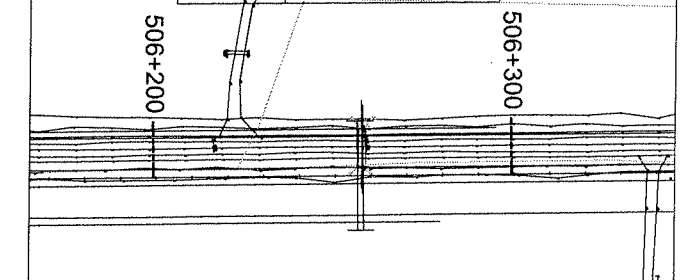
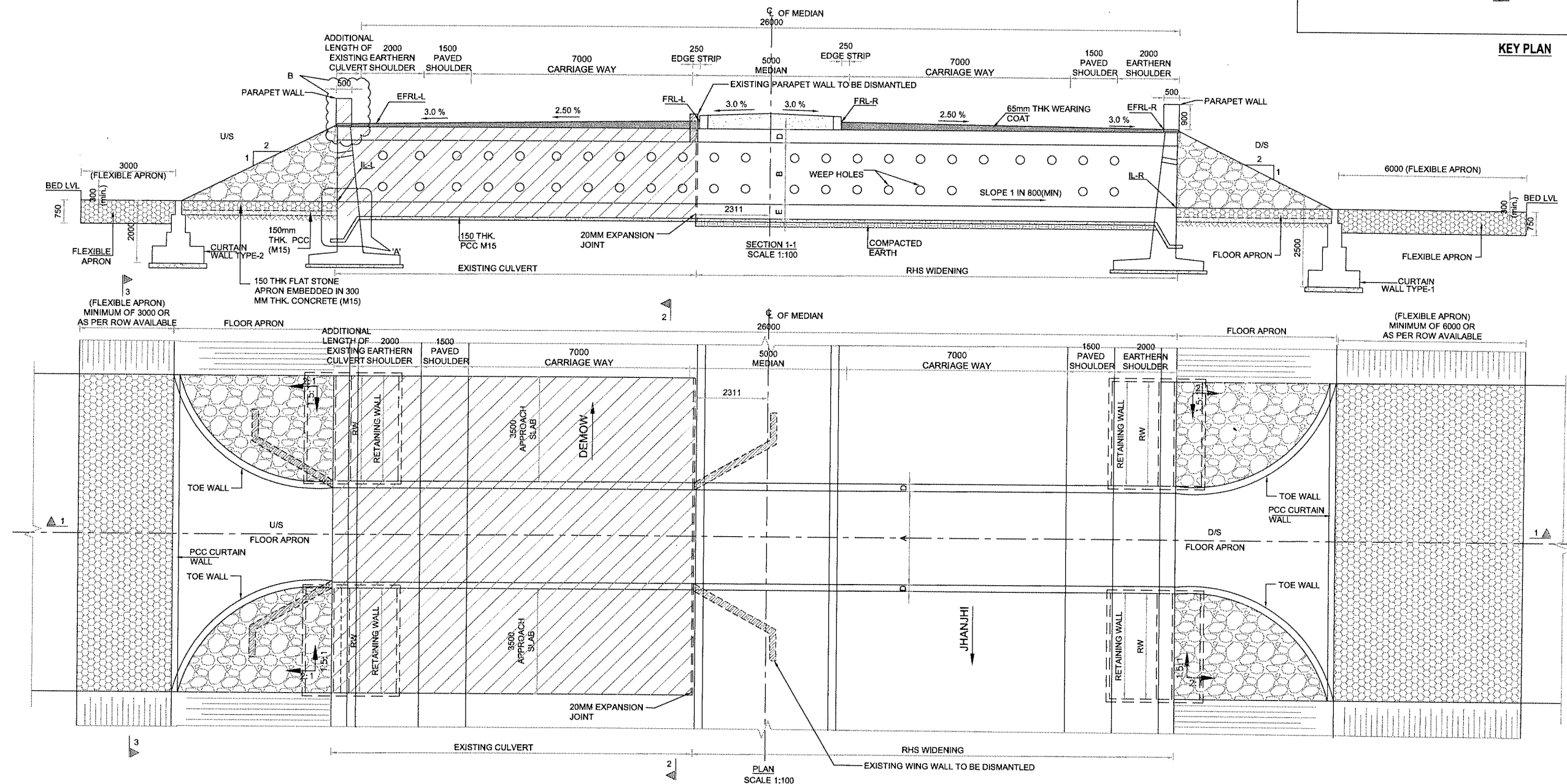


EXISTING CHAINAGE	DESIGN CHAINAGE	SPAN	FRL-L	FRL-R	EFRL-L	EFRL-R	EC-L	EC-R	IL-L	IL-R	CLEAR WIDTH (A)	CLEAR HEIGHT (B)	TOP SLAB THICKNESS (C)	WALL THICKNESS (D)	BOTTOM RAFT THICKNESS (E)	RW	FLOW DIRECTION	RHS WIDENING
506+604	506+257	1X2.0X2.916	91.193	91.193	90.921	90.921	0.270	0.270	87.673	87.640	2.000	2.916	0.35	0.35	0.35	4.9	L-R	15,311

STRUCTURE NO:		16
DESCRIPTION	EXISTING	PROPOSED
CHAINAGE	506604	506257
SPAN	1X2.0X2.916	1X2.0X2.916
TYPE	BOX	BOX
PROPOSAL	WIDENING	




KEY PLAN



Vas
VASANTH KUMAR T.H.

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

Garrison Dunkerley & Co. Ltd.
86A TOPSIA ROAD (SOUTH)
HATFIELD STREET - 1ST FLOOR
KOLKATA - 700045

DESIGN CONSULTANT

PROFESSIONAL CIVIL ENGINEER PVT. LTD.

1838, GROUND FLOOR,
SIR. M VISVESWARAYA LAYOUT,
NAGADEVANAHALLI,
BANGALORE - 560 056

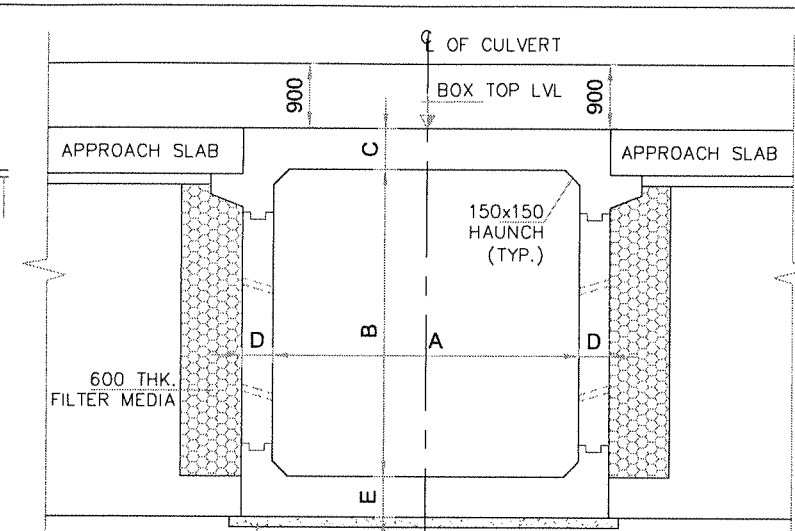
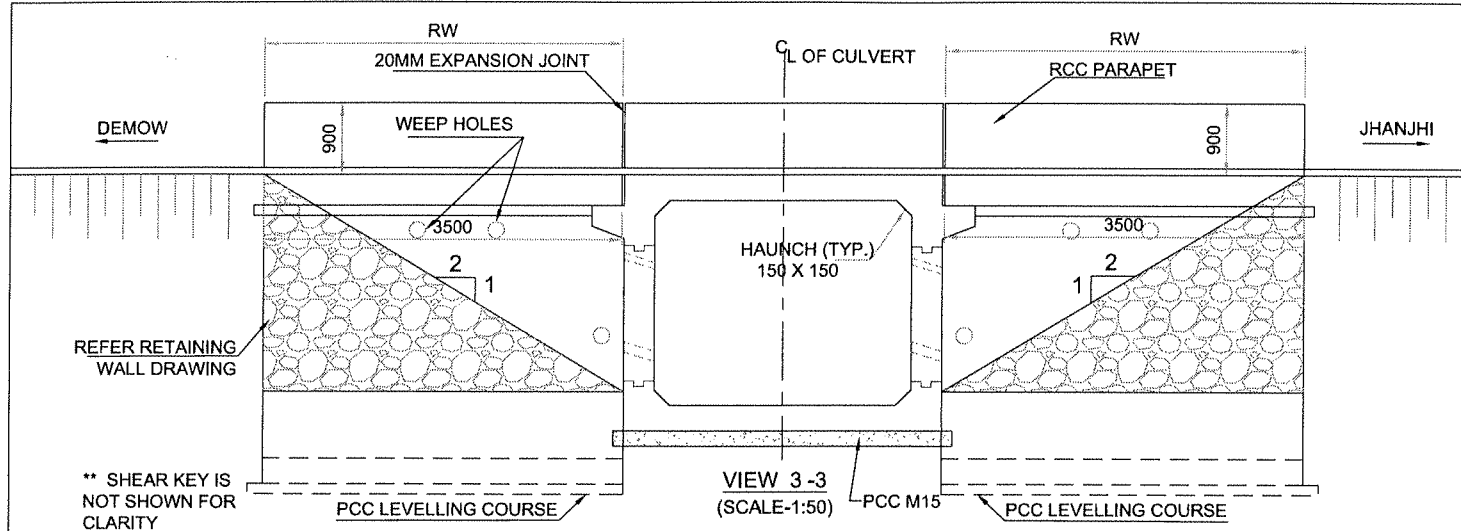
PROFESSIONAL CONSULTANT
CHETAN INFRA-TECH
CONSULTANTS (P) LTD.
7/1, 1ST FLOOR,
11TH MAIN, SRIDAGAR
OPP. PES COLLEGE,
BENGALURU-560040

SAFETY CONSULTANT
SMART SAFETY SERVICES
D-3-53 & 7, HARI HARA NIVAS
GUMMAKONDA COLONY,
HYDERGUDA,
HYDERABAD - 500048
CRSA/2016/11

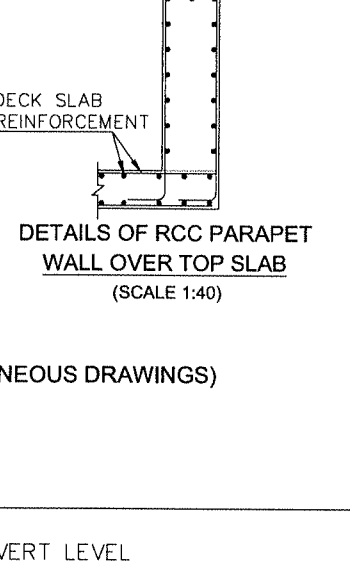
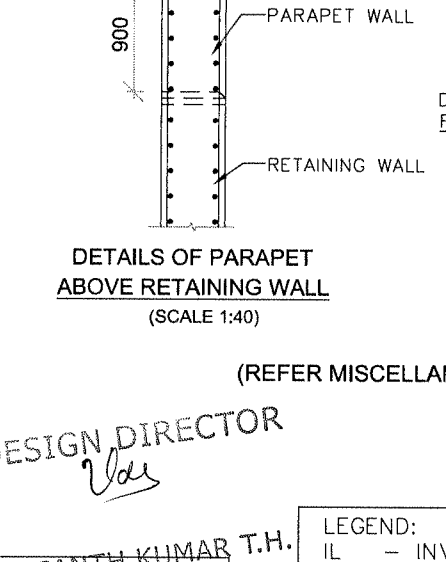
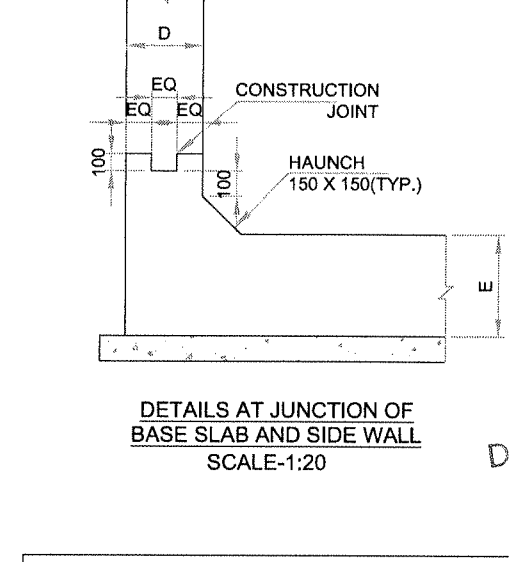
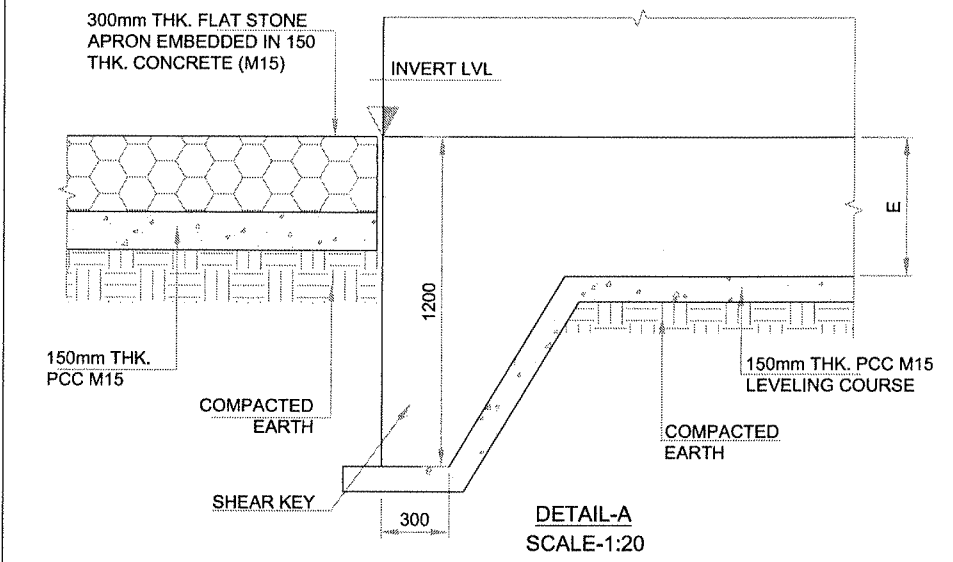
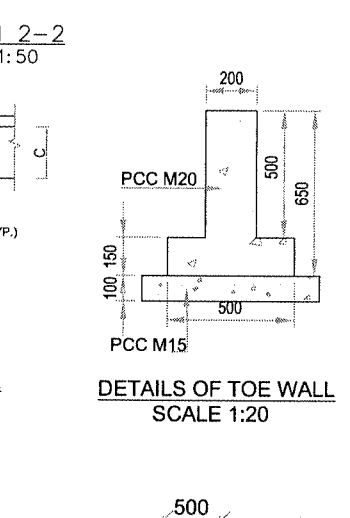
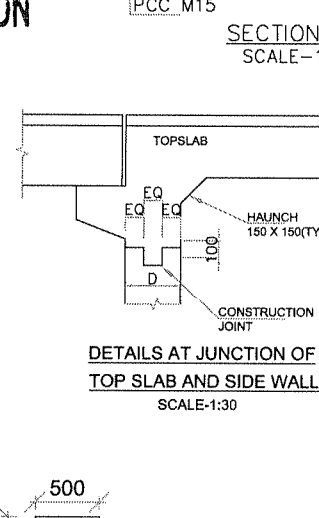
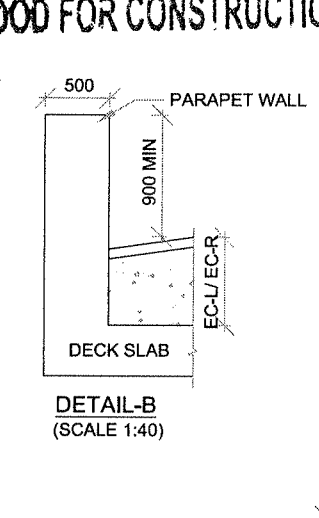
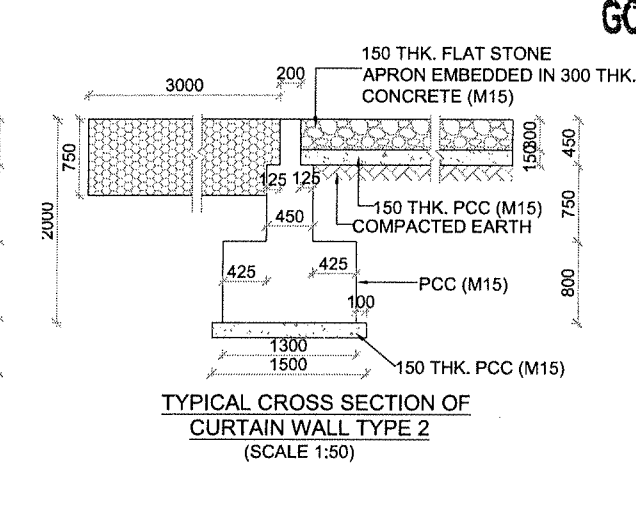
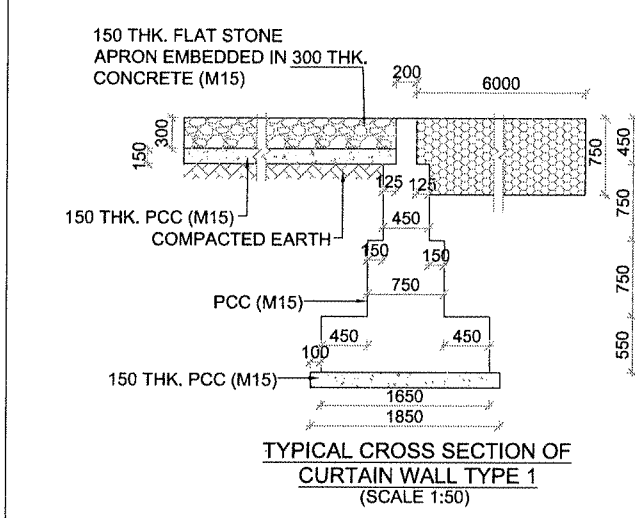
AS. VOYANTS SOLUTIONS PVT. LTD.
Date: 11/5/2019
403, 4th Floor, BEEP Park
Centra, Block A, Jal Vayu
Vihar, Sector 30,
Gurgaon, Haryana 122001

		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 506+257 (EXISTING CH 506+604)	
DRAWING No.	REV.
PCIPL/NH-37/J-D/STR/BC/05	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:
 - (i) BOX.....M30
 - (ii) PARAPET.....M40
 - (iii) RETURN WALL.....M30
 - (iv) LEVELING COURSE.....M15
 - (v) CURTAIN WALL.....M20
 - (vi) TOE WALL.....M20
 - (vii) 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 12 $\frac{1}{m^2}$. 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 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 / BOULDRES 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
 - 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.
 - 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
 - REFER TCS TYPE: TCS-1C



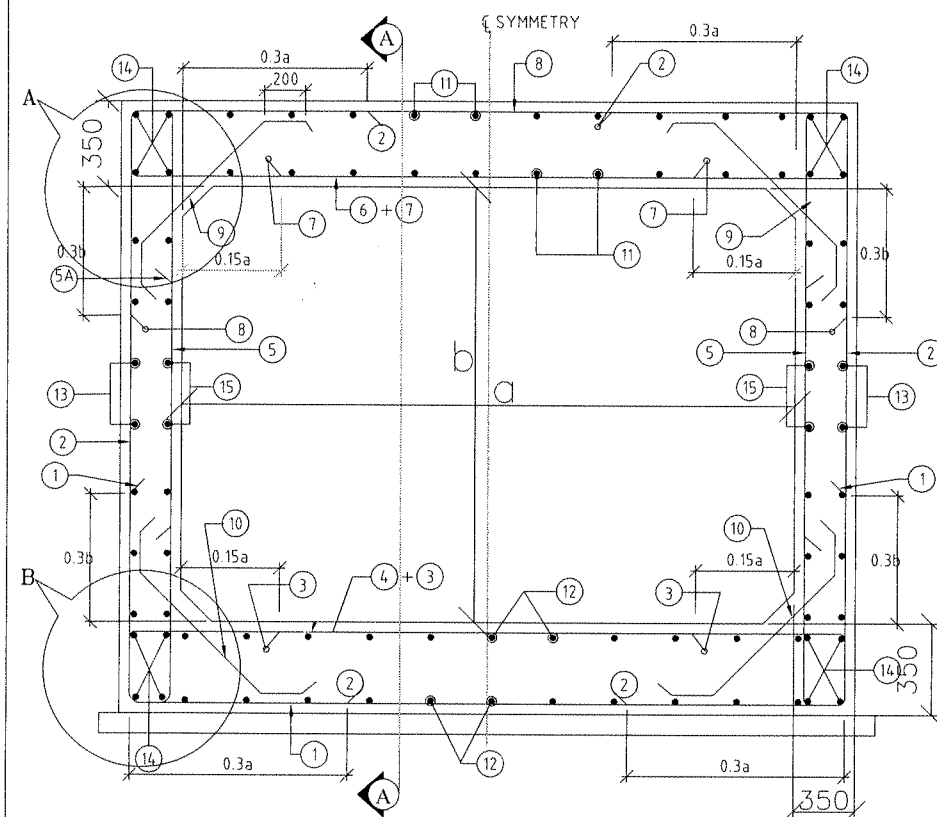
REFERENCE DRAWINGS:	
DETAILS OF RCC BOX	PCIPL/NH-37/JD/BC/STR/REIN/05
MISCELLANEOUS DETAILS	PCIPL/NH-37/JD/STR/RCC-MIS/01
DETAILS OF RETAINING WALL	PCIPL/NH-37/JD/STR/RW/G1

PROJECT	CLIENT	CONTRACTOR
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	SAVAND KUNERLEY & Co. Ltd.

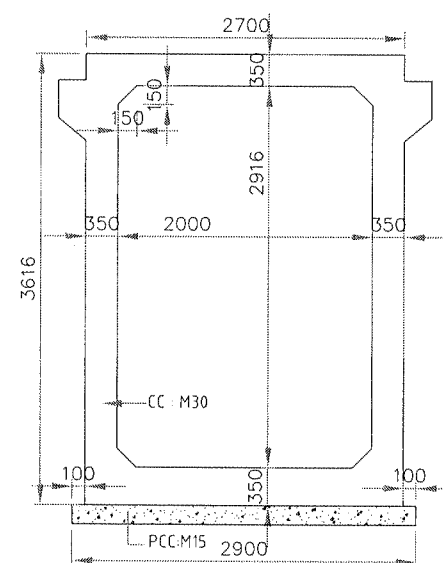
DESIGN CONSULTANT	PROOF CONSULTANT	SAFETY CONSULTANT
PROFESSIONAL CIVIL ENGINEER PVT. LTD. # 1838, GROUND FLOOR, SIR. M. VISVESWARAYAN LAYOUT, NAGADEVANAHALLI, BANGALORE - 560 058	CHETAN INFRASTRUCTURE CONSULTANTS PVT. LTD. 7/1, 1ST FLOOR, 7/1, MAIN STREET, OPP. P. COLLEGE, BANGALORE - 560 004	SMART SAFETY SERVICES # 3-5-5-5-7, HARI HARA NIVAS, GUMMAKONDA COLONY, HYDERABAD - 500048

LEGEND:	DESIGN DIRECTOR
IL - INVERT LEVEL	NAME
EC - EARTH CUSHION	SHEET SIZE
FRL - FINISHED ROAD LEVEL	A2
EFRL - FINISHED ROAD LEVEL AT EDGE	SCALE
A - CLEAR WIDTH OF BOX	AS SHOWN
B - CLEAR HEIGHT OF BOX	SHEET No.
C - TOP SLAB THICKNESS	02 OF 02
D - SIDE WALL THICKNESS	
E - BOTTOM RAIL THICKNESS	
RW - RETAINING WALL	

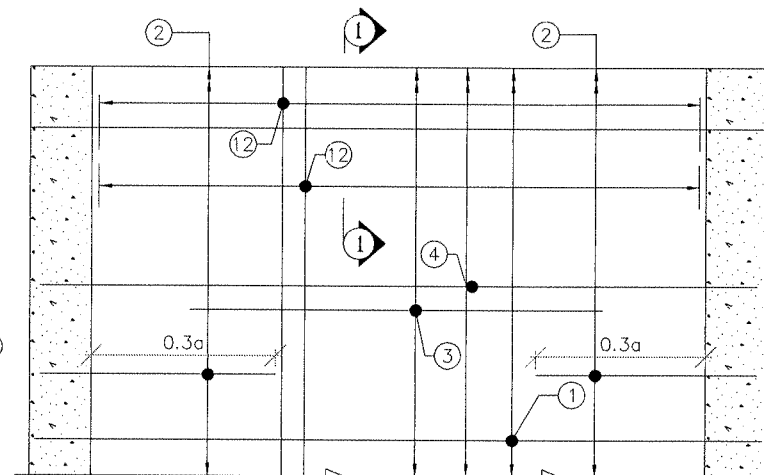
TITLE:	GENERAL ARRANGEMENT DRAWING OF BOX CULVERT (WIDENING) AT DESIGN CH 506+257 (EXISTING CH 506+604)
DRAWING No.	PCIPL/NH-37/J-D/STR/BC/05
REV.	00



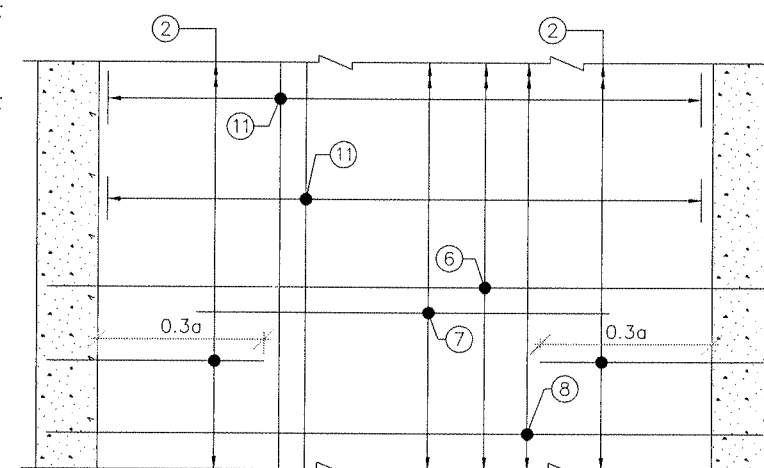
REINFORCEMENT DETAILS OF RCC BOX
(SCALE 1:20)



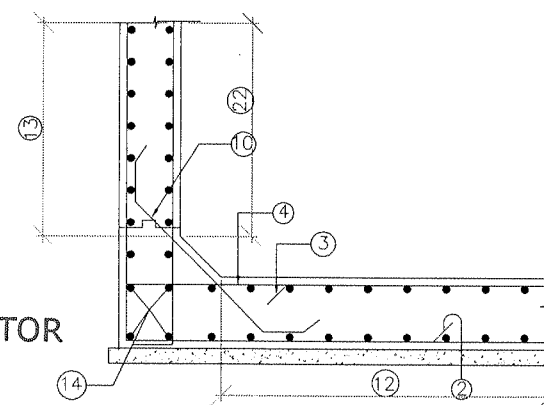
DETAILS OF RCC BOX
(SCALE 1:30)



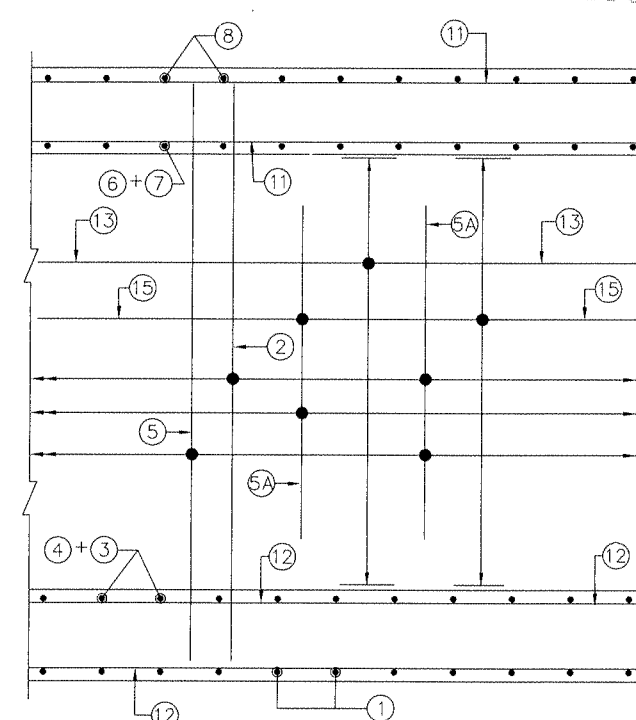
REINFORCEMENT DETAILS OF BOTTOM SLAB
HAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY
(SCALE 1:25)



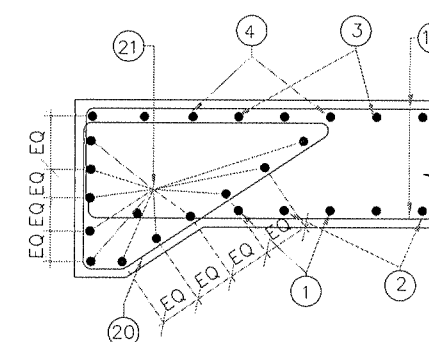
REINFORCEMENT DETAILS OF TOP SLAB
HAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY
(SCALE 1:25)



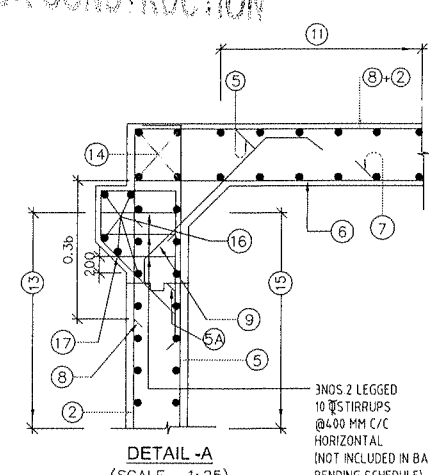
DETAIL -B
(SCALE 1:50)



SECTION A-A
(SCALE 1:25)



SECTION 1-1
(SCALE 1:30)



DETAIL -A
(SCALE 1:25)

DESIGN CH: 506+257
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		12	200 C/C
4		12	200 C/C
5		12	200 C/C
5A		12	200 C/C
6		12	200 C/C
7		12	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		10	10 NOS.
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 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
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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
Gandhi Duttale & Co. Ltd.
100, TOP OF ROAD, INDIA
100, TOP OF ROAD, INDIA
100, TOP OF ROAD, INDIA
100, TOP OF ROAD, INDIA

DESIGN CONSULTANT
PROFESSIONAL CIVIL INFRA PVT. LTD.
100, TOP OF ROAD, INDIA
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SAFETY CONSULTANT
SMART SAFETY SERVICES
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AUTHORITY ENGINEER
VYAS'S SOLUTIONS PVT. LTD.
100, TOP OF ROAD, INDIA
100, TOP OF ROAD, INDIA
100, TOP OF ROAD, INDIA
100, TOP OF ROAD, INDIA

DESIGN DIRECTOR
NAME: VASANTH KUMAR T.H.
SHEET SIZE: A2
SCALE: AS SHOWN
SHEET No. 01 OF 01

TITLE: REINFORCEMENT DETAILS OF
BOX CULVERT (1X2X2.916) AT
DESIGN CHAINAGE 506+257
(EXISTING CHAINAGE 506+604)
DRAWING No. PCIPL/NH-37/JD/BC/STR/REIN/05
REV. 00

FOR APPROVAL