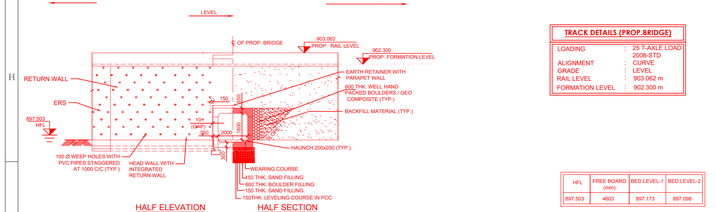
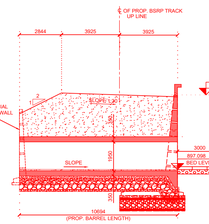
HEBBAL — KANAKA NAGAR



HALF ELEVATION — HALF SECTION

TRACK DETAILS (PROP.BRIDGE)		
LOADING	:	25 T-AXLE LOAD 2008-STD
ALIGNMENT	:	CURVE
GRADE	:	LEVEL
RAIL LEVEL	:	903.062 m
FORMATION LEVEL	:	902.300 m

HFL	FREE BOARD (mm)	BED LEVEL-1	BED LEVEL-2
897.503	4603	897.173	897.098



CONSTRUCTION STAGE - 1

CONSTRUCTION STAGE - 2

CONSTRUCTION STAGE - 3

BRIDGE DETAILS		
DESCRIPTION	EXG. IR BRIDGE : 556	PROP. BSRP BRIDGE : 556
CHAINAGE AT CENTER OF BRIDGE (km)	-	8+735.559
RAIL LEVEL AT CENTER OF BRIDGE (m)	-	903.062
FORMATION LEVEL AT CENTRE OF BRIDGE (m)	-	902.300
DIMENSIONS (Nos x SPAN(m) x HEIGHT(m))	-	1 x 2 x1.95
STRUCTURE CONFIGURATION	-	RCC BOX

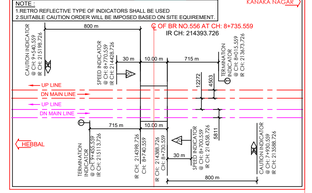
ABBREVIATIONS :		
℄	-	CENTER LINE
TYP	-	TYPICAL
THK	-	THICKNESS
U/S	-	UP STREAM SIDE
D/S	-	DOWN STREAM SIDE
DN	-	DOWN
BR	-	BRIDGE
FRL	-	FORMATION LEVEL
PROP.	-	PROPOSED
EXG.	-	EXISTING
CG	-	CONSTRUCTION JOINT

DEPTH OF CONSTRUCTION FOR 1 x 2 x 1.95 m RCC BOX		
RAIL 60 kg	:	172 mm
GR PAD	:	10 mm
PSC SLEEPER	:	230 mm
BALLAST CUSHION	:	350 mm
EARTH CUSHION	:	2977 mm
TOP SLAB	:	350 mm
TOTAL	=	4089 mm

GRADE OF CONCRETE	
GRADE	
RCC BOX	M30
WEARING COURSE	M25
LEVELLING COURSE (PCC)	M20
RETAINING/RETURN WALL	M35

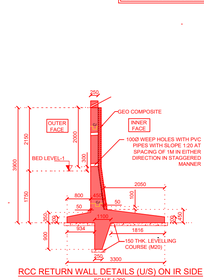
KEY PLAN SHOWING THE PROP.TY, ENGINEERING INDICATORS
(NOT TO SCALE)

NOTE:
1.RETRO REFLECTIVE TYPE OF INDICATORS SHALL BE USED
2.SUITABLE CAUTION ORDER WILL BE IMPOSED BASED ON SITE EQUIREMENT.



LEGENDS:

- = COLOUR CODE BLACK = EXG. WORKS
- = COLOUR CODE RED = PROP. RLY WORKS
- = COLOUR CODE YELLOW = TO BE DISMANTLED
- = COLOUR CODE MAGENTA = PROP. IR TRACK



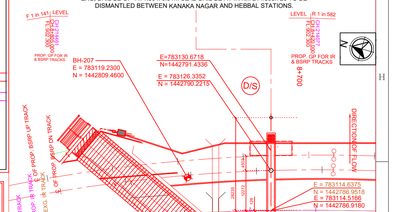
RCC RETURN WALL DETAILS (U/S) ON IR SIDE
SCALE 1:200

RCC RETURN WALL DETAILS (D/S) ON BSRP SIDE
SCALE 1:200

DETAILS OF EXISTING STRUCTURE SHOWN ARE AS PER JSVR

DETAILS OF EXISTING STRUCTURE SHOWN ARE AS PER JSVR

HEBBAL — KANAKA NAGAR



KEY PLAN

IR TRACK		
SKEW	:	NIL
GRADIENT	:	LEVEL
CURVE	:	R476

BSRP TRACK		
SKEW	:	NIL
GRADIENT	:	LEVEL
CURVE	:	R476

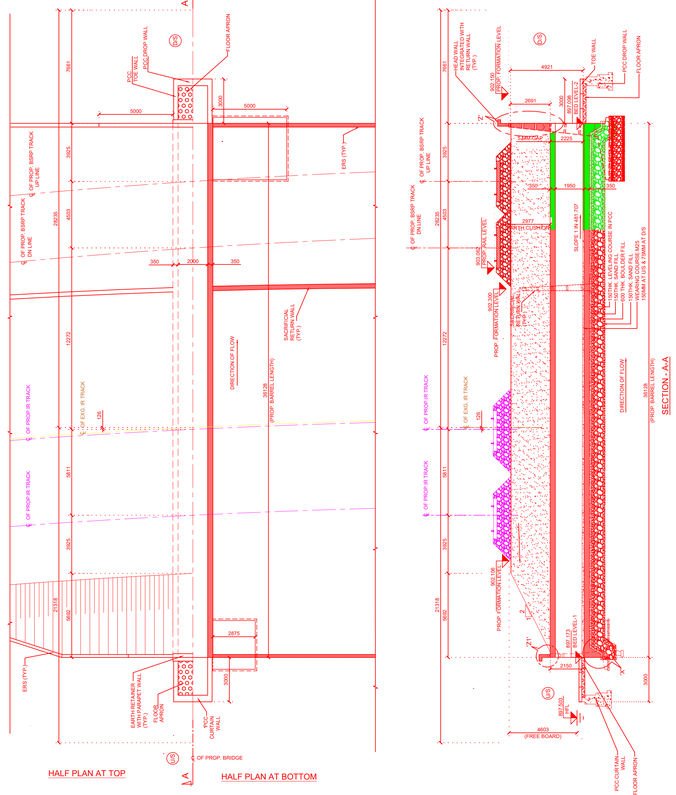
WATERWAY PARTICULARS		
CATCHMENT AREA	:	0.089 SQKM.
LATITUDE	:	13° 2' 17.336" N
LONGITUDE	:	77° 36' 36.970" E
TOPOSHEET NO	:	043.I5-12
Q50 DISCHARGE	:	2.11 CUMSEC
VELOCITY	:	1.6 M/S
DEPTH OF FLOW	:	0.36M
OHFL	:	897.503 M
Q50HFL (DESIGN HFL)	:	897.503 M

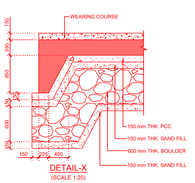
	REQUIRED	PROVIDED
WATERWAY AREA, Sqm	0.78	2.70
FREE BOARD, m	1.00	4.603
VERTICAL CLEARANCE, m	0.000	1.020
SCOUR DEPTH		
From GI HFL, m		1.836
Scour Level		895.667
From BL, m	1.431	1.5

EXISTING WATERWAY PARTICULARS	
	PROVIDED
WATERWAY AREA, Sqm	-
FREE BOARD, m	-
VERTICAL CLEARANCE, m	-

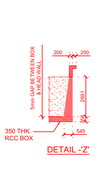
KEY PLAN NOTE:-
1. PROPOSALS ARE SHOWN IN RED.
2. RAILWAY BOUNDARY DISTANCE ARE WITH RESPECT TO CENTRE LINE OF EXG.TRACK.
3. TRACK IS STRAIGHT ON BRIDGE LOCATION.

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, USE FIGURED DIMENSIONS ONLY.
4. THE TYPE,GRADE,% 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 400 KN/M^2.
6. LENGTH OF PITCHING FOR APPROACHES SHALL BE DECIDED BY THE ENGINEER-IN-CHARGE OF THE WORK TO SUIT SITE CONDITIONS.
7. FOR DETAILS OF OLD BRIDGE (EXG.) AS PER THE SITE DETAILS PROVIDED.
8. DISMANTLING OF EXISTING BRIDGE AND PROTECTIVE PITCHING SHOULD BE DONE AS PER SITE CONDITION.
9. PROVIDE WEEP HOLES OF 100 MM DIA PVC PIPES @ 1000 MM C/C EACH DAYS WORK DEPRESSION IN ZIG-ZAG PATTERN TO BE FORMED BY EMBEDDING HORIZONTALLY SCANTLINGS OR SLEEPERS TO FORM KEY FOR ADEQUATE BOND FOR THE NEXT DAYS CONCRETING.
10. IN 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 GR. GP, SW CORRECT AS PER IS 1498 - 1970.
12. EXPOSURE CONDITION IS MODERATE.
13. CONCRETE GRADE AND CEMENT CONTENT MIX TO BE USED AND MIXED BY WEIGH BATCHING.
14. DISMANTLING ELEMENTS ARE SHOWN IN DOTTED LINE.
15. WHILE EXECUTION OF PROP. BRIDGE FOR STAGE-1, EXISTING FLOOR PROTECTIVE WORKS MAY GET DAMAGED, PROTECT THE EXG.BRIDGE FROM SCOURING EFFECT FLOOWING 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. ALL THE WORKS SHALL BE CARRIED OUT AS PER THE "GUIDELINES FOR SAFETY DURING 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. 20MM THK. THERMOCOL SHEETS TO BE PROVIDED BETWEEN FACE WALL OF EXG.BRIDGE & PROP. RCC BOX & IF REQUIRED DOWEL BARS TO BE FIXED.
19. ENGINEER IN-CHARGE SHALL ENSURE THAT LEVEL OF FOUNDATION OF DROP WALL, CURTAIN WALL AND RETURN WALL SHALL BE SUFFICIENTLY LOWER LEVEL THAN THE REQUIRED CALCULATED SCOUR LEVEL.
20.LEVEL THIS DRAWING IS PREPARED BASED ON RDSO STANDARD DRG. NO. RDSO/B/10155 & 101554. AS PER BOX SIZE 1x2.0x1.8

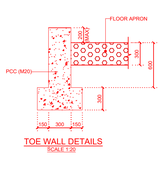




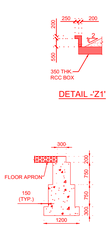
DETAIL-X
(SCALE 1:20)



DETAIL -'Z'

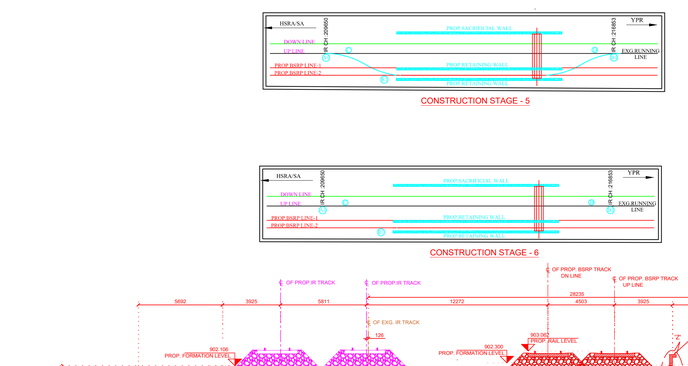


TOE WALL DETAILS
SCALE 1:20



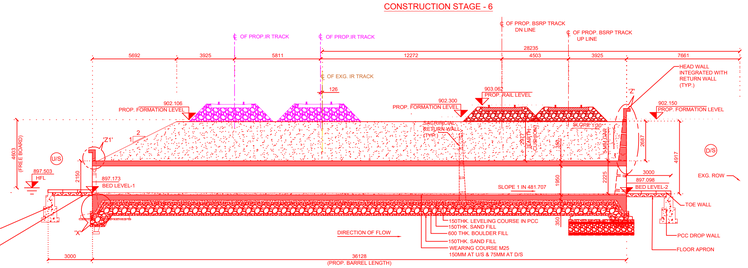
DETAIL -'Z1'

PCC CURTAIN WALL & DROP WALL DETAILS
SCALE 1:50



CONSTRUCTION STAGE - 5

CONSTRUCTION STAGE - 6



LEGENDS:

Total Barrel length of MIB 556 = 36.128
Completed Barrel length = 7.2m(BSRP Slde).
Remaining Barrel length 28.928m is yet to be Constructed.

MODUS OPERANDI:
PRELIMINARY WORKS
1. IMPOSE SPEED RESTRICTIONS 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- EXCAVATION OF FOUNDATION OF BSRP LINE-2
2. EXCAVATE THE EARTH TO THE REQUIRED DEPTH AT THE BOX PORTION,PREPARE THE GROUND WELL BY RAMMING ETC AS NECESSARY AS PER REQUIREMENT.
4. LEVEL THE GROUND SURFACE.
5. BASE COURSE OF 350 mm
6. BACKFILLING BEHIND OF THE RETURN WALLS WILL BE EXECUTED WITH ALL SAFETY MEASURES EXCEPT AT RUB PORTION.
7. CONSTRUCTION OF PROP. STAGE 1 BOX, RETAINING WALL R1 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 IR 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. CONSTRUCTION OF REMAINING BOX PORTIONS 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 58.5M
14. AFTER CUT AND CONNECTION, INDIAN RAILWAY TRAFFIC WILL BE DIVERTED TO MAIN LINE.
15. EXISTING TRACK (REDUNDANT LINE BETWEEN POINT 'A1' & POINT 'B1') WILL BE CLEARED FROM THE SITE.

STAGE 4- CONSTRUCTION OF REMAINING BOX PORTIONS
16. EXCAVATE THE EARTH TO THE REQUIRED DEPTH AT THE BEX PORTION,PREPARE THE GROUND WELL BY RAMMING ETC AS NECESSARY AS PER REQUIREMENT.
17. LEVEL THE GROUND SURFACE.
18. BASE COURSE OF 350 mm
19. FOUNDATION WORK FOR THE RETAINING WALLS WILL BE EXECUTED WITH ALL SAFETY MEASURES EXCEPT AT RUB PORTION.
20. CONSTRUCT THE REMAINING RCC BOX PORTION.
21. LAY THE BACKFILL MATERIAL.
22. BACKFILLING WILL BE DONE AROUND THE BOX.
23. 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 5.5 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 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 238(G) OF IRPWM. RAILWAY ELECTRIFICATION INSTALLATIONS WILL BE SHIFTED AS PER REQUIREMENT AT SITE, FOR WHICH NECESSARY POWER BLOCK TO BE PROVIDED.

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 THE UPSTREAM SIDE OF THE BOX.
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.

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(I) REVISED).
   d. IRS BRIDGE RULES 2014(REPRINT).
2. WING WALL/RETAINING – 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 23).
4. PCC – PLAIN CEMENT CONCRETE OF GRADE M20 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 & EARTH RETAINER OF BOX.
7. LOADING STANDARD – 25 T – 2008 AXLE LOAD
8. TOE WALL – GRADE M25 WITH DESIGN MIX.
9. REINFORCEMENT STEEL – HYSD BARS CONFORMING TO IS 1786-2008.
10. CEMENT 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. WHEREVER SBC IS LESS THAN THE REQUIREMENT AS PER RDSO DRAWING, IMPROVE THE SBC OF SOIL TWO LAYERS OF SAND 150mm & BOULDER FILLING OF 600MM THICKNESS EACH TO BE LAID & COMPACTED BEFORE LEVELLING COURSE FOR RCC BOX. RETURN WALL FOUNDATION & APRON FLOORING.
16.COPING– CC M25 GRAD USING 20MM MAX SIZE GRADED HARD STONE AGGREGATE OD APP QUALITY .
17. FOUNDATION – FOUNDATION OF RETURN WALL SHALL BE DESIGNED FOR SBC AS PER RDSO GUIDELINES.
18.FOR RETAINING STRUCTURE, SEPERATE DRAWING WILL BE SUBMITTED.
19.THE DIMENSION OF INTEGRATED RETURN WALL & SACRIFICIAL RETURN WALL SHOWN IN GAD ARE ONLY INDICATIVE AND TO FOLLOW AS PER APPROVAL DESIGN AND DRAWING.

REFERENCE:
1. RCC BOX(CAST-IN-SITU) - DRG NO. RDSO/B-10155 & 101554
2. RETURN WALL DESIGN DOCUMENT NO-DOC:BSRP-CR2-AG-DGN-RW-30-1105
3. RETAINING WALL - CI22077-BSRP-CR2-C-NB-0-30-1160
4. WEEP HOLES AS PER PARA 7.6 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. SHORING ARRANGEMENTS AS PER DESIGN.
8. GIR DOCUMENT NO.
   FOR BOX :DOC:BSRP-CR2-AG-DGN-GB-20-1134
   FOR RETURN WALL : DOC-BSRP-CR2-AG-DGN-GBRW-20-1134.
9. DESIGN OF TYPICAL EARTH RETAINER / PARAPET WALL (UPTO 2m HEIGHT)
   DOC-BSRP-CR2-AG-DGN-GEN-20-0000
   DWG NO.C22077-BSRP-CR2-C-GEN-20-2000

STRATA DESCRIPTION	DEPTH IN METERS	REMARKS (N-VALUE)	REMARKS SBC (kN/SQM)
LOOSE CLAYEY SAND (SC)	0.00 – 4.00	N = 7 (3/25)	114.35 (BOX)
STIFF CLAY OF LOW PLASTICITY (CL)		N = 11 (3/4/7)	171.15 (RW -U/S)
MEDIUM DENSE TO DENSE SILTY SAND (SM)	4.00 – 9.00	N = 15 (5/8/7)	400 (RW -D/S)
		N = 24 (7/9/15)	
		N = 30 (9/13/17)	
END OF BOREHOLE AT 9.00m (SM)		N = 36 (9/17/19)	

GROUND LEVEL 898.609
BED LEVEL 897.173 / 897.098
PROPOSED BOX FOUNDATION LEVEL 896.673
RETAINING FOUNDATION LEVEL 895.423 / 895.348

BOREHOLE ID 556 (BH-207)

BASE PRESSURE AT FOUNDATION LEVEL			
STRUCTURE		MAX.	MIN
RCC BOX (kN/m^2)		210.00	-
RETURN WALL - (U/S) (kN/m^2)		137.93	-
RETURN WALL – (D/S) (kN/m^2)		313.72	-

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.556 AT BSRP CH: 8+735.559 OF 1 X 2.0 X 1.95m (CLEAR HEIGHT - 1.8m) RCC BOX (CAST-IN-SITU) IN LIEU OF THE EXG. BRIDGE OF 1 x 1.80 x0.91m RCC SLAB AT IR KM 214/393.726 BETWEEN KANAKA NAGAR AND HEBBAL STATIONS

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

KRIDE.DRG.NO:

HQ.DRG.NO:

SCALE : (UNLESS SPECIFIED OTHERWISE)

DRAWING NO. : C22077-BSRP-CR2-C-NB-0-30-1103

SHEET SIZE - A1