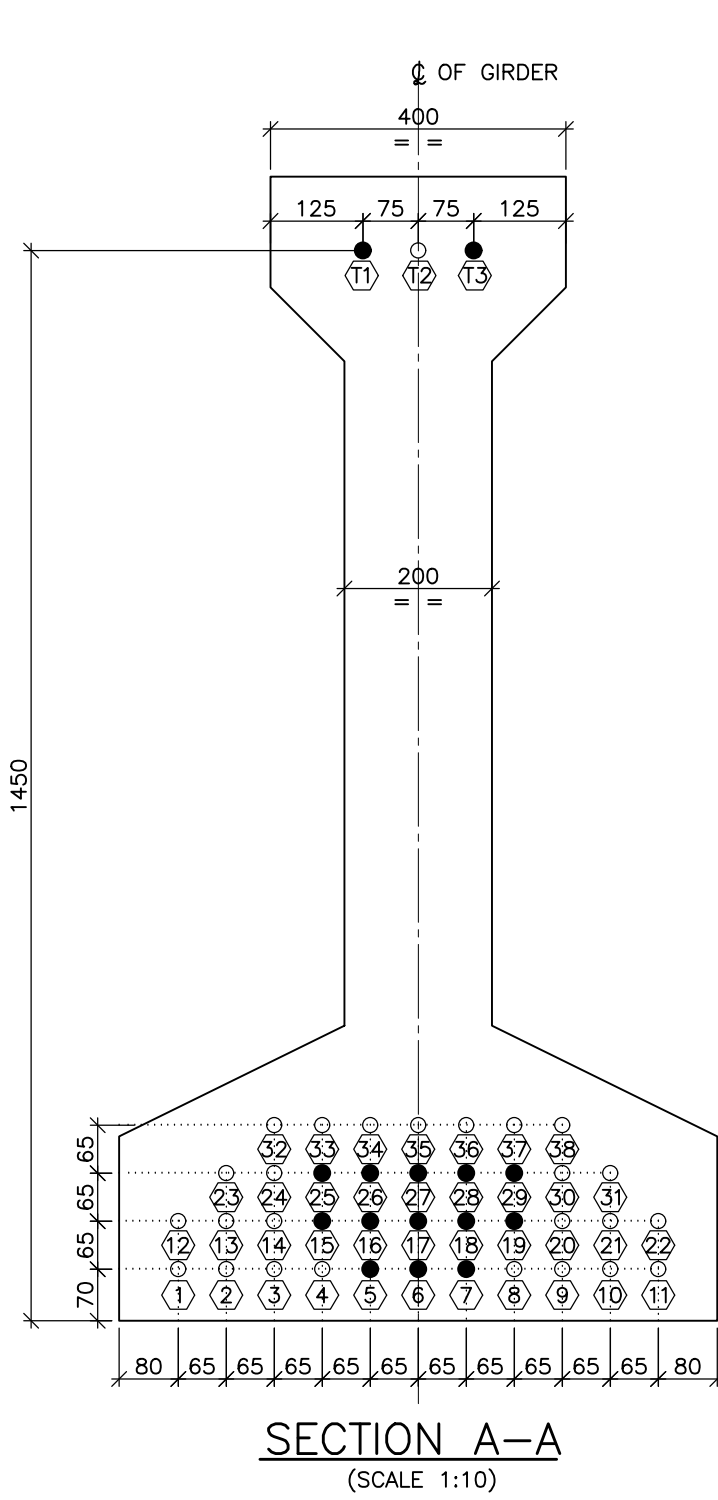


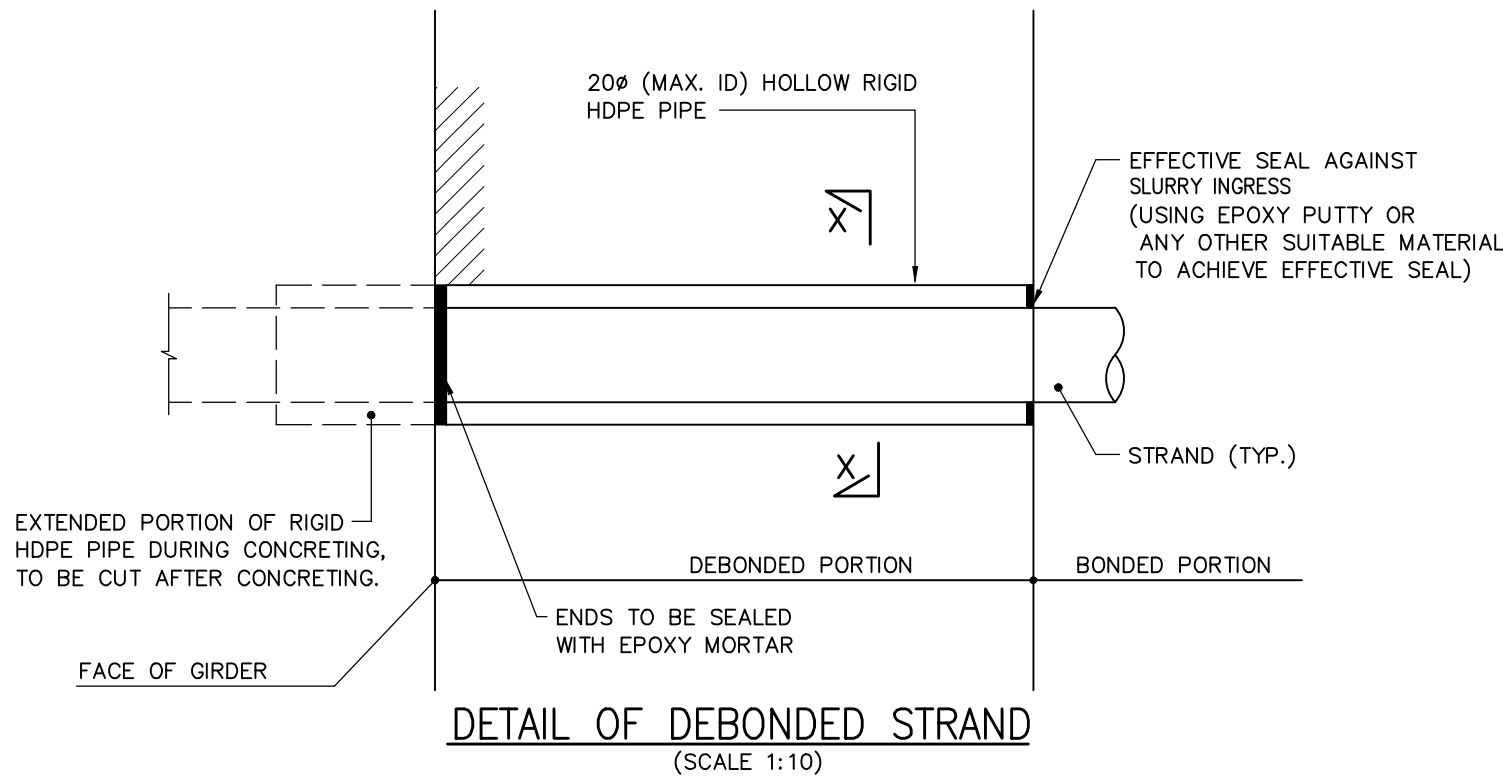
ELEVATION OF INNER GIRDER-G2 & OUTER GIRDER-G1
(SHOWING PRESTRESSING STRANDS ONLY)
(SCALE 1:20)

FULL LENGTH DEBONDED STRANDS / INACTIVE STRANDS
(12 , 1 , 2 , 3 , 4 , 8 , 9 , 10 , 11 , 12 , 13 , 14 , 20 , 21 , 22 , 23 , 24 , 30 , 31 , 32 TO 39)

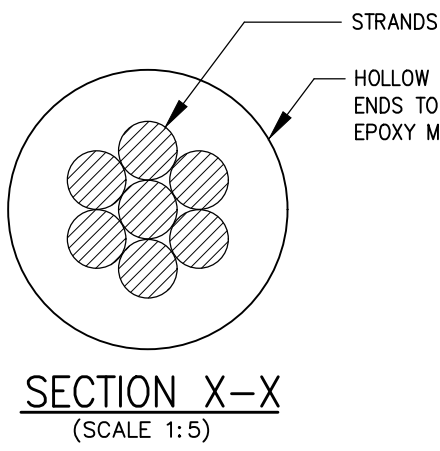
TOTAL ACTIVE STRANDS	= 15
TOTAL INACTIVE STRANDS	= 26
TOTAL STRANDS	= 41



SECTION A-A
(SCALE 1:10)



DETAIL OF DEBONDED STRAND
(SCALE 1:10)



SECTION X-X
(SCALE 1:5)

DEFLECTION OF GIRDER AT MID SPAN

STAGE	STAGE	OUTER (mm)	INNER (mm)
1	DL+PSC	-2.508	-2.508
2	STAGE-1 + SLAB	-1.917	-1.909
3	STAGE-2 + SIDL	-1.710	-1.723
4	STAGE-3 + LL	-0.933	-1.365

NOTE: -Ve UPWARD, +Ve DOWNWARD
THE DEFLECTION HAS BEEN CHECKED AS PER UIC 776:3R
TABLE 3 AND FOUND TO SAFE.

SR. NO.	ACTIVITY	DAYS	STRENGTH
1	PLACING OF REINFORCEMENT & STRANDS PRESTRESSING OF STRANDS.	-	-
2	PLACING MOULDS & POURING OF CONCRETE.	-	-
3	TRANSFER OF PRESTRESS	4 DAYS AFTER CONCRETING OF I-GIRDER	45 MPa
4	CASTING OF DECK SLAB & DIAPHRAGM	21 DAYS AFTER CONCRETING OF I-GIRDER	60 MPa
5	APPLICATION OF SIDL	28 DAYS AFTER CONCRETING OF DECK SLAB	100% STRENGTH OF CONCRETE OF DECK SLAB

* STRENGTH OR DURATION WHICHEVER IS LATER.

NOTES:

- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS, UNLESS OTHERWISE MENTIONED.
- THIS DRAWING SHALL NOT BE SCALED, ONLY WRITTEN DIMENSIONS SHOULD BE FOLLOWED.
- MATERIALS:**
 - CONCRETE : GRADE OF CONCRETE IN PSC GIRDER = M60
 - PRESTRESSING STEEL
 - PRESTRESSING STEEL SHALL BE STRESS RELIEVED LOW RELAXATION CLASS II STRANDS CONFIRMING TO IS: 14268 WITH MINIMUM ULTIMATE STRENGTH OF 1862 Mpa.
 - NOMINAL DIA OF STRANDS SHALL BE 15.2mm 7 PLY WITH A CROSS SECTION AREA OF 140sqmm.
 - MODULUS OF ELASTICITY = 1.95x10⁵ Mpa.
 - JACKING FORCE FOR EACH STRAND SHALL BE 195.510 kN 7 PLY WITH A CROSS SECTION AREA OF 140sqmm.
- DEBONDING OF STRANDS SHALL BE DONE WITH 20mm DIA HOLLOW RIGID HDPE PIPE.
- MINIMUM CLEAR COVER TO PRESTRESSING STEEL SHALL BE 35mm.
- ALL PRECAUTION ARE TO BE TAKEN AS PER IRC-SP-71-2018 & IRC CBC-1997 DURING CASTING & ERECTION.
- PRESTRESS SHALL BE RELEASED SYMMETRICAL TO VERTICAL AXIS OF GIRDER.
- ADJUSTMENT FOR ACTUAL AREA & MODULUS OF ELASTICITY SHALL BE DONE AS PER STANDARD PRACTICE.
- CONSTRUCTION:**
 - THE GIRDER SHALL BE CAST IN ONE CONCRETING OPERATION WITHOUT ANY CONSTRUCTION JOINT.
 - OPERATION TO BE FOLLOWED DURING CASTING OF GIRDER:
 - PLACE UNTENSIONED REINFORCEMENT CAGE (PRE-FORMED).
 - INSERT THE PRE-STRESSING STRANDS THROUGH THE REINFORCEMENT CAGE.
 - PRE-TENSION THE STRAND.
 - PLACE THE MOULDS AFTER APPLYING THE MOULD RELEASE AGENT.
 - POUR THE CONCRETE & COMPACT AS PER THE STANDARD & ACCEPTED PRACTICE.
 - RELEASE THE STRANDS BY RELEASING THE HYDRAULIC JACKS MINIMUM CONCRETE STRENGTH AT TRANSFER SHALL BE 45MPa & MINIMUM AGE OF CONCRETE IS 4 DAYS, WHICHEVER IS LATER.
 - REMOVE THE MOULDS & LIFT THE BEAMS FROM SPECIFIC LIFTING POINTS & SHIFT IT TO THE STACKING YARD.
 - SUDDEN CUTTING OF STRANDS PROHIBITED THIS OPERATION SHALL BE DONE CAREFULLY & GRADUALLY.
 - COMPACTION OF CONCRETE AT GIRDER ENDS (WHERE REINFORCEMENT IS CONGESTED) IS TO BE DONE CAREFULLY.
 - THE END SURFACES OF GIRDERS SHALL BE HACKED TO REMOVE LAITANCE BEFORE ERECTION.
 - SLAB AND DIAPHRAGM TO BE CASTED WHEN GIRDER CONCRETE ATTAINS 60MPa OR 21st DAY OF CONCRETING OF I-GIRDER WHICHEVER IS LATER.
 - SIDL CAN BE APPLIED WHEN 100% OF STRENGTH OF DECK SLAB IS ACHIEVED OR AFTER 28 DAYS OF CONCRETING OF DECK SLAB WHICHEVER IS LATER.
- ELONGATION:

THE ELONGATION SHOULD BE MEASURED AT A RATE (0.75x1862x1000/1.95E5) =7.161mm/m SUITABLE CORRECTION SHALL BE APPLIED BASED ON DIFFERENT MATERIAL PROPERTIES GIVEN AGAINST 3b ABOVE.
- ELONGATION GIVEN SHALL BE MODIFIED AT SITE IN CASE ACTUAL AREA VALUE OF STRAND 'A' AND MODULUS OF ELASTICITY 'E' VARIES FROM THOSE ASSURED IN DESIGN, REVISED EXTENSION SHALL BE CALCULATED AS UNDER

REVISED EXTENSION= (NEW AREA X NEW MODULUS)

- STRAND CUTTING SEQUENCE SHALL BE SYMMETRIC WITH RESPECTIVE CENTER LINE OF GIRDER AT A TIME THERE SHALL NOT BE ECCENTRICITY OF MORE THAN 1 STRAND.
- AFTER PRETENSIONING THE STRANDS AND BEFORE CONCRETING, A RECHECK SHALL BE MADE TO ENSURE THAT THE DEBONDING TUBES ARE PLACED AT THE INTENDED LOCATIONS. BOTH ENDS OF THE DEBONDING TUBES SHALL BE EFFECTIVELY SEALED AGAINST INGRESS OF ANY CEMENT SLURRY USING EPOXY PUTTY OR ANY OTHER SUITABLE MATERIAL.
- DIAMOND BIT SAW OR GRINDER WITH CUTTING WHEEL SHALL BE USED TO CUT THE STRANDS.
- PRE-TENSIONING OF STRANDS MAY BE CARRIED OUT USING MULTI PULL JACK. ELONGATION AT THE PRESTRESSING END SHALL BE CHECKED AS PER CL. NO. 4.2 OF IRS-CBC-71
- RECOMMENDED DIMENSIONAL TOLERANCES FOR PRECAST GIRDERS:
 - LENGTH : ±10mm
 - FLANGE WIDTH & THICKNESS : ±5mm
 - DEPTH : ±5mm
 - WEB THICKNESS : ±3mm
 - POSITION OF TENDONS : ±3mm
 - MAXIMUM SURFACE ROUGHNESS : 1.5mm ON 3.0m TEMPLATE
- WHILE CALCULATING EFFECTIVE ELONGATION OF PRESTRESSING STRANDS, ACTUAL DEFORMATION OF THE BUTTRESSES SHALL BE ACCOUNTED AND SUBTRACTED FROM THE ELONGATION OF THE PRESTRESSING STRANDS MEASURED AT SITE DURING STRESSING.
- DEVELOPMENT LENGTH REPRESENTED BY L_d SHALL BE EQUAL TO 41 TIMES THE DIA OF THE BAR.
- LAP LENGTH SHALL BE EQUAL TO 58 TIMES THE DIA. OF BAR AND NOT MORE THAN 50% OF THE BARS SHALL BE LAPPED AT A SECTION.
- ALL LAPS SHALL BE STAGGERED, NOT MORE THAN 50% OF REINFORCEMENT SHALL BE LAPPED AT ANY SECTION.
- ADEQUATE LINKS/SPACER BARS SHALL BE PROVIDED FOR PROPER POSITIONING OF REINFORCEMENT.
- DOWEL BARS FOR DIAPHRAGM SHALL BE LEFT BEFORE CONCRETING.
- RELEASE OF STRANDS AT TRANSFER TO BE DONE GRADUALLY AND CONTROLLED MANNER UNIFORMLY THROUGHOUT THE CROSS SECTION OF GIRDER.
- NO CONSTRUCTION JOINTS SHALL BE PERMITTED DURING CONSTRUCTION OF I-GIRDERS AND SHALL BE APPROVED BY ENGINEER-IN-CHARGE.
- LIFTING ARRANGEMENT OF GIRDERS SHALL BE PROVIDED AND CHECKED BY CONTRACTOR AND APPROVED BY ENGINEER-IN-CHARGE.
- IN CASE OF REINFORCEMENT FOULING WITH OTHER BAR AS PRE-STRESSING STRANDS, BARS SHALL BE CRANKED AT YARD AND SLOPE NOT EXCEEDING 1:6.
- DURING JACKING OPERATION ALL THE JACKS PLACED UNDER EACH I-GIRDER SHALL BE OPERATED SIMULTANEOUSLY USING STRESS CONTROL SYSTEM SO AS TO ENSURE THAT THE ERECTION ON ALL THE JACKS IS EQUAL AT ALL TIMES.
- GIRDER SHALL BE KEPT UPRIGHT AT ALL TIMES AND TO BE CLEARLY MARKED INDICATING SPAN, LOCATION AND RESPECTIVE ENDS BEFORE REMOVAL FROM CASTING BED.
- ANY DISCREPANCY MUST BE BOUGHT TO THE NOTICE OF CONSULTANT BEFORE EXECUTION OF WORK.
- GIRDER LENGTH SHALL BE VERIFIED BEFORE CASTING AND ERECTION.
- INSTALLATION OF CRASH BARRIER, MEDIAN AND WEARING COAT AT THE END OF 35TH DAY OR AFTER SLAB ATTAINS MINIMUM STRENGTH WHICHEVER IS LATER.
- DEBONDING TUBES SHALL BE 20MM DIA.(MAX), HOLLOW RIGID HDPE PIPE OF 3MM THICKNESS.
- BOTH ENDS OF THE DEBONDING TUBE SHALL BE EFFECTIVELY SEALED AGAINST INGRESS OF ANY CONCRETE SLURRY USING EPOXY PUTTY OR ANY OTHER SUITABLE.
- SUITABLE MOULDS RELEASE AGENTS OF APPROVED QUALITY SHALL BE USED FOR EASY REMOVAL OF MOULDS.
- REMOVE THE MOULDS AND LIFT THE GIRDER FROM SPECIFIC LIFTING POINTS AND SHIFT IT TO THE STACKING YARD.
- ERECT SHUTTERING OVER ALREADY ERECTED GIRDERS AND CAST IN SITU DECK SLAB AND DIAPHRAGM.
- CARE SHALL BE TAKEN TO PREVENT TOPPING/TILTING OF PRECAST PRETENSION GIRDER DURING TRANSPORTATION AND ERECTION.

GOOD FOR CONSTRUCTION

REFERENCE DRAWINGS :

- O22077-BSRP-CR2-C-VD-GEN-30-2469...GENERAL ARRANGEMENT FOR 12.034M TRANSITION SPAN SUPERSTRUCTURE AT VIADUCT FOR CR2 FOR PP202A-UP203 - SINGLE TRACK
- O22077-BSRP-CR2-C-VD-GEN-30-2470...REINFORCEMENT DETAILS OF 12.034M TRANSITION SPAN SUPERSTRUCTURE AT VIADUCT FOR CR2 FOR PP202A-UP203 - SINGLE TRACK
- O22077-BSRP-CR2-C-VD-GEN-30-2472...REINFORCEMENT DETAILS OF 12.034M TRANSITION SPAN SUPERSTRUCTURE AT VIADUCT FOR CR2 FOR PP202A-UP203 - SINGLE TRACK (DECK SLAB AND DIAPHRAGM)

NOTES :		LEGEND :		REFERENCE DRAWINGS :		REFERENCE DOCUMENTS :		KEY PLAN		STATION BOX KEY PLAN	
						DOC-BSRP-CR2-EV-DGN-GEN-30-1371					
REV# DATE BRIEF DESCRIPTION		CONTRACTOR :		QUALITY ASSURANCE		GENERAL CONSULTANTS		EMPLOYER :		PROJECT :	
		TRANSPORTATION INFRASTRUCTURE IC		The responsibility of control, check and verification of accuracy, correctness, completeness, integration and full compliance of Contract provisions in respect of design analysis and drawing rests with Design & Build Contractor.		CHECKED & APPROVED		RAIL INFRASTRUCTURE DEVELOPMENT COMPANY (KARNATAKA) LIMITED		BENGALURU SUBURBAN RAILWAY PROJECT (BSRP) K-RIDE CORRIDOR - 2	
		STUP Consultants Pvt. Ltd.		Indian Institute of Technology Madras		NAME SIGN		AECOM		DRAWING TITLE :	
		PROOF CONSULTANT (PC) :		IIT P.O., Chennai 600 036 INDIA		PROJECT DIRECTOR		AECOM		PRE TENSIONED STRAND DETAILS FOR 12.034M TRANSITION SPAN SUPERSTRUCTURE AT VIADUCT FOR PP202A-UP203 - SINGLE TRACK	
		L&T CONSTRUCTION		ISSUED BY :		NAME SIGN		AECOM		DRAWING NO. :	
		EDRC-SPECIAL BRIDGES - TIC		PREPARED BY :		DATE		AECOM		O22077-BSRP-CR2-C-VD-GEN-30-2471	
				APPROVED BY :		CIVIL/GAD		AECOM		REVISION	
						CIVIL/STRUCTURAL		AECOM		0	
						CIVIL/GEOTECH		AECOM		DWG STATUS	
								AECOM		C	
								AECOM		SCALE : AS SHOWN	
								AECOM		DATE : 23.09.2024	
								AECOM		SHEET SIZE : A1	