STORMWATER INFILTRATION

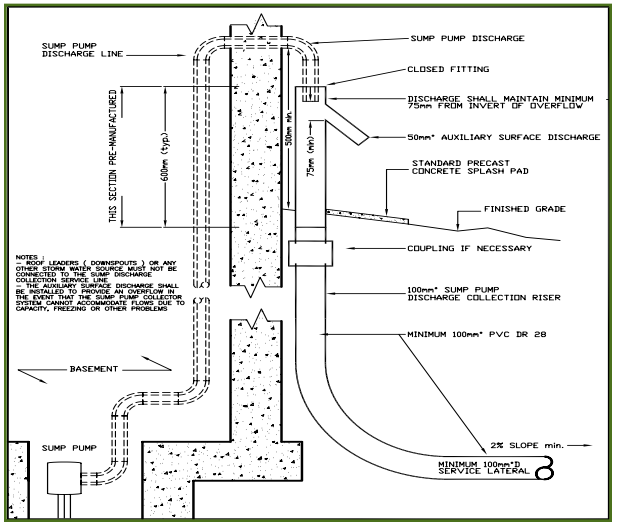
Residential flooding may also arise when stormwater enters basements due to:

- Ponding of water against the foundation that migrates into the basement. Reasons can include: compromised foundation drain; sump pump failure; back up of weeping tile connected to a stormwater main when surcharged; a downspout that is blocked or too close to house; and/or poor grading at the house,
- Cracks in basement walls,
- Substandard foundation backfill, and/or
- Compromised storm connections.

Homeowners can mitigate basement flooding and contribute positively to long term wastewater reduction by:

- Re-grading and re-contouring surface drainage to maximize stormwater runoff and minimize inflow and infiltration into the sanitary sewer system
- Correcting improper or altered lot grading
- Relocating and optimizing residential rainwater downspouts
- Installing sump pumps (battery back-up system optional but recommended)
- Reducing overall water usage (water conservation), and
- Eliminating cross-connections.

Typical Sump Pump Discharge Connection At House



WHAT IS THE TOWN OF MORINVILLE DOING?

Municipal programs, strategies and public education programs for mitigating flooding and for contributing to increased long term wastewater reduction include:

- Building awareness and understanding of longer term actions required to achieve success on area flooding,
- Increasing awareness and knowledge of water conservation and water use reduction (eg. toilet replacement program)
- Increasing awareness and knowledge of sump pump maintenance and repair, (web site)
- Requiring sump pump collection systems to drain directly into the stormwater system in all new developments,
- Use of flow monitoring and Closed Circuit Television (CCTV) inspections, where appropriate, to identify areas of high inflow and infiltration,
- Revising engineering standards (eg. pipe materials, lot grading, water tight systems, sump pump collector systems, etc.).
- Annual Town wide sanitary sewer flushing program.
- Town staff available to provide assistance to residents in assessing cause of sewer backups.

For more Information, contact
Morinville Public Works Department
at (780) 939-2590.
Additional information is also available on the Town's website: www.morinville.ca

Morinville
PUBLIC WORKS

Morinville
Growing Together

PUBLIC WORKS

FLOOD MITIGATION

DRAINAGE

Drainage in a municipality is managed by two systems: the stormwater system and the sanitary sewer system. These systems normally function independently to prevent flooding and unsanitary conditions.

The stormwater system collects surface water from rain and snow melt by use of pipes or overland drainage on roads and ditches to an outlet point. The sanitary system collects household and business waste water in pipes and directs it to a treatment facility.

MORINVILLE RESIDENTIAL DRAINAGE SERVICE CONNECTION SYSTEMS

In Morinville, there are three variations of drainage service connections:

- **Type 1** - The weeping tile system is connected directly to the sanitary service.
- **Type 2** – The weeping tile system discharges to an internal sump which is then pumped out to ground surface and discharged at or near the foundation.
- **Type 3** - a separate sump pump collection service is provided to each residence. This service is connected to the stormwater system.

In general terms, Type 1 systems are likely to be found in older homes, constructed prior to 1980, Type 2 systems are likely to be found in homes constructed between 1980 and 2005, and Type 3 systems are likely to be found in homes constructed after 2005.

All new residential subdivisions being constructed in Town are required to provide a sump pump collector service to each lot in accordance with the Town's Municipal Engineering Standards.

WATER MANAGEMENT PROBLEMS

Stormwater and sanitary systems are designed to meet expected demands and provide a high level of effectiveness for users. The systems are not infallible as they are subject to aging and to changes in conditions (eg. adding more pavement to a site causes an increase in surface runoff, an increase in population densities due to redevelopment increases flow volumes).

Issues become evident in heavy and/or prolonged wet weather when stormwater finds its way into the sanitary sewer system, often resulting in basement flooding.

The terms "Inflow" and "infiltration" are used to describe the way stormwater can enter the storm or sanitary sewer systems.

Inflow is defined as water that enters a system through a direct connection.

Infiltration is water that enters the system due to structural defects consistent with damaged or aging infrastructure.

Inflow and infiltration are found in both the private and public parts of the collection systems.

CAUSES OF INFLOW AND INFILTRATION?

Factors contributing to inflow and infiltration and leading to reduced stormwater and sanitary sewer capacity include:

- Lot grading – inadequate or modified grades prevent efficient surface drainage
- Settlements around basement walls – prevents runoff to the street, allowing water to percolate down to the weeping tile system
- Damage and aging – water enters systems through joints, cracks, and/or faulty manhole covers/frames
- High groundwater – allows water to surround and infiltrate pipe joints and manholes
- Cross connections – where surface water intended for a storm connection or ground absorption is connected to the sanitary system. Examples include: foundation drain/weeping tile connected to the house service; window wells draining to the weeping tiles; and, driveway/ parking lot drains tied directly to the sanitary system.

EFFECTS OF INFLOW AND INFILTRATION

Inflow and infiltration have these effects:

- Reduced system carrying capacity
- Higher volumes increase treatment costs at the regional plant causing an increase in rates
- Sewer backups
- Basement flooding

RESIDENTIAL FLOODING

There are two primary types of residential flooding that occurs: Sanitary sewer backups and Stormwater infiltration

SANITARY SEWER BACKUPS

The sanitary collection system uses smaller diameter pipes than the stormwater system and has much less carrying capacity that the stormwater system which is designed to handle large water volumes in a short period of time.

Problems arise when stormwater enters the sanitary system. The resulting increase in flows can overload the system, resulting in backups in floor drains and other sanitary facilities (toilets, etc.).

Sewer backups can also occur when residential connections to the sewer mains are blocked. Typical causes of this include improper disposal of cooking oils, fats & greases, flushing non-biodegradable items other than toilet paper, and tree roots.