



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

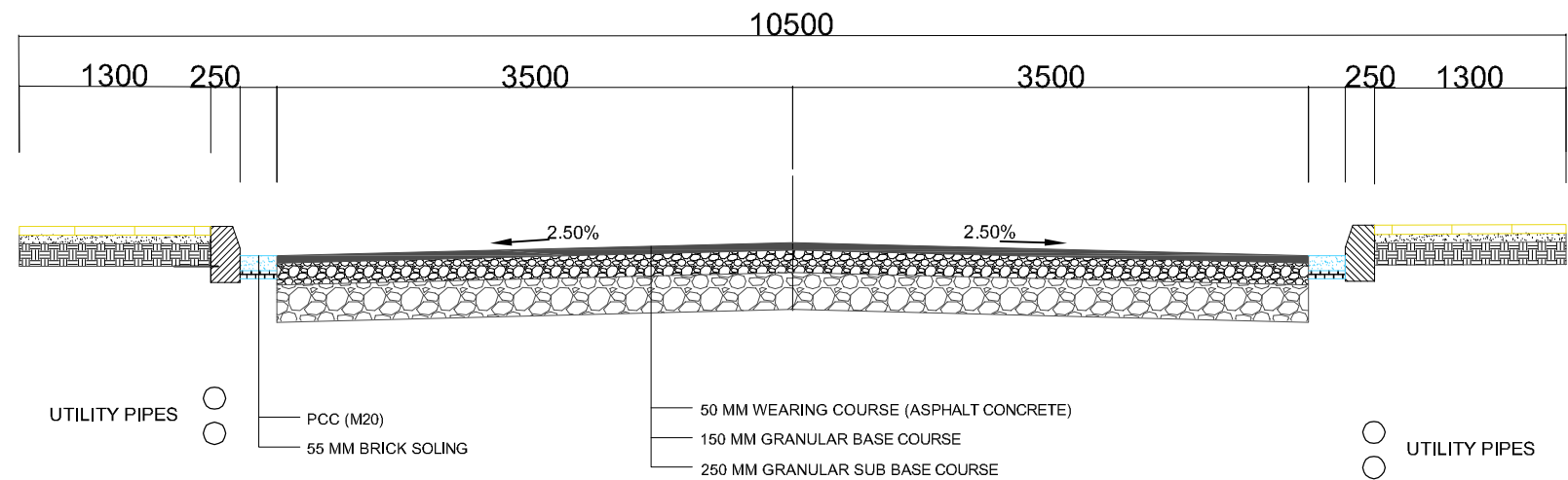
DETAIL PROJECT REPORT
for
LUMBINI URBAN ROADS SUBPROJECT

VOLUME – III (TYPICAL DRAWINGS)
LUMBINI URBAN ROADS, LUMBINI SANSKRITIK MUNICIPALITY
CH: 0+000 - 12+257.65 Km

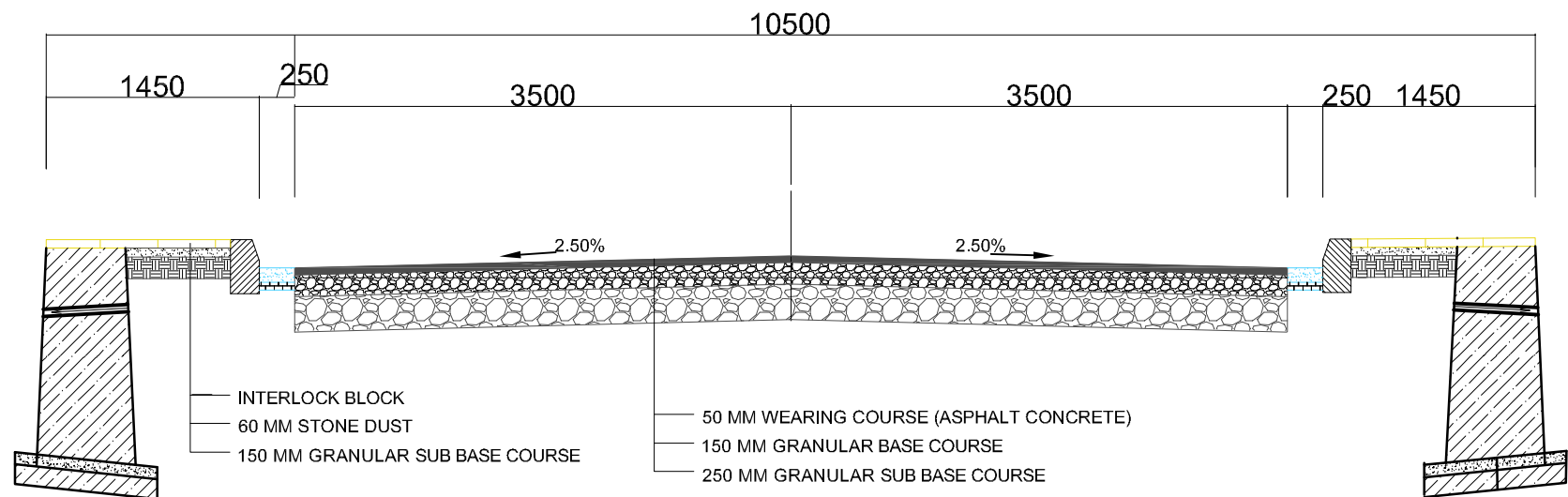
Pre-Feasibility Study, Feasibility Study and Preparation of Detail Project Report
of West Urban Corridor (WUC) Development Project
[Ref. No. RUDP/DUDBC/PDC/1-WC]

Consultant

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



Typical Cross Section of Road (Total width -10.5 m)
Scale - 1:50



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



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Construction (DUDBC)
Regional Urban Development Project (RUDP)
Project Coordination Office
Babarmahal, Kathmandu, Nepal

Reviewed & Designed By :
DOHWA Engineering Co. Ltd.
In Association with
ERM (P.) Ltd., SILT Consultants (P.) Ltd., and
DIGICON (P.) Ltd.
Mid- Baneshwor, Kathmandu
Tel: 01-4589393

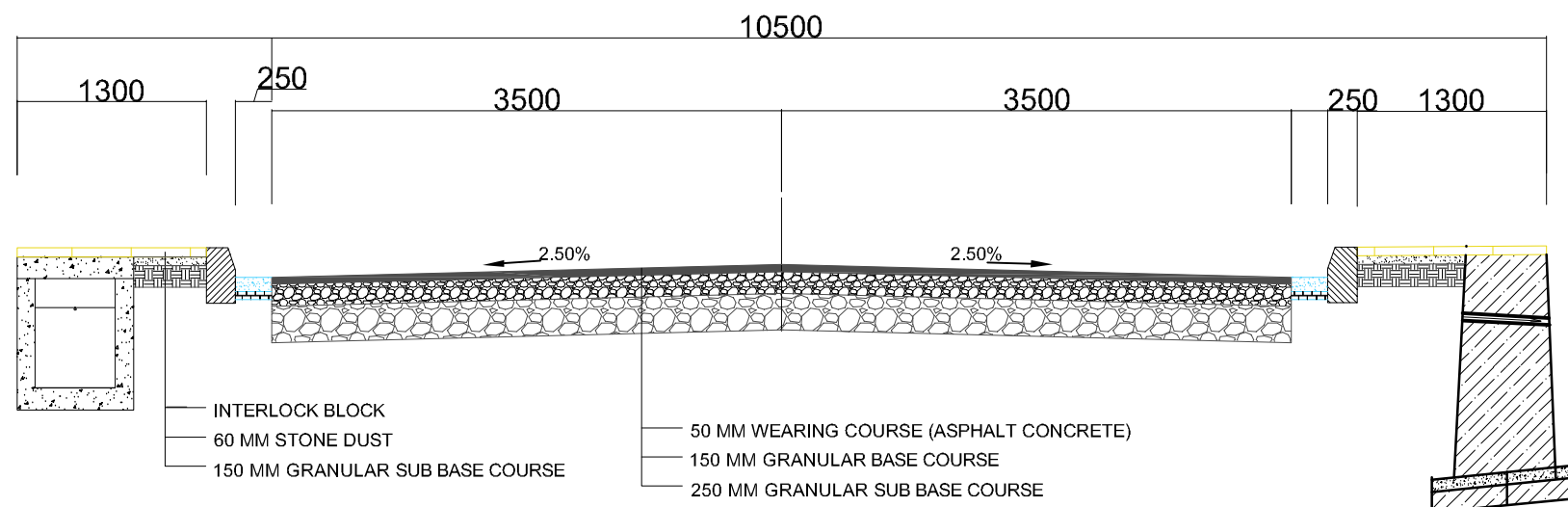
Consultant
Team Leader : YOO CHANGMIN
Reviewed By : YAGYA BAHADUR MALLA
Drawn By : SHRIJANA SHRESTHA

Client
Approved By :
Checked By :

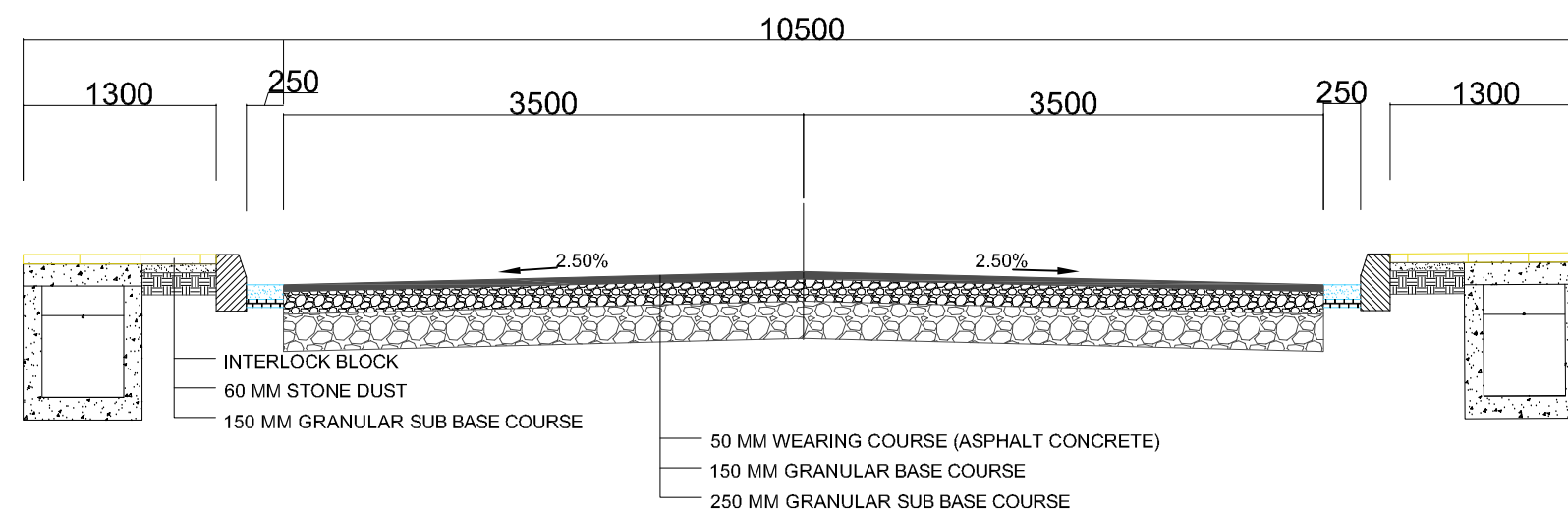
Scale
As Shown

TYPICAL CROSS SECTION OF ROAD
LUMBINI SANSKRITIK URBAN ROADS
LUMBINI SANSKRITIK MUNICIPALITY
CH: 0+000 - 12+257.65 Km

REV : DEC 2024
TITLE : TYPICAL DRAWINGS
DRG NO : LSM/RD/TD/01
SHEET NO : 01



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



Typical Cross Section of Road with Drain (Total Width-10.5m)
Scale - 1:50



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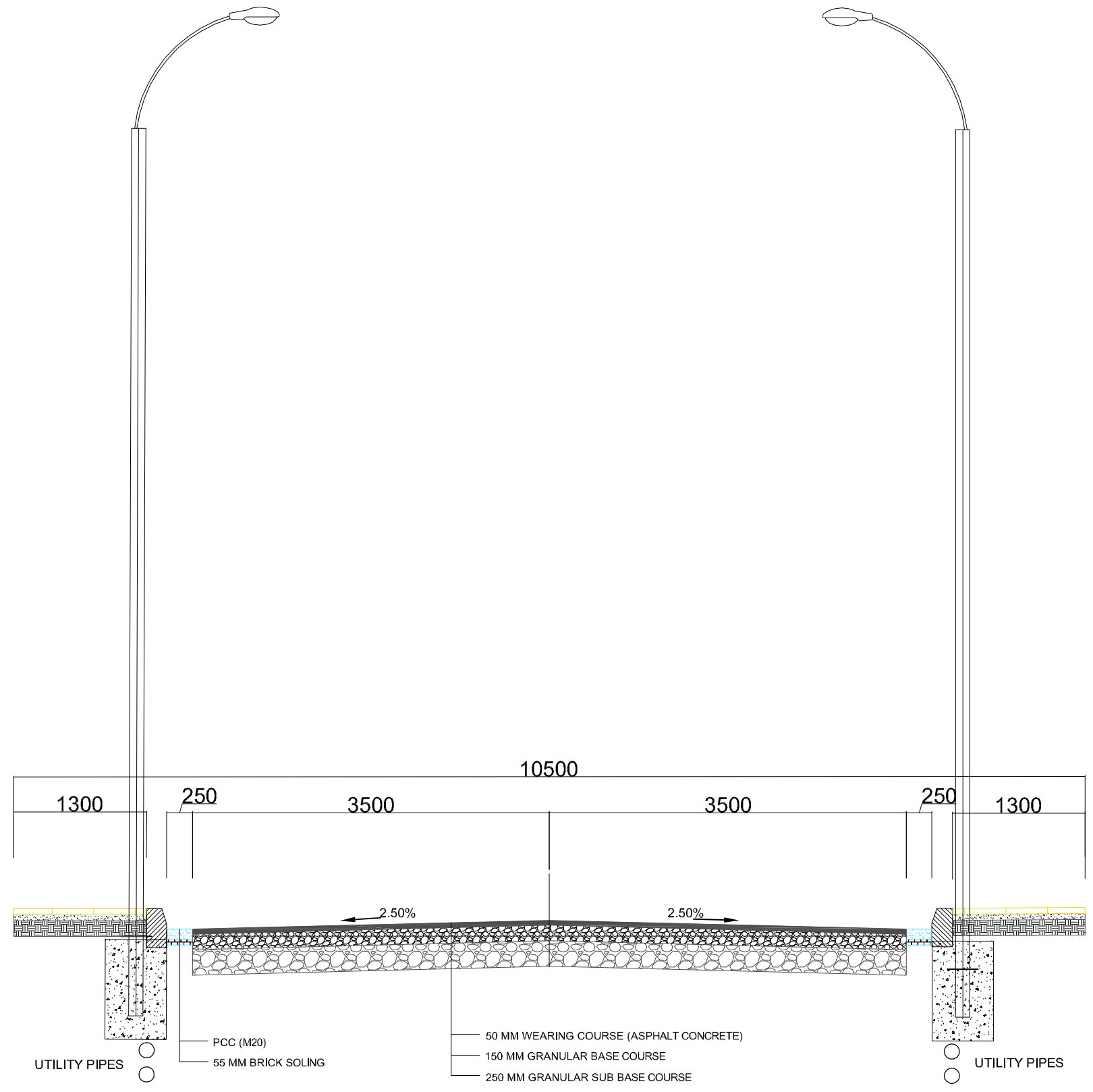
Consultant
Team Leader : YOO CHANGMIN
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Drawn By : SHRIJANA SHRESTHA

Client
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Checked By :

Scale
As Shown

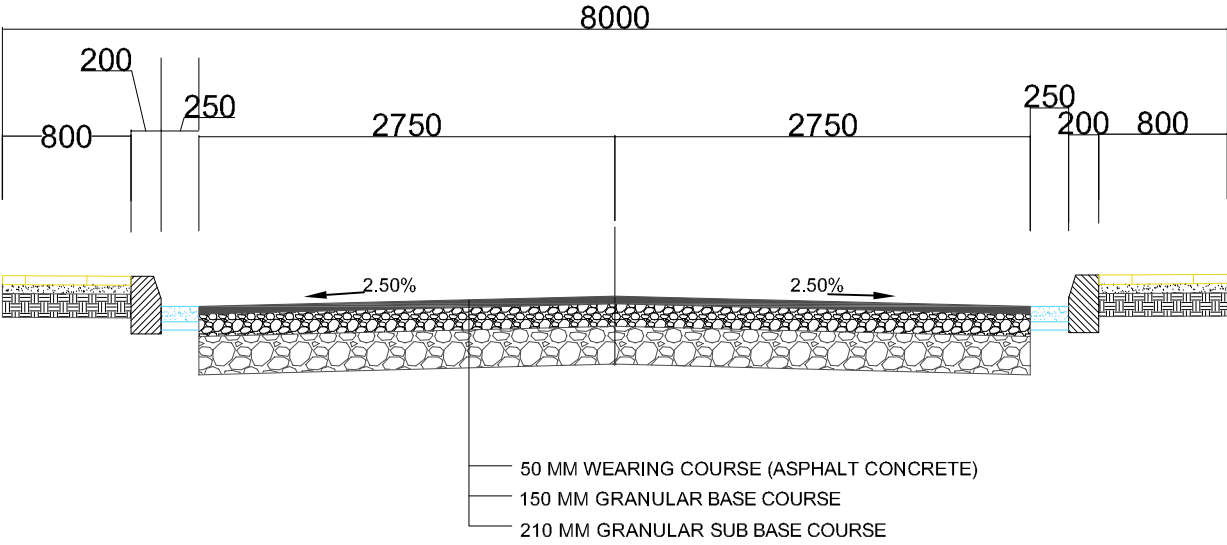
TYPICAL CROSS SECTION OF ROAD
LUMBINI SANSKRITIK URBAN ROADS
LUMBINI SANSKRITIK MUNICIPALITY
CH: 0+000 - 12+257.65 Km

REV : DEC 2024
TITLE : TYPICAL DRAWINGS
DRG NO : LSM/RD/TD/02
SHEET NO : 02

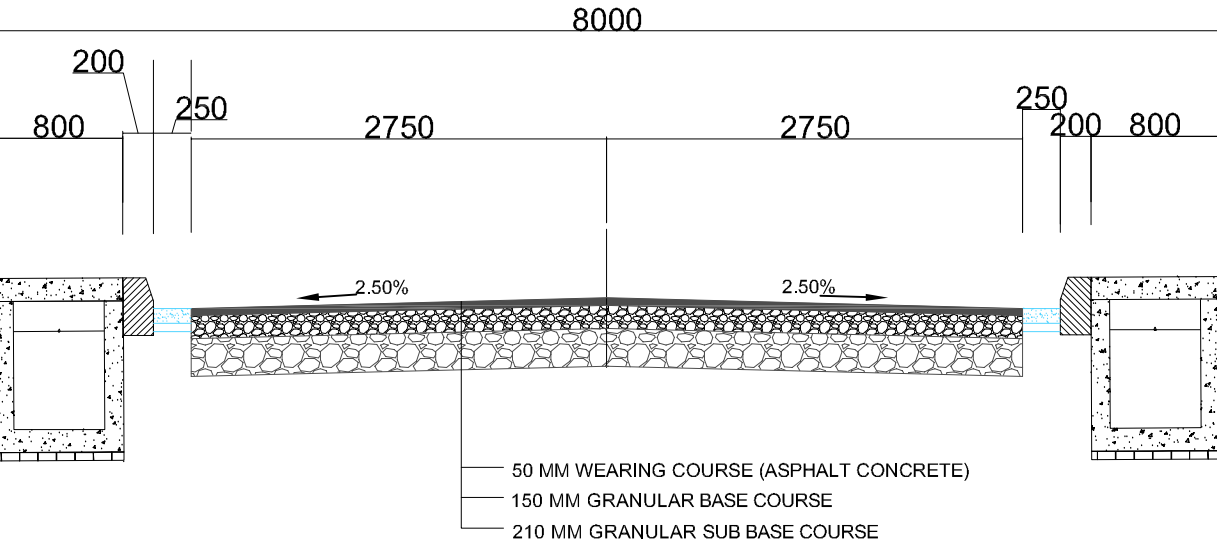


Typical Cross Section of Footpath with Street Light (Total width -10.5 m)
Scale - 1:50

	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 ERMIC (P.) Ltd., SILT Consultants (P.) Ltd., and DIGICON (P.) Ltd. Mid- Baneshwor, Kathmandu Tel: 01 - 4589393	Consultant	Client	Scale As Shown	TYPICAL CROSS SECTION OF ROAD LUMBINI SANSKRITIK URBAN ROADS LUMBINI SANSKRITIK MUNICIPALITY CH: 0+000 - 12+257.65 Km	REV : DEC 2024
			Team Leader : YOO CHANGMIN	Approved By :			TITLE : TYPICAL DRAWINGS
			Reviewed By : YAGYA BAHADUR MALLA	Checked By :			DRG NO : LSM/RD/TD/03
			Drawn By : SHRIJANA SHRESTHA				SHEET NO : 03

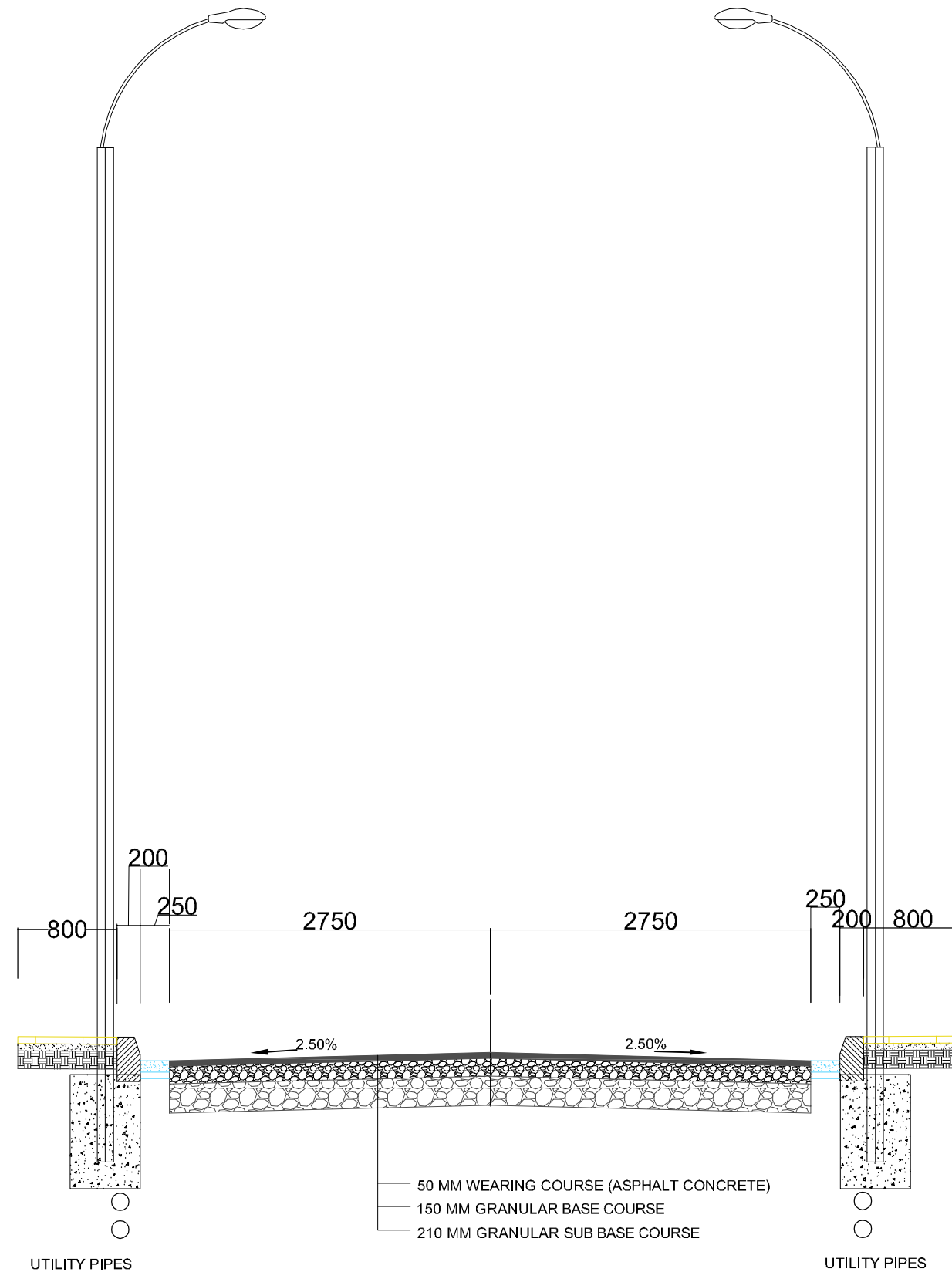


Typical Cross Section of Road with Footpath
Scale - 1:50



Typical Cross Section of Road with RCC Covered Drain
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 ERMIC (P.) Ltd., SILT Consultants (P.) Ltd., and DIGICON (P.) Ltd. Mid- Baneshwor, Kathmandu Tel: 01-4589393	Consultant	Client	Scale As Shown	TYPICAL CROSS SECTION OF ROAD LUMBINI SANSKRITIK URBAN ROADS LUMBINI SANSKRITIK MUNICIPALITY CH: 0+000 - 12+257.65 Km	REV : DEC 2024		
			Team Leader : YOO CHANGMIN				Approved By :		TITLE : TYPICAL DRAWINGS
			Reviewed By : YAGYA BAHADUR MALLA				Checked By :		DRG NO : LSM/RD/TD/04
			Drawn By : SHRIJANA SHRESTHA						SHEET NO : 04



Typical Cross Section of Road (8.0 m) with Street Light
Scale - 1:50



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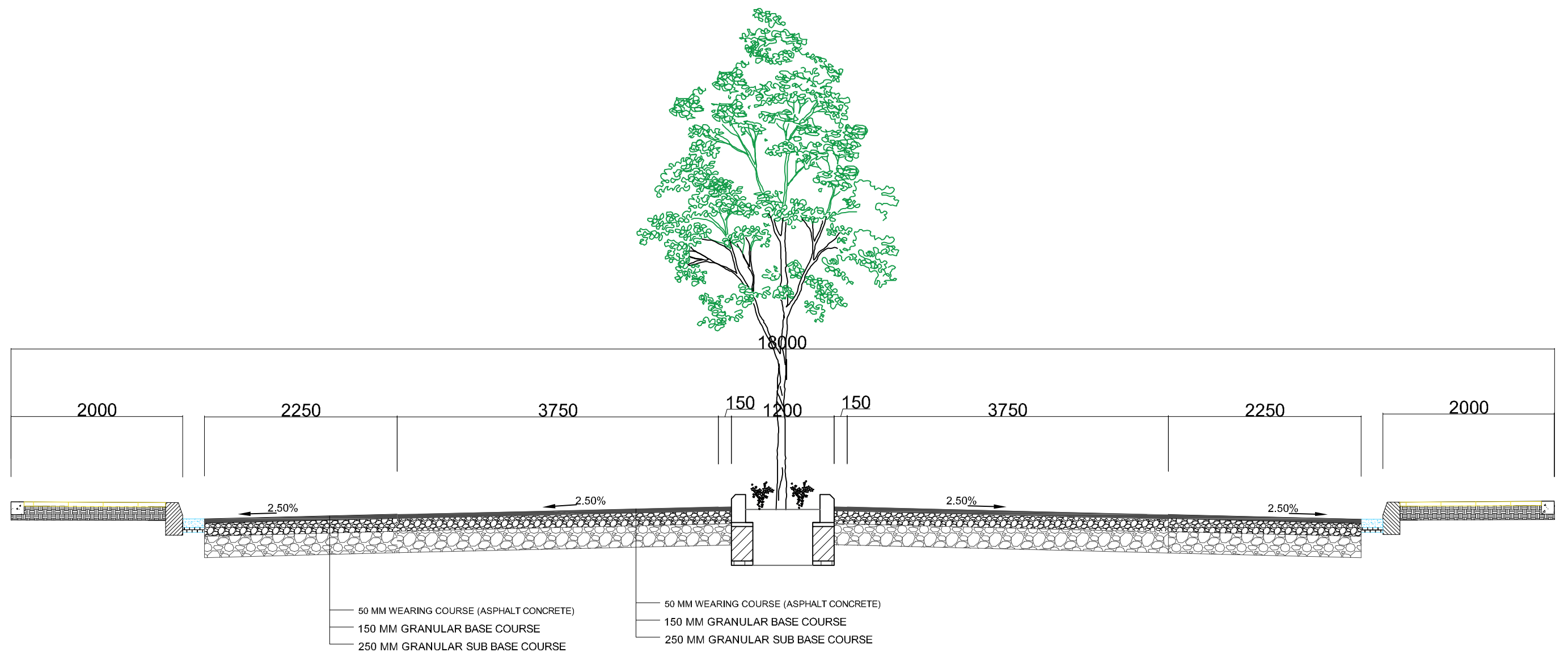
Consultant
Team Leader : YOO CHANGMIN
Reviewed By : YAGYA BAHADUR MALLA
Drawn By : SHRIJANA SHRESTHA

Client
Approved By :
Checked By :

Scale
As Shown

TYPICAL CROSS SECTION OF ROAD
LUMBINI SANSKRITIK URBAN ROADS
LUMBINI SANSKRITIK MUNICIPALITY
CH: 0+000 - 12+257.65 Km

REV : DEC 2024
TITLE : TYPICAL DRAWINGS
DRG NO : LSM/RD/TD/05
SHEET NO : 05



Typical Cross Section of Footpath (Total width -18 m)
Scale - 1:50



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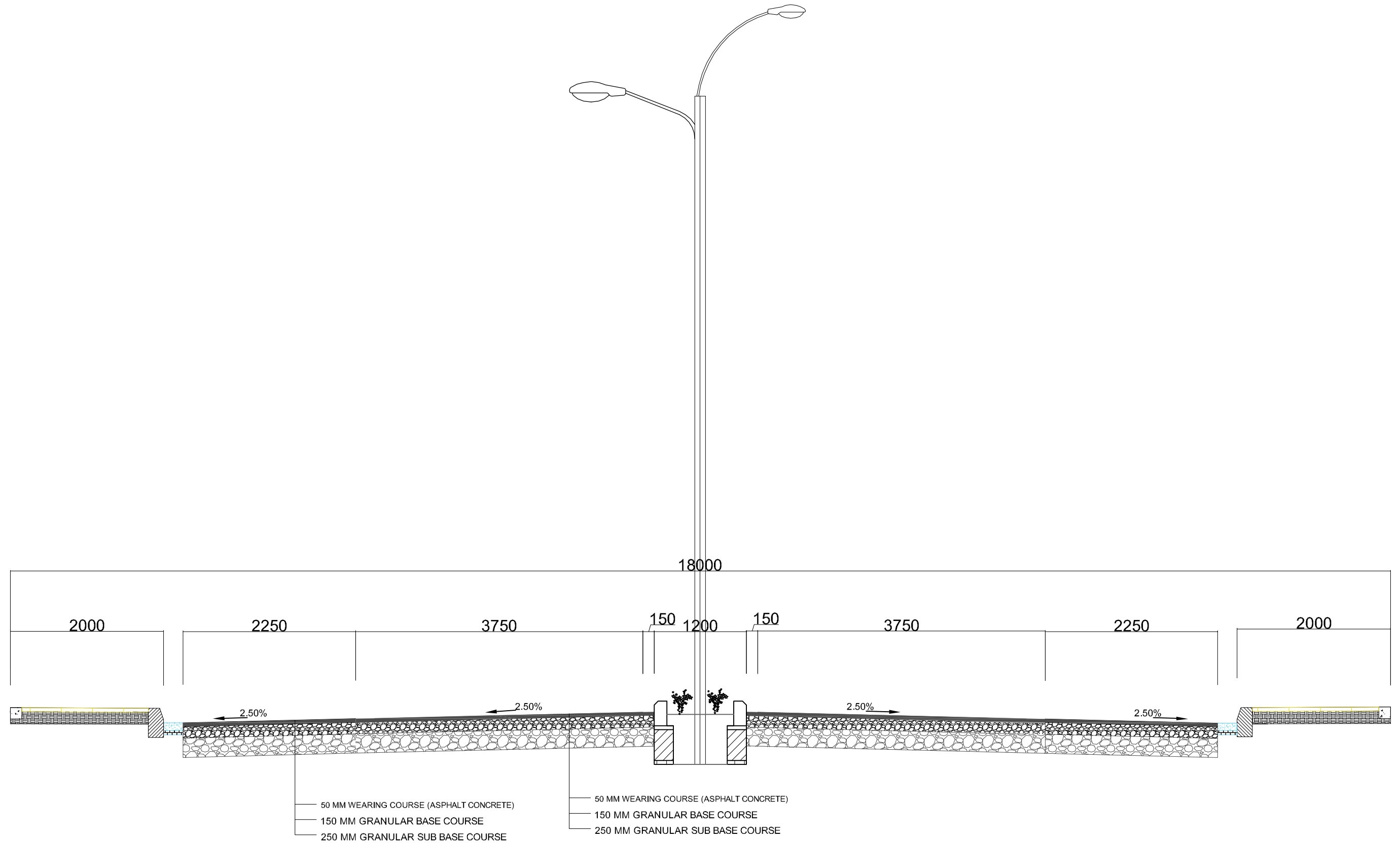
Consultant
Team Leader : YOO CHANGMIN
Reviewed By : YAGYA BAHADUR MALLA
Drawn By : SHRIJANA SHRESTHA

Client
Approved By :
Checked By :

Scale
As Shown

TYPICAL CROSS SECTION OF ROAD
LUMBINI SANSKRITIK URBAN ROADS
LUMBINI SANSKRITIK MUNICIPALITY
CH: 0+000 - 12+257.65 Km

REV	: DEC 2024
TITLE	: TYPICAL DRAWINGS
DRG NO	: LSM/RD/TD/06
SHEET NO	: 06



Typical Cross Section of Footpath (Total width -18 m)
Scale - 1:50



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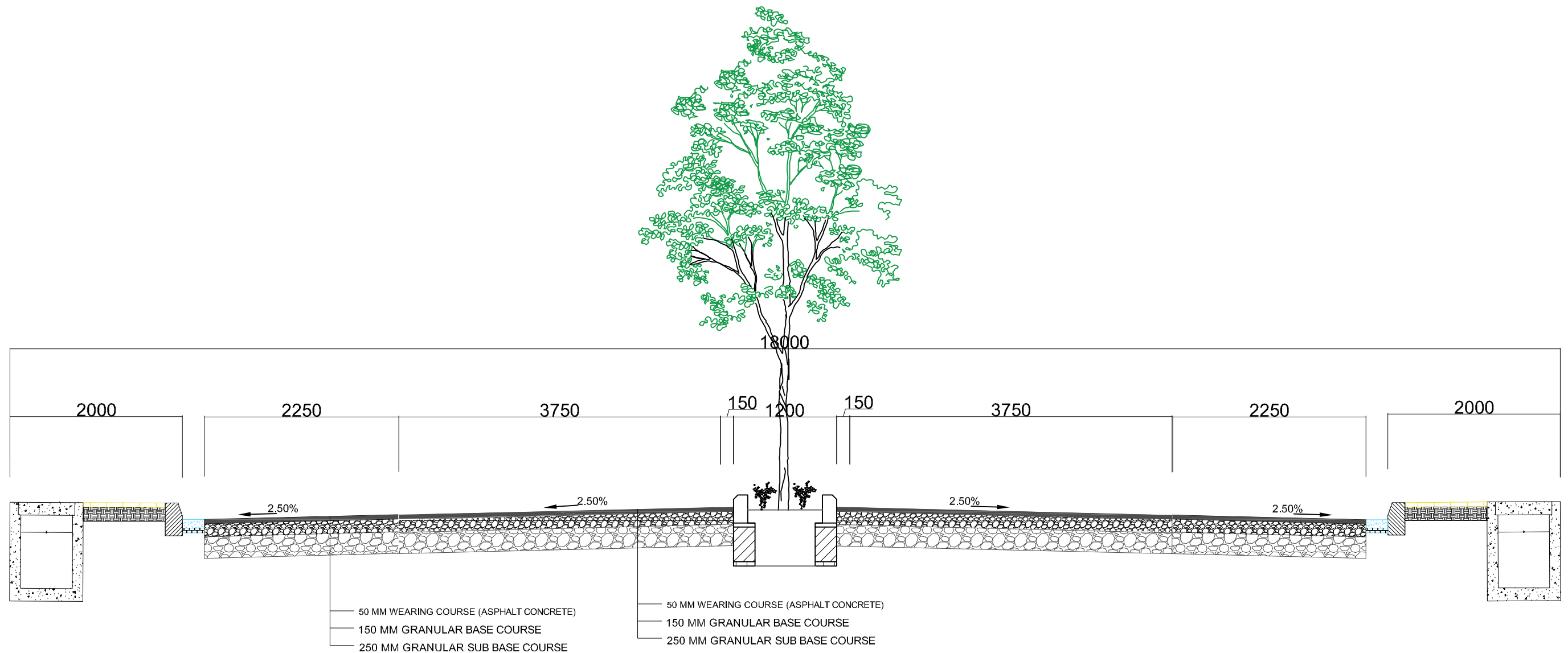
Consultant
Team Leader : YOO CHANGMIN
Reviewed By : YAGYA BAHADUR MALLA
Drawn By : SHRIJANA SHRESTHA

Client
Approved By :
Checked By :

Scale
As Shown

TYPICAL CROSS SECTION OF ROAD
LUMBINI SANSKRITIK URBAN ROADS
LUMBINI SANSKRITIK MUNICIPALITY
CH: 0+000 - 12+257.65 Km

REV : DEC 2024
TITLE : TYPICAL DRAWINGS
DRG NO : LSM/RD/TD/07
SHEET NO : 07



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



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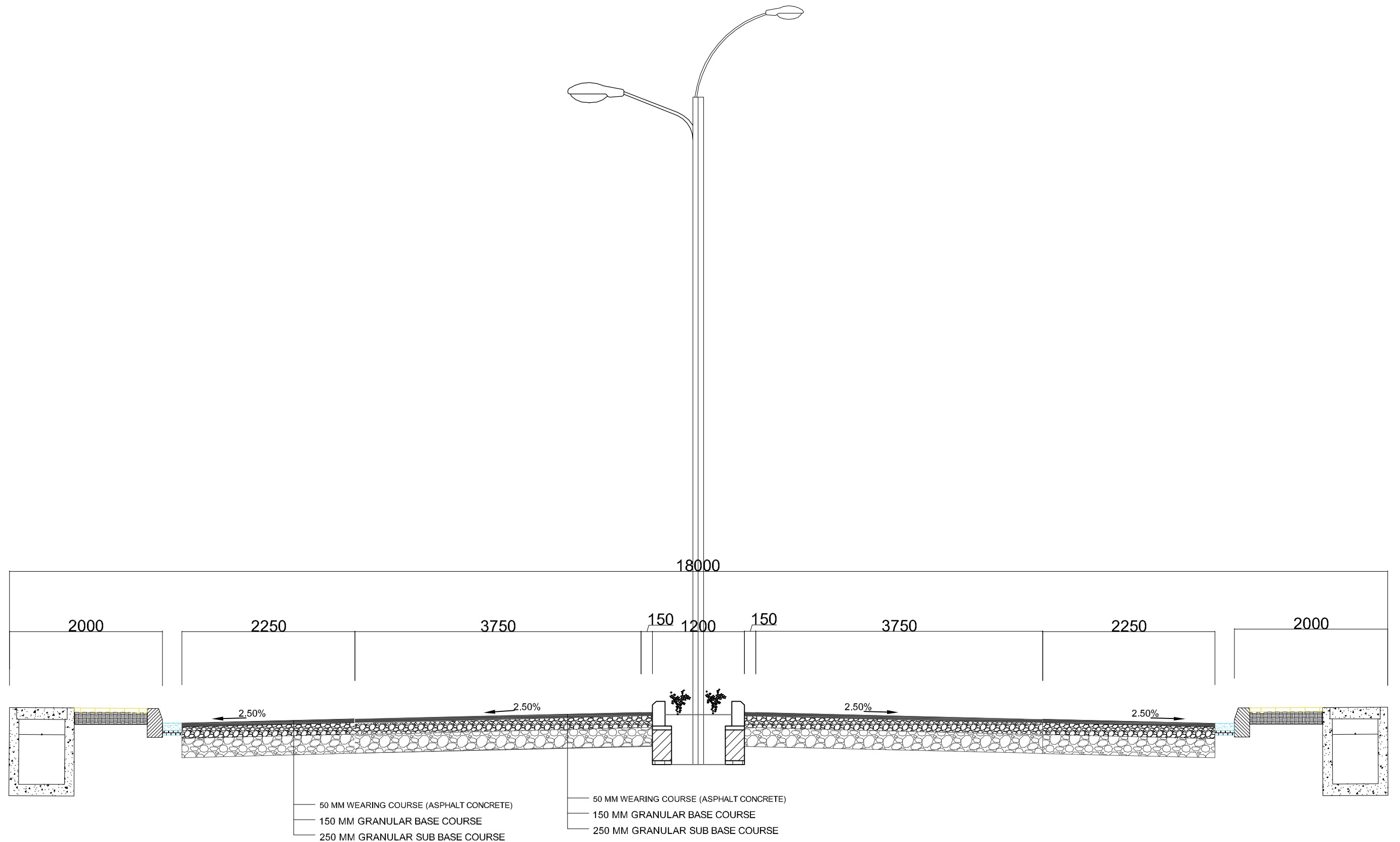
Consultant
Team Leader : YOO CHANGMIN
Reviewed By : YAGYA BAHADUR MALLA
Drawn By : SHRIJANA SHRESTHA

Client
Approved By :
Checked By :

Scale
As Shown

TYPICAL CROSS SECTION OF ROAD
LUMBINI SANSKRITIK URBAN ROADS
LUMBINI SANSKRITIK MUNICIPALITY
CH: 0+000 - 12+257.65 Km

REV : DEC 2024
TITLE : TYPICAL DRAWINGS
DRG NO : LSM/RD/TD/08
SHEET NO : 08



Typical Cross Section of Road (Total width -18 m)
Scale - 1:50



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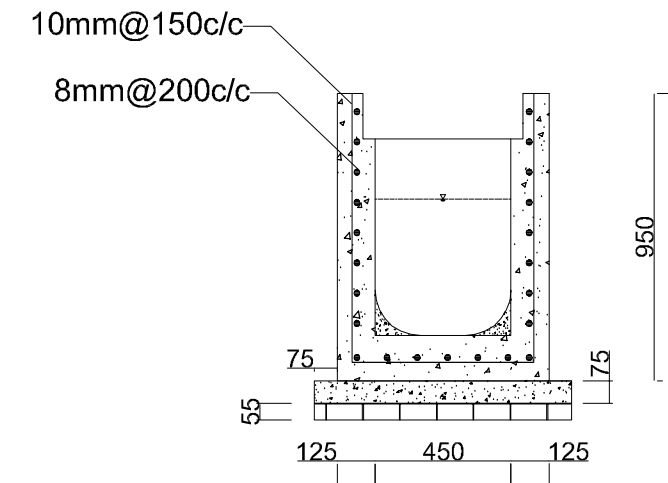
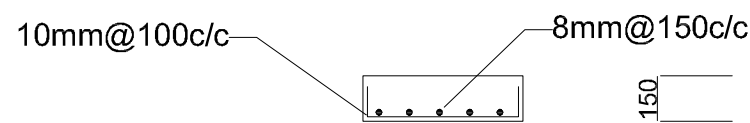
Consultant
Team Leader : YOO CHANGMIN
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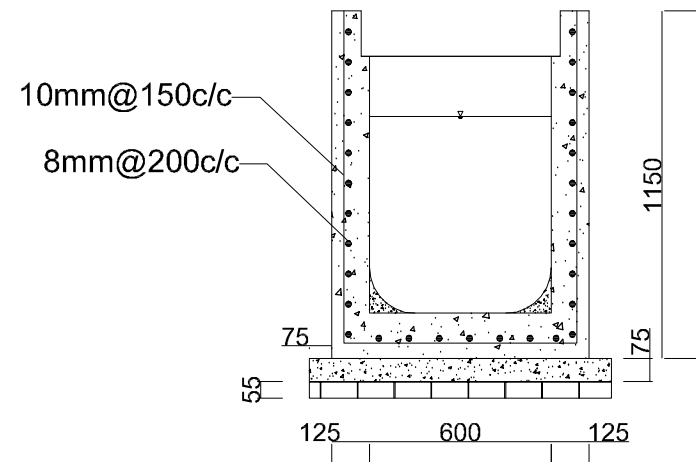
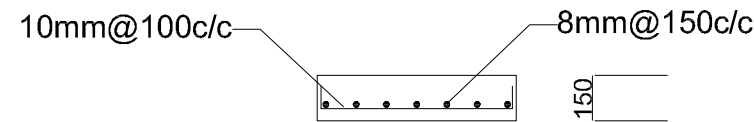
Scale
As Shown

TYPICAL CROSS SECTION OF ROAD
LUMBINI SANSKRITIK URBAN ROADS
LUMBINI SANSKRITIK MUNICIPALITY
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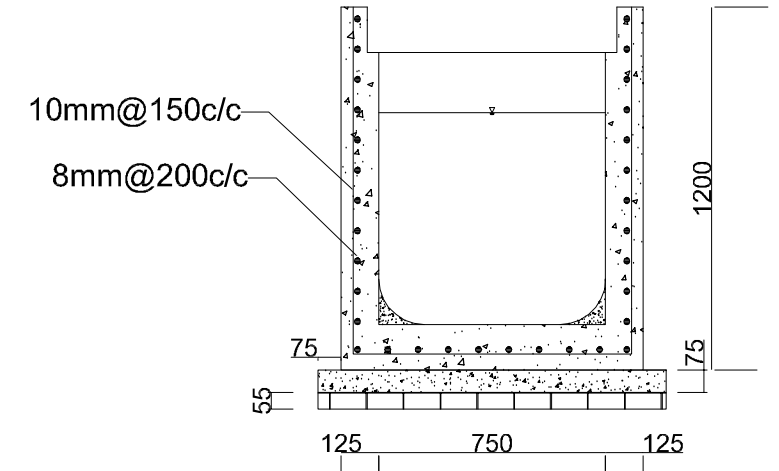
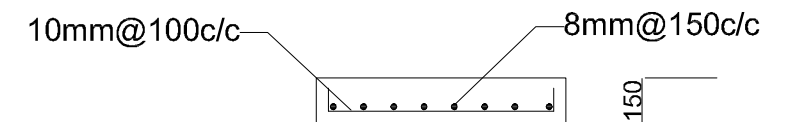
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TITLE : TYPICAL DRAWINGS
DRG NO : LSM/RD/TD/09
SHEET NO : 09



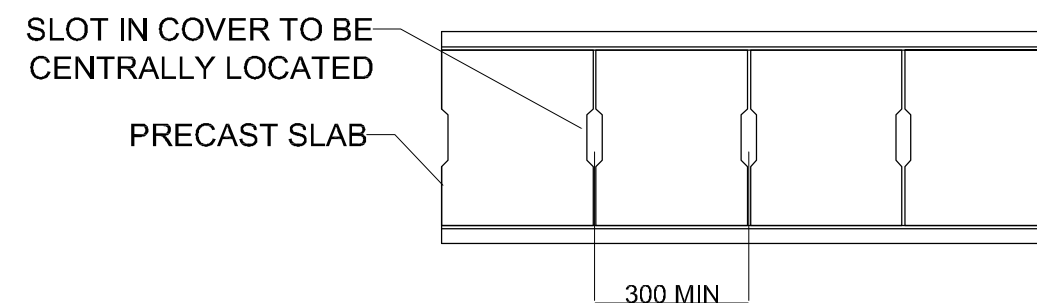
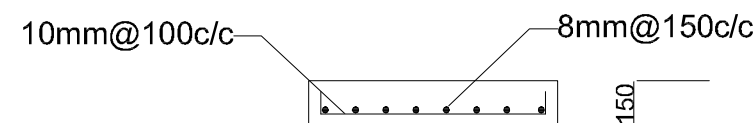
RCC DRAIN - TYPE A
Scale - 1:25



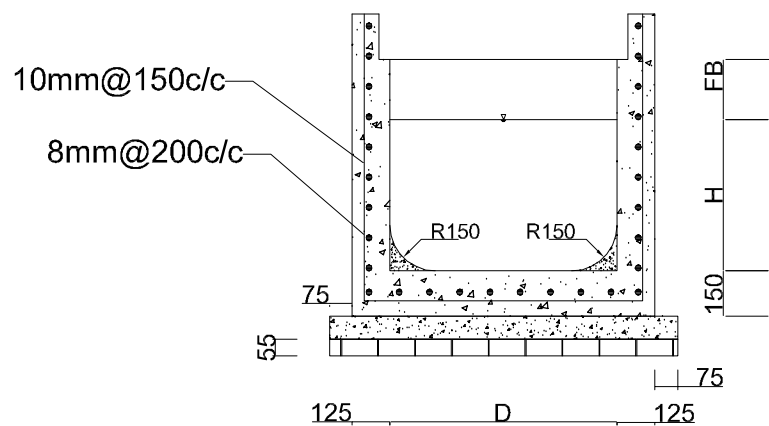
RCC DRAIN - TYPE B
Scale - 1:25



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
F	550	550	200
G	550	800	200



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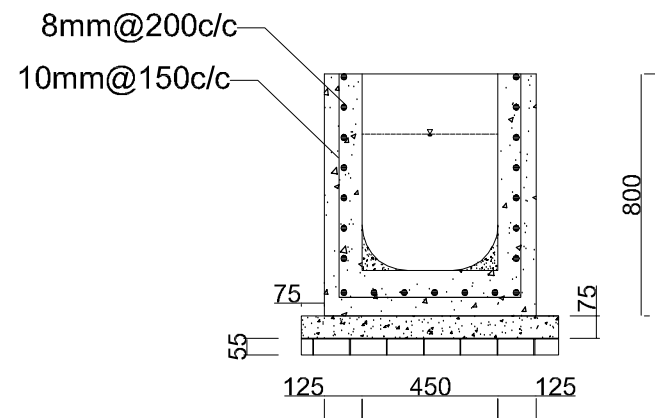
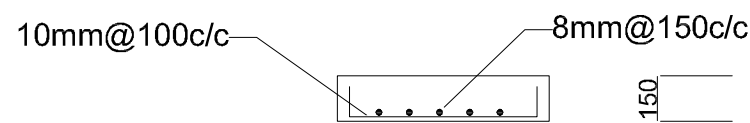
Consultant
Team Leader : YOO CHANGMIN
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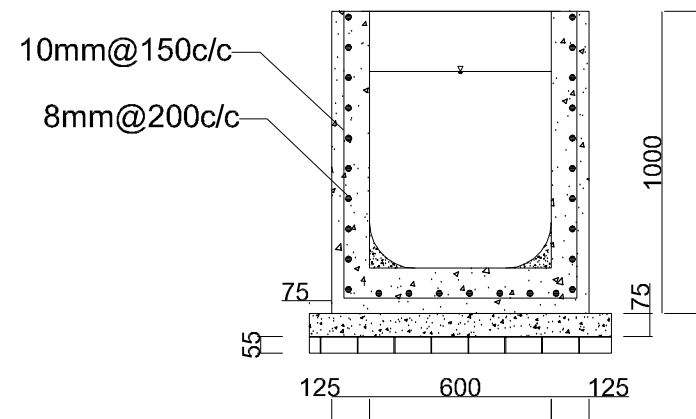
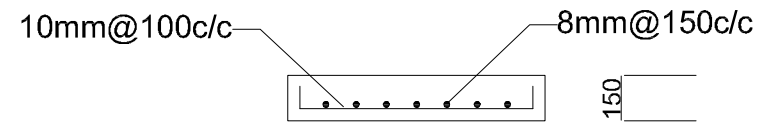
Scale
As Shown

TYPICAL DRAIN SECTIONS
LUMBINI SANSKRITIK URBAN ROADS
LUMBINI SANSKRITIK MUNICIPALITY
CH: 0+000 - 12+257.65 Km

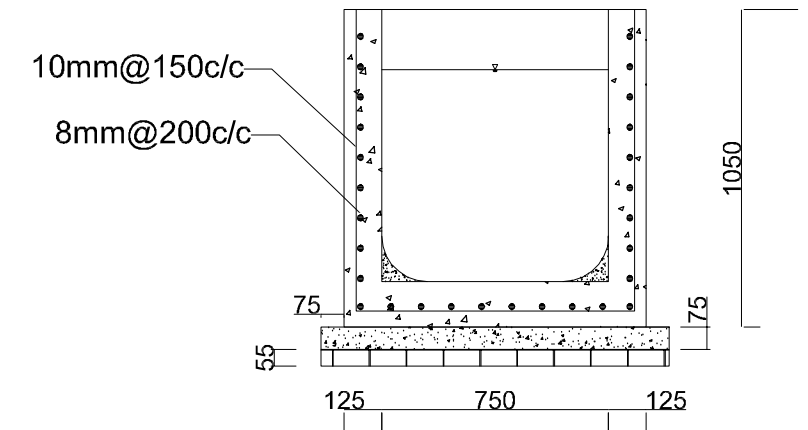
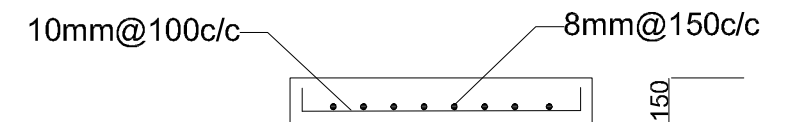
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DRG NO : LSM/RD/TD/10
SHEET NO : 10



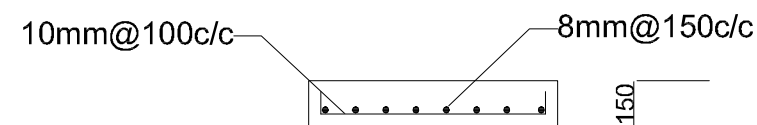
RCC DRAIN - TYPE A
Scale - 1:25



RCC DRAIN - TYPE B
Scale - 1:25

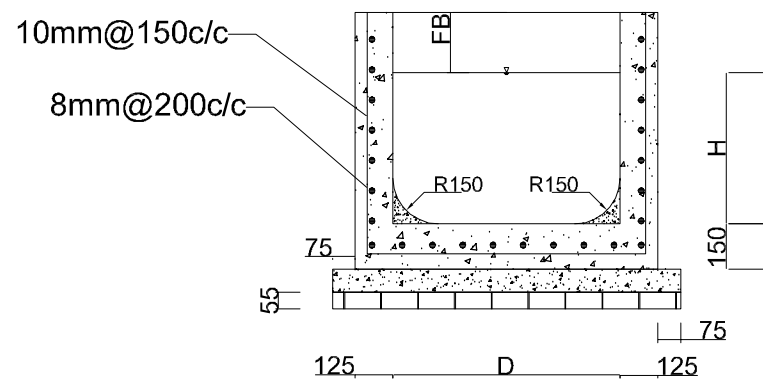


RCC DRAIN - TYPE C
Scale - 1:25



PRECAST SLAB

PRECAST SLAB
TO CLEAN AND OPEN



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
F	550	550	200
G	550	800	200



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Client
Approved By :
Checked By :

Scale
As Shown

TYPICAL DRAIN SECTIONS
LUMBINI SANSKRITIK URBAN ROADS
LUMBINI SANSKRITIK MUNICIPALITY
CH: 0+000 - 12+257.65 Km

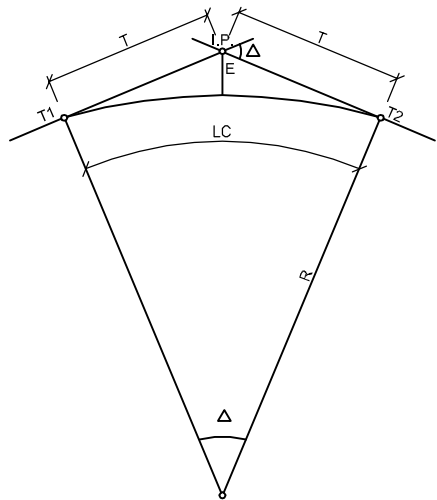
REV : DEC 2024
TITLE : TYPICAL DRAWINGS
DRG NO : LSM/RD/TD/11
SHEET NO : 11

Transition Curve Detail

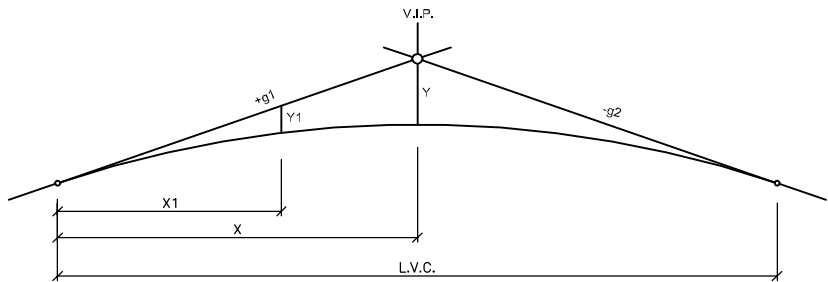
Transition Length

Mountainous 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				



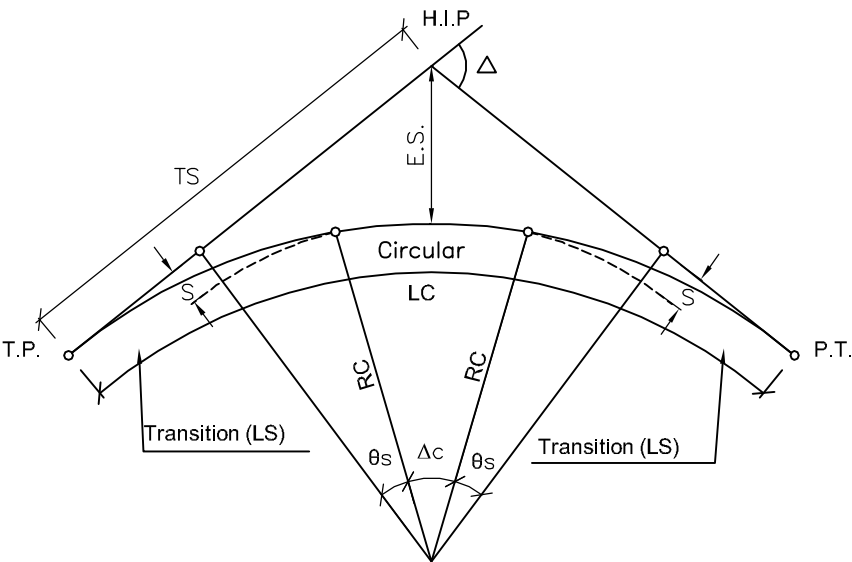
Circular Curve
For Horizontal Alignment



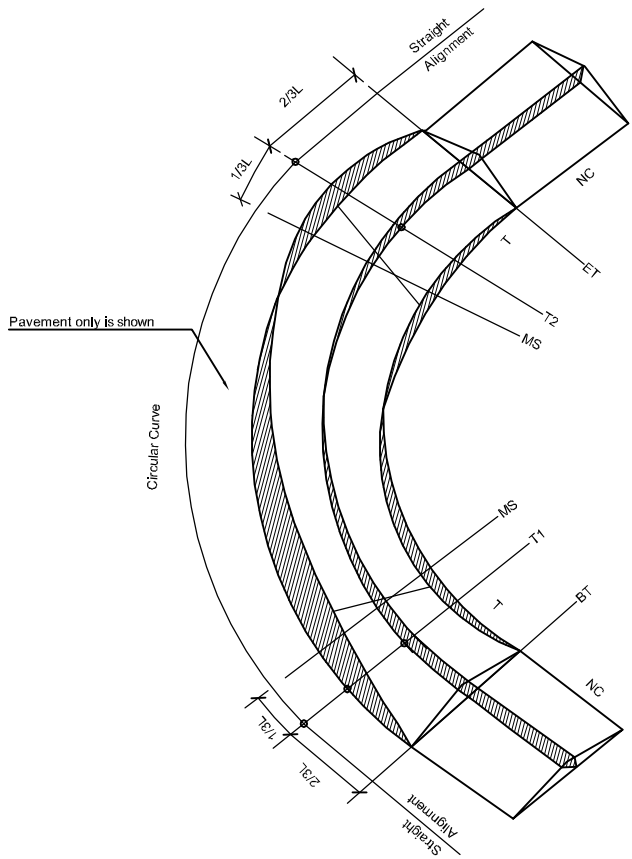
Parabolic Curve
For Vertical Alignment

- T.P.,P.T = Tangent Point.
H.I.P = Horizontal Intersection Point.
Δ = Total Deviation Angle.
Δc = 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.

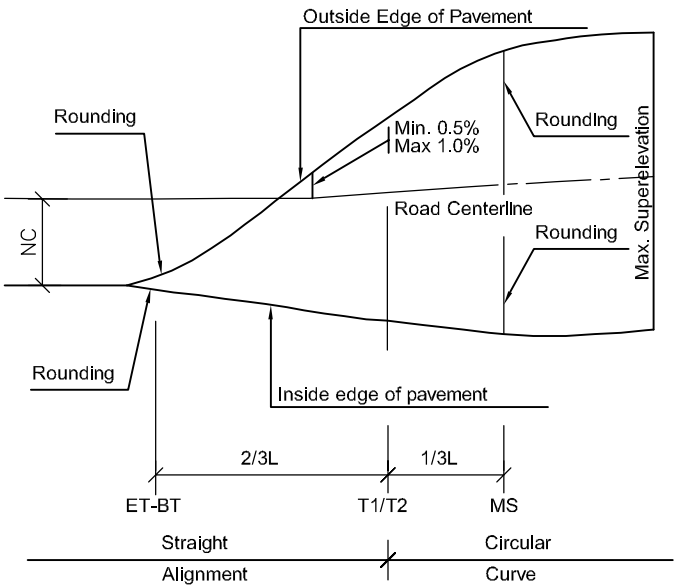
- I.P. = Intersection Point
Δ = Deflection Angle
R = Radius of Curvature
T = Tangent length
E = Distance from I.P. to Circular Curve Measured on the Bisectors
LC = Length of Circular Curve
T1 = Beginning of Circular Curve
T2 = End of Circular Curve
 $T = R \cdot \tan \frac{\Delta}{2}$
 $E = R \cdot \left(\frac{1}{\cos \frac{\Delta}{2}} - 1 \right)$
 $LC = R \cdot \frac{\pi}{200} \cdot \Delta$



Elements of Combined Circular and
Transition Curve



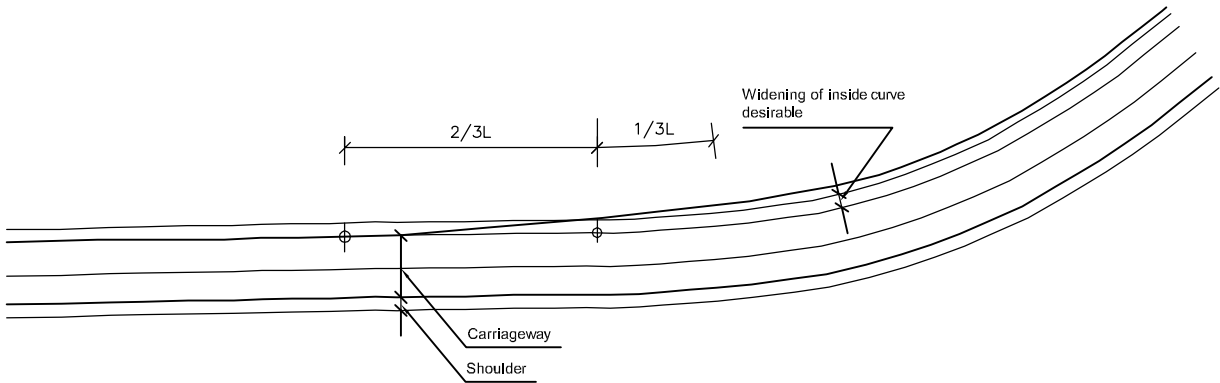
Typical Superelevation



Cross Slope in Curves

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

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



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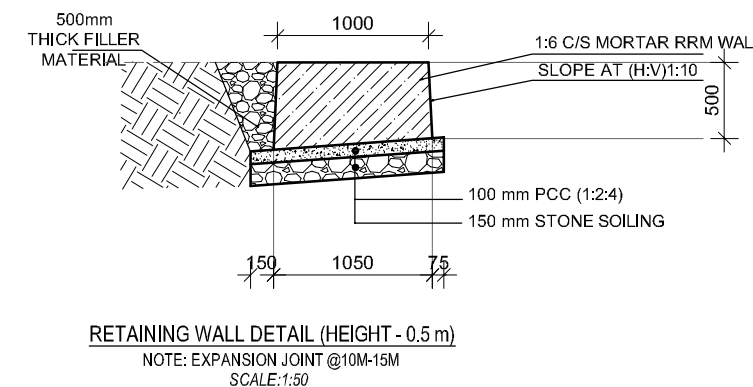
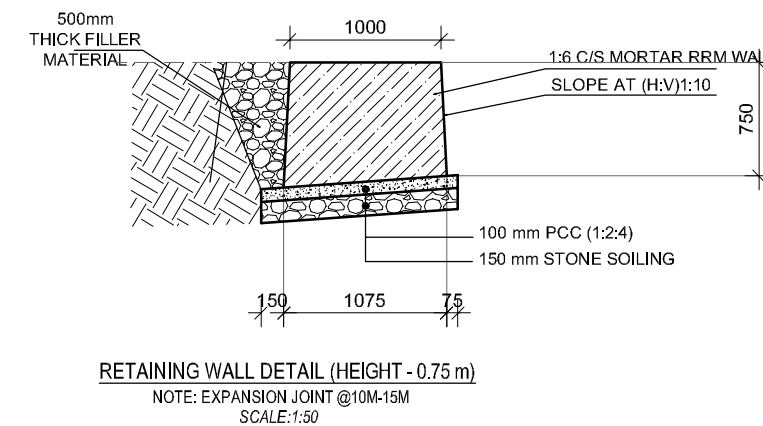
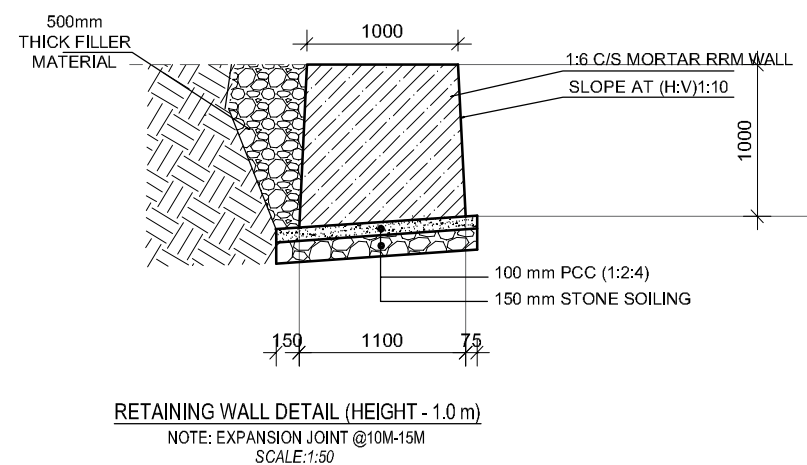
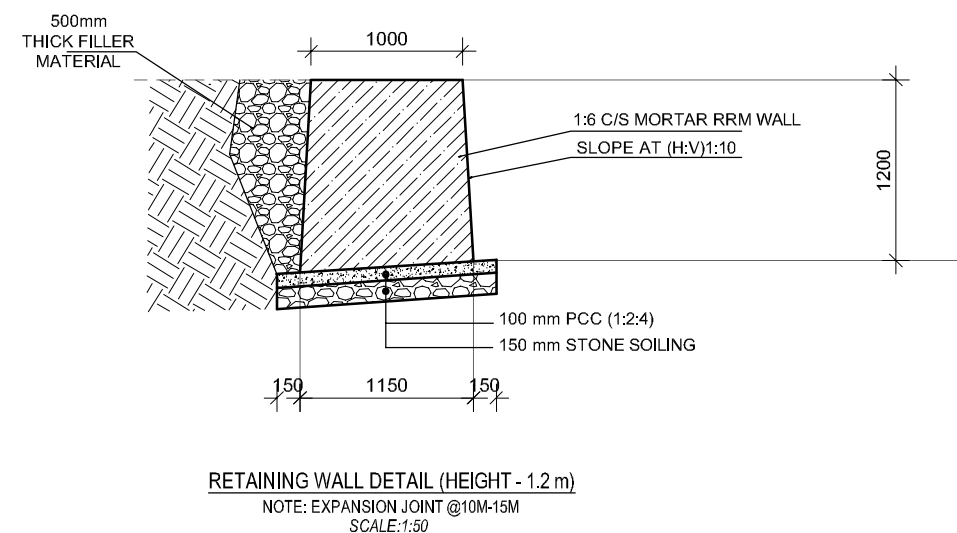
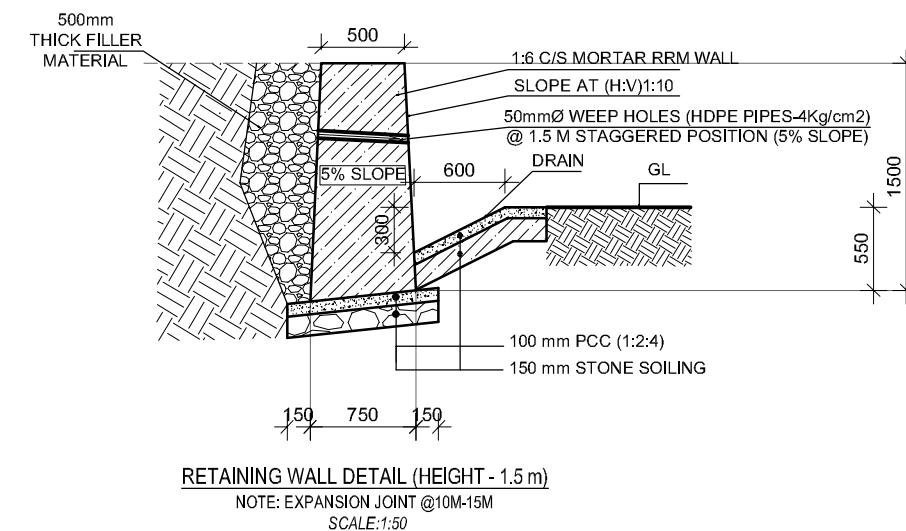
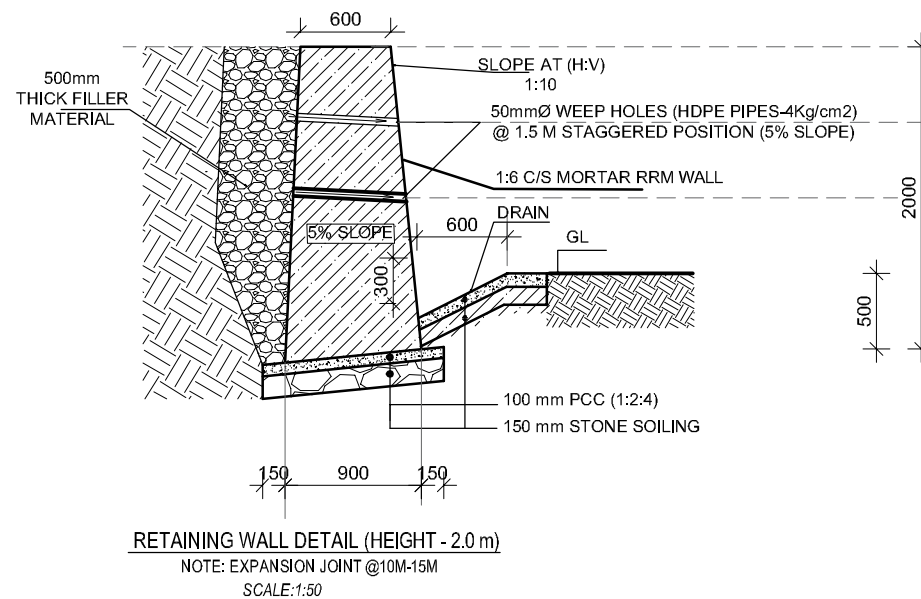
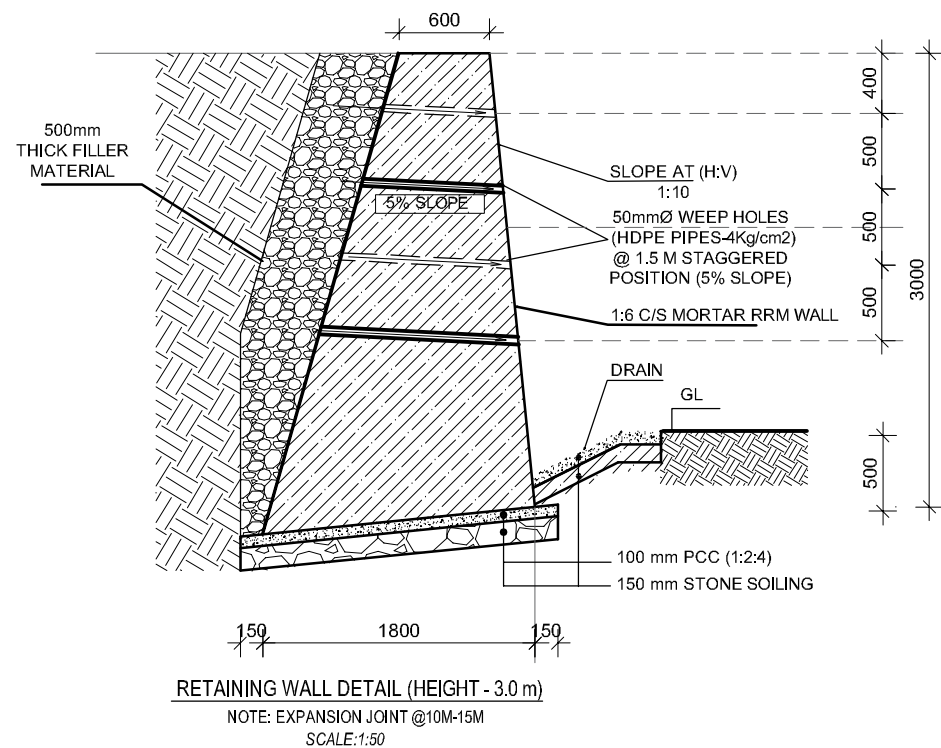
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Team Leader : **YOO CHANGMIN**
Reviewed By : **YAGYA BAHADUR MALLA**
Drawn By : **SHRIJANA SHRESTHA**

Client
Approved By :
Checked By :

Scale
As Shown

DETAILS OF ELEMENTS OF CURVES
**LUMBINI SANSKRITIK URBAN ROADS
LUMBINI SANSKRITIK MUNICIPALITY**
CH: 0+000 - 12+257.65 Km

REV : DEC 2024
TITLE : TYPICAL DRAWINGS
DRG NO : LSM/RD/TD/12
SHEET NO : 12



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

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ERMIC (P.) Ltd., SILT Consultants (P.) Ltd., and
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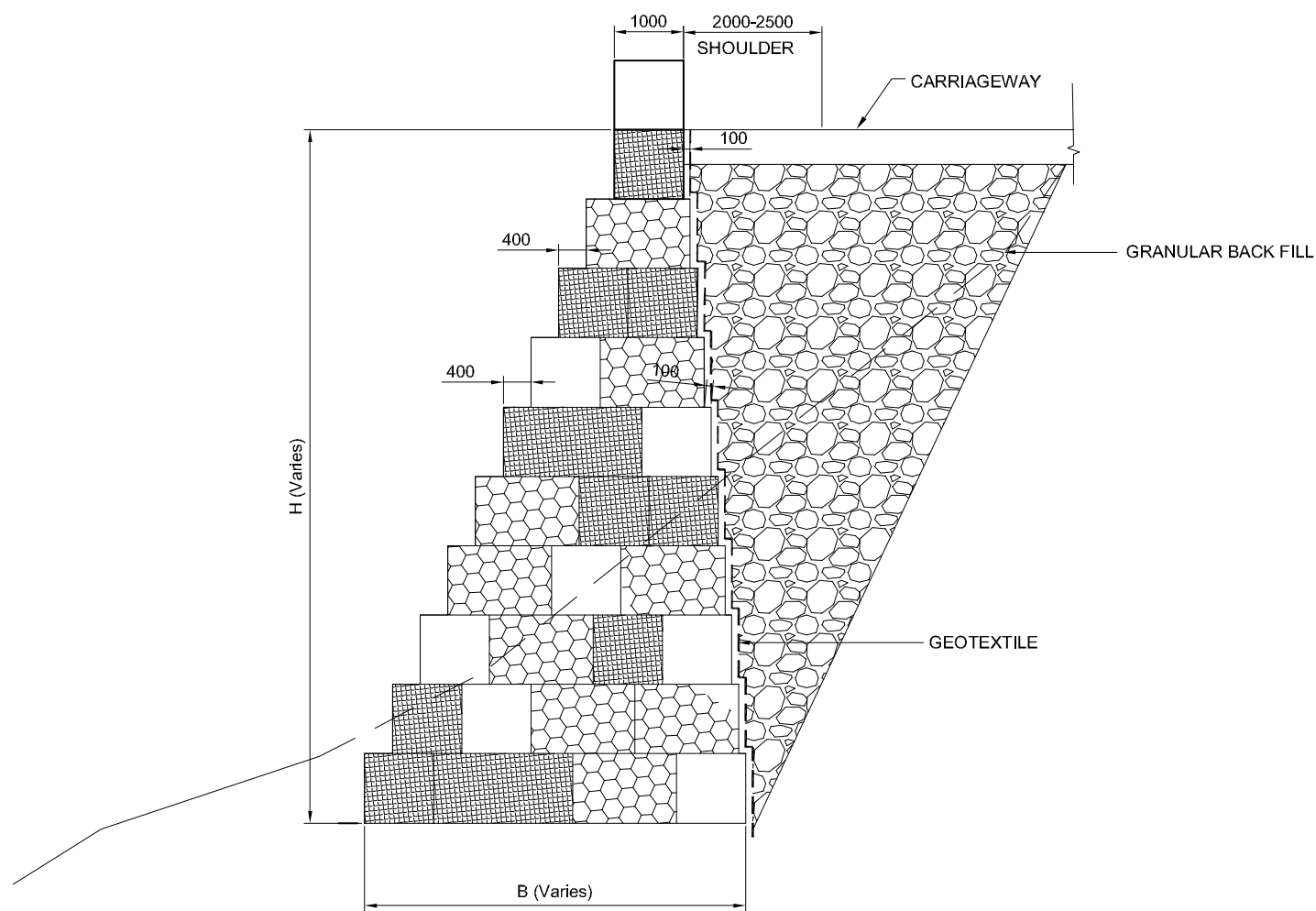
Consultant
Team Leader : YOO CHANGMIN
Reviewed By : YAGYA BAHADUR MALLA
Drawn By : SHRIJANA SHRESTHA

Client
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Scale
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TYPICAL RETAINING WALL
LUMBINI SANSKRITIK URBAN ROADS
LUMBINI SANSKRITIK MUNICIPALITY
CH: 0+000 - 12+257.65 Km

REV : DEC 2024
TITLE : TYPICAL DRAWINGS
DRG NO : LSM/RD/TD/13
SHEET NO : 13



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/m ²))								
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/m ²)	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/m ²)	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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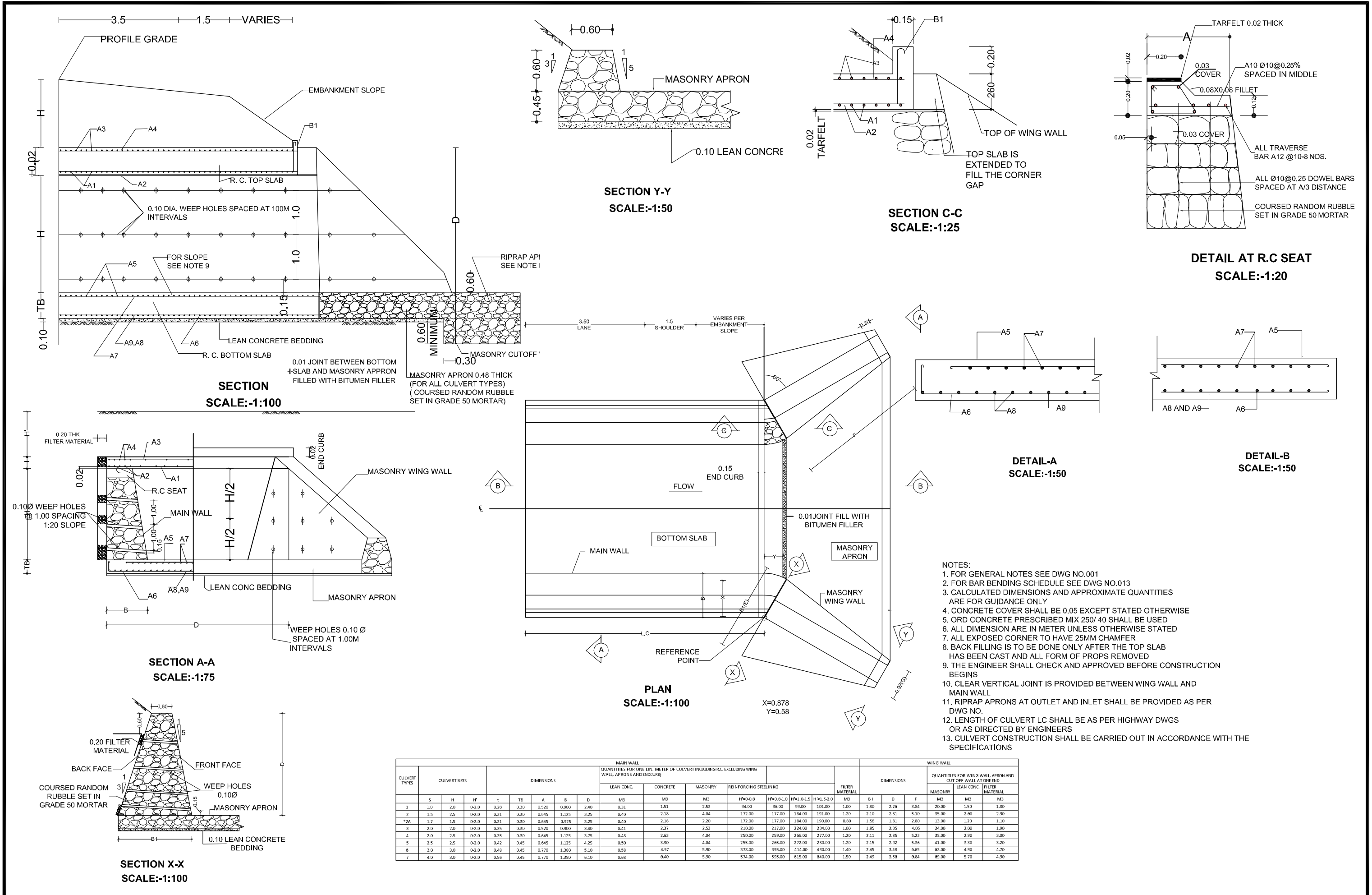
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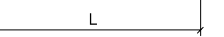


Scale
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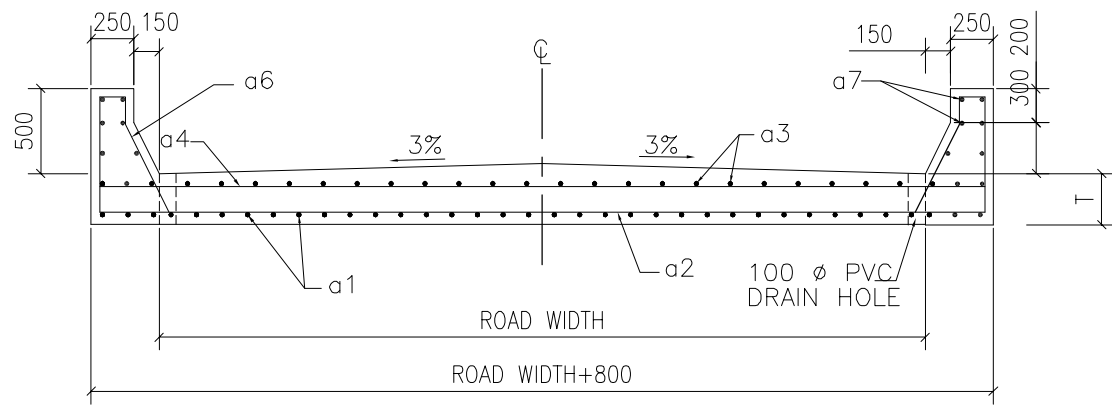
TYPICAL GABION RETAINING WALL
LUMBINI SANSKRITIK URBAN ROADS
LUMBINI SANSKRITIK MUNICIPALITY
CH: 0+000 - 12+257.65 Km

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

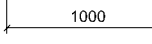
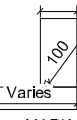



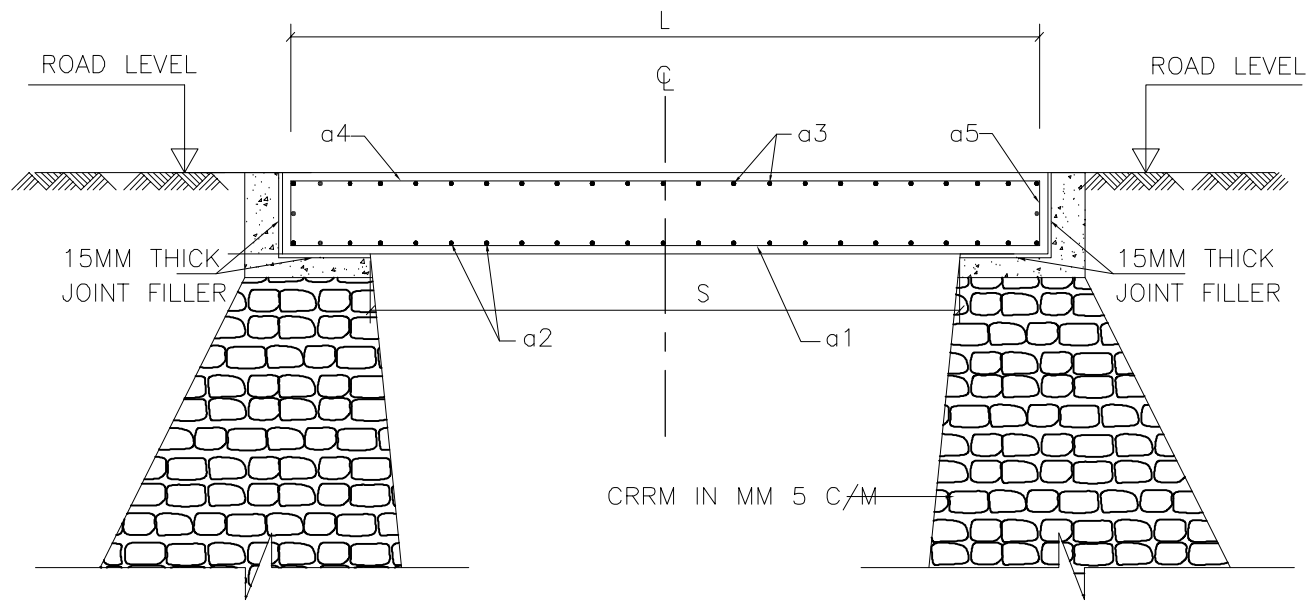


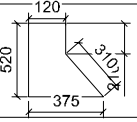
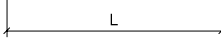
BAR BENDING SCHEDULE PER ONE LINEAR METRE OF CULVERT (EXCLUDING CURB & ABUTMENT SEAT)																					
CULVERT TYPE																					
	MARK a1					MARK a2				MARK a3				MARK a4				MARK a5			
	DIA (mm)	SPACING	NO. REQD/ PER METRE	L	Remarks	DIA	SPACING	NO. REQD/ PER METRE	L	DIA	SPACING	NO. REQD/ 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 thlrđ 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	7.90	10	8	0.60	4.80
IV	10	9	1.00	9.00	10	5	1.94	9.69	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

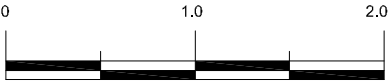


BAR BENDING SCHEDULE OF CURB								
CULVERT TYPE								
	MARK a6				MARK a7			
	DIA (mm)	NO.	LENGTH	TOTAL LENGTH	DIA (mm)	NO.	LENGTH	TOTAL LENGTH
I	10	22	1.74	38.17	10	12	1.96	23.52
II	10	36	1.74	62.46	10	12	3.22	38.64
III	10	48	1.74	83.28	10	12	4.46	53.52
IV	10	56	1.74	97.16	10	12	5.44	65.28
V	10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

SCALE (m)

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.



Department of Urban Development & Building
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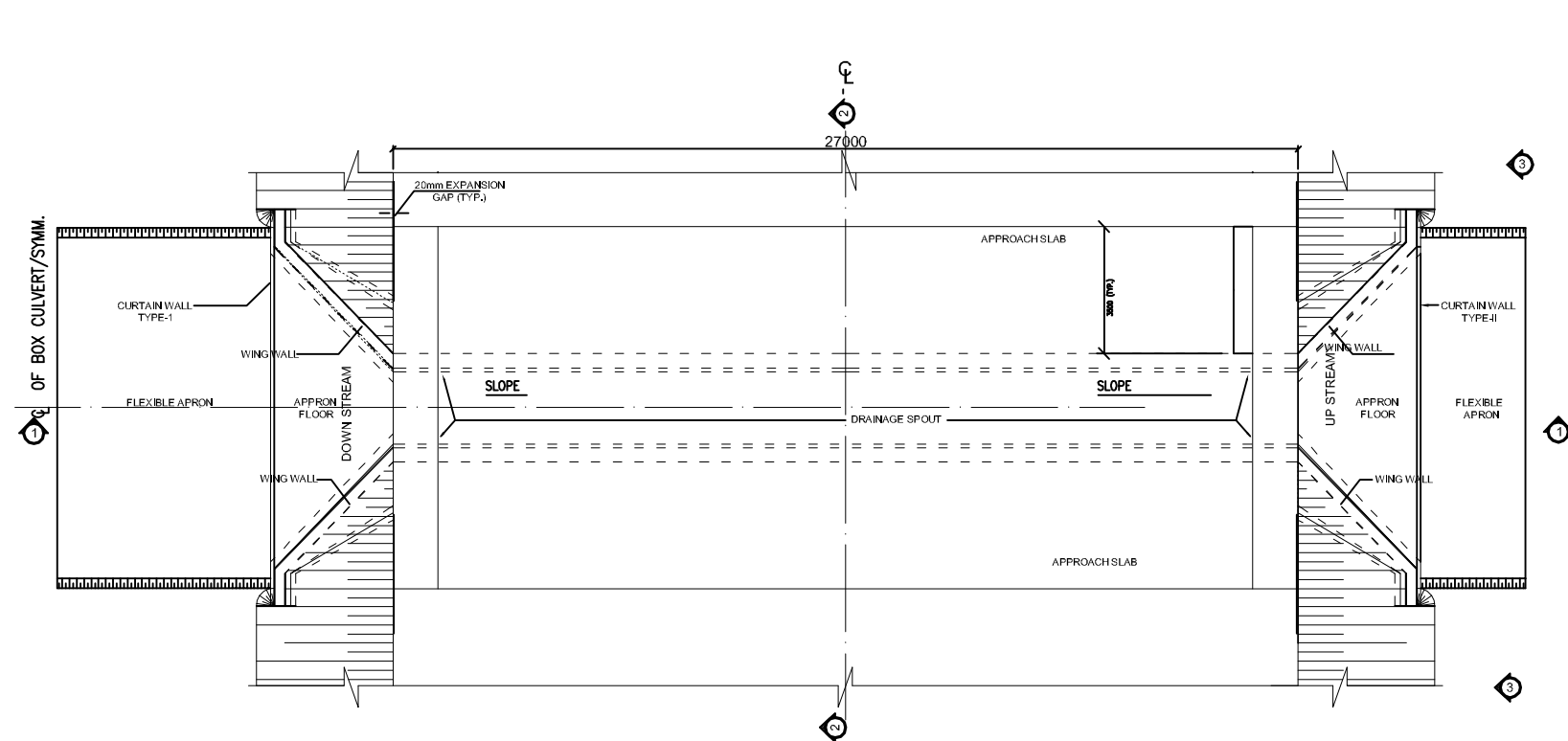
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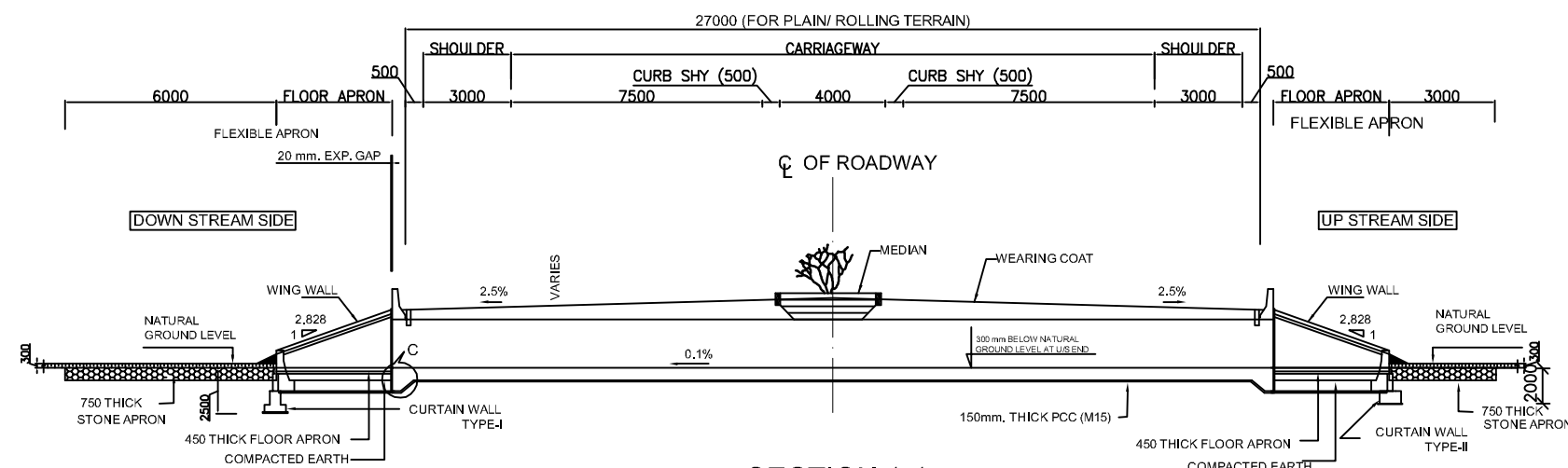
As Shown

SLAB CULVERT NO FILL REINFORCEMENT
LUMBINI SANSKRITIK URBAN ROADS
LUMBINI SANSKRITIK MUNICIPALITY
CH: 0+000 - 12+257.65 Km

REV	: DEC 2024
TITLE	: TYPICAL DRAWINGS
DRG NO	: LSM/RD/TD/17
SHEET NO	: 17



PLAN AT ROAD LEVEL



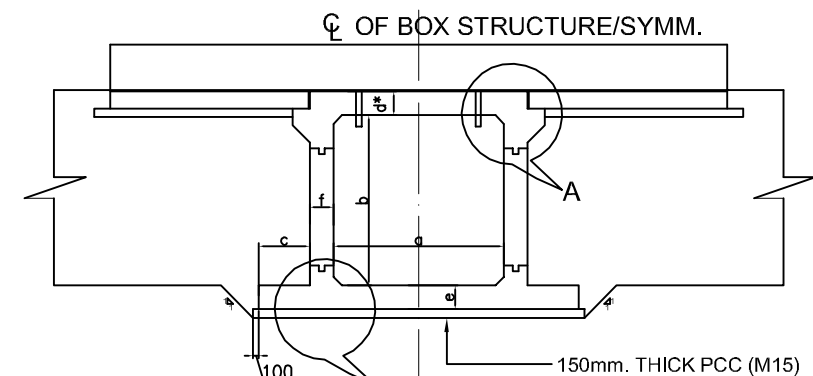
SECTION 1-1

TABLE SHOWING SALIENT DIMENSIONS

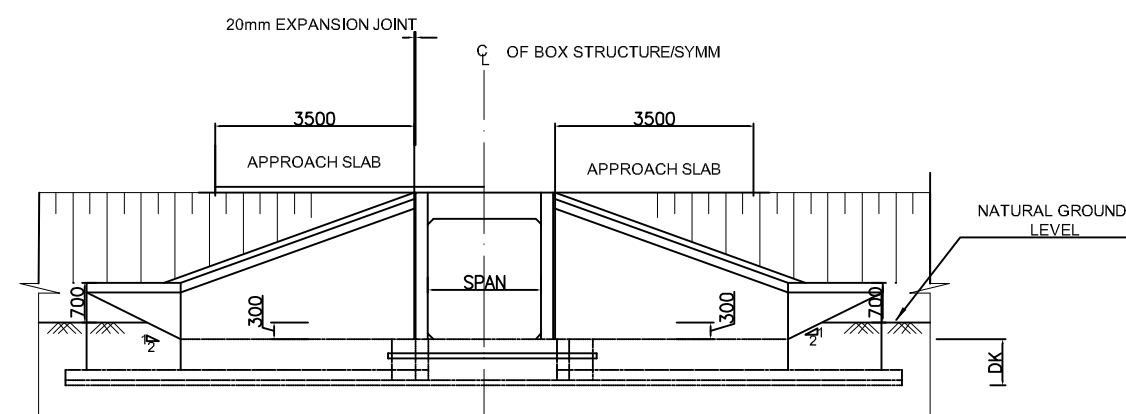
BOX CELL DESIGNATION	a (mm)	b (mm)	c (mm)	d (mm)	e (mm)	f (mm)
2m x 2m	2000	2000	500	350	380	300
3m x 3m	3000	3000	900	420	420	420
6m x 5m	6000	5000	1100	680	750	750

NOTES:

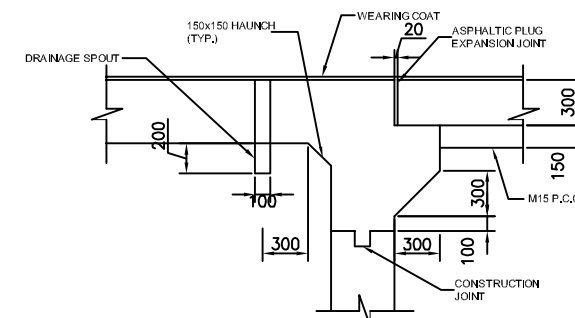
- All dimensions are in millimeters unless otherwise noted. Only written dimensions are to be followed.
- Soft and loose patches in the bearing area shall be replaced by compacted granular fills with layers not exceeding 300mm.
- Net bearing capacity for the soil shall not be less than 15 T/m².
- 'DK' 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



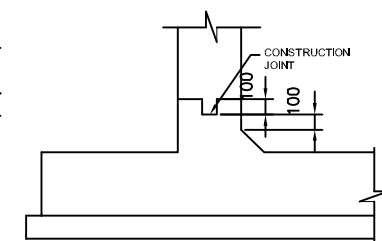
SECTION 2-2



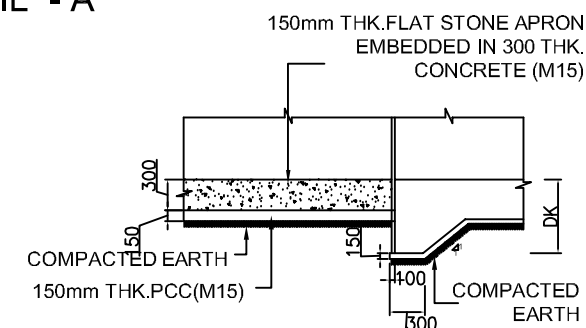
SECTION 3-3



DETAIL - A



DETAIL - D



DETAIL - C



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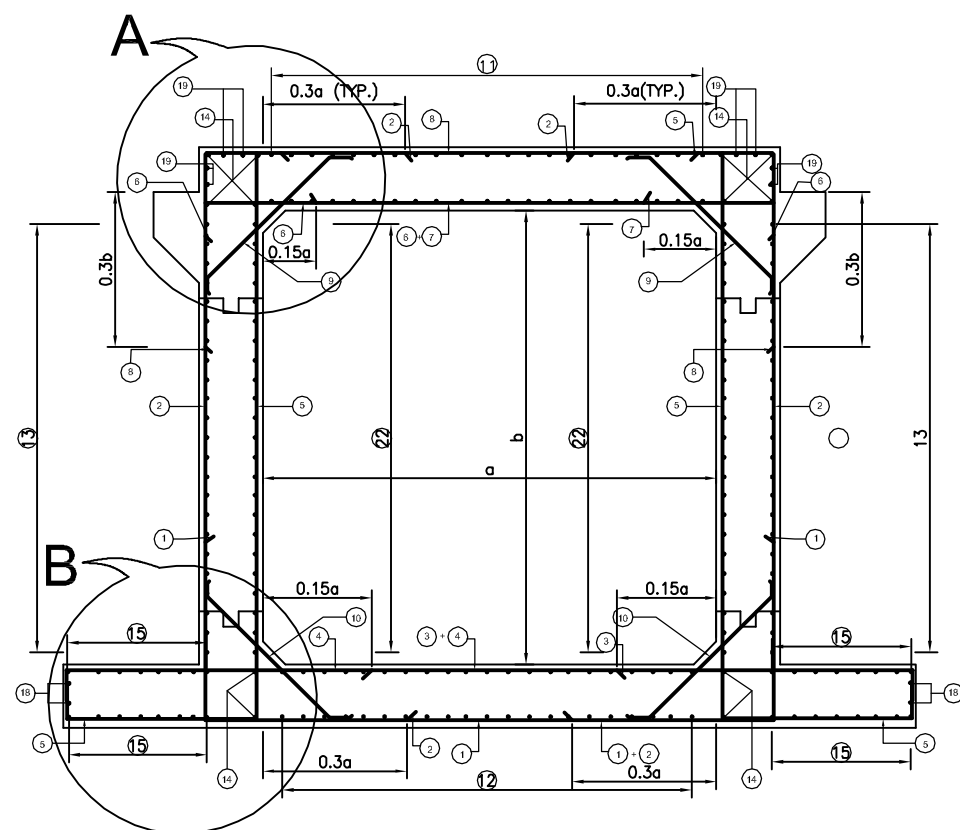
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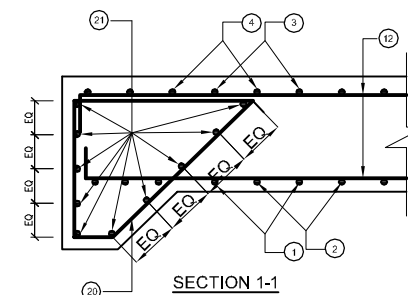
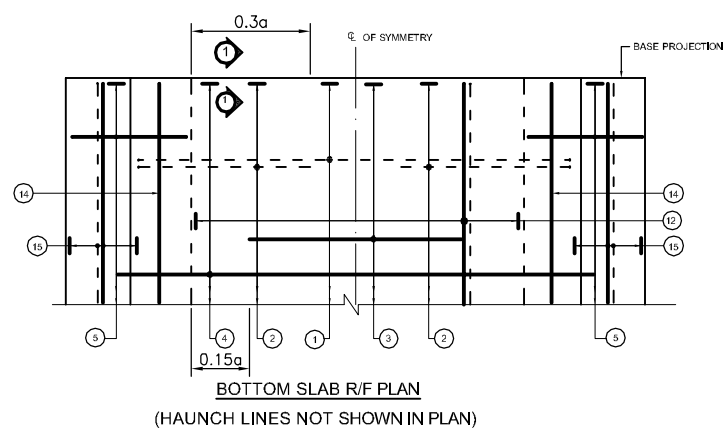
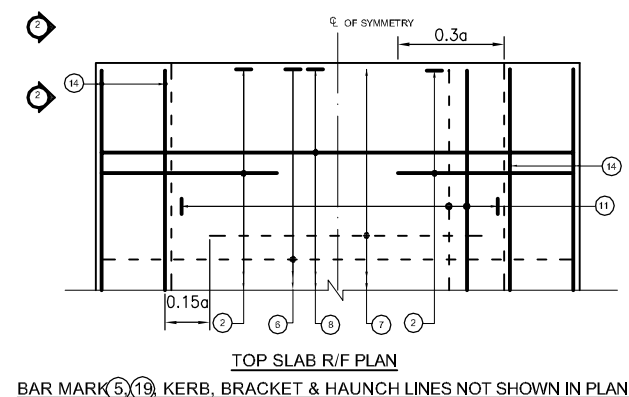
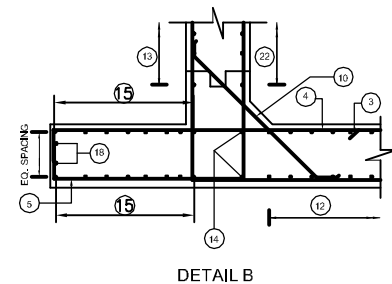
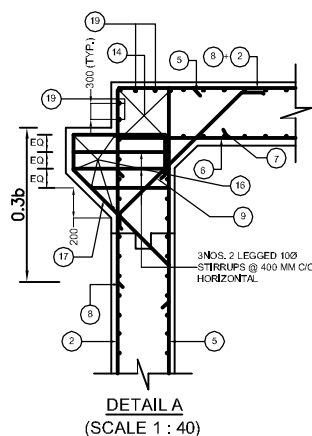
Scale
As Shown

SINGLE CELL BOX CULVERT W/O CUSHION
LUMBINI SANSKRITIK URBAN ROADS
LUMBINI SANSKRITIK MUNICIPALITY
CH: 0+000 - 12+257.65 Km

REV : DEC 2024
TITLE : TYPICAL DRAWINGS
DRG NO : LSM/RD/TD/18
SHEET NO : 18



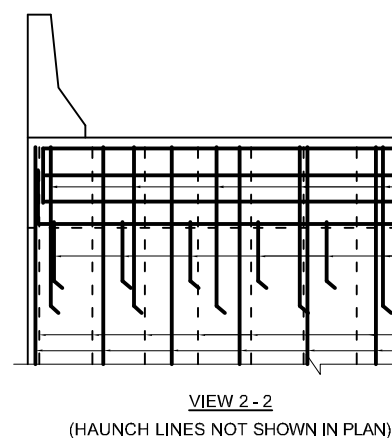
REINFORCEMENT DETAILS OF SINGLE CELL BOX CULVERT



LEGEND:

— : TOP FACE BARS/
OUTER FACE BARS

- - - : BOTTOM FACE BARS/
INNER FACE BARS



- 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.



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Approved By :
Checked By :

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SINGLE CELL BOX CULVERT W/O CUSHION
LUMBINI SANSKRITIK URBAN ROADS
LUMBINI SANSKRITIK MUNICIPALITY
CH: 0+000 - 12+257.65 Km

REV : DEC 2024
TITLE : TYPICAL DRAWINGS
DRG NO : LSM/RD/TD/19
SHEET NO : 19

BAR SCHEDULE FOR BOX CULVERT 2X2 (WITHOUT CUSHION) PER M LENGTH										
BAR MARK	DESCRIPTION OF BARS	BAR DIA. (mm)	SPACING (mm)	M1 In mm.	M2 In mm.	LENGTH In mm.	NO. OF BARS	TOTAL LENGTH (m)	UNIT WEIGHT (kg/m)	TOTAL WEIGHT (kg)
1		10	250	930	2500	4326	5	21.63	0.617	13.35
2		16	250	850	2630	4275	10	42.75	1.580	67.56
3		0	0	0	0	0	0	0.00	0.000	0.00
4		16	250	280	3500	4005	5	20.03	1.580	31.65
5		16	250	2630	700	3648	10	36.48	1.580	57.65
6		16	250	260	2500	2965	5	14.83	1.580	23.43
7		0	0	0	0	0	0	0.00	0.000	0.00
8		10	250	900	2500	4266	5	21.33	0.617	13.17
9		10	250	200	890	1243	10	12.43	0.617	7.67
10		12	250	200	932	1291	10	12.91	0.889	11.48
11		10	250	225	1000	1450	16	23.20	0.617	14.32
12		10	250	190	1000	1380	16	22.08	0.617	13.63
13		10	250	160	1000	1320	16	21.12	0.617	13.04
14		10	0	160	1000	1320	12	15.84	0.617	9.78
15		10	250	190	1000	1380	12	16.56	0.617	10.22
16		12	0	1000	0	1000	10	10.00	0.889	8.89
17		12	250	1006	1268	2274	10	22.74	0.889	20.21
18		10	0	160	1000	1320	4	5.28	0.617	3.26
19		10	0	160	1000	1320	8	10.56	0.617	6.52
20		10	150	1100	1556	4207	50	210.35	0.617	129.85
21		10	0	160	3500	3786	20	75.72	0.617	46.74
22		10	250	160	1000	1320	16	21.12	0.617	13.04
TOTAL WEIGHT=										515.47

BAR SCHEDULE FOR BOX CULVERT 3X3 (WITHOUT CUSHION) PER M LENGTH										
BAR MARK	DESCRIPTION OF BARS	BAR DIA. (mm)	SPACING (mm)	M1 In mm.	M2 In mm.	LENGTH In mm.	NO. OF BARS	TOTAL LENGTH (m)	UNIT WEIGHT (kg/m)	TOTAL WEIGHT (kg)
1		10	200	1270	3740	6246	6	37.48	0.617	23.13
2		16	200	1270	3740	6225	12	74.70	1.580	118.05
3		12	200	2100		2100	5	10.50	0.889	9.33
4		16	200	320	5540	6125	6	36.75	1.580	58.08
5		12	150	3740	1220	5298	16	84.77	0.889	75.35
6		16	200	260	3740	4205	6	25.23	1.580	39.87
7		0	0	0	0	0	0	0.00	0.000	0.00
8		10	200	1270	3740	6246	6	37.48	0.617	23.13
9		10	200	200	1158	1511	12	18.13	0.617	11.19
10		10	200	200	1158	1524	12	18.29	0.617	11.29
11		10	200	260	1000	1520	30	45.60	0.617	28.15
12		12	200	210	1000	1420	30	42.60	0.889	37.87
13		10	200	210	1000	1420	30	42.60	0.617	26.30
14		10	0	160	1000	1320	12	15.84	0.617	9.78
15		10	200	210	1000	1420	24	34.08	0.617	21.04
16		12	0	1000	0	1000	10	10.00	0.889	8.89
17		12	200	1006	1268	2274	12	27.29	0.889	24.26
18		10	0	160	1000	1320	4	5.28	0.617	3.26
19		10	0	160	1000	1320	8	10.56	0.617	6.52
20		10	200	1100	1556	4207	58	244.01	0.617	150.63
21		10	0	160	5540	5826	20	116.52	0.617	71.93
22		10	250	210	1000	1420	24	34.08	0.617	21.04
TOTAL WEIGHT=										779.10

BAR SCHEDULE FOR BOX CULVERT 6X5 (WITHOUT CUSHION) PER M LENGTH										
BAR MARK	DESCRIPTION OF BARS	BAR DIA. (mm)	SPACING (mm)	M1 In mm.	M2 In mm.	LENGTH In mm.	NO. OF BARS	TOTAL LENGTH (m)	UNIT WEIGHT (kg/m)	TOTAL WEIGHT (kg)
1		20	200	2200	7400	11731	6	70.39	2.469	173.80
2		20	200	2500	6330	11261	12	135.13	2.469	333.68
3		16	200	4200	0	4200	5	21.00	1.580	33.19
4		20	200	650	9600	10831	6	64.99	2.469	160.47
5		12	125	6330	1750	8418	18	151.52	0.889	134.70
6		16	200	260	7400	7865	6	47.19	1.580	74.58
7		12	200	4200	0	4200	5	21.00	0.889	18.67
8		10	200	2130	7400	11626	6	69.76	0.617	43.06
9		10	200	200	1993	2346	12	28.15	0.617	17.38
10		10	200	200	2092	2457	12	29.48	0.617	18.20
11		10	150	390	1000	1780	78	138.84	0.617	85.71
12		12	150	375	1000	1750	78	136.50	0.889	121.34
13		12	150	375	1000	1750	66	115.50	0.889	102.67
14		10	0	160	1000	1320	12	15.84	0.617	9.78
15		10	150	375	1000	1750	36	63.00	0.617	38.89
16		12	0	1000	0	1000	10	10.00	0.889	8.89
17		12	200	1171	1702	2872	12	34.46	0.889	30.64
18		10	0	160	1000	1320	4	5.28	0.617	3.26
19		10	0	160	1000	1320	8	10.56	0.617	6.52
20		10	150	1100	1556	4207	130	546.91	0.617	337.62
21		10	0	160	9600	9886	20	197.72	0.617	122.06
22		10	170	375	1000	1750	58	101.50	0.617	62.66
TOTAL WEIGHT=										1937.76

NOTES:

- Quantity of steel does not include 5% extra for wastage and laps.
- Joint or lapping of bars shall be suitably staggered as per IRC:21-2000.
- 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)
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Reviewed & Designed By :
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ERMIC (P.) Ltd., SILT Consultants (P.) Ltd., and DIGICON (P.) Ltd.
 Mid- Baneshwor, Kathmandu
 Tel: 01- 4589393

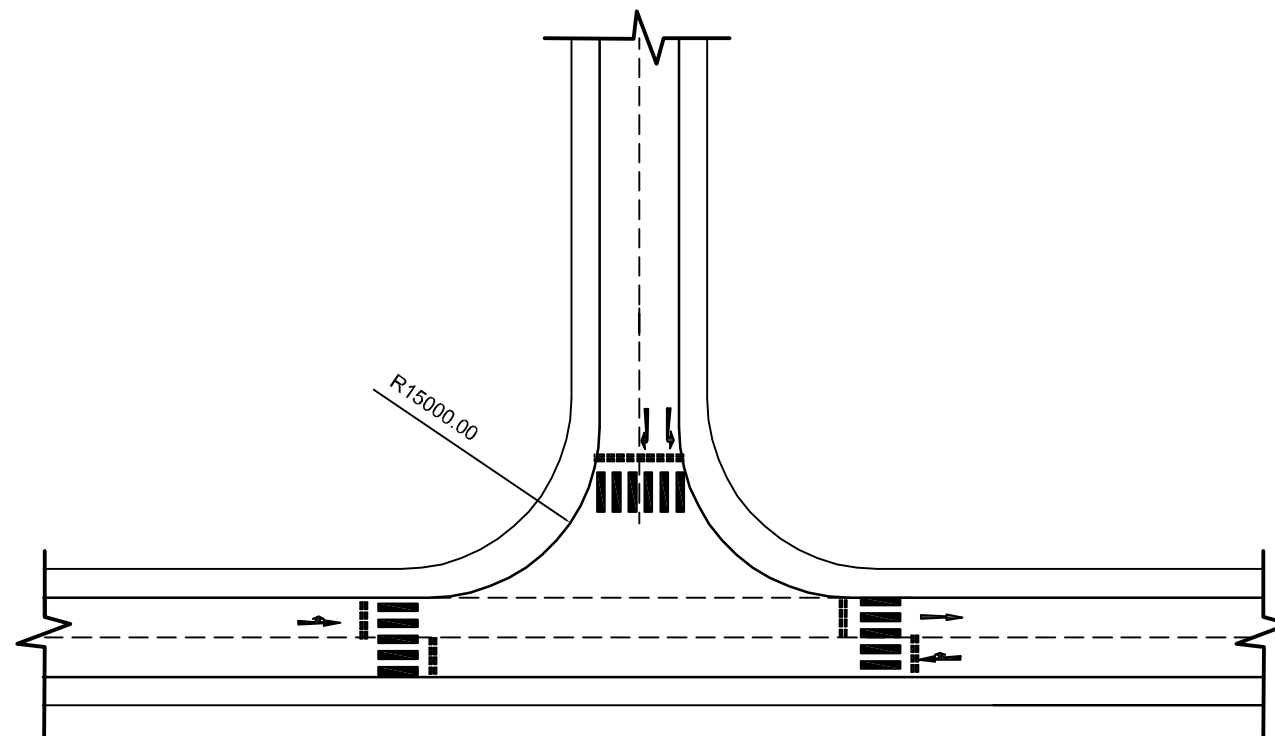
Consultant
Team Leader : YOO CHANGMIN
Reviewed By : YAGYA BAHADUR MALLA
Drawn By : SHRIJANA SHRESTHA

Client
Approved By :
Checked By :

Scale
As Shown

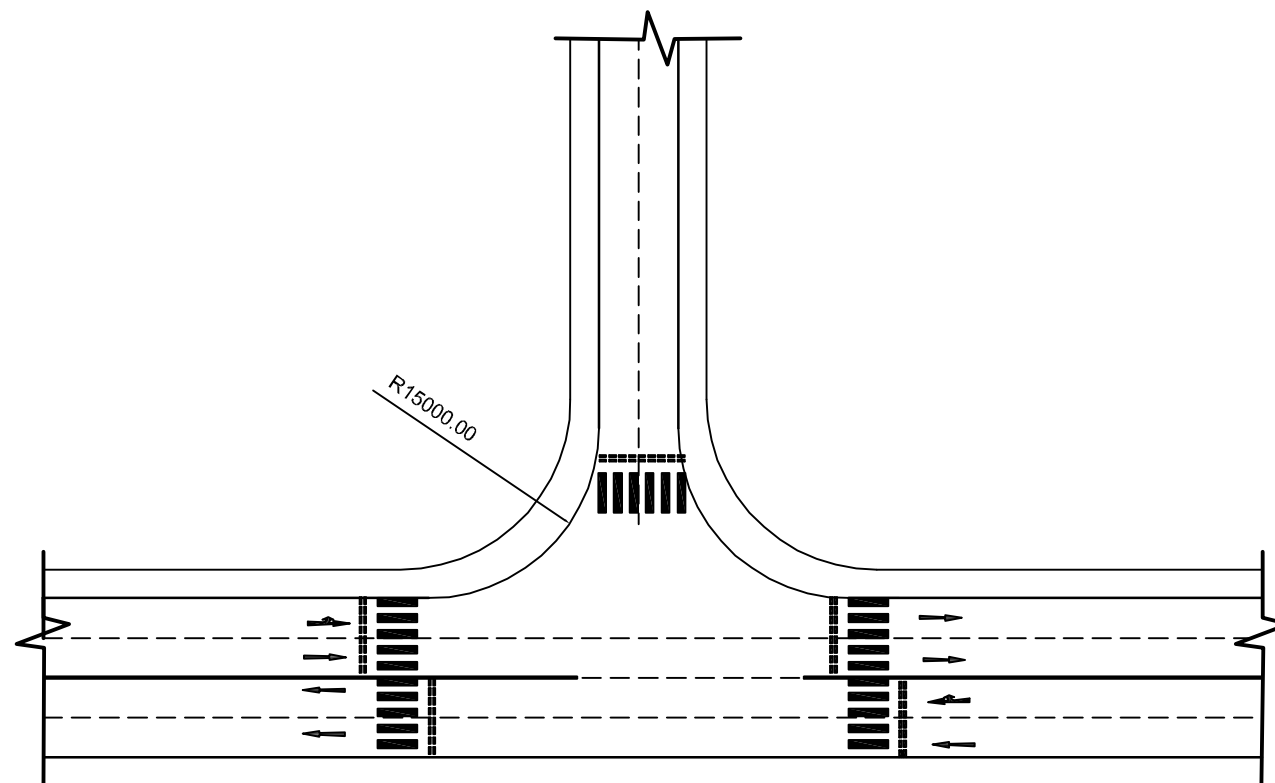
SINGLE CELL BOX CULVERT W/O CUSHION
LUMBINI SANSKRITIK URBAN ROADS
LUMBINI SANSKRITIK MUNICIPALITY
CH: 0+000 - 12+257.65 Km

REV : DEC 2024
TITLE : TYPICAL DRAWINGS
DRG NO : LSM/RD/TD/20
SHEET NO : 20



T-INTERSECTION WITH BASIC RIGHT TURN TREATMENT

SCALE:-1:1500



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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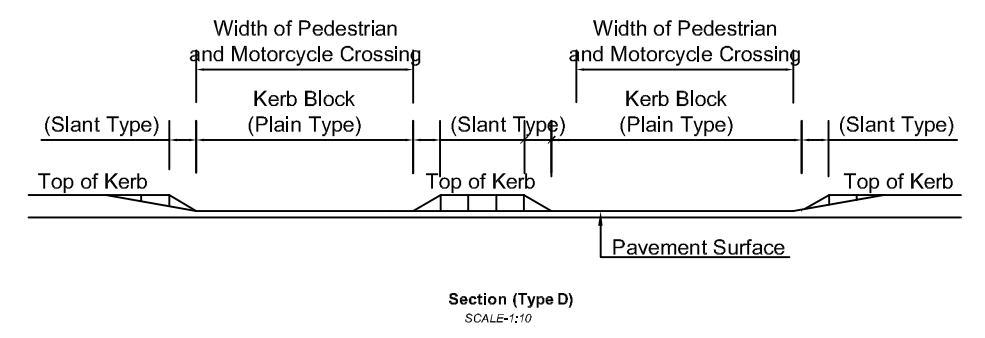
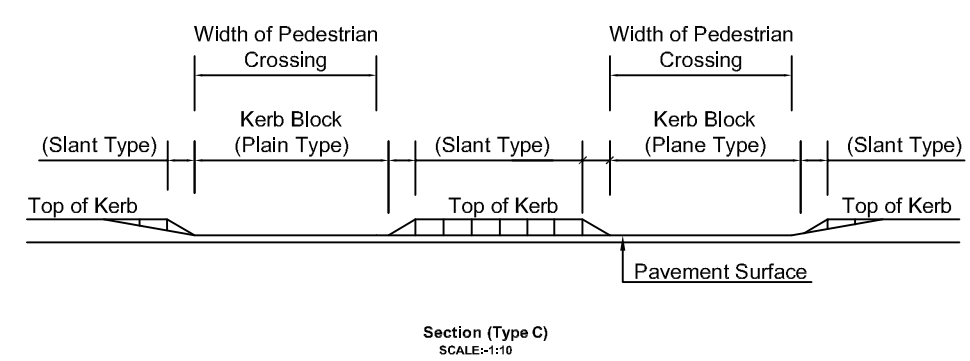
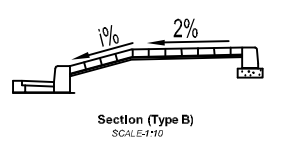
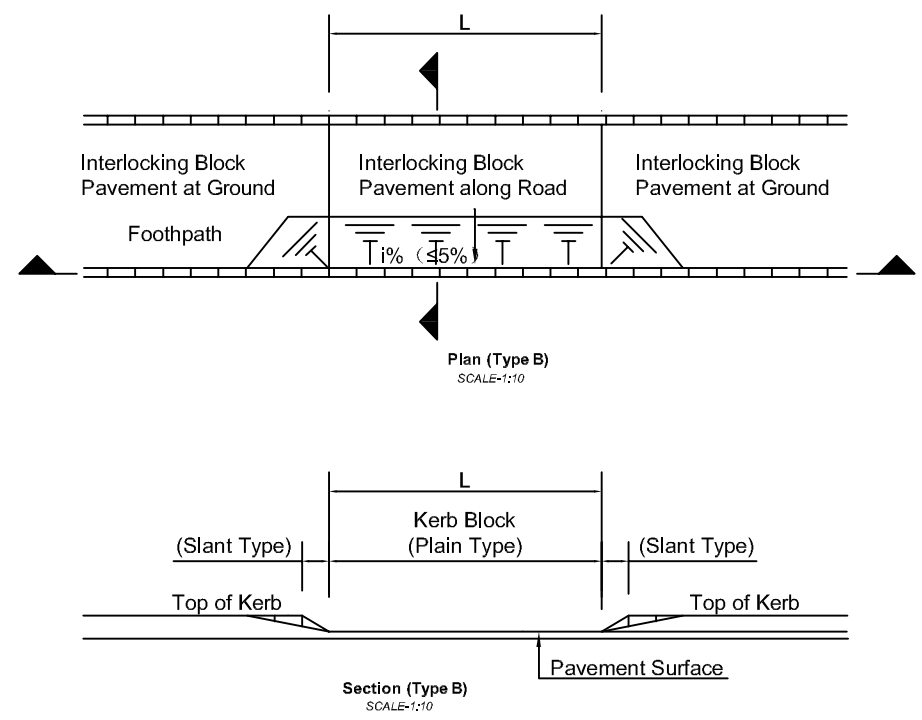
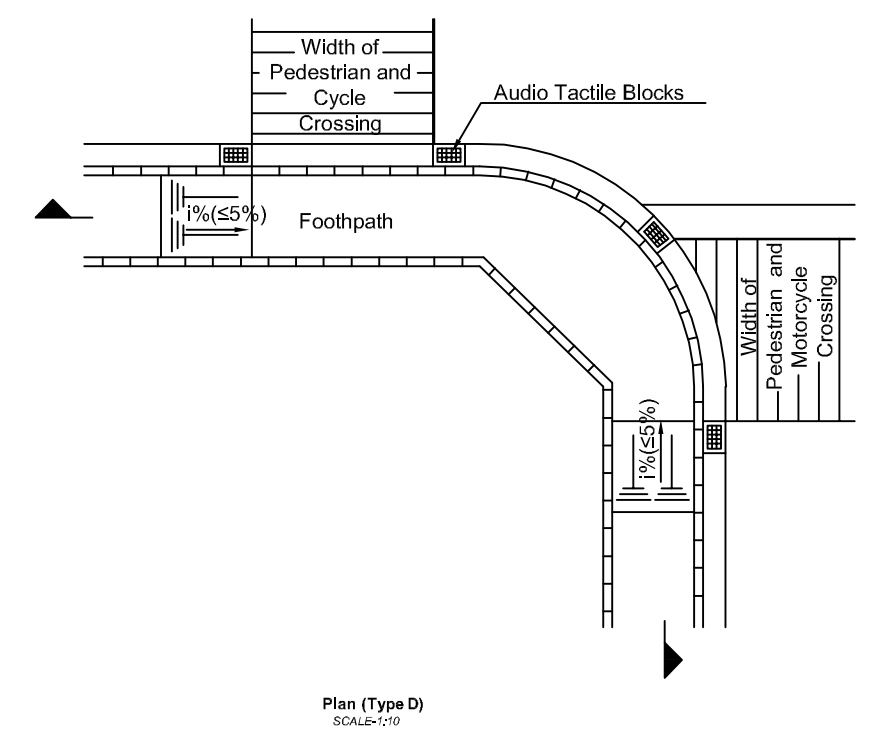
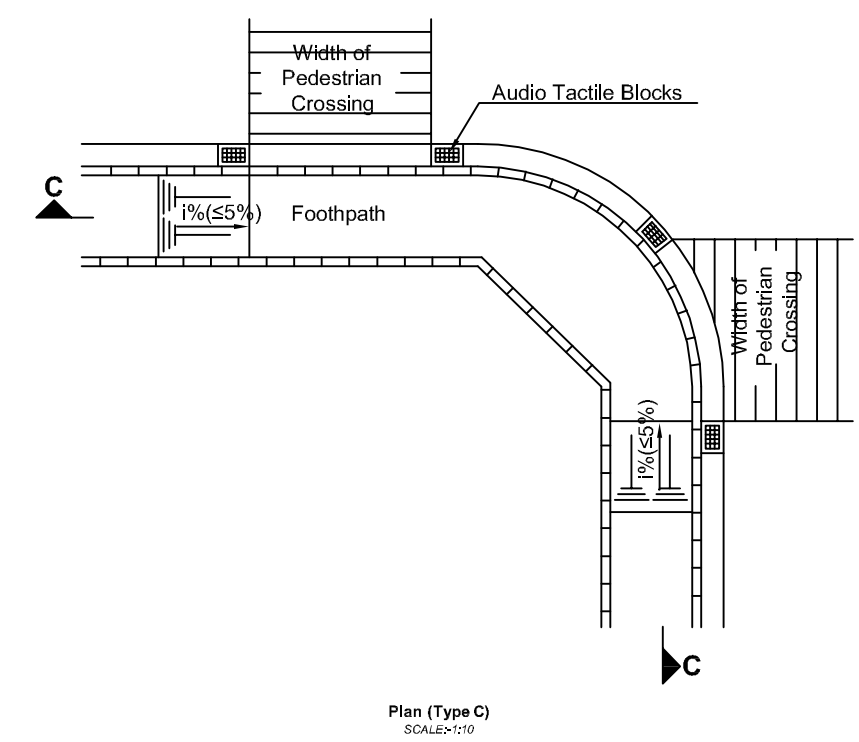
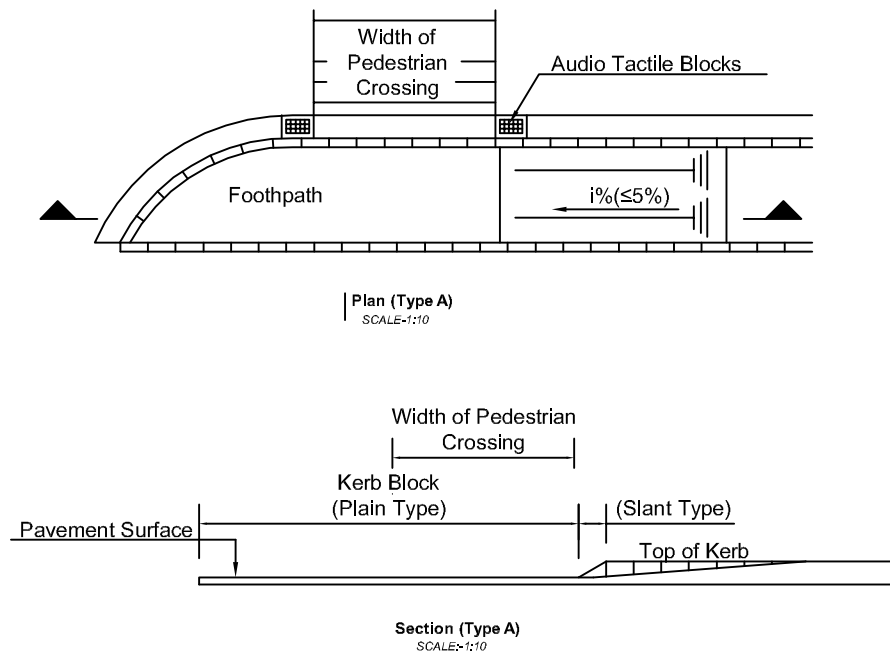
Consultant
Team Leader : YOO CHANGMIN
Reviewed By : YAGYA BAHADUR MALLA
Drawn By : SHRIJANA SHRESTHA

Client
Approved By :
Checked By :

Scale
As Shown

JUNCTION IMPROVEMENTS
LUMBINI SANSKRITIK URBAN ROADS
LUMBINI SANSKRITIK MUNICIPALITY
CH: 0+000 - 12+257.65 Km

REV : DEC 2024
TITLE : TYPICAL DRAWINGS
DRG NO : LSM/RD/TD/21
SHEET NO : 21



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Regional Urban Development Project (RUDP)
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 Babarmahal, Kathmandu, Nepal

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 DIGICON (P.) Ltd.
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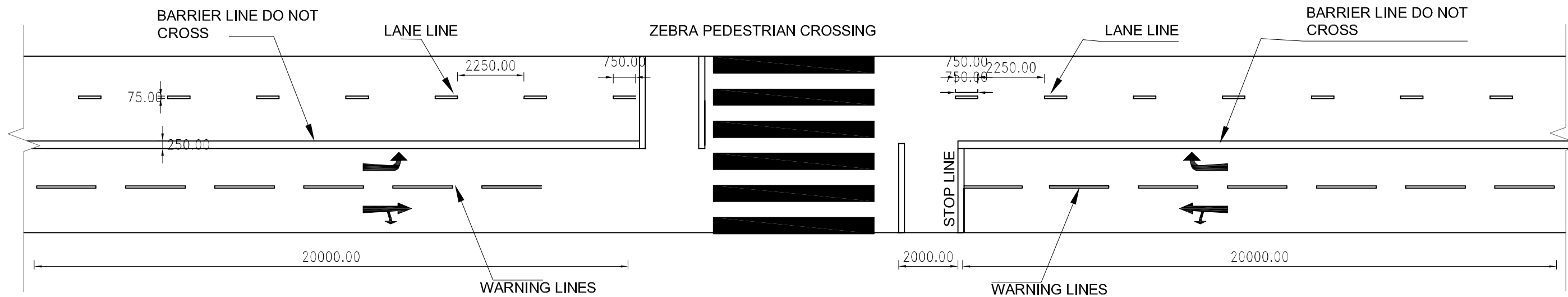
Consultant
Team Leader : YOO CHANGMIN
Reviewed By : YAGYA BAHADUR MALLA
Drawn By : SHRIJANA SHRESTHA

Client
Approved By :
Checked By :

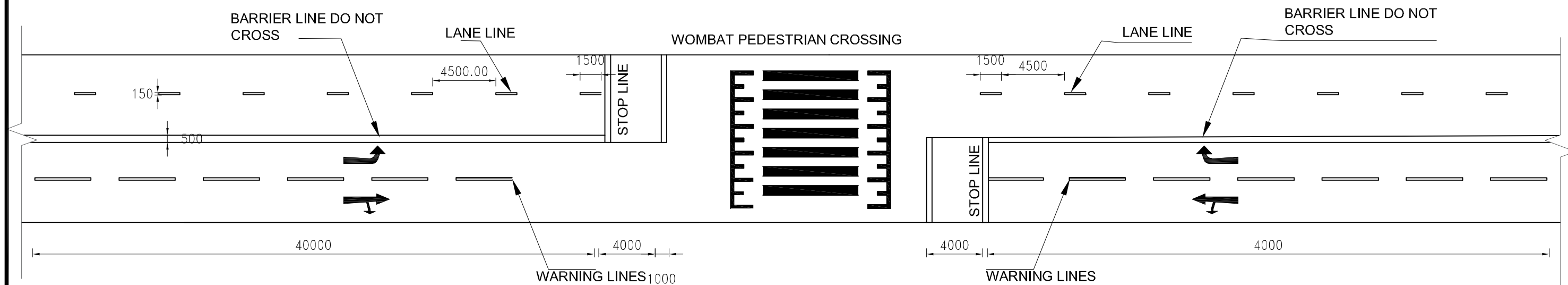
Scale
As Shown

KERB RAMPS AND FOOTPATH
LUMBINI SANSKRITIK URBAN ROADS
LUMBINI SANSKRITIK MUNICIPALITY
CH: 0+000 - 12+257.65 Km

REV : DEC 2024
TITLE : TYPICAL DRAWINGS
DRG NO : LSM/RD/TD/22
SHEET NO : 22



MID-BLOCK ZEBRA CROSSING
NOT TO SCALE



MID-BLOCK WOMBAT CROSSING
NOT TO SCALE



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Tel: 01-4589393

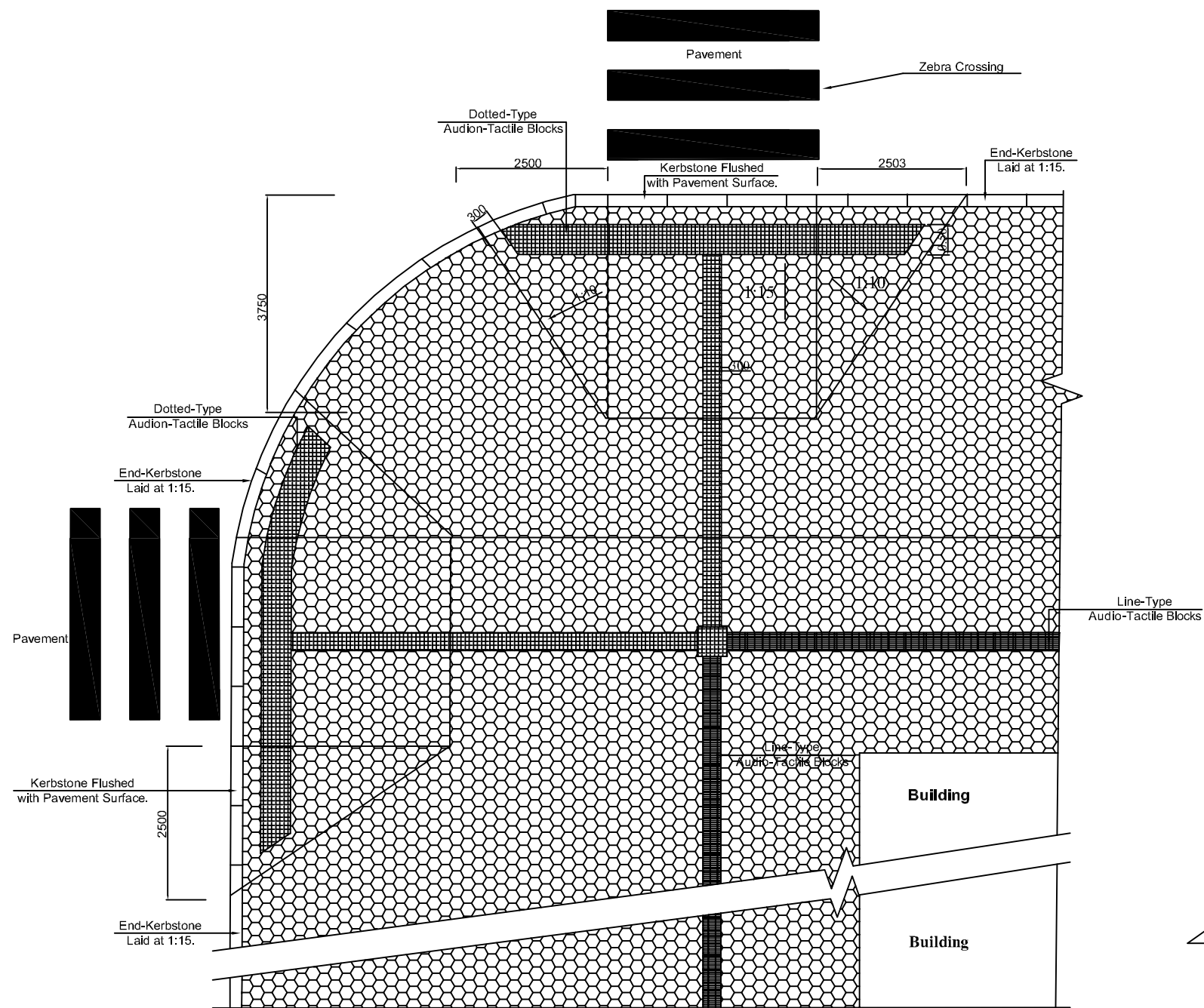
Consultant
Team Leader : YOO CHANGMIN
Reviewed By : YAGYA BAHADUR MALLA
Drawn By : SHRIJANA SHRESTHA

Client
Approved By :
Checked By :

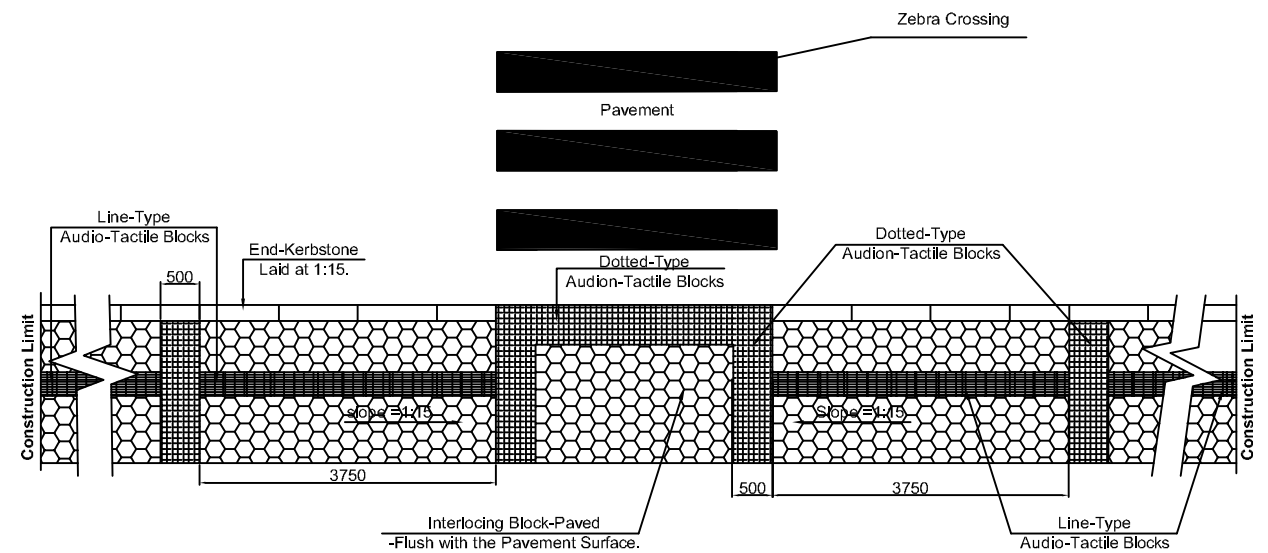
Scale
As Shown

PEDESTRIAN CROSSINGS & LANE MARKINGS
LUMBINI SANSKRITIK URBAN ROADS
LUMBINI SANSKRITIK MUNICIPALITY
CH: 0+000 - 12+257.65 Km

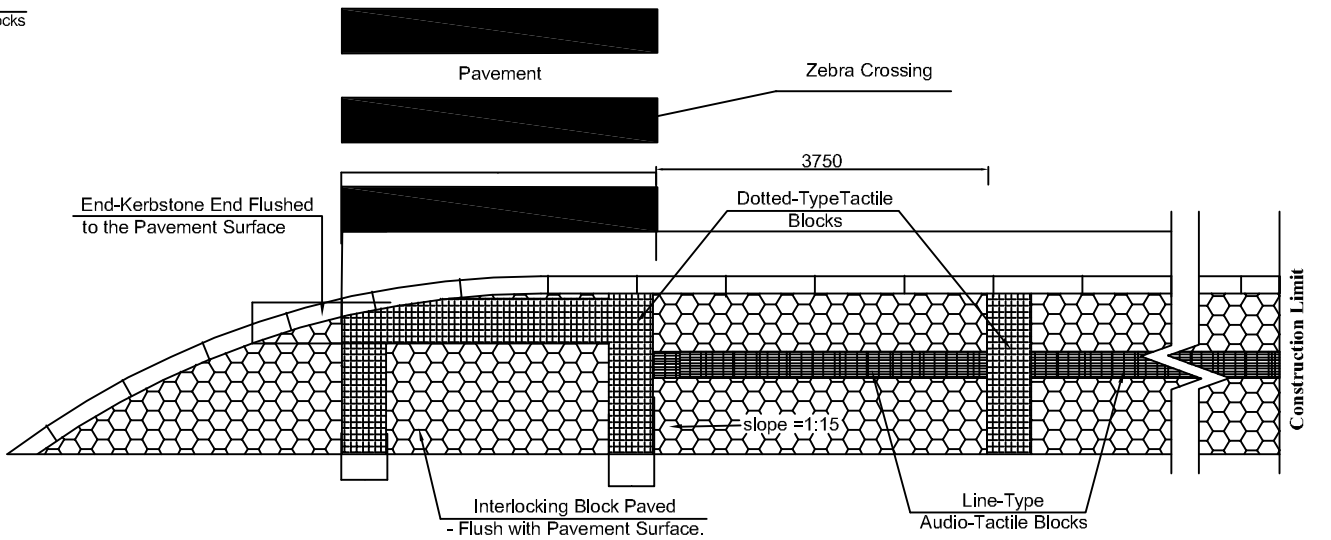
REV : DEC 2024
TITLE : TYPICAL DRAWINGS
DRG NO : LSM/RD/TD/23
SHEET NO : 23



FLARED KERB RAMP WITH AUDIO-TACTILE BLOCKS



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



KERB-RAMP AT INTERSECTION WITH AUDIO-TACTILE BLOCKS



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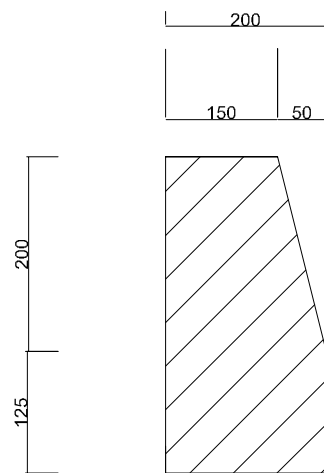
Consultant
Team Leader : YOO CHANGMIN
Reviewed By : YAGYA BAHADUR MALLA
Drawn By : SHRIJANA SHRESTHA

Client
Approved By :
Checked By :

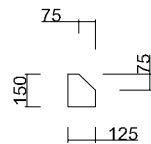
Scale
As Shown

TACTILE PAVEMENTS
LUMBINI SANSKRITIK URBAN ROADS
LUMBINI SANSKRITIK MUNICIPALITY
CH: 0+000 - 12+257.65 Km

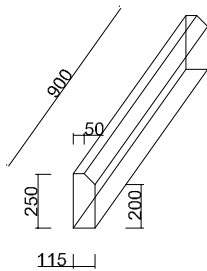
REV : DEC 2024
TITLE : TYPICAL DRAWINGS
DRG NO : LSM/RD/TD/24
SHEET NO : 24



KERB STONE DETAIL
Scale 1:35



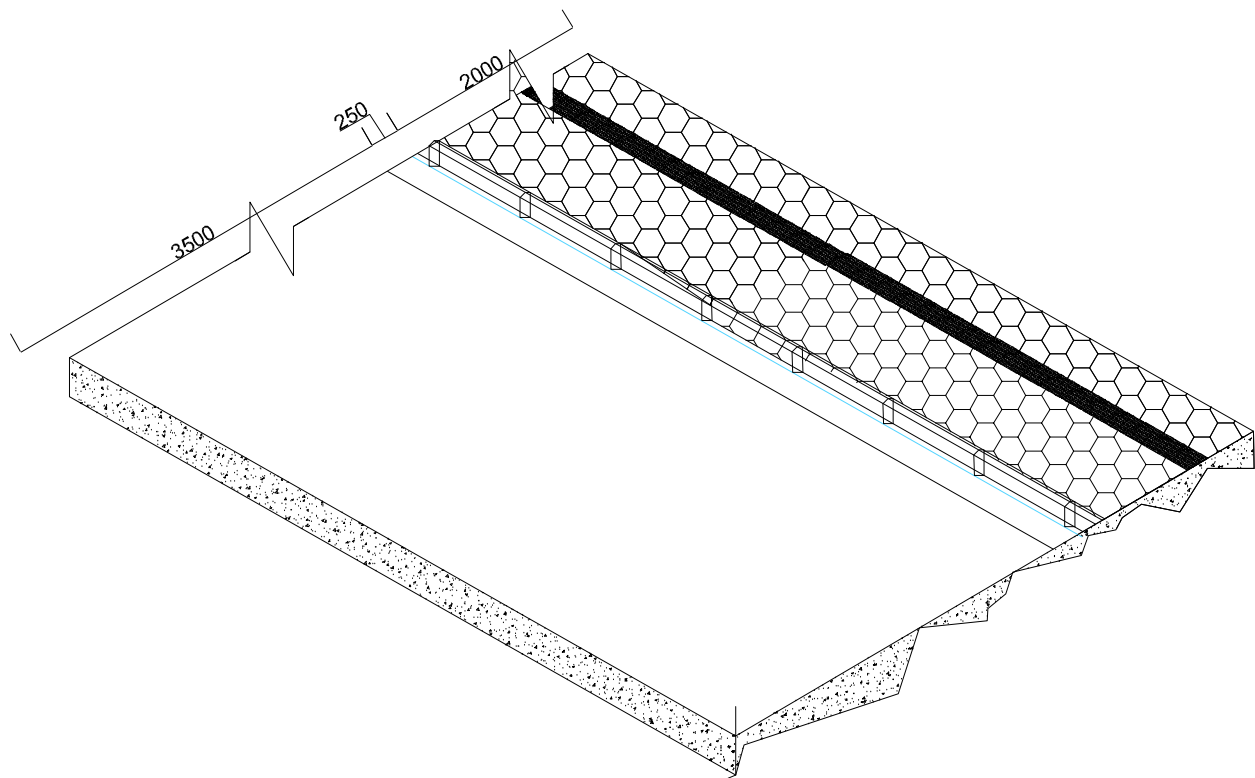
SPLAYED KERB
Scale 1:35



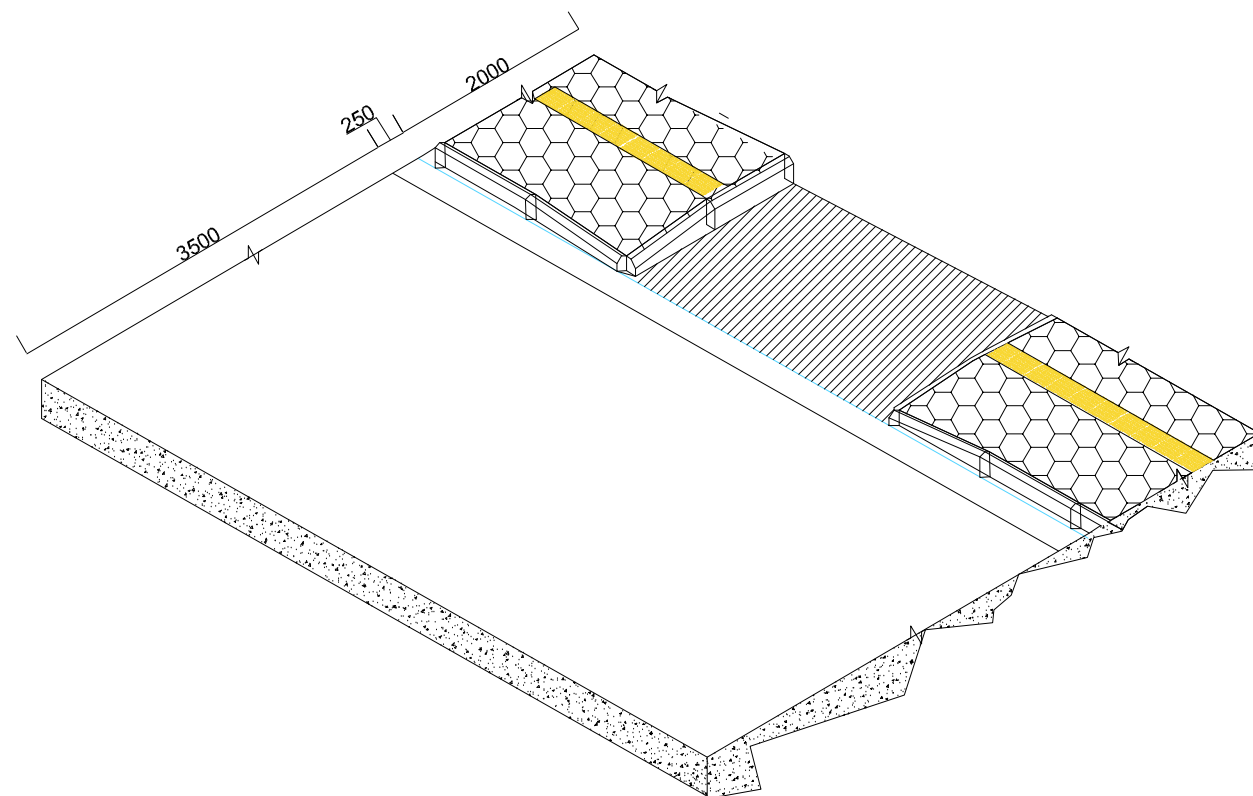
PRECAST KERB
Scale 1:35



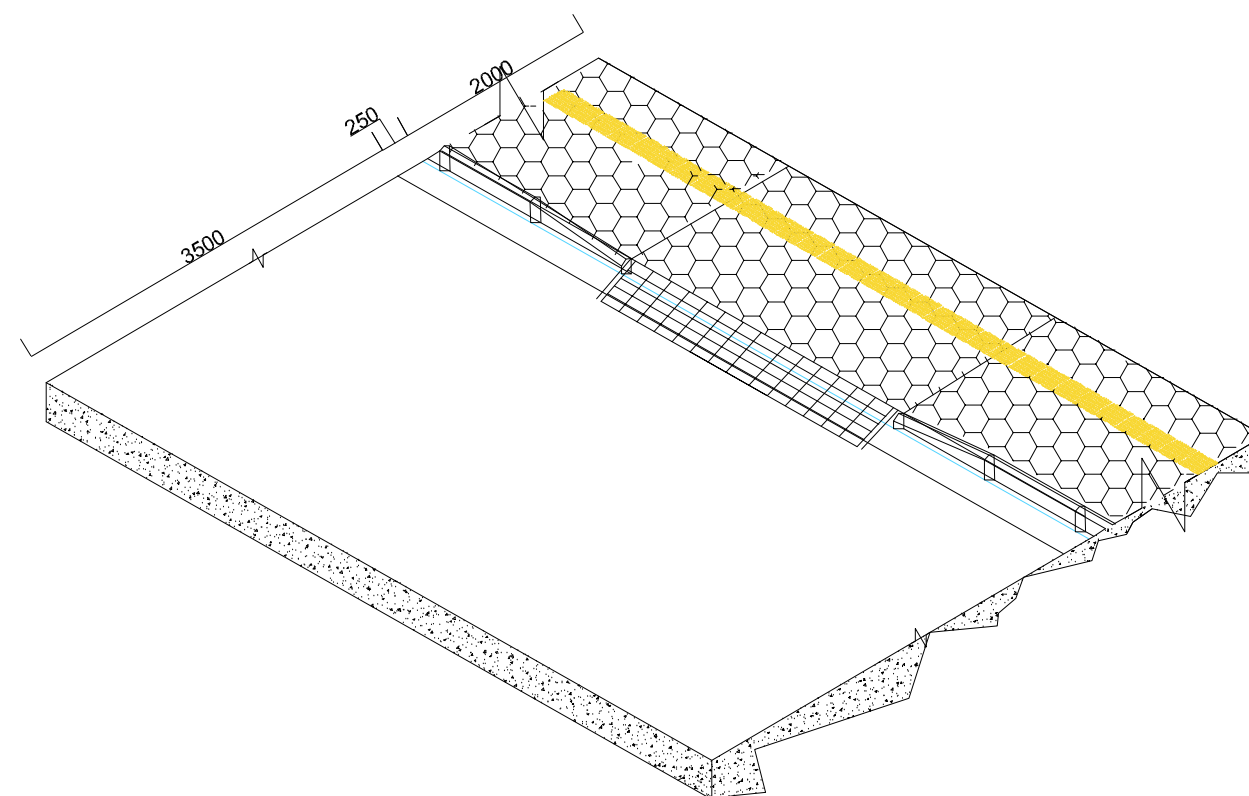
BULL NOSED KERB
Scale 1:35



Isometric view of Raised cross walk & Kerb Detail



Isometric view of Main Road and Side Road Junction



Isometric view of Ramp with Footpath



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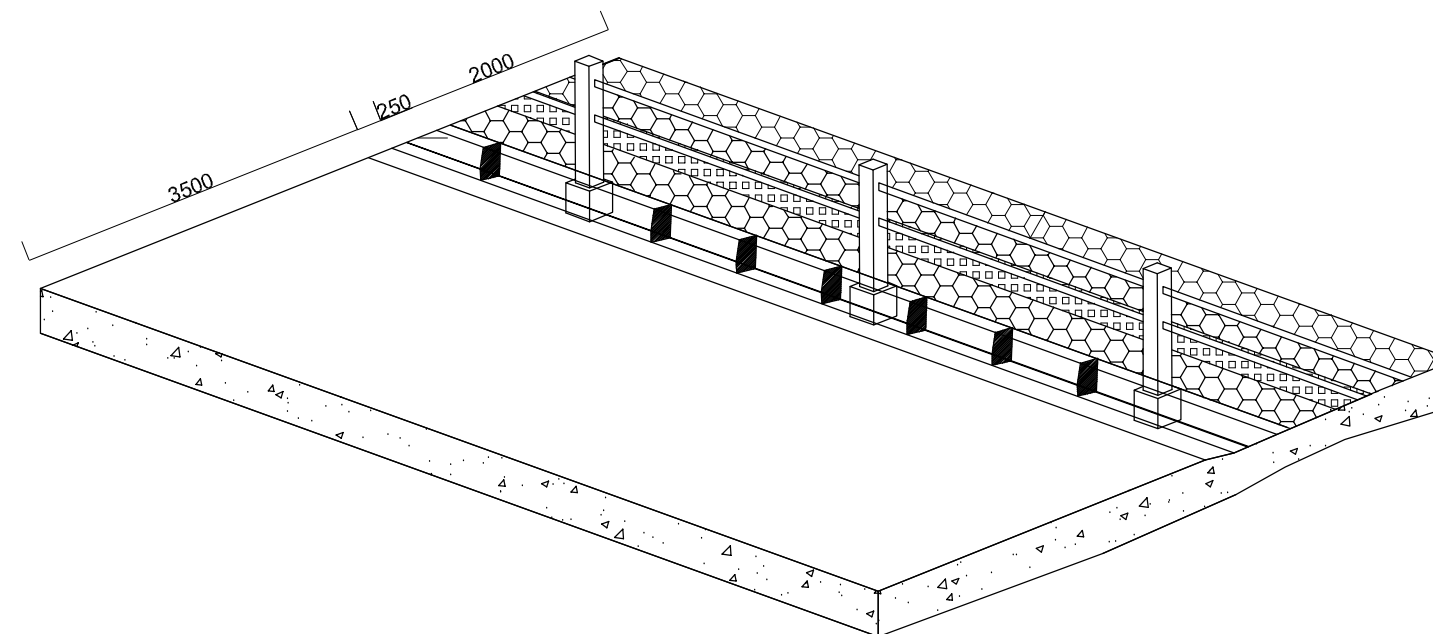
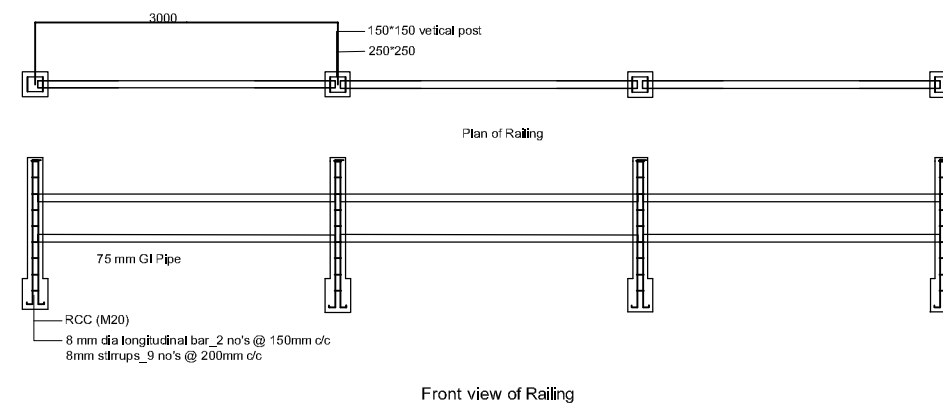
Consultant
Team Leader : YOO CHANGMIN
Reviewed By : YAGYA BAHADUR MALLA
Drawn By : SHRIJANA SHRESTHA

Client
Approved By :
Checked By :

Scale
As Shown

Isometric View of Footpaths and Kerbs
LUMBINI SANSKRITIK URBAN ROADS
LUMBINI SANSKRITIK MUNICIPALITY
CH: 0+000 - 12+257.65 Km

REV : DEC 2024
TITLE : TYPICAL DRAWINGS
DRG NO : LSM/RD/TD/26
SHEET NO : 26



Isometric view of Railing with Footpath



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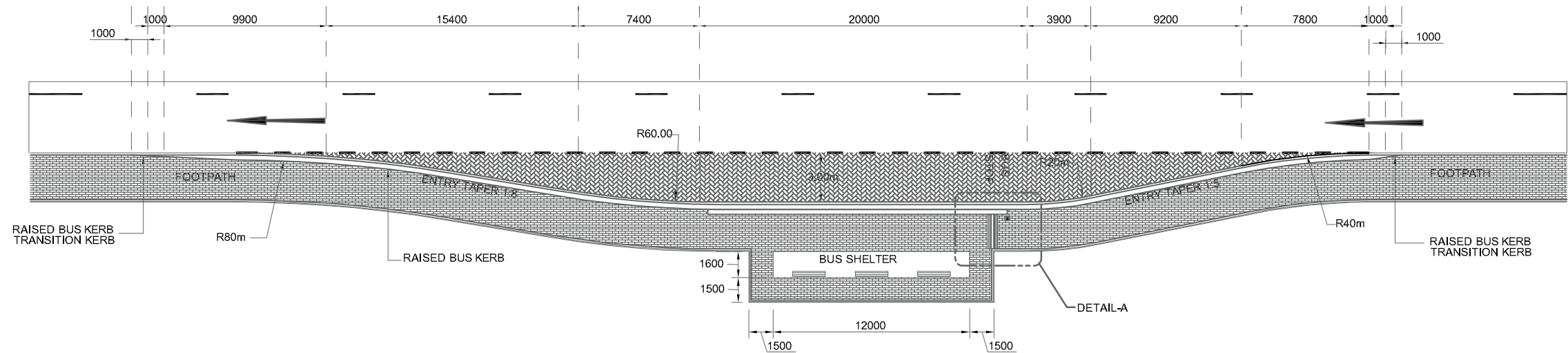
Consultant
Team Leader : YOO CHANGMIN
Reviewed By : YAGYA BAHADUR MALLA
Drawn By : SHRIJANA SHRESTHA

Client
Approved By :
Checked By :

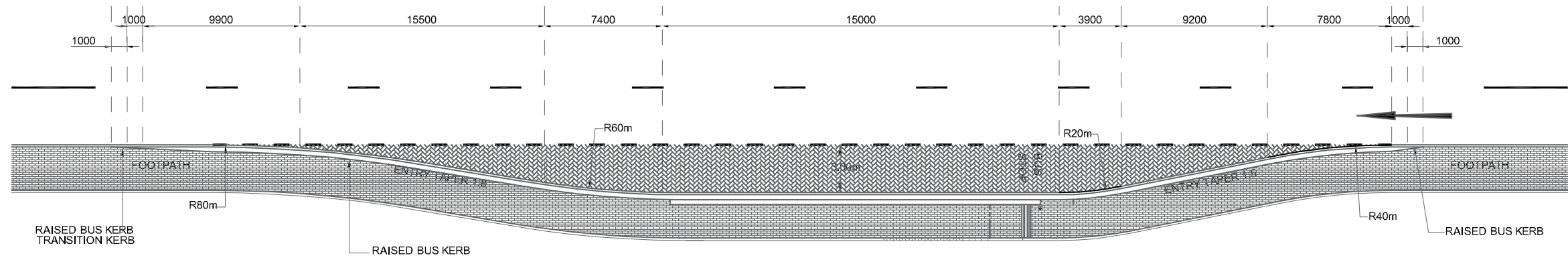
Scale
As Shown

Isometric View of Footpaths and Kerbs
LUMBINI SANSKRITIK URBAN ROADS
LUMBINI SANSKRITIK MUNICIPALITY
CH: 0+000 - 12+257.65 Km

REV : DEC 2024
TITLE : TYPICAL DRAWINGS
DRG NO : LSM/RD/TD/27
SHEET NO : 27



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.



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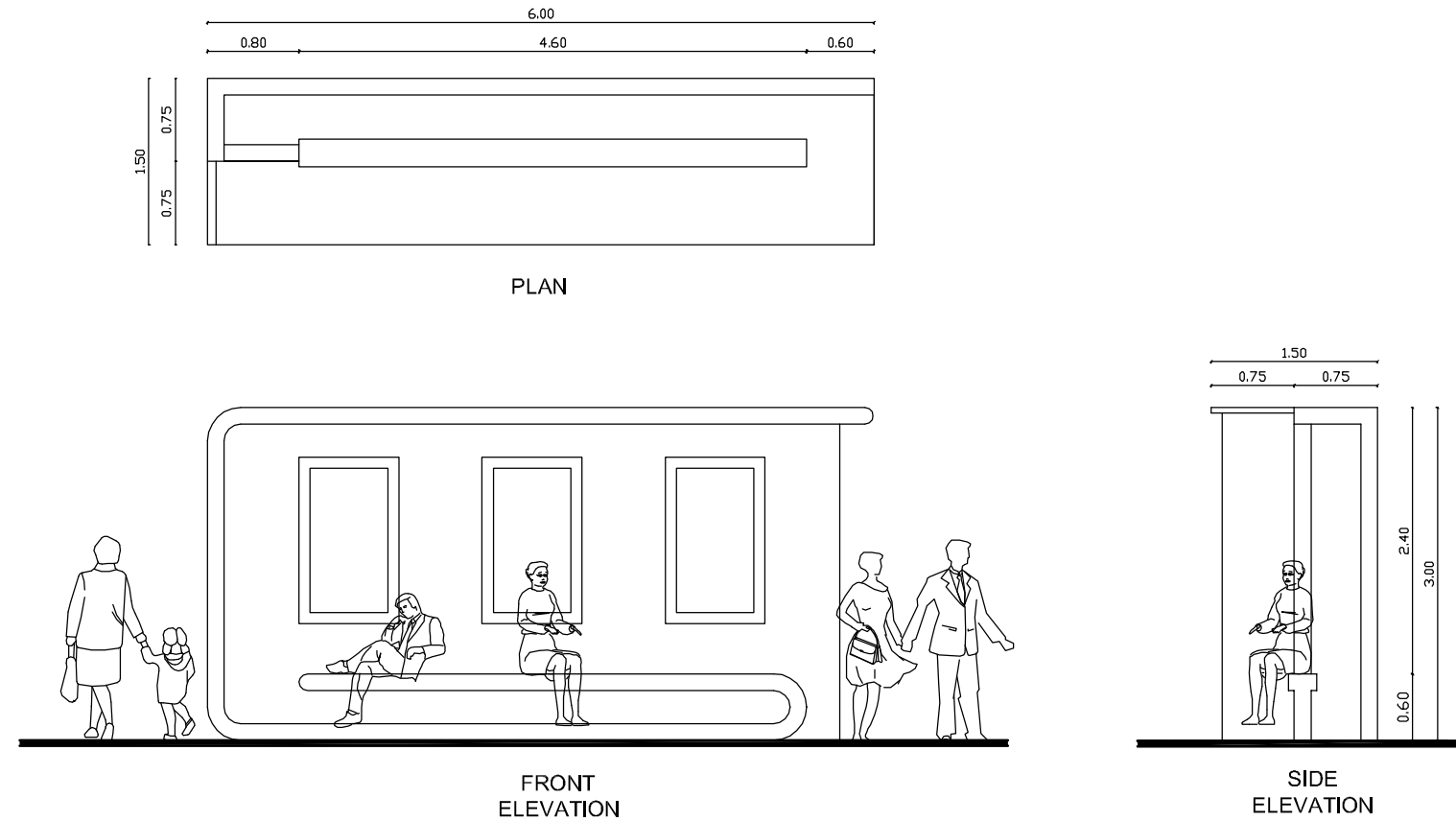
Consultant
Team Leader : YOO CHANGMIN
Reviewed By : YAGYA BAHADUR MALLA
Drawn By : SHRIJANA SHRESTHA

Client
Approved By :
Checked By :

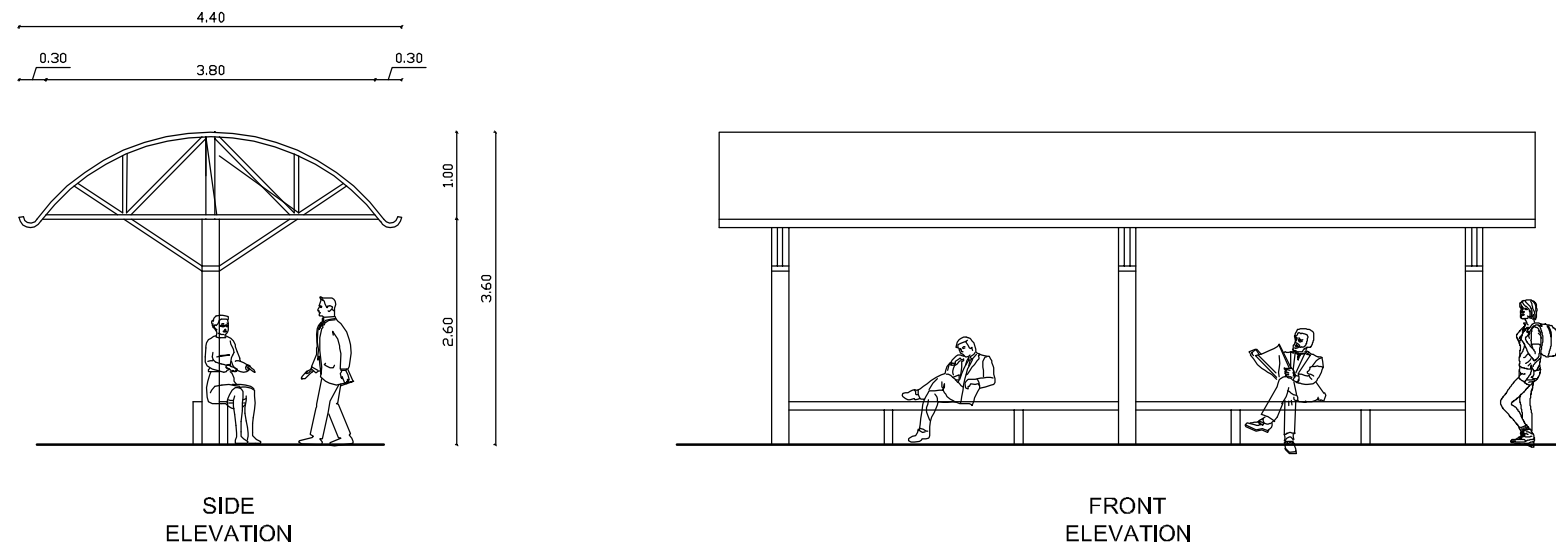
Scale
As Shown

TYPICAL BUS LAYBYS
LUMBINI SANSKRITIK URBAN ROADS
LUMBINI SANSKRITIK MUNICIPALITY
CH: 0+000 - 12+257.65 Km

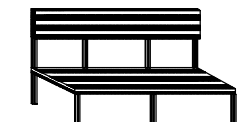
REV : DEC 2024
TITLE : TYPICAL DRAWINGS
DRG NO : LSM/RD/TD/28
SHEET NO : 28



BUS STAND



REST/WAITING STATIONS WITH SHEDS



WOODEN RESTING BENCH



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Regional Urban Development Project (RUDP)
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Consultant
Team Leader : YOO CHANGMIN
Reviewed By : YAGYA BAHADUR MALLA
Drawn By : SHRIJANA SHRESTHA

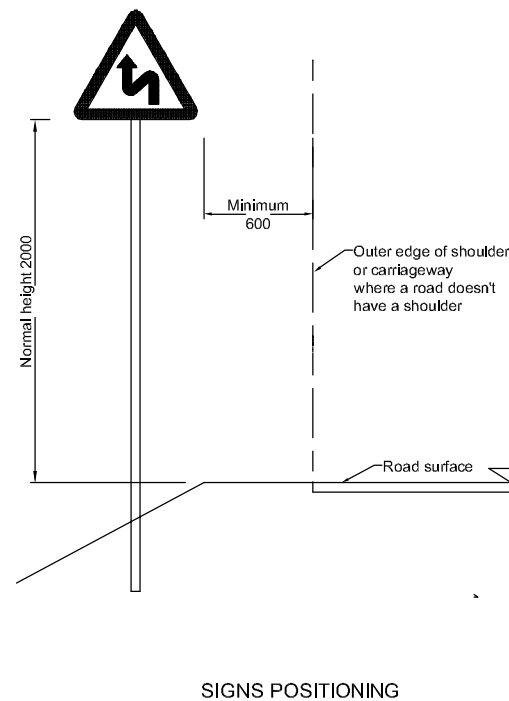
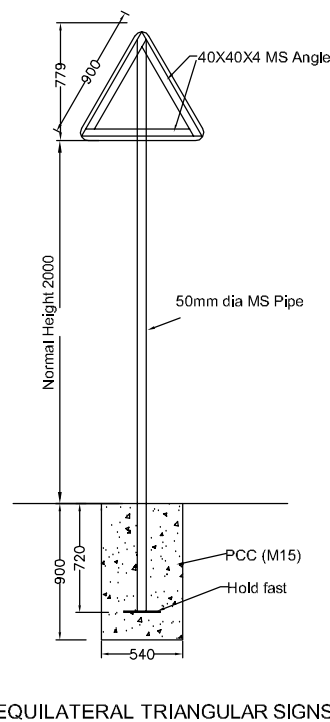
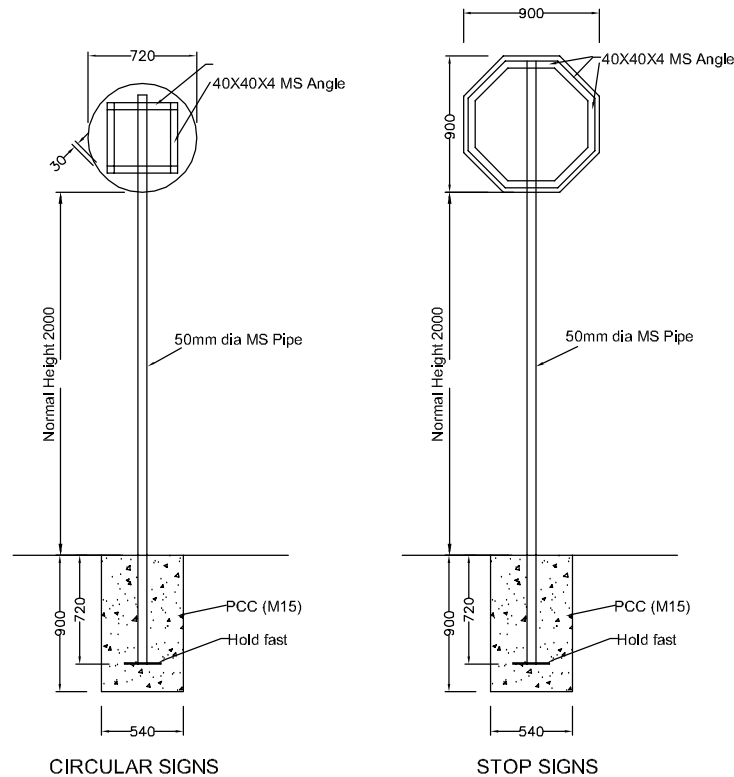
Client
Approved By :
Checked By :

Scale

As Shown

TYPICAL BUS AND WAITING STANDS
LUMBINI SANSKRITIK URBAN ROADS
LUMBINI SANSKRITIK MUNICIPALITY
CH: 0+000 - 12+257.65 Km

REV : DEC 2024
TITLE : TYPICAL DRAWINGS
DRG NO : LSM/RD/TD/29
SHEET NO : 29



R-1 NO ENTRY FOR VEHICLE	R-2 GIVE WAY TO TRAFFIC ON MAJOR ROAD/ROUNDBOUT	R-3 NO ENTRY FOR VEHICLE	R-4 NO MOTOR VEHICLE	R-5 NO TRUCKS	R-6 NO HANDCARTS	R-7 NO ANIMAL DRAWN VEHICLES	R-8 NO PEDESTRAINS	R-9 NO VEHICLES OVER LENGTH SHOWN	R-10 NO VEHICLES OVER HEIGHT SHOWN
R-11 NO VEHICLE OVER WIDTH SHOWN	R-12 NO VEHICLE OVER MAXIMUM GROSS WEIGHT SHOWN	R-13 AXLE WEIGHT LIMIT	R-14 NO PARKING	R-15 NO STOPPING	R-16 NO OVERTAKING	R-17 NO PASSING WITHOUT STOPPING	R-18 NO RIGHT TURN	R-19 NO LEFT TURN	R-20 NO U-TURNS
R-21 NO USE OF HORN	R-22 MAXIMUM SPEED	R-23 END OF SPEED RESTRICTION	R-24 TEMPORARY 'STOP' SIGN	R-25 TEMPORARY 'GO' SIGN	R-26 RESTRICTION ENDS	R-27 AHEAD ONLY	R-28 TURN LEFT (RIGHT IF SYMBOL IS REVERSED)	R-29 KEEP LEFT (RIGHT IF SYMBOL IS REVERSED)	R-30 TURN LEFT AHEAD (RIGHT IF SYMBOL IS REVERSED)
R-31 SMALL ROUNDBOUT (GIVE WAY TO THE RIGHT)	R-32 PASS EITHER SIDE	R-33 ONE-WAY TRAFFIC	W-1 CROSS ROADS	W-2 MAJOR ROAD AHEAD (CROSSROADS)	W-3 SIDE ROAD RIGHT (LEFT IF SYMBOL IS REVERSED)	W-4 STAGGERED JUNCTION (SYMBOL JULY BE REVERSED)	W-5 T-JUNCTION	W-6 Y-JUNCTION	W-7 TRAFFIC MERGES FROM LEFT
W-8 TRAFFIC MERGES FROM RIGHT	W-9 ROUNDBOUT	W-10 BEND TO RIGHT (LEFT IF SYMBOL IS REVERSED)	W-11 HAIRPIN BEND TO RIGHT (LEFT IF SYMBOL IS REVERSED)	W-12 DOUBLE BEND LEFT FIRST (RIGHT IF SYMBOL IS REVERSED)	W-14 ROAD NARROWS ON BOTH SIDES	W-15 ROAD NARROWS ON RIGHT (LEFT IF SIGN REVERSED)	W-16 DUAL CARRIAGEWAY ENDS	W-17 TRAFFIC SIGNALS	W-18 STEEP HILL DOWNWARDS
W-19 STEEP HILL UPWARDS	W-20 HEIGHT LIMIT AHEAD	W-21 TWO-WAY TRAFFIC STRAIGHT AHEAD	W-22 TWO-WAY TRAFFIC CROSSES ONE-WAY ROAD	W-23 PEDESTRIAN CROSSING	W-24 PEDESTRIAN ROAD AHEAD	W-25 CHILDREN	W-26 CATTLE	W-27 WILD ANIMALS	W-28 RIVER BANK
W-29 UNEVEN ROAD	W-30 SLIPPERY ROAD	W-31 ROAD HUMP	W-32 LOW FLYING AIRCRAFT	W-33 FALLING ROCKS (SYMBOL JULY BE REVERSED)	W-34 DANGEROUS DIP	W-35 NARROW BRIDGE	W-36 OTHER DANGER	W-37 CHECKPOINT	W-38 ROAD WORKS
W-39 LOOSE CHIPPINGS	W-40 RAILWAY LEVEL CROSSING WITHOUT GATE OR BARRIER	W-41 RAILWAY LEVEL CROSSING WITH GATE OR BARRIER	I-1 NO THROUGH ROAD	I-2 PEDESTRIAN CROSSING	I-3 PARKING PLACE	I-4 OVERTAKING SECTION	I-5 FILLING STATION	I-6 BREAKDOWN SERVICE	I-7 TELEPHONE
I-8 OVERNIGHT ACCOMMODATION	I-9 HOSPITAL	I-10 REFRESHMENTS	I-11 RESTAURANT	I-12 PICNIC SITE	I-13 RECOMMENDED ROUTE FOR PEDESTRIAN AND CYCLISTS	I-14 RECOMMENDED ROUTE FOR PEDESTRIANS	I-15 RECOMMENDED ROUTE FOR CYCLISTS	I-16 BUS STOP	I-17 TAXI PARK
I-18 ONE-WAY STREET									

Note:

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



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Consultant
Team Leader : YOO CHANGMIN
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Drawn By : SHRIJANA SHRESTHA

Client
Approved By :
Checked By :

Scale

Not to Scale

TRAFFIC CONTROL MEASURES
LUMBINI SANSKRITIK URBAN ROADS
LUMBINI SANSKRITIK MUNICIPALITY
CH: 0+000 - 12+257.65 Km

REV : DEC 2024
TITLE : TYPICAL DRAWINGS
DRG NO : LSM/RD/TD/30
SHEET NO : 30

RECTO-REFLECTIVE SIGN TYPICAL



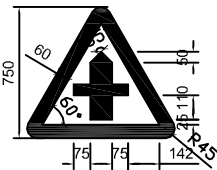
SIZE OF REGULATORY SIGNS (Reviews)

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

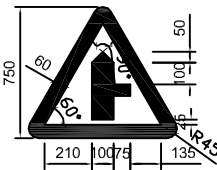
NOTE:
Refer Nepal Traffic Sign Manual by D.O.R.

SIZE OF REGULATORY SIGNS (Reviews)

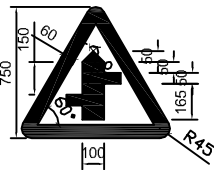
DETAILS OF FEW RECTO-REFLECTIVE SIGN TYPICAL



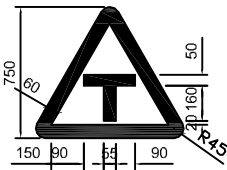
B1:Cross Roads
Scale:-1:25



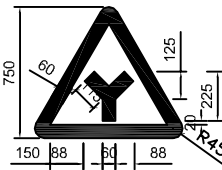
B3:Side Road Right
(left if symbol reversed)



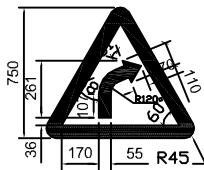
B4:Staggered Junction
(symbol JULY be reversed)



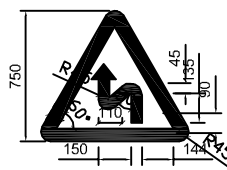
B5:T Junction



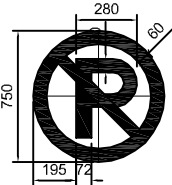
B6:Y Junction



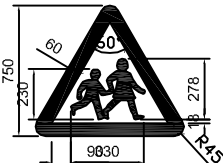
B10:Bend to Right



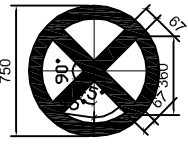
B12:Double Bend
(right if symbol reversed)



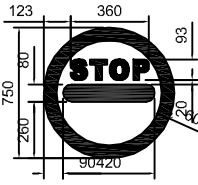
B14:No Parking
(right if symbol reversed)



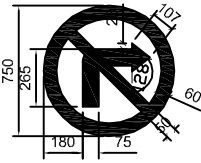
B25:Children



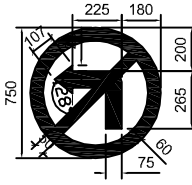
A15:No Stopping



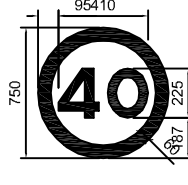
A17:No Passing
Without Stopping



A18:No Right Turn



A19:No Left Turn



A22:Maximum Speed



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Babarmahal, Kathmandu, Nepal

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in Association with
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DIGICON (P.) Ltd.
Mid- Baneshwor, Kathmandu
Tel: 01- 4589393

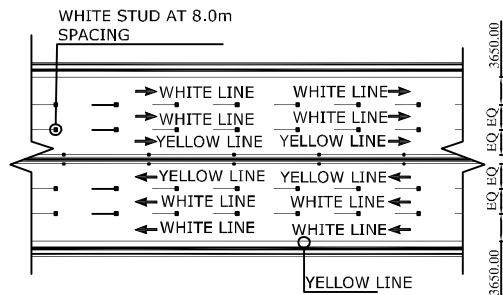
Consultant
Team Leader : YOO CHANGMIN
Reviewed By : YAGYA BAHADUR MALLA
Drawn By : SHRIJANA SHRESTHA

Client
Approved By :
Checked By :

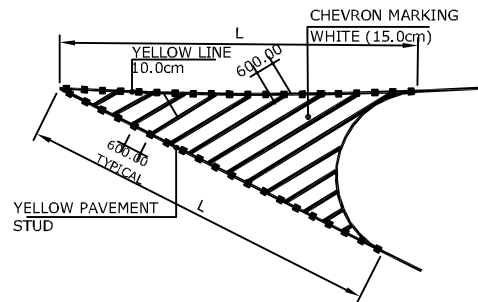
Scale
As Shown

TRAFFICE CONTROL MEASURES 02
LUMBINI SANSKRITIK URBAN ROADS
LUMBINI SANSKRITIK MUNICIPALITY
CH: 0+000 - 12+257.65 Km

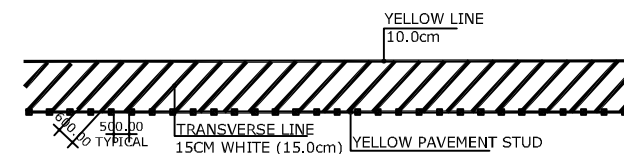
REV : DEC 2024
TITLE : TYPICAL DRAWINGS
DRG NO : LSM/RD/TD/31
SHEET NO : 31



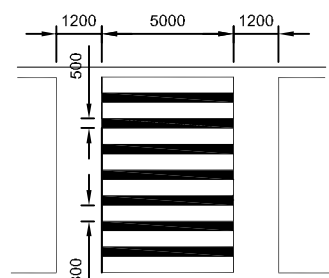
Typical Part of Pavement With Studs and Marking
Not in scale



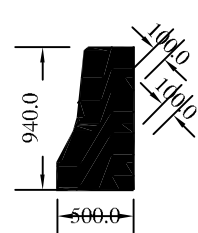
CHEVRON MARKING
Not in scale



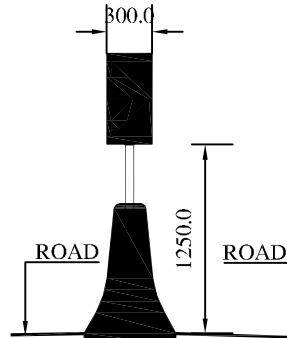
DETAIL OF TRAVERSE LINE MARKING
SCALE:-1:250



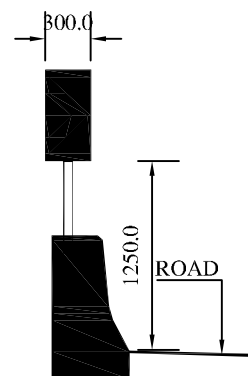
PEDESTRIAN CROSSING
SCALE:-1:100



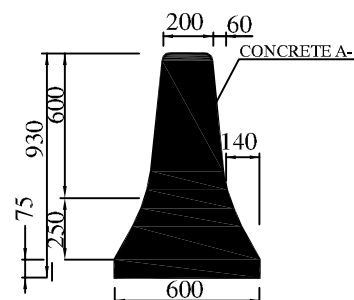
PAINT MARKING
SCALE:-1:200



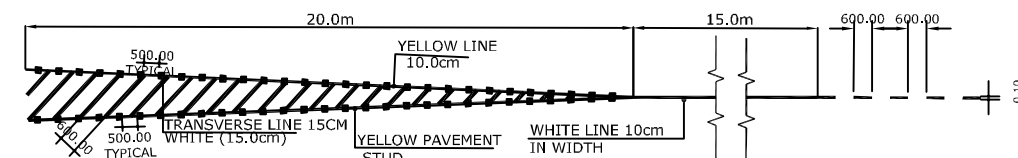
TYPE 1: BARRIER
SCALE:-1:50



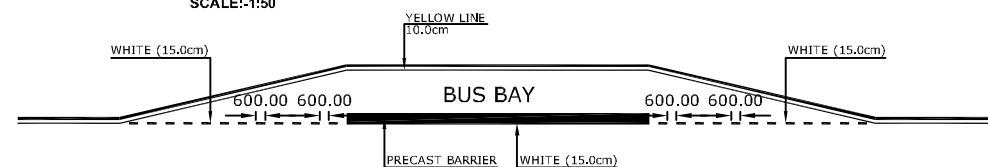
TYPE 2: BARRIER
SCALE:-1:50



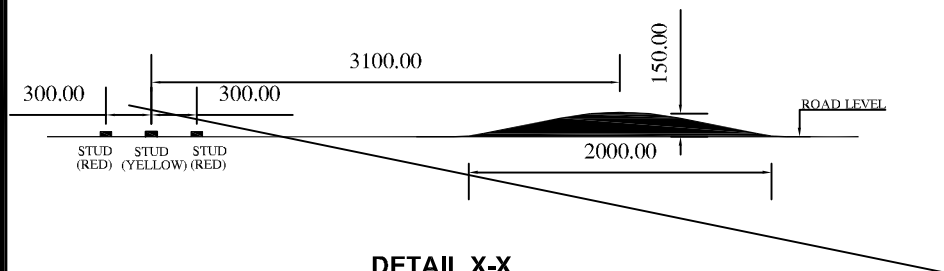
BARRIER USED AT BUS-BAYS
NOT IN SCALE



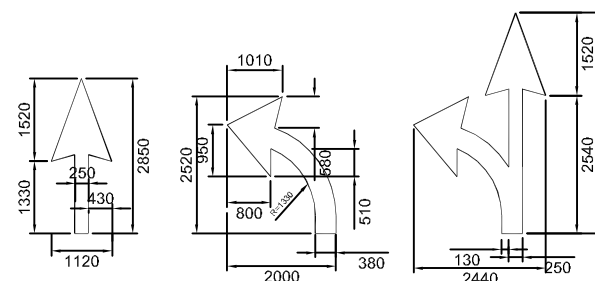
TRAVERSE LINE MARKING
SCALE:-1:250



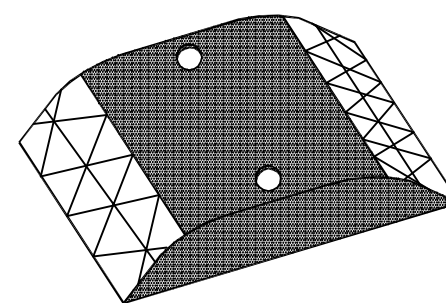
TYPICAL MARKING IN BUS-BAYS
SCALE:-1:500



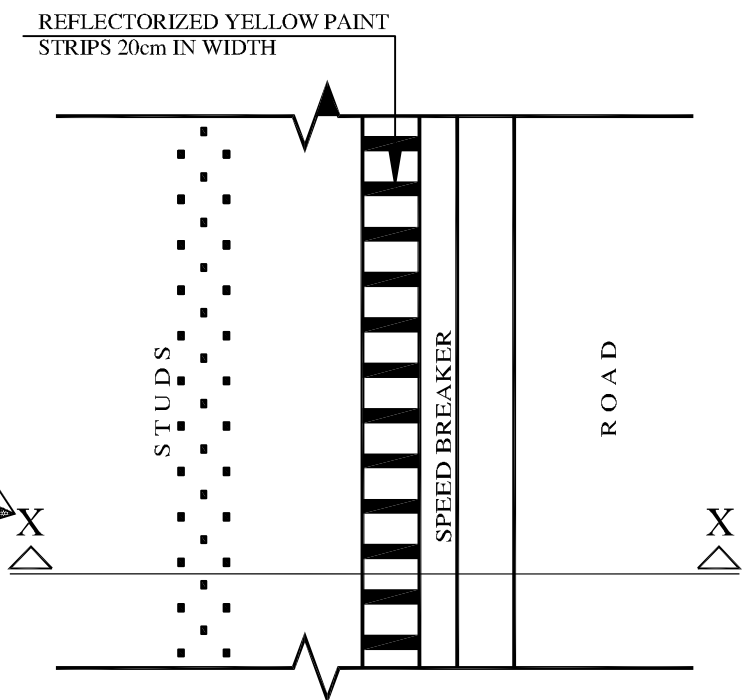
DETAIL X-X
SCALE:-1:50



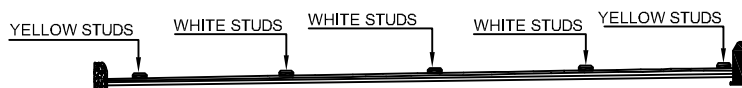
TYPICAL ARROWS
Not in scale



STUD
SCALE:-1:100



PLAN OF SPEED BREAKER
SCALE:-1:100



DETAIL OF STUDS
SCALE:-1:100



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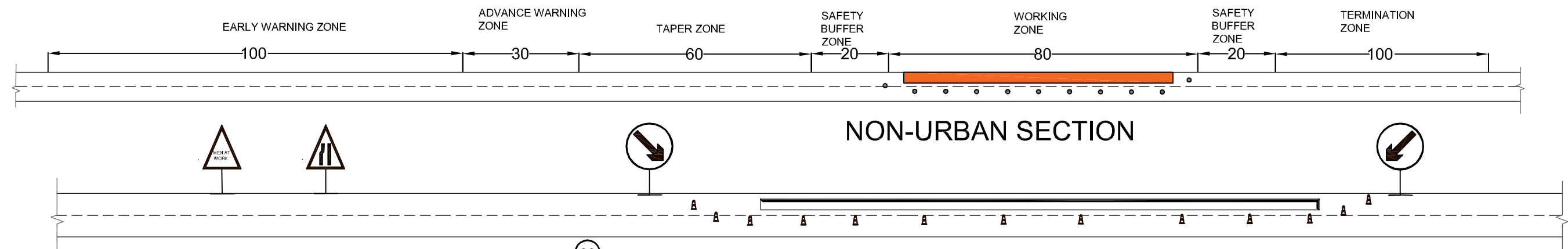
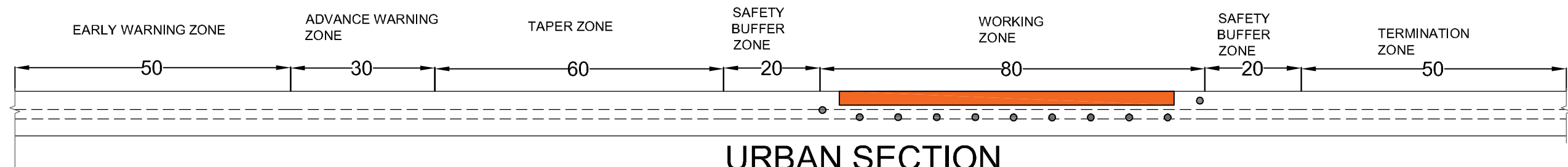
Consultant
Team Leader : YOO CHANGMIN
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Approved By :
Checked By :

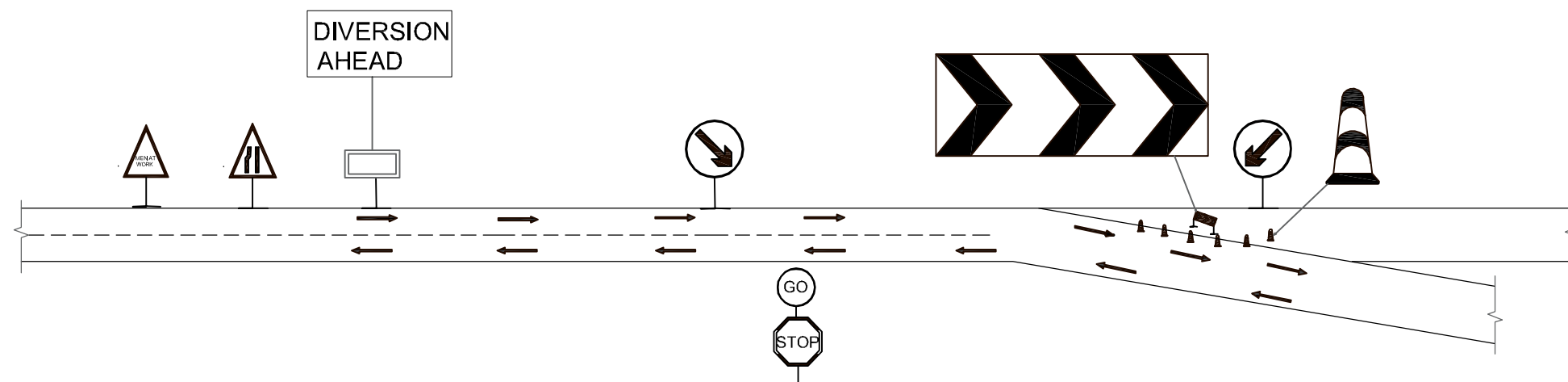
Scale
As Shown

SPECIAL TRAFFIC CONTROL MEASURES
LUMBINI SANSKRITIK URBAN ROADS
LUMBINI SANSKRITIK MUNICIPALITY
CH: 0+000 - 12+257.65 Km

REV : DEC 2024
TITLE : TYPICAL DRAWINGS
DRG NO : LSM/RD/TD/32
SHEET NO : 32



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



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



Department of Urban Development & Building
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Regional Urban Development Project (RUDP)
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Client
Approved By :
Checked By :

Scale
As Shown

TRAFFIC MANAGEMENT PLAN
LUMBINI SANSKRITIK URBAN ROADS
LUMBINI SANSKRITIK MUNICIPALITY
CH: 0+000 - 12+257.65 Km

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DRG NO : LSM/RD/TD/33
SHEET NO : 33