### Roadworks

<table>
<thead>
<tr>
<th>Sheet Number</th>
<th>Sheet Title</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>R0.1</td>
<td>DRAWING INDEX</td>
<td>ROADWORKS</td>
</tr>
<tr>
<td>R2.1</td>
<td>TYPICAL CROSS SECTION</td>
<td>RESIDENTIAL (LIGHT DUTY) STREET</td>
</tr>
<tr>
<td>R2.2</td>
<td>TYPICAL CROSS SECTION</td>
<td>HIGHER-ZONED STREET</td>
</tr>
<tr>
<td>R2.3</td>
<td>TYPICAL CROSS SECTION</td>
<td>INDUSTRIAL, ARTERIAL, &amp; BUS ROUTES</td>
</tr>
<tr>
<td>R2.4</td>
<td>TYPICAL CROSS SECTION</td>
<td>P.C.C. BASE</td>
</tr>
<tr>
<td>R2.5</td>
<td>TYPICAL CROSS SECTION</td>
<td>ROADS ON PEAT</td>
</tr>
<tr>
<td>R3.1</td>
<td>TYPICAL CROSS SECTION</td>
<td>RESIDENTIAL CENTRE STRIP LANEWAY</td>
</tr>
<tr>
<td>R3.2</td>
<td>TYPICAL CROSS SECTION</td>
<td>HIGHER-ZONED LANEWAY</td>
</tr>
<tr>
<td>R3.3</td>
<td>TYPICAL CROSS SECTION</td>
<td>PROTECTED/RAISED BIKE LANE</td>
</tr>
<tr>
<td>R4.1</td>
<td>ROADS</td>
<td>RESIDENTIAL ROAD</td>
</tr>
<tr>
<td>R4.2</td>
<td>ROADS</td>
<td>STANDARD BULGE DESIGN INTERIM GUIDELINES</td>
</tr>
<tr>
<td>R4.3</td>
<td>ROADS</td>
<td>TYPICAL ARTERIAL LEFT TURN BAY</td>
</tr>
<tr>
<td>R5.1</td>
<td>ROADS</td>
<td>TRAFFIC CIRCLES</td>
</tr>
<tr>
<td>R7.1</td>
<td>LANEWAYS</td>
<td>LANEWAY ENTRANCE</td>
</tr>
<tr>
<td>R8.1</td>
<td>MARKINGS &amp; SIGNAGE</td>
<td>INSTALLATION OF PAVEMENT MARKINGS</td>
</tr>
<tr>
<td>R8.2</td>
<td>MARKINGS &amp; SIGNAGE</td>
<td>DETAIL OF MEDIAN GORE MARKING</td>
</tr>
<tr>
<td>R8.3</td>
<td>MARKINGS &amp; SIGNAGE</td>
<td>MERGING OR DIVERGING GORE AREA MARKING</td>
</tr>
<tr>
<td>R8.4</td>
<td>MARKINGS &amp; SIGNAGE</td>
<td>LEFT TURN BAY ARROW INSTALLATION</td>
</tr>
<tr>
<td>R8.5</td>
<td>MARKINGS &amp; SIGNAGE</td>
<td>TURN ARROWS</td>
</tr>
<tr>
<td>R8.6</td>
<td>MARKINGS &amp; SIGNAGE</td>
<td>TYPICAL MERGE ARROW PLACEMENT</td>
</tr>
<tr>
<td>R8.7</td>
<td>MARKINGS &amp; SIGNAGE</td>
<td>MERGE ARROW</td>
</tr>
<tr>
<td>R8.8</td>
<td>MARKINGS &amp; SIGNAGE</td>
<td>TYPICAL BUS LANE PAVEMENT MARKING</td>
</tr>
<tr>
<td>R8.9</td>
<td>MARKINGS &amp; SIGNAGE</td>
<td>ELEPHANT’S FEET DETAILS</td>
</tr>
<tr>
<td>R8.10</td>
<td>MARKINGS &amp; SIGNAGE</td>
<td>ELEPHANT’S FEET DETAILS</td>
</tr>
<tr>
<td>R8.11</td>
<td>MARKINGS &amp; SIGNAGE</td>
<td>TYPICAL CROSSWALK MARKINGS</td>
</tr>
<tr>
<td>R8.12</td>
<td>MARKINGS &amp; SIGNAGE</td>
<td>PEDESTRIAN CROSSWALK SIGN PLACEMENT</td>
</tr>
<tr>
<td>R8.13</td>
<td>MARKINGS &amp; SIGNAGE</td>
<td>STANDARD CROSSWALK SIGNING AND MARKING</td>
</tr>
<tr>
<td>R8.14</td>
<td>MARKINGS &amp; SIGNAGE</td>
<td>STOP BAR PLACEMENT</td>
</tr>
<tr>
<td>R8.15</td>
<td>MARKINGS &amp; SIGNAGE</td>
<td>MOTORCYCLE QUADRANGLE</td>
</tr>
<tr>
<td>R8.16</td>
<td>MARKINGS &amp; SIGNAGE</td>
<td>BIKE PATH ARROW STENCILS</td>
</tr>
<tr>
<td>R9.1</td>
<td>PARKING</td>
<td>TYPICAL PARKING METER LAYOUTS</td>
</tr>
</tbody>
</table>
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.
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
   AND GEOTECHNICAL ENGINEER REQUIRED TO DETERMINE SUBGRADE SOIL CLASSIFICATION.
3. FOR PORTLAND CEMENT CONCRETE ROADS, USE THE ROAD STRUCTURE ON G5.5.
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.
4. FOR PORTLAND CEMENT CONCRETE ROADS, USE THE ROAD STRUCTURE ON G5.5.

SCALE: N.T.S.
NOTES:
1. ONLY TO BE USED FOR NEW ROAD CONSTRUCTION.
2. 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.
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.

TYPICAL CROSS SECTION
ROADS ON PEAT

ISSUE DATE: SEPTEMBER 2018
APPROVED BY: J. LEE
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 GEOENGINEERING ENGINEER REQUIRED TO DETERMINE SUBGRADE SOIL CLASSIFICATION.
4. FOR PORTLAND CEMENT CONCRETE LANES, USE THE ROAD STRUCTURE ON GS.5.

SCALE: N.T.S.

TYPICAL CROSS SECTION
RESIDENTIAL CENTRE STRIP LANeway

APPROVED BY: J. LEE
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.
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.

TYPICAL CROSS SECTION
PROTECTED/RAISED BIKE LANE

ISSUE DATE: SEPTEMBER 2018
APPROVED BY: J. LEE
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.
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.
NOTE:
1. ALL DIMENSIONS IN METERS UNLESS STATED OTHERWISE.
DRIFTPINS TO BE 275mm LENGTHS OF 15M REBAR SPACED AT 1m INTERVALS

TIE 10M REBAR TO DRIFTPINS

MIN 0.2m

20mm MIN COVER

15M REBAR (TYP)

DIG-OUT AROUND SIGN SLEEVE SEE DWG C19.1

BREAK-OUT EXISTING PAVEMENT/BASE AND EXCAVATE PLANTING AREA (IF PLANTED). GROWING MEDIUM TO COMPLY WITH TOPSOIL & FINISH GRADING IN SECTION 32 91 21 OF THE CONSTRUCTION SPECIFICATIONS.

CONCRETE TO HAVE A 28 DAY COMpressive STRENGTH OF 32 MPa

INSTALL 50mm (2") PVC DRAIN PIPE(S) WHERE NECESSARY TO FACILITATE DRAINAGE. PIPE TO BE CUT IN HALF AND LAID OVER EXISTING PAVEMENT.

KEEP RIGHT SIGN RB-25 (X4). SEE COV ENGINEERING DESIGN MANUAL FOR MORE DETAILS

NOTES:

1. NOTIFY TRANSPORTATION BRANCH PRIOR TO DESIGN.

SCALE: N.T.S.

ISSUE DATE: SEPTEMBER 2018
APPROVED BY: J. LEE

ROADS
TRAFFIC CIRCLES
FOR TYP. 20m STREET ALLOWANCE

<table>
<thead>
<tr>
<th>ROAD WIDTH</th>
<th>BLVD A</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.5m</td>
<td>5.75m</td>
</tr>
<tr>
<td>10.0m</td>
<td>5.0m</td>
</tr>
<tr>
<td>11.0m</td>
<td>4.5m</td>
</tr>
<tr>
<td>12.0m</td>
<td>4.0m</td>
</tr>
</tbody>
</table>

LANEWAYS
LANEWAY ENTRANCE

SCALE: N.T.S.

REV. REVISION DATE APPROVED

ISSUE DATE: SEPTEMBER 2018
APPROVED BY: R. KENNY
### INSTALLATION OF PAVEMENT MARKINGS

<table>
<thead>
<tr>
<th>TYPE</th>
<th>LINE DIMENSIONS (mm)</th>
<th>COLOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOLID</td>
<td><img src="#" alt="SOLID Drawing" /></td>
<td>1. EDGELINES ON THE RIGHT</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. LANE LINES PROHIBITING LANE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CHANGES</td>
</tr>
<tr>
<td>BROKEN</td>
<td><img src="#" alt="BROKEN Drawing" /></td>
<td>1. LANE LINES</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1. DIRECTIONAL DIVIDING LINES</td>
</tr>
<tr>
<td>SHORT BROKEN</td>
<td><img src="#" alt="SHORT BROKEN Drawing" /></td>
<td>1. CONTINUITY LINES</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IN MERGING AND</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DIVERGING AREAS</td>
</tr>
<tr>
<td>DENSE BROKEN</td>
<td><img src="#" alt="DENSE BROKEN Drawing" /></td>
<td>1. GUIDE LINES FOR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>INTERSECTION MOVEMENTS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1. GUIDE LINES FOR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>INTERSECTION MOVEMENTS</td>
</tr>
<tr>
<td>STOP</td>
<td><img src="#" alt="STOP Drawing" /></td>
<td>1. STOP LINES</td>
</tr>
<tr>
<td>CROSSWALK</td>
<td><img src="#" alt="CROSSWALK Drawing" /></td>
<td>1. CROSSWALKS</td>
</tr>
<tr>
<td>ELEPHANT’S FEET</td>
<td><img src="#" alt="ELEPHANT’S FEET Drawing" /></td>
<td>1. BIKE CROSSINGS</td>
</tr>
</tbody>
</table>

**NOTE:**

1. ALL DIMENSIONS IN MILLIMETERS UNLESS STATED OTHERWISE.

**SCALE:** N.T.S.
NOTE:
1. ALL DIMENSIONS IN MILLIMETERS UNLESS STATED OTHERWISE.
NOTE:
1. ALL DIMENSIONS IN MILLIMETERS UNLESS STATED OTHERWISE.

SCALE: N.T.S.
NOTE: EQUAL DIMENSIONS

<table>
<thead>
<tr>
<th>DIMENSION 'A' (METRES)</th>
<th>NUMBER OF ARROWS</th>
<th>DIMENSION 'B'</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 TO 20</td>
<td>1</td>
<td>3m</td>
</tr>
<tr>
<td>20 TO 35</td>
<td>2</td>
<td>3m, 18m</td>
</tr>
<tr>
<td>35 TO 50</td>
<td>3</td>
<td>3m, 18m, 33m</td>
</tr>
<tr>
<td>50 +</td>
<td>4</td>
<td>3m, 18m, 33m, 48m</td>
</tr>
</tbody>
</table>

SCALE: N.T.S.

MARKINGS & SIGNAGE
LEFT TURN BAY ARROW INSTALLATION

ISSUE DATE: SEPTEMBER 2018
APPROVED BY: R. KENNY
NOTE:
1. ALL DIMENSIONS IN MILLIMETERS UNLESS STATED OTHERWISE.
NOTE:
1. WHEN MORE OR LESS THAN 3 ARROWS ARE REQUIRED, ALL ARROWS ARE TO BE PLACED IN THE CENTER OF THE LANE.
NOTE:
1. ALL DIMENSIONS IN MILLIMETERS UNLESS STATED OTHERWISE.

MARKINGS & SIGNAGE
MERGE ARROW

SCALE: N.T.S.

ISSUE DATE: SEPTEMBER 2018
APPROVED BY: R. KENNY
NOTES:
1. BUS LANE MARKINGS - WHITE
2. ALL DIMENSIONS IN MILLIMETERS UNLESS STATED OTHERWISE.

SCALE: N.T.S.

MARKINGS & SIGNAGE
TYPICAL BUS LANE PAVEMENT MARKING

ISSUE DATE: SEPTEMBER 2018
APPROVED BY: R. KENNY
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.
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.
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

ENSURE CB LOCATION FALLS OUTSIDE THE PROPOSED CROSSWALK ALIGNMENT

WATER VALVE BOX

DIRECTIONAL DIVIDING LINE - YELLOW

CROSSWALK AND STOP LINES - WHITE
DIRECTIONAL DIVIDING LINE - YELLOW

SCALE: N.T.S.

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:

A

B

C

D

E

RA-4R

RA-4L

WC-2R

WC-2L

RA-1

STOP

NOTES:
1. MAY BE INSTALLED WHERE VISIBILITY IS POOR (WC-2R OR WC-2L).
CASE 1:
MARKED SCHOOL CROSSWALK ON ROUTE TO SCHOOL

CASE 2:
MARKED SCHOOL CROSSWALK ON STREET ADJACENT TO SCHOOL

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

SCALE: N.T.S.
STOP BARS AT INTERSECTIONS UNDER 10°

STOP BARS AT INTERSECTIONS OVER 10°

SCALE: N.T.S.

MARKINGS & SIGNAGE
STOP BAR PLACEMENT
NOTE:
1. $3\times 2\times 2.3m$ 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.
NOTE:
1. ALL DIMENSIONS IN MILLIMETERS UNLESS STATED OTHERWISE.

SCALE: N.T.S.
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.

△ SINGLE METER

△△ TWIN METER

SCALE: N.T.S.

PARKING TYPICAL PARKING METER LAYOUTS

ISSUE DATE: SEPTEMBER 2018
APPROVED BY: C. DARWENT