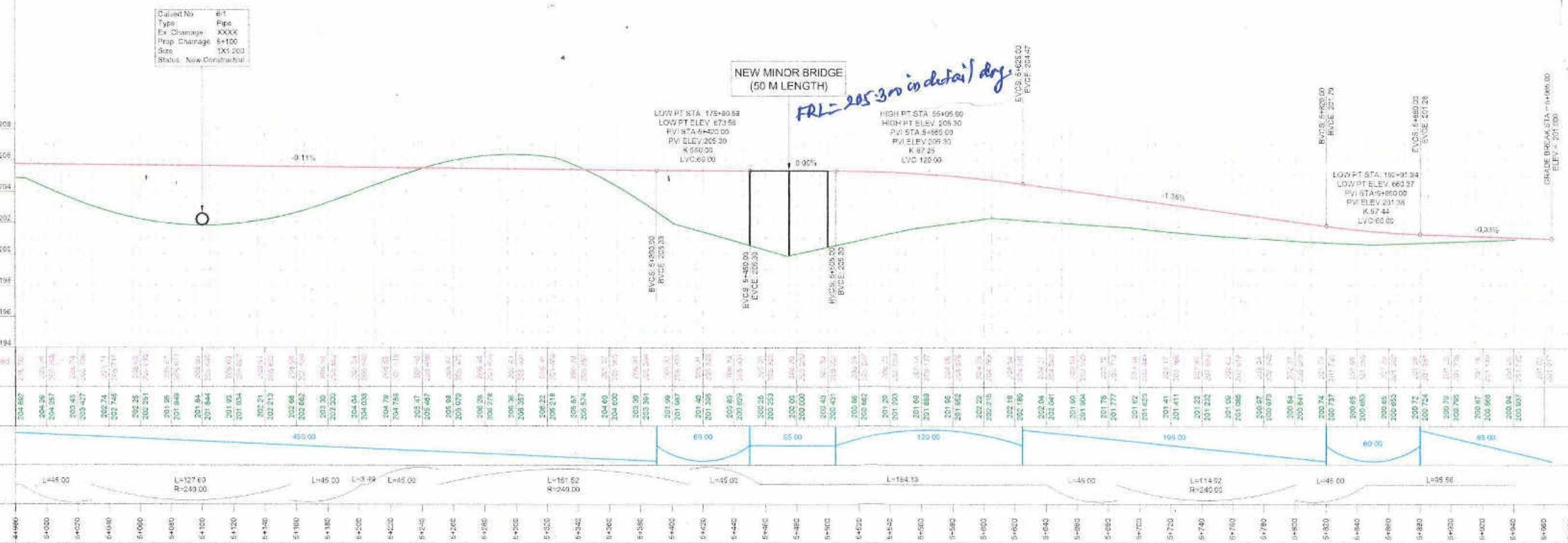
Revision No:  
Date: FEB - 2014

Approved by  
(Signature with date)

Gifford  
(part of RAMEBOLL)

GIFFORD INDIA PVT. LTD. (PART OF RAMEBOLL)  
LEVEL - 17, TOWER - B, BUILDING NO. 5,  
DLF CYBER CITY, PHASE - III,  
GURGAON - 122002

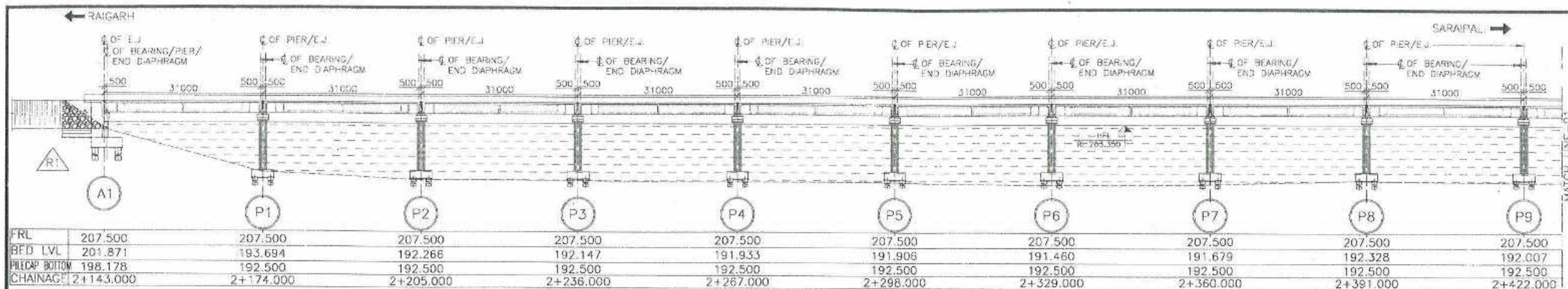




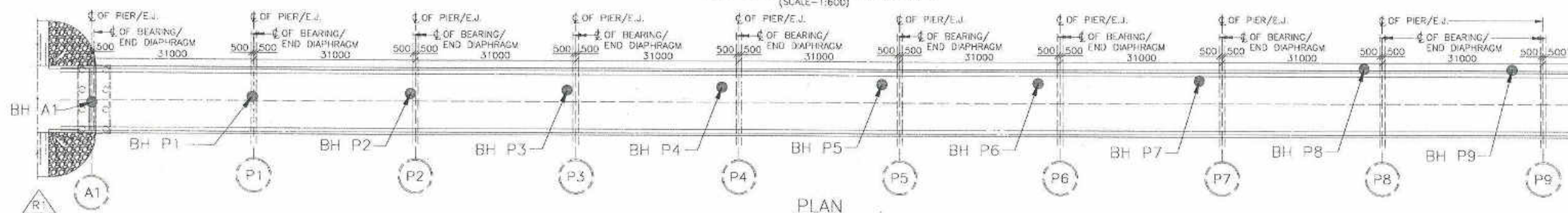
GIFFORD INDIA PVT. LTD. (PART OF RAMBOLL)  
LEVEL - 17, TOWER - B, BUILDING NO. 5,  
DLF CYBER CITY, PHASE - III,  
GURGAON - 122002

# **Mahanadi New Major Bridge @ Km 28+400 Drawings**

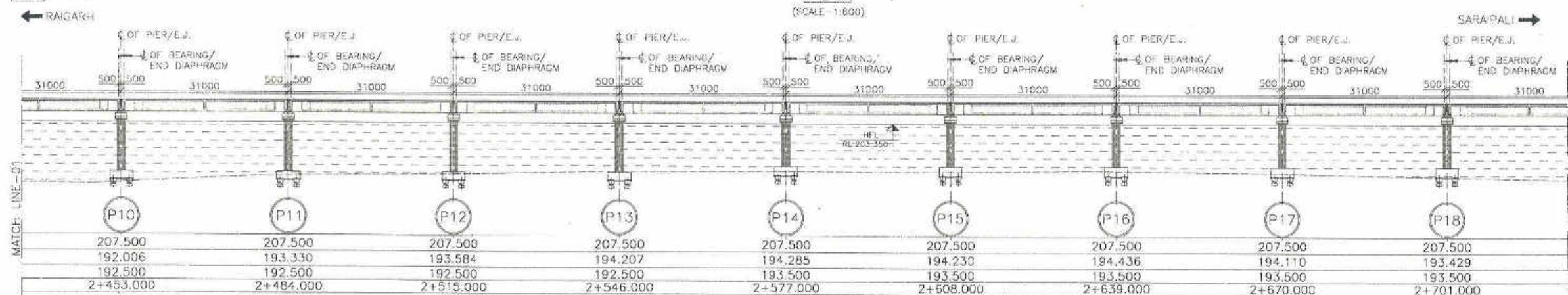




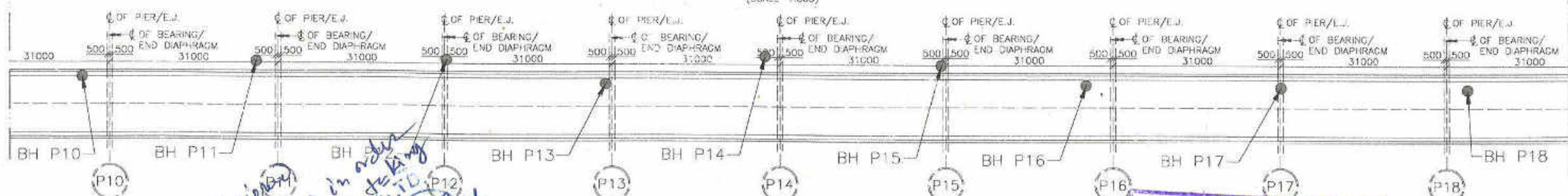
LONGITUDINAL ELEVATION  
(SCALE-1:600)



PLAN  
(SCALE-1:600)



LONGITUDINAL ELEVATION  
(SCALE-1:600)



PLAN  
(SCALE-1:600)

NOTES:-

1. ALL DIMENSIONS ARE IN MM. & LEVELS ARE IN METERS UNLESS OTHERWISE SPECIFIED.
2. DIMENSIONS SHALL NOT BE SCALED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
3. THIS DRG SHALL BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRGS.

REFERENCES (LATEST REVISION)

1. STCPL\_564\_3000\_11 - NUMERATION DETAILS OF PRECAST PSC GIRDER TYPE SUPERSTRUCTURE
2. STCPL\_564\_3000\_23 - NUMERATION DETAILS OF PIER & PIERCAP (GROUP-I)
3. STCPL\_564\_3000\_25 - NUMERATION DETAILS OF PIER & PIERCAP (GROUP-II)
4. STCPL\_564\_3000\_29 - NUMERATION DETAILS OF PIER & PIERCAP (GROUP-III)
5. STCPL\_564\_3000\_32 - NUMERATION DETAILS OF PIER & PIERCAP (GROUP-IV)
6. STCPL\_564\_3000\_35 - NUMERATION DETAILS OF PIER & PIERCAP (GROUP-V)
7. STCPL\_564\_3000\_38 - NUMERATION DETAILS OF ABUTMENT & ABUTMENT CAP-A1
8. STCPL\_564\_3000\_41 - NUMERATION DETAILS OF ABUTMENT & ABUTMENT CAP-A2
9. STCPL\_564\_3000\_05 - MISCELLANEOUS DETAILS

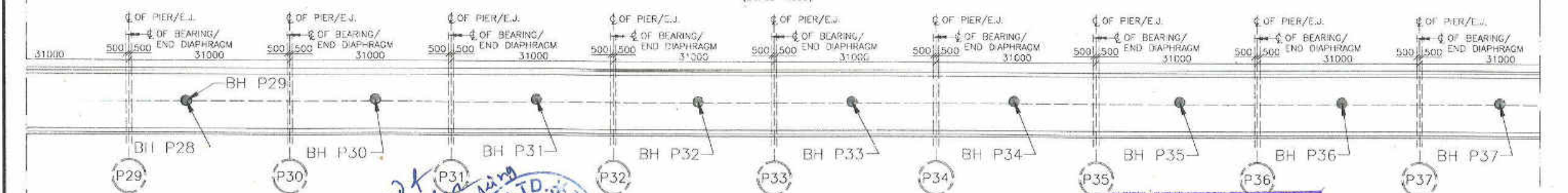
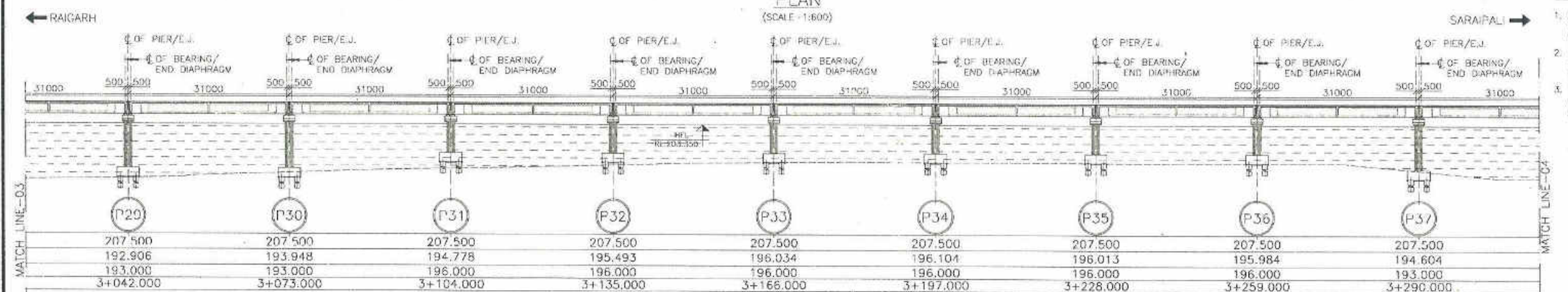
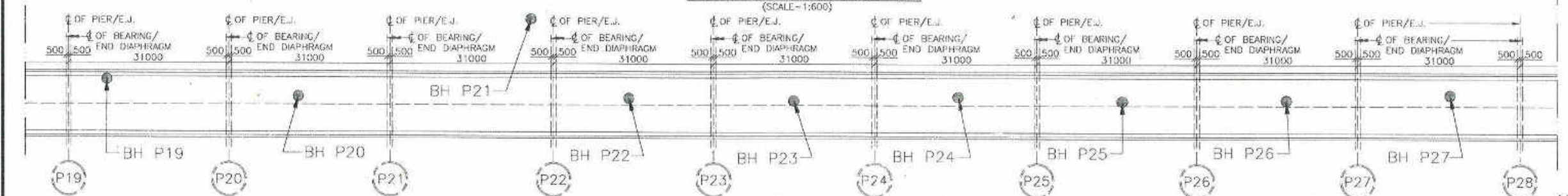
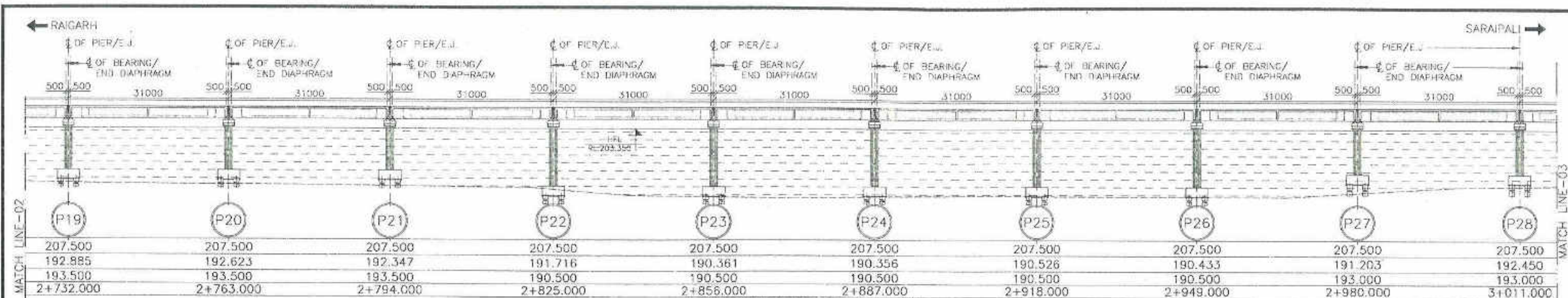
**REVIEWED**

J.K. Singh  
Bridge/Structural Engineer

R.A. Singh  
Bridge/Structural Engineer

CLIENT: NORTH THE MINISTRY OF ROAD, TRANSPORT & HIGHWAYS, (INDIA) A.C.E.D. STATE PWD CHATTISGARH		AUTHORITY ENGINEER: FEEDBACK INFRA		PROJECT CONSULTANT: HBS		SAFETY CONSULTANT: S.A. Infra		DESIGN CONSULTANT: ERA		CONTRACTOR: Feedback Infra		NAME OF PROJECT: REHABILITATION AND UPGRADE OF NH-316 FROM KM 0+00 TO KM 1+00 (RAIGARH TO SARAIPALI) IN THE STATE OF CHHATTISGARH		DRAWING TITLE: GENERAL ARRANGEMENT DRAWING OF MAJOR BRIDGE AT DESIGN CH-2B+400		PROJECT NO: 564	
DATE: 14/03/19	BY: R1	DATE: 14/03/19	BY: R1	DATE: 14/03/19	BY: R1	DATE: 14/03/19	BY: R1	DATE: 14/03/19	BY: R1	DATE: 14/03/19	BY: R1	DATE: 14/03/19	BY: R1	DATE: 14/03/19	BY: R1	DATE: 14/03/19	BY: R1





#### NOTES:-

1. ALL DIMENSIONS ARE IN MM & LEVELS ARE IN METERS UNLESS OTHERWISE SPECIFIED.
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3. STCPL\_564\_3000\_26 - NUMERATION DETAILS OF PIER & PERCAP (GROUP-II)
4. STCPL\_564\_3000\_29 - NUMERATION DETAILS OF PIER & PERCAP (GROUP-III)
5. STCPL\_564\_3000\_32 - NUMERATION DETAILS OF PIER & PERCAP (GROUP-IV)
6. STCPL\_564\_3000\_35 - NUMERATION DETAILS OF PIER & PERCAP (GROUP-V)
7. STCPL\_564\_3000\_38 - NUMERATION DETAILS OF ABUTMENT & ABUTMENT CAP-A1
8. STCPL\_564\_3000\_41 - NUMERATION DETAILS OF ABUTMENT & ABUTMENT CAP-A2
9. STCPL\_564\_3000\_05 - MISCELLANEOUS DETAILS

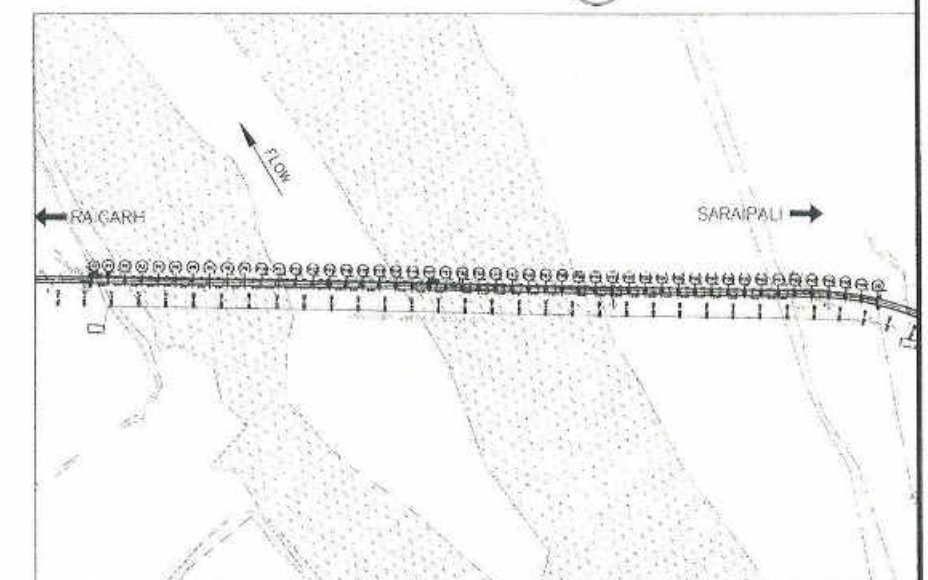
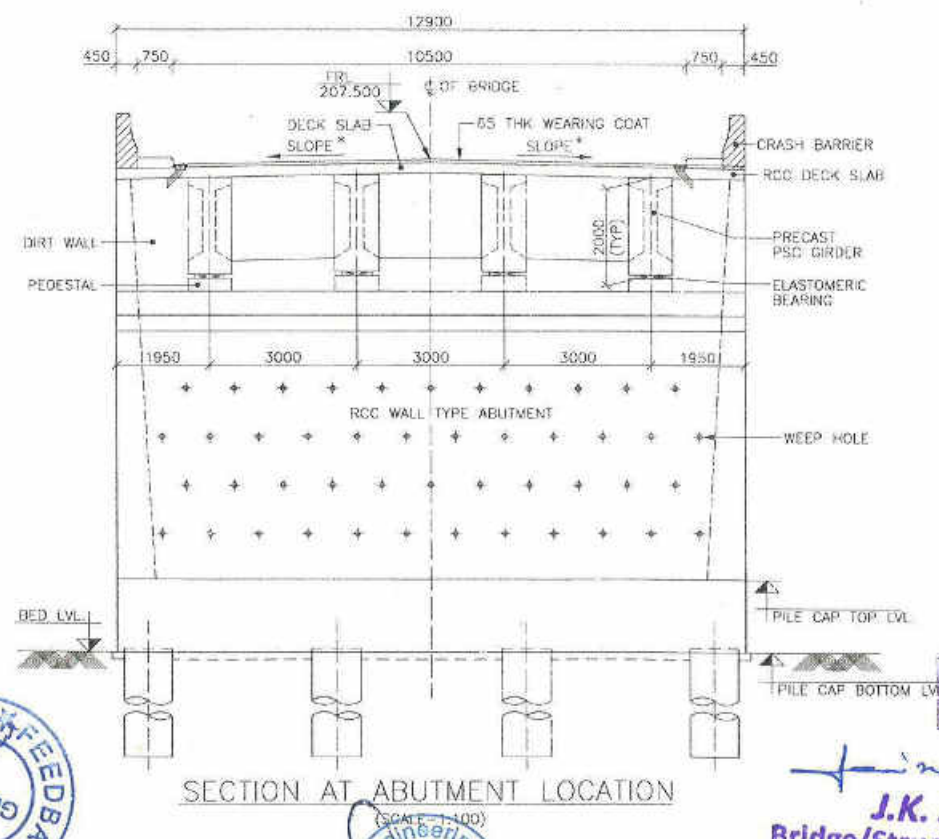
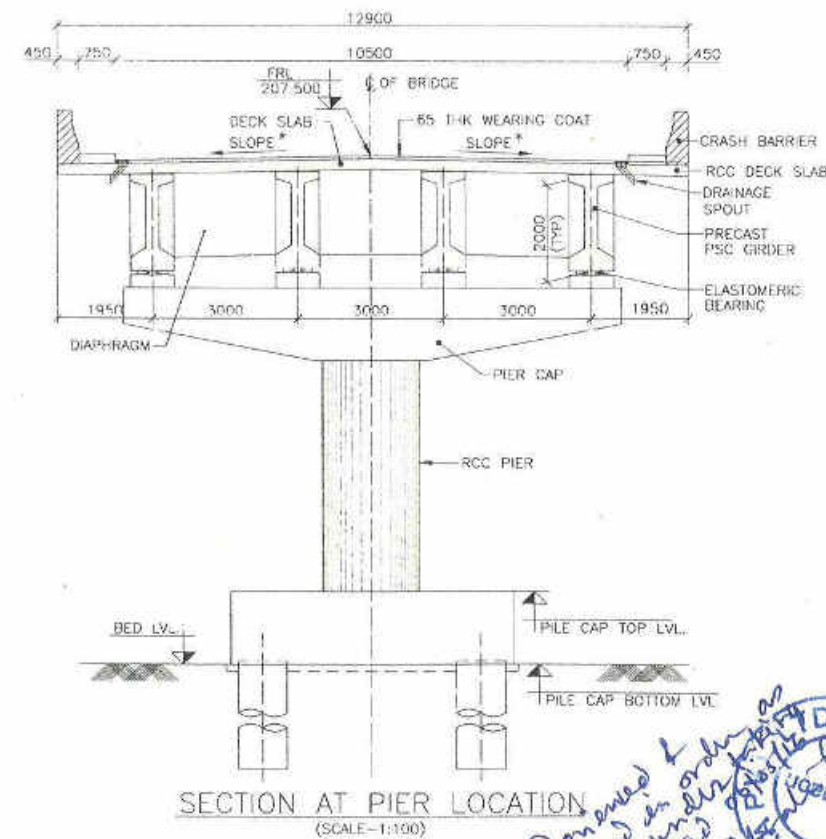
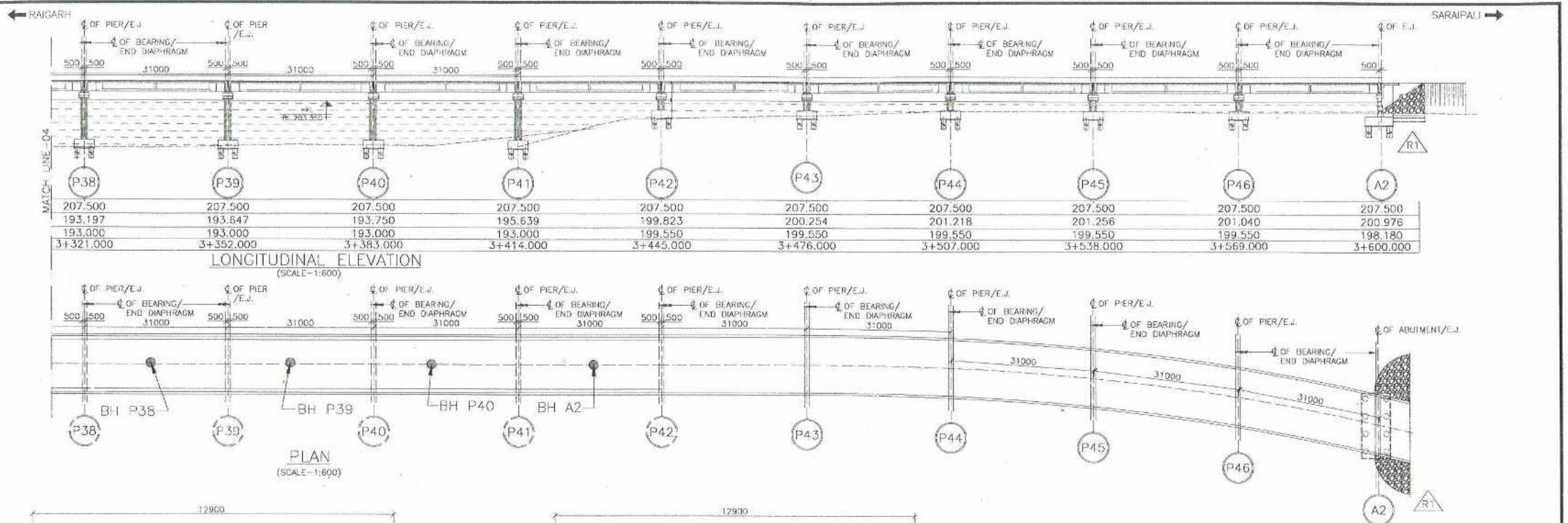
Reviewed & Found in order as per underdressing dated 06/07/2016

**REVIEWED**

J.K. Singh  
Team Leader  
Feedback Infra  
NH-216 (Raigarh)

DATE	NO	REVISION	BY	CLIENT	AUTHORITY ENGINEER	PROJECT CONSULTANT	SAFETY CONSULTANT	DESIGN DIRECTOR	EPC CONTRACTOR	NAME OF PROJECT	DRAWING TITLE	PROJECT NO.
04/05/15	01	FOR APPROVAL/REVISION TO THE WORKING DRAWING	CMS	NORTH	FEEDBACK INFRA	HBS	SA	J.K. Singh	ERA	REHABILITATION AND UPGRADATION OF NH-216 FROM KM 180 TO KM 200-400 (RAIGARH TO SARAI PALI SECTION) TO TWO LANES WITH PAVED SHOULDERS IN THE STATE OF CHHATTISGARH UNDER NHDP-IV	GENERAL ARRANGEMENT DRAWING OF MAJOR BRIDGE AT DESIGN CH:28+400	564
14/02/16	02	FOR APPROVAL	CMS	THE MINISTRY OF ROAD TRANSPORT & HIGHWAYS (NHDP-IV A CELL), STATE PWD/CHHATTISGARH	Feedback Infra Private Limited, 12th Floor, Tower 9B, DLF Cyber City, Phase-II, Gurgaon 122002, Haryana, India	HBS INFRA ENGINEERS INDIA PVT LTD, Flat no. 102, Plot no. 4 in 11, Techno-Chowk, Ganga Garden Road, Malviya, Hyderabad-500081	S. A. Infrastructure Consultants Pvt. Ltd, 101-102 CS-1, Choudhary Indraprastha, Gurgaon-122002	P. MAJUMDAR, GDA Infra Engineering Limited, 150411, Sector C2, Noida-201301	ERA, 150411, Sector C2, Noida-201301		DRG. NO. : STCPL_564_3000_01 (SHEET 2 OF 4)	SCALE: AS SHOWN
											DRAWN: KJM, DESIGNED: KJM, CHECKED: KJM, APPROVED: KJM	REV: 01





**REVIEWED**

*for review to S.P.*  
**J.K. Singh**  
Bridge/Structural Engineer  
Feedback Infra  
NH-216, (Raigarh)

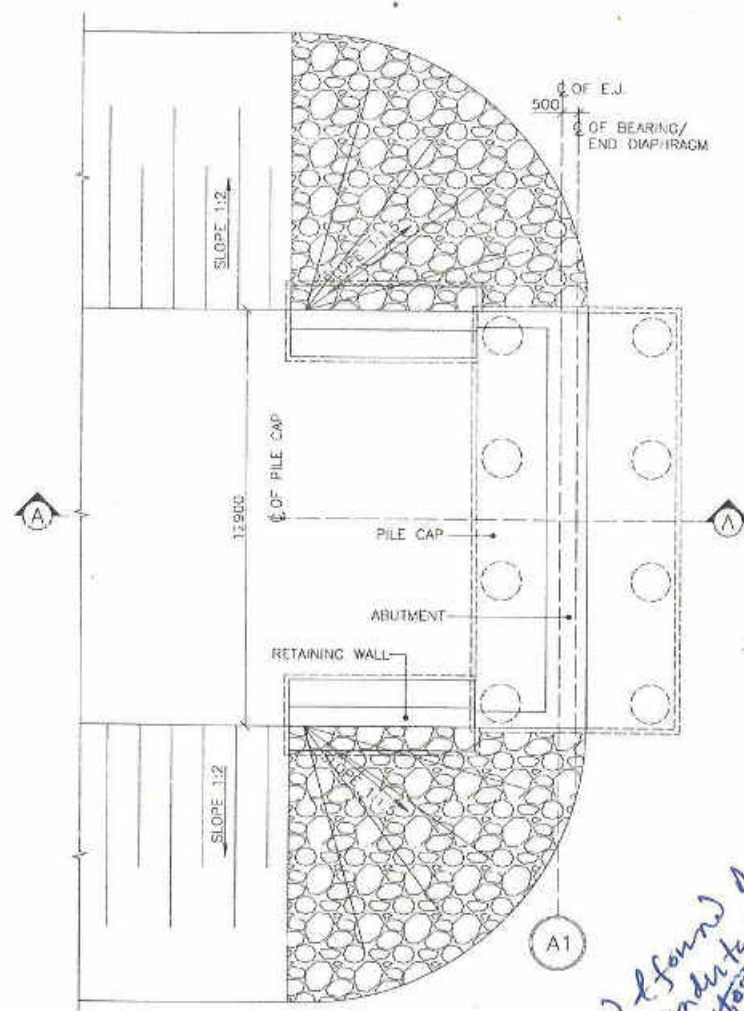
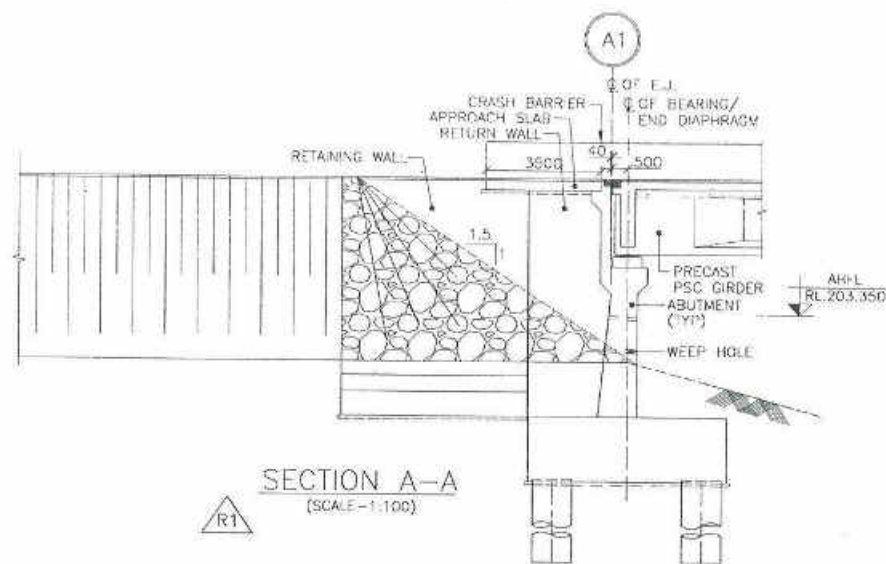
*R.N. Singh*  
**R.N. Singh**  
Team Leader  
Feedback Infra  
NH-216, (Raigarh)

**NOTES:-**

1. ALL DIMENSIONS ARE IN MM, & LEVELS ARE IN METERS UNLESS OTHERWISE SPECIFIED.
2. DIMENSIONS SHALL NOT BE SCALED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
3. THIS DRC. SHALL BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRCs.

<p>DATE: 04/02/18</p> <p>NO: 1</p> <p>REVISION: 1</p> <p>BY: GMS</p>	<p>CLIENT: MORTH THE MINISTRY OF ROAD TRANSPORT &amp; HIGHWAYS (NHDD-IV A CELL) STATE PWD, CHHATTISGARH</p>	<p>AUTHORITY ENGINEER: <b>FEEDBACK INFRA</b> Feedback Infra Private Limited 13th Floor, Tower 90, DLF Cyber City, Phase-III, Gurgaon (122002), Haryana, India</p>	<p>PROOF CONSULTANT: <b>HBS</b> HBS INFRA ENGINEERS INDIA PVT. LTD. Plot no. 102, Plot no. 8 to 11, Fortune Chambers, Image Garden Road, Madhapur, Hyderabad-500 084</p>	<p>SAFETY CONSULTANT: <b>S.A.</b> S.A. Infrastructure Consultants Pvt. Ltd. 101-102, 4th Floor, Sunland-II, Indraprastha, Gurgaon-122004</p>	<p>ENGINEER: <b>ERA</b> ERA INFRA ENGINEERING LIMITED C-641, Sector-62, Noida-201301</p>	<p>EPC CONTRACTOR: <b>ERA</b> ERA INFRA ENGINEERING LIMITED C-641, Sector-62, Noida-201301</p>	<p>CONSULTANT: <b>SPECTRUM</b> SPECTRUM Techno-Consultants Pvt. Ltd. 401/402, Baiton Bhawan, Plot No. 1, Sector-13, Vashi, Navi Mumbai-400 703 India. Ph: 022-41115900, Email: info@spectrumworld.net</p>	<p>NAME OF PROJECT: REHABILITATION AND UPGRADEATION OF NH-216 FROM KM+800 TO KM 90+000 (RAIGARH TO SARAIPALI SECTION) TO TWO LANES WITH PAVED SHOULDERS IN THE STATE OF CHHATTISGARH UNDER NHDD-IV</p>	<p>DRAWING TITLE: GENERAL ARRANGEMENT DRAWING OF MAJOR BRIDGE AT DESIGN CH-2B+400</p> <p>DWG. NO.: STCPL_564_3000_01 (SHEET 3 OF 4)</p> <p>SCALE: AS SHOWN</p>	<p>PROJECT NO: 564</p> <p>REV: R1</p>
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# DETAILS OF BORE HOLES

Location	E	N	Top RL (m)	Depth (m)
A1	733356.025	2401408.072	201.871	
P1	733337.959	2401388.529	193.707	16.0000
P2	733309.818	2401368.924	192.269	18.0000
P3	733286.726	2401349.359	192.160	18.0000
P4	733264.276	2401330.338	191.929	18.0000
P5	733240.672	2401310.502	191.966	18.0000
P6	733217.267	2401291.300	191.443	18.0000
P7	733193.675	2401271.530	191.569	18.0000
P8	733170.310	2401249.636	192.354	18.0000
P9	733147.976	2401231.806	192.064	18.0000
P10	733122.405	2401212.940	191.759	18.0000
P11	733099.249	2401190.523	193.297	18.0000
P12	733071.895	2401167.973	193.587	18.0000
P13	733046.243	2401152.857	194.204	18.0000
P14	733026.593	2401130.404	194.291	26.0000
P15	733000.003	2401110.952	194.222	30.0000
P16	732976.741	2401096.951	194.488	30.0000
P17	732948.447	2401074.551	194.109	30.0000
P18	732921.074	2401052.997	193.342	30.0000
P19	732895.046	2401030.254	193.758	30.0000
P20	732864.333	2401009.650	192.546	30.0000
P21	732839.196	2400990.142	192.046	30.0000
P22	732814.870	2400970.114	190.586	30.0000
P23	732789.841	2400950.537	190.148	30.0000
P24	732765.907	2400930.257	190.568	30.0000
P25	732740.629	2400910.840	190.479	30.0000
P26	732716.200	2400890.878	190.378	30.0000
P27	732692.484	2400870.457	192.751	30.0000
P28	732648.032	2400837.134	193.068	30.0000
P29	732647.898	2400837.023	193.307	30.0000
P30	732596.079	2400794.748	194.483	30.0000
P31	732619.787	2400813.961	195.105	30.0000
P32	732571.505	2400775.293	195.920	30.0000
P33	732548.431	2400756.602	196.151	30.0000
P34	732524.536	2400737.135	196.060	30.0000
P35	732499.524	2400716.968	195.966	30.0000
P36	732475.115	2400697.432	196.003	30.0000
P37	732451.702	2400678.640	193.143	30.0000
P38	732428.378	2400659.777	193.246	30.0000
P39	732405.074	2400640.512	193.968	30.0000
P40	732381.502	2400622.297	193.598	30.0000
P41	732354.206	2400600.389	197.430	

# REFERENCES (LATEST REVISION)

1. STCPL\_564\_3000\_11 - NUMERATION DETAILS OF PRECAST PSC GIRDER TYPE SUPERSTRUCTURE
2. STCPL\_564\_3000\_23 - NUMERATION DETAILS OF PIER & PIERCAP (GROUP-I)
3. STCPL\_564\_3000\_26 - NUMERATION DETAILS OF PIER & PIERCAP (GROUP-II)
4. STCPL\_564\_3000\_29 - NUMERATION DETAILS OF PIER & PIERCAP (GROUP-III)
5. STCPL\_564\_3000\_32 - NUMERATION DETAILS OF PIER & PIERCAP (GROUP-IV)
6. STCPL\_564\_3000\_35 - NUMERATION DETAILS OF PIER & PIERCAP (GROUP-V)
7. STCPL\_564\_3000\_38 - NUMERATION DETAILS OF ABUTMENT & ABUTMENT CAP-A1
8. STCPL\_564\_3000\_41 - NUMERATION DETAILS OF ABUTMENT & ABUTMENT CAP-A2
9. STCPL\_564\_3000\_05 - MISCELLANEOUS DETAILS

# NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS MENTIONED OTHERWISE.
2. DIMENSIONS ARE NOT TO BE SCALED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
3. READ THIS DRAWING WITH ROAD ALIGNMENT DRAWING.
4. ADJUSTMENT TO THE ABUTMENT/PIER LOCATIONS IF REQUIRED SHALL BE DONE DEPENDING UPON SITE CONDITIONS.
5. BEFORE STARTING UP THE EXECUTION VERIFY THE DIMENSIONS, ANY DISCREPANCY SHALL BE BROUGHT TO THE NOTICE OF THE CONSULTANT.
6. HYDRAULIC DATA :
  - a) H.F.L. (AFFLUXED) : 203.350 M
  - b) DESIGN DISCHARGE : 40500 Cumecs
  - c) DESIGN VELOCITY : 3.00 m/sec
  - d) MAX. SCOUR LVL : TOP OF NON SCOURABLE ROCK
  - e) MIN. SCOUR LVL : TOP OF NON SCOURABLE ROCK
7. GRADE OF CONCRETE & CLEAR COVER TO OUTERMOST STEEL :
  - SUPER STRUCTURE
  - PSC PRECAST GIRDER : RCC M45 40mm
  - CAST IN SITU SLAB : RCC M40 40mm
  - SUB STRUCTURE
  - (ABUTMENT & RETURN WALL) : RCC M35
  - EARTH FACE : 75mm
  - OTHER FACE : 50mm
  - PIER, PIER CAP : RCC M35 50mm
  - FOUNDATION : RCC M35 75mm
  - PILE, PILE CAP : RCC M35 75mm
  - PGC : PGC M15
8. DESIGN DETAILS :

		VERTICAL *	HORIZONTAL *	REMARKS
ABUTMENT	NORMAL	----	----	TESTS TO BE CARRIED OUT ON PILE AS PER IS:2911/MOST SPECIFICATIONS.
PIER P1 TO P10	NORMAL	405 T	6.5 T	TESTS TO BE CARRIED OUT ON PILE AS PER IS:2911/MOST SPECIFICATIONS.
PIER P11 TO P13	NORMAL	405 T	7.1 T	
PIER P14 TO P21 & P27 TO P30 & P37 TO P41	NORMAL	400 T	7.8 T	
PIER P22 TO P26	NORMAL	420 T	8.0 T	
PIER P31 TO P36	NORMAL	385 T	7.4 T	
PIER P42 TO P46	NORMAL	----	----	

- \* EXCLUDING SELF WEIGHT OF PILE
- 9. ALL REINFORCING STEEL SHALL BE HIGH YIELD STRENGTH DEFORMED BARS (GRADE DESIGNATION Fe500) CONFORMING TO IS:1786 (EXCEPT FOR MESH REINFORCEMENT WHICH SHALL BE M5 BARS GRADE DESIGNATION Fe 240 CONFORMING TO IS:432 PART-I MILD STEEL)
- 10. BEARINGS- ELASTOMERIC BEARINGS.
- 11. EXPANSION JOINT- STRIP SEAL TYPE (140mm)
- 12. PERMANENT LINEAR OF 6mm THK (MS) SHALL BE PROVIDED UP TO TOP OF ROCK/ NON SCOURABLE LEVEL/REFUSAL WHICH EVER IS EARLIER.
- 13. STRUCTURE LOCATION REFER TO THE CHAINAGE AT STRUCTURE CENTER AND LEVELS AT CENTER LINE OF ROAD.
- 14. FOR STRUCTURE LOCATION, FRL, SUPERELEVATION & KEYPLAN REFER LATEST APPROVED HIGHWAY DRAWINGS. FOR ANY VARIATION HIGHWAY DRAWING TO BE FOLLOWED.
- 15. THE FOLLOWING LOADS HAVE BEEN CONSIDERED IN THE DESIGN.
  - a) ONE LANE, TWO LANE, THREE LANE OF CLASS A
  - b) ONE LANE 70R
- 16. SEISMIC ZONE -II AS PER IS:1893-2002 HAS BEEN CONSIDERED.
- 17. TYPE OF STRUCTURE & CONSTRUCTION METHODOLOGY CONSIDERED IN DESIGN IS :
  - FOUNDATION - OPEN/PILE FOUNDATION
  - SUBSTRUCTURE - CIRCULAR PIER, WALL TYPE ABUTMENT
  - SUPERSTRUCTURE - PRECAST PSC GIRDER & CAST IN SITU DECK SLAB & DIAPHRAGM
- 18. PEDESTAL HEIGHT SHALL BE ADJUSTED TO MAINTAIN TRANSVERSE DECK SLOPE.
- 19. THE LOCATION OF JACK FOR LIFTING OF SUPERSTRUCTURE TO REPLACE BEARING ETC IS SHOWN ↑ THUS THIS SHALL BE DISTINCTLY ETCHED FOR EASY IDENTIFICATION ON THE END CROSS GIRDERS AND PIER/ABUTMENT CAPS.
- 20. THE WEARING COAT OF 65MM THICKNESS SHALL BE PROVIDED IN ACCORDANCE WITH CL. 2702.1 OF MORTH.
- 21. BACKFILLING BEHIND ABUTMENT/RETURN WALL SHALL BE CONSISTS OF SELECTED EARTH FILL CONFIRMING APPENDIX OF IRC:78 HAVING F = 30

REVIEWED

J.K. Singh  
Bridge/Structural Engineer  
Feedback Infra  
NH-216, (Raigarh)

R.N. Singh  
Team Leader  
Feedback Infra  
NH-216, (Raigarh)



DATE	NO	REVISION	BY	CLIENT:	AUTHORITY ENGINEER:	PROJECT CONSULTANT:	SAFETY CONSULTANT:	DESIGN CONSULTANT:	EPC CONTRACTOR:	CONSULTANT:	NAME OF PROJECT:	DRAWING TITLE:	PROJECT NO:
04/05/18	01			MORTH	FEEDBACK INFRA	TBS			ERA	SPECTRUM	REHABILITATION AND UPGRADE OF NH-216 FROM KM+00 TO KM+400 (RAIGARH TO SARAIPALI SECTION) TO TWO LANES WITH PAVED SHOULDERS IN THE STATE OF CHHATTISGARH UNDER NHPI-IV	GENERAL ARRANGEMENT DRAWING OF MAJOR BRIDGE AT DESIGN CH:28+400	564
14/01/18	00											DRG NO. STCPL_564_3000_01 (Sheet 4 of 4)	SCALE AS SHOWN
												DRAWN: KJM DESIGNED: KJM CHECKED: KJM APPROVED: KJM	REV: R1



COORDINATES OF PIERS																																		
PIER	P1				PIER	P2				PIER	P3				PIER	P4				PIER	P5				PIER	P6				PIER	P7			
FILE CENTER	1	X=733332.282	Y=2401388.929		1	X=733308.148	Y=2401369.471		1	X=733284.015	Y=2401350.014		1	X=733259.882	Y=2401330.557		1	X=733235.748	Y=2401311.100		1	X=733211.615	Y=2401291.643		1	X=733187.482	Y=2401272.186							
	2	X=733332.821	Y=2401392.092		2	X=733308.488	Y=2401372.635		2	X=733284.354	Y=2401353.178		2	X=733260.221	Y=2401333.721		2	X=733236.088	Y=2401314.264		2	X=733211.954	Y=2401294.807		2	X=733187.821	Y=2401275.350							
	3	X=733335.446	Y=2401388.589		3	X=733311.312	Y=2401369.132		3	X=733287.179	Y=2401349.675		3	X=733263.045	Y=2401330.218		3	X=733238.912	Y=2401310.761		3	X=733214.779	Y=2401291.303		3	X=733190.645	Y=2401271.846							
	4	X=733331.942	Y=2401385.765		4	X=733307.809	Y=2401366.308		4	X=733283.676	Y=2401346.850		4	X=733259.542	Y=2401327.393		4	X=733235.409	Y=2401307.936		4	X=733211.275	Y=2401288.479		4	X=733187.142	Y=2401269.022							
	5	X=733329.118	Y=2401389.268		5	X=733304.985	Y=2401369.811		5	X=733280.851	Y=2401350.354		5	X=733256.718	Y=2401330.897		5	X=733232.584	Y=2401311.439		5	X=733208.451	Y=2401291.982		5	X=733184.318	Y=2401272.525							

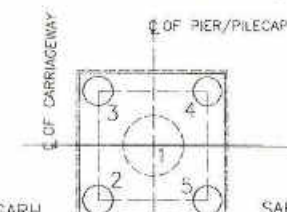
COORDINATES OF PIERS																											
PIER P8	1	X=733163.348	Y=2401252.729	PIER P9	1	X=733139.215	Y=2401233.271	PIER P10	1	X=733115.081	Y=2401213.814	PIER P11	1	X=733090.948	Y=2401194.357	PIER P12	1	X=733066.815	Y=2401174.900	PIER P13	1	X=733042.681	Y=2401155.443	PIER P14	1	X=733018.548	Y=2401135.986
PILE CENTER	2	X=733163.688	Y=2401255.892	PILE CENTER	2	X=733139.554	Y=2401236.435	PILE CENTER	2	X=733115.421	Y=2401216.978	PILE CENTER	2	X=733091.287	Y=2401197.521	PILE CENTER	2	X=733067.154	Y=2401178.064	PILE CENTER	2	X=733043.021	Y=2401158.607	PILE CENTER	2	X=733018.887	Y=2401139.150
	3	X=733166.512	Y=2401252.389		3	X=733142.379	Y=2401232.932		3	X=733118.245	Y=2401213.475		3	X=733094.112	Y=2401194.017		3	X=733069.979	Y=2401174.561		3	X=733045.845	Y=2401155.103		3	X=733021.712	Y=2401135.646
	4	X=733163.009	Y=2401249.265		4	X=733138.875	Y=2401230.108		4	X=733114.742	Y=2401210.650		4	X=733090.609	Y=2401191.193		4	X=733066.475	Y=2401171.736		4	X=733042.342	Y=2401152.279		4	X=733018.208	Y=2401132.822
	5	X=733160.184	Y=2401253.068		5	X=733136.051	Y=2401233.611		5	X=733111.918	Y=2401214.154		5	X=733087.784	Y=2401194.697		5	X=733063.651	Y=2401175.239		5	X=733039.518	Y=2401155.782		5	X=733015.384	Y=2401136.325

COORDINATES OF PIERS																																		
PIER CENTER	P15				PIER CENTER	P16				PIER CENTER	P17				PIER CENTER	P18				PIER CENTER	P19				PIER CENTER	P20				PIER CENTER	P21			
	1	X=732994.415	Y=2401116.529			1	X=732970.281	Y=2401097.071			1	X=732946.148	Y=2401077.614			1	X=732922.015	Y=2401058.157			1	X=732897.881	Y=2401038.700			1	X=732873.748	Y=2401019.243			1	X=732849.614	Y=2400999.786	
	2	X=732994.754	Y=2401119.692			2	X=732970.621	Y=2401100.235			2	X=732946.487	Y=2401080.778			2	X=732922.354	Y=2401061.321			2	X=732898.221	Y=2401041.864			2	X=732874.087	Y=2401022.407			2	X=732849.954	Y=2401002.949	
	3	X=732997.578	Y=2401116.189			3	X=732973.445	Y=2401096.732			3	X=732949.312	Y=2401077.275			3	X=732925.178	Y=2401057.818			3	X=732901.045	Y=2401038.361			3	X=732876.912	Y=2401018.903			3	X=732852.778	Y=2400999.446	
	4	X=732994.075	Y=2401113.365			4	X=732969.942	Y=2401093.908			4	X=732945.808	Y=2401074.450			4	X=732921.675	Y=2401054.993			4	X=732897.542	Y=2401035.536			4	X=732873.408	Y=2401016.079			4	X=732849.275	Y=2400996.622	
	5	X=732991.251	Y=2401116.868			5	X=732967.117	Y=2401097.411			5	X=732942.984	Y=2401077.954			5	X=732918.851	Y=2401058.496			5	X=732894.717	Y=2401039.039			5	X=732870.584	Y=2401019.582			5	X=732846.451	Y=2401000.125	

COORDINATES OF PIERS																											
PIER CENTER P22	1	X=732825.481	Y=2400980.328	PIER CENTER P23	1	X=732801.348	Y=2400960.871	PIER CENTER P24	1	X=732777.214	Y=2400941.414	PIER CENTER P25	1	X=732753.081	Y=2400921.957	PIER CENTER P26	1	X=732728.948	Y=2400902.500	PIER CENTER P27	1	X=732704.814	Y=2400883.043	PIER CENTER P28	1	X=732680.681	Y=2400863.586
PIER CENTER	2	X=732825.820	Y=2400983.492	2	X=732801.687	Y=2400964.035	2	X=732777.554	Y=2400944.578	2	X=732775.554	Y=2400944.578	2	X=732753.420	Y=2400925.121	2	X=732729.287	Y=2400905.664	2	X=732705.154	Y=2400886.207	2	X=732681.020	Y=2400866.749			
	3	X=732828.645	Y=2400979.989	3	X=732804.512	Y=2400960.532	3	X=732780.378	Y=2400941.075	3	X=732780.378	Y=2400941.075	3	X=732756.245	Y=2400921.618	3	X=732732.111	Y=2400902.160	3	X=732707.978	Y=2400882.703	3	X=732683.845	Y=2400863.246			
	4	X=732825.142	Y=2400977.165	4	X=732801.008	Y=2400957.708	4	X=732776.875	Y=2400938.250	4	X=732776.875	Y=2400938.250	4	X=732752.742	Y=2400918.793	4	X=732728.608	Y=2400899.336	4	X=732704.475	Y=2400879.879	4	X=732680.341	Y=2400860.422			
	5	X=732822.317	Y=2400980.668	5	X=732798.184	Y=2400961.211	5	X=732774.050	Y=2400941.754	5	X=732774.050	Y=2400941.754	5	X=732749.917	Y=2400922.296	5	X=732725.284	Y=2400902.839	5	X=732701.650	Y=2400883.382	5	X=732677.517	Y=2400863.925			

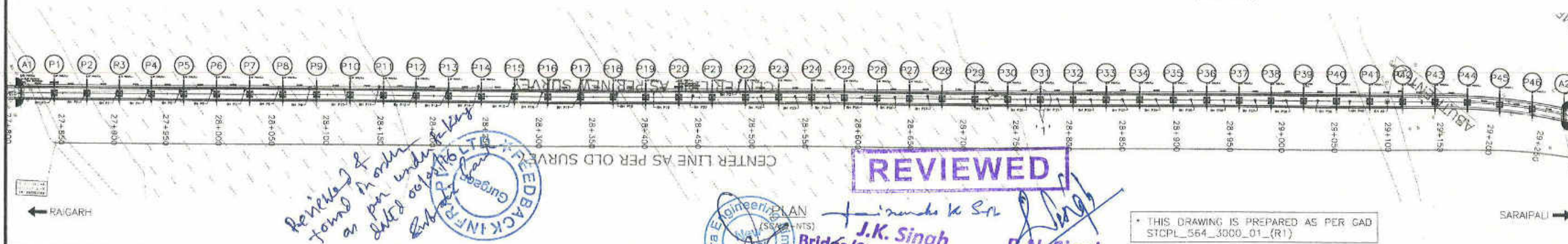
COORDINATES OF PIERS																											
PIER P29	1	X=732656.547	Y=2400844.128	PIER P30	1	X=732632.414	Y=2400824.671	PIER P31	1	X=732608.281	Y=2400805.214	PIER P32	1	X=732584.147	Y=2400785.757	PIER P33	1	X=732560.014	Y=2400766.300	PIER P34	1	X=732535.881	Y=2400746.843	PIER P35	1	X=732511.747	Y=2400727.386
PILE CENTER	2	X=732656.887	Y=2400847.292	2	X=732632.754	Y=2400827.835	2	X=732608.620	Y=2400808.378	2	X=732584.487	Y=2400788.921	2	X=732560.353	Y=2400769.464	2	X=732536.220	Y=2400750.007	2	X=732512.087	Y=2400730.549						
	3	X=732659.711	Y=2400843.789	3	X=732635.578	Y=2400824.332	3	X=732611.445	Y=2400804.875	3	X=732587.311	Y=2400785.418	3	X=732563.178	Y=2400765.960	3	X=732539.044	Y=2400746.503	3	X=732514.911	Y=2400727.046						
	4	X=732656.208	Y=2400840.965	4	X=732632.075	Y=2400821.507	4	X=732607.941	Y=2400802.050	4	X=732583.808	Y=2400782.593	4	X=732559.675	Y=2400763.136	4	X=732535.541	Y=2400743.679	4	X=732511.408	Y=2400724.222						
	5	X=732653.384	Y=2400844.468	5	X=732629.250	Y=2400825.011	5	X=732605.117	Y=2400805.554	5	X=732580.984	Y=2400786.096	5	X=732556.850	Y=2400766.639	5	X=732532.717	Y=2400747.182	5	X=732508.583	Y=2400727.725						

COORDINATES OF PIERS																			
PIER P36	1	X=732487.614	Y=2400707.928	PIER P37	1	X=732463.481	Y=2400688.471	PIER P38	1	X=732439.347	Y=2400669.014	PIER P39	1	X=732415.214	Y=2400649.557	PIER P40	1	X=732391.080	Y=2400630.100
PIER CENTER	2	X=732487.953	Y=2400711.092	2	X=732463.820	Y=2400691.635	2	X=732439.687	Y=2400672.178	2	X=732415.553	Y=2400652.721	2	X=732391.420	Y=2400633.264				
	3	X=732490.778	Y=2400707.589	3	X=732466.644	Y=2400688.132	3	X=732442.511	Y=2400668.675	3	X=732418.378	Y=2400649.218	3	X=732394.244	Y=2400629.760				
	4	X=732487.275	Y=2400704.765	4	X=732463.141	Y=2400685.307	4	X=732439.008	Y=2400665.850	4	X=732414.874	Y=2400646.393	4	X=732390.741	Y=2400626.936				
	5	X=732484.450	Y=2400708.268	5	X=732460.317	Y=2400688.811	5	X=732436.183	Y=2400669.354	5	X=732412.050	Y=2400649.896	5	X=732387.917	Y=2400630.439				



NOTES:-  
 1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METER UNLESS WRITTEN OTHERWISE.  
 2. NO DIMENSION SHALL BE SCALED FROM THIS DRAWING. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.

DETAIL - '1'  
 (SCALE=1:200)

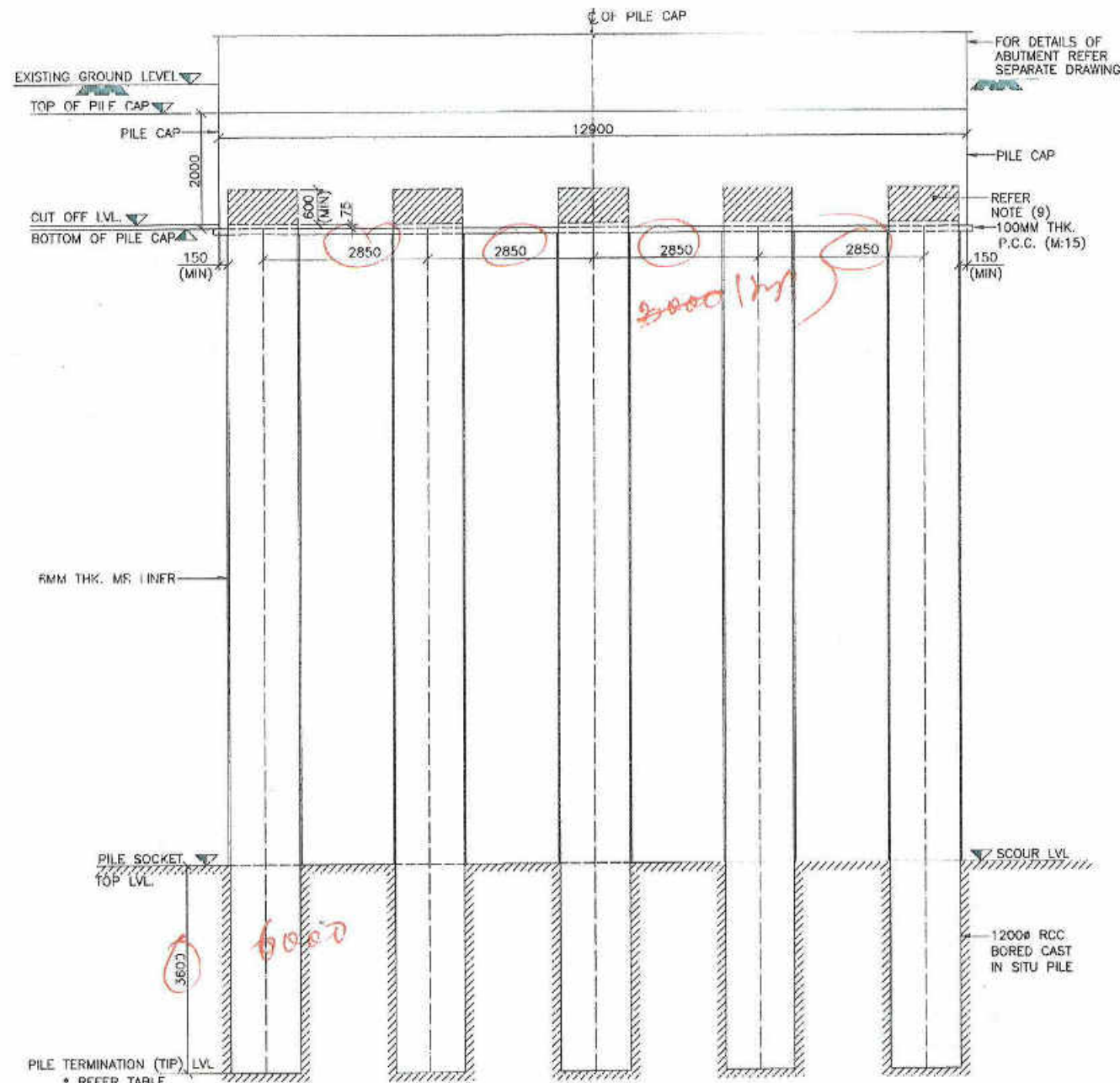


CLIENT: MORTH THE MINISTRY OF ROAD TRANSPORT & HIGHWAYS, (NORTH & NORTH-EAST) STATE PWD, CHATTISGARH	AUTHORITY ENGINEER: <b>FEEDBACK INFRA</b> Feetback Infra Private Limited 15th Floor, Tower-05, DLT Cyber City, Phase-II, Gurgaon 122002, Haryana, India	PROOF CONSULTANT: <b>HBS</b> HBS INFRA ENGINEERS INDIA PVT. LTD. Plot no. 102, Plot no. 840 11, Fortune Chambers, Image Garden Road, Madhapur, Hyderabad-500081	SAFETY CONSULTANT: <b>SD</b> S. A. Infrastructure Consultants Pvt. Ltd. 101-102, CS-1, Gyanaband-II, Indraprastha, Gurgaon-122014	DESIGN ENGINEER: <b>ERA</b> ERA Infra Engineering Limited C/10411, Sector-62, NOIDA-201301	NAME OF PROJECT: REHABILITATION AND UPGRADEMENT OF NH-216 FROM KM1+800 TO KM 91+400 (RAIGARH TO SARAIPALI SECTION) TO TWO LANES WITH PAVED SHOULDER IN THE STATE OF CHHATTISGARH UNDER NHDP-IV	DRAWING TITLE: DETAILS OF CO-ORDINATES FOR MAJOR BRIDGE AT DESIGN CH-28+400 DRG. NO.: STCPL_564_3000_03 SCALE: AS SHOWN	PROJECT NO: 564 SCALE: AS SHOWN
DATE: 08/05/16 NO: 01 BY: [Signature]	FOR APPROVAL: [Signature] REVISION: [Signature]	DATE: 08/05/16 NO: 01 BY: [Signature]	DATE: 08/05/16 NO: 01 BY: [Signature]	DATE: 08/05/16 NO: 01 BY: [Signature]	DATE: 08/05/16 NO: 01 BY: [Signature]	DATE: 08/05/16 NO: 01 BY: [Signature]	DATE: 08/05/16 NO: 01 BY: [Signature]

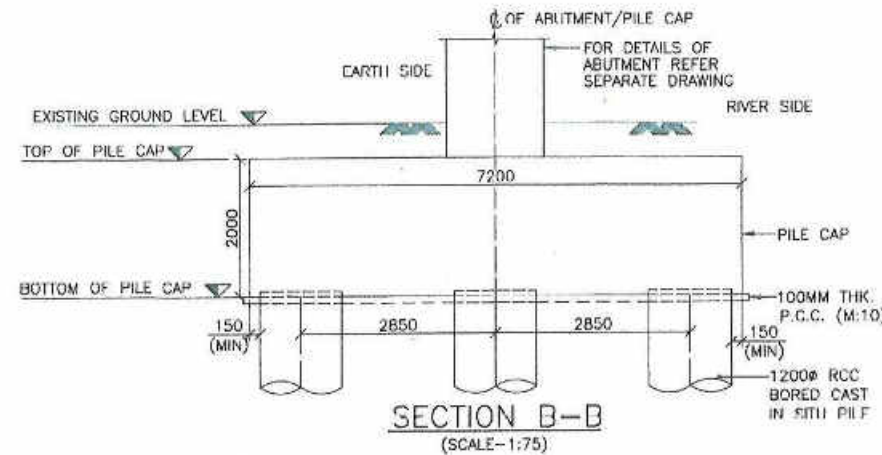


04/12/2017 - 322 ydt 03.05.2017

1st copy



SECTION A-A  
(SCALE-1:75)



SECTION B-B  
(SCALE-1:75)

TABLE OF LEVELS

ABUTMENT LOCATION	GROUND LEVEL	TOP OF PILE CAP	BOTTOM OF PILE CAP	PILE CUTOFF LEVEL	PILE SOCKET TOP LEVEL	SCOUR LEVEL	PILE TIP LEVEL
A1	201.671	200.176	198.178	198.253	187.200	187.250	183.650

DESIGN LOAD FOR PILE CAPACITY

LOAD CASE	VERTICAL LOAD * (T)	LATERAL LOAD (T)
NORMAL	171.0	28.53
WIND	181.0	29.11
SEISMIC	190.0	31.29

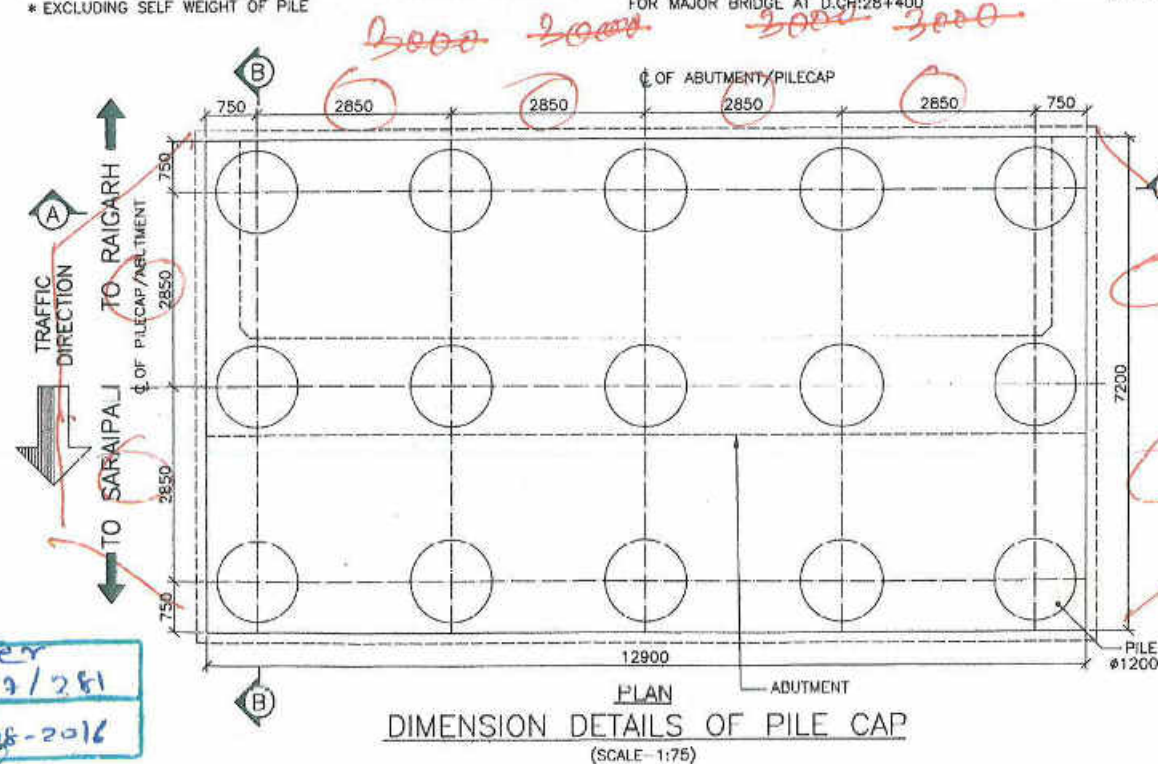
\* EXCLUDING SELF WEIGHT OF PILE

REFERENCES (LATEST REVISION)

- STCPL\_564\_3000\_38 - NUMERATION DETAILS OF ABUTMENT-A1 FOR MAJOR BRIDGE AT D.CH:28+400
- STCPL\_564\_3000\_39 - REINFORCEMENT DETAILS OF ABUTMENT-A1 FOR MAJOR BRIDGE AT D.CH:28+400

LEGEND








- (1/P) ..... TYPICAL  
..... TOP R/F  
..... BOTTOM R/F
- ..... CENTER LINE  
R/F ..... REINFORCEMENT



**REVIEWED**

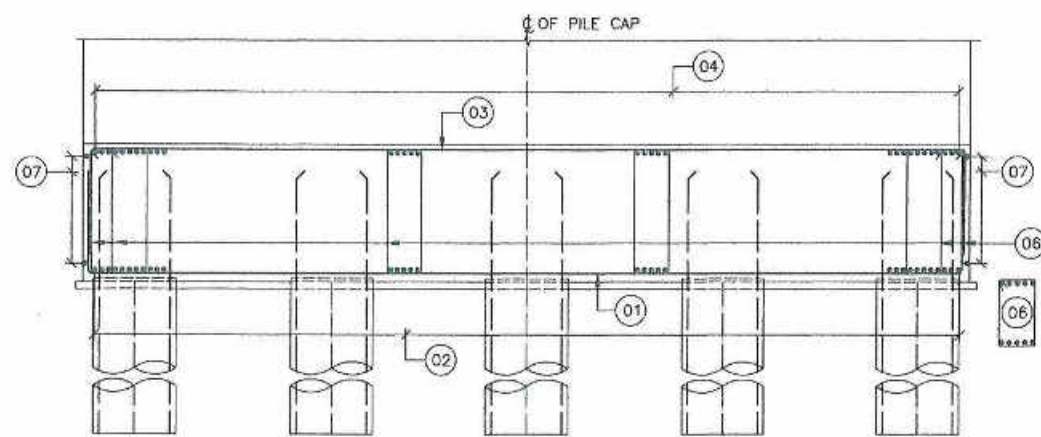
R.N. Singh  
Team Leader  
Feedback Infra  
NH-216, (Raigarh)

REF: Letter  
SCH-13/281  
Date: 12-08-2016

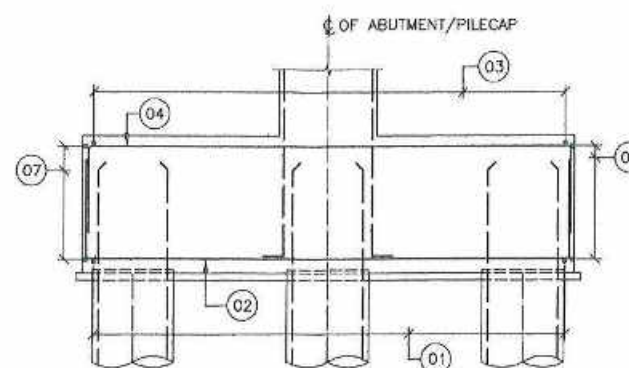
				 <b>CLIENT:</b> <b>MORTH</b> THE MINISTRY OF ROAD TRANSPORT & HIGHWAYS, (NHDP-IV A CELL) STATE PWD, CHATTISGARH		<b>AUTHORITY ENGINEER:</b>  <b>FEEDBACK INFRA</b> <i>Working Infrastructure Happens</i> Feedback Infra Private Limited 15th Floor, Tower 9B, DLF Cyber City, Phase-III, Gurgaon 122002, Haryana, India		<b>PROOF CONSULTANT:</b>  <b>HBS</b> HBS INFRA ENGINEERING INDIA PVT. LTD. Flat no: 102, Plot no: 8 & 11, Fortune Chambers, Image Garden Road, Indraprastha Extension-50, Delhi		<b>SAFETY CONSULTANT:</b>  <b>S. A. Infrastructure</b> Consultants Pvt. Ltd. 101-102, CS-1, Gyanland-II, Indraprastha, Ghaziabad-201014		<b>DESIGN DIRECTOR:</b> <b>J.P. MAJUMDAR</b> ERA Infra Engineering Limited C56/41, Sector-62, Noida 201301		<b>EPC CONTRACTOR:</b>  <b>ERA</b> ERA INFRA ENGINEERING LIMITED C56/41, Sector-62, NOIDA-201301		<b>CONSULTANT:</b>  <b>SPECTRUM Techno-Consultants Pvt. Ltd.</b> 401/402, Radha Bhawan, Plot No. 9, Sector-19, Vashi, New Mumbai-400 701, Maharashtra Email : info@spectrumtechno.com		<b>NAME OF PROJECT:</b> REHABILITATION AND UPGRADEMENT OF NH-216 FROM KM3+800 TO KM 90+460 (RAIGARH TO SARAIKHALI SECTION) TO TWO LANES WITH PAVED SHOULDERS IN THE STATE OF CHHATTISGARH UNDER NHDP-IV		<b>DRAWING TITLE:</b> PILE AND PILECAP DETAILS OF ABUTMENT -A1 FOR MAJOR BRIDGE AT D.CH:28+400				<b>PROJECT NO:</b> 564	
22/08/18 RD FOR APPROVAL GWS																		DRG. NO. : STCPL_564_3000_40 (SHEET 1 OF 2)				SCALE: AS SHOWN			
DATE NO REVISION BY																				DRAWN DESIGNED CHECKED APPROVED CMS  VMM  KJM  NDP 				REV. RO	

DRG NO:-STCPL\_564\_3000\_40-RD P3

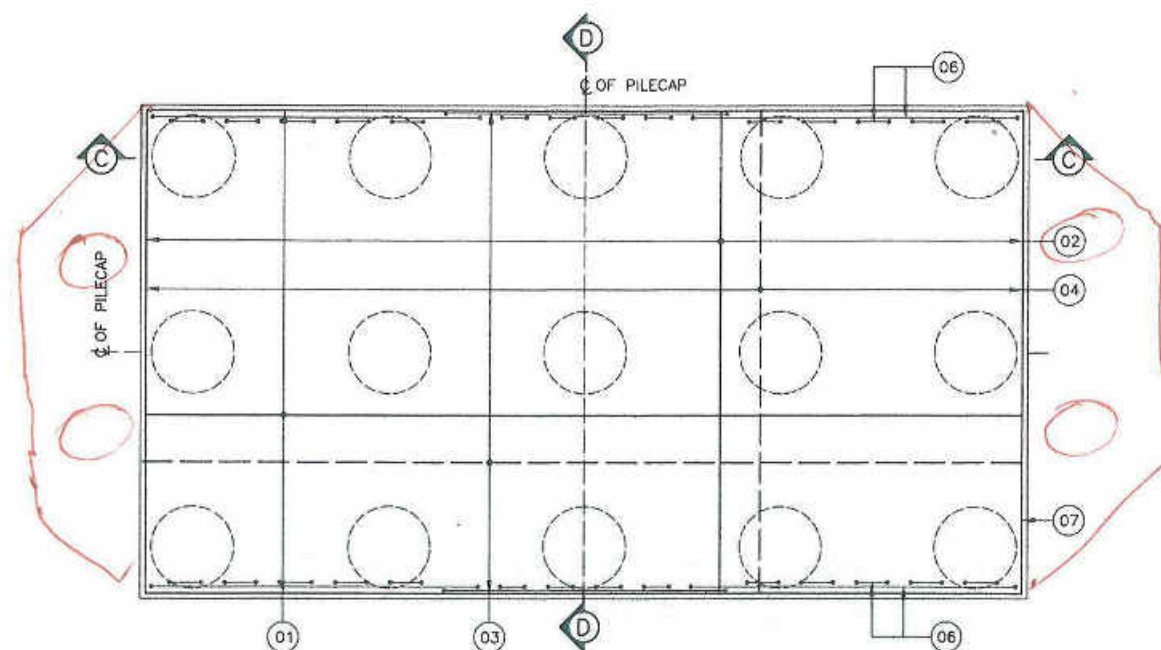




SECTION C-C  
(SCALE-1:75)



SECTION D-D  
(SCALE-1:75)



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

#### SCHEDULE OF REINFORCEMENT

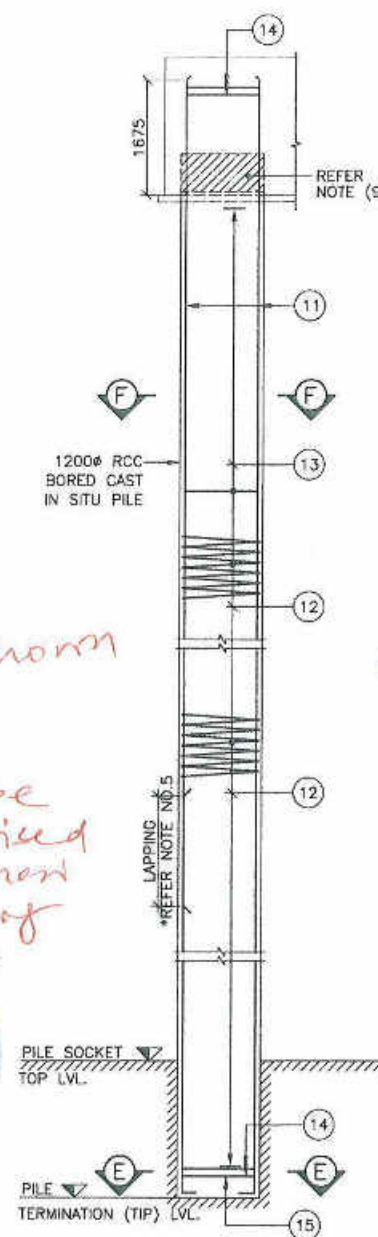
BAR MARK	DIA OF BAR	SHAPE	SPACING/NOS	REMARKS
01	H20	1000	100 c/c	ACROSS SPAN
02	H25	1000	100 c/c	ALONG SPAN
03	H16	1000	100 c/c	ACROSS SPAN
04	H16	1000	100 c/c	ALONG SPAN
05	NOT USED			
06	H10	200 c/c	34	LEGGED STIRRUPS
07	H16	600 (PLAN)	8 NOS	ON SIDE FACES (ALL AROUND)
11	H32		22 NOS	-
12	H10		150 PITCH	HELICAL
13	H16		1500 c/c	-
14	H16		2 NOS	-
15	H16		2X2=4 NOS	WELDED TO PILE R/F

NOTE: BAR MARK 05, 08 TO 10 NOT USED

#### LAP LENGTH:

CURTAILMENT	GRADE OF CONCRETE (M35)	10mm	12mm	16mm	20mm	25mm	32mm
< 25%	37#	370	445	595	740	925	1185
> 25% & < 33%	42#	420	505	675	840	1050	1345
> 33% & < 50%	52#	520	625	835	1040	1300	1675

# = DIA OF BAR



DETAILS OF  
PILE REINFORCEMENT  
(SCALE 1.75)

Piles as shown in Drawing & incorporated & piles are approved as per provided reinforcement.

to be revised from use of pile



**REVIEWED**

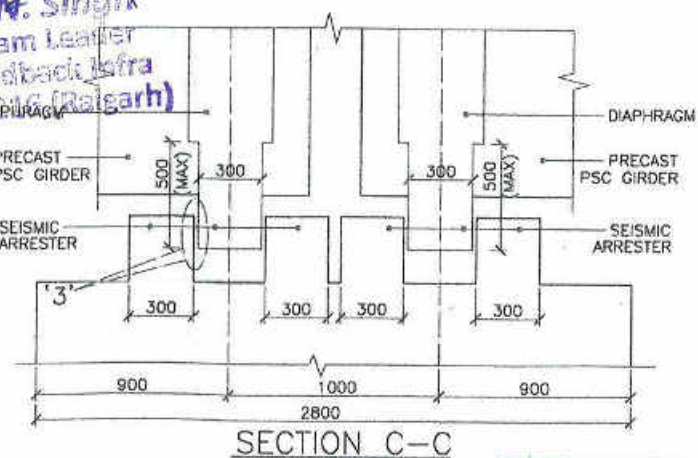
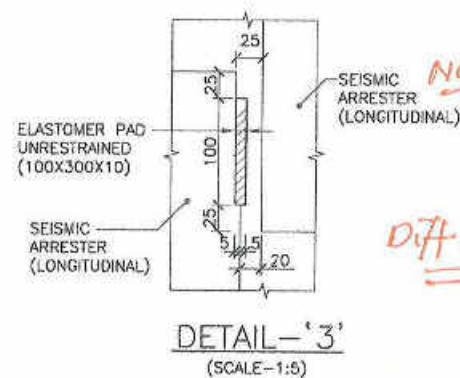
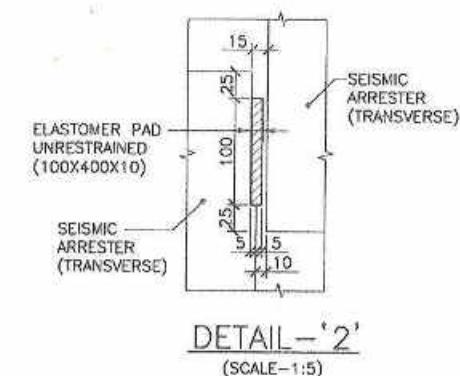
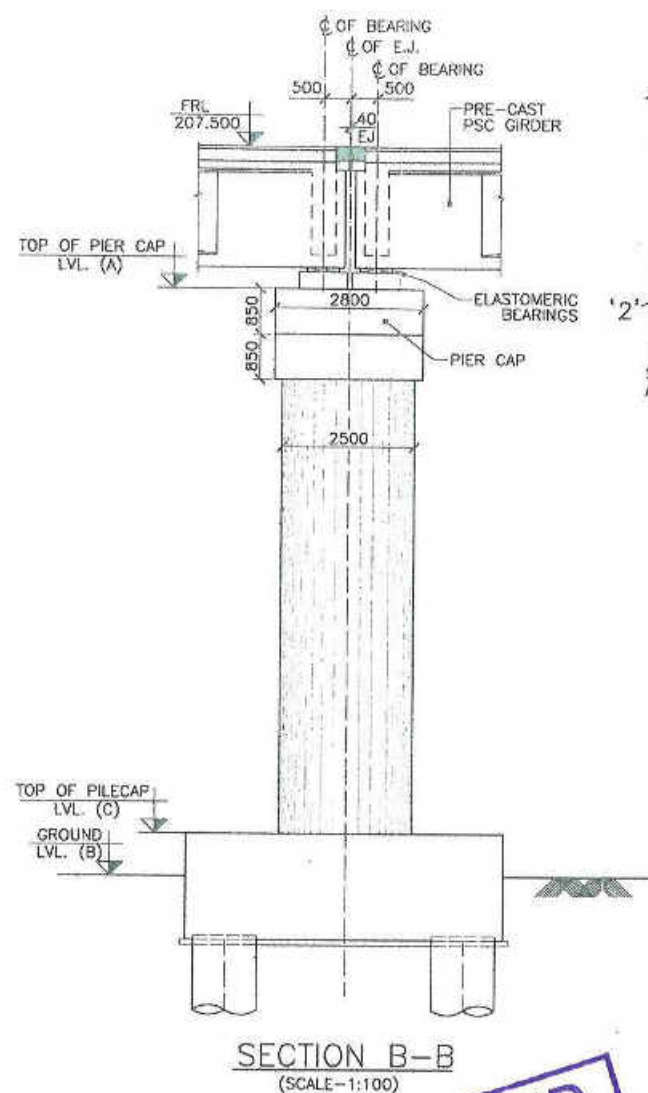
R.N. Singh  
Team Leader  
Feedback Infra  
NH-216, (Raigarh)

REF: 564-17/281  
Date: 22-08-2018



22/08/18	RD	FOR APPROVAL	GWS	CLIENT: NORTH THE MINISTRY OF ROAD TRANSPORT & HIGHWAYS, (NHDP-IV A CELL), STATE PWD, CHATTISGARH	AUTHORITY ENGINEER: FEEDBACK INFRA PVT. LTD. 15th Floor, Tower 9B, DLF Cyber City, Phase-III, Gurgaon 122002, Haryana, India	PROOF CONSULTANT: HBS INFRA ENGINEERS INDIA PVT. LTD. Flat no. 102, Plot no. 8 to 14, Fortune Chambers, Image Garden Road, Madhapur, Hyderabad-500082	SAFETY CONSULTANT: S. A. Infrastructure Consultants Pvt. Ltd. 101-102, C8-1, Gyankhand-II, Indrapuram, Chhatrapati-201014	DESIGN DIRECTOR: J.P. MAJUMDAR ERA Infra Engineering Limited C56/41, Sector-62, Noida-201301	EPC CONTRACTOR: ERA INFRA ENGINEERING LIMITED C56/41, SECTOR-62, NOIDA-201301	CONSULTANT: SPECTRUM Techno-Consultants Pvt. Ltd. 401/402, Raikar Bhawan, Plot No.9, Sector-17, Vashi, Navi Mumbai-400 703 India. Ph. 022-41115900, Email: info@spectrumworld.net	NAME OF PROJECT: REHABILITATION AND UPGRADEMENT OF NH-216 FROM KM3+800 TO KM 90+460 (RAIGARH TO SARAI PALLI SECTION) TO TWO LANES WITH PAVED SHOULDERS IN THE STATE OF CHHATTISGARH UNDER NHDP-IV	DRAWING TITLE: PILE AND PILECAP DETAILS OF ABUTMENT -A1 FOR MAJOR BRIDGE AT D.CH:2B+400	PROJECT NO: 564
DATE	NO	REVISION	BY									DRG. NO.: STCPL_564_3000_40 (SHEET 2 OF 2)	SCALE: AS SHOWN
												DRAWN: GMS DESIGNED: VMM CHECKED: JKM APPROVED: NDP REV: RO	





**LEGEND**

(TYP)	-	TYPICAL
F.R.L.	-	FINISHED ROAD LEVEL
E.J.	-	EXPANSION JOINT
CL	-	CENTER LINE

### REFERENCES (LATEST REVISION)

1. STCPL\_564\_3000\_01 - GENERAL ARRANGEMENT OF MAJOR BRIDGE AT D.CH:28+400
2. STCPL\_564\_3000\_24 - REINFORCEMENT DETAILS OF PIER & PIERCAP (GROUP-I) FOR MAJOR BRIDGE AT D. CH:28+400
3. STCPL\_564\_3000\_25 - NUMERATION DETAILS OF PILE & PILECAP (GROUP-I) FOR MAJOR BRIDGE AT D. CH:28+400

due to change in RLs of TBM all levels are changed / revised except FRL as under

1. Existing TBM RL = 200.00
2. Now final TBM RL = 202.08 (202.08)

FOR GROUP 1:- P1 - P10  
GROUP 1A:- P11 - P13

PIER MARK	FORMATION LEVEL	TOP OF PIER CAP (A)	GROUND LEVEL (B)	TOP OF PILE CAP LVL. (C)
P1	207.500	204.716	193.694	194.500
P2	207.500	204.716	192.266	194.500
P3	207.500	204.716	192.147	194.500
P4	207.500	204.716	191.933	194.500
P5	207.500	204.716	191.906	194.500
P6	207.500	204.716	191.460	194.500
P7	207.500	204.716	191.679	194.500
P8	207.500	204.716	192.328	194.500
P9	207.500	204.716	192.007	194.500
P10	207.500	204.716	192.006	194.500
P11	207.500	204.716	193.330	194.500
P12	207.500	204.716	193.584	194.500
P13	207.500	204.716	194.207	194.500

due to diff in  
RLs of TPB  
changed levels  
by 2.08

forwards pass  
HMC works as to  
be written at the

\* Refer revised CRAD appd.

REF.	Letter 564-09/220
Date:	14-03-2018

SECTION B-B  
(SCALE=1:100)

**REVIEWED**

**R.N. Singh**  
Team Leader  
Feedback Intra  
N.C.G. Raigarh

PLAN AT PIER CAP  
(SCALE=1:50)

(SCALE-1/25)

ANMEDABAD  
TEL: 40076864

[illegible]

DRG NO:-STCPL 564 3000 23-80 23

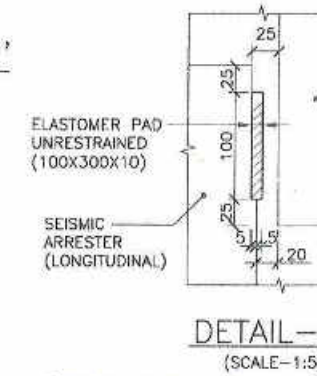
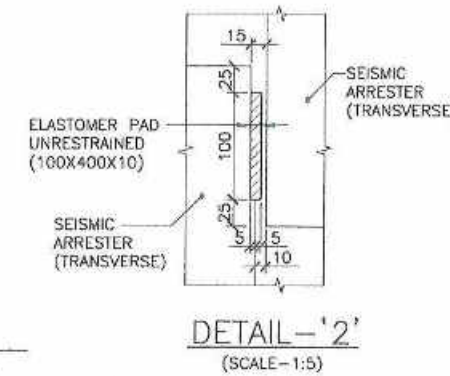
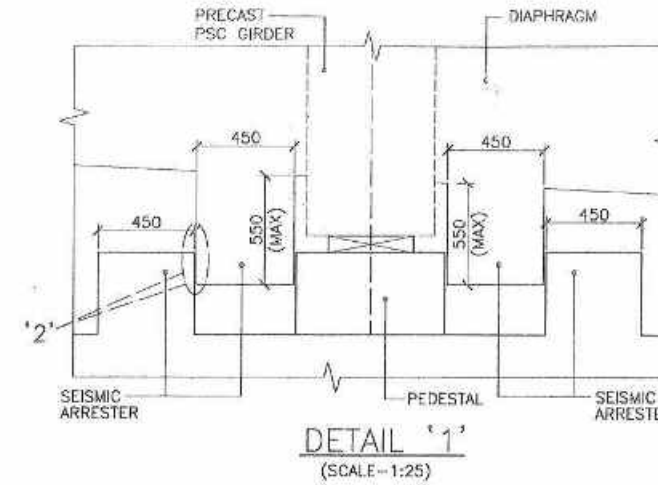
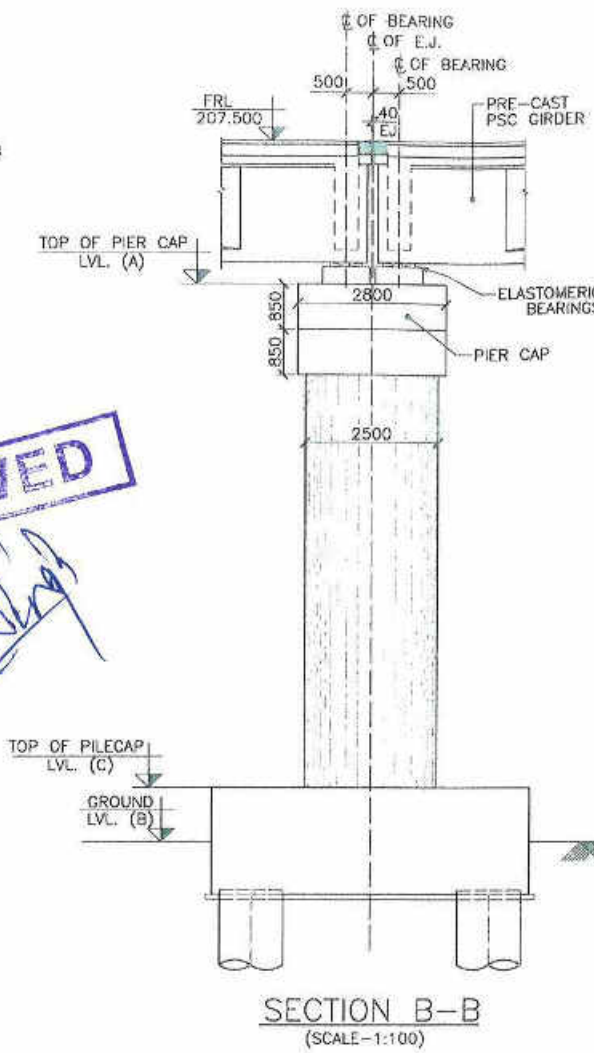
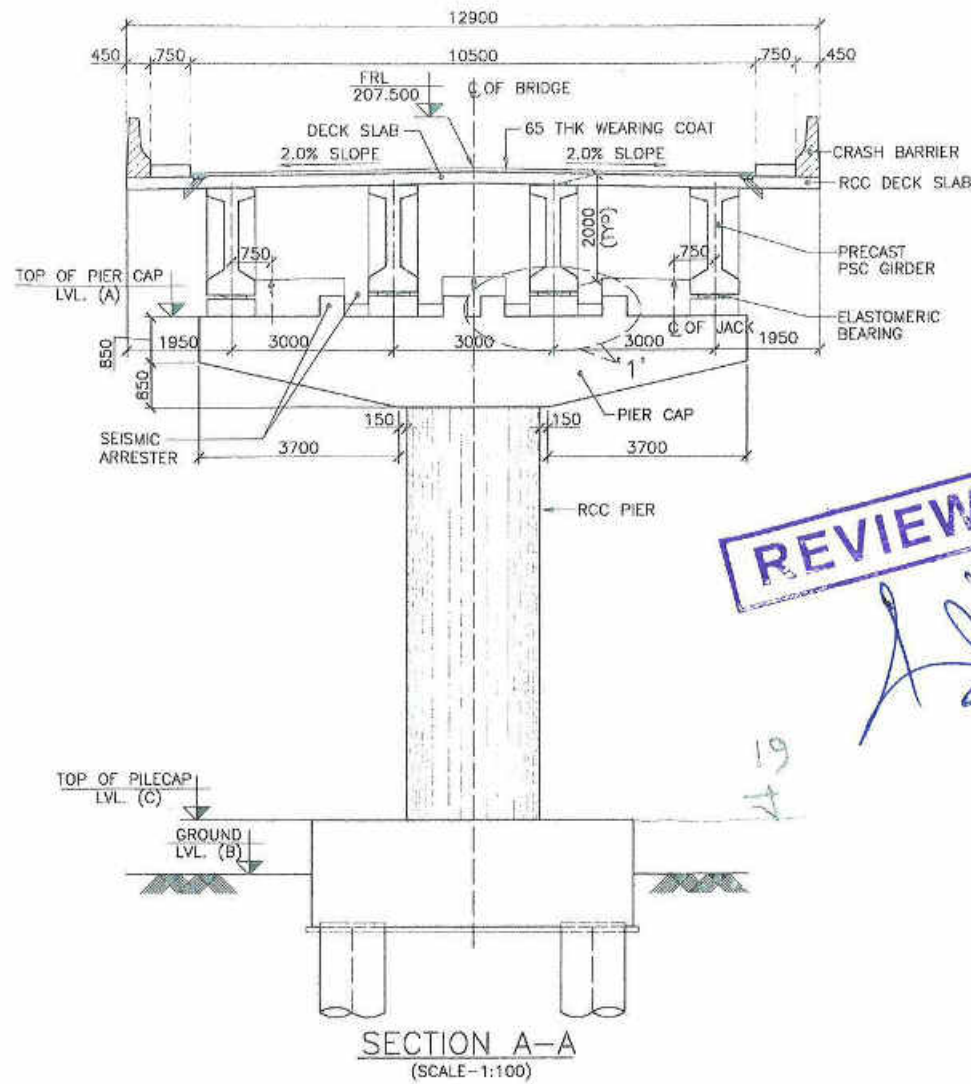












- NOTES:-**
- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METER, UNLESS WRITTEN OTHERWISE.
  - NO DIMENSION SHALL BE SCALED FROM THIS DRAWING. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
  - MATERIALS:**  
GRADE OF CONCRETE CONFORMING TO IRC : 112  
PIER CAP, PIER : M35  
PEDESTAL : M40  
REINFORCEMENT : Fe 500 CONFORMING TO IS 1786.
  - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE PLAN AND PROFILE DRAWING OF ROAD.
  - THE FOLLOWING LOADS HAVE BEEN CONSIDERED IN THE DESIGN:- ONE LANE OF 70R + ONE LANE OF CLASS A OR THREE LANES OF CLASS A WHICH EVER GOVERNS.
  - ELASTOMERIC BEARINGS SHALL BE PROVIDED ON TOP OF PEDESTAL.
  - STRIP SEAL TYPE EXPANSION JOINT SHALL BE USED.
  - MIN. WEARING COAT OF 40MM THK. ASPHALTIC CONCRETE OVER 25MM THK. MASTIC ASPHALT AS PER MOST SPECIFICATION NO.2702.1.1 OVER TOP SLAB.
  - AS PER THE IRC 6:2014 THE LOCATION OF THE STRUCTURES FALLS UNDER ZONE II OF THE SEISMIC ZONES OF INDIA.

**LEGEND**

(TYP) - TYPICAL  
F.R.L. - FINISHED ROAD LEVEL  
E.J. - EXPANSION JOINT  
CL - CENTER LINE

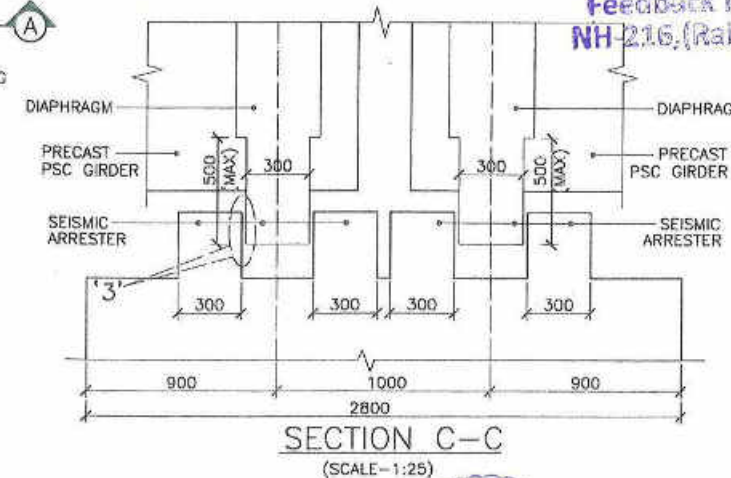
**REFERENCES (LATEST REVISION)**

- STCPL\_564\_3000\_01 - GENERAL ARRANGEMENT OF MAJOR BRIDGE AT D.CH:28+400
- STCPL\_564\_3000\_27 - REINFORCEMENT DETAILS OF PIER & PIERCAP (GROUP-II) FOR MAJOR BRIDGE AT D. CH:28+400
- STCPL\_564\_3000\_28 - NUMERATION DETAILS OF PILE & PILECAP (GROUP-II) FOR MAJOR BRIDGE AT D. CH:28+400

**NOTE:** Due to change in R.L.s of TBMs all the levels are changed as under:  
1- Earlier TBM RL = 200.00  
2- Now final TBM RL = 202.08  
Diff = 2.08  
(maintaining FRL unchanged)

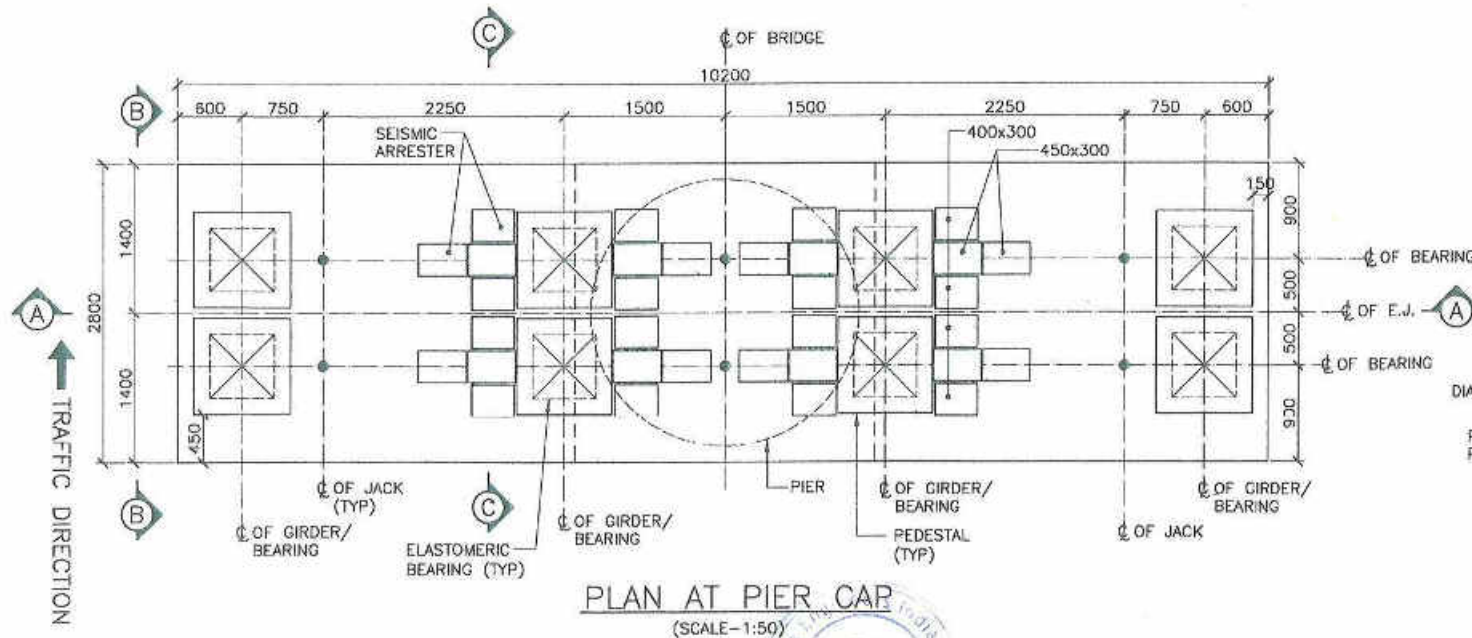
Pile cap top Level = 196.580

**R.N. Singh**  
Team Leader  
Feedback Infra  
NH-216, (Raigarh)



**SCHEDULE OF PIER LEVELS FOR GROUP-II :- P14-P21 & P27-P30, P37-P41**

PIER MARK	FORMATION LEVEL	TOP OF PIER CAP (A)	GROUND LEVEL (B)	TOP OF PILE CAP LVL. (C)
P14	207.500	204.716	194.285	195.500
P15	207.500	204.716	194.230	195.500
P16	207.500	204.716	194.436	195.500
P17	207.500	204.716	194.110	195.500
P18	207.500	204.716	193.429	195.500
P19	207.500	204.716	192.885	195.500
P20	207.500	204.716	192.623	195.500
P21	207.500	204.716	192.347	195.500
P27	207.500	204.716	191.203	195.000
P28	207.500	204.716	192.450	195.000
P29	207.500	204.716	192.906	195.000
P30	207.500	204.716	193.948	195.000
P37	207.500	204.716	194.604	195.000
P38	207.500	204.716	193.197	195.000
P39	207.500	204.716	193.647	195.000
P40	207.500	204.716	193.750	195.000
P41	207.500	204.716	195.639	195.000



REF: Letter 564-12/275  
Date: 12-05-2016

12/05/16	RD	FOR APPROVAL	GMS	DATE	NO	REVISION	BY
12/05/16	RD	FOR APPROVAL	GMS	DATE	NO	REVISION	BY







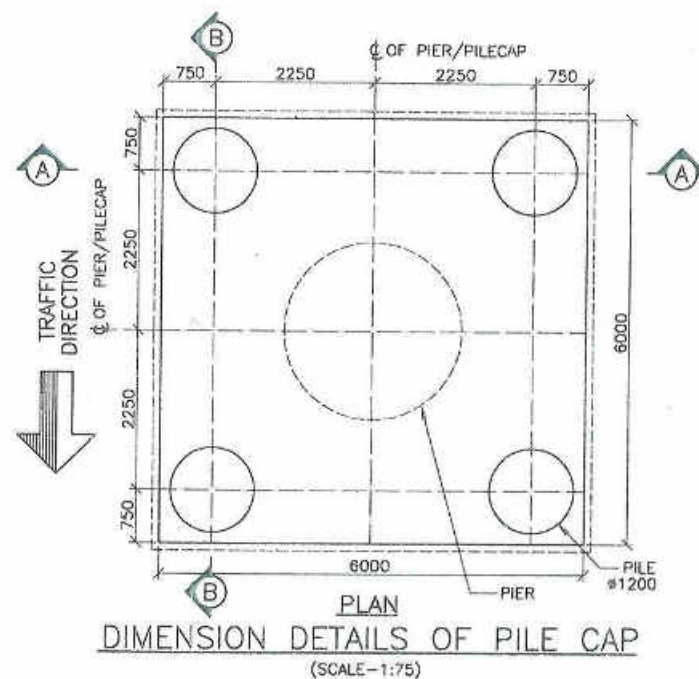
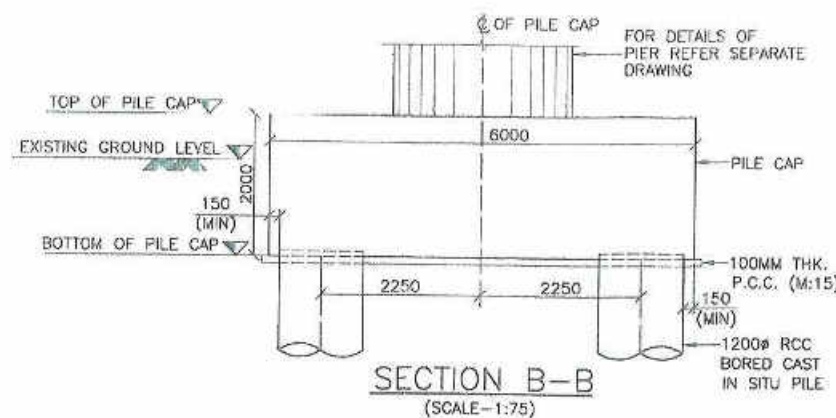
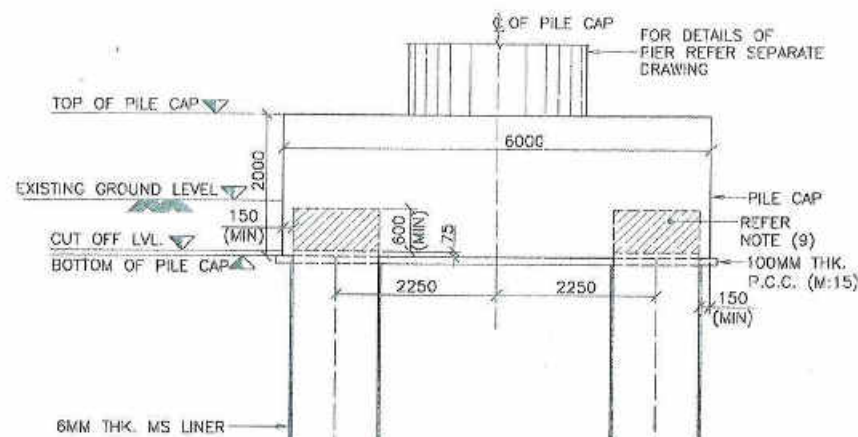


TABLE OF LEVELS FOR GROUP-2 :- P14-P21 & P27-P30, P37-P41

PIER LOCATION	GROUND LEVEL	TOP OF PILE CAP	BOTTOM OF PILE CAP	PILE CUTOFF LEVEL	PILE SOCKET TOP LEVEL	SCOUR LEVEL	PILE TIP LEVEL
P14	194.285	195.500	193.500	193.575	177.727	177.727	174.127
P15	194.230	195.500	193.500	193.575	178.043	178.043	174.443
P16	194.436	195.500	193.500	193.575	173.596	173.596	169.996
P17	194.110	195.500	193.500	193.575	176.976	176.976	173.376
P18	193.429	195.500	193.500	193.575	179.095	179.095	175.495
P19	192.885	195.500	193.500	193.575	179.202	179.202	175.602
P20	192.623	195.500	193.500	193.575	176.536	176.536	172.936
P21	192.347	195.500	193.500	193.575	174.788	174.788	171.188
P27	191.203	195.000	193.000	193.075	176.296	176.296	172.696
P28	192.450	195.000	193.000	193.075	176.038	176.038	172.438
P29	192.906	195.000	193.000	193.075	177.370	177.370	173.770
P30	193.948	195.000	193.000	193.075	179.982	179.982	176.382
P37	194.604	195.000	193.000	193.075	176.762	176.762	173.162
P38	193.197	195.000	193.000	193.075	176.762	176.762	173.162
P39	193.647	195.000	193.000	193.075	176.976	176.976	173.376
P40	193.750	195.000	193.000	193.075	177.551	177.551	173.951
P41	195.639	195.000	193.000	193.075	182.823	182.823	179.223

DESIGN LOAD FOR PILE CAPACITY

LOAD CASE	VERTICAL LOAD* (T)	LATERAL LOAD (T)
NORMAL	400.0	7.8
WIND	480.0	16.1
SEISMIC	455.0	30.0

\* EXCLUDING SELF WEIGHT OF PILE

- NOTES**
- ALL DIMENSIONS ARE IN MILLIMETER, ALL LEVELS ARE IN METER.
  - DO NOT SCALE THIS DRAWING. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
  - MATERIALS:**  
CONCRETE GRADE CONFIRMING TO IRC 112: 2011  
PILE, PILE CAP : M-35  
REINFORCEMENT : Fe-500 CONFORMING TO IS:1786.
  - CLEAR COVER TO REINFORCEMENT:  
PILE, PILE CAP : 75mm
  - (a) FOR LAP LENGTH OF THE BARS REFER TABLE.  
(b) NOT MORE THAN 50% OF BARS SHALL BE LAPPED AT ANY LOCATION. AND THE LAPS SHOULD BE STAGGERED.
  - WHEREVER TOTAL NO OF BARS ARE SPECIFIED, THEY ARE TO BE SPACED UNIFORMLY, UNLESS MENTIONED OTHERWISE.
  - COVER BLOCKS SHALL BE ATTACHED TO THE REINFORCEMENT CAGE SO AS TO MAINTAIN APPROPRIATE COVER FROM THE FACE OF THE BORE HOLE. CONCRETE GRADE OF COVER BLOCKS SHALL BE M-35.
  - THE PILE SHOULD PROJECT 75 MM IN TO THE CAP CONCRETE.
  - PILE SHALL BE CAST 600mm (MIN) ABOVE CUT-OFF LEVEL AND THE PORTION ABOVE CUT-OFF LEVEL SHALL BE CHISELLED AFTER 7 DAYS OF PILE CASTING & BEFORE CASTING OF PILE CAP.
  - IN CASE THE PILE ABOVE CUT-OFF LEVEL IS NOT REMOVED BEFORE SETTING OF PILE CONCRETE, THEN A 40mm DEEP GROOVE SHALL BE MADE ALL AROUND THE PILE AT THE REQUIRED CUT-OFF LEVEL.
  - FOR DETAILS OF BORE HOLE DATA AND LOCATION, PLEASE REFER SOIL INVESTIGATION REPORT.
  - THE DESIGN OF PILE FOUNDATION IS BASED ON THE SOIL INVESTIGATION REPORT. THE SOIL DATA DURING BORING OF PILE SHALL BE CONFIRMED WITH RESPECTIVE BORE HOLE DATA OF SOIL INVESTIGATION REPORT. AND IF ANY DISCREPANCY IS OBSERVED, THE SAME SHALL BE IMMEDIATELY REPORTED TO ENGINEER BEFORE CONCRETING OF THE PILE.
  - THE GEOTECHNICAL CAPACITY OF PILE CONSIDERED FOR DESIGN IS 525T & THE SAME SHALL BE CONFIRMED BY SUITABLE TESTS ON SITE.
  - THE GL SHOWN ARE AS PER SURVEY DETAILS. THE SAME SHALL BE VERIFIED BEFORE EXECUTION. IF ANY VARIATION FOUND IN THE GL, THE OTHER LEVELS SHALL BE MODIFIED ACCORDINGLY.
  - PERMISSIBLE TOLERANCES FOR PILE SHALL BE:-  
a. SHIFT NOT TO EXCEED 75 MM. AT PILING PLATFORM LEVEL.  
b. TILT NOT TO EXCEED 1 IN 150.  
HOWEVER TILT & SHIFT AS MEASURED MUST BE REFERRED BACK TO DESIGN OFFICE. THE DESIGN & DRAWING FOR PILE/PILE CAP MUST BE REVISED.

**REFERENCES (LATEST REVISION)**

- STCPL\_564\_3000\_26 - NUMERATION DETAILS OF PIER & PIERCAP (GROUP-II) FOR MAJOR BRIDGE AT D. CH:28+400
- STCPL\_564\_3000\_27 - REINFORCEMENT DETAILS OF PIER & PIERCAP (GROUP-II) FOR MAJOR BRIDGE AT D. CH:28+400

*Note: GRAD revised due to change in RL of TBM. Existing RL of TBM was 200.00 NOW final RL is 202.08. maintaining FRL unchanged.*

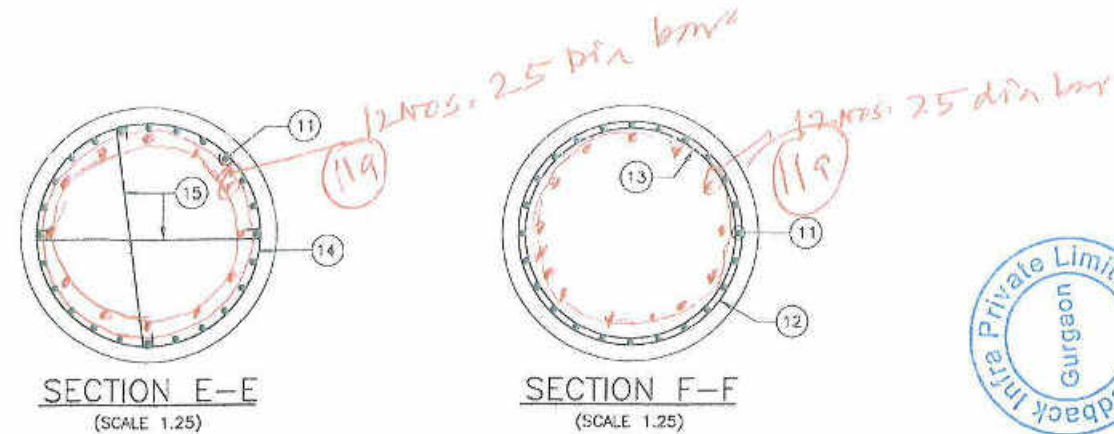
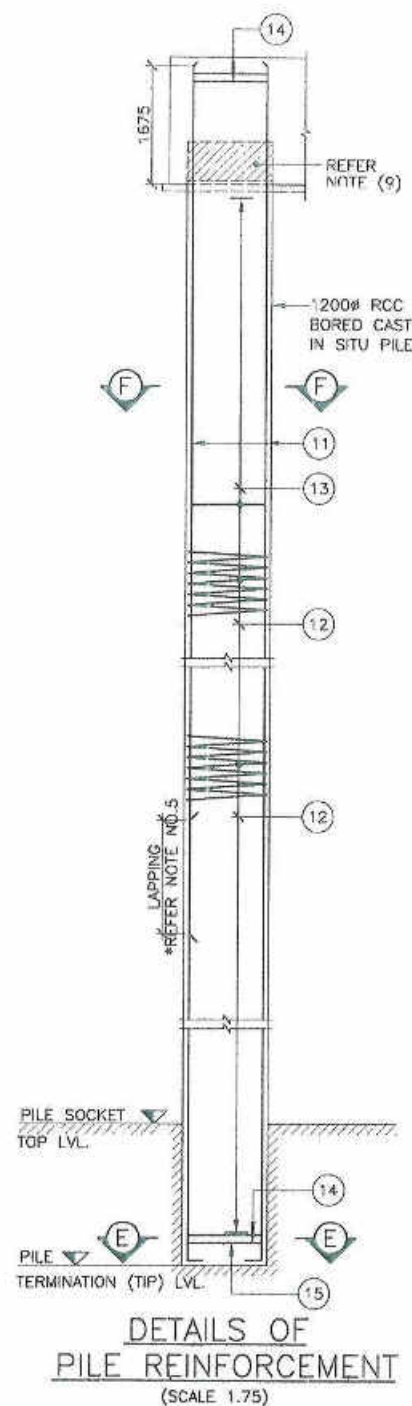
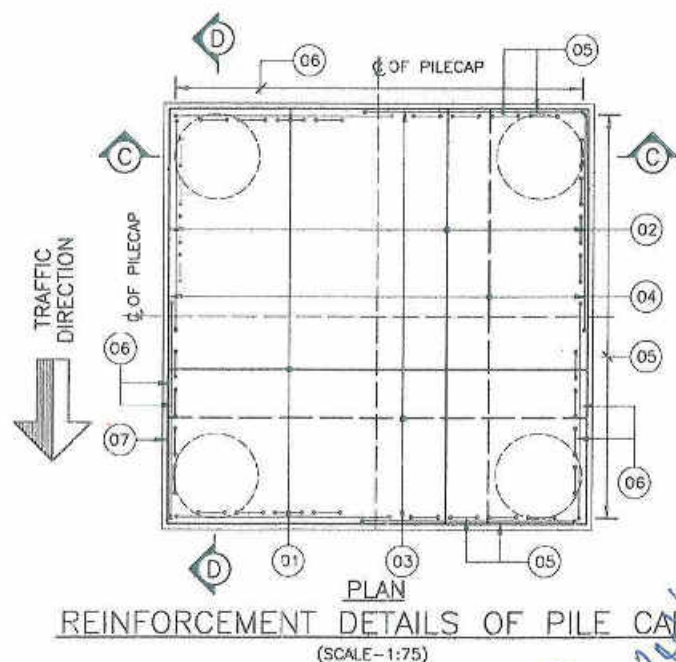
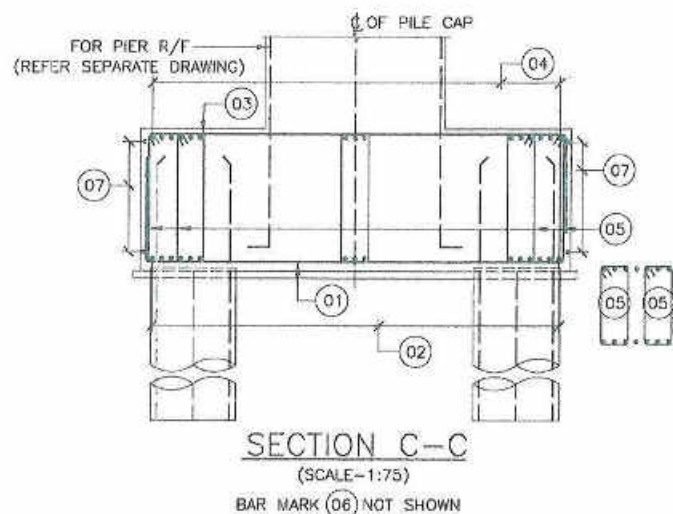
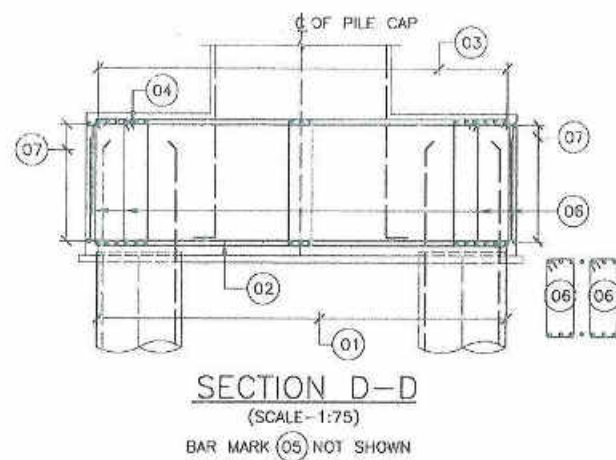
*\* socketing 6m shall be from top of hard rock encountered at site.*

REF: Letter 564-09/220  
Date: 14-03-2016

*All levels to be verified at site before execution*

CLIENT: MORTH THE MINISTRY OF ROAD TRANSPORT & HIGHWAYS, (NHDP-IV A CELL) STATE PWD, CHATTISGARH	AUTHOR: ENGINEER: FEEDBACK INFRA Private Limited 15th Floor, Tower 9B, DLF Cyber City, Phase-III, Gurgaon 122002, Haryana, India	PROOF CONSULTANT: HBS HBS INFRA ENGINEERS INDIA PVT. LTD. Plot no: 102, Plot no: P to 11, Fortune Chambers, Image Garden Road, Madhapur, Hyderabad-500 081	SAFETY CONSULTANT: S. A. Infrastructure Consultants Pvt. Ltd. 101-102, CS-1, Gyankhand-II, Indirapuram, Ghaziabad-201014	DESIGN CONSULTANT: ERA INFRA ENGINEERING LIMITED C56/41, Sector-62, Noida-201301	EPC CONTRACTOR: ERA INFRA ENGINEERING LIMITED C56/41, SECTOR-62, NOIDA-201301	CONSULTANT: SPECTRUM Techno-Consultants Pvt. Ltd. 401/402, Railkar Bhawan, Plot No 9, Sector-17, Vashi, Navi Mumbai-400 703 India. Ph. 022-41115900, Email: info@spectrumworld.net	NAME OF PROJECT: REHABILITATION AND UPGRADE OF NH-216 FROM KM3+800 TO KM 90+460 (RAIGARH TO SARAPALLI SECTION) TO TWO LANES WITH PAVED SHOULDERS IN THE STATE OF CHHATTISGARH UNDER NHDP-IV	DRAWING TITLE: NUMERATION DETAILS OF PIER & PIERCAP (GROUP-II) FOR MAJOR BRIDGE AT D. CH:28+400	PROJECT NO: 564
DATE: 14/03/16	NO: 01	FOR APPROVAL: GMS	REVISION: BY	SCALE: AS SHOWN	REV: RO	DRAWN: YJC DESIGNED: YJC CHECKED: YJC APPROVED: NDF			





#### LAP LENGTH:

CURTALMENT	GRADE OF CONCRETE (M35)	10mm	12mm	16mm	20mm	25mm	32mm
< 25%	37#	370	445	595	740	925	1185
> 25% & < 33%	42#	420	505	675	840	1050	1345
> 33% & < 50%	52#	520	625	835	1040	1300	1675

# = DIA OF BAR

#### SCHEDULE OF REINFORCEMENT

BAR MARK	DIA OF BAR	SHAPE	SPACING/NOS	REMARKS
01	H32	1200	43 NOS	ACROSS TRAFFIC
02	H32	1200	43 NOS	ALONG TRAFFIC
03	H16	1200	43 NOS	ACROSS TRAFFIC
04	H16	1200	43 NOS	ALONG TRAFFIC
05	H12	280 c/c	20 LEGGED STIRRUPS	
06	H12	280 c/c	20 LEGGED STIRRUPS	
07	H12	600 (PLAN)	150 c/c	ON SIDE FACES (ALL AROUND)
11	H32		24 NOS	-
12	H10		150 PITCH	HELICAL
13	H16		1500 c/c	-
14	H16		2 NOS	-
15	H16		2X2=4 NOS	WELDED TO PILE R/F

NOTE: BAR MARK (08) TO (10) NOT USED

11# H25 12# 12#

**REVIEWED**

R.N. Singh  
Team Leader  
Feedback Infra  
NH-216, (Raigarh)

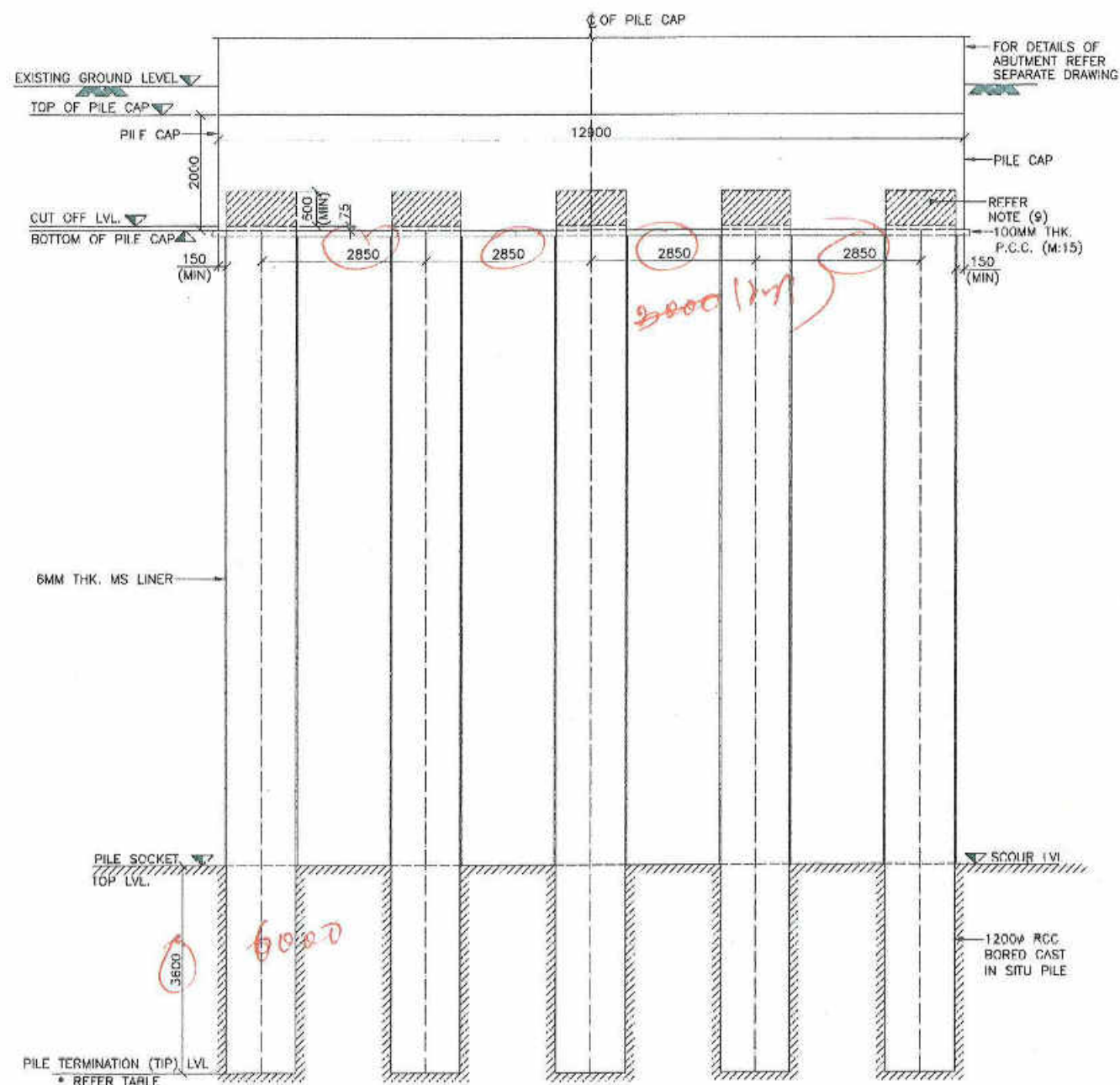


REF: Letter  
564-09/210  
Date: 14-03-2016

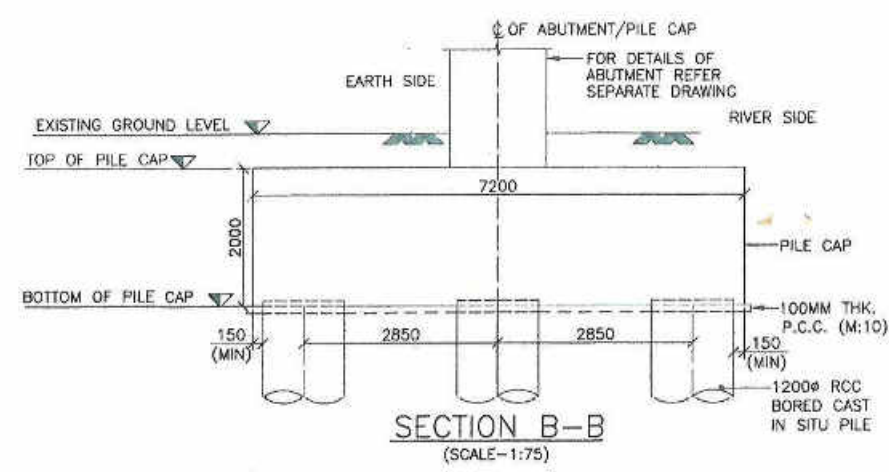
 CLIENT:	MORTH THE MINISTRY OF ROAD TRANSPORT & HIGHWAYS, (NHDP-IV A CELL) STATE PWD, CHATTISGARH		
	ALTERNATIVE ENGINEER:  FEEDBACK INFRA Infrastructure Consultants Pvt. Ltd. Feedback Infra Private Limited 15th Floor, Tower No. 102, Old City, City, Phase-III, Gurgaon 122002, Haryana, India		
PROJ. CONSULTANT:	 HBS HBS INFRA ENGINEERS INDIA PVT. LTD. Flat no: 102, Plot no: 8 to 11, Preetam Chambers, Image Garden Road, Midnapur, Hyderabad-500 081		
SAFETY CONSULTANT:	 S. A. Infrastructure Consultants Pvt. Ltd. 101-102, CS-1, Gopabandh-1, Indirapuram, Ghaziabad-201014		
DESIGN ENGINEER:	 P. K. MAJUMDAR ERA INFRA Engineering Limited C56/41, Sector-62, Noida-201301		
EPC CONTRACTOR:	 ERA ERA INFRA ENGINEERING LIMITED C56/41, Sector-62, NOIDA-201301		
CONSULTANT:	 SPECTRUM Techno-Consultants Pvt. Ltd. 401/402, Raika: Bhavan, Plot No.9, Sector-17, Vashi, Navi Mumbai-400 703 India. Ph: 022-41115900, Email: info@spectrumworld.net		
NAME OF PROJECT:	REHABILITATION AND UPGRADE OF NH-216 FROM KM3+800 TO KM 50+460 (RAIGARH TO SARAIKALLI SECTION) TO TWO LANES WITH PAVED SHOULDERS IN THE STATE OF CHHATTISGARH UNDER NHDP-IV		
DRAWING TITLE:	NUMERATION DETAILS OF PILE & PILECAP (GROUP-II) FOR MAJOR BRIDGE AT D. CH:28+400		
DRG. NO.:	STCPL_564_3000_28 (SHEET 2 OF 2)		
DRAWN	DESIGNED	CHECKED	APPROVED
GMS	YJC	YJC	NDP
PROJECT NO:	564		
SCALE:	AS SHOWN		
REV:	RO		



our Letter No. 323, 2nd Copy Date. 03/05/2017



SECTION A-A  
(SCALE-1:75)



SECTION B-B  
(SCALE-1:75)

TABLE OF LEVELS

ABUTMENT LOCATION	GROUND LEVEL	TOP OF PILE CAP	BOTTOM OF PILE CAP	PILE CUTOFF LEVEL	PILE SOCKET TOP LEVEL	SCOUR LEVEL	PILE TIP LEVEL
A1	201.871	200.178	198.178	198.253	187.250	187.250	183.650

DESIGN LOAD FOR PILE CAPACITY

LOAD CASE	VERTICAL LOAD* (T)	LATERAL LOAD (T)
NORMAL	171.0	28.53
WIND	181.0	29.11
SEISMIC	190.0	31.29

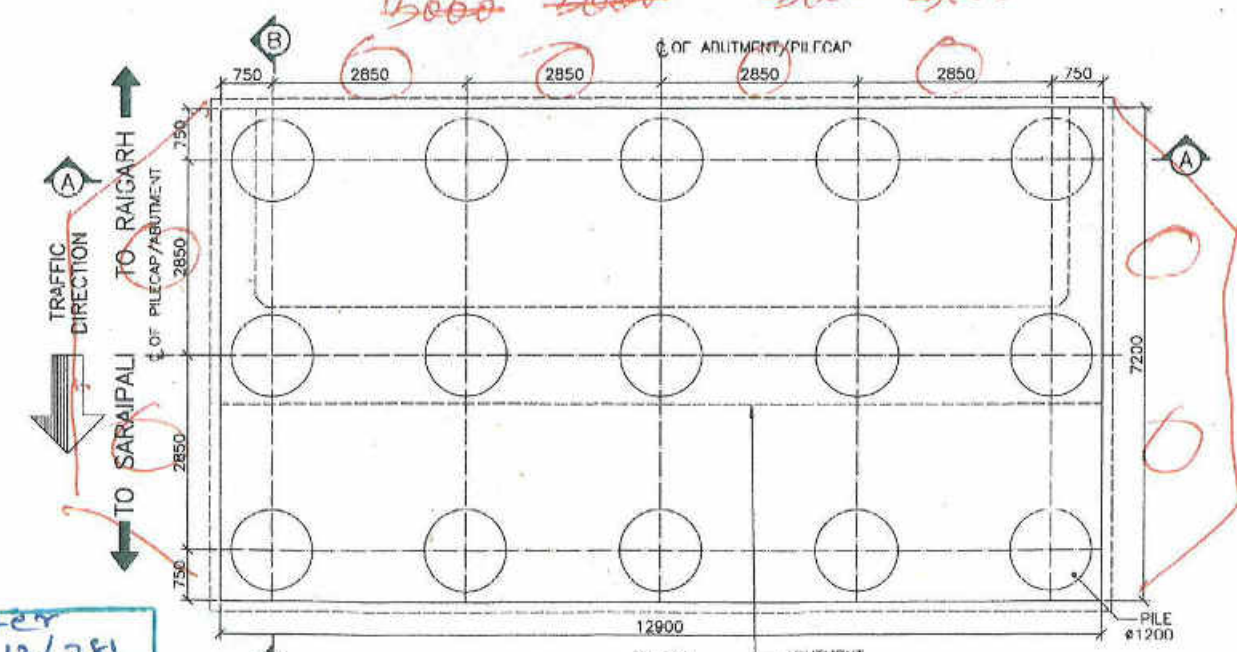
\* EXCLUDING SELF WEIGHT OF PILE

REFERENCES (LATEST REVISION)

- STCPL\_564\_3000\_38 - NUMERATION DETAILS OF ABUTMENT-A1 FOR MAJOR BRIDGE AT D.CH:28+400
- STCPL\_564\_3000\_39 - REINFORCEMENT DETAILS OF ABUTMENT-A1 FOR MAJOR BRIDGE AT D.CH:28+400

LEGEND

- (TYP) ..... TYPICAL  
..... TOP R/F  
..... BOTTOM R/F  
..... CENTER LINE  
R/F ..... REINFORCEMENT



PLAN  
DIMENSION DETAILS OF PILE CAP  
(SCALE-1:75)

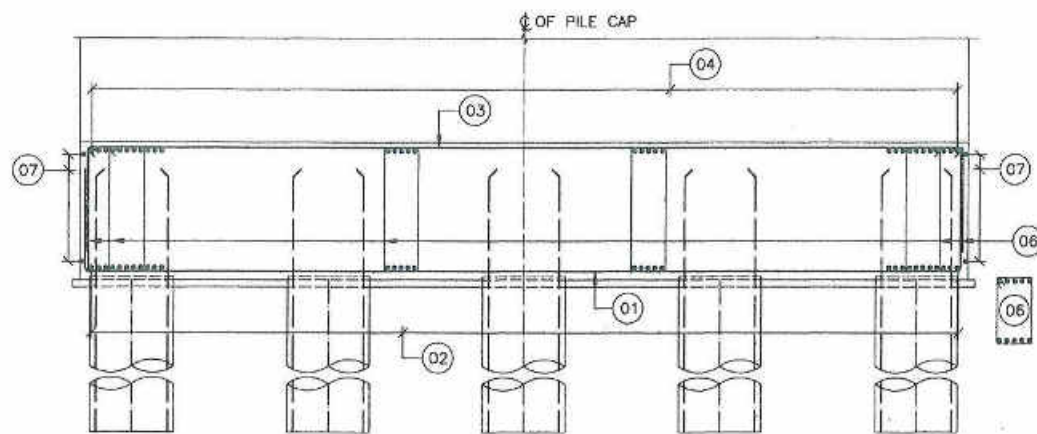
REVIEWED

R.N. Singh  
Team Leader  
Feedback Infra  
NH-216, (Raigarh)

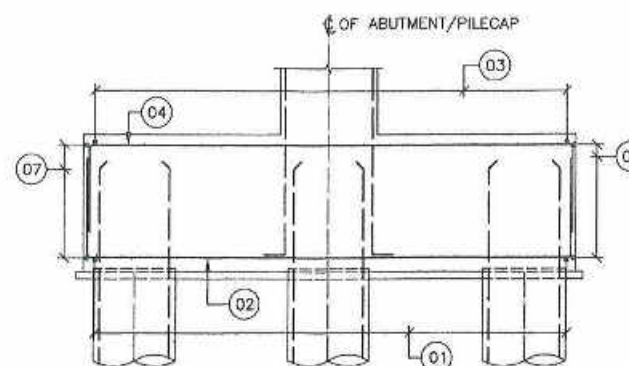
REF: Letter  
SGH-12/281  
Date: 12-05-2016

22/08/16	RO	FOR APPROVAL	GMS	CLIENT: MORTH THE MINISTRY OF ROAD TRANSPORT & HIGHWAYS, (NHDP-IV A CELL) STATE PWD, CHATTISGARH	AUTHORITY ENGINEER: FEEDBACK INFRA Maha Infrastructure Projects Feedback Infra Private Limited 15th Floor, Tower 9B, DLF Cyber City, Phase-III, Gurgaon 122002, Haryana, India	PROOF CONSULTANT: HBS HBS INFRA ENGINEERING INDIA PVT. LTD. Plot no. 102, Plot no. 9 to 11, Tannu Chaudhary Image Garden Road, Bhopal-462004	SAFETY CONSULTANT: S.A. Infrastructure Consultants Pvt. Ltd. G1-102, CS-1, Gyanikhand-II, Indrapuram, Chhatrasgarh-201014	DESIGN DIRECTOR: J.P. MAJUMDAR BRA India Engineering Limited C56/41, Sector-62, Noida-201301	EPC CONTRACTOR: ERA ERA INFRA DEVELOPMENT LIMITED C56/41, SECTOR-62, NOIDA-201301	CONSULTANT: SPECTRUM SPECTRUM Techno-Consultants Pvt. Ltd. 401/402, Rajendra Nagar, 110040, New Delhi, New Mumbai-400 001, India Email: info@spectrumworldwide.com	NAME OF PROJECT: REHABILITATION AND UPGRADE OF NH-216 FROM KM+800 TO KM+940 (RAIGARH TO SARAIKAL) SECTION TO TWO LANES WITH PAVED SHOULDERS IN THE STATE OF CHHATTISGARH UNDER NHDP-IV	DRAWING TITLE: PILE AND PILECAP DETAILS OF ABUTMENT -A1 FOR MAJOR BRIDGE AT D.CH:28+400 DRG. NO.: STCPL_564_3000_40 (SHEET 1 OF 2) DRAWN: GMS DESIGNED: VMM CHECKED: KJM APPROVED: NDP REV: RO	PROJECT NO: 564 SCALE: AS SHOWN REV: RO
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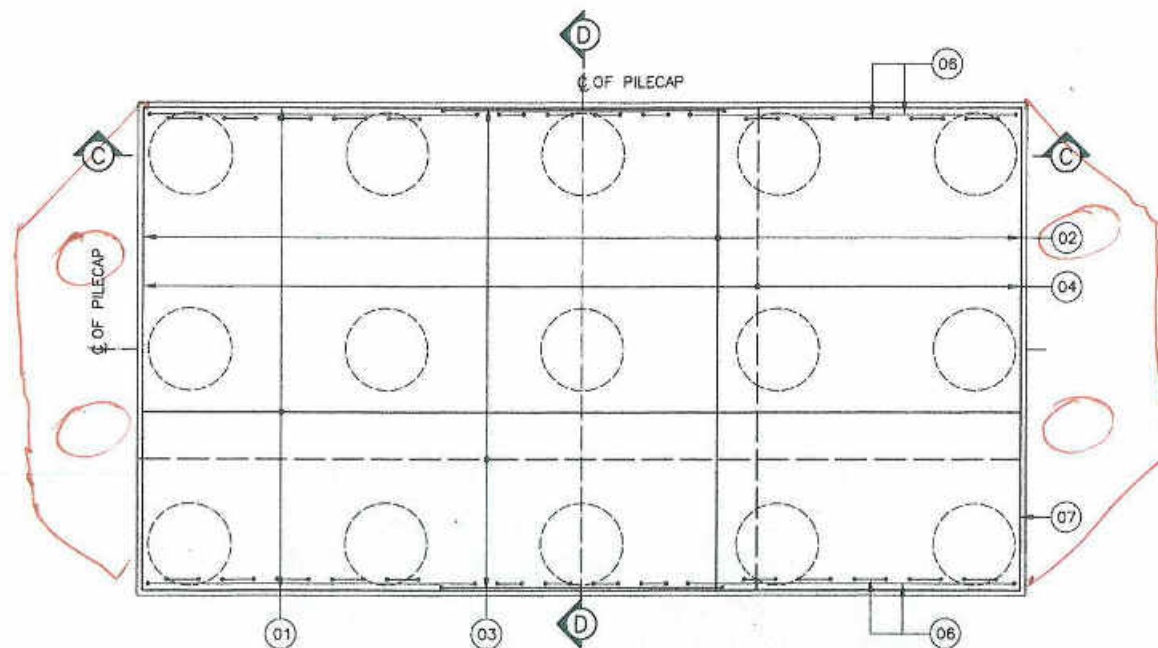




SECTION C-C  
(SCALE-1:75)



SECTION D-D  
(SCALE-1:75)



REINFORCEMENT DETAILS OF PILE CAP  
(SCALE-1:75)

#### SCHEDULE OF REINFORCEMENT

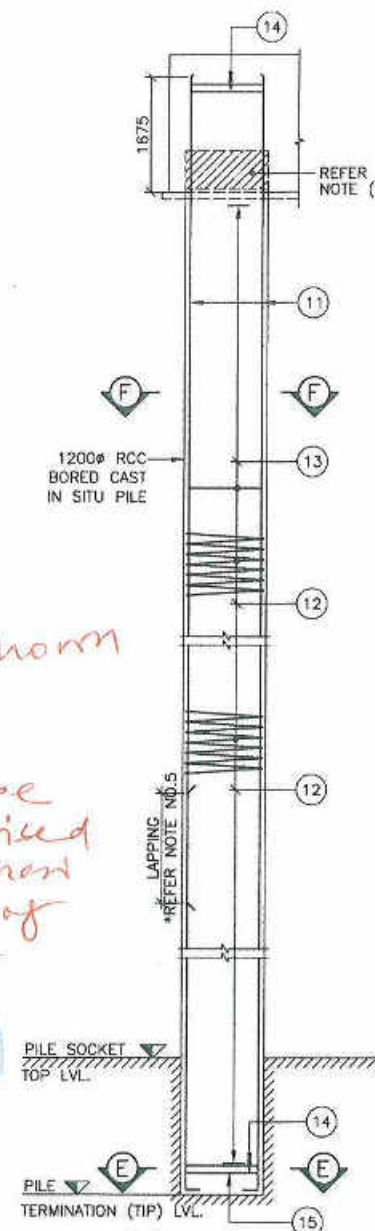
BAR MARK	DIA OF BAR	SHAPE	SPACING/NOS	REMARKS
01	H20	J1000	100 c/c	ACROSS SPAN
02	H25	J1000	100 c/c	ALONG SPAN
03	H16	J1000	100 c/c	ACROSS SPAN
04	H16	J1000	100 c/c	ALONG SPAN
05	NOT USED			
06	H10	200 c/c	34	LEGGED STIRRUPS
07	H16	800L (PLAN)	8 NOS	ON SIDE FACES (ALL AROUND)
11	H32		22 NOS	
12	H10		150 PITCH	HELICAL
13	H16		1500 c/c	
14	H16		2 NOS	
15	H16		2X2=4 NOS	WELDED TO PILE R/F

NOTE: BAR MARK 05, 08 TO 10 NOT USED

#### LAP LENGTH:

CURTAILMENT	GRADE OF CONCRETE (M35)	10mm	12mm	16mm	20mm	25mm	32mm
< 25%	37#	370	445	595	740	925	1185
> 25% & < 33%	42#	420	505	675	840	1050	1345
> 33% & < 50%	52#	520	625	835	1040	1300	1675

# = DIA OF BAR



DETAILS OF PILE REINFORCEMENT  
(SCALE 1.75)

Only pile reinforcement approved. Pile cap to be revised as per approved reinforcement.

To be revised for use of pile

Piles as shown in Drawing & incorporated & pile are approved as per provided reinforcement.



**REVIEWED**

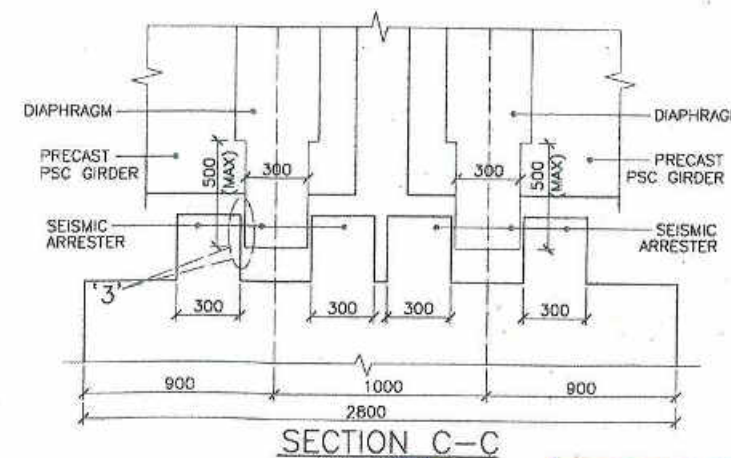
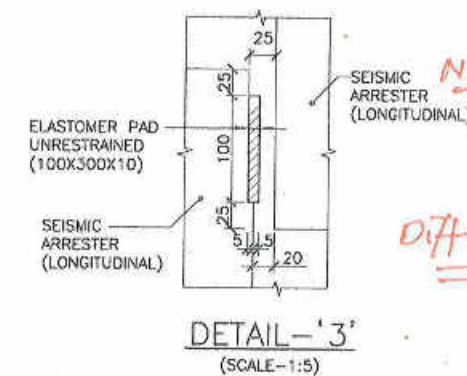
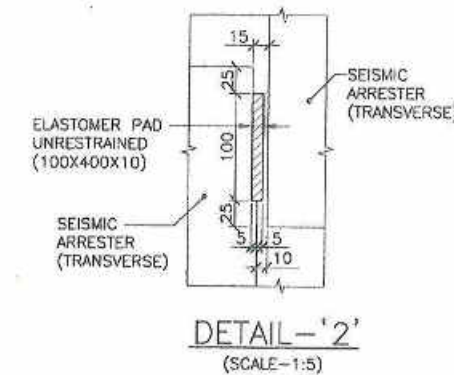
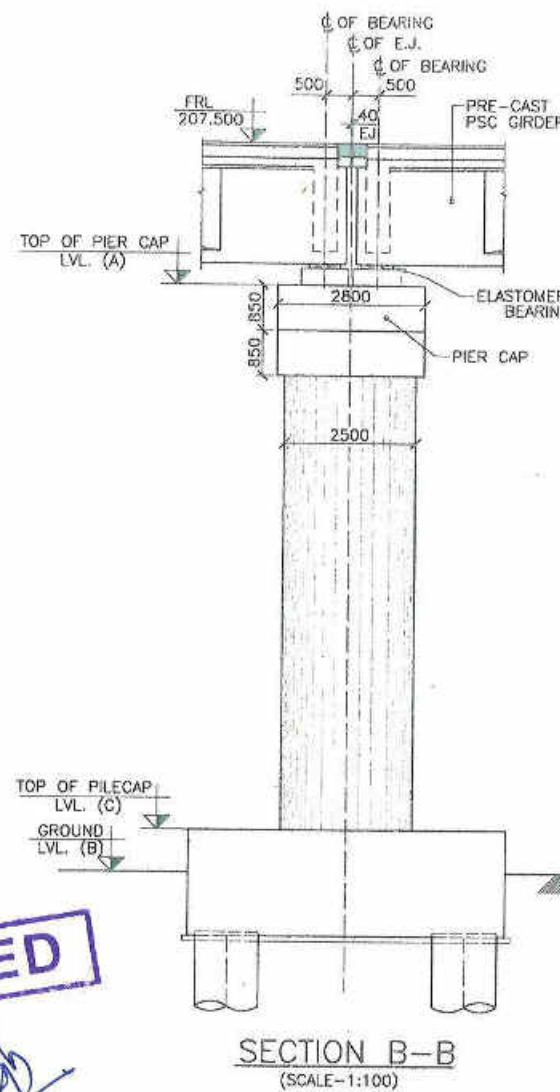
R.N. Singh  
Team Leader  
Feedback Infra  
NH-216, (Raigarh)

REF: Letter 564-12/281  
Date: 22-08-2010



				CLIENT:	AUTHORITY ENGINEER:	PROOF CONSULTANT:	SAFETY CONSULTANT:	DESIGN DIRECTOR:	EPC CONTRACTOR:	CONSULTANT:	NAME OF PROJECT:	DRAWING TITLE:	PROJECT NO:
				 <b>MORTH</b> THE MINISTRY OF ROAD TRANSPORT & HIGHWAYS, (NHDP-IV A CELL) STATE PWD, CHATTISGARH	 <b>FEEDBACK INFRA</b> Feedback Infra Private Limited 15th Floor, Tower 9B, DLF Cyber City, Phase-III, Gurgaon 122002, Haryana, India	 <b>HBS</b> HBS INFRA ENGINEERING INDIA PVT. LTD. Plot no: 102, Plot no: 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000	STATE PWD, CHATTISGARH	FEEDBACK INFRA Feedback Infra Private Limited 15th Floor, Tower 9B, DLF Cyber City, Phase-III, Gurgaon 122002, Haryana, India	 <b>HBS</b> HBS INFRA ENGINEERING INDIA PVT. LTD. Plot no: 102, Plot no: 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000	STATE PWD, CHATTISGARH	FEEDBACK INFRA Feedback Infra Private Limited 15th Floor, Tower 9B, DLF Cyber City, Phase-III, Gurgaon 122002, Haryana, India	 <b>HBS</b> HBS INFRA ENGINEERING INDIA PVT. LTD. Plot no: 102, Plot no: 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 6	





**LEGEND**

(TYP)	-	TYPICAL
F.R.L.	-	FINISHED ROAD LEVEL
E.J.	-	EXPANSION JOINT
⊕	-	CENTER LINE

## REFERENCES (LATEST REVISION)

1. STCPL\_564\_3000\_01 - GENERAL ARRANGEMENT OF MAJOR BRIDGE AT D.CH:28+400
2. STCPL\_564\_3000\_24 - REINFORCEMENT DETAILS OF PIER & PIERCAP (GROUP-I) FOR MAJOR BRIDGE AT D. CH:28+400
3. STCPL\_564\_3000\_25 - NUMERATION DETAILS OF PILE & PILECAP (GROUP-I) FOR MAJOR BRIDGE AT D. CH:28+400

due to change in RLs of TBM all levels are changed / revised except FRL as under

1. Existing TBM RL = 200.00
2. New final TBM RL = 202.08 (202.08)

FOR GROUP 1:- P1 - P10  
GROUP 1A:- P11 - P13

PIER MARK	FORMATION LEVEL	TOP OF PIER CAP (A)	GROUND LEVEL (B)	TOP OF PILE CAP LVL (C)
P1	207.500	204.716	193.694	194.500
P2	207.500	204.716	192.266	194.500
P3	207.500	204.716	192.147	194.500
P4	207.500	204.716	191.933	194.500
P5	207.500	204.716	191.906	194.500
P6	207.500	204.716	191.460	194.500
P7	207.500	204.716	191.679	194.500
P8	207.500	204.716	192.328	194.500
P9	207.500	204.716	192.007	194.500
P10	207.500	204.716	192.006	194.500
P11	207.500	204.716	193.330	194.500
P12	207.500	204.716	193.584	194.500
P13	207.500	204.716	194.207	194.500

\* Refer revised CRAD appd.

du & diff w  
RLs of TBm  
changed levels  
by 2.08

Subsidiary  
works are to  
be unfixed outside.

**REVIEWED**

**R.N. Singh**  
Team Leader  
Feedback Intra  
NH-216, (Raigarh)

ELASTOMERIC BEARING (YP) E OF GIRDER/ BEARING

PLAN AT PIER (SCALE-1:50)

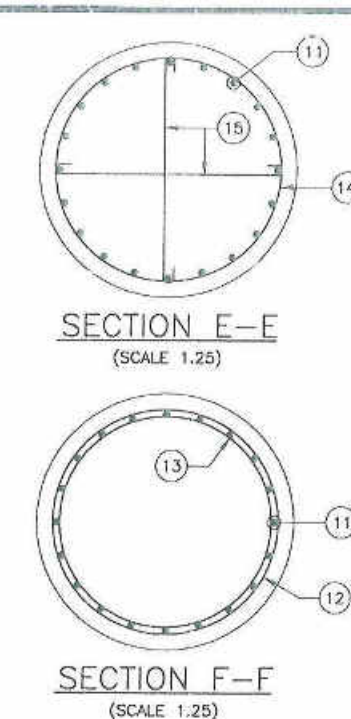
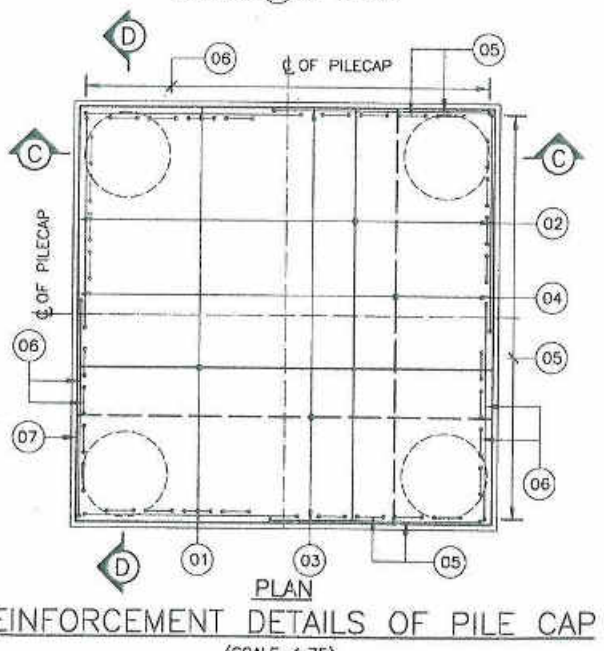
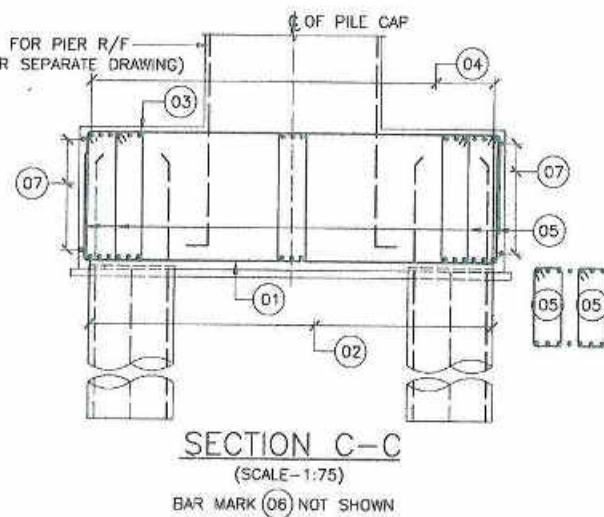
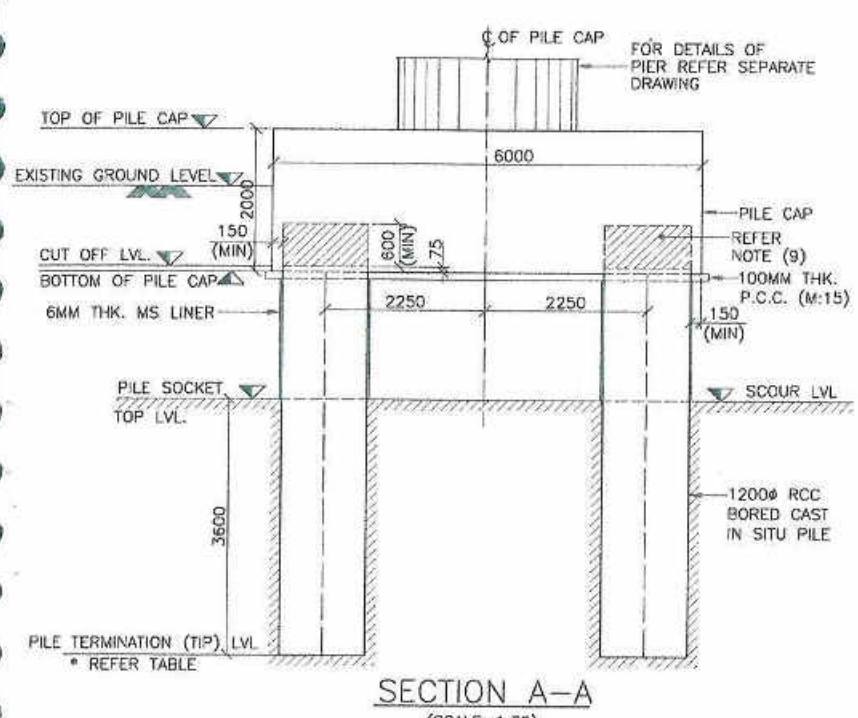
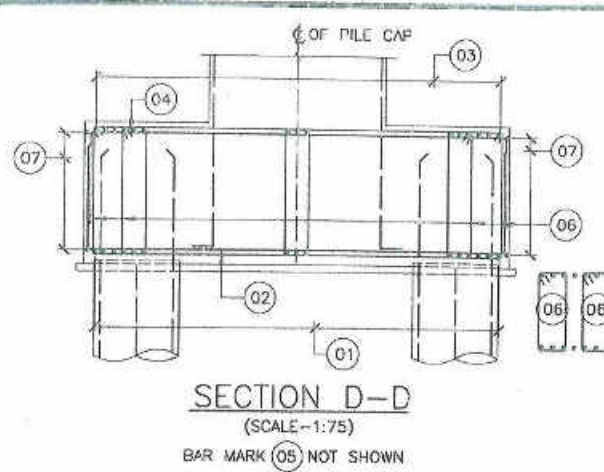
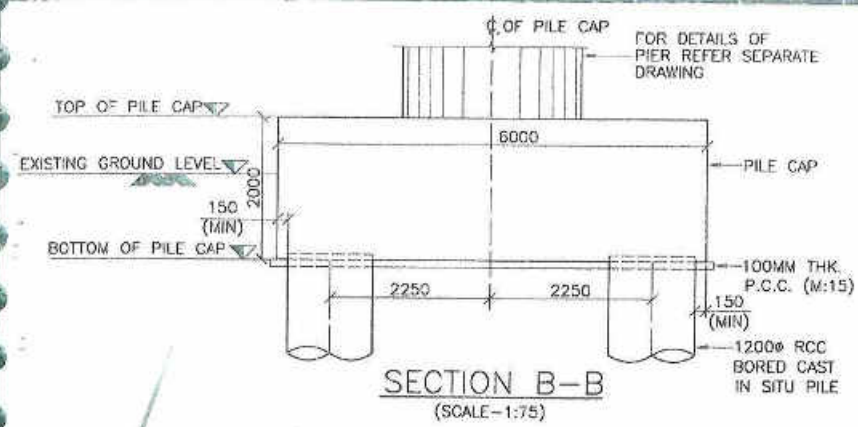
(SCS) 1-251

ARM TECHNICAL CONSULTANTS PVT. LTD.  
AHMEDABAD  
TEL: 40076864

REF: Letter  
564-09/220  
Date: 14-03-2016

		<b>NAME OF PROJECT:</b> REHABILITATION AND UPGRADATION OF NH-216 FROM KM+800 TO KM 90+460 (RAIGHAT TO SARAPALI SECTION) TO TWO LANES WITH PAVED SHOULDERS IN THE STATE OF CHHATTISGARH UNDER NHDP-IV		<b>DRAWING TITLE:</b> NUMERATION DETAILS OF PIER & PIERCAP (GROUP-I) FOR MAJOR BRIDGE AT D. CH:28+400 <b>PROJECT NO:</b> 564	
<b>CLIENT:</b>  <b>MORTH</b> THE MINISTRY OF ROAD TRANSPORT & HIGHWAYS, (NHDP-IV A CELL), STATE PWD, CHATTISGARH		<b>AUTHORITY ENGINEER:</b> <b>FEEDBACK INFRA</b> <i>Working on Infrastructure, Happiness</i> Feedback Infra Private Limited 15th Floor, Tower 9B, DLF Cyber City, Phase-III, Gurgaon: 122002, Haryana, India		<b>PROOF CONSULTANT:</b>  <b>HBS</b> HBS INFRA ENGINEERS INDIA PVT. LTD. Flat no: 102, Plot no: 8 to 11, Fortune Chambers, Image Garden Road, Madhapur, Hyderabad-500 081.	
<b>PROOF CHECKER:</b> 		<b>SAFETY CONSULTANT:</b>  <b>S.A. Infrastructure Consultants Pvt. Ltd.</b> 101/102, CS-3, Gyanabhad-II, Indrapuram, Chhatrabad-201014		<b>DESIGN DIRECTOR:</b>  <b>ERA</b> <i>Engineers in Infrastructure</i> ERA INFRA ENGINEERING LIMITED C56/41, Sector-62, NOIDA-201301	
<b>EPC CONTRACTOR:</b>  <b>SPECTRUM Techno-Consultants Pvt. Ltd.</b> 401/402, Railar Bhavan, Plot No.9, Sector-17, Vashi, Navi Mumbai-400 703 India. Ph: 022-41115900. Email: info@spectrumworld.net		<b>CONSULTANT:</b> 		<b>DRAWING NO.:</b> STCPIL_564_3000_23 <b>SCALE:</b> AS SHOWN <b>REV.:</b> R0	
<b>DATE:</b> 03/05/14 <b>REVISION:</b>		<b>FOR APPROVAL:</b>		<b>BY:</b>	





- NOTES**
- ALL DIMENSIONS ARE IN MILLIMETER, ALL LEVELS ARE IN METER.
  - DO NOT SCALE THIS DRAWING, ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
  - MATERIALS:**  
CONCRETE GRADE CONFIRMING TO IRC 112: 2011  
PILE, PILE CAP : M-35  
REINFORCEMENT : Fe-500 CONFORMING TO IS:1786.
  - CLEAR COVER TO REINFORCEMENT:  
PILE, PILE CAP : 75mm
  - (a) FOR LAP LENGTH OF THE BARS REFER TABLE.  
(b) NOT MORE THAN 50% OF BARS SHALL BE LAPPED AT ANY LOCATION, AND THE LAPS SHOULD BE STAGGERED.
  - WHEREVER TOTAL NO OF BARS ARE SPECIFIED, THEY ARE TO BE SPACED UNIFORMLY, UNLESS MENTIONED OTHERWISE.
  - COVER BLOCKS SHALL BE ATTACHED TO THE REINFORCEMENT CAGE SO AS TO MAINTAIN APPROPRIATE COVER FROM THE FACE OF THE BORE HOLE. CONCRETE GRADE OF COVER BLOCKS SHALL BE M-35.
  - THE PILE SHOULD PROJECT 75 MM IN TO THE CAP CONCRETE.
  - PILE SHALL BE CAST 600mm (MIN) ABOVE CUT-OFF LEVEL AND THE PORTION ABOVE CUT-OFF LEVEL SHALL BE CHISELLED AFTER 7 DAYS OF PILE CASTING & BEFORE CASTING OF PILE CAP.
  - IN CASE THE PILE ABOVE CUT-OFF LEVEL IS NOT REMOVED BEFORE SETTING OF PILE CONCRETE, THEN A 40mm DEEP GROOVE SHALL BE MADE ALL AROUND THE PILE AT THE REQUIRED CUT-OFF LEVEL.
  - FOR DETAILS OF BORE HOLE DATA AND LOCATION, PLEASE REFER SOIL INVESTIGATION REPORT.
  - THE DESIGN OF PILE FOUNDATION IS BASED ON THE SOIL INVESTIGATION REPORT. THE SOIL DATA DURING BORING OF PILE SHALL BE CONFIRMED WITH RESPECTIVE BORE HOLE DATA OF SOIL INVESTIGATION REPORT, AND IF ANY DISCREPANCY IS OBSERVED, THE SAME SHALL BE IMMEDIATELY REPORTED TO ENGINEER BEFORE CONCRETING OF THE PILE.
  - THE GEOTECHNICAL CAPACITY OF PILE CONSIDERED FOR DESIGN IS 550T & THE SAME SHALL BE CONFIRMED BY SUITABLE TESTS ON SITE.
  - THE GL SHOWN ARE AS PER SURVEY DETAILS. THE SAME SHALL BE VERIFIED BEFORE EXECUTION. IF ANY VARIATION FOUND IN THE GL, THE OTHER LEVELS SHALL BE MODIFIED ACCORDINGLY.
  - PERMISSIBLE TOLERANCES FOR PILE SHALL BE:-  
a. SHIFT NOT TO EXCEED 75 MM. AT PILING PLATFORM LEVEL.  
b. TILT NOT TO EXCEED 1 IN 150.  
HOWEVER TILT & SHIFT AS MEASURED MUST BE REFERRED BACK TO DESIGN OFFICE. THE DESIGN & DRAWING FOR PILE/PILE CAP MUST BE REVISED.

*Note - Due to change in RLs of TBMs all the levels are changed/revised as under -*

1. Earlier TBM RL - 200.00  
2. Now final TBM RL - 202.08  
Diff = 2.08  
(Maintaining FRL unchanged)

**REVIEWED**

**R.N. Singh**  
Team Leader

DESIGN LOADS FOR PILE CAPACITY

LOAD CASE	LOAD * (T)	LOAD (T)
NORMAL	405.0	6.5
WIND	490.0	14.6
SEISMIC	605.0	53.5

\* EXCLUDING SELF WEIGHT OF PILE

**TABLE OF LEVELS FOR GROUP-1**

PIER LOCATION	GROUND LEVEL	TOP OF PILE CAP	BOTTOM OF PILE CAP	PILE CUTOFF LEVEL	PILE SOCKET TOP LEVEL	SCOUR LEVEL	PILE TIP LEVEL
P1	193.694	194.500	192.500	192.575	190.707	190.707	187.107
P2	192.266	194.500	192.500	192.575	189.269	189.269	185.669
P3	192.147	194.500	192.500	192.575	189.160	189.160	185.560
P4	191.933	194.500	192.500	192.575	189.953	189.953	186.353
P5	191.808	194.500	192.500	192.575	188.540	188.540	184.940
P6	191.460	194.500	192.500	192.575	188.510	188.510	184.910
P7	191.679	194.500	192.500	192.575	188.959	188.959	185.359
P8	192.328	194.500	192.500	192.575	189.364	189.364	185.764
P9	192.007	194.500	192.500	192.575	190.564	190.564	186.964
P10	192.006	194.500	192.500	192.575	190.345	190.345	186.745

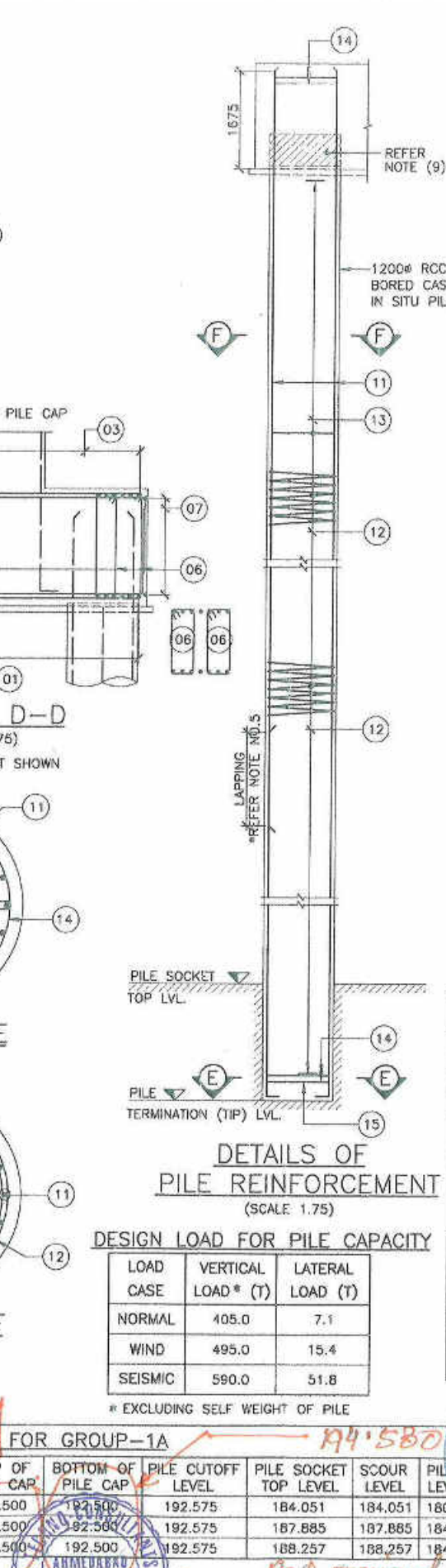
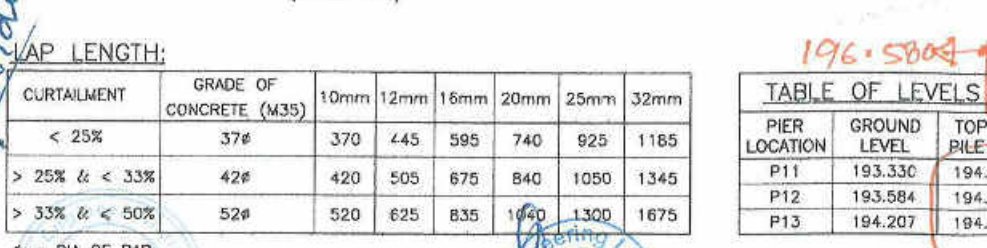
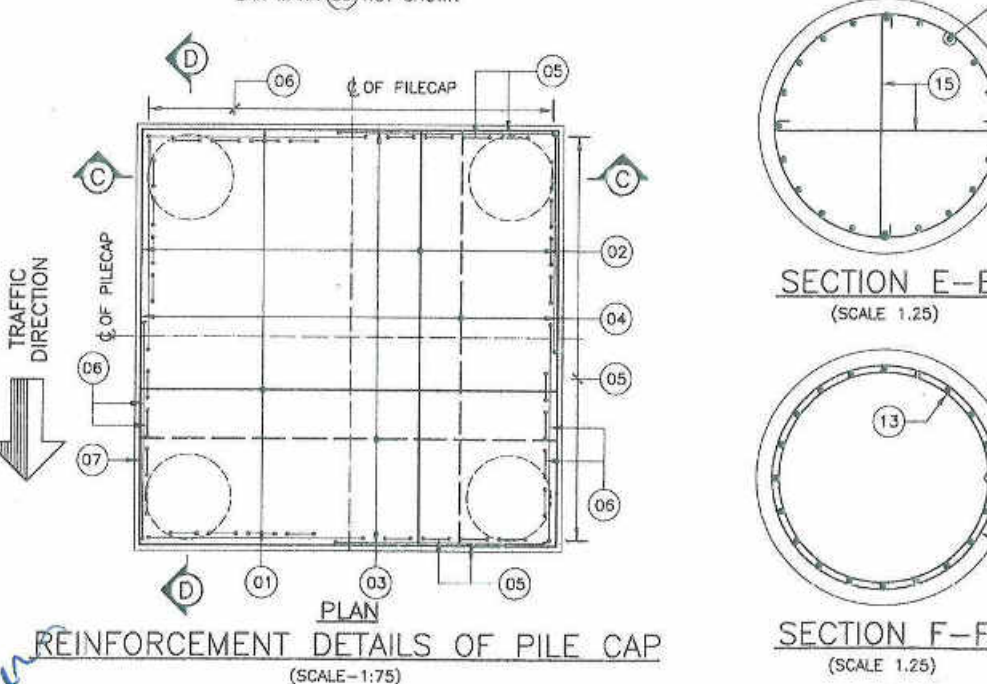
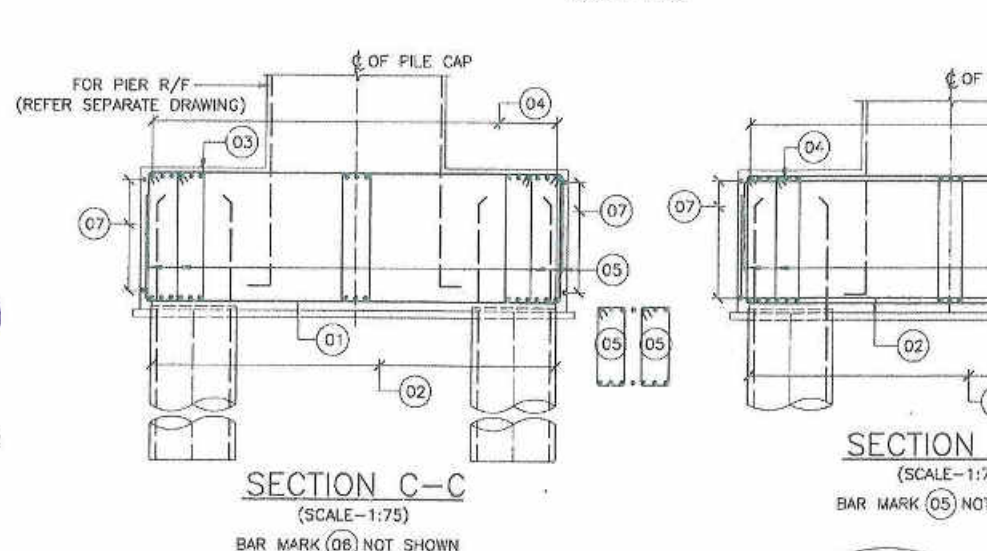
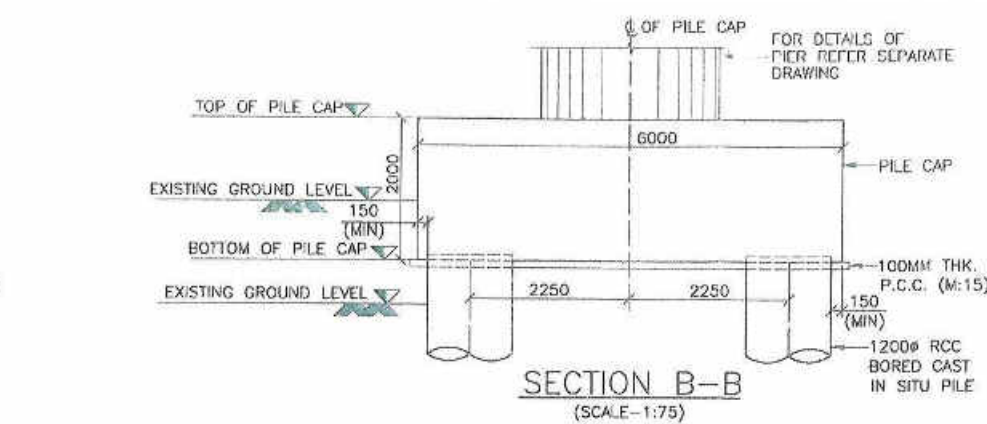
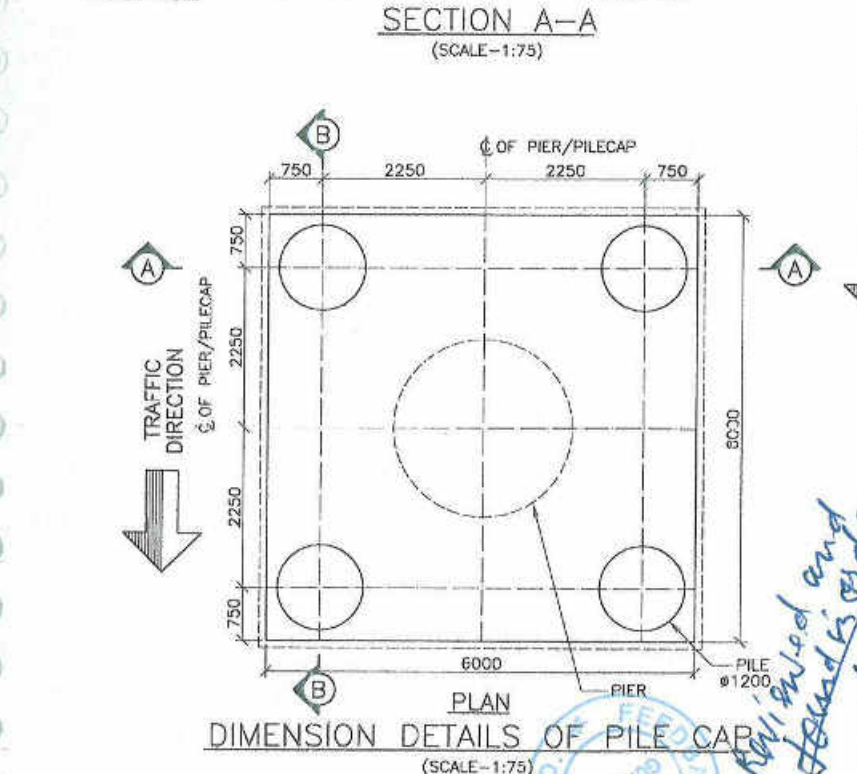
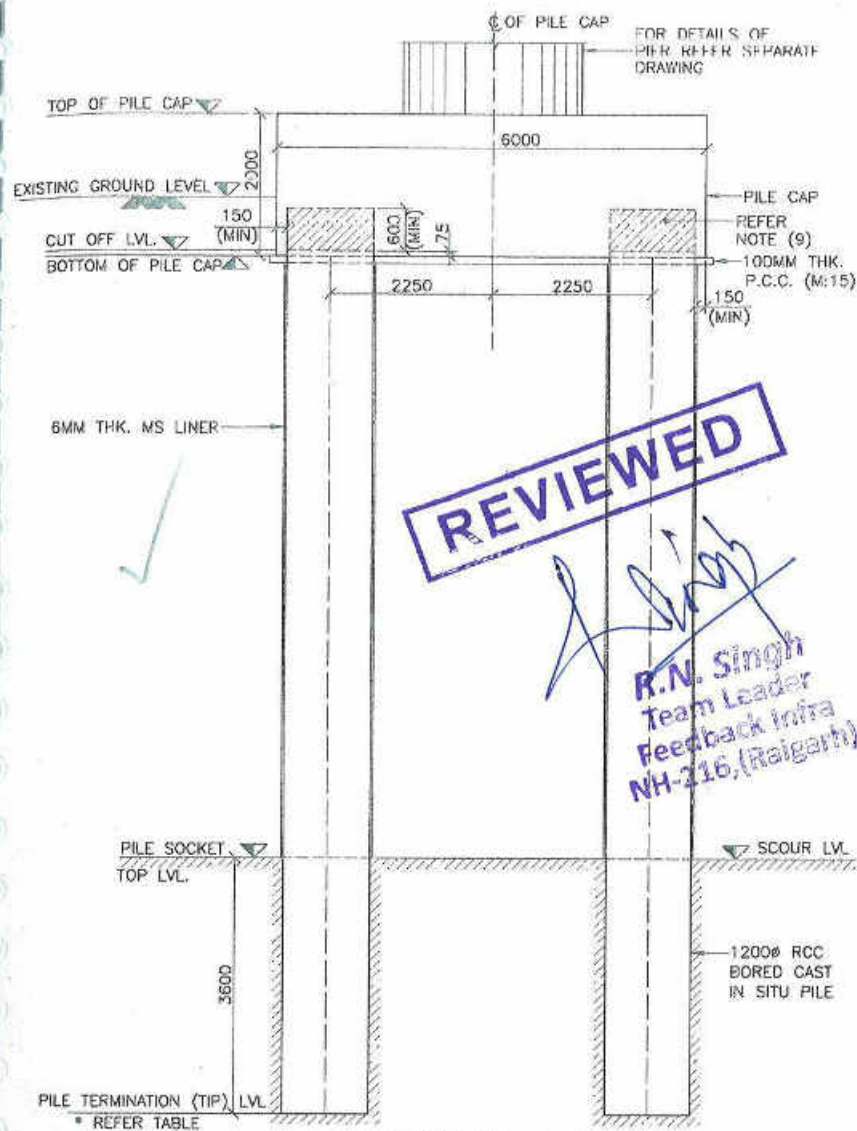
**SCHEDULE OF REINFORCEMENT**

BAR MARK	DIA OF BAR	SHAPE	SPACING/NOS	REMARKS
01	H32	—	43 NOS	ACROSS TRAFFIC
02	H32	—	43 NOS	ALONG TRAFFIC
03	H16	—	43 NOS	ACROSS TRAFFIC
04	H16	—	43 NOS	ALONG TRAFFIC
05	H12	—	280 c/c	20 LEGGED STIRRUPS
06	H12	—	280 c/c	20 LEGGED STIRRUPS
07	H12	—	150 c/c	ON SIDE FACES (ALL AROUND)
11	H25	—	20 NOS	—
12	H10	—	150 PITCH	HELICAL
13	H16	—	1500 c/c	—
14	H16	—	2 NOS	—
15	H16	+	2X2=4 NOS	WELDED TO PILE R/F

NOTE: BAR MARK (08) TO (10) NOT USED

REF: Letter 564-09/230  
Date: 14-03-2016





- NOTES**
- ALL DIMENSIONS ARE IN MILLIMETER, ALL LEVELS ARE IN METER.
  - DO NOT SCALE THIS DRAWING. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
  - MATERIALS:**  
CONCRETE GRADE CONFORMING TO IRC 112: 2011  
PILE, PILE CAP : M-35  
REINFORCEMENT : Fe-500 CONFORMING TO IS:1786.
  - CLEAR COVER TO REINFORCEMENT:  
PILE, PILE CAP : 75mm
  - (a) FOR LAP LENGTH OF THE BARS REFER TABLE.  
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  - THE PILE SHOULD PROJECT 75 MM IN TO THE PILE CONCRETE.
  - PILE SHALL BE CAST 800mm (MIN) ABOVE CUT-OFF LEVEL AND THE PORTION ABOVE CUT-OFF LEVEL SHALL BE CHISELLED AFTER 7 DAYS OF PILE CASTING & BEFORE CASTING OF PILE CAP.
  - IN CASE THE PILE ABOVE CUT-OFF LEVEL IS NOT REMOVED BEFORE SETTING OF PILE CONCRETE, THEN A 40mm DEEP GROOVE SHALL BE MADE ALL AROUND THE PILE AT THE REQUIRED CUT-OFF LEVEL.
  - FOR DETAILS OF BORE HOLE DATA AND LOCATION, PLEASE REFER SOIL INVESTIGATION REPORT.
  - THE DESIGN OF PILE FOUNDATION IS BASED ON THE SOIL INVESTIGATION REPORT. THE SOIL DATA DURING BORING OF PILE SHALL BE CONFIRMED WITH RESPECTIVE BORE HOLE DATA OF SOIL INVESTIGATION REPORT. AND IF ANY DISCREPANCY IS OBSERVED, THE SAME SHALL BE IMMEDIATELY REPORTED TO ENGINEER BEFORE CONCRETING OF THE PILE.
  - THE GEOTECHNICAL CAPACITY OF PILE CONSIDERED FOR DESIGN IS 550T & THE SAME SHALL BE CONFIRMED BY SUITABLE TESTS ON SITE.
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b. TILT NOT TO EXCEED 1 IN 150.  
HOWEVER TILT & SHIFT AS MEASURED MUST BE REFERRED BACK TO DESIGN OFFICE. THE DESIGN & DRAWING FOR PILE/PILE CAP MUST BE REVISED

- REFERENCES (LATEST REVISION)**
- STCPL\_564\_3000\_23 - NUMERATION DETAILS OF PIER & PIERCAP (GROUP-I) FOR MAJOR BRIDGE AT D. CH:28+400
  - STCPL\_564\_3000\_24 - REINFORCEMENT DETAILS OF PIER & PIERCAP (GROUP-I) FOR MAJOR BRIDGE AT D. CH:28+400

**SCHEDULE OF REINFORCEMENT**

BAR MARK	DIA OF BAR	SHAPE	SPACING/NOS	REMARKS
01	H32	—	43 NOS	ACROSS TRAFFIC
02	H32	—	43 NOS	ALONG TRAFFIC
03	H16	—	43 NOS	ACROSS TRAFFIC
04	H16	—	43 NOS	ALONG TRAFFIC
05	H12	—	280 c/c	20 LEGGED STIRRUPS
06	H12	—	280 c/c	20 LEGGED STIRRUPS
07	H12	—	150 c/c	ON SIDE FACES (ALL AROUND)
11	H32	—	20 NOS	—
12	H10	—	150 PITCH	HELICAL
13	H16	—	1500 c/c	—
14	H16	—	2 NOS	—
15	H16	+	2X2=4 NOS	WELDED TO PILE R/F

NOTE: BAR MARK (08) TO (10) NOT USED

**TABLE OF LEVELS FOR GROUP-1A**

PIER LOCATION	GROUND LEVEL	TOP OF PILE CAP	BOTTOM OF PILE CAP	PILE CUTOFF LEVEL	PILE SOCKET TOP LEVEL	SCOUR LEVEL	PILE TIP LEVEL
P11	193.330	194.500	192.500	192.575	184.051	184.051	180.451
P12	193.584	194.500	192.500	192.575	187.885	187.885	184.285
P13	194.207	194.500	192.500	192.575	188.257	188.257	184.657

**REINFORCEMENT DETAILS OF PILE CAP**

CURTAILMENT	GRADE OF CONCRETE (M35)	LAP LENGTH:					
		10mm	12mm	16mm	20mm	25mm	32mm
< 25%	37#	370	445	595	740	925	1185
> 25% & < 33%	42#	420	505	675	840	1050	1345
> 33% & < 50%	52#	520	625	835	1040	1300	1675

Φ = DIA OF BAR

**CLIENT:** MORTH THE MINISTRY OF ROAD TRANSPORT & HIGHWAYS, (NHDP-IV A CELL), STATE PWD, CHATTISGARH

**AUTHORITY ENGINEER:** FEEDBACK INFRA

**PROOF CONSULTANT:** HBS

**SAFETY CONSULTANT:** S. A. Infrastructure Consultants Pvt. Ltd.

**DESIGN CONSULTANT:** ERA INFRA ENGINEERING LIMITED

**EPC CONTRACTOR:** ERA INFRA ENGINEERING LIMITED

**CONSULTANT:** SPECTRUM

**NAME OF PROJECT:** REHABILITATION AND UPGRADE OF NH-216 FROM KM3+800 TO KM 90+460 (RAIGARI TO SARAPALLI SECTION) TO TWO LANES WITH PAVED SHOULDERS IN THE STATE OF CHHATTISGARH UNDER NHDP-IV

**DRAWING TITLE:** NUMERATION DETAILS OF PILE & PIERCAP (GROUP-I) FOR MAJOR BRIDGE AT D. CH:28+400

**PROJECT NO:** 564

**DRG. NO.:** STCPL\_564\_3000\_25 (SHEET 2 OF 2)

**SCALE:** AS SHOWN

**DRAWN:** YJC

**DESIGNED:** YJC

**CHECKED:** YJC

**APPROVED:** YJC

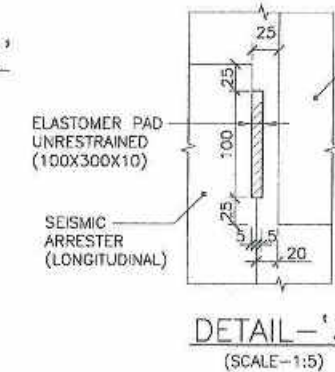
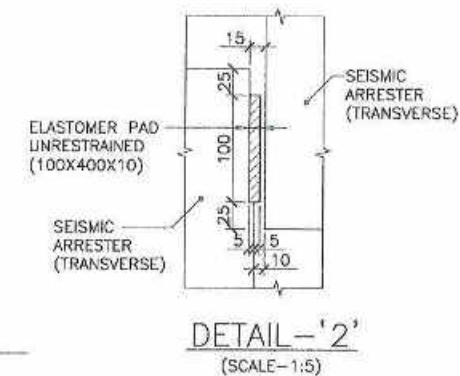
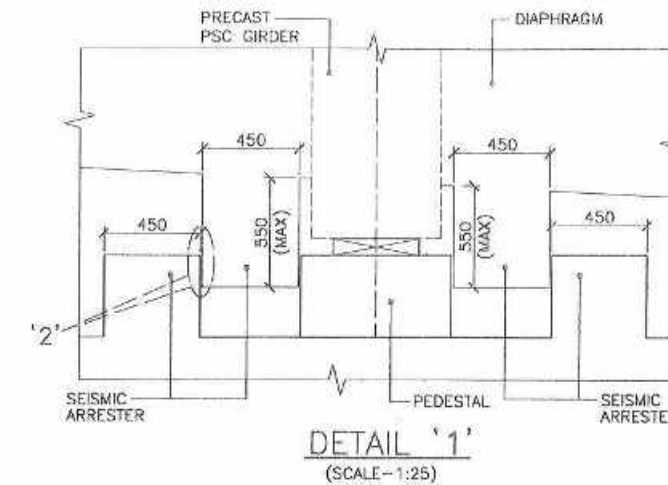
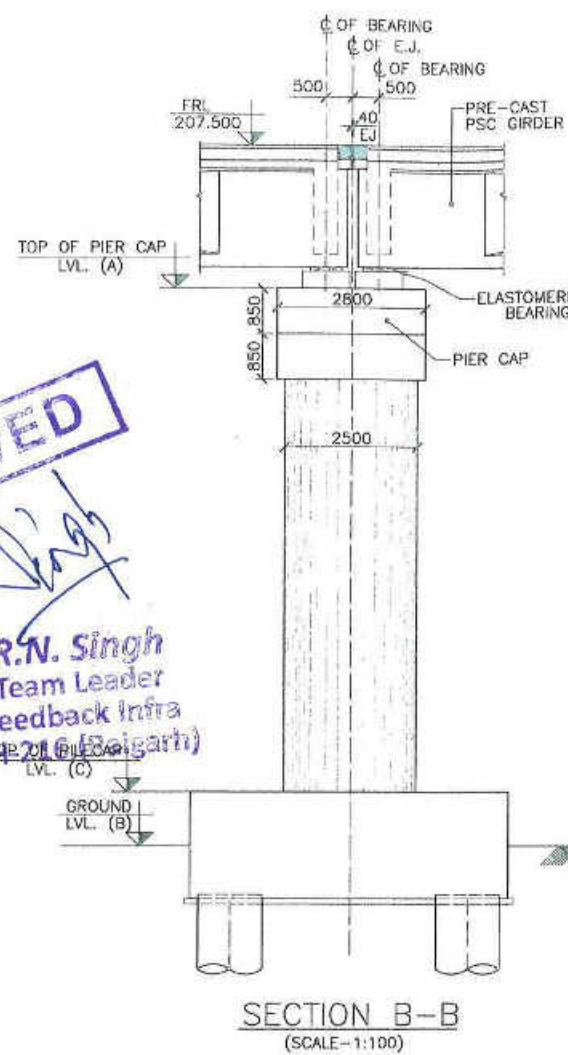
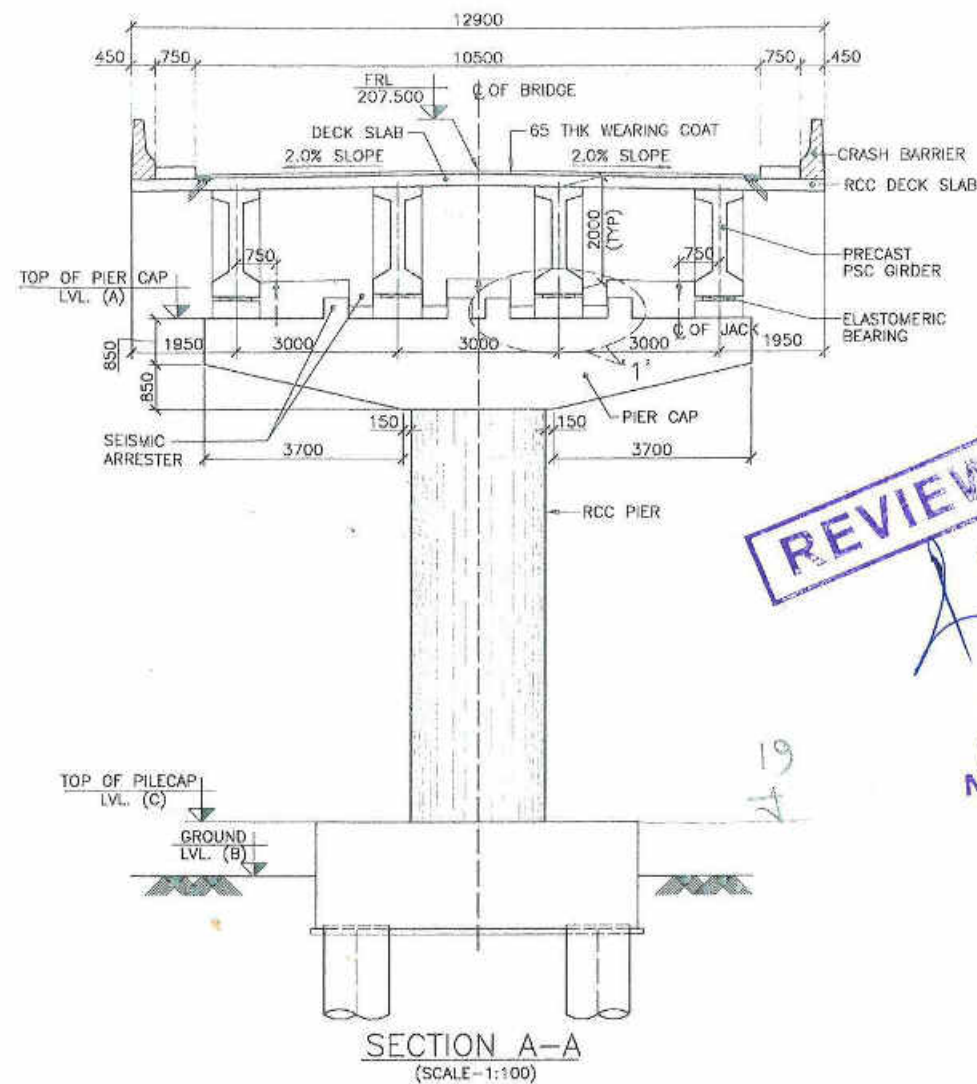
**REV.:** RO

**DATE:** 14-03-2016

**Ref. forwardd. GAO office.**

**PROOF CHECKED**





# NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METER, UNLESS WRITTEN OTHERWISE.
2. NO DIMENSION SHALL BE SCALED FROM THIS DRAWING. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
3. MATERIALS:  
GRADE OF CONCRETE CONFORMING TO IRC : 112  
PIER CAP, PIER : M35  
PEDESTAL : M40  
REINFORCEMENT : Fe 500 CONFORMING TO IS 1785.
4. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE PLAN AND PROFILE DRAWING OF ROAD.
5. THE FOLLOWING LOADS HAVE BEEN CONSIDERED IN THE DESIGN:- ONE LANE OF 70R + ONE LANE OF CLASS A OR THREE LANES OF CLASS A WHICH EVER GOVERNS.
6. ELASTOMERIC BEARINGS SHALL BE PROVIDED ON TOP OF PEDESTAL.
7. STRIP SEAL TYPE EXPANSION JOINT SHALL BE USED.
8. MIN. WEARING COAT OF 40MM THK. ASPHALTIC CONCRETE OVER 25MM THK. MASTIC ASPHALT AS PER MOST SPECIFICATION NO.2702.1.1 OVER TOP SLAB.
9. AS PER THE IRC 6:2014 THE LOCATION OF THE STRUCTURES FALLS UNDER ZONE II OF THE SEISMIC ZONES OF INDIA.

## LEGEND

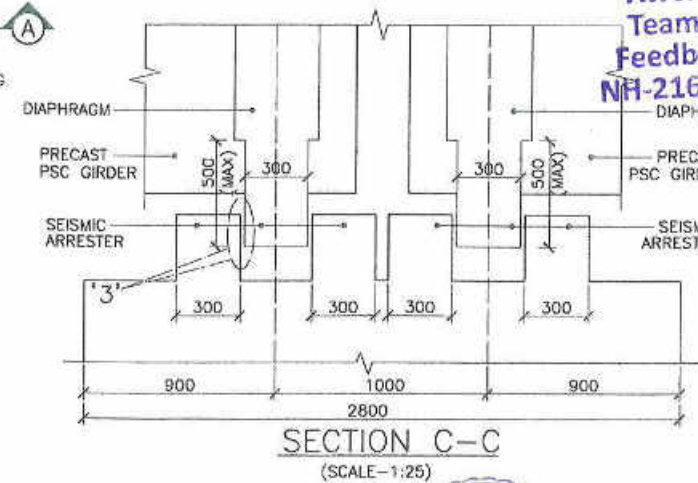
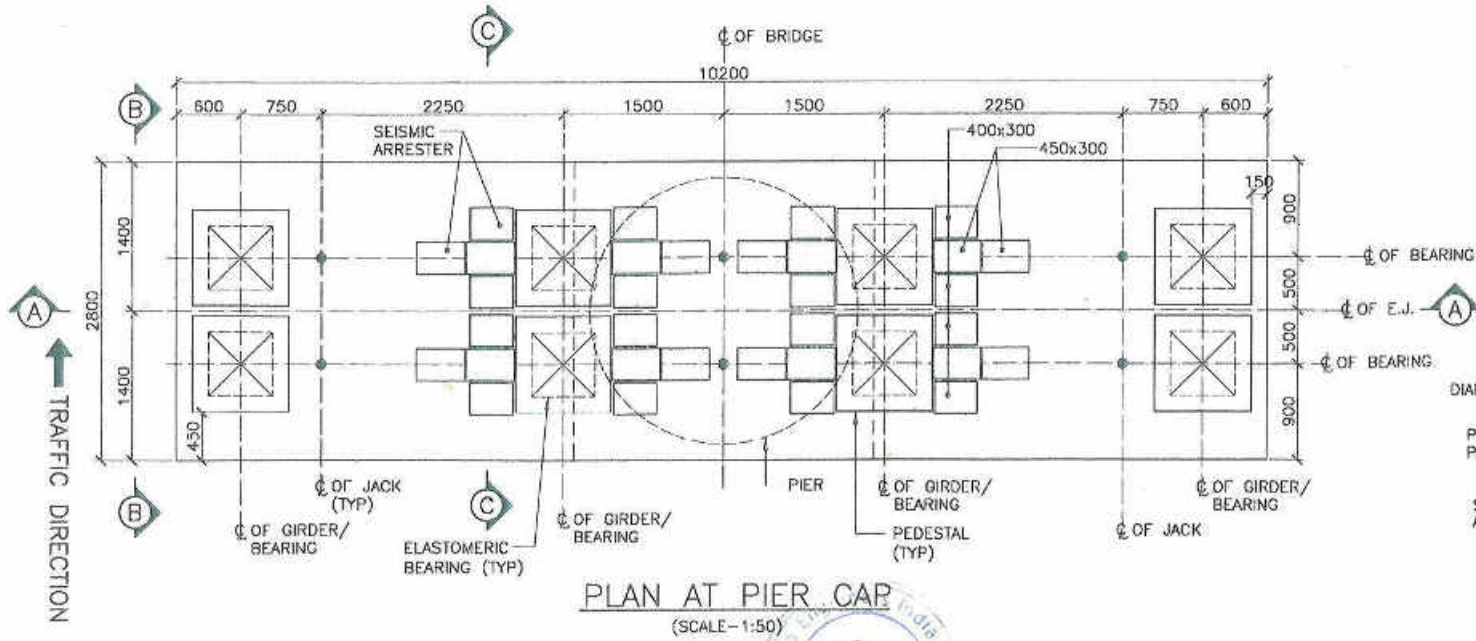
(TYP) - TYPICAL  
F.R.L. - FINISHED ROAD LEVEL  
E.J. - EXPANSION JOINT  
C - CENTER LINE

## REFERENCES (LATEST REVISION)

1. STCPL\_564\_3000\_01 - GENERAL ARRANGEMENT OF MAJOR BRIDGE AT D.CH:28+400
2. STCPL\_564\_3000\_27 - REINFORCEMENT DETAILS OF PIER & PIERCAP (GROUP-I) FOR MAJOR BRIDGE AT D. CH:28+400
3. STCPL\_564\_3000\_28 - NUMERATION DETAILS OF PIER & PIERCAP (GROUP-II) FOR MAJOR BRIDGE AT D. CH:28+400

**NOTE:** Due to change in R/Ls of TBMs all the levels are changed from as under:  
1. Earlier TBM RL = 200.00  
2. Now final TBM RL = 202.08  
Diff = 2.08  
(maintaining FRL unchanged)  
197.508

Pier cap top Level = 196.58



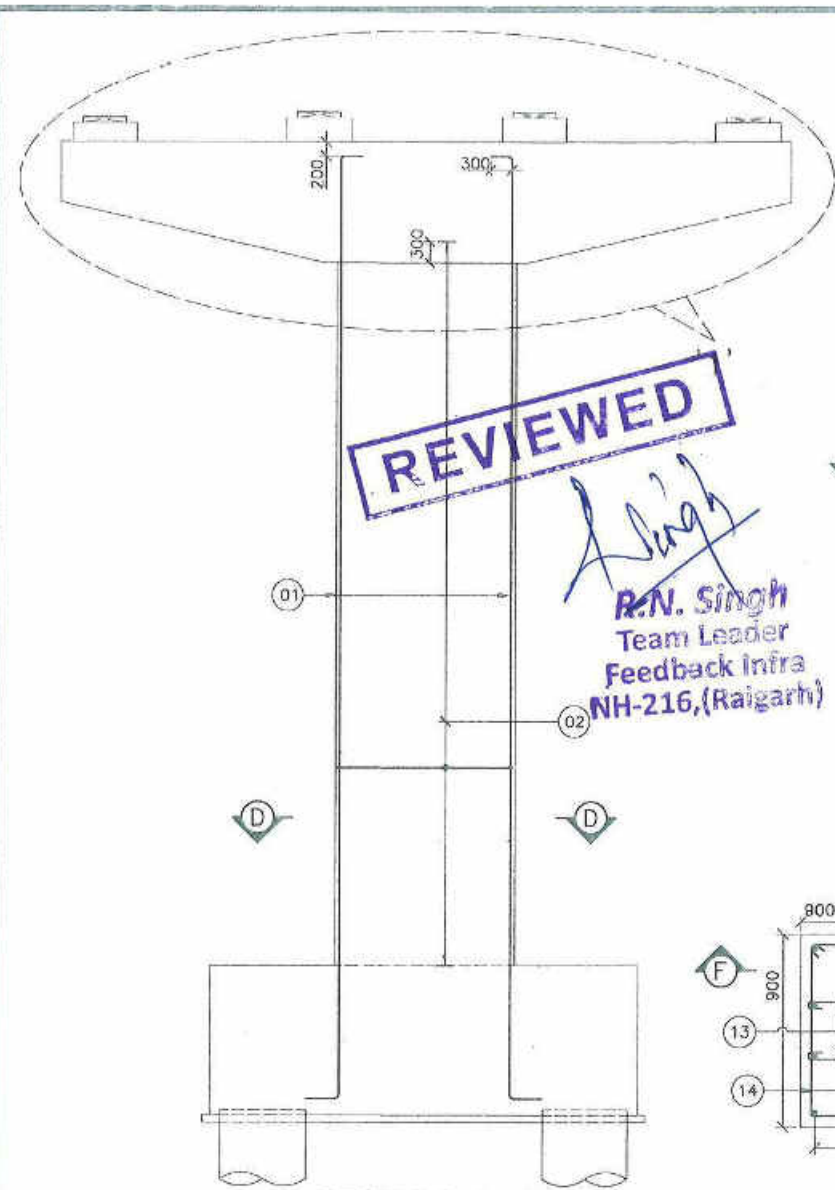
## SCHEDULE OF PIER LEVELS FOR GROUP-II :- P14-P21 & P27-P30, P37-P41

PIER MARK	FORMATION LEVEL	TOP OF PIER CAP (A)	GROUND LEVEL (B)	TOP OF PILE CAP LVL. (C)
P14	207.500	204.716	194.285	195.500
P15	207.500	204.716	194.230	195.500
P16	207.500	204.716	194.436	195.500
P17	207.500	204.716	194.110	195.500
P18	207.500	204.716	193.429	195.500
P19	207.500	204.716	192.885	195.500
P20	207.500	204.716	192.623	195.500
P21	207.500	204.716	192.347	195.500
P27	207.500	204.716	191.203	195.000
P28	207.500	204.716	192.450	195.000
P29	207.500	204.716	192.906	195.000
P30	207.500	204.716	193.948	195.000
P37	207.500	204.716	194.604	195.000
P38	207.500	204.716	193.197	195.000
P39	207.500	204.716	193.647	195.000
P40	207.500	204.716	193.750	195.000
P41	207.500	204.716	195.639	195.000

due to change in R/Ls of TBMs all the levels are changed from as under:  
1. Earlier TBM RL = 200.00  
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Diff = 2.08  
(maintaining FRL unchanged)  
197.508

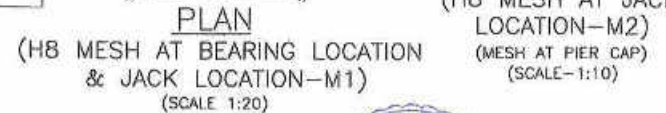
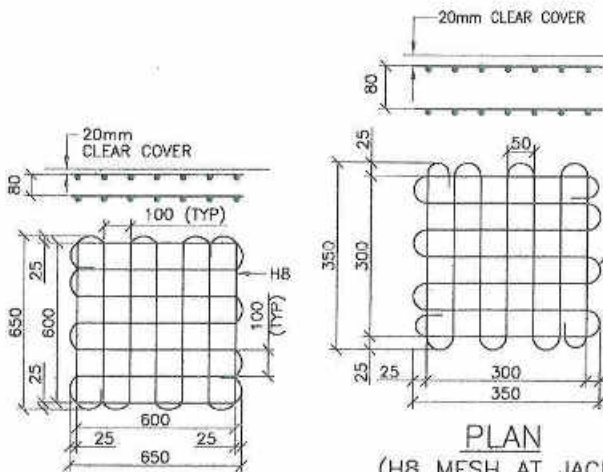
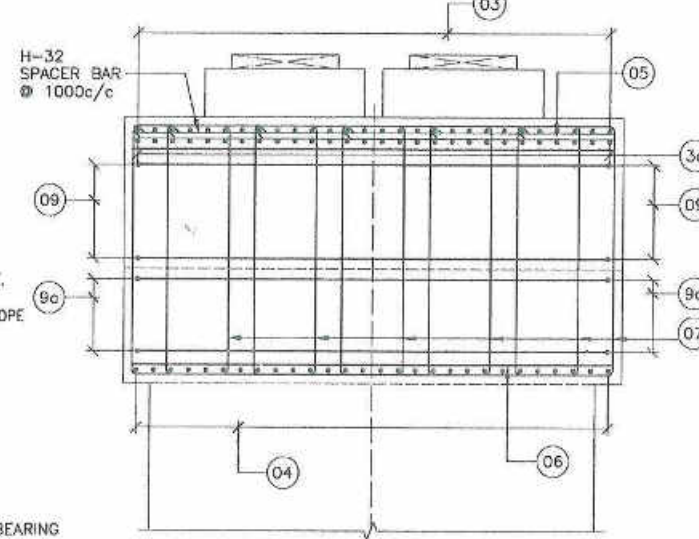
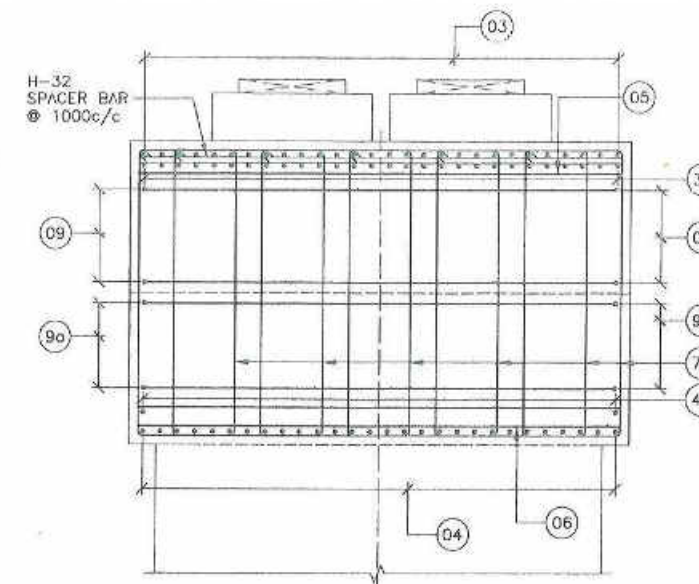
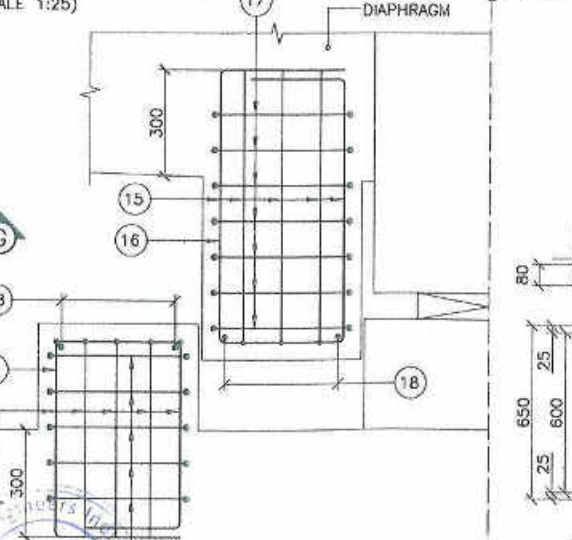
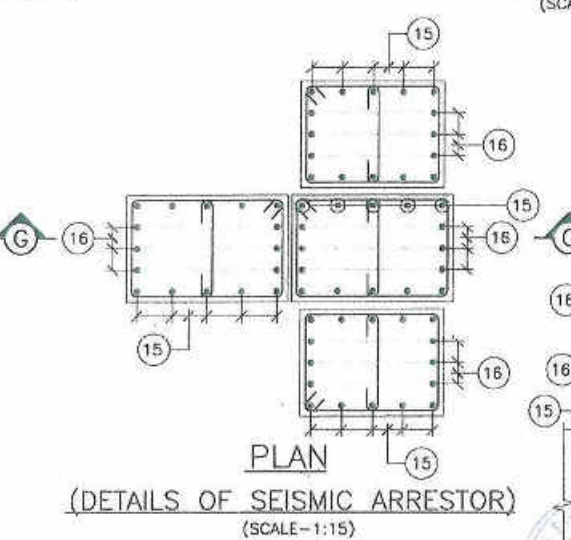
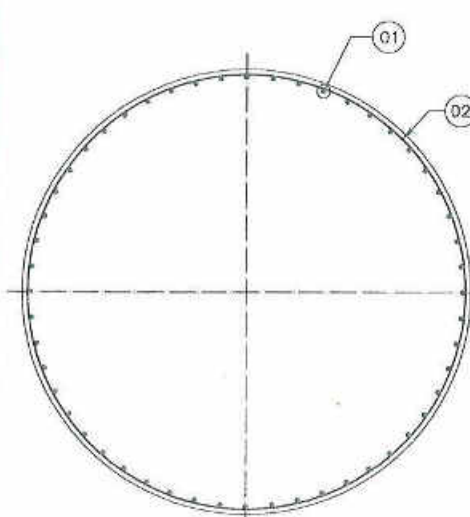
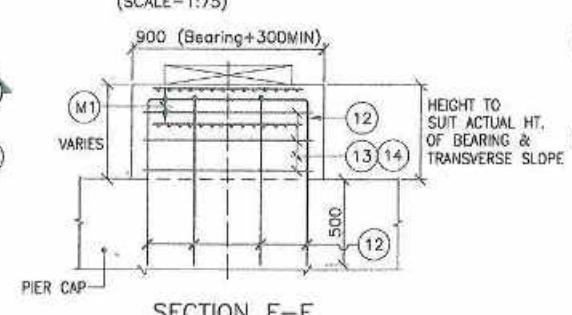
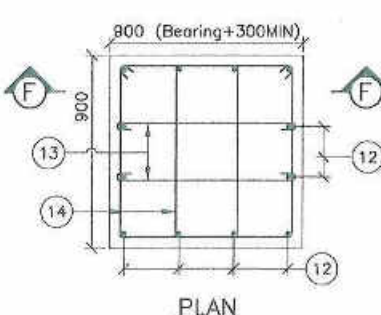
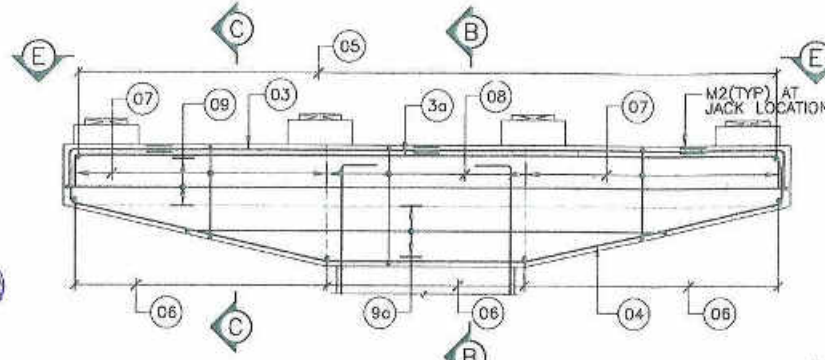
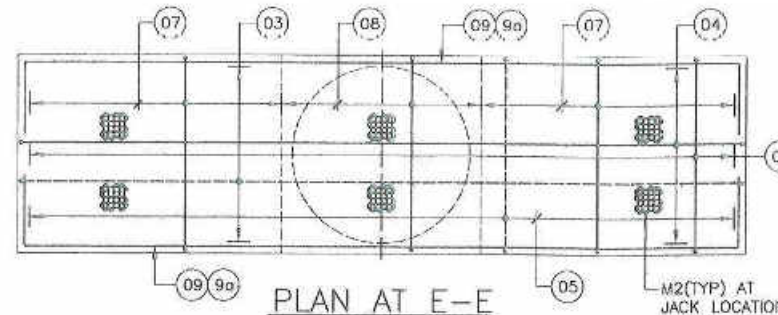
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**REVIEWED**

**R.N. Singh**  
Team Leader  
Feedback Infra  
NH-216, (Raigarh)



- NOTES:-**
- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS.
  - DO NOT SCALE THIS DRAWING. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
  - LAP LENGTH SHALL BE :
    - FOR LAP LENGTH OF THE BARS REFER TABLE
    - AT PARTICULAR LOCATION LAPPING OF BAR SHALL NOT BE GREATER THAN 50%
  - WHEREVER TOTAL NO OF BARS ARE SPECIFIED, THEY ARE TO BE SPACED UNIFORMLY, UNLESS MENTIONED OTHERWISE.
  - CLEAR COVER TO THE MAIN REINFORCEMENT SHALL BE PIER, PIERCAP --- 50mm, PEDESTAL --- 40mm UNLESS OTHERWISE SPECIFIED.
  - MATERIALS:
    - CONCRETE : M-35 GRADE CONFORMING TO IRC : 112-2011.
    - STEEL: REINFORCEMENT: Fe 500 CONFORMING TO IS 1786-2008.
  - ALL REINFORCEMENT BARS SHALL BE CLEAN AND FREE FROM DIRT, MILL SCALE RUST ETC. AND SHALL BE BENT COLD TO SHAPES AND DIMENSIONS INDICATED AND SHALL BE PLACED EXACTLY AS SHOWN.
  - ALL REINFORCEMENT PROVIDED SHALL BE H.Y.S.D BARS ONLY AND SHALL BE OF TESTED QUALITY.
- LEGEND**
- TYP - TYPICAL      CL - CENTER LINE  
E.J. - EXPANSION JOINT      --- TOP REINFORCEMENT  
R/F - REINFORCEMENT      --- BOTTOM REINFORCEMENT

- REFERENCES (LATEST REVISION)**
- STCPL\_564\_3000\_26 - NUMERATION DETAILS OF PIER & PIERCAP (GROUP-II) FOR MAJOR BRIDGE AT D. CH:28+400
  - STCPL\_564\_3000\_28 - NUMERATION DETAILS OF PILE & PILECAP (GROUP-II) FOR MAJOR BRIDGE AT D. CH:28+400

**SCHEDULE OF REINFORCEMENT FOR GROUP-II**

	BAR MARK	BAR DIA.	NOS./SPACING	SHAPE	REMARKS
PIER	01	H32	52 NOS.	300	
	02	H12	200 c/c		
	03	H32	28 NOS.	300	ACROSS TRAFFIC 1st LAYER
	04	H32	28 NOS.	300	ACROSS TRAFFIC 2nd LAYER
	05	H16	28 NOS.	300	ACROSS TRAFFIC
	06	H16	200 c/c	300	ALONG TRAFFIC
PIER CAP	07	H16	200 c/c	300	ALONG TRAFFIC
	08	H16	125 c/c		12 LEGGED
	09	H16	250 c/c		12 LEGGED
	10	H12	3 NOS.	500	SIDE FACE
	11	H12	3 NOS.	500	SIDE FACE
	12	H8			SEE MESH DETAIL M1
PEDESTAL	13	H8			SEE MESH DETAIL M2
	14	H12	4+2=6 NOS.		ON BOTH SIDE
	15	H8	@100c/c		LINKS
	16	H8	@100c/c		TIES
	17	H20	5 NOS.	300	HORIZONTAL STIRRUPS
	18	H20	3 NOS.	300	STIRRUPS + LINK
SEISMIC ARRESTER	19	H12	@100c/c		
	20	H20	2 NOS.		CORNER STEEL

**LAP LENGTH:**

CURTAILMENT	GRADE OF CONCRETE (M35)	10mm	12mm	16mm	20mm	25mm	32mm
< 25%	37#	370	444	592	740	925	1184
> 25% & < 33%	42#	420	504	672	840	1050	1344
> 33% & ≤ 50%	55#	550	660	880	1100	1375	1760

# = DIA OF BAR

CLIENT: MORTH THE MINISTRY OF ROAD TRANSPORT & HIGHWAYS, (NHDP-IV A CELL) STATE PWD, CHATTISGARH	AUTHORITY ENGINEER: <b>FEEDBACK INFRA</b> Feedback Infra Private Limited 15th Floor, Tower 9B, DLF Cyber City, Phase-III, Gurgaon-122002, Haryana, India	PROOF CONSULTANT: <b>HBS</b> HBS INFRA ENGINEERS INDIA PVT. LTD. Flat no: 102, Plot no: 11 to 11, Fortune Chambers, Image Garden Road, Madhapur, Hyderabad-500 081	DESIGN DIRECTOR: J.P. MAJUMDAR ERA Infra Engineering Limited C56/1, Sector-62, Noida-201301	EPC CONTRACTOR: <b>ERA</b> ERA INFRA ENGINEERING LIMITED C56/1, SECTOR-62, NOIDA-201301	CONSULTANT: <b>TECHNICAL CONSULTANTS</b> SPECTRUM Technical Consultants Pvt. Ltd. 401/402, 2nd Floor, Plot No 9, Sector-17, Vashi, Navi Mumbai-401 203 India Ph: 022-41115909, Email: info@spectrumworldwide.net	NAME OF PROJECT: REHABILITATION AND UPGRADE OF NH-216 FROM KM3+800 TO KM 90+460 (RAIGARH TO SARAIKALLI SECTION) TO TWO LANES WITH PAVED SHOULDERS IN THE STATE OF CHHATTISGARH UNDER NHDP-IV	DRAWING TITLE: REINFORCEMENT DETAILS OF PIER & PIERCAP (GROUP-II) FOR MAJOR BRIDGE AT D. CH:28+400 DRG. NO.: STCPL_564_3000_27	PROJECT NO: 564 SCALE: AS SHOWN REV: R0
12/05/16 DATE	NO REVISION	FOR APPROVAL BY	GMS BY	DESIGNED YJC	CHECKED YJC	APPROVED NDP	REV R0	



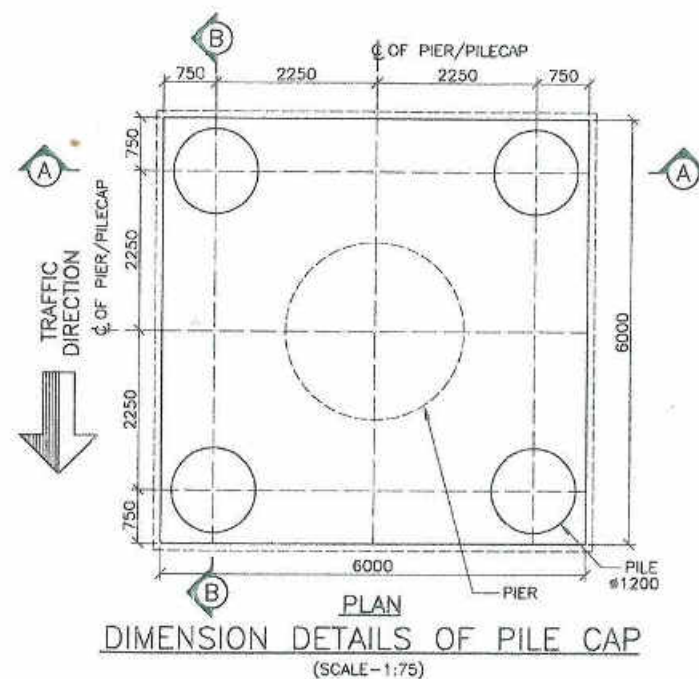
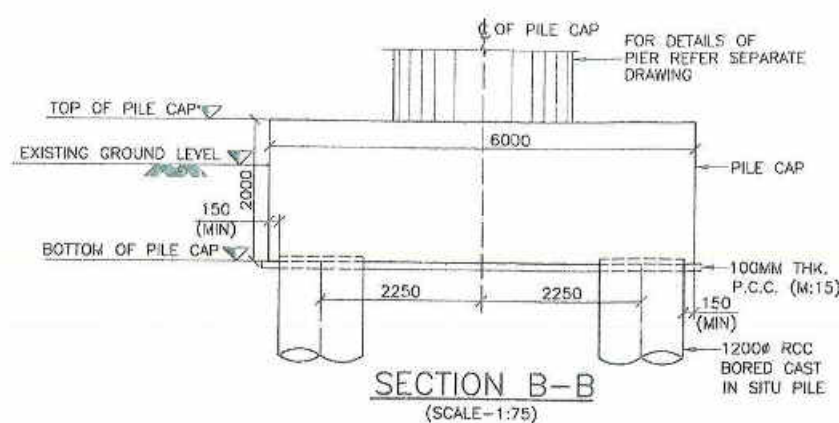
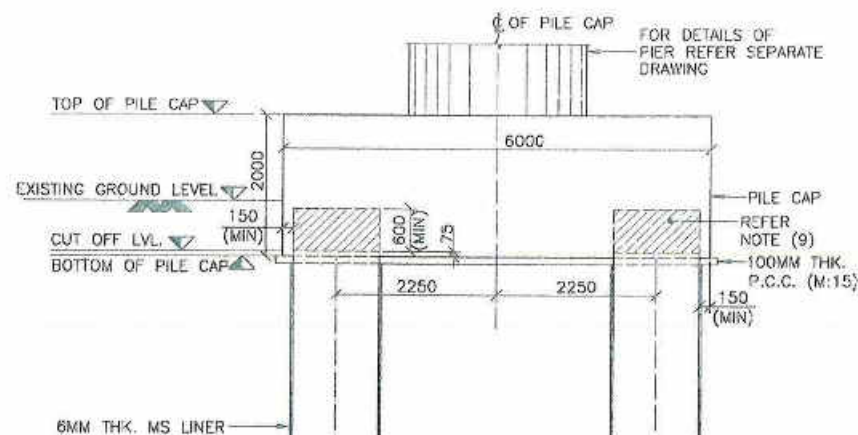


TABLE OF LEVELS FOR GROUP-2 :- P14-P21 & P27-P30, P37-P41

PIER LOCATION	GROUND LEVEL	TOP OF PILE CAP	BOTTOM OF PILE CAP	PILE CUTOFF LEVEL	PILE SOCKET TOP LEVEL	SCOUR LEVEL	PILE TIP LEVEL
P14	194.285	195.500	193.500	193.575	177.727	177.727	174.127
P15	194.230	195.500	193.500	193.575	178.043	178.043	174.443
P16	194.436	195.500	193.500	193.575	173.596	173.596	169.996
P17	194.110	195.500	193.500	193.575	176.976	176.976	173.376
P18	193.429	195.500	193.500	193.575	179.095	179.095	175.495
P19	192.885	195.500	193.500	193.575	179.202	179.202	175.602
P20	192.623	195.500	193.500	193.575	176.536	176.536	172.936
P21	192.347	195.500	193.500	193.575	174.788	174.788	171.188
P27	191.203	195.000	193.000	193.075	176.296	176.296	172.696
P28	192.450	195.000	193.000	193.075	176.038	176.038	172.438
P29	192.906	195.000	193.000	193.075	177.370	177.370	173.770
P30	193.948	195.000	193.000	193.075	179.982	179.982	176.382
P37	194.604	195.000	193.000	193.075	176.762	176.762	173.162
P38	193.197	195.000	193.000	193.075	176.762	176.762	173.162
P39	193.647	195.000	193.000	193.075	176.976	176.976	173.376
P40	193.750	195.000	193.000	193.075	177.551	177.551	173.951
P41	195.639	195.000	193.000	193.075	182.823	182.823	179.223

DESIGN LOAD FOR PILE CAPACITY

LOAD CASE	VERTICAL LOAD * (T)	LATERAL LOAD (T)
NORMAL	400.0	7.8
WIND	480.0	16.1
SEISMIC	455.0	30.0

\* EXCLUDING SELF WEIGHT OF PILE

# NOTES

1. ALL DIMENSIONS ARE IN MILLIMETER, ALL LEVELS ARE IN METER.
2. DO NOT SCALE THIS DRAWING. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
3. MATERIALS:  
CONCRETE GRADE CONFIRMING TO IRC 112: 2011  
PILE, PILE CAP : M-35  
REINFORCEMENT : Fe-500 CONFORMING TO IS:1786.
4. CLEAR COVER TO REINFORCEMENT:  
PILE, PILE CAP : 75mm
5. (a) FOR LAP LENGTH OF THE BARS REFER TABLE.  
(b) NOT MORE THAN 50% OF BARS SHALL BE LAPPED AT ANY LOCATION, AND THE LAPS SHOULD BE STAGGERED.
6. WHEREVER TOTAL NO. OF BARS ARE SPECIFIED, THEY ARE TO BE SPACED UNIFORMLY, UNLESS MENTIONED OTHERWISE.
7. COVER BLOCKS SHALL BE ATTACHED TO THE REINFORCEMENT CAGE SO AS TO MAINTAIN APPROPRIATE COVER FROM THE FACE OF THE BORE HOLE. CONCRETE GRADE OF COVER BLOCKS SHALL BE M-35.
8. THE PILE SHOULD PROJECT 75 MM IN TO THE CAP CONCRETE.
9. PILE SHALL BE CAST 600mm (MIN) ABOVE CUT-OFF LEVEL AND THE PORTION ABOVE CUT-OFF LEVEL SHALL BE CHISELLED AFTER 7 DAYS OF PILE CASTING & BEFORE CASTING OF PILE CAP.
10. IN CASE THE PILE ABOVE CUT-OFF LEVEL IS NOT REMOVED BEFORE SETTING OF PILE CONCRETE, THEN A 40mm DEEP GROOVE SHALL BE MADE ALL AROUND THE PILE AT THE REQUIRED CUT-OFF LEVEL.
11. FOR DETAILS OF BORE HOLE DATA AND LOCATION, PLEASE REFER SOIL INVESTIGATION REPORT.
12. THE DESIGN OF PILE FOUNDATION IS BASED ON THE SOIL INVESTIGATION REPORT. THE SOIL DATA DURING BORING OF PILE SHALL BE CONFIRMED WITH RESPECTIVE BORE HOLE DATA OF SOIL INVESTIGATION REPORT. AND IF ANY DISCREPANCY IS OBSERVED, THE SAME SHALL BE IMMEDIATELY REPORTED TO ENGINEER BEFORE CONCRETING OF THE PILE.
13. THE GEOTECHNICAL CAPACITY OF PILE CONSIDERED FOR DESIGN IS 525T & THE SAME SHALL BE CONFIRMED BY SUITABLE TESTS ON SITE.
14. THE GL SHOWN ARE AS PER SURVEY DETAILS. THE SAME SHALL BE VERIFIED BEFORE EXECUTION. IF ANY VARIATION FOUND IN THE GL, THE OTHER LEVELS SHALL BE MODIFIED ACCORDINGLY.
15. PERMISSIBLE TOLERANCES FOR PILE SHALL BE:-  
a. SHIFT NOT TO EXCEED 75 MM. AT PILING PLATFORM LEVEL.  
b. TILT NOT TO EXCEED 1 IN 150.  
HOWEVER TILT & SHIFT AS MEASURED MUST BE REFERRED BACK TO DESIGN OFFICE. THE DESIGN & DRAWING FOR PILE/PILE CAP MUST BE REVISED.

## REFERENCES (LATEST REVISION)

1. STCP\_564\_3000\_26 - NUMERATION DETAILS OF PIER & PIERCAP (GROUP-II) FOR MAJOR BRIDGE AT D. CH:28+400
2. STCP\_564\_3000\_27 - REINFORCEMENT DETAILS OF PIER & PIERCAP (GROUP-II) FOR MAJOR BRIDGE AT D. CH:28+400

Note:

GRAD revised due to change in RL of TBM. Existing RL of TBM was 200.00 now final RL is 202.08. maintaining FRL unchanged.

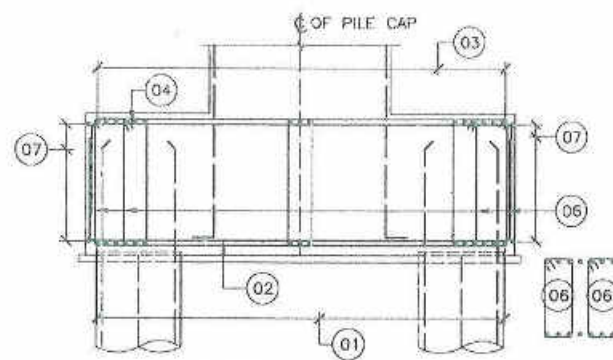
\* socketing 6m shall be from top of hard rock encountered at site.

Revise as marked

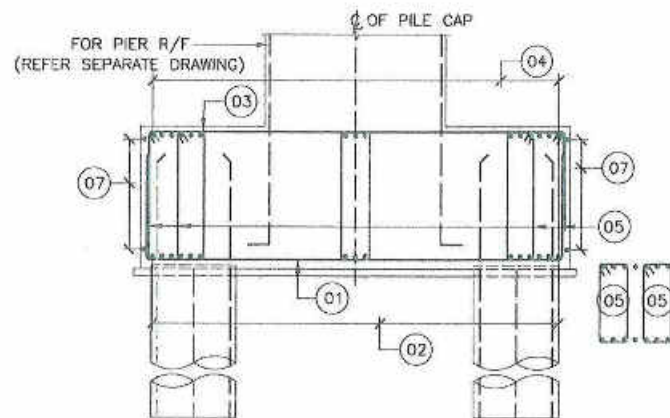
REF: Letter 564-09/270  
Date: 14-03-2016

CLIENT: NORTH THE MINISTRY OF ROAD TRANSPORT & HIGHWAYS, (NHDP-IV A CELL), STATE PWD, CHATTISGARH	AUTHOR: ENGINEER: FEEDBACK INFRA Private Limited, 15th Floor, Tower 9B, DLF Cyber City, Phase-III, Gurgaon 122002, Haryana, India	PROF. CONSULTANT: HBS INFRA ENGINEERS INDIA PVT. LTD., Plot no: 102, Plot no: 8 to 11, Fortune Chambers, Image Garden Road, Madhapur, Hyderabad-500 081	SAFETY CONSULTANT: S. A. Infrastructure Consultants Pvt. Ltd., 101-102, CSR-I, Gyanikhand-II, Indirapuram, Ghaziabad-201014	DESIGN: L. MAJUMDAR, ERA INFRA Engineering Limited, C5641, Sector-62, Noida-201301	EPC CONTRACTOR: ERA INFRA ENGINEERING LIMITED, C5641, SECTOR-62, NOIDA-201301	CONSULTANT: SPECTRUM Techno-Consultants Pvt. Ltd., 401/402, Raikar Bhavan, Plot No 9, Sector-17, Vashi, Navi Mumbai-400 703 India. Ph. 022-41115900, Email: info@spectrumworld.net	NAME OF PROJECT: REHABILITATION AND UPGRADEMENT OF NH-216 FROM KM3+800 TO KM 90+460 (RAIGARH TO SARAIPALLI SECTION) TO TWO LANES WITH PAVED SHOULDERS IN THE STATE OF CHHATTISGARH UNDER NHDP-IV	DRAWING TITLE: NUMERATION DETAILS OF PIER & PIERCAP (GROUP-II) FOR MAJOR BRIDGE AT D. CH:28+400	PROJECT NO: 564
DATE: 14/03/16	NO. 01	FOR APPROVAL: GMS	BY: GMS	DATE: 14-03-2016	NO. 01	FOR APPROVAL: YJC	BY: YJC	DATE: 14-03-2016	NO. 01

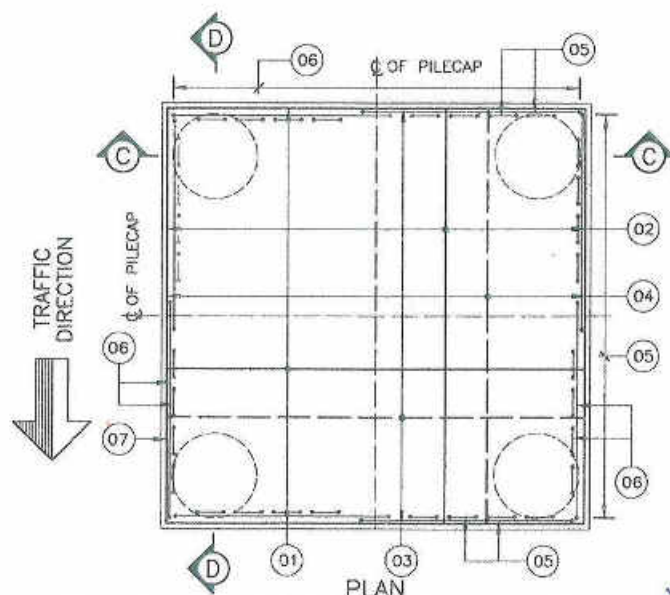




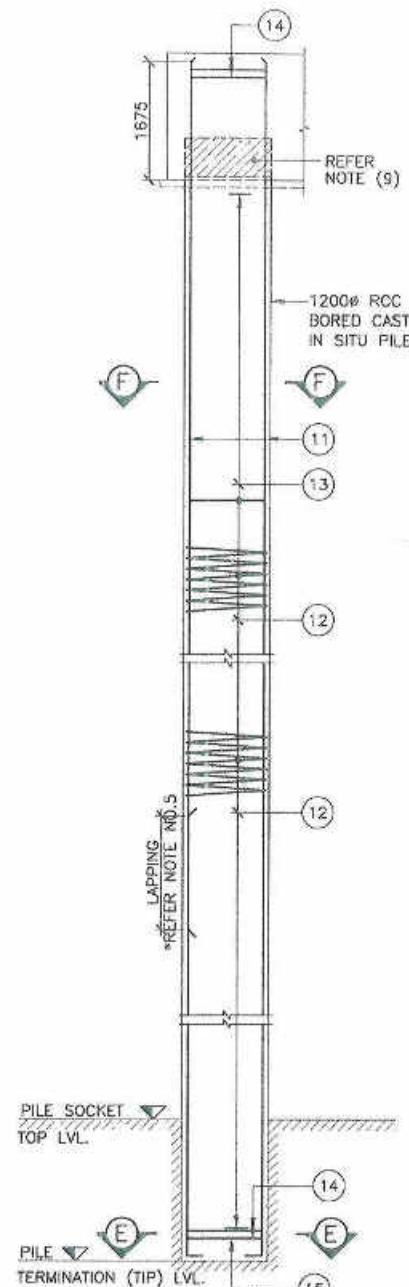
SECTION D-D  
(SCALE-1:75)  
BAR MARK (05) NOT SHOWN



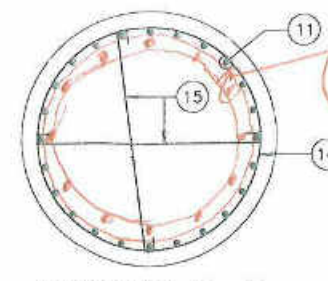
SECTION C-C  
(SCALE-1:75)  
BAR MARK (06) NOT SHOWN



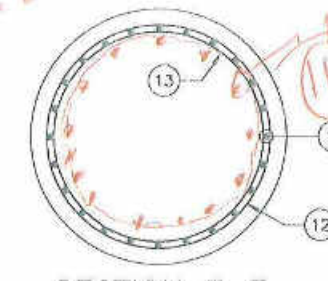
REINFORCEMENT DETAILS OF PILE CAP  
(SCALE-1:75)



DETAILS OF PILE REINFORCEMENT  
(SCALE 1:75)



SECTION E-E  
(SCALE 1:25)



SECTION F-F  
(SCALE 1:25)

#### LAP LENGTH:

CURTAILMENT	GRADE OF CONCRETE (M35)	10mm	12mm	16mm	20mm	25mm	32mm
< 25%	37Ø	370	445	595	740	925	1185
> 25% & < 33%	42Ø	420	505	675	840	1050	1345
> 33% & < 50%	52Ø	520	625	835	1040	1300	1675

Ø = DIA OF BAR

#### SCHEDULE OF REINFORCEMENT

BAR MARK	DIA OF BAR	SHAPE	SPACING/NOS	REMARKS
01	H32	1200	43 NOS	ACROSS TRAFFIC
02	H32	1200	43 NOS	ALONG TRAFFIC
03	H16	1200	43 NOS	ACROSS TRAFFIC
04	H16	1200	43 NOS	ALONG TRAFFIC
05	H12	280 c/c	20 LEGGED STIRRUPS	
06	H12	280 c/c	20 LEGGED STIRRUPS	
07	H12	600 (PLAN)	150 c/c	ON SIDE FACES (ALL AROUND)
11	H32		24 NOS	-
12	H10		150 PITCH	HELICAL
13	H16	300	1500 c/c	- ✓
14	H16	300	2 NOS	-
15	H16		2X2=4 NOS	WELDED TO PILE R/F

NOTE: BAR MARK (08) TO (10) NOT USED.

11A H25 1200 12 NOS

**REVIEWED**

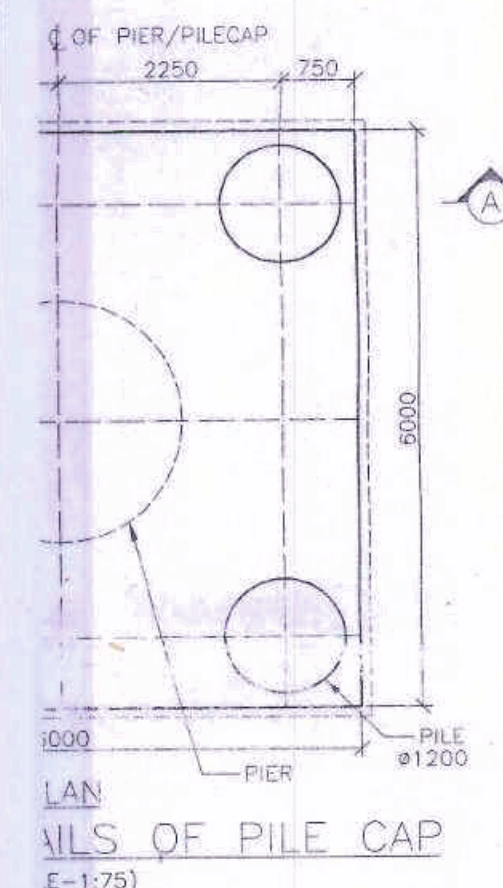
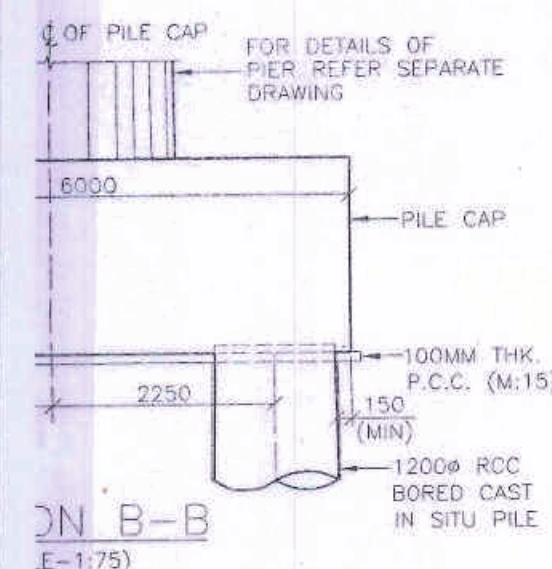
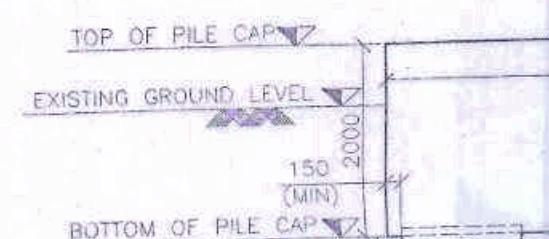
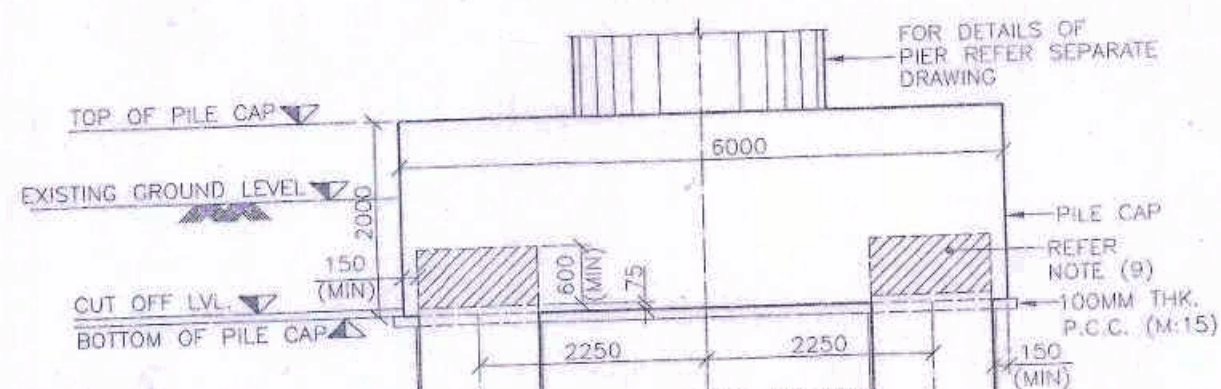
*R.N. Singh*  
Team Leader  
Feedback Infra  
NH-216, (Raigarh)



REF: Letter 564-09/210  
Date: 14-03-2016

DATE	NO	FOR APPROVAL	BY	REVISION	CLIENT	AUTHORITY ENGINEER	PROOF CONSULTANT	SAFETY CONSULTANT	DESIGN ENGINEER	EPC CONTRACTOR	CONSULTANT	NAME OF PROJECT	DRAWING TITLE	PROJECT NO.
14/03/16	NO	FOR APPROVAL	GMS		MORTH THE MINISTRY OF ROAD TRANSPORT & HIGHWAYS, (NHDP-IV A CELL), STATE PWD, CHATTISGARH	FEEDBACK INFRA Private Limited 15th Floor, Tower 20, DLF Cyber City, Phase-III, Gurgaon 122002, Haryana, India	HBS HBS INFRA ENGINEERS INDIA PVT. LTD. Flat no. 102, Plot no. 8 to 11, Fortune Chambers, Image Garden Road, Madhapur, Hyderabad-500 081	S. A. Infrastructure Consultants Pvt. Ltd. 101-102, CS-1, Gyanikund-II, Indraprastha, Ghaziabad-201014	I. P. MAJUMBAR ERA Infra Engineering Limited C56/41, Sector-62, Noida-201301	ERA ERA INFRA ENGINEERING LIMITED C56/41, SECTOR-62, NOIDA-201301	SPECTRUM Techno-Consultants Pvt. Ltd. 401/402, Raikar Bhavan, Plot No 9, Sector-17, Vashi, Navi Mumbai-403 703 India. Ph. 022-41115900, Email: info@spectrumworld.net	REHABILITATION AND UPGRADEMENT OF NH-216 FROM KM3+800 TO KM 90+460 (RAIGARH TO SARAIPALLI SECTION) TO TWO LANES WITH PAVED SHOULDERS IN THE STATE OF CHHATTISGARH UNDER NHDP-IV	NUMERATION DETAILS OF PILE & PILECAP (GROUP-II) FOR MAJOR BRIDGE AT D. CH:28+400 DRG. NO.: STCPL_564_3000_28 (SHEET 2 OF 2)	564





## NOTES

1. ALL DIMENSIONS ARE IN MILLIMETER, ALL LEVELS ARE IN METER.
2. DO NOT SCALE THIS DRAWING. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
3. MATERIALS:
  - CONCRETE GRADE CONFIRMING TO IRC 112: 2011
  - PILE, PILE CAP : M-35
  - REINFORCEMENT : Fe-500 CONFORMING TO IS:1786.
4. CLEAR COVER TO REINFORCEMENT:
  - PILE, PILE CAP : 75mm
5. (a) FOR LAP LENGTH OF THE BARS REFER TABLE.
  - (b) NOT MORE THAN 50% OF BARS SHALL BE LAPPED AT ANY LOCATION. AND THE LAPS SHOULD BE STAGGERED
6. WHEREVER TOTAL NO OF BARS ARE SPECIFIED, THEY ARE TO BE SPACED UNIFORMLY, UNLESS MENTIONED OTHERWISE.
7. COVER BLOCKS SHALL BE ATTACHED TO THE REINFORCEMENT CAGE SO AS TO MAINTAIN APPROPRIATE COVER FROM THE FACE OF THE BORE HOLE. CONCRETE GRADE OF COVER BLOCKS SHALL BE M-35
8. THE PILE SHOULD PROJECT 75 MM IN TO THE CAP CONCRETE.
9. PILE SHALL BE CAST 600mm (MIN) ABOVE CUT-OFF LEVEL AND THE PORTION ABOVE CUT-OFF LEVEL SHALL BE CHISSELLED AFTER 7 DAYS OF PILE CASTING & BEFORE CASTING OF PILE CAP.
10. IN CASE THE PILE ABOVE CUT-OFF LEVEL IS NOT REMOVED BEFORE SETTING OF PILE CONCRETE, THEN A 40mm DEEP GROOVE SHALL BE MADE ALL AROUND THE PILE AT THE REQUIRED CUT-OFF LEVEL
11. FOR DETAILS OF BORE HOLE DATA AND LOCATION, PLEASE REFER SOIL INVESTIGATION REPORT.
12. THE DESIGN OF PILE FOUNDATION AS BASED ON THE SOIL INVESTIGATION REPORT, THE SOIL DATA DURING BORING OF PILE SHALL BE CONFIRMED WITH RESPECTIVE BORE HOLE DATA OF SOIL INVESTIGATION REPORT. AND IF ANY DISCREPANCY IS OBSERVED, THE SAME SHALL BE IMMEDIATELY REPORTED TO ENGINEER BEFORE CONCRETING OF THE PILE.
13. THE GEOTECHNICAL CAPACITY OF PILE CONSIDERED FOR DESIGN IS 500T & THE SAME SHALL BE CONFIRMED BY SUITABLE TESTS ON SITE.
14. THE GL SHOWN ARE AS PER SURVEY DETAILS, THE SAME SHALL BE VERIFIED BEFORE EXECUTION. IF ANY VARIATION FOUND IN THE GL, THE OTHER LEVELS SHALL BE MODIFIED ACCORDINGLY.
15. PERMISSIBLE TOLERANCES FOR PILE SHALL BE:-
  - a. SHIFT NOT TO EXCEED 75 MM. AT PILING PLATFORM LEVEL.
  - b. TILT NOT TO EXCEED 1 IN 150.HOWEVER TILT & SHIFT AS MEASURED MUST BE REFERRED BACK TO DESIGN OFFICE. THE DESIGN & DRAWING FOR PILE/PILE CAP MUST BE REVISED
16. PERMANENT STEEL LINER SHALL BE PROVIDE AS/IRC 78 CL.709.1.4. UP TO SCOUR DEPTH.

## REFERENCES (LATEST REVISION)

1. STCPL 564\_3000\_32 - NUMERATION DETAILS OF PIER & PIERCAP (GROUP-IV) FOR MAJOR BRIDGE AT D. CH:2B+400
2. STCPL 564\_3000\_33 - REINFORCEMENT DETAILS OF PIER & PIERCAP (GROUP-IV) FOR MAJOR BRIDGE AT D. CH:2B+400

REVIEWED

Bridge/Structural Engineer  
Feedback Infra  
NH-215,(Raigarh)

DESIGN LOAD FOR PILE CAPACITY

LOAD CASE	VERTICAL LOAD * (T)	LATERAL LOAD (T)
NORMAL	385.0	7.4
WIND	450.0	15.6
SEISMIC	415.0	28.8

\* EXCLUDING SELF WEIGHT OF PILE

TABLE OF LEVELS	
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16
17	17
18	18
19	19
20	20
21	21
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23	23
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93	93
94	94
95	95
96	96
97	97
98	98
99	99
100	100

PIER LOCATION	GROUND LEVEL	TO PIER
P31	192.863	19
P32	193.988	19
P33	194.748	19
P34	196.248	19
P35	196.848	19
P36	196.548	19

GROUP-4 :- P31-P36

BOTTOM OF PILE CAP	PILE CUTOFF LEVEL	SCOUR LEVEL	PILE TIP LEVEL
190.363	190.538	179.548	160.363
191.488	191.463	179.443	161.488
192.248	192.323	176.743	162.248
193.748	193.823	179.483	163.748
194.348	194.423	179.973	164.348
194.048	194.123	180.013	164.048






✓  
177.370  
179.894  
176.296  
176.976  
177.551  
177.174



SECTION A-A  
(SCALE-1:75)

P3	26/02/19	PILE DEPTH REVISED (30.0MM) AS PER MOM DATED 05.02.2018	DS	GA	JP
P2	14/03/16	HBS TO AE CONVERT & PILE CAPACITY CHANGE	GMS	YJC	NSP
P1	04/03/16	ERA TO HBS CONVERT	GMS	YJC	NDP
P0	01/03/16	FOR REVIEW	GMS	YJC	NDP
M/D	ISSUED	DESCRIPTION	DEALT	CHECKED	APPROVED

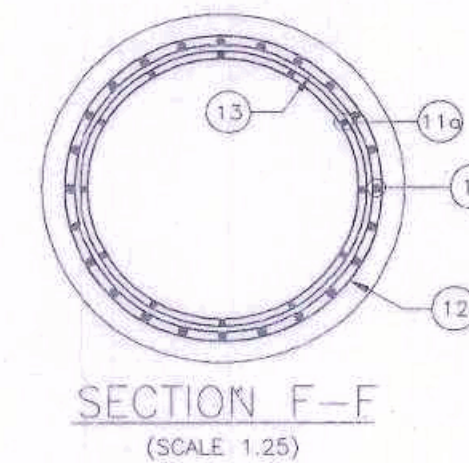
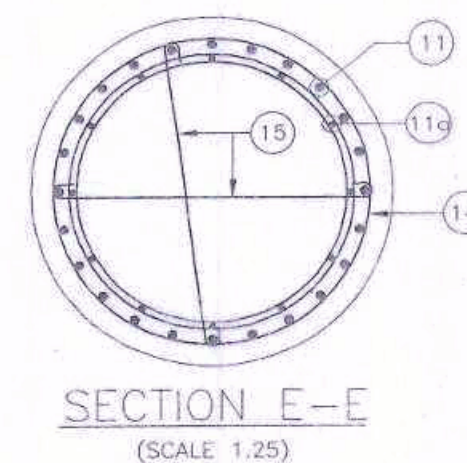
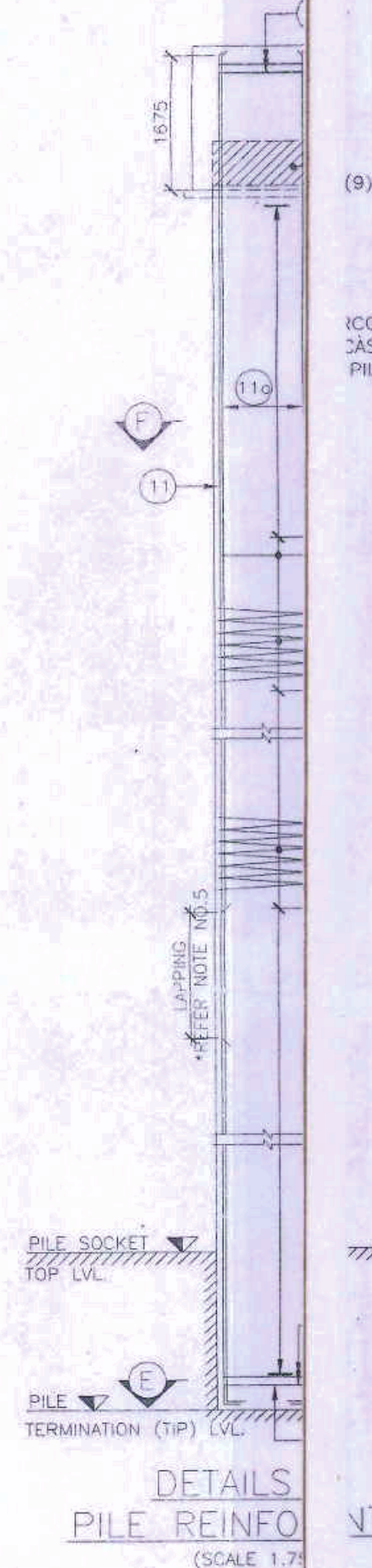
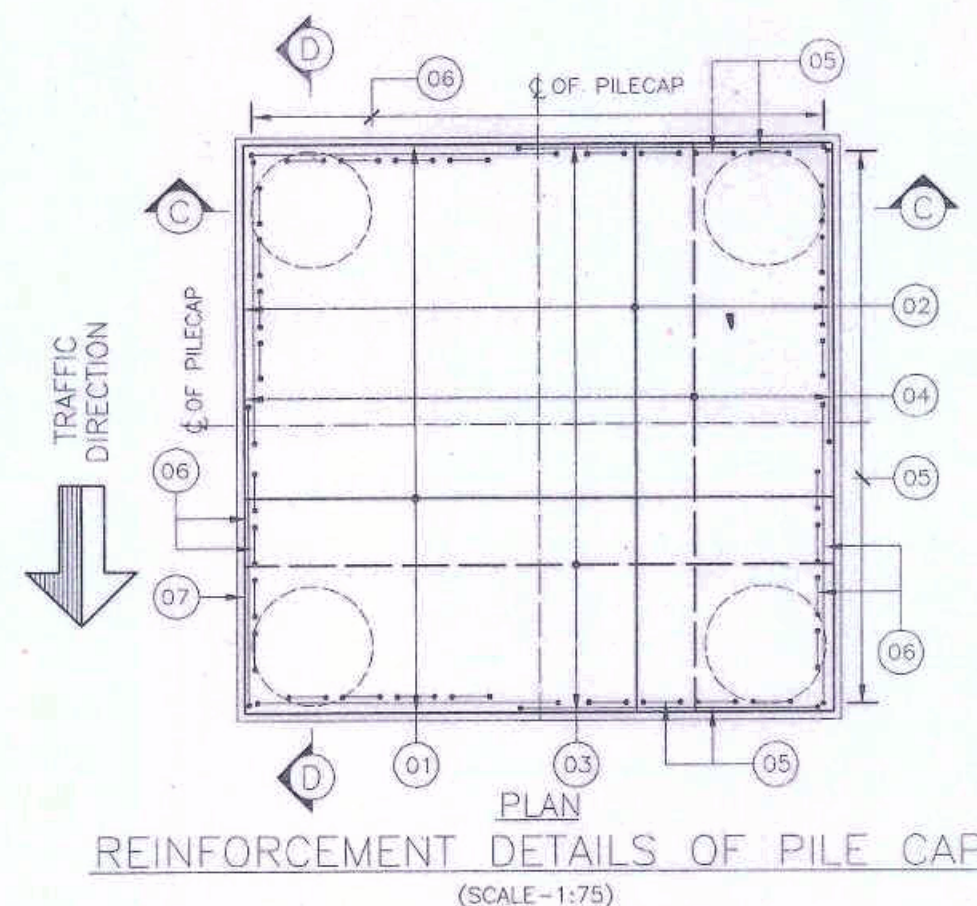
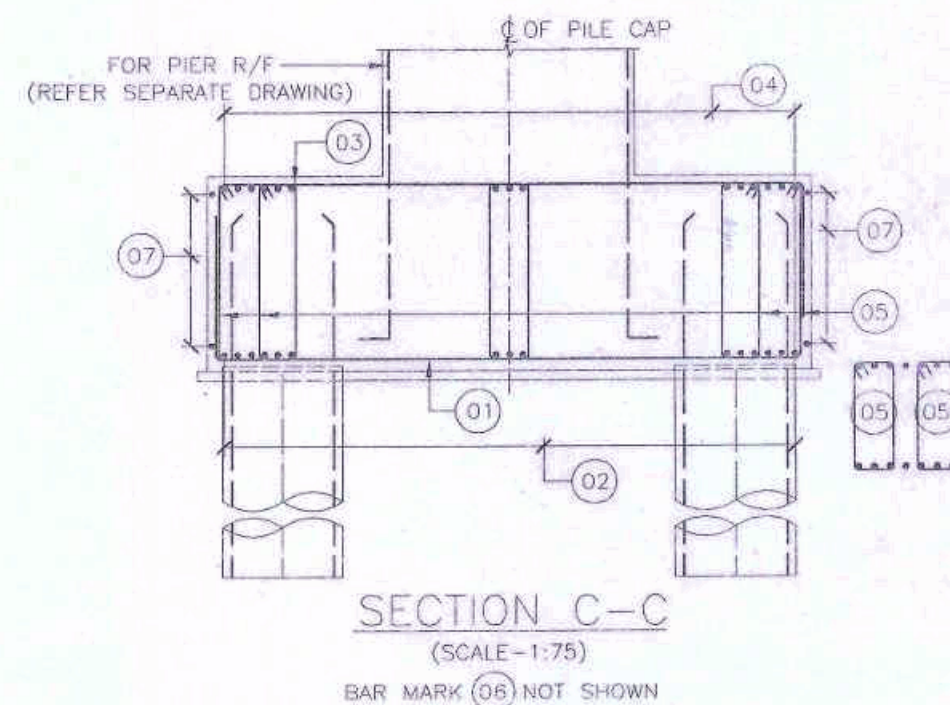
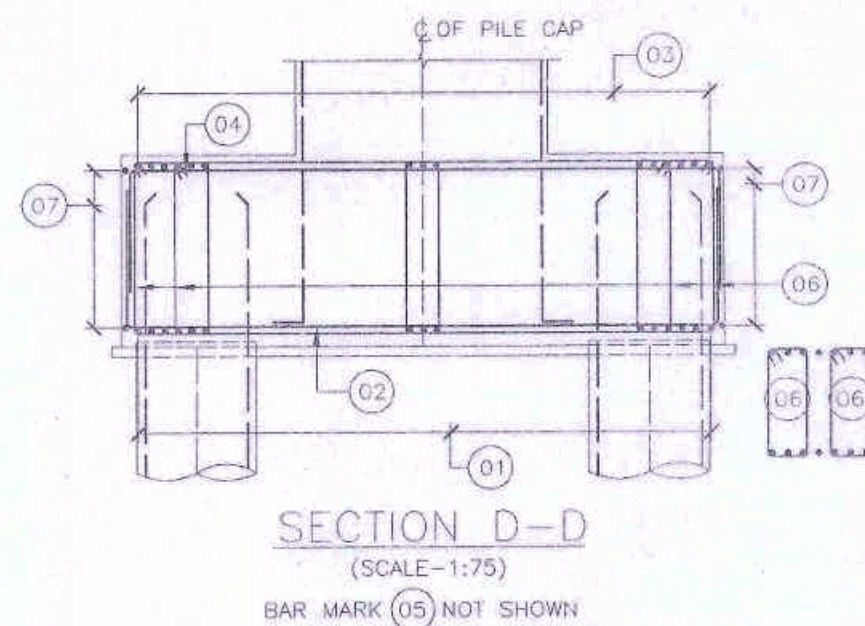
## REVISIONS

REVISIONS	
\\172.16.0.4\D&E Division\D&E Doc\8.Raigorh - Saraipali\Structure Drawings\28+400\Drawings\	STCPL_564_3000_34-R0 P2 PILE&PILECAP REINF_GR-IV(A).dwg dhyaripal

P3	26/02/19	PILE DEPTH REVISED (30.00M) AS PER MOM DATED 05.02.2018	DS	GA	JP	<b>CLIENT:</b>  <b>MORTH</b>  (Ministry of Road, Transport & Highways) <b>NHDP-IV A CELL.</b> State PWD Chhattisgarh	<b>AUTHORITY ENGINEER:</b>  <b>HBS</b>  HBS INFRA ENGINEERS INDIA PVT. LTD Flat no 102, Plot no. 8 to 11 fortune chambers, Madhapura HYDERABAD	<b>PROF CONSULTANT:</b>  <b>HBS</b>  HBS INFRA ENGINEERS INDIA PVT. LTD Flat no 102, Plot no. 8 to 11 fortune chambers, Madhapura HYDERABAD	<b>SAFETY CONSULTANT:</b>  <b>Vasupradha</b> Consultants LLP  Flat C-11, CEL Apartments, Vasundhara Enclave, New Delhi 110 036	<b>DESIGN &amp; VECTOR:</b>  <b>J.P. MACMUDAR</b> E&A INFRA ENGINEERING LTD C-56/41, SECTOR-52 NOIDA 201303.
P2	14/03/16	HBS TO AE CONVERT & PILE CAPACITY CHANGE	GMS	YJC	NBP					
P1	04/03/16	ERA TO HBS CONVERT	GMS	YJC	NBP					
P0	01/03/16	FOR REVIEW	GMS	YJC	NBP					
MYD	ISSUED	DESCRIPTION	DEALT	CHECKED	APPROVED					
<b>REVISIONS</b>							2019-03-05 09:56:21 C:\P\CE&P\RELINE_GB-IV(A).dwg dhyanpol.s			

<div></div> <div>ENGINEERING DIVISION ENGINEERING LIMITED OHASAS 18001 Certified Company SECTOR-62, NOIDA 201303 TO 4145036</div>	CONSULTANT: <div></div> <div>SPECTRUM Techno Consultants Pvt Ltd. 401, 4th Floor, Raikar Bhavan, Plot No 9, Sector 17, Vashi, Navi Mumbai, Maharashtra.</div>	NAME OF PROJECT: <div>Rehabilitation &amp; upgradation of NH-216 from km.3.800 to 90.460 (Raigarh-Saraipalli Section) in the State of Chhattisgarh to two-lanes with paved shoulders under NHDP-IV .</div>	DRAWING TITLE: <div>NUMERATION DETAILS OF PILE &amp; PILECAP (GROUP-IVA) FOR MAJOR BRIDGE AT D. CH:28+400</div>				REV R0						
			DRAWING NUMBER: <div>STCPL_564_3000_34 (SHEET 1 OF 2)</div>	SCALE As Shown									
			<table><tr><td>DRAWN</td><td>DESIGNED</td><td>CHECKED</td><td>APPROVED</td></tr><tr><td>Dhyongar</td><td>Gav</td><td>JP. Majumdar</td><td>JP Majumdar</td></tr></table>	DRAWN	DESIGNED	CHECKED	APPROVED	Dhyongar	Gav	JP. Majumdar	JP Majumdar		
DRAWN	DESIGNED	CHECKED	APPROVED										
Dhyongar	Gav	JP. Majumdar	JP Majumdar										





LAP LENGTH:

CURTAILMENT	GRADE OF CONCRETE (M35)	10mm	12mm	16mm	20mm	25mm	32mm
< 25%	37φ	370	445	595	740	925	1185
> 25% & < 33%	42φ	420	505	675	840	1050	1345
> 33% & < 50%	52φ	520	625	835	1040	1300	1675

φ = DIA OF BAR

SCHEDULE OF REINFORCEMENT

BAR MARK	DIA OF BAR	SHAPE	SPACING/NOS	REMARKS
01	H32	1200	43 NOS	ACROSS TRAFFIC
02	H32	1200	43 NOS	ALONG TRAFFIC
03	H16	1200	43 NOS	ACROSS TRAFFIC
04	H16	1200	43 NOS	ALONG TRAFFIC
05	H12	280 c/c	20 LEGGED STIRRUPS	
06	H12	280 c/c	20 LEGGED STIRRUPS	
07	H12	600 (PLAN)	150 c/c	ON SIDE FACES (ALL AROUND)
11	H32		24 NOS	-
11a	H32		12 NOS	-
12	H10		150 PITCH	HELICAL
13	H16	300	1500 c/c	-
14	H16	300	2 NOS	-
15	H16		2X2=4 NOS	WELDED TO PILE R/F

NOTE: BAR MARK (08) TO (10) NOT USED

REVIEWED

Bridge/Structural Engineer  
Feedback Infra  
NH-216, (Raigarh)

not more than 50% bars to be curtailed at one location in pile.

Feedback Infra Pvt. Ltd.  
Gurgaon  
24-11-19

REV.	DATE	DESCRIPTION	DESIGNED	CHECKED	APPROVED
P3	26/02/19	PILE DEPTH REVISED (30.00M) AS PER MOM	DS	GA	JP
P2	14/03/16	HBS TO AE COVERT & PILE CAPACITY CHANGE	QMS	YJC	NOP
P1	04/03/16	ERA TO HBS CONVERT	QMS	YJC	NOP
P0	01/03/16	FOR REVIEW	QMS	YJC	NOP
MAK	ISSUED	DESCRIPTION	DEALT	CHECKED	APPROVED

REVISIONS

CLIENT:

MORTH

(Ministry of Road, Transport & Highways)  
NHDP-IV A CELL,  
State PWD Chhattisgarh

AUTHORITY ENGINEER:

FEEDBACK INFRA

Feedback Infra Private Limited  
15TH Floor, DLF Building 9B,  
DLF Cyber city, DLF Phase-2,  
Sector-25, Gurgaon, HARYANA,  
Pin-122002

PROJECT CONSULTANT:

HBS INFRA ENGINEERS

INDIA PVT. LTD  
Flat no. 102, Plot no. 8 to 11  
fortune chambers, Madhapura  
HYDERABAD

SAFETY CONSULTANT

Vasuprada

Consultants LLP  
Flat C-11, CEL  
Apartments,  
Vasundhara Enclave,  
New Delhi 110 096

DESIGN DIRECTOR:

J.P. MAJUMDAR

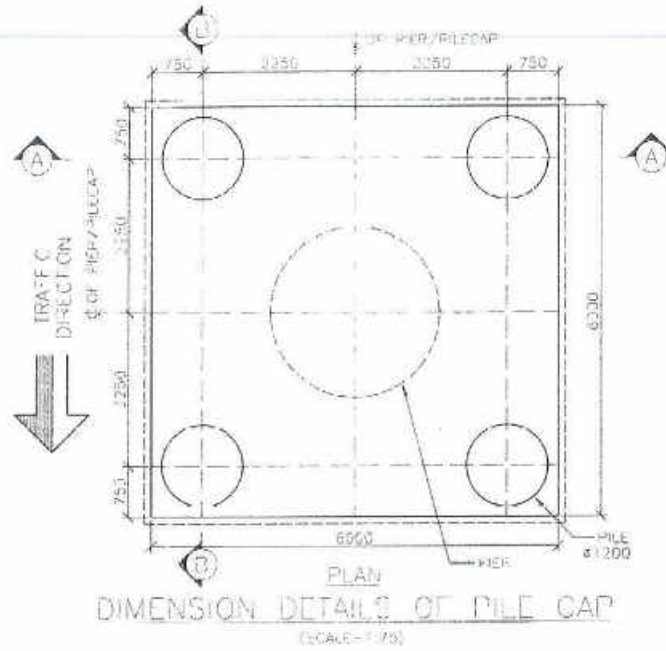
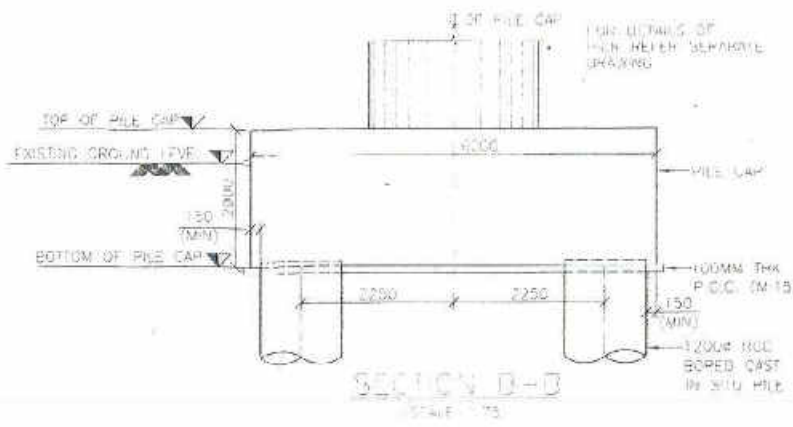
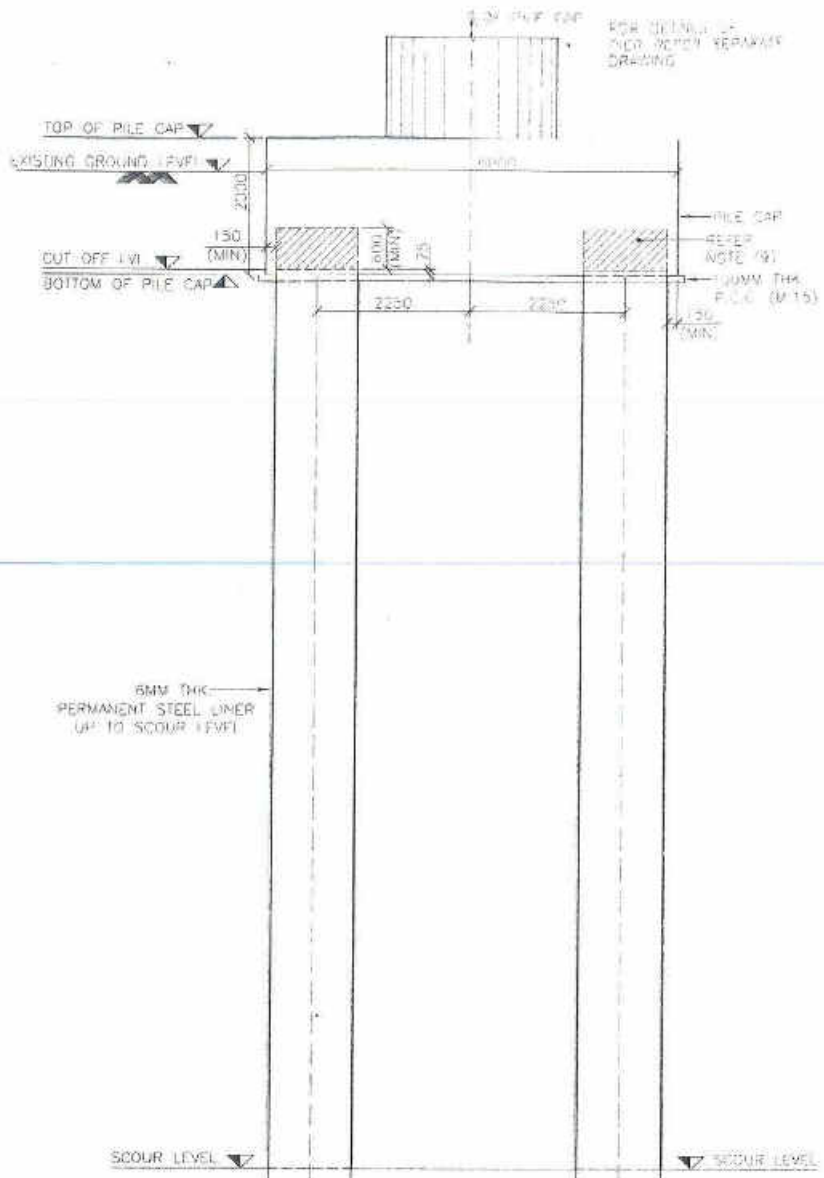
ERA INFRA  
ENGINEERING LTD  
C-56/41, SECTOR -42  
NOIDA 201303

CONSULTANT:	NAME OF PROJECT:
SPECTRUM Techno Consultants Pvt Ltd. 401, 4th Floor, Raikar Bhawan, Plot No 9, Sector 17, Vashi, Navi Mumbai, Maharashtra.	Rehabilitation & upgradation of NH-216 from km.3.800 to 90.460 (Raigarh-Saraipalli Section) in the State of Chhattisgarh to two-lanes with paved shoulders under NHDP-IV.

DRAWING TITLE:	NUMERATION DETAILS OF PILE & PILECAP (GROUP-IVA) FOR MAJOR BRIDGE AT D. CH:28+400
DRAWING NUMBER:	STCPL_564_3000_34 (SHEET 2 OF 2)
DRAWN	DESIGNED
Dhyana	Gaurav
CHECKED	APPROVED
JP Majumdar	JP Majumdar



1 copy



- NOTES**
1. ALL DIMENSIONS ARE IN MILLIMETER. ALL LEVELS ARE IN M+RL.
  2. DO NOT SCALE THIS DRAWING. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
  3. **MATERIALS**
  4. CONCRETE GRADE CONFIRMING TO IS 112:2011.
  5. PILE, PILE CAP: M-40.
  6. REINFORCEMENT: Fe-50S CONFORMING TO IS 1786.
  7. CLEAR COVER TO REINFORCEMENT: PILE, PILE CAP: 75mm.
  8. (a) FOR LAP LENGTH OF THE BARS REFER TABLE.
  9. (b) NOT MORE THAN 50% OF BARS SHALL BE LAPPED AT ANY LOCATION AND THE LAPS SHOULD BE STAGGERED.
  10. WHEREVER TOTAL NO. OF BARS ARE SPECIFIED THEY ARE TO BE SPACED UNIFORMLY, UNLESS MENTIONED OTHERWISE.
  11. COVER BLOCKS SHALL BE ATTACHED TO THE REINFORCEMENT LAGE SO AS TO MAINTAIN APPROPRIATE COVER FROM THE FACE OF THE BORE HOLE. CONCRETE GRADE OF COVER BLOCKS SHALL BE M-40.
  12. THE PILE SHOULD PROJECT 75 MM IN TO THE CAP CONCRETE.
  13. PILE SHALL BE CAST 600mm (MIN) ABOVE CUT-OFF LEVEL AND THE PORTION ABOVE CUT-OFF LEVEL SHALL BE CHISELED AWAY 7 DAYS OF PILE CASTING & BEFORE CASTING OF PILE CAP.
  14. IN CASE THE PILE ABOVE CUT-OFF LEVEL IS NOT REMOVED BEFORE SETTING OF PILE CONCRETE THEN A 40mm DEEP GROOVE SHALL BE MADE ALL AROUND THE PILE AT THE REQUIRED CUT-OFF LEVEL.
  15. FOR UP-TO-10% BORE HOLE DATA AND LOCATION, PLEASE REFER SOIL INVESTIGATION REPORT.
  16. THE DESIGN OF PILE FOUNDATION IS BASED ON THE SOIL INVESTIGATION REPORT. THE SOIL DATA DURING BORING OF PILE SHALL BE CONFIRMED WITH RESPECTIVE BORE HOLE DATA OF SOIL INVESTIGATION REPORT. AND IF ANY DISCREPANCY IS OBSERVED, THE SAME SHALL BE IMMEDIATELY REPORTED TO ENGINEER BEFORE CONCRETING OF THE PILE.
  17. THE PERTECHNICAL CAPACITY OF PILE CONSIDERED FOR DESIGN IS 525t & THE SAME SHALL BE CONFIRMED BY SITUATED TESTS ON SITE.
  18. THE IS SHOWN AND AS PER SURVEY DATA, THE PILE SHALL BE VERIFIED BEFORE EXECUTION. IF ANY VARIATION FOUND IN THE ALL THE OTHER LEVELS SHALL BE MODIFIED ACCORDINGLY.
  19. PERMISSIBLE INTERFACES FOR PILE SHALL BE:
    - a. SHIFT NOT TO EXCEED 75 MM AT PILING PLATFORM LEVEL.
    - b. BUT NOT TO EXCEED 1 IN 150.
 HOWEVER THE SHIFT AS MEASURED MUST BE REFERRED BACK TO DESIGN OFFICE. THE DESIGN & DRAWING FOR PILE/PILE CAP MUST BE REVISED.
  20. PERMANENT STEEL LINER SHALL BE PROVIDED AS PER IS 112:2011 UP TO SCOUR DEPTH.

- REFERENCES (LATEST REVISION)**
1. STCPL\_564\_3000\_25 - NUMERATION DETAILS OF PIER & PIERCAP (GROUP -I) FOR MAJOR BRIDGE AT D. CH-28+400.
  2. STCPL\_564\_3000\_27 - REINFORCEMENT DETAILS OF PIER & PIERCAP (GROUP-II) FOR MAJOR BRIDGE AT D. CH-28+400.

**TABLE OF LEVELS FOR GROUP-IIA - P37-P41**

PIER LOCATION	GROUND LEVEL	TOP OF PILE CAP	BOTTOM OF PILE CAP	PILE CUTOFF LEVEL	SCOUR LEVEL	PILE TIP LEVEL
P37	195.848	195.348	193.348	193.423	182.703	163.348
P38	193.598	193.098	191.098	191.173	180.463	161.098
P39	193.878	193.378	191.378	191.453	180.143	161.378
P40	194.598	194.098	192.098	192.173	181.503	162.098
P41	195.000	194.500	192.500	192.575	178.155	162.500

176.762  
176.762  
176.956  
177.551  
182.823

DESIGN LOAD FOR PILE CAPACITY

LOAD CASE	VERTICAL LOAD * (t)	LATERAL LOAD (t)
NORMAL	400.0	7.8
WIND	400.0	10.1
SEISMIC	455.0	30.0

\* EXCLUDING SELF WEIGHT OF PILE

**REVIEWED**

*Rama*  
Bridge/Structural Engineer  
Feedback Infra  
NH-216, (Raigarh)

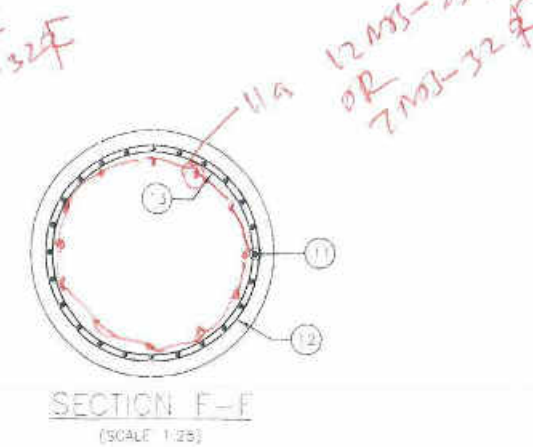
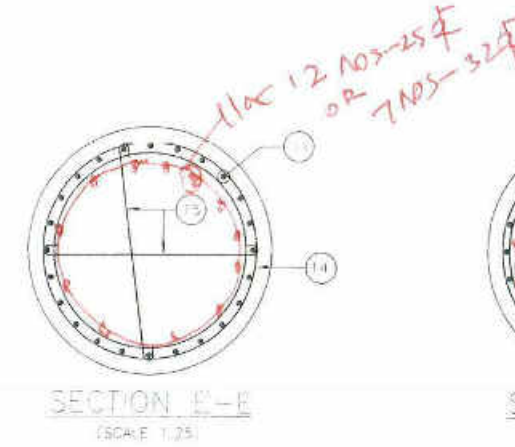
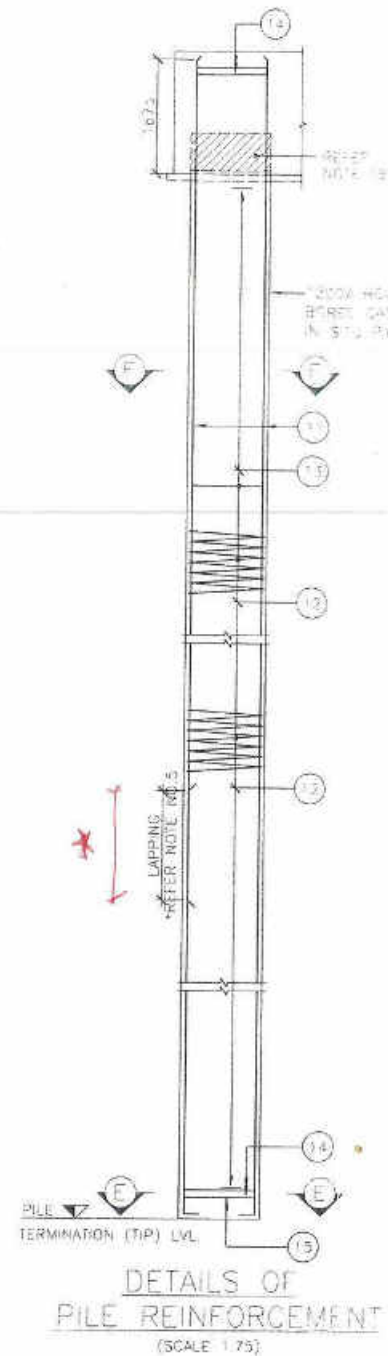
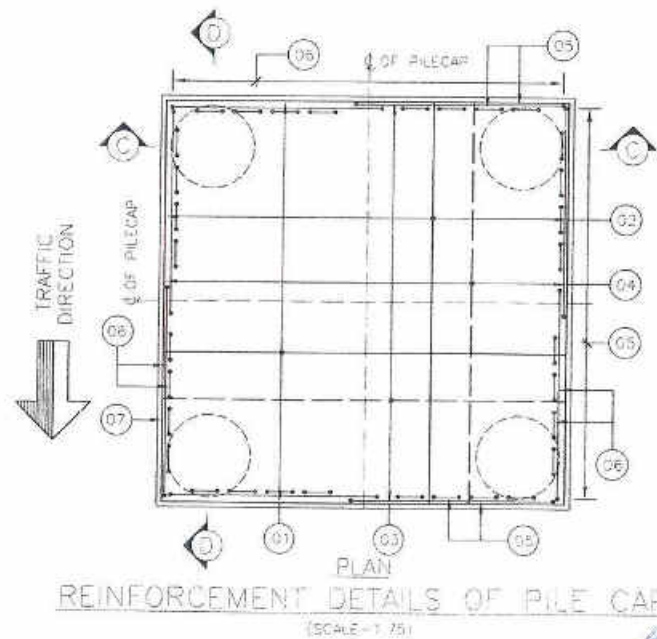
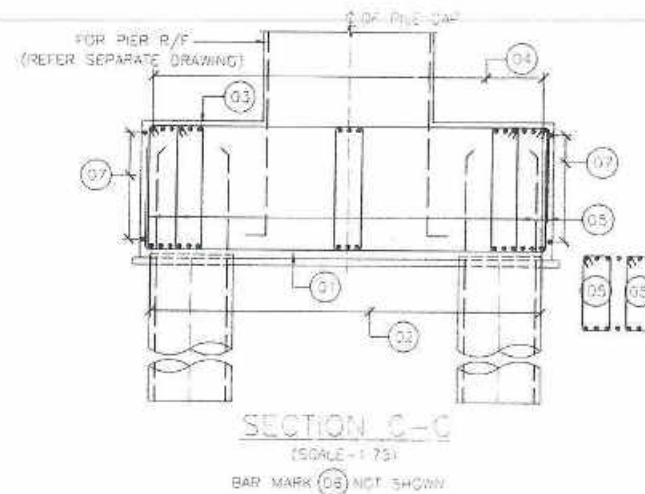
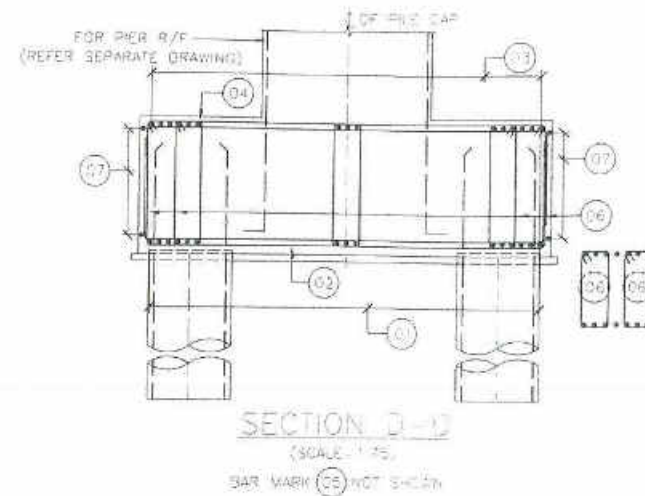
Any work you to be checked at site pile termination level / pile length shall not be checked at site

REV	DATE	DESCRIPTION	BY	CHECKED	APPROVED	REVISIONS
P1	18/01/18	PILE CAP & BORED PILE (3000) AS PER ROW (A)ED	OS	OS	JP	
P2	18/02/18	WBS TO 4E CONERT & PILE CAPACITY CHOICE	OS	OS	JP	
P3	05/02/18	ERA 05 HRS CHOICE	OS	OS	JP	
P4	01/02/18	FOR APPROVAL	OS	OS	JP	

CLIENT	AUTHORITY ENGINEER	SAFETY CONSULTANT	DESIGN DIRECTOR	DESIGN & ENGINEERING DIVISION	CONSULTANT	NAME OF PROJECT	DRAWING TITLE	REV
MORTH	FEEDBACK INFRA	Vasuprade	JP MAJUMDAR	ERA INFRA ENGINEERING LTD	SPECTRUM	Rehabilitation & upgradation of NH-216 from Km.1.800 to 90.460 (Raigarh-Saraipalli Section) in the State of Chhattisgarh to two-lanes with paved shoulders under NHDP-IV.	NUMERATION DETAILS OF PILE & PILECAP (GROUP-IIA) FOR MAJOR BRIDGE AT D. CH-28+400	R0
Ministry of Road, Transport & Highways	Feedback Infra Private Limited 15TH Floor, DLF Building 9B, DLF Cyber city, DLF Phase-2, Saket, New Delhi, India Pin-110002	Flat C-11, CEL Apartments, Vasundhara Enclave, New Delhi 110035	ERA INFRA ENGINEERING LTD C-5641, SECTOR-42, HOIDA 201003	ERA INFRA ENGINEERING LIMITED ANISO-1001, 1003 & C-5641, 18001 (Central Office) Road Off. C-5641, SECTOR- 62, HOIDA 201003 Tel: 01123415688, 01123415689	401, 4th Floor, Raigarh, Chhattisgarh Sector 17, Vasni, Near Mumbai, Maharashtra Sector 17, Vasni, Near Mumbai, Maharashtra		SCALE: As Shown	





LAP LENGTH

CURTAINMENT	GRADE OF CONCRETE (M35)	10mm	12mm	16mm	20mm	25mm	32mm
< 25%	37d	370	445	595	740	925	1185
> 25% & < 33%	48d	420	505	675	840	1050	1345
> 33% & < 50%	52d	520	625	835	1040	1300	1675

d = DIA OF BAR

SCHEDULE OF REINFORCEMENT

BAR MARK	DIA OF BAR	SHAPE	SPACING/NOS	REMARKS
01	H32	H200	43 NOS	ACROSS TRAFFIC
02	H32	H200	43 NOS	ALONG TRAFFIC
03	H16	H200	43 NOS	ACROSS TRAFFIC
04	H16	H200	43 NOS	ALONG TRAFFIC
05	H12	280 c/c	20 LEGGED STIRRUPS	
06	H12	280 c/c	20 LEGGED STIRRUPS	
07	H12	500 (PLAN)	150 c/c	ON SIDE FACES (ALL AROUND)
08	H32		24 NOS	
09	H10		150 PITCH	HELICAL
10	H16		1500 c/c	
11	H16		2 NOS	
12	H16		2X2=4 NOS	WELDED TO PILE R/F

NOTE: BAR MARK (08) TO (10) NOT USED

\* 100% Curtailment not allowed as per note 56

11a- 12 NOS-25#  
OR 7 NOS-32#

**REVIEWED**

*[Signature]*  
Bridge/Structural Engineer  
Feedback Infra  
NH-216, (Raigarh)

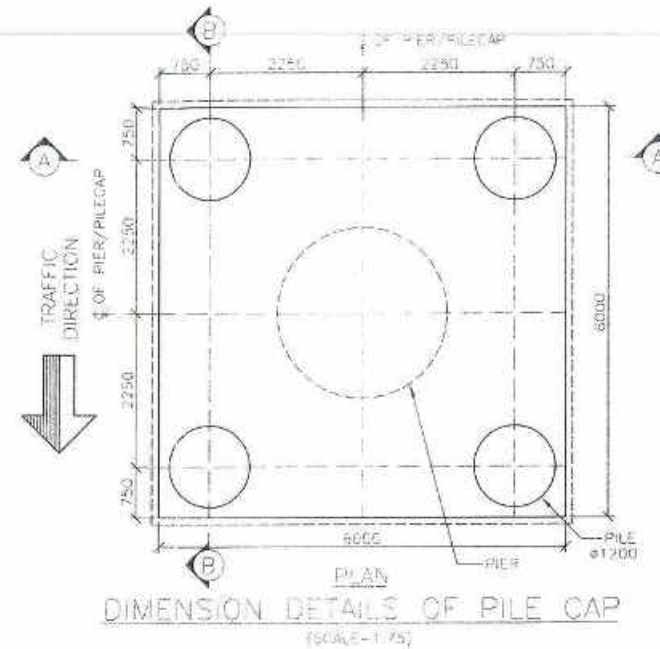
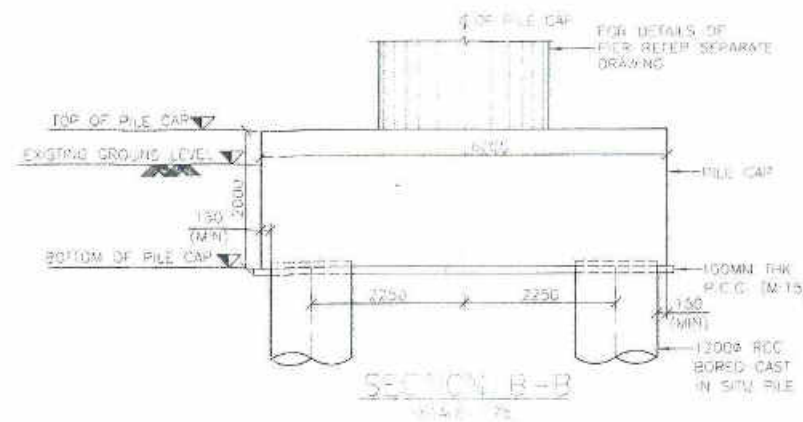
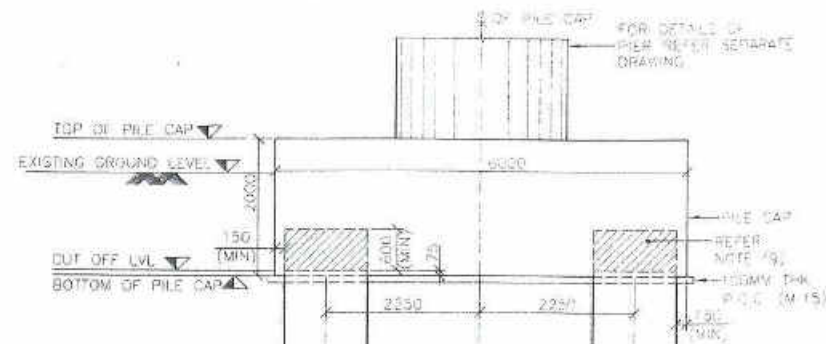


REV	DATE	DESCRIPTION	BY	CHECKED	APPROVED
01	15/01/19	PILE DEPTH REVISED (30.00M) AS PER MWD (REQD 35.00M)	MS	HC	20P
02	14/03/19	HRS TO AE COVERT & PILE CAPACITY CHANGE	MS	HC	20P
03	04/03/19	ERA TO HRS COVERT	MS	HC	20P
04	01/03/19	FOR APPROVAL	MS	HC	20P

CLIENT	AUTHORITY ENGINEER	SAFETY CONSULTANT	DESIGN DIRECTOR	EPC CONTRACTOR	CONSULTANT	NAME OF PROJECT	DRAWING TITLE	REV
<b>MORTH</b> (Ministry of Road, Transport & Highways) <b>NHDP-IV A CELL</b> State PWD Chhattisgarh	<b>FEEDBACK INFRA</b> Feedback Infra Private Limited 15TH Floor, DLF Building 9B, DLF Cyber City, DLF Phase-2, Sector-25 Gurgaon, HARYANA, Pin-122002	<b>Vasuprade</b> CHANDRASEKHAR LAL Flat C-11, CBI Apartments, II Vasundhara Enclave, New Delhi 110 065	<b>J.P. MAJUMDAR</b> ERA INFRA ENGINEERING LTD C-55/41, SECTOR-62, NOIDA 201303	<b>ERA</b> ERA INFRA ENGINEERING LIMITED An ISO 9001:2001 & OHSAS 18001 Certified Company Head Office - C-6/41, SECTOR-62, NOIDA 201303 Tel: 912041-5009 TO 4145036	<b>SPECTRUM</b> Techno Consultants Pvt. Ltd. 601, 4th Floor, Raktak Bhawan, Plot No 2, Sector 17, Vashi, Near Mumbai, Maharashtra	<b>Rehabilitation &amp; upgradation of NH-216 from km.3.800 to 90.460 (Raigarh-Saraipalli Section) in the State of Chhattisgarh to two-lanes with paved shoulders under NHDP-IV.</b>	<b>NUMERATION DETAILS OF PILE &amp; PILECAP (GROUP-1A) FOR MAJOR BRIDGE AT D. CH-28+400</b>	<b>R0</b>
DRAWING NUMBER: <b>STCPL_564_3000_28A (SHEET 2 OF 2)</b>							SCALE: A2	As Shown
DRAWN: <i>[Signature]</i>		DESIGNED: <i>[Signature]</i>		CHECKED: <i>[Signature]</i>		APPROVED: <i>[Signature]</i>		
Chyapal		Gururaj		JP Majumdar		JP Majumdar		





PIER LOCATION	GROUND LEVEL	TOP OF PILE CAP	BOTTOM OF PILE CAP	PILE CUTOFF LEVEL	SCOUR LEVEL	PILE TIP LEVEL
P37	195.848	195.348	193.348	193.423	182.703	183.348
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P41	195.000	194.500	192.500	192.575	178.155	182.500

176.762  
176.762  
176.762  
177.551  
182.823

- NOTES**
- ALL DIMENSIONS ARE IN MILLIMETER. ALL LEVELS ARE IN METER.
  - DO NOT SCALE THIS DRAWING. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
  - MATERIALS**
    - CONCRETE GRADE CONFORMING TO IS: 112-2011
    - PILE, PILE CAP: M-35
    - REINFORCEMENT: Fe-415 CONFORMING TO IS: 1786
    - CLEAR COVER TO REINFORCEMENT: PILE, PILE CAP: 75mm
  - (a) FOR LAP LENGTH OF THE BARS REFER TABLE (b) NOT MORE THAN 50% OF BARS SHALL BE LAPPED AT ANY LOCATION AND THE LAPS SHOULD BE STAGGERED.
  - WHEREVER TOTAL NO. OF BARS ARE SPECIFIED, THEY ARE TO BE SPACED UNIFORMLY, UNLESS MENTIONED OTHERWISE.
  - COVER BLOCKS SHALL BE ATTACHED TO THE REINFORCEMENT CASE SO AS TO MAINTAIN APPROPRIATE COVER FROM THE FACE OF THE BORE HOLE. CONCRETE GRADE OF COVER BLOCKS SHALL BE M-35.
  - THE PILE SHOULD PROJECT 15 MM IN TO THE CAP CONCRETE.
  - PILE SHALL BE CAST 600MM (MIN) ABOVE CUT-OFF LEVEL AND THE PORTION ABOVE CUT-OFF LEVEL SHALL BE CHISELED OFF AFTER 7 DAYS OF PILE CASTING & BEFORE CASTING OF PILE CAP.
  - IN CASE THE PILE ABOVE CUT-OFF LEVEL IS NOT REMOVED BEFORE SETTING OF PILE CONCRETE, THEN A 40mm DEEP GROOVE SHALL BE MADE ALL AROUND THE PILE AT THE REQUIRED CUT-OFF LEVEL.
  - FOR DETAILS OF BORE HOLE DATA AND LOCATION, PLEASE REFER SOIL INVESTIGATION REPORT.
  - THE DESIGN OF PILE FOUNDATION IS BASED ON THE SOIL INVESTIGATION REPORT. THE SOIL DATA DURING BORING OF PILE SHALL BE CONFIRMED WITH RESPECTIVE BORE HOLE DATA OF SOIL INVESTIGATION REPORT AND IF ANY DISCREPANCY IS OBSERVED, THE SAME SHALL BE IMMEDIATELY REPORTED TO ENGINEER BEFORE CONCRETING OF THE PILE.
  - THE GEOTECHNICAL CAPACITY OF PILE CONSIDERED FOR DESIGN IS 525T & THE SAME SHALL BE CONFIRMED BY SUITABLE TESTS ON SITE.
  - THE GL SHOWN ARE AS PER SURVEY DETAILS. THE SAME SHALL BE VERIFIED BEFORE EXECUTION. IF ANY VARIATION FOUND IN THE GL, THE OTHER LEVELS SHALL BE MODIFIED ACCORDINGLY.
  - PERMISSIBLE TOLERANCES FOR PILE SHALL BE:
    - a. SHIFT NOT TO EXCEED 75 MM AT PILING PLATFORM LEVEL.
    - b. TILT NOT TO EXCEED 1 IN 150.
 HOWEVER TILT & SHIFT AS MEASURED MUST BE REFERRED BACK TO DESIGN OFFICE. THE DESIGN & DRAWING FOR PILE/PILE CAP MUST BE REVISED.
  - PERMANENT STEEL LINER SHALL BE PROVIDED AS PER IS: 808-1 & UP TO SCOUR DEPTH.

#### REFERENCES (LATEST REVISION)

- STCPL\_564\_3000\_26 - NUMERATION DETAILS OF PIER & PILECAP (GROUP-B) FOR MAJOR BRIDGE AT D. CH 28+400
- STCPL\_564\_3000\_27 - REINFORCEMENT DETAILS OF PIER & PILECAP (GROUP-B) FOR MAJOR BRIDGE AT D. CH 28+400

#### DESIGN LOAD FOR PILE CAPACITY

LOAD CASE	VERTICAL LOAD* (T)	LATERAL LOAD (T)
NORMAL	400.0	7.8
WIND	480.0	16.1
SEISMIC	455.0	30.0

\* EXCLUDING SELF WEIGHT OF PILE

**REVIEWED**

*Signature*  
Bridge/Structural Engineer  
Feedback Infra  
NH-216, (Raigarh)

Any work  
to be  
checked at site  
pile termination  
level / pile length  
shall not be checked  
at site

**Feedback Infra Pvt. Ltd.**  
Gurugram

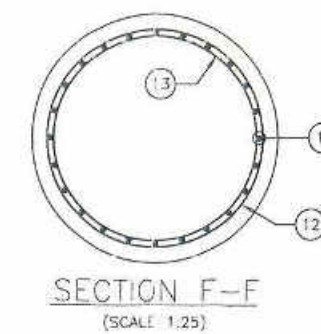
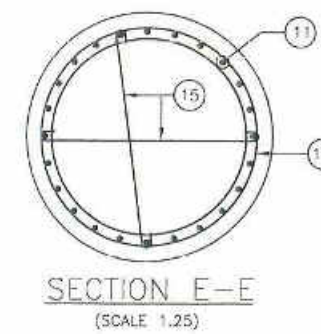
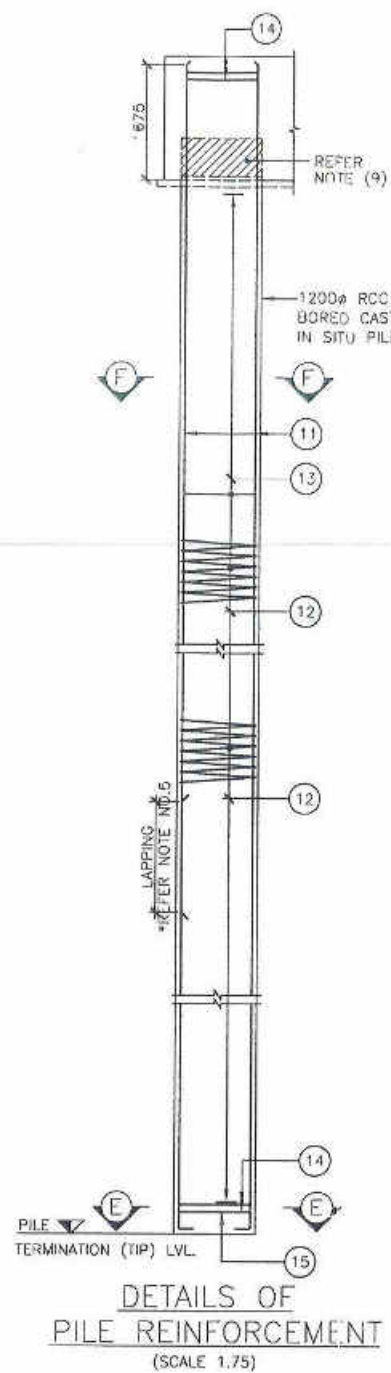
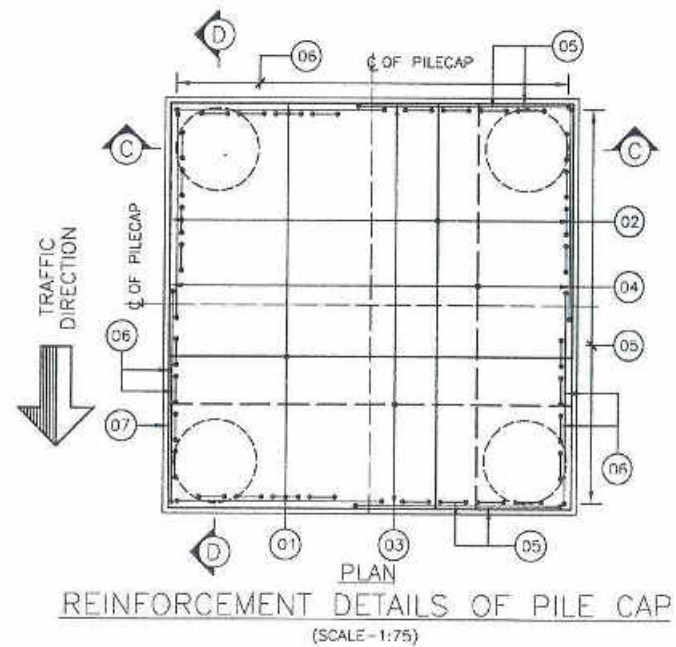
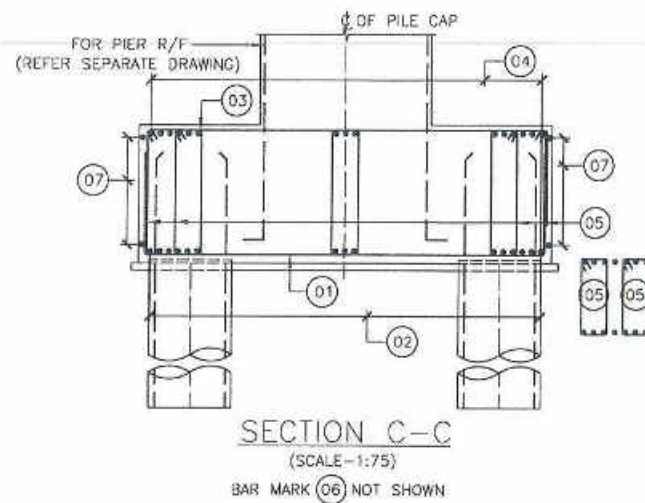
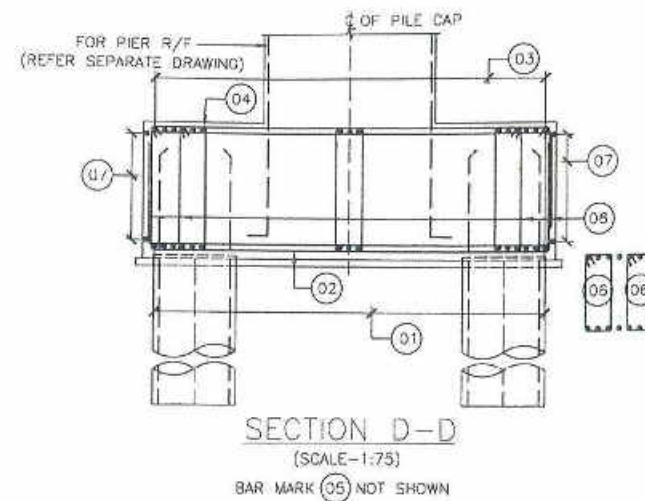
**Feedback Infra Pvt. Ltd.**  
Gurugram

**Feedback Infra Pvt. Ltd.**  
Gurugram

**Feedback Infra Pvt. Ltd.**  
Gurugram

REV	DESCRIPTION	DATE	BY	CHECKED	APPROVED
01	PIE DEPTH (1000-13000) AS PER ROW DATA	05.08.2019	BS	CA	JP
02	REV TO 41 CONFR & PILE CAPACITY CHANGE	09.08.2019	DPS	SC	JP
03	REV TO 1000 CONFR	09.08.2019	SCB	SC	JP
04	FOR APPROV	09.08.2019	SCB	SC	JP





LAP LENGTH:

CURTAILMENT	GRADE OF CONCRETE (M35)	10mm	12mm	16mm	20mm	25mm	32mm
< 25%	37#	370	445	595	740	925	1185
> 25% & < 33%	42#	420	505	675	840	1050	1345
> 33% & < 50%	52#	520	625	835	1040	1300	1675

Ø = DIA OF BAR

SCHEDULE OF REINFORCEMENT

BAR MARK	DIA OF BAR	SHAPE	SPACING/NOS	REMARKS
01	H32	J1200	43 NOS	ACROSS TRAFFIC
02	H32	J1200	43 NOS	ALONG TRAFFIC
03	H16	J1200	43 NOS	ACROSS TRAFFIC
04	H16	J1200	43 NOS	ALONG TRAFFIC
05	H12	280 c/c	20 LEGGED STIRRUPS	
06	H12	280 c/c	20 LEGGED STIRRUPS	
07	H12	600 (PLAN)	150 c/c	ON SIDE FACES (ALL AROUND)
11	H32	24 NOS		
12	H10	150 PITCH		HELICAL
13	H16	1500 c/c		
14	H16	2 NOS		
15	H16	2X2=4 NOS		WELDED TO PILE R/F

NOTE: BAR MARK (08) TO (10) NOT USED

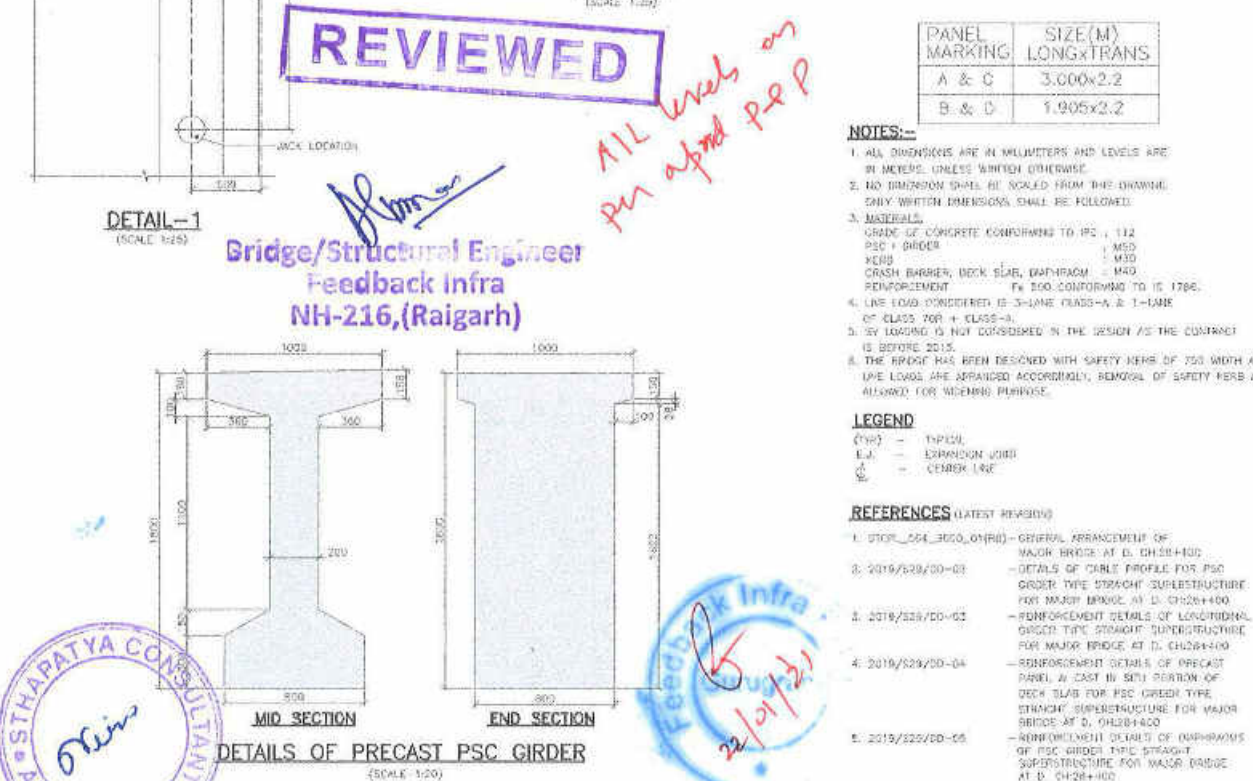
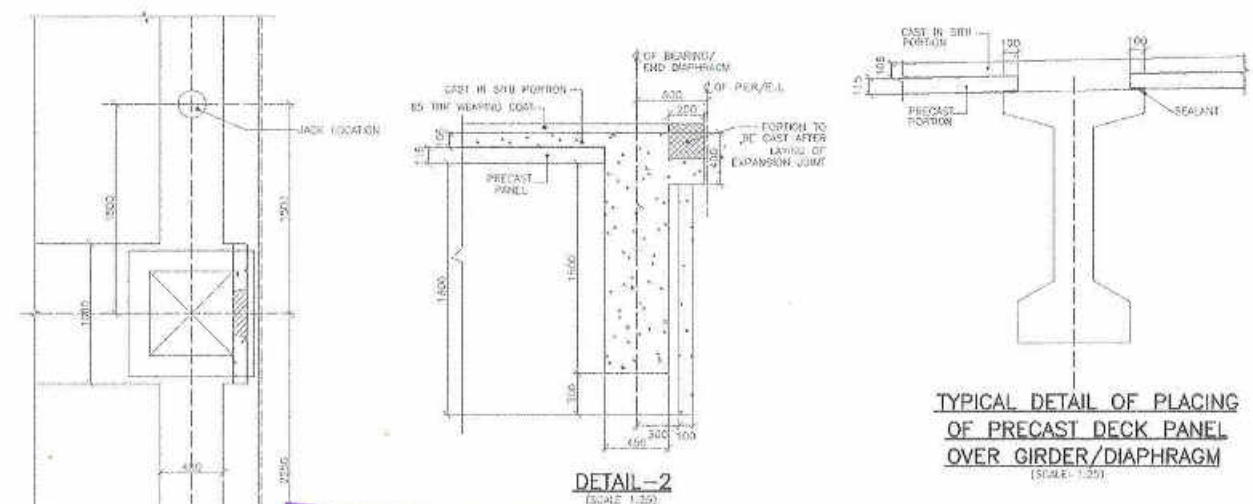
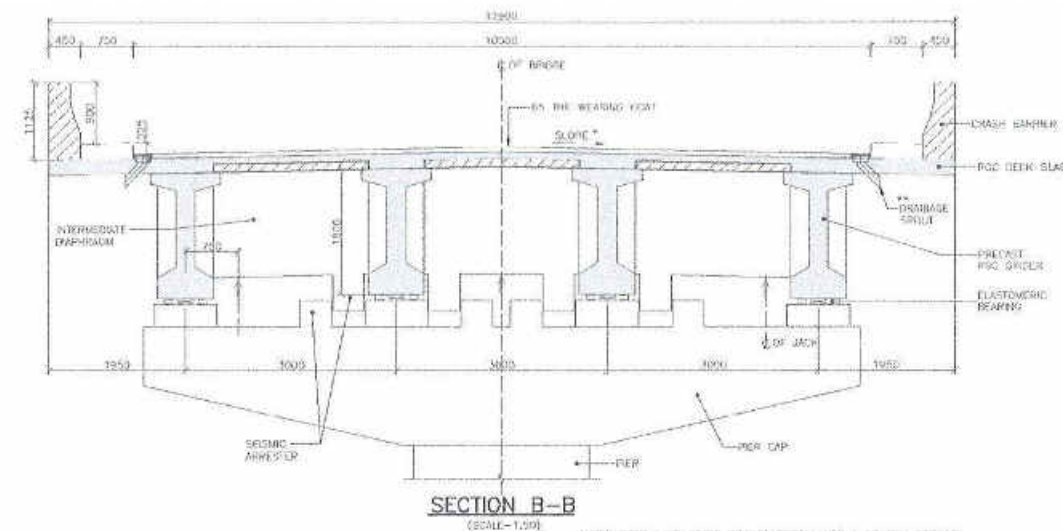
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Bridge/Structural Engineer  
Feedback Infra  
NH-216, (Raigarh)



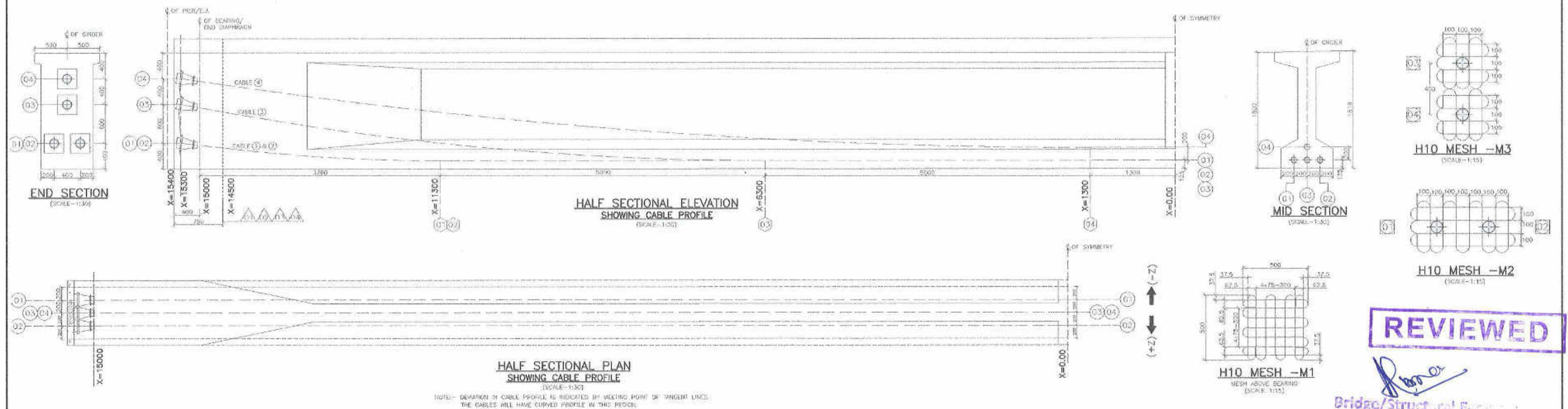
<div>REVISIONS</div> <table><thead><tr><th>NO</th><th>DATE</th><th>DESCRIPTION</th><th>BY</th><th>CHKD</th><th>APPD</th></tr></thead><tbody><tr><td>P3</td><td>22/03/19</td><td>PILE DEPTH REVISED (30.00M) AS PER VOM DATED 05.02.2018</td><td>DS</td><td>GA</td><td>JP</td></tr><tr><td>P2</td><td>14/03/19</td><td>HBS TO AF CONVERT &amp; PILE CAPACITY CHANGE</td><td>QMS</td><td>YJC</td><td>NBP</td></tr><tr><td>P1</td><td>04/03/18</td><td>ERA TO HBS CONVERT</td><td>QMS</td><td>YJC</td><td>NBP</td></tr><tr><td>RD</td><td>07/03/16</td><td>FOR APPROVAL</td><td>QMS</td><td>YJC</td><td>NBP</td></tr><tr><td>WRO</td><td>ISSUED</td><td>DESCRIPTION</td><td>RDNT</td><td>CHECKED</td><td>APPROVED</td></tr></tbody></table>						NO	DATE	DESCRIPTION	BY	CHKD	APPD	P3	22/03/19	PILE DEPTH REVISED (30.00M) AS PER VOM DATED 05.02.2018	DS	GA	JP	P2	14/03/19	HBS TO AF CONVERT & PILE CAPACITY CHANGE	QMS	YJC	NBP	P1	04/03/18	ERA TO HBS CONVERT	QMS	YJC	NBP	RD	07/03/16	FOR APPROVAL	QMS	YJC	NBP	WRO	ISSUED	DESCRIPTION	RDNT	CHECKED	APPROVED	<div>CLIENT:</div> <div><b>MORTH</b></div> <div>(Ministry of Road, Transport &amp; Highways)</div> <div><b>NHDP-IV A CELL</b></div> <div>State PWD Chhattisgarh</div>		<div>AUTHORITY ENGINEER:</div> <div><b>FEEDBACK INFRA</b></div> <div>Feedback Infra Private Limited</div> <div>15TH Floor, DLF Building 90,</div> <div>DLF Cyber City, DLF Phase-2,</div> <div>Sector-25, Gurgaon, HARYANA</div> <div>Pin-122002</div>		<div>PROOF CONSULTANT:</div> <div><b>HBS INFRA ENGINEERS INDIA PVT. LTD</b></div> <div>Flat no.102, Plot no. 8 to 11</div> <div>fortune chambers, Madhapur,</div> <div>HYDERABAD</div>		<div>SAFETY CONSULTANT:</div> <div><b>Vasuprada consultants LLP</b></div> <div>Flat C-11, CEL Apartments,</div> <div>Vasundhara Enclave,</div> <div>New Delhi 110 096</div>		<div>DESIGN DIRECTOR:</div> <div><b>ERA</b> <i>Design is difference</i></div> <div>DESIGN &amp; ENGINEERING DIVISION</div> <div>ERA INFRA ENGINEERING LIMITED</div> <div>An ISO 9001, 14001 &amp; OHSAS 18001 Certified Company</div> <div>Head Off. : C-5/41, SECTOR-42, NOIDA 201303</div> <div>Tel. : 0120-411-5090 TO 4149036</div>		<div>EPC CONTRACTOR:</div> <div><b>ERA</b> <i>Design is difference</i></div> <div>DESIGN &amp; ENGINEERING DIVISION</div> <div>ERA INFRA ENGINEERING LIMITED</div> <div>An ISO 9001, 14001 &amp; OHSAS 18001 Certified Company</div> <div>Head Off. : C-5/41, SECTOR-42, NOIDA 201303</div> <div>Tel. : 0120-411-5090 TO 4149036</div>		<div>CONSULTANT:</div> <div><b>SPECTRUM</b> Techno Consultants Pvt Ltd.</div> <div>401, 4th Floor, Rakar Bhawan, Plot No 9,</div> <div>Sector 17, Vashi, Navi Mumbai, Maharashtra</div>		<div>NAME OF PROJECT:</div> <div><b>Rehabilitation &amp; upgradation of NH-216 from km.3.800 to 90.460 (Raigarh-Saraipalli Section) in the State of Chhattisgarh to two-lanes with paved shoulders under NHDP-IV.</b></div>		<div>DRAWING TITLE:</div> <div>NUMERATION DETAILS OF PILE &amp; PILECAP (GROUP-IIB) FOR MAJOR BRIDGE AT D. CH:28+400</div> <div>REV. <b>R0</b></div>	
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RD	07/03/16	FOR APPROVAL	QMS	YJC	NBP																																																						
WRO	ISSUED	DESCRIPTION	RDNT	CHECKED	APPROVED																																																						
<div>DRAWING NUMBER:</div> <div>STCPL_564_3000_28B (SHEET 2 OF 2)</div> <div>SCALE: As Shown</div>										<div>DRAWN</div> <div> Dhyanesh</div>		<div>DESIGNED</div> <div> Gaurav</div>		<div>CHECKED</div> <div>JP Majumdar</div>		<div>APPROVED</div> <div>JP Majumdar</div>																																											





23.01.20	RI	OBSERVATIONS OF ALL PREPARED DURING THE DATE 23/01/2020 INCORPORATED	APP	 <b>MORTH</b> THE MINISTRY OF ROAD TRANSPORT & HIGHWAYS, (CHHAPRA-IV A CELL), STATE PWD, CHATTISGARH	<b>CLIENT:</b>  <b>FEEDBACK INFRA</b> Feedback Infra Private Limited 15th Floor, Tower 9B, DLF Cyber City, Phase-II, Gurgaon 122002, Haryana, India	<b>AUTHORITY ENGINEER:</b>  <b>HBS INFRA ENGINEERS INDIA PVT. LTD.</b> Plot No. 12, Plot No. 8 to 11, Fortuna City, Phase-III, Gurgaon 122002, Haryana, India	<b>PROOF CONSULTANT:</b>  <b>HBS INFRA ENGINEERS INDIA PVT. LTD.</b> Plot No. 12, Plot No. 8 to 11, Fortuna City, Phase-III, Gurgaon 122002, Haryana, India	<b>SAFETY CONSULTANT:</b>  <b>Vasuprada CONSULTANTS LLP</b> Flat C-11, Cell, Apartment-II Vasundhara Enclave, New Delhi -110 095	<b>DESIGN DIRECTOR:</b> J.P. MAJUMDAR ERA Infra Engineering Limited C-56/41, Sector-62, Noida-201301	<b>EPC CONTRACTOR:</b>  <b>ERA INFRA</b> ERA INFRA ENGINEERING LIMITED C-56/41, Sector-62, Noida-201301	<b>CONSULTANT:</b>  <b>STHAPAYA</b> A-412, PUSHP BUSINESS CAMPUS VASTRAL CROSS ROAD S P RING ROAD VASTRAL, AHMEDABAD-382418	<b>NAME OF PROJECT:</b> REHABILITATION AND UPGRADEATION OF NH-276 FROM KM3+000 TO KM 96+800 (RAICHURI TO SARAPALLI SECTION) TO TWO LANES WITH PARALLEL SHOULDERS IN THE STATE OF CHHATTISGARH UNDER NHDP-IV	<b>DRAWING TITLE:</b> NUMERATION DETAILS OF PRECAST PSC GIRDER TYPE STRAIGHT SUPERSTRUCTURE FOR MAJOR BRIDGE AT CH 28+400	<b>PROJECT NO:</b> 2019/529
23.02.19	RO	FOR APPROVAL	APP									<b>DRG. NO.:</b> 2019/529/DD-01(R1)P(2)	<b>SCALE:</b> AS SHOWN	<b>REV.</b> RO
DATE	NO	REVISION	BY									DRAWN APP	CHECKED NRAY PATEL	RO





SCHEDULE OF CABLE CO-ORDINATES IN MM

CABLE NO.	X = 15300	X = 15000	X = 14500	X = 14000	X = 13000	X = 12000	X = 11000	X = 10000	X = 9000	X = 8000	X = 7000	X = 6000	X = 5000	X = 4000	X = 3000	X = 2000	X = 1000	X = 0
1	400.00	-200.00	365.28	-200.00	313.16	-200.00	254.86	-200.00	176.48	-200.00	133.73	-200.00	125.00	-200.00	125.00	-200.00	125.00	-200.00
2	400.00	+200.00	365.28	+200.00	313.16	+200.00	254.86	+200.00	176.48	+200.00	133.73	+200.00	125.00	+200.00	125.00	+200.00	125.00	+200.00
3	1000.00	0.00	946.15	0.00	885.38	0.00	769.96	0.00	613.31	0.00	478.43	0.00	359.30	0.00	273.82	0.00	204.50	0.00
4	1400.00	0.00	1356.27	0.00	1290.68	0.00	1212.17	0.00	1077.96	0.00	954.75	0.00	842.54	0.00	741.33	0.00	651.12	0.00

SCHEDULE FOR STRESS FORCE AND EXTENSION

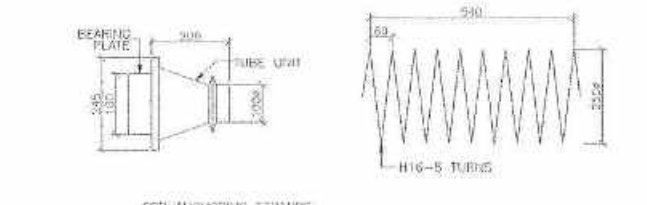
CABLE NOS	TYPE OF CABLES	TOTAL LENGTH OF CABLE (mm)	ANGLE @ ANCHORAGE DEGREES	CABLE STRESS kg/mm <sup>2</sup>	ELONGATION AT EACH END OF CABLE DURING STRESSING	ANTICIPATED SLIP OF STRANDS AFTER BLOCKING OF WEDGES (mm)	NET RESIDUAL ELONGATION AT EACH END
1	19T13	30628	6.802°	148.00	113	6	107
2	19T13	30628	6.802°	148.00	113	6	107
3	19T13	30714	10.176°	148.00	112	6	100
4	19T13	30710	8.293°	148.00	113	6	107

1. PRESUMED VALUES FOR 13.7 mm STRAND ARE  $A = 0.988 \text{ cm}^2$ ,  $E = (1.956 \pm 0.03) \times 10^5 \text{ kg/cm}^2$
2. ANTICIPATED SLIP OF STRANDS IS 6 mm. THE ACTUAL SLIP MAY VARY FROM CABLE TO CABLE. VARIATION IN SLIP UP TO  $\pm 2 \text{ mm}$  MAY BE ADJUSTED IN SUCCESSIVE CABLES.
3. ALL CABLES SHALL BE STRESSED SIMULTANEOUSLY FROM BOTH THE ENDS. DURING STRESSING OPERATION, THE SLIP AT TWO ENDS MAY DIFFER, BUT TOTAL ELONGATION AFTER SLIP AT BOTH ENDS TOGETHER SHALL NOT BE LESS THAN TOTAL NET RESIDUAL ELONGATION OF THAT CABLE.
4. IN CASE OF VARIATION IN VALUES OF A & E, THE REVISED ELONGATION SHALL BE CALCULATED AS FOLLOWS:
 
$$[\text{REVISED ELONGATION}] = \left[ \frac{\text{ELONGATION GIVEN IN DRAWING}}{E} \right] \times \left[ \frac{A}{\text{ACTUAL AREA AS PER TEST CERTIFICATE}} \right] \times \left[ \frac{1.95 \times 10^5}{\text{ACTUAL AS PER TEST CERTIFICATE}} \right]$$
5. CABLE STRESS VALUES INDICATED ARE AT WORKING END. JUCK PRESSURE SHALL BE WORKED OUT BASED ON DESIGN AREA, JUCK EFFICIENCY, ETC.

DETAILS OF CABLE (FOR G1 TO G4)

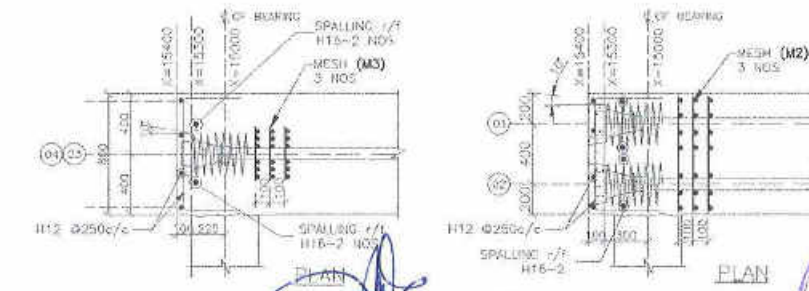
STAGE	CABLE NOS	CABLE TYPE	NO OF STRANDS			STRESSING SCHEDULE
			TOTAL CAPACITY	NOS USED	BALANCE FOR EMERGENCY	
I	1, 2	19 T 13	2 x 19 = 38	2 x 19 = 38		1. 1st STAGE STRESSING SHALL BE CARRIED OUT 21 DAYS AFTER CASTING OF ORDER OR ORDER ATTAINS MINIMUM STRENGTH OF 42.76 MPa WHICHEVER IS LATER; 2. 2nd STAGE STRESSING SHALL BE CARRIED OUT 25 DAYS AFTER CASTING OF GIRDER OR GIRDER ATTAINS MINIMUM STRENGTH OF 50 MPa WHICHEVER IS LATER.
II	3	19 T 13	1 x 19 = 19	1 x 13 = 13	03	
I	4	19 T 13	1 x 19 = 19	1 x 19 = 19		

SEQUENCE OF STRESSING = 4, 1, 2 & 3

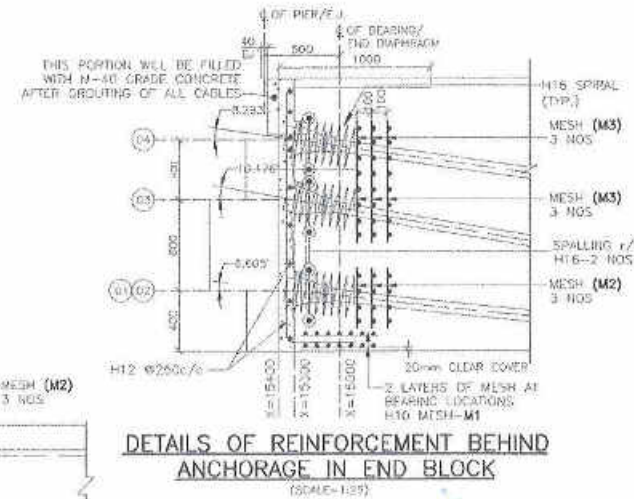


DETAIL OF CONE ANCHORAGE (19 T 13)  
(CCL/DYNAMIC TYPE OR ANY OTHER APPROVED TYPE)

(H16 DIA SPIRAL AROUND EVERY CONE ANCHORAGE)  
(ACTUAL DIMENSIONS OF CONE MAY VARY WITH THE MANUFACTURER'S SUPPLY)  
(SCALE-1:10)



DETAILS OF REINFORCEMENT BEHIND ANCHORAGE IN END BLOCK  
(SCALE-1:25)



DETAILS OF REINFORCEMENT BEHIND ANCHORAGE IN END BLOCK  
(SCALE-1:25)

NOTES :

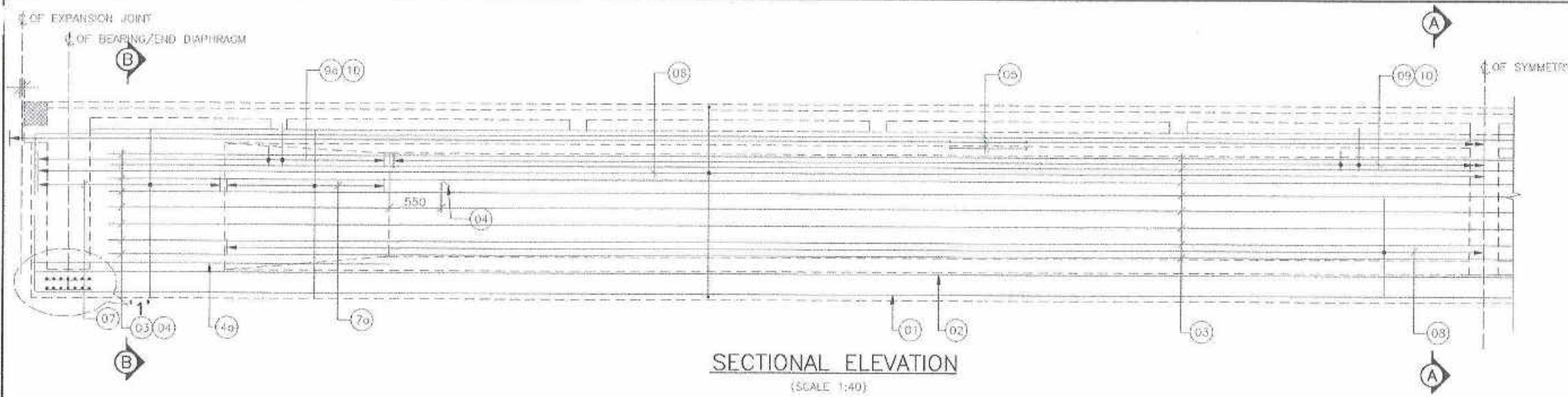
1. ALL DIMENSIONS ARE IN MILLIMETERS, UNLESS OTHERWISE SPECIFIED.
2. DIMENSIONS ARE NOT TO BE SCALED, ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
3. H.T. STEEL SHALL BE 7 PLY UNCOATED STRANDS HAVING NOMINAL DIA OF 12.7mm CONFORMING TO CLASS II OF IS-14268 AND HAVING U.T.S. (MIN) OF 1613/7 kg / STRAND.
4. THE BRACING SHALL BE MADE FROM 0.5 mm THICK (min) CORRUGATED HOPE AND HAVING I.D. OF 100mm FOR 19 T 13 CABLES.
5. CABLES SHALL BE GROUTED AS SOON AS STRESSING OF ALL STRANDS IS COMPLETED AS PER IS: 113: 2011
6. SURABLE JOINT MADE OUT BY WELDING H.Y.S.D. BARS, TO THE EXACT ORIGINATES OF CABLES, SHALL BE PLACED AT EVERY REFERENCE SECTION & AT 1.0 M INTERVAL TO FACILITATE THE EXACT POSITIONING OF CABLES.
7. ALL ORIGINATES SHALL BE MEASURED FROM THE SORT OF THE ORDER TO THE CENTER OF THE SHEATHING AT THAT POINT AND ALL DISTANCES SHALL BE MEASURED FROM CENTER LINE OF ORDER.
8. REINFORCEMENT IN END BLOCK REGION MAY BE SURABLY JOICED AT LOCATIONS WHERE IT INTERFERES WITH THE CABLES OR ANCHORAGES.
9. LOW RELAXATION PRESTRESSING STRANDS HAVING RELAXATION LOSSES AS PER IS: 112: 2011 TABLE 8.2 & 8.3 ARE CONSIDERED IN DESIGN.
10. FOLLOWING VALUES ARE CONSIDERED IN THE DESIGN - COEFFICIENT OF FRICTION ( $\mu$ ) = 0.17 MOBILE COEFFICIENT ( $\mu$ ) = 0.0024
11. ANCHORAGE SLIP OF 6MM IS ASSUMED IN THE DESIGN.
12. CABLE EXTENSIONS CALCULATED AS PER AREA OF STRAND  $0.988 \text{ cm}^2$  EXA.  $1.00 \text{ m}^2 / \text{m}^2$  ADD FOR ZERO GRIP LENGTH. THE ADDITIONAL EXTENSION DUE TO GRIP LENGTH SHALL BE ADDED SUITABLY.
13. THE CABLES ARE TO BE STRESSED FROM BOTH THE ENDS SIMULTANEOUSLY AND JACKING FORCE AT EACH END SHALL CORRESPOND TO STRESS OF 148.00 kg/mm<sup>2</sup> PER STRAND.
14. THE LENGTH OF CABLES INDICATED ARE MEASURED ALONG PROFILE BETWEEN ANCHORAGES. ADDITIONAL LENGTH REQUIRED FOR ATTACHING JACK IS TO BE ADDED IN CONSULTATION WITH SYSTEM MANUFACTURER.
15. IN CABLE NO. 3, 3 STRANDS ARE LEFT IN CASE OF SHORT FALL IN PRESTRESS OF CABLE NO. 1, 2 & 4. THE STRESSING SCHEDULE SHALL BE OBTAINED FROM DESIGN OFFICE IF NECESSARY. IF DUMMY CABLE IS NOT USED THE DUCT SHALL BE GROUTED & CLOSED BY USING GLASS PLATE.

REFERENCES (LATEST EDITION)

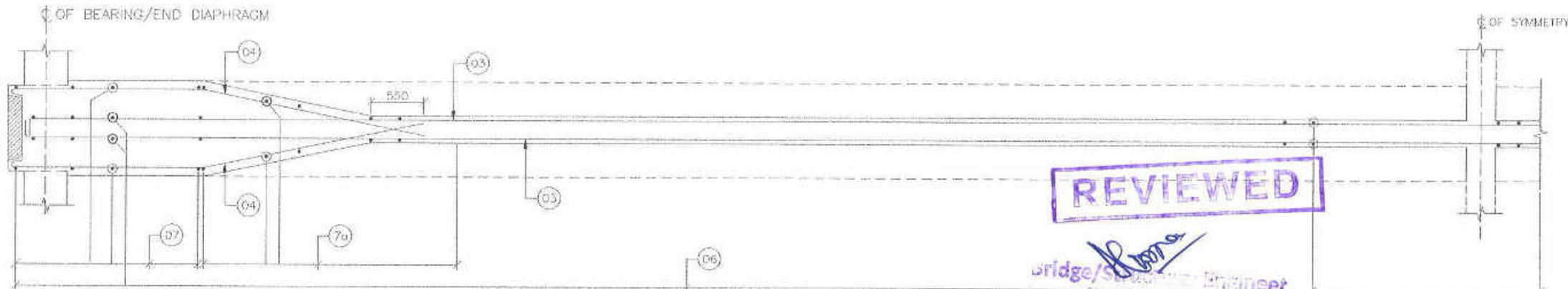
1. STCPL-04-SC02-01 - GENERAL ARRANGEMENT OF MAJOR BRIDGE AT DESIGN CH28+450
2. 2019/S29/00-01 - NUMERATION DETAILS OF PRECAST PSC GIRDER TYPE SPANISH SUPERSTRUCTURE FOR MAJOR BRIDGE AT D. CH28+450
3. 2019/S29/00-03 - REINFORCEMENT DETAILS OF LONGITUDINAL ORDER FOR MAJOR BRIDGE AT D. CH28+450
4. 2019/S29/00-04 - REINFORCEMENT DETAILS OF DECK SLAB FOR PRECAST PSC GIRDER FOR MAJOR BRIDGE AT D. CH28+450
5. 2019/S29/00-05 - REINFORCEMENT DETAILS OF DIAPHRAGMS FOR MAJOR BRIDGE AT D. CH28+450

DATE	NO	REVISION	BY	CLIENT:	AUTHORITY ENGINEER:	PROJECT CONSULTANT:	SAFETY CONSULTANT:	DESIGN DIRECTOR:	EPC CONTRACTOR:	CONSULTANT:	NAME OF PROJECT:	DRAWING TITLE:	PROJECT NO:
10/01/19	R2	FOR APPROVAL OF SUPERVISOR INCORPORATED	APP	MORTH	FEEDBACK INFRA	HBS	Vasuprade Consultants LLP	J.P. MAJUMDAR	ERA INFRA ENGINEERING LIMITED	STHAPATYA CONSULTANTS	REHABILITATION AND UPGRADEMENT OF NH-216 FROM KM3+800 TO KM 9+140 (RAIGARH TO SARAIWALLI SECTION) TO TWO LANES WITH PAVED SHOULDERS IN THE STATE OF CHHATTISGARH UNDER NHDP-IV	DETAILS OF CABLE PROFILE FOR PSC GIRDER TYPE SUPERSTRUCTURE FOR MAJOR BRIDGE AT D. CH28+450	2019/S29
01/02/19	R1	FOR APPROVAL OF SUPERVISOR INCORPORATED	APP									DRG. NO. : 2019/S29/00-02(R1)(P2)	SCALE: AS SHOWN
05/02/19	R3	FOR APPROVAL	APP									DRAWN APP	REV. R2
												CHECKED NURAV PADEL	





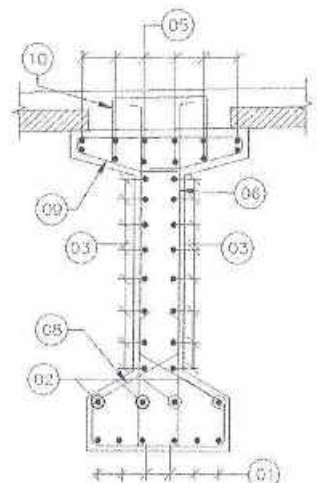
SECTIONAL ELEVATION  
(SCALE 1:40)



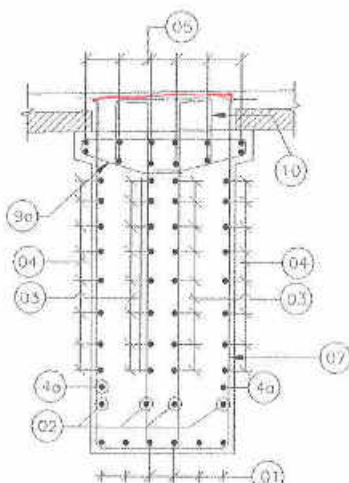
HALF SECTIONAL PLAN  
(SCALE 1:40)

**REVIEWED**

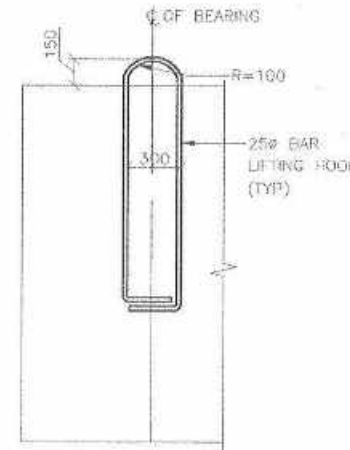
Bridge/Structural Engineer  
Feedback Infra  
NH-216, (Raigarh)



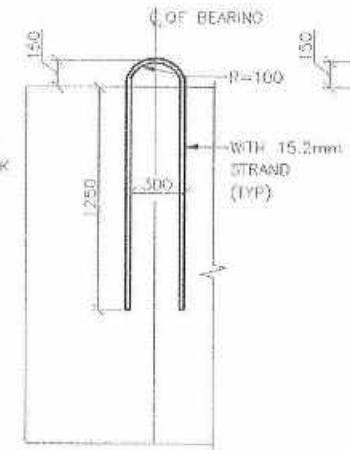
SECTION A-A  
(SCALE 1:30)



SECTION B-B  
(SCALE 1:30)



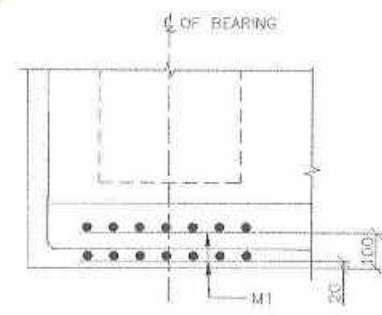
L-SECTION



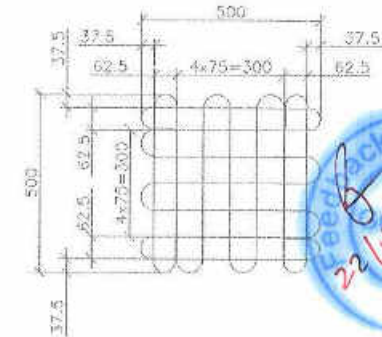
L-SECTION  
ALTERNATE TO BAR

CROSS SECTION

DETAILS OF LIFTING HOOK  
LIFTING HOOK CAPACITY SHALL BE 60T AT EACH END  
(1:30)



DETAIL-1  
(SHOWING MESH-1)  
(SCALE 1:15)



DETAIL OF MESH-1 (H10)  
MESH ABOVE BEARING  
(SCALE 1:15)

**NOTES:-**

1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS.
2. DO NOT SCALE THIS DRAWING. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
3. LAP LENGTH SHALL BE :  
a) FOR LAP LENGTH OF THE BARS REFER TABLE  
b) AT PARTICULAR LOCATION LAPPING OF BAR SHALL NOT BE GREATER THAN 50%.
4. WHEREVER TOTAL NO OF BARS ARE SPECIFIED, THEY ARE TO BE SPACED UNIFORMLY, UNLESS MENTIONED OTHERWISE.
5. CLEAR COVER TO ANY REINFORCEMENT SHALL BE 40mm, UNLESS OTHERWISE SPECIFIED.
6. MATERIALS:  
a) CONCRETE : M-50 GRADE CONFORMING TO IRC : 112-2011.  
b) STEEL REINFORCEMENT : Fe 500 CONFORMING TO IS 1786-2008.
7. ALL REINFORCEMENT BARS SHALL BE CLEAN AND FREE FROM DIRT, MIL. SCALE RUST ETC. AND SHALL BE BENT COLD TO SHAPES AND DIMENSIONS INDICATED AND SHALL BE PLACED EXACTLY AS SHOWN.
8. ALL REINFORCEMENT PROVIDED SHALL BE H.V.S.D BARS ONLY AND SHALL BE OF TESTED QUALITY.

**LEGEND**

- TYP - TYPICAL  
E.J. - EXPANSION JOINT  
R/F - REINFORCEMENT  
CL - CENTER LINE  
--- TOP REINFORCEMENT  
--- BOTTOM REINFORCEMENT

**REFERENCES (LATEST REVISION)**

1. STCPL\_584\_J000\_01 ..... GENERAL ARRANGEMENT OF MAJOR BRIDGE AT D.CH.28+400
2. 2019/S29/00-01 ... NUMERATION DETAILS OF PRECAST PSC GIRDER TYPE STRAIGHT SUPERSTRUCTURE FOR MAJOR BRIDGE AT D.CH.28+400
3. 2019/S29/00-02 ... DETAILS OF CABLE PROFILE FOR PSC GIRDER TYPE STRAIGHT SUPERSTRUCTURE FOR MAJOR BRIDGE AT D.CH.28+400
4. 2019/S29/00-04 ... REINFORCEMENT DETAILS OF DECK SLAB FOR PRECAST PSC GIRDER FOR MAJOR BRIDGE AT D.CH.28+400
5. 2019/S29/00-05 ... REINFORCEMENT DETAILS OF DIAPHRAGMS FOR MAJOR BRIDGE AT D.CH.28+400

**SCHEDULE OF REINFORCEMENT**

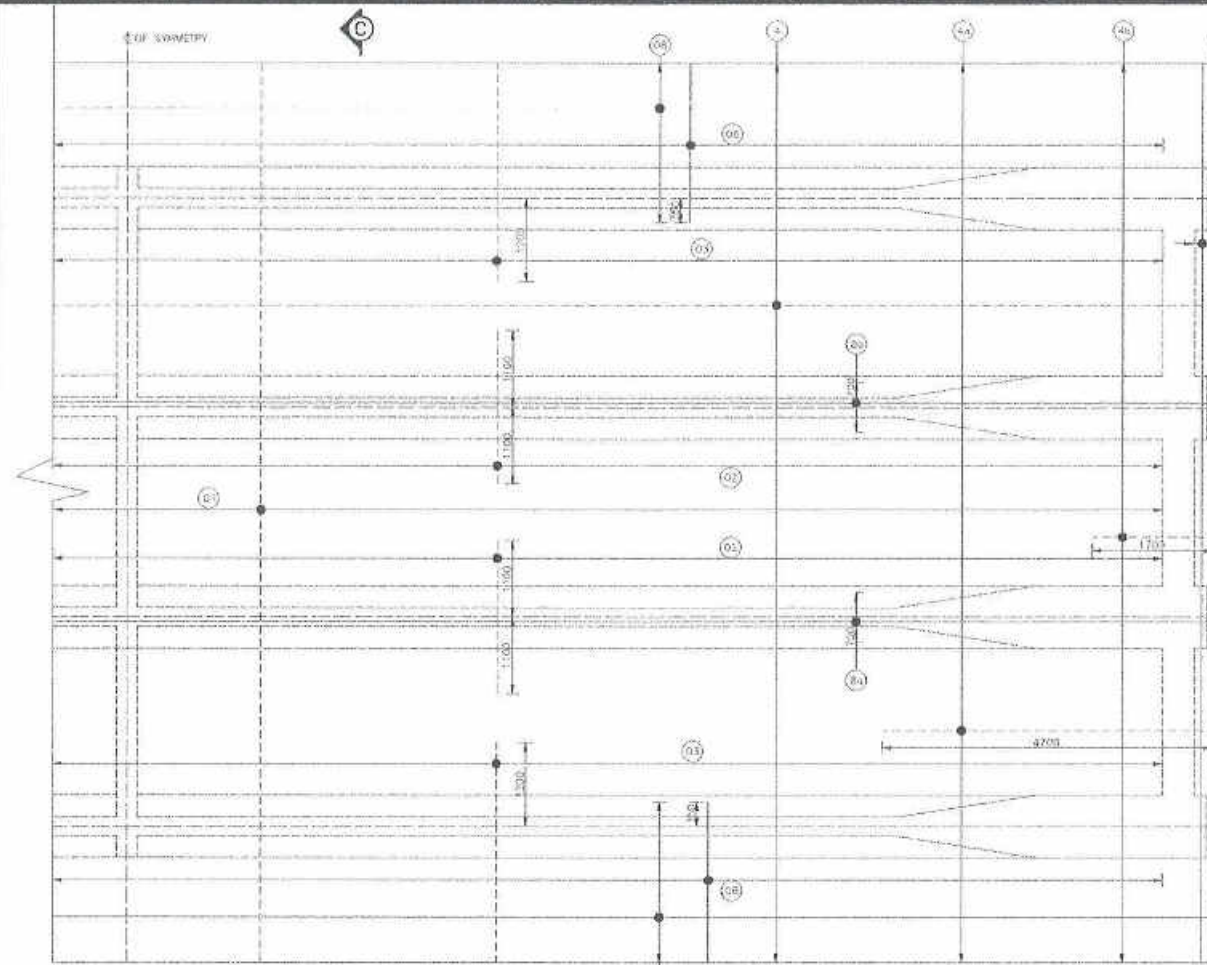
BAR MARK	DIA OF BAR	SPACING/NOS	SHAPE	REMARKS
01	H12	6 NOS	750	THROUGH
02	H12	4 NOS	750	THROUGH
03	H12	8x2=16 NOS	100 (PLAN)	EACH FACE
04	H12	8x2=16 NOS	120 (PLAN)	EACH FACE
04a	H12	1x2=2 NOS	130 (PLAN)	EACH FACE
05	H12	6x2=12 NOS	750	THROUGH
06	H16	175 c/c	750	2 LEGGED STP'S
07	H16	175 c/c	750	2 LEGGED STP'S
08	H16	175 c/c	750	2 LEGGED STP'S
08a	H12	175 c/c	750	AT BOTTOM OF GIRDER UP TO SIMILAR WEB THK. (280)
09	H12	175 c/c	750	2 LEGGED STP'S
09a	H12	175 c/c	750	2 LEGGED STP'S
09b	H12	175 c/c	750	2 LEGGED STP'S

**LAP LENGTH:**

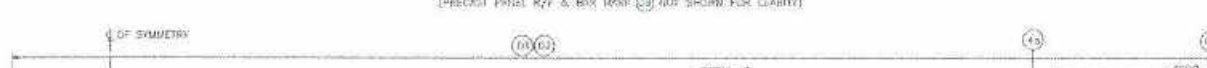
CURTAILMENT	GRADE OF CONCRETE (M45)	10mm	12mm	16mm	20mm	25mm	32mm
< 25%	29#	290	348	464	580	725	928
> 25% & < 33%	34#	340	408	544	680	850	1088
> 33% & < 50%	41#	410	492	656	820	1025	1312

\* = DIA OF BAR





PLAN  
(SCALE-1:50)  
(PRECAST PANEL R/F & B/R MARKS NOT SHOWN FOR CLARITY)



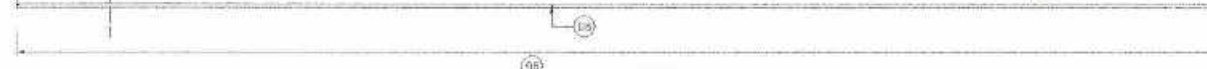
SECTION B-B  
(SCALE-1:40)



SECTION A-A  
(SCALE-1:40)



SECTION G-G  
PANEL B & D  
(SCALE-1:25)



SECTION F-F  
PANEL-B  
(SCALE-1:25)



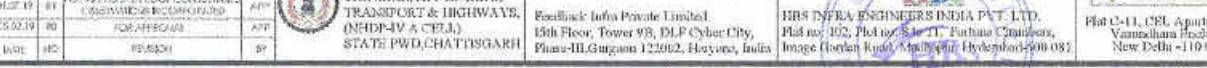
SECTION E-E  
PANEL A & C  
(SCALE-1:25)



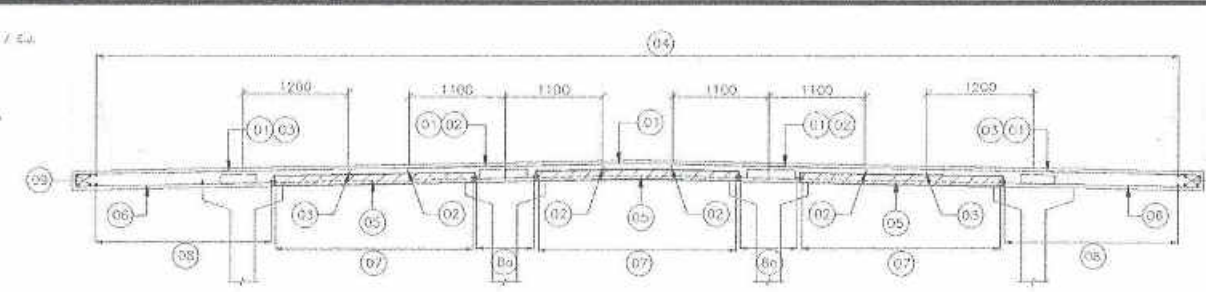
SECTION D-D  
PANEL-A  
(SCALE-1:25)



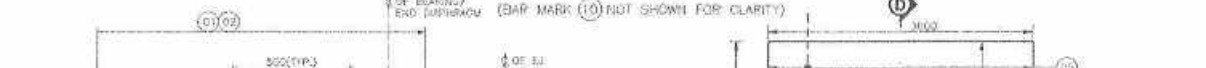
SECTION D-D  
PANEL-C  
(SCALE-1:25)



SECTION D-D  
PANEL-D  
(SCALE-1:25)



SECTION C-C  
(SCALE-1:50)  
(BAR MARK (10) NOT SHOWN FOR CLARITY)



DETAIL-1  
(SCALE-1:15)



DETAIL-2  
(SCALE-1:15)



DETAIL-3  
(SCALE-1:15)



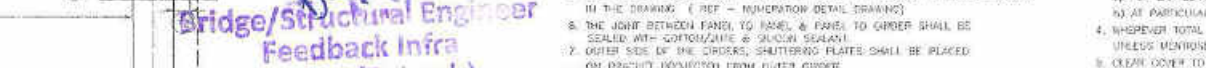
DETAIL-4  
(SCALE-1:15)



DETAIL-5  
(SCALE-1:15)



DETAIL-6  
(SCALE-1:15)



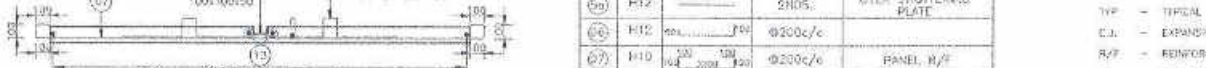
DETAIL-7  
(SCALE-1:15)



DETAIL-8  
(SCALE-1:15)



DETAIL-9  
(SCALE-1:15)



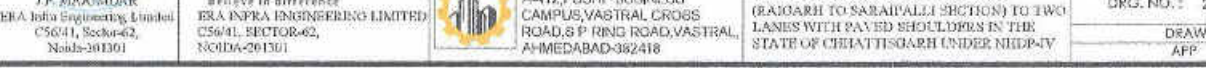
DETAIL-10  
(SCALE-1:15)



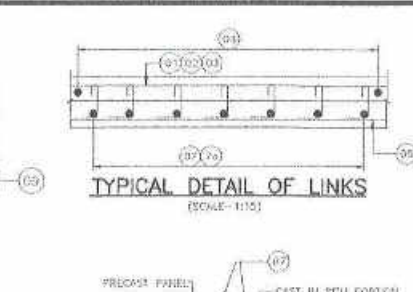
DETAIL-11  
(SCALE-1:15)



DETAIL-12  
(SCALE-1:15)



DETAIL-13  
(SCALE-1:15)



TYPICAL DETAIL OF LINKS  
(SCALE-1:15)



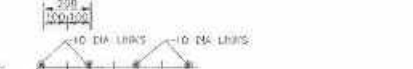
DETAIL-3  
(SCALE-1:15)



DETAIL-4  
(SCALE-1:15)



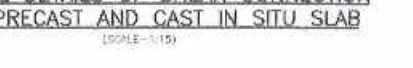
DETAIL-5  
(SCALE-1:15)



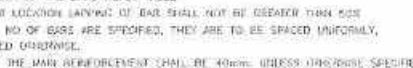
DETAIL-6  
(SCALE-1:15)



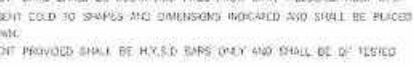
DETAIL-7  
(SCALE-1:15)



DETAIL-8  
(SCALE-1:15)



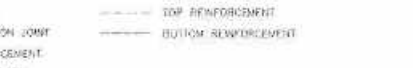
DETAIL-9  
(SCALE-1:15)



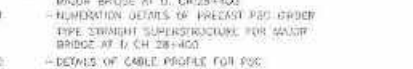
DETAIL-10  
(SCALE-1:15)



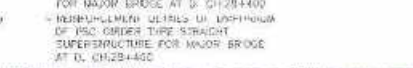
DETAIL-11  
(SCALE-1:15)



DETAIL-12  
(SCALE-1:15)



DETAIL-13  
(SCALE-1:15)



DETAIL-14  
(SCALE-1:15)



DETAIL-15  
(SCALE-1:15)

**REVIEWED**

Bridge/Structural Engineer  
Feedback Infra  
NH-216, (Raigarh)

22/12/2019

**CONSTRUCTION SEQUENCE:-**

1. CAST THE PRECAST PANEL IN CASTING YARD. KEEP THE TOP SURFACE OF PRECAST PANEL ROUGH.
2. THE PRECAST PANEL FROM CASTING YARD SHALL BE SHIFTED TO CONSTRUCTION SITE.
3. THE PRECAST PSC ORDER SHALL BE LAUNCHED IN PLACE OVER PIER CAP WITH THE HELP OF HYDRA/ MOBILE CRANE/ HYDRAULIC CRANES.
4. THE UNDERWAYS SHALL BE CASTED UP TO BOTTOM OF THE PRECAST SLAB.
5. THE PRECAST PANELS SHALL BE PLACED OVER THE PRECAST ORDER AS SHOWN IN THE DRAWING. ( REF - NUMERATION DETAIL DRAWING)
6. THE JOINT BETWEEN PANEL TO PANEL & PANEL TO GIRDER SHALL BE SEALED WITH GUTTOR/MASTIC & RUBBER SEALANT.
7. OUTER SIDE OF THE ORDERS, SHUTTERING PLATES SHALL BE PLACED ON BRACKET PROVIDED FROM OUTER GIRDER.
8. PLACING OF THE REINFORCEMENT OF THE CAST IN SITU PORTION SHALL BE WITH THE PROVIDED REINFORCEMENT OF THE PRECAST PANELS.
9. CONCRETING OF THE CAST IN SITU PORTION INCLUDING THE GAP BETWEEN PRECAST PANELS.

**SCHEDULE OF REINFORCEMENT**

BAR	NO. OF BAR	SHAPE	SPACING/NO.	REMARKS
1	H16	100	0200c/c	TOP THROUGH
2	H16	100	0200c/c	EXTRA TOP
3	H16	100	0200c/c	EXTRA TOP AT SUPPORT
4	H16	100	0200c/c	EXTRA TOP AT SUPPORT
5	H16	100	0200c/c	EXTRA TOP AT SUPPORT
6	H16	100	0200c/c	EXTRA TOP AT SUPPORT
7	H16	100	0200c/c	EXTRA TOP AT SUPPORT
8	H16	100	0200c/c	EXTRA TOP AT SUPPORT
9	H16	100	0200c/c	EXTRA TOP AT SUPPORT
10	H16	100	0200c/c	EXTRA TOP AT SUPPORT
11	H16	100	0200c/c	EXTRA TOP AT SUPPORT
12	H16	100	0200c/c	EXTRA TOP AT SUPPORT
13	H16	100	0200c/c	EXTRA TOP AT SUPPORT
14	H16	100	0200c/c	EXTRA TOP AT SUPPORT
15	H16	100	0200c/c	EXTRA TOP AT SUPPORT
16	H16	100	0200c/c	EXTRA TOP AT SUPPORT
17	H16	100	0200c/c	EXTRA TOP AT SUPPORT
18	H16	100	0200c/c	EXTRA TOP AT SUPPORT
19	H16	100	0200c/c	EXTRA TOP AT SUPPORT
20	H16	100	0200c/c	EXTRA TOP AT SUPPORT
21	H16	100	0200c/c	EXTRA TOP AT SUPPORT
22	H16	100	0200c/c	EXTRA TOP AT SUPPORT
23	H16	100	0200c/c	EXTRA TOP AT SUPPORT
24	H16	100	0200c/c	EXTRA TOP AT SUPPORT
25	H16	100	0200c/c	EXTRA TOP AT SUPPORT
26	H16	100	0200c/c	EXTRA TOP AT SUPPORT
27	H16	100	0200c/c	EXTRA TOP AT SUPPORT
28	H16	100	0200c/c	EXTRA TOP AT SUPPORT
29	H16	100	0200c/c	EXTRA TOP AT SUPPORT
30	H16	100	0200c/c	EXTRA TOP AT SUPPORT
31	H16	100	0200c/c	EXTRA TOP AT SUPPORT
32	H16	100	0200c/c	EXTRA TOP AT SUPPORT
33	H16	100	0200c/c	EXTRA TOP AT SUPPORT
34	H16	100	0200c/c	EXTRA TOP AT SUPPORT
35	H16	100	0200c/c	EXTRA TOP AT SUPPORT
36	H16	100	0200c/c	EXTRA TOP AT SUPPORT
37	H16	100	0200c/c	EXTRA TOP AT SUPPORT
38	H16	100	0200c/c	EXTRA TOP AT SUPPORT
39	H16	100	0200c/c	EXTRA TOP AT SUPPORT
40	H16	100	0200c/c	EXTRA TOP AT SUPPORT
41	H16	100	0200c/c	EXTRA TOP AT SUPPORT
42	H16	100	0200c/c	EXTRA TOP AT SUPPORT
43	H16	100	0200c/c	EXTRA TOP AT SUPPORT
44	H16	100	0200c/c	EXTRA TOP AT SUPPORT
45	H16	100	0200c/c	EXTRA TOP AT SUPPORT
46	H16	100	0200c/c	EXTRA TOP AT SUPPORT
47	H16	100	0200c/c	EXTRA TOP AT SUPPORT
48	H16	100	0200c/c	EXTRA TOP AT SUPPORT
49	H16	100	0200c/c	EXTRA TOP AT SUPPORT
50	H16	100	0200c/c	EXTRA TOP AT SUPPORT
51	H16	100	0200c/c	EXTRA TOP AT SUPPORT
52	H16	100	0200c/c	EXTRA TOP AT SUPPORT
53	H16	100	0200c/c	EXTRA TOP AT SUPPORT
54	H16	100	0200c/c	EXTRA TOP AT SUPPORT
55	H16	100	0200c/c	EXTRA TOP AT SUPPORT
56	H16	100	0200c/c	EXTRA TOP AT SUPPORT
57	H16	100	0200c/c	EXTRA TOP AT SUPPORT
58	H16	100	0200c/c	EXTRA TOP AT SUPPORT
59	H16	100	0200c/c	EXTRA TOP AT SUPPORT
60	H16	100	0200c/c	EXTRA TOP AT SUPPORT
61	H16	100	0200c/c	EXTRA TOP AT SUPPORT
62	H16	100	0200c/c	EXTRA TOP AT SUPPORT
63	H16	100	0200c/c	EXTRA TOP AT SUPPORT
64	H16	100	0200c/c	EXTRA TOP AT SUPPORT
65	H16	100	0200c/c	EXTRA TOP AT SUPPORT
66	H16	100	0200c/c	EXTRA TOP AT SUPPORT
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90	H16	100	0200c/c	EXTRA TOP AT SUPPORT
91	H16	100	0200c/c	EXTRA TOP AT SUPPORT
92	H16	100	0200c/c	EXTRA TOP AT SUPPORT
93	H16	100	0200c/c	EXTRA TOP AT SUPPORT
94	H16	100	0200c/c	EXTRA TOP AT SUPPORT
95	H16	100	0200c/c	EXTRA TOP AT SUPPORT
96	H16	100	0200c/c	EXTRA TOP AT SUPPORT
97	H16	100	0200c/c	EXTRA TOP AT SUPPORT
98	H16	100	0200c/c	EXTRA TOP AT SUPPORT
99	H16	100	0200c/c	EXTRA TOP AT SUPPORT
100	H16	100	0200c/c	EXTRA TOP AT SUPPORT

**NOTES:-**

1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS.
2. DO NOT SCALE THIS DRAWING. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
3. LAP LENGTH SHALL BE :-  
a) FOR LAP LENGTH OF THE BARS (REFER TABLE)  
b) AT PARTICULAR LOCATION LAPING OF BAR SHALL NOT BE GREATER THAN 50%  
c) WHENEVER TOTAL NO OF BARS ARE SPECIFIED, THEY ARE TO BE SPACED UNIFORMLY, UNLESS MENTIONED OTHERWISE.
4. CLEAR OVER TO THE MAIN REINFORCEMENT SHALL BE 40MM, UNLESS OTHERWISE SPECIFIED.
5. MATERIALS:  
a) CONCRETE : M-40 GRADE CONFORMING TO IS 112-2014.  
b) STEEL REINFORCEMENT : Fe 500 CONFORMING TO IS 1786-2008.
6. ALL REINFORCEMENT BARS SHALL BE CLEAN AND FREE FROM OIL, MILLSCALE, RUST ETC. AND SHALL BE BENT TO SHAPES AND DIMENSIONS INDICATED AND SHALL BE PLACED EXACTLY AS SHOWN.
7. ALL REINFORCEMENT PROVIDED SHALL BE HYSD BARS ONLY AND SHALL BE OF TESTED QUALITY.

**LAP LENGTH:**

CURTLEMENT	GRADE OF CONCRETE (M40)	16mm	18mm	20mm	25mm	32mm
< 25%	34d	34d	40d	54d	60d	108d
> 25% & < 33%	40d	40d	48d	64d	80d	128d
> 33% & < 40%	48d	48d	57d	76d	96d	156d

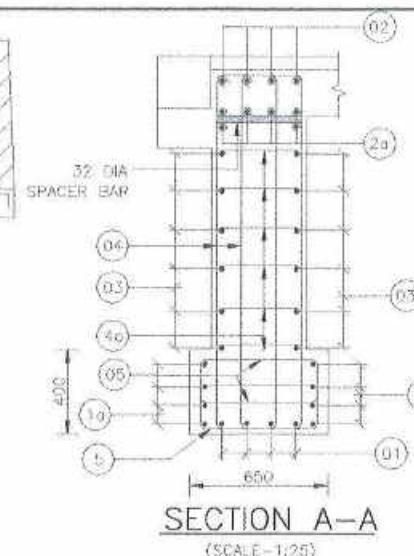
**LEGEND**

- TYP - TYPICAL  
 C.J. - EXPANSION JOINT  
 R/F - REINFORCEMENT  
 V. - CENTER LINE  
 --- TOP REINFORCEMENT  
 --- BOTTOM REINFORCEMENT

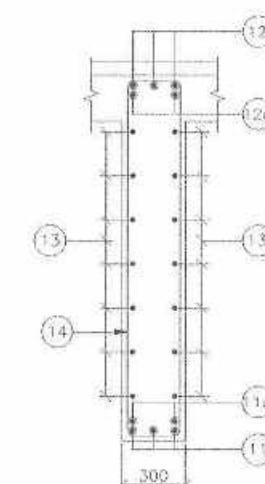
**REFERENCES (LATEST VERSION)**

1. IS:112-2014 (M40) - GENERAL ARRANGEMENT OF MAJOR BRIDGE AT D. CH:28+400
2. IS:112-2014 (M40) - DIMENSIONAL DETAILS OF PRECAST PSC ORDER TYPE STRAIGHT SUPERSTRUCTURE FOR MAJOR BRIDGE AT D. CH:28+400
3. IS:112-2014 (M40) - DETAILS OF CABLE PROFILE FOR PSC ORDER TYPE STRAIGHT SUPERSTRUCTURE FOR MAJOR BRIDGE AT D. CH:28+400
4. IS:112-2014 (M40) - REINFORCEMENT DETAILS OF LONGITUDINAL ORDER TYPE STRAIGHT SUPERSTRUCTURE FOR MAJOR BRIDGE AT D. CH:28+400
5. IS:112-2014 (M40) - REINFORCEMENT DETAILS OF TRANSVERSE ORDER TYPE STRAIGHT SUPERSTRUCTURE FOR MAJOR BRIDGE AT D. CH:28+400

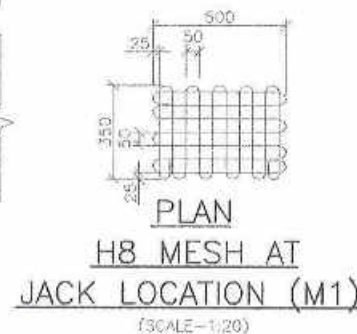




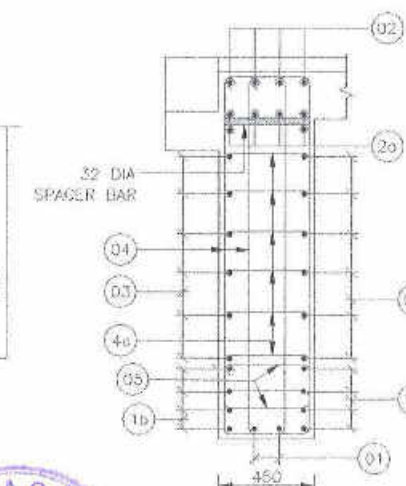
SECTION A-A  
(SCALE-1:25)



SECTION C-C  
(SCALE-1:35)



DETAIL '1'



SECTION B-B  
(SCALE=1:25)

CURTAILMENT	GRADE OF CONCRETE (M45)	10mm	12mm	15mm	20mm	25mm	32mm
< 25%	29ø	290	348	464	580	725	928
> 25% & < 33%	34ø	340	408	544	680	850	1088
> 33% & < 50%	41ø	410	492	656	820	1025	1312

0.000 DIA CF BAR

1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS.
2. DO NOT SCALE THIS DRAWING. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
3. LAP LENGTH SHALL BE :
  - a) FOR LAP LENGTH OF THE BARS REFER TABLE
  - b) AT PARTICULAR LOCATION LAPPING OF BAR SHALL NOT BE GREATER THAN 50%
4. WHEREVER TOTAL NO OF BARS ARE SPECIFIED, THEY ARE TO BE SPACED UNIFORMLY, UNLESS MENTIONED OTHERWISE.
5. CLEAR COVER TO THE MAIN REINFORCEMENT SHALL BE 40mm, UNLESS OTHERWISE SPECIFIED.
6. MATERIALS:
  - a) CONCRETE : M-40 GRADE CONFORMING TO IRC : 112-2011.
  - b) STEEL REINFORCEMENT : Fe 500 CONFORMING TO IS 1786-2008.
7. ALL REINFORCEMENT BARS SHALL BE CLEAN AND FREE FROM DIRT, MILLSALE RUST ETC. AND SHALL BE BENT COLD TO SHAPES AND DIMENSIONS INDICATED AND SHALL BE PLACED EXACTLY AS SHOWN.
8. ALL REINFORCEMENT PROVIDED SHALL BE H.Y.S.D BARS ONLY AND SHALL BE OF TESTED QUALITY.
9. W32 SPACER BARS BETWEEN MAIN R/F SHALL BE PROVIDED AT 1 m C/C.
10. THE LOCATION OF JACK FOR LIFTING UP THE SUPERSTRUCTURE TO REPLACE BEARING OR IS SHOWN THAT THESE SHOULD BE DISTINCTLY ETCHED ON THE CROSS GIRDERS AND PIER/ABUTMENTS CAPS.
11. REQUIRED CAPACITY OF JACK 175T. ALL THE JACKS SHALL BE OPERATED IN UNISON.
12. REINFORCEMENT BARS MAY BE BENT OR SHIFTED LOCALLY TO AVOID CLASHING WITH PRESTRESSING CABLES AND ANCHORAGES WHENEVER REQUIRED.

TYP → TYPICAL  
E.J. → EXPANSION JOINT  
R/F → REINFORCEMENT  
CL → CENTER LINE

REVIEWED

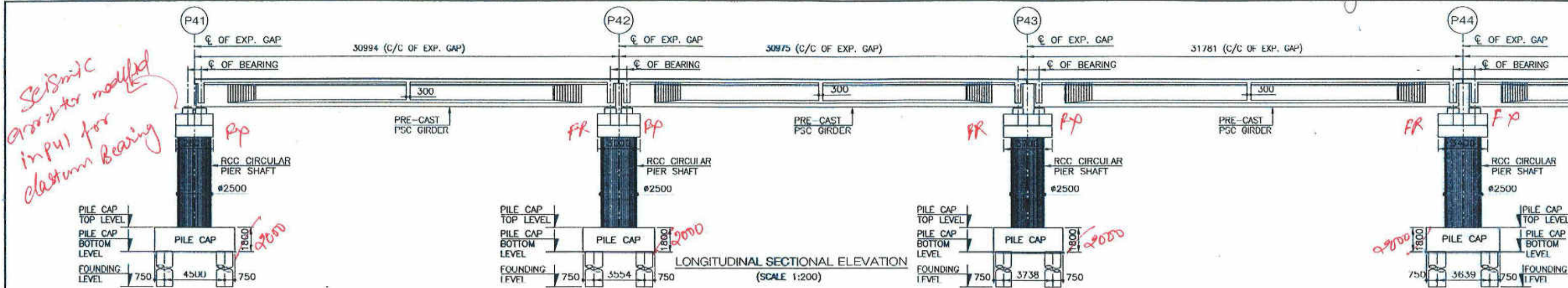
Bridge/Structural Engineer  
Feedback Infra  
NH-216,(Raigarh)

	BAR MARK	SIZE	NOS./SPACING	SHAPE	REMARKS
END DIAPHRAGM	(01)	H 18	4 NOS.		
	(1a)	H 25	4x2=8 NOS.		2nd LAYER
	(1b)	H 18	4x2=8 NOS.		2nd LAYER
	(02)	H 20	4 NOS.		
	(2a)	H 20	6 NOS.		3 LAYERS
	(03)	H 16	2x6 NOS.		ON EACH FACE
	(04)	H 12	Ø 100/c		STEP'S (4-LEGGE)
	(4a)	H 10	6 NOS.		AT EVERY 4TH STEP'S
	(05)	H 12	Ø 100/c		STEP'S (4-LEGGE)
INTERMEDIATE DIAPHRAGM	(11)	H 18	3 NOS.		2 LAYERS
	(11a)	H 18	2 NOS.		2 LAYERS
	(12)	H 16	3 NOS.		2 LAYERS
	(12a)	H 16	2 NOS.		2 LAYERS
	(13)	R 12	2x6 NOS.		ON EACH FACE
	(14)	H 12	Ø 100/c		STEP'S (2-LEGGE)

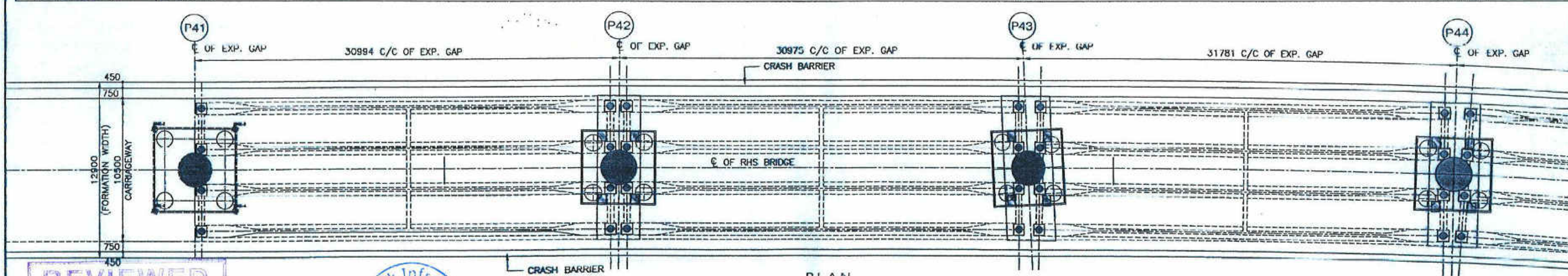
17/03/19	REVISION FOR PROOF CONSULTANTS DESIGNATIONS	APP BY	 <b>CLIENT:</b> <b>MORTH</b> THE MINISTRY OF ROAD TRANSPORT & HIGHWAYS (NHDP-IV A CELL) STATE PWD, CHATTISGARH	 <b>AUTHORITY ENGINEER:</b> <b>FEEDBACK INFRA</b> <i>Building Infrastructure - Improving</i> Feedback Infra Private Limited 15th Floor, Tower-9D, C-2, Cyber City, Phase-III, Gurgaon, 122002, Haryana, India	 <b>PROOF CONSULTANT:</b> <b>HBS INFRA ENGINEERING PVT. LTD.</b> Flat no- 102, Plot no- 8 & 9, L. K. Mathur Chowk, Gurgaon City Road, Middleburg, Haryana-122009	 <b>SAFETY CONSULTANT:</b> <b>Vasuprada</b> <i>Consultants LLP</i> Flat C-11, CBL Apartments-II Vasantpura Enclave-a, C-56/41, Sector-62, Noida-201301	 <b>DESIGN DIRECTOR:</b> <b>ERA INFRA ENGINEERING LIMITED</b> C-56/41, Sector-62, Noida-201301	 <b>EPC CONTRACTOR:</b> <b>ERA INFRA ENGINEERING LIMITED</b> C-56/41, Sector-62, Noida-201301	 <b>CONSULTANT:</b> <b>STHAPATYA CONSULTANTS</b> A-112, PUSHP BUSINESS CAMPUS, VAISTAL CROSS ROAD, S.P. RING ROAD, VAISTAL, AHMEDABAD-382418	<b>NAME OF PROJECT:</b> REHABILITATION AND UPGRADEATION OF NH-216 FROM KM3+800 TO KM 90+400 (RAIKARU TO SARAPALLI SECTION) TO TWO LANES WITH PAVED SHOULDERS IN THE STATE OF CHHATTISGARH UNDER NHDP-IV	<b>DRAWING TITLE: REINFORCEMENT DETAILS OF DIAPHRAGMS WITH PIN BEARING FOR MAJOR BRIDGE AT D.C.28+400</b> DRG. NO.: 2019/529/DC-06(R1)(P1)	<b>PROJECT NO:</b> 2019/529	<b>SCALE:</b> AS SHOWN	<b>REV.</b> R1
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PROPOSED FRL AT (IN m)	207.500	207.500	207.500	207.500
GROUND LEVEL (IN m)	-----	197.504	199.341	199.000
PILE CAP TOP LEVEL	-----	197.504	199.341	190.000
PILE CAP BOTTOM LEVEL	-----	195.704	197.541	197.200
FOUNDING LEVEL	-----	166.704	166.541	167.200
VERTICAL PROFILE	P=-0.000% L=1477.867			
HORIZONTAL ALIGNMENT	D=1372.756		29131.036	29176.036
SUPERELEVATION/ CROSSFALL (%)	Q=2.000			
CHAINAGE (IN Km)	29+81.863	29+112.756	29+143.731	29+174.797



REVIEWED

*Bridge/Structural Engineer*  
Feedback Infra  
NH-216 (Raigarh)

Feedback Infra Pvt. Ltd.  
Gurgaon

CONSULTANT  
HBS

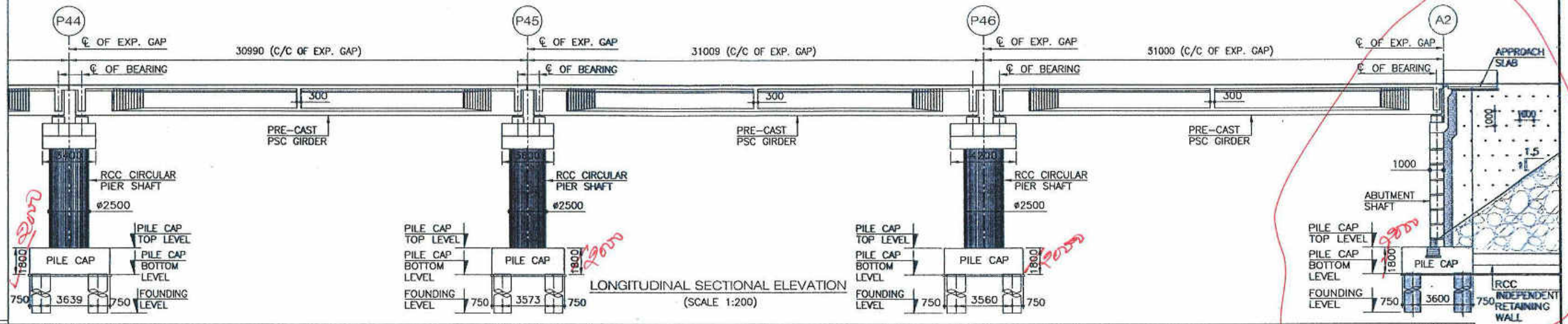
New Delhi

NOTES:  
1. ALL DIMENSIONS ARE IN mm. LEVELS ARE IN m AND CHAINAGES ARE IN Km. UNLESS OTHERWISE MENTIONED, ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NO DIMENSION IS TO BE SCALED.

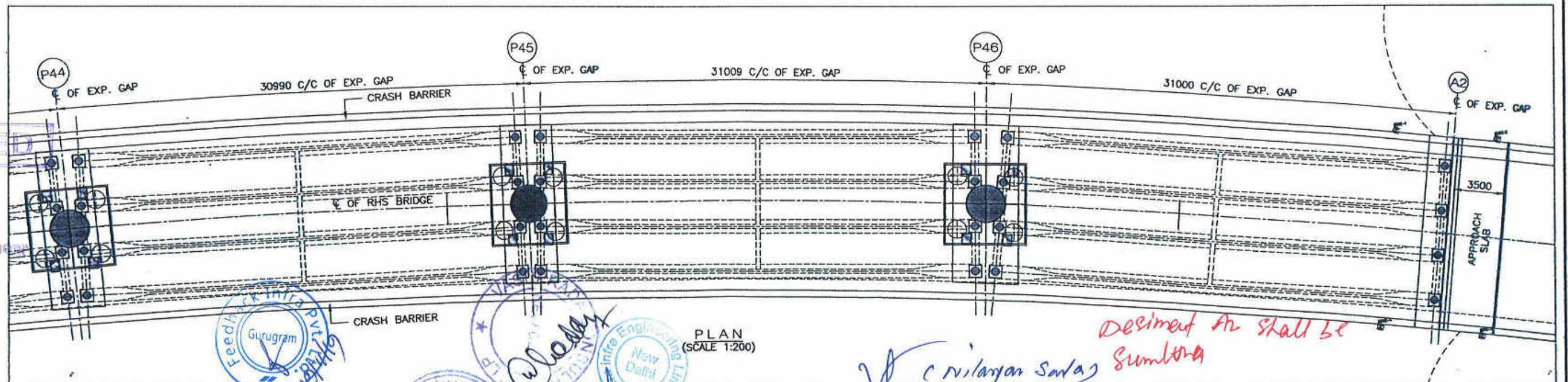
HYDROLOGICAL DATA	
HFL	203.350m
DISCHARGE	40500 cumecs
VELOCITY	3.5 m/s
MSL AT ABUTMENT	SEE DETAILS DRAWINGS
MSL AT PIER	SEE DETAILS DRAWINGS

REVISIONS					CLIENT:		AUTHORITY ENGINEER:		ROOF CONSULTANT:		SAFETY CONSULTANT:		DESIGN DIRECTOR:		ERD CONTRACTOR:		CONSULTANT:		NAME OF PROJECT:		DRAWING TITLE:		REV.	
R1	03/06/18	REMOVED AS PER SITE CONSTRUCTION & PC COMMENTS	QMS	YIC	NOP	MORTH  (Ministry of Road, Transport & Highways) NHDP-IV A CELL, State PWD Chhattisgarh	 MORTH (Ministry of Road, Transport & Highways) NHDP-IV A CELL, State PWD Chhattisgarh	FEEDBACK INFRA Feedback Infra Private Limited 15TH Floor, DLF Building No. 2, DLF Cyber city, DLF Phase-2 Sector-25, Gurgaon, HARYANA, Pin-122002	HBS  HBS INFRA ENGINEERING LTD INDIA NO. 401800 Flat no. 107, Phase-2, Plot 11, fortune chambers, Madhapura HYDERABAD	VERUSPACE  VERUSPACE CONSULTANTS LLP Flat C-11, CEL Apartments, Vasundhara Enclave, New Delhi 110 096, India	ERA  ERA INFRA ENGINEERING DIVISION DESIGN & ENGINEERING DIVISION ERA INFRA ENGINEERING LIMITED An ISO 9001:2008 & OHSAS 18001 Certified Company Head Office - C-56/41, SECTOR -52, NOIDA 201303 Tel. : 0120-4145900 TO 4145936	ERA  ERA INFRA ENGINEERING DIVISION DESIGN & ENGINEERING DIVISION ERA INFRA ENGINEERING LIMITED An ISO 9001:2008 & OHSAS 18001 Certified Company Head Office - C-56/41, SECTOR -52, NOIDA 201303 Tel. : 0120-4145900 TO 4145936	SPECTRUM Techno Consultants Pvt Ltd. 401, 4th Floor, Raigarh Bhawan, Plot No. 9, Sector 11, Vashi, Navi Mumbai, Maharashtra.	Rehabilitation & upgradation of NH-216 from km.3.800 to 90.460 (Raigarh-Saraipalli Section) in the State of Chhattisgarh to two-lanes with paved shoulders under NHDP-IV .	GENERAL ARRANGEMENT DRAWING FOR MAJOR BRIDGE AT CH. 28+400	R4								
R2	04/06/18	REMOVED AS PER SITE CONSTRUCTION & PC COMMENTS	QMS	YIC	NOP																			
R3	04/06/18	REMOVED AS PER SITE CONSTRUCTION & PC COMMENTS	QMS	YIC	NOP																			
REVISIONS					MORTH		FEEDBACK INFRA		HBS		VERUSPACE		ERA		SPECTRUM		NAME OF PROJECT:		DRAWING TITLE:		REV.			
REVISIONS					MORTH		FEEDBACK INFRA		HBS		VERUSPACE		ERA		SPECTRUM		NAME OF PROJECT:		DRAWING TITLE:		REV.			
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PROPOSED FRL AT (IN m)	207.500	207.500	207.500	207.500
GROUND LEVEL (IN m)	199.000	200.111	200.055	---
PILE CAP TOP LEVEL	190.000	200.111	200.055	---
PILE CAP BOTTOM LEVEL	197.200	198.311	198.255	---
FOUNDING LEVEL	167.200	169.311	169.255	---
VERTICAL PROFILE				
HORIZONTAL ALIGNMENT	29176.036			
SUPERELEVATION/ CROSSFALL (%)	Q=5.470			
	Q=5.470			
CHAINAGE (IN Km)	29+174.797	29+205.787	29+236.796	29+267.796

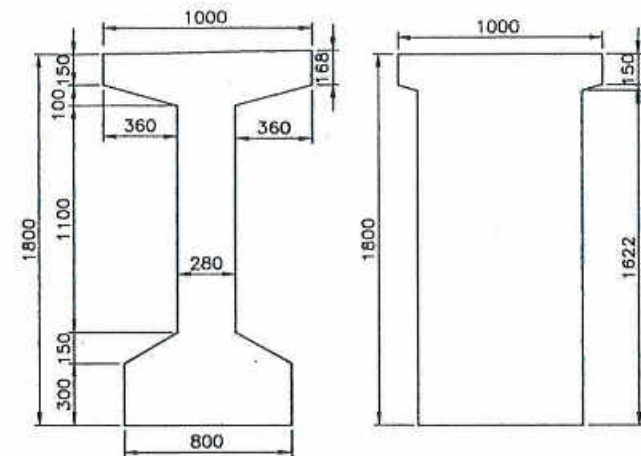
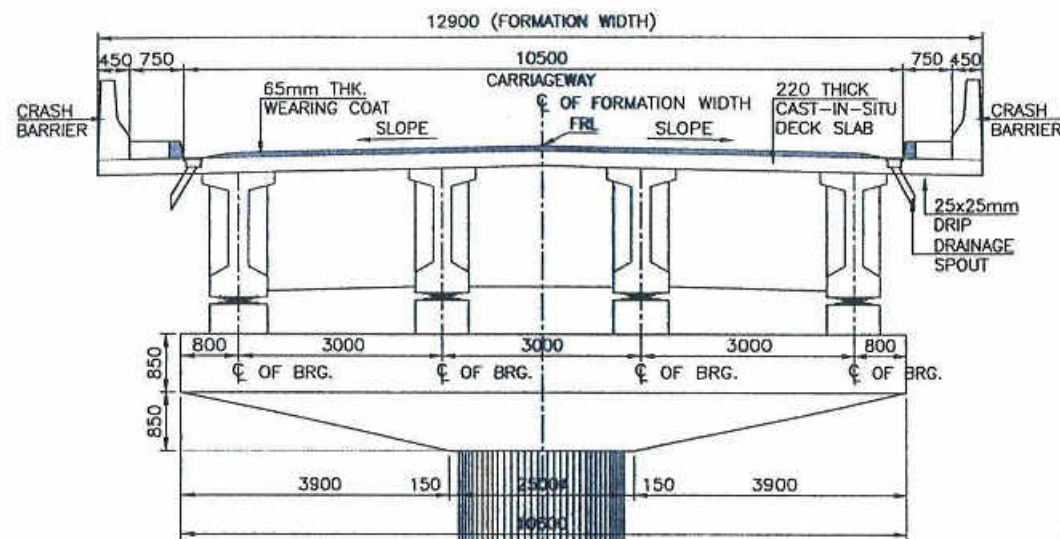


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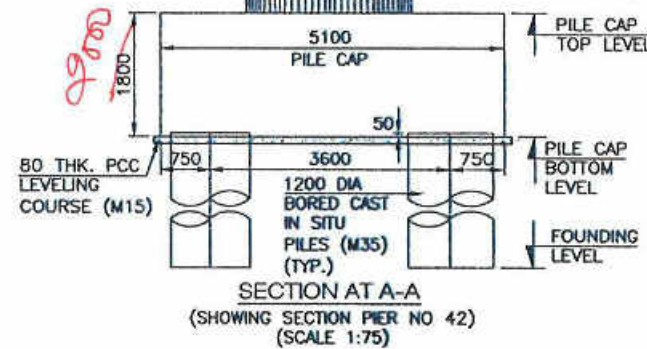


# NOTES:-

- ALL DIMENSION ARE IN MILLIMETERS, LEVELS IN METERS AND CHAINAGES IN KILOMETERS UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSION TO BE FOLLOWED.
- CONCRETE SHALL BE DESIGN MIX AND SHALL HAVE MINIMUM 28 DAYS CHARACTERISTIC STRENGTH ON 150mm CUBES FOR ALL ELEMENTS OF STRUCTURES AS INDICATED BELOW:-
  - RCC CRASH BARRIER ..... M40
  - PRE CAST PSC GIRDER (40.0m SUPERSTRUCTURE)..... M50
  - PRE CAST PSC GIRDER (30.0m SUPERSTRUCTURE)..... M50
  - SUBSTRUCTURE & FOUNDATION ..... M35
  - APPROACH SLAB ..... M35
  - PCC LEVELING COURSE ..... M15
  - DECK SLAB ..... M40
  - BEARING PEDESTAL & SECIS STOPPER ..... M40
- THE CARRIAGEWAY OF PROPOSED BRIDGE IS DESIGNED FOR 3 LANES OF IRC CLASS A OR ONE LANE OF IRC CLASS 70R + 1 LANE OF IRC CLASS A OR ~~SV~~ **LOADING** WHICHEVER GOVERNS.
- UNTENSIONED REINFORCING STEEL SHALL BE OF THERMO MECHANICALLY TREATED (TMT) BARS, (GRADE DESIGNATION Fe500D) CONFORMING TO IS:1786.
- 50 THICK BITUMINOUS CONCRETE WEARING COAT SHALL BE PROVIDED.
- CLEAR COVER TO OUTERMOST STEEL SHALL BE AS BELOW:-
  - SUPERSTRUCTURE (CAST IN-SITU) ..... 40mm
  - SUB-STRUCTURE ..... 50mm
  - FOUNDATION ..... 75mm
- ALL SPACE EXCAVATED AND NOT OCCUPIED BY THE FOUNDATION & OTHER PERMANENT WORK SHALL BE REFILLED WITH EARTH UP TO SURFACE OF SURROUNDING GROUND IN ACCORDANCE WITH SECTION 300 OF "MORTH" SPECIFICATION. IN CASE OF EXCAVATION IN ROCK, THE ANNULAR SPACE AROUND FOUNDATION SHALL BE FILLED WITH M15 PCC UP TO THE TOP OF ROCK.
- ~~50~~ STRIP SEAL TYPE EXPANSION JOINTS SHALL BE PROVIDED AS PER MORTH SPECIFICATIONS FOR ROAD AND BRIDGE WORKS.
- LAP/SPLICES SHALL BE PROVIDED AS PER CLAUSE NO. 15.2.4 & 15.2.5 OF IRC : 112-2011.
- PILE CAP TOP LEVEL MAY CHANGE AS PER SITE CONDITION.
- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH RELEVANT APPROVED HIGHWAY DRAWINGS FOR STRUCTURE ORIENTATION, SKEW FRL & CAMBER/SUPER ELEVATION, ETC IF ANY DISCREPANCY FOUND IT SHALL BE BROUGHT TO THE NOTICE OF DESIGN CONSULTANT/PROOF CHECKING CONSULTANT.
- PROPOSED CHAINAGE / FRL SHALL BE CHECKED AND CONFIRMED AS PER APPROVED PLAN & PROFILE.
- THE PROJECT ROAD FALLS WITHIN SEISMIC ZONE-II
- BEARING TYPE - ELASTOMERIC & PIN BEARING



TYPICAL X-SECTION OF GIRDER  
(SCALE 1:25)



SECTION A-A  
(SHOWING SECTION PIER NO 42)  
(SCALE 1:75)

REVIEWED

Bridge/Structural Engineer  
Feedback Infra  
NH-216, (Raigarh)



*Nilanjan Sankar*

REV.	DATE	REVISION	BY	CHECKED	APPROVED
R4	03/06/19	REVISED AS PER SITE CONSTRUCTION & PC COMMENTS	QMS	YAC	NOP
R3	06/05/19	REVISED AS PER SITE CONSTRUCTION & PC COMMENTS	QMS	YAC	NOP
R2	06/01/19	REVISED AS PER R1	QMS	YAC	NOP
MKD	ISSUED	DESCRIPTION	DDLT	CHECKED	APPROVED

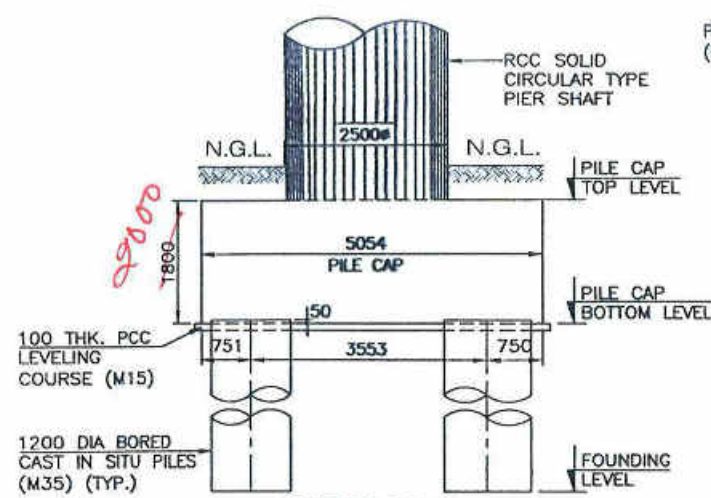
  

CLIENT:	MORTH	AUTHORITY ENGINEER:	FEEDBACK INFRA	PROOF CONSULTANT:	HBS	SAFETY CONSULTANT:	VASUPRADA CONSULTANTS LLP	DESIGN DIRECTOR:	J.P. MAJUMDAR	EPC CONTRACTOR:	ERA	CONSULTANT:	SPECTRUM	NAME OF PROJECT:	Rehabilitation & upgradation of NH-216 from km.3.800 to 90.460 (Raigarh-Saraipalli Section) in the State of Chhattisgarh to two-lanes with paved shoulders under NHDP-IV.	DRAWING TITLE:	GENERAL ARRANGEMENT DRAWING FOR MAJOR BRIDGE AT CH. 28+400	REV.	R4
	(Ministry of Road, Transport & Highways)		Feedback Infra Private Limited, 15TH Floor, DLF Building 68, DLF Cyber city, DLF Phase-2, Sector-25, Gurgaon, HARYANA Pin-122002		HBS INFRA ENGINEERS INDIA PVT. LTD., Flat no. 102, Plot no. 8 to 11 Fortune Chambers, Madhapur HYDERABAD		VASUPRADA CONSULTANTS LLP, Flat c-11, CEL Apartments, Vasundhara Enclave, New Delhi 110 095, India		J.P. MAJUMDAR, ERA INFRA ENGINEERING LTD, C-56/41, SECTOR-42, NOIDA 201303.		ERA INFRA ENGINEERING LIMITED, An ISO 9001:2001 & OHSAS 18001 Certified Company, Head Office: C-56/41, SECTOR-42, NOIDA 201303, Tel.: 0120-4145000 TO 4145036		SPECTRUM Techno Consultants Pvt Ltd, 401, 4th Floor, Raikar Shevan, Plot No 9, Sector 17, Vashi, Navi Mumbai, Maharashtra.						

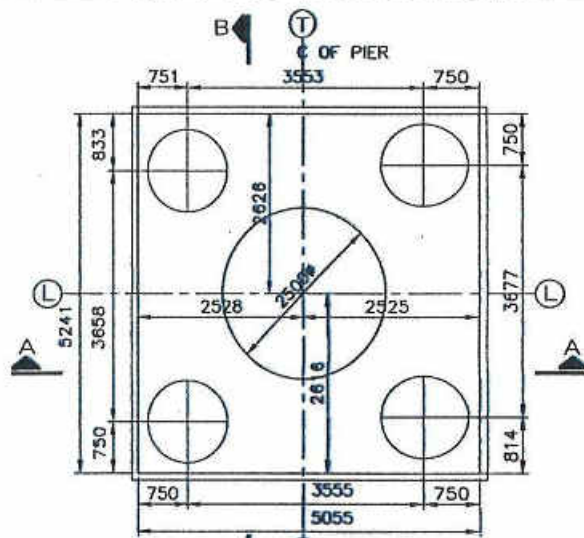
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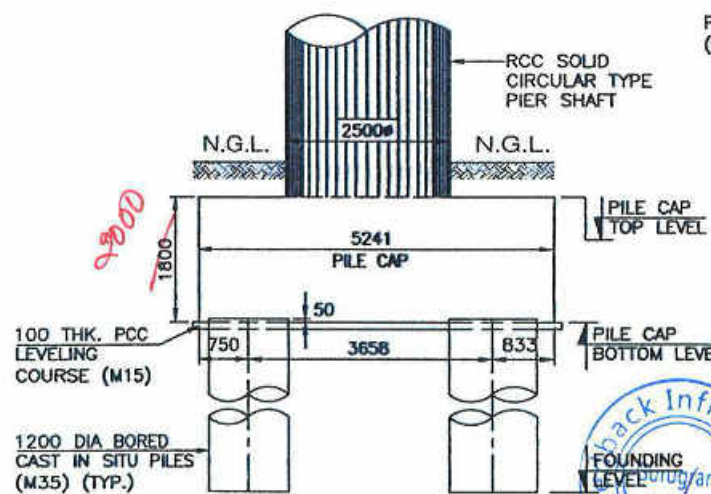


SECTION AT A-A  
(SHOWING DIMENSION ONLY)  
(SCALE 1:75)

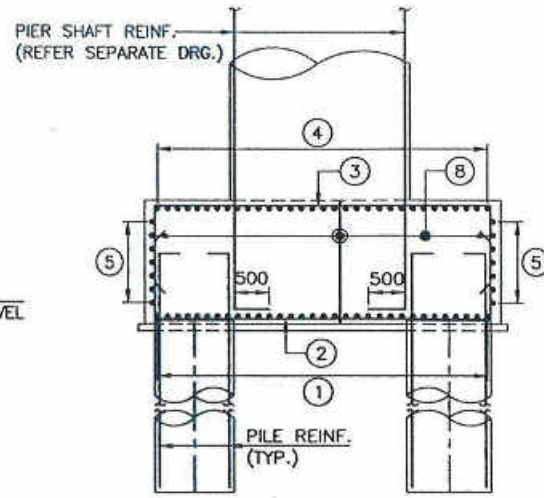
TRAFFIC DIRECTION



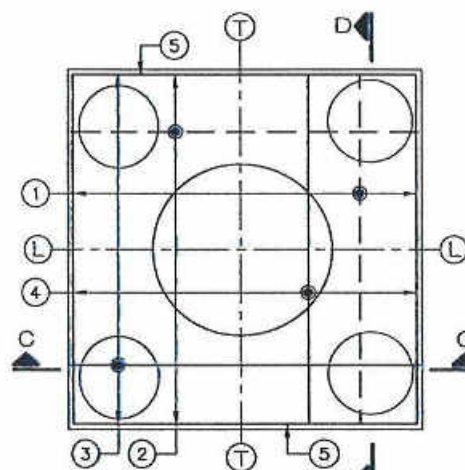
PLAN  
(SHOWING DIMENSION ONLY)  
(SCALE 1:75)



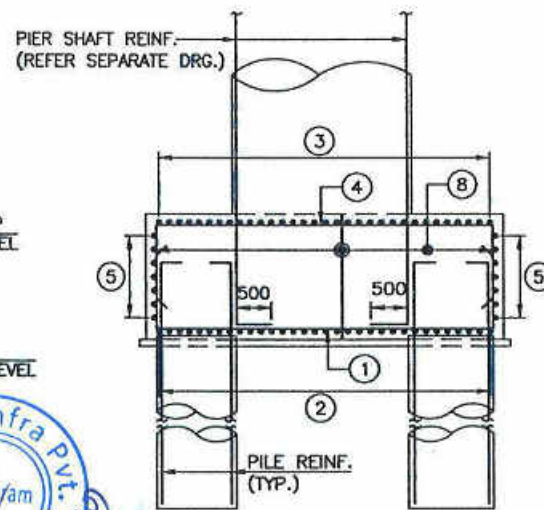
SECTION AT B-B  
(SHOWING DIMENSION ONLY)  
(SCALE 1:75)



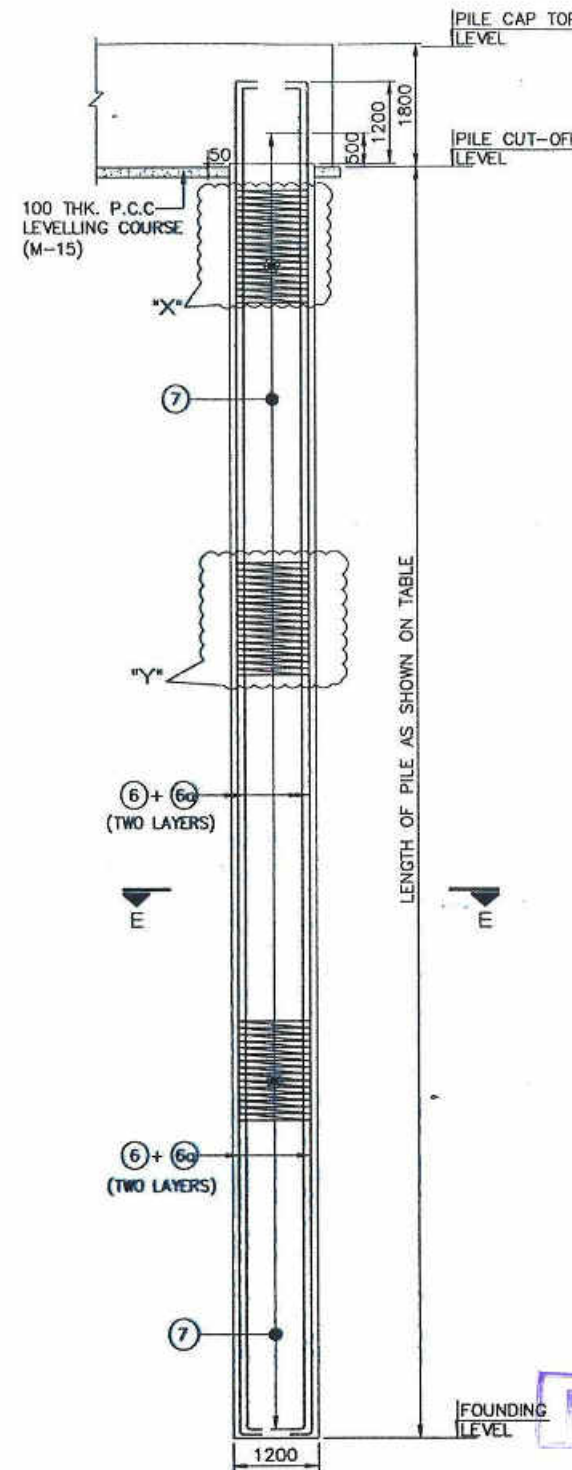
SECTION AT C-C  
(SHOWING REINFORCEMENT ONLY)  
(SCALE 1:75)



PLAN  
(SHOWING REINFORCEMENT ONLY)  
(SCALE 1:75)



SECTION AT D-D  
(SHOWING REINFORCEMENT ONLY)  
(SCALE 1:75)



REINFORCEMENT DETAILS  
OF PILE SHAFT  
(SCALE 1:75)

PIER NO.	GROUND LEVEL (m.)	PILE CAP TOP LEVEL (m.)	PILE CAP BOTTOM LEVEL (m.)	SCOUR LEVEL (m.)	FOUNDING LEVEL (m.)
P42	197.504	197.504	195.704	183.006	166.704

HYDROLOGICAL DATA	
HFL	203.350m
DISCHARGE	40500 cumecs
VELOCITY	3.5 m/s
MSL AT PIER	183.006 m
PILE CAPACITY:-	
NORMAL CASE	398.20T
SEISMIC CASE	446.00T

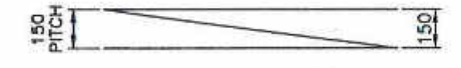
Pile Capacity as per  
just pile 425 T (Normal  
Case)

REVIEWED

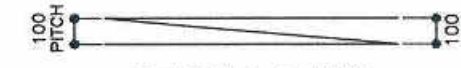
Bridge/Structural Engineer  
Feedback Infra  
NH-216, (Raigarh)

(Nilanjani Sarlam)

SECTION E-E  
(SCALE 1:25)

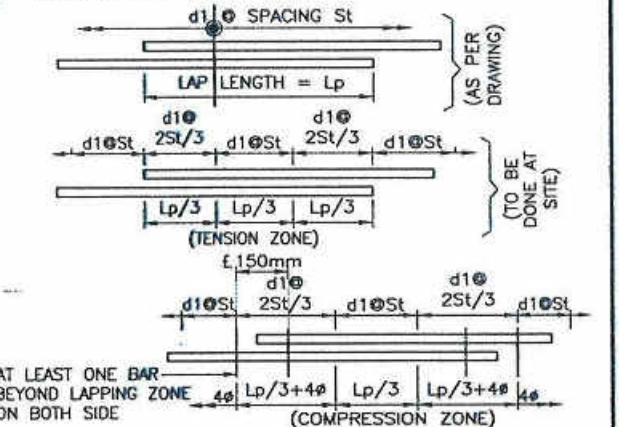


DETAILS AT "X"  
(SCALE 1:20)



DETAILS AT "Y"  
(SCALE 1:20)

- NOTES:-
- ALL DIMENSIONS ARE IN mm AND LEVELS IN METRES, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NO DIMENSION IS TO BE SCALED.
  - GRADE OF CONCRETE SHALL BE AS FOLLOWED:-  
PILE & PILE CAP ..... M35
  - CLEAR COVER TO ANY REINFORCEMENT :-  
IN FOUNDATION ..... 75mm  
IN SUB STRUCTURE ..... 50mm
  - BARS SHOWN IN THE DRAWING ARE NOT TO BE COUNTED, ONLY WRITTEN DATA SHALL BE FOLLOWED.
  - TMT HIGH YIELD STRENGTH DEFORMED BARS OF GRADE DESIGNATION Fe-500D CONFORMING TO IS:1786-1985, SHALL ONLY BE USED.
  - INITIAL AND ROUTINE LOAD TEST SHALL BE CARRIED OUT ON PILE ACCORDING TO IRC:78 AND AS PER STANDARD SPECIFICATION TO DETERMINE VERTICAL (V) AND HORIZONTAL (H) LOAD CARRYING CAPACITY OF PILE. IT SHALL BE ENSURED THAT IT IS NOT LESS THEN DESIGN WORKING LOAD.
  - PILE SHALL BE CAST ABOVE THE BOTTOM OF PILE CAP LEVEL. THE TOP OF CONCRETE SHALL BE BROKEN BEFORE CASTING OF PILE CAP, TAKING 50mm PILE EMBEDDED INTO THE PILE CAP.
  - L-L REPRESENTS LONGITUDINAL AXIS OF BRIDGE, T-T REPRESENTS TRANSVERSE AXIS OF BRIDGE.
  - OVERLAPPING FOR SPLICING OF REINFORCEMENT SHALL BE AS PER CLAUSE NO.15.2.5. ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:-



- 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.

GRADE OF CONCRETE	PERCENTAGE OF LAPPED BARS	<25%	33%	50%	>50%
M30		58	67	81	87
M35	X	53	61	74	80
M40		50	58	70	75

LEGEND:-	
TOP BAR	-----
BOTTOM BAR	-----

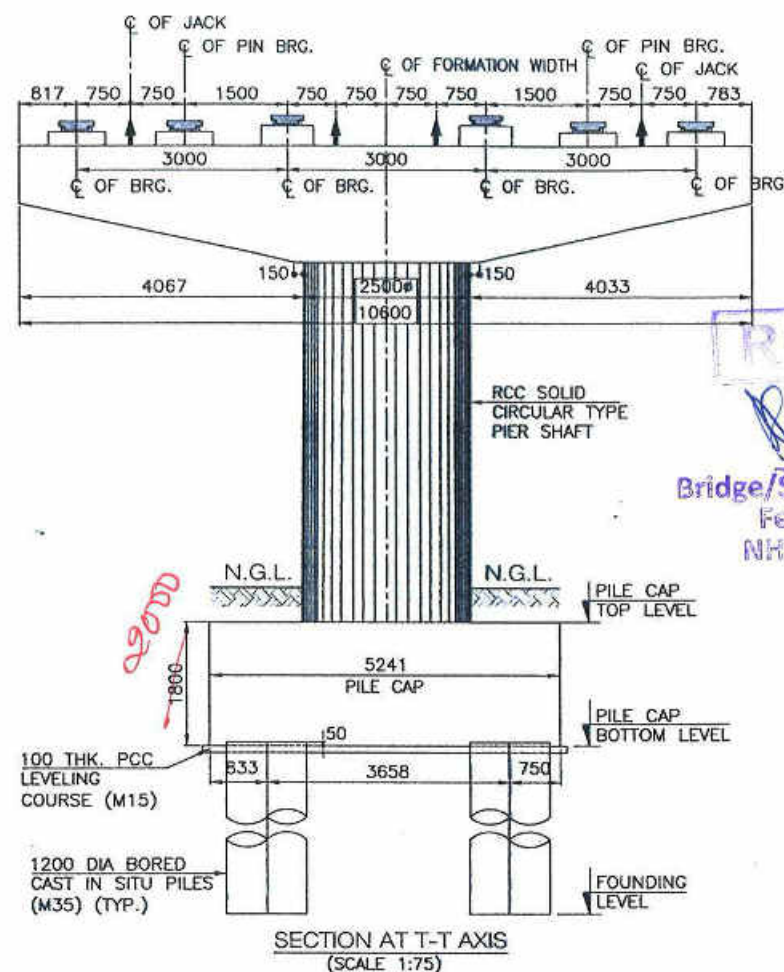
REINFORCEMENT DETAILS		
BAR MKD.	BAR DIA & SPACING/NOS	BAR SHAPE
1	20 # @100c/c	1000 1000
2	20 # @100c/c	1000 1000
3	16 # @100c/c	1000 1000
4	16 # @100c/c	1000 1000
5	12 # @200c/c	
6	15 NOS. 32 #	300
6a	15 NOS. 32 #	300
7	10 # @100c/c	
8	10 # @200c/c (L-L & T-T)	

R6	03/06/19	REVISED AS PER SITE CONSTRUCTION & PC COMMENTS	MS	YC	NDP
R5	06/05/19	REVISED AS PER SITE CONSTRUCTION & PC COMMENTS	MS	YC	NDP
R4	22/04/19	REVISED AS PER SITE CONSTRUCTION & PC COMMENTS	MS	YC	NDP
R3	18/02/19	REVISED AS PER RFI	MS	YC	NDP
MRD	ISSUED	DESCRIPTION	MS	CHECKED	APPROVED

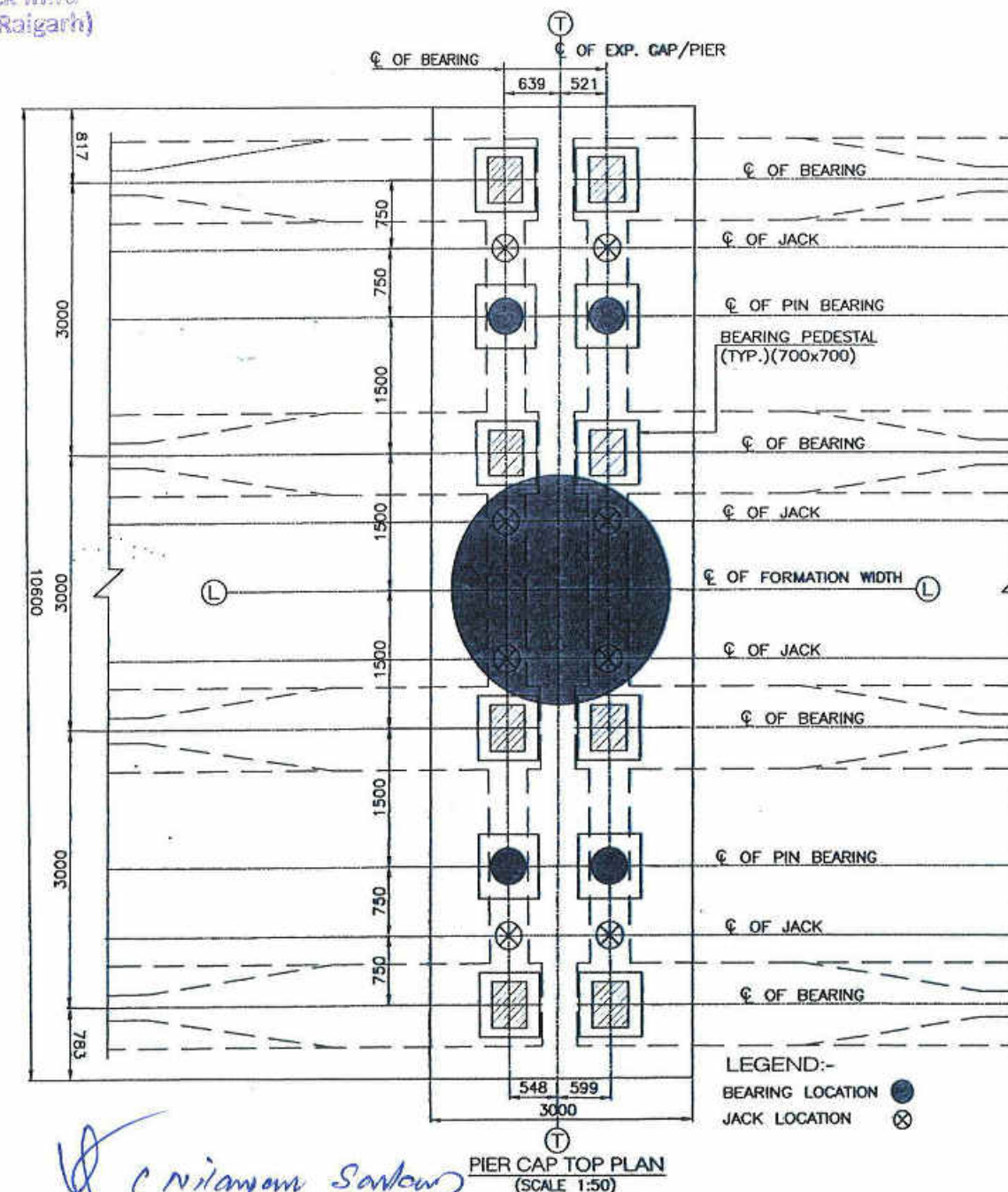
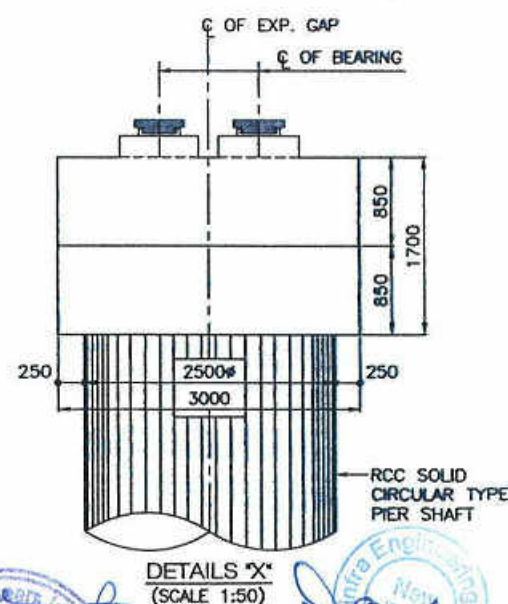
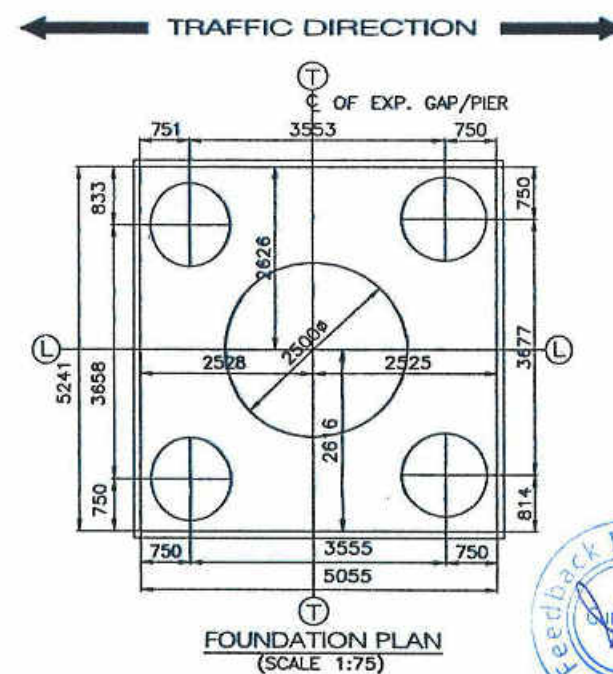
REVISIONS		
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CLIENT:	 <b>MORTH</b> Ministry of Road, Transport & Highways NHDP-IV A CELL, State PWD Chhattisgarh	AUTHORITY ENGINEER:	 <b>FEEDBACK INFRA</b> Feedback Infra Private Limited, 15TH Floor, DLF Building 9B, DLF Cyber city, DLF Phase-2, Sector-25 Gurgaon, HARYANA, Pin-122002	PROOF CONSULTANT:	 <b>HBS</b> HBS INFRA ENGINEERS INDIA PVT. LTD Flat No.102, Plot No. 8 to 11 fortune chambers, Madhapura, HYDERABAD	SAFETY CONSULTANT:	 <b>VASUPRADA</b> CONSULTANTS LLP Flat c-11, CEL Apartments, Vasundhara Enclave, New Delhi 110 095, India	DESIGN DIRECTOR:	 <b>ERA</b> J.P. MAJUMDAR ERA INFRA ENGINEERING LTD C-5541, SECTOR-42, NOIDA 201303	EPC CONTRACTOR:	 <b>ERA</b> Believe in difference DESIGN & ENGINEERING DIVISION ERA INFRA ENGINEERING LIMITED An ISO 9001:2001 & DHSAS 18001 Certified Company Head Office: C-6941, SECTOR-42, NOIDA 201303 Tel.: 0120-4145000 TO 4145036	CONSULTANT:	 <b>SPECTRUM</b> Techno Consultants Pvt Ltd 401, 4th Floor, Raikar Bhawan, Plot No 9, Sector 17, Vashi, Navi Mumbai, Maharashtra.	NAME OF PROJECT:	Rehabilitation & upgradation of NH-216 from km.3.800 to 90.460 (Raigarh-Saraipalli Section) in the State of Chhattisgarh to two-lanes with paved shoulders under NHDP-IV.		DRAWING TITLE:	DIMENSION & REINF. DETAILS OF PILE, PILE CAP FOR PIER P42 OF MJBR AT CH. 28+400		REV.	R6
DRAWING NUMBER:												00/00/STR/MNB/28+400-201		SCALE: As Shown							
DRAWN		DESIGNED		CHECKED		APPROVED															
																					














SCHEDULE OF PIER LEVELS :- P42					
PIER MARK	FORMATION LEVEL	GROUND LEVEL	PIER CAP TOP LEVEL	PILE CAP TOP LEVEL	PILE CAP BOTTOM LEVEL
P42	207.500	197.504	<del>204.926</del>	<del>197.504</del>	195.704



- NOTES:-

1. ALL DIMENSION ARE IN MILLIMETERS, LEVELS IN METERS, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS TO BE FOLLOWED.
2. ⊗ SHOWN JACK LOCATION IN PLAN AND  
 ↑ SHOWN JACK LOCATION IN ELEVATION,
3. GRADE OF CONCRETE SHALL BE FOLLOWED:-  
 PIER SHAFT, PIER CAP ..... M35  
 BEARING PEDESTAL ..... M40
4. CLEAR COVER TO OUTERMOST STEEL SHALL BE AS BELOW:-  
 PIER SHAFT ..... 50mm  
 FOUNDATION ..... 75mm  
 SEISMIC STOPPER/PEDESTAL ..... 50mm
5. THE REINFORCEMENT SHALL BE OF HYSD BARS (GRADE DESIGNATION Fe-500D) CONFORMING TO IS:1786.
6. L-L REPRESENTS LONGITUDINAL AXIS OF BRIDGE.  
 T-T REPRESENTS TRANSVERSE AXIS OF BRIDGE.

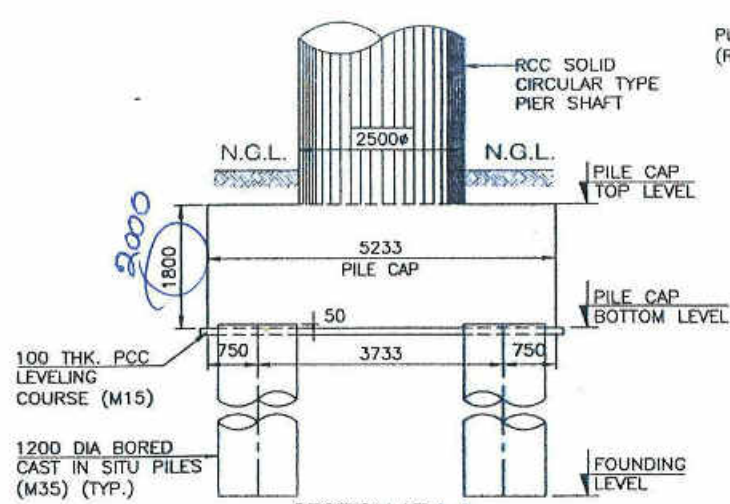
Bridge/Structural Engineer  
Feedback Infra  
NH-216.(Raigarh)

NO						03/06/19	REVISED AS PER SITE CONSTRUCTION & PC COMMENTS	QMS	YAC	NOP	<b>CLIENT:</b>  <b>MORTH</b> Ministry of Road, Transport & Highways NHDP-IV A CELL, State PWD Chhattisgarh	<b>AUTHORITY ENGINEER:</b>  <b>FEEDBACK INFRA</b> Feedback Infra Private Limited 15TH Floor, DLF Building 9B, DLF Cyber city, DLF Phase-2, Sector-25, Gurgaon, HARYANA, Pin-122002	<b>PROOF CONSULTANT:</b>  <b>HBS</b> HBS INFRA ENGINEERS INDIA PVT. LTD Flat no.102, Plot no. 8 to 11 10th/11th chambers, MG Road, HYDERABAD	<b>SAFETY CONSULTANT:</b>  <b>VASUPRADA</b> CONSULTANTS LLP Flat c-11, CEL Apartments, 10th/11th chambers, MG Road, Delhi 110 096, India	<b>DESIGN DIRECTOR:</b>  <b>ERA INFRA</b> ENGINEERING LTD C-56/41, SECTOR -42, NOIDA 201303, An ISO 9001, 14001 & OHSAS 18001 Certified Company Head Off. : C-56/41, SECTOR -42, NOIDA 201303 Tel. : 0120-4145000 To 4145036	<b>EPC CONTRACTOR:</b>  <b>SPECTRUM</b> Techno Consultants Pvt.Ltd. 401, 4th Floor, Raktar Bhawan, Plot No 9, Sector 17, Vashi, Navi Mumbai, Maharashtra . Tel. : 0120-4145000 To 4145036	<b>CONSULTANT:</b>  <b>SPECTRUM</b> Techno Consultants Pvt.Ltd. 401, 4th Floor, Raktar Bhawan, Plot No 9, Sector 17, Vashi, Navi Mumbai, Maharashtra . Tel. : 0120-4145000 To 4145036	<b>NAME OF PROJECT:</b> <b>Rehabilitation &amp; upgradation of NH-216 from km.3.800 to 90.460 (Raigarh-Saraipalli Section) in the State of Chhattisgarh to two-lanes with paved shoulders under NHDP-IV .</b>	<b>DRAWING TITLE:</b> DIMENSIONAL DETAILS OF PIER SHAFT,CAP,PEDESTAL FOR PIER P42 OF MJBR AT CH. 28+400	<b>REV.</b> R6		
RS						06/06/19	REVISED AS PER SITE CONSTRUCTION & PC COMMENTS	QMS	YAC	NOP									<b>DRAWING NUMBER:</b> 00/00/STR/MNB/28+400-202	<b>SCALE:</b> As Shown		
RA						22/04/19	REVISED AS PER SITE CONSTRUCTION & PC COMMENTS	QMS	YAC	NOP									<b>DRAWN</b>	<b>DESIGNED</b>	<b>CHECKED</b>	<b>APPROVED</b>
RJ						16/02/19	REVISED AS PER INT.	QMS	YAC	NOP												
MND						ISSUED	DESCRIPTION	BOOK	CHECKED	APPROVED												
REVISIONS																						

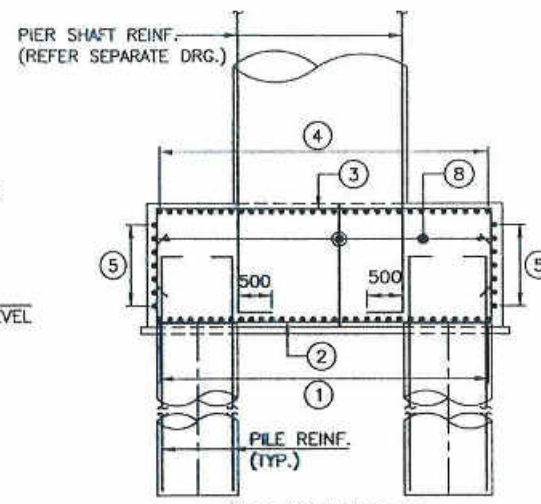




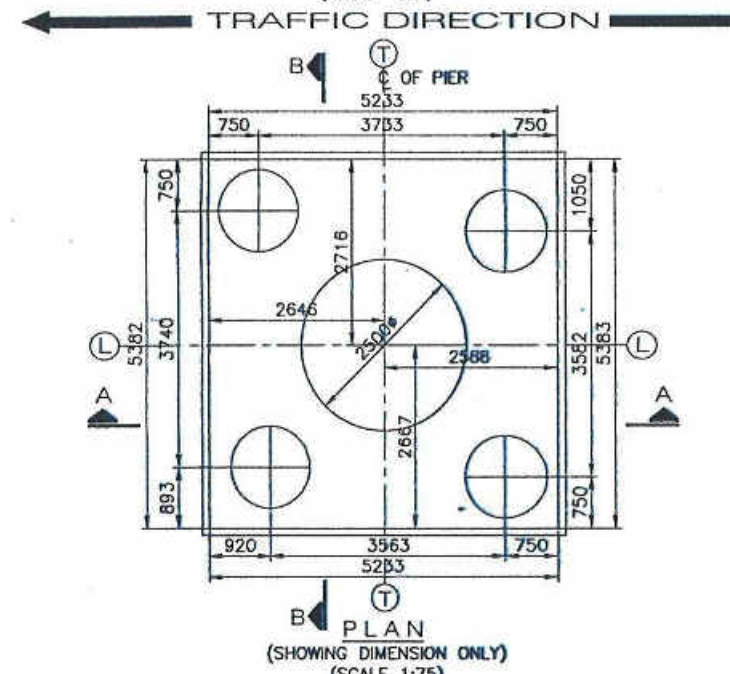




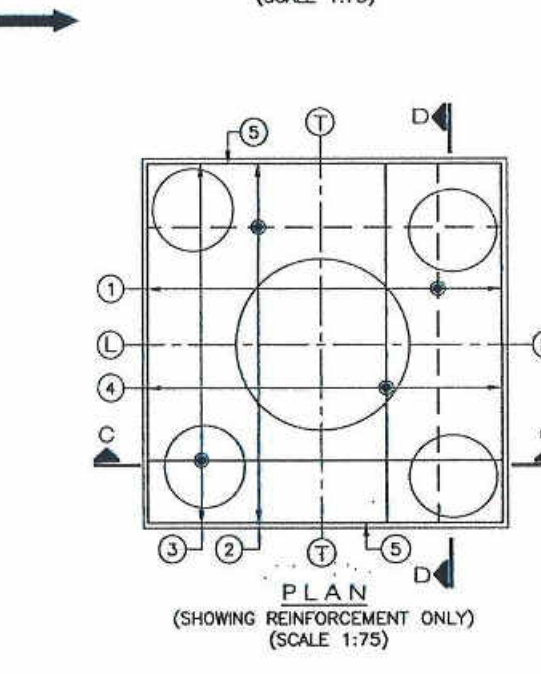
SECTION AT A-A  
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(SCALE 1:75)



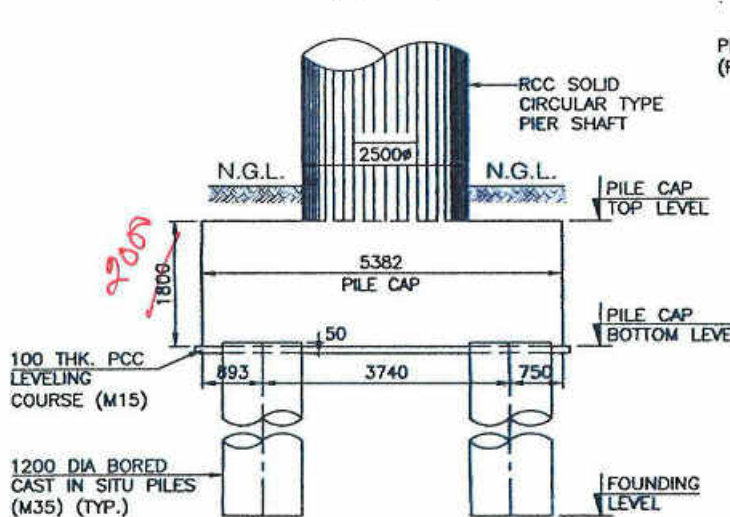
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(SCALE 1:75)



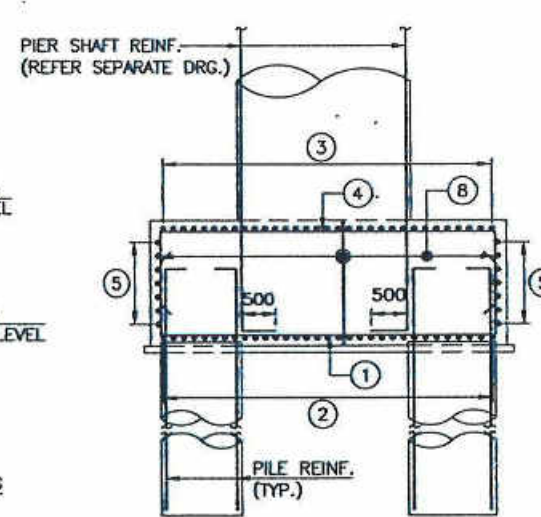
PLAN  
(SHOWING DIMENSION ONLY)  
(SCALE 1:75)



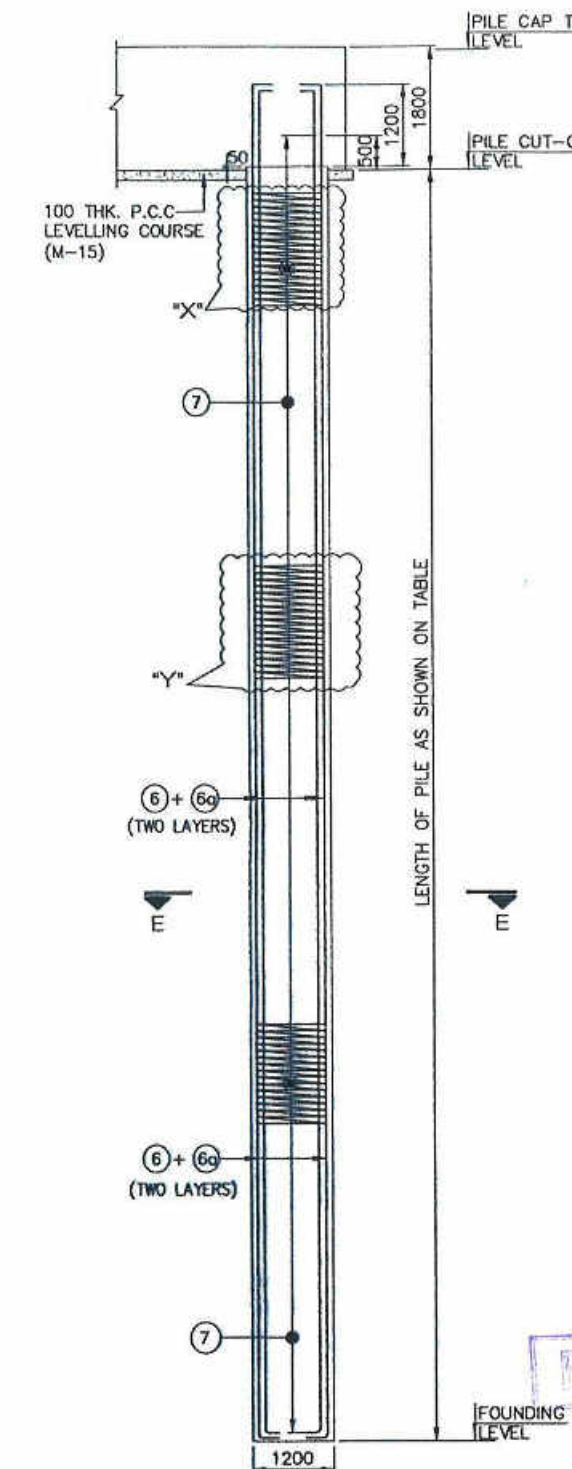
PLAN  
(SHOWING REINFORCEMENT ONLY)  
(SCALE 1:75)



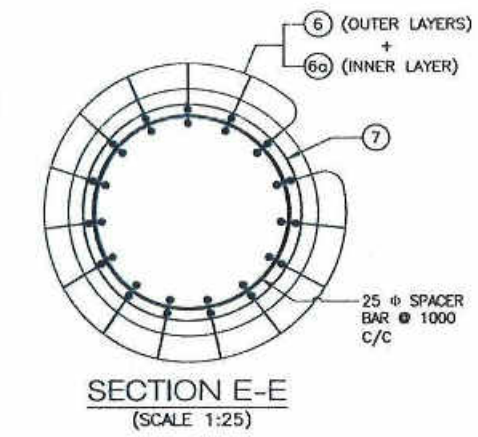
SECTION AT B-B  
(SHOWING DIMENSION ONLY)  
(SCALE 1:75)



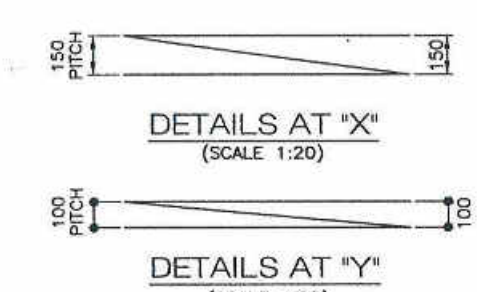
SECTION AT D-D  
(SHOWING REINFORCEMENT ONLY)  
(SCALE 1:75)



REINFORCEMENT DETAILS  
OF PILE SHAFT  
(SCALE 1:75)



SECTION E-E  
(SCALE 1:25)



HYDROLOGICAL DATA	
HFL	203.350m
DISCHARGE	40500 cumecs
VELOCITY	3.5 m/s
MSL AT PIER	184.326 m

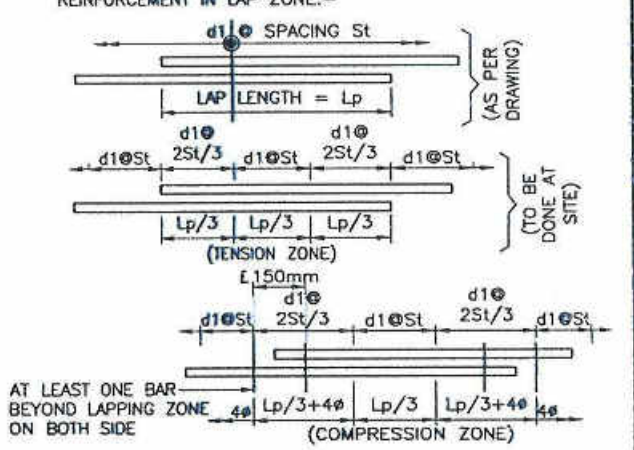
PILE CAPACITY:-	
NORMAL CASE	398.20T
SEISMIC CASE	445.00T

*Pile capacity as per  
got pile normal case 425*

**REVIEWED**  
Bridge/Structural Engineer  
Feedback Infra  
NH-216, (Raigarh)

PIER NO.	GROUND LEVEL (m.)	PILE CAP TOP LEVEL (m.)	PILE CAP BOTTOM LEVEL (m.)	SCOUR LEVEL (m.)	FOUNDING LEVEL (m.)
P43	199.341	199.341	197.541	185.118	168.541

- NOTES:-**
- ALL DIMENSIONS ARE IN mm AND LEVELS IN METRES, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NO DIMENSION IS TO BE SCALED.
  - GRADE OF CONCRETE SHALL BE AS FOLLOWED:-  
PILE & PILE CAP ..... M35
  - CLEAR COVER TO ANY REINFORCEMENT :-  
IN FOUNDATION ..... 75mm  
IN SUB STRUCTURE ..... 50mm
  - BARS SHOWN IN THE DRAWING ARE NOT TO BE COUNTED, ONLY WRITTEN DATA SHALL BE FOLLOWED.
  - TMT HIGH YIELD STRENGTH DEFORMED BARS OF GRADE DESIGNATION Fe-500D CONFORMING TO IS:1786-1985, SHALL ONLY BE USED.
  - INITIAL AND ROUTINE LOAD TEST SHALL BE CARRIED OUT ON PILE ACCORDING TO IRC:78 AND AS PER STANDARD SPECIFICATION TO DETERMINE VERTICAL (V) AND HORIZONTAL (H) LOAD CARRYING CAPACITY OF PILE. IT SHALL BE ENSURED THAT IT IS NOT LESS THEN DESIGN WORKING LOAD.
  - PILE SHALL BE CAST ABOVE THE BOTTOM OF PILE CAP LEVEL. THE TOP OF CONCRETE SHALL BE BROKEN BEFORE CASTING OF PILE CAP, TAKING 50mm PILE EMBEDDED INTO THE PILE CAP.
  - L-L REPRESENTS LONGITUDINAL AXIS OF BRIDGE.  
T-T REPRESENTS TRANSVERSE AXIS OF BRIDGE.
  - OVERLAPPING FOR SPLICING OF REINFORCEMENT SHALL BE AS PER CLAUSE NO.15.2.5. ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:-



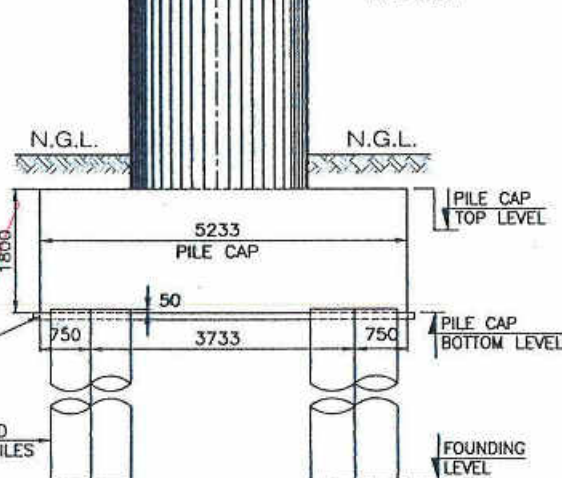
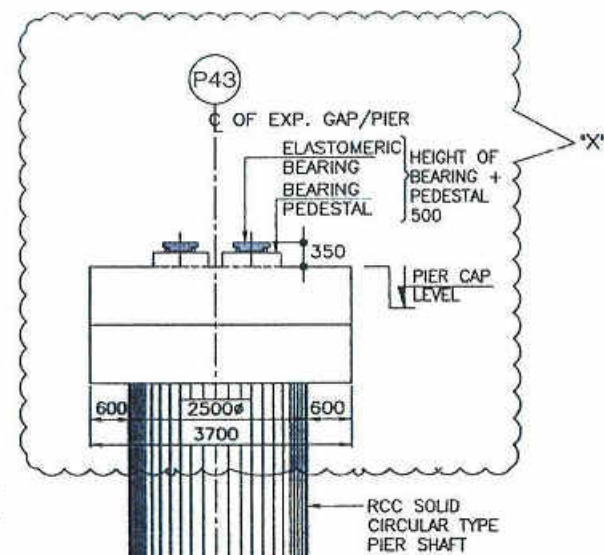
GRADE OF CONCRETE	PERCENTAGE OF LAPPED BARS	<25%	33%	50%	>50%
M30		58	67	81	87
M35	X	53	61	74	80
M40		50	58	70	75

**LEGEND:-**  
TOP BAR .....  
BOTTOM BAR .....

REINFORCEMENT DETAILS		
BAR MKD.	BAR DIA & SPACING/NOS	BAR SHAPE
1	20 # @100c/c	1000 1000
2	20 # @100c/c	1000 1000
3	16 # @100c/c	1000 1000
4	16 # @100c/c	1000 1000
5	12 # @200c/c	
6	15 NOS. 32 #	300
6a	15 NOS. 32 #	300
7	10 # @100c/c	
8	10 # @200c/c (L-L & T-T)	

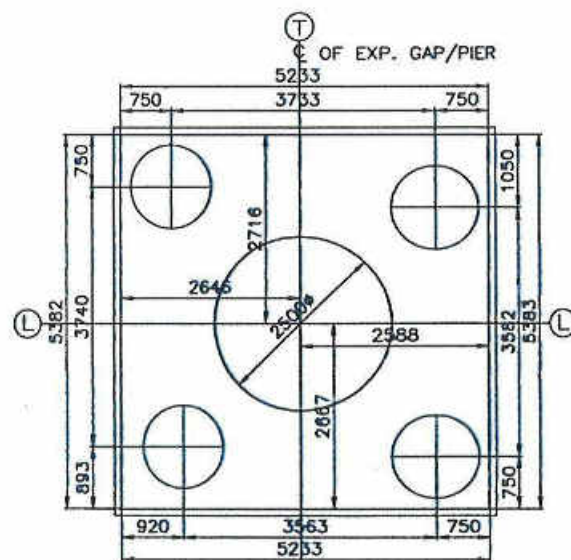
R6	03/06/19	REVISED AS PER SITE CONSTRUCTION & PC COMMENTS	QMS	Y/C	NOP	CLIENT:  <b>MORTH</b> Ministry of Road, Transport & Highways <b>NHDP-IV A CELL</b> , State PWD Chhattisgarh	AUTHORITY ENGINEER:  <b>FEEDBACK INFRA</b> Feedback Infra Private Limited 15TH Floor, DLF Building 98, DLF Cyber city, DLF Phase-2, Sector-25 Gurgaon, HARYANA Pin-122002	PROOF CONSULTANT:  <b>HPS</b> HPS INFRA ENGINEERS PRIVATE LTD Flat no 101, 1st Floor, 98/1, Toriwal Chambers, Main Road, HYDERABAD	SAFETY CONSULTANT:  <b>VASUPRADA</b> CONSULTANTS LLP Flat C-11, CEL Apartments, Vasundhara Enclave, New Delhi 110 096, India	DESIGN & ENGINEERING DIVISION ERA INFRA ENGINEERING LIMITED An ISO 9001,14001 & OHSAS 18001 Certified Company Head Off. : C-66/41, SECTOR -62, NOIDA 201303 Tel. : 0120-4145000 TO 4145038	EPC CONTRACTOR:  <b>ERA</b> Believe in difference	CONSULTANT:  <b>SPECTRUM</b> Techno Consultants Pvt.Ltd. 401, 4th Floor, Ralkar Bhawan, Plot No 8, Sector 17, Vashi, Navi Mumbai, Maharashtra	NAME OF PROJECT: <b>Rehabilitation &amp; upgradation of NH-216 from km.3.800 to 90.460 (Raigarh-Saraipalli Section) in the State of Chhattisgarh to two-lanes with paved shoulders under NHDP-IV.</b>	DRAWING TITLE: DIMENSION & REINF. DETAILS OF PILE, PILE CAP FOR PIER P43 OF MJBR AT CH. 28+400	REV. R6																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
R5	06/05/19	REVISED AS PER SITE CONSTRUCTION & PC COMMENTS	QMS	Y/C	NOP									DRAWING NUMBER: 00/00/STR/MNB/28+400-204	SCALE: As Shown																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
R4	22/04/19	REVISED AS PER SITE CONSTRUCTION & PC COMMENTS	QMS	Y/C	NOP																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
R3	18/02/19	REVISED AS PER RFI	QMS	Y/C	NOP																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
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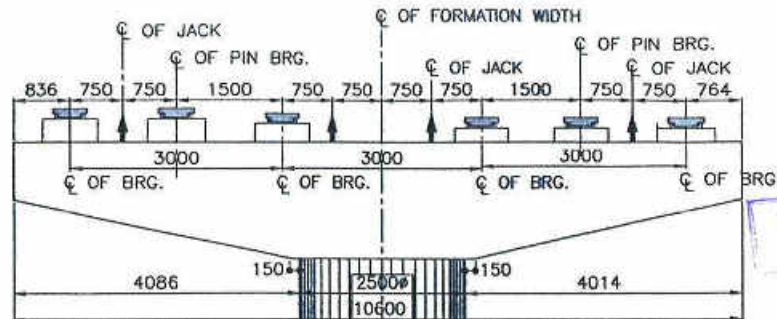


SECTION AT L-L AXIS  
(SCALE 1:75)

TRAFFIC DIRECTION

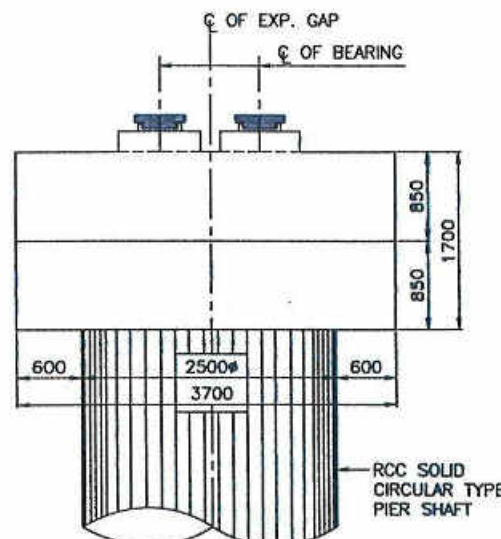


FOUNDATION PLAN  
(SCALE 1:75)



SECTION AT T-T AXIS  
(SCALE 1:75)

SCHEDULE OF PIER LEVELS :- P43					
PIER MARK	FORMATION LEVEL	GROUND LEVEL	PIER CAP TOP LEVEL	PILE CAP TOP LEVEL	PILE CAP BOTTOM LEVEL
P43	207.500	199.341	204.822	199.341	197.541



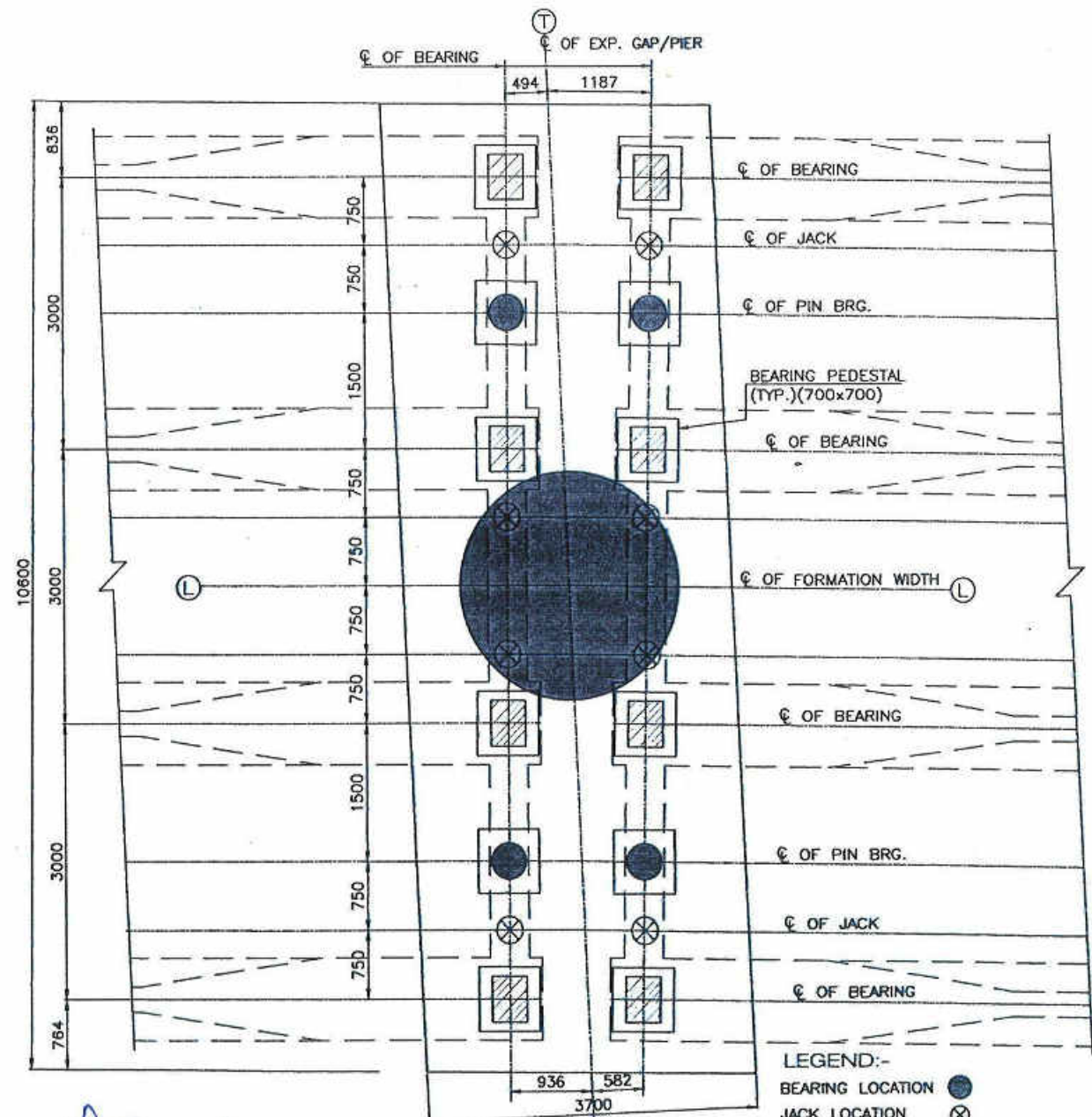
DETAILS 'X'  
(SCALE 1:50)

REVIEWED

Bridge/Structural Engineer  
Feedback Infra  
NH-216, (Raigarh)

NOTES:-

- ALL DIMENSION ARE IN MILLIMETERS, LEVELS IN METERS, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS TO BE FOLLOWED.
- SHOWN JACK LOCATION IN PLAN AND  
SHOWN JACK LOCATION IN ELEVATION,
- GRADE OF CONCRETE SHALL BE FOLLOWED:-  
PIER SHAFT, PIER CAP ..... M35  
BEARING PEDESTAL ..... M40
- CLEAR COVER TO OUTERMOST STEEL SHALL BE AS BELOW:-  
PIER SHAFT ..... 50mm  
FOUNDATION ..... 75mm
- THE REINFORCEMENT SHALL BE OF HYSD BARS (GRADE DESIGNATION Fe-500D) CONFORMING TO IS:1786.
- L-L REPRESENTS LONGITUDINAL AXIS OF BRIDGE.  
T-T REPRESENTS TRANSVERSE AXIS OF BRIDGE.



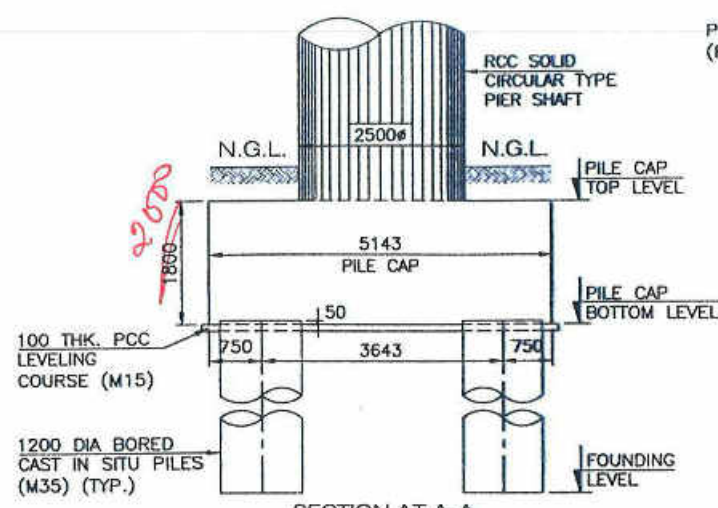
PIER CAP TOP PLAN  
(SCALE 1:50)

REV.	DATE	REVISION	DESIGNED	CHECKED	APPROVED	CLIENT	AUTHORITY ENGINEER	PROJECT CONSULTANT	SAFETY CONSULTANT	DESIGNER	CONTRACTOR	CONSULTANT	NAME OF PROJECT	DRAWING TITLE	REV.
R6	03/06/19	REVISED AS PER SITE CONSTRUCTION & PC COMMENTS	QMS	YAC	NOP	MORTH	MORTH	FEEDBACK INFRA	FEEDBACK INFRA PRIVATE LIMITED	J.P. MAJUMBAR	ERA	SPECTRUM	Rehabilitation & upgradation of NH-216 from km.3.800 to 90.460 (Raigarh-Saraipalli Section) in the State of Chhattisgarh to two-lanes with paved shoulders under NHDP-IV.	DIMENSIONAL DETAILS OF PIER SHAFT, CAP, PEDESTAL	R6
R5	05/05/19	REVISED AS PER SITE CONSTRUCTION & PC COMMENTS	QMS	YAC	NOP	MORTH	MORTH	FEEDBACK INFRA	FEEDBACK INFRA PRIVATE LIMITED	J.P. MAJUMBAR	ERA	SPECTRUM	Rehabilitation & upgradation of NH-216 from km.3.800 to 90.460 (Raigarh-Saraipalli Section) in the State of Chhattisgarh to two-lanes with paved shoulders under NHDP-IV.	DIMENSIONAL DETAILS OF PIER SHAFT, CAP, PEDESTAL	R6
R4	22/04/19	REVISED AS PER SITE CONSTRUCTION & PC COMMENTS	QMS	YAC	NOP	MORTH	MORTH	FEEDBACK INFRA	FEEDBACK INFRA PRIVATE LIMITED	J.P. MAJUMBAR	ERA	SPECTRUM	Rehabilitation & upgradation of NH-216 from km.3.800 to 90.460 (Raigarh-Saraipalli Section) in the State of Chhattisgarh to two-lanes with paved shoulders under NHDP-IV.	DIMENSIONAL DETAILS OF PIER SHAFT, CAP, PEDESTAL	R6
R3	18/02/19	REVISED AS PER RFI	QMS	YAC	NOP	MORTH	MORTH	FEEDBACK INFRA	FEEDBACK INFRA PRIVATE LIMITED	J.P. MAJUMBAR	ERA	SPECTRUM	Rehabilitation & upgradation of NH-216 from km.3.800 to 90.460 (Raigarh-Saraipalli Section) in the State of Chhattisgarh to two-lanes with paved shoulders under NHDP-IV.	DIMENSIONAL DETAILS OF PIER SHAFT, CAP, PEDESTAL	R6
MAD	ISSUED	DESCRIPTION	QMS	YAC	NOP	MORTH	MORTH	FEEDBACK INFRA	FEEDBACK INFRA PRIVATE LIMITED	J.P. MAJUMBAR	ERA	SPECTRUM	Rehabilitation & upgradation of NH-216 from km.3.800 to 90.460 (Raigarh-Saraipalli Section) in the State of Chhattisgarh to two-lanes with paved shoulders under NHDP-IV.	DIMENSIONAL DETAILS OF PIER SHAFT, CAP, PEDESTAL	R6

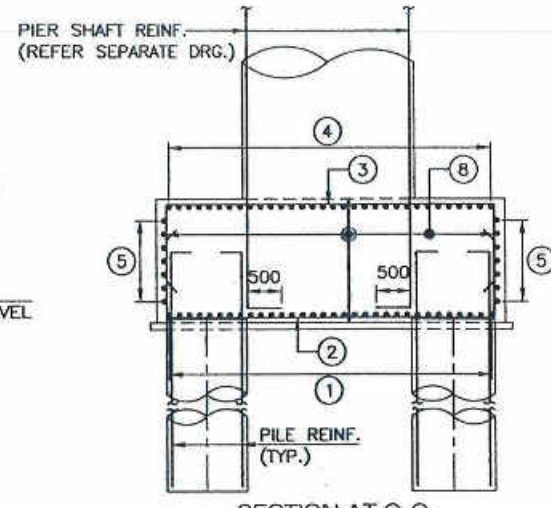


REVISIONS				CLIENT:		AUTHORITY ENGINEER:		PROOF CONSULTANT:		SAFETY CONSULTANT:		DESIGN SECTION:		EPC CONTRACTOR:		CONSULTANT:		NAME OF PROJECT:		DRAWING TITLE:		REV.	
REVISIONS				MORTH		MORTH		HBS		VASUPRADA		J.P. MAJUMDAR		ERA		SPECTRUM		Rehabilitation & upgradation of NH-216 from km.3.600 to 90.460 (Raigarh-Sarapalli Section) in the State of Chhattisgarh to two-lanes with paved shoulders under NHDP-IV .		REINFORCEMENT DETAILS OF PIER SHAFT,CAP,PEDESTAL PIER P43 OF MJBR AT CH.28+00		R6	
REVISIONS				MORTH		MORTH		HBS		VASUPRADA		J.P. MAJUMDAR		ERA		SPECTRUM		Rehabilitation & upgradation of NH-216 from km.3.600 to 90.460 (Raigarh-Sarapalli Section) in the State of Chhattisgarh to two-lanes with paved shoulders under NHDP-IV .		DRAWING NUMBER:		SCALE:AS SHOWN	
REVISIONS				MORTH		MORTH		HBS		VASUPRADA		J.P. MAJUMDAR		ERA		SPECTRUM		Rehabilitation & upgradation of NH-216 from km.3.600 to 90.460 (Raigarh-Sarapalli Section) in the State of Chhattisgarh to two-lanes with paved shoulders under NHDP-IV .		DRAWING NUMBER:		SCALE:AS SHOWN	
REVISIONS				MORTH		MORTH		HBS		VASUPRADA		J.P. MAJUMDAR		ERA		SPECTRUM		Rehabilitation & upgradation of NH-216 from km.3.600 to 90.460 (Raigarh-Sarapalli Section) in the State of Chhattisgarh to two-lanes with paved shoulders under NHDP-IV .		DRAWING NUMBER:		SCALE:AS SHOWN	
REVISIONS				MORTH		MORTH		HBS		VASUPRADA		J.P. MAJUMDAR		ERA		SPECTRUM		Rehabilitation & upgradation of NH-216 from km.3.600 to 90.460 (Raigarh-Sarapalli Section) in the State of Chhattisgarh to two-lanes with paved shoulders under NHDP-IV .		DRAWING NUMBER:		SCALE:AS SHOWN	
REVISIONS				MORTH		MORTH		HBS		VASUPRADA		J.P. MAJUMDAR		ERA		SPECTRUM		Rehabilitation & upgradation of NH-216 from km.3.600 to 90.460 (Raigarh-Sarapalli Section) in the State of Chhattisgarh to two-lanes with paved shoulders under NHDP-IV .		DRAWING NUMBER:		SCALE:AS SHOWN	
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REVISIONS				MORTH		MORTH		HBS		VASUPRADA		J.P. MAJUMDAR		ERA		SPECTRUM		Rehabilitation & upgradation of NH-216 from km.3.600 to 90.460 (Raigarh-Sarapalli Section) in the State of Chhattisgarh to two-lanes with paved shoulders under NHDP-IV .		DRAWING NUMBER:		SCALE:AS SHOWN	
REVISIONS				MORTH		MORTH		HBS		VASUPRADA		J.P. MAJUMDAR		ERA		SPECTRUM		Rehabilitation & upgradation of NH-216 from km.3.600 to 90.460 (Raigarh-Sarapalli Section) in the State of Chhattisgarh to two-lanes with paved shoulders under NHDP-IV .		DRAWING NUMBER:		SCALE:AS SHOWN	
REVISIONS				MORTH		MORTH		HBS		VASUPRADA		J.P. MAJUMDAR		ERA		SPECTRUM		Rehabilitation & upgradation of NH-216 from km.3.600 to 90.460 (Raigarh-Sarapalli Section) in the State of Chhattisgarh to two-lanes with paved shoulders under NHDP-IV .		DRAWING NUMBER:		SCALE:AS SHOWN	
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REVISIONS				MORTH		MORTH		HBS		VASUPRADA		J.P. MAJUMDAR		ERA		SPECTRUM		Rehabilitation & upgradation of NH-216 from km.3.600 to 90.460 (Raigarh-Sarapalli Section) in the State of Chhattisgarh to two-lanes with paved shoulders under NHDP-IV .		DRAWING NUMBER:		SCALE:AS SHOWN	
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REVISIONS				MORTH		MORTH		HBS		VASUPRADA		J.P. MAJUMDAR		ERA		SPECTRUM		Rehabilitation & upgradation of NH-216 from km.3.600 to 90.460 (Raigarh-Sarapalli Section) in the State of Chhattisgarh to two-lanes with paved shoulders under NHDP-IV .		DRAWING NUMBER:		SCALE:AS SHOWN	
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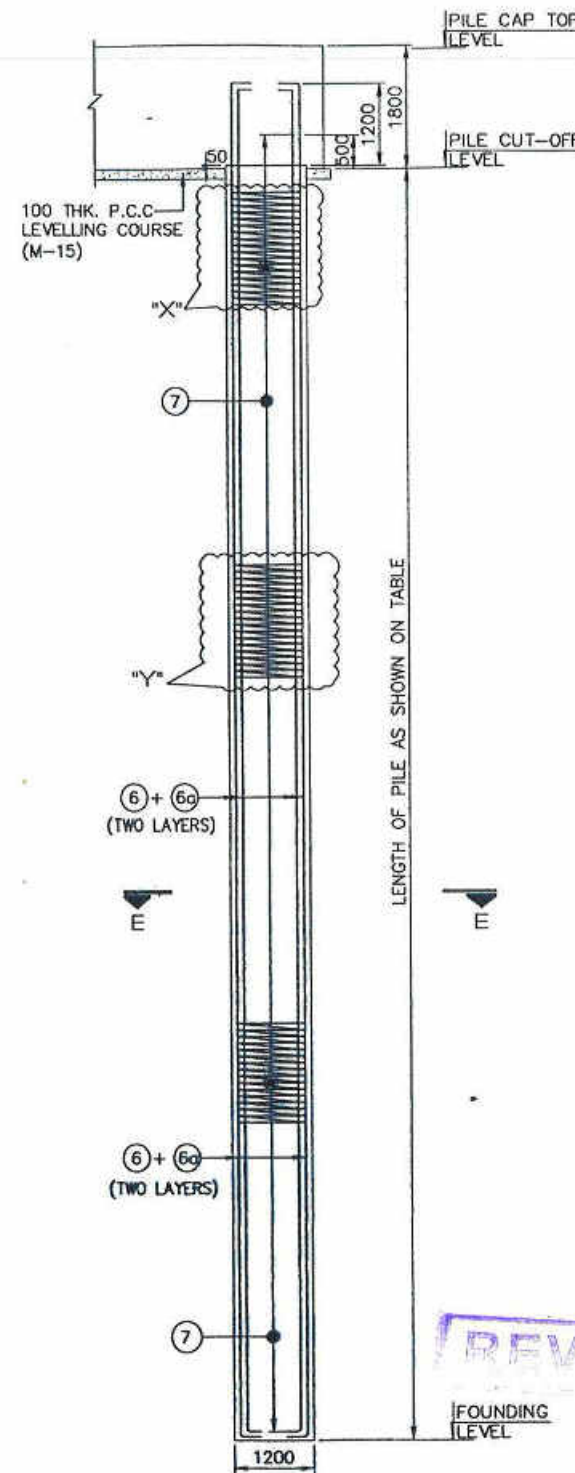




SECTION AT A-A  
(SHOWING DIMENSION ONLY)  
(SCALE 1:75)



SECTION AT C-C  
(SHOWING REINFORCEMENT ONLY)  
(SCALE 1:75)

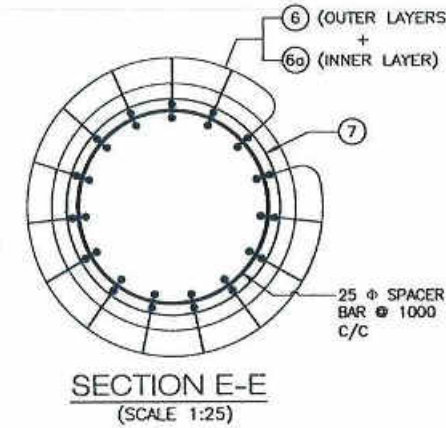


REINFORCEMENT DETAILS  
OF PILE SHAFT  
(SCALE 1:75)

HYDROLOGICAL DATA	
HFL	203.350m
DISCHARGE	40500 cumecs
VELOCITY	3.5 m/s
MSL AT PIER	184.326 m

PILE CAPACITY:-	
NORMAL CASE	415.00T
SEISMIC CASE	442.00T

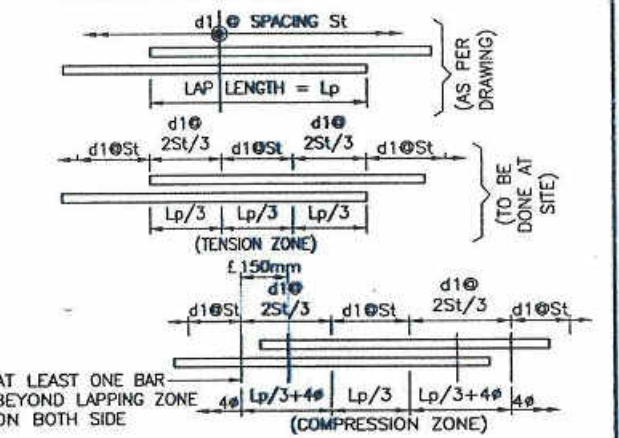
*Pile capacity as per  
test pile  
Normal case 425T*



DETAILS AT "X"  
(SCALE 1:20)

DETAILS AT "Y"  
(SCALE 1:20)

- NOTES:-
- ALL DIMENSIONS ARE IN mm AND LEVELS IN METRES, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NO DIMENSION IS TO BE SCALED.
  - GRADE OF CONCRETE SHALL BE AS FOLLOWED:-  
PILE & PILE CAP ..... M35
  - CLEAR COVER TO ANY REINFORCEMENT :-  
IN FOUNDATION ..... 75mm  
IN SUB STRUCTURE ..... 50mm
  - BARS SHOWN IN THE DRAWING ARE NOT TO BE COUNTED, ONLY WRITTEN DATA SHALL BE FOLLOWED.
  - TMT HIGH YIELD STRENGTH DEFORMED BARS OF GRADE DESIGNATION Fe-500D CONFORMING TO IS:1786-1985. SHALL ONLY BE USED.
  - INITIAL AND ROUTINE LOAD TEST SHALL BE CARRIED OUT ON PILE ACCORDING TO IRC:78 AND AS PER STANDARD SPECIFICATION TO DETERMINE VERTICAL (V) AND HORIZONTAL (H) LOAD CARRYING CAPACITY OF PILE. IT SHALL BE ENSURED THAT IT IS NOT LESS THEN DESIGN WORKING LOAD.
  - PILE SHALL BE CAST ABOVE THE BOTTOM OF PILE CAP LEVEL. THE TOP OF CONCRETE SHALL BE BROKEN BEFORE CASTING OF PILE CAP, TAKING 50mm PILE EMBEDDED INTO THE PILE CAP.
  - L-L REPRESENTS LONGITUDINAL AXIS OF BRIDGE. T-T REPRESENTS TRANSVERSE AXIS OF BRIDGE.
  - OVERLAPPING FOR SPLICING OF REINFORCEMENT SHALL BE AS PER CLAUSE NO.15.2.5. ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:-



- 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.

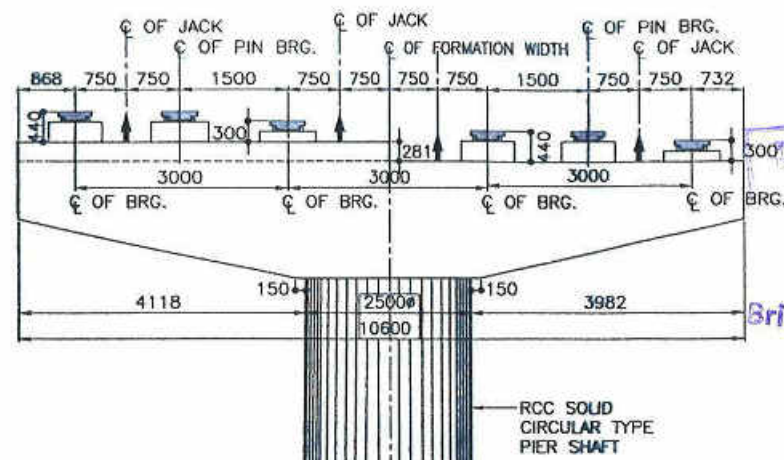
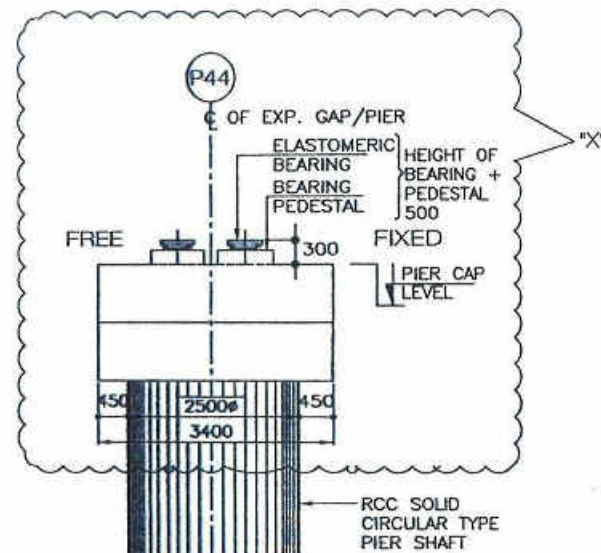
GRADE OF CONCRETE	PERCENTAGE OF LAPPED BARS	<25%	33%	50%	>50%
M30		58	67	81	87
M35	X	53	61	74	80
M40		50	58	70	75

LEGEND:-  
TOP BAR .....  
BOTTOM BAR .....  
REINFORCEMENT DETAILS

BAR MKD.	BAR DIA & SPACING/NOS	BAR SHAPE
1	20 # @100c/c	1000 1000
2	20 # @100c/c	1000 1000
3	16 # @100c/c	1000 1000
4	16 # @100c/c	1000 1000
5	12 # @200c/c	
6	15 NOS. 32 #	300
6a	15 NOS. 32 #	300
7	10 # @100c/c	
8	10 # @200c/c (L-L & T-T)	

03/06/19			REVISED AS PER SITE CONSTRUCTION & PC COMMENTS			QMS	YAC	NOP	CLIENT: <b>MORTH</b>  Ministry of Road, Transport & Highways NHDP-IV & CELL - State PWD Chhattisgarh	AUTHORITY ENGINEER:  <b>FEEDBACK INFRA</b> Feedback Infra Private Limited 15TH Floor, DLF Building 9B, DLF Cyber city,DLF Phase-2, Sector-25,Gurgaon, HARYANA Pin-122002	PROOF CONSULTANT:  <b>HBS INFRA ENGINEERS</b> INDIA PVT LTD Flat no.169, Phase-4, C-11 torjane chambers,Madhapura HYDERABAD	SAFETY CONSULTANT:  <b>VASUPRADA CONSULTANTS LLP</b> Flat c-11, CEL Apartments, Vasundhara Enclave, New Delhi 110 096, India	DESIGN DIRECTOR:  J.P.MAJUMDAR ERA INFRA ENGINEERING LTD. C-56/41, SECTOR -42 NOIDA 201303.	ERC CONTRACTOR:  <b>ERA</b> Believe in difference DESIGN & ENGINEERING DIVISION ERA INFRA ENGINEERING LIMITED An ISO 9001:2001 & OHSAS 18001 Certified Company Head Office : C-59/41, SECTOR -42, NOIDA 201303 Tel : 0120-4145000 TO 4145036	CONSULTANT:  <b>SPECTRUM Techno Consultants Pvt Ltd</b> 401, 4th Floor, Railkar Bhavan, Plot No 9, Sector 17, Vashi, Navi Mumbai, Maharashtra	NAME OF PROJECT: <b>Rehabilitation &amp; upgradation of NH-216 from km.3.800 to 90.460 (Raigarh-Saralpalli Section) in the State of Chhattisgarh to two-lanes with paved shoulders under NHDP-IV.</b>	DRAWING TITLE: DIMENSION & REINF. DETAILS OF PILE, PILE CAP FOR PIER P44 OF MJBR AT CH. 28+400	REV. <b>R6</b>	
06/05/19			REVISED AS PER SITE CONSTRUCTION & PC COMMENTS			QMS	YAC	NOP									DRAWING NUMBER: 00/00/STR/MNB/28+400-207	SCALE@A2 As Shown	
22/04/19			REVISED AS PER SITE CONSTRUCTION & PC COMMENTS			QMS	YAC	NOP											
18/02/19			REVISED AS PER RFI			QMS	YAC	NOP											
ISSUED			DESCRIPTION			DUAL	CHECKED	APPROVED											
REVISIONS																			

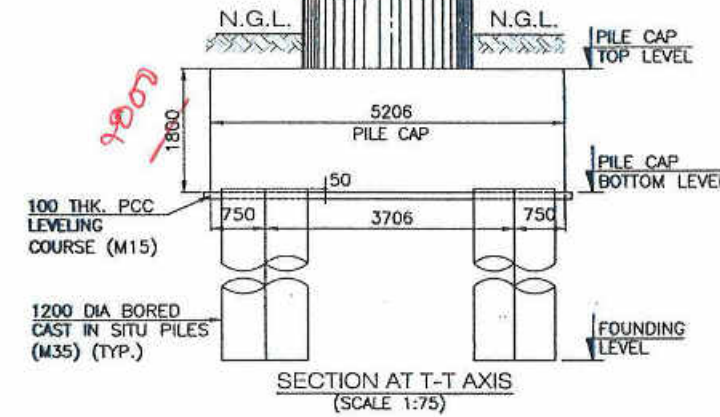
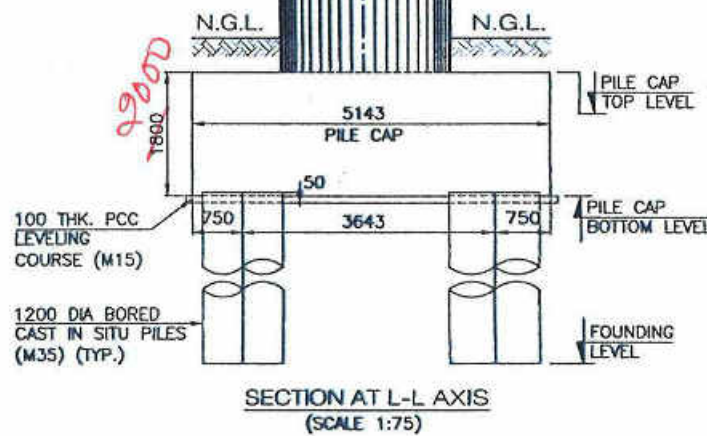




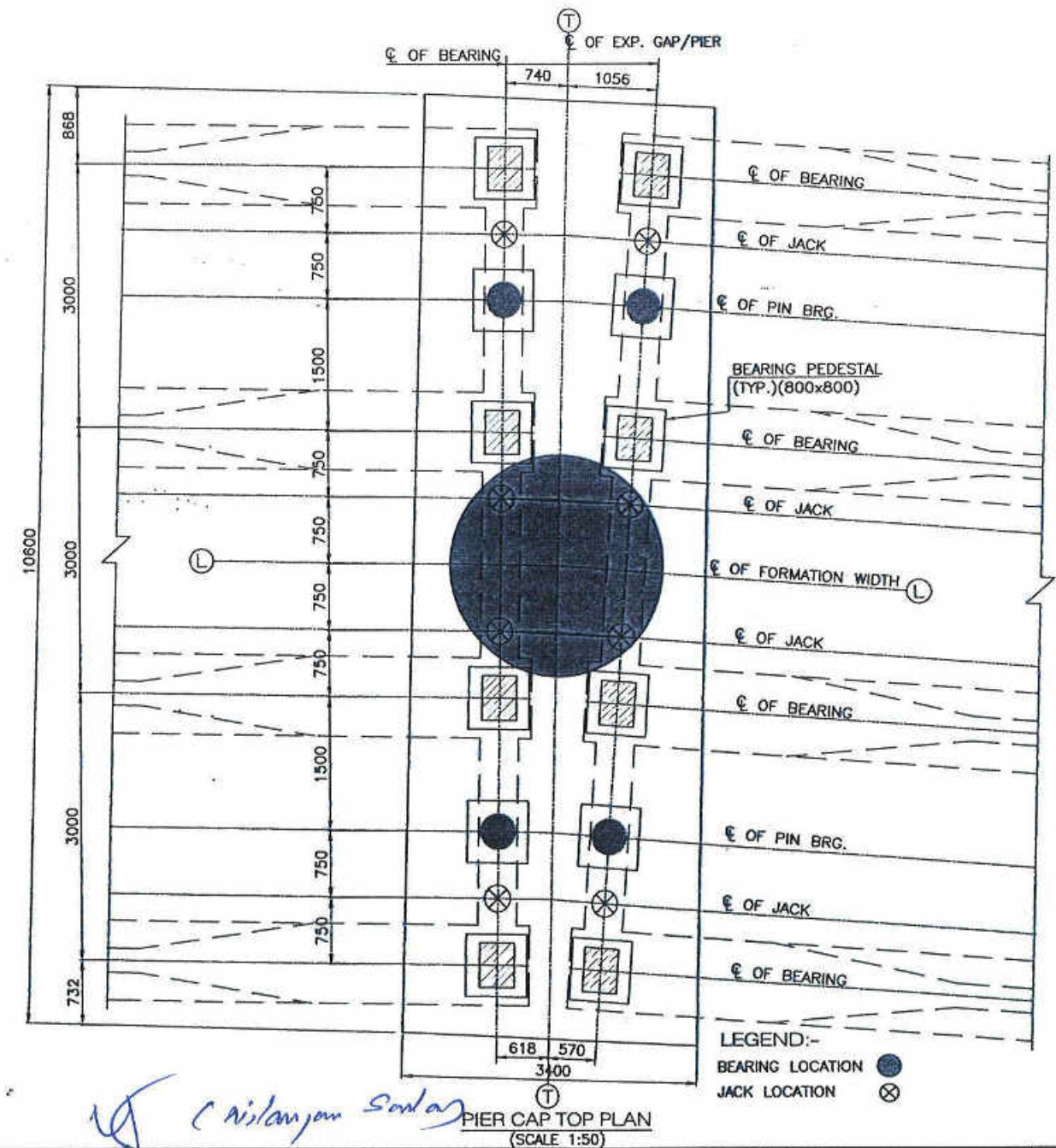
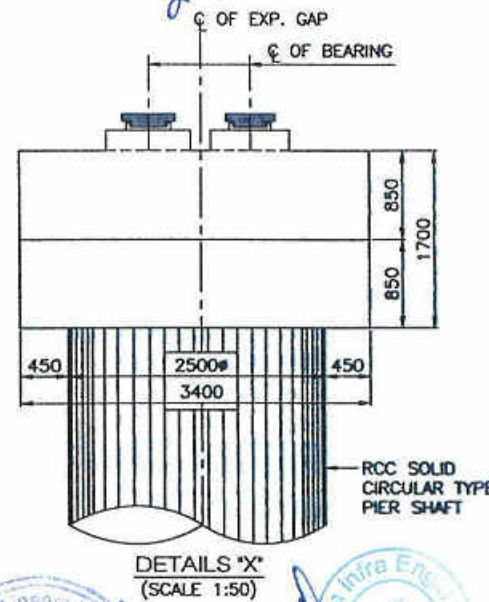
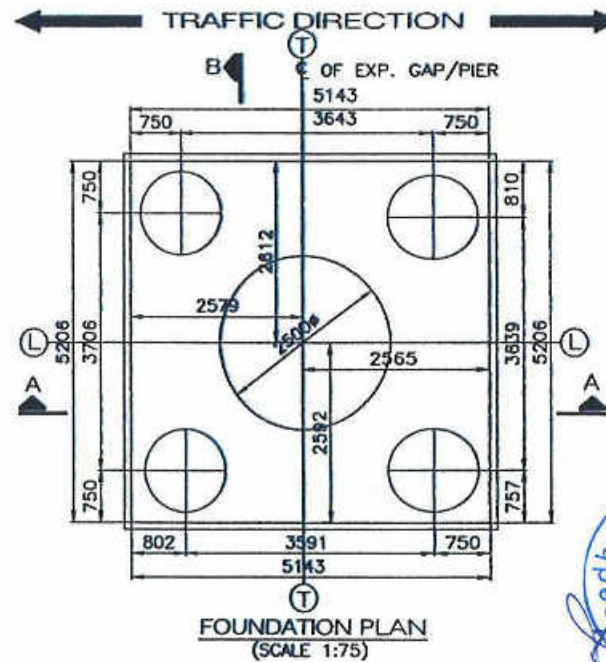
Bridge/Structural Engineer  
Feedback Infra  
NH-216, (Raigarh)

#### NOTES:-

1. ALL DIMENSION ARE IN MILLIMETERS, LEVELS IN METERS, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS TO BE FOLLOWED.
2. ⊗ SHOWN JACK LOCATION IN PLAN AND  
↑ SHOWN JACK LOCATION IN ELEVATION,
3. GRADE OF CONCRETE SHALL BE FOLLOWED:-  
PIER SHAFT, PIER CAP ..... M35  
BEARING PEDESTAL ..... M40
4. CLEAR COVER TO OUTERMOST STEEL SHALL BE AS BELOW:-  
PIER SHAFT ..... 50mm  
FOUNDATION ..... 75mm
5. THE REINFORCEMENT SHALL BE OF HYSD BARS (GRADE DESIGNATION Fe-500D) CONFORMING TO IS:1786.
6. L-L REPRESENTS LONGITUDINAL AXIS OF BRIDGE.  
T-T REPRESENTS TRANSVERSE AXIS OF BRIDGE.



PIER MARK	FORMATION LEVEL	GROUND LEVEL	PIER CAP TOP LEVEL	PILE CAP TOP LEVEL	PILE CAP BOTTOM LEVEL
P44	207.500	199.000	204.563	199.000	197.200



<div>REVISIONS</div> <table><tr><th>NO</th><th>DATE</th><th>REVISION</th><th>DESIGNED</th><th>CHECKED</th><th>APPROVED</th></tr><tr><td>R6</td><td>03/06/19</td><td>REVISED AS PER SITE CONSTRUCTION &amp; PC COMMENTS</td><td>MS</td><td>YC</td><td>NDP</td></tr><tr><td>R5</td><td>06/02/19</td><td>REVISED AS PER SITE CONSTRUCTION &amp; PC COMMENTS</td><td>MS</td><td>YC</td><td>NDP</td></tr><tr><td>R4</td><td>22/04/19</td><td>REVISED AS PER SITE CONSTRUCTION &amp; PC COMMENTS</td><td>MS</td><td>YC</td><td>NDP</td></tr><tr><td>R3</td><td>18/02/19</td><td>REVISED AS PER RIT</td><td>MS</td><td>YC</td><td>NDP</td></tr><tr><td>MND</td><td>ISSUED</td><td>DESCRIPTION</td><td>BDLT</td><td>CHDGD</td><td>APPROVED</td></tr></table>						NO	DATE	REVISION	DESIGNED	CHECKED	APPROVED	R6	03/06/19	REVISED AS PER SITE CONSTRUCTION & PC COMMENTS	MS	YC	NDP	R5	06/02/19	REVISED AS PER SITE CONSTRUCTION & PC COMMENTS	MS	YC	NDP	R4	22/04/19	REVISED AS PER SITE CONSTRUCTION & PC COMMENTS	MS	YC	NDP	R3	18/02/19	REVISED AS PER RIT	MS	YC	NDP	MND	ISSUED	DESCRIPTION	BDLT	CHDGD	APPROVED	<div>CLIENT: MORTH</div> <div>(Ministry of Road, Transport &amp; Highways) NHDP-IV A CELL, State PWD Chhattisgarh</div>		<div>AUTHORITY ENGINEER: </div> <div>FEEDBACK INFRA Feedback Infra Private Limited 15TH Floor, DLF Building #2, DLF Cyber city, DLF Phase-2, Sector-25, Gurgaon, HARYANA, Pin-122002</div>		<div>PROOF CONSULTANT: </div> <div>HBS INFRA ENGINEERS INDIA PVT. LTD Flat no.102, Plot No. 8 &amp; 9, Fortune Chambers, Market Road, HYDERABAD</div>		<div>SAFETY CONSULTANT: </div> <div>KASUPRADA CONSULTANTS LLP Plot c-11, CEL Apartments, Vasundhara Enclave, New Delhi 110 096, India</div>		<div>DESIGN &amp; ENGINEERING DIVISION ERA INFRA ENGINEERING LTD C-56/41, SECTOR -42, NOIDA 201303.</div> <div>An ISO 9001:2001 &amp; OHSAS 18001 Certified Company Head Office: C-56/41, SECTOR -42, NOIDA 201303. Tel.: 0120-4145000 TO 4145038</div>		<div>CONSULTANT: </div> <div>SPECTRUM Techno Consultants Pvt Ltd, 401, 4th Floor, Rialta Bhavan, Plot No 9, Sector 17, Vashi, Navi Mumbai, Maharashtra.</div>		<div>NAME OF PROJECT: Rehabilitation &amp; upgradation of NH-216 from km.3.800 to 90.460 (Raigarh-Saraipalli Section) in the State of Chhattisgarh to two-lanes with paved shoulders under NHDP-IV.</div>		<div>DRAWING TITLE: DIMENSIONAL DETAILS OF PIER SHAFT,CAP,PEDESTAL PIER P44 OF MBR AT CH.28+400</div> <div>DRAWING NUMBER: 00/00/STR/MNB/28+400-208</div> <table><tr><td>DRAWN</td><td>DESIGNED</td><td>CHECKED</td><td>APPROVED</td></tr><tr><td></td><td></td><td></td><td></td></tr></table>		DRAWN	DESIGNED	CHECKED	APPROVED					<div>REV. R6</div> <div>SCALE: As Shown</div>	
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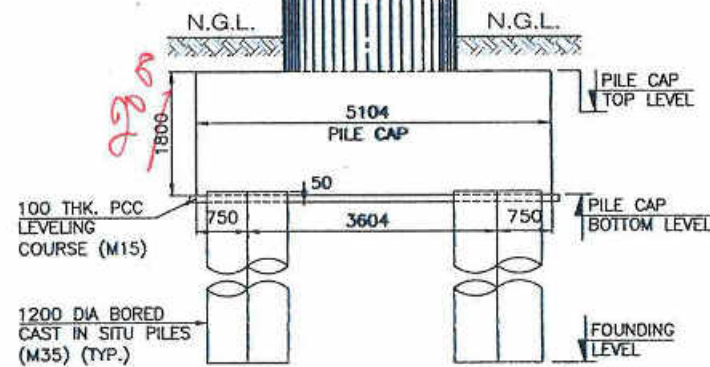
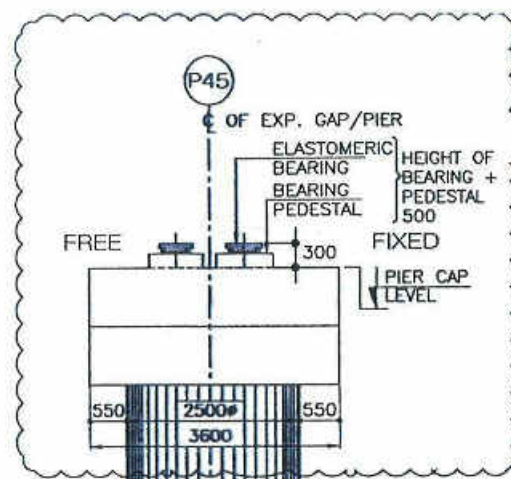






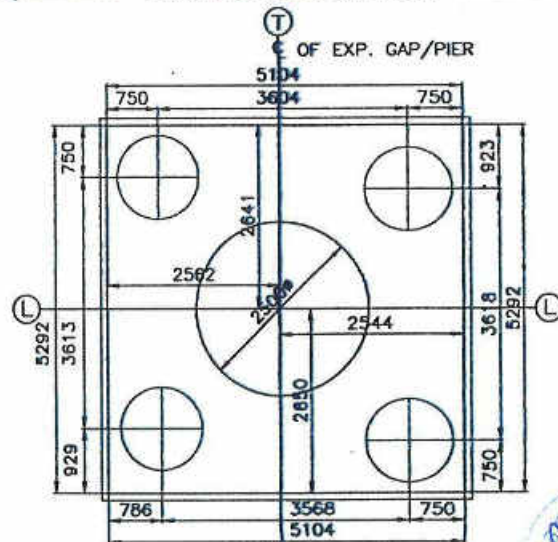




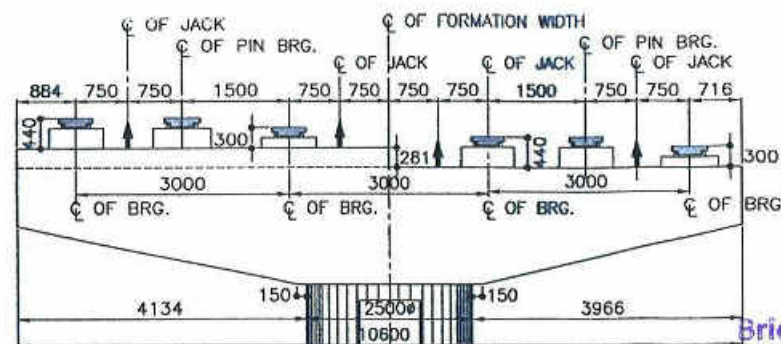


SECTION AT L-L AXIS  
(SCALE 1:75)

TRAFFIC DIRECTION



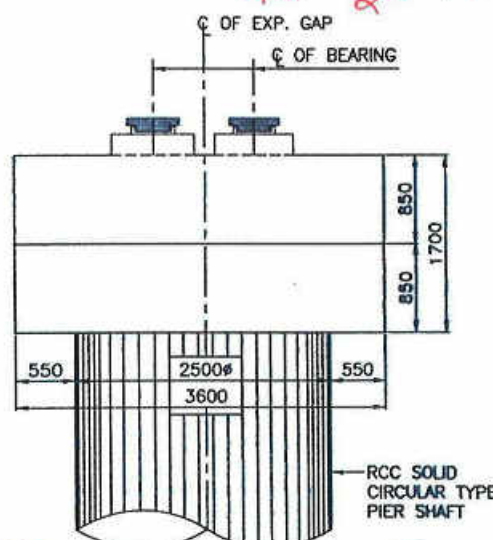
FOUNDATION PLAN  
(SCALE 1:75)



SECTION AT T-T AXIS  
(SCALE 1:75)

SCHEDULE OF PIER LEVELS :- P45

PIER MARK	FORMATION LEVEL	GROUND LEVEL	PIER CAP TOP LEVEL	PILE CAP TOP LEVEL	PILE CAP BOTTOM LEVEL
P45	207.500	200.111	204.563	199.111	198.311



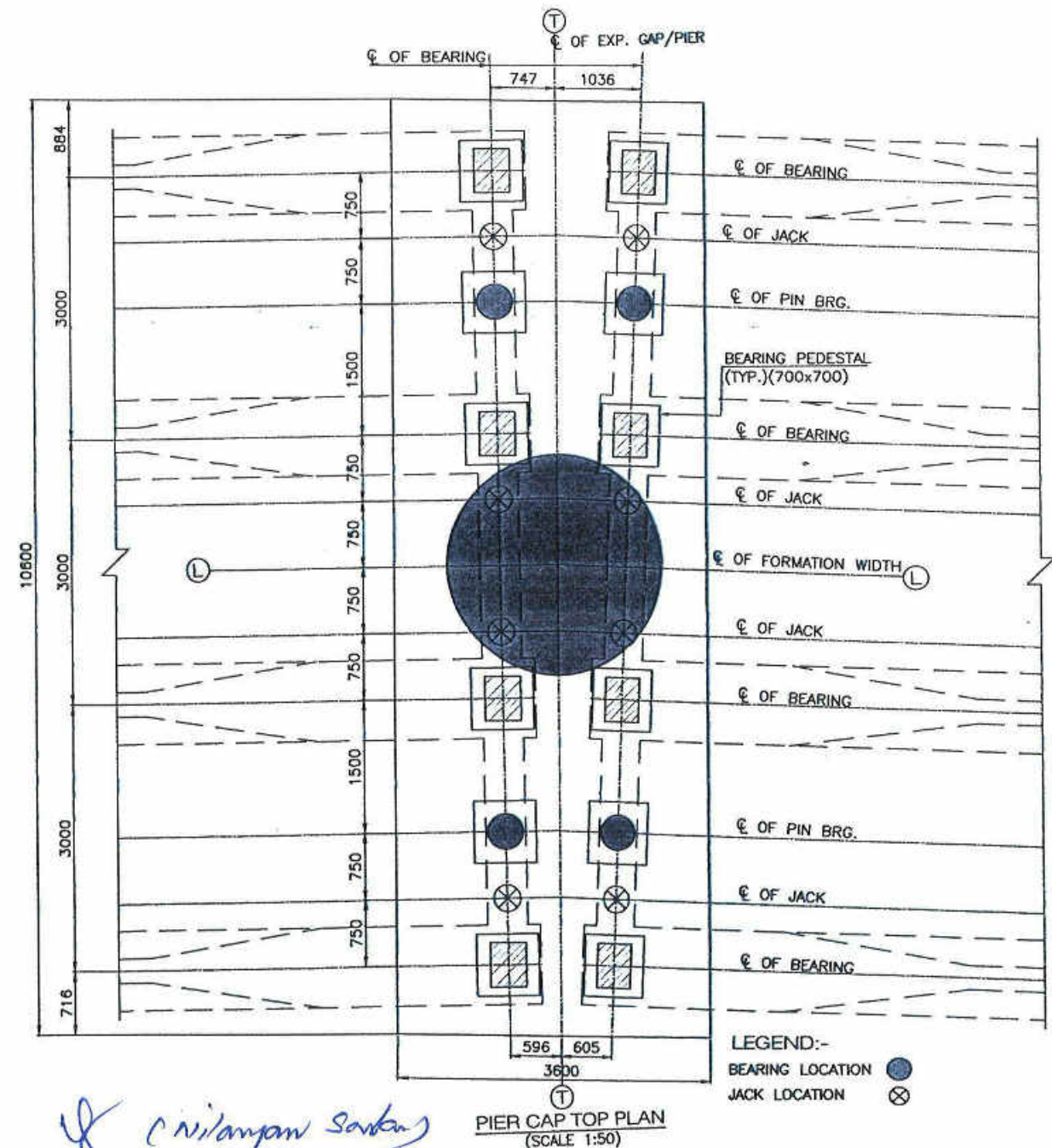
DETAILS 'X'  
(SCALE 1:50)

REVIEWED

Bridge/Structural Engineer  
Feedback Infra  
NH-216, (Raigarh)

# NOTES:-

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## LEGEND:-

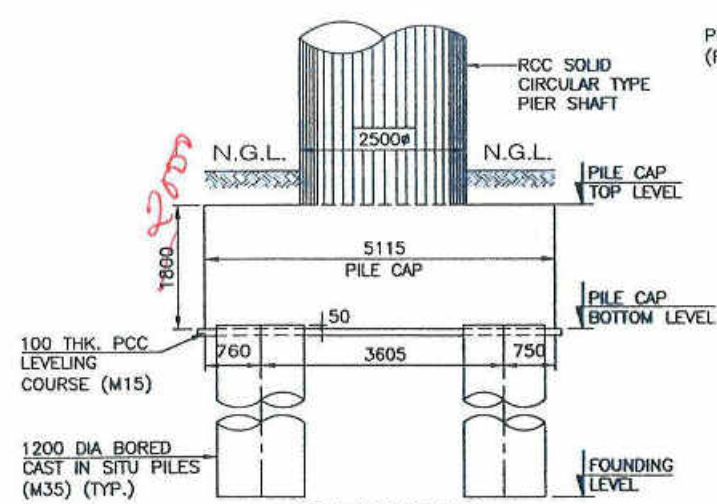
- BEARING LOCATION
- JACK LOCATION

R6	05/06/19	REVISED AS PER SITE CONSTRUCTION & PC COMMENTS	ONS	TJC	NEP	CLIENT:  <b>MORTH</b> (Ministry of Road, Transport & Highways) <b>NHDP-IV A CELL</b> State PWD Chhattisgarh	AUTHORITY ENGINEER:  <b>FEEDBACK INFRA</b> Feedback Infra Private Limited 15TH Floor, DLF Building 98, DLF Cyber city, DLF Phase-2, Sector-25, Gurgaon, HARYANA, Pin-122002	PROOF CONSULTANT:  <b>HBS</b> HBS INFRA ENGINEERS INDIA PVT. LTD. Flat no.102, PRR no. 8 to 11 Fortune chambers, Madhapura HYDERABAD	SAFETY CONSULTANT:  <b>VASUPRADA</b> CONSULTANTS LLP Flat c-11, CEL Apartments, Vasundhara Enclave, New Delhi 110 095, India	DESIGN DIRECTOR:  <b>ERA</b> Believe in difference <b>DESIGN &amp; ENGINEERING DIVISION</b> ERA INFRA ENGINEERING LIMITED An ISO 9001,14001 & OHSAS 18001 Certified Company Head Office : C-56/41 ,SECTOR -42, NOIDA 201303 Tel. : 0120-4145500 TO 4145535	EPD CONTRACTOR:  <b>SPECTRUM</b> Techno Consultants Pvt.Ltd. 401, 4th Floor, Raigarh Bhawan, Plot No. 8, Sector 17, Vashi, Navi Mumbai, Maharashtra	CONSULTANT:  <b>SPECTRUM</b> Techno Consultants Pvt.Ltd. 401, 4th Floor, Raigarh Bhawan, Plot No. 8, Sector 17, Vashi, Navi Mumbai, Maharashtra	NAME OF PROJECT: <b>Rehabilitation &amp; upgradation of NH-216 from km.3.800 to 90.460 (Raigarh-Sarapalli Section) in the State of Chhattisgarh to two-lanes with paved shoulders under NHDP-IV .</b>	DRAWING TITLE: DIMENSIONAL DETAILS OF PIER SHAFT,CAP,PEDESTAL PIER P45 OF MJBR AT CH.28+400	REV. R6																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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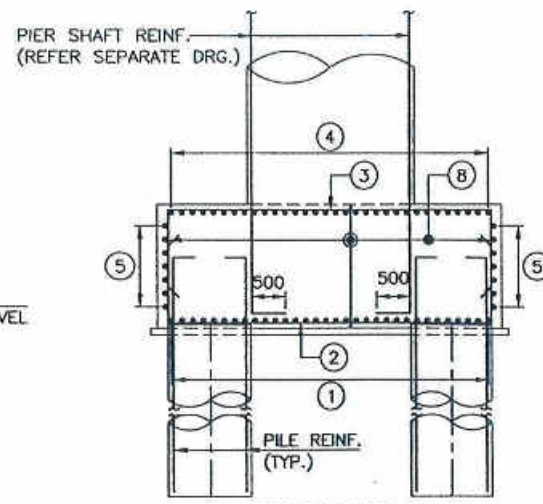




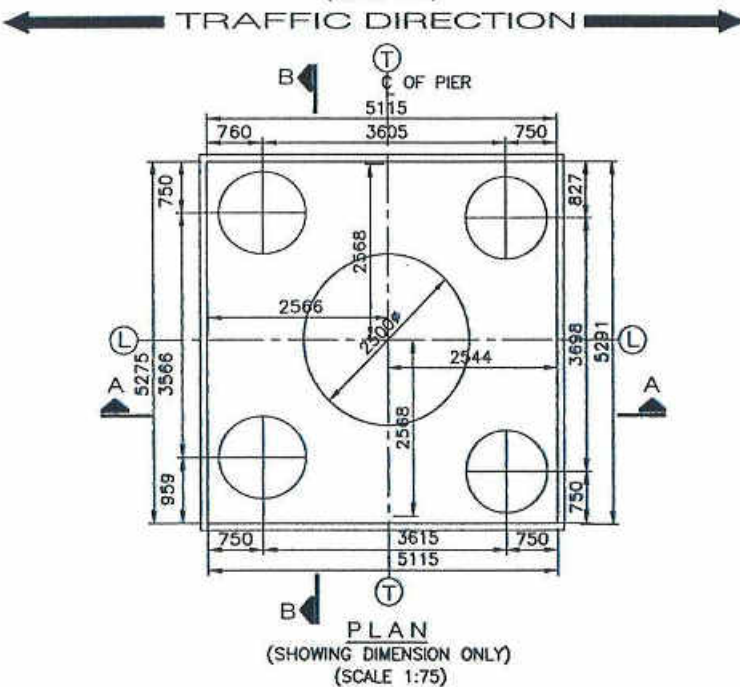




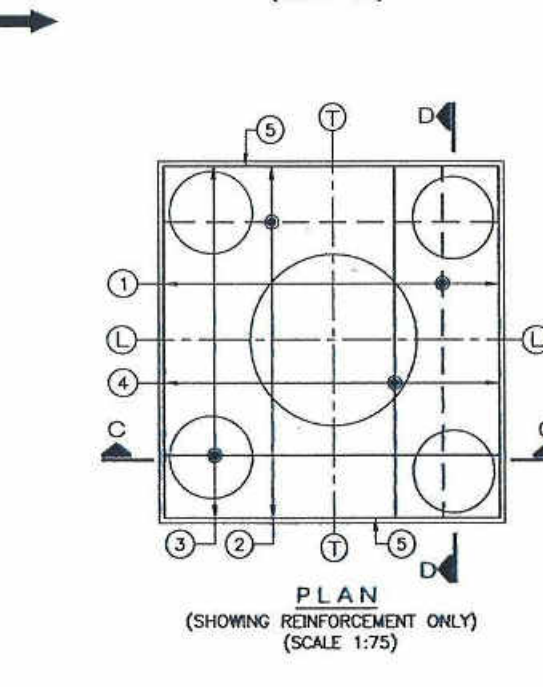
SECTION AT A-A  
(SHOWING DIMENSION ONLY)  
(SCALE 1:75)



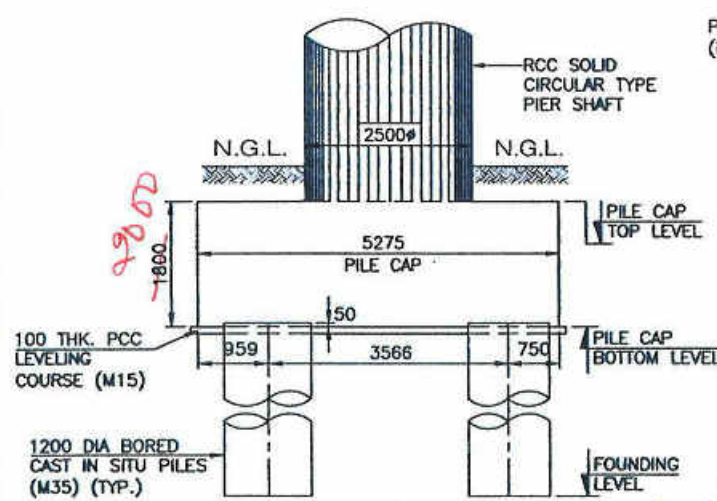
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(SCALE 1:75)



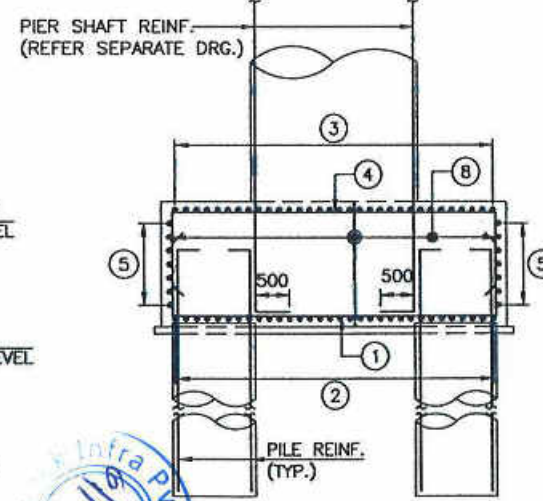
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(SCALE 1:75)



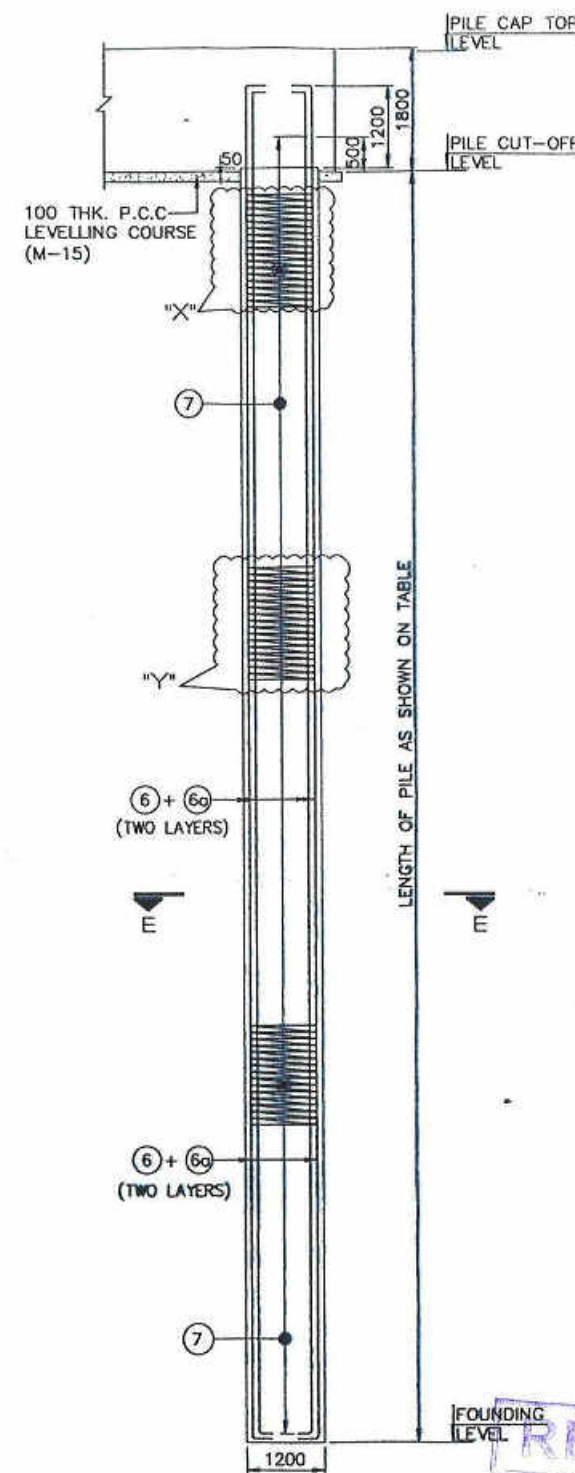
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(SHOWING REINFORCEMENT ONLY)  
(SCALE 1:75)



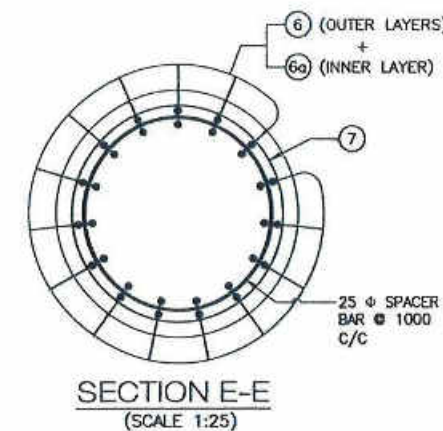
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(SCALE 1:75)



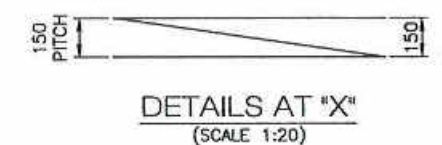
SECTION AT D-D  
(SHOWING REINFORCEMENT ONLY)  
(SCALE 1:75)



REINFORCEMENT DETAILS  
OF PILE SHAFT  
(SCALE 1:75)



SECTION E-E  
(SCALE 1:25)



DETAILS AT 'X'  
(SCALE 1:20)



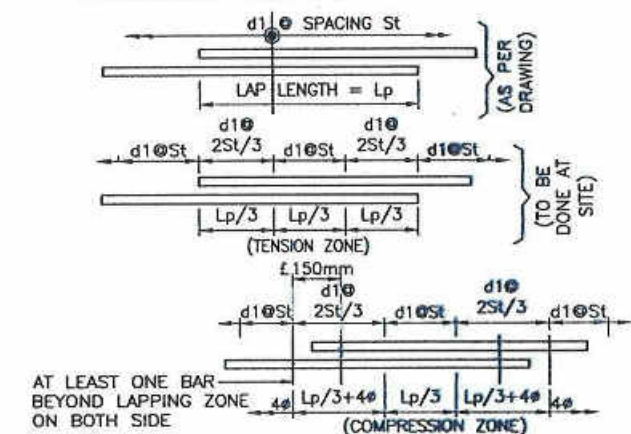
DETAILS AT 'Y'  
(SCALE 1:20)

HYDROLOGICAL DATA	
HFL	203.350m
DISCHARGE	40500 cumecs
VELOCITY	3.5 m/s
MSL AT PIER	185.713 m

PILE CAPACITY:-	
NORMAL CASE	411.00T
SEISMIC CASE	429.00T

Pile Capacity super  
test pile  
Normal case 425T

- NOTES:-
- ALL DIMENSIONS ARE IN mm AND LEVELS IN METRES, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NO DIMENSION IS TO BE SCALED.
  - GRADE OF CONCRETE SHALL BE AS FOLLOWED:-  
PILE & PILE CAP ..... M35
  - CLEAR COVER TO ANY REINFORCEMENT :-  
IN FOUNDATION ..... 75mm  
IN SUB STRUCTURE ..... 50mm
  - BARS SHOWN IN THE DRAWING ARE NOT TO BE COUNTED, ONLY WRITTEN DATA SHALL BE FOLLOWED.
  - TMT HIGH YIELD STRENGTH DEFORMED BARS OF GRADE DESIGNATION Fe-500D CONFORMING TO IS:1786-1985, SHALL ONLY BE USED.
  - INITIAL AND ROUTINE LOAD TEST SHALL BE CARRIED OUT ON PILE ACCORDING TO IRC:78 AND AS PER STANDARD SPECIFICATION TO DETERMINE VERTICAL (V) AND HORIZONTAL (H) LOAD CARRYING CAPACITY OF PILE. IT SHALL BE ENSURED THAT IT IS NOT LESS THEN DESIGN WORKING LOAD.
  - PILE SHALL BE CAST ABOVE THE BOTTOM OF PILE CAP LEVEL. THE TOP OF CONCRETE SHALL BE BROKEN BEFORE CASTING OF PILE CAP, TAKING 50mm PILE EMBEDDED INTO THE PILE CAP.
  - L-L REPRESENTS LONGITUDINAL AXIS OF BRIDGE.  
T-T REPRESENTS TRANSVERSE AXIS OF BRIDGE.
  - OVERLAPPING FOR SPLICING OF REINFORCEMENT SHALL BE AS PER CLAUSE NO.15.2.5. ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:-



- 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.

GRADE OF CONCRETE	PERCENTAGE OF LAPPED BARS	<25%	33%	50%	>50%
M30		58	67	81	87
M35	X	53	61	74	80
M40		50	58	70	75

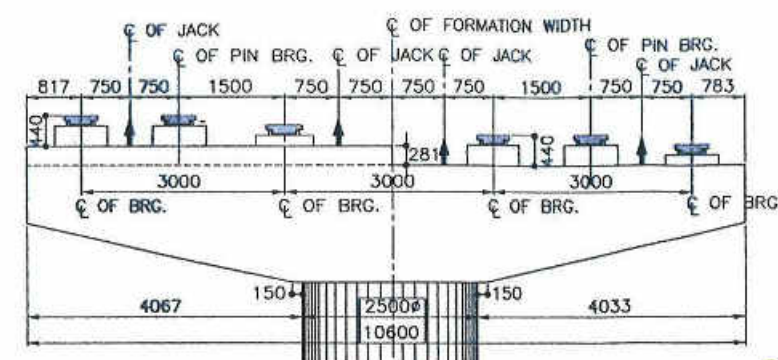
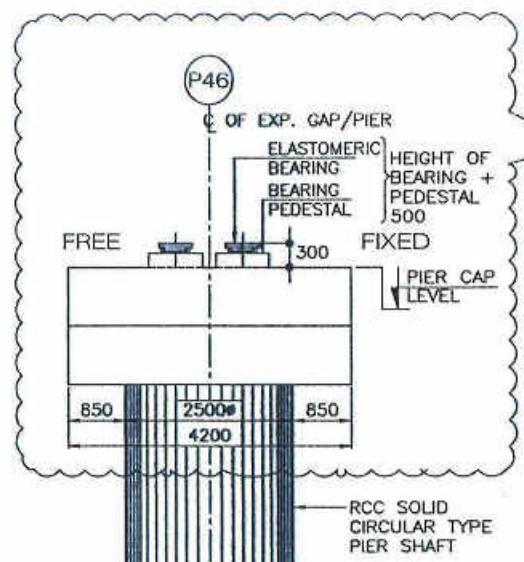
LEGEND:-

TOP BAR .....  
BOTTOM BAR .....

REINFORCEMENT DETAILS		
BAR MKD.	BAR DIA & SPACING/NOS	BAR SHAPE
1	20 # @100c/c	1000 1000
2	20 # @100c/c	1000 1000
3	16 # @100c/c	1000 1000
4	16 # @100c/c	1000 1000
5	12 # @200c/c	
6	15 NOS. 32 #	300
6a	15 NOS. 32 #	300
7	10 # @100c/c	
8	10 # @200c/c (L-L & T-T)	

REVISIONS				CLIENT:		AUTHORITY ENGINEER:		PROOF CONSULTANT:		SAFETY CONSULTANT:		DESIGNER/ENGINEER:		EPC CONTRACTOR:		CONSULTANT:		NAME OF PROJECT:		DRAWING TITLE:		REV.	
R6	03/06/19	REVISED AS PER SITE CONSTRUCTION & PC COMMENTS	QMS	YAC	NDP	MORTH		HBS		Vasuprada		J.P. MAJUMDAR		ERA		SPECTRUM		Rehabilitation & upgradation of NH-216 from km.3.800 to 90.460 (Raigarh-Saralipalli Section) in the State of Chhattisgarh to two-lanes with paved shoulders under NHDP-IV.		DIMENSION & REINF. DETAILS OF PILE, PILE CAP FOR PIER P46 OF MJBR AT CH. 28+400		R6	
R5	06/05/19	REVISED AS PER SITE CONSTRUCTION & PC COMMENTS	QMS	YAC	NDP	MORTH		HBS		Vasuprada		J.P. MAJUMDAR		ERA		SPECTRUM						SCALE: As Shown	
R4	22/04/19	REVISED AS PER SITE CONSTRUCTION & PC COMMENTS	QMS	YAC	NDP	MORTH		HBS		Vasuprada		J.P. MAJUMDAR		ERA		SPECTRUM							
R3	18/02/19	REVISED AS PER RFI	QMS	YAC	NDP	MORTH		HBS		Vasuprada		J.P. MAJUMDAR		ERA		SPECTRUM							
R2	18/02/19	REVISED AS PER RFI	QMS	YAC	NDP	MORTH		HBS		Vasuprada		J.P. MAJUMDAR		ERA		SPECTRUM							
R1	18/02/19	REVISED AS PER RFI	QMS	YAC	NDP	MORTH		HBS		Vasuprada		J.P. MAJUMDAR		ERA		SPECTRUM							
MD	ISSUED	DESCRIPTION	DEALT	CHECKED	APPROVED	MORTH		HBS		Vasuprada		J.P. MAJUMDAR		ERA		SPECTRUM							

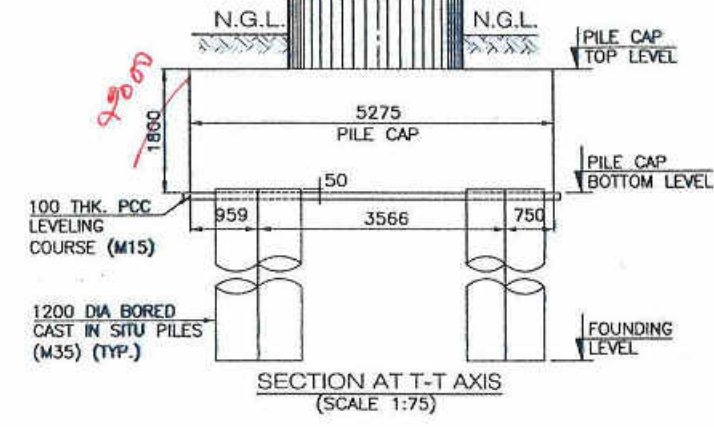
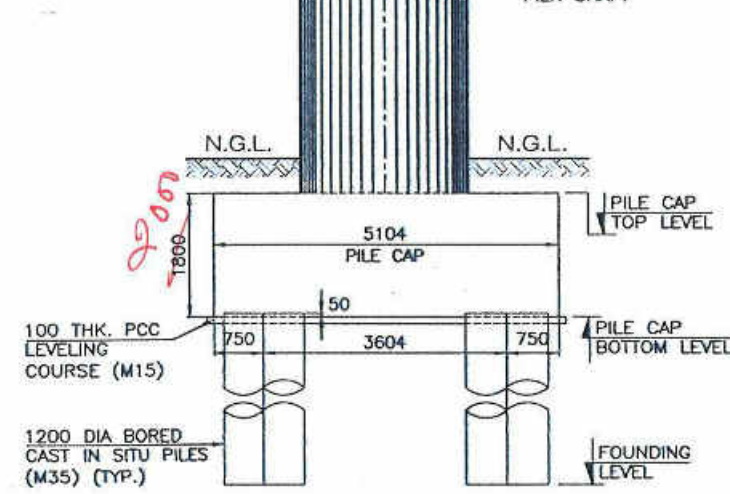




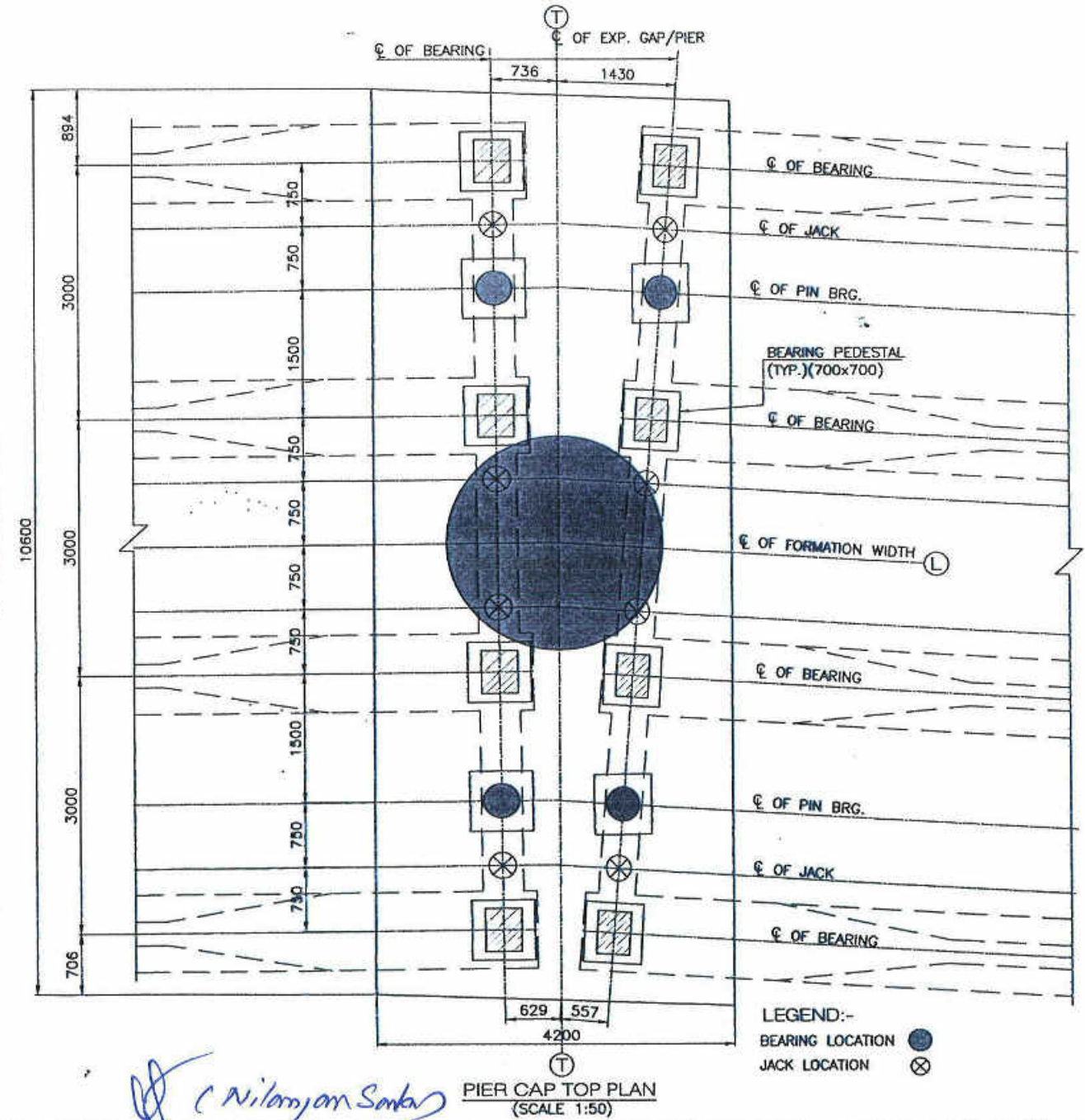
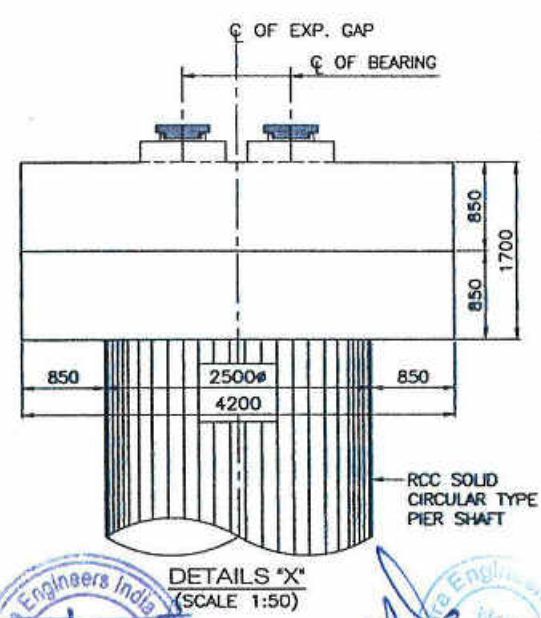
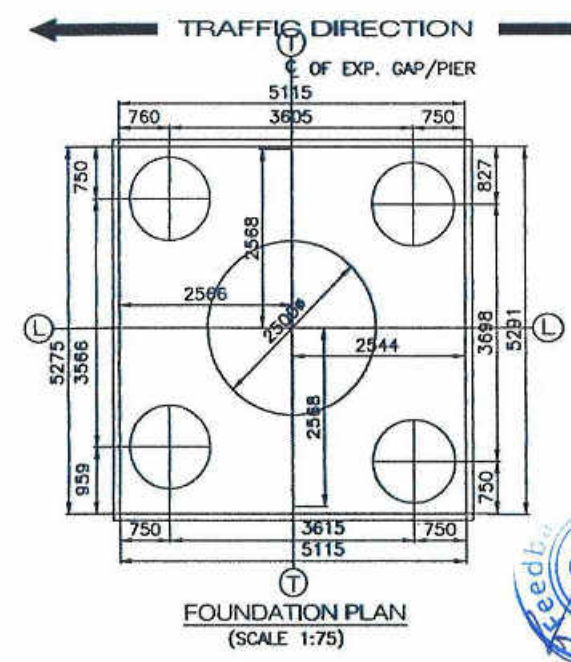
**REVIEWED**

Bridge/Structural Engineer  
Feedback Infra  
NH-216, (Raigarh)

- NOTES:-**
1. ALL DIMENSION ARE IN MILLIMETERS, LEVELS IN METERS, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS TO BE FOLLOWED.
  2. ⊗ SHOWN JACK LOCATION IN PLAN AND  
↑ SHOWN JACK LOCATION IN ELEVATION,
  3. GRADE OF CONCRETE SHALL BE FOLLOWED:-  
PIER SHAFT, PIER CAP ..... M35  
BEARING PEDESTAL ..... M40
  4. CLEAR COVER TO OUTERMOST STEEL SHALL BE AS BELOW:-  
PIER SHAFT ..... 50mm  
FOUNDATION ..... 75mm
  5. THE REINFORCEMENT SHALL BE OF HYSD BARS (GRADE DESIGNATION Fe-500D) CONFORMING TO IS:1786.
  6. L-L REPRESENTS LONGITUDINAL AXIS OF BRIDGE.  
T-T REPRESENTS TRANSVERSE AXIS OF BRIDGE.




PIER MARK	FORMATION LEVEL	GROUND LEVEL	PIER CAP TOP LEVEL	PILE CAP TOP LEVEL	PILE CAP BOTTOM LEVEL
P46	207.500	200.055	204.563	200.055	198.255



**LEGEND:-**  
BEARING LOCATION ⊗  
JACK LOCATION ⊙

R6	05/06/19	REVISED AS PER SITE CONSTRUCTION & PC COMMENTS	QMS	YAC	ROP
R5	06/05/19	REVISED AS PER SITE CONSTRUCTION & PC COMMENTS	QMS	YAC	ROP
R4	22/04/19	REVISED AS PER SITE CONSTRUCTION & PC COMMENTS	QMS	YAC	ROP
R3	18/02/19	REVISED AS PER R/R	QMS	YAC	ROP
MKD	ISSUED	DESCRIPTION	DEALT	CHECKED	APPROVED
REVISIONS					

CLIENT:	 <b>MORTH</b> <small>(Ministry of Road, Transport &amp; Highways)</small> <b>NHDP-IV A CELL,</b> State PWD Chhattisgarh	AUTHORITY ENGINEER:	 <b>FEEDBACK INFRA</b> Feedback Infra Private Limited 15TH Floor,DLF Building 9B, DLF Cyber city,DLF Phase-2, Sector 28,Gurgaon, HARYANA, Pin-122002	PROJECT CONSULTANT:	 <b>HRS</b> HRS INFRA ENGINEERS INDIA PVT. LTD. Flat no.102, Plot no. 8 to 11 Irbane chambers, Madhapur, HYDERABAD	SAFETY CONSULTANT:	 <b>VASUPRADA</b> CONSULTANTS LLP Flat c-11, CEL Apartments, Vasundhara Enclave, New Delhi 110 096, India	DESIGN DIRECTOR:	 <b>J.P. MAJUMDAR</b> ERA INFRA ENGINEERING LTD C-56/41, SECTOR-42 NOIDA 201303.	ERA CONTRACTOR:	 <b>ERA</b> DESIGN & ENGINEERING DIVISION ERA INFRA ENGINEERING LIMITED An ISO 9001:2001 & OHSAS 18001 Certified Company Head Office, C-56/41, SECTOR-42, NOIDA 201303 Tel.: 0120 41 48000 TO 41 49236	CONSULTANT:	 <b>SPECTRUM</b> Techno Consultants Pvt Ltd. 401, 4th Floor, Relkar Bhawan, Plot No 9, Sector 17, Vashi, Navi Mumbai, Maharashtra.	NAME OF PROJECT:	<b>Rehabilitation &amp; upgradation of NH-216 from km.3.800 to 90.460 (Raigarh-Saraipalli Section) in the State of Chhattisgarh to two-lanes with paved shoulders under NHDP-IV.</b>	DRAWING TITLE:	DIMENSIONAL DETAILS OF PIER SHAFT,CAP,PEDESTAL		REV.	R6
													DRAWING NUMBER:	00/00/STR/MNB/28+400-214		As Shown	SCALE: 1:1			
													DRAWN	DESIGNED	CHECKED	APPROVED				
																				





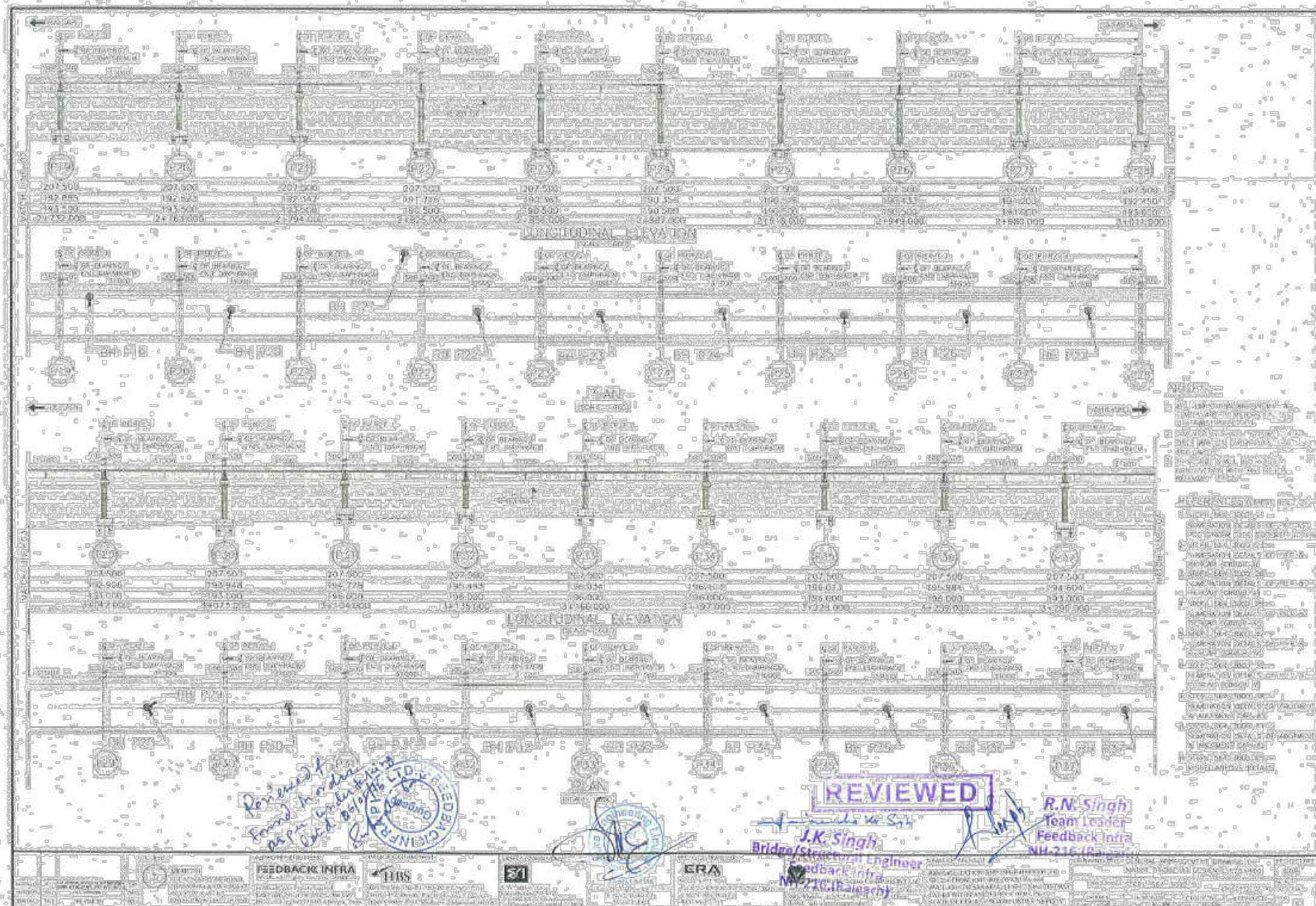


**New Major Bridge @ 28+400 work Done Drawings  
(Hatched Portion Area)**

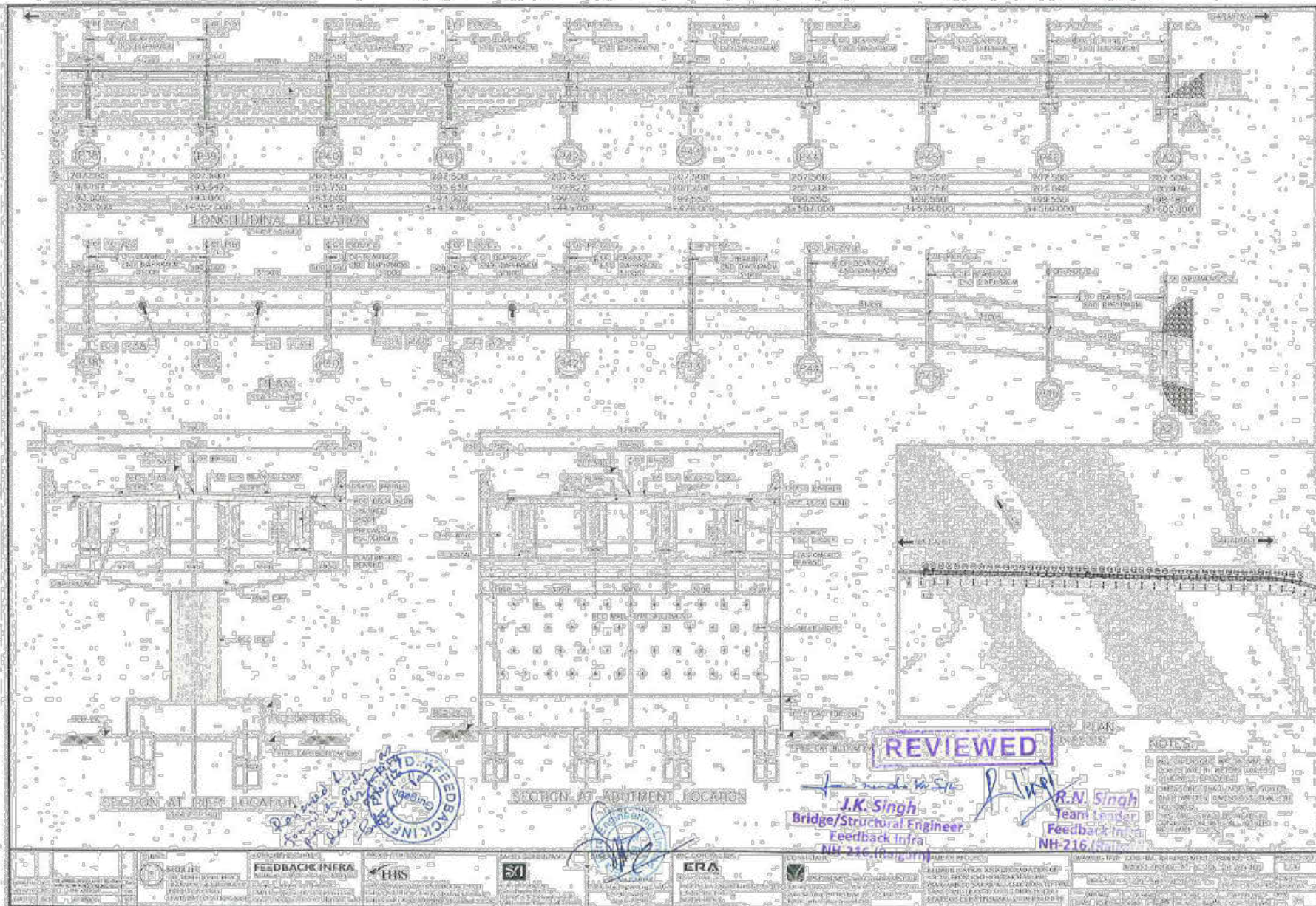








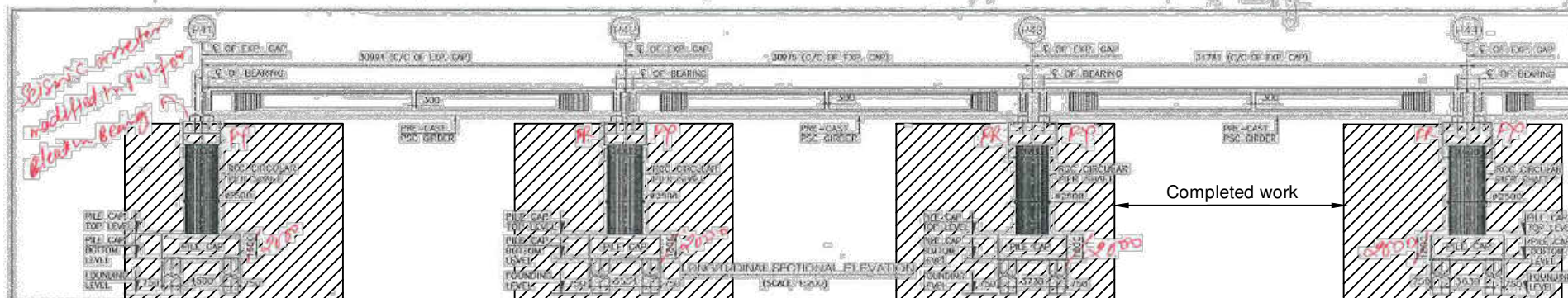












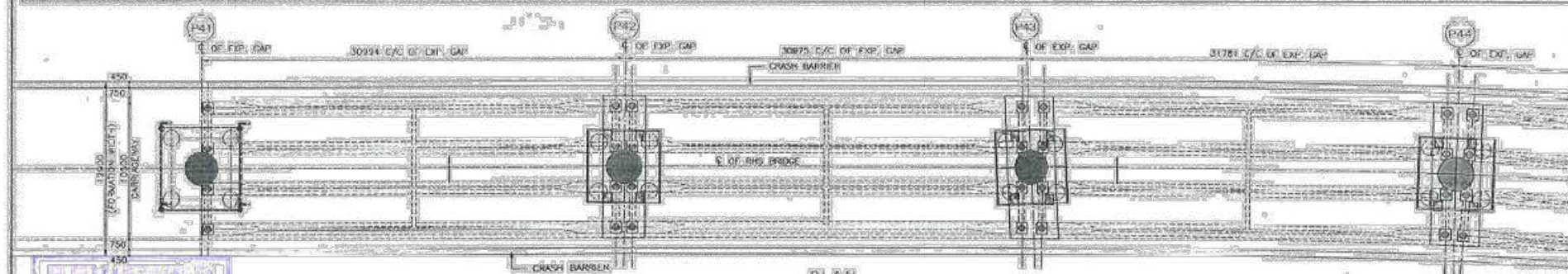
PROPOSED PILE AT (m)	307.540	307.500	307.500	307.500
GROUND-LEVEL (m)	197.504	199.341	199.341	199.000
PILE CAP TOP LEVEL	197.504	199.341	199.341	199.000
PILE CAP BOTTOM LEVEL	195.704	197.541	197.541	197.200
FOUNDATION FWD	166.704	168.541	168.541	167.200

VERTICAL PROFILE	P=1.000% L=147.867			
HORIZONTAL ALIGNMENT	D=1372.756	29131.036	SL=45.000	29176.036
SUPPORT PAVEN (CROSSFALL IN)	0.67.000			

CHAINAGE IN KM	29+81.893	29+112.756	29+143.751	29+174.797
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PLAN  
(SCALE 1:200)

NOTES:  
1. ALL DIMENSIONS ARE IN MM. LEVELS ARE IN MWD. DIMENSIONS ARE IN KM, UNLESS OTHERWISE NOTED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NO DIMENSION IS TO BE SCALED.

HYDROLOGICAL DATA	
HFL	203.350m
DISCHARGE	10500 cumecs
VELOCITY	3.5 m/s
W/L AT ABUTMENT	SEE DETAILS
MIN. AT PIER	DRAWINGS

Bridge Structural Engineer  
Ferozhat Intra  
NH-215 (Raigarh)

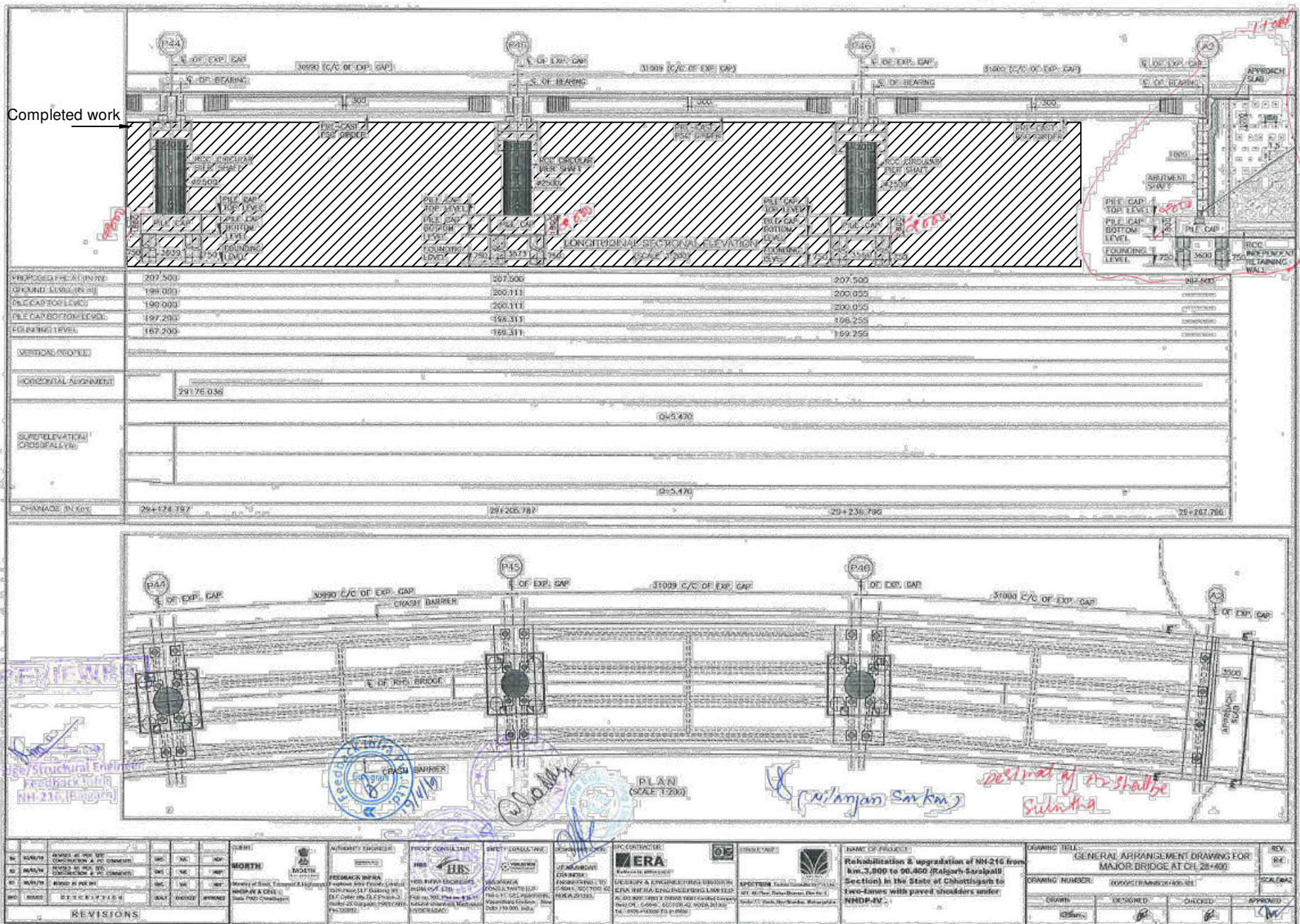


(Signature)

<b>REVISIONS</b> R1 12/06/16 REVISED TO PER SITE CONSTRUCTION & PC COMMENTS R2 06/01/18 REVISED TO PER SITE CONSTRUCTION & PC COMMENTS R3 06/01/18 REVISED TO PER SITE CONSTRUCTION & PC COMMENTS R4 06/01/18 REVISED TO PER SITE CONSTRUCTION & PC COMMENTS	<b>CLIENT</b> Ministry of Road, Transport & Highways NH&PI & CELL State (NH&PI) Cell	<b>AUTHORITY ENGINEER</b> Ferozhat Intra 19/11/16	<b>SAFETY CONSULTANT</b> HRS 19/11/16	<b>PC CONTRACTOR</b> ERA 19/11/16	<b>NAME OF PROJECT</b> Rehabilitation & upgrade of NH-215 from km 3.800 to 30.460 (Raigarh-Saraipali Section) in the State of Chhattisgarh to two-lanes with paved shoulders under NHDP-IV	<b>DRAWING TITLE</b> GENERAL ARRANGEMENT DRAWING FOR MAJOR BRIDGE AT CH 28+400	<b>REVISIONS</b> R1 12/06/16 R2 06/01/18 R3 06/01/18 R4 06/01/18
<b>DESIGNED</b> [Signature]	<b>CHECKED</b> [Signature]	<b>APPROVED</b> [Signature]	<b>DATE</b> 19/11/16	<b>SCALE</b> 1:200	<b>PROJECT NUMBER</b> NHDP/IV/2016/400-101	<b>DRAWING NUMBER</b> NHDP/IV/2016/400-101	<b>REVISIONS</b> R1 12/06/16 R2 06/01/18 R3 06/01/18 R4 06/01/18



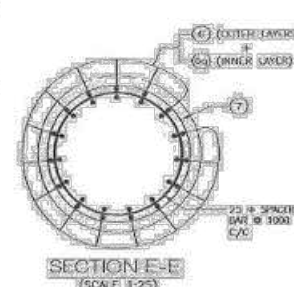
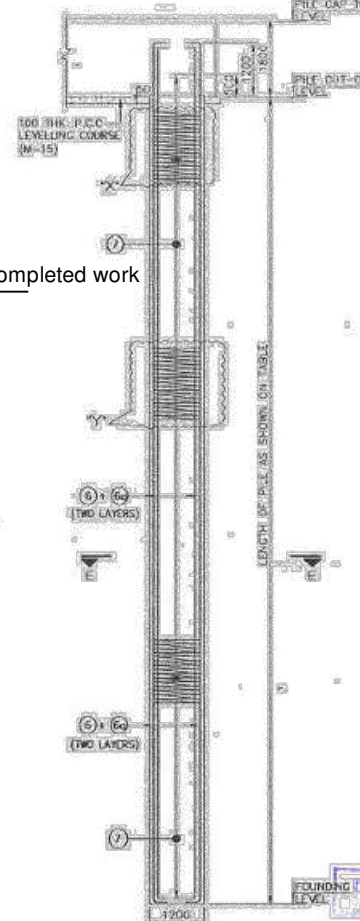
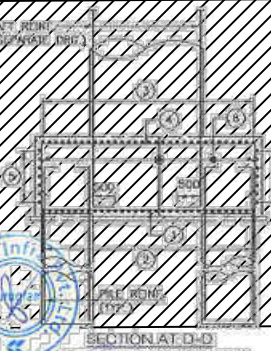
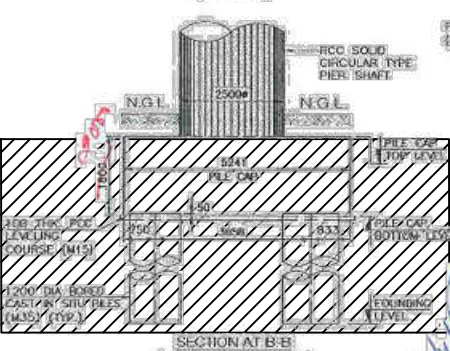
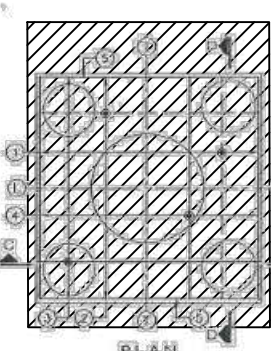
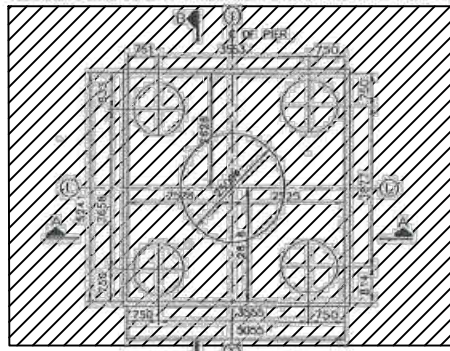
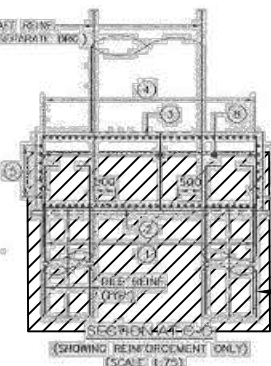
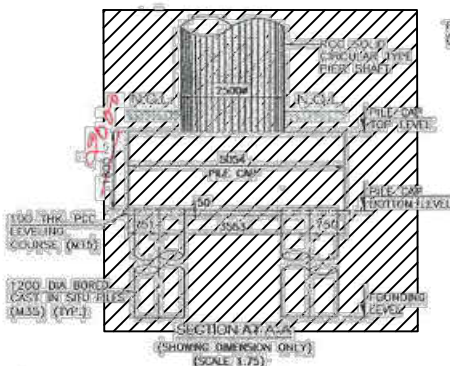
Completed work











HYDROLOGICAL DATA	
HFL	203.340m
DISCHARGE	40500 cumecs
VELOCITY	3.8 m/s
MSL AT PIER	183.006 m
PILE CAPACITY:	
NORMAL CASE	298.20T
SEISMIC CASE	446.00T

- NOTES:**
- ALL DIMENSIONS ARE IN MM AND LEVELS IN METRES, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NO DIMENSION IS TO BE SCALED.
  - GRADE OF CONCRETE SHALL BE AS FOLLOWED: PILE & PILE CAP - M35.
  - CLEAR COVER TO ANY REINFORCEMENT IN FOUNDATION SHALL BE 75mm.
  - REINFORCEMENT SHALL BE AS PER STANDARD SPECIFICATION TO DETERMINE VERTICAL (V) AND HORIZONTAL (H) LOAD CARRYING CAPACITY OF PILE. IT SHALL BE ENSURED THAT IT IS NOT LESS THAN DESIGN WORKING LOAD.
  - PILE SHALL BE CAST ABOVE THE BOTTOM OF PILE CAP LEVEL. THE TOP OF CONCRETE SHALL BE BROKEN BEFORE CASTING OF PILE CAP, TAKING 50mm PILE EMBEDDED INTO THE PILE CAP.
  - L REPRESENTS LONGITUDINAL AXIS OF BRIDGE. T REPRESENTS TRANSVERSE AXIS OF BRIDGE.
  - OVERLAPPING FOR SPLICING OF REINFORCEMENT SHALL BE AS PER CLAUSE NO.15.2.5. ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE.

GRADE OF CONCRETE	PERCENTAGE OF LAPPED BARS	25%	33%	50%	75%
M30		58	67	81	87
M35	X	53	61	74	80
M40		50	58	70	75

LEGEND:	
TOP BAR	100% LAPPED BARS
BOTTOM BAR	100% LAPPED BARS

REINFORCEMENT DETAILS		
BAR NO.	BAR DIA & SPACING (NO)	BAR SHAPE
1	20 # @ 100c/c	1000 1000
2	20 # @ 100c/c	1000 1000
3	16 # @ 100c/c	1000 1000
4	16 # @ 100c/c	1000 1000
5	12 # @ 200c/c	1000 1000
6	15 NOS. 32 #	300
7	10 # @ 100c/c	1000 1000
8	10 # @ 200c/c (L-L & T-T)	1000 1000

PIER NO.	GROUND LEVEL (m)	PILE CAP TOP LEVEL (m)	PILE CAP BOTTOM LEVEL (m)	SCOUR LEVEL (m)	FOUNDATIONS LEVEL (m)
P42	197.504	197.504	195.704	183.006	168.704

*Handwritten notes:*  
 446.00T  
 Pile Capacity as per  
 test pile (Normal case)

*Handwritten signature:*  
 Bridge Structural Engineer  
 Feedback Infra  
 NH-216 (Raigarh)

*Handwritten signature:*  
 (Nityan Sarcar)

REVISIONS				APPROVED				DESIGNED				CHECKED				APPROVED			
NO.	DATE	DESCRIPTION	BY	NO.	DATE	DESCRIPTION	BY	NO.	DATE	DESCRIPTION	BY	NO.	DATE	DESCRIPTION	BY	NO.	DATE	DESCRIPTION	BY
1	10/01/21	ISSUED AS PER THE DIMENSIONS & P.C. COMMENTS	MS	1	10/01/21	ISSUED AS PER THE DIMENSIONS & P.C. COMMENTS	MS	1	10/01/21	ISSUED AS PER THE DIMENSIONS & P.C. COMMENTS	MS	1	10/01/21	ISSUED AS PER THE DIMENSIONS & P.C. COMMENTS	MS	1	10/01/21	ISSUED AS PER THE DIMENSIONS & P.C. COMMENTS	MS
2	10/01/21	ISSUED AS PER THE DIMENSIONS & P.C. COMMENTS	MS	2	10/01/21	ISSUED AS PER THE DIMENSIONS & P.C. COMMENTS	MS	2	10/01/21	ISSUED AS PER THE DIMENSIONS & P.C. COMMENTS	MS	2	10/01/21	ISSUED AS PER THE DIMENSIONS & P.C. COMMENTS	MS	2	10/01/21	ISSUED AS PER THE DIMENSIONS & P.C. COMMENTS	MS
3	10/01/21	ISSUED AS PER THE DIMENSIONS & P.C. COMMENTS	MS	3	10/01/21	ISSUED AS PER THE DIMENSIONS & P.C. COMMENTS	MS	3	10/01/21	ISSUED AS PER THE DIMENSIONS & P.C. COMMENTS	MS	3	10/01/21	ISSUED AS PER THE DIMENSIONS & P.C. COMMENTS	MS	3	10/01/21	ISSUED AS PER THE DIMENSIONS & P.C. COMMENTS	MS
4	10/01/21	ISSUED AS PER THE DIMENSIONS & P.C. COMMENTS	MS	4	10/01/21	ISSUED AS PER THE DIMENSIONS & P.C. COMMENTS	MS	4	10/01/21	ISSUED AS PER THE DIMENSIONS & P.C. COMMENTS	MS	4	10/01/21	ISSUED AS PER THE DIMENSIONS & P.C. COMMENTS	MS	4	10/01/21	ISSUED AS PER THE DIMENSIONS & P.C. COMMENTS	MS





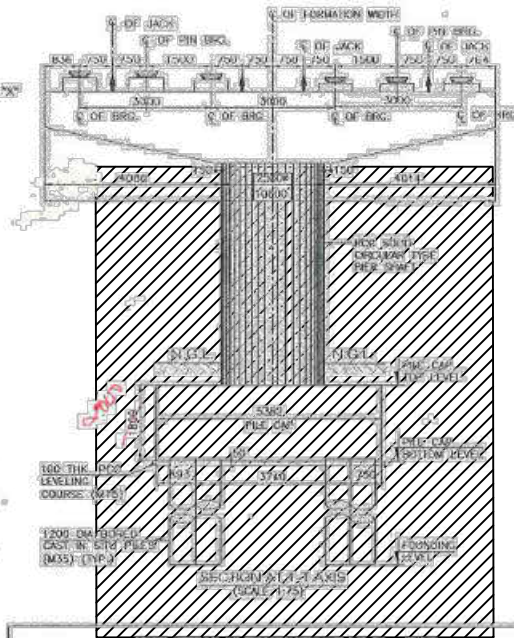




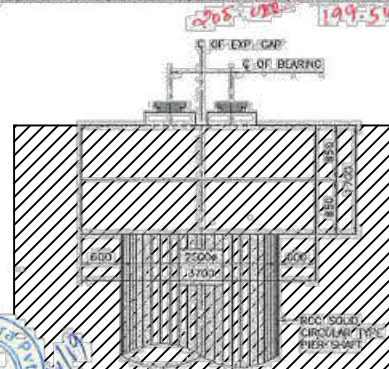




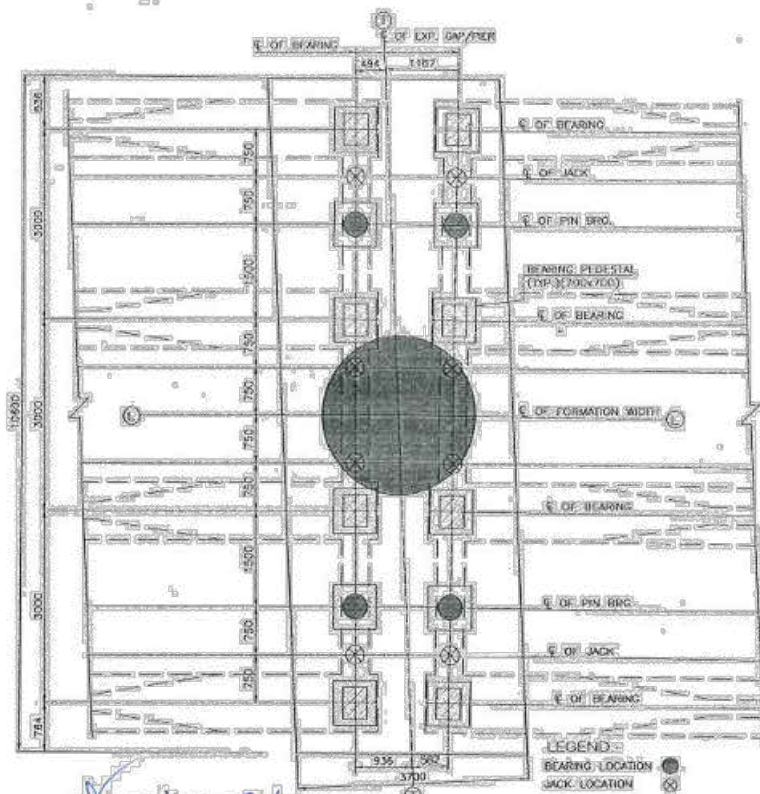




PIER MARK	FORMATION LEVEL	GROUND LEVEL	PIER CAP TOP LEVEL	PILE CAP TOP LEVEL	PILE CAP BOTTOM LEVEL
P43	207.500	199.341	204.822	199.341	197.541



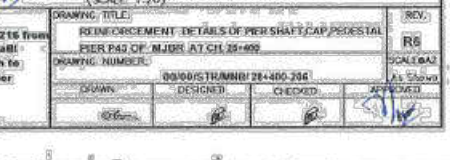
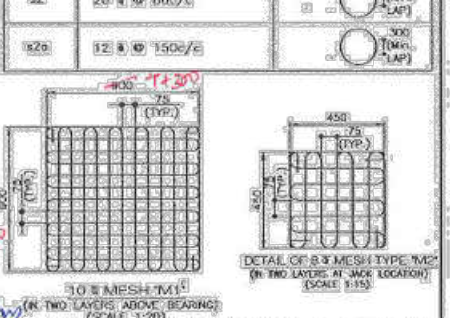
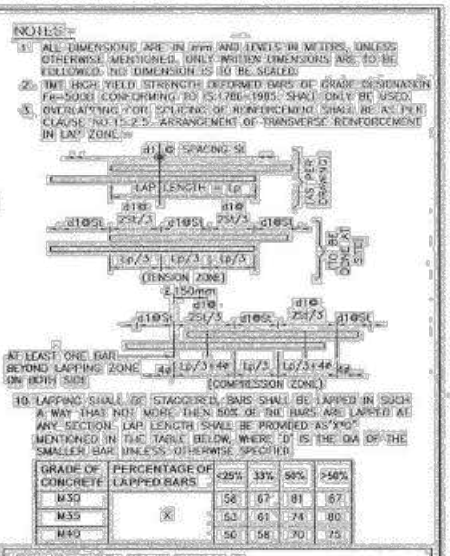
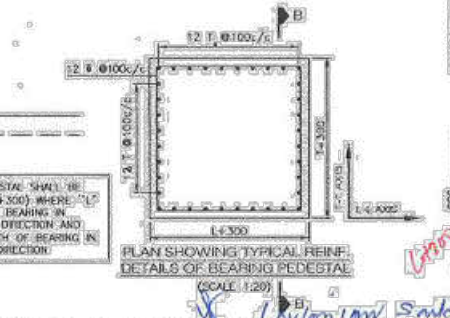
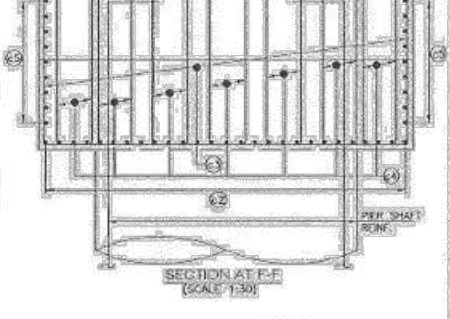
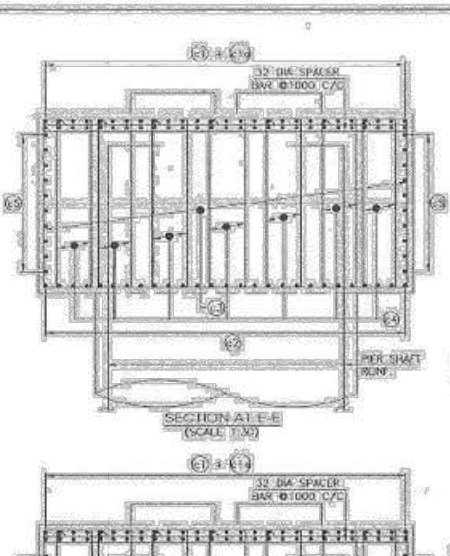
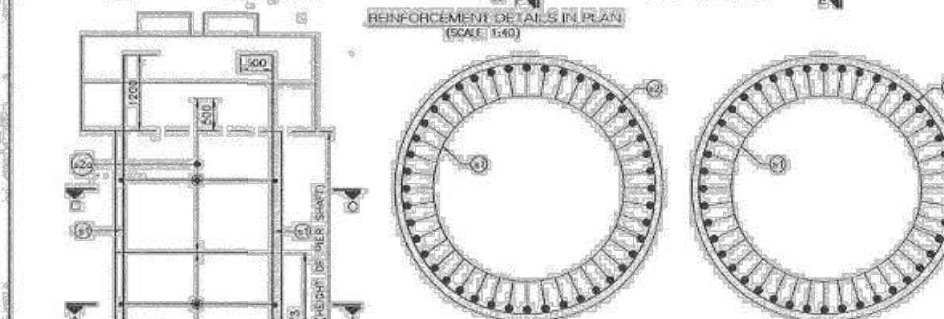
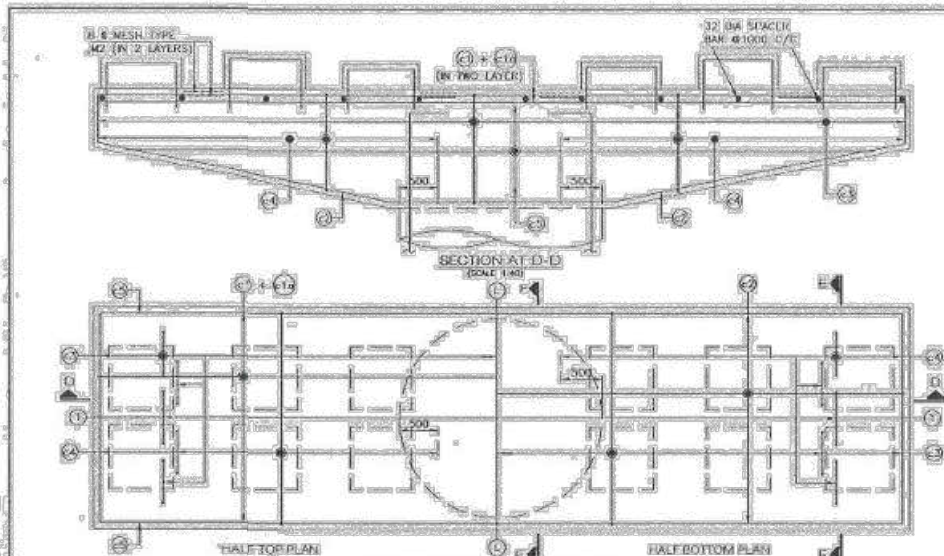
DETAILS 'X'  
(SEE PAGE 10)



PIER CAP TOP PLAN

[illegible]





**NOTES:**

- ALL DIMENSIONS ARE IN mm AND LEVELS IN METERS, UNLESS OTHERWISE MENTIONED. ONLY WHOLE DIMENSIONS ARE TO BE FOLLOWED. NO DIMENSION IS TO BE SCALED.
- THE HIGH YIELD STRENGTH DEFORMED BARS OF GRADE 500N/mm<sup>2</sup> CONFORMING TO IS: 1786-1985 SHALL ONLY BE USED.
- OVERLAPPING FOR SPHERES OF NONPERPENDICULAR SHALL BE AS PER CLAUSE NO.15.2.5. ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:

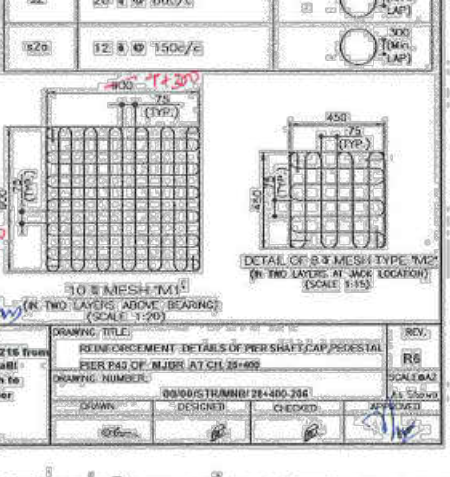
AT LEAST ONE BAR BEYOND LAPPING ZONE ON BOTH SIDES

10. LAPPING SHALL BE STAGGERED. BARS SHALL BE LAPPED IN SUCH A WAY THAT NO MORE THAN ONE BAR OF THE SAME ARE LAPPED AT ANY SECTION. LAP LENGTH SHALL BE PROVIDED AS 'X' MENTIONED IN THE TABLE BELOW, WHERE 'D' IS THE DIA OF THE SMALLER BAR UNLESS OTHERWISE SPECIFIED.

GRADE OF CONCRETE	PERCENTAGE OF LAPPED BARS	<25%	33%	50%	>50%
M30		58	67	81	87
M35	X	63	61	74	80
M40		50	58	70	75

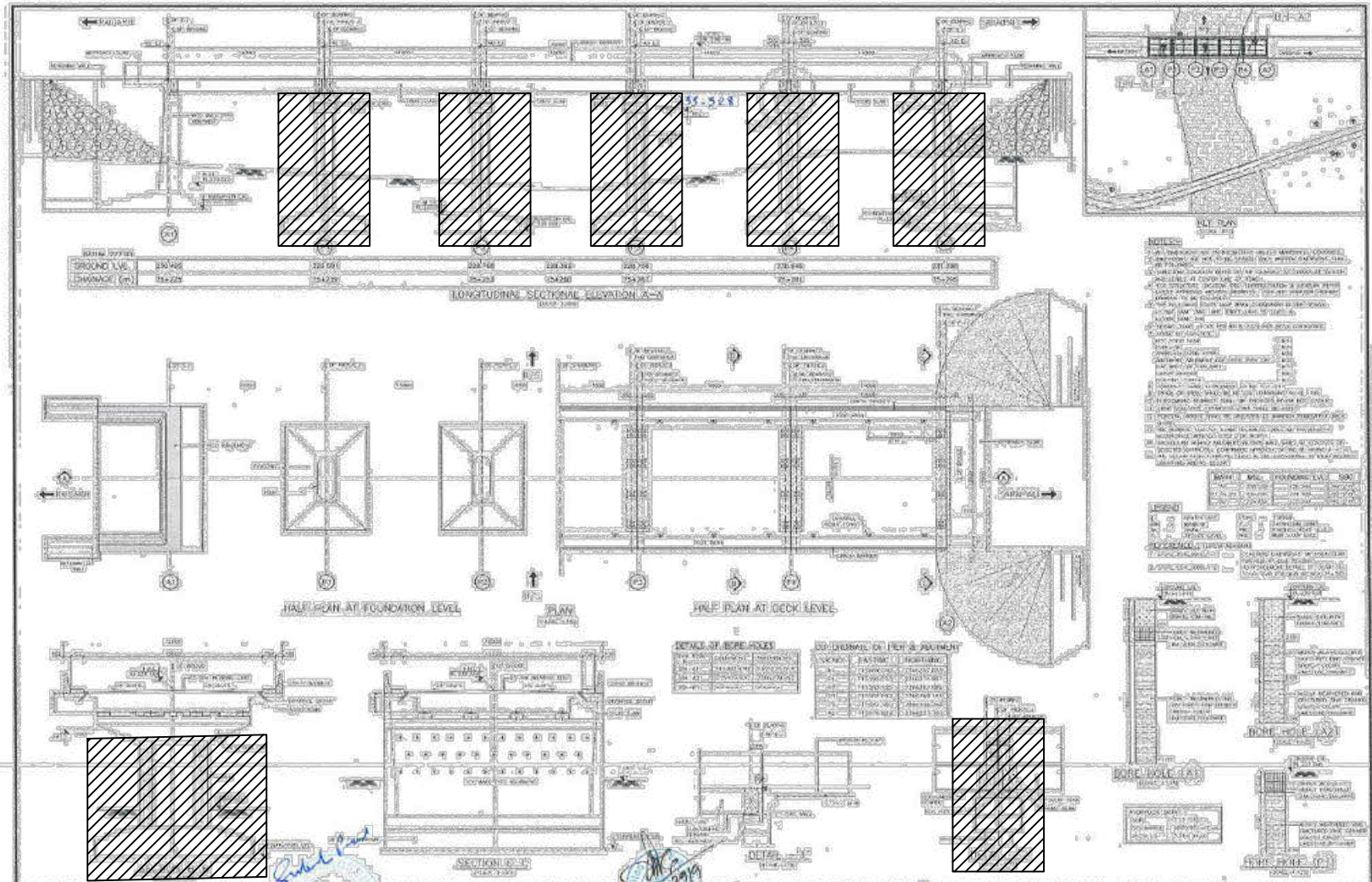
**REINFORCEMENT DETAILS**

BAR MARK	BAR DIA & SPACING NO.	BAR SHAPE
11	21 NOS. 32 # (1st LAYERS)	300
11a	21 NOS. 32 # (1st LAYERS)	300
12	21 NOS. 16 #	500
13	2 LEGGED STIRRUPS 16 # @ 1000 C/C	1500
14	10 LEGGED STIRRUPS 16 # @ 1000 C/C	1500
15	12 # @ 1500 C/C	LENGTH VARIES
PER SHAFT:		
16	22 NOS. 32 # + 22 NOS. 25 # (ALTERNATE)	500
17	20 # @ 600 C/C	300 (MIN. LAP)
18	12 # @ 1500 C/C	300 (MIN. LAP)



NO.	REVISION	DATE	BY	CHKD.	APPD.	REVISION
1	ISSUED FOR TENDER	01/01/2024	...	...	...	...
2	...	...	...	...	...	...
3	...	...	...	...	...	...
4	...	...	...	...	...	...
5	...	...	...	...	...	...





- NOTES:**
1. ALL THE WORK SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS OF THE FEEDBACK INFRASTRUCTURE PROJECT.
  2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL AUTHORITIES.
  3. THE CONTRACTOR SHALL MAINTAIN ACCESS TO ALL ADJACENT PROPERTIES AND PUBLIC AREAS AT ALL TIMES.
  4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING UTILITIES AND STRUCTURES.
  5. THE CONTRACTOR SHALL MAINTAIN A SAFE WORKING ENVIRONMENT AT ALL TIMES.
  6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DISPOSAL OF ALL WASTE MATERIALS.
  7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL ADJACENT PROPERTIES AND PUBLIC AREAS.
  8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING UTILITIES AND STRUCTURES.
  9. THE CONTRACTOR SHALL MAINTAIN A SAFE WORKING ENVIRONMENT AT ALL TIMES.
  10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DISPOSAL OF ALL WASTE MATERIALS.
- TABLE OF MATERIALS**
- | ITEM             | QUANTITY | UNIT  | REMARKS           |
|------------------|----------|-------|-------------------|
| 1. CEMENT        | 1000     | KG    | FOR CONCRETE WORK |
| 2. SAND          | 500      | CU M  | FOR CONCRETE WORK |
| 3. GRAVEL        | 200      | CU M  | FOR CONCRETE WORK |
| 4. BRICKS        | 10000    | NO    | FOR WALLS         |
| 5. ROOFING SHEET | 100      | SQ M  | FOR ROOFING       |
| 6. PAINT         | 10       | LITRE | FOR PAINTING      |

PROJECT NO: NH-71678

DATE: 10/10/2023

DRAWN BY: [Signature]

CHECKED BY: [Signature]

APPROVED BY: [Signature]

**FEEDBACK INFRA**

Infrastructure Development Solutions

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Phone: +91 11 1234 5678

Email: info@feedbackinfra.com

**CONTRACTOR**

CONSTRUCTION COMPANY

100, Main Road, New Delhi, India

Phone: +91 11 1234 5678

Email: info@construction.com

**REVIEWED**

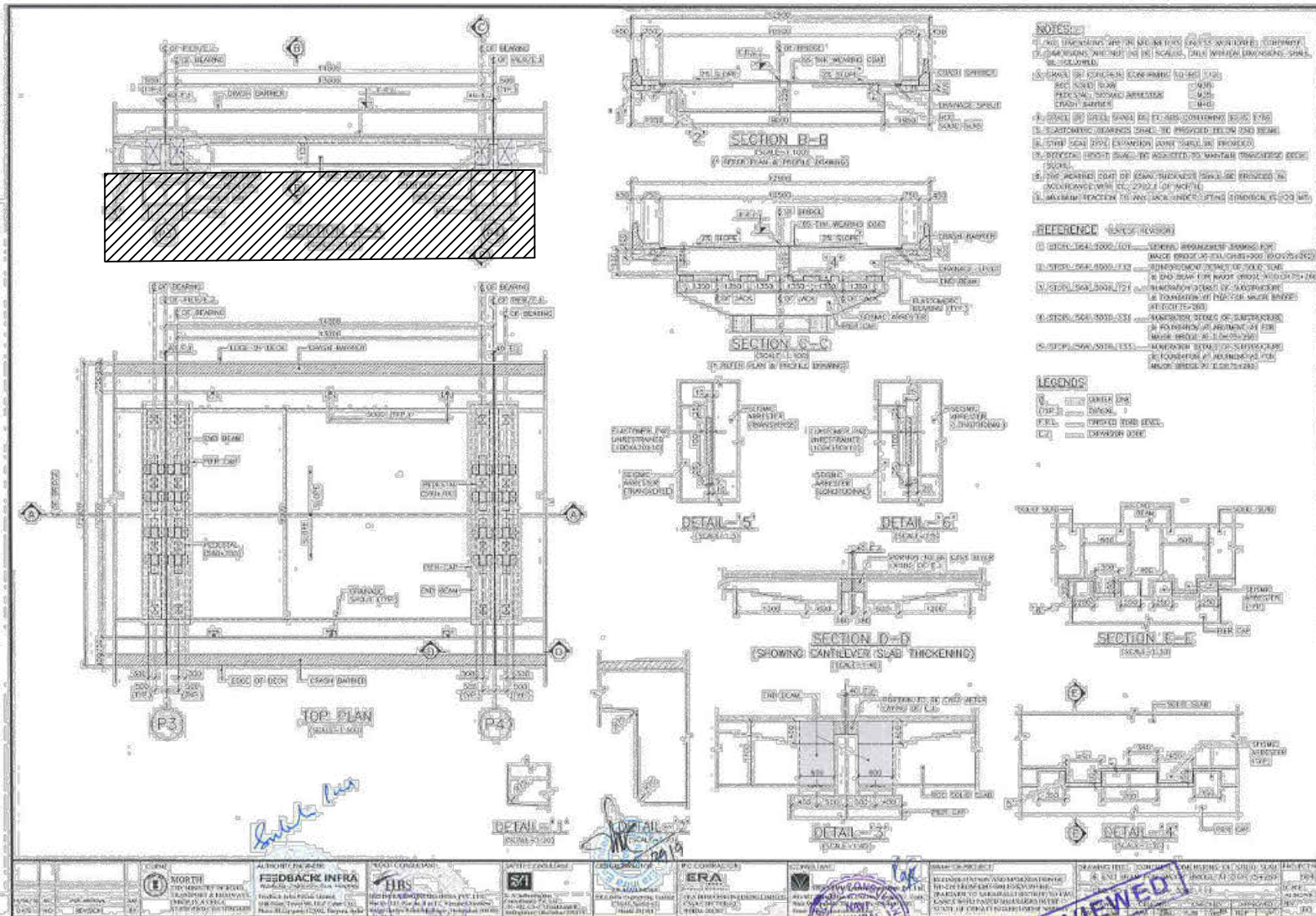
A. N. Singh

Team Leader

Feedback Infra

NH-71678

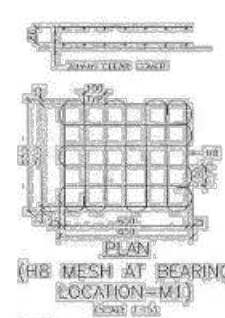
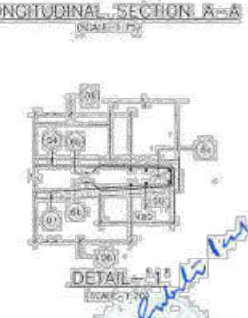
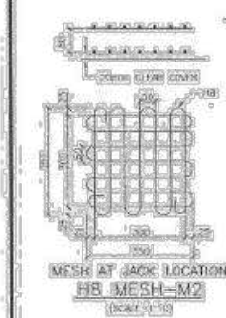
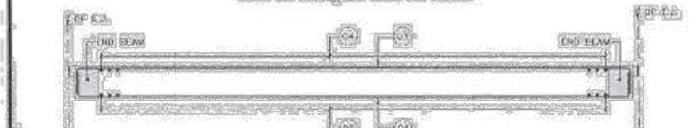
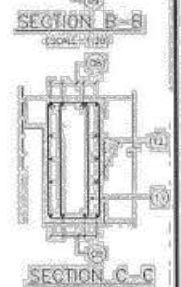
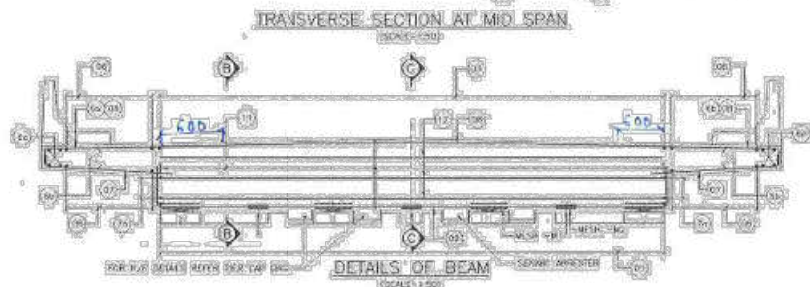
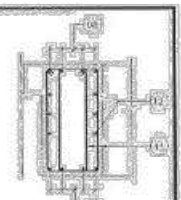
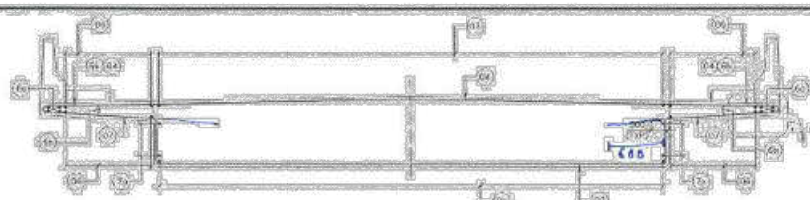
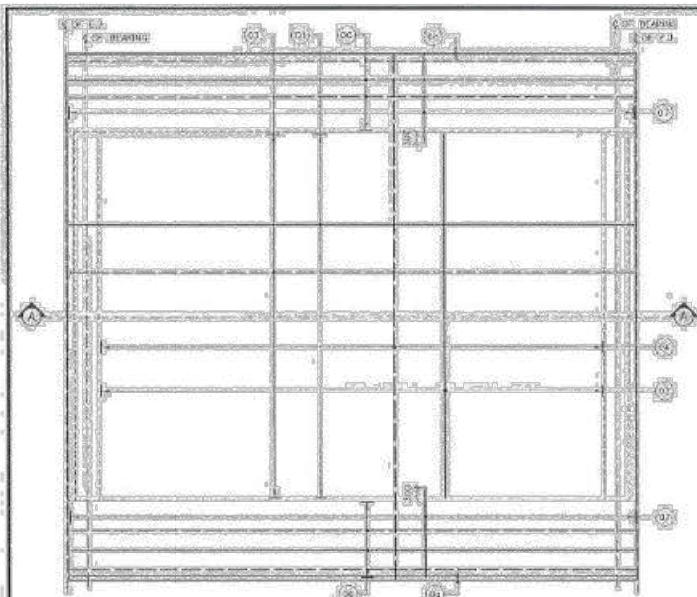




*South*

*North*





**NOTES:-**

- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS.
- DO NOT SCALE THIS DRAWING. ONLY NOTED DIMENSIONS SHALL BE FOLLOWED.
- DO NOT SCALE THIS DRAWING.
- FOR LAP LENGTH OF THE BARS REFER TABLE.
- AT PARTICULAR LOCATION LAPPING OF BARS SHALL NOT BE GREATER THAN 300.
- WHEREVER JOINTING OF BARS ARE REQUIRED, THEY ARE TO BE SPACED UNIFORMITY, UNLESS NOTED OTHERWISE.
- DEVELOPMENT LENGTH OF THE MAIN REINFORCEMENT SHALL BE 45d, EXCEPT OTHERWISE NOTED.
- WATERPROOFING
- CONCRETE SHALL BE GRADE CONFORMING TO IS 456.
- STEEL REINFORCEMENT SHALL BE GRADE CONFORMING TO IS 456.
- ALL REINFORCEMENT BARS SHALL BE CLEAN AND FREE FROM OIL, GREASE, RUST, ETC.
- AND SHALL BE WELD TO SHAPES AND DIMENSIONS INDICATED AND SHALL BE PLACED EXACTLY AS SHOWN.
- ALL REINFORCEMENT PROVIDED SHALL BE IN 1:1.50 RATIO ONLY AND SHALL BE OF TESTED QUALITY.
- FOR DETAILS OF DETAILS REFER TO THE COMPANY DRAWING.

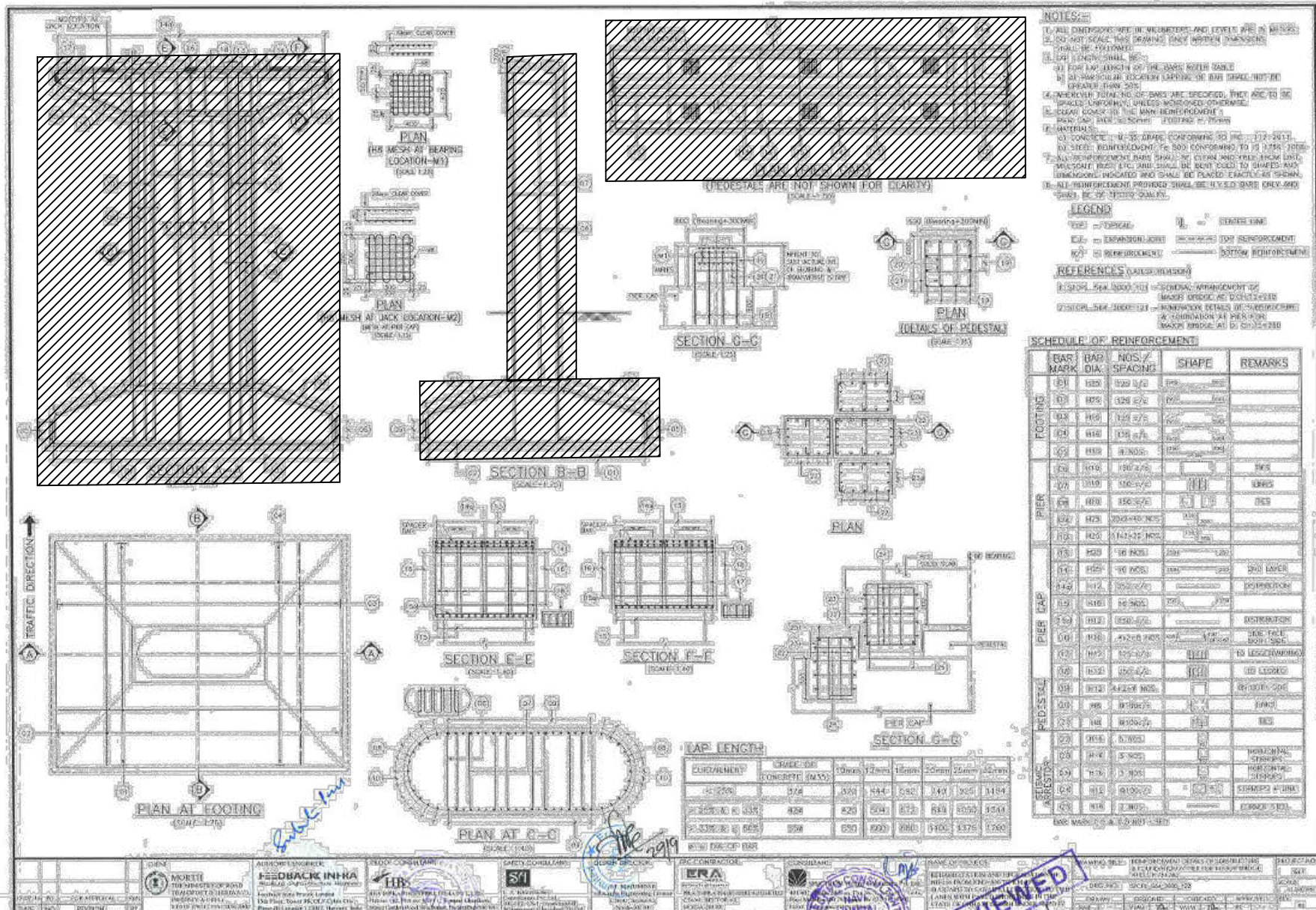
**LEGEND**

- 100% - 100% REINFORCEMENT
- 50% - 50% REINFORCEMENT
- 25% - 25% REINFORCEMENT
- 12.5% - 12.5% REINFORCEMENT
- 6.25% - 6.25% REINFORCEMENT
- 3.125% - 3.125% REINFORCEMENT
- 1.5625% - 1.5625% REINFORCEMENT
- 0.78125% - 0.78125% REINFORCEMENT
- 0.390625% - 0.390625% REINFORCEMENT
- 0.1953125% - 0.1953125% REINFORCEMENT
- 0.09765625% - 0.09765625% REINFORCEMENT
- 0.048828125% - 0.048828125% REINFORCEMENT
- 0.0244140625% - 0.0244140625% REINFORCEMENT
- 0.01220703125% - 0.01220703125% REINFORCEMENT
- 0.006103515625% - 0.006103515625% REINFORCEMENT
- 0.0030517578125% - 0.0030517578125% REINFORCEMENT
- 0.00152587890625% - 0.00152587890625% REINFORCEMENT
- 0.000762939453125% - 0.000762939453125% REINFORCEMENT
- 0.0003814697265625% - 0.0003814697265625% REINFORCEMENT
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- 0.0000000000000000000000051698788284564240150105041465001723775730143750006187656745012675210140168112134497072265625% - 0.0000000000000000000000051698788284564240150105041465001723775730143750006187656745012675210140168112134497072265625% REINFORCEMENT
- 0.00000000000000000000000258493941422821200750525207325000863887827118750030938283725012675210140168112134497072265625% - 0.00000000000000000000000258493941422821200750525207325000863887827118750030938283725012675210140168112134497072265625% REINFORCEMENT
- 0.000000000000000000000001292469707114106003752626036625004319439135937500154691418625012675210140168112134497072265625% - 0.000000000000000000000001292469707114106003752626036625004319439135937500154691418625012675210140168112134497072265625% REINFORCEMENT
- 0.000000000000000000000000646234853557053001876313018312500215974572968750077345709312675210140168112134497072265625% - 0.000000000000000000000000646234853557053001876313018312500215974572968750077345709312675210140168112134497072265625% REINFORCEMENT
- 0.00000000000000000000000032311742677852650093815650915625001098728648437500386738546562675210140168112134497072265625% - 0.00000000000000000000000032311742677852650093815650915625001098728648437500386738546562675210140168112134497072265625% REINFORCEMENT
- 0.00000000000000000000000016155871338926325046907825457812500549364324218750019336927328282812675210140168112134497072265625% - 0.00000000000000000000000016155871338926325046907825457812500549364324218750019336927328282812675210140168112134497072265625% REINFORCEMENT
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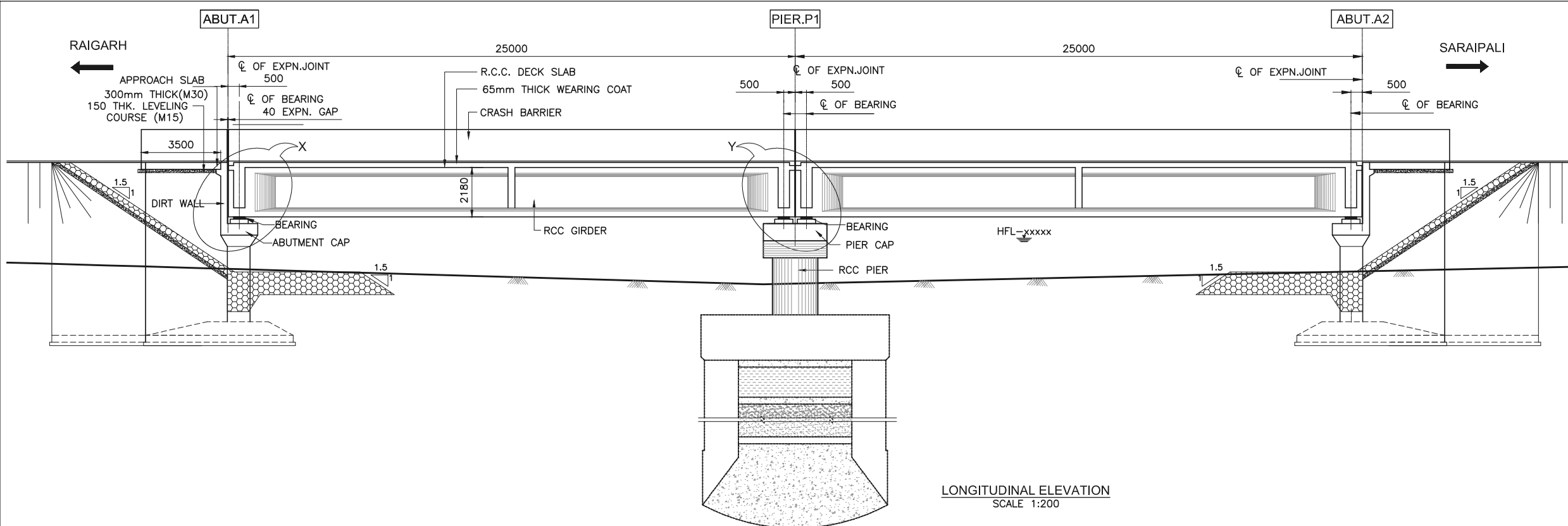






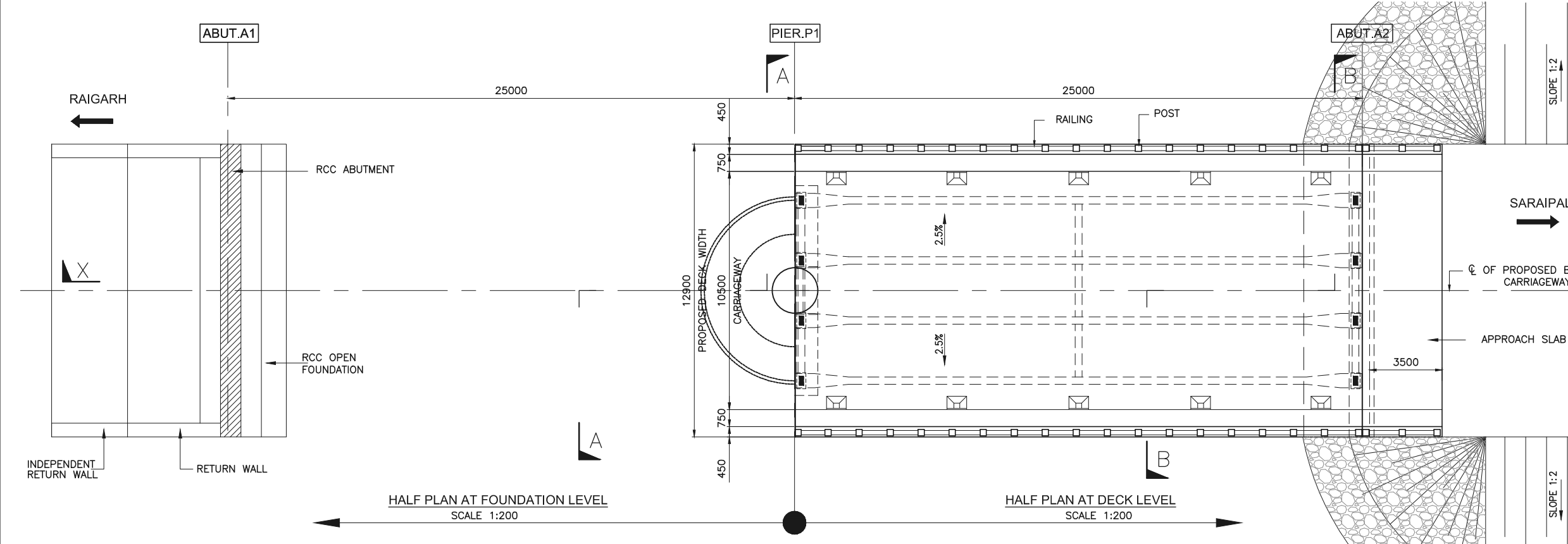
# **New Minor Bridge & Culverts Drawings**





LONGITUDINAL ELEVATION  
SCALE 1:200

FORMATION LEVEL (FRL)	205.300	205.300	205.300
EXISTING GROUND LEVEL	200.54	199.89	200.43
CHAINAGE	31+055	31+080	31+105



HALF PLAN AT FOUNDATION LEVEL  
SCALE 1:200

HALF PLAN AT DECK LEVEL  
SCALE 1:200

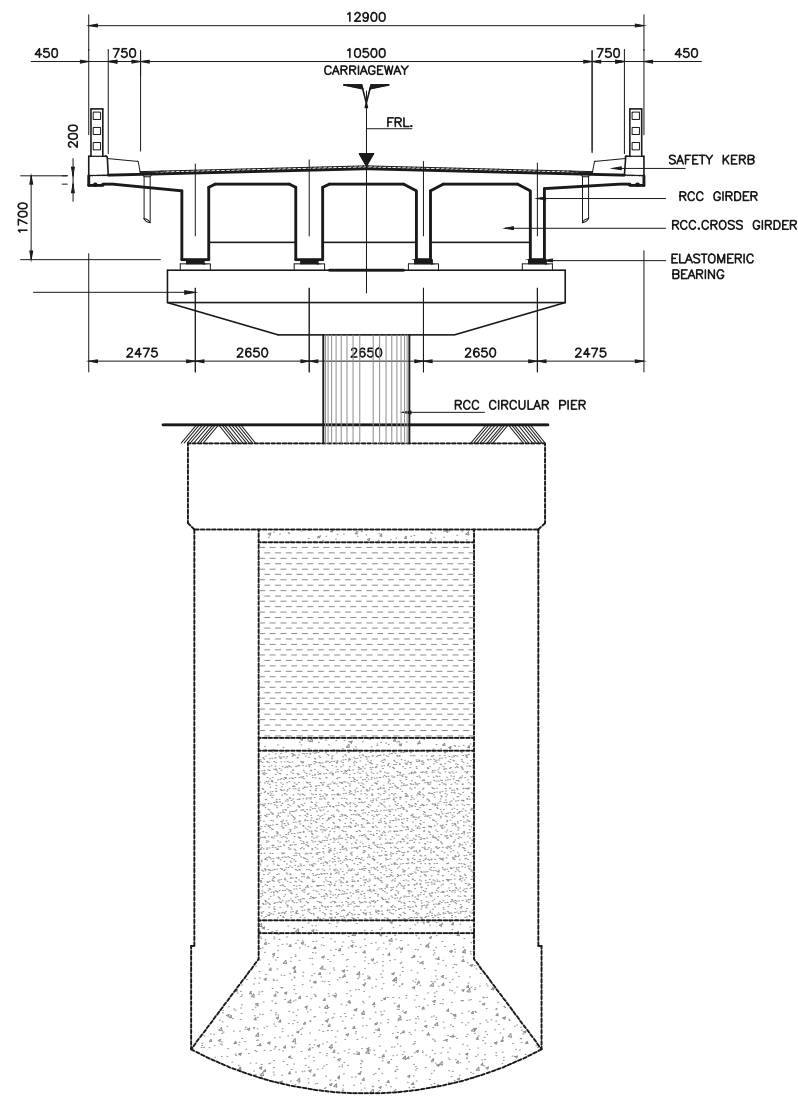
- NOTES :**
1. ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS ARE IN METRES.
  2. DIMENSIONS ARE NOT TO BE SCALED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
  3. ALL STRUCTURAL DIMENSIONS ARE TENTATIVE AND SUBJECT TO MODIFICATION AFTER DETAILED DESIGN.
  4. R.C.C. WORK SHALL BE DONE AS PER IRC SPECIFICATIONS FOR ROAD AND BRIDGE WORKS.
  5. FOR GRADE OF CONCRETE REFER GENERAL NOTE DRAWING.
  6. HIGH STRENGTH DEFORMED TMT BARS (TOR) CONFORMING TO Fe 500 SHALL BE USED.
  7. STRUCTURE SHALL BE DESIGNED FOR ONE LANE OF IRC CLASS 70 R WHEELED VEHICLE TOGETHER WITH ONE LANE OF IRC CLASS-A VEHICLES OR THREE LANES OF IRC CLASS-A VEHICLES WHICHEVER PRODUCES SEVERE CONDITIONS.
  8. BEARING SHALL BE ELASTOMERIC TYPE.
  9. THE HYDRAULIC DATA FOR SUBSTRUCTURE DESIGN IS AS FOLLOWS:-
 

a. DESIGN DISCHARGE	= 0.00 CUMEC/S
b. DESIGN LWL	= 0.000M
c. DESIGN HFL	= 0.00M
d. SCOUR LVL FOR ABUTMENT	= 0.00M

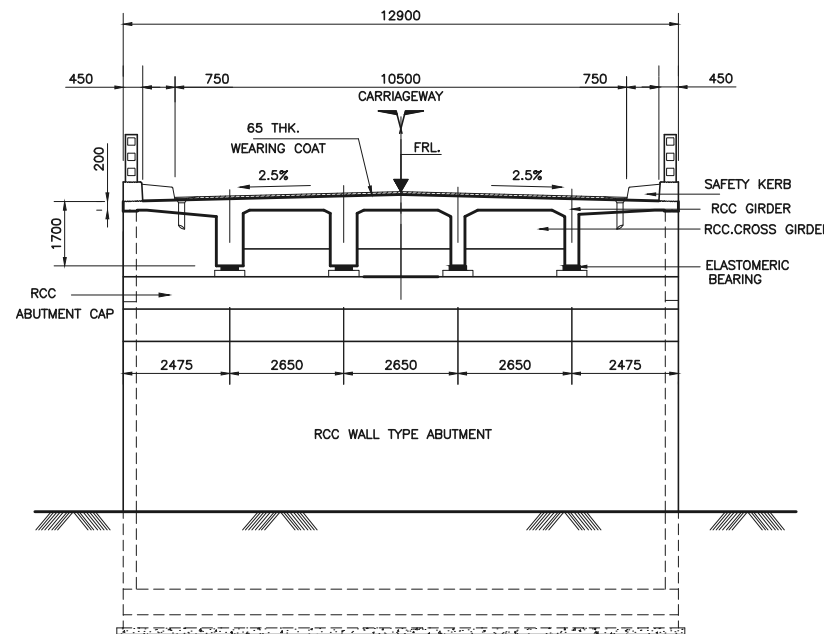
LEGEND  

 THUS SHOWN EXISTING STRUCTURE.

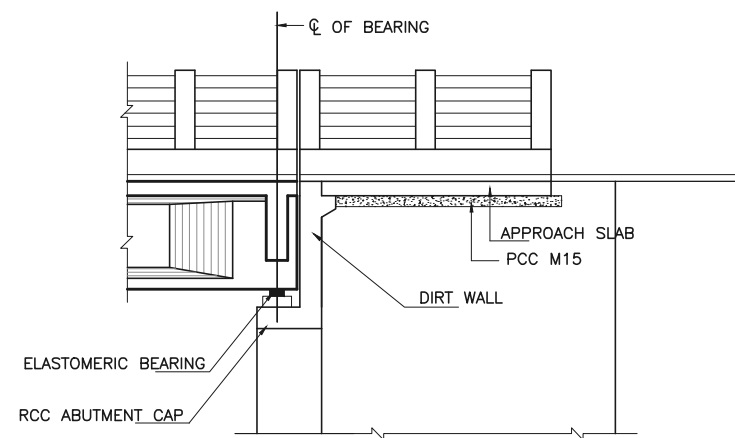




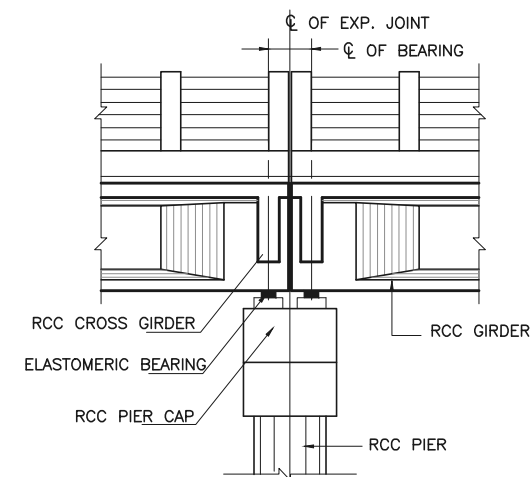
**CROSS SECTION A-A**  
SCALE 1:200



**CROSS SECTION B-B**  
SCALE 1:200



**DETAIL - A**  
SCALE 1:100



**DETAIL - B**  
SCALE 1:100

**NOTES :**

1. ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS ARE IN METRES.
2. DIMENSIONS ARE NOT TO BE SCALED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
3. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH OTHER RELEVANT DRAWINGS.



**MINISTRY OF ROAD TRANSPORT & HIGHWAYS**

Gifford India Private Limited  
2nd Floor  
Plot no.J-3/1  
B-1 Extn.  
Mohan Co-Operative Area  
New Delhi - 110044

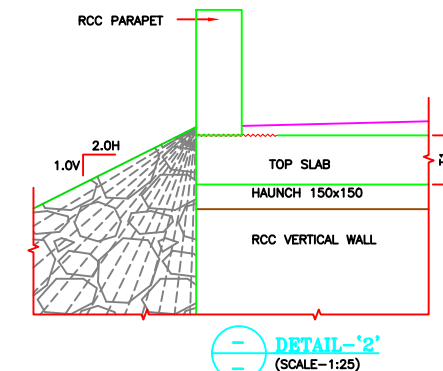
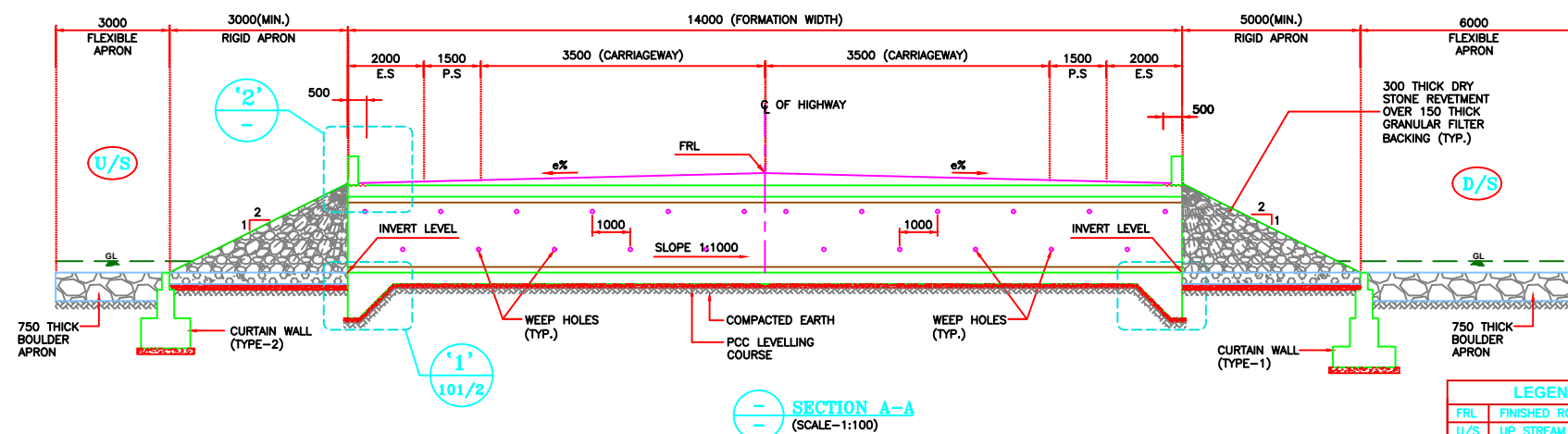
Gifford  
Carlton House  
Ringwood Road  
Woodlands  
Southampton  
SO40 7HT, UK

Project  
PREPARATION OF FEASIBILITY REPORT FOR  
TWO LANING WITH PAVED SHOULDERS FROM RAIGARH-  
SARANGARH-SARAIPALLI SECTION OF NH-216 IN STATE OF  
CHATTISGARH THROUGH PPP ON DBFOT BASIS

Drawing Title  
**GENERAL ARRANGEMENT DRAWING  
FOR MINOR BRIDGE AT CH:31.080 (5+480)  
(SH-2 OF 2)**

				XX/09/14	
				ISSUED FOR APPROVAL	
0	CJM	SK	VN		
Rev.	Drawn	Chkd.	Appr.	Date	Description
Scale			Date		Drawn
AS SHOWN			OCTOBER 2014		C.J.M
Drg.no.					Rev.
16241/B/RAI-SARAI/101					0





LEGEND	
FRL	FINISHED ROAD LEVEL
U/S	UP STREAM
D/S	DOWN STREAM
RHS	RIGHT HAND SIDE
LHS	LEFT HAND SIDE
RME	RIGHT MEDIAN EDGE
LME	LEFT MEDIAN EDGE
GL	GROUND LEVEL

#### NOTES:-

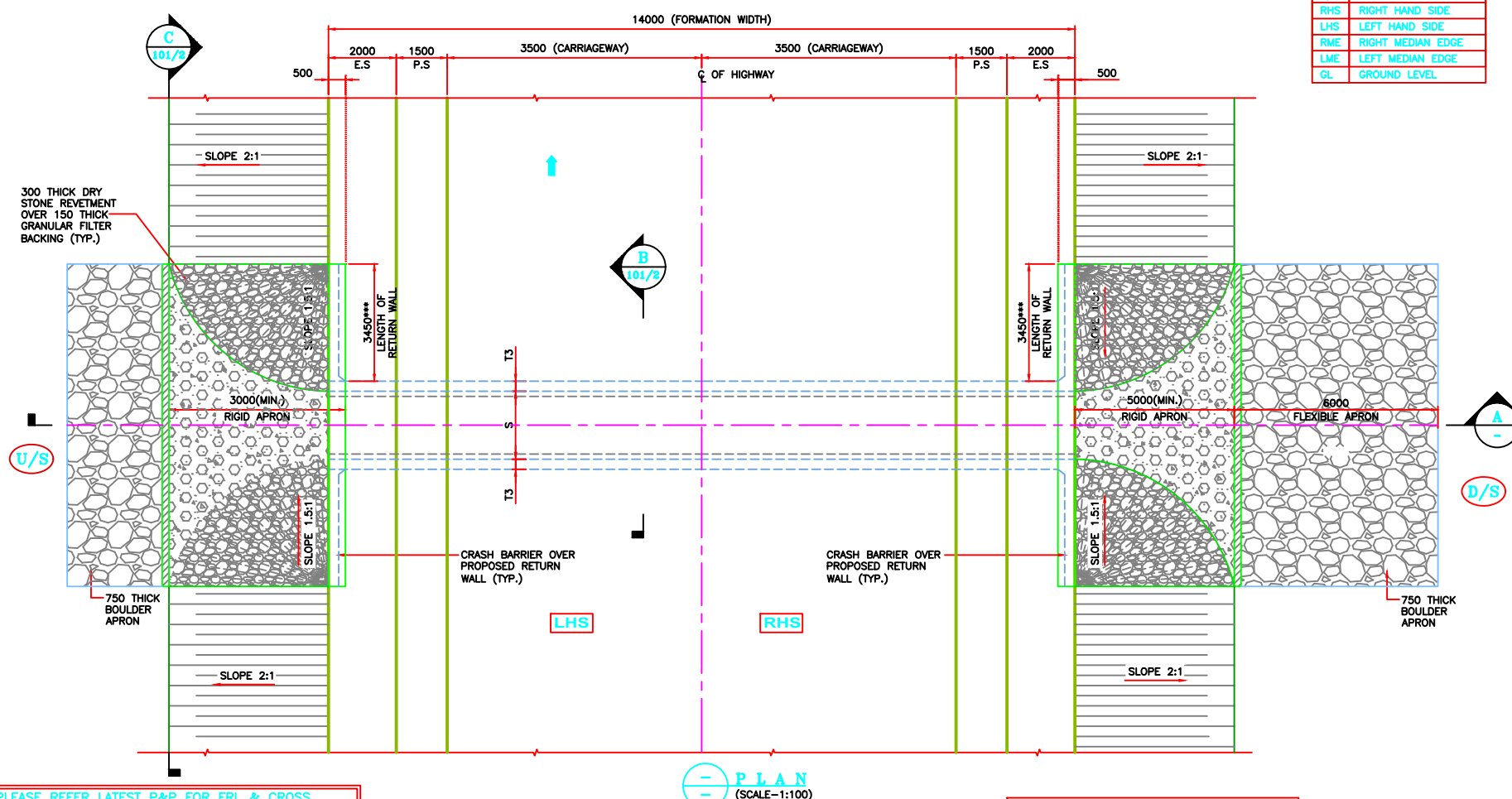
- ALL DIMENSIONS ARE IN MILLIMETERS, LEVELS IN METERS AND CHAINAGES IN KILOMETERS UNLESS OTHERWISE MENTIONED.
- DIMENSIONS ARE NOT TO BE SCALED, ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
- THE CARRIAGEWAY OF PROPOSED CULVERT IS DESIGNED AS PER IRC: 6.
- WEARING COAT SHALL CONFORM TO CLAUSE 2702.1 OF "MORT&H" SPECIFICATION.
- CONCRETE SHALL BE DESIGN MIX UNLESS OTHERWISE SPECIFIED IN DETAILED DRAWINGS, AND SHALL HAVE MINIMUM 28 DAYS CHARACTERISTIC STRENGTH ON 150mm CUBES FOR ALL ELEMENTS OF STRUCTURES AS INDICATED BELOW:
 

a) RCC PARAPET WALL	.....M30
b) RCC BOX CELL	.....M30
c) RCC RETAINING WALL	.....M30
- REINFORCING STEEL SHALL BE OF HYSD (TMT) BARS, MAKE DESIGNATION Fe 500D CONFORMING TO TABLE 18.1 OF IRC: 112-2011.
- MINIMUM CLEAR COVER TO ANY REINFORCEMENT SHALL BE AS BELOW:
 

i) TOP SLAB (BOTH FACE)	.....45mm
ii) VERTICAL WALL (EARTH FACE)	.....45mm
iii) VERTICAL WALL (REAR FACE)	.....75mm
iv) BOTTOM SLAB (BOTH FACE)	.....45mm
v) RCC CRASH BARRIER	.....75mm
vi) RCC RETAINING WALL	.....45mm
FOOTING	.....45mm
- 100mm WEEP HOLES SPACED AT 1000 C/C BOTH HORIZONTALLY AND VERTICALLY SHALL BE PROVIDED IN A STAGGERED MANNER IN EARTH RETAINING VERTICAL WALLS ABOVE GROUND LEVEL.
- 600 THICK FILTER MEDIA BEHIND EARTH RETAINING VERTICAL WALL SHALL BE PROVIDED AS PER "MORT&H" SPECIFICATION.
- BEFORE WIDENING THE FACE OF EXISTING STRUCTURE SHALL BE THOROUGHLY CLEANED WITH MECHANICAL HAND TOOLS AND WITH AIR JET TO REMOVE DUST, LOOSE PARTICALS, DEBRIS AND ACCUMULATED RUBBISH FROM THE SURFACE.
- LAYING, COMPACTION AND EXTENT OF BACK FILL BEHIND EARTH RETAINING WALLS SHALL CONFORM TO SPECIFICATIONS IN APPENDIX 6 OF IRC: 78-2014.
- BACK FILLING BEHIND EARTH RETAINING WALL CONSIST OF SELECTED EARTH CONFORMING TO APPENDIX 6 OF IRC: 78-2014 HAVING PROPERTIES  $C=0$ ,  $\phi=30^\circ$  AND  $\gamma=2.0 \text{ T/m}^3$ .
- THE DRAWING SHALL BE READ IN CONJUNCTION WITH RELEVANT APPROVED HIGHWAY DRAWINGS FOR STRUCTURE ORIENTATION, SKEW ANGLE, FRL AND CAMBER/SUPERELEVATION ETC.
- DURING WIDENING OPERATION ALL NECESSARY PRECAUTIONS SHALL BE TAKEN FOR THE SAFETY OF THE MOVING VEHICLES OVER THE CULVERT.
- MAX DESIGN PRESSURE AT FOUNDING LEVEL OF BOX IS  $13.0 \text{ T/m}^2$ .
- COMPACTED EARTH SHALL CONFORM TO CL. 305.2.1.5 OF "MORT&H" SPECIFICATION.

#### REFERENCE DRAWINGS:-

- GENERAL ARRANGEMENT DRAWING  
RAM-SAS/NH-730/ST/CBC/487+946/101 (SH. 2 OF 2)
- TYPICAL REINFORCEMENT DETAIL OF BOX  
RAM-SAS/NH-730/ST/CBC/TYP/203 (1 SHEET)



\* PLEASE REFER LATEST P&P FOR FRL & CROSS SLOPE OF EXISTING/NEWLY CONSTRUCTED STRUCTURE.

\*\* MARKED DIMENSION TO BE VERIFIED AT SITE.

\*\*\* LENGTH OF RETAINING WALL SHOULD BE CHECKED AS PER SITE CONDITION.

CLIENT:-



Ministry of Road Transport and Highways

CONSULTANT:-



Bloom Companies LLC In JV with Subudhi Technoengineers Pvt. Ltd  
1105 B&C Welldone, Tech Park Sect. 48,  
Sohna Road Gurgaon H.R.- 122018  
Email id- info@bloom-india.com  
Phone:- 0124-4292105

PROJECT:-

Balance work for Two Lanning with paved shoulder of Raigarh - Saraipalli section of new NH153 (old NH 216 ) from 3.8 km to 90.64km in the state of Chattisgarh

SCALE :-  
1:2500

TITLE:-

GENERAL ARRANGEMENT  
DRAWING FOR BOX  
CULVERT 1X3X2 AT CH.  
76.319

DRAWING No :

PAGE No :

DATE : SEP 2023

Revision: R0

PREPARED BY

CHECKED BY



