

Ref: AGICL/A.E/PKG-05/2024/322

Date- 12/06/2024

To,
The Authorized Signatory/ Project Manager
M/S KAMAC Engineers Pvt. Ltd.
F0201, City Centre Office Block,
Uttrayon Matigara, Siliguri,
Dist: Darjeeling, West Bengal.
PIN: 734010
E-Mail- kamacengineers.ledobypass@gmail.com

SUB: Strengthening/Improvement to 2- Lane with Paved Shoulder from KM 27+150 (Golai Gaon) to KM 47+628 (Ledo) on existing Dibrugarh to Ledo section with proposed Digboi Bypass (Green Field and Brown Field) (2-Lane+PS) of NH-315 (Old NH-38) in Tinsukia District in the State of Assam on EPC mode. **(Pkg. 5):**
Reg._ Approval of Box Culverts .

Ref: i) Our letter No. AGICL/AE/PKG-05/2024/219, Dated. 01/05/2024.
ii) Your letter No. KEPL/NHIDCL/D-L/2024/064, Dated. 08/04/2024.
iii) Our letter No. AGICL/AE/PKG-05/2024/116, Dated. 20/03/2024.
iv) Your letter No. KEPL/NHIDCL/D-L/2024/034, Dated. 13/03/2024.

Dear Sir,

The EPC Contractor has re-submitted with compliance the Design & Drawing of Box culvert vide letter dated 08-04-2024 for review and Approval at Ch . 46+009. Ch. 47+ 298 and 47+ 487.

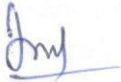
The same has been reviewed & found in order. The EPC contractor has advised to submit 3 sets of Drawing for GFC.

This is for your kind information and further action.

Thanking you and assuring our best services at all times

With Regards

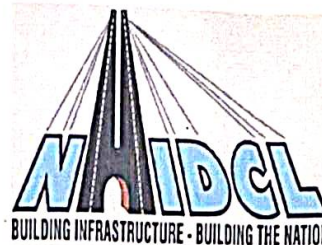
For, Almondz Global Infra Consultant Limited In JV with Ayoleeza Consultant Private Limited.



Pramod Kumar
Team Leader
(Authority Engineer)

Copy to:

- i) GM. (P) PMU, Dibrugarh (Assam) for kind information please.
- ii) The Almondz Global infra consultant Ltd, HO, for kind information.

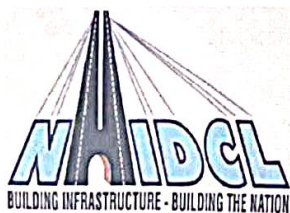


**NATIONAL HIGHWAYS & INFRASTRUCTURE
DEVELOPMENT CORPORATION LTD.**

**WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150
(GOLAI GOAN) TO KM 47+682 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH PROPOSED
MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (2-LANE+PS) OF NH-38 IN
TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE.(PACKAGE-5)**

STRUCTURE DRAWING
BOX CULVERT

CLIENT:



**NATIONAL HIGHWAYS &
INFRASTRUCTURE DEVELOPMENT
CORPORATION LTD.**

DESIGN CONSULTANT:



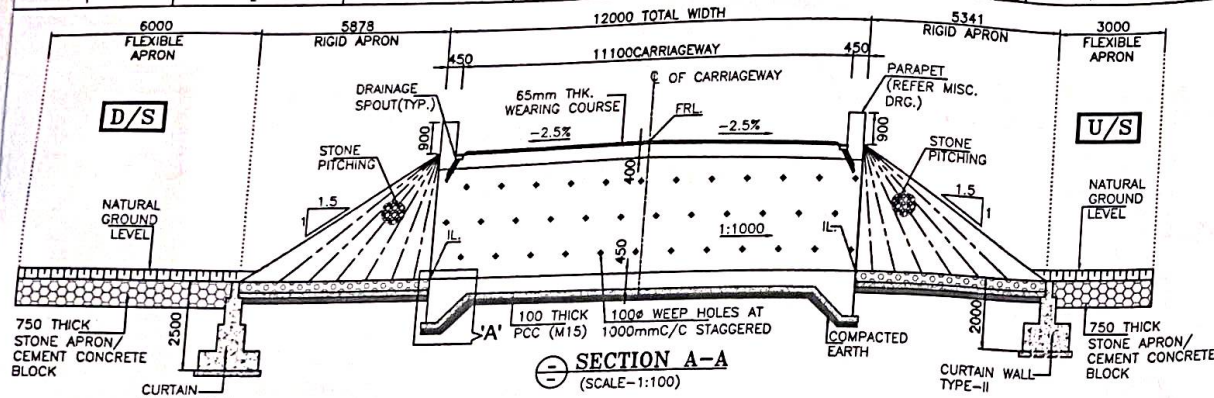
A.V. CONSTRUCTION

**1ST FLOOR, WZ-1240, PALAM EXTENSION,
BOSCO ASHRAM WALI GALI, NEW DELHI 110045**

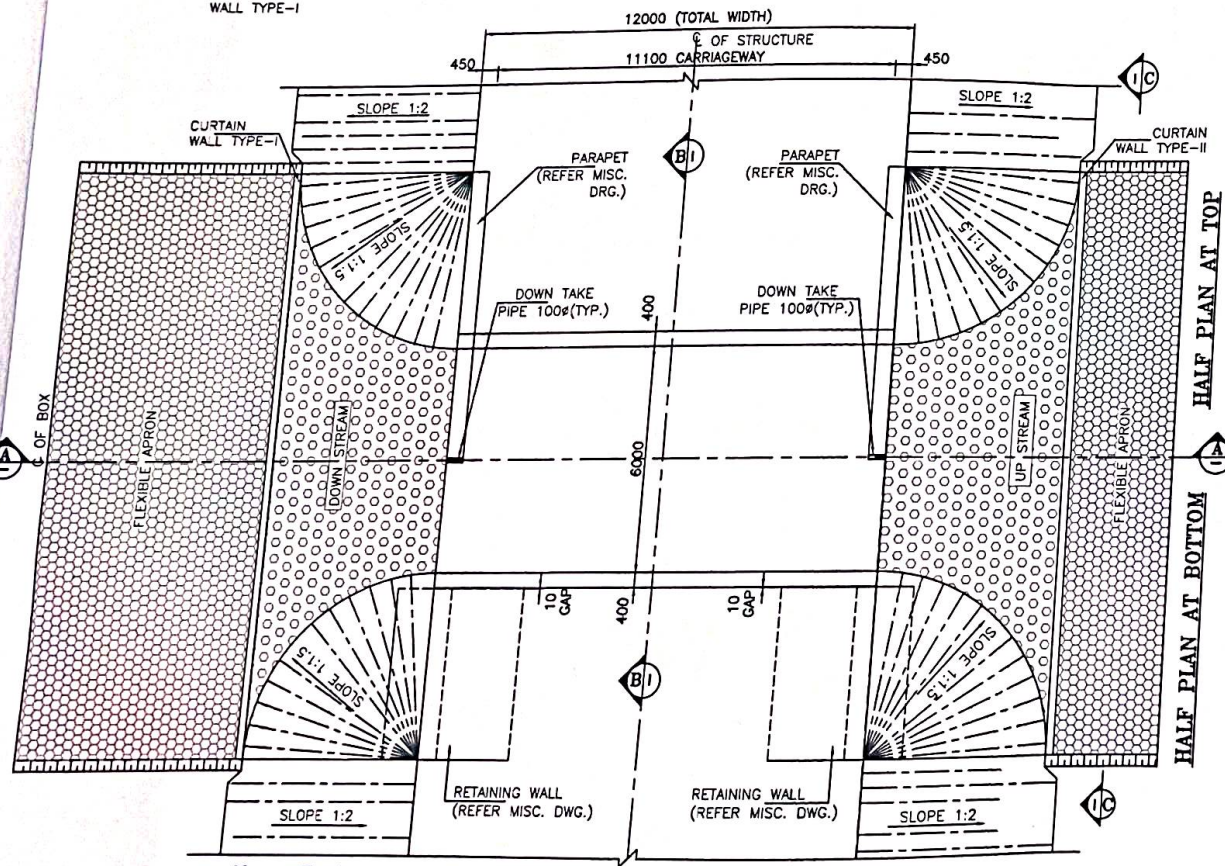


**WINST INFRA SOLUTION
PVT. LTD.**

**OFFICE: F-6, ISHAAN CORPORATE TOWER, PLOT NO-C-23, SECTOR-13,
VASUNDHRA, GHAZIABAD, U.P.-201012**



SECTION A-A
(SCALE-1:100)



PLAN
(SCALE-1:100)

DESCRIPTION	PROPOSED
DESIGN CHN.	32+297
CA.CHN.	32+307
STR. TYPE	BOX
SPAN/DIA	1X6X3m
PROPOSAL	NEW 2 LANE

KEY PLAN

LEVELS

DESIGN CH.	FRL	GROUND LEVEL	INVERT LEVEL		VERTICAL CLEARANCE (MAX.)	EARTH FILL (MAX.)	EARTH FILL (MIN.)
			LHS	RHS			
32+297	149.501	148.080	145.780	145.772	3.270m	0	0

NOTES:-

- ALL DIMENSIONS ARE IN MILLIMETER, LEVELS ARE IN METER AND CHAINAGE ARE IN KILOMETERS UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE RELEVANT PLAN AND PROFILE DRAWING OF ROAD.
- GRADE OF CONCRETE:-
 - M30-FOR RCC BOX CELL STRUCTURE.
 - M15-FOR PCC AND LEVELING COURSE.
 - M30-PARAPET
- GRADE OF STEEL - Fe500D.
- THE FOLLOWING LOADS HAVE BEEN CONSIDERED IN THE DESIGN:-
 - ONE LANE, TWO LANE AND THREE LANE OF CLASS A
 - ONE LANE OF CLASS A IN ADDITION OF ONE LANE OF CLASS 70R WHEEL OR ONE LANE OF 70R TRACKED WHICHEVER IS GOVERNS.
- BACKFILL MATERIAL BEHIND END WALL SHALL BE SELECTED GRANULAR SOIL HAVING PROPERTIES
MAX DRY DENSITY = 1850-2280kg/m³
OPTIMUM MOISTURE CONTENT = 7-15
AS PER IRC78-2014 AND MORTH SPECIFICATION.
- THE FRL SHOWN IN THE DRAWING SHALL BE VERIFIED WITH CORRESPONDING PLAN AND PROFILE DRAWING BEFORE EXECUTION, IF THERE IS ANY VARIATION SHALL BE BROUGHT TO THE NOTICE OF ENGINEER.
- THE DIMENSION AND LEVEL ARE SUBJECT TO CHANGE AS PER SITE CONDITION AND DETAILED DESIGN.
- BACKFILL TO BE DONE AND COMPACTED FROM BOTH SIDE SIMULTANEOUSLY.
- 600MM THICK FILTER MATERIAL BEHIND RETAINING WALL SHALL BE LAID AS PER APPENDIX 6 OF IRC 78-2014.
- 50MM THICK CEMENT CONCRETE WEARING COAT SHALL BE PROVIDED.
- 100MM DIA P.V.C. PIPE AT SPACING 1000MM/C IN HORIZONTAL/VERTICAL DIRECTION SHALL BE PROVIDED UP TO 150MM ABOVE GROUND LEVEL FOR WEEP HOLES IN RETAINING WALL.
- SBC SHALL BE 8t/m² AND SAME SHALL BE ENSURED AT SITE BY ANY SUITABLE METHOD.
- AS PER MORTH SECTION-2500, WHERE THE REQUIRED SIZE OF BOULDERS ARE NOT AVAILABLE ECONOMICALLY, CEMENT CONCRETE BLOCKS OF EQUIVALENT WEIGHT SHALL BE USED. THE GRADE OF CONCRETE SHALL BE M15 NOMINAL MIX. CEMENT CONCRETE BLOCK SHALL BE PREFERRED WHERE PRACTICABLE.
- CHOOSE ANY SUITABLE METHOD TO ACHIEVE THE REQUIRED SBC AS PER SITE.
- THE EXPOSURE CONDITION IS MODERATE.

LEGEND:-

FRL FINISHED ROAD LEVEL
IL INVERT LEVEL
LVL. LEVEL
EGL EXISTING GROUND LEVEL

FRL CAMBER & LOCATION IS TO BE MATCHED WITH HIGHWAY ALIGNMENT DRAWING.

REFERENCE DRAWINGS:-

- REINFORCEMENT DETAIL OF BOX CULVERT
AVC/NH-38/BOX/REINF./32+297/02

Kamac Engineer's (P) Ltd

KAMAC ENGINEERS PVT.LTD
F0201, CITY CENTER OFFICE
BLOCK, 2ND FLOOR,
MATIGARA 734010

AUTHORITY'S ENGINEER
ALMONDZ GLOBAL INFRA CONSULTANT
LIMITED IN JV WITH AYOLEEZA
CONSULTANT PRIVATE LIMITED.

C/O JAYANTA SAIKIA, SARBAJANIN
NAMGHAR, BORBIL NO.2, DIGBOI,
TINSUKIA, ASSAM-786171

PROOF CONSULTANT:

CREATIVE ENGINEERING SERVICES
OFFICE NO: 620, SIGNATURE GLOBAL
MALL, SECTOR-3,
VAISHALI, GHAZIABAD, U.P-201010

SAFETY CONSULTANT:

DESIGN AID
PLOT NO.54, 3rd FLOOR(FRONT),
MASOODPUR DAIRY FARM, VASANT KUNJ,
NEW DELHI-110070,

DESIGN CONSULTANT:

A.V. CONSTRUCTION
1st Floor, WZ-1240,
Palam Extension, Bosco
Ashram Wali Gali, New
Delhi 110045
Winst Infra Solution
Pvt. Ltd.
OFFICE F-8, ISHAAN CORPORATE
TOWER, PLOT NO-C-23, SECTOR-13,
VASUNDHRA GHAZIABAD, U.P-201012

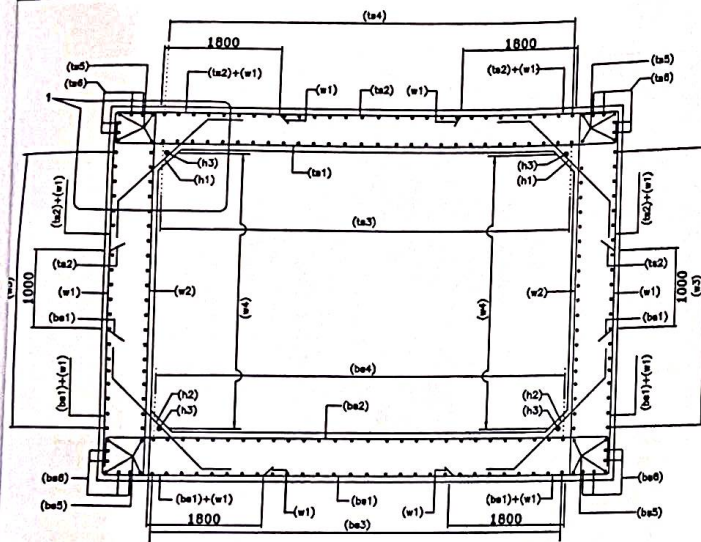
PROJECT:

WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150
(GOLAI GOAN) TO KM 47+482 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH
PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD)
(2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC
MODE (PACKAGE-I)

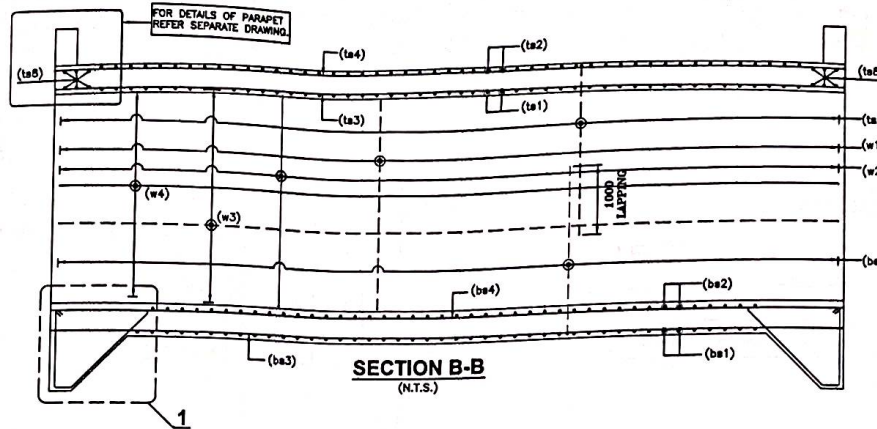
DRAWING TITLE:-

GENERAL ARRANGEMENT DRAWING FOR
BOX CULVERT AT CHAINAGE 32+297

Date	Drw.	Chk.	App.	Scale	Drawing Status
MAR.2024	W.P.	V.S	A.B	NTS	
Project No.	Drawing No.	Sheet No.	Rev	RO	
	AVC/NH-38/BC/GAD/32+297/01	01 OF 03			



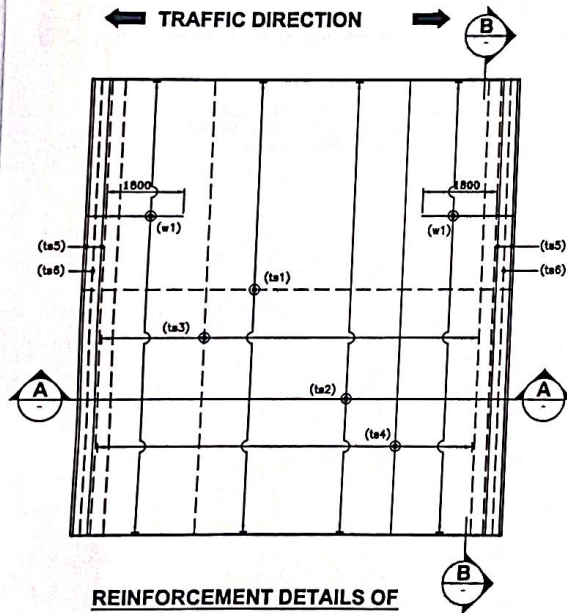
SECTION A-A
(N.T.S.)



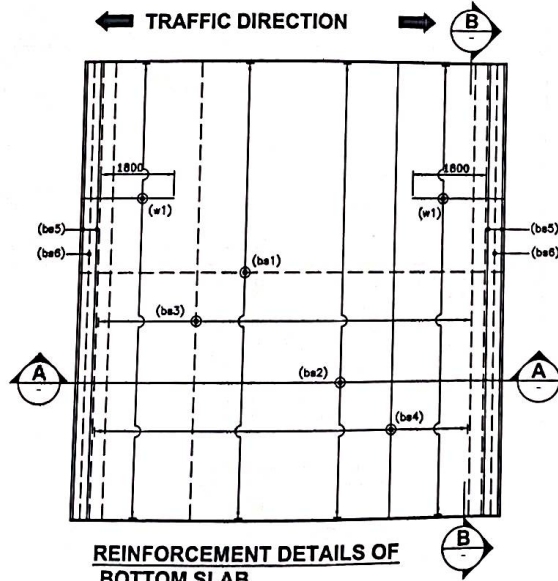
SECTION B-B
(N.T.S.)

LEGEND:-

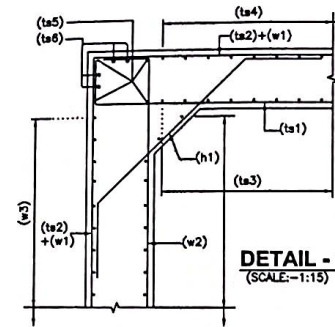
TOP FACE BAR	---
BOTTOM FACE BAR	---



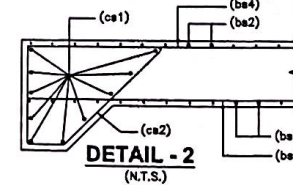
REINFORCEMENT DETAILS OF
TOP SLAB
(HAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
(N.T.S.)



REINFORCEMENT DETAILS OF
BOTTOM SLAB
(HAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
(N.T.S.)



DETAIL - 1
(SCALE:-1:15)



DETAIL - 2
(N.T.S.)

- ANCHORAGE LENGTH OF BOX SHALL BE TAKEN AS 40 ϕ AS PER IRC:112.
- FOR UNFAVORABLE BOND CONDITIONS THE FACTOR 40 SHOULD BE MULTIPLIED BY FACTOR OF 1.43.
- CENTER LINE OF OVERLAPPING BAR bs1 & ts2 IN WALL & MID HEIGHT OF WALLS ARE AT SAME POINT.
- BAR BENDING SCHEDULE SHOULD BE STRICTLY FOLLOW DURING THE TIME OF EXECUTION IF IN CASE ANY CHANGES AT SITE KINDLY DISCUSS IT WITH ENGINEER IN CHARGE.

REFERENCE DRAWING:-

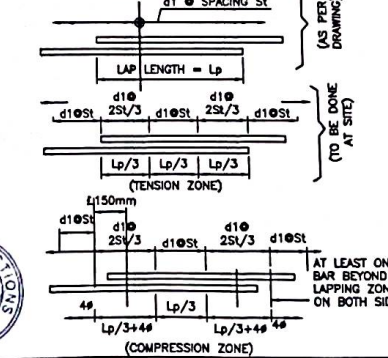
- GENERAL ARRANGEMENT DRAWING.
AVC/NH-38/BOX/GAD/32+297/01

BOX REINF. SCHEDULE

SL.NO.	BAR MARK	BAR SHAPE	DIAMETER	SPACING
1	ts1		16+10	200
2	ts2		16	200
3	ts3		10	200
4	ts4		12	200
5	ts5		12	2x4 Nos.
6	ts6		12	2x4 Nos.
7	w1		16	200
8	w2		16	200
9	w3		12	200
10	w4		10	200
11	bs1		16	200
12	bs2		20+10	200
13	bs3		12	200
14	bs4		12	200
15	bs5		12	2x4 Nos.
16	bs6		12	2x4 Nos.
17	h1		10	200
18	h2		10	200
19	h3		10	1x4 Nos.
20	cs1		12	10 Nos.
21	cs2		10	200

NOTES:-

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- DRAWING SHOULD NOT BE SCALED ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
- ALL REINFORCING BARS SHALL BE THERMO MECHANICALLY TREATED (TMT) BARS (GRADE DESIGNATION Fe-500D) CONFIRMING TO IS:1786 STANDARDS.
- MINIMUM CLEAR COVER TO OUTERMOST REINFORCEMENT SHALL BE AS FOLLOWS:-
 - a) TOP SLAB - 45mm
 - b) BOTTOM SLAB - 75mm
 - c) SIDE WALL (EARTH SIDE) - 75mm
 - d) SIDE WALL (INNER SIDE) - 45mm
- OVERLAPPING FOR SPlicing OF REINFORCEMENT SHALL BE AS PER CLAUSE NO.15.2.5. LAP LENGTH SHALL NOT BE LESS THAN 50 ϕ . ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:-



AT LEAST ONE BAR BEYOND LAPPING ZONE ON BOTH SIDE

CLIENT:
NHAI
NATIONAL HIGHWAYS &
INFRASTRUCTURE DEVELOPMENT
CORPORATION LTD.

EPC CONTRACTOR
KAMAC ENGINEERS PVT.LTD
F0201, CITY CENTER OFFICE
BLOCK, 2ND FLOOR,
MATIGARA 734010

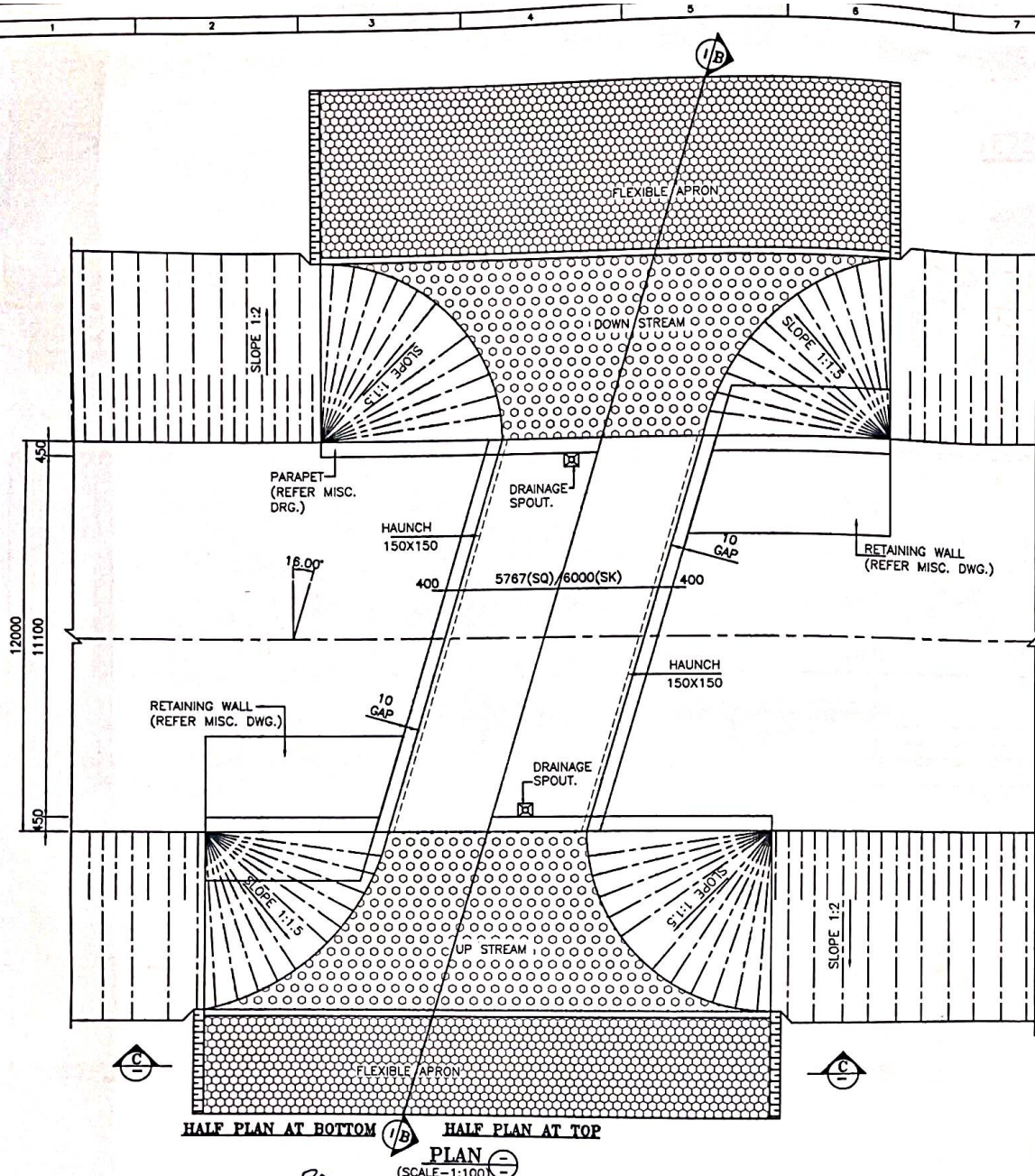
AUTHORITY'S ENGINEER
ALMONDZ GLOBAL INFRA CONSULTANT
LIMITED IN JV WITH AYOLEEZA
CONSULTANT PRIVATE LIMITED.
C/O JAYANTA SAIKIA, SARBAJANIN
NAMGHAR, BORBIL NO.2, DIGBOI,
TINSUKIA, ASSAM-786171

PROOF CONSULTANT:
CREATIVE ENGINEERING SERVICES
OFFICE NO: 620, SIGNATURE GLOBAL
MALL, SECTOR-3,
VAISHALI, GHAZIABAD, U.P.-201010

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PLOT NO.54, 3RD FLOOR(FRONT),
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NEW DELHI-110070,

DESIGN CONSULTANT:
A.V. CONSTRUCTION
1st Floor, WZ-1240,
Palam Extension, Bosco
Ashram Wall Gali, New
Delhi 110045
Winst Infra Solution
Pvt. Ltd.
OFFICE: F.A. ISHAN CORPORATE
TOWER, PLOT NO-C-23,SECTOR-13,
VASUNDHRA GHAZIABAD, U.P-201012

PROJECT:
WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150
(GOLA GOAN) TO KM 47+002 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH
PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD)
(2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC
MODE.(PACKAGE-5)
DRAWING TITLE:- REINFORCEMENT DETAIL OF BOX CULVERT
AT CH. 32+297
Date: MAR.2024
Project No. Drawing No. Rev. RD
Drw. W/P
Dwg. V/S
Chk. A.B
App. Scale. NTS
Sheet No. 01 OF 01



32450

32550

DESCRIPTION	PROPOSED
DESIGN CHN.	32+467
CA.CHN.	32+480
STR.TYPE	BOX
SPAN/DIA	1X8X3m
PROPOSAL	NEW 2 LANE

LEVELS

DESIGN CH.	FRL	GROUND LEVEL	INVERT LEVEL		VERTICAL CLEARANCE (MAX.)	EARTH FILL (MAX.)	EARTH FILL (MIN.)
			LHS	RHS			
32+467	146.054	142.794	142.494	142.506	3.089m	0	0

KEY PLAN

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a. M30-FOR RCC BOX CELL STRUCTURE.
b. M15-FOR PCC AND LEVELING COURSE.
c. M30-PARAPET
- GRADE OF STEEL - Fe500D.
- THE FOLLOWING LOADS HAVE BEEN CONSIDERED IN THE DESIGN:-
a. ONE LANE, TWO LANE AND THREE LANE OF CLASS A
b. ONE LANE OF CLASS A IN ADDITION OF ONE LANE OF CLASS 70R WHEEL OR ONE LANE OF 70R TRACKED WHICHEVER IS GOVERNS.
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- 600MM THICK. FILTER MATERIAL BEHIND RETAINING WALL SHALL BE LAID AS PER APPENDIX 6 OF IRC 78-2014.
- 150MM THICK CEMENT CONCRETE WEARING COAT SHALL BE PROVIDED.
- 100MM DIA P.V.C. PIPE AT SPACING 1000MM/c IN HORIZONTAL/VERTICAL DIRECTION SHALL BE PROVIDED UP TO 150MM ABOVE GROUND LEVEL FOR WEEP HOLES IN RETAINING WALL.
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LEGEND:-

- FRL FINISHED ROAD LEVEL
- IL INVERT LEVEL
- LVL. LEVEL
- EGL. EXISTING GROUND LEVEL

FRL CAMBER & LOCATION IS TO BE MATCHED WITH HIGHWAY ALIGNMENT DRAWING.

REFERENCE DRAWINGS:-

- REINFORCEMENT DETAIL OF BOX CULVERT
AVC/NH-36/BOX/REINF./32+467/02



CLIENT:

NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.

EPC CONTRACTOR

KAMAC ENGINEERS PVT.LTD
F0201, CITY CENTER OFFICE
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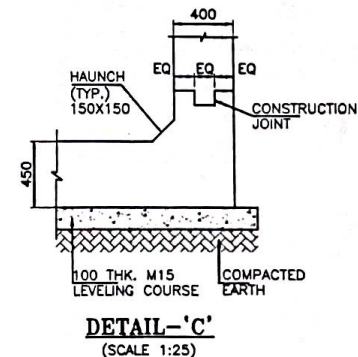
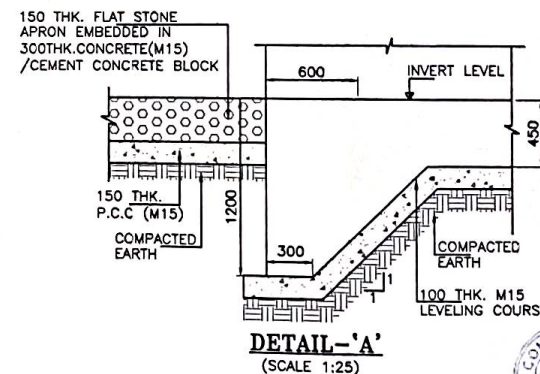
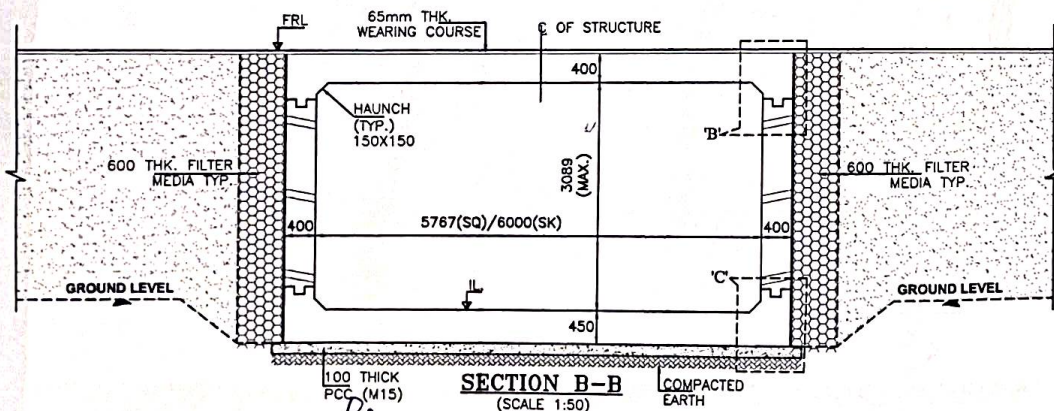
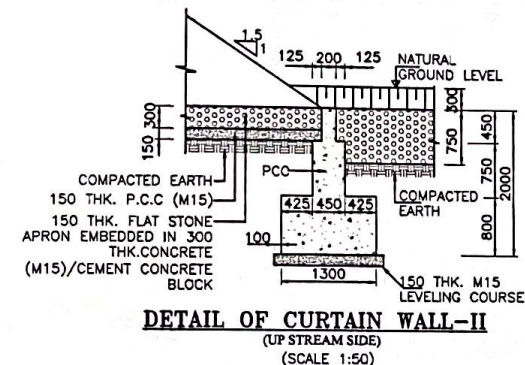
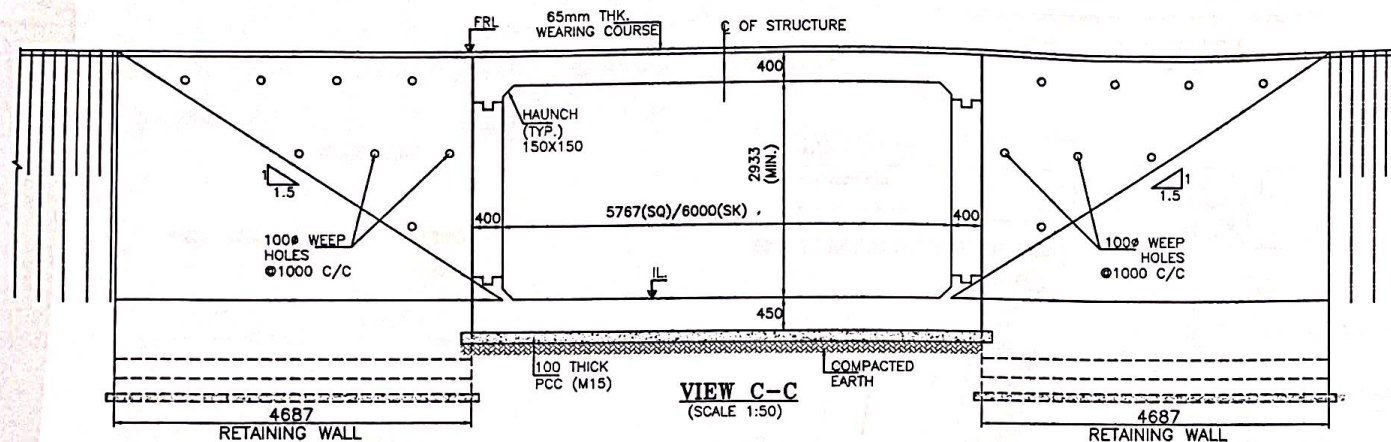
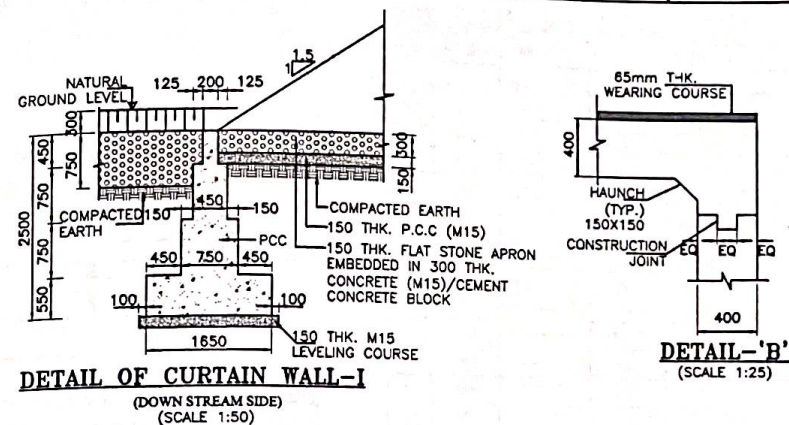
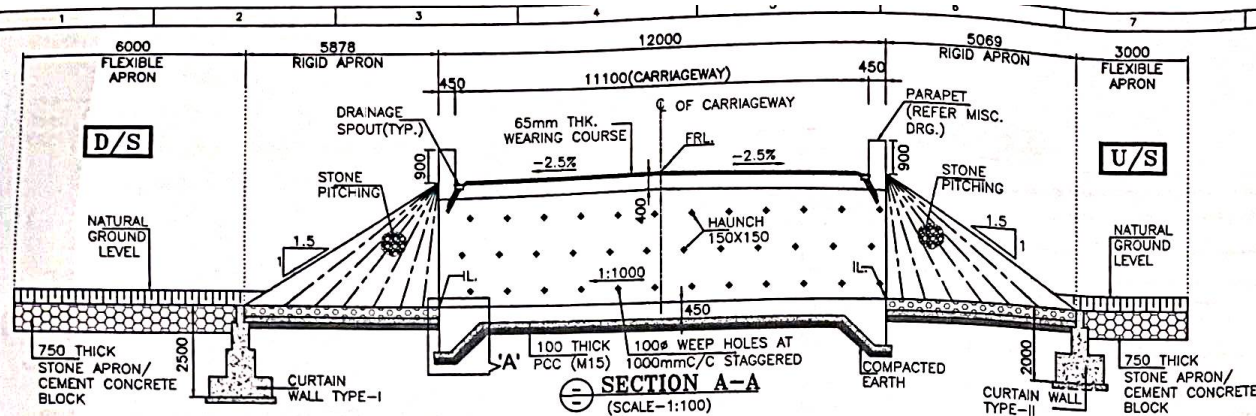
Winst Infra Solution
Pvt. Ltd.
OFFICE: F-8, 18TH AN CORPORATE
TOWER, PLOT NO-C-23, SECTOR-13,
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WIDENING/IMPROVEMENT TO 3-LANE LANE WITH PAVED SHOULDER FROM KM 27+150
(GOLAI GOAN) TO KM 47+052 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH
PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD)
(2-LANE+PS) OF 10+30 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC
MODE.(PACKAGE-6)

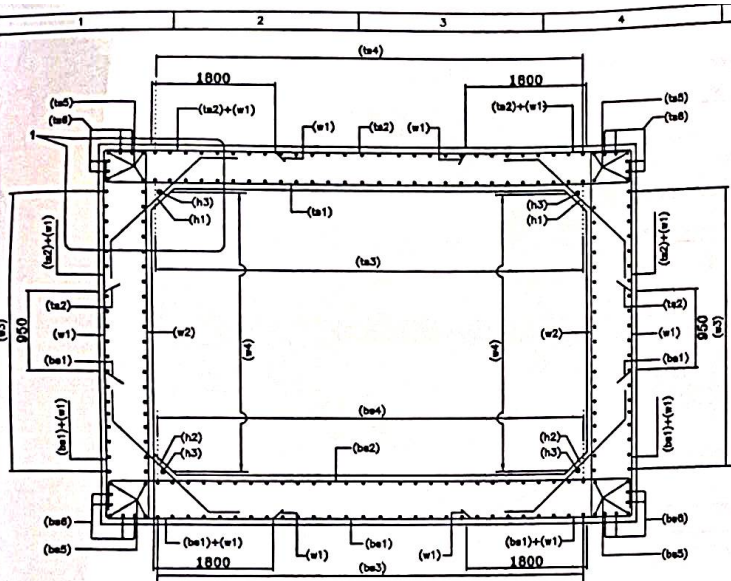
DRAWING TITLE:-
GENERAL ARRANGEMENT DRAWING FOR
BOX CULVERT AT CHAINAGE 32+467

Date	Drw. W.P	Dwg. V.S	Chk. A.B	App. NTS	Scale.	Drawing Status.
JAN.2024						
Project No.						

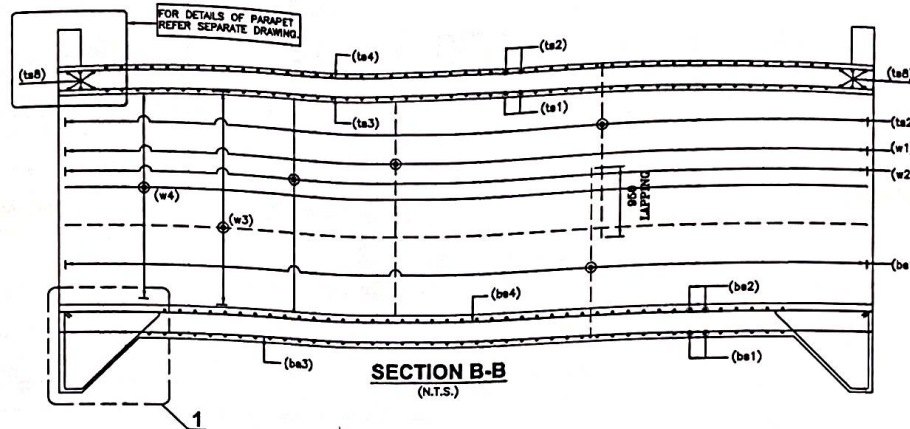
Sheet No. 1 OF 2 Rev. RO



CLIENT:  NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	EPC CONTRACTOR  KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	AUTHORITY'S ENGINEER ALMONDZ GLOBAL INFRA CONSULTANT LIMITED IN JV WITH AYOLEEZA CONSULTANT PRIVATE LIMITED. C/O JAYANTA SAIKIA, SARBAJANIN NAMGHAR, BORBIL NO.2, DIGBOI, TINSUKIA, ASSAM-786171	PROOF CONSULTANT:  CREATIVE ENGINEERING SERVICES OFFICE NO: 620, SIGNATURE GLOBAL MALL, SECTOR-3, VAISHALI, GHAZIABAD, U.P-201010	SAFETY CONSULTANT:  DESIGN AID PLOT NO.54, 3rd FLOOR(FRONT), MASOODPUR DAIRY FARM,VASANT KUNJ, NEW DELHI-110070,	DESIGN CONSULTANT:  A.V. CONSTRUCTION 1 st Floor, WZ-1240, Palam Extension, Bosco Ashram Wall Gali, New Delhi 110045 Winst Infra Solution Pvt. Ltd. OFFICE: F-8, ISHAAN CORPORATE TOWER, PLOT NO-C-23,SECTOR-13, VASUNDHRA GHAZIABAD, U.P-201012	PROJECT: WIDENING/IMPROVEMENT TO 3-LANE LANE WITH PAVED SHOULDER FROM KM 27+180 (GOLAI GOAN) TO KM 47+482 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (PLANE-PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE.(PACKAGE-8) DRAWING TITLE: GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 32+467 <table border="1"> <thead> <tr> <th>Date</th> <th>Drw. W.P</th> <th>Dag. V.B</th> <th>Chk. A.B</th> <th>App. NTS</th> <th>Scale</th> <th>Drawing Status.</th> </tr> </thead> <tbody> <tr> <td>JAN.2024</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Project No.</td> <td colspan="5">AYC/NH-38/BOX/GAD/32-467/01</td> <td>Sheet No. 2 OF 2</td> </tr> <tr> <td></td> <td colspan="5"></td> <td>Rev. R0</td> </tr> </tbody> </table>	Date	Drw. W.P	Dag. V.B	Chk. A.B	App. NTS	Scale	Drawing Status.	JAN.2024							Project No.	AYC/NH-38/BOX/GAD/32-467/01					Sheet No. 2 OF 2							Rev. R0
Date	Drw. W.P	Dag. V.B	Chk. A.B	App. NTS	Scale	Drawing Status.																												
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						Rev. R0																												



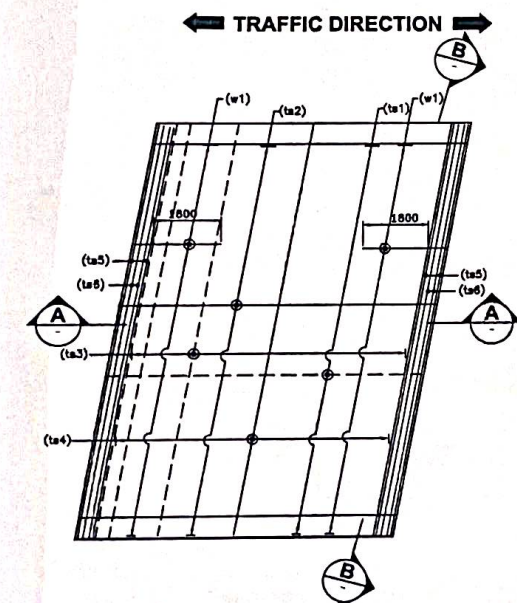
SECTION A-A
(N.T.S.)



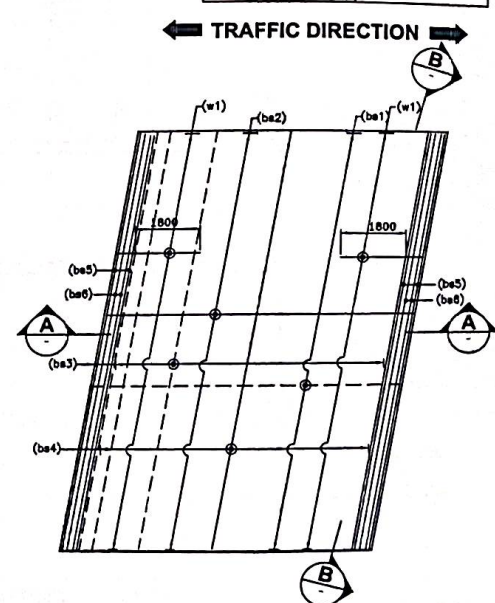
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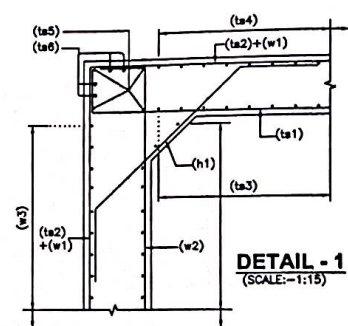
TOP FACE BAR	---
BOTTOM FACE BAR	---



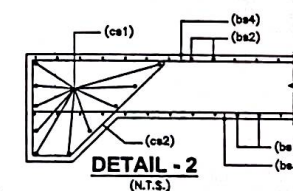
REINFORCEMENT DETAILS OF TOP SLAB
(HAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
(N.T.S.)



REINFORCEMENT DETAILS OF BOTTOM SLAB
(HAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
(N.T.S.)



DETAIL - 1
(SCALE:-1:15)



DETAIL - 2
(N.T.S.)

- ANCHORAGE LENGTH OF BOX SHALL BE TAKEN AS 40d AS PER IRC:112.
- FOR UNFAVORABLE BOND CONDITIONS THE FACTOR 40 SHOULD BE MULTIPLIED BY FACTOR OF 1.43.
- CENTER LINE OF OVERLAPPING BAR bs1 & ts2 IN WALL & MID HEIGHT OF WALLS ARE AT SAME POINT.
- BAR BENDING SCHEDULE SHOULD BE STRICTLY FOLLOW DURING THE TIME OF EXECUTION IF IN CASE ANY CHANGES AT SITE KINDLY DISCUSS IT WITH ENGINEER IN CHARGE.

REFERENCE DRAWING:-

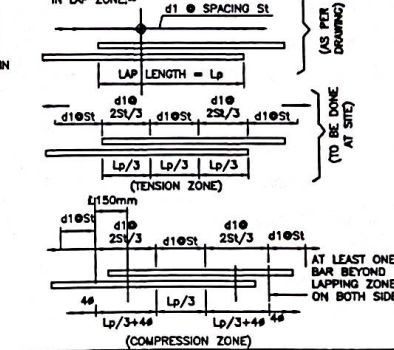
- GENERAL ARRANGEMENT DRAWING, AVC/NH-38/BOX/GAD/32+467/01

BOX REINF. SCHEDULE

SL.NO.	BAR MARK	BAR SHAPE	DIAMETER	SPACING
1	ts1		16+10	200
2	ts2		16	200
3	ts3		10	200
4	ts4		12	200
5	ts5		12	2x4 Nos.
6	ts6		12	2x4 Nos.
7	w1		16	200
8	w2		16	200
9	w3		12	200
10	w4		10	200
11	bs1		16	200
12	bs2		20+10	200
13	bs3		12	200
14	bs4		12	200
15	bs5		12	2x4 Nos.
16	bs6		12	2x4 Nos.
17	h1		10	200
18	h2		10	200
19	h3		10	1x4 Nos.
20	cs1		12	10 Nos.
21	cs2		10	200

NOTES:-

- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS UNLESS OTHERWISE MENTIONED.
- DRAWING SHOULD NOT BE SCALED ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
- ALL REINFORCING BARS SHALL BE THERMO MECHANICALLY TREATED (TMT) BARS (GRADE DESIGNATION Fe-500D) CONFORMING TO IS:1786 STANDARDS.
- MINIMUM CLEAR COVER TO OUTERMOST REINFORCEMENT SHALL BE AS FOLLOWS:-
 - a) TOP SLAB - 45mm
 - b) BOTTOM SLAB - 75mm
 - c) SIDE WALL (EARTH SIDE) - 75mm
 - d) SIDE WALL (INNER SIDE) - 45mm
- OVERLAPPING FOR SPACING OF REINFORCEMENT SHALL BE AS PER CLAUSE NO.15.2.5. LAP LENGTH SHALL NOT BE LESS THAN 56d. ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:-
 - d1 @ SPACING S1
 - LAP LENGTH = Lp
 - d1 @ 2S1/3
 - d1 @ 2S1/3
 - d1 @ 2S1/3
 - Lp/3
 - Lp/3
 - Lp/3
 - (TENSION ZONE)
 - Lp/3+4d
 - Lp/3+4d
 - (COMPRESSION ZONE)



DESIGN CONSULTANT:

A.V. CONSTRUCTION
1st Floor, WZ-1240,
Palam Extension, Bosco
Ashram Wall Gall, New
Delhi 110045

Winst Infra Solution
Pvt. Ltd.
OFFICE: F-6, 18th AN CORPORATE
TOWER, PLOT NO-C-23, SECTOR-13,
VASUNDHRA GHAZIABAD, U.P-201012

SAFETY CONSULTANT:

DESIGN AID
PLOT NO.54, 3rd FLOOR(FRONT),
MASOODPUR DAIRY FARM, VASANT KUNJ,
NEW DELHI-110070,

PROOF CONSULTANT:

CREATIVE ENGINEERING SERVICES
OFFICE NO: 620, SIGNATURE GLOBAL
MALL, SECTOR-3,
VAISHALI, GHAZIABAD, U.P-201010

AUTHORITY'S ENGINEER

ALMONDZ GLOBAL INFRA CONSULTANT
LIMITED IN JV WITH AYOLEEZA
CONSULTANT PRIVATE LIMITED.

C/O JAYANTA SAIKIA, SARBAJANIN
NAMGHAR, BORBIL NO.2, DIGBOI,
TINSUKIA, ASSAM-786171

EPC CONTRACTOR

KAMAC ENGINEERS PVT.LTD
F0201, CITY CENTER OFFICE
BLOCK, 2ND FLOOR,
MATIGARA 734010

CLIENT:

**NATIONAL HIGHWAYS &
INFRASTRUCTURE DEVELOPMENT
CORPORATION LTD.**

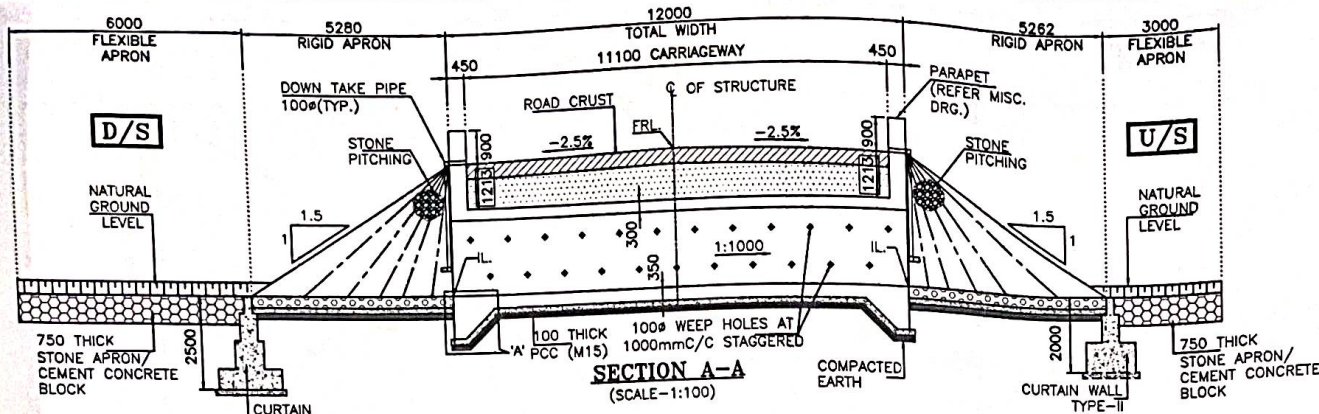
PROJECT:

WIDENING/IMPROVEMENT TO 3-LANE WITH PAVED SHOULDER FROM KM 27+150
(GOLAI GOAN) TO KM 47+462 (LEDO) ON DISBURGHARH TO LEDO SECTION WITH
PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD)
(2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC
MODE.(PACKAGE-6)

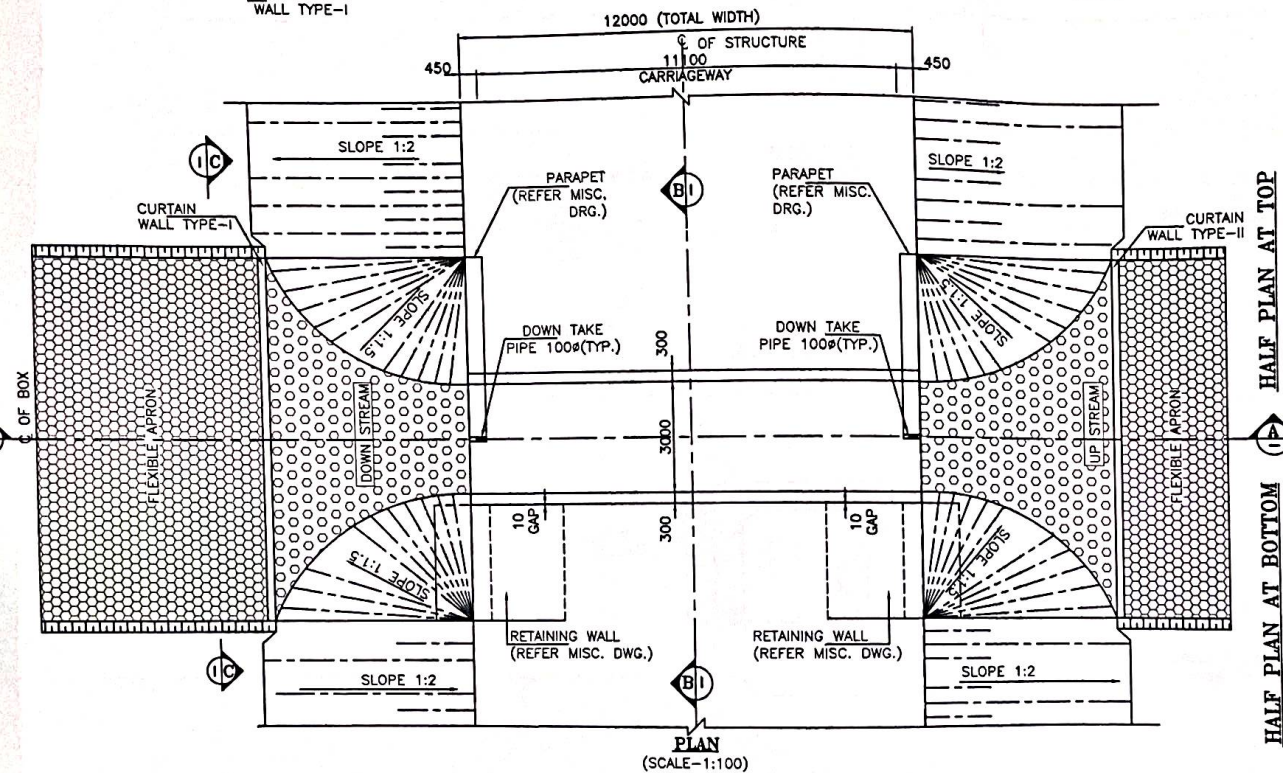
DRAWING TITLE:

REINFORCEMENT DETAIL OF BOX CULVERT
AT CH. 32+467

Date	Drw.	Dwg.	Chk.	App.	Scale	Drawing Status.
MAR 2024	W.P.	V.L.	A.B		N.T.S	
Project No.	Drawing No.	Sheet No.	Rev.			
	AVC/NH-38/BOX/REIN/32+467/01	01 OF 01	RO			



SECTION A-A
(SCALE-1:100)



PLAN
(SCALE-1:100)

LEVELS

DESIGN CH.	FRL	GROUND LEVEL	INVERT LEVEL		VERTICAL CLEARANCE (MAX.)	EARTHFILL (MAX.)	EARTHFILL (MIN.)
			LHS	RHS			
32+622	145.725	142.361	142.061	142.073	2.012m	1.352m	1.213m

REFERENCE DRAWINGS:-

1. REINFORCEMENT DETAIL OF BOX CULVERT
AVC/NH-38/BC/RENF./32+622/01

LEGEND:-

FRL FINISHED ROAD LEVEL
IL INVERT LEVEL
LVL. LEVEL
EGL. EXISTING GROUND LEVEL

FRL CAMBER & LOCATION IS TO BE MATCHED WITH HIGHWAY ALIGNMENT DRAWING.

32550

DESCRIPTION	PROPOSED
DESIGN CHN.	32+622
CA.CHN.	32+635
STR.TYPE	BOX
SPAN/DIA	1X3X2m
PROPOSAL	NEW 2 LANE

32650

KEY PLAN

NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETER, LEVELS ARE IN METER AND CHAINAGE ARE IN KILOMETERS UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
2. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE RELEVANT PLAN AND PROFILE DRAWING OF ROAD.
3. GRADE OF CONCRETE:-
a. M30-FOR RCC BOX CELL STRUCTURE.
b. M15-FOR PCC AND LEVELING COURSE.
c. M30-PARAPET
4. GRADE OF STEEL - Fe 500D.
5. THE CARRIAGEWAY OF PROPOSED CULVERT IS DESIGN AS PER 6-2017.
6. BACKFILL MATERIAL BEHIND END WALL SHALL BE SELECTED GRANULAR SOIL HAVING PROPERTIES
MAX DRY DENSITY = 1850-2280kg/m³
OPTIMUM MOISTURE CONTENT = 7-15
AS PER IRC78-2014 AND MORTH SPECIFICATION.
7. THE FRL SHOWN IN THE DRAWING SHALL BE VERIFIED WITH CORRESPONDING PLAN AND PROFILE DRAWING BEFORE EXECUTION, IF THERE IS ANY VARIATION SHALL BE BROUGHT TO THE NOTICE OF ENGINEER.
8. THE DIMENSION AND LEVEL ARE SUBJECT TO CHANGE AS PER SITE CONDITION AND DETAILED DESIGN.
9. BACKFILL TO BE DONE AND COMPACTED FROM BOTH SIDE SIMULTANEOUSLY.
10. 100MM DIA P.V.C. PIPE AT SPACING 1000MM/c IN HORIZONTAL/VERTICAL DIRECTION SHALL BE PROVIDED UP TO 150MM ABOVE GROUND LEVEL FOR WEEP HOLES IN RETAINING WALL.
11. SBC SHALL BE 8t/m². AND SAME SHALL BE ENSURED AT SITE BY ANY SUITABLE METHOD.
12. AS PER NORTH SECTION-2500, WHERE THE REQUIRED SIZE OF BOULDERS ARE NOT AVAILABLE ECONOMICALLY, CEMENT CONCRETE BLOCKS OF EQUIVALENT WEIGHT SHALL BE USED. THE GRADE OF CONCRETE SHALL BE M15 NOMINAL MIX. CEMENT CONCRETE BLOCK SHALL BE PREFERRED WHERE PRACTICABLE.
13. CHOOSE ANY SUITABLE METHOD TO ACHIEVE THE REQUIRED SBC AS PER SITE.



FRL CAMBER & LOCATION IS TO BE MATCHED WITH HIGHWAY ALIGNMENT DRAWING.

CLIENT:



NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.

EPC CONTRACTOR



KAMAC ENGINEERS PVT.LTD
F0201, CITY CENTER OFFICE
BLOCK, 2ND FLOOR,
MATIGARA 734010

AUTHORITY'S ENGINEER

ALMONDZ GLOBAL INFRA CONSULTANT LIMITED IN JV WITH AYOLEEZA CONSULTANT PRIVATE LIMITED.

C/O JAYANTA SAIKIA, SARBAJANIN
NAMGHAR, BORBI NO.2, DIGBOI,
TINSUKIA, ASSAM-786171

PROOF CONSULTANT:



CREATIVE ENGINEERING SERVICES
OFFICE NO: 620, SIGNATURE GLOBAL
MALL, SECTOR-3,
VAISHALI, GHAZIABAD, U.P-201010

SAFETY CONSULTANT:



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PLOT NO.54, 3rd FLOOR(FRONT),
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DESIGN CONSULTANT:



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1st Floor, WZ-1240,
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Winst Infra Solution
Pvt. Ltd.
OFFICE: F-1, ISHAAN CORPORATE
TOWER, PLOT NO-C-23, SECTOR-13,
VASUNDHRA, GHAZIABAD, U.P-201012

PROJECT:

WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (GOLAJI DOKH) TO KM 47+482 (LEDO) ON DISBURGHARH TO LEDO SECTION WITH PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE.(PACKAGE-5)

DRAWING TITLE:-

GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 32+622

Date:

MAR-2024

Project No.

Drw. W.P.

Dwg. V.B.

Chk. A.B.

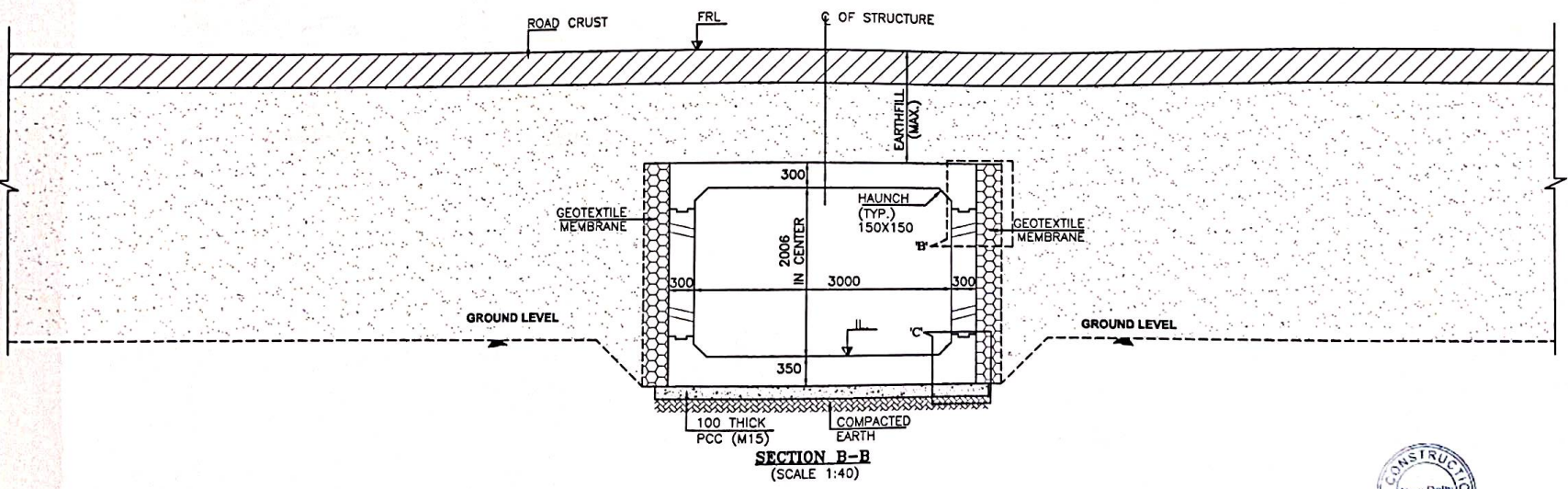
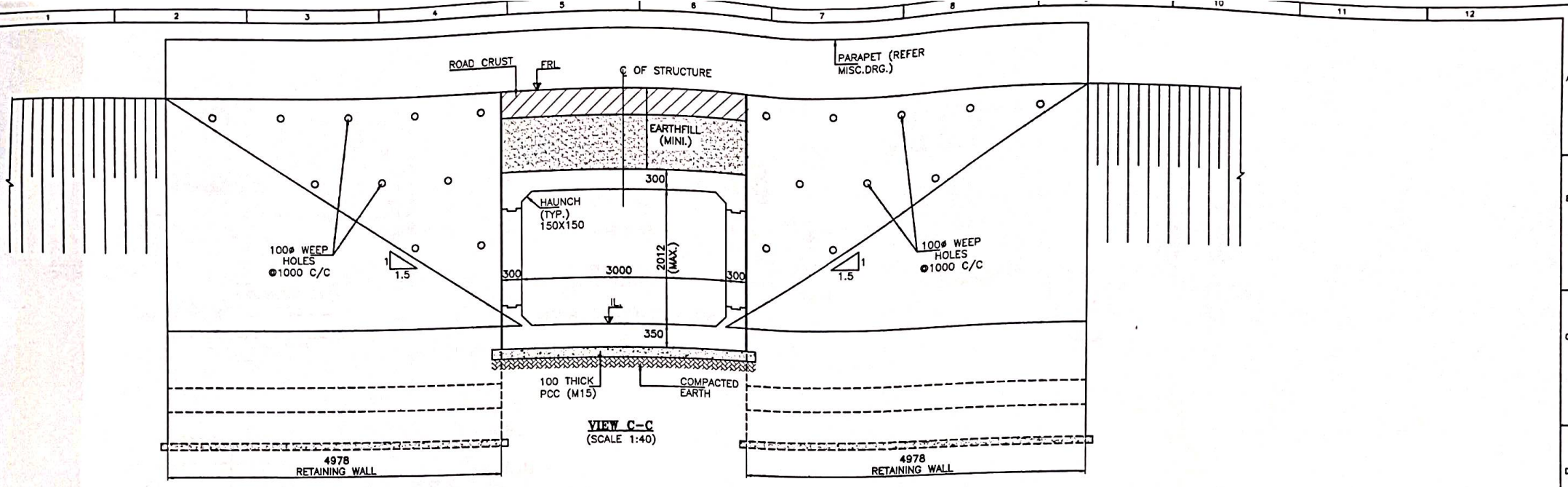
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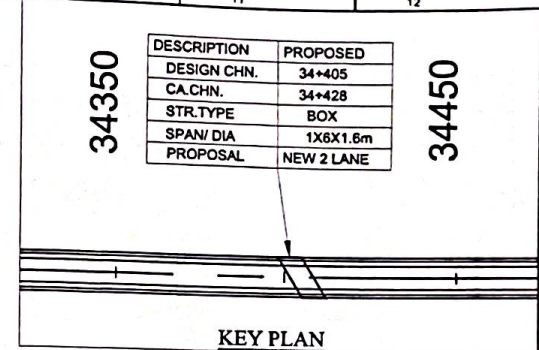
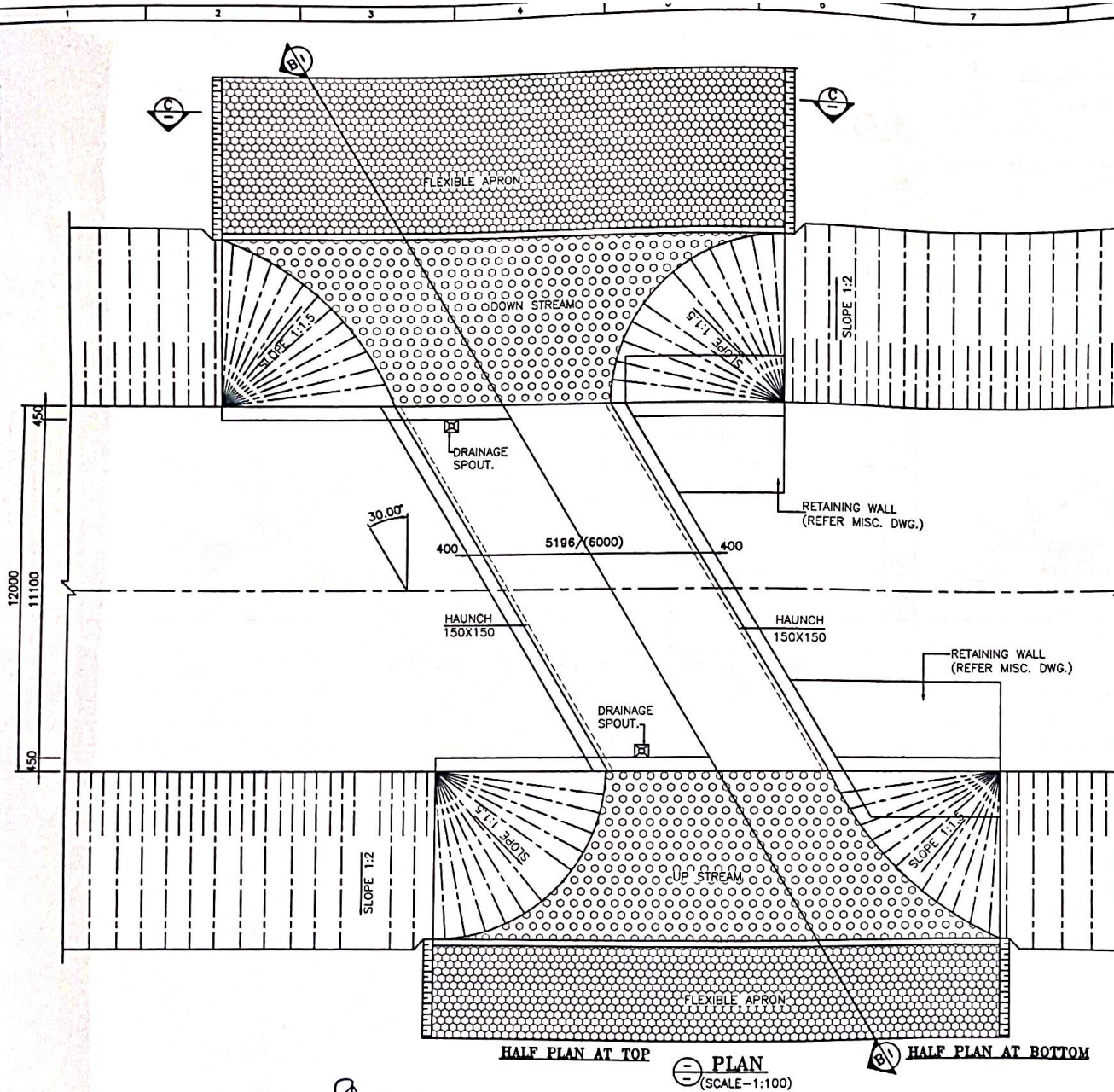
NTS

Drawing Status.

81 OF.



CLIENT:  NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	EPC CONTRACTOR  KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	AUTHORITY'S ENGINEER ALMONDZ GLOBAL INFRA CONSULTANT LIMITED IN JV WITH AYOLEEZA CONSULTANT PRIVATE LIMITED. C/O JAYANTA SAIKIA, SARBAJANIN NAMGHAR, BORBIL NO.2, DIGBOI, TINSUKIA, ASSAM-786171	PROOF CONSULTANT:  CREATIVE ENGINEERING SERVICES OFFICE NO: 620, SIGNATURE GLOBAL MALL, SECTOR-3, VAISHALI, GHAZIABAD, U.P-201010	SAFETY CONSULTANT:  DESIGN AID PLOT NO.54, 3rd FLOOR(FRONT), MASOODPUR DAIRY FARM,VASANT KUNJ, NEW DELHI-110070,	DESIGN CONSULTANT:  A.V. CONSTRUCTION 1st Floor, WZ-1240, Palam Extension, Bosco Ashram Wall Gali, New Delhi 110045 Winst Infra Solution Pvt. Ltd. OFFICE: F-4, ISHAAN CORPORATE TOWER, PLOT NO-C-23, SECTOR-13, VASUNDHRA GHAZIABAD, U.P-201012	PROJECT: WIDENING/IMPROVEMENT TO 3-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (GOLAI GOAN) TO KM 47+482 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE.(PACKAGE-8) DRAWING TITLE: GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 32+422 <table border="1"> <tr> <td>Date</td><td>Drw.</td><td>Des.</td><td>Chk.</td><td>App.</td><td>Scale</td><td>Drawing Status.</td></tr> <tr> <td>MAR 2024</td><td>W.P</td><td>V.B</td><td>A.B</td><td></td><td>NTS</td><td></td></tr> <tr> <td>Project No.</td><td>Drawing No.</td><td></td><td></td><td></td><td></td><td>Sheet No. 82 OF 83 Rev. RO</td></tr> <tr> <td></td><td>AVCNH-38/BC/GAD/32+422/01</td><td></td><td></td><td></td><td></td><td></td></tr> </table>	Date	Drw.	Des.	Chk.	App.	Scale	Drawing Status.	MAR 2024	W.P	V.B	A.B		NTS		Project No.	Drawing No.					Sheet No. 82 OF 83 Rev. RO		AVCNH-38/BC/GAD/32+422/01					
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Project No.	Drawing No.					Sheet No. 82 OF 83 Rev. RO																												
	AVCNH-38/BC/GAD/32+422/01																																	



LEVELS

DESIGN CH.	FRL	GROUND LEVEL	INVERT LEVEL		VERTICAL CLEARANCE (MAX.)	EARTHFILL (MAX.)	EARTHFILL (MIN.)
			LHS	RHS			
34+405	141.844	139.264	138.976	138.984	1.612m	0.868m	0.729m

NOTES:-

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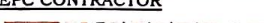


CLIENT:



NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.

EPC CONTRACTOR



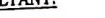
KAMAC ENGINEERS PVT.LTD
F0201, CITY CENTER OFFICE
BLOCK, 2ND FLOOR,
MATIGARA 734010

AUTHORITY'S ENGINEER

ALMONDZ GLOBAL INFRA CONSULTANT LIMITED IN JV WITH AYOLEEZA CONSULTANT PRIVATE LIMITED.

C/O JAYANTA SAIKIA, SARBAJANIN NAMGHAR, BORBIL NO.2, DIGBOI, TINSUKIA, ASSAM-786171

PROOF CONSULTANT:



CREATIVE ENGINEERING SERVICES
OFFICE NO: 620, SIGNATURE GLOBAL MALL, SECTOR-3, VAISHALI, GHAZIABAD, U.P-201010

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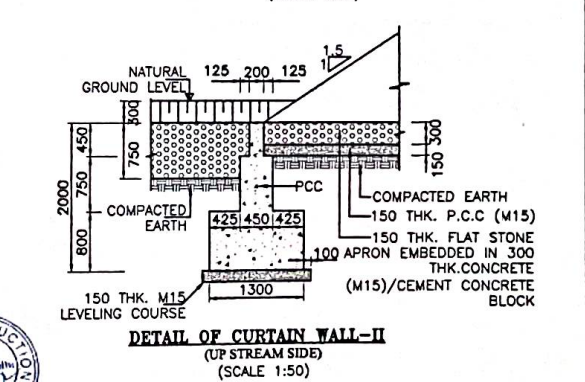
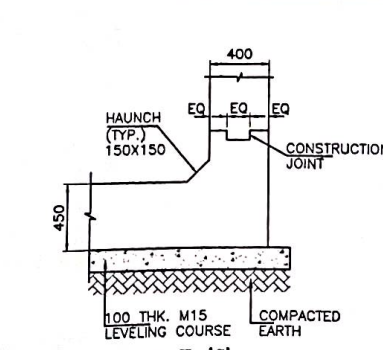
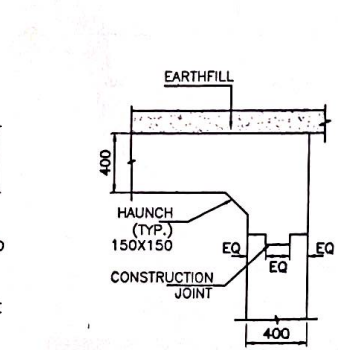
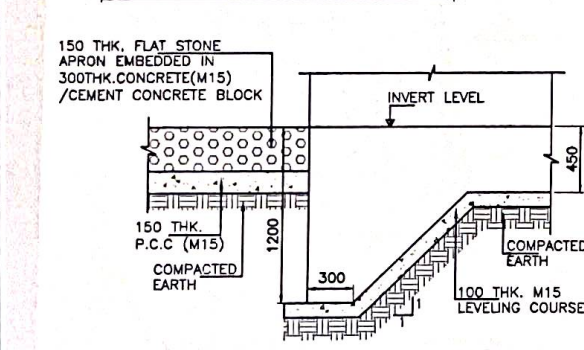
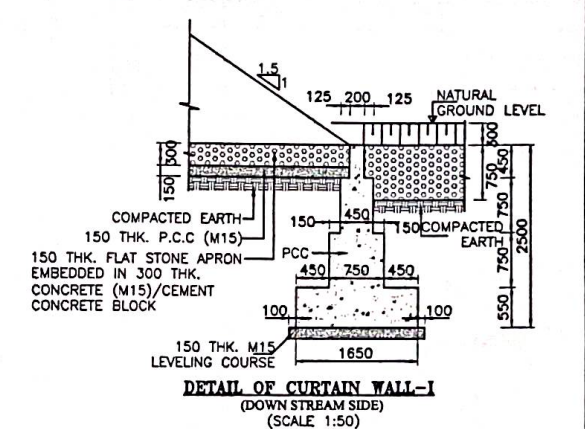
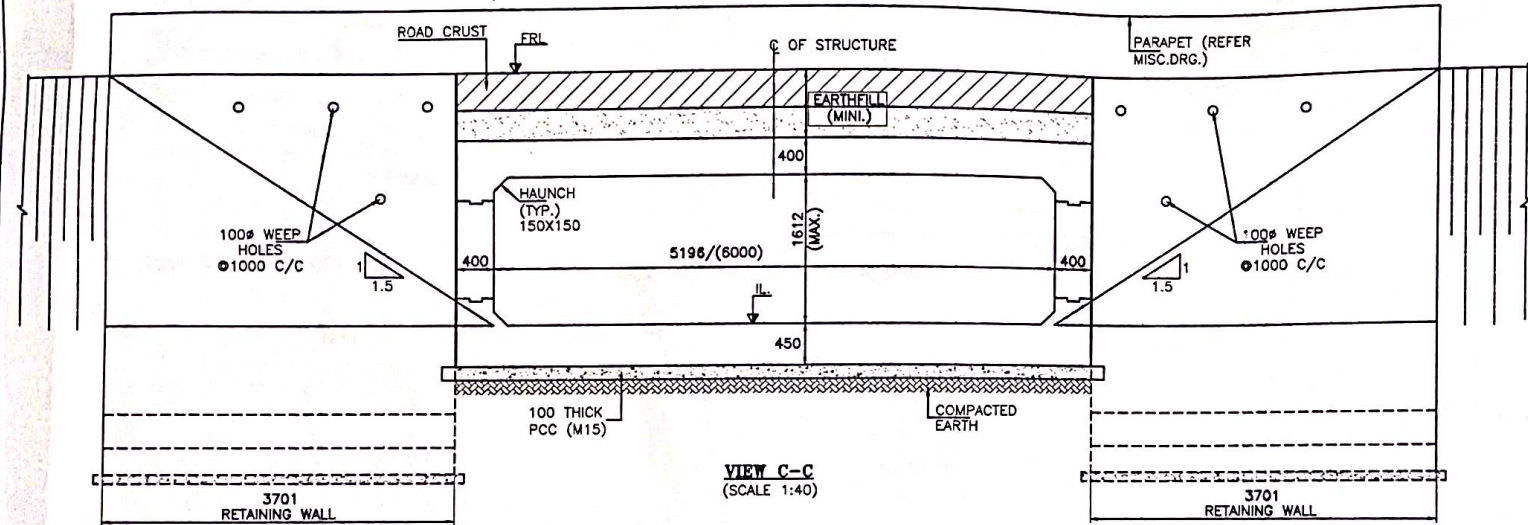
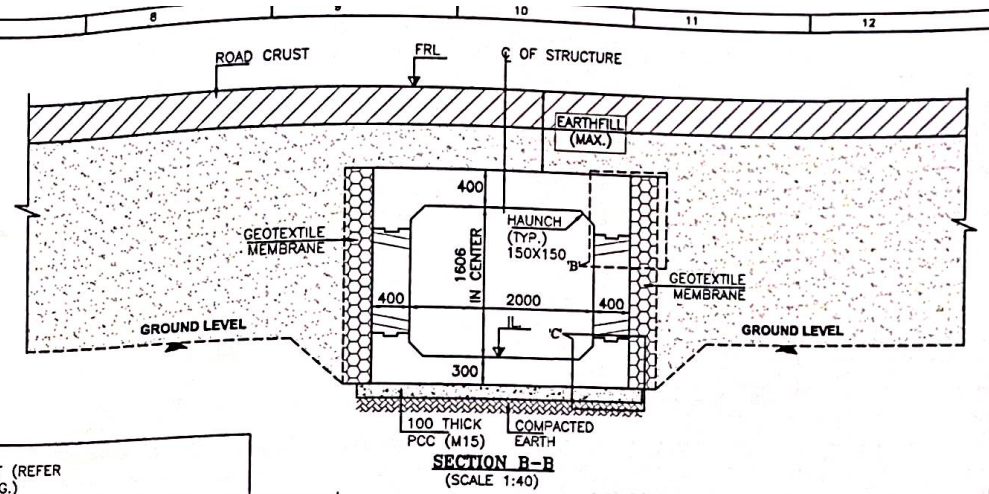
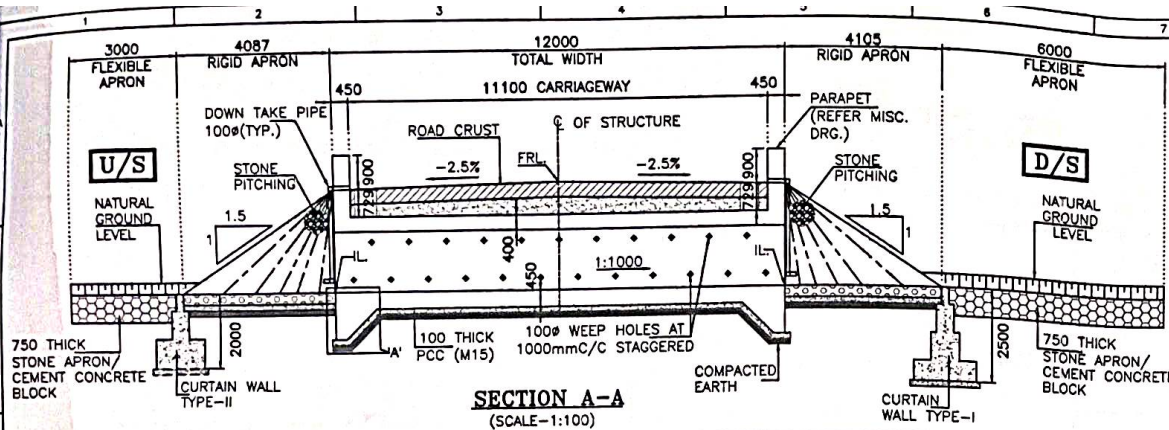
PROJECT:

WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+100 (DOLA GOAN) TO KM 47+002 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE (PACKAGE-8)

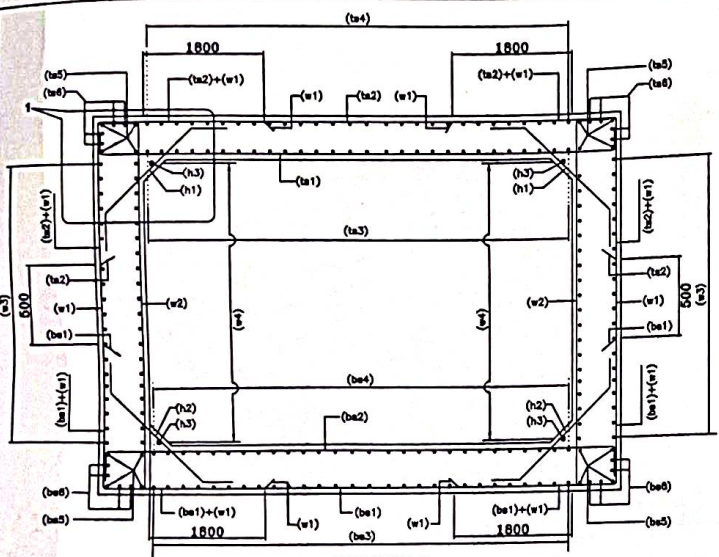
DRAWING TITLE:-

GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 34+405

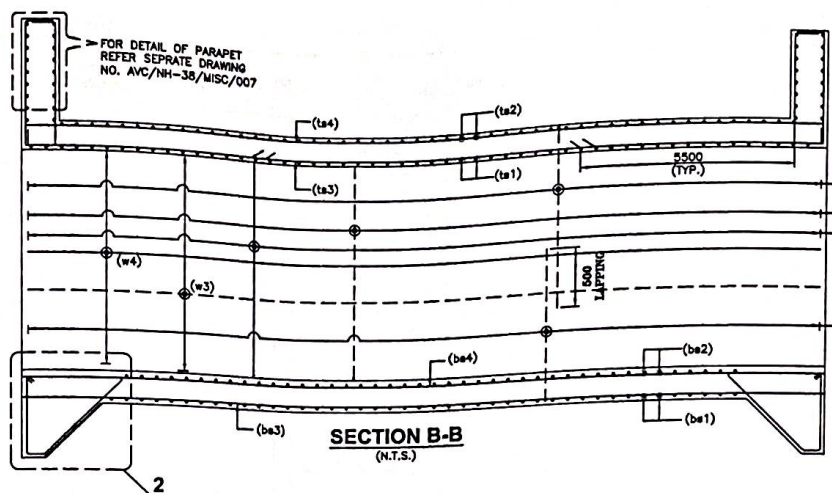
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MAR.2024	V.B	A.B						
Project No.	Drawing No.	Sheet No.	Rev					
	AVC/NH-38/BC/04D/34+405/01	01 OF 02	RO					



CLIENT: NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	EPC CONTRACTOR KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	AUTHORITY'S ENGINEER ALMONDZ GLOBAL INFRA CONSULTANT LIMITED IN JV WITH AYOLEEZA CONSULTANT PRIVATE LIMITED. C/O JAYANTA SAKIA, SARBAJANIN NAMGHAR, BORBIL NO.2, DIGBOI, TINSUKIA, ASSAM-786171	PROOF CONSULTANT: CREATIVE ENGINEERING SERVICES OFFICE NO: 620, SIGNATURE GLOBAL MALL, SECTOR-3, VAISHALI, GHAZIABAD, U.P-201010	SAFETY CONSULTANT: DESIGN AID PLOT NO.54, 3rd FLOOR(FRONT), MASOODPUR DAIRY FARM,VASANT KUNJ, NEW DELHI-110070,	DESIGN CONSULTANT: A.V. CONSTRUCTION 1st Floor, WZ-1240, Palam Extension, Bosco Ashram Wall Gali, New Delhi 110045 Winst Infra Solution Pvt. Ltd. OFFICE F-8, BHAWAN CORPORATE TOWER, PLOT NO-C-23, SECTOR-13, VASUNDHRA, GHAZIABAD, U.P-201012	PROJECT: WIDENING/IMPROVEMENT TO 3-LANE LANE WITH PAVED SHOULDER FROM KM 37+100 (BOLAI GAOH) TO KM 41+00 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH PROPOSED MARHERTA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE (PACKAGE-0) DRAWING TITLE: GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 34+405 <table border="1"> <thead> <tr> <th>Date</th> <th>Drw. W.P.</th> <th>Des. V.S.</th> <th>Chk. A.B.</th> <th>App. NTS</th> <th>Scale</th> <th>Drawing Status.</th> </tr> </thead> <tbody> <tr> <td>MAR 2024</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> Project No. Drawing No. AVCNH-38/BC/GAD/24-405/01 Sheet No. 82 OF 82 Rev. RD	Date	Drw. W.P.	Des. V.S.	Chk. A.B.	App. NTS	Scale	Drawing Status.	MAR 2024						
Date	Drw. W.P.	Des. V.S.	Chk. A.B.	App. NTS	Scale	Drawing Status.														
MAR 2024																				



SECTION A-A
(N.T.S.)



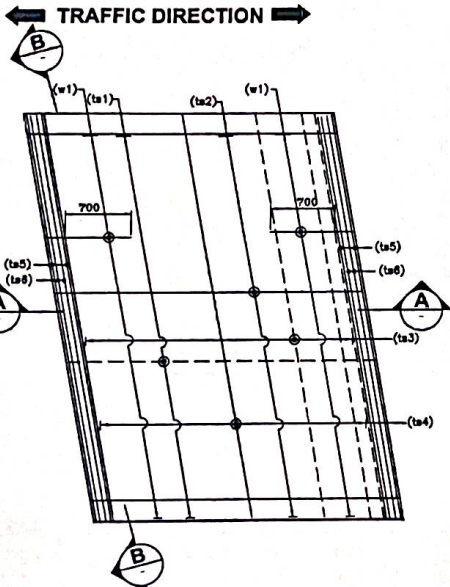
SECTION B-B
(N.T.S.)

LEGEND:-

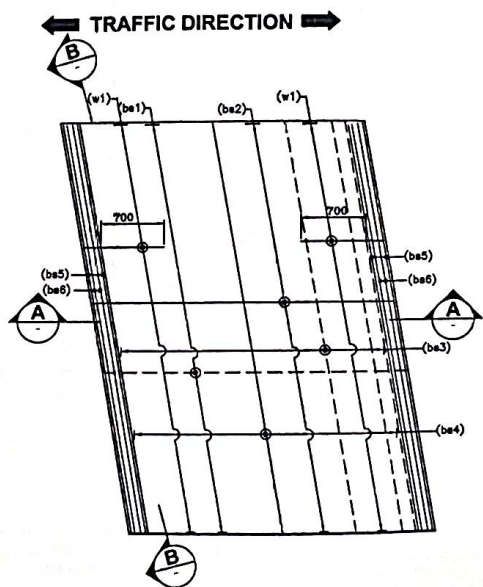
TOP FACE BAR	_____
BOTTOM FACE BAR	-----

BOX REINF. SCHEDULE

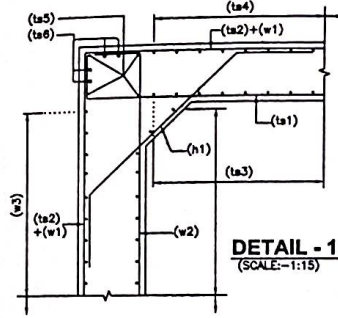
SL.NO.	BAR MARK	BAR SHAPE	DIAMETER	SPACING
1	ts1		16+12	180
2	ts2		16	180
3	ts3		10	180
4	ts4		12	180
5	ts5		12	2x4 Nos.
6	ts6		12	2x4 Nos.
7	w1		16	180
8	w2		12	180
9	w3		12	180
10	w4		10	180
11	bs1		16	180
12	bs2		16+12	180
13	bs3		12	180
14	bs4		10	180
15	bs5		12	2x4 Nos.
16	bs6		12	2x4 Nos.
17	h1		10	180
18	h2		10	180
19	h3		10	1x4 Nos.
20	cs1		12	10 Nos.
21	cs2		10	180



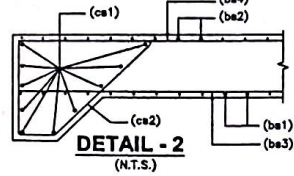
REINFORCEMENT DETAILS OF TOP SLAB
(HAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
(N.T.S.)



REINFORCEMENT DETAILS OF BOTTOM SLAB
(HAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
(N.T.S.)



DETAIL - 1
(SCALE:-1:15)



DETAIL - 2
(N.T.S.)

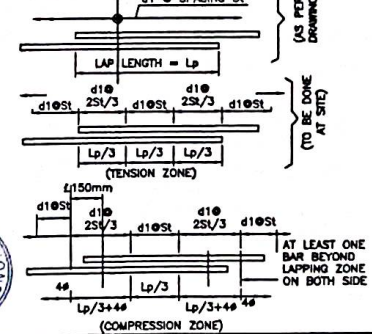
- ANCHORAGE LENGTH OF BOX SHALL BE TAKEN AS 40d AS PER IRC:112.
- FOR UNFAVORABLE BOND CONDITIONS THE FACTOR 40 SHOULD BE MULTIPLIED BY FACTOR OF 1.43.
- CENTER LINE OF OVERLAPPING BAR bs1 & ts2 IN WALL & MID HEIGHT OF WALLS ARE AT SAME POINT.
- BAR BENDING SCHEDULE SHOULD BE STRICTLY FOLLOW DURING THE TIME OF EXECUTION IF IN CASE ANY CHANGES AT SITE KINDLY DISCUSS IT WITH ENGINEER IN CHARGE.

REFERENCE DRAWING:-

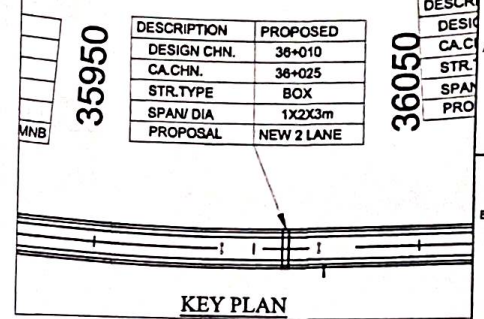
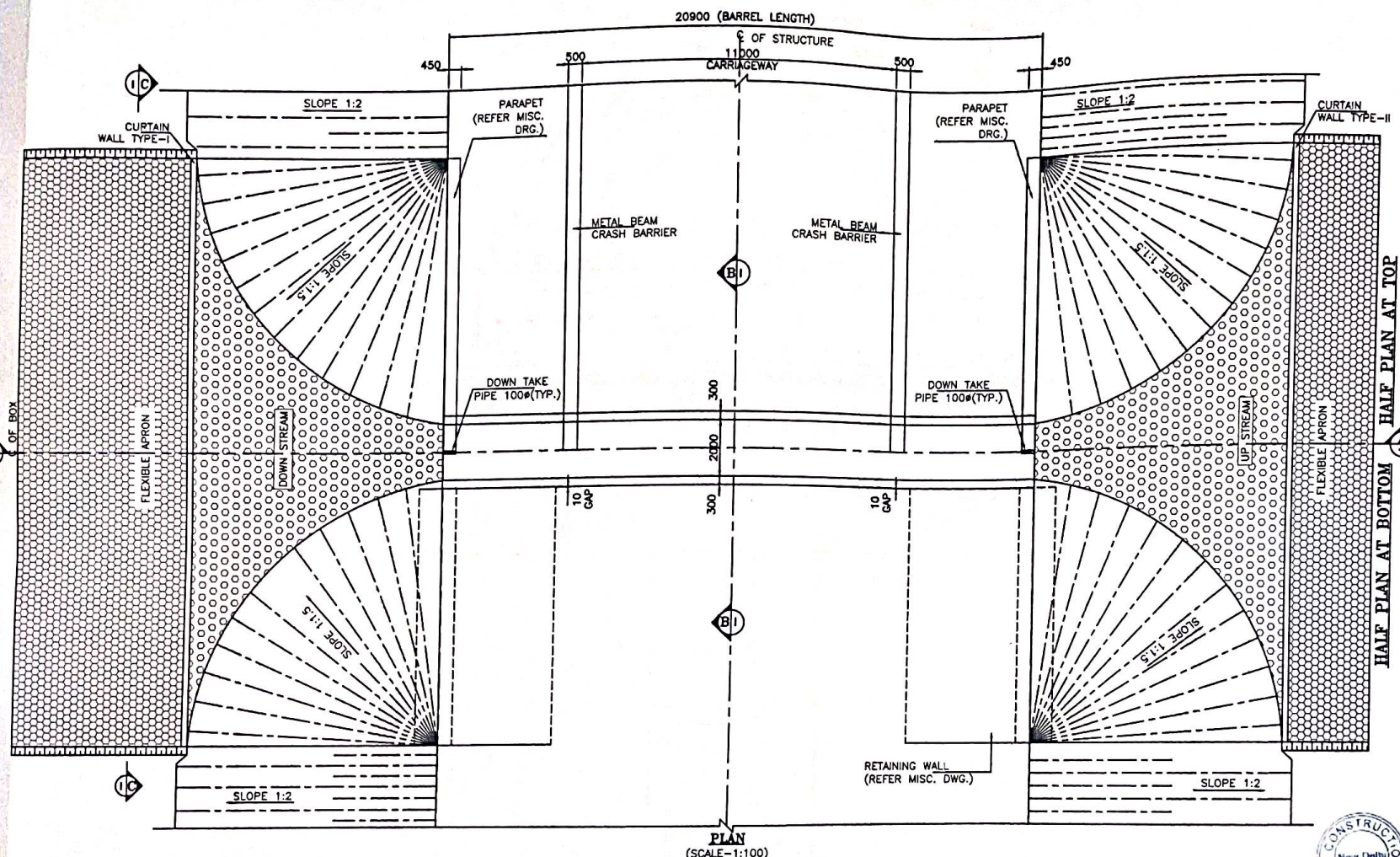
- GENERAL ARRANGEMENT DRAWING.
AVC/NH-38/BOX/GAD/344+405/01

NOTES:-

- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS UNLESS OTHERWISE MENTIONED.
- DRAWING SHOULD NOT BE SCALED ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
- ALL REINFORCING BARS SHALL BE THERMO MECHANICALLY TREATED (TMT) BARS (GRADE DESIGNATION Fe-500D) CONFIRMING TO IS:1786 STANDARDS.
- MINIMUM CLEAR COVER TO OUTERMOST REINFORCEMENT SHALL BE AS FOLLOWS:-
 - a) TOP SLAB - 45mm
 - b) BOTTOM SLAB - 75mm
 - c) SIDE WALL (EARTH SIDE) - 75mm
 - d) SIDE WALL (INNER SIDE) - 45mm
- OVERLAPPING FOR SPLICING OF REINFORCEMENT SHALL BE AS PER CLAUSE NO.15.2.5.
LAP LENGTH SHALL NOT BE LESS THAN 56d.
ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:-



CLIENT: NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	EPC CONTRACTOR: KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	AUTHORITY'S ENGINEER: ALMONDZ GLOBAL INFRA CONSULTANT LIMITED IN JV WITH AYOLEEZA CONSULTANT PRIVATE LIMITED. C/O JAYANTA SAIKIA, SARBAJANIN NAMGHAR, BORBIL NO.2, DIGBOI, TINSUKIA, ASSAM-786171	PROOF CONSULTANT: CREATIVE ENGINEERING SERVICES OFFICE NO: 620, SIGNATURE GLOBAL MALL, SECTOR-3, VAISHALI, GHAZIABAD, U.P-201010	SAFETY CONSULTANT: DESIGN AID PLOT NO.54, 3rd FLOOR(FRONT), MASOODPUR DAIRY FARM,VASANT KUNJ, NEW DELHI-110070,	DESIGN CONSULTANT: A.V. CONSTRUCTION 1 st Floor, WZ-1240, Palam Extension, Bosco Ashram Wall Gali, New Delhi 110045 Winst Infra Solution Pvt. Ltd. OFFICE: P-4, ISHAAN CORPORATE TOWER, PLOT NO-C-23, SECTOR-13, VASUNDHRA, GHAZIABAD, U.P-201012	PROJECT: WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (GOLAI GAON) TO KM 47+852 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (2-LANE+FB) OF NH-34 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE (PACKAGE-B) DRAWING TITLE:- REINFORCEMENT DETAIL OF BOX CULVERT AT CK. 34+405 <table border="1"> <tr> <th>Date</th> <th>Drw. W.P</th> <th>Dwg. V.B</th> <th>Chk. A.B</th> <th>App. N.T.S</th> <th>Scale</th> <th>Drawing Status.</th> </tr> <tr> <td>JAN.2024</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Project No.</td> <td>Drawing No.</td> <td colspan="4">AVC/NH-38/BOX/REIN/344+405/01</td> <td>Sheet No. 01 OF 01</td> </tr> <tr> <td></td> <td></td> <td colspan="4"></td> <td>Rev. RO</td> </tr> </table>	Date	Drw. W.P	Dwg. V.B	Chk. A.B	App. N.T.S	Scale	Drawing Status.	JAN.2024							Project No.	Drawing No.	AVC/NH-38/BOX/REIN/344+405/01				Sheet No. 01 OF 01							Rev. RO
Date	Drw. W.P	Dwg. V.B	Chk. A.B	App. N.T.S	Scale	Drawing Status.																												
JAN.2024																																		
Project No.	Drawing No.	AVC/NH-38/BOX/REIN/344+405/01				Sheet No. 01 OF 01																												
						Rev. RO																												



- NOTES:-**
- ALL DIMENSIONS ARE IN MILLIMETER, LEVELS ARE IN METER AND CHAINAGE ARE IN KILOMETERS UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE RELEVANT PLAN AND PROFILE DRAWING OF ROAD.
 - GRADE OF CONCRETE:-
 - M30-FOR RCC BOX CELL STRUCTURE.
 - M15-FOR PCC AND LEVELING COURSE.
 - M30-PARAPET
 - GRADE OF STEEL - F_o 500D.
 - THE CARRIAGEWAY OF PROPOSED CULVERT IS DESIGN AS PER 6-2017.
 - BACKFILL MATERIAL BEHIND END WALL SHALL BE SELECTED GRANULAR SOIL HAVING PROPERTIES
MAX DRY DENSITY = 1850-2280kg/m³
OPTIMUM MOISTURE CONTENT = 7-15
AS PER IRC78-2014 AND MORTH SPECIFICATION.
 - THE FRL SHOWN IN THE DRAWING SHALL BE VERIFIED WITH CORRESPONDING PLAN AND PROFILE DRAWING BEFORE EXECUTION, IF THERE IS ANY VARIATION SHALL BE BROUGHT TO THE NOTICE OF ENGINEER.
 - THE DIMENSION AND LEVEL ARE SUBJECT TO CHANGE AS PER SITE CONDITION AND DETAILED DESIGN.
 - BACKFILL TO BE DONE AND COMPACTED FROM BOTH SIDE SIMULTANEOUSLY.
 - 100MM DIA P.V.C. PIPE AT SPACING 1000MM/c IN HORIZONTAL/VERTICAL DIRECTION SHALL BE PROVIDED UP TO 150MM ABOVE GROUND LEVEL FOR WEEP HOLES IN RETAINING WALL.
 - SBC SHALL BE 18t/m². AND SAME SHALL BE ENSURED AT SITE BY ANY SUITABLE METHOD.
 - AS PER MORTH SECTION-2500, WHERE THE REQUIRED SIZE OF BOULDERS ARE NOT AVAILABLE ECONOMICALLY, CEMENT CONCRETE BLOCKS OF EQUIVALENT WEIGHT SHALL BE USED. THE GRADE OF CONCRETE SHALL BE M15 NOMINAL MIX. CEMENT CONCRETE BLOCK SHALL BE PREFERRED WHERE PRACTICABLE.
 - CHOOSE ANY SUITABLE METHOD TO ACHIEVE THE REQUIRED SBC AS PER SITE.

LEVELS

DESIGN CH.	FRL	GROUND LEVEL	INVERT LEVEL		VERTICAL CLEARANCE (MAX.)	EARTHFILL (MAX.)	EARTHFILL (MIN.)
			LHS	RHS			
36+010	144.890	136.671	136.371	136.392	3.021m	5.198m	2.492m

REFERENCE DRAWINGS:-

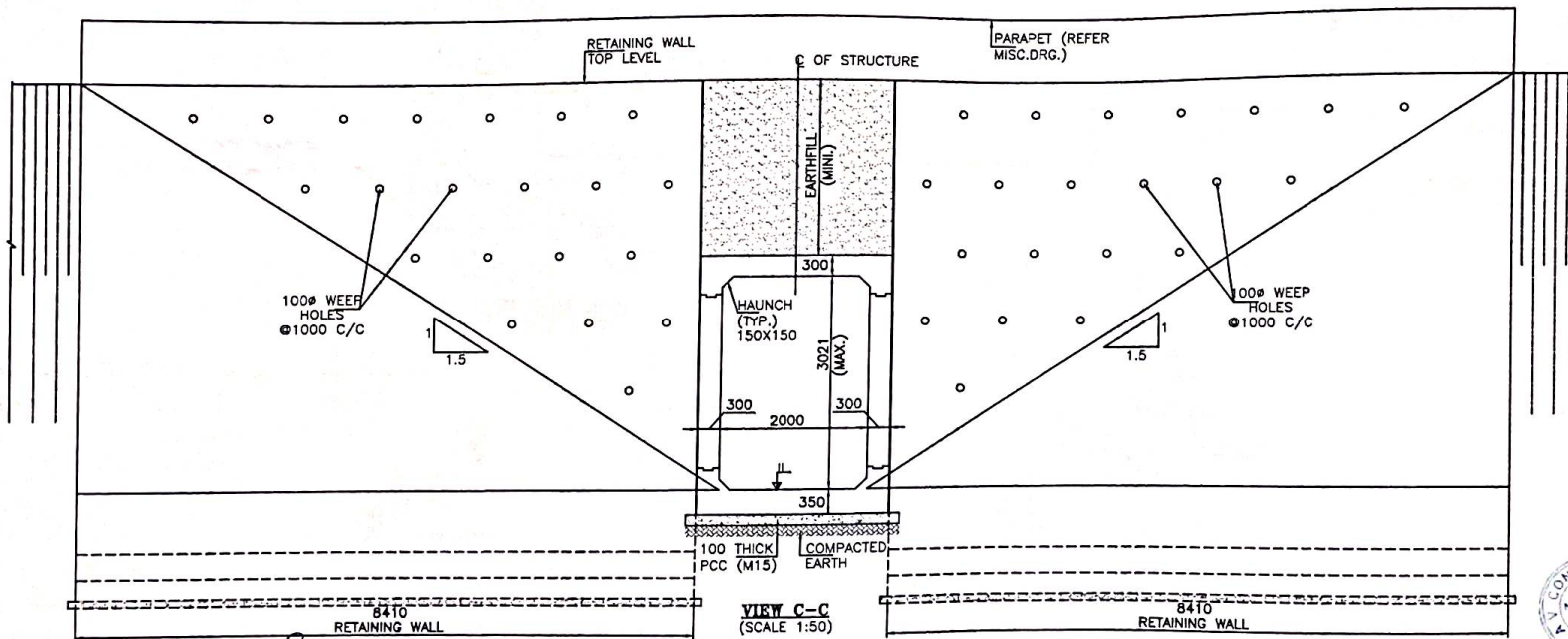
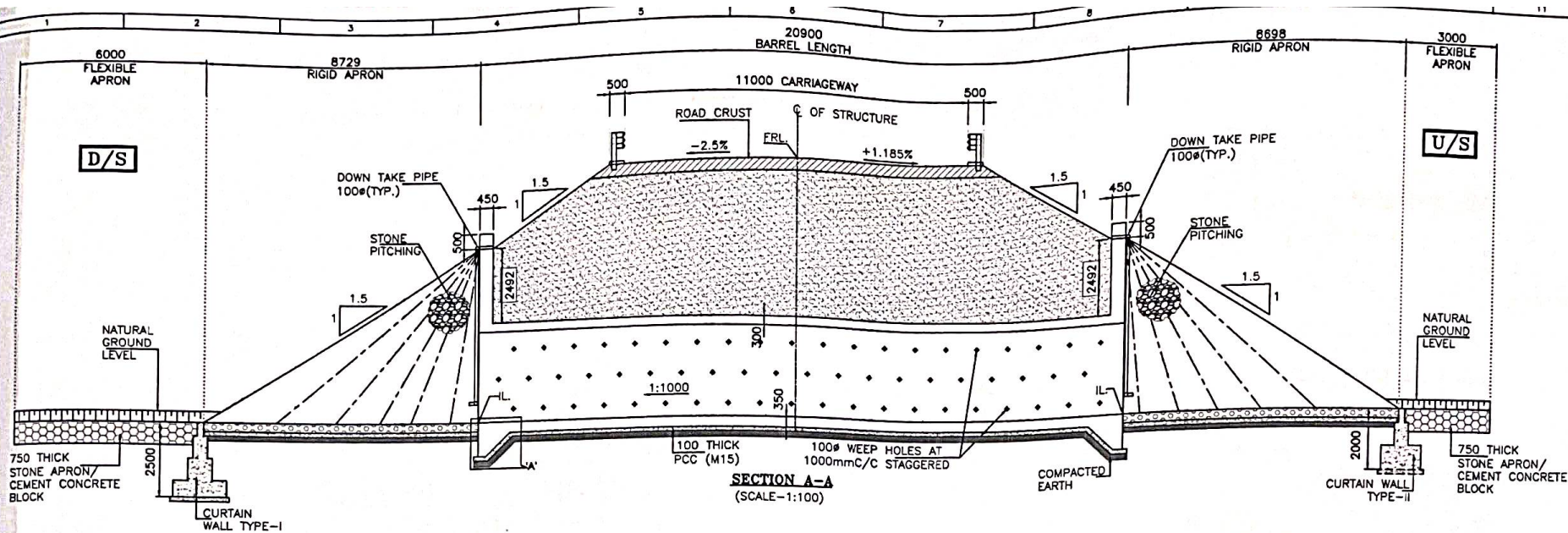
- REINFORCEMENT DETAIL OF BOX CULVERT
AVC/NH-38/BC/REINF./36+010/01

LEGEND:-

FRL FINISHED ROAD LEVEL
IL INVERT LEVEL
LVL LEVEL
EGL EXISTING GROUND LEVEL

FRL CAMBER & LOCATION IS TO BE MATCHED WITH HIGHWAY ALIGNMENT DRAWING.

CLIENT: NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	EPC CONTRACTOR KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	AUTHORITY'S ENGINEER 	PROOF CONSULTANT: CREATIVE ENGINEERING SERVICES OFFICE NO. 620, SIGNATURE GLOBAL MALL, SECTOR-3, VAISHALI, GHAZIABAD, U.P-201010	SAFETY CONSULTANT: DESIGN AID PLOT NO.54, 3rd FLOOR(FRONT), MASOODPUR DAIRY FARM, VASANT KUNJ, NEW DELHI-110070,	DESIGN CONSULTANT: A.V. CONSTRUCTION 1 st Floor, WZ-1240, Palam Extension, Bosco Ashram Wall Gali, New Delhi 110045 Winst Infra Solution Pvt. Ltd. OFFICE: F-6, ISHAN CORPORATE TOWER, PLOT NO-C-23, SECTOR-13, VASUNDHRA GHAZIABAD, U.P-201012	PROJECT: WIDENING/IMPROVEMENT TO 2-LANE WITH PAVED SHOULDER FROM KM 27+180 (LOCAL/GOAN) TO KM 47+482 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE (PACKAGE-6) DRAWING TITLE:- GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 36+010 Date: MAR-2024 Project No.: Drawing No.: Rev: RO
	Drawing Status:					



CLIENT:

NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.

EPC CONTRACTOR

KAMAC ENGINEERS PVT.LTD
 F0201, CITY CENTER OFFICE
 BLOCK, 2ND FLOOR,
 MATIGARA 734010

AUTHORITY'S ENGINEER

PROOF CONSULTANT:

CREATIVE ENGINEERING SERVICES
 OFFICE NO. 620, SIGNATURE GLOBAL
 MALL, SECTOR-3,
 VAISHALI, GHAZIABAD, U.P-201010

SAFETY CONSULTANT:

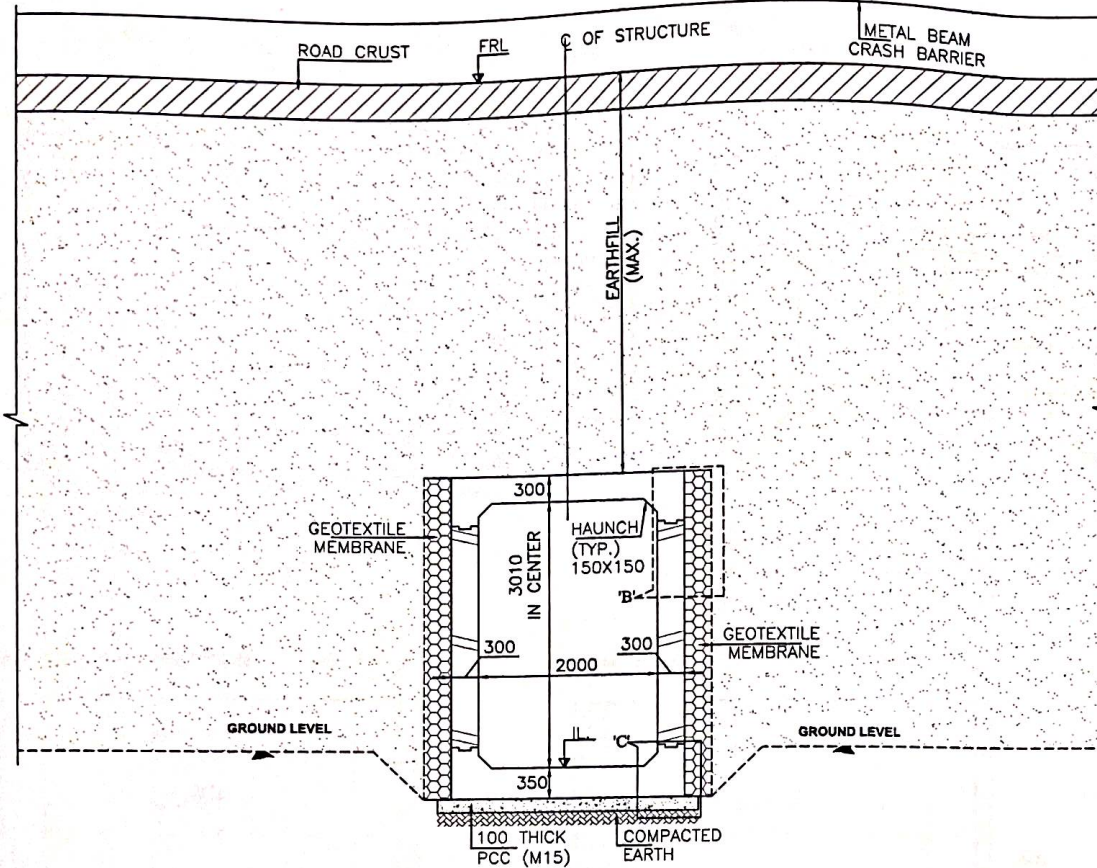
DESIGN AID
 PLOT NO.54, 3rd FLOOR(FRONT),
 MASOODPUR DAIRY FARM,VASANT KUNJ,
 NEW DELHI-110070,

DESIGN CONSULTANT:

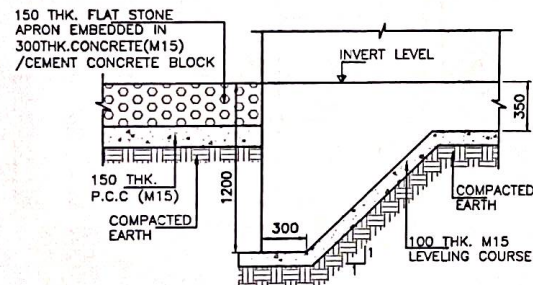
A.V. CONSTRUCTION
 1st Floor, WZ-1240,
 Palam Extension, Bosco
 Ashram Wall Gali, New
 Delhi 110045
Winst Infra Solution
 Pvt. Ltd.
 OFFICE: F4, ISHAAN CORPORATE
 TOWER, PLOT NO-C-23, SECTOR-13,
 VASUNDHRA GHAZIABAD, U.P.201012

PROJECT:
 WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150
 (SOJAI GOAN) TO KM 47+882 (LEDO) ON DIBRUGAH TO LEDO SECTION WITH
 PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD)
 (2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC
 MODE.(PACKAGE-8)
 DRAWING TITLE:- **GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 36+010**

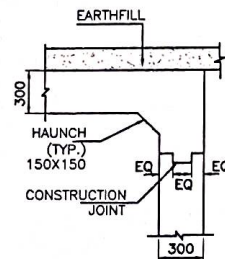
Date	Drw.	Dwg.	Chk.	App.	Scale	Drawing Status
MAR 2024	W.P	V.B	A.B		NTS	
Project No.	Drawing No.	AVC/NH-38/BC/GAD/36+010/01				Sheet No. 02 OF 03
						Rev. RO



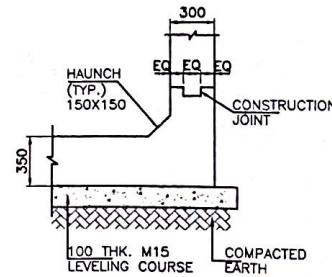
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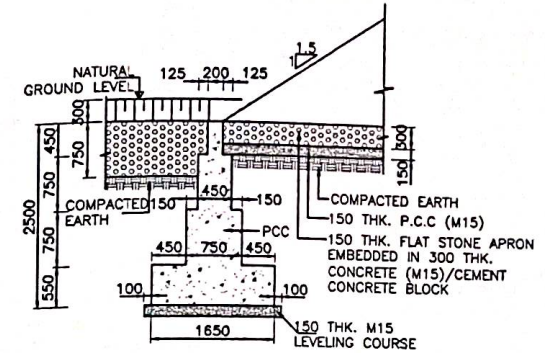
DETAIL-A
(SCALE 1:25)



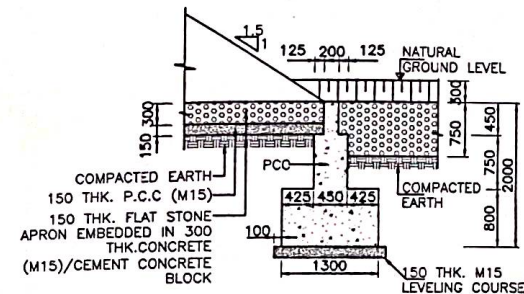
DETAIL-B
(SCALE 1:25)



DETAIL-C
(SCALE 1:25)



DETAIL OF CURTAIN WALL-I
(DOWN STREAM SIDE)
(SCALE 1:50)



DETAIL OF CURTAIN WALL-II
(UP STREAM SIDE)
(SCALE 1:50)

CLIENT:



**NATIONAL HIGHWAYS &
INFRASTRUCTURE DEVELOPMENT
CORPORATION LTD.**

EPC CONTRACTOR



KAMAC ENGINEERS PVT. LTD.
F0201, CITY CENTER OFFICE
BLOCK, 2ND FLOOR,
MATIGARA 734010

AUTHORITY'S ENGINEER

PROOF CONSULTANT:



CREATIVE ENGINEERING SERVICES
OFFICE NO: 620, SIGNATURE GLOBAL
MALL, SECTOR-3,
VAISHALI, GHAZIABAD, U.P-201010

SAFETY CONSULTANT:



DESIGN AID
PLOT NO.54, 3rd FLOOR(FRONT),
MASOODPUR DAIRY FARM,VASANT KUNJ,
NEW DELHI-110070,

DESIGN CONSULTANT:



A.V. CONSTRUCTION
1st Floor, WZ-1240,
Palam Extension, Boko
Ashram Wall Gali, New
Delhi 110045



**Winst Infra Solution
Pvt. Ltd.**
OFFICE: F-8, ISHAAN CORPORATE
TOWER, PLOT NO-C-23, SECTOR-13,
VASUNDHRA GHAZIABAD, U.P-201012

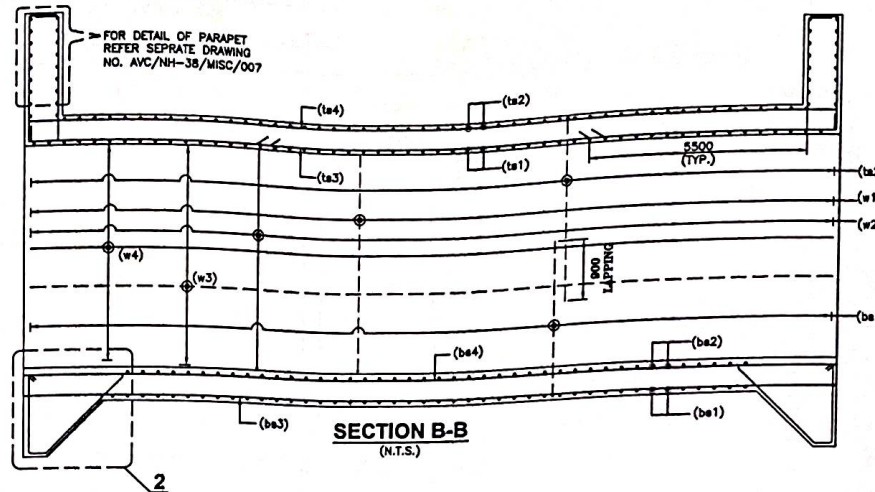
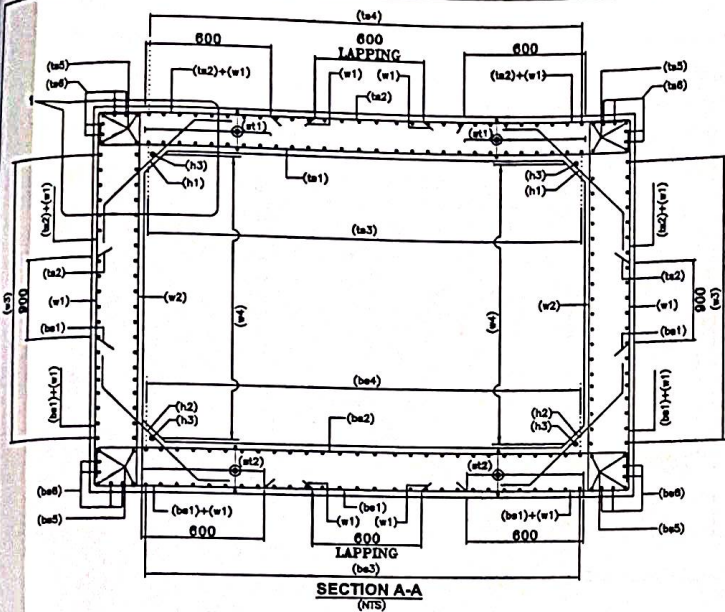
PROJECT:

WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+100
(COLLA GRAM) TO KM 47+482 (LEDO) ON DISRUPTOR TO LEDO SECTION WITH
PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD)
(2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC
MODE.(PACKAGE-6)

DRAWING TITLE:-

GENERAL ARRANGEMENT DRAWING FOR
BOX CULVERT AT CHAINAGE 38+010

BOX CULVERT AT CHAINAGE 38+010							
Date	Drw.	Dwg.	Chk.	App.	Scale.	Drawing Status.	
MAR.2024	W.P.	V.8	A.B		NTS		
Project No.	Drawing No.					Sheet No.	Rev.
	AVC/NH-38/BC/GAD/38+010/01					03 OF 03	RO



LEGEND:-

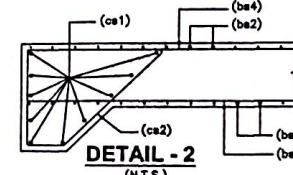
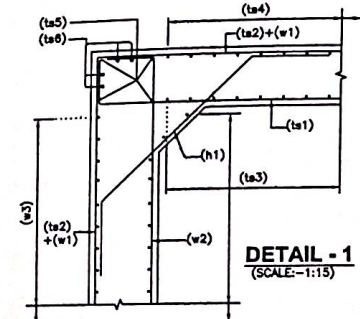
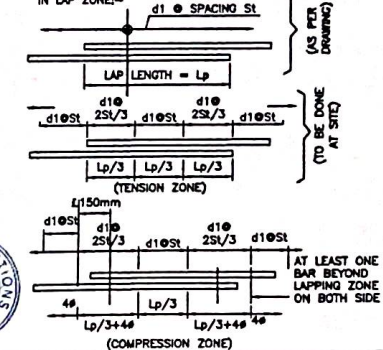
TOP FACE BAR	_____
BOTTOM FACE BAR	-----

BOX REINF. SCHEDULE

SL.NO.	BAR MARK	BAR SHAPE	DIAMETER	SPACING
1	ts1		12+10	160
2	ts2		10	160
3	ts3		10	200
4	ts4		10	200
5	ts5		12	2x4 Nos.
6	ts6		12	2x4 Nos.
7	w1		12	160
8	w2		12	160
9	w3		10	200
10	w4		10	200
11	bs1		10	160
12	bs2		12+10	160
13	bs3		10	200
14	bs4		10	200
15	bs5		12	2x4 Nos.
16	bs6		12	2x4 Nos.
17	h1		10	160
18	h2		10	160
19	h3		10	1x4 Nos.
20	cs1		12	10 Nos.
21	cs2		10	200
22	st1		2 LEGGED 10# 200 c/c (L-L) & 160 (T-T) DIRECTION	
23	st2		2 LEGGED 10# 200 c/c (L-L) & 160 (T-T) DIRECTION	

NOTES:-

- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS UNLESS OTHERWISE MENTIONED.
- DRAWING SHOULD NOT BE SCALED ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
- ALL REINFORCING BARS SHALL BE THERMO MECHANICALLY TREATED (TMT) BARS (GRADE DESIGNATION Fe-500D) CONFORMING TO IS:1786 STANDARDS.
- MINIMUM CLEAR COVER TO OUTERMOST REINFORCEMENT SHALL BE AS FOLLOWS:-
 - a) TOP SLAB - 45mm
 - b) BOTTOM SLAB - 75mm
 - c) SIDE WALL (EARTH SIDE) - 75mm
 - d) SIDE WALL (INNER SIDE) - 45mm
- OVERLAPPING FOR SPACING OF REINFORCEMENT SHALL BE AS PER CLAUSE NO.15.2.5. LAP LENGTH SHALL NOT BE LESS THAN 50#. ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:-
 - a) SPACING ST
 - b) LAP LENGTH = L_p
 - c) LAP LENGTH SHALL NOT BE LESS THAN 50#.



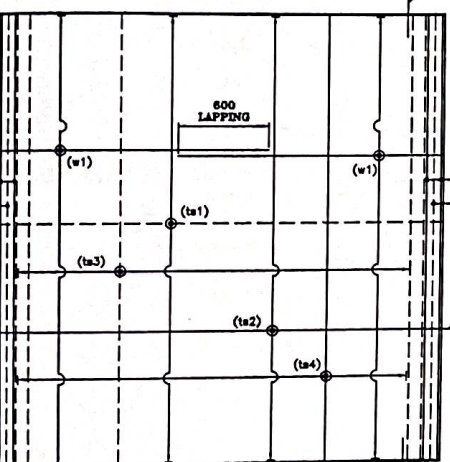
- ANCHORAGE LENGTH OF BOX SHALL BE TAKEN AS 40# AS PER IRC:112.
- FOR UNFAVORABLE BOND CONDITIONS THE FACTOR 40 SHOULD BE MULTIPLIED BY FACTOR OF 1.43
- CENTER LINE OF OVERLAPPING BAR bs1 & ts2 IN WALL & MID HEIGHT OF WALLS ARE AT SAME POINT.
- BAR BENDING SCHEDULE SHOULD BE STRICTLY FOLLOW DURING THE TIME OF EXECUTION IF IN CASE ANY CHANGES AT SITE KINDLY DISCUSS IT WITH ENGINEER IN CHARGE.

REFERENCE DRAWING:-

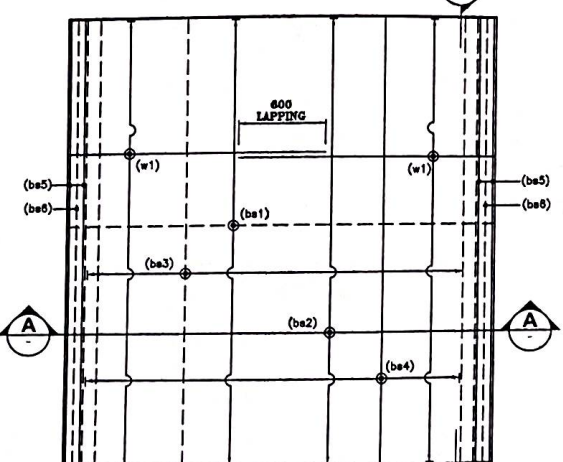
- GENERAL ARRANGEMENT DRAWING. AVC/NH-38/BOX/GAD/38+010/01

TRAFFIC DIRECTION

TRAFFIC DIRECTION

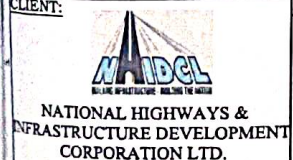


REINFORCEMENT DETAILS OF TOP SLAB
(HAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
(N.T.S.)



REINFORCEMENT DETAILS OF BOTTOM SLAB
(HAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
(N.T.S.)

CLIENT:



EPC CONTRACTOR



AUTHORITY'S ENGINEER

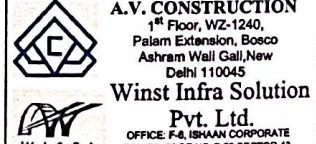
PROOF CONSULTANT:



SAFETY CONSULTANT:



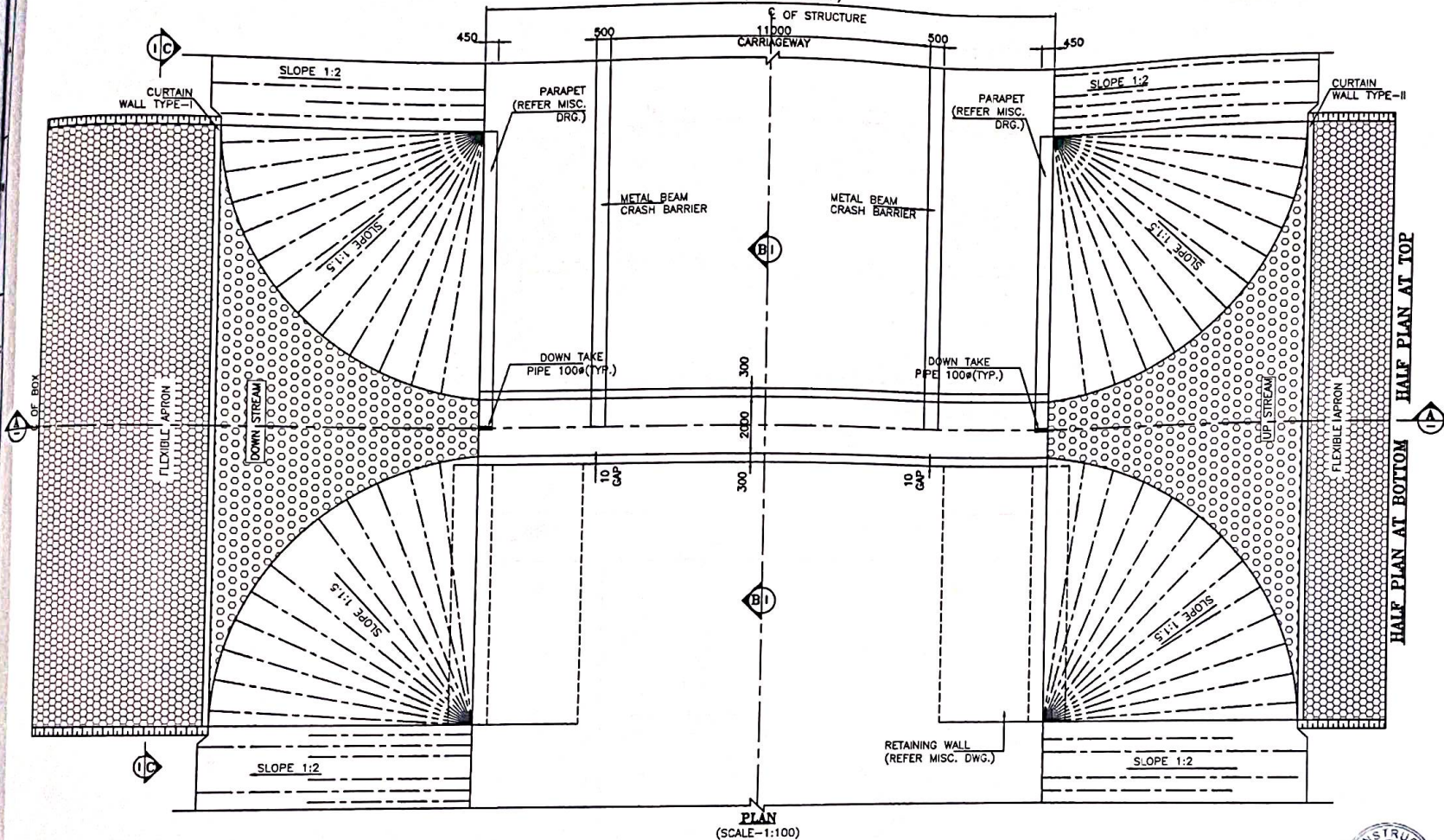
DESIGN CONSULTANT:



PROJECT:

Date	Drw.	Dwg.	Chk.	App.	Scale	Drawing Status
MAR.2024	W.P	V.B	A.B		NTS	
Project No.	Drawing No.	AVC/NH-38/BOX/REIN/38+010/01				Sheet No. 01 OF 01
		Rev. RD				

19700 (BARREL LENGTH)

C. OF STRUCTURE
11000
CARRIAGEWAYPLAN
(SCALE-1:100)

DESCRIPTION	PROPOSED
DESIGN CHN.	36+121
CA.CHN.	36+135
STR.TYPE	BOX
SPAN/ DIA	1X2X3m
PROPOSAL	NEW 2 LANE

36050

36150

KEY PLAN

HALF PLAN AT TOP
HALF PLAN AT BOTTOM

NOTES:-

- ALL DIMENSIONS ARE IN MILLIMETER, LEVELS ARE IN METER AND CHAINAGE ARE IN KILOMETERS UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE RELEVANT PLAN AND PROFILE DRAWING OF ROAD.
- GRADE OF CONCRETE:-
 - M30-FOR RCC BOX CELL STRUCTURE.
 - M15-FOR PCC AND LEVELING COURSE.
 - M30-PARAPET
- GRADE OF STEEL - Fe 500D.
- THE CARRIAGEWAY OF PROPOSED CULVERT IS DESIGN AS PER 6-2017.
- BACKFILL MATERIAL BEHIND END WALL SHALL BE SELECTED GRANULAR SOIL HAVING PROPERTIES
MAX DRY DENSITY = 1850-2280kg/m³
OPTIMUM MOISTURE CONTENT = 7-15
AS PER IRC78-2014 AND MORTH SPECIFICATION.
- THE FRL SHOWN IN THE DRAWING SHALL BE VERIFIED WITH CORRESPONDING PLAN AND PROFILE DRAWING BEFORE EXECUTION, IF THERE IS ANY VARIATION SHALL BE BROUGHT TO THE NOTICE OF ENGINEER.
- THE DIMENSION AND LEVEL ARE SUBJECT TO CHANGE AS PER SITE CONDITION AND DETAILED DESIGN.
- BACKFILL TO BE DONE AND COMPACTED FROM BOTH SIDE SIMULTANEOUSLY.
- 100MM DIA P.V.C. PIPE AT SPACING 1000MM/c IN HORIZONTAL/VERTICAL DIRECTION SHALL BE PROVIDED UP TO 150MM ABOVE GROUND LEVEL FOR WEEP HOLES IN RETAINING WALL.
- SBC SHALL BE 19t/m³. AND SAME SHALL BE ENSURED AT SITE BY ANY SUITABLE METHOD.
- AS PER MORTH SECTION-2500, WHERE THE REQUIRED SIZE OF BOULDERS ARE NOT AVAILABLE ECONOMICALLY, CEMENT CONCRETE BLOCKS OF EQUIVALENT WEIGHT SHALL BE USED. THE GRADE OF CONCRETE SHALL BE M15 NOMINAL MIX. CEMENT CONCRETE BLOCK SHALL BE PREFERRED WHERE PRACTICABLE.
- CHOOSE ANY SUITABLE METHOD TO ACHIEVE THE REQUIRED SBC AS PER SITE.

LEGEND:-

FRL FINISHED ROAD LEVEL
IL INVERT LEVEL
LVL. LEVEL
EGL. EXISTING GROUND LEVEL

FRL CAMBER & LOCATION IS TO BE MATCHED WITH HIGHWAY ALIGNMENT DRAWING.

LEVELS

DESIGN CH.	FRL	GROUND LEVEL	INVERT LEVEL		VERTICAL CLEARANCE (MAX.)	EARTHFILL (MAX.)	EARTHFILL (MIN.)
			LHS	RHS			
36+121	144.469	136.544	136.244	136.264	3.020 m	4.905m	2.489m

REFERENCE DRAWINGS:-

- REINFORCEMENT DETAIL OF BOX CULVERT
AVC/NH-38/BC/REINF./36+121/01

CLIENT:



NATIONAL HIGHWAYS &
INFRASTRUCTURE DEVELOPMENT
CORPORATION LTD.

EPC CONTRACTOR

KAMAC ENGINEERS Pvt.Ltd
KAMAC ENGINEERS PVT.LTD
F0201, CITY CENTER OFFICE
BLOCK, 2ND FLOOR,
MATIGARA 734010

AUTHORITY'S ENGINEER

PROOF CONSULTANT:



CREATIVE ENGINEERING SERVICES
OFFICE NO. 620, SIGNATURE GLOBAL
MALL, SECTOR-3,
VAISHALI, GHAZIABAD, U.P-201010

SAFETY CONSULTANT:



DESIGN AID
PLOT NO.54, 3rd FLOOR(FRONT),
MASOODPUR DAIRY FARM,VASANT KUNJ,
NEW DELHI-110070,

DESIGN CONSULTANT:



A.V. CONSTRUCTION
1st Floor, WZ-1240,
Palam Extension, Bosco
Ashram Wall Gali, New
Delhi 110045
Winst Infra Solution
Pvt. Ltd.
OFFICE: F-8, ISHAN CORPORATE
TOWER, PLOT NO-C-23, SECTOR-13,
VASUNDHRA GHAZIABAD, U.P-201212

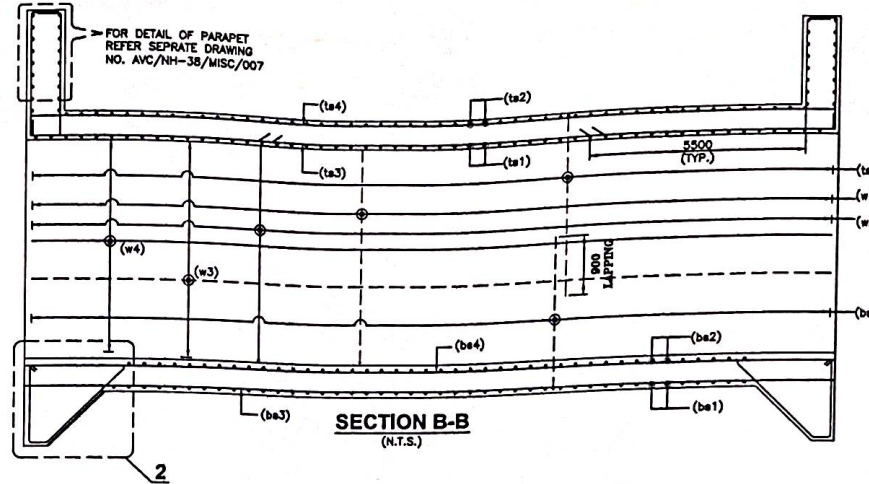
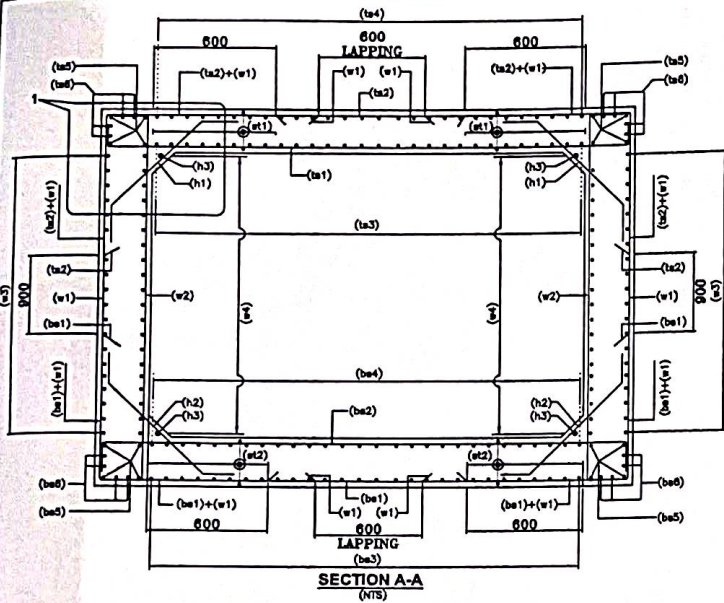
PROJECT:

WIDENING/IMPROVEMENT TO 2LANE LANE WITH PAVED SHOULDER FROM KM 27+100
(GOLAN GANJ) TO KM 47+482 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH
PROPOSED MAROHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD)
(2-LANE+PS) OF NH-36 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC
MODE.(PACKAGE-5)

DRAWING TITLE:-

GENERAL ARRANGEMENT DRAWING FOR
BOX CULVERT AT CHAINAGE 36+121

Date	Drw. W.P	Des. V/S	Chk. A.B	App.	Scale	Drawing Status.
MAR.2024					NTS	
Project No.	Drawing No.	Sheet No.	Rev.			
	AVC/NH-38/BC/GAD/36+121/01	#1 OF 03	RO			

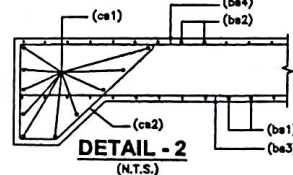
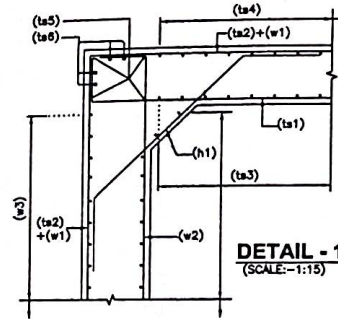
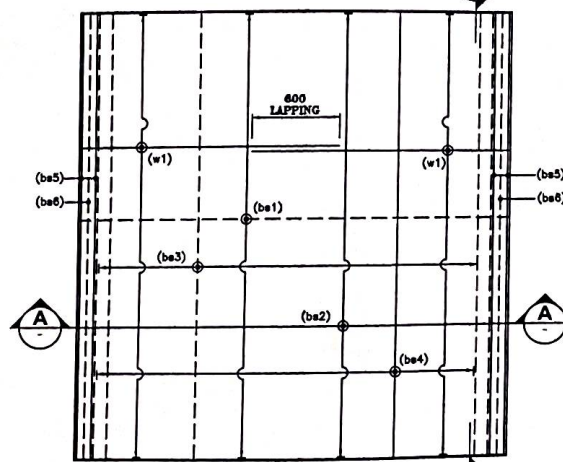
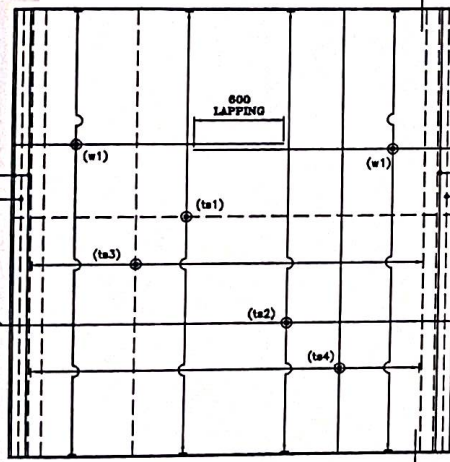


LEGEND:-

TOP FACE BAR
BOTTOM FACE BAR

TRAFFIC DIRECTION

TRAFFIC DIRECTION



- ANCHORAGE LENGTH OF BOX SHALL BE TAKEN AS 40d AS PER IRC:112.
- FOR UNFAVORABLE BOND CONDITIONS THE FACTOR 40 SHOULD BE MULTIPLIED BY FACTOR OF 1.43.
- CENTER LINE OF OVERLAPPING BAR bs1 & ts2 IN WALL & MID HEIGHT OF WALLS ARE AT SAME POINT.
- BAR BENDING SCHEDULE SHOULD BE STRICTLY FOLLOW DURING THE TIME OF EXECUTION IF IN CASE ANY CHANGES AT SITE KINDLY DISCUSS IT WITH ENGINEER IN CHARGE.

REFERENCE DRAWING:-

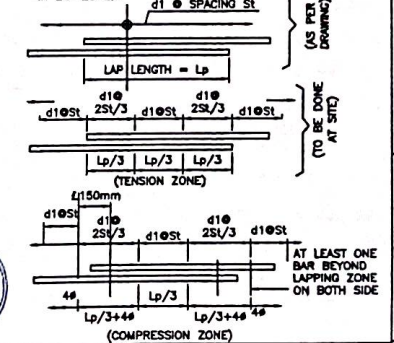
- GENERAL ARRANGEMENT DRAWING.
AVC/NH-38/BOX/GAD/35+121/01

BOX REINF. SCHEDULE

SL.NO.	BAR MARK	BAR SHAPE	DIAMETER	SPACING
1	ts1		12+10	160
2	ts2		10	160
3	ts3		10	200
4	ts4		10	200
5	ts5		12	2x4 Nos.
6	ts6		12	2x4 Nos.
7	w1		12	160
8	w2		12	160
9	w3		10	200
10	w4		10	200
11	bs1		10	160
12	bs2		12+10	160
13	bs3		10	200
14	bs4		10	200
15	bs5		12	2x4 Nos.
16	bs6		12	2x4 Nos.
17	h1		10	160
18	h2		10	160
19	h3		10	1x4 Nos.
20	cs1		12	10 Nos.
21	cs2		10	200
22	st1		2 LEGGED 10Ø 200 c/c (L-L) & 160 (T-T) DIRECTION	
23	st2		2 LEGGED 10Ø 200 c/c (L-L) & 160 (T-T) DIRECTION	

NOTES:-

- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS UNLESS OTHERWISE MENTIONED.
- DRAWING SHOULD NOT BE SCALED ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
- ALL REINFORCING BARS SHALL BE THERMO MECHANICALLY TREATED (TMT) BARS (GRADE DESIGNATION Fe-500D) CONFORMING TO IS:1786 STANDARDS.
- MINIMUM CLEAR COVER TO OUTERMOST REINFORCEMENT SHALL BE AS FOLLOWS:-
 - a) TOP SLAB - 45mm
 - b) BOTTOM SLAB - 75mm
 - c) SIDE WALL (EARTH SIDE) - 75mm
 - d) SIDE WALL (INNER SIDE) - 45mm
- OVERLAPPING FOR SPLICING OF REINFORCEMENT SHALL BE AS PER CLAUSE NO.15.2.5. LAP LENGTH SHALL NOT BE LESS THAN 56d. ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:-
 - (AS PER DRAWING)
 - (TO BE DONE AT SITE)



A.V. CONSTRUCTION
1st Floor, WZ-1240,
Palam Extension, Bosco
Ashram Wall Gali, New
Delhi 110045

Winst Infra Solution
Pvt. Ltd.
OFFICE: P-8, ISHAN CORPORATE
TOWER, PLOT NO-C-23, SECTOR-13,
VASINDHRA, GHAZIABAD, U.P-201212

PROJECT	DRAWING TITLE	Date	Drw.	W.P.	Des.	Chk.	App.	Scale	Drawing Status
WIDENING/IMPROVEMENT TO 2-LANE WITH PAVED SHOULDER FROM KM 77+150 (ODLA GOAN) TO KM 47+485 (LEDO) ON DISBURGARI TO LEDO SECTION WITH PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE.(PACAGE-5)	REINFORCEMENT DETAIL OF BOX CULVERT AT CH. 38+121	MAR 2024						NTS	
		Project No.	Drawing No.	AVC/NH-38/BOX/REIN/38+121/01					
		Sheet No.	01 OF 01						
		Rev.	RO						

NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.

KAMAC ENGINEERS PVT.LTD
F0201, CITY CENTER OFFICE
BLOCK, 2ND FLOOR,
MATIGARA 734010

AUTHORITY'S ENGINEER

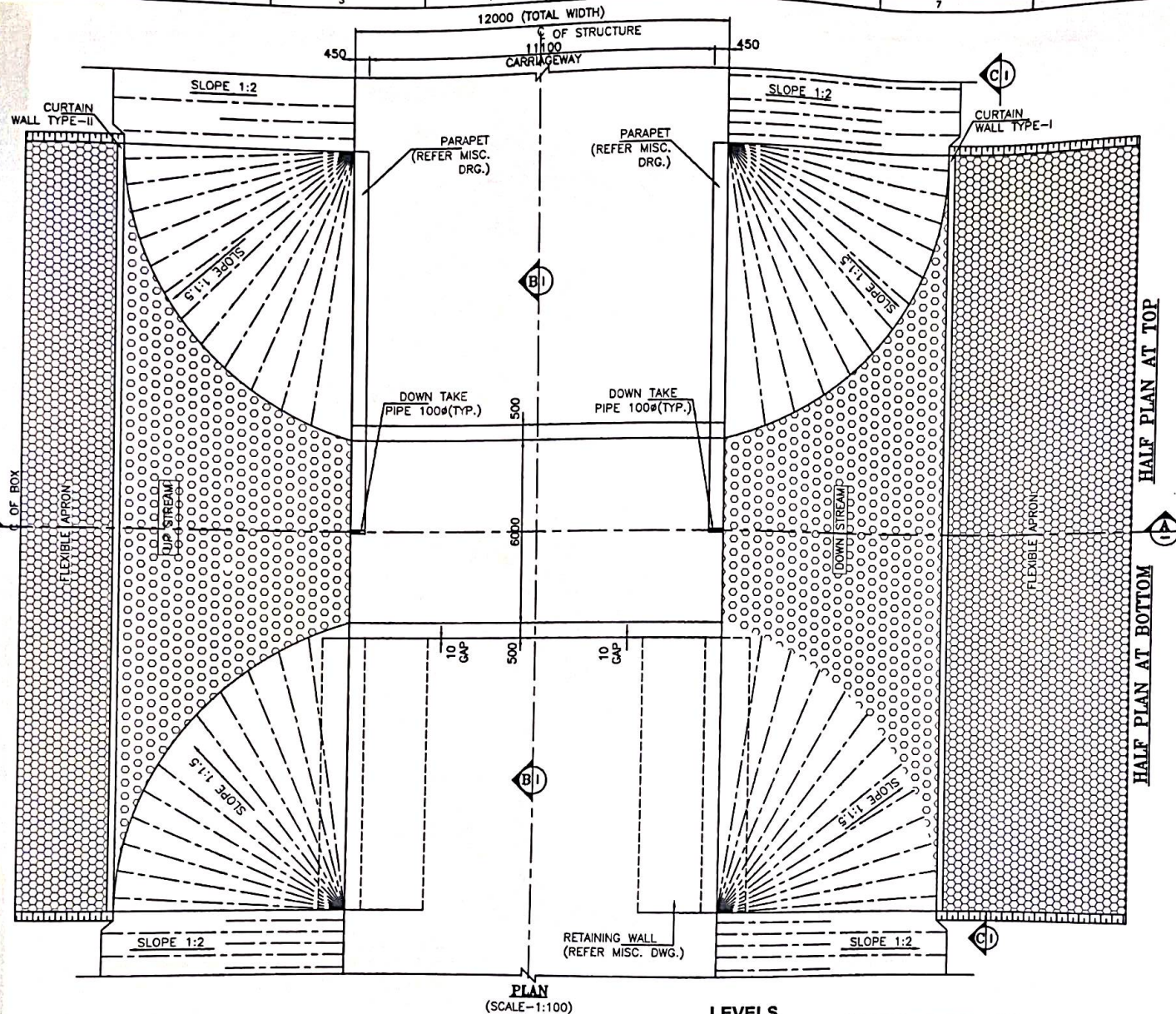
PROOF CONSULTANT:

CREATIVE ENGINEERING SERVICES
OFFICE NO: 620, SIGNATURE GLOBAL
MALL, SECTOR-3,
VAISHALI, GHAZIABAD, U.P-201010

SAFETY CONSULTANT:

DESIGN AID
PLOT NO.54, 3rd FLOOR(FRONT),
MASOODPUR DAIRY FARM,VASANT KUNJ,
NEW DELHI-110070,





42450

DESCRIPTION	PROPOSED
DESIGN CHN.	42+454
CA.CHN.	42+425
STR.TYPE	BOX
SPAN/DIA	1X2X2m
PROPOSAL	NEW 2 LANE

42550

KEY PLAN

LEGEND:-

FRL FINISHED ROAD LEVEL
IL INVERT LEVEL
LVL LEVEL
EGL EXISTING GROUND LEVEL

FRL CAMBER & LOCATION IS TO BE MATCHED WITH HIGHWAY ALIGNMENT DRAWING.

NOTES:-

- ALL DIMENSIONS ARE IN MILLIMETER, LEVELS ARE IN METER AND CHAINAGE ARE IN KILOMETERS UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE RELEVANT PLAN AND PROFILE DRAWING OF ROAD.
- GRADE OF CONCRETE:-
 - M30-FDR RCC BOX CELL STRUCTURE.
 - M15-FDR PCC AND LEVELING COURSE.
 - M30-PARAPET
- GRADE OF STEEL - Fe 500D.
- THE CARRIAGEWAY OF PROPOSED CULVERT IS DESIGN AS PER 8-2017.
- BACKFILL MATERIAL BEHIND END WALL SHALL BE SELECTED GRANULAR SOIL HAVING PROPERTIES
MAX DRY DENSITY = 1850-2280kg/m³
OPTIMUM MOISTURE CONTENT = 7-15
AS PER IRC78-2014 AND MORTH SPECIFICATION.
- THE FRL SHOWN IN THE DRAWING SHALL BE VERIFIED WITH CORRESPONDING PLAN AND PROFILE DRAWING BEFORE EXECUTION. IF THERE IS ANY VARIATION SHALL BE BROUGHT TO THE NOTICE OF ENGINEER.
- THE DIMENSION AND LEVEL ARE SUBJECT TO CHANGE AS PER SITE CONDITION AND DETAILED DESIGN.
- BACKFILL TO BE DONE AND COMPACTED FROM BOTH SIDE SIMULTANEOUSLY.
- 100MM DIA P.V.C. PIPE AT SPACING 1000MM/c IN HORIZONTAL/VERTICAL DIRECTION SHALL BE PROVIDED UP TO 150MM ABOVE GROUND LEVEL FOR WEEP HOLES IN RETAINING WALL.
- SBC SHALL BE 12t/m². AND SAME SHALL BE ENSURED AT SITE BY ANY SUITABLE METHOD.
- AS PER MORTH SECTION-2500, WHERE THE REQUIRED SIZE OF BOULDERS ARE NOT AVAILABLE ECONOMICALLY, CEMENT CONCRETE BLOCKS OF EQUIVALENT WEIGHT SHALL BE USED. THE GRADE OF CONCRETE SHALL BE M15 NOMINAL MIX. CEMENT CONCRETE BLOCK SHALL BE PREFERRED WHERE PRACTICABLE.
- CHOOSE ANY SUITABLE METHOD TO ACHIEVE THE REQUIRED SBC AS PER SITE.

LEVELS

DESIGN CH.	FRL	GROUND LEVEL	INVERT LEVEL		VERTICAL CLEARANCE (MAX.)	EARTHFILL (MAX.)	EARTHFILL (MIN.)
			LHS	RHS			
36+421	144.986	137.375	137.090	137.075	6.012m	1.449m	1.310m

REFERENCE DRAWINGS:-

- REINFORCEMENT DETAIL OF BOX CULVERT
AVC/NH-38/BC/REINF./36+421/01

CLIENT:



NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.

EPC CONTRACTOR

KAMAC ENGINEERS PVT.LTD
F0201, CITY CENTER OFFICE
BLOCK, 2ND FLOOR,
MATIGARA 734010

AUTHORITY'S ENGINEER

ALMONDZ GLOBAL INFRA CONSULTANT
LIMITED IN JV WITH AYOLEEZA
CONSULTANT PRIVATE LIMITED.

C/O JAYANTA SAIKIA, SARBAJANIN
NAMGHAR, BORBIL NO.2, DIGBOI,
TINSUKIA, ASSAM-786171

PROOF CONSULTANT:



CREATIVE ENGINEERING SERVICES
OFFICE NO: 620, SIGNATURE GLOBAL
MALL, SECTOR-3,
VAISHALI, GHAZIABAD, U.P-201010

SAFETY CONSULTANT:

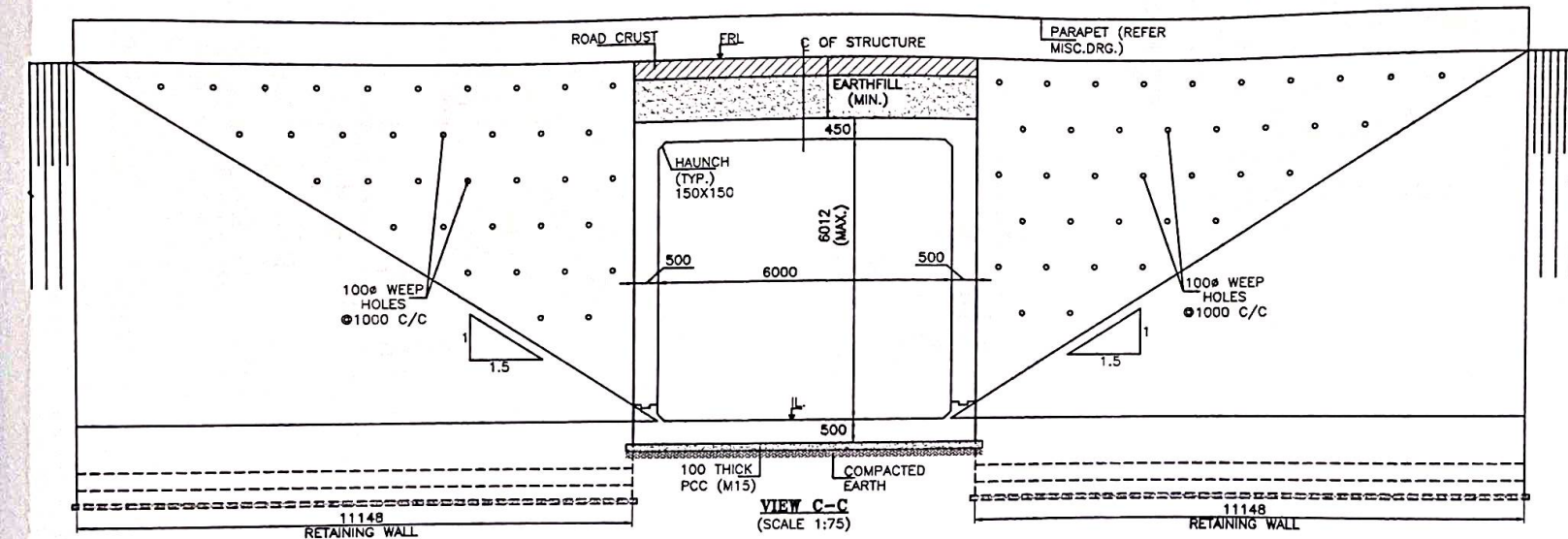
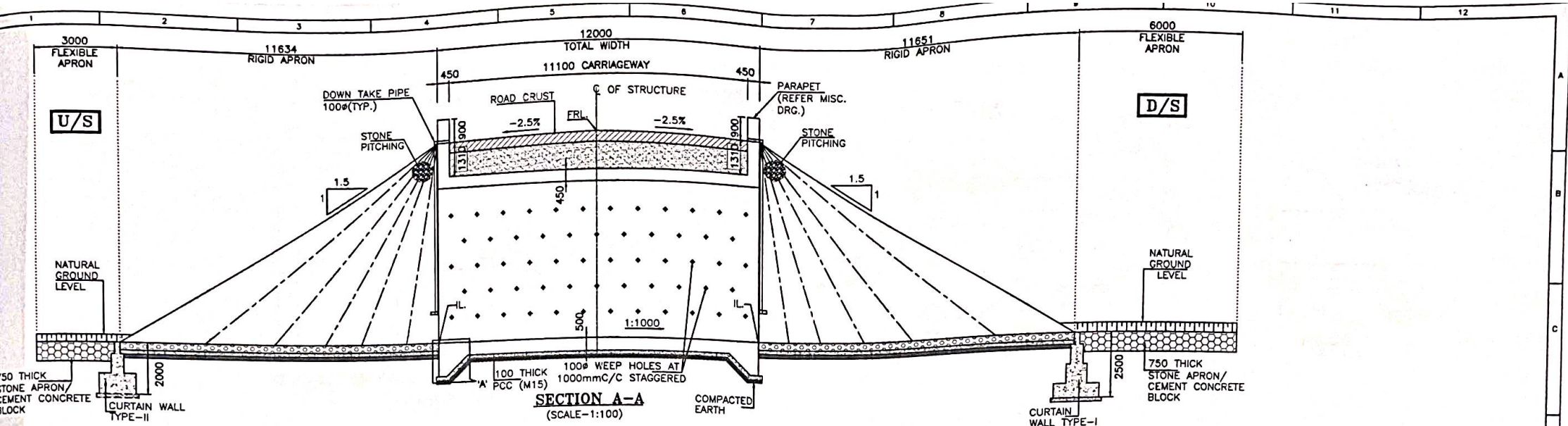


DESIGN AID
PLOT NO.54, 3rd FLOOR(FRONT),
MASOODPUR DAIRY FARM,VASANT KUNJ,
NEW DELHI-110070,

DESIGN CONSULTANT:

A.V. CONSTRUCTION
1st Floor, WZ-1240,
Palam Extension, Boco
Ashram Wall Gali, New
Delhi 110045
Winst Infra Solution
Pvt. Ltd.
OFFICE F-8, ISHAAN CORPORATE
TOWER, PLOT NO-C-23, SECTOR-13,
VASUNDHRA, GHAZIABAD, U.P-201212

PROJECT: WIDENING/IMPROVEMENT TO 2 LANE LANE WITH PAVED SHOULDER FROM KM 27+180 (LOCAL GOAN) TO KM 47+482 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE PACKAGE-3									
DRAWING TITLE:- GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 36+421									
Date MAR 2024	Drw. W.P	Dwg. V.8	Chk. A.B	App. A.B	Scale NTS	Drawing Status.			
Project No.	Drawing No.		A/CNH-38/BC/GAD/36+421/01		Sheet No. 01 OF 03		Rev. RO		



NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.

EPC CONTRACTOR
KAMAC ENGINEERS PVT. LTD.
F0201, CITY CENTER OFFICE
BLOCK, 2ND FLOOR,
MATIGARA 734010

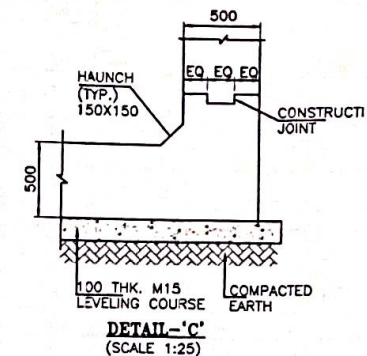
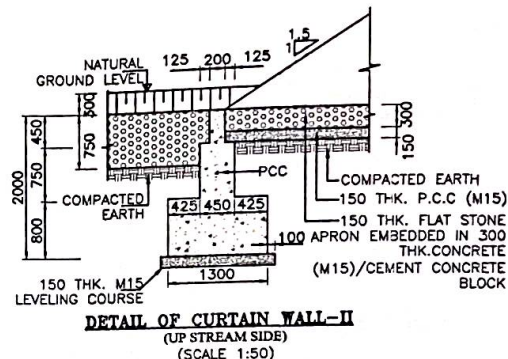
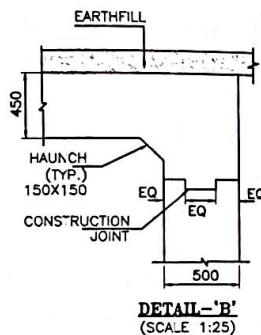
AUTHORITY'S ENGINEER
ALMONDZ GLOBAL INFRA CONSULTANT LIMITED IN JV WITH AYOLEEZA CONSULTANT PRIVATE LIMITED.
C/O JAYANTA SAIKIA, SARBAJANIN
NAMGHAR, BORBIL NO.2, DIGBOI,
TINSUKIA, ASSAM-786171

PROOF CONSULTANT:
CREATIVE ENGINEERING SERVICES
OFFICE NO: 620, SIGNATURE GLOBAL
MALL, SECTOR-3,
VAISHALI, GHAZIABAD, U.P.-201010

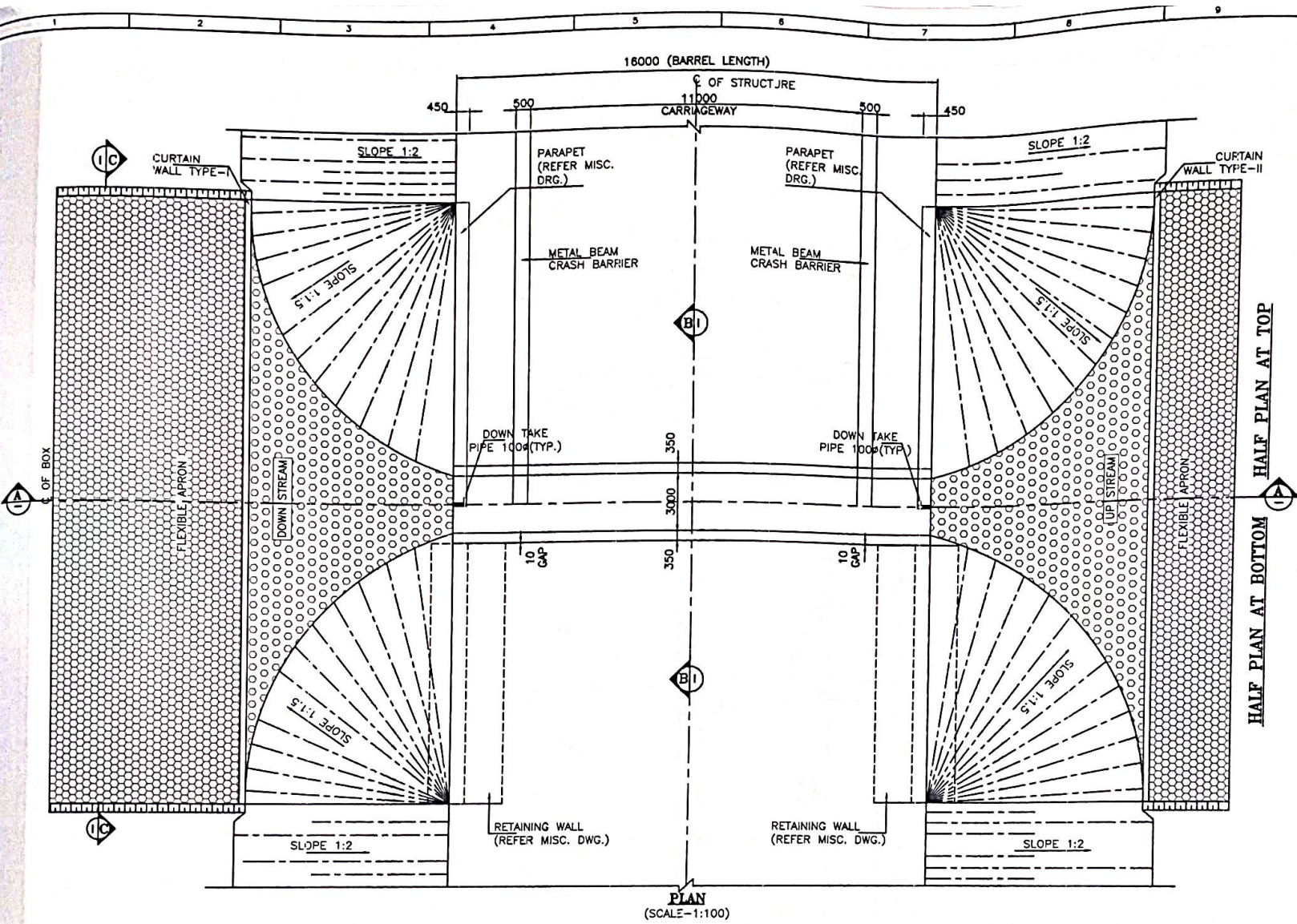
SAFETY CONSULTANT:
DESIGN AID
PLOT NO.54, 3rd FLOOR(FRONT),
MASOODPUR DAIRY FARM,VASANT KUNJ,
NEW DELHI-110070,

DESIGN CONSULTANT:
A.V. CONSTRUCTION
1st Floor, WZ-1240,
Palam Extension, Bosco
Ashram Wall Gali, New
Delhi 110045
Winst Infra Solution Pvt. Ltd.
OFFICE: P-8, 18MAAN CORPORATE
TOWER, PLOT NO-C-23, SECTOR-13,
VASUNDHRA GHAZIABAD, U.P.-201212

PROJECT:					
WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (GOLAI GOAN) TO KM 47+682 (LEDO) ON DISBURGARH TO LEDO SECTION WITH PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE.(PACKAGE-5)					
DRAWING TITLE:					
GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 36+431					
Date	Drw.	Deg.	Chk.	App.	Scale.
MAR 2024	W.P	V.S	A.B	NTS	
Project No.	Drawing No.	Drawing Status.			
	AVC/NH-38/BC/GAD/36+421/01	Sheet No.	82 OF 83	Rev.	RO



Date MAR. 2024	Drw. W.P	Dwg. V 8	Chk. A.B	App.	Scale NTS	Drawing Status.	
Project No.	Drawing No. AVC/NH-38/BC/GAD/36-421/01					Sheet No. 03 OF 03	Rev. R0



DESCRIPTION	PROPOSED
DESIGN CHN.	36+673
C.A.CHN.	36+680
STR. TYPE	BOX
SPAN/ DIA	1X3X4m
PROPOSAL	NEW 2 LANE



LEGEND:-
 FFL FINISHED ROAD LEVEL
 IL INVERT LEVEL
 LVL. LEVEL
 EGL. EXISTING GROUND LEVEL

FRL CAMBER & LOCATION IS TO BE MATCHED WITH HIGHWAY ALIGNMENT DRAWING.

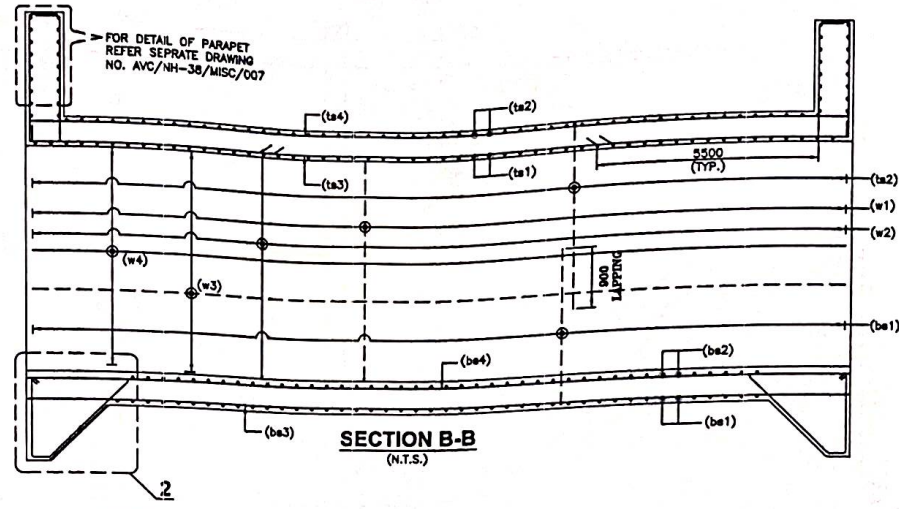
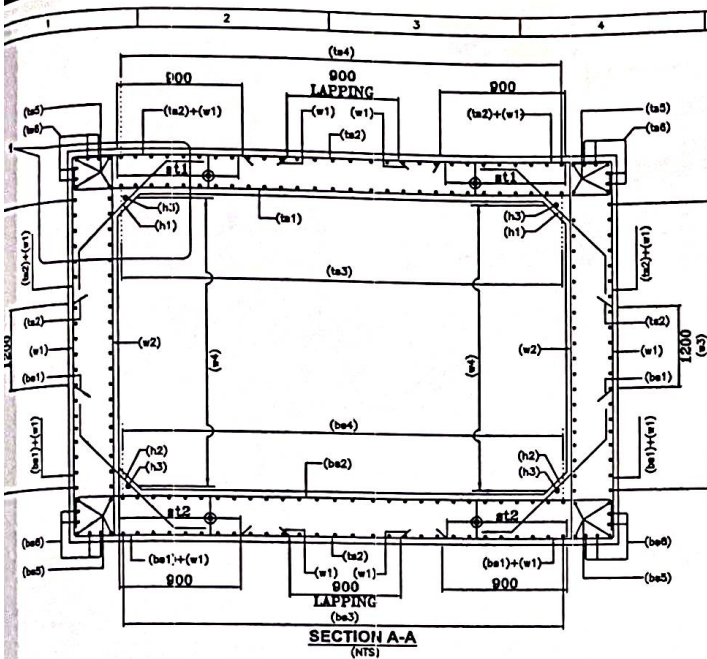
- NOTES:-**
- ALL DIMENSIONS ARE IN MILLIMETER, LEVELS ARE IN METER AND CHAINAGE ARE IN KILOMETERS UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE RELEVANT PLAN AND PROFILE DRAWING OF ROAD.
 - GRADE OF CONCRETE:-
 a. M30-FOR RCC BOX CELL STRUCTURE.
 b. M15-FOR PCC AND LEVELING COURSE.
 c. M30-PARAPET
 - GRADE OF STEEL - Fe 5000.
 - THE CARRIAGEWAY OF PROPOSED CULVERT IS DESIGN AS PER 6-2017.
 - BACKFILL MATERIAL BEHIND END WALL SHALL BE SELECTED GRANULAR SOIL HAVING PROPERTIES
 MAX DRY DENSITY = 1850-2280kg/m³
 OPTIMUM MOISTURE CONTENT = 7-15
 AS PER IRC78-2014 AND MORTH SPECIFICATION.
 - THE FRL SHOWN IN THE DRAWING SHALL BE VERIFIED WITH CORRESPONDING PLAN AND PROFILE DRAWING BEFORE EXECUTION, IF THERE IS ANY VARIATION SHALL BE BROUGHT TO THE NOTICE OF ENGINEER.
 - THE DIMENSION AND LEVEL ARE SUBJECT TO CHANGE AS PER SITE CONDITION AND DETAILED DESIGN.
 - BACKFILL TO BE DONE AND COMPACTED FROM BOTH SIDE SIMULTANEOUSLY.
 - 100MM DIA P.V.C. PIPE AT SPACING 1000MM/c IN HORIZONTAL/VERTICAL DIRECTION SHALL BE PROVIDED UP TO 150MM ABOVE GROUND LEVEL FOR WEEP HOLES IN RETAINING WALL.
 - SBC SHALL BE 16t/m² AND SAME SHALL BE ENSURED AT SITE BY ANY SUITABLE METHOD.
 - AS PER MORTH SECTION-2500, WHERE THE REQUIRED SIZE OF BOULDERS ARE NOT AVAILABLE ECONOMICALLY, CEMENT CONCRETE BLOCKS OF EQUIVALENT WEIGHT SHALL BE USED. THE GRADE OF CONCRETE SHALL BE M15 NOMINAL MIX. CEMENT CONCRETE BLOCK SHALL BE PREFERRED WHERE PRACTICABLE.
 - CHOOSE ANY SUITABLE METHOD TO ACHIEVE THE REQUIRED SBC AS PER SITE.

LEVELS

DESIGN CH.	FRL	GROUND LEVEL	INVERT LEVEL		VERTICAL CLEARANCE (MAX.)	EARTH FILL (MAX.)	EARTH FILL (MIN.)
			LHS	RHS			
36+673	145.408	137.635	137.335	137.351	4.016m	3.707m	2.524m

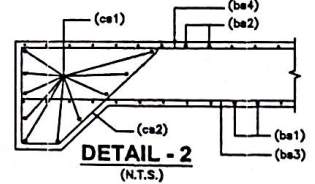
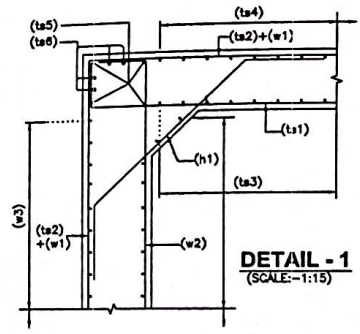
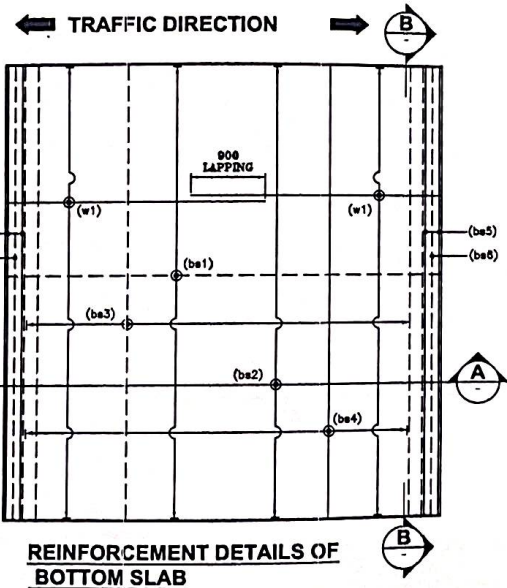
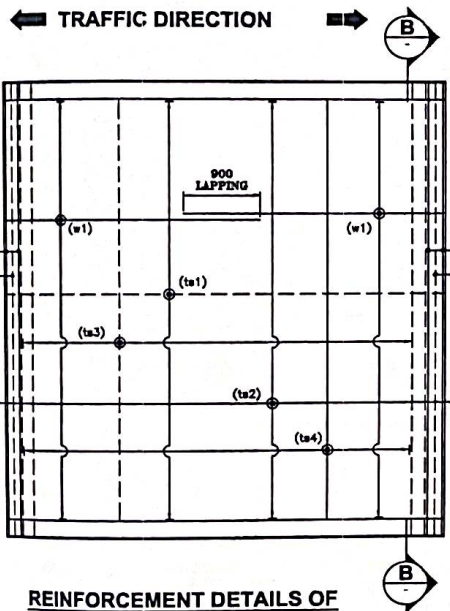
REFERENCE DRAWINGS:-
 1. REINFORCEMENT DETAIL OF BOX CULVERT
 AVC/NH-38/BC/REINF./36+673/01

CLIENT: NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	EPC CONTRACTOR KAMAC ENGINEERS PVT. LTD. F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	AUTHORITY'S ENGINEER ALMONDZ GLOBAL INFRA CONSULTANT LIMITED IN JV WITH AYOLEEZA CONSULTANT PRIVATE LIMITED. C/O JAYANTA SAIKIA, SARBAJANIN NAMGHAR, BORBIL NO.2, DIGBOI, TINSUKA, ASSAM-786171	PROOF CONSULTANT: CREATIVE ENGINEERING SERVICES OFFICE NO: 620, SIGNATURE GLOBAL MALL, SECTOR-3, VAISHALI, GHAZIABAD, U.P-201010	SAFETY CONSULTANT: DESIGN AID PLOT NO.54, 3rd FLOOR(FRONT), MASOODPUR DAIRY FARM, VASANT KUNJ, NEW DELHI-110070,	DESIGN CONSULTANT: A.V. CONSTRUCTION 1st Floor, WZ-1240, Palam Extension, Bosco Ashram Wall Gali, New Delhi 110045 Winst Infra Solution Pvt. Ltd. OFFICE: F-8, ISHAN CORPORATE TOWER, PLOT NO-23, SECTOR-13, VASUNDHRA GHAZIABAD, U.P-201212	PROJECT: WIDENING/IMPROVEMENT TO 2-LANE WITH PAVED SHOULDER FROM KM 27+100 (GOLA GOAN) TO KM 47+682 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (2-LANE+PS) OF NH-38 IN TINSUKA DISTRICT IN THE STATE OF ASSAM ON EPC MODE (PACAGE-6) DRAWING TITLE:- GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 36+673 <table border="1"> <tr> <th>Date</th> <th>Drw.</th> <th>Des.</th> <th>Chk.</th> <th>App.</th> <th>Scale</th> <th>Drawing Status.</th> </tr> <tr> <td>MAR-2024</td> <td>W.P</td> <td>V.S</td> <td>A.B</td> <td></td> <td>NTS</td> <td></td> </tr> <tr> <td>Project No.</td> <td colspan="5">Drawing No.</td> <td>Sheet No.</td> </tr> <tr> <td colspan="5">AVC/NH-38/BC/GAD/36+673/01</td> <td>81 OF 83</td> <td>Rev. RO</td> </tr> </table>	Date	Drw.	Des.	Chk.	App.	Scale	Drawing Status.	MAR-2024	W.P	V.S	A.B		NTS		Project No.	Drawing No.					Sheet No.	AVC/NH-38/BC/GAD/36+673/01					81 OF 83	Rev. RO
	Date	Drw.	Des.	Chk.	App.	Scale	Drawing Status.																											
MAR-2024	W.P	V.S	A.B		NTS																													
Project No.	Drawing No.					Sheet No.																												
AVC/NH-38/BC/GAD/36+673/01					81 OF 83	Rev. RO																												



LEGEND:-

TOP FACE BAR	---
BOTTOM FACE BAR	---



- ANCHORAGE LENGTH OF BOX SHALL BE TAKEN AS 40d AS PER IRC:112.
- FOR UNFAVORABLE BOND CONDITIONS THE FACTOR 40 SHOULD BE MULTIPLIED BY FACTOR OF 1.43.
- CENTER LINE OF OVERLAPPING BAR bs_1 & ts_2 IN WALL & MID HEIGHT OF WALLS ARE AT SAME POINT.
- BAR BENDING SCHEDULE SHOULD BE STRICTLY FOLLOW DURING THE TIME OF EXECUTION IF IN CASE ANY CHANGES AT SITE KINDLY DISCUSS IT WITH ENGINEER IN CHARGE.

REFERENCE DRAWING:-

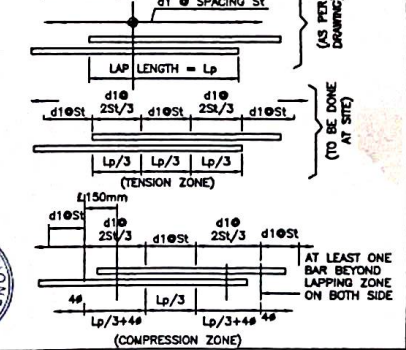
- GENERAL ARRANGEMENT DRAWING. AVC/NH-38/BOX/GAD/38+673/01

BOX REINF. SCHEDULE

SL.NO.	BAR MARK	BAR SHAPE	DIAMETER	SPACING
1	ts1		12+10	160
2	ts2		12	160
3	ts3		10	180
4	ts4		10	180
5	ts5		12	2x4 Nos.
6	ts6		12	2x4 Nos.
7	w1		16	160
8	w2		16	160
9	w3		10	180
10	w4		10	180
11	bs1		12	160
12	bs2		12+12	160
13	bs3		10	180
14	bs4		10	180
15	bs5		12	2x4 Nos.
16	bs6		12	2x4 Nos.
17	h1		10	160
18	h2		10	160
19	h3		10	1x4 Nos.
20	cs1		12	10 Nos.
21	cs2		10	180
22	st1		LINK BAR 10 ϕ 180 c/c (L-L) & 160 (T-T) DIRECTION	
23	st2		LINK BAR 12 ϕ 180 c/c (L-L) & 160 (T-T) DIRECTION	

NOTES:-

- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS UNLESS OTHERWISE MENTIONED.
- DRAWING SHOULD NOT BE SCALED ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
- ALL REINFORCING BARS SHALL BE THERMO MECHANICALLY TREATED (TMT) BARS (GRADE DESIGNATION Fe-500D) CONFORMING TO IS:1786 STANDARDS.
- MINIMUM CLEAR COVER TO OUTERMOST REINFORCEMENT SHALL BE AS FOLLOWS:-
 - a) TOP SLAB = 45mm
 - b) BOTTOM SLAB = 75mm
 - c) SIDE WALL (EARTH SIDE) = 75mm
 - d) SIDE WALL (INNER SIDE) = 45mm
- OVERLAPPING FOR SPlicing OF REINFORCEMENT SHALL BE AS PER CLAUSE NO.15.2.5. LAP LENGTH SHALL NOT BE LESS THAN 56 ϕ . ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:-
 - a) TOP SLAB
 - b) BOTTOM SLAB



CLIENT:

NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.

EPC CONTRACTOR

KAMAC ENGINEERS PVT.LTD
F0201, CITY CENTER OFFICE
BLOCK, 2ND FLOOR,
MATIGARA 734010

AUTHORITY'S ENGINEER

ALMONDZ GLOBAL INFRA CONSULTANT LIMITED IN JV WITH AYOLEEZA CONSULTANT PRIVATE LIMITED.
C/O JAYANTA SAIKIA, SARBAJANIN NAMGHAR, BORBIL NO.2, DIGBOI, TINSUKIA, ASSAM-786171

PROOF CONSULTANT:

CREATIVE ENGINEERING SERVICES
OFFICE NO: 620, SIGNATURE GLOBAL MALL, SECTOR-3, VAISHALI, GHAZIABAD, U.P.-201010

SAFETY CONSULTANT:

DESIGN AID
PLOT NO.54, 3rd FLOOR(FRONT), MASOODPUR DAIRY FARM, VASANT KUNJ, NEW DELHI-110070,

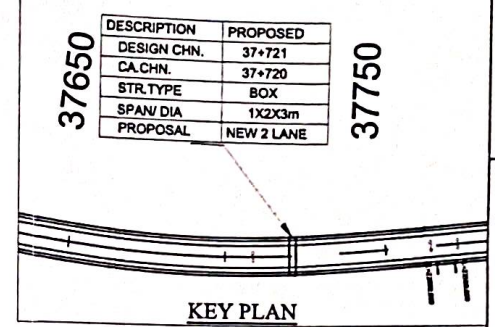
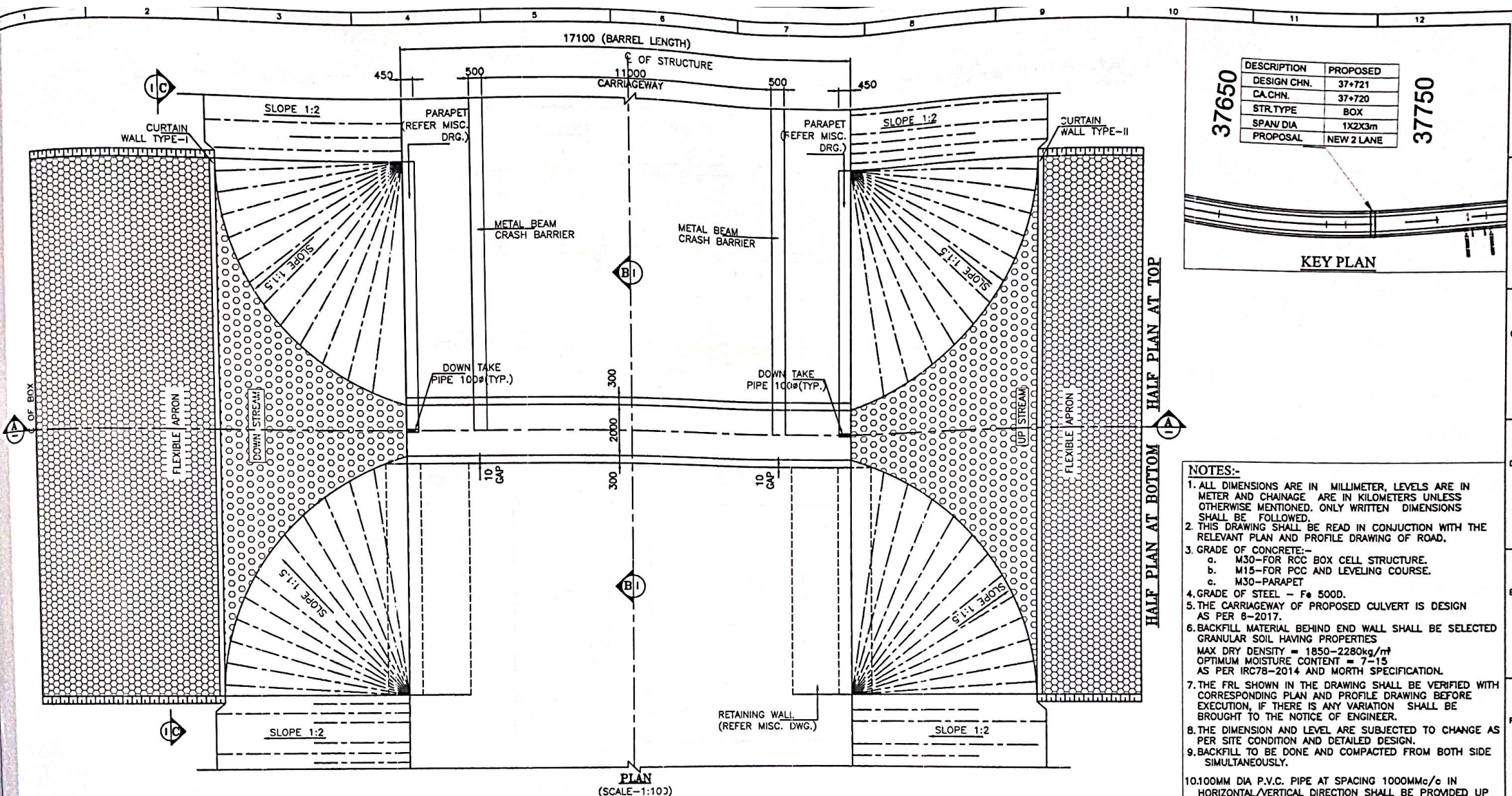
DESIGN CONSULTANT:

A.V. CONSTRUCTION
1st Floor, WZ-1240, Palam Extension, Bosco Ashram Wall Gali, New Delhi 110045
Winst Infra Solution Pvt. Ltd.
OFFICE: F-6, ISHAAN CORPORATE TOWER, PLOT NO-C-23, SECTOR-13, VASUNDHRA, GHAZIABAD, U.P.201712

PROJECT:
WIDENING/IMPROVEMENT TO 3-LANE LANE WITH PAVED SHOULDER FROM KM 27+180 (GOLLA GOAN) TO KM 47+832 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE.(PACKAGE-5)

DRAWING TITLE:-
REINFORCEMENT DETAIL OF BOX CULVERT
AT CH. 38+673

Date	Drw. W.P.	Dsg. V.B	Chk. A.B	App. NTS	Scale	Drawing Status.
MAR.2024					NTS	
Project No.	Drawing No.	AVC/NH-38/BOX/REIN.38+673/01			Sheet No.	Rev.
					01 OF 01	RO



- NOTES:-**
- ALL DIMENSIONS ARE IN MILLIMETER, LEVELS ARE IN METER AND CHAINAGE ARE IN KILOMETERS UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE RELEVANT PLAN AND PROFILE DRAWING OF ROAD.
 - GRADE OF CONCRETE:-
 - M30-FOR RCC BOX CELL STRUCTURE.
 - M15-FOR PCC AND LEVELING COURSE.
 - M30-PARAPET
 - GRADE OF STEEL - F_o 500D.
 - THE CARRIAGEWAY OF PROPOSED CULVERT IS DESIGN AS PER 6-2017.
 - BACKFILL MATERIAL BEHIND END WALL SHALL BE SELECTED GRANULAR SOIL HAVING PROPERTIES
 MAX DRY DENSITY = 1850-2280kg/m³
 OPTIMUM MOISTURE CONTENT = 7-15
 AS PER IRC78-2014 AND MORTH SPECIFICATION.
 - THE FRL SHOWN IN THE DRAWING SHALL BE VERIFIED WITH CORRESPONDING PLAN AND PROFILE DRAWING BEFORE EXECUTION, IF THERE IS ANY VARIATION SHALL BE BROUGHT TO THE NOTICE OF ENGINEER.
 - THE DIMENSION AND LEVEL ARE SUBJECTED TO CHANGE AS PER SITE CONDITION AND DETAILED DESIGN.
 - BACKFILL TO BE DONE AND COMPACTED FROM BOTH SIDE SIMULTANEOUSLY.
 - 10.100MM DIA P.V.C. PIPE AT SPACING 1000MM/c IN HORIZONTAL/VERTICAL DIRECTION SHALL BE PROVIDED UP TO 150MM ABOVE GROUND LEVEL FOR WEEP HOLES IN RETAINING WALL.
 - 11.SBC SHALL BE 16t/m² AND SAME SHALL BE ENSURED AT SITE BY ANY SUITABLE METHOD.
 - 12.AS PER MORTH SECTION-2500,WHERE THE REQUIRED SIZE OF BOULDERS ARE NOT AVAILABLE ECONOMICALLY.CEMENT CONCRETE BLOCKS OF EQUIVALENT WEIGHT SHALL BE USED. THE GRADE OF CONCRETE SHALL BE M15 NOMINAL MIX.CEMENT CONCRETE BLOCK SHALL BE PREFERRED WHERE PRACTICABLE.
 - 13.CHOOSE ANY SUITABLE METHOD TO ACHIEVE THE REQUIRED SBC AS PER SITE.

LEVELS

DESIGN CH.	FRL	GROUND LEVEL	INVERT LEVEL		VERTICAL CLEARANCE (MAX.)	EARTHFILL (MAX.)	EARTHFILL (MIN.)
			LHS	RHS			
37+721	145.255	139.051	138.751	138.768	3.017 m	3.187m	1.453m

REFERENCE DRAWINGS:-

- REINFORCEMENT DETAIL OF BOX CULVERT
AVC/NH-38/BC/REINF./37+721/01

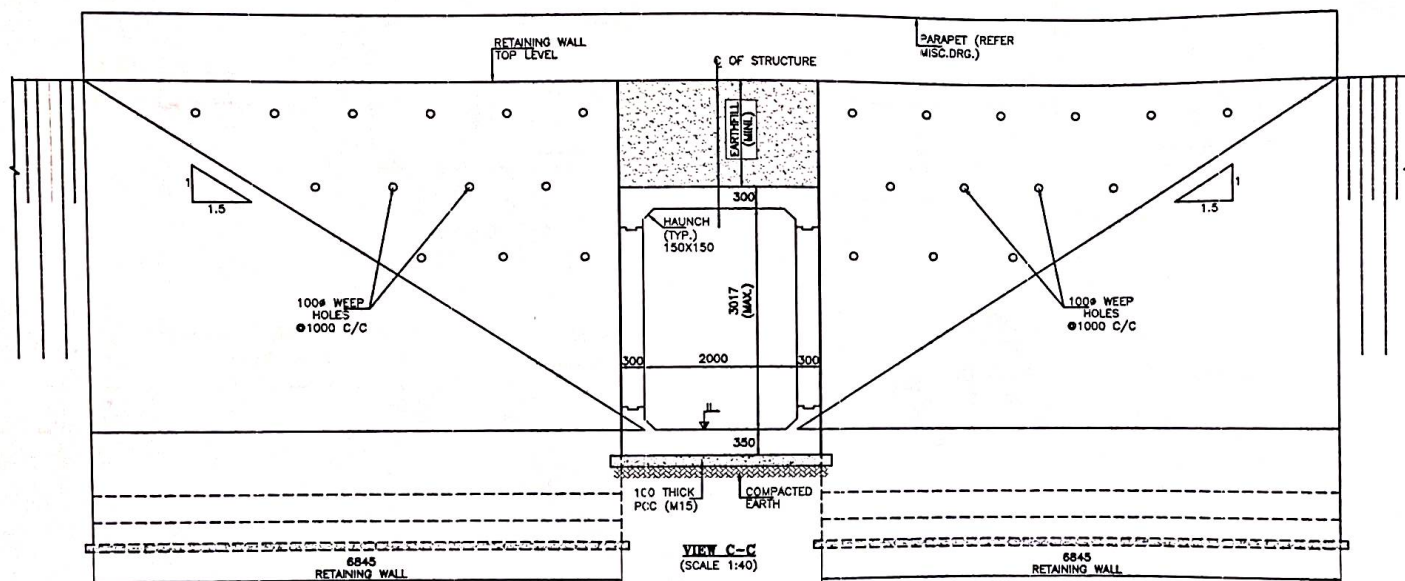
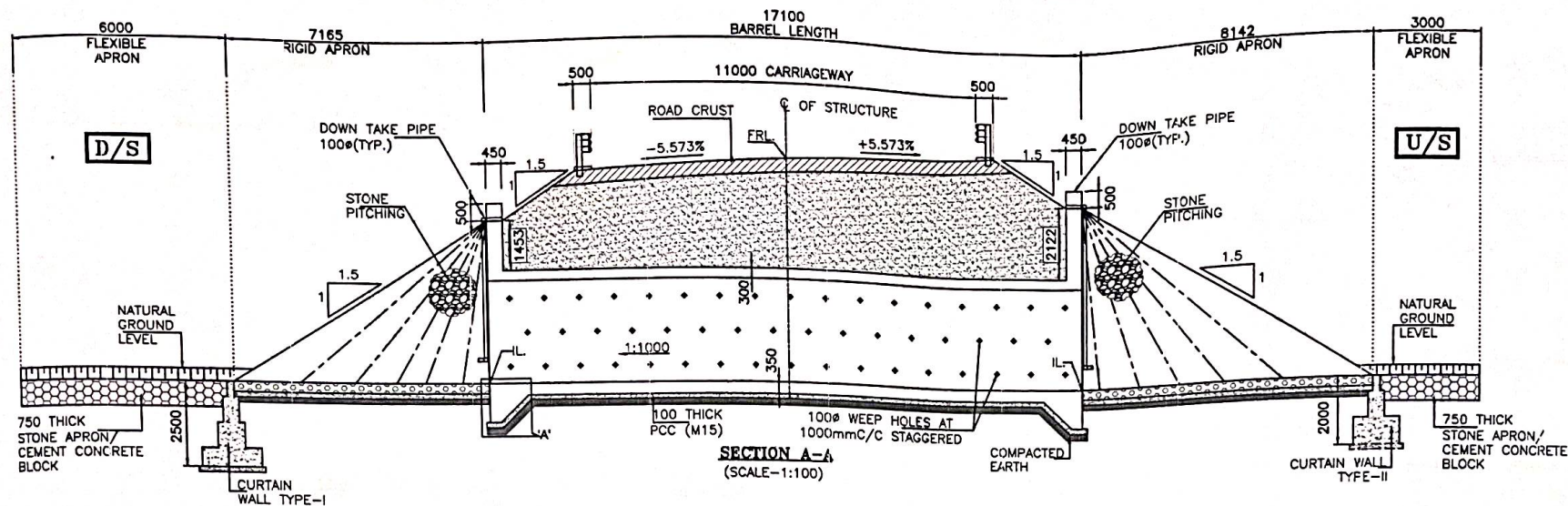


LEGEND:-

FRL FINISHED ROAD LEVEL
 IL INVERT LEVEL
 LVL. LEVEL
 EGL. EXISTING GROUND LEVEL

FRL CAMBER & LOCATION IS TO BE MATCHED WITH HIGHWAY ALIGNMENT DRAWING.

CLIENT: NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	EPC CONTRACTOR KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	AUTHORITY'S ENGINEER 	PROOF CONSULTANT: CREATIVE ENGINEERING SERVICES OFFICE NO: 620, SIGNATURE GLOBAL MALL, SECTOR-3, VAISHALI, GHAZIABAD, U.P-201010	SAFETY CONSULTANT: DESIGN AID PLOT NO.54, 3rd FLOOR(FRONT), MASOODPUR DAIRY FARM,VASANT KUNJ, NEW DELHI-110070,	DESIGN CONSULTANT: A.V. CONSTRUCTION 1 st Floor, WZ-1240, Palam Extension, Bosco Ashram Wall Gali, New Delhi 110045 Winst Infra Solution Pvt. Ltd. OFFICE: F-8, ISHAAN CORPORATE TOWER, PLOT NO-C-23,SECTOR-13, VASUNDHRA GHAZIABAD, U.P-201212	PROJECT: WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (GOLAN GOAN) TO KM 47+882 (LEDO) ON DIBRUGAHAT TO LEDO SECTION WITH PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD), (2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE.(PACKAGE-E)
	DRAWING TITLE:- GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 37+721					
Date MAR-2024 Project No.		Drw. W.P. Drawing No.		Des. V.B. Chk. A.B. App. NTS Scale. NTS		Drawing Status. Sheet No. 01 OF 03 Rev. RO



CLIENT:
NATIONAL HIGHWAYS &
INFRASTRUCTURE DEVELOPMENT
CORPORATION LTD.

EPC CONTRACTOR
KAMAC ENGINEERS Pvt.Ltd
KAMAC ENGINEERS PVT.LTD
F0201, CITY CENTER OFFICE
BLOCK, 2ND FLOOR,
MATIGARA 734010

AUTHORITY'S ENGINEER

PROOF CONSULTANT:

CREATIVE ENGINEERING SERVICES
OFFICE NO: 620, SIGNATURE GLOBAL
MALL, SECTOR-3,
VAISHALI, GHAZIABAD, U.P-201010

SAFETY CONSULTANT:

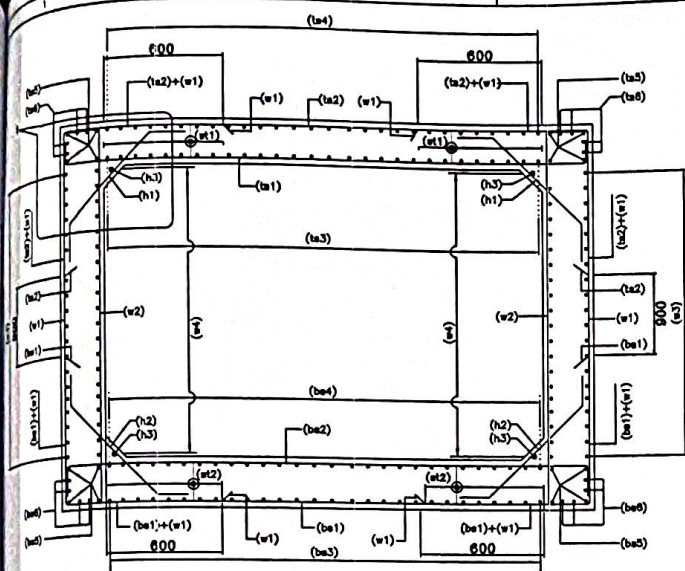
DESIGN AID
PLOT NO.54, 3rd FLOOR(FRONT),
MASOODPUR DAIRY FARM, VASANT KUNJ,
NEW DELHI-110045

DESIGN CONSULTANT:

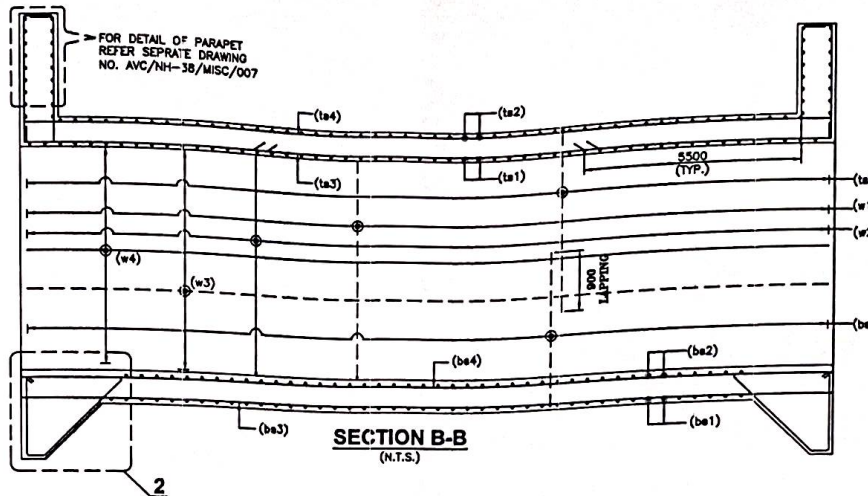
A.V. CONSTRUCTION
1st Floor, WZ-1240,
Palam Extension, Bosco
Ashram Wall Gali, New
Delhi 110045
Winst Infra Solution
Pvt. Ltd.
OFFICE: F-8, ISHAAN CORPORATE
TOWER, PLOT NO-C-23, SECTOR-13,
VASUNDHRA GHAZIABAD, U.P-201012

PROJECT:
WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150
(GOLA GOAN) TO KM 47+682 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH
PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD)
(2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC
MODE.(PACKAGE-8)
DRAWING TITLE:-
GENERAL ARRANGEMENT DRAWING FOR
BOX CULVERT AT CHAINAGE 37+721
Date MAR.2024
Project No. Drawing No. AVCNH-38/BC/GAD/37+721/01
Draw. W.P. V.S. Chk. A.B. App. NTS
Scale. NTS
Drawing Status.
Sheet No. 02 OF 03
Rev. RO

PROJECT: WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 37+150 (GOLJA GOAN) TO KM 47+682 (LEDO) ON DIBRUAGARH TO LEDO SECTION WITH PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (2-LANE+PS) OF NH-38 IN THE NICVA REGION IN THE STATE OF ASSAM ON ERC MODE. (PACKAGE-6)						
DRAWING TITLE:- GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 37+721						
Date MAR. 2024	D.W.P. W.P.	Dag. V.S	Chk. A.B.	App. Scale. NTS	Drawing Status.	
Project No. Drawing No.	AYCAN-38/BC/GAD/37+721/01				Sheet No. 03 OF 03	Rev. R0



SECTION A-A
(N.T.S.)

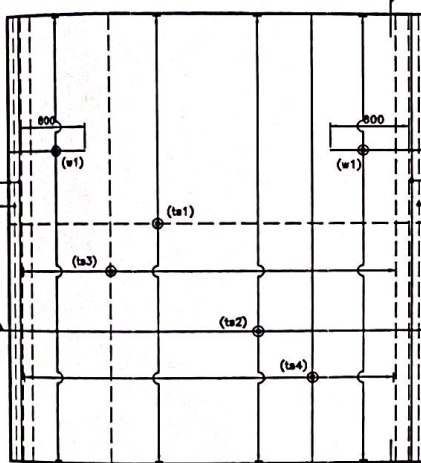


SECTION B-B
(N.T.S.)

LEGEND:-

TOP FACE BAR
BOTTOM FACE BAR

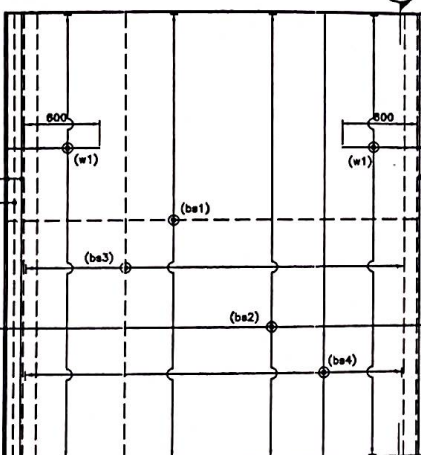
TRAFFIC DIRECTION



REINFORCEMENT DETAILS OF
TOP SLAB

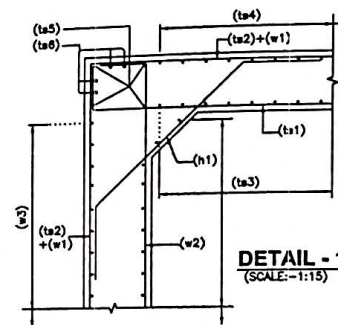
(HAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
(N.T.S.)

TRAFFIC DIRECTION

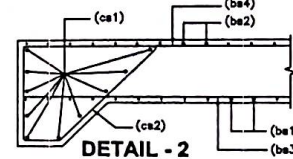


REINFORCEMENT DETAILS OF
BOTTOM SLAB

(HAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
(N.T.S.)



DETAIL - 1
(SCALE:-1:15)



DETAIL - 2
(N.T.S.)

- ANCHORAGE LENGTH OF BOX SHALL BE TAKEN AS 40 ϕ AS PER IRC-112.
- FOR UNFAVORABLE BOND CONDITIONS THE FACTOR 40 SHOULD BE MULTIPLIED BY FACTOR OF 1.43.
- CENTER LINE OF OVERLAPPING BAR: ba1 & ta2 IN WALL & MID HEIGHT OF WALLS ARE AT SAME POINT.
- BAR BENDING SCHEDULE SHOULD BE STRICTLY FOLLOW DURING THE TIME OF EXECUTION IF IN CASE ANY CHANGES AT SITE KINDLY DISCUSS IT WITH ENGINEER IN CHARGE.

REFERENCE DRAWING:-

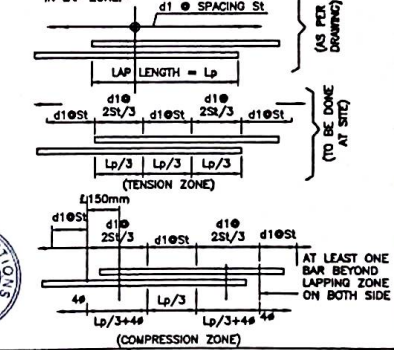
- GENERAL ARRANGEMENT DRAWING.
AVC/NH-38/BOX/QAD/37+721/01

BOX REINF. SCHEDULE

SL.NO.	BAR MARK	BAR SHAPE	DIAMETER	SPACING
1	ta1		12	160
2	ta2		10	160
3	ta3		8	200
4	ta4		10	200
5	ta5		12	2x4 Nos.
6	ta6		12	2x4 Nos.
7	w1		12	160
8	w2		12	160
9	w3		10	200
10	w4		8	200
11	bs1		10	160
12	bs2		10+10	160
13	bs3		10	200
14	bs4		8	200
15	bs5		12	2x4 Nos.
16	bs6		12	2x4 Nos.
17	h1		10	160
18	h2		10	160
19	h3		10	1x4 Nos.
20	cs1		12	10 Nos.
21	cs2		10	200
22	st1		8	200 c/c (L-L) 160 c/c (T-T) DIRECTION
23	st2		8	200 c/c (L-L) 160 c/c (T-T) DIRECTION

NOTES:-

- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS UNLESS OTHERWISE MENTIONED.
- DRAWING SHOULD NOT BE SCALED ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
- ALL REINFORCING BARS SHALL BE THERMO MECHANICALLY TREATED (TMT) BARS (GRADE DESIGNATION Fe-500D) CONFORMING TO IS-1786 STANDARDS.
- MINIMUM CLEAR COVER TO OUTERMOST REINFORCEMENT SHALL BE AS FOLLOWS:-
 - TOP SLAB - 45mm
 - BOTTOM SLAB - 75mm
 - SIDE WALL (EARTH SIDE) - 75mm
 - SIDE WALL (INNER SIDE) - 45mm
- OVERLAPPING FOR SPlicing OF REINFORCEMENT SHALL BE AS PER CLAUSE NO.15.2.5. LAP LENGTH SHALL NOT BE LESS THAN 56 ϕ . ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:-



NHIDCL
NATIONAL HIGHWAYS &
INFRASTRUCTURE DEVELOPMENT
CORPORATION LTD.

KAMAC ENGINEERS PVT.LTD
F0201, CITY CENTER OFFICE
BLOCK, 2ND FLOOR,
MATIGARA 734010

AUTHORITY'S ENGINEER
CREATIVE ENGINEERING SERVICES
OFFICE NO. 620, SIGNATURE GLOBAL
MALL, SECTOR-3,
VAISHALI, GHAZIABAD, U.P-201010

PROOF CONSULTANT:
DESIGN
PLOT NO.54, 3rd FLOOR(FRONT),
MASOODPUR DAIRY FARM,VASANT KUNJ,
NEW DELHI-110070,

SAFETY CONSULTANT:
DESIGN
PLOT NO.54, 3rd FLOOR(FRONT),
MASOODPUR DAIRY FARM,VASANT KUNJ,
NEW DELHI-110070,

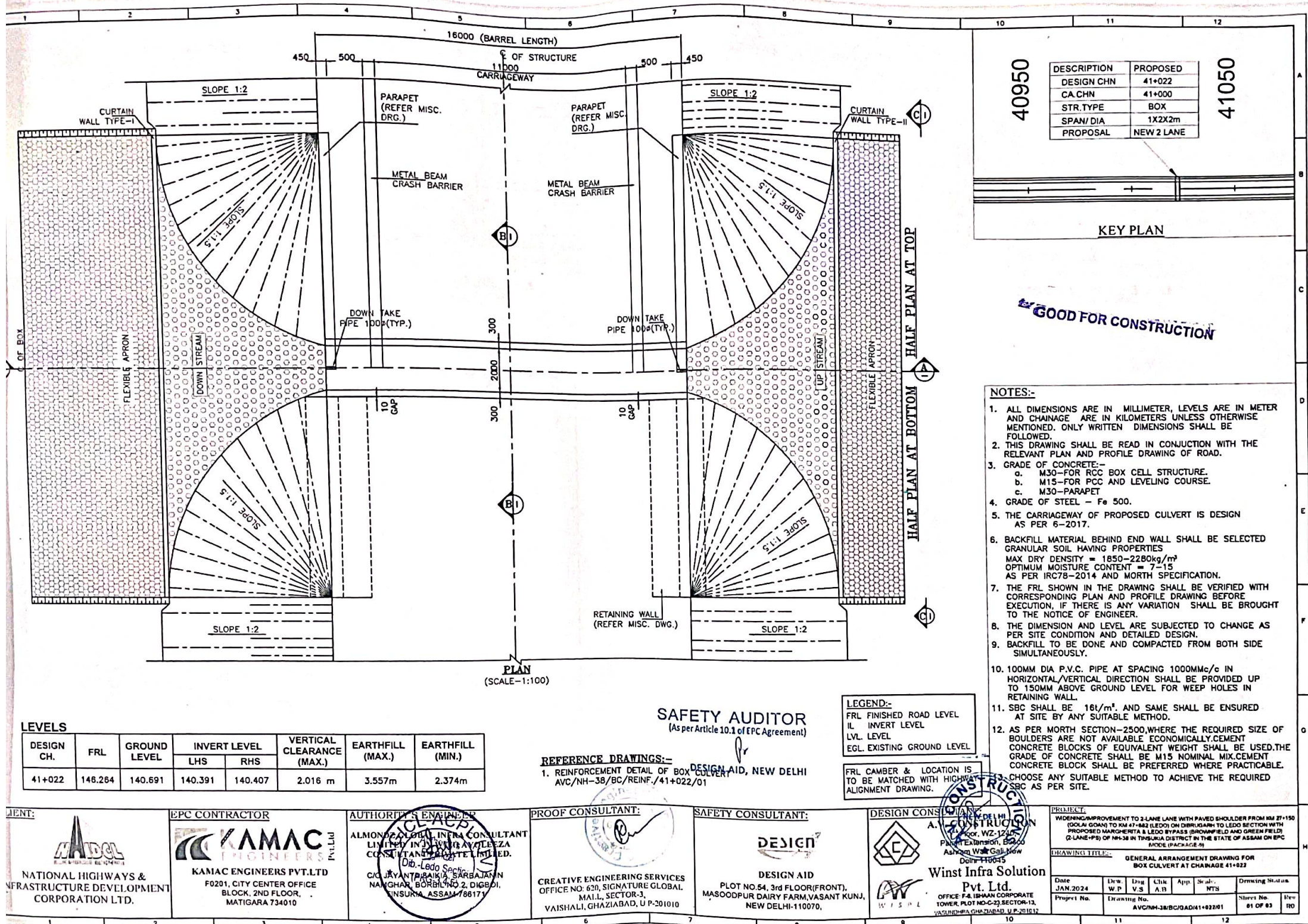
DESIGN CONSULTANT:
A.V. CONSTRUCTION
1st Floor, WZ-1240,
Palam Extension, Bosco
Ashram Wall Gali, New
Delhi 110045
Winst Infra Solution
Pvt. Ltd.
OFFICE: F-8, ISHAAN CORPORATE
TOWER, PLOT NO-C-23,SECTOR-13,
VASUNDHRA, GHAZIABAD, U.P-201722

PROJECT:
WIDENING/IMPROVEMENT TO 2LANE LANE WITH PAVED SHOULDER FROM KM 27+180
(GOLAI GOAN) TO KM 47+482 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH
PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD).
(PLAN-18) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC
MODE (PACKAGE-4)

DRAWING TITLE:- REINFORCEMENT DETAIL OF BOX CULVERT
AT CH. 37+721

Date	Drw.	Deg.	Chk.	App.	Scale	Drawing Status.
MAR. 2024	W.P	V.B	A.B		NTS	
Project No.	Drawing No.					
	AVC/NH-38/BOX/REIN/37+721/01					

Sheet No. 01 OF 01 Rev. RD



DESCRIPTION	PROPOSED
DESIGN CHN	41+022
CA CHN	41+000
STR. TYPE	BOX
SPAN/DIA	1X2X2m
PROPOSAL	NEW 2 LANE

KEY PLAN

GOOD FOR CONSTRUCTION

NOTES:-

- ALL DIMENSIONS ARE IN MILLIMETER, LEVELS ARE IN METER AND CHAINAGE ARE IN KILOMETERS UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE RELEVANT PLAN AND PROFILE DRAWING OF ROAD.
- GRADE OF CONCRETE:-
 - M30-FOR RCC BOX CELL STRUCTURE.
 - M15-FOR PCC AND LEVELING COURSE.
 - M30-PARAPET
- GRADE OF STEEL - Fe 500.
- THE CARRIAGEWAY OF PROPOSED CULVERT IS DESIGN AS PER 6-2017.
- BACKFILL MATERIAL BEHIND END WALL SHALL BE SELECTED GRANULAR SOIL HAVING PROPERTIES
MAX DRY DENSITY = 1850-2280kg/m³
OPTIMUM MOISTURE CONTENT = 7-15
AS PER IRC78-2014 AND MORTH SPECIFICATION.
- THE FRL SHOWN IN THE DRAWING SHALL BE VERIFIED WITH CORRESPONDING PLAN AND PROFILE DRAWING BEFORE EXECUTION, IF THERE IS ANY VARIATION SHALL BE BROUGHT TO THE NOTICE OF ENGINEER.
- THE DIMENSION AND LEVEL ARE SUBJECT TO CHANGE AS PER SITE CONDITION AND DETAILED DESIGN.
- BACKFILL TO BE DONE AND COMPACTED FROM BOTH SIDE SIMULTANEOUSLY.
- 100MM DIA P.V.C. PIPE AT SPACING 1000MM/c IN HORIZONTAL/VERTICAL DIRECTION SHALL BE PROVIDED UP TO 150MM ABOVE GROUND LEVEL FOR WEEP HOLES IN RETAINING WALL.
- SBC SHALL BE 16t/m² AND SAME SHALL BE ENSURED AT SITE BY ANY SUITABLE METHOD.
- AS PER MORTH SECTION-2500, WHERE THE REQUIRED SIZE OF BOULDERS ARE NOT AVAILABLE ECONOMICALLY, CEMENT CONCRETE BLOCKS OF EQUIVALENT WEIGHT SHALL BE USED. THE GRADE OF CONCRETE SHALL BE M15 NOMINAL MIX. CEMENT CONCRETE BLOCK SHALL BE PREFERRED WHERE PRACTICABLE.
- CHOOSE ANY SUITABLE METHOD TO ACHIEVE THE REQUIRED SBC AS PER SITE.

LEVELS

DESIGN CH.	FRL	GROUND LEVEL	INVERT LEVEL		VERTICAL CLEARANCE (MAX.)	EARTHFILL (MAX.)	EARTHFILL (MIN.)
			LHS	RHS			
41+022	148.264	140.691	140.391	140.407	2.016 m	3.557m	2.374m

SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

REFERENCE DRAWINGS:-

- REINFORCEMENT DETAIL OF BOX CULVERT
AVC/NH-38/BC/REINF./41+022/01

FRL FINISHED ROAD LEVEL
IL INVERT LEVEL
LVL. LEVEL
EGL. EXISTING GROUND LEVEL

FRL CAMBER & LOCATION IS TO BE MATCHED WITH HIGHWAY ALIGNMENT DRAWING.

CLIENT: NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.

EPC CONTRACTOR: KAMAC ENGINEERS PVT. LTD.
F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010

AUTHORITY'S ENGINEER: ALMOND & CO. INFRA CONSULTANT LIMITED
C/O. JAYANTA BAIKIA, SARBAJANN NANGHAR, BORHIL NO. 2, DIGBOI, INSURIA, ASSAM 786171

PROOF CONSULTANT: CREATIVE ENGINEERING SERVICES
OFFICE NO. 620, SIGNATURE GLOBAL MALL, SECTOR-3, VAISHALI, GHAZIABAD, U.P. 201010

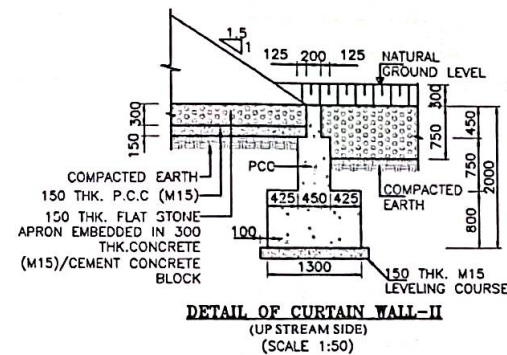
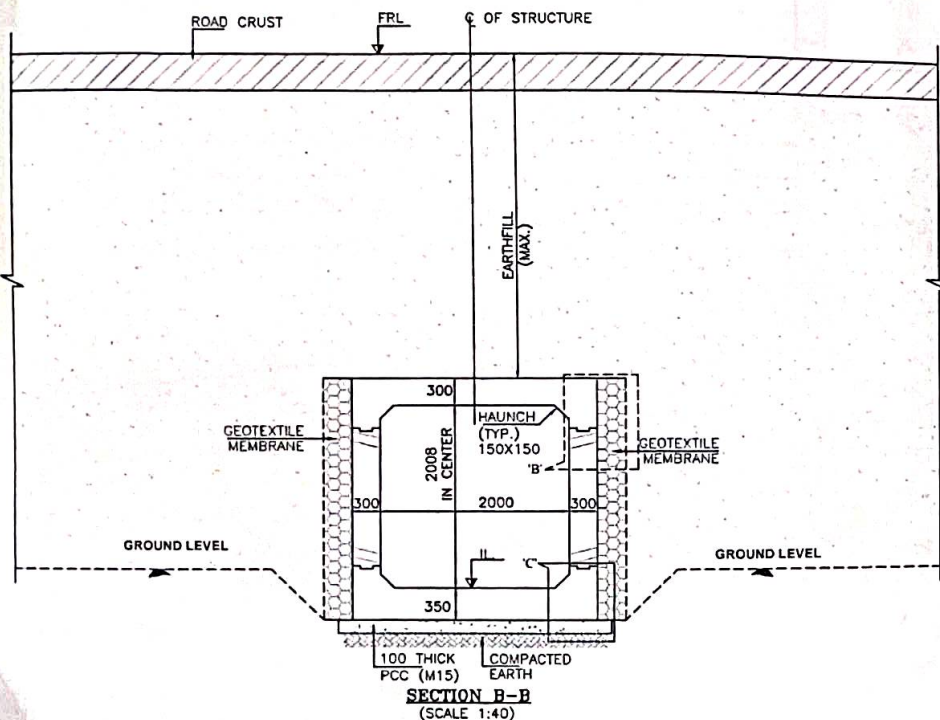
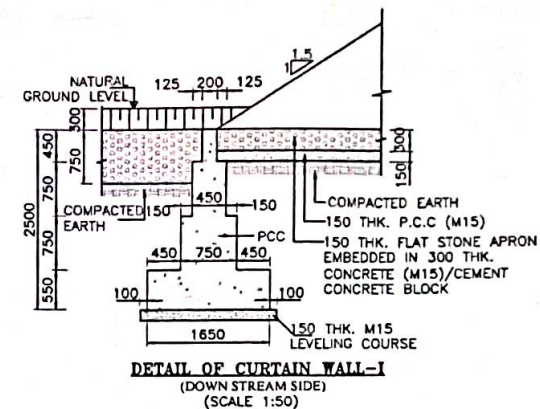
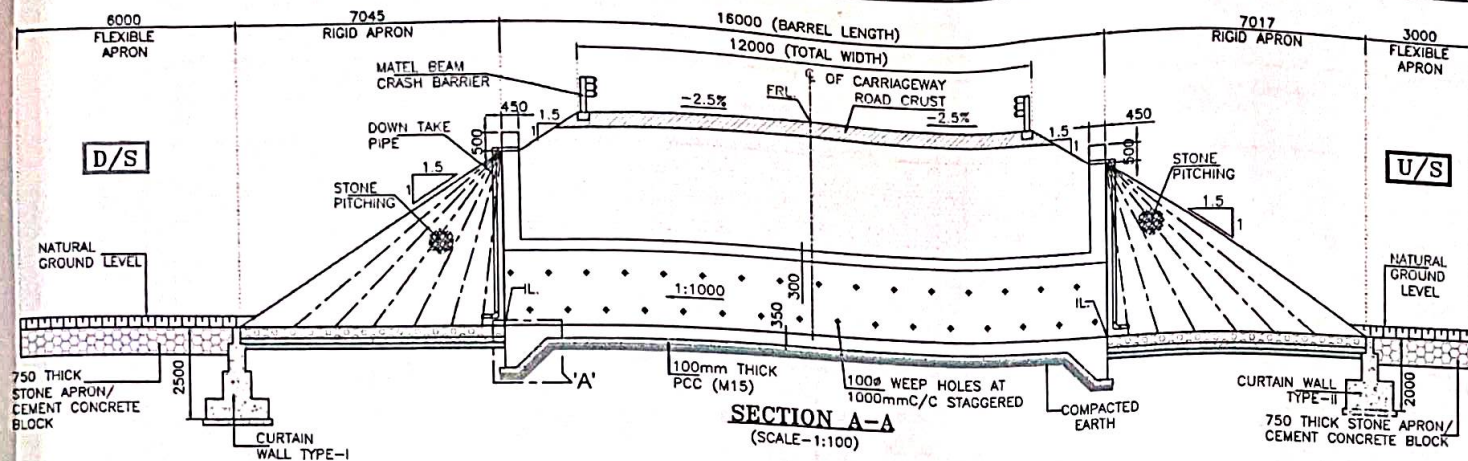
SAFETY CONSULTANT: DESIGN AID
PLOT NO. 54, 3rd FLOOR (FRONT), MASOODPUR DAIRY FARM, VASANT KUNJ, NEW DELHI-110070.

DESIGN CONSULTANT: Winst Infra Solution Pvt. Ltd.
OFFICE: P-8, 18TH FLOOR CORPORATE TOWER, PLOT NO. C-23, SECTOR-13, VASANT KUNJ, GHAZIABAD, U.P. 201012

PROJECT: WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (LOCAL GOAN) TO KM 47+882 (LEDO) ON DIBRUGAHAT TO LEDO SECTION WITH PROPOSED MAROHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE (PACKAGE-9)

DRAWING TITLE: GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 41+022

Date	Jan. 2024	Drawn	W.P.	Eng.	V.S.	Check	A.N.	Appr.	NTN	Scale	NTN	Drawing No.	AVC/NH-38/BC/GAD/41+022/01	Sheet No.	81 OF 83	Rev	NO
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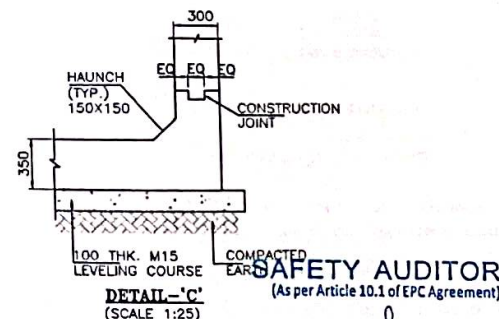
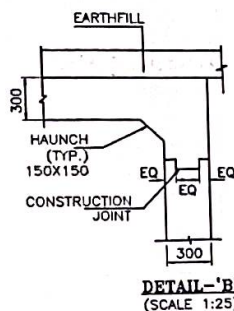
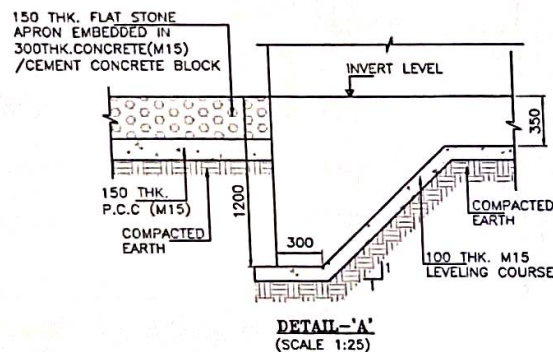
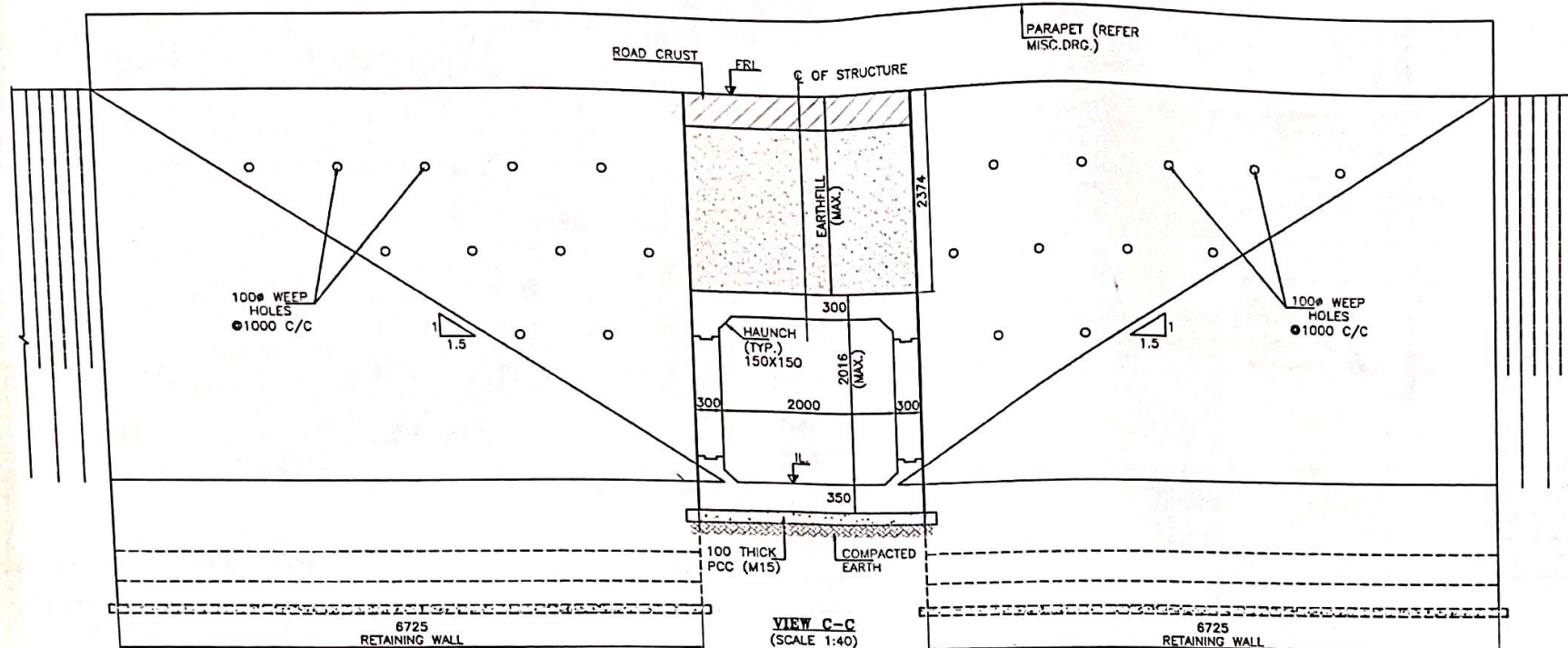


SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

DESIGN AID, NEW DELHI

GOOD FOR CONSTRUCTION

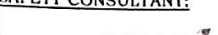
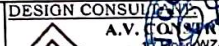
CLIENT: NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	EPC CONTRACTOR KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	AUTHORITY'S ENGINEER ALMOND CONSULTANTS LIMITED, IN A/11, WAZIRPUR CONSULTANTS LIMITED, D/o Lido Section C/O JAYANTA SAKHIA SARKAR NAMCHAR, BORBI NO.2, DIGBOI TINSUKIA, ASSAM-786171	PROOF CONSULTANT: CREATIVE ENGINEERING SERVICES OFFICE NO. 620, SIGNATURE GLOBAL MALL, SECTOR-3, VAISHALI, GHAZIABAD, U.P-201010	SAFETY CONSULTANT: DESIGN AID PLOT NO.54, 3rd FLOOR(FRONT), MASOODPUR DAIRY FARM,VASANT KUNJ, NEW DELHI-110070.	DESIGN CONSULTANT Winst Infra Solution Pvt. Ltd. OFFICE: F-8 ISHAN CORPORATE TOWER, PLOT NO-C-23 SECTOR-13, VASUDEVIA CHAUDHARY, U.P-201012	PROJECT: WIDENING/IMPROVEMENT TO 2-LANE WITH PAVED SHOULDER FROM KM 27+150 (DUGAI GOAN) TO KM 47+882 (LEDO) ON DIBRUGAHAT TO LEDO SECTION WITH PROPOSED MARCHERITA & LEDO BYPASS (BROWN FELD AND GREEN FELD) (2-LANE +PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE (PACKAGE 1) DRAWING TITLE: GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 41+022 <table border="1"> <tr> <th>Date</th><th>Drawn</th><th>Eng.</th><th>Chk.</th><th>Appr.</th><th>No. of</th><th>Drawing Status</th></tr> <tr> <td>JAN 2024</td><td>W.P</td><td>V.S</td><td>A.B</td><td>NTS</td><td>NTS</td><td></td></tr> <tr> <td>Project No.</td><td>Drawing No.</td><td>AVG/NH-38/BC/GAD/11-022/01</td><td>Sheet No.</td><td>82 OF 83</td><td>Rev</td><td>00</td></tr> </table>	Date	Drawn	Eng.	Chk.	Appr.	No. of	Drawing Status	JAN 2024	W.P	V.S	A.B	NTS	NTS		Project No.	Drawing No.	AVG/NH-38/BC/GAD/11-022/01	Sheet No.	82 OF 83	Rev	00
Date	Drawn	Eng.	Chk.	Appr.	No. of	Drawing Status																					
JAN 2024	W.P	V.S	A.B	NTS	NTS																						
Project No.	Drawing No.	AVG/NH-38/BC/GAD/11-022/01	Sheet No.	82 OF 83	Rev	00																					

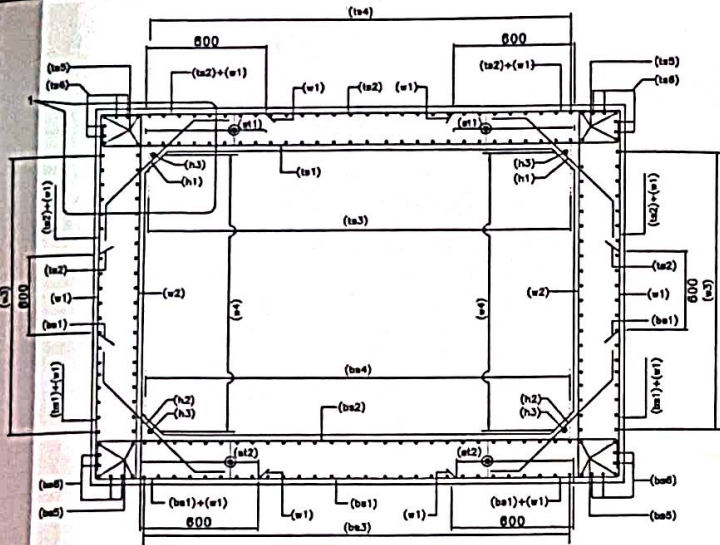


GOOD FOR CONSTRUCTION

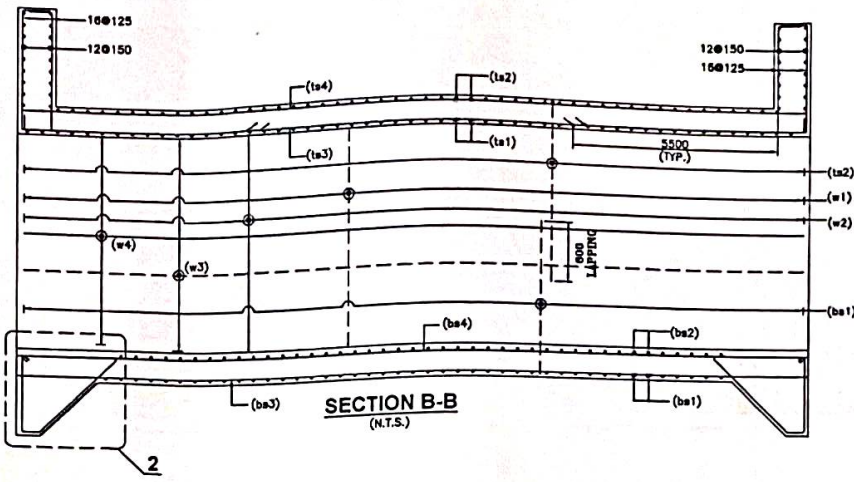
SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

DESIGN AID, NEW DELHI

CLIENT:  NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	EPC CONTRACTOR  KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	AUTHORITY'S ENGINEER  ALMOND GLOBAL INFRA CONSULTANT LIMITED C/O. ATAL BISHARIA SARBAJAN NAGAR, B-1063, NO. 2, DGBCL, INSUKA, ASSAM-786171	PROOF CONSULTANT:  CREATIVE ENGINEERING SERVICES OFFICE NO. 620, SIGNATURE GLOBAL MALL, SECTOR-3, VAISHALI, GHAZIABAD, U.P-201010	SAFETY CONSULTANT:  DESIGN AID PLOT NO.54, 3rd FLOOR(FRONT), MASOODPUR DAIRY FARM,VASANT KUNJ, NEW DELHI-110070,	DESIGN CONSULTANT:  Winst Infra Solution Pvt. Ltd. OFFICE: F-8, USMAN CORPORATE TOWER, PLOT NO-C-23,SECTOR-13, VASUNDHRA CHANDIGARH, U.P-201012	PROJECT: WIDENING/IMPROVEMENT TO 3-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (GOLAI GOAN) TO KM 47+852 (LEDO) ON DISRUGARH TO LEDO SECTION WITH PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE. (PACKAGE-3) DRAWING TITLE: GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 41+022 <table><tr><td>Date</td><td>Drawn</td><td>Check</td><td>Appr.</td><td>Scale</td><td>Drawing Status</td></tr><tr><td>JAN.2024</td><td>W.P.</td><td>V.S.</td><td>A.B.</td><td>MTS</td><td></td></tr><tr><td>Project No.</td><td>Drawing No.</td><td>Sheet No.</td><td>Rev</td><td>NO</td><td></td></tr><tr><td></td><td></td><td>AVC/NH-38/BC/GAD/41+022/01</td><td>03 OF 03</td><td></td><td></td></tr></table>	Date	Drawn	Check	Appr.	Scale	Drawing Status	JAN.2024	W.P.	V.S.	A.B.	MTS		Project No.	Drawing No.	Sheet No.	Rev	NO				AVC/NH-38/BC/GAD/41+022/01	03 OF 03		
Date	Drawn	Check	Appr.	Scale	Drawing Status																									
JAN.2024	W.P.	V.S.	A.B.	MTS																										
Project No.	Drawing No.	Sheet No.	Rev	NO																										
		AVC/NH-38/BC/GAD/41+022/01	03 OF 03																											



SECTION A-A
(N.T.S.)



SECTION B-B
(N.T.S.)

LEGEND:-

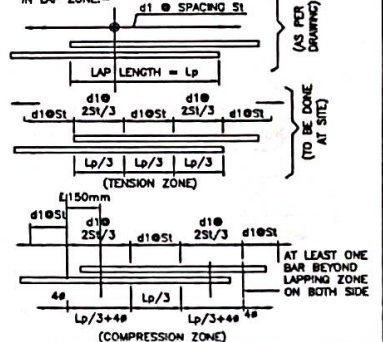
TOP FACE BAR	_____
BOTTOM FACE BAR	_____

BOX REIN. SCHEDULE

SL.NO.	BAR MARK	BAR SHAPE	DIAMETER	SPACING
1	ts1		12	160
2	ts2		10	160
3	ts3		8	200
4	ts4		10	200
5	ts5		12	2x4 Nos.
6	ts6		12	2x4 Nos.
7	w1		10	160
8	w2		10	160
9	w3		10	200
10	w4		8	200
11	bs1		10	160
12	bs2		10+8	160
13	bs3		10	200
14	bs4		8	200
15	bs5		12	2x4 Nos.
16	bs6		12	2x4 Nos.
17	h1		10	160
18	h2		10	160
19	h3		10	1x4 Nos.
20	cs1		12	10 Nos.
21	cs2		10	200
22	st1		8	200 c/c (L-L) 160 c/c (T-T) DIRECTION
23	st2		8	200 c/c (L-L) 160 c/c (T-T) DIRECTION

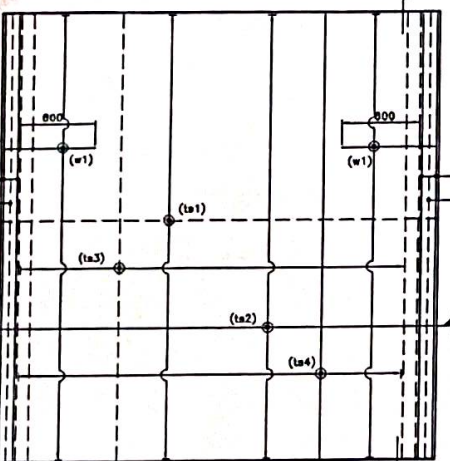
NOTES:-

- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS UNLESS OTHERWISE MENTIONED.
 - DRAWING SHOULD NOT BE SCALED ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
 - ALL REINFORCING BARS SHALL BE THERMO MECHANICALLY TREATED (TMT) BARS (GRADE DESIGNATION Fe-500) CONFORMING TO IS:1786 STANDARDS.
 - MINIMUM CLEAR COVER TO OUTERMOST REINFORCEMENT SHALL BE AS FOLLOWS:-
 - a) TOP SLAB - 45mm
 - b) BOTTOM SLAB - 75mm
 - c) SIDE WALL (EARTH SIDE) - 75mm
 - d) SIDE WALL (INNER SIDE) - 45mm
- OVERLAPPING FOR SPACING OF REINFORCEMENT SHALL BE AS PER CLAUSE NO.18.2.3. LAP LENGTH SHALL NOT BE LESS THAN 56d. ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:-

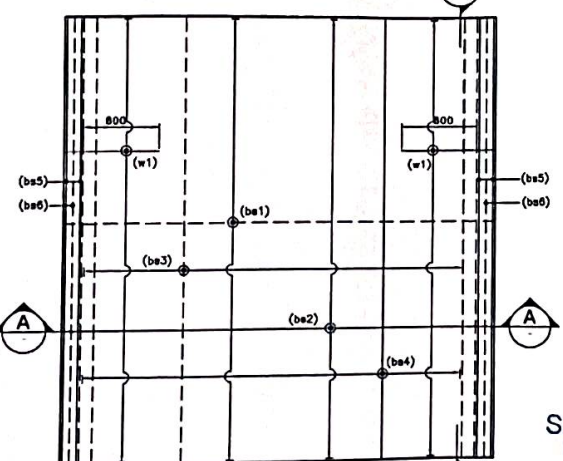


TRAFFIC DIRECTION

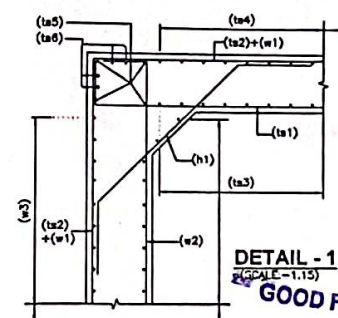
TRAFFIC DIRECTION



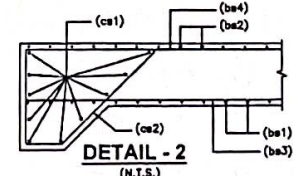
REINFORCEMENT DETAILS OF
TOP SLAB
(HAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
(N.T.S.)



REINFORCEMENT DETAILS OF
BOTTOM SLAB
(HAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
(N.T.S.)



DETAIL - 1
(SCALE - 1:15)



DETAIL - 2
(N.T.S.)

SAFETY AUDIT

(As per Article 10.1 of CPC Act, 1933 and HEIGHT OF WALLS ARE AT SAME POINT. BAR BENDING SCHEDULE SHOULD BE STRICTLY FOLLOW DURING THE TIME OF EXECUTION IF IN CASE ANY CHANGES AT SITE KINDLY DISCUSS IT WITH ENGINEER IN CHARGE.

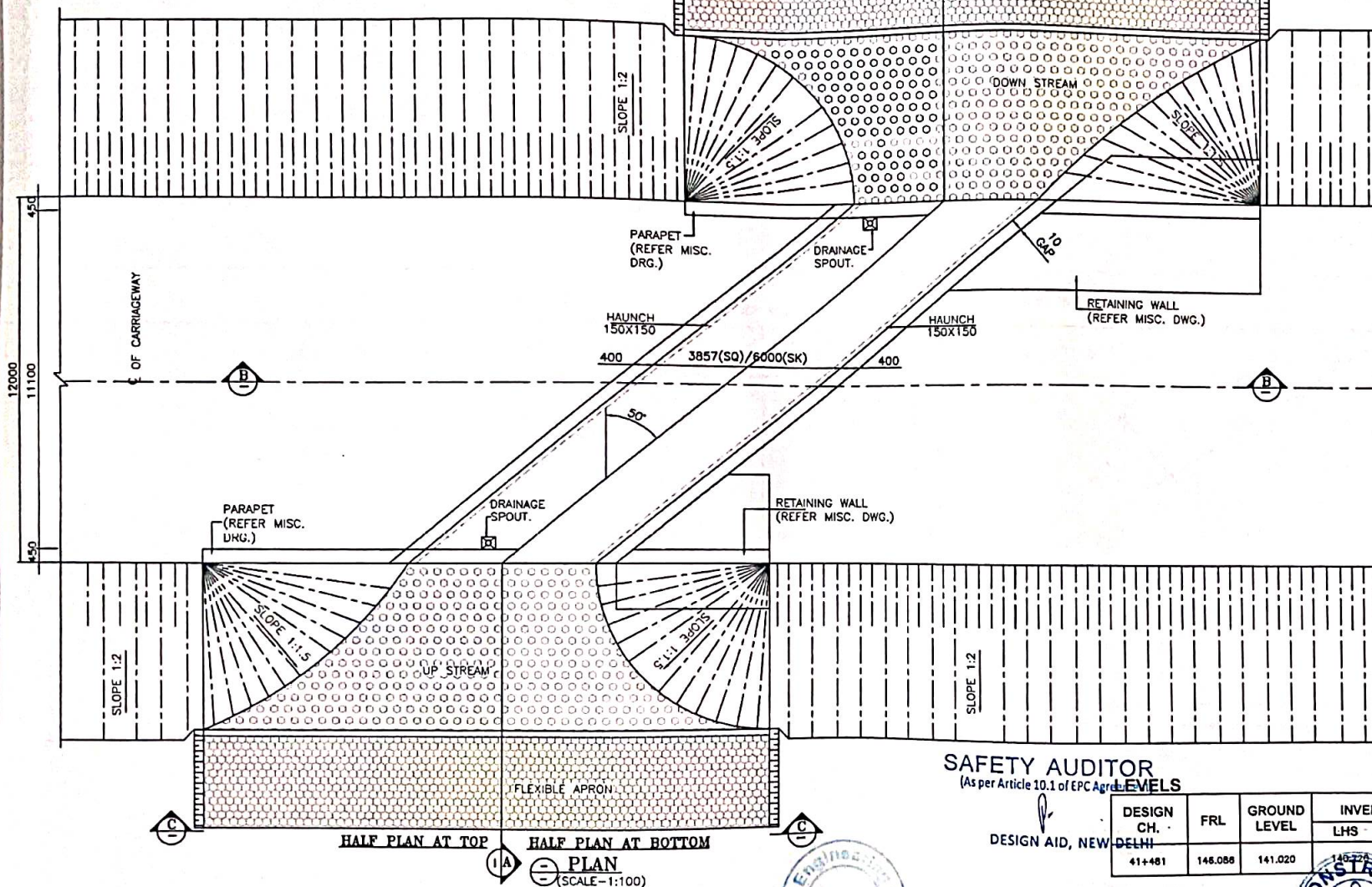
DESIGN AID, NEW REFERENCE DRAWING:-

- GENERAL ARRANGEMENT DRAWING. AVC/NH-38/BOX/CAD/41+022/01

CLIENT: NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	EPC CONTRACTOR: KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE, BLOCK, 2ND FLOOR, MATIGUDA 734010	AUTHORITY ENGINEER: ALMONDZ GLOBAL INFRA CONSULTANT LIMITED IN INDIA WITH ATOLTEZA CONSULTING PRIVATE LIMITED. C/O. JAYANTA SARKAR, SAFBAJANIN NARAYAN, BORDO NO.2, DIGBOI, TINSUKIA, ASSAM-786171	PROOF CONSULTANT: CREATIVE ENGINEERING SERVICES OFFICE NO. 620, SIGNATURE GLOBAL MALL, SECTOR-3, VAISHALI, GHAZIABAD, U.P-201010	SAFETY CONSULTANT: DESIGN AID PLOT NO.54, 3rd FLOOR(FRONT), MASOODPUR DAIRY FARM,VASANT KUNJ, NEW DELHI-110070,	DESIGN CONSULTANT: Winst Infra Solution Pvt. Ltd. OFFICE P-4, BHAWAN CORPORATE TOWER, PLOT NO-C-33, SECTOR-13, VASINDHRA CHATRAPATI, U.P-201012	PROJECT: WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 37-150 (GOLAI GOAN) TO KM 47+882 (LEDO) ON DISBURGH TO LEDO SECTION WITH PROPOSED MARGHERITA & LEDO BYPASS (SHOWFIELD AND GREEN FIELD) (2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE (PACKAGE B)
DRAWING TITLE: REINFORCEMENT DETAIL OF BOX CULVERT AT CH. 41+032						
Date: JAN-2024 Project No.:	Drawn By: W.P. Drawing No.:	Des. V.S. App. A.B. Scale: NTS	Chk. A.B. App. NTS	Sheet No.: 01 OF 01 Rev. RD	Drawing Status:	

LEGEND:-
 FRL FINISHED ROAD LEVEL
 IL INVERT LEVEL
 LVL. LEVEL
 FGL. EXISTING GROUND LEVEL

FRL CAMBER & LOCATION IS TO BE MATCHED WITH HIGHWAY ALIGNMENT DRAWING.



GOOD FOR CONSTRUCTION

REFERENCE DRAWINGS:-
 1. REINFORCEMENT DETAIL OF BOX CULVERT
 AVC/NH-38/BOX/REINF./41+481/02

SAFEY AUDITOR
 (As per Article 10.1 of EPC Agreement)

DESIGN AID, NEW DELHI

DESIGN CH.	FRL	GROUND LEVEL	INVERT LEVEL		VERTICAL CLEARANCE (MAX.)	EARTH FILL (MAX.)	EARTH FILL (MIN.)
			LHS	RHS			
41+481	146.086	141.020	140.732	140.732	4.012m	0.954m	0.815m

HALF PLAN AT TOP
HALF PLAN AT BOTTOM
PLAN
 (SCALE-1:100)

CLIENT:



NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.

EPC CONTRACTOR

KAMAC ENGINEERS PVT.LTD
 F0201, CITY CENTER OFFICE
 BLOCK, 2ND FLOOR,
 MATIGARA 734010

AUTHORITY'S ENGINEER

ALMOND CONSULTANTS
 LIMITED, IN JV WITH AYOUEFA
 CONSULTANTS LIMITED.
 C/O JAYANTA SANKAR SARKAR ANIN
 NAMO FAR, BORDO RD 2, D/GBOL
 TINSUKIA, ASSAM-786171

PROOF CONSULTANT:

CREATIVE ENGINEERING SERVICES
 OFFICE NO: 620, SIGNATURE GLOBAL
 MALL, SECTOR-3,
 VAISHALI, GHAZIABAD, U.P-201010

SAFETY CONSULTANT:

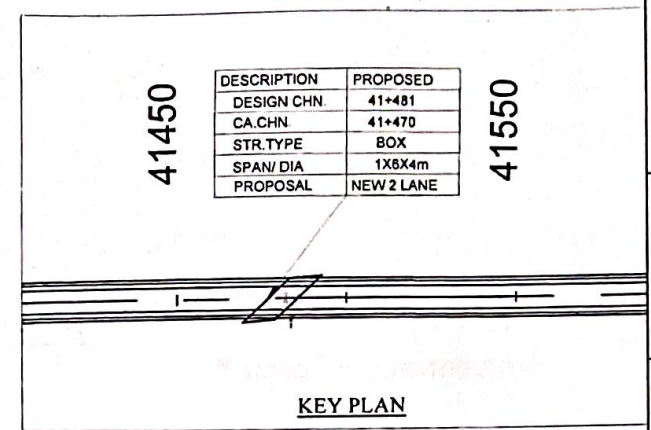
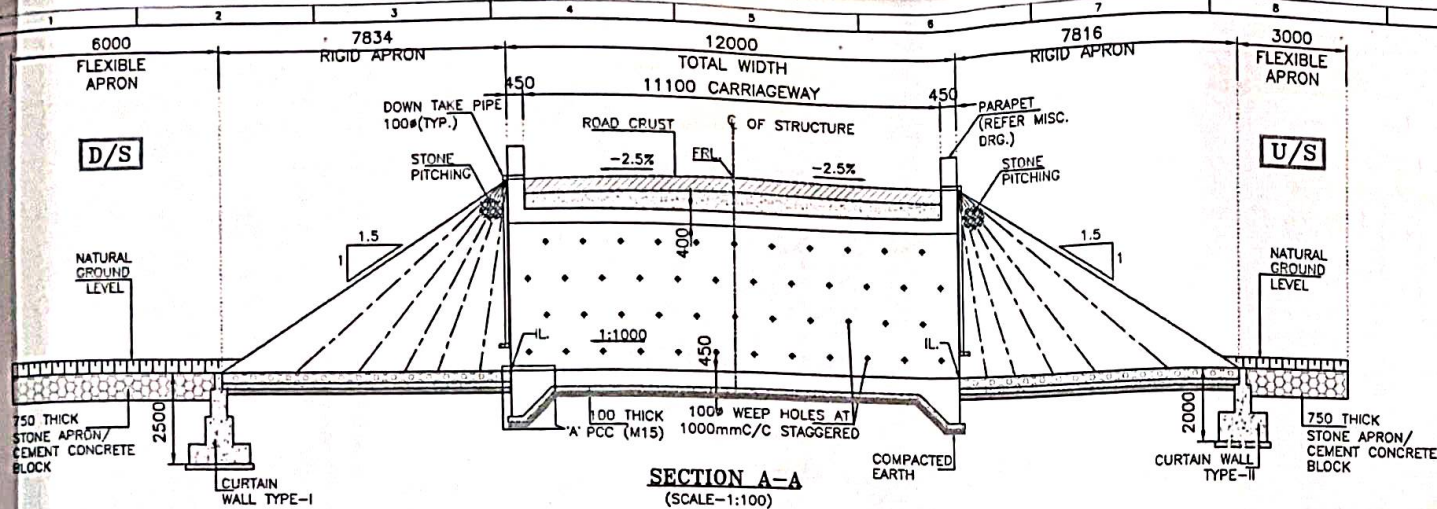
DESIGN AID
 PLOT NO.54, 3rd FLOOR(FRONT),
 MASOODPUR DAIRY FARM,VASANT KUNJ,
 NEW DELHI-110070,

DESIGN CONSULTANT:

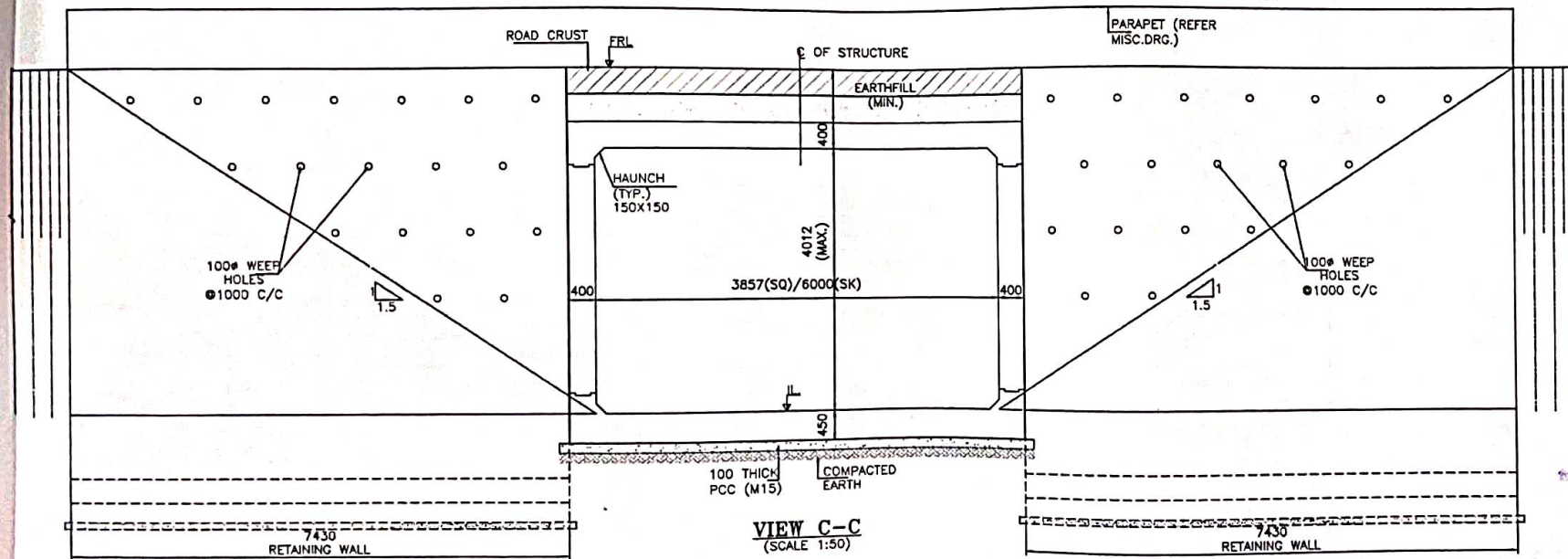
Winst Infra Solution Pvt. Ltd.
 OFFICE: P-8, ISHAAN CORPORATE
 TOWER, PLOT NO-C-23, SECTOR-13,
 VASANT KUNJ, NEW DELHI-110017

PROJECT:
 WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 37+145
 (DOLAI GOAN) TO KM 47+862 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH
 PROPOSED MAROHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD)
 (2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC
 MODE (PACKAGE-B)

DRAWING TITLE:-							
GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 41+481							
Date	Drw	Des	Chk	App	Scale	Drawing Status	
JAN. 2024	W.P.	V.S	A.B		NTS		
Project No.	Drawing No.			Sheet No.	Rev.		
	AVC/NH-38/BOX/GAD/41+481/01			1 OF 3	NO		



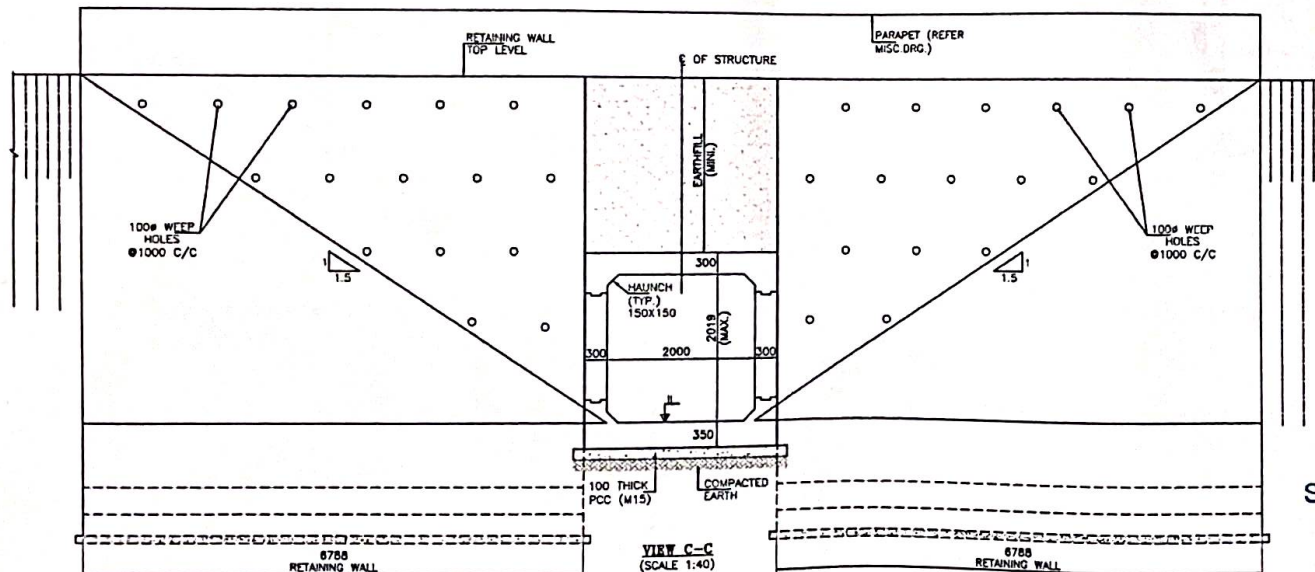
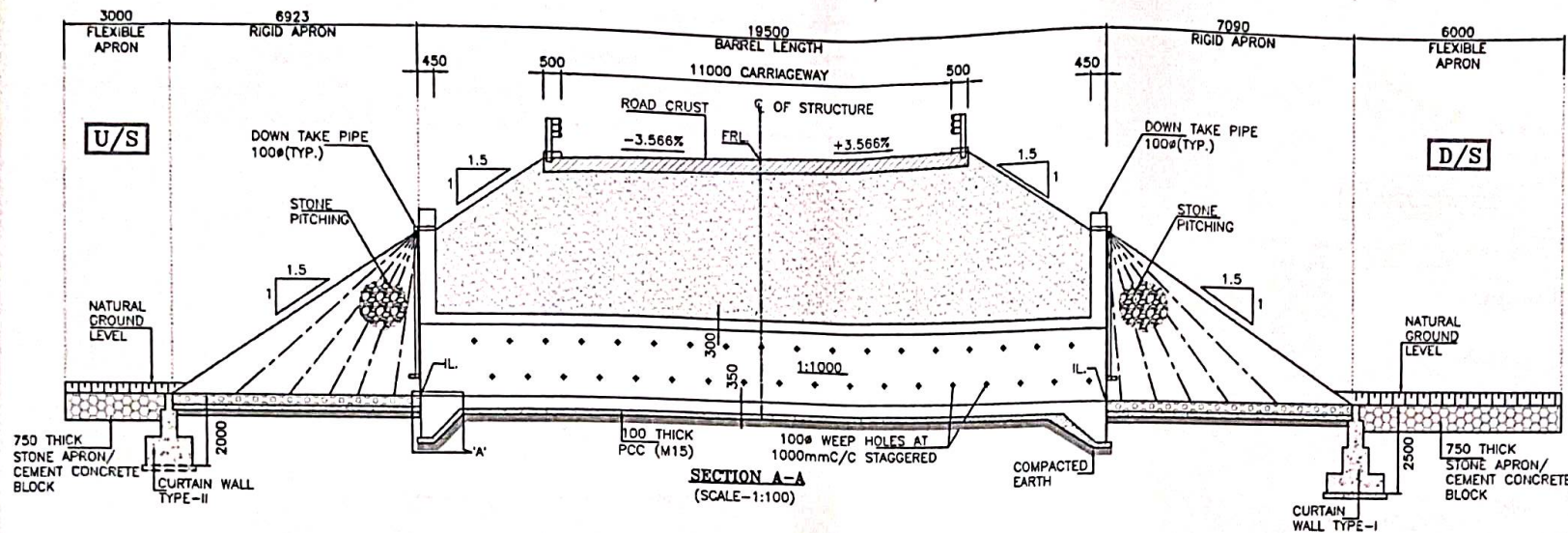
DESCRIPTION	PROPOSED
DESIGN CHN.	41+481
CA.CHN.	41+470
STR.TYPE	BOX
SPAN/ DIA	1X6X4m
PROPOSAL	NEW 2 LANE



SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

DESIGN AID, NEW DELHI

CLIENT: NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	EPC CONTRACTOR: KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	AUTHORITY'S ENGINEER: ALMONDZ GLOBAL INFRA CONSULTANT LIMITED AND WITH AYOJEZA CONSULTANT PRIVATE LIMITED. CO-JAYKAR, SHYAM BARBAJANIN NAMGHAR, BORAIL NO. 2, DIGLOI, DISURMA, ASSAM-786171	PROOF CONSULTANT: CREATIVE ENGINEERING SERVICES OFFICE NO. 620, SIGNATURE GLOBAL MALL, SECTOR-3, VAISHALI, GHAZIABAD, U.P-201010	SAFETY CONSULTANT: DESIGN AID PLOT NO.54, 3rd FLOOR(FRONT), MASOODPUR DAIRY FARM,VASANT KUNJ, NEW DELHI-110070,	DESIGN CONSULTANT: Winst Infra Solution Pvt. Ltd. OFFICE P-8, 8TH FLOOR CORPORATE TOWER, PLOT NO-C-22,SECTOR-13, VASUPURHDA CHA, TARN TARN, U.P-201012	PROJECT: WIDENING/IMPROVEMENT TO 2-LANE WITH PAVED 8'-OLLDER FROM KM 27+150 (GOLAI GOAN) TO KM 47+882 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (4-LANE-PS) OF NH-38 IN TIBHURA DISTRICT IN THE STATE OF ASSAM ON EPC MODE (PACKAGE 5)
DRAWING TITLE: GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 41+481						
Date JAN.2024 Project No.	Draw. W.P. V.S. Drawing No.	Des. V.S. A.B. App. MTS Rev.	Sheet No. 1 OF 3	Rev. RD	Drawing Status.	



SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

DESIGN AID, NEW DELHI

GOOD FOR CONSTRUCTION

CLIENT:



NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.

EPC CONTRACTOR



KAMAC ENGINEERS PVT. LTD.
F0201, CITY CENTER OFFICE
BLOCK, 2ND FLOOR,
MATIGARA 734010

AUTHORITY'S ENGINEER

ALMONDZ GLOB. DIMERA CONSULTANT LIMITED IN U WITH A VOLDEZA CONSULTANT PRIVATE LIMITED.

C/O JAYANTA BAKSI, SARBAJANIN
NANGHAR, SUBIL NO. 2, DIGIOI,
TINSUKIA, ASSAM-786171

PROOF CONSULTANT:

CREATIVE ENGINEERING SERVICES
OFFICE NO. 620, SIGNATURE GLOBAL
MALL, SECTOR-3,
VAISHALI, GHAZIABAD, U.P-201010

SAFETY CONSULTANT:



DESIGN AID
PLOT NO.54, 3rd FLOOR(FRONT),
MASOODPUR DAIRY FARM,VASANT KUNJ,
NEW DELHI-110070,

DESIGN CONSULTANT:

A.V. CONSTRUCTION
1st Floor, WZ-1240
Palam Extension, Biscuit
Ashram Wall, New
Delhi 110045

Winst Infra Solution Pvt. Ltd.
OFFICE F-8, BHANU CORPORATE
TOWER, PLOT NO-C-23 SECTOR-13,
VASI, MIDHANA CHANDRABAD, U.P-201012

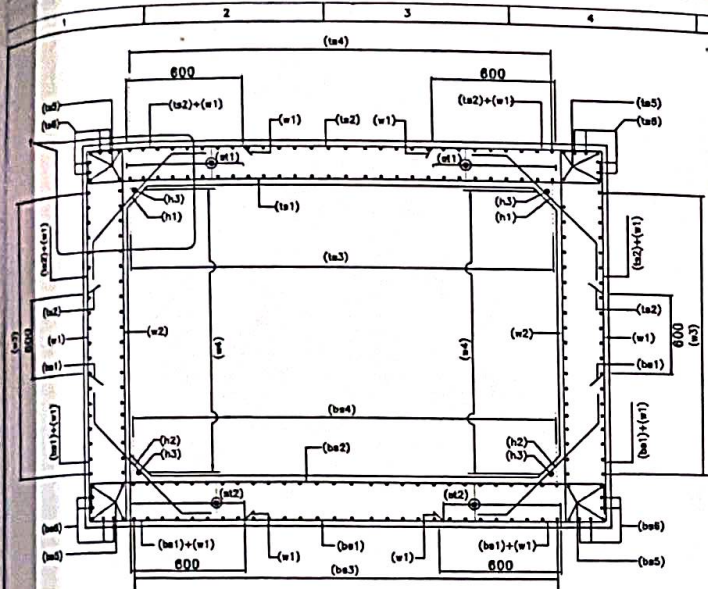
PROJECT:

WIDENING/IMPROVEMENT TO 3-LANE LANE WITH PAVED SHOULDER FROM KM 37-150 (GOLAN GOAN) TO KM 47-882 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE (PACKAGE-B)

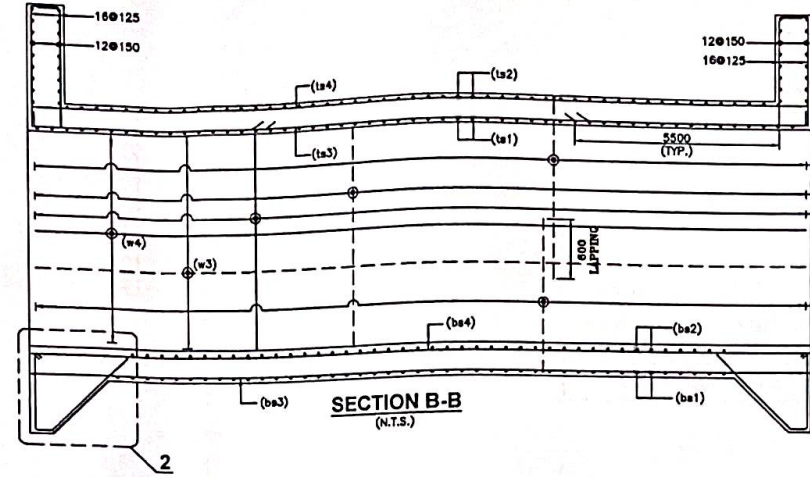
DRAWING TITLE:

GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 42+108

Date	Drw.	Des.	Chk.	App.	Scale	Drawing Status
JAN 2023	W.P.	V.S.	A.D.		MTS	
Project No.	Drawing No.					Sheet No. 82 OF 83
						Rev. 00



SECTION A-A
(N.T.S.)



SECTION B-B
(N.T.S.)

LEGEND:-

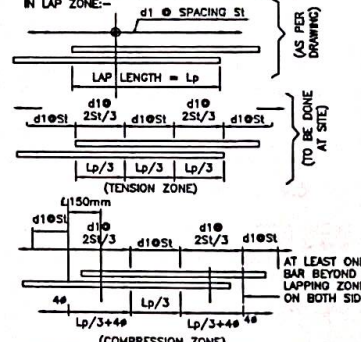
TOP FACE BAR	_____
BOTTOM FACE BAR	-----

BOX REINF. SCHEDULE

S.L.NO.	BAR MARK	BAR SHAPE	DIAMETER	SPACING
1	ts1		12+8	150
2	ts2		10	150
3	ts3		10	200
4	ts4		10	200
5	ts5		12	2x4 Nos.
6	ts6		12	2x4 Nos.
7	w1		10	150
8	w2		12	150
9	w3		10	200
10	w4		8	200
11	bs1		10	150
12	bs2		12+10	150
13	bs3		10	200
14	bs4		10	200
15	bs5		12	2x4 Nos.
16	bs6		12	2x4 Nos.
17	h1		10	150
18	h2		10	150
19	h3		10	1x4 Nos.
20	cs1		12	10 Nos.
21	cs2		10	200
22	st1		10	200 c/c (L-L) 150 c/c (T-T) DIRECTION
23	st2		10	200 c/c (L-L) 150 c/c (T-T) DIRECTION

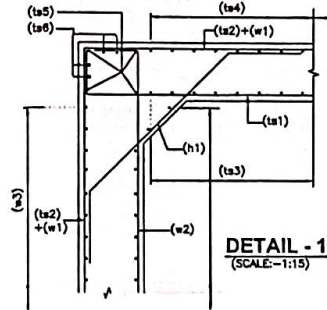
NOTES:-

- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS UNLESS OTHERWISE MENTIONED.
- DRAWING SHOULD NOT BE SCALED ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
- ALL REINFORCING BARS SHALL BE THERMO MECHANICALLY TREATED (TMT) BARS (GRADE DESIGNATION Fe-500) CONFORMING TO IS:1786 STANDARDS.
- MINIMUM CLEAR COVER TO OUTERMOST REINFORCEMENT SHALL BE AS FOLLOWS:-
 - a) TOP SLAB - 45mm
 - b) BOTTOM SLAB - 75mm
 - c) SIDE WALL (EARTH SIDE) - 75mm
 - d) SIDE WALL (INNER SIDE) - 45mm
- OVERLAPPING FOR SPACING OF REINFORCEMENT SHALL BE AS PER CLAUSE NO.15.2.5. LAP LENGTH SHALL NOT BE LESS THAN 50φ. ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:-

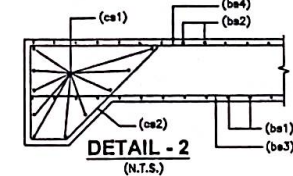


(TENSION ZONE)

(COMPRESSION ZONE)



DETAIL - 1
(SCALE:-1:15)



DETAIL - 2
(N.T.S.)

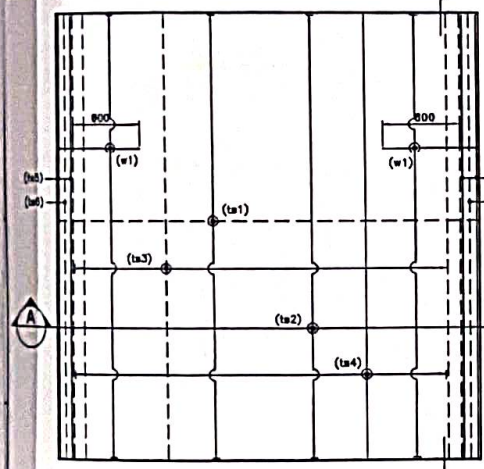
- ANCHORAGE LENGTH OF BOX SHALL BE TAKEN AS 40φ AS PER IRC:112.
- FOR UNFAVORABLE BOND CONDITIONS THE FACTOR 40 SHOULD BE MULTIPLIED BY FACTOR OF 1.43.
- CENTER LINE OF OVERLAPPING BAR bs1 & ts2 IN WALL & MID HEIGHT OF WALLS ARE AT SAME POINT.
- BAR BENDING SCHEDULE SHOULD BE STRICTLY FOLLOW DURING THE TIME OF EXECUTION IF IN CASE ANY CHANGES AT SITE KINDLY DISCUSS IT WITH ENGINEER IN CHARGE.

REFERENCE DRAWING:-

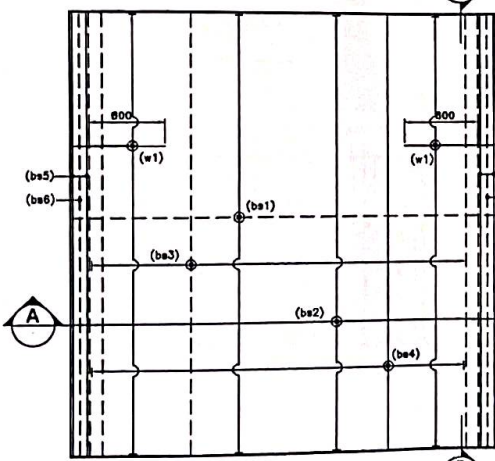
- GENERAL ARRANGEMENT DRAWING. AVG/NH-38/BOX/GAD/42+108/01

← TRAFFIC DIRECTION →

← TRAFFIC DIRECTION →



REINFORCEMENT DETAILS OF
TOP SLAB
(LAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
(N.T.S.)



REINFORCEMENT DETAILS OF
BOTTOM SLAB
(LAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
(N.T.S.)

SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

DESIGN AID, NEW DELHI

REFERENCE DRAWING:-

- GENERAL ARRANGEMENT DRAWING. AVG/NH-38/BOX/GAD/42+108/01

CLIENT:



NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.

EPC CONTRACTOR



KAMAC ENGINEERS PVT.LTD
F0201, CITY CENTER OFFICE
BLOCK, 2ND FLOOR, MATIGARA 734010

AUTHORITY'S ENGINEER

ALMONDE GLOBAL INFRA CONSULTANT LIMITED INDIA
CONSULTANT PRIVATE LIMITED.
C/O JAYANTA BABIA, SARBASAJIN NANGHAR, BORBIL NO.2, DIGBOI, TINSUKIA, ASSAM-786171

PROOF CONSULTANT:

CREATIVE ENGINEERING SERVICES
OFFICE NO: 620, SIGNATURE GLOBAL MALL, SECTOR-3, VAISHALI, GHAZIABAD, U.P-201010

SAFETY CONSULTANT:



DESIGN AID
PLOT NO.54, 3rd FLOOR(FRONT), MASOODPUR DAIRY FARM,VASANT KUNJ, NEW DELHI-110070,

DESIGN CONSULTANT:



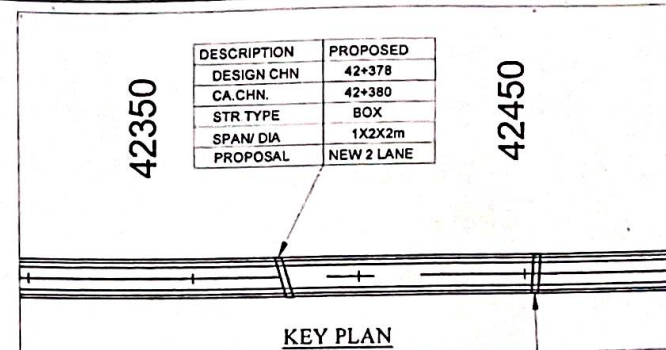
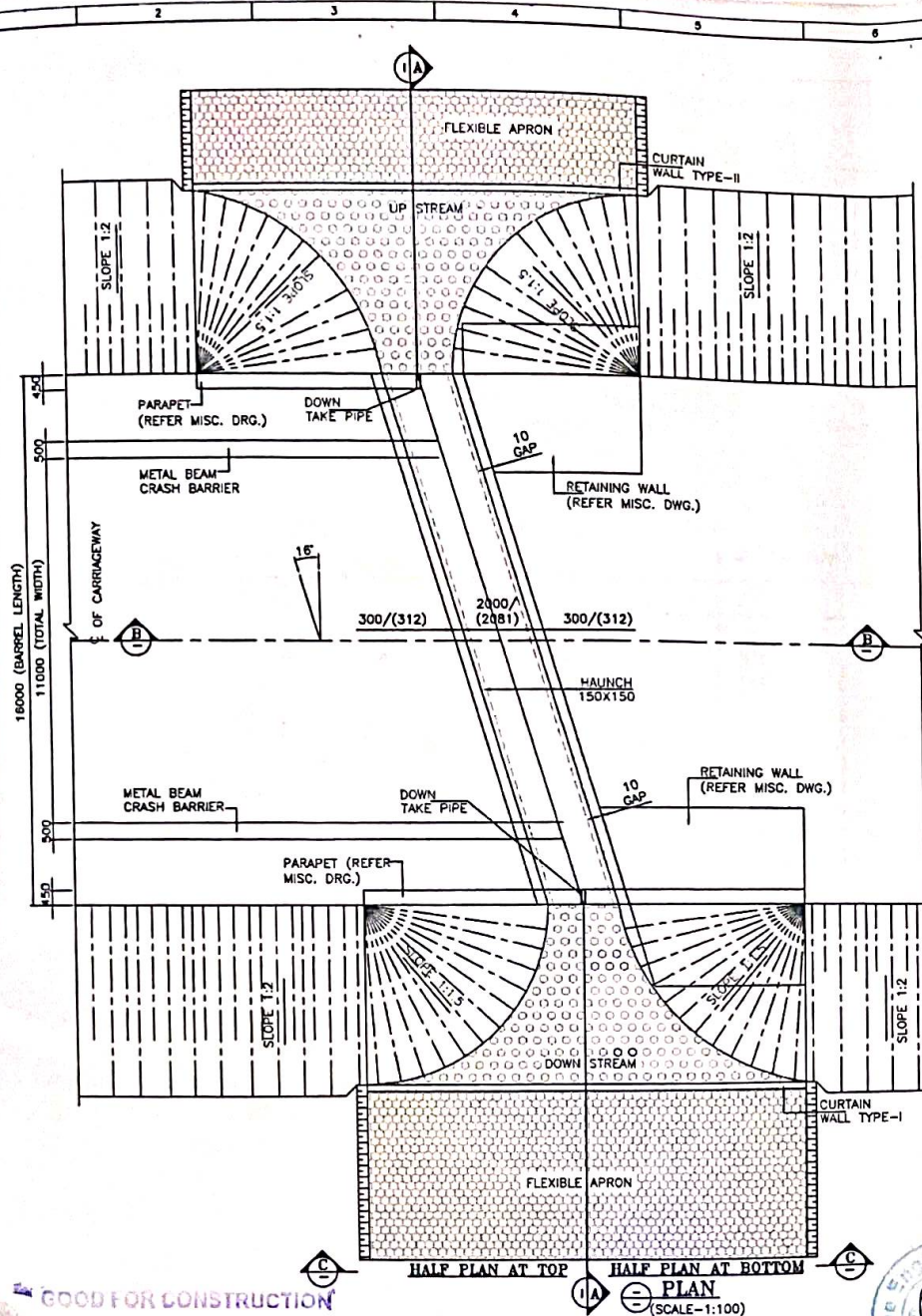
Winst Infra Solution Pvt. Ltd.
OFFICE: F-8, ISHAAN CORPORATE TOWER, PLOT NO-C-23, SECTOR-13, VASUNDERPURA, GHAZIABAD, U.P-201012

PROJECT:

WIDENING/IMPROVEMENT TO 2-LANE WITH PAVED SHOULDER FROM KM 27+150 (DOLAJ GADW) TO KM 47+882 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH PROPOSED MARGHERITA & LEDO BYPASS (SHOWFIELD AND GREEN FIELD) (2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE (PACKAGE-3)

DRAWING TITLE: REINFORCEMENT DETAIL OF BOX CULVERT AT CH. 42+108

Date	Drw.	W.P.	Des.	Chk.	App.	Scale	Drawing Status
JAN.2024			V.S.	A.D.		N.T.S.	
Project No.	Drawing No.	AVG/NH-38/BOX/REIN/42+108/01		Sheet No.	81 OF 81	Rev.	RD



LEVELS

DESIGN CH.	FRL	GROUND LEVEL	INVERT LEVEL		VERTICAL CLEARANCE (MAX.)	EARTH FILL (MAX.)	EARTH FILL (MIN.)
			LHS	RHS			
42+378	145.850	140.585	140.297	140.285	2.010m	3.049m	1.883m

NOTES:-

- ALL DIMENSIONS ARE IN MILLIMETER, LEVELS ARE IN METER AND CHAINAGE ARE IN KILOMETERS UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE RELEVANT PLAN AND PROFILE DRAWING OF ROAD.
- GRADE OF CONCRETE:-
 - M30-FOR RCC BOX CELL STRUCTURE.
 - M15-FOR PCC AND LEVELING COURSE.
 - M30-PARAPET
- GRADE OF STEEL - F₂₅₀.
- THE FOLLOWING LOADS HAVE BEEN CONSIDERED IN THE DESIGN:-
 - ONE LANE, TWO LANE AND THREE LANE OF CLASS A
 - ONE LANE OF CLASS A IN ADDITION OF ONE LANE OF CLASS 70R WHEEL OR ONE LANE OF 70R TRACKED WHICHEVER IS GOVERNS.
- BACKFILL MATERIAL BEHIND END WALL SHALL BE SELECTED GRANULAR SOIL HAVING PROPERTIES
MAX DRY DENSITY = 1850-2280kg/m³
OPTIMUM MOISTURE CONTENT = 7-15
AS PER IRC78-2014 AND MORTH SPECIFICATION.
- THE FRL SHOWN IN THE DRAWING SHALL BE VERIFIED WITH CORRESPONDING PLAN AND PROFILE DRAWING BEFORE EXECUTION, IF THERE IS ANY VARIATION SHALL BE BROUGHT TO THE NOTICE OF ENGINEER.
- THE DIMENSION AND LEVEL ARE SUBJECT TO CHANGE AS PER SITE CONDITION AND DETAILED DESIGN.
- BACKFILL TO BE DONE AND COMPACTED FROM BOTH SIDE SIMULTANEOUSLY.
- 600MM THICK, FILTER MATERIAL BEHIND RETAINING WALL SHALL BE LAID AS PER APPENDIX 6 OF IRC 78-2014.
- 150MM THICK CEMENT CONCRETE WEARING COAT SHALL BE PROVIDED.
- 100MM DIA P.V.C. PIPE AT SPACING 1000MM/c IN HORIZONTAL/VERTICAL DIRECTION SHALL BE PROVIDED UP TO 150MM ABOVE GROUND LEVEL FOR WEEP HOLES IN RETAINING WALL.
- SBC SHALL BE 14t/m² AND SAME SHALL BE ENSURED AT SITE BY ANY SUITABLE METHOD.
- AS PER MORTH SECTION-2500, WHERE THE REQUIRED SIZE OF BOULDERS ARE NOT AVAILABLE ECONOMICALLY, CEMENT CONCRETE BLOCKS OF EQUIVALENT WEIGHT SHALL BE USED. THE GRADE OF CONCRETE SHALL BE M15 NOMINAL MIX. CEMENT CONCRETE BLOCK SHALL BE PREFERRED WHERE PRACTICABLE.
- CHOOSE ANY SUITABLE METHOD TO ACHIEVE THE REQUIRED SBC AS PER SITE.
- EXPOSURE CONDITION IS MODERATE.

LEGEND:-
FRL FINISHED ROAD LEVEL
IL INVERT LEVEL
LVL LEVEL
EGL EXISTING GROUND LEVEL

FRL CAMBER & LOCATION IS TO BE MATCHED WITH HIGHWAY ALIGNMENT DRAWING.

SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

DESIGN AID, NEW DELHI

REFERENCE DRAWINGS:-
1. REINFORCEMENT DETAIL OF BOX CULVERT
AVC/NH-38/BOX/REINF/42+378/02

NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.

KAMAC ENGINEERS PVT.LTD
F0201, CITY CENTER OFFICE
BLOCK, 2ND FLOOR,
MATIGARA 734010

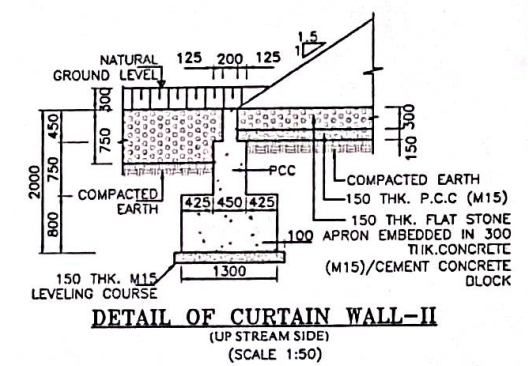
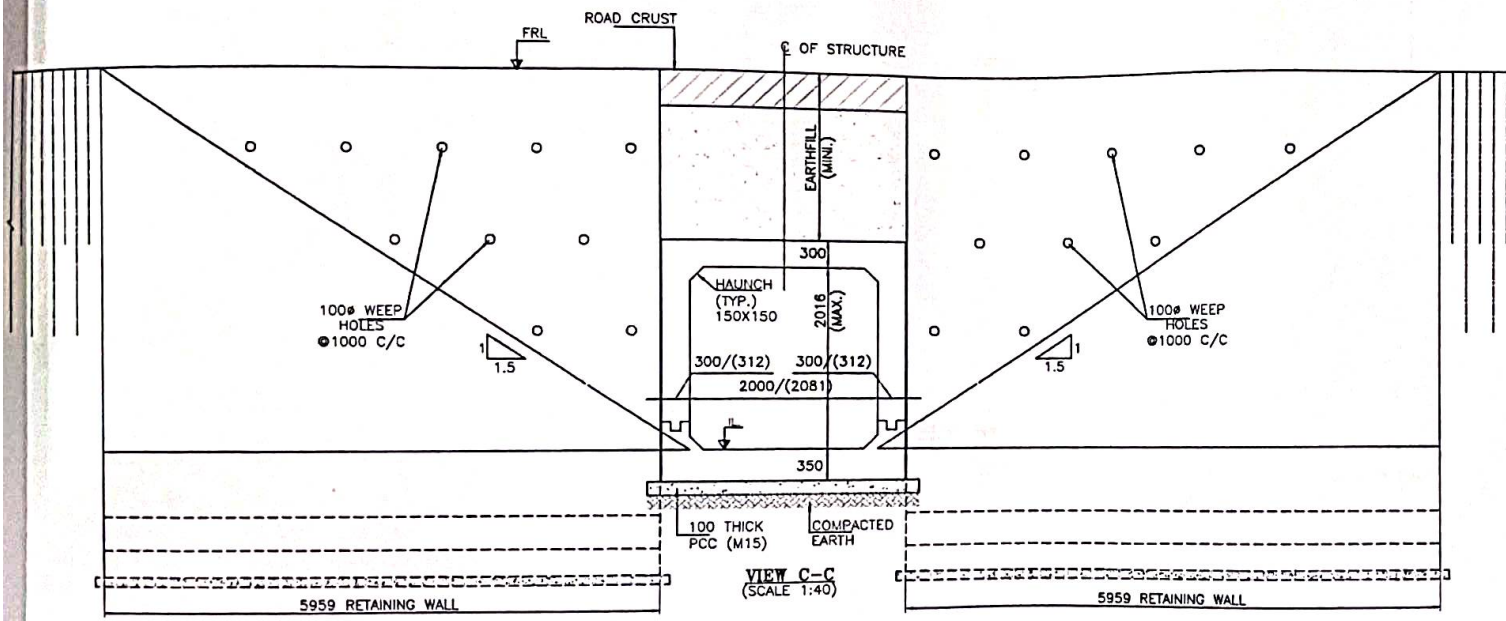
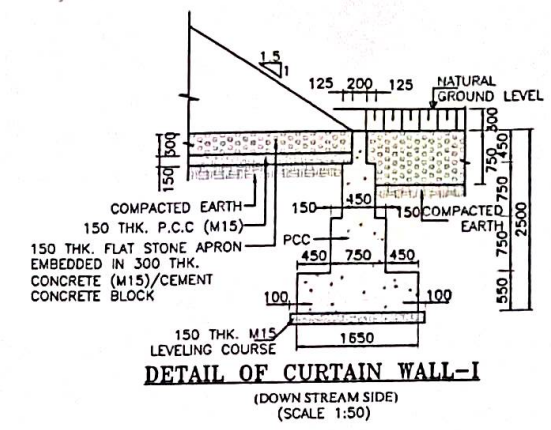
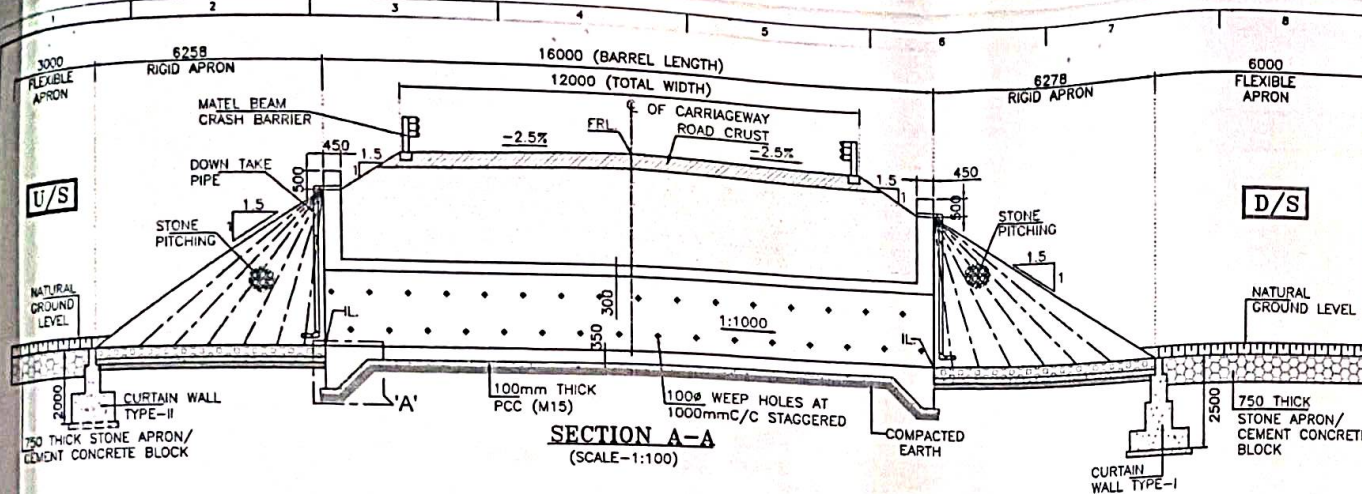
ALMOND & CO. INFRA CONSULTANT PRIVATE LIMITED
C/O JAYANTA SANKAR SARKAR
NANGHAR, BORBI, NO.2, DIGBOI,
TINSUKIA, ASSAM-786171

CREATIVE ENGINEERING SERVICES
OFFICE NO. 620, SIGNATURE GLOBAL
MALL, SECTOR-3,
VAISHALI, GHAZIABAD, U.P.-201010

DESIGN AID
PLOT NO.54, 3rd FLOOR(FRONT),
MASOODPUR DAIRY FARM,VASANT KUNJ,
NEW DELHI-110070,

Winst Infra Solution Pvt. Ltd.
OFFICE: F-4, 18TH ANN CORPORATE
TOWER, PLOT NO-C-23, SECTOR-13,
VASUNDHRA CHANDEL, U.P.-201012

WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27-150 (GOLAI DOUN) TO KM 47-482 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH PROPOSED MARCHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (LANE-PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE (PACKAGE 3)
DRAWING TITLE:- GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 42+378
Date: JAN/2024
Project No.:
Drawing No.: AVS/NH-38/BOX/GADH/2+378/01
Sheet No.: 01 OF 03
Drawing Status: RO

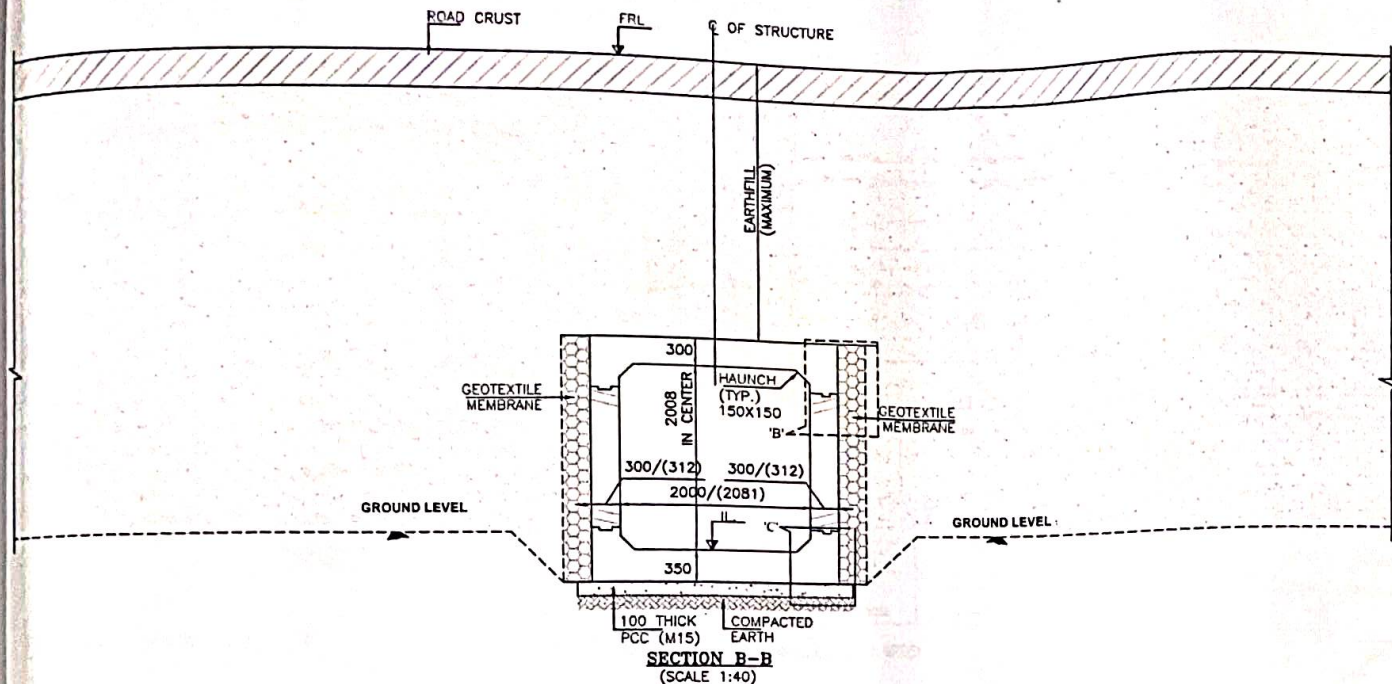


SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

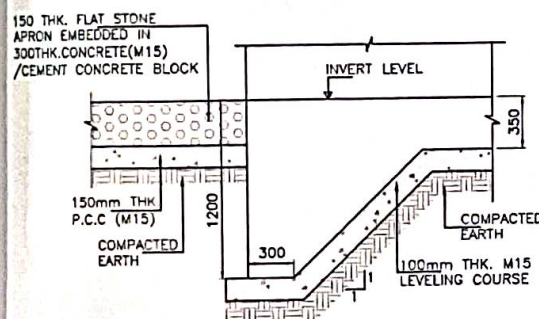
DESIGN AID, NEW DELHI

GOOD FOR CONSTRUCTION

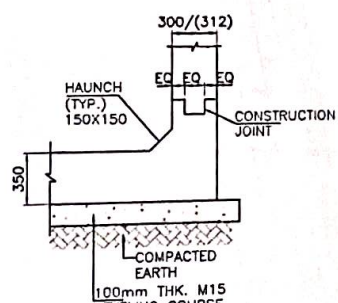
CLIENT: NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	EPC CONTRACTOR KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	AUTHORITY'S ENGINEER ALMONDZ CIVIL & MECHANICAL CONSULTANTS PRIVATE LIMITED. C/O JAYANTA SENGU, ASSAM NAGHAR, BORSA, 781001, DISBOL, TINSUKIA, ASSAM-786171	PROOF CONSULTANT: CREATIVE ENGINEERING SERVICES OFFICE NO. 620, SIGNATURE GLOBAL MALL, SECTOR-3, VAISHALI, GHIAZIABAD, U.P-201010	SAFETY CONSULTANT: DESIGN AID PLOT NO.54, 3rd FLOOR(FRONT), MASOODPUR DAIRY FARM,VASANT KUNJ, NEW DELHI-110070.	DESIGN CONSULTANT: Winst Infra Solution Pvt. Ltd. OFFICE: F-8, ISHAAN CORPORATE TOWER, PLOT NO-C-23, SECTOR-19, VASIBHOPIA, GHAZIABAD, U.P-201012	PROJECT: WIDENING/IMPROVEMENT TO 3-LANE LANE WITH PAVED SHOULDER FROM KM 37+150 (GOLAI GAON) TO KM 47+882 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (2-LANE+PB) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE (PACKAGE 9) DRAWING TITLE: GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAMPADE 42+378 <table border="1"> <thead> <tr> <th>Date</th> <th>Drw.</th> <th>Eng.</th> <th>Chk.</th> <th>App.</th> <th>Scale</th> <th>Drawing Status</th> </tr> </thead> <tbody> <tr> <td>JAN 2024</td> <td>W.P.</td> <td>V.S.</td> <td>A.D.</td> <td></td> <td>NTS</td> <td></td> </tr> </tbody> </table> Project No. Drawing No. Sheet No. Rev AVC/NH-38/BC/IGAD/42+378/01-02 OF 03 RO	Date	Drw.	Eng.	Chk.	App.	Scale	Drawing Status	JAN 2024	W.P.	V.S.	A.D.		NTS	
Date	Drw.	Eng.	Chk.	App.	Scale	Drawing Status														
JAN 2024	W.P.	V.S.	A.D.		NTS															



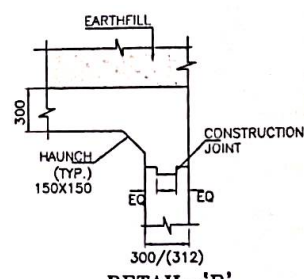
SECTION B-B
(SCALE 1:40)



DETAIL-A
(SCALE 1:25)



DETAIL-C
(SCALE 1:25)



DETAIL-B
(SCALE 1:25)

SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

DESIGN AID, NEW DELHI

GOOD FOR CONSTRUCTION

NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.

EPC CONTRACTOR
KAMAC ENGINEERS PVT. LTD
F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010

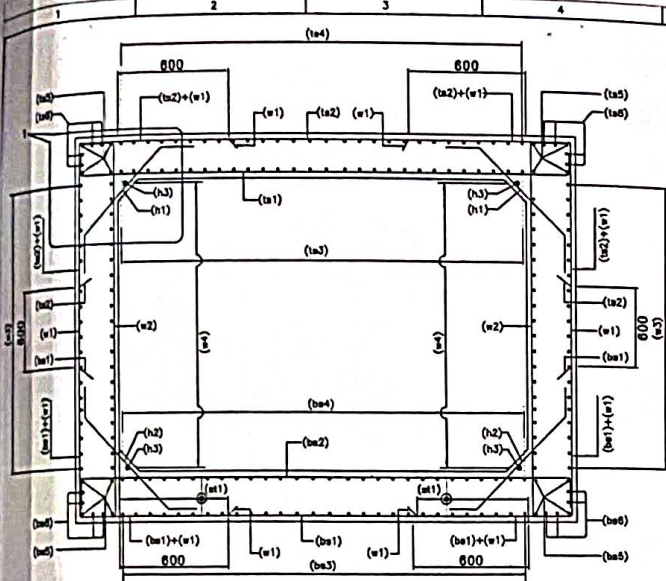
AUTHORITY ENGINEER
ALMONDE GLOBAL INFRA CONSULTANT LIMITED
C/O VAYANTHA SANKAR, SARABJANINI NAGAR, BORSIL NO. 21, DIBBO, INSUKA, ASSAM-786171

PROOF CONSULTANT:
CREATIVE ENGINEERING SERVICES
OFFICE NO: 620, SIGNATURE GLOBAL MALL, SECTOR-3, VAISHALI, GHAZIABAD, U.P-201010

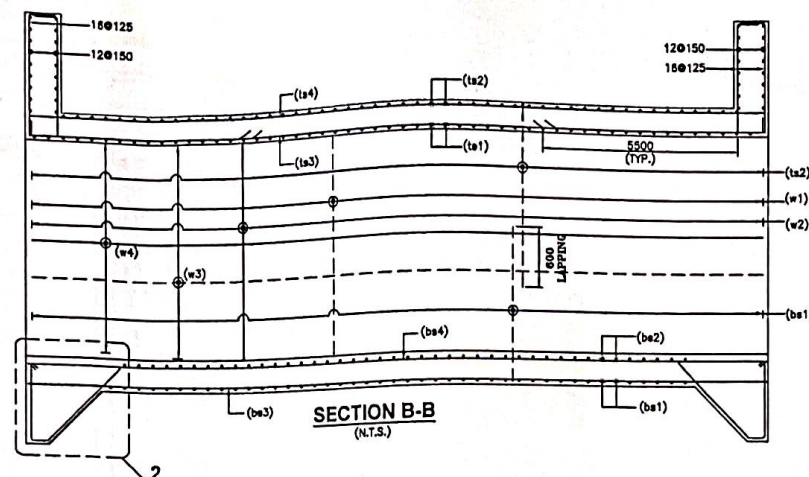
SAFETY CONSULTANT:
DESIGN AID
PLOT NO.54, 3rd FLOOR(FRONT), MASOODPUR DAIRY FARM, VASANT KUNJ, NEW DELHI-110070,

DESIGN CONSULTANT:
A.V. CONSTRUCTION
1st Floor, W2140, Palm Extension, Bosco, Ashram Wall Gali, New Delhi 110045
Winst Infra Solution Pvt. Ltd.
OFFICE: F-4, SHANU CORPORATE TOWER, PLOT NO-23, SECTOR-13, VASANT KUNJ, NEW DELHI-110017

DESIGNED TO KM 47+68.2 (LEDO ON DURGAMCHAU TO LEDO SECTION WITH PROPOSED MARGINAL CHINEE LEVO BAYAS, BIRCHOWA AND GREEN FIELD PLANT. PDS OF KM 34 IN THINDA DISTRICT IN THE STATE OF ASSAM ON MODE (PACKAGE 5)						
DRAWING TITLE:		GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHANAGE 42+378				
Date	Drw.	Dsg.	Chk.	App.	Scale	Drawing Status
JAN, 2024	W.P	V.S	A.B		NTS	
Project No.	Drawing No.		Sheet No.		Rev.	
	AVC/NN-38/BC/GAD142-378/01		83 OF 83		RD	
11			12			



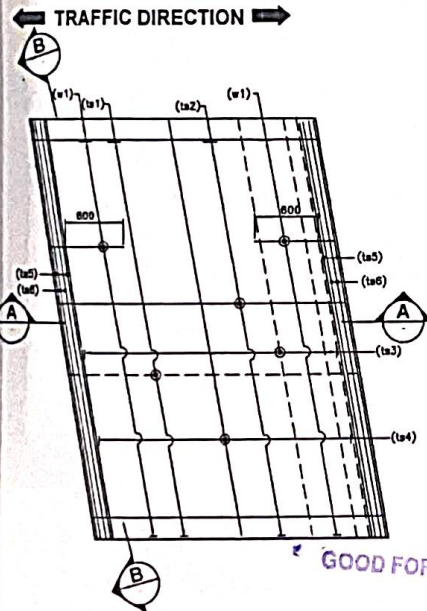
SECTION A-A
(N.T.S.)



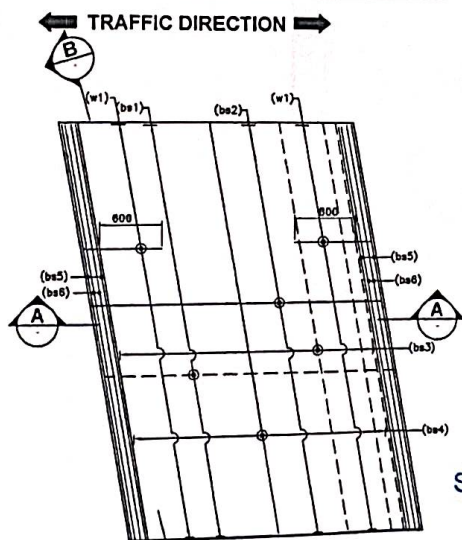
SECTION B-B
(N.T.S.)

LEGEND:-

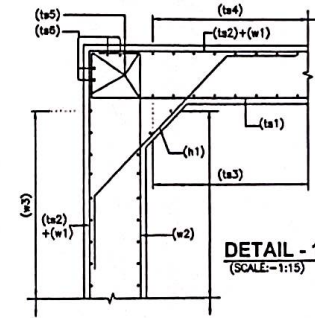
TOP FACE BAR	_____
BOTTOM FACE BAR	-----



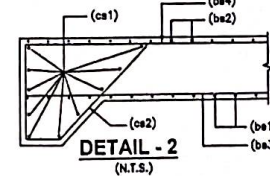
REINFORCEMENT DETAILS OF TOP SLAB
(LAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
(N.T.S.)



REINFORCEMENT DETAILS OF BOTTOM SLAB
(LAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
(N.T.S.)



DETAIL - 1
(SCALE: 1:15)



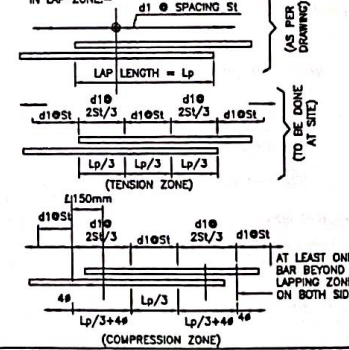
DETAIL - 2
(N.T.S.)

BOX REINF. SCHEDULE

SL.NO.	BAR MARK	BAR SHAPE	DIAMETER	SPACING
1	ts1		12	170
2	ts2		10	170
3	ts3		8	200
4	ts4		10	200
5	ts5		12	2x4 Nos.
6	ts6		12	2x4 Nos.
7	w1		10	170
8	w2		10	170
9	w3		10	200
10	w4		8	200
11	bs1		10	170
12	bs2		10+8	170
13	bs3		10	200
14	bs4		8	200
15	bs5		12	2x4 Nos.
16	bs6		12	2x4 Nos.
17	h1		10	170
18	h2		10	170
19	h3		10	1x4 Nos.
20	cs1		12	10 Nos.
21	cs2		10	200
22	st1		8	200 c/c (L-L) 170 c/c (T-T) DIRECTION

NOTES:-

- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS UNLESS OTHERWISE MENTIONED.
- DRAWING SHOULD NOT BE SCALED ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
- ALL REINFORCING BARS SHALL BE THERMO MECHANICALLY TREATED (TMT) BARS (GRADE DESIGNATION Fe-500) CONFORMING TO IS:1786 STANDARDS.
- MINIMUM CLEAR COVER TO OUTERMOST REINFORCEMENT SHALL BE AS FOLLOWS:-
 - a) TOP SLAB - 45mm
 - b) BOTTOM SLAB - 75mm
 - c) SIDE WALL (EARTH SIDE) - 75mm
 - d) SIDE WALL (INNER SIDE) - 45mm
- OVERLAPPING FOR SPACING OF REINFORCEMENT SHALL BE AS PER CLAUSE NO.15.2.3. LAP LENGTH SHALL NOT BE LESS THAN 55d. ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:-



SAFETY AUDIT
(As per Article 10.1 of EPC Agreement)

DESIGN AID, NEW DELHI

REFERENCE DRAWING:-

- GENERAL ARRANGEMENT DRAWING. A/C/NH-38/BOX/GAD/42+378/01

CLIENT:

NHAI
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.

EPC CONTRACTOR

KAMAC ENGINEERS PVT.LTD
F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010

AUTHORITY'S ENGINEER

ALNOUD GLOBAL INFRA CONSULTANT
LIMITED, PLOT NO. 2, VOLEEZA CONSULTANT PHASE II LIMITED, CHANDRA, ASSAM-785171

PROOF CONSULTANT:

CREATIVE ENGINEERING SERVICES
OFFICE NO. 620, SIGNATURE GLOBAL MALL, SECTOR-3, VAISHALI, GHAZIABAD, U.P.-201010

SAFETY CONSULTANT:

DESIGN AID
PLOT NO.54, 3rd FLOOR(FRONT), MASOODPUR DAIRY FARM, VASANT KUNJ, NEW DELHI-110070,

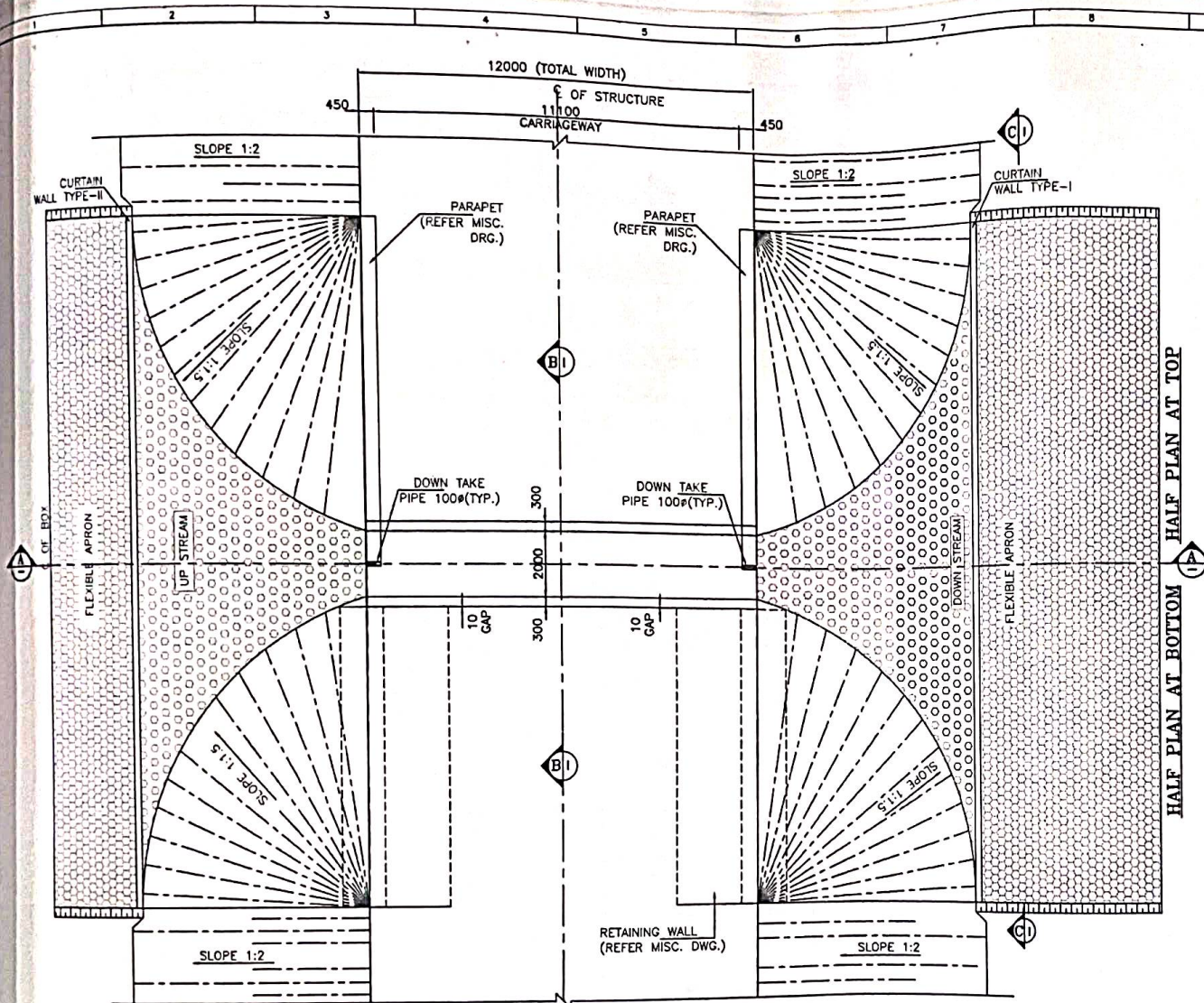
DESIGN CONSULTANT:

A.V. CONSTRUCTION
Palam Extension, Secco Ashram Wali Gurgaon, Delhi 110045
Winst Infra Solution Pvt. Ltd.
OFFICE: F-8, ISHAAN CORPORATE TOWER, PLOT NO-C-23, SECTOR-13, VASINDHRA CHANDRABAD, U.P.-201012

PROJECT:
WIDENING/IMPROVEMENT TO 2-LANE WITH PAVED SHOULDER FROM KM 27+150 (SOLAI GOAST) TO KM 41+80 (LEDO) ON DISBURGH TO LEDO SECTION WITH PROPOSED MARGHERITA A LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE (PACKAGE II)

DRAWING TITLE:
REINFORCEMENT DETAIL OF BOX CULVERT AT CH. 42+378

Date	Drawn	Checked	Appr.	Scale	Drawing Status
JAN.2024	W.P.	W.S.	A.II	MTS	
Project No.	Drawing No.	Revision	Sheet No.	1 of 01	Rev. 00



PLAN
(SCALE-1:100)

GOOD FOR CONSTRUCTION

SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

DESIGN AID, NEW DELHI

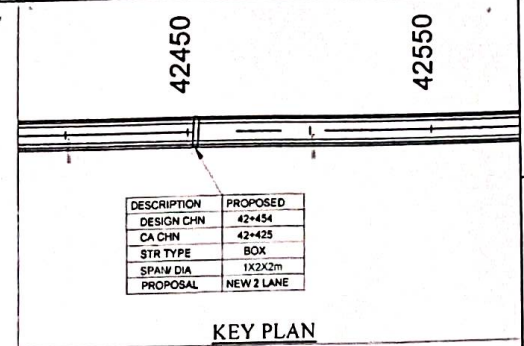
REFERENCE DRAWINGS:-

1. REINFORCEMENT DETAIL OF BOX CULVERT
AVC/NH-38/BC/REINF./42+454/01

LEGEND:-

- FRL FINISHED ROAD LEVEL
- IL INVERT LEVEL
- LVL. LEVEL
- EGL. EXISTING GROUND LEVEL

FRL CAMBER & LOCATION IS TO BE MATCHED WITH HIGHWAY ALIGNMENT DRAWING.



NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETER, LEVELS ARE IN METER AND CHAINAGE ARE IN KILOMETERS UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
2. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE RELEVANT PLAN AND PROFILE DRAWING OF ROAD.
3. GRADE OF CONCRETE:-
 - a. M30-FOR RCC BOX CELL STRUCTURE.
 - b. M15-FOR PCC AND LEVELING COURSE.
 - c. M30-PARAPET
4. GRADE OF STEEL - Fe 500.
5. THE CARRIAGEWAY OF PROPOSED CULVERT IS DESIGN AS PER 6-2017.
6. BACKFILL MATERIAL BEHIND END WALL SHALL BE SELECTED GRANULAR SOIL HAVING PROPERTIES
MAX DRY DENSITY = 1850-2280kg/m³
OPTIMUM MOISTURE CONTENT = 7-15
AS PER IRC78-2014 AND MORTH SPECIFICATION.
7. THE FRL SHOWN IN THE DRAWING SHALL BE VERIFIED WITH CORRESPONDING PLAN AND PROFILE DRAWING BEFORE EXECUTION, IF THERE IS ANY VARIATION SHALL BE BROUGHT TO THE NOTICE OF ENGINEER.
8. THE DIMENSION AND LEVEL ARE SUBJECT TO CHANGE AS PER SITE CONDITION AND DETAILED DESIGN.
9. BACKFILL TO BE DONE AND COMPACTED FROM BOTH SIDE SIMULTANEOUSLY.
10. 100MM DIA P.V.C. PIPE AT SPACING 1000MM/c IN HORIZONTAL/VERTICAL DIRECTION SHALL BE PROVIDED UP TO 150MM ABOVE GROUND LEVEL FOR WEEP HOLES IN RETAINING WALL.
11. SBC SHALL BE 13t/m² AND SAME SHALL BE ENSURED AT SITE BY ANY SUITABLE METHOD.
12. AS PER MORTH SECTION-2500, WHERE THE REQUIRED SIZE OF BOULDERS ARE NOT AVAILABLE ECONOMICALLY, CEMENT CONCRETE BLOCKS OF EQUIVALENT WEIGHT SHALL BE USED. THE GRADE OF CONCRETE SHALL BE M15 NOMINAL MIX. CEMENT CONCRETE BLOCK SHALL BE PREFERRED WHERE PRACTICABLE. CHOOSE ANY SUITABLE METHOD TO ACHIEVE THE REQUIRED SBC AS PER SITE.

LEVELS

DESIGN CH.	FRL	GROUND LEVEL	INVERT LEVEL		VERTICAL CLEARANCE (MAX.)	EARTHFILL (MAX.)	EARTHFILL (MIN.)
			LHS	RHS			
42+454	145.753	141.200	140.912	140.900	2.012m	2.541m	2.391m

NADCL
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.

KAMAC
KAMAC ENGINEERS PVT.LTD
F0201, CITY CENTER OFFICE
BLOCK, 2ND FLOOR,
MATIGARA 734010

ALMOND ENGINEERING CONSULTANTS
LIMITED
C/O JAYANTA SANKAR SARKAR
NAMO HAR, BOBIL NO.2, DGBOI
TINSUKIA, ASSAM-786171

CREATIVE ENGINEERING SERVICES
OFFICE NO. 620, SIGNATURE GLOBAL
MALL, SECTOR-3,
VAISHALI, GHAZIABAD, U.P.-201010

DESIGN AID
PLOT NO.54, 3rd FLOOR(FRONT),
MASOODPUR DAIRY FARM, VASANT KUNJ,
NEW DELHI-110070,

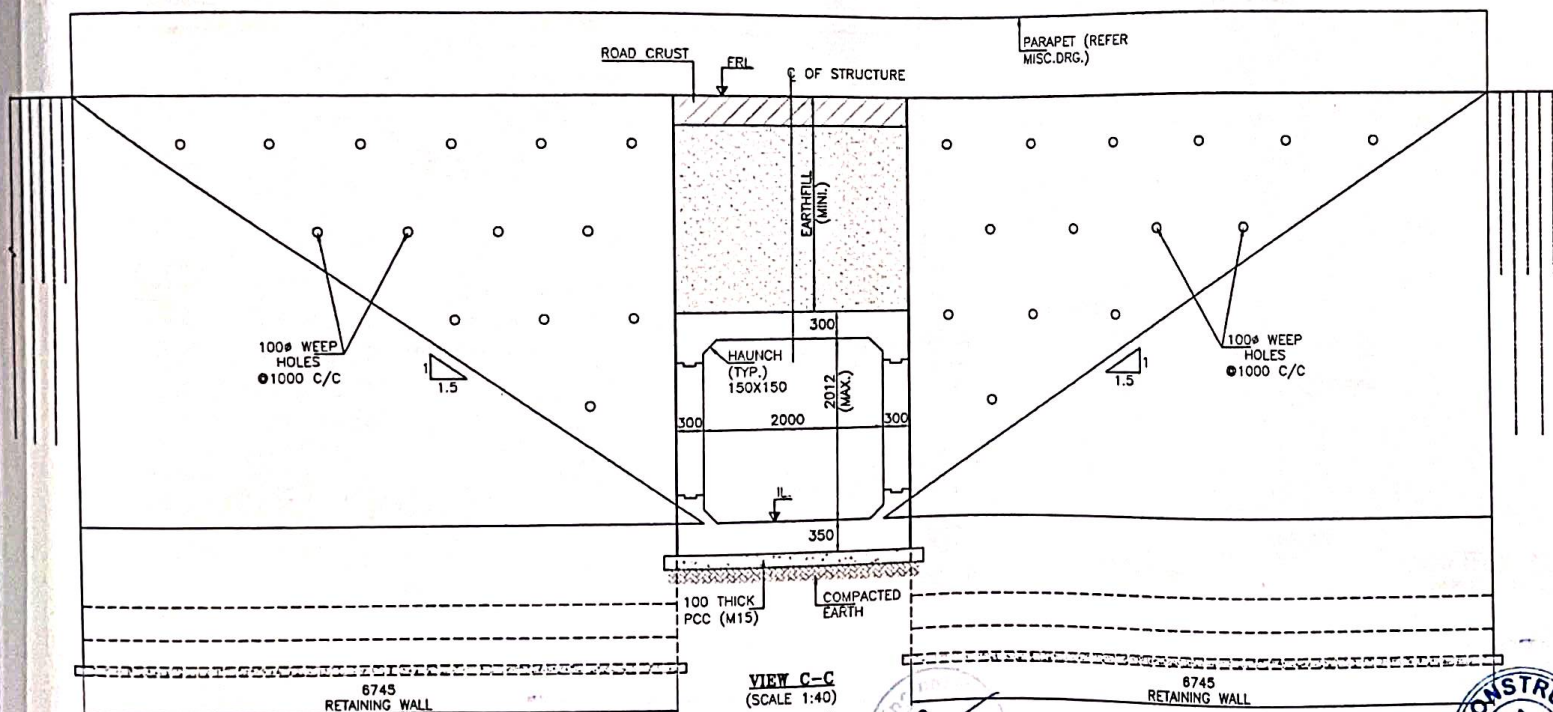
Winst Infra Solution Pvt. Ltd.
OFFICE: F-8, ISHAAN CORPORATE
TOWER, PLOT NO-G-23, SECTOR-13,
VASUDEV VIHAR, GHAZIABAD, U.P.-201012

PROJECT
WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150
(SOLA GOAN) TO KM 47+882 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH
PROPOSED MARGHERITA & LEDO BYPASS (BROWN FIELD AND GREEN FIELD)
(2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC
MODE (PACKAGE-5)

DRAWING TITLE:- GENERAL ARRANGEMENT DRAWING FOR
BOX CULVERT AT CHAINAGE 42+454

Date	Drawn	Check	Appr.	Scale	Drawing Status
JAN.2024	V.S.	A.D.	NTS		

Project No. Drawing No. Sheet No. 01 OF 03 Rev. RO



DESIGN AID, NEW DELHI

GOOD FOR CONSTRUCTION

VIEW C-C
(SCALE 1:40)



NATIONAL HIGHWAYS &
INFRASTRUCTURE DEVELOPMENT
CORPORATION LTD.

EPC CONTRACTOR	
----------------	--



KAMAC ENGINEERS PVT.LTD
F0201, CITY CENTER OFFICE
BLOCK, 2ND FLOOR,
MATIGARA 734010

AUTHORITY'S ENGINEER

ALMOND ROYAL HINDIA CONSULTANT
LIMITED IN 100 HAYDEEZA
CONSULTANT PRIVATE LIMITED.
Bib. Lead Section

C/O JAYANTA SAHIN, SARGAJANIN
NAMEHAR, BORBIL NO 2, DIGBOI,
TINSUKIA, ASSAM-786171.

PROOF CONSULTANT:

CREATIVE ENGINEERING SERVICES
OFFICE NO: 620, SIGNATURE GLOBAL
MALL, SECTOR-3,
VAISHALI, GHAZIABAD, U P-201010

SAFETY CONSULTANT:	
--------------------	--

DESIGN

DESIGN AID
PLOT NO.54, 3rd FLOOR(FRONT),
MASOODPUR DAIRY FARM,VASANT KUNJ,
NEW DELHI-110070.

DESIGN CONSULTANT:



A. CONSTRUCTION

Palam Extension, Busco
Ashram Wall Gali, New
Delhi 110045

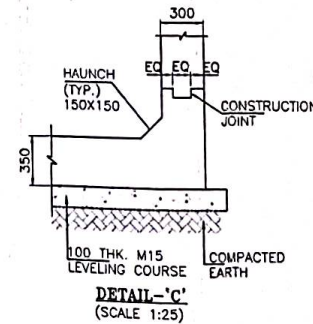
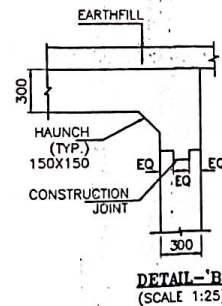
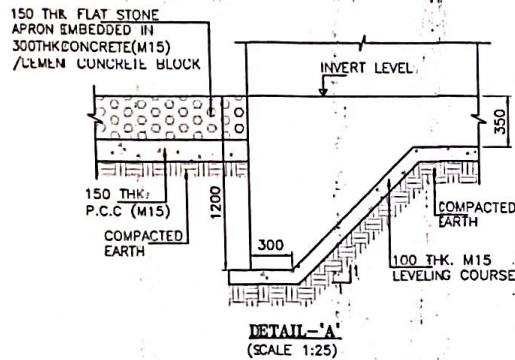
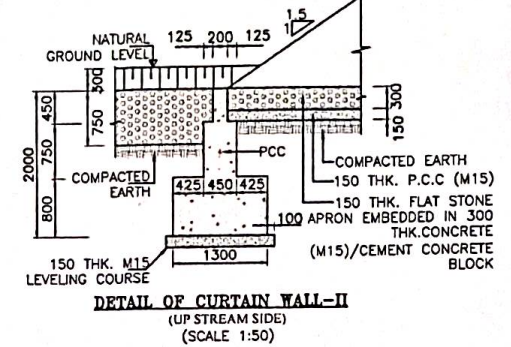
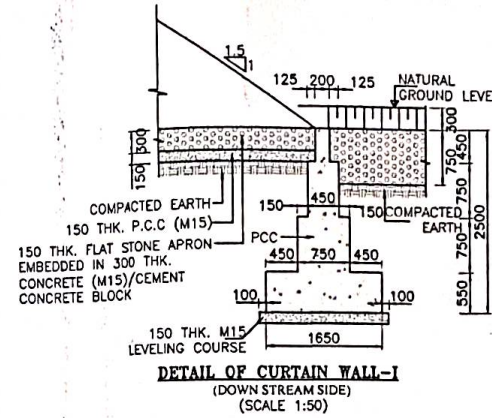
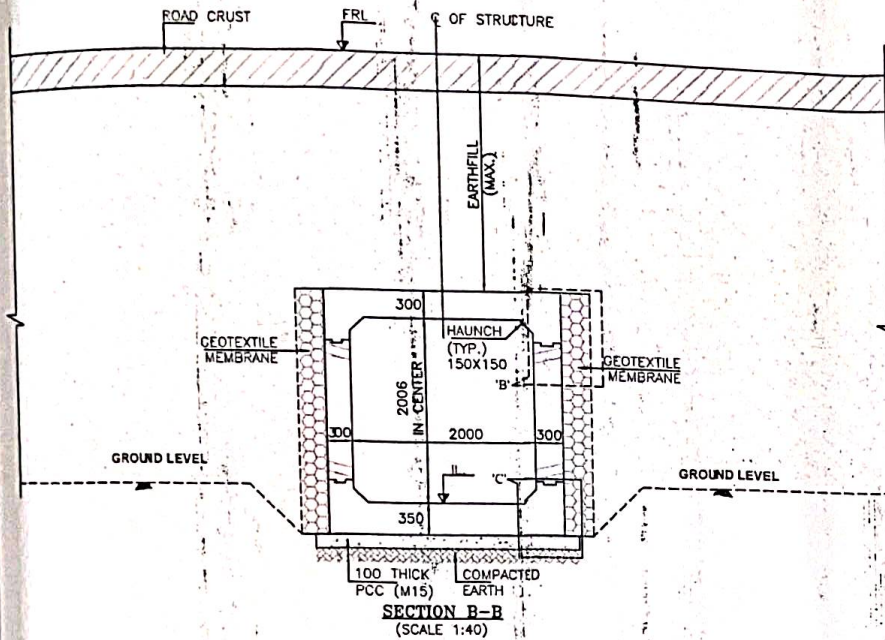
**Winst Infra Solution
Pvt. Ltd.**

OFFICE: F-8, ISHAAN CORPORATE
TOWER, PLOT NO-C-23, SECTOR-13,
GURGAON, HARYANA

PROJECT:
WIDENING/IMPROVEMENT TO 2-LANE LANE ON DIBRUGARH TO LEDO SECTION WITH
(GOLIA GOAN) TO KM 47+482 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH
PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD)
(2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC
MODE (PACKAGE-3)

DRAWING TITLE: GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 42+454

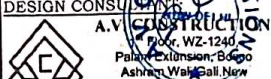
Date JAN.2024	Drw. W.P	Dsg V.S	Chk. A.B	App.	Scale. NTS	Drawing Status.
Project No.	Drawing No. AVC/NH-38/BC/GAD/42-454/01				Sheet No. 02 OF 03	Rev.

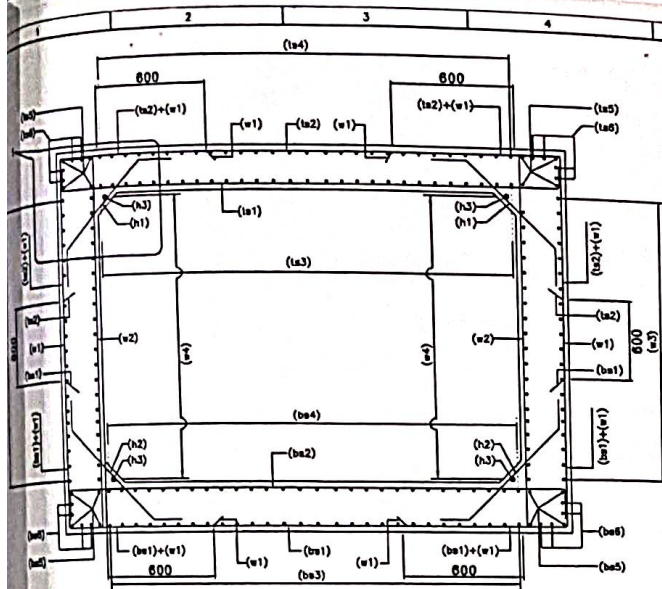


SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

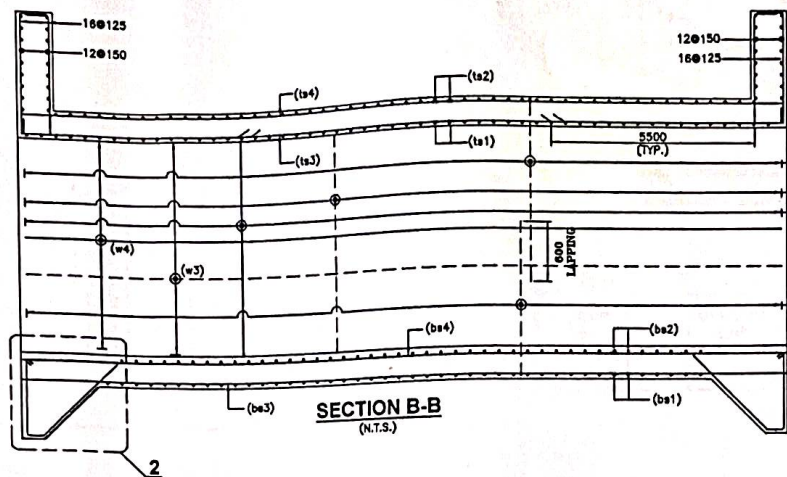
DESIGN AID, NEW DELHI

GOOD FOR CONSTRUCTION

CLIENT:  NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	EPC CONTRACTOR  KAMAC ENGINEERS PVT.LTD F0201, QTY CENTER OFFICE - BLOCK, 2ND FLOOR, MATIGARA 734010	AUTHORITY'S ENGINEER  ALMONDZ GLOBAL INFRA CONSULTANT LIMITED (INDIA) PRIVATE LIMITED. CONSULTANT PRIVATE LIMITED. P.O. Lado Sector 3 C/O JAYANARAYAN & S. ANANIN NAGGAR, BORAIL NO.2, DISBOI, TINSUKIA, ASSAM-786171	PROOF CONSULTANT:  CREATIVE ENGINEERING SERVICES OFFICE NO. 620, SIGNATURE GLOBAL MALL, SECTOR-3, VAISHALI, GHAZIABAD, U.P.201010	SAFETY CONSULTANT:  DESIGN AID PLOT NO.54, 3RD FLOOR(FRONT), MASOODPUR DAIRY FARM,VASANT KUNJ, NEW DELHI-110070,	DESIGN CONSULTANT:  Winst Infra Solution Pvt. Ltd. OFFICE F-4, ISHAM CORPORATE TOWER, PLOT NO-C-23,SECTOR-13, VASUKHURA, CHANAYAN, U.P.201012	PROJECT: WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27-150 (GOAL GOAN) TO KM 47-882 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (2-LANE-PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE (PACKAGE-3) DRAWING TITLE: GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 42+454 <table><tr><th>Date</th><th>Drw.</th><th>W.P.</th><th>Dsg.</th><th>Chk.</th><th>App.</th><th>Scale</th><th>Drwng Status</th></tr><tr><td>JAN.2024</td><td></td><td></td><td></td><td></td><td></td><td>NTS</td><td></td></tr><tr><td>Project No.</td><td>Drwng No.</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> Sheet No. 83 OF 83 Rev. RU	Date	Drw.	W.P.	Dsg.	Chk.	App.	Scale	Drwng Status	JAN.2024						NTS		Project No.	Drwng No.														
Date	Drw.	W.P.	Dsg.	Chk.	App.	Scale	Drwng Status																															
JAN.2024						NTS																																
Project No.	Drwng No.																																					



SECTION A-A
(N.T.S.)



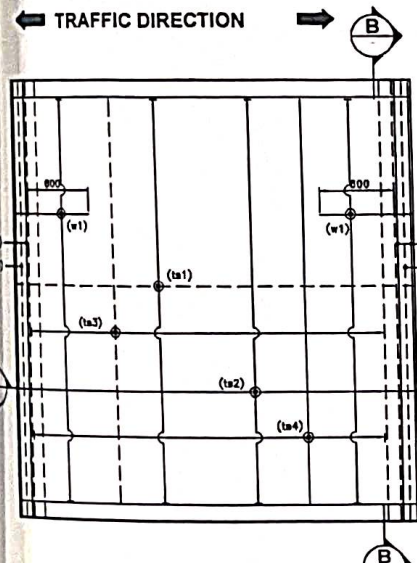
SECTION B-B
(N.T.S.)

LEGEND:-

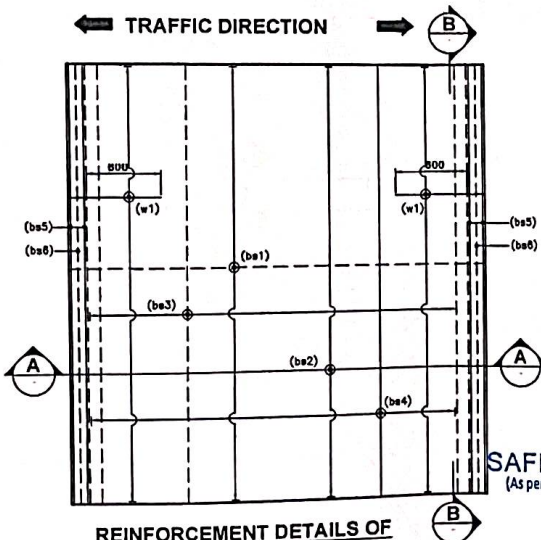
TOP FACE BAR	—————
BOTTOM FACE BAR	-----

BOX REIN. SCHEDULE

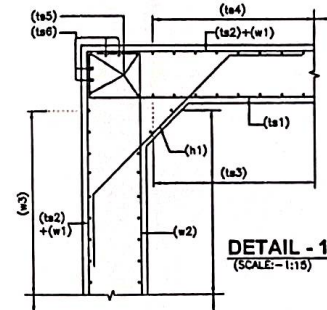
SL.NO.	BAR MARK	BAR SHAPE	DIAMETER	SPACING
1	ts1		12	180
2	ts2		10	180
3	ts3		8	200
4	ts4		10	200
5	ts5		12	2x4 Nos.
6	ts6		12	2x4 Nos.
7	w1		10	180
8	w2		10	180
9	w3		10	200
10	w4		8	200
11	bs1		10	180
12	bs2		10+8	180
13	bs3		10	200
14	bs4		8	200
15	bs5		12	2x4 Nos.
16	bs6		12	2x4 Nos.
17	h1		10	180
18	h2		10	180
19	h3		10	1x4 Nos.
20	cs1		12	10 Nos.
21	cs2		10	200



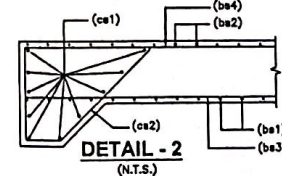
REINFORCEMENT DETAILS OF
TOP SLAB
(LAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
(N.T.S.)



REINFORCEMENT DETAILS OF
BOTTOM SLAB
(LAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
(N.T.S.)



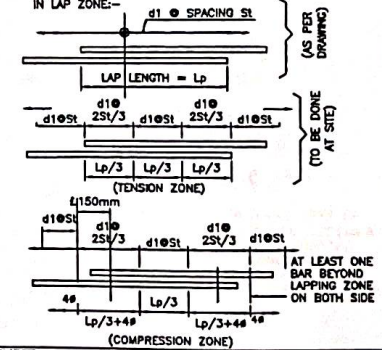
DETAIL - 1
(SCALE: 1:10)



DETAIL - 2
(N.T.S.)

NOTES:-

- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS UNLESS OTHERWISE MENTIONED.
- DRAWING SHOULD NOT BE SCALED ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
- ALL REINFORCING BARS SHALL BE THERMO MECHANICALLY TREATED (TMT) BARS (GRADE DESIGNATION Fe-500) CONFORMING TO IS:1786 STANDARDS.
- MINIMUM CLEAR COVER TO OUTERMOST REINFORCEMENT SHALL BE AS FOLLOWS:-
 - a) TOP SLAB — 45mm
 - b) BOTTOM SLAB — 75mm
 - c) SIDE WALL (EARTH SIDE) — 75mm
 - d) SIDE WALL (INNER SIDE) — 45mm
- OVERLAPPING FOR SPlicing OF REINFORCEMENT SHALL BE AS PER CLAUSE NO.15.2.5. LAP LENGTH SHALL NOT BE LESS THAN 55d. ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:-



SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

DESIGN AID, NEW DELHI

REFERENCE DRAWING:-

- GENERAL ARRANGEMENT DRAWING. AYC/NH-38/BOX/GAD/42+454/01



CLIENT:
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.

EPC CONTRACTOR
KAMAC ENGINEERS PVT. LTD.
F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010

AUTHORITY'S ENGINEER
ALMOUNT GLOBAL INFRA CONSULTANT LIMITED
C/O JAYANK SAHAI, SURBAJANIN NAGHAR, BORER, NO.2, D/BOI, TINSUKIA, ASSAM-786711

PROOF CONSULTANT:
CREATIVE ENGINEERING SERVICES
OFFICE NO. 630, SIGNATURE GLOBAL MALL, SECTOR-3, VAISHALI, GHAZIABAD, U.P.-201010

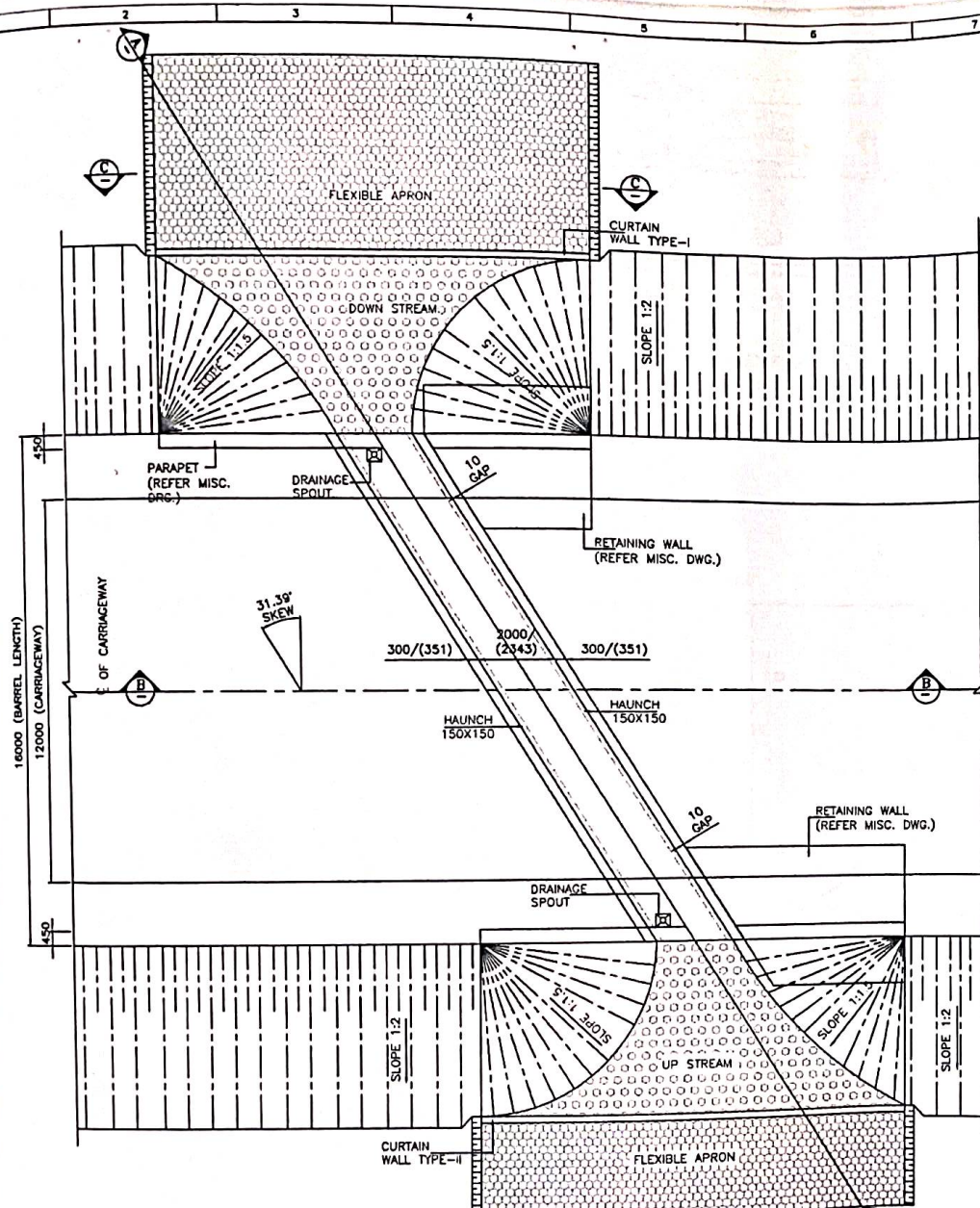
SAFETY CONSULTANT:
DESIGN AID
PLOT NO.54, 3rd FLOOR(FRONT), MASOODPUR DAIRY FARM,VASANT KUNJ, NEW DELHI-110070.

DESIGN CONSULTANT:
A.V. CONSTRUCTION
1st FLOOR, WZ-1040, Palam Extension, New Delhi 110045
Winst Infra Solution Pvt. Ltd.
OFFICE: F-8, IRMAAN CORPORATE TOWER, PLOT NO-C-23, SECTOR-13, VASANTHAPURA, GHAZIABAD, U.P.-201012

PROJECT:
WIDENING/IMPROVEMENT TO 2-LANE WITH PAVED SHOULDER FROM KM 27+150 (GOLA GOMTI) TO KM 47+445 (LEDO ON DIBRUGHARH TO LEDO SECTION WITH PROPOSED MARGHERITA & LEDO BYPASS (BROWN FIELD AND GREEN FIELD)) (2-LANE-PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE (PACKAGE-5)

DRAWING TITLE:-
REINFORCEMENT DETAIL OF BOX CULVERT AT CH. 42+454

Date	Drw. W.P.	Des. V.S.	Chk. A.B.	App. NTS	Scale	Drawing Status
JAN 2024						
Project No.	Drawing No.			Sheet No.		Rev.
	AVC/NH-38/BOX/REIN/42+454/01			81 OF 01		RB



42950

DESCRIPTION	PROPOSED
DESIGN CHN.	42+970
CA.CHN.	43+000
STR.TYPE	BOX
SPAN DIA	1X2X2m
PROPOSAL	NEW 2 LANE

43050

KEY PLAN

LEVELS

DESIGN CH.	FRL	GROUND LEVEL	INVERT LEVEL		VERTICAL CLEARANCE (MAX.)	EARTH FILL (MAX.)	EARTH FILL (MIN.)
			LHS	RHS			
42+970	146.155	141.108	140.808	140.820	2.018m	3.031m	1.847m

LEGEND:-
 FRL FINISHED ROAD LEVEL
 IL INVERT LEVEL
 LVL. LEVEL
 EGL. EXISTING GROUND LEVEL

FRL CAMBER & LOCATION IS TO BE MATCHED WITH HIGHWAY ALIGNMENT DRAWING.

NOTES:-

- ALL DIMENSIONS ARE IN MILLIMETER, LEVELS ARE IN METER AND CHAINAGE ARE IN KILOMETERS UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE RELEVANT PLAN AND PROFILE DRAWING OF ROAD.
- GRADE OF CONCRETE:-
 a. M30-FOR RCC BOX CELL STRUCTURE.
 b. M15-FOR PCC AND LEVELING COURSE.
 c. M30-PARAPET
- GRADE OF STEEL - Fe500.
- THE FOLLOWING LOADS HAVE BEEN CONSIDERED IN THE DESIGN:-
 a. ONE LANE, TWO LANE AND THREE LANE OF CLASS A
 b. ONE LANE OF CLASS A IN ADDITION OF ONE LANE OF CLASS 70R WHEEL OR ONE LANE OF 70R TRACKED WHICHEVER IS GOVERNS.
- BACKFILL MATERIAL BEHIND END WALL SHALL BE SELECTED GRANULAR SOIL HAVING PROPERTIES
 MAX DRY DENSITY = 1850-2280kg/m³
 OPTIMUM MOISTURE CONTENT = 7-15
 AS PER IRC78-2014 AND MORTH SPECIFICATION.
- THE FRL SHOWN IN THE DRAWING SHALL BE VERIFIED WITH CORRESPONDING PLAN AND PROFILE DRAWING BEFORE EXECUTION, IF THERE IS ANY VARIATION SHALL BE BROUGHT TO THE NOTICE OF ENGINEER.
- THE DIMENSION AND LEVEL ARE SUBJECT TO CHANGE AS PER SITE CONDITION AND DETAILED DESIGN.
- BACKFILL TO BE DONE AND COMPACTED FROM BOTH SIDE SIMULTANEOUSLY.
- 600MM THICK FILTER MATERIAL BEHIND RETAINING WALL SHALL BE LAID AS PER APPENDIX 6 OF IRC 78-2014.
- 50MM THICK CEMENT CONCRETE WEARING COAT SHALL BE PROVIDED.
- 100MM DIA P.V.C. PIPE AT SPACING 1000MM/C IN HORIZONTAL/VERTICAL DIRECTION SHALL BE PROVIDED UP TO 150MM ABOVE GROUND LEVEL FOR WEEP HOLES IN RETAINING WALL.
- SBC SHALL BE 14t/m² AND SAME SHALL BE ENSURED AT SITE BY ANY SUITABLE METHOD.
- AS PER MORTH SECTION-2500, WHERE THE REQUIRED SIZE OF BOULDERS ARE NOT AVAILABLE ECONOMICALLY, CEMENT CONCRETE BLOCKS OF EQUIVALENT WEIGHT SHALL BE USED. THE GRADE OF CONCRETE SHALL BE M15 NOMINAL MIX. CEMENT CONCRETE BLOCK SHALL BE PREFERRED WHERE PRACTICABLE.
- CHOOSE ANY SUITABLE METHOD TO ACHIEVE THE REQUIRED SBC AS PER SITE.
- THE EXPOSURE CONDITION IS MODERATE.

SAFETY AUDITOR
 (As per Article 10.1 of EPC Agreement)

DESIGN AID, NEW DELHI

REFERENCE DRAWINGS:-

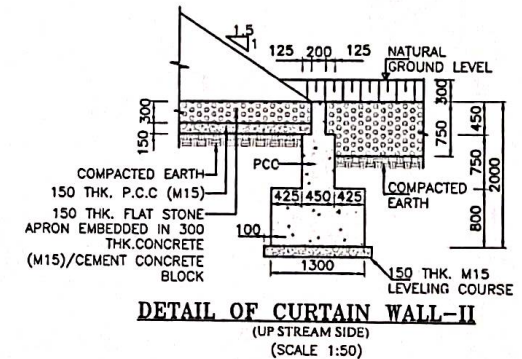
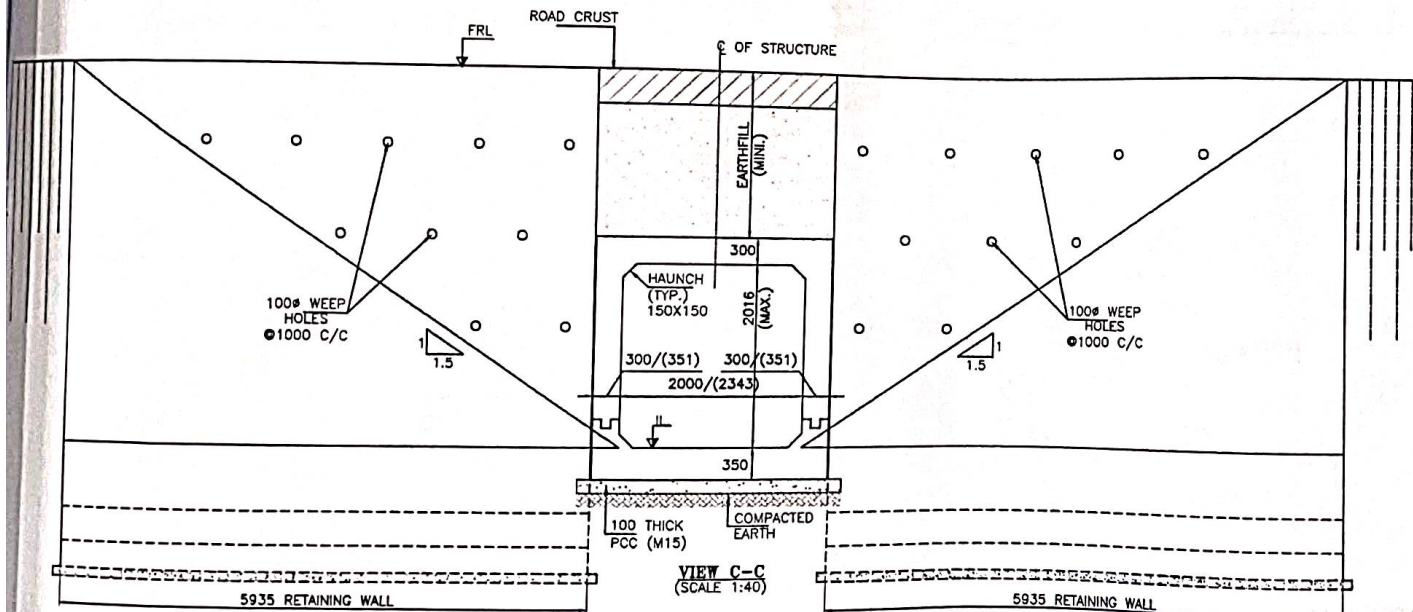
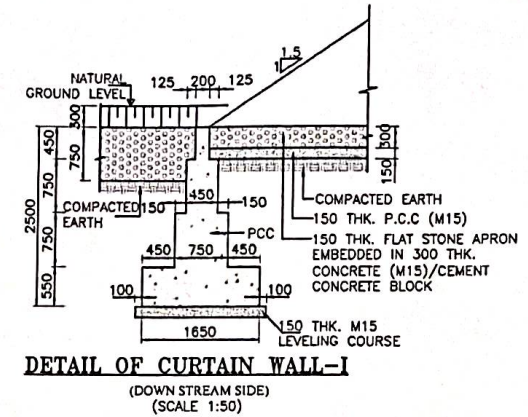
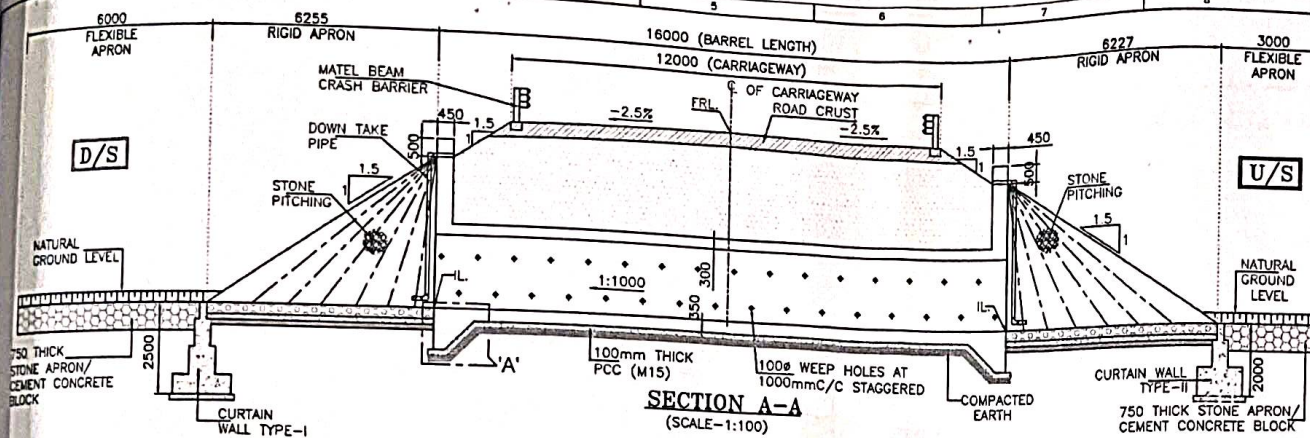
- REINFORCEMENT DETAIL OF BOX CULVERT
 AVG/NH-38/BOX/REINF./42+970/02

GOOD FOR CONSTRUCTION

HALF PLAN AT TOP HALF PLAN AT BOTTOM

PLAN
 (SCALE - 1:100)

 NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	EPC CONTRACTOR KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	AUTHORITY'S ENGINEER ALMOND GLOBAL INFRA CONSULTANT LIMITED (A JV WITH AYOLEEZA CONSULTANTS PRIVATE LIMITED). P.O. JAYANT SARKI, SARDAANIN KANGAR, BORILL NO.2, GBOI, TINSUKIA, ASSAM 786171	PROOF CONSULTANT: CREATIVE ENGINEERING SERVICES OFFICE NO: 620, SIGNATURE GLOBAL MALL, SECTOR-3, VAISHALI, GHAZIABAD, U.P. 201010	SAFETY CONSULTANT: DESIGN AID PLOT NO.54, 3rd FLOOR(FRONT), MASOODPUR DAIRY FARM, VASANT KUNJ, NEW DELHI-110070,	DESIGN CONSULTANT: Winst Infra Solution Pvt. Ltd. OFFICE: F-8, ISHAAN CORPORATE TOWER, PLOT NO-62, SECTOR-13, VASISHTA GHAZIABAD, U.P. 201012	PROJECT: WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27-190 (GOLA GOAN) TO KM 47+682 (LEDO) ON DISBURG TO LEDO SECTION WITH PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE (PACKAGE-3) DRAWING TITLE:- GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 42+970 <table border="1"> <tr> <th>Date</th> <th>Drw. W.P</th> <th>Usg. V.S</th> <th>Chk. A.B</th> <th>Appr. NTS</th> <th>Scale</th> <th>Drawing Status</th> </tr> <tr> <td>JAN 2024</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <th>Project No.</th> <th>Drawing No.</th> <th>Sheet No.</th> <th>Rev.</th> <th>RO</th> <th></th> <th></th> </tr> <tr> <td></td> <td>AVC/NH-38/BC/GAD42+970/01</td> <td>01 OF 03</td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	Date	Drw. W.P	Usg. V.S	Chk. A.B	Appr. NTS	Scale	Drawing Status	JAN 2024							Project No.	Drawing No.	Sheet No.	Rev.	RO				AVC/NH-38/BC/GAD42+970/01	01 OF 03				
	Date	Drw. W.P	Usg. V.S	Chk. A.B	Appr. NTS	Scale	Drawing Status																											
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Project No.	Drawing No.	Sheet No.	Rev.	RO																														
	AVC/NH-38/BC/GAD42+970/01	01 OF 03																																



SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

DESIGN AID, NEW DELHI

GOOD FOR CONSTRUCTION



NATIONAL HIGHWAYS &
INFRASTRUCTURE DEVELOPMENT
CORPORATION LTD.

EPC CONTRACTOR



KAMAC ENGINEERS PVT. LTD
F0201, CITY CENTER OFFICE
BLOCK, 2ND FLOOR,
MATIGARA 734010

AUTHORITY'S ENGINEER

ALMOYDE CONSULTING ENGINEERS
LIMITED
C/O JALPA SAKTA SARBAJANIN
NAGHARI, BOISALING DIGOI,
TINSUKIA, ASSAM-786117

PROOF CONSULTANT:

CREATIVE ENGINEERING SERVICES
OFFICE NO: 620, SIGNATURE GLOBAL
MALL, SECTOR-3,
VAISHALI, GHAZIABAD, U.P-201010

SAFETY CONSULTANT:



DESIGN AID

PLOT NO.54, 3rd FLOOR(FRONT),
MASOODPUR DAIRY FARM,VASANT KUNJ,
NEW DELHI-110070,

DESIGN CONSULTANT

ASHWINI WINGALL NEW
DELHI-110045

Winst Infra Solution
Pvt. Ltd.

OFFICE: F-8 ISHAAN CORPORATE
TOWER, PLOT NO-C-23, SECTOR-13,
VAISHALI, GHAZIABAD, U.P-201012

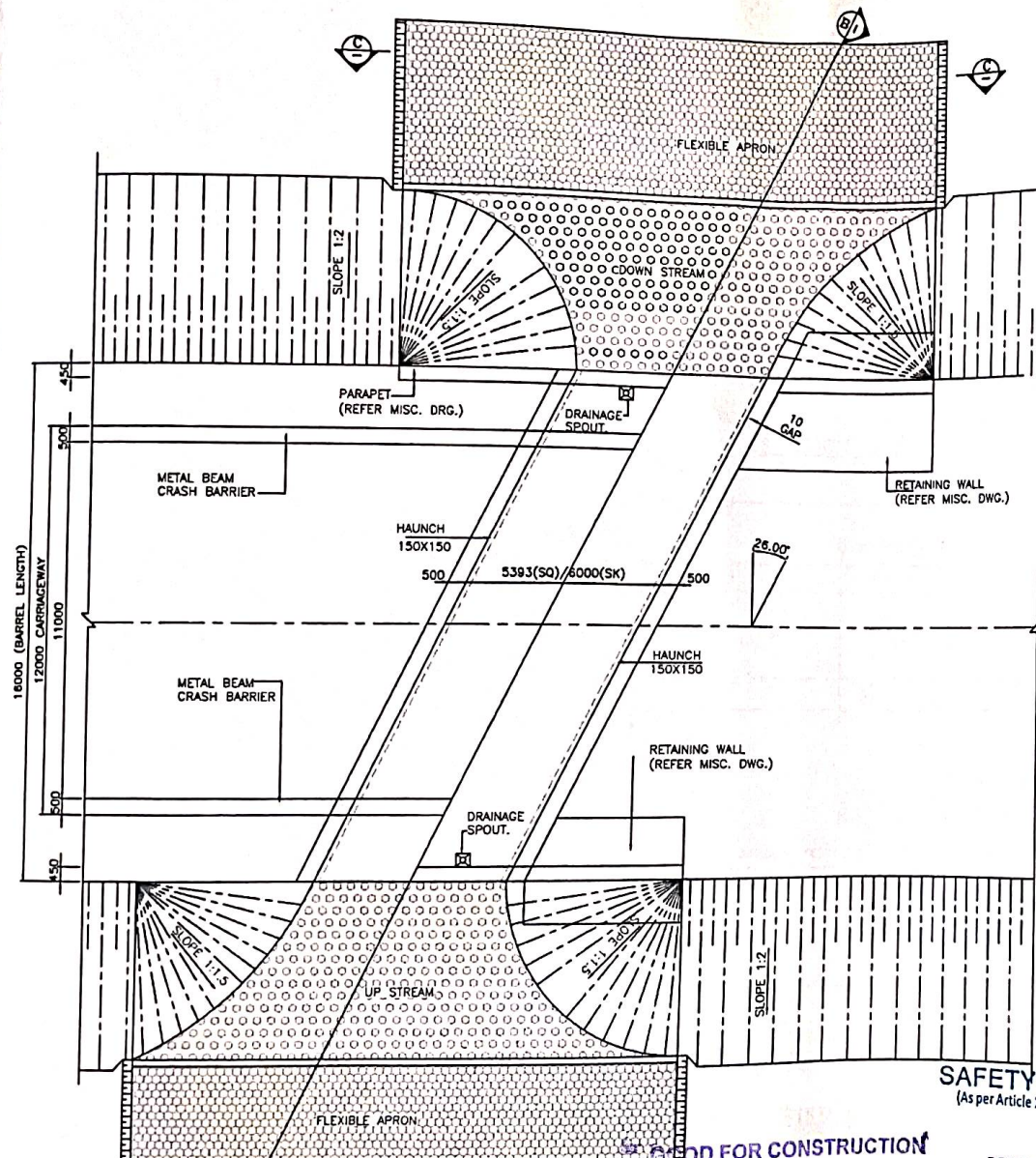
PROJECT:

WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+190
(DOLAI GOAN) TO KM 47+982 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH
PROPOSED MARGHERITA A LEDO BYPASS (BROWNFIELD AND GREEN FIELD)
(2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC
MODE (PACKAGE-5)

DRAWING TITLE:

GENERAL ARRANGEMENT DRAWING FOR
BOX CULVERT AT CHAINAGE 42+870

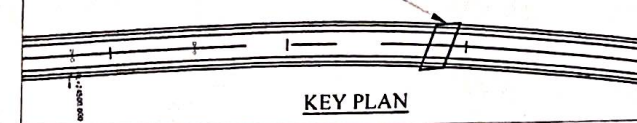
Date	Drawn	Check	App	Scale	Drawing Status
JAN.2024	W.P.	V.S.	A.B.	NTS	
Project No.	Drawing No.	Sheet No.	Rev.		
	AVC/NH-38/BC/04/42+870/01	02 OF 03	RO		



43550

DESCRIPTION	PROPOSED
DESIGN CHN.	43+643
CA.CHN.	43+625
STR.TYPE	BOX
SPAN/DIA	1X6X4m
PROPOSAL	NEW 2 LANE

43650



KEY PLAN

LEVELS

DESIGN CH.	FRL	GROUND LEVEL	INVERT LEVEL		VERTICAL CLEARANCE (MAX.)	EARTH FILL (MAX.)	EARTH FILL (MIN.)
			LHS	RHS			
43+843	147.431	142.472	142.172	172.184	4.012m	2.697m	1.178m

NOTES:-

- ALL DIMENSIONS ARE IN MILLIMETER, LEVELS ARE IN METER AND CHAINAGE ARE IN KILOMETERS UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE RELEVANT PLAN AND PROFILE DRAWING OF ROAD.
- GRADE OF CONCRETE:-
 - M30-FOR RCC BOX CELL STRUCTURE.
 - M15-FOR PCC AND LEVELING COURSE.
 - M30-PARAPET
- GRADE OF STEEL - Fe500.
- THE FOLLOWING LOADS HAVE BEEN CONSIDERED IN THE DESIGN:-
 - ONE LANE, TWO LANE AND THREE LANE OF CLASS A
 - ONE LANE OF CLASS A IN ADDITION OF ONE LANE OF CLASS 70R WHEEL OR ONE LANE OF 70R TRACKED WHICHEVER IS GOVERNS.
- BACKFILL MATERIAL BEHIND END WALL SHALL BE SELECTED GRANULAR SOIL HAVING PROPERTIES
 MAX DRY DENSITY - 1850-2280kg/m³
 OPTIMUM MOISTURE CONTENT - 7-15
 AS PER IRC78-2014 AND MORTH SPECIFICATION.
- THE FRL SHOWN IN THE DRAWING SHALL BE VERIFIED WITH CORRESPONDING PLAN AND PROFILE DRAWING BEFORE EXECUTION. IF THERE IS ANY VARIATION SHALL BE BROUGHT TO THE NOTICE OF ENGINEER.
- THE DIMENSION AND LEVEL ARE SUBJECT TO CHANGE AS PER SITE CONDITION AND DETAILED DESIGN.
- BACKFILL TO BE DONE AND COMPACTED FROM BOTH SIDE SIMULTANEOUSLY.
- 800MM THICK. FILTER MATERIAL BEHIND RETAINING WALL SHALL BE LAID AS PER APPENDIX 8 OF IRC 78-2014.
- 50MM THICK CEMENT CONCRETE WEARING COAT SHALL BE PROVIDED.
- 100MM DIA P.V.C. PIPE AT SPACING 1000MM/c IN HORIZONTAL/VERTICAL DIRECTION SHALL BE PROVIDED UP TO 150MM ABOVE GROUND LEVEL FOR WEEP HOLES IN RETAINING WALL.
- SBC SHALL BE 13t/m² AND SAME SHALL BE ENSURED AT SITE BY ANY SUITABLE METHOD.
- AS PER MORTH SECTION-2500, WHERE THE REQUIRED SIZE OF BOULDERS ARE NOT AVAILABLE ECONOMICALLY CEMENT CONCRETE BLOCKS OF EQUIVALENT WEIGHT SHALL BE USED. THE GRADE OF CONCRETE SHALL BE M15 NOMINAL MIX. CEMENT CONCRETE BLOCK SHALL BE PREFERRED WHERE PRACTICABLE.
- CHOOSE ANY SUITABLE METHOD TO ACHIEVE THE REQUIRED EXPOSURE CONDITION IS MODERATE.

LEGEND:-

FRL FINISHED ROAD LEVEL
 IL INVERT LEVEL
 LVL LEVEL
 EGL EXISTING GROUND LEVEL

FRL CAMBER & LOCATION IS TO BE MATCHED WITH HIGHWAY ALIGNMENT DRAWING.

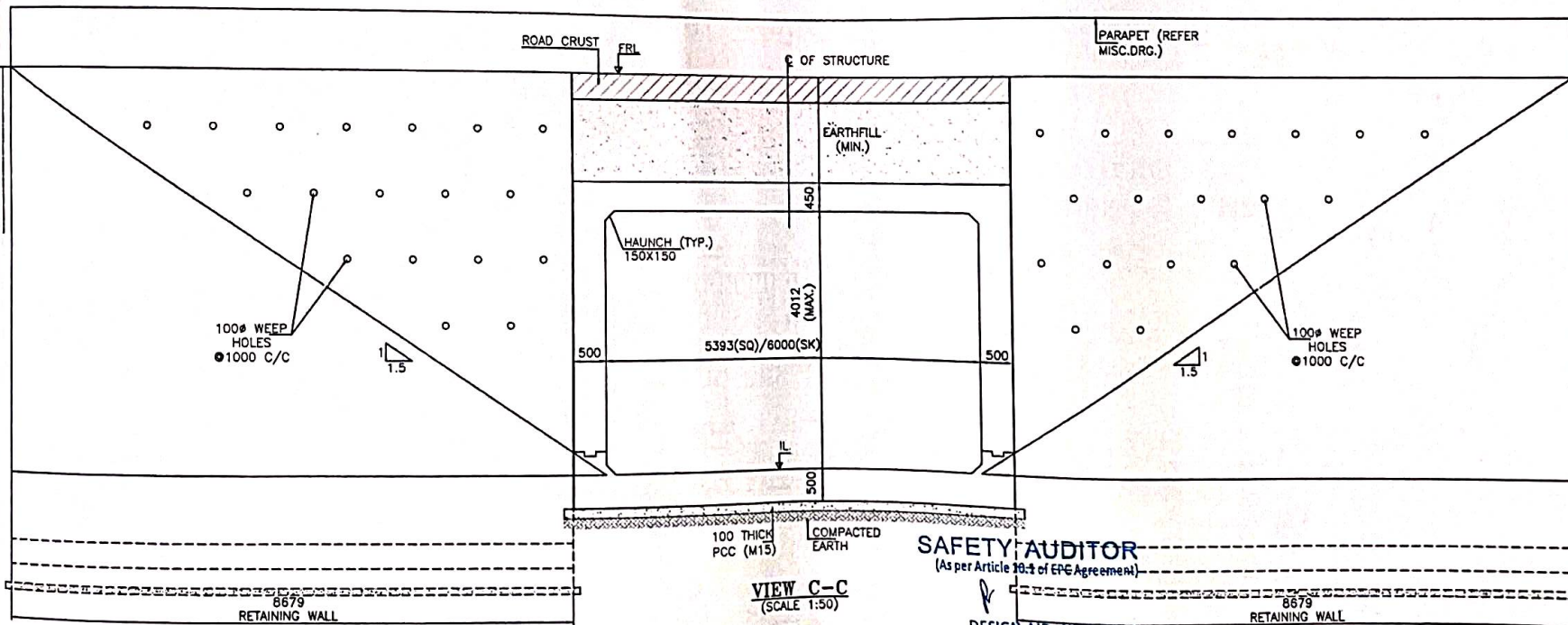
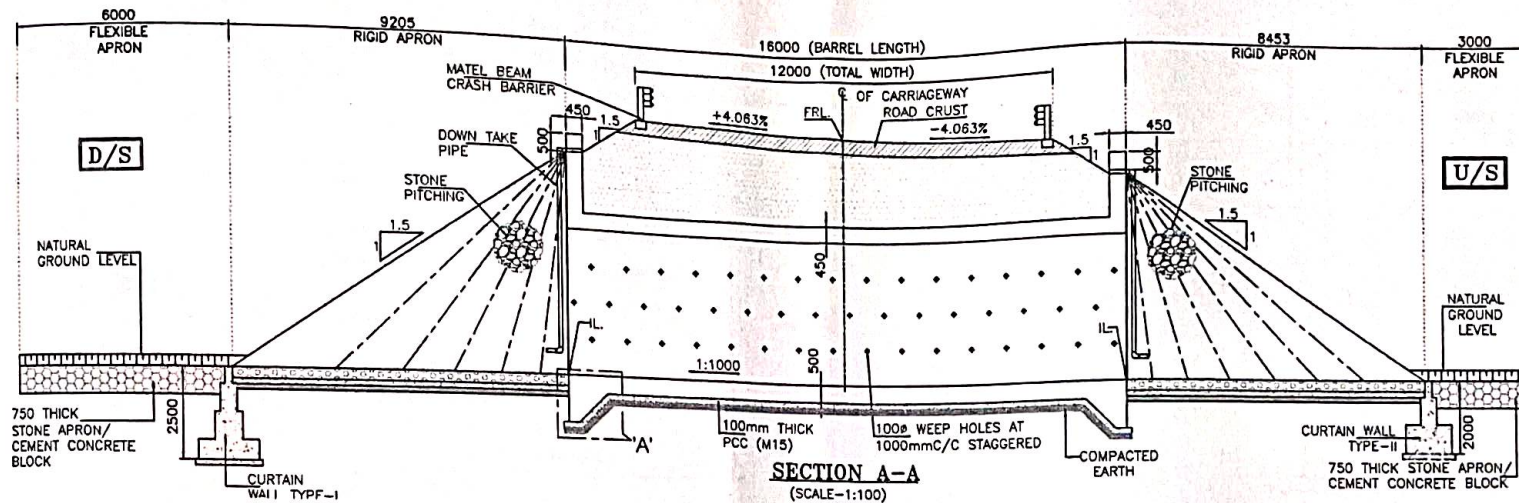
SAFETY AUDITOR
 (As per Article 10.1 of EPC Agreement)

REFERENCE DRAWINGS:-

DESIGN AID, NEW DELHI REINFORCEMENT DETAIL OF BOX CULVERT
 AVG/NH-38/BOX/REINF./43+843/01

HALF PLAN AT TOP
 PLAN
 HALF PLAN AT BOTTOM
 (SCALE=1:100)

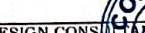
ADDITIONAL HIGHWAYS & STRUCTURE DEVELOPMENT CORPORATION LTD.	EPC CONTRACTOR KAMAC ENGINEERS PVT. LTD. F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	AUTHORITY APPROVER ALVONDA CONSULTANT LIMITED, PLOT NO. 2, TINSUKIA, ASSAM-786171	PROOF CONSULTANT CREATIVE ENGINEERING SERVICES OFFICE NO. 420, SIGNATURE GLOBAL MALL, SECTOR-3, VAISHALI, GHAZIABAD, U.P-201010	SAFETY CONSULTANT DESIGN AID PLOT NO. 54, 3rd FLOOR (FRONT), MASOODPUR DAIRY FARM, VASANT KUNJ, NEW DELHI-110070,	DESIGN CONSULTANT Winst Infra Solution Pvt. Ltd. OFFICE F-4, BHAVAN CORPORATE TOWER, PLOT NO. C-23, SECTOR-13, VASUDEV PURA, GHAZIABAD, U.P-201012	PROJECT WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (GOLAI GOAN) TO KM 47+682 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH PROPOSED MARGHERITA & LEDO BYPASS (BROWN FIELD AND GREEN FIELD) (2-LANE + 4) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE (PACKAGE-5) DRAWING TITLE:- GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 43+643 <table border="1"> <tr> <th>Date</th> <th>W.D.</th> <th>Drg. V.S.</th> <th>Chk. A.B.</th> <th>App. Scint. MTS</th> <th>Drawing Status</th> </tr> <tr> <td>JAN 2024</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> Project No. Drawing No. Sheet No. 1 OF 3	Date	W.D.	Drg. V.S.	Chk. A.B.	App. Scint. MTS	Drawing Status	JAN 2024					
Date	W.D.	Drg. V.S.	Chk. A.B.	App. Scint. MTS	Drawing Status													
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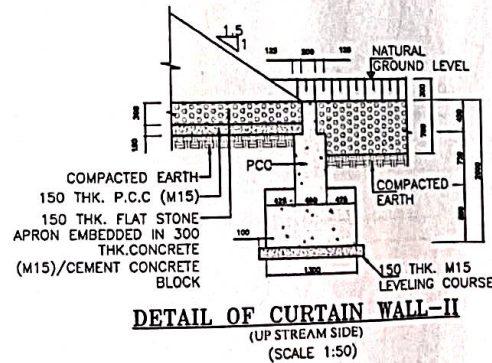
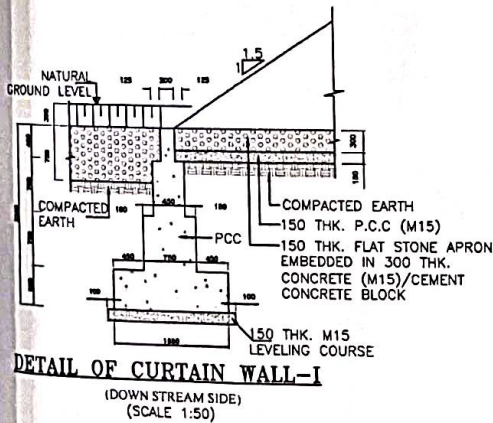
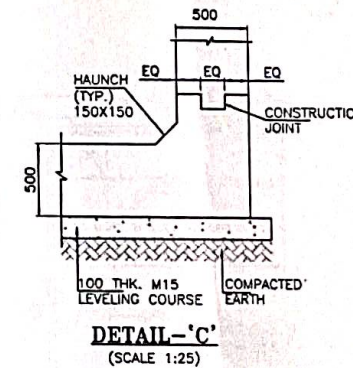
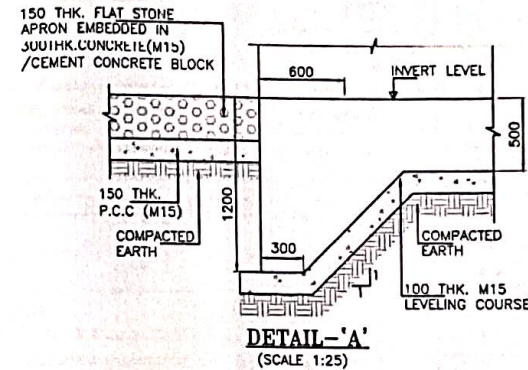
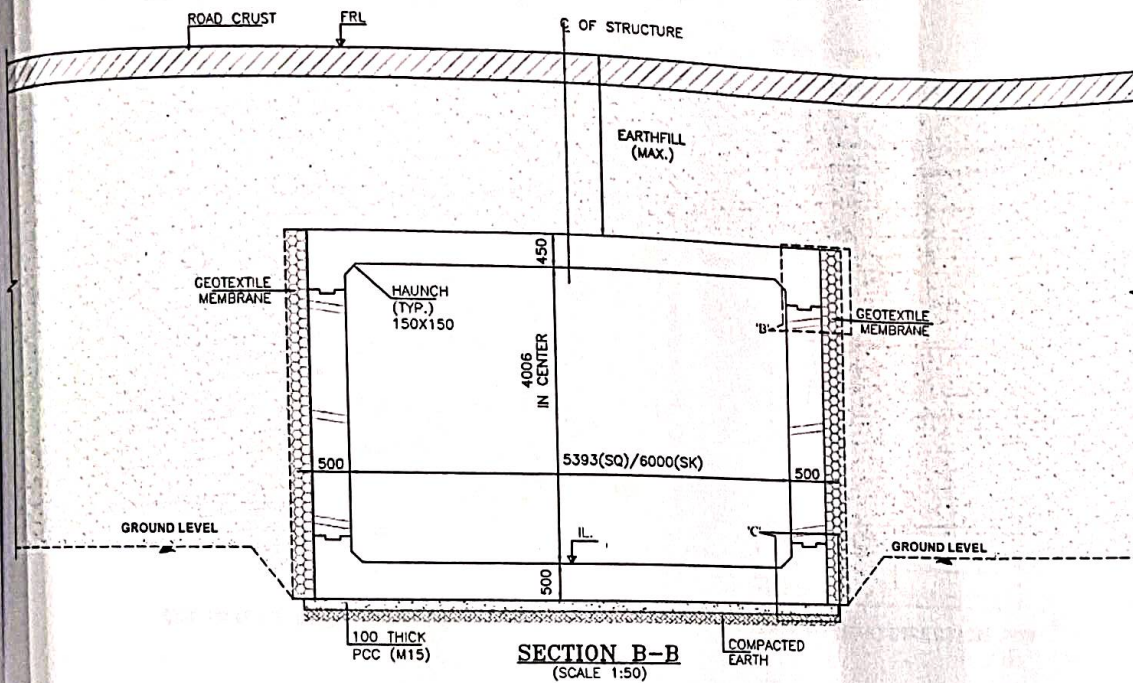


SAFETY AUDITOR
(As per Article 30.3 of EPC Agreement)

DESIGN AID, NEW DELHI

GOOD FOR CONSTRUCTION

 NADCL NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	EPC CONTRACTOR  KAMAC ENGINEERS KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	AUTHORITY'S APPROVAL  ALMOND CONSULTANTS LIMITED IN ASSOCIATION WITH CONSULTANTS PRIVATE LIMITED. DR. LEDO SECTION C/O JAYANIPUR, BARAJANIN NANGHAR, BORBIL N/2, DIGBOI, TINSUKIA, ASSAM-786 111	PROOF CONSULTANT:  CREATIVE ENGINEERING SERVICES OFFICE NO. 620, SIGNATURE GLOBAL MALL, SECTOR-3, VAISHALI, GHAZIABAD, U.P.-201010	SAFETY CONSULTANT:  DESIGN AID PLOT NO.54, 3rd FLOOR(FRONT), MASOODPUR DAIRY FARM,VASANT KUNJ, NEW DELHI-110070,	DESIGN CONSULTANT:  Winst Infra Solution Pvt. Ltd. OFFICE: F-8 ISHAN CORPORATE TOWER, PLOT NO-C-23, SECTOR-13, VASANT VIHAR, GHAZIABAD, U.P.-201012	PROVIDE C.T. WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (GOLAI GOAN) TO KM 27+882 (LEDO) ON DISRUPTION TO LEDO SECTION WITH PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE (PACKAGE 3) DRAWING TITLE: GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 43+843 Date JAN 2024 Drawn W B Chk V S Appr A B Scale MTS Drawing Status Project No. AVCHH-38/BOX/GADI43+843/01 Drawing No. Sheet No 2 OF 3 Rev. 00
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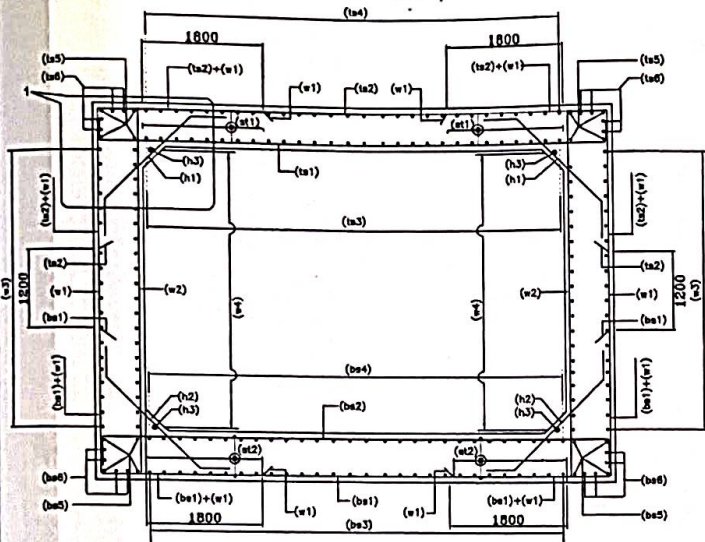


SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

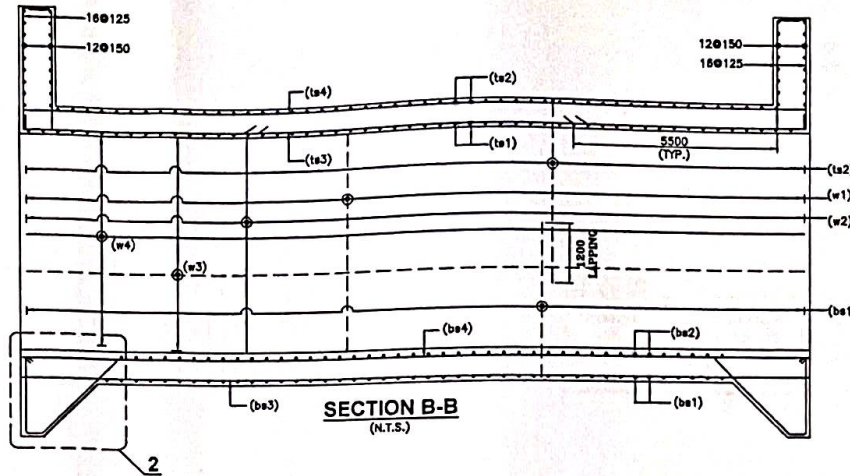
DESIGN AID, NEW DELHI

GOOD FOR CONSTRUCTION

CLIENT: NADCL NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	EPC CONTRACTOR: KAMAC ENGINEERS PVT. LTD. F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	AUTHORITY'S ENGINEER: ALMONDZ CLOUTIER & ASSOCIATES CONSULTANT PVT. LTD. WITH A.C. LEEZA CONSULTANTS PVT. LTD. Dib. Ledo Sec 01 P/O JAYANTA BAKI (S) SARBAJANIN NAGIAH, BORBIL NO.2, D.GBOI, TINSUKIA, AS8AM-786171	PROOF CONSULTANT: CREATIVE ENGINEERING SERVICES OFFICE NO. 620, SIGNATURE GLOBAL MALL, SECTOR-3, VAISHALI, GHAZIABAD, U.P.-201010	SAFETY CONSULTANT: DESIGN AID PLOT NO.54, 3rd FLOOR(FRONT), MASOODPUR DAIRY FARM, VASANT KUNJ, NEW DELHI-110070.	DESIGN CONSULTANT: A.M. CONSTRUCTION Floor WZ-1241 Palah Exclusion Bosco Ashram Wall Gali, New Delhi 110045 Winst Infra Solution Pvt. Ltd. OFFICE P-4, USHAAN CORPORATE TOWER, PLOT NO-C-2, SECTOR-13, VASUKI, GHAZIABAD, U.P.-201012	PROJECT: WIDENING/IMPROVEMENT TO 3-LANE LANE WITH PAVED SHOULDER FROM KM 37+150 (DOLAI GOANS) TO KM 47+882 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (2-LANE+PB) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE (PACKAGE II) DRAWING TITLE: GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 43+643 <table border="1"> <tr> <td>Date</td><td>Drawn</td><td>Eng.</td><td>Chk.</td><td>App.</td><td>Scale</td><td>Drawing Status</td></tr> <tr> <td>JAN 2024</td><td>W.P.</td><td>V.S.</td><td>A.B.</td><td></td><td>NTS</td><td></td></tr> <tr> <td>Project No.</td><td>Drawing No.</td><td>Sheet No.</td><td>Rev.</td><td></td><td></td><td></td></tr> <tr> <td></td><td>AVC/NH-38/BO X/GAD43+64301</td><td>3 OF 3</td><td>BO</td><td></td><td></td><td></td></tr> </table>	Date	Drawn	Eng.	Chk.	App.	Scale	Drawing Status	JAN 2024	W.P.	V.S.	A.B.		NTS		Project No.	Drawing No.	Sheet No.	Rev.					AVC/NH-38/BO X/GAD43+64301	3 OF 3	BO			
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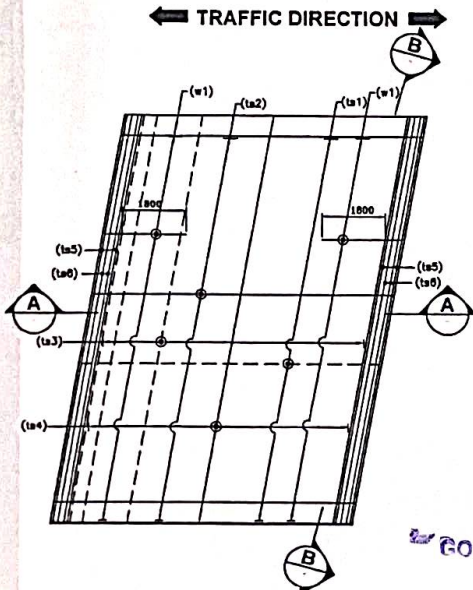
SECTION A-A
(N.T.S.)



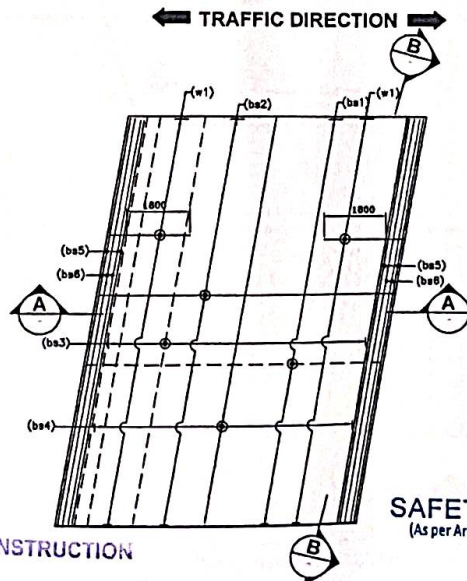
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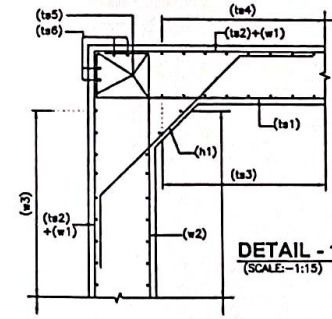
TOP FACE BAR	———
BOTTOM FACE BAR	-----



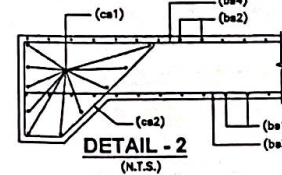
REINFORCEMENT DETAILS OF TOP SLAB
(LAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
(N.T.S.)



REINFORCEMENT DETAILS OF BOTTOM SLAB
(LAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
(N.T.S.)



DETAIL - 1
(SCALE: 1:15)



DETAIL - 2
(N.T.S.)

- ANCHORAGE LENGTH OF BOX SHALL BE TAKEN AS 40 ϕ AS PER IRC:112.
- FOR UNFAVORABLE BOND CONDITIONS THE FACTOR 40 SHOULD BE MULTIPLIED BY FACTOR OF 1.43.
- CENTER LINE OF OVERLAPPING BAR ϕ 1 & ϕ 2 IN WALL & ϕ 3 HEIGHT OF WALLS ARE AT SAME POINT.
- BAR BENDING SCHEDULE SHOULD BE STRICTLY FOLLOW DURING THE TIME OF EXECUTION IF IN CASE ANY CHANGES AT SITE KINDLY DISCUSS IT WITH ENGINEER IN CHARGE.

REFERENCE DRAWING:-

- GENERAL ARRANGEMENT DRAWING.
AVG/NH-38/BOX/GAD/43+843/01

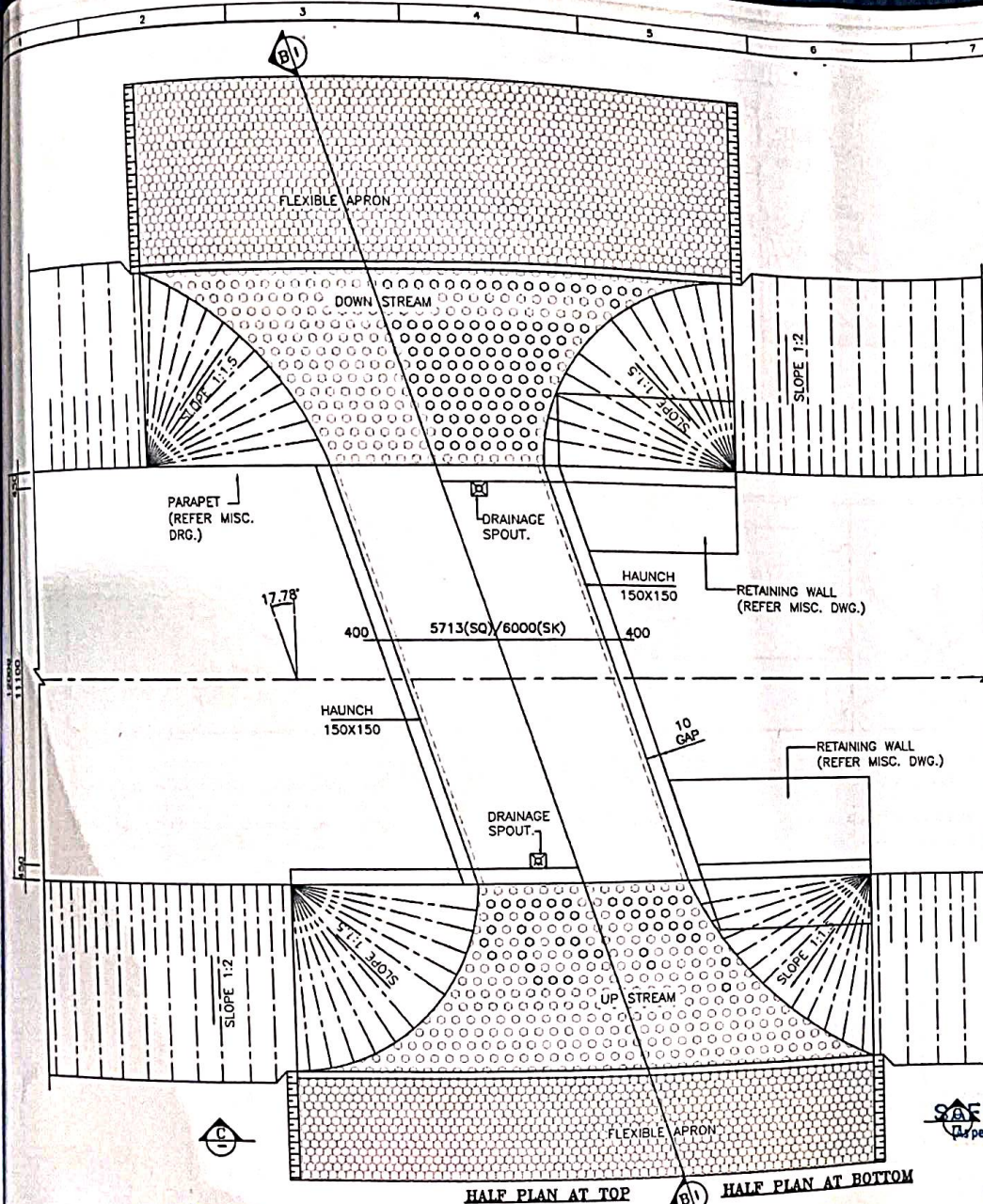
BOX REINFE. SCHEDULE

SL.NO.	BAR MARK	BAR SHAPE	DIAMETER	SPACING
1	ts1		20+12	150
2	ts2		16	150
3	ts3		12	150
4	ts4		12	150
5	ts5		12	2x4 Nos.
6	ts6		12	2x4 Nos.
7	w1		16	150
8	w2		16	150
9	w3		12	150
10	w4		10	150
11	bs1		16	150
12	bs2		20+12	150
13	bs3		12	150
14	bs4		12	150
15	bs5		12	2x4 Nos.
16	bs6		12	2x4 Nos.
17	h1		10	150
18	h2		10	150
19	h3		10	1x4 Nos.
20	cs1		12	10 Nos.
21	cs2		10	150
22	st1		12	200 c/c (L-L) 150 c/c (T-T) DIRECTION
23	st2			2 LEGGED 10 ϕ 150 C/C (T-T) & (L-L) DIRECTION

NOTES:-

- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS UNLESS OTHERWISE MENTIONED.
- DRAWING SHOULD NOT BE SCALED ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
- ALL REINFORCING BARS SHALL BE THERMO MECHANICALLY TREATED (TMT) BARS (GRADE DESIGNATION Fe-500) CONFORMING TO IS:1786 STANDARDS.
- MINIMUM CLEAR COVER TO OUTERMOST REINFORCEMENT SHALL BE AS FOLLOWS:-
 - a) TOP SLAB - 45mm
 - b) BOTTOM SLAB - 75mm
 - c) SIDE WALL (EARTH SIDE) - 75mm
 - d) SIDE WALL (INNER SIDE) - 45mm
- OVERLAPPING FOR SPlicing OF REINFORCEMENT SHALL BE AS PER CLAUSE NO.15.2.5. LAP LENGTH SHALL NOT BE LESS THAN 56 ϕ . ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:-
 - d1 ϕ SPACING S1
 - LAP LENGTH = Lp
 - Lp/3 Lp/3 Lp/3
 - (TENSION ZONE)
 - AT LEAST ONE BAR BEYOND LAPPING ZONE ON BOTH SIDE
 - (COMPRESSION ZONE)

CLIENT: NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	EPC CONTRACTOR: KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	AUTHOR/DESIGNER/ENGINEER: ALMORQZ GLOBAL INFRA CONSULTANT UNITED ENGINEERS & ARCHITECTS CONSULTANTS PRIVATE LIMITED. (PVG-345) C/O JAYANTA SAIKIA, SARBAJANIN NANGHAR, GORBI NO.2, DGBOI, TINSUKIA, ASSAM-786171	PROOF CONSULTANT: CREATIVE ENGINEERING SERVICES OFFICE NO: 620, SIGNATURE GLOBAL MALL, SECTOR-3, VAISHALI, GHAZIABAD, U.P-201010	SAFETY CONSULTANT: DESIGN AID PLOT NO.54, 3rd FLOOR(FRONT), MASOODPUR DAIRY FARM,VASANT KUNJ, NEW DELHI-110070,	DESIGN CONSULTANT: Winst Infra Solution Pvt. Ltd. OFFICE: F-4 BHANU CORPORATE TOWER, PLOT NO-C-23, SECTOR-13, VASANT KUNJ, GHAZIABAD, U.P-201012	REFERENCE: WIDENING/IMPROVEMENT TO 4-LANE LANE WITH PAVED SHOULDER FROM KM 37+150 (GOLAN GOAN) TO KM 47+482 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC BIDDING (PACKAGE 5) DRAWING TITLE:- REINFORCEMENT DETAIL OF BOX CULVERT AT CH. 43+843																											
<table border="1"> <tr> <th>Date</th> <th>Drw.</th> <th>Eng.</th> <th>Chk.</th> <th>App.</th> <th>Rev.</th> <th>Drawing Status</th> </tr> <tr> <td>JAN 2024</td> <td>V.S.</td> <td>V.S.</td> <td>A.B.</td> <td>NTS</td> <td></td> <td></td> </tr> <tr> <th>Project No.</th> <th>Drawing No.</th> <th>Sheet No.</th> <th>Rev.</th> <th colspan="3"></th> </tr> <tr> <td></td> <td>AVC/NH-38/BOX/REIN/M3+843/01</td> <td>01 OF 01</td> <td>01</td> <td colspan="3"></td> </tr> </table>						Date	Drw.	Eng.	Chk.	App.	Rev.	Drawing Status	JAN 2024	V.S.	V.S.	A.B.	NTS			Project No.	Drawing No.	Sheet No.	Rev.					AVC/NH-38/BOX/REIN/M3+843/01	01 OF 01	01			
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	AVC/NH-38/BOX/REIN/M3+843/01	01 OF 01	01																														



HALF PLAN AT TOP
PLAN
(SCALE=1:100)
HALF PLAN AT BOTTOM

GOOD FOR CONSTRUCTION

SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

DESIGN AID, NEW DELHI

REFERENCE DRAWINGS:-
1. REINFORCEMENT DETAIL OF BOX CULVERT
AVC/NH-38/BOX/REINF./44+070/03

LEGEND:-
FRL FINISHED ROAD LEVEL
I/L INVERT LEVEL
LVL. LEVEL
EGL. EXISTING GROUND LEVEL

FRL CAMBER & LOCATION IS
TO BE MATCHED WITH HIGHWAY
ALIGNMENT DRAWING.

44050

DESCRIPTION	PROPOSED
DESIGN CHN.	44+070
CA.CHN.	44+065
STR.TYPE	BOX
SPAN/DIA	1X6X3m
PROPOSAL	NEW 2 LANE

44150

LEVELS

DESIGN CH.	FRL	GROUND LEVEL	INVERT LEVEL		VERTICAL CLEARANCE (MAX.)	EARTH FILL (MAX.)	EARTH FILL (MIN.)
			LHS	RHS			
44+070	148.578	143.249	142.949	142.981	3.158m	0	0

KEY PLAN

NOTES:-

- ALL DIMENSIONS ARE IN MILLIMETER, LEVELS ARE IN METER AND CHAINAGE ARE IN KILOMETERS UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE RELEVANT PLAN AND PROFILE DRAWING OF ROAD.
- GRADE OF CONCRETE:-
 - M30-FOR RCC BOX CELL STRUCTURE.
 - M15-FOR PCC AND LEVELING COURSE.
 - M30-PARAPET
- GRADE OF STEEL - Fe500.
- THE FOLLOWING LOADS HAVE BEEN CONSIDERED IN THE DESIGN:-
 - ONE LANE, TWO LANE AND THREE LANE OF CLASS A
 - ONE LANE OF CLASS A IN ADDITION OF ONE LANE OF CLASS 70R WHEEL OR ONE LANE OF 70R TRACKED WHICHEVER IS GOVERNS.
- BACKFILL MATERIAL BEHIND END WALL SHALL BE SELECTED GRANULAR SOIL HAVING PROPERTIES
MAX DRY DENSITY = 1850-2280kg/m³
OPTIMUM MOISTURE CONTENT = 7-15
AS PER IRC78-2014 AND MORTH SPECIFICATION.
- THE FRL SHOWN IN THE DRAWING SHALL BE VERIFIED WITH CORRESPONDING PLAN AND PROFILE DRAWING BEFORE EXECUTION, IF THERE IS ANY VARIATION SHALL BE BROUGHT TO THE NOTICE OF ENGINEER.
- THE DIMENSION AND LEVEL ARE SUBJECT TO CHANGE AS PER SITE CONDITION AND DETAILED DESIGN.
- BACKFILL TO BE DONE AND COMPACTED FROM BOTH SIDE SIMULTANEOUSLY.
- 600MM THICK, FILTER MATERIAL BEHIND RETAINING WALL SHALL BE LAID AS PER APPENDIX 6 OF IRC 78-2014.
- 50MM THICK CEMENT CONCRETE WEARING COAT SHALL BE PROVIDED.
- 100MM DIA P.V.C. PIPE AT SPACING 1000MM/c IN HORIZONTAL/VERTICAL DIRECTION SHALL BE PROVIDED UP TO 150MM ABOVE GROUND LEVEL FOR WEEP HOLES IN RETAINING WALL.
- SBC SHALL BE 8t/m². AND SAME SHALL BE ENSURED AT SITE BY ANY SUITABLE METHOD.
- AS PER MORTH SECTION-2500, WHERE THE REQUIRED SIZE OF BOULDERS ARE NOT AVAILABLE ECONOMICALLY, CEMENT CONCRETE BLOCKS OF EQUIVALENT WEIGHT SHALL BE USED. THE GRADE OF CONCRETE SHALL BE M15 NOMINAL MIX. CEMENT CONCRETE BLOCK SHALL BE PREFERRED WHERE PRACTICABLE. CHOOSE ANY SUITABLE METHOD TO ACHIEVE THE REQUIRED SBC AS PER SITE.

THE EXPOSURE CONDITION IS MODERATE.

GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 44+070

Date	Drawn	Checked	Appr.	Scale	Drawing Status
JAN 2024	W.P.	V.S.	A.B.	MTS	1 OF 2
Project No.	Drawing No.	AVC/NH-38/BOX/GAD/44+070R1			

NADCL
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.

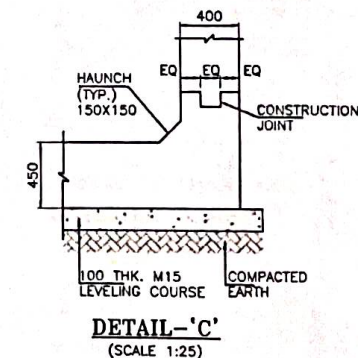
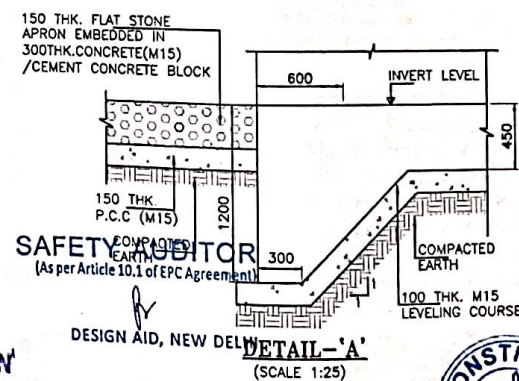
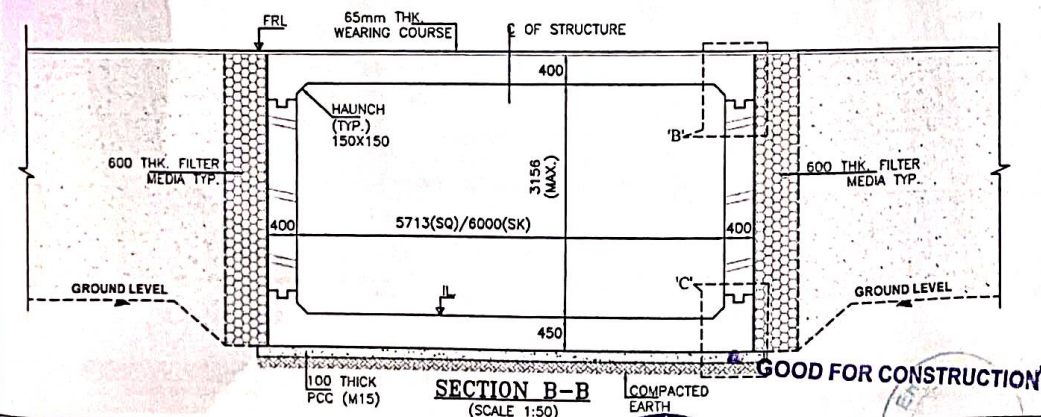
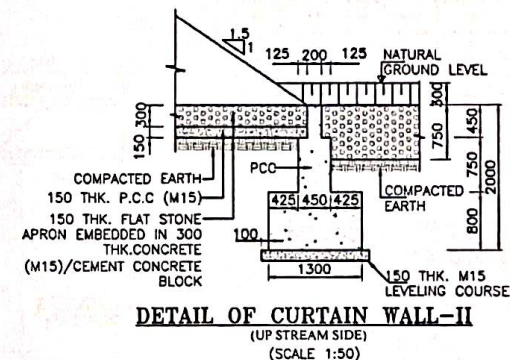
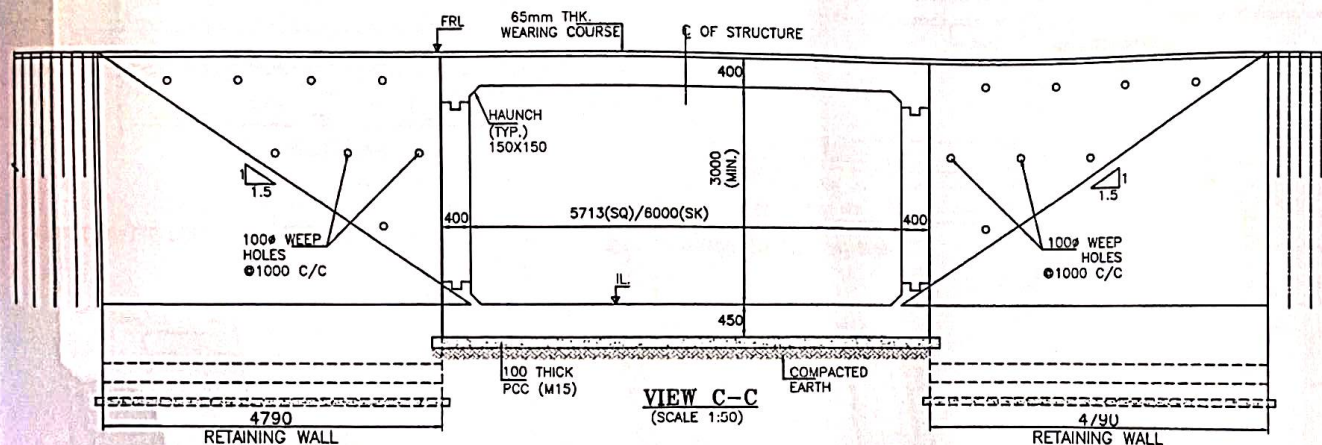
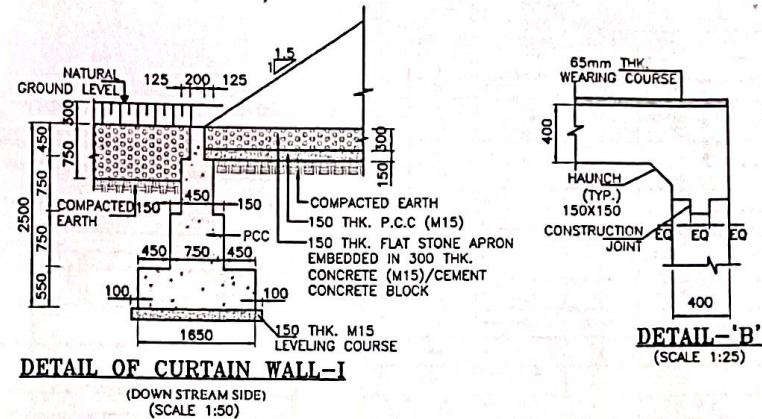
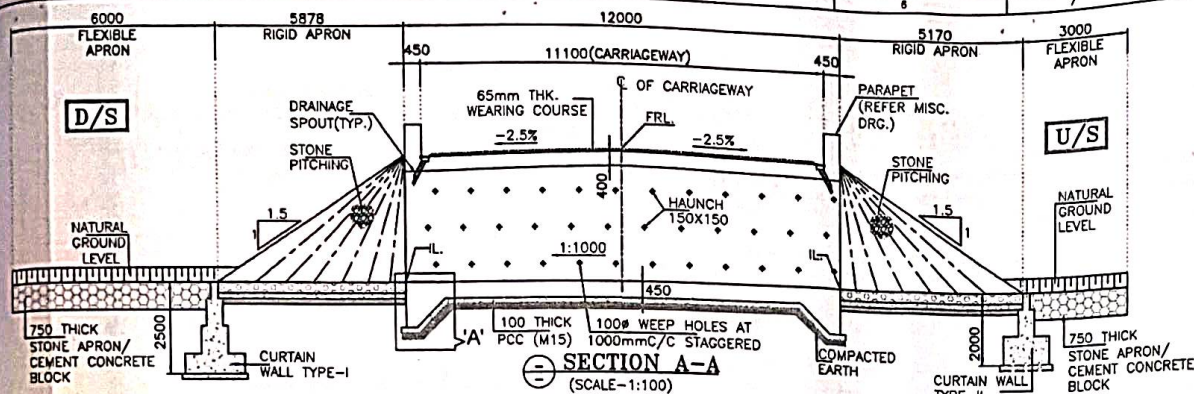
KAMAC ENGINEERS PVT. LTD.
F0201, CITY CENTER OFFICE
BLOCK, 2ND FLOOR,
MATIGARA 734010

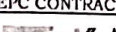
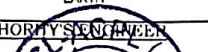
PROOF CONSULTANT:
ALMOKDAR ENGINEERING CONSULTANT
LIMITED IN INDIA
Q/O JAYANTANIKIA, SARBA ANIN
NABHAR, BORBI NO.2, DGBOI,
TINSUKIA, ASSAM-781171

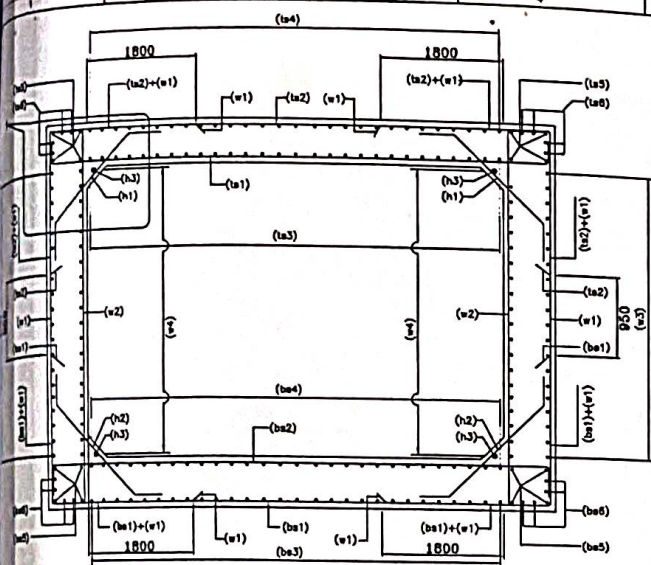
SAFETY CONSULTANT:
CREATIVE ENGINEERING SERVICES
OFFICE NO: 620, SIGNATURE GLOBAL
MALL, SECTOR-3,
VAISHALI, GHAZIABAD, U.P.-201010

DESIGN AID
PLOT NO.54, 3rd FLOOR(FRONT),
MASOOPUR DAIRY FARM,VASANT KUNJ,
NEW DELHI-110070,

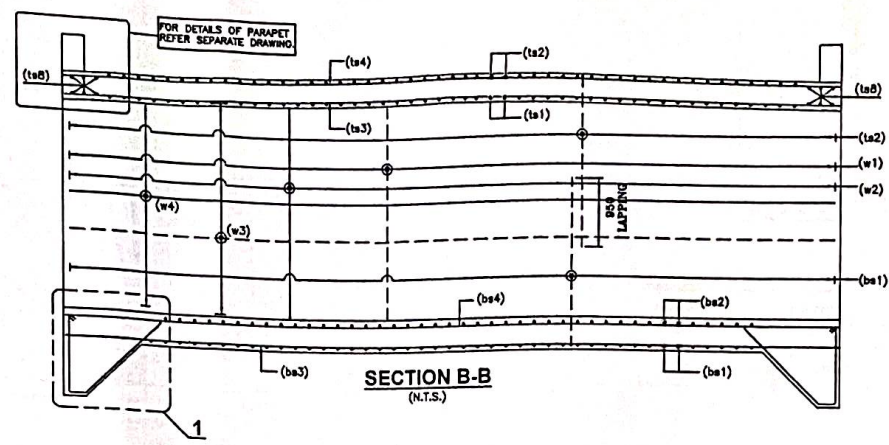
DESIGN CONSULTANT:
A. CONSTRUCTION
Palam Vihar, New Delhi-110045
Winst Infra Solution Pvt. Ltd.
OFFICE: F-8, ISHAN CORPORATE
TOWER, PLOT NO-C-22, SECTOR-13,
VASUNDHRA GHAZIABAD, U.P.-201012



CLIENT:  NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	EPC CONTRACTOR  KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	AUTHORITY SIGNATURE  ALMOND CONSULTANTS ALMOND CONSULTANTS PVT. LTD. C/O JAYANT, 60/3, SARGAJAN NAGAR, BORJIL NO. 2, DIGOI, INSUKIA, ASSAM-786117	PROOF CONSULTANT:  CREATIVE ENGINEERING SERVICES OFFICE NO. 620, SIGNATURE GLOBAL MALL, SECTOR-3, VAISHALI, GHAZIABAD, U.P-201010	SAFETY CONSULTANT:  DESIGN AID PLOT NO.54, 3rd FLOOR(FRONT), MASOODPUR DAIRY FARM,VASANT KUNJ, NEW DELHI-110070,	DESIGN CONSULTANT:  Winst Infra Solution Pvt. Ltd. OFFICE: P-4, ISHAAN CORPORATE TOWER, PLOT NO-G-23,SECTOR-13, VAISHALI, GHAZIABAD, U.P-201012	PROJECT: WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (GOLAI GOAN) TO KM 47+882 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE (PACKAGE-B) DRAWING TITLE: GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 44+070 <table><tr><td>Date</td><td>Drawn</td><td>Check</td><td>Appr.</td><td>Scale</td><td>Drawing Status</td></tr><tr><td>JAN-2024</td><td>W.P</td><td>V.S</td><td>A.B</td><td>NTS</td><td></td></tr></table> <table><tr><td>Project No.</td><td>Drawing No.</td><td>Sheet No.</td><td>Rev.</td></tr><tr><td></td><td>AVCN-28/BOX/GAD/64/70701</td><td>2 OF 2</td><td>NO</td></tr></table>	Date	Drawn	Check	Appr.	Scale	Drawing Status	JAN-2024	W.P	V.S	A.B	NTS		Project No.	Drawing No.	Sheet No.	Rev.		AVCN-28/BOX/GAD/64/70701	2 OF 2	NO
Date	Drawn	Check	Appr.	Scale	Drawing Status																					
JAN-2024	W.P	V.S	A.B	NTS																						
Project No.	Drawing No.	Sheet No.	Rev.																							
	AVCN-28/BOX/GAD/64/70701	2 OF 2	NO																							



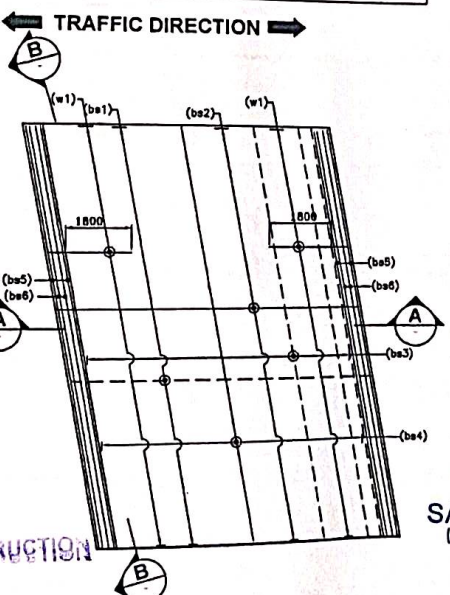
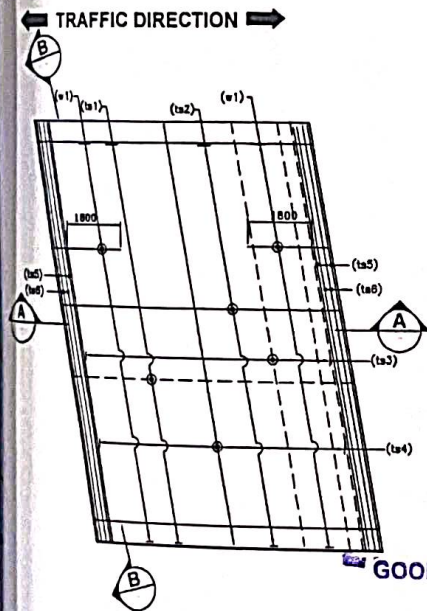
SECTION A-A
(N.T.S.)



SECTION B-B
(N.T.S.)

LEGEND:-

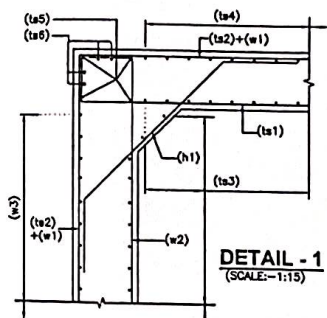
TOP FACE BAR	———
BOTTOM FACE BAR	- - - - -



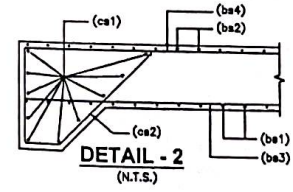
GOOD FOR CONSTRUCTION

REINFORCEMENT DETAILS OF TOP SLAB
(LAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
(N.T.S.)

REINFORCEMENT DETAILS OF BOTTOM SLAB
(LAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
(N.T.S.)



DETAIL - 1
(SCALE:-1:15)



DETAIL - 2
(N.T.S.)

- ANCHORAGE LENGTH OF BOX SHALL BE TAKEN AS 40 ϕ AS PER IRC:112.
- FOR UNFAVORABLE BOND CONDITIONS THE FACTOR 40 SHOULD BE MULTIPLIED BY FACTOR OF 1.43.
- MID HEIGHT OF WALLS ARE AT SAME POINT.
- BAR BENDING SCHEDULE SHOULD BE STRICTLY FOLLOWED DURING THE TIME OF EXECUTION IF IN CASE ANY CHANGES AT SITE KINDLY DISCUSS IT WITH ENGINEER IN CHARGE.

SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

DESIGN AID, NEW DELHI

REFERENCE DRAWING:-

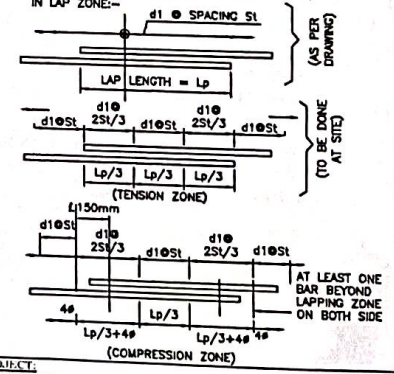
- GENERAL ARRANGEMENT DRAWING.
AVC/NH-38/BOX/GAD/44+070/01

BOX REINF. SCHEDULE

SL.NO.	BAR MARK	BAR SHAPE	DIAMETER	SPACING
1	ts1		16+10	200
2	ts2		16	200
3	ts3		10	200
4	ts4		12	200
5	ts5		12	2x4 Nos.
6	ts6		12	2x4 Nos.
7	w1		16	200
8	w2		16	200
9	w3		12	200
10	w4		10	200
11	bs1		16	200
12	bs2		20+10	200
13	bs3		12	200
14	bs4		12	200
15	bs5		12	2x4 Nos.
16	bs6		12	2x4 Nos.
17	h1		10	200
18	h2		10	200
19	h3		10	1x4 Nos.
20	cs1		12	10 Nos.
21	cs2		10	200

NOTES:-

- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS UNLESS OTHERWISE MENTIONED.
- DRAWING SHOULD NOT BE SCALED ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
- ALL REINFORCING BARS SHALL BE THERMO MECHANICALLY TREATED (TMT) BARS (GRADE DESIGNATION Fe-500) CONFORMING TO IS:1786 STANDARDS.
- MINIMUM CLEAR COVER TO OUTERMOST REINFORCEMENT SHALL BE AS FOLLOWS:-
 - a) TOP SLAB - 45mm
 - b) PITCHER SLAB - 75mm
 - c) SIDE WALL (EARTH SIDE) - 75mm
 - d) SIDE WALL (INNER SIDE) - 45mm
- OVERLAPPING FOR SPACING OF REINFORCEMENT SHALL BE AS PER CLAUSE NO.15.2.5. LAP LENGTH SHALL NOT BE LESS THAN 5 ϕ . ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:-



AT LEAST ONE BAR BEYOND LAPPING ZONE ON BOTH SIDE

NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.

EPC CONTRACTOR
KAMAC ENGINEERS PVT.LTD
F0201, CITY CENTER OFFICE
BLOCK, 2ND FLOOR,
MATIGARA 734010

AUTHORITY'S ENGINEER
ALMOHIZ GLOKON/BA CONSULTANT
LIMITED, INDIAN RAILWAYS
CONSULTANT PRIVATE LIMITED.
PLOT NO. 630, SIGNATURE GLOBAL
MALL, SECTOR-3,
VAISHALI, GHAZIABAD, U.P.-201010

PROOF CONSULTANT:
CREATIVE ENGINEERING SERVICES
OFFICE NO. 630, SIGNATURE GLOBAL
MALL, SECTOR-3,
VAISHALI, GHAZIABAD, U.P.-201010

SAFETY CONSULTANT:
DESIGN AID
PLOT NO.54, 3rd FLOOR(FRONT),
MASOODPUR DAIRY FARM,VASANT KUNJ,
NEW DELHI-110070,

DESIGN CONSULTANT:
Winst Infra Solution Pvt. Ltd.
OFFICE: F-8, ISHAAN CORPORATE
TOWER, PLOT NO-C-23, SECTOR-13,
VAISHALI, GHAZIABAD, U.P.-201012

PROJECT:
WIDENING/IMPROVEMENT TO 3-LANE WITH PAVED SHOULDER FROM KM 27-150 (GOLAN GOAN) TO KM 47+80 (LEDO) ON DRUGABARI TO LEDO SECTION WITH PROPOSED MARGHERITA & LEDO BYPASS (BROWN FIELD AND GREEN FIELD) (PLANE-PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE (PACKAGE-5)

DRAWING TITLE:-
REINFORCEMENT DETAIL OF BOX CULVERT AT CH. 44+070

Date	Drw. W.P.	Dwg. V.S.	Chk. A.H.	App. NTS	Scale	Drawing Status
JAN. 2024						
Project No.	Drawing No.	Sheet No.	Rev.			
	AVG/NH-38/BOX/REIN/44+070/01	01 OF 01	RO			

44450

DESCRIPTION	PROPOSED
DESIGN CHN.	44+526
CA.CHN.	44+515
STR.TYPE	BOX
SPAN/DIA	1X6X4m
PROPOSAL	NEW 2 LANE

44550

KEY PLAN

LEVELS

DESIGN CH.	FRL	GROUND LEVEL	INVERT LEVEL		VERTICAL CLEARANCE (MAX.)	EARTH FILL (MAX.)	EARTH FILL (MIN.)
			LHS	RHS			
44+526	147.431	142.472	142.172	172.184	4.012m	0.847m	0.708m

NOTES:-

- ALL DIMENSIONS ARE IN MILLIMETER, LEVELS ARE IN METER AND CHAINAGE ARE IN KILOMETERS UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE RELEVANT PLAN AND PROFILE DRAWING OF ROAD.
- GRADE OF CONCRETE:-
 - M30-FOR RCC BOX CELL STRUCTURE.
 - M15-FOR PCC AND LEVELING COURSE.
 - M30-PARAPET
- GRADE OF STEEL - Fe500.
- THE FOLLOWING LOADS HAVE BEEN CONSIDERED IN THE DESIGN:-
 - ONE LANE, TWO LANE AND THREE LANE OF CLASS A
 - ONE LANE OF CLASS A IN ADDITION OF ONE LANE OF CLASS 70R WHEEL OR ONE LANE OF 70R TRACKED WHICHEVER IS GOVERNS.
- BACKFILL MATERIAL BEHIND END WALL SHALL BE SELECTED GRANULAR SOIL HAVING PROPERTIES
MAX DRY DENSITY = 1850-2280kg/m³
OPTIMUM MOISTURE CONTENT = 7-15
AS PER IRC78-2014 AND MORTH SPECIFICATION.
- THE FRL SHOWN IN THE DRAWING SHALL BE VERIFIED WITH CORRESPONDING PLAN AND PROFILE DRAWING BEFORE EXECUTION, IF THERE IS ANY VARIATION SHALL BE BROUGHT TO THE NOTICE OF ENGINEER.
- THE DIMENSION AND LEVEL ARE SUBJECT TO CHANGE AS PER SITE CONDITION AND DETAILED DESIGN.
- BACKFILL TO BE DONE AND COMPACTED FROM BOTH SIDE SIMULTANEOUSLY.
- 600MM THICK. FILTER MATERIAL BEHIND RETAINING WALL SHALL BE LAID AS PER APPENDIX 6 OF IRC 78-2014.
- 50MM THICK CEMENT CONCRETE WEARING COAT SHALL BE PROVIDED.
- 100MM DIA P.V.C. PIPE AT SPACING 1000MM/c IN HORIZONTAL/VERTICAL DIRECTION SHALL BE PROVIDED UP TO 150MM ABOVE GROUND LEVEL FOR WEEP HOLES IN RETAINING WALL.
- SBC SHALL BE 10t/m² AND SAME SHALL BE ENSURED AT SITE BY ANY SUITABLE METHOD.
- AS PER MORTH SECTION-2500, WHERE THE REQUIRED SIZE OF BOULDERS ARE NOT AVAILABLE ECONOMICALLY, CEMENT CONCRETE BLOCKS OF EQUIVALENT WEIGHT SHALL BE USED. THE GRADE OF CONCRETE SHALL BE M15 NOMINAL MIX. CEMENT CONCRETE BLOCK SHALL BE PREFERRED WHERE PRACTICABLE.
- CHOOSE ANY SUITABLE METHOD TO ACHIEVE THE REQUIRED SBC AS PER SITE.
- THE EXPOSURE CONDITION IS MODERATE.

LEGEND:-

FRL FINISHED ROAD LEVEL
IL INVERT LEVEL
LVL. LEVEL
EGL. EXISTING GROUND LEVEL

FRL CAMBER & LOCATION IS TO BE MATCHED WITH HIGHWAY ALIGNMENT DRAWING.

SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

REFERENCE DRAWINGS:-

1. REINFORCEMENT DETAIL OF BOX CULVERT
AVC/NH-38/BOX/REINF/44+526

DESIGN AID, NEW

HALF PLAN AT TOP

PLAN

(SCALE-1:100)

HALF PLAN AT BOTTOM

CLIENT:



NATIONAL HIGHWAYS &
INFRASTRUCTURE DEVELOPMENT
CORPORATION LTD.

EPC CONTRACTOR



KAMAC ENGINEERS PVT.LTD
F0201, CITY CENTER OFFICE
BLOCK, 2ND FLOOR,
MATIGARA 734010

AUTHORITY ENGINEER

ALMOND GLOBE INFRA CONSULTANT
LIMITED IN CHARGE
CONSULTANT
(PKG-3.4.5)
C/O JAYANTA SARKAR BARJANIN
NANGHAR, BORAIL NO.2, DISBOI,
TINSUKIA, ASSAM-786171

PROOF CONSULTANT:

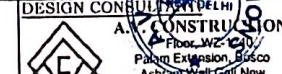
CREATIVE ENGINEERING SERVICES
OFFICE NO: 620, SIGNATURE GLOBAL
MALL, SECTOR-3,
VAISHALI, GHAZIABAD, U.P-201010

SAFETY CONSULTANT:



DESIGN AID
PLOT NO.54, 3rd FLOOR(FRONT),
MASOODPUR DAIRY FARM,VASANT KUNJ,
NEW DELHI-110070,

DESIGN CONSULTANT DELHI



Winst Infra Solution
Pvt. Ltd.
OFFICE: P-4, ISHAN CORPORATE
TOWER, PLOT NO-C-23, SECTOR-13,
VAISHALI, GHAZIABAD, U.P-201012

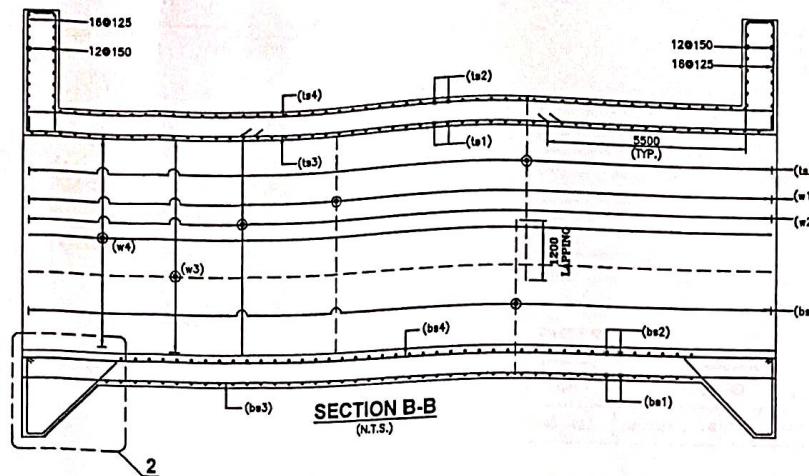
PROJECT:

WIDENING/IMPROVEMENT TO 2-LANE WITH PAVED SHOULDER FROM KM 27+150
(GOLAI GOAN) TO KM 47+482 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH
PROPOSED MARCHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD)
(2-LANE +PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC
MODE (PACKAGE 5)

DRAWING TITLE:

GENERAL ARRANGEMENT DRAWING FOR
BOX CULVERT AT CHAINAGE 44+526

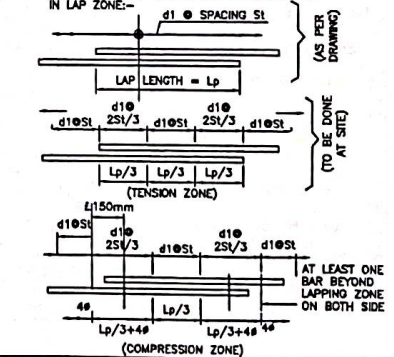
Date	Drawn	Checked	Appr.	Rev.	Drawing Status
JAN 2024	V.S.	A.II	NTS		
Project No.	Drawing No.	Sheet No.	Rev		
	AVC/NH-38/BOX/GAD/44+526/01	1 OF 3	RO		



BOX REIN. SCHEDULE				
SL.NO.	BAR MARK	BAR SHAPE	DIAMETER	SPACING
1	ts1		20+8	180
2	ts2		16	180
3	ts3		12	200
4	ts4		12	200
5	ts5		12	2x4 Nos.
6	ts6		12	2x4 Nos.
7	w1		16	180
8	w2		16	180
9	w3		12	200
10	w4		10	200
11	bs1		16	180
12	bs2		20+10	180
13	bs3		12	200
14	bs4		12	200
15	bs5		12	2x4 Nos.
16	bs6		12	2x4 Nos.
17	h1		10	180
18	h2		10	180
19	h3		10	1x4 Nos.
20	cs1		12	10 Nos.
21	cs2		10	200
22	st1		8	200 c/c (L-L) 180 c/c (T-T) DIRECTION

NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS UNLESS OTHERWISE MENTIONED.
2. DRAWING SHOULD NOT BE SCALED ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
3. ALL REINFORCING BARS SHALL BE THERMO MECHANICALLY TREATED (TMT) BARS (GRADE DESIGNATION Fe-500) CONFORMING TO IS 1786 STANDARDS.
4. MINIMUM CLEAR COVER TO STANDARD REINFORCEMENT SHALL BE AS FOLLOWS:-
 - a) TOP SLAB - 45mm
 - b) BOTTOM SLAB - 75mm
 - c) SIDE WALL (EARTH SIDE) - 75mm
 - d) SIDE WALL (INNER SIDE) - 45mm
5. OVERLAPPING FOR JOINTING OF REINFORCEMENT SHALL BE AS PER CLAUSE NO.15.2.5.
LAP LENGTH SHALL NOT BE LESS THAN 56 ϕ .
ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:-



SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

6. ANCHORAGE LENGTH OF BAR SHALL BE TAKEN AS 40 ϕ AS PER IS: 456-1978.
7. FOR UNFAVORABLE BOND CONDITIONS THE FACTOR 40 SHOULD BE MULTIPLIED BY FACTOR OF 1.43.
8. CENTER LINE OF OVERLAPPING BAR ϕ_1 & ϕ_2 IN WALL & MID HEIGHT OF WALLS ARE AT SAME POINT.
9. BAR BENDING SCHEDULE SHOULD BE STRICTLY FOLLOW DURING THE TIME OF EXISTENCE OF THESE AND ANY CHANGES AT SITE KINDLY DISCUSS IT WITH ENGINEER IN CHARGE.

REFERENCE DRAWING

1. GENERAL ARRANGEMENT DRAWING.
AVC/NH-38/BOX/GAD/44+528/0

DESIGN AID, NEW DELH

GOOD FOR CONSTRUCTION

REINFORCEMENT DETAILS OF TOP SLAB

(HAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY,
(N.T.S.)

REINFORCEMENT DETAILS OF BOTTOM SLAB

(HAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
(N.T.S.)

CLIENT:

AMIDEL
NATIONAL HIGHWAYS &
INFRASTRUCTURE DEVELOPMENT
CORPORATION LTD.

EPC CONTRACTOR

 **KAMAC**
ENGINEERS

KAMAC ENGINEERS PVT.LTD
F0201, CITY CENTER OFFICE
BLOCK, 2ND FLOOR,
MATIGARA 734010

AUTHORITY'S ENGINEER
 ALMOND GLOBAL INFRA CONSULTANT
 LIMITED, 14, PONDICH MYLEEEZA
 CONSULTANT PRIVATE LIMITED,
 Chennai
 C/O JAYANTA SARKA, SARKA JAMIN
 NAMBAR, POBAIL NO. 2, DIGBOI,
 TINSUKIA, ASSAM 786173

PROOF CONSULTANT:



CREATIVE ENGINEERING SERVICES
OFFICE NO. 620, SIGNATURE GLOBAL
MALL, SECTOR-3,
VAISHALI, GHAZIABAD, U.P.-201010

SAFETY CONSULTANT:

DESIGN

DESIGN AID

PLOT NO.54, 3rd FLOOR(FRONT),
MASOODPUR DAIRY FARM,VASANT KUNJ,
NEW DELHI-110070.

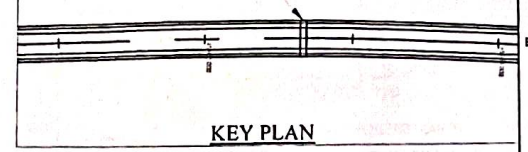
DESIGN CONSULTANT:
A.V. CONSTRUCTION
 Floor, WZ-124
 Palam Extension, Boco
 Ashram Wall Gali, Now
 Delhi 110045
Winst Infra Solution
Pvt. Ltd.
 OFFICE: F-8, ISHAN CORPORATE
 TOWER, PLOT NO C-23, SECTOR-13,
 VASUNDHRA CHANDEN, U.P. 201015

(COMPRESSION ZONE)							
PURJECT:							
WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27-150 (LOCAL ROAD) TO KM 47+882 (LEDO) ON DISBURGHAL TO LEDO SECTION WITH PROPOSED MARGHERITA A LEDO BYPASS (BROWNFIELD AND GREEN FIELD (2-LANE+PS) OF NH-38 IN TINKULIA DISTRICT IN THE STATE OF ASSAM ON EPIC LOGS (PAGE-5)							
DRAWING TITLE:							
REINFORCEMENT DETAIL OF BOX CULVERT AT CH. 44+525							
Date JAN 2024	Drw. W I	Dsg. V	Chk. A B	App. S	Scale NTS	Drawing Status	
Project No.	Drawing No.				Sheet No.		Rev
	AVCHN-38/BOX/REIN.44+525				01 OF 01		00

45350

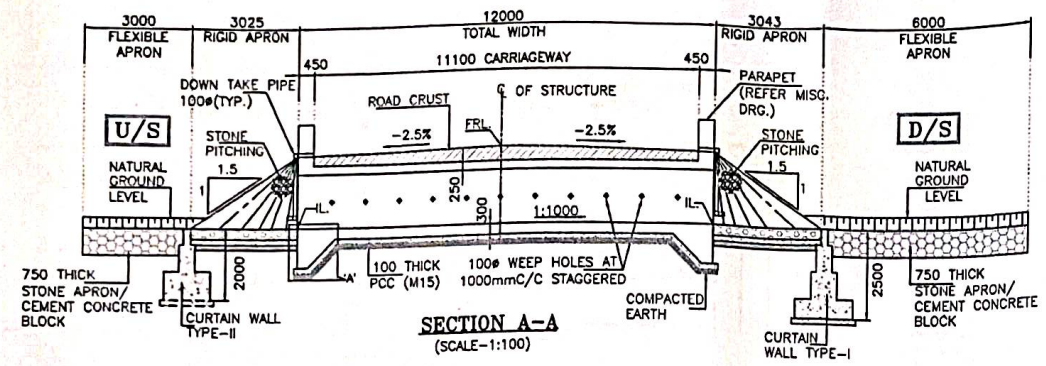
45450

DESCRIPTION	PROPOSED
DESIGN CHN	45+433
CA.CHN	45+400
STR TYPE	BOX
SPAN/DIA	1X2X1.8m
PROPOSAL	NEW 2 LANE



KEY PLAN

SECTION A-A
(SCALE-1:100)



LEVELS

DESIGN CH.	FRL	GROUND LEVEL	INVERT LEVEL		VERTICAL CLEARANCE (MAX.)	EARTHFILL (MAX.)	EARTHFILL (MIN.)
			LHS	RHS			
45+433	149.591	147.719	147.431	147.419	1.512 m	0.410 m	0.271 m

NOTES:-

- ALL DIMENSIONS ARE IN MILLIMETER, LEVELS ARE IN METER AND CHAINAGE ARE IN KILOMETERS UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE RELEVANT PLAN AND PROFILE DRAWING OF ROAD.
- GRADE OF CONCRETE:-
 - M30-FOR RCC BOX CELL STRUCTURE.
 - M15-FOR PCC AND LEVELING COURSE.
 - M30-PARAPET
- GRADE OF STEEL - Fe 500.
- THE CARRIAGEWAY OF PROPOSED CULVERT IS DESIGN AS PER 6-2017.
- BACKFILL MATERIAL BEHIND END WALL SHALL BE SELECTED GRANULAR SOIL HAVING PROPERTIES:
MAX DRY DENSITY = 1850-2280kg/m³
OPTIMUM MOISTURE CONTENT = 7-15
AS PER IRC78-2014 AND MORTH SPECIFICATION.
- THE FRL SHOWN IN THE DRAWING SHALL BE VERIFIED WITH CORRESPONDING PLAN AND PROFILE DRAWING BEFORE EXECUTION. IF THERE IS ANY VARIATION SHALL BE BROUGHT TO THE NOTICE OF ENGINEER.
- THE DIMENSION AND LEVEL ARE SUBJECT TO CHANGE AS PER SITE CONDITION AND DETAILED DESIGN.
- BACKFILL TO BE DONE AND COMPACTED FROM BOTH SIDE SIMULTANEOUSLY.
- 100MM DIA P.V.C. PIPE AT SPACING 1000MM/C IN HORIZONTAL/VERTICAL DIRECTION SHALL BE PROVIDED UP TO 150MM ABOVE GROUND LEVEL FOR WEEP HOLES IN RETAINING WALL.
- SBC SHALL BE 9t/m² AND SAME SHALL BE ENSURED AT SITE BY ANY SUITABLE METHOD.
- AS PER MORTH SECTION-2500, WHERE THE REQUIRED SIZE OF BOULDERS ARE NOT AVAILABLE ECONOMICALLY, CEMENT CONCRETE BLOCKS OF EQUIVALENT WEIGHT SHALL BE USED. THE GRADE OF CONCRETE SHALL BE M15 NOMINAL MIX. CEMENT CONCRETE BLOCK SHALL BE PREFERRED WHERE PRACTICABLE. CHOOSE ANY SUITABLE METHOD TO ACHIEVE THE REQUIRED SBC AS PER SITE.

LEGEND:-

FRL FINISHED ROAD LEVEL
IL INVERT LEVEL
LVL LEVEL
EGL EXISTING GROUND LEVEL

FRL CAMBER & LOCATION IS TO BE MATCHED WITH HIGHWAY ALIGNMENT DRAWING.

SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

- REFERENCE DRAWINGS:-
- REINFORCEMENT DETAIL OF BOX CULVERT AVC/NH-38/BC/REINF./45+433/01

GOOD FOR CONSTRUCTION

HADCL
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.

EPC CONTRACTOR

KAMAC ENGINEERS PVT. LTD.
F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010

AUTHORITY'S ENGINEER

ALMONDE PRAKASH INFRA CONSULTANT LIMITED
C/O. JAYAN DESAI & SARBANJAN NAMSHAR, 80/80B NO. 2, DIGBOI, TINSUKIA, ASSAM-786171

PROOF CONSULTANT:

CREATIVE ENGINEERING SERVICES
OFFICE NO. 620, SIGNATURE GLOBAL MALL, SECTOR-3, VAISHALI, GHAZIABAD, U.P.-201010

SAFETY CONSULTANT:

DESIGN AID
PLOT NO. 54, 3rd FLOOR (FRONT), MASOODPUR DAIRY FARM, VASANT KUNJ, NEW DELHI-110070.

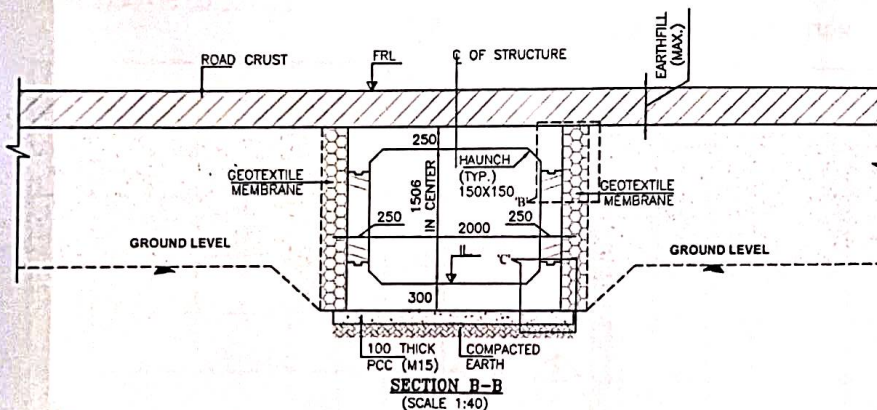
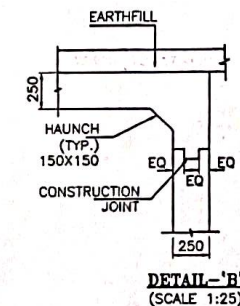
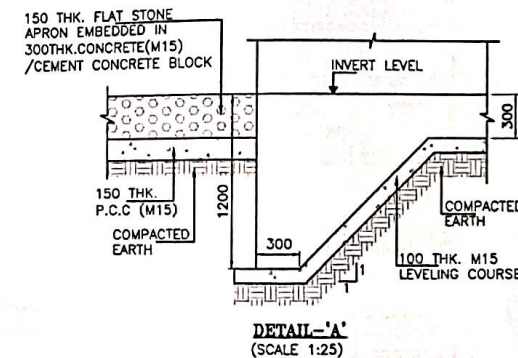
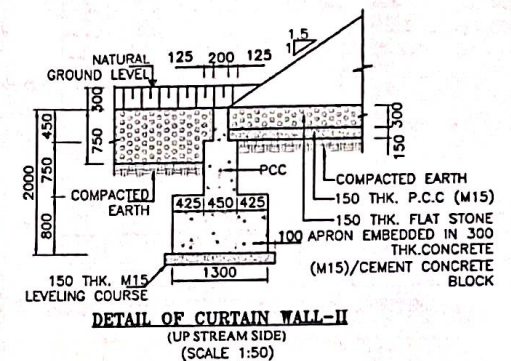
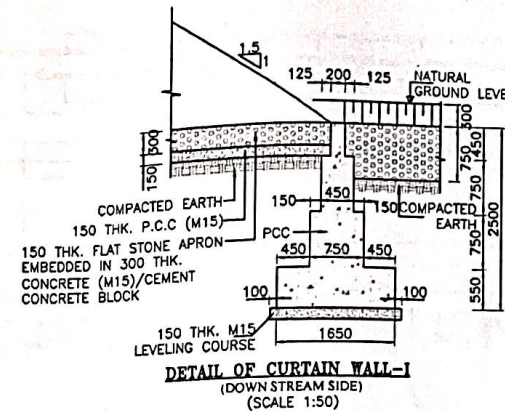
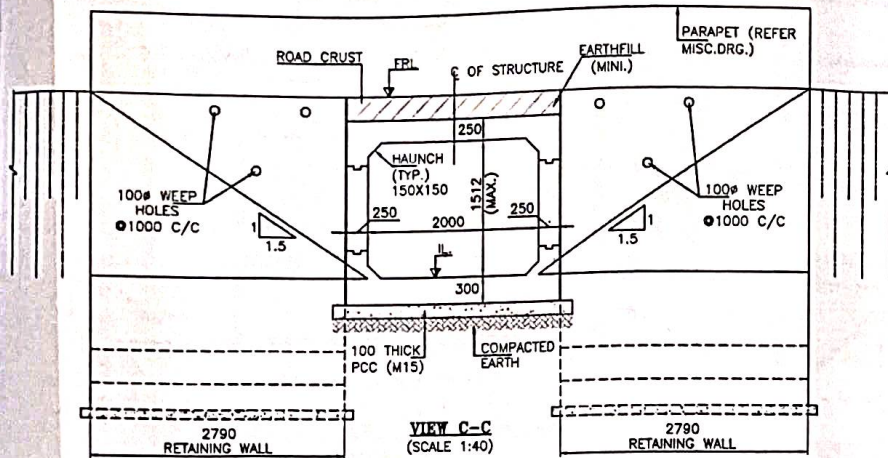
DESIGN CONSULTANT:

Winst Infra Solution Pvt. Ltd.
OFFICE: P-8, 18TH ANAND TOWER, PLOT NO. C-23, SECTOR-13, VASANT KUNJ, CHANDIGARH-160012

PROJECT:
WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (GOLAI GOAN) TO KM 47+482 (LEDO) ON DISBURGH TO LEDO SECTION WITH PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD), (2-LANE+PB) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE (PACKAGE-5)

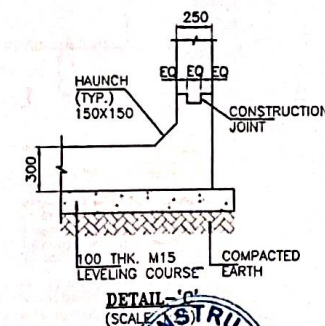
DRAWING TITLE:-
GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 45+433

Date	Drawn	Checked	Appr.	Scale	Drawing Status
JAN. 2024	W.P.	V.S.	A.D.	NTS	
Project No.	Drawing No.	Sheet No.	Rev.		
	AVC/NH-38/BC/GADMS-433/01	81 OF 82	02		

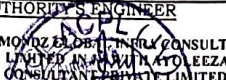
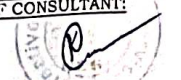


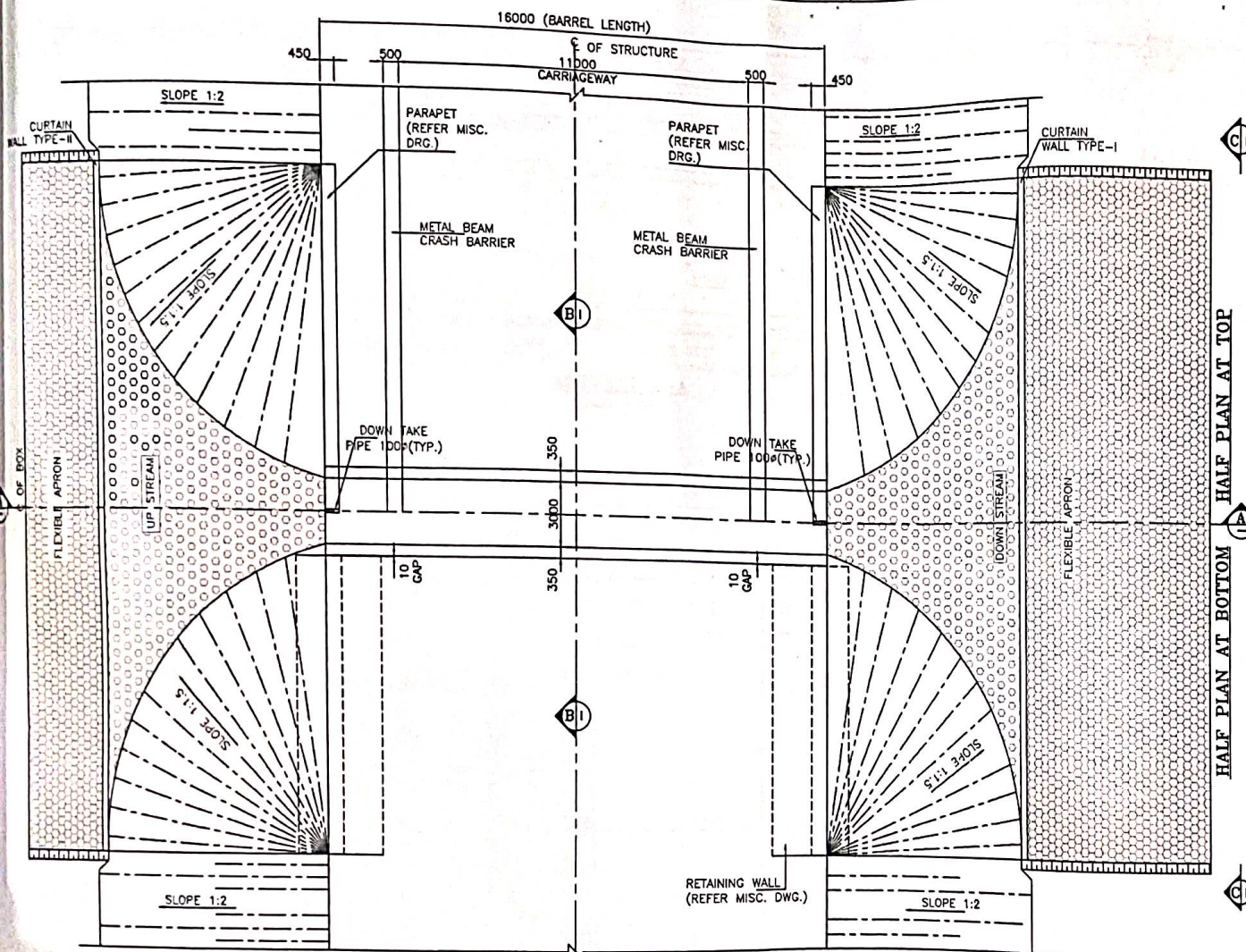
SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

DESIGN AID, NEW DELHI



GOOD FOR CONSTRUCTION

CLIENT:  NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	EPC CONTRACTOR  KAMAC ENGINEERS PVT. LTD. F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	AUTHORITY'S ENGINEER  ALMONDZELOR, INFRA CONSULTANT LAYER IN ANANTA TOLEEA CONSULTANT PRIVATE LIMITED. G-22, YANTA SAKINS BARAJANIN MANGAR BARIL NO.2, DIBROI, TINSUKIA, ASSAM-786141	PROOF CONSULTANT:  CREATIVE ENGINEERING SERVICES OFFICE NO: 620, SIGNATURE GLOBAL MALL, SECTOR-3, VAISHALI, GHAZIABAD, U.P.-201010	SAFETY CONSULTANT:  DESIGN AID PLOT NO.54, 3rd FLOOR(FRONT), MASOOPUR DAIRY FARM,VASANT KUNJ, NEW DELHI-110070,	DESIGN CONSULTANT:  Winst Infra Solution Pvt. Ltd. OFFICE: F-8, ISHAN CORPORATE TOWER, PLOT NO-C-23, SECTOR-13, VASUNDHRA CHATRAUD, U.P.-201012	PROJECT: WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (GOLAI GOAN) TO KM 47+682 (LEDO) ON DISBURGMENT TO LEDO SECTION WITH PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE (PACKAGE-3) DRAWING TITLE: GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 45+432 <table border="1"> <tr> <th>Date</th><th>Drw. W.P.</th><th>Eng. V.S.</th><th>Chk. A.D.</th><th>App. MTS</th><th>Scale</th><th>Drawing Status</th></tr> <tr> <td>JAN 2024</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>Project No.</td><td>Drawing No.</td><td>Sheet No.</td><td>Rev</td><td></td><td></td><td></td></tr> <tr> <td></td><td>AVCNH-38/BC/GAD/45+433/01</td><td>02 OF 02</td><td>NO</td><td></td><td></td><td></td></tr> </table>	Date	Drw. W.P.	Eng. V.S.	Chk. A.D.	App. MTS	Scale	Drawing Status	JAN 2024							Project No.	Drawing No.	Sheet No.	Rev					AVCNH-38/BC/GAD/45+433/01	02 OF 02	NO			
Date	Drw. W.P.	Eng. V.S.	Chk. A.D.	App. MTS	Scale	Drawing Status																												
JAN 2024																																		
Project No.	Drawing No.	Sheet No.	Rev																															
	AVCNH-38/BC/GAD/45+433/01	02 OF 02	NO																															



45950

DESCRIPTION	PROPOSED
DESIGN CHN.	46+009
CA.CHN.	45+975
STR.TYPE	BOX
SPAN/DIA	1X3X4m
PROPOSAL	NEW 2 LANE

46050

KEY PLAN

NOTES:-

- ALL DIMENSIONS ARE IN MILLIMETER, LEVELS ARE IN METER AND CHAINAGE ARE IN KILOMETERS UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE RELEVANT PLAN AND PROFILE DRAWING OF ROAD.
- GRADE OF CONCRETE:-
 - M30-FOR RCC BOX CELL STRUCTURE.
 - M15-FOR PCC AND LEVELING COURSE.
 - M30-PARAPET
- GRADE OF STEEL - Fe 500.
- THE CARRIAGEWAY OF PROPOSED CULVERT IS DESIGN AS PER 6-2017.
- BACKFILL MATERIAL BEHIND END WALL SHALL BE SELECTED GRANULAR SOIL HAVING PROPERTIES
 MAX DRY DENSITY = 1850-2280kg/m³
 OPTIMUM MOISTURE CONTENT = 7-15
 AS PER IRC78-2014 AND MORTH SPECIFICATION.
- THE FRL SHOWN IN THE DRAWING SHALL BE VERIFIED WITH CORRESPONDING PLAN AND PROFILE DRAWING BEFORE EXECUTION, IF THERE IS ANY VARIATION SHALL BE BROUGHT TO THE NOTICE OF ENGINEER.
- THE DIMENSION AND LEVEL ARE SUBJECT TO CHANGE AS PER SITE CONDITION AND DETAILED DESIGN.
- BACKFILL TO BE DONE AND COMPACTED FROM BOTH SIDE SIMULTANEOUSLY.
- 100MM DIA P.V.C. PIPE AT SPACING 1000MM/c IN HORIZONTAL/VERTICAL DIRECTION SHALL BE PROVIDED UP TO 150MM ABOVE GROUND LEVEL FOR WEEP HOLES IN RETAINING WALL.
- SBC SHALL BE 12t/m² AND SAME SHALL BE ENSURED AT SITE BY ANY SUITABLE METHOD.
- AS PER MORTH SECTION-2500, WHERE THE REQUIRED SIZE OF BOULDERS ARE NOT AVAILABLE ECONOMICALLY, CEMENT CONCRETE BLOCKS OF EQUIVALENT WEIGHT SHALL BE USED. THE GRADE OF CONCRETE SHALL BE M15 NOMINAL MIX. CEMENT CONCRETE BLOCK SHALL BE PREFERRED WHERE PRACTICABLE.
- CHOOSE ANY SUITABLE METHOD TO ACHIEVE THE REQUIRED SBC AS PER SITE.

LEVELS

DESIGN CH.	FRL	GROUND LEVEL	INVERT LEVEL		VERTICAL CLEARANCE (MAX.)	EARTH FILL (MAX.)	EARTH FILL (MIN.)
			LHS	RHS			
46+009	150.841	145.306	145.018	145.006	4.016m	1.469m	0.285m

SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

LEGEND:-

FRL FINISHED ROAD LEVEL
IL INVERT LEVEL
LVL LEVEL
EGL EXISTING GROUND LEVEL

REFERENCE DRAWINGS:-
 1. REINFORCEMENT DETAIL OF BOX CULVERT
 AVC/NH-38/BC/REINF./46+009/01

NADCL
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.

AMAC ENGINEERS
KAMAC ENGINEERS PVT. LTD.
F0201, CITY CENTER OFFICE
BLOCK, 2ND FLOOR,
MATIGARA 734010

ALMONDZ GLOBAL INFRA CONSULTANT
LIMITED IN JAWAHAR VOLEEZA
CONSULTANT PRIVATE LIMITED.
(PKG-3.4.5)
C/O JAYANTA SAKIA, BARBAJANIN
NAMGHAR, BORBIL NO.2, DIGBOI,
TINSUKIA, ASSAM-786171

PROOF CONSULTANT:
CREATIVE ENGINEERING SERVICES
OFFICE NO: 620, SIGNATURE GLOBAL
MALL, SECTOR-3,
VAISHALI, GHAZIABAD, U.P.-201010

SAFETY CONSULTANT:
DESIGN AID
PLOT NO.54, 3rd FLOOR(FRONT),
MASOODPUR DAIRY FARM, VASANT KUNJ,
NEW DELHI-110070,

DESIGN CONSULTANT:
Winst Infra Solution Pvt. Ltd.
OFFICE P-4 SHANU CORPORATE
TOWER, PLOT NO-C-32 SECTOR-13,
VASU BHADRA CHAUNARD, U.P.-201012

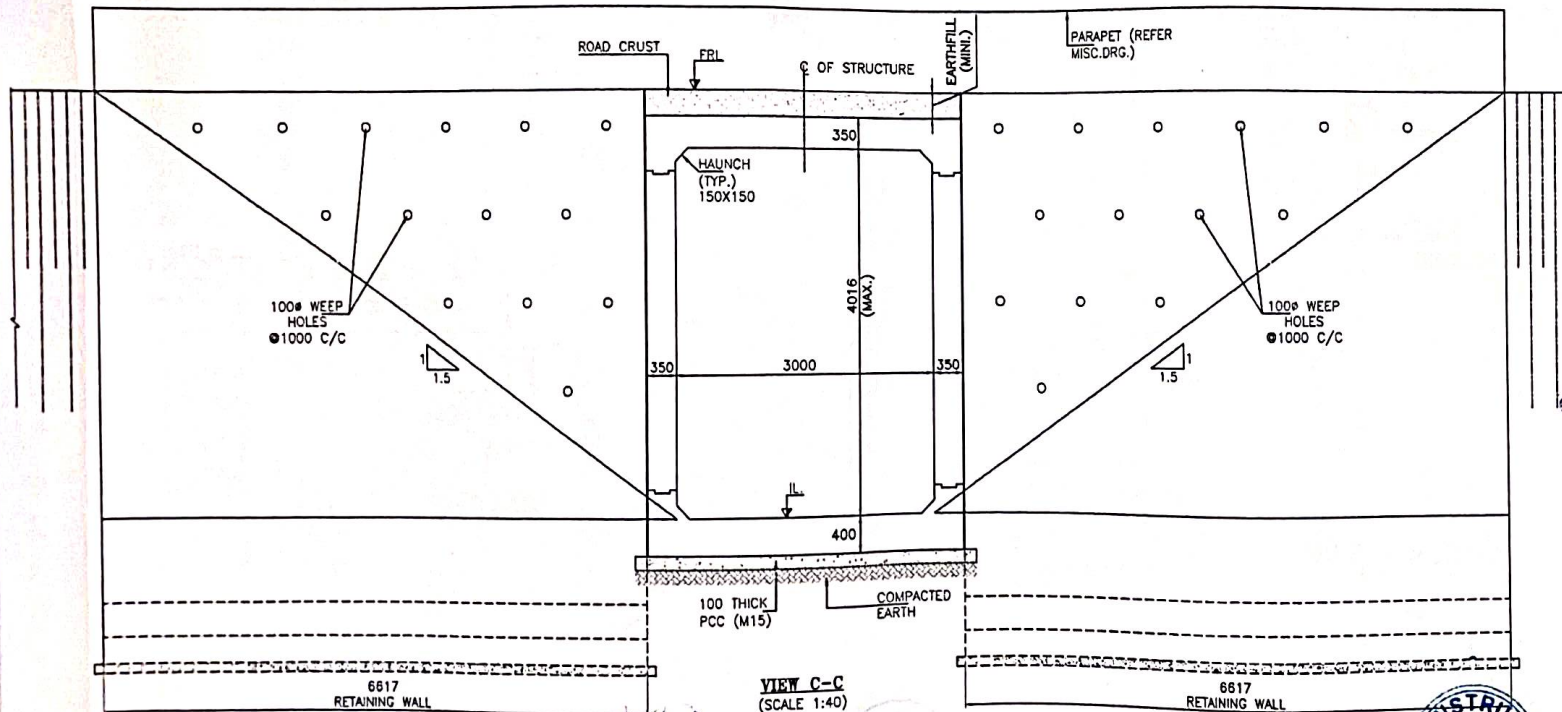
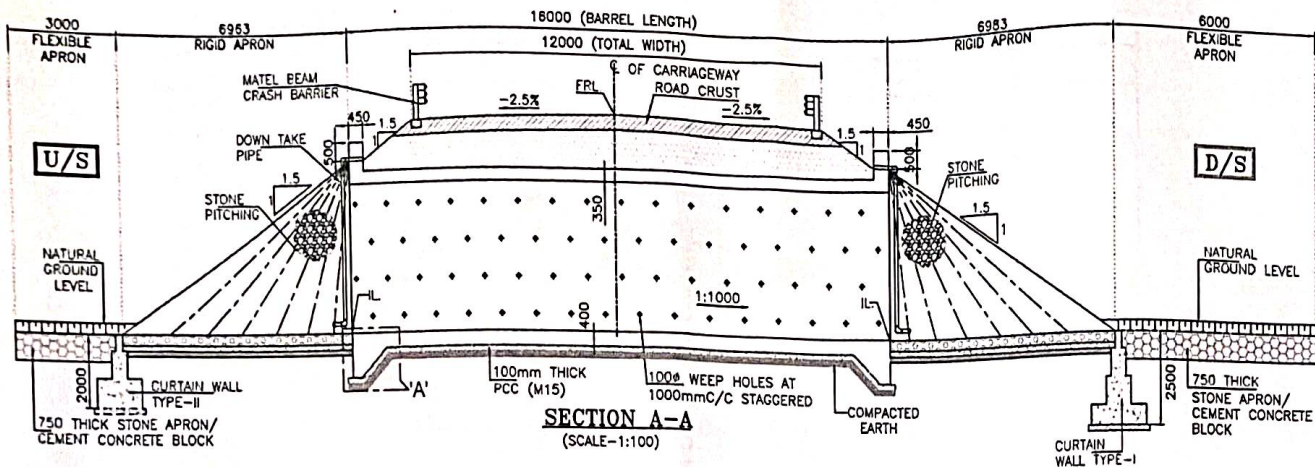
PROJECT:
WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (GOLAI GOAN) TO KM 47+882 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH PROPOSED MARGHERITA & LEDO BYPASS (BROWN FIELD AND GREEN FIELD) (2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE (PACKAGE 3)

DRAWING TITLE:
GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 46+009

Date	Drw.	Upr.	Chk.	Appr.	Scale	Drawing Status
JAN 2024	W.P.	V.S.	A.B.		NTS	
Project No.	Drw. No.					

AVC/NH-38/BC/AD/46+009/01

Sheet No. 81 OF 83 Rev. 80



GOOD FOR CONSTRUCTION

SAFETY AUDITOR
(As per Article 10.1 of EPC Appr)

CLIENT:
NHAI
NATIONAL HIGHWAYS &
INFRASTRUCTURE DEVELOPMENT
CORPORATION LTD.

EPC CONTRACTOR
KAMAC ENGINEERS
KAMAC ENGINEERS PVT. LTD.
F0201, CITY CENTER OFFICE
BLOCK, 2ND FLOOR,
MATIGARA 734010

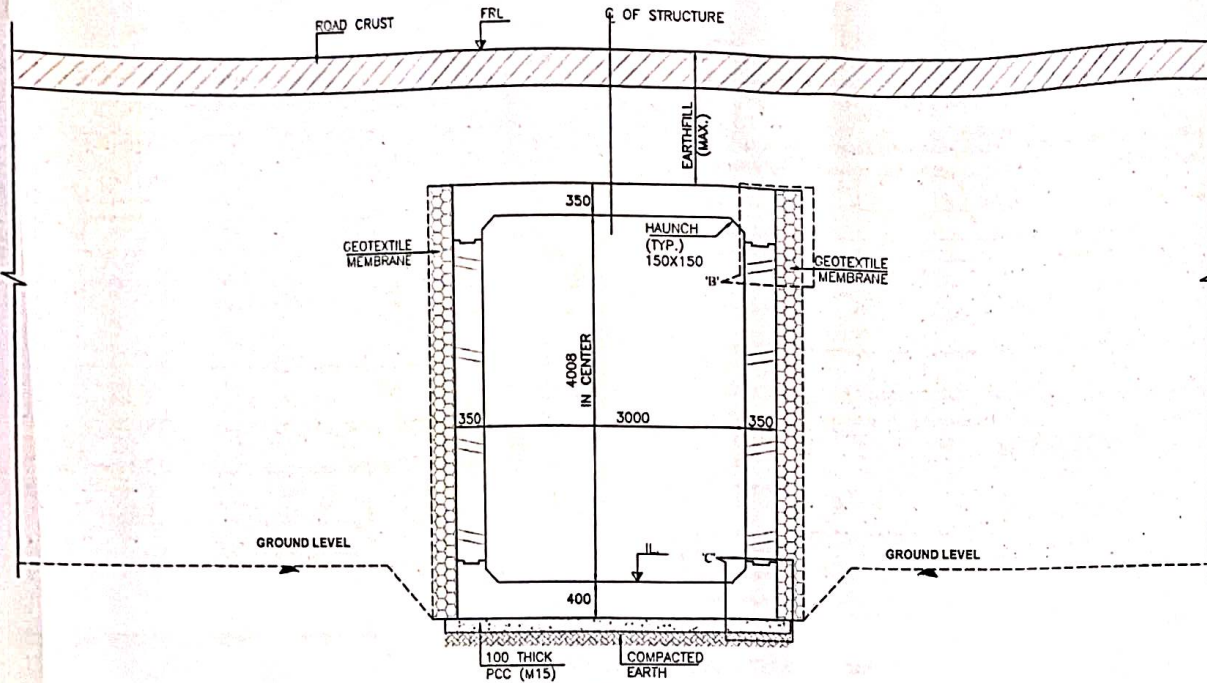
AUTHORITY'S ENGINEER
ALMONDA GLOBAL INFRA CONSULTANT
LIMITED IN PRIVATE (VOLUNTARY)
CONSULTANTS PRIVATE LIMITED.
C/O JANANTA SAKIA, SARBABAJANIN
NAMGHAR, P.O. NO.2, DIGBOI,
TINSUKIA, ASSAM-786171

PROOF CONSULTANT:
CREATIVE ENGINEERING SERVICES
OFFICE NO. 620, SIGNATURE GLOBAL
MALL, SECTOR-3,
VAISHALI, GHAZIABAD, U.P-201010

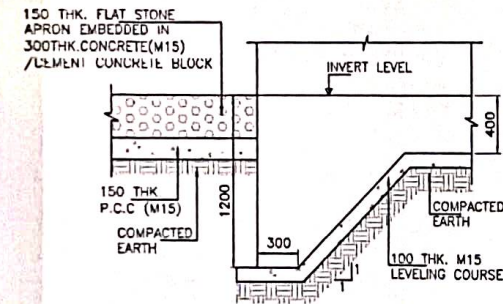
SAFETY CONSULTANT:
DESIGN AID
DESIGN AID
PLOT NO.54, 3rd FLOOR(FRONT),
MASOODPUR DAIRY FARM,VASANT KUNJ,
NEW DELHI-110070,

DESIGN CONSULTANT:
Winst Infra Solution
Pvt. Ltd.
OFFICE: P-4, BHAVAN CORPORATE
TOWER, PLOT NO-C-23, SECTOR-13,
VAISHALI, GHAZIABAD, U.P-201012

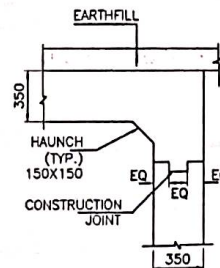
PROJECT:
WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+100
(GOLAI GOAN) TO KM 47+000 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH
PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD)
(2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC
MODE (PACKAGE 5)
DRAWING TITLE:
GENERAL ARRANGEMENT DRAWING FOR
BOX CULVERT AT CHAINAGE 48+000
Date: JAN 2024
Project No.:
Dwg. No.:
Dwg. V/S:
Chk. A/B:
App. NTS:
Scale:
Drawing Status:
Sheet No.:
Rev:
62 OF 83
RO



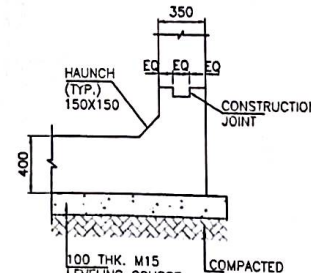
SECTION B-B
(SCALE 1:40)



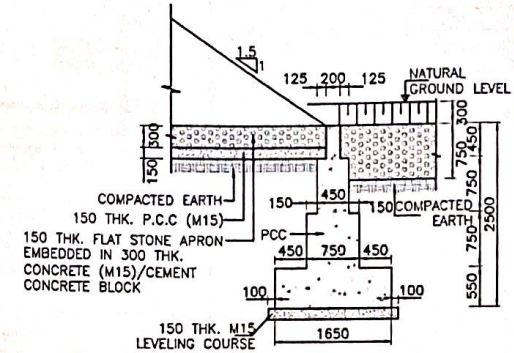
DETAIL - 'A'
(SCALE 1:25)



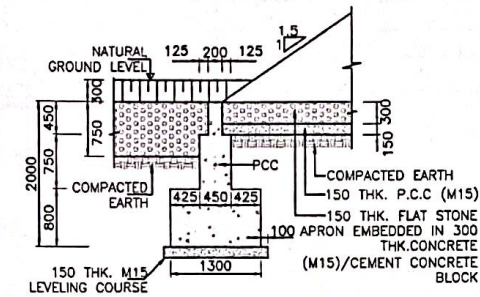
DETAIL - 'B'
(SCALE 1:25)



DETAIL - 'C'
(SCALE 1:25)



DETAIL OF CURTAIN WALL-I
(DOWN STREAM SIDE)
(SCALE 1:50)



DETAIL OF CURTAIN WALL-II
(UP STREAM SIDE)
(SCALE 1:50)

SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

DESIGN AID, NEW DELHI

GOOD FOR CONSTRUCTION

NADCL
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.

KAMAC ENGINEERS
KAMAC ENGINEERS PVT. LTD.
F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010

AUTHORITY'S ENGINEER
ALMONDZOL INFRA CONSULTANT LIMITED IN ASSOCIATION WITH CONSULTANT ENGINEERS LIMITED.
C/O. MANTA SAKIA, SARBAJA IN NAGHAR, ROAD NO. 2, DIGBOI, TINSUKIA, ASSAM 786117

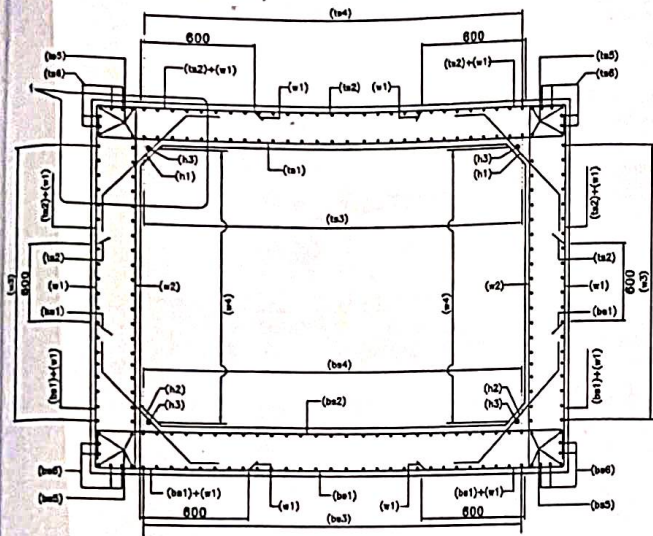
PROOF CONSULTANT:
CREATIVE ENGINEERING SERVICES
OFFICE NO. 620, SIGNATURE GLOBAL MALL, SECTOR-3, VAISHALI, GHAZIABAD, U.P. 201010

SAFETY CONSULTANT:
DESIGN AID
PLOT NO. 54, 3rd FLOOR (FRONT), MASOODPUR DAIRY FARM, VASANT KUNJ, NEW DELHI-110070.

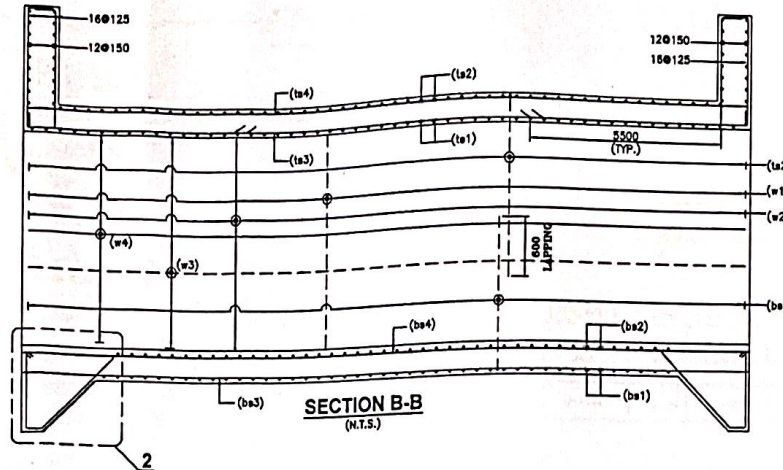
DESIGN CONSULTANT:
A.V. CONSTRUCTION
PLOT NO. WZ-1240
Palam Extension, B-50, Ashram Wall, New Delhi 110045
Winst Infra Solution Pvt. Ltd.
OFFICE: F-1, ISHAN CORPORATE TOWER, PLOT NO. C-23, SECTOR-13, VAISHALI, GHAZIABAD, U.P. 201012

PROJECT:
WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (GOLAN DOAN) TO KM 47+482 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE (PACKAGE-5)
DRAWING TITLE:
GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 46+008

Date	Drw.	Dsg.	Chk.	App.	Scale	Drawing Status
JAN 2024	W.P.	V.S.	A.B.		N75	
Project No.	Drawing No.	AVC/NH-38/BC/GAD/46+008/01				Sheet No. 03 OF 03
						Rev. RD



SECTION A-A
(N.T.S.)



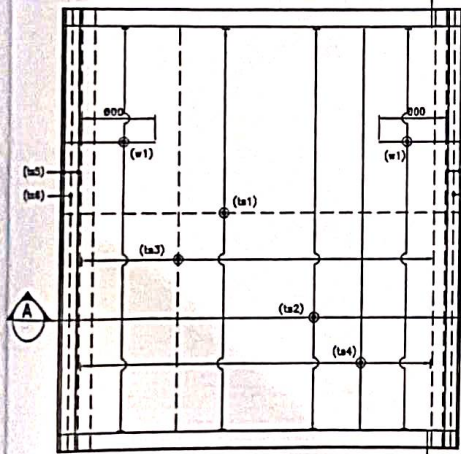
SECTION B-B
(N.T.S.)

LEGEND:-

TOP FACE BAR
BOTTOM FACE BAR

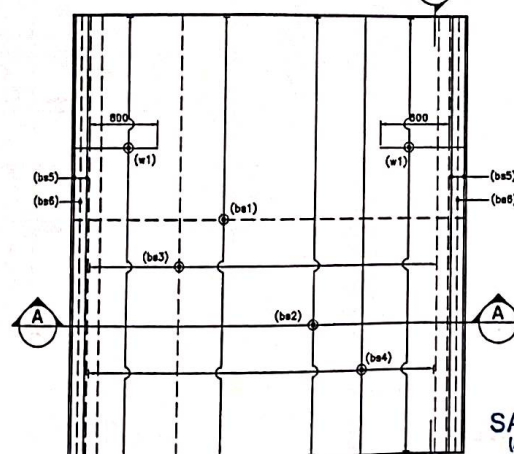
TRAFFIC DIRECTION

TRAFFIC DIRECTION



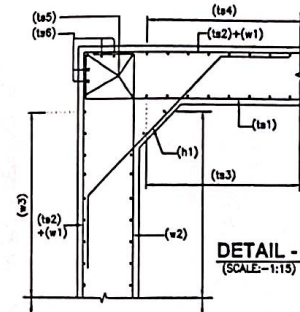
REINFORCEMENT DETAILS OF
TOP SLAB

(LAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
(N.T.S.)

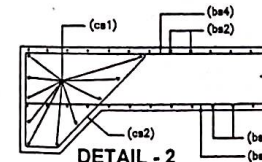


REINFORCEMENT DETAILS OF
BOTTOM SLAB

(LAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
(N.T.S.)



DETAIL - 1
(SCALE - 1:15)



DETAIL - 2
(N.T.S.)

SAFETY AUDIT

(As per Article 10.1 of EPC Agreement)
8. ANCHORAGE LENGTH OF BOX SHALL BE TAKEN AS 40d AS PER IRC:112.
9. FOR UNFAVORABLE BOND CONDITIONS THE FACTOR 40 SHOULD BE MULTIPLIED BY FACTOR OF 1.43.
10. CENTER LINE OF OVERLAPPING BAR bs1 & bs2 IN WALL SHALL BE AT SAME POINT.
11. BAR BENDING SCHEDULE SHOULD BE STRICTLY FOLLOWED DURING THE TIME OF EXECUTION IF IN CASE ANY CHANGES AT SITE KINDLY DISCUSS IT WITH ENGINEER IN CHARGE.

DESIGN AID, NEW DELHI

REFERENCE DRAWING:-

1. GENERAL ARRANGEMENT DRAWING.
AVC/NH-38/BOX/GAD/48+009/01

BOX REINF. SCHEDULE

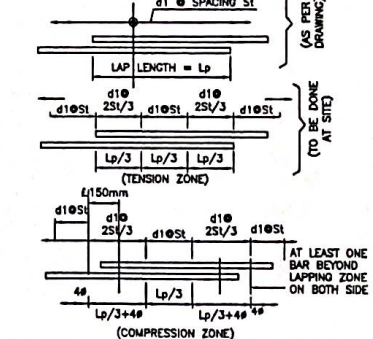
SL.NO.	BAR MARK	BAR SHAPE	DIAMETER	SPACING
1	ts1		12+10	180
2	ts2		12	180
3	ts3		10	180
4	ts4		10	180
5	ts5		12	2x4 Nos.
6	ts6		12	2x4 Nos.
7	w1		16	180
8	w2		16	180
9	w3		10	180
10	w4		10	180
11	bs1		12	180
12	bs2		12+12	180
13	bs3		10	180
14	bs4		10	180
15	bs5		12	2x4 Nos.
16	bs6		12	2x4 Nos.
17	h1		10	180
18	h2		10	180
19	h3		10	1x4 Nos.
20	cs1		12	10 Nos.
21	cs2		10	200

NOTES:-

- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS UNLESS OTHERWISE MENTIONED.
- DRAWING SHOULD NOT BE SCALED ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
- ALL REINFORCING BARS SHALL BE THERMO MECHANICALLY TREATED (TMT) BARS (GRADE DESIGNATION Fe-500) CONFORMING TO IS:1786 STANDARDS.
- MINIMUM CLEAR COVER TO OUTERMOST REINFORCEMENT SHALL BE AS FOLLOWS:-

- TOP SLAB - 45mm
- BOTTOM SLAB - 75mm
- SIDE WALL (EARTH SIDE) - 75mm
- SIDE WALL (INNER SIDE) - 45mm

- OVERLAPPING FOR SPlicing OF REINFORCEMENT SHALL BE AS PER CLAUSE NO.13.2.5. LAP LENGTH SHALL NOT BE LESS THAN 56d. ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:-



CLIENT:
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.

EPC CONTRACTOR
KAMAC ENGINEERS PVT. LTD.
F0201, CITY CENTER OFFICE
BLOCK, 2ND FLOOR,
MATIGARA 734010

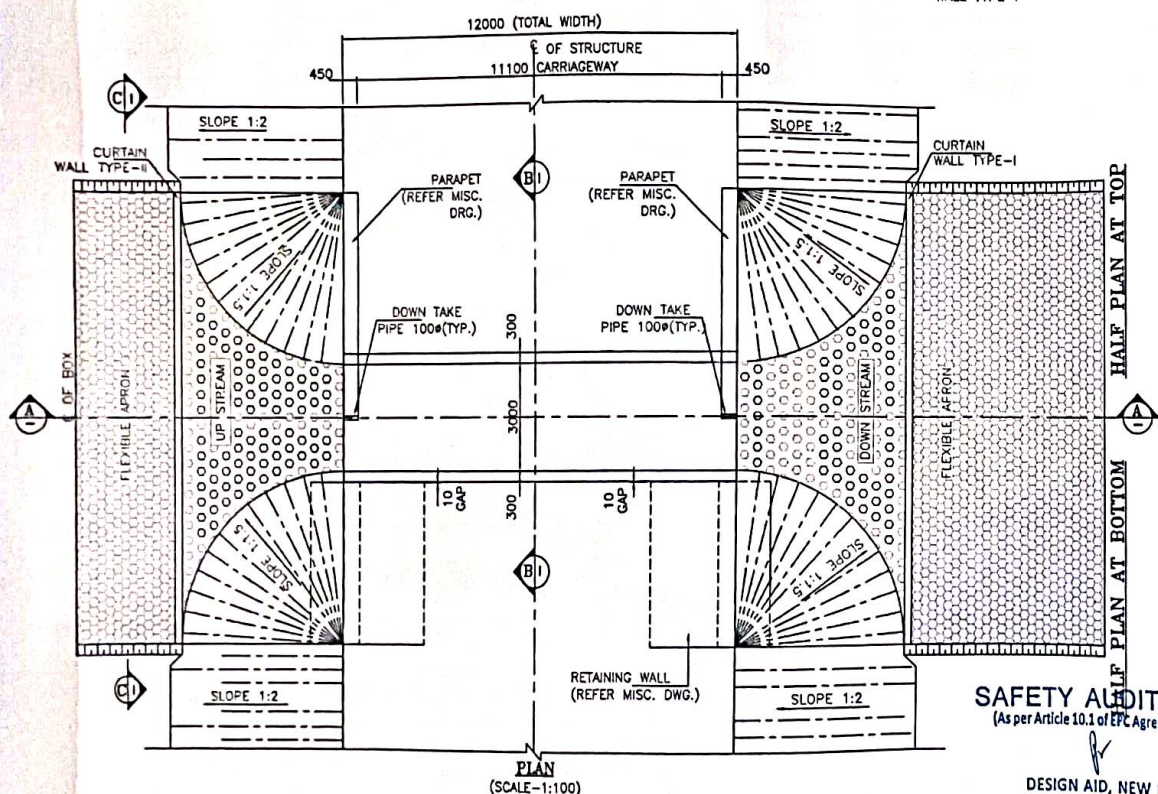
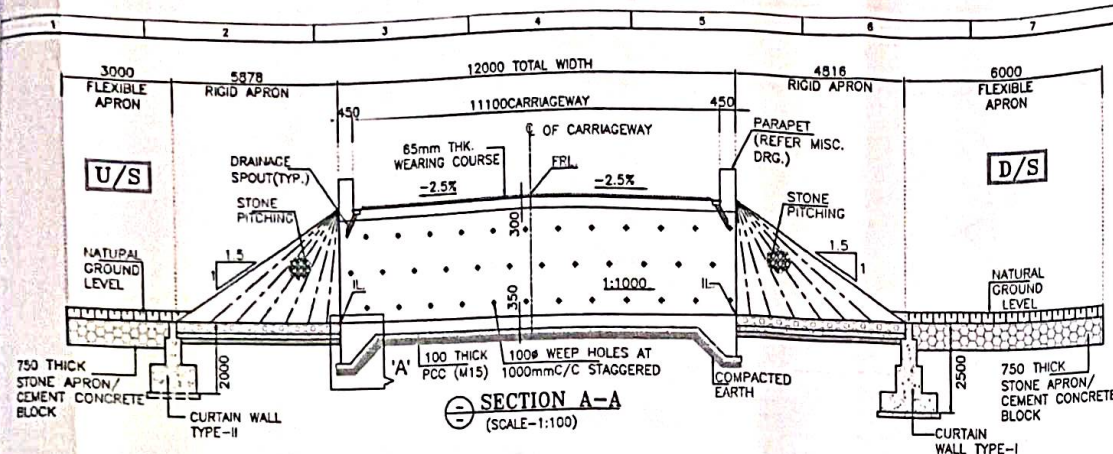
AUTHORITY'S ENGINEER
ALMOND GLOVE INFRA CONSULTANT
LIMITED, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

PROOF CONSULTANT:
CREATIVE ENGINEERING SERVICES
OFFICE NO: 620, SIGNATURE GLOBAL
MALL, SECTOR-3,
VAISHALI, GHAZIABAD, U P-201010

SAFETY CONSULTANT:
DESIGN AID
PLOT NO.54, 3rd FLOOR(FRONT),
MASOODPUR DAIRY FARM,VASANT KUNJ,
NEW DELHI-110070,

DESIGN CONSULTANT:
Winst Infra Solution
Pvt. Ltd.
OFFICE: F-8 SHAAN CORPORATE
TOWER, PLOT NO-23, SECTOR-13,
VAISHALI, GHAZIABAD, U P-201012

PROJECT:
WIDENING/IMPROVEMENT TO 3 LANE LANE WITH PAVED SHOULDER FROM KM 37+150
(GOLLA GOAN) TO KM 47+482 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH
PROPOSED MARGHERITA & LEDO BYPASS (BROWN FIELD AND GREEN FIELD)
(2-LANE+PB) OF NH-38 IN TINJIBARA DISTRICT IN THE STATE OF ASSAM ON EPC
MODE (PACKAGE-B)
DRAWING TITLE:-
REINFORCEMENT DETAIL OF BOX CULVERT
AT CH. 48+009
Date JAN 2024 Dwn. W.P. Dwg. V.S. Chk. A.D. App. N.T.S. Drawing Status.
Project No. Drawing No. AVCHN-38/BOX/REINJ48+009/01 Sheet No. 01 OF 01 Rev. RO



46050

DESCRIPTION	PROPOSED
DESIGN CHN.	46+146
C.A.CHN.	46+112
STR. TYPE	BOX
SPAN/DIA	1X3X3m
PROPOSAL	NEW 2 LANE

46150

KEY PLAN

LEVELS

DESIGN CH.	FRL	GROUND LEVEL	INVERT LEVEL		VERTICAL CLEARANCE (MAX.)	EARTH FILL (MAX.)	EARTH FILL (MIN.)
			LHS	RHS			
46+146	148.959	145.880	145.592	145.580	3.008m	0	0

NOTES:-

- ALL DIMENSIONS ARE IN MILLIMETER, LEVELS ARE IN METER AND CHAINAGE ARE IN KILOMETERS UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE RELEVANT PLAN AND PROFILE DRAWING OF ROAD.
- GRADE OF CONCRETE:-
 - M30-FOR RCC BOX CELL STRUCTURE.
 - M15-FOR PCC AND LEVELING COURSE.
 - M30-PARAPET
- GRADE OF STEEL - Fe500.
- THE FOLLOWING LOADS HAVE BEEN CONSIDERED IN THE DESIGN:-
 - ONE LANE, TWO LANE AND THREE LANE OF CLASS A
 - ONE LANE OF CLASS A IN ADDITION OF ONE LANE OF CLASS 70R WHEEL OR ONE LANE OF 70R TRACKED WHICHEVER IS GOVERNS.
- BACKFILL MATERIAL BEHIND END WALL SHALL BE SELECTED GRANULAR SOIL HAVING PROPERTIES
MAX DRY DENSITY = 1850-2280kg/m³
OPTIMUM MOISTURE CONTENT = 7-15
AS PER IRC78-2014 AND MORTH SPECIFICATION.
- THE FRL SHOWN IN THE DRAWING SHALL BE VERIFIED WITH CORRESPONDING PLAN AND PROFILE DRAWING BEFORE EXECUTION, IF THERE IS ANY VARIATION SHALL BE BROUGHT TO THE NOTICE OF ENGINEER.
- THE DIMENSION AND LEVEL ARE SUBJECT TO CHANGE AS PER SITE CONDITION AND DETAILED DESIGN.
- BACKFILL TO BE DONE AND COMPACTED FROM BOTH SIDE SIMULTANEOUSLY.
- 600MM THICK FILTER MATERIAL BEHIND RETAINING WALL SHALL BE LAID AS PER APPENDIX 6 OF IRC 78-2014.
- 150MM THICK CEMENT CONCRETE WEARING COAT SHALL BE PROVIDED.
- 100MM DIA P.V.C. PIPE AT SPACING 1000MM/C IN HORIZONTAL/VERTICAL DIRECTION SHALL BE PROVIDED UP TO 150MM ABOVE GROUND LEVEL FOR WEEP HOLES IN RETAINING WALL.
- SBC SHALL BE 8t/m² AND SAME SHALL BE ENSURED AT SITE BY ANY SUITABLE METHOD.
- AS PER MORTH SECTION-2500, WHERE THE REQUIRED SIZE OF BOULDERS ARE NOT AVAILABLE ECONOMICALLY, CEMENT CONCRETE BLOCKS OF EQUIVALENT WEIGHT SHALL BE USED. THE GRADE OF CONCRETE SHALL BE M15 NOMINAL MIX. CEMENT CONCRETE BLOCK SHALL BE PREFERRED WHERE PRACTICABLE.
- CHOOSE ANY SUITABLE METHOD TO ACHIEVE THE REQUIRED SBC AS PER SITE.
- THE EXPOSURE CONDITION IS MODERATE.

LEGEND:-	
FRL FINISHED ROAD LEVEL	
IL INVERT LEVEL	
LVL LEVEL	
EGL. EXISTING GROUND LEVEL	

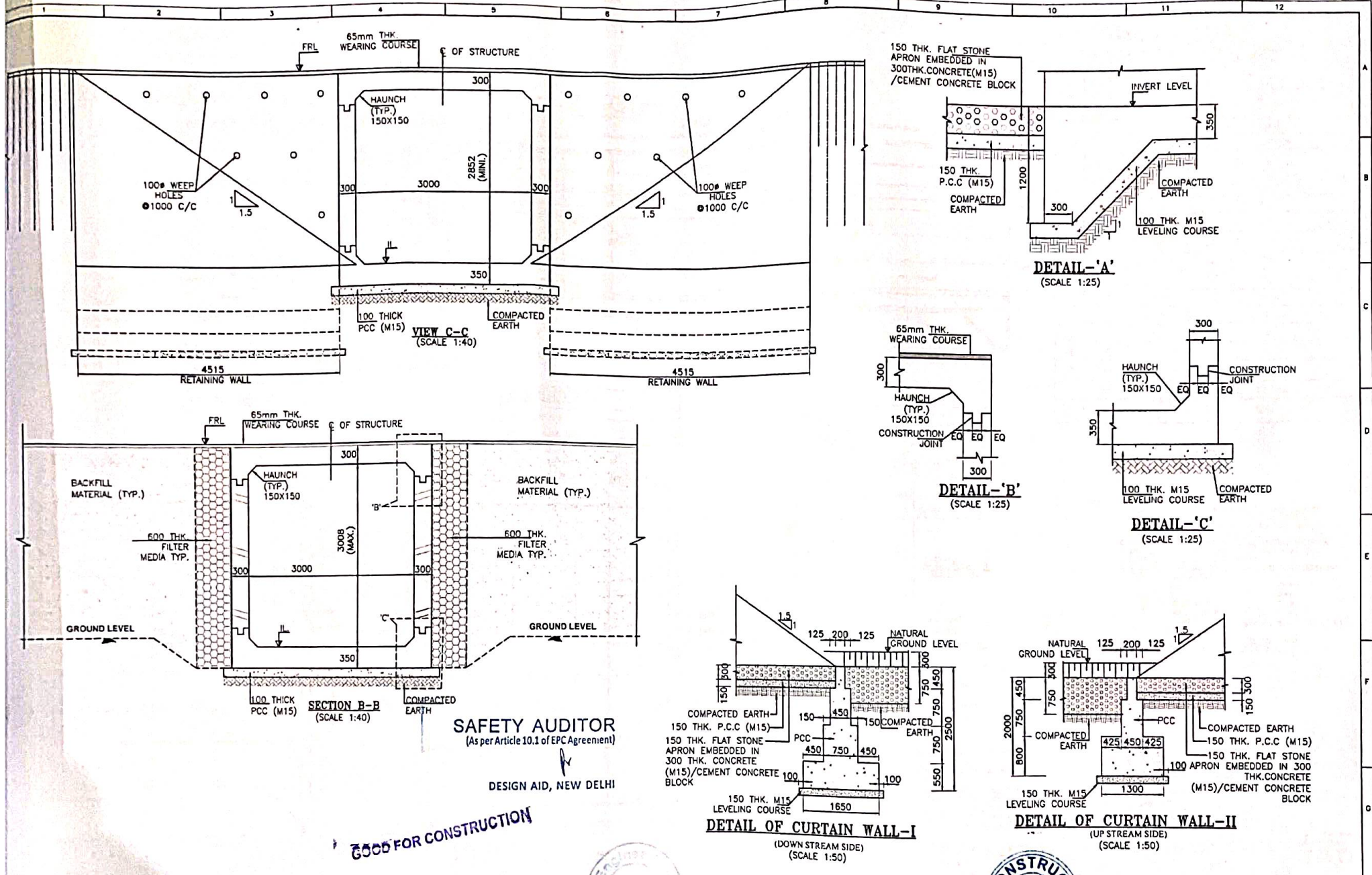
FRL CAMBER & LOCATION IS TO BE MATCHED WITH HIGHWAY ALIGNMENT DRAWING.

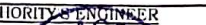
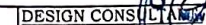
SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

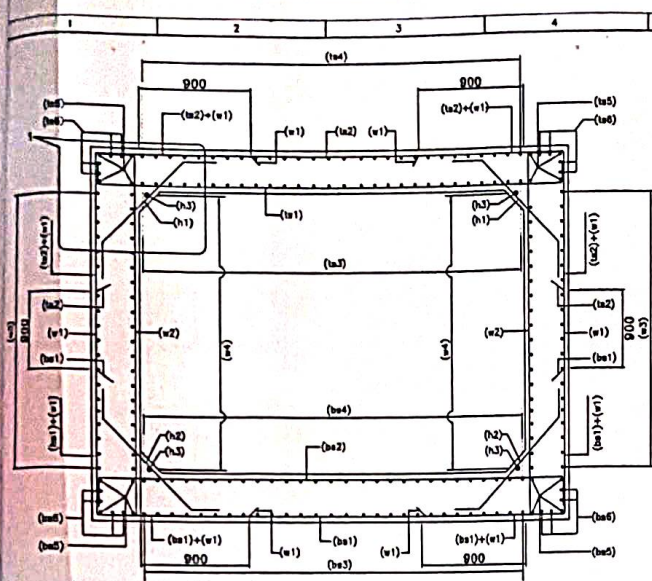
DESIGN AID, NEW DELHI

- REFERENCE DRAWINGS:-**
- REINFORCEMENT DETAIL OF BOX CULVERT
AVC/NH-38/BOX/REINF./46+146/02

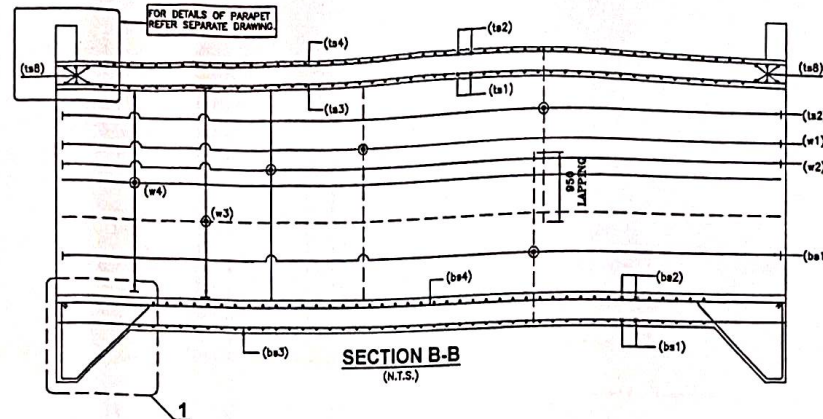
CLIENT: NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	EPC CONTRACTOR KAMAC ENGINEERS PVT. LTD. F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	AUTHORITY'S ENGINEER ALMOND CONSULTANTS LIMITED C/O. JAYNTO SARKAR, SARBAAJAN NAMOHAR, BORJIL NO. 2, DIGBOI, TINJUKIA, ASSAM-786117	PROOF CONSULTANT CREATIVE ENGINEERING SERVICES OFFICE NO. 630, SIGNATURE GLOBAL MALL, SECTOR-3, VAISHALI, GHAZIABAD, U.P-201010	SAFETY CONSULTANT: DESIGN AID PLOT NO.54, 3rd FLOOR(FRONT), MASOOPUR DAIRY FARM, VASANT KUNJ, NEW DELHI-110070.	DESIGN CONSULTANT: Winst Infra Solution Pvt. Ltd. OFFICE: F-4, BHANU CORPORATE TOWER, PLOT NO-C-23, SECTOR-13, VASUNHARA, CHANDIGARH-160017	PROJECT: HIGHWAY IMPROVEMENT TO 2 LANE WITH PAVED SHOULDER FROM KM 27+150 (LOCAL GOAN) TO KM 47+482 (LEDO) ON DIBRUAGARH TO LEDO SECTION WITH PROPOSED WARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (2-LANE+PB) OF NH-38 IN TINJUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE (PACKAGE 5) DRAWING TITLE:- GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 46+146 <table border="1"> <tr> <th>Date</th> <th>Drawn</th> <th>Check</th> <th>Appr.</th> <th>Scale</th> <th>Drawing Status</th> </tr> <tr> <td>JAN 2023</td> <td>V.S</td> <td>A.B</td> <td></td> <td>NTS</td> <td></td> </tr> <tr> <td>Project No</td> <td>Drawing No.</td> <td>Sheet No.</td> <td>Rev.</td> <td></td> <td></td> </tr> <tr> <td></td> <td>AVC/NH-38/BOX/REINF./46+146/01</td> <td>81 OF 82</td> <td>02</td> <td></td> <td></td> </tr> </table>	Date	Drawn	Check	Appr.	Scale	Drawing Status	JAN 2023	V.S	A.B		NTS		Project No	Drawing No.	Sheet No.	Rev.				AVC/NH-38/BOX/REINF./46+146/01	81 OF 82	02		
Date	Drawn	Check	Appr.	Scale	Drawing Status																									
JAN 2023	V.S	A.B		NTS																										
Project No	Drawing No.	Sheet No.	Rev.																											
	AVC/NH-38/BOX/REINF./46+146/01	81 OF 82	02																											



CLIENT:		EPC CONTRACTOR		AUTHORITY ENGINEER		PROOF CONSULTANT:		SAFETY CONSULTANT:		DESIGN CONSULTANT:		PROJECT:	
 NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.		 KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010		 ALMOND CHOWK INDIAN CONSULTANT LIMITED IN NEW DELHI CONSULTANT ENGINEER C/O JAY CHANDRA SARKAR JAYNAN NAGAR, PLOT NO. 2, DISCO, TINSUKIA, ASSAM-786171		 CREATIVE ENGINEERING SERVICES OFFICE NO. 620, SIGNATURE GLOBAL MALL, SECTOR-3, VAISHALI, GHAZIABAD, U.P.-201010		 DESIGN AID PLOT NO.54, 3rd FLOOR(FRONT), MASOODPUR DAIRY FARM,VASANT KUNJ, NEW DELHI-110070,		 Winst Infra Solution Pvt. Ltd. OFFICE: F-1, BHANU CORPORATE TOWER, PLOT NO-C-23,SECTOR-13, VASANT VIHAR CHATWAD, U.P.-201012		 WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (GOLAI GOAN) TO KM 47+882 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE (PACKAGE-B)	
										DRAWING TITLE:-		GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 46+148	
										Date		Drawing Status	
										JAN. 2024		Drw W.P	
										Project No.		Drawing No.	
										AVCMH-38/BC/GAD/46+148/01		Sheet No. 02 OF 02	
												Rev. R0	



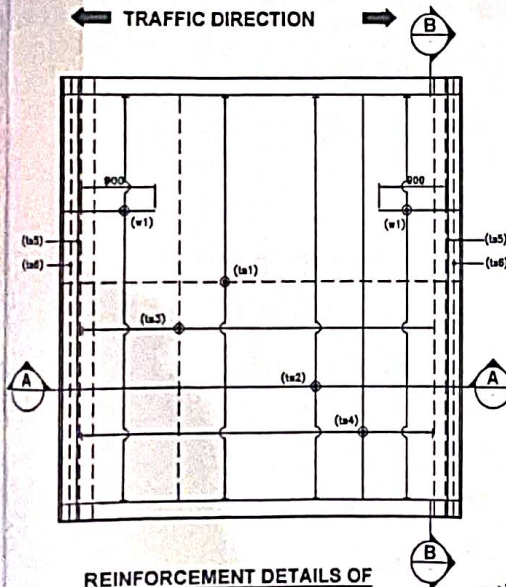
SECTION A-A
(N.T.S.)



SECTION B-B
(N.T.S.)

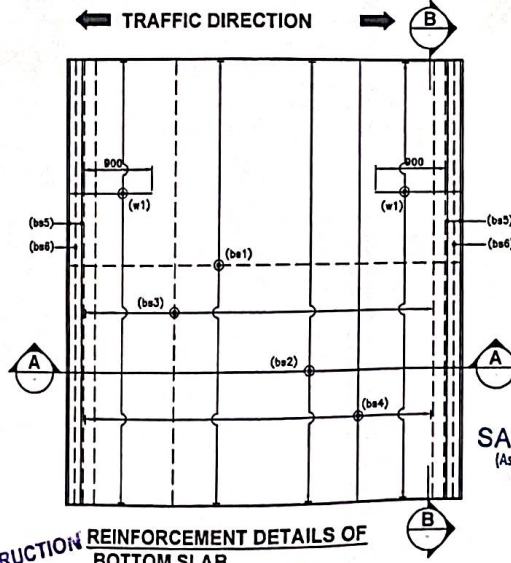
LEGEND:-

TOP FACE BAR
BOTTOM FACE BAR



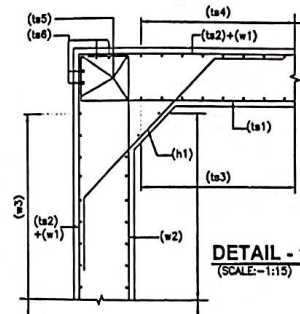
REINFORCEMENT DETAILS OF
TOP SLAB

(LAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
(N.T.S.)

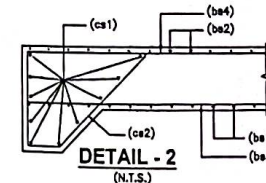


REINFORCEMENT DETAILS OF
BOTTOM SLAB

(LAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
(N.T.S.)



DETAIL - 1
(SCALE:-1:15)



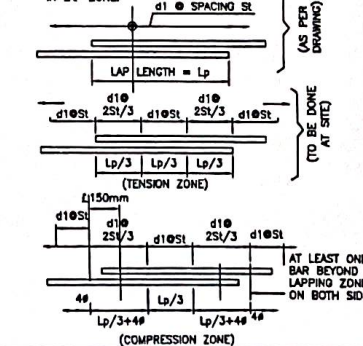
DETAIL - 2
(N.T.S.)

BOX REINF. SCHEDULE

SL.NO.	BAR MARK	BAR SHAPE	DIAMETER	SPACING
1	ts1		12+10	180
2	ts2		12	180
3	ts3		10	200
4	ts4		10	200
5	ts5		12	2x4 Nos.
6	ts6		12	2x4 Nos.
7	w1		12	180
8	w2		12	180
9	w3		10	200
10	w4		8	200
11	bs1		12	180
12	bs2		12+12	180
13	bs3		10	200
14	bs4		10	200
15	bs5		12	2x4 Nos.
16	bs6		12	2x4 Nos.
17	h1		10	180
18	h2		10	180
19	h3		10	1x4 Nos.
20	cs1		12	10 Nos.
21	cs2		10	200

NOTES:-

- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS UNLESS OTHERWISE NOTIONED.
- DRAWING SHOULD NOT BE SCALED ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
- ALL REINFORCING BARS SHALL BE THERMO MECHANICALLY TREATED (TMT) BARS (GRADE DESIGNATION Fe-500) CONFORMING TO IS:1786 STANDARDS.
- MINIMUM CLEAR COVER TO OUTERMOST REINFORCEMENT SHALL BE AS FOLLOWS:-
 - a) TOP SLAB - 45mm
 - b) BOTTOM SLAB - 75mm
 - c) SIDE WALL (EARTH SIDE) - 75mm
 - d) SIDE WALL (INNER SIDE) - 45mm
- OVERLAPPING FOR SPLICING OF REINFORCEMENT SHALL BE AS PER CLAUSE NO.15.2.5. LAP LENGTH SHALL NOT BE LESS THAN 56 ϕ . ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:-



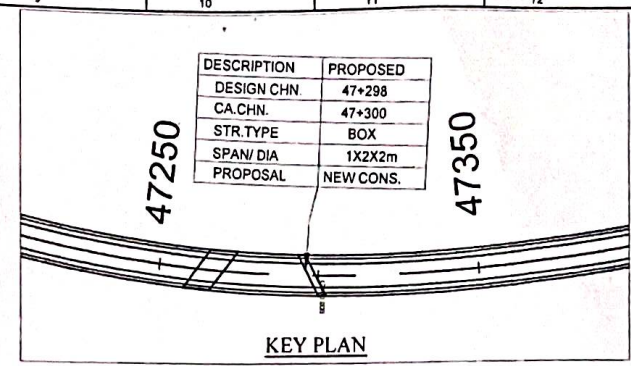
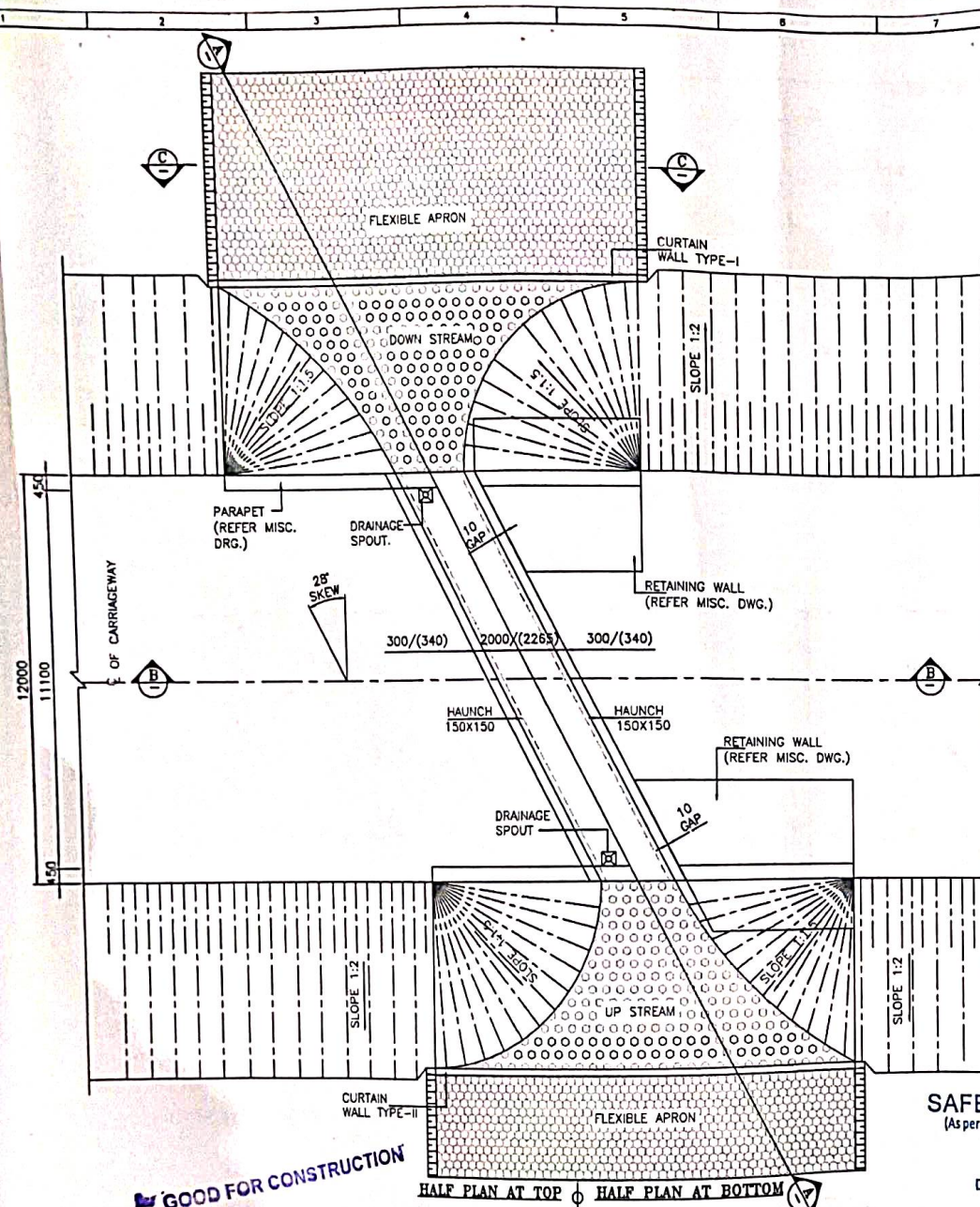
SAFETY AUDIT
(As per Article 10.1 of EPC Agreement)

DESIGN AID, NEW DELHI

REFERENCE DRAWING:-

- GENERAL ARRANGEMENT DRAWING. A/C/NH-38/BOX/GAD/48+148/01

CLIENT: NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	EPC CONTRACTOR: KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	AUTHORITY'S ENGINEER: ALMONDZ ENGINEERING CONSULTANTS LIMITED IN A PARTNERSHIP WITH ANEESA CONSULTANT PRIVATE LIMITED. CO-AYAN TASAKIA, SARBAJANIN NAGAR, BOISAL NO.2, DIBBOI, TINDUKIA, ASSAM-781071	PROOF CONSULTANT: CREATIVE ENGINEERING SERVICES OFFICE NO. 620, SIGNATURE GLOBAL MALL, SECTOR-3, VAISHALI, GHAZIABAD, U.P-201010	SAFETY CONSULTANT: DESIGN AID PLOT NO.54, 3rd FLOOR(FRONT), MASOODPUR DAIRY FARM,VASANT KUNJ, NEW DELHI-110070,	DESIGN CONSULTANT: Winst Infra Solution Pvt. Ltd. OFFICE-F-4, BHANU CORPORATE TOWER, PLOT NO-C-23,SECTOR-13, VASUNDERPURA GHAZIABAD, U.P-201012	PROJECT: WIDENING/IMPROVEMENT TO 4-LANE LANE WITH PAVED SHOULDER FROM KM 27+100 (GOLAI GOAN) TO KM 47+882 (LEO) ON DISBURGMENT TO LEO SECTION WITH PROPOSED MARCHENGA A LEO BYPASS (BYPASS AND GREEN FIELD) (2-LANE-1PH) OF NH-38 IN THE KUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE (PACKAGE 5)
DRAWING TITLE: REINFORCEMENT DETAIL OF BOX CULVERT AT CH. 48+148						
Date: JAN.2024 Project No.:	Draw. W.P.: Draw. V.B.: Chk. A.B.:	App.: Scale: NTS	Drawing Status: Sheet No. 01 OF 01 Rev. RO			



LEVELS

DESIGN CH.	FRL	GROUND LEVEL	INVERT LEVEL		VERTICAL CLEARANCE (MAX.)	EARTH FILL (MAX.)	EARTH FILL (MIN.)
			LHS	RHS			
47+298	155.130	151.475	150.294	150.308	2.312m	2.540m	1.908m

NOTES:-

- ALL DIMENSIONS ARE IN MILLIMETER, LEVELS ARE IN METER AND CHAINAGE ARE IN KILOMETERS UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE RELEVANT PLAN AND PROFILE DRAWING OF ROAD.
- GRADE OF CONCRETE:-
 - M30-FOR RCC BOX CELL STRUCTURE.
 - M15-FOR PCC AND LEVELING COURSE.
 - M30-PARAPET
- GRADE OF STEEL - Fe500.
- THE FOLLOWING LOADS HAVE BEEN CONSIDERED IN THE DESIGN:-
 - ONE LANE, TWO LANE AND THREE LANE OF CLASS A
 - ONE LANE OF CLASS A IN ADDITION OF ONE LANE OF CLASS 70R WHEEL OR ONE LANE OF 70R TRACKED WHICHEVER IS GOVERNS.
- BACKFILL MATERIAL BEHIND END WALL SHALL BE SELECTED GRANULAR SOIL HAVING PROPERTIES
 MAX DRY DENSITY = 1850-2280kg/m³
 OPTIMUM MOISTURE CONTENT = 7-15
 AS PER IRC78-2014 AND MORTH SPECIFICATION.
- THE FRL SHOWN IN THE DRAWING SHALL BE VERIFIED WITH CORRESPONDING PLAN AND PROFILE DRAWING BEFORE EXECUTION, IF THERE IS ANY VARIATION SHALL BE BROUGHT TO THE NOTICE OF ENGINEER.
- THE DIMENSION AND LEVEL ARE SUBJECT TO CHANGE AS PER SITE CONDITION AND DETAILED DESIGN.
- BACKFILL TO BE DONE AND COMPACTED FROM BOTH SIDE SIMULTANEOUSLY.
- 600MM THICK. FILTER MATERIAL BEHIND RETAINING WALL SHALL BE LAID AS PER APPENDIX 6 OF IRC 78-2014.
- 50MM THICK CEMENT CONCRETE WEARING COAT SHALL BE PROVIDED.
- 100MM DIA P.V.C. PIPE AT SPACING 1000MM/c IN HORIZONTAL/VERTICAL DIRECTION SHALL BE PROVIDED UP TO 150MM ABOVE GROUND LEVEL FOR WEEP HOLES IN RETAINING WALL.
- SBC SHALL BE 131/m² AND SAME SHALL BE ENSURED AT SITE BY ANY SUITABLE METHOD.
- AS PER MORTH SECTION-2500, WHERE THE REQUIRED SIZE OF BOULDERS ARE NOT AVAILABLE ECONOMICALLY, CEMENT CONCRETE BLOCKS OF EQUIVALENT WEIGHT SHALL BE USED. THE GRADE OF CONCRETE SHALL BE M15 NOMINAL MIX. CEMENT CONCRETE BLOCK SHALL BE PREFERRED WHERE PRACTICABLE.
- CHOOSE ANY SUITABLE METHOD TO ACHIEVE THE REQUIRED SBC AS PER SITE.
- THE EXPOSURE CONDITION IS MODERATE.

LEGEND:-
 FRL FINISHED ROAD LEVEL
 IL INVERT LEVEL
 LVL LEVEL
 EGL EXISTING GROUND LEVEL

FRL CAMBER & LOCATION IS TO BE MATCHED WITH HIGHWAY ALIGNMENT DRAWING.

SAFETY AUDITOR
 (As per Article 10.1 of EPC Agreement)

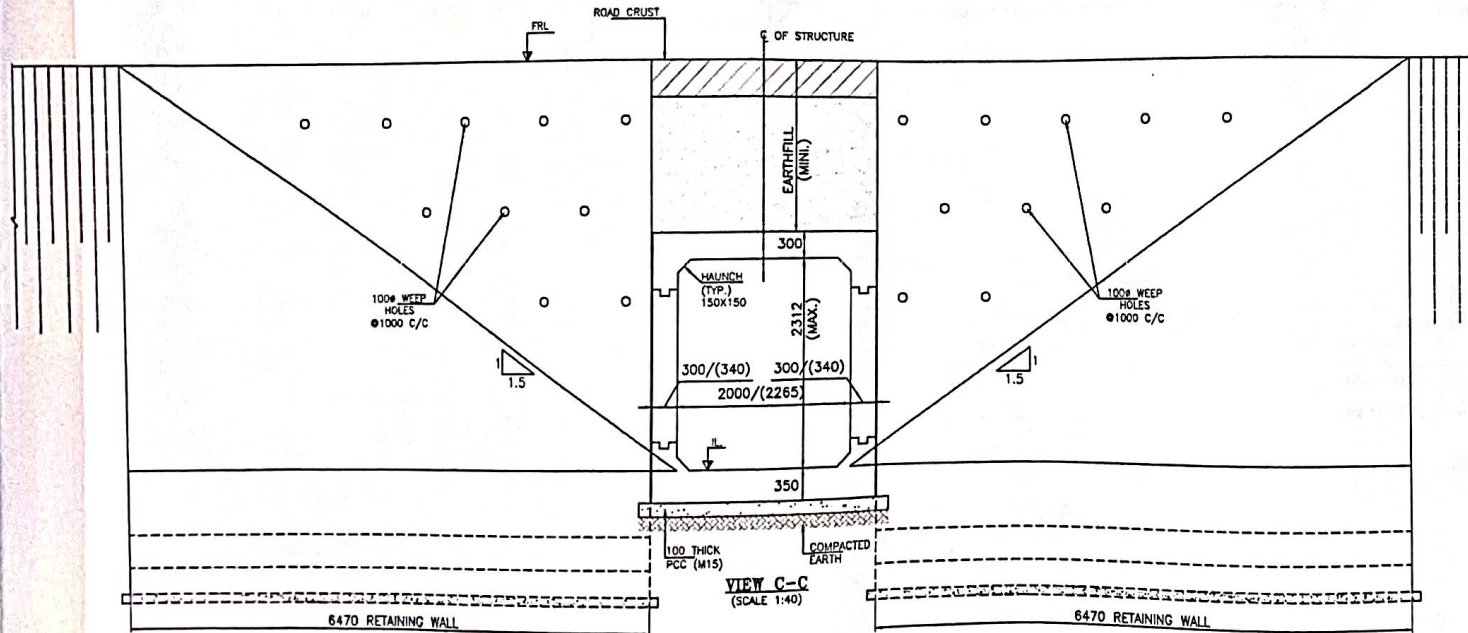
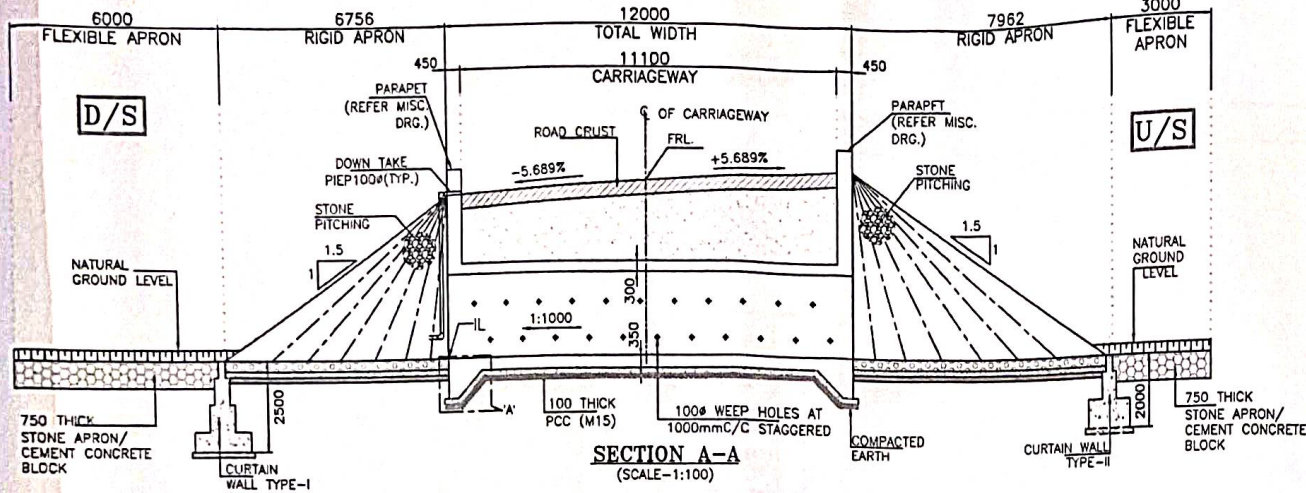
REFERENCE DRAWINGS:-
 1. REINFORCEMENT DETAIL OF BOX CULVERT
 MSPL/NH-38/BOX/REINF./47+298/02

GOOD FOR CONSTRUCTION

HALF PLAN AT TOP **HALF PLAN AT BOTTOM**

PLAN
 (SCALE-1:100)

CLIENT: NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	EPC CONTRACTOR KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	AUTHORITY'S ENGINEER ALMOND GLOBA INFRAS CONSULTANT LIMITED INDIAN WITH A LEEZA CONSULTANT PRIVATE LIMITED. CO. JAYANTA BAIJA SARA JANIN WASHAN, BORBI NO.2, JIGBOI, TINSUKIA, ASSAM-786171	PROOF CONSULTANT: CREATIVE ENGINEERING SERVICES OFFICE NO: 620, SIGNATURE GLOBAL, MAIL, SECTOR-3, VAISHALI, GHAZIABAD, U.P-201010	SAFETY CONSULTANT: DESIGN AID PLOT NO.54, 3rd FLOOR(FRONT), MASOODPUR DAIRY FARM,VASANT KUNJ, NEW DELHI-110070,	DESIGN CONSULTANT: Winst Infra Solution Pvt. Ltd. OFFICE: F-8, ISMAAN CORPORATE TOWER, PLOT NO-C-23, SECTOR-13, VASINHERA, GHAZIABAD, U.P-201012	PROJECT: WIDENING/IMPROVEMENT TO 3 LANE LANE WITH PAVED SHOULDER FROM KM 37+150 (GOLAI GOAN) TO KM 47+882 (LEDO) ON DERGAH TO LEDO SECTION WITH PROPOSED MARGHERITA A LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE (PACKAGE-3) DRAWING TITLE: GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 47+298 <table border="1"> <tr> <th>Date</th> <th>Drawn</th> <th>Checked</th> <th>Appr.</th> <th>Scale</th> <th>Drawing Status</th> </tr> <tr> <td>JAN 2024</td> <td>W.P.</td> <td>V.S.</td> <td>A.I.</td> <td>NIS</td> <td></td> </tr> <tr> <td>Project No.</td> <td>Drawing No.</td> <td>Sheet No.</td> <td>Rev.</td> <td></td> <td></td> </tr> <tr> <td></td> <td>AVG/NH-38/BC/GADIAT/288/1</td> <td>01 OF 03</td> <td>NO</td> <td></td> <td></td> </tr> </table>	Date	Drawn	Checked	Appr.	Scale	Drawing Status	JAN 2024	W.P.	V.S.	A.I.	NIS		Project No.	Drawing No.	Sheet No.	Rev.				AVG/NH-38/BC/GADIAT/288/1	01 OF 03	NO		
Date	Drawn	Checked	Appr.	Scale	Drawing Status																									
JAN 2024	W.P.	V.S.	A.I.	NIS																										
Project No.	Drawing No.	Sheet No.	Rev.																											
	AVG/NH-38/BC/GADIAT/288/1	01 OF 03	NO																											



SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

DESIGN AID, NEW

GOOD FOR CONSTRUCTION

CLIENT:



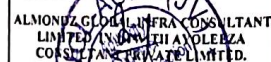
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.

EPC CONTRACTOR



KAMAC ENGINEERS PVT. LTD.
F0201, CITY CENTER OFFICE
BLOCK, 2ND FLOOR,
MATIGARA 734010

AUTHORITY'S ENGINEER



ALMONIZ GLOBAL INFRA CONSULTANT LIMITED
CONSULTANTS PRIVATE LIMITED.
C/O. VIKAS NAGAR, BARBAJAN
NAGAR, BORRIL NO. 2, DIGBARI,
TINSUKIA, ASSAM 786171

PROOF CONSULTANT:



CREATIVE ENGINEERING SERVICES
OFFICE NO. 620, SIGNATURE GLOBAL
MALL, SECTOR-3,
VAISHALI, GHAZIABAD, U.P. 201010.

SAFETY CONSULTANT:



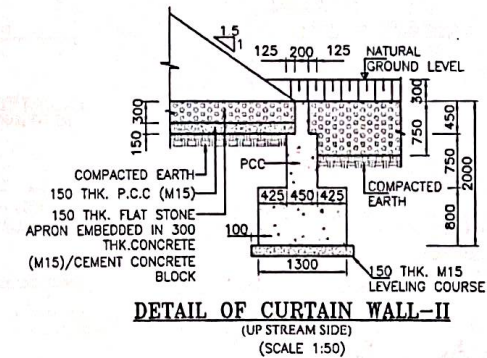
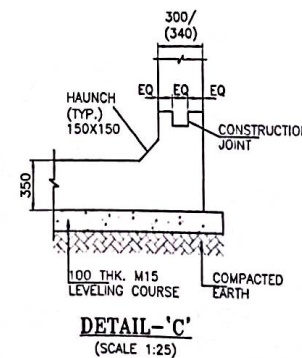
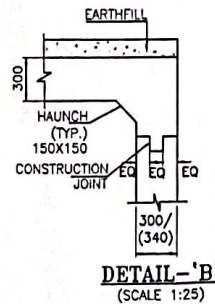
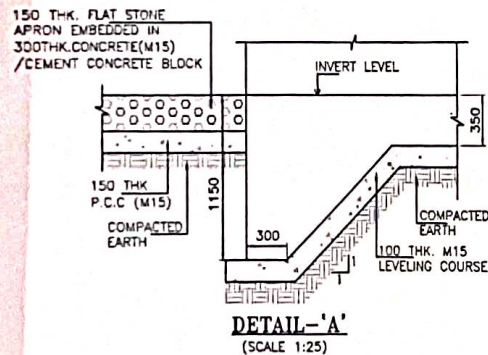
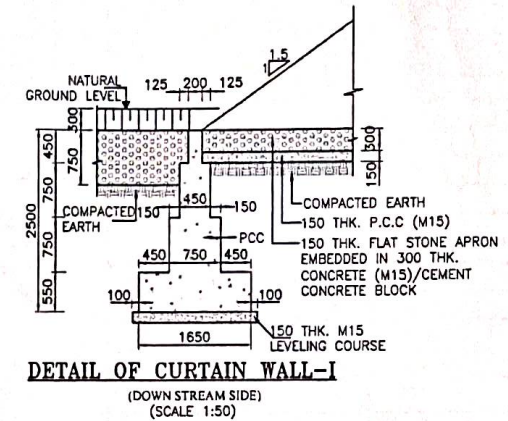
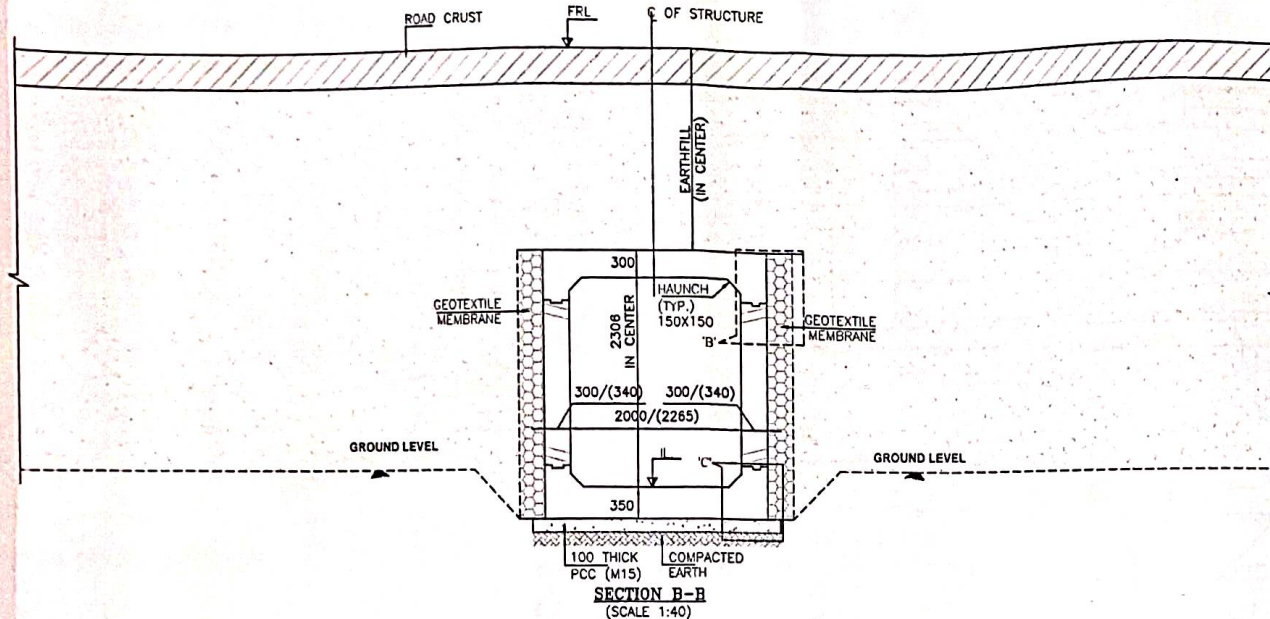
DESIGN AID
PLOT NO. 54, 3rd FLOOR (FRONT),
MASOODPUR DAIRY FARM, VASANT KUNJ,
NEW DELHI-110070.

DESIGN CONSULTANT:



Winst Infra Solution Pvt. Ltd.
OFFICE: F-8, ISHAAN CORPORATE
TOWER, PLOT NO. C-23, SECTOR-13,
VAISHALI, GHAZIABAD, U.P. 201017

PROJECT: WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (GOLAI GOAN) TO KM 47+882 (LEDO) ON DIBRUAGH TO LEDO SECTION WITH PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (2 LANE+PS) OF NH-38 IN TRIBHENA DISTRICT IN THE STATE OF ASSAM ON EPC MODE (PACKAGE-3)									
DRAWING TITLE: GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 47+298									
Date: JAN 2024	Drawn: W.P.	Checked: V.S.	Approved: A.D.	Scale: NTS	Drawing Status:				
Project No.	Drawing No.	AVCNH-38/BC/GAD/47+298/01				Sheet No.	01 OF 03	Rev.	00



SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

DESIGN AID, NEW DELHI

GOOD FOR CONSTRUCTION

NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.

KAMAC ENGINEERS PVT. LTD.
F0201, CITY CENTER OFFICE
BLOCK A, 2ND FLOOR,
MATIGARA 734010

ALMOND GLOBAL INFRA CONSULTANT
LIMITED, NEW DELHI
CONSULTANT PRIVATE LIMITED.
C/O JAYANTA BAKSI & SARKAR
NAGHAR, BORAIL NO 2, DISBOI,
TINSUKIA, ASSAM-786771

CREATIVE ENGINEERING SERVICES
OFFICE NO: 620, SIGNATURE GLOBAL
MALL, SECTOR-3,
VAISHALI, GHAZIABAD, U.P.-201010

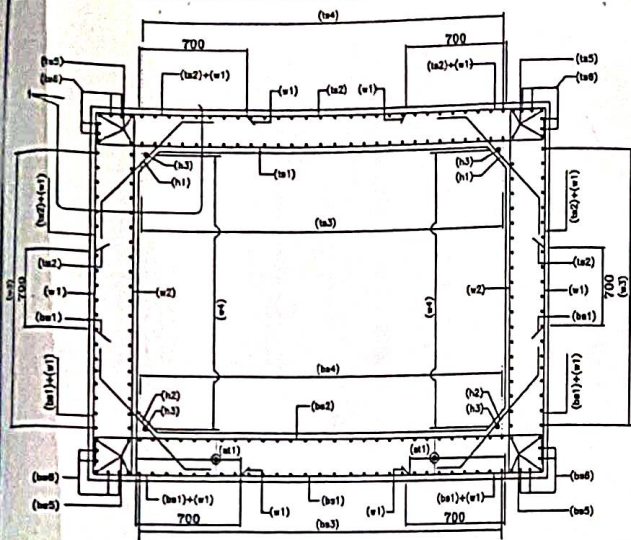
DESIGN AID
PLOT NO.54, 3rd FLOOR(FRONT),
MASOODPUR DAIRY FARM,VASANT KUNJ,
NEW DELHI-110070.

Winst Infra Solution Pvt. Ltd.
OFFICE: P-4, ISHMANI CORPORATE
TOWER, PLOT NO-C-23, SECTOR-13,
VASUNDHRA GHAZIABAD, U.P.-201012

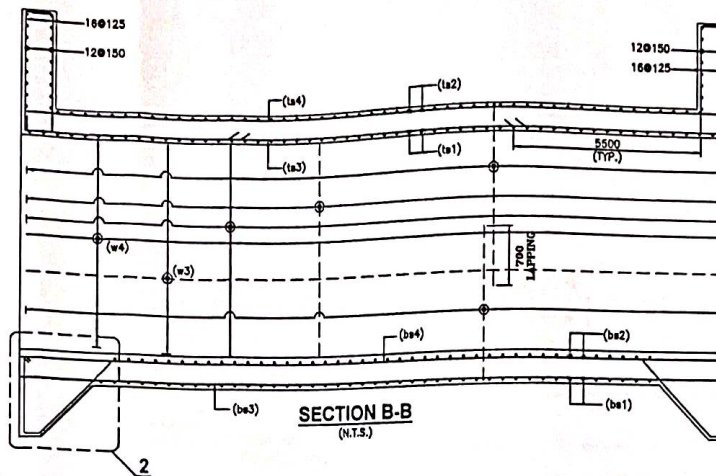
PROJECT:
WIDENING/IMPROVEMENT TO 2-LANE WITH PAVED SHOULDER FROM KM 27+150
(GOLAI GOAN) TO KM 47+882 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH
PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD).
2-LANE+PS OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC
MODE (PACKAGE-5)

DRAWING TITLE:
GENERAL ARRANGEMENT DRAWING FOR
BOX CULVERT AT CHAINAGE 47+298

Date	W.P.	Eng.	Chk.	App.	Scale	Drawing Status
JAN.2024		V.S	A.D		NTS	
Project No.	Drawing No.	AVC/NH-38/BC/GAD/47+298/01				Sheet No. 03 OF 03
						Rev. RD



SECTION A-A
(N.T.S.)



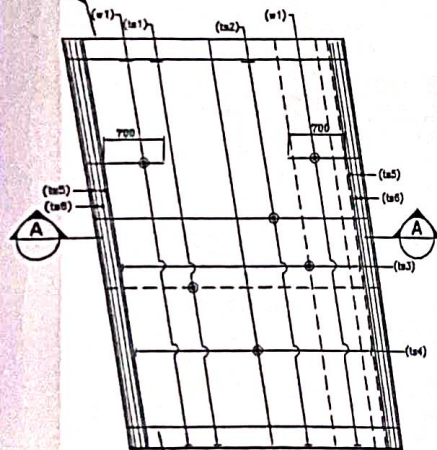
SECTION B-B
(N.T.S.)

LEGEND:-

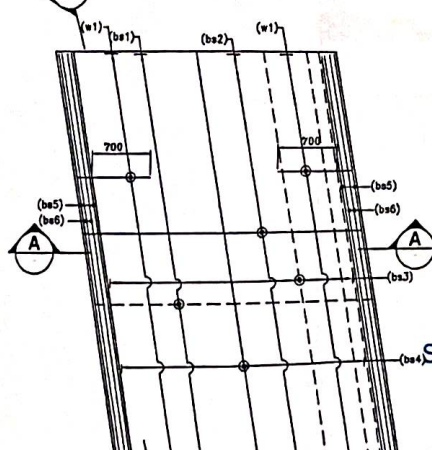
TOP FACE BAR
BOTTOM FACE BAR

TRAFFIC DIRECTION

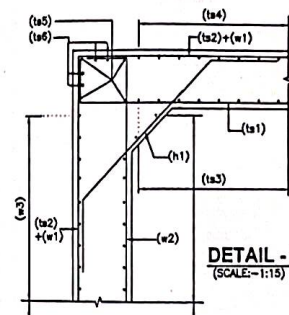
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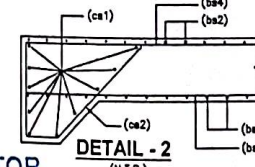
REINFORCEMENT DETAILS OF TOP SLAB
(LAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
(N.T.S.)



REINFORCEMENT DETAILS OF BOTTOM SLAB
(LAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
(N.T.S.)



DETAIL - 1
(SCALE: 1:15)



DETAIL - 2
(N.T.S.)

SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

DESIGN AID, NEW DELHI

- ANCHORAGE LENGTH OF BOX SHALL BE TAKEN AS 40 ϕ AS PER IRC:112.
- FOR UNFAVORABLE BOND CONDITIONS THE FACTOR 40 SHOULD BE MULTIPLIED BY FACTOR OF 1.43.
- CENTER LINE OF OVERLAPPING BAR bs1 & ts2 IN WALL & MID HEIGHT OF WALLS ARE AT SAME POINT.
- BAR BENDING SCHEDULE SHOULD BE STRICTLY FOLLOW DURING THE TIME OF EXECUTION IF IN CASE ANY CHANGES AT SITE KINDLY DISCUSS IT WITH ENGINEER IN CHARGE.

REFERENCE DRAWING:-

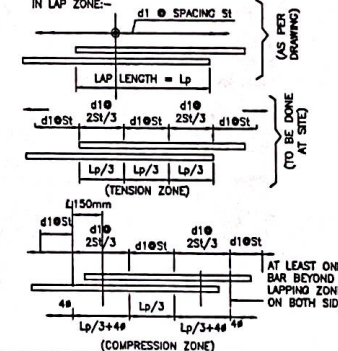
- GENERAL ARRANGEMENT DRAWING.
AVC/NH-38/BOX/GAD/47+298/01

BOX REIN. SCHEDULE

SL.NO.	BAR MARK	BAR SHAPE	DIAMETER	SPACING
1	ts1		12	170
2	ts2		10	170
3	ts3		8	200
4	ts4		10	200
5	ts5		12	2x4 Nos.
6	ts6		12	2x4 Nos.
7	w1		10	170
8	w2		10	170
9	w3		10	200
10	w4		8	200
11	bs1		10	170
12	bs2		12+8	170
13	bs3		10	200
14	bs4		8	200
15	bs5		12	2x4 Nos.
16	bs6		12	2x4 Nos.
17	h1		10	170
18	h2		10	170
19	h3		10	1x4 Nos.
20	cs1		12	10 Nos.
21	cs2		10	200
22	st1		8	200 c/c (L-L) 170 c/c (T-T) DIRECTION

NOTES:-

- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS UNLESS OTHERWISE MENTIONED.
- DRAWING SHOULD NOT BE SCALED ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
- ALL REINFORCING BARS SHALL BE THERMO MECHANICALLY TREATED (TMT) BARS (GRADE DESIGNATION Fe-500) CONFORMING TO IS:1786 STANDARDS.
- MINIMUM CLEAR COVER TO OUTERMOST REINFORCEMENT SHALL BE AS FOLLOWS:-
 - TOP SLAB - 45mm
 - BOTTOM SLAB - 75mm
 - SIDE WALL (EARTH SIDE) - 75mm
 - SIDE WALL (INNER SIDE) - 45mm
- OVERLAPPING FOR SPlicing OF REINFORCEMENT SHALL BE AS PER CLAUSE NO.15.2.5. LAP LENGTH SHALL NOT BE LESS THAN 50 ϕ . ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:-



AT LEAST ONE BAR BEYOND LAPPING ZONE ON BOTH SIDE

NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.

KAMAC ENGINEERS PVT.LTD
F0201, CITY CENTER OFFICE
BLOCK, 2ND FLOOR,
MATIGARA 734019

ALMORZ GLOBE INFRA CONSULTANT LIMITED
C/O JAYANTA SANKAR SARBAJANIN
NAMCHAR, BORBIL NO.2, DIGBOI,
TINSUKIA, ASSAM-781171

CREATIVE ENGINEERING SERVICES
OFFICE NO. 620, SIGNATURE GLOBAL
MALL, SECTOR-3,
VAISHALI, GHAZIABAD, U.P-201010

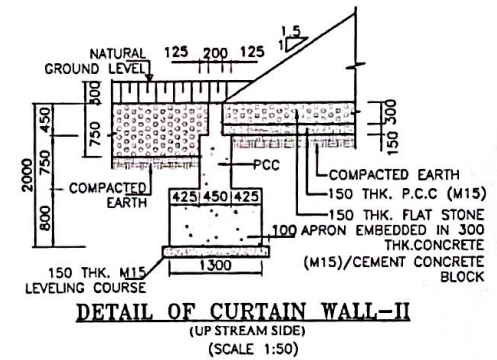
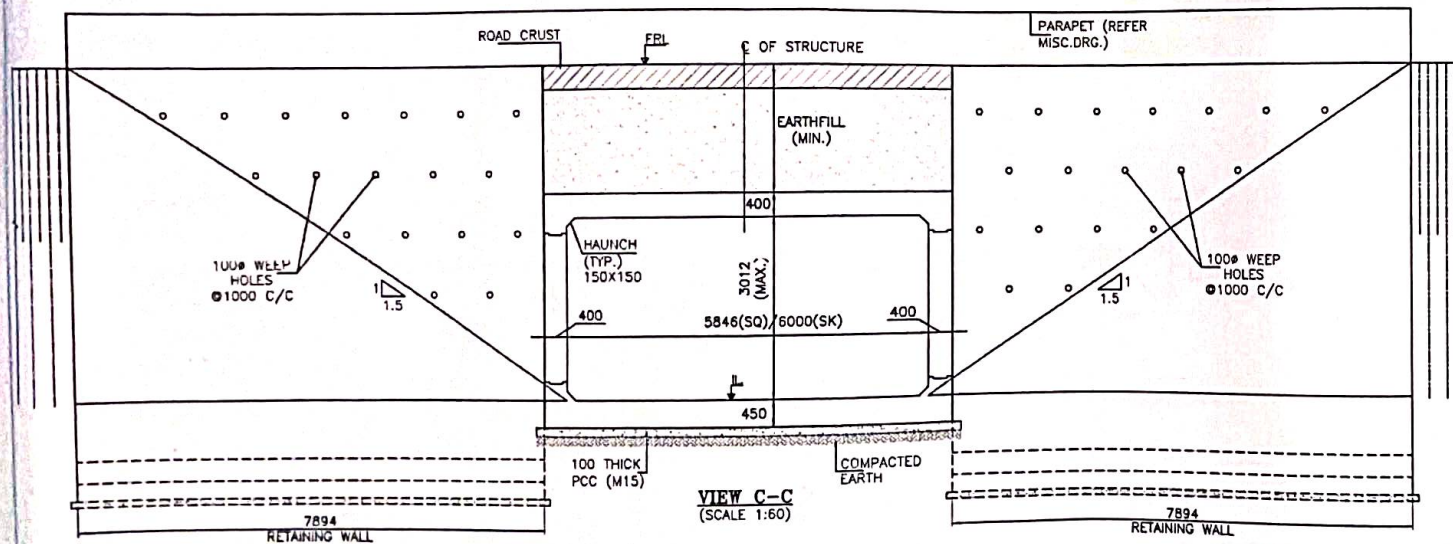
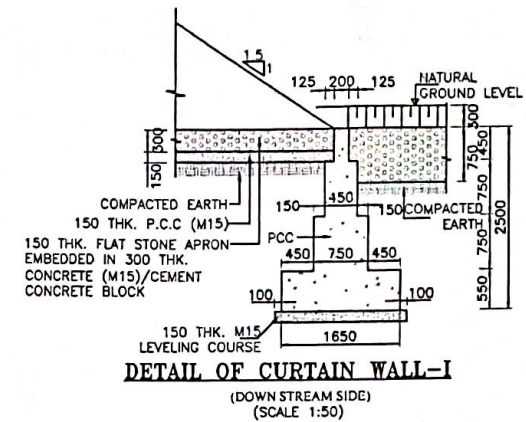
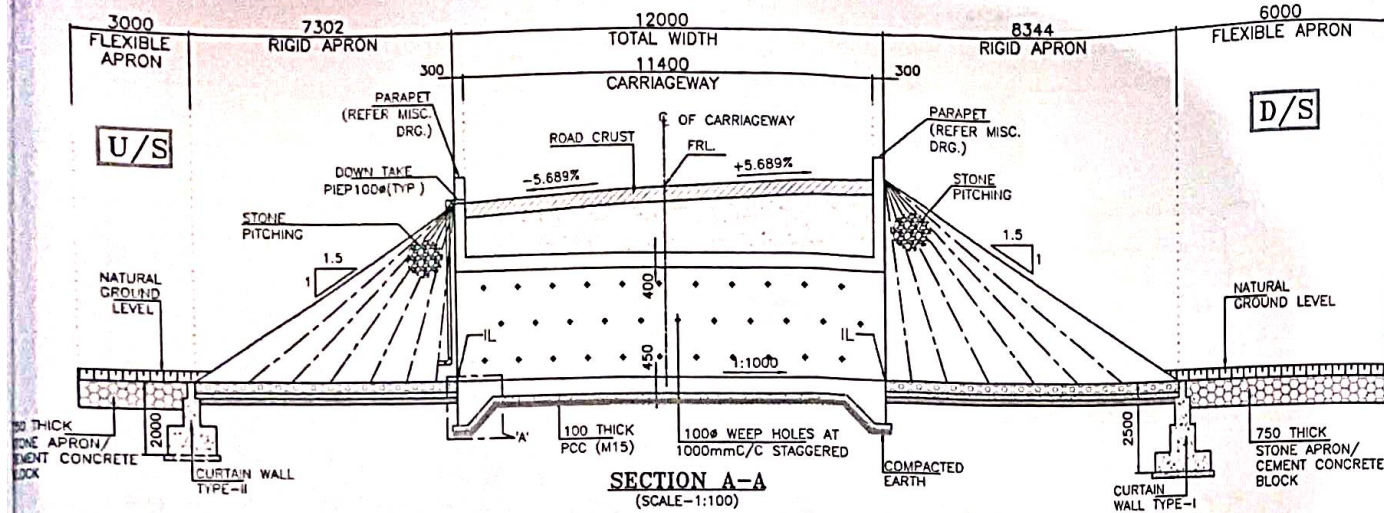
DESIGN AID
PLOT NO.54, 3rd FLOOR(FRONT),
MASOODPUR DAIRY FARM,VASANT KUNJ,
NEW DELHI-110070,

Winst Infra Solution Pvt. Ltd.
OFFICE F&B BHAWAN CORPORATE
TOWER, PLOT NO-C-23, SECTOR-13,
VASUKI, GHAZIABAD, U.P-201017

PROJECT:
WIDENING/IMPROVEMENT TO 2-LANE WITH PAVED SHOULDER FROM KM 27+150 (GOLAI SOAN) TO KM 47+482 (LEO) ON DIBRUGARH TO LEDO SECTION WITH PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD), (2-LANE+PB) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE (PACKAGE-3)

DRAWING TITLE:
REINFORCEMENT DETAIL OF BOX CULVERT AT CH. 47+298

Date: JAN.2024
Drawn By: W.P.
Checked By: V.S.
App.: A.B.
Scale: NTS
Drawing Status:
Project No.: AVC/NH-38/BOXREIN/47+298/01
Sheet No.: 01 OF 01
Rev.: RD

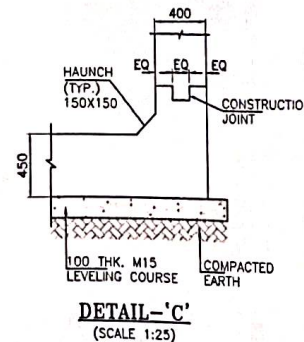
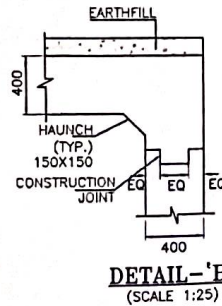
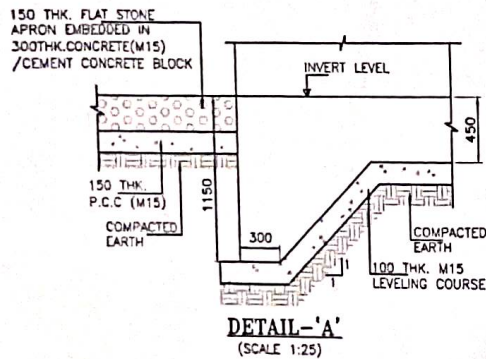
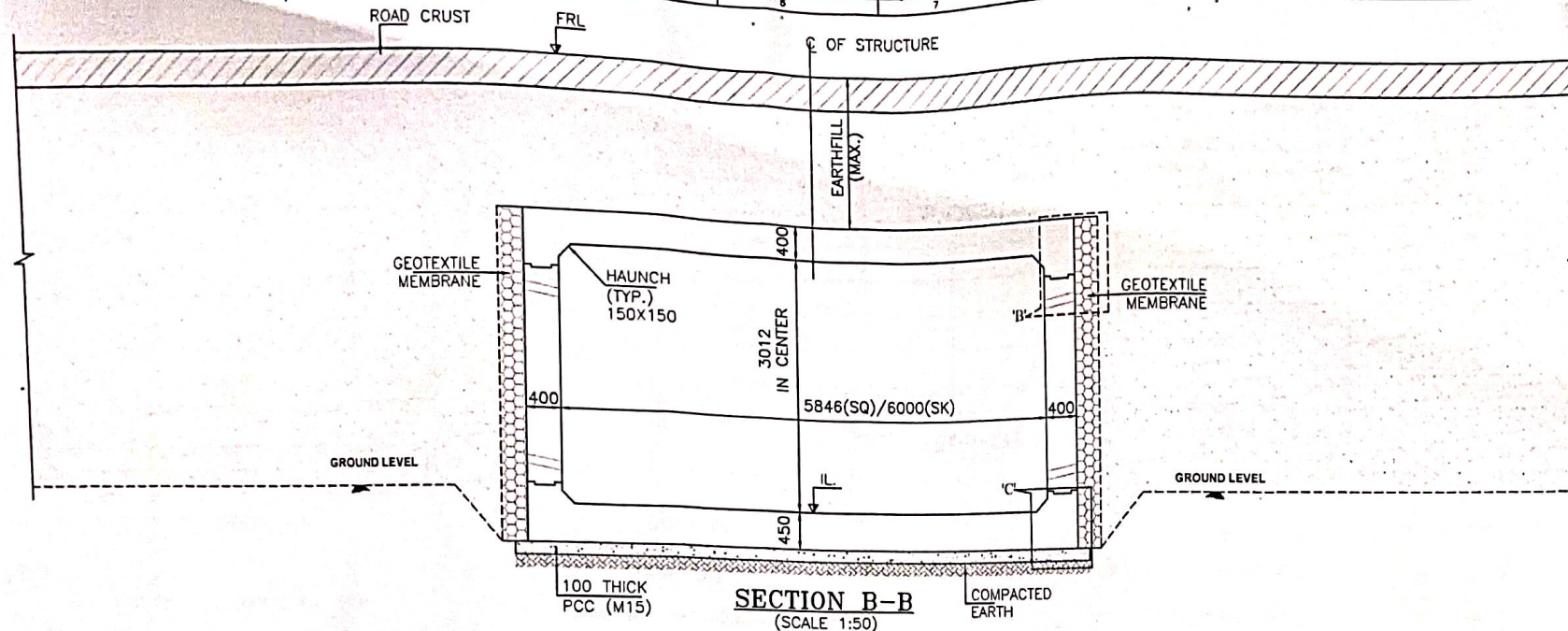


SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

DESIGN AID, NEW DELHI

GOOD FOR CONSTRUCTION

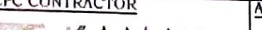
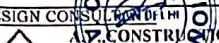
ENT: NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	EPC CONTRACTOR: KAMAC ENGINEERS PVT. LTD. F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	AUTHORITY'S ENGINEER: ALMOND GLOBAL INFRA CONSULTANT LIMITED C/O JAYANTA SAIKIA, SARBA ANIN NANGHAR, SCHEME NO.2, DGBOI, THUSUKIA, ASSAM-786171	PROOF CONSULTANT: CREATIVE ENGINEERING SERVICES OFFICE NO. 620, SIGNATURE GLOBAL MALL, SECTOR-3, VAISHALI, GHAZIABAD, U.P. 201010	SAFETY CONSULTANT: DESIGN AID PLOT NO.54, 3rd FLOOR(FRONT), MASOOPUR DAIRY FARM, VASANT KUNJ, NEW DELHI-110070.	DESIGN CONSULTANT: Winst Infra Solution Pvt. Ltd. OFFICE F-8, ISHAN CORPORATE TOWER, PLOT NO-C-23, SECTOR-13, VASBIHRA CHUK-CHAND, U.P. 201012	PROJECT: WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27-190 (GOLAI GOAN) TO KM 47-082 (LEDO) ON DISBURGMENT TO LEDO SECTION WITH PROPOSED MARGHERITA & LEDO BYPASS BURNHFIELD AND GREEN FIELD (2-LANE+PB) OF NH-38 IN TINBUKA DISTRICT IN THE STATE OF ASSAM ON EPC MODE (PACKAGE-3) DRAWING TITLE: GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 47+487 Date: JAN 2024 Project No.: Dwg. No.: W.P. V.S Chk. A.D App. NTS Scale: NTS Drawing Status: Sheet No. 02 OF 03 Rev. RD
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SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

DESIGN AID, NEW DELHI

GOOD FOR CONSTRUCTION

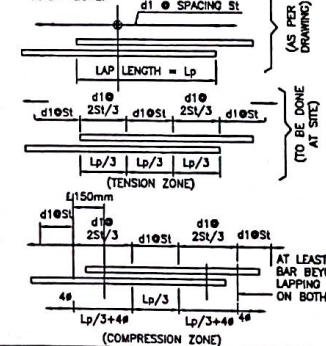
 NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	 KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734210	 AUTHORITY'S ENGINEER ALMOND GEOTECHNICAL CONSULTANT LIMITED, INDIAN ROAD & CONSTRUCTION CONSULTANTS LIMITED. City Section C/O. JAYANTA SARKAR, BARBANJAN NAMCHAR, BORBIL NO.2, JIGBOI, TINSUKIA, ASSAM-786171	 PROOF CONSULTANT: CREATIVE ENGINEERING SERVICES OFFICE NO: 620, SIGNATURE GLOBAL MALL, SECTOR-3, VAISHALI, GHAZIABAD, U.P-201010	 SAFETY CONSULTANT: DESIGN AID PLOT NO 54, 3rd FLOOR(FRONT), MASOODPUR DAIRY FARM,VASANT KUNJ, NEW DELHI-110070.	 DESIGN CONSULTANT: Winst Infra Solution Pvt. Ltd. OFFICE: F-8, ISHAN CORPORATE TOWER, PLOT NO-C-23,SECTOR-13, VASANT KUNJ, NEW DELHI-110017	PROJECT: WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27-150 (GOLA GOAN) TO KM 47-682 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH PROPOSED MARCHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE (PACKAGE-B) DRAWING TITLE: GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 47+487 <table><tr><td>Date</td><td>Drawn</td><td>Des</td><td>Chk.</td><td>App.</td><td>Scale</td><td>Drawing Status</td></tr><tr><td>JAN 2024</td><td>W.P.</td><td>V.S.</td><td>A.B.</td><td></td><td>NTS</td><td></td></tr><tr><td>Project No.</td><td>Drawing No.</td><td colspan="4">AVCANH-38/BC/GAD/47-487/01</td><td>Sheet No. 02 OF 02</td></tr><tr><td></td><td></td><td colspan="4"></td><td>Rev. 00</td></tr></table>	Date	Drawn	Des	Chk.	App.	Scale	Drawing Status	JAN 2024	W.P.	V.S.	A.B.		NTS		Project No.	Drawing No.	AVCANH-38/BC/GAD/47-487/01				Sheet No. 02 OF 02							Rev. 00
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						Rev. 00																												

BOX REIN. SCHEDULE

SL.NO.	BAR MARK	BAR SHAPE	DIAMETER	SPACING
1	ts1		16+10	130
2	ts2		16	130
3	ts3		12	180
4	ts4		12	180
5	ts5		12	2x4 Nos.
6	ts6		12	2x4 Nos.
7	w1		12	130
8	w2		16	130
9	w3		12	180
10	w4		10	180
11	bs1		16	130
12	bs2		16+10	130
13	bs3		12	180
14	bs4		12	180
15	bs5		12	2x4 Nos.
16	bs6		12	2x4 Nos.
17	h1		10	130
18	h2		10	130
19	h3		10	1x4 Nos.
20	cs1		12	10 Nos.
21	cs2		10	180
22	st1		10	180 c/c (L-L) 130 c/c (T-T) DIRECTION
23	st2		12	180 c/c (L-L) 130 c/c (T-T) DIRECTION

NOTES:-

- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS UNLESS OTHERWISE MENTIONED.
- DRAWING SHOULD NOT BE SCALED ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
- ALL REINFORCING BARS SHALL BE THERMO MECHANICALLY TREATED (TMT) BARS (GRADE DESIGNATION Fe-500) CONFORMING TO IS:1786 STANDARDS.
- MINIMUM CLEAR COVER TO OUTERMOST REINFORCEMENT SHALL BE AS FOLLOWS:-
 - a) TOP SLAB - 45mm
 - b) BUTTUM SLAB - 75mm
 - c) SIDE WALL (EARTH SIDE) - 75mm
 - d) SIDE WALL (INNER SIDE) - 45mm
- OVERLAPPING FOR SPLICING OF REINFORCEMENT SHALL BE AS PER CLAUSE NO.15.2.5. LAP LENGTH SHALL NOT BE LESS THAN 56 ϕ . ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:-



- ANCHORAGE LENGTH OF BOX SHALL BE TAKEN AS 40 ϕ AS PER IS:112.
- FOR UNFAVORABLE BOND CONDITIONS THE FACTOR 40 SHOULD BE MULTIPLIED BY FACTOR OF 1.43.
- CENTER LINE OF OVERLAPPING BAR bs1 & ts2 IN WALL & MID HEIGHT OF WALLS ARE AT SAME POINT.
- BAR BENDING SCHEDULE SHOULD BE STRICTLY FOLLOW DURING THE TIME OF EXECUTION IF IN CASE ANY CHANGES AT SITE KINDLY DISCUSS IT WITH ENGINEER IN CHARGE.

REFERENCE DRAWING:-

- GENERAL ARRANGEMENT DRAWING. AYC/NH-38/BOX/GAD/47+487/01

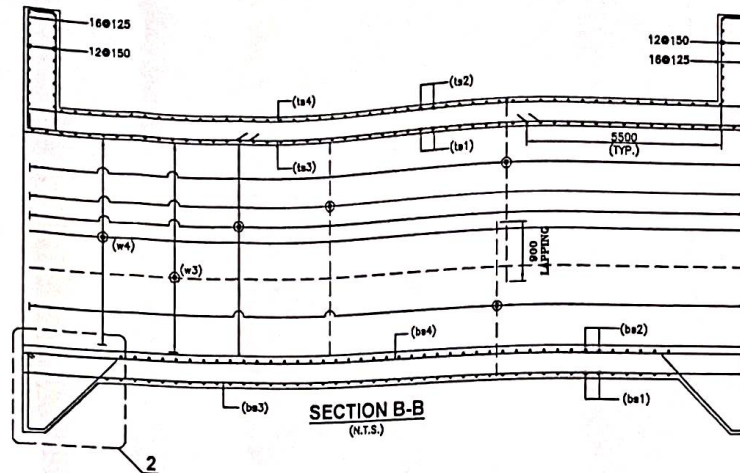
CONSTRUCTION
Winst Infra Solution Pvt. Ltd.
OFFICE: F-8, 18th FLOOR, TOWER, PLOT NO-C-23, SECTOR-12, VASINDHRA CH-20, DELHI-110012

PROJECT:				
WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27-180 (GOLAI GOAN) TO KM 47-482 (LEDO) ON DISBURGMENT TO LEDO SECTION WITH PROPOSED MARCHERITA & LEDO BYPASS (BROWN FIELD AND GREEN FIELD) (2-LANE+P) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE (PACKAGE-3)				
DRAWING TITLE:				
REINFORCEMENT DETAIL OF BOX CULVERT AT CH. 47+487				
Date	Draw.	Dep.	Chk.	Scale.
JAN 2024	W.P.	V.S.	A.B.	NTS
Project No.	Drawing No.	Sheet No.	Rev.	
AVC/NH-38/BOX/REIN/47+487/01		01 OF 01	RO	

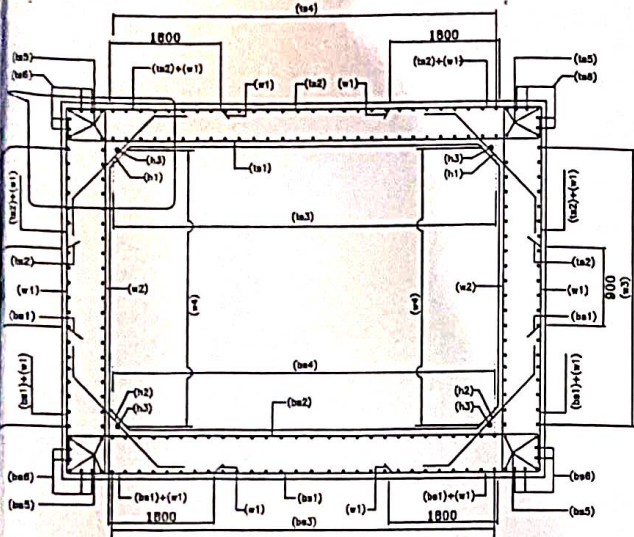
LEGEND:-

TOP FACE BAR	_____
BOTTOM FACE BAR	_____

SECTION B-B (N.T.S.)

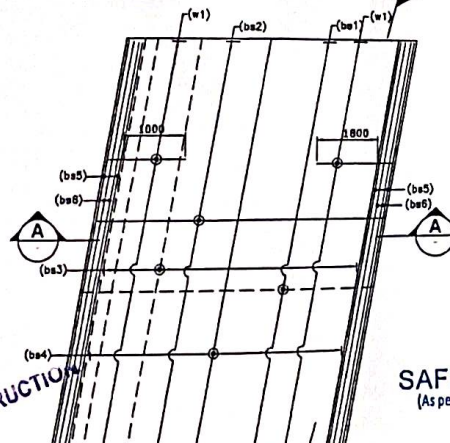
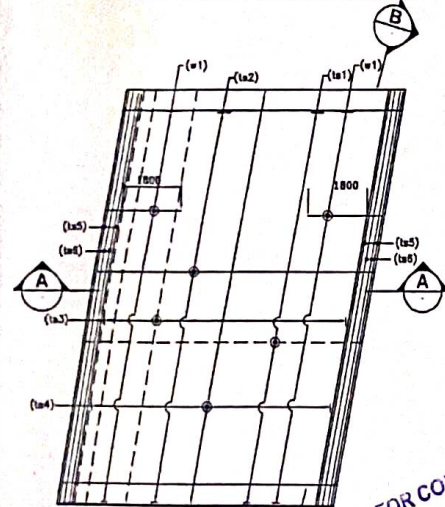


SECTION A-A (N.T.S.)



TRAFFIC DIRECTION

TRAFFIC DIRECTION



SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

DESIGN AID, NEW DELHI

REINFORCEMENT DETAILS OF TOP SLAB

(HAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
(N.T.S.)

REINFORCEMENT DETAILS OF BOTTOM SLAB

(HAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
(N.T.S.)

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F0201, CITY CENTER OFFICE
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ALMONDZ GLOBAL INFRA CONSULTANT LIMITED
C/O. MYANTA SAKIA, SARBAMAJIN
NAMGHAR, BORBIL MP-2, DIGBOI,
TINSUKIA, ASSAM-786111

CREATIVE ENGINEERING SERVICES
OFFICE NO. 620, SIGNATURE GLOBAL
MALL, SECTOR-3,
VAISHALI, GHAZIABAD, U.P-201010

DESIGN AID
PLOT NO.54, 3rd FLOOR(FRONT),
MASOODPUR DAIRY FARM,VASANT KUNJ,
NEW DELHI-110070,

Winst Infra Solution Pvt. Ltd.
OFFICE: F-8, 18th FLOOR, TOWER, PLOT NO-C-23, SECTOR-12, VASINDHRA CH-20, DELHI-110012