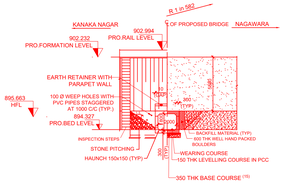
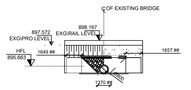
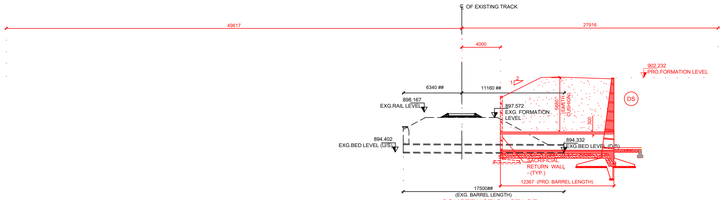


HALF ELEVATION & HALF SECTION

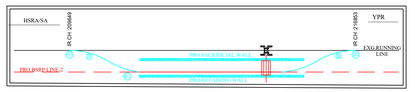


EXISTING BRIDGE ELEVATION

HFL	FREE BOARD (mm)	PRO.BED LEVEL-1	PRO. BED LEVEL-2
895.663	6569	894.402	894.327

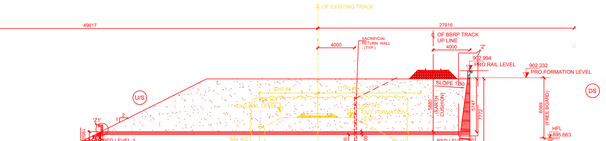


CONSTRUCTION STAGE - 1



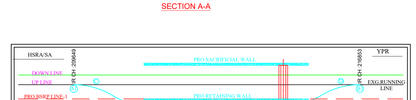
CONSTRUCTION STAGE - 2

CONSTRUCTION STAGE - 3

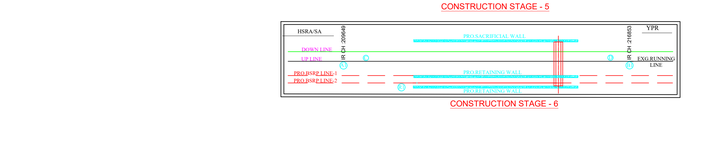


SECTION A-A

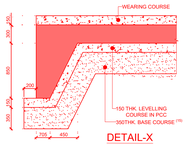
CONSTRUCTION STAGE - 5



CONSTRUCTION STAGE - 6

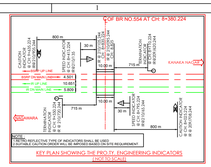


CONSTRUCTION - STAGE - 7



DETAIL-X

(SCALE 1:30)

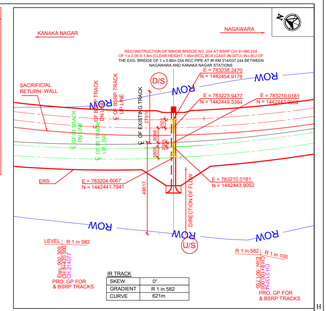


DEPTH OF CONSTRUCTION FOR 1 x 2 x 1.8 m RCC BOX	
RAIL 60 kg	: 172 mm
GR PAD	: 6 mm
PSC SLEEPER	: 210 mm
BALLAST CUSHION	: 350 mm
EARTH CUSHION	: 5880 mm
TOP SLAB	: 300 mm
TOTAL	= 6918 mm

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

WATERWAY PARTICULARS		
CATCHMENT AREA	: 0.094	
LATITUDE	: 13°23'9.918"N	
LONGITUDE	: 77°36'40.244"N	
TOPOSHEET NO	: 57 H 12	
50Q DISCHARGE	: 2.28 CUMSEC	
VELOCITY	: 1.9 M/SEC	
DEPTH OF FLOW	: 1.331m	
HWL	: 895.663 m	
200YRS (DESIGN HFL)	: 895.663 m	
	REQUIRED	PROVIDED
WATERWAY AREA, Sqm	: 2.952	3.365
FREE BOARD, m	: 1	6.569
VERTICAL CLEARANCE, m	: 0.05	0.314
SCOUR DEPTH		
FOR DP HFL, m	: 1.330	
SCOUR LEVEL	: 894.504	
FROM R.L of	: 6	1.2

EXISTING WATERWAY PARTICULARS	
	PROVIDED
WATERWAY AREA, Sqm	0.503
FREE BOARD, m	2.534
VERTICAL CLEARANCE, m	0.050



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

KEY PLAN
Scale: 1:750

MODUS OPERANDI:
PRECAUTIONS TO BE TAKEN:
1. AS PER THE INSTRUCTIONS FOR EXISTING MAIN LINE AT BRIDGE LOCATION BY INSTALLING NECESSARY TEMPORARY ENGINEERING SPEED INDICATOR AS PER IRPWM AND ALLOW TRAFFIC AT RESTRICTED SPEED.
STAGE 1: EARTHWORK FOR EMBANKMENT OF BSRP LINE-2
3. EXCAVATE THE EARTH TO THE REQUIRED DEPTH AT THE BOX PORTION PREPARE THE GROUND WELL BY RAMPING ETC AS NECESSARY AS PER REQUIREMENT.
4. LEVEL THE GROUND SURFACE.
5. DO NOT SCALE THE DRAWING.
6. FOUNDATION WORK FOR THE RETURN WALLS WILL BE EXECUTED WITH ALL SAFETY MEASURES EXCEPT AT STRUCTURE PORTION.
7. CONSTRUCTION OF PROPOSED STAGE 1 BOX, RETAINING WALL RS WILL BE DONE EXCEPT AT IR STRUCTURE SIDE.
8. LAY THE BACKFILL MATERIAL.
9. BACKFILLING WILL BE DONE AROUND THE BOX.
10. CARRYOUT THE EARTH FILLING AND BLANKET MATERIAL IN BSRP LINE 2 AT STRUCTURE LOCATION.
STAGE 2: LAYING OF TRACKS FOR BSRP LINE-2 BY K-RIDE
11. TRACK WILL BE LAID FOR BSRP LINE-2 FROM POINT 'A' TO POINT 'B' (FOR A LENGTH OF 5.0 KM).
STAGE 3: CUT AND CONNECTION DURING TRAFFIC BLOCK BY K-RIDE.
12. CUT & CONNECTION OPERATION WILL BE CARRIED OUT AND POINT 'A1' WILL BE CONNECTED TO POINT 'A' WITH A LENGTH OF 58.5M
13. SIMULTANEOUSLY DURING TRAFFIC BLOCK, CUT & CONNECTION OPERATION WILL BE CARRIED OUT AND POINT 'B1' WILL BE CONNECTED TO POINT 'B' WITH A LENGTH OF 55.0M
14. AFTER CUT AND CONNECTION, INDIAN RAILWAY TRAFFIC WILL BE DIVERTED TO PROPOSED BSRP LINE-2.
15. EXISTING TRACK (REDUNDANT LINE BETWEEN POINT 'A1' & POINT 'B1') WILL BE CLEARED FROM THE SITE.
STAGE 4: CONSTRUCTION OF REMAINING BOX PORTIONS
16. AFTER DIVERTING INDIAN RAILWAY TRAFFIC TO BSRP LINE-2, EXISTING IR BOX TO BE DISMANTLED EXCEPT IR RETAINING WALL.
17. EXCAVATE THE EARTH TO THE REQUIRED DEPTH AT THE BOX PORTION PREPARE THE GROUND WELL BY RAMPING ETC AS NECESSARY AS PER REQUIREMENT.
18. LEVEL THE GROUND SURFACE.
19. DO NOT SCALE THE DRAWING.
20. FOUNDATION WORK FOR THE RETAINING WALLS WILL BE EXECUTED WITH ALL SAFETY MEASURES EXCEPT AT RUB PORTION.
21. CONSTRUCT THE REMAINING RCC BOX PORTION.
22. LAY THE BACKFILL MATERIAL.
23. BACKFILLING WILL BE DONE AROUND THE BOX.
24. BLANKETING WILL BE DONE FOR BSRP LINE-1,UP & DOWN MAIN LINE.
STAGE 5: LAYING OF TRACKS FOR BSRP LINE-1,UP & DOWN MAIN LINE BY K-RIDE.
25. TRACK WILL BE LAID FOR BSRP LINE-1,UP & DOWN MAIN LINE FROM POINT 'C' TO POINT 'D' (FOR A LENGTH OF 5.0 KM).
STAGE 6: CUT AND CONNECTION DURING TRAFFIC BLOCK BY K-RIDE.
26. DURING TRAFFIC BLOCK CUT & CONNECTION OPERATION WILL BE CARRIED OUT AND POINT 'C' WILL BE CONNECTED TO POINT 'A1' WITH A LENGTH OF 55.0M
27. SIMULTANEOUSLY CUT & CONNECTION OPERATION WILL BE CARRIED OUT AND POINT 'D' WILL BE CONNECTED TO POINT 'B1' WITH A LENGTH OF 55.0M
28. FINALLY EXISTING INDIAN RAILWAY TRAFFIC WILL BE RE-DIVERTED TO UP MAIN LINE.
STAGE 7:
29. COMPLETE THE WORK IN ALL RESPECTS SUCH AS CONSTRUCTION OF RETAINING WALL , PARAPET WALLS, SIDE DRAIN ETC.ON BOTH SIDES OF RCC BOX.
30. RESTORE NORMAL SPEED IN STAGES GRADUALLY AS PER PARA 2380(3) OF IRPWM, RAILWAY ELECTRIFICATION INSTALLATIONS WILL BE SHIFTED AS PER REQUIREMENT AT SITE, FOR WHICH NECESSARY POWER BLOCK TO BE PROVIDED.

DETAIL-'Z'

(SCALE 1:200)

TRACK DETAILS (PRO.BRIDGE)	
LOADING	: 25 T-AXLE LOAD 2008-STD
ALIGNMENT	: CURVE
GRADE	: 1 IN 582
RAIL LEVEL	: 902.994m
FORMATION LEVEL	: 902.232 m

TRACK DETAILS (EXG.BRIDGE)	
LOADING	: MBG-1987
ALIGNMENT	: CURVE
GRADE	: 1 IN 582
RAIL LEVEL	: 898.167 m
FORMATION LEVEL	: 898.572 m

BASE PRESSURE AT FOUNDATION LEVEL

STRUCTURE	MAX	MIN
RCC BOX (KN/M^2)	169.124	-
RETURN WALL-1 (KN/M^2) U/S	101.63	-
RETURN WALL-2 (KN/M^2) D/S	239.46	-

DETAILS OF EXISTING STRUCTURE SHOWN ARE AS PER JS/R
* THE GAP TO BE FILLED WITH SUITABLE SEALANT MATERIAL

BRIDGE DETAILS

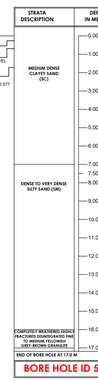
DESCRIPTION	EXISTING IR BRIDGE : 554	PROPOSED BSRP BRIDGE : 554
CHAINAGE AT CENTER OF BRIDGE (km)	214/037.244	8+380.224
RAIL LEVEL AT CENTER OF BRIDGE (m)	898.167 m	902.994 m
FORMATION LEVEL AT CENTRE OF BRIDGE (m)	897.572 m	902.232 m
DIMENSIONS (Nos x SPAN(m) x HEIGHT(m))	1 x 0.8 m DIA ##	1 x 2 x 1.8m
STRUCTURE CONFIGURATION	RCC PIPE	RCC BOX

GRADE OF CONCRETE

	GRADE
RCC BOX	M35
WEARING COURSE	M25
LEVELLING COURSE (PCC)	M20
RETURN WALL	M35

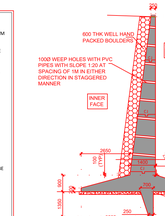
ABBREVIATIONS :

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



BORE HOLE ID 554(BH205)

MODUS OPERANDI:
1. IMPOSE 20KM/PH SPEED RESTRICTIONS DURING EXCAVATION WORKS,IF REQUIRED AS PER SITE CONDITION.
2. DIVERT OR RESTRICT THE WATER FLOW BY PROVIDING BUND/TEMPORARY PIPES 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. EARTH WORK EXCAVATION TO BE DONE FOR PROPOSED BARREL LENGTH WITH 350MM BASE COURSE FILL BENEATH THE BOX BOTTOM RAFT.
5. RETURNS & BRIDGE PROTECTION WORKS TO BE DONE ON IR SIDE.



RCC RETURN WALL SECTION (D/S) OB BSRP SIDE

(SCALE 1:200)

SPECIFICATION:

1. ALL WORKS TO BE CARRIED OUT AS PER THE FOLLOWING.
   a. RAILWAY BOARD'S 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(n 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 250MM THICK OVER 150MM THICK SAND MIXED WITH STONE CHIPS (AS PER PARA 205 OF INDIAN RAILWAY BRIDGE MANUAL, ANNEXURE 23).
4. RCC BOX - REINFORCED CEMENT CONCRETE M35 GRADE USING 20MM MAXIMUM SIZE GRADED HARD STONE AGGREGATE FOR WEARING COURSE.
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. CLEAR COVER TO MAIN REINFORCEMENT SHALL BE AS PER RDSO GUIDELINES.
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:- GC M25 GRAD USING 20MM MAX SIZE GRADED HARD STONE AGGREGATE OD APP QUALITY.
17. EXPANSION JOINTS SHALL BE PROVIDED AT THE END OF EACH DAYS WORK DEPRESSION IN ZIG-ZAG PATTERN TO BE FORMED BY EMBEDDING WOODEN SLEEPERS TO FORM KEY FOR ADEQUATE BOND FOR THE NEXT DAYS CONCRETING.
18. ON COMPLETION OF EACH DAY ALL THE LATANCE 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.
19. 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.
20. WEEP HOLES AS PER PARA 7.4 OF SUB-STRUCTURE CODE
21. CURTAIN WALL AND TOE WALL AS PER DESIGN
22. BACKFILL MATERIALS BEHIND RCC BOX TO PROVIDE AS PER PARA 7.5 OF IRS BRIDGE SUBSTRUCTURE &FOUNDATION CODE.
23. CONSTRUCTION JOINTS AS PER DESIGN.
24. GIR DOCUMENT NO:
   FOR BOX :DOC-BSRP-CR2-AG-DGN-GB-20-1131
   FOR RETURN WALL :DOC-BSRP-CR2-AG-DGN-GBRW-20-1131

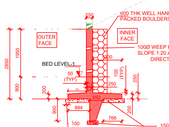
REFERENCE:

1. RCC BOX (CAST-IN-SITU) - DRG NO. RDSO/B-10155 & 101557
2. INUMERATION & BC DETAIL OF BOX - C02077-BSRP-CR2-C-NB-0-30-1095
3. INUMERATION & BC DETAIL OF RETURN WALL - C02077-BSRP-CR2-C-NB-0-20-1096
4. WEEP HOLES AS PER PARA 7.4 OF SUB-STRUCTURE CODE
5. CURTAIN WALL AND TOE WALL AS PER DESIGN
6. BACKFILL MATERIALS BEHIND RCC BOX TO PROVIDE AS PER PARA 7.5 OF IRS BRIDGE SUBSTRUCTURE &FOUNDATION CODE.
7. CONSTRUCTION JOINTS AS PER DESIGN.
8. GIR DOCUMENT NO:
   FOR BOX :DOC-BSRP-CR2-AG-DGN-GB-20-1131
   FOR RETURN WALL :DOC-BSRP-CR2-AG-DGN-GBRW-20-1131

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 209.320 KN/SQM
6. THE FOUNDATION LEVELS AND DEPTHS 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 SLEEPERS TO FORM KEY FOR ADEQUATE BOND FOR THE NEXT DAYS CONCRETING.
    b) ON COMPLETION OF EACH DAY ALL THE LATANCE 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. CONSTRUCTION JOINTS AS PER DESIGN SHOWN IN DRG.NO.
15. WHILE EXECUTION OF PRO. BRIDGE FOR STAGE-1, EXISTING FLOOD PROTECTIVE WORKS MAY GET DAMAGED. SO TO PROTECT THE EXG.BRIDGE PROPER SCOURING EFFECT FLOORING PROTECTIVE WORKS WILL BE PROVIDED.
16. SUITABLE SPEED RESTRICTIONS MAY BE IMPOSED BASED ON SITE CONDITIONS WHENEVER & WHEREVER IT 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 WHOE & SENIOR, CONSULTANT THAT SHALL INCLUDE NECESSARY SHORING ARRANGEMENTS TO BE PROVIDED FOR THE PROTECTION OF EXG.TRACK & FORMATION.
18. ALL PRECAUTIONS SHALL BE TAKEN TO ENSURE SAFETY OF TRAFFIC DURING EXECUTION OF WORK DISPLINE AT SITE" AND AS PER PCE CIRCULAR NO:01/2011 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-CORR2 OM/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. 200MM THK THERMOCOL SHEETS TO BE PROVIDED BETWEEN FACE WALL OF EXG.BRIDGE & PRO.RCC BOX & IF REQUIRED DOWEL BARS TO BE PROVIDED.
21. ALL THE DIMENSIONS OF EXISTING BRIDGE & FOUNDATION OF DROP WALL, CURTAIN WALL AND RETAINING WALL SHALL BE SUFFICIENTLY LOWER LEVEL THAN THE REQUIRED CALCULATED SCOUR LEVELS.
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 & 101557, AS PER BOX SIZE 1x2.0x1.8m

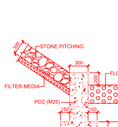
LOADING STANDARD
A) PRO BRIDGE 25T-AXLE LOAD 2008 STD
B) EXG. STD BRIDGE:MGB 1987



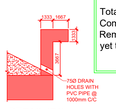
RCC RETURN WALL SECTION (U/S) ON IR SIDE

(SCALE 1:200)

PCC CURTAIN /DROP WALL DETAIL ON BSRP SIDE



TOE WALL DETAILS ON IR SIDE



DETAIL-'Z1'

SCALE 1:30

LEGENDS:
= COLOUR CODE BLACK = EXISTING WORKS
= COLOUR CODE RED = PROPOSED R/LY WORKS
= COLOUR CODE YELLOW = TO BE DISMANTLED

LEGENDS:
Total Barrel length of MIB 554 = 40.183m.
Completed Barrel length = 0m(BSRP Side).
Remaining Barrel length 40.183m is yet to be Construted.

REV.	DATE	
1	02.07.2024	FOR GOOD FOR CONSTRUCTION
0	06-06-2024	FOR GOOD FOR CONSTRUCTION

GENERAL CONSULTANTS:

EGIS-AECOM-WSP

EMPLOYER :

RAIL INFRASTRUCTURE DEVELOPMENT COMPANY (KARNATAKA) LIMITED

GENERAL ARRANGEMENT DRAWING

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

RECONSTRUCTION OF MINOR BRIDGE NO. 554 AT BSRP CH: 8+380.224 OF 1 x 2.00 X 1.8m (CLEAR HEIGHT 1.65m) RCC BOX (CAST-IN-SITU) IN LIEU OF THE EXG. BRIDGE OF 1 x 0.80m DIA RCC PIPE AT IR KM 214/037.244 BETWEEN NAGAWARA AND KANAKA NAGAR STATIONS

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

KRIDE.DRG.NO:

HQ.DRG.NO:

SCALE : AS SHOWN (UNLESS SPECIFIED OTHERWISE)

DRAWING NO. : C02077-BSRP-CR2-C-NB-0-30-1094

REVISION: 1

DWG STATUS: C

PRELIMINARY DWG (P), DEFINITIVE DWG (D), CONSTRUCTION DWG (C), AS BUILT DWG (B), SHOP DWG (S), MANUFACTURED DWG (M)

SHEET SIZE - A1