

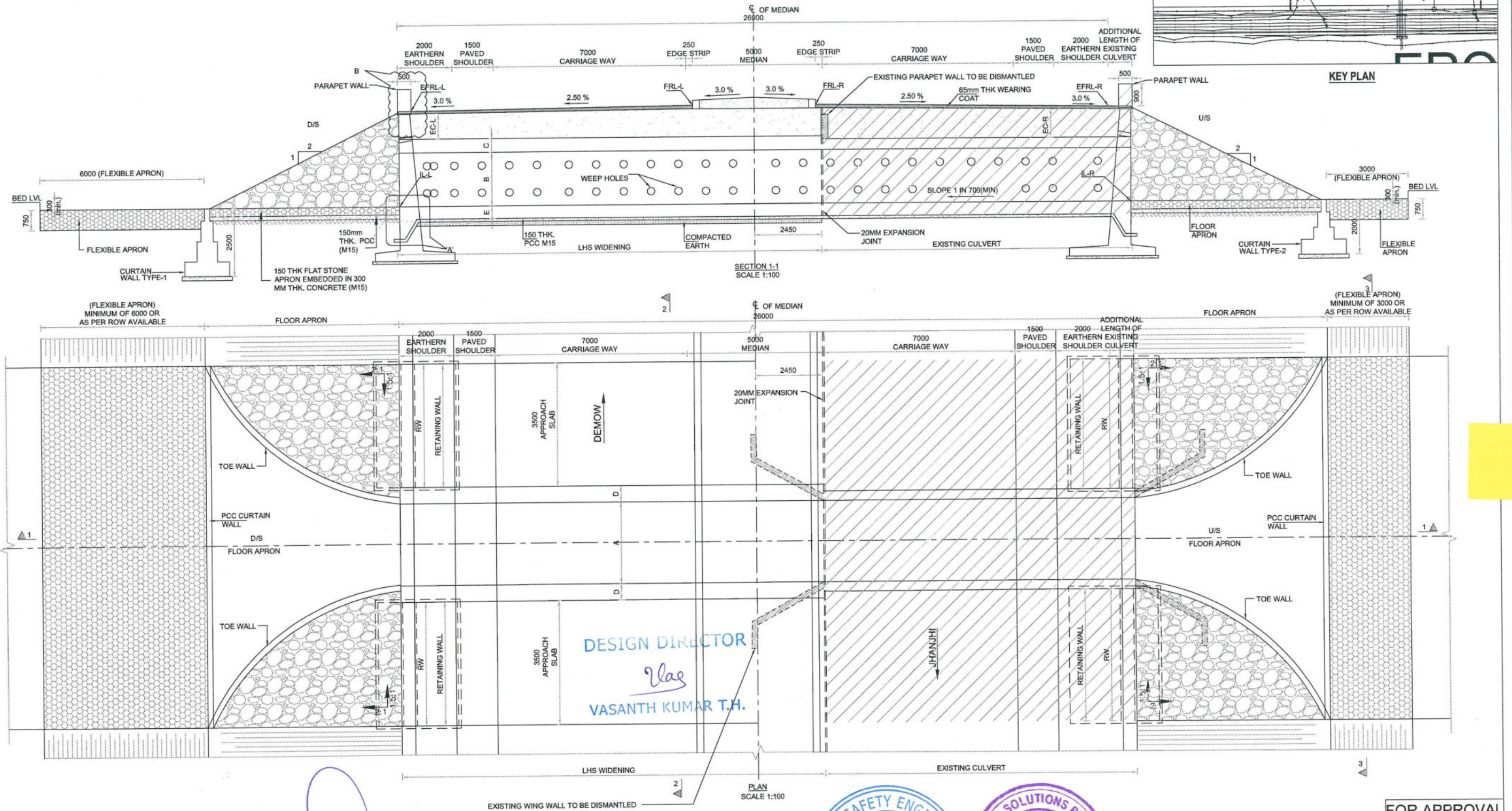
Details Of Box culvert:

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
524+960	524+457	1X4.4X3.141	93.180	93.180	92.908	92.908	0.404	0.404	89.081	89.116	4.400	3.141	0.50	0.60	0.50	5.7	R-L	15.450

GOOD FOR CONSTRUCTION

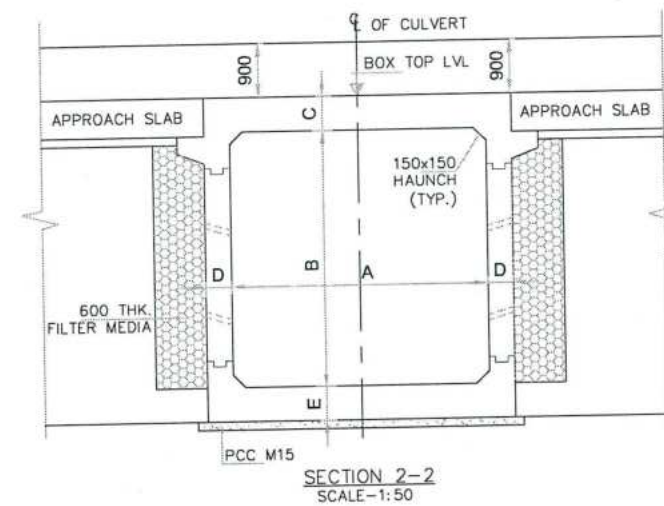
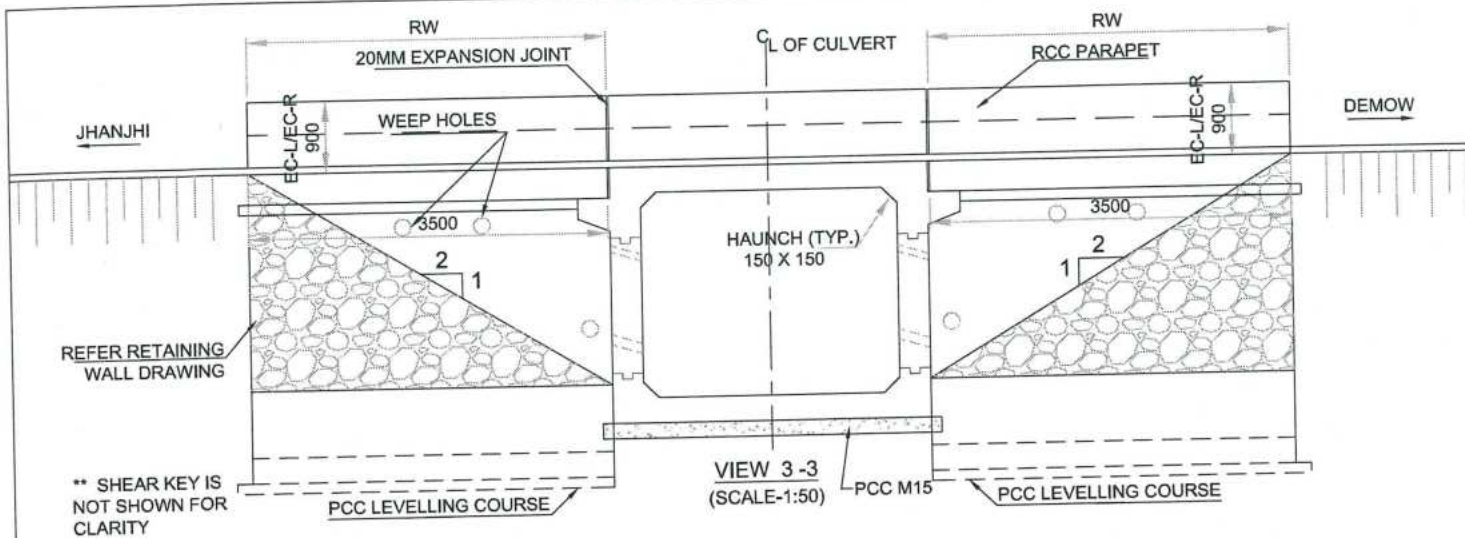
STRUCTURE NO:	35
DESCRIPTION	EXISTING PROPOSED
CHAINAGE	524960 524457
SPAN	1X4.40X3.141 1X4.40X3.141
TYPE	BOX BOX
PROPOSAL	WIDENING

Ts(m)	99.913
Es(m)	99.36
Design Speed (V):	



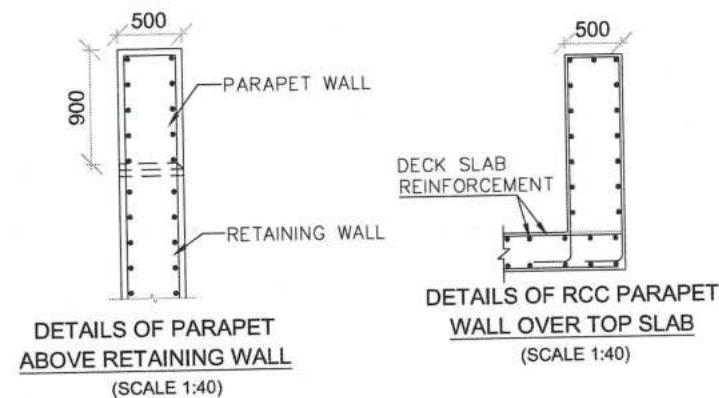
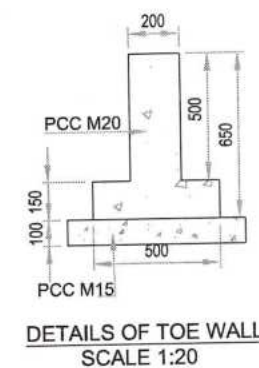
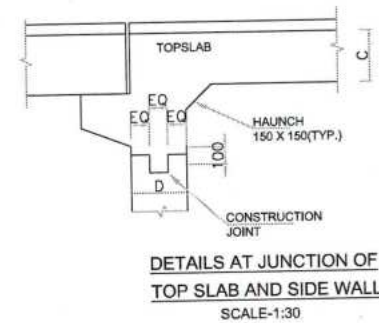
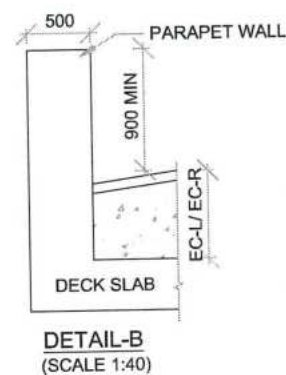
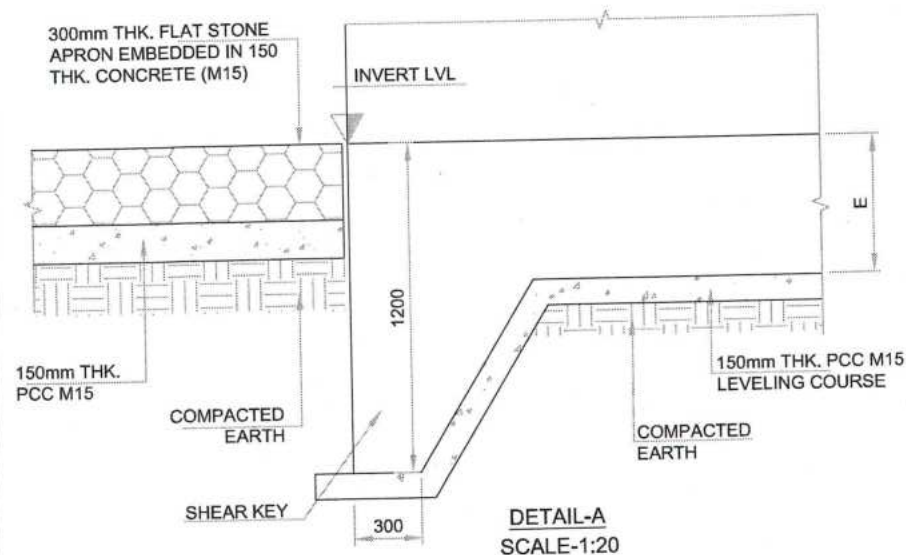
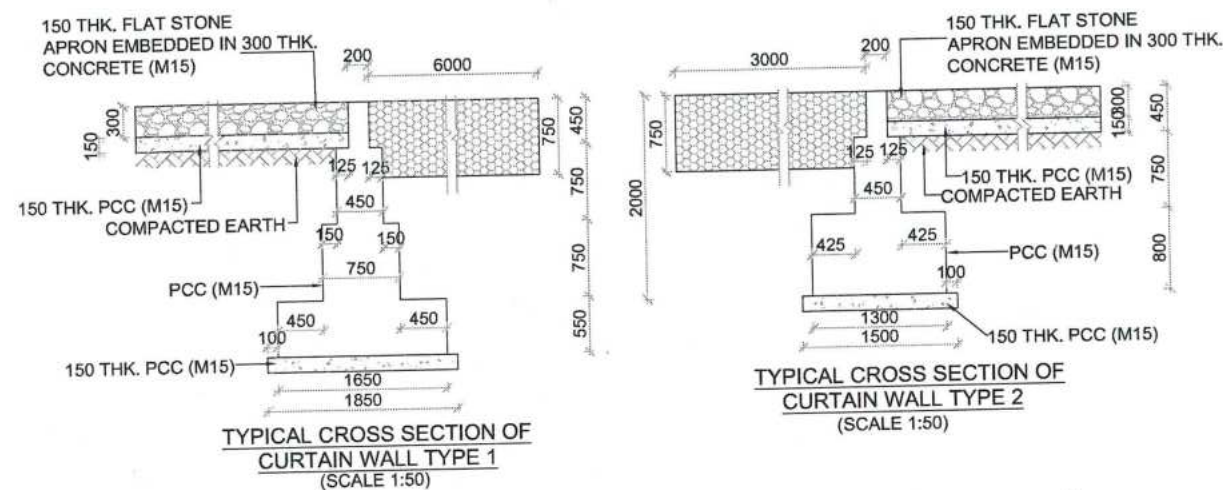
PROJECT	CLIENT	CONTRACTOR	DESIGN CONSULTANT	PROOF CONSULTANT	SAFETY CONSULTANT	AUTHORITY ENGINEER	NAME	SHEET SIZE	TITLE	REV.
FOUR LANE OF JHANJHI TO DEMOW SECTION OF NH-37 FROM EXISTING CH. Km 491+050 TO Km 535+250 (DESIGN CH. Km 490+800 TO Km 534+800) IN THE STATE OF ASSAM UNDER EPC MODE.	National Highways infrastructure Development Corporation Ltd. Ministry of Road Transport & Highways, Government of India Branch office : House No.1, Panipath, Ambikagiri Nagar, Zoo road, Guwahati-24	Ganesh Dunkerley & Co. Ltd. 8th TOPSIA ROAD (SOUTH) BAUTE STREET, 7th FLOOR KOLKATA - 700046	PROFESSIONAL CIVIL INFRA PVT. LTD. # 1838, GROUND FLOOR, SIR. M VISVESWARAYA LAYOUT, NAGADEVANAHALLI, BANGALORE - 560 056	CHETAN INFRA TECH CONSULTANTS (P) LTD. 7th, 1st FLOOR, 13th MAIN, SRINAGAR, OPTICS COLLEGE, BENGALURU-560050	SMART SAFETY SERVICES # 3-5 & 7, HARI HARA NIVAS, GUMMAKONDA COLONY, HYDERGUDA, HYDERABAD - 500048	VOYANTS SOLUTIONS PVT. LTD. 403, 4th Floor, BPT Park Centre, Block A, Jai Vayu Vihar, Sector 30, Gurgaon, Haryana 122001	DESIGN DIRECTOR	A2	GENERAL ARRANGEMENT DRAWING OF BOX CULVERT (WIDENING) AT DESIGN CH 524+457 (EXISTING CH 524+960)	
							PROOF CONSULTANT	SCALE	DRAWING No.	
							SAFETY CONSULTANT	AS SHOWN	PCIP/NH-37/J-D/STR/BC/19	
							AUTHORITY CONSULTANT	SHEET No. 01 OF 02		00

GOOD FOR CONSTRUCTION

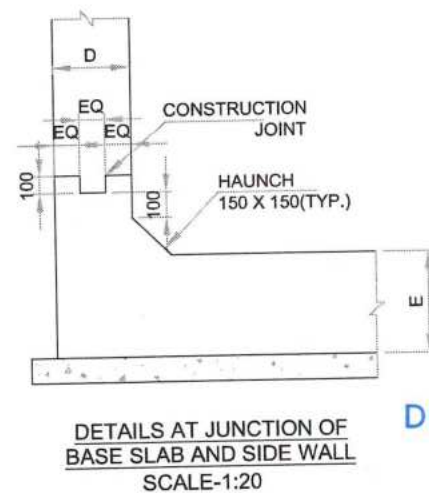


NOTES:

- 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°, $\gamma=2.0$ T/Cum.
 07. SEISMIC ZONE - V.
 08. SAFE BEARING CAPACITY AT FOUNDING LEVEL IS 12u/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 OF 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 $\frac{1}{4}$ 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



(REFER MISCELLANEOUS DRAWINGS)



DESIGN DIRECTOR

Vas
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

REFERENCE DRAWINGS:

DETAILS OF RCC BOX	PCIPL/NH-37/JD/BC/STR/REN/19
MISCELLANEOUS DETAILS	PCIPL/NH-37/JD/STR/RCC-MIS/01
DETAILS OF RETAINING WALL	PCIPL/NH-37/JD/STR/RW/01

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

Gannon Dunkerley & Co., Ltd
86A, TOPSIA ROAD (SOUTH)
HAUTE STREET, 7th FLOOR
KOLKATA - 700046

DESIGN CONSULTANT

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.

W/11, 1ST FLOOR,
13TH MAIN, SRINAGAR
GRIPES COLLEGE,
BENGALURU-560050

SAFETY CONSULTANT

SMART SAFETY SERVICES
35687, HARI HARA NIVAS
GUMMAKONDA COLONY,
HYDERGUDA,
HYDERABAD - 500048

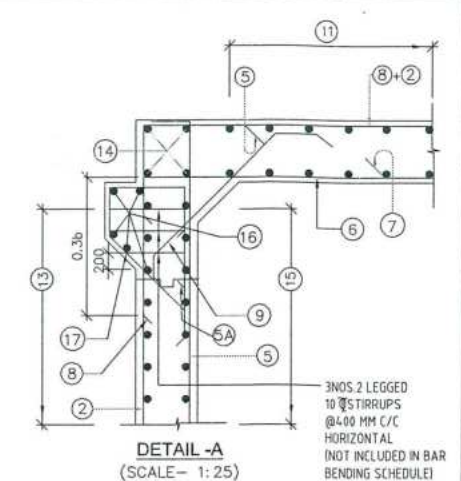
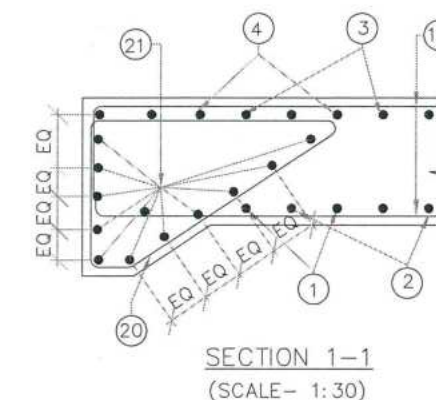
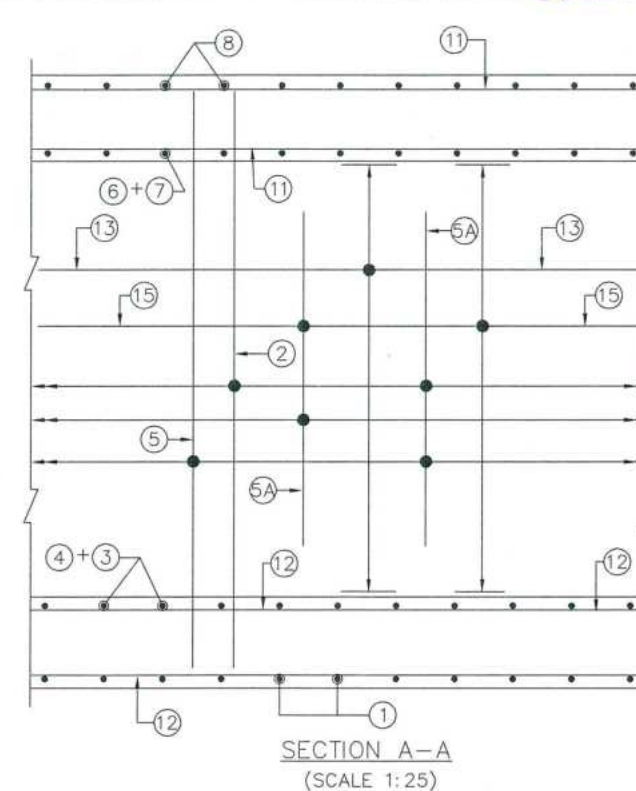
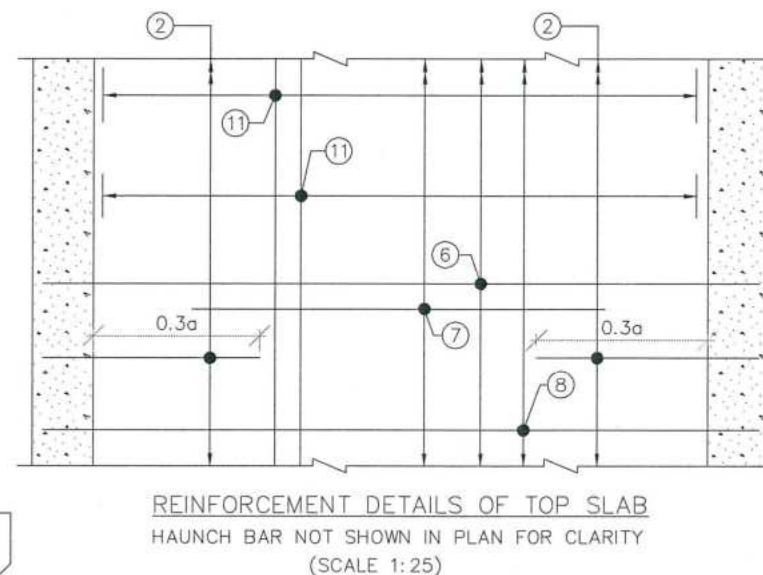
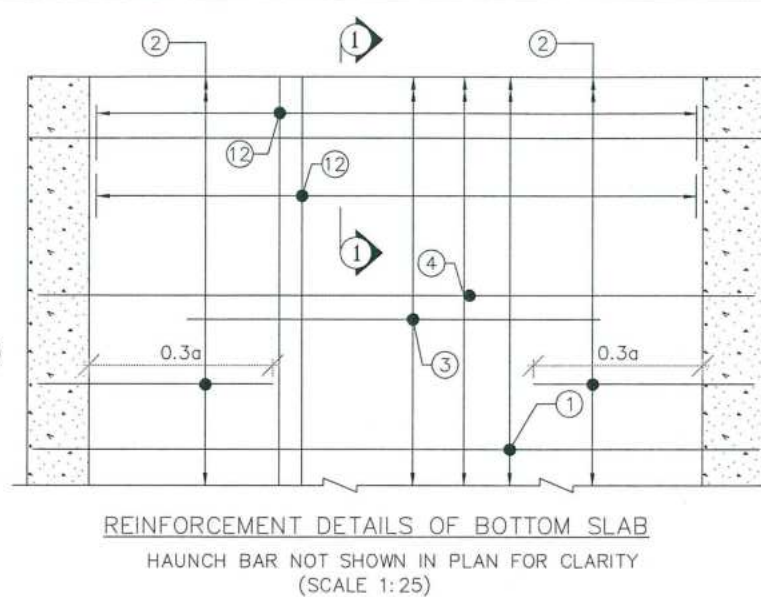
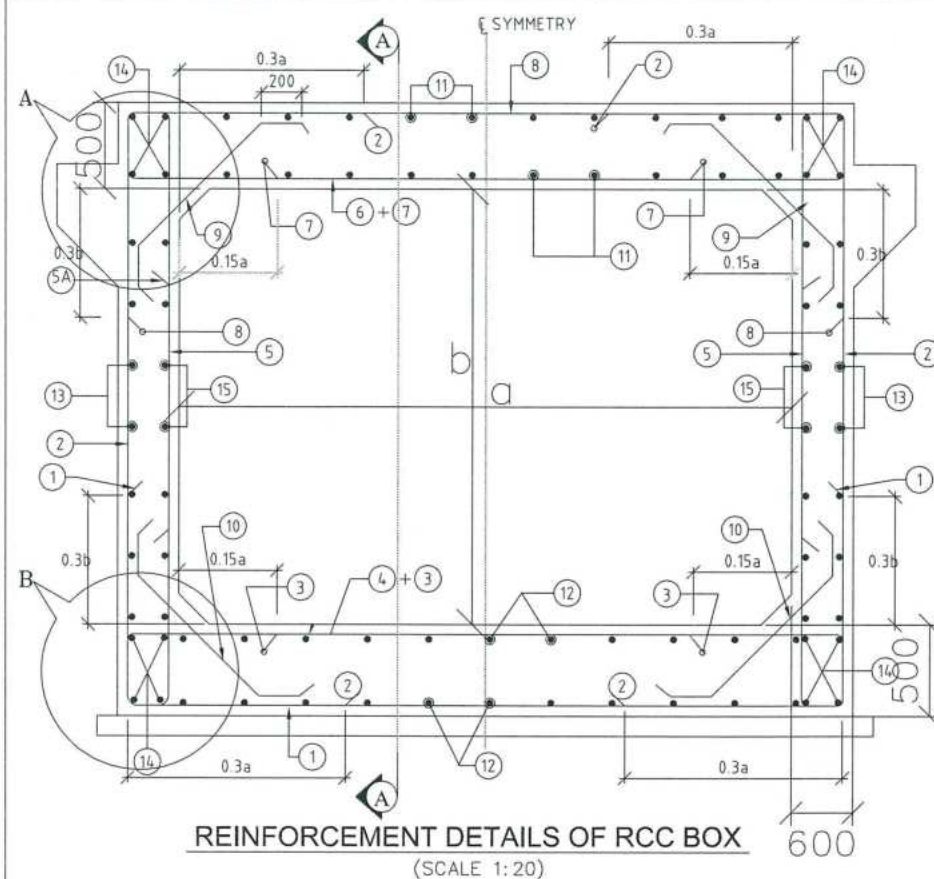
AUTHORITY ENGINEER

VOYANTS SOLUTIONS PVT. LTD.
Date: 12/05/2020
403, 4th Floor, BTF Park
Centra, Block A, Jal Mayur
Vihar, Sector 30
Gurgaon, Haryana 122001

D. ark yu 001		NAME	SHEET SIZE	TITLE: GENERAL ARRANGEMENT DRAWING OF BOX CULVERT (WIDENING) AT DESIGN CH 524+457 (EXISTING CH 524+960)	
	DESIGN DIRECTOR		A2		
	PROOF CONSULTANT		SCALE	DRAWING No.	REV.
	SAFETY CONSULTANT		AS SHOWN		
	AUTHORITY CONSULTANT		SHEET No. 02 OF 02		

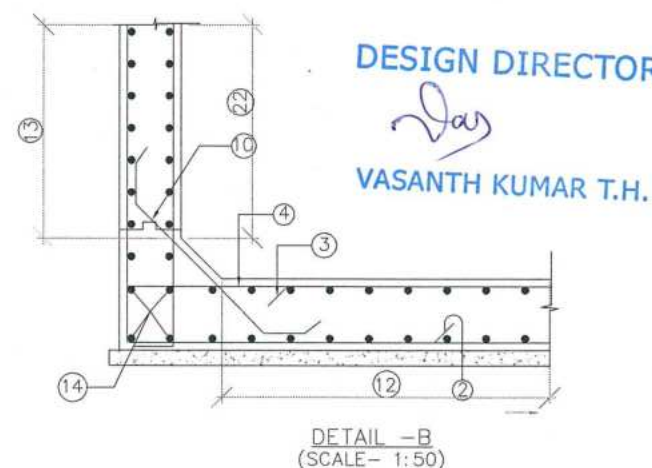
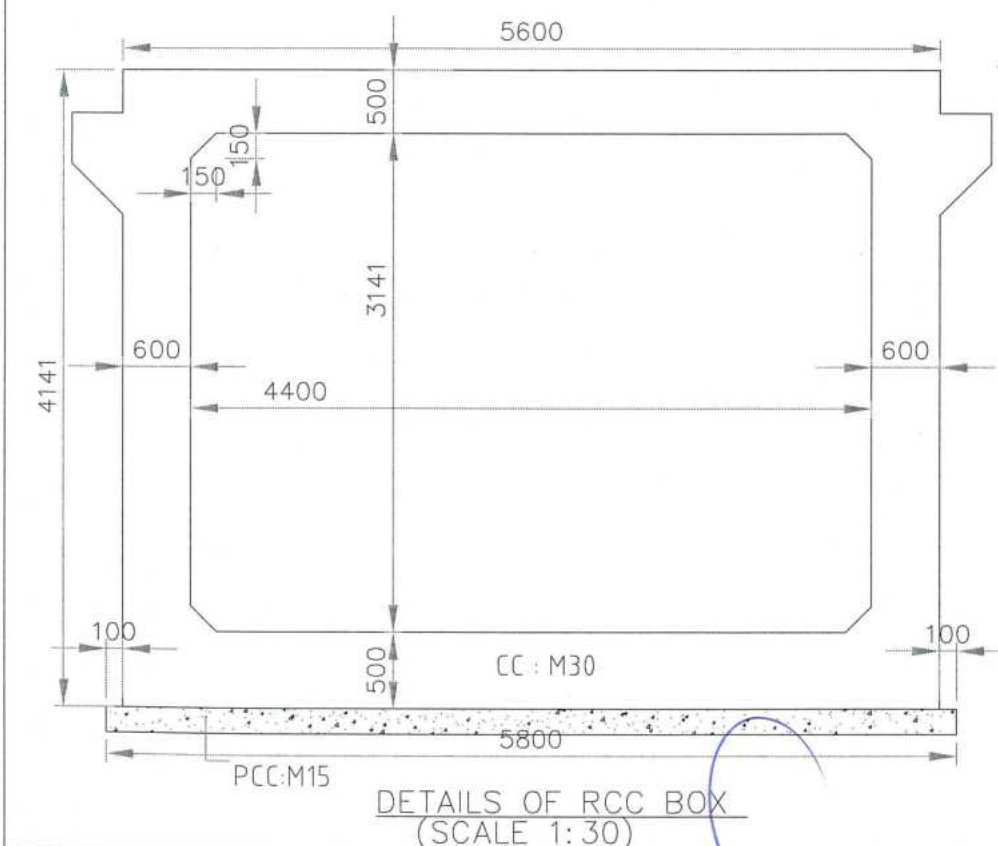
FOR APPROVAL

GOOD FOR CONSTRUCTION



DESIGN CH: 524+457
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		16	150 C/C
3		10	150 C/C
4		12	150 C/C
5		12	150 C/C
5A		10	200 C/C
6		12	200 C/C
7		10	200 C/C
8		12	150 C/C
9		12	200
10		12	200
11		12	200
12		12	200
13		12	200
14		12	16 NOS.
15		12	200
16		12	10 NOS.
17		12	250
18		12	NOT USED
19		12	NOT USED
20		12	150
21		12	20 NOS.



DESIGN DIRECTOR
Vasanth Kumar T.H.
VASANTH KUMAR T.H.

- 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 x 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

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) HANTE STREET, 7th FLOOR, KOLKATA - 700046	DESIGN CONSULTANT PROFESSIONAL CIVIL INFRA PVT. LTD. A 1338, GROUND FLOOR, SIR M. VISVESWARAYA LAYOUT, NAGADEVANAHALLI, BANGALORE - 560 086	PROOF CONSULTANT CHETAN INFRA-TECH CONSULTANTS (P) LTD., 7/11, 1ST FLOOR, 13TH MAIN, SRINAGAR OPP. PES COLLEGE, BENGALURU-560090	SAFETY CONSULTANT SMART SAFETY SERVICES PRABHAKAR HARI HARA NIVAS, SUNAMKONDA COLONY, AYENKUDA, HYDERABAD - 500048	AUTHORITY ENGINEER VOYANTS SOLUTIONS PVT. LTD. 403, 4th Floor, BPTP Park Centra, Block A, Jai Yau Vihar, Sector 30, Gurgaon, Haryana 122001	DESIGN DIRECTOR PROOF CONSULTANT SAFETY CONSULTANT AUTHORITY CONSULTANT	NAME SCALE AS SHOWN SHEET No.	SHEET SIZE A2 01 OF 01	TITLE: REINFORCEMENT DETAILS OF BOX CULVERT (1X4.4X3.141) AT DESIGN CHAINAGE 524+457 (EXISTING CHAINAGE 524+960)	DRAWING No. PCIL/NH-37/JD/BC/STR/REIN/19	REV. 00
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FOR APPROVAL