

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS UNLESS NOTED OTHERWISE.
2. ALL WRITTEN DIMENSIONS SHALL BE FOLLOWED.
3. GRADE OF CONCRETE:
  - a) PCC ORDER: \_\_\_\_\_ M30
  - b) PCC REQD. CROSS ORDER: \_\_\_\_\_ M30
4. ALL REINFORCEMENT SHALL BE OF FE-550 STEEL (YIELD STRENGTH 550 N/MM<sup>2</sup>) CONFORMING TO IS 1786.
5. CLEAR COVER TO REINFORCEMENT SHALL BE AS FOLLOWING:-
  - a) PCC SLAB: 25MM.
  - b) PCC ORDER: 30MM.
  - c) CROSS ORDER: 30MM.
6. LAPS OF REINFORCEMENT:
  - a) MINIMUM DEVELOPMENT LENGTH OF REINFORCEMENT SHALL BE 36d, WHERE d IS THE DIAMETER OF THE BAR.
  - b) MINIMUM LAP LENGTH OF REINFORCEMENT SHALL BE 36d, WHERE d IS THE DIAMETER OF THE BAR.
7. IF NOT MORE THAN SIZE OF REINFORCEMENT SHALL BE LAPPED AT ANY LOCATION, UNLESS OTHERWISE SHOWN.

LEGEND -

TOP OR INNER FACE BAR SHOWN THIS: ~~~~~~

BOTTOM OR OUTER FACE BAR SHOWN THIS: ~~~~~~

1 - LAPPED JOINTS

 National Highways & Infrastructure Development Corporation Limited	PROJECT	CONTRACTOR	PROJECT OWNER/UNIT	SAFETY CONSULTANT	Authorizing Engineer	SOLE AGENT	AS SHOWN	DPG NO. NHDD/KA/SG/SP/08/01/02 DATE: MAR 2023 (REVISION: 0) TITLE: REINFORCEMENT DETAILS OF PSC GIRDER OF BRIDGE ABUTTAL AT KM-500+578
	FOUR LANE OF ADDITION TO EXISTING SECTION FROM KM-495+00 TO 500+00 ON NH-66 IN THE STATE OF KARNATAKA UNDER THE CHARGE OF NATIONAL HIGHWAYS DEVELOPMENT CORPORATION LIMITED, BANGALORE.	  Project Engineer	  Project Owner/Unit	  Safety Consultant	  Authorizing Engineer	  Sole Agent	AS SHOWN DESIGNED CHECKED APPROVED	



TABLE-1

ORDINATES AT DISTANCE 'X' FROM ANCHORAGE OF PSC GIRDER

CABLE NO.	0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	11000	12000	13000	14000	15000	16000	17000	18000	19000	20000
1	490	170	399	175	348	179	299	184	245	189	194	144	198	125	200	125	200	125	200	125	200
2	490	170	399	-175	348	-179	299	-184	245	-189	194	144	-198	125	-200	125	-200	125	-200	125	-200
3	800	00	741	00	681	00	622	00	562	00	503	00	443	00	384	00	324	00	265	00	205
4	1150	00	1085	00	1016	00	950	00	883	00	816	00	749	00	682	00	615	00	549	00	482
5	1500	00	1427	00	1354	00	1281	00	1208	00	1135	00	1062	00	989	00	916	00	843	00	770
6	1850	00	1772	00	1693	00	1615	00	1536	00	1458	00	1380	00	1301	00	1223	00	1144	00	1066

## LEGEND

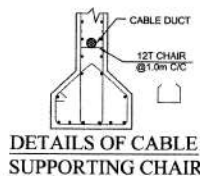
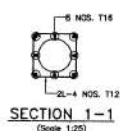
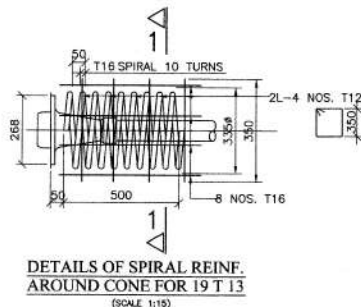
○	INDICATES START OF CURVE IN ELEVATION
□	INDICATES END OF ELEVATION
○	INDICATES END OF CURVE CABLE
○	INDICATES CABLE NUMBER
○	THEORETICAL DEVIATION POINT OF CABLE
○	INDICATES END OF CURVE IN PLAN

TABLE-2

CABLE NO.	NO. OF STRANDS	JACKING FORCE (kN)	ESTIMATED ELONGATION AT EITHER END (MM)				TOTAL ELONGATION (MM)	EXIT ANGLE (°)	STRESSING AT	STRESSING STATUS
			WITHIN GIRDER STANDS LENGTH (MM)	WITHIN JACK GRIP ELONGATION (MM)	WITHIN JACK GRIP ELONGATION (MM)	WITHIN JACK GRIP ELONGATION (MM)				
1	19	2733	38523	140.42	750	6	146.42	2.930	STAGE I	BOTH END STRESSING
2	19	2733	38523	140.42	750	6	146.42	2.930	STAGE I	
3	19	2733	38540	140.85	750	6	146.85	3.463	STAGE I	
4	19	2733	40550	148.05	750	6	154.05	3.922	STAGE II	
5	19	2733	40571	148.12	750	6	154.12	4.177	STAGE II	
6	14	2014	40568	148.21	750	6	154.21	4.453	STAGE II	

## STRESSING/ERECTION/CASTING etc. SEQUENCE

CASTING OF PRECAST GIRDER	= 0 DAYS
STAGE-I OF PRESTRESSING	= 14 DAYS
SUBJECT TO MINIMUM 45.0Mpa COMPRESSIVE STRESS	
STAGE-II OF PRESTRESSING	= 28 DAYS
SUBJECT TO MINIMUM 50.0Mpa COMPRESSIVE STRESS	
ERECTION OF GIRDER	= 30 DAYS
CASTING OF DECK SLAB	= 60 DAYS
REMOVAL OF SHUTTERING & LAYING OF WEARING COURSE & CRASH BARRIER	= 90 DAYS



## 2. PRESTRESSING OPERATION

- ALL CABLES SHALL BE IN SMOOTH CURVES PASSING THROUGH THE GIVEN ORDINATES AND SHALL BE SUPPORTED AT A SPACING NOT EXCEEDING 1000 mm BY A 16 mm DIA. CROSS BARS TACK WELDED/ SECURELY HELD IN POSITION WITH VERTICAL WEB REINFORCEMENT.
- CABLE LENGTH MENTIONED IN THE DRAWING ARE INCLUSIVE OF 1200 mm EXTRA LENGTH AT EACH END. THE TOTAL LENGTH OF CABLE SHALL BE VERIFIED AT SITE.
- STRESSING OF CABLES SHALL BE CARRIED OUT SIMULTANEOUSLY FROM BOTH ENDS. JACKING FORCES GIVEN IN TABLE, SHALL BE INCREASED BY APPROPRIATE PERCENTAGE TO ACCOUNT FOR ANCHORAGE AND JACK FRICTION AND EFFICIENCY AS PER THE MANUFACTURER'S INSTRUCTIONS.
- EXTENSION ARE GIVEN FOR TOTAL CABLE LENGTHS INCLUSIVE OF 750 mm GRIP LENGTH AT EACH END. LOSS UP TO 6 mm DUE TO SLIP OF ANCHORAGES ARE NOT TO BE COMPENSATED DURING SITE OPERATION. JACK PRESSURE AND EXTENSION OF CABLES AT EACH END GIVEN IN THE DRAWING SHALL BE VERIFIED AT SITE.
- INITIAL SLACKNESS IN PRESTRESSING TENDONS SHALL BE REMOVED BY APPLYING SMALL INITIAL 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 CLAUSE 12.2.1.3 OF IS : 1343-1980.
- THE EXTENSION GIVEN IN TABLE NO. 2 SHALL BE MODIFIED AT SITE IN CASE ACTUAL VALUE OF AREA OF STRAND 'A' AND MODULUS OF ELASTICITY 'E' VARIES FROM THE VALUES CONSIDERED IN DESIGN. REVERSED EXTENSION = EXTENSION AS PER DESIGN (98.7 mm x 195 x 10 m po) / (NEW AREA x NEW MODULUS).
- EXTENSION OF CABLE SHALL BE VERIFIED FOR A FEW CABLES AT SITE. IN CASE THE VALUE OF 'u' AND 'k' ARE FOUND TO BE MORE THAN HAVE BEEN CONSIDERED, EXTENSION SHALL BE SUFFICIENTLY MODIFIED AFTER APPROVAL OF THE ENGINEER.

## NOTES:

- ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.
- THE FOLLOWING BASIC PROPERTIES OF PRESTRESS TENDONS & CORRUGATED HOPE SHEATHING HAVE BEEN CONSIDERED IN THE DESIGN-
  - NOMINAL DIAMETER = 12.7 mm
  - AREA OF EACH STRAND = 98.7mm<sup>2</sup>
  - MOBILE COEFFICIENT k = 0.0020 per meter
  - FRICTION COEFFICIENT u = 0.17 / radians
  - MODULUS OF ELASTICITY OF STRAND = 195000 Mpa
  - ANCHORAGE SLIP = 6mm
  - ULTIMATE BREAKING LOAD OF EACH STRAND = 153.71 kN
- SHEATHING
  - SHEATHING SHALL BE CORRUGATED HOPE PIPE OF INTERNAL DIAMETER 35mm IT SHALL BE TESTED AS PER IS:112-2020.
  - JOINING OF SHEATHING SHALL BE WITH HEAT SHINK SLEEVES AND CONFORM TO PROVISIONS CONTAINED IN IS:112-2020.
- CABLE 1 & 2 SHALL BE STRESSED SIMULTANEOUSLY. OR CABLE 1 & 2 SHALL BE STRESSED ALTERNATIVELY IN PARTS (TOTAL-3 PARTS).
- HT STEEL SHALL BE 7 PLY UNSTRESSED STRESS RELIEVED LOW RELAXATION STRAND OF DIA 12.7mm CONFORMING TO IS:14268. DELIVERED STRAND SHOULD BE FREE OF ANY COATING OF GREASE OF ANY ANTICORROSIVE TREATMENT.
- RADIUS OF CURVATURE OF CABLE IN ELEVATION IS 20.0M
- CABLES SHALL BE GROUDED IMMEDIATELY AFTER STRESSING & GROUT SHALL CONFORM TO SPECIFICATIONS.
- ALL VERTICAL ORDINATES OF THE CABLES SHOWN IN THE DRAWING SHALL BE MEASURED FROM THE SOFT OF THE GIRDERS.
- SHEATHING DUCT SHALL BE SUPPORTED AT EVERY ONE METER BY FIRM SUPPORT.
- IF NOMINAL DIA AND THE VALUE OF E OF STRAND DIFFER FROM ABOVE VALUE, MODIFIED EXTENSION = TOTAL EXTENSION 98.700mm/NEW VALUE OF A & MODIFIED EXTENSION = TOTAL EXTENSION 195000Mpa/NEW VALUE OF E.
- THE SIZE & SHAPE OF ANCHORAGE AS PRESENTED ABOVE IS TENTATIVE. THE SAME SHALL BE AS PER STANDARD FOR 19T13 CABLES OF APPROVED MANUFACTURE.

Bridge Engineer  
VSP, Sivasagar

CLIENT	PROJECT	CONTRACTOR	DESIGN/ENGINEER	PROJECT CONSULTANT	SAFETY CONSULTANT	AUTHORITY ENGINEER	SCALE	DATE	REVISION
GOVERNMENT OF ASSAM Public Works Department Sivasagar	FOUR LANE OF JAMUN TO BRIDGE SECTION FROM KM 40+00 TO 50+00 DESIGN AND CONSTRUCTION OF BRIDGE IN THE CITY OF JAMUNABAR SARUP ON ENGINEERING PROCUREMENT & CONSTRUCTION (EPC) MODE	M/S KAMAL ENGINEERS PVT LTD HIS DESH HARILAKA (JAM) Sivasagar	Pratik Choudhary	TASPL TECHNOLOGICAL ADVISORY SERVICES PVT. LTD. NEW DELHI-110082	LA INFRA TECH LEGATO & CO NEW DELHI-110082	Pratik Choudhary	AS SHOWN	01.04.2023	REVISION: B0
PREPARED	DESIGNED	CHECKED	APPROVED						
K.R.	G.R.	P.S.	P.S.						

TITLE: CABLE LAYOUT FOR PSC GIRDER OF  
MINOR BRIDGE AT KM-500+578



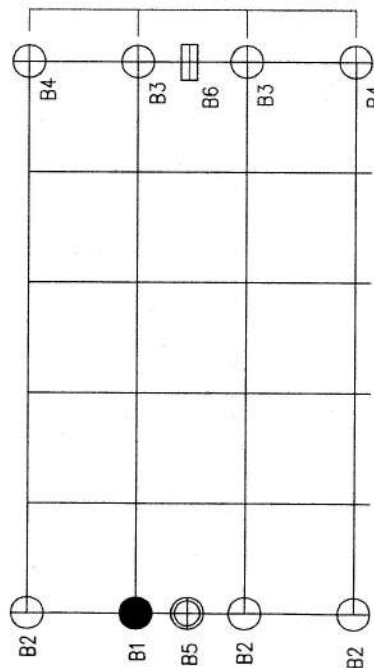




BEARING TYPE & LOAD DETAILS		FIXED BEARING	LONG FIXED BEARING	TRANS FIXED BEARING	FREE BEARING	PIN BEARING	MEATALIC GUIDED BEARING		
BEARING MARK		B1	B2	B3	B4	B5	B6		
TOTAL QUANTITY (NO)		1	3	1	3	1	1		
GRADE OF CONCRETE	UPPER SURFACE	SLS	M50	M50	M50	M50	M50		
	LOWER SURFACE	SLS	M45	M45	M45	M45	M45		
DESIGN LOAD (KN)	SLS	ULS	M45	M45	M45	M45	M45		
		MAX	2641	2641	2641	2641	-		
		VERTICAL	PERMANENT	1538	1538	1538	-		
		MIN	1385	1385	1385	-			
		LONGITUDINAL	87	87	0	0			
DESIGN LOAD (KN)	ULS	TRANSVERSE	0	0	0	0	-		
		MAX	4498	4498	4498	4498	-		
		VERTICAL	PERMANENT	2095	2095	2095	-		
		MIN	-25	-25	-25	-25	-		
		LONGITUDINAL	131	131	0	0	10579	5256	
TRANSLATION (MM)	SLS	TRANSVERSE	0	0	0	0	0	5256	
		LONG	-	-	-	-	-	-	
		IRREVERSABLE	TRAN	-	-	-	-	-	-
		LONG	-	-	21	21	-	-	
		REVERSABLE	TRAN	-	13	-	13	-	-
TRANSLATION (MM)	ULS	IRREVERSABLE	TRAN	-	-	-	-	-	
		LONG	-	-	-	-	-	-	
		REVERSABLE	TRAN	-	-	-	-	-	-
		LONG	-	-	32	32	-	32	
		IRREVERSABLE	TRAN	-	20	-	20	-	-
ROTATION (RED)	SLS	IRREVERSABLE	LONG	0.00253	0.00253	0.00253	-	-	
		LONG	-	-	-	-	-	-	
		REVERSABLE	TRAN	0.00253	0.00253	0.00253	-	-	-
		LONG	-	-	-	-	-	-	
		IRREVERSABLE	TRAN	0.00380	0.00380	0.00380	0.00380	0.00380	0.00380
ROTATION (RED)	ULS	IRREVERSABLE	LONG	0.00380	0.00380	0.00380	-	-	-
		LONG	-	-	-	-	-	-	-
		REVERSABLE	TRAN	0.00380	0.00380	0.00380	0.00380	0.00380	0.00380
		LONG	-	-	-	-	-	-	-
		IRREVERSABLE	TRAN	0.00380	0.00380	0.00380	0.00380	0.00380	0.00380

NOTES:

- ALL DIMENSIONS ARE IN MILLIMETERS. LEVELS ARE IN METERS AND UNLESS OTHERWISE SPECIFIED, ALL WRITTEN DIMENSIONS SHALL BE FOLLOWED.
2. THE CONTRACTOR SHALL SUBMIT DESIGN / DRAWING OF INDIVIDUAL BEARINGS BASED ON LOAD DATA AS GIVEN IN THIS DRAWING FOR APPROVAL OF THE ENGINEER.
3. MANUFACTURER TO BE SELECTED FROM THE LIST OF APPROVED MANUFACTURERS BY NOTIFICATION.
4. ALL BEARINGS SHALL CONFORM TO THE LATEST MORTHIN SPECIFICATION, IRC-83 (PART-B) - RAILWAYS AND TENDER SPECIFICATION, IF ANY.
5. THE TESTING OF RAW MATERIALS, METALIC COMPONENTS, ELASTOMER & PITE AND ACCEPTANCE TESTS ON BEARINGS SHALL CONFORM TO MOST SPECIFICATION/TENDER SPECIFICATION.
6. MANUFACTURER SHALL SUBMIT THE CERTIFICATES FOR LOAD TESTING AND DIMENSIONS OF BEARING.
7. SUITABLE EXERCISE CLAMPS FOR SAFE TRANSPORTATION AND HANDLING ALONG WITH TEMPLATE FOR ALIGNMENT SHALL BE PROVIDED BY THE CONTRACTOR.
8. THE PLAN SIZE AND HEIGHT OF FOUNDATION SHALL BE ADJUSTED TO SUIT THE FINAL SIZE OF BEARINGS AT THE TIME OF EXECUTION.
9. THE GROUT BEDDING WORK SHALL BE OF HIGH STRENGTH FREE FLOWING NON-SHINK TYPE.



### KEY PLAN SHOWING ARRANGEMENT OF BEARING LOCATIONS FOR POT cum PTFE BEARINGS

FIXED BEARING

TRANS GUIDED BEARING

LONG GUIDED BEARING

FREE BEARING

PIN BEARING

METALLIC GUIDED BEARING

B1

B2 (

B3 (

B4 (

B5 (C)

86 E

[illegible]