

City of Newton



Ruthanne Fuller
Mayor

**DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION**
OFFICE OF THE CITY ENGINEER
1000 Commonwealth Avenue
Newton Centre, MA 02459-1449

**POLICY FOR SEWER INFILTRATION/INFLOW (I/I) MITIGATION
FOR NEW CONNECTIONS AND MODIFICATIONS TO EXISTING
CONNECTIONS TO THE MUNICIPAL SEWER SYSTEM**

UPDATED: March 7, 2019

The following summarizes, clarifies and updates the City of Newton's policy for infiltration/inflow mitigation for new connections and modifications of existing connections to the municipal sewer system.

Purpose and Background

A. City & State Sewer System

The sanitary sewer system in the City of Newton transports wastewater to the Massachusetts Water Resources Authority (MWRA) system. Flows are conveyed through City and MWRA pipes, pump stations and other facilities for treatment and ultimate discharge at the Deer Island Wastewater Treatment Facility. Particularly during intense rain events, the Newton sewer system has insufficient capacity to accommodate the flows, thereby creating flooding and surcharges or overflows at manholes or into buildings, particularly into below-grade plumbing fixtures. Newton's connections to the MWRA system, and the MWRA system itself are also capacity-limited, and intense rain events can cause sanitary system overflows that discharge pollutants, including disease-causing bacteria to local surface waters such as the Charles River.

To mitigate both the local and regional impacts of insufficient capacity, long-standing policies of the City of Newton, administered by the Department of Public Works (DPW) Engineering Division, have regulated connections to the sewer system from private properties. The policies are consistent with and informed by the City Ordinances, the permits, policies and guidance issued by the MWRA, Environmental Protection Agency (EPA), and the Massachusetts Department of Environmental Protection (MassDEP), and applicable federal and state regulations, including, but not limited to:

- Newton Revised Ordinances, Chapter 29 – Water, Sewers and Drains
- MWRA Municipal discharge permit # 24101388 issued to Newton on January 1, 2019
- 314 CMR 12.00: Operation, Maintenance and Pretreatment Standards for Wastewater Treatment Works and Indirect Dischargers
- MWRA Enabling Act, MGL Chapter 372 as Amended

B. Infiltration and Inflow

Infiltration, generally groundwater, is water other than sanitary wastewater that enters the sewer system through cracks and structural defects in the system. Inflow, generally stormwater, is water other than sanitary wastewater that enters the system, either illegally or incorrectly, through roof leaders, sump pumps, cellar drains, cooling towers, yard drains, driveway drains, catch basins, and other storm drain connections. Infiltration and Inflow (I/I) causes a range of problems including reducing the ability of wastewater treatment facilities to adequately cleanse sanitary flows, increasing operations and maintenance costs for sanitary pumping equipment, limiting capacity for sanitary flows, and creating sanitary system overflows.

The City of Newton requires I/I mitigation in order to deal with the increased demand on the City's sewer system. The City's existing sewer infrastructure is old and has limited capacity. New development can and will substantially increase the burden on the system and will impact its capacity and capability. The purpose of the mitigation requirement is to decrease the burden on the City's overtaxed sewer system by ensuring that I/I is removed in sufficient amounts to accommodate the increased demand on the City's sewer pipes resulting from new developments. Since 2000, the City has performed sewer I/I removal projects in many of the interceptor and collector sewer pipes and manholes throughout the City. However, much work remains to be completed. The City initiated a strategic sewer I/I removal plan in 2012, encompassing the entire sewer infrastructure city-wide.

Reducing I/I is a requirement of the permits issued to Newton as well as policies and regulations enforced by EPA, MassDEP and MWRA to which Newton is subject. In 2014, MassDEP revised 314 CMR 12.00, and in 2017 issued revised policies and guidance for I/I removal. Consequently, the City's stormwater, sewer system, and I/I management policies that have been employed since the 1990s are subject to state review and enforcement.

I/I Mitigation Requirements

For all new connections to the City's sewer system and for all existing connections where the property is completely or substantially reconstructed (both residential and commercial), I/I must be removed from the City's sewer system at a minimum rate of four gallons of I/I removal for each gallon of wastewater that will be discharged to the sewer system.

A property is "completely or substantially reconstructed" when: (i) a dwelling or structure is razed; (ii) a dwelling or structure is renovated and/or gutted more than 50%; or (iii) a dwelling or structure has an addition constructed that increases the footprint by more than 1,000 square feet or increases the total square footage more than 1,000 square feet.

The City Engineer may require a higher removal rate per gallon of sewer flow in sensitive areas, such as where there are frequent sewer overflow events, where overflows have the potential to impact wetlands, water resources or nitrogen sensitive areas, or where the area is so burdened by I/I as to be a hazard to public health, as confirmed by the City's Department of Public Health.

The removal of I/I and/or payment of any monetary fee assessed is required prior to the issuance of a building permit for the subject property.

Residential and mixed-use developments that include four or fewer residential dwelling units on any parcel or contiguous parcels comprising a development site are not subject to the I/I mitigation requirement contained in this policy, but must still comply with the City's Water & Sewer Service Renewal Policy, which further addresses the impact of development on the City's sewer system capacity and capability by requiring new water and sewer services to be installed when a dwelling is razed or completely or substantially reconstructed. For example, while the development of a single family home does not require the payment of any I/I mitigation fee, it will require, in most instances, the developer to install new water and sewer services. A copy of the City's Water & Sewer Renewal Policy is attached hereto as **Appendix A**.

Calculation of Wastewater Flow

In accordance with the MassDEP policy for the calculation of wastewater flows (set forth in Section 15.203 of Massachusetts "Title 5" (310 CMR 15), flow rate is based on the following:

- For residential properties, the flow rate is based on the number of bedrooms and the flow rate of 110 gallons per day per bedroom.
- For commercial properties, the flow rate is based on the estimated generated flow for the proposed use set forth in Title 5.

The calculation of wastewater flow is based on the gross flow generated by the proposed development, without any discount for flow generated by an existing use. For the purpose of encouraging the installation of water-efficient fixtures and equipment, whenever the manufacturer's specifications for such fixtures and/or equipment proposed to be installed as part of any development indicates a flow that is less than the standard set forth in Title 5 and/or normally used by the City Engineer, the City Engineer uses the lower flow amount indicated in the manufacturer's specifications and proposed by the developer.

The City Engineer is responsible for calculating the flows and fees for the use of any building or portion thereof for which an application is submitted and provides applicants with a detailed response to their application within 10 business days of its filing.

Achieving I/I Mitigation

The City of Newton DPW Utilities Division is administering the I/I removal program, including sewer system rehabilitation and sewer cleaning and lining projects. Renovation and development project applicants subject to the I/I Policy may elect to pay a fee based on the project's I/I mitigation requirement. The fee will be deposited into a dedicated account that funds those projects.

The per-gallon fee is established annually based on the program costs to remove I/I. The revised FY2018 I/I mitigation fee is \$19.77. This fee is calculated by the City Engineer based on a capital cost analysis report prepared by the City's consulting engineer, attached hereto as **Appendix B**.

Alternatively, development project applicants have the option of implementing the sewer system capital improvement program, subject to the approval of DPW and in accordance with plans and

calculations approved by the City Engineer, and it shall be the applicant's responsibility for completing the sewer I/I removal project, prior to connecting into the sewer system.

Waiver of I/I Mitigation Fee by City Council

The City Council, upon petition from an applicant, may waive, in whole or in part, the I/I fee for a particular property, provided that:

- a) the City Council receives written recommendations of the requested waiver from the City Engineer and the Director of Planning and Development;
- b) the City Council determines that the waiver will benefit the health and well-being of the public and is reasonably in the best interest of the City; and
- c) the applicant has agreed, in writing, to make a voluntary payment to the City for general development mitigation in an amount equal to no less than seventy-five percent (75%) of the portion of the I/I fee being waived.

The City Council, in making its determination, and the City Engineer and the Director of Planning and Development in making their written recommendation to the Council as applicable, shall consider the following criteria:

- a) the expected impact of the development on I/I;
- b) whether I/I mitigation has previously been conducted in the general area; and
- c) whether a greater need has arisen for mitigation of a different nature.

EXAMPLE CALCULATION – PARTIAL WAIVER

- I/I mitigation fee for Project A = \$100,000
- City Council determines that 50% of the I/I mitigation fee should be waived
- Project A developer pays:
 - \$50,000 = non-waived I/I fee deposited into dedicated account for I/I projects
(50% of the I/I fee)
 - \$37,500 = voluntary general development mitigation payment
(75% of the waived amount of \$50,000)
- Project A total payment is \$87,500

Effective Date

The effective date of this revised policy is April 1, 2019. The requirements of this revised I/I Policy shall not apply to any building permit, special permit or comprehensive permit issued prior to the effective date. For all developments that have not received any such permit as of the effective date of the revision, compliance with the revised I/I Policy is required.

City of Newton



David B. Cohen
Mayor

DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION
OFFICE OF THE CITY ENGINEER
1000 Commonwealth Avenue
Newton Centre, MA 02459-1449

Water & Sanitary Sewer Service Renewal Policy Effective February 1, 2007

1. When a dwelling or structure is razed, then new water and sewer services must be installed.
2. When a dwelling or structure (built prior to 1970) is renovated, gutted more than 50% then new water and sewer services must be installed.
3. When a dwelling or structure (built prior to 1970) has an addition constructed that increase the footprint by more than 1,000 square feet, or increase the total square footage more than 1,000 square feet; then both water and sewer services must be updated.
4. Updated shall mean that the sewer service is installed to the City's Standard minimum standard of 6" SDR 35 PVC pipe; and the water service shall be a minimum of 1" Type K copper. Installed from the respective mains to the dwelling or structure.
5. If an existing sanitary sewer service is less than 20 years old, and is SDR 35 PVC or better (per City Engineer) then per Section 29-62 of the City Ordinances the sewer line may be tested (Closed Circuit Television- CCTV) and witnessed by the Engineering Division to verify (to the Commissioner of Public Works) its ability to be reused without replacement.
6. All renewals must conform to the City's Construction Standards.

NEWTON, MA
CIP PROJECT COSTS COMPARED TO I/I REMOVED

CIP PROJECT	CONTRACT COST
CIP Project 1	
Design	\$166,000
Construction (FY14)	\$3,481,848
Construction Services	\$25,000
Post Construction Flow Evaluation	\$496,200
SUBTOTAL	\$4,169,048
ESTIMATED INFILTRATION REMOVED (GPD)	221,462
COST PER GPD REMOVED	\$18.83
CIP Project 2	
Design	\$181,500
Construction (FY15)	\$4,459,458
Construction Services	\$630,500
Post Construction Flow Evaluation	\$25,000
SUBTOTAL	\$5,296,458
ESTIMATED INFILTRATION REMOVED (GPD)	412,917
COST PER GPD REMOVED	\$12.83
CIP Project 3 and CIP Project 4	
Design	\$374,700
Construction (FY17)	\$5,718,300
Construction Services	\$779,312
Post Construction Flow Evaluation	\$25,000
SUBTOTAL	\$6,897,312
ESTIMATED INFILTRATION REMOVED (GPD)	363,373
COST PER GPD REMOVED	\$18.98
CIP Project 5	
Design	\$207,000
Construction (FY18)	\$2,840,732
Construction Services	\$563,500
Post Construction Flow Evaluation	\$25,000
SUBTOTAL	\$3,636,232
ESTIMATED INFILTRATION REMOVED (GPD)	127,731
COST PER GPD REMOVED	\$28.47
AVERAGE COST PER GPD REMOVED (CIP Project 1 to CIP Project 5)	\$19.78

Notes:

1. Peak direct (manhole) inflow and rain-induced infiltration was converted to an equivalent infiltration rate and included in "Estimated Infiltration Removed."

Calculate peak inflow for the peak hour of the 1-year 6-hour storm (0.87 in/hr)

Assume 45 inches of precipitation per year

Equivalent infiltration rate = (peak inflow) x (45 inches per year/0.87 inches per hour) x
(1 year/365 days) x (1 day/24 hours)