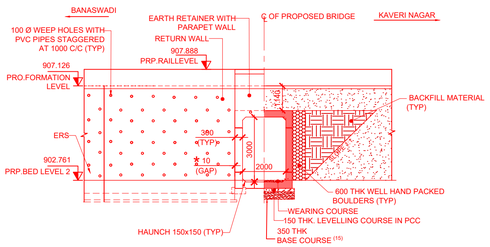
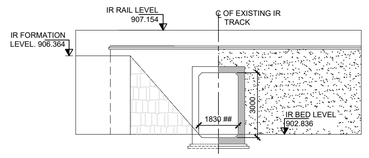


HALF ELEVATION & HALF SECTION



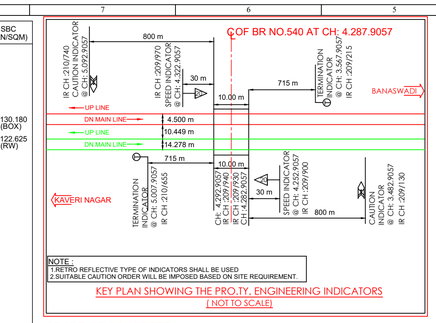
EXISTING BRIDGE ELEVATION

GROUND LEVEL : 905.106

BED LEVEL: 902.836/902.761
PROPOSED BOX FOUNDATION LEVEL 902.384
RETAINING WALL FOUNDATION LEVEL 901.861

STRATA DESCRIPTION	DEPTH IN M	LEGEND	(N-VALUE)	SBC (KN/SQM)
MEDIUM DENSE CLAYEY SAND WITH GRAVLLS (SC)	0.00		N = 13 (4/6/7)	
STIFF CLAY OF HIGH PLASTICITY (CH)	3.00		N = 13 (4/5/8)	130.180 (BOX) 122.625 (RW)
STIFF CLAY OF MEDIUM PLASTICITY (CI)	4.00		N=14 (7/6/8)	
STIFF CLAY OF HIGH PLASTICITY (CH)	5.50			
STIFF INORGANIC SILT OF HIGH COMPRESSIBILITY (MH)	6.00		N=14 (3/5/9)	
STIFF INORGANIC SLAT OF MEDIUM PLASTICITY (MI)	7.00		N=13 (3/6/7)	
HIGHLY WEATHERED HORIZONTALLY FRACTURED, FINE MEDIUM GRAINED, GREYISH BLACK DOLERITE	8.50			
COMPLETELY WEATHERED, HIGHLY FRACTURED, DISINTEGRATED, GREYISH BLACK DOLERITE	9.50			
MEDIUM TO VERY DENSE SILTY SAND (SM)	10.50		N=25 (7/10/15)	
			N=36 (9/16/20)	
			N=19 (7/10/19)	
			N=56 (7/24/32)	
COMPLETELY WEATHERED, HIGHLY FRACTURED, DISINTEGRATED, GREYISH BLACK DOLERITE	17.00			
HIGHLY WEATHERED, ANGULAR TO HORIZONTALLY FRACTURED, FINE TO MESIUM GRAINED, GREYISH BLACK DOLERITE	20.00			
COMPLETELY WEATHERED, HIGHLY FRACTURED, DISINTEGRATED, GREYISH BLACKDOLERITE	22.00			
	23.00			

BORELOG (BH-159)
(E 785016.560, N 1439332.680)



GRADE OF CONCRETE

	GRADE	
i.	RCC BOX	M35
ii.	WEARING COURSE	M25
iii.	LEVELLING COURSE (PCC)	M20
iv.	RETURN WALL	M35

TRACK DETAILS (PRO.BRIDGE)

LOADING	:	25 T-AXLE LOAD 2008-STD
ALIGNMENT	:	TRANSITION R 1009
GRADE	:	LEVEL
RAIL LEVEL	:	907.888 m
FORMATION LEVEL	:	907.126 m

LOADING STANDARD

A) PRO.BRIDGE:25T-AXLE LOAD 2008 STD
B) EXG.BRIDGE:MBG OF 1987

DEPTH OF CONSTRUCTION FOR 1 x 2.0 x 3.0 m RCC BOX

RAIL 60 kg	:	172 mm
GR PAD	:	6 mm
PSC SLEEPER	:	210 mm
BALLAST CUSHION	:	350 mm
EARTH CUSHION	:	1140 mm
TOP SLAB	:	300 mm
TOTAL	=	2178 mm

BRIDGE DETAILS

DESCRIPTION	EXISTING IR BRIDGE : 540	PROPOSED BSRP BRIDGE : 540
CHAINAGE AT CENTER OF BRIDGE (km)	209/935	4+287.9057
RAIL LEVEL AT CENTER OF BRIDGE (m)	907.154	907.888
FORMATION LEVEL AT CENTRE OF BRIDGE (m)	906.364	907.126
DIMENSIONS (Nos x SPAN(m) x HEIGHT(m))	1 x 1.83 x 3.0 ##	1 x 2.0 x 3.0m
STRUCTURE CONFIGURATION	RCC BOX	RCC BOX

WATERWAY PARTICULARS

CATCHMENT AREA	:	0.104 SQKM.
LATITUDE	:	13°0'22.951" N
LONGITUDE	:	77°37'38.054" E
TOPOSHEET NO	:	D43 R-12
Q50 DISCHARGE	:	3.24 CUM/SEC
VELOCITY	:	1.8 M/S
DEPTH OF FLOW	:	1.5 M
OHFL	:	904.336 M
Q50HFL (DESIGN HFL)	:	904.336 M

	REQUIRED	PROVIDED
WATERWAY AREA, Sqm	3.00	5.700
FREE BOARD, m	1.00	2.799
VERTICAL CLEARANCE, m	0.00	1.350
SCOUR DEPTH		
From Of HFL, m	2.459	
Sosur Level	903.047	
From B.L, m	0	1.2

EXISTING WATERWAY PARTICULARS

	PROVIDED
WATERWAY AREA, Sqm	7.677
FREE BOARD, m	2.000
VERTICAL CLEARANCE, m	1.425

TRACK DETAILS (EXG.BRIDGE)

LOADING	:	MBG-1987
ALIGNMENT	:	TRANSITION R 1009
GRADE	:	LEVEL
RAIL LEVEL	:	907.154 m
FORMATION LEVEL	:	906.364 m

ABBREVIATIONS :

℄	-	CENTER LINE
TYP	-	TYPICAL
THK.	-	THICKNESS
U/S	-	UP STREAM SIDE
D/S	-	DOWN STREAM SIDE
DN	-	DOWN
BR	-	BRIDGE
FRL	-	FORMATION LEVEL

BASE PRESSURE AT FOUNDATION LEVEL

STRUCTURE	MAX	MIN
RCC BOX (KN/m^2)	111.961	-
RETAINING WALL (KN/m^2)	108.891	-

LEGENDS:

= COLOUR CODE BLACK = EXISTING WORKS
= COLOUR CODE RED = PROPOSED RLY WORKS
= COLOUR CODE YELLOW = TO BE DISMANTLED

LEGENDS:

Total Barrel length of MIB 540 = 13.645m.
Completed Barrel length = 0m(BSRP Slde).
Remaining Barrel length 13.645m is yet to be Constructed.

SPECIFICATION:

1. ALL WORKS ARE TO BE CARRIED OUT AS PER THE FOLLOWING.
   a. INDIAN RAILWAY UNIFIED STANDARD SPECIFICATIONS FOR WORKS AND MATERIALS 2019.
   b. IRS CONCRETE BRIDGE CODE 2014(REPRINT) & RELEVANT I.S SPECIFICATIONS.
   c. IRS BRIDGE SUB - STRUCTURE CODE,2013(ii REVISED).
   d. IRS BRIDGE RULES 2014(REPRINT).
2. WING WALL/RETAINING WALL :- REINFORCED CEMENT CONCRETE OF GRADE M35 WITH DESIGN MIX.
3. PITCHING :- DRY STONE PITCHING 230MM THICK OVER 150MM THICK SAND MIXED WITH STONE CHIPS (AS PER PARA 205 OF INDIAN RAILWAY BRIDGE MANUAL ANNEXURE 2/3).
4. RCC BOX:- REINFORCED CEMENT CONCRETE M35 GRADE USING 20MM MAXIMUM SIZE GRADED HARD STONE AGGREGATE OF APPROVED QUALITY.
5. LEVELING COURSE :- 150 MM THICK M20 DESIGN MIX.
6. WEEP HOLES :- WEEP HOLES TO BE PROVIDED AS PARA 7.6 OF SUB STRUCTURE CODE & WEEP HOLES SHALL BE OF 100 DIA AC PIPES STAGGERED AT 1000 C/C ABOVE LOW WATER LEVEL IN BOTH WING WALL/RETAINING WALL & EARTH RETAINER OF BOX.
7. LOADING STANDARD :- 25 T - 2008 AXLE LOAD.
8. TOE WALL :- GRADE M25 WITH DESIGN MIX.
9. GRADE OF STEEL FOR RCC IS TMT-500D CONFORMING TO IS 1786-2008.
10. MASS CONCRETE TO BE OF M25 WITH 20MM GRADED STONE AGGREGATE FOR WEARING COURSE.
11. CONCRETE SHALL BE MECHANICALLY MIXED,VIBRATED & THOROUGHLY CURED.
12. BAR BENDING SHALL CONFORM TO IS 2502.
13. FLOORING :- ROUGH STONE FLOORING 300MM THICK GROUTED WITH CM:1:3.
14. DROP WALL / CURTAIN WALL :- GRADE M25 WITH DESIGN MIX.
15. BASE COURSE SHALL BE 350MM OF PROPERLY COMPACTED CRUSHED STONE LAYER OF 80MM SIZE AND DOWNGRADED SHALL BE PROVIDED BELOW PCC LEVELING COURSE. AS A COMMON CONSTRUCTION PRACTICE, THIS LAYER SHOULD FULFILL THE CRITERIA OF BINDING THE BOX CULVERT AND THE UNDERNEATH SOIL.
16. COPING :- CC M25 GRAD USING 20MM MAX.SIZE GRADED HARD STONE AGGREGATE OD APP.QUALITY.
17. SKIN REINFORCEMENT TO BE PROVIDED FOR WING & RETAINING WALL AS PER DESIGN.
18. GROUND IMPROVED SOIL SHALL BE OF SOIL QUALITY CLASS SQ2 AND SQ3 AS PER RDSO GUIDELINES.
19. TYPICAL COLLAR SHALL BE PROVIDED BETWEEN THE EXISTING AND PROPOSED STRUCTURE AS PER LETTER BEARING NO.SWR/W.70/POLICY/2022 DATED ON 08.09.2022 ISSUED BY SWR.
20. THE DIMENSIONS OF RETURN WALL SHOWN IN GAD ARE ONLY INDICATIVE AND TO FOLLOW AS PER APPROVED DESIGN & DRAWINGS.

REFERENCE:

1. RCC BOX (CAST-IN-SITU) - DRG NO. RDSO/B-10155 & 10155/3.
2. BOX DESIGN DOCUMENT NO.DOC-BSRP-CR2-AG-DGN-BR-20-1509
3. SUBSTRUCTURE BOX - O22077-BSRP-CR2-C-NB-0-20-1026
4. RETURN WALL - O22077-BSRP-CR2-C-NB-0-20-1027
5. WEEP HOLES AS PER PARA 7.6 OF SUB-STRUCTURE CODE
6. BALLAST RETAINER AS PER DESIGN,MONOLOTHIC WITH BOX
7. CURTAIN WALL AND TOE WALL AS PER DESIGN
8. BACKFILL MATERIALS BEHIND RCC BOX TO PROVIDE AS PER PARA 7.5 OF IRS BRIDGE SUBSTRUCTURE &FOUNDATION CODE
9. SHORING ARRANGEMENTS AS PER DESIGN.
10. GIR DOCUMENT NO.DOC-BSRP-CR2-AG-DGN-GB-20-1108.

BRIDGE STRENGTH CERTIFICATE

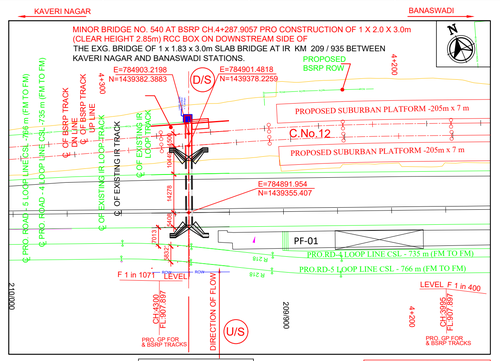
CERTIFIED THAT THE PRO RCC BOX BRIDGE,BR.NO.540 OF 1x2.0x3.0AT BSRP CH: 4+287.9057 TO BE CONSTRUCTED IS OF SUCH DESIGN, DIMENSIONS AND CONSTRUCTIONS AS WILL ENABLE IT TO CARRY THE DEAD LOAD OF THE STRUCTURE ITSELF (INCLUDING P-WAY COMPLETE) AND IN ADDITION TO THE EQUIVALENT OF 25T - 2008 LOADING PRESCRIBED IN THE BRIDGE RULES CHAPTER VIII OF THE RULES FOR THE OPENING OF RAILWAYS AT FULL SPEED.

ALSO CERTIFIED THAT THE HEAVIEST LOADS WHICH THE BRIDGE WILL HAVE TO CARRY WILL NOT BE IN EXCESS OF THE ABOVE STANDARDS OF LOADING AT THE STIPULATED SPEED AND WILL NOT CAUSE ANY STRESS IN ANY MEMBERS OR PORTION OF THE STRUCTURE IN EXCESS OF MAXIMUM PERMISSIBLE STRESSES LAID DOWN IN THE INDIAN RAILWAY STANDARD CODE OF PRACTICES.

GC KRIDE

MODUS OPERANDI :

1. IMPOSE 20KMPH SPEED RESTRICTIONS DURING EXCAVATION WORKS,IF REQUIRED AS PER SITE CONDITION.
2. DIVERT OR RESTRICT THE WATER FLOW BY PROVIDING BUND ON UPSTREAM SIDE OF THE BRIDGE.
3. PORTION OF RETURN WALL/TOE WALL, PITCHING TO BE DISMANTLED TO ACCOMMODATE RCC BOX WITH SUITABLE SHORING CONDITION AS PER SITE CONDITION .
4. EARTHWORK EXCAVATION TO BE DONE FOR PROPOSED BARREL LENGTH WITH 350MM BASE COURSE FILL BENEATH THE BOX BOTTOM RAFT.
5. THE GAP BETWEEN PROPOSED BOX AND THE EXG. BOX SHALL BE CLOSED WITH CONJUNCTION WALL.
6. RETURNS & BRIDGE PROTECTION WORKS TO BE DONE.
7. BACKFILL AS PER IRS SUBSTRUCTURE CODE TO BE DONE.
8. REMOVE THE SPEED RESTRICTION IF IMPOSED & ALSO RE-DIVERT THE WATER THROUGH THE BRIDGE



IR	
SKEW	
GRADIENT	LEVEL
CURVE	TRANSITION R 1009

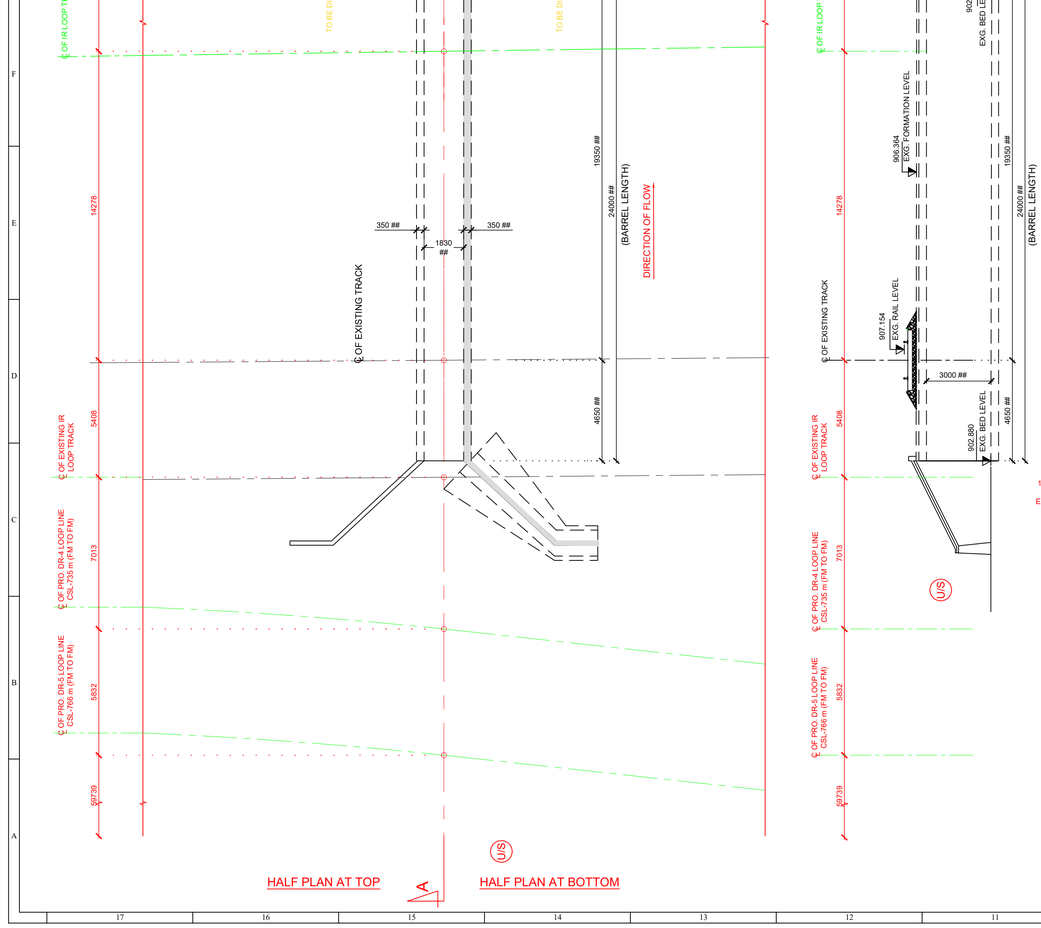
BSRP	
SKEW	
GRADIENT	LEVEL
CURVE	TRANSITION R 1009

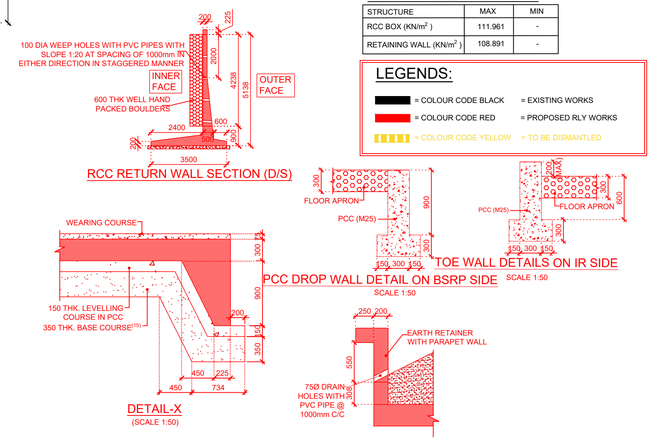
KEY PLAN
[SCALE1:1500]

KEY PLAN NOTE:-
1. PROPOSALS ARE SHOWN IN RED.
2. RAILWAY BOUNDARY DISTANCE ARE WITH RESPECT TO CENTRE LINE OF EXG.TRACK.
3. TRACK IS IN CURVED ON BRIDGE LOCATION.

NOTES:
1. ALL LEVELS ARE W.R.T TO MSL.
2. ALL DIMENSIONS ARE IN MILLIMETERS, REDUCED LEVELS ARE IN METRES AND CHAINAGE ARE IN KILOMETERS, UNLESS STATED OTHERWISE.
3. DO NOT SCALE THE DRAWING,FOLLOW FIGURED DIMENSIONS ONLY.
4. THE TYPE,DESIGN & DEPTH OF FOUNDATION SHOWN IN GAD ARE INDICATIVE ONLY. THE ACTUAL TYPE & DEPTH OF FOUNDATION WILL BE DECIDED BY THE ENGINEER-IN-CHARGE AS PER ACTUAL SOIL ENCOUNTERED AT SITE DURING EXECUTION.
5. SAFE BEARING CAPACITY OF SOIL IS 130.18 KN/SQM
6. LENGTH OF PITCHING FOR APPROACHES SHALL BE DECIDED BY THE ENGINEER-IN-CHARGE OF THE WORK TO SUIT SITE CONDITIONS.
7. PRO.BRIDGE WITH UP & DN LINE IS ON THE UP STREAM SIDE OF THE EXISTING BRIDGE.
8. FOR DETAILS OF OLD BRIDGE (EXG.) AS PER THE SITE DETAILS PROVIDED.
9. DISMANTLING OF EXISTING BRIDGE AND PROTECTIVE/PITCHING SHOULD BE DONE AS PER SITE CONDITION.
10. A) ON THE TOP SURFACE OF CONCRETE AT THE END OF EACH DAYS WORK DEPRESSION IN ZIG-ZAG PATTERN TO BE FORMED BY EMBEDDING WOODEN SCANTLINGS OR SLEEPERS TO FORM KEY FOR ADEQUATE BOND FOR THE NEXT DAYS CONCRETING.
    B) ON THE NEXT WORKING DAY ALL THE LAITANCE SHALL BE REMOVED BY SCRUBBING THE SURFACE WITH WIRE BRUSH WITHOUT DISLODGING THE PARTICLES OF AGGREGATE,THE SURFACE SHALL BE THOROUGHLY WETTED & CAN BE COATED WITH NEAT CEMENT GROUT BEFORE FIRST LAYER OF CONCRETE IS LAID.
11. THE BOULDER FILLING SHALL CONSISTS OF WELL HAND PACKED BOULDERS & COBBLES TO THICKNESS NOT LESS THAN 600 mm BEHIND THE BOULDER FILLING. BACKFILLING MATERIALS SHALL CONSIST OF GRANULAR MATERIALS OF GW, GP, SW CORRECT AS PER IS 1498 - 1970.
12. EXPOSURE CONDITION IS MODERATE.
13. CONTROLLED CONCRETE AS PER DESIGN MIX TO BE USED AND MIXED BY WEIGH BATCHING.
14. DISMANTLING ELEMENTS ARE SHOWN IN DOTTED LINE.
15. WHILE EXECUTION OF PRO. BRIDGE FOR STAGE-1, EXISTING FLOOR PROTECTIVE WORKS MAY GET DAMAGED, SO TO PROTECT THE EXG.BRIDGE FROM SCOURING EFFECT FLOORING PROTECTIVE WORKS WILL BE PROVIDED.
16. SUITABLE SPEED RESTRICTIONS MAY BE IMPOSED BASED ON SITE CONDITIONS WHENEVER & WHEREVER IF IS NEEDED TO ENSURE SAFETY OF RUNNING LINE.
17. SUITABLE PROTECTIVE MEASURES SHOULD BE PUT IN PLACE WHILE CARRYING OUT THE WORK IN CONSULTATION WITH KRIDE & GENERAL CONSULTANT.THIS SHALL INCLUDE NECESSARY SHORING ARRANGEMENTS TO BE PROVIDED FOR THE PROTECTION OF EXG.TRACK & FORMATION.
18. INSTRUCTIONS CONVEYED VIDE PCE'S CIRCULAR NO 01.2015, DATED: 09.03.2015 REGARDING" WORK DISPLINE AT SITE" AND AS PER PCE CIRCULAR NO.01/2021 DATED: 22.06.2021 REGARDING "ENSURING QUALITY OF WORK AND MAINTAINING SITE RECORDS IN WORKS CONTRACTS" TO BE STRICTLY FOLLOWED.
19. IT IS TO ENSURED BY KRIDE/BSRP-COR2 GM/CIVIL/PROJECTS BEFORE EXECUTION, THAT THE MAXIMUM BASE PRESSURE AT THE FOUNDATION LEVEL FOR EACH ELEMENT OF BRIDGE IS LESS THAN THE SAFE BEARING CAPACITY OF THE SOIL AT THAT LOCATION.
20. 20MM THK THERMOCOL SHEETS TO BE PROVIDED BETWEEN FACE WALL OF EXG.BRIDGE & PRO.RCC BOX & IF REQUIRED DOWEL BARS TO BE FIXED.
21. ENGINEER IN-CHARGE SHALL ENSURE THAT LEVEL OF FOUNDATION OF DROP WALL, CURTAIN WALL AND RETAINING WALL SHALL BE SUFFICIENTLY LOWER LEVEL THAN THE REQUIRED CALCULATED SCOUR LEVEL.
22. FEASIBILITY OF THIS BOX STRUCTURE AT SITE SHOULD BE ENSURED BY GM/KRIDE/BSRP-CORRIDOR2.
23. LEVEL THIS DRAWING IS PREPARED BASED ON RDSO STANDARD DRG. NO. RDSO/B/10155 & 10155/3, AS PER BOX SIZE 1x2.0x3.0 m

LOADING STANDARD
A) PRO.BRIDGE:25T-AXLE LOAD 2008 STD
B) EXG. STD BRIDGE:MGB 1987





GC/K-RIDE	K-RIDE
FOR GC	FOR K-RIDE

GENERAL CONSULTANTS:
egis AECOM WSP Egis AECOM-WSP

EMPLOYER :
RAIL INFRASTRUCTURE DEVELOPMENT COMPANY (KARNATAKA) LIMITED

GENERAL ARRANGEMENT DRAWING

BENGALURU SUBURBAN RAILWAY PROJECT(BSRP)
BETWEEN STATIONS BENNIGANAHALLI AND CHIKKABANAVARA

MINOR BRIDGE NO. 540 AT BSRP CH.4+287.9057 PRO CONSTRUCTION OF 1 X 2.0 X 3.0m (CLEAR HEIGHT 2.85m) RCC BOX ON DOWNSTREAM SIDE OF THE EXG. BRIDGE OF 1 x 1.83 x 3.0m SLAB BRIDGE AT IR KM 209 / 935 BETWEEN KAVERI NAGAR AND BANASWADI STATIONS

KRIDE.DRG.NO:

HQ.DRG.NO:

SCALE - 1 : 100 (UNLESS SPECIFIED OTHERWISE)

O22077-BSRP-CR2-C-NB-0-20-1025-D