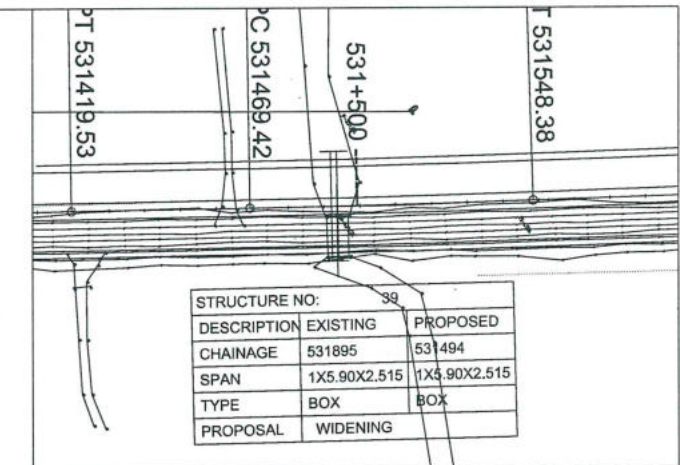


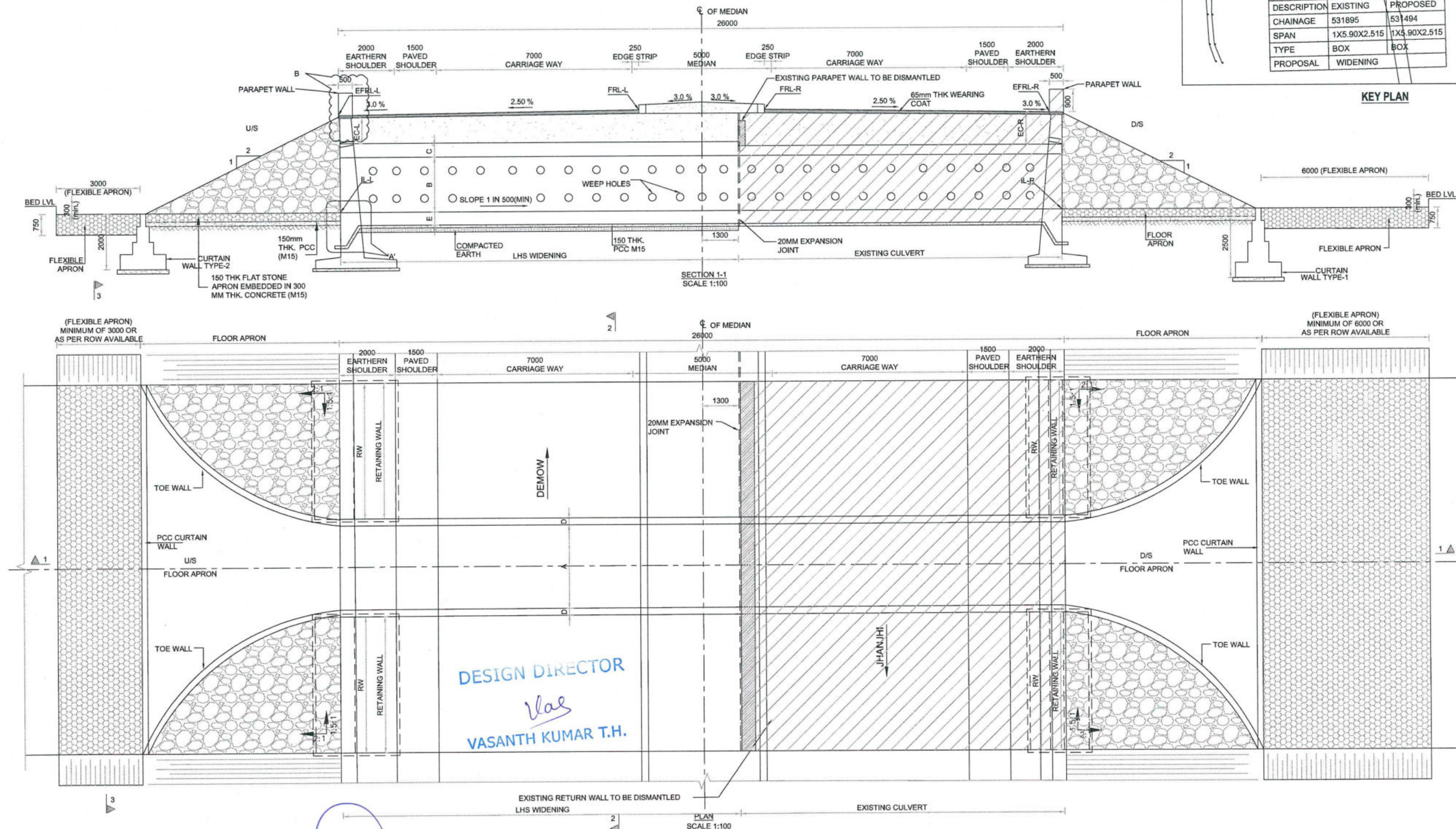
Details Of Box culvert:

| EXISTING CHAINAGE | DESIGN CHAINAGE | SPAN | FRL-L | FRL-R | EFRL-L | EFRL-R | EC-L | EC-R | IL-L | IL-R | CLEAR WIDTH (A) | CLEAR HEIGHT (B) | TOP SLAB THICKNESS (C) | WALL THICKNESS (D) | BOTTOM RAFT THICKNESS (E) | RW | FLOW DIRECTION | LHS WIDENING |
|-------------------|-----------------|-------------|--------|--------|--------|--------|-------|-------|--------|--------|-----------------|------------------|------------------------|--------------------|---------------------------|-----|----------------|--------------|
| 531+895 | 531+494 | 1X5.9X2.515 | 94.819 | 94.569 | 95.344 | 94.044 | 1.564 | 1.564 | 90.156 | 90.106 | 5.900 | 2.515 | 0.50 | 0.60 | 0.60 | 7.9 | L-R | 14.300 |

GOOD FOR CONSTRUCTION



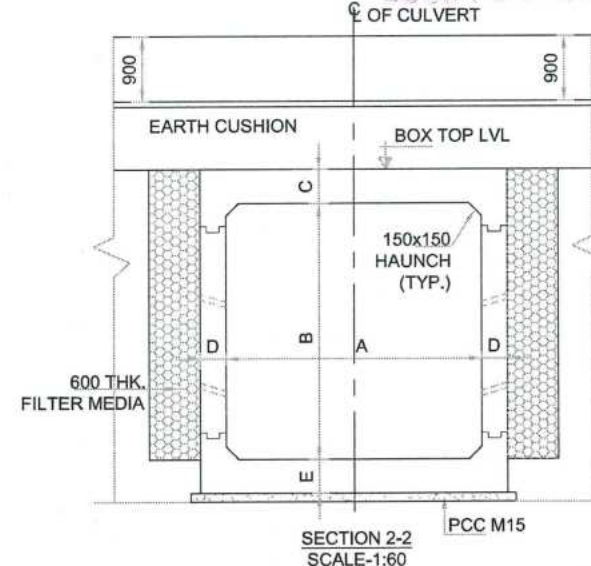
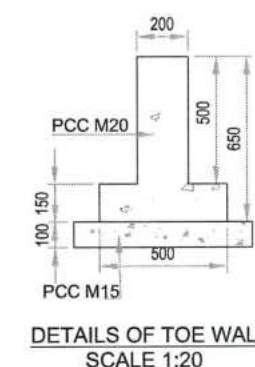
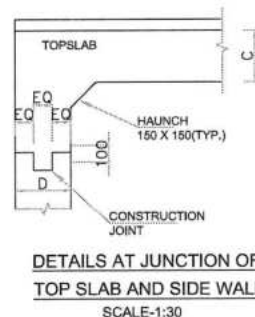
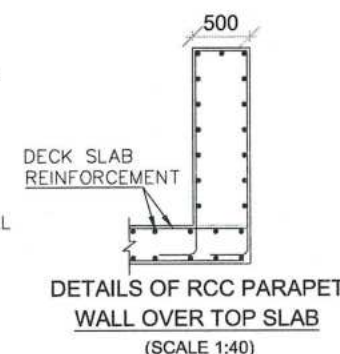
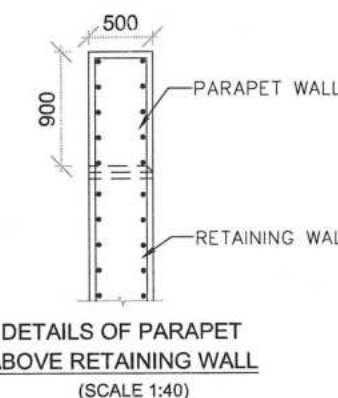
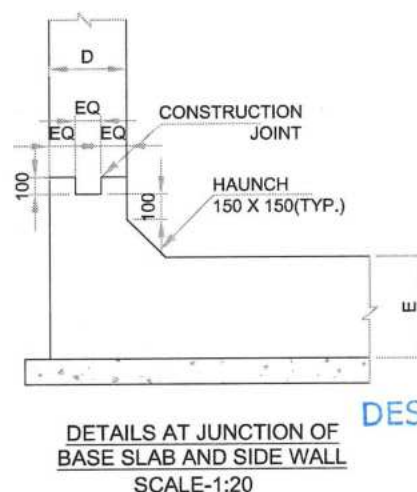
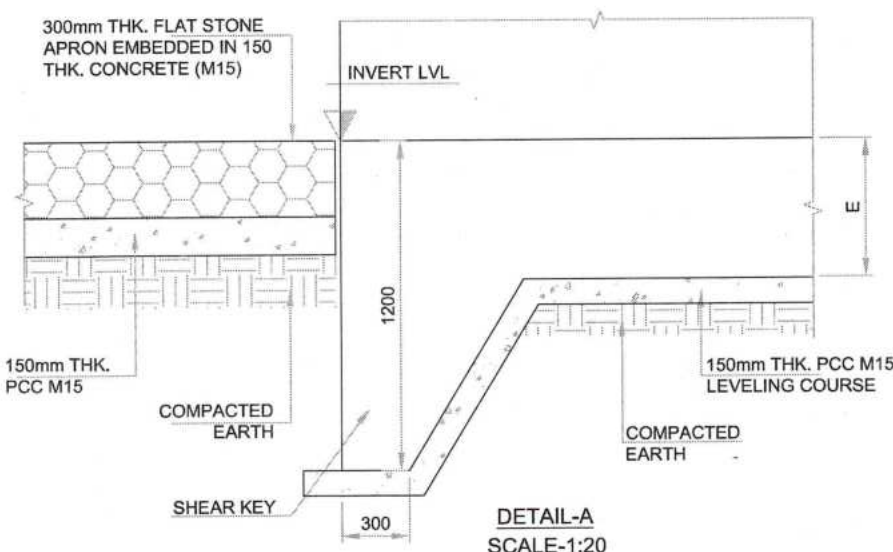
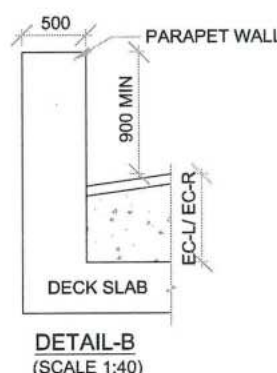
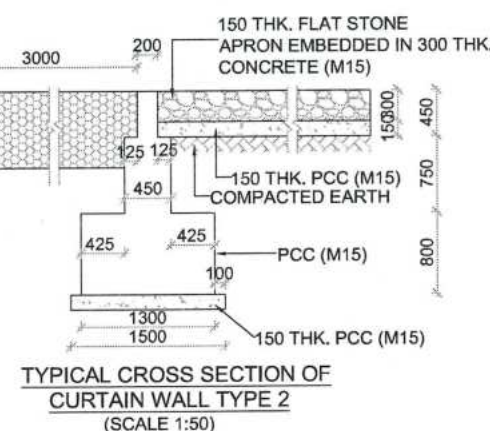
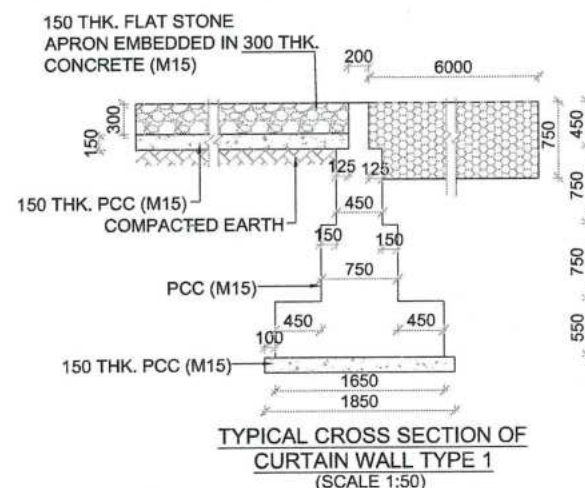
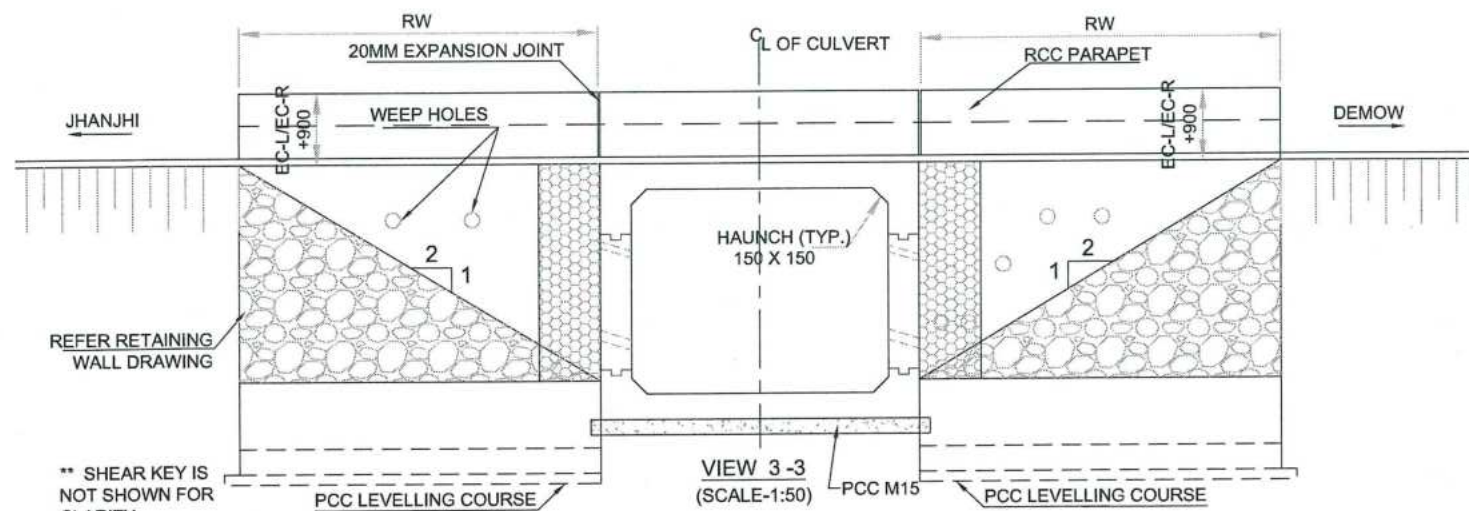
KEY PLAN



DESIGN DIRECTOR
Vas
VASANTH KUMAR T.H.

FOR APPROVAL

| | | | | | | | | |
|---|---|---|--|---|--|--|---|--|
| PROJECT FOUR LANE OF JHANJHI TO DEMOW SECTION OF NH-37 FROM EXISTING CH. Km 491+050 TO Km 535+250 (DESIGN CH. Km 490+800 TO Km 534+800) IN THE STATE OF ASSAM UNDER EPC MODE. | CLIENT National Highways infrastructure Development Corporation Ltd. Ministry of Road Transport & Highways, Government of India Branch office : House No.1, Panipath, Ambikagiri Nagar, Zoo road, Guwahati-24 | CONTRACTOR Gannon Dunkerley & Co. Ltd. 88A, TOPSIA ROAD (SOUTH) HATIE STREET, 7th FLOOR KOLKATA - 700048 | DESIGN CONSULTANT PROFESSIONAL CIVIL INFRA PVT. LTD. # 1838, GROUND FLOOR, SIR. M VISVESWARAYA LAYOUT, NAGADEVANAHALLI, BANGALORE - 560056 | PROOF CONSULTANT CHETAN INFRA TECH CONSULTANTS (P) LTD. 7/11, 1ST FLOOR, 13TH MAIN, SRINAGAR, OPP. PES COLLEGE, BENGALURU - 560050 | SAFETY CONSULTANT SMART SAFETY SERVICES # 3-5-5 & 7, HARI HARA NIVAS, CUMMAKONDA COLONY, HYDERGUDA, HYDERABAD - 500048 | AUTHORITY ENGINEER VOYANTS SOLUTIONS PVT. LTD. 403, 4th Floor, BPTP Park Centre, Block A, Jal Vayu Vihar, Sector 30, Gurgaon, Haryana 122001 | NAME SHEET SIZE DESIGN DIRECTOR A2 PROOF CONSULTANT SCALE SAFETY CONSULTANT AS SHOWN AUTHORITY CONSULTANT SHEET No. 01 OF 02 | TITLE: GENERAL ARRANGEMENT DRAWING OF BOX CULVERT (WIDENING) AT DESIGN CH 531+494 (EXISTING CH 531+895) DRAWING No. PCIPL/NH-37/J-D/STR/BC/23 REV. 00 |
|---|---|---|--|---|--|--|---|--|



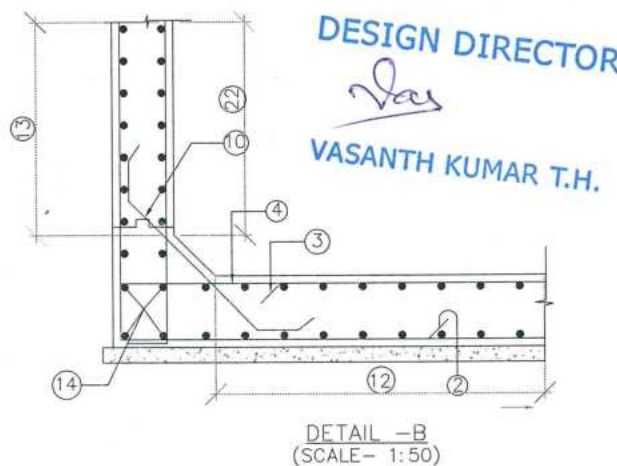
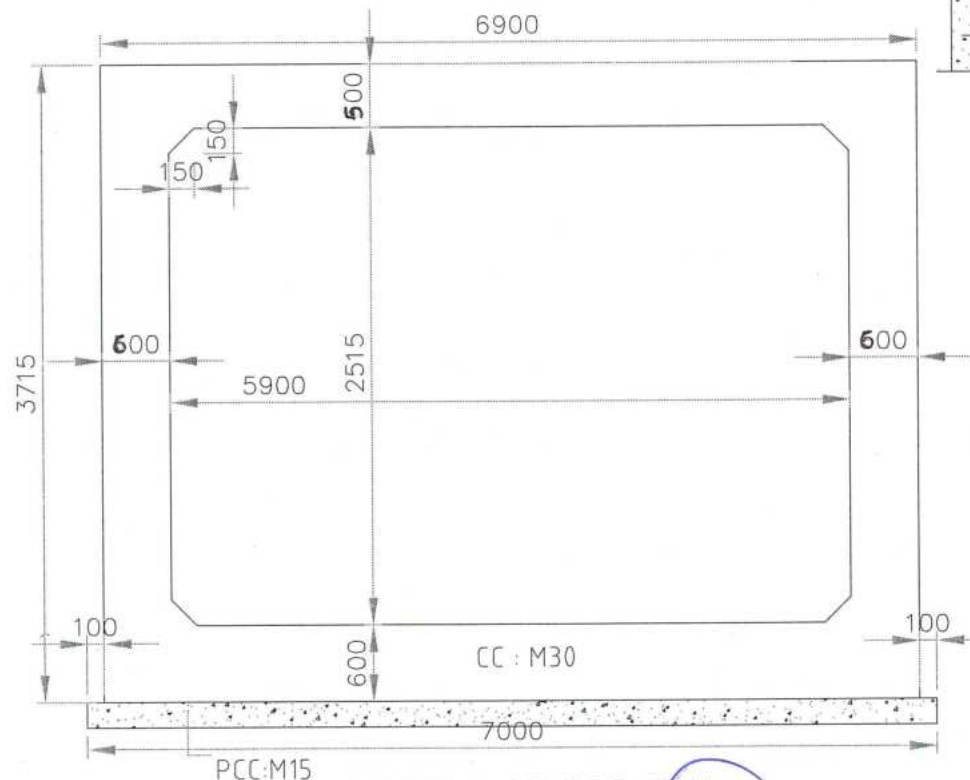
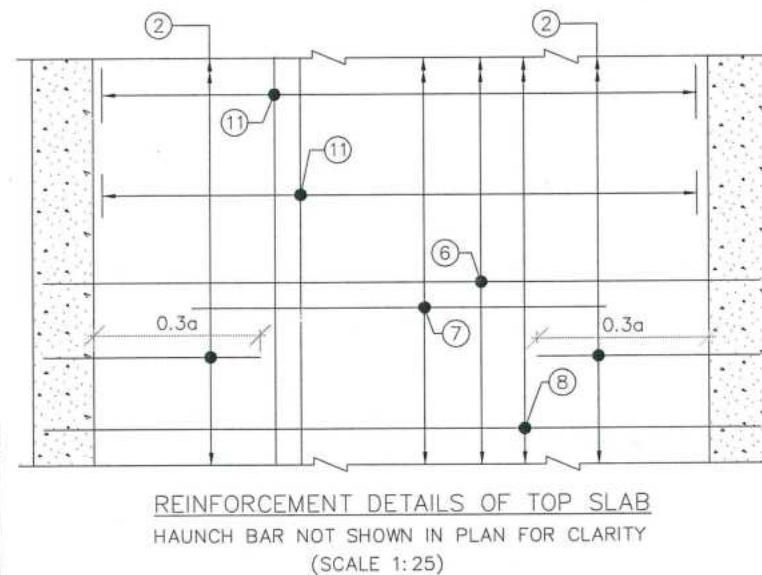
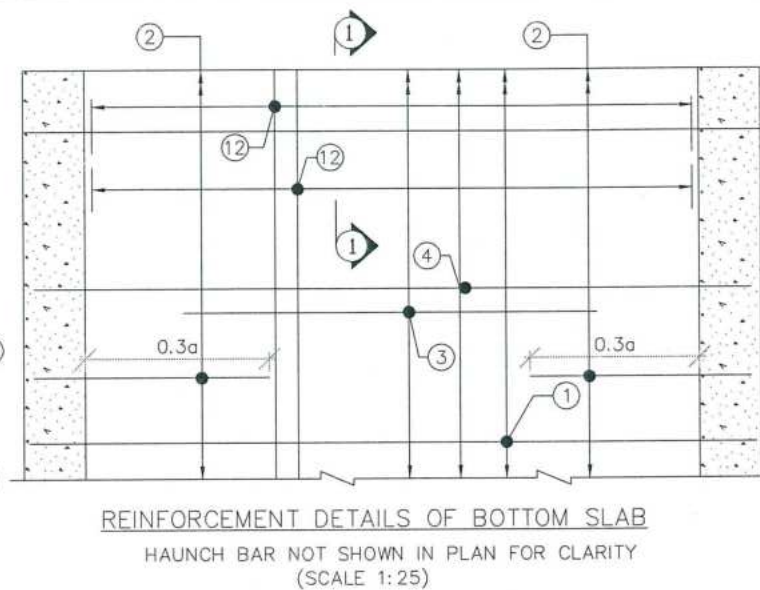
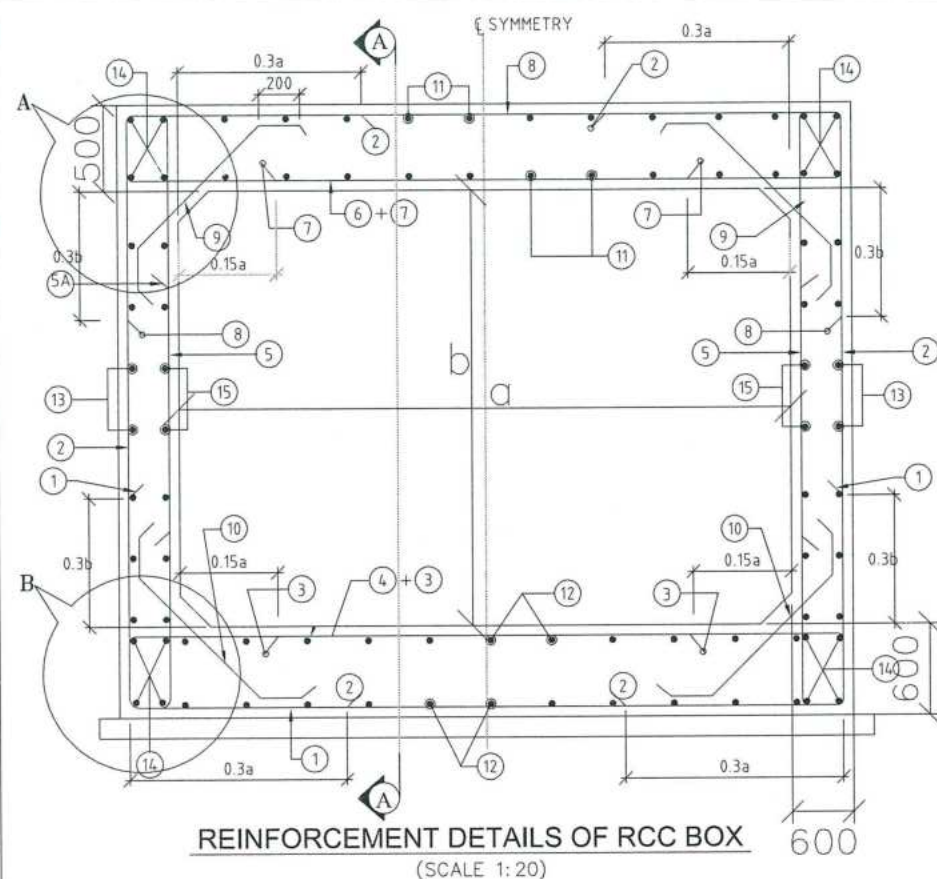
- NOTES:
- ALL DIMENSIONS ARE IN mm AND LEVELS ARE IN METERS, UNLESS MENTIONED OTHERWISE.
 - DIMENSIONS ARE NOT TO BE SCALED, ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
 - CONCRETE MIX SHALL BE DESIGN MIX AND SHALL HAVE MAXIMUM 28 DAYS CHARACTERISTIC CUBE STRENGTH AS FOLLOWS:
 - BOX.....M30
 - PARAPET.....M40
 - RETURN WALL.....M30
 - LEVELING COURSE.....M15
 - CURTAIN WALL.....M20
 - TOE WALL.....M20
 - GUARD STONE.....M20
 - GRADE OF UNTENSIONED STEEL SHALL BE Fe 500D, CONFORMING TO IS: 1786.
 - 600mm FILTER MEDIA SHALL BE PROVIDED BEHIND RCC BOX AND RETURN WALL.
 - THE BACK FILL MATERIAL BEHIND RCC BOX / RETAINING WALL SHALL HAVE FOLLOWING PROPERTIES $\phi 30^\circ$, $\gamma=2.0$ T/Cum.
 - SEISMIC ZONE - V.
 - SAFE BEARING CAPACITY AT FOUNDING LEVEL IS 12t/m^2 . THE SAME SHALL BE VERIFIED AT SITE BEFORE STARTING OF WORK.
 - FLOW DIRECTION SHOWN IN THE PLAN IS INDICATIVE ONLY, BED PROTECTION FOR UPSTREAM AND DOWN STREAM SHALL BE BASED ON THE FLOW DIRECTION OF THE SITE.
 - FLEXIBLE APRON SHALL BE PROVIDED BASED ON SITE CONDITION & SHALL BE DECIDED BY ENGINEER-IN-CHARGE WHEREVER ROCK IS AVAILABLE AT TOP LEVEL FLEXIBLE APRON SHALL BE DISPENSED.
 - BACK FILLING SHALL BE DONE SIMULTANEOUSLY ON BOTH SIDE OF BOX.
 - DRAWING SHALL BE READ IN CONJUNCTION WITH RELEVANT APPROVED HIGHWAY DRAWING FOR FRL, INVERT LEVEL, GL, CROSS SLOPE, LONGITUDINAL GRADIENT, ROAD WAY DETAILS ETC
 - PITCHING / REVETMENT ON SLOPES TO BE PROVIDED AS PER MORTH SPECIFICATION.
 - IF BC/CLAYEY SOIL ENCOUNTERED AS FOUNDING SOIL, THEN 900mm. DEPTH OF SOIL BELOW FOUNDATION TO BE REMOVED & FILLED BY METAL / BOULDERES WITH SAND AS PER SP-13.
 - THE CLEAR OPENING SIZE AND EARTH CUSHION MENTIONED SHALL BE VERIFIED WITH EXISTING STRUCTURE / APPROVED PPD AND IN CASE OF ANY DISCREPANCY, IT SHOULD BE IMMEDIATELY REPORTED FOR SUITABLE ACTION PRIOR TO COMMENCEMENT OF THE WORK.
 - SOFT AND LOOSE PATCHES IN THE BEARING AREA SHALL BE REPLACED BY COMPACTED GRANULAR FILLS AND SHALL BE PROPERLY COMPACTED WITH LAYERS NOT EXCEEDING 200mm BEFORE LAYING PCC OVER IT.
 - PCC LEVelling COURSE:
 - BELOW BOX STRUCTURE & TOE WALL - 150 THK.
 - BELOW FLOOR APRON - 150 THK.
 - STRUCTURE HAS BEEN DESIGNED FOR
 - ONE LANE, TWO LANE AND THREE LANES OF CLASS A
 - ONE LANE OF CLASS 70R + ONE LANE OF CLASS A
 - ONE LANE OF 40R BOGIE + ONE LANE OF CLASS A.
 - CONSTRUCTION JOINTS:-
 - THE LOCATION AND PROVISION OF CONSTRUCTION JOINTS SHALL BE AS PER THE DRAWING AND THE SAME SHALL BE APPROVED BY THE ENGINEER-IN-CHARGE.
 - THE CONCRETE SURFACE AT THE JOINT SHALL BE BRUSHED WITH A STIFF BRUSH AFTER CASTING WHILE THE CONCRETE IS STILL FRESH AND IT HAS ONLY SLIGHTLY HARDENED.
 - BEFORE NEW CONCRETE IS POURED THE SURFACE OF OLD CONCRETE SHALL BE PREPARED AS UNDER:
 - FOR HARDENED CONCRETE, THE SURFACE SHALL BE THOROUGHLY CLEANED TO REMOVE DEBRIS / LAITANCE & MADE ROUGH SO THAT $\frac{1}{4}$ OF THE SIZE OF THE AGGREGATE IS EXPOSED
 - FOR PARTIALLY HARDENED CONCRETE, THE SURFACE SHALL BE TREATED BY WIRE BRUSH FOLLOWED BY AN AIR JET
 - THE OLD SURFACE SHALL BE SOAKED WITH WATER WITHOUT LEAVING PUDDLES IMMEDIATELY, BEFORE STARTING CONCRETING TO PREVENT THE ABSORPTION OF WATER FROM NEW CONCRETE
 - NEW JOINT SHALL BE THOROUGHLY COMPACTED IN THE REGION OF THE JOINT
 - REFER TCS TYPE: TCS-1B

| REFERENCE DRAWINGS: | |
|---------------------------|-------------------------------|
| DETAILS OF RCC BOX | PCIPL/NH-37/JD/BC/STR/REIN/23 |
| MISCELLANEOUS DETAILS | PCIPL/NH-37/JD/STR/RCC-MIS/01 |
| DETAILS OF RETAINING WALL | PCIPL/NH-37/JD/STR/RW/01 |

- PROPOSED SEQUENCE OF CONSTRUCTION:-
- EARTH WORK EXCAVATION
 - CONFIRMATION OF FOUNDING LEVEL AS MENTIONED IN GFC DRAWING
 - LAYING OF PCC LEVelling COURSE
 - CONSTRUCTION OF BOTTOM SLAB WITH A PORTION OF WEB
 - CONSTRUCTION OF WEB
 - CONSTRUCTION OF TOP SLAB WITH A PORTION OF TOP WEB
 - BACK FILLING BEHIND THE SIDE WALL
 - LAYING OF WEARING COAT
 - PLACING OF SIDL

- LEGEND:
- IL - INVERT LEVEL
 - EC - EARTH CUSHION
 - FRL - FINISHED ROAD LEVEL
 - EFRL - FINISHED ROAD LEVEL AT EDGE
 - A - CLEAR WIDTH OF BOX
 - B - CLEAR HEIGHT OF BOX
 - C - TOP SLAB THICKNESS
 - D - SIDE WALL THICKNESS
 - E - BOTTOM RAFT THICKNESS
 - F - RETAINING WALL THICKNESS

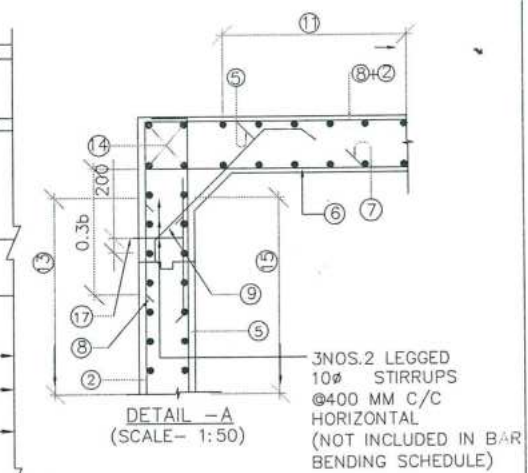
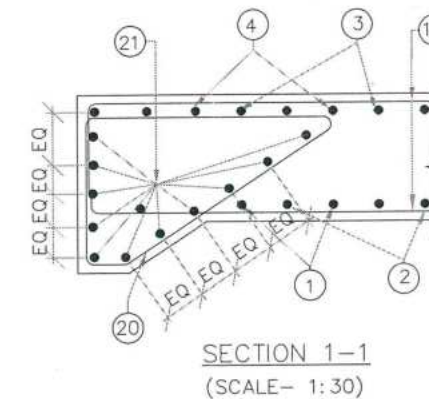
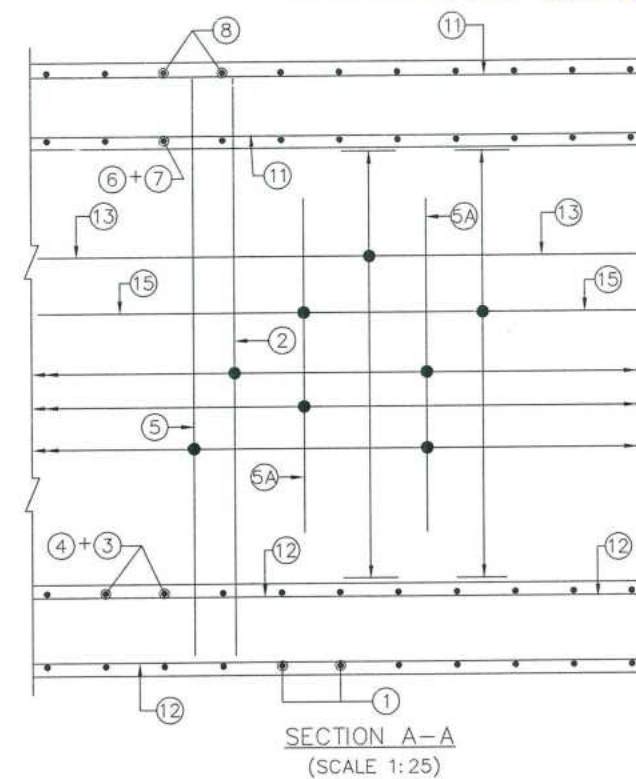
| PROJECT | CLIENT | CONTRACTOR | DESIGN CONSULTANT | PROOF CONSULTANT | SAFETY CONSULTANT | AUTHORITY ENGINEER | NAME | SHEET SIZE | TITLE | DRAWING No. | REV. |
|---|--|---|---|---|--|--|----------|------------|--|---------------------------|------|
| FOUR LANING OF JHANJHI TO DEMOW SECTION OF NH-37 FROM EXISTING CH. Km 491+050 TO Km 535+250 (DESIGN CH. Km 490+800 TO Km 534+800) IN THE STATE OF ASSAM UNDER EPC MODE. | National Highways Infrastructure Development Corporation Ltd. Ministry of Road Transport & Highways, Government of India Branch office : House No. 1, Panipath, Ambikagiri Nagar - Zoo road, Guwahati-24 | Ganesh Dinkar & Co. Ltd. B-1, TOPSA ROAD (SC/TH) HATTE STREET, 7th FLOOR KODATA - 700046 | PROFESSIONAL CIVIL INFRA PVT. LTD. # 1838, GROUND FLOOR, SIR. M VISVESWARAYA LAYOUT, NAGADEVANAHALLI BANGALORE - 560 056 | CHETAN INFRA-TECH CONSULTANTS (P) LTD. 7/11, 1ST FLOOR, 18TH MAIN, SINGANAGAR, CHAPLES COLLEGE, BENGALURU - 560050 | SMART SAFETY SERVICES # 3-5-6 & 7, HARI HARA NIVAS GUMMAKONDA COLONY, HYDERGUDA, HYDERABAD - 500048 | VOYANTS SOLUTIONS PVT. LTD. 403-4th Floor, 80TH Park Central Block A, Jai Vayu Vihar, Sector 38 Gurgaon, Haryana 122001 | AS SHOWN | A2 | GENERAL ARRANGEMENT DRAWING OF BOX CULVERT (WIDENING) AT DESIGN CH 531+494 (EXISTING CH 531+895) | PCIPL/NH-37/J-D/STR/BC/23 | 00 |



NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS & LEVELS ARE IN METERS.
2. DIMENSIONS ARE NOT TO BE SCALED, ONLY WRITTEN DIMENSIONS TO BE FOLLOWED.
3. GRADE OF CONCRETE : M30 FOR BOX.
4. GRADE OF STEEL : Fe500.
5. CLEAR COVER TO REINFORCEMENT SHALL BE AS FOLLOWS.
TOP SLAB = 75mm (TOP FACE); 50mm (BOTTOM FACE)
BOTTOM SLAB = 50mm (TOP FACE); 75mm (BOTTOM FACE)
OUTER WALL = 75mm (EARTH FACE); 50mm (WATER FACE).
6. ANCHORAGE LENGTH SHALL BE 40x BAR DIA (#)
7. LAP LENGTH OF THE STEEL SHALL BE PROVIDED AS BELOW.
LAP LENGTH = $K \times l$
 $K = 1.00$ (<25% LAPPED BAR RELATIVE TO TOTAL CROSS SECTIONAL AREA.)
 $K = 1.15$ (33% LAPPED BAR RELATIVE TO TOTAL CROSS SECTIONAL AREA.)
 $K = 1.40$ (50% LAPPED BAR RELATIVE TO TOTAL CROSS SECTIONAL AREA.)
ALTERNATIVELY BAR SPICE COUPLER CAN BE USED FOR REBAR LAPPING AND SPLICING.
8. NOT MORE THAN 50% OF BARS CAN BE LAPPED AT A SECTION AND LAPS SHALL BE STAGGERED.
9. FOR DETAILS OF APPROACH SLAB, HAND RAILING RETAINING WALL, REFER SEPARATE MISCELLANEOUS DRAWINGS.
10. SBC OF SOIL BELOW THE BOX STRUCTURE SHALL NOT BE LESS THAN 12.0 T/Sq.m

GOOD FOR CONSTRUCTION



DESIGN CH: 531+494 SCHEDULE OF REINFORCEMENT

| BAR MARK | SHAPE OF BARS (NOT TO SCALE) | BAR DIA IN mm | SPACING OR NO. OF BAR |
|----------|------------------------------|---------------|-----------------------|
| 1 | | 12 | 100 C/C |
| 2 | | 12 | 100 C/C |
| 3 | | 12 | 100 C/C |
| 4 | | 12 | 100 C/C |
| 5 | | 12 | 125 C/C |
| 5A | | 12 | 150 C/C |
| 6 | | 12 | 125 C/C |
| 7 | | 12 | 125 C/C |
| 8 | | 12 | 100 C/C |
| 9 | | 10 | 200 |
| 10 | | 10 | 200 |
| 11 | | 10 | 200 |
| 12 | | 10 | 150 |
| 13 | | 10 | 200 |
| 14 | | 10 | 16 NOS. |
| 15 | | 10 | 200 |
| 16 | | | NOT USED |
| 17 | | 10 | 250 |
| 18 | | | NOT USED |
| 19 | | | NOT USED |
| 20 | | 10 | 150 |
| 21 | | 10 | 20 NOS. |

FOR APPROVAL

| PROJECT | CLIENT | CONTRACTOR | DESIGN CONSULTANT | PROOF CONSULTANT | SAFETY CONSULTANT | AUTHORITY ENGINEER | NAME | SHEET SIZE | TITLE |
|---|--|---|---|--|--|--|--|--|--|
| FOUR LANE OF JHANJHI TO DEMOW SECTION OF NH-37 FROM EXISTING CH. Km 491+050 TO Km 535+250 (DESIGN CH. Km 490+800 TO Km 534+800) IN THE STATE OF ASSAM UNDER EPC MODE. | National Highways Infrastructure Development Corporation Ltd. Ministry of Road Transport & Highways, Government of India Branch office : House No.1, Panipath, Ambikagiri Nagar, Zoo road, Guwahati-24 | Gannon Dunkerley & Co. Ltd. 86A, TOPSTA ROAD (SOUTH), HALITE STREET, 7TH FLOOR, KOLKATA - 700046 | PROFESSIONAL CIVIL INFRA PVT. LTD. 7/11, 1ST FLOOR, 13TH MAIN, SRINAGAR OPP. PES COLLEGE, BANGALORE-560045 | CHETAN INFRA TECH CONSULTANTS (P) LTD., 7/11, 1ST FLOOR, 13TH MAIN, SRINAGAR OPP. PES COLLEGE, BANGALORE-560045 | SMART SAFETY SERVICES 402, 4th Floor, BPTP Park, Central, Block A, Jai Vayu Vihar, Sector 30, Gurgaon, Haryana 122001 | VOYANTS SOLUTIONS PVT. LTD. 402, 4th Floor, BPTP Park, Central, Block A, Jai Vayu Vihar, Sector 30, Gurgaon, Haryana 122001 | DESIGN DIRECTOR PROOF CONSULTANT SAFETY CONSULTANT AUTHORITY CONSULTANT | A2 SCALE AS SHOWN SHEET No. 01 OF 01 | REINFORCEMENT DETAILS OF BOX CULVERT (1X5.9X2.515) AT DESIGN CHAINAGE 531+494 (EXISTING CHAINAGE 531+895) DRAWING No. PCIL/NH-37/JD/BC/STR/REIN/23 REV. 00 |