

HALDIMAND COUNTY

DESIGN CRITERIA

SECTION J

WATER DISTRIBUTION SYSTEM

Reviewed/Revised August 2018

J 1.00 GENERAL REQUIREMENTS

All watermains and appurtenances shall be designed and constructed in accordance with the current County drawings, MOECC guidelines, Ontario Provincial Standards and Specifications and AWWA standards and specifications.

For all additions and modifications to the County's Schedule A – Drinking Water System Description under Drinking Water Works Permit a Form 1 – Record of Watermains Authorized as Future Alteration shall be prepared and signed by a Professional Engineer. The Form 1 shall be prepared with all documentation as per the requirements of the County's License.

Haldimand County commissioning activities will not be initiated until verification that a completed Form 1 document has been received by Haldimand County Water and Wastewater Operations.

J 1.01 DESIGN WATER DEMANDS

The system shall be designed to meet the greater of either of the following demands:

- a) Maximum daily demand plus fire flow; or
- b) Maximum hourly demand.

Fire flows will be considered in accordance with the requirements of the latest edition of "Water Supply For Public Fire Protection" A Guide to Recommended Practice by Fire Underwriters Survey.

J 1.02 EQUIVALENT POPULATION

Type of Development / Equivalent Population Density
(Person/Hectare)

Residential

- | | |
|---|-----|
| a) Single Family | 55 |
| b) Semi-detached duplex and 4 plex | 100 |
| c) Townhouse, Maisonette, 6 story apartment or less | 135 |

d)	Apartments (over 6 stories high)	285
e)	Light Commercial Areas	90
f)	Light Industrial Areas	125
g)	Hospitals persons/bed	4

Individual studies shall be made for special commercial establishments, major commercial areas, special industries, major industrial areas, schools and large high-density residential areas.

J 1.03 DESIGN FACTORS

The following are the design factors for water distribution systems:

- a) Average daily demand per capita = 0.450 m³/capita/day
- b) Maximum daily demand factor = 2.25
- c) Maximum hourly demand factor:
 - Residential = 4.00
 - Industrial = 2.00
 - Commercial = 2.00
 - Community Services = 2.00

J 2.00 HYDRAULIC DESIGN

J 2.01 PIPE DESIGN FLOW

Hazen-Williams equation may be used

$$Q = 0.84918 \times C \times A \times R^{0.63} \times S^{0.54}$$

Where:

- Q = Design Flow (m³/sec.)
- C = Hazen-Williams 'C' factor of friction loss coefficient (dimensionless)
- R = Hydraulic radius (m)
- S = Slope of energy grade line (m/m)
- A = Section area of flow (m²)

The following values of 'C' shall be used for all types of pipe:

150mm diameter	C = 100
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200-250mm diameter	C = 110
300-600mm diameter	C = 120
Over 600mm diameter	C = 130

In evaluating the existing systems, the value of 'C' shall be determined by actual field tests.

a) Standard Pipe Sizes

150mm, 200mm, 250mm, 300mm, 350mm, 400mm, 500mm, 600mm diameter and larger.

The nominal diameter shall be used for general water distribution system design.

b) Minimum Pipe Size

For all commercial and industrial areas, minimum pipe size shall be 300mm diameter.

For all residential areas minimum pipe size shall be 150mm diameter.

c) Pressure

Under normal operating conditions, the maximum working pressure should not be more than 700 kPa, and the minimum not less than 275 kPa.

Under fire flow conditions, the minimum system pressure shall not be less than 140 kPa .

In cases where any localized area has design pressures in excess of 700 kPa, pressure-reducing valves shall be provided on the distribution main or on individual services as required.

J 3.00 STRUCTURAL REQUIREMENTS

All watermains, mechanical restraint and thrust blocks will be designed to withstand the maximum operating pressure plus the transient pressure to which it will be subjected. The value of the transient pressure will not be less than the pressure surge that would be created by instantaneous stoppage of water column moving at 0.6m/s. However, the design pressure will not be less than 1035 kPa in any case.

a) Pipe Materials

Current AWWA procedures will be adopted for the

computation of strength and thickness of pipe. However, the following are the minimum requirements:

D. I. Cement Lined	- Minimum Class 52
P.V.C.	- Minimum Class 150 DR =18
Reinforced Concrete Pressure Pipe -	As Designed

b) Thrust Blocks/ Mechanical Restraint

Haldimand County's preference is to avoid thrust blocks on distribution and transmission mains wherever possible, giving preference to appropriate mechanical restraint.

Thrust blocks are required at all fire hydrant locations.

c) Watermains of 300 mm diameter or smaller.

Horizontal Bends

Concrete thrust blocks, where permitted by the County, are acceptable provided they are resting against suitable undisturbed soil with adequate bearing capacity. The watermain location and depth would have to be such that the possibility of being disturbed in the future is very low, e.g. close to street lines. This determination shall rest solely with Haldimand County Public Works Department.

Mechanically restrained joints are required between elbow and pipes and between pipe sections within the pre-determined length of the watermain on both sides of the elbow.

Vertical Bends

Mechanically restrained joints only are required between elbow and pipes and between pipe sections within the predetermined length of the watermain on both sides of the elbow.

Hydrant Laterals

Straight laterals with no change of vertical elevations require concrete thrust blocks at anchored tee and hydrant boot and mechanically restrained joints along the entire length of the lateral.

Laterals with vertical bends require mechanically restrained

joints.

Temporary Dead Ends

Only mechanically restrained joints are allowed.

- d) Watermains of 400 mm diameter or larger.

Concrete thrust blocks are not generally allowed. However, thrust blocks may be utilized only where it is deemed that the likelihood of the bearing soil being disturbed is very small. Generally, mechanical restraint will be utilized. This determination shall rest solely with Haldimand County Public Works Department.

- e) Bedding

The minimum bedding requirements for the watermains will depend upon the type and class of pipe used as per AWWA Standard or OPSS. As a minimum requirement, watermains shall be laid on 150mm of selected native material bedding. However, each installation shall be reviewed on a site-specific basis.

- f) Backfill

The type of backfill material will usually be determined by the location of watermain within the R.O.W. and backfilled as per AWWA Standards.

J 4.00 PIPE DEPTH

The top of the watermain shall have a minimum of 1.7m cover. On unimproved roads or those with open ditches, increased cover shall be provided to allow for future road improvements or lowering when urbanization takes place.

J 5.00 LOCATION

The watermain shall be located 1.0m behind the curb, wherever possible, on the north or east side of the road. Refer to Drawing G2 in Section G.

J 6.00 SYSTEM LAYOUT

Grid Design

- a) Dead ends shall be minimized by looping all mains.
- b) Should a dead end main occur, it shall be provided with a fire hydrant/valve assembly.
- c) No flushing devices shall be directly connected from the water system to any sanitary or storm sewer appurtenance in order to avoid contamination of the water system.
- d) Maximum allowable pipe joint deflection shall be 66% of the manufacturer's specifications, for pipe other than high pressure concrete.

Valves

- a) Gate valves conforming to AWWA standards shall be provided on watermains 300mm diameter or smaller. Line gate valves do not require chambers, and shall have slide type valve boxes.
- b) Butterfly valves conforming to AWWA standards shall be provided on watermains 350mm diameter or larger. All butterfly valves shall be housed in valve chambers.
- c) On distribution mains, valves shall be provided at the limits of every intersection, but not greater than 300m apart. Under normal circumstances, on distribution mains, three valves shall be provided at tee intersections, and four valves shall be provided at cross intersections.

In addition, valves on distribution mains in residential areas shall be placed such that no more than 20 services can be shut off at one time.

- d) On large trunk/transmission mains, valve location shall be approved by the County on a site specific basis (preferred maximum distance between two valves is 600m).
- e) The size of the line valves shall be the same as the watermain up to and including 600mm diameter. On 750mm diameter and larger size of watermain, valves one size smaller are acceptable.
- f) Air release valves shall be provided at all significant high points of the large diameter watermain (preferably 300mm and larger) in a separate chamber.

- g) Drain valves shall be provided at all significant low points of the large diameter mains (preferably 300mm and larger) in a separate chamber.
- h) All valves to open left (counter clock wise) and shall have 50mm square standard AWWA operating nut.

Hydrants

- a) Hydrants shall be installed on all distribution watermains with a maximum allowable spacing of 150m in Residential areas. Maximum allowable spacing for Commercial or Industrial areas shall be 100 m. The hydrants shall be manufactured in accordance with AWWA standards and shall have steamer ports equipped with a Storz fitting.
- b) All hydrant laterals shall have 150mm secondary valve, valve box and anchor tee.
- c) Hydrants shall be located at high points, at the end of cul-de-sacs and other dead end mains.
- d) Hydrants to be within 6m of a fire access route and installed with the 100mm steamer port facing the fire access route.
- e) All hydrants shall be fire flow tested.
- f) Preferred locations for fire hydrants shall be at street intersections, on the same side of the road as the main, consistently on the same side of the road as existing and future fire hydrants, at the dividing property line between adjacent properties and at high points.
- g) Minimum clearance around fire hydrants shall be 1.5 meters.
- h) The installation of bollards for fire hydrant protection shall be as directed by the municipality.
- i) Where possible, hydrants shall be placed at least 12m from the building face and not obscured by planting.
- j) All hydrants shall be identified by colour coding as to main size and flow as per NFPA standards.
- k) All hydrants shall be repainted at the end of the two-year warranty period according to County colour Standards.

- l) All hydrants are to be installed with drain plugs sealed or without drain holes present.
- m) All hydrants shall be painted with Multiguard 2500 paints. The body and cap shall be painted bright yellow. The steamer port shall be painted black. The hose parts shall be painted according to the following colour code:

WATERMAIN DIAMETER	COLOUR
100mm	Red
150mm	Green
200mm	White
250mm	Blue
300mm	Black
>300mm	Orange

J 7.00 TYPE OF PIPE AND JOINTS ACCEPTABLE

a) **Ductile Iron Cement Lined Pipe**

For sizes up to 600mm, ductile iron cement lined pipe with tyton joints or equivalent may be used.

The current requirements of AWWA and County's specifications shall apply to all classes of ductile iron cement lined pipe.

In designing for class of pipe, refer to AWWA. All ductile iron pipe for County work is to be manufactured in accordance with AWWA.

b) **Poly-vinyl Chloride (P.V.C.) Pipe**

For sizes up to 300mm, P.V.C. pipe with gasketed joint may be used. The current requirements of AWWA shall apply to all classes of P.V.C. pipe.

For sizes 350mm to 1200mm the current requirements of AWWA shall apply to all classes of P.V.C. pipe.

c) **PVC Pipe and Tracer Wire**

Tracer Wire is to be installed on all new installations of P.V.C. watermain pipe for locating purposes. A solid 10 gauge

T.W.U. copper wire is to be installed along the top of the pipe, strapped to the pipe at 6 meter intervals.

The wire is to be installed between each valve and/or the end of the new P.V.C. watermain as well as hydrant leads. The tracer wire from the watermain shall be extended to the fire hydrant. At the fire hydrant the tracer wire shall be inserted into a 20mm PVC electrical duct with a PCV junction box and cover glued to the 20mm duct approximately 500mm above grade. The 20mm PVC electrical duct shall have a minimum buried depth of 500mm below grade. Refer to Drawing J-1 at end of section. Joints in the wire between valves are not permitted. Access to the tracer wire shall be provided at each hydrant via an access box or valve box in the event a hydrant is unavailable.

The Inspector shall test the tracing wire for conductivity. If the tracing wire is not continuous from valve to valve, the contractor shall, at his own expense, replace or repair the wire.

d) Reinforced Concrete Pressure Pipe

For sizes 400mm and over, reinforced concrete pressure pipe with gasketed joints may be used as indicated below:

For 400mm to 500mm – pretensioned concrete cylinder pipe must conform to AWWA C-303.

For 400mm to 500mm – pretensioned concrete cylinder pipe must conform to AWWA C-303.

For 600mm and larger sizes – prestressed concrete lined cylinder pipe conforming to AWWA C-301.

Note: This is the preferred size range for concrete pressure pipe. Pipe should be designed to a higher pressure rating if the engineer feels it is required.

WATERMAIN MATERIAL TYPES – PREFERRED DESIGN RANGE

Material	Size	Joint	Spec	Service Connections
Ductile Iron (cement lined)	< 600mm	Tyton Joint	AWWA C150 AWWA C104	> 50mm

Polyvinyl Chloride	< 300 mm Class 150 SDR 18	Gasketed	AWWA C900	>100mm
Polyvinyl Chloride Pressure Pipe	350mm – 1200mm	Gasketed	AWWA C905	Polyvinyl Chloride Pressure Pipe
Type K Soft Copper	50mm		AWWA C800 ASTM B-88-62	20mm-50mm
Polyethylene	>400mm < 900mm		AWWA C906	

REINFORCED CONCRETE PRESSURE PIPE

Material	Size	Joint	Spec
Pre-tensioned Concrete Cylinder Pipe	400mm – 500mm	Gasketed	AWWA C303
Pre-stressed Concrete Lined Cylinder Pipe	>600mm	Gasketed	AWWA C301
Pre-Stressed Concrete Embedded Cylinder Pipe	>600mm	Gasketed	AWWA C301

J 8.00 SERVICE CONNECTIONS

- a) All water services shall be installed at right angles to the watermain.

Pipe for service connections up to 50mm diameter shall be: Copper Tubing meeting ASTM B88, Type “K” Soft Warnoc Hersey Certified; or Cross-Linked Polyethylene (PEX) pipe, CSA certified to CSA B137.5 conforming to AWWA C904 and shall be SDR9, pressure rated at the following:

- 160 psi @ 73.4°F (1,100kPa @ 23°C)
- 100 psi @ 180°F (690 kPa @ 82°C)
- 80 psi @ 200°F (55kPa @ 93°C)

PVC pipe shall be used for service connections 100mm

diameter and larger.

Minimum Service connections sizes are:

Single Family - 19mm diameter;

Industrial, Commercial or Institutional (ICI) and multi family - 25mm diameter.

- b) Every water service will be metered. Soldered joints or fittings will not be allowed before the meter. Meters shall meet Haldimand County's most current requirements for ICI and residential installations, and shall be provided at the Developer's cost. Meter Pits may be required on a site specific basis.
- c) Only one (1) service per property shall be permitted, unless authorized by Haldimand County's Water Purveyor. For separation of Fire Protection vs. Domestic Use, the application titled, "*Application for Water Use Billing New Construction with Fire Protection*", located on page 26 of this Section must be completed and submitted to the water Purveyor for approval.
- d) On high-risk buildings, an approved backflow preventer must be installed as per the Building Code.
- e) Fire lines connected to any private fire system using chemicals are to be equipped with approved backflow preventers.
- f) Services 100mm and larger shall be valved at the main and at the property line.
- g) Direct service connections to transmission mains and to watermains greater than 400mm diameter are not permitted.
- h) Servicing from transmission mains and watermains greater than 400mm may be permitted, subject to detailed design review, through construction of a secondary distribution watermain at a minimum of 100m in length or the extent of the property frontage, whichever is the greater
- i) For private, multi-unit developments, an approved meter and backflow prevention device shall be installed at or near the property line. (see Section J-page 25, "Haldimand County Water Servicing Standard")
- j) Tracer wire requirements will be determined by Public Works for all non-metallic services during design review.

- k) Manufactured tees shall be used for all services on new installations of PVC watermain.
- l) Where a temporary watermain is required to maintain existing services, a connection to each service shall be made at property line.
- m) In order to assess and adjust the billing method for an existing property serviced by Municipal water where the current property use is changing and the change will result in a significant reduction in water demand, the application titled "*Application to Bill Water Usage Existing Property*", located on page 27 of this Section, must be completed and submitted to the water Purveyor for approval.

J 8.01 PRIVATE SIDE WATER SERVICES

The following requirements apply to all private side water services connecting to a watermain that is part of a Haldimand County municipal drinking water system .

GENERAL REQUIREMENTS

All private side water services shall be designed and constructed in accordance with Haldimand County Design Criteria Section J-Water Distribution System and The Ontario Building Code (OBC).

MATERIALS

- a) Water service piping up to 50mm in diameter shall be:
Type "K" Certified to ASTM B88 "Seamless Copper Water Tube"; or
Cross-Linked Polyethelene (PEX) Certified to CAN/CSA-B137.5
- b) Soldered joints or fittings are not permitted before the water meter.
- c) Any copper joints used underground shall conform to 7.3.3.12. OBC
- d) Every non-metallic water service shall have a 14 gauge TW tracer wire attached to it conforming to 7.2.11.3. OBC
- e) Water service piping 100 mm in diameter and larger shall be certified to CAN/CSA-B137.3 "Rigid Polyvinylchloride (PVC) Pipe and Fittings for Pressure Applications"; or CAN/CSA-B137.2 "Polyvinylchloride (PVC) Injection-Moulded Gasketed Fittings for Pressure Applications", and have a minimum pressure rating of 1100 kPa.

INSTALLATION OF PIPING

- a) All nominally horizontal piping shall be supported on a base that is firm and continuous under the whole of the pipe and free of any rocks, stones, cinders or any foreign material that may damage the pipe.
- b) Installation of piping must conform to 7.3.5. Protection of Piping OBC including isolation from loads, spatial separation and backfill.

INSPECTIONS

Inspections shall be to confirm there is proper bedding for the water service pipe, the correct pipe has been installed, and all other installation requirements under this Design Criteria and 7.3.5. of the OBC have been adhered to.

A service flow and pressure test shall be conducted by fully opening the valve installed at the end of the service pipe to ensure adequate flow, then closing the valve fully to visually check for leaks.

J 9.00 WATER METER SPECIFICATIONS

All Haldimand County water meters are Master Meter, radio frequency drive-by technology. The following identifies responsibilities for supply and installation, meter type, size and applicable parts.

SIZE	TYPE	SUPPLY / INSTALL / INSPECTION
16mmx19mm (5/8"X3/4") and 25mm (1")	Positive Displacement (PD) or Bottom Load Multi-Jet (BLMJ)	<ul style="list-style-type: none"> • County supplies tails and water meter to owner/plumber • Qualified plumber installs tails and meter as per County specifications • County inspects installation workmanship and materials
37mm (1 ½") and 50mm (2")	Positive Displacement (PD) or Octave Ultrasonic Meter	<ul style="list-style-type: none"> • County supplies water meter only to owner/plumber (also XTR Remote if required) • Owner supplies flanges and gaskets • Qualified plumber installs required flanges, gaskets and water meter • County inspects installation workmanship and materials

75mm (3") 100mm (4") and greater	Octave Ultrasonic Meter	<ul style="list-style-type: none"> • Owner purchases and supplies all necessary material and meter as per County specs. • Qualified plumber installs all materials and meter • County inspects installation workmanship and materials
NOTE: all meters and materials to be supplied by the County are 100% cost recovered through the water and wastewater connection permit process		

J 10.00 SEPARATION FROM SEWERS

- a) Lateral horizontal separation of watermains from the storm and sanitary sewers or manholes will be at least 2.5m (measured from the nearest edges).
- b) Under normal conditions, watermains will cross above sewers with sufficient vertical separation to allow for proper bedding and structural support of the watermain and sewer. (Minimum vertical separation = 150mm).
- c) In cases where the watermain must pass under the sewer, the required vertical separation between the invert of sewer and crown of watermain shall be at least 0.5m. The watermain segment shall be centered in the crossing to ensure that the joints of watermain are equidistant from the sewer.
- d) Should the above vertical separation be unobtainable, the sewer shall be constructed of material and with joints that are equivalent to watermain standards of construction, and shall be pressure tested to ensure water tightness.

J 11.00 CORROSION PREVENTION

All metallic components in the water distribution system shall be protected from corrosion by Polyethylene encasement or Cathodic Protection and shall conform to the latest revision of OPSD or AWWA.

- a) Polyethylene Encasement

Polyethylene Encasement as per AWWA (8 mil High Density) is an acceptable form of corrosion protection for all Ductile Iron pipe and cast iron fittings including thrust restraint devices.

The acceptance of polyethylene encasement for corrosion protection has made the requirement for Hyprotec pipe obsolete. Ductile Iron pipe can now be used in sizes ranging

from 150mm to 900mm design in accordance with AWWA C-150.

b) Cathodic Protection

New Pipe

The installation of a sacrificial zinc anode on every length of pipe or fitting will suffice, as will the use of County approved DENSO tapes on the fittings.

All sacrificial anodes shall conform to A.Z.T.M. B-481 Type II and shall be made of high grade electrolytic zinc, 99.9% pure.

All metallic watermains, fittings, hydrants, services and restrainers to have one zinc anode per length of pipe in sizes according to Table A.7.1

Anode installation is not required within chambers. For all anodes connected to new pipe, fittings or to existing metallic watermains, a Cadwelder and CA-15, or equivalent, cartridge shall be used. Anode installation shall be performed in accordance with the manufacturer's instructions. Where new pipe is to be connected to existing ductile iron or cast iron pipe, a 14.5 kg magnesium anode is to be connected to the first length of existing pipe, as per Haldimand County Standard Drawing at the end of this section. All weld connections to be coated with "TC Mastic" or approved equivalent.

Existing Cast or Ductile Iron Pipe

Anodes may be used to cathodically protect existing cast iron or ductile iron watermains. An initial study of the number of breaks already recorded shall be made to determine if cathodic protection of the existing pipe is still a viable preventative measure. A useful rule of thumb is that cathodic protection of existing watermains is effective if the number of breaks is less than 0.6 breaks/km/year. For watermains with a higher break frequency, replacement is a better solution, as the existing watermain is likely to be too deteriorated for cathodic protection.

A soils report is to be undertaken to identify the existing soil conditions, including resistivity, pH value, and chloride ion concentration. The soil samples should be taken no more than 500 meters apart with a minimum of two samples per street. Samples shall be collected as close to the existing pipe

as possible.

Anodes placed for protection of existing pipe shall be packaged 14.5 kg. Magnesium anodes at a spacing to be specified by the County.

c) Water Services

Each copper water service shall be protected as per Table A.7.1. Services larger than 50mm are to be treated like any metallic watermain.

Sacrificial nuts shall be placed on all bolts on bolted connections on watermain pipe, fittings, valves, etc.

The use of zinc or magnesium anodes shall be as approved by the Design Engineer.

TABLE A.7.1 ANODE REQUIREMENT CHART

Pipe/Fitting Size (mm)	Zinc Anode Size (kg)
150 and 100	5.5
200	5.5
250	5.5
300	5.5
400	11
450	11
Hydrant	11
Copper Service (mm)	
20	5.5
25	5.5
40	5.5
50	5.5

d) There are two standards for the Design of PVC pipe: AWWA C-900 and AWWA C-905. The differences between the two are that C-905 uses a reduced factor of Safety 2.0 vs. 2.5 and makes no allowance for surge pressures in the design. AWWA C-900 is intended for use on distribution mains sizes 100mm to 300mm and will usually require a DR 18 main to be installed, while C-905 is intended for use on Transmission main sizes 350mm to 900mm and will usually indicate that a DR 25 main is adequate. Problems can occur when using 350mm and 400mm mains, which can be used as distribution mains as well as transmission mains. In designing this size of main, the

designer must consider the function of the main (distribution or transmission) and choose the appropriate standard for the calculation of the DR. The County now approves the use of larger diameter PVC pipe up to 900mm.

J 12.00 WATER VALVE CHAMBER

- a) 1500mm diameter Precast Valve Chamber (O.P.S.D. 1101.010)

To be used only when there are two valves for watermains 150mm in diameter or singular line valve for watermain 300mm or smaller in diameter.

- b) 1800mm x 2400mm Rectangular Precast Concrete Valve Chamber (O.P.S.D. 1101.012 to 015)

To be used in all combinations other than those specified in (a) above.

J 13.00 ACCEPTANCE AND MAINTENANCE PROCESS

All infrastructure, including an appropriate sampling station, will be constructed under the supervision of the Developer's engineer. For sampling station, refer to Drawing J-2 at end of section. All watermains shall be constructed, tested, disinfected, and proven to be free of all debris and bacteriological matter in accordance with applicable AWWA, MOECC, OPS standards, specifications and regulations. Upon confirmation of same via appropriate sampling/testing methods, the new main shall be connected to the distribution system within one week. Otherwise, re-disinfection and sampling/ testing will be required. This requirement also applies to any service connections over 50 mm diameter.

Once watermains/services have been deemed acceptable in accordance with the above-noted standards, specifications and regulations, the Developer's engineer shall certify such in writing, to the Manager of Engineering, and recommend that the works be given preliminary acceptance and commencement of the two year maintenance period.

LIST OF APPROVED MANUFACTURERS AND PRODUCTS FOR WATER SYSTEMS

PRODUCT	MANUFACTURER	DESC-MAKE-MODEL
COUPLINGS	Baker Couplings	Series 200
	Cascade Waterworks Mfg.	
	Ford	Bolt Flex Coupling FCI
	James Jones Co.	2609-SG, J2607-SG, J2606-SG
	Romac Waterworks	501, RC501, 702
	Robar Ind.	1406, 1408, 1506, 7407, 7506, 1606
	Smith and Blair Inc.	441
	Viking Johnson	Maxifit Range Coupling
	Straub Flex Coupling	Flex Coupling for underground use
CURB STOPS	A. Y. McDonald	4713T, 4714T, 6100T
	Cambridge Brass	Series 128, 129
	Emco Limited	Series 15722, 17052
	Ford	Style Z44-333G
	James Jones Co.	J1949-SG
	Mueller Canada	A-616, A-617
FITTINGS	A. Y. McDonald	4758T for D.I. pipe
	Bibby Waterworks	Ductile Iron Fittings AWWA C-153
	Ford	Quick Joint copper fittings (19mm – 50mm) and coupling adapt, FFCA

PRODUCT	MANUFACTURER	DESC-MAKE-MODEL
FITTINGS CONTINUED	Magotteaux Canada	D. I. Pipe
	IPEX	PVC 100/150/200mm AWWA C-905 and CSA B137.3 up to 600mm
	Centennial	Reinforced concrete
	Robar	Service Fittings
	Star Pipe Products	Exclude valve box, cut in sleeves, restrainers custom castings and fabricated products
	Flange Adapter 200	Standard flange adapters for steel and ductile iron pipe
	Flange Adapter 400	Heavy duty flange adapters for steel and ductile iron pipe
	MJ Retainer Gland 600	Heavy Duty Retainer Glands for Ductile Iron Pipe, Valves and Fittings
	Sigma Corp	Ductile Iron Fittings
	Le-Ron	Fabricated PVC watermain fittings
	Harco	Injection Molded PVC Fittings (AWWA C-905)
	Union Foundry	Ductile Iron Fittings up to 900mm
	Tyler Foundry	Ductile Iron Fittings up to 900mm
	Bennett Mechanical	Steel Pipe and Fittings for swabbing hatch valve chambers
HYDRANTS	Mueller Canada	Century Modern Centurion Darling B-50-B-18 Post and Flushing Hydrants
	Clow Canada	Brigadier
MAIN STOPS	Cambridge Brass	Series 102
	Emco Limited	Series 15972, 17072
	Ford	Style F-600

PRODUCT	MANUFACTURER	DESC-MAKE-MODEL
MAIN STOPS CONTINUED	Mueller Canada Inc.	Model A-220 or A-221
D. I. PIPE	American Pipe	900mm to 1600mm dia
	Canada Pipe Co.	Hyprotec 100-900mm Class 350
COPPER PIPE		ASTM B88, Type "K" Soft Warnoc Hersey Certified
POLYETHYLENE	KWH	Large Diameter - AWWA C906-90 ASTM F714-85
	PEX	CSA certified to B137.5 and conform to AWWA C904PEX tubing shall be SDR 9
PVC PIPE	Certainteed Corp	Vinyliron PVC to 300mm
	Diamond Plastics	100 to 300mm diameter and 350 to 600mm
	National Pipe and Plastics	
	Rehau Industries Inc.	Aqualoc
	Royal Flex-lox Pipe	C900 High Pressure Large Diameter 350mm and 400mm
	IPEX	Blue Brute, Centurion and Large Diameter PVC
	Duchesne	PVC Watermain Pipe (DR 18)
CONCRETE PIPE	Hyprescon	Hyprescon pipe
	Hanson	Reinforced Concrete Pipe
	Lafarge	Reinforced Concrete Pipe
	Price Brothers	Prestressed Concrete Pressure Pipe Sizes 400mm to 1200mm
CLAMPS	Cambridge Brass	Teck with overlapping gasket
	Ford	FSI Stainless Steel
	Mueller Canada Inc.	All

PRODUCT	MANUFACTURER	DESC-MAKE-MODEL
CLAMPS CONTINUED	Robar Industries Limited	All
	Smith and Blair Inc.	All
	Romac	SS1, SS2 and SS3
SERVICE SADDLES	Cambridge Brass	Teck Stainless Steel Double Bolt
	Clow Canada Limited	D-71 38mm, D-72 50mm
	Ford	Style F-202
	James Jones Co.	Model J979 (Bronze)
	Mueller Canada Inc.	Bronze Double Strap
	Smith and Blair Inc.	Series 323 for D.I.
TAPPING SLEEVES	Clow Canada	TS-100 for D.I. pipe TS-110 for Asbestos Cement
	Ford	FTS
	IPEX	Tapped Tee (fitting)
	Mueller Canada Inc.	Stainless Steel Tapping Sleeve, Style H615 (M.J.), H-610 (CI), G-611, (AC), 1004 (MJ) and style 1003
	Smith and Blair Inc.	Model 622
SERVICE/CURB BOX	Bibby-Ste-Croix Inc.	Multi-Service Box
	Mueller Canada Inc.	Model A-753 (38 and 50mm)
VALVE BOX COMPONENTS	Bibby-Ste-Croix Inc.	Series 4000
	Mueller Canada Inc.	Model A-726
VALVES RESILIENT SEAT	Clow Canada Limited	WEDGE GATE VALVE F-6100 100-300mm F-6102 100-300mm F-6106 100-300mm F-6114 100-300mm

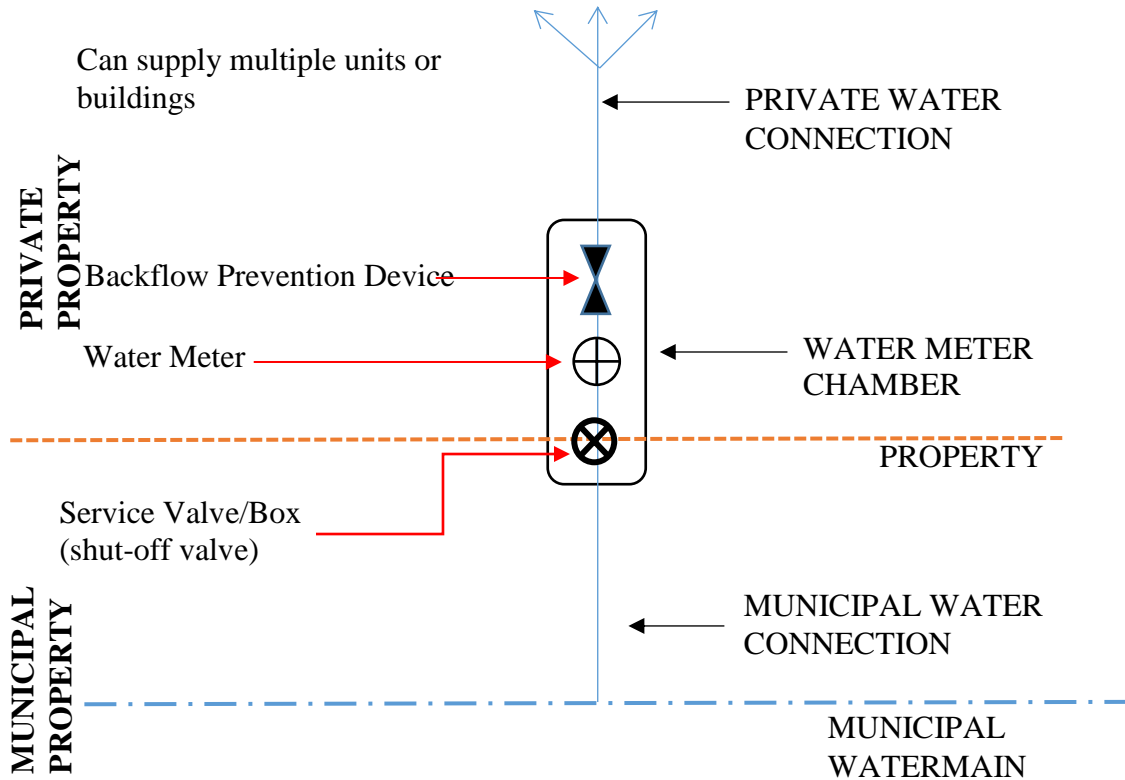
PRODUCT	MANUFACTURER	DESC-MAKE-MODEL
VALVES RESILIENT SEAT CONTINUED	Clow Canada	SEAT GATE VALVE Compression 2000 McAvity 100-300mm #20075R gate
	Mueller Canada Inc.	A-2360
	Clow Canada (Bibby)	Bibby, Seat Gate Valve
	Mueller Canada	Darling, Seat Gate Valve
	AVK	
VALVES BUTTERFLY	Miliken	AWWA Butterfly Valve
	Mueller Canada Inc.	Model B3211-6 and Mueller Linsal III
	Clow Canada	M7H Butterfly Valve
	Mosser	830 Butterfly Valve for 600mm and over
	AVK	Resilient Seal 200 PSI
TAPPING	Mueller Canada Inc.	Style 667 (MJ) Style 662 (CI) Style 642 (AC) Style 565 (MJ) Style 56
	Clow Canada Limited	F-6114 100-300mm Style #20695R
	Clow Canada (Bibby)	
CORROSION PROTECTION	Correxco Corrision	All Products
	Denso	Denso Tape
	Duratron Systems Limited	Sacrificial Washer nut 411DSW0625 5/8" 411DSW0750 3/4" 411DSW1000 1" 4111 DSW2236 1 1/8"
	Canada Pipe Company	Polyethylene Encasement
	Royston Handy Cap	Handy Cap 2 Corrosion Protection

PRODUCT	MANUFACTURER	DESC-MAKE-MODEL
CORROSION PROTECTION CONTINUED	Interprovincial Corrosion	Corrosion Products
	Corrosion Interventions	Cathodic Anodes
	Tapecoat	Protective Coating System
TUNNEL CASING SPACER	Advance Casing	Advance Casing Spacer
	PSI	PSI Casing Spacer
	Cascade Waterworks Mfg.	
	Raci Casing Spaces	Raci Casing Spaces
JOINT RESTRAINT DEVICES	Clow Canada	Restraint Devices meeting UNI-B-13 and FM
	EBA Iron	Meg-A-Lug for D.I. Pipe
		200 PV for PVC
	Ford/Uni-Flange Pipe Products	Series 1500 Restrainers 1300 Restrainer/Casing Spacer PVC and Ductile Series 1300-C, 1350-C, 1360-C 900-C for PVC only 400 for Ductile Iron Pipe 1400 Series for Pressure Rated Ductile Iron
	Romac Waterworks	Grip-Ring for 100-300mm diameter
	Star Pipe	Star-Grip for Ductile Iron Pipe
	PVC Pipe Restrainers 1000C	Restrainers for AWWA C900 PVC Pipe to mechanical joint fittings
	PVC Pipe Restrainers 1100C	Restrainers for AWWA C900/C905 PVC pipe to pipe
	PVC Pipe Restrainers 1200C	Restrainers for AWWA C900 to PVC pressure fittings
	Stargrip® Series 3000	Mechanical Joint Wedge Action Restraint for Ductile Iron Pipe
	PVC Stargrip® Series 4000	Mechanical Joint Wedge Action Restraint for AWWA C900/C905 and IPS PVC Pipe

PRODUCT	MANUFACTURER	DESC-MAKE-MODEL
JOINT RESTRAINT DEVICES CONTINUED	PVC Ring Lock 3500 (PVCGrip™)	Mechanical Joint 360 Ring Type Restraint System C900/C905 and IPS PVC Pipe
SAMPLE STATIONS	Cromer Industries	Test Tap
	Kupferle	Eclipse 88

Haldimand County Water Servicing Standard

The following dictates the County’s Standard with respect to the supply of Municipal Water to a premise as defined by the Water Use Bylaw 1420-14 (as amended).



Notes:

- The Service Valve Box, Water meter and backflow Prevention device will all be the same diameter (size) as the Municipal Water Connection
- Where the water servicing needs can be distinctly identified as Fire protection demand and Domestic use, and where the service size needs are greater than/equal to (\geq) the flow capable of being supplied by a 100 mm (4") diameter pipe, an Application for Water Use Billing New construction with Fire Protection may be completed and submitted to the Water Purveyor to investigate billing options. The application forms part of the design criteria.

Water Use Bylaw 1420-14 (as amended) states:

Section 7. Water Connections/Disconnections; paragraph 8; Only one municipal water connection per premise shall be permitted, unless authorized in writing, by the Water Purveyor.

Definitions

- "Premise" means a tract of land including its buildings, together with its grounds or other appurtenances
- "Municipal Water Connection" means the pipe portion of a drinking-water system that extends from the Municipal Water Works to a Private Water Connection commonly located within the limits of the public road allowance or other public land interests held for water purposes



**APPLICATION FOR WATER USE BILLING
NEW CONSTRUCTION WITH FIRE PROTECTION**

In order to assess a development’s water demand needs, fire flow and domestic, and bill accordingly based on the domestic flow, this application must be completed and submitted to the Water Purveyor for approval. Applications not signed by a professional engineer will not be considered.

NOTE: This application is available for new developments where the water servicing needs can be distinctly identified as Fire Protection demand and Domestic use and where the service size needs are equal to or greater than the flow capable of being supplied by a 100 mm (4”) diameter pipe. A formal letter on company letterhead, signed by a professional engineer, must accompany this application and outline the design specifications, flow requirements and infrastructure equivalencies for the development’s fire flow and domestic needs.

SECTION A: PROPERTY OWNER INFORMATION (Please Print)

Owner’s name:	
Business name:	
Mailing address:	City
	Province / Postal code
	Telephone N ^o
	E-mail

SECTION B: PROPERTY TO BE DEVELOPED (Please Print)

Name of Development	
Property Assessment Roll Number	

SECTION C: WATER USAGE DEMAND NEEDS FOR PROPOSAL (Please Print)

Fire Protection Flow Requirements	L/s
Infrastructure Required to Meet Fire Flow Requirements (service pipe size)	mm
Domestic Use Flow Requirements	L/s
Minimum Service Pipe Size Capable of Supplying domestic Use Flow Requirements	mm

SECTION D: PROFESSIONAL ENGINEER AUTHENTICATING APPLICATION INFORMATION

NAME AND COMPANY

SIGNATURE

DATE

For County Use only:

Based on the above information together with the formal letter submission, the County will allow the proponent to install a water service _____mm in diameter to service the proposal’s maximum demand needs and will bill the monthly basic water charge based on the _____mm diameter actual domestic service size needs.

Haldimand County Water Purveyor



**APPLICATION FOR WATER USE BILLING
EXISTING PROPERTY REPURPOSING USE OF BUILDING**

In order to assess and adjust the billing method for an existing property serviced by Municipal water where the current property use is changing and the change will result in a significant reduction in water demand, this application must be completed and submitted to the water Purveyor for approval. Applications not signed by a professional engineer will not be considered.

NOTE: This application is available for existing properties serviced by municipal water where the water servicing needs will be reduced as a result of a change in the use of the property. A formal letter on company letterhead, signed by a professional engineer, must accompany this application and outline the design specifications, flow requirements and infrastructure equivalencies for the property's fire flow and domestic needs.

SECTION A: PROPERTY OWNER INFORMATION (Please Print)

Owner's Name:	
Mailing address: City/Province/Postal code	
Telephone N ^o	
E-mail	

SECTION B: PROPERTY TO BE REPURPOSED (Please Print)

Current Name of Business	
Property Assessment Roll Number	
Current Property Business Use (i.e. school, store, food plant, etc.)	
Proposed Name of Business	
Proposed Property Use	

SECTION C: WATER USAGE DEMAND NEEDS (Please Print)

Current Water demand usage	L/s	Proposed Water demand usage	L/s
Existing size of water service	mm	Existing size of water meter	mm
Size of water service necessary to meet Proposed water demand usage		mm	
Internal Fire Protection Flow Requirements		L/s	
Infrastructure required to meet fire flow requirements (service pipe size)		mm	

SECTION D: PROFESSIONAL ENGINEER AUTHENTICATING APPLICATION INFORMATION

NAME AND COMPANY

SIGNATURE

DATE

For County Use only:

Based on the above information together with the formal letter submission, the County will allow the proponent to downsize the existing service size at the water meter from _____mm in diameter to _____mm in diameter meeting the proposal's maximum demand needs as identified above. The monthly basic water charge will be based on the diameter of the downsized service size at the water meter.

Haldimand County Water Purveyor