



THE REGIONAL MUNICIPALITY OF DURHAM

**DESIGN SPECIFICATIONS FOR
SERVICE CONNECTIONS**

WORKS DEPARTMENT

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1. Storm Sewer Connections

1.1 General

The storm sewer connections to the main storm sewer shall be made with an approved manufactured tee for main sewer sizes up to and including 375 millimetre diameter and according to Region of Durham requirements for larger sizes.

1.2 Foundation Drains

No foundation drains (foundation weepers) or roof leaders are permitted to connect into the sanitary sewer system, as per the Regional Sewer Use By-law.

1.3 Minimum Sizes of Pipe

Service connections for single family and semi-detached units shall be a minimum 150 millimetre diameter.

Service connections for multiple family and other blocks, commercial, industrial, and institutional areas shall be sized individually according to the intended use.

1.4 Location

Storm sewer service connections shall be installed according to Region of Durham Standard Drawing S-230.010 unless otherwise noted on drawing. Connections installed to the rear of building require a Region of Durham rear yard storm sewer agreement and are not maintained on private property by the Region of Durham.

The location of storm sewer service connections for semi-detached lots shall suit the house style and shall be according to Region of Durham Standard Drawing S-230.010.

Service connections shall not be connected into a catch basin.

1.5 Test Fitting

A 150 millimetre by 150 millimetre cast iron test fitting with test plate marked "Storm" shall be installed 1.50 metres beyond the property line on private property.

1.6 Minimum Depth of Pipe

The depth of service connections at the street line in residential areas, measured from the final center line road elevation shall be:

1. Minimum shall be 1.80 metres.
2. Maximum shall be 2.50 metres.

Risers shall be used when the invert depth of the sewer main exceeds 4.60 metres. Risers shall not exceed three metres in depth.

1.7 Storm Drainage and Storm Sewer Connections to Multiple Family, Commercial, Institutional and Other Blocks

Parking lots, driveways and/or other hard surfaced areas servicing multiple family, commercial and other blocks, shall be drained by a properly designed internal drainage system (including catch basins, maintenance holes and pipe) which shall connect to the storm sewer system or other approved outfall.

A maintenance hole shall be required located either on private property, 1.50 metres from property line to center of rim or on the sewer main.

1.8 Velocity

1. Minimum velocity shall be 0.80 metres per second.
2. Maximum velocity shall be 3.65 metres per second.

1.9 Materials

For storm sewer service connection materials refer to the Region of Durham Approved Manufacturers' Product List

Polyvinyl chloride (PVC) pipe for storm service connections shall be white in colour.

1.10 Construction

Construction of all connections shall be according to the current and appropriate design specifications, Region of Durham Construction Specifications for Regional Services and Region of Durham Standard Drawings.

2. Sanitary Sewer Connections

2.1 General

Sanitary service connections are subject to the Region of Durham's Sanitary Sewer System By-Law 90-2003 or most recent amendment.

All sanitary sewer service connections for single family and semi-detached, link dwellings and duplexes shall be individual service connections.

The connection to the main sanitary sewer shall be made with an approved manufactured tee or approved saddle. A "WYE" service connection shall be installed on the services of the first upstream leg.

No service connection of a size greater than half the diameter of the main sanitary sewer shall be cut into the main sanitary sewer. A maintenance hole shall be installed on the main sanitary sewer at the intersection of a sanitary service connection, which has a size greater than half the diameter of the main sanitary sewer except as provided below:

A 150 millimetre sanitary service connection will be permitted to connect to a 200 millimetre and 250 millimetre main sanitary sewer providing an approved manufactured tee is installed and providing the invert of the sanitary service connection is above the spring line of the main sanitary sewer.

2.2 Foundation Drains

No foundation drains (foundation weepers) or roof leaders are permitted to connect into the sanitary sewer system, as per the Regional Sewer Use By-law.

2.3 Cleanouts

Where service connections are greater than 30 metres in length, a 100 millimetre diameter property line cleanout shall be installed according to Region of Durham Standard Drawing S-100.030.

2.4 Pipe Size

Sanitary service connections for single family, semi-detached, links and duplexes units shall be 100 millimetre diameter.

Sanitary service connections for multiple family and other blocks, commercial, institutional, and industrial areas shall be sized individually according to the intended use.

2.5 Location

Sanitary sewer service connections shall be installed according to Region of Durham Standard Drawing S-230.010 unless otherwise noted on drawing. Connections installed to the rear of building require a Region of Durham rear yard sanitary sewer agreement and are not maintained on private property by the Region of Durham.

The location of sanitary sewer service connections for semi-detached lots shall suit the house style.

The depth of the sanitary service connections for single family units and semi-detached units, at the property line, measured from the final center line road elevation shall be:

1. Minimum depth shall be 2.50 metres
2. Maximum depth shall be three metres

Risers shall be used when the obvert depth of the sanitary sewer main exceeds 4.50 metres. The riser connection shall not exceed three metres in depth.

2.6 Velocity and Grade

1. Minimum low flow velocity shall be 0.60 metres per second
2. Minimum grade shall be:
 - 100 millimetre diameter connection - two per cent.
 - 150 millimetre diameter connection - one per cent.

2.7 Maintenance Holes

Sanitary sewer connections to multiple family and other blocks shall require a maintenance hole be installed and located either on private property (1.50 metres from property line to center of rim) or on the main sewer.

Sanitary sewer connections to commercial, industrial, and institutional blocks shall require a maintenance hole located on private property 1.50 metres from the property line to the center of rim.

2.8 Residential Sanitary Service Connections into Maintenance Holes

Sanitary service connections will only be permitted into the first upstream maintenance hole of cul-de-sac's and first upstream maintenance holes where future upstream development is not anticipated. A maximum of three connections per maintenance hole will be permitted. Lateral sanitary service connections shall be benched according to OPSD 701.021. Lateral sanitary service connections and downstream mainline sanitary sewer obverts shall be equal. The Region of Durham will not accept drop structures for the sanitary service connections into the maintenance holes.

2.9 Materials

For sanitary material refer to the Region of Durham Approved Manufacturers' Product List.

For single family and semi-detached units, links, duplexes, multiple family, and other blocks, the service connections shall be polyvinyl chloride (PVC).

For industrial areas the service connections shall be bell and spigot vitrified clay (VC) pipe or acceptable alternative.

PVC pipe for sanitary service connections shall be green in colour.

2.10 Construction

Construction of all connections shall be according to the current and appropriate design specifications, Region of Durham Construction Specifications for Regional Services and Region of Durham Standard Drawings.

3. Water Service Connections

3.1 General

Water service connections are subject to the Region of Durham's Water Supply System By-Law 89-2003 or recent amendment.

All water service connections for single and semi-detached, link dwellings and duplexes shall be individual service connections.

The Ontario Building Code requires, "where the static pressure exceeds 550 kPa, a pressure reducing valve shall be installed to limit the maximum static pressure to not more than 550 kPa in areas that may be occupied".

Connections to the watermain shall be by pressure tap connection using a stainless steel service saddle. Piping shall be connected at 45° above horizontal including a vertical gooseneck.

No service connection shall be made to watermains greater than 400 millimetre diameter.

3.2 Minimum Sizes of Pipe

The minimum size for service connections shall be 19 millimetre diameter except when the length of the connection from the main to the building setback exceeds 30 metres the minimum size shall then be 25 millimetre diameter.

Service connections for multiple family dwellings shall be sized to provide capacity equivalent to a 19 millimetre diameter connection to each dwelling unit.

Water services are sized for domestic consumption only and not for private water sprinkler systems and/or private lawn watering systems, as indicated in the Water Supply System By-Law 89-2003.

Service connections for blocks, commercial, industrial, and institutional areas shall be sized according to the intended use.

Fire lines for industrial, commercial, and institutional properties shall be sized and installed according to the guidelines recommended by the Fire Insurance Advisory Organization.

Commercial, industrial, institutional and multi residential water service connections (domestic and/or fireline) shall be installed according to Region of Durham Standard Drawings and the Region of Durham's Water Supply System By-Law 89-2003.

Commercial, industrial, institutional and multi residential water service connections (domestic and/or fireline) shall not become operational until documentation, including acceptable laboratory test results from an accredited laboratory is provided to the Region of Durham, verifying that all water system pipe on private property has been chlorinated, flushed and pressure tested according to Region of Durham, Ontario Building Code and Ministry of the Environment requirements.

3.3 Location

Water service connections shall be installed at the mid-point of the frontage of a single-family lot, to the right of the sanitary connection and terminating a minimum of 0.15 metres inside the property line on private property. Water service connections shall preferably be located outside of the driveway. The location of water service connections for semi-detached lots shall suit the house style and be according to Region of Durham Standard Drawings.

3.4 Minimum Depth of Pipe

Roads with curb and gutter shall have water service connections installed 1.70 metres minimum below finished centerline road grade.

On open ditch roads and unimproved roads water service connections shall have a minimum cover of 1.70 metres.

3.5 Mainstops

All domestic water service connections shall have mainstops installed at the watermain equal to the water service connection diameter.

3.6 Valves, Curb Stops & Boxes

All service connections less than 100 millimetre diameter shall have curb stops and boxes installed at property line.

Valves for service connections 100 millimetre diameter and greater shall be restrained to the tee on the watermain and located according to Region of Durham Standard Drawings.

Blow-off for water service connections 100 millimetre to 300 millimetre in size shall be a 50 millimetre copper pipe connection, complete with service box and rod, with copper pipe blow-off into top section of valve box.

3.7 Materials

For watermain service connection materials refer to the Region of Durham Approved Manufacturers' Product List.

Water service connections 50 millimetre diameter or less shall be type "K" copper.

Water service connections larger than 50 millimetre diameter shall be an approved pipe material according to the Approved Manufacturer's Products List.

3.8 Construction

Construction of all connections shall be according to the current and appropriate design specifications, Region of Durham Construction Specifications for Regional Services and Region of Durham Standard Drawings.

4. Cross Connection and Backflow Prevention

4.1 General

A backflow prevention device shall be installed on a service pipe, pipe, fixture, appliance and / or fire line which may allow any source of pollution or contamination entering the Region of Durham's potable water system.

A backflow prevention device shall be installed on a service pipe, piping, fixture, appliance and / or a fire line by the Consumer where required by the Local Municipalities and/or the Region of Durham.

Backflow prevention devices shall be selected, supplied, installed, and tested at the owner's expense, and shall be according to Region of Durham, Ontario Building Code, CSA B64 and NFPA 13/14 standards and specifications.

Backflow prevention devices shall be installed in a location that is readily accessible; capable of being reached for operation, renewal, servicing, or inspection, without requiring the climbing over or removal of an obstacle or the use of a portable ladder.

Backflow prevention devices shall be located in a building, unless the Region of Durham directs in writing that another location be used.

All facilities installed to house the backflow prevention device shall be constructed and maintained by the owner to allow free access by the Region of Durham and/or the Plumbing Inspector of the Local Municipalities.

All proposed commercial, industrial, institutional, and multi-residential developments shall provide to the Region of Durham for approval, a plan showing the backflow preventer size, type and location. The Region of Durham shall determine final means of fire line isolation.

A cross connection survey of an existing building shall be completed by approved personnel at the owner's expense if requested by the Region of Durham.

4.2 Fire Protection Systems

Where a Region of Durham water supply system services a fire protection system, the fire protection system shall be isolated by means of:

1. A double check valve assembly where no water treatment chemicals or anti-freeze are added to the fire protection system.
2. A reduced pressure principal backflow preventer where water treatment chemicals or anti-freeze solutions are added to the fire protection system.

Existing fire protection systems that do contain chemicals or anti-freeze solutions shall be protected with a reduced pressure principal backflow preventer.

Special note is to be given to the following requirements in NFPA 13/14:

1. All valves shall be listed indicating type and be supervised in the open position by the following methods:
 1. Valves on retrofitted existing fire lines shall be locked open.
 2. New construction, where a fire alarm system is required to have an annunciator, each valve controlling water supplies shall be equipped with an electrically supervised switch for transmitting a signal for individual annunciation in the event of movement of the valve handle.
 3. All proposed and existing fire line protection systems requiring the installation of a backflow device shall be hydraulically calculated by a qualified person to ensure that it will meet NFPA 13/14 requirements. A professional engineer shall verify that all calculations are correct. A letter verifying these calculations shall be sent to the Region of Durham, Local Municipalities, and fire service.
 4. The fire service and fire alarm companies shall be notified prior to a fire protection system being shut down to facilitate testing. They shall also be notified on the system being restored.

4.3 Cross Connection Surveyors

The Cross Connection Surveyor shall:

1. Have a good working knowledge of a potable water system and have extensive experience (minimum two years) in cross connection surveys.
2. Have a trade or professional qualifications (i.e., plumbing certificate, professional engineer, technologist, or equivalent status) or working under the authority of that person.
3. Have attended and passed an approved cross connection surveyors' course.
4. Have met all requirements of the Local Municipalities, including licensing and insurance requirements. That person or company shall show proof to the Local Municipalities and/or Region of Durham that they have the appropriate liability insurance.

A person may qualify as a cross connection surveyor prior to taking an approved course but must within six months show proof to the Region of Durham that they have taken and passed an approved cross connection surveyors' course. That person must meet all other requirements prior to being placed on the approved cross connection surveyors' list. If proof is not shown within the six month period, that person will be removed from the approved list.

4.4 Installing and/or Repairing

The installing and/or repairing person shall:

1. Have a plumbing certificate or professional qualifications or be under the authority of that person.
2. Meet all the requirements of the CSA B64 standard.
3. Meet all requirements of the Local Municipalities, including licensing and insurance requirements.

4.5 Testers

The Tester shall:

1. Have attended and passed a course of study in backflow prevention device testing.
2. Meet all the requirements of the CSA B64 Standard.
3. Meet all the requirements of the Local Municipalities, including licensing and insurance requirements.

Backflow prevention devices shall be tested upon installation and thereafter annually, or more often if required by the Region of Durham or the Plumbing Inspector of the Local Municipality.

The consumer shall submit a report on a form approved by the Region of Durham on any or all tests performed on a backflow device within 14 days after installation and within 30 days for annual tests on notification by the Region of Durham. A record card approved by the Region of Durham shall be displayed on or adjacent to the backflow preventer.

When results of a test show that a backflow device is not in good working condition, the consumer shall make repairs or replace the device within seven working days of the test.

Backflow test gauges shall be calibrated annually. Test gauges shall only be used for testing backflow devices if they have been calibrated when purchased or on an annual basis. Calibrating results shall be sent to the Region of Durham within 30 days from the date of calibration.