

September 28, 2020

Glenda Velez - CIP
U.S. Environmental Protection Agency - Region 1
5 Post Office Square – OEP06-01
Boston, MA 02109-3912

**Re: Annual Report - NPDES Phase II MS4 Permit
Permit Year 2 (July 1, 2019 – June 30, 2020)
City of Waltham, Massachusetts - NPDES Permit ID # MAR041066**

Dear Ms. Glenda:

Attached is a copy of the NPDES Phase II MS4 Permit Annual Report (report) for Permit Year 2 (July 1, 2019 - June 30, 2020). We are submitting this on behalf of the City of Waltham, Massachusetts.

An electronic version of this document in pdf format was also submitted via e-mail to:
stormwater.reports@epa.gov and laura.schifman@mass.gov.

We are also submitting a hard copy of this report to:

Laura Schifman
Massachusetts Department of Environmental Protection
One Winter Street - 5th Floor
Boston, MA 02108

Please feel free to contact me by phone at 508-745-4077 or via e-mail at sbade@ssv-eng.com if you have any questions or need any further information.

Very truly yours,



Sam Bade
President

C: Laura Schifman, MassDEP
Robert Winn, City Engineer - Waltham, MA

Year 2 Annual Report
Massachusetts Small MS4 General Permit
Reporting Period: July 1, 2019-June 30, 2020

*****Please DO NOT attach any documents to this form. Instead, attach all requested documents to an email when submitting the form*****

Unless otherwise noted, all fields are required to be filled out. If a field is left blank, it will be assumed the requirement or task has not been completed. Please ONLY report on activities between July 1, 2019 and June 30, 2020 unless otherwise requested.

Part I: Contact Information

Name of Municipality or Organization: City of Waltham

EPA NPDES Permit Number: MAR041066

Primary MS4 Program Manager Contact Information

Name: Robert Winn

Title: City Engineer

Street Address Line 1: Arthur J Clark - Government Center

Street Address Line 2: 119 School Street, Room #10

City: Waltham

State: MA

Zip Code: 02451

Email: rwinn@city.waltham.ma.us

Phone Number: (781) 314-3830

Stormwater Management Program (SWMP) Information

SWMP Location (web address): <https://www.city.waltham.ma.us/clean-stormwater-initiative/pages/stormwater-management-plan>

Date SWMP was Last Updated: 10/23/2019

If the SWMP is not available on the web please provide the physical address:

Part II: Self-Assessment

First, in the box below, select the impairment(s) and/or TMDL(s) that are applicable to your MS4. Make sure you are referring to the most recent EPA approved Section 303(d) Impaired Waters List which can be found here: <https://www.epa.gov/tmdl/region-1-impaired-waters-and-303d-lists-state>

Impairment(s)			
<input checked="" type="checkbox"/> Bacteria/Pathogens	<input type="checkbox"/> Chloride	<input type="checkbox"/> Nitrogen	<input type="checkbox"/> Phosphorus
<input checked="" type="checkbox"/> Solids/ Oil/ Grease (Hydrocarbons)/ Metals			
TMDL(s)			
In State:	<input type="checkbox"/> Assabet River Phosphorus	<input checked="" type="checkbox"/> Bacteria and Pathogen	<input type="checkbox"/> Cape Cod Nitrogen
	<input checked="" type="checkbox"/> Charles River Watershed Phosphorus	<input type="checkbox"/> Lake and Pond Phosphorus	
Out of State:	<input type="checkbox"/> Bacteria/Pathogens	<input type="checkbox"/> Metals	<input type="checkbox"/> Nitrogen
			<input type="checkbox"/> Phosphorus
			<input type="button" value="Clear Impairments and TMDLs"/>

Next, check off all requirements below that have been completed. By checking each box you are certifying that you have completed that permit requirement fully. If you have not completed a requirement leave the box unchecked. Additional information will be requested in later sections.

Year 2 Requirements

- ☒ Completed Phase I of system mapping
- ☒ Developed a written catchment investigation procedure and added the procedure to the SWMP
- ☐ Developed written procedures to require the submission of as-built drawings and ensure the long term operation and maintenance of completed construction sites and added these procedures to the SWMP
- ☒ Enclosed or covered storage piles of salt or piles containing salt used for deicing or other purposes
- ☐ Developed written operations and maintenance procedures for parks and open space, buildings and facilities, and vehicles and equipment and added these procedures to the SWMP
- ☐ Developed an inventory of all permittee owned facilities in the categories of parks and open space, buildings and facilities, and vehicles and equipment and added this inventory to the SWMP
- ☒ Completed a written program for MS4 infrastructure maintenance to reduce the discharge of pollutants
- Developed written SWPPPs, included in the SWMP, for all of the following permittee owned or
- ☒ operated facilities: maintenance garages, public works yards, transfer stations, and other waste handling facilities where pollutants are exposed to stormwater

Optional: If you would like to describe progress made on any incomplete requirements listed above, provide any additional information, and/or if any of the above year 2 requirements could not be completed due to the impacts of COVID-19, please identify the requirement that could not be completed, any actions taken to attempt to complete the requirement, and reason the requirement could not be completed below:

Due to the mandatory COVID-19 shutdown of municipal offices resulting in limited departmental staff availability, limited departmental operations and meeting restrictions, the City's regular Stormwater Sub-Committee meetings could not be held. The last meeting was held on February 18, 2020. As a standard

procedure MS4 Permit requirement deliverables are developed in draft form and presented to the City's Stormwater Sub-Committee for review prior to approval. The incomplete items identified above have been developed in draft and will be finalized at future Stormwater Sub-Committee meetings.

Annual Requirements

- ☐ Provided an opportunity for public participation in review and implementation of SWMP and complied with State Public Notice requirements
- ☒ Kept records relating to the permit available for 5 years and made available to the public
- ☒ The SSO inventory has been updated, including the status of mitigation and corrective measures implemented
 - ☐ This is not applicable because we do not have sanitary sewer
 - ☐ This is not applicable because we did not find any new SSOs
 - ☒ The updated SSO inventory is attached to the email submission
 - ☐ The updated SSO inventory can be found at the following website:
- ☒ Properly stored and disposed of catch basin cleanings and street sweepings so they did not discharge to receiving waters
- ☐ Provided training to employees involved in IDDE program within the reporting period
- ☒ All curbed roadways were swept at least once within the reporting period
- ☒ Updated outfall and interconnection inventory and priority ranking as needed

Optional: If you would like to describe progress made on any incomplete requirements listed above, provide any additional information, and/or if any of the above annual requirements could not be completed due to the impacts of COVID-19, please identify the requirement that could not be completed, any actions taken to attempt to complete the requirement, and reason the requirement could not be completed below:

The SWMP has been posted on the City's Clean Stormwater Initiative Website and public input was sought with announcements on City's Webpage, we believe that it may not meet the State Public Notice requirements. Please see description under "Employee Training" MCM3 below.

Bacteria/ Pathogens (Combination of Impaired Waters Requirements and TMDL Requirements as Applicable)

Annual Requirements

*Public Education and Outreach**

- ☒ Annual message was distributed encouraging the proper management of pet waste, including noting any existing ordinances where appropriate
- ☐ Permittee or its agents disseminated educational material to dog owners at the time of issuance or renewal of dog license, or other appropriate time
- ☐ Provided information to owners of septic systems about proper maintenance in any catchment that discharges to a water body impaired for bacteria

** Public education messages can be combined with other public education requirements as applicable (see Appendix H and F for more information)*

Optional: If you would like to describe progress made on any incomplete requirements listed above or provide any additional details, please use the box below:

Solids, Oil and Grease (Hydrocarbons), or Metals

Annual Requirements

Good Housekeeping and Pollution Prevention for Permittee Owned Operations

- ☒ Increased street sweeping frequency of all municipal owned streets and parking lots to a schedule that targets areas with potential for high pollutant loads

- ☐ Prioritized inspection and maintenance for catch basins to ensure that no sump shall be more than 50 percent full; Cleaned catch basins more frequently if inspection and maintenance activities indicated excessive sediment or debris loadings

Optional: If you would like to describe progress made on any incomplete requirements listed above or provide any additional details, please use the box below:

The City is working on developing a system for capturing catch basin inspection data electronically during cleaning. Approximately 25% of the catch basins are cleaned annually; however, the public works department knows the locations where catch basins need cleaning at least once annually and maintains them. Once the inspection data collection system is in place and all of the catch basins have been cleaned at least once the City will develop a prioritized catch basin cleaning plan based on the sediment accumulation.

Charles River Watershed Phosphorus TMDL

- ☐ Completed Legal Analysis

Optional: If you would like to describe progress made on any incomplete requirements listed above or provide any additional details, please use the box below:

A draft Legal Analysis has been developed; however, as mentioned above due to impacts from COVID, it has not been submitted for review to the City's Stormwater Sub-Committee meeting. The draft will be reviewed and finalized in the future meetings.

Optional: Use the box below to provide any additional information you would like to share as part of your self-assessment:

Due to the mandatory COVID-19 shutdown of municipal offices resulting in limited departmental staff availability, limited departmental operations and meeting restrictions, the City's regular Stormwater Sub-Committee meetings could not be held. The last meeting was held on February 18, 2020 with a future meeting planned in May 2020 to update Proposed Draft Stormwater Rules and Regulations to conform with MS4 Permit Requirements. At that meeting, the City's current on-site stormwater runoff infiltration requirement from any construction work involving land disturbances greater than 150 square feet was briefly discussed. Due to the subsequent issuance of the proposed 2020 Modifications to the 2016 MS4 General Permit by EPA in April 2020, the City's discussion and preparation of proposed revisions to the draft regulations is ongoing pending the Agency's issuance of final 2020 Modifications.

Part III: Receiving Waters/Impaired Waters/TMDL

Have you made any changes to your lists of receiving waters, outfalls, or impairments since the NOI was submitted?

☐ Yes

☒ No

If yes, describe below, including any relevant impairments or TMDLs:

Part IV: Minimum Control Measures

Please fill out all of the metrics below. If applicable, include in the description who completed the task if completed by a third party.

MCM1: Public Education

Number of educational messages completed during this reporting period: 3

Below, report on the educational messages completed during this reporting period. For the measurable goal(s) please describe the method/measures used to assess the overall effectiveness of the educational program.

BMP:Stormwater Management for Residents

Message Description and Distribution Method:

A detailed stormwater brochure for residents was posted on the City's Clean Stormwater Initiative Webpage. "Dwayne the Storm Drain" kids book was also posted.

Targeted Audience: Residents

Responsible Department/Parties: Engineering Department and Conservation Commission

Measurable Goal(s):

The City's Recycling Website received 14,103 hits and the Clean Stormwater Initiative received 218 hits.

Message Date(s): July 1, 2019 through June 30, 2020

Message Completed for: Appendix F Requirements ☒ Appendix H Requirements ☒

Was this message different than what was proposed in your NOI? Yes ☐ No ☒

If yes, describe why the change was made:

BMP:Stormwater Management for Businesses, Institutions and Commercial Facilities

Message Description and Distribution Method:

A brochure was developed for parking lots at commercial buildings to describe proper equipment inspection, waste disposal, dumpster maintenance, use and storage of de-icing materials and parking lot sweeping and posted on the City's Clean Stormwater Initiative Webpage.

Targeted Audience: Businesses, Institutions and Commercial Facilities

Responsible Department/Parties: Building, Engineering and PW Departments

Measurable Goal(s):

The Clean Stormwater Initiative Website received 218 hits.

Message Date(s): July 1, 2019 through June 30, 2020

Message Completed for: Appendix F Requirements ☒ Appendix H Requirements ☒

Was this message different than what was proposed in your NOI? Yes ☐ No ☒

If yes, describe why the change was made:

BMP:Public Education Flyers Mailings

Message Description and Distribution Method:

Flyers containing three public education items were included in the water and sewer bill mailings to residential and commercial accounts.

Targeted Audience: Residential and Commercial

Responsible Department/Parties: Engineering and PW Departments

Measurable Goal(s):

July/August/September 2019 – Indoor Water Conservation Flyer - (Commercial – 544 Residential – 13,229)
October/November/December 2019 – Fat Free Sewers Flyer - (Commercial – 549 Residential – 13,252)
April/May/June 2020 – Flushable Wipes Are Not Flushable flyers - (Commercial – 565 Residential – 13,261)

Message Date(s): July 1, 2019 through June 30, 2020

Message Completed for: Appendix F Requirements ☒ Appendix H Requirements ☒

Was this message different than what was proposed in your NOI? Yes ☐ No ☒

If yes, describe why the change was made:

Add an Educational Message

MCM2: Public Participation

Describe the opportunity provided for public involvement in the development of the Stormwater Management Program (SWMP) during this reporting period:

The Stormwater Management Program (SWMP) was posted to the City's Clean Stormwater Initiative Website on June 30, 2019. A public announcement on City's Website was made to seek input on the SWMP. See Attachment B.

Was this opportunity different than what was proposed in your NOI? Yes ☐ No ☒

Describe any other public involvement or participation opportunities conducted **during this reporting period**:

The City of Waltham performed several storm water-related activities in collaboration with residents. Numerous volunteer cleanup activities along surface water bodies and educational walks/tours have been organized by the Waltham Land Trust. The City continued with the hazardous waste/used oil collection days for the residents throughout the reporting period. The City also continued to offer the Rain Barrel Purchase Program for residents.

MCM3: Illicit Discharge Detection and Elimination (IDDE)

Sanitary Sewer Overflows (SSOs)

Check off the box below if the statement is true.

☐ This SSO section is NOT applicable because we DO NOT have sanitary sewer

Below, report on the number of SSOs identified in the MS4 system and removed during this reporting period.

Number of SSOs identified: 6

Number of SSOs removed: 6

MS4 System Mapping

Below, check all that apply.

The following elements of the Phase I map have been completed:

- ☒ Outfalls and receiving waters
- ☒ Open channel conveyances
- ☒ Interconnections
- ☒ Municipally-owned stormwater treatment structures
- ☒ Waterbodies identified by name and indication of all use impairments
- ☒ Initial catchment delineations

Optional: Describe any additional progress you made on your map during this reporting period or provide additional status information regarding your map:

Municipally owned stormwater treatment systems have been mapped and used to inspect and maintain on regular basis. The City will continue to update the mapping to include additional treatment systems as they are installed.

Screening of Outfalls/Interconnections

If conducted, please submit any outfall monitoring results from this reporting period. Outfall monitoring results should include the date, outfall/interconnection identifier, location, weather conditions at time of sampling, precipitation in previous 48 hours, field screening parameter results, and results from all analyses.

- ☒ The outfall screening data is attached to the email submission

- ☐ The outfall screening data can be found at the following website:

Below, report on the number of outfalls/interconnections screened during this reporting period.

Number of outfalls screened:

Catchment Investigations

If conducted, please submit all data collected during this reporting period as part of the dry and wet weather investigations. Also include the presence or absence of System Vulnerability Factors for each catchment.

- ☒ The catchment investigation data is attached to the email submission
☐ The catchment investigation data can be found at the following website:

Below, report on the number of catchment investigations completed during this reporting period.

Number of catchment investigations completed this reporting period:

Below, report on the percent of catchments investigated to date.

Percent of total catchments investigated:

Optional: Provide any additional information for clarity regarding the catchment investigations below:

Sampling of outfalls discharging into Charles River along with municipal interconnections were conducted in 2008. See maps located at [https://www.city.waltham.ma.us/clean-stormwater-initiative/pages/initial outfall sampling](https://www.city.waltham.ma.us/clean-stormwater-initiative/pages/initial%20outfall%20sampling). The IDDE Plan is located at https://www.city.waltham.ma.us/sites/walthamma/files/uploads/waltham_idde_plan.pdf. Appendix C of this Plan shows the Stormwater Catchment Delineation, Stormwater Catchment Prioritization and Ranking.

IDDE Progress

If illicit discharges were found, please submit a document describing work conducted over this reporting period, and cumulative to date, including location source; description of the discharge; method of discovery; date of discovery; and date of elimination, mitigation, or enforcement OR planned corrective measures and schedule of removal.

- ☒ The illicit discharge removal report is attached to the email submission
☐ The illicit discharge removal report can be found at the following website:

Below, report on the number of illicit discharges identified and removed, along with the volume of sewage removed during this reporting period.

Number of illicit discharges identified:

Number of illicit discharges removed:

Estimated volume of sewage removed: gallons/day

Below, report on the total number of illicit discharges identified and removed to date. At a minimum, report on the number of illicit discharges identified and removed since the effective date of the permit (July 1, 2018).

Total number of illicit discharges identified:

Total number of illicit discharges removed:

Optional: Provide any additional information for clarity regarding illicit discharges identified, removed, or planned to be removed below:

As summarized in Attachment C, a total estimate of 13.53 MGY of illicit flow has been removed between April 1, 2010 and July 2013. Additional illicit flow has been removed since July 2013 to-date and the City is compiling the information and will present it in the next annual report.

Employee Training

Describe the frequency and type of employee training conducted **during the reporting period:**

Employee training for City of Waltham employees is managed, handled and generally provided at the departmental level by each respective department head. Each City department head is responsible for and determines what training is necessary and/or desirable for each of their departmental employees based on his/her job responsibilities and duties and makes training available to his/her employees as appropriate. During the reporting period, various City employees received training in OSHA HazCom and other OSHA training, asbestos and other training necessary and appropriate for their job duties.

MCM4: Construction Site Stormwater Runoff Control

Below, report on the construction site plan reviews, inspections, and enforcement actions completed during this reporting period.

Number of site plan reviews completed:

Number of inspections completed:

Number of enforcement actions taken:

Optional: Enter any additional information relevant to construction site plan reviews, inspections, and enforcement actions:

MCM5: Post-Construction Stormwater Management in New Development and Redevelopment

Ordinance or Regulatory Mechanism

Below, select the option that describes your ordinance or regulatory mechanism progress.

- ☐ Bylaw, ordinance, or regulations are updated and adopted consistent with permit requirements
- ☐ Bylaw, ordinance, or regulations are updated consistent with permit requirements but are not yet adopted
- ☒ Bylaw, ordinance, or regulations have not been updated or adopted

As-built Drawings

Describe the measures the MS4 has utilized to require the submission of as-built drawings and ensure long term operation and maintenance of completed construction sites:

The Stormwater Ordinance requires the submission of as-built drawings.

Street Design and Parking Lots Report

Describe the status of the street design and parking lots assessment due in year 4 of the permit term, including any planned or completed changes to local regulations and guidelines:

A green infrastructure guidance document was prepared for the City's Embassy Parking Garage. This project was completed under the MassDEP 604 (b) Grant Program funding in association with the Charles River Watershed Association. Copy of the document is included in Attachment F.

Green Infrastructure Report

Describe the status of the green infrastructure report due in year 4 of the permit term, including the findings and progress towards making the practice allowable:

A green infrastructure guidance document was prepared for the City's Embassy Parking Garage. This project was completed under the MassDEP 604 (b) Grant Program funding in association with the Charles River Watershed Association. Copy of the document is included in Attachment F.

Retrofit Properties Inventory

Describe the status of the inventory, due in year 4 of the permit term, of permittee-owned properties that could be modified or retrofitted with BMPs to mitigate impervious areas and report on any properties that have been modified or retrofitted:

The City owned parcels are compiled in the City's GIS database and are readily accessible at https://www.city.waltham.ma.us/sites/g/files/vyhlif1386/f/uploads/stormwater_permit_-_permittee_facilities.pdf. Vortex type particle separators with oil and grease and floatables traps have been installed in certain City

owned school facilities that are inspected on an annual basis.

MCM6: Good Housekeeping

Catch Basin Cleaning

Below, report on the number of catch basins inspected and cleaned, along with the total volume of material removed from the catch basins during this reporting period.

Number of catch basins inspected: 2,000

Number of catch basins cleaned: 2,000

Total volume or mass of material removed from all catch basins: 642 tons

Below, report on the total number of catch basins in the MS4 system.

Total number of catch basins: 8,090

If applicable:

Report on the actions taken if a catch basin sump is more than 50% full during two consecutive routine inspections/cleaning events:

The City is working on developing a system for capturing catch basin inspection data electronically during cleaning. Approximately 25% of the catch basins are cleaned annually; however, the public works department knows the locations where catch basins need cleaning at least once annually and maintains them. Once the inspection data collection system is in place and all of the catch basins have been cleaned at least once the City will develop a prioritized catch basin cleaning plan based on the sediment accumulation. Please note that the 2,000 catch basins listed above as inspected and cleaned is an estimate based on the 25% of the total number; however, the 642 tons is the actual amount of sediment that was removed based on the disposal reports.

Street Sweeping

Report on street sweeping completed during this reporting period using one of the three metrics below.

☐ Number of miles cleaned: 293.41

☒ Volume of material removed: 1,135 cubic yards

☐ Weight of material removed: [Select Units]

O&M Procedures and Inventory of Permittee-Owned Properties

Below, check all that apply.

The following permittee-owned properties have been inventoried:

- ☒ Parks and open spaces
- ☒ Buildings and facilities
- ☐ Vehicles and equipment

The following O&M procedures for permittee-owned properties have been completed:

- ☐ Parks and open spaces
- ☒ Buildings and facilities
- ☒ Vehicles and equipment

Stormwater Pollution Prevention Plan (SWPPP)

Below, report on the number of site inspections for facilities that require a SWPPP completed during this reporting period.

Number of site inspections completed: 8

Describe any corrective actions taken at a facility with a SWPPP:

Inspections of the City's Public Works facility by the CPW P2 Team under the Rhodes Municipal Center/City Yard SWPPP continued to be conducted monthly from July 2019 through February 2020. While subsequent monthly inspections by the CPW P2 Team were scheduled, due to the mandatory COVID-19 shutdown of municipal offices resulting in limited staff availability, limited municipal departmental operations and meeting restrictions, the CPW P2 Team was unable to meet to conduct monthly inspections beginning in March 2020, however the CPW P2 Team has recently begun to resume monthly inspections. Daily inspections of the City Yard are routinely conducted by the designated City Yard representative.

Additional Information

Monitoring or Study Results

Results from any other stormwater or receiving water quality monitoring or studies conducted during the reporting period not otherwise mentioned above, where the data is being used to inform permit compliance or permit effectiveness must be attached.

- ☒ Not applicable
- ☐ The results from additional reports or studies are attached to the email submission
- ☐ The results from additional reports or studies can be found at the following website(s):

If such monitoring or studies were conducted on your behalf or if monitoring or studies conducted by other entities were reported to you, a brief description of the type of information gathered or received shall be described below:

Additional Information

Optional: Enter any additional information relevant to your stormwater management program implementation during the reporting period. Include any BMP modifications made by the MS4 if not already discussed above:

COVID-19 Impacts

Optional: If any of the above year 2 requirements could not be completed due to the impacts of COVID-19, please identify the requirement that could not be completed, any actions taken to attempt to complete the requirement, and reason the requirement could not be completed below:

As stated above, due to the mandatory COVID-19 shutdown of municipal offices resulting in limited departmental staff availability, limited departmental operations and meeting restrictions, the City's regular Stormwater Sub-Committee meetings could not be held. The last meeting was held on February 18, 2020 with a future meeting planned in May 2020 to update Proposed Draft Stormwater Rules and Regulations to conform with MS4 Permit Requirements.

Other Permit Requirements identified above as incomplete have been developed in draft form and will be presented to the City's Stormwater Sub-Committee for review prior to approval once the meetings resume.

Activities Planned for Next Reporting Period

Please confirm that your SWMP has been, or will be, updated to comply with all applicable permit requirements including but not limited to the year 3 requirements summarized below. (Note: impaired waters and TMDL requirements are not listed below)

Yes, I agree ☒

- Inspect all outfalls/ interconnections (excluding Problem and Excluded outfalls) for the presence of dry weather flow
- Complete follow-up ranking as dry weather screening becomes available

Annual Requirements

- Annual report submitted and available to the public
- Annual opportunity for public participation in review and implementation of SWMP
- Keep records relating to the permit available for 5 years and make available to the public
- Properly store and dispose of catch basin cleanings and street sweepings so they do not discharge to receiving waters
- Annual training to employees involved in IDDE program
- Update inventory of all known locations where SSOs have discharged to the MS4
- Continue public education and outreach program
- Update outfall and interconnection inventory and priority ranking and include data collected in connection with the dry weather screening and other relevant inspections conducted
- Implement IDDE program
- Review site plans of construction sites as part of the construction stormwater runoff control program
- Conduct site inspection of construction sites as necessary
- Inspect and maintain stormwater treatment structures
- Log catch basins cleaned or inspected
- Sweep all uncurbed streets at least annually
- Continue investigations of catchments associated with Problem Outfalls
- Review inventory of all permittee owned facilities in the categories of parks and open space, buildings and facilities, and vehicles and equipment; update if necessary

Provide any additional details on activities planned for permit year 3 below:

Part V: Certification of Small MS4 Annual Report 2020**40 CFR 144.32(d) Certification**

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, I certify that the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

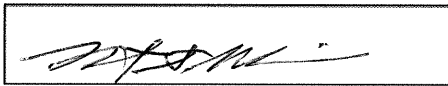
Name:

Robert S. Winn

Title:

City Engineer

Signature:



Date:

9/28/20

*[Signatory may be a duly authorized
representative]*

YEAR 2 ANNUAL REPORT

**Massachusetts Small MS4 General Permit
Reporting Period: July 1, 2019 – June 30, 2020**

CITY OF WALTHAM, MASSACHUSETTS

SEPTEMBER 22 2020

LIST OF ATTACHMENTS

ATTACHMENT A	STORMWATER PUBLIC EDUCATION
ATTACHMENT B	STORMWATER PUBLIC PARTICIPATION
ATTACHMENT C	SSO SUMMARY AND EPA IDDE PROGRAM PROGRESS REPORTS
ATTACHMENT D	MAINTENANCE OF CITY OWNED STORMWATER FACILITIES
ATTACHMENT E	HARDY POND CARE GUIDE
ATTACHMENT F	GREEN INFRASTRUCTURE GUIDANCE DOCUMENT

YEAR 2 ANNUAL REPORT

**Massachusetts Small MS4 General Permit
Reporting Period: July 1, 2019 – June 30, 2020**

CITY OF WALTHAM, MASSACHUSETTS


ATTACHMENT A

STORMWATER PUBLIC EDUCATION

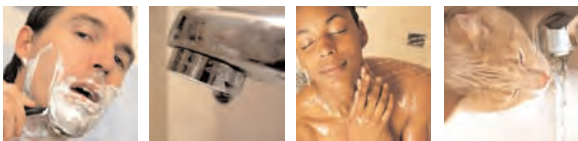


The City purchased a tabletop display board titled, "Stormwater Matters - Outreach and Participation" from SuAsCo in 2016. The City has displayed this board for a period of one month at each of its elementary schools and also at the Waltham Public Library for a period of 6 weeks in 2016. The City displayed the board at the Waltham Public Library for one month during the 2018 - 2019 permit year. The board is currently displayed in the main hallway at the Government Center Auditorium and the Engineering offices since June 2019.

Residential and Commercial Water and Sewer Bill Inserts

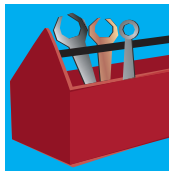


A few gallons of water in the kitchen, a few dozen in the bathroom, a few hundred on the lawn - it adds up quickly.



With a family of four using 90,000 gallons of water a year, wasted water can add up too – unnecessarily increasing household water and energy costs. Here are some of the ways to make your home and your habits more water efficient.

Build in Water Savings



Make your old toilet a water saver

Here are some easy ways to make your older model more efficient:

INSTALL one of several new toilet retrofit products available at hardware

stores. Some work only with certain toilets, so get a recommendation from your local plumber on the right one for you.

REDUCE the volume of each flush by placing a toilet dam or a water-filled plastic bottle weighted with gravel in the tank if you have not already installed a 1.6 gallon toilet. Be sure not to interfere with the flushing mechanism.

(Note: do not use bricks as they might disintegrate.)



Water efficient showerheads

Some showerheads may still use 3-7 gallons or more per minute. If you have not installed a showerhead which uses 2.5 gallons per minute or less, you are missing an excellent way to save water and energy without sacrificing the benefits of a satisfying shower.

Faucet aerators

Low-flow faucet aerators mix air with tap water to reduce the flow to 1.5 - 2.5 gallons per minute.

Faucets without aerators may be using 3-7 gallons per minute.

Water & energy efficient appliances (Energy Star label)

HIGH EFFICIENCY WASHERS Unlike traditional machines, which must be filled to the top with water in



SIMPLE TEST FOR YOUR SHOWER: Hold a bucket underneath your showerhead for 20 seconds. If more than one gallon accumulates, you need a water efficient showerhead.

order to immerse clothes sufficiently to clean them, front loading washers use about 25 gallons per load. The horizontal wash tub allows clothes to be lifted through a shallow pool of water at the bottom of the tub. Front loaders save energy too – 50% – or more by using less hot water and by extracting more water during the spin cycle, clothes need less time for drying. In addition to saving water, these new washers create less wear and tear on clothes, clean clothes better, and use less detergent. These machines save more water in one year than the average person drinks in a lifetime. To help defray the incremental cost of these new models, some gas and electric utilities offer incentives.

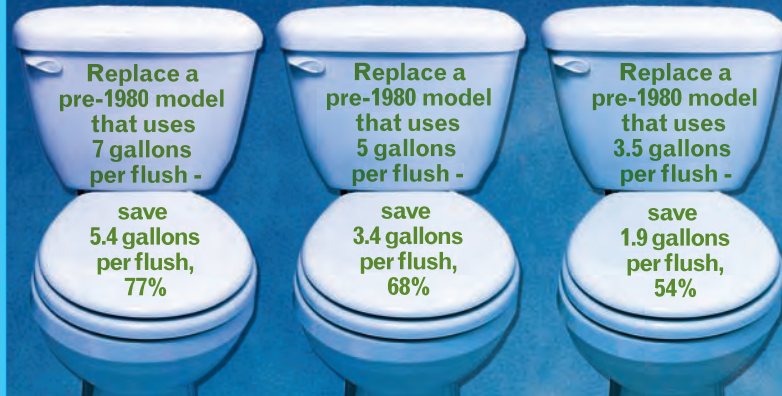


Dishwashers

Newer energy and water efficient dishwashers exceed minimum federal government standards. These newer models operate on 13 - 25% less energy and on as little as 6 gallons of water per load. Benefits to the consumer include: lower utility bills, improved washing systems that eliminate pre-rinsing, and less energy used to heat the water to clean the dishes.

When selecting new appliances, check the water and energy efficiency ratings in manufacturer's specifications or consumer magazines and look for the Energy Star label.

How much does installing a 1.6 gallon toilet save?



Installing all low flow toilets could cut your toilet water use in half.

Low flow toilets need only 1.6 gallons per flush, saving thousands of gallons each year, and unlike some earlier models, some low flow toilets available today receive high marks from consumers for overall performance. And, recent studies show that the number of flushes per household remains essentially the same in low-flow households, countering the argument that low-flow toilets require multiple flushes.

Ways To Save Water Everyday

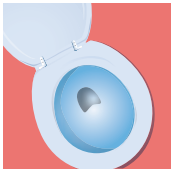


FIND & FIX HOUSEHOLD LEAKS

There is a good chance you have at least one leak in your home that could be wasting hundreds of gallons of water a week, costing you money.

Leaky Toilets

The trickling sound you hear in the bathroom could be your toilet wasting 50 gallons of water a day - thousands each year. Because you can't always see or hear these leaks, here's a simple test:



TEST TO TRY AT HOME:

Put a few drops of blue food coloring in your toilet tank. Do not flush. If color appears in the bowl within 10 - 15 minutes, you have a leak. To repair it, the flush valve ("flapper") or the valve seat may need to be cleaned or replaced. Parts are inexpensive and easy to install.

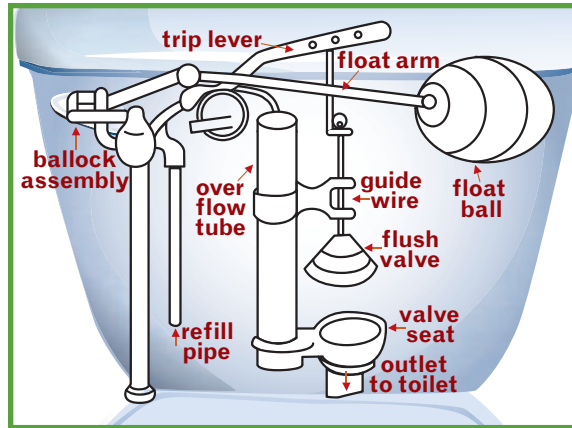
Dripping Faucets & Showerheads

Worn-out washers – the cause of most dripping faucets and showerheads – cost pennies to replace and are easily installed.

Leaky Pipes

Check under sinks, behind your washing machine and around basement plumbing for suspicious looking wet areas. Leaks not only waste water – they could be damaging your walls, floors, and ceilings.

Because homeowners and businesses alike have taken



water conservation to heart, MWRA water is currently in good supply. The challenge lies in protecting our supplies over the long term. With good water use habits and efficient home plumbing and appliances you can help make that happen – and lower your water and energy costs.

For more information about how MWRA and your local water supplier bring you the water you need every day, or to get more detailed information on water efficient toilets, appliances or smart outdoor water use call the MWRA:

Water Efficiency: 617-242-SAVE

General Information: 617-242-6000, www.MWRA.com



WATER CONSERVATION KITS

Water Conservation Kits are offered free of charge. Just fill out the request form found on MWRA.com.



Simple Saving Tips IN THE HOME

- Fix leaky faucets, pipes, toilets and save hundreds of gallons per week.
- Turn off the tap while you brush your teeth, shave, or do dishes.
- Don't flush the toilet needlessly.
- Run dishwashers and washing machines only when full or adjust the water level setting accordingly.



- Keep a jug of drinking water in your refrigerator to avoid running water until it is cold enough to drink.
- Don't fill the tub to the top when bathing and take shorter showers.

For tips on how to use water more efficiently outdoors, see our brochure - **OUTDOOR WATER CONSERVATION.**

The Massachusetts Legislature created MWRA in 1985 to manage and modernize water and sewer services for 2.5 million people and 5,500 business in 61 communities. While the Boston Harbor Project and the Integrated Water Supply Improvement Program are the best known projects, MWRA also maintains over 400 miles of water pipes, aqueducts and tunnels and over 240 miles of sewers.

FOR MORE INFORMATION:

Massachusetts Water Resources Authority
Charlestown Navy Yard, Boston, MA 02129
617-242-6000, www.MWRA.com.



150K 6/06

INDOOR WATER CONSERVATION



MASSACHUSETTS
WATER RESOURCES
AUTHORITY

What Restaurant and Building Owners Need to Know About Grease Traps or Interceptors:

Restaurants, large buildings such as apartment complexes, and other commercial establishments may have grease traps or interceptors that keep grease out of the sewer system. For a grease trap/interceptor to work correctly, the following must be done:

- 1) Grease Trap/Interceptor must be properly designed, sized and manufactured to handle the amount of Fats, Oils and Grease that are expected to be produced
- 2) Grease Trap/Interceptor should be properly installed, with correct levels and ventilation necessary
- 3) Grease Trap/Interceptor should be correctly maintained, with frequent cleanings and services.

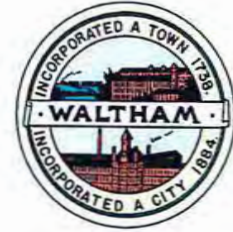
Solids should never be put into grease traps or interceptors. Routine maintenance (daily is suggested) of grease traps and interceptors is needed to ensure that blockages are prevented and/or reduced.

Be cautious of chemicals and additives (including such substances as soaps and detergents) that claim to dissolve grease and oils. Some of these additives merely pass the grease further down the pipes where a clog can develop in another area.



For more information, please contact

The City of Waltham
Water-Sewer Division
165 Lexington Street
Waltham MA 02452
781 314 3820



Fat-Free Sewers

**Preventing Fats, Oils and Grease
from Damaging your Property
and the Environment**



City of Waltham
Water-Sewer Division
781 314 3820

Fats, Oils and Grease are not just bad for your arteries and waistline; they are bad for our sewers as well.

Sewer backups and overflows can cause property damage to homes and buildings, create serious health hazards, and endanger the environment. A frequent reason for overflows is grease blocking a sewer pipe. Grease enters into the sewer system from household fixtures such as sinks, as well as from poorly maintained grease traps in restaurants and other types of businesses.

Where Does Grease Come From?

Grease is found in common products such as

<i>Meat Fats</i>	<i>Food Scraps</i>
<i>Lard</i>	<i>Baked goods</i>
<i>Cooking Oils</i>	<i>Sauces</i>
<i>Shortening</i>	<i>Dairy Items</i>
<i>Butter & Margarine</i>	

Too often, grease is washed into the plumbing system, frequently via the kitchen sink. Grease will adhere to the interior of sewer pipes, on your property and in the streets. As time goes on, the grease can build up to such an extent, that the entire pipe becomes blocked.

Garbage disposal units do not restrict grease from entering your home's plumbing system. They merely shred solids into smaller bits. Grease is still able to go down the drain.

Commercial additives that claim to dissolve grease often pass the grease further down the line, which could cause a problem elsewhere.



Blocked sewer lines can result in:

- Raw Sewage overflows into private homes and businesses
- Expensive and extensive cleanups that often are the burden of the property or home owner to pay for
- Raw Sewage overflows into public areas such as city streets, parks and waterways
- Potential contact with disease carrying pathogens
- Higher operations and maintenance costs for the city's water – sewer department which can then drive up the cost of customers' utility bills.

What Can We Do to Help?

The best way to solve the grease problem and help prevent overflows from occurring is to keep the grease, fats and oils from entering the sewer system in the first place.

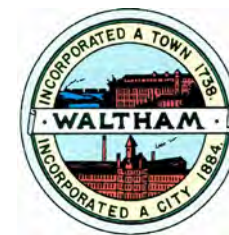
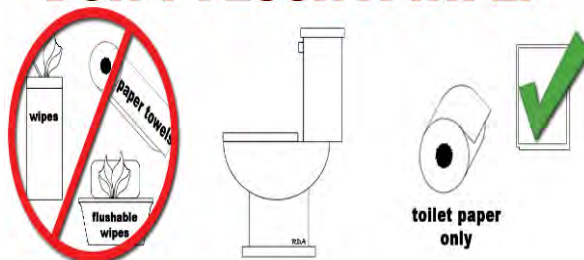


There are several ways to help:

- Never pour grease down the sink drain or into the toilet
- Scrape grease and food scraps from trays, plates, pots, pans, utensils, grills and cooking surfaces into a can, or into the trash for disposal (or recycle where available).
- Do NOT put grease down the garbage disposal. Use a basket or strainer in the sink drain to catch food scraps and other solids. Then empty them into the trash.
- Speak with your colleagues and neighbors regarding the problems of grease in the sewer system and how best to keep it out. Call the local Sewer Dept. if you have questions.



**IGNORE THE HYPE:
DON'T FLUSH A WIPE!**



Flushable Wipes Are Not Flushable

**Flushable Wipes Can Clog
Your Toilet**



Don't Flush Wipes

Flushed wipes cause
sewer backups and
increase maintenance
costs

For more information, please contact

The City of Waltham
Water-Sewer Division
165 Lexington Street
Waltham MA 02452
(781) 314 3820



**City of Waltham
Water-Sewer Division
(781) 314 3820**

FLUSH ONLY HUMAN WASTE AND TOILET PAPER. Flushable Wipes are not flushable. In a recent study, 101 single-use wipes were tested, and not one of them passed a flushability test. Instead, the wipes failed to fall apart or disintegrate safely. 23 of those wipes tested were labeled “flushable” by the manufacturer. What this means is that cleansing wipes, diaper wipes and other types of single-use wipes, while convenient, should not be flushed. Despite the “flushable” labels, these products should never be flushed because they will clog your toilet and the sewer system. The products do not breakdown and disperse in the sewer system which causes a risk of clogging your plumbing or causing damage to sewer infrastructure. The only things that should ever be flushed in a toilet are human waste and toilet paper. Single use wipes should be thrown in the trash. These everyday items can cause messy and expensive problems for the plumbing in your home or building. Just because it *can* be flushed, doesn’t mean you *should* flush it!



“Disposable” is not the same as “Flushable”. Only Human Waste and Toilet Paper are Flushable.

Blocked sewer lines can result in:

- Raw Sewage overflows into private homes and businesses
- Expensive and extensive cleanups that often are the burden of the property or home owner to pay for
- Raw Sewage overflows into public areas such as city streets, parks and waterways
- Potential contact with disease carrying pathogens
- Higher operations and maintenance costs for the city’s water – sewer department which can then drive up the cost of customers’ utility bills.



WHAT NOT TO FLUSH:

Adult Wipes	Cleansing Wipes
Diaper Wipes	Facial Tissues
Paper Towels	Single Use Wipes

Social Media Postings and Public Education



The City of Waltham

March 5 · 🌐



A reminder that plastic bags get stuck in recycling machinery! Please do not put any plastic bags of any kind in your recycling carts! ♻️

See our new 2020-21 Recycling, Trash, Hazardous Products & Yard Waste brochure: https://www.city.waltham.ma.us/.../u.../2020_online_brochure.pdf

NO PLASTIC BAGS IN THE RECYCLING CART



DO NOT BAG Recyclables

Collecting recyclables in a bag? Empty the contents into the cart.



Return plastic bags to retailers.

1,522

People Reached

47

Engagements

Boost Post



CJ Laychak and Kaitlyn Hesse

1 Comment 1 Share



Like



Comment



Share





The City of Waltham

February 21 · 🌐



A reminder that plastic bags get stuck in recycling machinery! Please do not put any plastic bags of any kind in your recycling carts! ♻️

NO PLASTIC BAGS IN THE RECYCLING CART



DO NOT BAG Recyclables

Collecting recyclables in a bag? Empty the contents into the cart.



Return plastic bags to retailers.

2,656

People Reached

109

Engagements

Boost Post

👤 Emma Fischer, Diane Teeven Ryberg and 10 others

3 Comments 4 Shares

👍 Like

💬 Comment

➦ Share





The City of Waltham

December 9, 2019 · 🌐



With warmer weather & rain today into tomorrow, it's important to make sure catch basins are clear of snow or debris to avoid any flooding!



2,616

People Reached

117

Engagements

Boost Post

👍 Patrick Draus, Halyna Lapeyev and 23 others

3 Comments 5 Shares

👍 Like

💬 Comment

➦ Share





The City of Waltham

October 28, 2019 · 🌐



With more rain in the forecast this week, please be on the lookout for debris/leaf covered catch basins! 🍁

Our Leaf Vacuuming Program begins this week. See our updated schedule here: https://www.city.waltham.ma.us/.../screen_shot_2019-10-18_at_...



1,782

People Reached

72

Engagements

Boost Post



Julie Marie, Erin Malloy and 14 others

3 Shares

👍 Like

💬 Comment

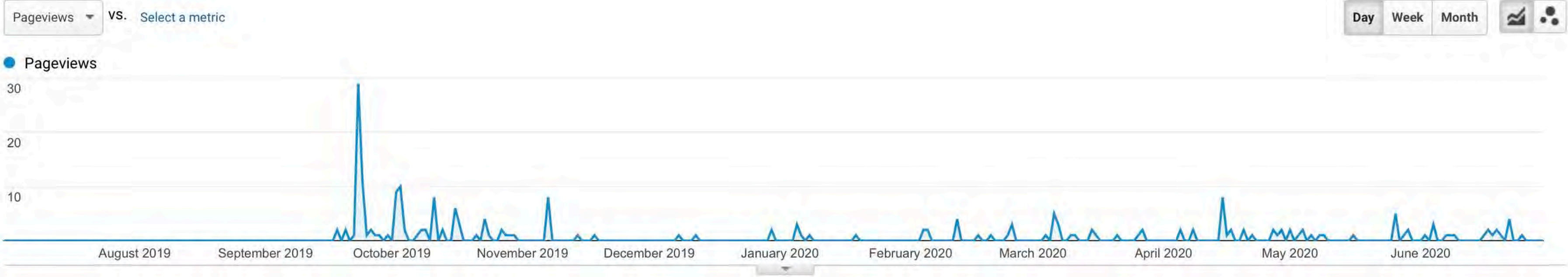
➦ Share



All Users
0.01% Pageviews

+ Add Segment

Explorer Navigation Summary



Primary Dimension: **Page** [Other](#)

Plot Rows

Secondary dimension Sort Type: Default

advanced

	Page ?	Pageviews ?	Unique Pageviews ?	Avg. Time on Page ?	Entrances ?	Bounce Rate ?	% Exit ?	Page Value ?
		218 % of Total: 0.01% (1,558,813)	153 % of Total: 0.01% (1,215,368)	00:01:24 Avg for View: 00:01:31 (-7.40%)	41 % of Total: 0.01% (650,857)	39.02% Avg for View: 42.52% (-8.23%)	17.89% Avg for View: 41.75% (-57.15%)	\$0.00 % of Total: 0.00% (\$0.00)
<input type="checkbox"/>	1. /clean-stormwater-initiative	218(100.00%)	153(100.00%)	00:01:24	41(100.00%)	39.02%	17.89%	\$0.00 (0.00%)

ALL » PAGE: /recycling-department

Jul 2, 2019 - Jun 30, 2020

All Users
0.91% Pageviews

+ Add Segment

Explorer

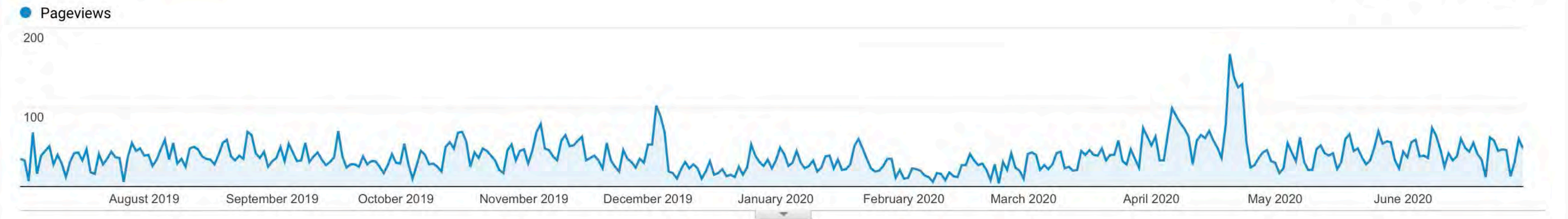
Navigation Summary

Pageviews VS. [Select a metric](#)

Day

Week

Month



Primary Dimension: **Page** [Other](#)

[Plot Rows](#)

Secondary dimension

Sort Type:

Default

[advanced](#)

<input type="checkbox"/>	Page	Pageviews		Unique Pageviews	Avg. Time on Page	Entrances	Bounce Rate	% Exit	Page Value
		14,103 % of Total: 0.91% (1,554,353)		10,723 % of Total: 0.88% (1,211,872)	00:00:57 Avg for View: 00:01:31 (-37.38%)	3,239 % of Total: 0.50% (649,038)	27.01% Avg for View: 42.53% (-36.50%)	25.45% Avg for View: 41.76% (-39.05%)	\$0.00 % of Total: 0.00% (\$0.00)
<input type="checkbox"/>	1. /recycling-department	14,103(100.00%)		10,723(100.00%)	00:00:57	3,239(100.00%)	27.01%	25.45%	\$0.00 (0.00%)

YEAR 2 ANNUAL REPORT

**Massachusetts Small MS4 General Permit
Reporting Period: July 1, 2019 – June 30, 2020**

CITY OF WALTHAM, MASSACHUSETTS

ATTACHMENT B

STORMWATER PUBLIC PARTICIPATION



The Waltham Engineering Department needs your input on our city's Stormwater Management Plan!

The City of Waltham Engineering Department, working with the Mayor and other Departments, has prepared and submitted a Stormwater Management Plan (Plan) to comply with USEPA's Municipal Stormwater Permit (NPDES MS4 Permit).

We are committed to improving quality of discharges from City's stormwater outfalls into the Charles River and other surface water bodies. Please review the Plan here: <https://www.city.waltham.ma.us/.../pages/stormwater-managemen...> and provide input to help the City with protecting and improving the City's surface waters here: <https://www.city.waltham.ma.us/.../contact-the-stormwater-team>

STORMWATER MANAGEMENT PLAN

CITY OF WALTHAM, MASSACHUSETTS



JUNE 2019



Prepared by:



**City Of Waltham**  @CityofWaltham

The Engineering Dept, needs input on our city's Stormwater Management Plan! We are committed to improving quality of discharges from City's stormwater outfalls into the Charles River and other surface water bodies. Review the plan & send us your feedback! <http://bit.ly/2mgHOXB>



JUNE 2019





News or Announcement *The Waltham Engineering Department needs your input on City's Stormwater Management Plan!* has been updated.

▼ Create Content

[Home](#)



The Waltham Engineering Department needs your input on City's Stormwater Management Plan!

POSTED ON: SEPTEMBER 23, 2019 - 2:49PM

The City of Waltham Engineering Department, working with the Mayor and other Departments, has prepared and submitted a Stormwater Management Plan (Plan) to comply with USEPA's Municipal Stormwater Permit (NPDES MS4 Permit). The City has committed to improving quality of discharges from City's stormwater outfalls into the Charles River and other surface water bodies. Please review the Plan here: <https://www.city.waltham.ma.us/clean-stormwater-initiative/pages/stormwater-management-plan> and provide input to help the City with protecting and improving the City's surface waters here: <https://www.city.waltham.ma.us/engineering/webforms/contact-the-stormwater-team>

Submission information

Form: [Contact the Stormwater Team](#)

Submitted by Anonymous (not verified)

July 2, 2019 – 9:35am

65.112.8.27

Name

Scott Macmillan

Email Address

scottmacmillan@gmail.com

Message

Hi folks,

Does the town or state lend any assistance to homeowners trying to create rain gardens? Because of a public road's runoff, our yard on the private way down the hill is being flooded out on a regular basis, and filled with silt. We're trying to figure out what options we have available to us – we'd love to get any advice you have.

Thanks very much,

Scott Macmillan

58 Blossom St.

Submission information

Form: [Contact the Stormwater Team](#)

Submitted by Anonymous (not verified)

September 23, 2019 – 4:05pm

71.126.226.243

Name

Sarah Robbins

Email Address

sarinkax@yahoo.com

Message

The storm drain across the street from 138 Lyman St doesn't work when there is a significant rain--it doesn't have to be a storm, just more than a moderate amount of rain or snow melt. This occurs at the narrowest part of Lyman street and is very dangerous.

Submission information

Form: [Contact the Stormwater Team](#)

Submitted by Anonymous (not verified)

September 24, 2019 – 11:31am

146.115.149.25

Name

Martha Creedon

Email Address

marthacreedon@rcn.com

Message

I am unable to open Appendix I The Hardy Pond Treatment, located at <https://www.city.waltham.ma.us/engineering/files/appendix-i-2018-hardy-pond-treatment-report>

Can you please check the link and/or format?

Thank you.

Submission information

Form: [Contact the Stormwater Team](#)

Submitted by Anonymous (not verified)

September 27, 2019 – 12:19pm

174.192.2.201

Name

Mike Gabrielli

Email Address

m1027g99@yahoo.com

Message

Please look into the possibility of paving the narrow strip of roadway in front of 43 Chesterbrook Road which erodes into my driveway when the Chesterbrook overflows Thanks.

Submission information

Form: [Contact the Stormwater Team](#)

Submitted by Anonymous (not verified)

December 19, 2019 – 10:19am

70.63.89.102

Name

Caleb Carpenter

Email Address

ccarpenter@core-states.com

Message

Dear Stormwater Team,

Can I get the information for the existing stormwater line going across the parcel we are working on designing for. We need to tie into the existing line and need inverts for a doghouse manhole connection.

Sincerely,

Caleb Carpenter

File Attachment #1

[2019-102-alta.jpg](#)

Submission information

Form: [Contact the Stormwater Team](#)

Submitted by Anonymous (not verified)

June 29, 2020 – 9:54am

172.68.54.196

Name

Heidi Harvey

Email Address

heidiharvey@comcast.net

Message

Clogged stormwater drains on east and west side of Leslie Road just by the mailbox for 90 Leslie Rd.

I'm at 80 Leslie Road. Last night about 5:30, the storm water drain on the west side of the street was completely clogged and overflowing. On the east side, the water was up to the grate but not overflowing. Further down the street (downhill as well) in the cul de sac, the drains were moving and water level was 2–3 feet below the street. I checked this morning and the water level in the west drain is now slightly below the grate but but obviously just draining out at a slow seep. An occasional air bubble comes up.

File Attachment #1

[2020-06-28_17.38.52.jpg](#)



The City of Waltham

June 22 · 🌐



Have any hazardous Waste to get rid of? The Lexington Minuteman Hazardous Waste Facility will be open Sat, 7/18, 9-2pm. Due to the Covid-19 epidemic, Waltham residents must pre-register by calling the Recycling Department at 781-314-3390:

<https://www.city.waltham.ma.us/home/events/103803>



4,443

People Reached

153

Engagements

Boost Post



Shumaila Kashif, Nancy Kist and 7 others

3 Comments 4 Shares

 Like

 Comment

 Share





The City of Waltham

April 30 · 🌐



FYI - Simple Recycling will be starting up services again on Monday, May 4th.

See more on the Simple Recycling Pink Bag Curbside Collection Program:
<https://www.city.waltham.ma.us/.../new-simple-recycling-pink-...>

CLOTHING, SHOE & HOME GOODS
RECYCLING BAG

**simple
recycling**

Give your clothing
another life.

COLLECTION BY ANY OTHER PARTY IS THEFT

4,795

People Reached

536

Engagements

Boost Post



Laura M. Henderson, Deanna Rodgers and 25 others

5 Comments 14 Shares



Like



Comment



Share



YEAR 2 ANNUAL REPORT

**Massachusetts Small MS4 General Permit
Reporting Period: July 1, 2019 – June 30, 2020**

CITY OF WALTHAM, MASSACHUSETTS

ATTACHMENT C

SSO SUMMARY

AND

EPA IDDE PROGRAM PROGRESS REPORTS

ATTACHMENTS

Quantity in gallons	Cause	Occurance Date	Street Location	Street Location	Time Noticed	Total(s)	
10,000-50,000	Insufficient Capacity p.s.	12/10/14	Trapelo Road	1493-1531	1:21 PM	1	
300	Blockage	06/03/14	Totten Pond Road	511	11:30 AM	2	
<150	Contractor Hit Sewer Line	03/28/14	Totten Pond Road	455	11:46 AM	3	
<200	Gravel Blockage from Repair 3/28	03/31/14	Totten Pond Road @ Craig Lane		9:14 AM	4	
<250	Blockage	12/16/14	South St @ Charles River Road		8:19 AM	5	
<50	Blockage	03/24/14	South St @ Charles River Road #713		9:17 AM	6	
1,000	Offset Joint - Dig Repaired	09/15/14	South Street	225	7:08 AM	7	
>1,000	Roots, Offset Joints Replaced Sewer Main to Fix	03/21/14	Rockridge Road	63	8:00 PM	8	
<200	Blockage	03/03/14	Rich St @ intersection w/ Columbus Ave		9:45 AM	9	
<100	Manhole Defect Moved to Daily Check	09/18/14	Rich Street	73-75	11:57 AM	10	
400	Grease	06/03/14	Prospect Hill Lane		10:20 AM	11	
<500	Blockage	02/13/14	Prospect Ave	15	8:25 AM	12	
<50*	Grease	04/01/14	Main St (KFC)	499-501	4:25 PM	13	
<100	Paper & Solids	12/28/14	Lexington St - Lexington Terrace Apts		1:21 PM	14	
50-100,00	I/I	12/09/14	Lexington St @ Lake St		10:39 AM	15	
<50	Blockage	04/22/14	Keach Street	1st SMH	2:05 PM	16	
<200	Blockage	03/31/14	Graymore Road	39	4:00 PM	17	
<50	Grease	05/26/14	Gorham Street	33-35	12:29 PM	18	
<100	Blockage	06/21/14	Gilman Road	rear 21	12:43 PM	19	
<75	Blockage	05/03/14	Forest St	385 Veteran's Field	3:40 PM	20	
200	Grease	12/18/14	Charles St @ Williams St		11:05 AM	21	
<50	Blockage	06/08/14	Charles Street	257	12:45 PM	22	2014
Quantity in gallons	Cause	Occurance Date	Street Location	Street Location	Time Noticed	Total(s)	
25	Brick in Invert	01/02/15	Parkview Road	81	9:30 AM	1	
< 100	Paper(s)	02/06/15	Winter Street	First Avenue	10:17 AM	2	
30-50	Unknown	02/18/15	Wamsutta Avenue	25	8:19 AM	3	
< 500	Unknown	02/23/15	Prospect Hill Road	Prentice Street	8:00 AM	4	
< 50	Unknown	02/23/15	Totten Pond Road	455	11:00 AM	5	
< 50	Paper/Rags	03/02/15	Totten Pond Road	455	9:45 AM	6	
< 200	Unknown	03/10/15	Prospect Hill Road	Prentice Street	7:30 AM	7	
6,300	Root Intrusion	03/10/15	Trapelo Road	1631	9:00 AM	8	
< 50	Unknown	03/11/15	Lexington Street	Lake Street	8:30 AM	9	
100	Unknown	03/17/15	Prospect Hill Road	Elson Road	12:00 AM	10	
< 20	Unknown	03/18/15	Chesterbrook Road	3	8:45 AM	11	
< 750	Grease	03/26/15	Prospect Hill Avenue	Columbus Avenue	11:00 AM	12	
<100	Unknown	04/20/15	Trapelo Road	1393	12:09 AM	13	
<200	Unknown	04/22/15	Hickory Drive	63	2:58 PM	14	
100	Solids	04/29/15	South Street	Charlesbank Way	10:18 AM	15	
<1200	Grease	07/01/15	Totten Pond Road	477/380 Winter	No Time Noted	16	
<50,000	Rain Event	09/30/15	Trapelo Road	1531-Pump St.	11:44 AM	17	
150,000	Grease	11/02/15	Prospect St.-203	Mt. Feake-South St	4:30 PM	18	
None Reported	Grease	11/24/15	South Street	Brandeis-Ctr for Studies	8:00 AM	19	2015
Quantity in gallons	Cause	Occurance Date	Street Location	Street Location	Time Noticed	Total(s)	
1200	Root Intrusion	03/16/16	Rockridge Road-67	Sewer Outlet	3:30 PM	1	
<75	Blockage	03/22/16	School Street	Liberty Street	7:30 AM	2	
5	Blockage	04/14/16	Bacon Street	No. 322	7:30 AM	3	
1.5 gal.	Blockage	07/07/16	Main Street	No. 1440	10:45 AM	4	

300-400 gal.	Blockage	08/31/16	South Street	No. 218	8:30 AM	5	
<500	Blockage	10/10/16	South Street	Highland Street	7:00 AM	6	
<150	Blockage	11/08/16	Winter Street	First Avenue	8:30 AM	7	
<100	Blockage	11/15/16	South Street	Shakespeare Rd	10:08 AM	8	
<300	Blockage	11/18/19	South Street	Up from No. 217	1:00 PM	9	
<100	Blockage	11/22/16	Totten Pond Road	No. 440	11:50 AM	10	2016
Quantity in gallons	Cause	Occurance Date	Street Location	Street Location	Time Noticed	Total(s)	
<50	Blockage	01/03/17	South Street	Charles River Rd.	9:00 AM	1	
<150	Blockage	01/14/17	Trapelo Road	Forest Street	9:30 AM	2	
300	Blockage	04/07/17	Easement Behind	1393 Trapelo Rd	10:00 AM	3	
<150	Blockage	05/17/17	South Street @	Shakespeare Rd	4:00 PM	4	
<100	Grease	06/13/17	Cherry St @	Crescent St	8:39 AM	5	
<50	Blockage	06/13/17	Easement	120 Totten Pond Rd	10:30 AM	6	
<250	Root Intrusion	08/30/17	Winter Street @	Cedarcroft and Smart	12:25 PM	7	
300	Blockage	12/24/17	Propect Hill Ave @	Prospect Hill Rd	4:30 PM	8	2017
Quantity in gallons	Cause	Occurance Date	Street Location	Street Location	Time Noticed	Total(s)	
6000	Grease	02/03/18	Totten Pond Rd	295	6:00 PM	1	
3800	Blockage	03/18/18	Totten Pond Rd	295	12:45 PM	2	
10000	Blockage	03/23/18	Prospect Hill Ave @	Prospect Hill Rd	6:30 PM	3	
1000	Grease	05/27/18	Keach St		1:30 PM	4	
600	Blockage	06/10/18	Prospect Hill Ave @	Columbus Ave	12:15 PM	5	
1500	Blockage	07/16/18	Prospect Hill Ave @	Prospect Hill Rd	2:10 PM	6	
225	Roots from upstream Root Control	09/28/18	Easement	1088 Trapelo	2:30 PM	7	
2300	Paper build up in invert	09/28/18	Easement	1393 Trapelo	2:00 PM	8	
3100	Paper in invert	10/06/18	15 Prospect Hill Ave		11:00 AM	9	2018
Quantity in gallons	Cause	Occurance Date	Street Location	Street Location	Time Noticed	Total(s)	
150	Paper in invert	03/07/19	Intersection First Ave &	Winter St	9:30 AM	1	
<1000	Road Construction	04/08/19	Harrington Rd	204	11:00 AM	2	
<600	Constuction Debris	05/02/19	College Farm Rd @	Lexington St	7:00 AM	3	
<500	Debris	05/20/19	College Farm Rd @	Lexington St	8:00 AM	4	
<2000	Paper/Root	08/10/19	Linden St	50	4:30 PM	5	
2300	Unknown	09/04/19	Metropolitan Parkway Easement		10:30 AM	6	2019

CITY OF WALTHAM
Engineering Department



Stephen A. Casazza, P.E.
City Engineer

January 27, 2020

Mr. Todd Borci
Office of Environmental Stewardship
US EPA New England
5 Post Office Square, Suite 100
Boston, MA 02109-3912

RE: City of Waltham
EPA Clean Water Act Administrative Docket No. 05-06
IDDE Program – Semi-Annual Report No. 23

Dear Mr. Borci:

Included in this package is the City of Waltham's IDDE Program Report No. 23 for your review. The City has prepared an update of the IDDE Program as required by the new MS4 NPDES Permit. In addition to the summary report, this package contains the schedule for the next six (6) months.

Should you have any questions, please contact me at 781-314-3830 or scasazza@city.waltham.ma.us.

Sincerely,

Stephen A. Casazza, P.E.
City Engineer

Cc: Honorable Jeannette A. McCarthy, Mayor
Patricia A. Azadi, Assistant City Solicitor
Ian McKenzie, P.E., Assistant City Engineer

City of Waltham, MA

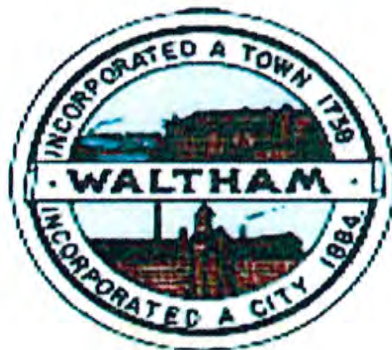
Illicit Discharge Detection and Elimination (IDDE) Program

EPA IDDE Program Progress Report No. 23

January 2020

Stephen A. Casazza, PE

City Engineer



City of Waltham
Illicit Discharge Detection and Elimination Program
IDDE Program Progress Report No. 23
January 2020

1. Introduction and Program Approach

This document serves as the City of Waltham's Semi-Annual IDDE Progress Report of January 2020. It contains a description of program achievements since submission of the Semi-Annual IDDE Progress Report #22 dated July 2019.

The City of Waltham is under a United States Environmental Protection Agency (EPA) Administrative Order (dated November 9, 2004) to implement an Illicit Discharge Detection and Elimination (IDDE) Program. The IDDE Program's main goal is to progressively eliminate illicit connections or flows into the City's stormwater system in order to minimize contamination in the receiving water bodies within the City of Waltham. This will be accomplished through systematic water quality sampling and detailed investigations of the outfalls and contributing areas to locate the sources of these illicit connections and subsequently eliminate the contaminated discharges.

2 IDDE Plan

The City of Waltham is implementing the IDDE Program using a phased approach. As part of the City's Stormwater Management Plan the IDDE Plan was submitted in July 1, 2019.

The IDDE Plan focuses on improving stormwater quality being discharged to impaired waters within the City. The impaired waters are:

- Charles River
- Beaver Brook
- Hardy Pond
- Unnamed tributary stream

To ensure/assist the City in achieving the goals of the IDDE Plan a continuation of the support from an IDDE Program Coordinator. Funding has already been authorized by the City to hire a consulting engineering firm. (See Attachment A) A request for proposals/RFP is being advertised in the near future with a Program Coordinator expected to be working for the City in the spring 2020.

3 Completed and On-Going Work

During this period funding was secured for the IDDE-Program Consultant/Engineer. The funding request included the “scope of work” to be performed for the next 12 months. (See Attachment B)

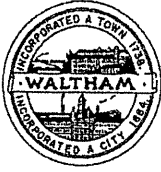
Plans to implement the IDDE Project in the Jennings Road neighborhood are progressing. As is customary the City requires the National Grid Gas Company to upgrade/replace their system, prior to City infrastructure improvements. National Grid’s engineers are working on their plans.

Next six months:

- Advertise and award IDDE Program Coordinator: The City is in the process of advertising the RFP for a Program Coordinator.
- Advertise and award Jennings Road IDDE Project: I expect the Jennings Road IDDE Project to be advertised for bids this spring, while concurrently National Grid is updating their mains/system.
- Proceed with IDDE Program “scope of work”: I anticipate having the Program Coordinator in-place as the funding has been secured, and working on the investigations, junction manhole sampling, and inter-municipal connections – outfall sampling. A six month look ahead schedule is provided. (See Attachment C)

Attachments:

- A. Funding for IDDE Program Coordinator
- B. IDDE Program “Scope of Work” for next 12 months
- C. Six month look ahead



CITY OF WALTHAM IN THE CITY COUNCIL

610 Main Street Waltham Massachusetts 02452

Order # 34571

Ordered:

That the City Council approves the transfer of funds totaling \$150,850 to fund the Illicit Discharge Detection Elimination (IDDE) program coordinator for the year 5 work package.

The following is the scope of services:

Illicit Discharge Detection and Elimination investigations	\$ 66,500.00
Junction manhole sampling	\$ 38,200.00
Intermunicipal connection sampling	\$ 17,750.00
DEP/EPA reporting	\$ 11,500.00
<u>Monthly progress meetings & coordination</u>	<u>\$ 16,900.00</u>
<u>TOTAL</u>	<u>\$150,850.00</u>

The funding transfer is as follows:

FROM		
#603-440-2008-7310	IDDE Program	\$ 12,954.50
#603-440-2010-7330	IDDE Program	\$ 628.82
#603-440-2015-7210	Rosewood Drive	\$ 49,000.00
#600-440-5800-7560	Section 1314-B Design	\$ 14,138.93
#600-440-5800-7500	I/I Mitigation Fees	\$ 74,127.75
<u>TOTAL</u>		<u>\$150,850.00</u>

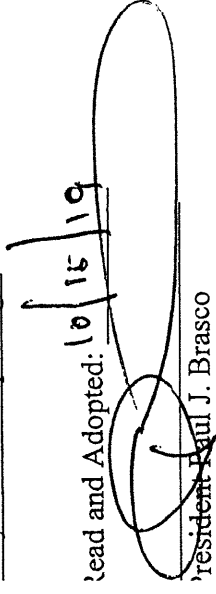
TO:


#603-440-2008-7350	IDDE Program	Coordinator	\$ 12,954.50
#603-440-2010-7350	IDDE Program	Coordinator	\$ 628.82
#603-440-2015-7350	IDDE Program	Coordinator	\$ 49,000.00
#600-440-5800-7350	IDDE Program	Coordinator	\$ 14,138.93
#600-440-5800-7350	IDDE Program	Coordinator	\$ 74,127.75
<u>TOTAL</u>			<u>\$150,850.00</u>

Read and Adopted:

Order # 34571

on the City Council
150,850 to fund the
Illicit Discharge Detection Elimination (IDDE)
program coordinator for
the year 5 work package.

Read and Adopted: 10/15/19

President Paul J. Brasco

Approved: 10/16/19

Mayor Jeannette A. McCarthy

RECEIVED
OCT 16 2019
Mayor's Office

CC: _____

Memorandum

To: Stephen A. Casazza, P.E., City Engineer
From: Natalie M. Pommersheim
Cc: Julie Martinos, Business Manager
Paul C. Millett, P.E., EP
Helen Gordon, P.E., EP
Date: July 16, 2019
Subject: Proposed Scope and Budget for IDDE Program Year 5

As requested, Environmental Partners Group, Inc. (Environmental Partners) has prepared the projected tasks and associated budget breakdown for the continuation of the IDDE Program into Year 5.

The proposed tasks include:

- Outfall Sampling
- Junction Manhole Sampling
- Intermunicipal Connection (IMC) Sampling
- DEP/EPA Reporting
- Monthly IDDE Progress Meetings

These tasks are provided in more detail below:

Task 1: Illicit Discharge Detection and Elimination (IDDE) Investigations - \$66,500

Under the City's MS4 Program, all outfalls are required to be screened for water quality within the first three years of the permit, or by June 30, 2021. The City's updated stormwater data identifies a total of 360 MS4 outfalls (discharging structure to a waterbody). Based on a review of records dating back to 2008, the City has only visited 38 of the total 360 outfalls, of which 19 were sampled for water quality testing, and 18 were dry. Under this task, Environmental Partners will check 171 outfalls (50% of the remaining 342 MS4 outfalls) that have been mapped previously. Environmental Partners will review the list of outfalls that have been ranked as high priority in the catchment ranking table provided in the IDDE plan to prioritize these for site visits.

Environmental Partners will survey these outfalls and update the data for each structure. As part of the site visit, the location and type of outfall will be verified, and the structure's material, size, condition, flow connectivity, the water body it discharges to, and the type of headwall it has will all be confirmed. This is most important to verify the outfall's receiving water body and to eliminate any improperly categorized outlets, inlets and culverts from the City's outfall count. For purposes of scope and budget, it is assumed two Environmental Partners staff members will be used for all field activities, and it is estimated to take 9 field days to complete the field visits.

Memorandum

Page 2

Updated survey data will be digitized using a tablet GPS running ArcPad® software. If an outfall has a flow or discharge during the time of the site visit, to be conducted during “dry-weather” conditions, a water sample will be collected and submitted for laboratory analysis at a Massachusetts DEP-Certified laboratory for analysis of chlorine, ammonia, surfactants, phosphorus, and bacteria (E.coli). Field screening will be completed for pH, temperature, and specific conductance. For purposes of scope and budget, it is assumed that the laboratory sampling will be conducted on up to a maximum of 85 outfalls.

Environmental Partners will submit an updated geodatabase depicting updated attribute data associated with each of the outfalls that were surveyed, and coordinate updates to the stormwater GIS database. The results of this program will be summarized in a memorandum for the City’s records.

Task 2: Junction Manhole Sampling - \$38,200

Under this task, EP will conduct additional field investigations for follow-up sampling and testing from previous IDDE investigations to identify and remove any illicit connections contributing to the high levels of bacteria found within SIB-6 (i.e. Cedarwood Avenue, Virginia Road). Costs include laboratory analysis and EP will deliver a memorandum presenting the results and recommendations for any further action.

Task 3: Intermunicipal Connection (IMC) Sampling - \$17,750

EP recommends wet-weather sampling at the City’s known Intermunicipal Connections (IMC) with neighboring MS4s. These locations will assist the City in identifying what is crossing the City’s Municipal Boundary from the other drainage systems. For the purposes of this proposal, it is assumed EP will visit the 17 known IMC locations. Costs include laboratory analysis and EP will deliver a memorandum presenting the results and recommendations for any further action.

Task 4: DEP/EPA Reporting - \$11,500

The IDDE reporting task includes a status report to DEP in December 2019 and June 2020, and a status report to EPA in January 2020 and July 2020. This task also includes providing relevant project updates for the City’s websites, project management, and general coordination.

As requested by Mr. Todd Borci (EPA), EP will review the previous report submittals to generate an estimate of the amount of illicit discharges removed as well as an estimate of the volume of sewage removed in gallons per day. This tracking table will be updated within the biannual reporting this year. This allows the City to demonstrate clear progress over time and to get credit for the significant work it is completing through the IDDE Program.

Task 5: Monthly Progress Meetings & Coordination - \$16,900

Environmental Partners to meet with Waltham representatives once per month over the course of the Contract for twelve (12) meetings up to a maximum of 24 hours total to discuss the IDDE Program, present findings and progress. Environmental Partners will prepare a meeting agenda and meeting minutes to detail the program status.

Memorandum

Page 3

Budget

EP proposes to perform the indicated Scope of Services for a not-to-exceed fee as provided in the following table.

Task 1 – IDDE Dry Weather Investigations (Outfalls)	\$ 66,500
Task 2 – Junction Manhole Sampling	\$ 38,200
Task 3 – Intermunicipal Connection (IMC) Sampling	\$ 17,750
Task 4 – DEP / EPA Reporting	\$ 11,500
Task 5 – Monthly Progress Meetings & Coordination	\$ 16,900
Total of Tasks 1 through 5	\$ 150,850

Please review the scope items and let us know how you would like to proceed.

City of Waltham, MA
 EPA IDDE Program Six Month Look-Ahead Schedule
 January 2020

Construction Work Packages		January		February		March		April		May		June	
Construction	Jennings Road 100% Design Plans Completed - Funding Estimated to Begin Spring 2020						ADVERTISE		FUNDING				CONSTRUCTION
									(NATIONAL GRID WORK →)				

IDDE Program Coordinator		January		February		March		April		May		June	
Task 1-Illicit Discharge Detection and Elimination (IDDE) Investigations													
Task 2-Junction Manhole Sampling													
Task 3-Intermunicipal Connections (IMC) Sampling													
Task 4-DEP/EPA Reporting													
Task 5-Monthly Progress Meetings													

CITY OF WALTHAM
Engineering Department



Stephen A. Casazza, P.E.
City Engineer

July 30, 2020

Mr. Todd Borci
Office of Environmental Stewardship
US EPA New England
5 Post Office Square, Suite 100
Boston, MA 02109-3912

RE: City of Waltham
EPA Clean Water Act Administrative Docket No. 05-06
IDDE Program – Semi-Annual Report No. 24

Dear Mr. Borci:

Included in this package is the City of Waltham's IDDE Program Report No. 24 for your review.

In this package there is an update on progress with the IDDE Program for the last six (6) months.

In addition to the summary report, this package contains the project schedule for the next twelve (12) months.

Should you have any questions, please contact me at (781) 314-3831 or scasazza@city.waltham.ma.us.

Sincerely,

Stephen A. Casazza, P.E.
City Engineer

cc: Honorable Jeannette A. McCarthy, Mayor
Patricia A. Azadi, Assistant City Solicitor

City of Waltham, MA

Illicit Discharge Detection and Elimination (IDDE) Program

EPA IDDE Program Progress Report No. 24

July 2020

Prepared by:

Stephen A. Casazza, PE

City Engineer



City of Waltham
Illicit Discharge Detection and Elimination
Program IDDE Program Progress Report No. 24
July 2020

1. Introduction and Program Approach

This document serves as the City of Waltham's Semi-Annual IDDE Progress Report of July 2020. It contains a description of program achievements since submission of the Semi-Annual IDDE Progress Report #23 dated January 2020.

The City of Waltham is under a United States Environmental Protection Agency (EPA) Administrative Order (dated November 9, 2004) to implement an Illicit Discharge Detection and Elimination (IDDE) Program. The IDDE Program's main goal is to progressively eliminate illicit connections or flows into the City's stormwater system in order to minimize contamination in the receiving water bodies within the City of Waltham. This will be accomplished through systematic water quality sampling and detailed investigations of the outfalls and contributing areas to locate the sources of these illicit connections and subsequently eliminate the contaminated discharges.

Our new program consultant Pare Engineering is implementing the IDDE Program using a phased approach to investigate priority outfalls with the recommendations of the June 2019 IDDE Plan.

IDDE Program Tasks are further described in the following sections:

2. Completed and On-Going Work

Work completed between January 31, 2020 and July 31, 2020 is presented below.

2.1. Selection of a New IDDE Program Consultant

In the Spring 2020, the City of Waltham acting through the Engineering and Purchasing Departments solicited bids for a new IDDE Program Coordinator. The new program coordinator is Pare Engineering of Foxboro, MA.

2.1.1 Summary of Work Complete to Date

- A Contract Notice to Proceed with the project was issued around July 1, 2020, with a kick-off meeting held on July 13, 2020 which included representatives of Pare and the City of Waltham.
- On July 15, 2020, Pare visited the City of Waltham Engineering Department to obtain past documentation on IDDE work conducted, including roughly 146 GB of documents that include mapping, CCTV footage, and recent permits for authorized discharges within the areas to be inspected as part of this project.
- Pare has been reviewing the upcoming weather forecasts in an effort to schedule inspections of outfalls, but due to the lockdown and scheduling constraints, as well as the precipitation around Waltham, MA has not been favorable for inspections to begin. The inspections must occur no less than 72-hours after a significant storm event, which is defined by EPA as a rainfall event with greater than 0.1-inch of precipitation. The most recent significant storm event to date, as reported by NOAA, was July 24, 2020 when a total of approximately 0.59-inches was measured.
- Pare has scheduled time on July 29, 2020 to conduct some inspections, however the weather forecast indicates the potential for precipitation today, July 28, 2020, that Pare will continue monitoring.

- Ms. Arianne Barton from Pare will be leading the field inspection/sampling activities and I will serve as the project and contracts manager.

2.1.2 Inspection Plans

- Over the course of the next 12 months, Pare will visually inspect 171 outfalls and sample 85 priority outfalls for parameters specified by the EPA and outlined in the June 2019 report.
- Inspections are to be conducted using a combination of the priority system developed and outlined in the June 2019 IDDE Plan, and the relative locations of the outfalls from each other in order to maximize the number of outfalls able to be inspected during the day. Initial inspections will consist of visual observations only and Pare will record the locations exhibiting discharge for sample collection, to be scheduled upon completion of visual inspections.
- The highest priority outfall locations will be inspected first. Using a combination of priority and relative location, Pare is anticipating being able to inspect anywhere from 8 to 20 outfalls per 8-hour day in the field, varying with distance from each other.
- Pare shall conduct a field investigation of the area of SIB-6 which is at the intersection of Cedarwood and Virginia Avenue. The initial field investigation shall include visual inspection and sampling as this storm sewer shed has been identified as an area of concern with regard to illicit discharge. To confirm any illicit sewer discharges, Pare will conduct E. Coli sampling to confirm and isolate sections of concern that may have potential illicit discharges. After sections/streets are narrowed down, Pare will use smoke testing and CCTV testing to further narrow the source of the illicit discharge. Smoke testing is a bottom-up approach to isolate illicit discharges. It works by introducing smoke into the storm drain system and observing where the smoke surfaces. Once the smoke is observed, the source can be identified. Prior to testing, residents shall be notified in advance and if concerns are registered, the testing will be planned to eliminate/mitigate those concerns. This investigation is planned for Summer 2020.
- Pare over the course of next twelve months will perform inspection and sampling of the 17 Intermunicipal Connections.

2.1.3 Sampling Plans

- During inspections, locations where flow is observed and illicit discharge is suspected will be documented, including information regarding the City's identification number for that location, a visual description of the discharge to the extent feasible, the date on which the discharge was observed, and weather conditions within the past 72-hours of the observation.
- Upon completion of visual inspections, Pare will return to locations where the abovementioned conditions were met to collect samples of discharge for field characterization and laboratory analysis for parameters specified in the June 2019 IDDE plan, which include several nutrient pollutants such as nitrogen, phosphorus, and ammonia as well as total surfactants, Enterococcus coli and fecal coliform, among others.
- Pare has determined that collecting samples from multiple outfalls over the course of one or more days, separate from the visual inspections, will be most efficient for the project due to the allowable hold time for coliform analysis (must be dropped off within 6-hours of collection and analyzed within 24-hours).
- Alpha Analytical of Westborough, MA will be used to perform the sample analysis that cannot be conducted in the field.

2.1.4 Additional Discharge Verification Methods

- For the storm sewer shed identified in SIB-6, any identified illicit discharge will be further evaluated to determine their source. Evaluation methods include smoke and dye testing and CCTV inspections.
- Pare will work closely and coordinate the priority Sampling Plan with the City's Engineering Department.

2.2. IDDE Work Project 2.2.1

2.2.1 Jennings Road IDDE Project

The following project is ready to go, following the completion of 100% design by EPG.

Jennings Road Sewer Replacement and Drain Rehabilitation Project:

Due to high concentrations of bacteria present in the junction manholes sampled in the Jennings Road area, the City has prepared a plan to eliminate the “communication” between the storm drainage system. A copy of the Bid Set of Construction Plans prepared by Environmental Partners Group (EPG) of Quincy, MA are attached in Appendix B.

The Scope of Work for this project includes sewer and drain work on a portion of Jennings Road, Prospect Hill Park and Woodland Road.

- Replace segments of 12-inch sewer and 15-inch drains, including manholes. The drains and sewers have been inspected via CCTV and are in deteriorated condition.
- Existing Conditions Survey was conducted in November 2017.
- Geotechnical Borings were conducted in December 2017.

3. Status of Outfall Areas and Illicit Flow Removal

3.1 Work planned for 2020- 2021

See Pare Engineering Project Schedule— Attachment A.

- 3.2 During this reporting period the illicit drainage system connection at 205 Willow Street was improved/modified to add a pre-treatment system prior to discharge to the City. A copy of the approved plan is shown in Attachment C.

3.3 Jennings Road – Sewer/Drain Separation Project

The City plans to go ahead with the construction of the Jennings Road Sewer/Drain Separation Project.

A

PROJECT SCHEDULE
City of Waltham
IDDE Project Implementation

Project Schedule	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21
Notice to Proceed 6/30/2020												
Task 0: Project Management a. Kickoff meeting b. Project Meeting/Minutes c. Monthly Invoices												
Task 1: Outfall Inspection a. Collection/Review Existing Data/Site Visits b. Data Compilation c. Inspection and Sampling ¹ d. Draft Report												
Task 2: Junction Manhole Sampling² a. Collection/Review Existing Data/Site Visits b. Inspection and Sampling ³ c. CCTV inspection ⁴ d. Smoke testing ⁵ e. Report												
Task 3: IMC Inspection and Sampling a. Collection/Review Existing Data/Site Visits b. Data Compilation c. Inspection and Sampling ⁶ d. Report												
Task 4: DEP/EPA reporting a. Submission of semi-annual progress reports to DEP/EPA												
FINAL REPORT												

Notes:

1. Inspection and Sampling will be based on weather and precipitation events. The original target is finish all 171 outfalls before the onset of Winter 2020 but there is a possibility that some of the outfalls may have to be inspected during Spring 2021.
2. The area of SIB-6 is also planned to inspected and sampled during Summer/Fall 2020 (weather permitting).
3. The area of SIB-6 is also planned to inspected and sampled during Summer/Fall 2020 (weather permitting).
4. After 2.b, this activity shall commence and is planned for a day.
5. After 2.c, this activity shall commence and is planned for a day.
6. The area of SIB-6 is also planned to inspected and sampled during Summer/Fall 2020 (weather permitting).



B

JENNINGS ROAD SEWER REPLACEMENT AND DRAIN REHABILITATION CITY OF WALTHAM, MASSACHUSETTS

MAY 2019

LIST OF DRAWINGS

G-1	GENERAL NOTES AND LEGEND	C-8	WOODLAND ROAD SEWER AND DRAIN REPLACEMENT STA 0+00 TO STA 4+00
C-1	JENNINGS ROAD EXISTING CONDITIONS STA 0+00 TO STA 5+20	C-9	WOODLAND ROAD SEWER REPLACEMENT STA 4+00 TO STA 7+00
C-2	JENNINGS ROAD EXISTING CONDITIONS STA 5+20 TO STA 10+80	C-10	PROSPECT HILL ROAD SEWER REPLACEMENT STA 7+00 TO STA 11+20
C-3	WOODLAND ROAD EXISTING CONDITIONS STA 0+00 TO STA 4+00	C-11	DRAIN REHABILITATION
C-4	WOODLAND ROAD EXISTING CONDITIONS STA 4+00 TO STA 7+00	CD-1	CIVIL DETAILS I
C-5	PROSPECT HILL ROAD EXISTING CONDITION STA 7+00 TO STA 11+20	CD-2	CIVIL DETAILS II
C-6	JENNINGS ROAD SEWER AND DRAIN REPLACEMENT STA 0+00 TO STA 5+20	CD-3	CIVIL DETAILS III
C-7	JENNINGS ROAD SEWER AND DRAIN REPLACEMENT STA 5+20 TO STA 10+80		



LOCUS MAP
1" = 1000'

ENGINEERING DEPARTMENT

STEPHEN A. CASAZZA, P.E. CITY ENGINEER



GENERAL NOTES:

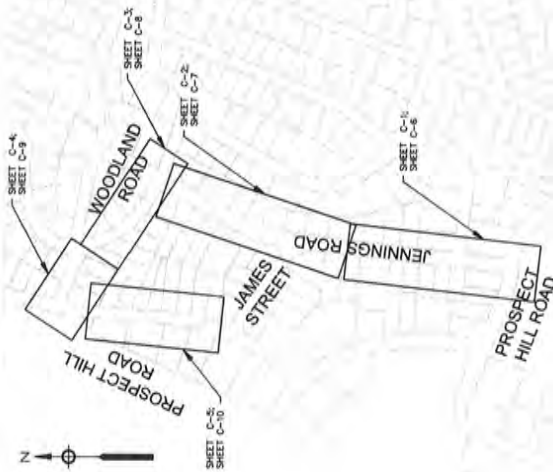
1. BASE MAP INFORMATION IS A COMPILED OF GROUND SURVEY PREPARED BY MILLENHAM ENGINEERING, INC. IN JANUARY 2018 AND WALTHAM RECORDS DRAWING INFORMATION UTILIZED IS MASSACHUSETTS STATE PLAT, MAPS, US SURVEY FEET.
2. IN AREAS WHERE CONSTRUCTION ACTIVITIES ARE ANTICIPATED TO OCCUR WITHIN PRIVATE PROPERTY, THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS FROM THE CITY OF WALTHAM PRIOR TO COMMENCING CONSTRUCTION ACTIVITIES.
3. ALL EXISTING UTILITIES SHOWN ARE APPROXIMATE. THE CONTRACTOR SHALL VERIFY THE LOCATION AND DEPTH OF ALL UTILITIES PRIOR TO ANY EXCAVATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS FROM THE CITY OF WALTHAM PRIOR TO ANY EXCAVATION.
4. DO NOT SCALE DRAWINGS UNLESS OTHERWISE NOTED. WRITTEN DIMENSIONS AND DIMENSIONS SHALL PREVAIL. REPORT ANY DISCREPANCIES TO THE ENGINEER IMMEDIATELY.
5. THE CONTRACTOR SHALL RESTORE ALL PUBLIC AND PRIVATE PROPERTY TO ITS PRE-CONSTRUCTION CONDITION AT NO ADDITIONAL COST TO THE OWNER.
6. ALL EXISTING STORM DRAIN, SEWER, AND WATER MAIN LINES ENCOUNTERED DURING CONSTRUCTION ARE TO REMAIN IN SERVICE UNLESS OTHERWISE NOTED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS FROM THE CITY OF WALTHAM PRIOR TO ANY EXCAVATION. THE CONTRACTOR SHALL RESTORE ALL PUBLIC AND PRIVATE PROPERTY TO ITS PRE-CONSTRUCTION CONDITION AT NO ADDITIONAL COST TO THE OWNER.
7. IN THOSE INSTANCES WHERE POWER OR TELEPHONE POLE SUPPORT IS REQUIRED, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS FROM THE CITY OF WALTHAM PRIOR TO ANY EXCAVATION. THE CONTRACTOR SHALL RESTORE ALL PUBLIC AND PRIVATE PROPERTY TO ITS PRE-CONSTRUCTION CONDITION AT NO ADDITIONAL COST TO THE OWNER.
8. ALL STRUCTURES AND APPURTEANCES LOCATED ADJACENT TO THE TRENCH EXCAVATION SHALL BE PROTECTED AND FIRMLY SUPPORTED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS FROM THE CITY OF WALTHAM PRIOR TO ANY EXCAVATION. THE CONTRACTOR SHALL RESTORE ALL PUBLIC AND PRIVATE PROPERTY TO ITS PRE-CONSTRUCTION CONDITION AT NO ADDITIONAL COST TO THE OWNER.
9. THE CONTRACTOR IS TO TAKE SPECIAL CARE NOT TO DAMAGE TREES, BUSHES, PLANTS, AND OTHERS, EXISTING STORM DRAINS, TRENCHES, ETC. WITHIN THE CONSTRUCTION AREA. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS FROM THE CITY OF WALTHAM PRIOR TO ANY EXCAVATION. THE CONTRACTOR SHALL RESTORE ALL PUBLIC AND PRIVATE PROPERTY TO ITS PRE-CONSTRUCTION CONDITION AT NO ADDITIONAL COST TO THE OWNER.
10. THE CONTRACTOR SHALL REMOVE AND REPLACE NEW OR REPAIR, ALL CURBS, SIDEWALKS, DRIVEWAYS, AND OTHERS, EXISTING STORM DRAINS, TRENCHES, ETC. WITHIN THE CONSTRUCTION AREA. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS FROM THE CITY OF WALTHAM PRIOR TO ANY EXCAVATION. THE CONTRACTOR SHALL RESTORE ALL PUBLIC AND PRIVATE PROPERTY TO ITS PRE-CONSTRUCTION CONDITION AT NO ADDITIONAL COST TO THE OWNER.
11. ANY TRAFFIC SIGNAL EQUIPMENT (LIGHTS, CONDUITS, LOOP DETECTORS) ENCOUNTERED SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR AS DIRECTED BY THE OWNER OR ENGINEER AT NO ADDITIONAL COST TO THE OWNER.
12. THE CONTRACTOR SHALL INSTALL AND MAINTAIN TRAFFIC CONTROL DEVICES AS DESCRIBED IN THE DESIGN SPECIFICATIONS AND DRAWINGS AND IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION.
13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING AND MAINTAINING A TELEPHONE NUMBER WHERE THE CONTRACTOR CAN BE REACHED 24 HOURS A DAY, 7 DAYS A WEEK.
14. THE LOCATION AND LIMITS OF ALL ON-SITE WORK AND STORAGE AREAS SHALL BE DETERMINED BY THE CONTRACTOR AND APPROVED BY THE CITY OF WALTHAM AND THE ENGINEER. THE CONTRACTOR SHALL MAINTAIN HIS ACTIVITIES TO THESE AREAS. THE CITY CANNOT GUARANTEE ON-SITE STORAGE.
15. THE CONTRACTOR SHALL VERIFY AND OBTAIN ALL NECESSARY PERMITS FOR WORK IN SIDEWALKS. THE CONTRACTOR IS RESPONSIBLE FOR CONFORMING TO ALL PERMITS AS AN INTEGRAL PART OF HIS WORK.
16. THE CONTRACTOR SHALL HANDLE AND DISPOSE OF GROUNDWATER, WHERE ENCOUNTERED, IN AN APPROVED MANNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS FROM THE CITY OF WALTHAM PRIOR TO ANY EXCAVATION. THE CONTRACTOR SHALL RESTORE ALL PUBLIC AND PRIVATE PROPERTY TO ITS PRE-CONSTRUCTION CONDITION AT NO ADDITIONAL COST TO THE OWNER.
17. THE CONTRACTOR SHALL SAW CUT ALL PAVEMENT TO ITS TOTAL DEPTH IN THE PROCESS OF INSTALLING NEW UTILITIES IN ALL PAVED AREAS INCLUDING STREETS, DRIVEWAYS, AND SIDEWALKS.
18. TEST PITS TO LOCATE EXISTING UTILITIES MAY BE ORDERED BY THE ENGINEER TO DETERMINE WHETHER TO RAISE OR LOWER THE PROPOSED UTILITIES TO CLEAR EXISTING UTILITIES OR MEET EXISTING PIPE INVERTS. THE CONTRACTOR SHALL NOTIFY THE CITY AT LEAST 48 HOURS IN ADVANCE, EXCLUDING WEEKENDS AND HOLIDAYS, PRIOR TO ANY EXCAVATION.
19. OPEN TRENCHES MUST BE CLOSED BY BACKFILLING OR PLACING AT THE END OF EACH DAY.
20. THE CONTRACTOR SHALL MAINTAIN ALL KEYWAY FOR OVERLAY WHERE SHOWN AND AT ALL BITUMINOUS CEMENT DRIVEWAYS WITHIN THE PROJECT AREA.

21. SILT SACKS SHALL BE FURNISHED, INSTALLED, AND MAINTAINED IN ALL CATCH BASINS, MANHOLES, AND TRENCHES. SILT SACKS SHALL BE MAINTAINED AND REPLACED AS NECESSARY. THE PROJECT AREA DURING CONSTRUCTION SHALL BE MAINTAINED AND REPLACED AS NECESSARY. SILT SACKS SHALL BE FURNISHED, INSTALLED, AND MAINTAINED IN ALL CATCH BASINS, MANHOLES, AND TRENCHES. SILT SACKS SHALL BE MAINTAINED AND REPLACED AS NECESSARY. THE PROJECT AREA DURING CONSTRUCTION SHALL BE MAINTAINED AND REPLACED AS NECESSARY.
- ## SEWER CONSTRUCTION NOTES:
1. SEWER TRENCHES MAY BE EXCAVATED WIDER THAN THE PAY LIMIT ANY SUCH ADDITIONAL EXCAVATION AND TRENCH PAVEMENT SHALL BE AT NO ADDITIONAL COST TO THE OWNER AND SHALL NOT BE MEASURED FOR PAYMENT.
 2. OPENINGS FOR SEWER PIPE IN PRECAST MANHOLE BASES SHALL BE CAST IN THE REQUIRED LOCATIONS DURING MANHOLE MANUFACTURE. FIELD CUT OPENINGS WILL NOT BE PERMITTED.
 3. FORM BRICK INVERTS IN MANHOLES WITH BRICK ON EDGE TO A DEPTH OF 0.8-FT INSIDE DIAMETER OF PIPE AND FORM A 1-INCH PER FOOT SLOPED BENCH WITH BRICK FLAT. INVERT SHALL BE SLOPED UNIFORMLY BETWEEN INLET AND OUTLET PIPE AND SHALL BE MAINTAINED AND REPLACED AS NECESSARY. SLOPED BENCH SHALL NOT BE MAINTAINED AND REPLACED AS NECESSARY. SLOPED BENCH SHALL NOT BE MAINTAINED AND REPLACED AS NECESSARY.
 4. CALCULATION OF PIPE SLOPE IS BASED ON ELEVATION CHANGES DIVIDED BY THE DISTANCE BETWEEN THE OUTSIDE EDGES OF THE MANHOLE WALLS.
 5. SEWER SERVICES SHALL MATCH THE EXISTING DIAMETER UNLESS OTHERWISE NOTED BY THE ENGINEER AND OWNER.
 6. NEW SEWER SERVICE CONNECTIONS SHALL BE INSTALLED SUCH THAT THEY ARE BENEATH THE WATER MAIN AND WATER SERVICE CONNECTIONS.
 7. SEWER BRIDGES SHALL ONLY BE ALLOWED DURING CONSTRUCTION OPERATIONS AND SUPERVISED BY CONTRACTOR PERSONNEL CONTINUOUSLY WHILE PREPARING.
 8. WASTE DISPOSAL ONLY WITH APPROVAL OF THE ENGINEER AND OWNER AND ACCORDING TO SPECIFICATIONS SECTIONS 0207, 0208, AND 0209.
 9. SEE APPENDIX B OF THE SPECIFICATIONS FOR CCTV REPORTS.
 10. SEE APPENDIX C OF THE SPECIFICATIONS FOR BORING LOGS.
 11. THE CONTRACTOR SHALL COMPLETE TEST PITS AS SHOWN ON THE PLAN AND AS REQUIRED BY THE ENGINEER TO VERIFY EXISTING UTILITY LOCATIONS. STRUCTURE SUBMITTALS WILL NOT BE APPROVED UNTIL EXISTING UTILITY LOCATIONS ARE VERIFIED.

DRAINAGE CONSTRUCTION NOTES:

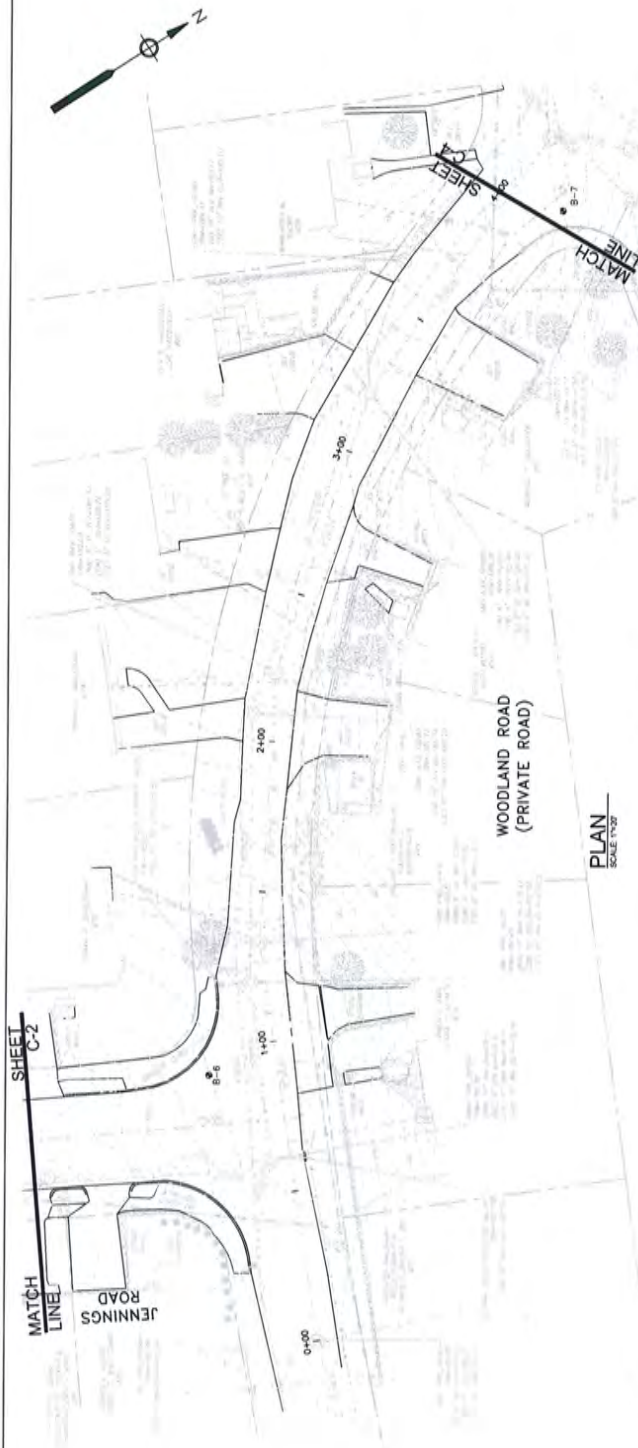
1. DRAINAGE TRENCHES MAY BE EXCAVATED WIDER THAN THE PAY LIMIT ANY SUCH ADDITIONAL EXCAVATION SHALL BE AT NO ADDITIONAL COST TO THE OWNER AND SHALL NOT BE MEASURED FOR PAYMENT. THIS INCLUDES BUT IS NOT LIMITED TO PAING, PROCESSED GRAVEL, LANDSCAPING, BACKFILL, ETC.
2. OPENINGS FOR PIPE IN PRECAST MANHOLE BASES SHALL BE CAST IN THE REQUIRED LOCATIONS DURING MANHOLE MANUFACTURE. FIELD CUT OPENINGS WILL NOT BE PERMITTED UNLESS APPROVED BY THE ENGINEER.
3. NEW STORM DRAINS SHALL BE INSTALLED AT THE MINIMUM DEPTH FROM FINISH GRADE TO TOP OF PIPE AS SHOWN ON THE DRAWINGS, WHERE NECESSARY.
4. SEE APPENDIX B OF THE SPECIFICATIONS FOR CCTV REPORTS.
5. SEE APPENDIX C OF THE SPECIFICATIONS FOR BORING LOGS.
6. THE CONTRACTOR SHALL COMPLETE TEST PITS AS SHOWN ON THE PLAN AND AS REQUIRED BY THE ENGINEER TO VERIFY EXISTING UTILITY LOCATIONS. STRUCTURE SUBMITTALS WILL NOT BE APPROVED UNTIL EXISTING UTILITY LOCATIONS ARE VERIFIED.

ABBREVIATIONS	LEGEND
AC ASBESTOS CEMENT	EXISTING
DC CAST IRON	PROPOSED
RC REINFORCED CONCRETE	SEWER
PVC POLYVINYL CHLORIDE	CATCH BASIN
CS COATED STEEL	DRAIN MANHOLE
VC VERTICAL CLAY	SEWER MANHOLE
CMP CORRUGATED METAL PIPE	WATER
DPE CORRUGATED POLYETHYLENE	TEST PIT
W WATER	SEWER MANHOLE
DB DRAIN BASIN	WATER SHUTOFF
DMH DRAIN MANHOLE	GRANITE CURB
EPH EDGE OF PAVEMENT	EDGE OF PAVEMENT
EPH EDGE OF PAVEMENT	PROPERTY LINE
DUP DRAINAGE UTILITY POLE	WOOD FENCE
TP TELEPHONE POLE	UTILITY POLE
	WATER MAIN
	DRAIN LINE
	OVERHEAD WIRE
	SEWER MAIN
	STONE WALL
	DECIDUOUS TREE
	CHALKLINE FENCE
	BORING
	ELECTRICAL BOX
	MAISON



KEY SHEET
SCALE 1" = 20'

					
Environmental Partners A partnership for engineering solutions.		SEWER REPLACEMENT AND DRAIN REHABILITATION CITY OF WALTHAM, MASSACHUSETTS		SHEET NO. G-1	
MARK DATE DESCRIPTION		FOR CONSTRUCTION		GENERAL NOTES AND LEGEND	
Title Date Job No. Drawn by Checked by Approved by	AS NOTED MAY 2018 2018-1002 JLR/SLC RJC RJC	THIS LINE IS ONE INCH LONG AND ONE INCH WIDE AT FULL SCALE ON A 22" X 34" Drawing			





PROFILE

PLAN
DATE 12-20

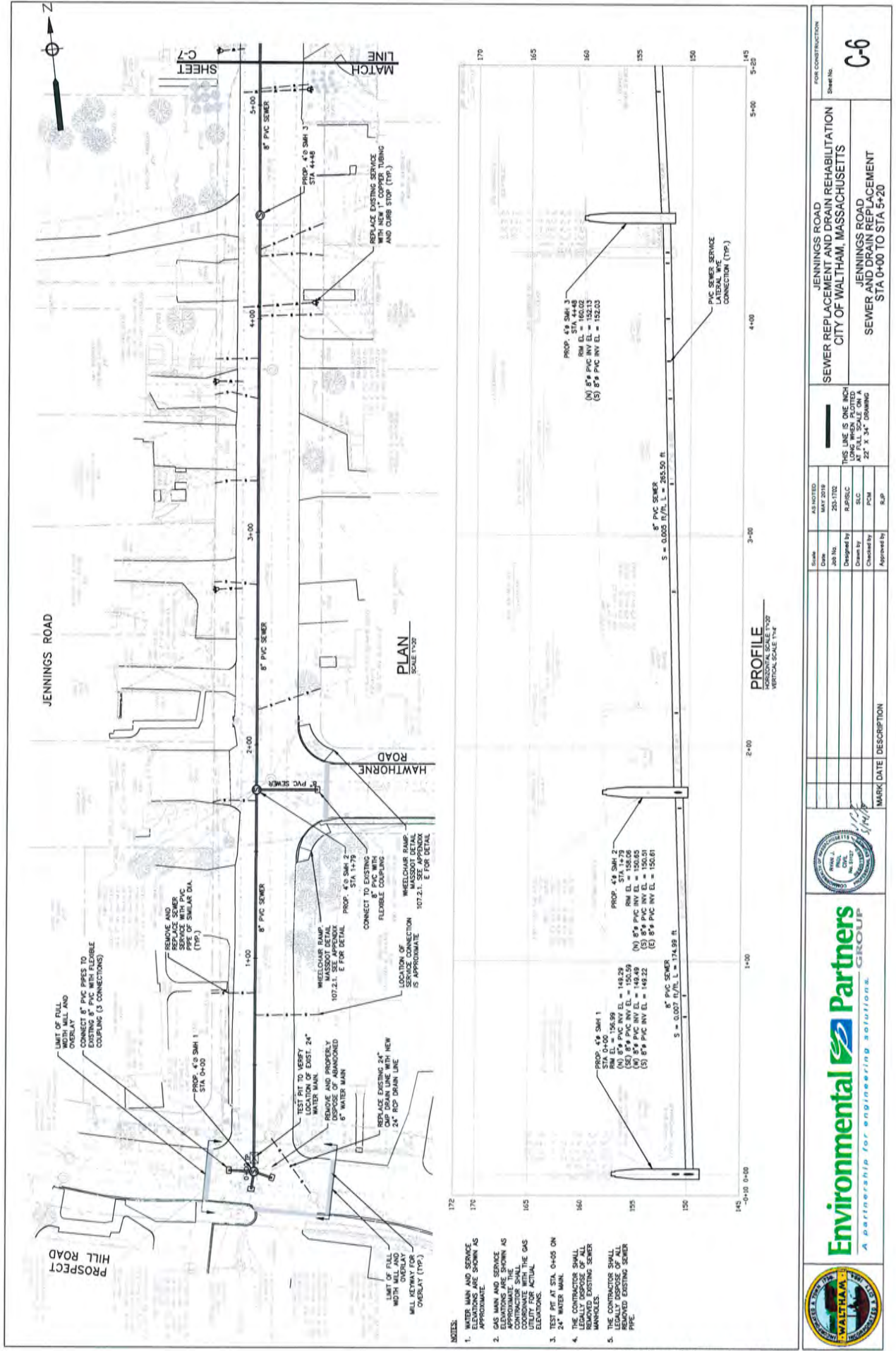
Environmental  Partners
A partnership for engineering solutions. GROUP

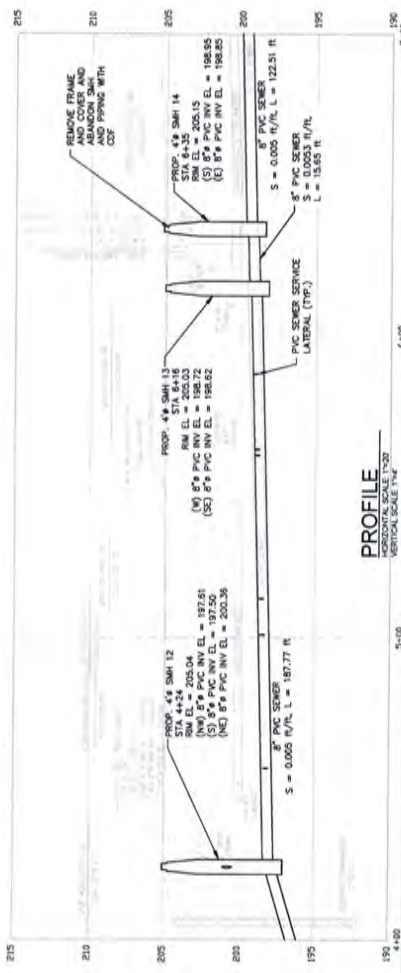
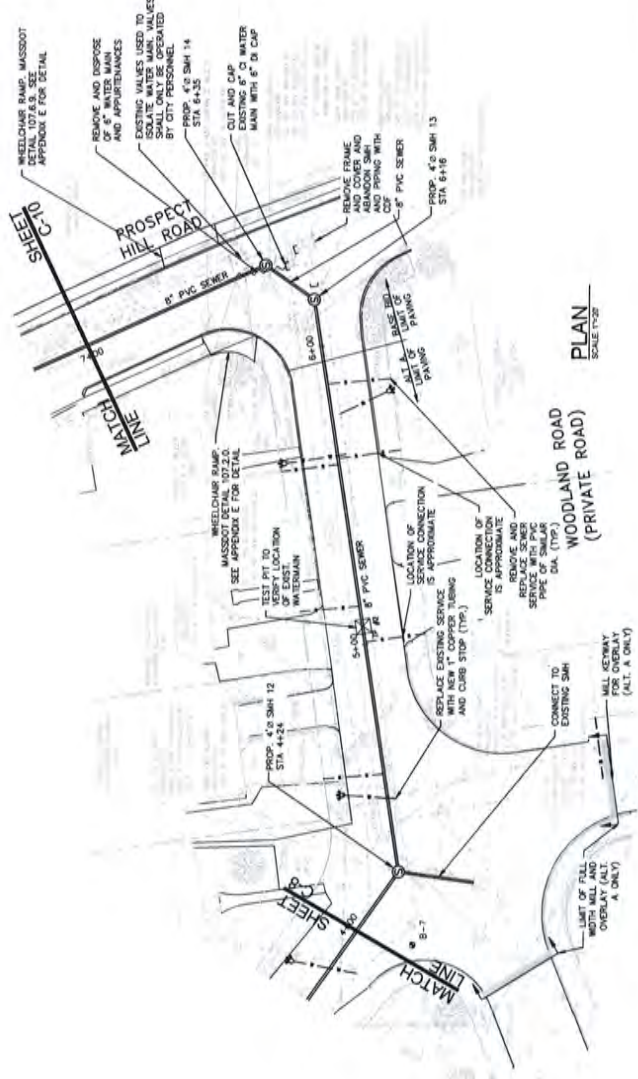
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JENNINGS ROAD SEWER REPLACEMENT AND DRAIN REHABILITATION CITY OF WALTHAM, MASSACHUSETTS	WOODLAND ROAD EXISTING CONDITIONS STA 4+00 TO STA 7+00
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FOR CONSTRUCTION

Sheet No. C-4





- NOTES:
1. WATER MAIN AND SERVICE ELEVATIONS ARE SHOWN AS APPROXIMATE.
 2. GAS MAIN AND SERVICE ELEVATIONS ARE SHOWN AS APPROXIMATE. THE CONTRACTOR SHALL COORDINATE WITH THE GAS UTILITY FOR ACTUAL ELEVATIONS.
 3. THE CONTRACTOR SHALL LEGALLY DISPOSE OF ALL REMOVED EXISTING SEWER MANHOLES.
 4. THE CONTRACTOR SHALL LEGALLY DISPOSE OF ALL REMOVED EXISTING SEWER PIPE.
 5. UNDER THE BASE BID, TRENCHES ON WOODLAND ROAD WILL BE PAVED WITH PERMANENT PAVING BID ALTERNATE. A INCLUDES FULL WIDTH MILL AND OVERLAY OF WOODLAND ROAD.



FOR CONSTRUCTION	
Sheet No.	C-9
JENNINGS ROAD SEWER REPLACEMENT AND DRAIN REHABILITATION CITY OF WALTHAM, MASSACHUSETTS	
WOODLAND ROAD SEWER REPLACEMENT STA 4+00 TO STA 7+00	
AS NOTED DATE 255-1102 DESIGNED BY R/S/SLC DRAWN BY SLC CHECKED BY PCM APPROVED BY R/S/	TRUE SCALE IS ONE INCH LONG WHEN PLOTTED AT FULL SCALE ON A 22" X 34" DRAWING
MARK	DATE DESCRIPTION



PLAN
SCALE 1"=80'



MARK	DATE	DESCRIPTION	State	AS NOTED
			Date	MAY 2019
			Job No.	253-1102
			Designed by	RUPOLC
			Drawn by	SJC
			Checked by	PCM
			Approved by	RJP

— 1 LINE IS ONE INCH
— 1 LINE IS ONE INCH
— 1 LINE IS ONE INCH

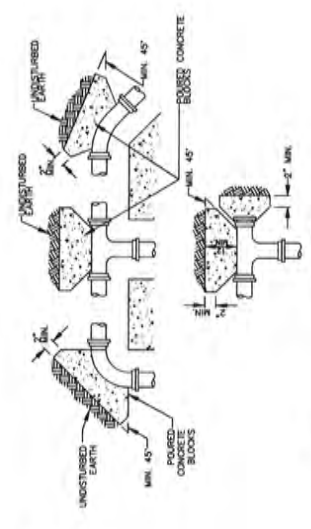
JENNINGS ROAD
SEWER REPLACEMENT AND DRAIN REHABILITATION
CITY OF WALTHAM, MASSACHUSETTS

DRAIN REHABILITATION

FOR CONSTRUCTION

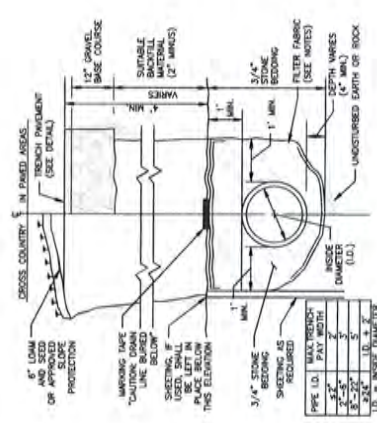
Sheet No.

C-11



1. FOR LOCATIONS THAT REQUIRE FLOWABLE FILL AT ITS DISCRETION.
2. FOR LOCATIONS WHERE THE FILL IS TO BE PLACED IN A PIPE OR LAY ON UNDISTURBED EARTH, OR ON SAND BEDDING CONSISTENT WITH THE DESIGN.
3. FOR LOCATIONS WHERE LEDGE IS ENCOUNTERED, SAND BEDDING SHALL BE PLACED TO A MINIMUM OF 12 INCHES BELOW THE PROPOSED FINISH ELEVATION.
4. FILL MATERIAL SHALL BE COMPACTED TO 95% PROCTOR DENSITY.
5. THE METHOD OF CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE ASTM D1557 METHOD C, UNLESS OTHERWISE NOTED IN THE SPECIFICATIONS OR DIRECTED BY THE ENGINEER.

TYPICAL THRUST BLOCK DETAIL



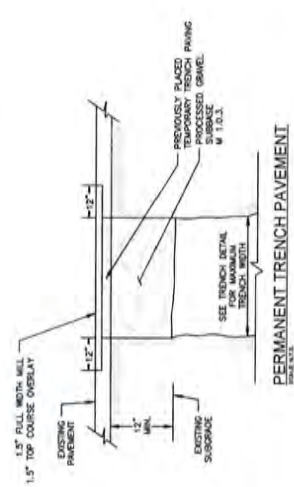
WATER MAIN DIAMETER	MINIMUM TAP DIAMETER
4"	1/2"
6"	3/4"
8"	1"
12"	1"

- | DEPTH (INCHES) | DIAMETER (IN.) | UNDISTURBED DENSITY OF SOIL |
|----------------|----------------|-----------------------------|
| 0-2 | 2 | |
| 2-4 | 2 | |
| 4-6 | 2 | |
| 6-8 | 2 | |
| 8-10 | 2 | |
| 10-12 | 2 | |
10. = INSIDE DIAMETER
- NOTES:
1. REFER TO TRENCH PAVEMENT DETAIL FOR PAVEMENT PAVEMENT NOTES.
 2. WHEN EXCAVATION IS IN SILT AND / OR CLAY, AND BELOW GROUNDWATER TABLE, SECONDING WITH FILTER FABRIC SHALL HAVE A MIN. OF 7' OVERLAP.
 3. COMPACTION TESTING SHALL BE COMPLETED IN ACCORDANCE WITH THE ASTM D1557-90C UNLESS OTHERWISE WRITTEN IN THE SPECIFICATION OR DISCREPANCY.

WATER SERVICE

1. TRENCH PAVEMENT: 4" OF HOT MIX ASPHALT BINDER TO BE USED AT THE END OF EACH WEEK TO STABILIZE TRENCHES. THIS WORK SHALL BE INCLUDED IN THE UNIT PRICE FOR TRENCH PAVEMENT. THE CONTRACTOR SHALL MAINTAIN THE TRENCH PAVEMENT THROUGHOUT THE DURATION OF CONSTRUCTION ACTIVITY AT NO ADDITIONAL COST TO THE CONTRACT.
2. ALL TRENCHES SHALL BE SAW CUT ONLY. NO OTHER METHOD OF CUTTING THE

* THE POLYETHYLENE BETWEEN CONCRETE AND FITTING SHALL NOT INTERFERE WITH JOINT).



100% ASPHALT DRIVEWAY (AS NEEDED)

- | PROPOSED PERMANENT TRENCH PAVEMENT (BASE BD. — WOOLAND RD. ONLY) | | PROPOSED HOT MIX ASPHALT DRIVEWAY (AS NEEDED) | |
|------------------------------------------------------------------|------------------------------------------------|-----------------------------------------------|----------------------------------------------------------------------------------|
| MILLING | 1.5" MILLING | SURFACE | 3" HOT MIX ASPHALT PLACED IN TWO LAYERS, 1.5" TOP COURSE OVER 1.5" BINDER COURSE |
| SURFACE | 1.5" HOT MIX ASPHALT TOP PLACED IN ONE LAYER | SUBBASE | 8" PROCESSED GRAVEL (M1.03 MASSDOT STANDARD) |
| SUBBASE | EXISTING SUBBASE | PROPOSED | PROPOSED CONCRETE WALL/RETICULOS RAMP (AS NEEDED) |
| PROPOSED | PROPOSED TROPICAN TRENCH PAVEMENT | SURFACE | 8" FIBER REINFORCED CONCRETE |
| SURFACE | 4" HOT MIX ASPHALT BINDER PLACED IN TWO LAYERS | SUBBASE | 8" PROCESSED GRAVEL (M1.03 MASSDOT STANDARD) |
| SUBBASE | 12" PROCESSED GRAVEL (M1.03 MASSDOT STANDARD) | | |
| PROPOSED | PROPOSED PERMANENT PAVEMENT | | |
| MILLING | 1.5" MILLING | | |
| SURFACE | 1.5" HOT MIX ASPHALT TOP PLACED IN ONE LAYER | | |
| SUBBASE | EXISTING SUBBASE | | |



Estimate of Illicit Flows Removed under the IDDE Program

Infiltration/Inflow Removed Under the Illicit Discharge Detection and Elimination (IDDE) Project (November 2011 - July 2013)

Illicit Sources Removed in Permit Year 8 (April 1st 2010 to March 31st, 2011)

Note: inflow rates for each repair indicated herein are estimated based on visual inspection, MassDEP's 310CMR Section 15.203; "System Sewage Flow design criteria", or the average dry weather peak infiltration per metered subsystem as indicated in Table 5-1 of the Sewer System Facilities Plan and Hydraulic Modeling Report by CDM dated April 2009.

1. **Stone Road:** 8-inch sewer rehab (cleaning & CIPP lining) of 265 linear feet (lf) or 0.40 inch-diameter-miles (idm) - completed in June 2010.
Estimated inflow removal: $20,639 \text{ (gpd/idm)} \times 0.40 \text{ idm} = \mathbf{8,255 \text{ gallons per day (gpd)}}$
2. **Porter Road:** 8-inch sewer rehab (cleaning & CIPP lining) of 145 lf (0.22 idm) and sealing of two sanitary manhole - completed in June 2010.
Estimated inflow removal: $3,076 \text{ (gpd/idm)} \times 0.22 \text{ idm} = \mathbf{677 \text{ gpd}}$
3. **Fuller Street:** Conversion of one common manhole to sanitary manhole - completed in June 2010.
Estimated inflow removal is indeterminate.
4. **Newton Street:** 6-inch sewer rehab (cleaning & CIPP lining) of 242 lf (0.275 idm) and sealing of two sanitary manholes – completed in June 2010.
Estimated inflow removal: $106 \text{ (gpd/idm)} \times 0.275 \text{ idm} = \mathbf{29.15 \text{ gpd}}$
5. **River Street:** 6-inch sewer rehab (cleaning & CIPP lining) of 260 lf or 0.30 idm) and sealing of one sanitary manhole – completed in June 2010.
Estimated peak inflow removal: $20,639 \text{ (gpd/idm)} \times 0.30 \text{ idm} = \mathbf{6,192 \text{ gpd}}$
6. **Main Street:** Removal of sanitary sewer cross-connection at uncapped roof drain within sanitary manhole – completed in June 2010.
Estimated inflow removal of 80.3 gpd based on the following assumptions:
 - Average inflow removal equal to 10% of total generated roof runoff
 - Average annual precipitation = 47 inches/year
 - Roof surface = 10,000 sq ft
 - Therefore the total annual roof runoff = **803 gpd**

7. **Parmenter and Cambria Streets:** 10-inch sewer rehab (cleaning & CIPP lining) of 277 lf or 0.52 idm, 8-inch sewer rehab (cleaning & CIPP lining) of 163lf or 0.25 idm), 6-inch sewer rehab (cleaning & CIPP lining) of 215 lf or 0.24 idm and sealing of one sanitary manhole – completed in October 2010.
Estimated inflow removal: $106 \text{ (gpd/idm)} \times 1.01 \text{ idm} = \mathbf{107.1 \text{ gpd}}$

8. **5 Brookway Road:** reconnection of the building sanitary lateral, which was connected to the drain, to the sanitary sewer in the same street –completed October 2010.
Estimated inflow removal of **330gpd**.

$$1 \text{ house} \times \frac{3 \text{ bedrooms}}{1 \text{ apartment}} \times \frac{110 \text{ gpd}}{\text{bedroom}} = \mathbf{330 \text{ gpd}}$$

9. **12 Calvary Street:** reconnection of the building sanitary lateral, which was connected to the drain, to the sanitary sewer in the same street- completed December 2010
Estimated inflow removal of 880gpd based on the following assumptions:

$$4 \text{ apartments} \times \frac{2 \text{ bedrooms}}{1 \text{ apartment}} \times \frac{110 \text{ gpd}}{\text{bedroom}} = \mathbf{880 \text{ gpd}}$$

**Total Illicit Flows Removed During PY8 (April 1st, 2010 through March 31st, 2011)
= 17,273 gpd = 6.30MGY**

Illicit Sources Removed in Permit Year 9 (April 1st 2011 through March 31st, 2012)

Note: Peak inflow rates for each repair indicated below are estimated based on visual inspection, MassDEP's 310CMR Section 15.203; "System Sewage Flow design criteria", or the average dry weather peak infiltration per metered subsystem as indicated in Table 5-1 of the Sewer System Facilities Plan and Hydraulic Modeling Report by CDM dated April 2009.

1. **Cherry Street**- replaced leaking sanitary lateral crossing drain.

- a. Estimated peak inflow removal: 0.1 gpm = **144gpd**

2. **Adams Street** – relocated compromised building sanitary lateral going through a drain manhole. Estimated peak inflow removal (assumed 25 apartments, average of 2 bedrooms per apartment and 4% of total generated sanitary flow reaches drain system):

$$25 \text{ apts} \times \frac{2 \text{ bedrooms}}{1 \text{ apartment}} \times \frac{110 \text{ gpd}}{1 \text{ bedroom}} \times 4\% = \mathbf{220 \text{ gpd}}$$

3. **Easement between Humboldt and Huntington Streets** (metered sub-system 7):

- a. 8-inch sewer rehab (cleaning & CIPP lining) of 310 linear feet (LF) or 0.47 inch-diameter-miles (idm). Completed in August 2011.

Estimated peak inflow removal: 3,076 (gpd/idm) \times 0.47 idm = **1445.7gpd**

4. **Beal Road** (metered sub-system 5):

- a. 8-inch sewer rehab (cleaning & CIPP lining) of 230 linear feet (LF) or 0.35 inch-diameter-miles (idm) - completed in September 2011.

Estimated peak inflow removal: 412 (gpd/idm) \times 0.35 idm = **144.2gpd**.

- b. Sealed two leaking sewer manholes (assumed 0.05gpm per manhole) = **144gpd** – Completed March 2012

5. **Candace Ave** (metered sub-system 5):

- a. 8-inch sewer rehab (cleaning & CIPP lining) of 355 linear feet (LF) or 0.54 inch-diameter-miles (idm) - completed in September 2011. Estimated peak inflow removal: 412 (gpd/idm) \times 0.54 idm = **222.5 gpd**.

- b. Sealed to leaking sewer manholes (assumed 0.05gpm per manhole) = **144gpd**. Completed March 2012.

- c. Sealed a leaking sanitary lateral crossing location. Estimated peak inflow removal: $0.1 \text{ gpm} = 144 \text{ gpd}$

6. **Ellison Park** (metered sub-system 10):

- a. 8-inch sewer rehab (cleaning & CIPP lining) of 245 linear feet (LF) or 0.37 inch-diameter-miles (idm) - completed in September 2011. Estimated peak inflow removal: $106 \text{ (gpd/idm)} \times 0.37 \text{ idm} = 39.2 \text{ gpd}$.

7. **Main Street** (metered sub-system 10):

- a. 10-inch sewer rehab (cleaning & CIPP lining) of 40 linear feet (LF) or 0.076 inch-diameter-miles (idm) - completed in September 2011. Estimated peak inflow removal: $106 \text{ (gpd/idm)} \times 0.076 \text{ idm} = 8.06 \text{ gpd}$.
- b. Sealed two leaking sewer manholes (assumed 0.02gpm per manhole) = **57.6gpd**.

Total Illicit Flows Removed During PY9 (April 1st, 2011 through March 31st, 2012)
= 2,713 gpd = 0.99MGY

Illicit Sources Removed in Permit Year 10 (April 1st 2012 to date)

1. **140 Trapelo Road:** reconnection of the building sanitary lateral, which was connected to the drain line, to the sanitary sewer line in the same street. Completed April 2012.

Estimated inflow removal of **330gpd**:

$$1 \text{ house} \times \frac{3 \text{ bedrooms}}{1 \text{ apartment}} \times \frac{110 \text{ gpd}}{\text{bedroom}} = 330 \text{ gpd}$$

2. Longfellow Road:

- a. Action: lining of 420 LF of 10-inch (0.79idm) and 15 feet of 8-inch (0.02idm) sanitary sewer and seal 3 sewer manholes.
- b. Estimated inflow removal: $0.81 \times 20,639(\text{gpd/idm}) = 16,773.9\text{gpd}$

Total illicit flows removed during PY10 (as of January of 2013): = 17,103.9 gpd = 6.24MGY

TOTAL ILLICIT FLOWS REMOVED UNDER THE IDDE PROGRAM (PY8 to PY10 as of July of 2013) = 6.30 + 0.99 + 6.24 = 13.53MGY

Identified Sources of Illicit Flow Pending Removal

1. Cliff Road (metered sub-system 12)

- a. Type of violation: E.Coli (2,400cfu/100mL)
- b. Action proposed: CIPP lining of 124 LF of 8-inch (0.19idm) sanitary sewer.
- c. Estimated inflow removal: $0.19 \times 4,216$ (gpd/idm) = 801 gpd
- d. Estimated construction date: Spring/Summer 2014.

2. River Street (metered sub-system 4)

- a. Type of violation: E.Coli (27,000cfu/100mL), Ammonia (2.32mg/L), Surfactants (0.10mg/L)
- b. Action proposed: CIPP lining of 175 LF of 8-inch (0.26idm) sanitary sewer.
- c. Estimated inflow removal: $0.26 \times 5,725$ (gpd/idm) = 1,488 gpd
- d. Estimated construction date: Spring/Summer 2014.

3. Candace Avenue (metered sub-system 5)

- a. Type of violation: E.Coli (1,300cfu/100mL), Ammonia (1.02mg/L), Surfactants (0.26mg/L)
- b. Action proposed: CIPP lining of 180 LF of 8-inch (0.27idm) sanitary sewer and redirect sanitary sewer lateral around drain manhole.
- c. Estimated inflow removal: 0.27×412 (gpd/idm) = 111 gpd
- d. Estimated construction date: Spring/Summer 2014.

4. Irving Street (metered sub-system 8)

- a. Type of violation (violation is at downstream system [MB-4]:
E.Coli (140,000cfu/100mL)
Ammonia: 16.7 mg/L
Surfactants: 0.55 mg/L
- b. Action proposed: common manhole separation at Oak Hill Road and Irving Street.
- c. Estimated inflow removal: unknown (suspected to activate in wet weather conditions)
- d. Estimated construction date: Spring/Summer 2014.

5. Hansen Road (metered sub-system 1314)

- a. Type of violation: E.Coli (3,500cfu/100mL), Ammonia (0.81mg/L)
- b. Action proposed: cleaning and CIPP lining of 135LF of 8-inch (0.20idm) sanitary sewer and 165LF of 12-inch storm drain (0.37 idm).
- c. Estimated inflow removal: $(0.20 + 0.37) \times 1,478$ (gpd/idm) = 842 gpd
- d. Estimated construction date: Spring/Summer 2014.

6. Weston Street (metered sub-system 1314)

- a. Type of violation: E.Coli (21,000cfu/100mL), Ammonia (0.53mg/L), Surfactants (0.12 mg/L).
- b. Action proposed: identify and eliminate potential illicit connections to the

stoprm drain (assumed one illicit connection, pipe inaccessible)

c. Estimated inflow removal:

$$1 \text{ house} \times \frac{3 \text{ bedrooms}}{1 \text{ apartment}} \times \frac{110 \text{ gpd}}{\text{bedroom}} = 330 \text{ gpd}$$

d. Estimated construction date: Spring/Summer 2014.

7. Fuller Street (metered sub-system 9):

- a. Type of violation: E.Coli (11,000cfu/100mL).
- b. Action proposed: cleaning and CIPP lining of 637LF of 8-inch (0.96idm) sanitary sewer and seal three sewer manholes.
- c. Estimated inflow removal: $(0.96) \times 1,951 \text{ (gpd/idm)} = 1,639 \text{ gpd}$
- d. Estimated construction date: Spring/Summer 2014.

8. Beal Road (metered sub-system 5):

- a. Type of violation: E.Coli (69,000cfu/100mL), Ammonia (1.12mg/L).
- b. Action proposed: sealing one drain manhole and one sanitary manhole.
- c. Estimated inflow removal: unknown (suspected to activate when sanitary line surcharges).
- d. Estimated construction date: Spring/Summer 2014.

9. Ash Street (metered sub-system 9):

- a. Type of violation: E.Coli (2,000cfu/100mL)
- b. Action proposed: replacement of 740 LF of 6-inch (0.84idm) sanitary sewer and 3 sewer manholes.
- c. Estimated inflow removal: $0.84 \times 1,951 \text{ (gpd/idm)} = 1,639 \text{ gpd}$
- d. Estimated construction date: this project will be assigned to developers doing work in Waltham under the I/I mitigation program on an on-going basis. This source will source be targeted in the next reporting period.

10. Charles Street (metered sub-system 8):

- a. Type of violation: E.Coli (11,000cfu/100mL), Ammonia (0.90mg/L), surfactants (1.40mg/L)
- b. Action proposed: replacement of 300 LF of 6-inch (0.34idm) sanitary sewer and 2 sewer manholes.
- c. Estimated inflow removal: $0.34 \times 6,116 \text{ (gpd/idm)} = 2,085 \text{ gpd}$
- d. Estimated construction date: this project will be assigned to developers doing work in Waltham under the I/I mitigation program on an on-going basis. This source will source be targeted in the next reporting period.

11. Brown Street (metered usb-system 9):

- a. Type of violation: E.Coli (550 –sample 1- and 1,300cfu/100mL-sample 2)
- b. Action proposed: replacement of 260 LF of 6-inch (0.29idm) sanitary sewer and 2 sewer manholes.

- c. Estimated inflow removal: $0.29 \times 1,951 \text{ (gpd/idm)} = 565.8 \text{ gpd}$
- d. Estimated construction date: this project will be assigned to developers doing work in Waltham under the I/I mitigation program on an on-going basis. This source will source be targeted in the next reporting period.

Note: small violation of E.Coli values most likely due to background sources.
Construction work was proposed to help ameliorate sanitary system capacity.

12. Derby Street (metered usb-system 9):

- a. Type of violation: E.Coli (14,000cfu/100mL) and surfactants (0.25 mg/L)
- b. Action proposed: replacement of 200 LF of 6-inch (0.23idm) sanitary sewer and 1 sewer manholes.
- c. Estimated inflow removal: $0.23 \times 1,951 \text{ (gpd/idm)} = 448.7 \text{ gpd}$
- d. Estimated construction date: this project will be assigned to developers doing work in Waltham under the I/I mitigation program on an on-going basis. This source will source be targeted in the next reporting period.

YEAR 2 ANNUAL REPORT

**Massachusetts Small MS4 General Permit
Reporting Period: July 1, 2019 – June 30, 2020**

CITY OF WALTHAM, MASSACHUSETTS

ATTACHMENT D

MAINTENANCE OF CITY OWNED

STORMWATER FACILITIES

Brook Cleaning

2020

LOCATION	DATE DONE	DEBRIS AMT.	DATE DONE	DEBRIS AMT.
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*** denotes trash rack

Leitha Drive	3/4/2020	Minimal	7/20/2020	Minimal
Copeland Street	3/4/2020	Minimal	7/20/2020	Minimal
Pinevale Road	3/4/2020	Minimal	7/20/2020	Minimal
Greenwood Lane ***	3/4/2020	Minimal	7/20/2020	Minimal
44 Worcester Lane ***	3/4/2020	1/2 Yard	7/20/2020	1/2 Yard
Clark Lane @ Cowassett Lane ***	3/4/2020	Minimal	7/20/2020	Minimal
Bacon St. @ Worcester Lane ***	3/4/2020	1/2 Yard	7/20/2020	1/2 Yard
Bacon St. @ Hollow	3/4/2020	Minimal	7/20/2020	Minimal
Totten Pond Road	3/4/2020	1/2 Yard	7/20/2020	1/2 Yard
Pond End School Lane	3/4/2020	1/2 Yard	7/20/2020	1/2 Yard
Linden Street ***	3/4/2020	1 yard	7/20/2020	1 yard
Winter St. Loop	3/4/2020	Minimal	7/20/2020	Minimal
Upper Main Street	3/4/2020	Minimal	7/20/2020	Minimal
Bow St. (Falzone Field)	3/4/2020	Minimal	7/20/2020	Minimal
Forest St. (Bentley)	3/4/2020	Minimal	7/20/2020	Minimal
Beaver St. @ Rail Road	3/4/2020	Minimal	7/20/2020	Minimal
Prospect Street Park	3/4/2020	1/2 Yard	7/20/2020	1/2 Yard
Waverly Oaks Road	3/4/2020	1/2 Yard	7/20/2020	1/2 Yard
Lexington Street @ Windsor	3/4/2020	Minimal	7/20/2020	Minimal
City Yard	3/4/2020	Minimal	7/20/2020	Minimal
Over 128 (in Hollow)	3/4/2020	Minimal	7/20/2020	Minimal
Trapelo Road (behind park)	3/4/2020	Minimal	7/20/2020	Minimal
Lakeview Housing	3/4/2020	Minimal	7/20/2020	Minimal
Behind #1080 & 1088 Trapelo Rd.	3/4/2020	Minimal	7/20/2020	Minimal
1643 Trapelo Road	3/4/2020	Minimal	7/20/2020	Minimal
136 Lyman Street	3/4/2020	Minimal	7/20/2020	Minimal
Graverson Park	3/4/2020	Minimal	7/20/2020	Minimal
Samosett @ Woodland ***	3/4/2020	1/2 Yard	7/20/2020	1/2 Yard
Hemlock Terrace	3/4/2020	Minimal	7/20/2020	Minimal

Inspection Log - Particle Separators/Stormceptors
Date of Inspection - 02/22/2018

Date Inspected	Facility/School	Street	Structure Depth (ft)	Sediment Depth (in)	Oil/Floatable Present	Date of Last Cleaning	Maintenance Performed (Inspected or Cleaned)	Inspected By	Observations	Unit Type	Recommendations	Jurisdiction
02/23/16	McArthur	Lincoln Street	17.3	1	No	UNK	Inspected	Sam Bade	Light sediment observed	Stormceptor 1800 (1800 gallon unit)	No cleaning required	School Department
02/23/16	Fitzgerald	Beal Road	8.5	2	No	UNK	Inspected	Sam Bade	Light sediment observed	Unknown	No cleaning required	School Department
02/23/16	JFK Middle	Lexington Street	8.4	2	No	UNK	Inspected	Sam Bade	Light sediment observed	Vorcentrix (Two chambers-one on either side of weir wall)	No cleaning required	School Department
02/23/16	JFK Middle	Lexington Street	10.3	2	No	UNK	Inspected	Sam Bade	Light sediment observed	Vorcentrix at outlet to brook	No cleaning required	School Department
02/22/18	Whittemore	Hovey Road	7.1	1	Yes	UNK	Inspected	Sam Bade	Floatables found	Unknown	Light cleaning, remove floatables	School Department
02/23/16	New Plympton	Bacon Street	8.4	1	No	UNK	Inspected	Sam Bade	Light sediment observed	Stormceptor 1800	No cleaning required	School Department
02/23/16	McDevitt Middle	School Street	10.6	6	Yes	2016	Inspected	Sam Bade	Floatables observed	Stormceptor 2 (8' diameter, 2400 or 3600)	Requires cleaning	School Department
02/23/16	McDevitt Middle	School Street	10.8	4	Yes	2016	Inspected	Sam Bade	Floatables observed; slight oil sheen	Stormceptor 1 (8' diameter, 2400 or 3600)	Remove floatables & trash,	School Department
02/23/16	Northeast	Putney Lane	20.8	1	No	UNK	Inspected	Sam Bade	Light sediment observed	Stormceptor 2 (8' diameter, 2400 or 3600)	No cleaning required	School Department
02/23/16	Northeast	Putney Lane	12.9	1	N0	UNK	Inspected	Sam Bade	Light sediment observed	Stormceptor 1 (8' diameter, 2400 or 3600)	No cleaning required	School Department
02/23/16	JFK Middle	Lexington Street	9.5			UNK	Not Inspected - Sewer	Sam Bade		Unknown	Inspection required	School Department
02/23/16	McDevitt Middle	Church Street	14.5	4	Yes	UNK	Inspected	Sam Bade	Floatables observed; slight oil sheen	Unknown	Remove floatables, sediment	School Department

Inspected on February 22, 2018

Follow up inspection required to observe existing conditions in 2018

Inspection Log - Particle Separators/Stormceptors
Date of Inspection - 1/28/2016 and 02/23/2016

Date Inspected	Facility/School	Street	Structure Depth (ft)	Sediment Depth (in)	Oil/Floatable Present	Date of Last Cleaning	Maintenance Performed (Inspected or Cleaned)	Inspected By	Observations	Unit Type	Plan Name	Plan No.	Recommendations	Jurisdiction
01/28/16		Hardy Pond Road		UNK		06/27/11	Could Not Access	Sam Bade	Fence Built Over Access	Conc. Sedimentation Tank	Hardy Pond-Sedimentation Tank Site G	128.075.007	Notify Residents for access and Inpsct (Engineer should be on hand for inspection	Engineering/Water and Sewer
01/28/16		Winter Street-Goose Pond		UNK		06/28/11	Inspected	Sam Bade		STC-900	As Built Plan-November 9, 2010-No.4	147.025.023/024, 147.025.025 & 147.025.021/020	Clean CB, reinspect with no ice in chamber	Engineering/Water and Sewer
01/28/16		Winter Street-Goose Pond	8.5	5	N	UNK	Inspected	Sam Bade		STC-900	As Built Plan-November 9, 2010-No.8	147.025.023/024, 147.025.025 & 147.025.021/020	Requires light cleaning	Engineering/Water and Sewer
01/28/16		Seminole Avenue	11.9	6	Yes	06/03/11	Inspected	Sam Bade		8,000 Gallon Gross Particle Separator	Gross Particle Separator Site C-Seminole Avenue	128.075.003	Monitor floatables	Engineering/Water and Sewer
01/28/16		Lakeview Avenue	10.7	8	Yes	06/03/11	Inspected	Sam Bade	floatables observed	10,000 Gallon Gross Particle Separator	Gross Particle Separator Site A-Lakeview Avenue	128.075.001	Monitor floatables	Engineering/Water and Sewer
01/28/16		Hibiscus Avenue	12.9	8	Yes	06/03/11	Inspected	Sam Bade	Trash on shelf	10,000 Gallon Gross Particle Separator	Gross Particle Separator Site B-Hibiscus Avenue	128.075.002	Monitor sediment	Engineering/Water and Sewer
01/28/16		Sylvan Road	10.2	<1	N	05/01/12	Inspected	Sam Bade		STC-900	General Plan-Sheet 9 of 11 (February 6, 2009)	148.024	No cleaning required	Engineering/Water and Sewer
01/28/16		Sylvan Road	10.4	5	N	05/01/12	Inspected	Sam Bade		STC-900	General Plan-Sheet 9 of 11 (February 6, 2009)	148.024	Minor Cleaning	Engineering/Water and Sewer
01/28/16		Winter Street	9.1	0	Y	05/01/12	Inspected	Sam Bade	Floatables observed	STC-900	As Built Plan-November 9, 2010	147.025.021 & 147.025.025	Remove floatables	Engineering/Water and Sewer
01/28/16		Winter Street-Goose Pond				05/01/12	Could Not Find	Sam Bade		STC-900	As Built Plan-November 9, 2010	147.025.023/024 & 147.025.025	Could not locate	Engineering/Water and Sewer
01/28/16		Winter Street-Goose Pond	8.6	2	N	05/01/12	Inspected	Sam Bade		STC-900	As Built Plan-November 9, 2010	147.025.023/024 & 147.025.025	No cleaning required	Engineering/Water and Sewer
01/28/16		Winter Street-Goose Pond	8.6	10	N	05/01/12	Inspected	Sam Bade		STC-900	As Built Plan-November 9, 2010	147.025.023/024 & 147.025.025	Requires cleaning	Engineering/Water and Sewer
01/28/16		Winter Street-Goose Pond	10.9	14	N	05/01/12	Inspected	Sam Bade		STC-900	As Built Plan-November 9, 2010	147.025.023/024 & 147.025.025	Requires cleaning	Engineering/Water and Sewer
01/28/16		Windsor Village	16.3	4	Y	05/20/13	Inspected	Sam Bade	Slight oil sheen	6,000 Gallon Gross Particle Separator	Gross Particle Separator Site D-Windsor Village	128.075.004	No cleaning required	PRIVATE-Notified Windsor Village
01/28/16		Windsor Village	10.0	6	Y	05/20/13	Inspected	Sam Bade	slight oil sheen	7,000 Gallon Gross Particle Separator	Gross Particle Separator Site E-Windsor Village	128.075.005	No cleaning required	PRIVATE-Notified Windsor Village
01/28/16		Windsor Village		6	Y	05/20/13	Inspected	Sam Bade	Slight oil sheen	5,000 Gallon Gross Particle Separator	Gross Particle Separator Site F-Windsor Village	128.075.006	No cleaning required	PRIVATE-Notified Windsor Village
02/23/16	McArthur	Lincoln Street	17.3	1	No	UNK	Inspected	Sam Bade	Light sediment observed	Stormceptor 1800 (1800 gallon unit)	McArthur School	McArthur School	No cleaning required	School Department
02/23/16	Fitzgerald	Beal Road	8.5	2	No	UNK	Inspected	Sam Bade	Light sediment observed	Unknown	Fitzgerald School	099-116	No cleaning required	School Department
02/23/16	JFK Middle	Lexington Street	8.4	2	No	UNK	Inspected	Sam Bade	Light sediment observed	Vorcentrix (Two chambers-one on either side of weir wall)	JFK Middle School Renovation/Addition	178.029	No cleaning required	School Department
02/23/16	JFK Middle	Lexington Street	10.3	2	No	UNK	Inspected	Sam Bade	Light sediment observed	Vorcentrix at outlet to brook	JFK Middle School Renovation/Addition	178.029	No cleaning required	School Department
02/23/16	Whitemore Elementary	Hovey Road	7.1	1	Yes	UNK	Inspected	Sam Bade	Floatables found	Unknown	As-built Plan of Whitemore Elementary School	154.005	Light cleaning, remove floatables	School Department
02/23/16	New Plympton Elementary	Bacon Street	8.4	1	No	UNK	Inspected	Sam Bade	Light sediment observed	Stormceptor 1800	New Plympton Elementary School	176.026	No cleaning required	School Department
02/23/16	McDevitt Middle	School Street	10.6	6	Yes	UNK	Inspected	Sam Bade	Floatables observed	Stormceptor 2 (8' diameter, 2400 or 3600)	School Street Middle School	153.016	Requires cleaning	School Department
02/23/16	McDevitt Middle	School Street	10.8	4	Yes	UNK	Inspected	Sam Bade	Floatables observed; slight oil sheen	Stormceptor 1 (8' diameter, 2400 or 3600)	School Street Middle School	153.016	Remove floatables & trash, cleaning required	School Department
02/23/16	Northeast Elementary	Putney Lane	20.8	1	No	UNK	Inspected	Sam Bade	Light sediment observed	Stormceptor 2 (8' diameter, 2400 or 3600)	Northeast Elementary	131.011	No cleaning required	School Department
02/23/16	Northeast Elementary	Putney Lane	12.9	1	NO	UNK	Inspected	Sam Bade	Light sediment observed	Stormceptor 1 (8' diameter, 2400 or 3600)	Northeast Elementary	131.011	No cleaning required	School Department
		South Street				UNK	Inspected	Sam Bade	Popped DMHs, no sumps or sediment observed	Detention Basin	Stanley Elementary School		Basin was not accessible, no recommended maintenance	School Department
02/23/16	JFK Middle	Lexington Street	9.5			UNK	Not Inspected - Snow	Sam Bade		Unknown	JFK Middle School Renovation/Addition- unit is in the back of the school	178.029	Inspection required	School Department
02/23/16	McDevitt Middle	Church Street	14.5	4	Yes	UNK	Inspected	Sam Bade	Floatables observed; slight oil sheen	Unknown		153.016	Remove floatables, sediment cleaning required	School Department

- Follow up inspection and potential cleaning required in 2018
- Follow up inspection required to observe existing conditions in 2018

YEAR 2 ANNUAL REPORT

**Massachusetts Small MS4 General Permit
Reporting Period: July 1, 2019 – June 30, 2020**

CITY OF WALTHAM, MASSACHUSETTS

ATTACHMENT E

HARDY POND CARE GUIDE

KEEP IT HARDY

A CARE GUIDE FOR OUR NEIGHBORHOOD POND

As neighbors in the immediate vicinity of Hardy Pond, we share special environmental responsibilities; our day-to-day actions have a considerable impact on the complex and sensitive ecosystem around the pond. Even if you live a few blocks away, the natural slope of the watershed combined with storm drains that empty into the pond can make supposedly harmless activities a threat. Washing cars, making home repairs, and maintaining lawns and gardens may all contribute to the pollution of Hardy Pond.

Please take a few minutes to discover the simple actions that each of us can take to protect our environment and ensure a hardy future for the pond.

Keep It Hardy is produced by the Hardy Pond Association
a project of the Waltham Land Trust

Original printing and distribution were funded by
The Massachusetts Department of Environmental Management,
The City of Waltham, and the Hardy Pond Association

ALL LABOR DONATED SECOND EDITION 2012

Hardy Pond Association Statement of Purpose

The Hardy Pond Association was organized by area residents in 1991 to protect Hardy Pond and its natural environment, recreational resources, and water quality. Its goals are to:

- promote and perform long-term maintenance and stewardship of the pond;
- clean up and protect the adjoining wetlands and shoreline;
- encourage proper conservation practices by abutters and users of the pond;
- keep the neighborhood residents aware of pond-related issues and events;
- initiate a comprehensive watershed and pond management study;
- pursue funding to maintain and improve the pond;
- develop Hardy Pond as an environmental education resource for Waltham.

Donations and Membership

The Hardy Pond Association (HPA) recently became a project of the Waltham Land Trust (WLT) and ceased operating as a separate Massachusetts nonprofit corporation. You can support our work in two ways: Become a member of the Waltham Land Trust — your membership dues pay for all of the open space protection work of the WLT, including pursuing the goals of the Hardy Pond Association. In addition, the WLT has created a Hardy Pond Fund to be used solely for improving and protecting Hardy Pond and the adjoining Hardy Pond Conservation Area. Earmark your contributions to the WLT for the “Hardy Pond Fund” to be sure they will be used exclusively for Hardy Pond activities: maintaining pond area signage, monitoring pond conditions, advocacy for pond improvements, coordinating the annual cleanups, and responding to neighborhood concerns.

Don't Feed the Weeds

Excessive phosphorus loading is a fundamental cause of Hardy Pond's explosive aquatic weed growth. Phosphorus is found in rocks and soil as well as in plants and animals. However, human activities and development can increase phosphorus in storm water run-off to levels ten times its natural concentration.

In a body of water such as Hardy Pond, phosphorus feeds microscopic algae and other aquatic plants. When they die, they fall to the bottom and decompose. This depletes oxygen levels in the water which then frees phosphorus that is trapped in the sediment.

This cycle accelerates excessive plant growth and the filling-in of the pond, a process known as eutrophication. The low levels of dissolved oxygen can kill fish in the pond. It also results in the foul stench that residents have noticed at times during the late summer months around Hardy Pond.

It is important for everyone to reduce the addition of phosphorus to the pond. A typical 50 lb. bag of lawn fertilizer contains five pounds of phosphorus; that's enough to result in 50,000 pounds of aquatic weed growth in Hardy Pond!



Steps to prevent phosphorus from entering the pond:

- set up a vegetated buffer zone (VBZ);
- follow recommended lawn and yard care practice;
- garden with a “less is more” approach and;
- avoid the outdoor use of harmful detergents and household chemicals.

Prevent pet waste from polluting Hardy Pond and the Charles River Watershed!

Dog droppings produce billions of fecal coliform bacteria, which pose a serious health risk to children, adults, and pets. To prevent waste and bacteria from entering storm drains and the pond, it's essential to pick up vigilantly after your dogs and cats. Immediately remove waste/droppings from your yard, and from the street while on walks with your pet—and never discard pet waste into storm drains.

The Massachusetts Department of Environmental Protection recommends discarding pet waste in a sealed plastic bag in the trash.

For more information about proper disposal (and health risks) of pest waste, go to www.mass.gov/dep/water/resources/petwaste.htm.

Vegetated Buffer Zones



One of the most effective means of preventing phosphorus overload is to maintain a vegetated buffer zone (VBZ). If you live near the shore or wetlands of Hardy Pond, you can help improve the water quality and reduce aquatic weed growth by planting a buffer zone between your lawn and the pond.

Vegetated buffer zones help filter nutrients and pollutants before they reach the pond, minimizing the impact of pesticides and

fertilizers from our lawns and oil and grease from streets and driveways. Native shrubs, ground covers, and trees in the buffer zone use the excess nutrients and their roots to slow the surface run-off, providing cleaner water to the pond. Lawns are inadequate buffers, for they only hold soil in place. Grass is not thirsty enough and grass roots are not deep enough to absorb even a fraction of the run-off during a rainstorm. With a VBZ, lawn maintenance will be reduced, wildlife habitats will increase, and visual diversity will be added to the landscape.

While it is most important for shoreline and wetland abutters to plant a buffer zone, nearby residents can greatly aid in this effort by planting a similar area on the side of their yard which drains towards the street or Hardy Pond.

An effective buffer zone can be created by following these suggestions:

- Use a variety of native shrubs, ground cover, and trees—because in combination they take up the most water and nutrients. See the next page for plant suggestions.
- Make the buffer zone as wide as possible.
- Leave the VBZ undisturbed—do not rake the leaves and limit foot traffic to a bark-mulched winding path.
- Do not use fertilizers or pesticides in the VBZ.

Suggested Buffer Zone Plantings

Trees

- Red Maple (*Acer rubrum*)
- Birch (*Betula* species)
- Black Gum or Tupelo (*Nyssa sylvatica*)
- White Ash (*Fraxinus americana*)
- Willow (*Salix* species)

Shrubs

- Shadbush (*Amelanchier canadensis*)
- Sweet Pepperbush (*Clethra alnifolia*)
- Red Osier Dogwood (*Cornus stolonifera*)
- Witherod (*Viburnum cassinoides*)
- Highbush Blueberry (*Vaccinium corybosum*)
- Fetterbush (*Leucothoe racemosa*)
- Swamp Azalea (*Rhododendron viscosum*)
- Buttonbush (*Cephalanthus occidentalis*)

Ground Covers

- Ferns (many species)
- Dewberry (*Rubus hispidus*)
- Pachysandra (many species)
- Daylily (*Hemerocallis*)



Lawn Care, Garden, and Yard Waste

Without realizing it, residents near Hardy Pond that strive for the “perfect lawn” may pose several threats to the life of the pond. A closely-cropped lawn that slopes down to the water’s edge does little to trap phosphates or petroleum in the storm water run-off from driveways and roads. Many finely manicured lawns are regularly over-treated with fertilizer and pesticides. While fertilizers can give a healthy-looking green lawn, they contain nutrients which can also promote a very green pond. Careless pesticide applications to a yard can result in toxic effects on aquatic life. Thousands of people live in Hardy Pond’s watershed. The effects of fertilizer and pesticide use is cumulative and damages this precious natural resource. If you must use these products, do so sparingly and follow the pond protection guidelines on the next page. Easy and inexpensive alternatives to chemical applications can be found online or in a organic gardening book at your local nursery or library.

Lawn care, garden, and yard waste recommendations:

- If possible, avoid fertilizing your lawn. Try mulching to get the desired results. If you must use fertilizer, use one that contains no phosphorus. Liquid fertilizer, when properly applied, can minimize run-off of excessive nutrients and phosphorus.
- Avoid application of fertilizers during the summer. Turf grass demand for nutrients is low at this time and unused fertilizer is more likely to end up in the pond.
- If you hire a lawn care company, find one using Integrated Pest Management (IPM). Lawn care companies offering IPM use focused chemical treatments to target specific pests and their areas of infestation, rather than indiscriminate routine “preventive” spraying.
- Keep vegetable gardens small and avoid the use of herbicides and pesticides, which are harmful to fish, wildlife, pets, and children; many natural alternatives are available. Consider joining the Waltham Community Garden instead. See Resources, page 11 for information.
- Avoid using fertilizers or pesticides before a rainstorm. Be aware of the weather forecast.
- Avoid over-application of fertilizers. Have your soil tested to determine what additional nutrients are needed. Contact the Soil Testing Services at the University of Massachusetts at Amherst, (413) 545-2311, or try the U.S.D.A. Soil Conservation Service, (617) 423-1175, <nrcs.usda.gov>.
- Read labels to determine correct pesticide application amounts. More is not always better! Heed all warnings, especially those concerning use near waterways.
- Never dump yard waste into the wetlands, water, or along the shoreline of the pond—it is illegal and it contributes excess nutrients which promote undesirable aquatic weed growth.
- A convenient way to dispose of yard waste is to participate in Waltham’s curbside recycling program. Leaves, branches, grass clippings, and other debris can be loaded into paper yard waste bags (available in supermarkets and hardware stores) or into clearly marked trash barrels. For information on your street’s yard waste schedule, call 781-314-3855 or see <www.city.waltham.ma.us/recycling>.



Storm Drains

Whatever's left on the street today will wash into Hardy Pond tomorrow. When it rains, storm drains collect run-off from the street and carry it into the pond. Petroleum from an oil change or a leaky transmission, coolant from a flushed radiator, or phosphate-loaded detergent from washing the car will all eventually make their way into Hardy Pond.



You may have noticed that storm drains near the pond carry the cautionary message “No Dumping; Drains to River.” Hopefully this will serve as a reminder to residents not to dump yard waste, toxic chemicals or used motor oil into the drains.

To prevent toxins from entering the storm drains around Hardy Pond, follow these guidelines:

- Storm drains are designed for collecting storm water run-off only; never use them for dumping automotive or household wastes.
- Never spill oil or leave residue from solvents or chemicals on your street or driveway.
- Check for and repair any oil leaks under your car or truck.
- To eliminate the possibility of detergents or toxins in water run-off, wash the car at a carwash.
- Leaves, sand, litter, and other street debris should be thrown away or recycled, not swept into the storm drains, which is illegal.
- Try to educate your neighbors on this issue if you notice improper practices.

Recreation

Hardy Pond hosts an abundance of recreational activities. Season upon season, boating, fishing, wildlife watching, as well as ice skating and hockey games have been enjoyed by the community around the pond.

To protect the future of Hardy Pond and its diverse inhabitants, we must observe the principles of conservation and practice thoughtful and responsible use of its waters.

- Leave no litter in the water or on the ice. Make a habit of removing all trash from the pond, even if it was dumped by someone else. Debris such as styrofoam, plastics, bottles, broken glass, cigarette butts, and fishing line are harmful to wildlife and contribute to the pollution of Hardy Pond.

- Report any fires on the pond to the Waltham Police and Fire Departments. Fires on the winter ice are hazardous and illegal. Fires on the ice have been

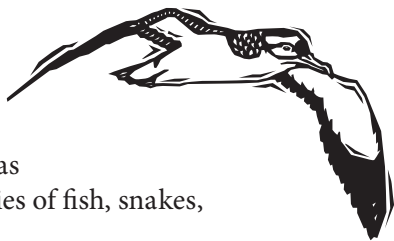


ignited with gasoline and other flammable solvents—these are highly toxic to aquatic life. Debris on and in the ice is a danger to skaters. When the ice melts, ashes and unburned debris sink into the pond where it gradually decomposes, adding nutrients and contaminants, and accelerates aquatic weed growth.

- Gasoline powered motorboats are prohibited on Hardy Pond. Because the pond drains and refills very slowly, it is particularly vulnerable to petroleum contamination. Any gas or oil leaked from a motorboat will remain in the water and the sediment, polluting the pond for years to come. Electric trolling motors are permitted; canoes and kayaks are ideal for traversing the pond and enjoying the scenery around it.
- Avoid lowering boat trailers into the pond as they often carry invasive nuisance weeds from other bodies of water. Carry boats into the pond and always check their hulls to remove hitchhiking seeds and plants.
- Don't forget to take hockey nets, chairs, or other items off of the ice or they may sink with unexpected warm weather.

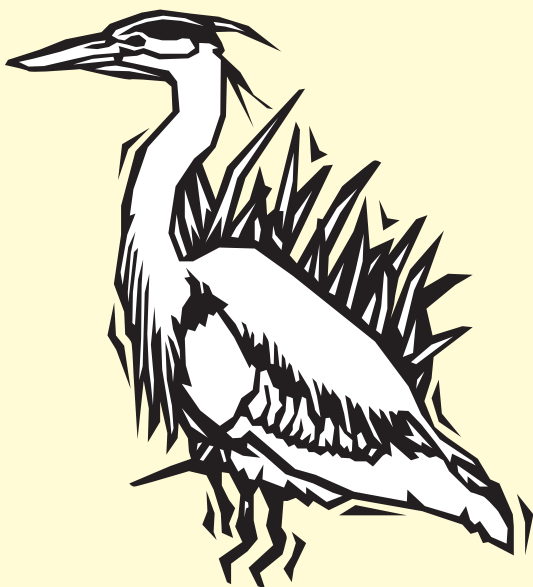
Wildlife

Hardy Pond is home to an incredible variety of wildlife including birds such as ducks, herons, and osprey; mammals such as muskrats and woodchucks; and many species of fish, snakes, frogs, and turtles.



To make sure Hardy Pond's wild inhabitants continue to make their homes here, follow these guidelines:

- Backyard bird feeders may be harmless, but don't feed other wildlife, including geese and ducks. Feeding waterfowl disturbs their community composition, increasing contamination; non-nutritional foods like bread can actually lead to starvation of wild birds.
- Stay away from nesting areas. In particular, Hardy Pond's swans like their privacy, but be sure to stay clear of all nests, burrows, and egg beds.
- Don't disturb or approach wildlife. To view wildlife, use binoculars or a camera's zoom lens to capture the moment without disturbing the subject.
- Turtles are not toys! Some of the big snapping turtles are 100 years old! They deserve our respect and should not be played with. Snapping turtles bite.
- When fishing Hardy Pond, practice catch-and-release. Also, be sure to take any remnants of monofilament line with you as this is very hazardous to wildlife.
- ■ If a bird, reptile, or animal is a nuisance or is injured or sick, call the Waltham Animal Control at 781-314-3596. Let them handle the problem.



Caution: Hazardous Materials

During several severe New England floods, many households around the pond hurried to remove possessions from the rising water in their basements. Unfortunately, in several instances toxic substances such as gas, oil, pesticides, fertilizers, paints and other toxic chemicals leaked into the flood waters.



To prevent contamination of the water in and around Hardy Pond:

- Store gas powered equipment and hazardous materials in a safe, secure area above the high-water mark.
- Dispose of paint and solvents in a responsible manner; never pour them down the drain, into storm sewers, or onto the ground.
- Latex paint can be dried out in a well-ventilated area, then put in the trash.
- Let used paint thinner settle. Once it separates, pour off the clear liquid for reuse. Let the solid residue dry out in a well-ventilated area, then put in the trash. Use caution as these materials are highly flammable.
- Used motor oil should be taken to a service station or auto parts store for recycling.
- Avoid using or purchasing detergents and household chemicals that contain phosphates.
- When possible, avoid purchasing paint strippers, solvents, or other highly toxic or flammable materials; they're dangerous to have around and are difficult to dispose of. Look for solutions that are more environmentally friendly and purchase products that are less toxic.
- The City of Waltham Recycling Department has found three places that will take used motor oil and four places that will take batteries.



Emergency and Resource Phone Numbers

- If you see any hazardous material in the pond or wetlands, call the Waltham Fire Department (911) then call the Department of Environmental Protection Emergency Response (888) 304-1133.
- Waltham Fire Department, 911, for in-pond rescue, reporting ice fires. For non-emergency situations (781) 893-4105.
- Waltham Police, 911, to report dumping, gas-powered boats, or emergencies. For non-emergency situations (781) 893-3700.
- Environmental Strike Force, to report environmental violations: esf.hotline@mass.gov; (617) 556-1000.
- Fisheries and Wildlife, (508) 389-6330, fishing information or wildlife concerns. For large fish kills call the MA F&W Environmental Police (800) 632-8075.
- Hardy Pond Association, a Project of the Waltham Land Trust: walthamlandtrust.org, (781) 893-3355.
- Waltham Community Garden (GROW), growcommunitygardens.org.
- MA Congress of Lake and Pond Associations (COLAP): macolap.org
- Soil Testing Service, UMASS Amherst, umass.edu/soiltest, (413) 545-2311.
- Waltham Animal Control, (781) 314-3596.
- Waltham Consolidated Works Department, (781) 314-3800.
- Waltham Recycling, (781) 314-3390; city.waltham.ma.us/recycling-department. Website has comprehensive list with instructions of what can be recycled, including appliances and electronics.





Hardy Pond Association
a project of the Waltham Land Trust
PO Box 541120
Waltham MA 02454-1120

ADDRESS SERVICE REQUESTED

Emergency Numbers Inside!

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YEAR 2 ANNUAL REPORT

**Massachusetts Small MS4 General Permit
Reporting Period: July 1, 2019 – June 30, 2020**

CITY OF WALTHAM, MASSACHUSETTS

ATTACHMENT F

GREEN INFRASTRUCTURE PARKING LOT GUIDANCE DOCUMENT

GREEN PARKING LOT GUIDANCE DOCUMENT



GREEN PARKING LOTS

The City of Waltham, along with the Charles River Watershed Association (CRWA) and SSV Engineering Incorporated, developed a general green infrastructure retrofit design for the Embassy Parking Lot. This retrofit design serves to improve aesthetics, reduce the phosphorous load by 50% and improve the quality of storm water discharging into the Charles River. The installation of small, strategically located bioretention areas and infiltration trenches helps to reduce phosphorous load and improve stormwater quality. This project serves as a model for public and private adaptation of parking lots throughout the City of Waltham.



Example of a small bioretention area called a rain garden. Stormwater flows from the parking lot into the garden where vegetation absorbs some of the storm-water and excess nutrients in it.

CHARLES RIVER NUTRIENT TOTAL MAXIMUM DAILY LOAD

The Charles River currently receives roughly double the phosphorus pollution it should. Phosphorus is a nutrient that acts like a fertilizer to the plants and algae in the river, causing them to grow out of control and alter the natural balance of the ecosystem. A total maximum daily load (TMDL) or pollution budget study conducted for the Charles River found that most of the phosphorus pollution is brought to the river in stormwater runoff (Figure 1). Phosphorus is found in detergents, fertilizers, deicers, and is a by-product of combustion engine exhaust. Densely developed cities like Waltham have a high concentration of phosphorous sources, and when there is stormwater there is phosphorus runoff! The TMDL study calls for a 65% reduction in phosphorus in stormwater coming off of densely developed land. Green infrastructure systems, particularly infiltrating systems, are far more efficient at removing phosphorus when compared to traditional stormwater infrastructure.

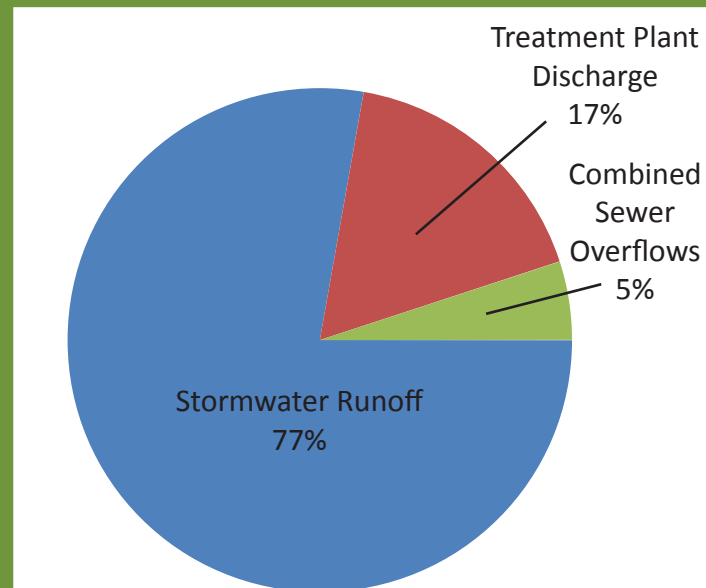


Figure 1: Annual Phosphorous Load to the Charles River By Source Category (as determined by the Charles River Nutrient TDML).

IMPACTS OF PARKING LOTS

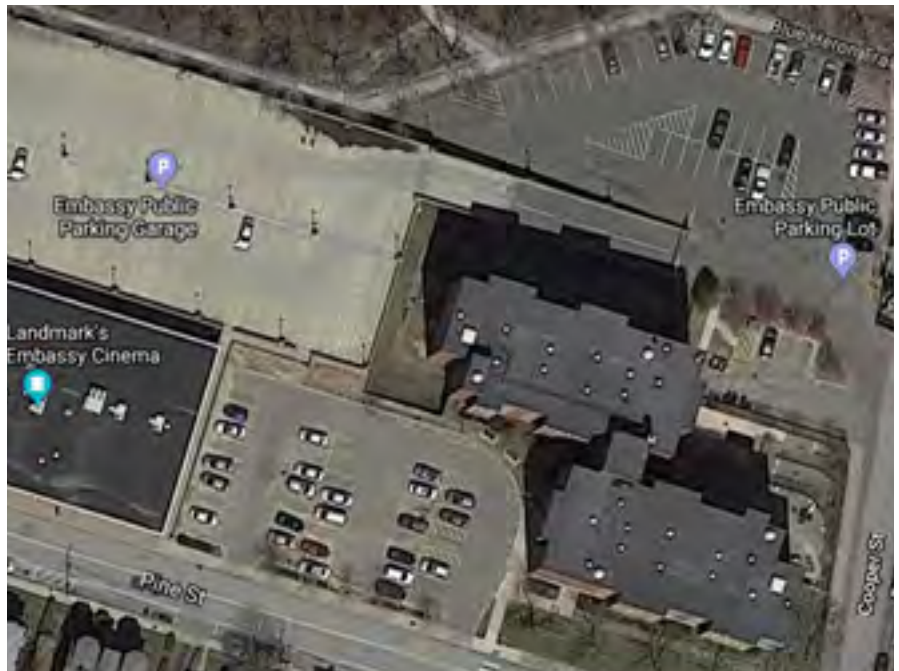
Traditional parking lots are made of asphalt which is an impervious surface that absorbs heat. Water that runs over asphalt does not permeate into the soil and picks up pollutants as a result. The unfiltered stormwater quickly makes its way to the nearest body of water, negatively affecting water quality and increasing chances of flooding. Runoff from parking lots contains oils, pesticides, fertilizers, and other pollutants that have a negative impact on the surrounding ecosystem. Since asphalt is black, parking lots contribute heavily to the heat island effect. The heat island effect causes urban areas to be several degrees hotter than they should be due to high levels of dark surfaces.



Image of stormwater puddled in a parking lot that will produce runoff containing pollutants absorbed from the surface of the asphalt.

EMBASSY PARKING LOT

The goal for retrofitting the Embassy Parking Lot with a stormwater management system is to reduce the phosphorous load by 50% and improve stormwater quality discharging into the Charles River. A field investigation was conducted to understand the current flow paths for the parking lot. All of the locations of catch basins and outlets were determined and delineated on a site plan. Green infrastructure retrofits were designed in order to increase stormwater storage and infiltration and encourage filtration. With the addition of green infrastructure, the runoff from the Embassy Parking Lot would be greatly reduced and would contain fewer



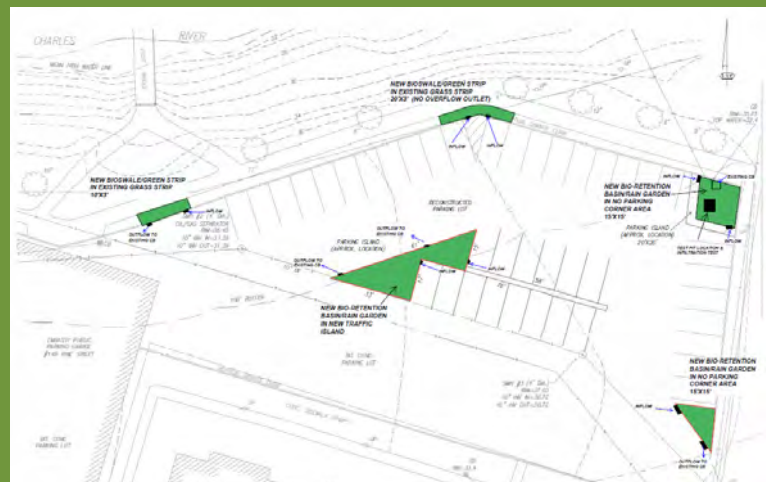
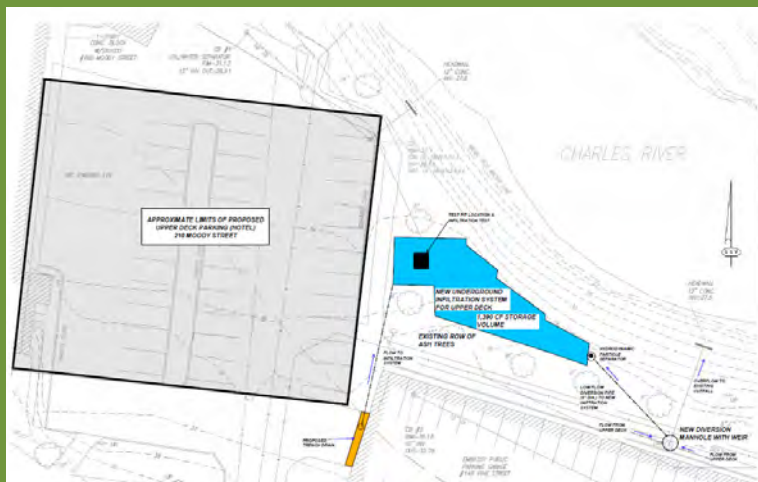
GREEN INFRASTRUCTURE FOR PARKING LOTS

Bioretention Area: One of the most common stormwater management techniques for parking lots. A bioretention area consists of a depressed curb inlet, which leads into a permeable patch of land full of plants. The plants serve to clean the water and the permeability allows for some of the stormwater to be absorbed into the ground.

Infiltration Trench: A trench designed to absorb and retain stormwater runoff, allowing gradual permeation over a longer period of time. Infiltration trenches work best if all the runoff passes through, so they are located underground with an infiltration drain leading to them. This technique greatly reduces the amount of stormwater that gets into the drainage system and helps with groundwater recharge.

Porous Pavement: Porous pavement is designed to be semi-permeable to allow for some stormwater infiltration. Underneath the porous pavement lays a stone reservoir which allows for temporary storage of stormwater. The two most popular types of porous pavement are porous asphalt and porous concrete. Porous asphalt can be used in any climate whereas porous concrete is more effective in hot climates. Porous pavements are highly effective at removing pollutants and reducing stormwater because they can be installed over relatively large areas.

PROPOSED RETROFIT DESIGNS



THE CITY OF WALTHAM AND CRWA

The City of Waltham:

Founded in 1736, The City of Waltham is a community committed to sustainability and stormwater management. Through outreach, education, monitoring, and green infrastructure construction, the City of Waltham has already reduced the amount of stormwater getting into the Charles River significantly. The city's partnership with the Charles River Watershed Association will take their existing stormwater management programs to a new level and help to increase water quality of the Charles River even further.



Charles River Watershed Association:

One of the country's oldest watershed organizations, Charles River Watershed Association (CRWA) was formed in 1965 in response to public concern about the declining condition of the Charles River. CRWA initiatives and advocacy work over the last five decades have dramatically improved the quality of water in the watershed and fundamentally changed approaches to water resource management. Today CRWA is protecting, preserving and enhancing the entire Charles River watershed through science, advocacy, and the law. Our strong science and engineering research and advocacy promote smart environmental policies. CRWA's work promotes resilient communities and a healthy river ecosystem.