almondz
the game changer
Almondz Global Infra-Consultant Limited
Head Office – F-33/3, Okhla Industrial Area, Phase II, New Delhi – 110020, Delhi, India

JV with

AYOLEEZA
Blue Print Of Engineering Dreams
Ayoleeza Consultants Private Limited
Head Office – B-901 | 9th Floor | Urbtech Trade Centre | Sector-132 | NOIDA-201304 (DELHI NCR) | India

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.

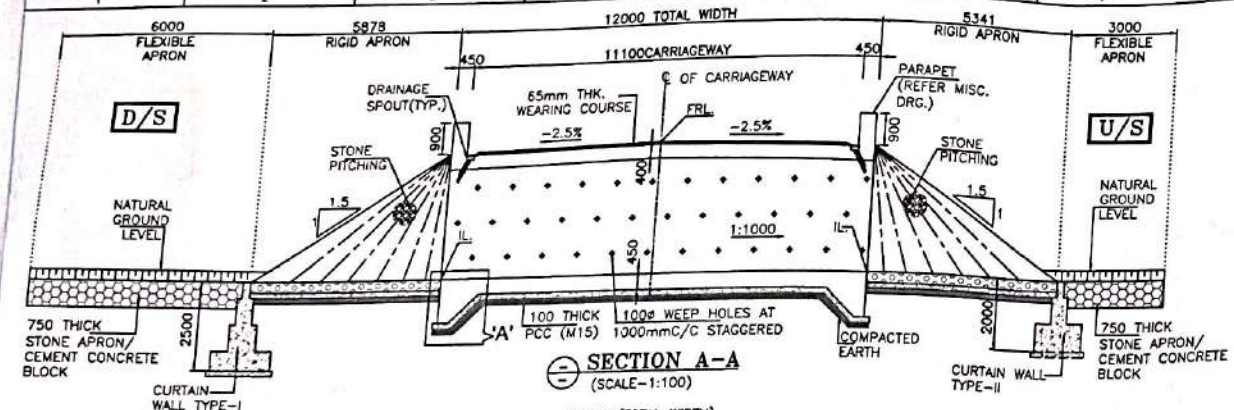
DESIGN CONSULTANT:

A.V. CONSTRUCTION

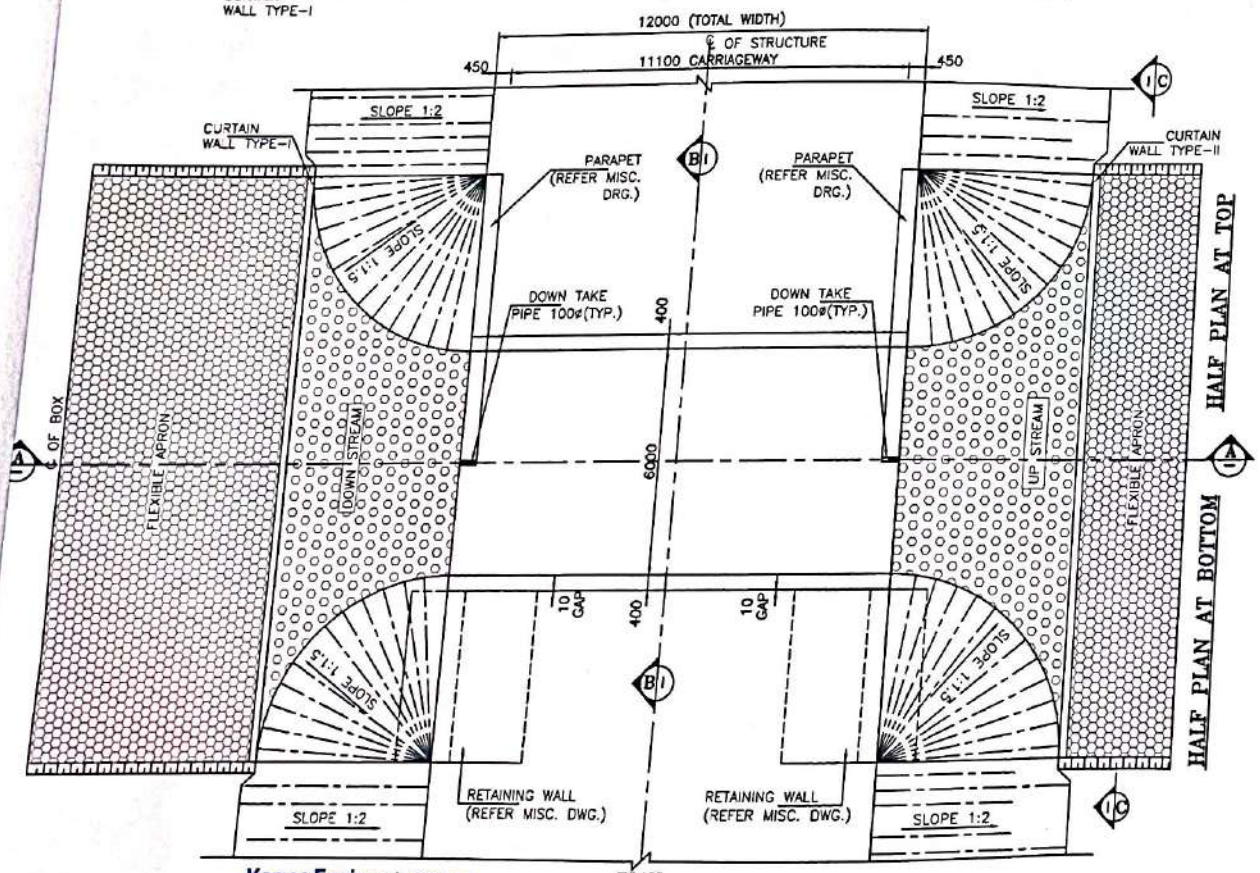
1ST FLOOR, WZ-1240, PALAM EXTENSION,
BOSCO ASHRAM WALI GALI,NEW DELHI 110045

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)

Kamac Engineer's (P) Ltd

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

32250 32350

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	146.060	145.760	145.772	3.270m	0	0

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

NOTES:-

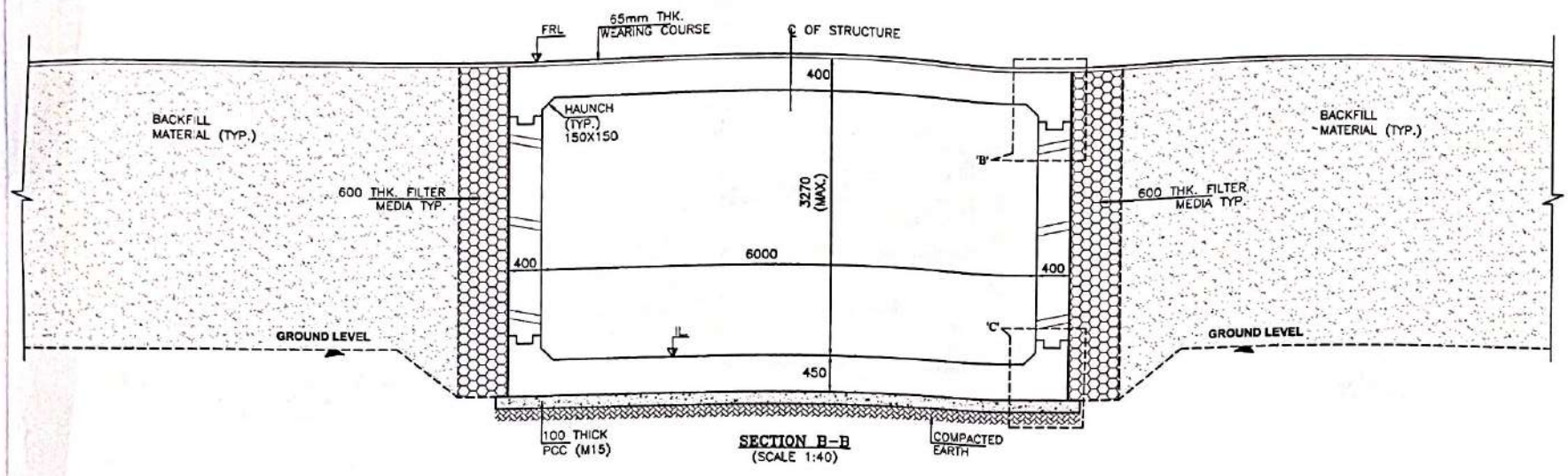
1. ALL DIMENSIONS ARE IN MILLIMETER, LEVELS ARE IN METER AND CHAINAGE ARE IN KILOMETERS UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
2. THIS DRAWING SHALL BE READ IN CONJUCTION WITH THE RELEVANT PLAN AND PROFILE DRAWING OF ROAD.
3. GRADE OF CONCRETE:–
   a. M30–FOR RCC BOX CELL STRUCTURE.
   b. M15–FOR PCC AND LEVELING COURSE.
   c. M30–PARAPET
4. GRADE OF STEEL – Fe500D.
5. 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.
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 SUBJECTED TO CHANGE AS PER SITE CONDITION AND DETAILED DESIGN.
9. BACKFILL TO BE DONE AND COMPACTED FROM BOTH SIDE SIMULTANEOUSLY.
10. 600MM THICK. FILTER MATERIAL BEHIND RETAINING WALL SHALL BE LAID AS PER APPENDIX 6 OF IRC 78–2014.
11. 50MM THICK CEMENT CONCRETE WEARING COAT SHALL BE PROVIDED.
12. 100MM DIA P.V.C. PIPE AT SPACING 1000MMc/c IN HORIZONTAL/VERTICAL DIRECTION SHALL BE PROVIDED UP TO 150MM ABOVE GROUND LEVEL FOR WEEP HOLES IN RETAINING WALL.
13. SBC SHALL BE 8t/m². AND SAME SHALL BE ENSURED AT SITE BY ANY SUITABLE METHOD.
14. 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.
15. CHOOSE ANY SUITABLE METHOD TO ACHIEVE THE REQUIRED SBC AS PER SITE.
16. THE EXPOSURE CONDITION IS MODERATE.

A.V. CONSTRUCTIONS New Delhi

CLIENT: NATIONAL HIGHWAYS & FRASTRUCTURE DEVELOPMENT CORPORATION LTD.	**EPC CONTRACTOR** Authorised Signatory KAMAC ENGINEERS Pvt.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-4, ISHAAN CORPORATE TOWER, PLOT NO-C-23,SECTOR-13, VASUNDHRA,GHAZIABAD, U.P-201012 WISPL	**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 (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 32+297

Date	Drw.	Dsg.	Chk.	App.	Scale.	Drawing Status.
MAR.2024	W.P	V.S	A.B		NTS	
Project No.	Drawing No. AVC/NH-38/BC/GAD/32+297/01				Sheet No. 81 OF 83	Rev R0



SECTION B-B
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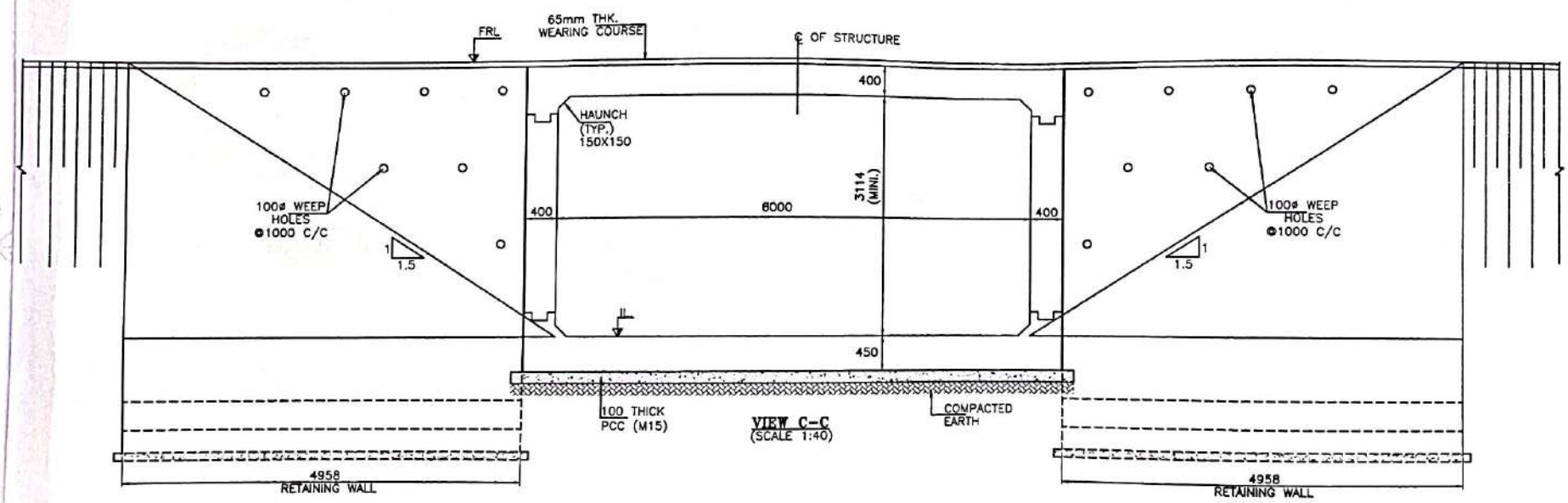


VIEW C-C
(SCALE 1:40)

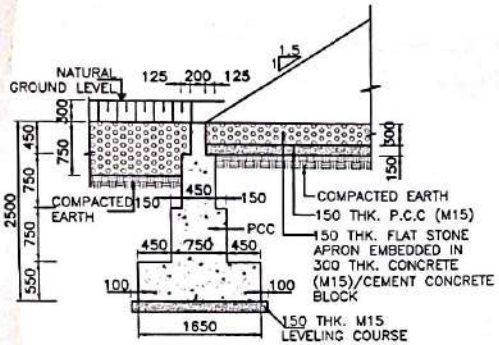
CLIENT:	EPC CONTRACTOR	AUTHORITY'S ENGINEER	PROOF CONSULTANT:	SAFETY CONSULTANT:	DESIGN CONSULTANT:
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	KAMAC ENGINEERS Pvt.Ltd KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	ALMONDZ GLOBAL INFRA CONSULTANT LIMITED IN JV WITH AYOLEEZA CONSULTANT PRIVATE LIMITED. C/O JAYANTA SAIKIA, SARBAJANIN NAMGHAR, BORBIL NO.2, DIGBOI, TINSUKIA, ASSAM-786171	CES CREATIVE ENGINEERING SERVICES OFFICE NO: 620, SIGNATURE GLOBAL MALL, SECTOR-3, VAISHALI, GHAZIABAD, U.P-201010	DESIGN DESIGN AID PLOT NO.54, 3rd FLOOR(FRONT), MASOODPUR DAIRY FARM,VASANT KUNJ, NEW DELHI-110070,	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 WISPL

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 (BROWNFIELD AND GREEN FIELD) (2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE.(PACKAGE-5)

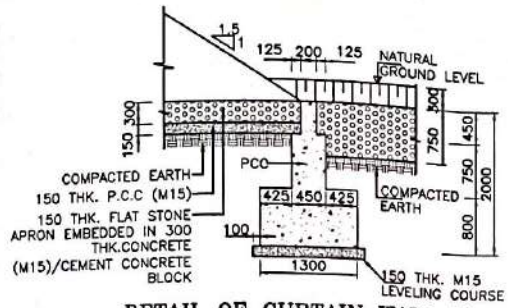
DRAWING TITLE:- GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 32+297

Date	Drw.	Dsg.	Chk.	App.	Scale.	Drawing Status.
MAR.2024	W.P	V S	A.B		NTS	

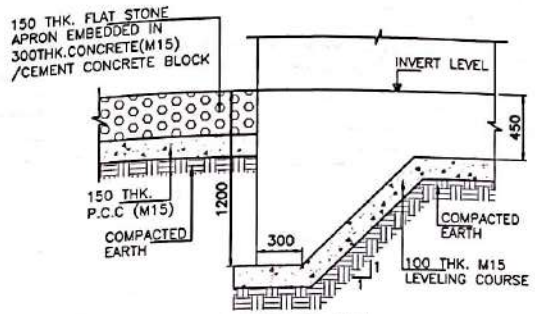
Project No.	Drawing No.	Sheet No.	Rev
	AVC/NH-38/BC/GAD/32+297/01	82 OF 83	R0



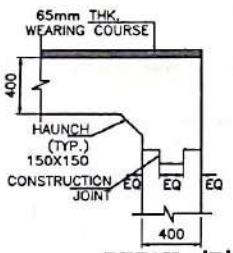
DETAIL OF CURTAIN WALL-I
(DOWN STREAM SIDE)
(SCALE 1:50)



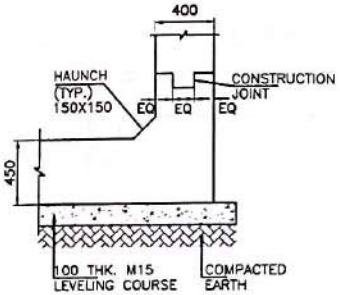
DETAIL OF CURTAIN WALL-II
(UP STREAM SIDE)
(SCALE 1:50)



DETAIL-'A'
(SCALE 1:25)



DETAIL-'B'
(SCALE 1:25)



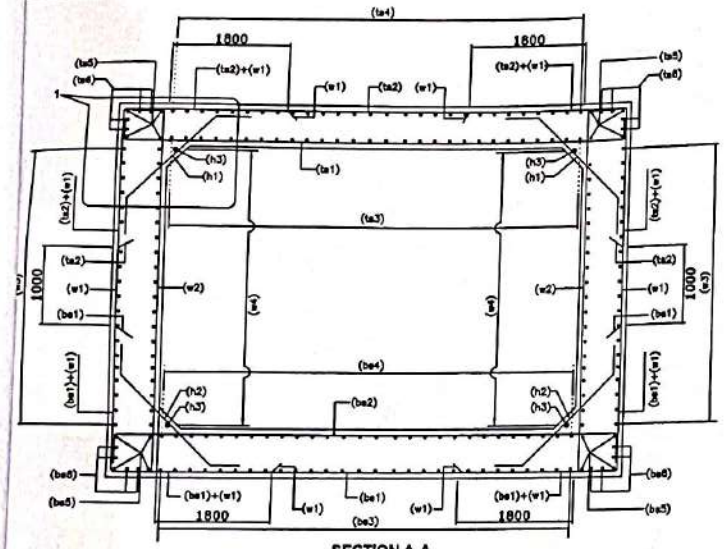
DETAIL-'C'
(SCALE 1:25)

CLIENT:	EPC CONTRACTOR	AUTHORITY'S ENGINEER	PROOF CONSULTANT:	SAFETY CONSULTANT:	DESIGN CONSULTANT:	PROJECT:
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	KAMAC ENGINEERS Pvt.Ltd KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	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	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,	A.V. CONSTRUCTION 1st Floor, WZ-1240, Palam Extension, Bosco Ashram Well 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 WISPL	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)

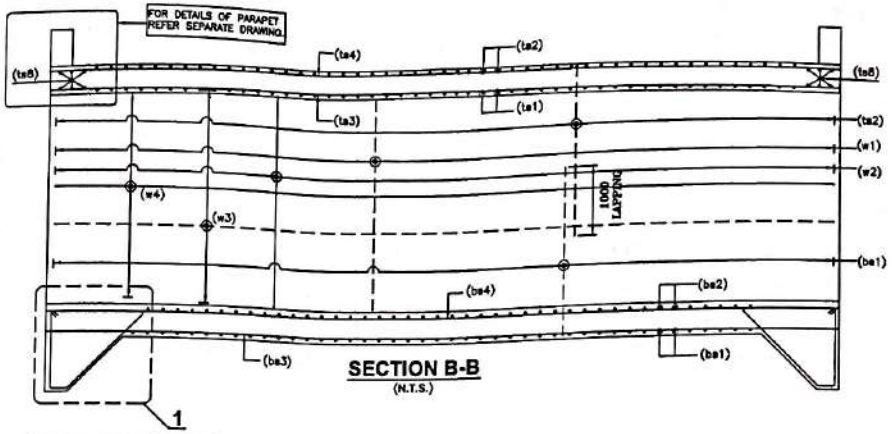
DRAWING TITLE:- GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 32+297

Date	Drw.	Dsg.	Chk.	App.	Scale.	Drawing Status.
MAR.2024	W.P	V.S	A.B		NTS	

Project No.	Drawing No.	Sheet No.	Rev.
	AVC/NH-38/BC/GAD/32+297/01	83 OF 83	R0



SECTION A-A
(NTS)



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

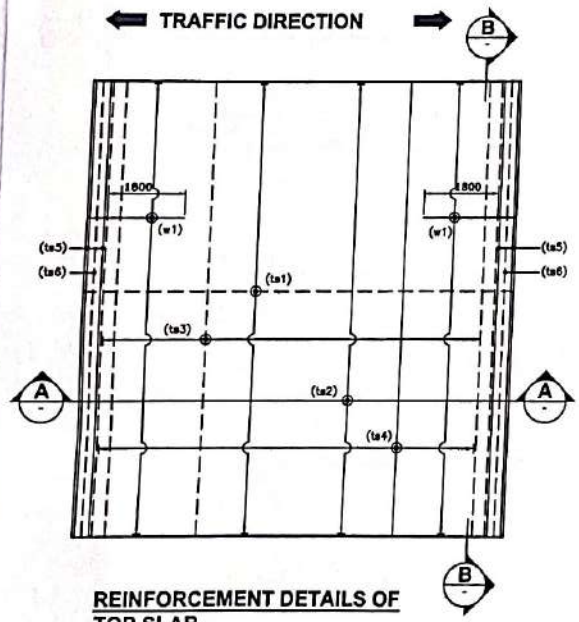
BOX REINF. SCHEDULE

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

LEGEND:-

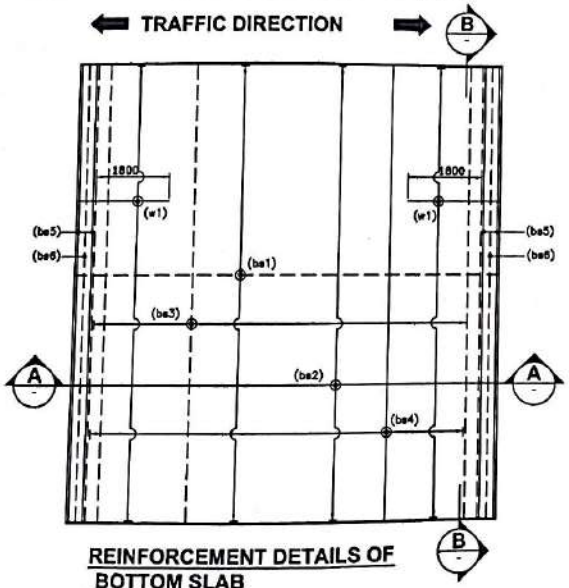
TOP FACE BAR	
BOTTOM FACE BAR	

TRAFFIC DIRECTION

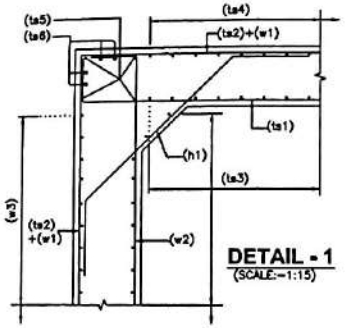


REINFORCEMENT DETAILS OF TOP SLAB
(HAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
(N.T.S.)

TRAFFIC DIRECTION



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



DETAIL - 1
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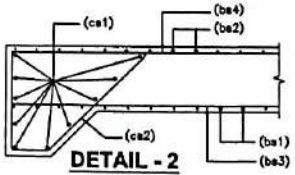
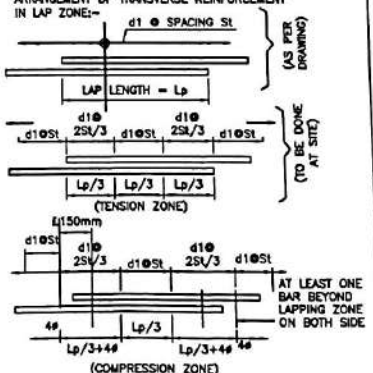


DETAIL - 2
(N.T.S.)

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-500D) CONFIRMING TO IS:1786 STANDARDS.
4. 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
5. OVERLAPPING FOR SPLICING OF REINFORCEMENT SHALL BE AS PER CLAUSE NO.15.2.5.
   LAP LENGTH SHALL NOT BE LESS THAN 56ø.
   ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:-



6. ANCHOURAGE LENGTH OF BOX SHALL BE TAKEN AS 40ø AS PER IRC:112.
7. FOR UNFAVORABLE BOND CONDITIONS THE FACTOR 40 SHOULD BE MULTIPLIED BY FACTOR OF 1.43 .
8. CENTER LINE OF OVERLAPPING BAR bs1 & ts2 IN WALL & MID HEIGHT OF WALLS ARE AT SAME POINT.
9. 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:-

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

A.V. CONSTRUCTIONS New Delhi

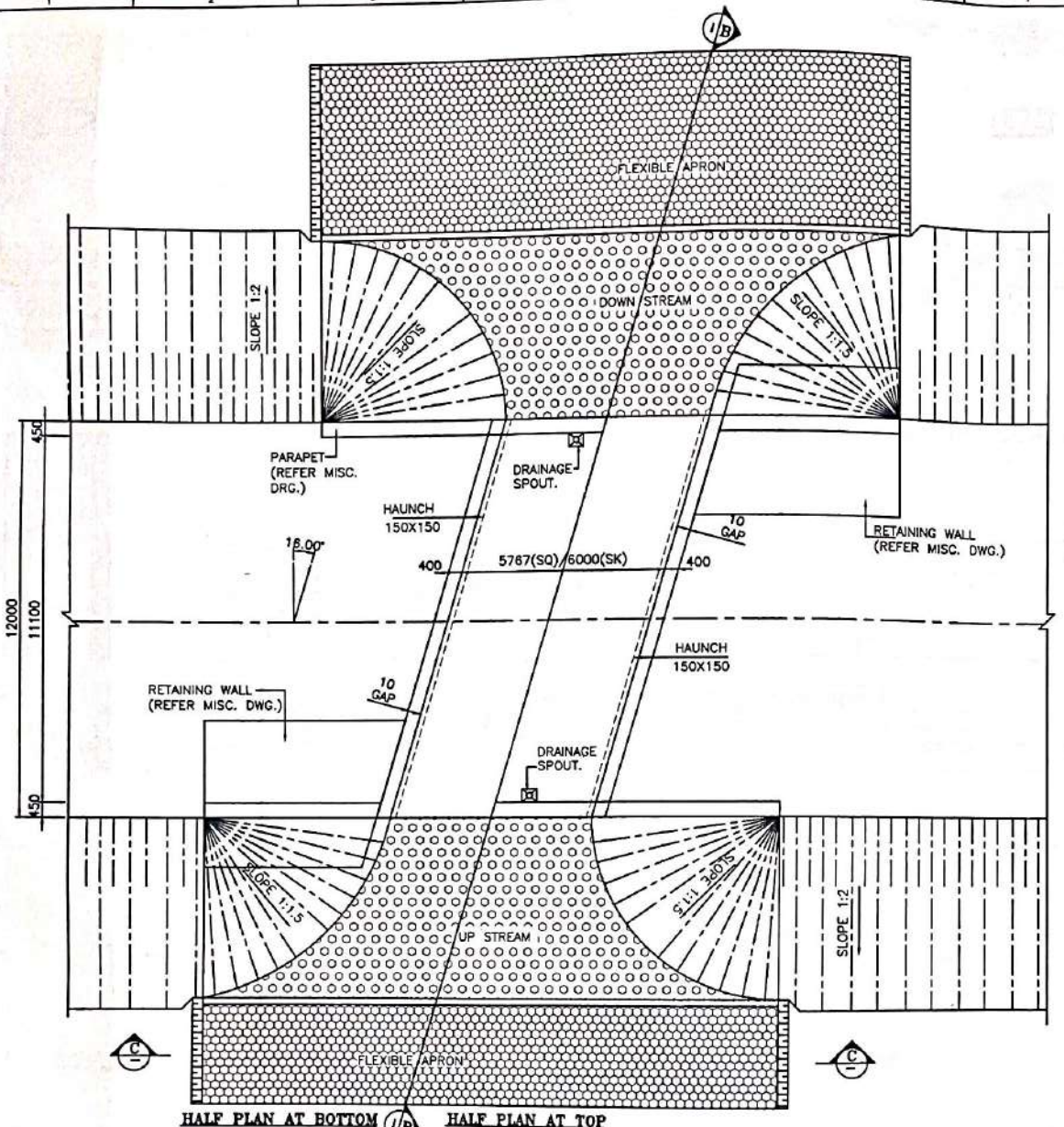
CLIENT:	EPC CONTRACTOR	AUTHORITY'S ENGINEER	PROOF CONSULTANT:	SAFETY CONSULTANT:	DESIGN CONSULTANT:
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	KAMAC ENGINEERS Pvt.Ltd KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	ALMONDZ GLOBAL INFRA CONSULTANT LIMITED IN JV WITH AYOLEEZA CONSULTANT PRIVATE LIMITED. C/O JAYANTA SAIKIA, SARBAJANIN NAMGHAR, BORBIL NO.2, DIGBOI, TINSUKIA, ASSAM-786171	CES 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,	A.V. CONSTRUCTION 1st Floor, WZ-1240, Palam Extension, Bosco Ashram Wali Gali,New Delhi 110045 WISPL 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+652 (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	Drw.	Des.	Chk.	App.	Scale.	Drawing Status.
MAR.2024	W.P	V.S	A.B		NTS	

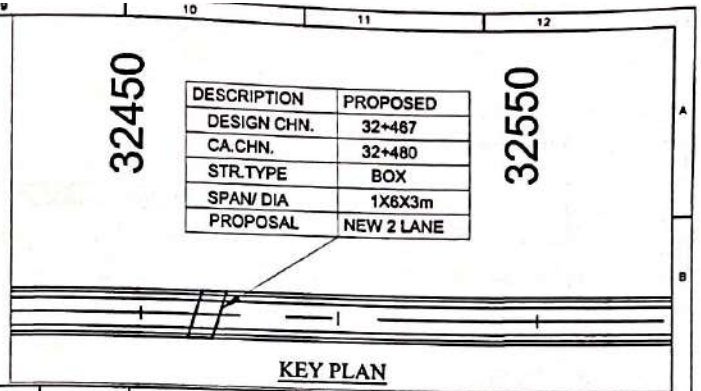
Project No.	Drawing No.	Sheet No.	Rev.
	AVC/NH-38/BOX/REIN./32+297/01	01 OF 01	R0



HALF PLAN AT BOTTOM 1/B HALF PLAN AT TOP

PLAN

(SCALE-1:100)



DESCRIPTION	PROPOSED
DESIGN CHN.	32+467
CA.CHN.	32+480
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+467	146.054	142.794	142.494	142.506	3.089m	0	0

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:-

1. REINFORCEMENT DETAIL OF BOX CULVERT AVC/NH-38/BOX/REINF./32+467/02

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 CONJUCTION 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 - Fe500D.
5. 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.
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 SUBJECTED TO CHANGE AS PER SITE CONDITION AND DETAILED DESIGN.
9. BACKFILL TO BE DONE AND COMPACTED FROM BOTH SIDE SIMULTANEOUSLY.
10. 600MM THICK. FILTER MATERIAL BEHIND RETAINING WALL SHALL BE LAID AS PER APPENDIX 6 OF IRC 78-2014.
11. 50MM THICK CEMENT CONCRETE WEARING COAT SHALL BE PROVIDED.
12. 100MM DIA P.V.C. PIPE AT SPACING 1000MMc/c IN HORIZONTAL/VERTICAL DIRECTION SHALL BE PROVIDED UP TO 150MM ABOVE GROUND LEVEL FOR WEEP HOLES IN RETAINING WALL.
13. SBC SHALL BE 8t/m². AND SAME SHALL BE ENSURED AT SITE BY ANY SUITABLE METHOD.
14. 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.
15. CHOOSE ANY SUITABLE METHOD TO ACHIEVE THE REQUIRED SBC AS PER SITE.
16. THE EXPOSURE CONDITION IS MODERATE.

A.V. CONSTRUCTION New Delhi

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: 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: CES
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,

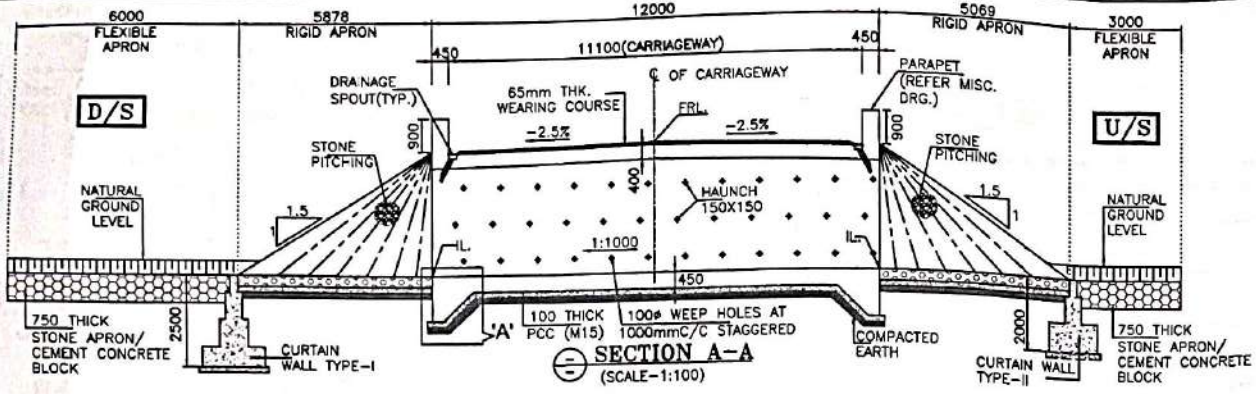
DESIGN CONSULTANT: A.V. CONSTRUCTION
1st Floor, WZ-1240, Palam Extension, Bosco Ashram Wali Gali,New Delhi 110045
Winst Infra Solution Pvt. Ltd.
OFFICE: F-6, ISHAAN CORPORATE TOWER, PLOT NO-C-23,SECTOR-13, VASUNDHRA,GHAZIABAD, U.P-201012
WISPL

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+467

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/NH-38/BOX/GAD/32+467/01	1 OF 2	R0



SECTION A-A
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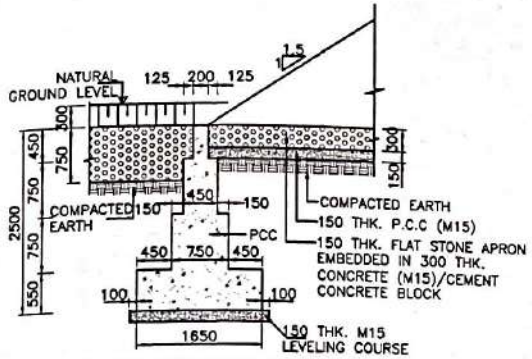
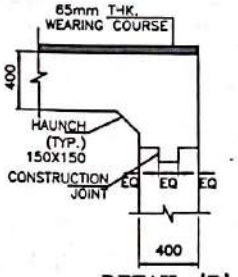
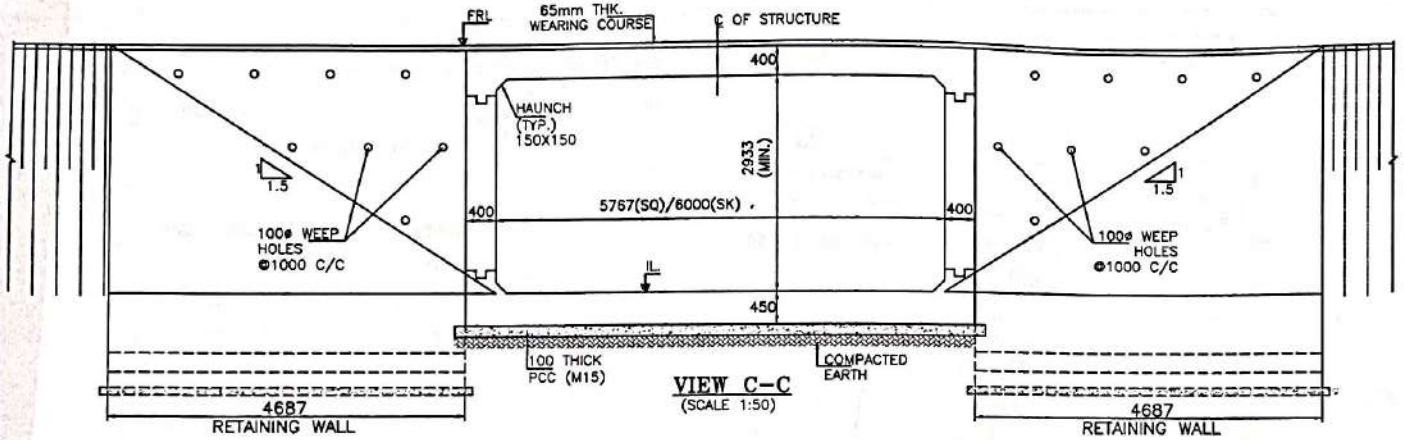


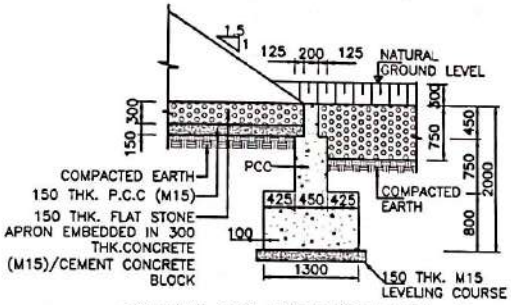
DETAIL OF CURTAIN WALL-I
(DOWN STREAM SIDE)
(SCALE 1:50)



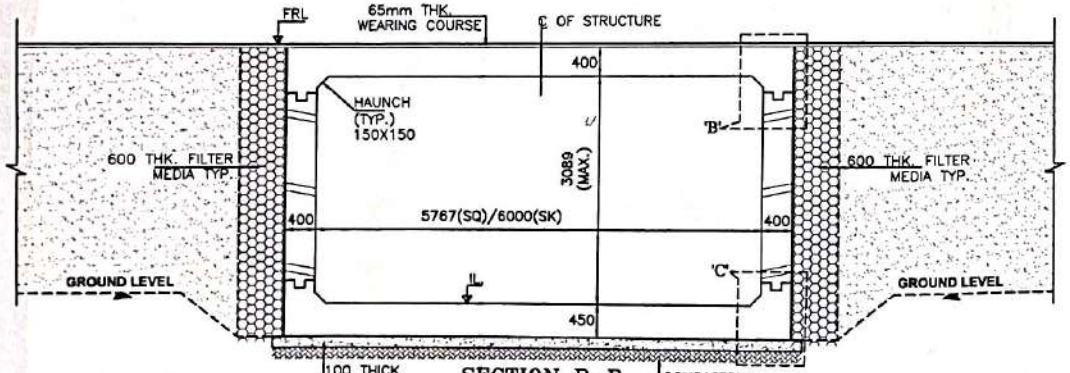
DETAIL-'B'
(SCALE 1:25)



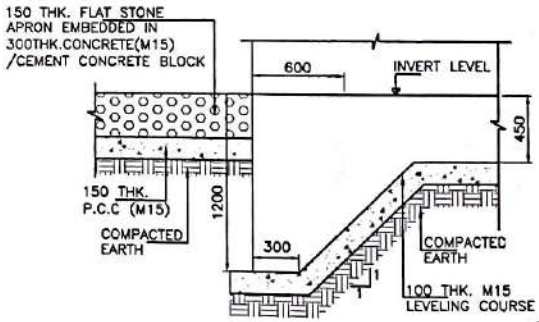
VIEW C-C
(SCALE 1:50)



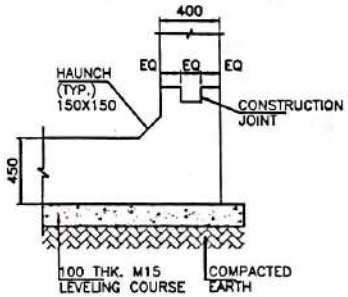
DETAIL OF CURTAIN WALL-II
(UP STREAM SIDE)
(SCALE 1:50)



SECTION B-B
(SCALE 1:50)



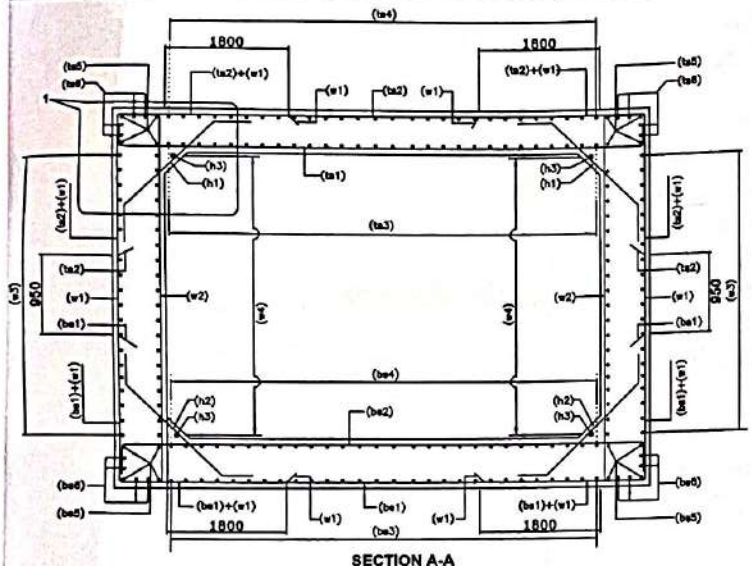
DETAIL-'A'
(SCALE 1:25)



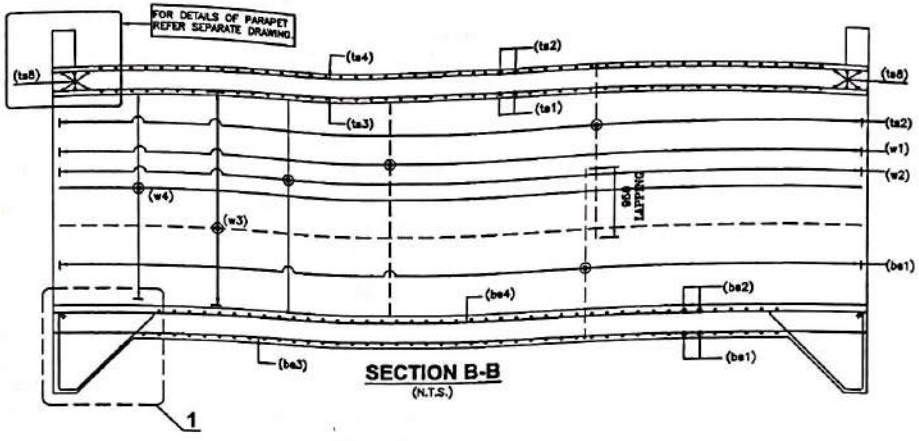
DETAIL-'C'
(SCALE 1:25)

CLIENT:	EPC CONTRACTOR	AUTHORITY'S ENGINEER	PROOF CONSULTANT:	SAFETY CONSULTANT:	DESIGN CONSULTANT:	PROJECT:
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	KAMAC ENGINEERS Pvt.Ltd KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	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	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,	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	WIDENING/IMPROVEMENT TO 3-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (GOLAI 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-6)

DRAWING TITLE:-						
GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 32+467						
Date JAN.2024	Drw. W.P	Dsg. V.B	Chk. A.B	App.	Scale. NTS	Drawing Status.
Project No.	Drawing No. AVC/NH-38/BOX/GAD/32+467/01				Sheet No. 2 OF 2	Rev. R0



SECTION A-A
(NTS)



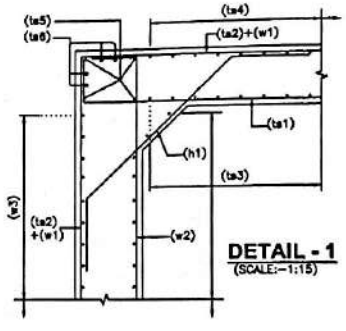
SECTION B-B
(N.T.S.)

BOX REINF. SCHEDULE

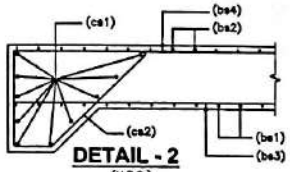
SL.NO.	BAR MARK	BAR SHAPE	DIAMETER	SPACING
1	ts1		16+10	200
2	ts2		16	200
3	ts3		10	200
4	ts4		12	200
5	ts5		12	2x4 Nos.
6	ts6		12	2x4 Nos.
7	w1		16	200
8	w2		16	200
9	w3		12	200
10	w4		10	200
11	bs1		16	200
12	bs2		20+10	200
13	bs3		12	200
14	bs4		12	200
15	bs5		12	2x4 Nos.
16	bs6		12	2x4 Nos.
17	h1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

LEGEND:-

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

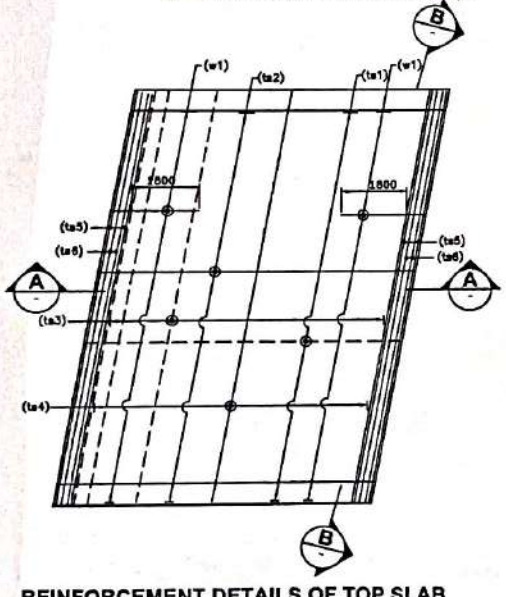


DETAIL - 1
(SCALE:-1:15)



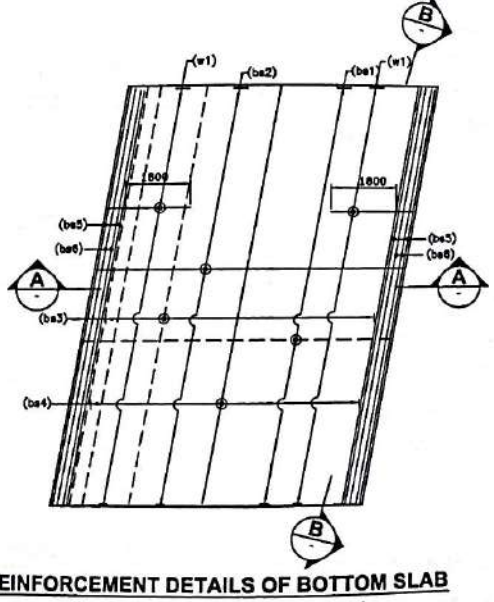
DETAIL - 2
(N.T.S.)

TRAFFIC DIRECTION



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

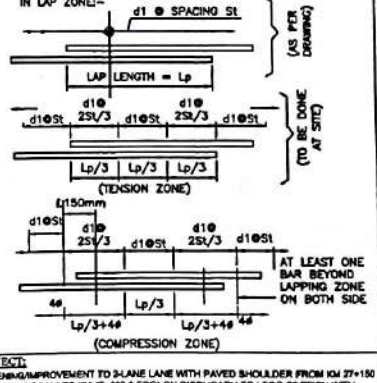
TRAFFIC DIRECTION



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

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-500D) CONFIRMING TO IS:1786 STANDARDS.
4. 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
5. OVERLAPPING FOR SPLICING OF REINFORCEMENT SHALL BE AS PER CLAUSE NO.15.2.5.
   LAP LENGTH SHALL NOT BE LESS THAN 56ø.
   ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:-



6. ANCHOURAGE LENGTH OF BOX SHALL BE TAKEN AS 40ø AS PER IRC:112.
7. FOR UNFAVORABLE BOND CONDITIONS THE FACTOR 40 SHOULD BE MULTIPLIED BY FACTOR OF 1.43 .
8. CENTER LINE OF OVERLAPPING BAR bs1 & ts2 IN WALL & MID HEIGHT OF WALLS ARE AT SAME POINT.
9. 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:-

1. GENERAL ARRANGEMENT DRAWING.
   AVC/NH-38/BOX/GAD/32+487/01

A.V. CONSTRUCTIONS New Delhi

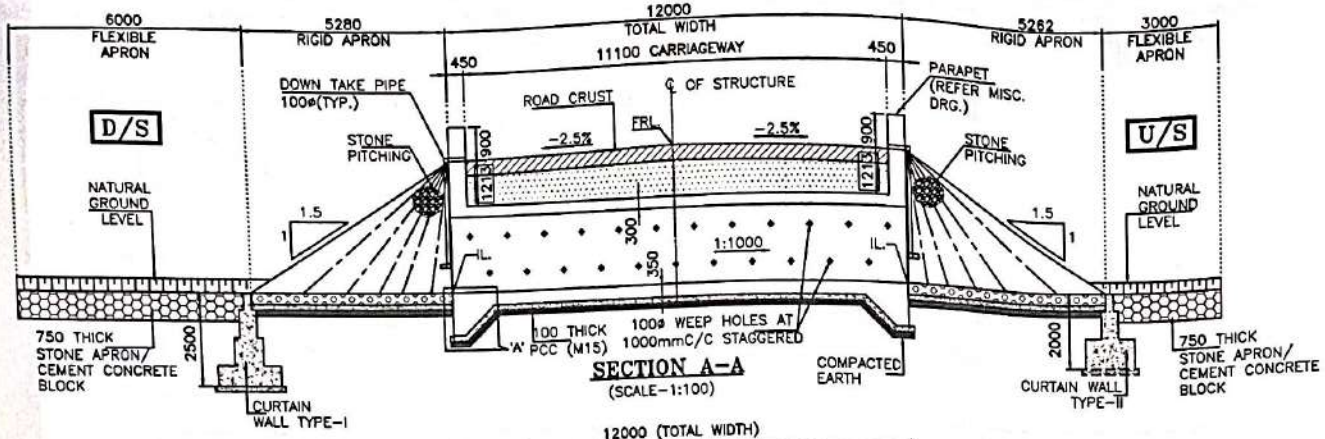
CLIENT:	EPC CONTRACTOR	AUTHORITY'S ENGINEER	PROOF CONSULTANT:	SAFETY CONSULTANT:	DESIGN CONSULTANT:
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	KAMAC ENGINEERS Pvt.Ltd KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	ALMONDZ GLOBAL INFRA CONSULTANT LIMITED IN JV WITH AYOLEEZA CONSULTANT PRIVATE LIMITED. C/O JAYANTA SAIKIA, SARBAJANIN NAMGHAR, BORBIL NO.2, DIGBOI, TINSUKIA, ASSAM-786171	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,	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 WISPL

PROJECT: WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (GOLAI GOAN) TO KM 47+462 (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)

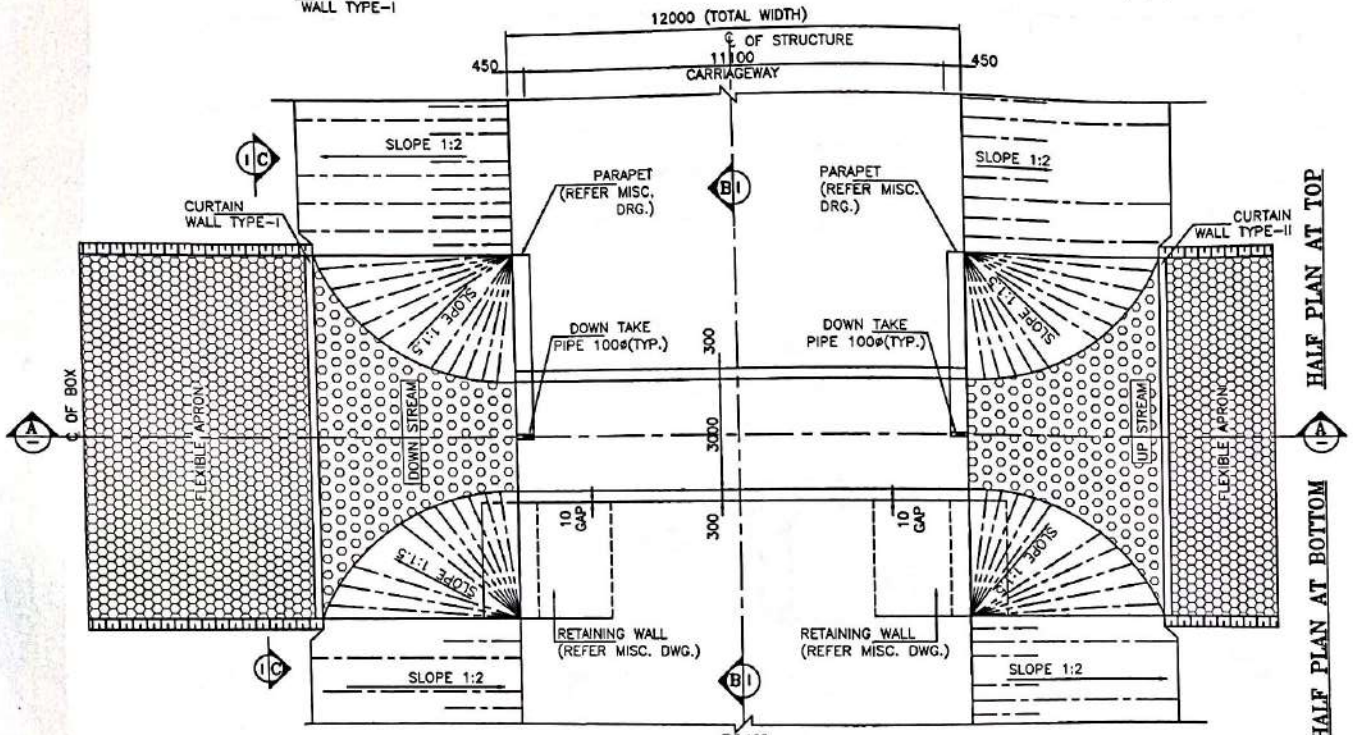
DRAWING TITLE:- REINFORCEMENT DETAIL OF BOX CULVERT AT CH. 32+487

Date	Drw.	Dsg.	Chk.	App.	Scale.	Drawing Status.
MAR.2024	W.P	V.S	A.B		NTS	

Project No.	Drawing No.	Sheet No.	Rev.
	AVC/NH-38/BOX/REIN./32+487/01	01 OF 01	R0



SECTION A-A
(SCALE-1:100)



PLAN
(SCALE-1:100)

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

KEY PLAN

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/REINF./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.

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 CONJUCTION 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 SUBJECTED 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 1000MMc/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 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.

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,

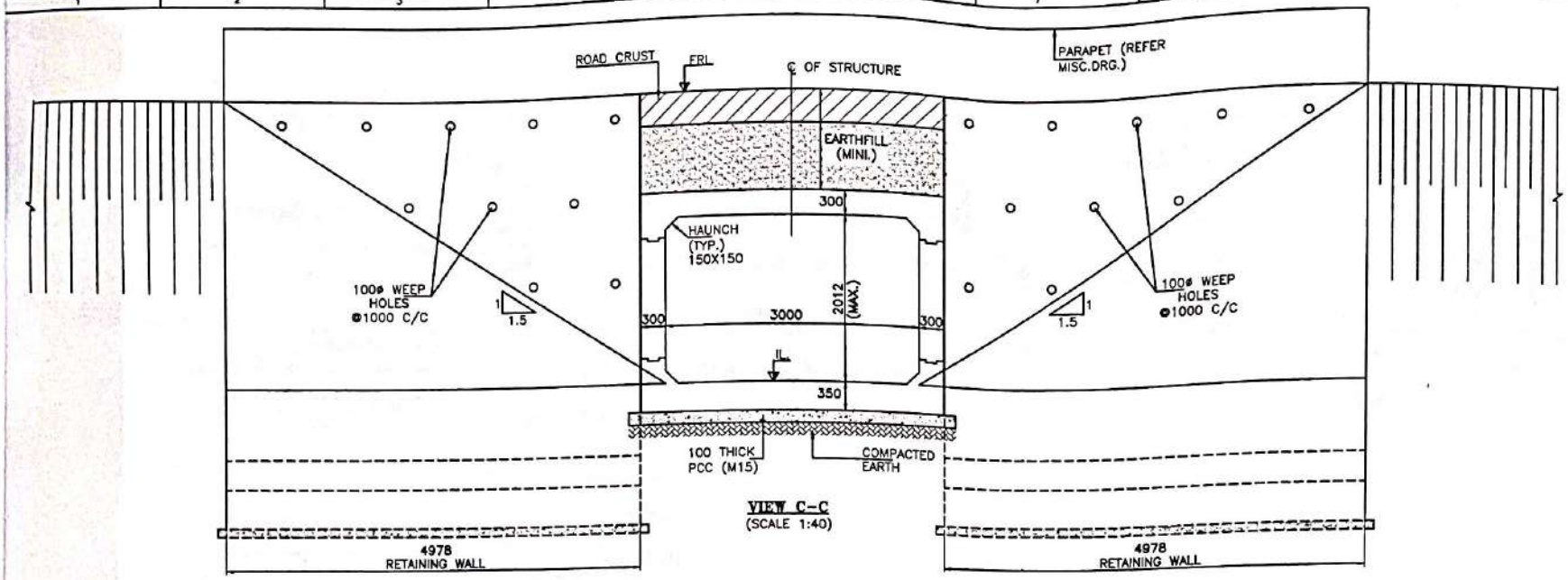
DESIGN CONSULTANT:
A.V. CONSTRUCTION
1st Floor, WZ-1240, Palam Extension, Bosco Ashram Wall Gali,New Delhi 110045
Winst Infra Solution Pvt. Ltd.
OFFICE F-8, ISHAAN CORPORATE TOWER, PLOT NO-C-23,SECTOR-13, VASUNDHRA,GHAZIABAD, U.P-201012

PROJECT: WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (GOLAI GOAN) TO KM 47+662 (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.(PACKAG E-6)

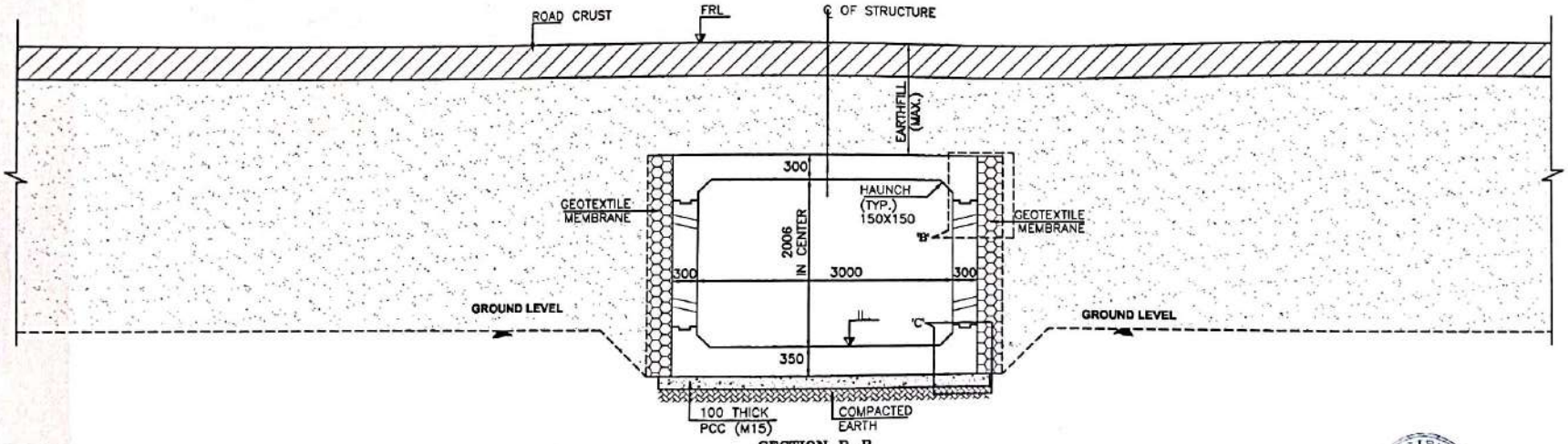
DRAWING TITLE:- GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 32+622

Date	Drw.	Dsg.	Chk.	App.	Scale.	Drawing Status.
MAR.2024	W.P	V.S	A.B		NTS	

Project No. | Drawing No. AVC/NH-38/BC/GAD/32+622/01 | Sheet No. 01 OF .



VIEW C–C
(SCALE 1:40)



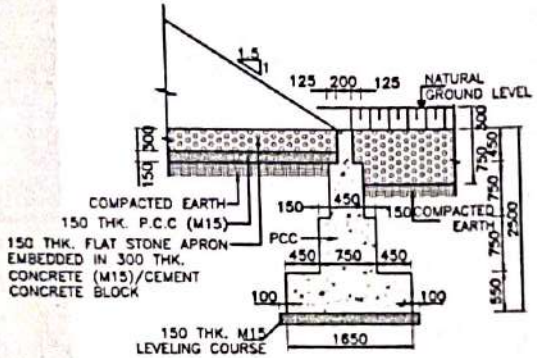
SECTION B–B
(SCALE 1:40)

CLIENT:	EPC CONTRACTOR	AUTHORITY'S 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	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	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,	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	WIDENING&IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (GOLAI GOAN) TO KM 47+622 (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-II)

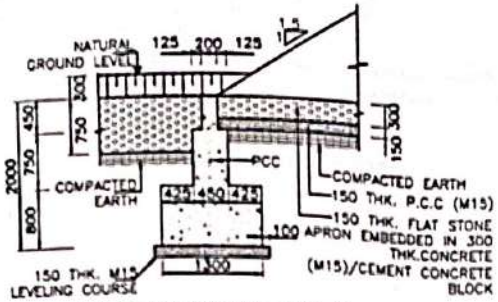
DRAWING TITLE:- GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 32+622

Date	Drw.	Des.	Chk.	App.	Scale.	Drawing Status.
MAR 2024	W.P	V.S	A.B		NTS	

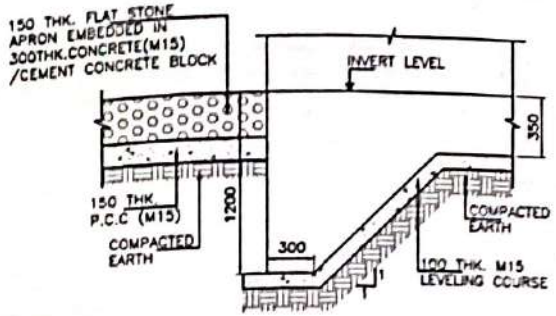
Project No.	Drawing No.	Sheet No.	Rev.
	AVC/NH-38/BC/GAD/32+622/01	62 OF 63	R0



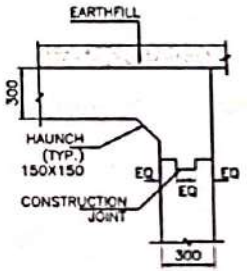
DETAIL OF CURTAIN WALL-I
(DOWN STREAM SIDE)
(SCALE 1:50)



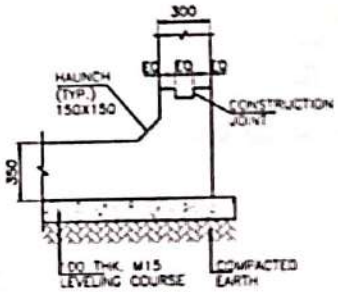
DETAIL OF CURTAIN WALL-II
(UP STREAM SIDE)
(SCALE 1:50)



DETAIL-'A'
(SCALE 1:25)



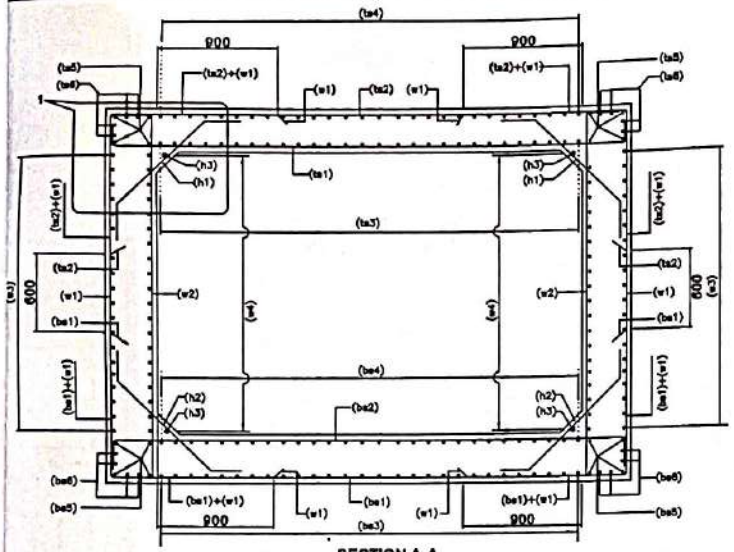
DETAIL-'B'
(SCALE 1:25)



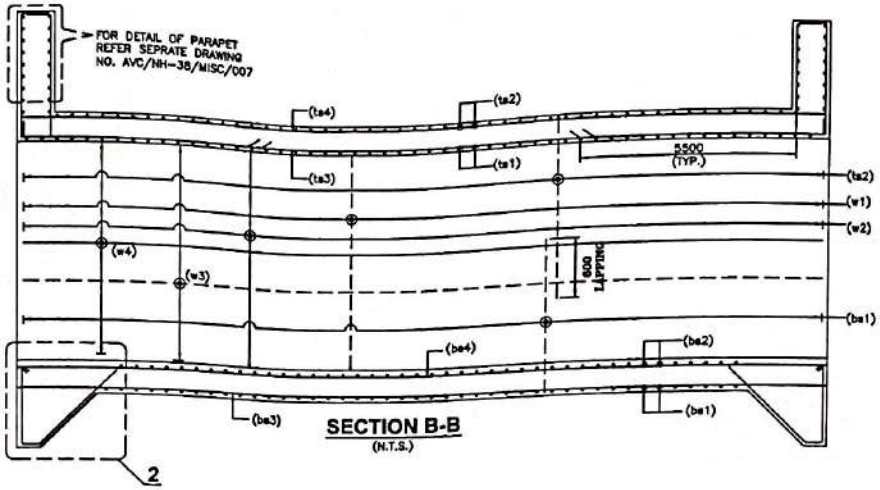
DETAIL-'C'
(SCALE 1:25)

CLIENT:	EPC CONTRACTOR	AUTHORITY'S ENGINEER	PROOF CONSULTANT:	SAFETY CONSULTANT:	DESIGN CONSULTANT:	PROJECT:
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	KAMAC ENGINEERS Pvt. Ltd KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	ALMONDZ GLOBAL INFRA CONSULTANT LIMITED IN JV WITH AYOLEEZA CONSULTANT PRIVATE LIMITED. C/O JAYANTA SAIKIA, BARBAJANIN NAMGHAR, BORBIL 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,	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-21,SECTOR-13, VASUNDHRA GHAZIABAD, U.P-201012	WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+180 (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-8)

DRAWING TITLE:-	GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 32+623						
Date MAR 2024	Drw W.P	Dsg V.S	Chk. A.B	App.	Scale. NTS	Drawing Status.	
Project No.	Drawing No. AVC/NH-38/BC/GAD/32+622/01					Sheet No. 03 OF 03	Rev R0



SECTION A-A
(NTS)



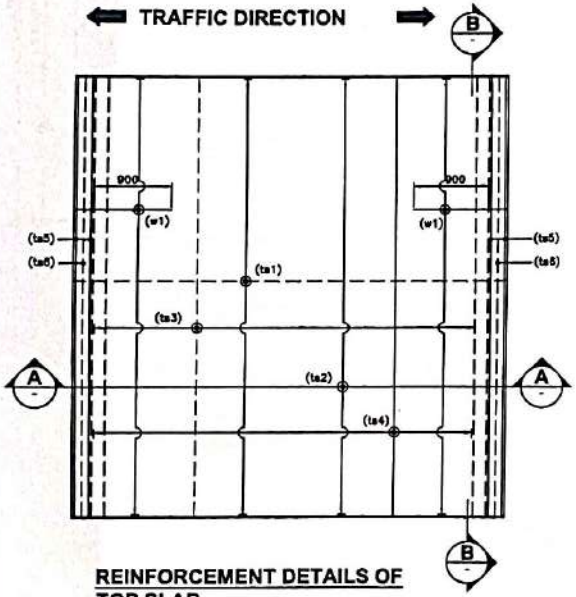
SECTION B-B
(N.T.S.)

BOX REINF. SCHEDULE

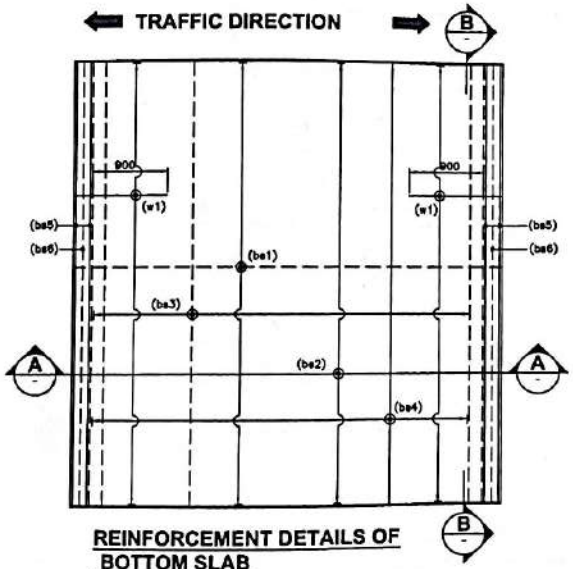
SL.NO.	BAR MARK	BAR SHAPE	DIAMETER	SPACING
1	ts1		10+10	160
2	ts2		10	160
3	ts3		10	200
4	ts4		10	200
5	ts5		12	2x4 Nos.
6	ts6		12	2x4 Nos.
7	w1		12	160
8	w2		12	160
9	w3		10	200
10	w4		8	200
11	bs1		10	160
12	bs2		10+10	160
13	bs3		10	200
14	bs4		10	200
15	bs5		12	2x4 Nos.
16	bs6		12	2x4 Nos.
17	h1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

LEGEND:-

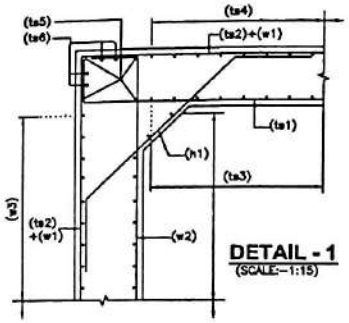
TOP FACE BAR	———
BOTTOM FACE BAR	- - - -



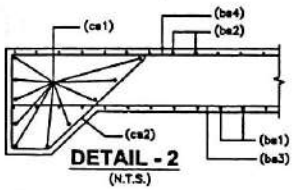
REINFORCEMENT DETAILS OF TOP SLAB
(HAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
(N.T.S.)



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.)

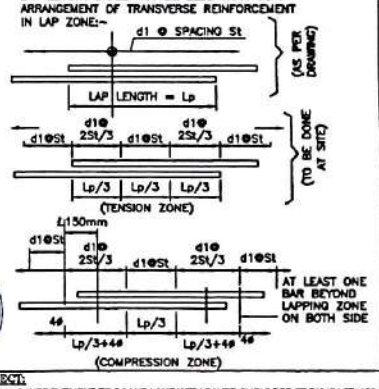
6. ANCHOURAGE LENGTH OF BOX SHALL BE TAKEN AS 40ϕ AS PER IRC:112.
7. FOR UNFAVORABLE BOND CONDITIONS THE FACTOR 40 SHOULD BE MULTIPLIED BY FACTOR OF 1.43 .
8. CENTER LINE OF OVERLAPPING BAR bs1 & ts2 IN WALL & MID HEIGHT OF WALLS ARE AT SAME POINT.
9. BAR BENDING SCHEDULE SHOULD BE STRICTLY FOLLOW DURING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

REFERENCE DRAWING:-

1. GENERAL ARRANGEMENT DRAWING. AVC/NH-38/BOX/GAD/32+622/01

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-5000) CONFIRMING TO IS:1786 STANDARDS.
4. 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
5. OVERLAPPING FOR SPLICING OF REINFORCEMENT SHALL BE AS PER CLAUSE NO,15.2.5.
   LAP LENGTH SHALL NOT BE LESS THAN 56ϕ.
   ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:-



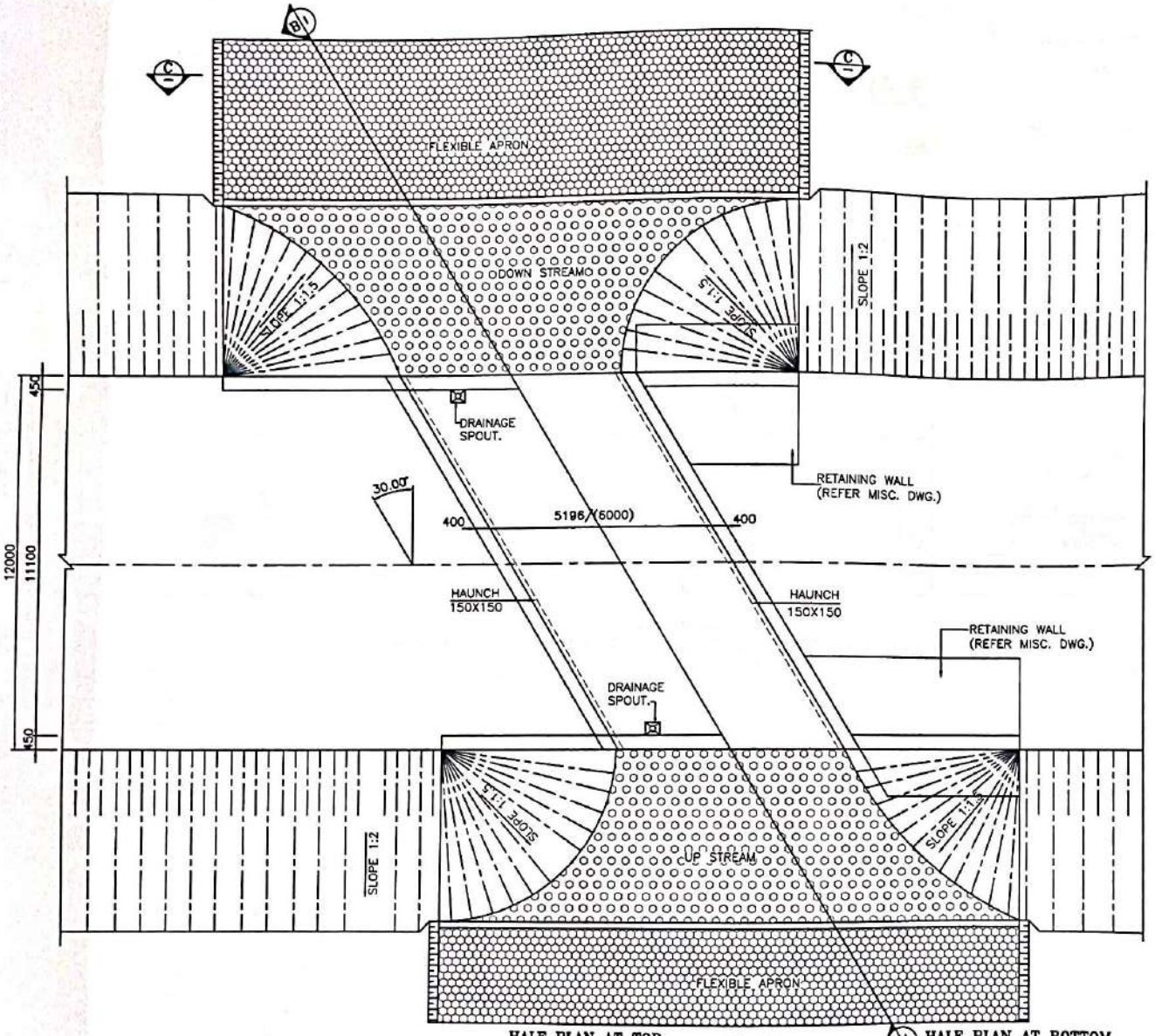
CLIENT:	EPC CONTRACTOR	AUTHORITY'S ENGINEER	PROOF CONSULTANT:	SAFETY CONSULTANT:	DESIGN CONSULTANT:
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	KAMAC ENGINEERS Pvt.Ltd KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	ALMONDZ GLOBAL INFRA CONSULTANT LIMITED IN JV WITH AYOLEEZA CONSULTANT PRIVATE LIMITED. C/O JAYANTA SAIKIA, SARBAJANIN NAMGHAR, BORBIL NO.2, DIGBOI, TINSUKIA, ASSAM-786171	CES 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,	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 WISPL

PROJECT: WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (GOLAI GOAN) TO KM 47-662 (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+622

Date	Drw.	Dsg.	Chk.	App.	Scale.	Drawing Status.
MAR.2024	W.P	V.S	A.B		NTS	

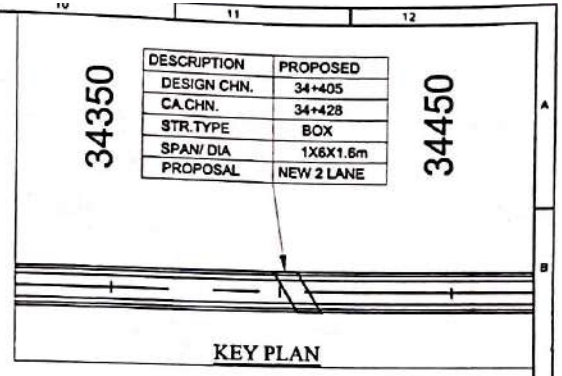
Project No.	Drawing No.	Sheet No.	Rev.
	AVC/NH-38/BOX/REIN./32+622/01	01 OF 01	R0



HALF PLAN AT TOP

PLAN (SCALE-1:100)

HALF PLAN AT BOTTOM



DESCRIPTION	PROPOSED
DESIGN CHN.	34+405
CA.CHN.	34+428
STR.TYPE	BOX
SPAN/ DIA	1X6X1.6m
PROPOSAL	NEW 2 LANE

KEY PLAN

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	138.964	1.612m	0.868m	0.729m

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 CONJUCTION 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 SUBJECTED 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 1000MMc/c IN HORIZONTAL/VERTICAL DIRECTION SHALL BE PROVIDED UP TO 150MM ABOVE GROUND LEVEL FOR WEEP HOLES IN RETAINING WALL.
11. SBC SHALL BE 9t/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.

A.V. CONSTRUCTIONS New Delhi

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
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:
CES
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,

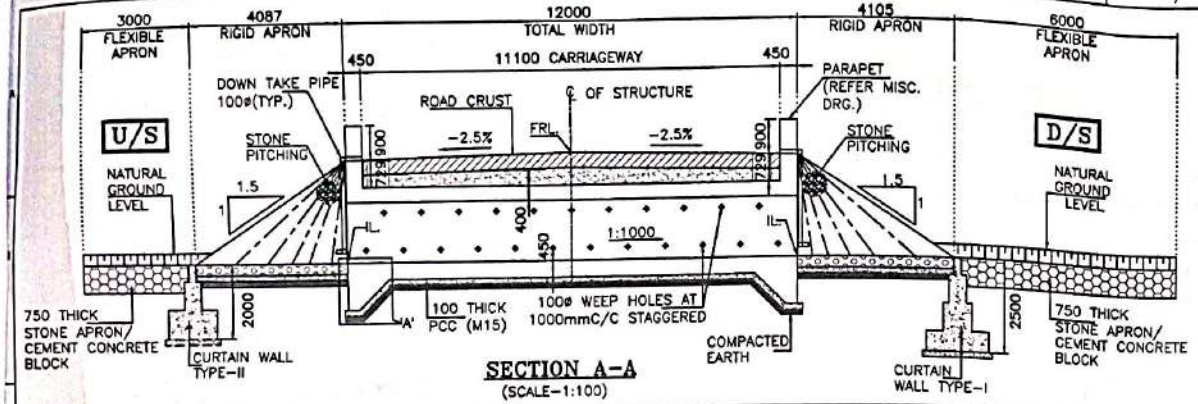
DESIGN CONSULTANT:
A.V. CONSTRUCTION
1st Floor, WZ-1240, Palam Extension, Bosco Ashram Wali Gali,New Delhi 110045
Winst Infra Solution Pvt. Ltd.
WISPL
OFFICE: F-6, ISHAAN CORPORATE TOWER, PLOT NO-C-23,SECTOR-13, VASUNDHRA GHAZIABAD, U.P-201012

PROJECT:
WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (GOLAI GOAN) TO KM 47+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)

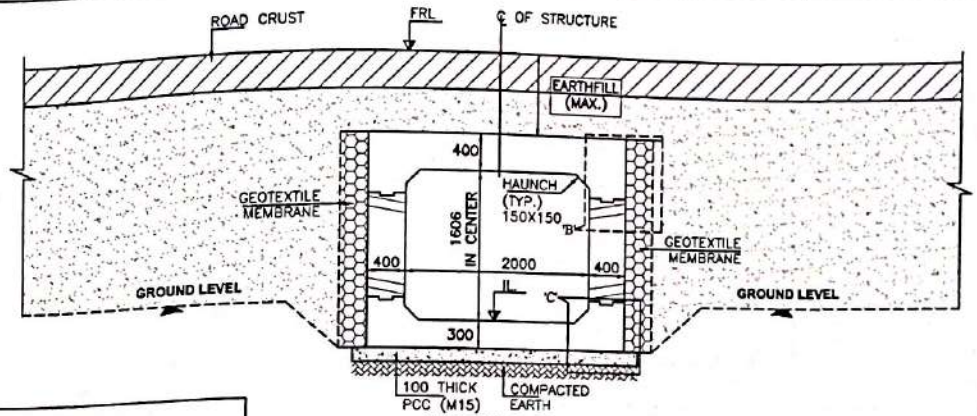
DRAWING TITLE:- GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 34+405

Date	Drw.	Dsg.	Chk.	App.	Scale.	Drawing Status.
MAR.2024	W.P	V S	A.B		NTS	

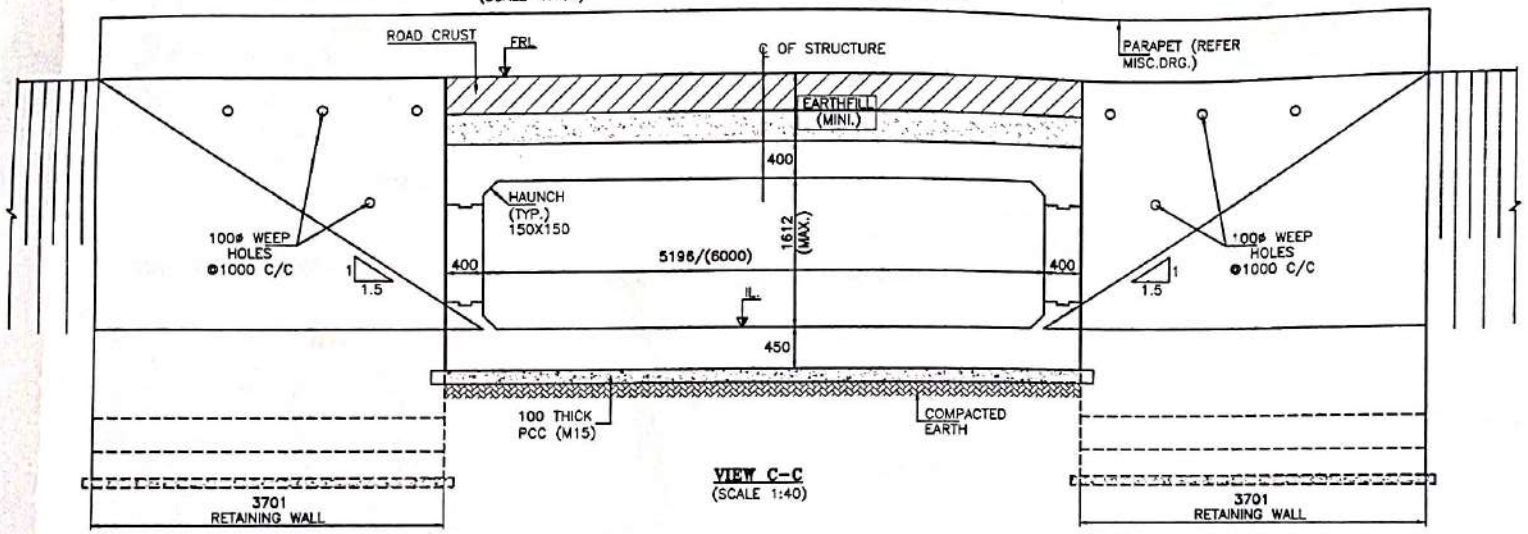
Project No.	Drawing No.	Sheet No.	Rev.
	AVC/NH-38/BC/GAD/34+405/01	01 OF 02	R0



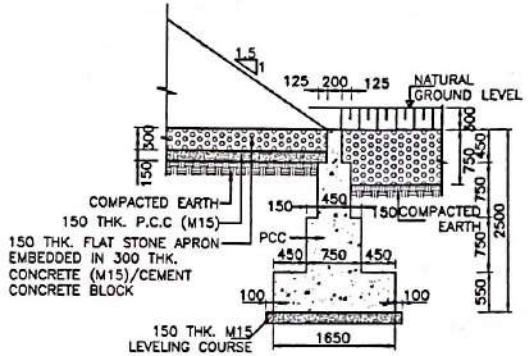
SECTION A-A
(SCALE-1:100)



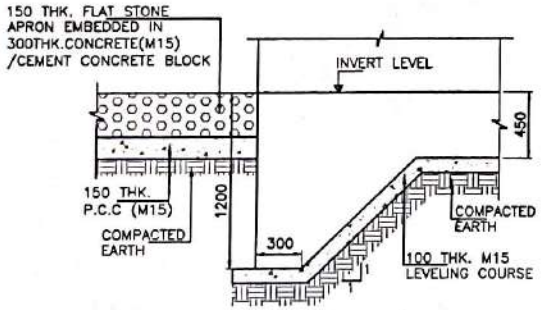
SECTION B-B
(SCALE 1:40)



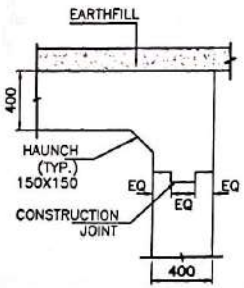
VIEW C-C
(SCALE 1:40)



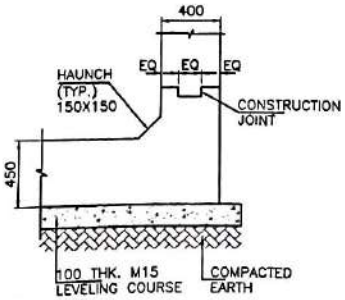
DETAIL OF CURTAIN WALL-I
(DOWN STREAM SIDE)
(SCALE 1:50)



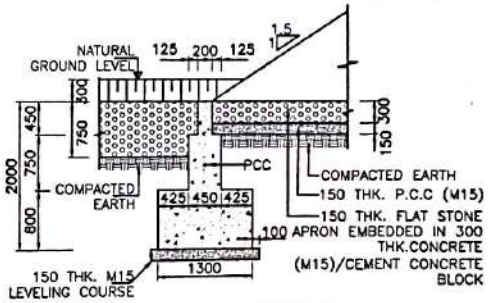
DETAIL-'A'
(SCALE 1:25)



DETAIL-'B'
(SCALE 1:25)



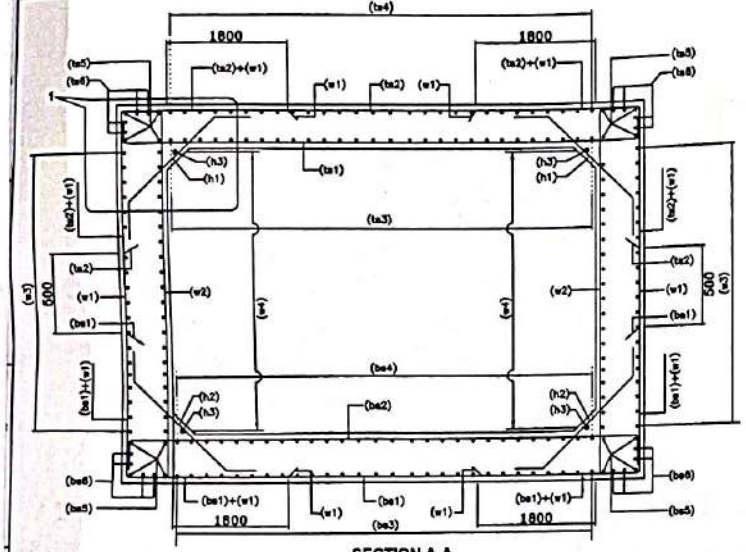
DETAIL-'C'
(SCALE 1:25)



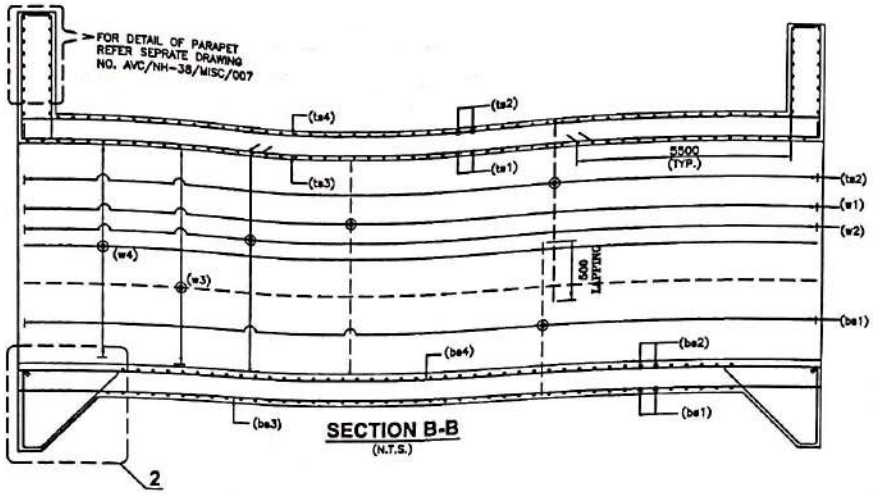
DETAIL OF CURTAIN WALL-II
(UP STREAM SIDE)
(SCALE 1:50)

CLIENT:	EPC CONTRACTOR	AUTHORITY'S ENGINEER	PROOF CONSULTANT:	SAFETY CONSULTANT:	DESIGN CONSULTANT:	PROJECT:
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	KAMAC ENGINEERS Pvt.Ltd KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	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	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,	A.V. CONSTRUCTION 1st Floor, WZ-1240, Palam Extension, Bosco Ashram Wall Gall,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	WIDENING/IMPROVEMENT TO 3-LANE LANE WITH PAVED SHOULDER FROM KM 37+150 (GOLAI GOAN) TO KM 47-082 (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 34+405							
Date MAR.2024	Drw. W.P	Dsg. V.S	Chk. A.B	App.	Scale. NTS	Drawing Status.	
Project No.	Drawing No. AVC/NH-38/BC/GAD/34+405/01					Sheet No. 82 OF 82	Rev. RD



SECTION A-A
(NTS)



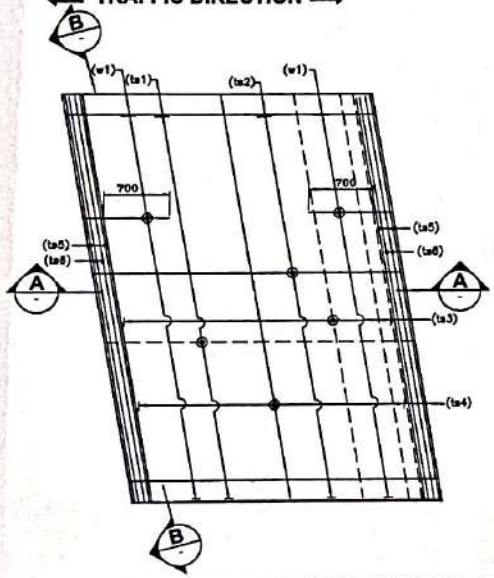
SECTION B-B
(N.T.S.)

LEGEND:-	
TOP FACE BAR	———
BOTTOM FACE BAR	- - - -

BOX REINF. SCHEDULE

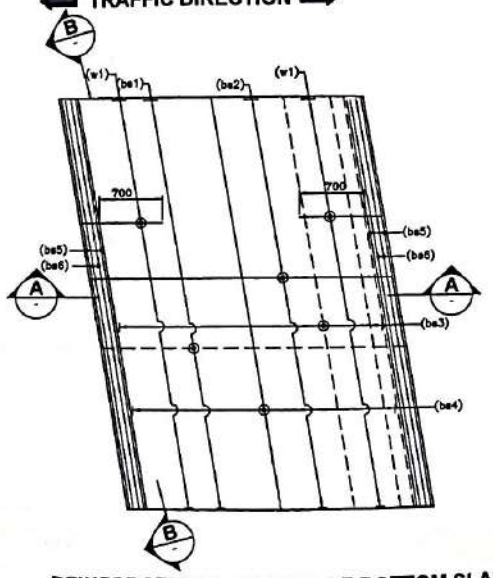
SL.NO.	BAR MARK	BAR SHAPE	DIAMETER	SPACING
1	ts1		16+12	180
2	ts2		16	180
3	ts3		10	180
4	ts4		12	180
5	ts5		12	2x4 Nos.
6	ts6		12	2x4 Nos.
7	w1		16	180
8	w2		12	180
9	w3		12	180
10	w4		10	180
11	bs1		16	180
12	bs2		16+12	180
13	bs3		12	180
14	bs4		10	180
15	bs5		12	2x4 Nos.
16	bs6		12	2x4 Nos.
17	h1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

TRAFFIC DIRECTION

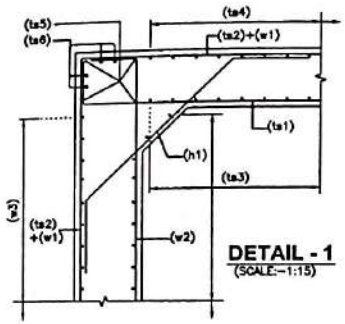


REINFORCEMENT DETAILS OF TOP SLAB
(HAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
(N.T.S.)

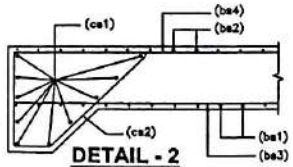
TRAFFIC DIRECTION



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



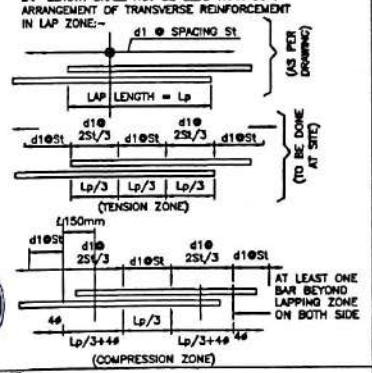
DETAIL - 1
(SCALE:-1:15)



DETAIL - 2
(N.T.S.)

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-500D) CONFIRMING TO IS:1786 STANDARDS.
4. 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
5. OVERLAPPING FOR SPLICING OF REINFORCEMENT SHALL BE AS PER CLAUSE NO.15.2.5.
   LAP LENGTH SHALL NOT BE LESS THAN 56ø.
   ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:-



6. ANCHOURAGE LENGTH OF BOX SHALL BE TAKEN AS 40ø AS PER IRC:112.
7. FOR UNFAVORABLE BOND CONDITIONS THE FACTOR 40 SHOULD BE MULTIPLIED BY FACTOR OF 1.43 .
8. CENTER LINE OF OVERLAPPING BAR bs1 & ts2 IN WALL & MID HEIGHT OF WALLS ARE AT SAME POINT.
9. 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:-

1. GENERAL ARRANGEMENT DRAWING. AVC/NH-38/BOX/GAD/34+405/01

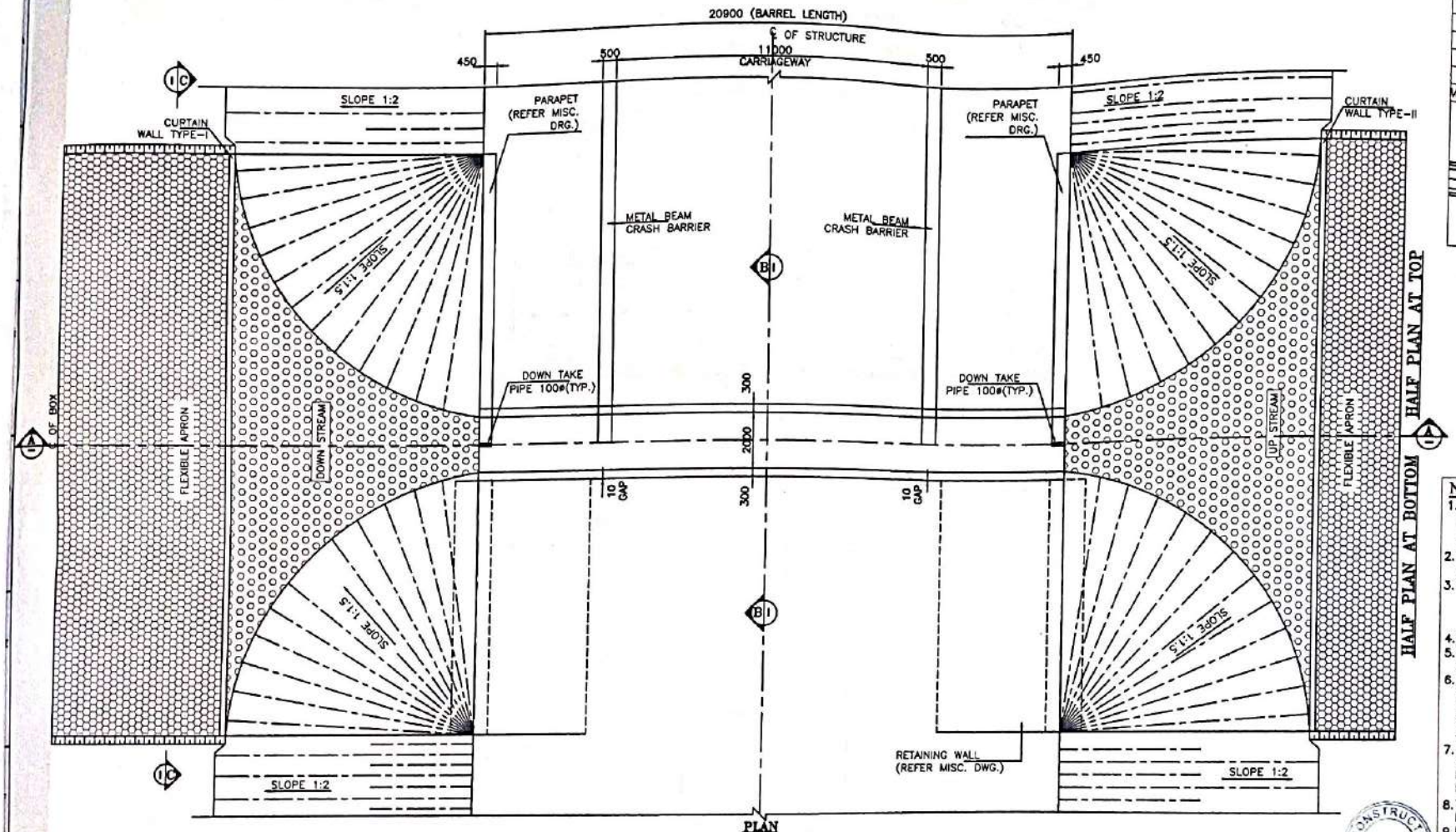
A.V. CONSTRUCTIONS New Delhi

CLIENT:	EPC CONTRACTOR	AUTHORITY'S ENGINEER	PROOF CONSULTANT:	SAFETY CONSULTANT:	DESIGN CONSULTANT:
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	KAMAC ENGINEERS Pvt.Ltd KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	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	CES CREATIVE ENGINEERING SERVICES OFFICE NO: 620, SIGNATURE GLOBAL MALL, SECTOR-3, VAISHALI, GHAZIABAD, U.P-201010	DESIGN DESIGN AID PLOT NO.54, 3rd FLOOR(FRONT), MASOODPUR DAIRY FARM,VASANT KUNJ, NEW DELHI-110070.	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 WISPL

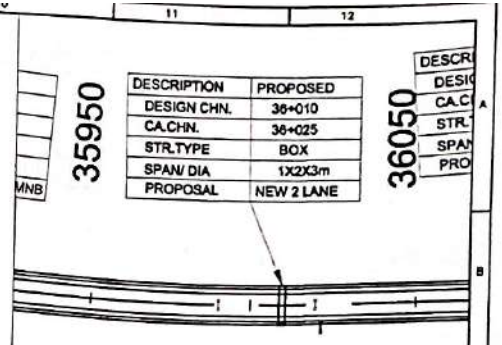
PROJECT: WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+180 (GOLAI GOAN) TO KM 47+462 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH PROPOSED MAROHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE.(PACKAGE-6)

DRAWING TITLE:- REINFORCEMENT DETAIL OF BOX CULVERT AT CH. 34+405

Date JAN.2024	Drw. W.P	Dsg. V.B	Chk. A.B	App.	Scale. NTS	Drawing Status.
Project No.	Drawing No. AVC/NH-38/BOX/R.ENL/34+405/01				Sheet No. 01 OF 01	Rev. R0



PLAN
(SCALE-1:100)



DESCRIPTION	PROPOSED
DESIGN CHN.	36+010
CA.CHN.	36+025
STR.TYPE	BOX
SPAN/ DIA	1X2X3m
PROPOSAL	NEW 2 LANE

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 CONJUCTION 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 8-2017.
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 SUBJECTED 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 1000MMc/c IN HORIZONTAL/VERTICAL DIRECTION SHALL BE PROVIDED UP TO 150MM ABOVE GROUND LEVEL FOR WEEP HOLES IN RETAINING WALL.
11. SBC SHALL BE 19t/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			
36+010	144.890	136.671	136.371	136.392	3.021m	5.198m	2.492m

REFERENCE DRAWINGS:-

1. 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
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,

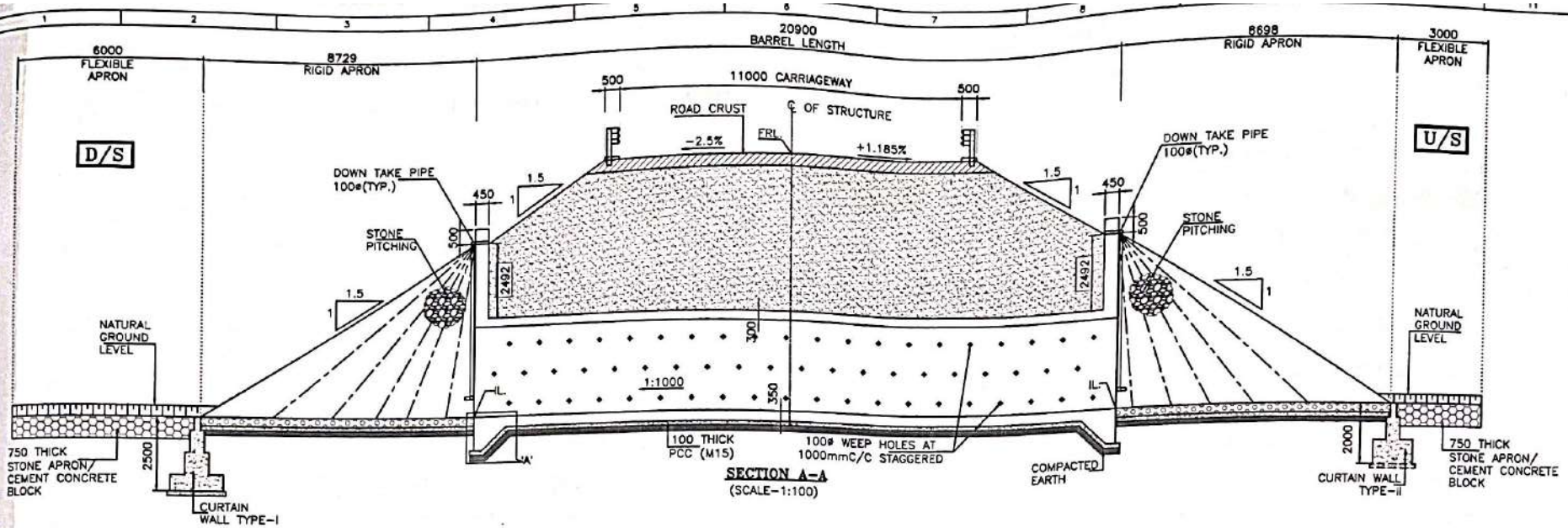
DESIGN CONSULTANT:
A.V. CONSTRUCTION
1st Floor, WZ-1240, Palam Extension, Bosco Ashram Wall Gali, New Delhi 110045
Winst Infra Solution Pvt. Ltd.
OFFICE: F-6, ISHAAN CORPORATE TOWER, PLOT NO-C-23, SECTOR-13, VASUNDHRA GHAZIABAD, U.P-201012

PROJECT:
WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+180 (GOLAI GOAN) TO KM 47+852 (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	Drw.	Dsg.	Chk.	App.	Scale.	Drawing Status.
MAR.2024	W P	V S	A.B		NTS	

Project No.	Drawing No.	Sheet No.	Rev.
	AVC/NH-38/BC/GAD/36+010/01	81 OF 83	R0



SECTION A-A
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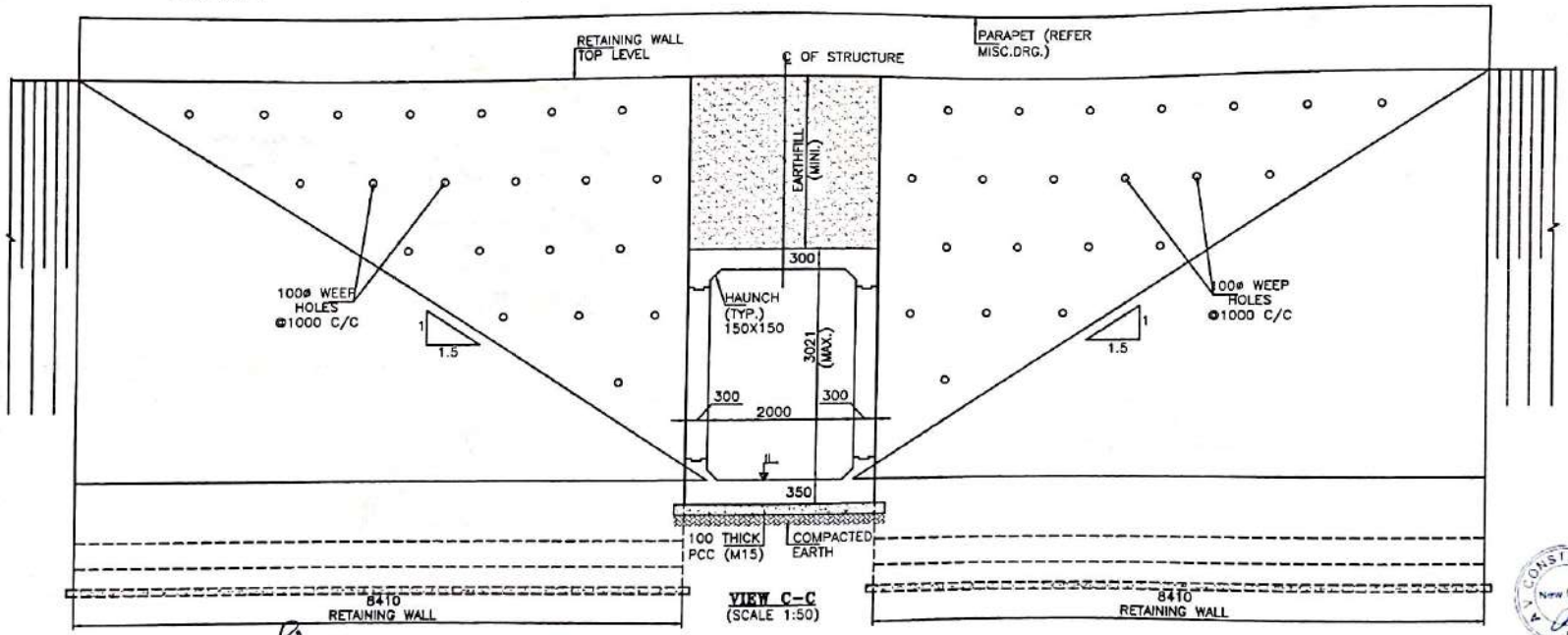


VIEW C-C
(SCALE 1:50)

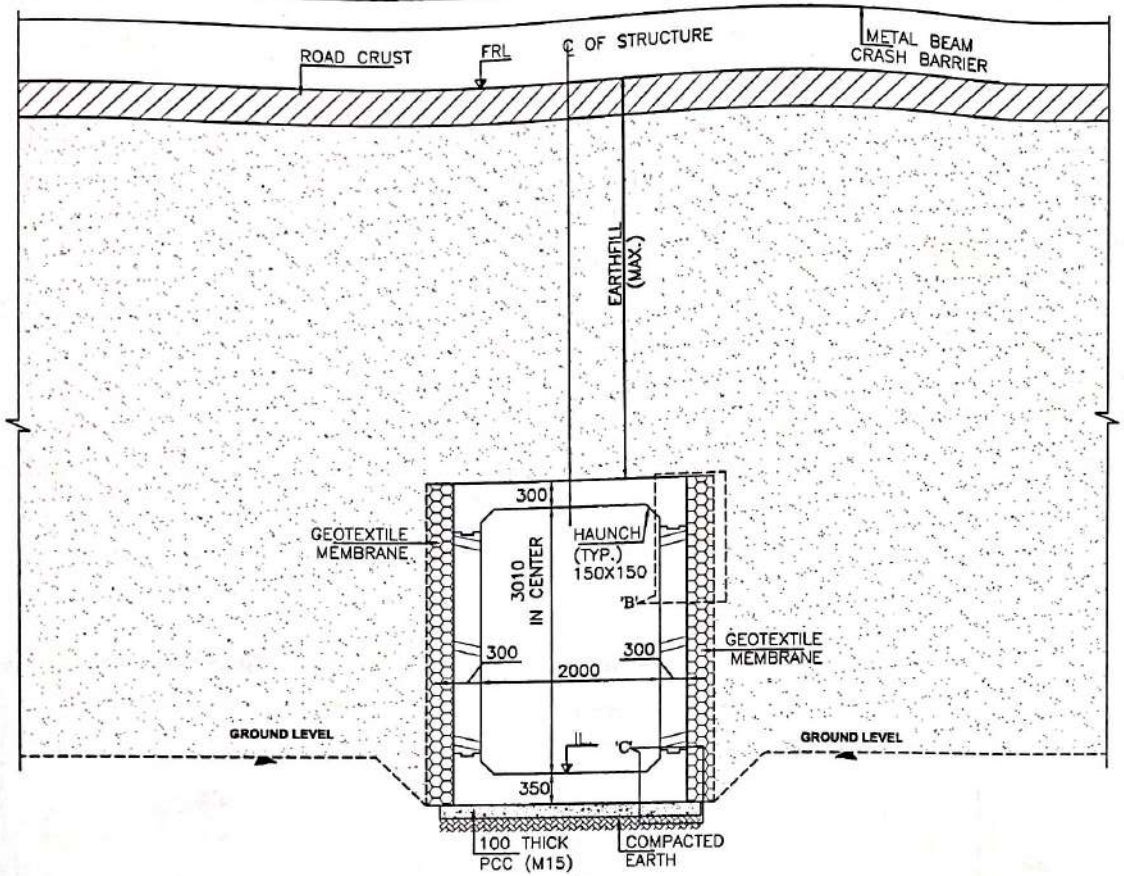
CLIENT:	EPC CONTRACTOR	AUTHORITY'S ENGINEER	PROOF CONSULTANT:	SAFETY CONSULTANT:	DESIGN CONSULTANT:
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010		CREATIVE ENGINEERING SERVICES OFFICE NO: 620, SIGNATURE 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,	A.V. CONSTRUCTION 1st Floor, WZ-1240, Palam Extension, Bosco Ashram Wall Gall,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

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 (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.	Dsg.	Chk.	App.	Scale.	Drawing Status.
MAR 2024	W.P	V.S	A.B		NTS	

Project No.	Drawing No.	Sheet No.	Rev.
	AVC/NH-38/BC/GAD/36+010/01	02 OF 03	R0



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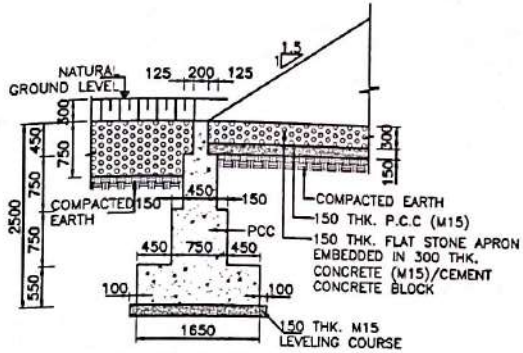
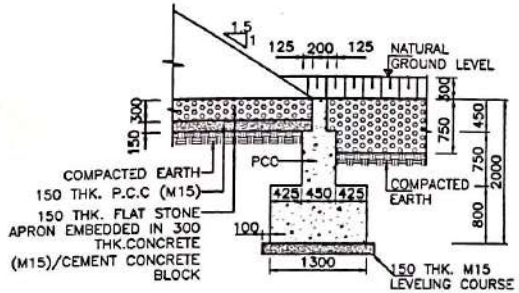
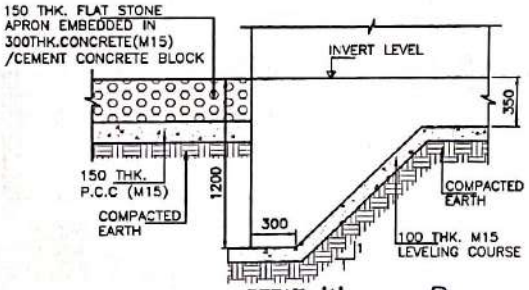


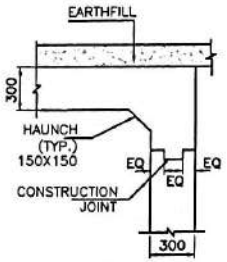
DETAIL OF CURTAIN WALL–I
(DOWN STREAM SIDE)
(SCALE 1:50)



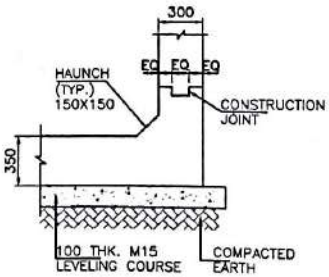
DETAIL OF CURTAIN WALL–II
(UP STREAM SIDE)
(SCALE 1:50)



DETAIL–'A'
(SCALE 1:25)



DETAIL–'B'
(SCALE 1:25)



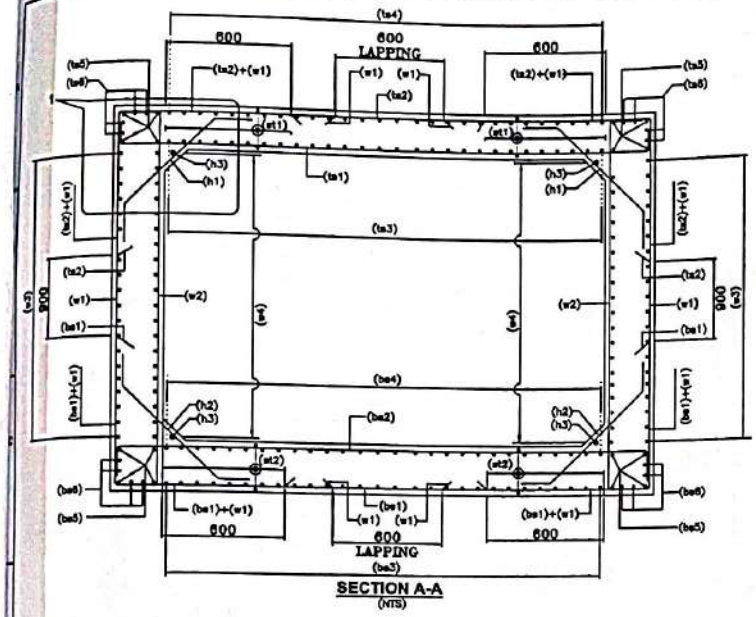
DETAIL–'C'
(SCALE 1:25)

CLIENT:	EPC CONTRACTOR	AUTHORITY'S ENGINEER	PROOF CONSULTANT:	SAFETY CONSULTANT:	DESIGN CONSULTANT:	PROJECT:
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	KAMAC ENGINEERS Pvt.Ltd KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010		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.	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 WISPL	WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (GOLAI GOAN) TO KM 47+662 (LEDO) ON DISRUGARH 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)

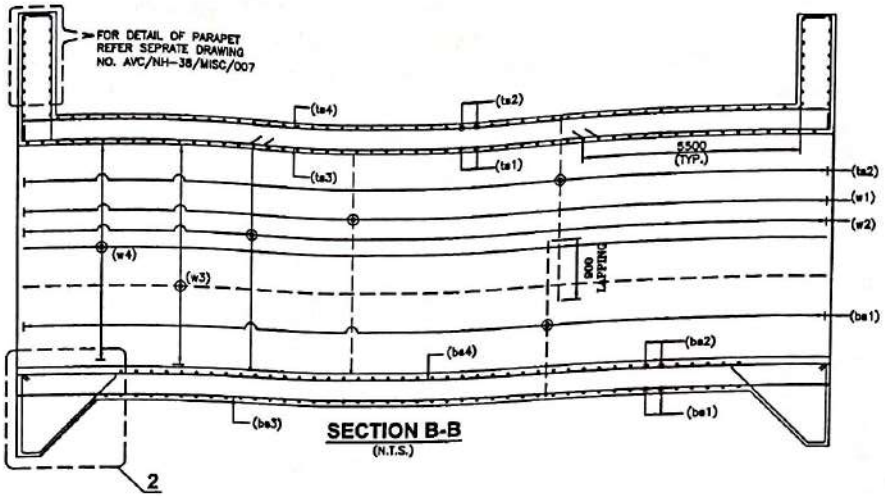
DRAWING TITLE:- GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 38+010

Date	Drw.	Dsg.	Chk.	App.	Scale.	Drawing Status.
MAR.2024	W.P	V.S	A.B		NTS	

Project No.	Drawing No.	Sheet No.	Rev.
	AVC/NH-38/BC/GAD/38+010/01	53 OF 53	R0



SECTION A-A
(NTS)

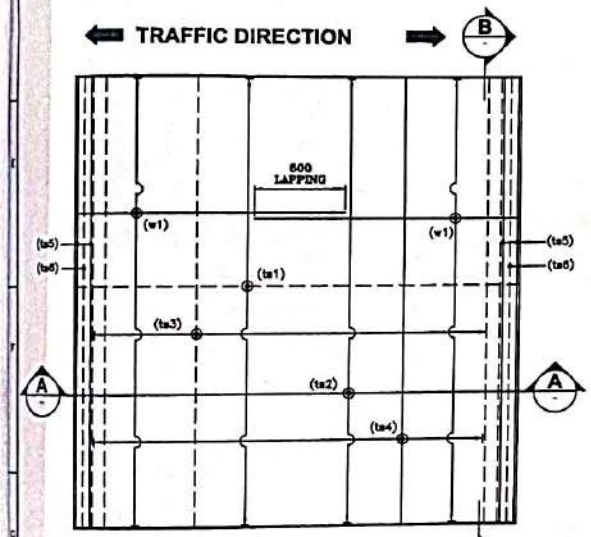


SECTION B-B
(N.T.S.)

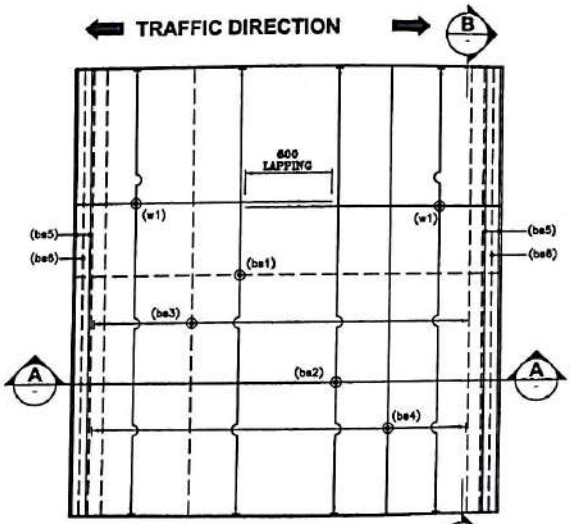
LEGEND:-	
TOP FACE BAR	———
BOTTOM FACE BAR	- - - - -

BOX REINF. SCHEDULE

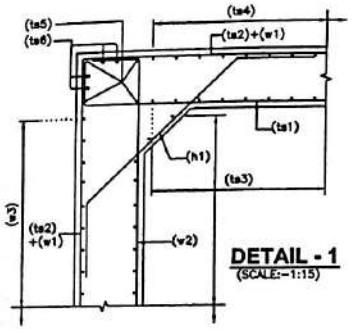
SL.NO.	BAR MARK	BAR SHAPE	DIAMETER	SPACING
1	ts1		12+10	160
2	ts2		10	160
3	ts3		10	200
4	ts4		10	200
5	ts5		12	2x4 Nos.
6	ts6		12	2x4 Nos.
7	w1		12	160
8	w2		12	160
9	w3		10	200
10	w4		10	200
11	bs1		10	160
12	bs2		12+10	160
13	bs3		10	200
14	bs4		10	200
15	bs5		12	2x4 Nos.
16	bs6		12	2x4 Nos.
17	h1		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	



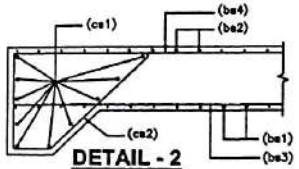
REINFORCEMENT DETAILS OF TOP SLAB
(HAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
(N.T.S.)



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.)

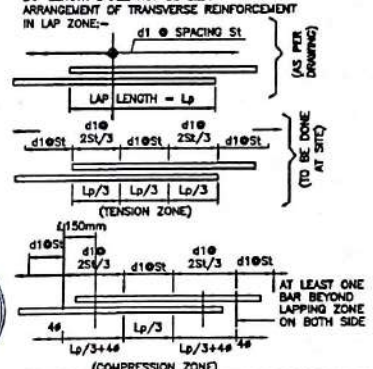
6. ANCHOURAGE LENGTH OF BOX SHALL BE TAKEN AS 40ø AS PER IRC:112.
7. FOR UNFAVORABLE BOND CONDITIONS THE FACTOR 40 SHOULD BE MULTIPLIED BY FACTOR OF 1.43 .
8. CENTER LINE OF OVERLAPPING BAR bs1 & ts2 IN WALL & MID HEGHT OF WALLS ARE AT SAME POINT.
9. BAR BENDING SCHEDULE SHOULD BE STRICTLY FOLLOW DURING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

REFERENCE DRAWING:-

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

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-500D) CONFIRMING TO IS:1786 STANDARDS.
4. 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
5. OVERLAPPING FOR SPLICING OF REINFORCEMENT SHALL BE AS PER CLAUSE NO.15.2.5.
   LAP LENGTH SHALL NOT BE LESS THAN 56ø.
   ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:-

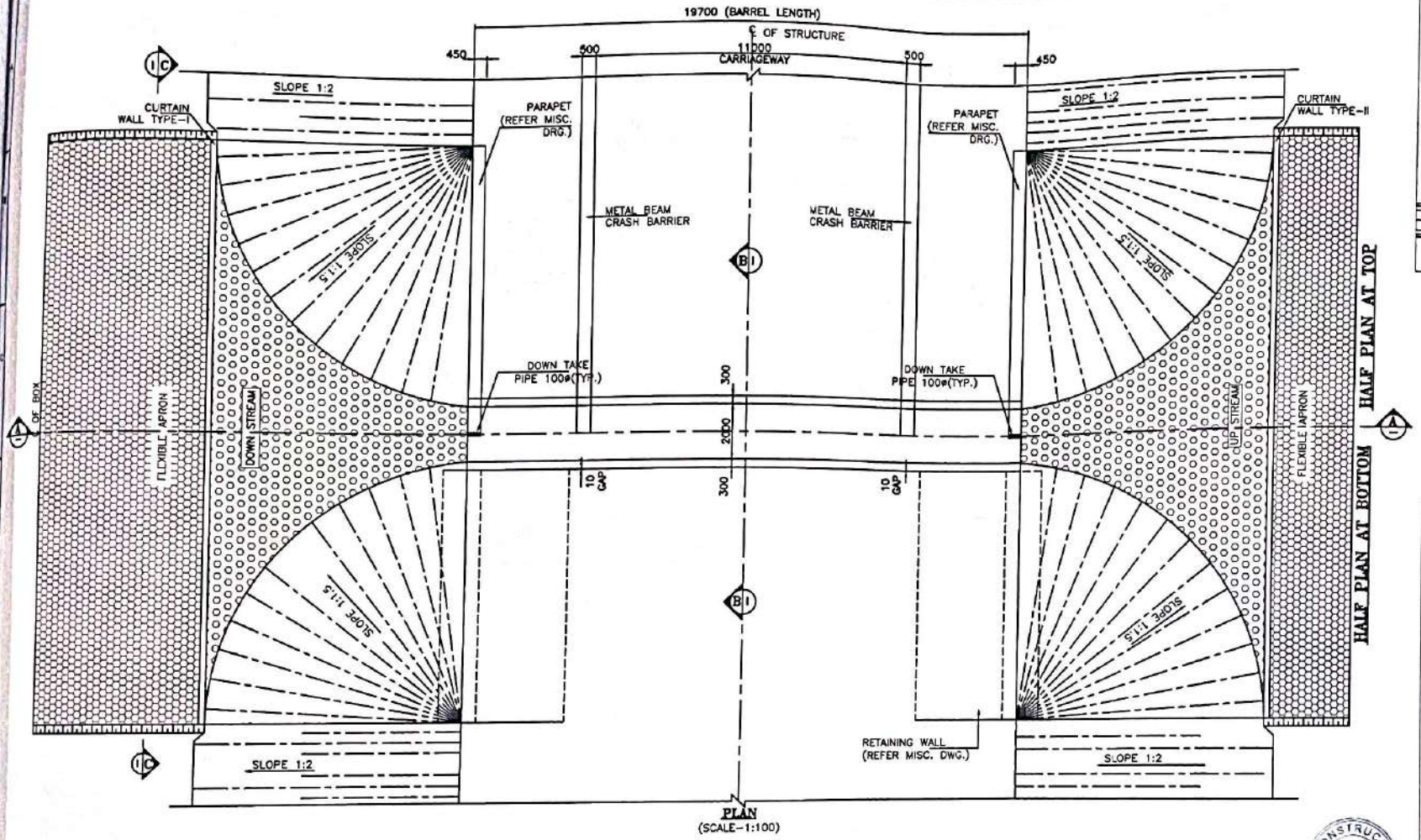


CLIENT:	EPC CONTRACTOR	AUTHORITY'S ENGINEER	PROOF CONSULTANT:	SAFETY CONSULTANT:	DESIGN CONSULTANT:
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	KAMAC ENGINEERS Pvt.Ltd KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010		CREATIVE ENGINEERING SERVICES 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,	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-201012 WISPL

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 (BROWNFIELD AND GREEN FIELD) (2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE.(PACKAGE-6)

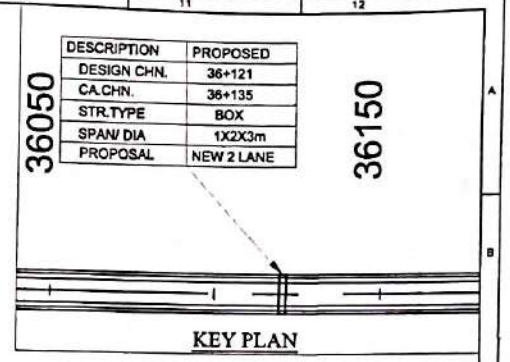
DRAWING TITLE:- REINFORCEMENT DETAIL OF BOX CULVERT AT CH. 36+010

Date	Drw.	Dsg.	Chk.	App.	Scale.	Drawing Status.
MAR.2024	W.P	V.S	A.B		NTS	
Project No.	Drawing No. AVC/NH-38/BOX/REIN./36+010/01				Sheet No. 01 OF 01	Rev. R0



PLAN
(SCALE-1:100)

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



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 CONJUCTION 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 SUBJECTED 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 1000MMc/c IN HORIZONTAL/VERTICAL DIRECTION SHALL BE PROVIDED UP TO 150MM ABOVE GROUND LEVEL FOR WEEP HOLES IN RETAINING WALL.
11. SBC SHALL BE 19t/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.

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:-
1. 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

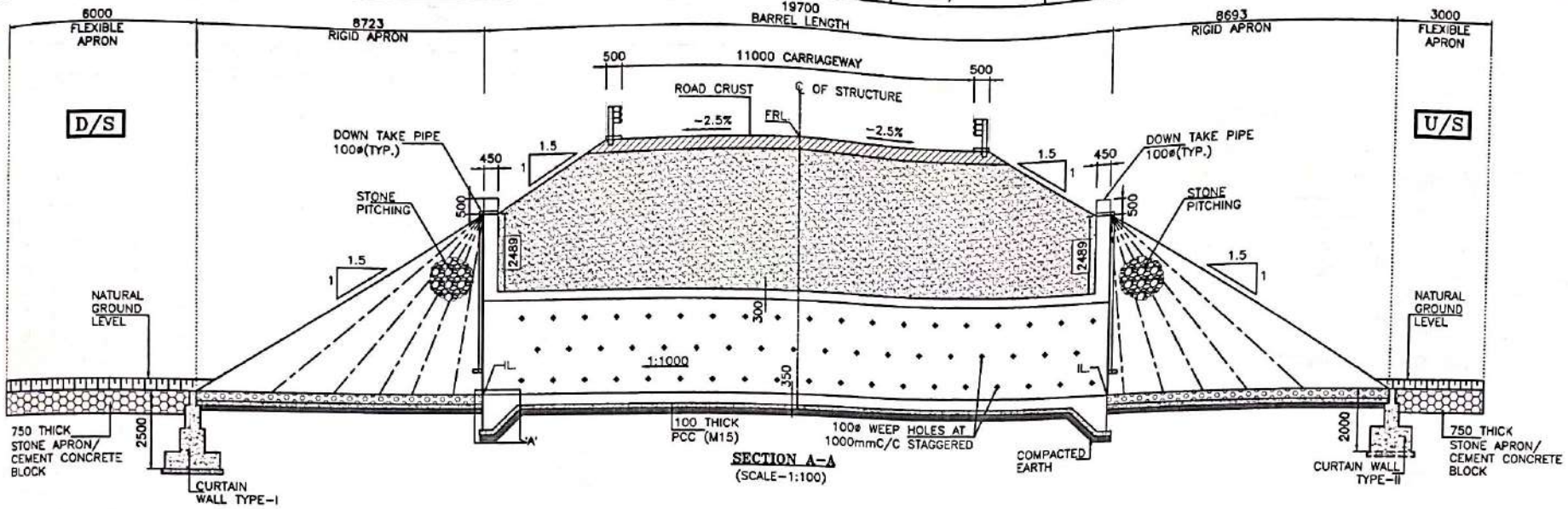
SAFETY CONSULTANT:
DESIGN AID
PLOT NO.54, 3rd FLOOR(FRONT), MASOODPUR DAIRY FARM, VASANT KUNJ, NEW DELHI-110070,

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-6, ISHAAN CORPORATE TOWER, PLOT NO-C-23, SECTOR-13, VASUNDHRA GHAZIABAD, U.P-201012
WISPL

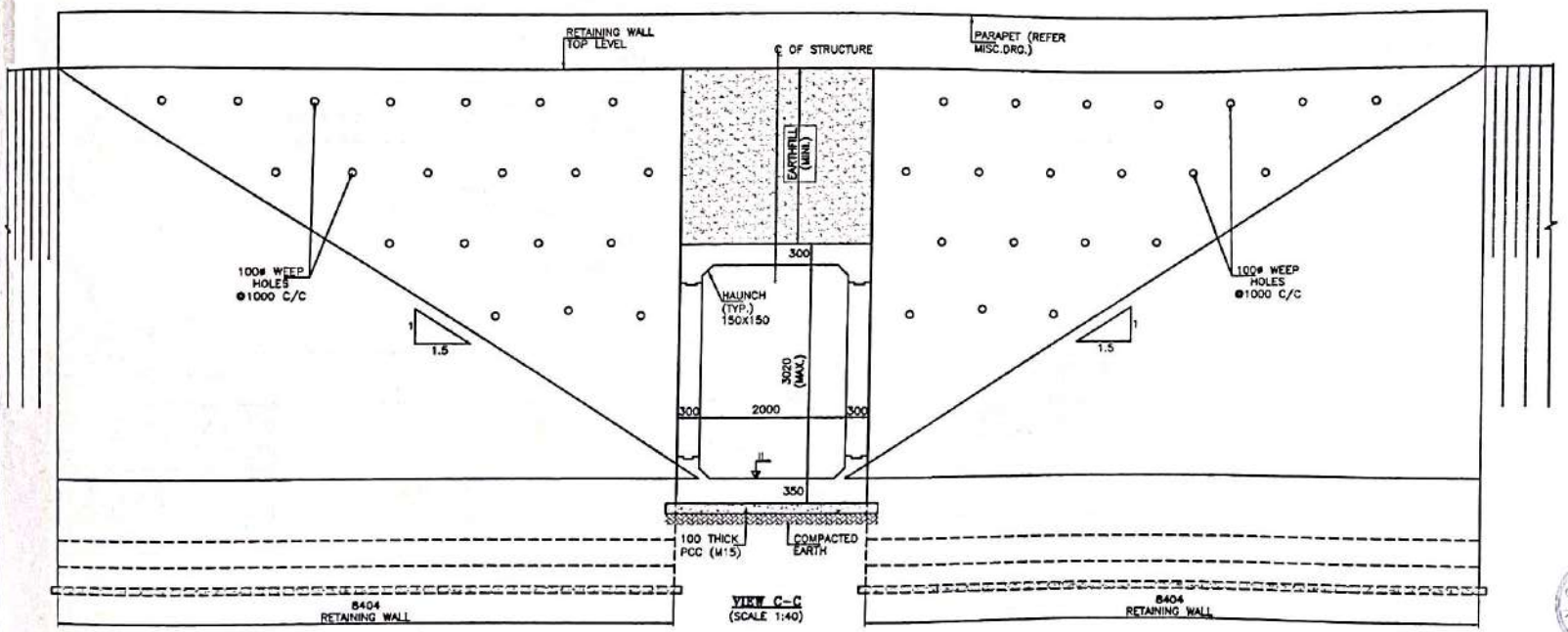
PROJECT:
WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+180 (GOLAI GOAN) TO KM 47+482 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH PROPOSED MAROHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE (PACKAGE-6)

DRAWING TITLE:- GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 36+121

Date	Drw.	Dsg.	Chk.	App.	Scale.	Drawing Status.
MAR.2024	W.P	V.S	A.B		NTS	
Project No.	Drawing No.				Sheet No.	Rev.
	AVC/NH-38/BC/GAD/36+121/01				01 OF 03	R0



SECTION A-A
(SCALE-1:100)



VIEW C-C
(SCALE 1:40)

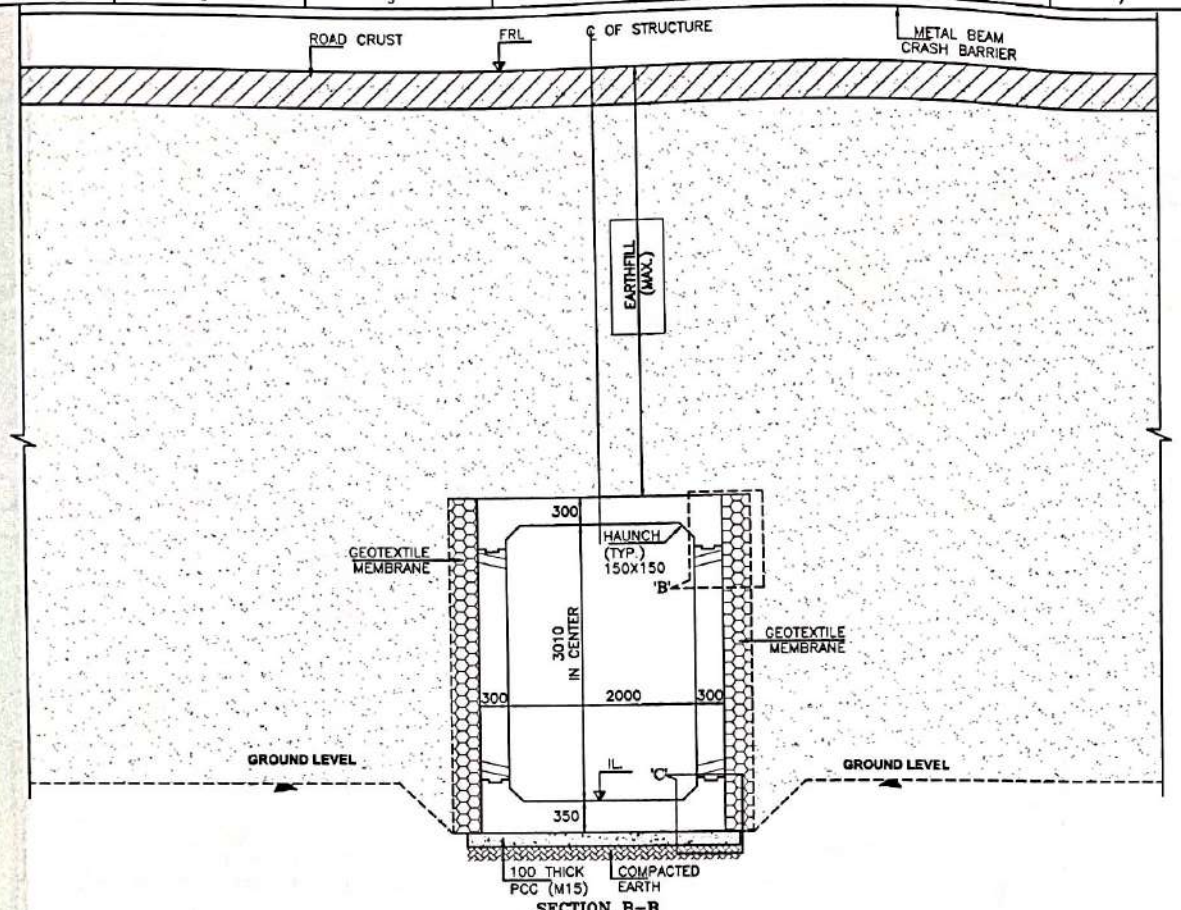
CLIENT:	EPC CONTRACTOR	AUTHORITY'S ENGINEER	PROOF CONSULTANT:	SAFETY CONSULTANT:	DESIGN CONSULTANT:
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	KAMAC ENGINEERS Pvt.Ltd KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010		CREATIVE ENGINEERING SERVICES 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,	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-O-23,SECTOR-13, VASUNDHRA GHAZIABAD, U.P-201012

PROJECT:
WIDENING/IMPROVEMENT TO 2-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) (2-LANE+PS) 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 36+121

Date	Drw.	Dsg.	Chk.	App.	Scale.	Drawing Status.
MAR.2024	W.P	V.S	A.B		NTS	

Project No.	Drawing No.	Sheet No.	Rev.
	AVC/NH-38/BC/GAD/36+121/01	02 OF 03	R0



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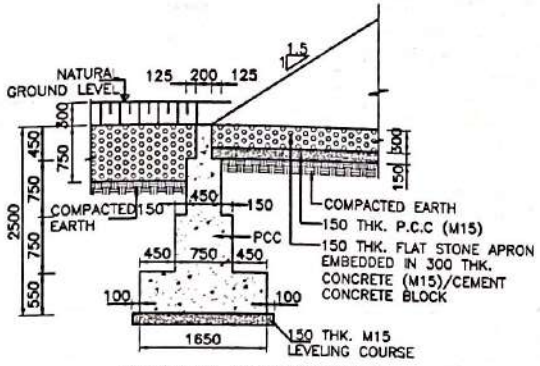
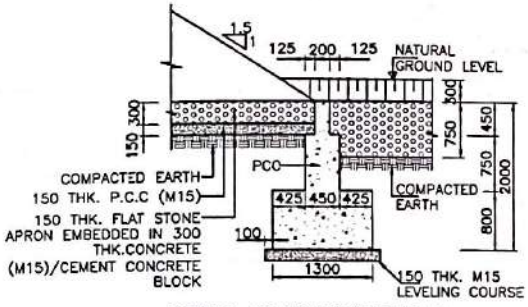
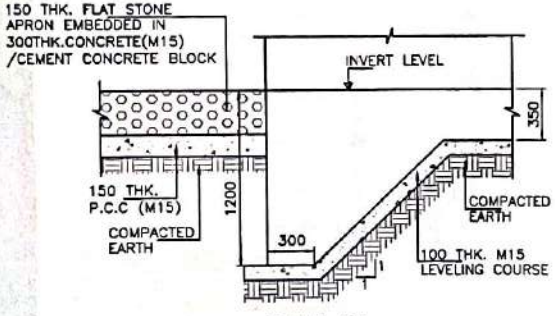


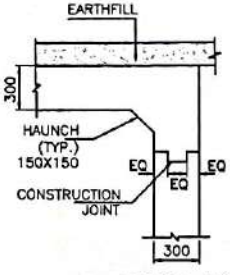
DETAIL OF CURTAIN WALL–I
(DOWN STREAM SIDE)
(SCALE 1:50)



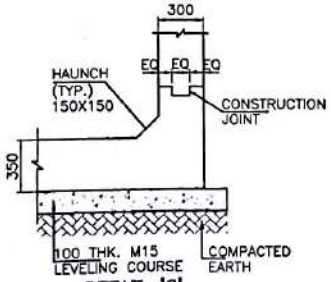
DETAIL OF CURTAIN WALL–II
(UP STREAM SIDE)
(SCALE 1:50)



DETAIL–'A'
(SCALE 1:25)



DETAIL–'B'
(SCALE 1:25)



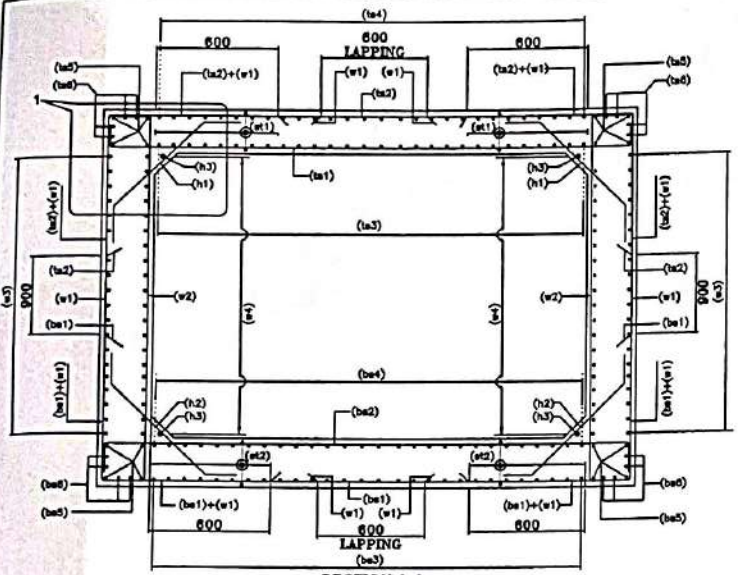
DETAIL–'C'
(SCALE 1:25)

CLIENT:	EPC CONTRACTOR	AUTHORITY'S ENGINEER	PROOF CONSULTANT:	SAFETY CONSULTANT:	DESIGN CONSULTANT:
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	KAMAC ENGINEERS Pvt.Ltd KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010		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,	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-201012

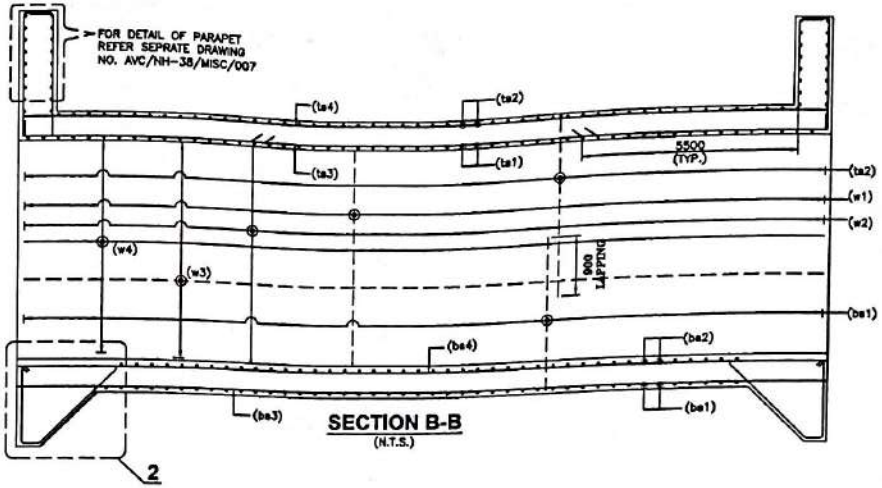
PROJECT: WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+180 (GOLAI GOAN) TO KM 47+662 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE.(PACKAGE-6)

DRAWING TITLE:- GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 36+121

Date	Drw.	Dsg.	Chk.	App.	Scale.	Drawing Status.
MAR.2024	W.P	V.S	A.B		NTS	
Project No.	Drawing No.				Sheet No.	Rev.
	AVC/NH-38/BC/GAD/36+121/01				03 OF 03	R0



SECTION A-A
(NTS)



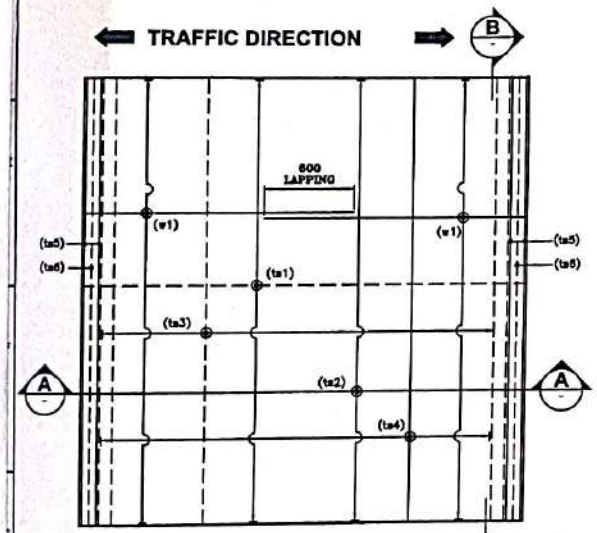
SECTION B-B
(N.T.S.)

LEGEND:-	
TOP FACE BAR	———
BOTTOM FACE BAR	- - - - -

BOX REINF. SCHEDULE

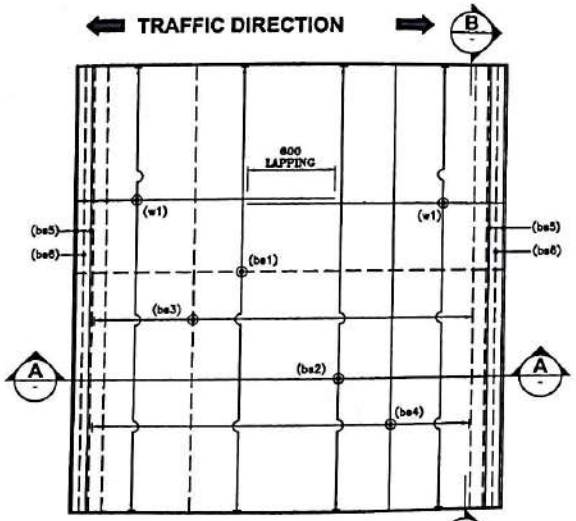
SL.NO.	BAR MARK	BAR SHAPE	DIAMETER	SPACING
1	ts1		12+10	160
2	ts2		10	160
3	ts3		10	200
4	ts4		10	200
5	ts5		12	2x4 Nos.
6	ts6		12	2x4 Nos.
7	w1		12	160
8	w2		12	160
9	w3		10	200
10	w4		10	200
11	bs1		10	160
12	bs2		12+10	160
13	bs3		10	200
14	bs4		10	200
15	bs5		12	2x4 Nos.
16	bs6		12	2x4 Nos.
17	h1		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	

TRAFFIC DIRECTION

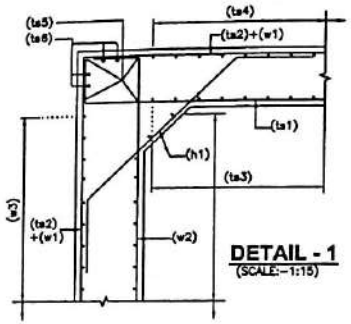


REINFORCEMENT DETAILS OF TOP SLAB
(HAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
(N.T.S.)

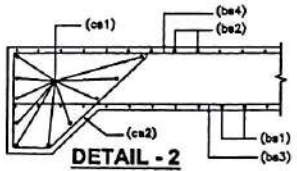
TRAFFIC DIRECTION



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



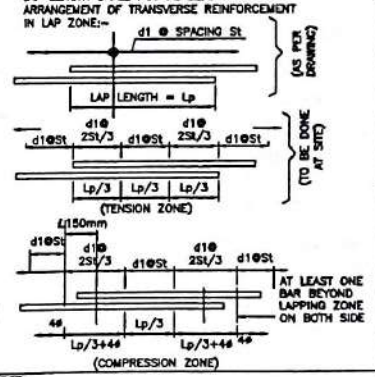
DETAIL - 1
(SCALE:-1:15)



DETAIL - 2
(N.T.S.)

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-500D) CONFIRMING TO IS:1786 STANDARDS.
4. 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
5. OVERLAPPING FOR SPLICING OF REINFORCEMENT SHALL BE AS PER CLAUSE NO.15.2.5.
   LAP LENGTH SHALL NOT BE LESS THAN 56ø.
   ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:-



6. ANCHOURAGE LENGTH OF BOX SHALL BE TAKEN AS 40ø AS PER IRC:112.
7. FOR UNFAVORABLE BOND CONDITIONS THE FACTOR 40 SHOULD BE MULTIPLIED BY FACTOR OF 1.43 .
8. CENTER LINE OF OVERLAPPING BAR bs1 & ts2 IN WALL & MID HEIGHT OF WALLS ARE AT SAME POINT.
9. 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:-

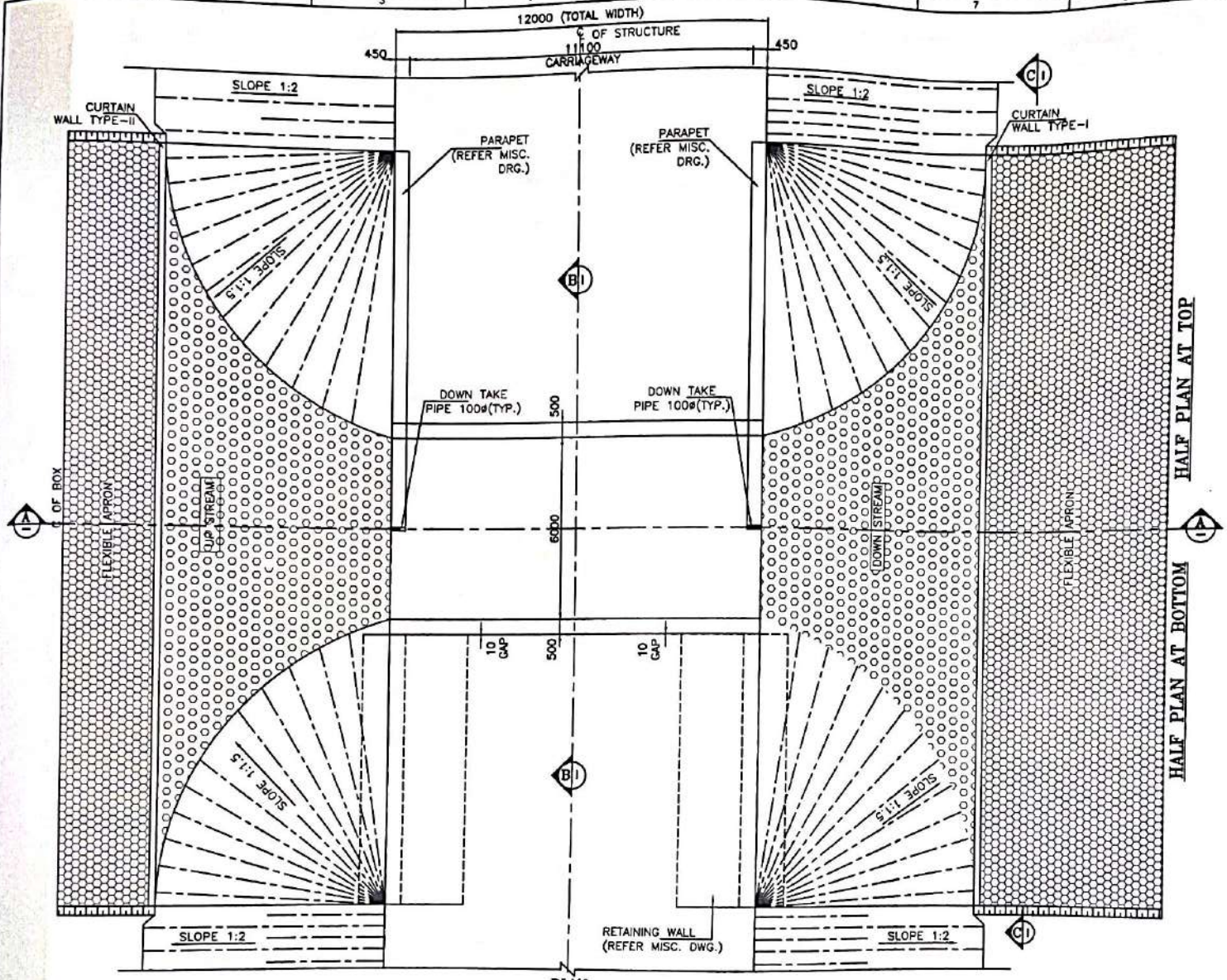
1. GENERAL ARRANGEMENT DRAWING.
   AVC/NH-38/BOX/GAD/38+121/01

CLIENT:	EPC CONTRACTOR	AUTHORITY'S ENGINEER	PROOF CONSULTANT:	SAFETY CONSULTANT:	DESIGN CONSULTANT:
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	KAMAC ENGINEERS Pvt.Ltd KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010		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,	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

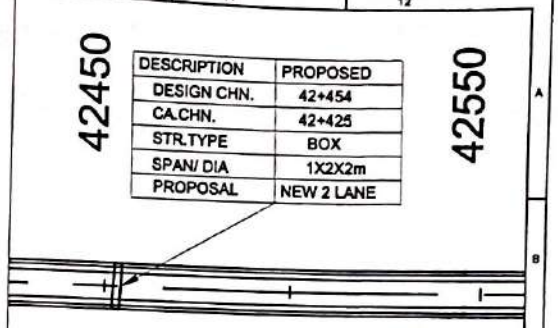
PROJECT: WIDENING/IMPROVEMENT TO 3-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (GOLAI GOAN) TO KM 47+482 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE.(PACKAGE-5)

DRAWING TITLE:- REINFORCEMENT DETAIL OF BOX CULVERT AT CH. 38+121

Date MAR.2024	Drw. W.P	Dsg. V.S	Chk. A.B	App.	Scale. NTS	Drawing Status.
Project No.	Drawing No. AVC/NH-38/BOX/REIN/38+121/01				Sheet No. 01 OF 01	Rev. R0



PLAN
(SCALE-1:100)



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

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:-

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 CONJUCTION WITH THE RELEVANT PLAN AND PROFILE DRAWING OF ROAD.
3. GRADE OF CONCRETE:-
   a. M30-FDR RCC BOX CELL STRUCTURE.
   b. M15-FDR 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 SUBJECTED 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 1000MMc/c IN HORIZONTAL/VERTICAL DIRECTION SHALL BE PROVIDED UP TO 150MM ABOVE GROUND LEVEL FOR WEEP HOLES IN RETAINING WALL.
11. SBC SHALL BE 12t/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.

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

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

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
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,

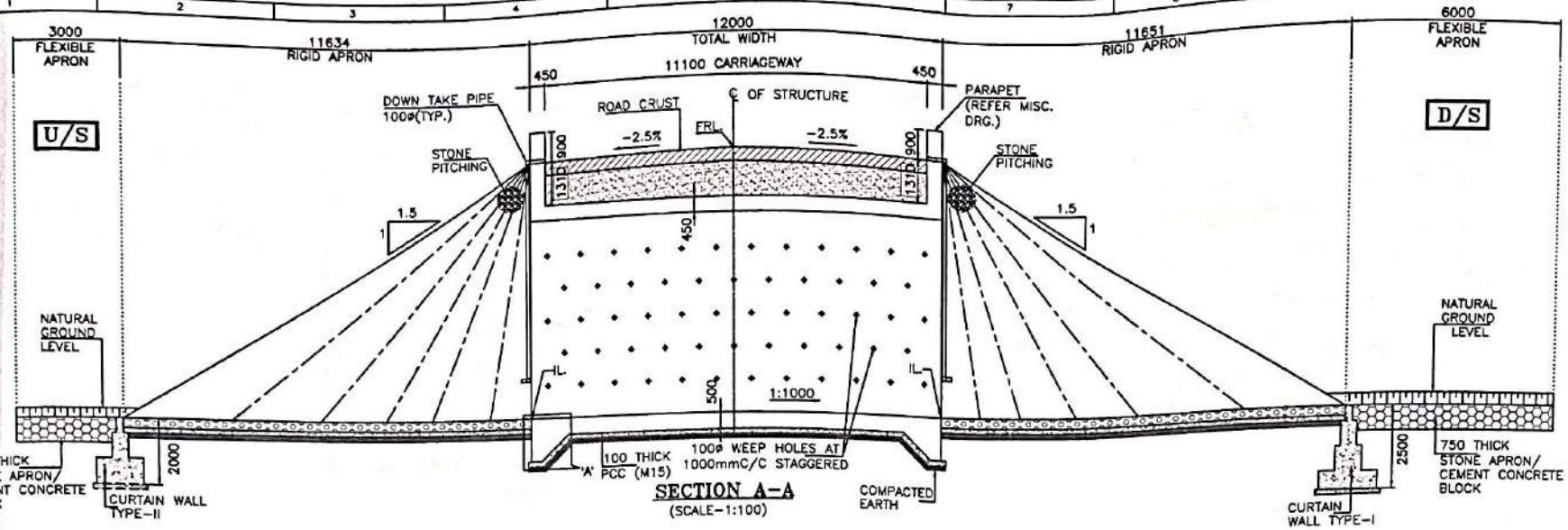
DESIGN CONSULTANT:
A.V. CONSTRUCTION
1st Floor, WZ-1240, Palam Extension, Bosco Ashram Wali Gali,New Delhi 110045
Winst Infra Solution Pvt. Ltd.
OFFICE: F-8, ISHAAN CORPORATE TOWER, PLOT NO-C-23,SECTOR-13, VASUNDHRA,GHAZIABAD, U.P-201012
WISPL

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-8)

DRAWING TITLE:- GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 36+421

Date	Drw.	Dsg.	Chk.	App.	Scale.	Drawing Status.
MAR 2024	W.P	V.S	A.B		NTS	

Project No. | Drawing No. AVC/NH-38/BC/GAD/36+421/01 | Sheet No. 01 OF 03 | Rev. R0



SECTION A-A
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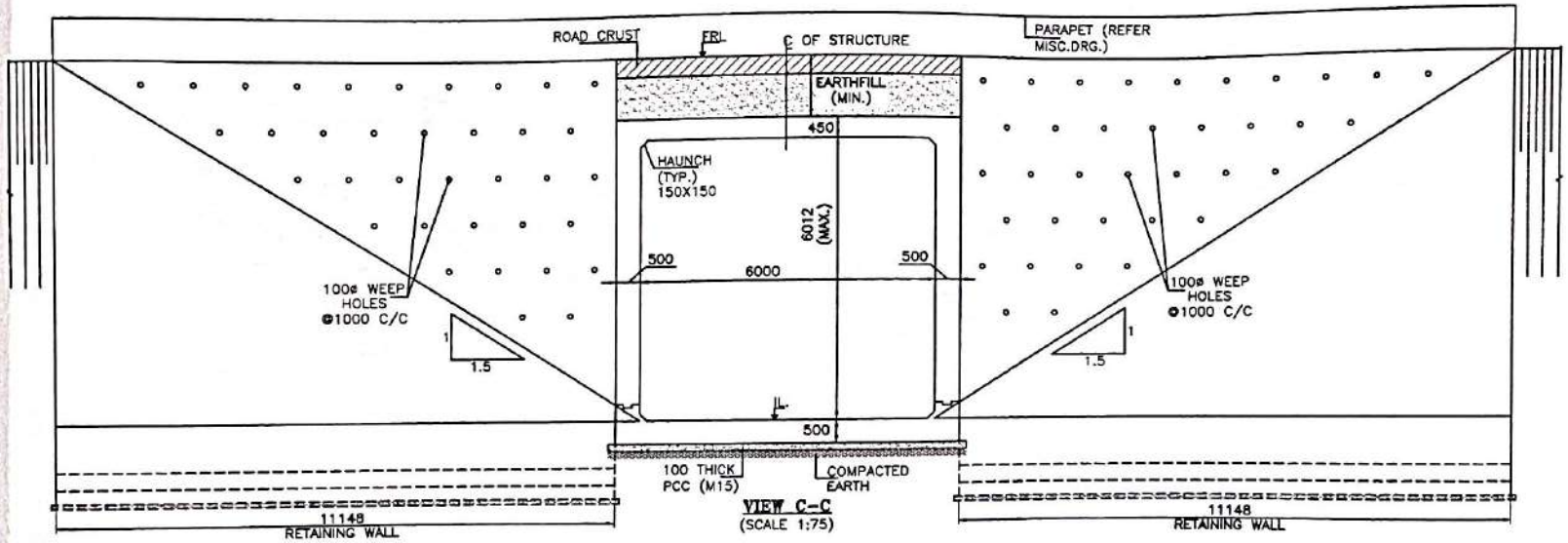


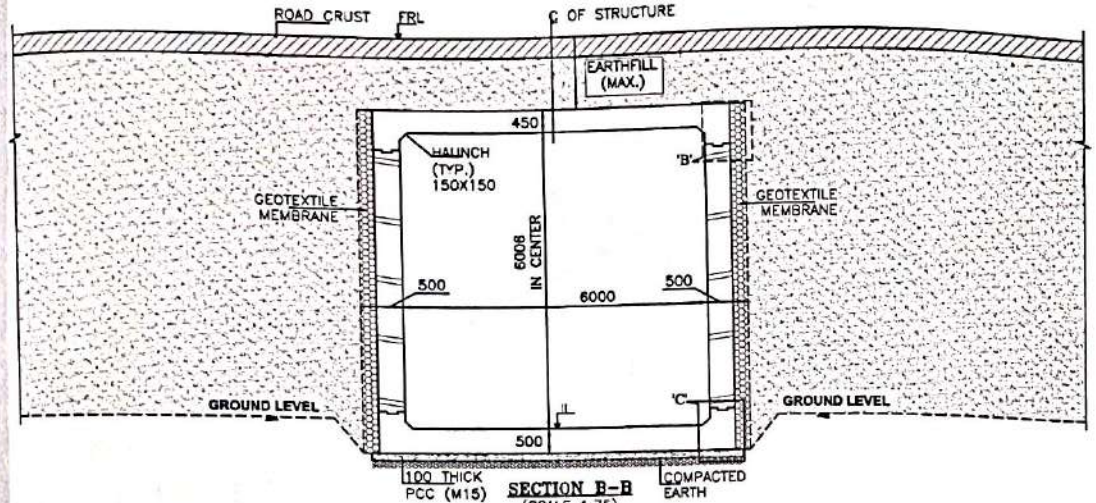
VIEW C-C
(SCALE 1:75)

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: 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: CES 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 Gall,New Delhi 110045 Winst Infra Solution Pvt. Ltd. WISPL 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+180 (GOLAI GOAN) TO KM 47+662 (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-II)

DRAWING TITLE:- GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 36+421

Date	Drw.	Des.	Chk.	App.	Scale.	Drawing Status.
MAR.2024	W.P	V.S	A.B		NTS	

Project No.	Drawing No.	Sheet No.	Rev.
	AVC/NH-38/BC/GAD/36+421/01	62 OF 63	R0



SECTION B-B
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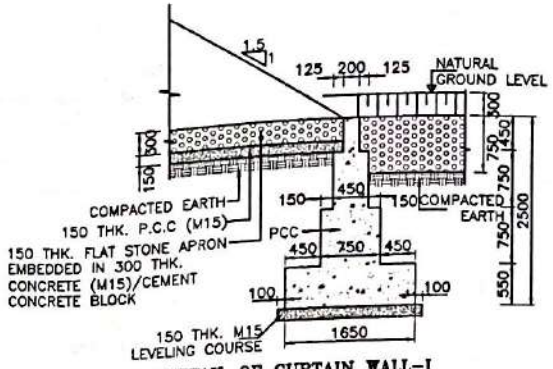
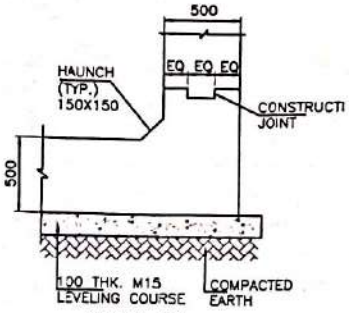
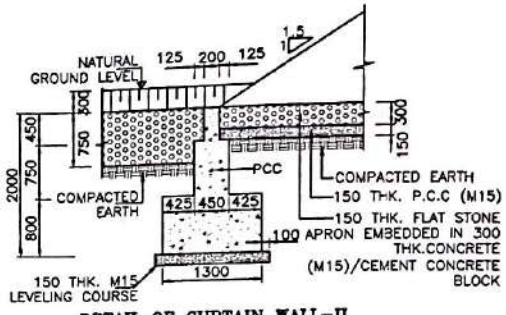


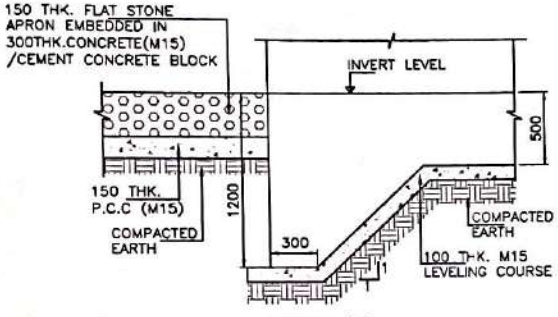
DETAIL OF CURTAIN WALL-I
(DOWN STREAM SIDE)
(SCALE 1:50)



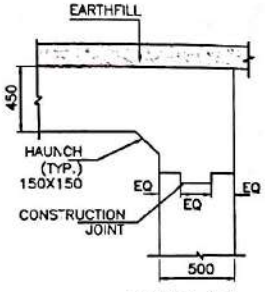
DETAIL-'C'
(SCALE 1:25)



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



DETAIL-'A'
(SCALE 1:25)



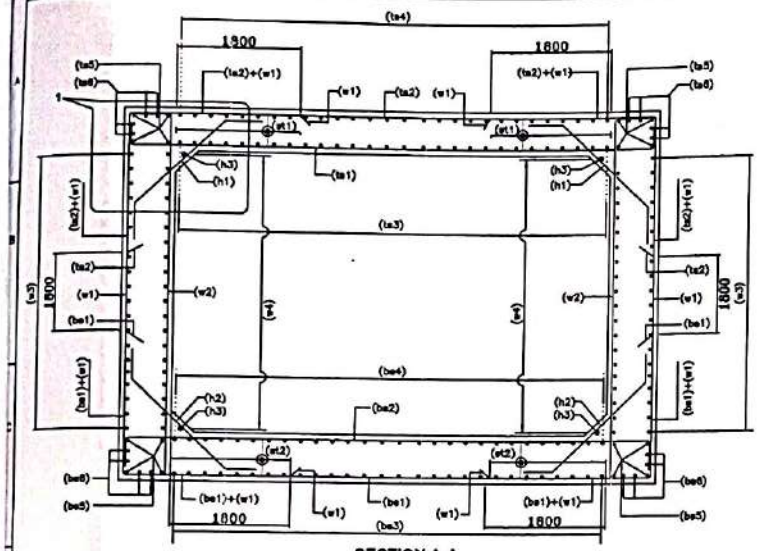
DETAIL-'B'
(SCALE 1:25)

CLIENT:	EPC CONTRACTOR	AUTHORITY'S ENGINEER	PROOF CONSULTANT:	SAFETY CONSULTANT:	DESIGN CONSULTANT:	PROJECT:
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	KAMAC ENGINEERS Pvt.Ltd KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	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	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,	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	WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (GOLAI GOAN) TO KM 47-662 (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)

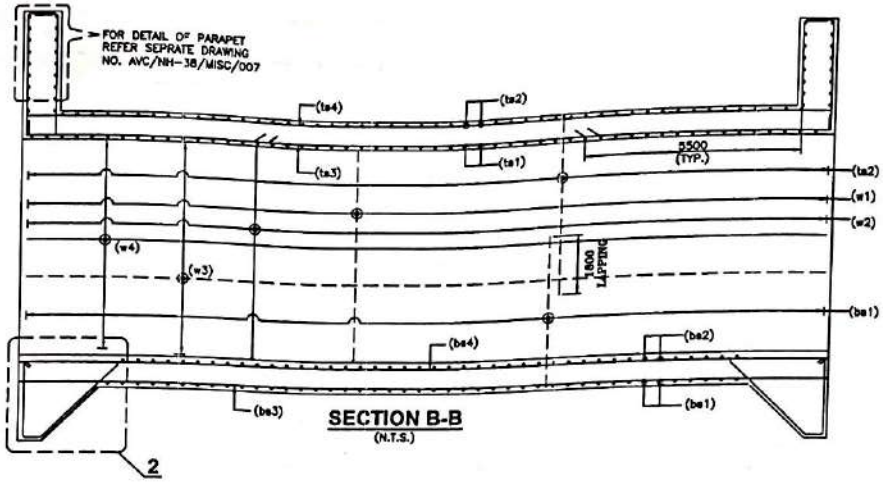
DRAWING TITLE:- GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 36+421

Date	Drw.	Dsg.	Chk.	App.	Scale.	Drawing Status.
MAR.2024	W.P	V.S	A.B		NTS	

Project No.	Drawing No.	Sheet No.	Rev.
	AVC/NH-38/BC/GAD/36+421/01	03 OF 03	R0



SECTION A-A
(NTS)



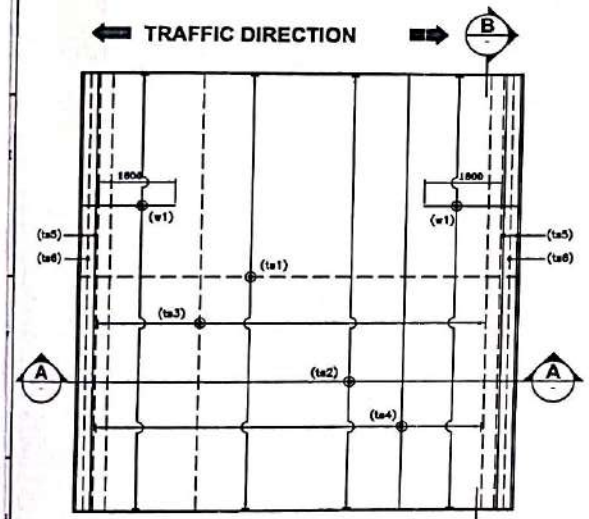
SECTION B-B
(N.T.S.)

LEGEND:-

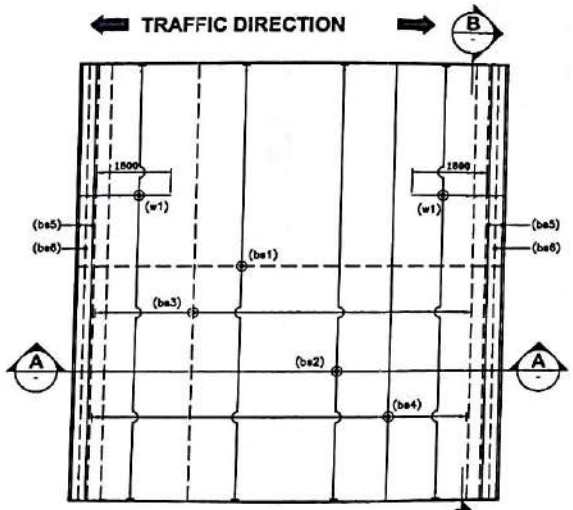
TOP FACE BAR	
BOTTOM FACE BAR	

BOX REINF. SCHEDULE

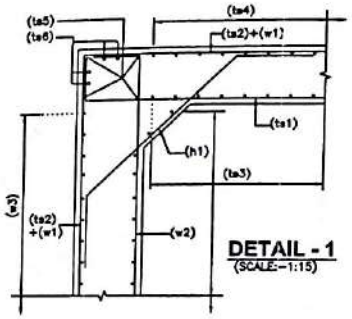
SL.NO.	BAR MARK	BAR SHAPE	DIAMETER	SPACING
1	ts1		20+12	150
2	ts2		16	150
3	ts3		12	150
4	ts4		12	150
5	ts5		12	2x4 Nos.
6	ts6		12	2x4 Nos.
7	w1		16	150
8	w2		16	150
9	w3		12	150
10	w4		10	150
11	bs1		16	150
12	bs2		20+12	150
13	bs3		12	150
14	bs4		12	150
15	bs5		12	2x4 Nos.
16	bs6		12	2x4 Nos.
17	h1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



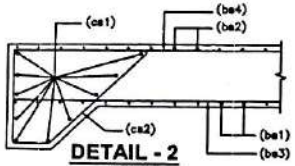
REINFORCEMENT DETAILS OF TOP SLAB
(HAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
(N.T.S.)



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



DETAIL - 1
(SCALE:-1:15)



DETAIL - 2
(N.T.S.)

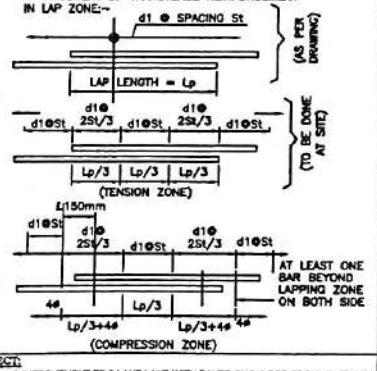
6. ANCHOURAGE LENGTH OF BOX SHALL BE TAKEN AS 40ø AS PER IRC:112.
7. FOR UNFAVORABLE BOND CONDITIONS THE FACTOR 40 SHOULD BE MULTIPLIED BY FACTOR OF 1.43 .
8. CENTER LINE OF OVERLAPPING BAR bs1 & ts2 IN WALL & MID HEIGHT OF WALLS ARE AT SAME POINT.
9. BAR BENDING SCHEDULE SHOULD BE STRICTLY FOLLOW DURING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

REFERENCE DRAWING:-

1. GENERAL ARRANGEMENT DRAWING. AVC/NH-38/BOX/GAD/38+421/01

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-500D) CONFIRMING TO IS:1786 STANDARDS.
4. 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
5. OVERLAPPING FOR SPLICING OF REINFORCEMENT SHALL BE AS PER CLAUSE NO.15.2.5.
   LAP LENGTH SHALL NOT BE LESS THAN 56ø.
   ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:-

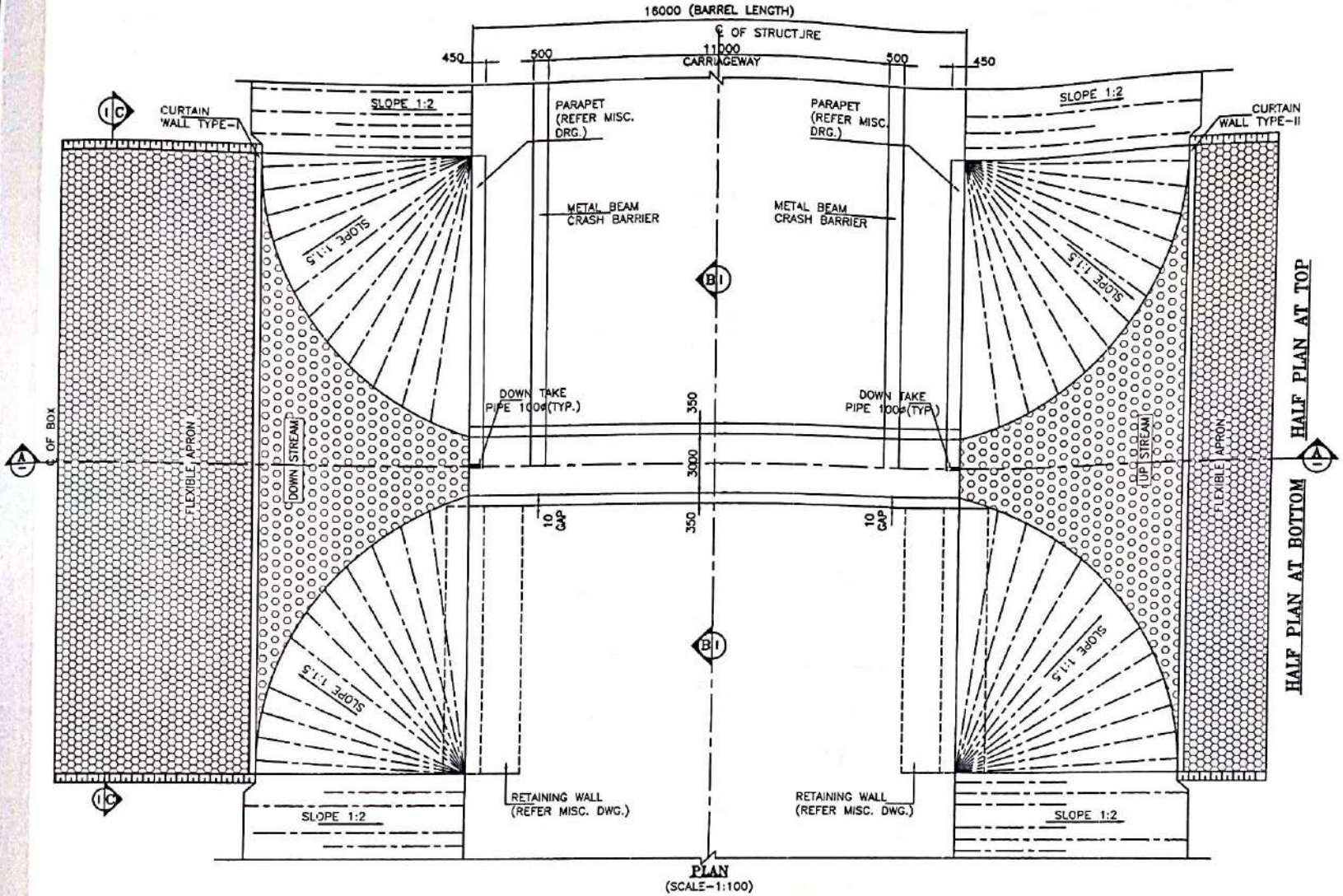


CLIENT:	EPC CONTRACTOR	AUTHORITY'S ENGINEER	PROOF CONSULTANT:	SAFETY CONSULTANT:	DESIGN CONSULTANT:
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	KAMAC ENGINEERS Pvt.Ltd KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010		CREATIVE ENGINEERING SERVICES 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,	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

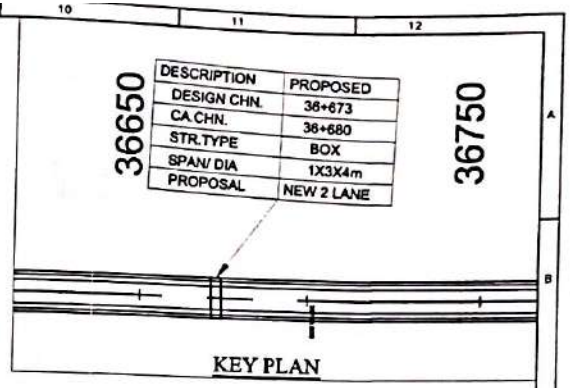
PROJECT: WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (GOLAI GOAN) TO KM 47+662 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE.(PACKAGE-II)

DRAWING TITLE:- REINFORCEMENT DETAIL OF BOX CULVERT AT CH. 38+421

Date	Drw.	Dsg.	Chk.	App.	Scale.	Drawing Status.
JAN.2024	W.P	V.S	A.B		NTS	
Project No.	Drawing No. AVC/NH-38/BOX/REIN/38+421/01				Sheet No. 01 OF 01	Rev. R0



PLAN
(SCALE-1:100)



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:-

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 CONJUCTION 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 SUBJECTED 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 1000MMc/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			
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

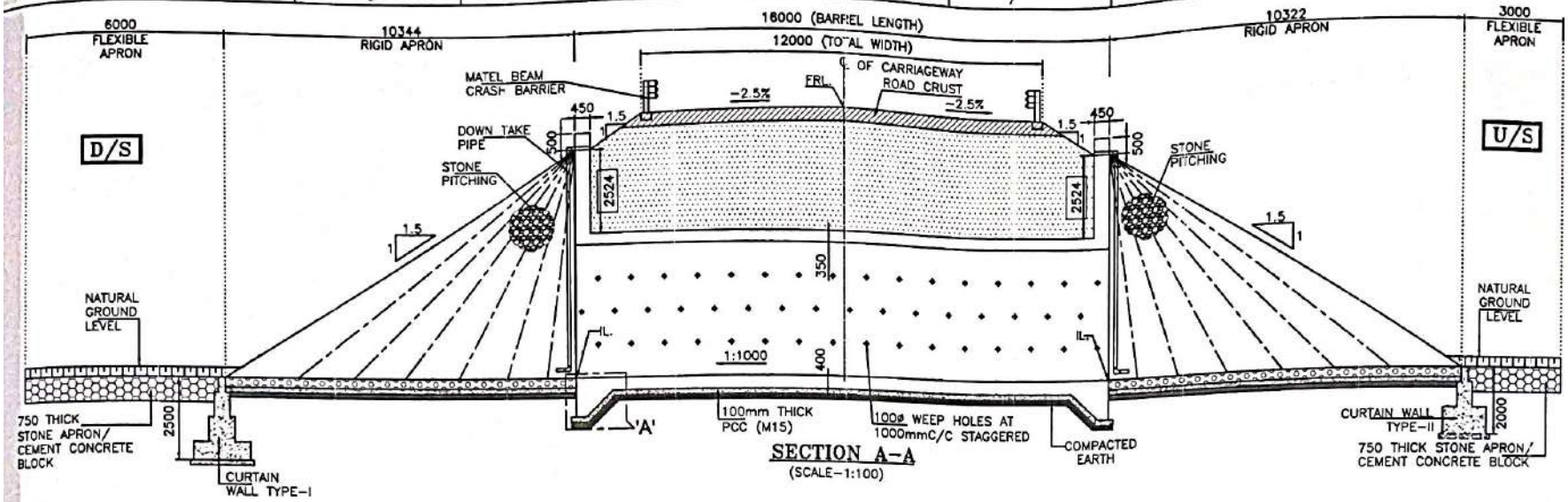
A.V. CONSTRUCTION New Delhi

CLIENT:	EPC CONTRACTOR	AUTHORITY'S ENGINEER	PROOF CONSULTANT:	SAFETY CONSULTANT:	DESIGN CONSULTANT:
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	KAMAC ENGINEERS Pvt.Ltd KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	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	CES 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,	A.V. CONSTRUCTION 1st Floor, WZ-1240, Palam Extension, Bosco Ashram Wali 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 WISPL

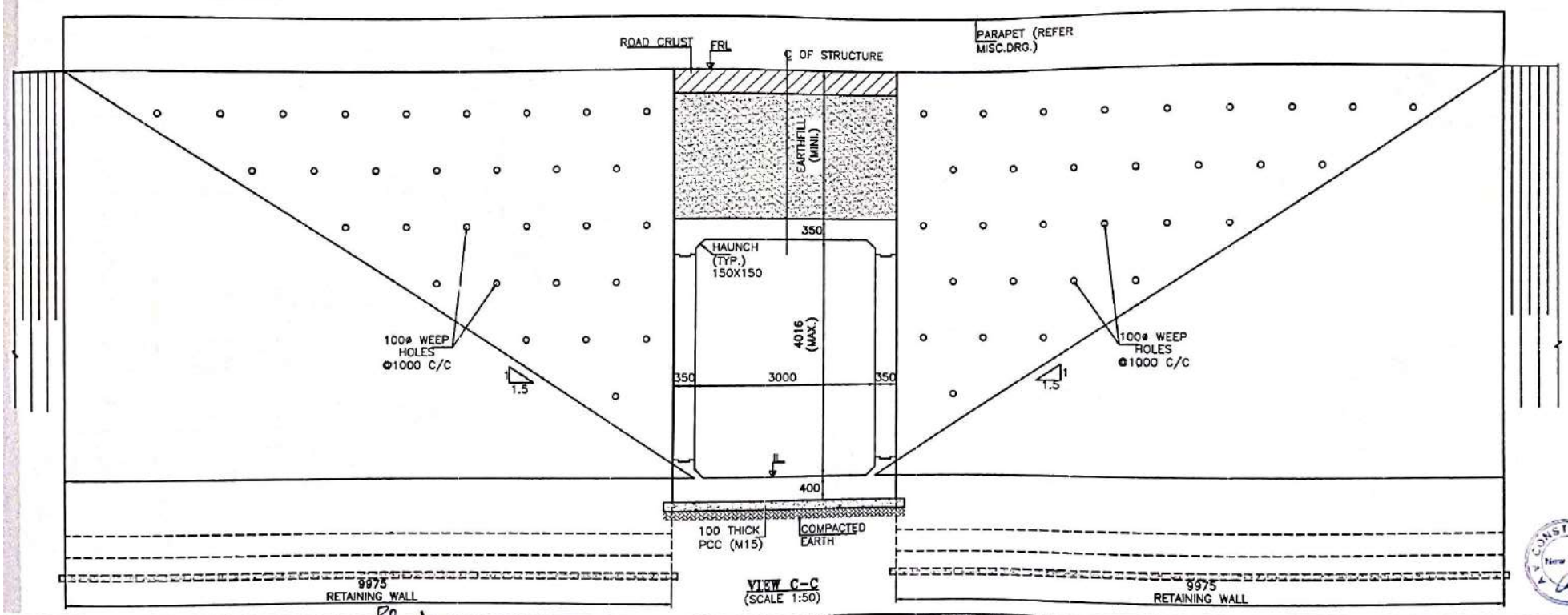
PROJECT: WIDENING/IMPROVEMENT TO 3-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (GOLAI GOAN) TO KM 47+662 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH PROPOSED NARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE.(PACKAGE-6)

DRAWING TITLE:- GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 36+673

Date	Drw.	Dsg.	Chk.	App.	Scale.	Drawing Status.
MAR.2024	W.P	V.S	A.B		NTS	
Project No.	Drawing No. AVC/NH-38/BC/GAD/36+673/01				Sheet No. 01 OF 03	Rev. R0



SECTION A-A
(SCALE-1:100)



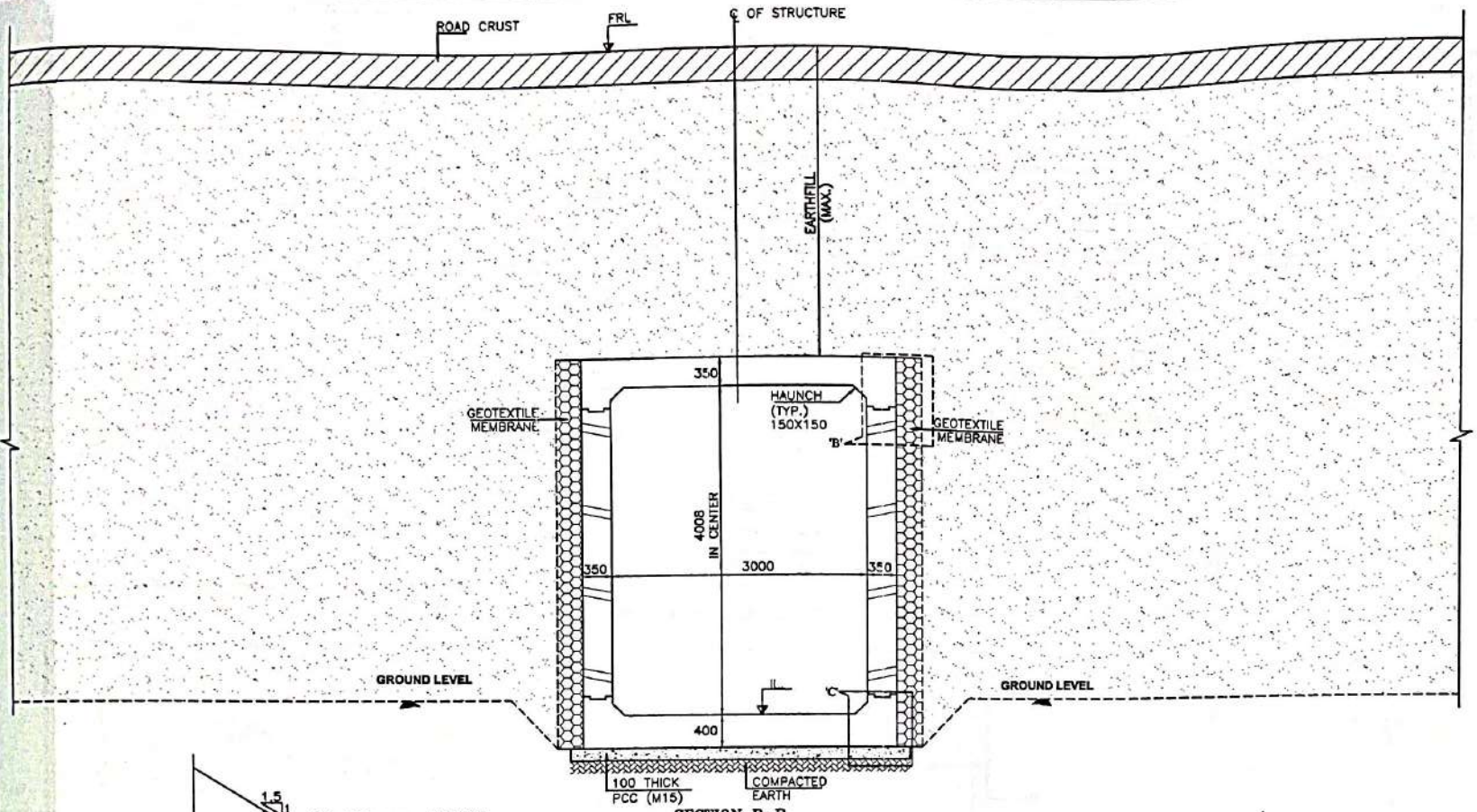
VIEW C-C
(SCALE 1:50)

ENT: NATIONAL HIGHWAYS & FRASTRUCTURE 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: 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: CES 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 Gall, 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 WISPL

PROJECT: WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (GOLAI GOAN) TO KM 47-683 (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 36+673

Date	Drw.	Dsg.	Chk.	App.	Scale.	Drawing Status.
MAR.2024	W.P	V.S	A.B		NTS	
Project No.	Drawing No. AVC/NH-38/BC/GAD/36+673/01				Sheet No. 02 OF 03	Rev. R0



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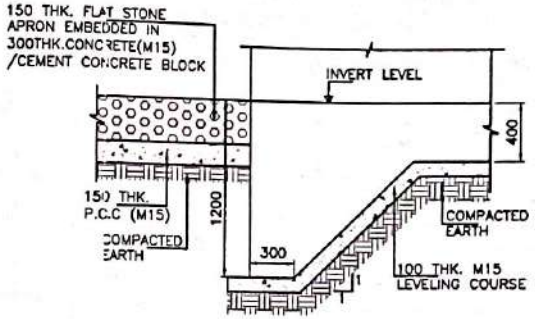
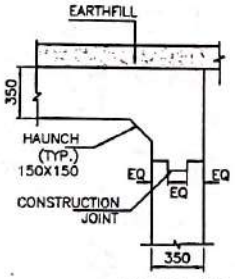


DETAIL–'A'
(SCALE 1:25)



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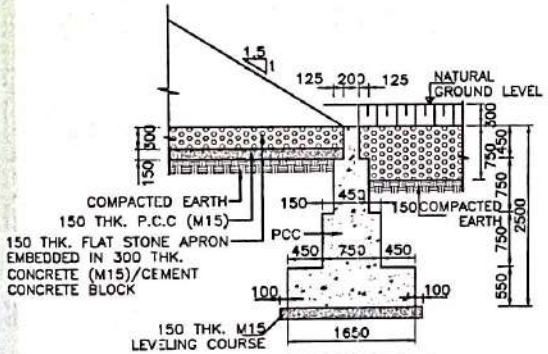
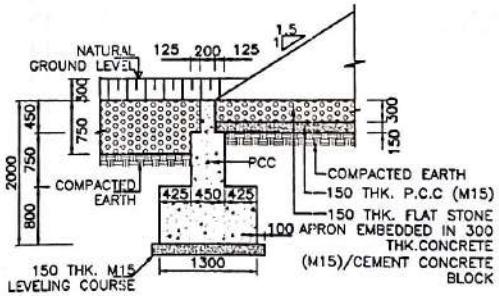
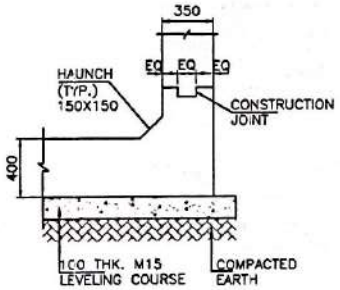


DETAIL OF CURTAIN WALL–I
(DOWN STREAM SIDE)
(SCALE 1:50)



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



DETAIL–'C'
(SCALE 1:25)

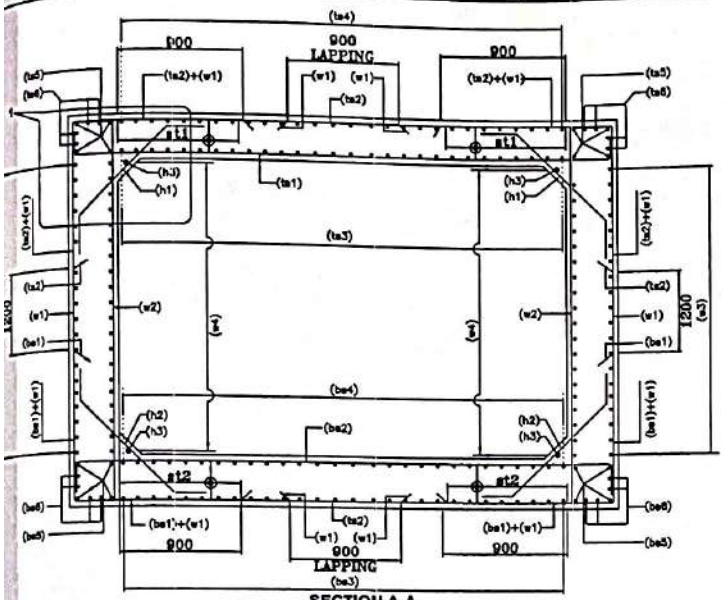
CLIENT:	EPC CONTRACTOR	AUTHORITY'S ENGINEER	PROOF CONSULTANT:	SAFETY CONSULTANT:	DESIGN CONSULTANT:
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	KAMAC ENGINEERS Pvt.Ltd KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	ALMONDZ GLOBAL INFRA CONSULTANT LIMITED IN JV WITH AYOLEEZA CONSULTANT PRIVATE LIMITED. C/O JAYANTA SAIKIA, SARBAJANIN NAMGHAR, BORBIL NO.2, DIGBOI, TINSUKIA, ASSAM-786171	CES 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.	A.V. CONSTRUCTION 1st Floor, WZ-1240, Palam Extension, Bosco Ashram Well 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 WISPL

PROJECT: WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (GOLAI GOAN) TO KM 47+652 (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-II)

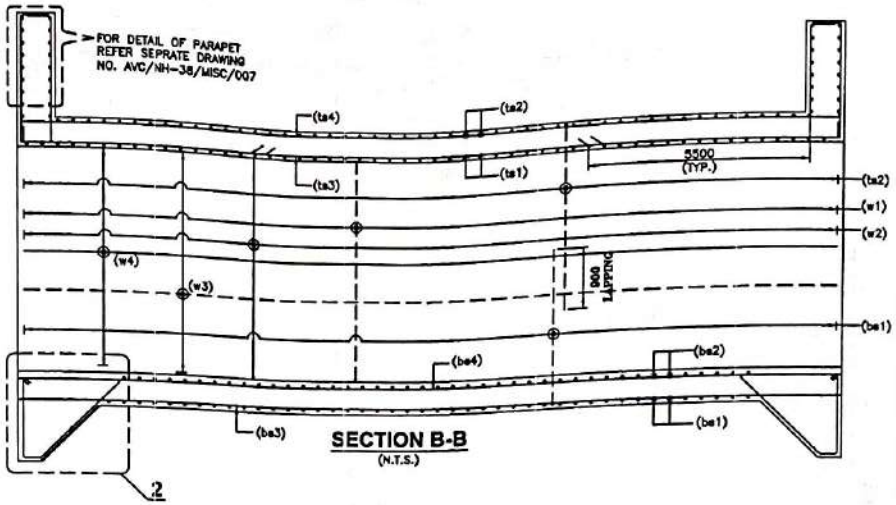
DRAWING TITLE:- GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 36+673

Date	Drw.	Dsg.	Chk.	App.	Scale.	Drawing Status.
MAR.2024	W.P	V.S	A.B		NTS	

Project No.	Drawing No.	Sheet No.	Rev.
	AVC/NH-38/BC/GAD/36+673/01	03 OF 03	R0



SECTION A-A
(NTS)



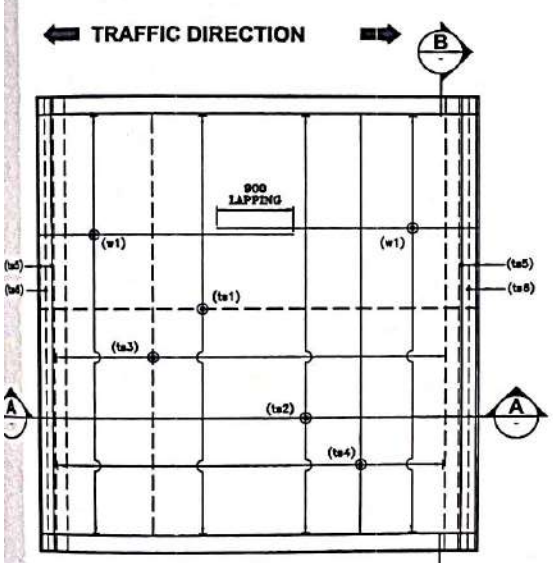
SECTION B-B
(N.T.S.)

BOX REINF. SCHEDULE

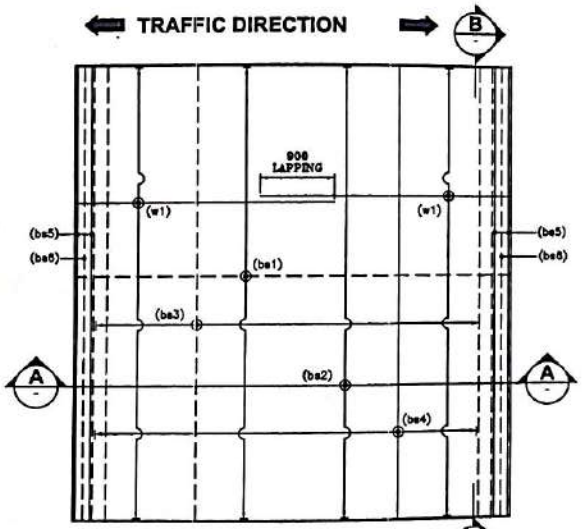
SL.NO.	BAR MARK	BAR SHAPE	DIAMETER	SPACING
1	ts1		12+10	160
2	ts2		12	160
3	ts3		10	180
4	ts4		10	180
5	ts5		12	2x4 Nos.
6	ts6		12	2x4 Nos.
7	w1		16	160
8	w2		16	160
9	w3		10	180
10	w4		10	180
11	bs1		12	160
12	bs2		12+12	160
13	bs3		10	180
14	bs4		10	180
15	bs5		12	2x4 Nos.
16	bs6		12	2x4 Nos.
17	h1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

LEGEND:-

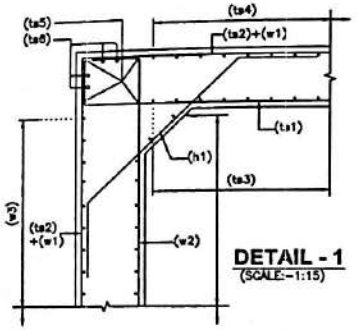
TOP FACE BAR	
BOTTOM FACE BAR	



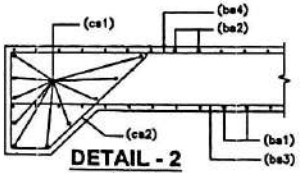
REINFORCEMENT DETAILS OF TOP SLAB
(HAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
(N.T.S.)



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



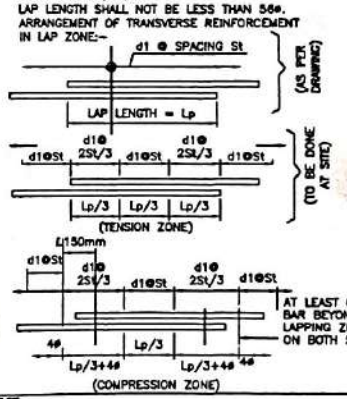
DETAIL - 1
(SCALE:-1:15)



DETAIL - 2
(N.T.S.)

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-5000) CONFIRMING TO IS:1786 STANDARDS.
4. 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
5. OVERLAPPING FOR SPLICING OF REINFORCEMENT SHALL BE AS PER CLAUSE NO.15.2.5.
   LAP LENGTH SHALL NOT BE LESS THAN 56ø.
   ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:-
6. AN CHOURAGE LENGTH OF BOX SHALL BE TAKEN AS 40ø AS PER IRC:112.
7. FOR UNFAVORABLE BOND CONDITIONS THE FACTOR 40 SHOULD BE MULTIPLIED BY FACTOR OF 1.43 .
8. CENTER LINE OF OVERLAPPING BAR bs1 & ts2 IN WALL & MID HEIGHT OF WALLS ARE AT SAME POINT.
9. 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:-

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

A.V. CONSTRUCTIONS New Delhi

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

PROOF CONSULTANT:
CES
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,

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A.V. CONSTRUCTION
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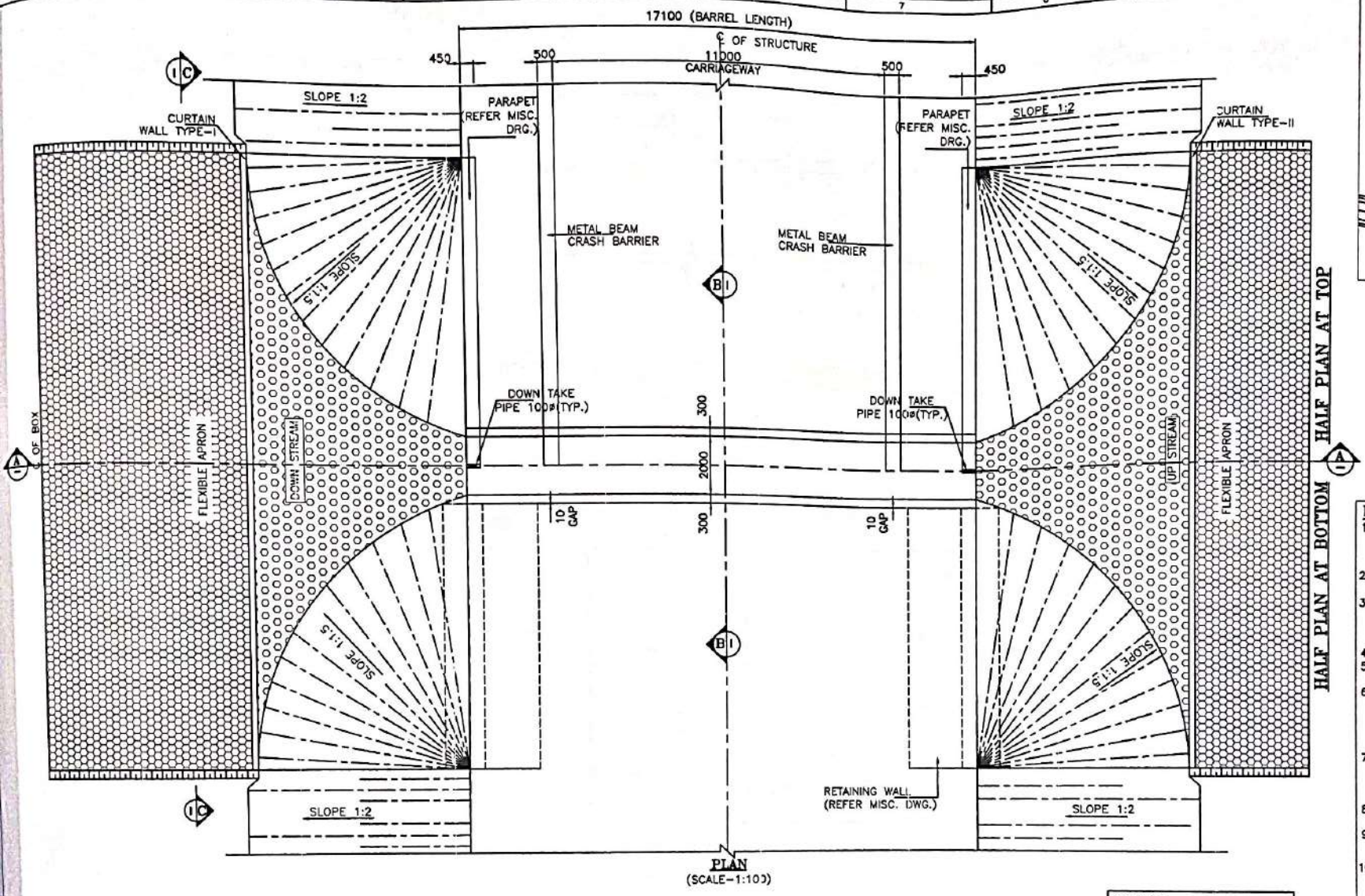
Winst Infra Solution Pvt. Ltd.
OFFICE: F-6, ISHAAN CORPORATE TOWER, PLOT NO-C-23,SECTOR- 13, VASUNDHRA,GHAZIABAD, U.P-201012
WISPL

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 (BROWNFIELD AND GREEN FIELD) (2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE.(PACKAGE-6)

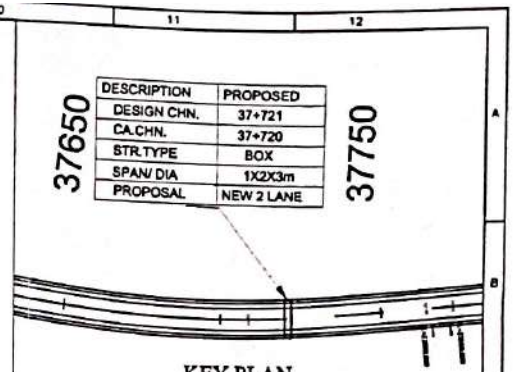
DRAWING TITLE:- REINFORCEMENT DETAIL OF BOX CULVERT AT CH. 38+673

Date	Drw.	Dsg.	Chk.	App.	Scale.	Drawing Status.
MAR.2024	W.P	V.S	A.B		NTS	

Project No.	Drawing No.	Sheet No.	Rev.
	AVC/NH-38/BOX/REIN/38+673/01	01 OF 01	R0



PLAN
(SCALE-1:100)



DESCRIPTION	PROPOSED
DESIGN CHN.	37+721
CA.CHN.	37+720
STR.TYPE	BOX
SPAN/ DIA	1X2X3m
PROPOSAL	NEW 2 LANE

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 CONJUCTION 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 SUBJECTED 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 1000MMc/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:-

1. 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:
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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

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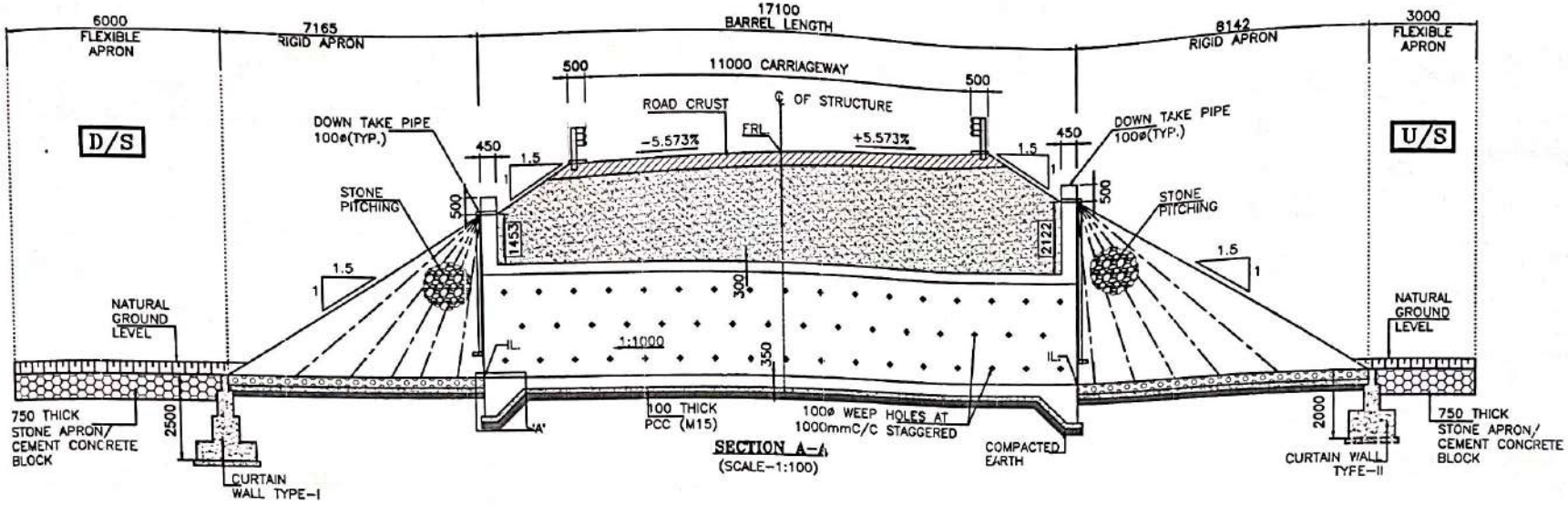
PROJECT:
WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (GOLAI GOAN) TO KM 47+692 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE.(PACKAGE-6)

DRAWING TITLE:- GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 37+721

Date	Drw.	Dsg.	Chk.	App.	Scale.	Drawing Status.
MAR.2024	W.P	V.S	A.B		NTS	
Project No.	Drawing No. AVC/NH-38/BC/GAD/37+721/01				Sheet No. 01 OF 03	Rev. R0



SECTION A-A
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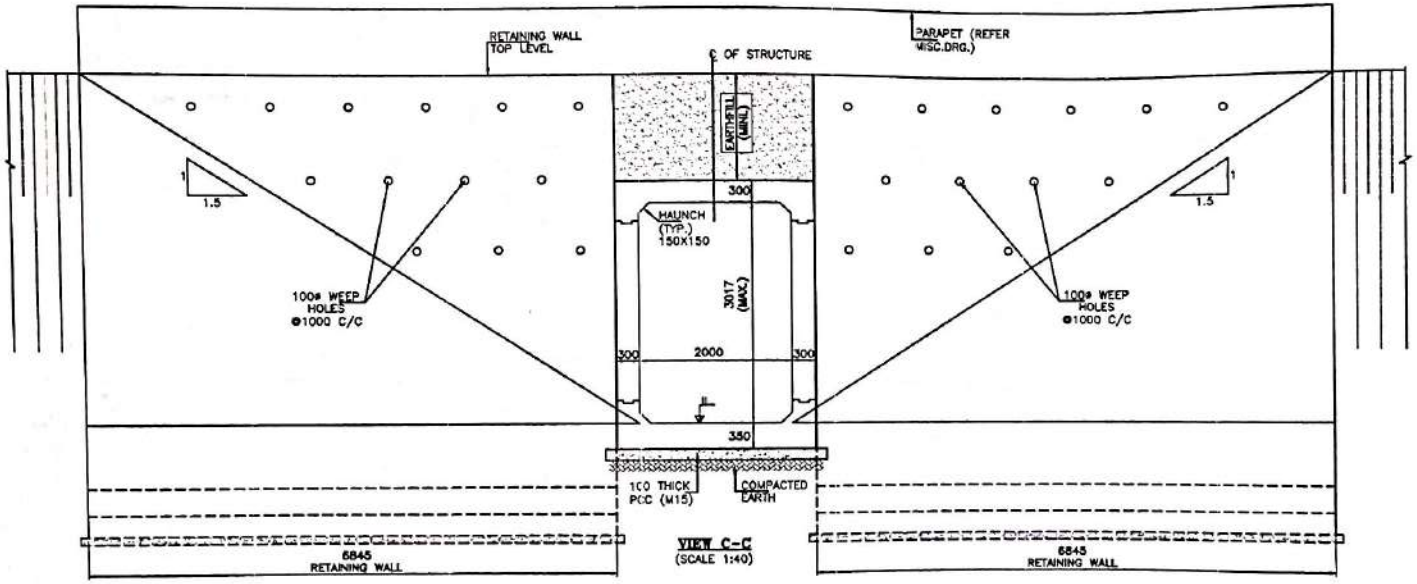

VIEW C-C
(SCALE 1:40)

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:

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NEW DELHI-110070,

DESIGN CONSULTANT:

A.V. CONSTRUCTION
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Ashram Wali Gali,New
Delhi 110045

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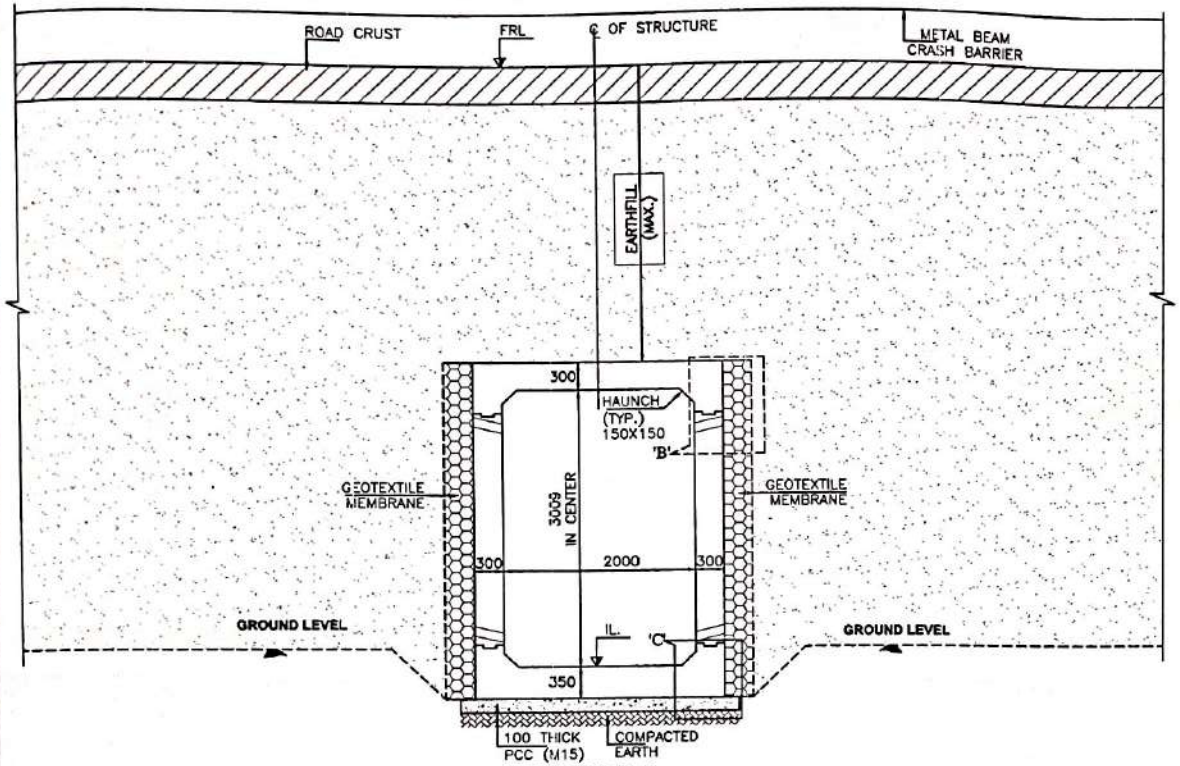
TOWER, PLOT NO-C-23,SECTOR-13,
VASUNDHRA,GHAZIABAD, U.P-201012

PROJECT:
WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (GOLAI GOAN) TO KM 47+662 (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 37+721

Date	Drw.	Dsg.	Chk.	App.	Scale.	Drawing Status.
MAR.2024	W.P	V S	A.B		NTS	
Project No.	Drawing No.				Sheet No.	Rev.
	AVC/NH-38/BC/GAD/37+721/01				02 OF 03	R0



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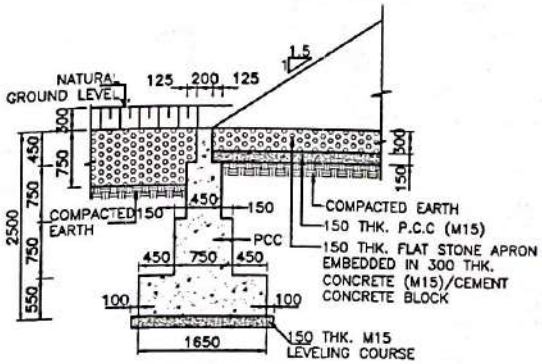
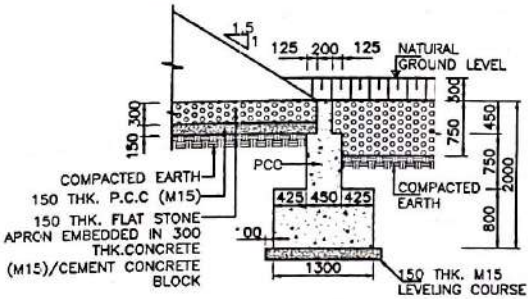
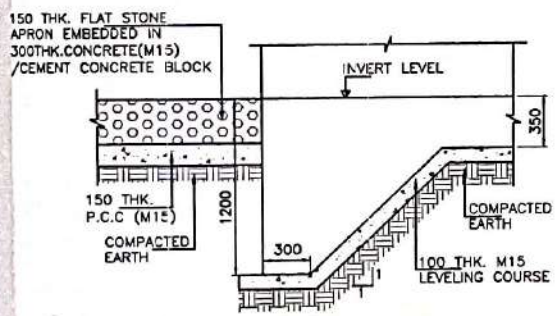


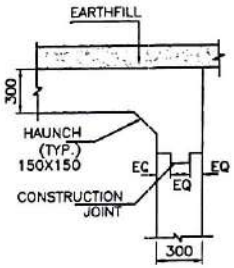
DETAIL OF CURTAIN WALL–I
(DOWN STREAM SIDE)
(SCALE 1:50)



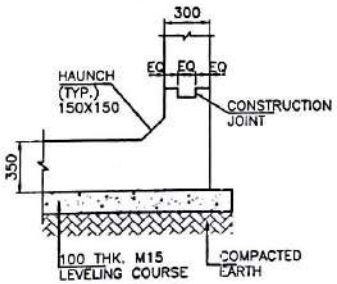
DETAIL OF CURTAIN WALL–II
(UP STREAM SIDE)
(SCALE 1:50)



DETAIL–'A'
(SCALE 1:25)

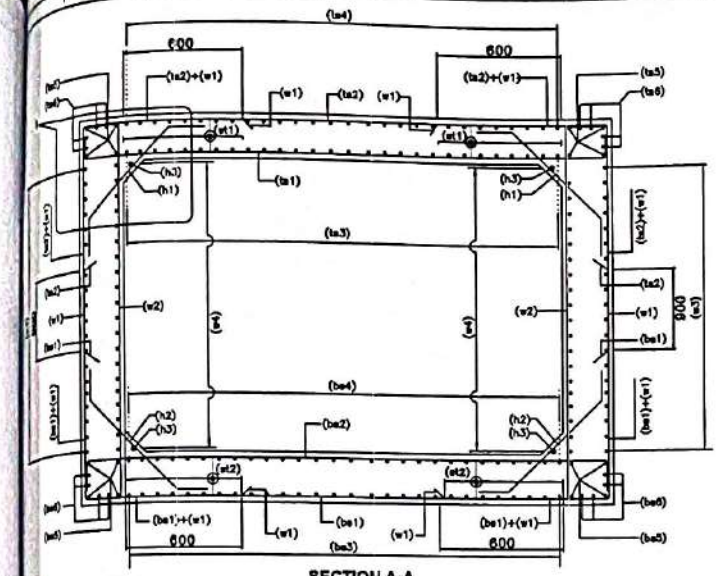


DETAIL–'B'
(SCALE 1:25)

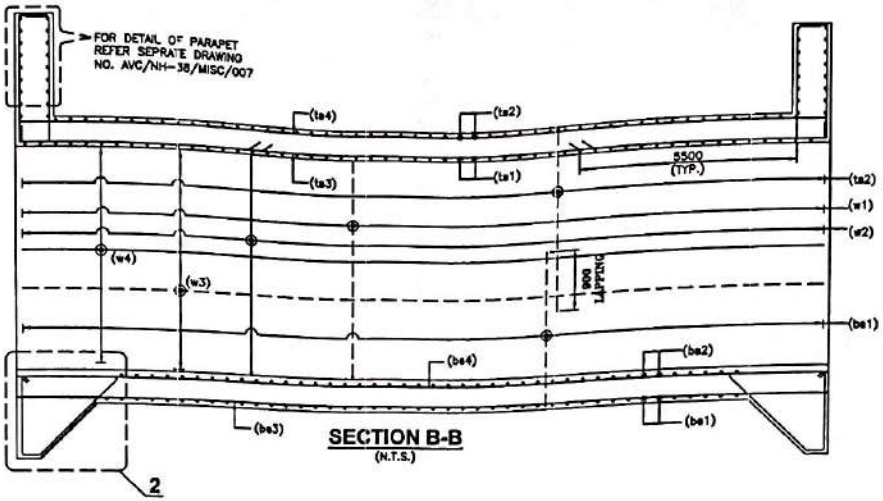


DETAIL–'C'
(SCALE 1:25)

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-6, 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+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-6)		
						DRAWING TITLE:- GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 37+721		
						Date MAR.2024 / Drw. W.P / Dsg. V.S / Chk. A.B / App. / Scale. NTS / Drawing Status.		
						Project No. / Drawing No. AVC/NH-38/BC/GAD/37+721/01	Sheet No. 03 OF 63	Rev. R0



SECTION A-A
(NTS)

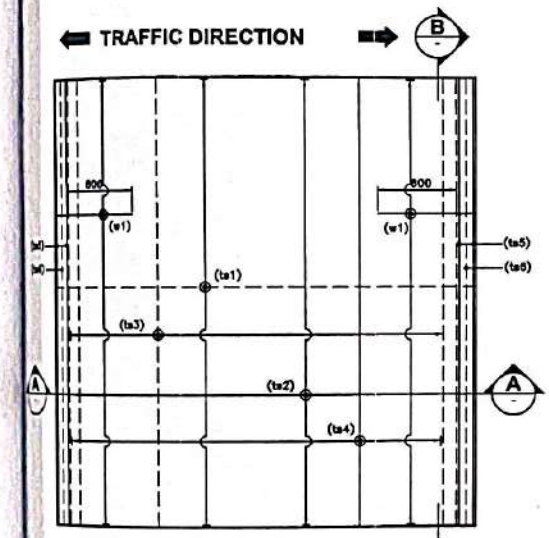


SECTION B-B
(N.T.S.)

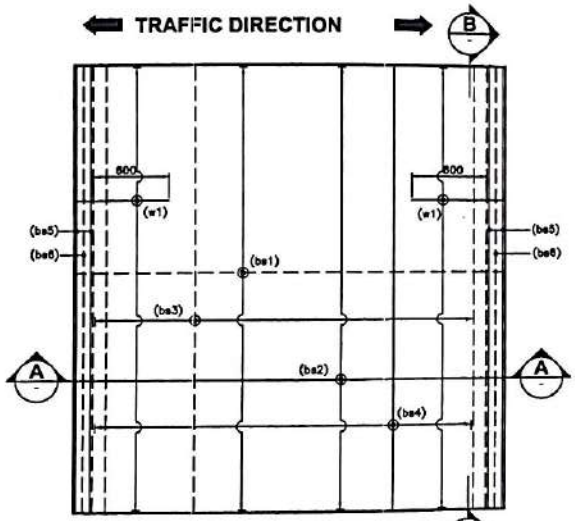
LEGEND:-	
TOP FACE BAR	
BOTTOM FACE BAR	

BOX REINF. SCHEDULE

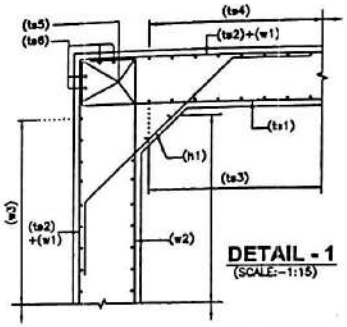
SL.NO.	BAR MARK	BAR SHAPE	DIAMETER	SPACING
1	ts1		12	160
2	ts2		10	160
3	ts3		8	200
4	ts4		10	200
5	ts5		12	2x4 Nos.
6	ts6		12	2x4 Nos.
7	w1		12	160
8	w2		12	160
9	w3		10	200
10	w4		8	200
11	bs1		10	160
12	bs2		10+10	160
13	bs3		10	200
14	bs4		8	200
15	bs5		12	2x4 Nos.
16	bs6		12	2x4 Nos.
17	h1		10	160
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



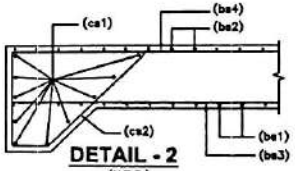
REINFORCEMENT DETAILS OF TOP SLAB
(HAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
(N.T.S.)



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.)

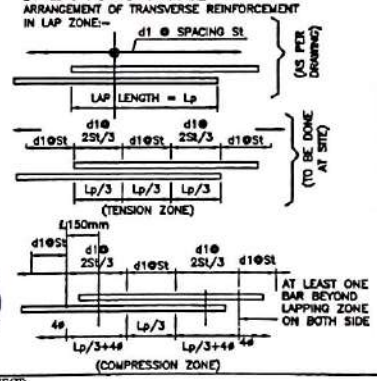
5. ANCHOURAGE LENGTH OF BOX SHALL BE TAKEN AS 40ϕ AS PER IRC:112.
7. FOR UNFAVORABLE BOND CONDITIONS THE FACTOR 40 SHOULD BE MULTIPLIED BY FACTOR OF 1.43 .
8. CENTER LINE OF OVERLAPPING BAR bs1 & ts2 IN WALL & MID HEIGHT OF WALLS ARE AT SAME POINT.
9. BAR BENDING SCHEDULE SHOULD BE STRICTLY FOLLOW DURING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

REFERENCE DRAWING:-

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

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-500D) CONFIRMING TO IS:1786 STANDARDS.
4. 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
5. OVERLAPPING FOR SPLICING OF REINFORCEMENT SHALL BE AS PER CLAUSE NO.15.2.5.
   LAP LENGTH SHALL NOT BE LESS THAN 58ϕ.
   ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:-



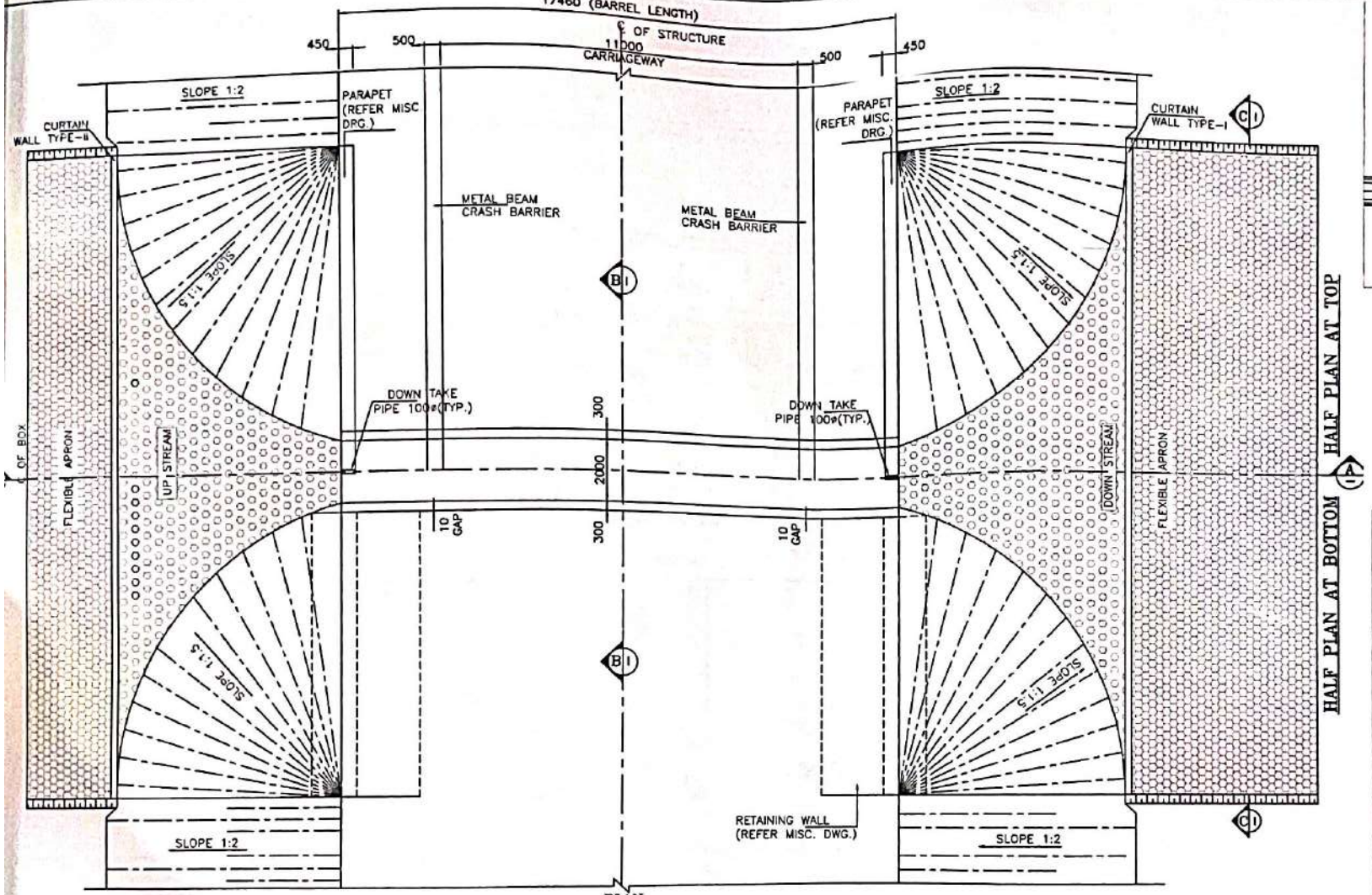
A.V. CONSTRUCTIONS New Delhi

CLIENT:	EPC CONTRACTOR	AUTHORITY'S ENGINEER	PROOF CONSULTANT:	SAFETY CONSULTANT:	DESIGN CONSULTANT:
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	KAMAC ENGINEERS Pvt.Ltd KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010		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,	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-201012 WISPL

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-6)

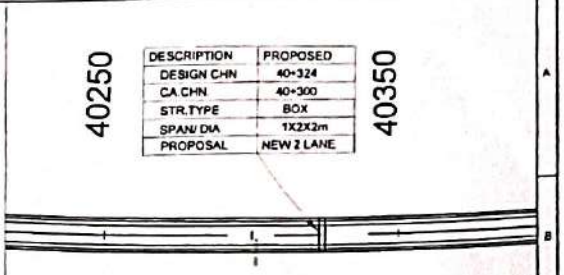
DRAWING TITLE:- REINFORCEMENT DETAIL OF BOX CULVERT AT CH. 37+721

Date	Drw.	Dsg.	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. R0



PLAN
(SCALE-1:100)

GOOD FOR CONSTRUCTION



DESCRIPTION	PROPOSED
DESIGN CHN	40+324
CA CHN	40+300
STR.TYPE	BOX
SPAN/ DIA	1X2X2m
PROPOSAL	NEW 2 LANE

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 CONJUCTION 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 SUBJECTED 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 1000MMc/c IN HORIZONTAL/VERTICAL DIRECTION SHALL BE PROVIDED UP TO 150MM ABOVE GROUND LEVEL FOR WEEP HOLES IN RETAINING WALL.
11. SBC SHALL BE 15t/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			
40+324	146.582	140.760	140.477	140.460	2.017 m	3.805m	2.135m

SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

REFERENCE DRAWINGS:–

1. REINFORCEMENT DETAILS OF BOX CULVERT AVC/NH–38/BC/REINF./40+324/01

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.

NT:
NATIONAL HIGHWAYS & ASTRUCTURE DEVELOPMENT CORPORATION LTD.

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

AUTHORITY ENGINEER
ALMONDZ GLOBAL INFRA CONSULTANT LIMITED JV WITH AYOLEZA CONSULTANT PRIVATE LIMITED.
C/O SAMANTA SAHA, 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

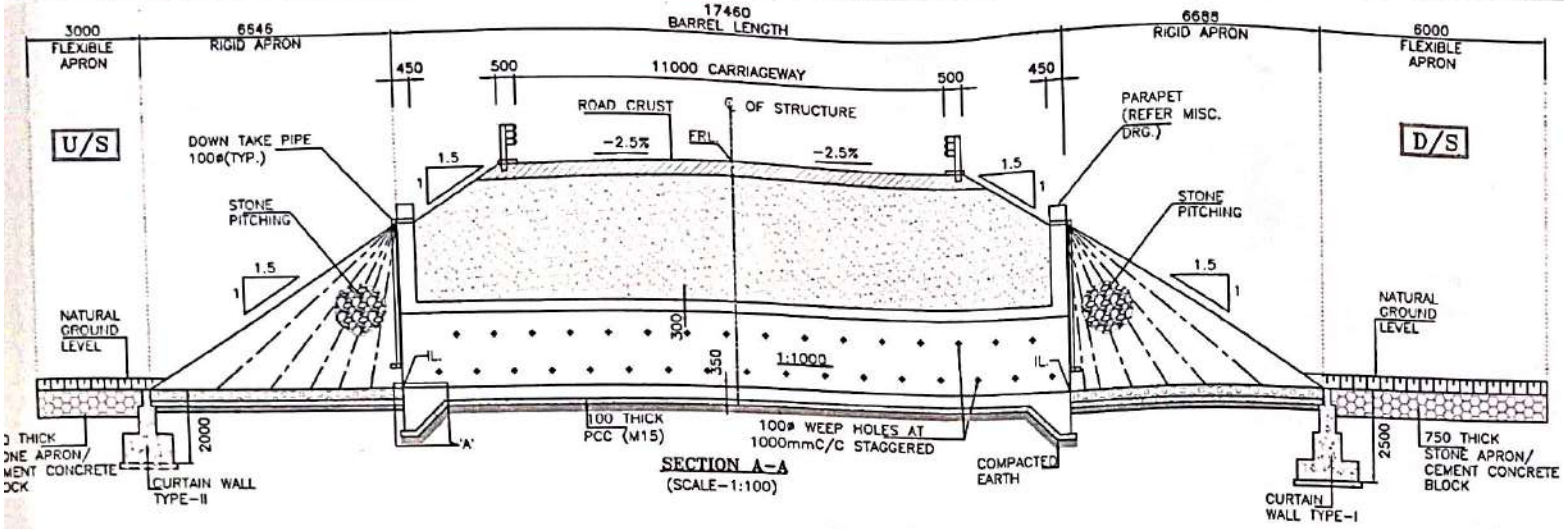
SAFETY CONSULTANT:
DESIGN AID
PLOT NO.54, 3rd FLOOR(FRONT), MASOODPUR DAIRY FARM,VASANT KUNJ, NEW DELHI-110070,

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

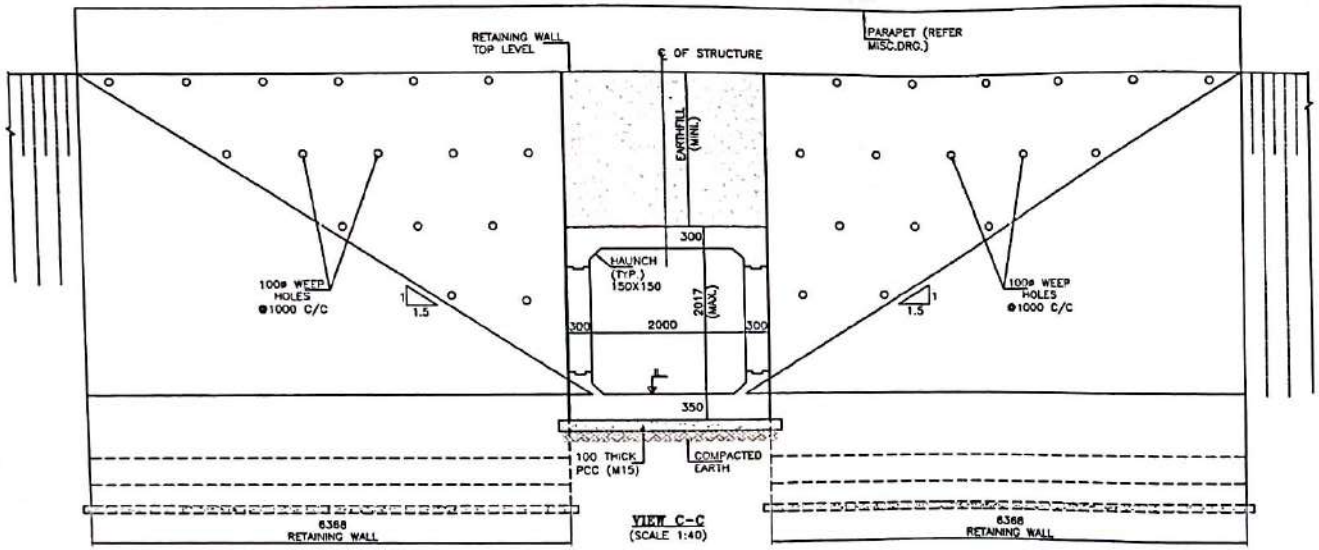
PROJECT:
WIDENING&IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 37+150 (GOLAI GOAN) TO KM 47+862 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (2-LANE-PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE (PACKAGE 5)

DRAWING TITLE:
GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 40+324

Date	Drw	Dsg.	Chk	App	Scale	Drawing Status
JAN.2024	W P	V S	A B		NTS	
Project No.	Drawing No AVC/NH-38/BC/GAD/40+324/01				Sheet No 01 OF 03	Rev. NO



SECTION A-A
(SCALE-1:100)



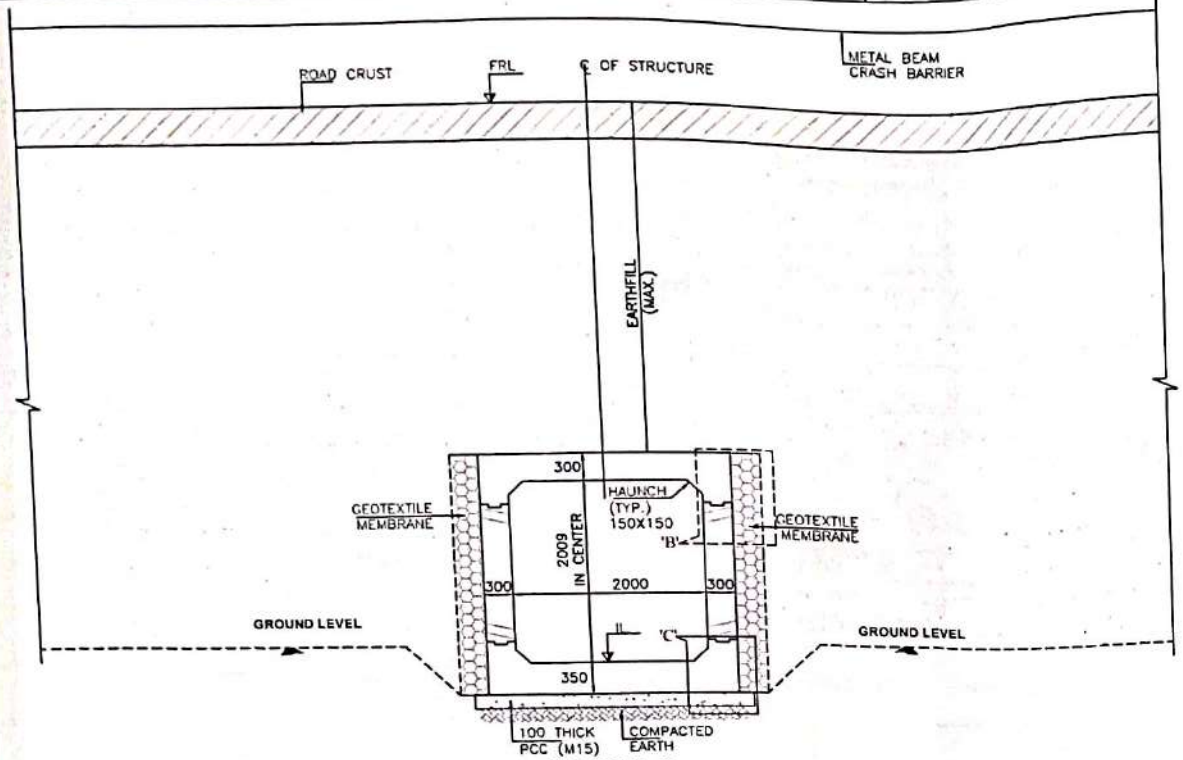
VIEW C-C
(SCALE 1:40)

GOOD FOR CONSTRUCTION

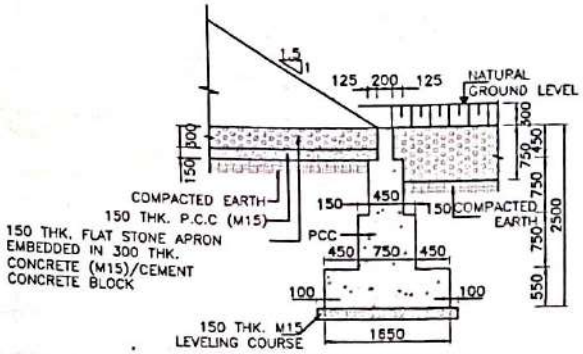
SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

DESIGN AID, NEW DELHI

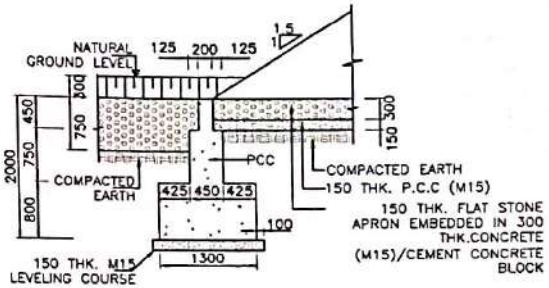
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	ALMONDZ GLOBAL INFRA CONSULTANT LIMITED (JV WITH AYOLEPZA COVIL PRIVATE LIMITED. C/O JAYANTA SAIKIA SARBAJANIK NAMGHAR, BORBIL NO.2, DIGBOI, TINSUKIA, ASSAM-786171	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,	A.V. CONSTRUCTION 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 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 9)		
						DRAWING TITLE: GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 40+324		
						Date JAN.2024 / Drw. W.P / Dsg V.S / Chk. A.D / App. / Scale NTS	Drawing Status	
						Project No. / Drawing No. AVC/NH-38/BC/GAD/40+324/01	Sheet No. 01 OF 02	Rev. R0



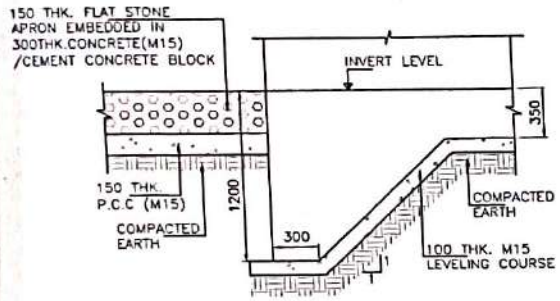
SECTION B-B
(SCALE 1:40)



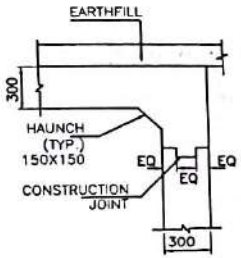
DETAIL OF CURTAIN WALL-I
(DOWN STREAM SIDE)
(SCALE 1:50)



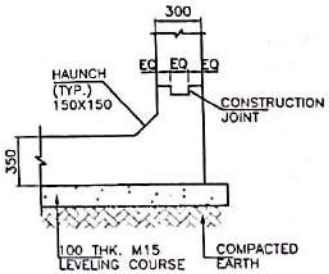
DETAIL OF CURTAIN WALL-II
(UP STREAM SIDE)
(SCALE 1:50)



DETAIL-'A'
(SCALE 1:25)



DETAIL-'B'
(SCALE 1:25)



DETAIL-'C'
(SCALE 1:25)

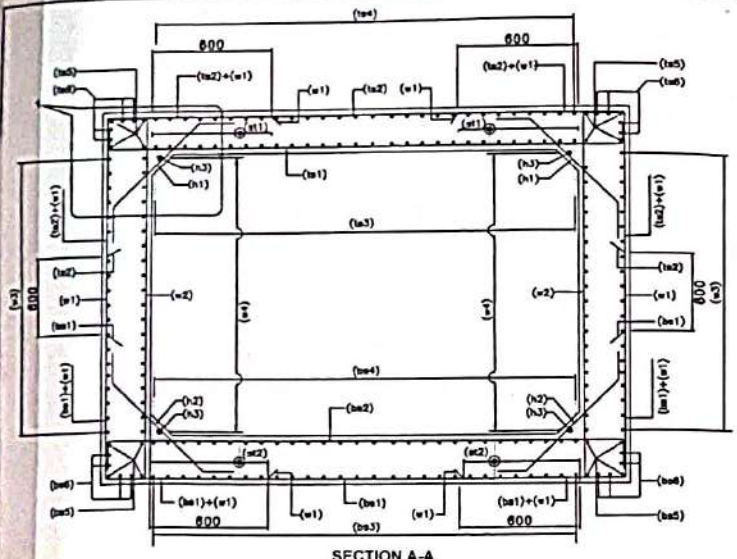
GOOD FOR CONSTRUCTION

SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

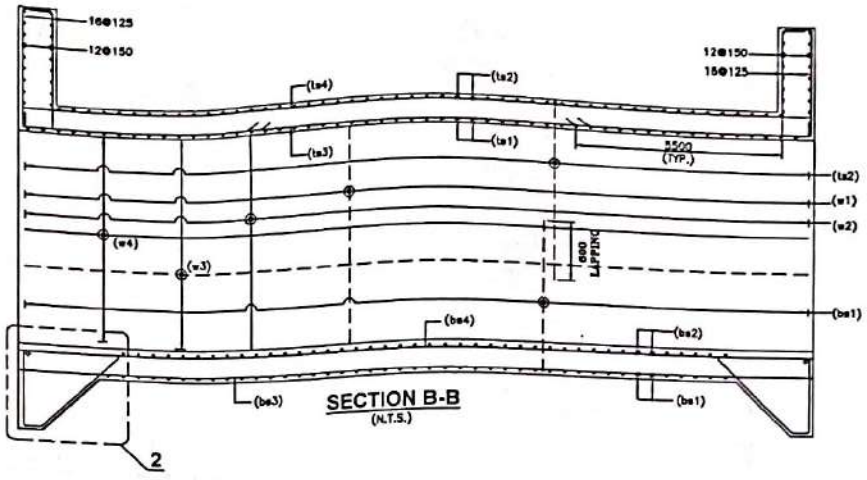
DESIGN AID, NEW DELHI

CLIENT:	EPC CONTRACTOR	AUTHORITY ENGINEER	PROOF CONSULTANT:	SAFETY CONSULTANT:	DESIGN CONSULTANT:	PROJECT:
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	KAMAC ENGINEERS Pvt.Ltd KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	ALMONDZ GLOBAL INFRA CONSULTANT LIMITED IN JV WITH ARCOLEZZA CONSULTING PRIVATE LIMITED. C/O GAUTA SAMIR, SARBAJANN NAMGHAR, DOPRC 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,	A.K. CONSTRUCTION Winst Infra Solution Pvt. Ltd. OFFICE: F-6, ISHAAN CORPORATE TOWER, PLOT NO-C-23, SECTOR-13, VASUNDHRA GHAZIABAD, U.P-201012	WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (GOLAI GOAN) TO KM 47+662 (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 40+324						
Date JAN.2024	Drw W.P	Dsg V.S	Chk A.D	App.	Scale NTS	Drawing Status
Project No.	Drawing No. AVG/NH-38/BC/GAD/40+324/01				Sheet No. 02 OF 03	Rev. 00



SECTION A-A
(NTS)

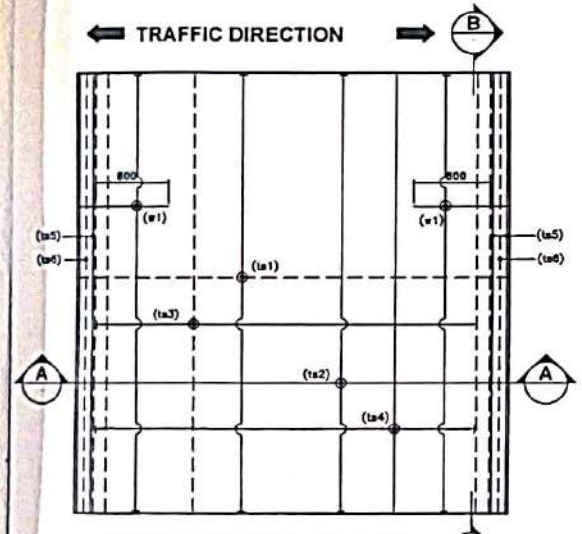


SECTION B-B
(N.T.S.)

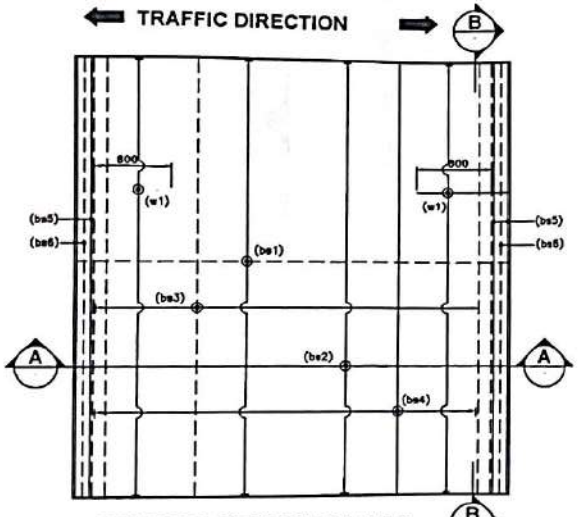
LEGEND:-	
TOP FACE BAR	———
BOTTOM FACE BAR	- - - -

BOX REINF. SCHEDULE

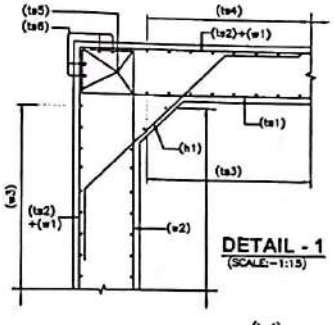
SL.NO.	BAR MARK	BAR SHAPE	DIAMETER	SPACING
1	ts1		12	160
2	ts2		10	160
3	ts3		8	200
4	ts4		10	200
5	ts5		12	2x4 Nos.
6	ts6		12	2x4 Nos.
7	w1		10	160
8	w2		10	160
9	w3		10	200
10	w4		8	200
11	bs1		10	160
12	bs2		10+8	160
13	bs3		10	200
14	bs4		8	200
15	bs5		12	2x4 Nos.
16	bs6		12	2x4 Nos.
17	h1		10	160
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



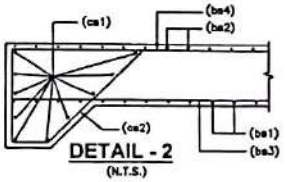
REINFORCEMENT DETAILS OF TOP SLAB
(HAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
(N.T.S.)



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



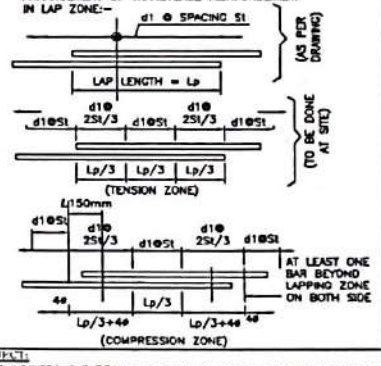
DETAIL - 1
(SCALE:-1:15)



DETAIL - 2
(N.T.S.)

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) CONFIRMING TO IS:1786 STANDARDS.
4. 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
5. OVERLAPPING FOR SPLICING OF REINFORCEMENT SHALL BE AS PER CLAUSE NO.15.2.5.
   LAP LENGTH SHALL NOT BE LESS THAN 58ø.
   ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:-
6. ANCHOURAGE LENGTH OF BOX SHALL BE TAKEN AS 40ø AS PER IRC:112.
7. FOR UNFAVORABLE BOND CONDITIONS THE FACTOR 40 SHOULD BE MULTIPLIED BY FACTOR OF 1.43 .
8. CENTER LINE OF OVERLAPPING BAR bs1 & ts2 IN WALL & MID HEIGHT OF WALLS ARE AT SAME POINT.
9. 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.



SAFETY AUDIT
(As per Article 10.1 of EPC Agreement)

REFERENCE DRAWING:-

1. GENERAL ARRANGEMENT DRAWING.
   AVC/NH-36/BOX/GAD/40+324/01

GOOD FOR CONSTRUCTION

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

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

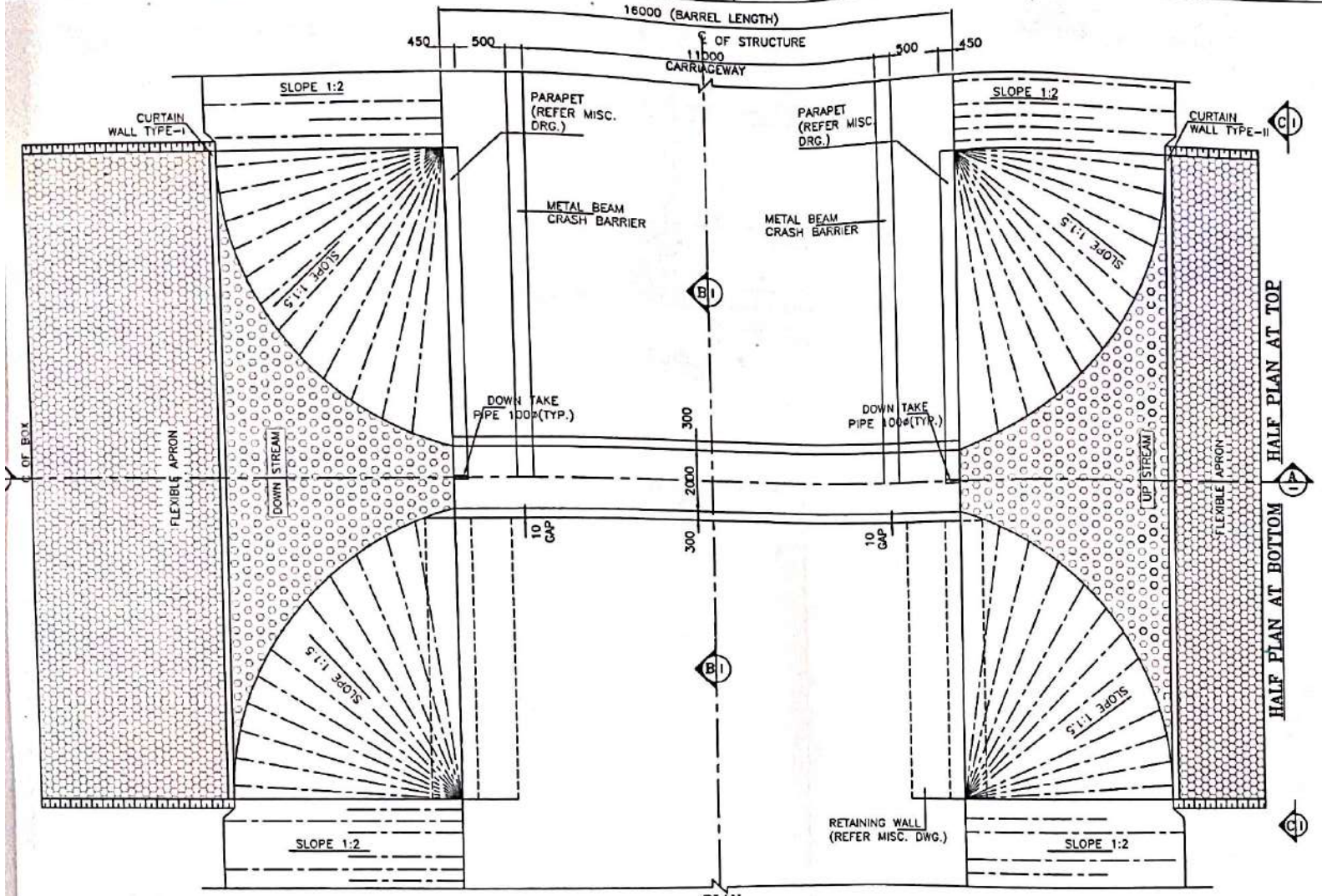
SAFETY CONSULTANT:
DESIGN AID
PLOT NO.54, 3rd FLOOR(FRONT), MASOODPUR DAIRY FARM, VASANT KUNJ, NEW DELHI-110070,

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

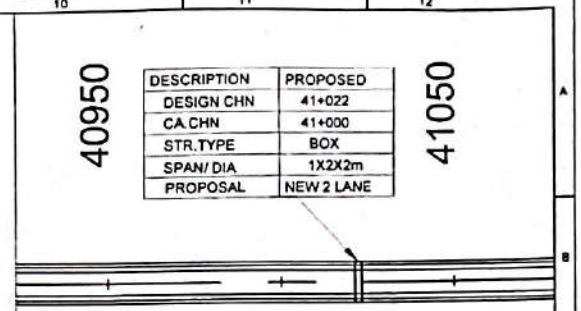
PROJECT:
WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+158 (GOLAI GOAN) TO KM 47+882 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (2-LANE-PS) OF NH-36 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE (PACKAGE-I)

DRAWING TITLE:- REINFORCEMENT DETAIL OF BOX CULVERT AT CH. 40+324

Date	Drw.	Dsg.	Chk.	App.	Scale	Drawing Status.
JAN.2024	W.P	V.S	A.B		NTS	
Project No.	Drawing No. AVC/NH-36/BOX/REIN.40+324/01				Sheet No. 01 OF 01	Rev 00



PLAN
(SCALE-1:100)



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:-

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 CONJUCTION 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 SUBJECTED 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 1000MMc/c IN HORIZONTAL/VERTICAL DIRECTION SHALL BE PROVIDED UP TO 150MM ABOVE GROUND LEVEL FOR WEEP HOLES IN RETAINING WALL.
11. SBC SHALL BE 18t/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			
41+022	146.264	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:-
1. REINFORCEMENT DETAIL OF BOX CULVERT AVC/NH-38/BC/REINF./41+022/01

DESIGN AID, NEW DELHI

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
ALMONDZ GLOBAL INFRA CONSULTANT LIMITED IN JV WITH AVOLEEZA CONSULTANTS PRIVATE LIMITED.
C/O JAYANTA BAIKIA, SARBAJANIN NANGHAR, BORBILNO 2, DIGBOI, TINSUKIA, ASSAM-786171

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

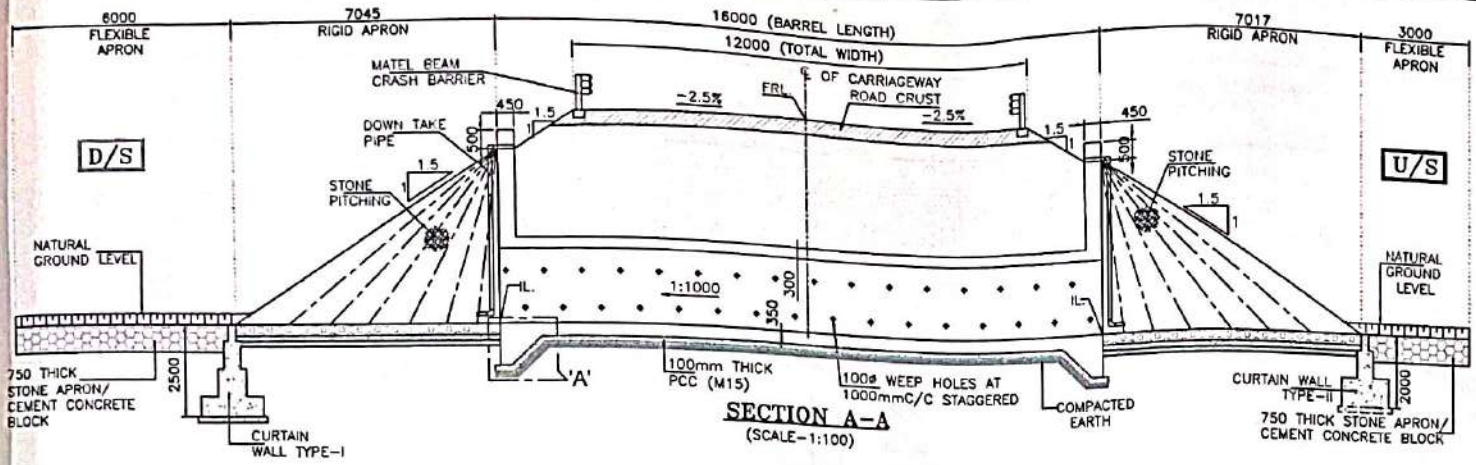
SAFETY CONSULTANT:
DESIGN AID
PLOT NO.54, 3rd FLOOR(FRONT), MASOODPUR DAIRY FARM,VASANT KUNJ, NEW DELHI-110070,

DESIGN CONSULTANT:
A.K. CONSTRUCTION
Winst Infra Solution Pvt. Ltd.
OFFICE: F-8, ISHAAN CORPORATE TOWER, PLOT NO-C-23, SECTOR-12, VASUNDHRA GHAZIABAD, U.P-201012

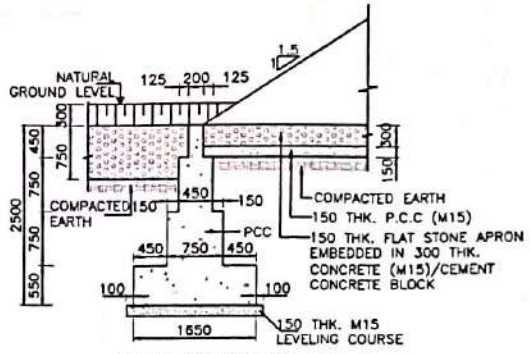
PROJECT:
WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (GOLAI GOAN) TO KM 47+882 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE (PACKAGE-II)

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

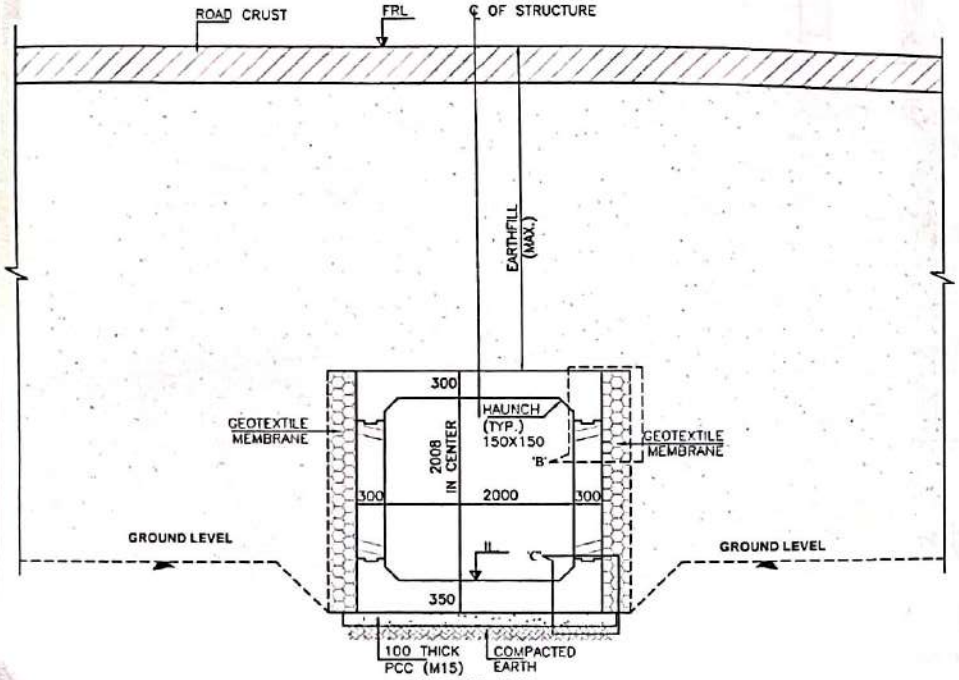
Date JAN.2024	Drw. W.P	Dsg V.S	Chk A.B	App.	Scale: NTS	Drawing Status
Project No.	Drawing No. AVC/NH-38/BC/GAD/41+022/01				Sheet No. 01 OF 03	Rev R0



SECTION A-A
(SCALE-1:100)



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



SECTION B-B
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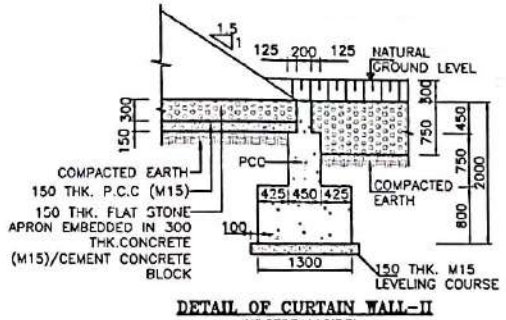


DETAIL OF CURTAIN WALL-II
(UP STREAM SIDE)
(SCALE 1:50)

GOOD FOR CONSTRUCTION

SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

DESIGN AID, NEW DELHI

CLIENT:	EPC CONTRACTOR	AUTHORITY'S ENGINEER	PROOF CONSULTANT:	SAFETY CONSULTANT:	DESIGN CONSULTANT:
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	ALMONDZ GLOBAL INFRA CONSULTANT LIMITED IN ASSOCIATION WITH AYOLEZA CONSULTANTS PRIVATE LIMITED. C/O JAYANTA SAIKIA, SARBANIN NAMGHAR, BORBIL NO.2, DIGBOI, TINSUKIA, ASSAM 786171	CREATIVE ENGINEERING SERVICES OFFICE NO. 630, 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.	A.V. CONSTRUCTION Winst Infra Solution Pvt. Ltd. OFFICE: F-6, ISHAN CORPORATE TOWER, PLOT NO-C-23, SECTOR-13, VASUNDHRA GHAZIABAD, U.P. 201012

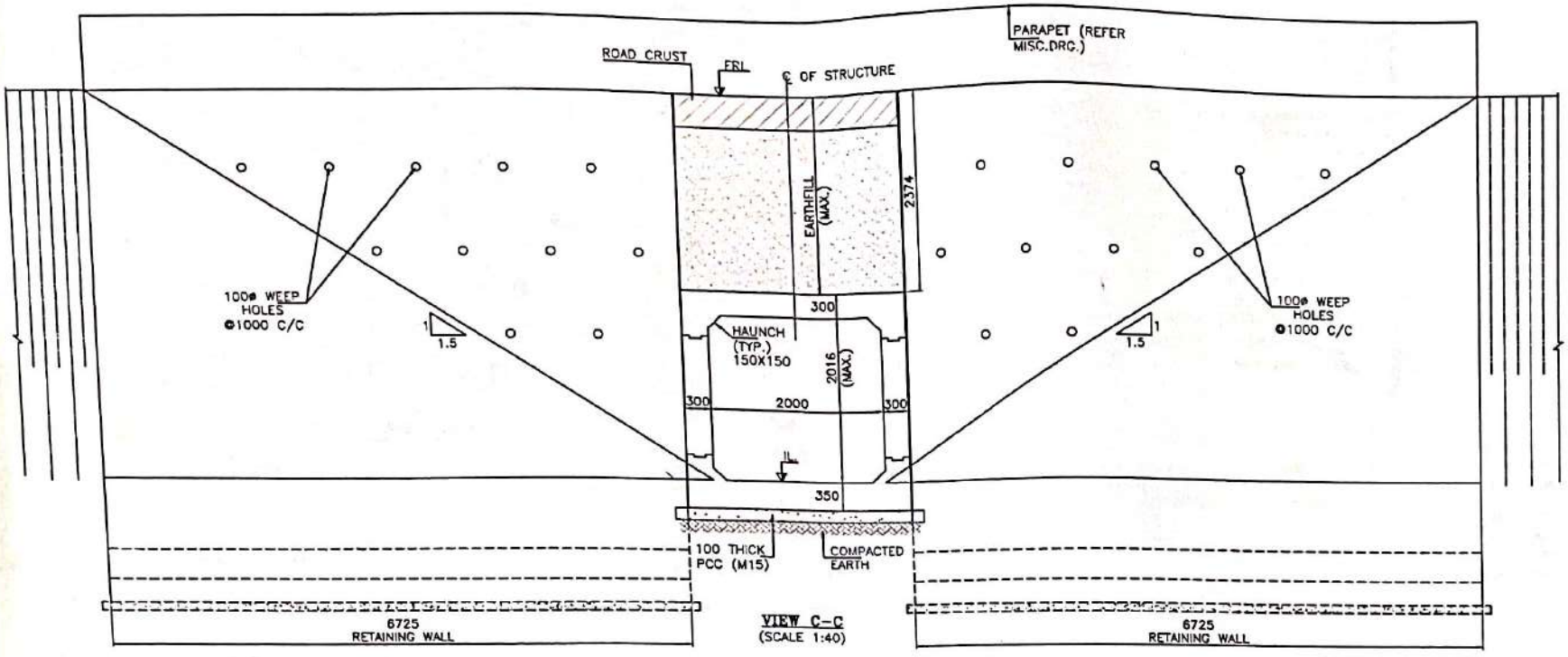
Dib.-Ledo Section

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 (BROWNFIELD AND GREEN FIELD) (2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE (PACKAGE 5)

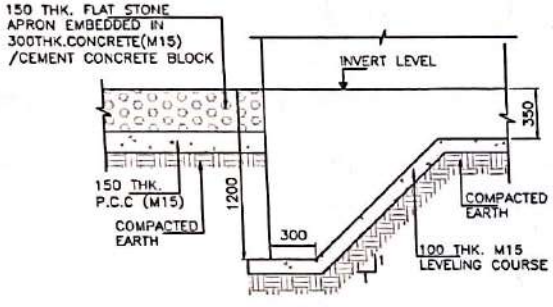
DRAWING TITLE: GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 41+022

Date	Drw	Dsg	Chk	Apr	Scale	Drawing Status
JAN.2024	W.P	V.S	A.B		NTS	

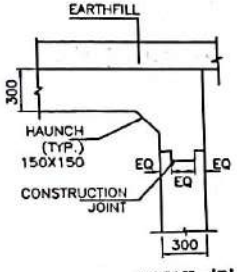
Project No.	Drawing No.	Sheet No.	Rev.
	AVC/NH-38/BC/GADM1+022/01	82 OF 83	00



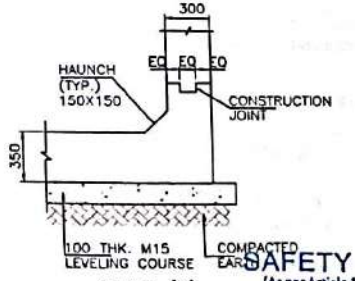
VIEW C–C
(SCALE 1:40)



DETAIL–'A'
(SCALE 1:25)



DETAIL–'B'
(SCALE 1:25)



DETAIL–'C'
(SCALE 1:25)

GOOD FOR CONSTRUCTION

SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)
DESIGN AID, NEW DELHI

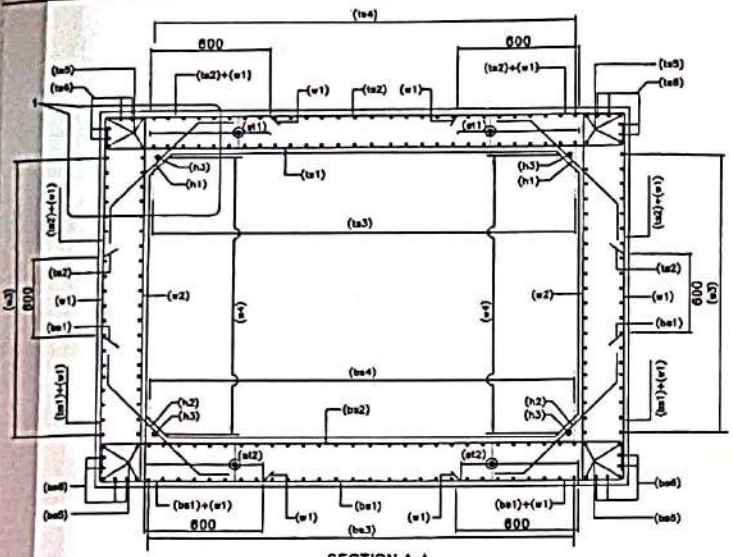
CLIENT:	EPC CONTRACTOR	AUTHORITY'S ENGINEER	PROOF CONSULTANT:	SAFETY CONSULTANT:	DESIGN CONSULTANT:
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	KAMAC ENGINEERS Pvt Ltd KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	ALMONDZ GLOBAL INFRA CONSULTANT LIMITED IN JV WITH AYOLEZA CONSULTANCY PRIVATE LIMITED. C/O DATA DISAIRIA, SARBANANI NAMGHAR, BORBIL-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,	A.V. CONSTRUCTION Winst Infra Solution Pvt. Ltd. OFFICE: F-6, 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+662 (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)

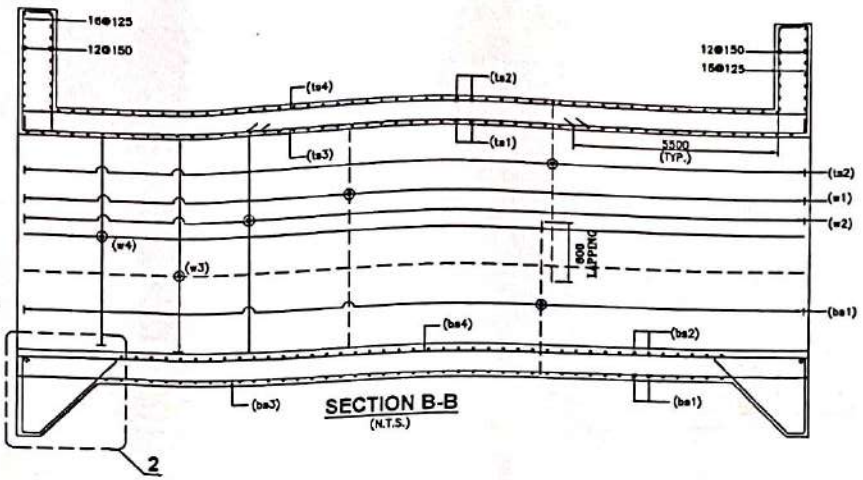
DRAWING TITLE: GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 41+022

Date	Drw.	Chg.	Chk.	App.	Scale	Drawing Status
JAN.2024	W.P	V.S	A.B		NTS	

Project No:	Drawing No.	Sheet No.	Rev.
	AVC/NH-38/BC/GAD/41+022/01	83 OF 83	R0



SECTION A-A
(NTS)



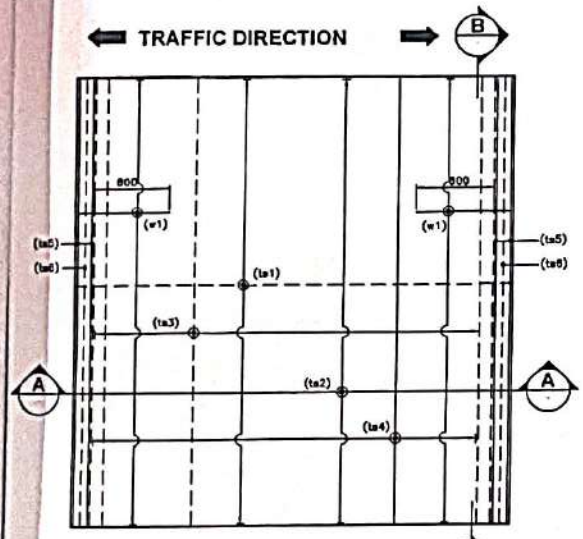
SECTION B-B
(N.T.S.)

LEGEND:-	
TOP FACE BAR	———
BOTTOM FACE BAR	- - - - -

BOX REINF. SCHEDULE

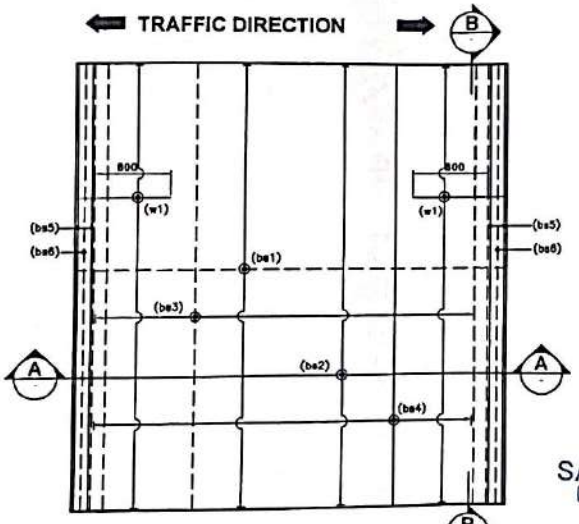
SL.NO.	BAR MARK	BAR SHAPE	DIAMETER	SPACING
1	ts1		12	160
2	ts2		10	160
3	ts3		8	200
4	ts4		10	200
5	ts5		12	2x4 Nos.
6	ts6		12	2x4 Nos.
7	w1		10	160
8	w2		10	160
9	w3		10	200
10	w4		8	200
11	bs1		10	160
12	bs2		10+8	160
13	bs3		10	200
14	bs4		8	200
15	bs5		12	2x4 Nos.
16	bs6		12	2x4 Nos.
17	h1		10	160
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

TRAFFIC DIRECTION

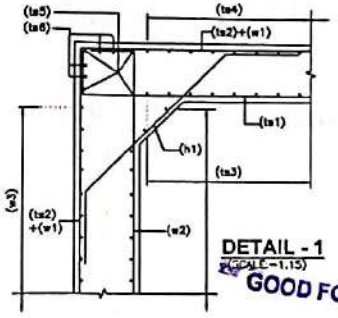


REINFORCEMENT DETAILS OF TOP SLAB
(HAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
(N.T.S.)

TRAFFIC DIRECTION

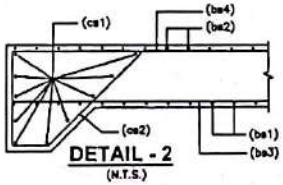


REINFORCEMENT DETAILS OF BOTTOM SLAB
(HAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
(N.T.S.)



DETAIL - 1
(SCALE-1.15)

GOOD FOR CONSTRUCTION



DETAIL - 2
(N.T.S.)

SAFETY AUDIT
(As per Article 10.1 of EPC Agreement)

DESIGN AID, NEW

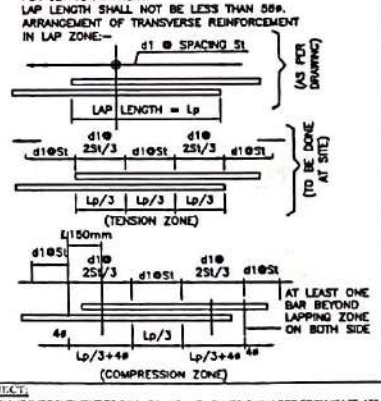
8. ANCHOURAGE LENGTH OF BOX SHALL BE TAKEN AS 40ϕ AS PER IRC:112.
7. FOR UNFAVOROABLE BOND CONDITIONS THE FACTOR 40 SHOULD BE MULTIPLIED BY FACTOR OF 1.43 .
8. CENTRE LINE OF OVERLAPPING BAR bs1 & ts2 IN WALL & WING HEIGHT OF WALLS ARE AT SAME POINT.
9. BAR BENDING SCHEDULE SHOULD BE STRICTLY FOLLOW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

REFERENCE DRAWING:-

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

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) CONFIRMING TO IS:1786 STANDARDS.
4. 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
5. OVERLAPPING FOR SPLICING OF REINFORCEMENT SHALL BE AS PER CLAUSE NO.15.2.2.
   LAP LENGTH SHALL NOT BE LESS THAN 58ϕ.
   ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:-



CLIENT:	EPC CONTRACTOR	AUTHORITY ENGINEER	PROOF CONSULTANT:	SAFETY CONSULTANT:	DESIGN CONSULTANT:
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	KAMAC ENGINEERS Pvt Ltd KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	ALMONDZ GLOBAL INFRA CONSULTANT LIMITED IN JV WITH AYOLEZA CONSULTANCY PRIVATE LIMITED. C/O JAYANTA SAIKIA, SARBAJANIN NAMGHAR, BORGIL NO.2, DIGBOI, TINSUKIA, ASSAM-786171	CREATIVE ENGINEERING SERVICES OFFICE NO: 620, SIGNATURE GLOBAL MALL, SECTOR-3, VAISHALI, GHAZIABAD, U P-201010	DESIGN DESIGN AID PLOT NO.54, 3rd FLOOR(FRONT), MASOODPUR DAIRY FARM,VASANT KUNJ, NEW DELHI-110070,	A.V. CONSTRUCT Winst Infra Solution Pvt. Ltd. OFFICE: F-6, ISHAAN CORPORATE TOWER, PLOT NO-C-23,SECTOR-13, VASUNDHRA GHAZIABAD, U.P.-201012

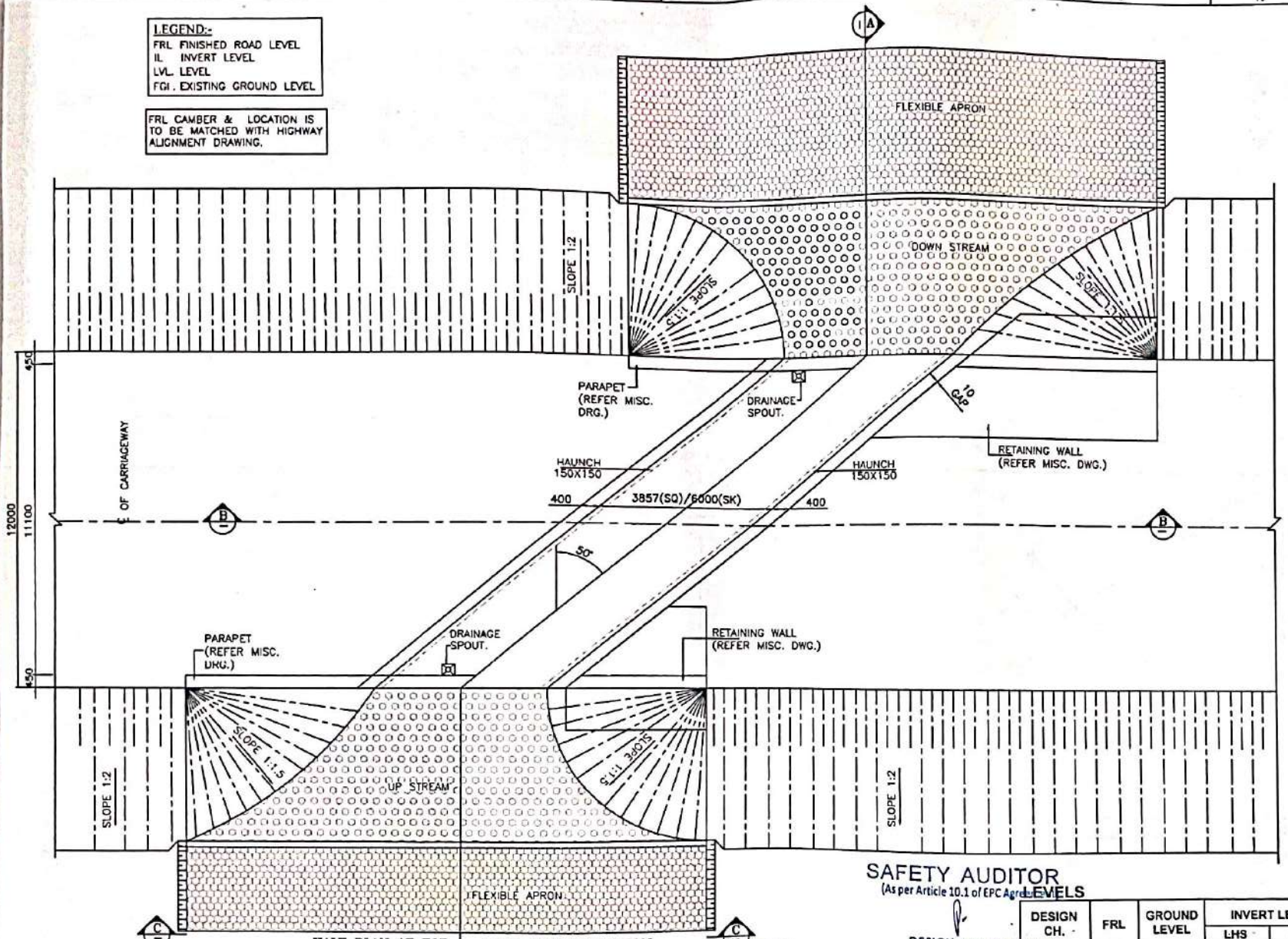
PROJECT: WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 37+180 (GOLAI GOAN) TO KM 47+683 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE (PACKAGE-II)

DRAWING TITLE:- REINFORCEMENT DETAIL OF BOX CULVERT AT CH. 41+022

Date	Drw.	Dsg.	Chk.	App.	Scale	Drawing Status
JAN.2024	W.P	V.S	A.B		NTS	
Project No. -	Drawing No. AVC/NH-38/BOX/REIN/41+022/01					Sheet No. 01 OF 01 / Rev. R0

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.



HALF PLAN AT TOP HALF PLAN AT BOTTOM

PLAN
(SCALE-1:100)

GOOD FOR CONSTRUCTION

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

SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

DESIGN AID, NEW DELHI

LEVELS

DESIGN CH.	FRL	GROUND LEVEL	INVERT LEVEL		VERTICAL CLEARANCE (MAX.)	EARTH FILL (MAX.)	EARTH FILL (MIN.)
			LHS	RHS			
41+481	146.086	141.020	140.226	140.732	4.012m	0.954m	0.815m

CLIENT:
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.

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

AUTHORITY ENGINEER
ALMONDZ GLOBAL INFRA CONSULTANT LIMITED IN JV WITH AYOLEEZA CONSULTANT PRIVATE LIMITED.
C/O JAYANTA SAHA, SARBA JANINI NAMGHAR, BORBARI RD 2, DIGBOI TINSUKIA, ASSAM-786171

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

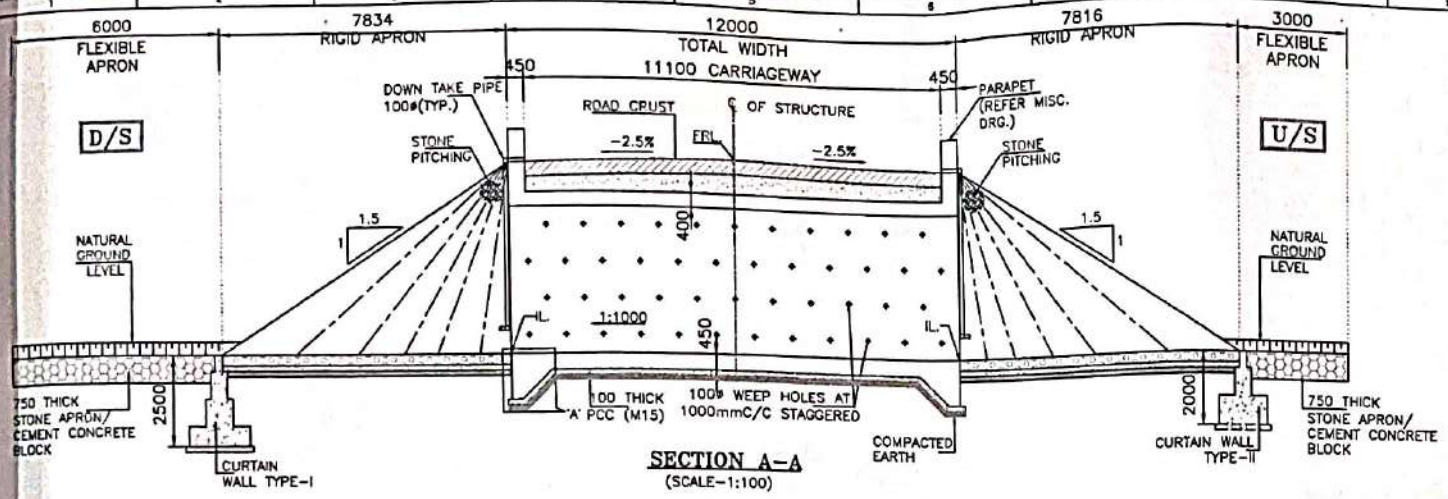
SAFETY CONSULTANT:
DESIGN AID
PLOT NO.54, 3rd FLOOR(FRONT), MASOODPUR DAIRY FARM, VASANT KUNJ, NEW DELHI-110070,

DESIGN CONSULTANT:
A.V. CONSTRUCTION
Winst Infra Solution Pvt. Ltd.
OFFICE F-8, ISHAAN CORPORATE TOWER, PLOT NO-G-23, SECTOR-13, VASUNDHRA, GHAZIABAD, U.P-201012

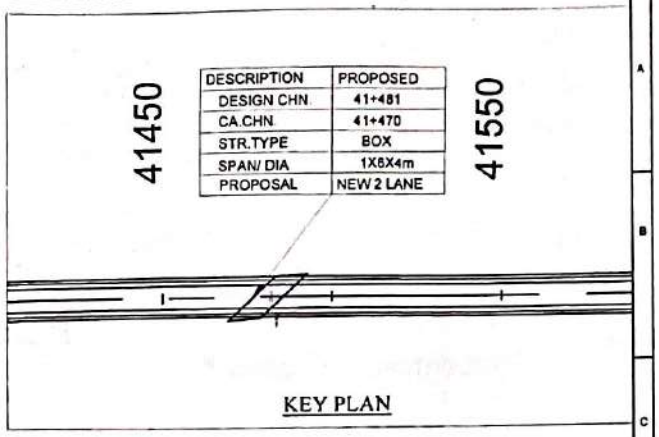
PROJECT:
WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+160 (DOLAI GOAN) TO KM 47+862 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE (PACKAGE 8)

DRAWING TITLE:-
GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 41+481

Date JAN.2024	Drw W.P	Dsg V.S	Chk. A.B	App	Scale NTS	Drawing Status
Project No.	Drawing No. AVC/NH-38/BOX/GAD/41+481/01				Sheet No. 1 OF 3	Rev. R0

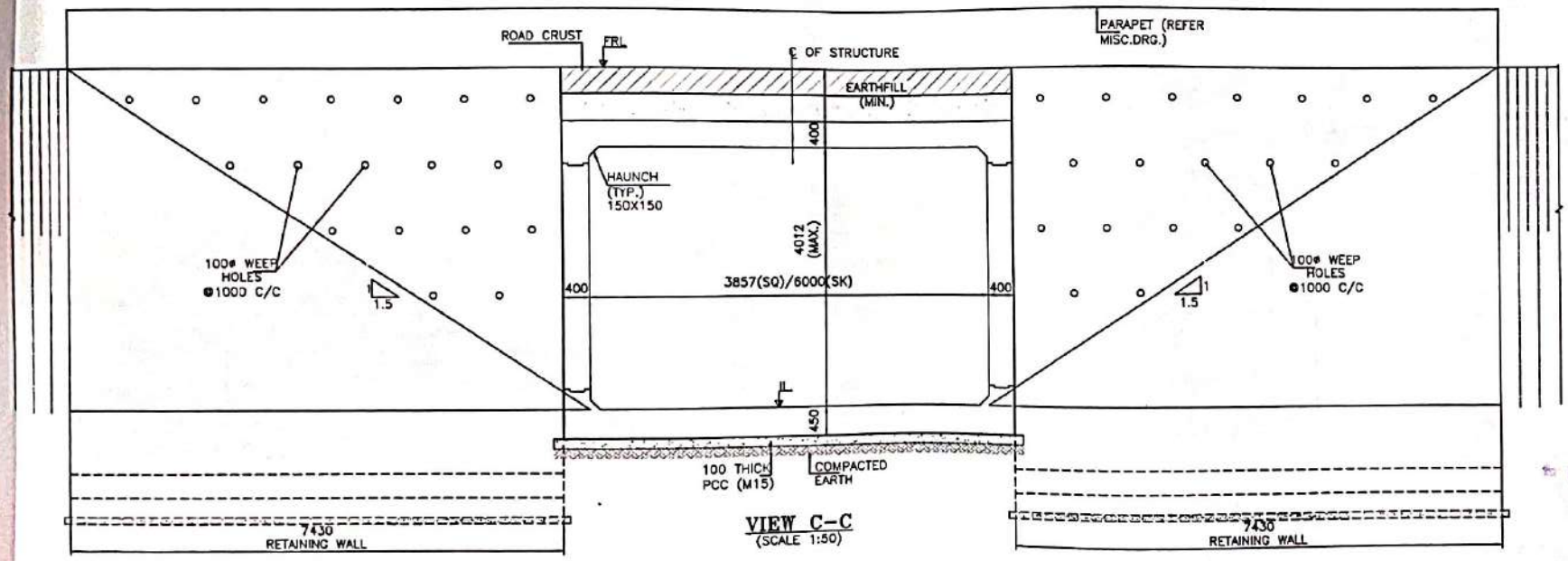


SECTION A-A
(SCALE-1:100)



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

KEY PLAN



VIEW C-C
(SCALE 1:50)

GOOD FOR CONSTRUCTION

SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

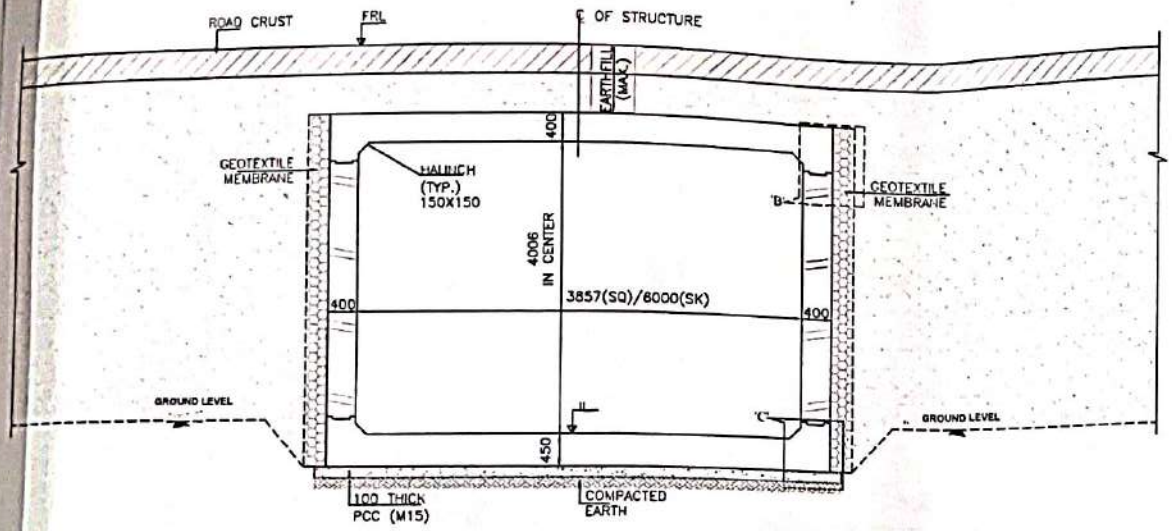
DESIGN AID, NEW DELHI

CLIENT:	EPC CONTRACTOR	AUTHORITY'S ENGINEER	PROOF CONSULTANT:	SAFETY CONSULTANT:	DESIGN CONSULTANT:
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	KAMAC ENGINEERS Pvt Ltd KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	ALMONDZ GLOBAL INFRA CONSULTANT LIMITED IN JV WITH AYOZ REZA CONSULTANT PRIVATE LIMITED. C/O JAYANTA SAHA, BARBAJANIN NAMGHAR, BORBIL NO.2, DIGBOI, TINSURIA, 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,	A.V. CONSTRUCTION 1st Floor, WZ-1240, Palam Extension, Besco 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 WISPL

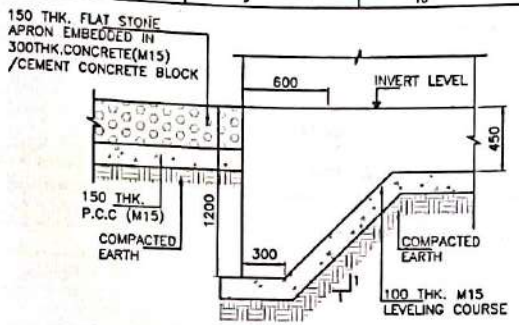
PROJECT:
WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (GOLAI GOAN) TO KM 47+882 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (2-LANE+PS) OF NH-38 IN TINSURIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE (PACKAGE 9)

DRAWING TITLE:
GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 41+481

Date	Drw.	Dsg.	Chk.	App.	Scale	Drawing Status.
JAN.2024	W.P	V.S	A.B		MTS	
Project No.	Drawing No.				Sheet No.	Rev
	AVC/NH-38/BOX/GAD/41+481/01				2 OF 3	R0

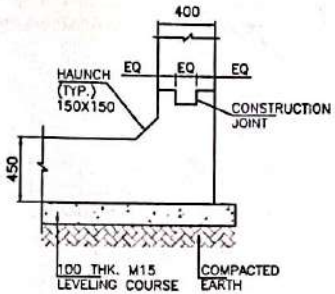


SECTION B–B
(SCALE 1:50)

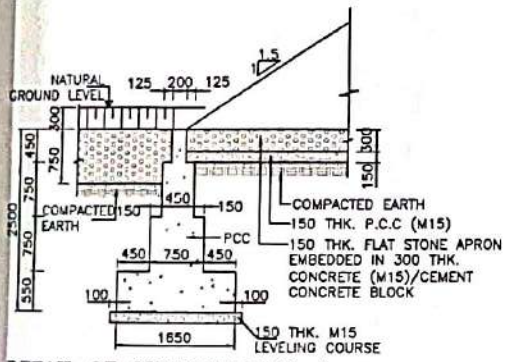


DETAIL–'A'
(SCALE 1:25)

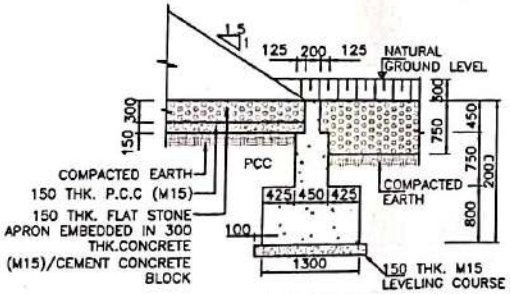
GOOD FOR CONSTRUCTION



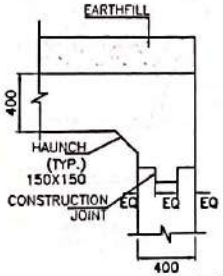
DETAIL–'C'
(SCALE 1:25)



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



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



DETAIL–'B'
(SCALE 1:25)

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 CONJUCTION 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 – Fe500.
5. 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.
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 SUBJECTED TO CHANGE AS PER SITE CONDITION AND DETAILED DESIGN.
9. BACKFILL TO BE DONE AND COMPACTED FROM BOTH SIDE SIMULTANEOUSLY.
10. 600MM THICK. FILTER MATERIAL BEHIND RETAINING WALL SHALL BE LAID AS PER APPENDIX 6 OF IRC 78–2014.
11. 50MM THICK CEMENT CONCRETE WEARING COAT SHALL BE PROVIDED.
12. 100MM DIA P.V.C. PIPE AT SPACING 1000MMc/c IN HORIZONTAL/VERTICAL DIRECTION SHALL BE PROVIDED UP TO 150MM ABOVE GROUND LEVEL FOR WEEP HOLES IN RETAINING WALL.
13. SBC SHALL BE 10t/m². AND SAME SHALL BE ENSURED AT SITE BY ANY SUITABLE METHOD.
14. 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.
15. CHOOSE ANY SUITABLE METHOD TO ACHIEVE THE REQUIRED SBC AS PER SITE.
16. THE EXPOSURE CONDITION IS MODERATE.

SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

DESIGN AID, NEW DELHI

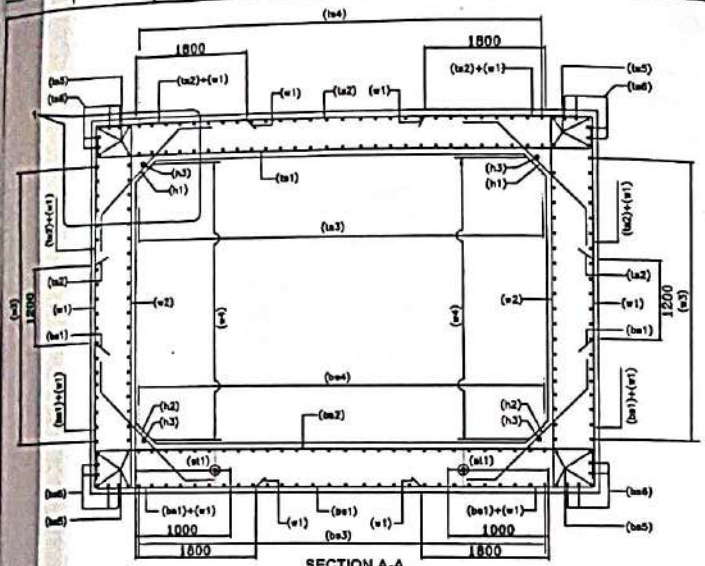
CLIENT:	EPC CONTRACTOR	AUTHORITY'S ENGINEER	PROOF CONSULTANT:	SAFETY CONSULTANT:	DESIGN CONSULTANT:
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	KAMAC ENGINEERS Pvt.Ltd KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	ALMONDZ GLOBAL INFRA CONSULTANT LIMITED IN JV WITH SYOLEEZA CONSULTAST PRIVATE LIMITED. C/O VAYANTA SAIKIA, SARBAJANIK NAMGHAR, BORBIL 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), MASOOPUR DAIRY FARM,VASANT KUNJ, NEW DELHI-110070,	A.V. CONSTRUCTION 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 GOANO TO KM 47+662 (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)

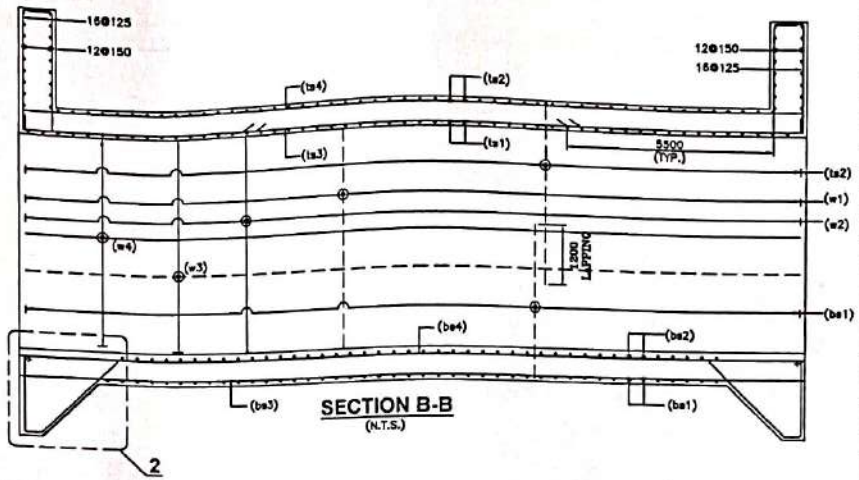
DRAWING TITLE: GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 41+461

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/NH-38/BOX/GAD/41+461/01	3 OF 3	R0



SECTION A-A
(NTS)



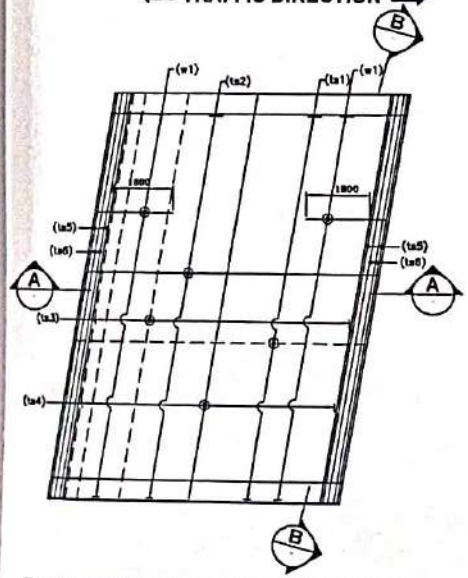
SECTION B-B
(N.T.S.)

BOX REINF. 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

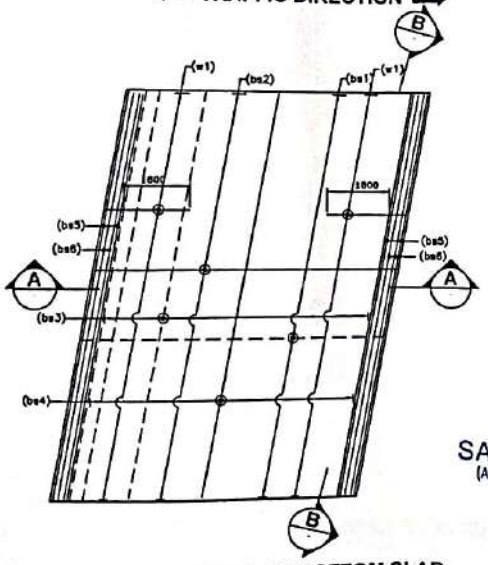
LEGEND:-	
TOP FACE BAR	———
BOTTOM FACE BAR	- - - -

TRAFFIC DIRECTION

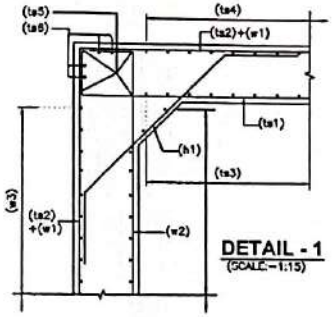


REINFORCEMENT DETAILS OF TOP SLAB
(HAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
(N.T.S.)

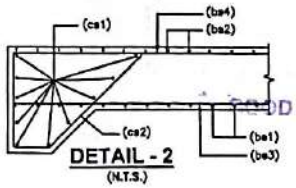
TRAFFIC DIRECTION



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



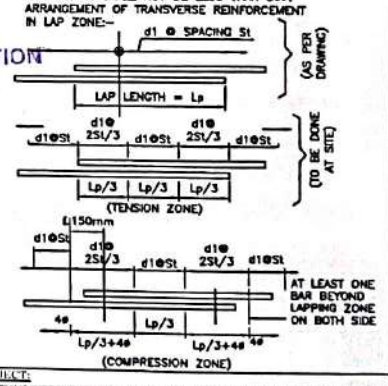
DETAIL - 1
(SCALE:-1:15)



DETAIL - 2
(N.T.S.)

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) CONFIRMING TO IS:1786 STANDARDS.
4. 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
5. OVERLAPPING FOR SPLICING OF REINFORCEMENT SHALL BE AS PER CLAUSE NO.15.2.5.
   LAP LENGTH SHALL NOT BE LESS THAN 56ø.
   ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:-



6. ANCHOURAGE LENGTH OF BOX SHALL BE TAKEN AS 40ø AS PER IRC:112.
7. FOR UNFAVORABLE BOND CONDITIONS THE FACTOR 40 SHOULD BE MULTIPLIED BY FACTOR OF 1.43 .
8. CENTER LINE OF OVERLAPPING BAR bs1 & ts2 IN WALL & MID HEIGHT OF WALLS ARE AT SAME POINT.
9. 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.

GOOD FOR CONSTRUCTION

SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)
DESIGN AID, NEW DELHI

REFERENCE DRAWING:-

1. GENERAL ARRANGEMENT DRAWING.
   AVC/NH-38/BOX/GAD/41+481/01

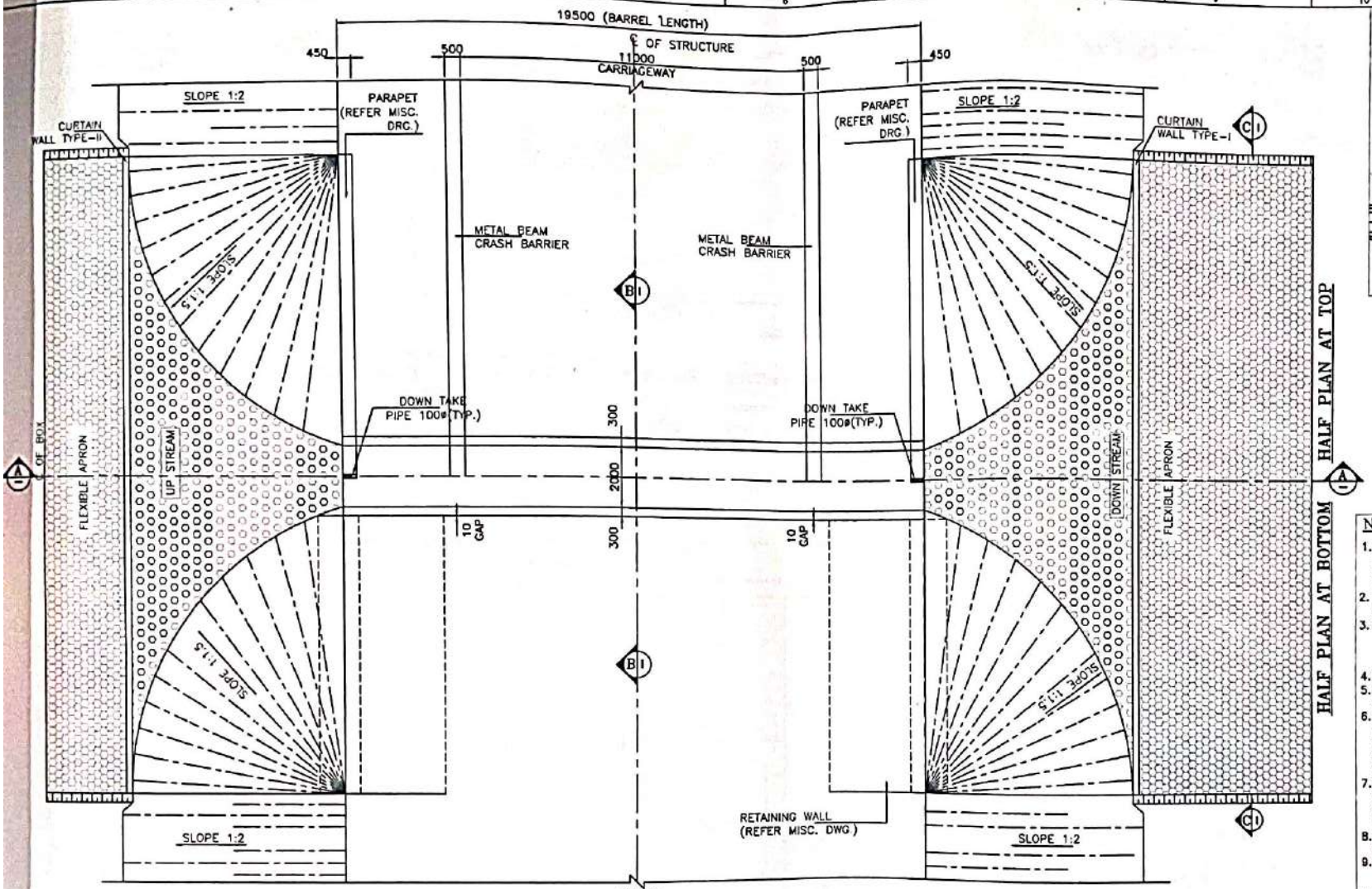
CONSTRUCTION
NEW DELHI

CLIENT:	EPC CONTRACTOR	AUTHORITY'S ENGINEER	PROOF CONSULTANT:	SAFETY CONSULTANT:	DESIGN CONSULTANT:
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	KAMAC ENGINEERS Pvt Ltd KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	ALMONDZ GLOBAL INFRA CONSULTANT LIMITED, IN JV WITH AYOLEEZA CONSULTANT PRIVATE LIMITED. C/O JAYANTA SAIKIA, SARBAJANI NAMGHAR, BORBIL NO.2, DIGBOI, TINSUKIA, ASSAM-786171	CREATIVE ENGINEERING SERVICES OFFICE NO: 620, SIGNATURE GLOBAL MALL, SECTOR-3, VAISHALI, GHAZIABAD, U.P-201010	DESIGN DESIGN AID PLOT NO.54, 3rd FLOOR(FRONT), MASOODPUR DAIRY FARM, VASANT KUNJ, NEW DELHI-110070.	A.V. CONSTRUCTION 1st Floor, WZ-1010, Palam Extension, Near Ashram Wali 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

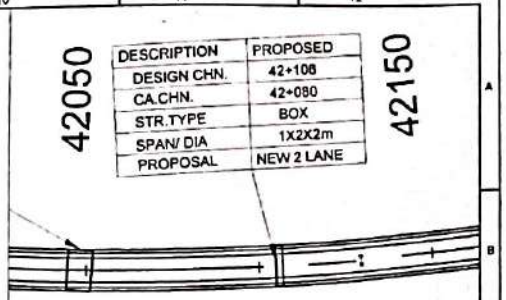
PROJECT: WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (GOLAI GOAN) TO KM 47+662 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE (PACKAGE-5)

DRAWING TITLE: REINFORCEMENT DETAIL OF BOX CULVERT AT CH. 41+481

Date	Drw.	Dsg.	Chk.	App.	Scale	Drawing Status.
JAN 2024	W.P	V.S	A.B		NTS	
Project No.	Drawing No. AVC/NH-38/BOX/REIN.41+481/01				Sheet No. 01 OF 01	Rev R0



PLAN
(SCALE-1:100)



DESCRIPTION	PROPOSED
DESIGN CHN.	42+106
CA.CHN.	42+080
STR.TYPE	BOX
SPAN/ DIA	1X2X2m
PROPOSAL	NEW 2 LANE

KEY PLAN

GOOD FOR CONSTRUCTION

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 CONJUCTION 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 SUBJECTED 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 1000MMc/c IN HORIZONTAL/VERTICAL DIRECTION SHALL BE PROVIDED UP TO 150MM ABOVE GROUND LEVEL FOR WEEP HOLES IN RETAINING WALL.
11. SBC SHALL BE 18t/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 ESBC AS PER SITE.

LEVELS

DESIGN CH.	FRL	GROUND LEVEL	INVERT LEVEL		VERTICAL CLEARANCE (MAX.)	EARTHFILL (MAX.)	EARTHFILL (MIN.)
			LHS	RHS			
42+106	147.277	140.692	140.411	140.392	2.019 m	4.566m	2.320m

SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

REFERENCE DRAWINGS:
1. REINFORCEMENT DETAIL OF BOX CULVERT AVC/NH-38/BC/REINF./42+106/01

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

AUTHORITY'S ENGINEER
ALMONDZ GLOBAL INFRA CONSULTANT LIMITED(AGICL) WITH AYOLEEZA CONSULTANCY PRIVATE LIMITED.
C/O JAYANTA SAGGIA, 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.

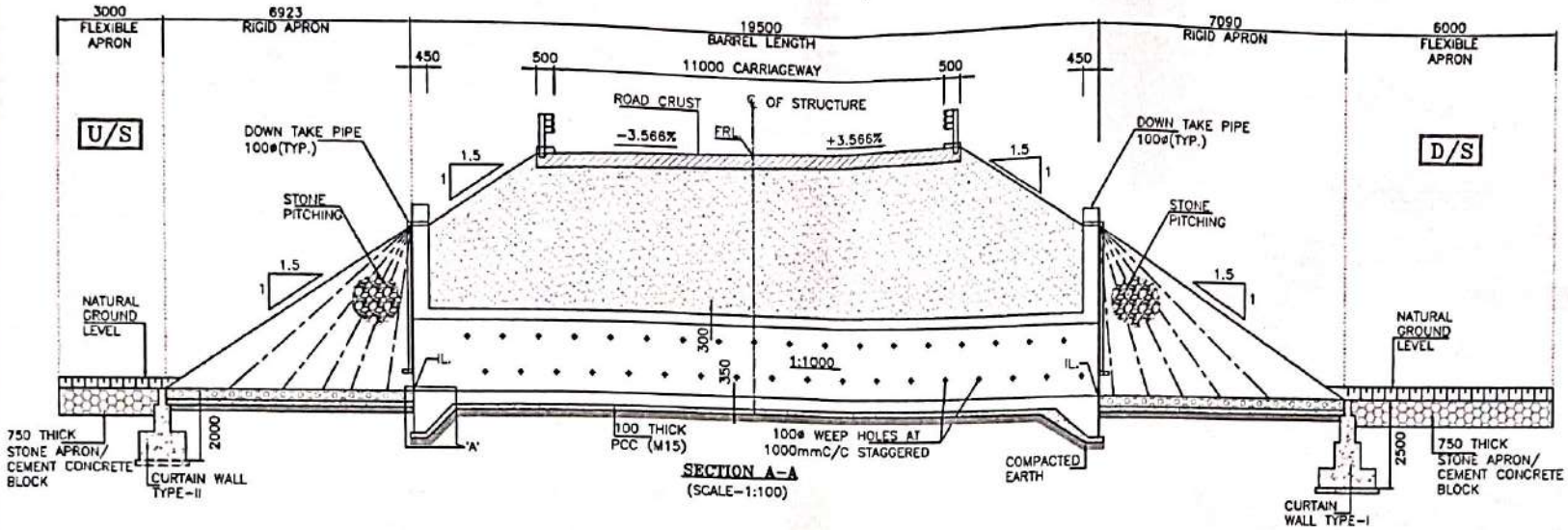
DESIGN CONSULTANT:
A.V. CONSTRUCTION
1st Floor, WZ-1240, Palam Extension Bosco Ashram Wali Gali, New Delhi 110045
WISPL
Winst Infra Solution Pvt. Ltd.
OFFICE: F-8, ISHAN CORPORATE TOWER, PLOT NO-C-23, SECTOR-13, VASUNDHRA GHAZIABAD, U.P. 201012

PROJECT:
WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+180 (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)

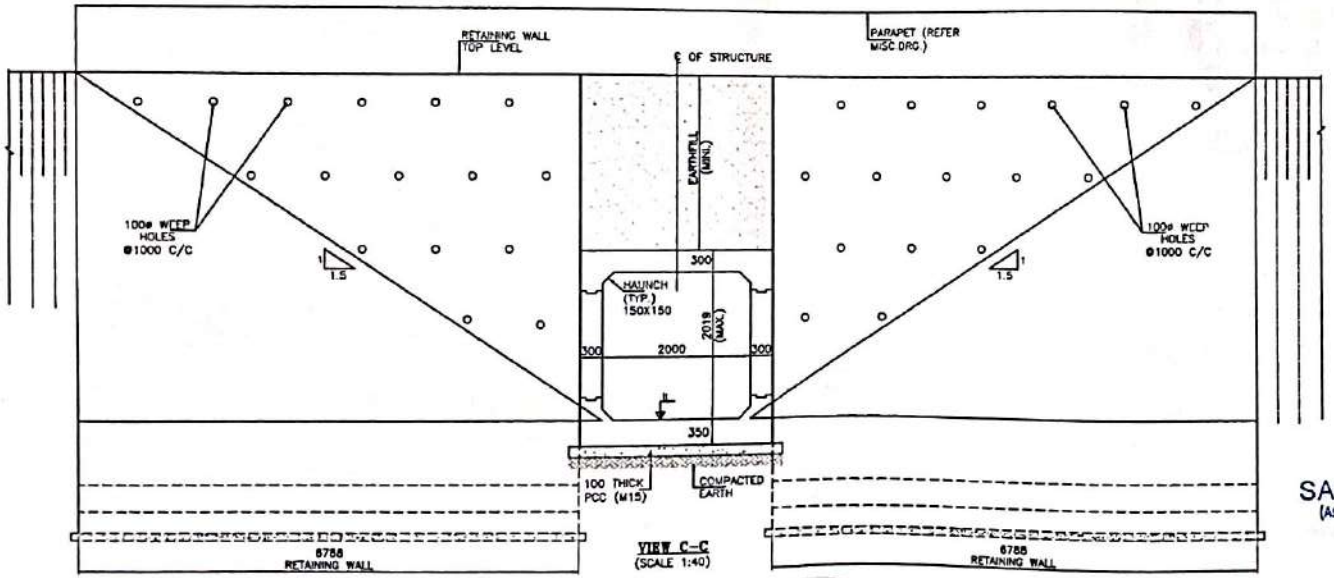
DRAWING TITLE:
GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 42+106

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/NH-38/BC/GAD/42+106/01	81 OF 83	00



SECTION A-A
(SCALE-1:100)



VIEW C-C
(SCALE 1:40)

SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)
DESIGN AID, NEW DELHI

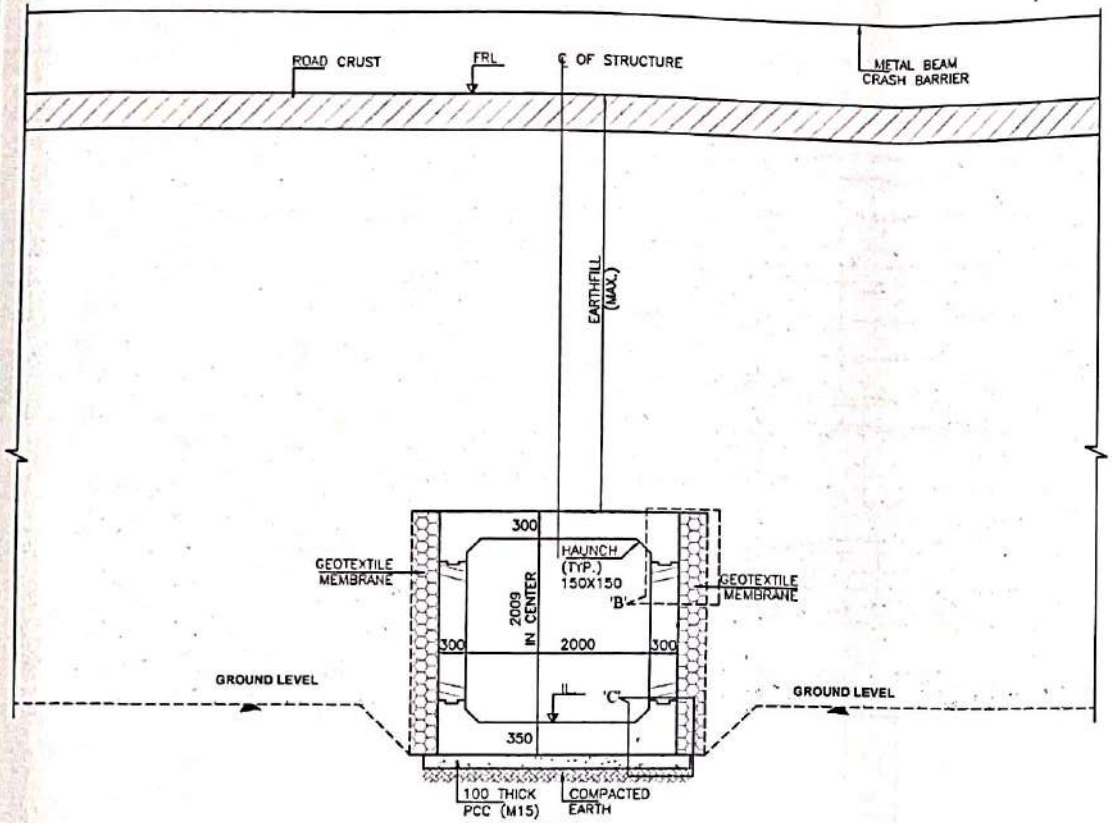
GOOD FOR CONSTRUCTION

CLIENT:	EPC CONTRACTOR	AUTHORITY'S ENGINEER	PROOF CONSULTANT:	SAFETY CONSULTANT:	DESIGN CONSULTANT:
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	KAMAC ENGINEERS Pvt.Ltd KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	ALMONDZ GLOBAL INFRA CONSULTANT LIMITED IN JV WITH AYOLEEZA CONSULTANT PRIVATE LIMITED. C/O JAYANTA SAHOO, SASBAJAKIN NAHGHAR, BORBIL NO-2, DIGBOI, TINSUKIA, ASSAM-786171	CREATIVE ENGINEERING SERVICES OFFICE NO: 620, SIGNATURE GLOBAL MALL, SECTOR-3, VAISHALI, GHAZIABAD, U.P-201010	DESIGN DESIGN AID PLOT NO.54, 3rd FLOOR(FRONT), MASOODPUR DAIRY FARM, VASANT KUNJ, NEW DELHI-110070,	A.V. CONSTRUCTION 1st Floor, WZ-1240, Palam Extension, Bosco Ashram Wali 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-201012 W I S P L

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-II)

DRAWING TITLE: GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 42+106

Date	Drw.	Dsg.	Chk.	App	Scale	Drawing Status
JAN 2024	W.P	V.S	A.D		NTS	
Project No.	Drawing No.				Sheet No.	Rev.
	AVCIN-38/BC/GADN2+106/01				02 OF 03	R0



SECTION B-B
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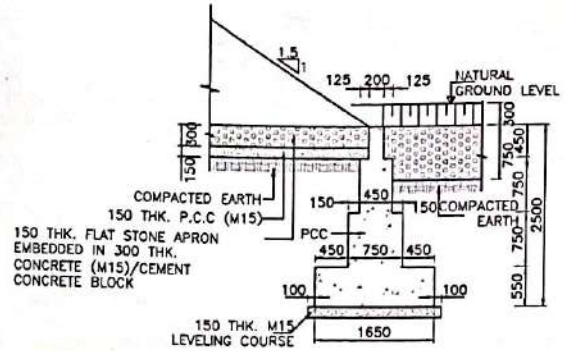
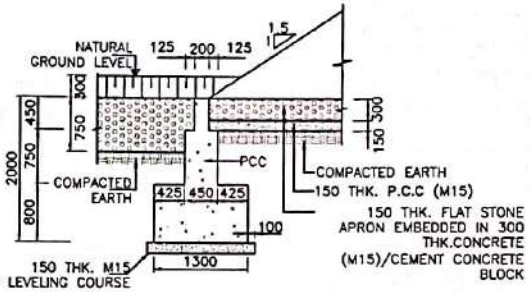
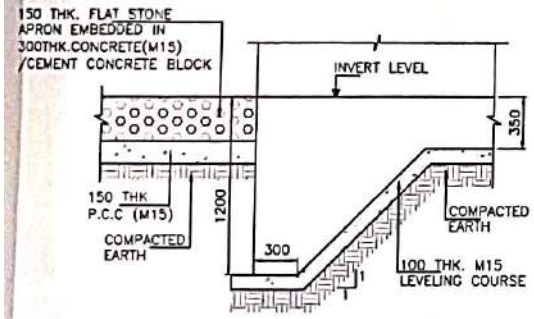


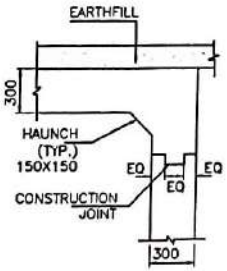
DETAIL OF CURTAIN WALL-I
(DOWN STREAM SIDE)
(SCALE 1:50)



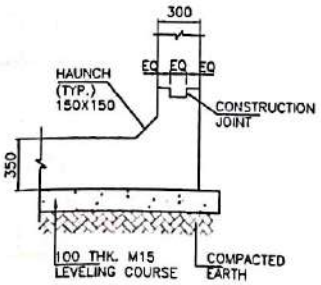
DETAIL OF CURTAIN WALL-II
(UP STREAM SIDE)
(SCALE 1:50)



DETAIL-'A'
(SCALE 1:25)



DETAIL-'B'
(SCALE 1:25)



DETAIL-'C'
(SCALE 1:25)

GOOD FOR CONSTRUCTION

SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

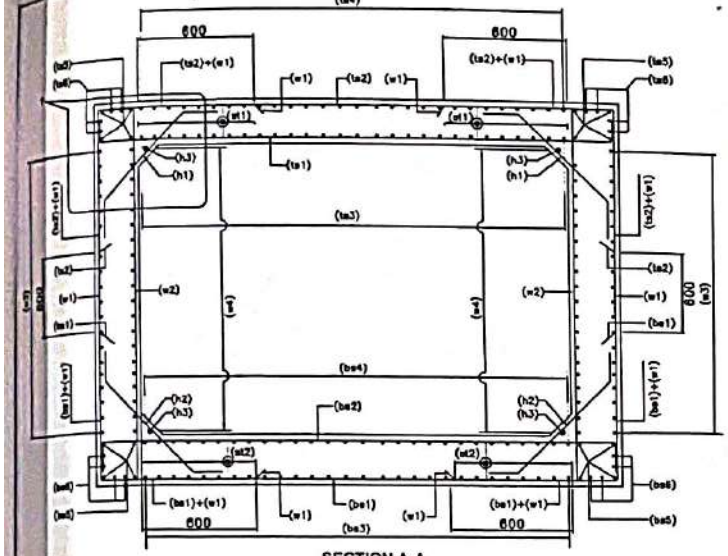
DESIGN AID, NEW DELHI

CONSTRUCTION
NEW DELHI

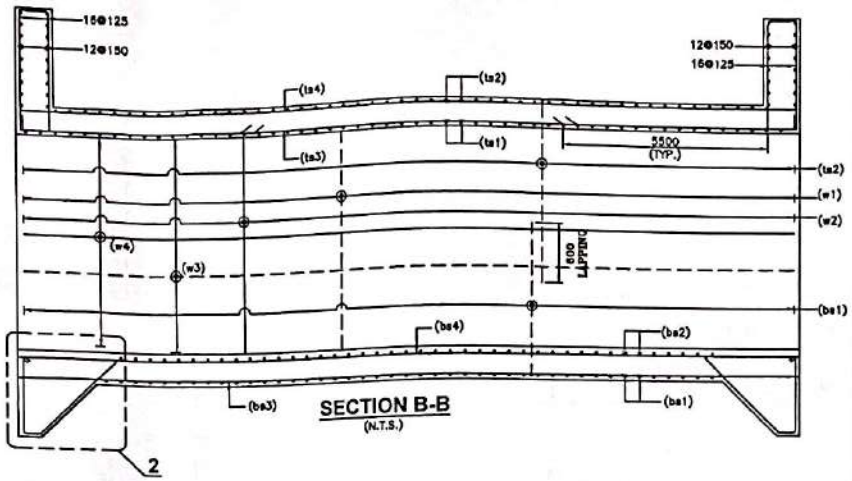
NATIONAL HIGHWAYS & STRUCTURE DEVELOPMENT CORPORATION LTD.	EPC CONTRACTOR: KAMAC ENGINEERS PVT.LTD, F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	AUTHORITY ENGINEER: ALMONDZ GLOBAL INFRA CONSULTANT LIMITED IN JV WITH AYOTEZA CONSULTANT PRIVATE LIMITED. C/O JAYANTA SAIKIA SARBAJANIN NAMGHAR, 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-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 (DOLAI GOAN) TO KM 47+662 (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 42+108

Date	Drw.	Dsg.	Chk.	App.	Scale	Drawing Status
JAN 2024	W.P	V.S	A.H		NTS	
Project No.	Drawing No. AVC/NH-38/BC/GAD/42+108/01				Sheet No. 03 OF 03	Rev. R0



SECTION A-A
(NTS)

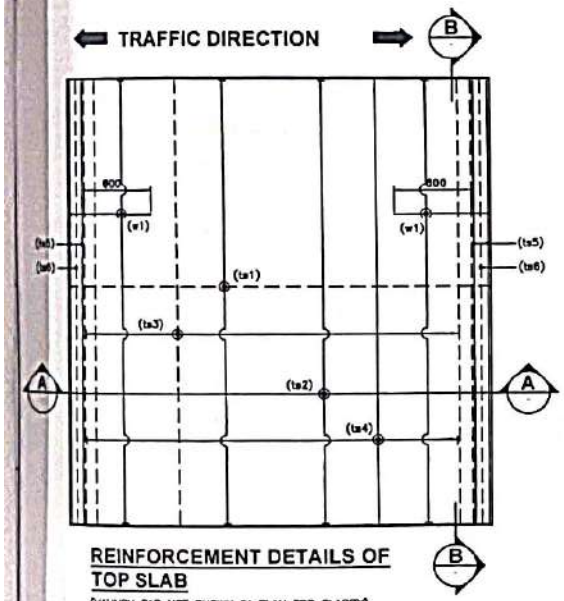


SECTION B-B
(N.T.S.)

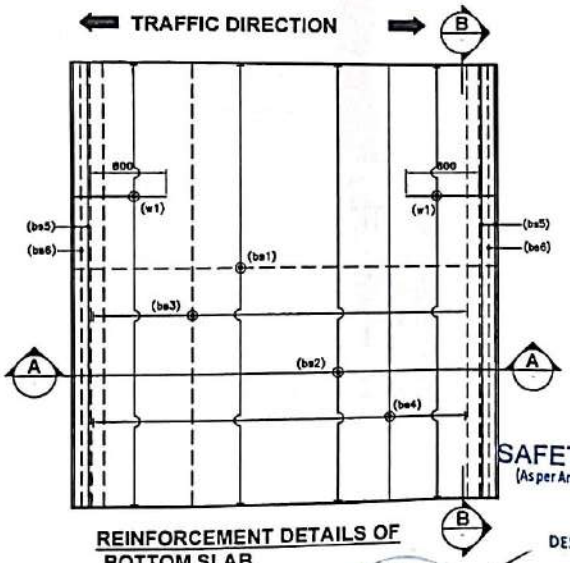
BOX REINF. SCHEDULE

SL.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

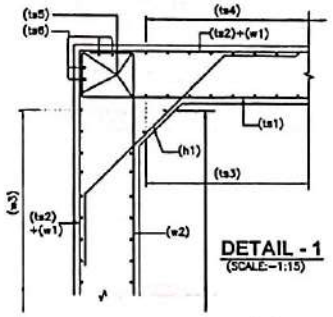
LEGEND:-	
TOP FACE BAR	———
BOTTOM FACE BAR	- - - -



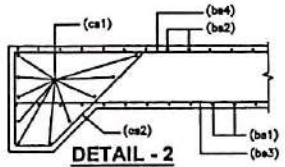
REINFORCEMENT DETAILS OF TOP SLAB
(HAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
(N.T.S.)



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



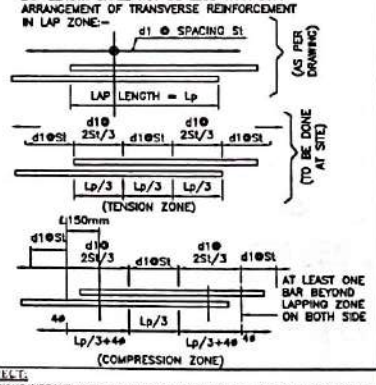
DETAIL - 1
(SCALE:-1:15)



DETAIL - 2
(N.T.S.)

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) CONFIRMING TO IS:1786 STANDARDS.
4. 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
5. OVERLAPPING FOR SPLICING OF REINFORCEMENT SHALL BE AS PER CLAUSE NO.15.2.5.
   LAP LENGTH SHALL NOT BE LESS THAN 56ϕ.
   ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:-



6. ANCHOURAGE LENGTH OF BOX SHALL BE TAKEN AS 40ϕ AS PER IRC:112.
7. FOR UNFAVORABLE BOND CONDITIONS THE FACTOR 40 SHOULD BE MULTIPLIED BY FACTOR OF 1.43 .
8. CENTER LINE OF OVERLAPPING BAR bs1 & ts2 IN WALL & MID HEIGHT OF WALLS ARE AT SAME POINT.
9. 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:-

1. GENERAL ARRANGEMENT DRAWING.
   AVC/NH-38/BOX/GAD/42+106/01

SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)
DESIGN AID, NEW DELHI

GOOD FOR CONSTRUCTION

CONSTRUCTION
NEW DELHI

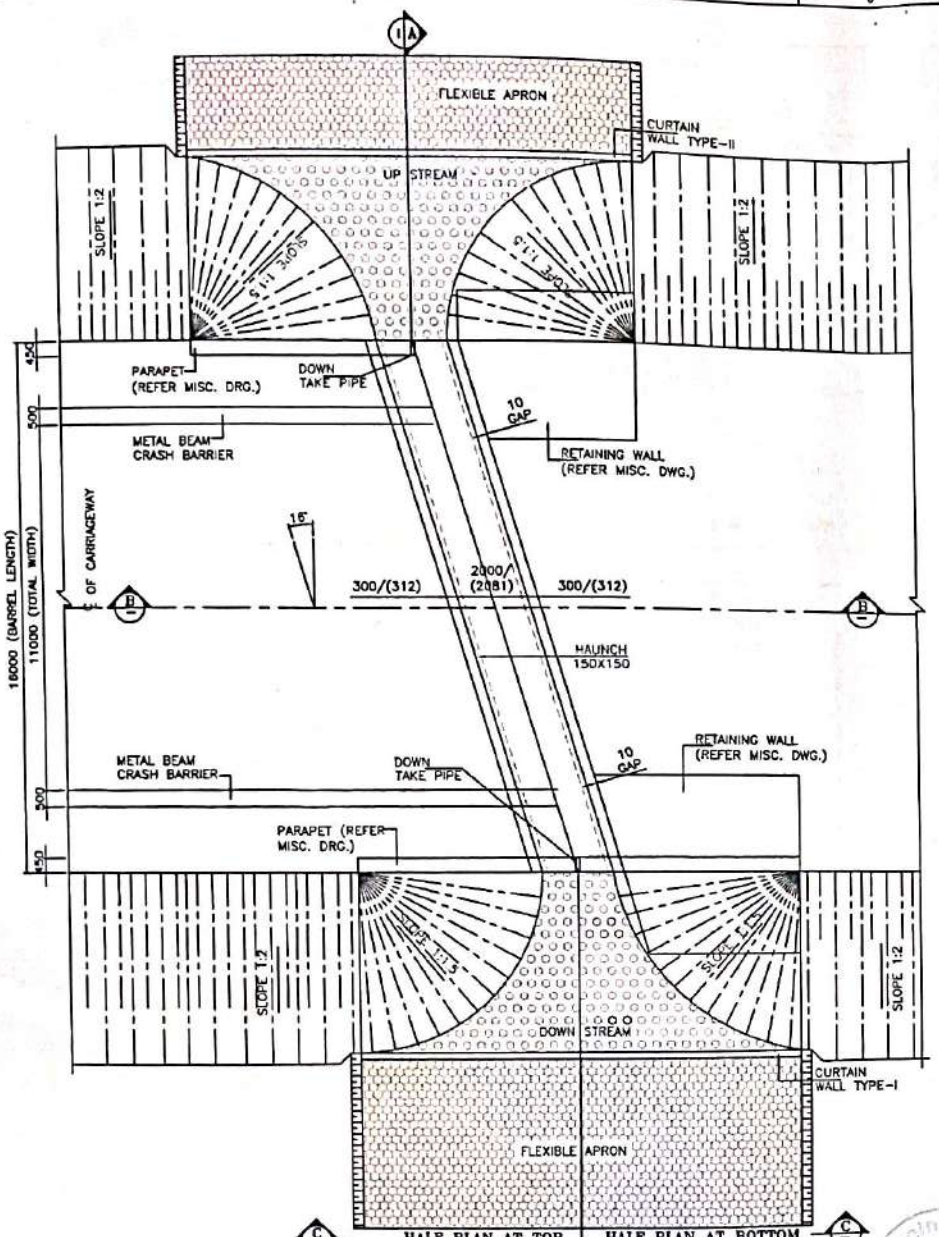
CLIENT:	EPC CONTRACTOR	AUTHORITY ENGINEER	PROOF CONSULTANT:	SAFETY CONSULTANT:	DESIGN CONSULTANT:
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	KAMAC ENGINEERS Pvt Ltd KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	ALMONDZ GLOBAL INFRA CONSULTANT LIMITED IN JV WITH LAXOLEZA CONSULTANT PRIVATE LIMITED. C/O JAYANTA SAIKIA, SARBAJANIN NAMGHAR, BORBIL NO.2, DIGBOI, TINSUKIA, ASSAM-786171	CREATIVE ENGINEERING SERVICES OFFICE NO: 620, SIGNATURE GLOBAL MALL, SECTOR-J, VAISHALI, GHAZIABAD, U.P-201010	DESIGN DESIGN AID PLOT NO.54, 3rd FLOOR(FRONT), MASOODPUR DAIRY FARM, VASANT KUNJ, NEW DELHI-110070,	A.V. CONSTRUCTION 1st Floor, WZ-1240 Palam Extension, Dabri Ashram Wali Gali, Now Delhi 110045 Winst Infra Solution Pvt. Ltd. OFFICE: F-8, ISHAAN CORPORATE TOWER, PLOT NO-C-23, SECTOR-13, VASUNDHRA GHAZIABAD, U.P-201012 WISPL

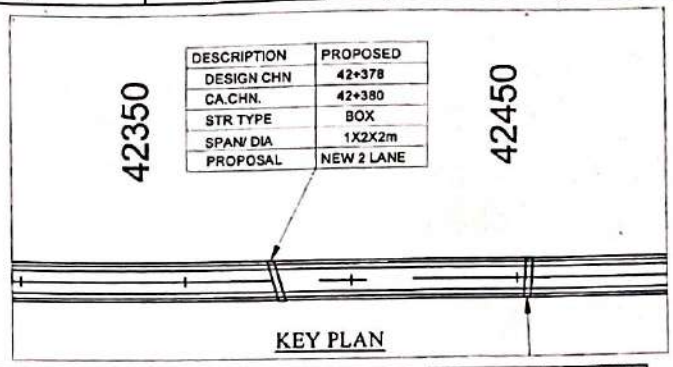
PROJECT:
WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (GOLAI GOAN) TO KM 47+882 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE (PACKAGE-I)

DRAWING TITLE:
REINFORCEMENT DETAIL OF BOX CULVERT AT CH. 42+106

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/NH-38/BOX/REIN/42+106/01	01 OF 01	R0





DESCRIPTION	PROPOSED
DESIGN CHN	42+378
CA.CHN.	42+380
STR TYPE	BOX
SPAN/ DIA	1X2X2m
PROPOSAL	NEW 2 LANE

LEVELS

DESIGN CH.	FRL	GROUND LEVEL	INVERT LEVEL		VERTICAL CLEARANCE (MAX.)	EARTH FILL (MAX.)	EARTH FILL (MIN.)
			LHS	RHS			
42+378	143.850	140.585	140.297	140.285	2.016m	3.049m	1.863m

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 CONJUCTION 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 – Fe500.
5. 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.
6. BACKFILL MATERIAL BEHIND END WALL SHALL BE SELECTED GRANULAR SOIL HAVING PROPERTIES
   MAX DRY DENSITY – 1650–2280kg/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 SUBJECTED TO CHANGE AS PER SITE CONDITION AND DETAILED DESIGN.
9. BACKFILL TO BE DONE AND COMPACTED FROM BOTH SIDE SIMULTANEOUSLY.
10. 600MM THICK. FILTER MATERIAL BEHIND RETAINING WALL SHALL BE LAID AS PER APPENDIX 6 OF IRC 78–2014.
11. 50MM THICK CEMENT CONCRETE WEARING COAT SHALL BE PROVIDED.
12. 100MM DIA P.V.C. PIPE AT SPACING 1000MMc/c IN HORIZONTAL/VERTICAL DIRECTION SHALL BE PROVIDED UP TO 150MM ABOVE GROUND LEVEL FOR WEEP HOLES IN RETAINING WALL.
13. SBC SHALL BE 14t/m². AND SAME SHALL BE ENSURED AT SITE BY ANY SUITABLE METHOD.
14. 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.
15. CHOOSE ANY SUITABLE METHOD TO ACHIEVE THE REQUIRED SBC AS PER SITE.
16. THE EXPOSURE CONDITION IS MODERATE.

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

GOOD FOR CONSTRUCTION

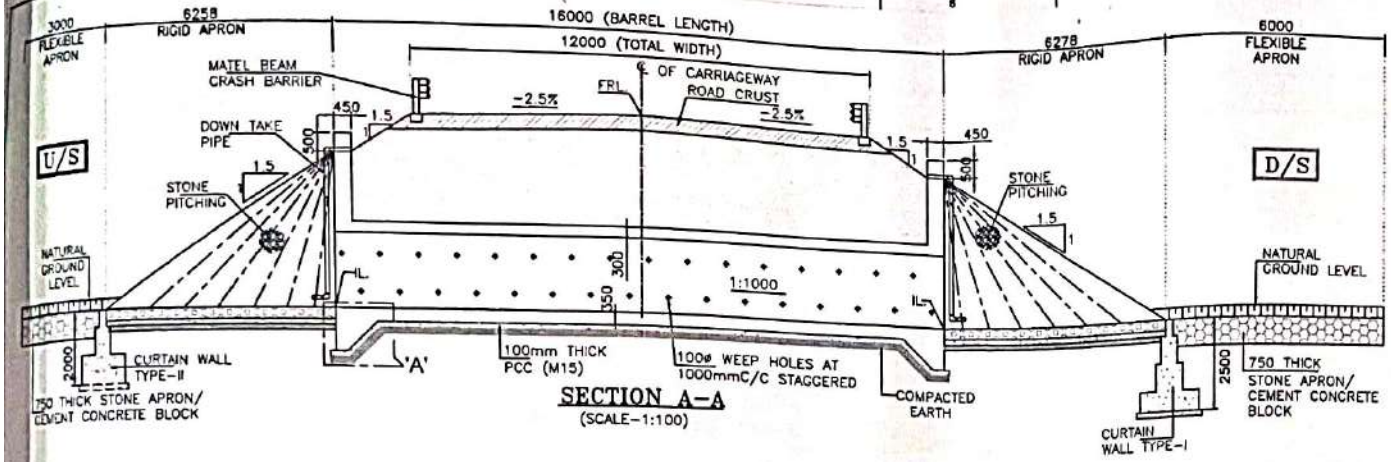
CLIENT:	EPC CONTRACTOR	AUTHORITY'S ENGINEER	PROOF CONSULTANT:	SAFETY CONSULTANT:	DESIGN CONSULTANT:
NATIONAL HIGHWAYS & STRUCTURE DEVELOPMENT CORPORATION LTD.	KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	ALMONDZ GLOBAL INFRA CONSULTANT LIMITED IN JOINT VENTURE WITH OLEEZA CONSULTANT PRIVATE LIMITED. C/O JAYANTA SAIKIA, SARBAJA LIN NAMGHAR, BORBIL 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,	A.V. CONSULTANTS Winst Infra Solution Pvt. Ltd. OFFICE: F-8, IBHAAN 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+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)

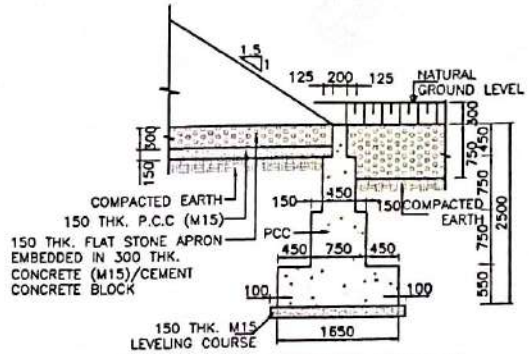
DRAWING TITLE:- GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 42+378

Date	Drw.	Chk.	Chk.	App.	Scale	Drawing Status.
JAN 2024	W.P	V.S	A.B		NTS	
Project No.	Drawing No. AVC/NH-38/BC/GADH2+378/01					Sheet No. 01 OF 03

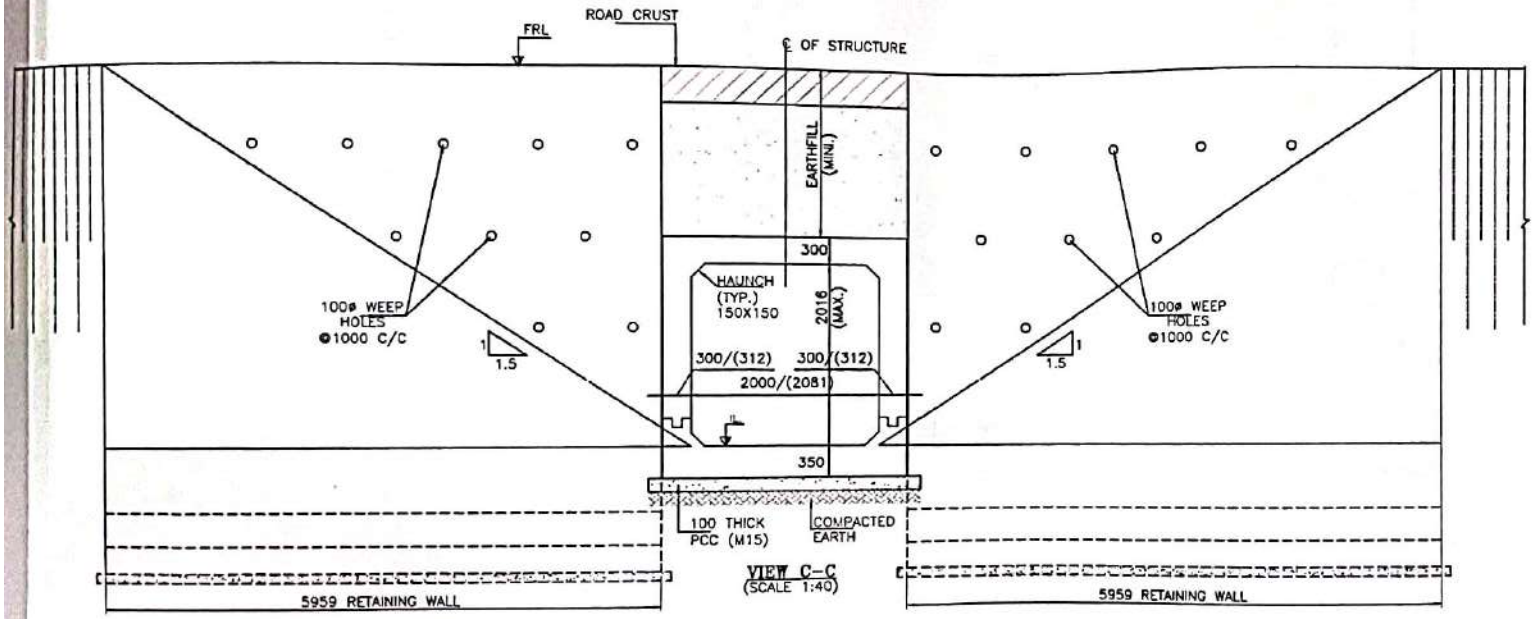
Rev. R0



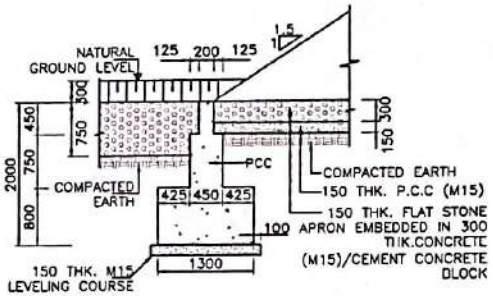
SECTION A-A
(SCALE-1:100)



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



VIEW C-C
(SCALE 1:40)



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

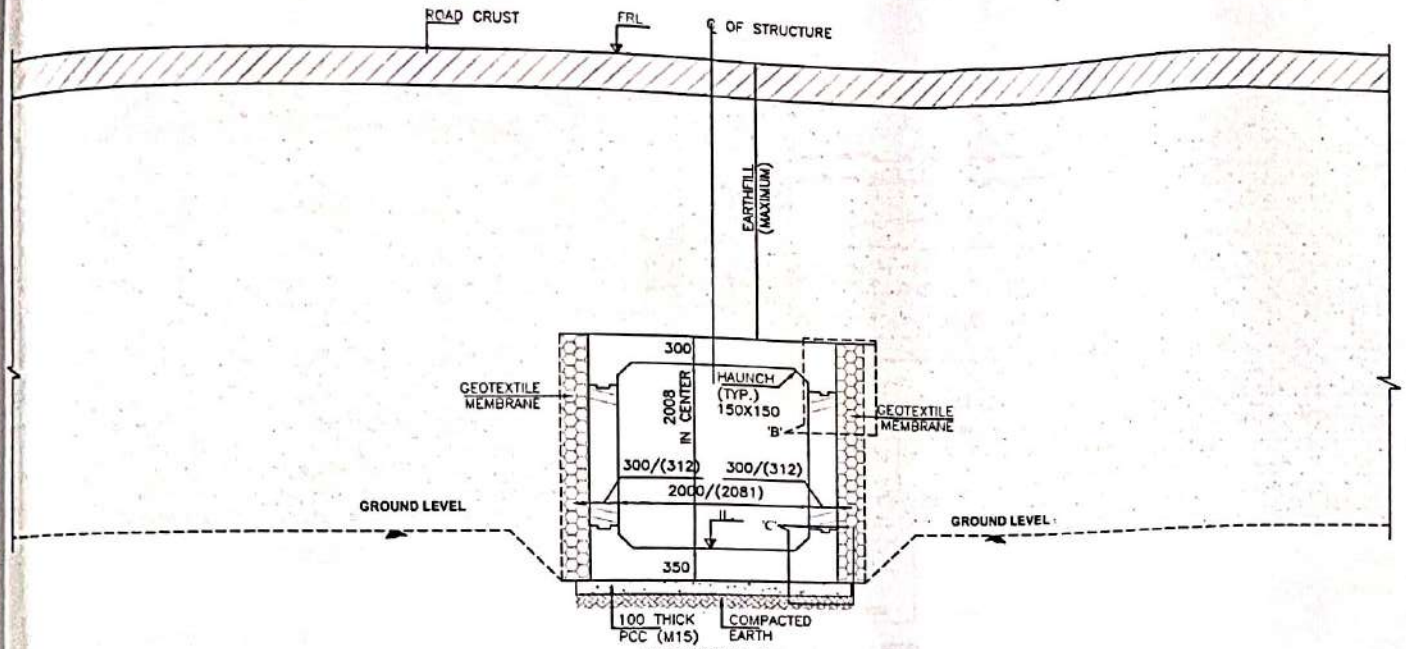
GOOD FOR CONSTRUCTION

CLIENT:	EPC CONTRACTOR	AUTHORITY ENGINEER	PROOF CONSULTANT:	SAFETY CONSULTANT:	DESIGN CONSULTANT:
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	ALMONDZ GLOBAL INFRA CONSULTANT LIMITED IN JV WITH VOLTEZA CONSULTANT PRIVATE LIMITED. C/O JAYANTA SAHA, SARGAJAON NAMGHAR, BORBIL NO2 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.	A.V. CONSTRUCTION Flour-WZ-12/C, Palam Extension, Bosco Ashram Wala 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

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 5)

DRAWING TITLE:
GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 42+378

Date	Drw.	Dsg.	Chk.	App.	Scale.	Drawing Status.
JAN 2024	W.P	V.S	A.D		NTS	
Project No.	Drawing No.				Sheet No.	Rev.
	AVC/NH-38/BC/GAD/42+378/01-				02 OF 03	R0



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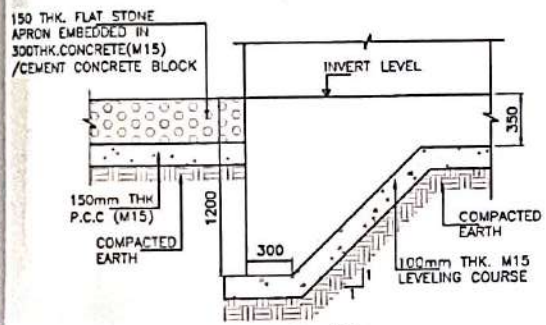
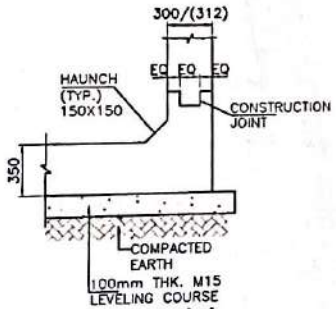
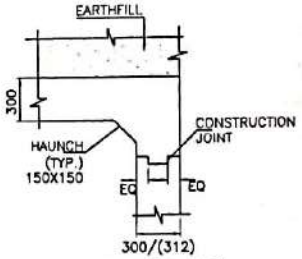


DETAIL-'A'
(SCALE 1:25)



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

CONSTRUCTION

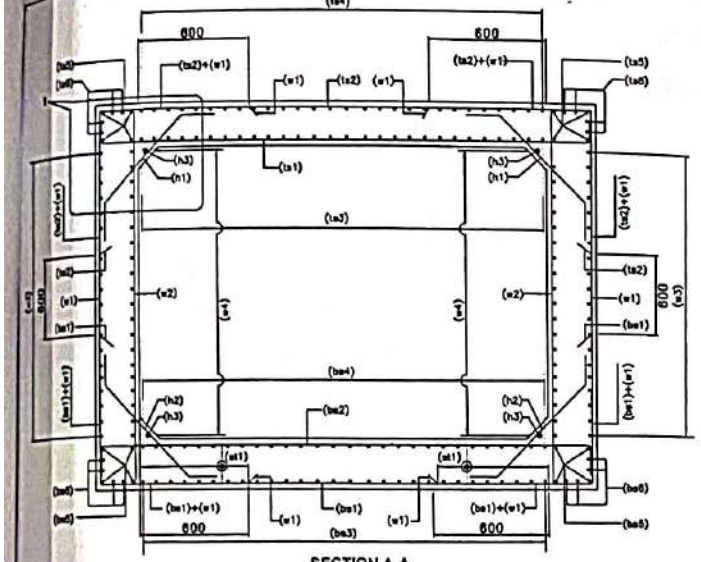
CLIENT:	EPC CONTRACTOR	AUTHORITY ENGINEER	PROOF CONSULTANT:	SAFETY CONSULTANT:	DESIGN CONSULTANT:
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	ALMONDZ GLOBAL INFRA CONSULTANT LIMITED IN JV WITH AYOG RAZA CONSULTANT PRIVATE LIMITED. C/O JAYANTA SAIKIA, SARBAJANIK NAMGHAR, BOREE-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,	A.V. CONSTRUCTION 1st Floor, W-2, 1640, Palam Extension Bosco, Ashram Wali 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 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (DUAL COMB) TO KM 47+882 (LEDO) ON DISPUR(NH-7) 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 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/NH-38/BC/GAD/42+378/01	03 OF 03	R0



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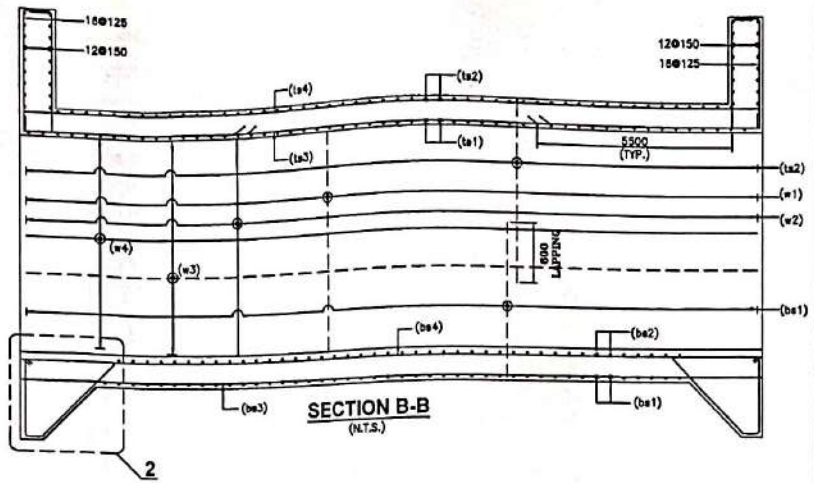
(NTS)



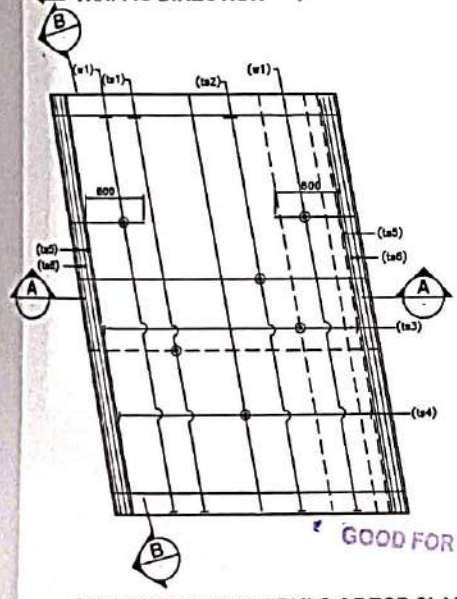
SECTION B-B
(N.T.S.)

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

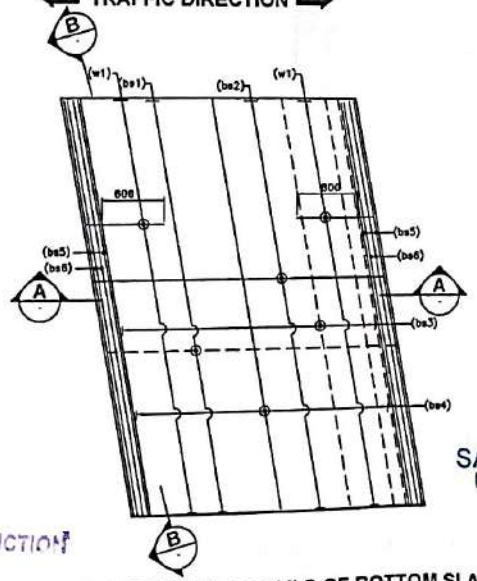
LEGEND:-	
TOP FACE BAR	———
BOTTOM FACE BAR	- - - - -

TRAFFIC DIRECTION

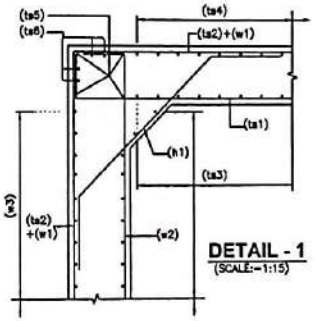


REINFORCEMENT DETAILS OF TOP SLAB
(HAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
(N.T.S.)

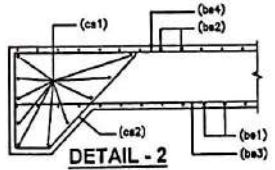
TRAFFIC DIRECTION



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



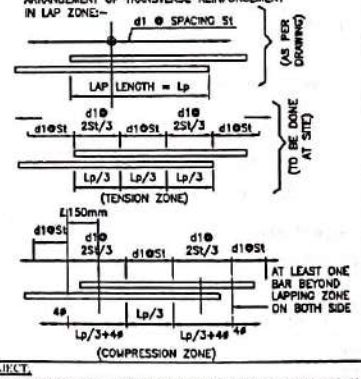
DETAIL - 1
(SCALE:-1:15)



DETAIL - 2
(N.T.S.)

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 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
5. OVERLAPPING FOR SPLICING OF REINFORCEMENT SHALL BE AS PER CLAUSE NO.15.2.3.
   LAP LENGTH SHALL NOT BE LESS THAN 66ϕ.
   ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:-



6. ANCHOURAGE 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 .
7. CENTER LINE OF OVERLAPPING BAR bs1 & ts2 IN WALL & MID HEIGHT OF WALLS ARE AT SAME POINT.
8. 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:-

1. GENERAL ARRANGEMENT DRAWING.
   AVC/NH-38/BOX/GAD/42+378/01

SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

GOOD FOR CONSTRUCTION

DESIGN AID, NEW DELHI

CONSTRUCTIONS NEW DELHI

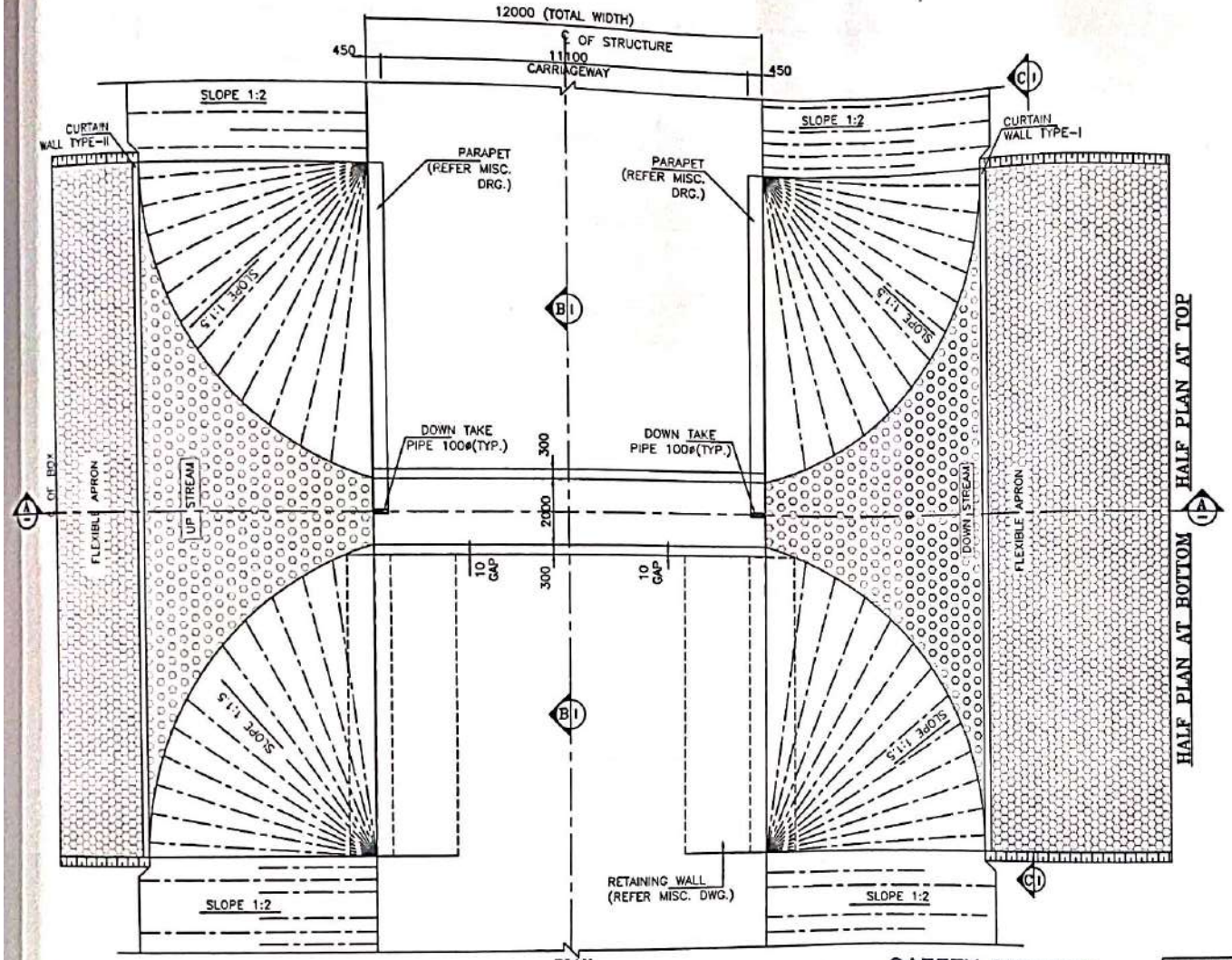
CLIENT:	EPC CONTRACTOR	AUTHORITY'S ENGINEER	PROOF CONSULTANT:	SAFETY CONSULTANT:	DESIGN CONSULTANT:
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	ALMONDZ GLOBAL INFRACONSULTANT LIMITED. Dip. Lodge Section C/O JAYANTA BHUYAN, SARE AJANIN NAMGHAR, BOX-BIL 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,	A.V. CONSTRUCTION 1st Floor, WZ-1240, Palam Extension, Sagarpur Ashram Wali Gali, Delhi 110045 Winst Infra Solution Pvt. Ltd. OFFICE F-4, 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 (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)

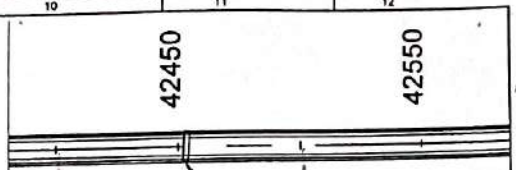
DRAWING TITLE:-
REINFORCEMENT DETAIL OF BOX CULVERT AT CH. 42+378

Date	Drw.	Dsg.	Chk.	App.	Scale.	Drawing Status.
JAN.2024	W.P	V.S	A.U		NTS	

Project No.	Drawing No.	Sheet No.	Rev.
	AVC/NH-38/BOX/REIN/42+378/01	01 OF 01	R0



PLAN
(SCALE-1:100)



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

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 CONJUCTION 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 SUBJECTED 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 1000MMc/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 ... AS PER SITE.

GOOD FOR CONSTRUCTION

SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

DESIGN AID, NEW DELHI

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

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.

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 WYSEE A CONSULTANT PRIVATE LIMITED.
C/O JAYANTA BAIKIA, SARBANANI NAMGHAR, BOREE 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,

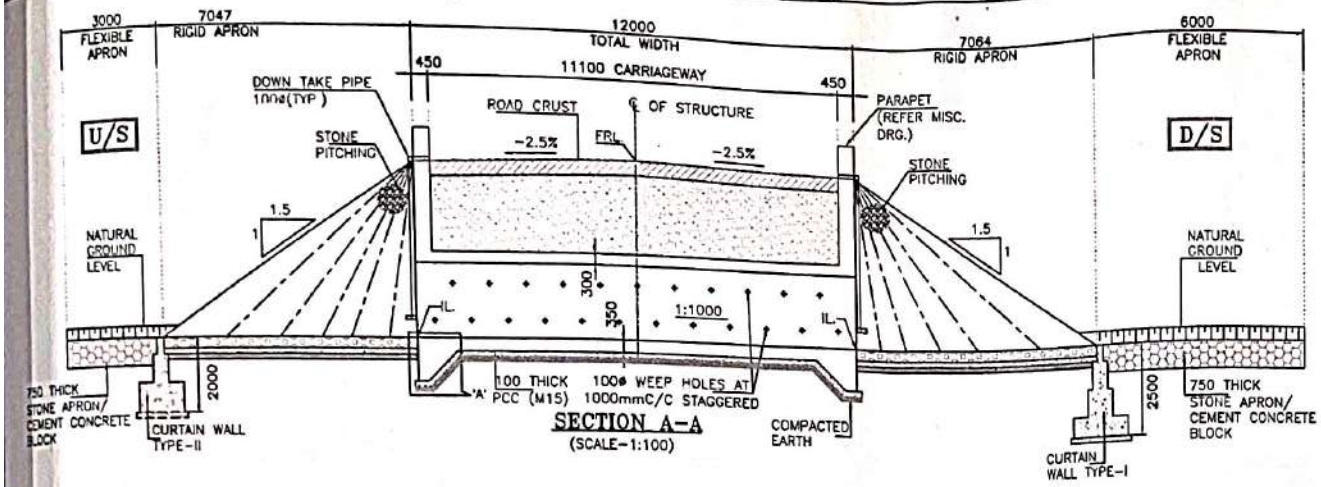
DESIGN CONSULTANT: NEW DELHI
A.V. CONSTRUCTION
1st Floor, WZ-1240, Palam Extension, Bosco Ashram Wali Gali New Delhi 110045
Winst Infra Solution Pvt. Ltd.
OFFICE: F-8, ISHAAN CORPORATE TOWER, PLOT NO-G-23,SECTOR-13, VASUNDHRA GHAZIABAD, U.P-201012

PROJECT:
WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (GOLAI GOAN) TO KM 47+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)

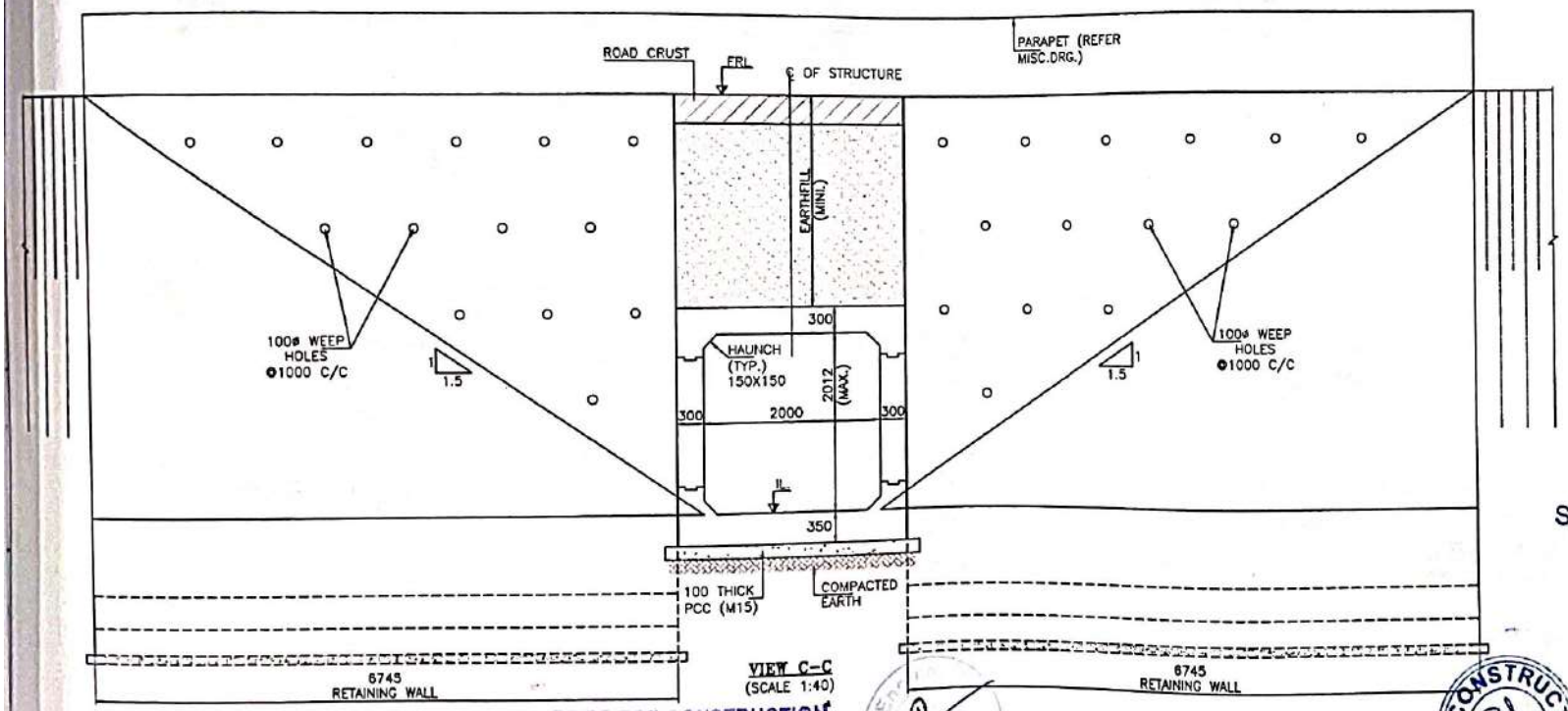
DRAWING TITLE:
GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 42+454

Date	Drw.	Dsg.	Chk.	App.	Scale	Drawing Status
JAN.2024	W.I*	V.S	A.B		NTS	

Project No.	Drawing No.	Sheet No.	Rev.
	AVC/NH-38/BC/GAD/42+454/01*	61 OF 83	R0



SECTION A-A
(SCALE-1:100)



VIEW C-C
(SCALE 1:40)

SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

DESIGN AID, NEW DELHI

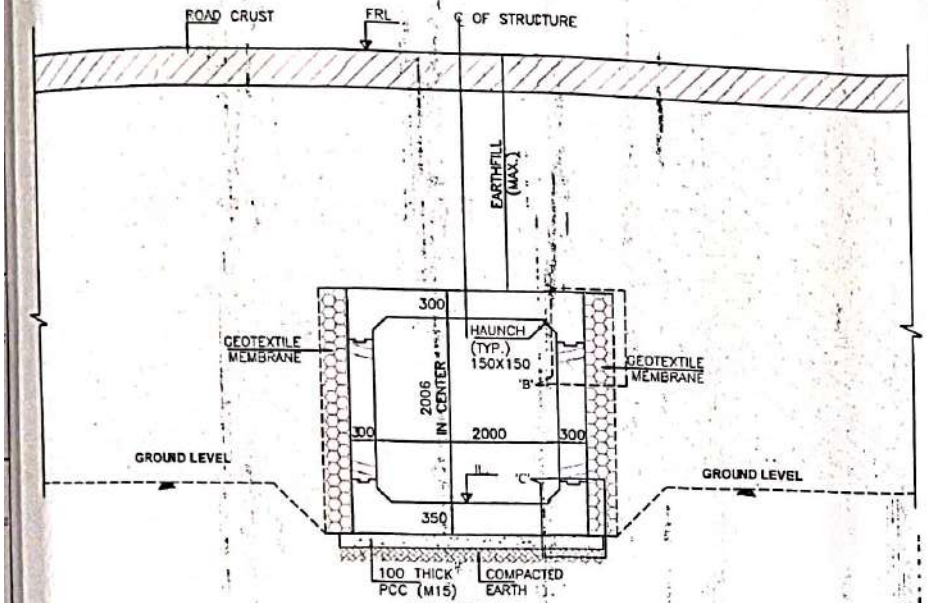
GOOD FOR CONSTRUCTION

CLIENT:	EPC CONTRACTOR	AUTHORITY'S ENGINEER	PROOF CONSULTANT:	SAFETY CONSULTANT:	DESIGN CONSULTANT:
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	ALMONDZ GLOBAL INFRA CONSULTANT LIMITED IN JV WITH AYODHYA CONSULTANT PRIVATE LIMITED. C/O JAYANTA SAKIA, SARAJANN NAMGHAR, SORBIL 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,	A.K. CONSTRUCTION Floor, WZ-1210, Palam Extension, BDSCO 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 (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)

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. R0



SECTION B-B
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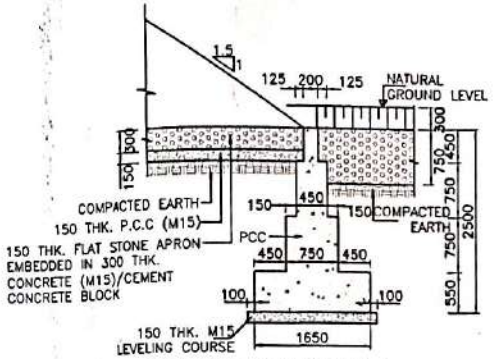
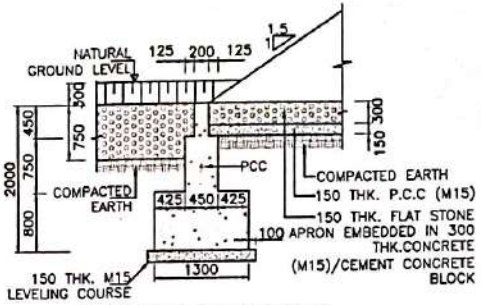
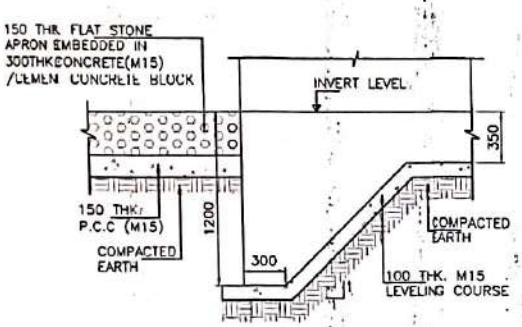


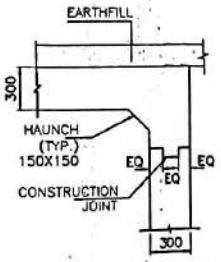
DETAIL OF CURTAIN WALL-I
(DOWN STREAM SIDE)
(SCALE 1:50)



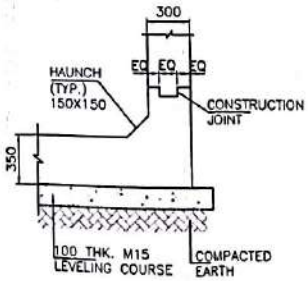
DETAIL OF CURTAIN WALL-II
(UP STREAM SIDE)
(SCALE 1:50)



DETAIL-'A'
(SCALE 1:25)



DETAIL-'B'
(SCALE 1:25)



DETAIL-'C'
(SCALE 1:25)

SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

DESIGN AID, NEW DELHI

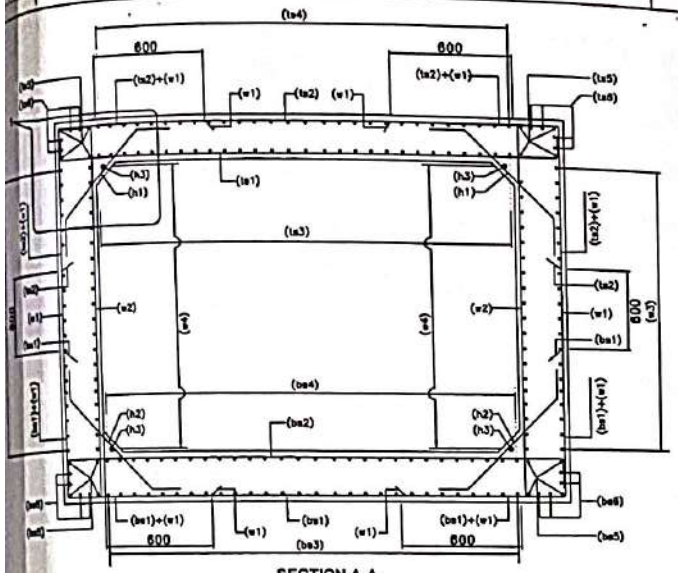
GOOD FOR CONSTRUCTION

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	ALMONDZ GLOBAL INFRA CONSULTANT LIMITED JV WITH MEEZA CONSULTANT PRIVATE LIMITED. C/O JAYANTA BARUAH SARBANANI KAMGHAR, BORBIL NO.2, DIBRUGARH, 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,	A.V. CONSTRUCTION Block, WZ-1240, Palam Extension, Bindapur Ashram Walk 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	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-5)

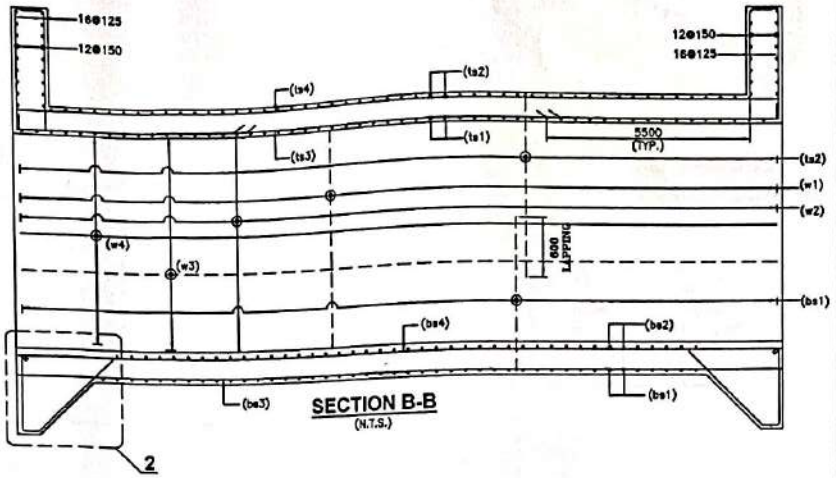
DRAWING TITLE: GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 42+454

Date	Drw.	Dsg.	Chk.	App.	Scale.	Drawing Status.
JAN.2024	W.P	V.S	A.D		NTS	

Project No.	Drawing No.	Sheet No.	Rev.
	AVC/NH-38/BC/GAD/42+454/01	03 OF 03	R0



SECTION A-A
(NTS)

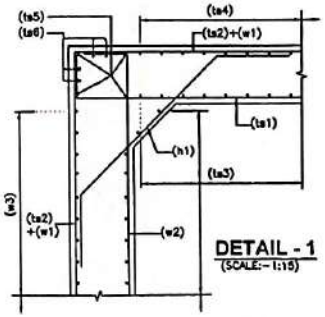


SECTION B-B
(N.T.S.)

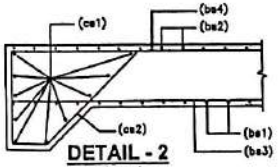
BOX REINF. SCHEDULE

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

LEGEND:-	
TOP FACE BAR	———
BOTTOM FACE BAR	- - - -

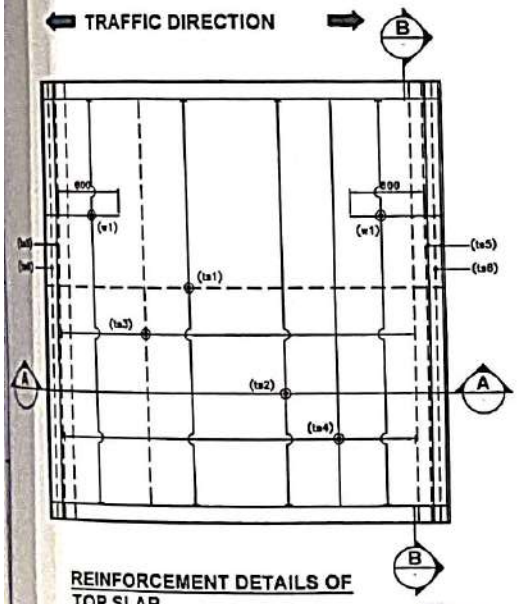


DETAIL - 1
(SCALE:- 1:15)



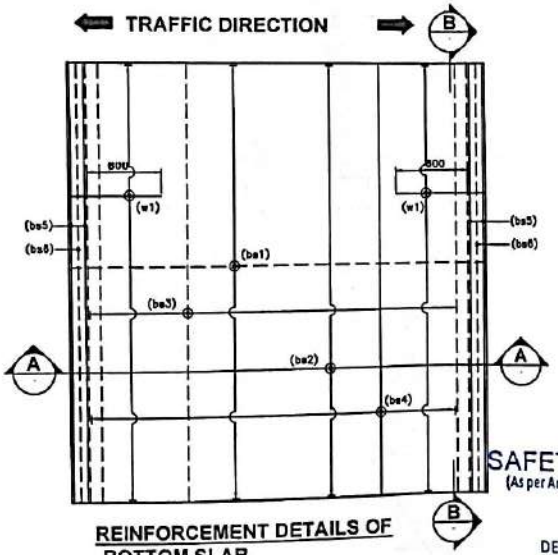
DETAIL - 2
(N.T.S.)

TRAFFIC DIRECTION



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

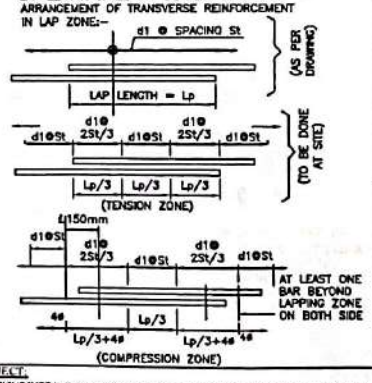
TRAFFIC DIRECTION



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

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) CONFIRMING TO IS:1786 STANDARDS.
4. 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
5. OVERLAPPING FOR SPLICING OF REINFORCEMENT SHALL BE AS PER CLAUSE NO.15.2.5.
   LAP LENGTH SHALL NOT BE LESS THAN 55ϕ.
   ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:-



6. ANCHOURAGE LENGTH OF BOX SHALL BE TAKEN AS 40ϕ AS PER IRC:112.
7. FOR UNFAVORABLE BOND CONDITIONS THE FACTOR 40 SHOULD BE MULTIPLIED BY FACTOR OF 1.43 .
8. CENTER LINE OF OVERLAPPING BAR bs1 & ts2 IN WALL & MID HEIGHT OF WALLS ARE AT SAME POINT.
9. 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:-

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

SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)
DESIGN AID, NEW DELHI

GOOD FOR CONSTRUCTION

CONSTRUCTION
NEW DELHI

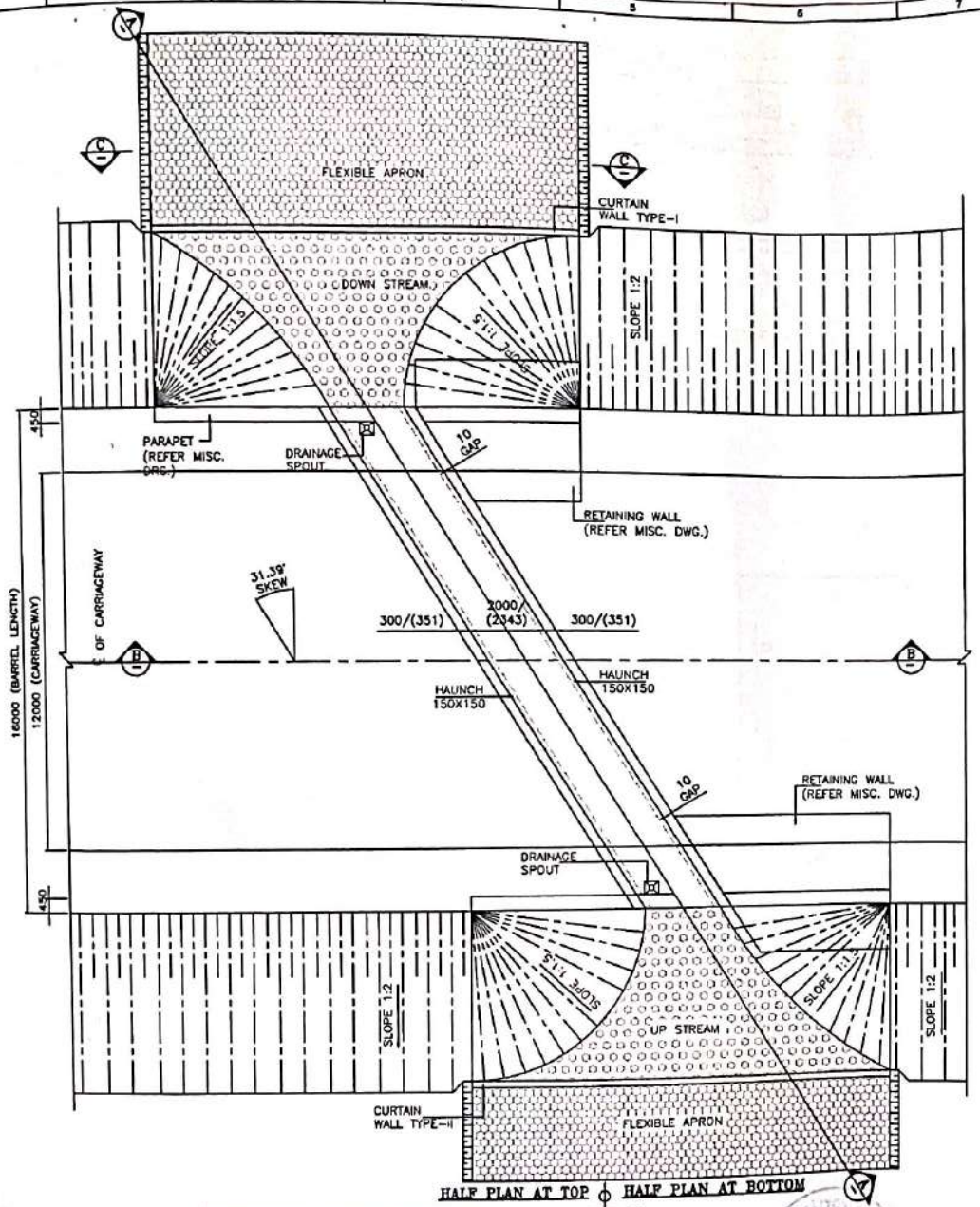
CLIENT:	EPC CONTRACTOR	AUTHORITY'S ENGINEER	PROOF CONSULTANT:	SAFETY CONSULTANT:	DESIGN CONSULTANT:
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	ALMONDZ GLOBAL INFRA CONSULTANT LIMITED JV SOUTH KOLEEZA CONSULTANT PRIVATE LIMITED. C/O JAYANTA SAIKIA, SARBANANIN NAMGHAR, BORBIL NO.2, DIBBOI, 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,	A.V. CONSULTANTS 1st Floor, WZ-1040, Palam Extension, Sagar 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+156 (GOLAI GOAN) TO KM 47+642 (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. 42+454

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/NH-38/BOX/REIN/42+454/01	01 OF 01	R0

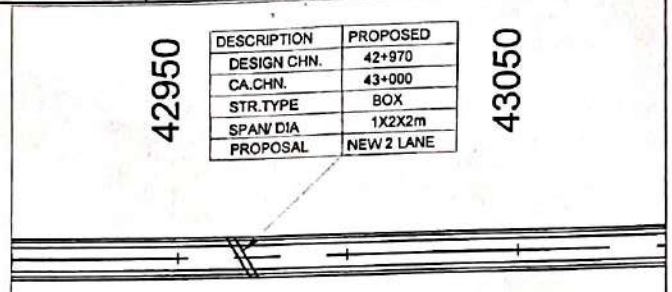


HALF PLAN AT TOP & HALF PLAN AT BOTTOM

PLAN

(SCALE-1:100)

GOOD FOR CONSTRUCTION



DESCRIPTION	PROPOSED
DESIGN CHN.	42+970
CA.CHN.	43+000
STR.TYPE	BOX
SPAN/ DIA	1X2X2m
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			
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:-

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 CONJUCTION 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 - Fe500.
5. 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.
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 SUBJECTED TO CHANGE AS PER SITE CONDITION AND DETAILED DESIGN.
9. BACKFILL TO BE DONE AND COMPACTED FROM BOTH SIDE SIMULTANEOUSLY.
10. 600MM THICK. FILTER MATERIAL BEHIND RETAINING WALL SHALL BE LAID AS PER APPENDIX 6 OF IRC 78-2014.
11. 50MM THICK CEMENT CONCRETE WEARING COAT SHALL BE PROVIDED.
12. 100MM DIA P.V.C. PIPE AT SPACING 1000MMc/c IN HORIZONTAL/VERTICAL DIRECTION SHALL BE PROVIDED UP TO 150MM ABOVE GROUND LEVEL FOR WEEP HOLES IN RETAINING WALL.
13. SBC SHALL BE 14t/m². AND SAME SHALL BE ENSURED AT SITE BY ANY SUITABLE METHOD.
14. 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.
15. CHOOSE ANY SUITABLE METHOD TO ACHIEVE THE REQUIRED SBC AS PER SITE.
16. THE EXPOSURE CONDITION IS MODERATE.

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+970/02

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
ALMONDZ GLOBAL INFRA CONSULTANT LIMITED IN JV WITH AYOLEEZA CONSULTANT PRIVATE LIMITED.
C/O JAYANTA SAIKIA, SARBANANIN 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,

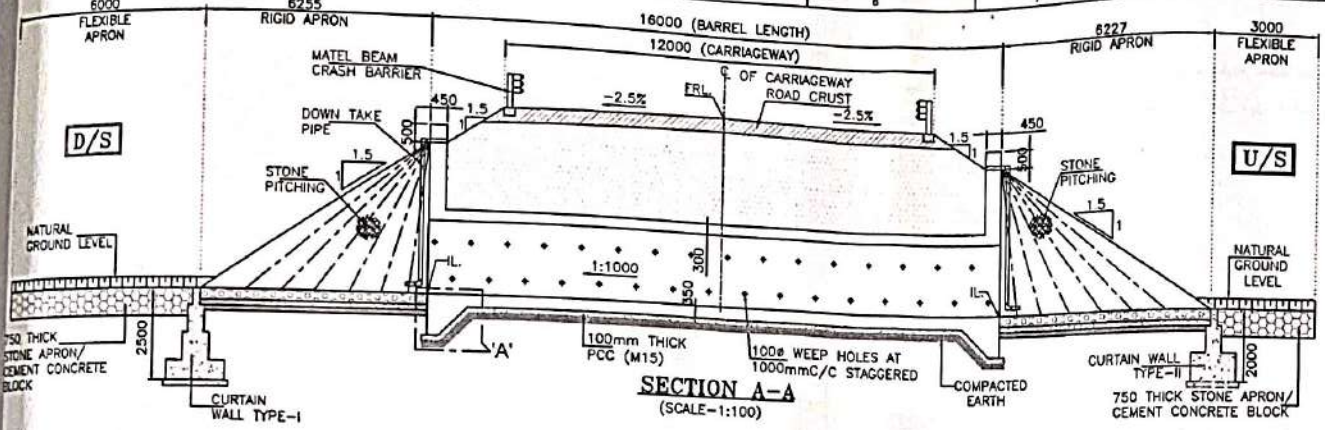
DESIGN CONSULTANT:
WISPL
Winst Infra Solution Pvt. Ltd.
OFFICE: F-8, ISHAAN CORPORATE TOWER, PLOT NO-C-23,SECTOR-13, VASUNDHRA GHAZIABAD, U.P-201012

PROJECT: WIDENING&IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (GOLAI GOAN) TO KM 47+852 (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)

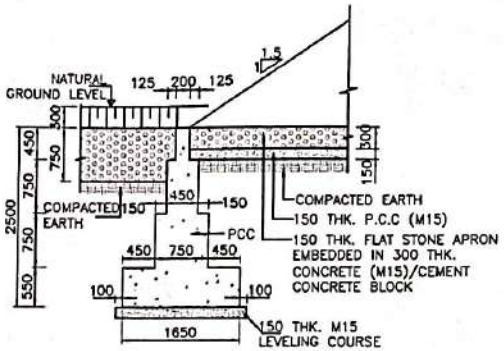
DRAWING TITLE: GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 42+970

Date	Drw.	Dsg.	Chk.	App.	Scale.	Drawing Status.
JAN.2024	W.P	V.S	A.B		NTS	

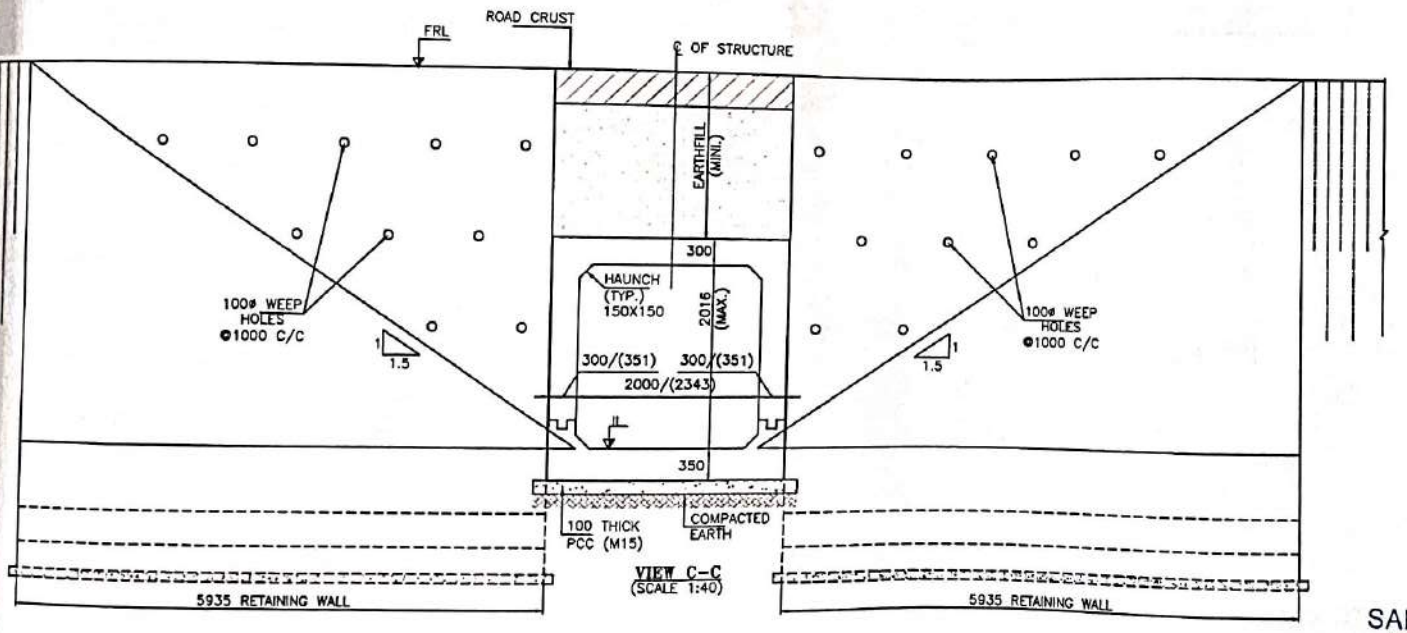
Project No.	Drawing No.	Sheet No.	Rev.
	AVC/NH-38/BC/GAD/42+970/01	01 OF 03	R0



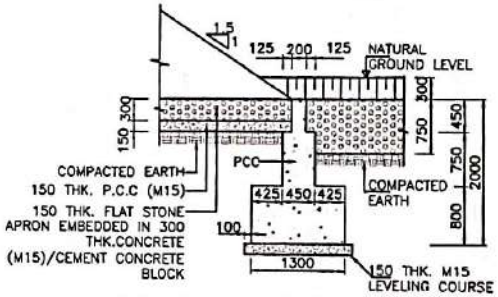
SECTION A-A
(SCALE-1:100)



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



VIEW C-C
(SCALE 1:40)



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

SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

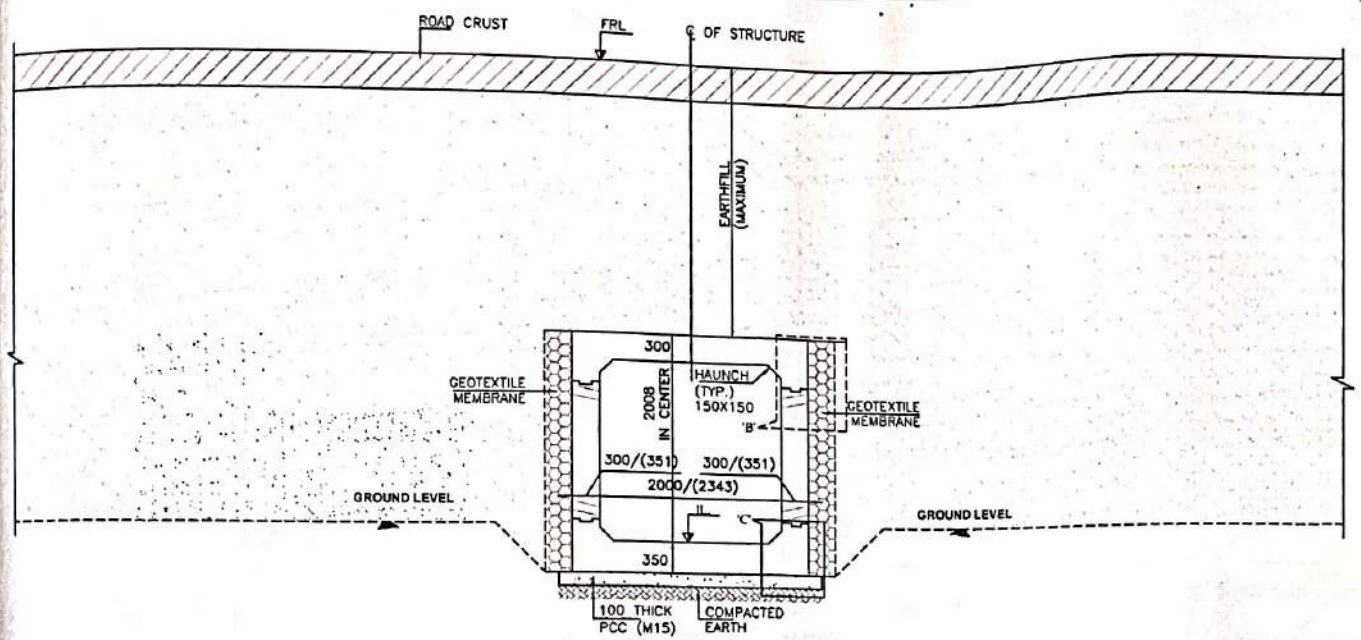
DESIGN AID, NEW DELHI

GOOD FOR CONSTRUCTION

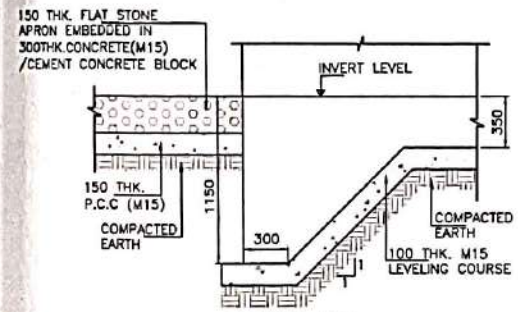
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	EPC CONTRACTOR: KAMAC ENGINEERS Pvt.Ltd. KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	AUTHORITY'S ENGINEER: ALMONDZ GLOBAL INFRA CONSULTANT LIMITED IN ASSOCIATION WITH DEEZA CONSULTANCY PRIVATE LIMITED. C/O JAYPEE GANGA, SARBAJANIN MANDIR (PO&PS) WARD 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 5th Floor, WZ-1240, Palam Extension, Block-C Ashram Main 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	PROJECT: WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (GOLAI GOAN) TO KM 47+662 (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 42+970

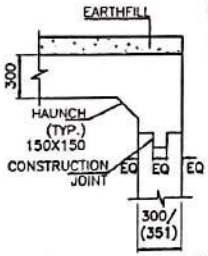
Date	Drw.	Dsg.	Chk.	App.	Scale	Drawing Status
JAN 2024	W.P	V.S	A.B		NTS	
Project No.	Drawing No. AVC/NH-38/DC/GAD/42+970/01					Sheet No. 02 OF 03 / Rev. R0



SECTION B-B
(SCALE 1:40)



DETAIL-'A'
(SCALE 1:25)



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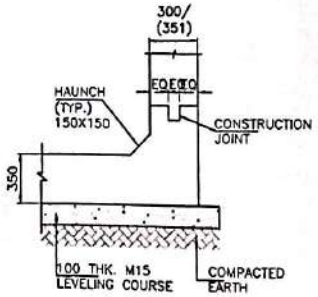


DETAIL-'C'
(SCALE 1:25)

SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

DESIGN AID, NEW DELHI

GOOD FOR CONSTRUCTION

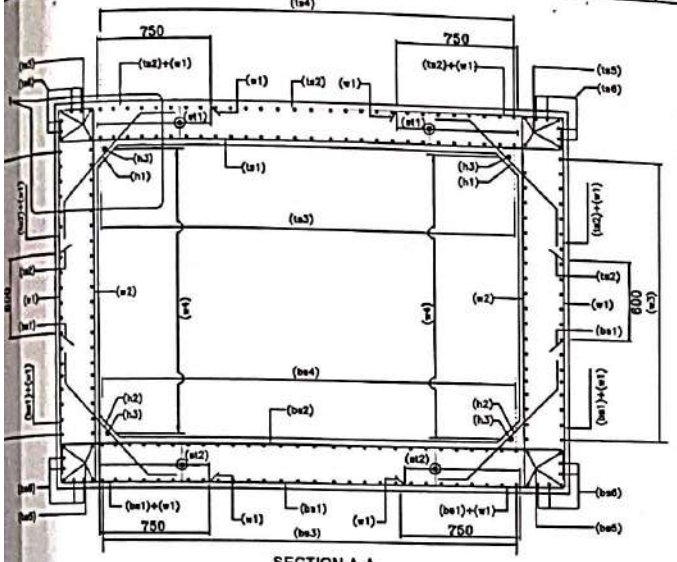
CLIENT:	EPC CONTRACTOR	AUTHORITY'S ENGINEER	PROOF CONSULTANT:	SAFETY CONSULTANT:	DESIGN CONSULTANT:
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	KAMAC ENGINEERS Pvt Ltd KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	ALMONDZ GLOBAL INFRA CONSULTANT LIMITED IN JOINT VENTURE WITH AYOLEEZA CONSULTANCY PRIVATE LIMITED. C/O JOGANI & SAIKIA, SARBAJANIN NAMGHAR, BOTBILI 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,	AV CONSTRUCTION 1st Floor, WZ-2B, 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+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)

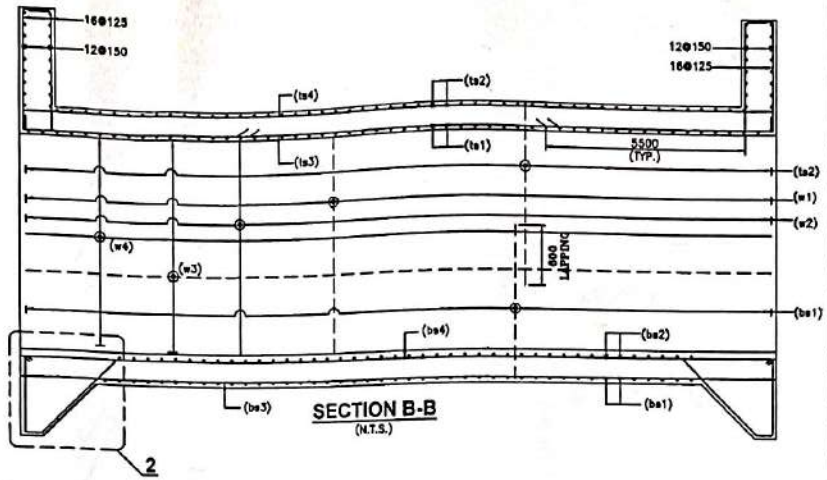
DRAWING TITLE: GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 42+970

Date	Drw.	Dsg.	Chk.	App.	Scale	Drawing Status
JAN.2024	W.P	V.S	A.B		NTS	

Project No.	Drawing No.	Sheet No.	Rev.
	AVCRNH-48/BC/GADN42+970/01	03 OF 03	R0



SECTION A-A
(NTS)



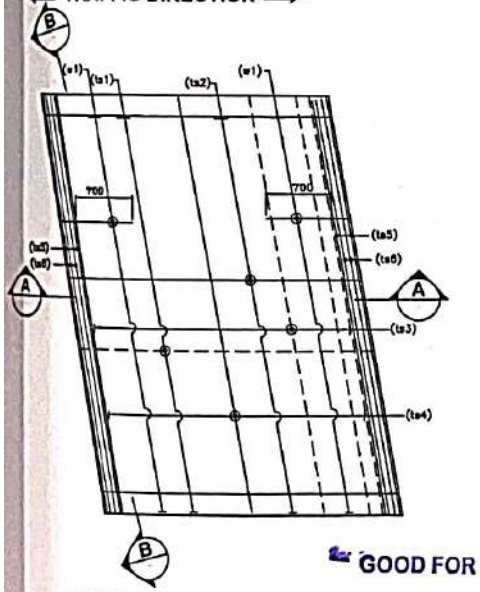
SECTION B-B
(N.T.S.)

BOX REINF. 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+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

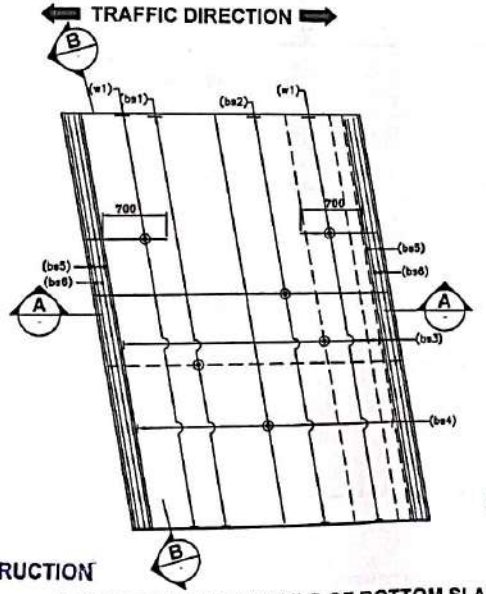
LEGEND:-	
TOP FACE BAR	———
BOTTOM FACE BAR	- - - -

TRAFFIC DIRECTION

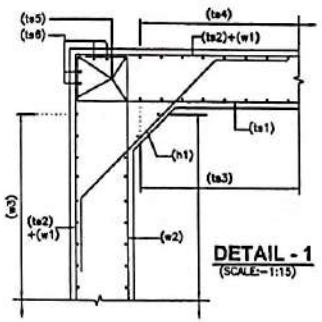


REINFORCEMENT DETAILS OF TOP SLAB
(HAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
(N.T.S.)

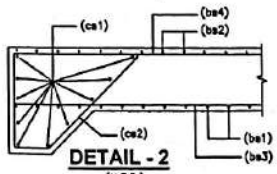
TRAFFIC DIRECTION



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



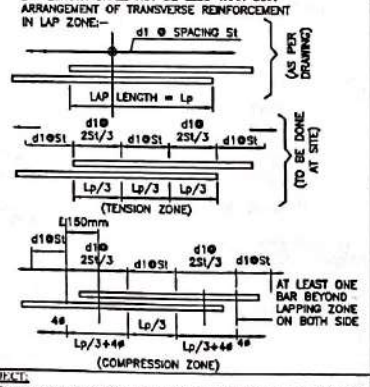
DETAIL - 1
(SCALE:-1:15)



DETAIL - 2
(N.T.S.)

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) CONFIRMING TO IS:1786 STANDARDS.
4. 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
5. OVERLAPPING FOR SPLICING OF REINFORCEMENT SHALL BE AS PER CLAUSE NO.15.2.5.
   LAP LENGTH SHALL NOT BE LESS THAN 58ϕ.
   ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:-



6. ANCHOURAGE LENGTH OF BOX SHALL BE TAKEN AS 40ϕ AS PER IRC:112.
7. FOR UNFAVORABLE BOND CONDITIONS THE FACTOR 40 SHOULD BE MULTIPLED BY FACTOR OF 1.43 .
8. CENTRE LINE OF OVERLAPPING BAR bs1 & ts2 IN WALL & HIR HEIGHT OF WALLS ARE AT SAME POINT.
9. 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.

SAFETY AUDIT
(As per Article 10.1 of EPC Agreement)

DESIGN AID, NEW DELHI

GOOD FOR CONSTRUCTION

REFERENCE DRAWING:-

1. GENERAL ARRANGEMENT DRAWING.
   AVC/NH-38/BOX/GAD/42+970/01

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 LAVTECZA CONSULTANT PRIVATE LIMITED.
CO SAYANTA SAMUI, SARBA JANIN NAMGHAR, BORBIL NO.2, DIBBOI, TINSUKIA, ASSAM-786171

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

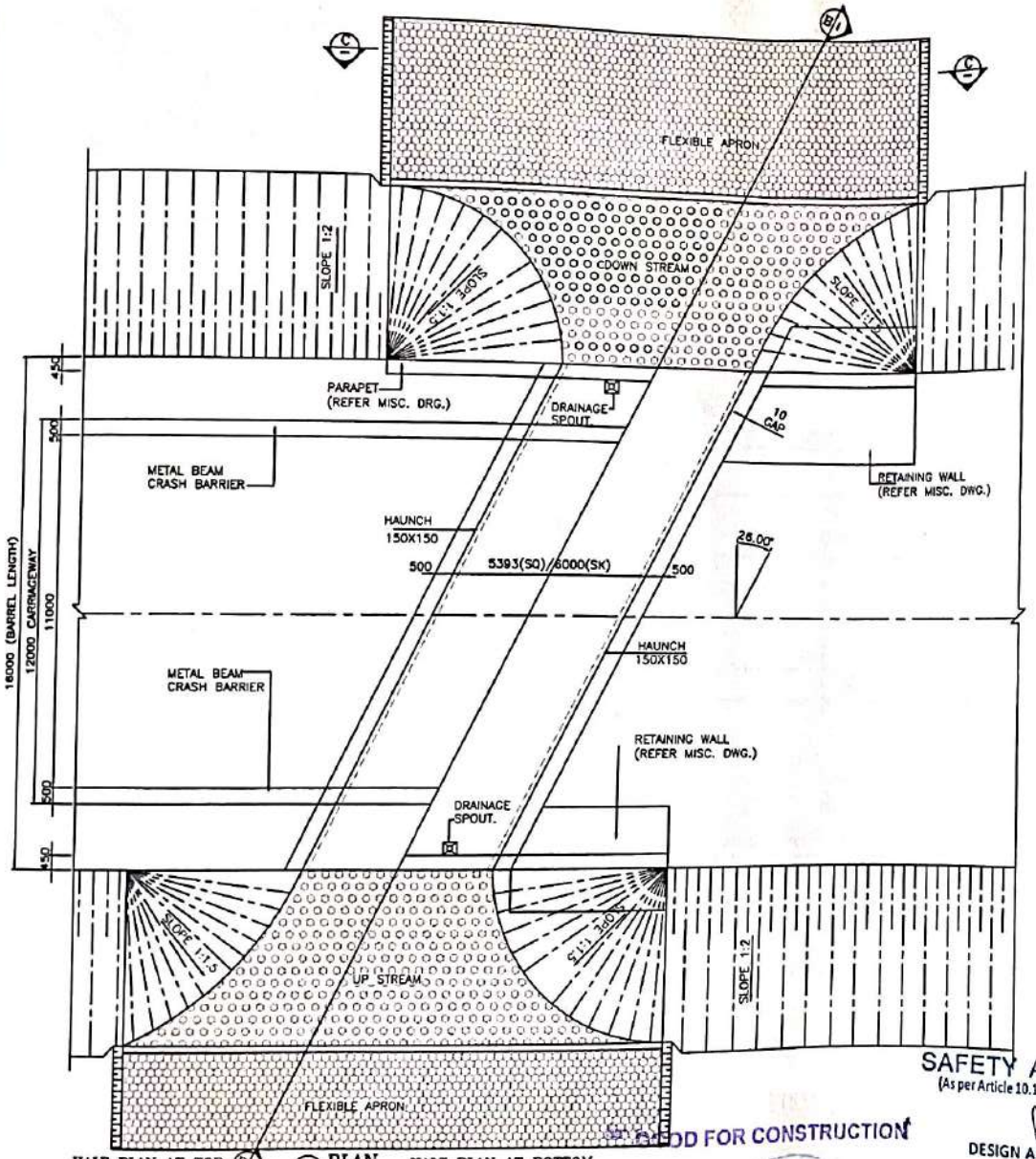
SAFETY CONSULTANT:
DESIGN AID
PLOT NO.54, 3rd FLOOR(FRONT), MASOODPUR DAIRY FARM,VASANT KUNJ, NEW DELHI-110070.

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

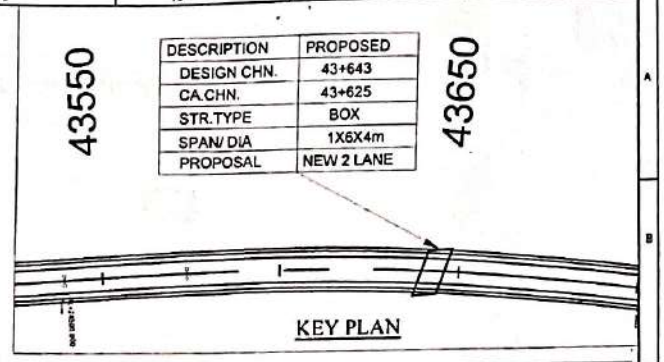
PROJECT:
WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (GOLAI GOAN) TO KM 47+662 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE (PACKAGE-9)

DRAWING TITLE:-
REINFORCEMENT DETAIL OF BOX CULVERT AT CH. 42+970

Date	Drw.	Dsg.	Chk.	App.	Scale.	Drawing Status.
JAN.2024	W.P	V.S	A.B		NTS	
Project No.	Drawing No. AVC/NH-38/BOX/REIN./42+970/01					Sheet No. 01 OF 01 / Rev. R0



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



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

LEVELS

DESIGN CH.	FRL	GROUND LEVEL	INVERT LEVEL		VERTICAL CLEARANCE (MAX.)	EARTH FILL (MAX.)	EARTH FILL (MIN.)
			LHS	RHS			
43+643	147.431	142.472	142.172	172.184	4.012m	2.697m	1.178m

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 CONJUCTION 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 – Fe500.
5. 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.
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 SUBJECTED TO CHANGE AS PER SITE CONDITION AND DETAILED DESIGN.
9. BACKFILL TO BE DONE AND COMPACTED FROM BOTH SIDE SIMULTANEOUSLY.
10. 600MM THICK. FILTER MATERIAL BEHIND RETAINING WALL SHALL BE LAID AS PER APPENDIX 6 OF IRC 78–2014.
11. 50MM THICK CEMENT CONCRETE WEARING COAT SHALL BE PROVIDED.
12. 100MM DIA P.V.C. PIPE AT SPACING 1000MMc/c IN HORIZONTAL/VERTICAL DIRECTION SHALL BE PROVIDED UP TO 150MM ABOVE GROUND LEVEL FOR WEEP HOLES IN RETAINING WALL.
13. SBC SHALL BE 13t/m². AND SAME SHALL BE ENSURED AT SITE BY ANY SUITABLE METHOD.
14. 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.
15. CHOOSE ANY SUITABLE METHOD TO ACHIEVE THE REQUIRED SBC AS PER SITE.
16. 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./43+643/02

GOOD FOR CONSTRUCTION

NATIONAL HIGHWAYS & STRUCTURE DEVELOPMENT CORPORATION LTD.

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

AUTHORITY ENGINEER
ALMONDZ GLOBAL INFRACONSULTANT LIMITED IN JV WITH ASOK LEEZA CONSULTANCY PRIVATE LIMITED.
DR. LEDO SECTION
(PKG-3A5)
C/O JAYANTA SAIKIA, BARBAJANIN RAMGHAR, BORBIL NO.2, NIGBOI, 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,

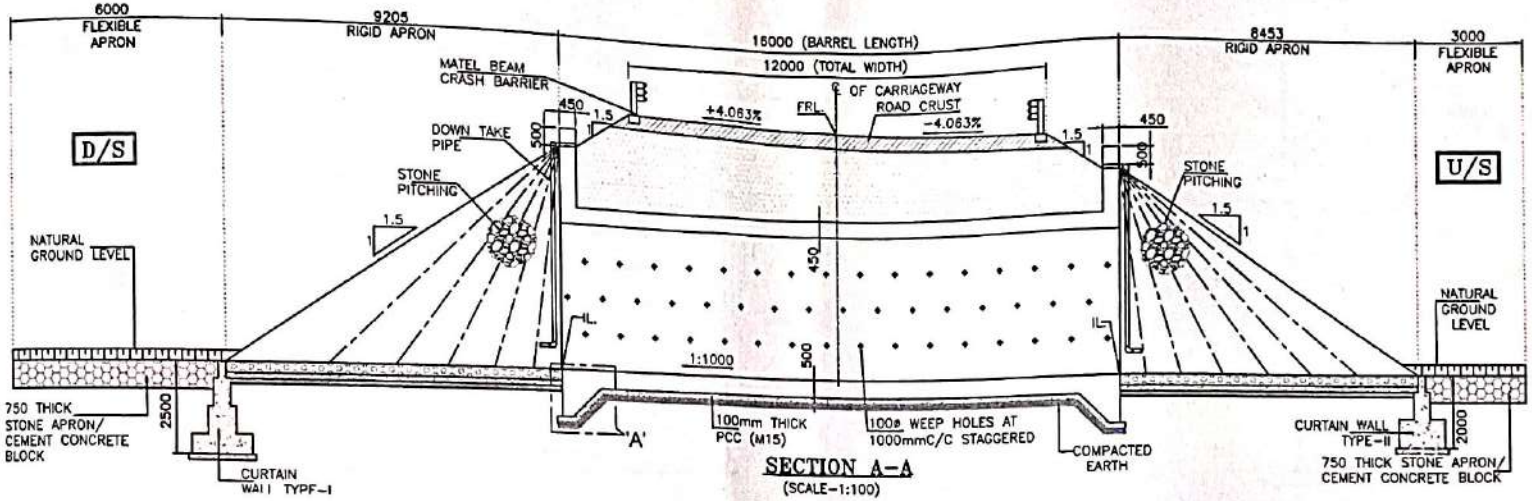
DESIGN CONSULTANT
A.V. CONSTRUCTION
NEW DELHI
Flat, WZ-1240
Palam Extension, Bose Ashram Wali Gali, New Delhi 110045
Winst Infra Solution Pvt. Ltd.
OFFICE F-8, ISHAAN CORPORATE TOWER, PLOT NO-C-23,SECTOR-13, VASUNDHRA GHAZIABAD, U.P-201012
WISPL

CONSTRUCTION

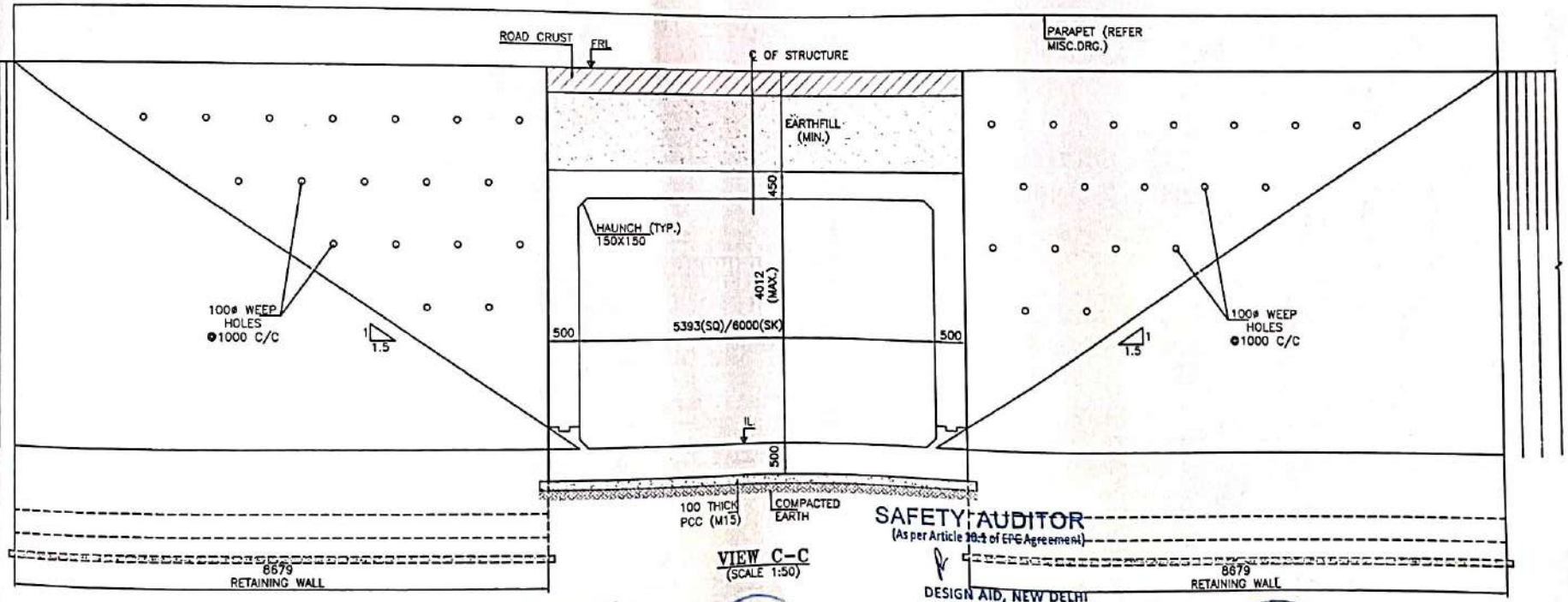
PROJECT:
WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (GOLAI GOAN) TO KM 47+682 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH PROPOSED NARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE (PACKAGE-5)

DRAWING TITLE:-
GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 43+643

Date	Drw.	Dsg.	Chk.	App.	Scale.	Drawing Status.
JAN.2024	W.P	V.S	A.B		NTS	
Project No.	Drawing No. AVC/NH-38/BOX/GAD/43+643/01				Sheet No. 1 OF 3	Rev. R0



SECTION A–A
(SCALE–1:100)



VIEW C–C
(SCALE 1:50)

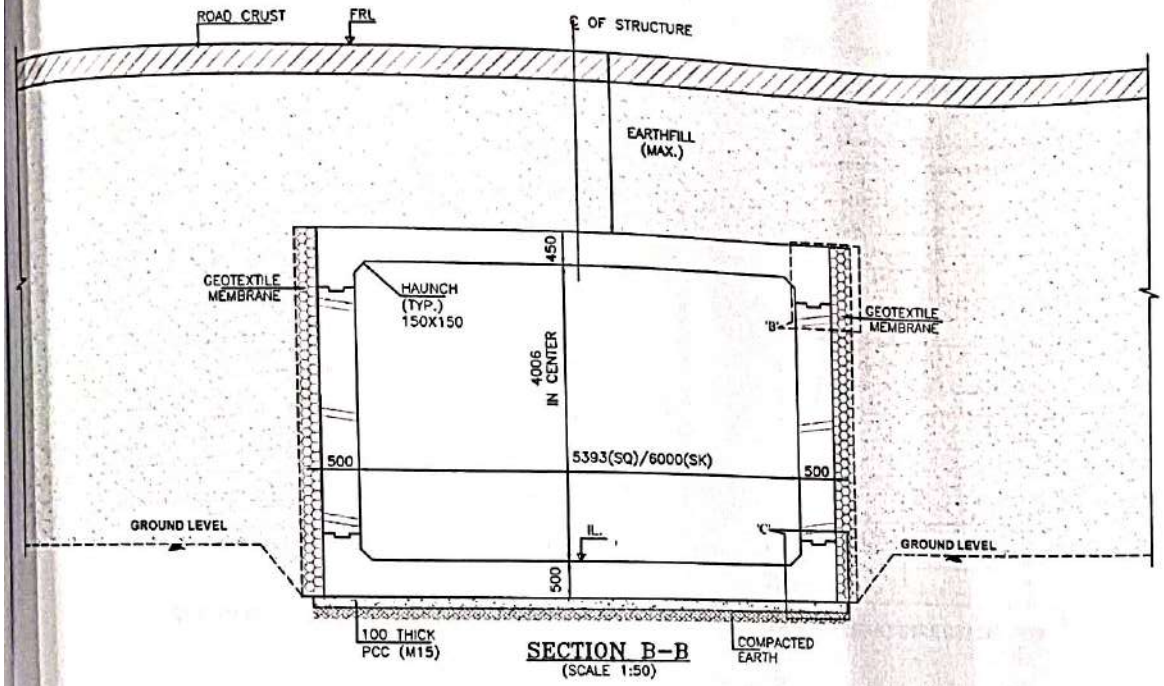
SAFETY AUDITOR
(As per Article 20.2 of EPC Agreement)
DESIGN AID, NEW DELHI

GOOD FOR CONSTRUCTION

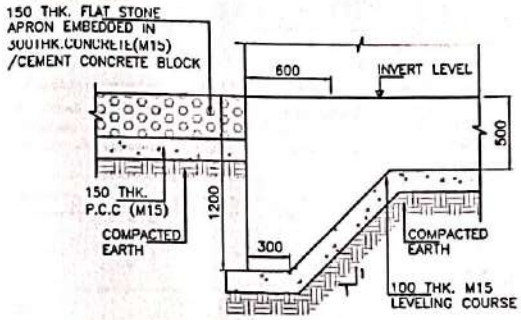
CLIENT:	EPC CONTRACTOR	AUTHORITY ENGINEER	PROOF CONSULTANT:	SAFETY CONSULTANT:	DESIGN CONSULTANT:	PROJECT:
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	KAMAC ENGINEERS Pvt.Ltd KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	ALMONDZ GLOBAL INFRA CONSULTANT LIMITED IN JOINT VENTURE WITH ZEZA CONSULTANT PRIVATE LIMITED. C/O JAYANTA BARUA, SARBAJANIN NAMGHAR, BORBIL 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.	A.V. CONSTRUCTION Winst Infra Solution Pvt. Ltd. WISPL OFFICE: F-8, ISHAAN CORPORATE TOWER, PLOT NO-C-23, SECTOR-13, VASUNDHRA GHAZIABAD, U.P-201012	WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM Km 27+180 (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)

DRAWING TITLE: GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 43+643

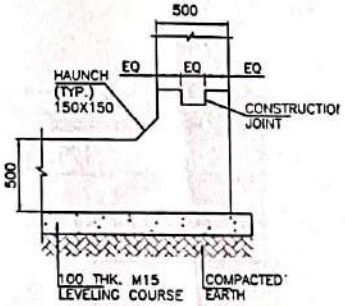
Date	Drw	Dsg	Chk	App	Scale	Drawing Status
JAN.2024	W.P	V.S	A.B		NTS	
Project No.	Drawing No. AVC/NH-38/BOX/GAD/43+643/01				Sheet No 3 OF 3	Rev 00



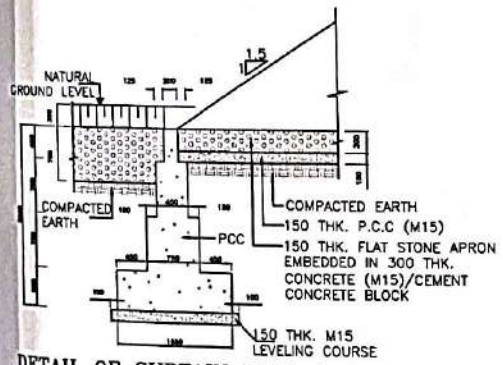
SECTION B–B
(SCALE 1:50)



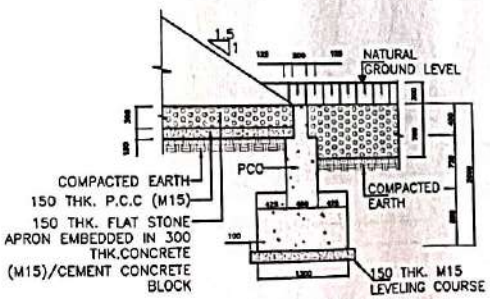
DETAIL–'A'
(SCALE 1:25)



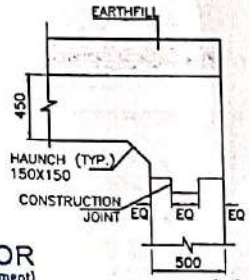
DETAIL–'C'
(SCALE 1:25)



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



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



DETAIL–'B'
(SCALE 1:25)

SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

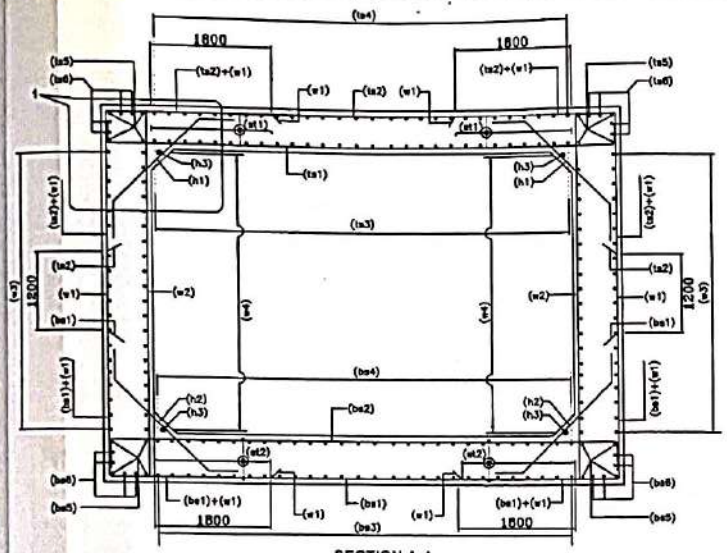
DESIGN AID, NEW DELHI

GOOD FOR CONSTRUCTION

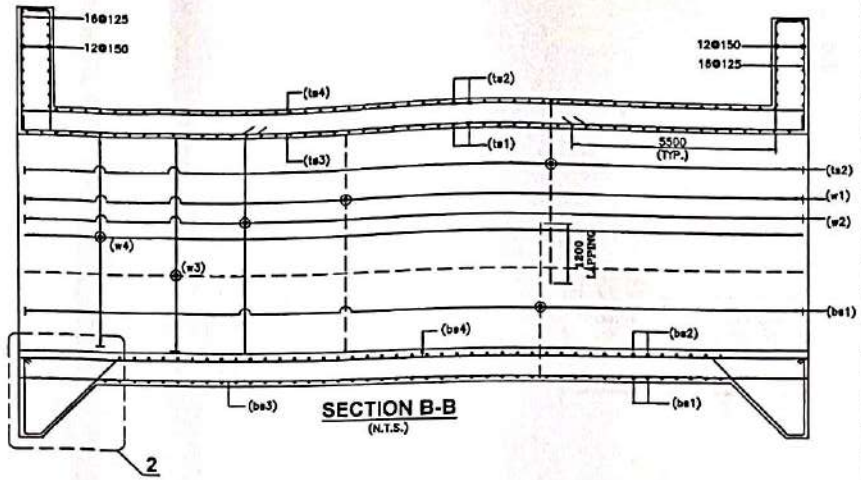
CLIENT:	EPC CONTRACTOR	AUTHORITY'S ENGINEER	PROOF CONSULTANT:	SAFETY CONSULTANT:	DESIGN CONSULTANT:	PROJECT:
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	ALMONDZ GLOBAL INFRA CONSULTANT LIMITED IN JOINT VENTURE WITH AKOLEEZA CONSULTING PRIVATE LIMITED. Dib.-Ledo Section C/O JAYANTA SAHA(L&T) SARBANIN MANGHAR, BORBIL 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.	A.V. CONSTRUCTION Floor WZ-12 R1 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	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)

DRAWING TITLE: GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 43+643

Date	Drw.	Dsg.	Chk.	App.	Scale	Drawing Status
JAN 2024	W.P	V.S	A.B		NTS	
Project No.	Drawing No. AVC/NH-38/BOX/GAD/43+643/01				Sheet No. 3 OF 3	Rev. R0



SECTION A-A
(NTS)



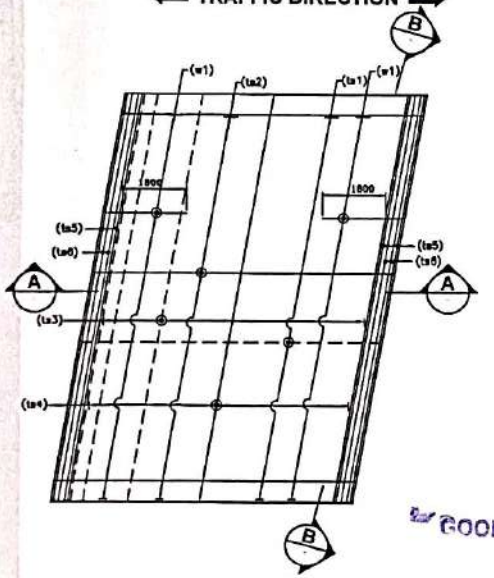
SECTION B-B
(N.T.S.)

BOX REINF. 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 ø 150 C/C (T-T) & (L-L) DIRECTION

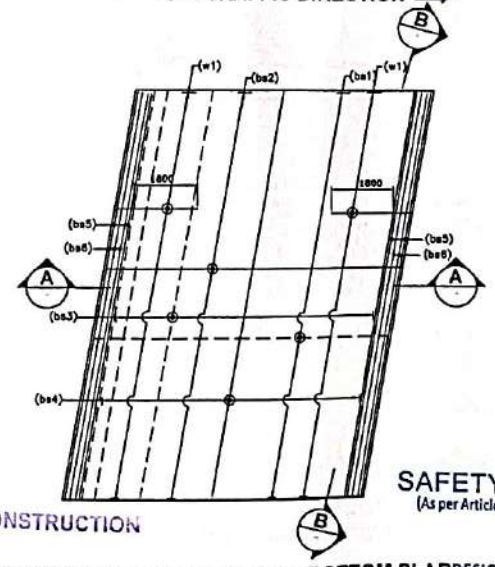
LEGEND:-	
TOP FACE BAR	———
BOTTOM FACE BAR	- - - - -

TRAFFIC DIRECTION

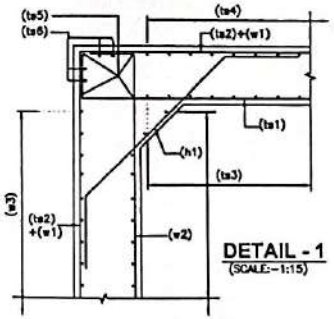


REINFORCEMENT DETAILS OF TOP SLAB
(HAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
(N.T.S.)

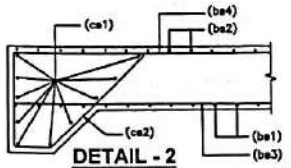
TRAFFIC DIRECTION



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



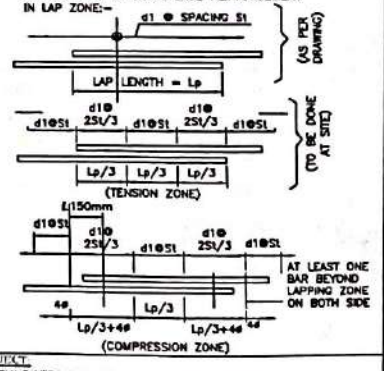
DETAIL - 1
(SCALE:-1:15)



DETAIL - 2
(N.T.S.)

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) CONFIRMING TO IS:1786 STANDARDS.
4. 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
5. OVERLAPPING FOR SPLICING OF REINFORCEMENT SHALL BE AS PER CLAUSE NO.15.2.5.
   LAP LENGTH SHALL NOT BE LESS THAN 56ø.
   ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:-



6. ANCHOURAGE LENGTH OF BOX SHALL BE TAKEN AS 40ø AS PER IRC:112.
7. FOR UNFAVORABLE BOND CONDITIONS THE FACTOR 40 SHOULD BE MULTIPLED BY FACTOR OF 1.43 .
8. CENTER LINE OF OVERLAPPING BAR bs1 & ts2 IN WALL & MID HEIGHT OF WALLS ARE AT SAME POINT.
9. 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:-

1. GENERAL ARRANGEMENT DRAWING. AVC/NH-38/BOX/GAD/43+643/01

GOOD FOR CONSTRUCTION

SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

DESIGN AID, NEW DELHI

CONSTRUCTION

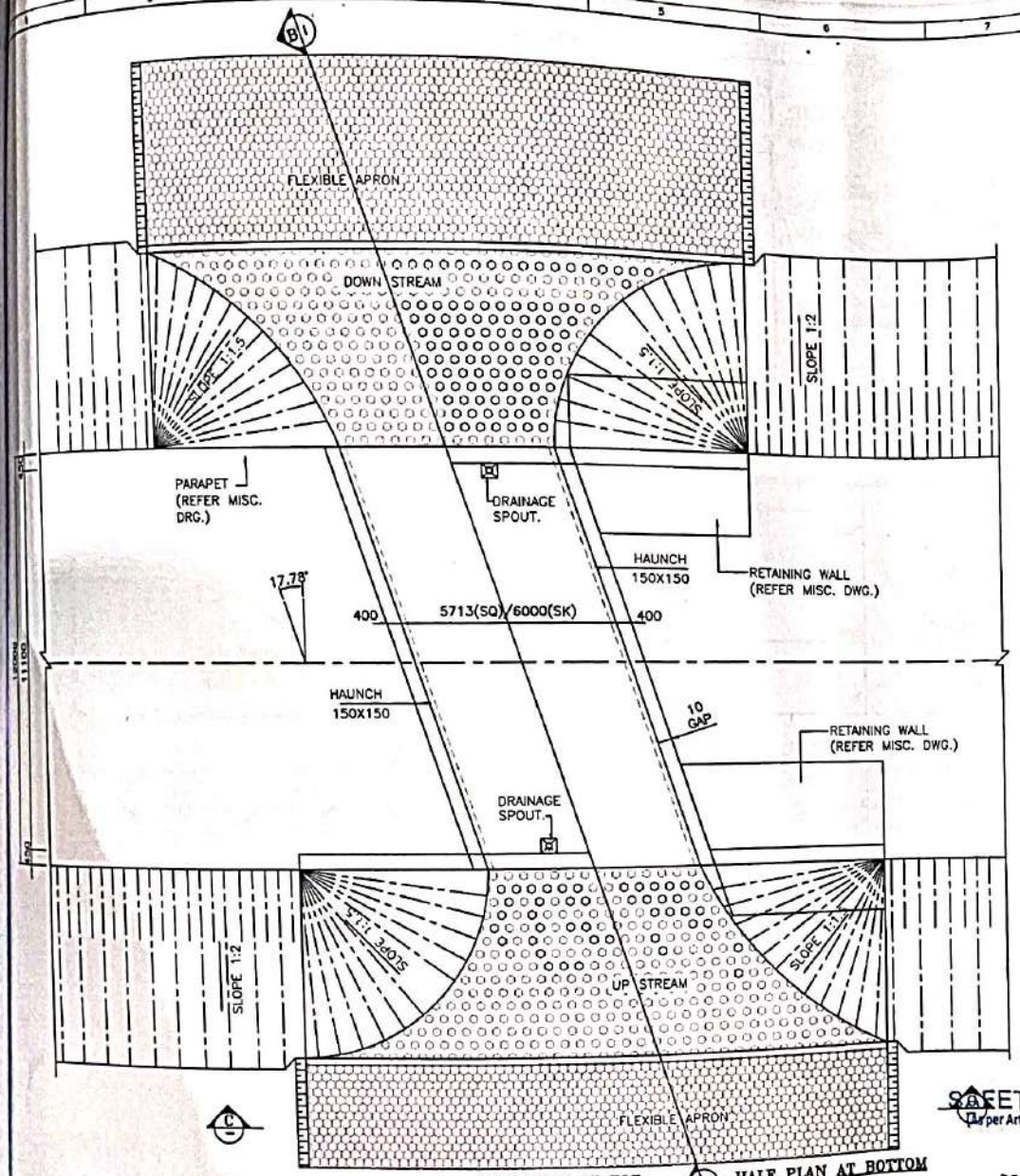
CLIENT:	EPC CONTRACTOR	AUTHORITY'S ENGINEER	PROOF CONSULTANT:	SAFETY CONSULTANT:	DESIGN CONSULTANT:
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	ALMONDZ GLOBAL INFRA CONSULTANT LIMITED ENGINEER-IN-CHARGE (PKG-3,4,5) C/O JAYANTA SAIKIA, SARBANIN NAMGHAR, BORBIL 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.	A.V. CONSTRUCTION 1st Floor, WZ-124-B, Palam Extension, Besco 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 3-LANE LANE WITH PAVED SHOULDER FROM KM 27+190 (GOLAI GOAN) TO KM 47+642 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (3-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. 43+643

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/NH-38/BOX/REIN.M3+643/01	01 OF 01	R0



HALF PLAN AT TOP

HALF PLAN AT BOTTOM

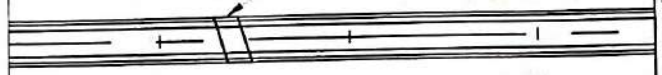
PLAN
(SCALE-1:100)

GOOD FOR CONSTRUCTION

44050

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

44150



KEY PLAN

LEVELS

DESIGN CH.	FRL	GROUND LEVEL	INVERT LEVEL		VERTICAL CLEARANCE (MAX.)	EARTH FILL (MAX.)	EARTH FILL (MIN.)
			LHS	RHS			
44+070	146.576	143.249	142.949	142.961	3.156m	0	0

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 CONJUCTION 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 - Fe500.
5. 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.
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 SUBJECTED TO CHANGE AS PER SITE CONDITION AND DETAILED DESIGN.
9. BACKFILL TO BE DONE AND COMPACTED FROM BOTH SIDE SIMULTANEOUSLY.
10. 600MM THICK. FILTER MATERIAL BEHIND RETAINING WALL SHALL BE LAID AS PER APPENDIX 6 OF IRC 78-2014.
11. 50MM THICK CEMENT CONCRETE WEARING COAT SHALL BE PROVIDED.
12. 100MM DIA P.V.C. PIPE AT SPACING 1000MMc/c IN HORIZONTAL/VERTICAL DIRECTION SHALL BE PROVIDED UP TO 150MM ABOVE GROUND LEVEL FOR WEEP HOLES IN RETAINING WALL.
13. SBC SHALL BE 8t/m². AND SAME SHALL BE ENSURED AT SITE BY ANY SUITABLE METHOD.
14. 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.
15. CHOOSE ANY SUITABLE METHOD TO ACHIEVE THE REQUIRED SBC AS PER SITE.
16. 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:-
1. REINFORCEMENT DETAIL OF BOX CULVERT AVC/NH-38/BOX/REINF./44+070/01

CLIENT:
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.

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

AUTHORITIES ENGINEER
ALMONDZ GLOBAL INFRA CONSULTANT LIMITED IN JV WITH STOREEZA CONSULTANT PRIVATE LIMITED.
C/O JAKANTABARIKIA, SARBANANIN 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

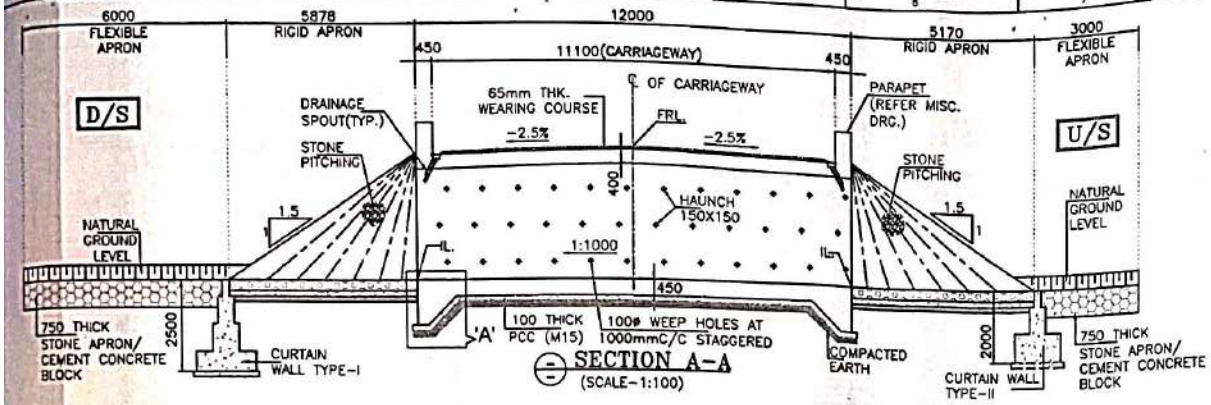
DESIGN CONSULTANT:
A. CONSTRUCTION
Ashram Wall Gali,New Delhi 110045
Winst Infra Solution Pvt. Ltd.
OFFICE: F-6, ISHAAN CORPORATE TOWER, PLOT NO-C-23,SECTOR-13, VASUNDHRA GHAZIABAD, U.P-201012

PROJECT:
WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (GOLAI GOAN) TO KM 47+583 (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)

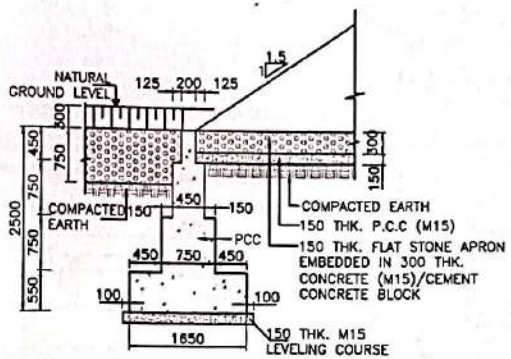
DRAWING TITLE:-
GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 44+070

Date	Drw.	Dsg.	Chk.	App.	Scale	Drawing Status
JAN 2024	W.P	V.S	A.R		NTS	

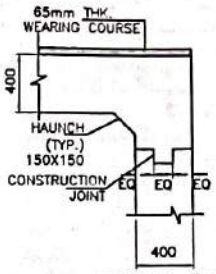
Project No.	Drawing Ref.	Sheet No.	Rev.
	AVC/NH-38/BOX/GAD/44+070/01	1 OF 1	R0



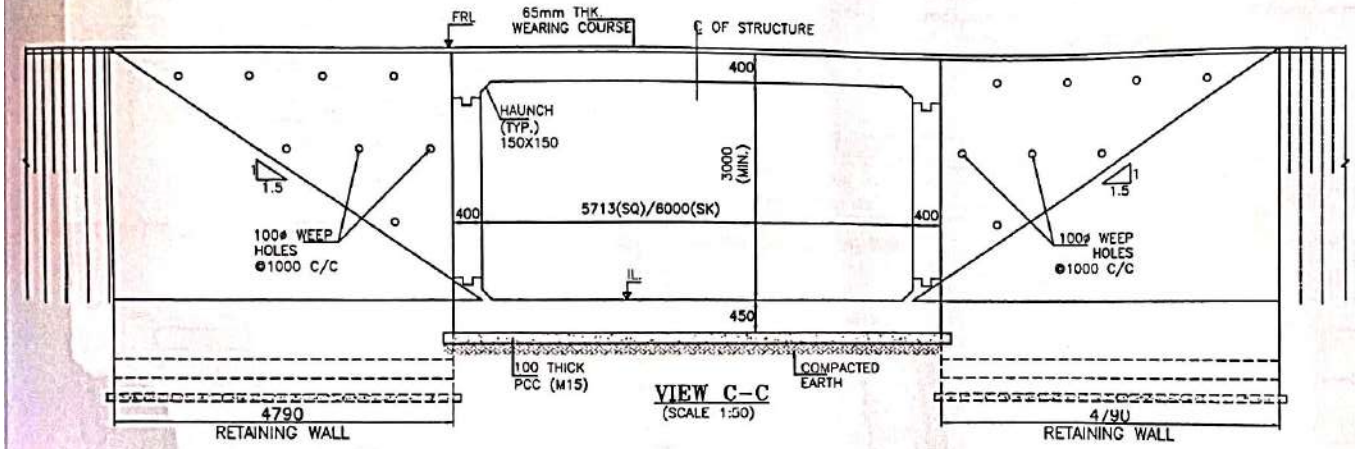
SECTION A-A
(SCALE-1:100)



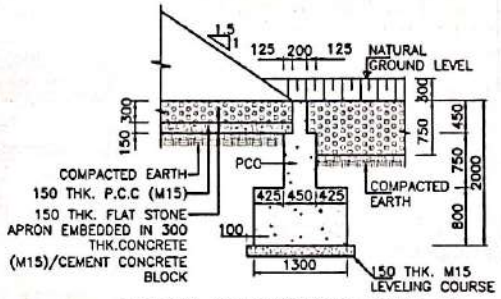
DETAIL OF CURTAIN WALL-I
(DOWN STREAM SIDE)
(SCALE 1:50)



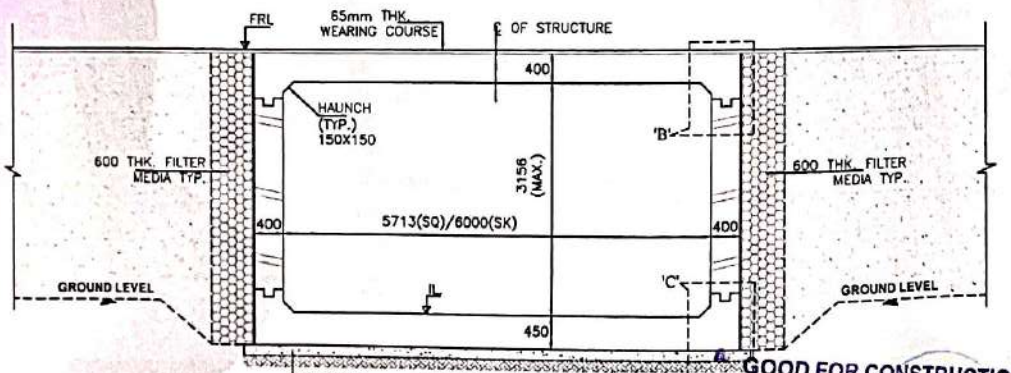
DETAIL-'B'
(SCALE 1:25)



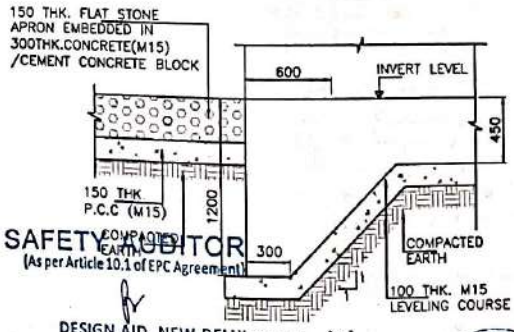
VIEW C-C
(SCALE 1:50)



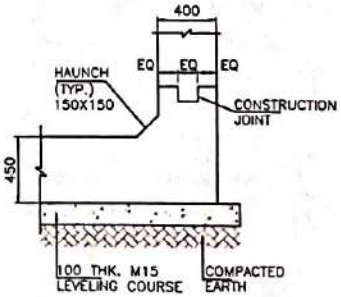
DETAIL OF CURTAIN WALL-II
(UP STREAM SIDE)
(SCALE 1:50)



SECTION B-B
(SCALE 1:50)



DETAIL-'A'
(SCALE 1:25)



DETAIL-'C'
(SCALE 1:25)

SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

DESIGN AID, NEW DELHI

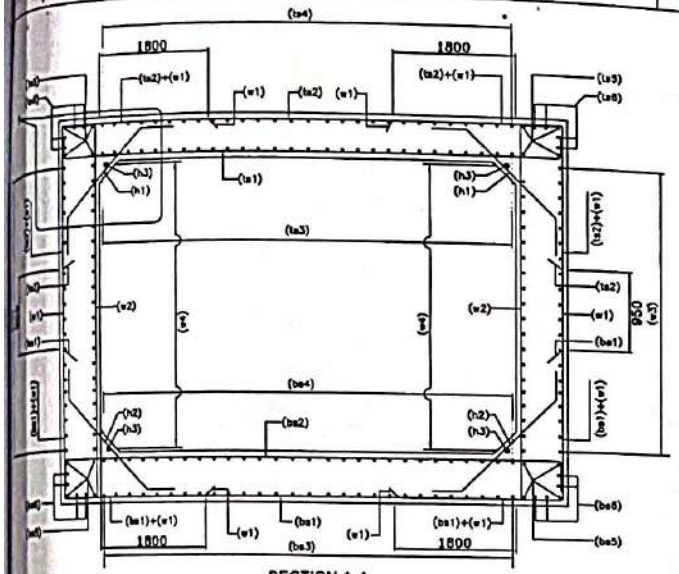
'GOOD FOR CONSTRUCTION'

CLIENT:	EPC CONTRACTOR	AUTHORITY'S ENGINEER	PROOF CONSULTANT:	SAFETY CONSULTANT:	DESIGN CONSULTANT:	PROJECT:
NATIONAL HIGHWAYS & FRASTRUCTURE DEVELOPMENT CORPORATION LTD.	KAMAC ENGINEERS Pvt.Ltd KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	ALMONDZ GLOBAL INFRA CONSULTANT LIMITED JOINT WITH A.G. LEZA CONSULTANT PRIVATE LIMITED. C/O JAYANTA SOLOMON BARBAJAJIN NAVIGHAR, BORBIL NO-1, 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-8, ISHAAN CORPORATE TOWER, PLOT NO-C-23,SECTOR-13, VASUNDHRA GHAZIABAD, U.P-201012	WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (GOLAI GOAN) TO KM 47+662 (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)

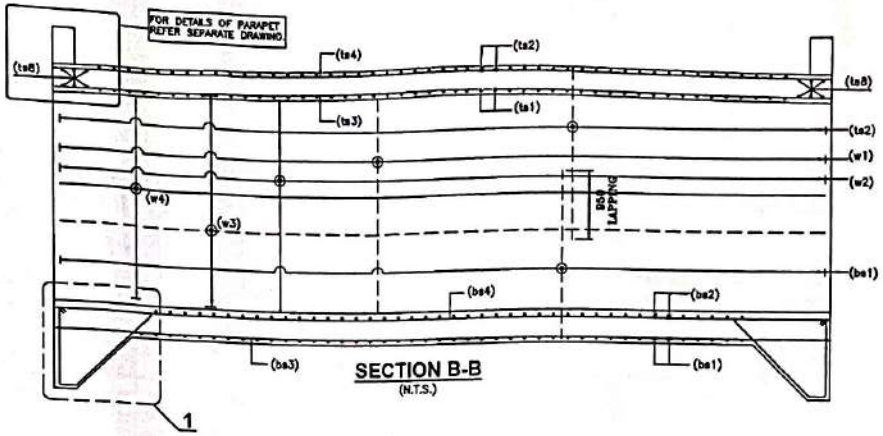
DRAWING TITLE: GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 44+070

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/NH-38/BOX/GAD/44+070/001	2 OF 2	R0



SECTION A-A
(NTS)



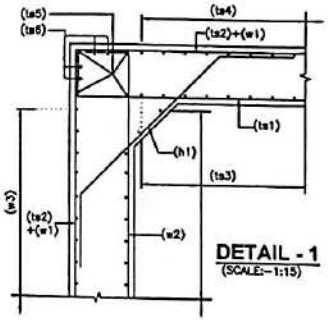
SECTION B-B
(N.T.S.)

BOX REINF. SCHEDULE

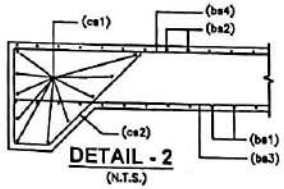
SL.NO.	BAR MARK	BAR SHAPE	DIAMETER	SPACING
1	ts1		16+10	200
2	ts2		16	200
3	ts3		10	200
4	ts4		12	200
5	ts5		12	2x4 Nos.
6	ts6		12	2x4 Nos.
7	w1		16	200
8	w2		16	200
9	w3		12	200
10	w4		10	200
11	bs1		16	200
12	bs2		20+10	200
13	bs3		12	200
14	bs4		12	200
15	bs5		12	2x4 Nos.
16	bs6		12	2x4 Nos.
17	h1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

LEGEND:-

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

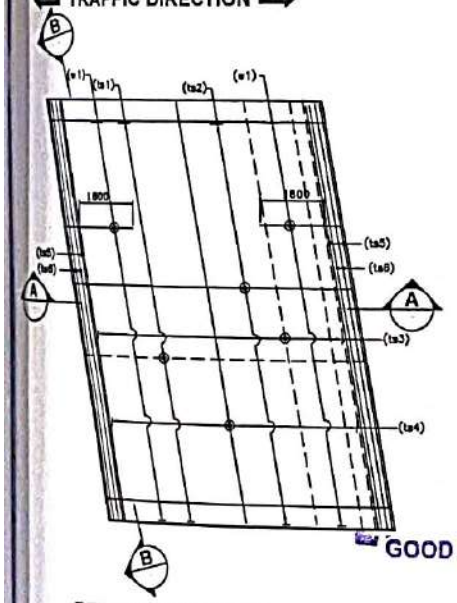


DETAIL - 1
(SCALE:- 1:15)



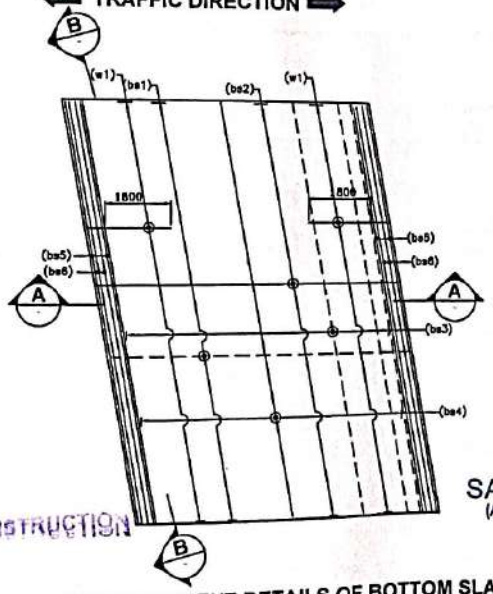
DETAIL - 2
(N.T.S.)

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.)

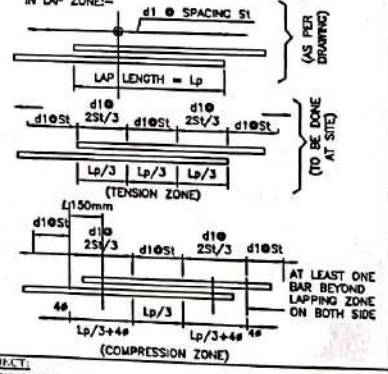
6. ANCHOURAGE LENGTH OF BOX SHALL BE TAKEN AS 40ø AS PER IRC:112.
7. FOR UNFAVORABLE BOND CONDITIONS THE FACTOR 40 SHOULD BE MULTIPLIED BY FACTOR OF 1.43 .

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.

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) CONFIRMING TO IS:1786 STANDARDS.
4. MINIMUM CLEAR COVER TO OUTERMOST REINFORCEMENT SHALL BE AS FOLLOWS:-
   a) TOP SLAB
   b) BOTTOM SLAB - 45mm
   c) SIDE WALL (EARTH SIDE) - 75mm
   d) SIDE WALL (INNER SIDE) - 75mm - 45mm
5. OVERLAPPING FOR SPLICING OF REINFORCEMENT SHALL BE AS PER CLAUSE NO.15.2.5.
   LAP LENGTH SHALL NOT BE LESS THAN 56ø.
   ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:-



SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

DESIGN AID, NEW DELHI

GOOD FOR CONSTRUCTION

REFERENCE DRAWING:-

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

NHDCL
NATIONAL HIGHWAYS & STRUCTURE DEVELOPMENT CORPORATION LTD.

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

AUTHORITY'S ENGINEER
ALMONDZ GLOBAL INFRA CONSULTANT LIMITED IN JOINT WITH AVOLTZA CONSULTANT PRIVATE LIMITED.
(PKG-34.5)
C/O JAYANTA SARKAR, 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

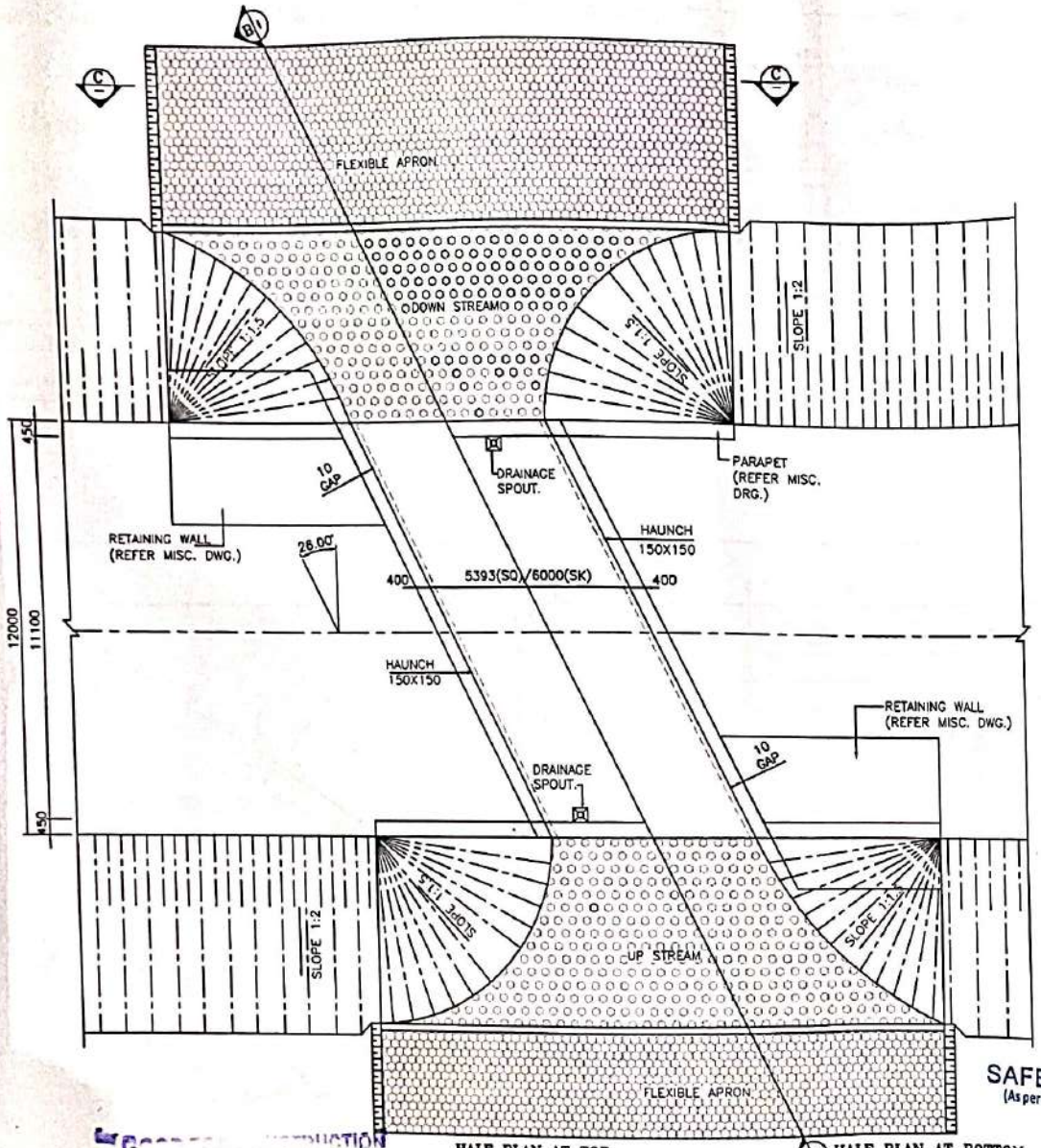
SAFETY CONSULTANT:
DESIGN AID
PLOT NO.54, 3rd FLOOR(FRONT), MASOODPUR DAIRY FARM, VASANT KUNJ, NEW DELHI-110070.

DESIGN CONSULTANT:
A.V. CONSTRUCTION
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 47-682 (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)

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

Date	Drw	Dsg	Chk.	App.	Scale.	Drawing Status.
JAN.2024	W.P	V.S	A.B		NTS	
Project No	Drawing No. AVC/NH-38/BOX/REIN/44+070/01				Sheet No. 01 OF 01	Rev. R0



HALF PLAN AT TOP

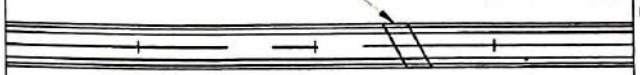
PLAN
(SCALE–1:100)

HALF PLAN AT BOTTOM

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

44450

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:-

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 CONJUCTION 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 – Fe500.
5. 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.
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 SUBJECTED TO CHANGE AS PER SITE CONDITION AND DETAILED DESIGN.
9. BACKFILL TO BE DONE AND COMPACTED FROM BOTH SIDE SIMULTANEOUSLY.
10. 600MM THICK. FILTER MATERIAL BEHIND RETAINING WALL SHALL BE LAID AS PER APPENDIX 6 OF IRC 78–2014.
11. 50MM THICK CEMENT CONCRETE WEARING COAT SHALL BE PROVIDED.
12. 100MM DIA P.V.C. PIPE AT SPACING 1000MMc/c IN HORIZONTAL/VERTICAL DIRECTION SHALL BE PROVIDED UP TO 150MM ABOVE GROUND LEVEL FOR WEEP HOLES IN RETAINING WALL.
13. SBC SHALL BE 10t/m². AND SAME SHALL BE ENSURED AT SITE BY ANY SUITABLE METHOD.
14. 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.
15. CHOOSE ANY SUITABLE METHOD TO ACHIEVE THE REQUIRED SBC AS PER SITE.
16. 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./44+526

CONSTRUCTION

CLIENT:
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.

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

AUTHORITY ENGINEER
ALMONAZ GLOBAL INFRA CONSULTANT LIMITED BY AYOB HAYAT REZA CONSULTING PRIVATE LIMITED.
(PKG-3,4,5)
C/O JAYANTA SAIKIA, SARBJANIN NAMGHAR, BOBBI NO.2, DIBBOI, 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,

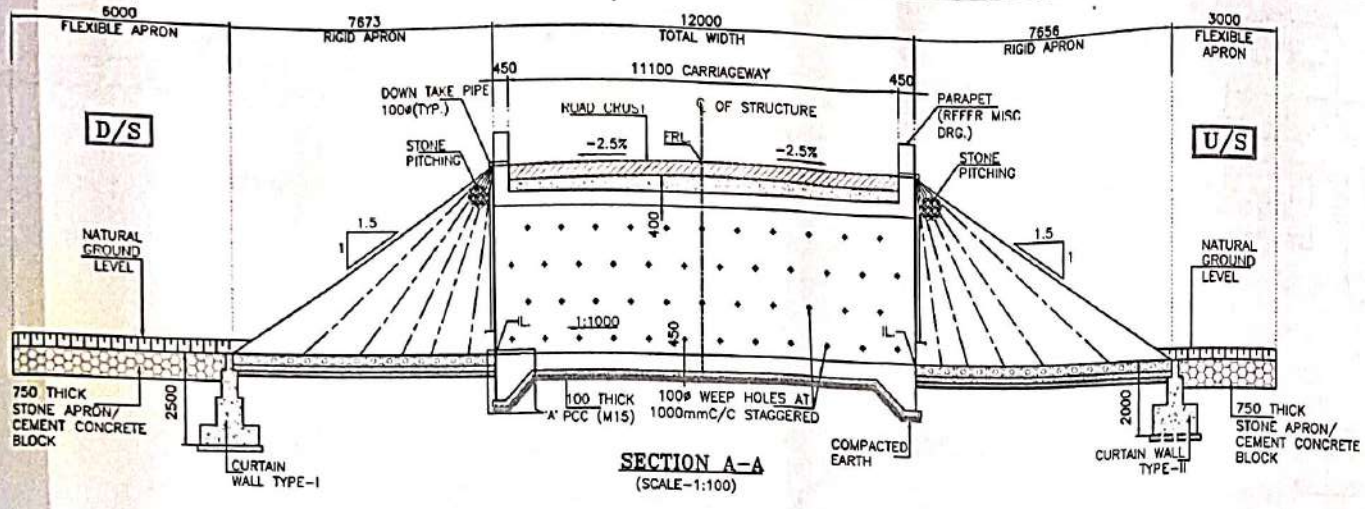
DESIGN CONSULTANT DELHI
A.K. CONSTRUCTION
Floor, WZ-1210, Palam Extension, Bosco Ashram Vill Gali,New Delhi 110045
Winst Infra Solution Pvt. Ltd.
OFFICE: F-8, ISHAAN CORPORATE TOWER, PLOT NO-C-23,SECTOR-13, VASUNDHRA GHAZIABAD, U.P-201012

PROJECT:
WIDENING/IMPROVEMENT TO 2-LANE LANE (WITH PAVED SHOULDER FROM KM 27+150 (GOLAI GOAN) TO KM 47+862 (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)

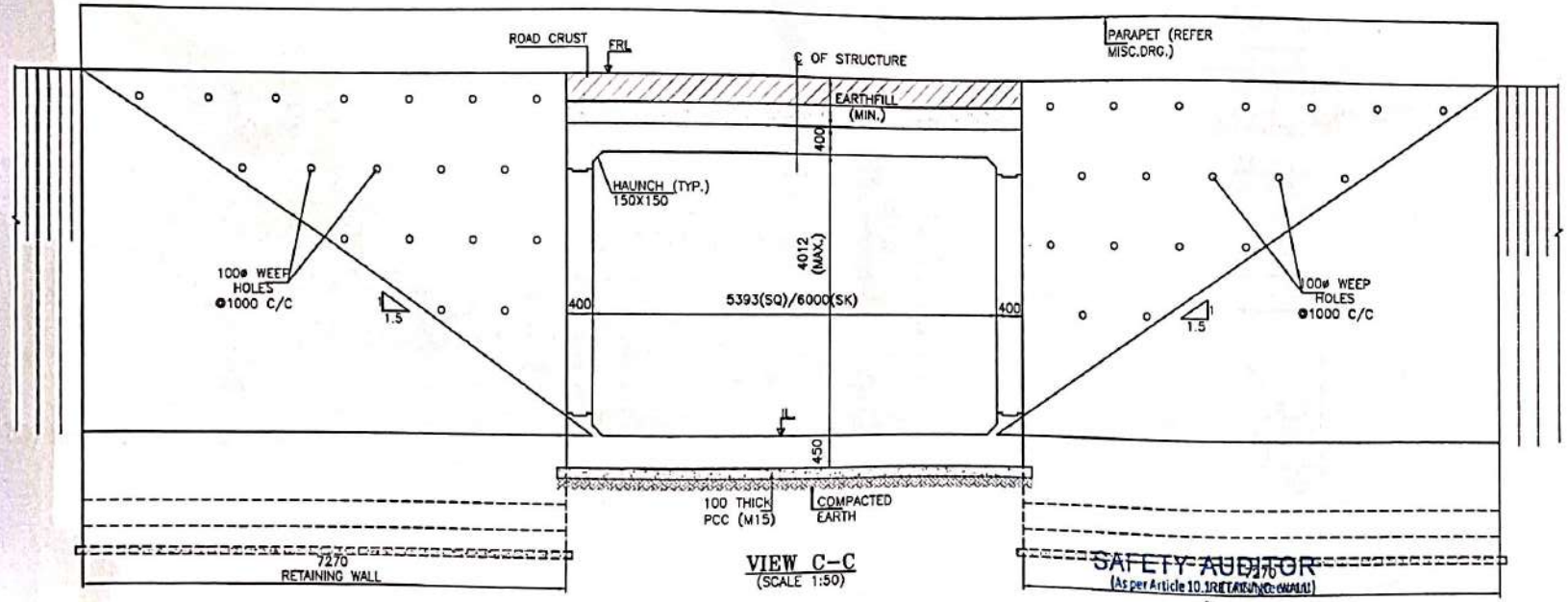
DRAWING TITLE:-
GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 44+526

Date	Drw.	Dsg.	Chk.	App	Scale	Drawing Status
JAN.2024	W.P	V.S	A.H		NTS	

Project No.	Drawing No.	Sheet No.	Rev
	AVC/NH-38/BOX/GAD/44+526/01	1 OF 3	R0



SECTION A-A
(SCALE-1:100)



VIEW C-C
(SCALE 1:50)

SAFETY AUDITOR
(As per Article 10.1(RETAINING WALL))

GOOD FOR CONSTRUCTION

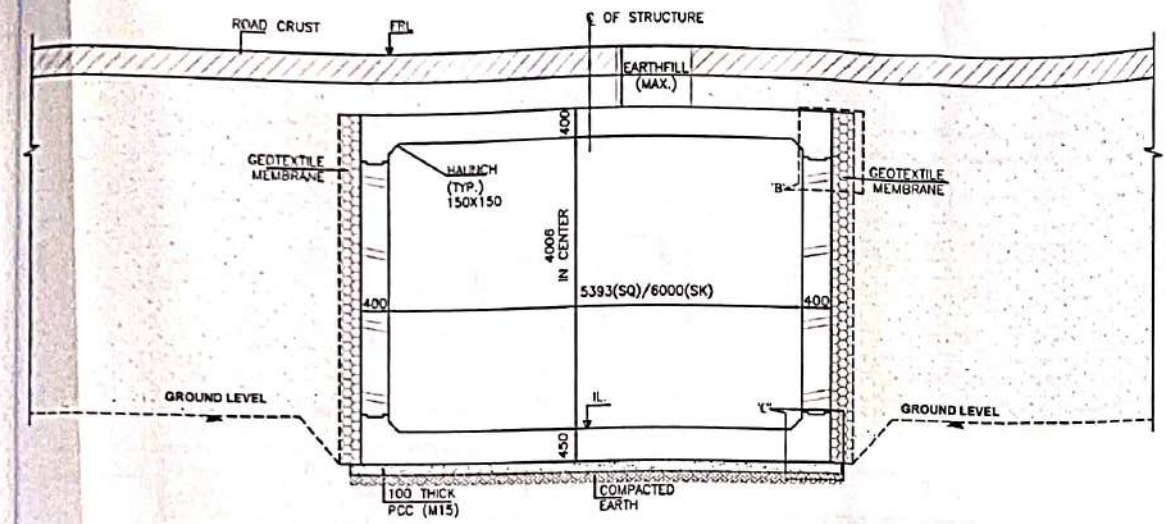
DESIGN AID, NEW DELHI

CLIENT:	EPC CONTRACTOR	AUTHORITY ENGINEER	PROOF CONSULTANT:	SAFETY CONSULTANT:	DESIGN CONSULTANT:	PROJECT:
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	KAMAC ENGINEERS Pvt.Ltd KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	ALMONDZ GLOBAL INFRA CONSULTANT LIMITED IN JV WITH JAYOI EEZA CONSULTOR PRIVATE LIMITED. C/O JAYANTA SAHA, SARBAJANIK NAMGHAR, BORBIL NO 2, DIGBOI, TINSUKIA, ASSAM-786171	CREATIVE ENGINEERING SERVICES OFFICE NO: 620, SIGNATURE GLOBAL MALL, SECTOR-3, VAISHALI, GHAZIABAD, U.P-201010	DESIGN DESIGN AID PLOT NO.54, 3rd FLOOR(FRONT), MASOODPUR DAIRY FARM,VASANT KUNJ, NEW DELHI-110070,	AVC CONSTRUCTION 4th Floor, WZ-1239, 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 WISPL	WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (GOLAI GOAN) TO KM 47+662 (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 44+526

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/NH-38/BOX/GAD/44+526/01	2 OF 2	R0



SECTION B–B
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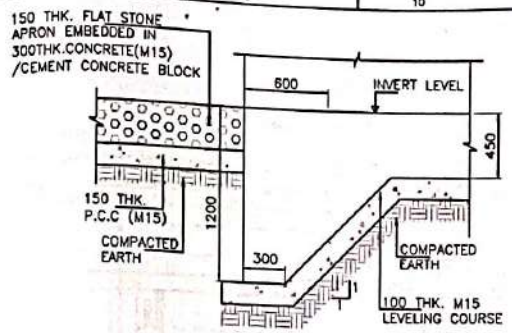
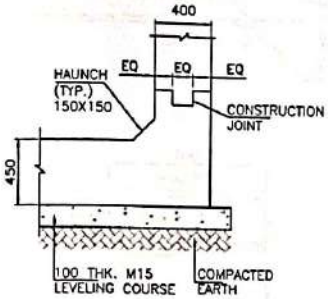
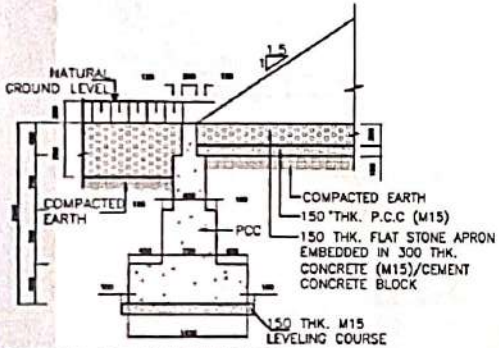


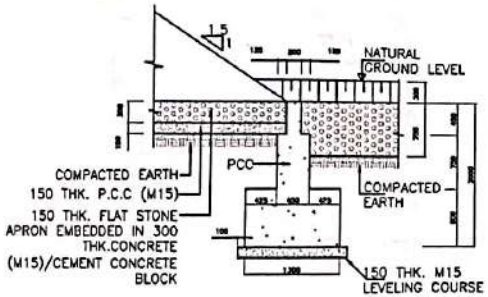
DETAIL–'A'
(SCALE 1:25)



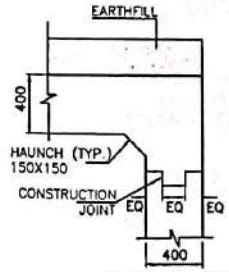
DETAIL–'C'
(SCALE 1:25)



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



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



DETAIL–'B'
(SCALE 1:25)

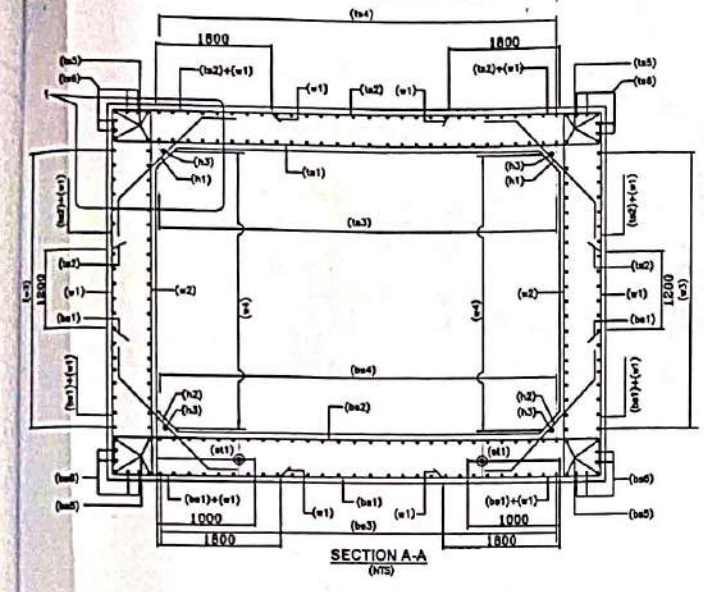
SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

DESIGN AID, NEW DELHI

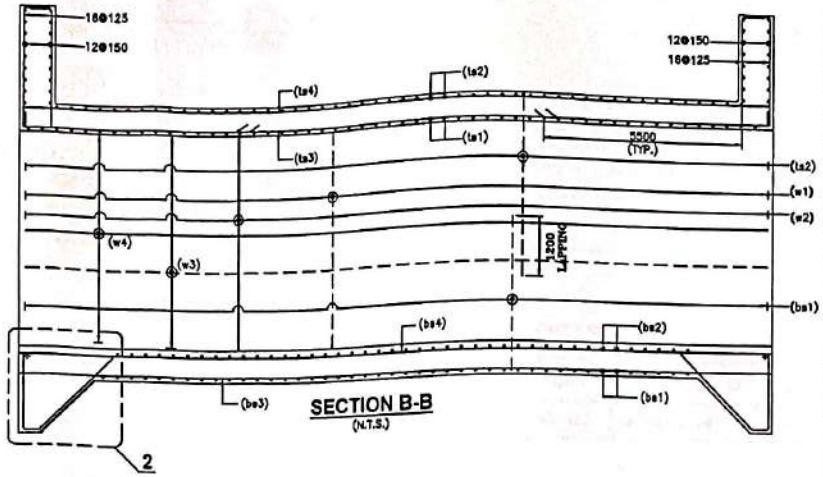
GOOD FOR CONSTRUCTION

CONSTRUCTION NEW DELHI

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: ALMONDZ GLOBAL INFRACONSULTANT LIMITED IN JOINT VENTURE WITH ACCESS CONSULTANT PRIVATE LIMITED. C/O AVANTA SAKHA, SAB BAJANN NAUGHAR, BOX 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, 127-1200, 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 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (GOLAI (GOAM) TO KM 47+582 (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 44+526		
						Date JAN.2024 / Drw. W.P / Dsg. V.S / Chk A.D / App / Scale NTS / Drawing Status		
						Project No. / Drawing No. AVC/NH-38/BOX/GAD/44+526/01	Sheet No. 2 OF 3	Rev 00



SECTION A-A
(NTS)



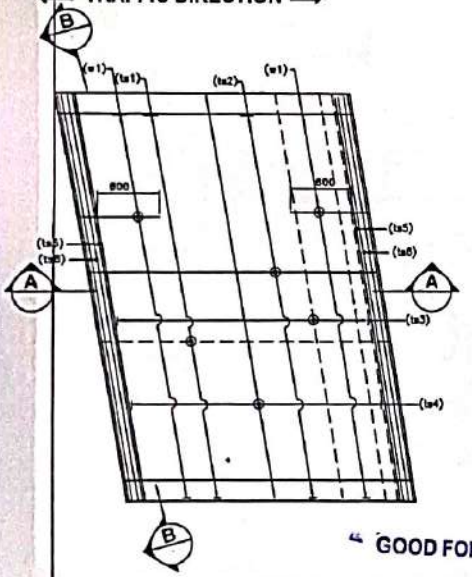
SECTION B-B
(N.T.S.)

BOX REINF. 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

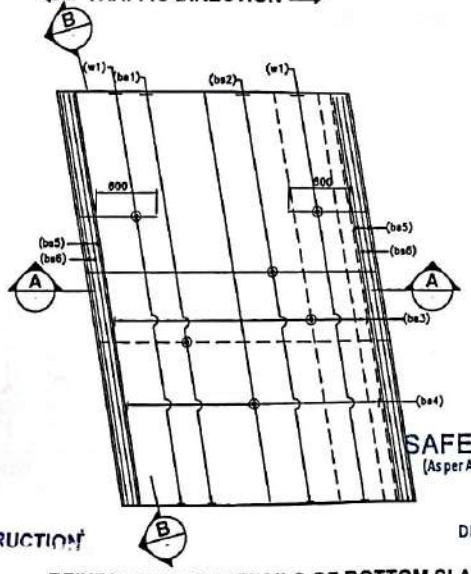
LEGEND:-	
TOP FACE BAR	———
BOTTOM FACE BAR	- - - - -

TRAFFIC DIRECTION

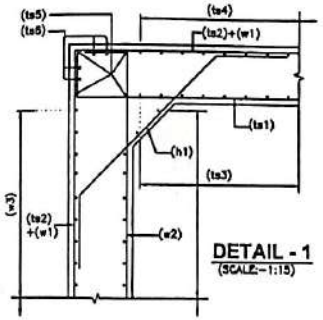


REINFORCEMENT DETAILS OF TOP SLAB
(HAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
(N.T.S.)

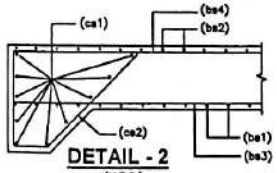
TRAFFIC DIRECTION



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



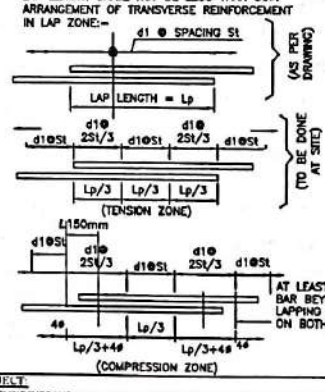
DETAIL - 1
(SCALE:-1:15)



DETAIL - 2
(N.T.S.)

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) CONFIRMING TO IS:1786 STANDARDS.
4. 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
5. OVERLAPPING FOR SPLICING OF REINFORCEMENT SHALL BE AS PER CLAUSE NO.15.2.5.
   LAP LENGTH SHALL NOT BE LESS THAN 58ϕ.
   ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:-



6. ANCHOURAGE LENGTH OF BOX SHALL BE TAKEN AS 40ϕ AS PER IRC:112.
7. FOR UNFAVORABLE BOND CONDITIONS THE FACTOR 40 SHOULD BE MULTIPLIED BY FACTOR OF 1.43 .
8. CENTER LINE OF OVERLAPPING BAR bs1 & ts2 IN WALL & MID HEIGHT OF WALLS ARE AT SAME POINT.
9. 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.

SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

DESIGN AID, NEW DELHI

"GOOD FOR CONSTRUCTION"

REFERENCE DRAWING:-

1. GENERAL ARRANGEMENT DRAWING.
   AVC/NH-38/BOX/GAD/44+528/01

CONSTRUCTION

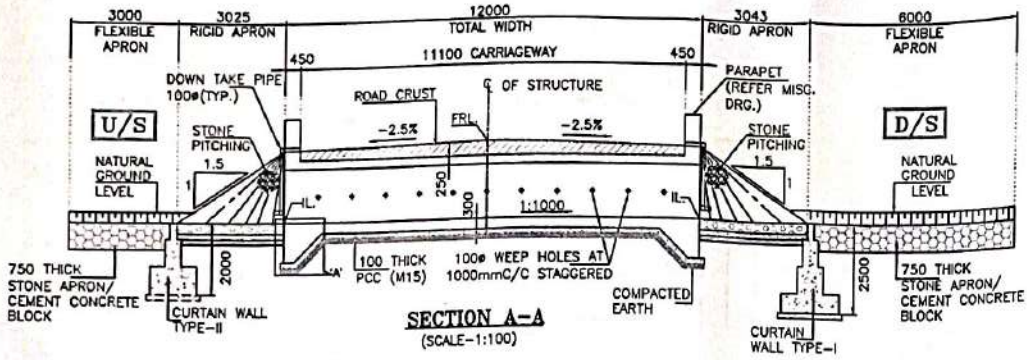
CLIENT:	EPC CONTRACTOR	AUTHORITY'S ENGINEER	PROOF CONSULTANT:	SAFETY CONSULTANT:	DESIGN CONSULTANT:
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	ALMONDZ GLOBAL INFRA CONSULTANT LIMITED IN JOINT WITH KULEEZA CONSULTANT PRIVATE LIMITED. C/O JAYANTA SAIKIA, SARBAJANIN NAMGHAR, BOGI 4.0.2/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,	A.V. CONSTRUCTION 1 Floor, WZ-1245 Palam Extention, Sagar 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.201012

PROJECT: WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (GOLAI GOAN) TO KM 47+662 (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)

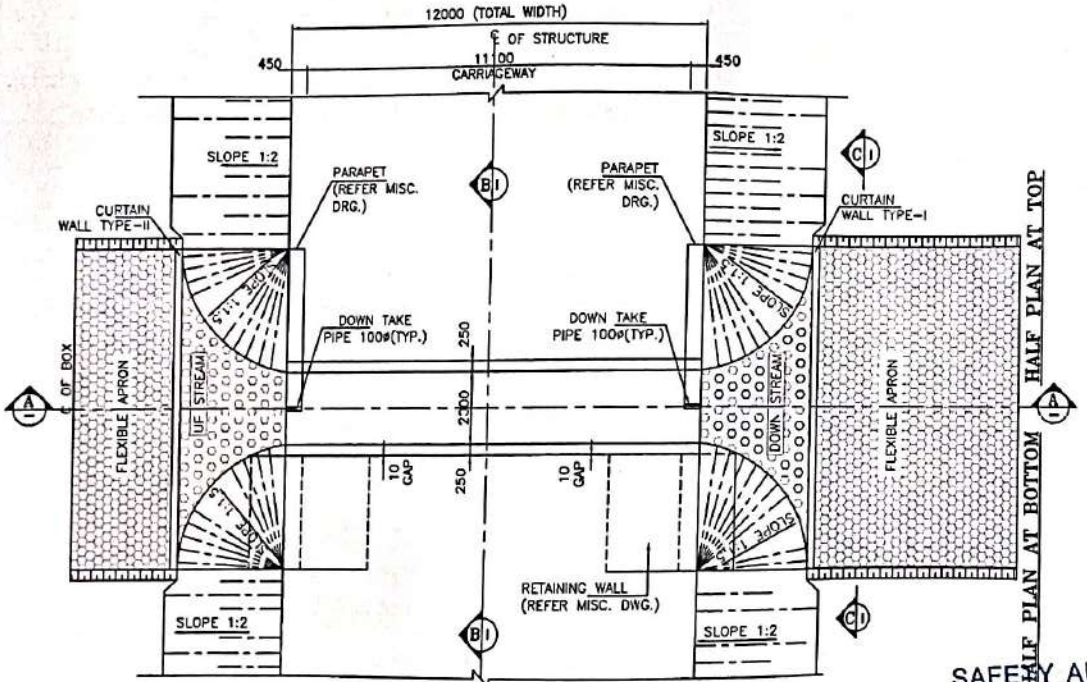
DRAWING TITLE: REINFORCEMENT DETAIL OF BOX CULVERT AT CH. 44+525

Date	Drw.	Dsg.	Chk.	App.	Scale.	Drawing Status
JAN.2024	W.I*	V.S	A.B		NTS	

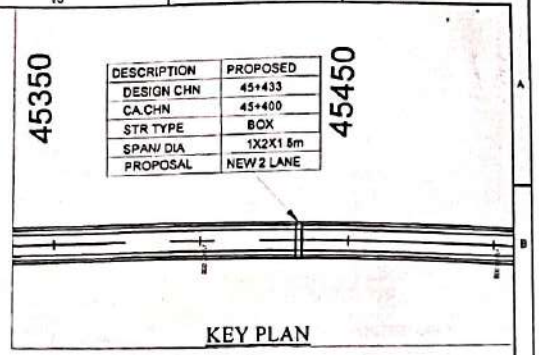
Project No.	Drawing No.	Sheet No.	Rev.
	AVC/NH-38/BOX/REIN.44+525/01	01 OF 01	R0



SECTION A-A
(SCALE-1:100)



PLAN
(SCALE-1:100)



DESCRIPTION	PROPOSED
DESIGN CHN	45+433
CA.CHN	45+400
STR TYPE	BOX
SPAN/ DIA	1X2X1.5m
PROPOSAL	NEW 2 LANE

KEY PLAN

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:-

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 CONJUCTION 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 SUBJECTED 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 1000MMc/c IN HORIZONTAL/VERTICAL DIRECTION SHALL BE PROVIDED UP TO 150MM ABOVE GROUND LEVEL FOR WEEP HOLES IN RETAINING WALL.
11. SBC SHALL BE 9t/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.

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/BC/REINF./45+433/01

GOOD FOR CONSTRUCTION

NATIONAL HIGHWAYS & STRUCTURE 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
ALMONDZ GLOBAL INFRA CONSULTANT LIMITED IN JOINT WITH AYOJEETA CONSULTANT PRIVATE LIMITED.
C/O AYAN DASARIA, SARBAJANIK 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:
W I S P L
Winst Infra Solution Pvt. Ltd.
OFFICE. F-4, ISHAAN CORPORATE TOWER, PLOT NO-G-23, SECTOR-13, VASUNDHRA GHAZIABAD, U.P-201012

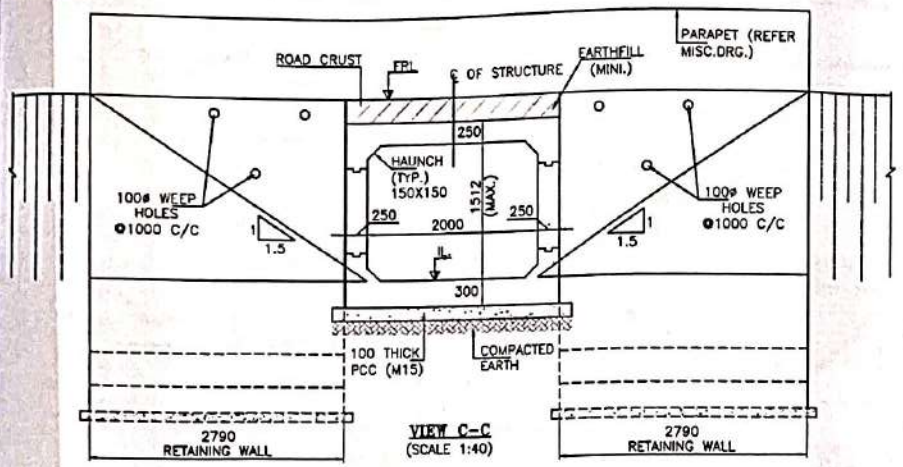
CONSTRUCTION
4th Floor, W.Z.-200, Kalam Extension, Bosco Ashram Well Gali, New Delhi 110045

PROJECT: WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (GOLAI GOAN) TO KM 47+662 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH PROPOSED MARGHERTA & 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)

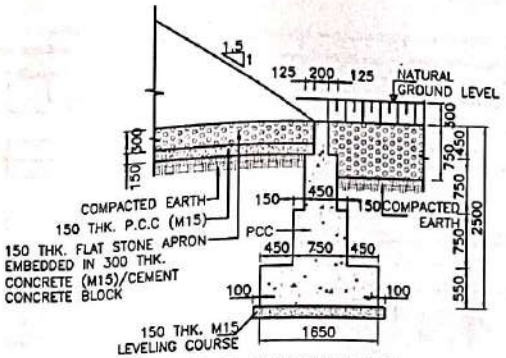
DRAWING TITLE: GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 45+433

Date	Drw	Dsg	Chk.	App.	Scale.	Drawing Status.
JAN.2024	W.P	V.S	A.B		NTS	

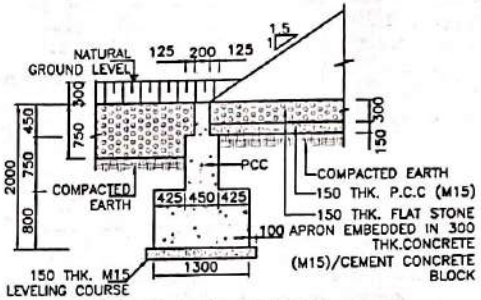
Project No.	Drawing No.	Sheet No.	Rev
	AVC/NH-38/BC/GAD/45+433/01	01 OF 02	R0



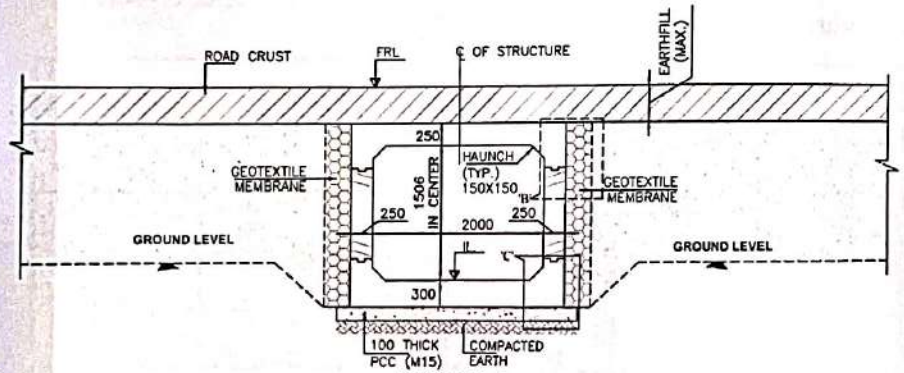
VIEW C–C
(SCALE 1:40)



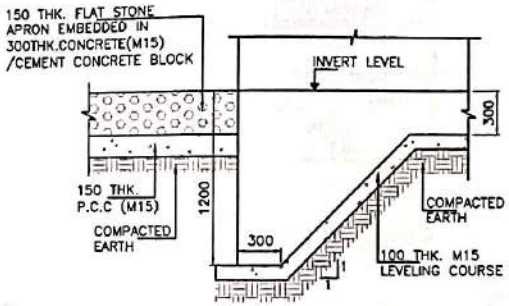
DETAIL OF CURTAIN WALL–I
(DOWN STREAM SIDE)
(SCALE 1:50)



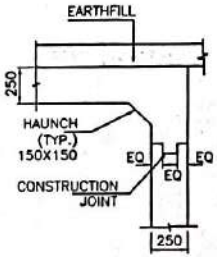
DETAIL OF CURTAIN WALL–II
(UP STREAM SIDE)
(SCALE 1:50)



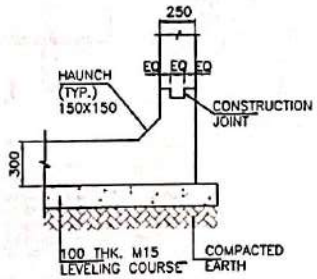
SECTION B–B
(SCALE 1:40)



DETAIL–'A'
(SCALE 1:25)



DETAIL–'B'
(SCALE 1:25)



DETAIL–'C'
(SCALE 1:25)

SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

DESIGN AID, NEW DELHI

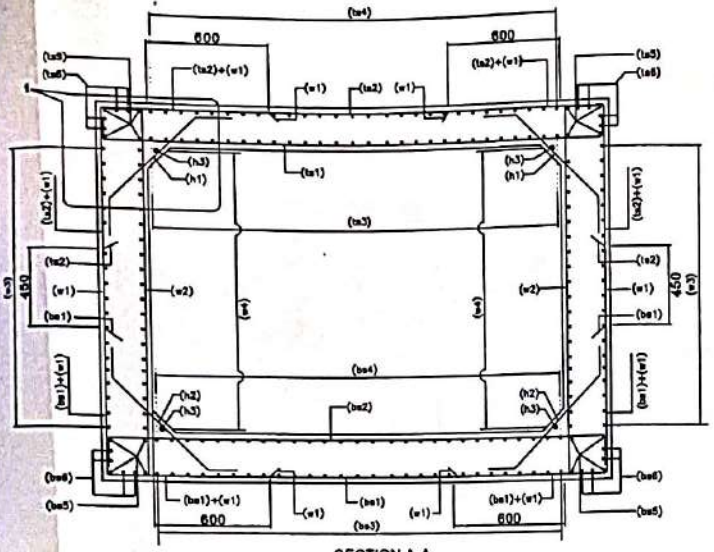
GOOD FOR CONSTRUCTION

CLIENT:	EPC CONTRACTOR	AUTHORITY'S 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	ALMONDZ ALDB JV PVT LTD CONSULTANT LTD. IN JOINT VENTURE WITH LEEZA CONSULTANT PRIVATE LIMITED. C/O JAYANTA SAIKIA SARBA JUNIN NAMGYAR BORBIL 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,	A.V. CONSTRUCTION Floor, WZ-124 Palam Extension, Block Ashram Wazirpur 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	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)

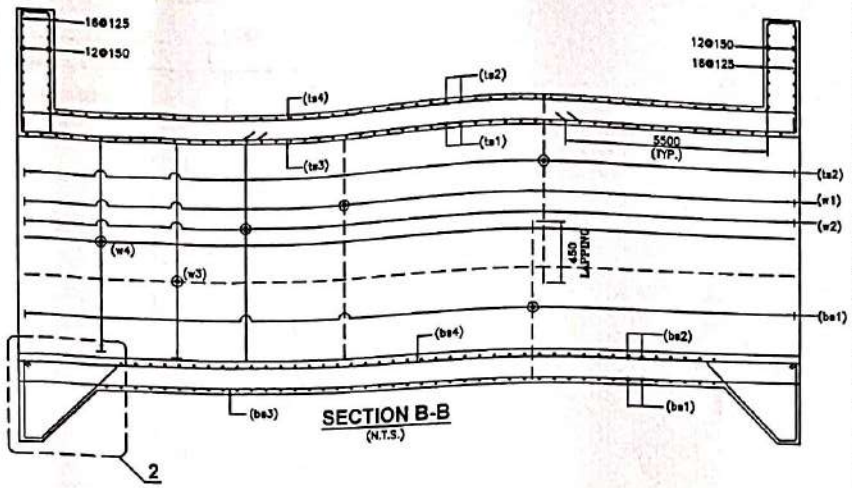
DRAWING TITLE: GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 45+433

Date	Drw.	Dsg	Chk	App.	Scale	Drawing Status
JAN.2024	W.I*	V.S	A.D		NTS	

Project No.	Drawing No.	Sheet No.	Rev.
	AVC/NH-38/BC/GAD/45+43301	02 OF 02	R0



SECTION A-A
(NTS)

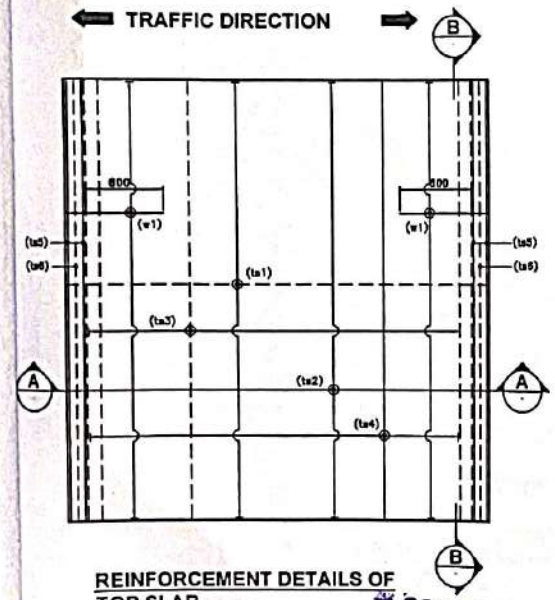


SECTION B-B
(N.T.S.)

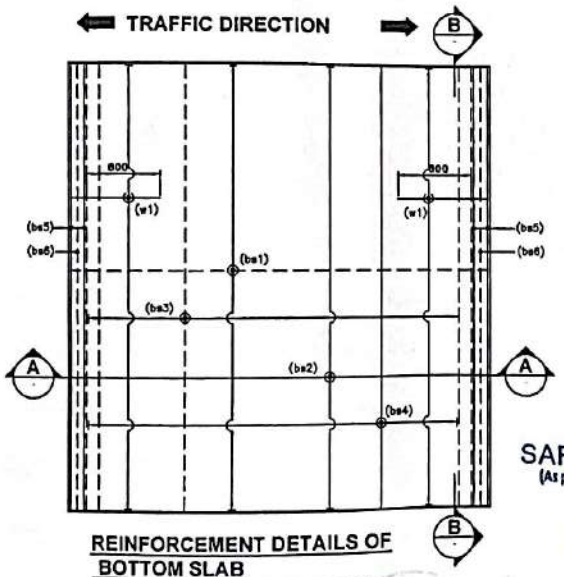
BOX REINF. SCHEDULE

SL.NO.	BAR MARK	BAR SHAPE	DIAMETER	SPACING
1	ts1		12	200
2	ts2		10	200
3	ts3		8	200
4	ts4		10	200
5	ts5		12	2x4 Nos.
6	ts6		12	2x4 Nos.
7	w1		10	200
8	w2		10	200
9	w3		10	200
10	w4		8	200
11	bs1		10	200
12	bs2		10+8	200
13	bs3		10	200
14	bs4		8	200
15	bs5		12	2x4 Nos.
18	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

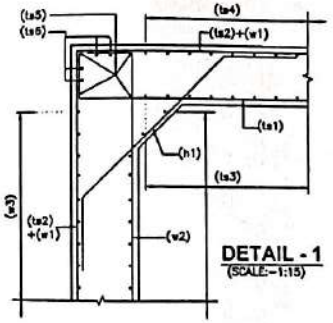
LEGEND:-	
TOP FACE BAR	———
BOTTOM FACE BAR	- - - -



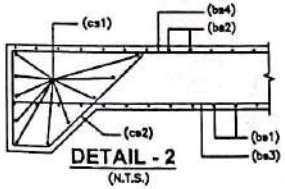
REINFORCEMENT DETAILS OF TOP SLAB
(HAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
(N.T.S.)



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



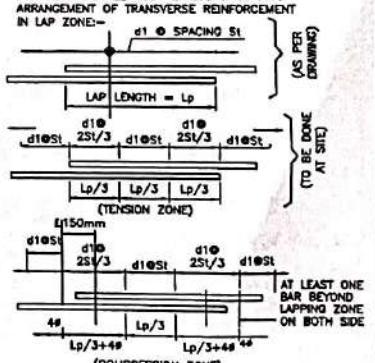
DETAIL - 1
(SCALE:-1:15)



DETAIL - 2
(N.T.S.)

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) CONFIRMING TO IS:1786 STANDARDS.
4. 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
5. OVERLAPPING FOR SPLICING OF REINFORCEMENT SHALL BE AS PER CLAUSE NO.15.2.2.5.
   LAP LENGTH SHALL NOT BE LESS THAN 56ϕ.
   ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:-



6. ANCHOURAGE LENGTH OF BOX SHALL BE TAKEN AS 40ϕ AS PER IRC:112.
7. FOR UNFAVORABLE BOND CONDITIONS THE FACTOR 40 SHOULD BE MULTIPLIED BY FACTOR OF 1.43 .
8. CENTER LINE OF OVERLAPPING BAR bs1 & ts2 IN WALL & MID HEIGHT OF WALLS ARE AT SAME POINT.
9. 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.

SAFETY AUDIT
(As per Article 10.1 of EPC Agreement)

DESIGN AID, NEW DELHI

GOOD FOR CONSTRUCTION

REFERENCE DRAWING:-

1. GENERAL ARRANGEMENT DRAWING.
   AVC/NH-38/BOX/GAD/45+433/01

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 AKHILESH ZA CONSULTANT (INDIA) LIMITED.
C/O JAYANTA SAIKIA, SARBAJANIN NAMGHAR, NORBIL NO.2, DIBRUGARH, 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.

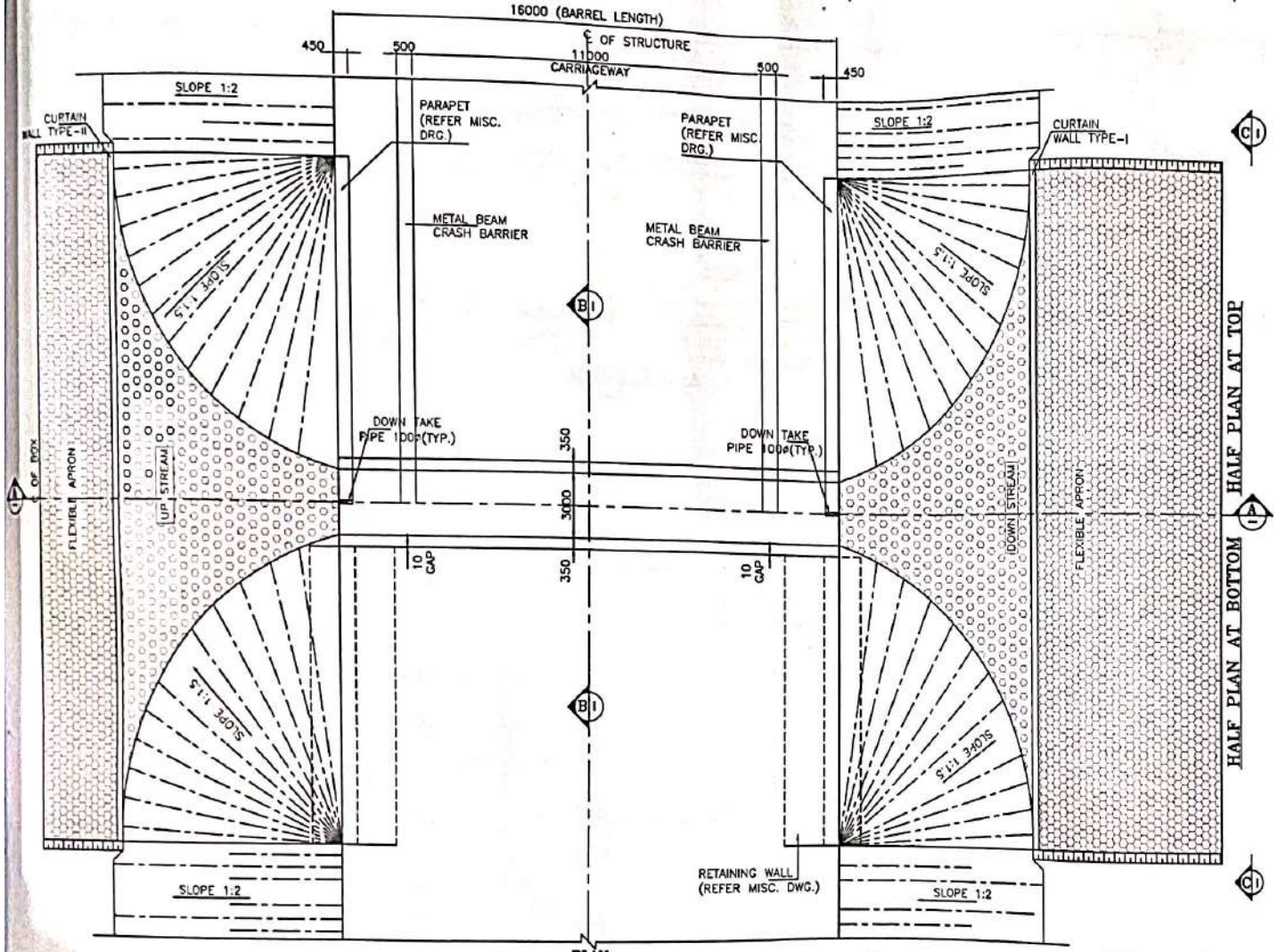
DESIGN CONSULTANT:
A.V. CONSULTANTS
Winst Infra Solution Pvt. Ltd.
OFFICE: F-8, ISHAAN CORPORATE TOWER, PLOT NO-C-23, SECTOR-13, VASUNDHRA GHAZIABAD, U.P-201012

PROJECT:
WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (GOLAI GOAN) TO KM 47+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)

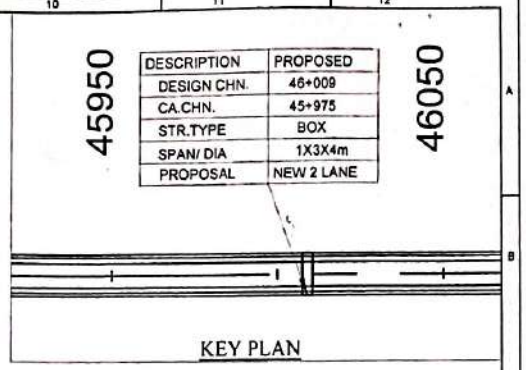
DRAWING TITLE:- REINFORCEMENT DETAIL OF BOX CULVERT AT CH. 45+433

Date	Drw.	Dsg.	Chk.	App.	Scale.	Drawing Status.
JAN 2024	W.P	V.S	A.D		NTS	

Project No.	Drawing No.	Sheet No.	Rev.
	AVC/NH-38/BOX/REIN.45+433/01	01 OF 01	R0



PLAN
(SCALE-1:100)



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

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 CONJUCTION 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 SUBJECTED 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 1000MMc/c IN HORIZONTAL/VERTICAL DIRECTION SHALL BE PROVIDED UP TO 150MM ABOVE GROUND LEVEL FOR WEEP HOLES IN RETAINING WALL.
11. SBC SHALL BE 12t/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.

GOOD FOR CONSTRUCTION

SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)
DESIGN AID, NEW DELHI

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			
46+009	150.841	145.306	145.018	145.006	4.016m	1.469m	0.285m

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

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 AVOLEEZA CONSULTANT PRIVATE LIMITED. (PKG-3,4,5)
C/O SAYANTA 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

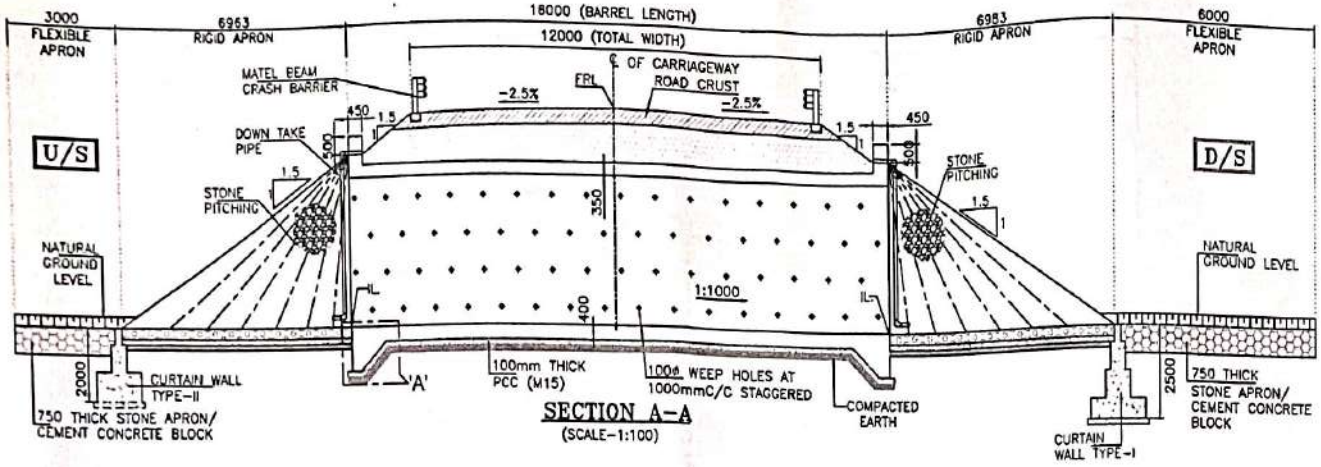
SAFETY CONSULTANT:
DESIGN AID
PLOT NO.54, 3rd FLOOR(FRONT), MASOODPUR DAIRY FARM,VASANT KUNJ, NEW DELHI-110070,

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

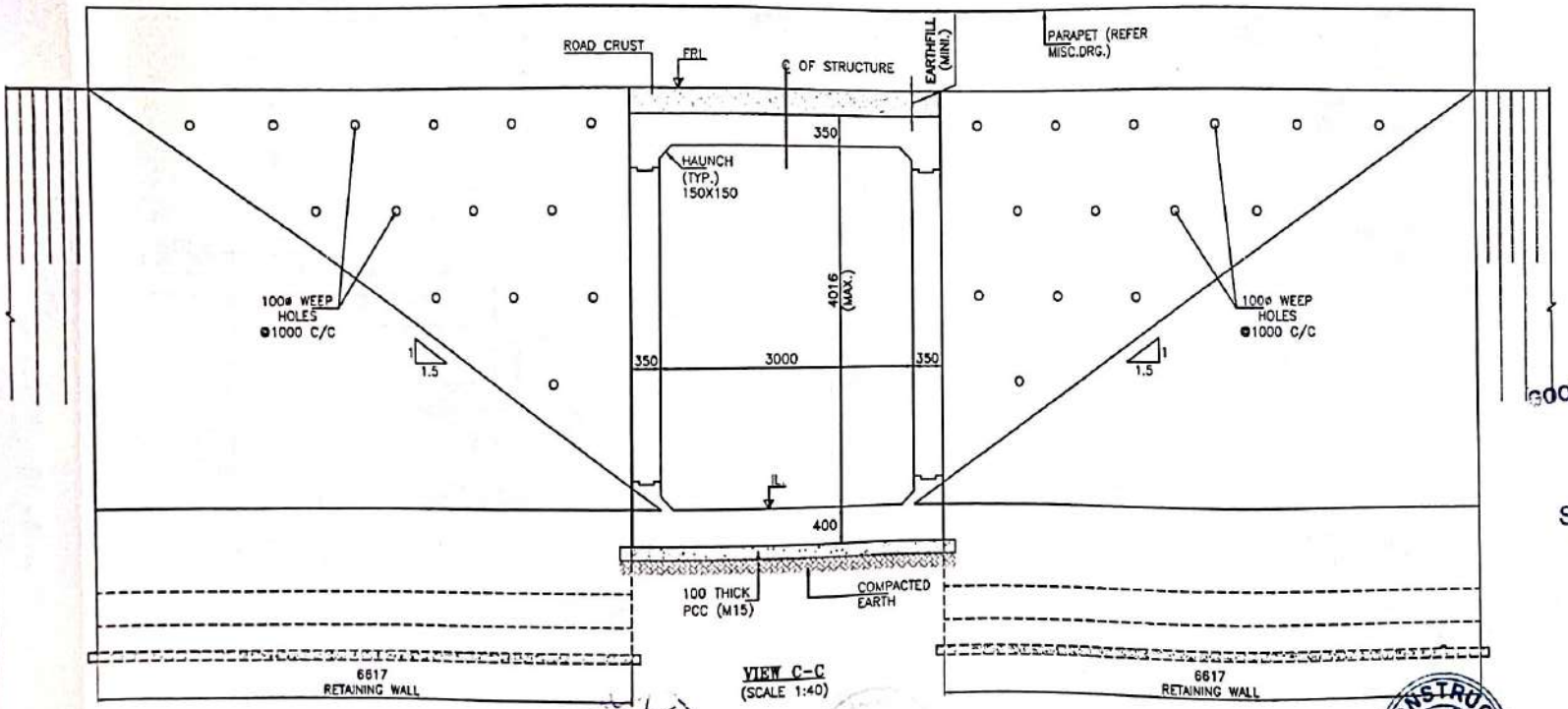
PROJECT:
WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (GOLAI GOAN) TO KM 47+882 (LEDO) ON DIBRUGARH TO LEDO SECTION IN THE PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (2-LANE-PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE (PACKAGE 5)

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

Date	Drw.	Dsg.	Chk.	App.	Scale	Drawing Status
JAN 2024	W.P	V.S	A.B		NTS	
Project No.	Drawing No. AVC/NH-38/BC/GAD/46+009/01				Sheet No. 61 OF 83	Rev. R0



SECTION A-A
(SCALE-1:100)



VIEW C-C
(SCALE 1:40)

GOOD FOR CONSTRUCTION

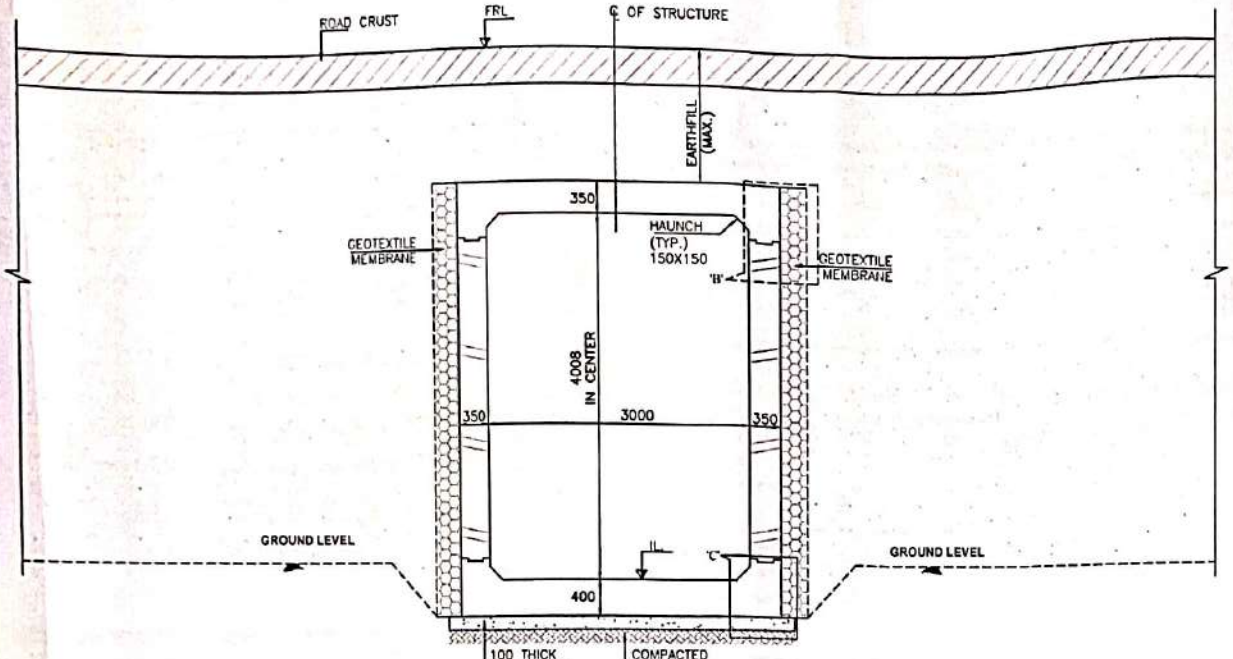
SAFETY AUDITOR
(As per Article 10.1 of EPC Agr...)

CLIENT:	EPC CONTRACTOR	AUTHORITY'S ENGINEER	PROOF CONSULTANT:	SAFETY CONSULTANT:	DESIGN CONSULTANT:
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	ALMONDZ GLOBAL INFRA CONSULTANT LIMITED IN JV WITH AYOUCEZA CONSULTANT PRIVATE LIMITED. C/O JAYANTA SAIKIA, SARBAJANIN NAMGHAR, BORBIL NO.2, DIGBOI, TINSUKIA, ASSAM-786171	CREATIVE ENGINEERING SERVICES OFFICE NO: 620, SIGNATURE GLOBAL MALL, SECTOR-3, VAISHALI, GHAZIABAD, U.P-201010	DESIGN A1D PLOT NO.54, 3rd FLOOR(FRONT), MASOODPUR DAIRY FARM,VASANT KUNJ, NEW DELHI-110070,	A. K. CONSTRUCTION 7th Floor, WZ-12, Palam Extension, Block Ashram Way Gali Now 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 RM 27+150 (SOLAI 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 48+009

Date	Drw	Dsg.	Chk.	App.	Scale	Drawing Status
JAN.2024	W.P	V.S	A.B		NTS	
Project No.	Drawing No. AVC/NH-38/BC/GAD/48+009/01				Sheet No. 02 OF 03	Rev. R0



SECTION B–B
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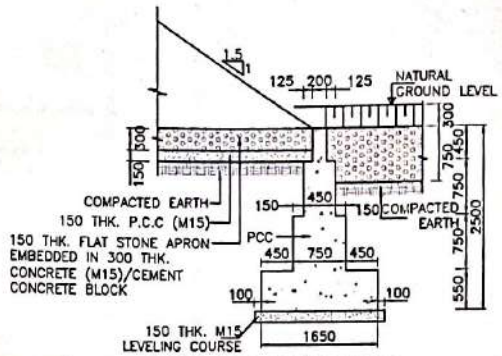
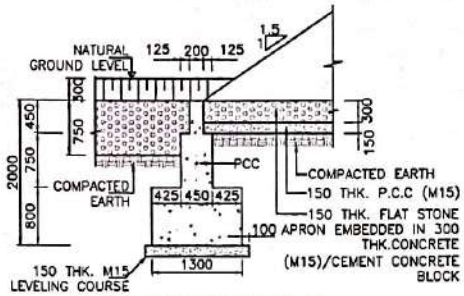
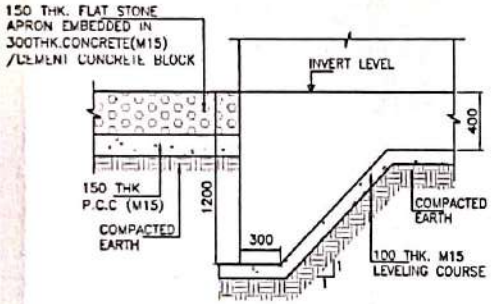


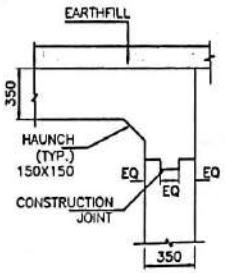
DETAIL OF CURTAIN WALL–I
(DOWN STREAM SIDE)
(SCALE 1:50)



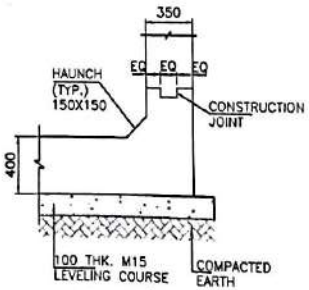
DETAIL OF CURTAIN WALL–II
(UP STREAM SIDE)
(SCALE 1:50)



DETAIL–'A'
(SCALE 1:25)



DETAIL–'B'
(SCALE 1:25)



DETAIL–'C'
(SCALE 1:25)

GOOD FOR CONSTRUCTION

SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

DESIGN AID, NEW DELHI

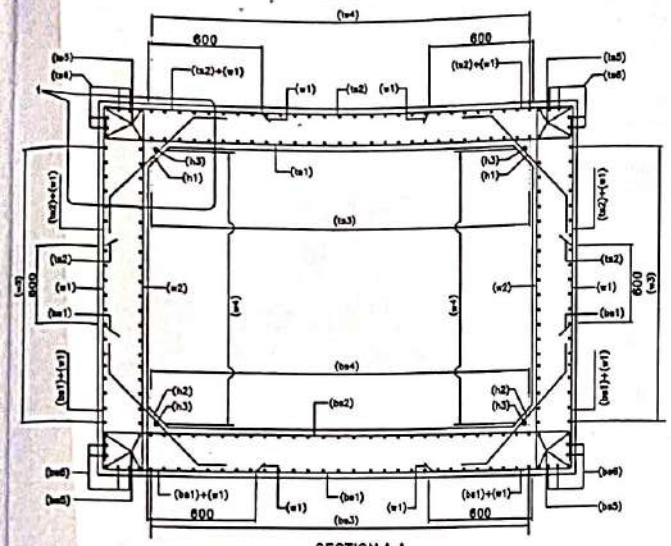
CLIENT:	EPC CONTRACTOR	AUTHORITY'S ENGINEER	PROOF CONSULTANT:	SAFETY CONSULTANT:	DESIGN CONSULTANT:
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	KAMAC ENGINEERS Pvt Ltd KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	ALMONDZ GLOBAL INFRA CONSULTANT LIMITED IN JV WITH AVOLZEZA CONSULTANCY PRIVATE LIMITED. C/O AYANTA ERIKA, SARBAJAN NAGCHAR, DOPSO 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,	A.V. CONSTRUCTION 1st Floor, WZ-1240, Palam Extension, Bosco Ashram Wali Gali Now, 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 (OOLAI 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-5)

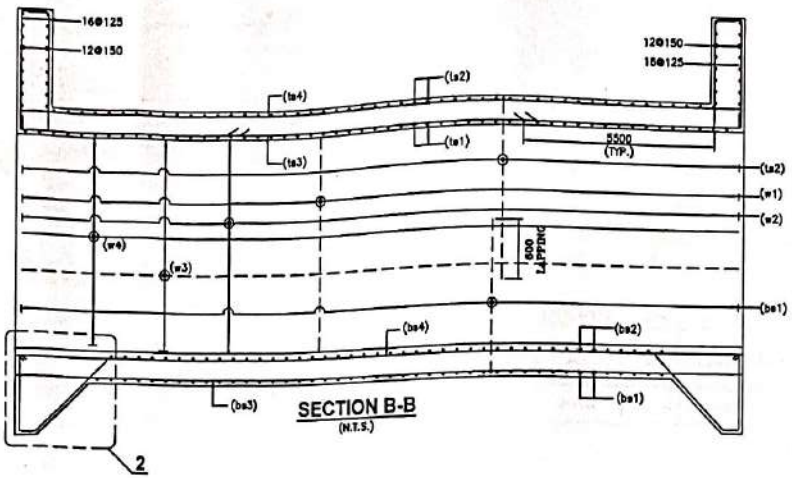
DRAWING TITLE: GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 46+008

Date	Drw.	Dsg.	Chk.	App.	Scale.	Drawing Status.
JAN.2024	W.P	V.S	A.B		NTS	

Project No.	Drawing No.	Sheet No.	Rev.
	AVC/NH-38/BC/GAD/46+008/01	03 OF 03	R0



SECTION A-A
(NTS)

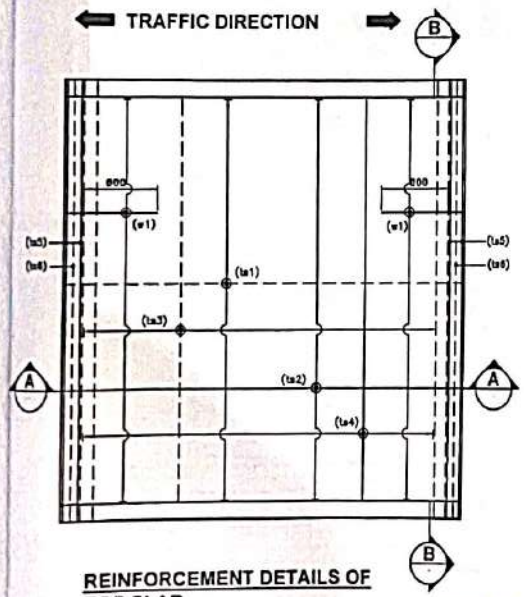


SECTION B-B
(N.T.S.)

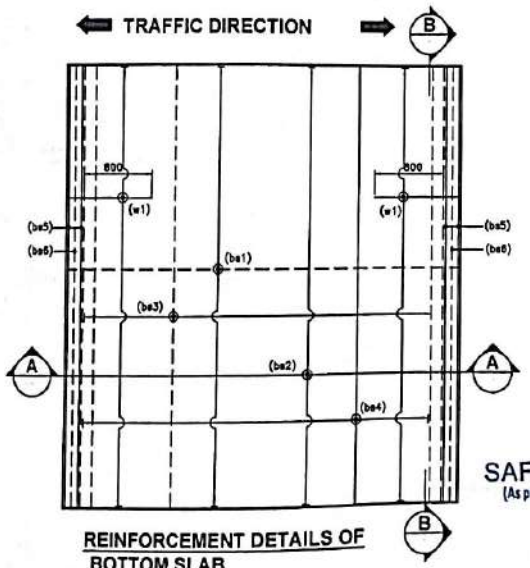
BOX REINF. SCHEDULE

SL.NO.	BAR MARK	BAR SHAPE	DIAMETER	SPACING
1	ts1		12+10	180
2	ts2		12	180
3	ts3		10	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

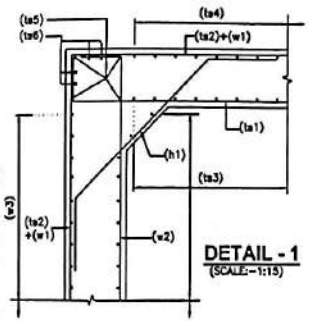
LEGEND:-	
TOP FACE BAR	———
BOTTOM FACE BAR	- - - -



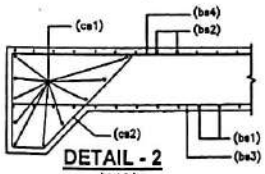
REINFORCEMENT DETAILS OF TOP SLAB
(HAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
(N.T.S.)



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



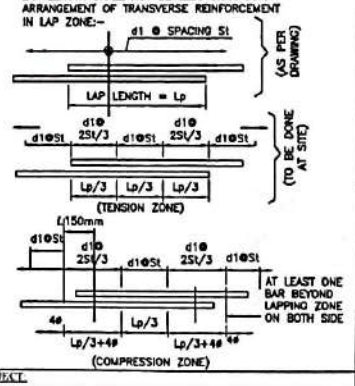
DETAIL - 1
(SCALE:-1:15)



DETAIL - 2
(N.T.S.)

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) CONFIRMING TO IS:1786 STANDARDS.
4. 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
5. OVERLAPPING FOR SPLICING OF REINFORCEMENT SHALL BE AS PER CLAUSE NO.15.2.5.
   LAP LENGTH SHALL NOT BE LESS THAN 56ϕ.
   ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:-



6. ANCHOURAGE LENGTH OF BOX SHALL BE TAKEN AS 40ϕ AS PER IRC:112.
7. FOR UNFAVORABLE BOND CONDITIONS THE FACTOR 40 SHOULD BE MULTIPLIED BY FACTOR OF 1.43 .
8. CENTER LINE OF OVERLAPPING BAR bs1 & ts2 IN WALL AND HEIGHT OF WALLS ARE AT SAME POINT.
9. 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.

SAFETY AUDIT
(As per Article 10.1 of EPC Agreement)
DESIGN AID, NEW DELHI

REFERENCE DRAWING:-

1. GENERAL ARRANGEMENT DRAWING.
   AVC/NH-38/BOX/GAD/46+009/01

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 ENGINEER
ALMONDZ GLOBAL INFRA CONSULTANT LIMITED IN JOINT WITH AYOREEZA CONSULTANT PRIVATE LIMITED.
GOLAGANTA BAKIA, SARBANANIN NAMGHAR, BORBIL NO.2, DIBOI, TINSUKIA, ASSAM-786171

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

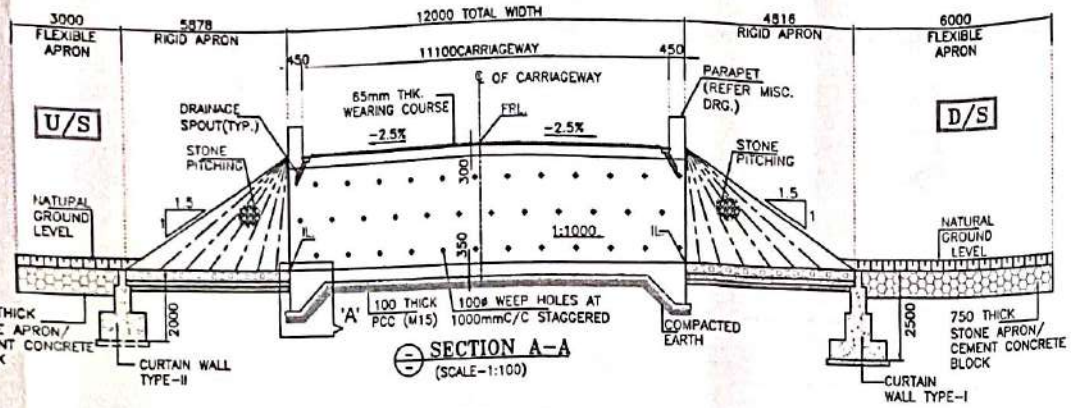
SAFETY CONSULTANT:
DESIGN AID
PLOT NO.54, 3rd FLOOR(FRONT), MASOODPUR DAIRY FARM,VASANT KUNJ, NEW DELHI-110070,

DESIGN CONSULTANT:
WISPL
Winst Infra Solution Pvt. Ltd.
OFFICE: F-8 ISHAAN CORPORATE TOWER, PLOT NO-G-23,SECTOR-12, VASUNDHRA GHAZIABAD, UP-201012

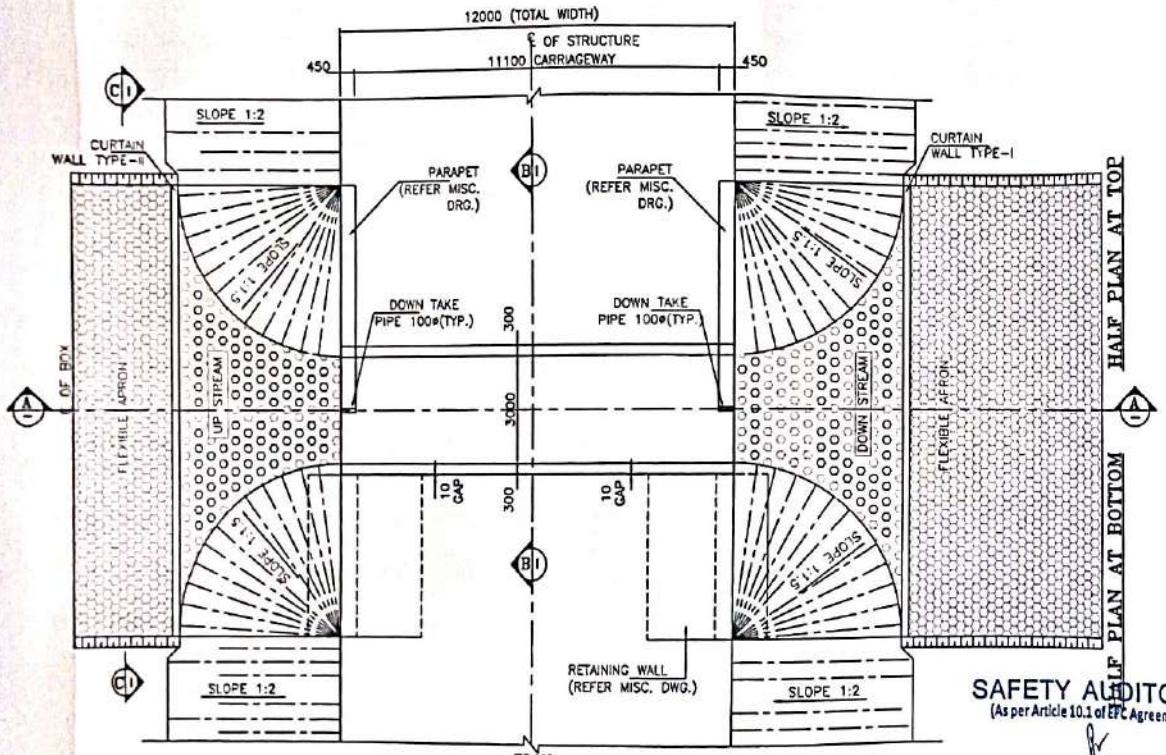
PROJECT:
WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (GOLAI GOAN) TO KM 47+982 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE (PACKAGE-8)

DRAWING TITLE:
REINFORCEMENT DETAIL OF BOX CULVERT AT CH. 46+009

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/NH-38/BOX/REINF/46+009/01				01 OF 01	R0



SECTION A–A
(SCALE–1:100)

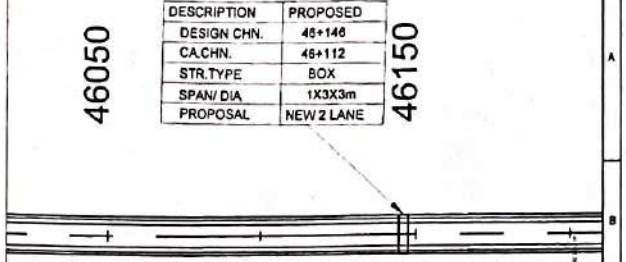


PLAN
(SCALE–1:100)

SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

DESIGN AID, NEW DELHI

GOOD FOR CONSTRUCTION



DESCRIPTION	PROPOSED
DESIGN CHN.	46+146
CA.CHN.	46+112
STR.TYPE	BOX
SPAN/ DIA	1X3X3m
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			
46+146	146.959	145.880	145.592	145.580	3.008m	0	0

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 CONJUCTION 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 – Fe500.
5. 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.
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 SUBJECTED TO CHANGE AS PER SITE CONDITION AND DETAILED DESIGN.
9. BACKFILL TO BE DONE AND COMPACTED FROM BOTH SIDE SIMULTANEOUSLY.
10. 600MM THICK. FILTER MATERIAL BEHIND RETAINING WALL SHALL BE LAID AS PER APPENDIX 6 OF IRC 78–2014.
11. 50MM THICK CEMENT CONCRETE WEARING COAT SHALL BE PROVIDED.
12. 100MM DIA P.V.C. PIPE AT SPACING 1000MMc/c IN HORIZONTAL/VERTICAL DIRECTION SHALL BE PROVIDED UP TO 150MM ABOVE GROUND LEVEL FOR WEEP HOLES IN RETAINING WALL.
13. SBC SHALL BE 8t/m². AND SAME SHALL BE ENSURED AT SITE BY ANY SUITABLE METHOD.
14. 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.
15. CHOOSE ANY SUITABLE METHOD TO ACHIEVE THE REQUIRED SBC AS PER SITE.
16. 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:-
1. REINFORCEMENT DETAIL OF BOX CULVERT AVC/NH-38/BOX/REINF./46+146/02

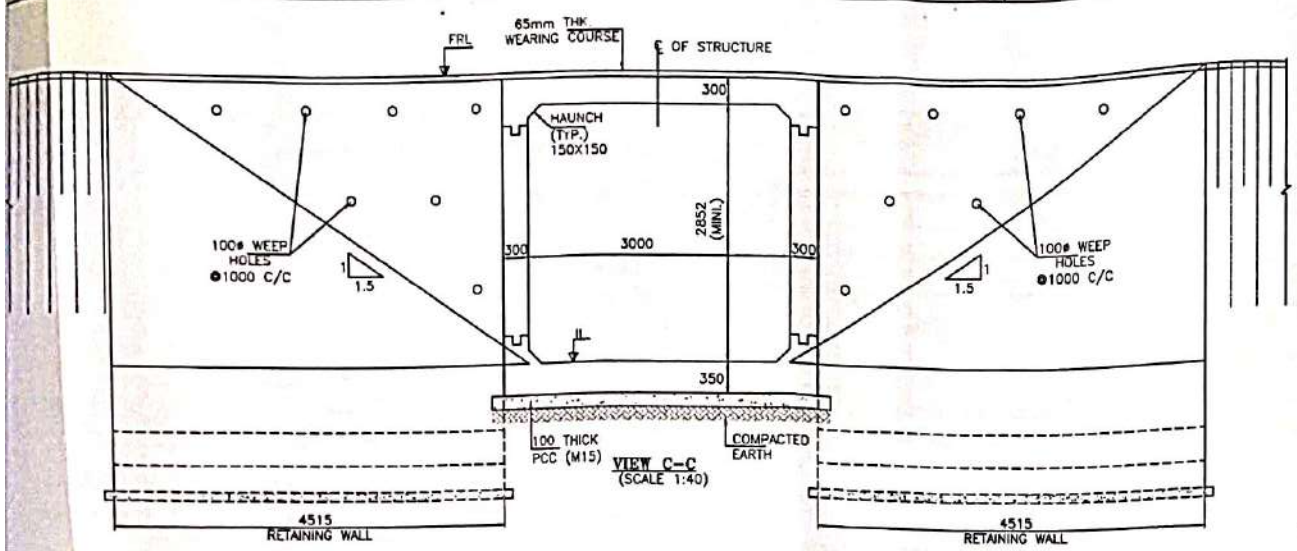
CLIENT:	EPC CONTRACTOR	AUTHORITY'S ENGINEER	PROOF CONSULTANT:	SAFETY CONSULTANT:	DESIGN CONSULTANT:
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	ALMOND GLOBAL INFRA CONSULTANT LIMITED IN JOINT VENTURE WITH SOLEEZA CONSULTANT PRIVATE LIMITED. C/O ALMOND SAGAR, SARBAJANIN NAMGHAR, BORBIL 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.	ALL CONSTRUCTION Floor, WZ-12 Palam Extension, Sagarpur Ashram Mall 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+180 (GOLAI GOAN) TO KM 47+662 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH PROPOSED WARGHERITA & 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)

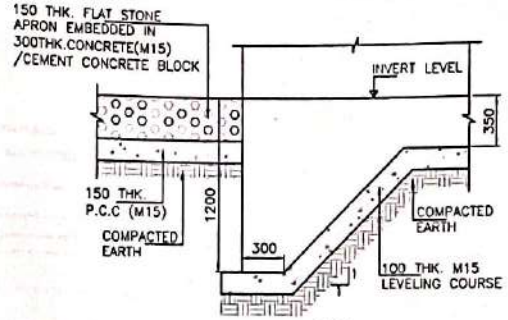
DRAWING TITLE: GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 46+146

Date	Drw.	Dwg	Chk.	App.	Scale.	Drawing Status.
JAN 2024	W.P	V.S	A.B		NTS	

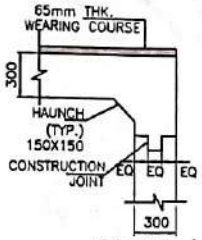
Project No	Drawing No.	Sheet No.	Rev.
	AVC/NH-38/BC/GAD/46+146/01	01 OF 02	R0



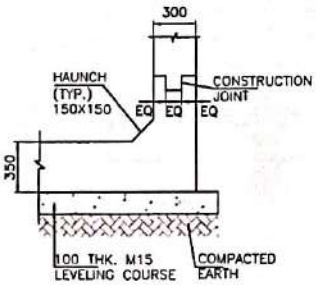
VIEW C–C
(SCALE 1:40)



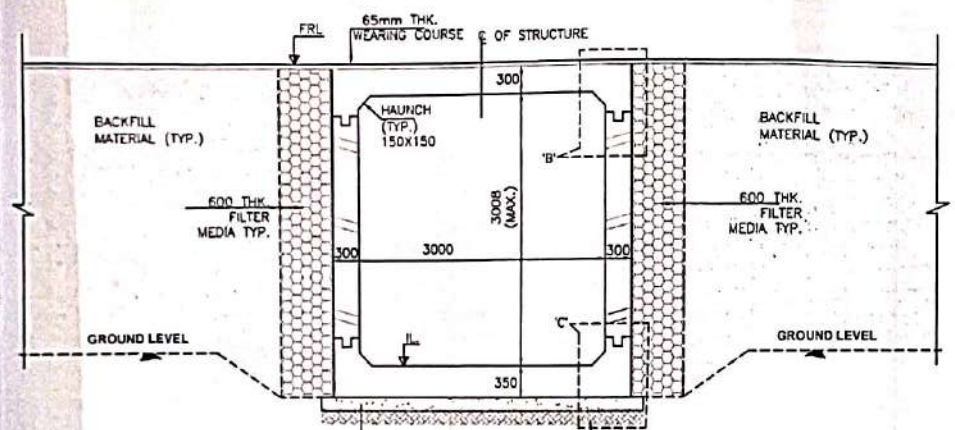
DETAIL–'A'
(SCALE 1:25)



DETAIL–'B'
(SCALE 1:25)



DETAIL–'C'
(SCALE 1:25)

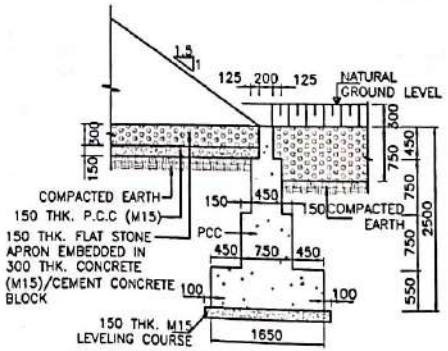


SECTION B–B
(SCALE 1:40)

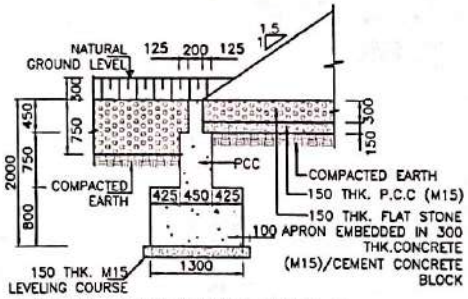
SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

DESIGN AID, NEW DELHI

GOOD FOR CONSTRUCTION



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



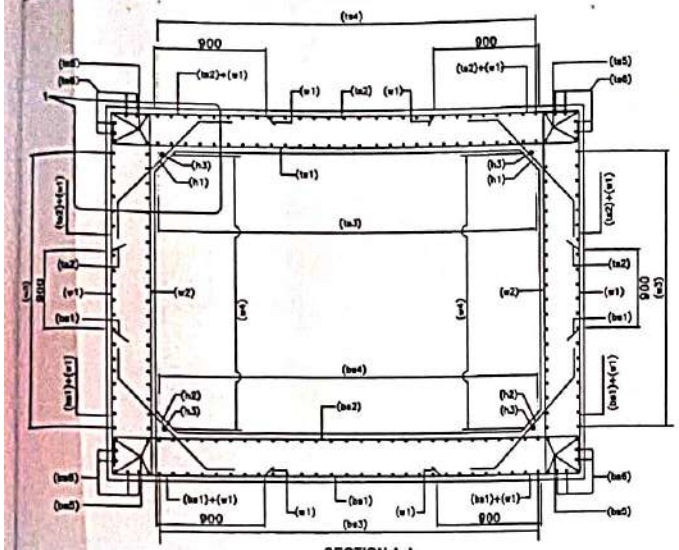
DETAIL OF CURTAIN WALL–II
(UP STREAM SIDE)
(SCALE 1:50)

CLIENT:	EPC CONTRACTOR	AUTHORITY'S ENGINEER	PROOF CONSULTANT:	SAFETY CONSULTANT:	DESIGN CONSULTANT: NEW DELHI	PROJECT:
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	ALMONDZ GLOBAL INFRA CONSULTANT LIMITED IN JV WITH WOLTEZA CONSULTANT PRIVATE LIMITED. C/O JAYDEAL 500 BESHA, NAVGHAR (PKG-8, 4D/2, DIBRUGARH, 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,	A.V. CONSTRUCTION 1st Floor, WZ-12-B 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

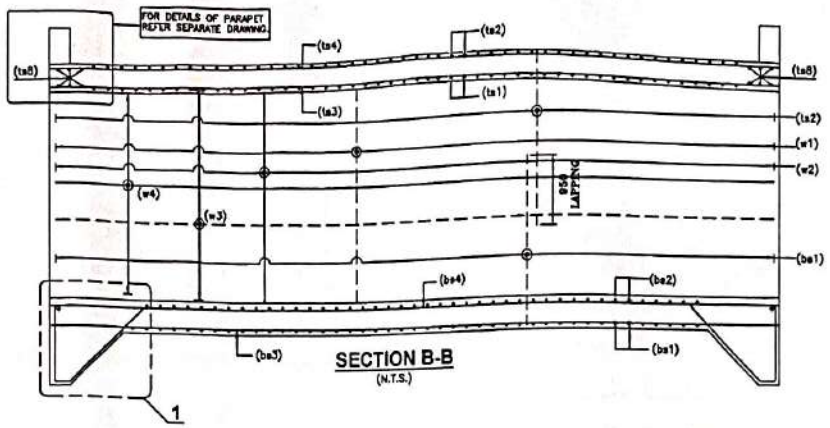
WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (GOLAI GOAN) TO KM 47+682 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH PROPOSED MARGHERITA & LEDO BY PASS (BROWNFIELD AND GREEN FIELD) (2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE (PACKAGE-8)

DRAWING TITLE: GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 46+146

Date	Drw	Dsg	Chk	App.	Scale	Drawing Status
JAN.2021	W.P	V.S	A.D		NTS	
Project No.	Drawing No. AVC/NH-38/BC/GAD/46+146/01				Sheet No. 02 OF 02	Rev. R0



SECTION A-A
(NTS)



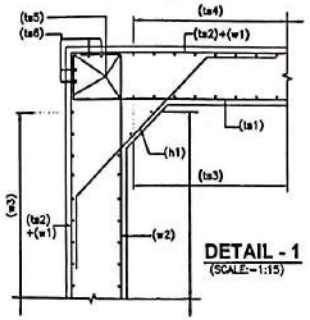
SECTION B-B
(N.T.S.)

BOX REINF. SCHEDULE

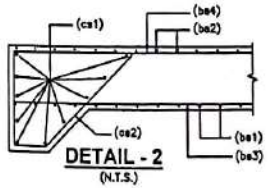
SL.NO.	BAR MARK	BAR SHAPE	DIAMETER	SPACING
1	ts1		12+10	180
2	ts2		12	180
3	ts3		10	200
4	ts4		10	200
5	ts5		12	2x4 Nos.
6	ts6		12	2x4 Nos.
7	w1		12	180
8	w2		12	180
9	w3		10	200
10	w4		8	200
11	bs1		12	180
12	bs2		12+12	180
13	bs3		10	200
14	bs4		10	200
15	bs5		12	2x4 Nos.
16	bs6		12	2x4 Nos.
17	h1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

LEGEND:-

TOP FACE BAR	
BOTTOM FACE BAR	

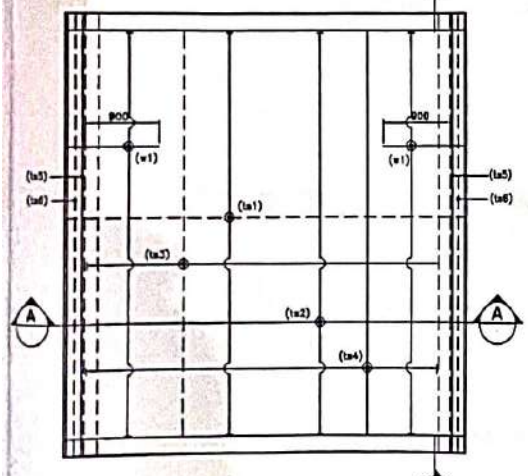


DETAIL - 1
(SCALE:-1:15)



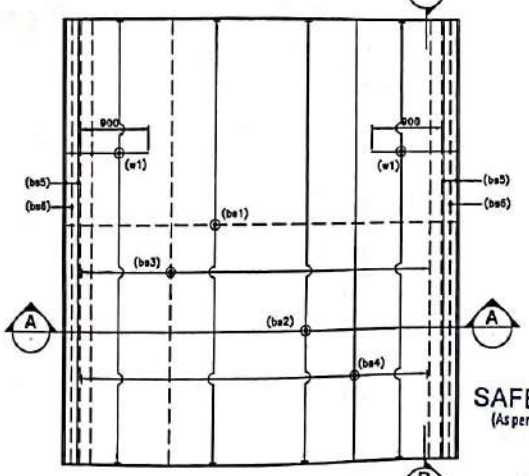
DETAIL - 2
(N.T.S.)

TRAFFIC DIRECTION



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

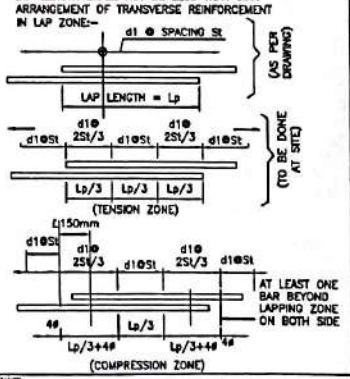
TRAFFIC DIRECTION



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

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) CONFIRMING TO IS:1786 STANDARDS.
4. 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
5. OVERLAPPING FOR SPLICING OF REINFORCEMENT SHALL BE AS PER CLAUSE NO.15.2.5.
   LAP LENGTH SHALL NOT BE LESS THAN 56ø.
   ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:-



6. ANCHOURAGE LENGTH OF BOX SHALL BE TAKEN AS 40ø AS PER IRC:112.
7. FOR UNFAVORABLE BOND CONDITIONS THE FACTOR 40 SHOULD BE MULTIPLIED BY FACTOR OF 1.43 .
8. CENTER LINE OF OVERLAPPING BAR bs1 & ts2 IN WALL & MID HEGHT OF WALLS ARE AT SAME POINT.
9. 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.

SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

DESIGN AID, NEW DELHI

GOOD FOR CONSTRUCTION

REFERENCE DRAWING:-

1. GENERAL ARRANGEMENT DRAWING.
   AVC/NH-38/BOX/GAD/48+148/01

CONSTRUCTION

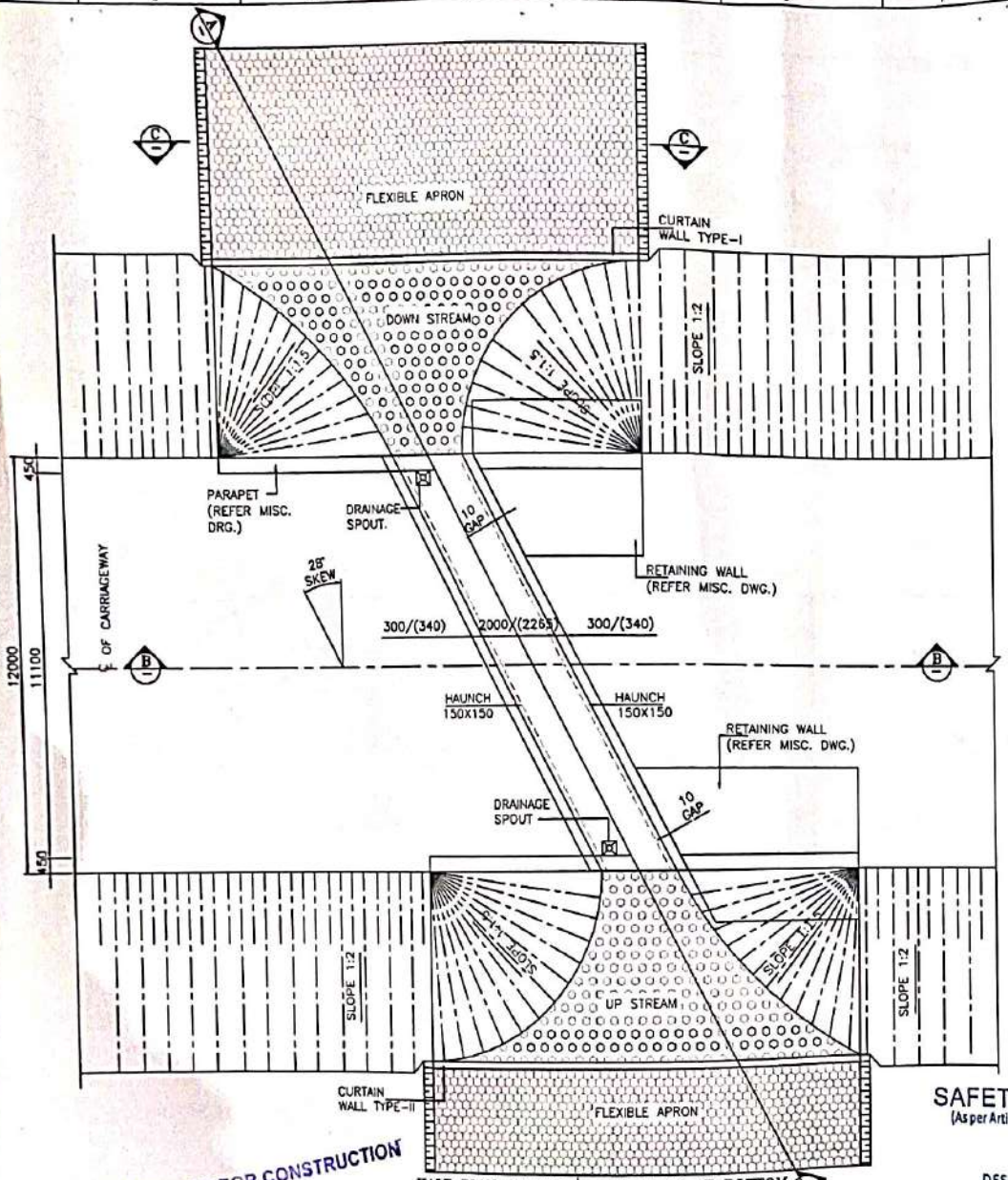
CLIENT:	EPC CONTRACTOR	AUTHORITY'S ENGINEER	PROOF CONSULTANT:	SAFETY CONSULTANT:	DESIGN CONSULTANT:
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	ALMONDZ GLOBAL INFRA CONSULTANT LIMITED IN ASSOCIATION WITH OLEEZA CONSULTANT PRIVATE LIMITED. C/O JAYANTA SAIKIA, SARBAJANIN NAMGHAR, BOZOI 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.	A.V. CONSTRUCTION Palam Extension, Bosco Ashram Well-Set, New Delhi 110045 Winst Infra Solution Pvt. Ltd. OFFICE: P-6, 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+160 (GOLAI GOAN) TO KM 47+862 (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. 48+148

Date	Drw.	Dsg.	Chk.	App.	Scale	Drawing Status
JAN.2024	W.P	V.S	A.B		NTS	

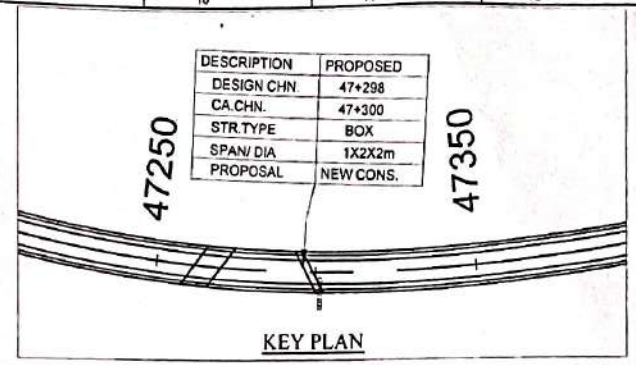
Project No.	Drawing No.	Sheet No.	Rev.
	AVC/NH-38/BOX/REIN/48+148/01	01 OF 01	R0



HALF PLAN AT TOP ϕ HALF PLAN AT BOTTOM

PLAN

(SCALE-1:100)



DESCRIPTION	PROPOSED
DESIGN CHN.	47+298
CA.CHN.	47+300
STR.TYPE	BOX
SPAN/ DIA	1X2X2m
PROPOSAL	NEW CONS.

KEY PLAN

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	150.306	2.312m	2.540m	1.905m

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 CONJUCTION 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 – Fe500.
5. 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.
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 SUBJECTED TO CHANGE AS PER SITE CONDITION AND DETAILED DESIGN.
9. BACKFILL TO BE DONE AND COMPACTED FROM BOTH SIDE SIMULTANEOUSLY.
10. 600MM THICK. FILTER MATERIAL BEHIND RETAINING WALL SHALL BE LAID AS PER APPENDIX 6 OF IRC 78–2014.
11. 50MM THICK CEMENT CONCRETE WEARING COAT SHALL BE PROVIDED.
12. 100MM DIA P.V.C. PIPE AT SPACING 1000MMc/c IN HORIZONTAL/VERTICAL DIRECTION SHALL BE PROVIDED UP TO 150MM ABOVE GROUND LEVEL FOR WEEP HOLES IN RETAINING WALL.
13. SBC SHALL BE 13t/m². AND SAME SHALL BE ENSURED AT SITE BY ANY SUITABLE METHOD.
14. 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.
15. 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:–
1. REINFORCEMENT DETAIL OF BOX CULVERT WISPL/NH–38/BOX/REINF./47+298/02

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

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

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

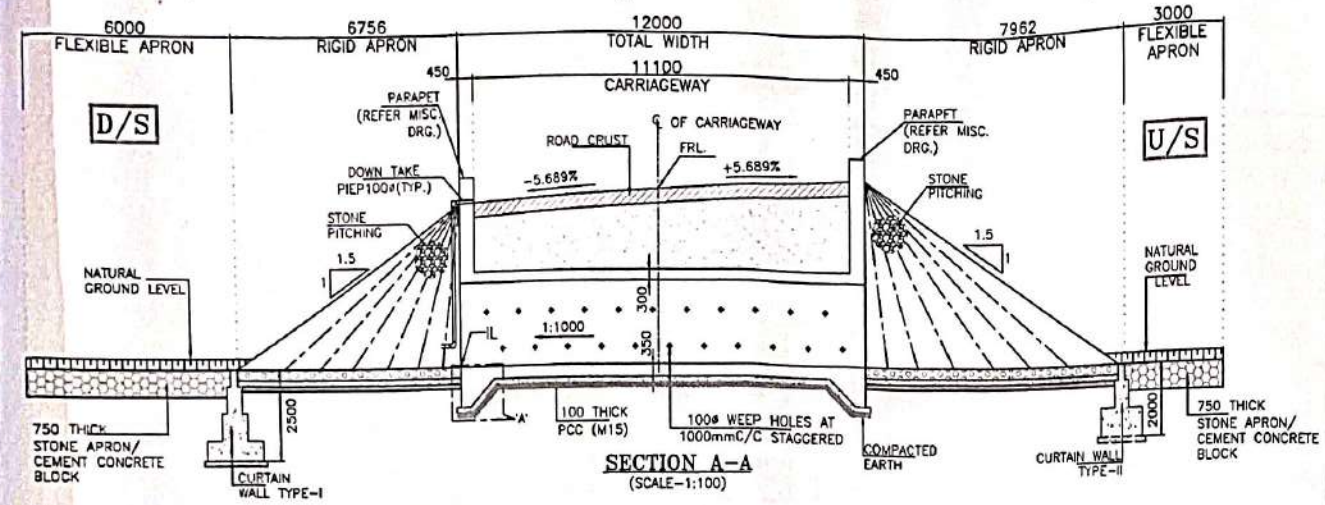
DESIGN CONSULTANT:
A.V. CONSTRUCTION
Winst Infra Solution Pvt. Ltd.
OFFICE: F-8, ISHAAN CORPORATE TOWER, PLOT NO-C-23,SECTOR-12, VASUNDHRA GHAZIABAD U.P-201012

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 (BROWNFIELD AND GREEN FIELD) (2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE (PACKAGE-3)

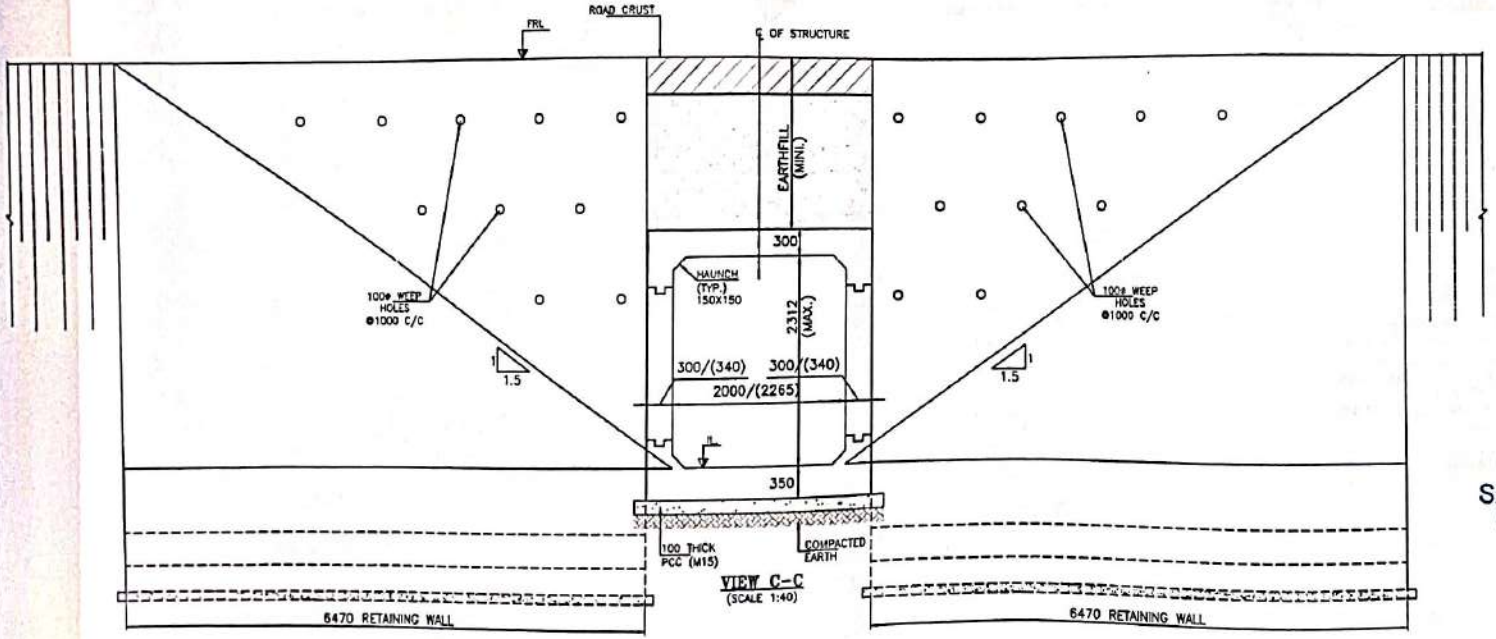
DRAWING TITLE:
GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 47+298

Date	Drw.	Dsg.	Chk.	App.	Scale.	Drawing Status.
JAN.2024	W.P	V.S	A.B		NTS	

Project No.	Drawing No.	Sheet No.	Rev.
	AVG/NH-38/BC/GAD/47+298/01	01 OF 03	R0



SECTION A–A
(SCALE–1:100)



VIEW C–C
(SCALE 1:40)

SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)
DESIGN AID, NEW D...

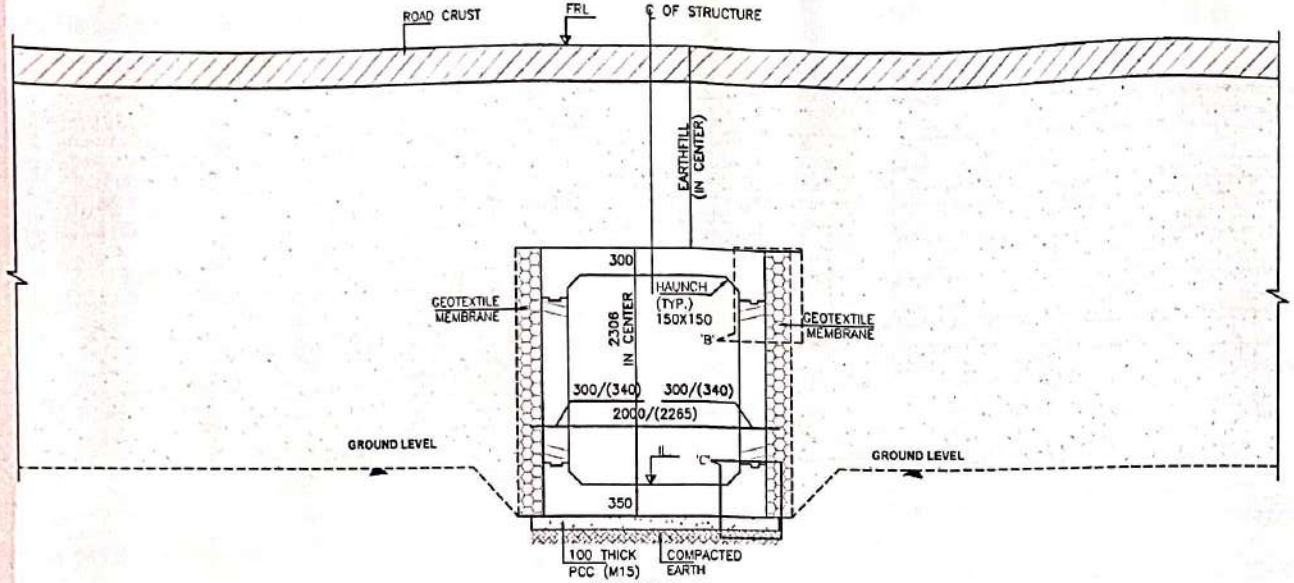
GOOD FOR CONSTRUCTION

CLIENT:	EPC CONTRACTOR	AUTHORITY ENGINEER	PROOF CONSULTANT:	SAFETY CONSULTANT:	DESIGN CONSULTANT:
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	ALMONDZ GLOBAL INFRA CONSULTANT LIMITED IN JOINT WITH AXOLEEZA CONSULTANTS PRIVATE LIMITED. C/O VATANSAKHA, BARBAJANN NAMCHER, BORBIL 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.	A. K. CONSTRUCTION NEW DELHI Floor, WZ-1[illegible] Palam Extension, Bosco Ashram Road, 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

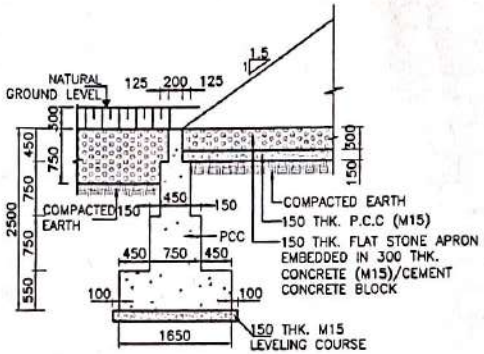
PROJECT: WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (DOLA GOAN) TO KM 47+582 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE (PACKAGE-5)

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

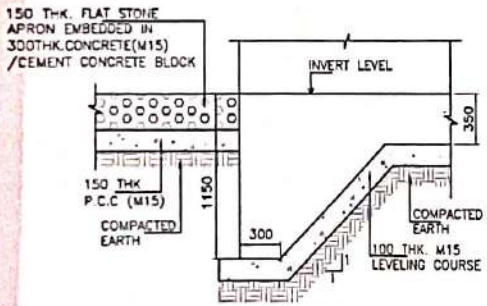
Date	Drw.	Dsg.	Chk.	App.	Scale	Drawing Status
JAN.2024	W.P	V.S	A.B		NTS	
Project No.	Drawing No. AVC/NH-38/BC/GAD/47+298/01				Sheet No. 02 OF 03	Rev. R0-



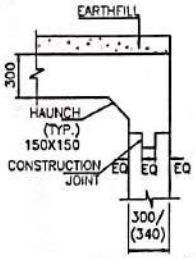
SECTION B-B
(SCALE 1:40)



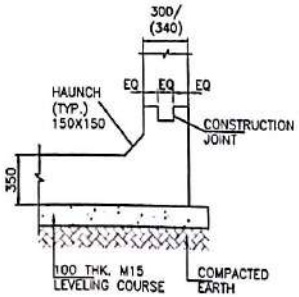
DETAIL OF CURTAIN WALL-I
(DOWN STREAM SIDE)
(SCALE 1:50)



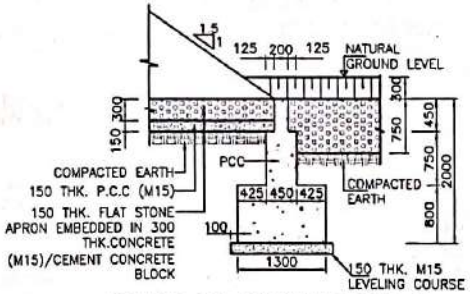
DETAIL-'A'
(SCALE 1:25)



DETAIL-'B'
(SCALE 1:25)



DETAIL-'C'
(SCALE 1:25)



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

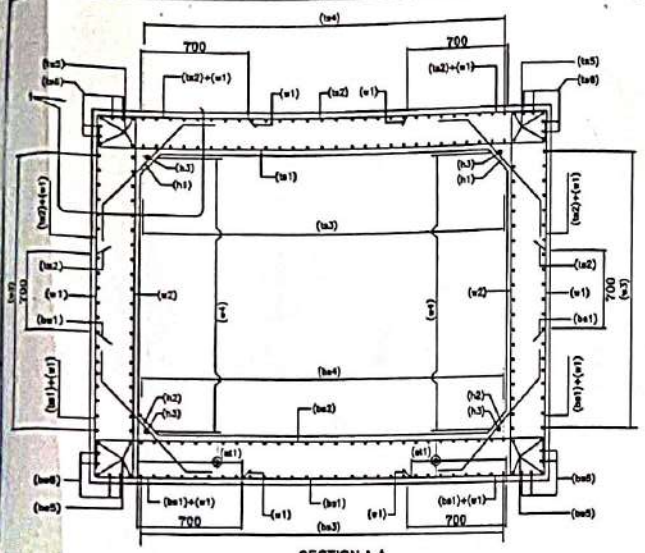
GOOD FOR CONSTRUCTION

NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	ALMONDZ GLOBAL INFRA CONSULTANT LIMITED JV ARMAN ALEEZA CONSULTANT PRIVATE LIMITED. C/O JAYANTA SAIKIA, BARBARANIN MAGHAR, BORBIL NO 2, DIBRUGARH, 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.	A.V. CONSTRUCTION 1st Floor, RZ-124A, Palam Extension, Bosco Ashram Wall Gali, New Delhi 110045 Winst Infra Solution Pvt. Ltd. OFFICE: F-8, ISHAAN CORPORATE TOWER, PLOT NO-G-21, SECTOR-13, VASUNDHRA, GHAZIABAD, U.P-201012

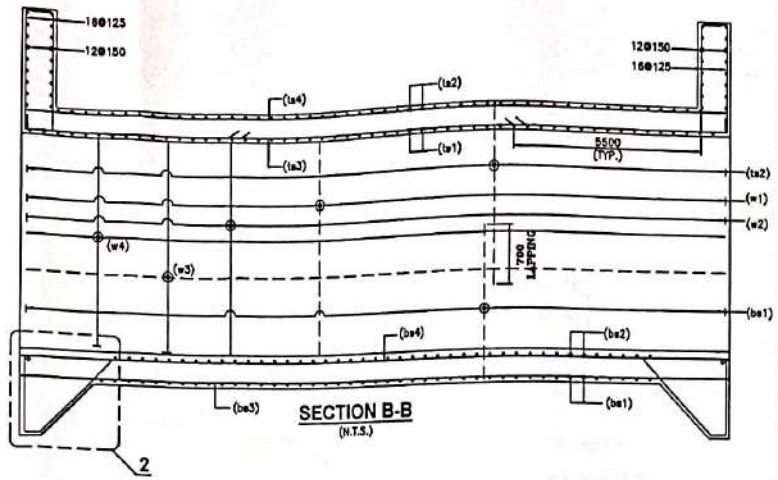
PROJECT: WIDENING&IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (GOLAI GOAN) TO KM 47+482 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH PROPOSED MAIRCHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE (PACKAGE-3)

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

Date	Drw.	Dsg.	Chk	App.	Scale.	Drawing Status.
JAN.2024	W.P	V.S	A.B		NTS	
Project No.	Drawing No. AVC/NH-38/BC/GAD/47+298/01				Sheet No. 03 OF 03	Rev. R0



SECTION A-A
(NTS)



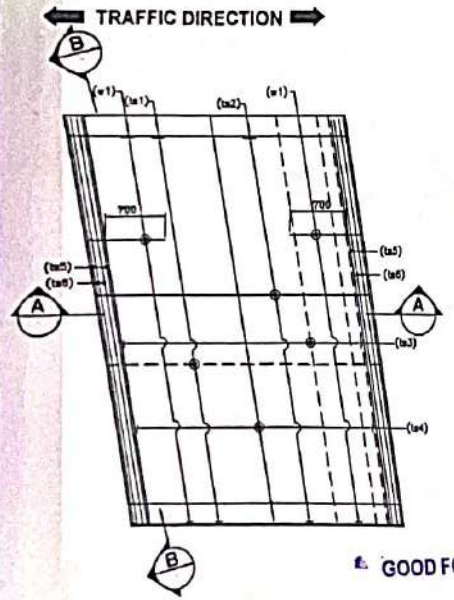
SECTION B-B
(N.T.S.)

BOX REINF. SCHEDULE

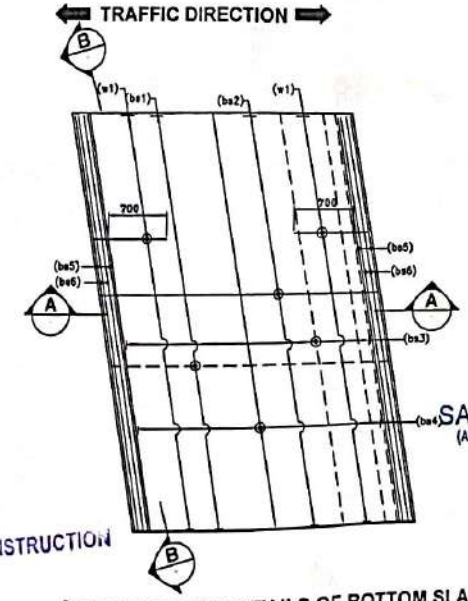
SL.NO.	BAR MARK	BAR SHAPE	DIAMETER	SPACING
1	ts1		12	170
2	ts2		10	170
3	ts3		8	200
4	ts4		10	200
5	ts5		12	2x4 Nos.
6	ts6		12	2x4 Nos.
7	w1		10	170
8	w2		10	170
9	w3		10	200
10	w4		8	200
11	bs1		10	170
12	bs2		12+8	170
13	bs3		10	200
14	bs4		8	200
15	bs5		12	2x4 Nos.
16	bs6		12	2x4 Nos.
17	h1		10	170
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

LEGEND:-

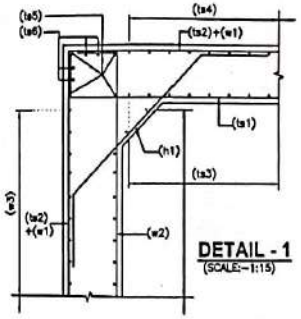
TOP FACE BAR	———
BOTTOM FACE BAR	- - - -



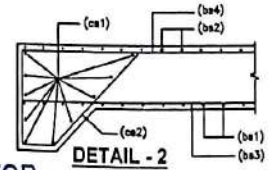
REINFORCEMENT DETAILS OF TOP SLAB
(HAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
(N.T.S.)



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



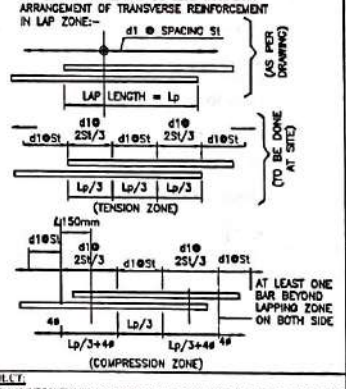
DETAIL - 1
(SCALE:-1:15)



DETAIL - 2
(N.T.S.)

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) CONFIRMING TO IS:1786 STANDARDS.
4. 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
5. OVERLAPPING FOR SPLICING OF REINFORCEMENT SHALL BE AS PER CLAUSE NO.15.2.5.
   LAP LENGTH SHALL NOT BE LESS THAN 58ø.
   ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:-



6. ANCHOURAGE LENGTH OF BOX SHALL BE TAKEN AS 40ø AS PER IRC:112.
7. FOR UNFAVORABLE BOND CONDITIONS THE FACTOR 40 SHOULD BE MULTIPLED BY FACTOR OF 1.43 .
8. CENTER LINE OF OVERLAPPING BAR bs1 & ts2 IN WALL & MID HEIGHT OF WALLS ARE AT SAME POINT.
9. 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:-

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

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 ENGINEER
ALMONDZ GLOBAL INFRACONSULTANT LIMITED IN JOINT WITH AVOLEEZA CONSULTANT PRIVATE LIMITED.
C/O JAYANTA BARTA, SARBAJANIN MANDIR, 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.

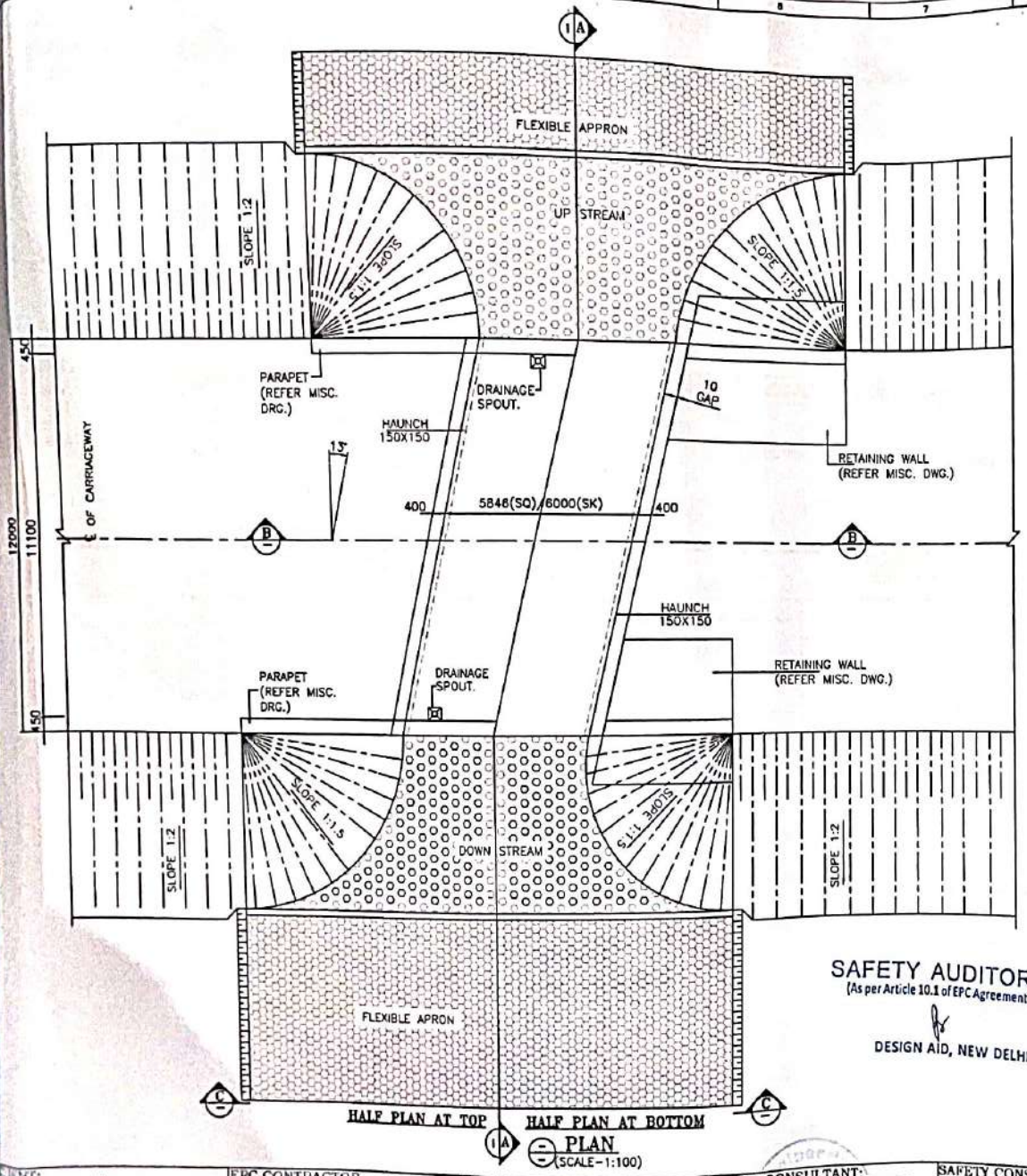
DESIGN CONSULTANT:
WISPL
Winst Infra Solution Pvt. Ltd.
OFFICE: F-8, ISHAAN CORPORATE TOWER, PLOT NO-C-23, SECTOR-13, VASUNDHRA GHAZIABAD, U.P-201012

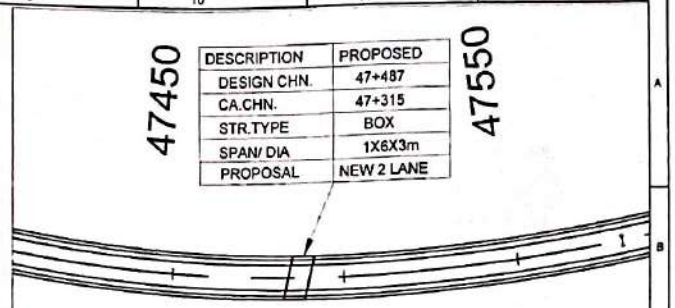
PROJECT:
WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (GOLAI GOAN) TO KM 47+882 (LEDO) ON DIBRUGARH TO LEDO SECTION WITH PROPOSED MARGHERITA & LEDO BYPASS (BROWNFIELD AND GREEN FIELD) (2-LANE+PS) OF NH-38 IN TINSUKIA DISTRICT IN THE STATE OF ASSAM ON EPC MODE (PACKAGE-5)

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

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/NH-38/BOX/REIN./47+298/01	01 OF 01	R0





DESCRIPTION	PROPOSED
DESIGN CHN.	47+487
CA.CHN.	47+315
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			
47+487	157.935	153.023	152.735	152.723	3.012m	2.124m	1.476m

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

GOOD FOR CONSTRUCTION

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 CONJUCTION 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 - Fe500.
5. 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.
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 SUBJECTED TO CHANGE AS PER SITE CONDITION AND DETAILED DESIGN.
9. BACKFILL TO BE DONE AND COMPACTED FROM BOTH SIDE SIMULTANEOUSLY.
10. 600MM THICK. FILTER MATERIAL BEHIND RETAINING WALL SHALL BE LAID AS PER APPENDIX 6 OF IRC 78-2014.
11. 50MM THICK CEMENT CONCRETE WEARING COAT SHALL BE PROVIDED.
12. 100MM DIA P.V.C. PIPE AT SPACING 1000MMc/c IN HORIZONTAL/VERTICAL DIRECTION SHALL BE PROVIDED UP TO 150MM ABOVE GROUND LEVEL FOR WEEP HOLES IN RETAINING WALL.
13. SBC SHALL BE 12t/m². AND SAME SHALL BE ENSURED AT SITE BY ANY SUITABLE METHOD.
14. 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.
15. CHOOSE ANY SUITABLE METHOD TO ACHIEVE THE REQUIRED SBC AS PER SITE.
16. THE EXPOSURE CONDITION IS MODERATE.

REFERENCE DRAWINGS:-

1. REINFORCEMENT DETAIL OF BOX CULVERT AVC/NH-38/BOX/REINF./47+487/02

CLIENT:
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.

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

AUTHORITY'S ENGINEER
ALMONDZ GLOBAL INFRA CONSULTANT LIMITED IN JOINT VENTURE WITH ALEEZA CONSULTANT PRIVATE LIMITED.
C/O AYANTA SAIKIA, BARBARUAHIN HAZO ROAD, 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.

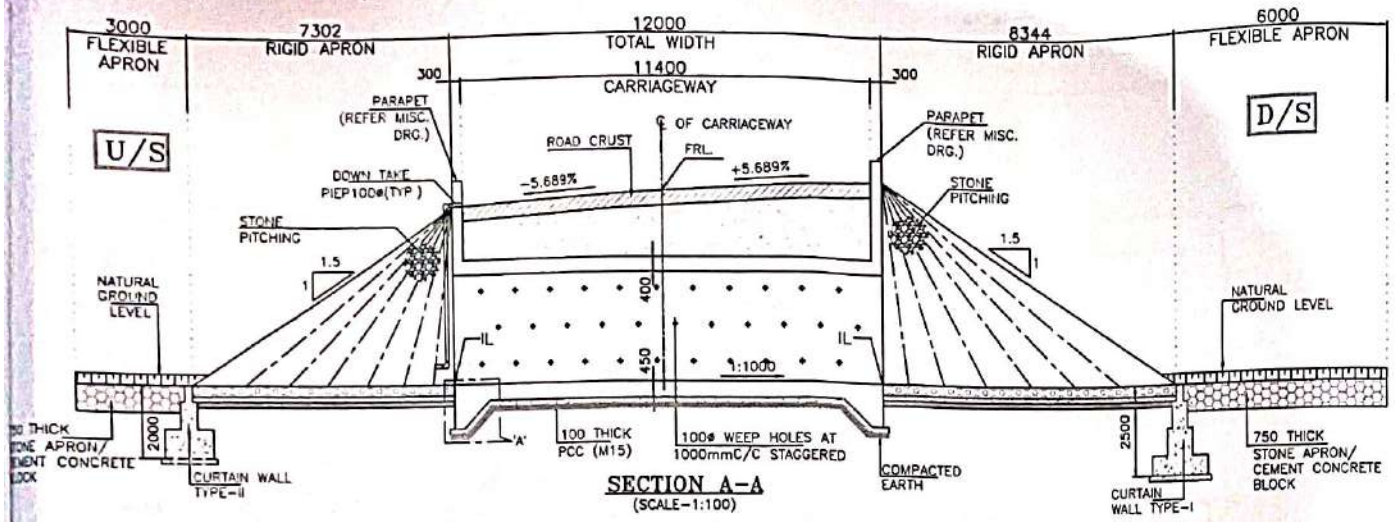
DESIGN CONSULTANT:
A.T. CONSTRUCTION
Palam Extension, Bosco Ashram Vill. Gaur, New Delhi 110045
Winst Infra Solution Pvt. Ltd.
OFFICE: F-8, ISHAN CORPORATE TOWER, PLOT NO-C,21,SECTOR-13, VASUNDHRA GHAZIABAD, U.P-201012

PROJECT:
WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+150 (GOLAI GOAN) TO KM 47+862 (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)

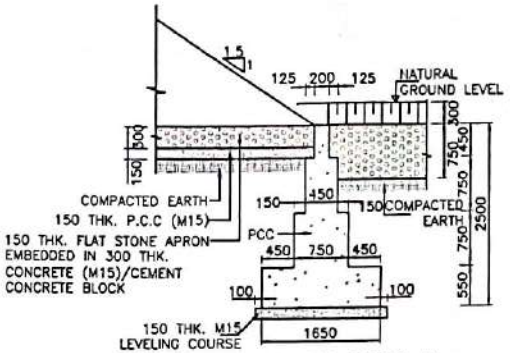
DRAWING TITLE:
GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 47+487

Date	Drw.	Dsg.	Chk	App	Scale	Drawing Status
JAN 2024	W.P	V.S	A.D		NTS	

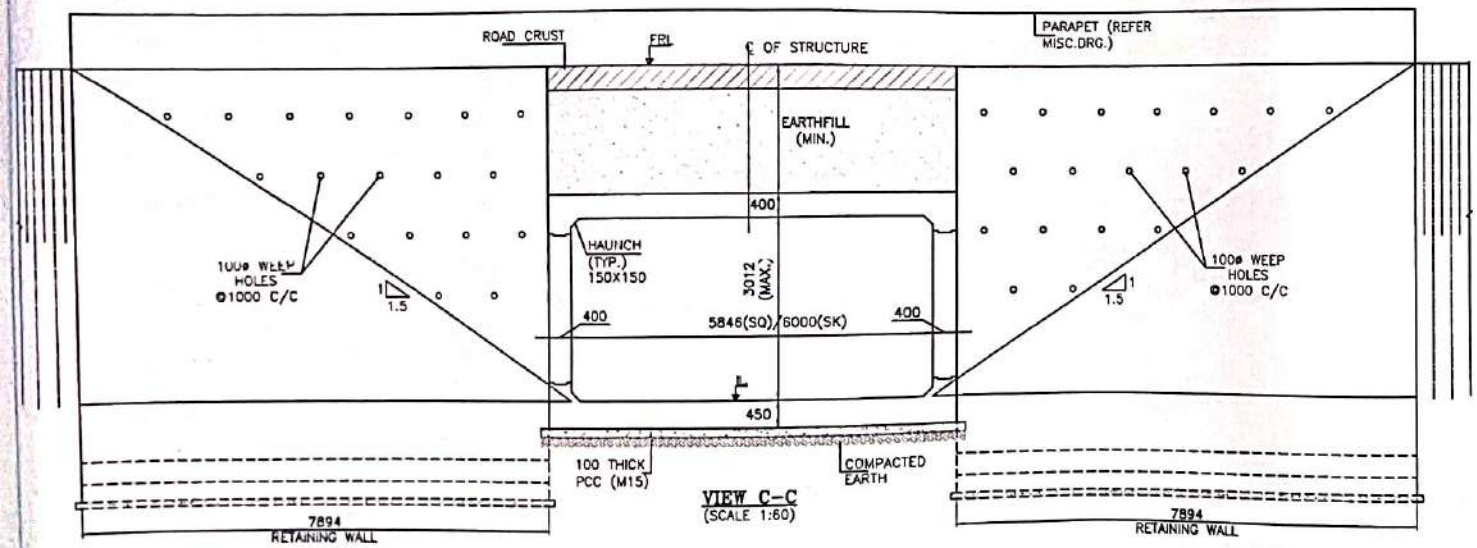
Project No.	Drawing No.	Sheet No.	Rev.
	AVC/NH-38/BC/GAD/47+487/01	01 OF 03	R0



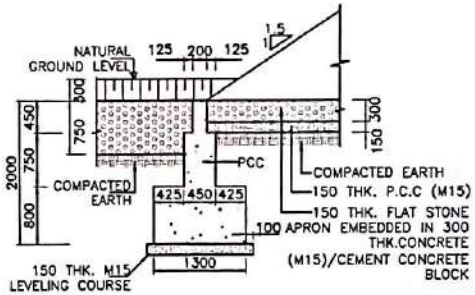
SECTION A-A
(SCALE-1:100)



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



VIEW C-C
(SCALE 1:60)



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

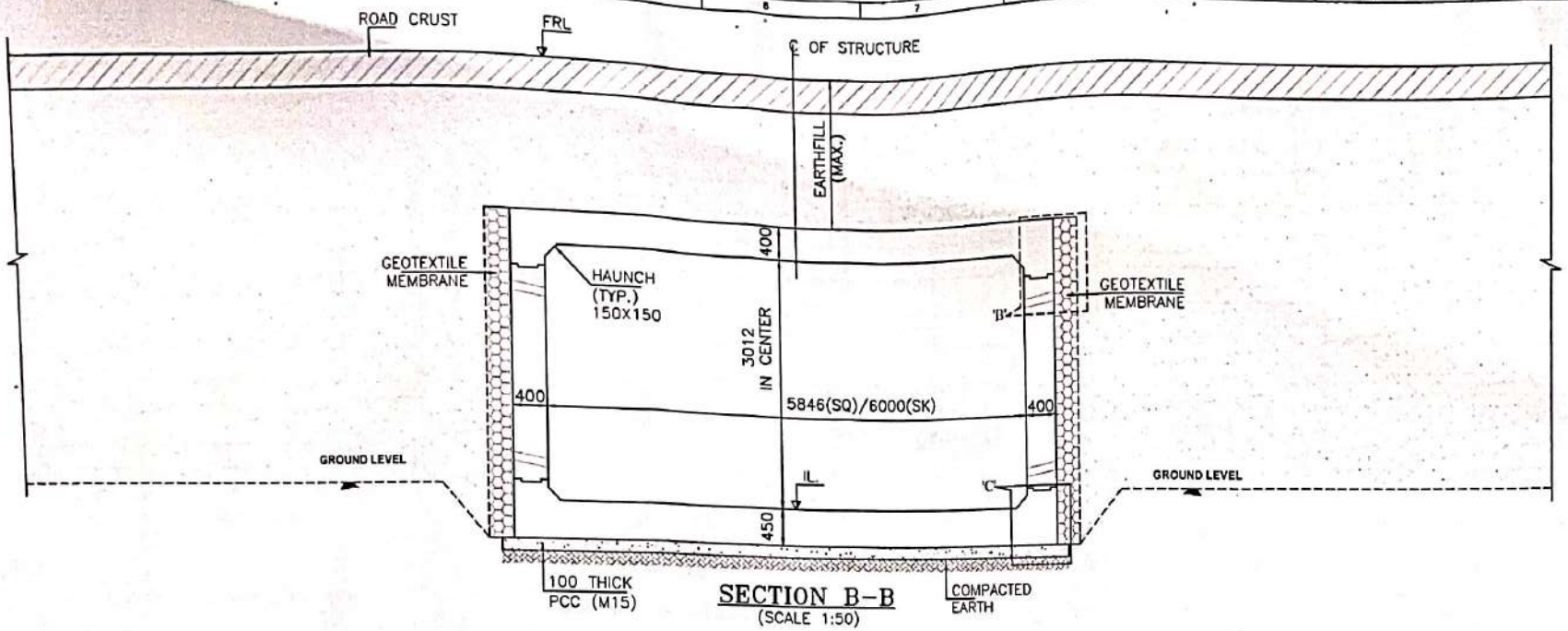
GOOD FOR CONSTRUCTION

SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

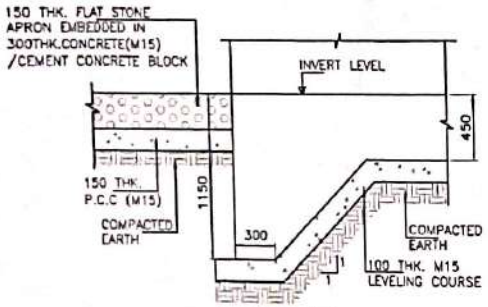
DESIGN AID, NEW DELHI

CLIENT:	EPC CONTRACTOR	AUTHORITIES 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	ALMONDZ GLOBAL INFRA CONSULTANT LIMITED IN JV WITH MULAN OLEZA CONSULTANCY PRIVATE LIMITED. C/O JAYANTA SAIKIA, SARBANANIN NAMGHAR, BORBIL 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,	A.V. CONSTRUCTION 1st Floor, WZ-1240 Palam Extension, Bosco Ashram Wali Gali, New Delhi 110045 Winst Infra Solution Pvt. Ltd. OFFICE F-4, ISHAAN CORPORATE TOWER, PLOT NO-C-23,SECTOR-13, YASUNDHRA GHAZIABAD, U.P-201012	WIDENING/IMPROVEMENT TO 2-LANE LANE WITH PAVED SHOULDER FROM KM 27+190 (GOLAI GOAN) TO KM 47+683 (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-S)

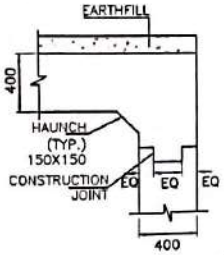
DRAWING TITLE:						
GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 47+487						
Date JAN.2024	Drw. W.P	Dsg. V.S	Chk. A.R	App.	Scale. NTS	Drawing Status
Project No.	Drawing No. AVC/NH-38/BC/GAD/47+487/01				Sheet No. 02 OF 03	Rev. R0



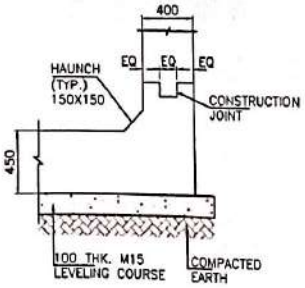
SECTION B–B
(SCALE 1:50)



DETAIL–'A'
(SCALE 1:25)



DETAIL–'B'
(SCALE 1:25)



DETAIL–'C'
(SCALE 1:25)

SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

DESIGN AID, NEW DELHI

GOOD FOR CONSTRUCTION

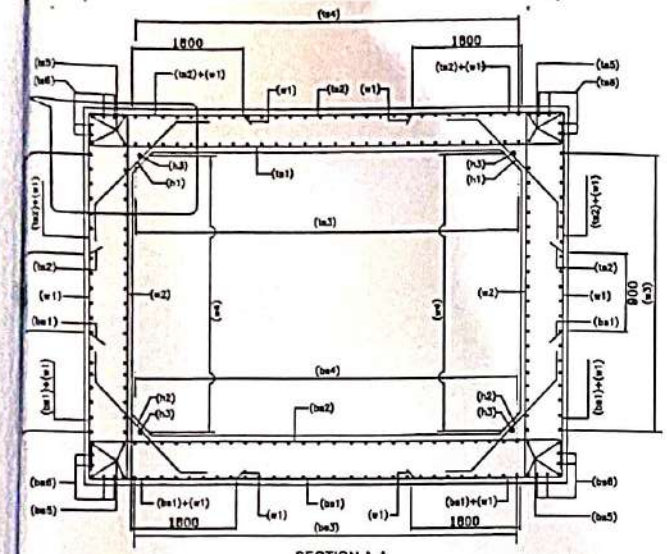
NT:	EPC CONTRACTOR	AUTHORITY'S ENGINEER	PROOF CONSULTANT:	SAFETY CONSULTANT:	DESIGN CONSULTANT:
NATIONAL HIGHWAYS & RASTRUCTURE DEVELOPMENT CORPORATION LTD.	KAMAC ENGINEERS PVT.LTD F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	ALMONDZ GLOBAL INFRA CONSULTANT LIMITED (FORMERLY ALMONDZ CONSULTANT PRIVATE LIMITED. C/O JAYANTA SAIKIA, SARBAJANIN NAMGHAR, BORBIL 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.	A.P. CONSTRUCTION 4th Floor, WZ-C01, Palam Extension, Gosco Ashram-Well Coll, 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+662 (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-II)

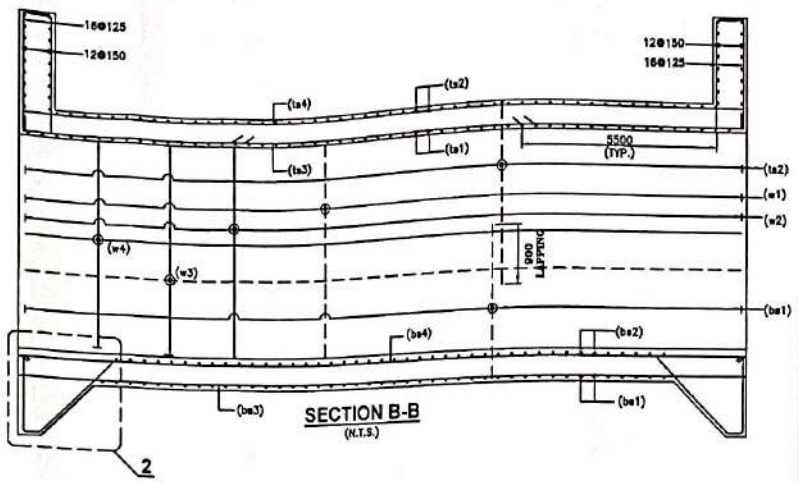
DRAWING TITLE: GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CHAINAGE 47+487

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/NH-38/BC/GADI/47+487/01	03 OF 03	R0



SECTION A-A
(NTS)



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

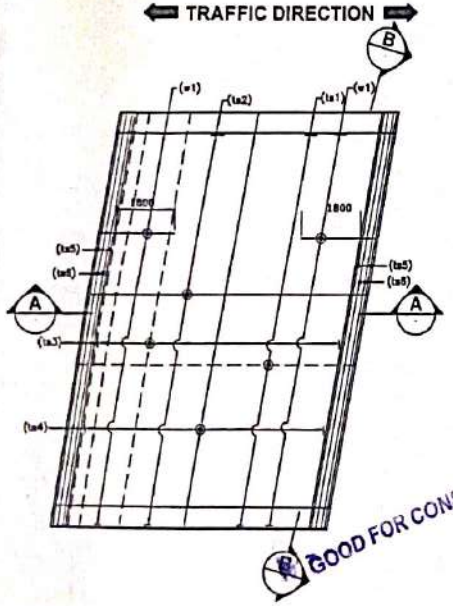
BOX REINF. SCHEDULE

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

LEGEND:-

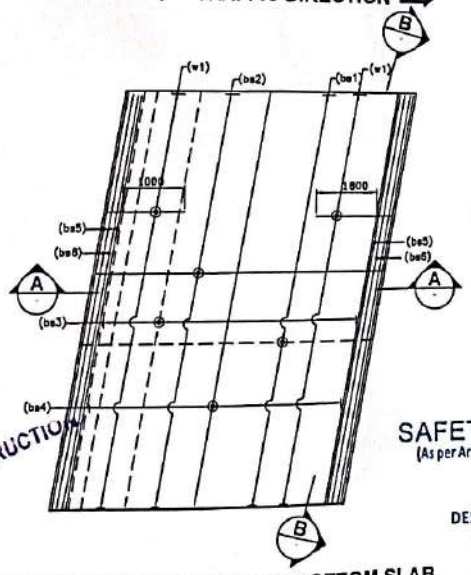
TOP FACE BAR	———
BOTTOM FACE BAR	- - - -

TRAFFIC DIRECTION

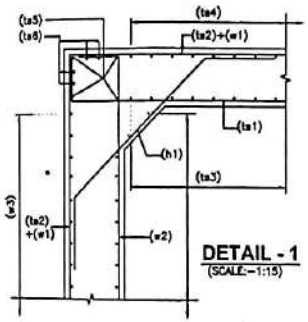


REINFORCEMENT DETAILS OF TOP SLAB
(HAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
(N.T.S.)

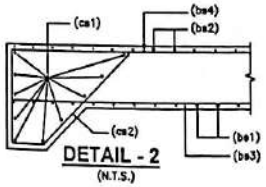
TRAFFIC DIRECTION



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.)

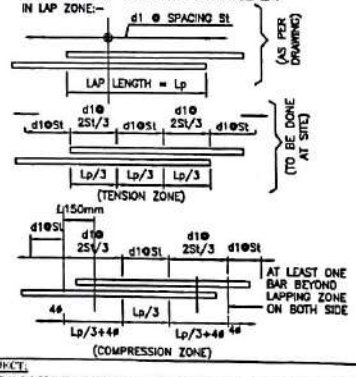
GOOD FOR CONSTRUCTION

SAFETY AUDITOR
(As per Article 10.1 of EPC Agreement)

DESIGN AID, NEW DELHI

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) CONFIRMING TO IS:1786 STANDARDS.
4. 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
5. OVERLAPPING FOR SPLICING OF REINFORCEMENT SHALL BE AS PER CLAUSE NO.15.2.5.
   LAP LENGTH SHALL NOT BE LESS THAN 56ϕ.
   ARRANGEMENT OF TRANSVERSE REINFORCEMENT IN LAP ZONE:-



6. ANCHOURAGE LENGTH OF BOX SHALL BE TAKEN AS 40ϕ AS PER IRC:112.
7. FOR UNFAVORABLE BOND CONDITIONS THE FACTOR 40 SHOULD BE MULTIPLIED BY FACTOR OF 1.43 .
8. CENTER LINE OF OVERLAPPING BAR bs1 & ts2 IN WALL & MID HEIGHT OF WALLS ARE AT SAME POINT.
9. 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:-

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

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 GLOBAL INFRA CONSULTANT LIMITED IN JV WITH AYODHYA CONSULTANT PRIVATE LIMITED. (PKG-3,4,5) C/O JAYANTA SAIKIA, SARBAJANIN NAMGHAR, BOREIL 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: WISPL, P. CONSTRUCTION, 4th Floor, WZ-C(A), Palam Extension, Bosco Ashram Walk 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 LANE WITH PAVED SHOULDER FROM KM 37+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 3)		
						DRAWING TITLE: REINFORCEMENT DETAIL OF BOX CULVERT AT CH. 47+487		
						Date: JAN.2024	Drw. W.P / Dsg. V.S / Chk. A.B / App. / Scale. NTS	Drawing Status
						Project No.	Drawing No. AVC/NH-38/BOX/REIN/47+487/01	Sheet No. 01 OF 01 / Rev. R0