

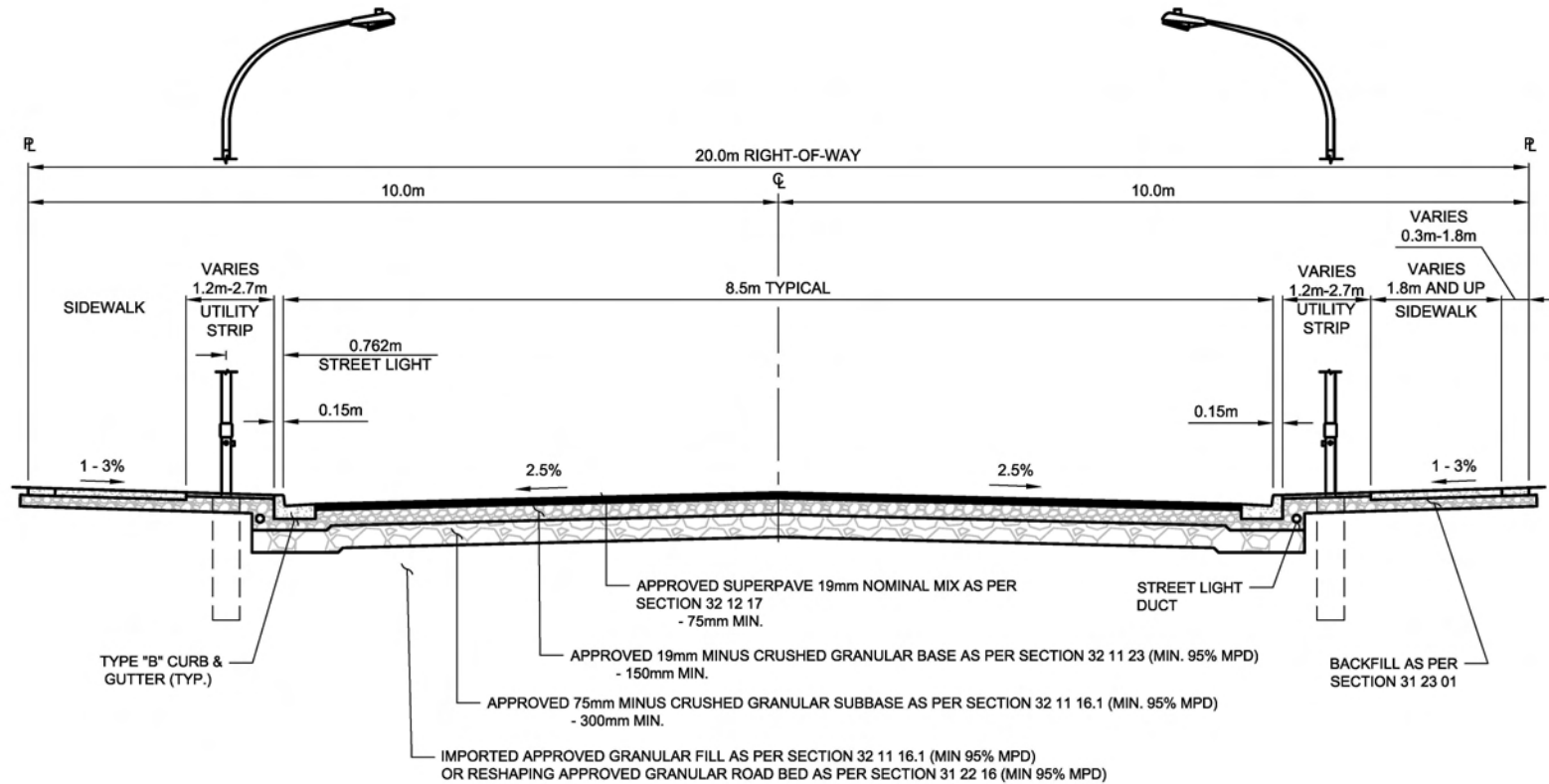
# Roadworks

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REV.	REVISION DATE	APPROVED

**DRAWING INDEX**  
**ROADWORKS**

ISSUE DATE: SEPTEMBER 2018  
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**NOTES:**

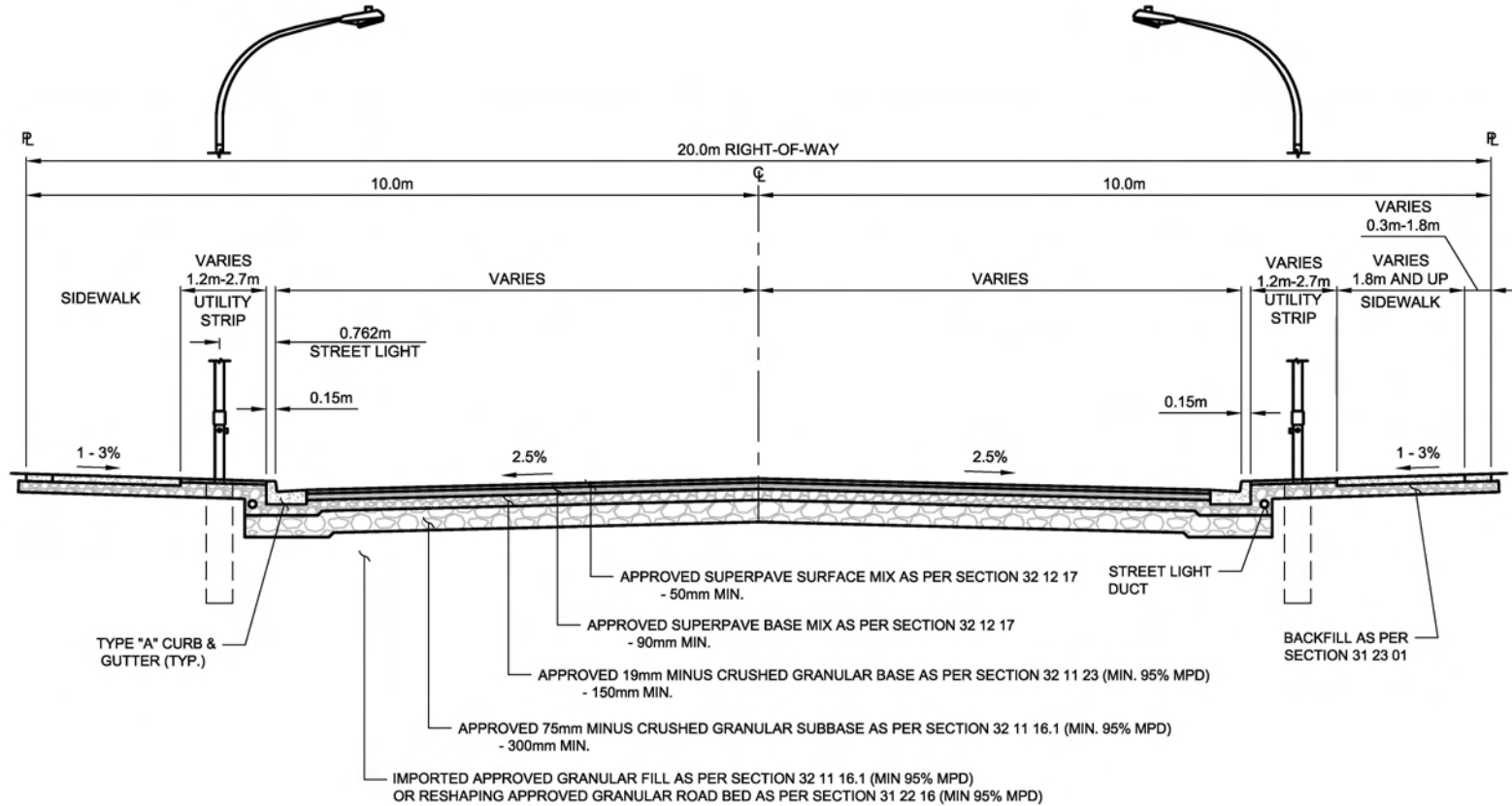
1. ONLY TO BE USED FOR NEW ROAD CONSTRUCTION.
2. FOR SUBGRADE SOIL CLASS SC, ML, OR CL ONLY. OTHER SOIL CLASSES REQUIRE SPECIAL TREATMENT  
GEOTECHNICAL ENGINEER REQUIRED TO DETERMINE SUBGRADE SOIL CLASSIFICATION.
3. FOR PORTLAND CEMENT CONCRETE ROADS, USE THE ROAD STRUCTURE ON G5.5.

SCALE: N.T.S.

TYPICAL CROSS SECTION  
RESIDENTIAL (LIGHT DUTY) STREET

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**NOTES:**

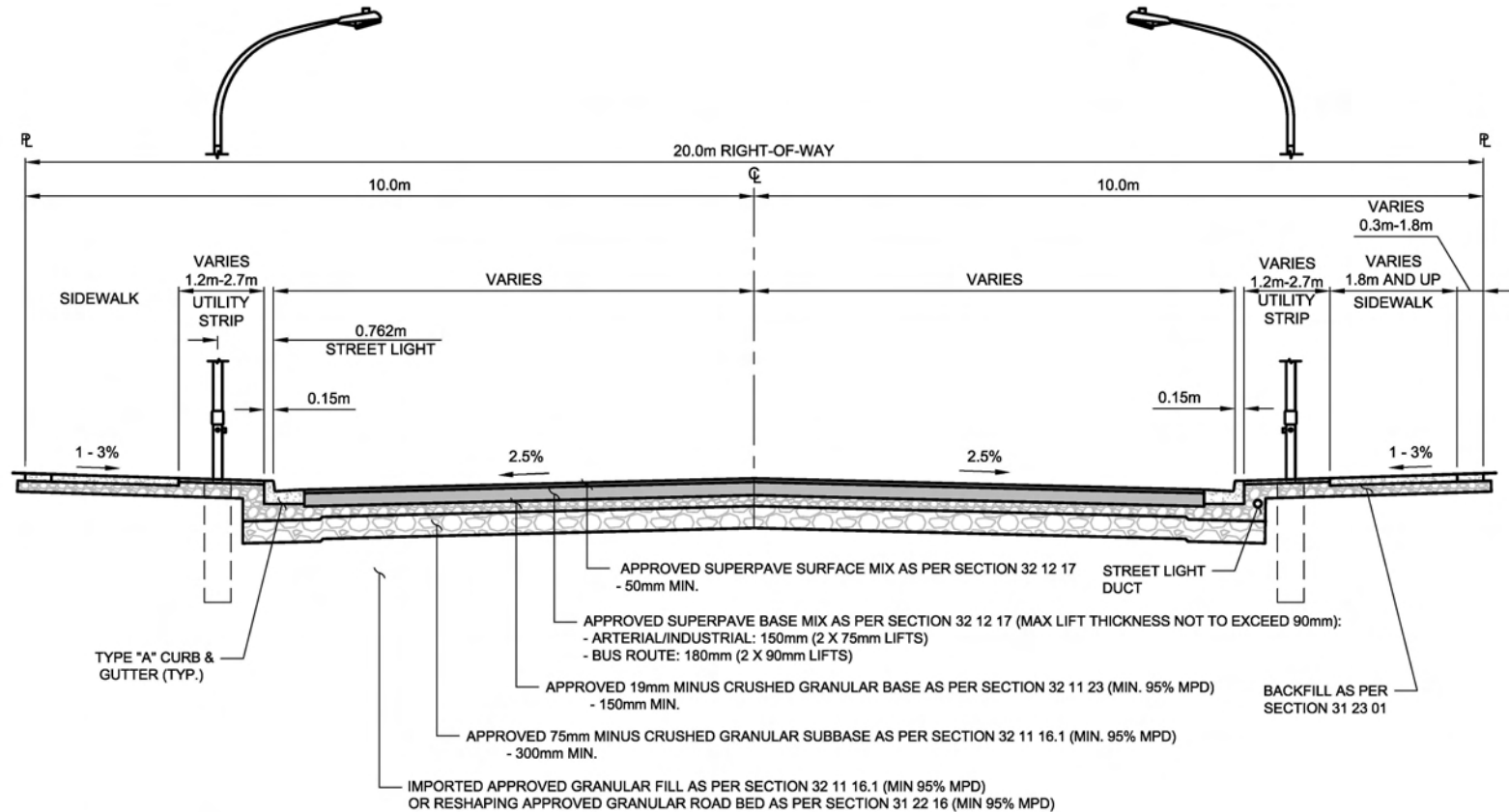
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SCALE: N.T.S.

TYPICAL CROSS SECTION  
HIGHER-ZONED STREET

ISSUE DATE: SEPTEMBER 2018  
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**NOTES:**

1. ONLY TO BE USED FOR NEW ROAD CONSTRUCTION.
2. R2.3 SPECIFICATION TO BE USED ONLY UPON THE APPROVAL OF THE CITY ENGINEER. R2.4 IS THE PREFERRED SPECIFICATION TO BE USED FOR THE NEW ROAD CONSTRUCTION OF INDUSTRIAL, ARTERIAL AND BUS ROUTES.
3. FOR SUBGRADE SOIL CLASS SC, ML, OR CL ONLY. OTHER SOIL CLASSES REQUIRE SPECIAL TREATMENT GEOTECHNICAL ENGINEER REQUIRED TO DETERMINE SUBGRADE SOIL CLASSIFICATION.
4. FOR PORTLAND CEMENT CONCRETE ROADS, USE THE ROAD STRUCTURE ON G5.5.

SCALE: N.T.S.

**TYPICAL CROSS SECTION**

**INDUSTRIAL, ARTERIAL, & BUS ROUTES**

ISSUE DATE: SEPTEMBER 2018

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2019-03-13

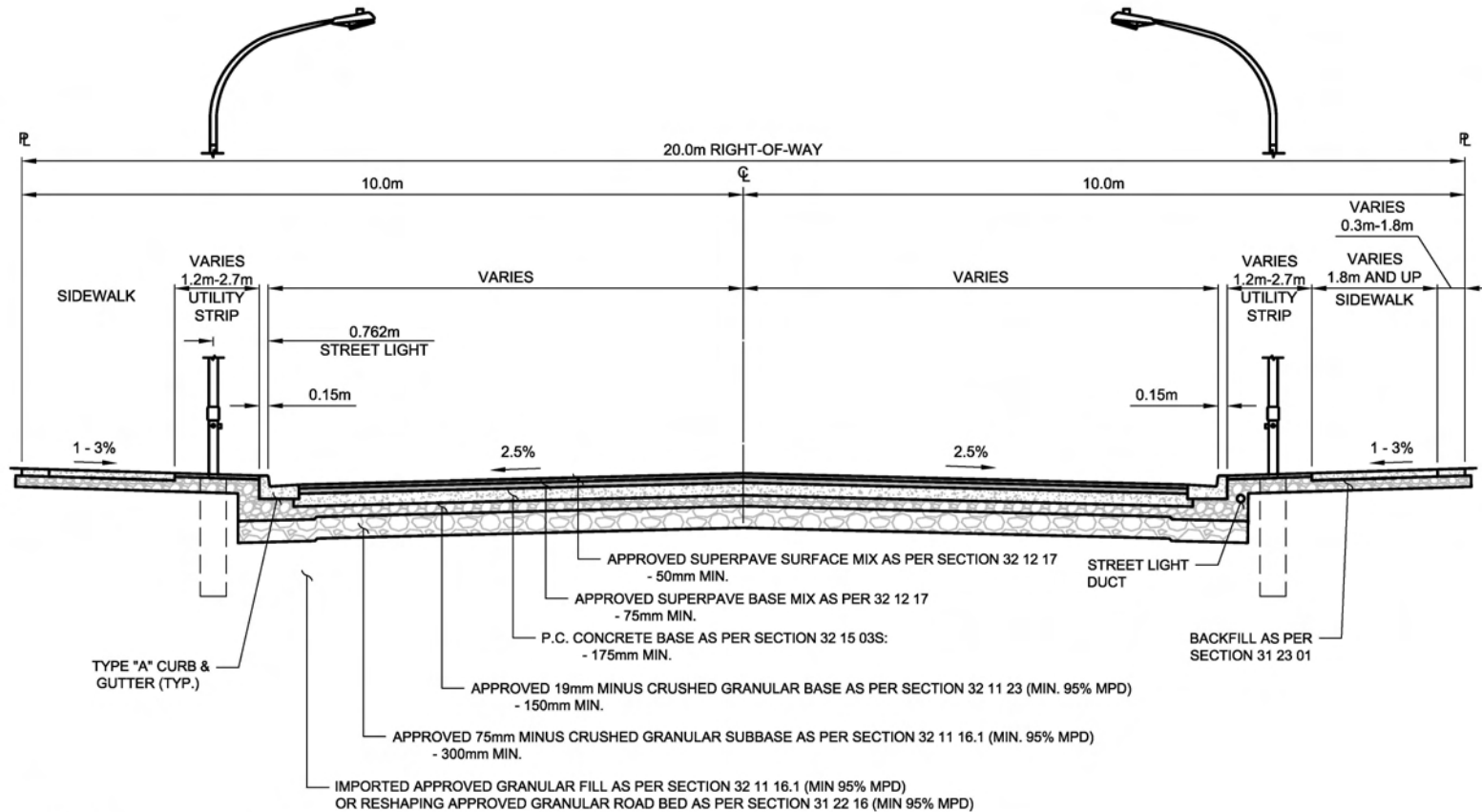
REVISION DATE

J. LEE

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1

REV.



**NOTES:**

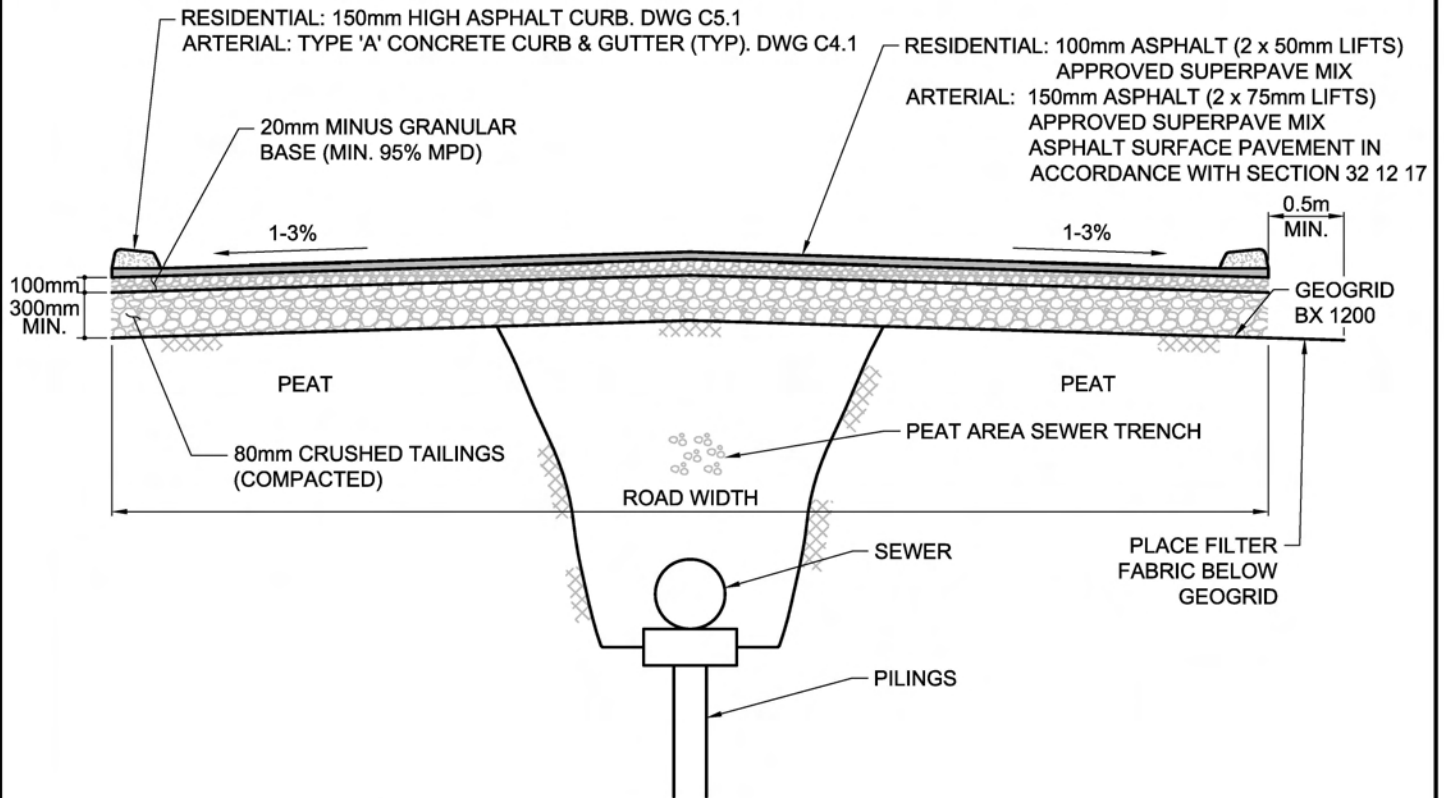
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3. FOR SUBGRADE SOIL CLASS SC, ML, OR CL ONLY. OTHER SOIL CLASSES REQUIRE SPECIAL TREATMENT GEOTECHNICAL ENGINEER REQUIRED TO DETERMINE SUBGRADE SOIL CLASSIFICATION.

SCALE: N.T.S.

REV.	1	2019-03-13	J. LEE
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TYPICAL CROSS SECTION, P.C.C. BASE  
INDUSTRIAL, ARTERIAL & BUS ROUTES

ISSUE DATE: SEPTEMBER 2018  
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**GEOGRID/GEOFABRIC INSTALLATION**

1. PLACE GEOFABRIC (AMOCO 4551) DIRECTLY ON PEAT, FOLLOWED BY GEOGRID (TENSAR BIAXIAL "BX-1200").
2. OVERLAP SHEETS OF GEOGRID A MINIMUM OF 900mm AND IN THE DIRECTION THAT THE FILL WILL BE SPREAD.
3. OVERLAPPED SHEETS OF GEOGRID MUST BE TIED TOGETHER ACCORDING TO NILEX INSTALLATION MANUAL.
4. EXTEND GEOGRID/GEOFABRIC A MINIMUM OF 500mm BEYOND BACK OF CURB.
5. PLACE 300mm OF AGGREGATE ROAD BASE IN TWO 150mm LIFTS.

**GEOGRID CUT REPAIR**

1. RETAIN A MINIMUM OF 1000mm EXISTING GEOGRID AROUND THE EXCAVATION FOR CONNECTION OF THE PATCH-GEOGRID.
2. PLACE GEOFABRIC (AMOCO 4551) FOLLOWED BY GEOGRID (TENSAR BIAXIAL "BX-1200") DIRECTLY ON BACKFILLED TRENCH AT THE SAME ELEVATION AS THE EXISTING GEOFABRIC AND GEOGRID.
3. OVERLAP GEOGRID A MINIMUM OF 300mm AND CONNECT WITH NYLON CABLE TIES.

**NOTE:**

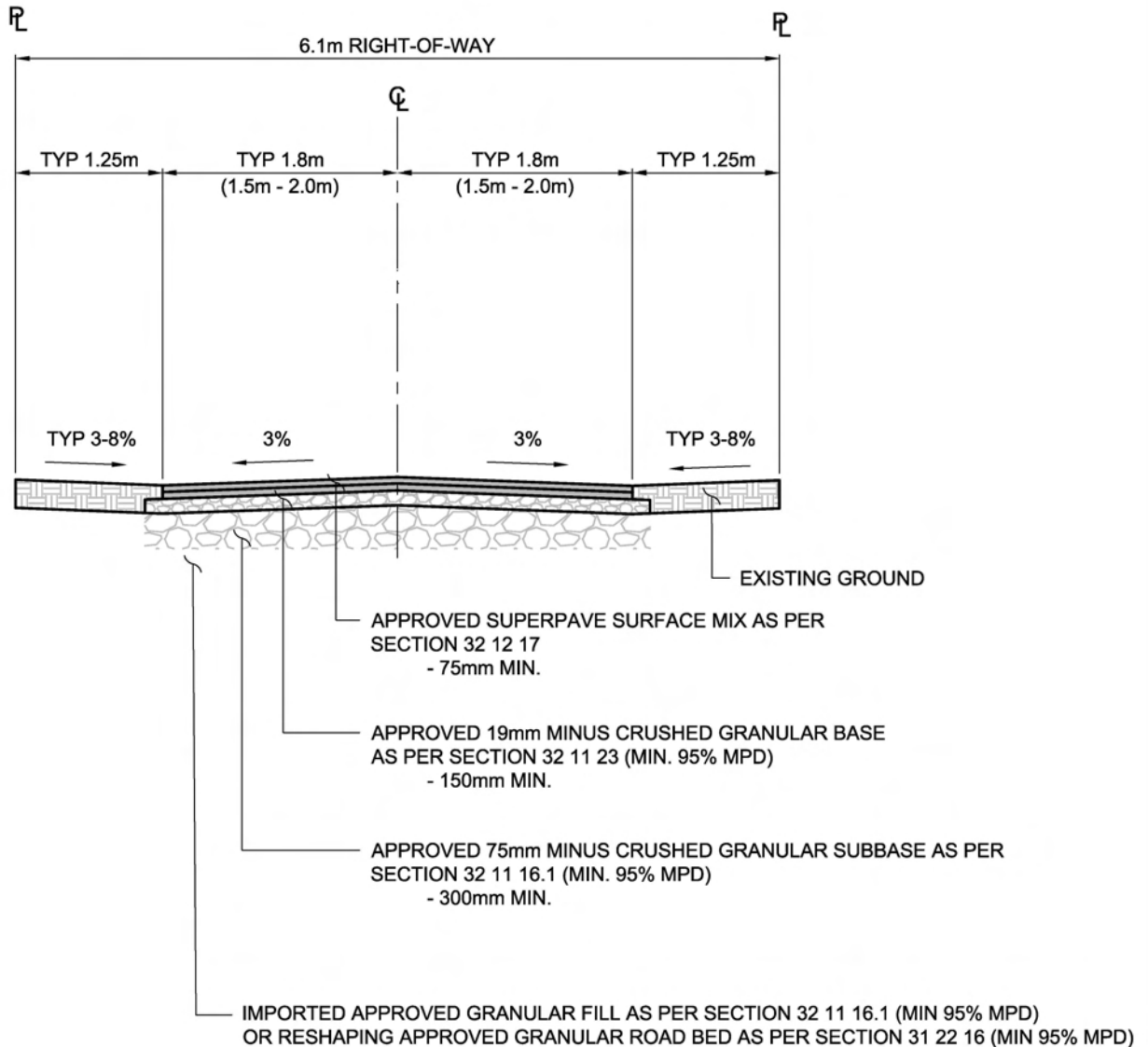
1. CONTACT CITY STREETS OPERATIONS BRANCH FOR GEOGRID MATERIAL.

SCALE: N.T.S.

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**TYPICAL CROSS SECTION  
ROADS ON PEAT**

ISSUE DATE: SEPTEMBER 2018  
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**NOTES:**

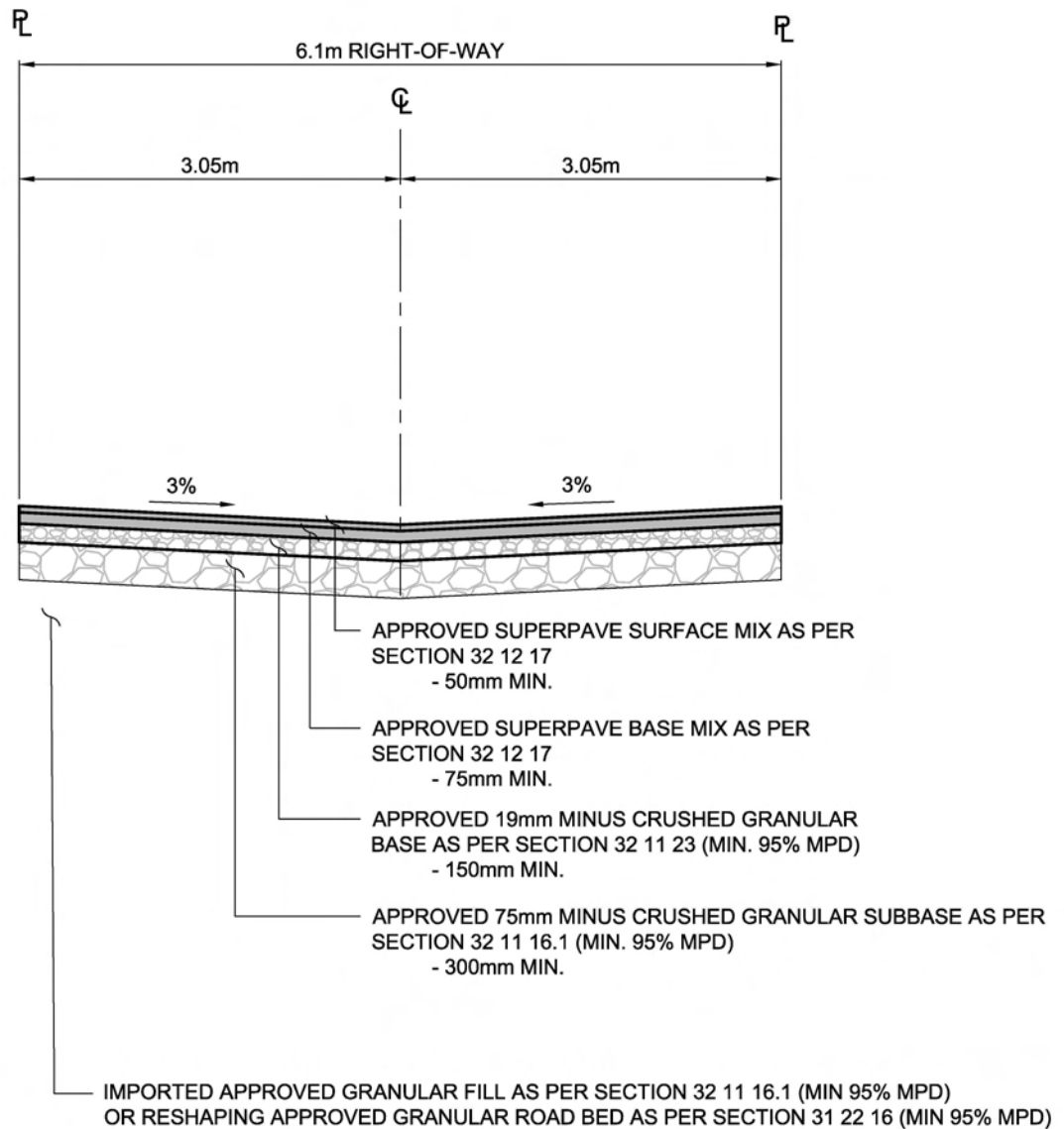
1. PAVED APRON CONNECTIONS ARE PERMITTED ONLY AT DRIVEWAYS, GARAGE DOORS, AND/OR PEDESTRIAN ENTRANCES.
2. APRONS MAY EXTEND NO MORE THAN 1.2m LONGITUDINALLY FROM THE EDGE OF THE DRIVEWAY, GARAGE DOOR, OR PEDESTRIAN ENTRANCE.
3. FOR SUBGRADE SOIL CLASS SC, ML, OR CL ONLY. OTHER SOIL CLASSES REQUIRE SPECIAL TREATMENT GEOTECHNICAL ENGINEER REQUIRED TO DETERMINE SUBGRADE SOIL CLASSIFICATION.
4. FOR PORTLAND CEMENT CONCRETE LANES, USE THE ROAD STRUCTURE ON G5.5.

SCALE: N.T.S.

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**TYPICAL CROSS SECTION  
RESIDENTIAL CENTRE STRIP LANEWAY**

ISSUE DATE: SEPTEMBER 2018  
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**NOTES:**

1. PAVED APRON CONNECTIONS ARE PERMITTED ONLY AT DRIVEWAYS, GARAGE DOORS, AND/OR PEDESTRIAN ENTRANCES.
2. APRONS MAY EXTEND NO MORE THAN 1.2m LONGITUDINALLY FROM THE EDGE OF THE DRIVEWAY, GARAGE DOOR, OR PEDESTRIAN ENTRANCE.
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4. FOR PORTLAND CEMENT CONCRETE LANES, USE THE ROAD STRUCTURE ON G5.5.

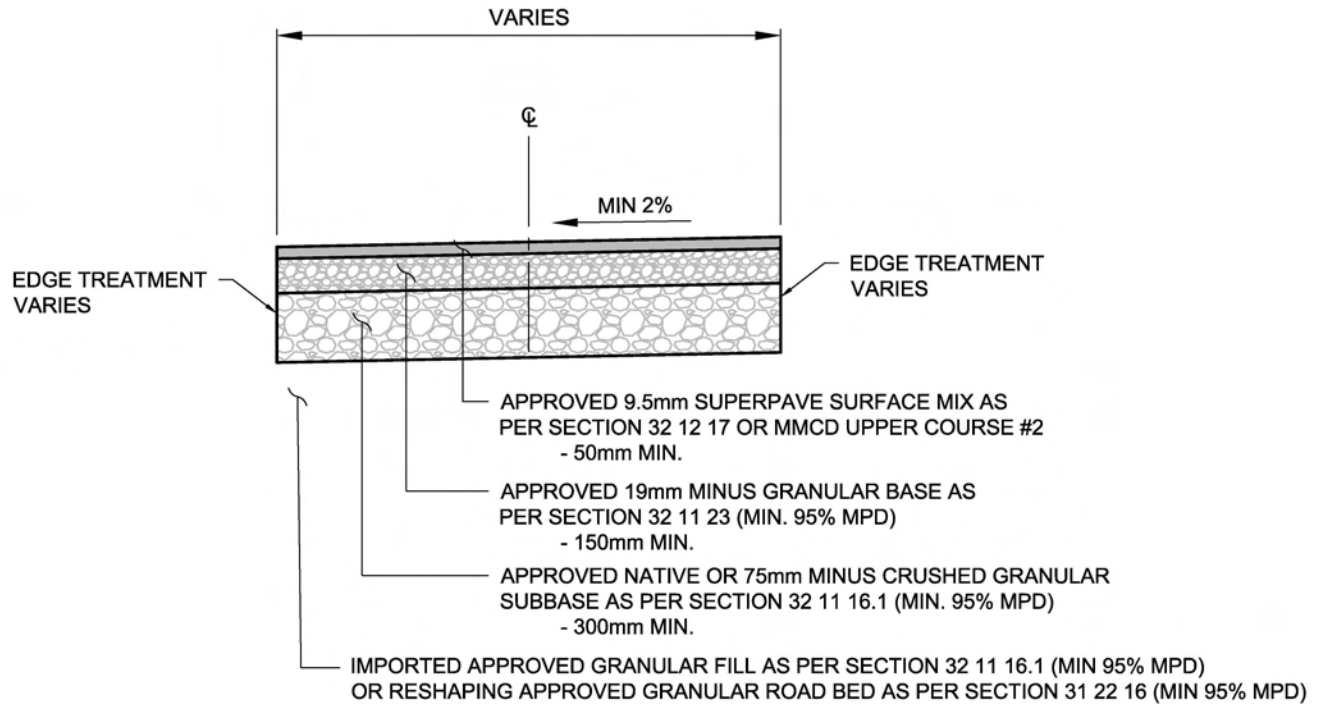
SCALE: N.T.S.

REV.	REVISION DATE	APPROVED

**TYPICAL CROSS SECTION  
HIGHER-ZONED LANEWAY**

ISSUE DATE: SEPTEMBER 2018  
APPROVED BY: J. LEE





**NOTES:**

1. FOR SUBGRADE SOIL CLASS SC, ML, OR CL ONLY. OTHER SOIL CLASSES REQUIRE SPECIAL TREATMENT  
GEOTECHNICAL ENGINEER REQUIRED TO DETERMINE SUBGRADE SOIL CLASSIFICATION.

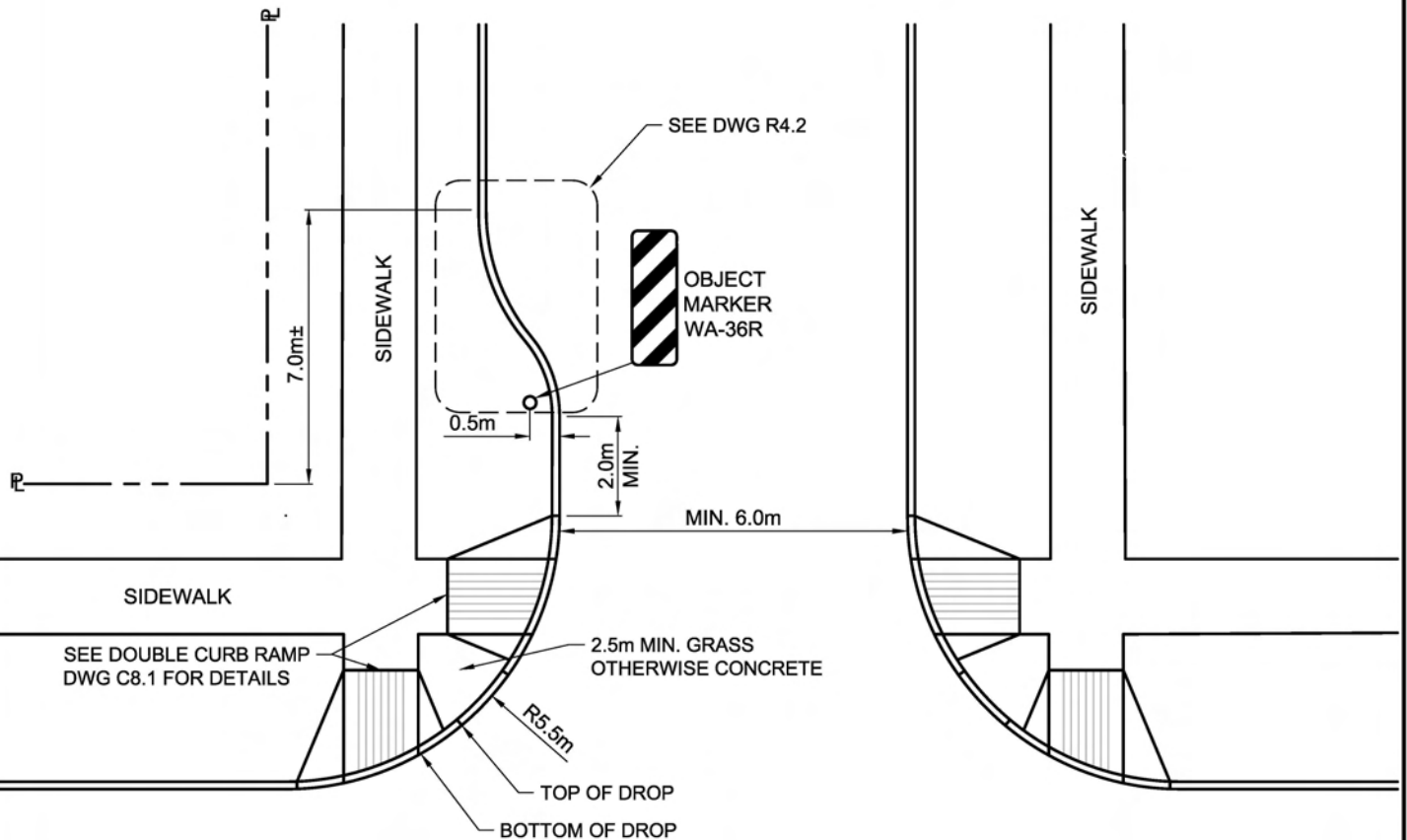
SCALE: N.T.S.

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TYPICAL CROSS SECTION  
PROTECTED/RAISED BIKE LANE

ISSUE DATE: SEPTEMBER 2018

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**NOTES:**

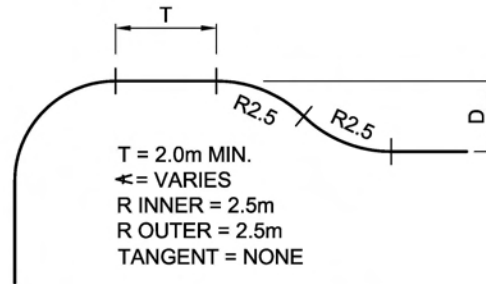
1. NOTIFY TRANSPORTATION BRANCH PRIOR TO DESIGN OF COMPLEX DESIGNS, NON RESIDENTIAL, BUS ROUTES ETC.
2. STREET DESIGN REQUIRED FOR DRAINAGE.
3. INFILTRATION BULGE SHOULD BE CONSIDERED AS AN ALTERNATIVE DESIGN.
4. FOR STANDARD BULGE DESIGN INTERIM GUIDELINES, REFER TO THE DESIGN CRITERIA MANUAL AND DWG R4.2.

SCALE: N.T.S.

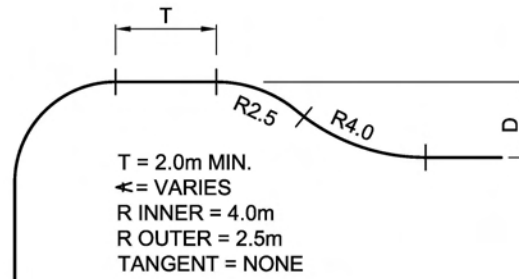
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**ROADS**  
**RESIDENTIAL ROAD**

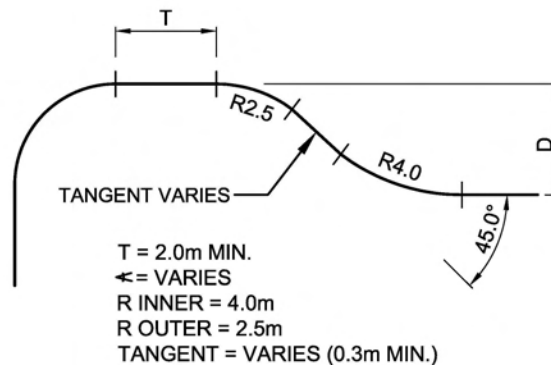
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**STANDARD BULGE DETAIL**  
**D = 1.2m TO 1.4m**



**STANDARD BULGE DETAIL**  
**D = 1.5m TO 2.1m**



**STANDARD BULGE DETAIL**  
**D = 2.2m TO 2.5m**

**NOTES:**

1. IF PARKING OR OTHER CONDITIONS CONSTRAIN THESE PARAMETERS, ADJUSTMENTS SHOULD BE MADE IN THE FOLLOWING PRIORITY ORDER:
  - (I) REDUCE THE R INNER TO R = 2.5
  - (II) MINIMIZE THE DEPTH
  - (III) REDUCE THE TANGENT TO AN ABSOLUTE MINIMUM OF 1.2m
2. BULGE WIDTH TO BE GREATER THAN 1.2m AND LESS THAN 2.5m.
3. ALL DIMENSIONS IN METERS UNLESS STATED OTHERWISE.

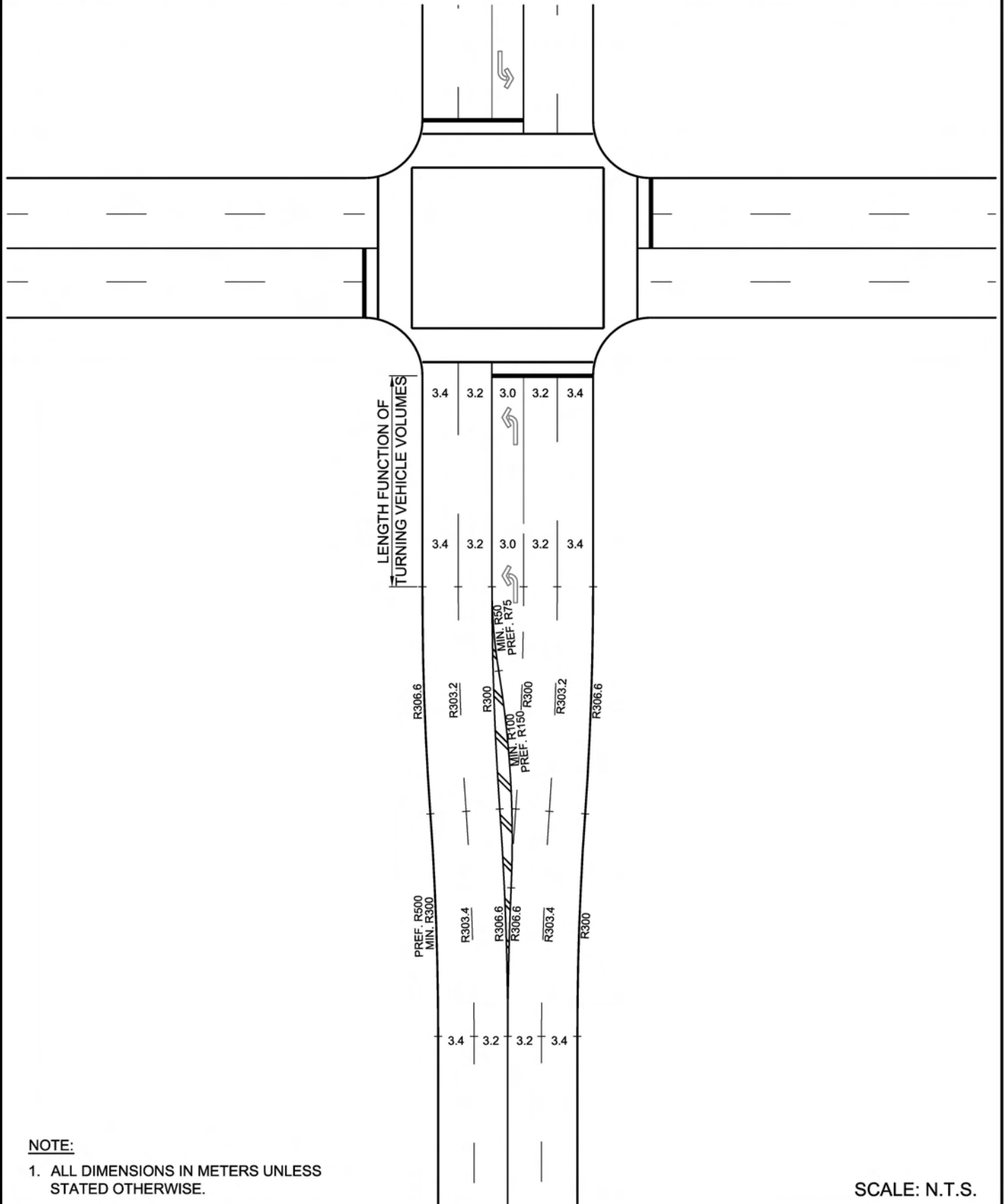
SCALE: N.T.S.

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**ROADS**  
**STANDARD BULGE DESIGN INTERIM GUIDELINES**

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**NOTE:**

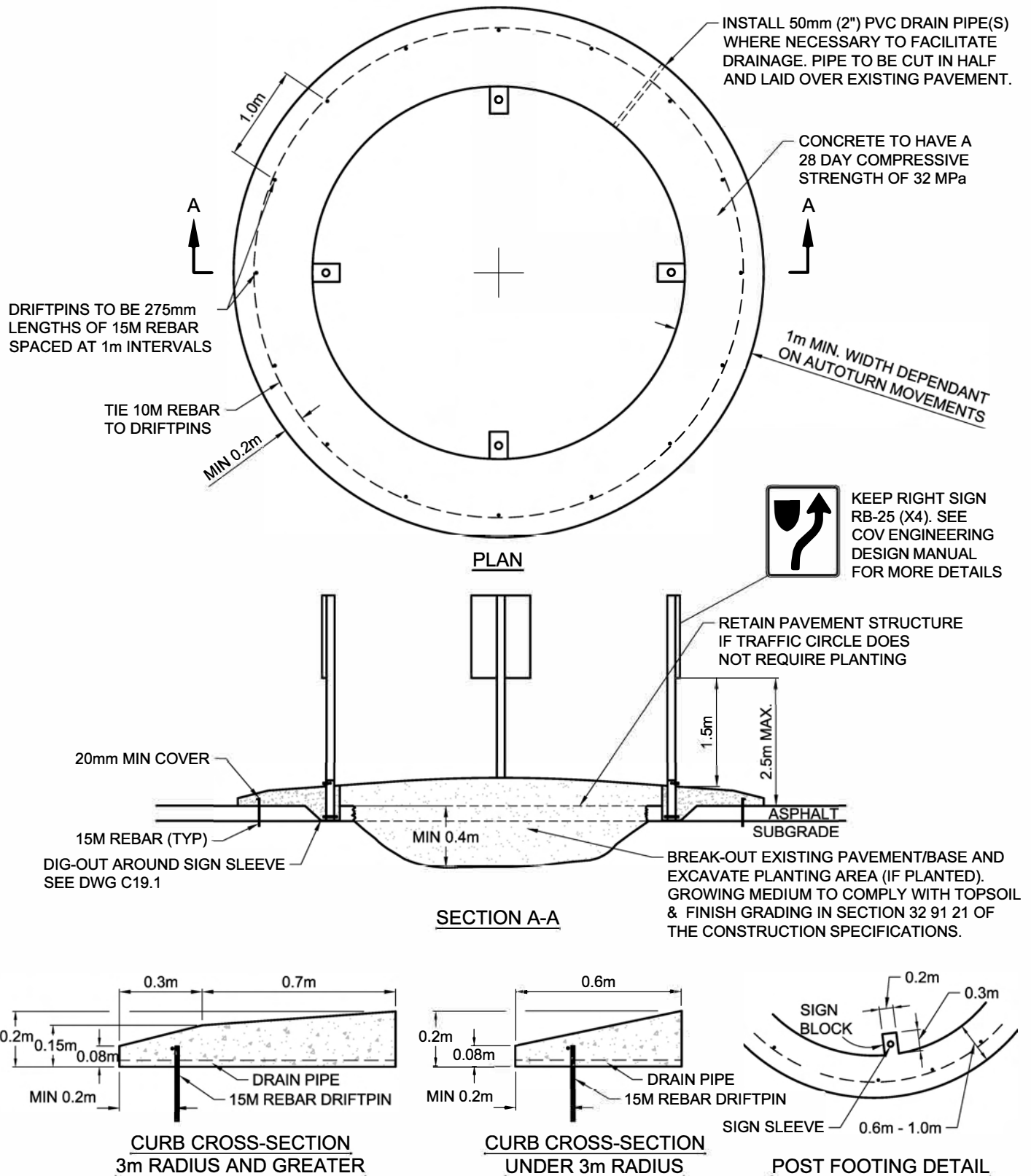
1. ALL DIMENSIONS IN METERS UNLESS STATED OTHERWISE.

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REV.	REVISION DATE	APPROVED

**ROADS**  
**TYPICAL ARTERIAL LEFT TURN BAY**

ISSUE DATE: SEPTEMBER 2018  
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NOTES:

1. NOTIFY TRANSPORTATION BRANCH PRIOR TO DESIGN.

SCALE: N.T.S.

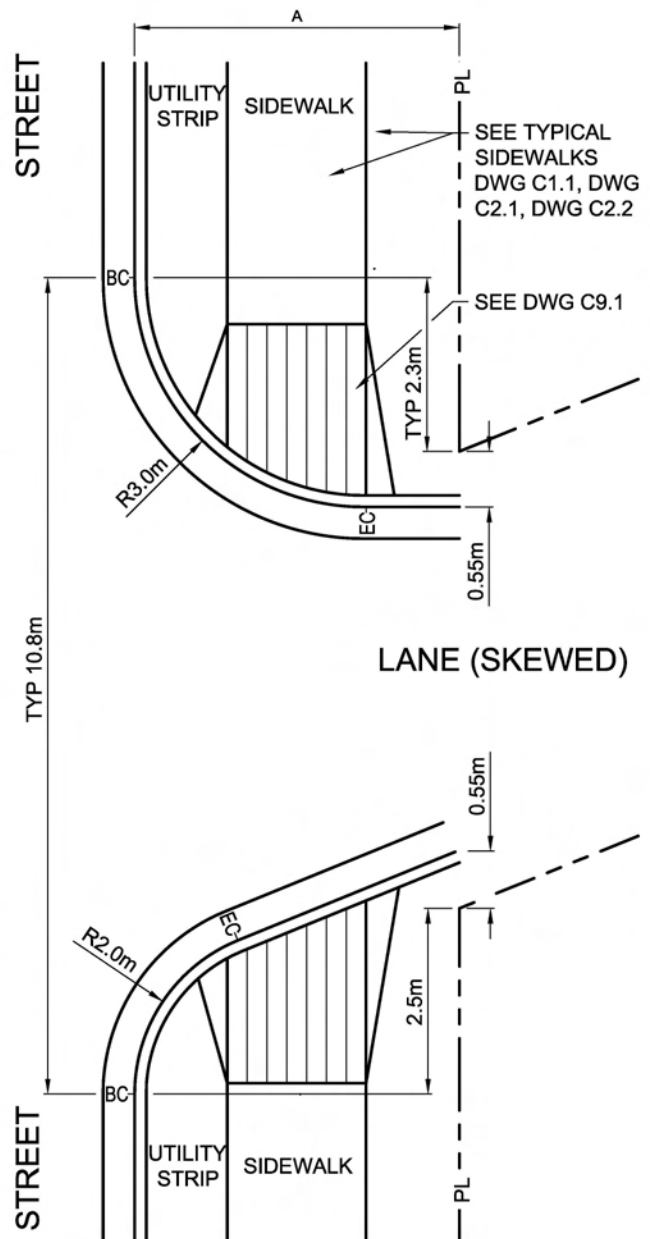
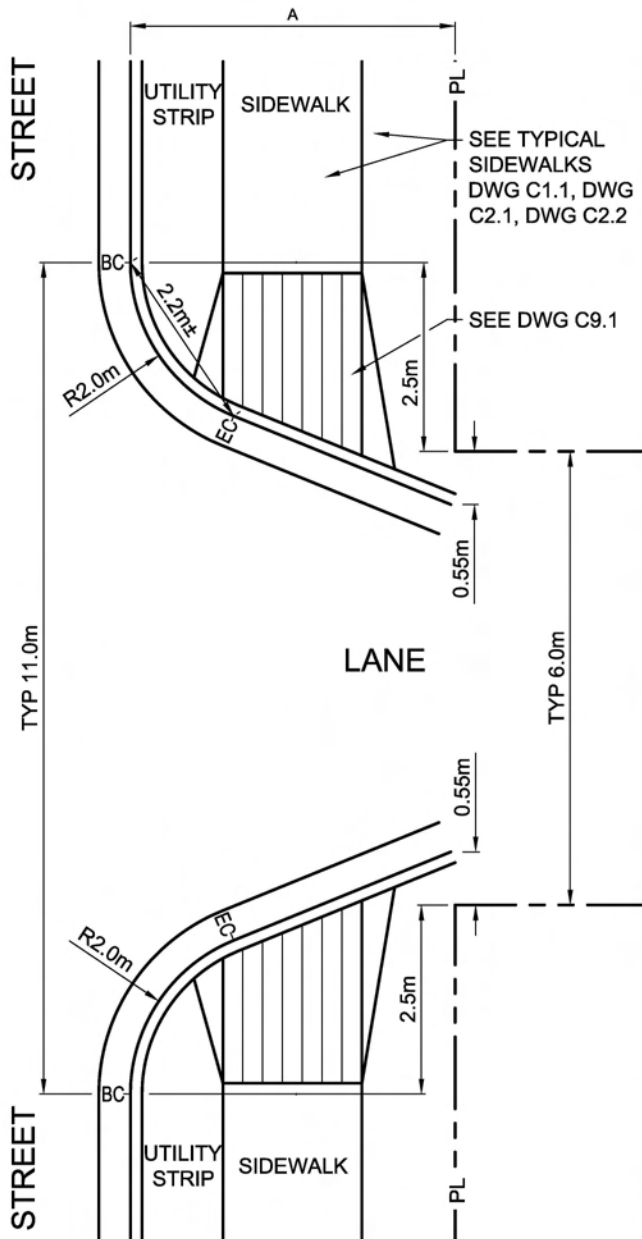
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ROADS  
TRAFFIC CIRCLES

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FOR TYP. 20m STREET ALLOWANCE	
ROAD WIDTH	BLVD A
8.5m	5.75m
10.0m	5.0m
11.0m	4.5m
12.0m	4.0m




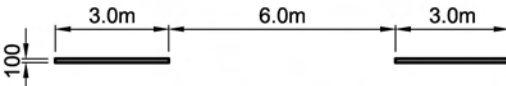
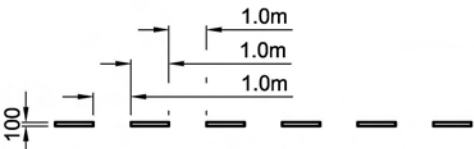
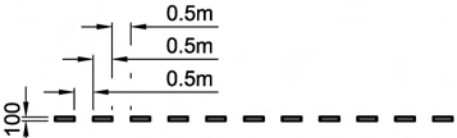
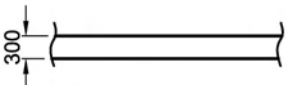
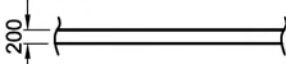
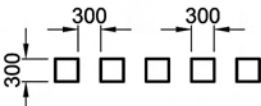
SCALE: N.T.S.

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LANEWAYS  
LANEWAY ENTRANCE

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INSTALLATION OF PAVEMENT MARKINGS

TYPE	LINE DIMENSIONS (mm)	COLOR	
		WHITE	YELLOW
SOLID		1. EDGELINES ON THE RIGHT 2. LANE LINES PROHIBITING LANE CHANGES	1. EDGELINES ON THE LEFT 2. DIRECTIONAL DIVIDING LINES
BROKEN		1. LANE LINES	1. DIRECTIONAL DIVIDING LINES
SHORT BROKEN		1. CONTINUITY LINES IN MERGING AND DIVERGING AREAS 2. LEFT TURN BAYS	
DENSE BROKEN		1. GUIDE LINES FOR INTERSECTION MOVEMENTS	1. GUIDE LINES FOR INTERSECTION MOVEMENTS
STOP		1. STOP LINES	
CROSSWALK		1. CROSSWALKS	
ELEPHANT'S FEET		1. BIKE CROSSINGS	

**NOTE:**

1. ALL DIMENSIONS IN MILLIMETERS UNLESS STATED OTHERWISE.

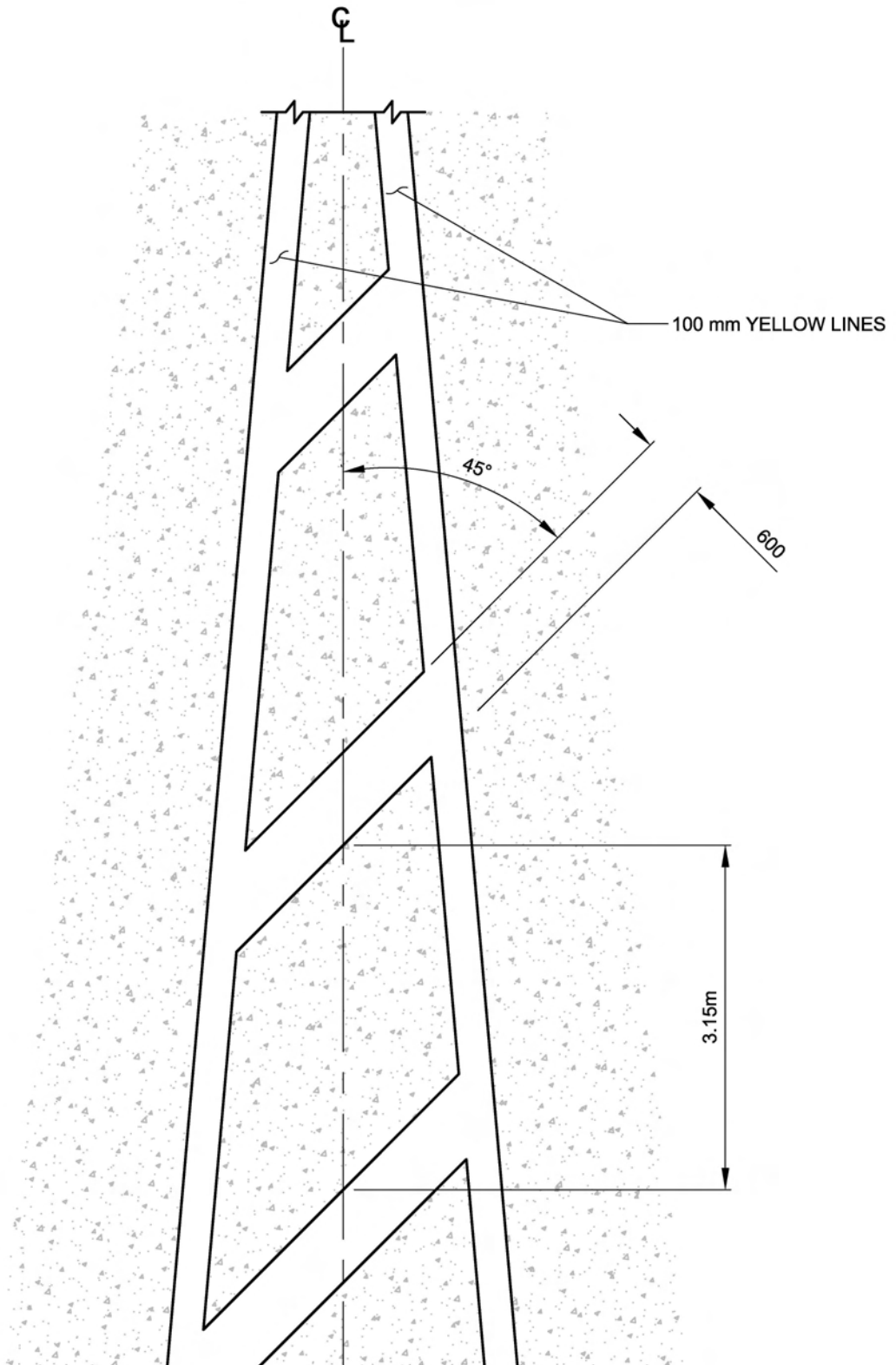
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MARKINGS & SIGNAGE  
INSTALLATION OF PAVEMENT MARKINGS

ISSUE DATE: SEPTEMBER 2018

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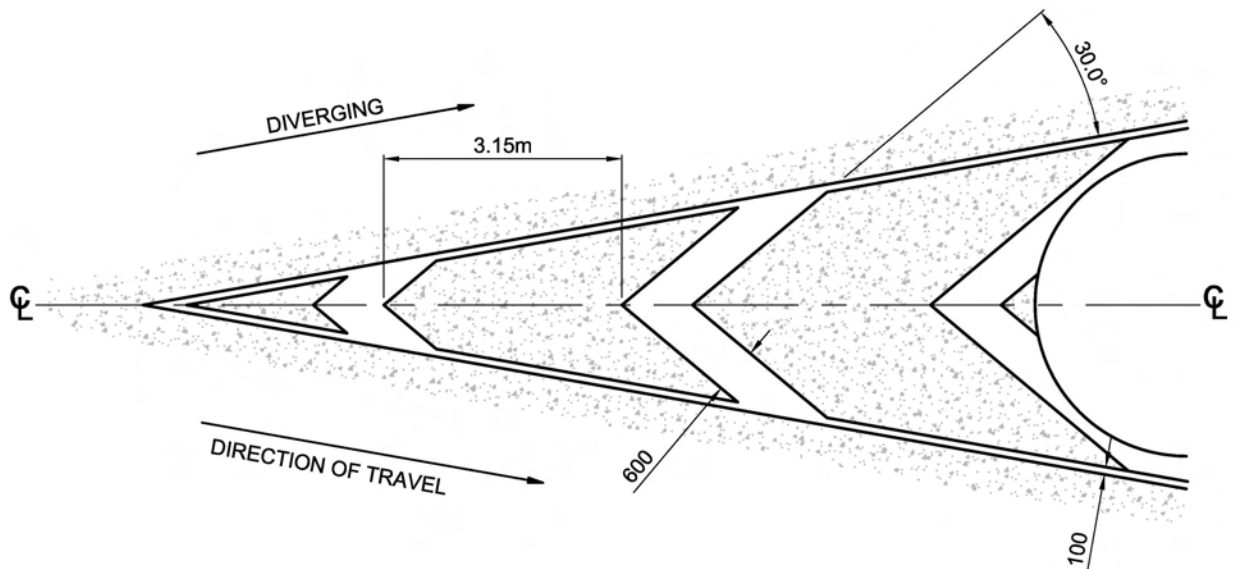
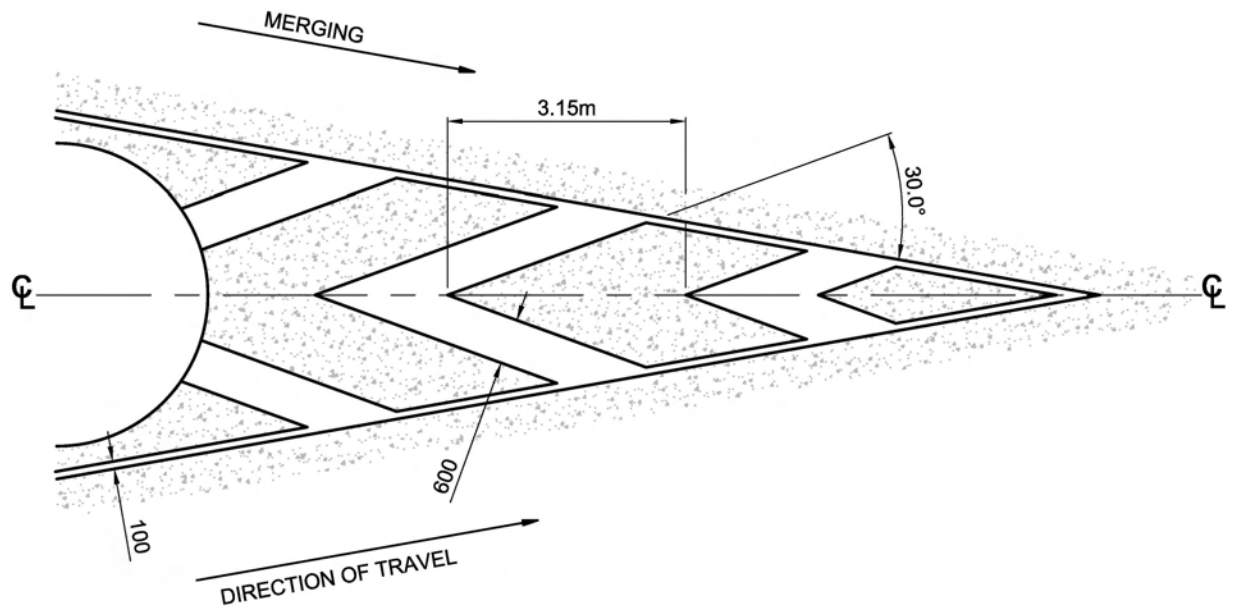
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MARKINGS & SIGNAGE  
DETAIL OF MEDIAN GORE MARKING

ISSUE DATE: SEPTEMBER 2018  
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**NOTE:**

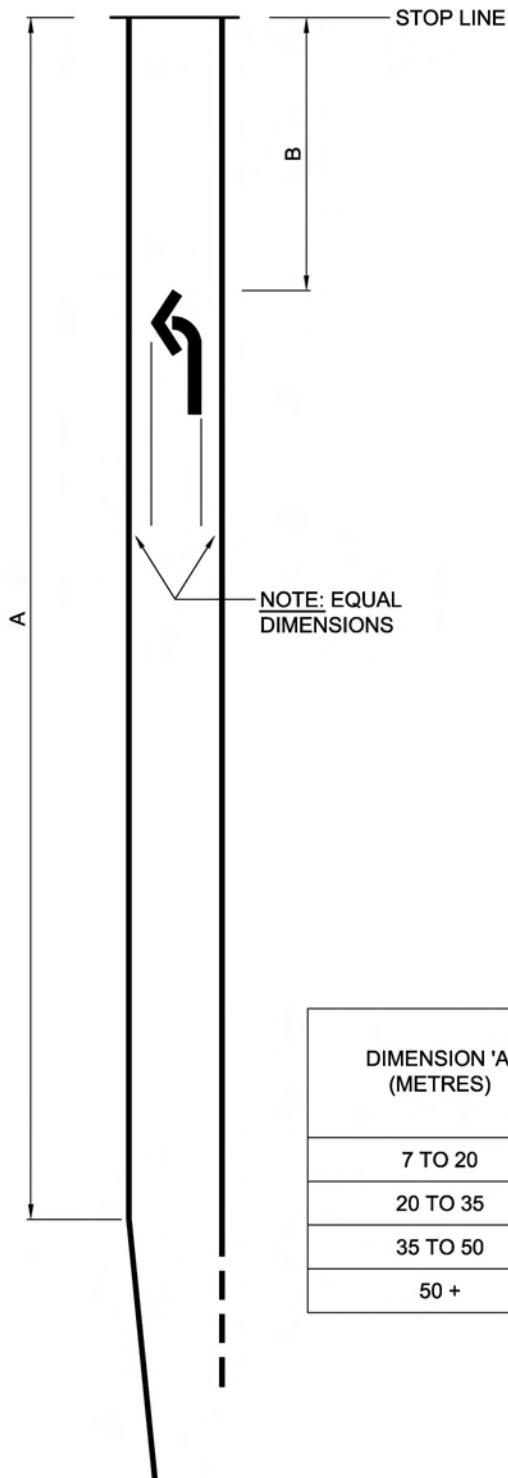
1. ALL DIMENSIONS IN MILLIMETERS UNLESS STATED OTHERWISE.

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REV.	REVISION DATE	APPROVED

**MARKINGS & SIGNAGE**  
**MERGING OR DIVERGING GORE AREA MARKING**

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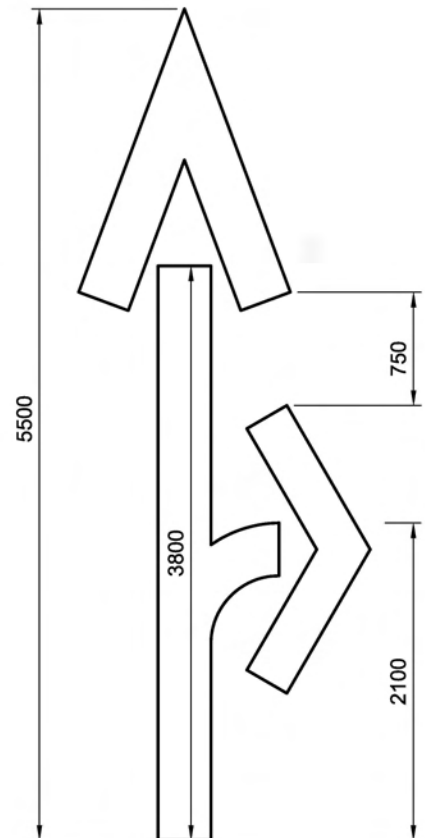
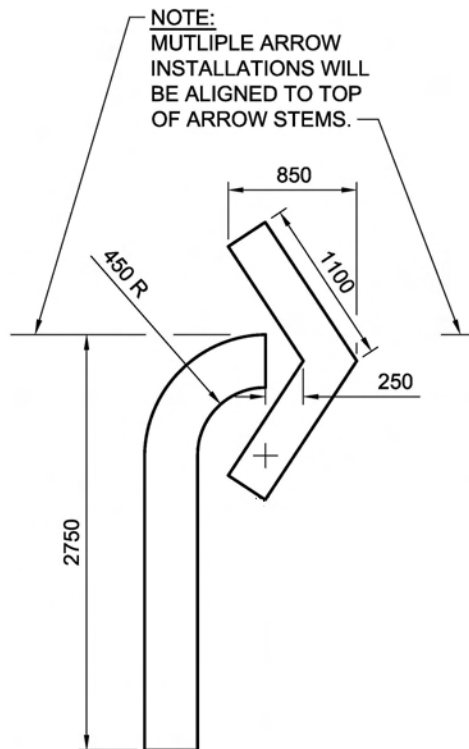
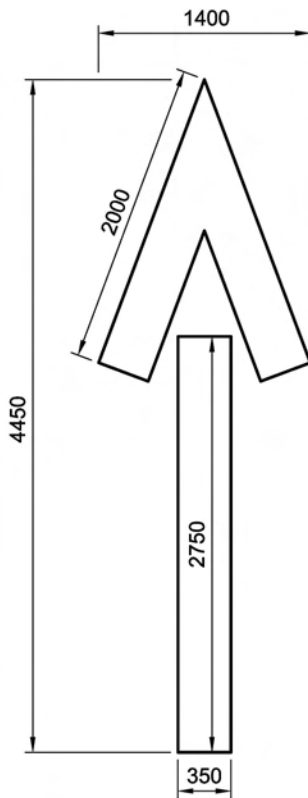
DIMENSION 'A' (METRES)	NUMBER OF ARROWS	DIMENSION 'B'
7 TO 20	1	3m
20 TO 35	2	3m, 18m
35 TO 50	3	3m, 18m, 33m
50 +	4	3m, 18m, 33m, 48m

SCALE: N.T.S.

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MARKINGS & SIGNAGE  
LEFT TURN BAY ARROW INSTALLATION

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**NOTE:**

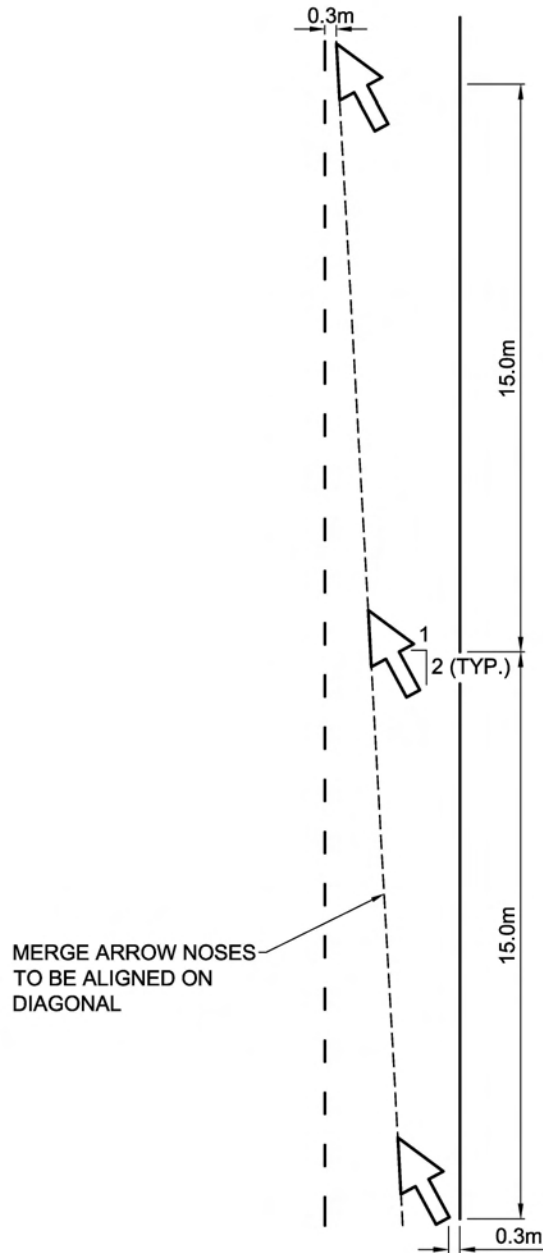
1. ALL DIMENSIONS IN MILLIMETERS UNLESS STATED OTHERWISE.

SCALE: N.T.S.

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**MARKINGS & SIGNAGE  
TURN ARROWS**

ISSUE DATE: SEPTEMBER 2018  
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**NOTE:**

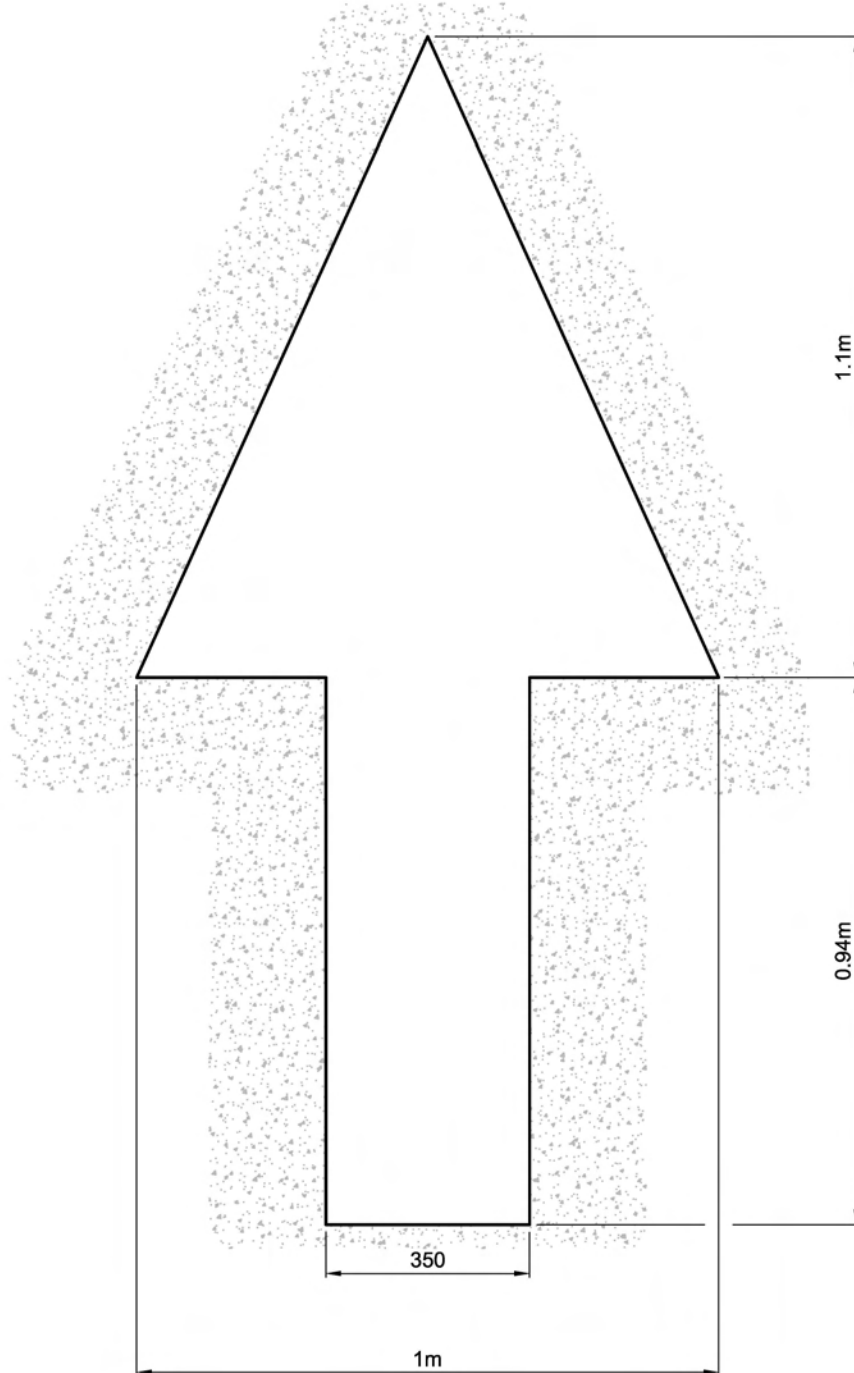
1. WHEN MORE OR LESS THAN 3 ARROWS ARE REQUIRED, ALL ARROWS ARE TO BE PLACED IN THE CENTER OF THE LANE.

SCALE: N.T.S.

REV.	REVISION DATE	APPROVED

MARKINGS & SIGNAGE  
TYPICAL MERGE ARROW PLACEMENT

ISSUE DATE: SEPTEMBER 2018  
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**NOTE:**

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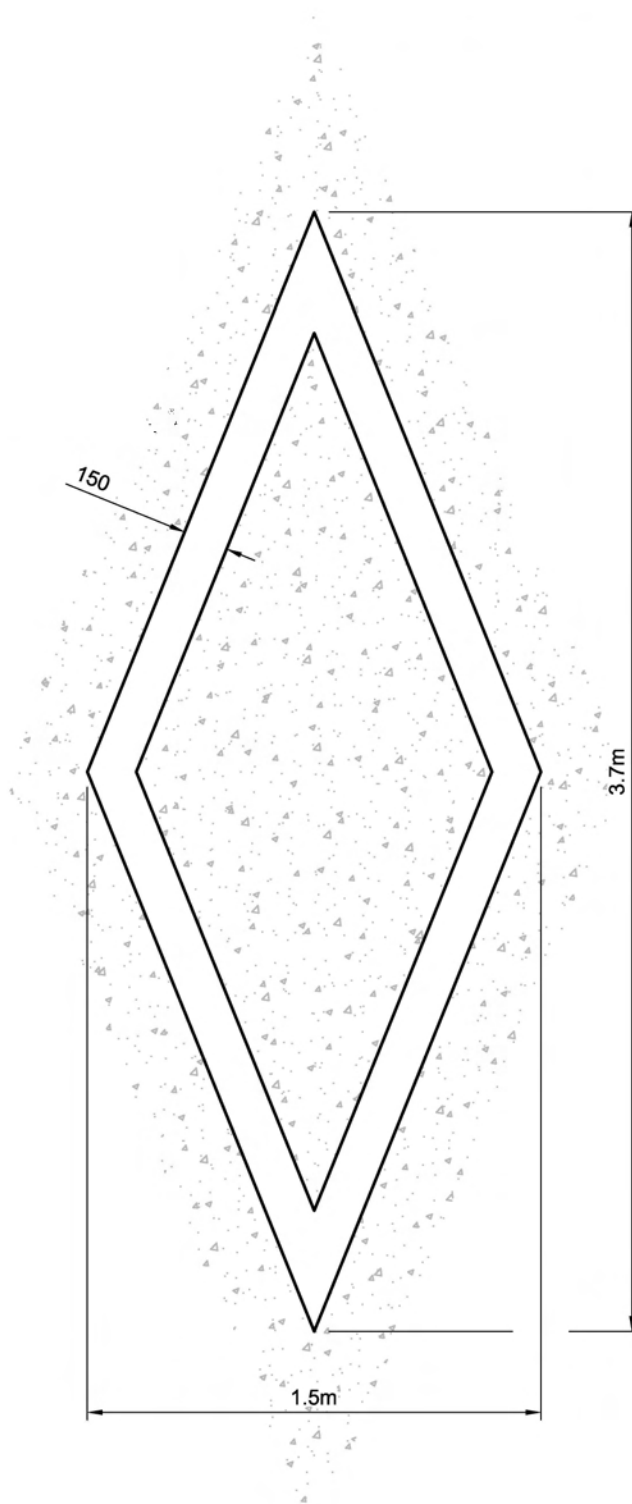
SCALE: N.T.S.

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**MARKINGS & SIGNAGE**  
**MERGE ARROW**

ISSUE DATE: SEPTEMBER 2018

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**NOTES:**

1. BUS LANE MARKINGS - WHITE
2. ALL DIMENSIONS IN MILLIMETERS UNLESS STATED OTHERWISE.

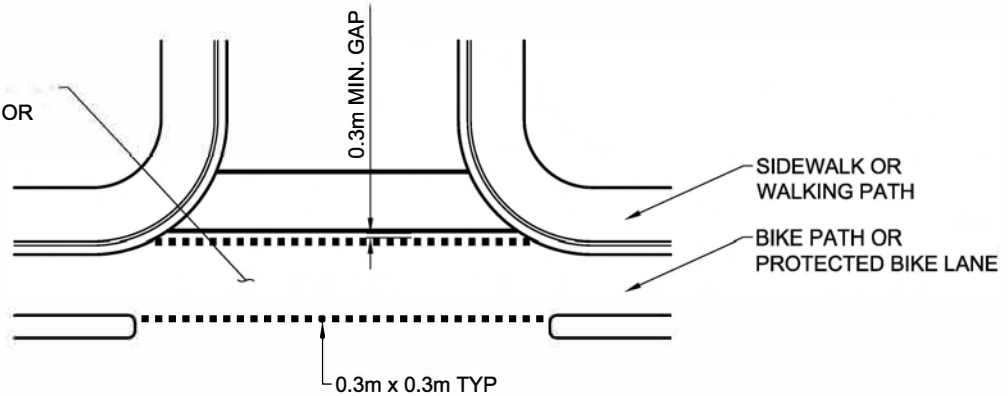
SCALE: N.T.S.

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**MARKINGS & SIGNAGE**  
**TYPICAL BUS LANE PAVEMENT MARKING**

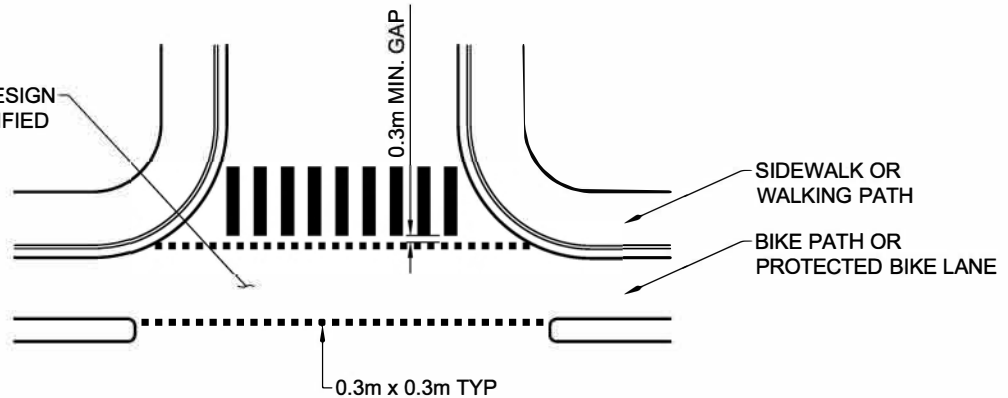
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APPLY GREEN PAINT AS PER  
ENGINEERING DESIGN MANUAL OR  
AS SPECIFIED



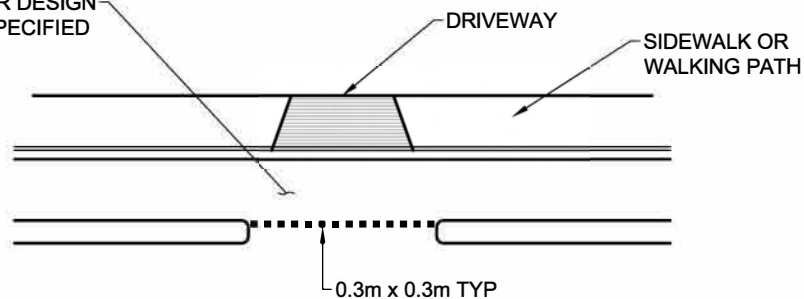
**BIKE CROSSING ADJACENT TO SIGNALIZED PEDESTRIAN CROSSING**

APPLY GREEN PAINT AS PER DESIGN  
CRITERIA MANUAL OR AS SPECIFIED



**BIKE CROSSING ADJACENT TO NON SIGNALIZED ZEBRA CROSSING**

APPLY GREEN PAINT AS PER DESIGN  
CRITERIA MANUAL OR AS SPECIFIED



**BIKE CROSSING ADJACENT TO DRIVEWAY CROSSING**

**NOTES:**

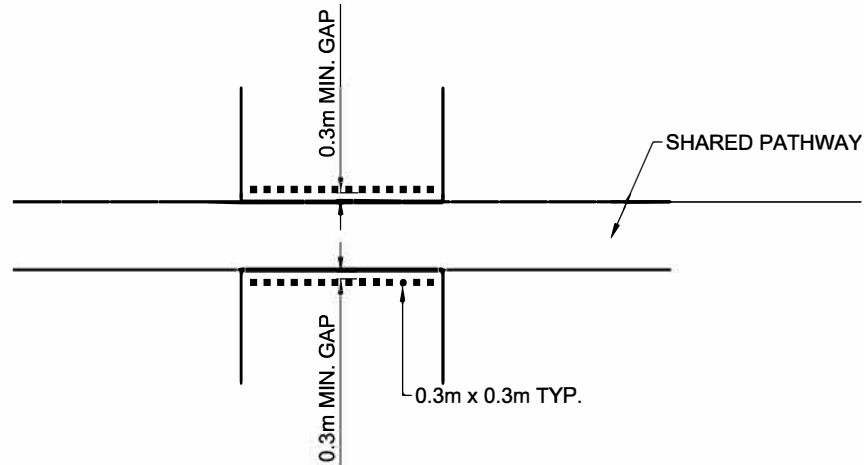
1. INSIDE EDGE OF ELEPHANT'S FEET TYPICALLY ALIGNED WITH OUTSIDE EDGE OF BIKE PATH.
2. ELEPHANT'S FEET TYPICALLY NOT APPLIED WHERE THERE IS A CONCRETE EDGE THROUGH THE CROSSING.

SCALE: N.T.S.

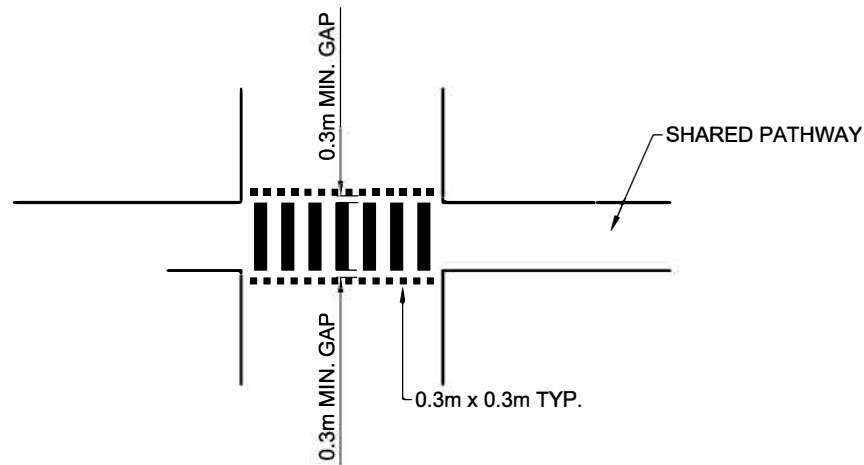
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**MARKINGS & SIGNAGE  
ELEPHANT'S FEET DETAILS**

ISSUE DATE: SEPTEMBER 2018  
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SHARED BIKE AND PEDESTRIAN CROSSING - SIGNALIZED



SHARED BIKE AND PEDESTRIAN CROSSING - NON SIGNALIZED

NOTES:

1. INSIDE EDGE OF ELEPHANT'S FEET TYPICALLY ALIGNED WITH OUTSIDE EDGE OF BIKE PATH.
2. ELEPHANT'S FEET TYPICALLY NOT APPLIED WHERE THERE IS A CONCRETE EDGE THROUGH THE CROSSING.

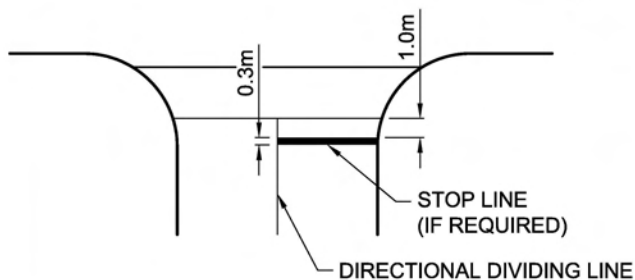
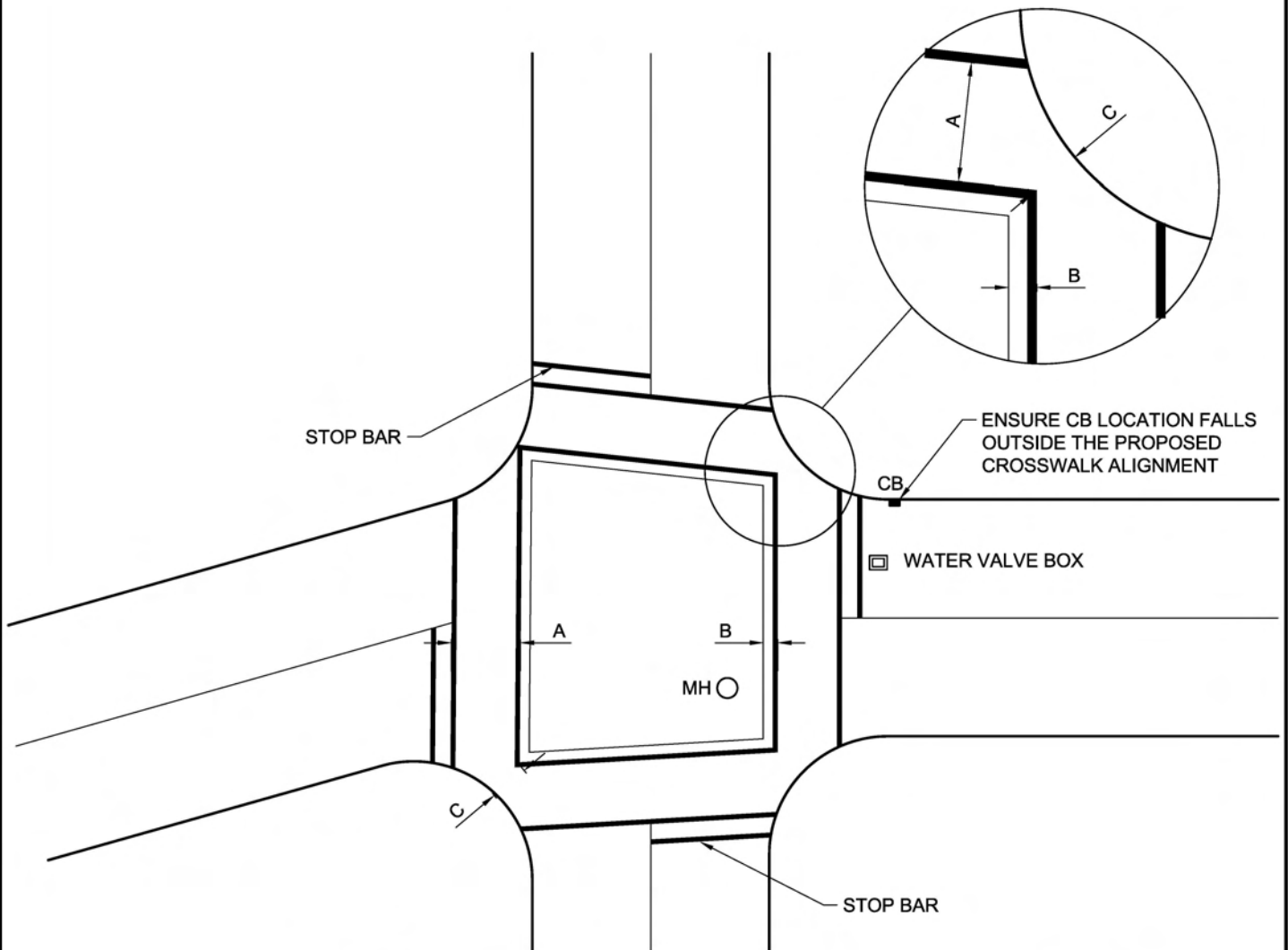
SCALE: N.T.S.

REV.	REVISION DATE	APPROVED

MARKINGS & SIGNAGE  
ELEPHANT'S FEET DETAILS

ISSUE DATE: SEPTEMBER 2018  
APPROVED BY: R. KENNY





CROSSWALK AND STOP LINES - WHITE  
DIRECTIONAL DIVIDING LINE - YELLOW

**TYPICAL STOPLINE AT  
MARKED CROSSWALK**

- A: CROSSWALK WIDTH: 3.0m, 4.0m TO 6.0m IN DOWNTOWN CORE  
REFER TO THE DESIGN CRITERIA MANUAL
- B: CROSSWALK SETBACK FROM GUTTERLINE:  
0.6m TO 2.0m
- C: CROSSWALK CORNER FROM CURB RETURN:  
1.0m DESIRABLE  
2.0m ACCEPTABLE

SCALE: N.T.S.

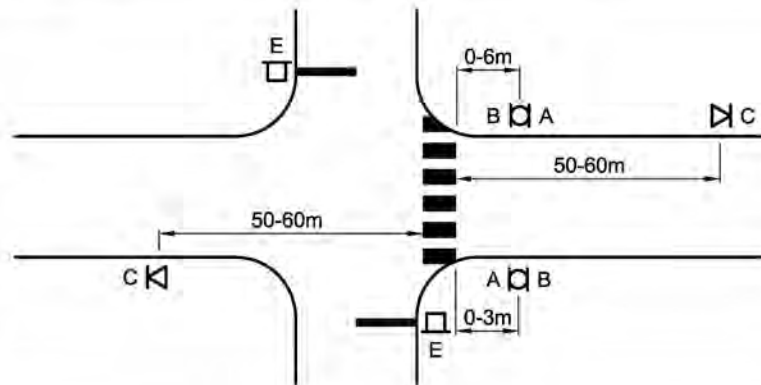
REV.	REVISION DATE	APPROVED

**MARKINGS & SIGNAGE  
TYPICAL CROSSWALK MARKINGS**

ISSUE DATE: SEPTEMBER 2018  
APPROVED BY: R. KENNY

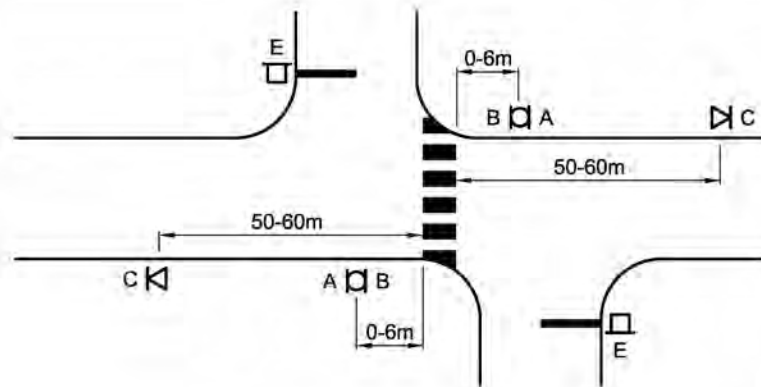
**CASE 1:**

SINGLE CROSSWALK AT  
STANDARD  
INTERSECTION



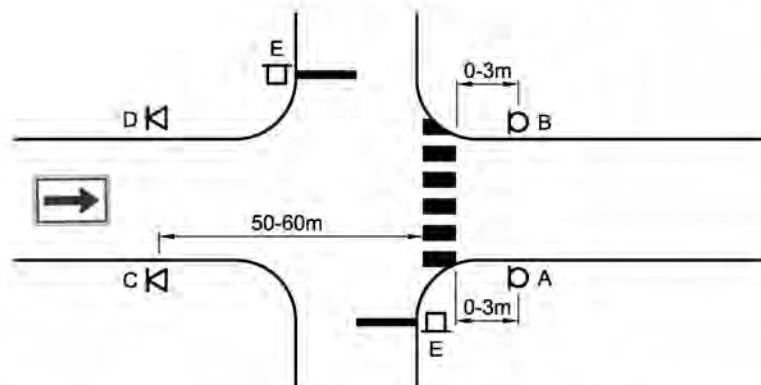
**CASE 2:**

CROSSWALK AT STAGGERED  
OR T-INTERSECTION



**CASE 3:**

CROSSWALKS ON  
ONE-WAY STREET



**LEGEND:**



**NOTES:**

1. MAY BE INSTALLED WHERE VISIBILITY IS POOR (WC-2R OR WC-2L).

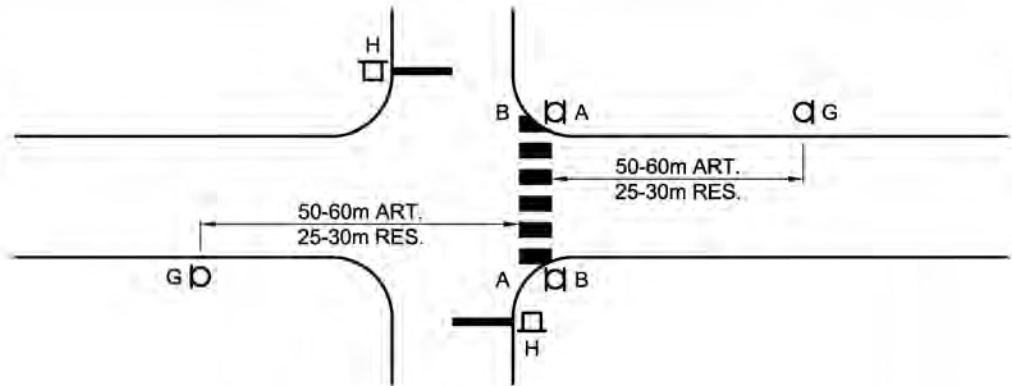
SCALE: N.T.S.

REV.	REVISION DATE	APPROVED

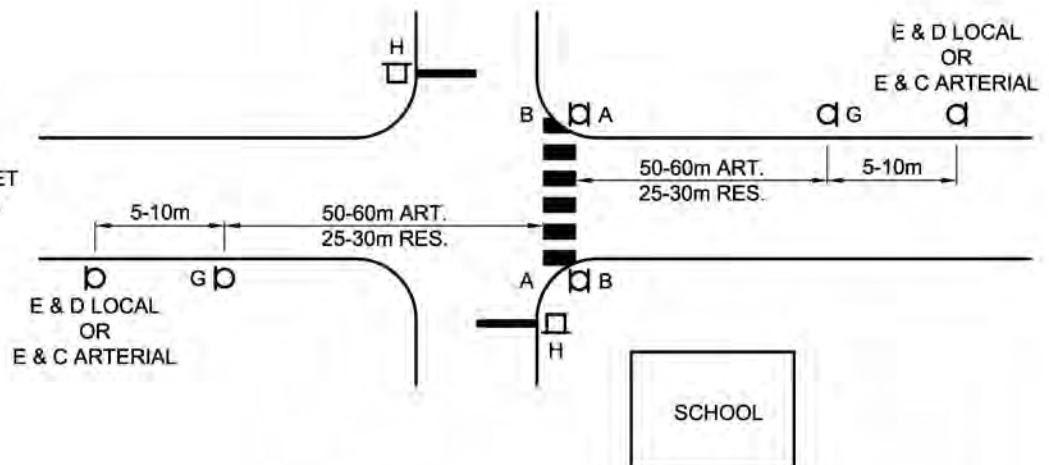
MARKINGS & SIGNAGE  
PEDESTRIAN CROSSWALK SIGN PLACEMENT

ISSUE DATE: SEPTEMBER 2018  
APPROVED BY: L. QUINTERO

**CASE 1:**  
MARKED SCHOOL  
CROSSWALK ON ROUTE  
TO SCHOOL



**CASE 2:**  
MARKED SCHOOL  
CROSSWALK ON STREET  
ADJACENT TO SCHOOL



A  
RA-3R



B  
RA-3L



C  
RB-31T



D  
RB-MISC-40



E  
WC-1



F  
WC-16L



G  
WC-16R



H  
RA-1

**NOTES:**

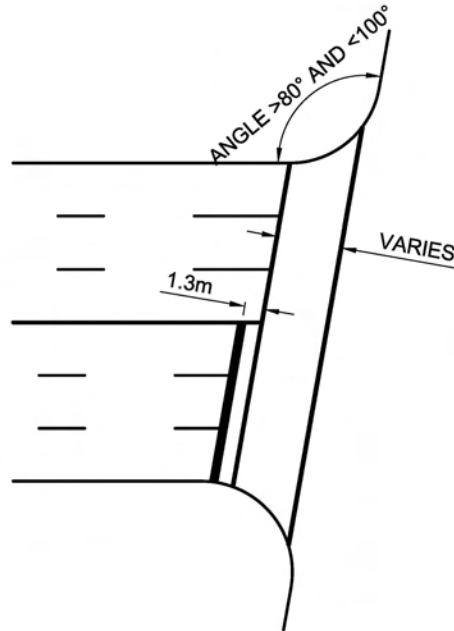
1. MAY BE INSTALLED WHERE VISIBILITY IS POOR (WC-16L OR WC-16R).

SCALE: N.T.S.

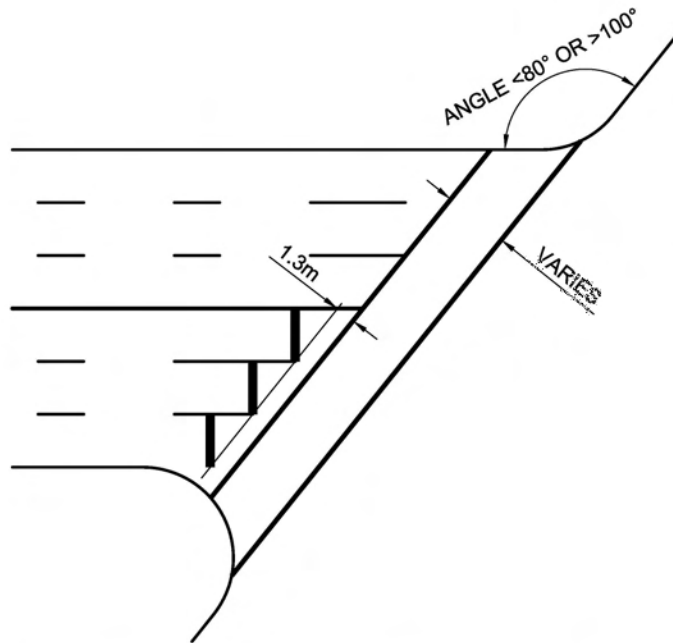
REV.	REVISION DATE	APPROVED

MARKINGS & SIGNAGE  
STANDARD CROSSWALK SIGNING AND MARKING

ISSUE DATE: SEPTEMBER 2018  
APPROVED BY: L. QUINTERO



STOP BARS AT INTERSECTIONS UNDER 10°



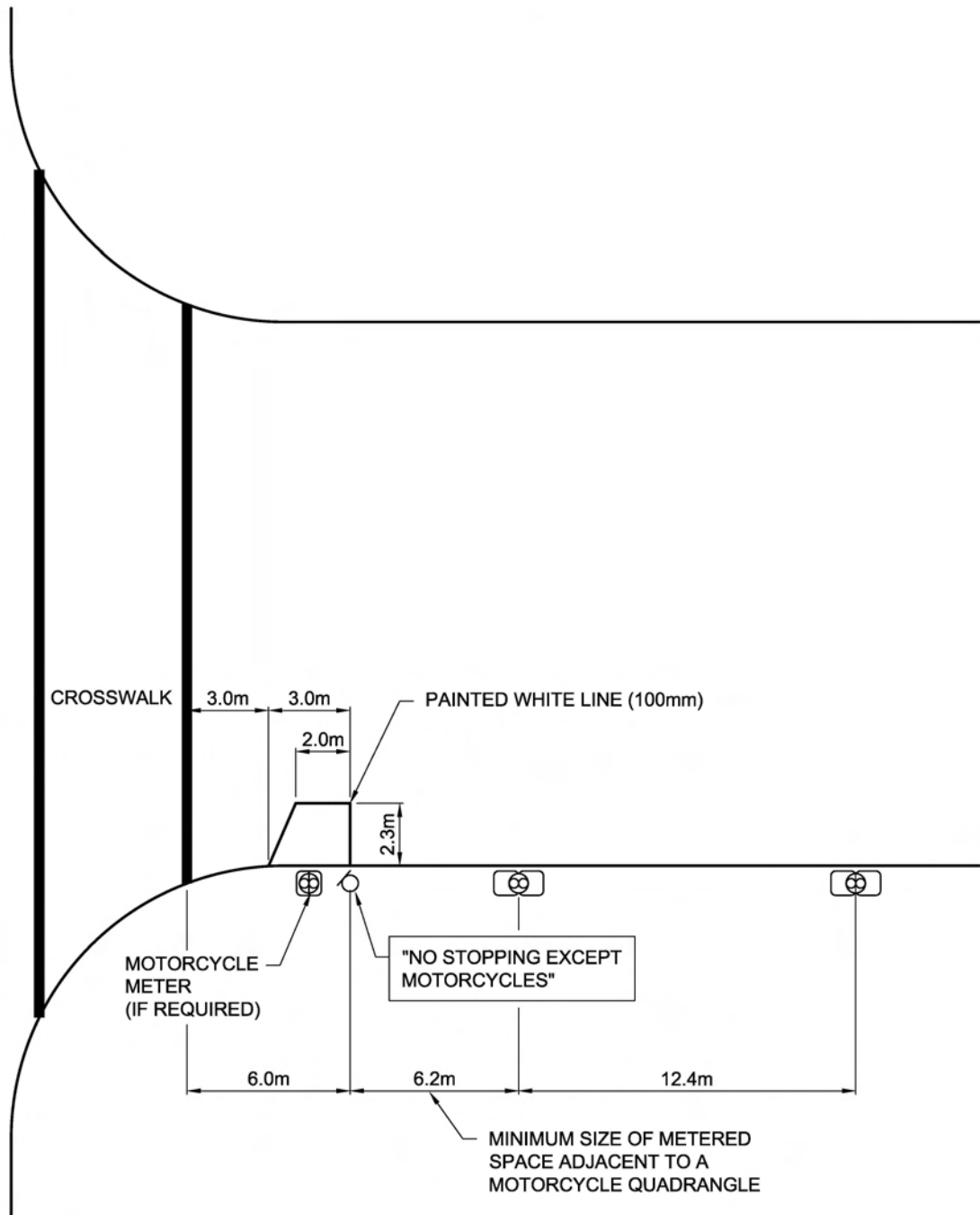
STOP BARS AT INTERSECTIONS OVER 10°

SCALE: N.T.S.

REV.	REVISION DATE	APPROVED

MARKINGS & SIGNAGE  
STOP BAR PLACEMENT

ISSUE DATE: SEPTEMBER 2018  
APPROVED BY: R. KENNY



**NOTE:**

1. 3mx2mx2.3m IS THE PREFERRED SIZE OF THE MOTORCYCLE QUADRANGLE ZONES. THIS PROVIDES 3m CLEARANCE FROM THE CROSSWALK TO THE START OF THE MOTORCYCLE QUADRANGLE.
2. TURNING TESTS WITH THE APPROPRIATE DESIGN VEHICLE MUST BE PERFORMED TO ENSURE NO CONFLICTS OCCUR.

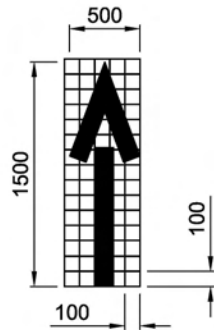
SCALE: N.T.S.

REV.	REVISION DATE	APPROVED

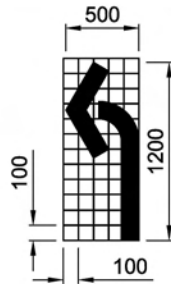
MARKINGS & SIGNAGE  
MOTORCYCLE QUADRANGLE

ISSUE DATE: SEPTEMBER 2018

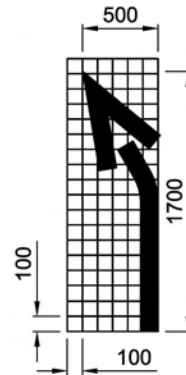
APPROVED BY: R. KENNY



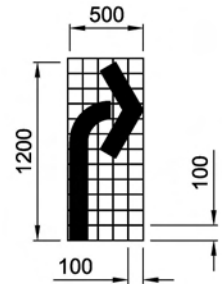
BIKE ARROW



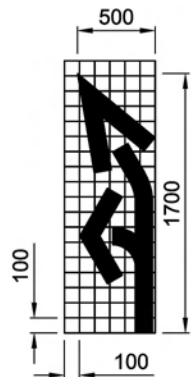
BIKE ARROW  
L90



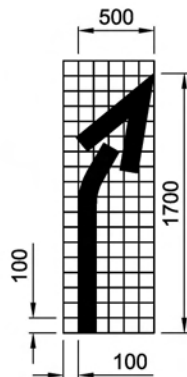
BIKE ARROW  
L30



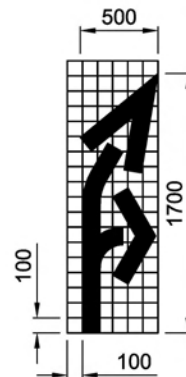
BIKE ARROW  
R90



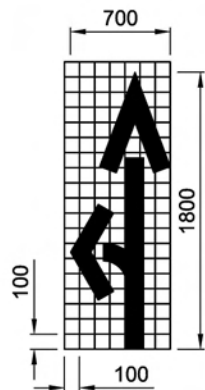
BIKE ARROW  
L30 + L90



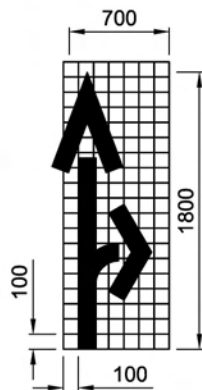
BIKE ARROW  
R30



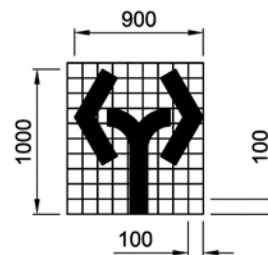
BIKE ARROW  
R30 + R90



BIKE ARROW  
L90 + THRU



BIKE ARROW  
R90 + THRU



BIKE ARROW  
L90 + R90

**NOTE:**

1. ALL DIMENSIONS IN MILLIMETERS UNLESS STATED OTHERWISE.

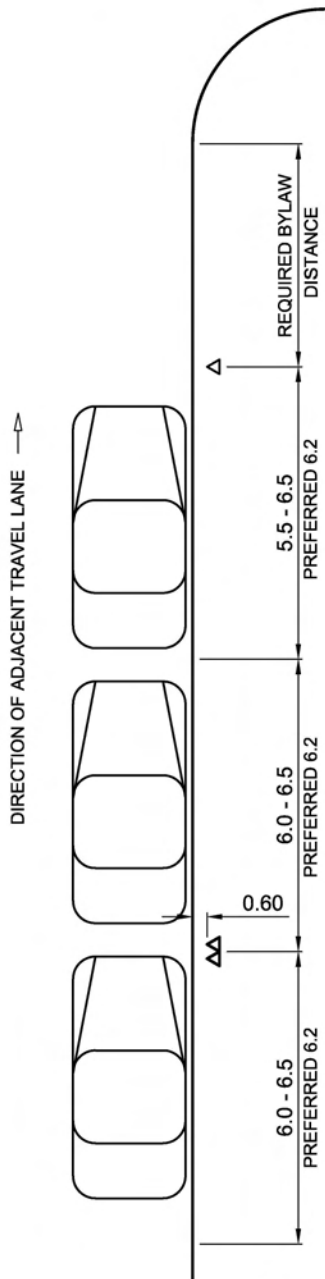
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REV.	REVISION DATE	APPROVED

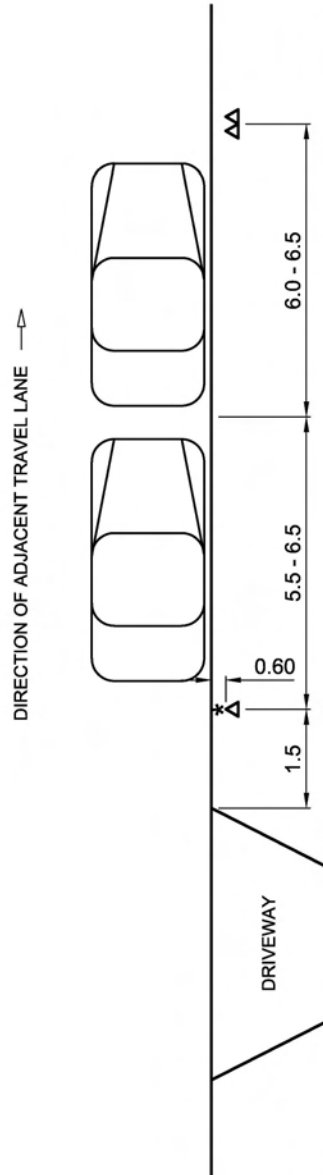
MARKINGS & SIGNAGE  
BIKE PATH ARROW STENCILS

ISSUE DATE: SEPTEMBER 2018

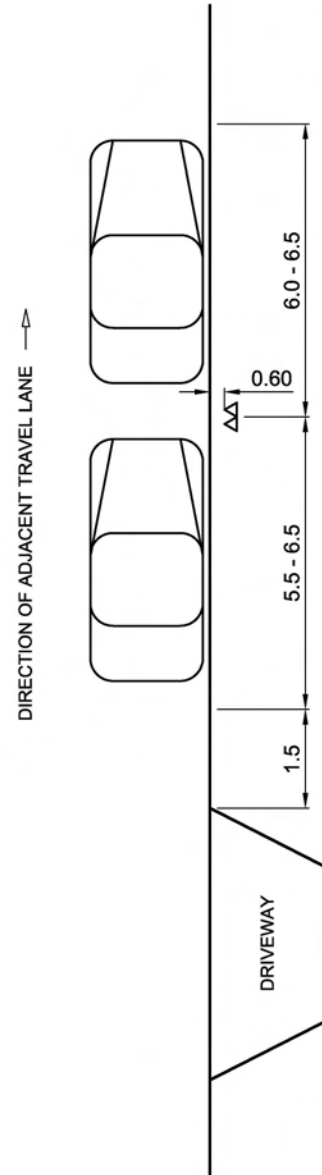
APPROVED BY: R. KENNY



**CASE 1**



**CASE 2**



**CASE 3**

△ SINGLE METER

△△ TWIN METER

**NOTES:**

1. \*A SINGLE METER AT THE REAR OF A METERED SPACE SHOULD ONLY BE INSTALLED IN RETROFIT PROJECTS
2. IDEAL SIZE = 6.2m. SIZES MAY VARY TO AVOID OBSTRUCTIONS (TREES, LAMP STANDARDS, ETC.) OR TO MAXIMIZE NUMBER OF SPACES/BLOCK.
3. SLEEVES SHOULD BE INSTALLED ACCORDING TO DWG C19.1.
4. ALL DIMENSIONS IN METERS UNLESS STATED OTHERWISE.

SCALE: N.T.S.

REV.	REVISION DATE	APPROVED

**PARKING  
TYPICAL PARKING METER LAYOUTS**

ISSUE DATE: SEPTEMBER 2018  
APPROVED BY: C. DARWENT