

SPECIFICATION:

- 1. ALL WORKS ARE TO BE CARRIED OUT AS PER THE FOLLOWING:
 - I) INDIAN RAILWAY UNIFIED STANDARD SPECIFICATIONS FOR WORKS AND MATERIALS 2019.
 - II) IRS CONCRETE BRIDGE CODE 2014 (REPRINT) & RELEVANT IS SPECIFICATIONS.
 - III) IRS BRIDGE SUB-STRUCTURE CODE, 2013 (2ND RVSD).
 - IV) IRS BRIDGE RULES 2014 (REPRINT).
 - V) IRS SCHEDULE OF DIMENSIONS 2022/READ WITH UPDATED CORRECTION SLIP.
 - VI) IRS SCHEDULE OF DIMENSIONS 2022/READ WITH UPDATED CORRECTION SLIP.
- 2. WING WALL/RETURN WALL - SHALL BE MAINTAINED CONCRETE OF GRADE M35 WITH MAX. 20 MM SIZE GRADED OF APP. QUALITY.
- 3. CORING - CC M25 GRADE USING 20MM MAX. SIZE GRADED HARD STONE AGGREGATE OF APP. QUALITY.
- 4. 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).
- 5. RCC - REINFORCED CEMENT CONCRETE M35 GRADE USING 20MM MAXIMUM SIZE GRADED HARD STONE AGG. OF APPROVED QUALITY.
- 6. LEVELLING COURSE - 150 MM THICK USING 20 MM MAX. SIZE GRADED HARD STONE AGGREGATE WITH APPROVED QUALITY.
- 7. WEEP HOLES - WEEP HOLES TO BE PROVIDED AS PER PARA 7.6 OF SUB STRUCTURE CODE & WEEP HOLES SHALL BE OF 75/100 DIA PVC/C PIPES STAGGERED AT 1000 C/C ABOVE LOW WATER LEVEL IN BOTH WING WALL/RETURN WALL & EARTH RETAINER OF BOX.
- 8. LOADING STANDARD - 25 T - 2008 AXLE LOAD.
- 9. TOE WALL - GRADE M25 WITH DESIGN MIX.
- 10. GRADE OF STEEL FOR RCC IS FE 500/500D CONFIRMING TO IS 1786-2008.
- 11. MASS CONCRETE TO BE OF M 25 WITH 20MM GRADED STONE AGGREGATE FOR WEARING COURSE.
- 12. CONCRETE SHALL BE MECHANICALLY MIXED, VIBRATED & THOROUGHLY CURED.
- 13. PROVIDE SKIN REINFORCEMENT FOR WING & RETURN WALL AS PER DESIGN.
- 14. BAR BENDING SHALL CONFORM TO IS 2502 HIGH YIELD STRENGTH DEFORMED BARS OF GRADE FE 500 CONFORMING TO IS 1786 - 2008 SHALL BE USED AS REINFORCEMENT.
- 15. FLOORING - ROUGH STONE FLOORING 300MM THICK WITH CM-1.3.
- 16. DROP WALL / CURTAIN WALL - GRADE M25 WITH DESIGN MIX.
- 17. WHEREVER SBC IS LESS THAN FOUNDATION PRESSURE TO IMPROVE THE SBC OF SOIL TWO LAYERS OF SAND & BOULDER FILLING OF 300MM THICKNESS EACH TO BE LAID & COMPACTED BEFORE LEVELLING COURSE OF 150MM FOR RCC BOX, RETAINING WALL FOUNDATION & APRON FLOORING.
- 18. GROUND IMPROVED SOIL SHALL BE OF SOIL QUALITY CLASS S02 & S03 AS PER RDSO GUIDELINES.
- 19. THE DIMENSION OF RETURN WALL SHOWN IN GAD ARE ONLY INDICATIVE AND TO FOLLOW AS PER APPROVAL DESIGN AND DRAWING.
- 20. 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.
- 21. ALL RCC SURFACES COMING IN CONTACT WITH SOIL SHOULD BE PAINTED WITH BITUMEN OR COATLAK OF APPROVED QUALITY @ 1.48 KG/SQ.M AS MENTIONED IN RDSO DRAWING.

MODUS OPERANDI:

- 1. DIVERT OR RESTRICT THE WATER FLOW BY PROVIDING BUND ON UPSTREAM SIDE OF THE BRIDGE.
- 2. SHORING ARRANGEMENTS WILL BE DONE FOR PROTECTION OF BANK AND EXT. TRACK.
- 3. EARTHWORK EXCAVATION TO BE DONE FOR PROPOSED BARREL LENGTH OF RCC BOX.
- 4. IF MAXIMUM BASE PRESSURE AT FOUNDATION LEVEL IS GREATER THAN THE SAFE BEARING CAPACITY OF SOIL THEN SOIL IMPROVEMENT TO BE DONE.
- 5. EARTHWORK EXCAVATION TO BE DONE FOR THE PROPOSED BARREL LENGTH AND FILL WITH SAND LAYER / BOULDERS AS RECOMMENDED IN CITY REPORT.
- 6. RETAINING WALL, DROP WALL, TOE WALL, STONE FLOORING WITH CM 1:3 & OTHER BRIDGE PROTECTION WORKS TO BE DONE.
- 7. BOULDER FILLING AND BACKFILL AS PER IRS SUBSTRUCTURE AND FOUNDATION CODE TO BE DONE.
- 8. COMPLETE THE REMAINING WORK IN ALL RESPECTS WITHOUT INTERFERING TRAIN TRAFFIC & RESTORE THE NORMAL SPEED IN EXG. LINE AFTER ATTAINING THE REQUIRED CONSOLIDATION IN NEW EMBANKMENTS.
- 9. ALSO RE-DIVERT THE WATER THROUGH THE BRIDGE.

NOTES:

- 1. LEVELS ARE TO BE VERIFIED AS PER APPROVED ALIGNMENT.

NOTES:

- 1. ALL DIMENSIONS ARE SHOWN IN MILLIMETERS, REDUCED LEVELS ARE IN METERS & CHANGES ARE IN KILOMETERS UNLESS STATED OTHERWISE.
- 2. DO NOT SCALE THE DRAWING. FOLLOW FIGURED DIMENSIONS ONLY.
- 3. 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 SO ENCOUNTERED AT THE SITE DURING EXECUTION.
- 4. SBC OF SOIL AT FOUNDATION LEVEL IS 18T/SQ.M FOR RCC BOX SOIL IMPROVEMENT TO BE DONE WITH SAND & BOULDER FILLING.
- 5. THE LENGTH OF PITCHING FOR APPROACHES SHALL BE DECIDED BY THE ENGINEER-IN-CHARGE OF THE WORK TO SUIT SITE CONDITIONS.
- 6. PRO BRIDGE WITH UP & DN LINE IS ON THE UP STREAM SIDE OF THE EXISTING BRIDGE.
- 7. STRUCTURAL AND DIMENSIONAL DETAILS OF OLD BRIDGE (EXG.) AS PER COMPLETION DRAWING.
- 8. DISMANTLING OF EXISTING PROTECTIVE/PITCHING SHALL BE DONE AS PER SITE CONDITION.
- 9. EXPOSURE CONDITION IS MODERATE.
- 10. CONTROLLED CONCRETE AS PER DESIGN MIX TO BE USED AND MIXED BY WEIGH BATCHING.
- 11. 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.
- 12. 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.
- 13. THE BOULDER FILLING SHALL CONSIST OF WELL-HAND-PAKED 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.
- 14. WHILE EXECUTION OF PRO BRIDGE, EXISTING FLOOR PROTECTIVE WORKS MAY GET DAMAGED, SO TO PROTECT THE EXISTING 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. NECESSARY SHORING ARRANGEMENTS TO BE DONE AS PER THE SITE CONDITIONS FOR THE PROTECTIVE EXISTING BRIDGE. PROVIDE SHORING AT SITE AS PER THE APPROVED DRAWINGS. BEFORE TAKING UP DISMANTLING WORKS OF EXISTING WING WALLS.
- 17. THE INSTRUCTIONS CONVEYED VIDE PCE CIRCULAR NO 01 / 2015 DT-09-03-15, REGARDING 'WORK DISCIPLINE 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. ENGINEER-IN-CHARGE SHALL ENSURE THAT AFTER SOIL IMPROVEMENT SBC OF THE SOIL BELOW THE BOX SHALL BE MORE THAN 18.0T/SQ.M.
- 19. ENGINEER-IN-CHARGE SHALL ENSURE THAT LEVEL OF THE FOUNDATION OF DROP WALL, CURTAIN WALL AND RETAINING WALL SHALL BE SUFFICIENTLY LOWER LEVEL THAN THE REQUIRED CALCULATED SCOUR LEVEL.
- 20. THE THICKNESS OF BOULDERS AND SAND FILLING SHALL BE CONFIRMED BY THE ENGINEER-IN-CHARGE AT THE SITE AFTER CONDUCTING A PLATE LOAD TEST AND SHOULD SATISFY THE DESIGN SBC VALUE SHOWN IN THE DRAWING.
- 21. ENGINEER-IN-CHARGE SHOULD ENSURE THAT SUITABILITY OF THE EXISTING BRIDGE TO TAKE CARE OF 25T LOAD DISPERSION FOR ITS ELEMENTS SUCH AS SUBSTRUCTURE AND FOUNDATION BEFORE TAKING UP PROPOSAL WORK.

REFERENCE:

- 1. RCC BOX SIMILAR TO DRG NO: RDSO/B-10155 & RDSO/B-10155/2 (SIZE: 3.00 x 1.80M/FILL-1.0M).
- 2. RETAINING WALL REFER DRAWING NO-024008-BSRP-CRA-C-AG-ERS-20-6001.
- 3. WEEP HOLES AS PER PARA 7.6 OF SUB-STRUCTURE CODE.
- 4. BALLAST RETAINER AS PER DESIGN MONOLITHIC WITH THE BOX.
- 5. REFER DRAWING NO-024008-BSRP-CRA-C-AG-ERS-10-6005.
- 6. DROP CURTAIN WALL AS PER DESIGN.
- 7. BACKFILL MATERIAL BEHIND RCC BOX TO PROVIDE AS PER PARA 7.5 OF IRS BRIDGE SUBSTRUCTURE & FOUNDATION CODE.
- 8. SHORING ARRANGEMENT ARE AS PER DESIGN AS PER SITE REQUIREMENT.
- 9. DETAILS OF EXISTING STRUCTURE SHOWN ARE AS PER IR COMPLETION DRAWING.
- 10. FOR FENCING AND CABLE TRAY REFER SEPARATE DRAWING.
- 11. HYDROLOGY REPORT NO.DOC-BSRP-CRA-AG-DON-GEN-10-3051.
- 12. GEOTECH REPORT NO.DOC-BSRP-CRA-AG-DON-GB-10-2060.

SPECIAL NOTES FOR 25T/AC TRACTION SYSTEM:

- 1. NECESSARY PROTECTIVE ARRANGEMENT SHALL BE MADE BY K-RIDE CIVIL-DEPT IN CONSULTATION WITH ELECTRICAL O/LTR/BRANCH TO AVOID ANY ELECTRICAL INDUCTION DURING LAUNCHING OF GIRDERS/RCC BOX.
- 2. WHILE LAUNCHING OF GIRDER/RCC BOX ABOVE THE ONE & ALSO DURING ANY WORK INVOLVING LESS THAN 2.0M WORKING CLEARANCE FROM ONE, THE WORK SHALL BE CARRIED OUT ONLY DURING POWER BLOCK CONDITION BY OBTAINING PERMISSION TO WORK FROM AUTHORIZED TRD BRANCH OFFICIALS.
- 3. ALL STEEL STRUCTURES/COMPOSITE GIRDERS/RCC BOX INVOLVING THE ABOVE WORKS SHALL BE SUITABLY EARTHED TO TRACTION RAILS/SEPARATE EARTH PIPE FOR SAFETY OF WORKING STAFF.
- 4. ALL OHLE PROFILING WORKS, GIRDER/RCC BOX ERECTION, ETC. WILL BE DONE UNDER THE SUPERVISION OF SSO/LTRD UNDER POWER BLOCK CONDITIONS.

WATERWAY PARTICULARS	
CATCHMENT AREA	0.177 SQKM
LATITUDE	13° 01' 29.28" N
LONGITUDE	77° 39' 35.05" E
TOPO SHEET NO	57G(D)48R(1/2)
250 DISCHARGE	3.205 CUM/SEC
VELOCITY	1.588 MIS
DEPTH OF FLOW	0.748 M
CHFL	901.457M
250HFL (DESIGN HFL)	902.050 M
REQUIRED/PROVIDED	
WATERWAY AREA, Sqm	2.019 / 3.645
FREE BOARD, m	1.000 / 1.030
VERTICAL CLEARANCE, m	0.000 / 0.602
SCOUR DEPTH	
From QF HFL, m	1.957
Scour Level	900.220
From B.L., m	1.082 / 1.350
EXISTING WATERWAY PARTICULARS	
WATERWAY AREA, Sqm	2.26
FREE BOARD, m	2.847
VERTICAL CLEARANCE, m	0.970

GRADE OF CONCRETE	
NO DESCRIPTION OF COMPONENTS	GRADE
I. RCC BOX	M35
II. WEARING COURSE	M25
III. LEVELLING COURSE (PCC)	M20
IV. RETAINING/RETURN WALL	M35

BRIDGE DETAILS		
DESCRIPTION	EXISTING IR BRIDGE : 542	PROPOSED BSRP BRIDGE : 542
CHAINAGE AT CENTER OF BRIDGE (m)	4+685.528	25+810.585
RAIL LEVEL AT CENTER OF BRIDGE (m)	904.992m	903.842m
FORMATION LEVEL AT CENTRE OF BRIDGE (m)	904.304m	903.080m
DIMENSIONS (Nos x SPAN(m) x HEIGHT(m))	2 x 12	1 x 2.7 x 2.15
STRUCTURE CONFIGURATION	PIPE	RCC BOX

LOADING STANDARD	
A) PRO. BRIDGE: 25T-AXLE LOAD 2008 SIT	

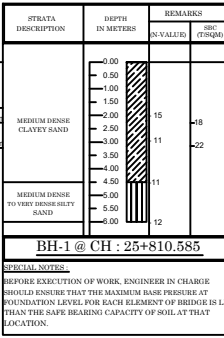
ABBREVIATIONS:	
C	- CENTER LINE
TYP	- TYPICAL
THK.	- THICKNESS
U/S	- UP STREAM SIDE
D/S	- DOWN STREAM SIDE
DN	- DOWN
BR	- BRIDGE
FL	- FORMATION LEVEL
PRO.	- PROPOSED
EXG.	- EXISTING

TRACK DETAILS (PRO BRIDGE)	
LOADING	25 T-AXLE LOAD 2008-STD
ALIGNMENT	CURVE
GRADE	LEVEL
RAIL LEVEL	903.842m
FORMATION LEVEL	903.080m

TRACK DETAILS (EXG. BRIDGE)	
LOADING	25 T-AXLE LOAD 2008-STD
ALIGNMENT	CURVE
GRADE	1 IN 114
RAIL LEVEL	904.922
FORMATION LEVEL	904.304

DEPTH OF CONSTRUCTION FOR 1 x 2.7 x 1.35 m RCC BOX	
RAIL 60 kg	172 mm
GR PAD	10 mm
PSC SLEEPER	230 mm
BALLAST CUSHION	350 mm
EARTH CUSHION	28 mm
TOP SLAB	400 mm
BOX CLEAR HT.	1350 mm
TOTAL	= 2540 mm

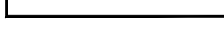
EXIS. DEPTH OF CONSTRUCTION FOR 2 x 1.2 PIPE	
RAIL TO FORMATION	688 mm
EARTH CUSHION	1757mm
THICKNESS	120 mm
CLEAR HEIGHT	1200 mm
TOTAL	= 3765mm



BASE PRESSURE AT FOUNDATION LEVEL	
STRUCTURE	MAX
RCC BOX (TIM)	19.0
RETAINING WALL (TIM) AS PER DESIGN	

BEFORE EXECUTION OF WORK, ENGINEER IN CHARGE SHOULD ENSURE THAT THE MAXIMUM BASE PRESSURE AT FOUNDATION LEVEL FOR EACH ELEMENT OF BRIDGE IS LESS THAN THE SAFE BEARING CAPACITY OF SOIL AT THAT LOCATION.

LEGEND:
Total Barrel length of MIB 542 = 14.5m.
Completed Barrel length = 0.0m
Remaining Barrel length 14.5m



CONCEPTUAL / TENDER DRAWING

GC/K-RIDE

K-RIDE

FOR GC

FOR K-RIDE

GENERAL CONSULTANTS:

AECOM WSP **EGIS-AECOM-WSP**

RAIL INFRASTRUCTURE DEVELOPMENT COMPANY (KARNATAKA) LIMITED

BENGALURU DIVISION

BAIYAPPANAHALLI - RAJANUKUNTE SECTION OF BSRP C-4

PROPOSED MINOR BRIDGE NO.542 AT BSRP CH:25+836 AS 1X2.7X1.5m RCC BOX(CAST-IN-SITU) ON UP STREAM SIDE OF THE EXG. BRIDGE OF 2 x 1.2Ø PIPE BETWEEN CHANNASANDRA AND JAKKUR STATIONS.

AUTHORITY OF WORK: DRG.NO:
AS PER BSRP DFSR K RIDE DRG.NO: KRIDE/BSRP/C-4/PKG2/MIB-542

HQ.DRG.NO: **SCALE - 1 : 100**