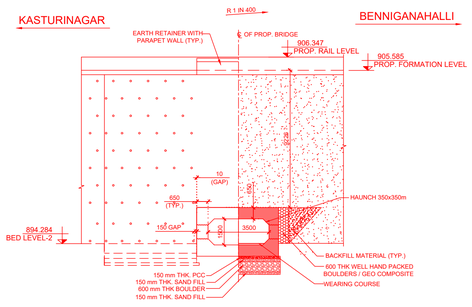
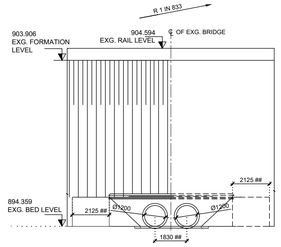
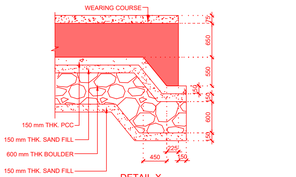
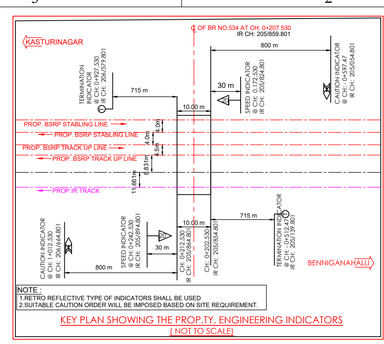
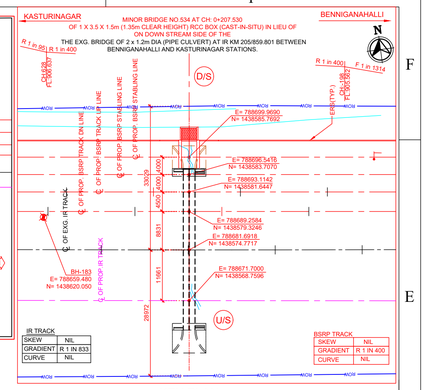




HFL	FREE BOARD (mm)	BED LEVEL-1	BED LEVEL-2
895.559	9609	894.359	894.284



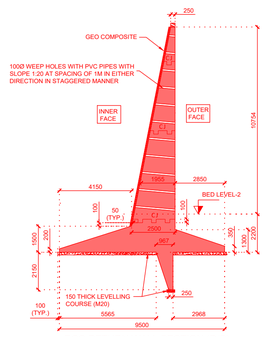


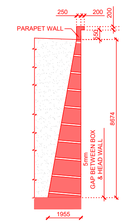


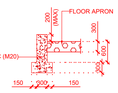
KEY PLAN

Scale: 1:750

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.







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.	-	PROP.
EXG.	-	EXISTING
EJ	-	EXPANSION JOINT
CJ	-	CONSTRUCTION JOINT

LEGENDS:

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

BASE PRESSURE AT FOUNDATION LEVEL

STRUCTURE	MAX	MIN
RCC BOX (KN/M^2)	300	-
RETURN WALL (KN/M^2)	378.76	-

DETAILS OF EXISTING STRUCTURE SHOWN ARE AS PER JSVR.

* THE GAP TO BE FILLED WITH SUITABLE SEALANT MATERIAL

TRACK DETAILS (EXG.BRIDGE)

LOADING	:	MBG-1987
ALIGNMENT	:	STRAIGHT
GRADE	:	R 1 IN 833
RAIL LEVEL	:	904.594 m
FORMATION LEVEL	:	903.906m

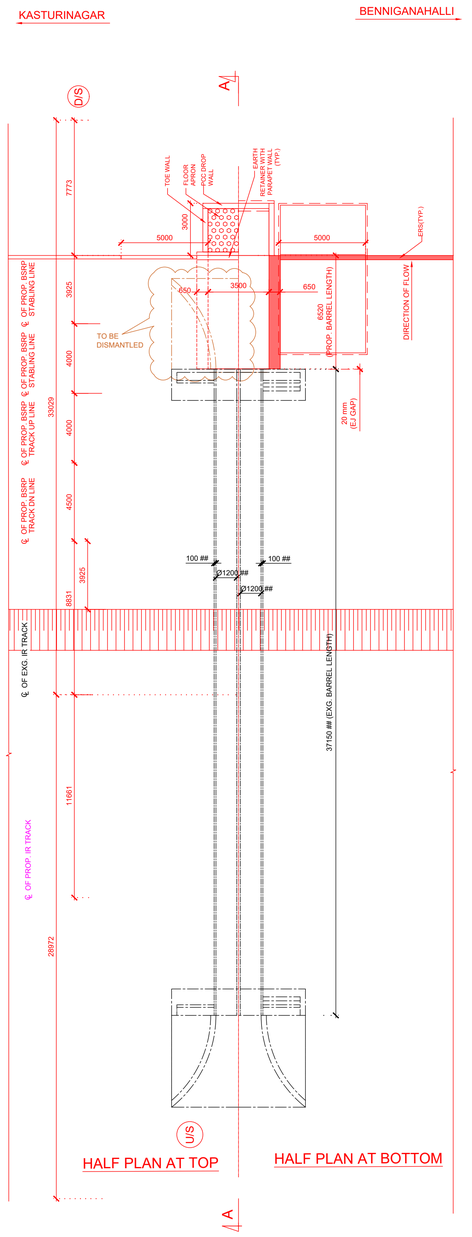
WATERWAY PARTICULARS

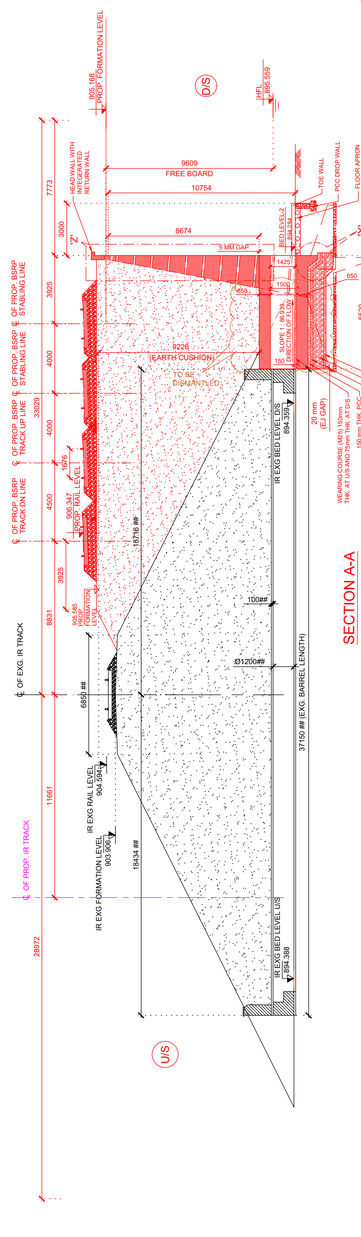
CATCHMENT AREA	:	0.104 SQKM
LATITUDE	:	12°59'58.1247N
LONGITUDE	:	77°39'40.167"E
TOPOSHEET NO	:	D43 N-12
Q50 DISCHARGE	:	4.28 CUMSEC
VELOCITY	:	1.87 MTSEC
DEPTH OF FLOW	:	0.66 M
OHFL	:	895.559 M
Q50HFL (DESIGN HFL)	:	895.559 M

	REQUIRED	PROVIDED
WATERWAY AREA, Sqm	2.31	4.725
FREE BOARD, m	1	9.609
VERTICAL CLEARANCE, m	0.000	0.15
SCOUR DEPTH		
Scour Of HFL, m		2.186
Scour Level		893.373
Foot B.L, m		0.911

EXISTING WATERWAY PARTICULARS

	PROVIDED
WATERWAY AREA, Sqm	2.400
FREE BOARD, m	8.347
VERTICAL CLEARANCE, m	0.000





STRATA DESCRIPTION	DEPTH IN METERS	REMARKS (N-VALUE)	SBC (kN/SQM)
DENSE, SILTY SAND (SM)	0.00 – 2.50	N = 36 (9/15/21)	254.09(BOX)
	2.50 – 3.00	N = 34 (10/14/20)	400(RW)
DENSE, CLAYEY SAND (SC)	3.00 – 5.50	N = 40 (11/15/25)	
	5.50 – 6.00	N = 36 (11/16/20)	
VERY DENSE SILTY SAND (SM)	6.00 – 7.50	R = 25/50 FOR 130MM	
	7.50 – 8.00	R = 35/50 FOR 110MM	
END OF BOREHOLE AT 8.00m			

GROUND LEVEL: 895.597
BED LEVEL 894.284/894.359
PROP_BOX FOUNDATION LEVEL 893.559
RETURN WALL FOUNDATION LEVEL 892.084

BOREHOLE ID 534 (BH-183)

BRIDGE DETAILS

DESCRIPTION	EXISTING IR BRIDGE : 534	PROP. BSRP BRIDGE : 534
CHAINAGE AT CENTER OF BRIDGE (km)	205/859.801	0+207.530
RAIL LEVEL AT CENTER OF BRIDGE (m)	904.594	906.347
FORMATION LEVEL AT CENTRE OF BRIDGE (m)	903.906	905.585
DIMENSIONS (Nos x SPAN(m) x HEIGHT(m))	2 x 1.2 DIA ##	1 x 3.5 X 1.5
STRUCTURE CONFIGURATION	PIPE CULVERT	RCC BOX (EXTENSION)

DEPTH OF CONSTRUCTION FOR 1 x 3.5 x 1.5 m RCC BOX

RAIL 60 kg	:	172 mm
GR PAD	:	10 mm
PSC SLEEPER	:	230 mm
BALLAST CUSHION	:	350 mm
EARTH CUSHION	:	9226 mm
TOP SLAB	:	450 mm
TOTAL	=	10438 mm

TRACK DETAILS (PROP.BRIDGE)

LOADING	:	25 T-AXLE LOAD 2008-STD
ALIGNMENT	:	STRAIGHT
GRADE	:	R 1 IN 400
RAIL LEVEL	:	906.347 m
FORMATION LEVEL	:	905.585 m

GRADE OF CONCRETE

	GRADE	
i.	RCC BOX	M30
ii.	WEARING COURSE	M25
iii.	LEVELLING COURSE (PCC)	M20
iv.	RETAINING/RETURN WALL	M35

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 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 & 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 REQUIRMENT AS PER RDSO DRAWING, IMPROVE THE SBC OF SOIL TWO LAYERS OF 150MM SAND & BOULDER FILLING OF 600MM THICKNESS EACH TO BE LAID & COMPACTED BEFORE LEVELING 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 SG2 AND SG3 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 & RDSO/B-10155/9.
2. NUMERATION & RC DETAIL OF BOX - O22077-BSRP-CR2-C-NB-0-30-2002
3. NUMERATION & RC DETAIL OF RETURN WALL - O22077-BSRP-CR2-C-NB-0-30-2003
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. GR DOCUMENT NO.
   FOR BOX :DOC-BSRP-CR2-AG-DGN-GB-20-1100
   FOR RETURN WALL:- DOC-BSRP-CR2-AG-DGN-GBRW-20-1100
9. DESIGN OF TYPICAL EARTH RETAINER / PARAPET WALL (UPTO 2m HEIGHT)
   DOC-BSRP-CR2-AG-DGN-GEN-20-2000
   DWG NO.O22077-BSRP-CR2-C-GEN-20-2000

BRIDGE STRENGTH CERTIFICATE

CERTIFIED THAT THE PRO RCC BOX BRIDGE, BR. NO. 534 OF 1x3.5x1.5m AT BSRP CH: 0+207.530, IR KM 205/859.801 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 VII 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.

L&T | 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/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 254.09 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. 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.
10. 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.
11. EXPOSURE CONDITION IS MODERATE.
12. CONTROLLED CONCRETE AS PER DESIGN MIX TO BE USED AND MIXED BY WEIGH BATCHING.
13. DISMANTLING ELEMENTS ARE SHOWN IN DOTTED LINE.
14. WHILE EXECUTION OF PROP. BRIDGE FOR STAGE-1, EXISTING FLOOR PROTECTIVE WORKS MAY GET DAMAGED, PROTECT THE EXG.BRIDGE FROM SCOURING EFFECT FLOORING PROTECTIVE WORKS WILL BE PROVIDED.
15. SUITABLE SPEED RESTRICTIONS MAY BE IMPOSED BASED ON SITE CONDITIONS WHENEVER & WHEREVER IF IS NEEDED TO ENSURE SAFETY OF RUNNING LINE.
16. 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.
17. 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.
18. 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. THIS DRAWING IS PREPARED BASED ON RDSO STANDARD DRG NO: RDSO/B-10155 & 10155/9 AS PER BOX SIZE 1x4.0x2.0m

LOADING STANDARD

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

LEGENDS:

Total Barrel length of MIB 534 = 10.243m.
Completed Barrel length = 0.m(BSRP SIde).
Remaining Barrel length 10.243m is yet to be Constructed.

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

MINOR BRIDGE NO.534 AT CH: 0+207.530 OF 1 X 3.5 X 1.5m (1.35m CLEAR HEIGHT) RCC BOX (CAST-IN-SITU) ON DOWN STREAM SIDE OF THE EXG. BRIDGE OF 2 x 1.2m DIA (PIPE CULVERT) AT IR KM 205/859.801 BETWEEN BENNIGANAHALLI AND KASTURINAGAR STATIONS.

KRIDE.DRG.NO:

HQ.DRG.NO:

SCALE (UNLESS SPECIFIED OTHERWISE)	DRAWING NO.	REVISION	DWG STATUS
	O22077-BSRP-CR2-C-NB-0-30-2001	2	C

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