City of Kitchener
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Standard As Built Measurement for Watermain Construction
Standard As Built Measurement for Watermain Construction

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1. Utility corridor (Hydro & Telecommunications) shall be 0.6m wide.
2. Utility corridor to have a minimum cover of 0.9m.
3. Watermain to have minimum cover of 2.0m for 300mm and smaller diameter and 1.8m for 450mm diameter and larger.
4. Clear separation between watermain and sewers shall be as per MOE requirements.
5. Minimum separation between the sanitary and storm sewers shall not be less than 1.5m.
6. Joint use trenches shall be used by Hydro and Telecommunication.

7. The following is a minimum road base and will require a soils report for verification to determine if additional thickness is required:
   - 40mm HL3
   - 60mm HL4 (100mm for bus routes)
   - 150mm granular "A"
   - 300mm granular "B"

8. Sub-grade shall be compacted to 100% of standard proctor density at max. dry density.
1. Utility corridor (hydro & telecommunications) shall be 0.6m wide.
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20.0m Minor Collector R.O.W. The Corporation of The CITY OF KITCHENER

Kitchener

SCALE: N.T.S.
1 Manual Update JULY 2012
No. Revision Date

STANDARD No.: 101
NOTES
1. UTILITY CORRIDOR (HYDRO & TELECOMMUNICATIONS) SHALL BE 0.6m WIDE.
2. UTILITY CORRIDOR TO HAVE A MINIMUM COVER OF 0.9m.
3. WATERMAIN TO HAVE MINIMUM COVER OF 2.0m FOR 300mm AND SMALLER DIAMETER AND 1.8m FOR 450mm DIAMETER AND LARGER.
4. CLEAR SEPARATION BETWEEN WATERMAIN AND SEWERS SHALL BE AS PER MOE REQUIREMENTS.
5. JOINT USE TRENCHING SHALL BE USED BY HYDRO AND TELECOMMUNICATION.

6. THE FOLLOWING IS A MINIMUM ROAD BASE AND WILL REQUIRE A SOILS REPORT VERIFICATION TO DETERMINE IF ADDITIONAL THICKNESS IS REQUIRED.
   - 40mm HL3
   - 100mm HL4
   - 150mm GRANULAR "A"
   - 450mm GRANULAR "B"

7. SUB-GRADE SHALL BE COMPACTED TO 100% OF STANDARD PROCTOR DENSITY AT MAX. DRY DENSITY.
1. Utility Corridor (Hydro & Telecommunications) shall be 0.6m wide.
2. Utility Corridor to have a minimum cover of 0.9m.
3. Watermain to have minimum cover of 2.0m for 300mm and smaller diameter and 1.8m for 450mm diameter and larger.
4. Clear separation between watermain and sewers shall be as per MOE requirements.
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   - 40mm HL3
   - 100mm HL4
   - 150mm Granular "A"
   - 450mm Granular "B"

7. Sub-grade shall be compacted to 100% of standard proctor density at max. dry density.
8. Refer to region of Waterloo standard drawing 211 for Boulevard Concrete Edge strip details.
### DRAINAGE

<table>
<thead>
<tr>
<th>Value</th>
<th>Over 50% Sand</th>
<th>Under 50% Sand</th>
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<tbody>
<tr>
<td>1. Water Table Between 600mm &amp; 1200mm</td>
<td>8</td>
<td>8</td>
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<tr>
<td>2. Water Table Below 1200mm—No Sewers</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>3. Water Table Below 1200mm—Sanitary Sewers</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>4. Water Table Below 1200mm—Storm Sewers</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>5. Water Table Below 1200mm—Storm &amp; San. Sewers</td>
<td>3</td>
<td>6</td>
</tr>
</tbody>
</table>

### FROST—SEE FROST VALUE CHART

### TRAFFIC

<table>
<thead>
<tr>
<th>Value</th>
<th>Minimum Asphalt</th>
<th>Minimum Base 16mm Crushed Gravel</th>
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<tbody>
<tr>
<td>1. Arterial Streets</td>
<td></td>
<td></td>
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<tr>
<td>Route Longer Than 1.6km</td>
<td>18</td>
<td>100mm</td>
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<tr>
<td>Route Shorter Than 1.6km</td>
<td>12</td>
<td>100mm</td>
</tr>
<tr>
<td>2. Residential Streets</td>
<td></td>
<td></td>
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<tr>
<td>Route Longer Than 0.8km</td>
<td>6</td>
<td>80mm</td>
</tr>
<tr>
<td>Route Shorter Than 0.8km</td>
<td>3</td>
<td>80mm</td>
</tr>
</tbody>
</table>

Add values from DRAINAGE, FROST and TRAFFIC TABLES.
EVALUATION OF SOIL WITH RESPECT TO FROST SUSCEPTIBILITY INDICATED BY LARGE NUMBERS

BASED ON U.S. BUREAU OF SOILS CLASSIFICATION FOR PARTICLE SIZE
EXAMPLE 1. 20% CLAY
   60% SILT
   20% SAND
EXAMPLE 2. 30% CLAY
   19% SILT
   48% SAND
   3% GRAVEL

FROST VALUE 7

% SILT

% SAND

% CLAY
NOTES
1. FOR SOILS WITH C.B.R. LESS THAN THREE ASSUME C.B.R. = 3

2. WHERE MECHANICAL ANALYSIS INDICATES THAT SOIL HAS MORE THAN 50% SILT OR MORE THAN 60% VERY FINE SAND AND SILT AN ADDITIONAL 150mm OF CLASS 'B' GRANULAR MATERIAL IS TO BE ADDED TO DESIGN DETERMINED FROM THESE CHARTS.
GENERAL NOTES:

1. If the driveway is concrete, expansion joint material shall be installed at the back of the sidewalk.

2. Saw cuts shall be placed at the centreline of the driveway ramp and extended through the sidewalk and curb.

3. Except in new development, driveway ramps may be poured monolithically with the adjacent sidewalk, in which case tooled saw cut joints shall be placed along the front edge of the sidewalk, across the driveway entrance, where boulevard is less than 1.5m.

4. The distance along the curb from the extended edge of the driveway at the back of the sidewalk to the bottom of the depressed curb shall be 1/4 of the distance from the back of curb to the front of sidewalk to a maximum of 1000mm, but shall not be less than 500mm. New development shall be 0.3m.

5. Saw cuts shall be placed in the sidewalk where the driveway ramp tapers intersects and in the curb at the bottom of grade transition.

6. Tooled joints in the driveway portion of the sidewalk shall be spaced equally to match the typical jointing of sidewalk as close as possible.

7. Where driveway ramp width exceeds 3000mm, a longitudinal saw cut joint is to be provided at the mid-point.

8. Allowable ramp widths at the sidewalk are between 3.65m and 7.30m.

9. Depressed curb and gutter at driveway entrances shall have an additional 50mm bench to support adjacent concrete ramps, refer to OPSD 600.040.

10. Refer to OPSD 350.010 for commercial/industrial ramp design.


12. For new development, ramp width at front of sidewalk is to equal the width of the driveway at the back of sidewalk.
CROSS SECTION OF COMBINED WALK, CURB & GUTTER

PLAN OF COMBINED WALK, CURB & GUTTER

TYPICAL CURB RETURN & WALK

NOTE:
CONCRETE STRENGTH 32MPa.
AIR ENTRAINMENT: 5% TO 8%
MIN. CEMENT CONTENT: 365kg/m³
COARSE AGGREGATE: 20mm/ NOMINAL MAX. SIZE
MAXIMUM WATER/CEMENTING MATERIALS RATIO 0.45
NOTES:

FOR CONCRETE SIDEWALK DETAILS,
SEE CITY OF KITCHENER STANDARD SPECIFICATIONS.
CONC. SIDEWALK TO BE CENTRED IN R.O.W.
AREA NOT COVERED WITH CONC. S/W
TO BE SODDED WITH No.1 NURSERY
SOD INCLUDING A MINIMUM 0.15m OF TOPSOIL.
CONCRETE PAVING - SIDEWALK / BOULEVARD ADJACENT TO BOULEVARD TREE

NOTE: ALL DETAILS FOR ROAD, SIDEWALK AND BOULEVARD AS PER CITY OF KITCHENER STANDARDS
NOTES

1. STANDARD PARKS GATE REQUIRED AT EACH END OF THE EMERGENCY ACCESS. REFER TO STANDARD DRAWING 508.

2. CONCRETE WALKWAY TO BE 125mm THICK AND CONSTRUCTED IN ACCORDANCE WITH THE CITY OF KITCHENER STANDARD SPECIFICATION FOR CONCRETE CURB, SIDEWALK, AND DRIVEWAY RAMPS.

**NOTE:**
1. ROAD CONSTRUCTION TO BE AS PER CITY ROAD STANDARD.
2. CONCRETE CURB AND WALK MAY BE SUBSTITUTE WITH ASPHALT.
NOTES:

1. SIDEWALK RAMP DETAIL TO BE INCORPORATED AT ALL INTERSECTIONS WHERE NEW RAMP CONSTRUCTION IS PROPOSED. MODIFICATIONS ARE SUBJECT TO APPROVAL BY THE ENGINEERING SERVICES DIVISION.

2. BOTTOM OF DEPRESSED CURB SHOULD LINE UP WITH BACK EDGE OF SIDEWALK.

3. THE SLOPE TRANSITION ZONE IS INTENDED TO ALLOW CONNECTION TO THE SIDEWALK AT ITS STANDARD ELEVATION USING A GRADIENT OF MIN. 0.5% AND MAX. 8% ALONG THE SIDEWALK.

4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE CITY OF KITCHENER STANDARD SPECIFICATION.

5. ALL MATERIALS SUPPLIED SHALL COMPLY WITH THE REQUIREMENTS OF THE APPROPRIATE CITY OF KITCHENER STANDARD SPECIFICATIONS.

6. TEXTURED SURFACE IS A COARSE BROOM FINISH WITH DEPTH VARIATIONS TO, BUT NOT EXCEEDING 6mm.

7. TRUNCATED DOME DETECTABLE WARNING PLATES AS PER REGIONAL MUNICIPALITY OF WATERLOO STANDARD DRAWING 224.
PLATE

NOTE 2:
SLOPE TRANSITION ZONE
LENGTH VARIES

NOTE 3:
SLOPE TRANSITION ZONE
LENGTH VARIES

NOTE 4:
SLOPE TRANSITION ZONE
LENGTH VARIES

PLAN

NOTES:
1. SIDEWALK RAMP DETAIL TO BE INCORPORATED AT ALL INTERSECTIONS WHERE NEW RAMP CONSTRUCTION IS PROPOSED. MODIFICATIONS ARE SUBJECT TO APPROVAL BY THE ENGINEERING SERVICES DIVISION.

2. THE SLOPE TRANSITION ZONE IS INTENDED TO ALLOW CONNECTION TO THE SIDEWALK AT ITS STANDARD ELEVATION USING A GRADIENT OF MIN. 0.5% AND MAX. 8% ALONG THE SIDEWALK.

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5. TEXTURED SURFACE IS A COARSE BROOM FINISH WITH DEPTH VARIATIONS TO, BUT NOT EXCEEDING 6mm.

6. ONLY SAW CUT JOINTS ARE PERMITTED IN THE DOWNTOWN (NO TOOLED JOINTING).

7. AT INTERSECTIONS WITH REGIONAL ROADS A MINIMUM OF 200mm THICK CONCRETE SHALL BE USED FOR WHEEL CHAIR RAMPS AND SIDEWALKS.

8. TRUNCATED DOME DETECTABLE WARNING PLATES AS PER REGIONAL MUNICIPALITY OF WATERLOO STANDARD DRAWING 224.
NOTES:

1. Contraction joint through sidewalk is required when curb and gutter is poured integral with sidewalk.
2. Adjust joints to coincide with centre of utility, with minimum slab length of 1m.
3. Expansion joint material shall be placed around Utility appurtenance flush with concrete surface.
4. Parallel contraction joint through curb and gutter to be offset 300mm.
5. Parallel expansion joint through curb at the edge of the catchbasin frame.
6. Expansion joint material shall be placed a minimum of 100mm from the pole.

A. For expansion joint detail, see OPSD 310.010.
B. All dimensions are in millimetres unless otherwise shown.
**NOTES**

1. STANDARD PARKS GATE REQUIRED AT EACH END OF THE EMERGENCY ACCESS. REFER TO STANDARD DRAWING 508.

2. MAINTAIN THE 1.8m GAP BETWEEN THE P-LOOP GATES

3. ENSURE A MINIMUM 900mm OFFSET BETWEEN THE O.D. OF CHAIN LINK FENCE AND P-LOOP GATE FOOTINGS


5. WHEN POSSIBLE A 2% MINIMUM CROSS FALL (SUPER-ELEVATED) CARRIAGEWAY SHALL BE DESIGNED TO PREVENT PONDING/ICING AND PROMOTE POSITIVE DRAINAGE INTO THE SWMF

6. 76.1mm WIDE FLUORESCENT YELLOW GREEN DIAMOND GRADE DG REFLECTIVE TAPE MANUFACTURER 3M

7. INSTALL "SWMF" IDENTIFICATION AND "NO WINTER" SIGNS AT ALL ACCESS POINTS TO THE SWMF BLOCK
NOTES
1. ALL MATERIAL PLACED AROUND CHAMBER TO BE PROPERLY COMPACTED.
2. 1830mm MIN. FROM BOTTOM OF CHAMBER TO UNDERSIDE OF PRECAST CAP.
3. PRECAST CAP TO BE REMOVABLE.
4. PRECAST CONCRETE TO COMPLY WITH CURRENT CSA SPECIFICATIONS.
5. UNLESS NOTED ALL DIMENSIONS IN MILLIMETRES.
6. A/R--AS REQUIRED BY LOAD AND SITE CONDITIONS.
NOTES – 1. ALL CONCRETE TO BE 20 MPa.
2. MIN. 25mm THICK CASTING PLATE ON CHAMBERS LOCATED IN TRAVELLED PORTION OF ROAD.
3. ALL MATERIAL PLACED AROUND CHAMBER TO BE PROPERLY COMPACTED.
4. A/R – AS REQUIRED BY LOAD AND SITE CONDITIONS.
NOTES —

1. ALL CONCRETE TO BE 20 MPa.

2. MIN. 25mm THICK CASTING PLATE ON CHAMBER LOCATED IN TRAVELLED PORTION OF ROAD.

3. ALL MATERIAL PLACED AROUND CHAMBER TO BE PROPERLY COMPACTED.

4. A/R—AS REQUIRED BY LOAD AND SITE CONDITIONS.
**MANUFACTURED ITEMS LIST**

1. **REGULAR 150mm DIA. BARREL USE EXTENSION IF REQUIRED.**
2. **MINIMUM DIA. PIPE FOR HYDRANT LEADS TO BE 150mm DIA.**
3. **MINIMUM SIZE M.J. GATE VALVE TO BE 150mm DIA.**
4. **VALVE BOX**
5. **USE ANCHOR TEE UP TO AND INCLUDING 450mm DIA.**
6. **FOR TEES LARGER THAN 450mm DIA. USE MECHANICAL RESTRAINTS.**

**NOTES:**

1. HYDRANT TO BE SET PLUMB WITH STEM EXTENSIONS TO SUIT DEPTH OF BRANCH. BRANCH TO BE SET LEVEL.
2. EXTENSIONS TO BE INSTALLED BETWEEN UPPER AND LOWER BARREL SECTION. ONLY ONE EXTENSION (MAX. 1.0m LONG) PER HYDRANT. IF MORE HEIGHT IS REQUIRED, THEN A LONGER BARREL SHALL BE USED.
3. ALL BLOCKING TO BE AGAINST UNDISTURBED TRENCH WALL.
4. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
5. BOND BREAKER TO BE USED BETWEEN CAST IN PLACE CONCRETE AND FITTINGS.
6. CORROSION PROTECTION SHALL BE AFFIXED AS PER STANDARD SPECIFICATIONS FOR WATERMAIN CONSTRUCTION.
7. NO FITTINGS, SLEEVES OR BENDS ON HYDRANT LEADS UNLESS APPROVED.
8. ALL JOINTS TO BE FULLY RESTRAINED FROM HYDRANT BOOT TO TEE (THREADED RODS SHALL NOT BE USED).
9. PLUG DRAIN HOLE IN HIGH WATER TABLE.
10. HYDRANTS SHALL BE CLEAR OF OBSTRUCTIONS FOR A DISTANCE OF 0.6m REAR, 2.0m ON SIDES AND CLEAR TO CURB IN FRONT.
11. **A SIDE OF TRACER WIRE LOOP TO BE ATTACHED TO:**  
   a) HYDRANT VALVE  
   b) HYDRANT BARREL
12. **B SIDE OF TRACER WIRE LOOP TO BE TAPE ONLY:**  
   a) HYDRANT BARREL  
   b) HYDRANT LEAD  
   c) TOP OF WATERMAIN

**STANDARD HYDRANT INSTALLATION**

The Corporation Of The
CITY OF KITCHENER

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203
NOTES:  1. CHAINAGE TO BE WATERMAIN CHAINAGE NOT Q OF ROAD.

2. A MIN. OF 2 TIES AT RIGHT ANGLES OR LESS ARE REQUIRED FOR VALVES AND FITTINGS OTHER THAN CURB STOPS

3. MEASUREMENTS BETWEEN CURB STOPS ON CURBES ARE TO BE CHORD MEASUREMENTS.
NOTES—1. CHAINAGE TO BE WATERMAIN CHAINAGE
   NOT Q. OF THE ROAD.

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   ARE REQUIRED FOR VALVES AND FITTINGS OTHER
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RAINFALL INTENSITY CURVE

CITY OF KITCHENER

RAINFALL INTENSITY - MILLIMETRES/HOUR

RETURN PERIOD EQUATION OF CURVE

100 year \( i = \frac{4688}{(td+17)^{0.9624}} \)
50 year \( i = \frac{3886}{(td+17)^{0.9495}} \)
25 year \( i = \frac{3158}{(td+17)^{0.9355}} \)
10 year \( i = \frac{2221}{(td+12)^{0.9080}} \)
5 year \( i = \frac{1593}{(td+11)^{0.8789}} \)

DURATION - MINUTES

COMMERCIAL
- DOWNTOWN & SUBURBAN SHOPPING 0.90

INDUSTRIAL
- DOWNTOWN 0.90
- SUBURBAN INDUSTRIAL PARKS 0.75

RESIDENTIAL
- APARTMENTS 0.75
- ROW DWELLINGS 0.70
- DUPLEX DWELLINGS 0.70
- SEMI-DETACHED-DOWNTOWN 0.60
- SINGLE FAMILY-DOWNTOWN 0.60
- SEMI-DETACHED-DOWNTOWN 0.50
- SINGLE FAMILY-SUBURBAN 0.40

SCHOOLS, CHURCHES, HOSPITALS 0.75

PARKS, CEMETERIES, RAILYARDS
- OVER 4Ha 0.20
- UNDER 4Ha 0.25

INLET TIMES

SUBURBAN RESIDENTIAL
-(ROOF DRAINS UNCONNECTED) 15MIN.
-(ROOF DRAINS CONNECTED) 10MIN.

SUBURBAN, COMMERCIAL,
INDUSTRIAL, MULTIPLE FAMILY 10MIN.

DOWNTOWN COMMERCIAL,
HIGH DENSITY APARTMENTS,
EXPRESSWAYS 5MIN.
<table>
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<tr>
<th>LOCATION</th>
<th>FROM M.H.</th>
<th>TO M.H.</th>
<th>DEPTH OF TRENCH (top of pipe)</th>
<th>WIDTH OF TRENCH</th>
<th>BACKFILL MATERIAL TYPE</th>
<th>WEIGHT (kg/m)</th>
<th>STATIC LOAD (kg/m)</th>
<th>SUPERIMPOSED LOAD (kg/m)</th>
<th>TOTAL LOAD (kg/m)</th>
<th>SAFETY FACTOR</th>
<th>DESIGN LOAD (kg/m)</th>
<th>BEDDING TYPE</th>
<th>BEDDING FACTOR</th>
<th>PIPE STRENGTH REQ'D (kg/m)</th>
<th>PIPE SECTION DIA.</th>
<th>TYPE</th>
<th>CLASS</th>
<th>PROJECT LOCATION</th>
<th>TYPE OF SEWER</th>
<th>SHEET NO.</th>
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PIPE STRENGTH AND BEDDING DESIGN CHART

The Corporation Of The
CITY OF KITCHENER

N.T.S.  Jul-10  301
NOTES
1. CONCRETE TO BE 20MPa COMPRESSIVE STRENGTH AT 28 DAYS.
2. M.H. FRAMES & COVERS TO BE CITY OF KITCHENER STANDARD.
   FRAMES TO BE SET FIRMLY IN MORTAR ON
   THE ADJUSTERS.
3. MANHOLES TO HAVE MIN. 3 COURSES AND MAX. 5 COURSES
   MODULOC OR APPROVED EQUAL AND PARLED ON
   THE OUTSIDE/ONLY WITH 15mm OF CEMENT MORTAR BETWEEN
   TOP OF CONCRETE AND FRAME.
4. BENCHING SHALL EXTEND TO THE SPRINGLINE OF THE LARGEST
   PIPE IN THE MANHOLE AND HAVE A SLOPE OF 8.5%.
5. SAFETY GRATING SHALL BE INSTALLED AT THE HALF-WAY POINT
   ON MANHOLES 5m OR OVER.
6. CONSTRUCTION JOINTS TO BE PROVIDED WITH 50mmX100mm
   KEY FOR THE ENTIRE LENGTH OF THE JOINTS BETWEEN
   SUCCESSIVE CONCRETE POURS.
7. (UNLESS NOTED ALL DIMENSIONS AND SIZES IN MILLIMETRES.
8. MAX. DISTANCE FROM TOP OF CASTING TO FIRST STEP=450mm.

TYPE 'C' MANHOLE
POURED CONCRETE MANHOLE
MAX. 6.10m DEPTH
NOTES
1. REINFORCED CONCRETE PIPE MANUFACTURED TO CSA SPECIFICATION.
2. MANHOLE RISER MANUFACTURED TO CSA SPECIFICATION.
3. PRECAST MANHOLE RISER MAY BE SPIGOT OR BELL END UP, DEPENDING ON SUPPLIER.
4. MANHOLE RISER SECTION REINFORCING WELDED TO PIPE REINFORCING, JOINT GROUTED WITH NON-SHRINK MORTAR.
5. REFER TO OPSD FOR DETAILS OF FRAME AND COVER AND ADJUSTMENT.
6. RUNGS SHALL BE INSTALLED ON LEFT SIDE, LOOKING AT SPIGOT END OF PIPE.
7. RUNGS TO BE GALVANIZED AS PER OPSD & INSTALLED ON 300mm CENTRES TO SPRINGLINE.
1. CONCRETE TO BE 30MPa AT 28 DAYS.

2. ALL JOINTS AND LIFTING HOLES TO BE COMPLETELY FILLED WITH A 1:3 MORTAR MIX AND POINTED BEFORE BACKFILLING.

3. WHERE INLET IS PLACED ACROSS DITCH AND IS ACCESSIBLE TO VEHICULAR TRAFFIC, GRATE SLOPE IS TO BE 6:1 OR FLATTER.

4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH OP3D–403–01 FOR GRATE AND ANCHOR BOLT DETAILS.

5. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH M.T. FORMS 407 AND 1351.
NOTES
1. FIELD TILES TO BE LOCATED BY FIELD ENGINEER. ALL EXPOSED EDGES TO HAVE 25mm CHAMBER.
2. ENERGY DISSIPATORS (CHUTE BLOCKS), MAY BE USED ON THE APRON AT THE DISCRETION OF THE ENGINEER.
3. ALL CONCRETE TO BE 20MPa COMpressive STRENGTH AT 28 DAYS & CONTAINING 5% TO 8% ENTRAINED AIR.
4. CONSTRUCTION JOINTS TO BE APPROVED BY THE ENGINEER.
5. REINFORCING BARS TO HAVE 50mm COVER.
6. FOOTINGS AND WALLS TO BE BACKFILLED WITH COMPACTED GRANULAR 'B'.
7. GRATING FOR CONCRETE ENDWALL REFER TO OPSD

SECTION A-A

ENDWALL DIMENSIONS

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<th>750</th>
<th>825</th>
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CONCRETE APRON FOR STORM SEWER OUTLET

The Corporation Of The CITY OF KITCHENER

Kitchener

No. REVISION DATE Std. No.: 305
SECTION B–B

NOTE: BARS SPACED 150mm C.C. AND CENTRE BAR PRODUCED THROUGH ROLLED BAR BY 40mm

SECTION A–A

PIPE RENFORCED WITH NO. 1 GAUGE (17.11mm) CORRUGATED SHEET. 3 FULL CORRUGATIONS BY 200mm AND BOLTED TO PIPE BY 2 BOLTS IN EACH OF THREE CONSECUTIVE DIPS.

CENTRE OF CHANNEL

R=19

100

VARIABLE

HINGE DETAIL

13mmx51mm ROLLED BAR
INTERMEDIATE GRADE STEEL

13mmx51mmx57mm LONG, ROLLED BAR

6mm DIAL

U-BOLT TO BE WELDED TO 133X51X57mm LONG
ROLLED BAR

13mm

VARIABLE

PTICH OF CORR. METAL PIPE

<table>
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<tr>
<td>68</td>
<td>203X57 a 5.22kg/0.3m</td>
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<tr>
<td>76</td>
<td>229X64 a 6.08kg/0.3m</td>
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<td>152</td>
<td>152X51 a 5.90kg/0.3m</td>
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NOTES

1. CORRUGATED SHEET TO BE NO.1 GAUGE (7.11mm) AND BOLTED TO PIPE BY 2 BOLTS IN EACH OF 3 CONSECUTIVE DIPS.
2. FOR PIPE 2400mm AND OVER GRATE BARS INCREASED TO 25mm. THREE VERTICAL 25mm BARS TO SPAN THE THREE CENTRAL HORIZ. BARS AT 600mm INTERVALS.
3. UNLESS NOTED ALL DIMENSIONS IN MILLIMETRES.

INTERNAL GRATE (OUTLETS ONLY)
FOR CORRUGATED METAL PIPE
750mmØ AND LARGER

The Corporation Of The CITY OF KITCHENER

Scale: N.T.S.
Rev. Date: JUNE 2010
Std. No.: 306
DOWNSPOUT CONNECTION DETAIL
FOR FRONT YARD
INфиLLATION GALLERIES

The Corporation Of The
CITY OF
KITCHENER

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<th>APR 2015</th>
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OFFSET FROM FOUNDATION
5.0m MIN

EASEMENT
VARI EES

250mm DIA. PVC OBSERVATION/Maintenance PORT (EXTENDED) THROUGH EACH MODULE LEVELS (WHERE APPLICABLE)

OVERFLOW FOR INFILTRATION FACILITY

INFILTERATION FACILITY INSTALLED PER MANUFACTURER SPECIFICATIONS

TERRAFIX 360R NON-WOVEN GEOTEXTILE WITH MINIMUM 300MM OVERLAP

CONCRETE FOUNDATION

SCREEN MUST BE IN PLACE

CONNECTION FOR OTHER ROOF LEADERS

BUILDING EXTERIOR

ROOF LEADER

1.5" DISCHARGE

3" X 2" BUSHINGS

CONEOUT

OVERFLOW TO GRADE

LOCKED ACCESS COVER

PROPERTY LINE

1.2m MIN OR AS PER D.B.C. AT PROPERTY LINE

TO STORM SEWER

PVC 2.00% MIN. STORM LATERAL (SUMP DISCHARGE)

PVC 2.00% MIN. STORM LATERAL (ROOF LEADER)

CONCRETE FOUNDATION

INFILTERATION FACILITY INSTALLED PER MANUFACTURER SPECIFICATIONS

OFFSET FROM FOUNDATION
5.0m MIN

EASEMENT
VARI EES

250mm DIA. PVC OBSERVATION/Maintenance PORT (EXTENDED) THROUGH EACH MODULE LEVELS (WHERE APPLICABLE)

INFILTERATION FACILITY INSTALLED PER MANUFACTURER SPECIFICATIONS

TERRAFIX 360R NON-WOVEN GEOTEXTILE WITH MINIMUM 300MM OVERLAP

CONCRETE FOUNDATION

SCREEN MUST BE IN PLACE

CONNECTION FOR OTHER ROOF LEADERS

BUILDING EXTERIOR

ROOF LEADER

1.5" DISCHARGE

3" X 2" BUSHINGS

CONEOUT

OVERFLOW TO GRADE

LOCKED ACCESS COVER

PROPERTY LINE

1.2m MIN OR AS PER D.B.C. AT PROPERTY LINE

TO STORM SEWER

PVC 2.00% MIN. STORM LATERAL (SUMP DISCHARGE)

PVC 2.00% MIN. STORM LATERAL (ROOF LEADER)
1. SANITARY AND WATER CONNECTIONS SHALL BE PLACED IN A COMMON TRENCH AND BE INSTALLED TO THE CENTER OF A SINGLE FAMILY LOT. VERTICAL/HORIZONTAL SPACING OF SERVICES AS PER M.O.E. AND O.B.C. FOR A SEMI-DETACHED LOT THE CONNECTIONS SHALL BE INSTALLED TO THE QUARTER POINTS OF THE LOT.

2. FRONT YARD INFILTRATION FACILITIES SHOULD BE SHARED BETWEEN TWO HOUSES ON THE OPPOSITE SIDE OF THE PAIRED DRIVES.

3. THE FRONT YARD INFILTRATION FACILITY SHALL HAVE MINIMUM 2.44m SEPARATION WITH THE WATER SERVICE.

4. SEWER AND WATER SERVICE CONNECTIONS SHALL NOT BE INSTALLED WITHIN 1.5m OF THE CENTER OF A SUBMERSIBLE TRANSFORMER VAULT OR WITHIN 0.9m OF A PROPOSED ELECTRICAL SERVICE STUB.

5. FIRE HYDRANTS SHALL NOT BE INSTALLED WITHIN 3.0m OF A PROPOSED LIGHT POLE OR HYDRO POLE STANDARD.

6. STORM AND SANITARY CONNECTIONS SHALL BE EXTENDED 1.5m INSIDE THE PROPERTY LINE OR TO THE EXTENT OF ANY EASEMENTS.
NOTES:

1. Extruded Polystyrene Insulation to be 50mm thick Multi-purpose STYROFOAM Brand SM Insulation with shiplap edge treatment or approved equivalent.
2. Trench width dimensions to conform to Region of Waterloo Standard Drawing SSMS E1-01.
3. Granular ‘A’ bedding to extend to a minimum of 1500mm below finished grade.
4. Insulation along trench side slope to extend all the way to the bottom of the bedding.
5. Minimum bedding depth to conform to Region of Waterloo Standard Drawing SSMS E1-01.
6. When the spring line of the pipe is below 1.5m insulation is not required.
A. All dimensions are in millimetres unless otherwise shown.
GENERAL NOTES

1. Specific Elevation At The House
   - Location and Direction Of
   - Rear Yard Catchbasin and
   - Proposed Elevation At Rear
   - Drainage Swale Catchment
   - Specific Elevation At The Flow Division Line
   - Berming All Swale Into 3' Minimum, 0.5' Minimum @ 0.3% Minimum
   - 2.0% Min. Street Line

2. Lot Number (If Required)
   - Rear Yard Catchbasin and
   - Proposed Elevation At Rear

3. Min. 9' Wide Swale
   - Flow To Be Carried Around
   - Located Beside Lot Line

4. The Difference Between Building Line Elevation And Side Yard Swale Elevation
   - 2.0% Min. Lot 15' Min. 1.0'" Nominal Diameter, 0.5' Min. @ 0.3% Minimum

5. 0' Min.
   - Drainage SWALEs Between Side Door sill And 12" Above Elevation To Be Max.
   - 12" Min. Of Sump At The Rear Lot Area From The Back Of The House Will
   - Be 0' Min.

6. Difference Between Top Of Foundation Wall And Building Line Elevation
   - 0' Min.

7. Difference Between Side Door sill And Ground Elevation To Be Max.
   - To Be No Greater Than 6' Elevation To No Side Door.
   - To Be 0' Min.

8. TRP, 4" And TRP, 6" lots with through drainage from other TRP lots
   - 4.0' Min. lot Access To Have A Max. Grade Of 3.1'

9. Access From Side Emanates To The Front and Rear Yards, 0.3' Min Access
   - Access From Side Emanates To The Front and Rear Yards, 0.3' Min Access
   - To Be Maintained Against All Overlying Units, To Allow Access From Side Emanates To The Front and Rear Yards, 0.3' Min Access

10. 2.0% Min. To Be Min. 2.0% Min. 1.0' Minimum, 0.5' Minimum @ 0.3% Minimum

11. 2.0% Min. To Be Min. 2.0% Min. 1.0' Minimum, 0.5' Minimum @ 0.3% Minimum

12. 2.0% Min. To Be Min. 2.0% Min. 1.0' Minimum, 0.5' Minimum @ 0.3% Minimum

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40. 2.0% Min. To Be Min. 2.0% Min. 1.0' Minimum, 0.5' Minimum @ 0.3% Minimum
GENERAL NOTES

1. Difference between building line elevation and site yard elevation is 100mm. A permeable subgrade (grass) is required. (For all grading types)

2. All slopes to be min. 2% with min. 100mm @ property line.

3. A min. 0.3m apron is to be maintained against all dwelling units to allow access from side entrances to the front and rear yards. 0.3m access to be min. 0.15m and max. 0.30m according to site yard width.

4. Slopes with min. lots 10% to have a max. grade of 3:1. Structural retaining walls required. Where max. slope exceeds.

5. Difference between side door sill and ground elevation to be max. 0.40m.

6. Difference between foundation wall and building line elevation to be min. 0.10m.

7. A min. of 6m of the rear lot area from the back of the house shall be paved between 2% to 4%.

8. The "L" and "T" lot through drainage cannot flow to other types lots.


At the rear lot line and 10% of the area of the lot, adjacent to the building line.

The front lot corner elevation is min. 0.45m above the height of the front of the house to be 0.2%.
GENERAL NOTES

1. The difference between building line elevation and site yard elevation is
   (for all grading types).

2. All swales to be min. 20% with min. 10% slope a permanent subbase (grass)
   to be min 0.15m and max 0.30m according to site yard width.

3. Access from side elevations to the rear and front yards, 0.3 m access to
   allow for all grading types.

4. Slopes within lots at rising to have a max grade of 3:1. Structural retaining
   walls required where max slope exceeded.

5. Difference between site door sill and ground elevation to be max 0.4m.

6. Foundation wall and building wall and building line elevation to
   elevation.

7. A min of 6m of the rear lot line from the back of the house shall be
   0.15m.

8. Type "a" and type "c" lots with through drainage from other type lots
   ground.

9. Building the rear lot line area to be a min of 12m in width.

FROM CURB TO STREET LINE MIN 2.0m, optimally 4.0m max 8.0m.
URBAN LOT GRADING

GENERAL NOTES

1. Lot Number
   (if required)

2. Elevation above SL
   (for all grading types)

3. Proposed elevation at the house

4. Proposed elevation at rear

5. Location and direction of
   rear yard swales

6. Location and direction of
   front yard swales

7. Proposed flow division line

8. Building elevation and
   ground elevation

9. Area of flow return

10. Calculated runoff

11. Perimeter sewer

12. House stopping away from house

MIN. 0.15m Profiled Apron Around

MIN. 0.9m Required Between Upper

MIN. 0.6m About High Lot Corner

MIN. 2.0% Min.
NOTE:

OPTIMUM SIDE SLOPE: 1 VERTICAL TO 6 HORIZONTAL

MAXIMUM SIDE SLOPE: 1 VERTICAL TO 3 HORIZONTAL

MINIMUM GRADIENT: 2%

MAXIMUM GRADIENT: 8%

GRADE TRANSITIONS SHALL BE SMOOTH TO FACILITATE THE MOWING OPERATION

MINIMUM SWALES DEPTH 150 mm

MAXIMUM SWALES DEPTH 300 mm
NOTE:
ALL POST DEPTH SHALL BE
AS PER CK–135 SPECIFICATION.

EXISTING GRADE

STONEDUST BACKFILL

20MPa CONCRETE

SONOTUBE SIZED
AS PER CK–135
SPECIFICATION

FENCE FOOTING
NOTE:
CONSULT SPECIFICATION CK-135 REGARDING FENCE AND FOOTING REQUIREMENTS.
NOTE:
CONSULT SPECIFICATION CK-135 REGARDING FENCE AND FOOTING REQUIREMENTS.

TYPICAL SECTION

HOME BASE

6.71m (22'-0")
6.59m (21'-6")
7.77m (25'-6")
7.89m (25'-9")
1.05m (0'-6")

(one half of backstop shown)
10ft. back

HOME BASE

8.20m (26'-11")
8.20m (26'-11")
7.62m (25'-9")
7.62m (25'-9")
3.05m (10'-0")

(one half of backstop shown)
20ft. back

PLAN VIEW

SOD BEHIND BACKSTOP

STONE DUST MOWING STRIP (VARIES IN WIDTH)
STONE DUST INFIELD

DELETED

The Corporation Of The
CITY OF KITCHENER

Scale: N.T.S.

Rev. Date: JUNE 2010

No. REVISION DATE Std. No.: 502
NOTE: EXCAVATE TO MINIMUM DEPTH OF 15 [380mm] OR END OF TOPSOIL LAYER TO A MAXIMUM DEPTH OF 33 [840mm]. FILL ADDITIONAL EXCAVATED TOPSOIL WITH COMPACTED GRANULAR 'B'.

REPAIR EDGE WITH TOPSOIL AND SEED

EVEET TREATMENT (SEE ABOVE DETAIL)

SUB-GRADE COMPACTED TO 96% S.P.D.

45mm COMPACTED H/L3 ASPHALT

300mm GRANULAR 'A' COMPACTED TO 96% S.P.D.

MEET PROPOSED / EXISTING GRADES 2% CROSS SLOPE OR CROWN

TOP OF ASPHALT TO BE 10mm ABOVE ADJACENT SURFACE.

HAND TAMP EDGES TO 45° ANGLE WHERE ASPHALT MEETS ADJACENT SURFACE. TEMPORARILY REMOVE ANY OBSTRUCTIONS INTERFERING WITH HAND TAMPING OPERATIONS. RESTORE EDGE UPTON COMPLETION.

COMMUNITY TRAIL - ASPHALT

KITCHENER

The City of Kitchener

DATE: JUNE 2010

No.: 503

REVISED NO.: N.T.S.

MANUAL UPDATE 2012
NOTE: EXCAVATE TO MINIMUM DEPTH OF 16" [400mm] OR END OF TOPSOIL LAYER TO A MAXIMUM DEPTH OF 34" [850mm]. FILL ADDITIONAL EXCAVATED TOP SOIL WITH COMPACTED GRANULAR 'B' BASE TO A MAXIMUM DEPTH OF 18" [450mm]
1. Refer to City of Kitchener Standards for Concrete, Jointing, and Walkway Block Details

2. For use WHERE walkway block terminations AT Parkland.

NOTE: Plan

---

2.0 m wide multi-use pathway

Park block

---

1.0 m concrete

Walkway block

---

1.5 m concrete walkway

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2.0 m lane to 1.5 m concrete walkway

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3.000

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1000

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1300

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15000

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45°

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AS SHOWN

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Sawcut joints

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Landing

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Walkway block

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Private block
NOTES:

1. ALL FENCING AND FASTENERS TO BE GALVANIZED PRIOR TO FABRICATION.
2. EXTRUDED BLACK VINYL COATING MAY BE APPLIED PROVIDED ALL FENCING MATERIALS ARE GALVANIZED PRIOR TO COATING. WHERE VINYL COATING APPLIED, ALL FENCING ELEMENTS TO BE COATED.
3. MID–BRACING RAILS REQUIRED WHERE FENCE HEIGHT IS GREATER THAN THAT SHOWN ON THE DETAIL. MID–BRACE TO BE 43mm Ø RAIL ON TERMINAL, CORNER, STRAINING OR GATE POSTS.
4. WIRE MESH SHALL BE MEASURED AT 9 GAUGE PRIOR TO GALVANIZING AND/OR ADDITIONAL COATING.
5. CONCRETE FOOTINGS TO BE 20Mpa STRENGTH AT 28 DAYS
6. ALL PIPE TO BE SCHEDULE 40.
7. WIRE MESH SHALL BE INSTALLED ON THE CITY PROPERTY SIDE OF FENCE.
METAL P-LOOP GATE

The Corporation Of The
CITY OF KITCHENER

NOTES:
1. ALL CONNECTIONS ARE WELDED WITH COMPLETE SOLID WELD
2. ALL STEEL ON GATES TO BE HDG DIPPED GALVANIZED AFTER FABRICATION
3. 76.1 mm WIDE FLUORESCENT YELLOW GREEN DIAMOND GRADE GG REFLECTIVE TAPE MANUFACTURER JM
4. LOCKING HOLE IS TO BE 3/8" MINIMUM
5. CHECK GATE LOCKS IN THE OPEN AND LOCK POSITION
NOTES:
1. MINIMUM DISTANCE BETWEEN ALL CONTROL OBJECTS 1800mm.
2. PLACE ARMOURSTONE AS REQUIRED BY SITE CONDITIONS TO MEET CONTROL STANDARDS. SIGN POSTS MAY BE CONSIDERED AS CONTROL OBJECTS.
3. ON-ROAD PAVEMENT AND WIDTH REQUIREMENTS SUBJECT TO REVIEW BY CITY OF KITCHENER TRAFFIC DEPARTMENT, MEETING OTM BOOK 18 REQUIREMENTS.
4. DIRECTIONAL AND WAYFINDING MAY BE REQUIRED BY THE CITY OF KITCHENER SUBJECT TO REVIEW OF LOCAL CONDITIONS AND DESTINATION POINTS.