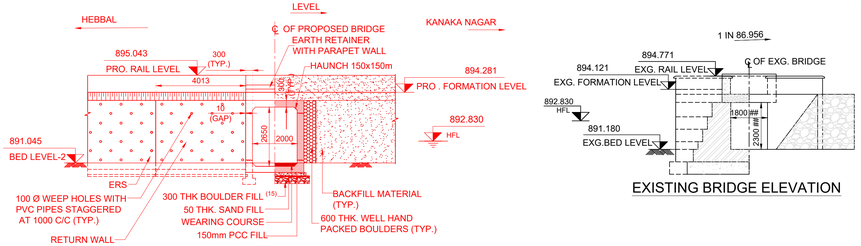



HALF ELEVATION HALF SECTION




EXISTING BRIDGE ELEVATION

## 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 | : | 361 mm |
| TOP SLAB | : | 300 mm |
| TOTAL | = | 1399 mm |

## GRADE OF CONCRETE

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

## BASE PRESSURE AT FOUNDATION LEVEL

| STRUCTURE | MAX | MIN |
|---|---|---|
| RCC BOX (KN/M$^2$ ) | 188.81 | - |
| RETURN WALL (KN/M$^2$ ) | 98.00 | - |

| HFL | FREE BOARD (mm) | BED LEVEL-1 | BED LEVEL-2 |
|---|---|---|---|
| 892.830 | 1301 | 891.120 | 891.045 |

## DETAILS OF EXISTING STRUCTURE SHOWN ARE AS PER JSVR

## TRACK DETAILS (PRO.BRIDGE)

| | | |
|---|---|---|
| LOADING | : | 25 T-AXLE LOAD 2008-STD |
| ALIGNMENT | : | STRAIGHT |
| GRADE | : | LEVEL |
| RAIL LEVEL | : | 895.043 m |
| FORMATION LEVEL | : | 894.281 m |

## TRACK DETAILS (EXG.BRIDGE)

| | | |
|---|---|---|
| LOADING | : | MBG-1987 |
| ALIGNMENT | : | STRAIGHT |
| GRADE | : | LEVEL |
| RAIL LEVEL | : | 894.771 m |
| FORMATION LEVEL | : | 894.121 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 |

## BRIDGE DETAILS

| DESCRIPTION | EXISTING IR BRIDGE : 566 | PROPOSED BSRP BRIDGE : 566 |
|---|---|---|
| CHAINAGE AT CENTER OF BRIDGE (km) | 216+613.294 | 10+961.777 |
| RAIL LEVEL AT CENTER OF BRIDGE (m) | 894.757 | 895.043 |
| FORMATION LEVEL AT CENTRE OF BRIDGE (m) | 894.107 | 894.281 |
| DIMENSIONS (Nos x SPAN(m) x HEIGHT(m)) | 1 x 1.80 x 2.30## | 1 x 2.0 X 2.65 |
| STRUCTURE CONFIGURATION | RCC SLAB | RCC BOX |

## WATERWAY PARTICULARS

| | | |
|---|---|---|
| CATCHMENT AREA | : | 0.026 km$^2$ |
| LATITUDE | : | 13° 2' 28.657" N |
| LONGITUDE | : | 77° 35' 29.170" E |
| TOPOSHEET NO | : | D43 R-12 |
| Q50 DISCHARGE | : | 0.76 Cum/sec |
| VELOCITY | : | 1.85 m/sec |
| DEPTH OF FLOW | : | 1.71 m |
| OHFL | : | 892.830 m |
| Q50HFL (DESIGN HFL) | : | 892.830 m |

| | REQUIRED | PROVIDED |
|---|---|---|
| WATERWAY AREA, Sqm | 3.42 | 5.00 |
| FREE BOARD, m | 1 | 1.301 |
| VERTICAL CLEARANCE, m | 0.00 | 0.79 |
| SCOUR DEPTH | | |
| From Qf HFL, m | 0.929 | |
| Scour Level | 891.901 | |
| From B.L, m | 0 | 1.2 |

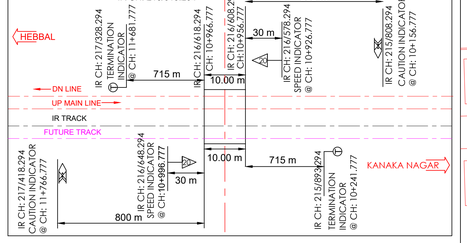
## EXISTING WATERWAY PARTICULARS

| | PROVIDED |
|---|---|
| WATERWAY AREA, Sqm | 4.14 |
| FREE BOARD, m | 1.291 |
| VERTICAL CLEARANCE, m | 0.65 |

## KEY PLAN SHOWING THE PRO.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 REQUIREMENT.




## SPECIFICATION:

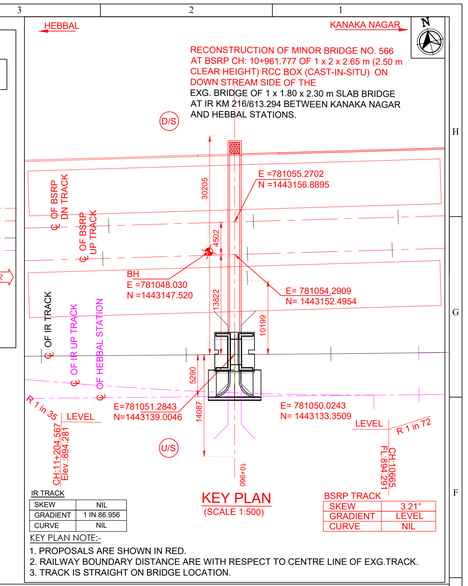
1. ALL WORKS ARE TO BE CARRIED OUT AS PER THE FOLLOWING.
   a. INDIAN RAILWAY UNIFIED STANDARD SPECIFICATIONS FOR WORKS AND MATERIALS 2019.
   b. IRS CONCRETE BRIDGE CODE 2014 (REPRINT) & RELEVANT I.S SPECIFICATIONS.
   c. IRS BRIDGE SUB - STRUCTURE CODE,2013 (# REVISED).
   d. IRS BRIDGE RULES 2014 (REPRINT).
2. WING WALL/RETAINING WALL :- REINFORCED CEMENT CONCRETE OF GRADE M35 WITH DESIGN MIX.
3. PITCHING :- DRY STONE PITCHING 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 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 SQ2 AND SQ3 AS PER RDSO GUIDELINES.
18. FOR RETAINING STRUCTURE, SEPERATE DRAWING WILL BE SUBMITTED.
19. TYPICAL COLLAR SHALL BE PROVIDED BETWEEN THE EXISTING AND PROPOSED STRUCTURE AS PER LETTER BEARING NO.SW/ROL/70/POL/2022 DATED ON 08.09.2022 ISSUED BY SWR.
20. THE DIMENSIONS OF RETURN WALL SHOWN IN GAD ARE ONLY INDICATIVE AND TO FOLLOW AS PER APPROVED DESIGN & DRAWINGS.

## REFERENCE:

1. RCC BOX AS PER RDSO DESIGN AND DRAWING NO RDSO/B-10155 & 10155/2
2. RETURN WALL - O22077-BSRP-CR2-C-NB-0-20-1158
3. WEEP HOLES AS PER PARA 7.6 OF SUB-STRUCTURE CODE
4. CURTAIN WALL AND TOE WALL AS PER DESIGN
5. BACKFILL MATERIALS BEHIND RCC BOX TO PROVIDE AS PER PARA 5 OF IRS BRIDGE SUBSTRUCTURE &FOUNDATION CODE
6. SHORING ARRANGEMENTS AS PER DESIGN.
7. GIR DOCUMENT NO.
   FOR BOX :DOC-BSRP-CR2-AG-DGN-GB-20-1146
   FOR RETURN WALL : DOC-BSRP-CR2-AG-DGN-GBRW-20-1146

## 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.




KEY PLAN
(SCALE 1:500)

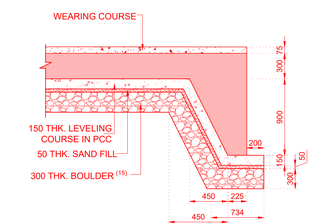
| IR TRACK | |
|---|---|
| SKEW | NIL |
| GRADIENT | 1 IN 86.956 |
| CURVE | NIL |

| BSRP TRACK | |
|---|---|
| SKEW | 3.21° |
| GRADIENT | LEVEL |
| CURVE | NIL |

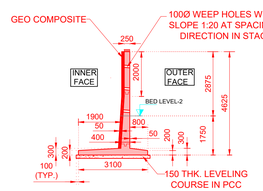
KEY PLAN NOTE:-
1. PROPOSALS ARE SHOWN IN RED.
2. RAILWAY BOUNDARY DISTANCE ARE WITH RESPECT TO CENTRE LINE OF EXG.TRACK.
3. TRACK IS STRAIGHT ON BRIDGE LOCATION.

## NOTES:

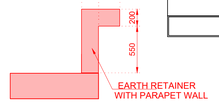
1. ALL LEVELS ARE W.R.T TO MSL.
2. ALL DIMENSIONS ARE IN MILLIMETERS, REDUCED LEVELS ARE IN METRES AND CHAINAGE ARE IN KILOMETERS, UNLESS STATED OTHERWISE.
3. DO NOT SCALE THE DRAWING,FOLLOW FIGURED DIMENSIONS ONLY.
4. THE TYPE,DESIGN & DEPTH OF FOUNDATION SHOWN IN GAD ARE INDICATIVE ONLY, THE ACTUAL 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 386.56 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 FOR 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.
24. THIS DRAWING IS PREPARED BASED ON RDSO STANDARD DRG NO: RDSO/B-10155 & 10155/2 AS PER BOX SIZE 1x3.0x3.0m WITH 1M FILL HEIGHT



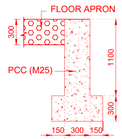

DETAIL-X
(SCALE 1:30)



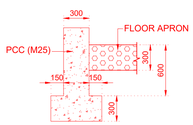

RCC RETAINING WALL SECTION (D/S)
(SCALE 1:50)




DETAIL-Z
(SCALE 1:30)




PCC DROP WALL DETAILS
(SCALE 1:30)




TOE WALL DETAILS
SCALE 1:30

## LEGENDS:

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

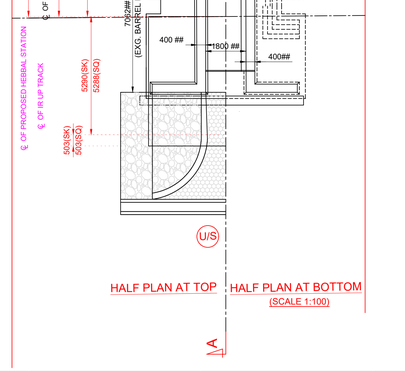
| STRATA DESCRIPTION | DEPTH IN METERS | REMARKS (N-VALUE) | SBC (kN/SQM) |
|---|---|---|---|
| GROUND LEVEL: 894.449 | 0.00 | | |
| FILED UP SOIL | 0.50 | | |
| | 1.00 | N = 16 (5/6/10) | |
| | 1.50 | N = 18 (6/8/10) | |
| MEDIUM DENSE CLAYEY SAND (SC) | 2.00 | | 386.56 (BOX) 400 (RW U/S) |
| | 2.50 | | |
| | 3.00 | | |
| | 3.50 | N = 13 (7/6/7) | |
| | 4.00 | | |
| | 4.50 | | |
| | 5.00 | N = 15 (5/6/9) | |
| MEDIUM DENSE TO DENSE SILTY SAND (SM) | 5.50 | | |
| | 6.00 | | |
| | 6.50 | N = 14 (6/6/8) | |
| | 7.00 | | |
| | 7.50 | | |
| | 8.00 | | |
| | 8.50 | N = 32 (8/14/18) | |
| END OF BOREHOLE AT 12.00m | 9.00 | | |
| | 9.50 | | |
| | 10.00 | | |
| | 10.50 | | |
| | 11.00 | | |
| | 11.50 | | |
| | 12.00 | | |

BED LEVEL (891.120/891.045)
PROPOSED BOX FOUNDATION LEVEL (890.670)
RETURN WALL FOUNDATION LEVEL 889.295

BOREHOLE ID 566(BH-216)




SECTION A-A




HALF PLAN AT TOP HALF PLAN AT BOTTOM
(SCALE 1:100)

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

**GENERAL CONSULTANTS:**

egis AECOM WSP 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 :
RECONSTRUCTION OF MINOR BRIDGE NO. 566 AT BSRP CH: 10+961.777 OF 1 x 2.0x 2.65 m (2.50 m CLEAR HEIGHT) RCC BOX (CAST-IN-SITU) ON DOWN STREAM SIDE OF THE
EXG. BRIDGE OF 1 x 1.80 x 2.30 m SLAB BRIDGE AT IR KM 216/613.294 BETWEEN KANAKA NAGAR AND HEBBAL STATIONS.

| | |
|---|---|
| KRIDE.DRG.NO: | |
| HQ.DRG.NO: | |
| SCALE - 1 : 100 (UNLESS SPECIFIED OTHERWISE) | DRAWING NO. : O22077-BSRP-CR2-C-NB-0-30-1156 |

SHEET SIZE - A1

## LOADING STANDARD

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

LEGENDS:
Total Barrel length of MIB 566 = 23.011m.
Completed Barrel length = 0m(BSRP Slde).
Remaining Barrel length 23.011m is yet to be constructed