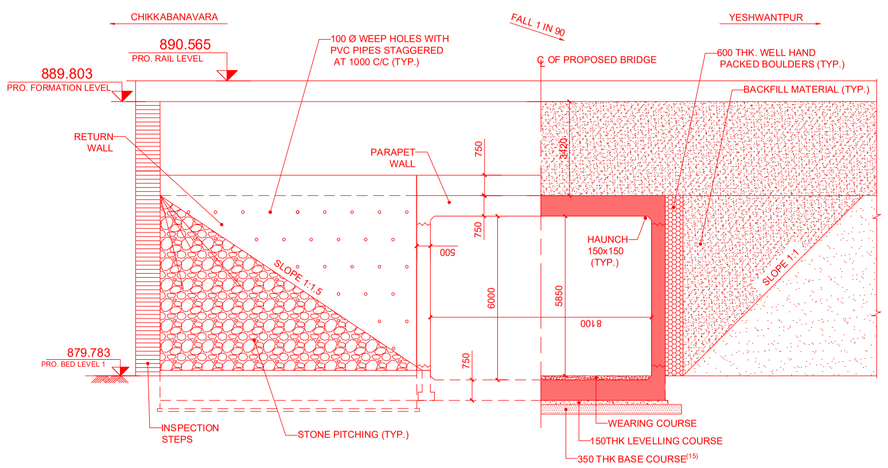
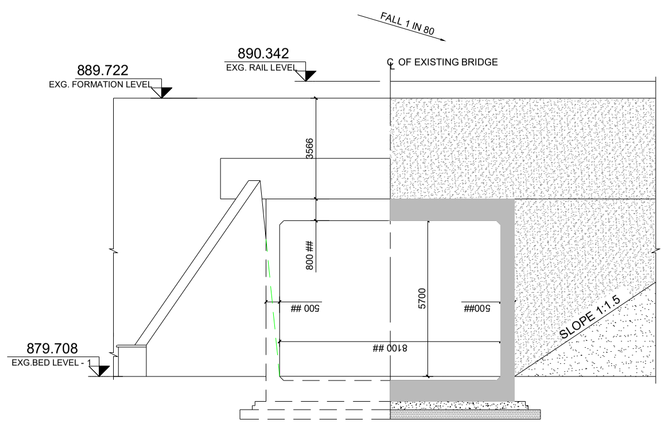




EXISTING BRIDGE ELEVATION

WATERWAY PARTICULARS		
CATCHMENT AREA	:	0.502 km²
LATITUDE	:	13° 3' 57.249" N
LONGITUDE	:	77° 31' 12.012" E
TOPOSHEET NO	:	043 L-11
Q50 DISCHARGE	:	5.28 Cum/sec
VELOCITY	:	0.94 m/sec
DEPTH OF FLOW	:	1.07 m
OHFL	:	882.754 m
Q50HFL (DESIGN HFL)	:	882.754 m

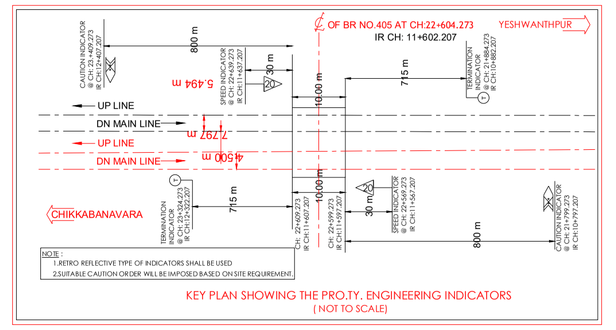
	REQUIRED	PROVIDED
WATERWAY AREA, Sqm	8.64	46.8
FREE BOARD, m	1	7.049
VERTICAL CLEARANCE, m	0	2.879
SCOUR DEPTH		
From Qf HFL, m	-	1.440
Scour Level	-	881.314
From B.L, m	-	-1.531

EXISTING WATERWAY PARTICULARS	
	PROVIDED
WATERWAY AREA, Sqm	39.330
FREE BOARD, m	7.141
VERTICAL CLEARANCE, m	3.639

DEPTH OF CONSTRUCTION FOR 1 x 8.1 x 6 m RCC BOX		
RAIL 60 kg	:	172 mm
GR PAD	:	6 mm
PSC SLEEPER	:	210 mm
BALLAST CUSHION	:	350 mm
EARTH CUSION	:	3420mm
TOP SLAB	:	750 mm
TOTAL	=	4908 mm

TRACK DETAILS (PRO.BRIDGE)		
LOADING	:	25 T-AXLE LOAD 2008-STD
ALIGNMENT	:	STRAIGHT
GRADE	:	F 1 IN 90
RAIL LEVEL	:	890.597 m
FORMATION LEVEL	:	889.803 m

TRACK DETAILS (EXG.BRIDGE)		
LOADING	:	MBG-1987
ALIGNMENT	:	STRAIGHT
GRADE	:	FALL I IN 80
RAIL LEVEL	:	890.342 m
FORMATION LEVEL	:	889.722 m



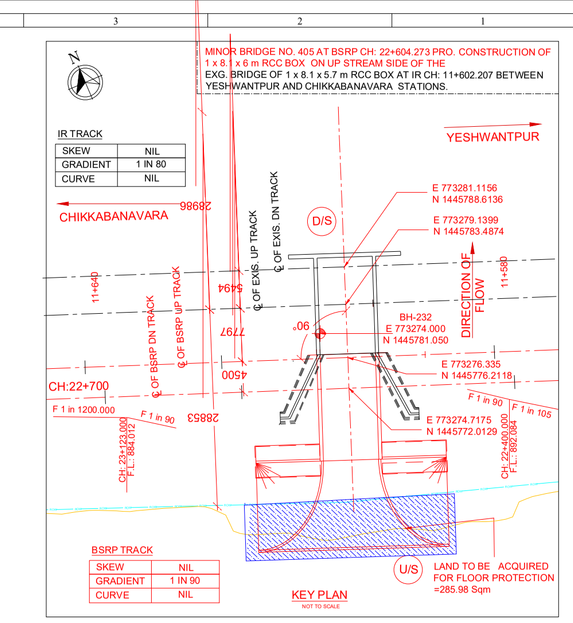
KEY PLAN SHOWING THE PRO.TY, ENGINEERING INDICATORS
(NOT TO SCALE)

BASE PRESSURE AT FOUNDATION LEVEL		
STRUCTURE	MAX	MIN
RCC BOX (kN/m²)	235.44	——
RETURN WALL (kN/m²)	301.75	——

BRIDGE DETAILS		
DESCRIPTION	EXISTING IR BRIDGE : 405	PROPOSED BSRP BRIDGE : 405
CHAINAGE AT CENTER OF BRIDGE (km)	11+602.207	22+601.495
RAIL LEVEL AT CENTER OF BRIDGE (m)	890.342	890.565
FORMATION LEVEL AT CENTRE OF BRIDGE (m)	889.722	889.803
DIMENSIONS (Nos x SPAN(m) x HEIGHT(m))	1 x 8.1 x 5.7 ##	1 x 8.1 x 6
STRUCTURE CONFIGURATION	RCC BOX	RCC BOX

GRADE OF CONCRETE		
	GRADE	
i.	RCC BOX	M35
ii.	WEARING COURSE	M25
iii.	LEVELING COURSE (PCC)	M20
iv.	RETAINING/RETURN WALL	M35

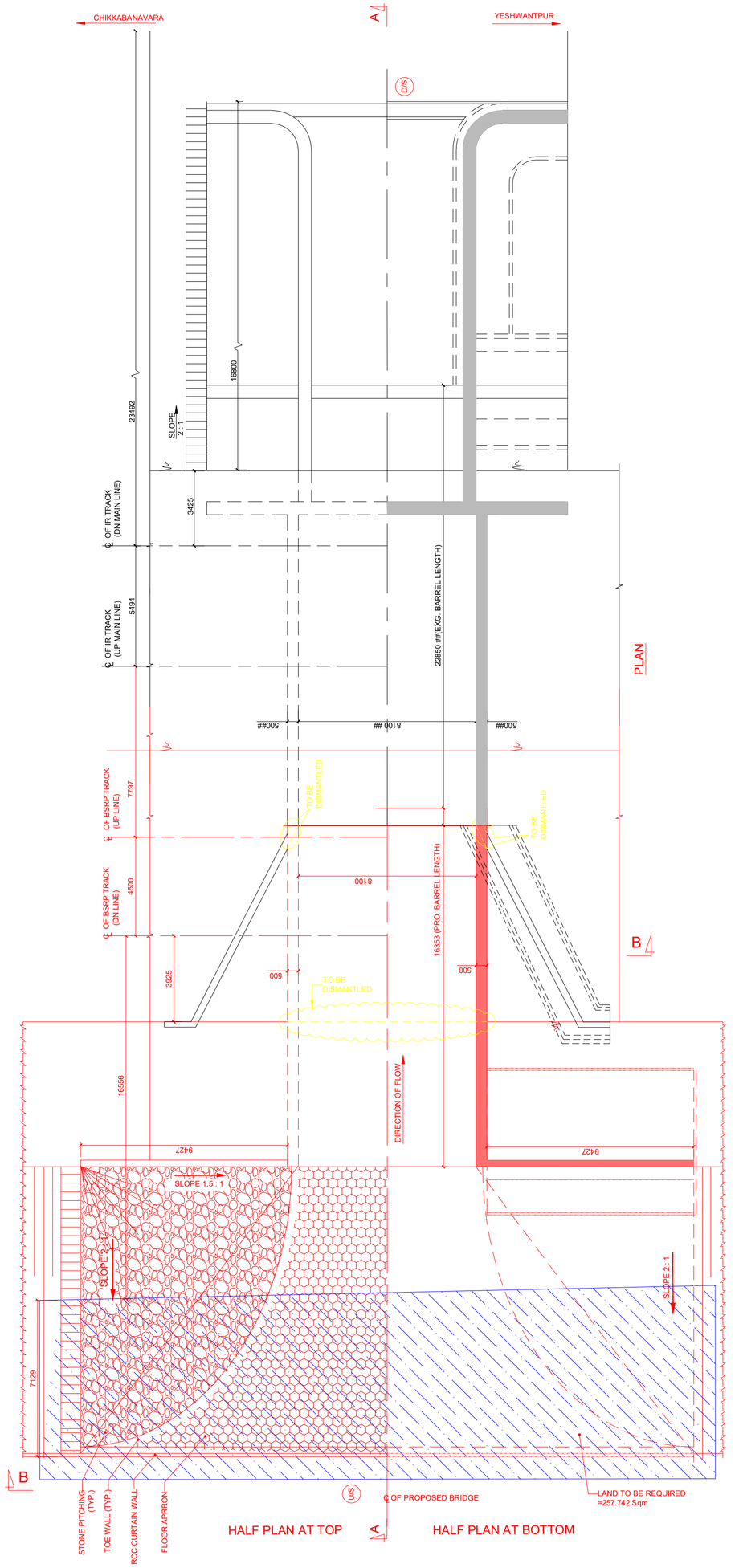
ABBREVIATIONS :		
℄	-	CENTER LINE
TYP	-	TYPICAL
THK.	-	THICKNESS
U/S	-	UP STREAM SIDE
D/S	-	DOWN STREAM SIDE
DN	-	DOWN
BR	-	BRIDGE
FRL	-	FORMATION LEVEL

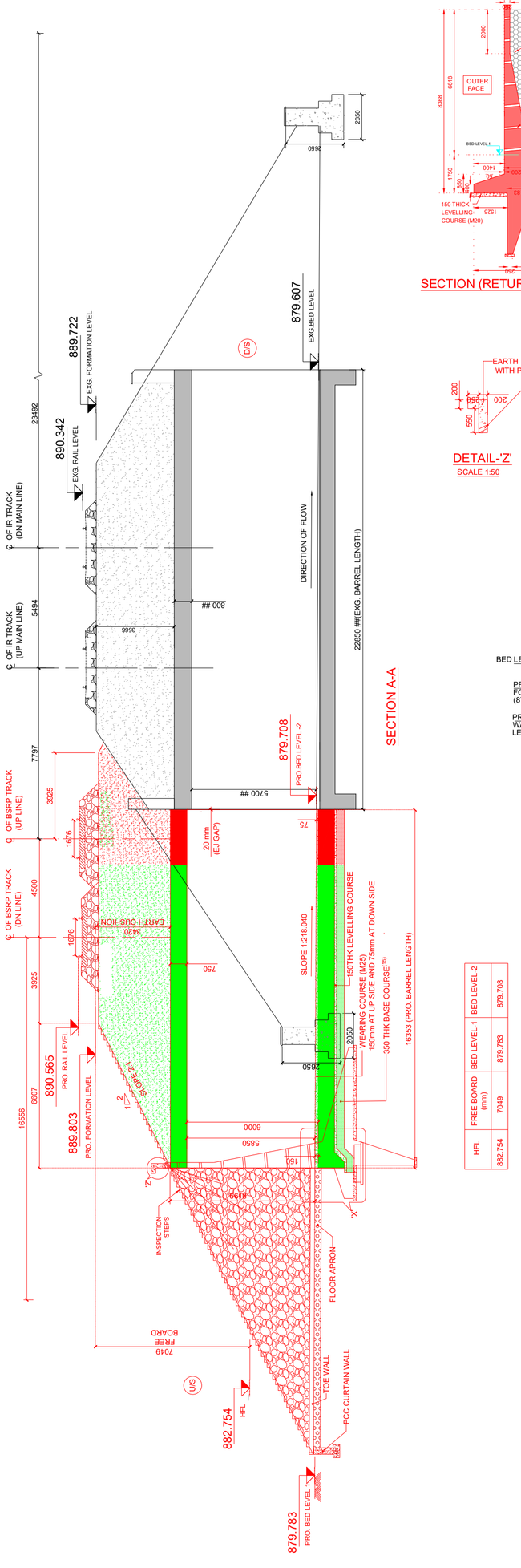


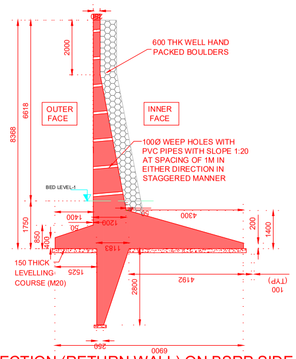
KEY PLAN NOTE:-

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.

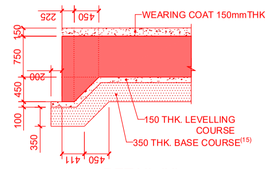
HALF ELEVATION HALF SECTION



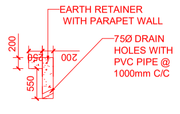




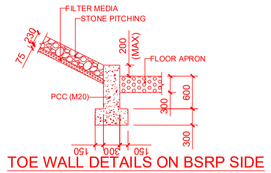
SECTION (RETURN WALL) ON BSRP SIDE



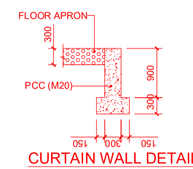
DETAIL-'X'
SCALE 1:50



DETAIL-'Z'
SCALE 1:50



TOE WALL DETAILS ON BSRP SIDE
SCALE 1:50



CURTAIN WALL DETAIL ON IR SIDE
SCALE 1:50

STRATA DESCRIPTION	DEPTH IN METERS	REMARKS (N-VALUE)	REMARKS SBC (kN/SQM)
GROUND LEVEL : 882.705	0.00		
	0.50		
MEDIUM DENSE TO VERY DENSE SILTY SAND WITH MICA (SM)	1.00		
	1.50		
	2.00	N = 11 (3/4/7)	
	2.50		
	3.00	N = 17 (5/5/12)	
BED LEVEL 879.708 / 879.783	3.50		
	4.00		400(BOX)
PROPOSED BOX FOUNDATION LEVEL (878.883)	4.50		400 (RW)
	5.00	R (13/14/50 FOR 130 mm)	
PROPOSED RETURN WALL FOUNDATION LEVEL (878.583)	5.50		
	6.00		
COMPLETELY WEATHERED, FRACTURED, MEDIUM TO COARSE GRAINED, WHITISH GREY GRANULITE	6.50		
	7.00		
	7.50		
	8.00		
COMPLETELY WEATHERED, HIGHLY FRACTURED, DISINTEGRATED, GREENISH WHITE-GREY GRANULITE	8.50		
	9.00		
HIGHLY WEATHERED, GREYISH WHITE MEDIUM TO COARSE GRAINED GRANULITE FOLLOWED BY GREYISH BLACK DOLERITE	9.50		
	10.00		
HIGHLY TO MODERRATELY WEATHERED, WHITISH GREY, FINE TO MEDIUM GRAINED DOLERITE	10.50		
	11.00		
	11.50		
	12.00		
	12.50		
	13.00		
	13.50		
END OF BOREHOLE AT 14.00m	14.00		

BED LEVEL-2	879.708
BED LEVEL-1	879.783
FREE BOARD (mm)	7049
HFL	882.754

BOREHOLE ID : 405(BH-232)

LEGENDS:

Total Barrel length of MIB 405 = 16.353m.
Completed Barrel length = 13.853m(BSRP Slde)
Remaining Barrel length 2.5m is yet to be constructed

LEGENDS:

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

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/RETURN 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 :- 100 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/RETURN 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 GRADE USING 20MM MAX.SIZE GRADED HARD STONE AGGREGATE OD APP.QUALITY.
17. GROUND IMPROVED SOIL SHALL BE OF SOIL QUALITY CLASS SQ2 AND SQ3 AS PER RDSO GUIDELINES.
18. FOR RETURN STRUCTURE, SEPARATE DRAWING WILL BE SUBMITTED.
19. TYPICAL COLLAR SHALL BE PROVIDED BETWEEN THE EXISTING AND PROPOSED STRUCTURE AS PER LETTER BEARING NO.SWRW.70/POLICY/2022 DATED ON 08.09.2022 ISSUED BY SWR.

REFERENCE:

1. K-RIDE BOX DESIGN DOCUMENT NO- DOC-BSRP-CR2-AG-DGN-BR-20-1567.
2. K-RIDE SUBSTRUCTURE BOX - O22077-BSRP-CR2-C-NB-0-20-1211
3. RETURN WALL - O22077-BSRP-CR2-C-NB-0-20-1212
4. WEEP HOLES AS PER PARA 7.6 OF SUB-STRUCTURE CODE
5. BALLAST RETAINER AS PER DESIGN.MONOLOTHIC WITH BOX
6. CURTAIN WALL AND TOE WALL AS PER DESIGN
7. BACKFILL MATERIALS BEHIND RCC BOX TO PROVIDE AS PER PARA 7.5 OF IRS BRIDGE SUBSTRUCTURE &FOUNDATION CODE
8. SHORING ARRANGEMENTS AS PER DESIGN.
9. GIR DOCUMENT NO.,
   FOR BOX :DOC:-BSRP-CR2-AG-DGN-GB-20-1164
   FOR RETURN WALL : DOC-BSRP-CR2-AG-DGN-GBRW-20-1164

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.

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 400KN/m².
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 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, 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 DISIPLINE 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-CCR2 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 RETURN 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. K-RIDE BOX DESIGN DOCUMENT NO- DOC-BSRP-CR2-AG-DGN-BR-20-1567 & K-RIDE SUBSTRUCTURE BOX - O22077-BSRP-CR2-C-NB-0-20-1211 WITH 4M FILL HEIGHT

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

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

DRAWING TITLE :

MINOR BRIDGE NO. 405 AT BSRP CH: 22+604.273 PRO. CONSTRUCTION OF 1 x 8.1 x 6 m(CLEAR HEIGHT 5.85m) RCC BOX ON UP STREAM SIDE OF THE EXG. BRIDGE OF 1 x 8.1 x 5.7 m RCC BOX AT IR CH: 11+602.207 BETWEEN YESHWANTPUR AND CHIKKABANAVARA STATIONS.

KRIDE.DRG.NO:

HQ.DRG.NO:

SCALE - 1 : 100 (UNLESS SPECIFIED OTHERWISE)	DRAWING NO. : O22077-BSRP-CR2-C-NB-0-20-1210	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