

City of Kitchener

Standard Drawings Index

100 Roads

100	18.0m Local Road
101	20.0m Minor Collector
102	26.0m Major Collector
103	30.0m Secondary Arterial
104	Residential Cul-De-Sac & Standard Utility Locations
105	Flexible Pavement Design Curve Selection Data
106	Flexible Pavement Design Frost Value
107	Flexible Pavement Design Thickness Design Curves
108	Perforated Sub-Drain Under Curb and Gutter
109	Standard Drop Curb and Driveway Ramp Details
110	Construction Details of Sidewalk Curb and Gutters
111	Public Walkway Details
112	Boulevard Tree Planting
113	Concrete Paving - Sidewalk/Boulevard Adjacent to Boulevard Tree
114	Walkway/Emergency Access Detail
115	Temporary Road Detail
116	Typical Curb and Intersection Sidewalk Ramp Detail
117	Curb and Gutter with Adjacent Sidewalk
118	Asphalt Joint Restoration Detail
119	Utility Isolation in Concrete Sidewalks
120	STM Facility Maintenance Access

For Typical Cross-Sections see
the LID X-Sections updated 2021



200 Watermains

200	Dimensional Standards for Precast Valve Chamber for 300mm Gate Valve
201	Dimensional Standards for Poured Valve Chamber for 450mm Gate Valve
202	Dimensional Standards for Poured Valve Chamber for 600mm Gate Valve
203	Standard Hydrant Installation
204	Standard As Built Measurement for Watermain Construction
205	Standard As Built Measurement for Watermain Construction
206	Standard As Built Measurement for Watermain Construction

300 Sewers

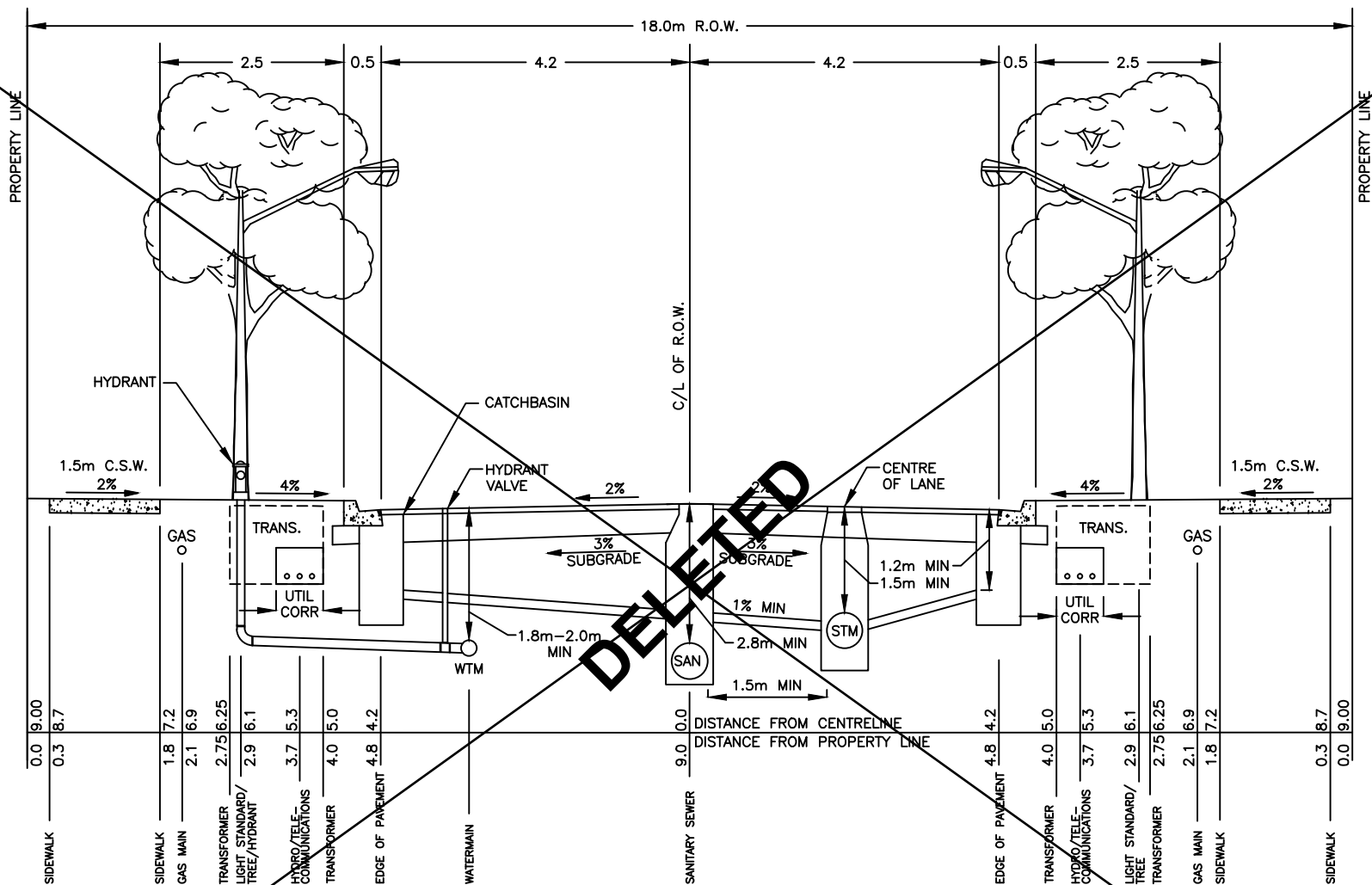
300	Rainfall Intensity Curve
301	Pipe Strength and Bedding Design Chart
302	Type 'C' Manhole Poured Concrete Manhole Max. 6.10m Depth
303	Precast Manhole Tee
304	Precast Ditch Inlet with Sump
305	Concrete Endwall with Apron for Storm Sewer Outlet
306	Internal Grate (Oulets Only) for Corrugated Metal Pipe 750mm Diameter and Larger
307	Downspout Connection Detail for Front Yard Infiltration Galleries
308	Front Yard Infiltration Facility Detail
309	Sewer Insulation Detail

400 Lot Grading

400	Urban Lot Grading Type 'A' - Back to Front Drainage
401	Urban Lot Grading Type 'B' - Split Drainage with Walkout
402	Urban Lot Grading Type 'C' - Back to Front Drainage with Walkout
403	Urban Lot Grading Type 'D' - Split Drainage
404	Cross Section of Grass Swales

500 Parks and Community Trails

500	Fence Footing
501	Backstop Layout
502	Major Backstop
503	Community Trail - Asphalt
504	Community Trail - Stonedust
505	Community Trail - Woodland Condition
506	Walkway Block Sidewalk Terminus at Parkland
507	Chainlink Fence - Walkway Block
508	Metal P-Loop Gate
509	Trail Road Crossing - Typical Condition
510	Trail Entrance Layout - Walkway Block from Local Road



DELETED

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. 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.

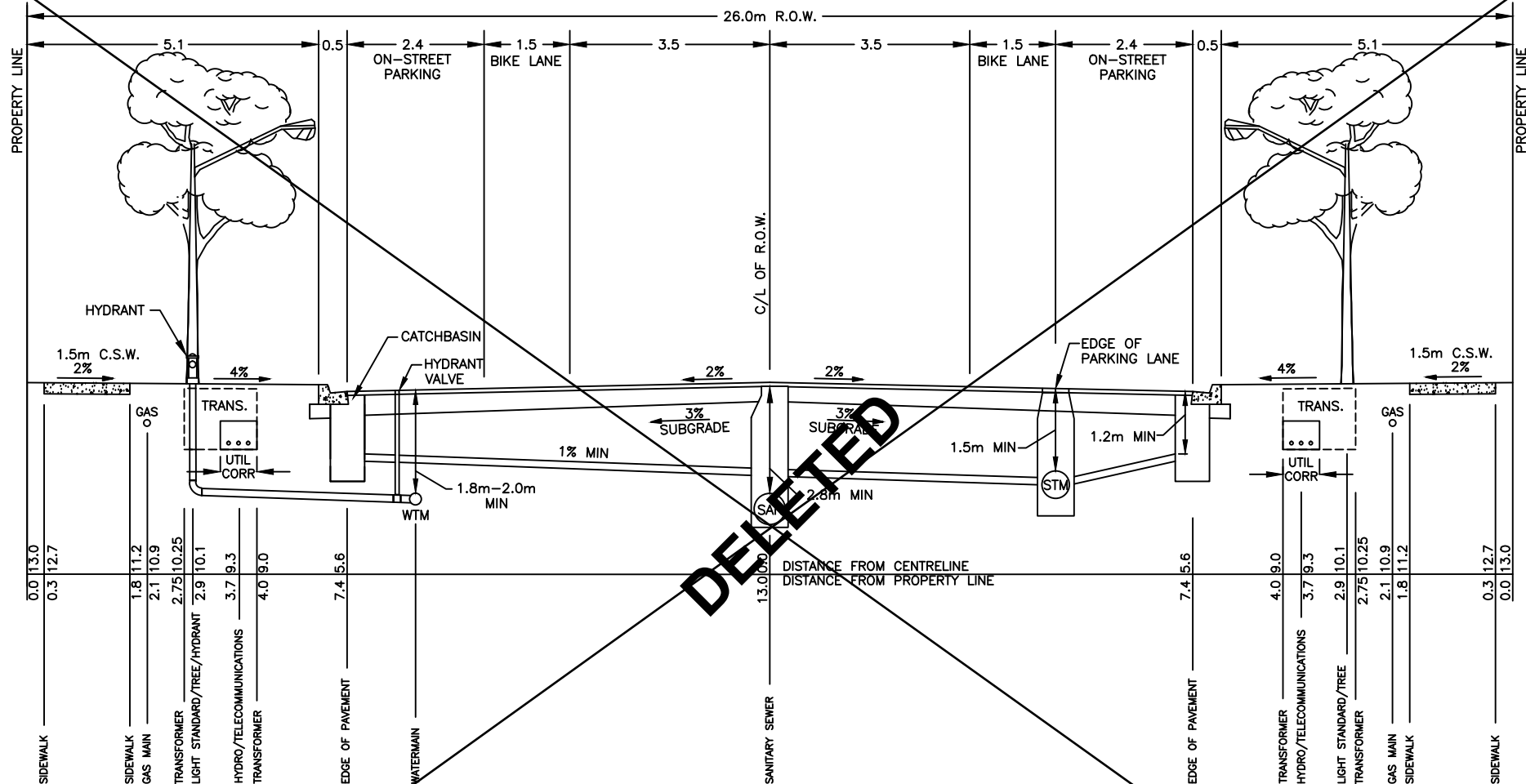
7. THE FOLLOWING IS A MINIMUM ROAD BASE AND WILL REQUIRE A SOILS REPORT VERIFICATION TO DETERMINE IF ADDITIONAL THICKNESS IS REQUIRED.
 - 40mm HL3
 - 60mm HL4 (100mm FOR BUS ROUTES)
 - 150mm GRANULAR "A"
 - 400mm GRANULAR "B"
8. SUB-GRADE SHALL BE COMPACTED TO 100% OF STANDARD PROCTOR DENSITY AT MAX. DRY DENSITY.

18.0m LOCAL R.O.W.

The Corporation Of The
**CITY OF
KITCHENER**



			SCALE:	N.T.S.
2	MANUAL UPDATE	APRIL 2015	DATE:	JUNE 2010
1	MANUAL UPDATE	JULY 2012		
NO.	REVISION	DATE	STANDARD No.:	100



NOTES

- UTILITY CORRIDOR (HYDRO & TELECOMMUNICATIONS) SHALL BE 0.6m WIDE.
- UTILITY CORRIDOR TO HAVE A MINIMUM COVER OF 0.9m.
- WATERMAIN TO HAVE MINIMUM COVER OF 2.0m FOR 300mm AND SMALLER DIAMETER AND 1.8m FOR 450mm DIAMETER AND LARGER.
- CLEAR SEPARATION BETWEEN WATERMAIN AND SEWERS SHALL BE AS PER MOE REQUIREMENTS.
- JOINT USE TRENCHES SHALL BE USED BY HYDRO AND TELECOMMUNICATION.

- 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"

- SUB-GRADE SHALL BE COMPACTED TO 100% OF STANDARD PROCTOR DENSITY AT MAX. DRY DENSITY.

26.0m MAJOR COLLECTOR R.O.W.

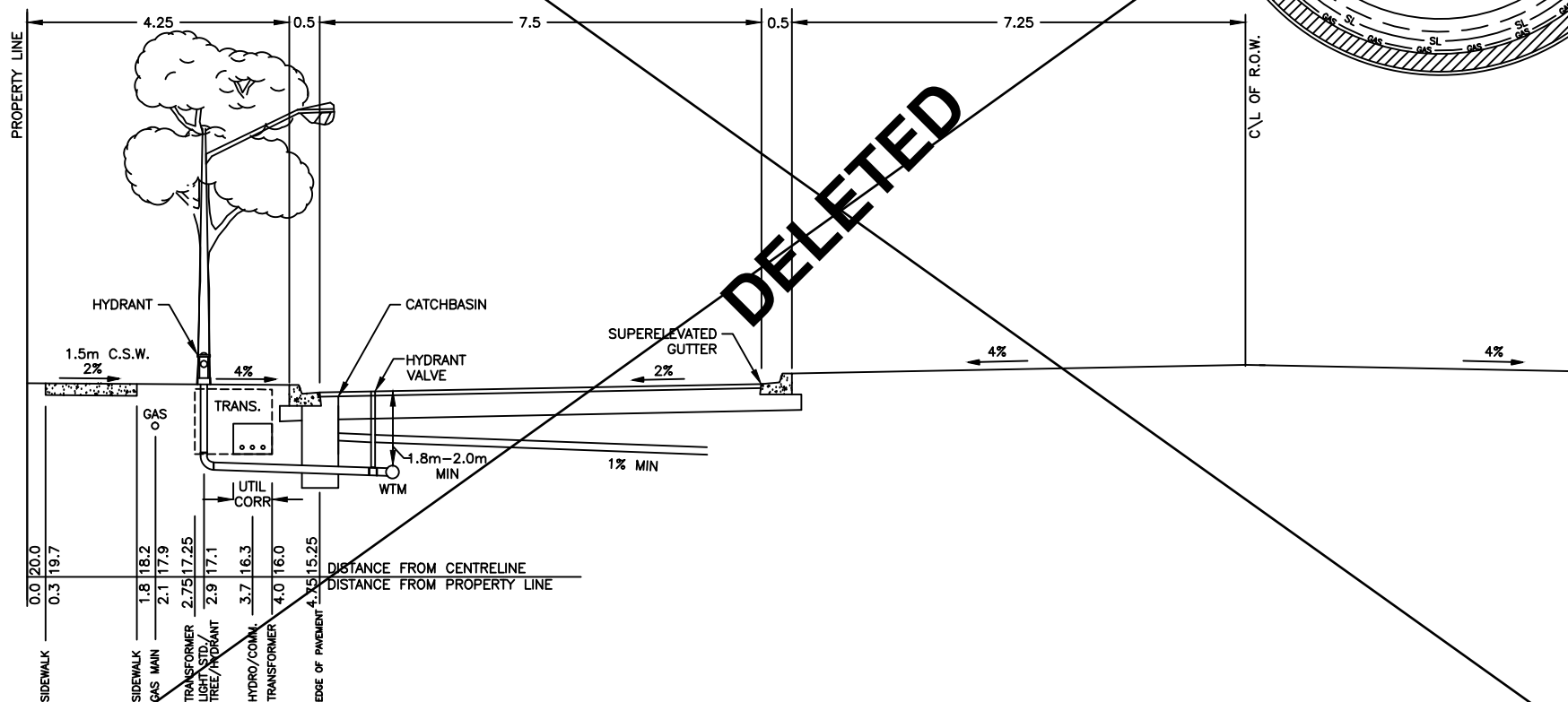
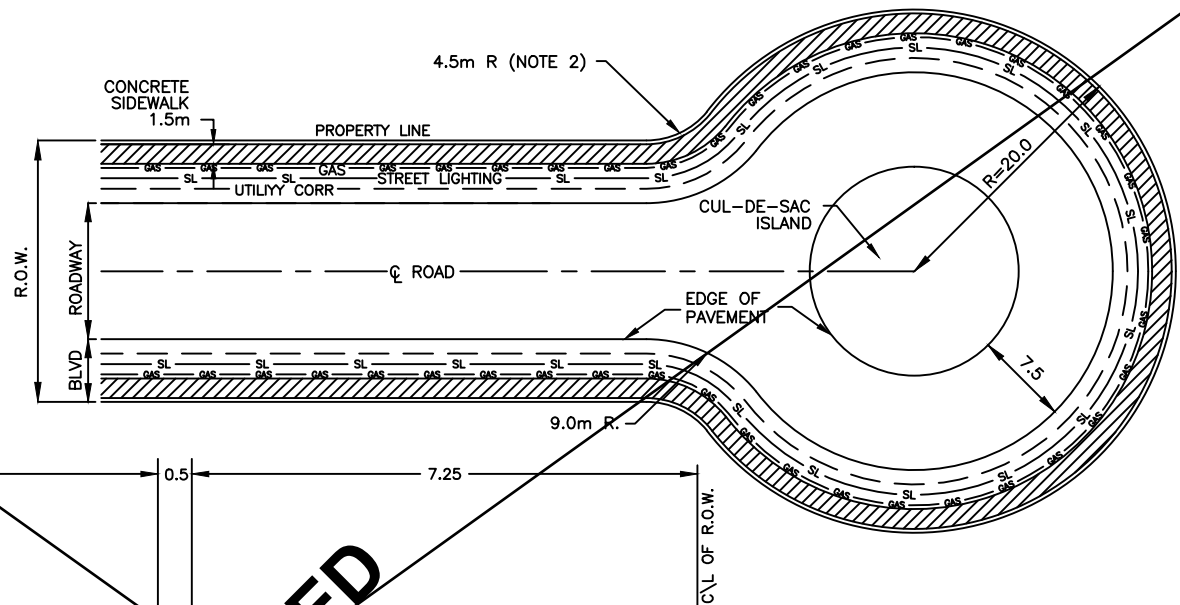
The Corporation Of The
**CITY OF
KITCHENER**



			SCALE:	N.T.S.
			DATE:	JUNE 2010
1	MANUAL UPDATE	JULY 2012	STANDARD No.:	102
NO.	REVISION	DATE		

NOTES

1. MIN. DEPTH OF COVER FOR GAS. AND UTILITIES IS 0.9m.
2. WHEN ROAD R.O.W. IS LESS THAN 20m PROPERTY LINE SHALL HAVE A RADIUS OF 4.5m.



RESIDENTIAL CUL-DE-SAC & STANDARD UTILITY LOCATIONS FOR 20m R.O.W. CUL-DE-SAC

The Corporation Of The
**CITY OF
KITCHENER**



			SCALE:	N.T.S.
2	MANUAL UPDATE	APRIL 2015	DATE:	JUNE 2010
1	MANUAL UPDATE	JULY 2012		
NO.	REVISION	DATE	STANDARD No.:	104

DRAINAGE	VALUE	
	OVER 50% SAND	UNDER 50% SAND
1. WATER TABLE BETWEEN 600mm & 1200mm	8	8
2. WATER TABLE BELOW 1200mm—NO SEWERS	6	6
3. WATER TABLE BELOW 1200mm—SANITARY SEWERS	4	6
4. WATER TABLE BELOW 1200mm—STORM SEWERS	3	6
5. WATER TABLE BELOW 1200mm—STORM & SAN. SEWERS	3	6

FROST—SEE FROST VALUE CHART

TRAFFIC	VALUE	MINIMUM ASPHALT	MINIMUM BASE 16mm CRUSHED GRAVEL
1. ARTERIAL STREETS			
—ROUTE LONGER THAN 1.6km	18	100mm	150mm
—ROUTE SHORTER THAN 1.6km	12	100mm	150mm
2. RESIDENTIAL STREETS			
—ROUTE LONGER THAN 0.8km	6	80mm	100mm
—ROUTE SHORTER THAN 0.8km	3	80mm	100mm

USE DESIGN CURVE IF TOTAL VALUE IS WITHIN LIMITS	A	B	C	D	E
	0–7	8–14	15–22	23–31	32–41

ADD VALUES FROM DRAINAGE, FROST AND TRAFFIC TABLES

BASED ON U.S. BUREAU OF SOILS CLASSIFICATION
FOR PARTICLE SIZE.

EXAMPLE 1. 20% CLAY

60% SILT

20% SAND

FROST VALUE-7

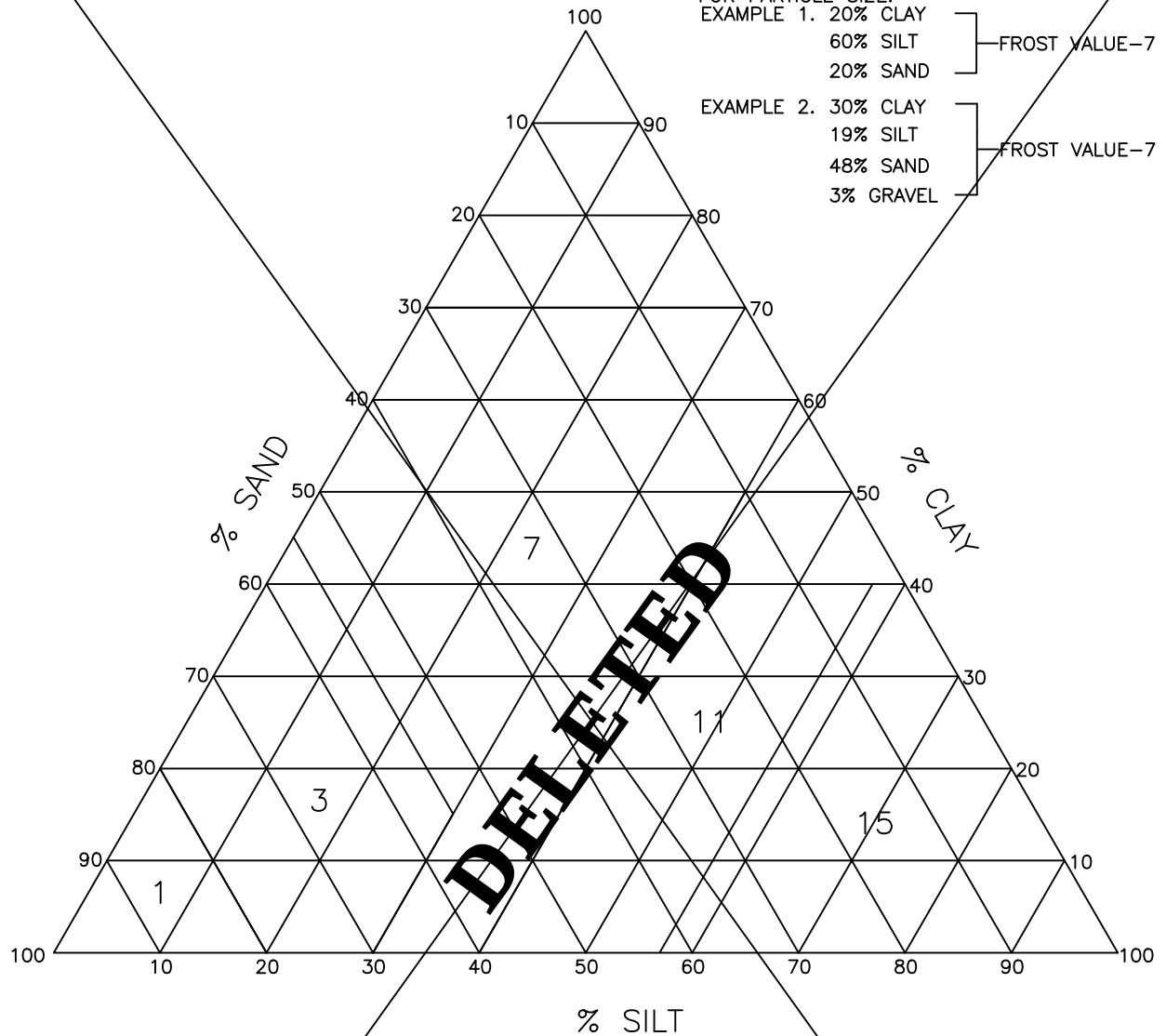
EXAMPLE 2. 30% CLAY

19% SILT

48% SAND

3% GRAVEL

FROST VALUE-7



EVALUATION OF SOIL WITH RESPECT TO FROST
SUSCEPTIBILITY INDICATED BY LARGE NUMBERS

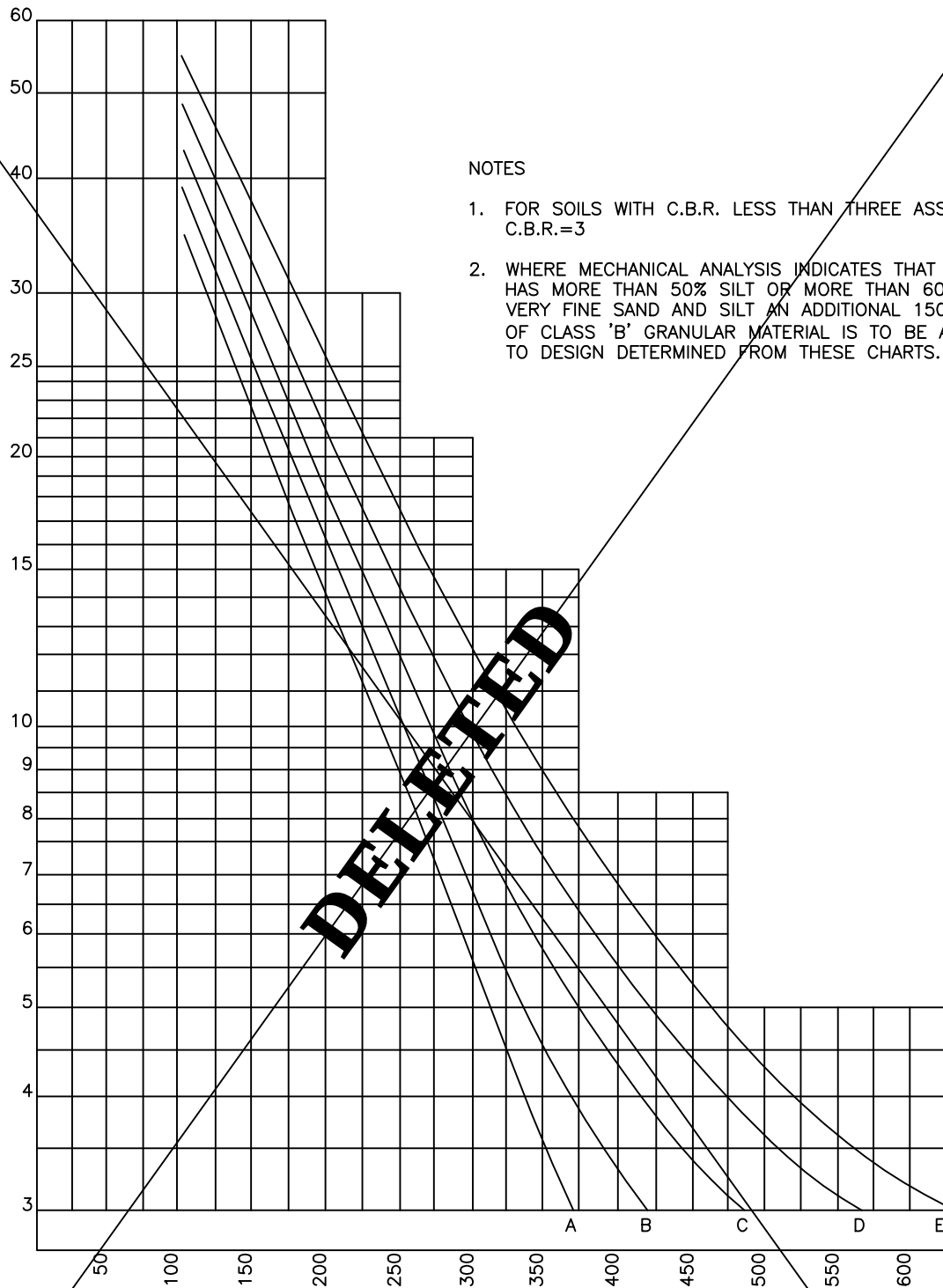
FLEXIBLE PAVEMENT DESIGN
FROST VALUE

The Corporation Of The
**CITY OF
KITCHENER**



No.	REVISION	DATE	Scale:	N.T.S.
			Rev. Date:	JUNE 2010
			Std. No.:	106

C.B.R. VALUE AT 0.1" PENETRATION—COMPACTED TO 95% STD. PROCTOR DENSITY



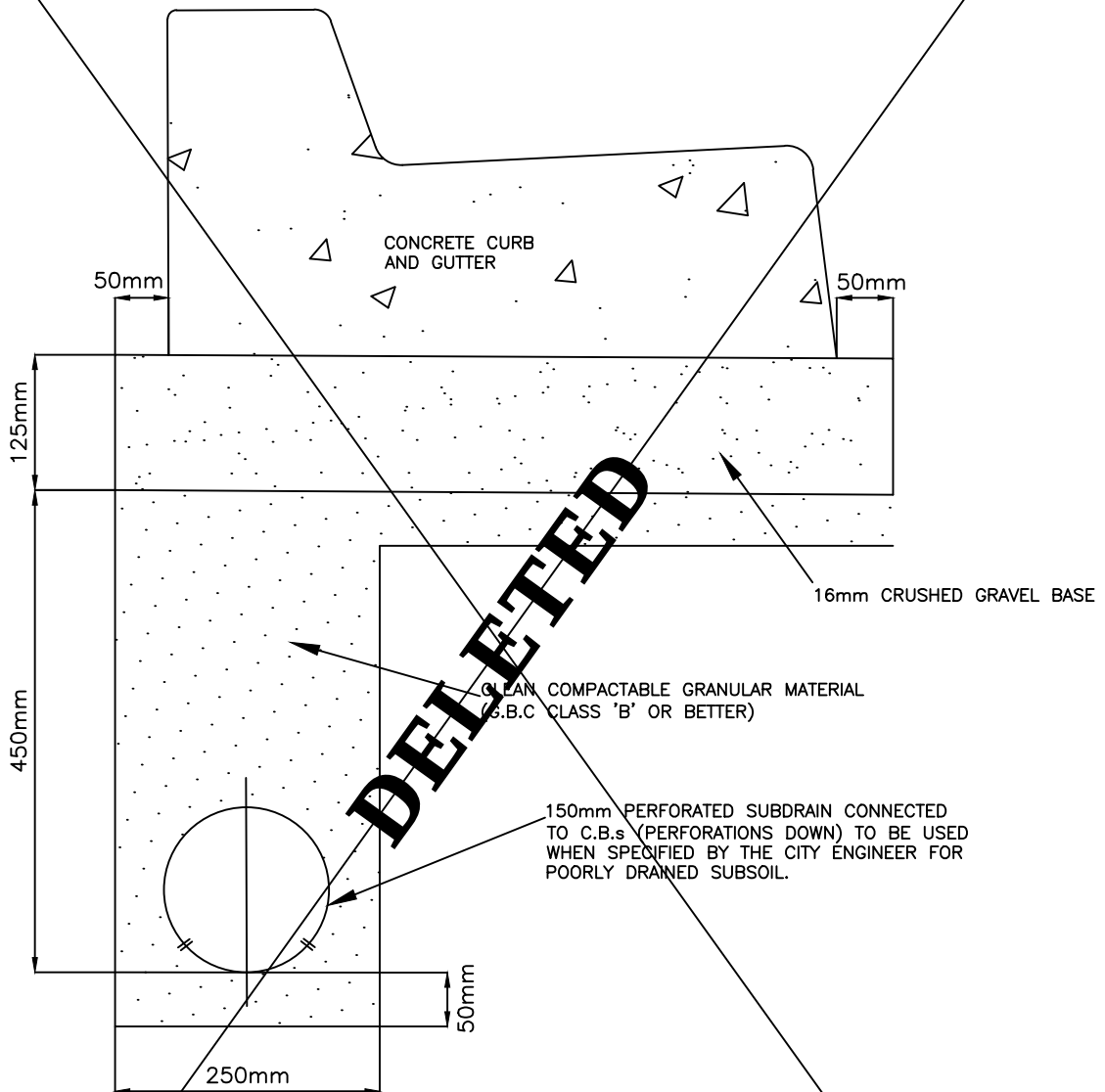
COMBINED THICKNESS OF ASPHALT AND GRANULAR MATERIALS (mm)

FLEXIBLE PAVEMENT DESIGN
THICKNESS DESIGN CURVES

The Corporation Of The
**CITY OF
KITCHENER**



No.	REVISION	DATE	Scale:	N.T.S.
			Rev. Date:	JUNE 2010
			Std. No.:	107

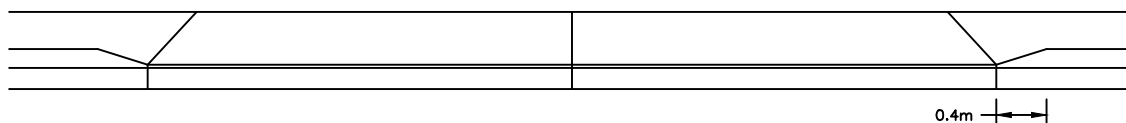
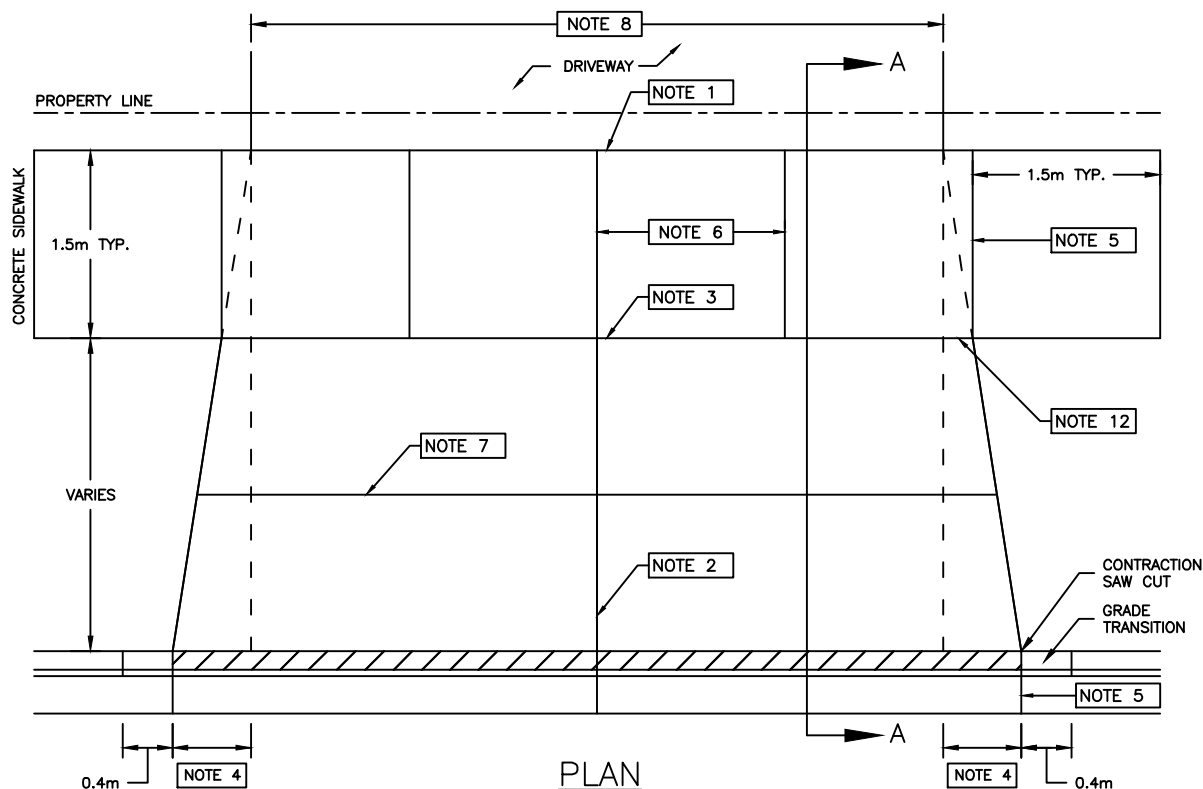


PERFORATED SUB-DRAIN
UNDER CURB AND GUTTER

The Corporation Of The
**CITY OF
KITCHENER**



No.	REVISION	DATE	Scale:	N.T.S.
			Rev. Date:	JUNE 2010
			Std. No.:	108



SECTION 'A-A'

GENERAL NOTES:

- IF THE DRIVEWAY IS CONCRETE, EXPANSION JOINT MATERIAL SHALL BE INSTALLED AT THE BACK OF THE SIDEWALK.
- SAW CUTS SHALL BE PLACED AT THE CENTRELINE OF THE DRIVEWAY RAMP AND EXTENDED THROUGH THE SIDEWALK AND CURB.
- 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.
- 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 $\frac{1}{4}$ 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.
- SAW CUTS SHALL BE PLACED IN THE SIDEWALK WHERE THE DRIVEWAY RAMP TAPER INTERSECTS AND IN THE CURB AT THE BOTTOM OF GRADE TRANSITION.
- TOOLED JOINTS IN THE DRIVEWAY PORTION OF THE SIDEWALK SHALL BE SPACED EQUALLY TO MATCH THE TYPICAL JOINTING OF SIDEWALK AS CLOSE AS POSSIBLE.
- WHERE DRIVEWAY RAMP WIDTH EXCEEDS 3000mm, A LONGITUDINAL SAW CUT JOINT IS TO BE PROVIDED AT THE MID-POINT.
- ALLOWABLE RAMP WIDTHS AT THE SIDEWALK ARE BETWEEN 3.65m AND 7.30m.
- DEPRESSED CURB AND GUTTER AT DRIVEWAY ENTRANCES SHALL HAVE AN ADDITIONAL 50mm BENCH TO SUPPORT ADJACENT CONCRETE RAMPS, REFER TO OPSD 600.040.
- REFER TO OPSD 350.010 FOR COMMERCIAL/INDUSTRIAL RAMP DESIGN.
- REFER TO CITY OF KITCHENER STANDARD SPECIFICATIONS AND THE DEVELOPMENT MANUAL FOR FURTHER INFORMATION.
- FOR NEW DEVELOPMENT, RAMP WIDTH AT FRONT OF SIDEWALK IS TO EQUAL THE WIDTH OF THE DRIVEWAY AT THE BACK OF SIDEWALK.

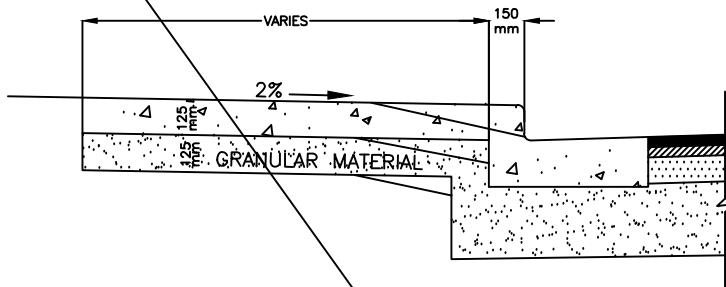
STANDARD DROP CURB AND
DRIVEWAY RAMP DETAILS

The Corporation Of The
**CITY OF
KITCHENER**

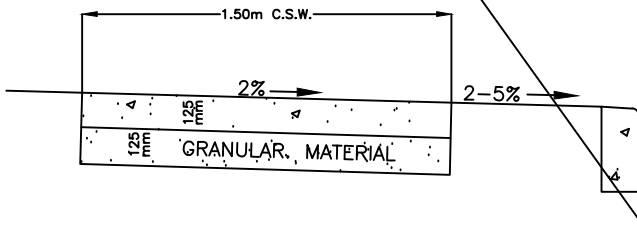


			Scale:	N.T.S.
1	MANUAL UPDATE	JULY 2012	Rev. Date:	JUNE 2010
No.	REVISION	DATE	Std. No.:	109

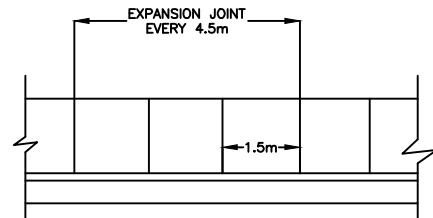
CROSS SECTION OF COMBINED WALK,
CURB & GUTTER



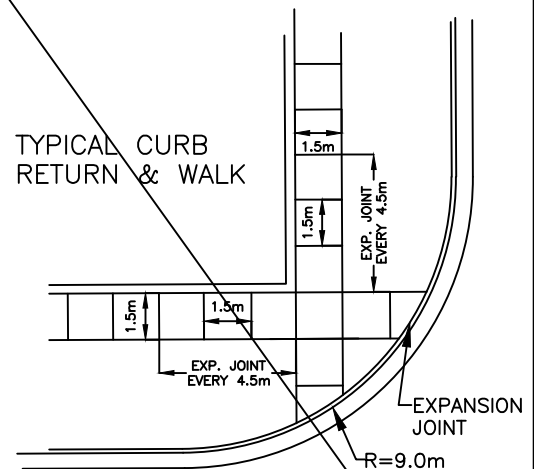
CROSS SECTION OF COMBINED WALK,
BOULEVARD, CURB & GUTTER



PLAN OF COMBINED WALK,
CURB & GUTTER



TYPICAL CURB
RETURN & WALK



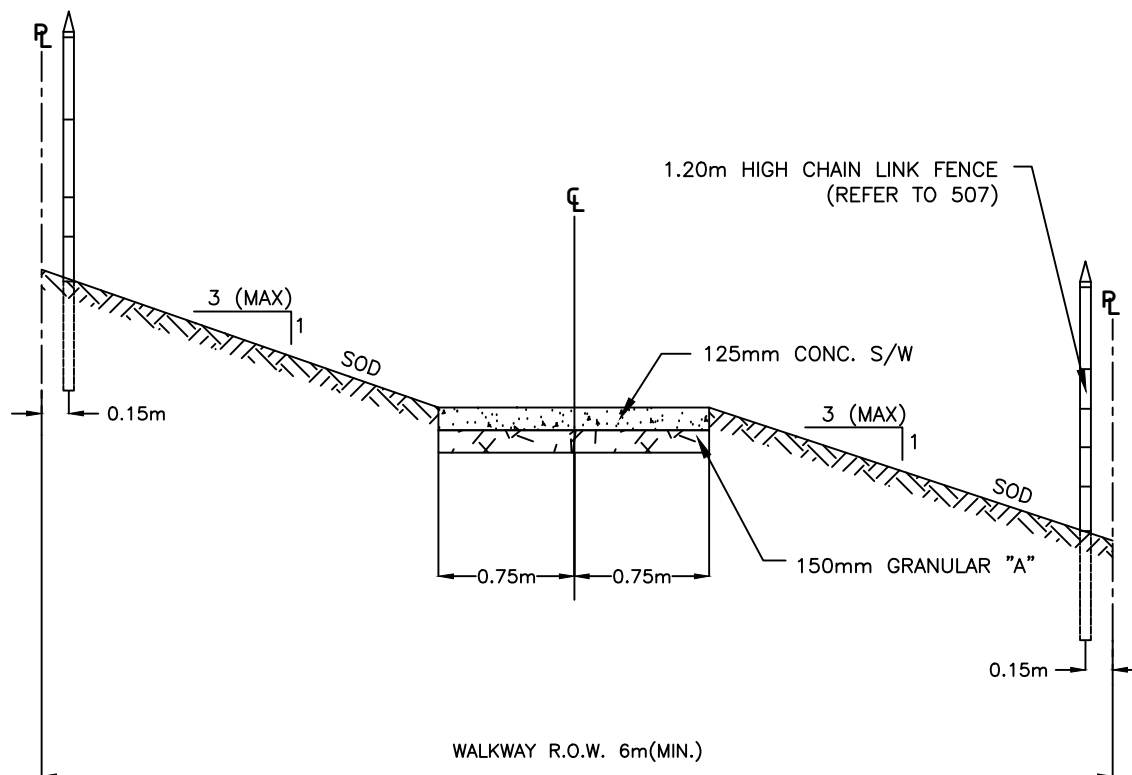
NOTE:
CONCRETE STRENGTH 32MPa.
AIR ENTRAINMENT: 5% TO 8%
MIN. CEMENT CONTENT: 365kg./m³
COARSE AGGREGATE: 20mm NOMINAL MAX. SIZE
MAXIMUM WATER/CEMENTING MATERIALS RATIO 0.45

CONSTRUCTION DETAIL OF
SIDEWALK, CURB & GUTTERS

The Corporation Of The
**CITY OF
KITCHENER**

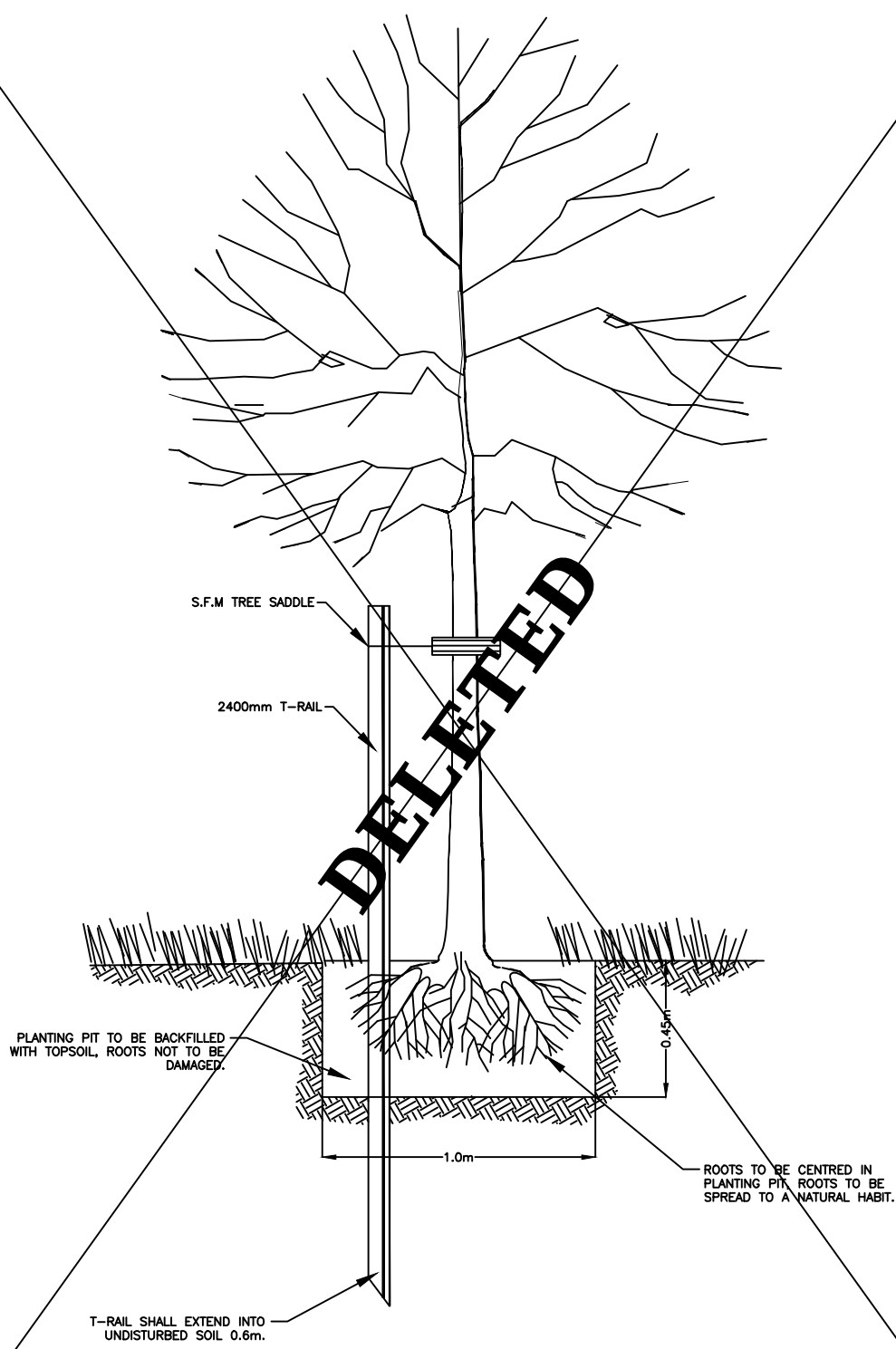


No.	REVISION	DATE	Scale:	N.T.S.
			Rev. Date:	JUNE 2010
			Std. No.:	110



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.



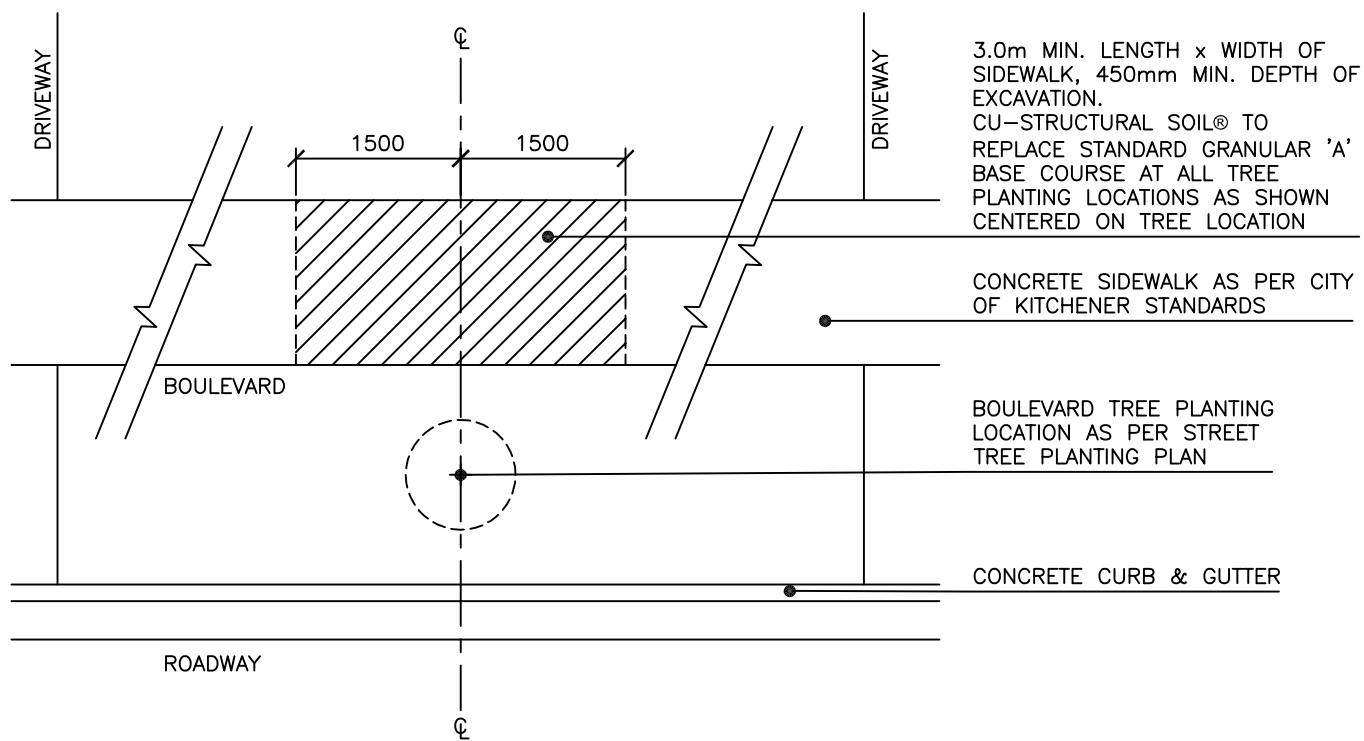
BOULEVARD TREE PLANTING

The Corporation Of The
**CITY OF
 KITCHENER**

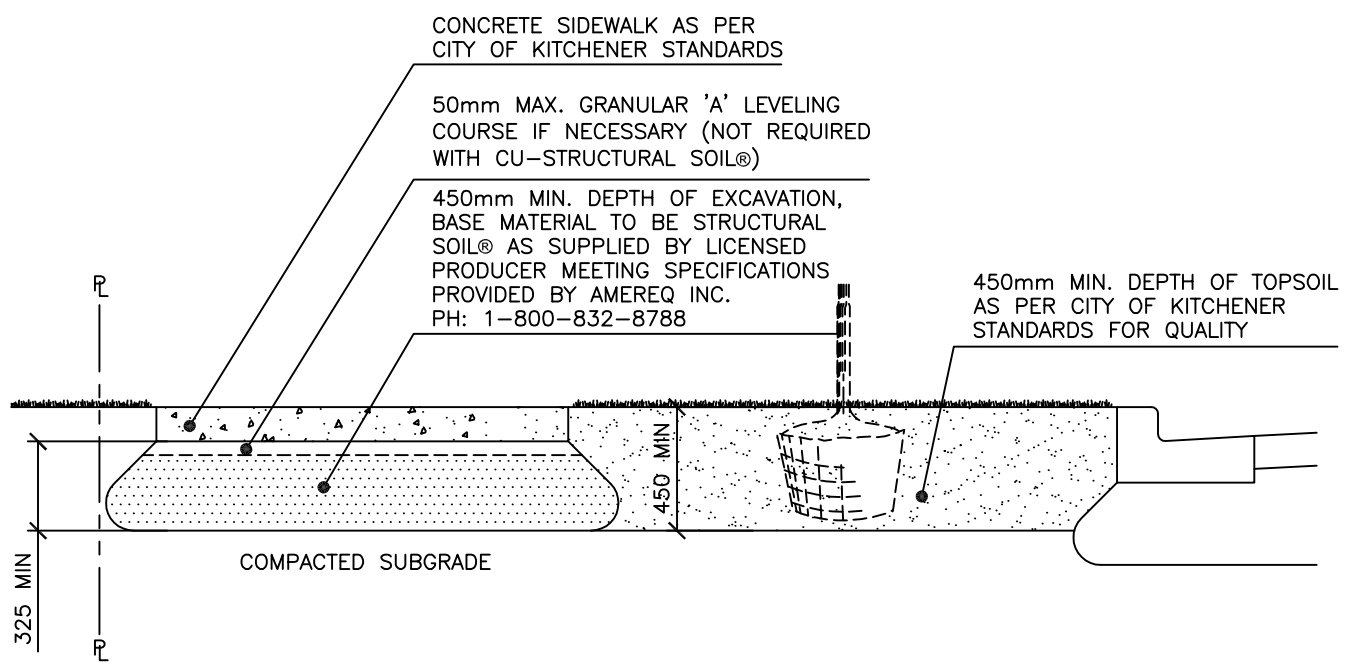


No.	REVISION	DATE
-----	----------	------

Scale:	N.T.S.
Rev. Date:	JUNE 2010
Std. No.:	112

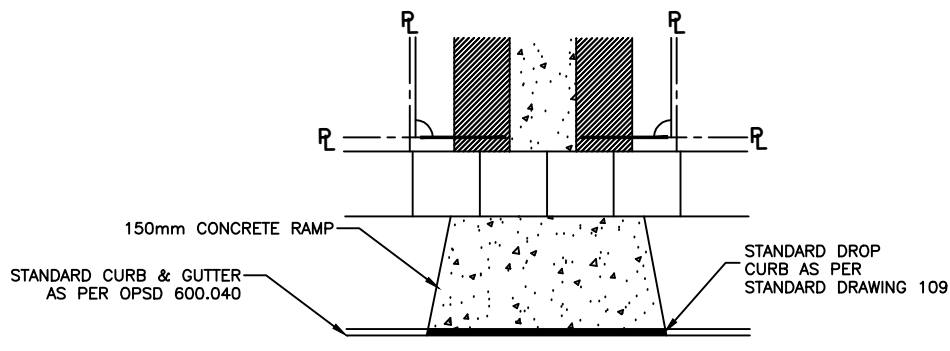


PLAN

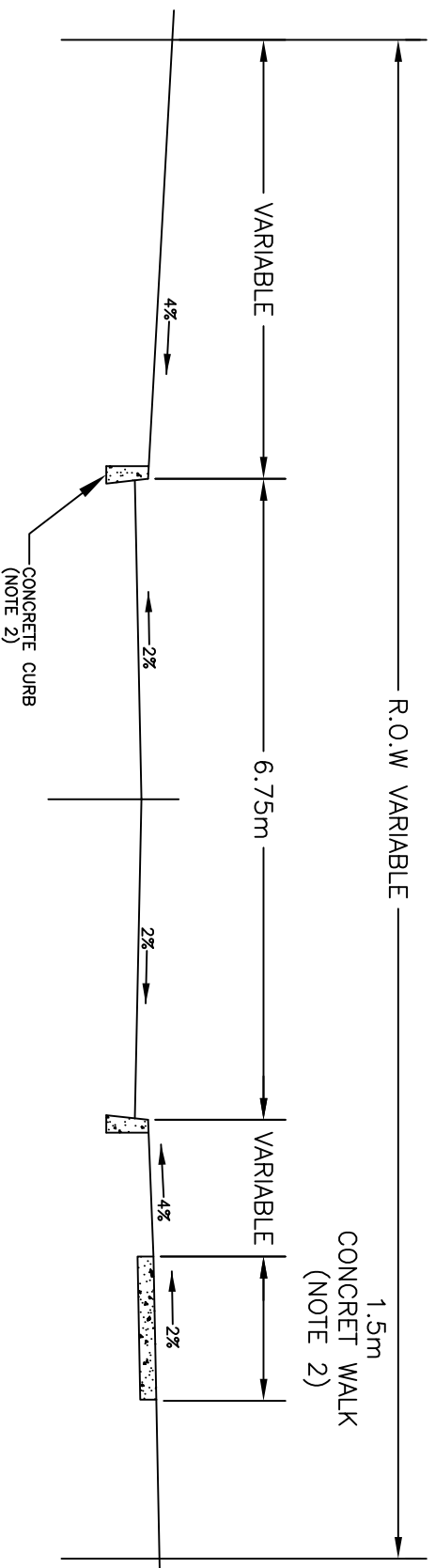


SECTION

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



WALKWAY/EMERGENCY ACCESS DETAIL	The Corporation Of The CITY OF KITCHENER					Scale:	N.T.S.
			1	MANUAL UPDATE	JULY 2012	Rev. Date:	JUNE 2010
			No.	REVISION	DATE	Std. No.:	114



NOTE:

1. ROAD CONSTRUCTION TO BE AS PER CITY ROAD STANDARD.
2. CONCRETE CURB AND WALK MAY BE SUBSTITUTED WITH ASPHALT.

TEMPORARY ROAD DETAILS				The Corporation Of The CITY OF KITCHENER		 KITCHENER					
								SCALE:		N.T.S.	
								DATE:		JUNE 2010	
		NO.		REVISION		DATE		STANDARD No.:		115	

PLAN OF SIDEWALK, CURB & GUTTER

1.5m
SIDEWALK CONTRACTION JOINT EVERY 4.5m (SAW CUT)
EXPANSION JOINT EVERY 18m
CURB AND GUTTER CONTRACTION JOINT EVERY 3.0m (SAW CUT)
SEE NOTE 6: TEXTURED SURFACE
0.5m RADIUS
4.5m
2-4% SLOPE
0.75m
1.0m MIN. TAPER
2% MAX
1.5m TYP.
1.5m TYP.
SAW CUT EVERY 3.0m PERPENDICULAR TO CURB
4.5m
2-4% SLOPE
0.75m
1.0m MIN. TAPER
ADDITIONAL CURB WIDTH TO SUPPORT ADJACENT SIDEWALK WITH POLY BOND BREAKER. REFER TO OPSD 600.040.
SEE NOTE 7

NOTE 3: SLOPE TRANSITION ZONE LENGTH VARIES

SEE NOTE 6: TEXTURED SURFACE
0.5m RADIUS
4.5m
2-4% SLOPE
0.75m
1.0m MIN. TAPER
2% MAX
1.5m TYP.
1.5m TYP.
SAW CUT EVERY 3.0m PERPENDICULAR TO CURB
4.5m
2-4% SLOPE
0.75m
1.0m MIN. TAPER
R=9.0 TO 15.0m
REFER TO DEVELOPMENT MANUAL

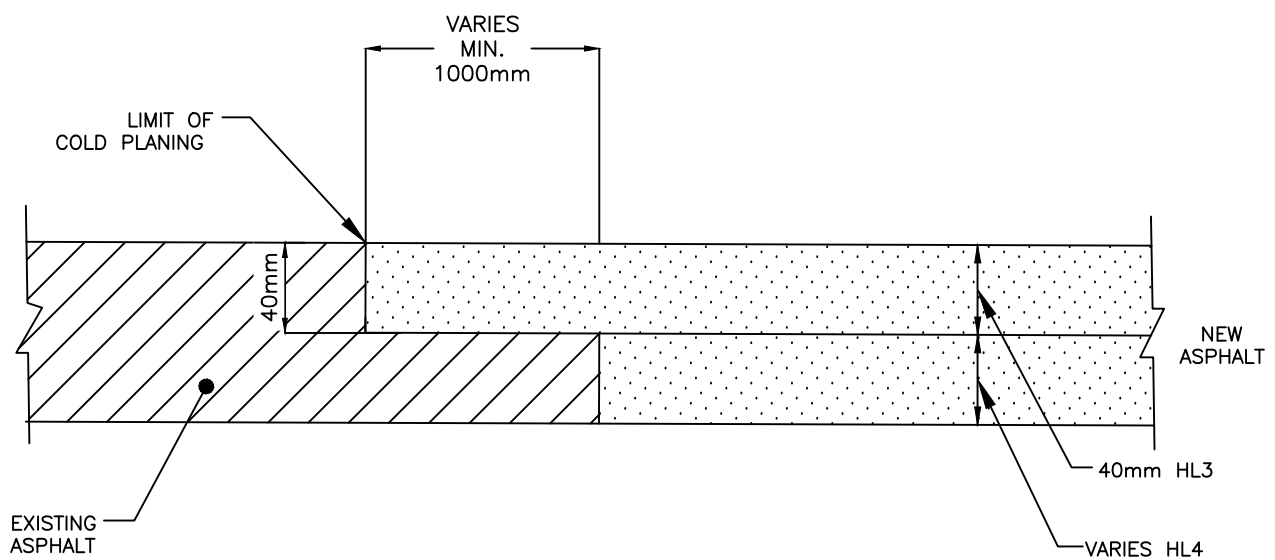
1. SIDEWALK RAMP DETAIL TO BE INCORPORATED AT ALL INTERSECTIONS WHERE NEW RAMP CONSTRUCTION IS PROPOSED. MODIFICATIONS ARE SUBJECT TO APPROVAL BY THE ENGINEERING SERVICES DIVISION.
2. BOTTOM OF DEPRESSED CURB SHOULD LINE UP WITH BACK EDGE OF SIDEWALK.
3. THE SLOPE TRANSITION ZONE IS INTENDED TO ALLOW 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.

The Corporation Of The
**CITY OF
KITCHENER**



			SCALE:	N.T.S.
2	MANUAL UPDATE	APRIL 2015	DATE:	JUNE 2010
1	MANUAL UPDATE	JULY 2012		
NO.	REVISION	DATE	STANDARD No.:	116

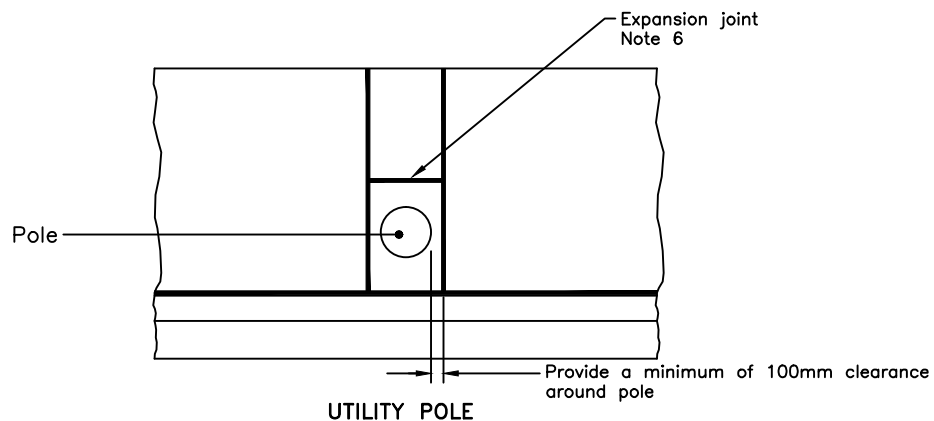
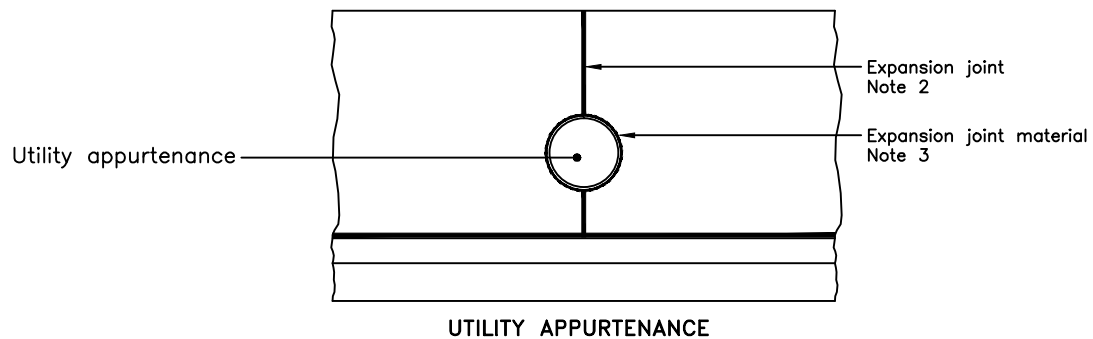
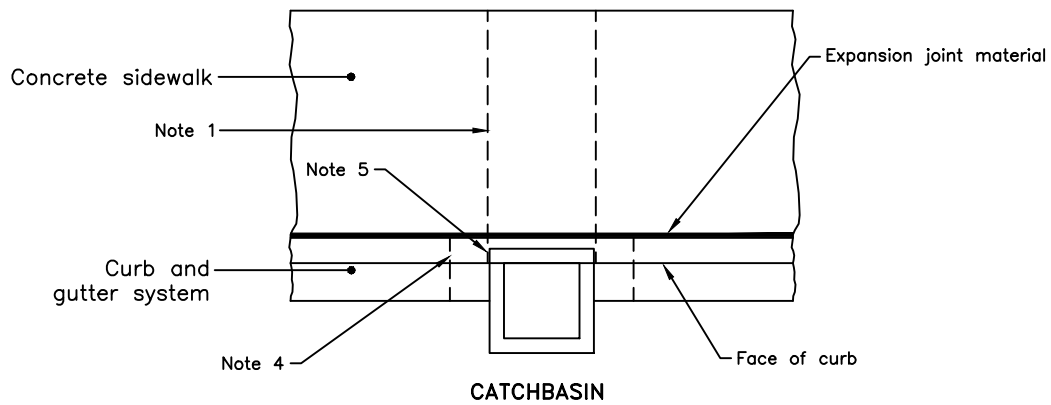


ASPHALT JOINT
RESTORATION DETAIL

The Corporation Of The
**CITY OF
KITCHENER**

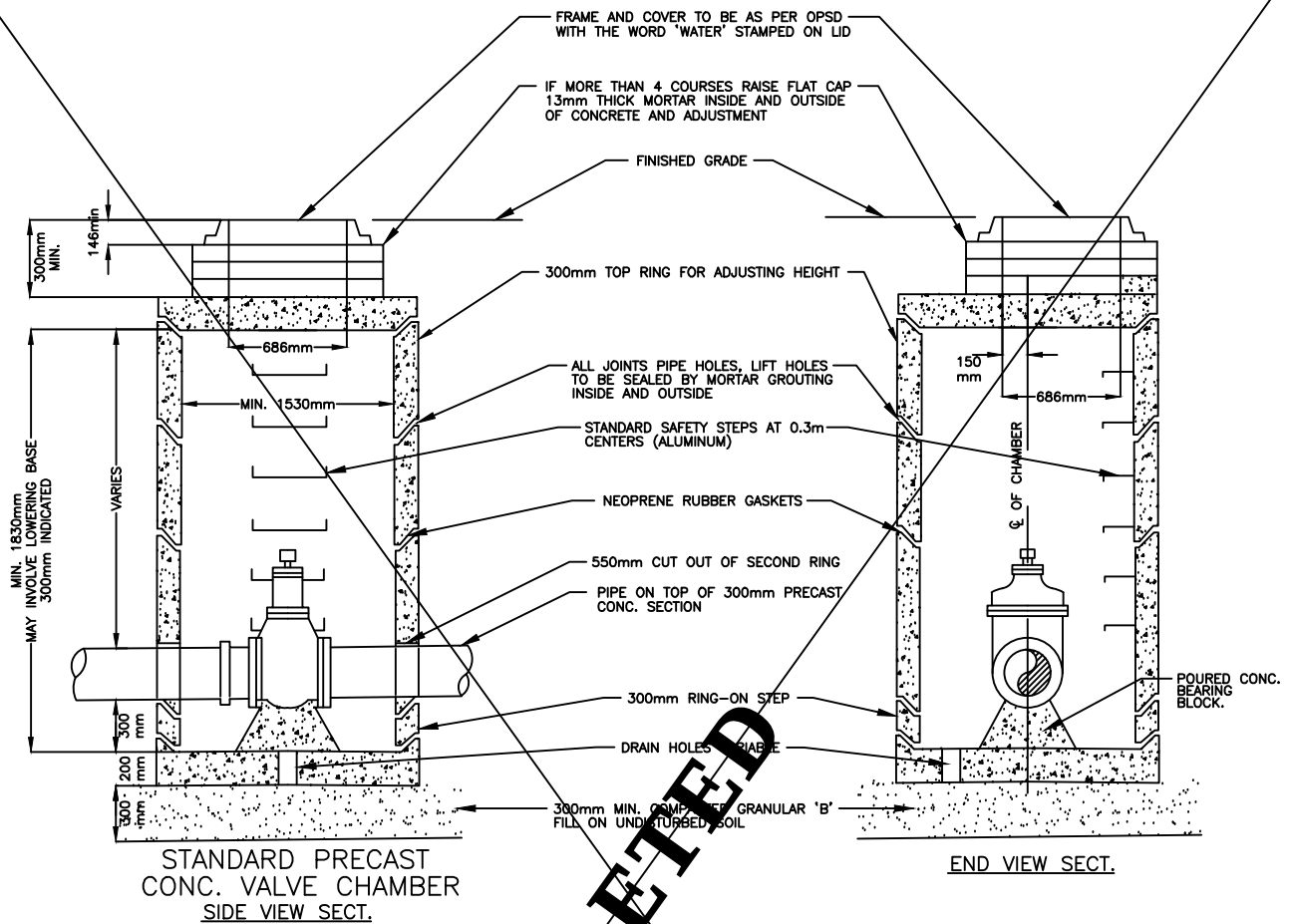


			Scale:	N.T.S.
1	MANUAL UPDATE	JULY 2012	Rev. Date:	JUNE 2010
No.	REVISION	DATE	Std. No.:	118

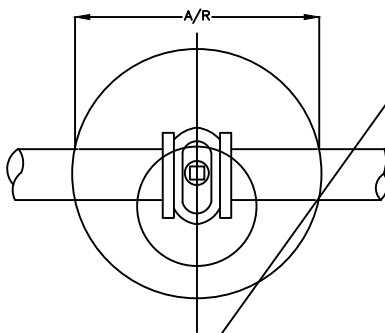


NOTES:

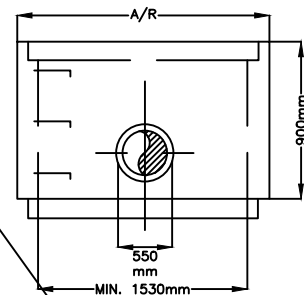
1. Contraction joint through sidewalk is required when curb and gutter is poured integral with sidewalk.
2. Adjust joints to coincide with centre of utility, with minimum slab length of 1m.
3. Expansion joint material shall be placed around Utility appurtenance flush with concrete surface.
4. Parallel 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.



PRECAST CAP WITH OFFSET M.H.



PRECAST SECTION-CUT OUT VIEW



NOTES

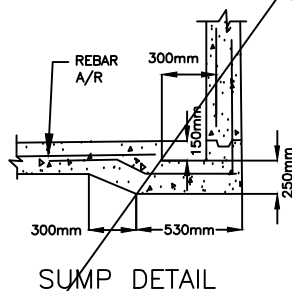
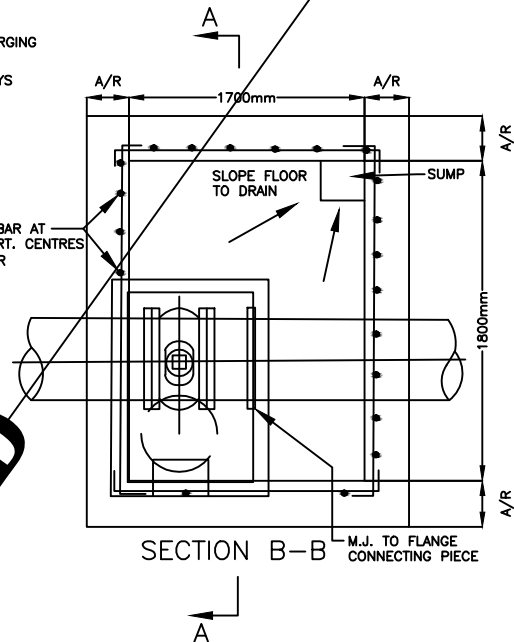
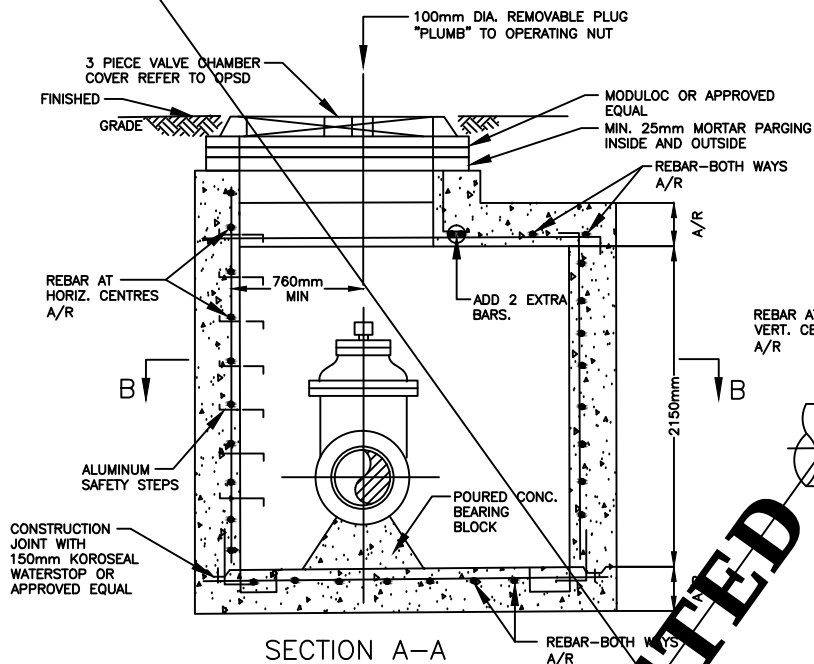
1. ALL MATERIAL PLACED AROUND CHAMBER TO BE PROPERLY COMPACTED.
2. 1830mm MIN. FROM BOTTOM OF CHAMBER TO UNDERSIDE OF PRECAST CAP.
3. PRECAST CAP TO BE REMOVABLE.
4. PRECAST CONCRETE TO COMPLY WITH CURRENT CSA SPECIFICATIONS.
5. UNLESS NOTED ALL DIMENSIONS IN MILLIMETRES.
6. A/R-AS REQUIRED BY LOAD AND SITE CONDITIONS.

DIMENSIONAL STANDARDS
FOR PRECAST VALVE CHAMBER
(FOR 300mm GATE VALVE)

The Corporation Of The
**CITY OF
KITCHENER**



No.	REVISION	DATE	Std. No.:	200
Scale:			N.T.S.	
Rev. Date:			JUNE 2010	



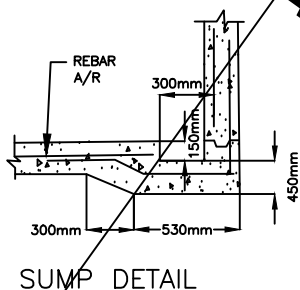
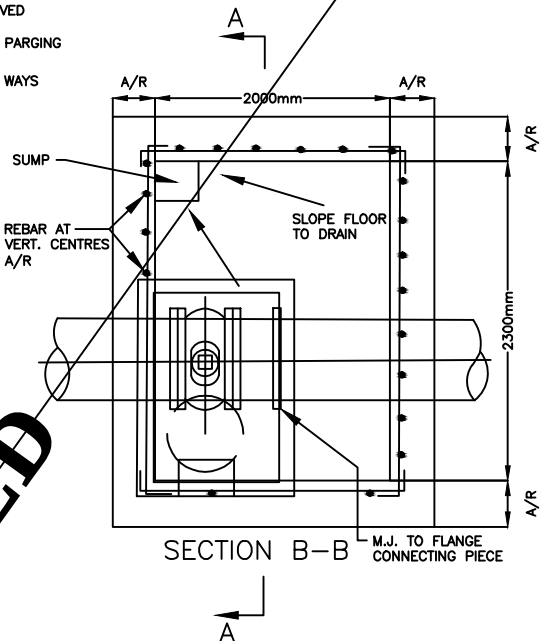
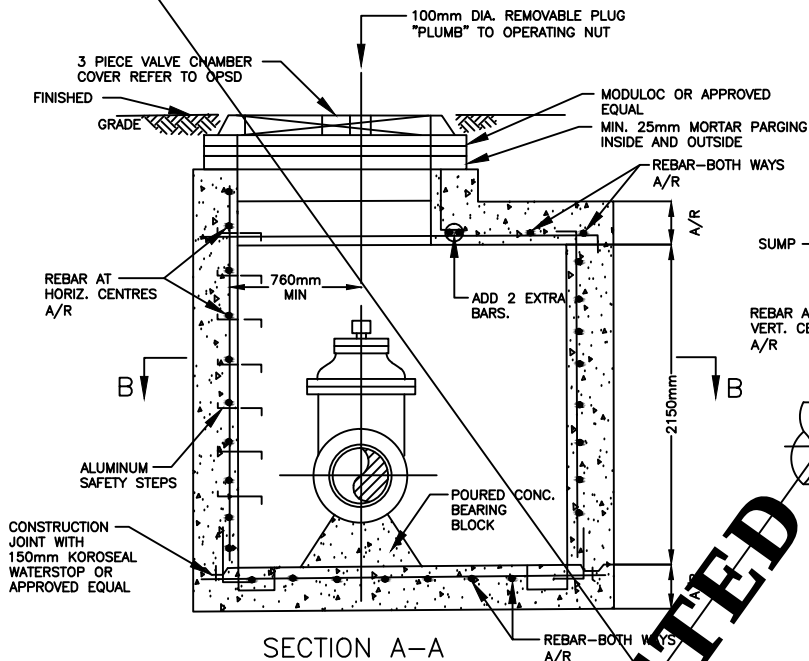
- NOTES - 1. ALL CONCRETE TO BE 20 MPa.
2. MIN. 25mm THICK CASTING PLATE ON CHAMBERS LOCATED IN TRAVELLED PORTION OF ROAD.
3. ALL MATERIAL PLACED AROUND CHAMBER TO BE PROPERLY COMPACTED.
4. A/R-AS REQUIRED BY LOAD AND SITE CONDITIONS.

DIMENSIONAL STANDARDS
FOR POURED VALVE CHAMBER
(FOR 450mm GATE VALVE)

The Corporation Of The
**CITY OF
KITCHENER**



No.	REVISION	DATE	Scale:	N.T.S.
			Rev. Date:	JUNE 2010
			Std. No.:	201



- 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.

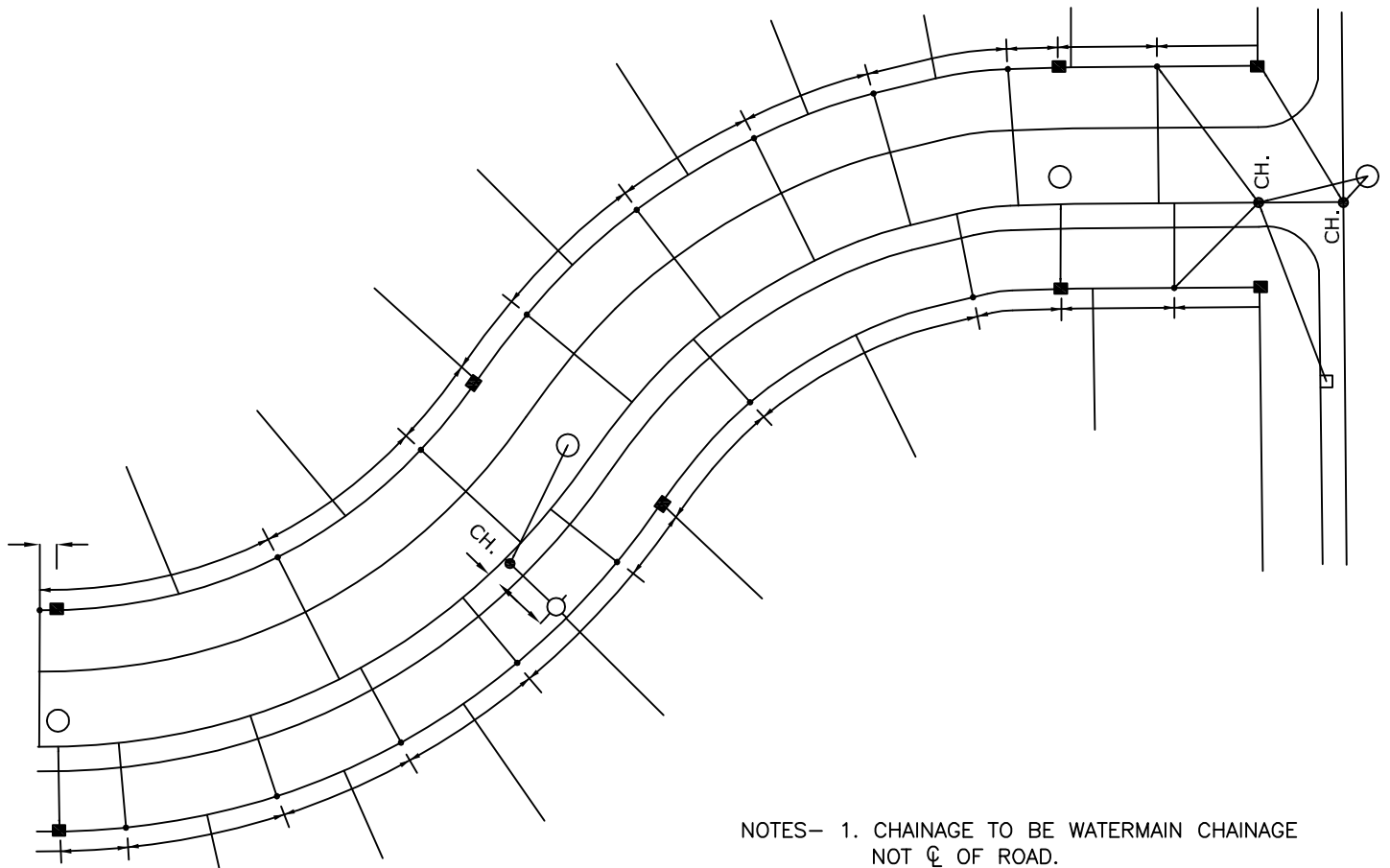
DIMENSIONAL STANDARDS
FOR POURED VALVE CHAMBER
(FOR 600mm GATE VALVE)

The Corporation Of The
**CITY OF
KITCHENER**



No.	REVISION	DATE	Std. No.:	202
			Scale:	N.T.S.
			Rev. Date:	JUNE 2010

STANDARD HYDRANT INSTALLATION	The Corporation Of The CITY OF KITCHENER		2	MANUAL UPDATE	2021		N.T.S.
			1	MANUAL UPDATE	JULY 2012		DEC 2020
			No.	REVISION	DATE		203



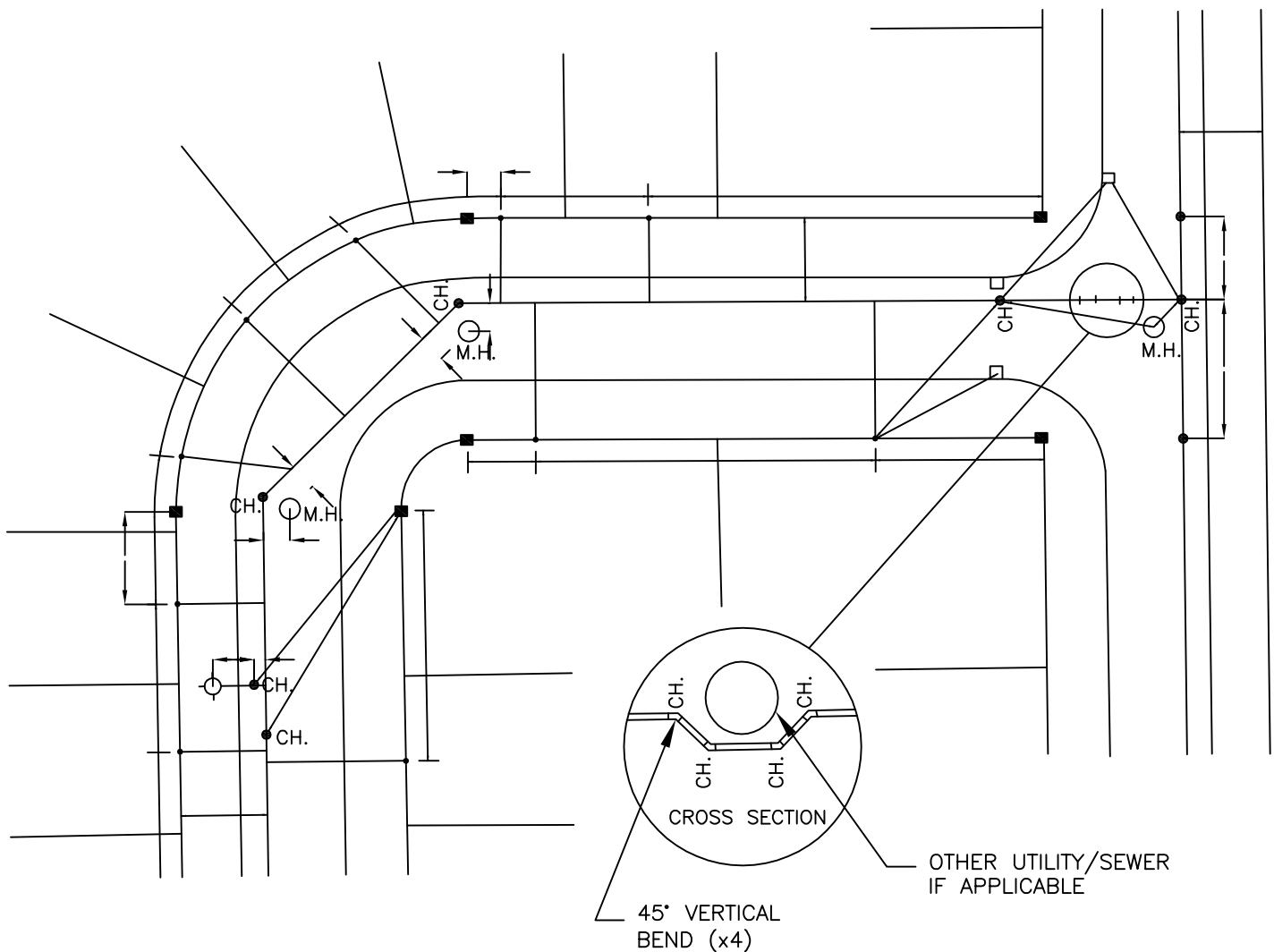
- NOTES— 1. CHAINAGE TO BE WATERMAIN CHAINAGE
NOT $\varnothing$ OF ROAD.
2. A MIN. OF 2 TIES AT RIGHT ANGLES
OR LESS ARE REQUIRED FOR VALVES
AND FITTINGS OTHER THAN CURB STOPS
3. MEASUREMENTS BETWEEN CURB STOPS
ON CURVES ARE TO BE CHORD
MEASUREMENTS.

STANDARD AS BUILT
MEASUREMENT FOR
WATERMAIN CONSTRUCTION

The Corporation Of The
**CITY OF
KITCHENER**



No.	REVISION	DATE	Scale:	N.T.S.
			Rev. Date:	JUNE 2010
			Std. No.:	204



NOTES—1. CHAINAGE TO BE WATERMAIN CHAINAGE
NOT $\varnothing$ OF THE 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
CURVES ARE TO BE CHORD MEASUREMENTS.

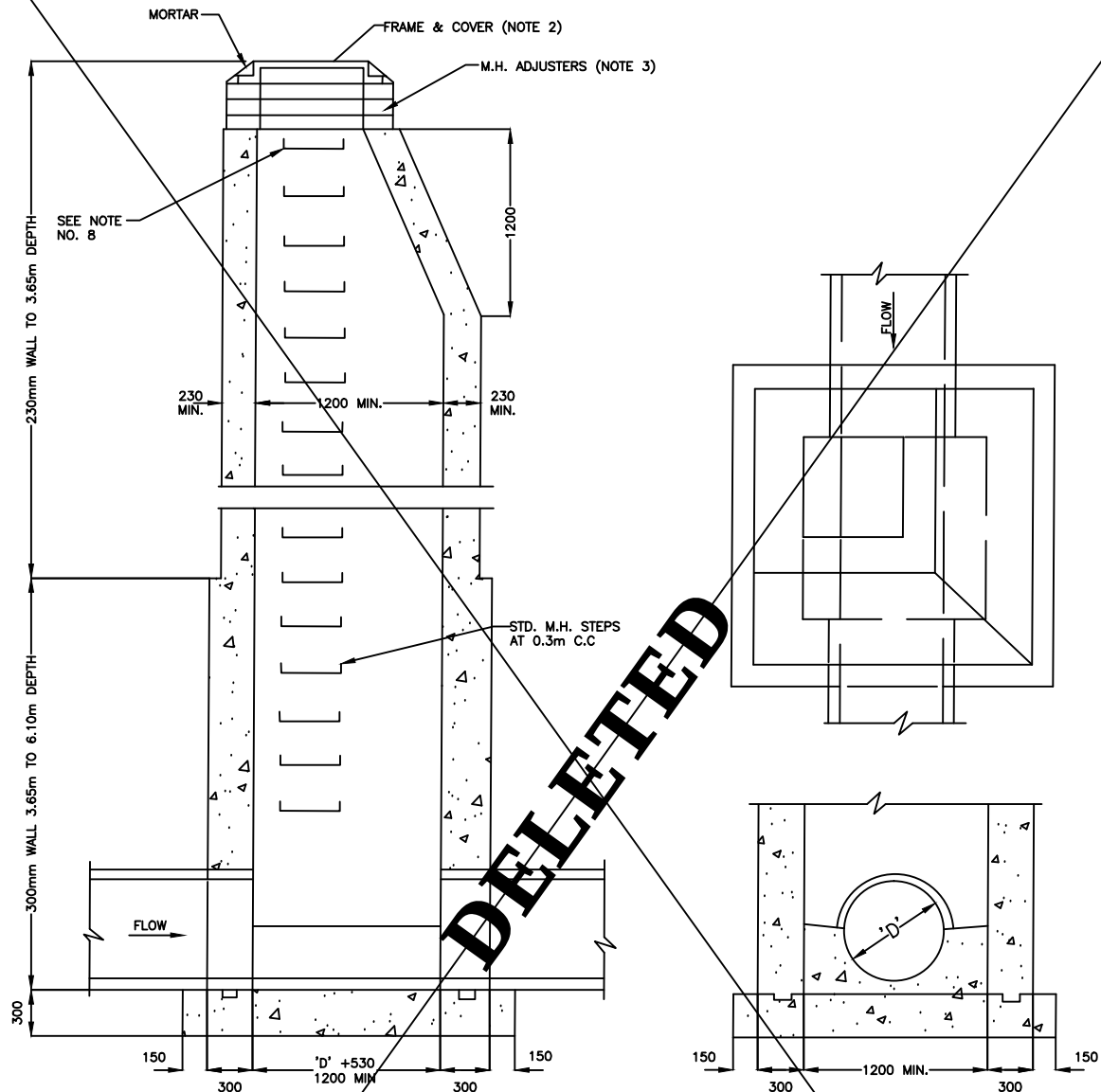
STANDARD AS BUILT
MEASUREMENT FOR
WATERMAIN CONSTRUCTION

The Corporation Of The
**CITY OF
KITCHENER**



No.	REVISION	DATE	Scale:	N.T.S.
			Rev. Date:	JUNE 2010
			Std. No.:	205

COMPUTED BY _____ CHECKED _____					PIPE STRENGTH AND BEDDING DESIGN								DATE _____				
TYPE OF SEWER _____					PROJECT LOCATION _____								SHEET NO. _____ OF _____				
LOCATION	FROM M.H.	TO M.H.	DEPTH OF COVER	WIDTH OF TRENCH (top of pipe)	BACKFILL MATERIAL		STATIC LOAD (kg/m)	SUPERIMPOSED LOAD (kg/m)	TOTAL LOAD (kg/m)	SAFTY FACTOR	DESIGN LOAD (kg/m)	BEDDING		PIPE STRENGTH REQ'D (kg/m)	PIPE SECTION		
					TYPE	WEIGHT (kg/m)						TYPE	FACTOR		DIA.	TYPE	CLASS
PIPE STRENGTH AND BEDDING DESIGN CHART							The Corporation Of The CITY OF KITCHENER						SCALE:		N.T.S.		
													DATE:		Jul-10		
										NO.	REVISION	DATE	STANDARD NO.:		301		



NOTES

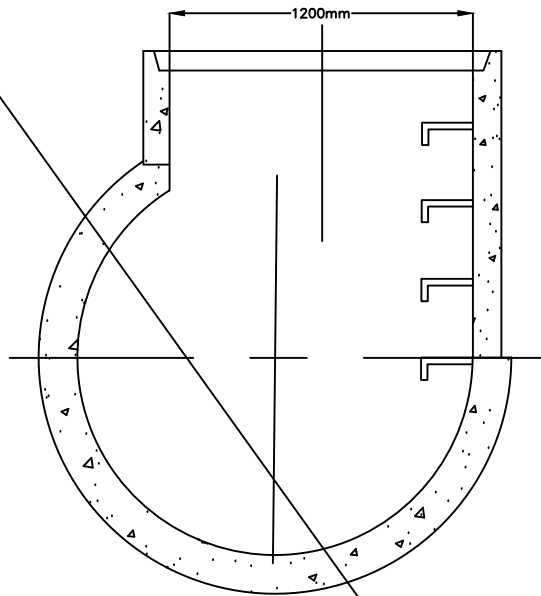
1. CONCRETE TO BE 20MPa COMPRESSIVE STRENGTH AT 28 DAYS.
2. M.H. FRAMES & COVERS TO BE CITY OF KITCHENER STANDARD. FRAMES TO BE SET FIRMLY IN MORTAR ON THE ADJUSTERS.
3. MANHOLES TO HAVE MIN. 3 COURSES AND MAX. 5 COURSES MODULOC OR APPROVED EQUAL AND PARGED ON THE OUTSIDE ONLY WITH 15mm OF CEMENT MORTAR 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

The Corporation Of The
**CITY OF
KITCHENER**

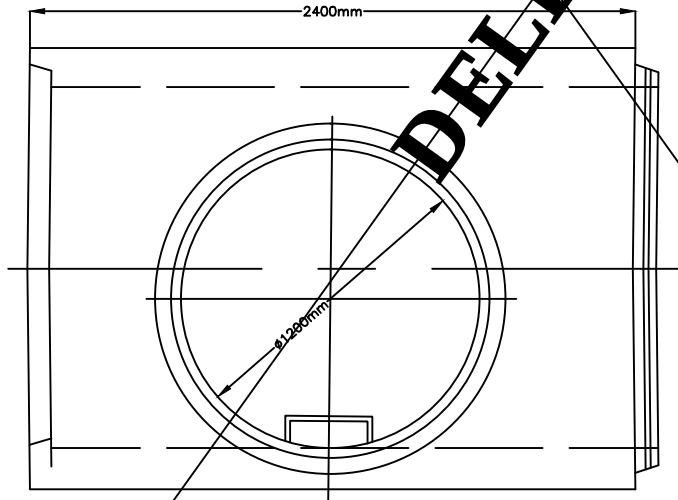


No.	REVISION	DATE	Scale:	N.T.S.
			Rev. Date:	JUNE 2010
			Std. No.:	302



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.



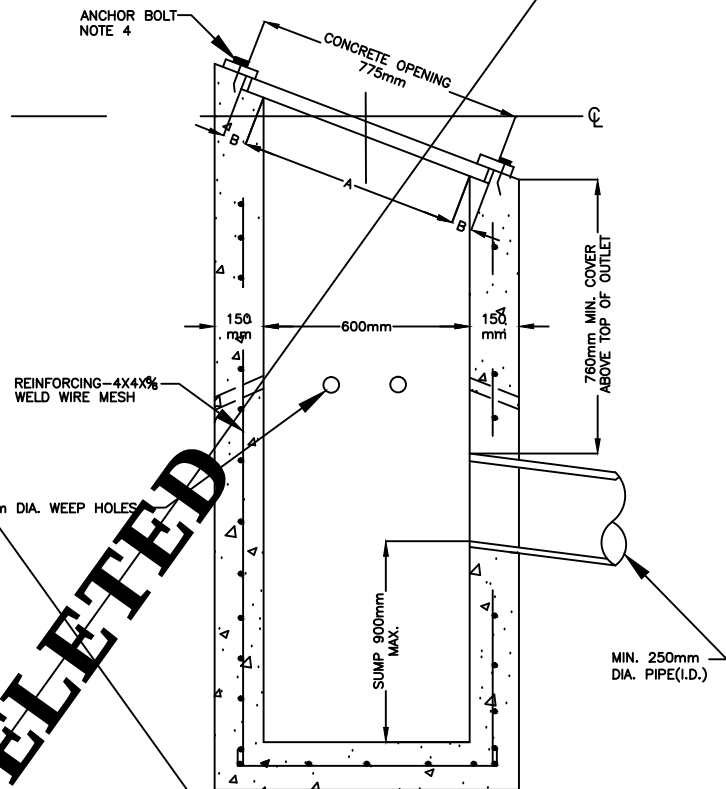
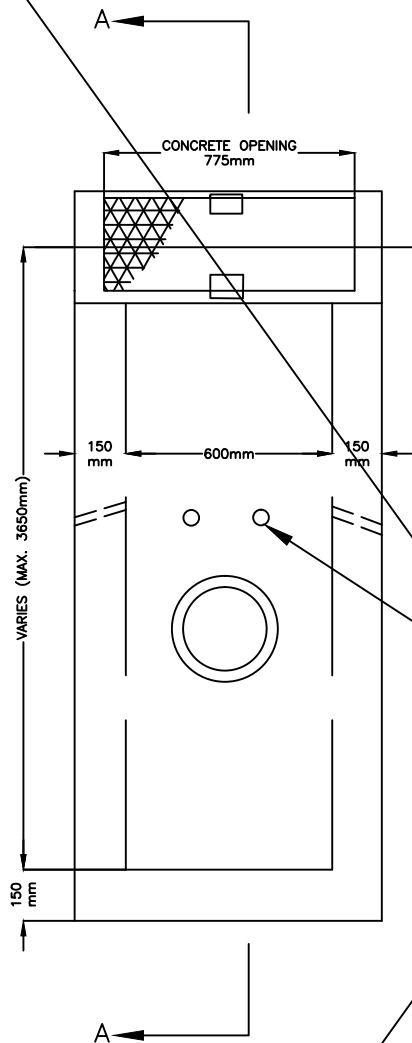
DELETED

PRECAST MANHOLE TEE

The Corporation Of The
**CITY OF
KITCHENER**



			Scale:	N.T.S.
			Rev. Date:	JUNE 2010
No.	REVISION	DATE	Std. No.:	303



SECTION 'A-A'

TABLE OF OPENING DIMENSIONS (IN MILLIMETRES)			
POSITION	GRATE SLOPE	A	B
INLET ON DITCH SLOPE	2:1	679	48
	3:1	641	67
	4:1	629	73
INLET ACROSS DITCH	2:1	679	48
	3:1	641	67
	4:1	629	73
	6:1	616	79
	8:1	616	79
	10:1	610	83
	HORIZ.	610	83

NOTES

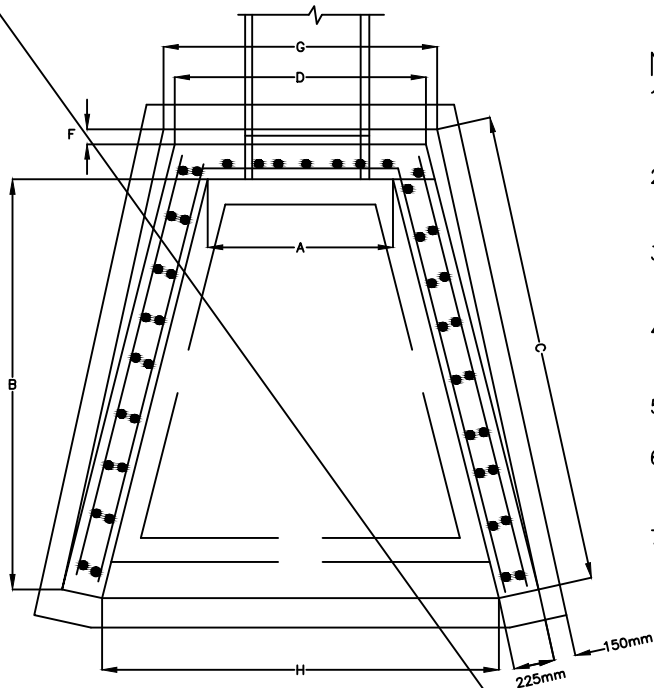
1. CONCRETE TO BE 30MPa AT 28 DAYS.
2. ALL JOINTS AND LIFTING HOLES TO BE COMPLETELY FILLED WITH A 1:3 MORTAR MIX AND POINTED BEFORE BACKFILLING.
3. WHERE INLET IS PLACED ACROSS DITCH AND IS ACCESSIBLE TO VEHICULAR TRAFFIC, GRATE SLOPE IS TO BE 6:1 OR FLATTER.
4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH OPSD-403-01 FOR GRATE AND ANCHOR BOLT DETAILS.
5. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH M.T. FORMS 407 AND 1351.

PRECAST DITCH INLET
WITH SUMP

The Corporation Of The
**CITY OF
KITCHENER**

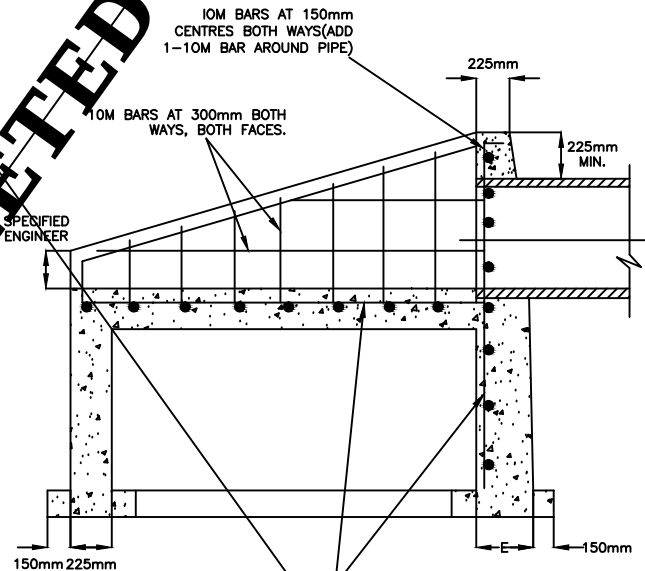
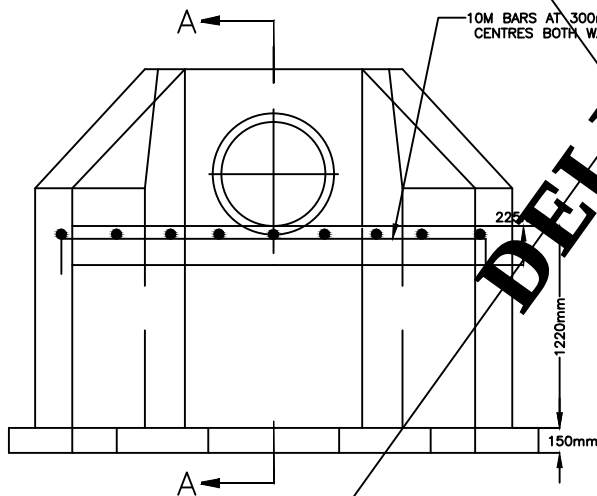


			Scale:	N.T.S.
			Rev. Date:	JUNE 2010
No.	REVISION	DATE	Std. No.:	304



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

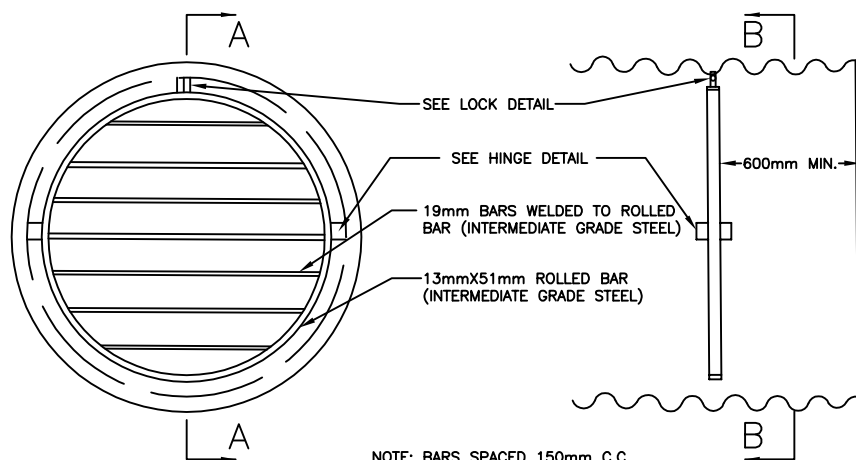
ENDWALL DIMENSIONS													
PIPE DIAMETER IN MILLIMETRES													
	600	675	750	825	900	975	1050	1200	1350	1500	1650	1800	
A	1070	1140	1220	1300	1370	1450	1520	1680	1830	1980	2130	2290	
B	2440	2440	2440	2400	2440	3050	3050	3050	3050	3050	3050	3050	
C	2770	2770	2770	2770	2770	2850	3450	3450	3450	3450	3450	3450	
D	1420	1500	1580	1650	1730	1800	1880	2030	2180	2340	2490	2640	
E	310	310	310	310	310	380	380	380	380	380	380	380	
F	80	80	80	80	80	150	150	150	150	150	150	150	
G	1550	1630	1700	1780	1850	2010	2080	2240	2390	2540	2690	2850	
H	2390	2460	2540	2620	2690	2770	3150	3300	3450	3610	3760	3910	

CONCRETE ENDWALL WITH
APRON FOR STORM
SEWER OUTLET

The Corporation Of The
**CITY OF
KITCHENER**



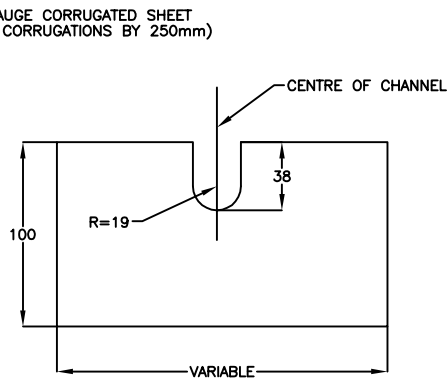
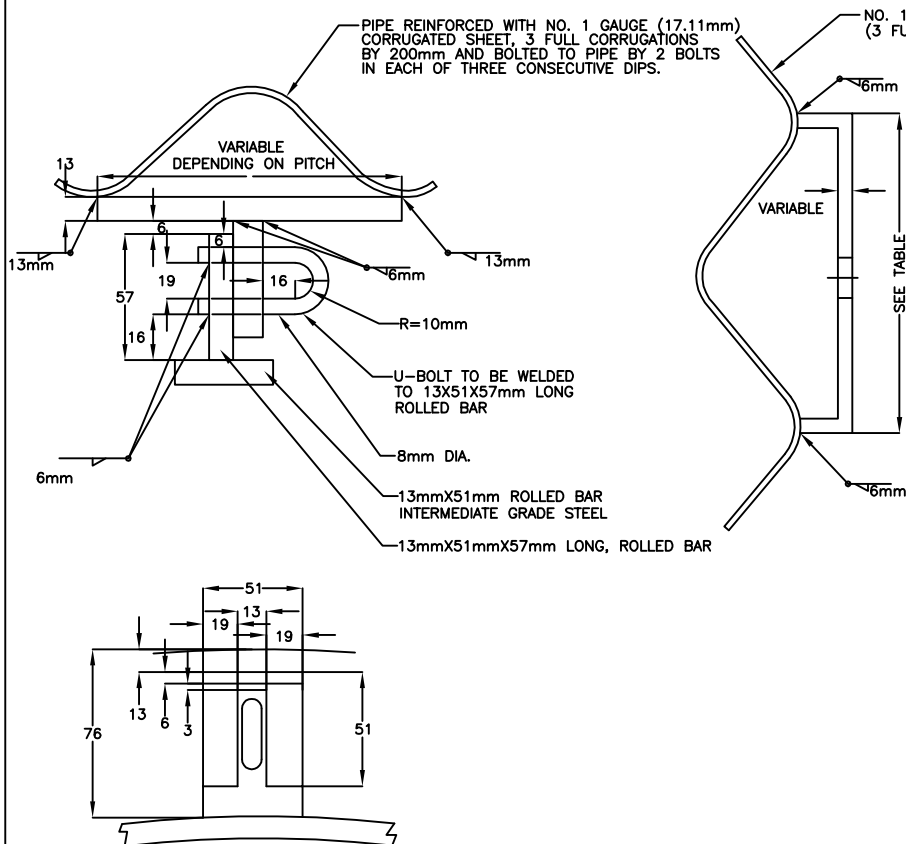
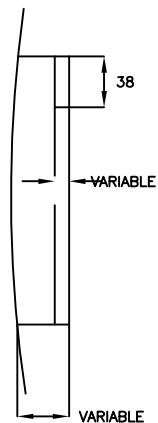
No.	REVISION	DATE	Scale:	N.T.S.
			Rev. Date:	JUNE 2010
			Std. No.:	305



SECTION B-B

SECTION A-A

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



HINGE DETAIL

PITCH OF CORR. METAL PIPE	PITCH OF CORR. METAL PIPE
68	203X57 a 5.22kg/0.3m
76	229X64 a 6.08kg/0.3m
152	152X51 a 5.90kg/0.3m

NOTES

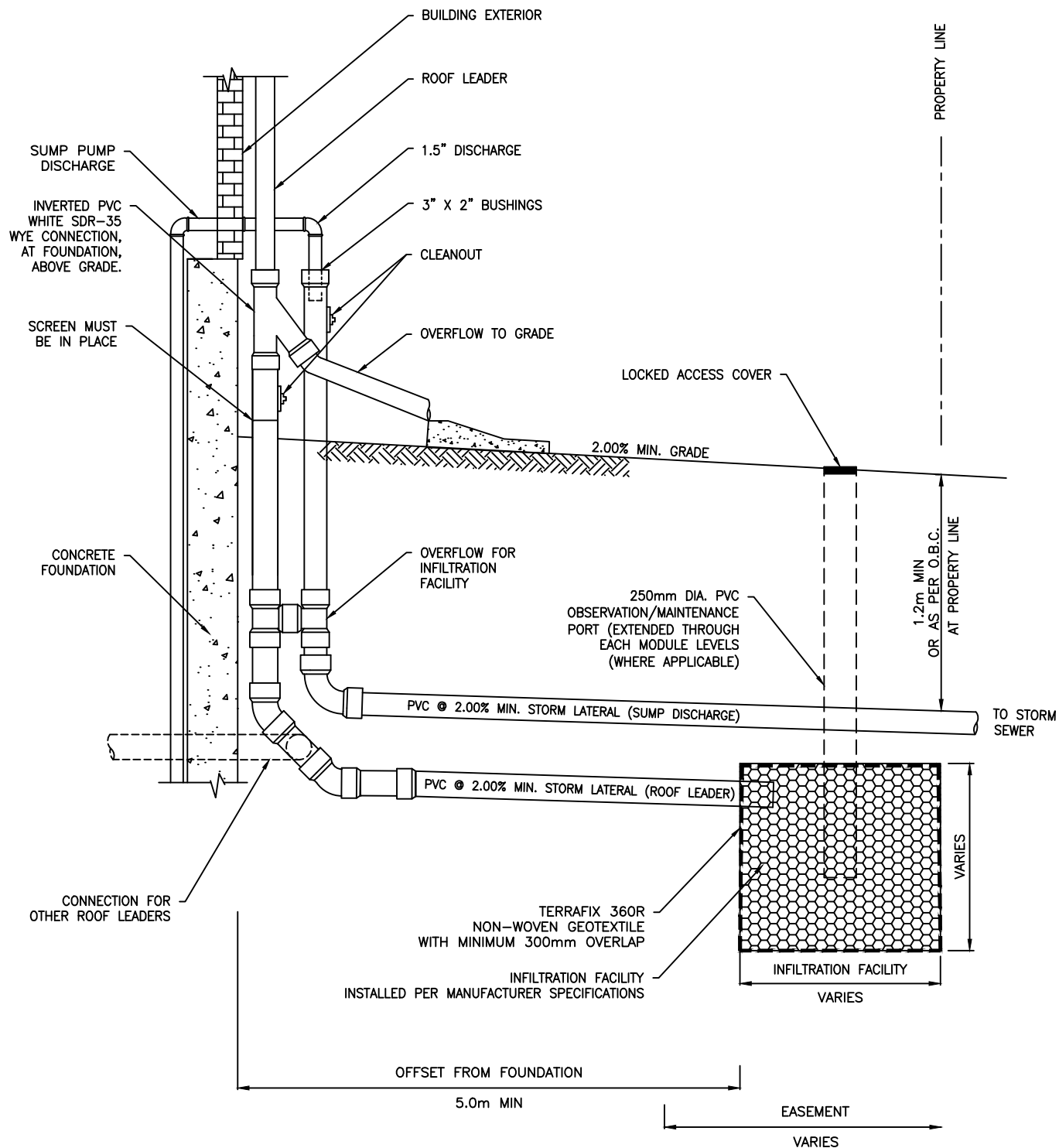
1. CORRUGATED SHEET TO BE NO.1 GAUGE (7.11mm) AND BOLTED TO PIP BY 2 BOLTS IN EACH OF 3 CONSECUTIVE DIPS.
2. FOR PIPE 2400mm AND OVER GRATE BARS INCREASED TO 25mm. THREE VERTICAL 25mm BARS TO SPAN THE THREE CENTRAL HORIZ. BARS AT 600mm INTERVALS.
3. UNLESS NOTED ALL DIMENSIONS IN MILLIMETRES.

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

The Corporation Of The
**CITY OF
KITCHENER**



No.	REVISION	DATE	Scale:	N.T.S.
			Rev. Date:	JUNE 2010
			Std. No.:	306

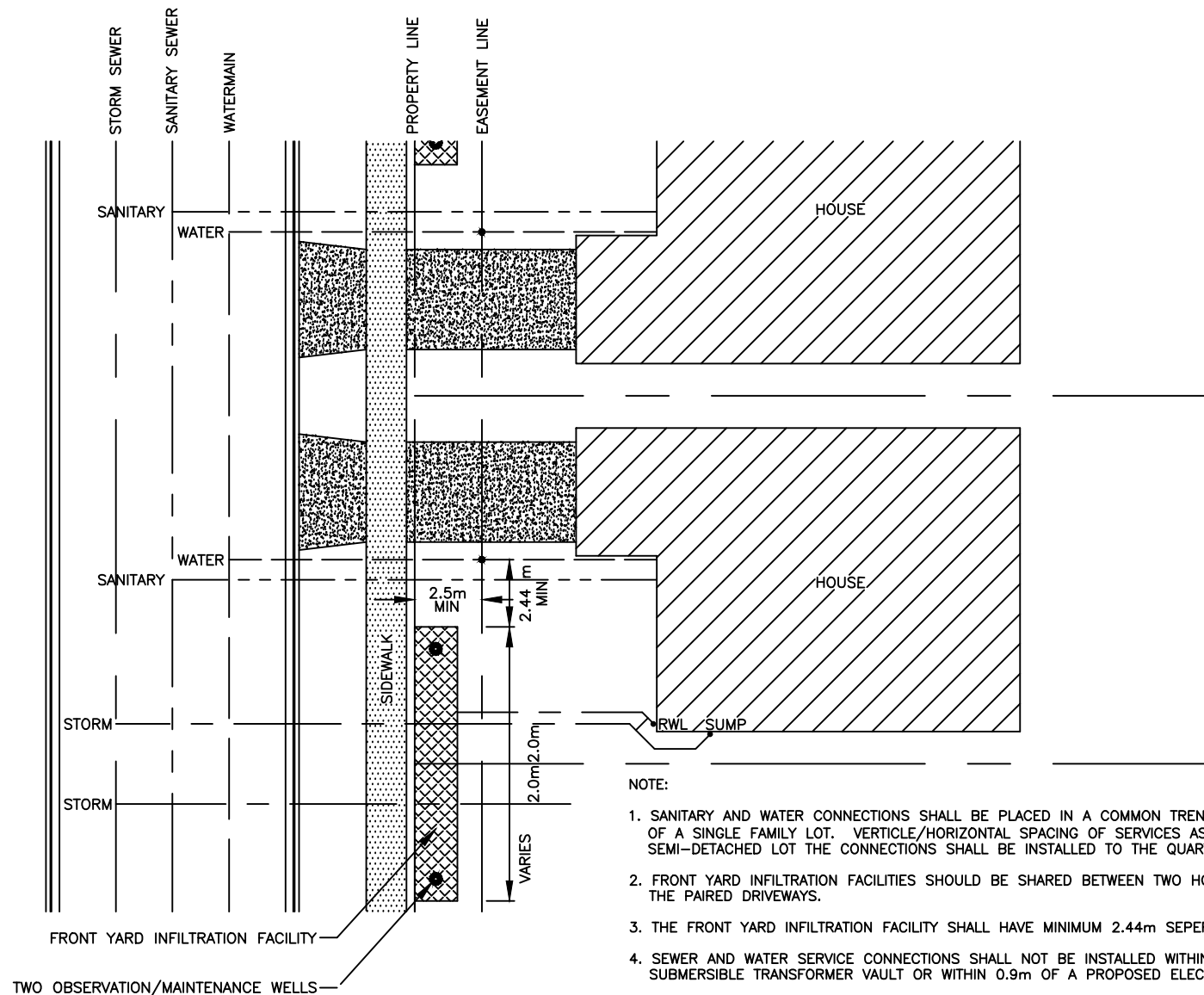


DOWNSPOUT CONNECTION DETAIL
FOR FRONT YARD
INFILTRATION GALLERIES

The Corporation Of The
**CITY OF
KITCHENER**



2	MANUAL UPDATE	APR 2015	Scale:	N.T.S.
1	MANUAL UPDATE	JULY 2012	Rev. Date:	JUNE 2010
No.	REVISION	DATE	Std. No.:	307



NOTE:

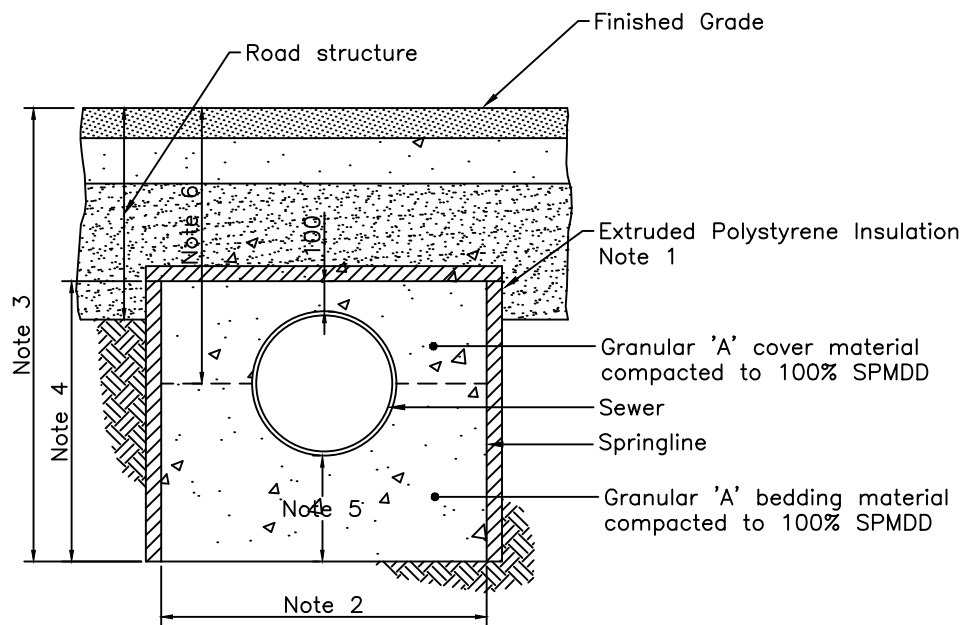
1. SANITARY AND WATER CONNECTIONS SHALL BE PLACED IN A COMMON TRENCH AND BE INSTALLED TO THE CENTER OF A SINGLE FAMILY LOT. VERTICLE/HORIZONTAL SPACING OF SERVICES AS PER M.O.E. AND O.B.C. FOR A SEMI-DETACHED LOT THE CONNECTIONS SHALL BE INSTALLED TO THE QUARTER POINTS OF THE LOT.
2. FRONT YARD INFILTRATION FACILITIES SHOULD BE SHARED BETWEEN TWO HOUSES ON THE OPPOSITE SIDE OF THE PAIRED DRIVEWAYS.
3. THE FRONT YARD INFILTRATION FACILITY SHALL HAVE MINIMUM 2.44m SEPERATION 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.

**FRONT YARD INFILTRATION
FACILITY DETAIL**

The Corporation Of The
**CITY OF
KITCHENER**



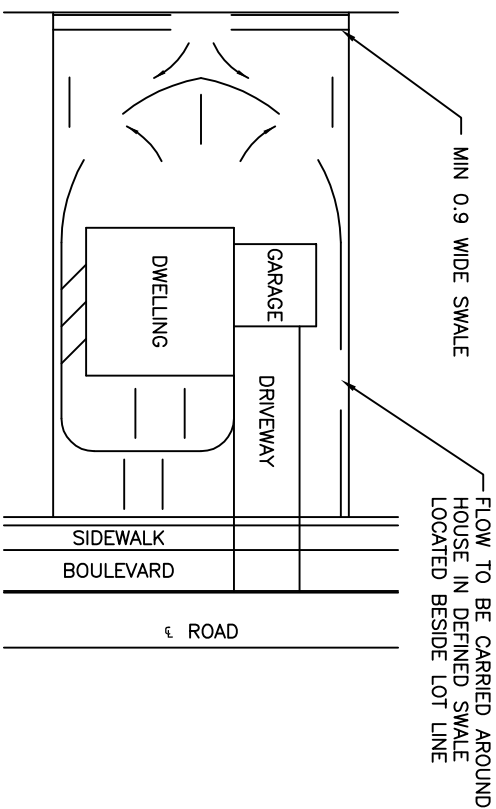
			SCALE:	N.T.S.
2	MANUAL UPDATE	APRIL 2015	DATE:	JUNE 2010
1	MANUAL UPDATE	JULY 2012		
NO.	REVISION	DATE	STANDARD No.:	308



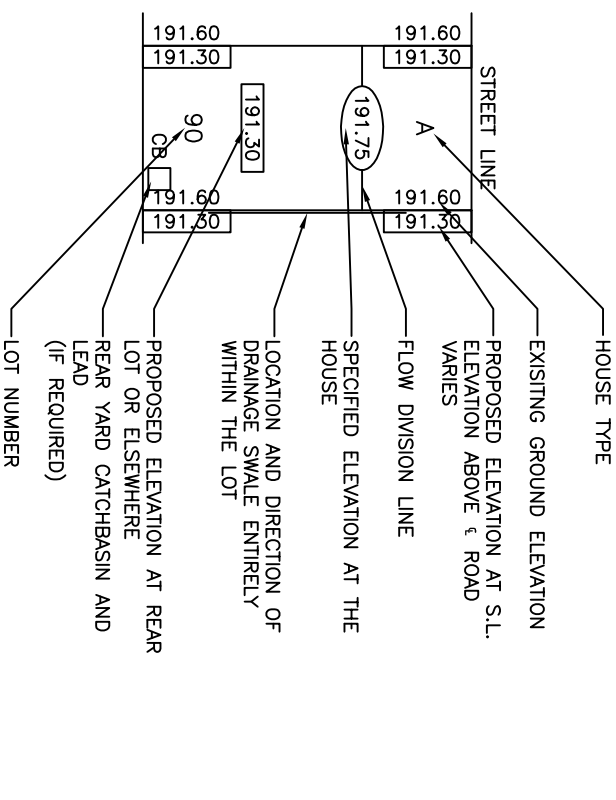
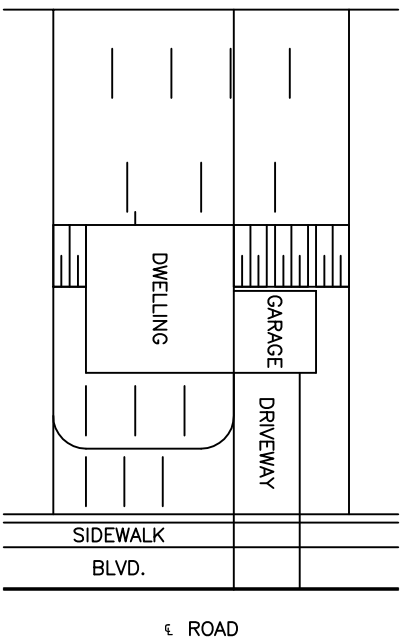
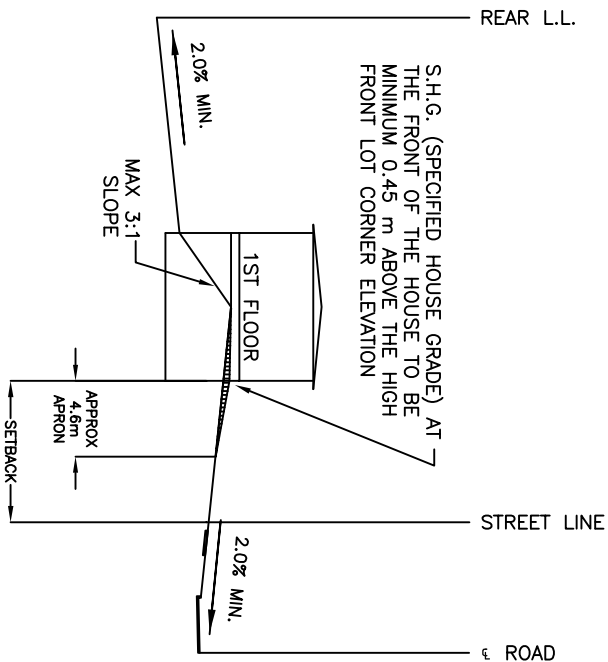
INSULATION OF SEWERS

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.



1. DIFFERENCE BETWEEN BUILDING LINE ELEVATION AND SIDE YARD SWALE ELEVATION IS TO BE MIN. 0.15m AND MAX 0.30m ACCORDING TO SIDE YARD WIDTH.
2. ALL SWALES TO BE MIN 2.0% WITH MIN. 100mm Ø PERFORATED SUBDRAIN (OPSS 405).
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 ON GARAGE SIDE IF NO SIDE DOOR.
4. SLOPES WITHIN LOTS ARE TO HAVE A MAX GRADE OF 3:1. STRUCTURAL RETAINING WALL REQUIRED WHERE MAX. SLOPE EXCEEDED.
5. DIFFERENCE BETWEEN SIDE DOOR SILL AND GROUND ELEVATION TO BE MAX. 0.40m.
6. DIFFERENCE BETWEEN TOP OF FOUNDATION WALL AND BUILDING LINE ELEVATION TO BE MIN 0.15m.
7. A MIN OF 6m OF THE REAR LOT AREA FROM THE BACK OF THE HOUSE SHALL BE GRADED BETWEEN 2% TO A MAX 6%.
8. TYPE "A" AND TYPE "C" LOTS WITH THROUGH DRAINAGE FROM OTHER TYPE LOTS ABUTTING THE REAR LOT LINE ARE TO BE A MIN. OF 12m IN WIDTH.
9. DRIVEWAY GRADES:
FROM CURB TO STREET LINE: MIN. 2.0%, OPTIMUM 4.0%, MAX. 8.0%



GENERAL NOTES (FOR ALL GRADING TYPES)

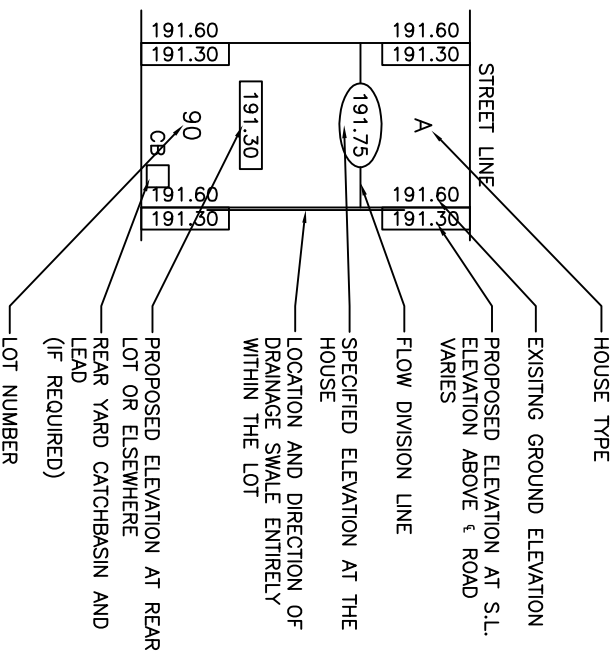
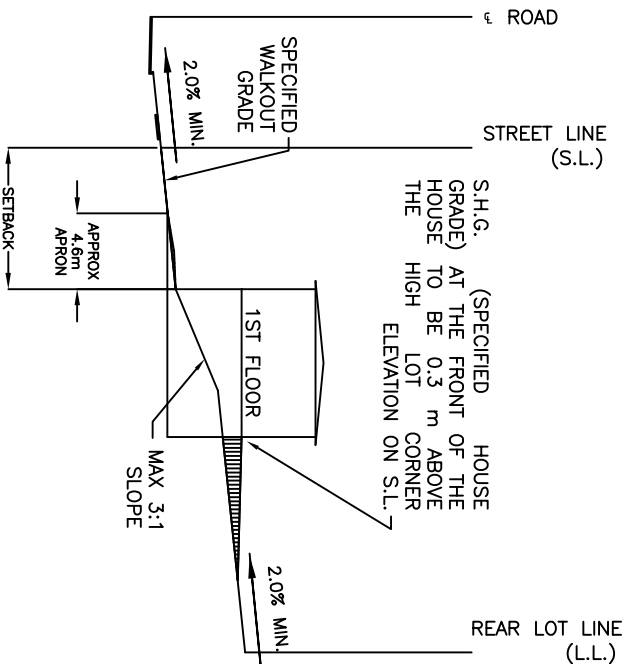
1. DIFFERENCE BETWEEN BUILDING LINE ELEVATION AND SIDE YARD SWALE ELEVATION IS TO BE MIN. 0.15m AND MAX 0.30m ACCORDING TO SIDE YARD WIDTH.
2. ALL SWALES TO BE MIN 2.0% WITH MIN. 100mm ϕ PERFORATED SUBDRAIN (OPSS 405).
3. A MIN 0.3 m APRON IS TO BE MAINTAINED AGAINST ALL DWELLING UNITS TO ALLOW ACCESS FROM SIDE ENTRANCES TO THE FRONT AND REAR YARDS, 0.3 m ACCESS TO BE ON GARAGE SIDE IF NO SIDE DOOR.
4. SLOPES WITHIN LOTS ARE TO HAVE A MAX GRADE OF 3:1. STRUCTURAL RETAINING WALL REQUIRED WHERE MAX. SLOPE EXCEEDED.
5. DIFFERENCE BETWEEN SIDE DOOR SILL AND GROUND ELEVATION TO BE MAX. 0.40m.
6. DIFFERENCE BETWEEN TOP OF FOUNDATION WALL AND BUILDING LINE ELEVATION TO BE MIN 0.15m.
7. A MIN OF 6m OF THE REAR LOT AREA FROM THE BACK OF THE HOUSE SHALL BE GRADED BETWEEN 2% TO A MAX 6%.
8. TYPE "A" AND TYPE "C" LOTS WITH THROUGH DRAINAGE FROM OTHER TYPE LOTS ABUTTING THE REAR LOT LINE ARE TO BE A MIN. OF 12m IN WIDTH.
9. DRIVEWAY GRADES:
FROM CURB TO STREET LINE: MIN. 2.0%, OPTIMUM 4.0%, MAX. 8.0%

URBAN LOT GRADING TYPE 'B'—SPLIT
DRAINAGE WITH WALKOUT

The Corporation Of The
**CITY OF
KITCHENER**

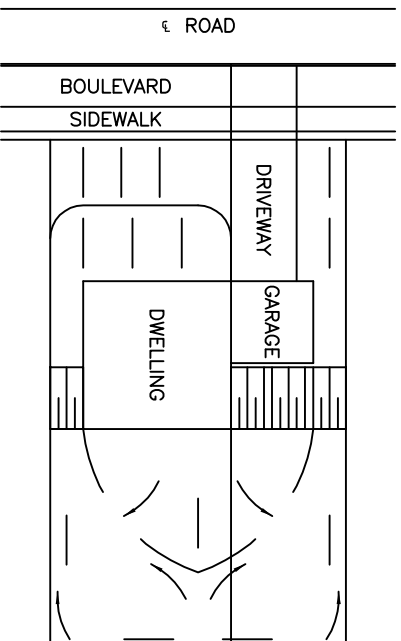


NO.	REVISION	DATE	SCALE:	N.T.S.
			DATE:	JUNE 2010
			STANDARD No.:	401



GENERAL NOTES (FOR ALL GRADING TYPES)

1. DIFFERENCE BETWEEN BUILDING LINE ELEVATION AND SIDE YARD SWALE ELEVATION IS TO BE MIN. 0.15m AND MAX 0.30m ACCORDING TO SIDE YARD WIDTH.
2. ALL SWALES TO BE MIN 2.0% WITH MIN. 100mm ϕ PERFORATED SUBDRAIN (OPSS 405).
3. A MIN 0.3 m APRON IS TO BE MAINTAINED AGAINST ALL DWELLING UNITS TO ALLOW ACCESS FROM SIDE ENTRANCES TO THE FRONT AND REAR YARDS, 0.3 m ACCESS TO BE ON GARAGE SIDE IF NO SIDE DOOR.
4. SLOPES WITHIN LOTS ARE TO HAVE A MAX GRADE OF 3:1. STRUCTURAL RETAINING WALL REQUIRED WHERE MAX. SLOPE EXCEEDED.
5. DIFFERENCE BETWEEN SIDE DOOR SILL AND GROUND ELEVATION TO BE MAX. 0.40m.
6. DIFFERENCE BETWEEN TOP OF FOUNDATION WALL AND BUILDING LINE ELEVATION TO BE MIN 0.15m.
7. A MIN OF 6m OF THE REAR LOT AREA FROM THE BACK OF THE HOUSE SHALL BE GRADED BETWEEN 2% TO A MAX 6%.
8. TYPE "A" AND TYPE "C" LOTS WITH THROUGH DRAINAGE FROM OTHER TYPE LOTS ABUTTING THE REAR LOT LINE ARE TO BE A MIN. OF 12m IN WIDTH.
9. DRIVEWAY GRADES:
FROM CURB TO STREET LINE: MIN. 2.0%, OPTIMUM 4.0%, MAX. 8.0%

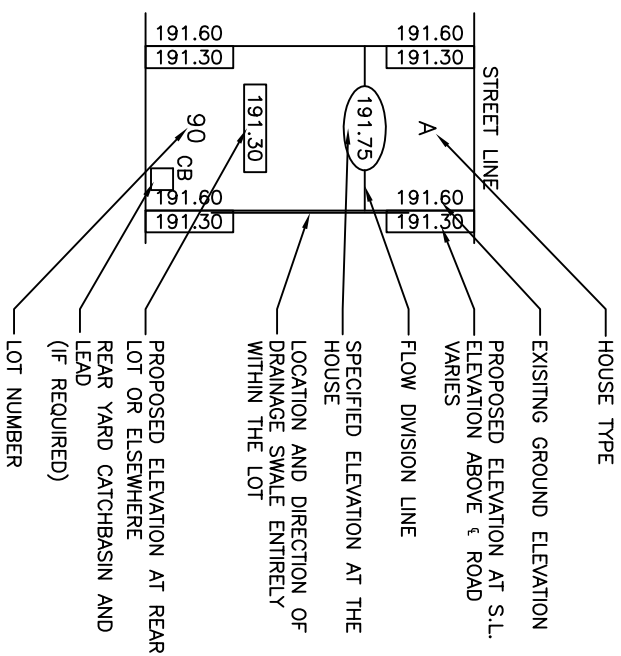
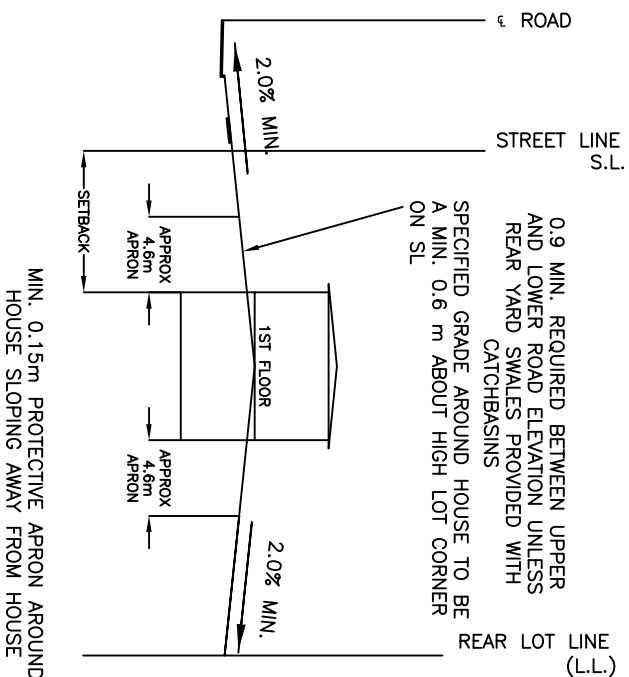


URBAN LOT GRADING TYPE 'C'-BACK TO FRONT DRAINAGE WITH WALKOUT

The Corporation Of The
CITY OF KITCHENER

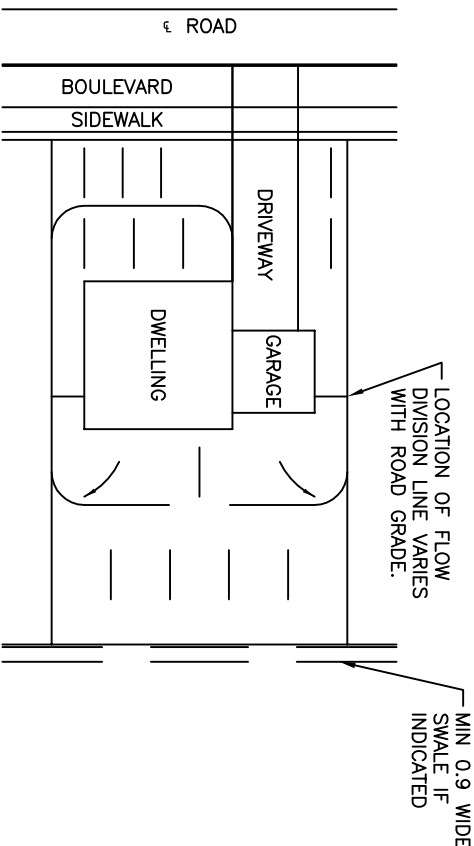


NO.	REVISION	DATE	SCALE:	N.T.S.
			DATE:	JUNE 2010
			STANDARD No.:	402



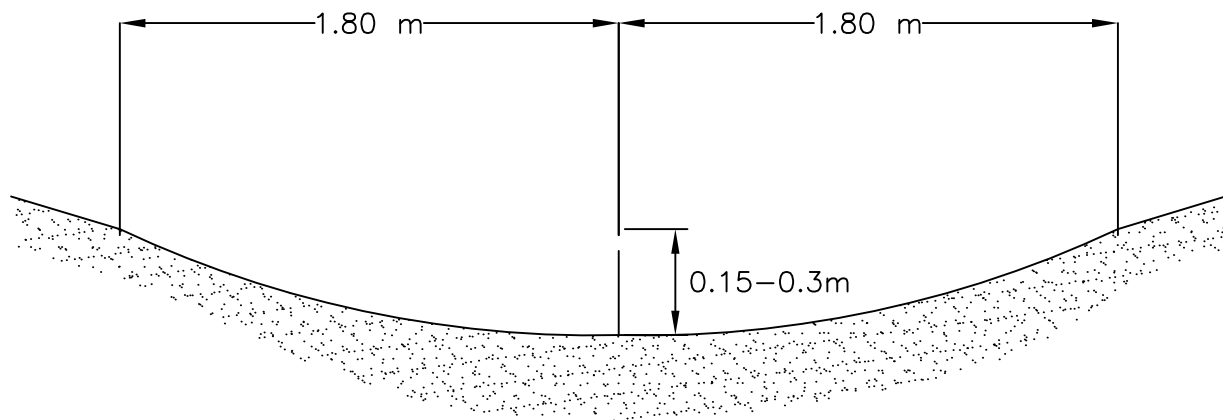
GENERAL NOTES (FOR ALL GRADING TYPES)

1. DIFFERENCE BETWEEN BUILDING LINE ELEVATION AND SIDE YARD SWALE ELEVATION IS TO BE MIN. 0.15m AND MAX 0.30m ACCORDING TO SIDE YARD WIDTH.
2. ALL SWALES TO BE MIN 2.0% WITH MIN. 100mm ϕ PERFORATED SUBDRAIN (OPSS 405).
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 ON GARAGE SIDE IF NO SIDE DOOR.
4. SLOPES WITHIN LOTS ARE TO HAVE A MAX GRADE OF 3:1. STRUCTURAL RETAINING WALL REQUIRED WHERE MAX. SLOPE EXCEEDED.
5. DIFFERENCE BETWEEN SIDE DOOR SILL AND GROUND ELEVATION TO BE MAX. 0.40m.
6. DIFFERENCE BETWEEN TOP OF FOUNDATION WALL AND BUILDING LINE ELEVATION TO BE MIN 0.15m.
7. A MIN OF 6m OF THE REAR LOT AREA FROM THE BACK OF THE HOUSE SHALL BE GRADED BETWEEN 2% TO A MAX 6%.
8. TYPE "A" AND TYPE "C" LOTS WITH THROUGH DRAINAGE FROM OTHER TYPE LOTS ABUTTING THE REAR LOT LINE ARE TO BE A MIN. OF 12m IN WIDTH.
9. DRIVEWAY GRADES:
FROM CURB TO STREET LINE: MIN. 2.0%, OPTIMUM 4.0%, MAX. 8.0%



URBAN LOT GRADING TYPE 'D'-SPLIT DRAINAGE

The Corporation Of The CITY OF KITCHENER					
			SCALE:		N.T.S.
			DATE:		JUNE 2010
			STANDARD No.:		403
NO.	REVISION	DATE			



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

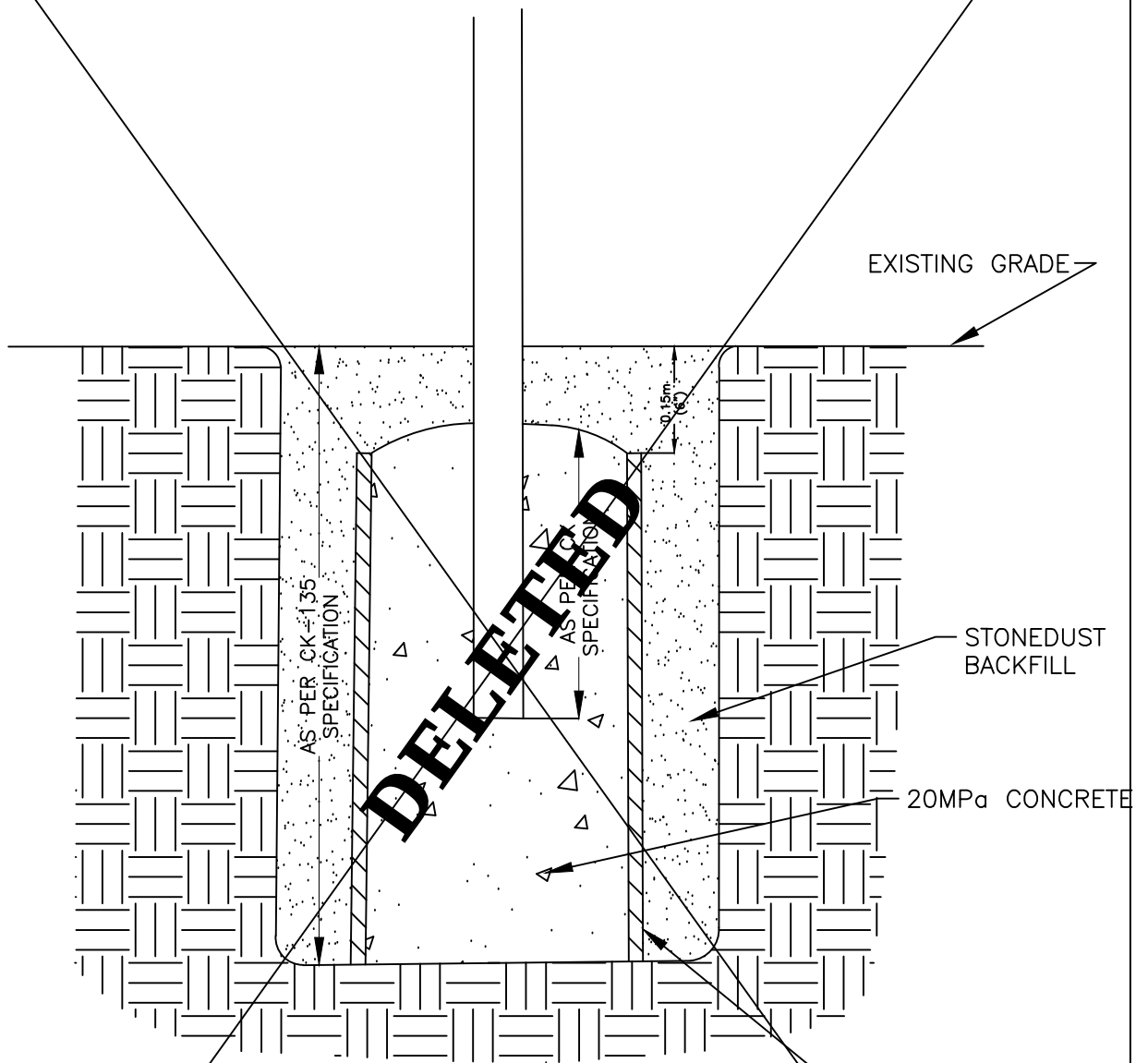
MAXIMUM SWALES DEPTH 300 mm

CROSS SECTION OF GRASS
SWALES

The Corporation Of The
**CITY OF
KITCHENER**



			Scale:	N.T.S.
			Rev. Date:	JUNE 2010
No.	REVISION	DATE	Std. No.:	404



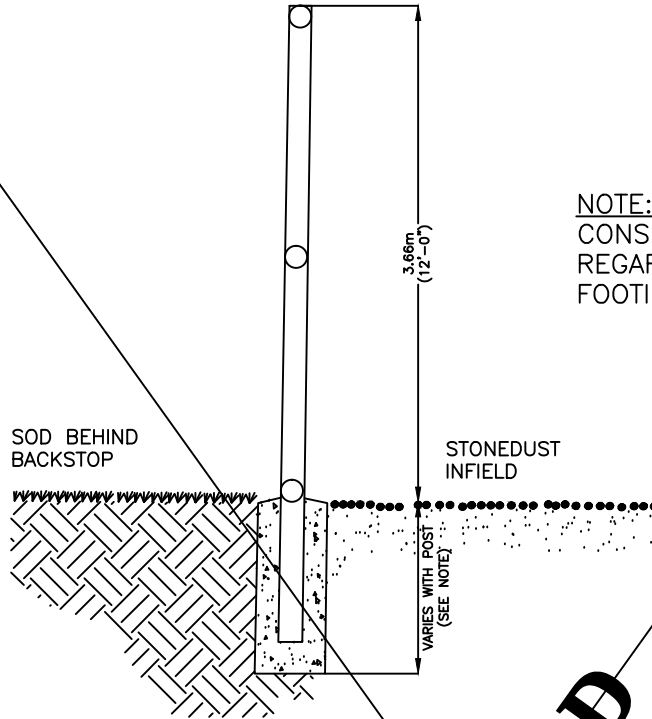
NOTE:
ALL POST DEPTH SHALL BE
AS PER CK-135 SPECIFICATION.

FENCE FOOTING

The Corporation Of The
**CITY OF
KITCHENER**

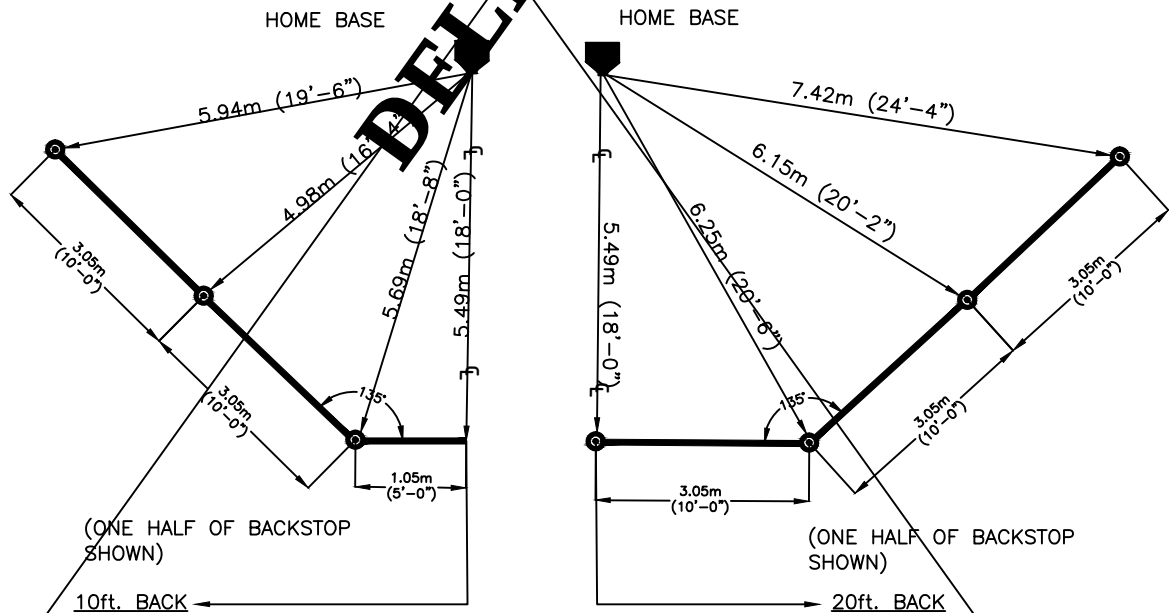


No.	REVISION	DATE	Std. No.:	500
Scale:			N.T.S.	
Rev. Date:			JUNE 2010	



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

TYPICAL SECTION



PLAN VIEW

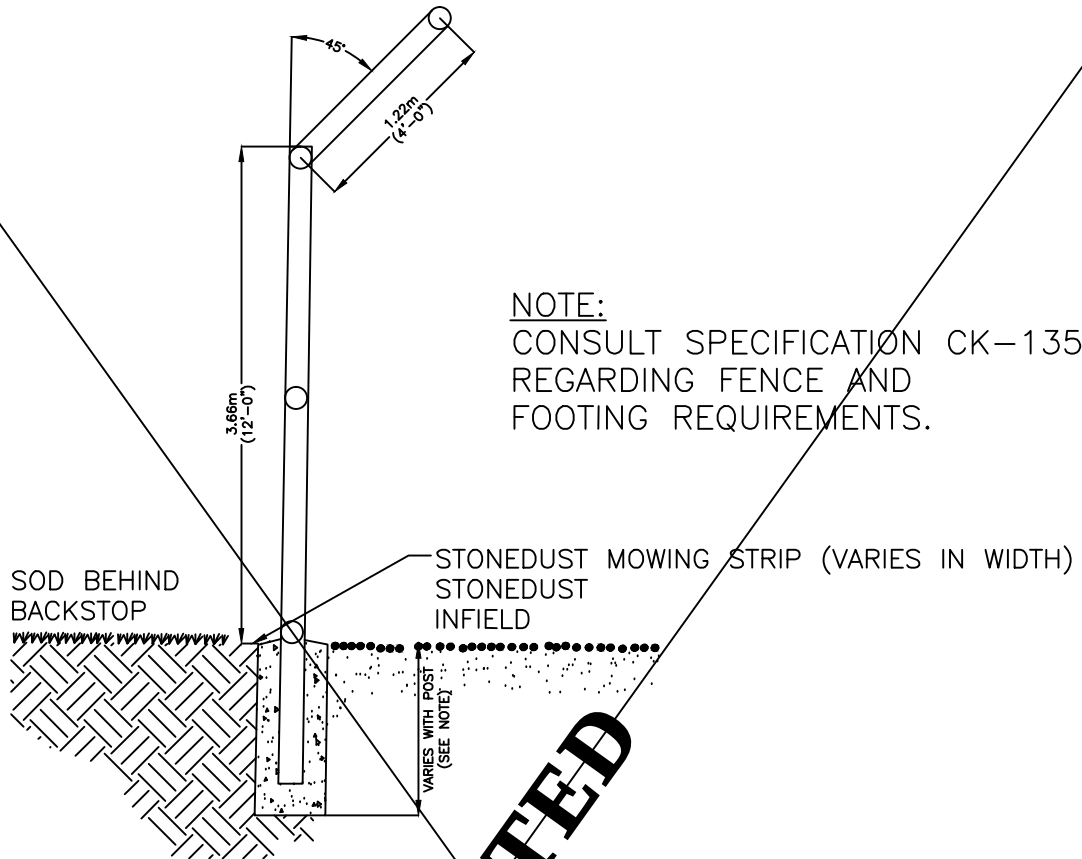
BACKSTOP LAYOUT

The Corporation Of The
**CITY OF
KITCHENER**

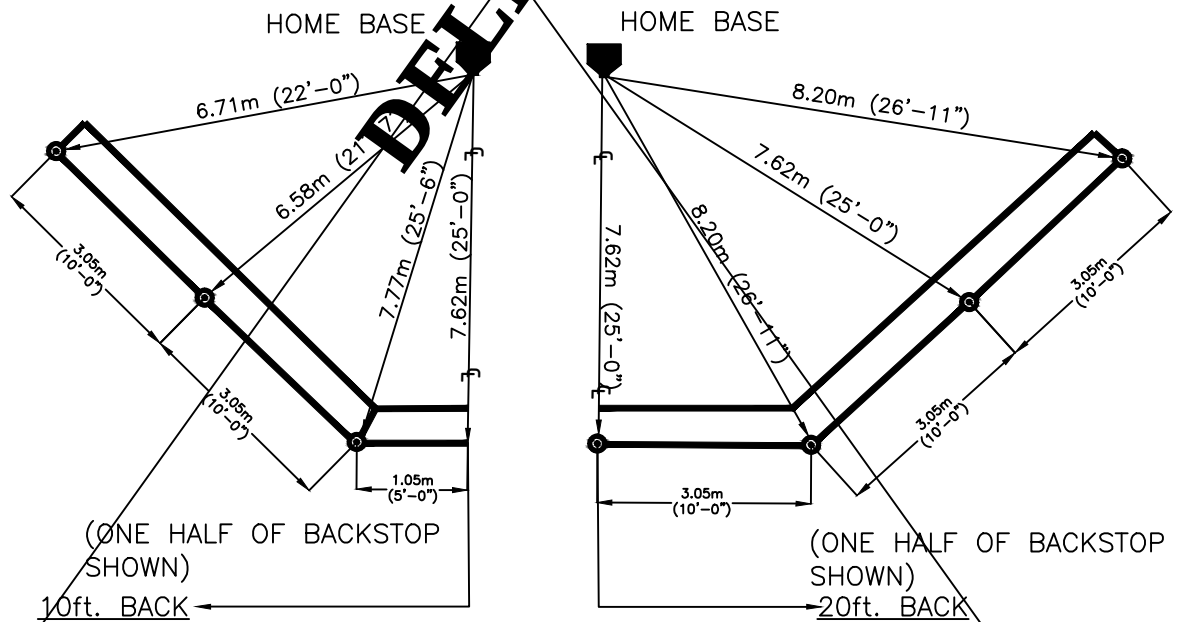


No.	REVISION	DATE	Std. No.:	501
			Scale:	N.T.S.
			Rev. Date:	JUNE 2010

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



TYPICAL SECTION



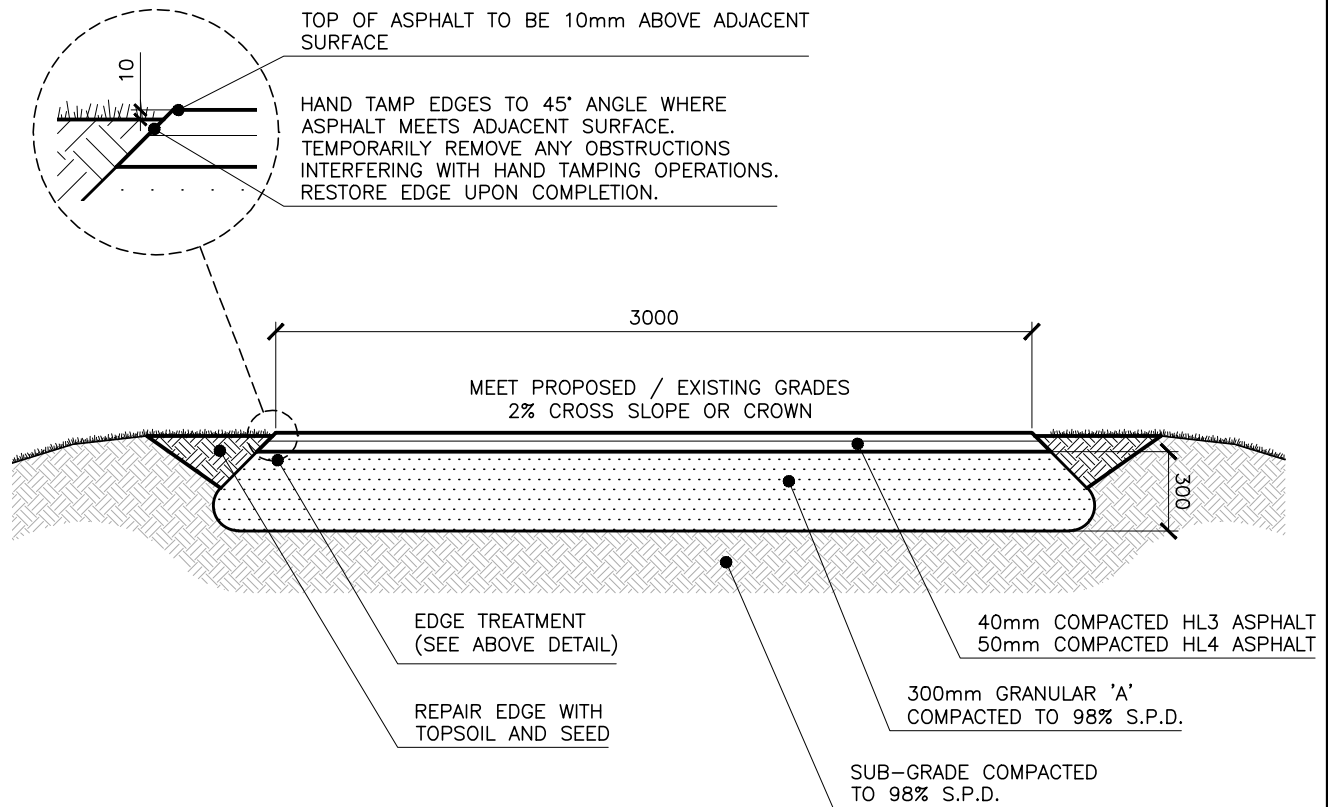
PLAN VIEW

MAJOR BACKSTOP

The Corporation Of The
**CITY OF
KITCHENER**



			Scale:	N.T.S.
			Rev. Date:	JUNE 2010
No.	REVISION	DATE	Std. No.:	502



SECTION

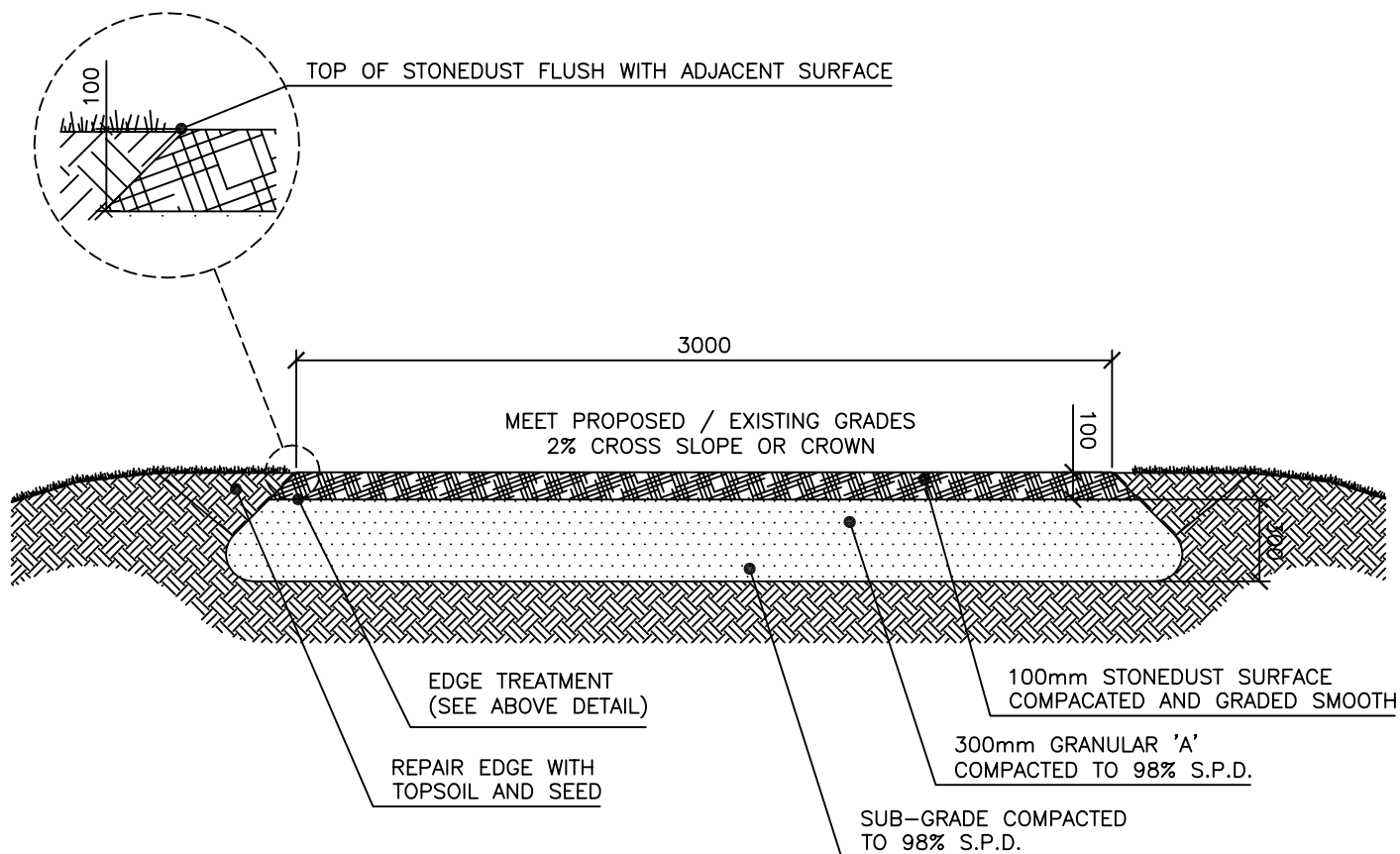
NOTE: EXCAVATE TO MINIMUM DEPTH OF 15" [390mm] OR END OF TOPSOIL LAYER TO A MAXIMUM DEPTH OF 33" [840mm]. FILL ADDITIONAL EXCAVATED TOP SOIL WITH COMPACTED GRANULAR 'B' BASE TO A MAXIMUM DEPTH OF 18" [450mm]

COMMUNITY TRAIL - ASPHALT

The Corporation Of The
**CITY OF
KITCHENER**

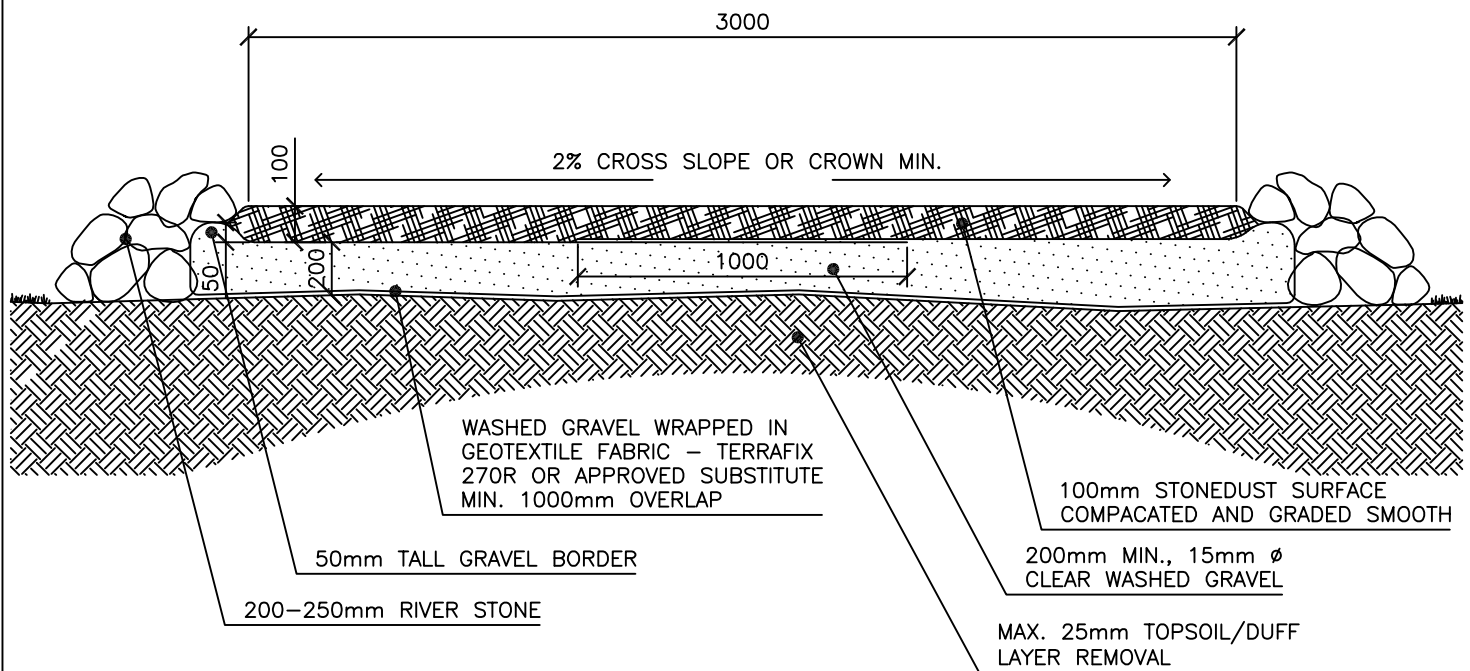


				N.T.S.
1	Manual Update	2012		JUNE 2010
No.	REVISION	DATE		503



SECTION

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]



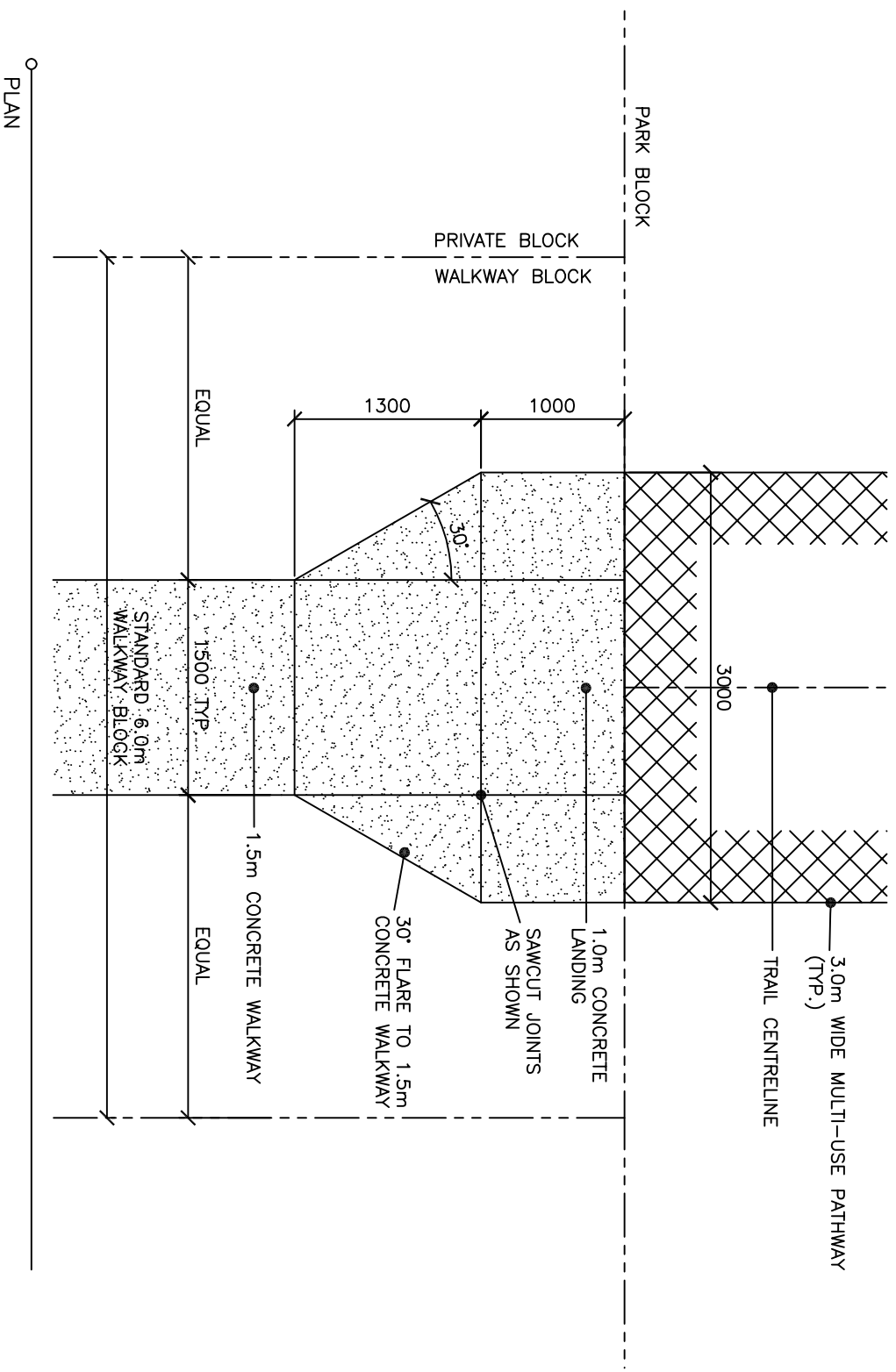
SECTION

COMMUNITY TRAIL -
WOODLAND CONDITION

The Corporation Of The
**CITY OF
KITCHENER**

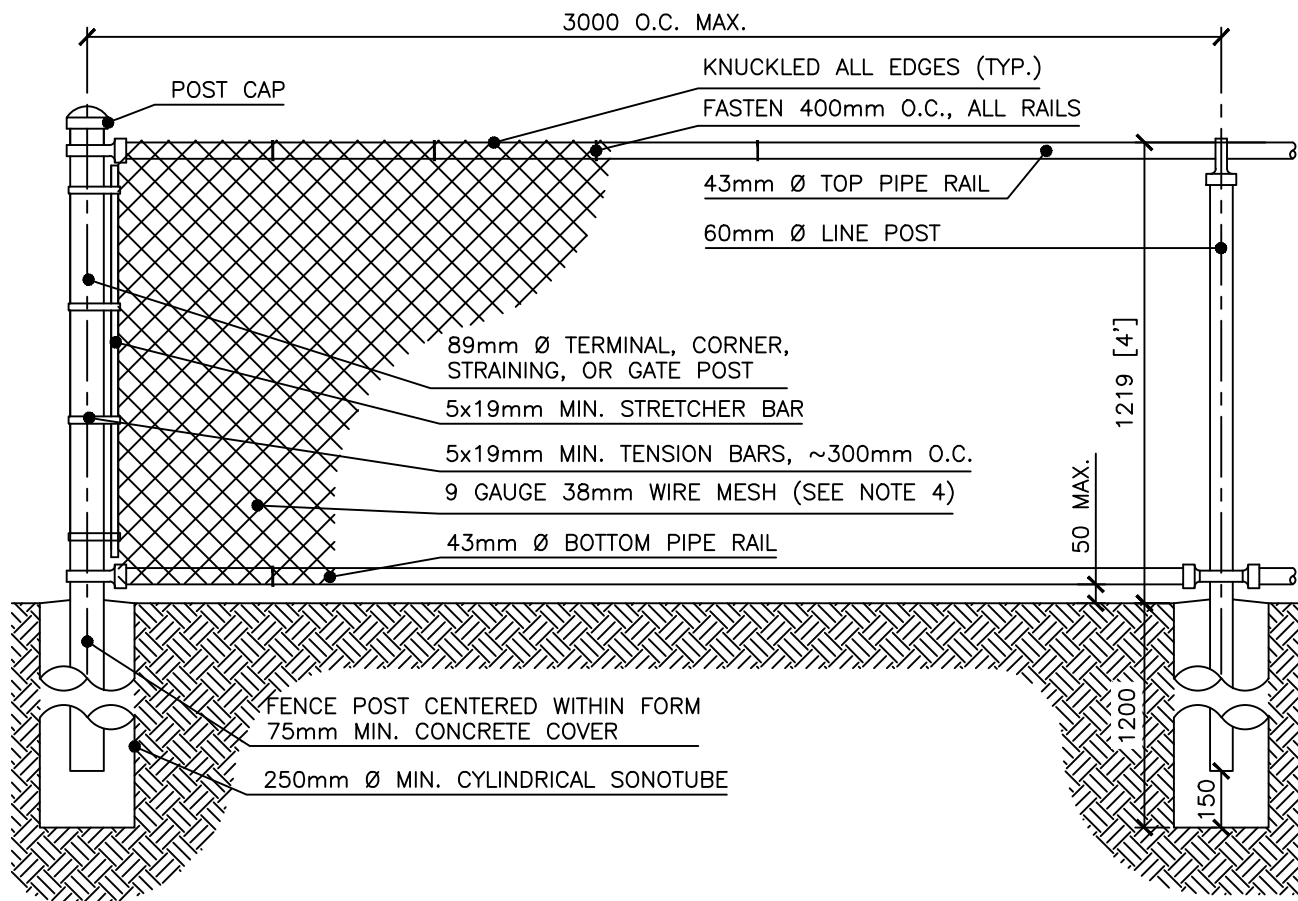


No.	REVISION	DATE	Std. No.:	505
			Scale:	N.T.S.
			Rev. Date:	JUNE 2010



- NOTE:
1. FOR USE WHERE WALKWAY BLOCK TERMINATES AT PARKLAND.
 2. REFER TO CITY OF KITCHENER STANDARDS FOR CONCRETE, JOINTING, AND WALKWAY BLOCK DETAILS

WALKWAY BLOCK SIDEWALK TERMINUS AT PARKLAND			The Corporation Of The CITY OF KITCHENER									
			NO.		REVISION		DATE		SCALE:		N.T.S.	
									DATE:		JUNE 2010	
									STANDARD No.:		506	



NOTES:

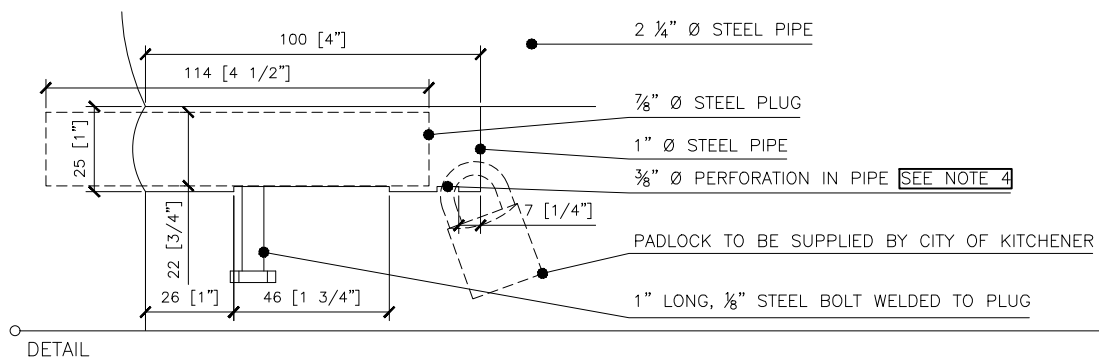
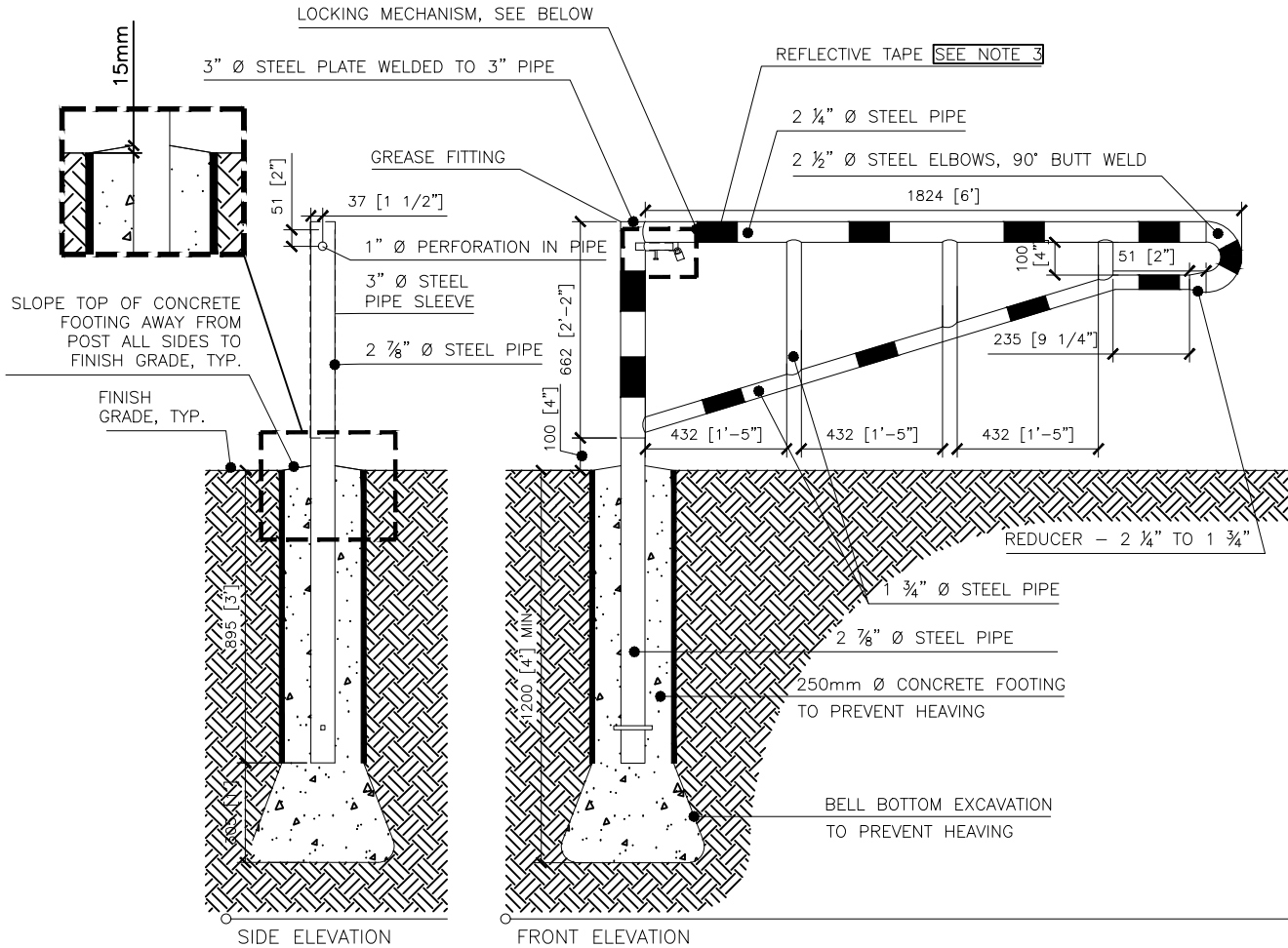
1. ALL FENCING AND FASTENERS TO BE GALVANIZED PRIOR TO FABRICATION.
2. EXTRUDED BLACK VINYL COATING MAY BE APPLIED PROVIDED ALL FENCING MATERIALS ARE GALVANIZED PRIOR TO COATING. WHERE VINYL COATING APPLIED, ALL FENCING ELEMENTS TO BE COATED.
3. MID-BRACING RAILS REQUIRED WHERE FENCE HEIGHT IS GREATER 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.

CHAINLINK FENCE
WALKWAY BLOCK

The Corporation Of The
**CITY OF
KITCHENER**



			Scale:	N.T.S.
1	MANUAL UPDATE	APR 2015	Date:	MARCH 2012
No.	REVISION	DATE	Std. No.:	507



NOTES:

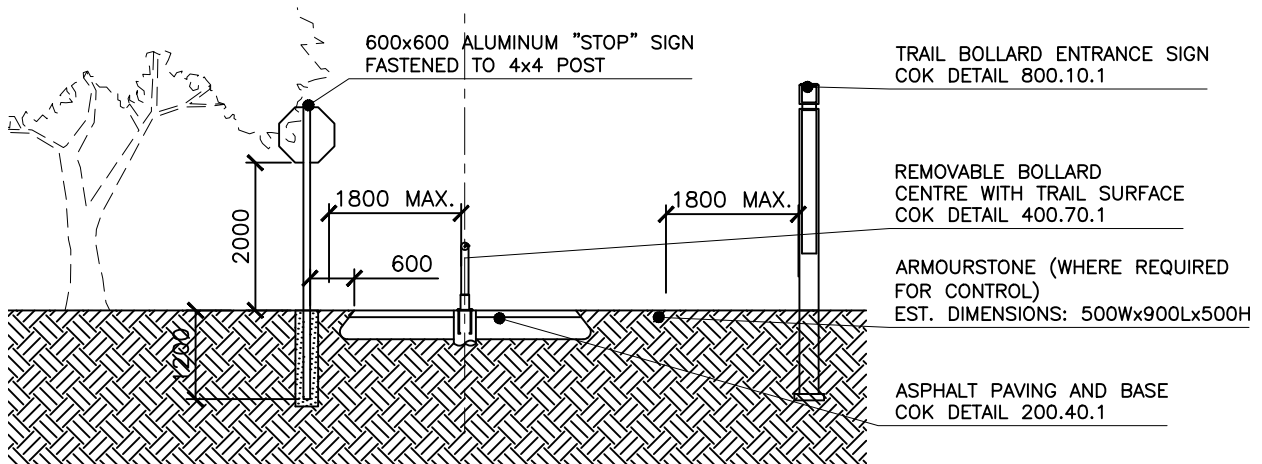
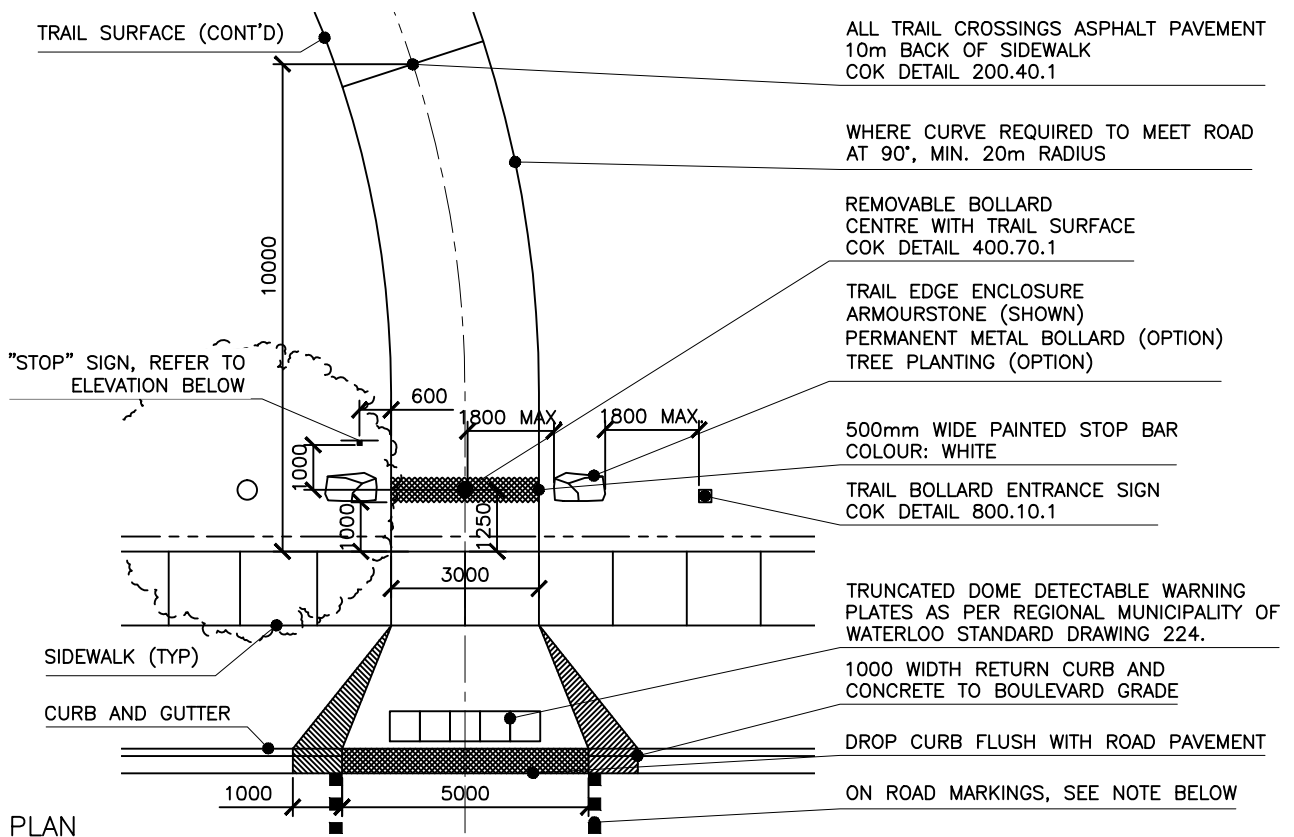
1. ALL CONNECTIONS ARE WELDED WITH COMPLETE SOLID WELD
2. ALL STEEL ON GATES TO BE HOT DIPPED GALVANIZED AFTER FABRICATION
3. 76.1mm WIDE FLUORESCENT YELLOW GREEN DIAMOND GRADE DG REFLECTIVE TAPE MANUFACTURER 3M
4. LOCKING HOLE IS TO BE 3/8" Ø MINIMUM
5. CHECK GATE LOCKS IN THE OPEN AND LOCK POSITION

METAL P-LOOP
GATE

The Corporation Of The
**CITY OF
KITCHENER**



			Scale:	N.T.S.
1	MANUAL UPDATE	JAN. 2022	Rev. Date:	MARCH 2012
No.	REVISION	DATE	Std. No.:	508



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.

TRAIL ROAD CROSSING -
TYPICAL CONDITION

The Corporation Of The
**CITY OF
KITCHENER**



No.

REVISION

DATE

Scale:

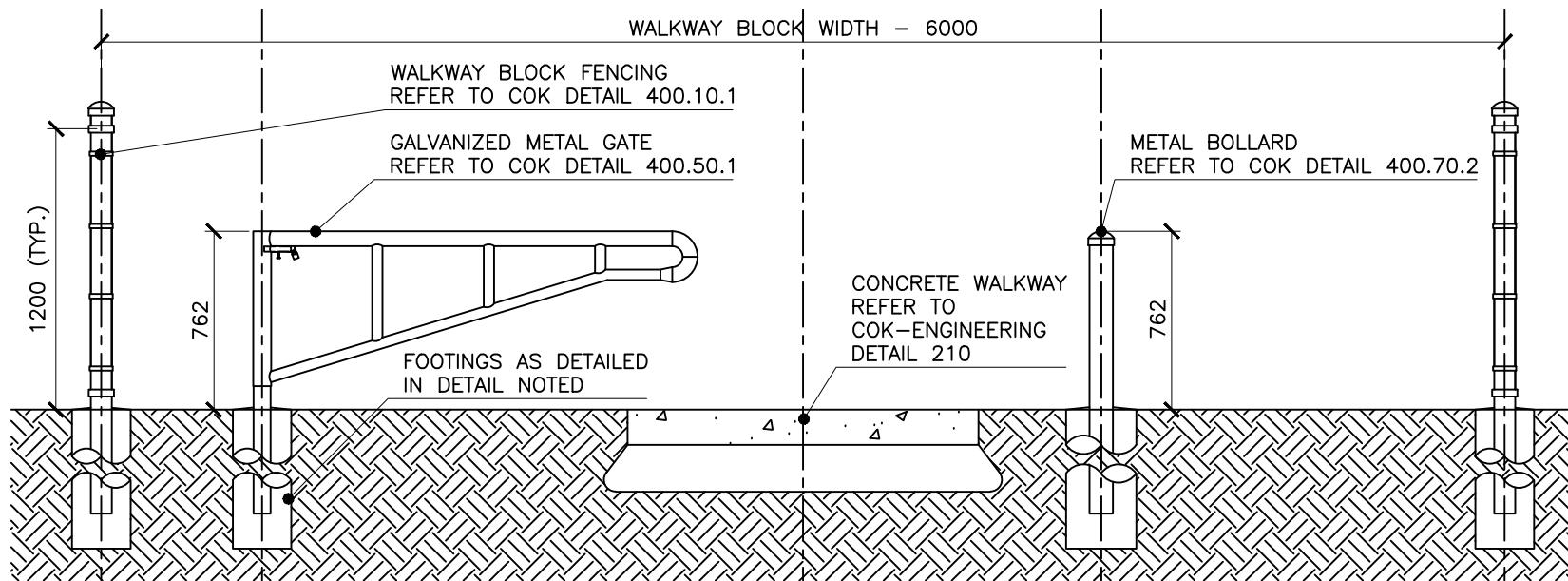
N.T.S.

Rev. Date:

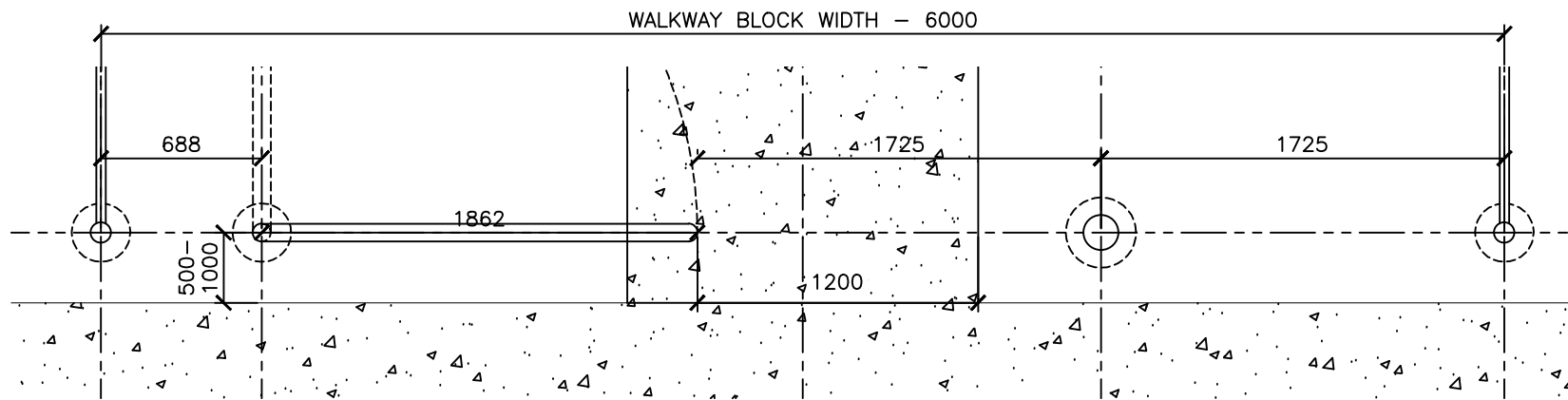
APRIL 2015

Std. No.:

509



PLAN



ELEVATION

TRAIL ENTRANCE LAYOUT -
WALKWAY BLOCK FROM LOCAL ROAD

The Corporation Of The
**CITY OF
KITCHENER**



			SCALE:	N.T.S.
			DATE:	APRIL 2015
NO.	REVISION	DATE	STANDARD No.:	510