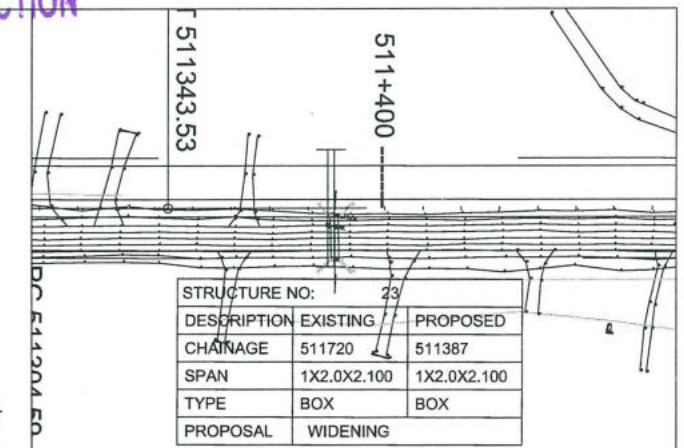


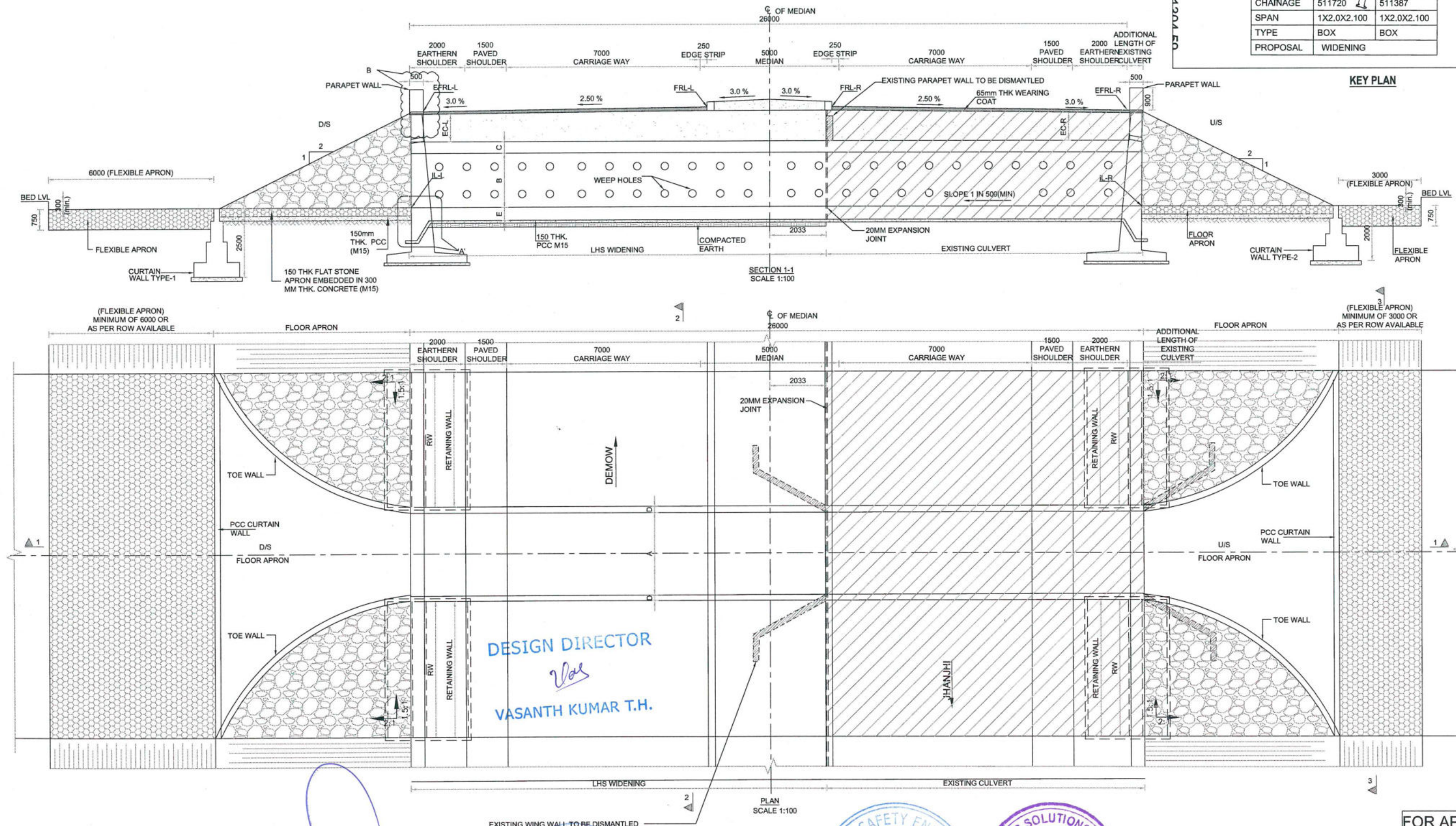
GOOD FOR CONSTRUCTION

Details Of Box culvert:

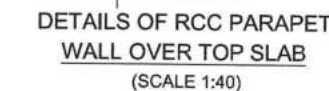
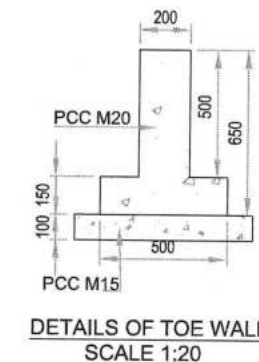
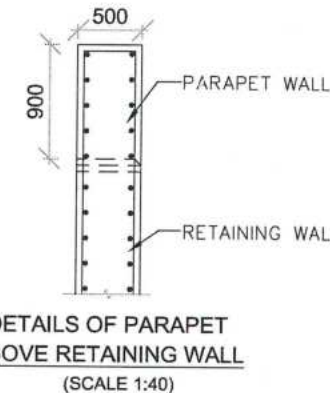
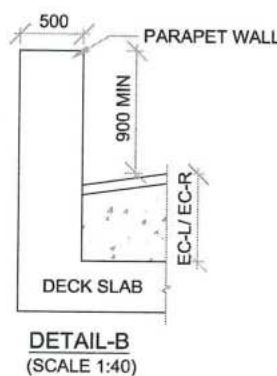
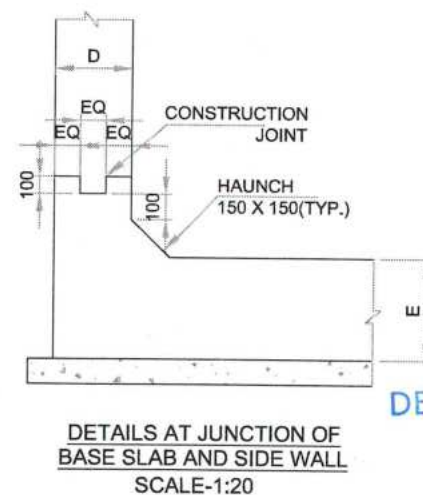
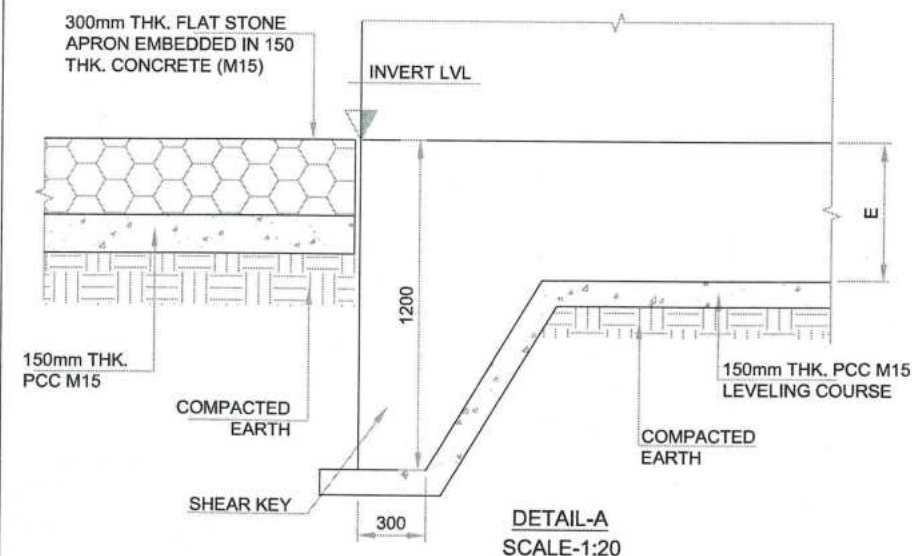
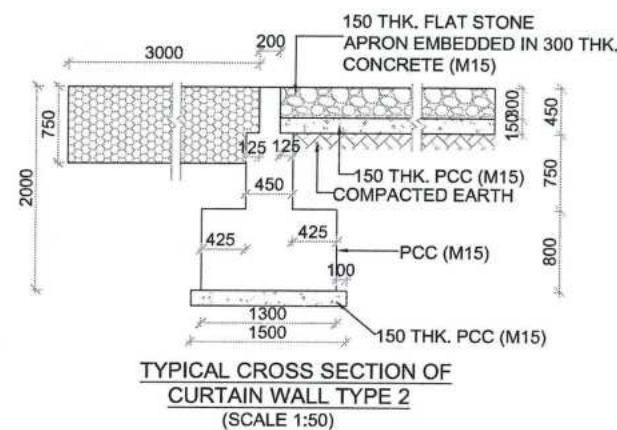
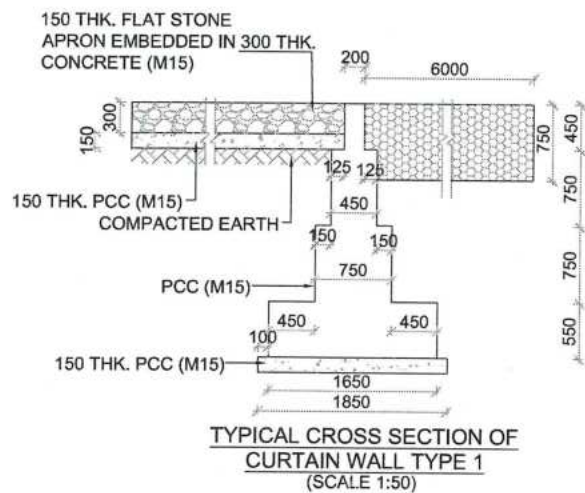
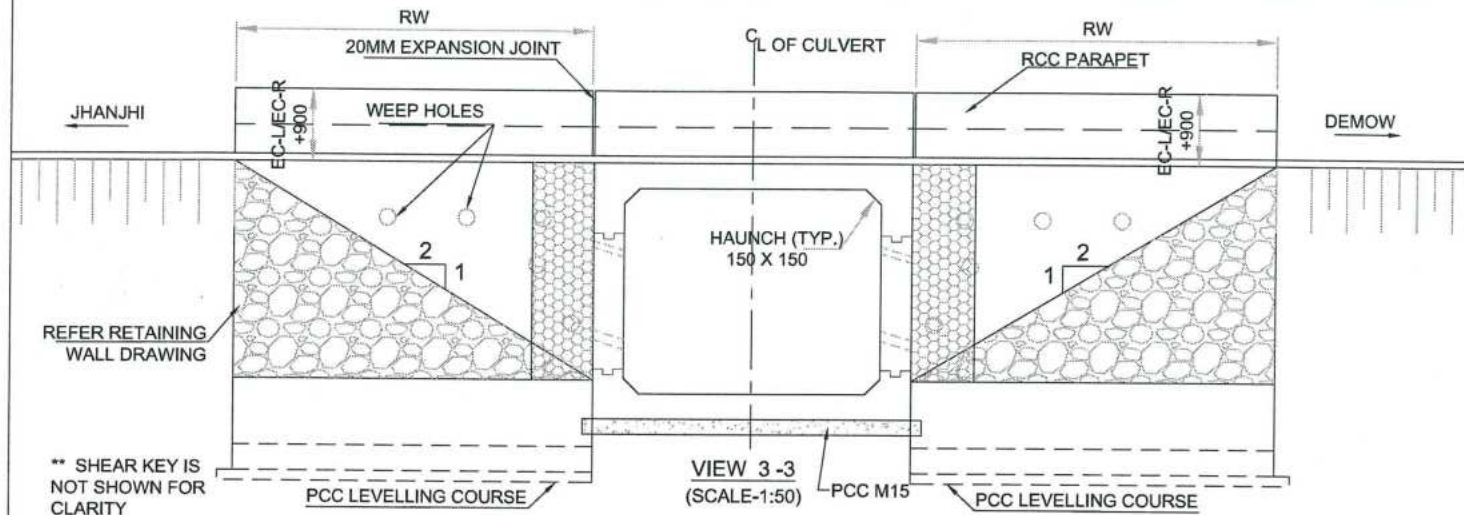
EXISTING CHAINAGE	DESIGN CHAINAGE	SPAN	FRL-L	FRL-R	EFRL-L	EFRL-R	EC-L	EC-R	IL-L	IL-R	CLEAR WIDTH (A)	CLEAR HEIGHT (B)	TOP SLAB THICKNESS (C)	WALL THICKNESS (D)	BOTTOM RAFT THICKNESS (E)	RW	FLOW DIRECTION	LHS WIDENING
511+720	511+387	1X2.0X2.1	92.281	92.281	92.009	92.009	1.377	1.377	88.424	88.484	2.000	2.100	0.30	0.35	0.30	5.3	R-L	15.033



KEY PLAN



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. 86A TOPSIA ROAD (SOUTH) BALTE STREET, 7th FLOOR KOLKATA - 700048	DESIGN CONSULTANT PROFESSIONAL CIVIL INFRA PVT. LTD. # 1838, GROUND FLOOR, SIR. M VISVESWARAYYA LAYOUT, NAGADEVANAHALLI, BANGALORE - 560 086	PROOF CONSULTANT CHETAN INFRA TECH CONSULTANTS (P) LTD. 7/11, 1ST FLOOR, 13TH MAIN, SRINAGAR, OFFICE COLLEGE BENGALURU - 560048	SAFETY CONSULTANT SMART SAFETY SERVICES # 3-5-6 & 7, HARI HARA NIVAS GUMMAKONDA COLONY, HYDERGUDA, HYDERABAD - 500048	AUTHORITY ENGINEER VOYANTS SOLUTIONS PVT. LTD. 405 4th Floor, BPT Park Centre, Block A, Jai Vayu Vihar, Sector 30, Gurgaon, Haryana 122001	FOR APPROVAL TITLE: GENERAL ARRANGEMENT DRAWING OF BOX CULVERT (WIDENING) AT DESIGN CH 511+387 (EXISTING CH 511+720) DRAWING No. PCIP/NH-37/J-D/STR/BC/11 REV. 00
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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 120 T/m². 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 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 / BOULDERS 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

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
 RW - RETAINING WALL

REFERENCE DRAWINGS:

DETAILS OF RCC BOX	PCIPL/NH-37/JD/BC/STR/REIN/11
MISCELLANEOUS DETAILS	PCIPL/NH-37/JD/STR/RCC-MIS/01
DETAILS OF RETAINING WALL	PCIPL/NH-37/JD/STR/RW/01

PROJECT
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 490+800 TO Km 534+800) IN THE STATE OF
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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
 Ganesh Dasker & Co. Ltd.
 B-8A, TOPSIK ROAD (SOUTH),
 LAKSHMI STREET, 7TH FLOOR,
 KOLKATA - 700046

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

PROOF CONSULTANT
 CHETAN INFRA TECH
 CONSULTANTS (P) LTD.
 7/11, 1ST FLOOR,
 11TH MAIN, SRINAGAR,
 CHAPES COLLEGE,
 BENGALURU-560030

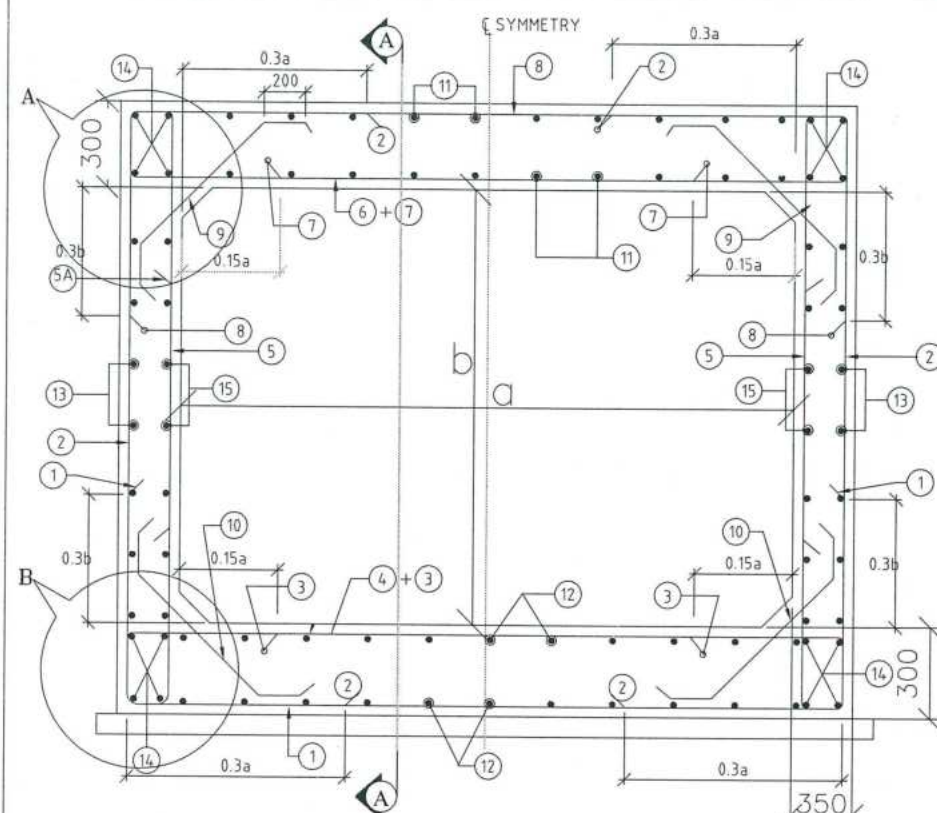
SAFETY CONSULTANT
 SMART SAFETY SERVICES
 # 35-6 & 7, HARI HARA NIVAS,
 GUMMAKONDA COLONY,
 HYDERGUDA,
 HYDERABAD - 500048
 CRSA/2016/11

AUTHORITY ENGINEER
 VOYANTS SOLUTIONS PVT. LTD.
 403, 4th Floor, BPTP Park
 Centre, Block A, Jal Vayu
 Vihar, Sector 30,
 Gurgaon, Haryana 122001

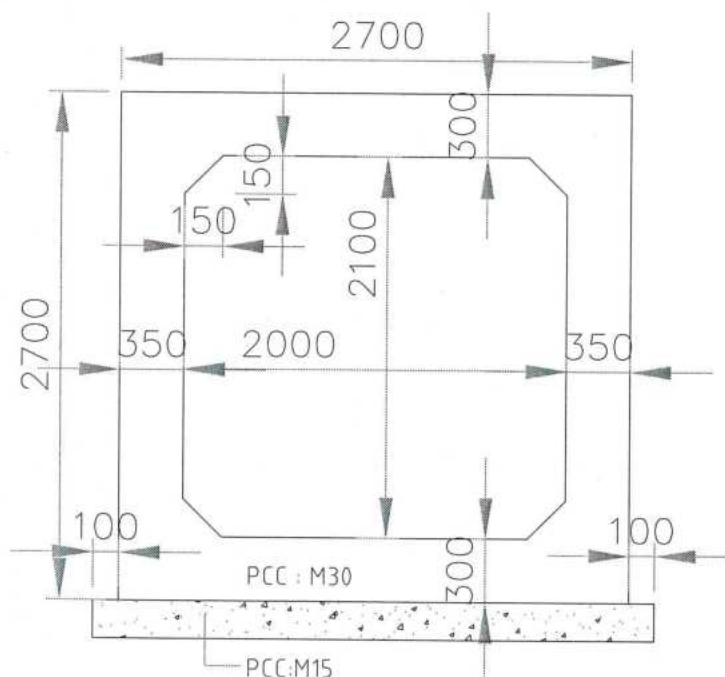
NAME	SHEET SIZE
DESIGN DIRECTOR	A2
PROOF CONSULTANT	SCALE
SAFETY CONSULTANT	AS SHOWN
AUTHORITY CONSULTANT	SHEET No. 02 OF 02

TITLE:	DRAWING No.	REV.
GENERAL ARRANGEMENT DRAWING OF BOX CULVERT (WIDENING) AT DESIGN CH 511+387 (EXISTING CH 511+720)	PCIPL/NH-37/J-D/STR/BC/11	00

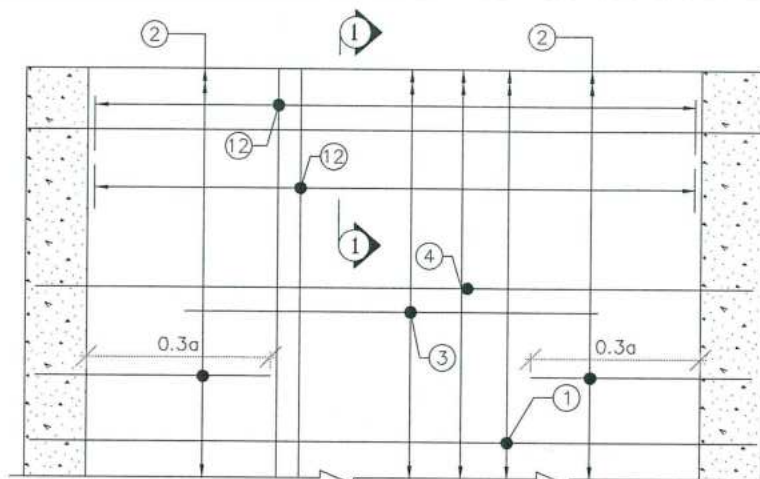
FOR APPROVAL



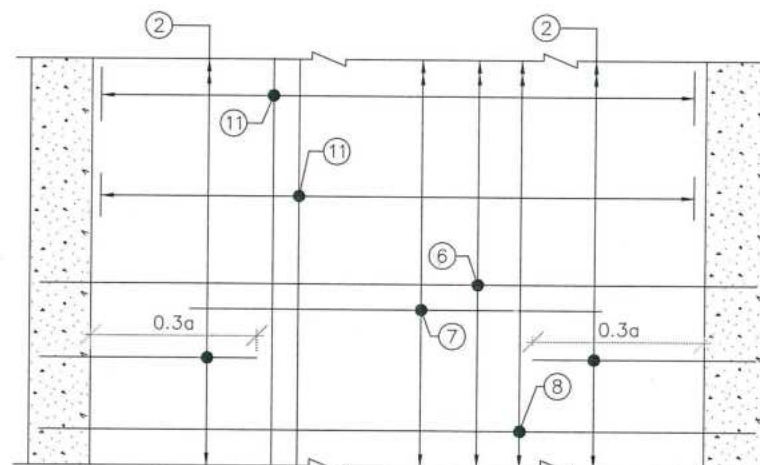
REINFORCEMENT DETAILS OF RCC BOX
(SCALE 1:20)



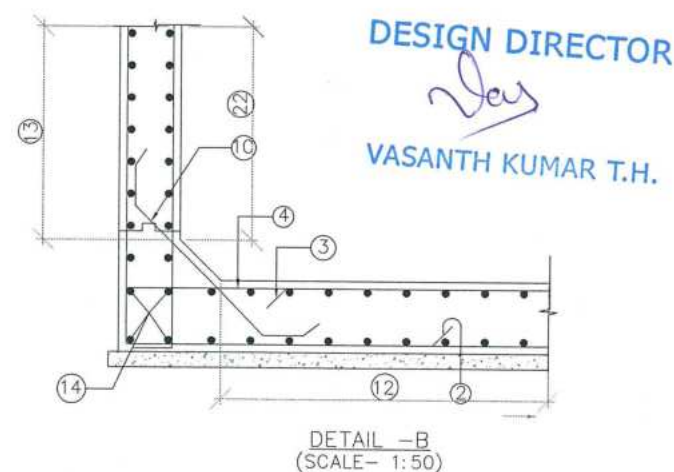
DETAILS OF RCC BOX
(SCALE 1:25)



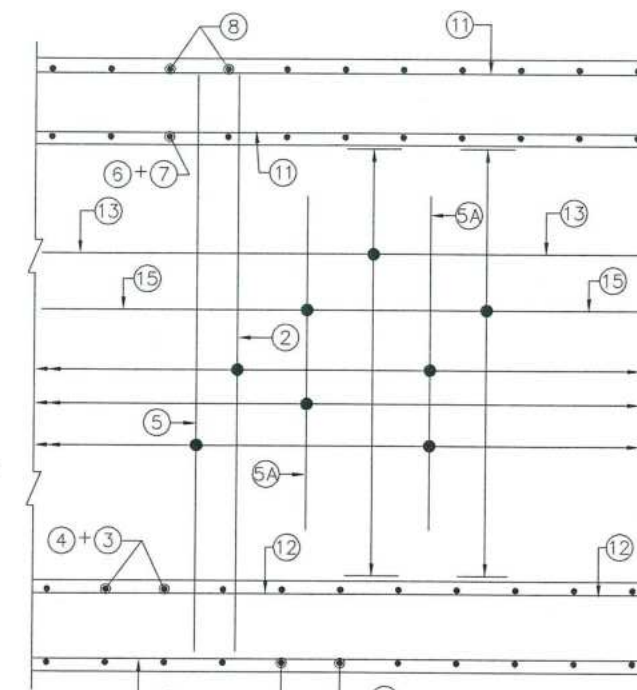
REINFORCEMENT DETAILS OF BOTTOM SLAB
HAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY
(SCALE 1:25)



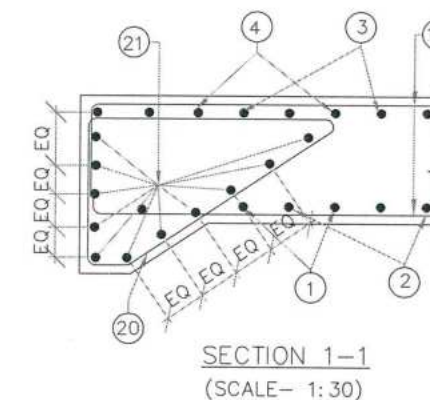
REINFORCEMENT DETAILS OF TOP SLAB
HAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY
(SCALE 1:25)



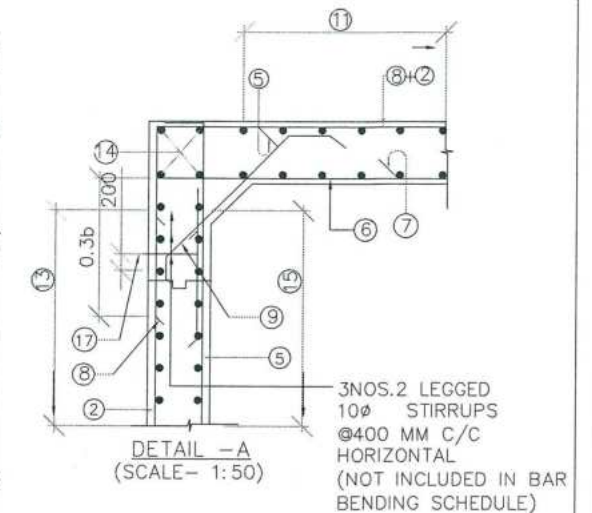
DETAIL -B
(SCALE 1:50)



SECTION A-A
(SCALE 1:25)



SECTION 1-1
(SCALE 1:30)



DETAIL -A
(SCALE 1:50)

3 NOS. 2 LEGGED
10# STIRRUPS
@400 MM C/C
HORIZONTAL
(NOT INCLUDED IN BAR
BENDING SCHEDULE)

DESIGN CH: 511+387
SCHEDULE OF REINFORCEMENT

BAR MARK	SHAPE OF BARS (NOT TO SCALE)	BAR DIA IN mm	SPACING OR NO. OF BAR
1		12	200 C/C
2		12	200 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	200 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 (ø)
- 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 LANING OF JHANJHI TO DEMOW
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80A TOPSIA ROAD (SOUTH)
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KOLKATA - 700048

DESIGN CONSULTANT

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VOYANTS SOLUTIONS PVT. LTD.
403, 3rd Floor, 397 P Park
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Vihar, Seelipahy,
Gurgaon, Haryana 122001

DESIGN DIRECTOR

PROOF CONSULTANT
SAFETY CONSULTANT
AUTHORITY CONSULTANT

NAME SHEET SIZE

A2
SCALE
AS SHOWN
SHEET No.
01 OF 01

TITLE: REINFORCEMENT DETAILS OF

BOX CULVERT (1X2.0X2.1) AT
DESIGN CHAINAGE 511+387
(EXISTING CHAINAGE 511+720)
DRAWING No. PCIP/NH-37/JD/BC/STR/REIN/11
REV. 00

FOR APPROVAL