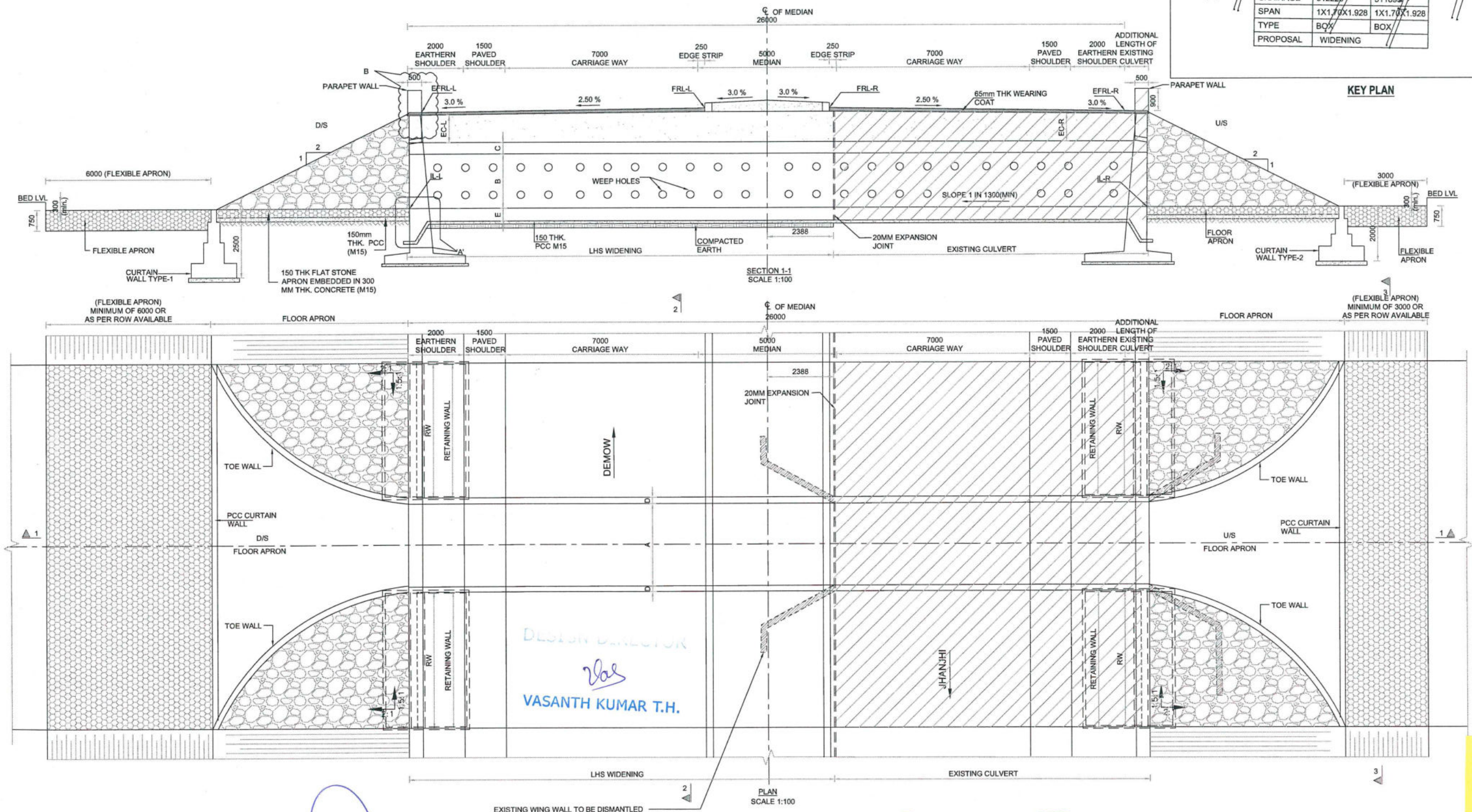
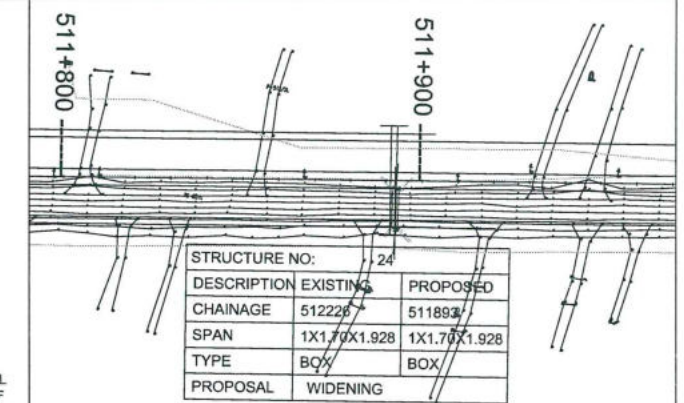


GOOD FOR CONSTRUCTION

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
512+226	511+893	1X1.7X1.928	92.067	92.067	91.795	91.795	1.376	1.376	88.566	88.586	1.700	1.928	0.20	0.35	0.20	4.8	R-L	15.388



PROJECT
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.

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
Gadner-Dunkley & Co. Ltd.
66A, TOPSIA ROAD (SOUTH)
HATTE STREET, 7TH FLOOR
KOLKATA - 700046

DESIGN CONSULTANT
PROFESSIONAL CIVIL INFRA PVT. LTD.
1838, GROUND FLOOR,
SIR. M VISVESWARAYIA LAYOUT,
NAGADEVANAHALLI,
BANGALORE - 560 056

PROOF CONSULTANT
CHETAN INFRA-TECH
CONSULTANTS (P) LTD.
7/11, 1ST FLOOR,
13TH MAIN, SRINAGAR,
OPJPES COLLEGE
BANGALURU-560050

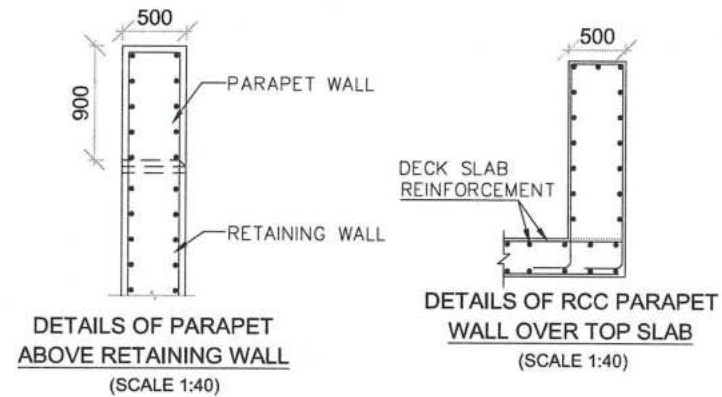
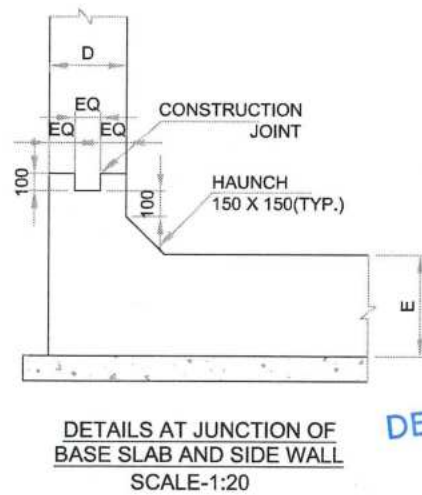
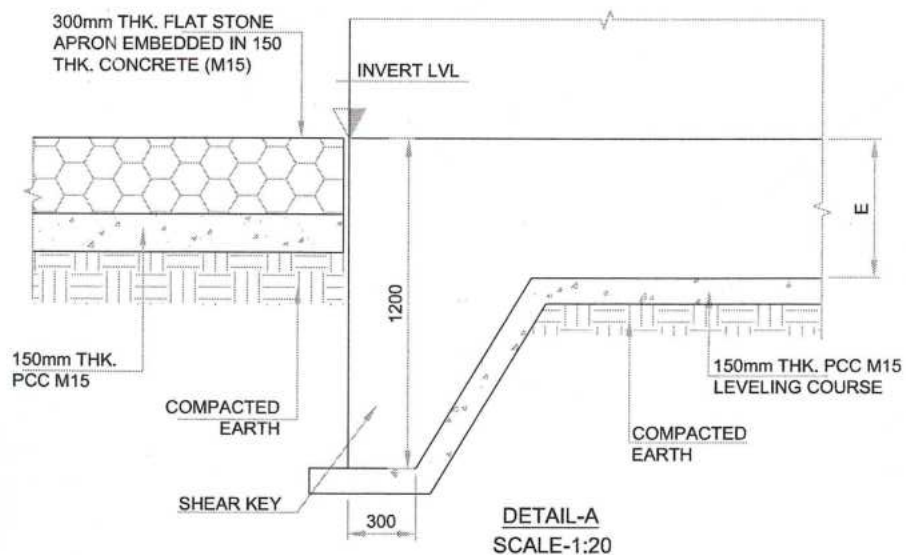
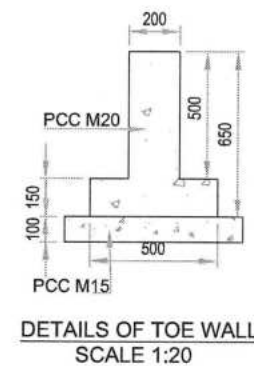
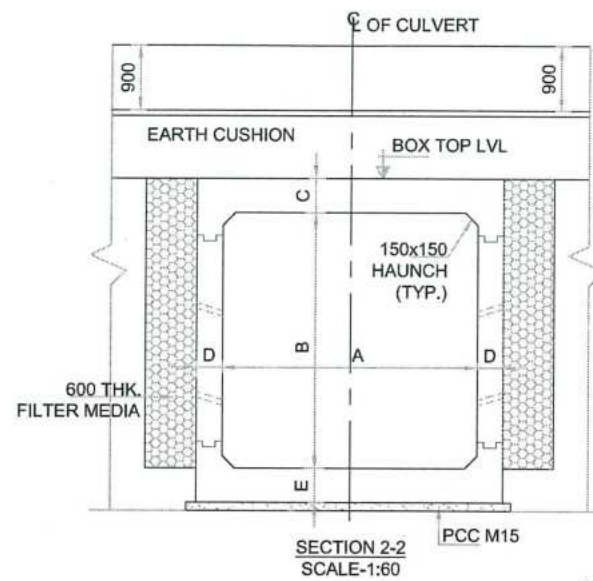
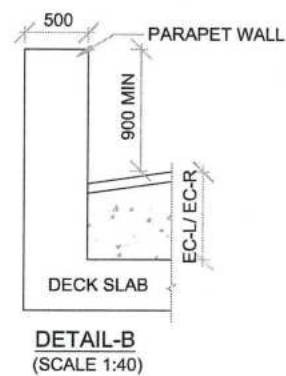
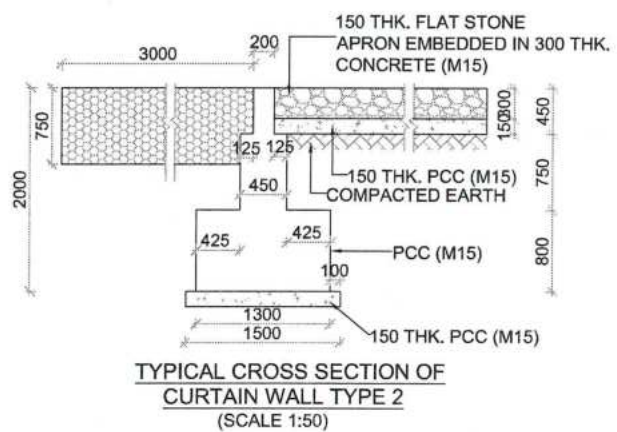
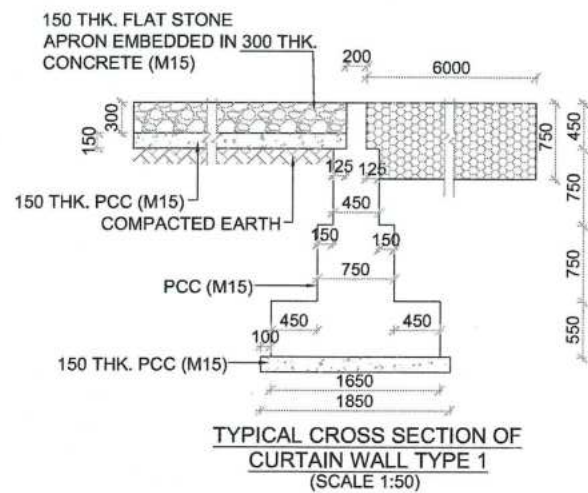
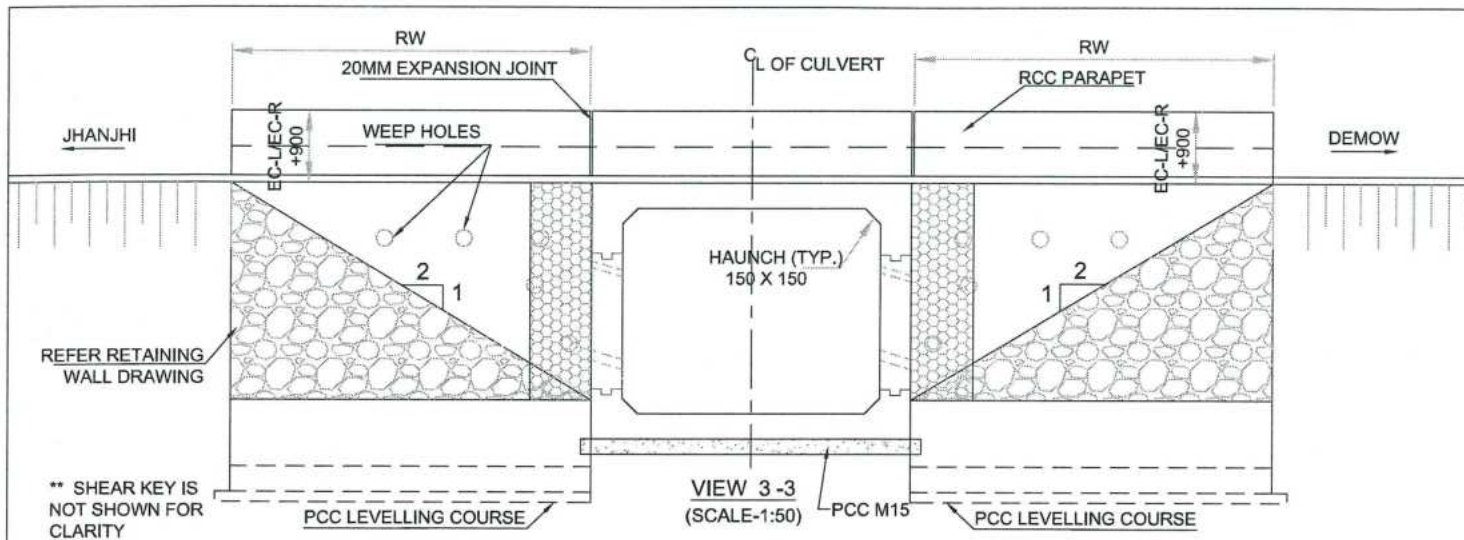
SAFETY CONSULTANT
SMART SAFETY SERVICES
3-5-6 & 7, HARI HARA NIVAS,
GUMMAKONDA COLONY,
HYDERABAD - 500048

AUTHORITY ENGINEER
VOYANTS SOLUTIONS PVT. LTD.
Date...
403 4th Floor, BPIT Park
Central Block A, Jai Vayu
Vihar, Sector 39,
Gurgaon, Haryana 122001

NAME	SHEET SIZE
DESIGN DIRECTOR	A2
PROOF CONSULTANT	SCALE
SAFETY CONSULTANT	AS SHOWN
AUTHORITY CONSULTANT	SHEET No. 01 OF 02

FOR APPROVAL
TITLE: GENERAL ARRANGEMENT
DRAWING OF BOX CULVERT
(WIDENING) AT DESIGN CH 511+893
(EXISTING CH 512+226)
DRAWING No.
PCIPL/NH-37/J-D/STR/BC/12
REV.
00

GOOD FOR CONSTRUCTION



DESIGN DIRECTOR (REFER MISCELLANEOUS DRAWINGS)

VASANTH KUMAR T.H.

PROPOSED SEQUENCE OF CONSTRUCTION:-

1. EARTH WORK EXCAVATION
2. CONFIRMATION OF FOUNDING LEVEL AS MENTIONED IN GFC DRAWING
3. LAYING OF PCC LEVELLING COURSE
4. CONSTRUCTION OF BOTTOM SLAB WITH A PORTION OF WEB
5. CONSTRUCTION OF WEB
6. CONSTRUCTION OF TOP SLAB WITH A PORTION OF TOP WEB
7. BACK FILLING BEHIND THE SIDE WALL
8. LAYING OF WEARING COAT
9. 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
- RW -RETAINING WALL

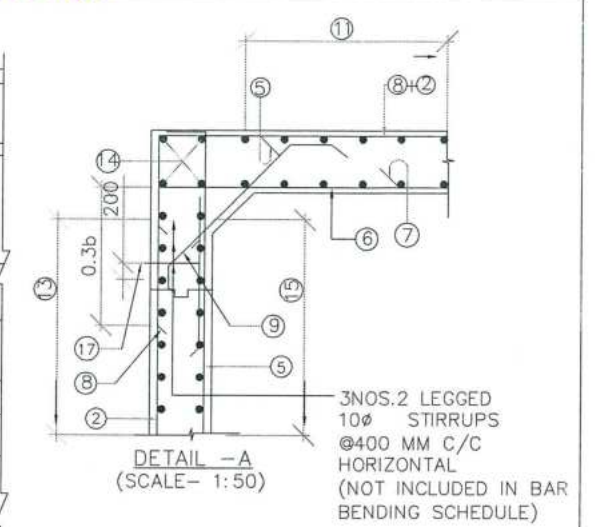
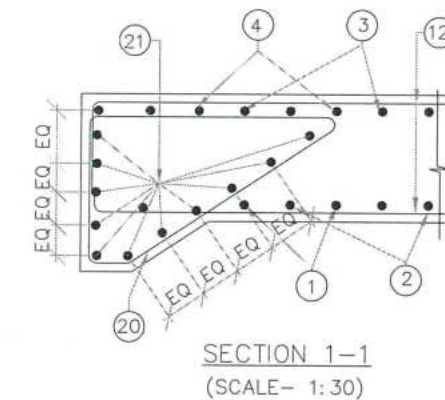
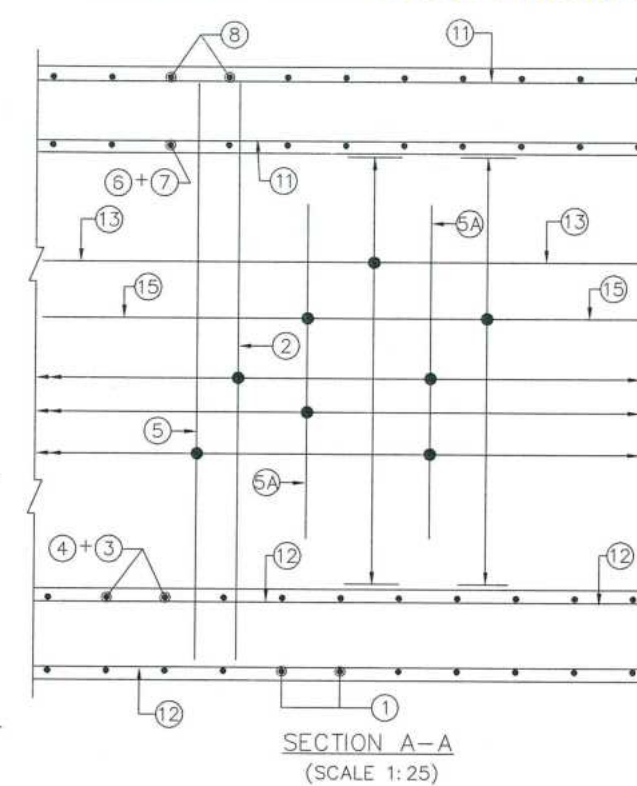
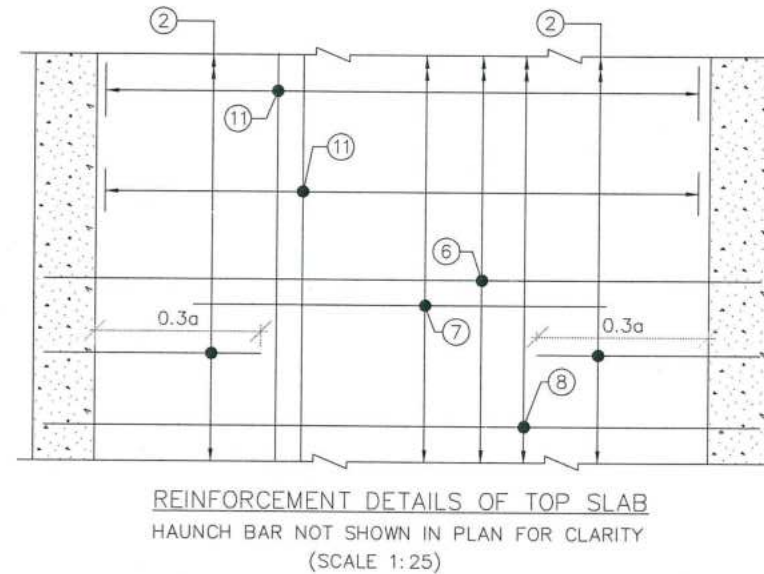
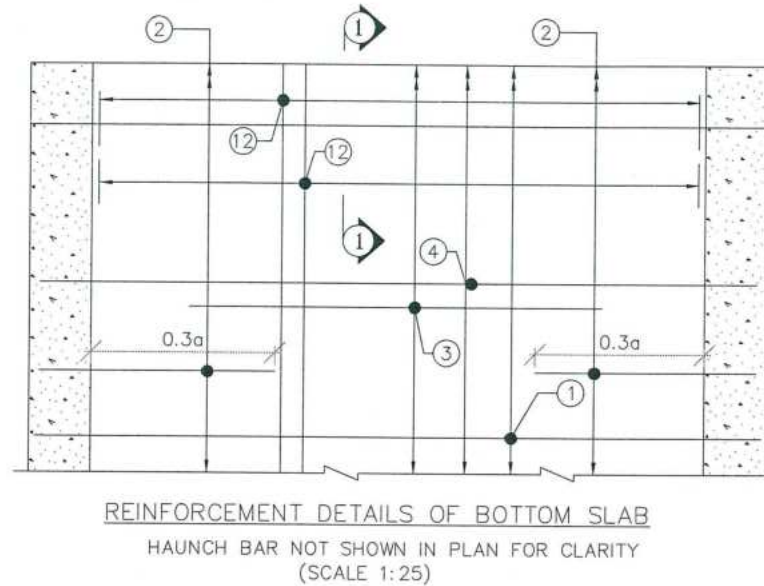
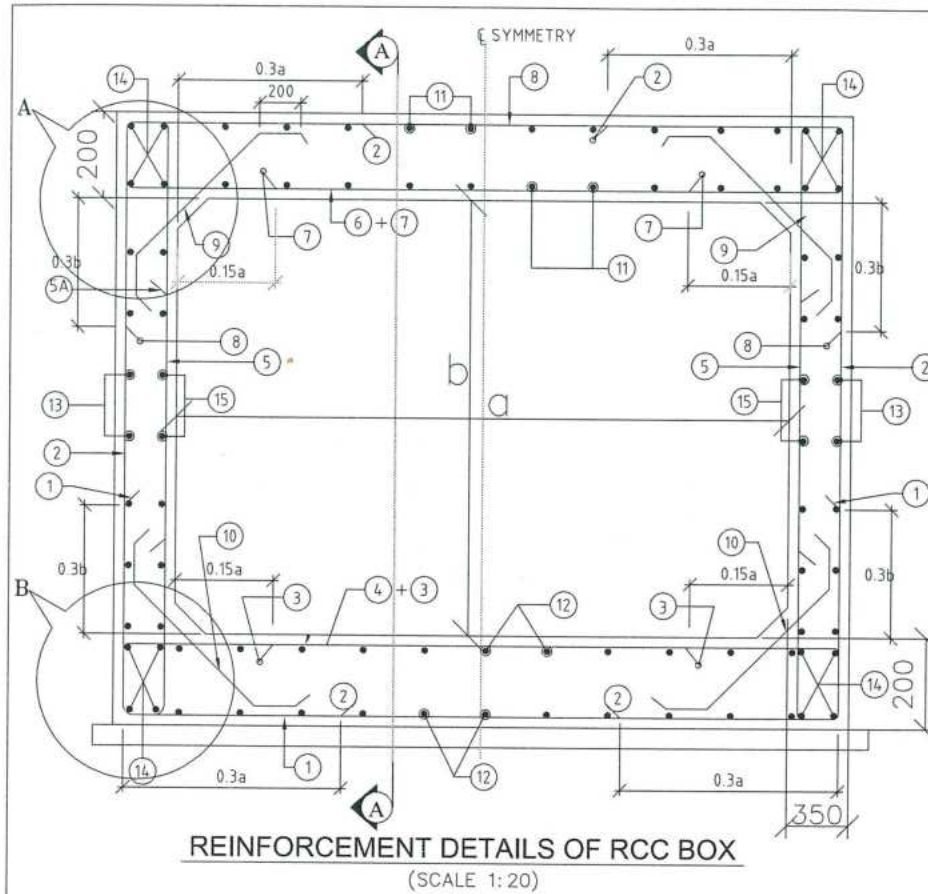
NOTES:

01. ALL DIMENSIONS ARE IN mm AND LEVELS ARE IN METERS, UNLESS MENTIONED OTHERWISE .
02. DIMENSIONS ARE NOT TO BE SCALED, ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
03. CONCRETE MIX SHALL BE DESIGN MIX AND SHALL HAVE MAXIMUM 28 DAYS CHARACTERISTIC CUBE STRENGTH AS FOLLOWS:
 - (i) BOX.....M30
 - (ii) PARAPETM40
 - (iii) RETURN WALL.....M30
 - (iv) LEVELING COURSE.....M15
 - (v) CURTAIN WALLM20
 - (vi) TOE WALLM20
 - (vii) GUARD STONEM20
04. GRADE OF UNTENSIONED STEEL SHALL BE Fe 500D, CONFORMING TO IS: 1786.
05. 600mm FILTER MEDIA SHALL BE PROVIDED BEHIND RCC BOX AND RETURN WALL.
06. THE BACK FILL MATERIAL BEHIND RCC BOX / RETAINING WALL SHALL HAVE FOLLOWING PROPERTIES ϕ 30°, γ =2.0 T/Cum.
07. SEISMIC ZONE - V.
08. SAFE BEARING CAPACITY AT FOUNDING LEVEL IS 12t/m². THE SAME SHALL BE VERIFIED AT SITE BEFORE STARTING OF WORK.
09. FLOW DIRECTION SHOWN IN THE PLAN IS INDICATIVE ONLY, BED PROTECTION FOR UPSTREAM AND DOWN STREAM SHALL BE BASED ON THE FLOW DIRECTION THE SITE.
10. 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.
11. BACK FILLING SHALL BE DONE SIMULTANEOUSLY ON BOTH SIDE OF BOX.
12. DRAWING SHALL BE READ IN CONJUNCTION WITH RELEVANT APPROVED HIGHWAY DRAWING FOR FRL, INVERT LEVEL, GL, CROSS SLOPE, LONGITUDINAL GRADIENT, ROAD WAY DETAILS ETC
13. PITCHING / REVETMENT ON SLOPES TO BE PROVIDED AS PER MORTH SPECIFICATION.
14. IF BC/CLAYEY SOIL ENCOUNTERED AS FOUNDING SOIL, THEN 900mm. DEPTH OF SOIL BELOW FOUNDATION TO BE REMOVED & FILLED BY METAL / BOULDERS WITH SAND AS PER SP-13.
15. 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.
16. 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.
17. PCC LEVELLING COURSE:
 - BELOW BOX STRUCTURE & TOE WALL - 150 THK.
 - BELOW FLOOR APRON - 150 THK.
18. STRUCTURE HAS BEEN DESIGNED FOR
 - i) ONE LANE, TWO LANE AND THREE LANES OF CLASS A
 - ii) ONE LANE OF CLASS 70R + ONE LANE OF CLASS A
 - iii) ONE LANE OF 40R BOGIE + ONE LANE OF CLASS A.
19. CONSTRUCTION JOINTS:-
 - i) THE LOCATION AND PROVISION OF CONSTRUCTION JOINTS SHALL BE AS PER THE DRAWING AND THE SAME SHALL BE APPROVED BY THE ENGINEER-IN-CHARGE.
 - ii) 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.
 - iii) BEFORE NEW CONCRETE IS POURED THE SURFACE OF OLD CONCRETE SHALL BE PREPARED AS UNDER:
 - (a) FOR HARDENED CONCRETE, THE SURFACE SHALL BE THOROUGHLY CLEANED TO REMOVE DEBRIS / LAITANCE & MADE ROUGH SO THAT 1/4 OF THE SIZE OF THE AGGREGATE IS EXPOSED
 - (b) FOR PARTIALLY HARDENED CONCRETE, THE SURFACE SHALL BE TREATED BY WIRE BRUSH FOLLOWED BY AN AIR JET
 - (c) THE OLD SURFACE SHALL BE SOAKED WITH WATER WITHOUT LEAVING PUDDLES IMMEDIATELY, BEFORE STARTING CONCRETING TO PREVENT THE ABSORPTION OF WATER FROM NEW CONCRETE
 - iv) NEW JOINT SHALL BE THOROUGHLY COMPACTED IN THE REGION OF THE JOINT
20. REFER TCS TYPE: TCS-1B

FOR APPROVAL

PROJECT		CLIENT		CONTRACTOR		DESIGN CONSULTANT		PROOF CONSULTANT		SAFETY CONSULTANT		AUTHORITY ENGINEER		FOR APPROVAL	
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		 Gannon Dunkerley & Co. Ltd. 65A, TOPSIA ROAD (SOUTH) HAUTE STREET, 7th FLOOR KOLKATA - 700046		 PROFESSIONAL CIVIL INFRA PVT. LTD. # 183A, GROUND FLOOR, SILENT SWARAYA LAYOUT, NAGADEVANAHALLY, BANGALORE - 560 056		 CHETAN INFRA-TECH CONSULTANTS PVT. LTD., 7th, 1st FLOOR, 13TH MAIN, SRINAGAR, SILENT SWARAYA COLLEGE, BANGALORE-560050		 SMART SAFETY SERVICES # 3-5 & 7, HARI HARA NIVAS, GUMMAKONDA COLONY, HYDERABAD, HYDERABAD - 500048		 VOYANTS SOLUTIONS PVT. LTD. 403, 4th Floor, BPTP Park Centre, Block-2, Jal Vayu Vihar, Sector 30, Gurgaon, Haryana 122001		TITLE: GENERAL ARRANGEMENT DRAWING OF BOX CULVERT (WIDENING) AT DESIGN CH 511+893 (EXISTING CH 512+226)	
														DRAWING No.	
														REV.	
														PC IPL/NH-37/J-D/STR/BC/12	
		NAME		SHEET SIZE											
		DESIGN DIRECTOR		A2											
		PROOF CONSULTANT		SCALE											
		SAFETY CONSULTANT		AS SHOWN											
		AUTHORITY CONSULTANT		SHEET No.											
				02 OF 02											

GOOD FOR CONSTRUCTION



DESIGN CH: 511+893
SCHEDULE OF REINFORCEMENT

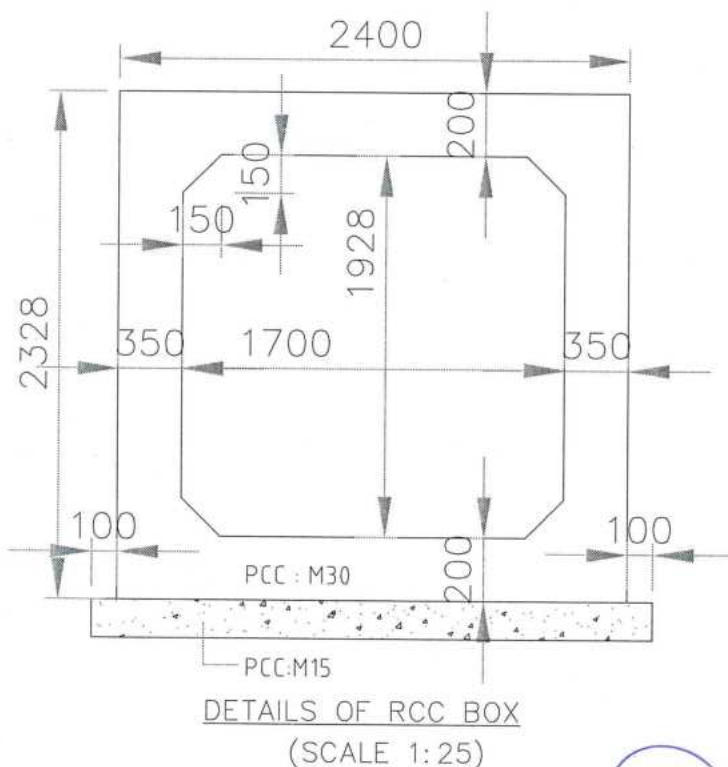
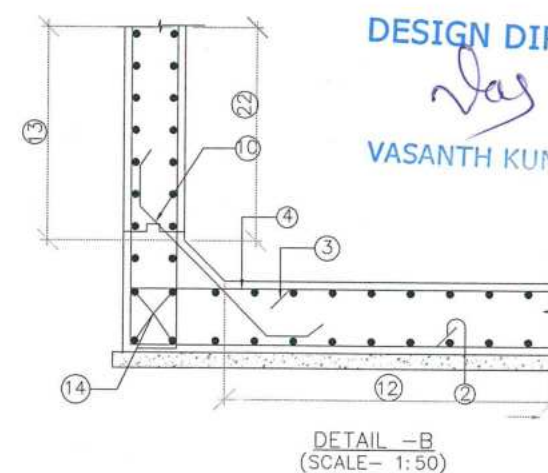
BAR MARK	SHAPE OF BARS (NOT TO SCALE)	BAR DIA IN mm	SPACING OR NO. OF BAR
1		12	150 C/C
2		12	150 C/C
3		10	200 C/C
4		12	200 C/C
5		12	200 C/C
5A		10	200 C/C
6		12	200 C/C
7		10	200 C/C
8		12	150 C/C
9		10	200
10		10	200
11		10	200
12		10	200
13		10	200
14		10	16 NOS.
15		10	200
16			NOT USED
17		10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

NOTES:

- ALL DIMENSIONS ARE IN MILLIMETERS & LEVELS ARE IN METERS.
- DIMENSIONS ARE NOT TO BE SCALED, ONLY WRITTEN DIMENSIONS TO BE FOLLOWED.
- GRADE OF CONCRETE : M30 FOR BOX.
- GRADE OF STEEL : Fe500.
- 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).
- ANCHORAGE LENGTH SHALL BE 40x BAR DIA (ϕ)
- 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 SPLICE COUPLER CAN BE USED FOR REBAR LAPPING AND SPLICING.
- NOT MORE THAN 50% OF BARS CAN BE LAPPED AT A SECTION AND LAPS SHALL BE STAGGERED.
- FOR DETAILS OF APPROACH SLAB, HAND RAILING RETAINING WALL, REFER SEPARATE MISCELLANEOUS DRAWINGS.
- SBC OF SOIL BELOW THE BOX STRUCTURE SHALL NOT BE LESS THAN 12.0 T/Sq.m

DESIGN DIRECTOR

VASANTH KUMAR T.H.



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. 100, TOPSI ROAD (SOUTH SIDE), 10TH FLOOR, KOLKATA - 700034	DESIGN CONSULTANT PROFESSIONAL CIVIL INFRA PVT. LTD. #1838, GROUND FLOOR, SIR M VISVESWARAYA LAYOUT, NAGADEVANAHALLI, BANGALORE - 560058	PROOF CONSULTANT CHETAN INFRA TECH CONSULTANTS (P) LTD. 7/11, 1ST FLOOR, WITH MAIN BRINAGAR, ORAPES COLLEGE, BENGALURU-560030	SAFETY CONSULTANT SMART SAFETY SERVICES 303, 301, HARI HARA NIVAS, CHANDRANANDA COLONY, HYDERGUDA, HYDERABAD - 500048	AUTHORITY ENGINEER VOYANTS SOLUTIONS PVT. LTD. 403, 401 Floor, SPITP Park, Ceptra, Block A, Ja Vayu Vihar, Sector 30, Gurgaon, Haryana 122001	DESIGN DIRECTOR NAME: VASANTH KUMAR T.H. SHEET SIZE: A2 SCALE: AS SHOWN SHEET No.: 01 OF 01	TITLE: REINFORCEMENT DETAILS OF BOX CULVERT (1X1.7X1.928) AT DESIGN CHAINAGE 511+893 (EXISTING CHAINAGE 512+226) DRAWING No. PCIP/NH-37/JD/BC/STR/REIN/12 REV. 00
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FOR APPROVAL