

Ref: AGICL/A.E/PKG-05/2024/295

Date: 28-05-2024

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 SMALL VEHICULAR UNDERPASS (SVUP)

Ref : i) Your letter No. KEPL/NHIDCL/D-L/2024/73 Dated: 01.05.24
ii) Our Letter No. AGICL/A.E/PKG-5/2024/203 Dated: 23.04.24
iii) Your letter No. KEPL/NHIDCL/D-L/2024/045 Dated: 04.03.2024

Dear Sir,

With reference to above cited subject, the EPC Contractor has submitted design and Drawing of SVUP for review and approval. The Authority Engineer reviewed after Compliance received from EPC Contractor and found in order. The EPC Contractor has advised to submit 3 sets of drawing for GFC duly sealed & signed by **Design Director, Proof Consultant & Safety Consultant**.

The following SVUP has been accorded approval after joint verification of locations.

Types Of Structure	Actual Chainage As Per Joint Verification	Chainage As Per Schedule-B
SVUP	31+242	31+266
	32+977	33+000
	33+902	33+910
	37+278	37+293
	40+454	40+465
	42+052	42+050
	42+773	42+750
	44+868	44+880
	45+825	45+820
	47+266	47+267

Thanking you and assuring our best services at all times.

With regards

For, Almondz Global Infra Consultant limited in JV with Ayoleeza consultant Private Lim

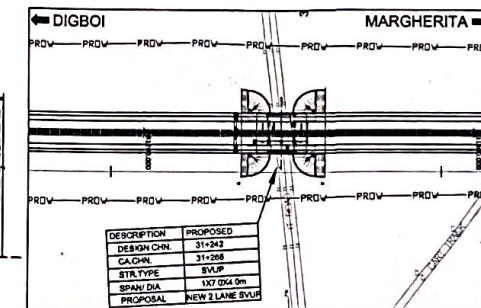
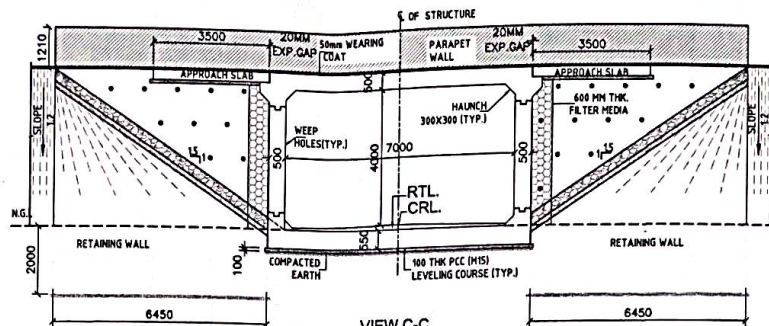


Pramod Kumar
Team Leader
(Authority Engineer)
Copy to:

- GM. (P) PMU, Dibrugarh (Assam) for kind information please.
- The Almondz Global Infra-Consultant Limited in JV with Ayoleeza Consultant Private Limited.

GENERAL ARRANGEMENT DRAWING
SMALL VEHICULAR UNDERPASS AT
CH:31+242

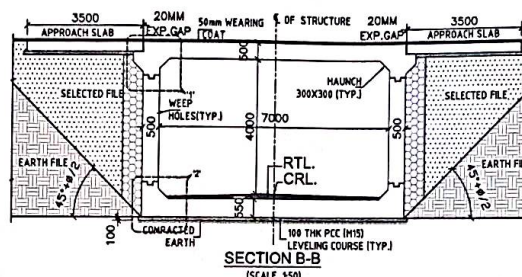
MARGHERITA ➡



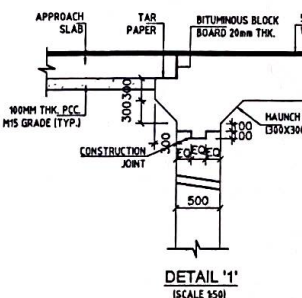
KEY PLAN
(NTS)

NOTES:-

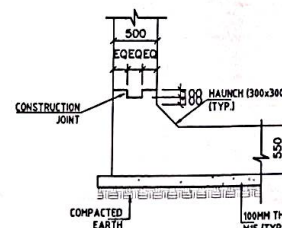
1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS, UNLESS NOTED MENTIONED.
2. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED. NO DIMENSION IS TO BE SCALED.
3. CONCRETE SHALL BE OF DESIGN MIX AND SHALL HAVE MINIMUM 28 DAYS CHARACTERISTIC CUBE STRENGTH AS FOLLOWS:
 - a) RCC BOX → M35
 - b) RCC LEVELING COURSE → M30
 - c) PARAPET WALL → M40
4. GRADE OF UNSTRENGTHENED STEEL SHALL BE F450SD, CONFORMING TO IS:1786.
5. SLOPE OF THE WEAR COURSE IS PROVIDED AS PER NORTH SPECIFICATION & CLASSIFICATION M202 TYPE - II.
6. THE BACKFILL MATERIAL, BEHIND RCC BOX SHALL HAVE FOLLOWING PROPERTIES $\phi_{30} 30$, $\gamma = 20.7 \text{ kN/m}^3$.
7. SELECTED GRANULAR NON PLASTIC MATERIAL SHALL BE USED AS FILL MATERIAL UP TO THE ACTIVE WEDGE OF RAINING SLOPE OF 1:1.5 (H:V) FROM SOLE OF BOTTOM RAIL. VIBRATORY PLATE COMPACTION SHALL BE USED FOR COMPACTION, PARALLEL TO THE EXTERNAL WALL IN LAYER BY LAYER.
8. THE RCC BOX SHOULD BE CONSTRUCTED FIRST AND THE SIDE FILLING & COMPACTION SHALL BE DONE AS PER NORTH SPECIFICATIONS.
9. THE DRAWING SHALL BE PROVIDED IN CONJUNCTION WITH RELEVANT HIGHWAY DRAWING, FRL & CAMBER/SURVEY ELEVATION AT PARTICULAR LOCATION SHALL BE VERIFIED WITH THE HIGHWAY DRAWING DISCREPANCY IF ANY IS TO BE IMMEDIATELY BROUGHT TO THE NOTICE OF ENGINEER FOR NECESSARY MODIFICATIONS IN THE DRAWING.
10. THE DEEP HOLES OF 100MM TO 150MM IN DIAMETER HORIZONTALLY AND VERTICALLY SHALL BE PROVIDED IN STRUTTED MANNER IN VERTICAL DIRECTION AT A SLOPE OF 120° AS PER IRC-53 (33) NORM. CLAUSE NO. 13.5.5.
11. DOWEL BAR SHALL BE PROVIDED TO ACCOMMODATE PARAPET WALL.
12. MISCELLANEOUS DRG. OF RETAINING WALL SHALL BE PROVIDE SEPARATELY.
13. REQUIRED SSK SHALL BE VERIFIED AT SITE BEFORE EXECUTION OF WORK.
14. EXPANSION GASK SHALL BE FILLED WITH COMPRESSIBLE FIBER BOARD.



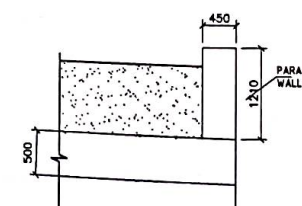
SECTION B-1
(SCALE 1:50)



DETAIL '1'
(SCALE 1/50)



DETAIL 'A'
(SCALE 1:50)



DETAIL '3'
(SCALE 1:50)

ABBREVIATIONS

- | | |
|------|-------------------------|
| C | - CENTER LINE |
| FRL | - FINISHED ROAD LEVEL |
| CR.L | - CROSS ROAD LEVEL |
| NGL | - NATURAL GROUND LEVEL |
| LHS | - LEFT HAND SIDE |
| RHS | - RIGHT HAND SIDE |
| EXP. | - EXPANSION GAP |
| P.S | - PAVED SHOULDER |
| E.S | - EARTHEN SHOULDER |
| PCC | - PLAIN CEMENT CONCRETE |
| THK | - THICKNESS |
| TYP. | - TYPICAL |
| RTL | - RAFT TOP LEVEL |

LEGENDS:

- ☒ -SELECTED F&L
- ☒ -PCC
- ☒ -COMPACTED EARTH

SCHEDULE

SL NO	SCHEDULE CHAINAGE	DESIGN CHAINAGE AS PER STR.	FRL		CAMBER/SUPER ELEVATION (%)		CROSS ROAD LEVEL (m)	RAFT TOP LEVEL (m)	CUSHION (m)	S RE T.
			LHS	RHS	LHS	RHS				
1	31+264	31+242	161.279	161.279	-2.50%	-2.50%	155.682	155.535	1.0 TO 1.5m	

EPIC 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,
SARBAJANTIN NAMGHAR, BORBIL
NO.2, DIGBOI, TINSUKIA,
ASSAM-786171

PROOF CONSULTANT:	
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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, BHAAH CORPORATE TOWER
PLOT NO-C-23, SECTOR-13,
VASUNDHRA CHAZIABAD, U.P-201012

PROJECT: Widening/Improvement to 2-Lane Lane with Paved Shoulder from km 27+150 (Golai Gurm) 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 OF
SVUP AT CH. 11+42

DETAILS:

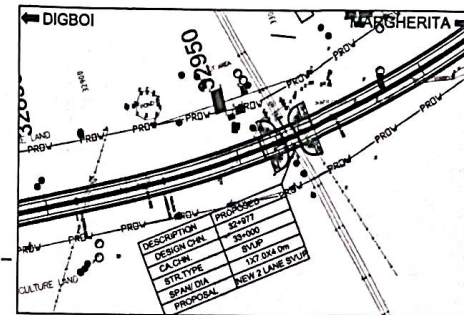
Date FEB.2024	Drw. A.J	Dwg. U.Y	Chk. P.S	App.	Scale AS SHOWN	Drawing Status FOR APPROVAL
Project No.	Drawing No. AVCET/PC/BU/BU/11/12/2024					Sheet No. 1 OF 1



NAIDCL

NATIONAL HIGHWAYS &
STRUCTURE DEVELOPMENT
CORPORATION LTD.

GENERAL ARRANGEMENT DRAWING
SMALL VEHICULAR UNDERPASS AT
CH:32+977

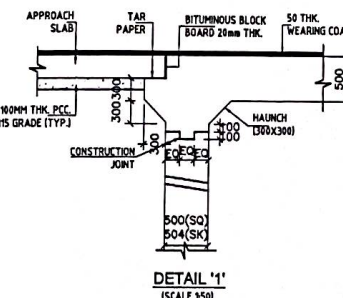


VIEW C-
(SCALE 1/110)

KEY PLAN
(NTS)

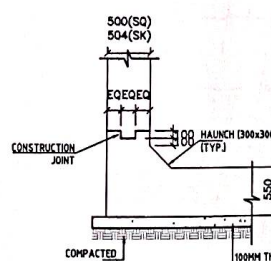
NOTES:-

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2. ONLY WRITTEN DIMENSION SHALL BE FOLLOWED, NO DIMENSION IS TO BE SCALED.
3. CONCRETE SHALL BE OF DESIGN MIX AND SHALL HAVE MINIMUM 28 DAYS CHARACTERISTIC CUBE STRENGTH AS FOLLOWS:
 - a) R/C BEAM - M35
 - b) R/C LEVELING COURSE - M20
 - c) PARAPET WALL - M25
4. GRADE OF UNSTRENGTHENED STEEL SHALL BE F450SD, CONFORMING TO IS-1786.
5. SOME THERMAL COEFF. OF EXP. PROVIDED AS PER MONTH SPECIFICATION & SLABE NO.2702 (TYPE-I) - 1
6. THE BACKFILL MATERIAL BEHIND RCC BOX SHALL HAVE FOLLOWING PROPERTIES $\phi_{30} \geq 2.07 \text{ mm}$.
7. SELECTED GRANULAR NON PLASTIC MATERIAL SHALL BE USED AS FILL MATERIAL UP TO ACTIVE SLOPE OF RAINING SLOPE OF 1:1.5 - 1.75 FROM THE BASE OF THE DOWEL AND REINFORCING PLATE COMPACTOR SHALL BE USED FOR COMPACTION, PARALLEL TO THE EXTERNAL WALL IN LAYER BY LAYER.
8. THE RCC BOX SHOULD BE CONSTRUCTED FIRST AND THE SIDE FILLING & COMPACTION SHALL BE DONE AS PER MONTH SPECIFICATIONS.
9. THE DRAWING SHALL BE READ IN CONNECTION WITH RELEVANT HIGHWAY DRAWING, RFL & CAMBER/SUPER ELEVATION AT PARTICULAR LOCATION SHALL BE VERIFIED WITH THE HIGHWAY DRAWING DISCREPANCY IF ANY IS TO BE IMMEDIATELY BROUGHT TO THE NOTICE OF ENGINEER FOR NECESSARY MODIFICATIONS IN THE DRAWING.
10. 100MM DIA. DEEP HOLES AT 1000MM C/C SHALL BE HORIZONTALLY AND VERTICALLY SHALL BE PROVIDED IN STAGGERED MANNER IN VERTICAL DIRECTION AT A SLOPE OF 2:20 AS PER IRC-SP-13-2004 CLAUSE NO. 13.5.10
11. DOWEL BAR SHALL BE PROVIDED TO ACCOMMODATE PARAPET WALL.
12. HIGH STRENGTH DRG. OF RETAINING WALL SHALL BE PROVIDE SEPARATELY.
13. REQUIRED SCG SHALL BE VERIFIED AT SITE BEFORE EXECUTION OF WORK.
14. EXPANSION GAP SHALL BE FILLED WITH COMPRESSIBLE FIBER BOARD.

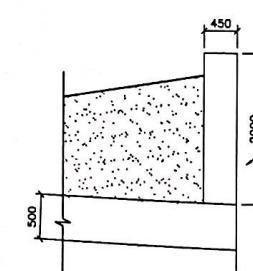


SECTION B-1
(SCALE 1/50)

DETAIL 'A'
(SCALE 1/50)



DETAIL 5
(SCALE 1:50)



DETAIL 9
(SCALE 3/8")

ABBREVIATIONS

- C - CENTER LINE
FRL - FINISHED ROAD LEVEL
CRL - CROSS ROAD LEVEL
NGL - NATURAL GROUND LEVEL
LHS - LEFT HAND SIDE
RHS - RIGHT HAND SIDE
EXP - EXPANSION GAP
P.S - PAVED SHOULDER
E.S - EARTHEN SHOULDER
PCC - PLAIN CEMENT CONCRETE
THK - THICKNESS
TYP - TYPICAL
RTL - RAFT TOP LEVEL

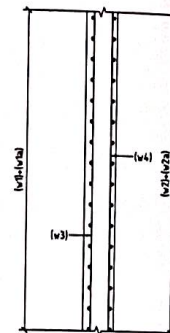
LEGENDS:-

- LEGEND:**
 -SELECTED FILL
 -PCC
 -COMPACTED EARTH

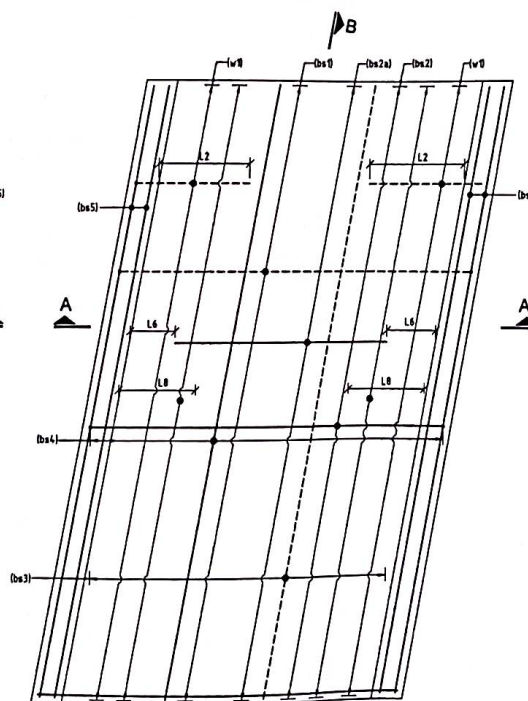
SCHEDULE

SL NO.	SCHEDULE CHAINAGE	DESIGN CHAINAGE AS PER STR.	FRL		CAMBER/SUPER ELEVATION (%)		CROSS ROAD LEVEL (m)	RAFT TOP LEVEL (m)	CUSHION (m)	S. REFIN. T.
			LHS	RHS	LHS	RHS				
1	33+000	33+977	149.750	149.750	-5.68%	+5.68%	143.998	143.846	18 TO 1.5m	

PROJECT: Widening/Improvement to 2-Lane Lane with Paved Shoulder from km 27+150 (Gola) Gm to km 47+682 (Leda) on Dibruigarh to Leda section with proposed Margherita & Leda Bypass (Brownfield and Green Field) (2-Lane) of NH-38 in Tinnukuli District in the State of Assam on EPC mode.(Package-5)						
DRAWING TITLE: GENERAL ARRANGEMENT DRAWING OF SVUP AT CH. 32-977 (SKEW'5)						
DETAILS:						
Date	Drw.	Dsg	Chk.	App.	Scale	Drawing Status.
FEB 2024	A.J	U.Y	P.S		AS SHOWN	FOR APPROVAL
Project No.	Drawing No.				Sheet No.	Rev
	AVC-ST/BO3VUP/CH. 32-977GAD-001				1 OF 1	RO



SECTION C-C
SCALE-1:30



REINFORCEMENT DETAIL OF TOP SLAB
(SHEAR KEY & LAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)

REINFORCEMENT DETAIL OF BOTTOM SLAB
(SHEAR KEY & HAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
SCALE-1:35

NOTES:-

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS TO BE FOLLOWED. NO DIMENSION SHALL BE SCALE.
2. CONCRETE SHALL BE DESIGN MIX WITH A MINIMUM CHARACTERISTIC STRENGTH OF 30MPa FOR RICE BOX STRUCTURE.
3. CLEAR COVER TO OUTER MOST STEEL SHALL BE AS FOLLOWS:-
EARTH FACE - 75mm
OTHER FACE - 45mm
4. THE REINFORCING STEEL SHALL BE HYSD BARS (GRADE DESIGNATION Fe-550D) CONFORMING TO IS-1786.
5. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE RELEVANT GENERAL ARRANGEMENT DRAWING.

SCHEDULE OF LAP LENGTH FOR REINFORCEMENT

CONCRETE GRADE X ⁰ LAPPED BAR	FAVORABLE BOND				UNFAVORABLE BOND			
	M25	M30	M35	M40	M25	M30	M35	M40
-25%	52x	44x	40x	37x	75x	63x	58x	53x
25-33%	60x	51x	46x	43x	87x	73x	67x	61x
33-50%	73x	62x	56x	52x	105x	89x	82x	75x
+50%	NOT ALLOWED							

FOR DETAILS FAVORABLE BOND AND UNFAVORABLE BOND
CONDITION REFER CLAUSE 15.2.3. OF IRC-112-2011.

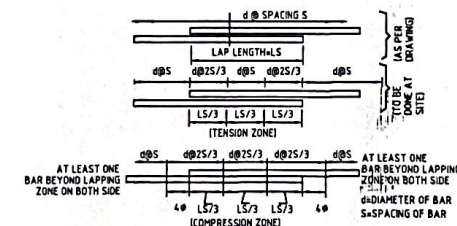
THIS TABLE IS USED FOR UP TO 32mm BAR
FOR ϕ 32mm IB, SHOULD BE INCREASED BY MULTIPLYING FACTOR $(\frac{32}{\phi})^2$

SCHEDULE OF DEVELOPMENT LENGTH FOR REINFORCEMENT

DESCRIPTION	FAVORABLE BOND				UNFAVORABLE BOND			
	M25	M30	M35	M40	M25	M30	M35	M40
CONCRETE GRADE	M25	M30	M35	M40	M25	M30	M35	M40
ANCHOR LENGTH	78xø	66xø	60xø	56xø	112xø	95xø	86xø	80xø

FOR DETAILS FAVORABLE BOND AND UNFAVORABLE BOND

CONDITION REFER CLAUSE 15.2.3. OF IRC-112-2011.



LEGEND:-

NEAR FACE BAR	—
FAR FACE BAR	— — —



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



KAMAC ENGINEERS PVT.LTD

F0201, CITY CENTER OFFICE
BLOCK, 2ND FLOOR,
MATIGARA 734010

EPC CONTRACTOR

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:	
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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.

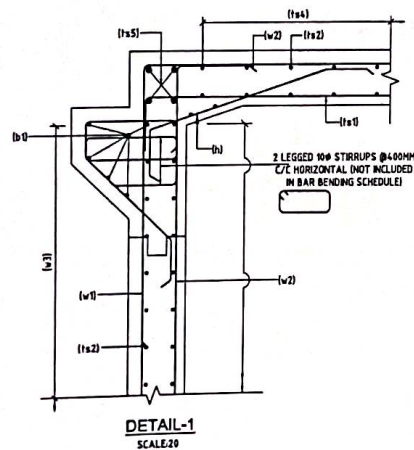
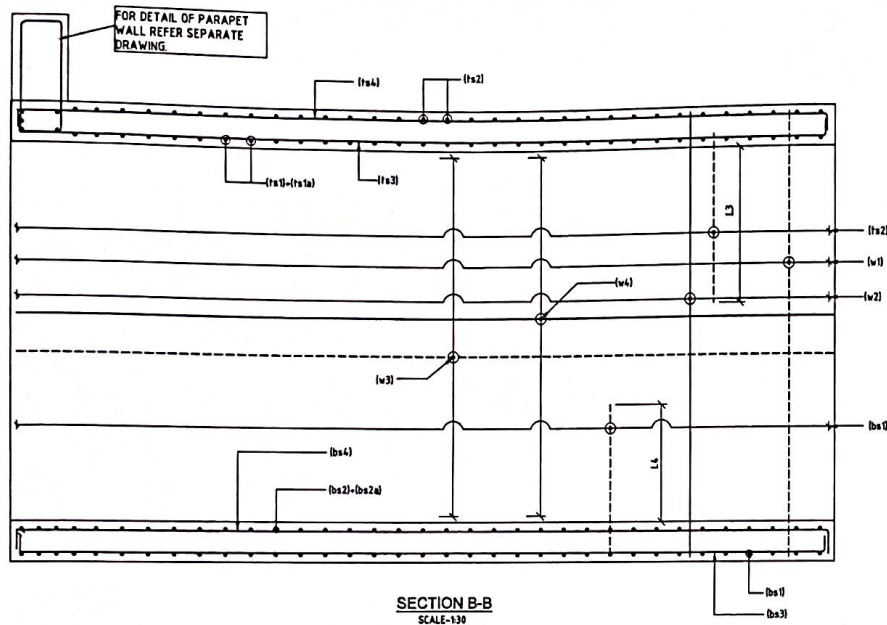
OFFICE: F-6, BHAAAN CORPORATE TOWER,
PLOT NO-C-23, SECTOR-13,
VASUNDHRA CHAZIABAD, U.P-201012

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 DRAWING
FOR CH. 32+977 SKEW 7.5°

DETAILS:

Date FEB 2024	Drw. A J	Dsg U Y	Chk. P S	App.	Scale AS SHOWN	Drawing Status. FOR APPROVAL
Project No.	Drawing No. AVC/ST/BC/UP02-977/REIN/201					Sheet No. 1 OF 2



REINFORCEMENT DETAIL

BAR MARK	BAR SHAPE	DIAMETER	SPACING NOS.	REMARKS
rs1		16	130	
rs1a		10	130	
rs2		12	130	
rs3		10	130	
rs4		10	130	
rs5		16	04	02 LOCATIONS
rs6		N.A		
rs7		N.A		
rs8		10	(LxT) 130x130	
w1		16	130	
w1a		N.A		
w2		12	130	
w2a		N.A		
w3		10	130	
w4		10	130	
w5		N.A		
w6		N.A		
bs1		12	130	
bs2		16	130	
bs2a		10	130	
bs3		10	130	
bs4		10	130	
bs5		16	04	02 LOCATIONS
bs6		N.A		
bs7		10	(LxT) 130x130	
h1		10	130	
h2		10	130	
b1		10	05nos.	02 LOCATIONS
b1a		12	130	
b2		12	360	03 LOCATIONS

BAR CURTAILMENT SCHEDULE TYPE

L1	900mm
L2	900mm
L3	900mm
L4	900mm
L5	450mm
L6	450mm
L7	900mm
L8	900mm
L9	900mm

CLIENT:

NADGL
NATIONAL HIGHWAYS &
INFRASTRUCTURE DEVELOPMENT
CORPORATION LTD.

EPC CONTRACTOR

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

AUTHORITY'S ENGINEER

ALMONDZ GLOBAL INFRA CONSULTANT
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PROOF CONSULTANT:



CREATIVE ENGINEERING SERVICES
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Winst Infra Solution
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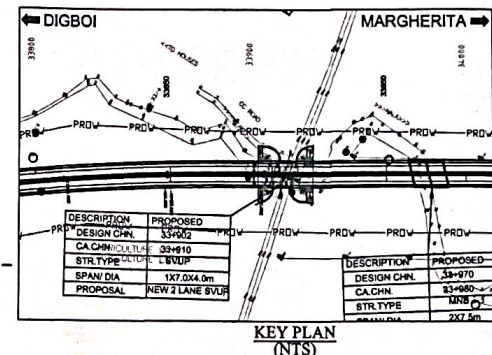
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27+150 (Golai Ghat) to km 47+682 (Lodo) on Dibrugarh to Lodo section
with proposed Margherita & Lodo Bypass (Brownfield and Green Field)
(2-Lane+PS) of NH-38 in Tinsukia District in the State of Assam on EPC
mode.(Package-5)

DRAWING TITLE: REINFORCEMENT DETAIL DRAWING OF SVUP
FOR CH. 32+977 (SKEW 7.5°)

DETAILS:-

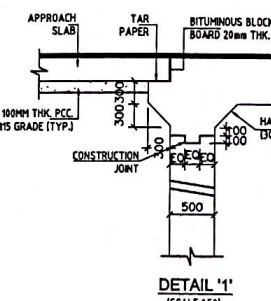
Date	Drw.	Des.	Chk.	App.	Scale	AS SHOWN	Drawing Status.
FEB.2024	A.J	U.Y	P.S				
Project No.	Drawing No.	AVC/ST/BC/SVUP/32+977/REIN-001	FOR APPROVAL	Sheet No.	Rev.	RO	
				2 OF 2			

**GENERAL ARRANGEMENT DRAWING
SMALL VEHICULAR UNDERPASS AT
CH:33+902**

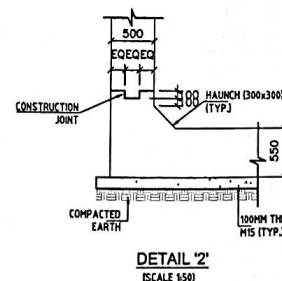


KEY PLAN
(NTS)

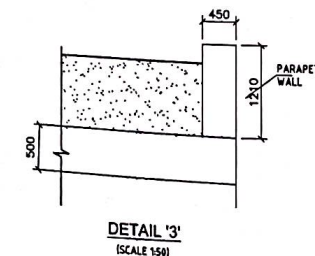
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2. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED, NO DIMENSION IS TO BE SCALE.
3. CONCRETE SHALL BE OF DESIGN MIX AND SHALL HAVE MINIMUM 28 DAYS CHARACTERISTIC CUBE STRENGTH AS FOLLOWS:
 - a) RCC CORE - M35
 - b) PCC LEVELING COURSE - M15
 - c) PARAPET WALL - M20
4. GRADE OF UNSTRENGTHENED STEEL SHALL BE F450, CONFORMING TO IS-1786.
5. SLAB AND BEAM CONCRETE IS PROVIDED AS PER MONTH SPECIFICATION & SLAB NO.2702 (TYPE-I)
6. THE BACKFILL MATERIAL BEHIND RCC BOX SHALL HAVE FOLLOWING PROPERTIES $\phi_{30} = 70$, $\gamma = 2.07 \text{ t/m}^3$.
7. SELECTED GRANULAR NON PLASTIC MATERIAL SHALL BE USED AS FILL MATERIAL TO THE ACTIVE SLOPE OF RAINING SLOPE OF 1:0.5-1:0.6 FROM THE BASE OF BOTTOM SILL. VIBRATORY PLATE COMPACTOR SHALL BE USED FOR COMPACTION, PARALLEL TO THE EXTERNAL WALL IN LAYER BY LAYER.
8. THE RCC BOX SHOULD BE CONSTRUCTED FIRST AND THE SIDE FILLING & COMPACTION SHALL BE DONE AS PER MONTH SPECIFICATIONS.
9. THE DRAWING SHALL BE IN CONJUNCTION WITH RELEVANT HIGHWAY DRAWING, FILL & CAMBER/SUPER ELEVATION AT PARTICULAR LOCATION SHALL BE VERIFIED WITH THE HIGHWAY DRAWING DISCREPANCY IF ANY IS TO BE IMMEDIATELY BROUGHT TO THE NOTICE OF ENGINEER FOR NECESSARY MODIFICATIONS IN THE DRAWING.
10. 100MM DEEP HOLES AT 900MM C/C BOTH HORIZONTALLY AND VERTICALLY SHALL BE PROVIDED IN STAGGERED MANNER IN VERTICAL DIRECTION AT A SLOPE OF 2% TO 5% PER S/C -19-204 CLASS NO. 13.5.10
11. DOWEL BAR SHALL BE PROVIDED TO ACCOMMODATE PARAPET WALL.
12. MISCELLANEOUS DRG. OF RETAINING WALL SHALL BE PROVIDE SEPARATELY.
13. REQUIRED SCG SHALL BE VERIFIED AT SITE BEFORE EXECUTION OF WORK.
14. EXPANSION GAP SHALL BE FILLED WITH COMPRESSIBLE FIBER BOARD.



DETAIL '1
(SEE E-150)



DETAIL '2'
(SCALE 1:50)



DETAIL 'S

ABBREVIATIONS

C	- CENTER LINE
FRL	- FINISHED ROAD LEVEL
CR.L	- CROSS ROAD LEVEL
NGL	- NATURAL GROUND LEVEL
LHS	- LEFT HAND SIDE
RHS	- RIGHT HAND SIDE
EXP.	- EXPANSION GAP
P.S	- PAVED SHOULDER
E.S	- EARTHEN SHOULDER
PCC	- PLAIN CEMENT CONCRETE
THK.	- THICKNESS
TYP.	- TYPICAL
RTL	- RAFT TOP LEVEL

LEGENDS:-

-  -SELECTED FILL
-  -PCC
-  -COMPACTED EARTH

SCHEDULE

SL NO	SCHEDULE CHAINAGE	DESIGN CHAINAGE AS PER STR.	FRL		CAMBER/SUPER ELEVATION (x%)		CROSS ROAD LEVEL (m)	RAFT TOP LEVEL (m)	CUSHION (m)	SBC REQ IN T/M ³
			LHS	RHS	LHS	RHS				
1	33+910	33+992	147.080	147.080	-2.50%	-2.50%	141.569	141.422	1.0 TO 1.5m	15



EPC CONTRACTOR

 **KAMAC**
ENGINEERS

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:



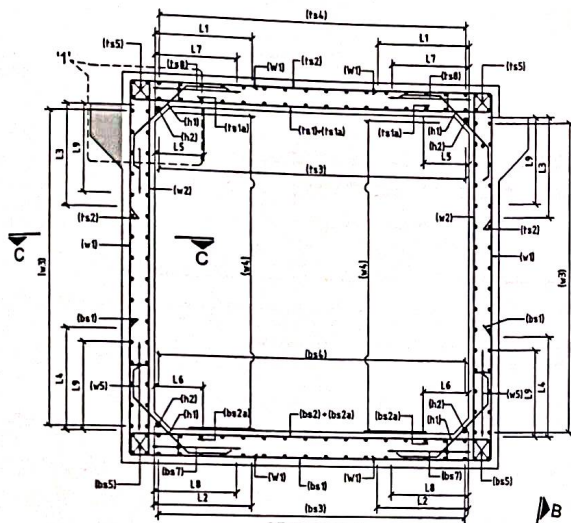
A.V. CONSTRUCTION
1st Floor, WZ-1240, Palam
Extension, Bosco Ashram
Wali Gali, New Delhi 110045

**Winst Infra Solution
Pvt. Ltd.**
OFFICE: 8-6 INHAAN CORPORATE TOWER

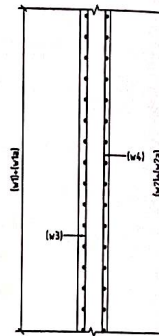
PROJECT: Widening/Improvement to 2-Lane Lane with Paved Shoulder from km 27+150 (Golai Goan) to km 47+682 (Ledo) on Dibrugarh to Ledo section with proposed Margherita & Ledo Bypass (Brownfield and Green Field) (2-Lane+PS) of NH-38 in Tinsukia District in the State of Assam on EPC mode.(Package-5)

DRAWING TITLE:- GENERAL ARRANGEMENT DRAWING OF
SVUP AT CH. 33+902 (SKEW 15°)

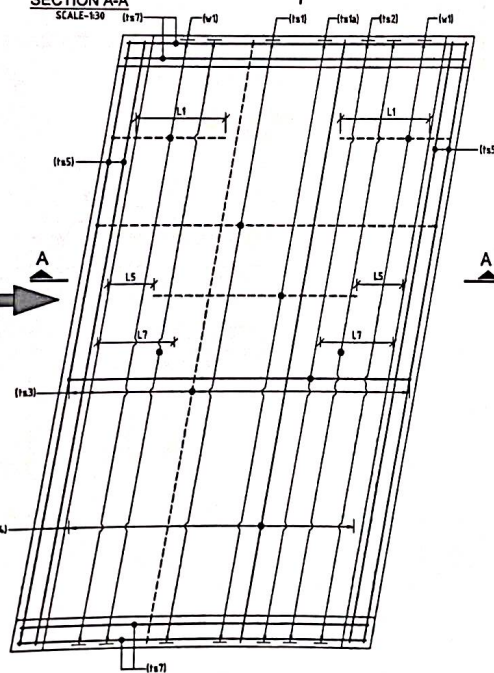
Date FEB.2024	Drw. A.J	Deg. U.Y	Chk. P.S	App.	Scale. AS SHOWN	Drawing Status. FOR APPROVAL
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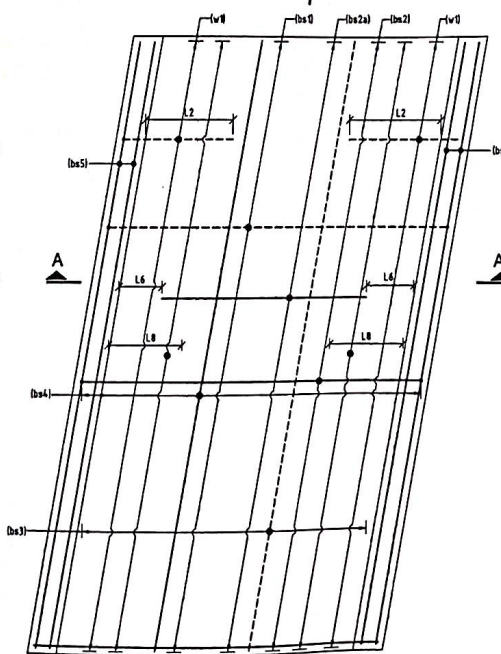
SECTION A-A
SCALE-1/30



SECTION C-C
SCALE-1/30



REINFORCEMENT DETAIL OF TOP SLAB
(SHEAR KEY & HAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
SCALE-1/35



REINFORCEMENT DETAIL OF BOTTOM SLAB
(SHEAR KEY & HAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
SCALE-1/35

NOTES:-

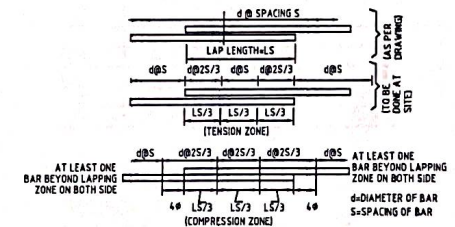
- ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS TO BE FOLLOWED. NO DIMENSION SHALL BE SCALED.
- CONCRETE SHALL BE DESIGN MIX WITH A MINIMUM CHARACTERISTIC STRENGTH OF 30MPa FOR RCC BOX STRUCTURE.
- CLEAR COVER TO OUTER MOST STEEL SHALL BE AS FOLLOWS:-
EARTH FACE - 75mm
OTHER FACE - 45mm
- THE REINFORCING STEEL SHALL BE HYSD BARS (GRADE DESIGNATION Fe-550) CONFORMING TO IS-1786.
- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE RELEVANT GENERAL ARRANGEMENT DRAWING.

SCHEDULE OF LAP LENGTH FOR REINFORCEMENT		FAVORABLE BOND				UNFAVORABLE BOND			
CONCRETE GRADE	XOP LAPPED BAR	M25	M30	M35	M40	M25	M30	M35	M40
<25%		52x#	44x#	40x#	37x#	75x#	62x#	58x#	53x#
25-33%		60x#	51x#	46x#	43x#	87x#	73x#	67x#	61x#
33-50%		73x#	62x#	56x#	52x#	105x#	89x#	82x#	75x#
>50%		NOT ALLOWED							

FOR DETAILS FAVORABLE BOND AND UNFAVORABLE BOND CONDITION REFER CLAUSE 15.2.3. OF IRC-112-2011.
THIS TABLE IS USED FOR UP TO 32mm BAR
FOR $\phi > 32\text{mm}$, SHOULD BE INCREASED BY MULTIPLYING FACTOR $(\phi/32)^{0.5}$

SCHEDULE OF DEVELOPMENT LENGTH FOR REINFORCEMENT		FAVORABLE BOND				UNFAVORABLE BOND			
CONCRETE GRADE	DESCRIPTION	M25	M30	M35	M40	M25	M30	M35	M40
	ANCHOR LENGTH	78x#	66x#	60x#	56x#	112x#	95x#	86x#	80x#

FOR DETAILS FAVORABLE BOND AND UNFAVORABLE BOND CONDITION REFER CLAUSE 15.2.3. OF IRC-112-2011.



LEGEND:-

NEAR FACE BAR	---
FAR FACE BAR	---

NADCL
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.

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

AUTHORITY'S ENGINEER
ALMONDZ GLOBAL INFRA CONSULTANT LIMITED IN JV WITH AVOLEZZA 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, Biscoo Ashram Wall Gali, New Delhi 110045
Winst Infra Solution Pvt. Ltd.
OFFICE: 84, BUDAAN CORPORATE TOWER, PLOT NO-C-31, SECTOR-13, VARUNDHRA, GHAZIABAD, U.P-201012

PROJECT: Widening/Improvement to 2-Lane Lane with Paved Shoulder from km 27+150 (Golai Gaon) to km 47+682 (Leda) on Dibrugarh to Leda section with proposed Margherita & Leda 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 DRAWING OF SYUP FOR CH. 33+902 (SKEW 15°)
DETAILS:-
Date FEB 2024
Project No. AVC/ST/BC/AVUP/03-102/REIN/001
Drw. A.J
Deg. U.Y
Chk. P.S
App. AS SHOWN
Scale. AS SHOWN
Drawing Status. FOR APPROVAL
Sheet No. 1 OF 2
Rev. RO

GENERAL ARRANGEMENT DRAWING
SMALL VEHICULAR UNDERPASS AT
CH:37+278

3[illegible]

ABBREVIATIONS

¶	- CENTER LINE
PS	- FINISHED ROAD LEVEL
CR.	- CROSS ROAD LEVEL
NBL	- NATURAL GROUND LINE
LHS.	- LEFT HAND SIDE
RHS.	- RIGHT HAND SIDE
EXP.	- EXPANSION GAP
P.S.	- PAVED SHOULDER
E.S.	- EARTHEN SHOULDER
PCC	- PLAIN CEMENT CONCRETE
THK.	- THICKNESS
TYP.	- TYPICAL
RTL.	- RAFT TOP LEVEL

LEGENDS:

- -SELECTED
- -POC
-  -COMPACT

SCHEDULE

SL. NO.	SCHEDULE CHARGE	DESIGN CHARGE AS PER STR.	PRL		CAMBER/SUPER ELEVATION (mm)		CROSS ROAD LEVEL (m)	RAFT TOP LEVEL (m)	CUSHION (m)	SB. REQ. (m)
			LWS	RHS	LWS	RHS				
1	97-99	97-99	94.78	94.78	-2.50%	-3.50%	99.559	99.512	0 TO 1.00	10

T: DETAIL 'X'


NATIONAL HIGHWAYS &
STRUCTURE DEVELOPMENT
CORPORATION LTD.

EPC CONTRACTOR

KAMAC ENGINEERS

KAMAC ENGINEERS PVT.LTD

F0201, CITY CENTER OFFICE
BLOCK, 2ND FLOOR,
MATIGARA 734010

DETAIL '7'
(SCALE 1:30) 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
NEW DELHI-110070.

DESIGN CONSULTANT:



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

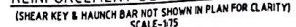
Winst Infra Solution
Pvt. Ltd.
OFFICE: F-6, ISHAAN CORPORATE
TOWER, PLOT NO-C-23, SECTOR-13,
VASINDRA CHAZIARAD, 110 201012

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)
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DRAWING TITLE:-	GENERAL ARRANGEMENT DRAWING OF SVUP AT CH. 37+278 (SKEW 31.041°)
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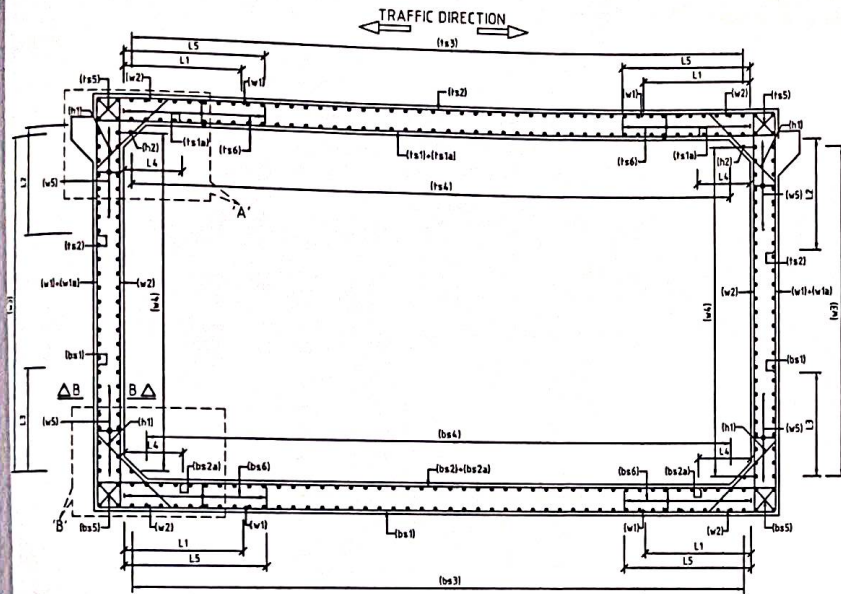
DETAILS:

Date JAN.2024	Drw.	Dwg.	Chk.	App.	Scale. AS SHOWN	Drawing Status
Project No.	Drawing No. AVC/ST/BC/SVP/CH. 37-283/GAD-001					Sheet No. 1 OF 1

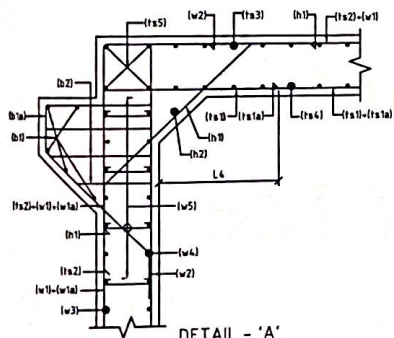


- _____ - NEAR FACE
- - - - - FAR FACE

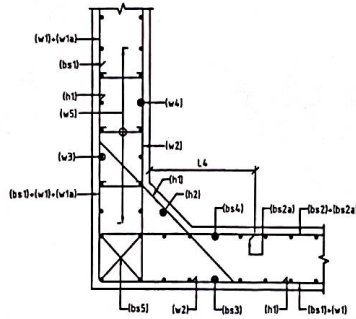




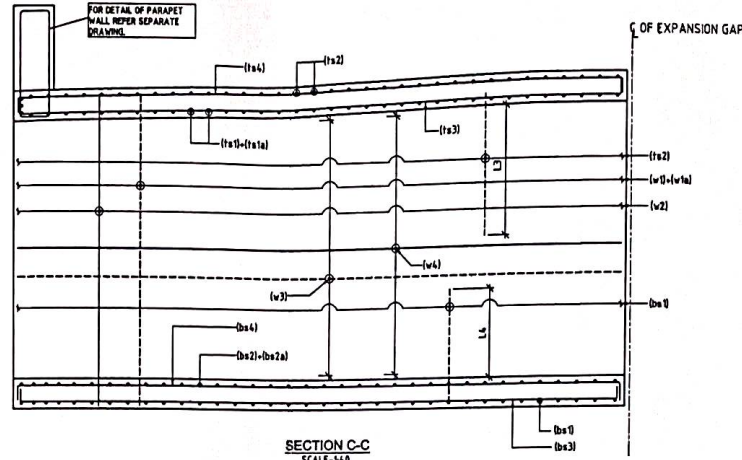
SECTION A-A
(BRACKET BAR NOT SHOWN FOR CLARITY)
SCALE-1:50



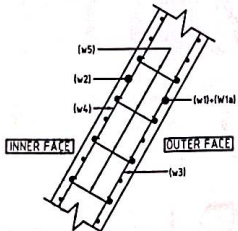
DETAIL - 'A'
SCALE-1:25



DETAIL - 'B'
SCALE-1:25



SECTION C-C
SCALE-1:40



SECTION B-B
SCALE-1:25

REINFORCEMENT DETAIL

Bar Mark	Shape of Bars (Not to Scale)	Bar Dia in mm	Spacing & Numbers	REMARKS	LOCATION
rs1		16	140 c/c		TOP SLAB
rs1a		10	140 c/c		
rs2		12	140 c/c		
rs2a		NA			
rs3		10	140 c/c		
rs4		10	140 c/c		
rs5		10	4 nos.	2 LOCATIONS	BOTTOM SLAB
rs6		10	140 c/c		
bs1		12	140 c/c		
bs2		16	140 c/c		
bs3		10	140 c/c		
bs4		10	140 c/c		
bs5		16	4 nos.	2 LOCATIONS	EXTERNAL WALL
bs6		08	140 c/c		
w1		16	140 c/c		
w2		12	140 c/c		
w3		10	140 c/c		
w4		10	140 c/c		
w5		NA			HAUNCH
h1		10	140 c/c		
h2		10	140 c/c	4 LOCATIONS	
eb1		16	7 nos.		EDGE BEAM FOR TOP SLAB
eb2		16	7 nos.		
eb3		12	4 nos.		
eb4		08	150 c/c	2 LEGGED STIRRUPS	
eb5		08	150 c/c	4 LEGGED STIRRUPS	
eb6		16	7 nos.		EDGE BEAM FOR BOTTOM SLAB
eb7		10	7 nos.		
eb8		10	4 nos.		
eb9		08	200 c/c	2 LEGGED STIRRUPS	
eb10		08	150 c/c	4 LEGGED STIRRUPS	
b1		16	85 nos.	02 LOCATIONS	BRACKET
b1a		12	140 c/c		
b2		12	360	03 LOCATIONS	

BAR CURTAILMENT SCHEDULE TYPE

L1	900 mm
L2	900 mm
L3	900 mm
L4	450 mm
L5	450 mm
L6	-

LEGEND:

— NEAR FACE
--- FAR FACE

NHIDCL
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.

KAMAC ENGINEERS
KAMAC ENGINEERS PVT.LTD
F0201, CITY CENTER OFFICE
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MATIGARA 734010

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

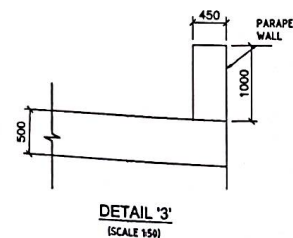
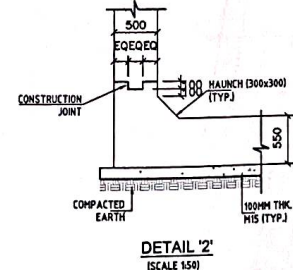
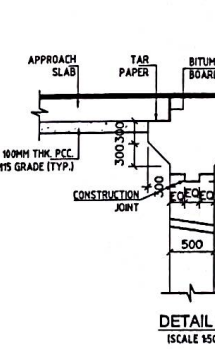
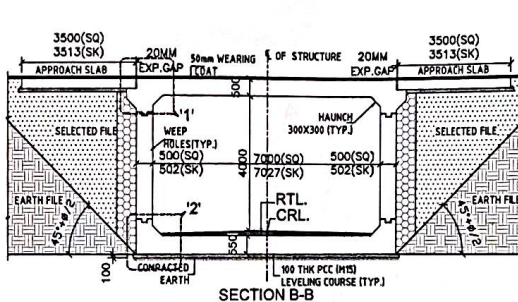
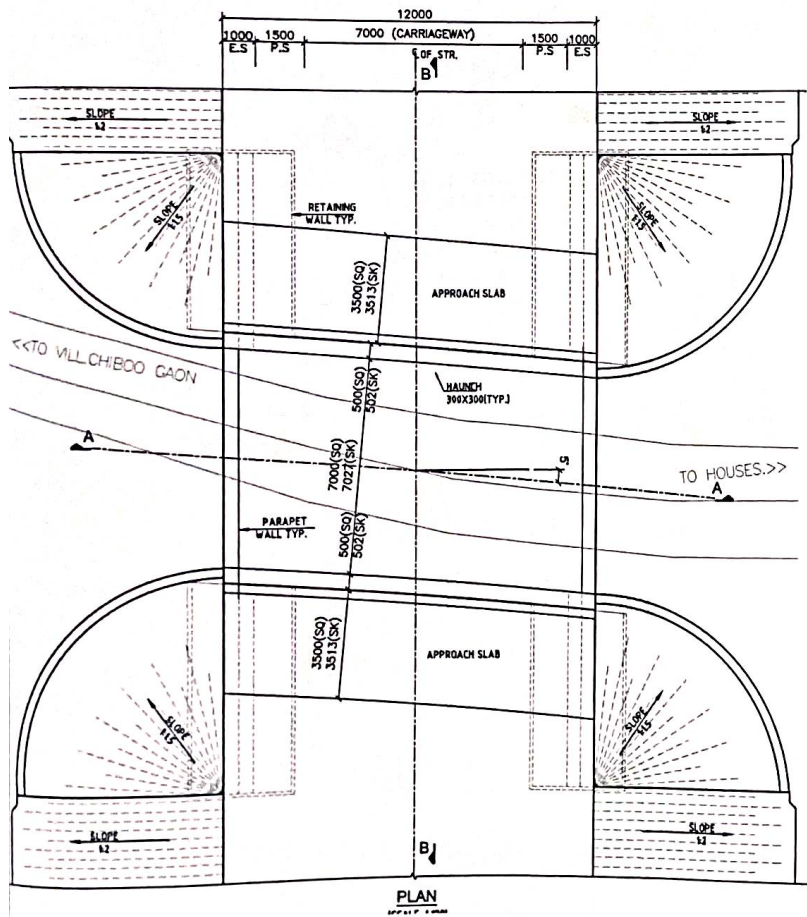
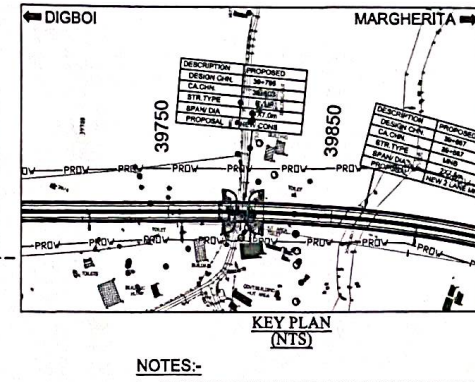
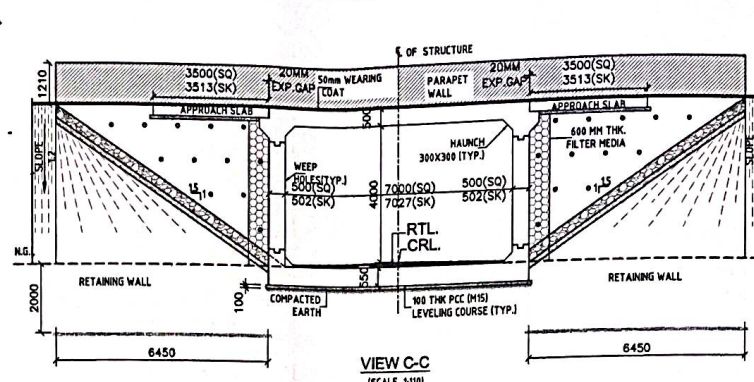
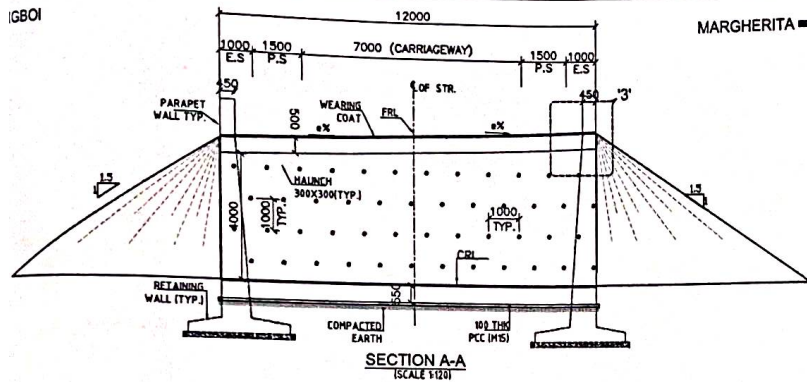
PROOF CONSULTANT:
CREATIVE ENGINEERING SERVICES
OFFICE NO: 620, SIGNATURE GLOBAL
MALL, SECTOR-3,
VAISHALI, GHAZIABAD, U.P-201010

SAFETY CONSULTANT:
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Wall Gali, New Delhi
110045
Winst Infr 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 (Chola Goun) to km 47+662 (Lodo) on Dibrugarh to Lodo section with proposed Margherita & Lodo 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 DRAWING
FOR SVUP AT CH. 37+287 (SKEW 31.041°)
DETAILS:
Date JAN 2024
Project No. Drawing No. AYC/ST/OK/SVUP/37+287/REINF001
Sheet No. 01 OF 02
Rev. RD

GENERAL ARRANGEMENT DRAWING
SMALL VEHICULAR UNDERPASS AT
CH:39+795



NOTES:-

- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS, UNLESS NOTED OTHERWISE.
- ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED, NO DIMENSION IS TO BE SCALED.
- CONCRETE SHALL BE OF DESIGN MIX AND SHALL HAVE MINIMUM 28 DAYS CHARACTERISTIC CUBE STRENGTH AS FOLLOWS:
a) RCC BOX - M35
b) PCC LEVELING COURSE - M15
c) PARAPET WALL - M20
- GRADE OF UNDESIGNED STEEL SHALL BE F45500, CONFORMING TO IS-1786.
- 50mm THICK WEARING COAT IS PROVIDED AS PER MONTH SPECIFICATION & CLAUSE NO.2702.1(TYP) - II
- THE BACKFILL MATERIAL BEHIND RCC BOX SHALL HAVE FOLLOWING PROPERTIES $\phi=30^\circ$, $\gamma=2.07\text{ t/m}^3$.
- SELECTED GRANULAR NON PLASTIC MATERIAL SHALL BE USED AS FILL MATERIAL UP TO THE ACTIVE WEDGE OF BANKING SLOPE OF (1:1.5) FROM THE BASE OF BOTTOM SLAB. VIBRATORY PLATE COMPACTOR SHALL BE USED FOR COMPACTION, PARALLEL TO THE EXTERNAL WALL IN LAYER BY LAYER.
- THE RCC BOX SHOULD BE CONSTRUCTED FIRST AND THE SIDE FILLING & COMPACTION SHALL BE DONE AS PER MONTH SPECIFICATIONS.
- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH RELEVANT HIGHWAY DRAWING. FRL & CAMBER/SUPER ELEVATION AT PARTICULAR LOCATION SHALL BE VERIFIED WITH THE HIGHWAY DRAWING DISCREPANCY IF ANY IS TO BE IMMEDIATELY BROUGHT TO THE NOTICE OF ENGINEER FOR NECESSARY MODIFICATIONS IN THE DRAWING.
- 100MM DIA WEEP HOLES AT 1000MM C/C BOTH HORIZONTALLY AND VERTICALLY SHALL BE PROVIDED IN STAGGERED MANNER IN VERTICAL DIRECTION AT A SLOPE OF 1:20 AS PER IRC-SP-13-2004 CLAUSE NO. 13.5.10
- DOWEL BAR SHALL BE PROVIDED TO ACCOMMODATE PARAPET WALL.
- MISCELLANEOUS DRG. OF RETAINING WALL SHALL BE PROVIDED SEPARATELY.
- REQUIRED SBC SHALL BE VERIFIED AT SITE BEFORE EXECUTION OF WORK.
- EXPANSION GAP SHALL BE FILLED WITH COMPRESSIBLE FIBER BOARD.

ABBREVIATIONS

- CL - CENTER LINE
- FRL - FINISHED ROAD LEVEL
- CRL - CROSS ROAD LEVEL
- NGL - NATURAL GROUND LEVEL
- LHS - LEFT HAND SIDE
- RHS - RIGHT HAND SIDE
- EXP. - EXPANSION GAP
- P.S. - PAVED SHOULDER
- E.S. - EARTHEN SHOULDER
- PCC - PLAIN CEMENT CONCRETE
- THK. - THICKNESS
- TYP. - TYPICAL
- RTL. - RAFT TOP LEVEL

LEGENDS:-

- SELECTED FILL
- PCC
- COMPACTED EARTH

SCHEDULE:

SL NO.	SCHEDULE CHANGE	DESIGN CHANGE AS PER STR.	FRL		CAMBER/SUPER ELEVATION (%)		CROSS ROAD LEVEL (m)	RAFT TOP LEVEL (m)	SBC REQ IN T/M ²
			LHS	RHS	LHS	RHS			
1	39-803	39-795	148.718	148.718	-3.55%	+3.55%	143.938	143.786	15

NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.

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

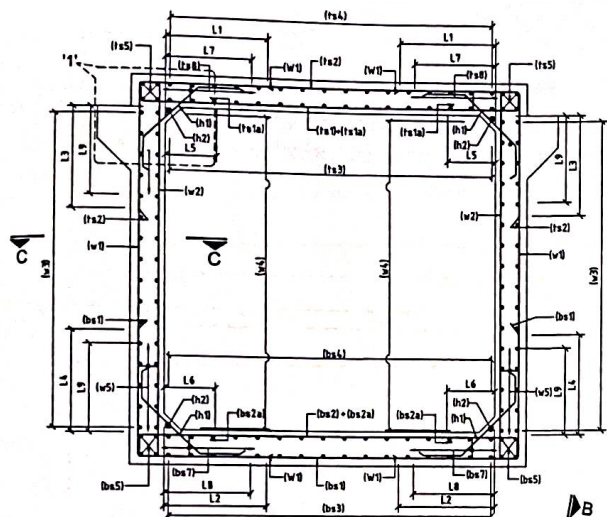
AUTHORITY'S ENGINEER
ALMONDZ GLOBAL INFRA CONSULTANT LIMITED IN JV WITH AVOLEZZA CONSULTANT PRIVATE LIMITED.
C/O JAYANTA SAIKIA, SARBAJAYAN NAMGHAR, BORBIL NO.2, DIGBOI, TINSUKIA, ASSAM-786171

PROOF CONSULTANT:
CREATIVE ENGINEERING SERVICES
OFFICE NO.54, 3rd FLOOR(FRONT), MASOOPUR DAIRY FARM,VASANT KUNJ, NEW DELHI-110070, VAISHALI, GHAZIABAD, U.P-201010

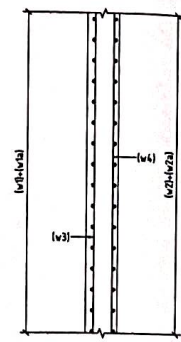
SAFETY CONSULTANT:
DESIGN AID
PLOT NO.54, 3rd FLOOR(FRONT), MASOOPUR DAIRY FARM,VASANT KUNJ, NEW DELHI-110070,

DESIGN CONSULTANT:
A.V. CONSTRUCTION
1st Floor, WZ-1240, Palm Extension, Bosco Ashram Wall Gali, New Delhi 110045
Winst Infra Solution Pvt. Ltd.
OFFICE: P-4, INHAAN CORPORATE TOWER, PLOT NO-C-33, SECTOR-13, VASUNDHRA, GHAZIABAD, U.P-201013

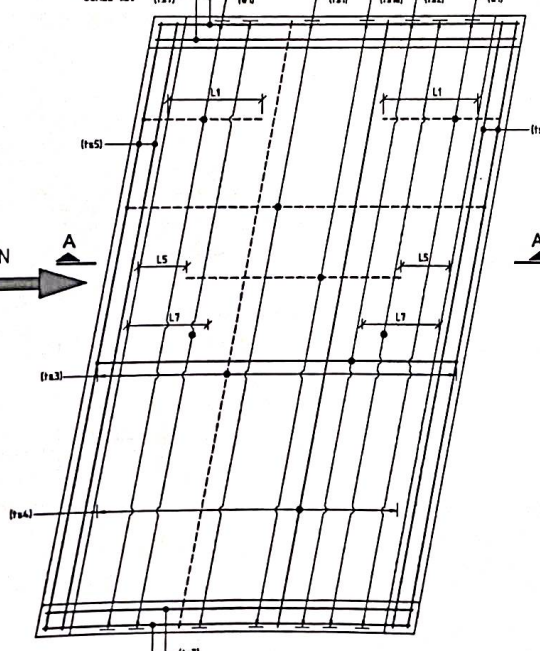
PROJECT: Widening/Improvement to 2-Lane Lane with Paved Shoulder from km 27+150 (Golai Gaon) to km 47+682 (Ledo) on Dibruaguri to Ledo section with proposed Margherita & Ledo Bypass (Brownfield and Green Field) (2-Lane+PS) of NH-38 in Tinsukia District in the State of Assam on EPC mode (Package-5)
DRAWING TITLE:- GENERAL ARRANGEMENT DRAWING OF SVUP AT CH. 39+795(SKEW)
DETAILS:-
Date: FEB 2024
Project No.: 11C/ST/BC/SVUP/CH. 39+795/GAD-001
Drawing No.: 11C/ST/BC/SVUP/CH. 39+795/GAD-001
Scale: AS SHOWN
Drawing Status: FOR APPROVAL
Sheet No.: 1 OF 1
Rev: 0



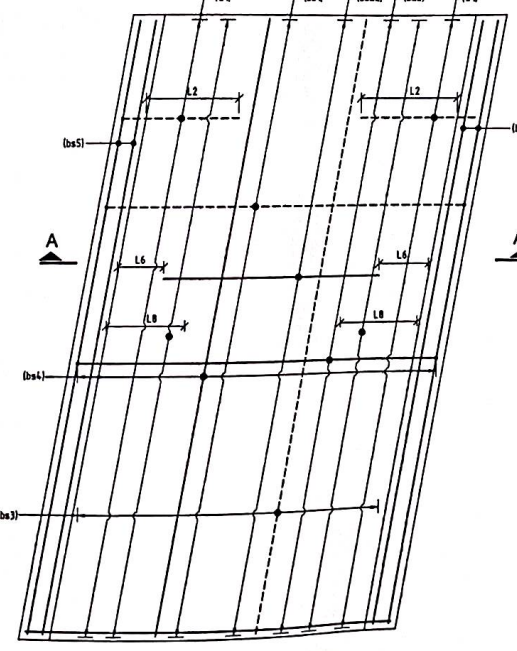
SECTION A-A
SCALE-1:30



SECTION C-C
SCALE-1:30



REINFORCEMENT DETAIL OF TOP SLAB
(SHEAR KEY & HAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
SCALE-1:35



REINFORCEMENT DETAIL OF BOTTOM SLAB
(SHEAR KEY & HAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
SCALE-1:35

NOTES:-

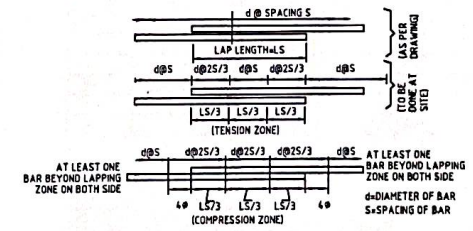
- ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS TO BE FOLLOWED. NO DIMENSION SHALL BE SCALED.
- CONCRETE SHALL BE DESIGN MIX WITH A MINIMUM CHARACTERISTIC STRENGTH OF 30MPa FOR RCC BOX STRUCTURE.
- CLEAR COVER TO OUTER MOST STEEL SHALL BE AS FOLLOWS:-
EARTH FACE - 75mm
OTHER FACE - 45mm
- THE REINFORCING STEEL SHALL BE HYSD BARS (GRADE DESIGNATION Fe-550D) CONFORMING TO IS-1786.
- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE RELEVANT GENERAL ARRANGEMENT DRAWING.

SCHEDULE OF LAP LENGTH FOR REINFORCEMENT								
CONCRETE GRADE	FAVORABLE BOND				UNFAVORABLE BOND			
	M25	M30	M35	M40	M25	M30	M35	M40
<25%	52xØ	44xØ	40xØ	37xØ	75xØ	63xØ	58xØ	53xØ
25-33%	60xØ	51xØ	46xØ	43xØ	87xØ	73xØ	67xØ	61xØ
33-50%	73xØ	62xØ	56xØ	52xØ	105xØ	89xØ	82xØ	75xØ
>50%	NOT ALLOWED							

FOR DETAILS FAVORABLE BOND AND UNFAVORABLE BOND CONDITION REFER CLAUSE 15.2.3 OF IRC:112-2011.
THIS TABLE IS USED FOR UP TO 32mm BAR
FOR Ø>32mm BS, SHOULD BE INCREASED BY MULTIPLYING FACTOR $(\frac{\phi}{32})^2$

SCHEDULE OF DEVELOPMENT LENGTH FOR REINFORCEMENT								
DESCRIPTION	FAVORABLE BOND				UNFAVORABLE BOND			
	M25	M30	M35	M40	M25	M30	M35	M40
CONCRETE GRADE	M25	M30	M35	M40	M25	M30	M35	M40
ANCHOR LENGTH	78xØ	66xØ	60xØ	56xØ	112xØ	95xØ	86xØ	80xØ

FOR DETAILS FAVORABLE BOND AND UNFAVORABLE BOND CONDITION REFER CLAUSE 15.2.3 OF IRC:112-2011.



LEGEND:-

NEAR FACE BAR	---
FAR FACE BAR	---

WSP
NATIONAL HIGHWAYS & STRUCTURE DEVELOPMENT CORPORATION LTD.

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

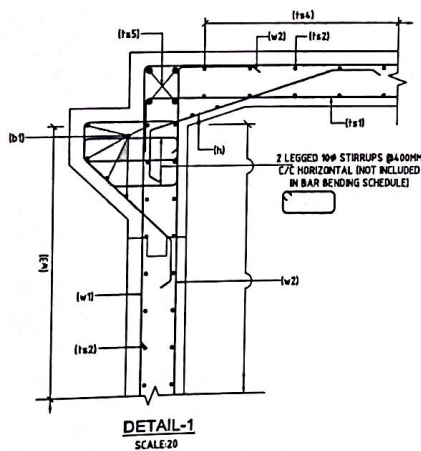
AUTHORITY'S ENGINEER
ALMONDZ GLOBAL INFRA CONSULTANT LIMITED IN JV WITH AVOLEZZA CONSULTANT PRIVATE LIMITED.
C/O JAYANTA SAIKIA, SARBAJANIN NAMGHAR, BORBIL NO.2, DIGBOI, TINSUKIA, ASSAM-786171

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

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

DESIGN CONSULTANT:
A.V. CONSTRUCTION
1st Floor, WZ-1240, Palam Extension, Bosco Ashram Wall Gali, New Delhi 110045
Winst Infra Solution Pvt. Ltd.
OFFICE: F-4, BHULAN CORPORATE TOWER, PLOT NO-C-13, SECTOR-13, VASUNDHRA, GHAZIABAD, U.P-201013

PROJECT: Widening/Improvement to 2-Lane Lane with Paved Shoulder from km 27+150 (Gulai Guan) to km 47+682 (Ledo) on Dibruagarh to Ledo section with proposed Margherita & Ledo Bypass (Brownfield and Green Field) (2-Lane+PS) of NH-38 in Tinsukia District in the State of Assam on EPC mode.(Package-5)
DRAWING TITLE:- REINFORCEMENT DETAIL DRAWING OF SVUP FOR CH. 39+795 (SKEW 5°)
DETAILS:-
Date: FEB 2024
Project No.: AVCS/BC/SVUP/09-795/REINF-001
Drw. No.:
Dwg. U.Y.
Chk. P.S.
App. AS SHOWN
Scale:
Drawing Status: FOR APPROVAL
Sheet No.: 1 OF 2
Rev. RD

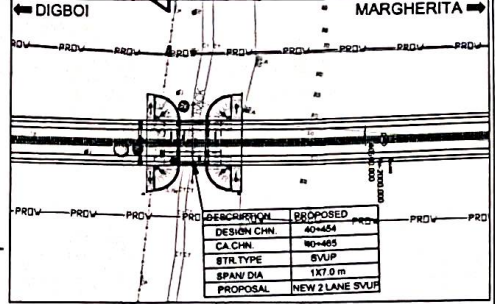
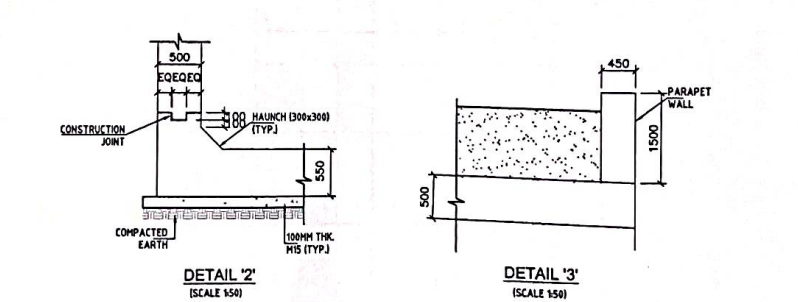
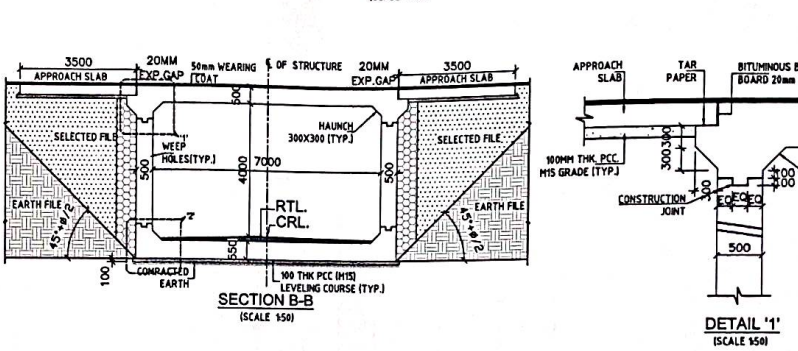
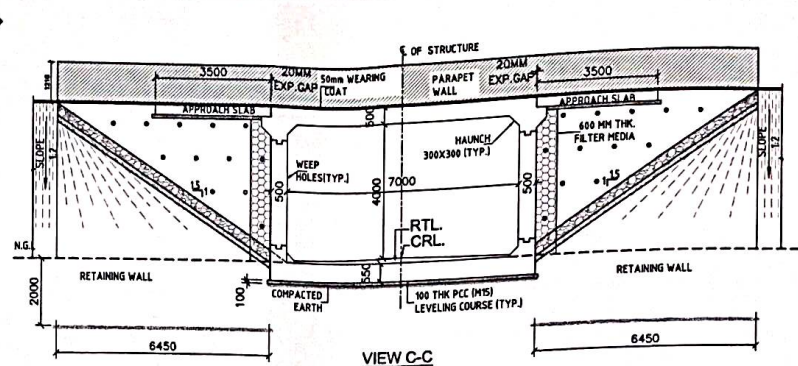
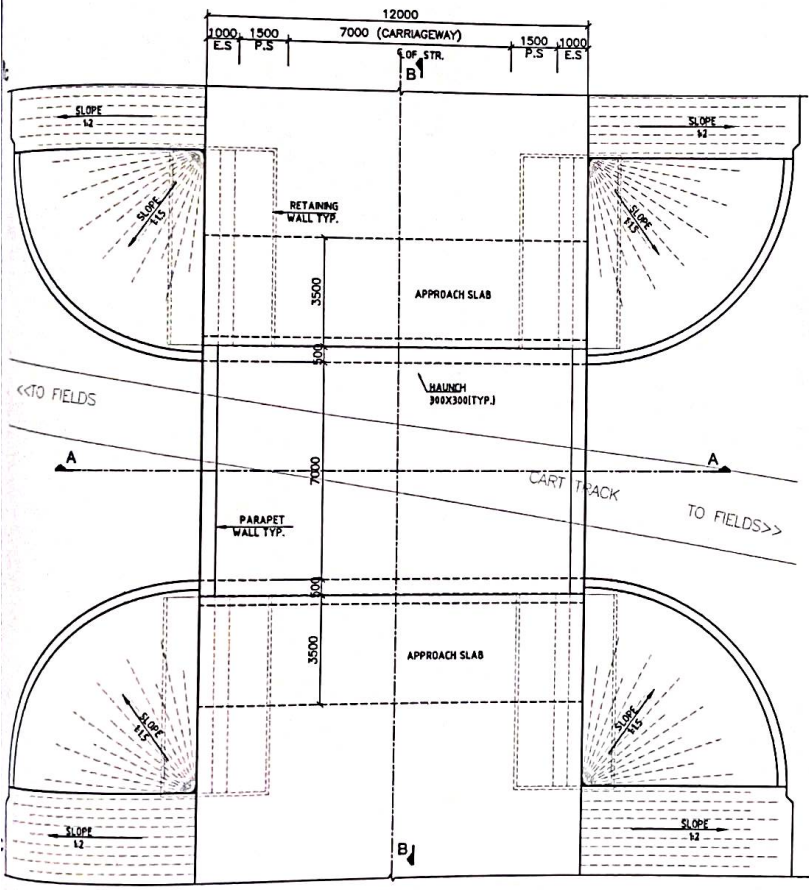
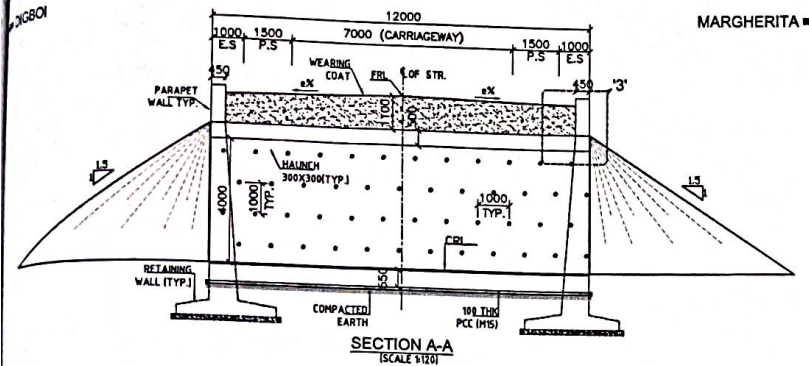


BAR MARK	BAR SHAPE	DIAMETER	SPACING NOS.	REMARKS
rs1		16	130	
rs1a		10	130	
rs2		12	130	
rs3		10	130	
rs4		10	130	
rs5		16	04	82 LOCATIONS
rs6		N.A		
rs7		N.A		
rs8		10	(LxT) 130x130	
w1		16	130	
w1a		N.A		
w2		12	130	
w2a		N.A		
w3		10	130	
w4		10	130	
w5		N.A		
w6		N.A		
bs1		12	130	
bs2		16	130	
bs2a		10	130	
bs3		10	130	
bs4		10	130	
bs5		16	04	82 LOCATIONS
bs6		N.A		
bs7		10	(LxT) 130x130	
h1		10	130	
h2		10	130	
b1		10	05nos.	82 LOCATIONS
b1a		12	030	
b2		12	360	83 LOCATIONS

L1	900mm
L2	900mm
L3	900mm
L4	900mm
L5	450mm
L6	450mm
L7	900mm
L8	900mm
L9	900mm

 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 AYOLEZZA CONSULTANT PRIVATE LIMITED. C/O JAYANTA SAIKIA, SARBAJANNI 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: P4, BHUJAN CORPORATE TOWER, PLOT NO-C-33,SECTOR-13, VASUNDHRA,GAZIABAD, U.P-201012	PROJECT: Widening/Improvement to 2-Lane Lane with Paved Shoulder from km 27+150 (Gali Gung) to km 47+600 on Dhingra to Lado section with proposed Margherita & Lado 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 DRAWING OF SVUP FOR CH. 39+795(SKEW 5°) DETAILS:- <table border="1"> <thead> <tr> <th>Date</th> <th>Drw.</th> <th>Dwg.</th> <th>Chk.</th> <th>App.</th> <th>Scale</th> <th>Drawing Status</th> </tr> <tr> <th>FEB 2024</th> <th>A.J</th> <th>U.Y</th> <th>P.S</th> <th></th> <th>AS SHOWN</th> <th>FOR APPROVAL</th> </tr> </thead> <tbody> <tr> <td>Project No.</td> <td colspan="2">Drawing No.</td> <td colspan="2">Sheet No.</td> <td colspan="2">Rev</td> </tr> <tr> <td></td> <td colspan="2">AWC/ITB/GSVUP/39+795/REIN-001</td> <td colspan="2">1 OF 2</td> <td colspan="2">RO</td> </tr> </tbody> </table>	Date	Drw.	Dwg.	Chk.	App.	Scale	Drawing Status	FEB 2024	A.J	U.Y	P.S		AS SHOWN	FOR APPROVAL	Project No.	Drawing No.		Sheet No.		Rev			AWC/ITB/GSVUP/39+795/REIN-001		1 OF 2		RO	
Date	Drw.	Dwg.	Chk.	App.	Scale	Drawing Status																												
FEB 2024	A.J	U.Y	P.S		AS SHOWN	FOR APPROVAL																												
Project No.	Drawing No.		Sheet No.		Rev																													
	AWC/ITB/GSVUP/39+795/REIN-001		1 OF 2		RO																													

**GENERAL ARRANGEMENT DRAWING
SMALL VEHICULAR UNDERPASS AT
CH:40+454**



- NOTES:-**
- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS, UNLESS NOTED OTHERWISE.
 - ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED. NO DIMENSION IS TO BE SCALED.
 - CONCRETE SHALL BE OF DESIGN MIX AND SHALL HAVE MINIMUM 28 DAYS CHARACTERISTIC CUBE STRENGTH AS FOLLOWS:
a) RCC BOX - M25
b) PCC LEVELING COURSE - M15
c) PARAPET WALL - M20
 - GRADE OF UNSTRENGTHENED STEEL SHALL BE F45500, CONFORMING TO IS-1786.
 - 50mm THICK WEARING COAT IS PROVIDED AS PER NORTH SPECIFICATION & CLAUSE NO.212. TYPE - B
 - THE BACKFILL MATERIAL BEHIND RCC BOX SHALL HAVE FOLLOWING PROPERTIES $\phi=30^\circ$, $\gamma=2.07 \text{ t/m}^3$.
 - SELECTED GRANULAR NON PLASTIC MATERIAL SHALL BE USED AS FILL MATERIAL UP TO THE ACTIVE WEDGE OF RANKING SLOPE OF $(45^\circ \pm \theta/2)$ FROM THE BASE OF BOTTOM SLAB. VIBRATORY PLATE COMPACTOR SHALL BE USED FOR COMPACTION, PARALLEL TO THE EXTERNAL WALL IN LAYER BY LAYER.
 - THE RCC BOX SHOULD BE CONSTRUCTED FIRST AND THE SIDE FILLING & COMPACTION SHALL BE DONE AS PER NORTH SPECIFICATIONS.
 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH RELEVANT HIGHWAY DRAWING. FRL & CAMBER/SUPER ELEVATION AT PARTICULAR LOCATION SHALL BE VERIFIED WITH THE HIGHWAY DRAWING DISCREPANCY IF ANY IS TO BE IMMEDIATELY BROUGHT TO THE NOTICE OF ENGINEER FOR NECESSARY MODIFICATIONS IN THE DRAWING.
 - GEO COMPOSITE DRAIN SHALL BE PROVIDED BEHIND THE RCC BOX AS PER NORTH SPECIFICATION CLAUSE NO. 724.
 - 100MM DIA WEEP HOLES AT 1000MM C/C BOTH HORIZONTALLY AND VERTICALLY SHALL BE PROVIDED IN STAGGERED MANNER IN VERTICAL DIRECTION AT A SLOPE OF 1:20 AS PER IRC-SP-13-2004 CLAUSE NO. 13.5.10
 - DOVEL BAR SHALL BE PROVIDED TO ACCOMMODATE PARAPET WALL.
 - MISCELLANEOUS DRG. OF RETAINING WALL SHALL BE PROVIDE SEPARATELY.
 - REQUIRED SBC SHALL BE VERIFIED AT SITE BEFORE EXECUTION OF WORK.
 - EXPANSION GAP SHALL BE FILLED WITH COMPRESSIBLE FIBER BOARD.

ABBREVIATIONS

CL	- CENTER LINE
FRL	- FINISHED ROAD LEVEL
CRL	- CROSS ROAD LEVEL
MGL	- NATURAL GROUND LEVEL
LHS	- LEFT HAND SIDE
RHS	- RIGHT HAND SIDE
EXP.	- EXPANSION GAP
P.S	- PAVED SHOULDER
E.S	- EARTHEN SHOULDER
PCC	- PLAIN CEMENT CONCRETE
THK	- THICKNESS
TYP.	- TYPICAL
RTL	- RAFT TOP LEVEL

LEGENDS:-

[Pattern]	-SELECTED FILL
[Pattern]	-PCC
[Pattern]	-COMPACTED EARTH

SCHEDULE:

SL. NO.	SCHEDULE CHANGE	DESIGN CHAINAGE AS PER STR.	FRL		CAMBER/SUPER ELEVATION (m)		CROSS ROAD LEVEL (m)	RAFT TOP LEVEL (m)	CUSHION (m)	SBC REQD IN T/M ³
			LHS	RHS	LHS	RHS				
1	40+465	40+454	147.530	147.530	-2.50%	-2.50%	14.1737	14.1585	1.0 TO 1.5m	15

NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.

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

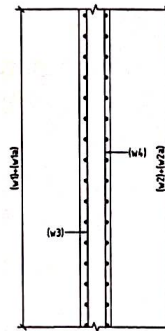
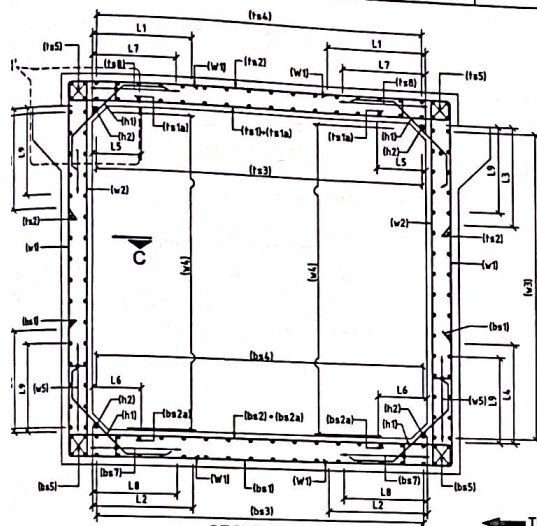
AUTHORITY'S ENGINEER
ALMONDZ GLOBAL INFRA CONSULTANT
LIMITED IN JV WITH ANOLEZZA CONSULTANT
PRIVATE LIMITED.
C/O JAYANTA SAIKIA,
SARBAJANIN NAMGHAR, BORBIL
NO.2, DIGBOI, TINSUKIA,
ASSAM-786171

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

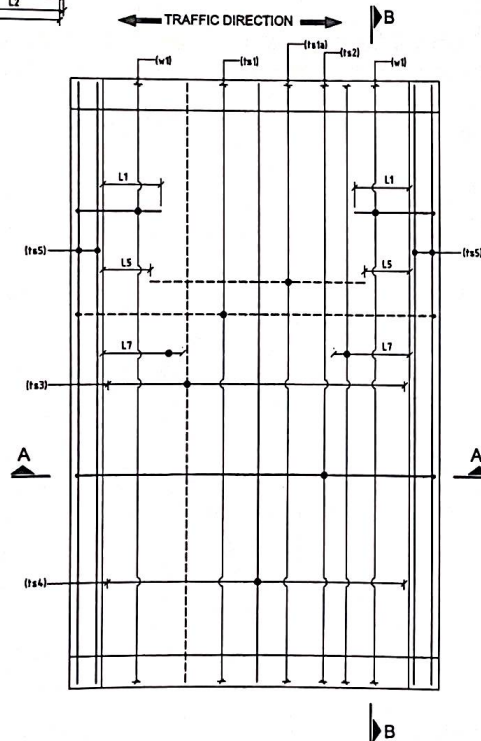
SAFETY CONSULTANT:
DESIGN AID
PLOT NO.54, 3rd FLOOR(FRONT),
MASOODPUR DAIRY FARM,VASANT KUNJ,
NEW DELHI-110070,

DESIGN CONSULTANT:
A.V. CONSTRUCTION
1st Floor, WZ-1240, Palm
Extension, Bosco Ashram
Wali Gali, New Delhi 110045
Winst Infra Solution Pvt. Ltd.
OFFICE: P4, BHASHA CORPORATE TOWER,
PLOT NO-C-33,SECTOR-13,
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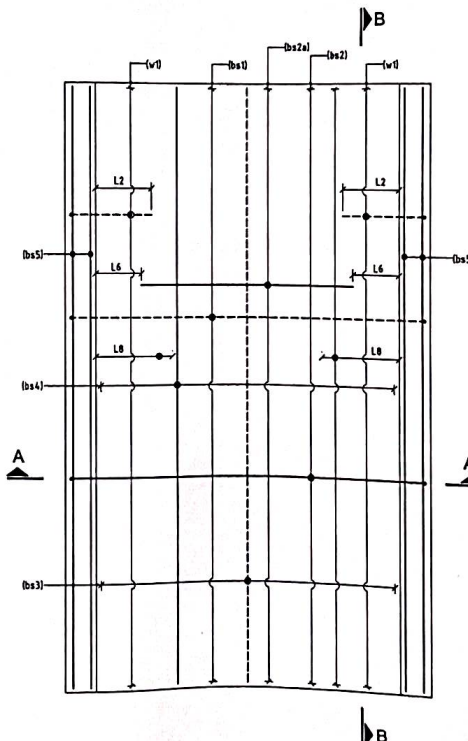
PROJECT: Widening/Improvement to 2-Lane Lane with Paved Shoulder from km 27+150 (Golai Goma) to km 47+682 (Lado) on Dibrugarh to Lado section with proposed Margherita & Lado Bypass (Brownfield and Green Field) (2-Lane-PS) of NH-38 in Tinsukia District in the State of Assam on EPC mode.(Package-3)
DRAWING TITLE:- GENERAL ARRANGEMENT DRAWING OF SVUP AT CH. 40+454
DETAILS:-
Date: FEB.2024
Project No.:
Drw. No.:
Drw. U.Y. P.S. App. Scale: AS SHOWN
Drawing No.:
Drawing Status: FOR APPROVAL
Sheet No.: 1 OF 1
Rev: RO



SECTION C-C
SCALE-1/30



REINFORCEMENT DETAIL OF TOP SLAB
(HAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
SCALE-1/30



REINFORCEMENT DETAIL OF BOTTOM SLAB
(HAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
SCALE-1/30

NOTES:-

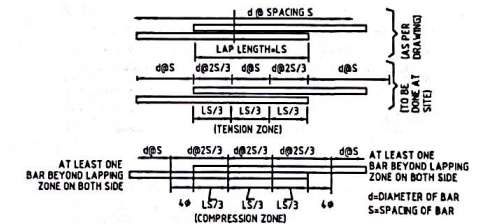
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EARTH FACE - 75mm
OTHER FACE - 45mm
- THE REINFORCING STEEL SHALL BE HYSD BARS (GRADE DESIGNATION Fe-550) CONFORMING TO IS:1786.
- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE RELEVANT GENERAL ARRANGEMENT DRAWING.

SCHEDULE OF LAP LENGTH FOR REINFORCEMENT								
CONCRETE GRADE X/OR LAPPED BAR	FAVORABLE BOND				UNFAVORABLE BOND			
	M25	M30	M35	M40	M25	M30	M35	M40
<25%	52xØ	44xØ	40xØ	37xØ	75xØ	63xØ	58xØ	53xØ
25-33%	60xØ	51xØ	46xØ	43xØ	87xØ	73xØ	67xØ	61xØ
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>50%	NOT ALLOWED							

FOR DETAILS FAVORABLE BOND AND UNFAVORABLE BOND
CONDITION REFER CLAUSE 15.2.3 OF IRC:112-2011.
THIS TABLE IS USED FOR UP TO 32mm BAR
FOR Ø-32mm Ø, SHOULD BE INCREASED BY MULTIPLYING FACTOR $\frac{Ø}{32}$

SCHEDULE OF DEVELOPMENT LENGTH FOR REINFORCEMENT								
DESCRIPTION	FAVORABLE BOND				UNFAVORABLE BOND			
	M25	M30	M35	M40	M25	M30	M35	M40
ANCHOR LENGTH	78xØ	66xØ	60xØ	56xØ	112xØ	95xØ	86xØ	80xØ

FOR DETAILS FAVORABLE BOND AND UNFAVORABLE BOND
CONDITION REFER CLAUSE 15.2.3 OF IRC:112-2011.



LEGEND:-

NEAR FACE BAR	=====
FAR FACE BAR	-----

NHIDCL
NATIONAL HIGHWAYS &
STRUCTURE DEVELOPMENT
CORPORATION LTD.

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

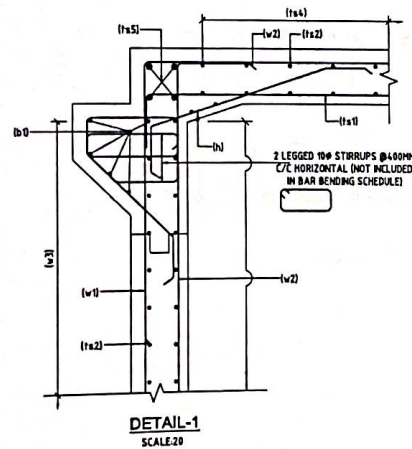
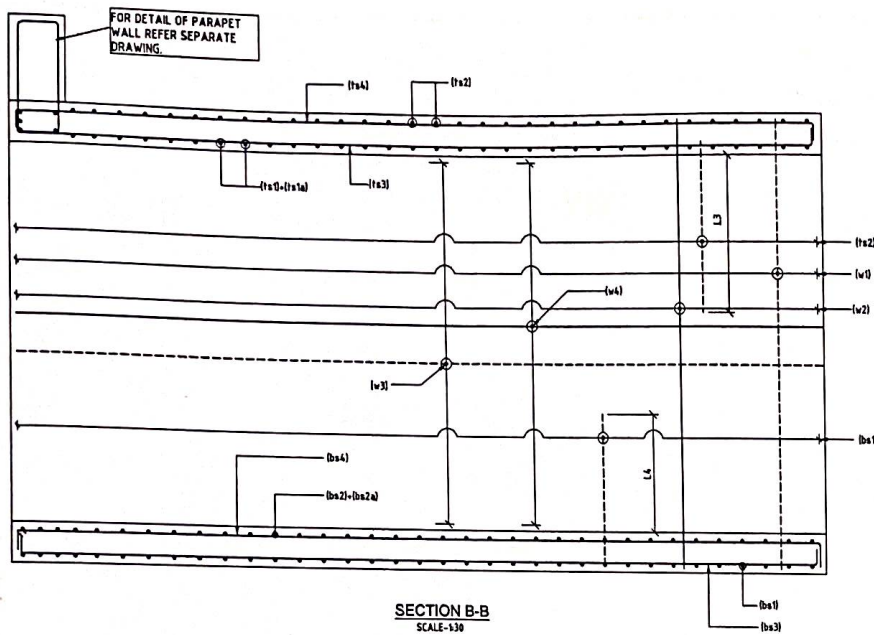
AUTHORITY'S ENGINEER
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LIMITED IN JV WITH AYOLEEZA CONSULTANT
PRIVATE LIMITED.
C/O JAYANTA SAIKIA,
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PROOF CONSULTANT:
CREATIVE ENGINEERING SERVICES
OFFICE NO: 620, SIGNATURE GLOBAL
MALL, SECTOR-3,
VAISHALI, GHAZIABAD, U.P-201010

SAFETY CONSULTANT:
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DESIGN CONSULTANT:
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Wall Gali, New Delhi 110045
Winst Infra Solution Pvt. Ltd.
OFFICE: P-4, INHAAN CORPORATE TOWER,
PLOT NO-C-35,SECTOR-13,
VASUNDHRA, GHAZIABAD, U.P-201012

PROJECT: Widening/Improvement to 2-Lane Lane with Paved Shoulder from km
27+150 (Gola Goum) to km 47+682 (Leda) on Dibrugarh to Leda section
with proposed Margherita & Leda Bypass (Brownfield and Green Field)
(2-Lane+PS) of NH-38 in Tinukia District in the State of Assam on EPC
mode.(Package-5)
DRAWING TITLE:- REINFORCEMENT DETAIL DRAWING OF SVLP
FOR CH. 40+454
DETAILS:-
Date FEB 2024 Drw. A.J. U.Y. Chk. P.B. App. AS SHOWN Drawing Status. FOR APPROVAL
Project No. Drawing No. AVCST/BCSV/PH40-454/REINF-01 Sheet No. 1 OF 2 Rev. RO



REINFORCEMENT DETAIL

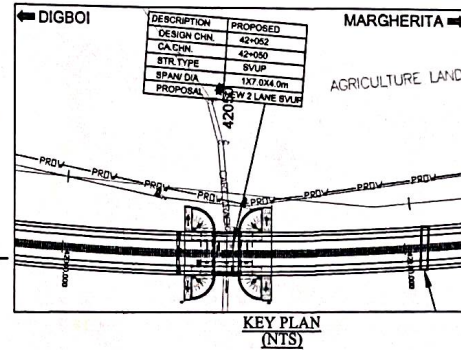
BAR MARK	BAR SHAPE	DIAMETER	SPACING NOS.	REMARKS
rs1	[Symbol]	16	150	
rs1a	[Symbol]	10	150	
rs2	[Symbol]	12	150	
rs3	[Symbol]	10	150	
rs4	[Symbol]	10	150	
rs5	[Symbol]	16	04	02 LOCATIONS
rs6	[Symbol]	N.A		
rs7	[Symbol]	N.A		
rs8	[Symbol]	10	(LxT) 150x150	
w1	[Symbol]	16	150	
w1a	[Symbol]	N.A		
w2	[Symbol]	12	150	
w2a	[Symbol]	N.A		
w3	[Symbol]	10	150	
w4	[Symbol]	10	150	
w5	[Symbol]	N.A		
w6	[Symbol]	N.A		
bs1	[Symbol]	12	150	
bs2	[Symbol]	16	150	
bs2a	[Symbol]	10	150	
bs3	[Symbol]	10	150	
bs4	[Symbol]	10	150	
bs5	[Symbol]	16	04	02 LOCATIONS
bs6	[Symbol]	N.A		
bs7	[Symbol]	10	(LxT) 150x150	
h1	[Symbol]	10	150	
h2	[Symbol]	10	150	
b1	[Symbol]	10	05nos.	02 LOCATIONS
b1a	[Symbol]	12	150	
b2	[Symbol]	12	340	03 LOCATIONS

BAR CURTAILMENT SCHEDULE TYPE

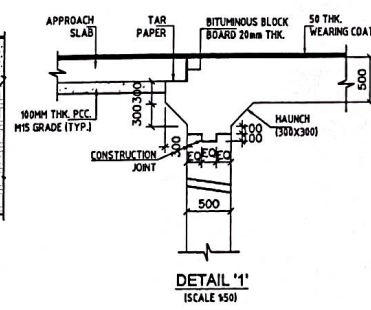
L1	900mm
L2	900mm
L3	900mm
L4	900mm
L5	650mm
L6	650mm
L7	900mm
L8	900mm
L9	900mm

WIDGL NATIONAL HIGHWAYS & STRUCTURE 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 Wali Gali, New Delhi 110045 Winst Infra Solution Pvt. Ltd. OFFICE: P-4, BHAAH CORPORATE TOWER, PLOT NO-C-33, SECTOR-13, VASUNDHRA, GHAZIABAD, U.P-201012	PROJECT: Widening/Improvement to 2-Lane Lane with Paved Shoulder from km 27+150 (Gola Ghat) to km 47+682 (Leda) on Dibrugarh to Leda section with proposed Margherita & Leda 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 DRAWING OF SVUP FOR CH. 48+454 DETAILS:- <table border="1"> <tr> <th>Date</th> <th>Drw.</th> <th>Des.</th> <th>Chk.</th> <th>App.</th> <th>Scale</th> <th>Drawing Status</th> </tr> <tr> <td>FEB 2024</td> <td>A.J</td> <td>U.Y</td> <td>P.S</td> <td></td> <td>AS SHOWN</td> <td>FOR APPROVAL</td> </tr> <tr> <td>Project No.</td> <td colspan="4">Drawing No.</td> <td>Sheet No.</td> <td>Rev</td> </tr> <tr> <td></td> <td colspan="4">AVC/ET/BC/SVUP/40+454/REIN-001</td> <td>2 OF 2</td> <td>R0</td> </tr> </table>	Date	Drw.	Des.	Chk.	App.	Scale	Drawing Status	FEB 2024	A.J	U.Y	P.S		AS SHOWN	FOR APPROVAL	Project No.	Drawing No.				Sheet No.	Rev		AVC/ET/BC/SVUP/40+454/REIN-001				2 OF 2	R0
Date	Drw.	Des.	Chk.	App.	Scale	Drawing Status																												
FEB 2024	A.J	U.Y	P.S		AS SHOWN	FOR APPROVAL																												
Project No.	Drawing No.				Sheet No.	Rev																												
	AVC/ET/BC/SVUP/40+454/REIN-001				2 OF 2	R0																												

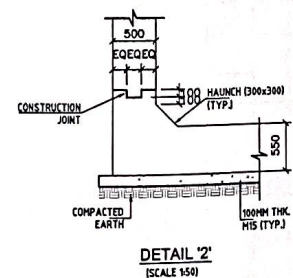
**GENERAL ARRANGEMENT DRAWING
SMALL VEHICULAR UNDERPASS AT
CH:42+052**



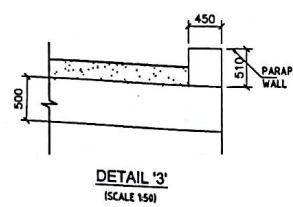
VIEW C-C
(SCALE 1:110)



SECTION E
(SCALE 1:50)



DETAIL '2'
(SCALE 1:50)



DETAIL 1
(SCALE 1/8"=1'-0")

- ### NOTES:-
1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS, UNLESS NOTED OTHERWISE.
 2. UNNOTED DIMENSIONS SHALL BE FOLLOWED. NO DIMENSION IS TO BE CONCEALED.
 3. SPECIFIC SHALL BE OF DESIGN MIX AND SHALL HAVE MINIMUM 28 DAYS CHARACTERISTIC CURE STRENGTH AS FOLLOWS:

a) RC BOX	- M35
b) P/C LEVELING COURSE	- M15
c) PARAPET WALL	- M20
 4. GRADE OF UNSTRENGTHENED STEEL SHALL BE F450, CONFORMING TO IS-1786.
 5. 50mm THK WEARING COAT IS PROVIDED AS PER MONTH SPECIFICATION & CLASS NO.72.02, TYPE - B
 6. THE BACKFILL MATERIAL BEHIND RC BOX SHALL HAVE FOLLOWING PROPERTIES: $\phi_{max} = 2.075\phi$
 7. SELECTED GRANULAR NON PLASTIC MATERIAL SHALL BE USED AS FILL MATERIAL. UPON THE ACTIVE WEDGE OF RANKING SLOPE OF $(\alpha = 46^\circ)$ FROM THE BASE OF BOTTOM SILL. VIBRATORY PLATE COMPACTOR SHALL BE USED FOR COMPACTION, PARALLEL TO THE EXTERNAL WALL IN LAYER BY LAYER.
 8. THE BOX SHOULD BE CONSTRUCTED FIRST AND THE SIDE FILLING & COMPACTION SHALL BE DONE AS PER MONTH SPECIFICATIONS.
 9. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH RELEVANT HIGHWAY DRAWING, FILL & CEMER/SURF ELEVATION AT PARTICULAR LOCATION SHALL BE VERIFIED WITH THE HIGHWAY DRAWING DISCREPANCY IF ANY IS TO BE IMMEDIATELY REPORTED TO THE INCHARGE ENGINEER FOR NECESSARY MODIFICATIONS IN THE DRAWING.
 10. 100MM DIA WEEP HOLES AT 1000MM C/C BOTH HORIZONTALLY AND VERTICALLY SHALL BE PROVIDED IN STAGGERED MANNER IN VERTICAL DIRECTION AT A SLOPE OF 1:50 AS PER RC-S-27-2004 CLASS NO. 19.3.10 OR WHICH SHALL BE PROVIDED TO ACCOMMODATE PARAPET WALL.
 11. MISCELLANEOUS DRG. OF RETAINING WALL SHALL BE PROVIDED SEPARATELY.
 12. REQUIRED SRC SHALL BE VERIFIED AT SITE BEFORE EXECUTION OF WORK.
 13. EXPANSION GAP SHALL BE FILLED WITH COMPRESSIBLE FIBER BOARD.

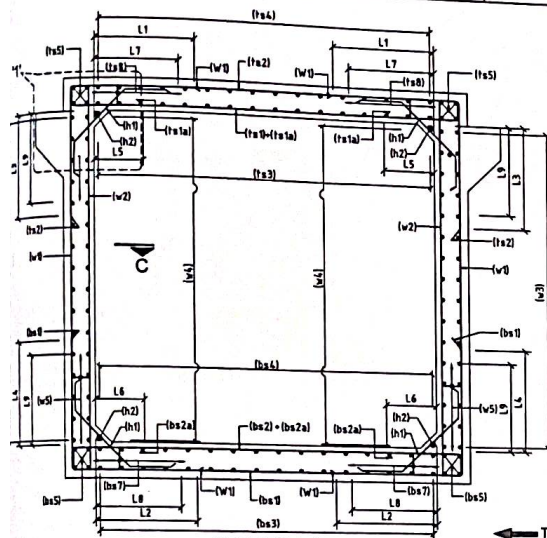
ABBREVIATIONS

C	- CENTER LINE
CR	- FINISHED ROAD LEVEL
FRL	- CROSS ROAD LEVEL
NGL	- NATURAL GROUND LEVEL
LHS.	- LEFT HAND SIDE
RHS.	- RIGHT HAND SIDE
EXP.	- EXPANSION GAP
P.S	- PAVED SHOULDER
E.S	- EARTHEN SHOULDER
PCC	- PLAIN CEMENT CONCRETE
THK.	- THICKNESS
TYP.	- TYPICAL
RTL.	- RAFT TOP LEVEL

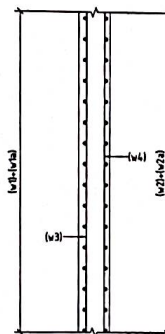
- LEGENDS:-**
-  -SELECTED FILL
 -  -PCC
 -  -COMPACTED EARTH

SCHEDULE:

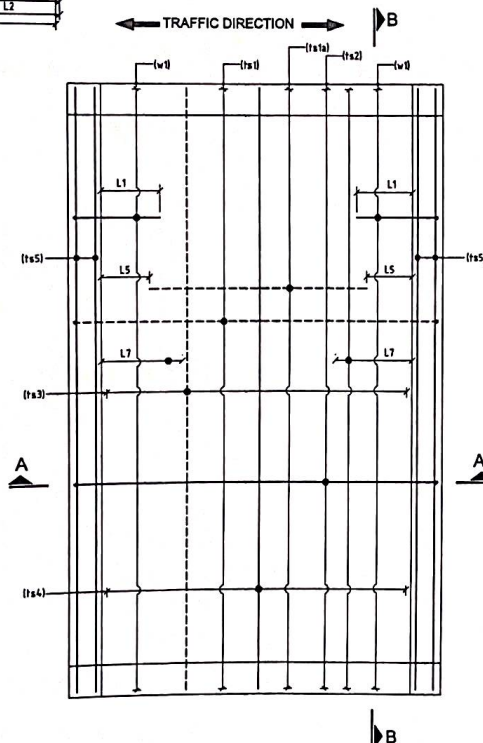
SL NO.	SCHEDULE CHARGE	DESIGN CHARGE AS PER STR.	FRL		CAMBER/SUPER ELEVATION (%)		CROSS ROAD LEVEL (m)	RAFT TOP LEVEL (m)	CUSHION (m)	SBC REQ TYP
			LHS	RHS	LHS	RHS				
1	62-050	42-052	147.654	147.654	-2.50%	-2.50%	142.568	142.413	Ø TO 0.5M	15



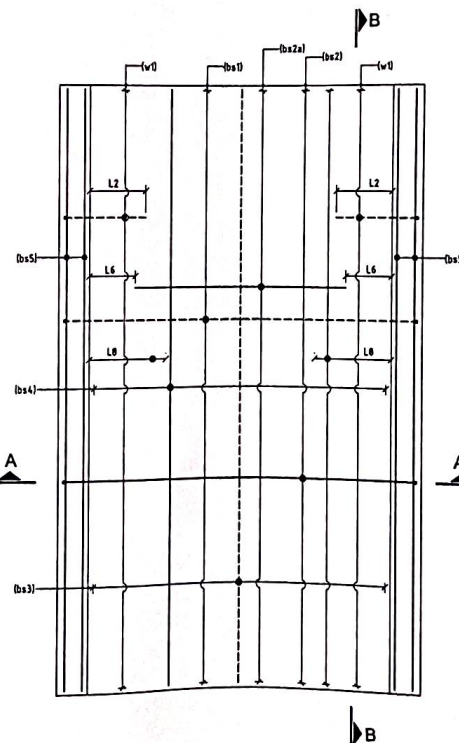
SECTION A-A
SCALE-130



SECTION C-C
SCALE-130



REINFORCEMENT DETAIL OF TOP SLAB
(HAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
SCALE-130



REINFORCEMENT DETAIL OF BOTTOM SLAB
(HAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
SCALE-130

NOTES:-

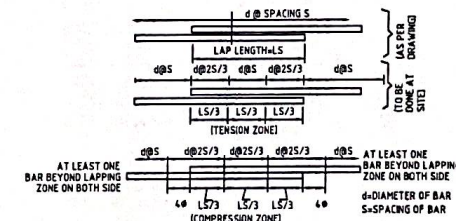
- ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS TO BE FOLLOWED. NO DIMENSION SHALL BE SCALED.
- CONCRETE SHALL BE DESIGN MIX WITH A MINIMUM CHARACTERISTIC STRENGTH OF 35MPa FOR RCC BOX STRUCTURE.
- CLEAR COVER TO OUTER MOST STEEL SHALL BE AS FOLLOWS:-
EARTH FACE - 75mm
OTHER FACE - 45mm
- THE REINFORCING STEEL SHALL BE MYSO BARS
IGRADE DESIGNATION Fa-550D) CONFORMING TO IS:1786.
- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE RELEVANT GENERAL ARRANGEMENT DRAWING.

SCHEDULE OF LAP LENGTH FOR REINFORCEMENT									
CONCRETE GRADE	FAVORABLE BOND				UNFAVORABLE BOND				% OF LAPPED BAR
	M25	M30	M35	M40	M25	M30	M35	M40	
<25%	52xØ	44xØ	40xØ	37xØ	75xØ	63xØ	58xØ	53xØ	
25-33%	60xØ	51xØ	46xØ	43xØ	87xØ	73xØ	67xØ	62xØ	
33-50%	73xØ	62xØ	56xØ	52xØ	105xØ	89xØ	82xØ	75xØ	
>50%	NOT ALLOWED								

FOR DETAILS FAVORABLE BOND AND UNFAVORABLE BOND
CONDITION REFER CLAUSE 15.2.3. OF IRC:112-2011
THIS TABLE IS USED FOR UP TO 32mm BAR
FOR Ø-32mm Ø, SHOULD BE INCREASED BY MULTIPLYING FACTOR $\frac{L_d}{32}$

SCHEDULE OF DEVELOPMENT LENGTH FOR REINFORCEMENT									
CONCRETE GRADE	FAVORABLE BOND				UNFAVORABLE BOND				DESCRIPTION
	M25	M30	M35	M40	M25	M30	M35	M40	
ANCHOR LENGTH	70xØ	66xØ	60xØ	56xØ	112xØ	95xØ	86xØ	80xØ	

FOR DETAILS FAVORABLE BOND AND UNFAVORABLE BOND
CONDITION REFER CLAUSE 15.2.3. OF IRC:112-2011.



LEGEND:-

NEAR FACE BAR	---
FAR FACE BAR	---

NADCL
NATIONAL HIGHWAYS &
INFRASTRUCTURE DEVELOPMENT
CORPORATION 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 AYOLEZZA 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.

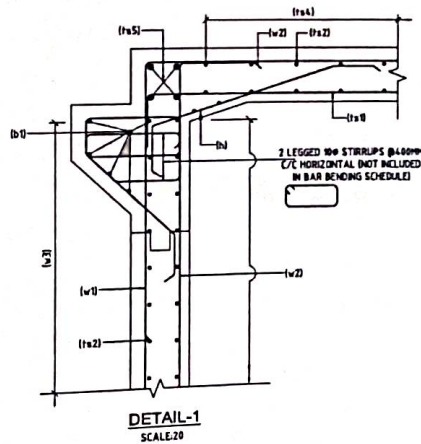
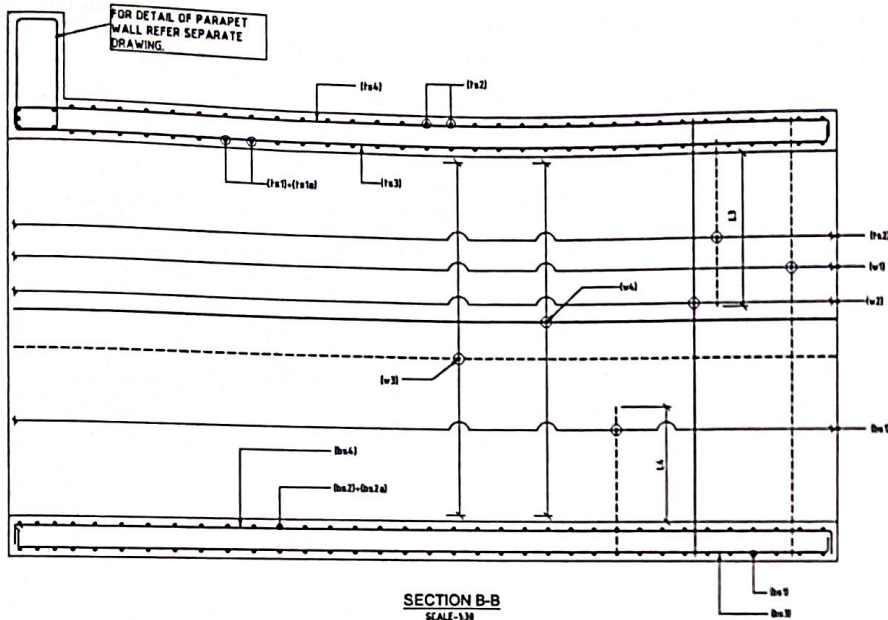
OFFICE: P-4, BHAAAN CORPORATE TOWER,
PLOT NO-C-23,SECTOR-1A,
VARUNDEHA, GHAZIABAD, U.P-201012

PROJECT: Widening/Improvement to 2-Lane Lane with Paved Shoulder from km
27+150 (Gola Gola) to km 47+682 (Lado) 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 DRAWING OF SVUP
FOR CH 42+052

DETAILS:-

Date	Drw.	Dsg.	Chk.	App.	Scale	AS SHOWN	Drawing Status
FEB 2024	A.J.	U.Y.	P.S.				FOR APPROVAL
Project No.	Drawing No.	AVC/ST/BC/SVUP/MS-052/REIN-001					Sheet No.
							1 OF 2



REINFORCEMENT DETAIL

BAR MARK	BAR SHAPE	DIAMETER	SPACING NOS.	REMARKS
rs1		16	150	
rs1a		16	150	
rs2		12	150	
rs3		16	150	
rs4		16	150	
rs5		16	84	82 LOCATIONS
rs6		N.A		
rs7		N.A		
rs8		16	150x150	
rs9		16	150	
rs10		N.A		
rs11		12	150	
rs12		N.A		
rs13		16	150	
rs14		16	150	
rs15		16	84	82 LOCATIONS
rs16		N.A		
rs17		16	150x150	
rs18		16	150	
rs19		16	150	
rs20		16	150	
rs21		16	150	
rs22		16	150	
rs23		16	150	
rs24		16	150	
rs25		16	84	82 LOCATIONS
rs26		N.A		
rs27		16	150x150	
rs28		16	150	
rs29		16	150	
rs30		16	150	
rs31		16	150	
rs32		16	150	
rs33		16	150	
rs34		16	150	
rs35		16	150	
rs36		16	150	
rs37		16	150	
rs38		16	150	
rs39		16	150	
rs40		16	150	
rs41		16	150	
rs42		16	150	
rs43		16	150	
rs44		16	150	
rs45		16	150	
rs46		16	150	
rs47		16	150	
rs48		16	150	
rs49		16	150	
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rs91		16	150	
rs92		16	150	
rs93		16	150	
rs94		16	150	
rs95		16	150	
rs96		16	150	
rs97		16	150	
rs98		16	150	
rs99		16	150	
rs100		16	150	

BAR CURTAILMENT SCHEDULE TYPE

L1	900mm
L2	900mm
L3	900mm
L4	900mm
L5	450mm
L6	450mm
L7	900mm
L8	900mm
L9	900mm

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

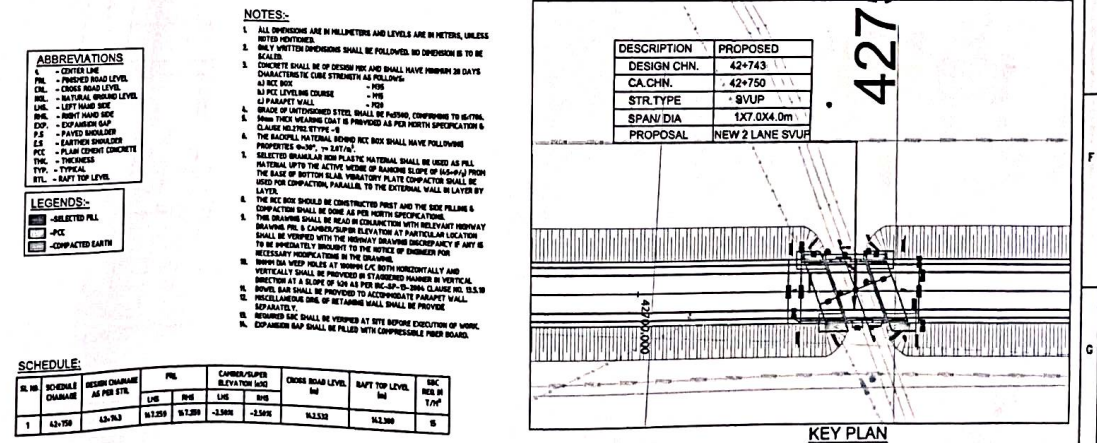
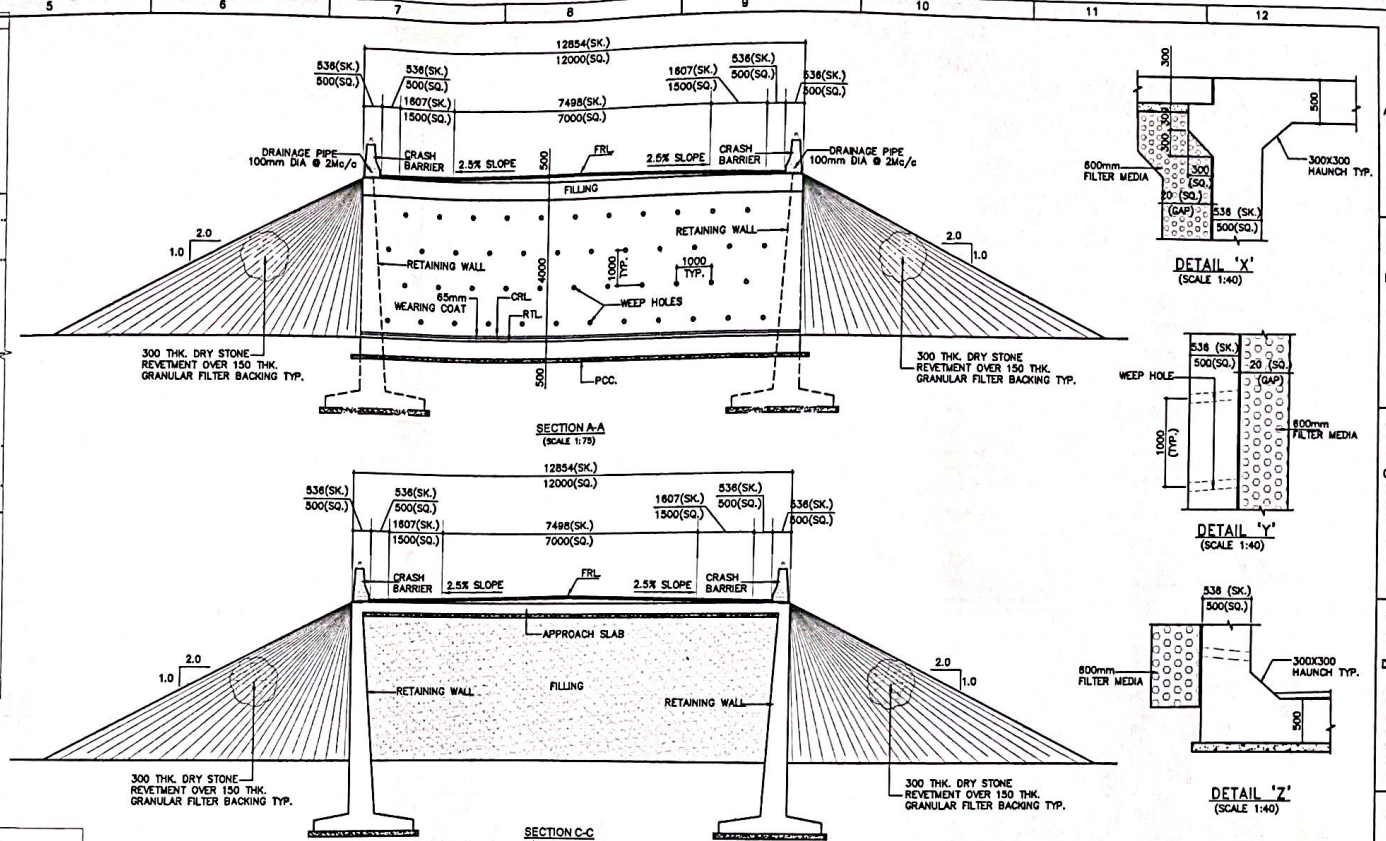
PROOF CONSULTANT:
CREATIVE ENGINEERING SERVICES
OFFICE NO: 620, SIGNATURE GLOBAL
MALL, SECTOR-3,
VAISHALI, GHAZIABAD, U.P-201010

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

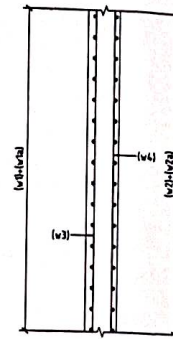
PROJECT: Widening Improvement to 2-Lane Lane with Paved Shoulder from km 27+150 (Ghat Ghat) to km 47+682 (Lado) on Dibrugarh to Lado section with proposed Margheria & Lado Bypass (Brownfield and Green Field) (2-Lane+PS) of NH-38 in Tamukia District in the State of Assam on EPC mode.(Package-5)
DRAWING TITLE: REINFORCEMENT DETAIL DRAWING OF SVUP FOR CH. 42+052
DETAILS:
Date FEB 2024 Drw. A.J. Deg. U.Y. Chk. P.S. App. AS SHOWN Drawing Status. FOR APPROVAL
Project No. Drawing No. AVC/ST/BC/SVUP/42+052/REIN-001
3 OF 3 Rev. RD

**GENERAL ARRANGEMENT DRAWING
SMALL VEHICULAR UNDERPASS AT
CH:42+743**

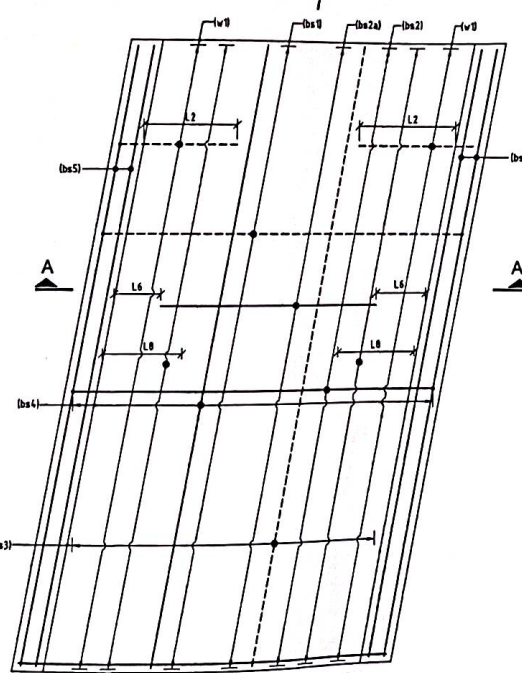


SL. NO.	SCHEDULE CHAMBER	DESIGN CHAMBER AS PER STD.	PWL		CAMBER/SUPER ELEVATION (cm)		CROSS ROAD LEVEL (m)	RAFT TOP LEVEL (m)	SAC. NO. IN T/M
			LWS	RWS	LWS	RWS			
1	42-750	42-763	91.255	91.260	-2.50%	-2.50%	91.332	91.300	5

Date FEB.2024	Drw. A.J	Dsg. U.Y	Chk. P.S	App.	Scale. AS SHOWN	Drawing Status. FOR APPROVAL	
Project No.	Drawing No. AVC/NT/RC/SVUP/CH. 42+743/GAD-001					Sheet No. 1 OF 1	Rev. R0



SECTION A-A
SCALE-1:30 (ft)



REINFORCEMENT DETAIL OF BOTTOM SLAB
(SHEAR KEY & HAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
SCALE-1/35

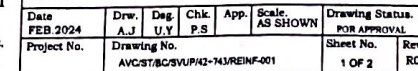
The diagram illustrates the lap length and tension zone for a bar lap joint. It shows two bars, one above the other, with a central lap section. The lap length is labeled as L . The distance from the center of the lap to the end of the bar is labeled as $d \text{ @ } 25/3$. The total length of the lap is labeled as $L/3$. The tension zone is indicated by a bracket labeled $(T \text{ TO BE DONE AT SITE})$. The diagram also shows the lap length L and the distance $d \text{ @ } 25/3$ from the center of the lap to the end of the bar. The diagram is labeled **AS PER DRAWING** and **(TO BE DONE AT SITE)**.

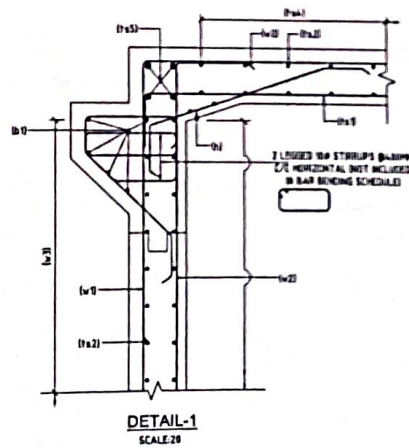
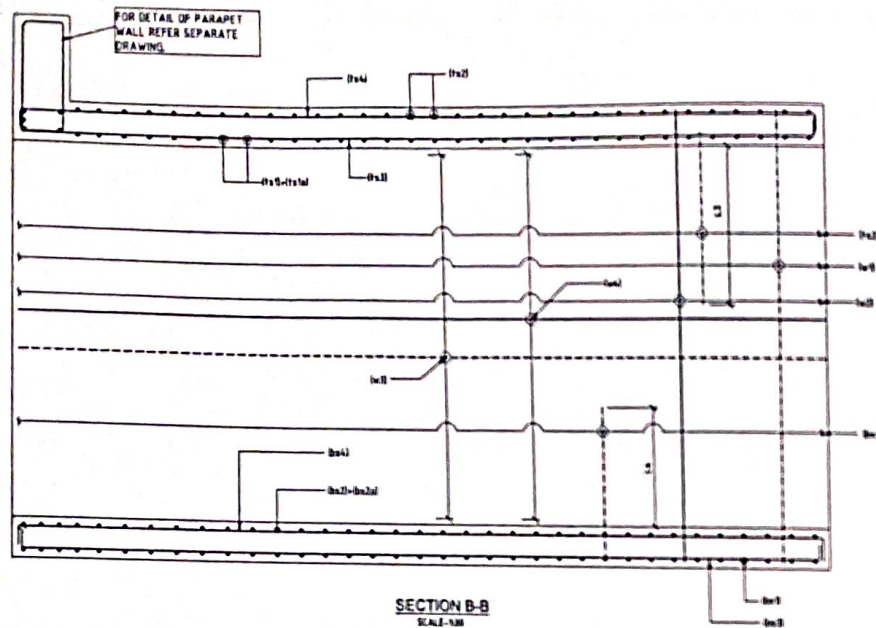
AT LEAST ONE BAR BEYOND LAPPING ZONE ON BOTH SIDE

AT LEAST ONE BAR BEYOND LAPPING ZONE ON BOTH SIDE

$d = \text{DIAMETER OF BAR}$
 $s = \text{SPACING OF BAR}$

NEAR FACE BAR	_____
FAR FACE BAR	_____





REINFORCEMENT DETAIL

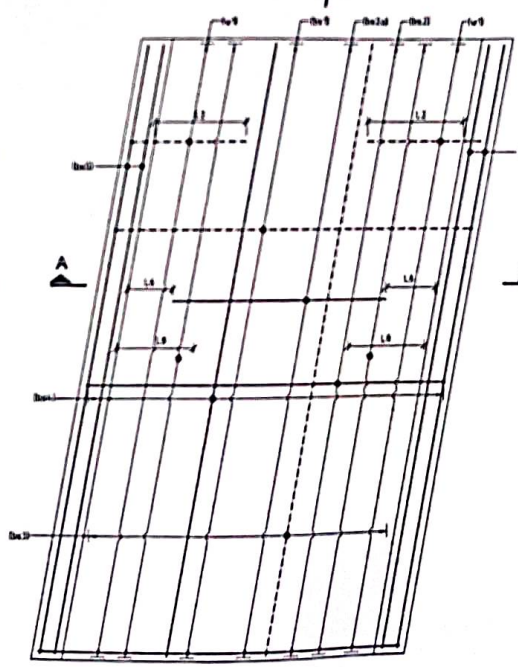
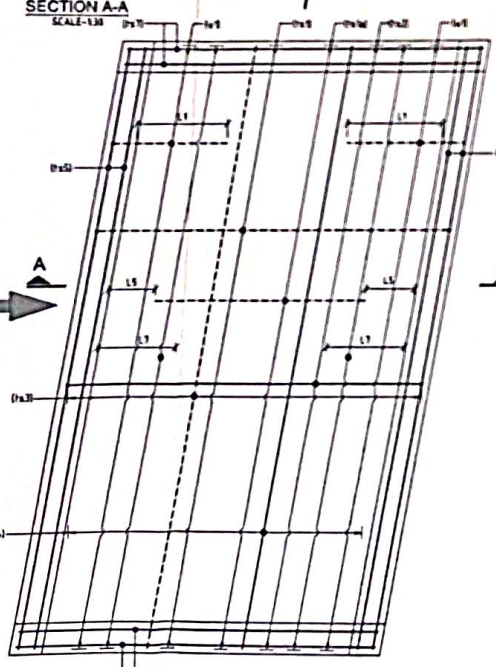
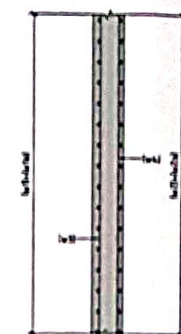
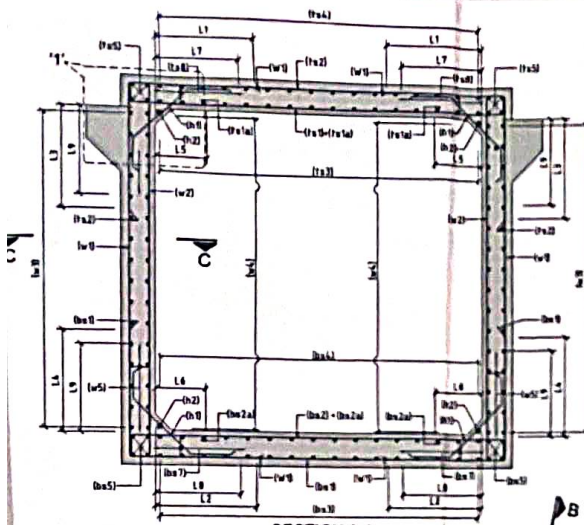
BAR MARK	BAR SHAPE	DIAMETER	SPACING NOS	REMARKS
Trs1		16	130	
Trs2		16	130	
Trs3		16	130	
Trs4		16	130	
Trs5		16	84	82 LOCATIONS
Trs6		N.A		
Trs7		N.A		
Trs8		16	84x71 130x130	
Trs9		16	130	
Trs10		N.A		
Trs11		16	130	
Trs12		N.A		
Trs13		16	130	
Trs14		16	130	
Trs15		N.A		
Trs16		N.A		
Trs17		16	130	
Trs18		16	130	
Trs19		16	130	
Trs20		16	130	
Trs21		16	84	82 LOCATIONS
Trs22		N.A		
Trs23		16	84x71 130x130	
Trs24		16	130	
Trs25		16	130	
Trs26		16	130	
Trs27		16	130	
Trs28		16	130	
Trs29		16	130	
Trs30		16	130	
Trs31		16	130	
Trs32		16	130	
Trs33		16	130	
Trs34		16	130	
Trs35		16	130	
Trs36		16	130	
Trs37		16	130	
Trs38		16	130	
Trs39		16	130	
Trs40		16	130	
Trs41		16	130	
Trs42		16	130	
Trs43		16	130	
Trs44		16	130	
Trs45		16	130	
Trs46		16	130	
Trs47		16	130	
Trs48		16	130	
Trs49		16	130	
Trs50		16	130	
Trs51		16	130	
Trs52		16	130	
Trs53		16	130	
Trs54		16	130	
Trs55		16	130	
Trs56		16	130	
Trs57		16	130	
Trs58		16	130	
Trs59		16	130	
Trs60		16	130	
Trs61		16	130	
Trs62		16	130	
Trs63		16	130	
Trs64		16	130	
Trs65		16	130	
Trs66		16	130	
Trs67		16	130	
Trs68		16	130	
Trs69		16	130	
Trs70		16	130	
Trs71		16	130	
Trs72		16	130	
Trs73		16	130	
Trs74		16	130	
Trs75		16	130	
Trs76		16	130	
Trs77		16	130	
Trs78		16	130	
Trs79		16	130	
Trs80		16	130	
Trs81		16	130	
Trs82		16	130	
Trs83		16	130	
Trs84		16	130	
Trs85		16	130	
Trs86		16	130	
Trs87		16	130	
Trs88		16	130	
Trs89		16	130	
Trs90		16	130	
Trs91		16	130	
Trs92		16	130	
Trs93		16	130	
Trs94		16	130	
Trs95		16	130	
Trs96		16	130	
Trs97		16	130	
Trs98		16	130	
Trs99		16	130	
Trs100		16	130	

BAR CURTAILMENT SCHEDULE TYPE

L1	Bottom
L2	Bottom
L3	Bottom
L4	Bottom
L5	Bottom
L6	Bottom
L7	Bottom
L8	Bottom
L9	Bottom

MIDEL 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: 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: Winst Infra Solution Pvt. Ltd. OFFICE: F-4, BHABHA CORPORATE TOWER, PLOT NO-G-23, SECTOR-13, VASUNDHRA, GHAZIABAD, U.P-201013	PROJECT: Warming Improvement to 3-Lane Lane with Paved Shoulder from km 27+150 (Global Geom) to km 47+000 (Lado) on Dibrugarh to Lado section with proposed Margherita & Lado 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 DRAWING OF SVUP FOR CHL 42-743 (SKEW 21°) DETAILS: <table border="1"> <tr> <th>Date</th> <th>Drawn</th> <th>Check</th> <th>Appr.</th> <th>Scale</th> <th>AS SHOWN</th> <th>Drawing Status</th> </tr> <tr> <td>FEB 2024</td> <td>A.J</td> <td>U.Y</td> <td>P.S</td> <td></td> <td></td> <td>FOR APPROVAL</td> </tr> <tr> <td>Project No.</td> <td>Drawing No.</td> <td colspan="4">AVC/STING/SVUP/04+TALRE/01</td> <td>Sheet No.</td> </tr> <tr> <td></td> <td></td> <td colspan="4"></td> <td>2 OF 2</td> </tr> <tr> <td></td> <td></td> <td colspan="4"></td> <td>RD</td> </tr> </table>	Date	Drawn	Check	Appr.	Scale	AS SHOWN	Drawing Status	FEB 2024	A.J	U.Y	P.S			FOR APPROVAL	Project No.	Drawing No.	AVC/STING/SVUP/04+TALRE/01				Sheet No.							2 OF 2							RD
Date	Drawn	Check	Appr.	Scale	AS SHOWN	Drawing Status																																			
FEB 2024	A.J	U.Y	P.S			FOR APPROVAL																																			
Project No.	Drawing No.	AVC/STING/SVUP/04+TALRE/01				Sheet No.																																			
						2 OF 2																																			
						RD																																			

GENERAL ARRANGEMENT DRAWING
SMALL VEHICULAR UNDERPASS AT
CH:45+825



NOTES:-

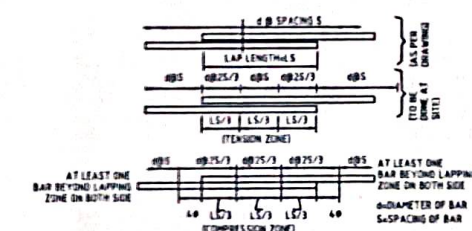
1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE MENTIONED ONLY WRITTEN DIMENSIONS TO BE FOLLOWED NO DIMENSION SHALL BE SCALED
2. CONCRETE SHALL BE DESIGN MIX WITH A MINIMUM CHARACTERISTIC STRENGTH OF 30MPa FOR RCC BOX STRUCTURE
3. CLEAR COVER TO OUTER MOST STEEL SHALL BE AS FOLLOWS:-
EARTH FACE - 75mm
OTHER FACE - 45mm
4. THE REINFORCING STEEL SHALL BE HYSD BARS
GRADE DESIGNATION Fe-550/500 CONFORMING TO IS-1786
5. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE RELEVANT GENERAL ARRANGEMENT DRAWING

SCHEDULE OF LAP LENGTH FOR REINFORCEMENT									
CONCRETE GRADE	FAVORABLE BOND				UNFAVORABLE BOND				
	M25	M30	M35	M40	M25	M30	M35	M40	
-25%	52x0	64x0	64x0	57x0	75x0	63x0	58x0	53x0	
25-30%	66x0	57x0	66x0	63x0	87x0	73x0	67x0	64x0	
35-50%	73x0	62x0	56x0	52x0	105x0	89x0	82x0	75x0	
>50%	NOT ALLOWED								

FOR DETAILS FAVORABLE BOND AND UNFAVORABLE BOND
CONDITION REFER CLAUSE 15.2.3 OF IRC 112-2011
THIS TABLE IS USED FOR UP TO 32mm BAR
FOR 32-50mm B. SHOULD BE INCREASED BY MULTIPLYING FACTOR $\frac{B}{32}$

SCHEDULE OF DEVELOPMENT LENGTH FOR REINFORCEMENT									
DESCRIPTION	FAVORABLE BOND				UNFAVORABLE BOND				
	M25	M30	M35	M40	M25	M30	M35	M40	
CONCRETE GRADE	78x0	64x0	66x0	56x0	102x0	75x0	66x0	60x0	
ANCHOR LENGTH	78x0	64x0	66x0	56x0	102x0	75x0	66x0	60x0	

FOR DETAILS FAVORABLE BOND AND UNFAVORABLE BOND
CONDITION REFER CLAUSE 15.2.3 OF IRC 112-2011



LEGEND:-	
NEAR FACE BAR	---
FAR FACE BAR	---

MAIDCL
INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.

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

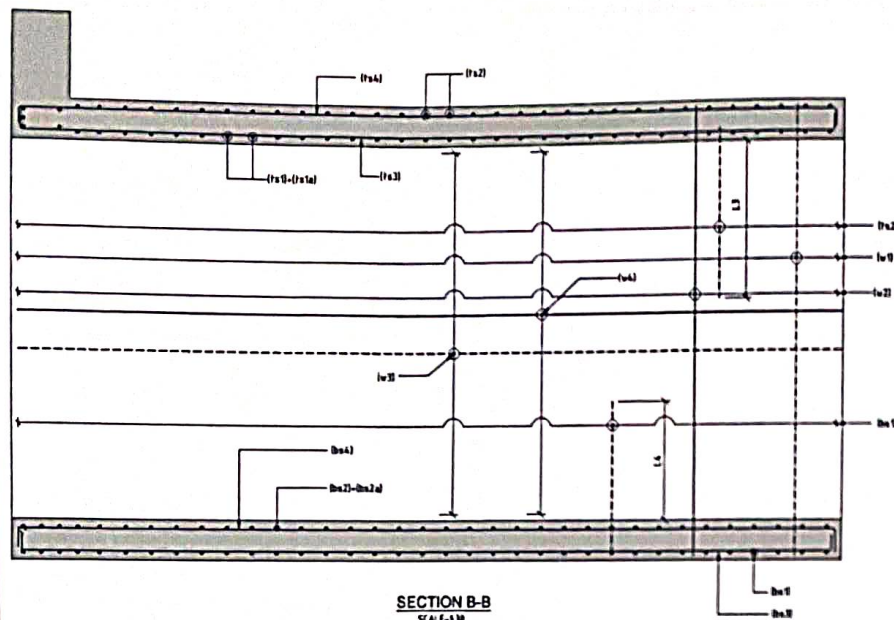
AUTHORITY'S ENGINEER
ALMONDZ GLOBAL INFRA CONSULTANT
LIMITED IN JV WITH AYOLEEZA CONSULTANT
PRIVATE LIMITED.
CO JAYANTA SAIKIA,
SARBAJANIN NAMGHAR, BORBIL
NO.2, DIGBOI, TINSUKIA,
ASSAM-786171

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

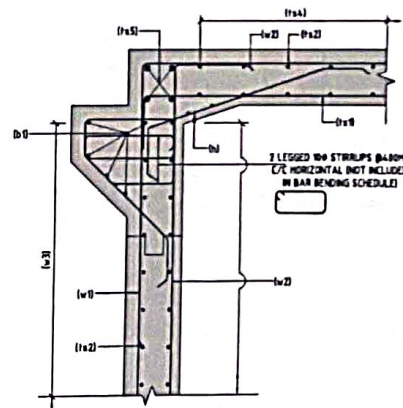
SAFETY CONSULTANT:
DESIGN
DESIGN AID
PLOT NO.54, 3rd FLOOR(FRONT),
MASOODPUR DAIRY FARM,VASANT KUNJ,
NEW DELHI-110070,

DESIGN CONSULTANT:
A.V. CONSTRUCTION
1st Floor, WZ-1240, Palam
Extension, Boco Ashram
Wali Gali, New Delhi 110045
Winst Infra Solution Pvt. Ltd.
OFFICE: P-4, BHARAN CORPORATE TOWER,
PLOT NO-C-23, SECTOR-13,
VASINDHRA, GHAZIABAD, U.P-201012

PROJECT: Widening Improvement to 2-Lane Lane with Paved Shoulder from km
27+150 (Gola Gola) to km 47+682 (Lado) on Dibrugarh to Lado section
with proposed Margherita & Lado Bypass (Browfield 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 DRAWING OF SVLP
FOR CH-45+825 (SKEW 30.48°)
DETAILS:-
Date: FEB 2024
Project No.:
Drw: A.J
Dag: U.Y
Chk: P.B
App: AS SHOWN
Sheet No.:
Rev: 1 OF 2
Drawing Status: **FOR APPROVAL**
Rev: 1 OF 2
Rev: 1 OF 2



SECTION B-B
SCALE:1:30



DETAIL-1
SCALE:20

REINFORCEMENT DETAIL

BAR MARK	BAR SHAPE	DIAMETER	SPACING NOS.	REMARKS
ra1		16	130	
ra1a		16	130	
ra2		12	130	
ra3		16	130	
ra4		16	130	
ra5		16	84	82 LOCATIONS
ra6		N.A.		
ra7		N.A.		
ra8		16	130x130	
ra9		16	130	
ra10		N.A.		
ra11		12	130	
ra12a		N.A.		
ra13		16	130	
ra14		16	130	
ra15		16	84	82 LOCATIONS
ra16		N.A.		
ra17		16	130x130	
ra18		16	130	
ra19		16	130	
ra20		12	85mm	82 LOCATIONS
ra21		12	130	
ra22		12	340	83 LOCATIONS

BAR CURTAILMENT SCHEDULE TYPE

L1	900mm
L2	900mm
L3	900mm
L4	900mm
L5	450mm
L6	450mm
L7	900mm
L8	900mm
L9	900mm

NADCL
NATIONAL HIGHWAYS &
ASTRUCTURE 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 AYOLEZZA CONSULTANT
PRIVATE LIMITED.
C/O JAYANTA SAIKIA,
SARBAJANIN NAMGHAR, BORBIL
NO.2, DIGBOI, TINSUKIA,
ASSAM-786171

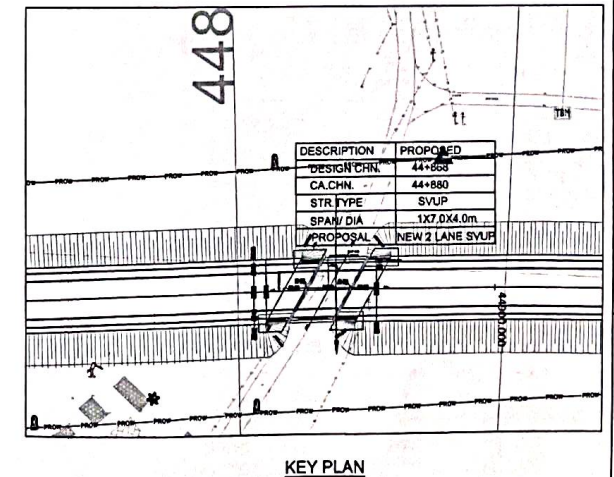
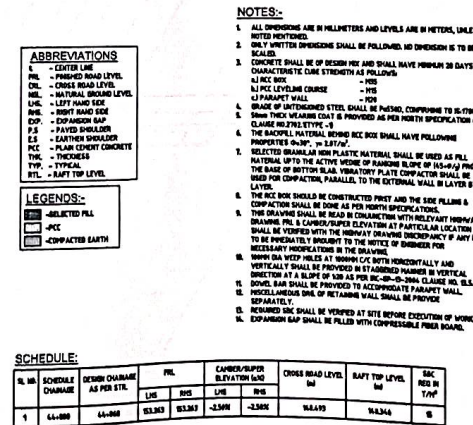
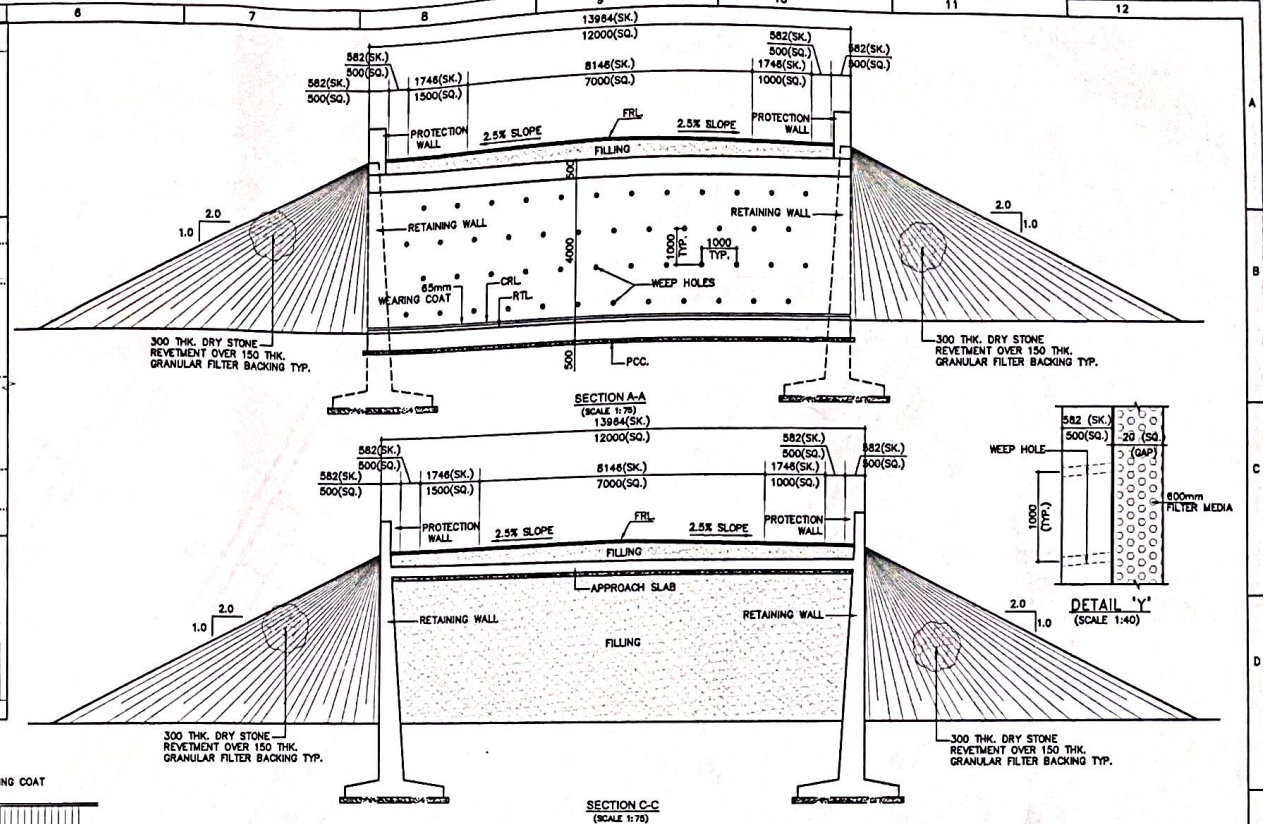
PROOF CONSULTANT:
CREATIVE ENGINEERING SERVICES
OFFICE NO. 620, SIGNATURE GLOBAL
MALL, SECTOR-3,
VAISHALI, GHAZIABAD, U.P-201010

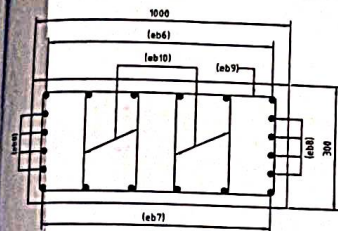
SAFETY CONSULTANT:
DESIGN AID
PLOT NO.54, 3rd FLOOR(FRONT),
MASOODPUR DAIRY FARM,VASANT KUNJ,
NEW DELHI-110070,

DESIGN CONSULTANT:
A.V. CONSTRUCTION
1st Floor, WZ-1240, Palam
Extension, Bosco Ashram
Wali Gali, New Delhi 110045
Winst Infra Solution Pvt. Ltd.
OFFICE: P-4, BHAAAN CORPORATE TOWER,
PLOT NO-C-13, SECTOR-13,
VASUNDHRA, GHAZIABAD, U.P-201012

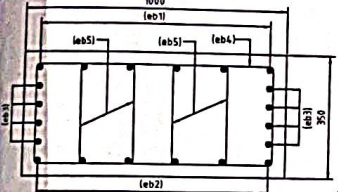
PROJECT: Widening/Improvement to 3-Lane Lane with Paved Shoulder from km
27+150 (Gohai Ghat) to km 47+682 (Lado) on Dibrugarh to Lado section
with proposed Margherita & Lado Bypass (Brownfield and Green Field)
(2-Lane+PS) of NH-38 in Tinsukia District in the State of Assam on EPC
mode (Package-5)
DRAWING TITLE:- REINFORCEMENT DETAIL DRAWING OF SVUP
FOR CH. 45+825 (SKEW 20.48°)
DETAILS:
Date FEB 2024 Drw. A.J. U.Y. Chk. P.S. App. AS SHOWN Scale. AS SHOWN Drawing Status. FOR APPROVAL
Project No. Drawing No. AV/CST/BC/SVUP/PS-425/REINF-001 Sheet No. 3 OF 2 Rev. RD

GENERAL ARRANGEMENT DRAWING
SMALL VEHICULAR UNDERPASS AT
CH:46+868

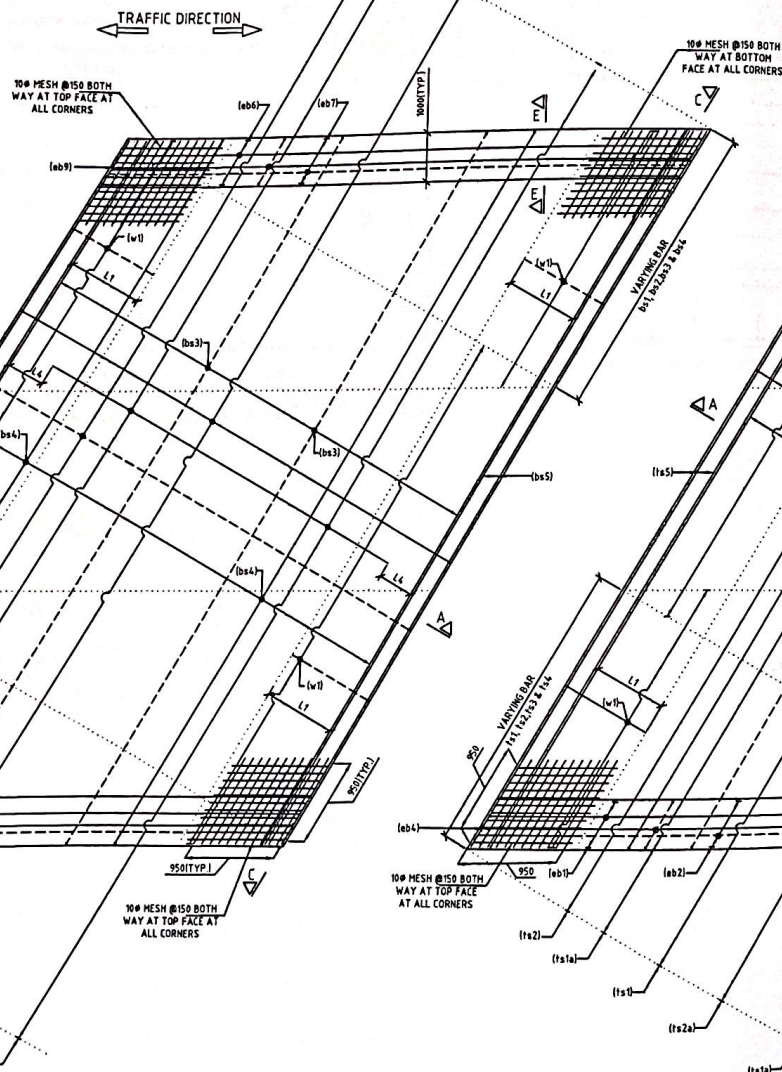




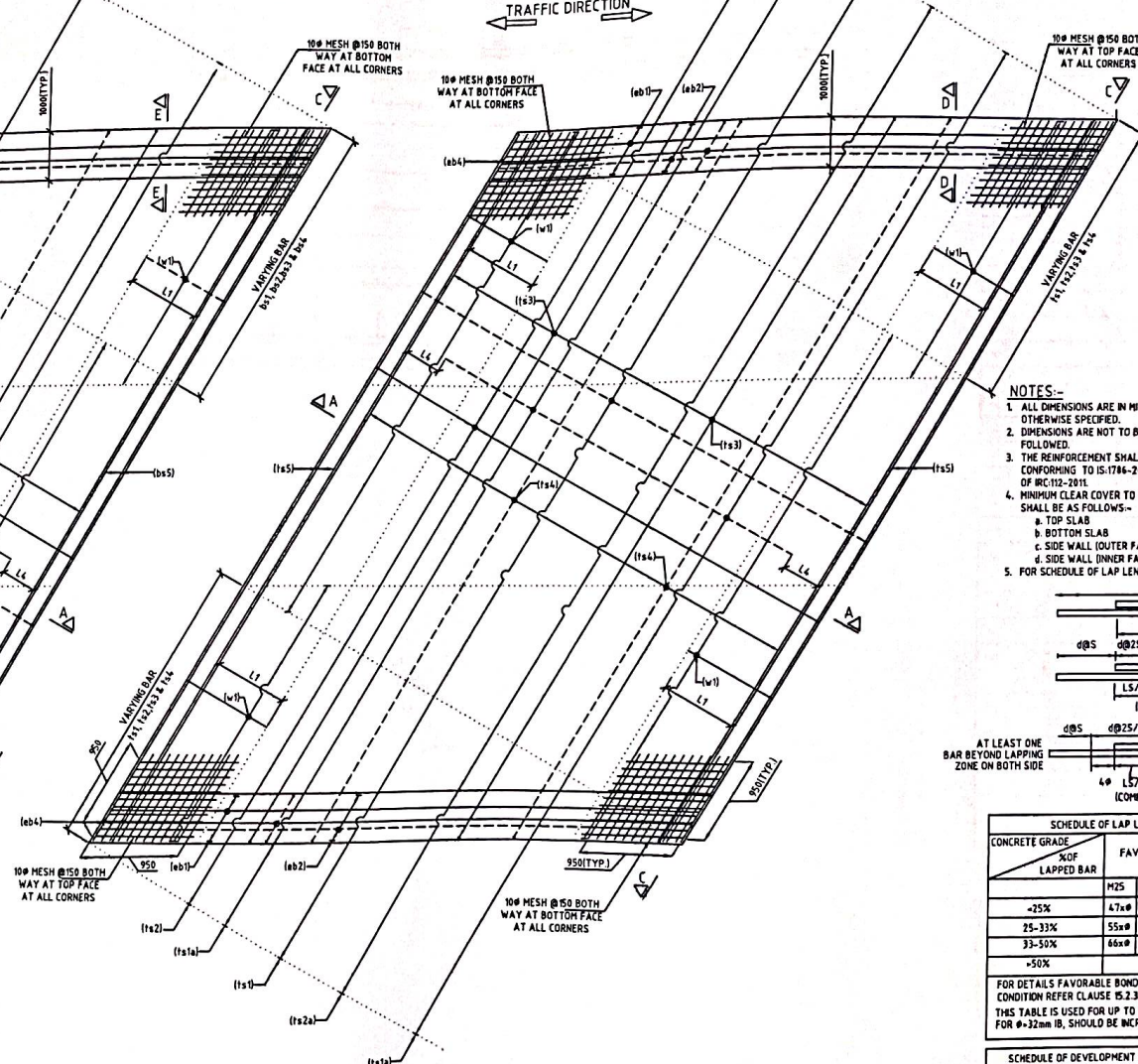
SECTION E-E
SCALE-1/15



SECTION D-D
SCALE-1/15

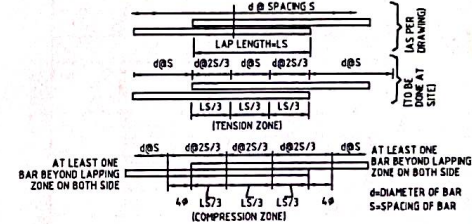


REINFORCEMENT DETAIL OF BOTTOM SLAB
(SHEAR KEY & HAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
SCALE-1/15



REINFORCEMENT DETAIL OF TOP SLAB
(SHEAR KEY & HAUNCH BAR NOT SHOWN IN PLAN FOR CLARITY)
SCALE-1/15

- NOTES:-
1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS UNLESS OTHERWISE SPECIFIED
 2. DIMENSIONS ARE NOT TO BE SCALED. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
 3. THE REINFORCEMENT SHALL BE MYSO. BARS (GRADE DESIGNATION Fe-500D) CONFORMING TO IS:1786-2008. HAVING MIN. ELONGATION OF 16% AS PER TABLE 10.1 OF IRC:112-2011
 4. MINIMUM CLEAR COVER TO OUTERMOST REINFORCEMENT SHALL BE AS FOLLOWS:-
 - a. TOP SLAB - 45mm
 - b. BOTTOM SLAB - 75mm
 - c. SIDE WALL (OUTER FACE) - 75mm
 - d. SIDE WALL (INNER FACE) - 45mm
 5. FOR SCHEDULE OF LAP LENGTH & DEVELOPMENT LENGTH PLEASE FOLLOW:-



SCHEDULE OF LAP LENGTH FOR REINFORCEMENT									
CONCRETE GRADE	% OF LAPPED BAR	FAVORABLE BOND				UNFAVORABLE BOND			
		M25	M30	M35	M40	M25	M30	M35	M40
-25%	47x0	40x0	36x0	34x0	68x0	58x0	52x0	49x0	
	25-33%	55x0	48x0	42x0	40x0	79x0	66x0	61x0	58x0
	33-50%	66x0	56x0	51x0	48x0	95x0	81x0	73x0	69x0
-50%									
NOT ALLOWED									
FOR DETAILS FAVORABLE BOND AND UNFAVORABLE BOND CONDITION REFER CLAUSE 15.2.3 OF IRC:112-2011. THIS TABLE IS USED FOR UP TO 32mm BAR FOR 32mm IB, SHOULD BE INCREASED BY MULTIPLYING FACTOR 1.15									

SCHEDULE OF DEVELOPMENT LENGTH FOR REINFORCEMENT								
DESCRIPTION	FAVORABLE BOND				UNFAVORABLE BOND			
	M25	M30	M35	M40	M25	M30	M35	M40
CONCRETE GRADE	M25	M30	M35	M40	M25	M30	M35	M40
ANCHOR LENGTH	71x0	60x0	54x0	51x0	102x0	84x0	78x0	73x0
FOR DETAILS FAVORABLE BOND AND UNFAVORABLE BOND CONDITION REFER CLAUSE 15.2.3 OF IRC:112-2011.								

NATIONAL HIGHWAYS & STRUCTURE DEVELOPMENT CORPORATION LTD.

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

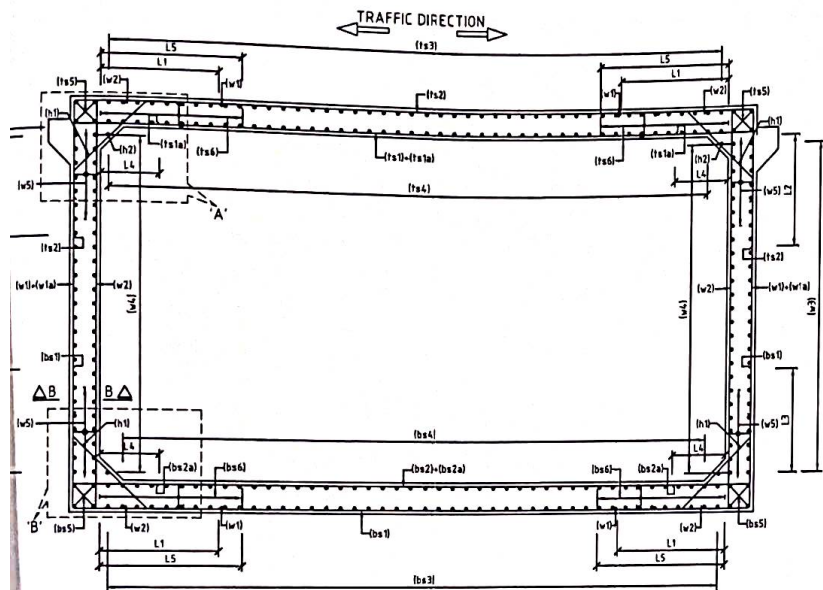
AUTHORITY'S ENGINEER
ALMONDZ GLOBAL INFRA CONSULTANT
LIMITED IN JV WITH AYOLEEZA CONSULTANT
PRIVATE LIMITED.
C/O JAYANTA SAIKIA,
SARBAJANIN NAMGHAR, BORBIL
NO.2, DIGBOI, TINSUKIA,
ASSAM-786171

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

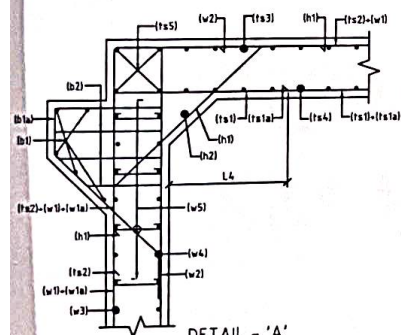
SAFETY CONSULTANT:
DESIGN AID
PLOT NO.54, 3rd FLOOR(FRONT),
MASOODPUR DAIRY FARM,VASANT KUNJ,
NEW DELHI-110070,

DESIGN CONSULTANT:
A.V. CONSTRUCTION
1st Floor, WZ-17, 1st Phase,
Extension, Bosco Ashram
Wali Gali, New Delhi
110045
Winst Infra Solution Pvt. Ltd.
OFFICE: P-4, ISHAAN CORPORATE
TOWER, PLOT NO-C-21, SECTOR-11,
VASUNDHRA GHAZIABAD, U.P-201012

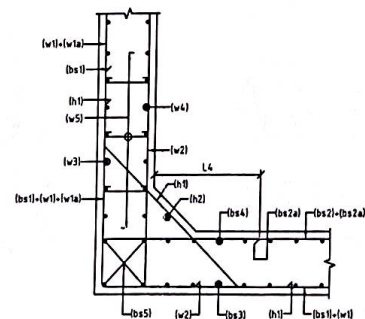
PROJECT: Widening/Improvement to 2-Lane Lane with Paved Shoulder from km 27+150 (Goli Gues) to km 47+682 (Lede) on Dibrugarh to Ledo section with proposed Margherita & Ledo Bypass (Brownfield and Green Field) (2-Lane+PS) of NH-38 in Tinsukia District in the State of Assam on EPC mode (Package-3)
DRAWING TITLE: REINFORCEMENT DETAIL DRAWING FOR SVUP AT CH. 44+868 (SKEW 30.75°)
DETAILS:
Date: JAN 2024
Project No.: Drawing No.: ANV/ST/BO/SVUP/44+868/REINF001
Sheet No.: 01 of 02
Rev.: R0
Drawing Status: AS SHOWN



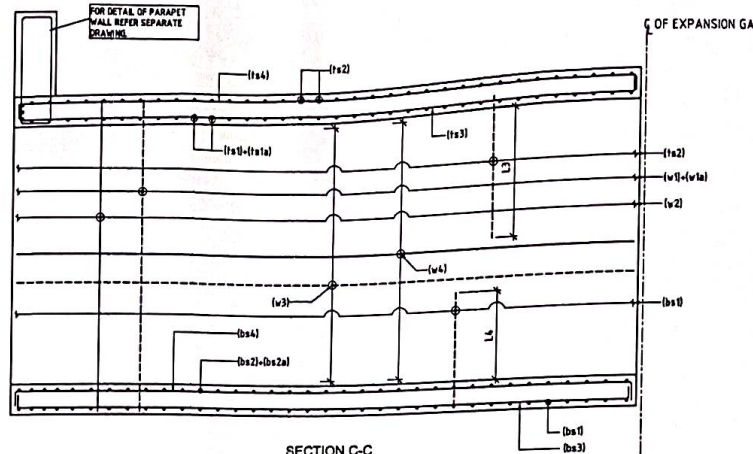
SECTION A-A
(BRACKET BAR NOT SHOWN FOR CLARITY)
SCALE-1:50



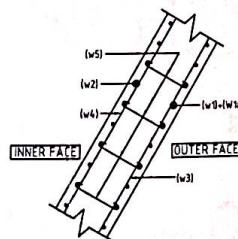
DETAIL - 'A'
SCALE-1:25



DETAIL - 'B'
SCALE-1:25



SECTION C-C
SCALE-1:40



SECTION B-B
SCALE-1:25

REINFORCEMENT DETAIL

Bar Mark	Shape of Bars (Not to Scale)	Bar Dia in mm	Spacing & Numbers	REMARKS	LOCATION
rs1		16	140 c/c		TOP SLAB
rs1a		10	140 c/c		
rs2		12	140 c/c		
rs2a		N/A			
rs3		10	140 c/c		
rs4		10	140 c/c		BOTTOM SLAB
rs5		16	4 nos.	2 LOCATIONS	
rs6		10	(LxT) (140x140)		
bs1		12	140 c/c		
bs2		15	140 c/c		
bs2a		140 c/c			EXTERNAL WALL
bs3		10	140 c/c		
bs4		10	140 c/c		
bs5		15	4 nos.	2 LOCATIONS	
bs6		08	(LxT) (140x140)		
w1		15	140 c/c		RAINFALL
w2		12	140 c/c		
w3		10	140 c/c		
w4		10	140 c/c		
w5		N/A			
h1		10	140 c/c		EDGE BEAM FOR TOP SLAB
h2		10	140 c/c	4 LOCATIONS	
eb1		10	7 nos.		
eb2		15	7 nos.		
eb3		12	4 nos.		
eb4		08	150 c/c	2 LEGGED STIRRUPS	EDGE BEAM FOR BOTTOM SLAB
eb5		08	150 c/c	4 LEGGED STIRRUPS	
eb6		15	7 nos.		
eb7		10	7 nos.		
eb8		10	4 nos.		
eb9		08	200 c/c	2 LEGGED STIRRUPS	BRACKET
eb10		08	150 c/c	4 LEGGED STIRRUPS	
b1		10	05nos.	02 LOCATIONS	
b1a		12	140 c/c		
b2		12	360	03 LOCATIONS	

BAR CURTAILMENT SCHEDULE TYPE

L1	900 mm
L2	900 mm
L3	900 mm
L4	450 mm
L5	450 mm
L6	-

LEGEND:	
---	- NEAR FACE
---	- FAR FACE



ONAL HIGHWAYS &
UCTURE DEVELOPMENT
RPORTATION 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,
SARBAJANINI NAMGHAR, BORBIL
NO.2, DIGBOI, TINSUKIA,
ASSAM-786171

PROOF CONSULTANT:



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

SAFETY CONSULTANT:



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

DESIGN CONSULTANT:



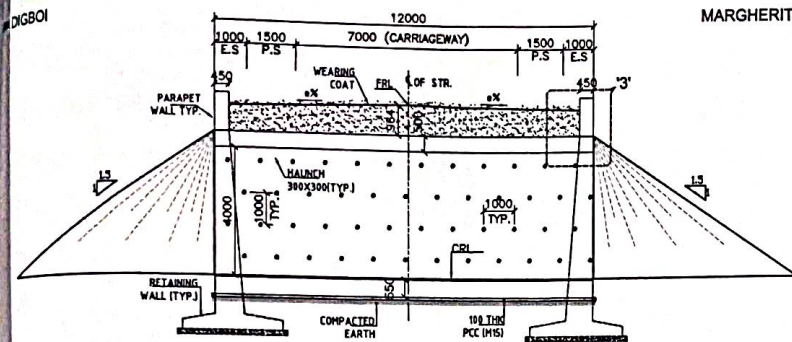
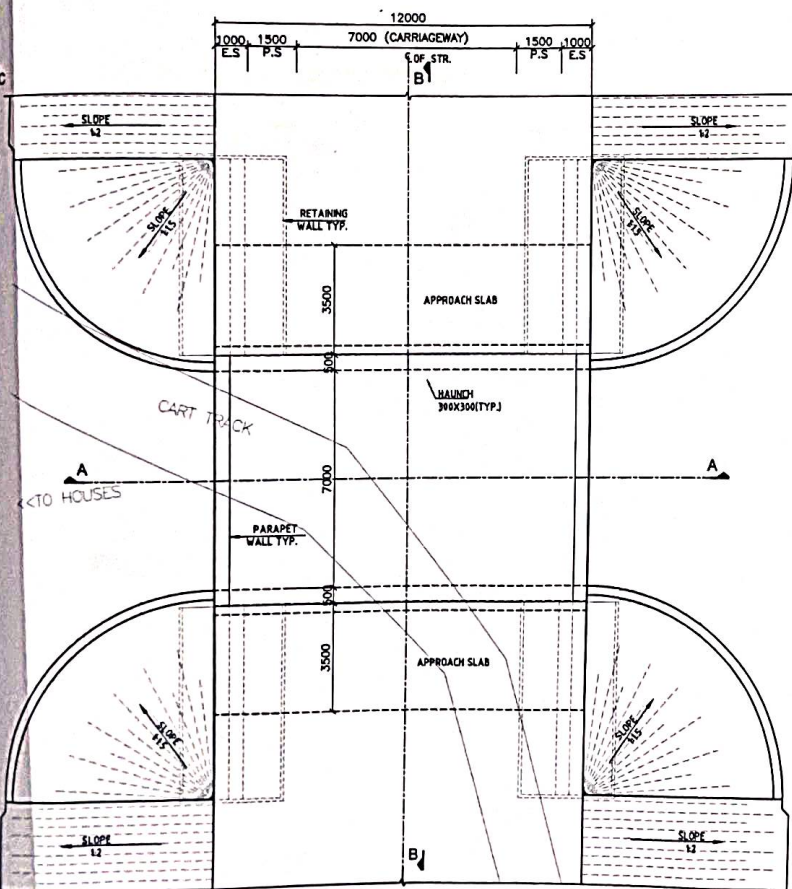
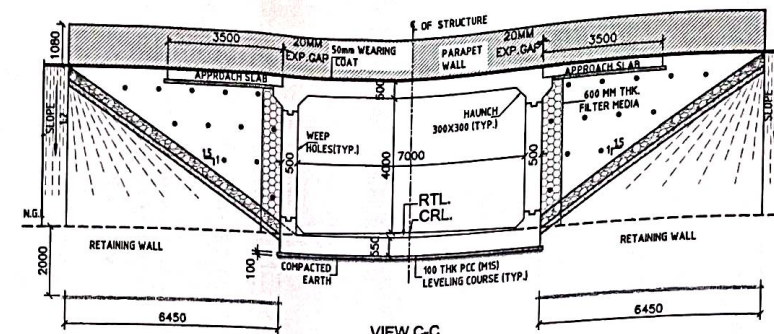
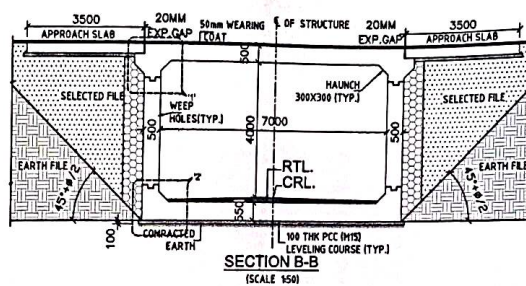
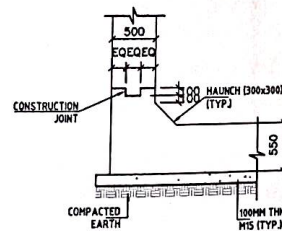
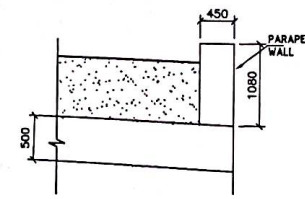
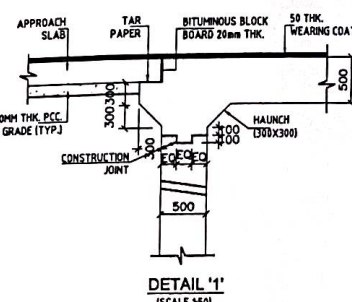
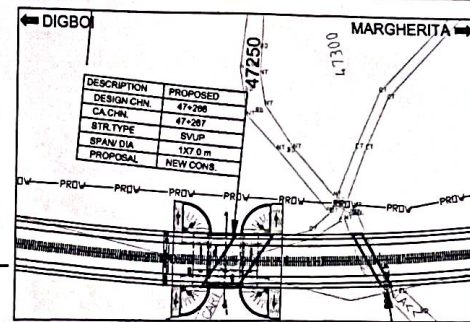
A.V. CONSTRUCTION
1st Floor, WZ-1240, Palam
Extension, Bosco Ashram
Wall Gali, New Delhi
110045
Winst Infra Solution
Pvt. Ltd.
OFFICE: P-4, ISHAAN CORPORATE
TOWER, PLOT NO-C-23, SECTOR-13,
VASUNDHRA, GHAZIABAD, U.P-201012

PROJECT: Widening/Improvement to 2-Lane Lane with Paved Shoulder from km
27+150 (Gola Gola) to km 47+582 (Lado) on Dibrugarh to Lado section
with proposed Margherita & Lado 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 DRAWING
FOR SVUP AT CH. 44+868 (SKEW 30.75°)

Date	Drw.	Dsg.	Chk.	App.	Scale	Drawing Status.
JAN 2024					AS SHOWN	
Project No.	Drawing No.					Sheet No. 02 of 02
	AVC/ST/BOC/SVUP/44+868/REH/001					Rev. RO

GENERAL ARRANGEMENT DRAWING
SMALL VEHICULAR UNDERPASS AT
CH:47+266

SECTION A-A
(SCALE 1:100)PLAN
(SCALE 1:100)VIEW C-C
(SCALE 1:100)SECTION B-B
(SCALE 1:50)DETAIL '2'
(SCALE 1:50)DETAIL '3'
(SCALE 1:50)DETAIL '1'
(SCALE 1:50)KEY PLAN
(NTS)

NOTES:-

- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS, UNLESS NOTED OTHERWISE.
- ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED. NO DIMENSION IS TO BE SCALED.
- CONCRETE SHALL BE OF DESIGN MIX AND SHALL HAVE MINIMUM 28 DAYS CHARACTERISTIC CUBE STRENGTH AS FOLLOWS:
a) RCC BOX - M25
b) PCC LEVELING COURSE - M15
c) PARAPET WALL - M20
- GRADE OF UNSTRENGTHENED STEEL SHALL BE Fe250, CONFORMING TO IS-1786. 50mm THICK WEARING COAT IS PROVIDED AS PER MORTH SPECIFICATION & CLAUSE NO.2702 (TYPE - I)
- THE BACKFILL MATERIAL BEHIND RCC BOX SHALL HAVE FOLLOWING PROPERTIES $\phi=30^\circ$, $\gamma=2.0 \text{ t/m}^3$
- SELECTED GRANULAR NON PLASTIC MATERIAL SHALL BE USED AS FILL MATERIAL UP TO THE ACTIVE WEDGE OF RANKING SLOPE OF (45+ $\phi/2$) FROM THE BASE OF BOTTOM SLAB. VIBRATORY PLATE COMPACTOR SHALL BE USED FOR COMPACTION, PARALLEL TO THE EXTERNAL WALL IN LAYER BY LAYER.
- THE RCC BOX SHOULD BE CONSTRUCTED FIRST AND THE SIDE FILLING & COMPACTION SHALL BE DONE AS PER MORTH SPECIFICATIONS.
- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH RELEVANT HIGHWAY DRAWING. FRL & CAMBER/SUPER ELEVATION AT PARTICULAR LOCATION SHALL BE VERIFIED WITH THE HIGHWAY DRAWING DISCREPANCY IF ANY IS TO BE IMMEDIATELY BROUGHT TO THE NOTICE OF ENGINEER FOR NECESSARY MODIFICATIONS IN THE DRAWING.
- 100MM DIA WEEP HOLES AT 1000MM L/C BOTH HORIZONTALLY AND VERTICALLY SHALL BE PROVIDED IN STAGGERED MANNER IN VERTICAL DIRECTION AT A SLOPE OF 1:20 AS PER IRC-SP-13-2004 CLAUSE NO. 13.5.1
- DOWEL BAR SHALL BE PROVIDED TO ACCOMMODATE PARAPET WALL.
- MISCELLANEOUS DRG. OF RETAINING WALL SHALL BE PROVIDED SEPARATELY.
- REQUIRED SBC SHALL BE VERIFIED AT SITE BEFORE EXECUTION OF WORK.
- EXPANSION GAP SHALL BE FILLED WITH COMPRESSIBLE FIBER BOARD.

ABBREVIATIONS

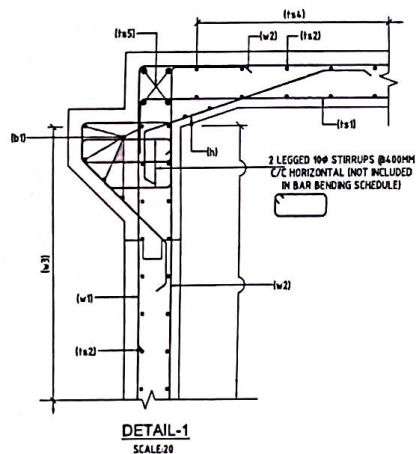
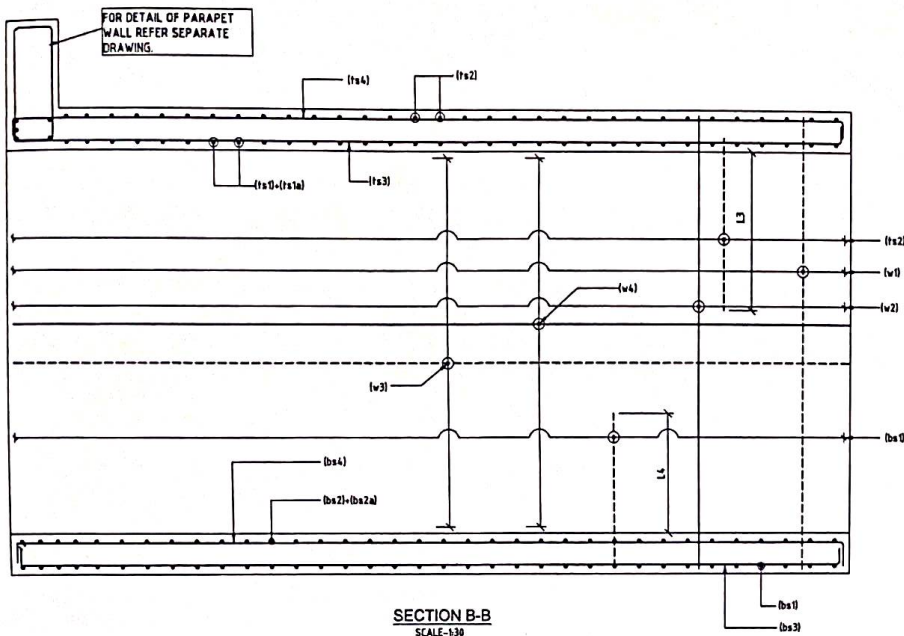
- CL - CENTER LINE
- FRL - FINISHED ROAD LEVEL
- CRL - CROSS ROAD LEVEL
- NGL - NATURAL GROUND LEVEL
- LHS - LEFT HAND SIDE
- RHS - RIGHT HAND SIDE
- EXP - EXPANSION GAP
- P.S - PAVED SHOULDER
- E.S - EARTHEN SHOULDER
- PCC - PLAIN CEMENT CONCRETE
- THK - THICKNESS
- TYP - TYPICAL
- RTL - RAFT TOP LEVEL

LEGENDS:-

- SELECTED FILL
- PCC
- COMPACTED EARTH

SCHEDULE:

SL NO	SCHEDULE CHAINAGE	DESIGN CHAINAGE AS PER STR.	FRL		CAMBER/SUPER ELEVATION (%)		CROSS ROAD LEVEL (m)	RAFT TOP LEVEL (m)	CUSHION (m)	SBC REG IN T/M
			LHS	RHS	LHS	RHS				
1	47+287	47+286	158.160	158.160	-2.50%	-2.50%	152.896	152.549	8.5 TO 1.0M	15



REINFORCEMENT DETAIL

BAR MARK	BAR SHAPE	DIAMETER	SPACING NOS.	REMARKS
rs1	[Symbol]	16	150	
rs1a	[Symbol]	10	150	
rs2	[Symbol]	12	150	
rs3	[Symbol]	10	150	
rs4	[Symbol]	10	150	
rs5	[Symbol]	16	04	02 LOCATIONS
rs6	[Symbol]	N.A		
rs7	[Symbol]	N.A		
rs8	[Symbol]	10	(LxT) 150x150	
ws1	[Symbol]	16	150	
ws1a	[Symbol]	N.A		
ws2	[Symbol]	12	150	
ws2a	[Symbol]	N.A		
ws3	[Symbol]	10	150	
ws4	[Symbol]	10	150	
ws5	[Symbol]	N.A		
ws6	[Symbol]	N.A		
bs1	[Symbol]	12	150	
bs2	[Symbol]	16	150	
bs2a	[Symbol]	10	150	
bs3	[Symbol]	10	150	
bs4	[Symbol]	10	150	
bs5	[Symbol]	16	04	02 LOCATIONS
bs6	[Symbol]	N.A		
bs7	[Symbol]	10	(LxT) 150x150	
h1	[Symbol]	10	150	
h2	[Symbol]	10	150	
b1	[Symbol]	10	05nos.	02 LOCATIONS
b1a	[Symbol]	12	150	
b2	[Symbol]	12	360	03 LOCATIONS

BAR CURTAILMENT SCHEDULE TYPE

L1	900mm
L2	900mm
L3	900mm
L4	900mm
L5	450mm
L6	450mm
L7	900mm
L8	900mm
L9	900mm

NADGL NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.	EPC CONTRACTOR KAMAC ENGINEERS PVT. LTD. F0201, CITY CENTER OFFICE BLOCK, 2ND FLOOR, MATIGARA 734010	AUTHORITY'S ENGINEER ALMONDZ GLOBAL INFRA CONSULTANT LIMITED IN JV WITH AYOLEEZA CONSULTANT PRIVATE LIMITED. C/O JAYANTA SAIKIA, SARBAJANIN NAMGHAR, BORBIL NO.2, DIGBOI, TINSUKIA, ASSAM-786171	PROOF CONSULTANT: CREATIVE ENGINEERING SERVICES OFFICE NO: 620, SIGNATURE GLOBAL MALL, SECTOR-3, VAISHALI, GHAZIABAD, U.P-201010	SAFETY CONSULTANT: DESIGN AID PLOT NO.54, 3rd FLOOR(FRONT), MASOODPUR DAIRY FARM,VASANT KUNJ, NEW DELHI-110070,	DESIGN CONSULTANT: A.V. CONSTRUCTION 1st Floor, WZ-1240, Palam Extension, Bosco Ashram Wall Gali, New Delhi 110045 Winst Infra Solution Pvt. Ltd. OFFICE: P-4, BHANU CORPORATE TOWER, PLOT NO-C-23,SECTOR-13, VASUNDHRA,GAZIABAD, U.P-201012	PROJECT: Widening/Improvement to 2-Lane Lane with Paved Shoulder from km 27+150 (Golai Goan) to km 47+682 (Leda) on Dibrugarh to Leda section with proposed Margherita & Leda 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 DRAWING OF SVUP FOR CH 41+266 DETAILS:- <table border="1"> <tr> <th>Date</th> <th>Drw.</th> <th>Deg.</th> <th>Chk.</th> <th>App.</th> <th>Scale</th> <th>Drawing Status</th> </tr> <tr> <td>FEB 2024</td> <td>A.J</td> <td>U.Y</td> <td>P.S</td> <td></td> <td>AS SHOWN</td> <td>FOR APPROVAL</td> </tr> <tr> <td>Project No.</td> <td colspan="3">Drawing No.</td> <td colspan="3">Rev.</td> </tr> <tr> <td></td> <td colspan="3">AVC/ST/BC/SVUP/41+266/REIN-001</td> <td colspan="3">1 OF 2</td> </tr> <tr> <td></td> <td colspan="3"></td> <td colspan="3">R0</td> </tr> </table>	Date	Drw.	Deg.	Chk.	App.	Scale	Drawing Status	FEB 2024	A.J	U.Y	P.S		AS SHOWN	FOR APPROVAL	Project No.	Drawing No.			Rev.				AVC/ST/BC/SVUP/41+266/REIN-001			1 OF 2							R0		
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