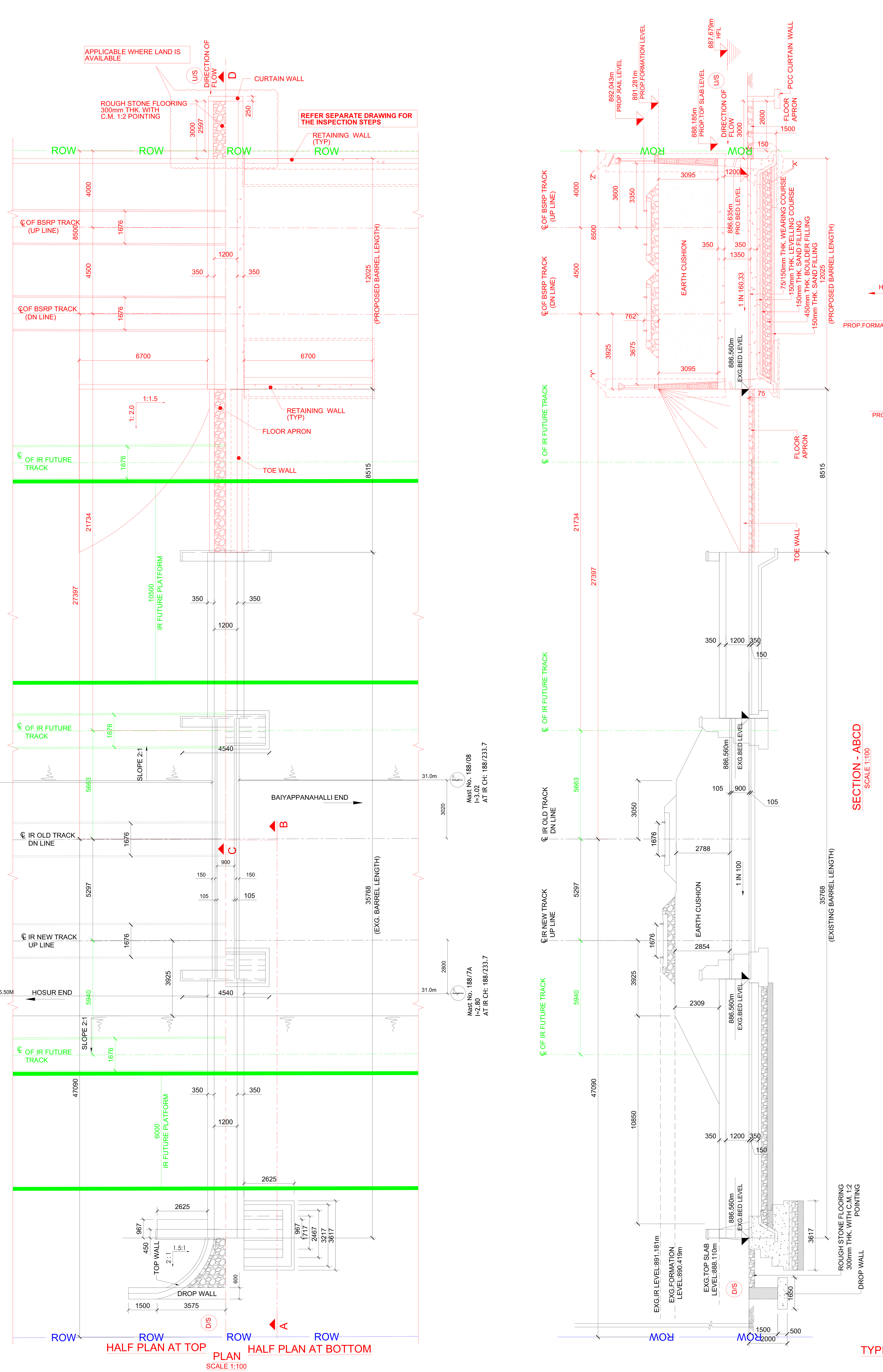
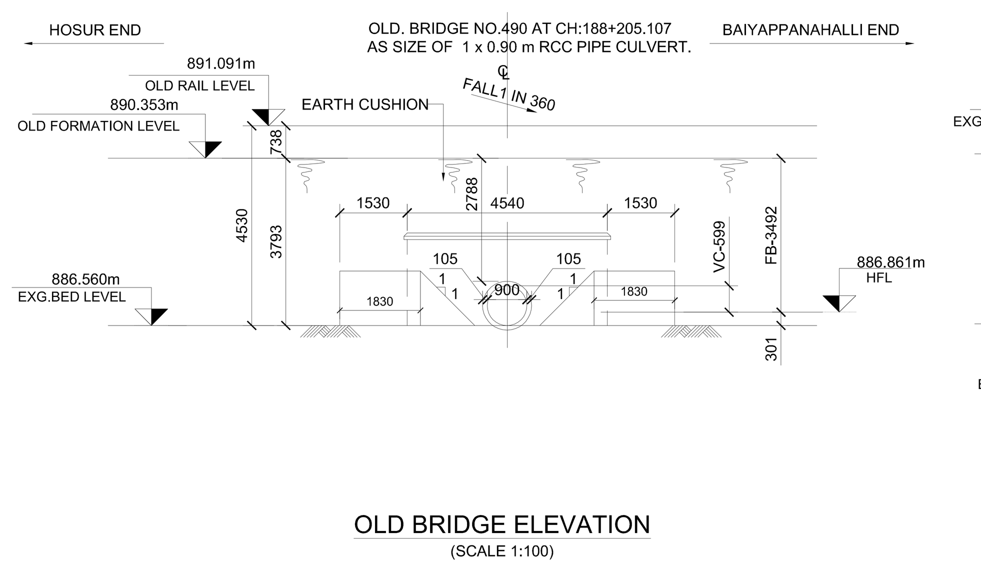
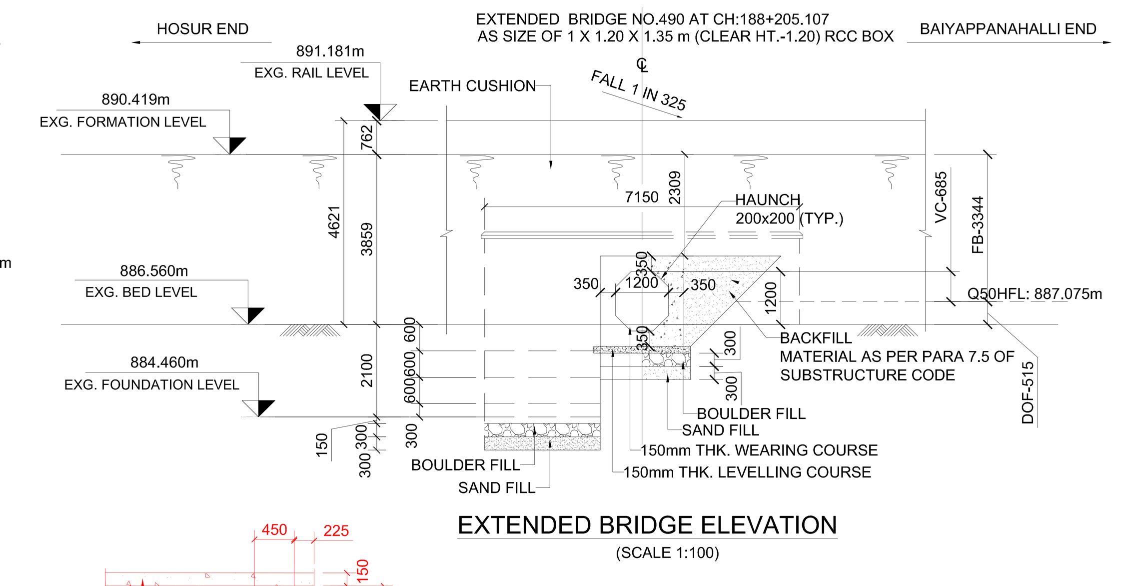
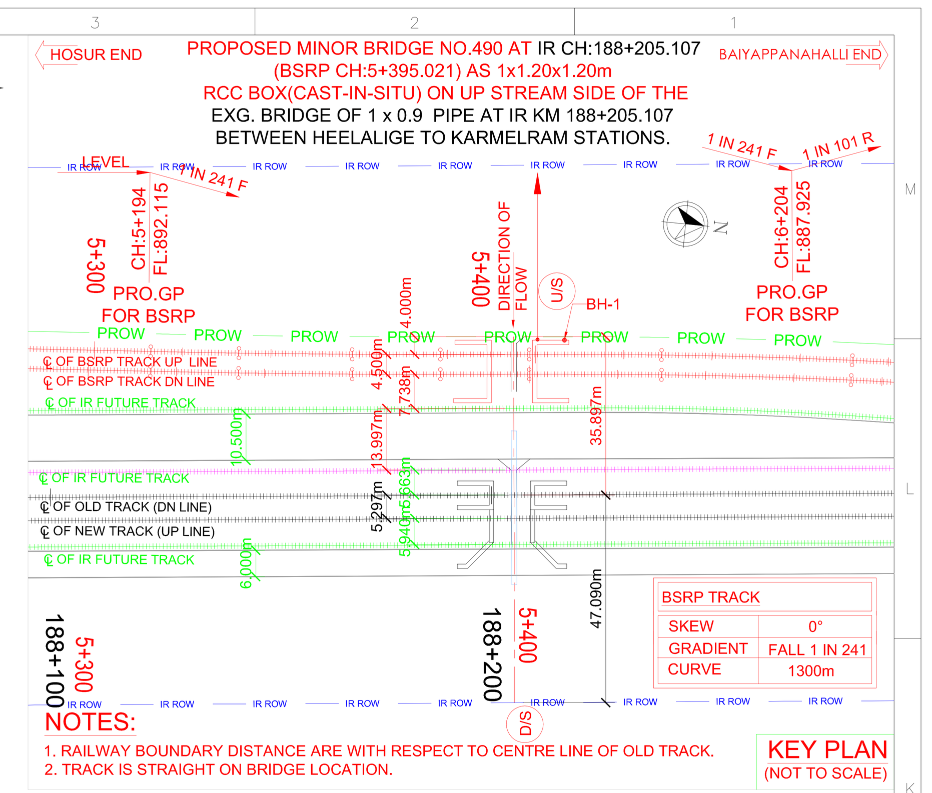


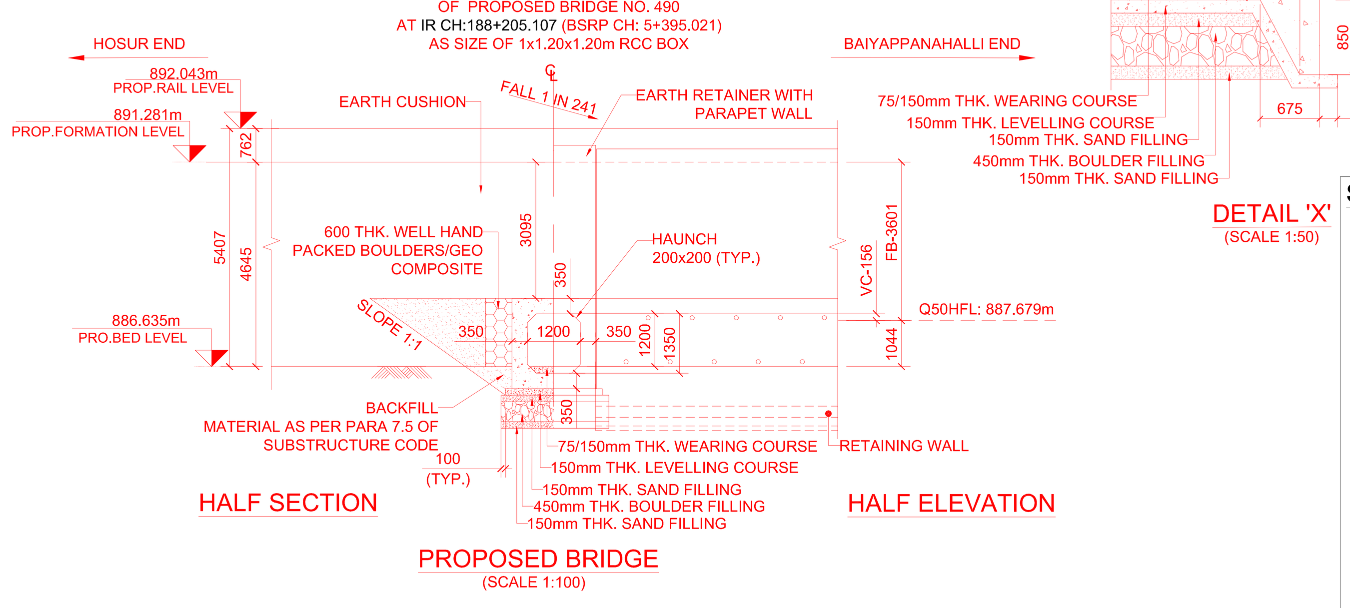






NOTES:
1. RAILWAY BOUNDARY DISTANCE ARE WITH RESPECT TO CENTRE LINE OF OLD TRACK.
2. TRACK IS STRAIGHT ON BRIDGE LOCATION.

KEY PLAN
(NOT TO SCALE)



WATERWAY PARTICULARS

CATCHMENT AREA	:	0.138 SQKM.
LATITUDE	:	12° 51' 43.19" N
LONGITUDE	:	77° 42' 35.77" E
TOPOSHEET NO	:	57H9 (D43X9)
Q50 DISCHARGE	:	2.051 CUM/SEC
VELOCITY	:	1.638 M/S
DEPTH OF FLOW	:	1.044 M
OHFL	:	886.861M
Q50HFL (DESIGN HFL)	:	887.679 M

	REQUIRED	PROVIDED
WATERWAY AREA, Sqm	1.252	1.440
FREE BOARD, m	1.000	3.601
VERTICAL CLEARANCE, m	0.000	0.156
SCOUR DEPTH		
From Of HFL, m	1.706	
Scour Level	886.151	
From B.L, m	0.485	1.350

EXISTING WATERWAY PARTICULARS

	PROVIDED
WATERWAY AREA, Sqm	1.131
FREE BOARD, m	3.492
VERTICAL CLEARANCE, m	0.599

TRACK DETAILS (PRO.BRIDGE)

LOADING	:	25 T-AXLE LOAD 2008-STD
ALIGNMENT	:	CURVE-1.342°
GRADE	:	FALL 1 IN 241
RAIL LEVEL	:	892.043m
FORMATION LEVEL	:	891.281m

DEPTH OF CONSTRUCTION FOR 1 x 1.2 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	:	3095 mm
TOP SLAB	:	350 mm
BOX CLEAR HT.	:	1200 mm
TOTAL	=	5407 mm

TRACK DETAILS (EXG.BRIDGE)

LOADING	:	MBG-1987
ALIGNMENT	:	STRAIGHT
GRADE	:	FALL 1 IN 360
RAIL LEVEL	:	891.091
FORMATION LEVEL	:	890.353

EXIS.DEPTH OF CONSTRUCTION FOR 1 x 0.9 RCC PIPE

RAIL TO FORMATION	:	738 mm
EARTH CUSHION	:	2788 mm
THICKNESS	:	105 mm
CLEAR HEIGHT	:	900 mm
TOTAL	=	4531 mm

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

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, IF REQUIRED AS PER SITE CONDITION.
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 GTI REPORT.
6. RETAININGS 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 INFRINGING 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.

BH-1 @ CH : 5+395.021

GROUND LEVEL : 890.084m
BED LEVEL : 886.635m
B. FOU. LEVEL : 886.135m
R. FOU. LEVEL : 885.135m

STRATA DESCRIPTION	DEPTH IN METERS	REMARKS (N-VALUE)	SBC (T/SQM)
HARD CLAY OF MEDIUM PLASTICITY	0.00		
	0.50		
	1.00		
	1.50	40	
	2.00		
	2.50		
	3.00	79	
	3.50		
	4.00		25.00
	4.50	60	
	5.00		30.00
	5.50		
	6.00	80	

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

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 I.S 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).
2. WING WALL/RETURN WALL: - MASS CEMENT CONCRETE OF GRADE M35 WITH MAX. 20 MM SIZE GRADED OF APP. QUALITY.
3. COPING: - 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. LEVELING 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 PARA 7.6 OF SUB STRUCTURE CODE & WEEP HOLES SHALL BE OF 75/100 DIA PVC/AC 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 450MM 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 SQ2 & SQ3 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. SWR/W.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 COALTAR OF APPROVED QUALITY @ 1.464 KG/SQM AS MENTIONED IN RDSO DRAWING

BRIDGE STRENGTH CERTIFICATE

CERTIFIED THAT THE PRO RCC BOX BRIDGE (PRO. EXTENSION PORTION) AS PER RDSO DRG NO:B-10155/10 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

NOTES

1. ALL DIMENSIONS ARE SHOWN IN MILLIMETERS, REDUCED LEVELS ARE IN METERS & CHAINAGES 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 SOIL ENCOUNTERED AT THE SITE DURING EXECUTION.
4. SBC OF SOIL AT FOUNDATION LEVEL IS APPROX. 25.0T/SQM 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 SITECONDITIONS.
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 SHOULD 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 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.
14. 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.
15. SUITABLE SPEED RESTRICTIONS MAY BE IMPOSED BASED ON SITE CONDITIONS WHENEVER & WHEREVER IF IS NEEDED TO ENSURE SAFETY OF RUNNING LINE.
16. FEASIBILITY OF THIS BOX STRUCTURE AT SITE SHOULD BE ENSURED BY GM/KRIDE/BSRP-CORRIDOR4.
17. NECESSARY SHORING ARRANGEMENTS TO BE DONE AS PER THE SITE CONDITIONS FOR THE PROTECTION OF EXISTING BRIDGE. PROVIDED AT SITE AS PER THE APPROVED DRAWINGS, BEFORE TAKING UP DISMANTLING WORKS OF EXISTING WING WALLS.
18. 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
19. IT IS TO BE ENSURED BY GM/KRIDE/BSRP-CORRIDOR4 (ENGINEER IN-CHARGE) BEFORE EXECUTION, 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.
20. ENGINEER IN-CHARGE SHALL ENSURE THAT AFTER SOIL IMPROVEMENT SBC OF THE SOIL BELOW THE BOX SHALL BE MORE THAN 15.0T/SQM.
21. 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.
22. 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.
23. 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

REFERENCE:

1. RCC BOX SIMILAR TO DRG NO: RDSO/B-10155 & RDSO/B-10155/10 (SIZE-2.00 X 1.20M & FILL-4M).
2. RETAINING WALL REFER DRAWING NO-O24008-BSRP-CR4-C-AG-ERS-20-6002.
3. WEEP HOLES AS PER PARA 7.6 OF SUB-STRUCTURE CODE.
4. BALLAST RETAINER AS PER DESIGN,MONOLOTHIC WITH THE BOX REFER DRAWING NO-O24008-BSRP-CR4-C-AG-ERS-10-6006.
5. DROP/CURTAIN WALL AS PER DESIGN
6. BACKFILL MATERIAL BEHIND RCC BOX TO PROVIDE AS PER PARA 7.5 OF IRS BRIDGE SUBSTRUCTURE &FOUNDATION CODE.
7. SHORING ARRANGEMENT ARE AS PER DESIGN AS PER SITE REQUIREMENT.
8. DETAILS OF EXISTING STRUCTURE SHOWN ARE AS PER IR COMPLETION DRAWING.
9. FOR FENCING AND CABLE TRAY REFER SEPARATE DRAWING.

SPECIAL NOTES FOR 25KV AC TRACTION SYSTEM:

1. NECESSARY PROTECTIVE ARRANGEMENT SHALL BE MADE BY K-RIDE CIVIL-DEPT IN CONSULTATION WITH ELECTRICAL OL/TRD/BRANCH TO AVOID ANY ELECTRICAL INDUCTION DURING LAUNCHING OF GIRDERS/RCC BOX.
2. WHILE LAUNCHING OF GIRDER/RCC BOX ABOVE THE OHE & ALSO DURING ANY WORK INVOLVING LESS THAN 2.0M WORKING CLEARANCE FROM OHE, 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 OHE PROFILING WORKS, GIRDER/RCC BOX ERECTION, ETC; WILL BE DONE UNDER THE SUPERVISION OF SSE/OL/TRD UNDER POWER BLOCK CONDITIONS.

LEGENDS:

- = COLOUR CODE BLACK = EXISTING WORKS
- = COLOUR CODE RED = PROPOSED RLY WORKS
- = COLOUR CODE YELLOW = TO BE DISMANTLED
- = COLOUR CODE GREEN = FUTURE TRACK
- ROW = COLOUR CODE BLUE = RAILWAY BOUNDARY
- ROW = COLOUR CODE GREEN = PROPOSED ROW

ABBREVIATIONS :

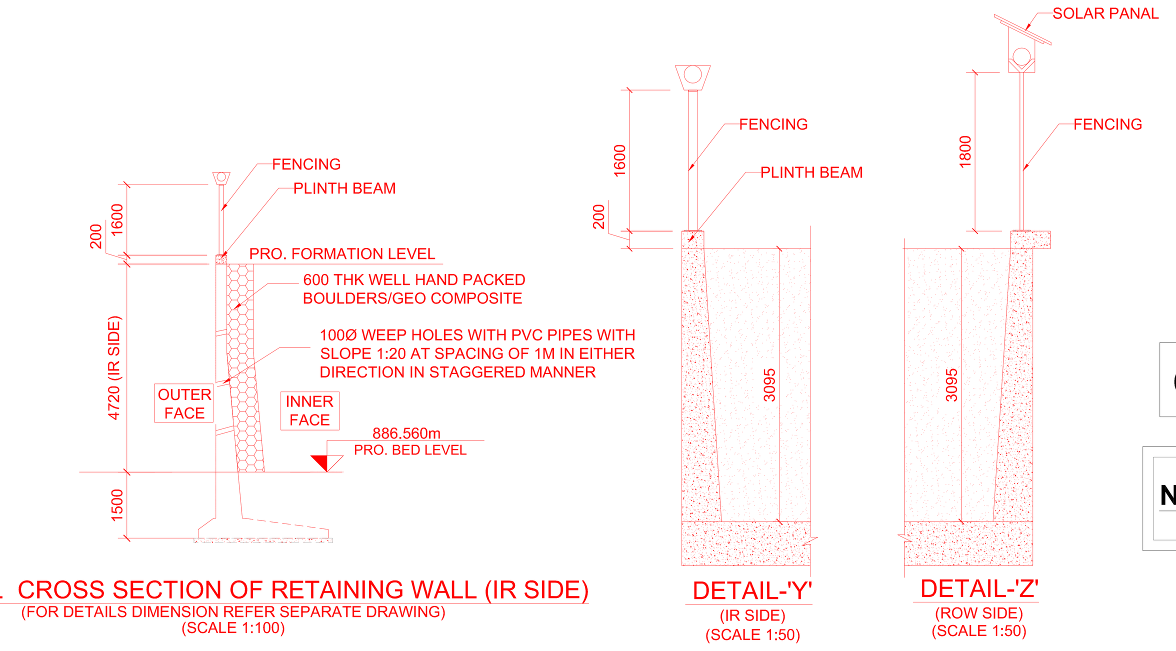
- ℄ - CENTER LINE
- TYP - TYPICAL
- THK. - THICKNESS
- U/S - UP STREAM SIDE
- D/S - DOWN STREAM SIDE
- DN - DOWN
- BR - BRIDGE
- FL - FORMATION LEVEL
- PRO. - PROPOSED
- EXG. - EXISTING

BASE PRESSURE AT FOUNDATION LEVEL

STRUCTURE	MAX
RCC BOX (T/M²)	15.0
RETAINING WALL (T/M²)	AS PER DESIGN

LOADING STANDARD

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

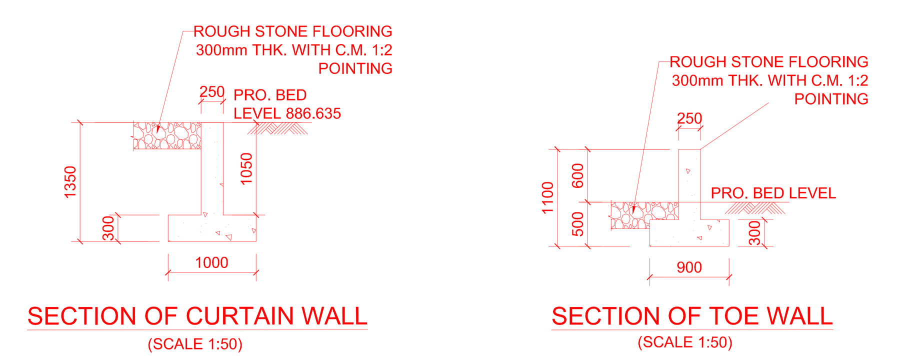


BRIDGE DETAILS

DESCRIPTION	EXISTING IR BRIDGE : 490	PROPOSED BSRP BRIDGE : 490
CHAINAGE AT CENTER OF BRIDGE (km)	188+205.107	5+395.021
RAIL LEVEL AT CENTER OF BRIDGE (m)	891.091m	892.043m
FORMATION LEVEL AT CENTRE OF BRIDGE (m)	890.353m	891.281m
DIMENSIONS (Nos x SPAN(m) x HEIGHT(m))	1 x 0.90	1 x1.20 x 1.20
STRUCTURE CONFIGURATION	PIPE	RCC BOX

GOOD FOR CONSTRUCTION

NO NO	NO NOC	NOR



REV.	DATE	DESCRIPTION
R0	04.12.2024	ISSUED FOR GFC SUBMISSION
0	10.06.2024	FOR APPROVAL

D.D.C (L&T)

	DATE	NAME	SIGN
PREPARED BY	04.12.2024	PACHAIYAMMAL	PACHAIYAMMAL (digitally signed)
CHECKED BY	04.12.2024	LINGARAJAN	LINGARAJAN (digitally signed)
APPROVED BY	04.12.2024	MANISHA J	MANISHA ATMARAM JADHAV (digitally signed)
PROJECT MANAGER	04.12.2024	SREEJITH	

PROOF CONSULTANT — CHECKED & APPROVED

NAME	SIGN
SYED JAKIR HUSSAIN	(digitally signed)
PARAG S MANDLEY	(digitally signed)

GENERAL CONSULTANTS — CHECKED & APPROVED

DEPARTMENT	NAME	SIGN
ALIGNMENT		
GAD		
STRUCTURAL		
GEOTECH		

COUNTER SIGN
PROJECT DIRECTOR
SIGN
NAME
DATE

K RIDE

NAME	DESIGNATION	SIGN
	DIRECTOR/PROJECTS & PLANNING/K-RIDE	
	GM/DESIGN/K-RIDE	
	GM/CIVIL/C-4/K-RIDE	
	GM/S&T(I/C)/KRIDE	
	AGM/ELEC./K-RIDE	
	MANAGER/CIVIL/ PLANNING/K-RIDE	

GOOD FOR CONSTRUCTION VIDE LETTER NO. GC/BSRP/KRIDE/C4/2024174 DATED 28.06.24

CONTRACTOR : L&T CONSTRUCTION

DETAILED DESIGN CONSULTANT (DDC) : STRUCTCON DESIGNS — L&T CONSTRUCTION EDRC - TIIC

PROOF CONSULTANT : SYSTRA INDIA

GENERAL CONSULTANTS: EGIS-AECOM-WSP

EMPLOYER : K RIDE — RAIL INFRASTRUCTURE DEVELOPMENT COMPANY (KARNATAKA) LIMITED

GENERAL ARRANGEMENT DRAWING

CORRIDOR - 4

BENGALURU SUBURBAN RAILWAY PROJECT(BSRP)
BETWEEN STATIONS HEELALIGE AND RAJANUKUNTE

PROPOSED MINOR BRIDGE NO.490 AT IR CH:188+205.107 (BSRP CH:5+395.021) AS 1x1.20x1.20m RCC BOX(CAST-IN-SITU) ON UP STREAM SIDE OF THE EXG. BRIDGE OF 1 x 0.90m PIPE AT IR KM 188+205.107 BETWEEN HEELALIGE TO KARMELRAM STATIONS.

SCALE - 1 : 100 (UNLESS SPECIFIED OTHERWISE)	KRIDE.DRG.NO: O24008-BSRP-CR4-C-NB-490-30-1055	REVISION R0	DWG STATUS C

PRELIMINARY DWG (P), DEFINITIVE DWG (D), CONSTRUCTION DWG (C), AS BUILT DWG (B), SHOP DWG (S), MANUFACTURED DWG (M) SHEET SIZE - A0