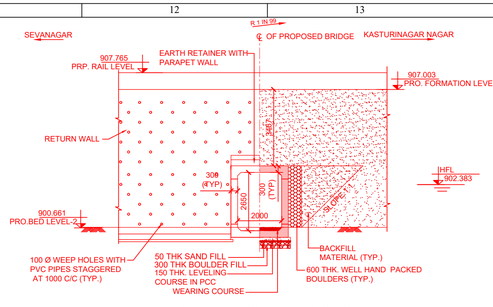
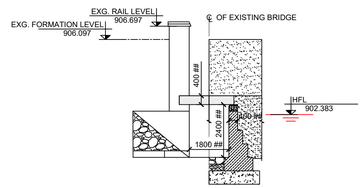


HALF ELEVATION HALF SECTION



EXISTING BRIDGE ELEVATION

STRATA DESCRIPTION	DEPTH IN METERS	REMARKS N(OW COUNTS (N-VALUE))	SBC (KN/SQM)
STIFF CLAY OFMEDIUM PLASTICITY (CI)	0.00–3.00	N=8 (3/4/4)	200.91 (BOX) 238.45 (RW)
MEDIUM DENSE CLAYEY SAND (SC)	3.00–4.50	N=21 (6/8/13)	
STIFF INORGANIC CLAYEY SAND (MI)	4.50–8.00	N=14 (4/5/9)	
MEDIUM DENSE SILTY SAND (SM)	8.00–9.00	N=19 (5/8/11)	
		N=18 (4/6/12)	
		N=22 (6/9/13)	

GROUND LEVEL 902.241

BED LEVEL 900.736 / 900.661

PROPOSED BOX FOUNDATION LEVEL 900.286

RETURN WALL FOUNDATION LEVEL 898.911

BOREHOLE ID: 537(BH-197)

WATERWAY PARTICULARS

CATCHMENT AREA	:	0.241 SQKM.
LATITUDE	:	13° 2' 28.576" N
LONGITUDE	:	77° 35' 42.420" E
TOPOSHEET NO	:	D43 R-12
Q50 DISCHARGE	:	5.76 CUM/SEC
VELOCITY	:	1.98 M/S
DEPTH OF FLOW	:	1.647 M
OHFL	:	902.383 M
Q50HFL (DESIGN HFL)	:	902.383 M

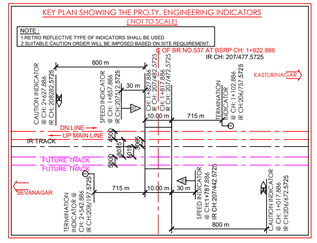
	REQUIRED	PROVIDED
WATERWAY AREA, Sqm	3.294	5
FREE BOARD, m	1	4.470
VERTICAL CLEARANCE, m	0	0.853
SCOUR DEPTH		
From Qf HFL, m	3.696	
Scour Level	898.687	
From B.L, m	1.974	

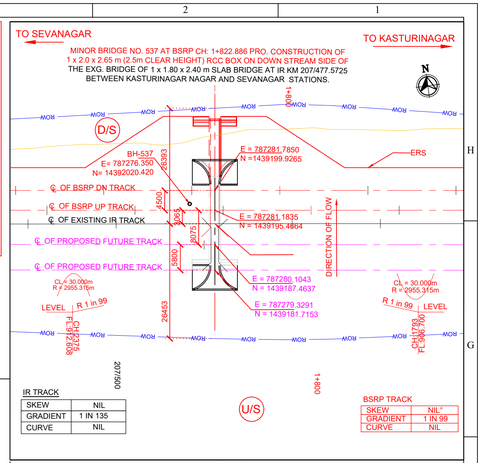
EXISTING WATERWAY PARTICULARS

	PROVIDED
WATERWAY AREA, Sqm	4.32
FREE BOARD, m	3.714
VERTICAL CLEARANCE, m	0.753

DETAILS OF EXISTING STRUCTURE SHOWN ARE AS PER JSVR

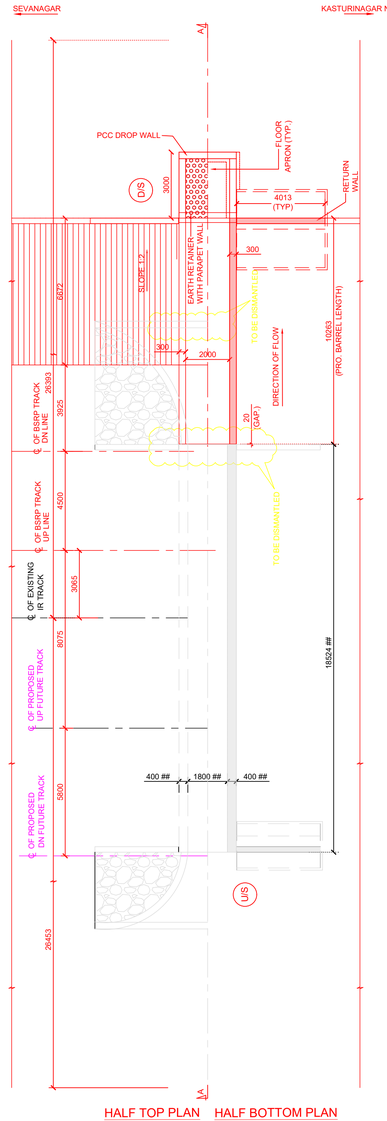
* THE GAP TO BE FILLED WITH SUITABLE SEALANT MATERIAL

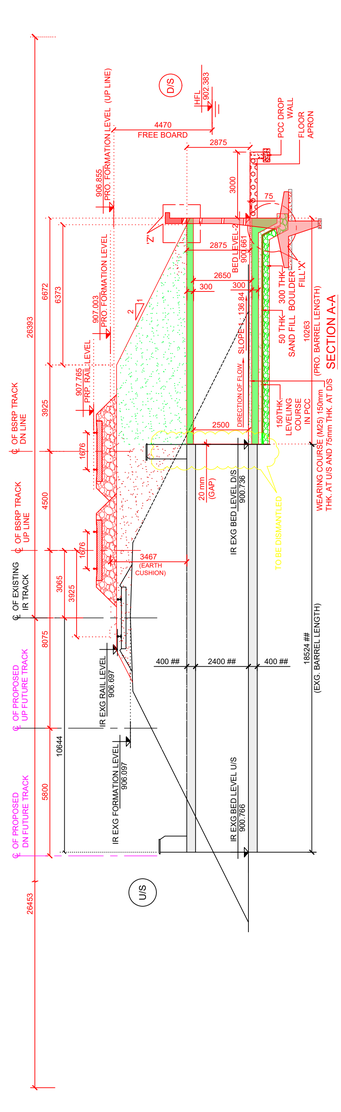




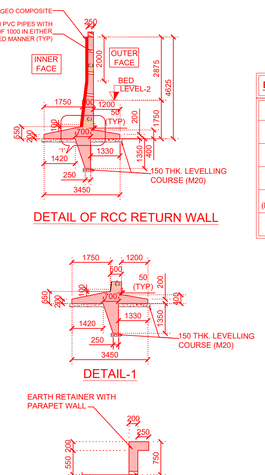
KEY PLAN
(SCALE 1:500)

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 CURVED ON BRIDGE LOCATION.



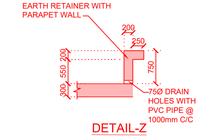


HALF TOP PLAN HALF BOTTOM PLAN
SCALE 1:100

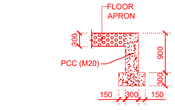


DETAIL OF RCC RETURN WALL

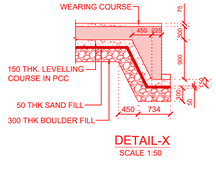
DETAIL-1



DETAIL-Z
SCALE 1:50



PCC DROP WALL DETAILS
SCALE 1:50



DETAIL-X
SCALE 1:50

BRIDGE DETAILS

DESCRIPTION	EXISTING IR BRIDGE : 537	PROPOSED BSRP BRIDGE : 537
CHAINAGE AT CENTER OF BRIDGE (km)	207/477.5725	1+822.886
RAIL LEVEL AT CENTER OF BRIDGE (m)	906.697	907.765
FORMATION LEVEL AT CENTRE OF BRIDGE (m)	906.097	907.003
DIMENSIONS (Nos x SPAN(m) x HEIGHT(m))	1 x 1.80 x 2.40##	1 x 2.0 X 2.65
STRUCTURE CONFIGURATION	RCC SLAB	RCC BOX

BASE PRESSURE AT FOUNDATION LEVEL

STRUCTURE	MAX	MIN
RCC BOX (KN/M^2)	129.88	-
RETURN WALL (KN/M^2)	152.64	-

HFL	FREE BOARD (mm)	BED LEVEL-1	BED LEVEL-2
902.383	4470	900.736	900.661

TRACK DETAILS (EXG.BRIDGE)

LOADING	:	MBG-1987
ALIGNMENT	:	STRAIGHT
GRADE	:	1 IN 135
RAIL LEVEL	:	906.697 m
FORMATION LEVEL	:	906.097m

DEPTH OF CONSTRUCTION FOR 1 x 2 x 2.65 m RCC BOX

RAIL 60 kg	:	172 mm
GR PAD	:	6 mm
PSC SLEEPER	:	210 mm
BALLAST CUSHION	:	350 mm
EARTH CUSHION	:	3467 mm
TOP SLAB	:	300 mm
TOTAL	=	4505 mm

GRADE OF CONCRETE

	GRADE	
i.	RCC BOX	M35
ii.	WEARING COURSE	M25
iii.	LEVELLING COURSE (PCC)	M20
iv.	RETAINING/RETURN WALL	M35
v.	DROP/CURTAIN WALL	M25

TRACK DETAILS (PRO.BRIDGE)

LOADING	:	25 T-AXLE LOAD 2008-STD
ALIGNMENT	:	STRAIGHT
GRADE	:	1 IN 99
RAIL LEVEL	:	907.765 m
FORMATION LEVEL	:	907.003 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

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/c REVISED).
   d. IRS BRIDGE RULES 2014(REPRINT).
2. RETURN 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 :- 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/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. WHEREVER SBC IS LESS THAN THE REQUIREMENT AS PER RDSO DRAWING, IMPROVE THE SBC OF SOIL TWO LAYERS OF 50MM SAND & BOULDER FILLING OF 300MM 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. GROUND IMPROVED SOIL SHALL BE OF SOIL QUALITY CLASS SO2 AND SC2) AS PER RDSO GUIDELINES.
18. 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.
19. THE DIMENSION OF 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 & 10155/5
2. BOX DESIGN DOCUMENT NO- DOC-BSRP-CR2-AG-DGN-BR-30-1503
3. SUBSTRUCTURE BOX - O22077-BSRP-CR2-C-NB-0-30-1011
4. RETURN WALL - O22077-BSRP-CR2-C-NB-0-30-1012
5. WEEP HOLES AS PER PARA 7.6 OF SUB-STRUCTURE CODE
6. CURTAIN WALL AND TOE WALL AS PER DESIGN
7. BACKFILL MATERIALS SHOWN 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-20-1103 FOR RETURN WALL :
   DOC-BSRP-CR2-AG-DGN-GBRW-20-1103

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/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 200.91 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. PRO.BRIDGE WITH UP & DN LINE IS ON THE DN 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. 20MM THK THERMOCOL SHEETS TO BE PROVIDED BETWEEN FACE WALL OF EXG.BRIDGE & PRO.RCC BOX & IF REQUIRED DOWEL BARS TO BE FIXED.
20. 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.
21. THIS DRAWING IS PREPARED BASED ON RDSO STANDARD DRG NO: RDSO/B-10155 & 10155/5 AS PER BOX SIZE 1x2.0x2.5m

LEGENDS:

Total Barrel length of MIB 537 = 10m.
Completed Barrel length = 10.3m(BSRP SIde).
Remaining Barrel length 0m

LOADING STANDARD

A) PRO.BRIDGE:25T-AXLE LOAD 2008 STD

B) EXG. STD BRIDGE:MGB 1987

GOOD FOR CONSTRUCTION

GENERAL CONSULTANTS:

egis AECOM 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. 537 AT BSRP CH: 1+822.886 PRO. CONSTRUCTION OF 1 x 2.0 x 2.65 m (2.5m CLEAR HEIGHT) RCC BOX ON DOWN STREAM SIDE OF THE EXG. BRIDGE OF 1 x 1.80 x 2.40 m SLAB BRIDGE AT IR KM 207/477.5725 BETWEEN KASTURINAGAR NAGAR AND SEVANAGAR STATIONS.

KRIDE.DRG.NO:

HQ.DRG.NO:

SCALE	DRAWING NO. :	REVISION	DWG STATUS
- 1 : 100 (UNLESS SPECIFIED OTHERWISE)	O22077-BSRP-CR2-C-NB-0-30-1010	2	C

PRELIMINARY DWG (P), DEFINITIVE DWG (D), CONSTRUCTION DWG (C), AS BUILT DWG (B), SHOP DWG (S), MANUFACTURED DWG (M) SHEET SIZE - A1