

## PROJECT:-

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

# SUPERSTRUCTURE AT CH. 516+938 (27.490m PSC GIRDER)

GOOD FOR CONSTRUCTION

### CLIENT:



NATIONAL HIGHWAYS INFRASTRUCTURE  
DEVELOPMENT CORPORATION LTD.  
(3RD FLOOR, PTI BUILDING, 4 PARLIAMENT  
STREET, NEW DELHI-110001)

### CONTRACTOR



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

### DESIGN CONSULTANT



ECSTATIC ENGINEERING CONSULTANTS  
PRIVATE LIMITED  
SCO 103 HUDA SHOPPING CENTRE,  
GURGOAN, SECTOR 55, GURUGRAM,  
HARYANA 122003

### AUTHORITY ENGINEER



VOYANTS SOLUTIONS PVT. LTD.  
403, 4TH FLOOR, BPTP PARK CENTRA,  
BLOCK A JAL VAYU VIHAR SECTOR 30 GURGOAN,  
HARYANA 122004

### SAFTY CONSULTANT:



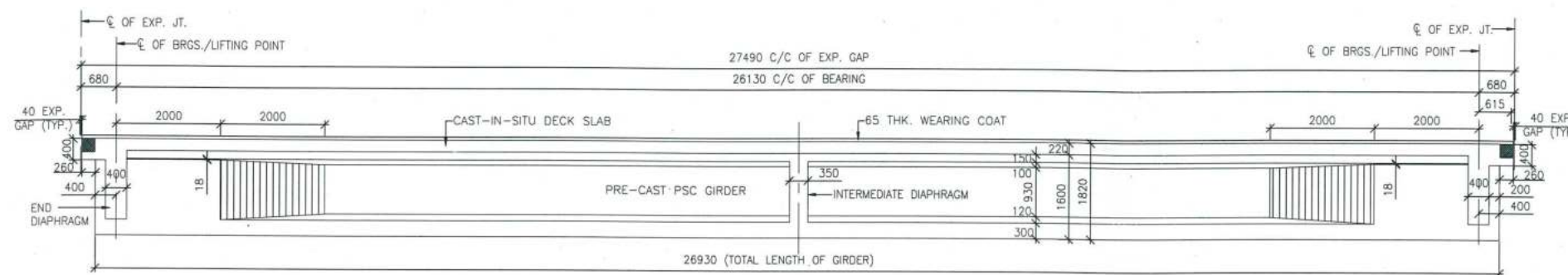
G-ENG ADVISORY SERVICES PVT. LTD.  
SCO-102, HUDA SHOPPING CENTER,  
SECTOR-56 GURGAON-122002, HARYANA.  
TEL:- +91-124-4295802, 4295803  
EMAIL:INFO@G-ENG.IN WEB:WWW.G-ENG.IN

### PROOF CONSULTANT:

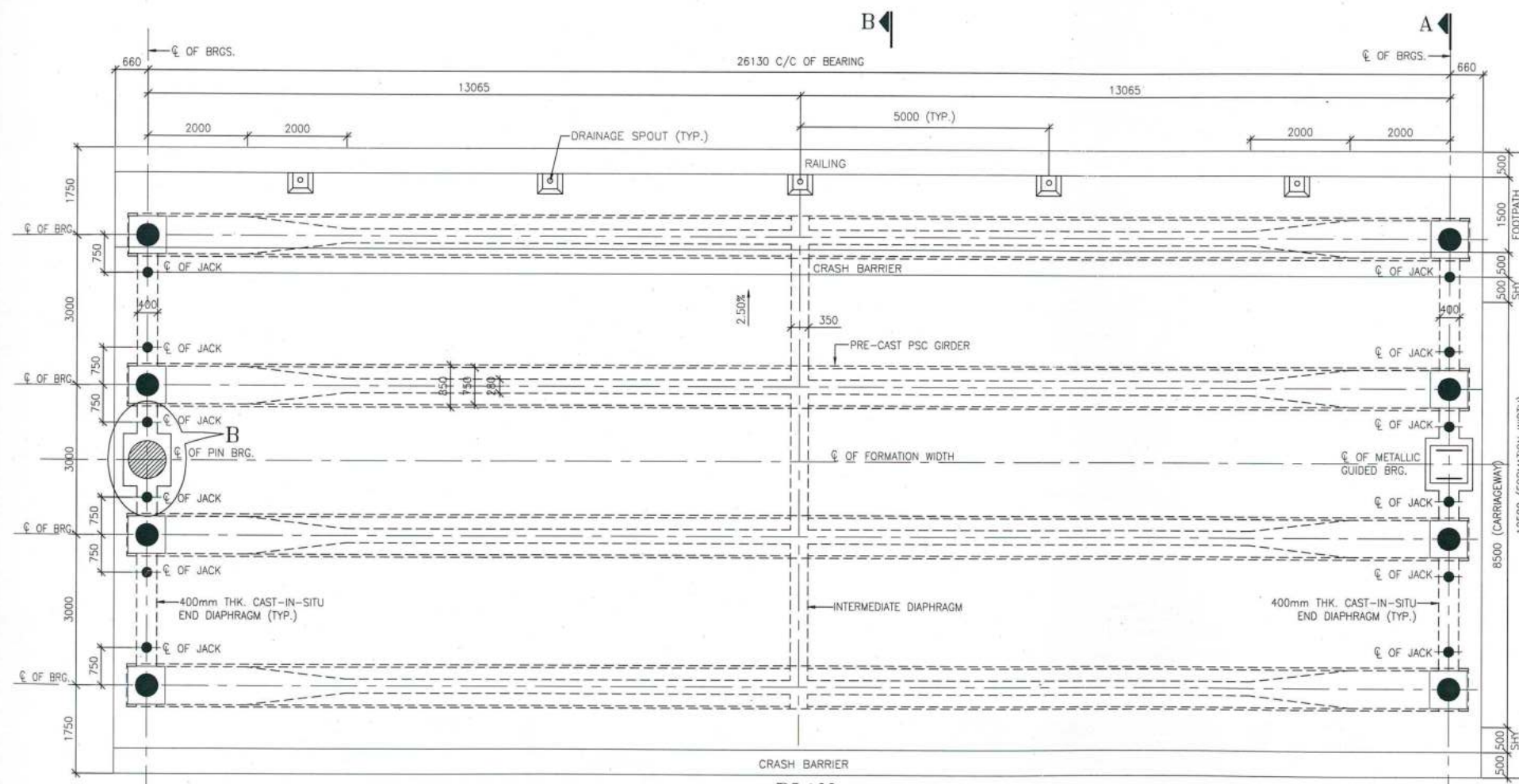


MARC TECHNOCRATS PVT. LTD.  
MARC HOUSE, SECTOR-6-7 (DIVIDING ROAD),  
OPPOSITE DEVI LAL PARK, BAHADURGARH,  
HARYANA 124507





**SECTIONAL ELEVATION**  
(SCALE 1:75)



**PLAN**  
(SCALE 1:75)

# **NOTES:-**

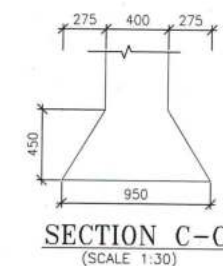
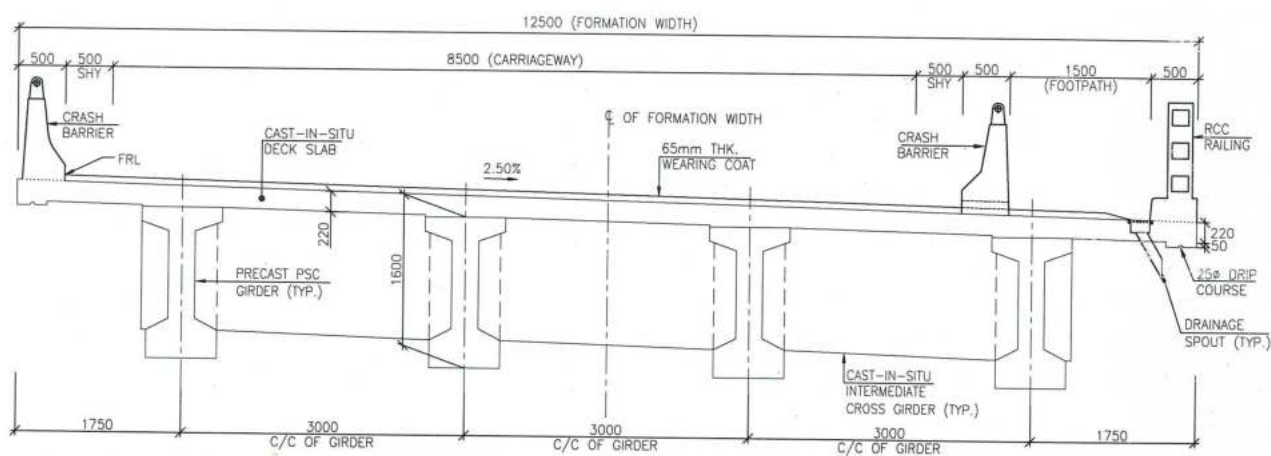
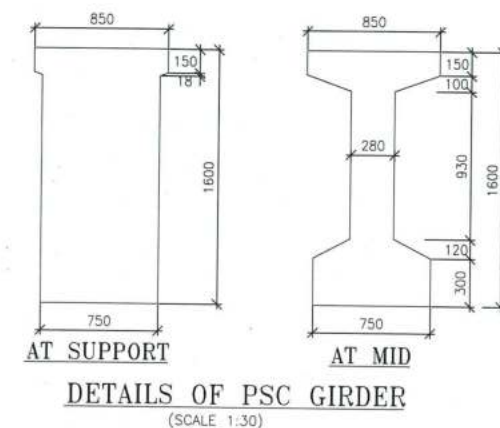
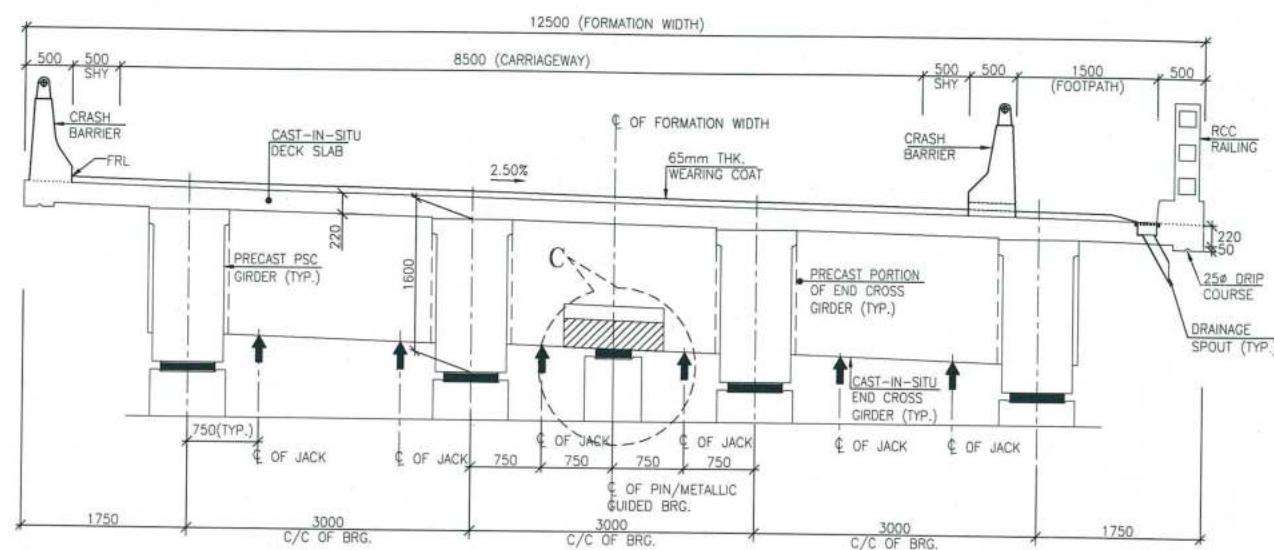
1. ALL DIMENSIONS ARE IN mm. UNLESS OTHERWISE MENTIONED.
2. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED AND NO DIMENSION SHALL BE SCALED.
3. THE PROPOSED FLYOVER IS DESIGNED FOR THE LIVE LOAD COMBINATIONS GIVEN IN IRC 6:2014. THE GOVERNING COMBINATION SHALL BE CONSIDERED FOR DESIGN.
4. CONCRETE SHALL BE DESIGN MIX AND HAVE MINIMUM 28 DAYS CHARACTERISTIC STRENGTH ON 150mm CUBES:-  
FOR PRECAST PSC GIRDER - 50MPa  
FOR CAST-IN-SITU DECK SLAB - 40MPa  
FOR END & INTERMEDIATE CROSS GIRDER - 40MPa
5. THE REINFORCING STEEL SHALL BE OF HYSD BARS (GRADE DESIGNATION Fe 500D) CONFORMING TO IS:1786.
6. CLEAR COVER TO OUTERMOST STEEL IS 50mm.
7. DURING JACKING OPERATION, JACKS PLACED UNDER ONE END CROSS-GIRDERS SHALL BE OPERATED SIMULTANEOUSLY USING STRESS CONTROL SYSTEM SO AS TO ENSURE THAT THE REACTION ON ALL THE JACKS IS EQUAL AT ALL TIMES.
8. CABLES CONSISTING OF 19 Nos. 12.7mm. DIA. 7 PLY CLASS II STRANDS. AS PER IS:14268 SHALL BE USED FOR PRESTRESSING.
9. BEAM SHALL BE KEPT UPRIGHT AT ALL TIMES AND TO BE CLEARLY MARKED INDICATING SPAN, LOCATION, AND RESPECTIVE ENDS BEFORE REMOVAL FROM THE CASTING BED.
10. TOP SURFACE OF GIRDER SHALL BE ROUGHED FOR EFFECTIVE BONDING.
11. ALL THE LENGTHS OF GIRDER & LAYOUT SHALL BE VERIFIED AT SITE BEFORE EXECUTION & ANY DISCREPANCIES MUST BE BROUGHT TO THE NOTICE OF THE CONSULTANT.
12. FOR LIFTING OF THE SUPERSTRUCTURE 6 Nos. JACKS AT EACH SIDE OF SPAN SHALL BE USED AS SHOWN IN PLAN. THE CAPACITY OF EACH JACK SHALL BE 150 TON.

## **REFERENCE DRAWINGS:-**

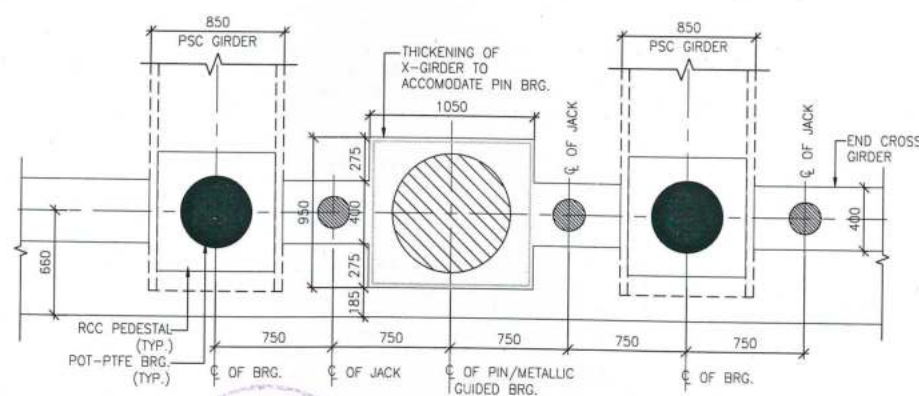
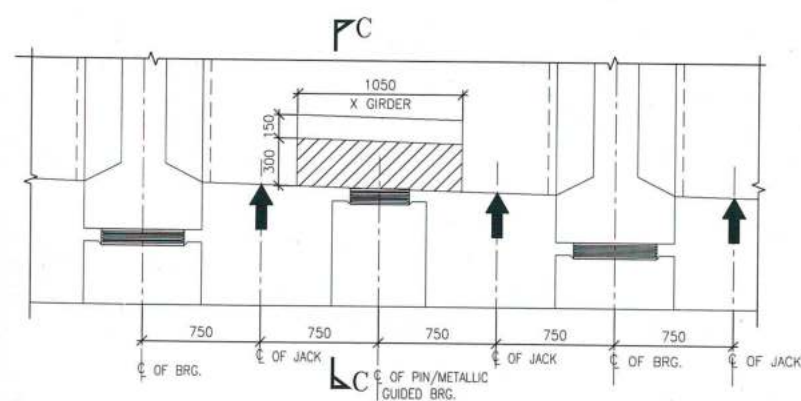
GOOD FOR CONSTRUCTION

			CLIENT:			CONTRACTOR:			DESIGN CONSULTANT:			APPROVED BY:			PROJECT:		
			NATIONAL HIGHWAYS INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. (3RD FLOOR, P.T.I. BUILDING, 4 PARLIAMENT STREET, NEW DELHI-110001)			GANNON DUNKERLEY & CO. LTD. 86A, TOPSIA ROAD (SOUTH) HAUTE STREET, 7th FLOOR KOLKATA-700046			ECSTATIC ENGINEERING CONSULTANTS PRIVATE LIMITED SCO 103 HUDA SHOPPING CENTRE, GURGOAN, SECTOR-55, GURUGRAM, HARYANA-122005			U.K.			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.		
			AUTHORITY ENGINEER:			SAFETY CONSULTANT:			PROOF CONSULTANT:			CHECKED BY:			TITLE:		
			VOYANTS SOLUTIONS PVT. LTD. 203, 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-56 GURGOAN-122002, HARYANA. TEL: +91-122-4295902, 4295903 EMAIL: INFO@G-ENG.IN, WEB: WWW.G-ENG.IN			MARC TECHNOCRATS PVT. LTD. MARC HOUSE, SECTOR-6-7 (DIVIDING ROAD), OPPOSITE DEVI LAL PARK, BAHADURGARH, HARYANA 124507			N.S.			DIMENSION DETAILS OF PRECAST PSC GIRDER & CAST-IN-SITU SLAB SUPERSTRUCTURE AT CH. 516+938		
			DATE			DATE			DATE			DESIGNED BY:			DRG NO:		
			27.02.2020			27.02.2020			27.02.2020			S.B.			EEC-NH-37-JD-SUP-CH.516+938-301		
			20.01.2020									S.S.			SHEET NO.		
			ISSUED FOR APPROVAL									AS SHOWN			01 OF 02		
			DESCRIPTION OF REVISIONS												REV.		
			BY												R1		



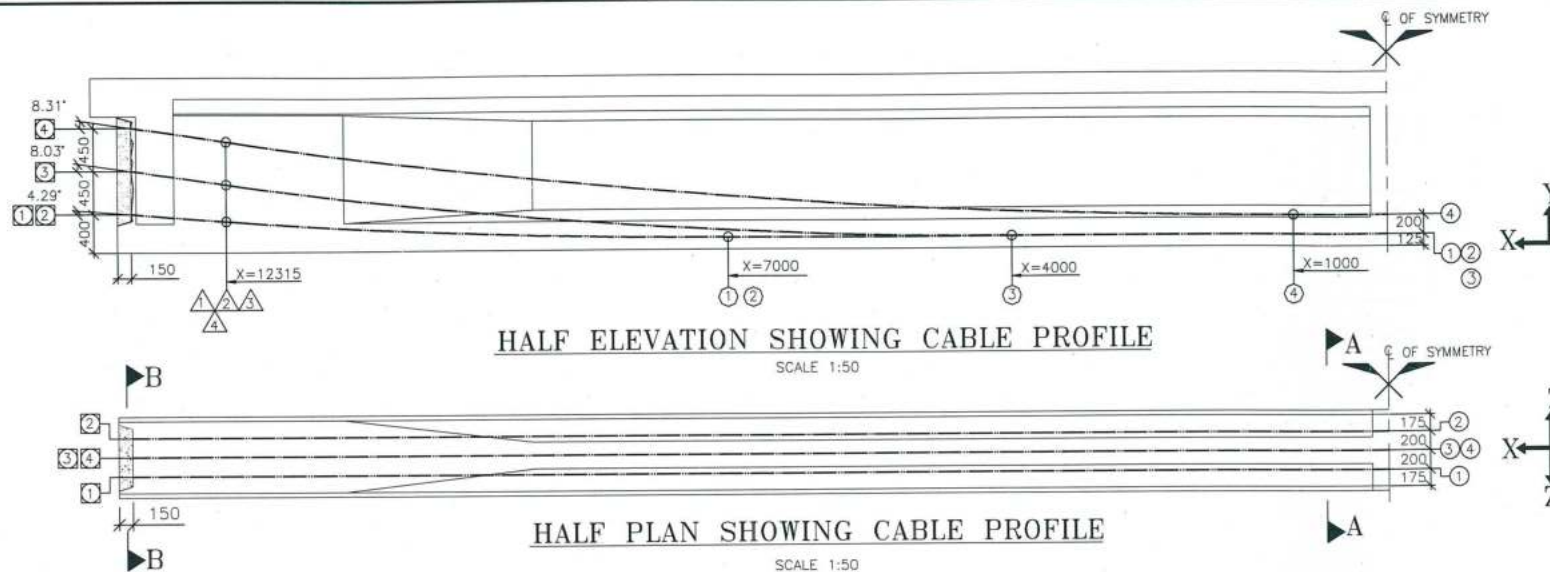


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GOOD FOR CONSTRUCTION

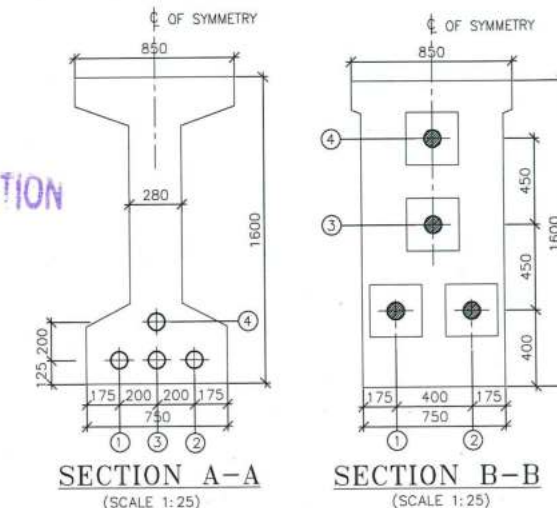
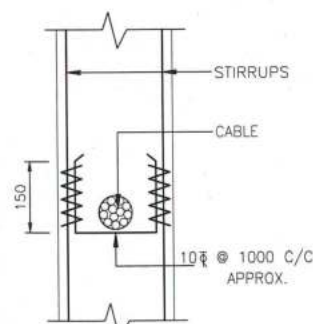


TABLE - I (CABLE CO - ORDINATES)

CABLE No.	0.00		1000		2000		3000		4000		5000		6000		7000		8000		9000		10000		11000		12315		13315	
	Y	Z	Y	Z	Y	Z	Y	Z	Y	Z	Y	Z	Y	Z	Y	Z	Y	Z	Y	Z	Y	Z	Y	Z	Y	Z	Y	Z
1	125	200	125	200	125	200	125	200	125	200	125	200	125	200	125	200	132	200	153	200	189	200	238	200	325	200	400	200
2	125	200	125	200	125	200	125	200	125	200	125	200	125	200	125	200	132	200	153	200	189	200	238	200	325	200	400	200
3	125	0	125	0	125	0	125	0	125	0	133	0	159	0	201	0	260	0	336	0	429	0	539	0	709	0	850	0
4	325	0	325	0	331	0	351	0	383	0	429	0	487	0	558	0	642	0	739	0	849	0	972	0	1154	0	1300	0

TABLE II -

CABLE NO.	THEORETICAL ELONGATION AT EACH END $\Delta_0$ (mm)	EMERGENCE ANGLE OF CABLE ( $\theta$ )	NO. OF STRANDS	JACKING FORCE (Tonne)	SEQUENCE OF STRESSING	EMERGENCY STRANDS	TOTAL LENGTH OF CABLE
1	104.331	4.29°	14	200.737	2	-	28.646
2	104.331	4.29°	14	200.737	2	-	28.646
3	104.002	8.03°	19	272.428	1	-	28.704
4	104.335	8.31°	10	143.383	3	3	28.732



TYPICAL DETAIL OF SUPPORTING ARRANGEMENT FOR CABLES

LEGENDS:

	INDICATES END OF CURVE IN ELEVATION
	INDICATES START OF CURVE IN ELEVATION
	INDICATES START/END OF CABLE
	INDICATES CABLE NUMBER
	INDICATES END OF CURVE IN PLAN

NOTES :-

- ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.
- THE PRESTRESSING TENDONS FOR PRESTRESSED CONCRETE SHALL BE 19 NOS. OF 12.7mm DIA 7-PLY CLASS 2 STRANDS AS PER IS:14268-1995, UNLESS OTHERWISE SPECIFIED IN THE DRAWING.
- THE FOLLOWING PROPERTIES HAVE BEEN ASSUMED IN DESIGN.
  - NOMINAL SIZE - 12.7mm DIA 7-PLY LOW RELAXATION STRANDS CONFORMING TO CLASS 2 OF IS:14268-1995
  - AREA - 98.7 sq.mm PER STRANDS
  - ULTIMATE LOAD - 183.7 KN PER STRANDS
  - MODULUS OF ELASTICITY -  $1.95 \times 10^5$  MPa
  - WOBBLE COEFFICIENT - 0.002
  - FRICTION COEFFICIENT - 0.17/radian
  - ANCHORAGE SLIP - 6mm (Average)
- THE PRESTRESSING STEEL AND ACCESSORIES SHALL BE SUBJECTED TO AN ACCEPTANCE TEST PRIOR TO THEIR ACTUAL USE ON THE WORKS (GUIDANCE MAY BE TAKEN FROM BS:4447). ONLY MULTISTRAND JACK SHALL BE USED FOR TENSIONING OF CABLES. DIRECT AND INDIRECT FORCE MEASUREMENT DEVICE (e.g. PRESSURE GAUGE) SHALL BE ATTACHED IN CONSULTATION WITH SYSTEM MANUFACTURER.
- SHEATHING SHALL BE OF 90mm ID HDPE. IT SHALL BE TESTED AS PER APPENDIX 1833/1 OF MOST SPECIFICATION FOR ROAD & BRIDGE WORK. THE JOINTS OF ALL SHEATHING SHALL BE WATERTIGHT AND CONFORM TO SECTION 13 OF IRC:112-2011.
- CONSTRUCTION SEQUENCE
 

DAY	ACTIVITY
14	STRESSING OF 1ST STAGE CABLE NO. 3 FROM BOTH ENDS UPTO 100%.
21	STRESSING OF 2ND STAGE CABLE NO. 1, 2 & 4 FROM BOTH ENDS. CABLE NO.1 SHALL BE STRESSED FIRST UPTO 50% OF JACKING FORCE. THEN CABLE NO.2 SHALL BE STRESSED FIRST UPTO 50% OF JACKING FORCE. THEREAFTER CABLE NOS. 1 & 2 SHALL BE STRESSED UPTO 100% OF JACKING FACES. CABLE NO. 4 SHALL BE STRESSED UPTO 100% OF JACKING FORCE.
28	CASTING OF CROSS GIRDERS AND DECK SLAB.
45	INSTALLATION OF EXPANSION JOINT AND CASTING/LAYING OF WEARING COAT AND CRASH BARRIER.

STRESSING OF 1ST STAGE CABLES CAN BE DONE ON CONCRETE ACHIEVING A STRENGTH OF 45 MPa OR AFTER 14 DAYS WHICHEVER IS LATER.

STRESSING OF 2ND STAGE CABLES CAN BE DONE ON CONCRETE ACHIEVING A STRENGTH OF 50 MPa OR AFTER 21 DAYS WHICHEVER IS LATER.

IN CASE OF EMERGENCY OR SHORTFALL THE REMAINING STRANDS OF CABLE NO. 4 MAY BE STRESSED.

- MINIMUM STRENGTH OF CONCRETE AT THE TIME OF TENSIONING OF STAGE II CABLES SHALL BE 50 MPa.
- GROUTING OF CABLES SHALL BE CARRIED OUT AS PER GUIDELINES IN IRC:112-2011.
- THE LENGTH OF TENDONS SHOWN IN THE TABLE ARE ALONG THEIR PROFILE BETWEEN ANCHORAGES. THE LENGTH INCLUDES GRIPPING LENGTH (600mm) & EXTRA LENGTH (400mm) APPROX. REQUIRED FOR CUTTING.
- ANY SUITABLE MULTISTRAND JACK CAPABLE OF STRESSING TO ATLEAST 10% HIGHER THAN THE REQUIRED JACKING FORCE SHALL BE USED FOR STRESSING OF CABLES.
- END FACES OF RECESSES IN THE PSC GIRDER TO BE COATED WITH TWO COATS OF EPOXY.
- ANCHORAGE RECESSES TO BE SEALED WITH PREPACKED NON SHRINK EPOXY MORTAR.
- IF ACTUAL VALUES OF X-SECTIONAL AREA ( $A'$ ) AND/OR MODULUS OF ELASTICITY ( $E'$ ) OF HIGH TENSILE STRANDS ARE DIFFERENT FROM ASSUMED VALUES, THEORETICAL ELONGATION IS MODIFIED AS BELOW:
 
$$\Delta' = \Delta_0 \times A \times E / (A' \times E')$$
 WHERE  $\Delta_0$  IS THEORETICAL ELONGATION MENTIONED IN TABLE-II, A & E ARE VALUES ASSUMED IN DESIGN WHILE  $A'$  &  $E'$  ARE ACTUAL VALUES OF THE STEEL USED.
- THE WORK OF PRESTRESSING SHALL BE CARRIED OUT BY FRESSINET SYSTEM OR ANY OTHER RECOGNIZED SYSTEM AFTER CARRYING OUT NECESSARY MODIFICATION IN THE DRAWING WITH THE APPROVAL OF ENGINEER-IN-CHARGE. ALL PRESTRESSING AND GROUTING WORK BE UNDERTAKEN BY TRAINED PERSONNEL ONLY. A REPRESENTATIVE OF THE SUPPLIER OF THE PRESTRESSING SYSTEM SHALL BE PRESENT DURING ALL TENSIONING AND GROUTING OPERATIONS AND SHALL ENSURE, MONITOR AND CERTIFY THEIR CORRECTNESS.
- EXTENSIONS SHALL BE RECHECKED AT 24 HOURS AFTER ANCHORING TO OBSERVE SLOW SLIPPAGE. IN CASE OF EXCESSIVE SLIPPAGE THE MATTER SHALL BE REPORTED TO THE ENGINEER-IN-CHARGE.
- INITIAL SLACKNESS IN CABLES SHALL BE REMOVED BY APPLYING SMALL TENSION. THE INITIAL TENSION REQUIRED TO REMOVE SLACKNESS SHALL BE TAKEN AS THE STARTING POINT FOR MEASURING ELONGATION AND CORRECTION SHALL BE APPLIED AS PER CL. 12.2.1.3 OF IS:1343-1980.
- GROUTING OF CABLES SHALL BE DONE IN SAME SEQUENCE AS STRESSING AND SHALL CONFIRM TO TECHNICAL SPECIFICATIONS. ANCHORAGE POCKET SHALL BE FILLED WITH EPOXY MORTAR AFTER STRESSING & GROUTING.

SPECIAL NOTES FOR PRESTRESSING:-

- FOR A PROVEN AND EFFECTIVE PRESTRESSING SYSTEM THE REQUIRED EXTENSIONS SHOULD NORMALLY BE ACHIEVED AT THE SPECIFIED FORCES AT STRESSING ENDS. HOWEVER, IN CASE THE REQUIRED EXTENSIONS ARE NOT ACHIEVED AT THE SPECIFIED JACKING FORCES THEN THE FOLLOWING MEASURES MAY BE TAKEN:
  - STRESSING SHOULD BE CONTINUED (WHERE POSSIBLE) TILL THE REQUIRED EXTENSIONS ARE OBTAINED SUBJECT TO THAT THE JACKING FORCES ARE NOT EXCEEDING 78.3% OF THE ULTIMATE TENSILE FORCE VALUES OF THE TENDONS.
  - SHOULD THE REQUIRED EXTENSIONS BE OBTAINED AT JACKING END FORCES LOWER THAN THE SPECIFIED VALUES THEN THE STRESSING SHOULD BE CONTINUED TILL THE SPECIFIED STRESSING-END FORCES ARE REACHED, PROVIDED THE ADDITIONAL EXTENSIONS ARE NOT MORE THAN ABOUT 5% OF THE SPECIFIED EXTENSIONS.
  - TENDONS SATISFYING THESE PROVISIONS SHOULD BE LOCKED (I.E. ANCHORED).
  - IF THE STRESSING END FORCES IN TENDONS ARE STILL LOWER THAN THE SPECIFIED VALUES DESPITE THE 5% INCREASE IN THE SPECIFIED EXTENSIONS, THEN THE PARTICULARS OF SUCH TENDONS SHOULD BE REPORTED TO THE DESIGNER FOR FURTHER INSTRUCTIONS ('LOCKING' BUT NOT 'GROUTING' THESE TENDONS TILL RECEIPT OF INSTRUCTIONS).
- ALL TENDONS WHICH SATISFY THE PROVISIONS OF ITEMS (A) (EXCEPT IV) ABOVE SHOULD BE GROUTED IMMEDIATELY, TAKING CARE THAT THE TENDONS NOT YET STRESSED ARE NOT ACCIDENTALLY BLOCKED DUE TO GROUT LEAK.
- THE PRESTRESSING JACKS AND THEIR GAUGES SHOULD BE REGULARLY CALIBRATED FOR CORRECTNESS AND REMOVAL OF ZERO-ERROR.
- 6mm SLIP AT ANCHORAGE IS CONSIDERED IN DESIGN.

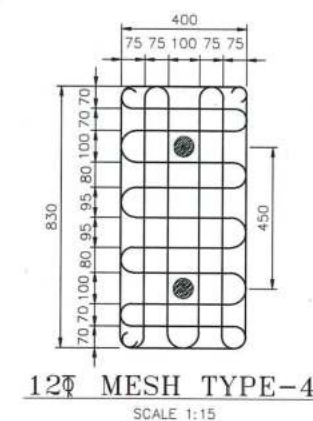
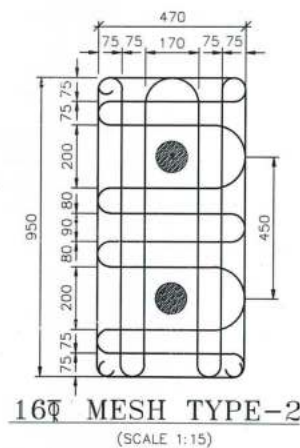
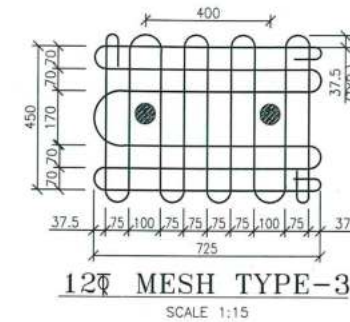
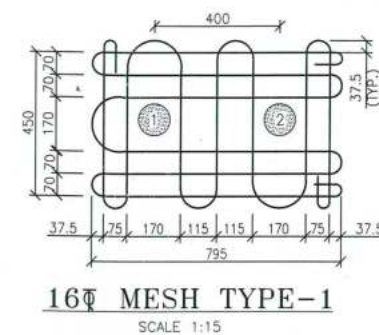
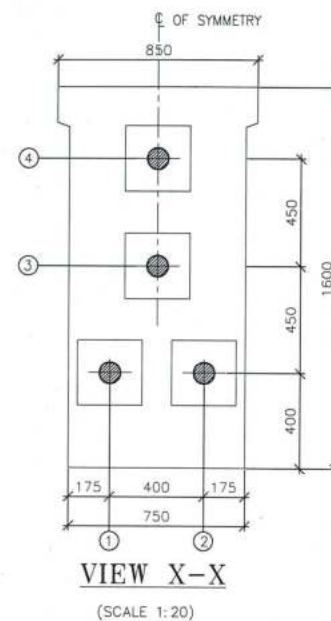
27.02.2020	R1	DIMENSIONS OF GIRDER MODIFIED	BY	DATE	REV	DESCRIPTION OF REVISIONS
20.01.2020	R0	ISSUED FOR APPROVAL				

CLIENT:	NATIONAL HIGHWAYS INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. (3RD FLOOR, P.T. BUILDING, 4 PARLIAMENT STREET, NEW DELHI-110001)
CONTRACTOR:	SHANNON DUNKERLEY & CO. LTD 86A TOPSIA ROAD (SOUTH) HAUTE STREET, 7TH FLOOR KOLKATA-700046
DESIGN CONSULTANT:	ECSTATIC ENGINEERING CONSULTANTS PRIVATE LIMITED SCO 103 HUDA SHOPPING CENTRE, GURGOAN, SECTOR 43, GURGRAM, HARYANA-122005
PROOF CONSULTANT:	MARC TECHNOCRATS PVT. LTD. MARC HOUSE, SECTOR 6-7 (DIVIDING ROAD), OPPOSITE DEVILAL PARK, BAHADURGARH, HARYANA-124507
SAFTY CONSULTANT:	G-ENG ADVISORY SERVICES PVT. LTD. SCO 103 HUDA SHOPPING CENTRE, SECTOR 43 GURGOAN-122002, HARYANA. TEL: 941124-4295802, 4295803. EMAIL: INFO@G-ENG.IN WEB: WWW.G-ENG.IN
AUTHORITY ENGINEER:	VOYANTS SOLUTIONS PVT. LTD. 403, 4TH FLOOR, BPTP PARK CENTRA, BLOCK A, JAL VAYU VIHAR SECTOR 30 GURGOAN, HARYANA-122001

APPROVED BY:	U.K
CHECKED BY:	N.S
DESIGNED BY:	S.B
DRAWN BY:	S.S
SCALE:	AS SHOWN
DATE:	JAN. 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:	DETAILS OF CABLE PROFILE FOR PRECAST PSC GIRDER AT CH. 516+938
DRG NO.:	EEC-NH-37-JD-SUP-CH.516+938-302
SHEET NO.	01 OF 01
REV.	R1





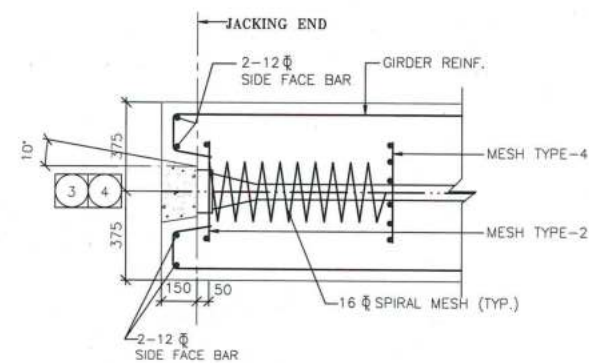
GOOD FOR CONSTRUCTION

1. ALL DIMENSIONS ARE IN mm, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED NO DIMENSIONS SHALL BE SCALED.
2. GRADE OF CONCRETE FOR SUPERSTRUCTURE SHALL BE **M50**.
3. PRESTRESSING CABLES 19 T 13 HAVING LOW RELAXATION STRANDS CONFORMING TO IS:14268.
4. THE REINFORCING STEEL SHALL BE OF TMT BARS (GRADE DESIGNATION Fe 500D) CONFORMING TO IS:1786.
5. THE WORK OF PRESTRESSING SHALL BE CARRIED OUT BY ANY RECOGNIZED SYSTEM AFTER CARRYING OUT NECESSARY MODIFICATION IN THE DRAWING WITH THE APPROVAL OF ENGINEER-IN- CHARGE. ALL PRESTRESSING AND GROUTING WORK BE UNDERTAKEN BY TRAINED PERSONNEL ONLY. A REPRESENTATIVE OF THE SUPPLIER OF THE PRESTRESSING SYSTEM SHALL BE PRESENT DURING ALL TENSIONING AND GROUTING OPERATIONS AND SHALL ENSURE, MONITOR AND THEIR CORRECTNESS.

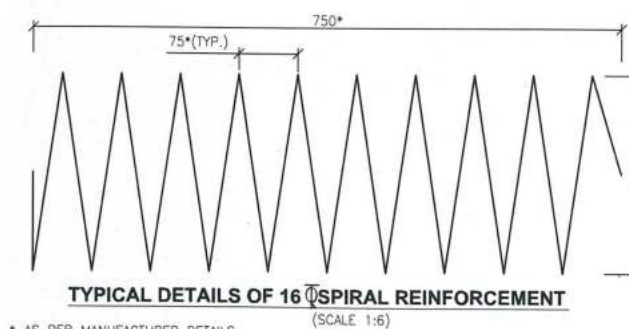
The diagram illustrates the reinforcement layout for a girder cross-section. Key features include:

- JACKING END:** Indicated at the top of the section.
- 12# SIDE FACE BAR:** Reinforcement bars located on the side face of the girder.
- MESH TYPE-1:** A specific type of reinforcement mesh used in the jacking end area.
- GIRDER REINF.:** General reinforcement for the girder.
- MESH TYPE-3:** Another type of reinforcement mesh used in the main body of the girder.
- 16 # SPIRAL MESH (TYP.):** Spiral reinforcement bars, typically 16 in diameter.
- Dimensions:**
  - 12# (top and bottom reinforcement bar size)
  - 175 (width of the side face bar area)
  - 400 (total width of the girder)
  - 150 (width of the mesh area)
  - 50 (thickness of the mesh)
- Detail:** A circular inset provides a close-up view of the mesh and spiral reinforcement.

PLAN AT A-A  
SCALE 1:20



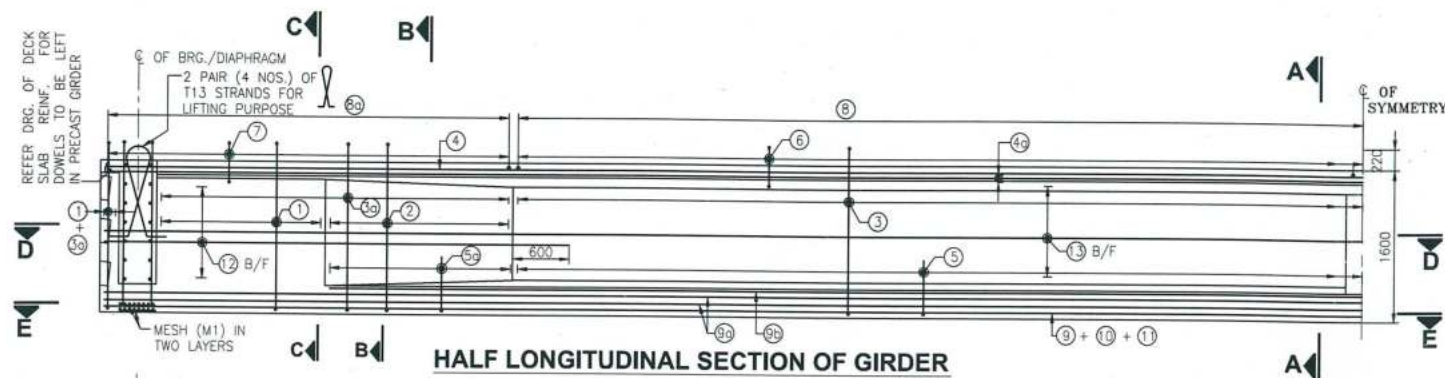
PLAN AT B-B  
SCALE 1:20



\* AS PER MANUFACTURER DETAILS

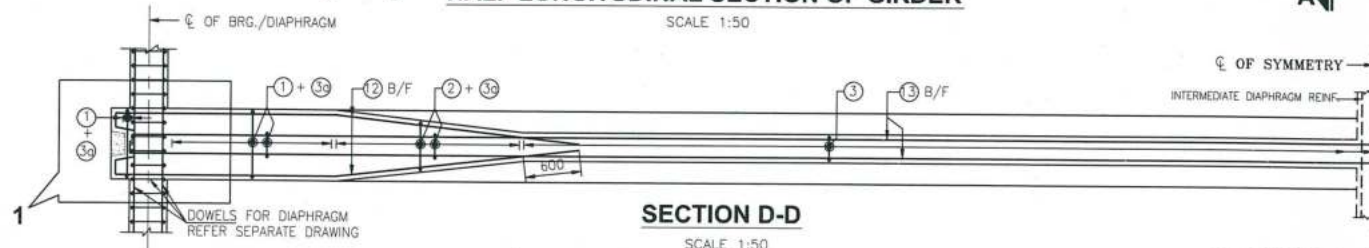
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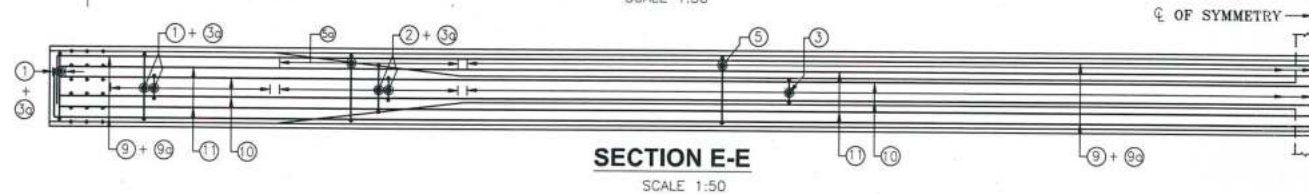
HALF LONGITUDINAL SECTION OF GIRDER

SCALE 1:50



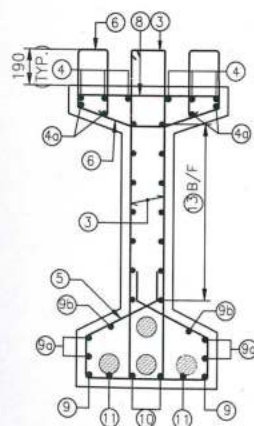
SECTION D-D

SCALE 1:50



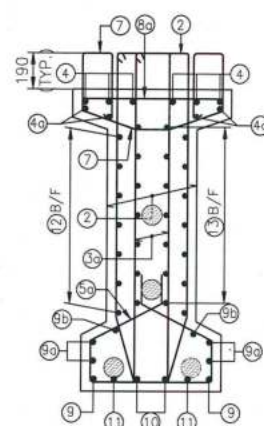
SECTION E-E

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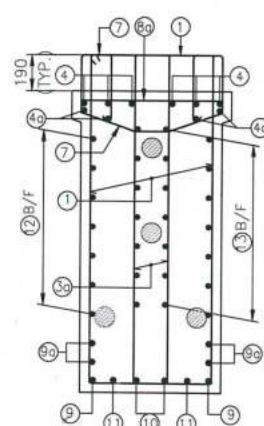
SECTION A-A

(SCALE 1:25)



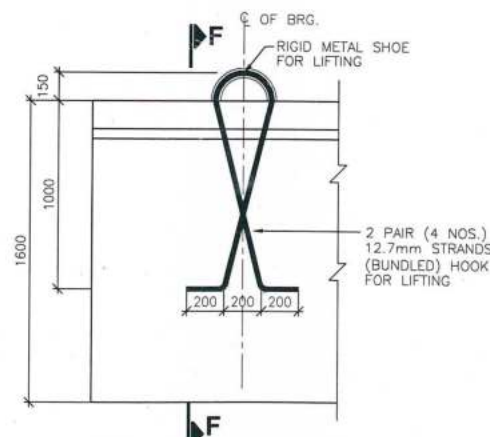
SECTION B-B

(SCALE 1:25)



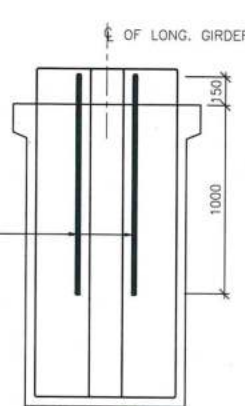
SECTION C-C

(SCALE 1:25)



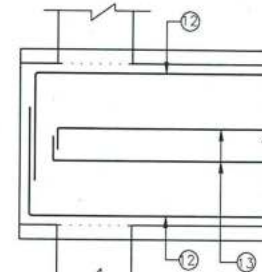
TYPICAL DETAIL OF LIFTING OF GIRDER AT EACH END OF THE GIRDER

(SCALE 1:25)



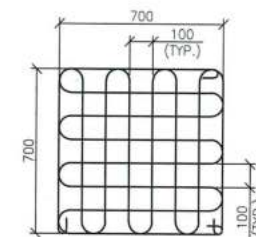
SECTION F-F

(SCALE 1:25)



DETAIL-1

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



80 MESH M1

(BEARING LOCATION)  
(SCALE 1:20)

## NOTES

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

## REINFORCEMENT DETAIL

BAR MKD.	BAR DIA.	No. OF BAR	SPACING c/c	SHAPE
1	10	-	2L-150 C/C	
2	10	-	2L-150 C/C	
3	10	-	2L-150 C/C	
3a	10	-	2L-150 C/C	
4	12	6	-	
4a	10	4	-	
5	10	-	150 C/C	
5a	10	-	150 C/C	
6	10	-	150 C/C	
7	10	-	150 C/C	
8	10	-	150 C/C	
8a	10	-	150 C/C	
9	12	2	-	
9a	10	2x2	-	
9b	10	2	-	
10	12	2	-	
11	12	2	-	
12	10	-	150 C/C	
13	10	-	150 C/C	

## LEGENDS:

STP. -----	STIRRUPS
B/F -----	BAR ON BOTH FACES
L.V. -----	LENGTH VARIES

GOOD FOR CONSTRUCTION

27.02.2020	R1	DIMENSIONS OF GIRDER MODIFIED	BY	DATE
20.01.2020	R0	ISSUED FOR APPROVAL	BY	DATE
DATE	REV	DESCRIPTION OF REVISIONS	BY	DATE

CLIENT:  
NATIONAL HIGHWAYS INFRASTRUCTURE  
DEVELOPMENT CORPORATION LTD.  
(3RD FLOOR, PTL BUILDING, 4 PARLIAMENT  
STREET, NEW DELHI-110001)

AUTHORITY ENGINEER:  
VOYANTS SOLUTIONS PVT. LTD.  
404, 4TH FLOOR, BPTP PARK CENTRA,  
BSPK 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.  
SCO-102, HUDA SHOPPING CENTER,  
SEC-68, GURGOAN-122002, HARYANA.  
TEL:- +91-124-4295802, 4295803  
EMAIL: INFO@G-ENG.IN WEB: WWW.G-ENG.IN

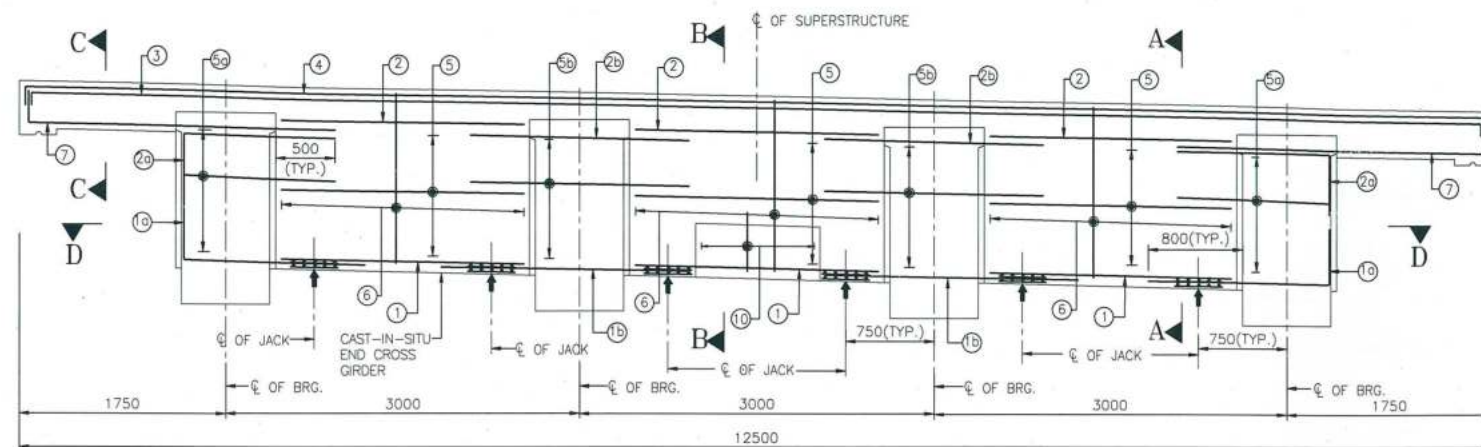
DESIGN CONSULTANT:  
ECSTATIC ENGINEERING CONSULTANTS  
PRIVATE LIMITED  
SCO-103 HUDA SHOPPING CENTRE,  
GURGOAN, SECTOR 55, GURUGRAM,  
HARYANA 122003

PROOF CONSULTANT:  
MARC TECHNOCRATS PVT. LTD.  
MARC HOUSE, SECTOR-67 (DIVIDING ROAD),  
OPPOSITE DENTAL PARK, BAHADURGARH,  
HARYANA 124507

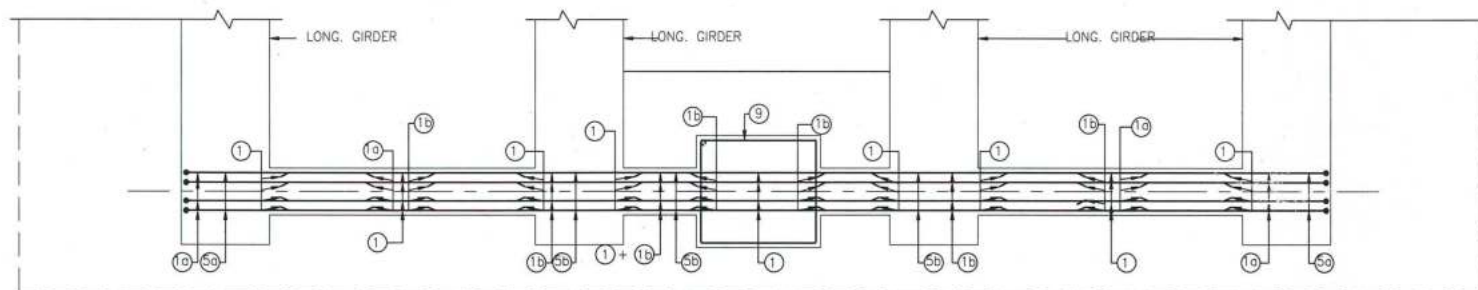
APPROVED BY: U.K.  
CHECKED BY: N.S.  
DESIGNED BY: S.B.  
DRAWN BY: S.S.  
SCALE: AS SHOWN  
DATE: JAN. 2020

PROJECT:  
FOUR LANING OF JHANJHI TO DEMOW SECTION OF  
NH-37 FROM EXISTING CH. K 491+050 TO KM 535+250  
(DESIGN CH. KM 490+800 TO KM 534+800) IN THE STATE  
OF ASSAM UNDER EPC MODE.  
TITLE:  
REINFORCEMENT DETAILS OF LONGITUDINAL  
GIRDER OF PSC GIRDER AT CH. 516+938  
DRG NO.:  
EEC-NH-37-JD-SUP-CH.516+938-304  
SHEET NO. 01 OF 01  
REV. R1

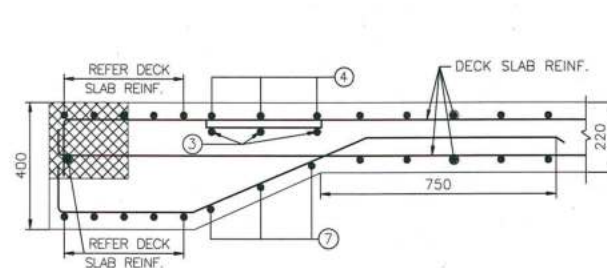




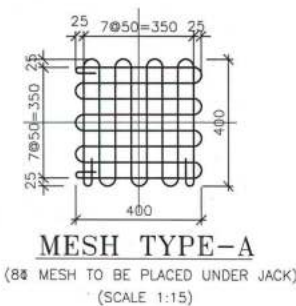
LONGITUDINAL SECTION OF END CROSS GIRDER  
(SCALE 1:40)



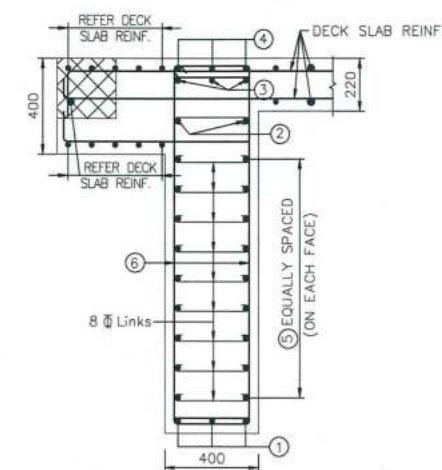
PLAN OF END CROSS GIRDER AT D-D  
(SCALE 1:40)



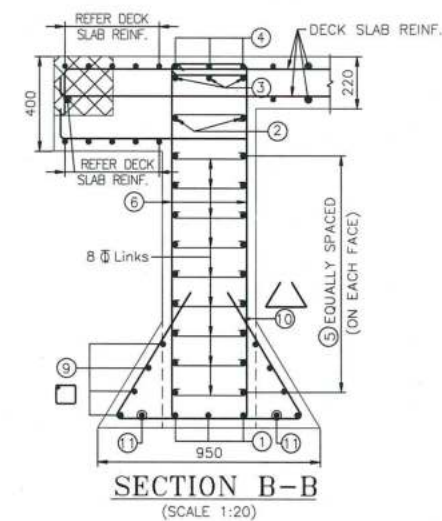
SECTION C-C  
(SCALE 1:15)



MESH TYPE-A  
(8# MESH TO BE PLACED UNDER JACK)  
(SCALE 1:15)



SECTION A-A  
(SCALE 1:20)



SECTION B-B  
(SCALE 1:20)

## REINF. DETAILS

BAR MKD.	BAR DIA.	NO./SPACING	SHAPE
1	25	3X3 NOS.	
1a	25	2X3 NOS.	650
1b	25	2X3 NOS.	
2	12	3X2 NOS.	
2a	12	2X2 NOS.	650
2b	12	2X2 NOS.	
3	25	3 NOS.	150
4	32	3 NOS.	150
5	20	3X9 NOS.	
5a	20	2X9 NOS.	
5b	20	2X9 NOS.	
6	12	150 C/C	2-LEGGED
7	12	2X3 NOS.	200
8		NOT USED	
9	10	4 NOS.	
10	16	8 NOS.	
11	12	2 NOS.	

## NOTES:-

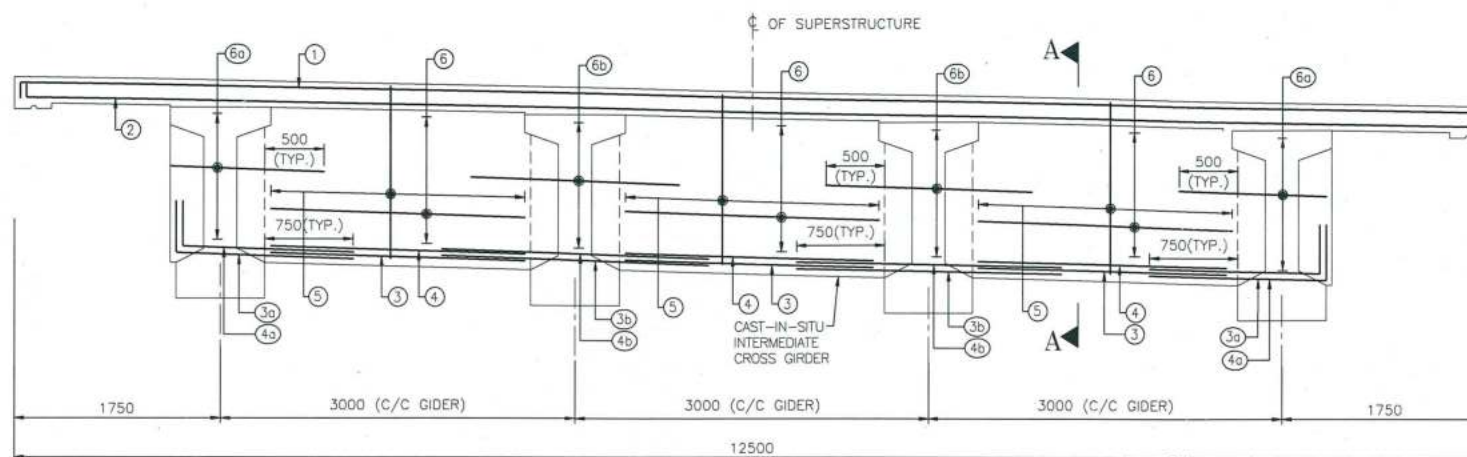
1. ALL DIMENSIONS ARE IN MM AND LEVELS IN METERS.
2. DO NOT SCALE THE DIMENSIONS. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
3. GRADE OF CONC. FOR R.C.C. WORKS = M-40
4. THE REINFORCING STEEL SHALL BE OF TMT BARS (GRADE DESIGNATION Fe 500D) CONFORMING TO IS:1786.
5. CLEAR COVER TO REINFORCEMENT SHALL BE 50mm.
6. NOT MORE THAN 50% OF BARS SHALL BE LAPPED AT A SECTION AND LAPPING SHALL BE STAGGERED. MINIMUM LAP LENGTH SHALL BE 76 TIMES DIA OF BAR.

## REFERENCE DRAWINGS:-

GOOD FOR CONSTRUCTION

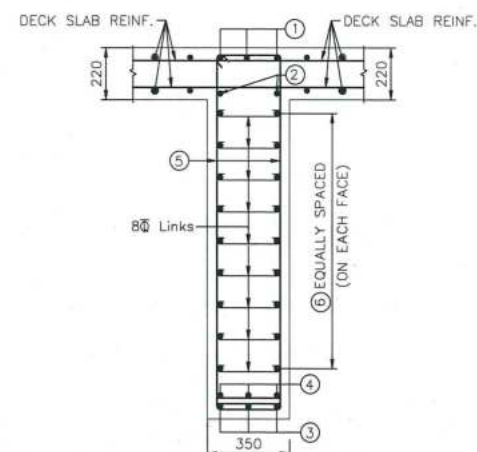
			CLIENT:		CONTRACTOR:		DESIGN CONSULTANT:		APPROVED BY:		PROJECT:	
			NATIONAL HIGHWAYS INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. (3RD FLOOR, P.T.I. BUILDING, 4 PARLIAMENT STREET, NEW DELHI-110001)		GANNON DUNKERLEY & CO. LTD 88A, TOPSIA ROAD (SOUTH) HAUTE STREET, 7th FLOOR KOLKATA-700046		ECSTATIC ENGINEERING CONSULTANTS PRIVATE LIMITED SCO 103 HUDA SHOPPING CENTRE, GURGOAN, SECTOR 55, GURUGRAM, HARYANA 122003		U.K.		FOUR LANING OF JHANJHI TO DEMOW SECTION OF NH-37 FROM EXISTING CH. K 491+050 TO KM 535+250 (DESIGN CH. KM 490+800 TO KM 534+800) IN THE STATE OF ASSAM UNDER EPC MODE.	
			AUTHORITY ENGINEER:		SAFTY CONSULTANT:		PROOF CONSULTANT:		CHECKED BY:		TITLE:	
			VOYANTS 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-103 HUDA SHOPPING CENTRE, SECTOR 55 GURGOAN, 122003, HARYANA. TEL: +91-124-4295802, 4295803 EMAIL: INFO@G-ENG.IN WEB: WWW.G-ENG.IN		MARC TECHNOCRATS PVT. LTD. MARC HOUSE, SECTOR 6-7 (DIVIDING ROAD), OPPOSITE DEW-LAL PARK, BAHADURGARH, HARYANA 124507		N.S.		REINFORCEMENT DETAILS END CROSS GIRDER AT CH. 516+938	
			DATE		DATE		DATE		DESIGNED BY:		DRG NO.:	
			27.02.2020		20.01.2020		20.01.2020		S.S.		EEC-NH-37-JD-SUP-CH.516+938-305	
			REV		BY		AS SHOWN		SCALE:		SHEET NO.	
			R1						JAN. 2020		01 OF 01	
			DESCRIPTION OF REVISIONS								REV.	
											R1	





LONGITUDINAL SECTION OF INTERMEDIATE CROSS GIRDER

(SCALE 1:40)



SECTION A-A

(SCALE 1:20)

# REINF. DETAILS

BAR MKD.	BAR DIA.	NO./SPACING	SHAPE
1	25	3 NOS.	150
2	12	2 NOS.	150
3	25	3X3 NOS.	
3a	25	2X3 NOS.	650
3b	25	2X3 NOS.	
4	25	3X3 NOS.	
4a	25	2X3 NOS.	650
4b	25	2X3 NOS.	
5	12	150 C/C	2-LEGGED
6	10	3X9 NOS.	
6a	10	2X9 NOS.	
6b	10	2X9 NOS.	

## NOTES:-

1. ALL DIMENSIONS ARE IN MM AND LEVELS IN METERS.
2. DO NOT SCALE THE DIMENSIONS. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
3. GRADE OF CONC. FOR R.C.C. WORKS = M-40
4. THE REINFORCING STEEL SHALL BE OF TMT BARS (GRADE DESIGNATION Fe 500D) CONFORMING TO IS:1786.
5. CLEAR COVER TO REINFORCEMENT SHALL BE 50mm.
6. NOT MORE THAN 50% OF BARS SHALL BE LAPPED AT A SECTION AND LAPPING SHALL BE STAGGERED. MINIMUM LAP LENGTH SHALL BE 76 TIMES DIA OF BAR.

## REFERENCE DRAWINGS:-

GOOD FOR CONSTRUCTION

			CLIENT:		CONTRACTOR:		DESIGN CONSULTANT:		APPROVED BY:		PROJECT:	
			NATIONAL HIGHWAYS INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. (3RD FLOOR, PTI BUILDING, 4 PARLIAMENT STREET, NEW DELHI-110001)		GANNON DUNKERLEY & CO. LTD 86A, TOPSIA ROAD (SOUTH) HAUTE STREET, 7TH FLOOR KOLKATA-700046		ECSTATIC ENGINEERING CONSULTANTS PRIVATE LIMITED S-103 HUDA SHOPPING CENTRE, GURGOAN, SECTOR 55, GURUGRAM, HARYANA 122003		U.K.		FOUR LANING OF JHANIHI 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:		SAFTY CONSULTANT:		PROOF CONSULTANT:		CHECKED BY:		TITLE:	
			VOYANTS 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. SCD-102, HUDA SHOPPING CENTER, SECTOR-55 GURGOAN-122002, HARYANA. TEL: +91-124-4295902, 4295903. EMAIL: INFO@G-ENG.IN WEB: WWW.G-ENG.IN		MARC TECHNOCRATS PVT. LTD. MARC HOUSE, SECTOR-6-7 (DIVIDING ROAD), OPPOSITE DEVILAL PARK, BAHADURGARH, HARYANA 124507		N.S.		REINFORCEMENT DETAILS OF INTERMEDIATE CROSS GIRDER AT CH. 516+938	
			27.02.2020 R1 DIMENSIONS OF GIRDER MODIFIED						DESIGNED BY:		DRG NO:	
			20.01.2020 R0 ISSUED FOR APPROVAL						S.S.		EEC-NH-37-JD-SUP-CH.516+938-306	
DATE	REV	DESCRIPTION OF REVISIONS	BY						SCALE:	DATE:	SHEET NO.	REV.
									AS SHOWN	JAN. 2020	01 OF 01	R1



main bridge

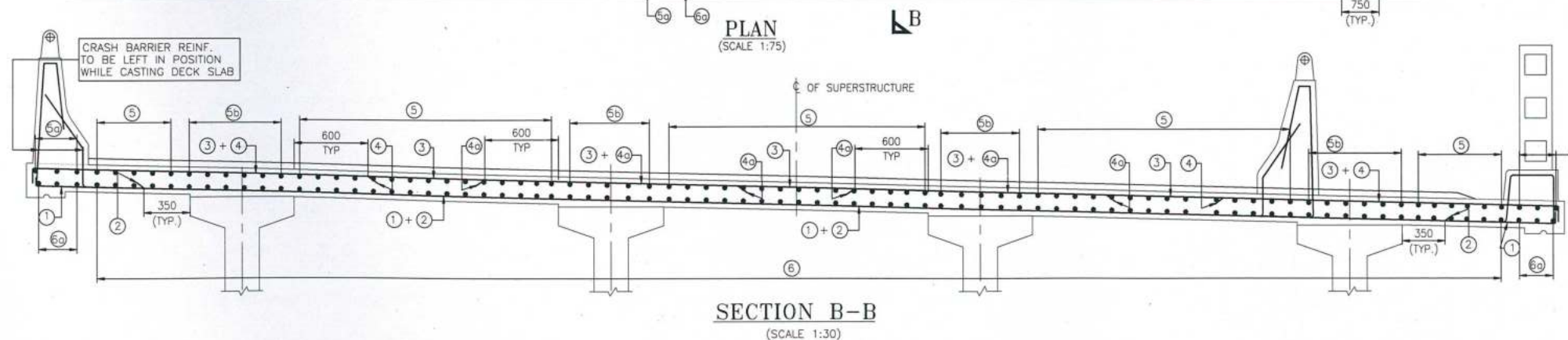
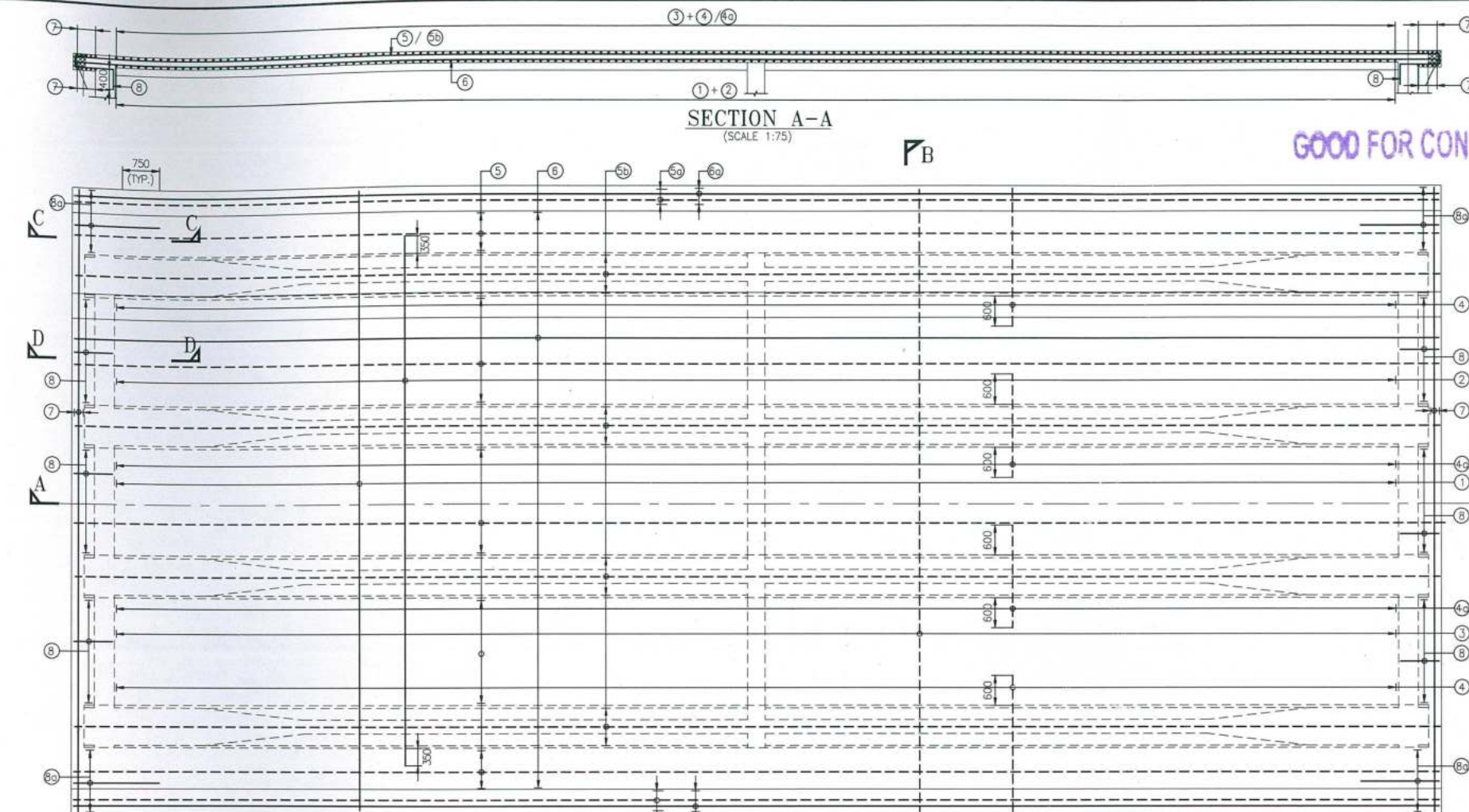
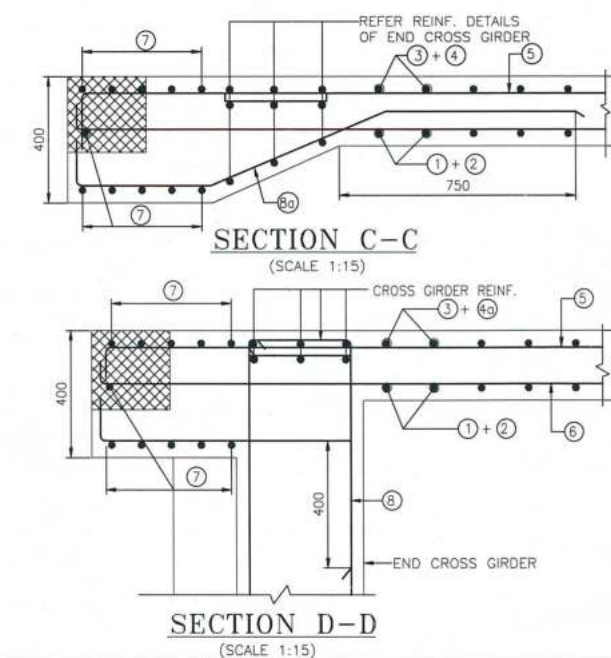
## REINFORCEMENT DETAILS

BAR MKD.	BAR DIA.	NO./SPACING	SHAPE	REMARKS
1	12	150 C/C		BAR NOS. ① & ② ARE ALTERNATE BARS
2	12	150 C/C		
3	12	150 C/C		BAR NOS. ③ & ④ ARE ALTERNATE BARS
4	12	150 C/C		
4a	12	150 C/C		
5	10	150 C/C		
5a	16	2x3 NOS.		
5b	10	150 C/C		
6	10	150 C/C		
6a	16	2x3 NOS.		
7	12	2x5 NOS.		
8	12	150 C/C		
8a	12	150 C/C		

## NOTES:-

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

## REFERENCE DRAWINGS:-



SECTION B-B  
(SCALE 1:30)

				CLIENT:  NATIONAL HIGHWAYS INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. (3RD FLOOR, PTI BUILDING, 4 PARLIAMENT STREET, NEW DELHI-110001)		CONTRACTOR  GANNON DUNKERLEY & CO. LTD 86A, TOPSIA ROAD (SOUTH) HAUTE STREET, 7th FLOOR KOLKATA-700046		DESIGN CONSULTANT:  ECSTATIC ENGINEERING CONSULTANTS PRIVATE LIMITED SCO 105, HUDA SHOPPING CENTRE, GURGOAN, SECTOR 55, GURUGRAM, HARYANA 122005		APPROVED BY: U.K	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.			
				AUTHORITY ENGINEER:  VOYANTS SOLUTIONS PVT. LTD. A25, 4TH FLOOR, BPTP PARK CENTRA, BLOCK A, JAL VAYU VIHAR SECTOR 30 GURGOAN, HARYANA 122001		SAFTY CONSULTANT:  G-ENG ADVISORY SERVICES PVT. LTD. SCO 105, HUDA SHOPPING CENTER, SECTOR 55 GURGOAN-122002, HARYANA. TEL: 981-124-4295802, 4295803 EMAIL: INFO@G-ENG.IN WWW.G-ENG.IN		PROOF CONSULTANT:  MARC TECHNOCRATS PVT. LTD. MARC HOUSE, SECTOR-6-7 (DIVIDING ROAD), OPPOSITE DEVI LAL PARK, BAHADURGARH, HARYANA 124507		CHECKED BY: N.S				
27.02.2020	R1	DIMENSIONS OF GIRDER MODIFIED								DESIGNED BY: S.B	TITLE: REINFORCEMENT DETAILS OF RCC DECK SLAB AT CH. 516+938			
20.01.2020	R0	ISSUED FOR APPROVAL								DRAWN BY: S.S				
DATE	REV	DESCRIPTION OF REVISIONS		BY						SCALE: AS SHOWN	DATE: JAN. 2020	DRG NO.: EEC-NH-37-JD-SUP-CH.516+938-307	SHEET NO. 01 OF 01	REV. R1