Government of Nepal
Ministry of Urban Development
Department of Urban Development and Building Construction
Regional Urban Development Project
Project Coordination Office
Babarmahal, Kathmandu

DETAIL PROJECT REPORT

for

READINESS ROAD SUBPROJECT

VOLUME – III (TYPICAL DRAWINGS)

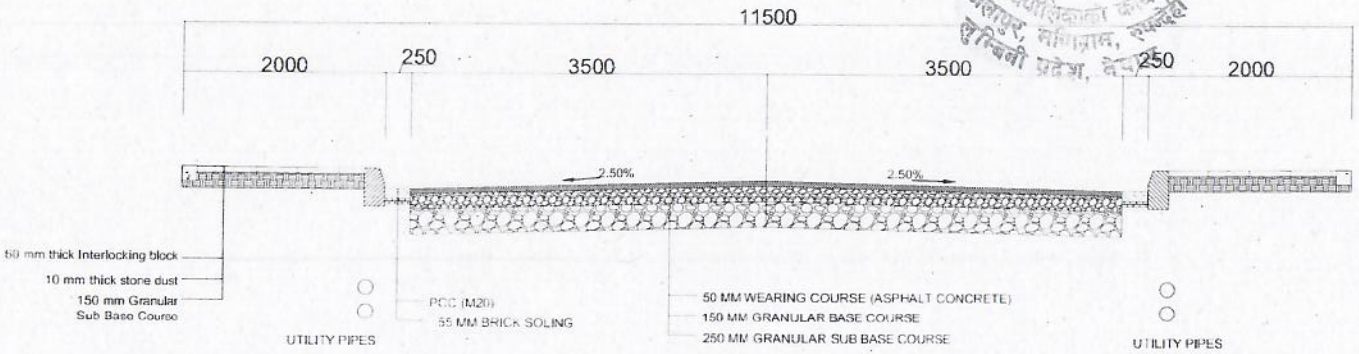
TILOTTAMA URBAN ROADS, TILOTTAMA MUNICIPALITY

CH: 0+000 - 13+560.09 Km

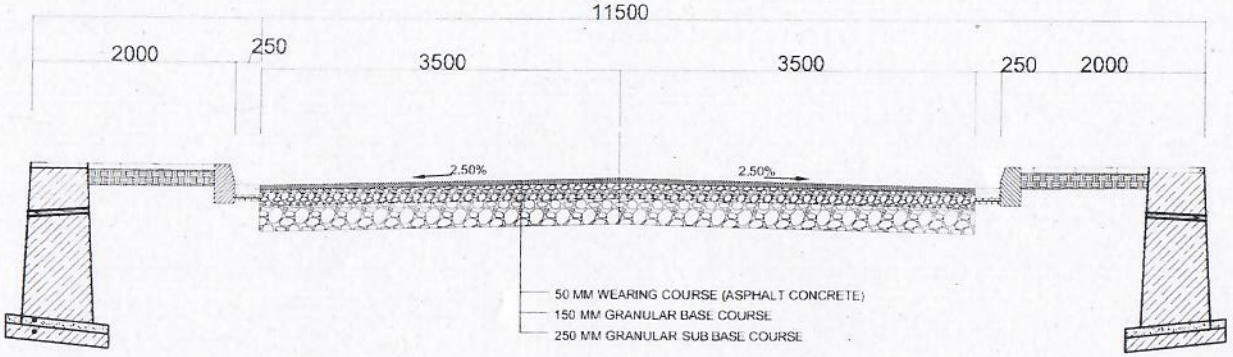
Pre-Feasibility Study, Feasibility Study and Preparation of Detail Project Report
of West Urban Corridor (WUC) Development Project
[Ref. No. RUDP/DUDBC/PDC/1-WC]

Consultant

DOHWA ENGINEERING *in association with* ERMC (P.) Ltd., SILT Consultants (P.) Ltd. and DIGICON (P.) Ltd.

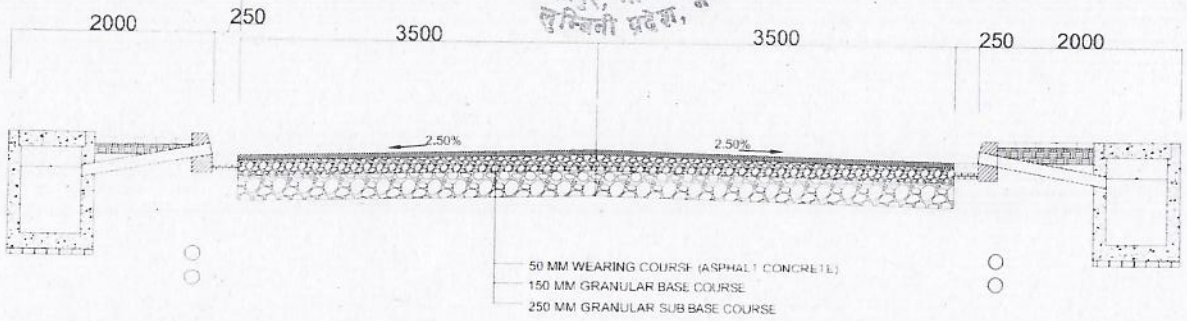


Typical Cross Section of Road (Total width -11.5 m)
Scale - 1:50

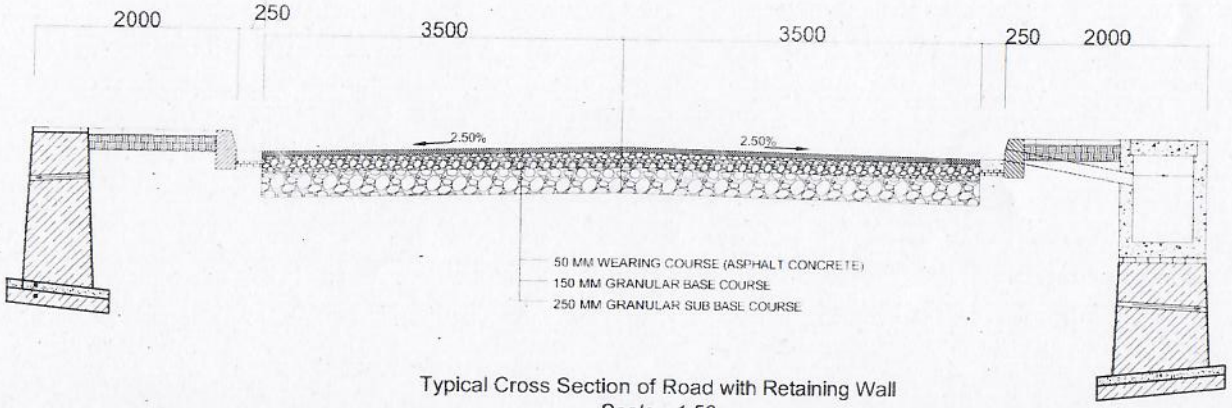


Typical Cross Section of Road with Retaining Wall
Scale - 1:50

Department of Urban Development & Building Construction (DUDBC) **Regional Urban Development Project (RUDP)** Project Coordination Office Babarmahal, Kathmandu, Nepal	**Reviewed & Designed By :** DOHWA Engineering Co. Ltd. in Association with ERMC (P.) Ltd., SILT Consultants (P.) Ltd., and DIGICON (P.) Ltd. Mid- Baneshwor, Kathmandu Tel: 01 - 4560080	**Consultant** Team Leader : YOO CHANGMIN Reviewed By : YAGYA BAHADUR MALLA Drawn By : SHRIJANA SHRESTHA	**Client** Approved By : Checked By :	**Scale** As Shown	TYPICAL CROSS SECTION OF ROAD TILOTTAMA URBAN ROADS TILOTTAMA MUNICIPALITY CH: 0+000 - 23+560.09 Km	REV : DEC 2024 TITLE : TYPICAL DRAWINGS DRG NO : TM/RD/TD/01 SHEET NO : 01

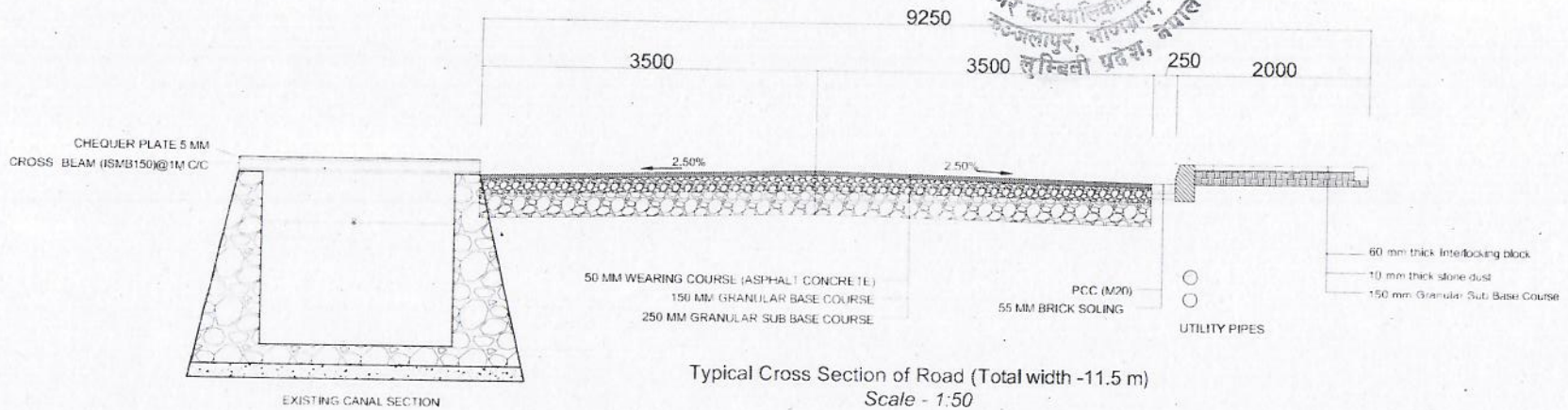


Typical Cross Section of Road with RCC Covered Drain
Scale - 1:50

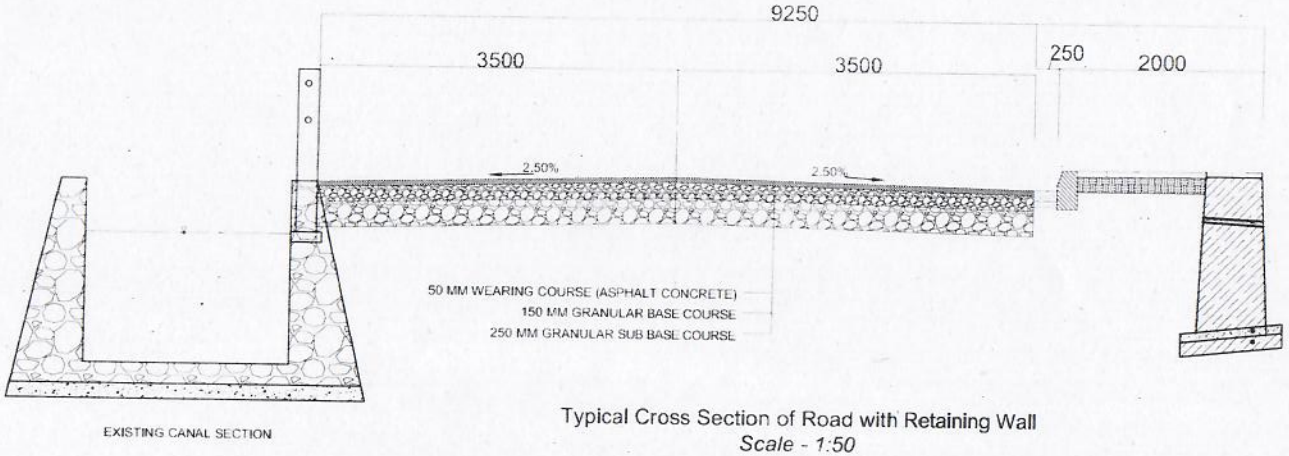


Typical Cross Section of Road with Retaining Wall
Scale - 1:50

Department of Urban Development & Building Construction (DUDBC) **Regional Urban Development Project (RUDP)** Project Coordination Office Babarmahal, Kathmandu, Nepal	**Reviewed & Designed By :** DOHWA Engineering Co. Ltd. in Association with ERMC (P.) Ltd., SILT Consultants (P.) Ltd., and DIGICON (P.) Ltd. Mid- Baneshwor, Kathmandu Tel: 01- 4589393	**Consultant** Team Leader : YOO CHANGMIN Reviewed By : YAGYA BAHADUR MALLA Drawn By : SHRIJANA SHRESTHA	**Client** Approved By : Checked By :	**Scale** As Shown	TYPICAL CROSS SECTION OF ROAD TILOTTAMA URBAN ROADS TILOTTAMA MUNICIPALITY CH: 0+000 - 23+560.09 Km	REV : DEC 2024 TITLE : TYPICAL DRAWINGS DRG NO : TM/RD/TD/02 SHEET NO : 02



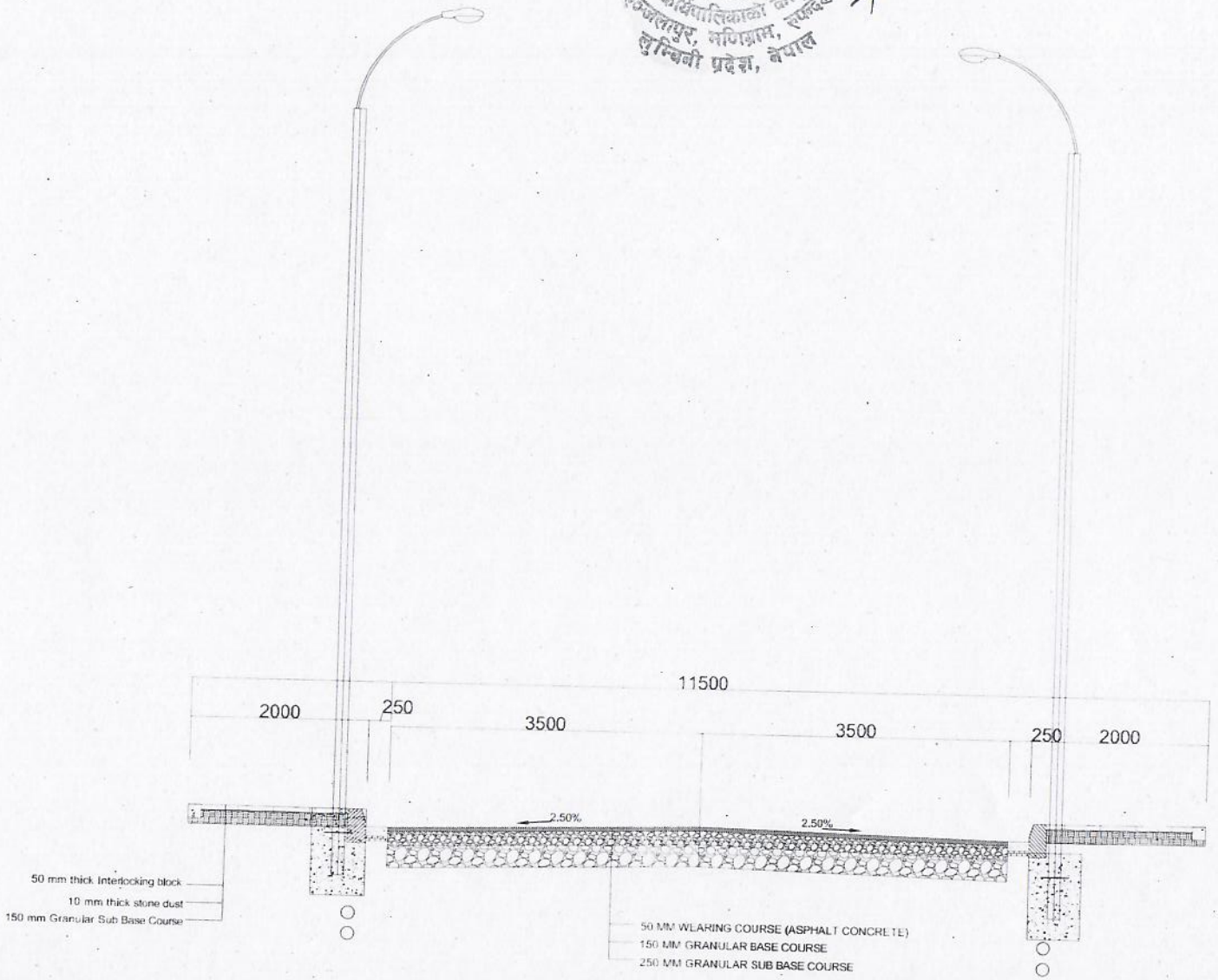
Typical Cross Section of Road (Total width -11.5 m)
Scale - 1:50



Typical Cross Section of Road with Retaining Wall
Scale - 1:50

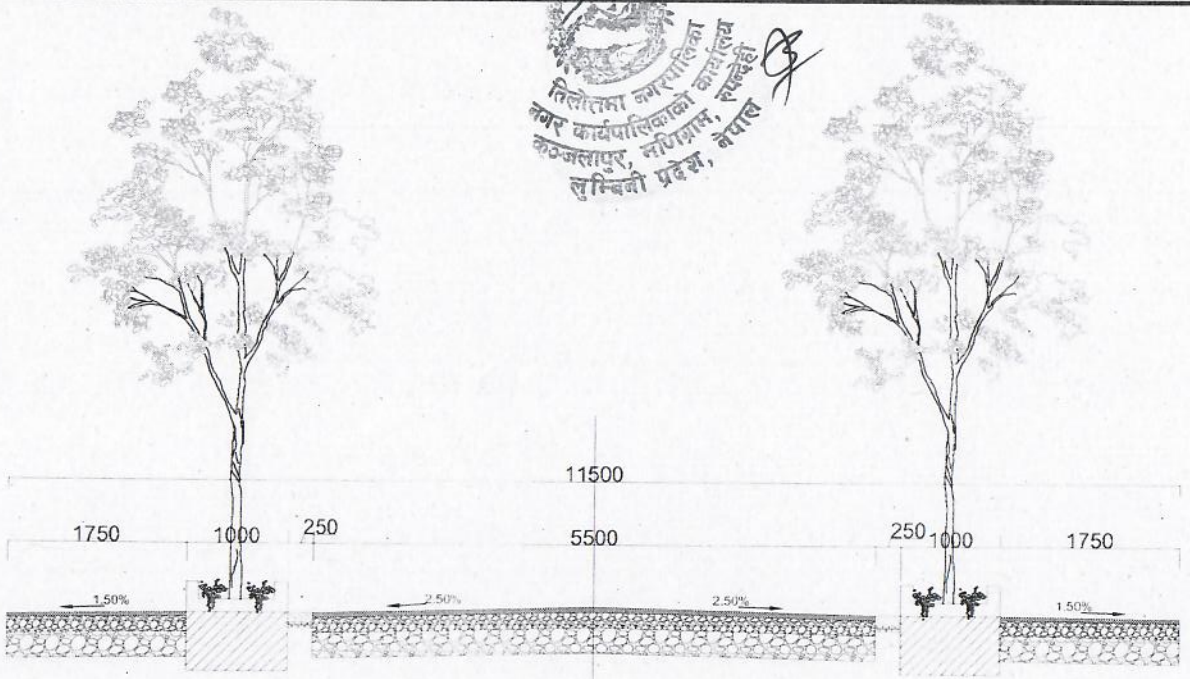
Department of Urban Development & Building Construction (DUDBC) **Regional Urban Development Project (RUDP)** Project Coordination Office Babarmahal, Kathmandu, Nepal	Reviewed & Designed By : DOHWA Engineering Co. Ltd. in Association with ERMC (P.) Ltd., SILT Consultants (P.) Ltd., and DIGICON (P.) Ltd. Mid- Baneshwor, Kathmandu Tel: 01- 4589189	Consultant Team Leader : YOO CHANGMIN Reviewed By : YAGYA BAHADUR MALLA Drawn By : SHRIJANA SHRESTHA	Client Approved By : Checked By :	Scale As Shown	TYPICAL CROSS SECTION OF ROAD TILOTTAMA URBAN ROADS TILOTTAMA MUNICIPALITY CH: 0+000 - 23+560.09 Km	REV : DEC 2024 TITLE : TYPICAL DRAWINGS DRG NO : TM/RD/TD/03 SHEET NO : 03

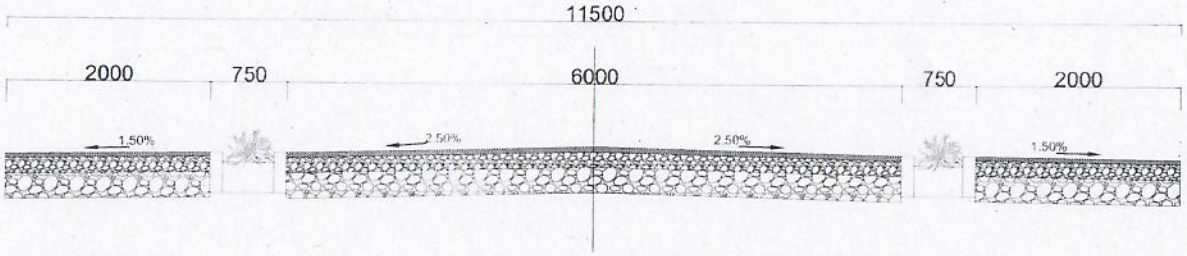
तिलोत्तमा नगरपालिका
नगर कार्यपालिकाको कार्यालय
रुज्जलपुर, मणिग्राम, रुपन्देही
लुम्बिनी प्रदेश, नेपाल



Typical Road Section (11.5 m) with Street Light

Department of Urban Development & Building Construction (DUDBC) Regional Urban Development Project (RUDP) Project Coordination Office Babarmahal, Kathmandu, Nepal	Reviewed & Designed By : DOHWA Engineering Co. Ltd. in Association with ERMC (P.) Ltd., SILT Consultants (P.) Ltd., and DIGICON (P.) Ltd. Mid- Baneshwor, Kathmandu Tel: 01- 4586880	Consultant Team Leader : YOO CHANGMIN Reviewed By : YAGYA BAHADUR MALLA Drawn By : SHRIJANA SHRESTHA	Client Approved By : Checked By :	Scale As Shown	TYPICAL CROSS SECTION OF ROAD TILOTTAMA URBAN ROADS TILOTTAMA MUNICIPALITY CH: 0+000 - 23+560.09 Km	REV : DEC 2024 TITLE : TYPICAL DRAWINGS DRG NO : TM/RD/TD/04 SHEET NO : 04

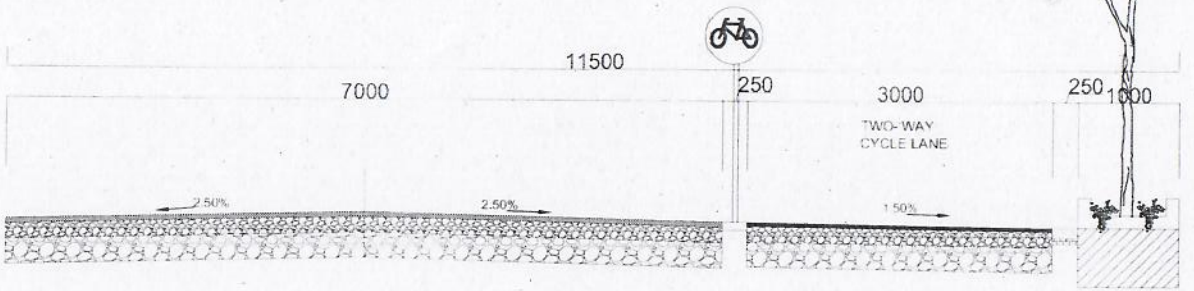


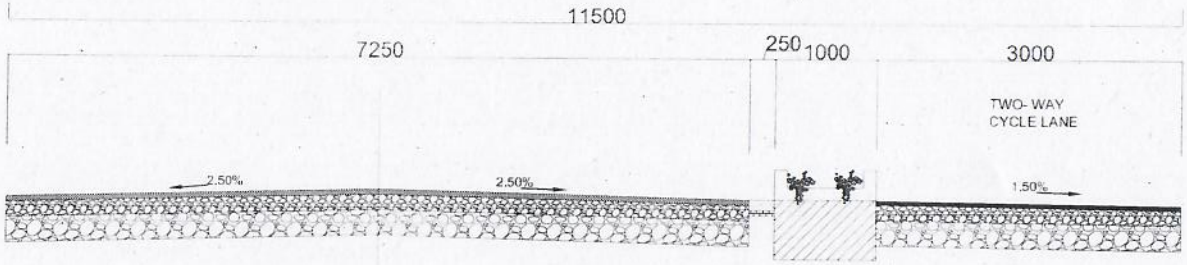


Typical Cross Sections of Road with Verge & Cycle Track

Scale - 1:50

Department of Urban Development & Building Construction (DUDBC) **Regional Urban Development Project (RUDP)** Project Coordination Office Babarmahal, Kathmandu, Nepal	**Reviewed & Designed By :** DOHWA Engineering Co. Ltd. in Association with ERMC (P.) Ltd., SILT Consultants (P.) Ltd., and DIGICON (P.) Ltd. Mid- Baneshwor, Kathmandu Tel: 01- 4589393	**Consultant** Team Leader : YOO CHANGMIN Reviewed By : YAGYA BAHADUR MALLA Drawn By : SHRIJANA SHRESTHA	**Client** Approved By : Checked By :	**Scale** As Shown	TYPICAL CROSS SECTION OF ROAD TILOTTAMA URBAN ROADS TILOTTAMA MUNICIPALITY CH: 0+000 - 23+560.09 Km	REV : DEC 2024 TITLE : TYPICAL DRAWINGS DRG NO : TM/RD/TD/05 SHEET NO : 05





Typical Cross Sections of Road with Verge & Cycle Track

Scale - 1:50

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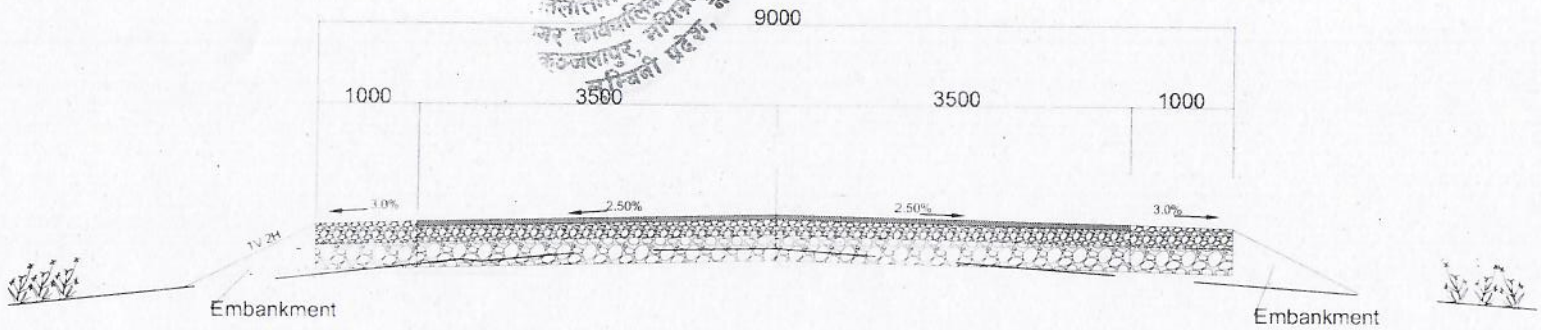
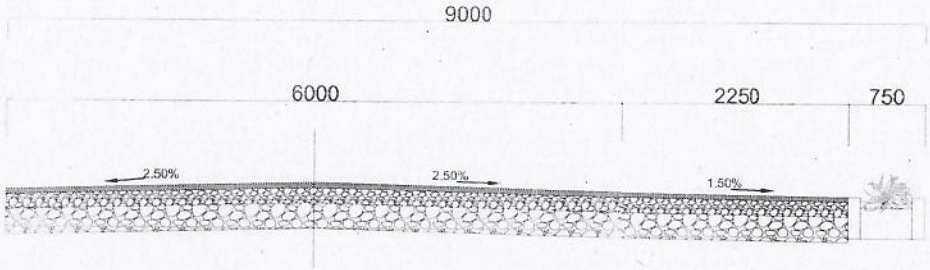
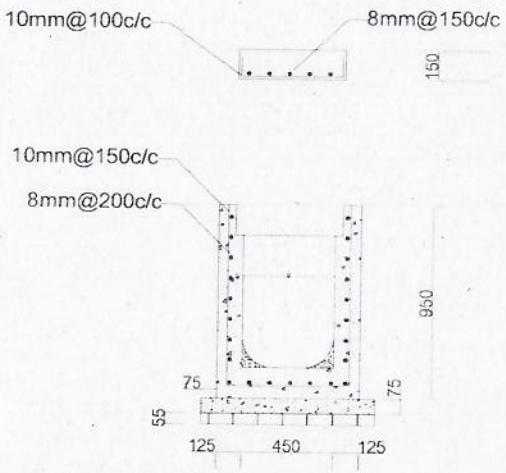


Typical Road Section With Shoulder and Embankment

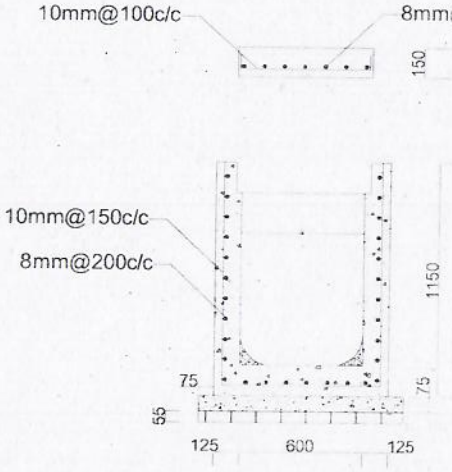


Typical Cross Sections of Road with Verge & Cycle Track
Scale - 1:50

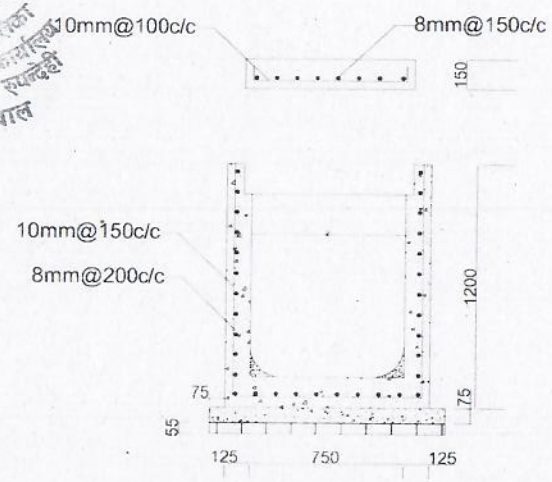
Department of Urban Development & Building Construction (DUDBC) **Regional Urban Development Project (RUDP)** Project Coordination Office Babarmahal, Kathmandu, Nepal	**Reviewed & Designed By :** DOHWA Engineering Co. Ltd. in Association with: ERMC (P.) Ltd., SILT Consultants (P.) Ltd., and DIGICON (P.) Ltd. Mid- Baneshwor, Kathmandu Tel: 01- 4589332	**Consultant** Team Leader : YOO CHANGMIN Reviewed By : YAGYA BAHADUR MALLA Drawn By : SHRIJANA SHRESTHA	**Client** Approved By : Checked By :	**Scale** As Shown	TYPICAL CROSS SECTION OF ROAD TILOTTAMA URBAN ROADS TILOTTAMA MUNICIPALITY CH: 0+000 - 23+560.09 Km	REV : DEC 2024 TITLE : TYPICAL DRAWINGS DRG NO : TM/RD/TD/07 SHEET NO : 07



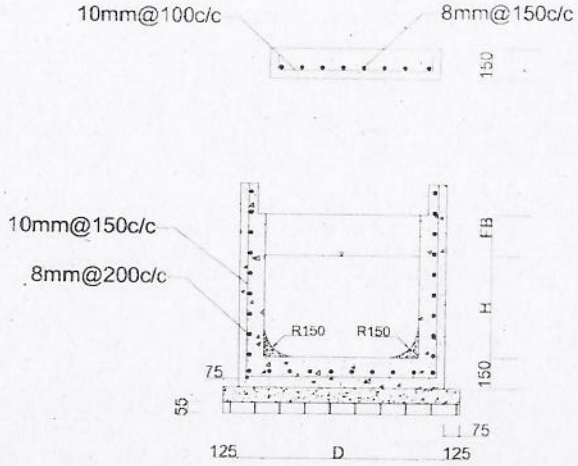
RCC DRAIN - TYPE A
Scale - 1:25

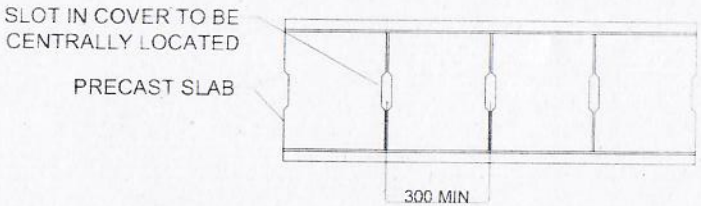


RCC DRAIN - TYPE B
Scale - 1:25



RCC DRAIN - TYPE C
Scale - 1:25





PLAN OF RCC DRAIN WITH PRECAST DRAIN COVER

DRAIN SIZES			
Type	D (mm)	H (mm)	FB (mm)
A	450	450	200
B	600	600	200
C	750	750	200

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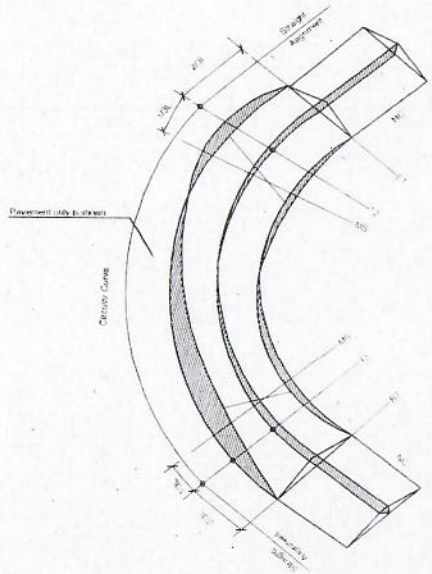
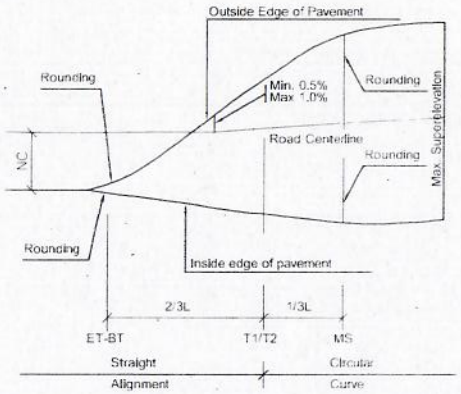
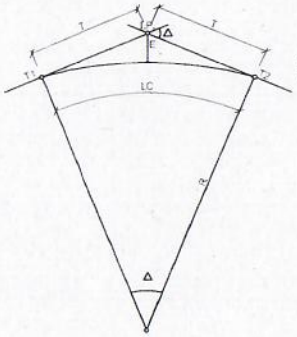


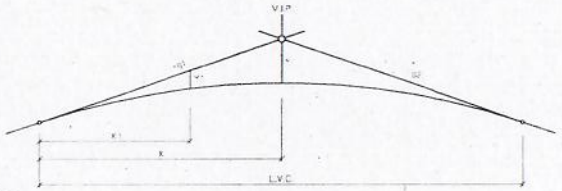
Typical Superelevation



Cross Slope in Curves



Circular Curve
For Horizontal Alignment



Parabolic Curve
For Vertical Alignment

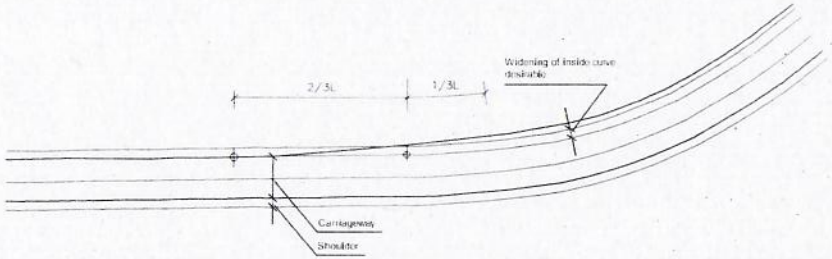
Transition Curve Detail

Transition Length

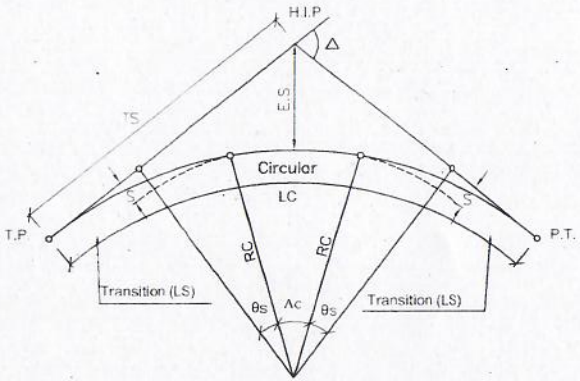
Mountaineous and Steep Terrain

Curve Radius (Meters)	Design Speed in km/h				
	50	40	30	25	20
	Transition Length in Meters				
14				NA	30
20				35	20
25			NA	25	20
30			30	25	15
40		NA	25	20	15
50		40	20	15	15
55		40	20	15	15
70	NA	30	15	15	15
80	55	25	15	15	NR
90	45	25	15	15	
100	45	20	15	15	
125	35	15	15	NR	
150	30	15	15		
170	25	15	NR		
200	20	15			
250	15	15			
300	15	NR			
400	15				
500	NR				

Note:
For Circular horizontal curves the length L of superelevation run-off is based on maximum relative slope between profile of center line and pavement edge of 1.0%.



Pavement Widening on Curves



Elements of Combined Circular and Transition Curve

T.P/P.T = Tangent Point.
H.I.P = Horizontal Intersection Point.
Δ = Total Deviation Angle.
Ac = Deviation and Central Angle of Circular arc.
TS = Deviation Angle of Transition Curve
RC = Radius of Circular Curve.
S = Shift.
θs = Tangent Distance.
ES = Apex Distance.
LS = Length of Transition.
LC = Length of Circular Curve.

I.P = Intersection Point
Δ = Deflection Angle
R = Radius of Curvature
T = Tangent length
E = Distance from I.P. to Circular Curve Measured on the Bisectors
LC = Length of Circular Curve
T_1 = Beginning of Circular Curve
T_2 = End of Circular Curve

$T = R.\ TAN\ \frac{\Delta}{2}$

$E = R.\left(\frac{1}{COS\frac{\Delta}{2}} - 1\right)$

$LC = R.\ \frac{\Pi}{200}.\Delta$

V.I.P. = Vertical Intersection Point.
L.V.C = Length of Vertical Curve.
±g1,g2 = Gradients.
Y,Y1 = Abscissa of the Vertical Curve.
X,X1 = Ordinate of the Vertical Curve.

$Y = X \frac{\pm g_1 - (\pm g_2)}{2LVC}$

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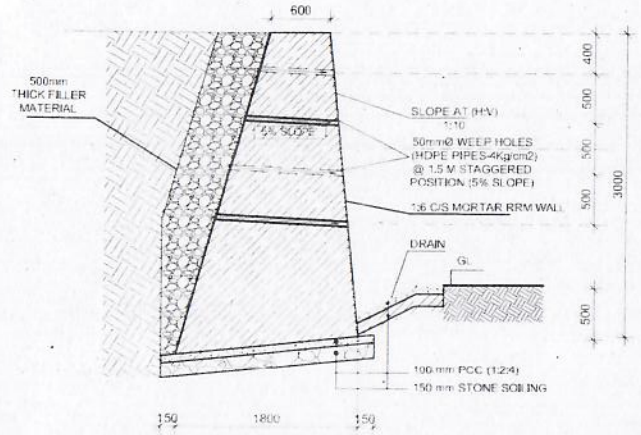
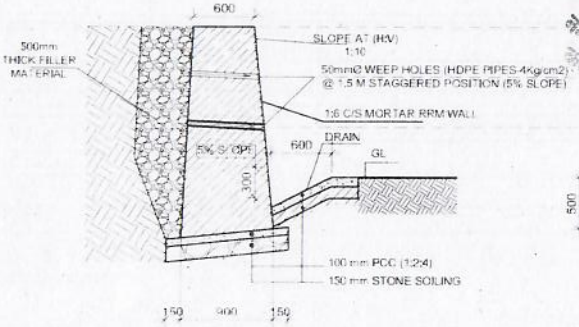
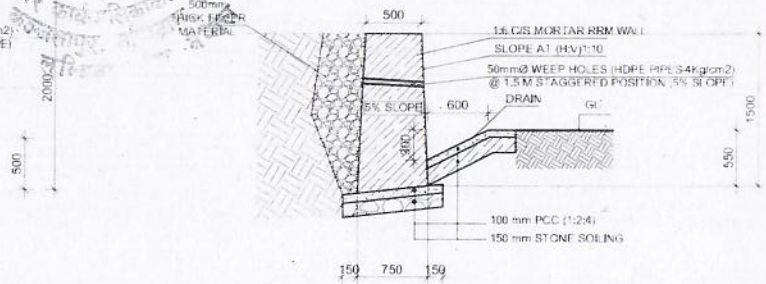


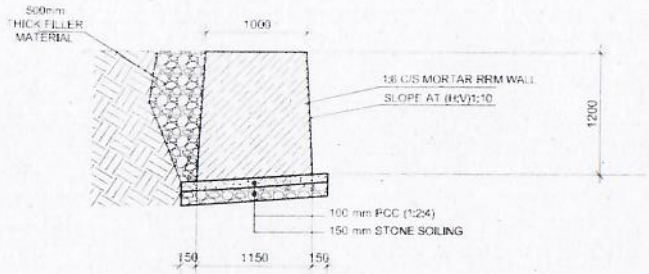
RETAINING WALL DETAIL (HEIGHT - 3.0 m)
NOTE: EXPANSION JOINT @10M-15M
SCALE 1:50



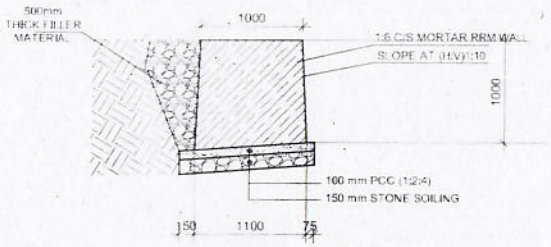
RETAINING WALL DETAIL (HEIGHT - 2.0 m)
NOTE: EXPANSION JOINT @10M-15M
SCALE 1:50



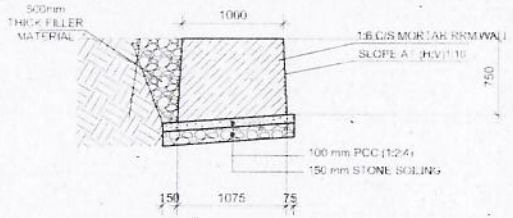
RETAINING WALL DETAIL (HEIGHT - 1.5 m)
NOTE: EXPANSION JOINT @10M-15M
SCALE 1:50



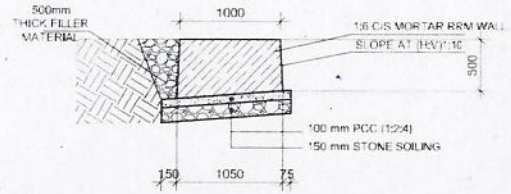
RETAINING WALL DETAIL (HEIGHT - 1.2 m)
NOTE: EXPANSION JOINT @10M-15M
SCALE 1:50



RETAINING WALL DETAIL (HEIGHT - 1.0 m)
NOTE: EXPANSION JOINT @10M-15M
SCALE 1:50

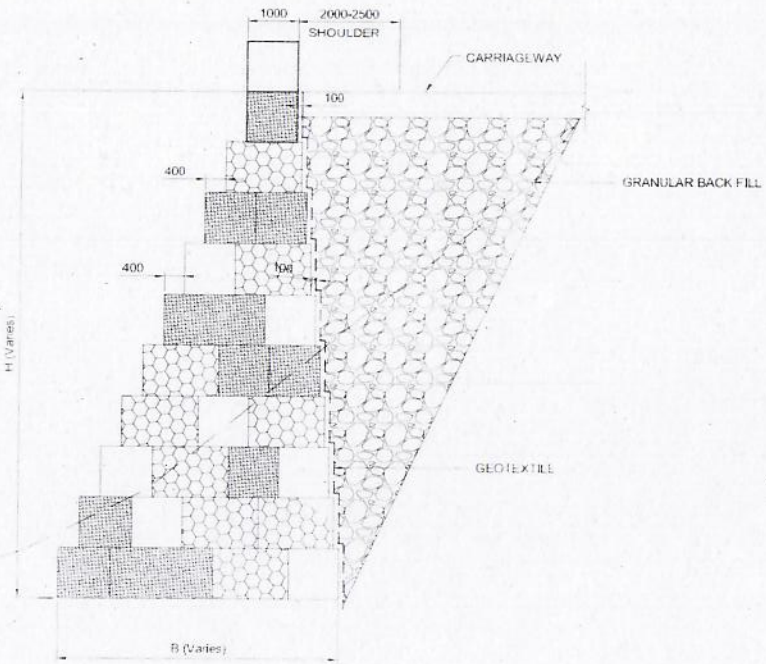


RETAINING WALL DETAIL (HEIGHT - 0.75 m)
NOTE: EXPANSION JOINT @10M-15M
SCALE 1:50



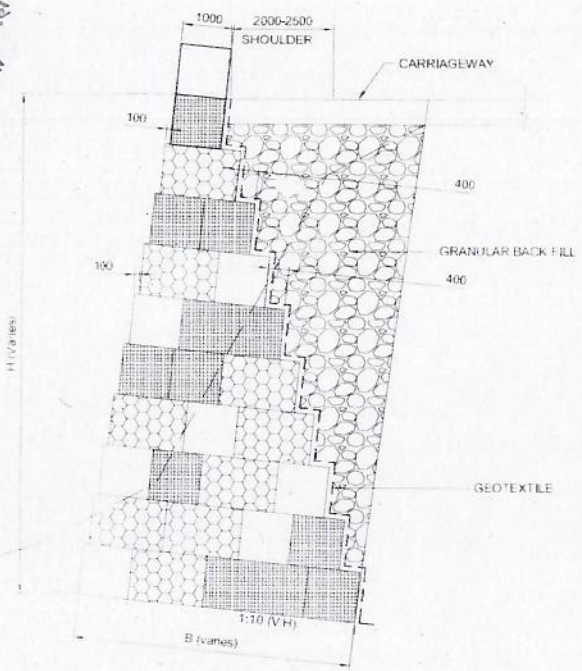
RETAINING WALL DETAIL (HEIGHT - 0.5 m)
NOTE: EXPANSION JOINT @10M-15M
SCALE 1:50

Department of Urban Development & Building Construction (DUDBC) **Regional Urban Development Project (RUDP)** Project Coordination Office Babarmahal, Kathmandu, Nepal	**Reviewed & Designed By :** DOHWA Engineering Co. Ltd. in Association with ERMC (P.) Ltd., SILT Consultants (P.) Ltd., and DIGICON (P.) Ltd. Mid- Baneshwor, Kathmandu Tel: 01-4586393	**Consultant**	**Client**	**Scale**	**TYPICAL RETAINING WALL**	REV : DEC 2024
		Team Leader : YOO CHANGMIN	Approved By :	As Shown	TILOTTAMA URBAN ROADS TILOTTAMA MUNICIPALITY CH: 0+000 - 23+560.09 Km	TITLE : TYPICAL DRAWINGS
		Reviewed By : YAGYA BAHADUR MALLA	Checked By :			DRG NO : TM/RD/TD/10
		Drawn By : SHRIJANA SHRESTHA				SHEET NO : 10



GRAVITY GABION WALL (FRONT BATTER)

SCALE:-1:100



GRAVITY GABION WALL (BACK BATTER)

SCALE:-1:100

- Detail for Gravity Gabion walls (FB-BB)

BASE WIDTHS AND TYPICAL GROUND PRESSURES (T/m²)								
Wall Height (H),m		2	3	4	6	8	10	12
Front Batter	Base Width, (B)	1.5	2.0	2.5	3.5	4.5	5.5	6.5
	Ground pressure (T/m²)	50	70	90	120	150	190	230
Back Batter	Base Width, (B)	1.5	2.0	2.55	3.5	4.5	5.5	6.5
	Ground pressure (T/m²)	70	110	150	220	290	360	420

NOTES:

1. All dimensions are in mm except in the table mentioned.
2. For wall height more than 6.0 m,and backfill slope angle greater than 20 degree. Detailed design with Soil investigation is to be done as directed by the Engineer.
3. If space is available, slopping outside is preferred for valley side of the road.

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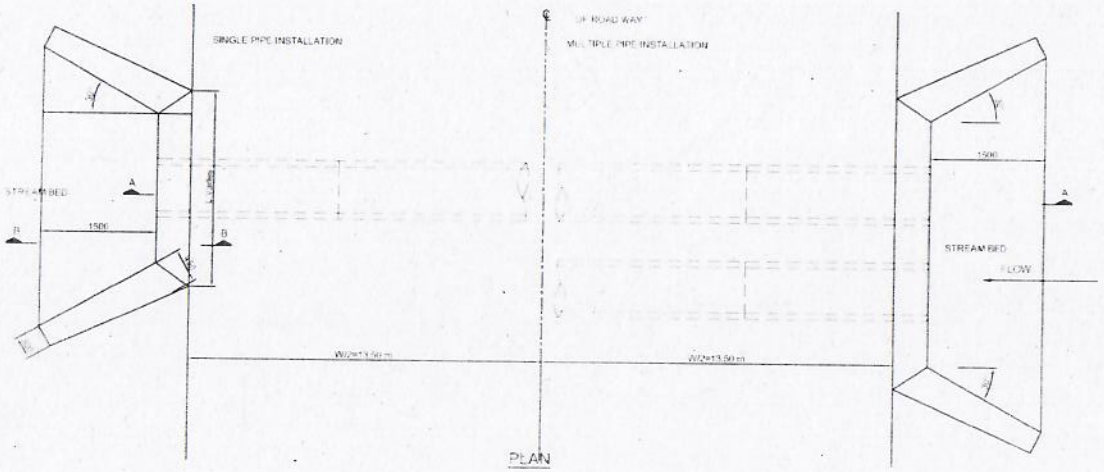
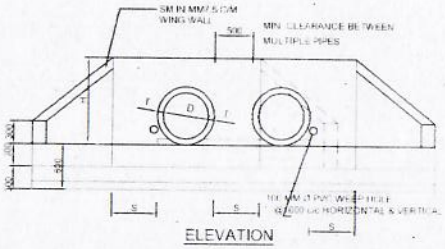
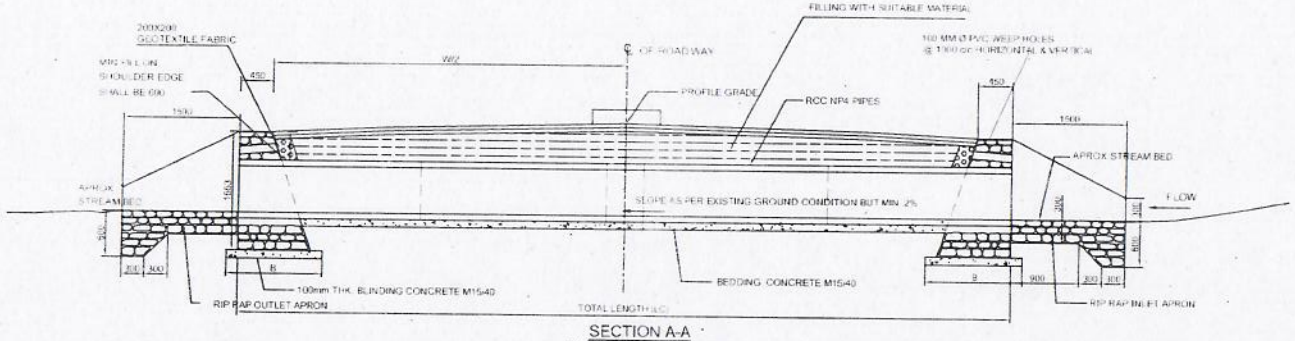


PLAN



ELEVATION

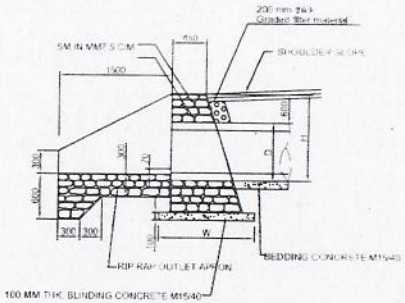
MASONRY END SECTION DIMENSIONS	
J	S
400	400
400	400



SECTION A-A

PIPE CULVERT INSTALLATION

Scale-15:1



SECTION B-B SHOWING END SECTION DETAILS

Scale-15:1

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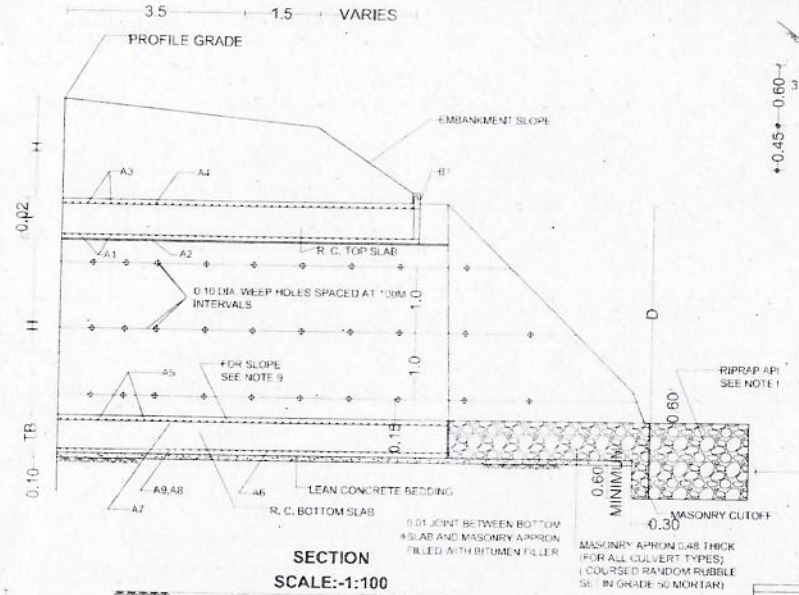

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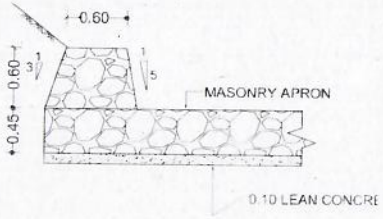
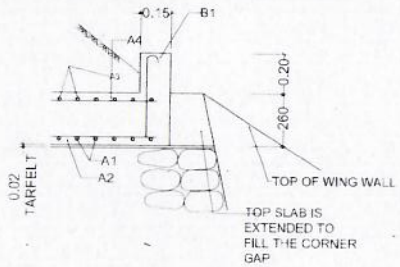
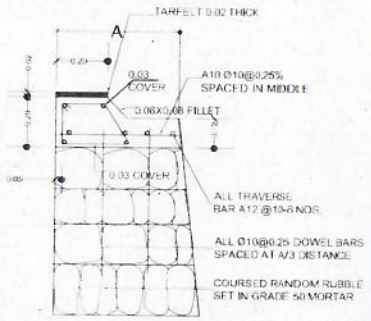


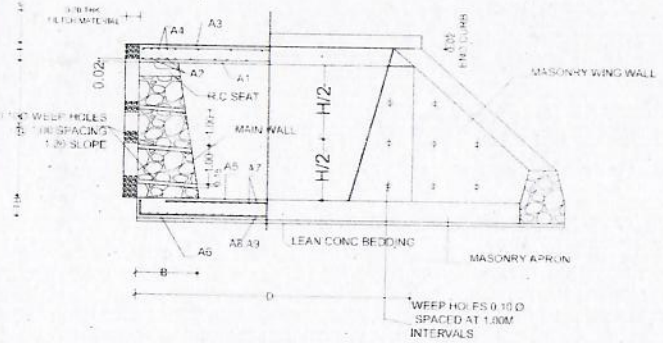
SECTION Y-Y
SCALE:-1:50



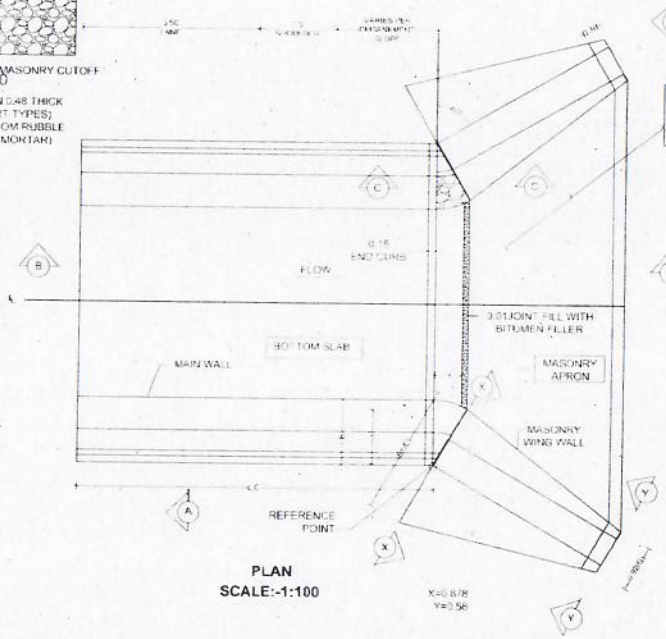
SECTION C-C
SCALE:-1:25



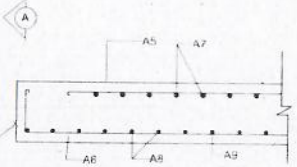
DETAIL AT R.C SEAT
SCALE:-1:20



SECTION A-A
SCALE:-1:75



PLAN
SCALE:-1:100



DETAIL-A
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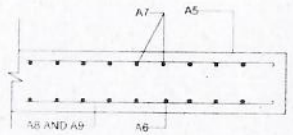
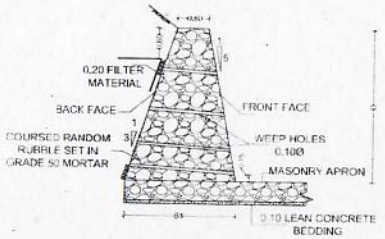


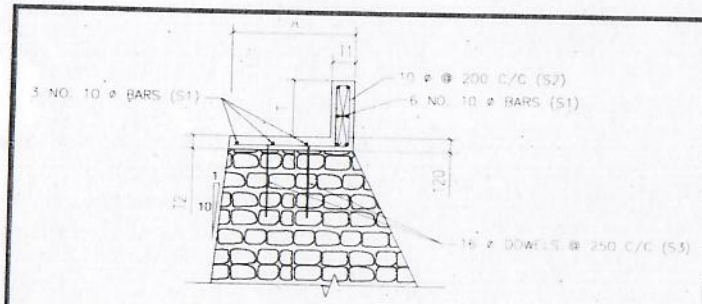
DETAIL-B
SCALE:-1:50

NOTES:
1. FOR GENERAL NOTES SEE DWG NO.001
2. FOR BAR BENDING SCHEDULE SEE DWG NO.013
3. CALCULATED DIMENSIONS AND APPROXIMATE QUANTITIES ARE FOR GUIDANCE ONLY
4. CONCRETE COVER SHALL BE 0.05 EXCEPT STATED OTHERWISE
5. ORD CONCRETE PRESCRIBED MIX 250/ 40 SHALL BE USED
6. ALL DIMENSION ARE IN METER UNLESS OTHERWISE STATED
7. ALL EXPOSED CORNER TO HAVE 25MM CHAMFER
8. BACK FILLING IS TO BE DONE ONLY AFTER THE TOP SLAB HAS BEEN CAST AND ALL FORM OF PROPS REMOVED
9. THE ENGINEER SHALL CHECK AND APPROVED BEFORE CONSTRUCTION BEGINS
10. CLEAR VERTICAL JOINT IS PROVIDED BETWEEN WING WALL AND MAIN WALL
11. RIPRAP APRONS AT OUTLET AND INLET SHALL BE PROVIDED AS PER DWG NO.
12. LENGTH OF CULVERT LC SHALL BE AS PER HIGHWAY DWGS OR AS DIRECTED BY ENGINEERS
13. CULVERT CONSTRUCTION SHALL BE CARRIED OUT IN ACCORDANCE WITH THE SPECIFICATIONS



SECTION X-X
SCALE:-1:100

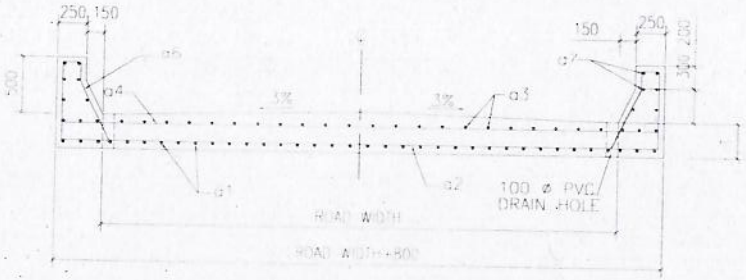
| | | |



ABUTMENT SEAT DETAIL

BAR BENDING SCHEDULE PER ONE LINEAR METRE OF CULVERT (EXCLUDING CURB & ABUTMENT SEAT)

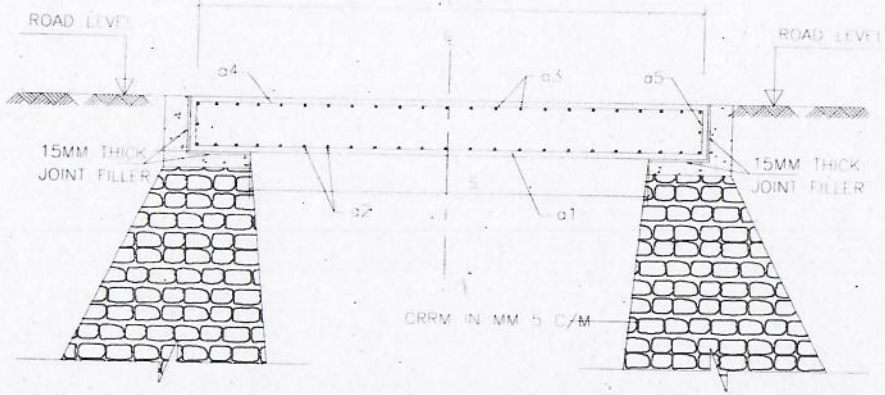
CULVERT TYPE	MARK a1					MARK a2				MARK a3				MARK a4				MARK a5		
	DIA (mm)	SPACING	NO. REQD/ PER METRE	L	Remarks	DIA	SPACING	NO. REQD/ PER METRE	L	DIA	SPACING	NO. REQD/ PER METRE	L	DIA	SPACING	NO. REQD/ PER METRE	L	DIA	NO. REQD/ PER METRE	L
I	12	140	7.14	1.54	Every third bar to be bent up	10	150	6.67	5.10	10	300	3.33	1.54	10	300	3.33	5.10	12	2	5.10
II	12	120	8.33	2.80	Every third bar to be bent up	10	150	6.67	5.10	10	300	3.33	2.80	10	300	3.33	5.10	12	2	5.10
III	16	140	7.14	4.04	Every third bar to be bent up	10	150	6.67	5.10	10	300	3.33	4.04	10	300	3.33	5.10	12	2	5.10
IV	16	110	9.09	5.04	Every third bar to be bent up	10	150	6.67	5.10	10	200	5.00	6.04	10	200	2.00	5.10	12	2	5.10
V	20	140	7.14	6.04	Alternate bar to be bent up	12	170	5.88	5.10	12	300	3.33	6.50	12	300	3.33	5.10	12	2	5.10
VI	20	130	7.69	7.04	Alternate bar to be bent up	12	150	6.67	5.10	12	200	5.00	7.80	12	200	5.00	5.10	12	2	5.10



TRANSVERSE SECTION

BAR BENDING SCHEDULE OF ABUTMENT SEAT PER LINEAR METRE

CULVERT TYPE	MARK s1				MARK s2				MARK s3			
	DIA (mm)	NO.	LENGTH	TOTAL LENGTH	DIA (mm)	NO.	LENGTH	TOTAL LENGTH	DIA (mm)	NO.	LENGTH	TOTAL LENGTH
I	10	9	1.00	9.00	10	5	1.25	6.25	10	8	0.60	4.80
II	10	9	1.00	9.00	10	5	1.26	6.32	10	8	0.60	4.80
III	10	9	1.00	9.00	10	5	1.58	7.91	10	8	0.60	4.80
IV	10	9	1.00	9.00	10	5	1.96	9.79	10	8	0.60	4.80
V	10	9	1.00	9.00	10	5	2.23	11.15	10	8	0.60	4.80
V	10	9	1.00	9.00	10	5	2.27	11.35	10	8	0.60	4.80



BAR BENDING SCHEDULE OF CURB

CULVERT TYPE	MARK a6				MARK a7			
	DIA (mm)	NO.	LENGTH	TOTAL LENGTH	DIA (mm)	NO.	LENGTH	TOTAL LENGTH
I	10	22	1.74	38.17	10	12	1.96	23.52
II	10	36	1.74	62.46	10	12	3.22	38.64
III	10	48	1.74	83.28	10	12	4.46	53.52
IV	10	56	1.74	97.16	10	12	5.44	65.28
V	10	70	1.74	121.45	10	12	6.90	82.80
VI	10	80	1.74	39.20	10	12	7.70	92.40

NOTES:

1. TMT BARS having characteristic strength 500 N/mm should be used.
2. All the dimensions are in millimetres except the dimensions in table.

SCALE (m)

0 1.0 2.0

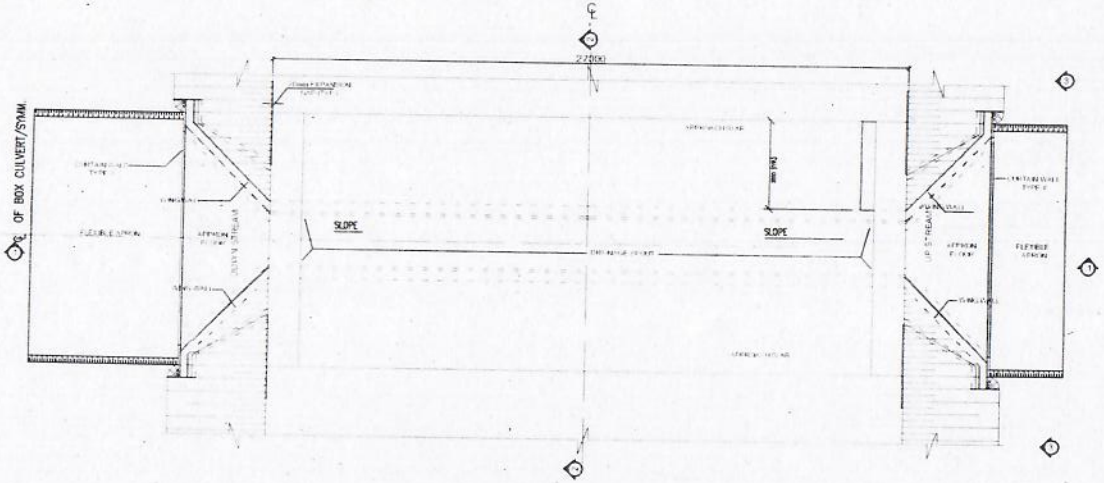
Department of Urban Development & Building Construction (DUDBC)
Regional Urban Development Project (RUDP)
Project Coordination Office
Babarmahal, Kathmandu, Nepal

Reviewed & Designed By :
DOHWA Engineering Co. Ltd.
in Association with
ERMC (P.) Ltd., SILT Consultants (P.) Ltd., and DIGICON (P.) Ltd.
Maa Baneshwor, Kathmandu
Tel: 01-4580302

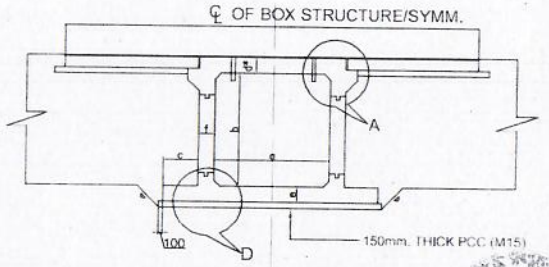
Consultant	Client	Scale
Team Leader : YOO CHANGMIN	Approved By :	As Shown
Reviewed By : YAGYA BAHADUR MALLA		
Drawn By : SHRIJANA SHRESTHA	Checked By :	

Slab Culvert No Fill Reinforcement
TILOTTAMA URBAN ROADS
TILOTTAMA MUNICIPALITY
CH: 0+000 - 23+560.09 Km

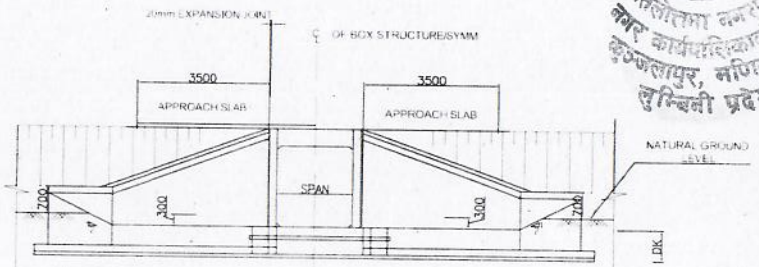
REV	: DEC 2024
TITLE	: TYPICAL DRAWINGS
DRG NO	: SM/RD/TD/14
SHEET NO	: 14



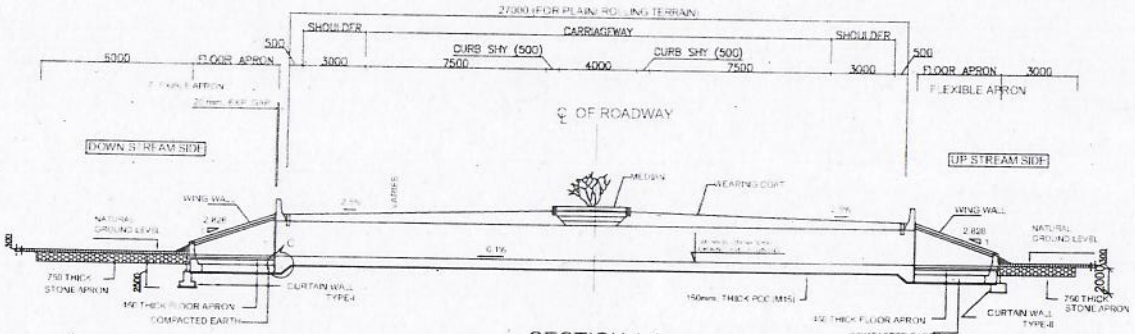
PLAN AT ROAD LEVEL



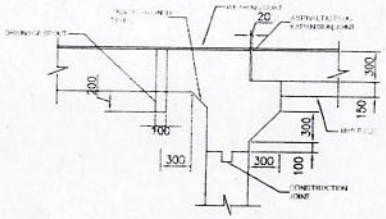
SECTION 2-2



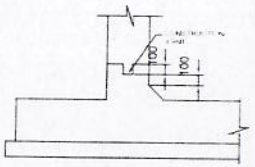
SECTION 3 -3



SECTION 1-1



DETAIL - A



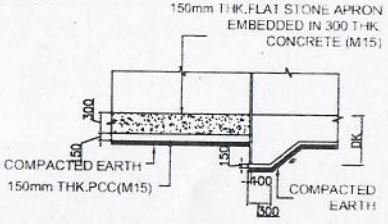
DETAIL - D

TABLE SHOWING SALIENT DIMENSIONS

BOX CELL DESIGNATION	a (mm)	b (mm)	c (mm)	d (mm)	e (mm)	f (mm)
2m x 2m	2000	2000	500	350	380	300
3m x 3m	3000	3000	900	420	420	420
6m x 5m	6000	5000	1100	680	750	750

NOTES:

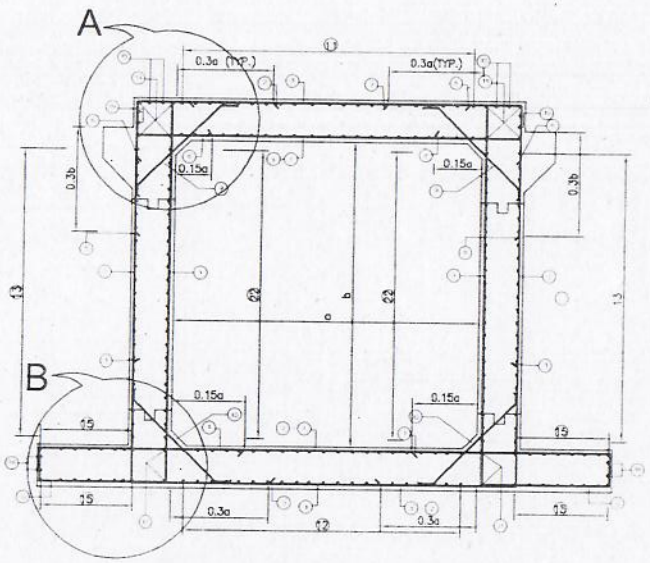
- All dimensions are in millimeters unless otherwise noted. Only written dimensions are to be followed.
- Soft and loose patches in the bearing area shall be replaced by compacted granular fills with layers not exceeding 300mm.
- Net bearing capacity for the soil shall not be less than 15 T/m2.
- 'DK' is depth of key at base slab. 'DK' shall be 1200mm upto base slab thickness of 900mm. For base slab thickness greater than 900mm, 'DK' shall be e+300mm, where 'e' is the base slab thickness.
- Concrete shall be design mix and shall have minimum 28 days characteristics strength of M25 for box structure. Reinforcing steel shall be High Yield Strength Deformed bars of Fe500 conforming to IS:1786



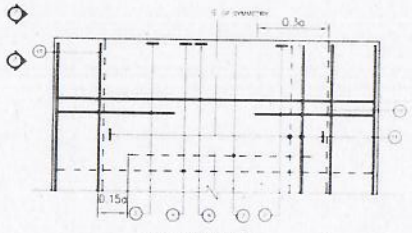
DETAIL -C

Department of Urban Development & Building Construction (DUDBC) Regional Urban Development Project (RUDP) Project Coordination Office Babarmahal, Kathmandu, Nepal	Reviewed & Designed By : DOHWA Engineering Co. Ltd. in Association with ERMC (P.) Ltd., SILT Consultants (P.) Ltd., and DIGICON (P.) Ltd. Mid- Baneshwor, Kathmandu Tel: 01- 4589300	Consultant Team Leader : YOO CHANGMIN Reviewed By : YAGYA BAHADUR MALLA Drawn By : SHRIJANA SHRESTHA	Client Approved By : Checked By :	Scale As Shown	SINGLE CELL BOX CULVERT W/O CUSHION TILOTTAMA URBAN ROADS TILOTTAMA MUNICIPALITY CH: 0+000 - 23+560.09 Km

REV : DEC 2024
TITLE : TYPICAL DRAWINGS
DRG NO : SM/RD/TD/15
SHEET NO : 15

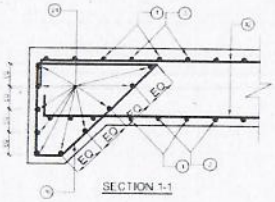


REINFORCEMENT DETAILS OF SINGLE CELL BOX CULVERT

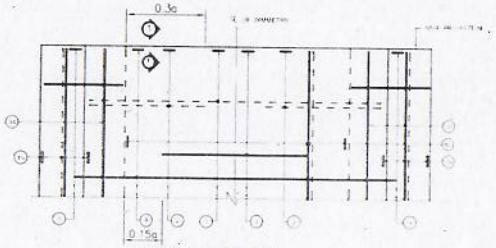


TOP SLAB R/F PLAN

BAR MARK (5) (19) KERB, BRACKET & HAUNCH LINES NOT SHOWN IN PLAN



SECTION 1-1



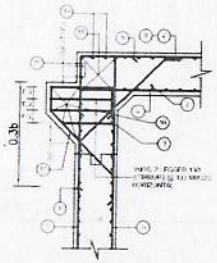
BOTTOM SLAB R/F PLAN

(HAUNCH LINES NOT SHOWN IN PLAN)

LEGEND:

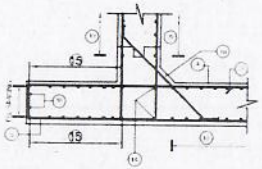
TOP FACE BARS/ OUTER FACE BARS

BOTTOM FACE BARS/ INNER FACE BARS

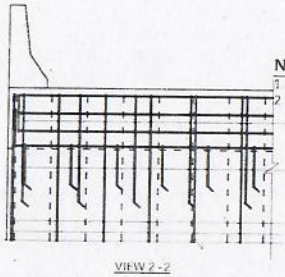


DETAIL A

(SCALE 1:40)



DETAIL B



VIEW 2-2

(HAUNCH LINES NOT SHOWN IN PLAN)

NOTES:

1. Minimum clear cover to any reinforcing including stirrups shall be 50mm unless otherwise noted
2. Construction Joints:
   a. The location and provision of construction joint shall be approved by Engineer-in-charge. In the drawings the construction joints are shown parallel to the direction of water flow. The concreting operation shall be carried out continuous upto the construction joints.
   b. The concrete surface at the joint shall be brushed with a stiff brush after casting while the concrete is still fresh, and it has only slightly hardened.
   c. Before new concrete is poured the surface of old concrete shall be prepared as under:
      - For hardened concrete, the surface shall be thoroughly cleaned to remove debris/laitance and made rough so that ¼ of the size of the aggregate is exposed.
      - For partially hardened concrete, the surface shall be treated with wire brush followed by an air jet.
      - The old surface shall be soaked with water without leaving puddles immediately, before starting concreting to prevent the absorption of water for new concrete.
   d. New concrete shall be thoroughly compacted in the region of the joints
3. Welding of reinforcement bars shall not be permitted.
4. Minimum lap length of reinforcement shall be decided as per the reinforcement arrangement based on IRC:21-2000. Not more than 50% of reinforcement shall be lapped at any one location.
5. Bending of reinforcement bars shall be as per IS: 2502.

Department of Urban Development & Building Construction (DUDBC) **Regional Urban Development Project (RUDP)** Project Coordination Office Babarmahal, Kathmandu, Nepal	**Reviewed & Designed By :** DOHWA Engineering Co. Ltd in Association with ERMC (P.) Ltd., SILT Consultants (P.) Ltd. and DIGICON (P.) Ltd. Mid- Baneshwor, Kathmandu Tel: 01- 4569100	**Consultant**	**Client**	**Scale**	SINGLE CELL BOX CULVERT W/O CUSHION TILOTTAMA URBAN ROADS TILOTTAMA MUNICIPALITY CH: 0+000 - 23+560.09 Km	REV : DEC 2024
		Team Leader : YOO CHANGMIN	Approved By :	As Shown		TITLE : TYPICAL DRAWINGS
		Reviewed By : YAGYA BAHADUR MALLA				DRG NO : SM/RD/TD/16
		Drawn By : SHRIJANA SHRESTHA	Checked By :			SHEET NO : 16

BAR SCHEDULE FOR BOX CULVERT 2X2 (WITHOUT CUSHION) PER M LENGTH

BAR MARK	DESCRIPTION OF BARS	BAR DIA (mm)	SPACING (mm)	M1 (mm)	M2 (mm)	LENGTH (mm)	NO. OF BARS	TOTAL LENGTH (m)	UNIT WEIGHT (kg/m)	TOTAL WEIGHT (kg)
1		16	250	930	2500	4326	4	17.30	1.58	27.33
2		16	250	850	2650	4275	8	34.20	1.58	54.00
3		8	0	0	0	0	0	0.00	0.395	0.00
4		16	250	240	5100	5405	4	21.62	1.58	34.15
5		16	250	2650	700	5446	8	43.57	1.58	68.82
6		16	250	240	2500	2944	4	11.77	1.58	18.59
7		8	0	0	0	0	0	0.00	0.395	0.00
8		16	250	900	2500	4296	4	17.18	1.58	27.14
9		16	250	280	840	2613	8	20.90	1.58	33.02
10		12	250	290	952	2914	8	23.31	0.889	20.72
11		16	250	225	680	1450	4	5.80	1.58	9.16
12		16	250	140	600	380	4	1.52	1.58	2.40
13		16	250	100	600	320	8	2.56	1.58	4.04
14		16		140	600	320	2	0.64	1.58	1.01
15		16	250	140	600	380	2	0.76	1.58	1.20
16		8		600	0	600	8	4.80	0.395	1.90
17		12	250	506	264	2274	4	9.10	0.889	8.09
18		16		140	600	320	4	1.28	1.58	2.02
19		16		140	600	320	4	1.28	1.58	2.02
20		16	250	100	1000	2207	16	35.31	1.58	55.80
21		16		140	5500	5720	20	114.40	1.58	180.7
22		16	250	140	600	320	4	1.28	1.58	2.02
								TOTAL WEIGHT=		555.4

BAR SCHEDULE FOR BOX CULVERT 3X3 (WITHOUT CUSHION) PER M LENGTH

BAR MARK	DESCRIPTION OF BARS	BAR DIA (mm)	SPACING (mm)	M1 (mm)	M2 (mm)	LENGTH (mm)	NO. OF BARS	TOTAL LENGTH (m)	UNIT WEIGHT (kg/m)	TOTAL WEIGHT (kg)
1		16	250	270	3150	6246	6	[illegible]	1.58	23.7
2		16	250	270	3150	5625	2	[illegible]	1.58	6.39
3		12	250	2400		2400	5	12.00	0.889	9.33
4		16	250	320	3500	6125	6	[illegible]	1.58	[illegible]
5		12	500	3740	220	5798	6	[illegible]	0.889	5.15
6		16	250	240	3150	6205	6	[illegible]	1.58	[illegible]
7		8	0	0	0	0	0	0.00	0.395	0.00
8		16	250	270	3150	6246	6	[illegible]	1.58	[illegible]
9		16	250	1200	56	[illegible]	[illegible]	[illegible]	1.58	[illegible]
10		16	250	200	56	520	2	[illegible]	1.58	[illegible]
11		16	250	240	600	420	30	[illegible]	1.58	[illegible]
12		12	250	240	600	420	30	[illegible]	0.889	[illegible]
13		16	250	240	600	420	30	[illegible]	1.58	[illegible]
14		16		100	600	320	2	[illegible]	1.58	[illegible]
15		16	250	240	600	420	2	[illegible]	1.58	[illegible]
16		12		600	0	600	2	[illegible]	0.889	[illegible]
17		12	250	506	264	2274	2	[illegible]	0.889	[illegible]
18		16		140	600	320	4	[illegible]	1.58	[illegible]
19		16		140	600	320	4	[illegible]	1.58	[illegible]
20		16	250	100	1000	[illegible]	16	[illegible]	1.58	[illegible]
21		16		140	5500	5620	20	[illegible]	1.58	[illegible]
22		16	250	140	600	420	24	[illegible]	1.58	[illegible]
								TOTAL WEIGHT		[illegible]

BAR SCHEDULE FOR BOX CULVERT 6X5 (WITHOUT CUSHION) PER M LENGTH

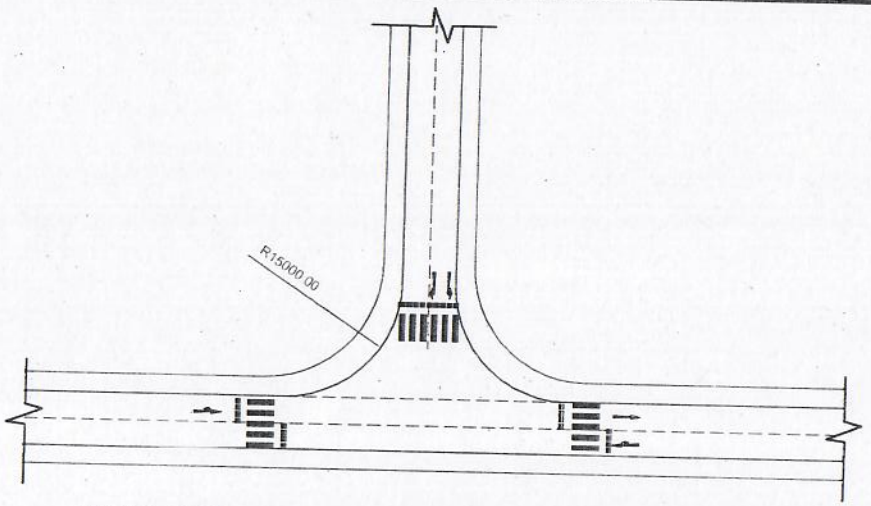
BAR MARK	DESCRIPTION OF BARS	BAR DIA (mm)	SPACING (mm)	M1 (mm)	M2 (mm)	LENGTH (mm)	NO. OF BARS	TOTAL LENGTH (m)	UNIT WEIGHT (kg/m)	TOTAL WEIGHT (kg)
1		20	200	2200	1400	[illegible]	8	[illegible]	2.466	[illegible]
2		20	200	2500	6350	26	2	[illegible]	2.466	[illegible]
3		8	200	4200	0	4200	5	21.00	0.395	[illegible]
4		20	200	650	9600	9651	6	[illegible]	2.466	[illegible]
5		2	25	6350	750	8-6	[illegible]	[illegible]	0.889	[illegible]
6		8	200	240	1400	1665	8	[illegible]	0.395	[illegible]
7		2	200	4200	0	4200	4	[illegible]	0.889	[illegible]
8		8	200	230	1400	1626	8	[illegible]	0.395	[illegible]
9		8	200	200	995	2546	2	[illegible]	0.395	[illegible]
10		8	200	200	2042	2567	2	[illegible]	0.395	[illegible]
11		8	50	590	1600	1760	4	[illegible]	0.395	[illegible]
12		2	50	570	1600	1750	4	[illegible]	0.889	[illegible]
13		2	50	570	1600	1750	66	[illegible]	0.889	[illegible]
14		8		140	1600	1520	2	[illegible]	0.395	[illegible]
15		8	50	570	1600	1750	34	[illegible]	0.395	[illegible]
16		2		500	0	600	4	[illegible]	0.889	[illegible]
17		2	200	[illegible]	102	2672	2	[illegible]	0.889	[illegible]
18		8		140	1600	1520	4	[illegible]	0.395	[illegible]
19		8		140	1600	1520	4	[illegible]	0.395	[illegible]
20		8	50	100	5550	[illegible]	16	[illegible]	0.395	[illegible]
21		8		140	5600	5660	20	[illegible]	0.395	[illegible]
22		8	50	570	1600	1750	24	[illegible]	0.395	[illegible]
								TOTAL WEIGHT		[illegible]

NOTES:

1. Quantity of steel does not include 5% extra for wastage and laps.
2. Joint or lapping of bars shall be suitably staggered as per IRC:21-2000.
3. The bar list does not include the 10ϕ stirrups on the notch where the approach slab rest on culvert.

Department of Urban Development & Building Construction (DUDBC) **Regional Urban Development Project (RUDP)** Project Coordination Office Babarmahal, Kathmandu, Nepal	**Reviewed & Designed By :** DOHWA Engineering Co. Ltd. in Association with ERMC (P.) Ltd., SILT Consultants (P.) Ltd., and DIGICON (P.) Ltd. Ma-Baneshwor, Kathmandu Tel: 01-4589393	**Consultant** Team Leader : YOO CHANGMIN Reviewed By : YAGYA BAHADUR MALLA Drawn By : SHRIJANA SHRESTHA	**Client** Approved By : Checked By :	**Scale** As Shown	SINGLE CELL BOX CULVERT W/O CUSHION TILOTTAMA URBAN ROADS TILOTTAMA MUNICIPALITY CH: 0+000 - 23+560.09 Km	REV : DEC 2024 TITLE : TYPICAL DRAWINGS DRG NO : SM/RD/TD/17 SHEET NO : 17

तिलोत्तमा नगरपालिका
नगर कार्यपालिकाको कार्यालय
देवदहवा, नवलपरासी (बर्दघाट सुस्ता पूर्व), लुम्बिनी प्रदेश, नेपाल



T-INTERSECTION WITH BASIC RIGHT TURN TREATMENT

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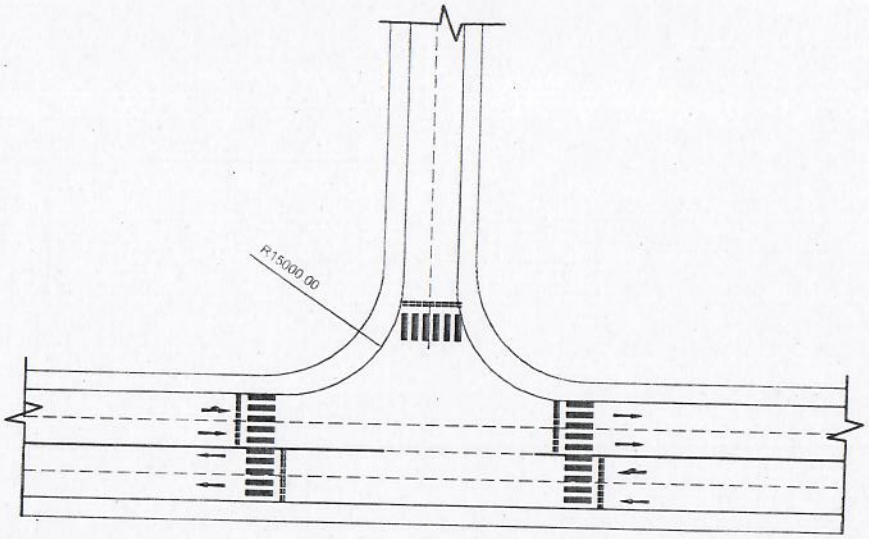

T-INTERSECTION WITH MULTIPLE LANE DIVIDED WITH NO SPECIFIC RIGHT TURN TREATMENT

SCALE:-1:1500

Notes:

1) All Dimension are in mm unless stated.

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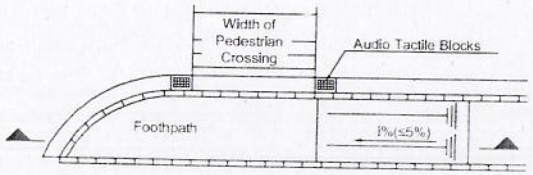

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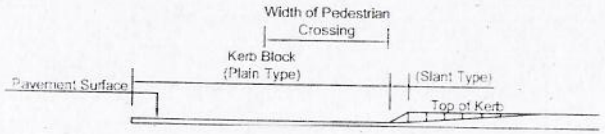
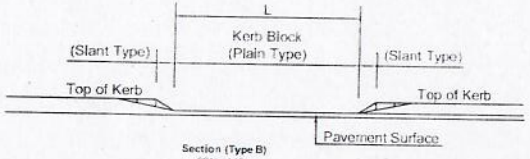


Section (Type A)

Plan (Type B)



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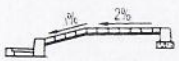

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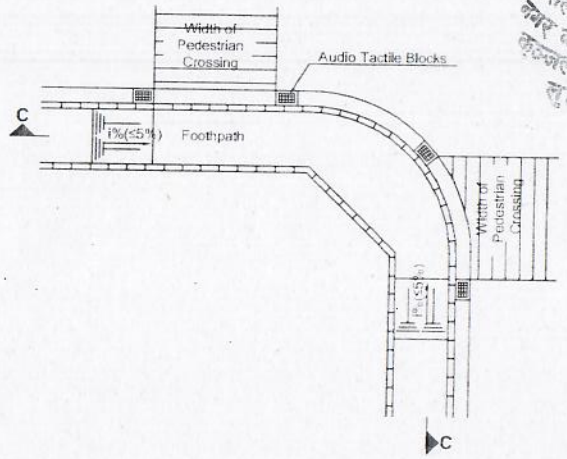

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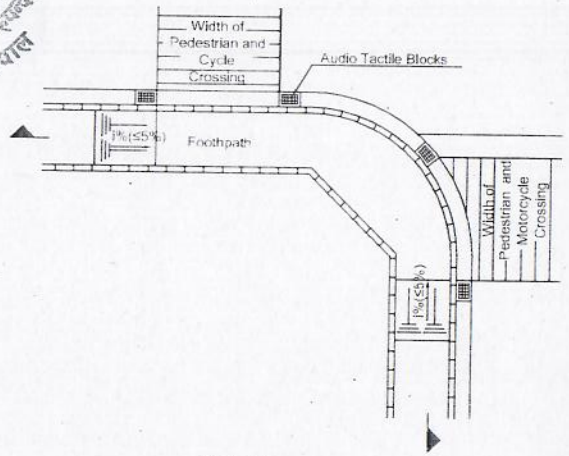

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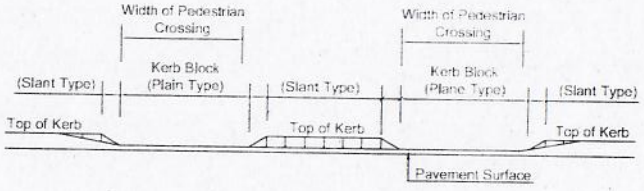

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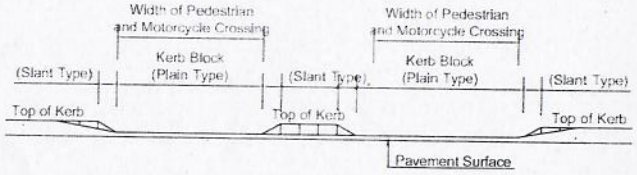

Section (Type D)

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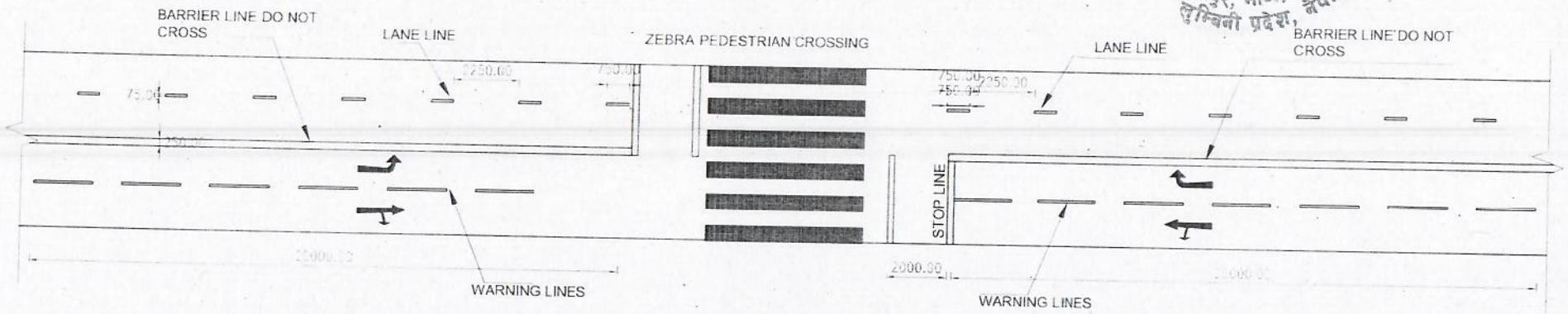
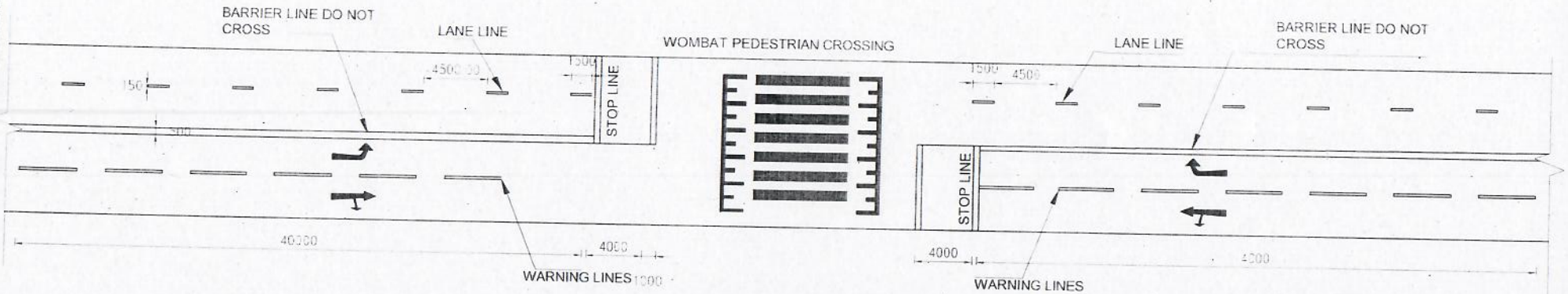


MID-BLOCK ZEBRA CROSSING

NOT TO SCALE



MID-BLOCK WOMBAT CROSSING

NOT TO SCALE

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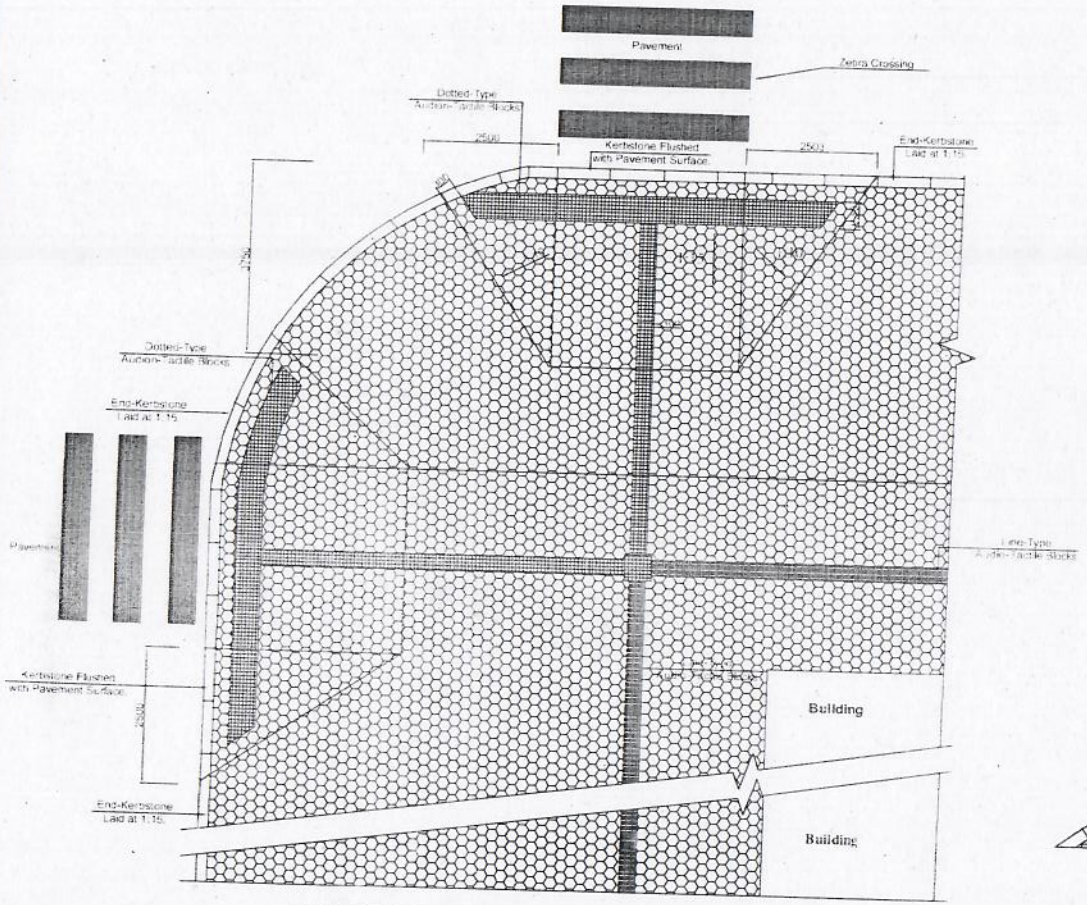
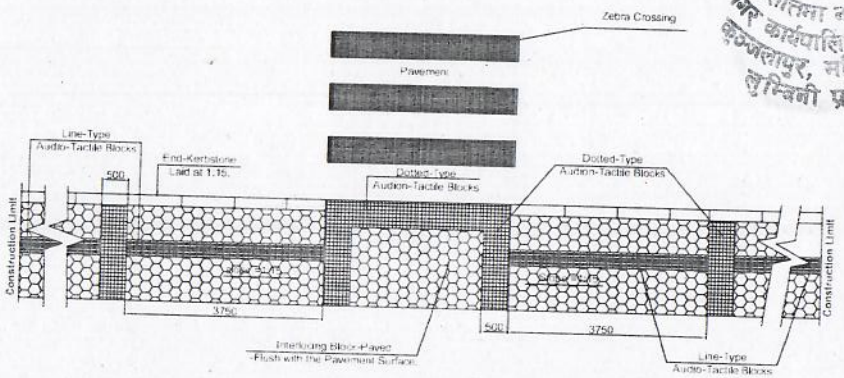
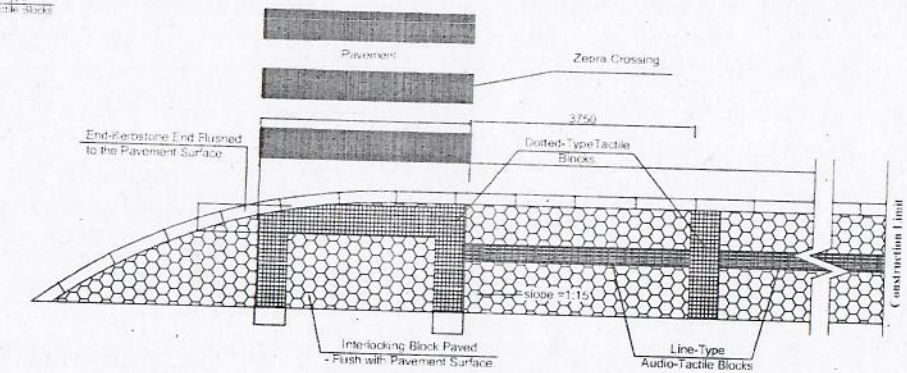


FLARED KERB RAMP WITH AUDIO-TACTILE BLOCKS

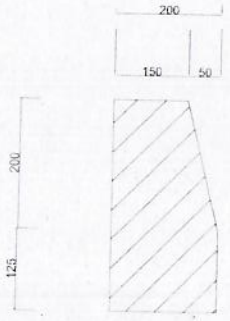


KERB-RAMP AT MID-BLOCK WITH AUDIO-TACTILE BLOCKS



KERB-RAMMP AT INTERSECTION WITH AUDIO-TACTILE BLOCKS

Department of Urban Development & Building Construction (DUDBC) **Regional Urban Development Project (RUDP)** Project Coordination Office Babarmahal, Kathmandu, Nepal	**Reviewed & Designed By :** DOHWA Engineering Co. Ltd. in Association with ERMC (P.) Ltd., SILT Consultants (P.) Ltd. and DIGICON (P.) Ltd. Ward- Baneshwor, Kathmandu Tel: 01- 4589393	**Consultant** Team Leader : YOO CHANGMIN Reviewed By : YAGYA BAHADUR MALLA Drawn By : SHRIJANA SHRESTHA	**Client** Approved By : Checked By :	**Scale** As Shown	TACTILE PAVEMENTS TILOTTAMA URBAN ROADS TILOTTAMA MUNICIPALITY CH: 0+000 - 23+560.09 Km	REV : DEC 2024 TITLE : TYPICAL DRAWINGS DRG NO : TM/RD/TD/21 SHEET NO : 21

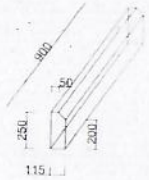


KERB STONE DETAIL

Scale 1:35

SPLAYED KERB

Scale 1:35

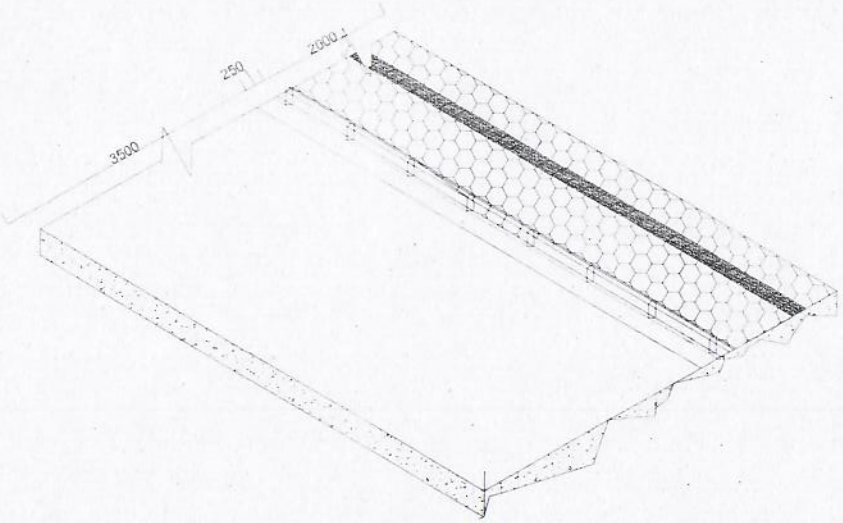


PRECAST KERB

Scale 1:35

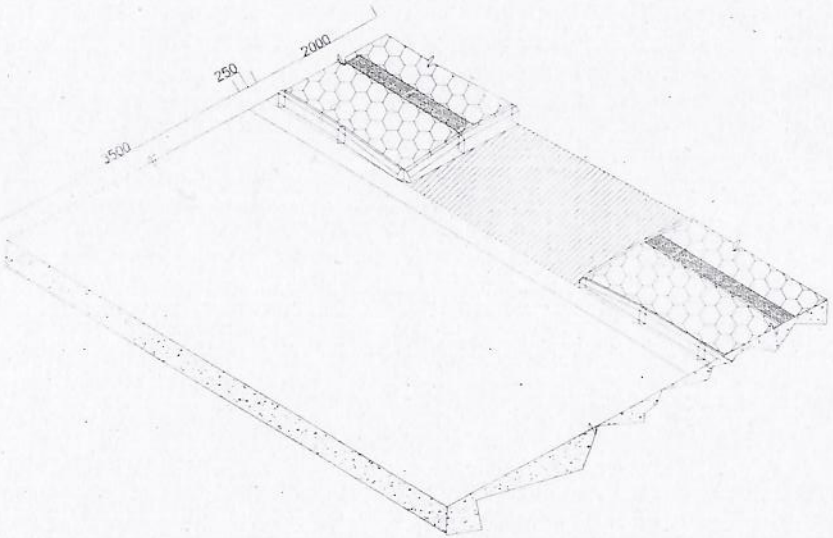
BULL NOSED KERB

Scale 1:35

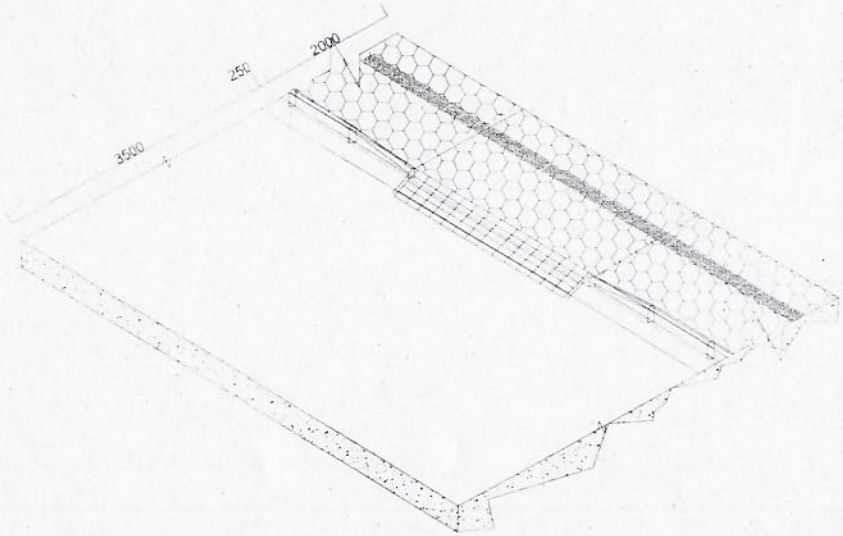


Isometric view of Raised cross walk & Kerb Detail

Department of Urban Development & Building Construction (DUDBC) **Regional Urban Development Project (RUDP)** Project Coordination Office Babarmahal, Kathmandu, Nepal	**Reviewed & Designed By :** DOHWA Engineering Co. Ltd. in Association with ERMC (P.) Ltd., SILT Consultants (P.) Ltd., and DIGICON (P.) Ltd. Maitighar, Kathmandu Tel: 01-4580061	**Consultant** Team Leader : YOO CHANGMIN Reviewed By : YAGYA BAHADUR MALLA Drawn By : SHRIJANA SHRESTHA	**Client** Approved By : Checked By :	**Scale** As Shown	ISOMETRIC VIEW OF FOOTPATH & KERBS TILOTTAMA URBAN ROADS TILOTTAMA MUNICIPALITY CH: 0+000 - 23+560.09 Km	REV : DEC 2024 TITLE : TYPICAL DRAWINGS DRG NO : TM/RD/TD/22 SHEET NO : 22

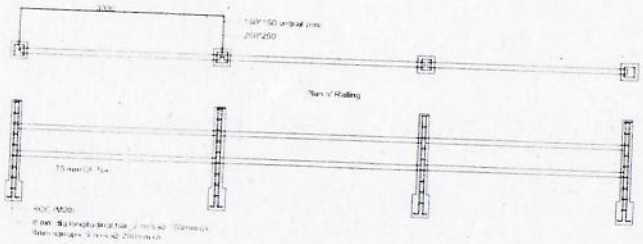


Isometric view of Main Road and Side Road Junction

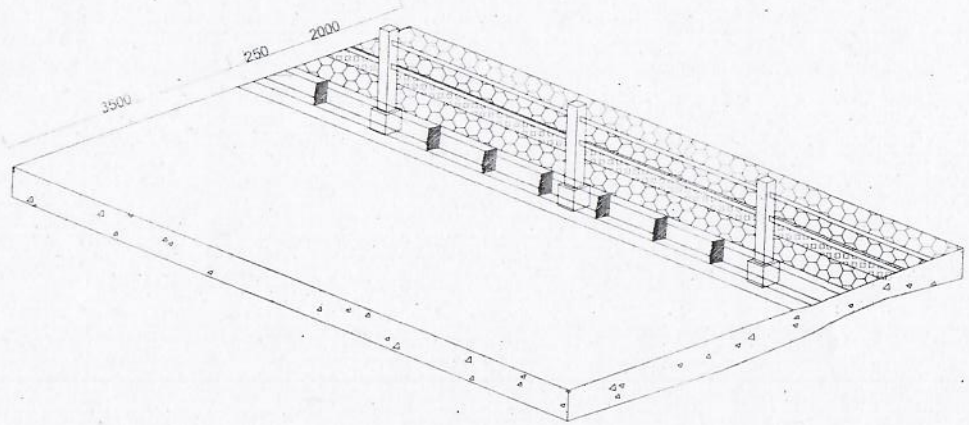


Isometric view of Ramp with Footpath

Department of Urban Development & Building Construction (DUDBC) **Regional Urban Development Project (RUDP)** Project Coordination Office Babarmahal, Kathmandu, Nepal	**Reviewed & Designed By :** DOHWA Engineering Co. Ltd. in Association with ERMC (P.) Ltd., SILT Consultants (P.) Ltd., and DIGICON (P.) Ltd. Mid- Baneshwor, Kathmandu Tel: 01-4509200	**Consultant** Team Leader : YOO CHANGMIN Reviewed By : YAGYA BAHADUR MALLA Drawn By : SHRIJANA SHRESTHA	**Client** Approved By : Checked By :	**Scale** As Shown	**Isometric View of Footpaths and Kerbs** TILOTTAMA URBAN ROADS TILOTTAMA MUNICIPALITY CH: 0+000 - 23+560.09 Km	REV : DEC 2024 TITLE : TYPICAL DRAWINGS DRG NO : TM/RD/TD/23 SHEET NO : 23

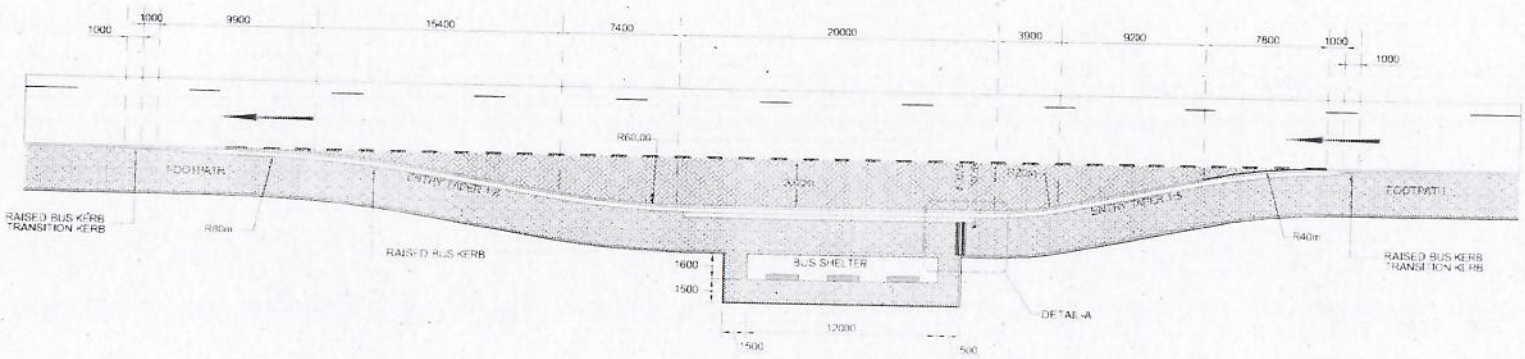


Front view of Railing



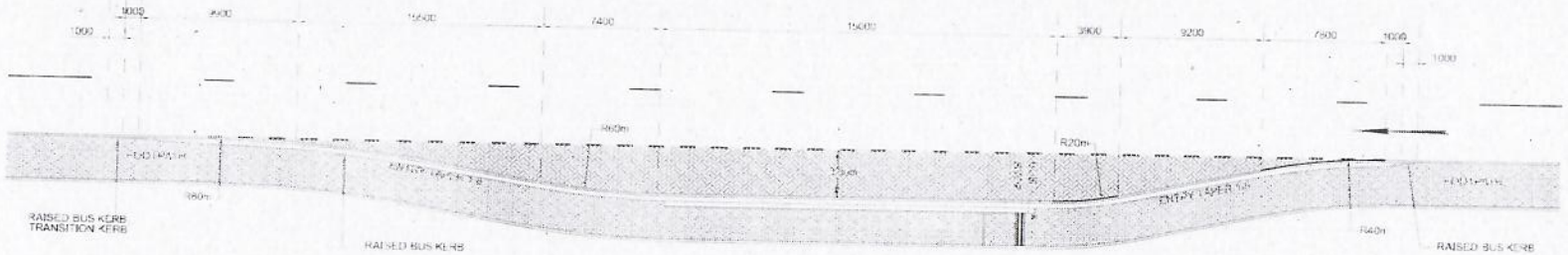
Isometric view of Railing with Footpath

Department of Urban Development & Building Construction (DUDBC) **Regional Urban Development Project (RUDP)** Project Coordination Office Babarmahal, Kathmandu, Nepal	**Reviewed & Designed By :** DOHWA Engineering Co. Ltd. in Association with ERMC (P.) Ltd., SILT Consultants (P.) Ltd., and DIGICON (P.) Ltd. Maitighar, Kathmandu Tel: 01-4589393	**Consultant** Team Leader : YOO CHANGMIN Reviewed By : YAGYA BAHADUR MALLA Drawn By : SHRIJANA SHRESTHA	**Client** Approved By : Checked By :	**Scale** As Shown	Isometric View of Footpaths and Kerbs TILOTTAMA URBAN ROADS TILOTTAMA MUNICIPALITY CH: 0+000 - 23+560.09 Km	REV : DEC 2024 TITLE : TYPICAL DRAWINGS DRG NO : TM/RD/TD/24 SHEET NO : 24



Typical Layout for a standard Bus Stop Layby

Not to Scale



Typical Layout for a Standard Bus Stop Layby

Not to Scale

NOTES:

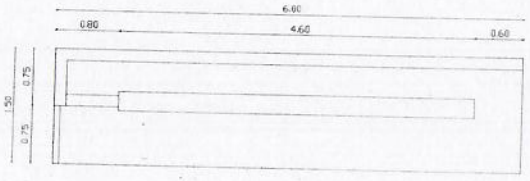
All dimensions are in millimeter unless otherwise stated.

All materials and workmanship shall be in accordance with the current N.C.S unless otherwise agreed with the engineer.

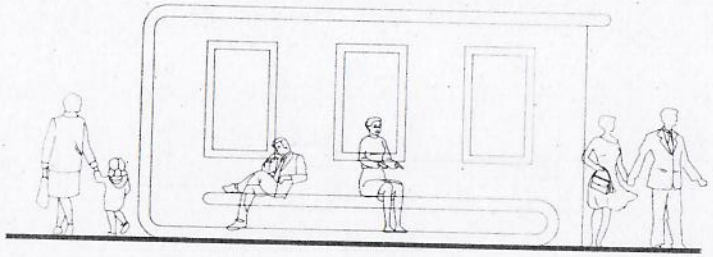
Production and siting of traffic signs and road marking shall be as per current version of the Nepal traffic control manual.

Department of Urban Development & Building Construction (DUDBC) **Regional Urban Development Project (RUDP)** Project Coordination Office Babarmahal, Kathmandu, Nepal	**Reviewed & Designed By :** DOHWA Engineering Co. Ltd in Association with ERMC (P.) Ltd., SILT Consultants (P.) Ltd., and DIGICON (P.) Ltd Mid- Baneshwor, Kathmandu Tel: 01-4580082	**Consultant** Team Leader : YOO CHANGMIN Reviewed By : YAGYA BAHADUR MALLA Drawn By : SHRIJANA SHRESTHA	**Client** Approved By : Checked By :	**Scale** As Shown	TYPICAL BUS LAYBYS TILOTTAMA URBAN ROADS TILOTTAMA MUNICIPALITY CH: 0+000 - 23+560.09 Km	REV : DEC 2024 TITLE : TYPICAL DRAWINGS DRG NO : TM/RD/TD/25 SHEET NO : 25

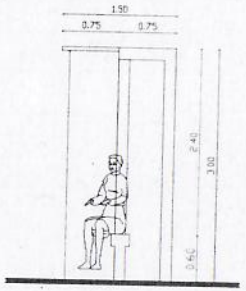
तिलोत्तमा नगरपालिका
नगर कार्यपालिकाको कार्यालय
रुन्जलापुर, मणिग्राम, रुपन्देही
लुम्बिनी प्रदेश, नेपाल



PLAN

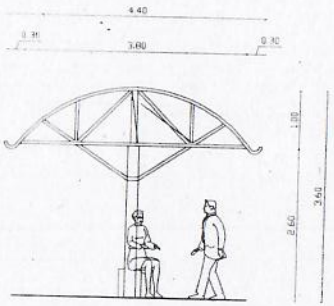


FRONT ELEVATION

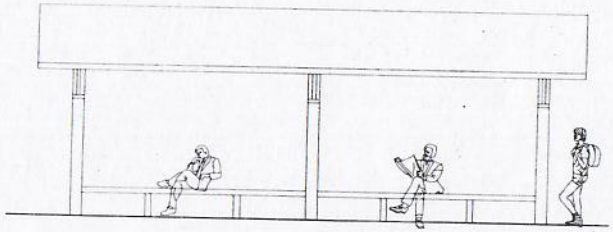


SIDE ELEVATION

BUS STAND

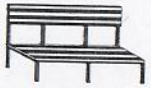


SIDE ELEVATION



FRONT ELEVATION

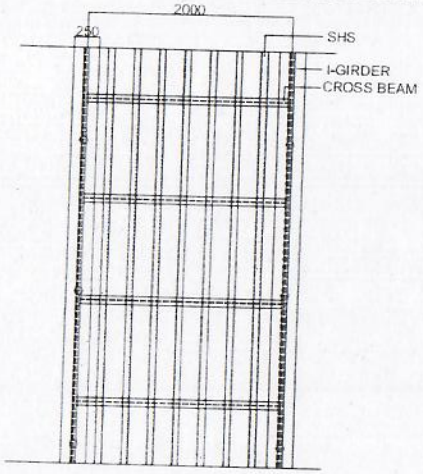
REST/WAITING STATIONS WITH SHEDS



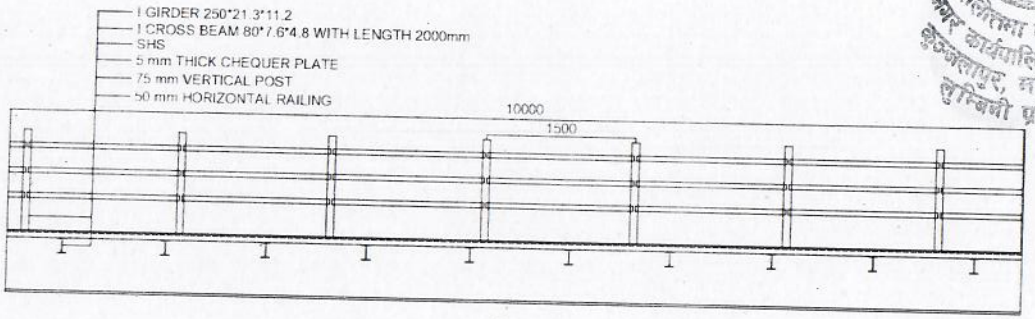
WOODEN RESTING BENCH

तिलोत्तमा नगरपालिका
नगर कार्यपालिकाको कार्यालय
कृष्णनगर, मणिग्राम, रुपन्देही
लुम्बिनी प्रदेश, नेपाल

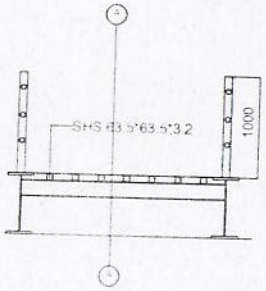
Department of Urban Development & Building Construction (DUDBC) **Regional Urban Development Project (RUDP)** Project Coordination Office Babarmahal, Kathmandu, Nepal	**Reviewed & Designed By :** DOHWA Engineering Co. Ltd. in Association with ERMC (P.) Ltd., SILT Consultants (P.) Ltd., and DIGICON (P.) Ltd. Ward, Baneshwor, Kathmandu Tel. 01- 4526180	**Consultant** Team Leader : YOO CHANGMIN Reviewed By : YAGYA BAHADUR MALLA Drawn By : SHRIJANA SHRESTHA	**Client** Approved By : Checked By :	**Scale** As Shown	TYPICAL BUS AND WAITING STANDS TILOTTAMA URBAN ROADS TILOTTAMA MUNICIPALITY. CH: 0+000 - 23+560.09 Km	REV : DEC 2024 TITLE : TYPICAL DRAWINGS DRG NO : TM/RD/TD/26 SHEET NO : 26



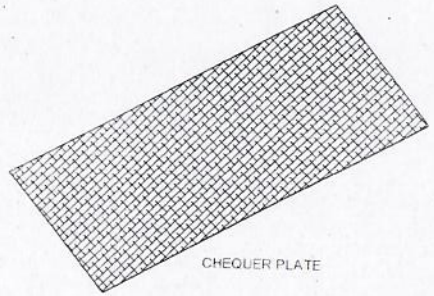
PLAN VIEW OF METAL DECK



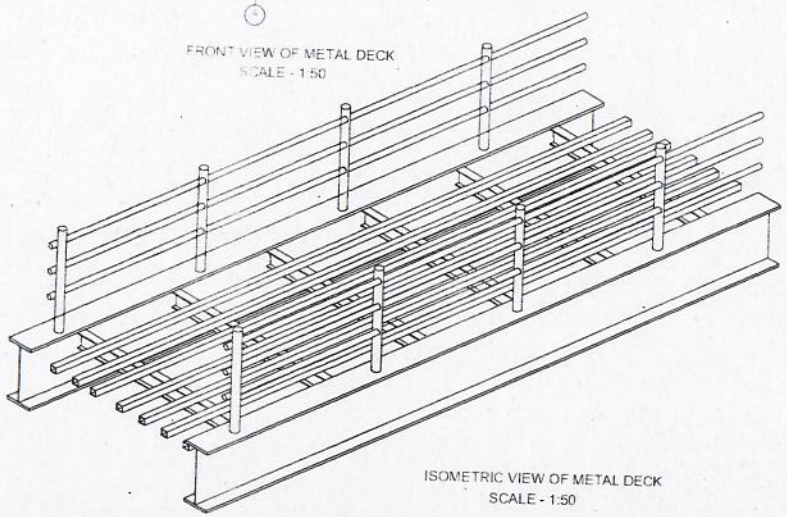
SECTION A-A



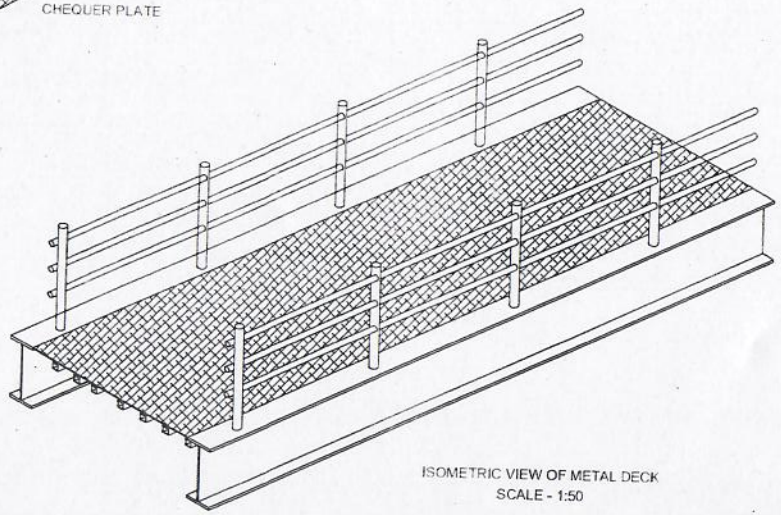
FRONT VIEW OF METAL DECK
SCALE - 1:50



CHEQUER PLATE



ISOMETRIC VIEW OF METAL DECK
SCALE - 1:50



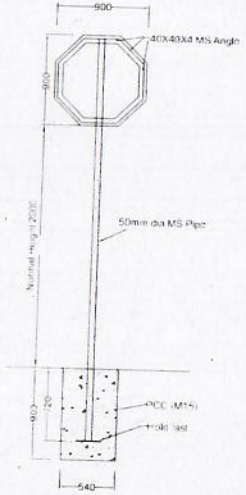
ISOMETRIC VIEW OF METAL DECK
SCALE - 1:50

Department of Urban Development & Building Construction (DUDBC)
Regional Urban Development Project (RUDP)
Project Coordination Office
Babarmahal, Kathmandu, Nepal

Reviewed & Designed By :
DOHWA Engineering Co. Ltd.
in Association with
ERMC (P.) Ltd., SILT Consultants (P.) Ltd. and DIGICON (P.) Ltd.
Ma- Baneshwor, Kathmandu
Tel: 01-4580000

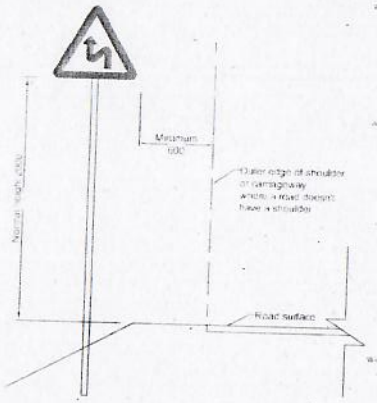
Consultant	Client	Scale	PEDESTRIAN CROSSING IN SLAB EXPANSION	REV : DEC 2024
Team Leader : YOO CHANGMIN	Approved By :	As Shown	TILOTTAMA URBAN ROADS TILOTTAMA MUNICIPALITY CH: 0+000 - 23+560.09 Km	TITLE : TYPICAL DRAWINGS
Reviewed By : YAGYA BAHADUR MALLA				DRG NO : TM/RD/TD/27
Drawn By : SHRIJANA SHRESTHA	Checked By :			SHEET NO : 27

CIRCULAR SIGNS

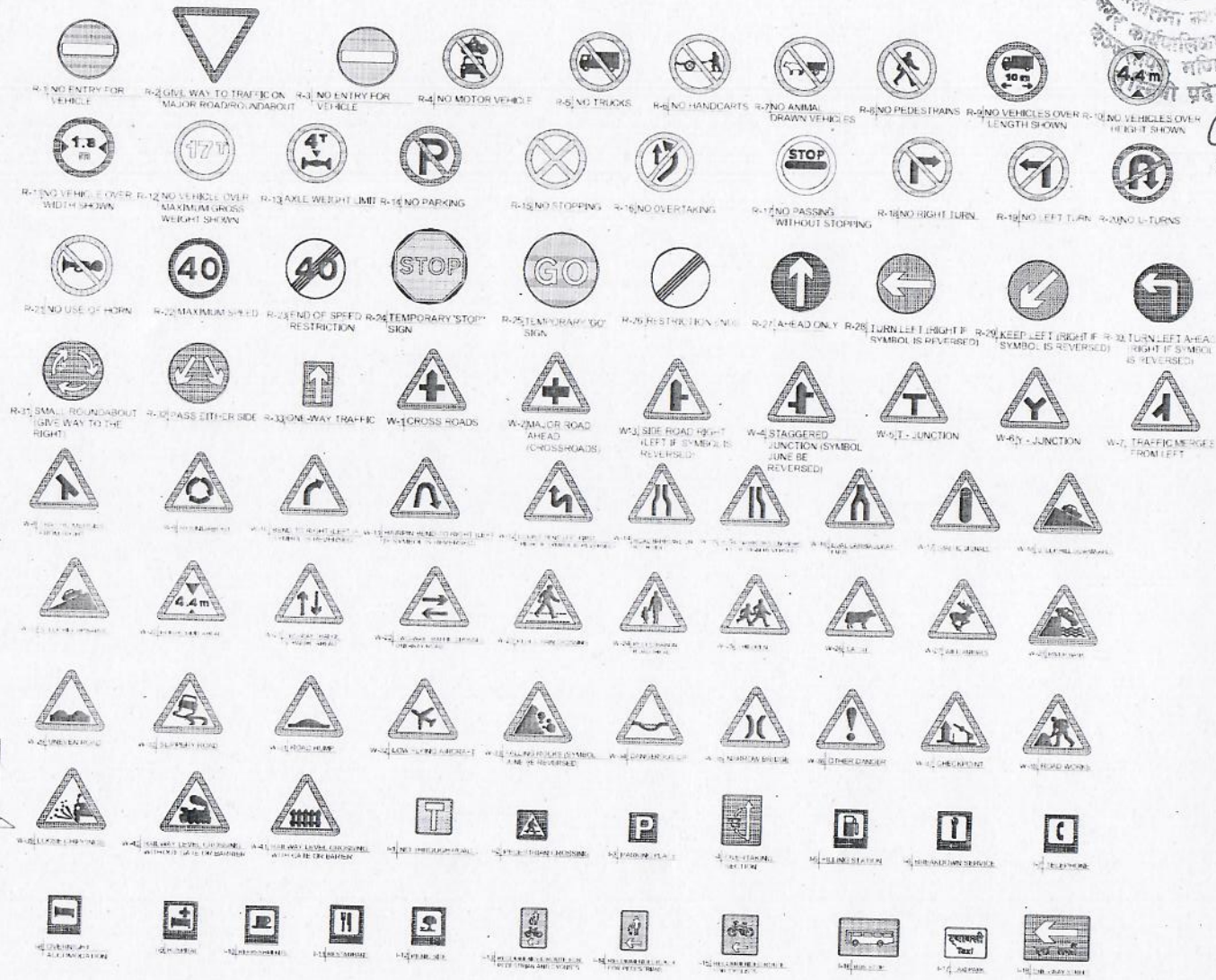


STOP SIGNS

EQUILATERAL TRIANGULAR SIGNS



SIGNS POSITIONING



Note:

For the dimensions of board signs and letter
Please Refer Traffic Signs Manual Vol 1 & 2.

Department of Urban Development & Building Construction (DUDBC) **Regional Urban Development Project (RUDP)** Project Coordination Office Babarmahal, Kathmandu, Nepal	**Reviewed & Designed By :** DOHWA Engineering Co. Ltd. In Association with ERMC (P.) Ltd., SILT Consultants (P.) Ltd., and DIGICON (P.) Ltd. Mid- Baneshwor, Kathmandu Tel: 01-4520080	**Consultant** Team Leader : YOO CHANGMIN Reviewed By : YAGYA BAHADUR MALLA Drawn By : SHRIJANA SHRESTHA	**Client** Approved By : Checked By :	**Scale** Not to Scale	TRAFFIC CONTROL MEASURES TILOTTAMA URBAN ROADS TILOTTAMA MUNICIPALITY CH: 0+000 - 23+560.09 Km	REV : DEC 2024 TITLE : TYPICAL DRAWINGS DRG NO : TM/RD/TD/28 SHEET NO : 28

RECTO-REFLECTIVE SIGN TYPICAL

SIZE OF REGULATORY SIGNS (Reviews)

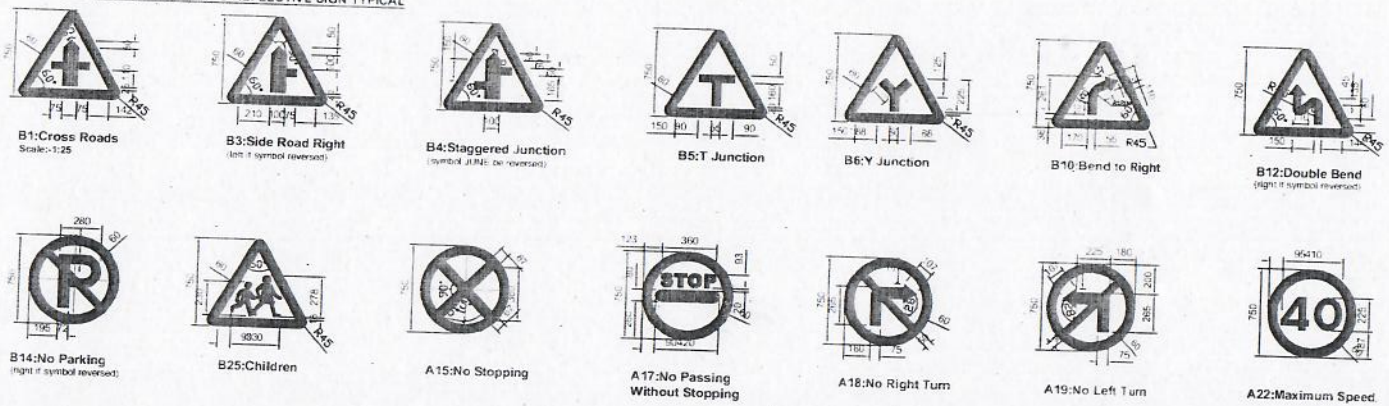
SIGN TYPE	A	B	C	D	E	F	G
a	750	864	750	600	865	300	600
b	750	750		450	600	300	375
REMARKS							
	A1	A2	A3-A32	A33	B1-B12	C2 C3	C17

NOTE:

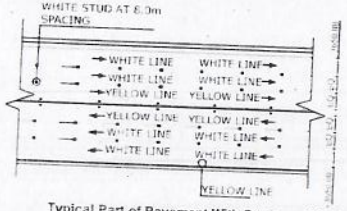
Refer Nepal Traffic Sign Manual by D.O.R.

SIZE OF REGULATORY SIGNS (Reviews)

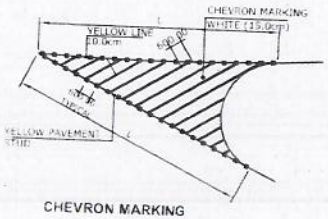
DETAILS OF FEW RECTO-REFLECTIVE SIGN TYPICAL



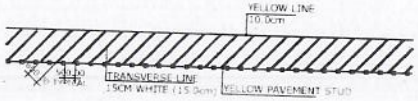
Department of Urban Development & Building Construction (DUDBC) **Regional Urban Development Project (RUDP)** Project Coordination Office Babarmahal, Kathmandu, Nepal	**Reviewed & Designed By :** DOHWA Engineering Co. Ltd. in Association with ERMC (P.) Ltd., SILT Consultants (P.) Ltd., and DIGICON (P.) Ltd. Mid-Baneshwor, Kathmandu Tel: 01-4580080	**Consultant** Team Leader : YOO CHANGMIN Reviewed By : YAGYA BAHADUR MALLA Drawn By : SHRIJANA SHRESTHA	**Client** Approved By : Checked By :	**Scale** As Shown	TRAFFICE CONTROL MEASURES 02 TILOTTAMA URBAN ROADS TILOTTAMA MUNICIPALITY CH: 0+000 - 23+560.09 Km	REV : DEC 2024 TITLE : TYPICAL DRAWINGS DRG NO : TM/RD/TD/29 SHEET NO 29



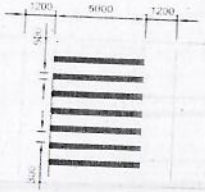
Typical Part of Pavement With Studs and Marking
Not in scale



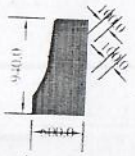
CHEVRON MARKING
Not in scale



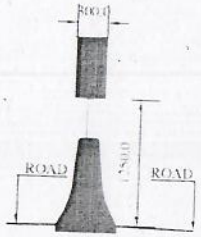
DETAIL OF TRAVERSE LINE MARKING
SCALE:-1:250



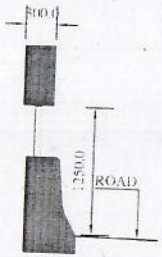
PEDESTRIAN CROSSING
SCALE:-1:100



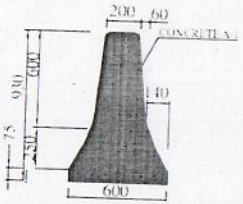
PAINT MARKING



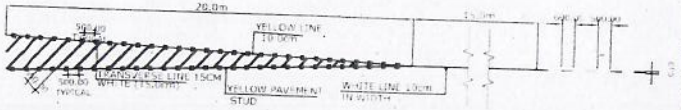
TYPE 1: BARRIER
SCALE:-1:50



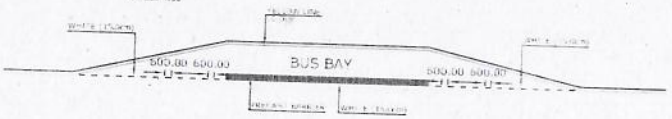
TYPE 2: BARRIER
SCALE:-1:50



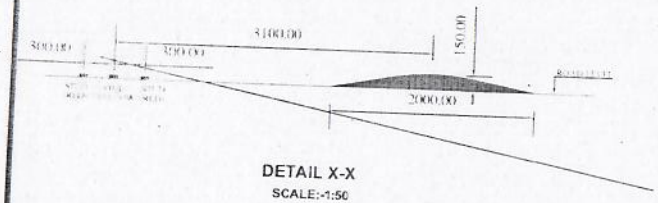
BARRIER USED AT BUS-BAYS
NOT IN SCALE



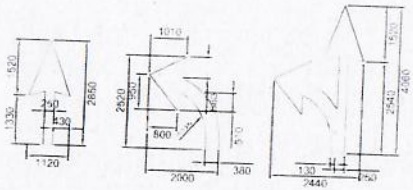
TRAVERSE LINE MARKING
SCALE:-1:250



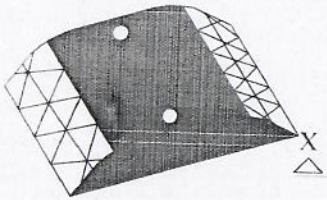
TYPICAL MARKING IN BUS-BAYS
SCALE:-1:500



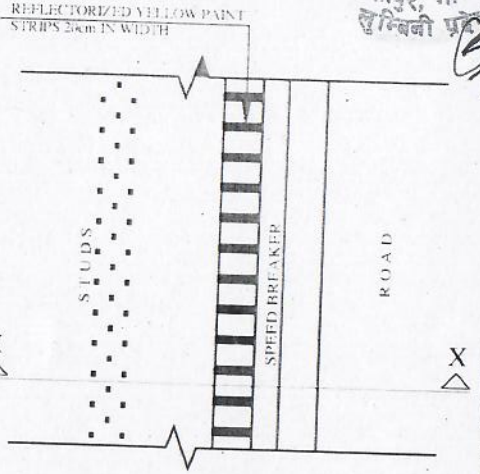
DETAIL X-X
SCALE:-1:50



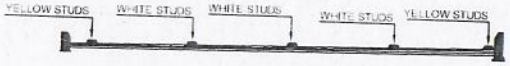
TYPICAL ARROWS
Not in scale



STUD
SCALE:-1:100

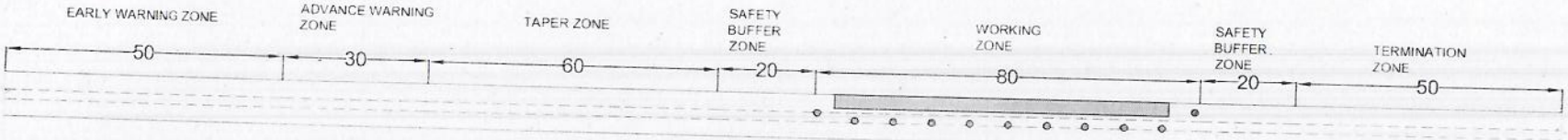


PLAN OF SPEED BREAKER
SCALE:-1:100

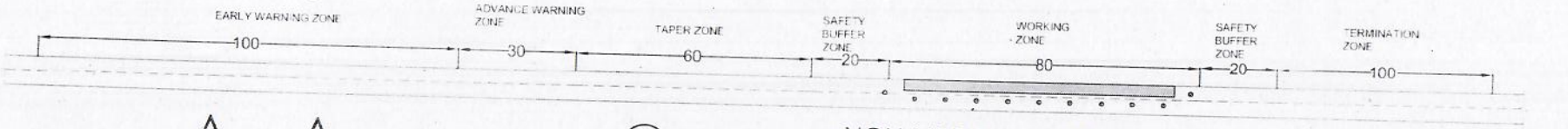


DETAIL OF STUDS
SCALE:-1:100

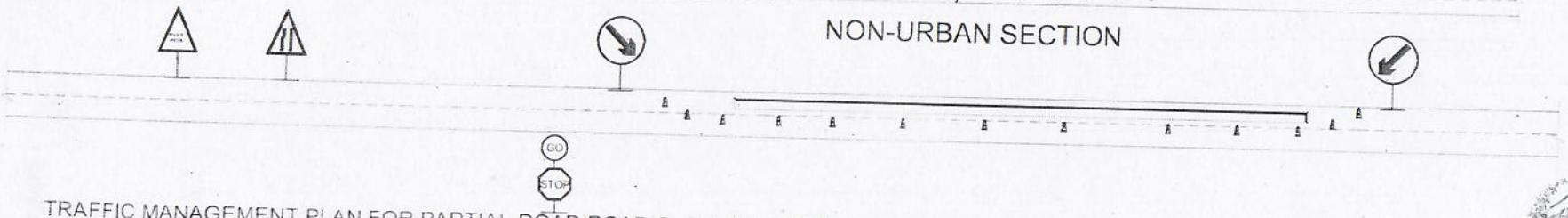
Department of Urban Development & Building Construction (DUDBC) Regional Urban Development Project (RUDP) Project Coordination Office Babarmahal, Kathmandu, Nepal	Reviewed & Designed By : DOHWA Engineering Co. Ltd. in Association with ERMC (P.) Ltd., SILT Consultants (P.) Ltd., and DIGICON (P.) Ltd. Vill- Baneshwor, Kathmandu Tel: 01-4586393	Consultant Team Leader : YOO CHANGMIN Reviewed By : YAGYA BAHADUR MALLA Drawn By : SHRIJANA SHRESTHA	Client Approved By : Checked By :	Scale As Shown	SPECIAL TRAFFIC CONTROL MEASURES TILOTTAMA URBAN ROADS TILOTTAMA MUNICIPALITY CH: 0+000 - 23+560.09 Km	REV : DEC 2024 TITLE : TYPICAL DRAWINGS DRG NO : TM/RD/TD/30 SHEET NO : 30



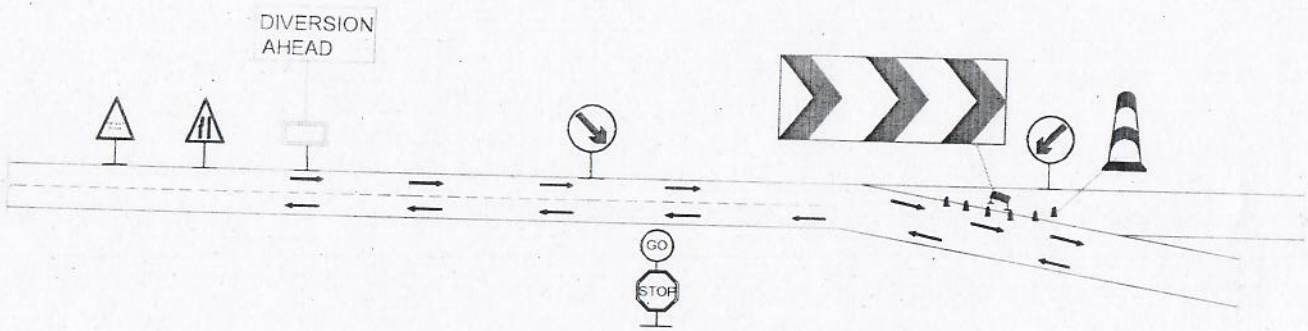
URBAN SECTION



NON-URBAN SECTION



TRAFFIC MANAGEMENT PLAN FOR PARTIAL ROAD ROAD CLOSURE (ONE LANE CLOSED) DURING CONSTRUCTION WORK



TRAFFIC MANAGEMENT PLAN FOR FULL ROAD CLOSURE (TRAFFIC DIVERSION) DURING CONSTRUCTION WORK

तिलोत्तमा नगरपालिका
नगर कार्यपालिकाको कार्यालय
कञ्जलपुर, मणिग्राम, रुपन्देही
लुम्बिनी प्रदेश, नेपाल

Department of Urban Development & Building Construction (DUDBC) **Regional Urban Development Project (RUDP)** Project Coordination Office Babarmahal, Kathmandu, Nepal	**Reviewed & Designed By :** DOHWA Engineering Co. Ltd in Association with ERMC (P.) Ltd., SILT Consultants (P.) Ltd., and DIGICON (P.) Ltd. Mid-Baneshwor, Kathmandu Tel: 01-4589100	**Consultant** Team Leader : YOO CHANGMIN Reviewed By : YAGYA BAHADUR MALLA Drawn By : SHRIJANA SHRESTHA	**Client** Approved By : Checked By :	**Scale** As Shown	TRAFFIC MANAGEMENT PLAN TILOTTAMA URBAN ROADS TILOTTAMA MUNICIPALITY CH: 0+000 - 23+560.09 Km	REV : DEC 2024 TITLE : TYPICAL DRAWINGS DRG NO : TM/RD/TD/31 SHEET NO : 31