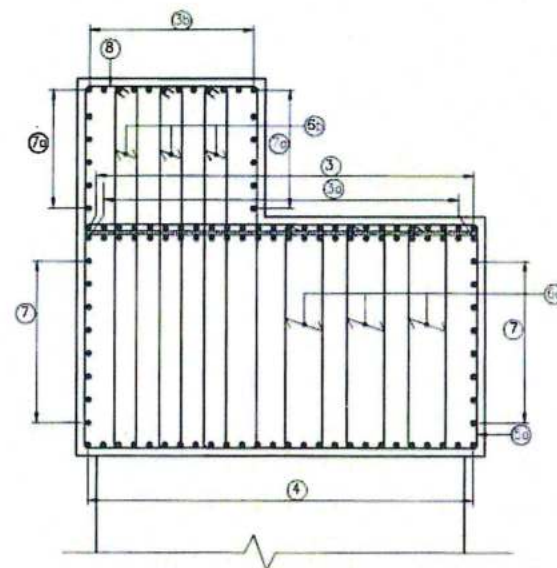
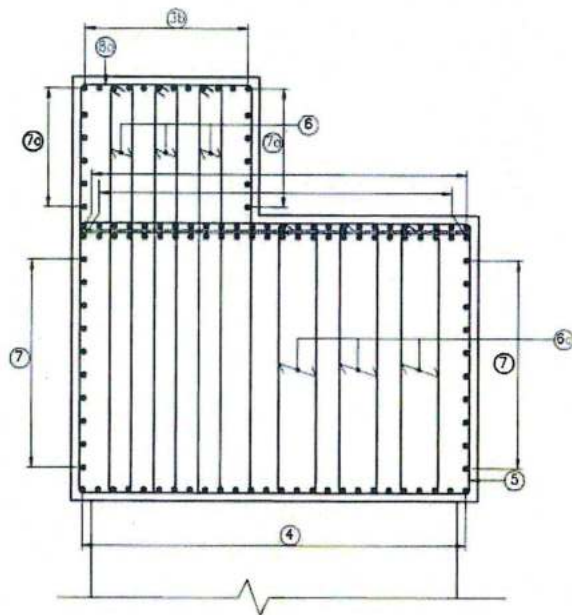
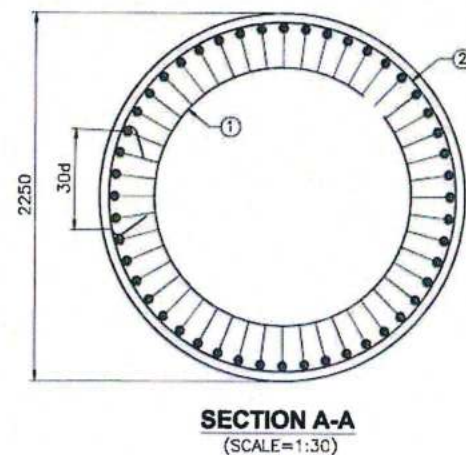
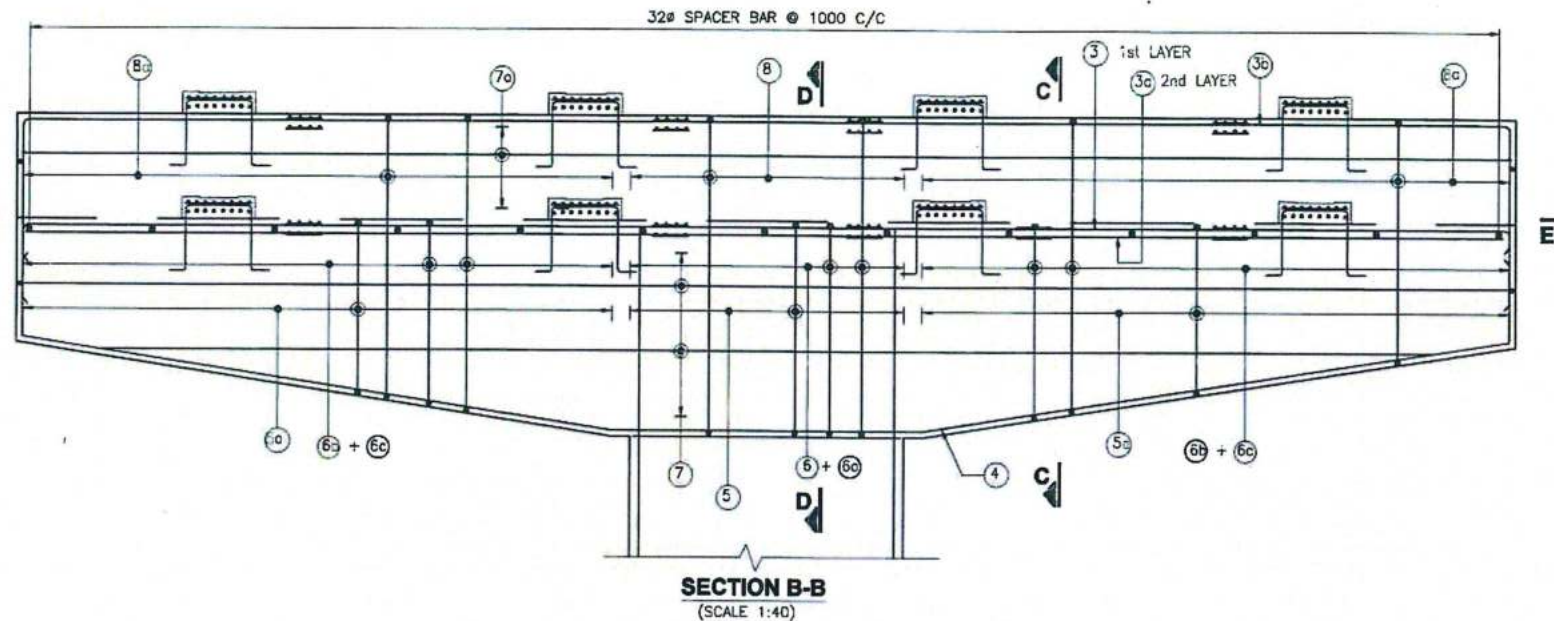
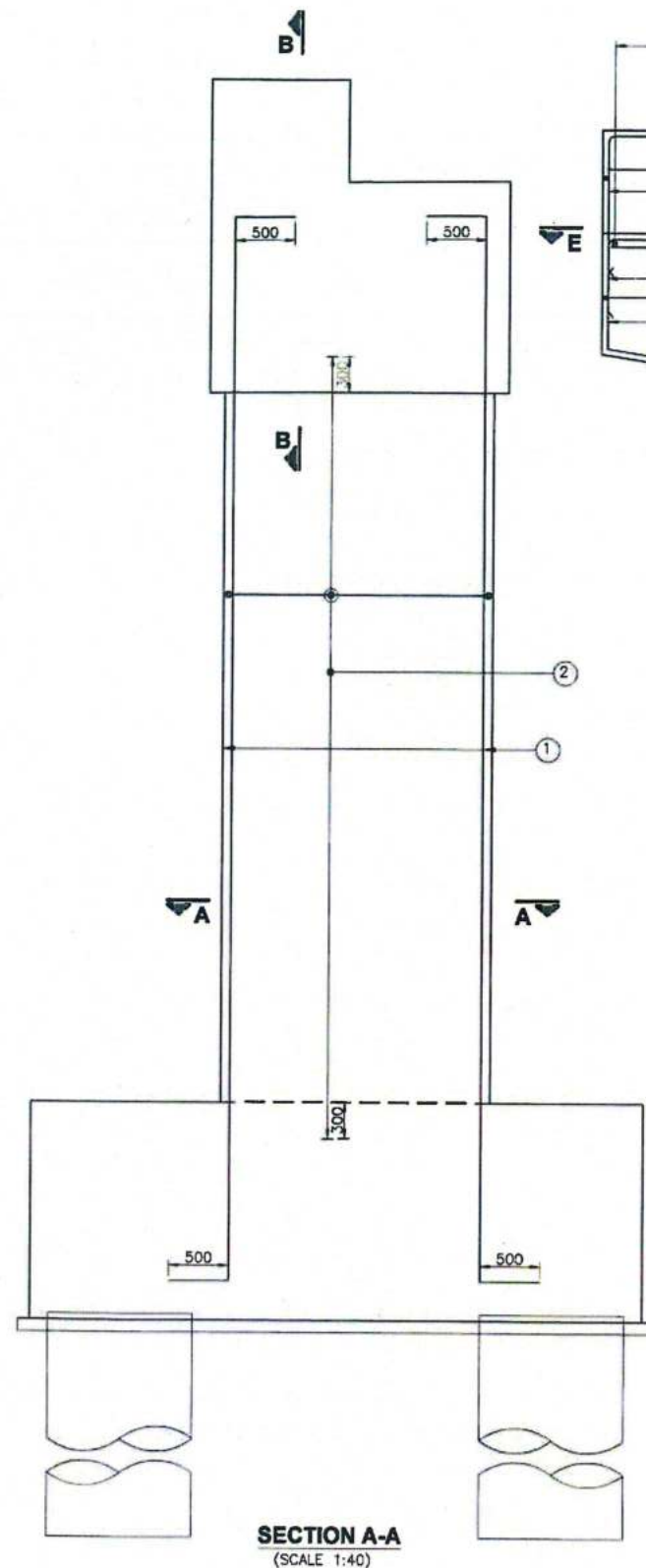


GOOD FOR CONSTRUCTION



			<div>CLIENT:</div> <div><div>NATIONAL HIGHWAYS INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. (3RD FLOOR, PTI BUILDING, 4 PARLIAMENT STREET, NEW DELHI-110001)</div></div>		<div>CONTRACTOR</div> <div><div>GANNON DUNKERLEY &amp; CO. LTD 86A, TOPSIA ROAD (SOUTH) HAUTE STREET, 7th FLOOR KOLKATA-700046</div></div>		<div>DESIGN CONSULTANT</div> <div><div>ECSTATIC ENGINEERING CONSULTANTS PRIVATE LIMITED SCO 103 HUDA SHOPPING CENTRE, GURGOAN, SECTOR 55, GURUGRAM, HARYANA 122011</div></div>		APPROVED BY:	U.S	<div>PROJECT:</div> <div>FOUR LANING OF JHANJI TO DEMOW SECTION OF NH-37 FROM EXISTING CH. K 491+050 TO KM 535+250 (DESIGN CH. KM 490+800 TO KM 534+800) IN THE STATE OF ASSAM UNDER EPC MODE.</div> <div>TITLE:</div> <div>REINFORCEMENT DETAILS OF PIER &amp; PIER CAP FOR PIER OF MJB AT CH. 516+938</div> <div>DRG NO:</div> <div>J-D/STR/MJB/CH-516+938/SUB-202</div> <div>SHEET NO.</div> <div>2 OF 2</div> <div>REV.</div> <div>R0</div>			
			<div>AUTHORITY ENGINEER:</div> <div><div>VOYANTS SOLUTIONS PVT. LTD. 405, 6TH FLOOR, BPTP PARK CENTRA, BLOCK A, JAL VAYU VIHAR SECTOR 30 GURGOAN, HARYANA 122001</div></div>		<div>SAFTY CONSULTANT:</div> <div><div>G-ENG ADVISORY SERVICES PVT. LTD. SCO-102, HUDA SHOPPING CENTER, SECTOR-66 GURGOAN-122002, HARYANA TEL:- +91-124-4299002, 4299003 EMAIL: INFO@G-ENG.IN WEBSITE: WWW.G-ENG.IN</div></div>		<div>PROOF CONSULTANT</div> <div><div>MARC TECHNOCRATS PVT. LTD. MARC House, Sector-7 (Dividing Road), opposite Devi Lal Park, Bahadurgarh, Haryana 124507</div></div>		CHECKED BY:	N.S				
							DESIGNED BY:	AR						
							DRAWN BY:	AKS						
25.01.2020	R0	ISSUE FOR APPROVAL						SCALE:	AS SHOWN	DATE:	JANUARY, 2020			
DATE	REV	DESCRIPTION OF REVISIONS		BY										





GOOD FOR CONSTRUCTION

#### LEGENDS

---	BAR ON TOP/EARTH FACE
---	BAR ON BOTTOM/OTHER FACE
B/F	BOTH FACE

#### NOTES:-

- ALL DIMENSIONS ARE IN mm, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS AND NUMBER IF BARS ARE TO BE FOLLOWED.
- CONCRETE SHALL BE DESIGN MIX AND SHALL HAVE MINIMUM 28 DAYS CHARACTERISTIC STRENGTH ON 150mm CUBES AS 35 MPa FOR PIERS & PIER CAPS.
- THE REINFORCEMENT STEEL SHALL BE HIGH YIELD STRENGTH DEFORMED BARS OF GRADE DESIGNATION Fe-500D CONFORMING TO IS:1786.
- CLEAR COVER TO OUTERMOST STEEL SHALL BE AS 50mm.
- LAPPING OF REINFORCEMENT SHALL BE AVOIDED AS FAR AS POSSIBLE. IN CASE LAPPING OF BARS BECOMES UNAVOIDABLE, MINIMUM LAP LENGTH OF REINFORCEMENT BARS SHALL BE CALCULATED AS (e) FOLLOW WITH MAXIMUM ALLOWABLE LAPPING (p) OF 50% ONLY.

(IRC:112-2011) (CLAUSE:15.2.2.i)

LAP LENGTH	$l_s = a1 \cdot l_{bnet}$
	$a1 = 1.0$ FOR $p\% \leq 25\%$
	$a1 = 1.15$ FOR $25\% < p\% \leq 33\%$
	$a1 = 1.4$ FOR $33\% < p\% < 50\%$

IN THE CASE OF BUNDLED BARS  
LAP LENGTH =  $1.3 \times l_s$  (CLAUSE:15.2.7.3)  
(IRC:112-2011) (CLAUSE:15.2.3.3)  
DEVELOPMENT LENGTH (l<sub>bnet</sub>) OR L<sub>d</sub> = 52D (D=DIA OF BAR)  
FOR M35, 48D FOR M40 & M45 Fe 500D)

- BARS OF PIER SHAFT TO BE LEFT IN POSITION WHILE CASTING THE PILE CAP.

#### REINFORCEMENT SCHEDULE:

	BAR MKD.	DIA (mm)	SPACING/ Nos.	SHAPE	REMARKS
CIRCULAR PIER	1	32	48 NOS.		
	2	20	90 C/C		STRPS.
	3	25	26 NOS.		
	3a	25	26 NOS.		
PIER CAP	3b	25	12 NOS.		
	4	16	26 NOS.		
	5	12	2L-150 C/C		STRPS.
	5a	16	2L-150 C/C		STRPS.
	6	10	6L-100 C/C		STRPS.
	6a	10	6L-100 C/C		STRPS.
	6b	12	6L-100 C/C		STRPS.
	6c	12	6L-100 C/C		STRPS.
	7	12	150 C/C		BOTH FACES
	7c	12	150 C/C		BOTH FACES
	8	10	2L-100 C/C		STRPS.
	8a	12	2L-100 C/C		STRPS.

#### CLIENT:

NATIONAL HIGHWAYS INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.  
(10th FLOOR, PITI BUILDING, 4 PARLIAMENT STREET, NEW DELHI-110001)

#### AUTHORITY ENGINEER:

VOYANTS SOLUTIONS PVT. LTD.  
403, 4TH FLOOR, BPTP PARK CENTRA, BLOCK A, JAL VAYU VIHAR SECTOR 30 GURGOAN, HARYANA-122001

#### CONTRACTOR:

GANNON DUNKERLEY & CO. LTD  
86A, TOPSIA ROAD (SOUTH) HAUTE STREET, 7th FLOOR KOLKATA-700046

#### SAFTY CONSULTANT:

G-ENG ADVISORY SERVICES PVT. LTD.  
8/10-102, HUDA SHOPPING CENTRE, SECTOR-56 GURGOAN-122002, HARYANA.  
TEL: +91-124-4255800, 4255803  
EMAIL: INFO@G-ENG.IN, WEB: WWW.G-ENG.IN

#### DESIGN CONSULTANT:

ECSTATIC ENGINEERING CONSULTANTS PRIVATE LIMITED  
SCO 103 HUDA SHOPPING CENTRE, GURGOAN, SECTOR-55, GURGOAN, HARYANA 122001

#### PROOF CONSULTANT:

MARC TECHNOCRATS PVT. LTD.  
Marc House, Sector-67 (Dividing Road), Opposite Devi Lal Park, Bahadurgarh, Haryana 124507

APPROVED BY: U.S

CHECKED BY: N.S

DESIGNED BY: AR

DRAWN BY: AKS

SCALE: AS SHOWN

DATE: JANUARY, 2020

PROJECT:

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

TITLE:

REINFORCEMENT DETAILS OF PIER & PIER CAP FOR PIER OF MJB AT CH. 616+938

DWG NO:

J-D/STR/MJB/CH-616+938/SUB-202

SHEET NO.

1 OF 2

REV.

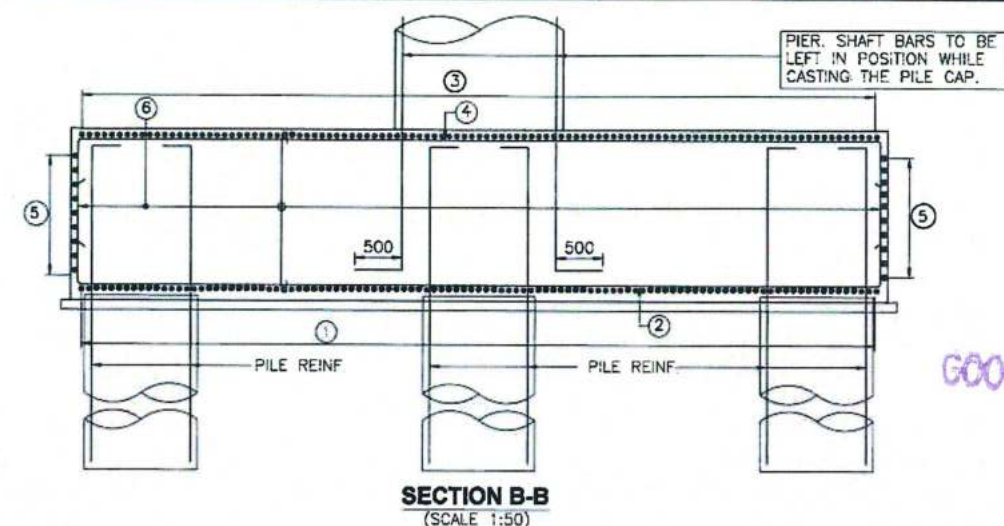
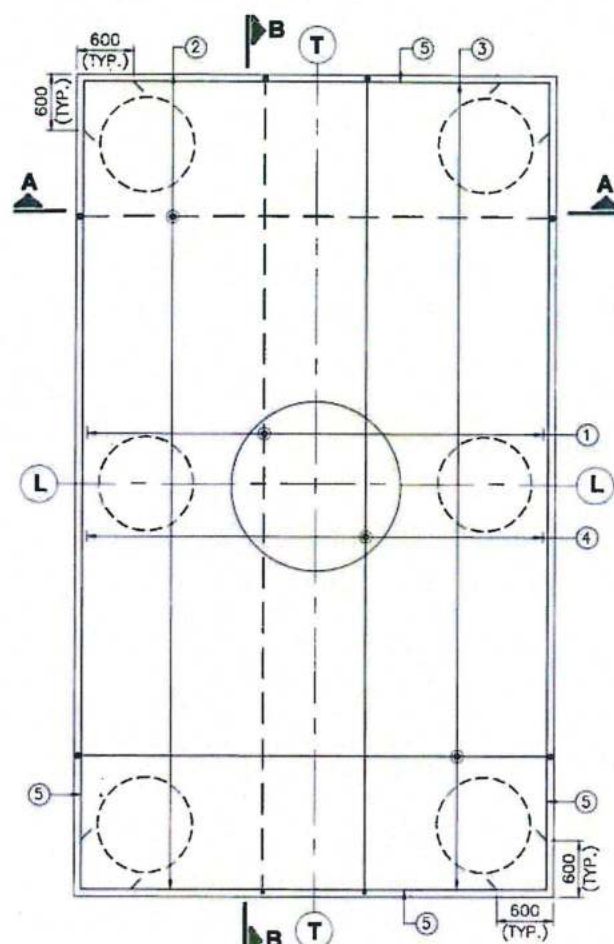
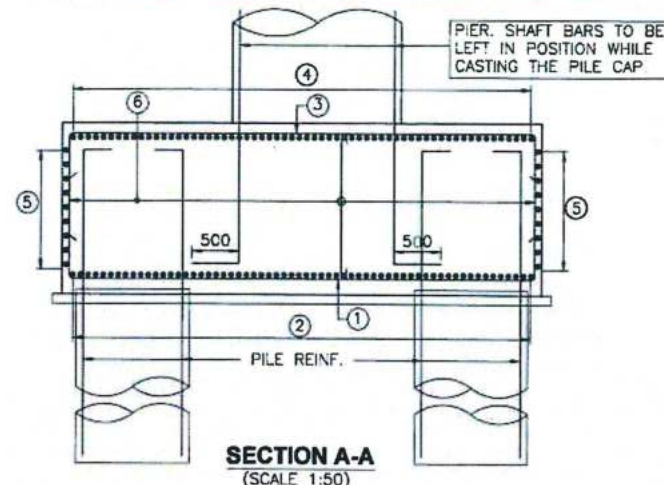
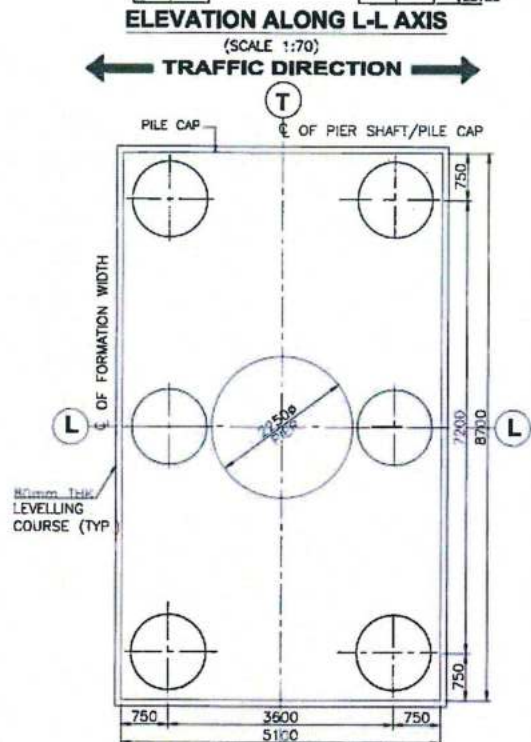
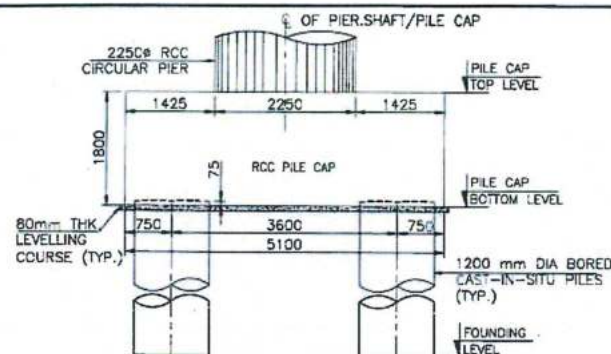
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25.01.2020 R0 ISSUE FOR APPROVAL

DATE REV DESCRIPTION OF REVISIONS

BY





GOOD FOR CONSTRUCTION

#### REINFORCEMENT SCHEDULE:

BAR MKD.	DIA (mm)	SPACING/Nos.	SHAPE	REMARKS
1	20	80 C/C		
2	25	80 C/C		
3	12	80 C/C		
4	16	80 C/C		
5	12	150 C/C		
6	10	LONGITUDINAL DIRECTION @160 C/C TRANSVERSE DIRECTION @160 C/C		

#### NOTES:-

- ALL DIMENSIONS ARE IN mm, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS AND NUMBER IF BARS ARE TO BE FOLLOWED.
- CONCRETE SHALL BE DESIGN MIX AND SHALL HAVE MINIMUM 28 DAYS CHARACTERISTIC STRENGTH ON 150mm CUBES AS 35 MPa FOR PILES & PILE CAPS.
- THE REINFORCEMENT STEEL SHALL BE HIGH YIELD STRENGTH DEFORMED BARS OF GRADE DESIGNATION Fe-500D CONFORMING TO IS:1786.
- CLEAR COVER TO OUTERMOST STEEL SHALL BE AS 75mm.
- ACTUAL LOAD TEST SHALL BE CARRIED OUT ON A TEST PILE AS PER STANDARD SPECIFICATIONS TO DETERMINE SAFE VERTICAL AND LATERAL CAPACITY OF PILE. IT SHALL HOWEVER BE ENSURED THAT IT IS NOT LESS THAN DESIGN WORKING LOAD.
- LAPPING OF REINFORCEMENT SHALL BE AVOIDED AS FAR AS POSSIBLE. IN CASE LAPPING OF BARS BECOMES UNAVOIDABLE, MINIMUM LAP LENGTH OF REINFORCEMENT BARS SHALL BE CALCULATED AS (e) FOLLOW WITH MAXIMUM ALLOWABLE LAPPING (p) OF 50% ONLY.

(IRC:112-2011) (CLAUSE:15.2.2.1)	LAP LENGTH	Is =	a1.1bn
		a1 =	1.0 FOR p% ≤ 25%
		a1 =	1.15 FOR 25% < p% ≤ 33%
		a1 =	1.4 FOR

33% < p% < 50%

- IN THE CASE OF BUNDLED BARS  
LAP LENGTH = 1.3x Is (CLAUSE:15.2.7.3)  
(IRC:112-2011) (CLAUSE:15.2.3.3)  
DEVELOPMENT LENGTH (l<sub>bn</sub>) OR L<sub>d</sub> = 52D (D=DIA OF BAR)  
FOR M35, 48D FOR M40 & M45 Fe 500D
- SPIRAL BINDERS SHALL BE LAPPED ONE AND HALF TURN.
  - BARS OF ABUTMENT SHAFT TO BE LEFT IN POSITION WHILE CASTING THE PILE CAP.

#### LEGENDS

---	BAR ON TOP/EARTH FACE
---	BAR ON BOTTOM/OTHER FACE
B/F	BOTH FACE

CLIENT:		CONTRACTOR:		DESIGN CONSULTANT:		APPROVED BY:		PROJECT:	
NATIONAL HIGHWAYS INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. (3RD FLOOR, P.T. BUILDING, 4 PARLIAMENT STREET, NEW DELHI-110001)		GANNON DUNKERLEY & CO. LTD 85A, TOPSIA ROAD (SOUTH) HAUTE STREET, 7th FLOOR KOLKATA-700048		ECSTATIC ENGINEERING CONSULTANTS PRIVATE LIMITED SCO IN HUDA SHOPPING CENTRE, GURGOAN, SECTOR 55, GURU GRAM, HARYANA 122011		U.S		FOUR LANE OF JHANJIHI TO DEMOW SECTION OF NH-37 FROM EXISTING CH. K 491+050 TO KM 535+250 (DESIGN CH. KM 490+800 TO KM 534+800) IN THE STATE OF ASSAM UNDER EPC MODE.	
AUTHORITY ENGINEER:		SAFETY CONSULTANT:		PROOF CONSULTANT:		CHECKED BY:		TITLE:	
VOYANT'S SOLUTIONS PVT. LTD. 403, 4TH FLOOR, BPTP PARK CENTRA, BLOCK A, JAL VAYU VIHAR SECTOR 30 GURGOAN, HARYANA 122001		G-ENG ADVISORY SERVICES PVT. LTD. SCO-102, HUDA SHOPPING CENTER, SECTOR-55 GURGOAN-122052, HARYANA TEL: +91-124-225502, 4285857, 4285858 EMAIL: INFO@G-ENG.NEWS@G-ENG.NEWS		MARC TECH CONSULTANTS PVT. LTD. Marc House, Sector-57 (Dividing Road), opposite Devi Lal Park, Bahadurgarh, Haryana 124507		N.S		DIMENSION & REINFORCEMENT DETAILS OF PILE CAP FOR PIER OF MJB AT CH. 516+938	
DATE		DATE		DATE		DESIGNED BY:		DRGNO:	
25.01.2020		25.01.2020		25.01.2020		AKS		J-D/STR/MJB/CH-516+938/SUB-201	
REV		REV		REV		SCALE:		SHEET NO.	
ISSUE FOR APPROVAL		ISSUE FOR APPROVAL		ISSUE FOR APPROVAL		AS SHOWN		1 OF 1	
DESCRIPTION OF REVISIONS		DESCRIPTION OF REVISIONS		DESCRIPTION OF REVISIONS		DATE:		REV.	
						JANUARY, 2020		R0	