FY 2020
(PY 2)

Town of Milton, MA

Stormwater Infrastructure Operation and Maintenance Program

DEPARTMENT OF PUBLIC WORKS

Contents

Introduction

This Operation and Maintenance (O&M) Plan has been prepared by the Town of Milton to address stormwater infrastructure O&M requirements[1] of the United States Environmental Protection Agency's (USEPA's) 2016 National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4) in Massachusetts, hereafter referred to as the "2016 Massachusetts MS4 Permit" or "MS4 Permit."

This O&M Plan addresses Minimum Control Measure 6, Good Housekeeping and Pollution Prevention for Permittee Owned Operations, by describing the activities and procedures the Town will implement so that the MS4 infrastructure is maintained in a timely manner to reduce the discharge of pollutants from the MS4. The O&M Plan outlines inspection and maintenance procedures for catch basins, municipally-owned streets and parking lots, and structural stormwater Best Management Practices (BMPs).

The Department of Public Works owns and is responsible for inspection and maintenance of most stormwater infrastructure in Milton, including structural BMPs. For structures located at Milton Schools, the Milton Department of Consolidated Facilities owns and is responsible for maintenance of structures. DPW and Consolidated Facilities responsible personnel and their contact information are below.

Personnel	Title	Contact	Responsibility
Chase Berkeley	Director of Public Works	cberkeley@townofmilton.org 617-898-4971	Manage DPW personnel and DPW Operations and Maintenance budgets
Thomas McCarthy	Assistant Director of Public Works/ Operations Manager	tmccarthy@townofmilton.org 617-898-4970	Manage DPW Operations staff
Hillary Waite	Environmental Coordinator	hwaite@townofmilton.org 617-898-4968	Maintain maintenance records and schedule; Manages maintenance contracts for structural BMPs
Bill Ritchie	Director of Consolidated Facilities	britchie@townofmilton.org 617-898-4930	Manages maintenance contract and schedule for structures at Milton Schools
Robert Mayhew	Operations Manager	rmayhew@townofmilton.org 617-898-4937	Manages maintenance contract and schedule for structures at Milton Schools
DPW Operations Staff	Various	Contact Thomas McCarthy above	Perform catch basin cleaning and street sweeping

A map of the existing stormwater infrastructure in Milton is available at https://www.mapsonline.net/miltonma/miltonofficialmapper.html with the layer "Drainage" selected.

[1] See Part 2.3.7.a.iii of the 2016 MS4 Permit for Infrastructure Operation and Maintenance program requirements.

Catch Basins

The Department of Public Works performs routine inspections, cleaning, and maintenance of the approximately 384 catch basins that are located within the MS4 regulated area. The Town will implement the following catch basin inspection and cleaning procedures to reduce the discharge of pollutants from the MS4:

- Routine inspection and cleaning of catch basins. Catch basins should be cleaned such that they are no more than 50 percent full[2] at any time. The Town will initially inspect all Town-owned catch basins within two (2) years of the effective date of the permit to evaluate sediment or debris accumulation and establish optimal inspection and maintenance frequencies to meet the "50 percent" goal. A catch basin inspection/cleaning procedure and example inspection form are included on the next page of this document. Logs of catch basin inspections may be exported from PeopleGIS.
- If a catch basin sump is more than 50 percent full during two consecutive routine inspections or cleaning events, the finding will be documented, the contributing drainage area will be investigated for sources of excessive sediment loading, and to the extent practicable, contributing sources will be addressed. If no contributing sources are found, the inspection and cleaning frequency will be increased.
- Catch basins located near construction activities (roadway construction, residential, commercial, or industrial development or redevelopment) will be inspected and cleaned more frequently if inspection and maintenance activities indicate excessive sediment or debris loadings (i.e., catch basins more than 50 percent full). Priority will also be given to catch basins that discharge to impaired waters.
- The following information will be included in each annual report:
    - Any action taken in response to excessive sediment or debris loadings
    - Total number of catch basins
    - Number of catch basins inspected
    - Number of catch basins cleaned
    - Total volume or mass of material removed from catch basins.

A full Catch Basin Inspection and Cleaning standard operating procedure follows.

[2] A catch basin sump is more than 50 percent full if the contents within the sump exceed one half the distance between the bottom interior of the catch basin to the invert of the deepest outlet of the catch basin.

Catch Basin Inspection and Cleaning

Introduction

Catch basins help minimize flooding and protect water quality by removing trash, sediment, decaying debris, and other solids from stormwater runoff. These materials are retained in a sump below the invert of the outlet pipe. Catch basin cleaning reduces foul odors, prevents clogs in the storm drain system, and reduces the loading of suspended solids, nutrients, and bacteria to receiving waters.

During regular cleaning and inspection procedures, data can be gathered related to the condition of the physical basin structure and its frame and grate and the quality of stormwater conveyed by the structure. Observations such as the following can indicate sources of pollution within the storm drain system:

- Oil sheen
- Discoloration
- Trash and debris

Both bacteria and petroleum can create a sheen on the water surface. The source of the sheen can be differentiated by disturbing it, such as with a pole. A sheen caused by oil will remain intact and move in a swirl pattern; a sheen caused by bacteria will separate and appear “blocky”. Bacterial sheen is not a pollutant but should be noted.

Observations such as the following can indicate a potential connection of a sanitary sewer to the storm drain system, which is an illicit discharge.

- Indications of sanitary sewage, including fecal matter or sewage odors
- Foaming, such as from detergent
- Optical enhancers, fluorescent dye added to laundry detergent

Each catch basin should be cleaned and inspected at least annually. Catch basins in high-use areas may require more frequent cleaning. Performing street sweeping on an appropriate schedule will reduce the amount of sediment, debris, and organic matter entering the catch basins, which will in turn reduce the frequency with which structures need to be cleaned.

Cleaning Procedure

Catch basin inspection cleaning procedures should address both the grate opening and the basin’s sump. Document any and all observations about the condition of the catch basin structure and water quality on the Catch Basin Inspection Form (attached).

Catch basin inspection and cleaning procedures include the following:

1. Work upstream to downstream.
2. Clean sediment and trash off grate.
3. Visually inspect the outside of the grate.
4. Visually inspect the inside of the catch basin to determine cleaning needs.
5. Inspect catch basin for structural integrity.
6. Determine the most appropriate equipment and method for cleaning each catch basin.
    a. Manually use a shovel to remove accumulated sediments, or
    b. Use a bucket loader to remove accumulated sediments, or

c. Use a high pressure washer to clean any remaining material out of catch basin while capturing the slurry with a vacuum.
d. If necessary, after the catch basin is clean, use the rodder of the vacuum truck to clean downstream pipe and pull back sediment that might have entered downstream pipe.

7. If contamination is suspected, chemical analysis will be required to determine if the materials comply with the Massachusetts DEP Hazardous Waste Regulations, 310 CMR 30.000 (http://www.mass.gov/dep/service/regulations/310cmr30.pdf). Chemical analysis required will depend on suspected contaminants. Note the identification number of the catch basin on the sample label, and note sample collection on the Catch Basin Inspection Form.
8. Properly dispose of collected sediments. See following section for guidance.
9. If fluids collected during catch basin cleaning are not being handled and disposed of by a third party, dispose of these fluids to a sanitary sewer system, with permission of the system operator.
10. If illicit discharges are observed or suspected, notify the appropriate Department (see "SOP 10: Addressing Illicit Discharges").
11. At the end of each day, document location and number of catch basins cleaned, amount of waste collected, and disposal method for all screenings.
12. Report additional maintenance or repair needs to the appropriate Department.

Disposal of Screenings

Catch basin cleanings from storm water-only drainage systems may be disposed at any landfill that is permitted by MassDEP to accept solid waste. MassDEP does not routinely require stormwater-only catch basin cleanings to be tested before disposal, unless there is evidence that they have been contaminated by a spill or some other means.

Catch basin cleanings (i.e., solid materials such as leaves, sand and twigs removed from stormwater collection systems during cleaning operations) and street sweepings will be managed in compliance with current Massachusetts Department of Environmental Protection policies:

- Catch Basin Cleanings
  http://www.mass.gov/eea/agencies/massdep/recycle/regulations/management-of-catch-basin-cleanings.html
- Street Sweepings
  http://www.mass.gov/eea/docs/dep/recycle/laws/stsweep.pdf

Prior to disposal or reuse, catch basin cleanings and street sweepings will be stored indoors or using proper controls such that they do not discharge to receiving waters. Screenings may need to be placed in a drying bed to allow water to evaporate before proper disposal. In this case, the Town will ensure that the screenings are managed to prevent pollution and not exposed to runoff.

For disposal, the Town currently operates under a contract between the Metropolitan Area Planning Commission and W.L. French. MAPC administers this contract on behalf of the South Shore Regional Services Consortium, of which Milton is a member.

Streets and Parking Lots

Streets and municipally-owned parking lots are swept at least twice annually, in spring and fall. Commercial areas, including the East Milton commercial district, the Central Avenue commercial district and the Milton Village commercial district, and the surrounding areas are generally swept every other week (26x/year). The Town uses a Tennant Tractor/Sweeper for sweeping.

The Town will implement the following street and parking lot sweeping procedures to reduce the discharge of pollutants from the MS4:

- More frequent sweeping will be considered for targeted areas based on pollutant load reduction potential, inspections, pollutant loads, catch basin cleaning or inspection results, land use, impaired waters, or other factors.
- The Town will keep a record of streets swept and material removed. The sweeping log is accessible in PeopleGIS.

The following information will be included in each annual report:

- Number of miles cleaned or the volume or mass of material removed

Winter Road Maintenance

The Town performs a variety of maintenance activities to ensure safe winter driving conditions on its roads and parking lots. These activities include the application of sand, sodium chloride, calcium chloride, and road salt pre-treated with magnesium chloride.

The town's full snow and ice control policy is available online at https://www.townofmilton.org/sites/miltonma/files/uploads/final_town_of_milton_snow_and_ice_control_program_policy_ad3.pdf.

The Town currently implements the following winter maintenance procedures to reduce the discharge of pollutants from the MS4:

- DPW minimizes the use and optimize the application of sodium chloride and other salt[3] (while maintaining public safety) and consider opportunities for use of alternative materials. Application of sand is particularly discouraged due to its impact on the storm sewer system and water bodies.
- Salt spreaders, snow plows, and other de-icing and snow removal equipment are stored indoors when not in use.
- The Town optimizes sand and/or chemical application rates through the use, where practicable, of automated application equipment (e.g., zero velocity spreaders), anti-icing and pre-wetting techniques, implementation of pavement management systems, and alternate chemicals.
- Town keeps record of the total amount of sand, anti-icing and de-icing chemicals applied by the DPW each year.

[3] For purposes of the MS4 Permit, salt means any chloride-containing material used to treat paved surfaces for deicing, including sodium chloride, calcium chloride, magnesium chloride, and brine solutions.

- All deicing products are stored indoors in Milton's salt shed, located at the DPW Yard at 629 Randolph Avenue. The loading area is swept after delivery when materials are loaded into shed.
- Snow disposal areas are located at least 500 feet from any storm drain inlets, drainage ditches, or surface waters.
- The town adheres to all state and federal requirements related to dumping of snow. The MS4 Permit prohibits snow disposal into waters of the United States. Snow disposal activities, including selection of appropriate snow disposal sites, will adhere to the Massachusetts Department of Environmental Protection Snow Disposal Guidance, Guideline No. BWR G2015-01 (Effective Date: December 21, 2015), located at: http://www.mass.gov/eea/agencies/massdep/water/regulations/snow-disposal-guidance.html
- The Town provides training for municipal employees on winter roadway maintenance procedures.

Structural Stormwater BMPs

An inventory of structural stormwater Best Management Practices (BMPs) owned and/or maintained by the Town is provided in **Appendix A**. The GIS stormwater infrastructure map also shows the locations of the structural BMPs.

Structural stormwater BMPs will be inspected annually at a minimum. Operation and maintenance of these structures is funded through Milton's stormwater enterprise. The Department of Public Works is responsible for maintenance.

Some structures are inspected and maintained by the Town and some are inspected and maintained by the Town's contractors. This information is noted in the inventory. The inventory also contains information about each structure's last inspection.

On the next page, general SOPs for stormwater structures of various types follows.

The Town has site-specific operation and maintenance plans for certain types of structures, including tree filter boxes and bioretention cells. These O&M plans should be conducted in addition to the general inspection SOP.

Inspecting Constructed Best Management Practices (BMP)

Best Management Practices (BMPs) are policies, procedures and structures designed to reduce stormwater pollution, prevent contaminant discharges to natural water bodies, and reduce stormwater facility maintenance costs. Constructed BMPs are permanent site features designed to treat stormwater before infiltrating it to the subsurface or discharging it to a surface water body.

This Standard Operating Procedure provides a general summary of inspection procedures for constructed BMPs in Milton, including:

1. Bioretention areas, rain gardens, infiltration basins, and bioswales
2. Proprietary media filters

Tree Filter Boxes are also present in Milton; these structures have their own Operation and Maintenance Program.

This SOP is based on the Massachusetts Stormwater Handbook and is not intended to replace that document. This SOP is also not intended to replace the Stormwater BMP Operation and Maintenance (O&M) Plan required by the Massachusetts Wetlands Protection Act, Order of Conditions.

Bioretention Areas, Infiltration Basins and Rain Gardens, including bioswales

Bioretention areas and rain gardens are shallow depressions filled with sandy soil, topped with a thick layer of mulch and planted with dense native vegetation. There are two types of bioretention cells:

1. Filtering bioretention area: Areas that are designed solely as an organic filter; and
2. Exfiltration bioretention area: Areas that are configured to recharge groundwater in addition to acting as a filter.

Inspection & Maintenance

Regular inspection and maintenance are important to prevent against premature failure of bioretention areas or rain gardens. Regular inspection and maintenance of pretreatment devices and bioretention cells for sediment buildup, structural damage and standing water can extend the life of the soil media.

Maintenance Schedule: Bioretention Areas and Rain Gardens

Activity	Time of Year	Frequency
Inspect for soil erosion and repair	Year round	Monthly after wet weather
Inspect for invasive species and remove if present	Year round	Monthly
Remove trash	Year round	Monthly
Mulch Void Areas	Spring	Annually
Remove dead vegetation	Fall and Spring	Bi-Annually
Replace dead vegetation	Spring	Annually
Prune	Spring or Fall	Annually
Replace all media and vegetation	Late Spring/Early Summer	As Needed

When failure is discovered, excavate the bioretention area, scarify the bottom and sides, replace the filter fabric and soil, replant vegetation and mulch the surface. Never store snow within a bioretention area or rain garden. This would prevent required water quality treatment and the recharge of groundwater.

Proprietary Media Filters

Media Filters are designed to reduce total suspended solids and other target pollutants, such as organics, heavy metals or nutrients, which are absorbed onto the filter media, which is contained in a concrete structure. The substrate used as filter media depends on the target pollutants, and may consist of leaf compost, pleated fabric, activated charcoal, perlite, amended sand in combination with perlite, and zeolite. Two types of Media Filters are manufactured: Dry Media Filters, which are designed to dewater within 72 hours; and Wet Media Filters, which maintain a permanent pool of water as part of the treatment system.

Inspection & Maintenance

Maintenance in accordance with the manufacturer's requirements is necessary to ensure stormwater treatment. Inspection or maintenance of the concrete structure may require OSHA confined space training. Dry Media Filters are required to dewater in 72 hours, thus preventing mosquito and other insect breeding. Proper maintenance is essential to prevent clogging. Wet Media Filters require tight fitting seals to keep mosquitoes and other insects from entering and breeding in the permanent pools. Required maintenance includes routine inspection and treatment.

Maintenance Schedule: Proprietary Media Filters

Activity	Time of Year	Frequency
Inspect for standing water, trash, sediment and clogging	Per manufacturer's schedule	Bi-Annually (minimum)
Remove trash and debris	N/A	Each Inspection
Examine to determine if system drains in 72 hours	Spring, after large storm	Annually
Inspect filtering media for clogging	Per manufacturer's schedule	Per manufacturer's schedule

Infiltration Basins

Infiltration basins are designed to contain stormwater quantity and provide groundwater recharge. Pollution prevention and pretreatment are required to ensure that contaminated stormwater is not infiltrated. Infiltration basins reduce local flooding and preserve the natural water balance of the site, however high failure rates often occur due to improper siting, inadequate pretreatment, poor design and lack of maintenance.

Inspection & Maintenance

Regular maintenance is required to prevent clogging, which results in infiltration basin failure. Clogging may be due to upland sediment erosion, excessive soil compaction or low spots. Inspections should include signs of differential settlement, cracking, erosion, leakage in the embankments, tree growth on the embankments, riprap condition, sediment accumulation and turf health.

Tree Filter Box Operation and Maintenance

Tree Filter Box

Each tree box consists of a precast concrete box filled with a "soil filter media" consisting of a specially engineered mixture of sandy soil. The filter media is covered with a 3" layer of bark mulch and is underlain by a perforated PVC under drain. Each box is planted with a small tree and capped with a concrete lid and cast iron tree grate.

Contaminated runoff enters the box through the curb inlet, spreading over the 3-inch layer of mulch on the surface of the filter media. As water passes through the mulch layer, most of the larger sediment particles and heavy metals are removed through sedimentation and chemical reactions with the organic material in the mulch. Water then percolates downward through the soil media where finer particles are removed and other chemical and biological reactions immobilize, capture and breakdown pollutants. The cleansed water passes into a perforated under drain and is discharged directly to a nearby storm drain line. Note that the Milton tree boxes are NOT tied into the nearby catch basin as in the standard Filterra design, but are plumbed directly into a storm drain line to avoid re-contamination of purified effluent in the catch basin sump. Higher flows bypass the Filterra unit and are captured by a nearby catch basin.

Once the pollutants are in the soil, bacteria and the plant begin to take up, break down and/or metabolize the pollutants. Some pollutants such as heavy metals, which are initially chemically bound to organic particles in the mulch, are released over time as the organic matter decomposes to the feeder roots of the plants and the cells of the bacteria in the soil where they remain and are recycled. Other pollutants such as phosphorus are chemically bound to the soil particles and released slowly back to the plants and bacteria for use in their metabolic processes. Nitrogen goes through a very complex variety of biochemical processes through which it may ultimately end up in the plant/bacteria biomass, be turned to nitrogen gas or dissolve back into the water column as nitrates depending on soil temperature, pH and the availability of oxygen.

Maintenance is a simple, inexpensive and safe operation that does not require confined space access, pumping or vacuum equipment or specialized tools. Properly trained landscape personnel can effectively maintain Filterra Stormwater systems by following instructions in this manual.

Milton Tree Box Details

In Milton, 11 tree boxes are installed along Brook Road and 3 are installed on Lincoln Street. 6 tree boxes are installed on Wendell Park. The tree boxes help protect Pine Tree Brook from polluted runoff.

NOTE: The trees used in the Lincoln Street and Brook Road tree boxes are Chanticleer Callery Pears. The trees used in the Wendell Park boxes are Amelanchier.

Maintenance Overview

Regular maintenance of the tree box is required to ensure continued effective pollutant removal and to extend the longevity of the living bio-filter system. Many types of pollutants will be recycled within the filter media biomass. Maintaining living plant material is essential to these pollutant removal functions.

Other pollutants such as sand, silt, litter and leaves will accumulate in and on top of the mulch layer. Regular removal and replacement of the mulch layer and accumulated sediment/litter is critical to

preventing the underlying filter media from clogging, and thus maintaining the effectiveness of the system.

Annual maintenance consists of two (2) scheduled visits. The spring visit aims to clean up after winter loads including salts and sands. The fall visit in late October or early November removes accumulated leaf litter and trash.

Some sites may be subjected to extreme sediment or trash loads, requiring more frequent maintenance visits. Keeping notes on maintenance actions for each unit will help the town better predict any unusual future maintenance frequencies.

In the event of an oil spill or other unusual event, the curb inlet and/or under drain outlet should be closed to prevent contamination of the filter media and Pine Tree Brook. If the filter media become saturated with oil or other contaminated materials, it will need to be replaced with clean filter media.

Each maintenance visit consists of the following tasks:

Step 1: Inspect Tree Box
Step 2: Remove Trash, Sediment and Mulch
Step 3: Evaluate and Recharge Filter Media
Step 4: Prune or Replace Tree
Step 5: Replace Mulch and Close Unit
Step 6: Sweep Area and Dispose of Refuse Appropriately
Step 7: Update Maintenance Records

Required tools and supplies:

- Camera, tape measure and gloves
- 5 gallon bucket with bail
- Shovel
- Hoe and/or iron rake
- Pruners
- Broom
- 3 bags of shredded hardwood mulch per unit (6 cubic feet per unit or just over 3 yards for all 14 units)
- Some visits may require additional Filterra® engineered soil media.

Step 1: Inspect Tree Box

For each unit, check for any of the following conditions and record on the maintenance data form. If any problems exist, make descriptive notes on the data sheet and document with a photograph.

- Standing water (possibly indicating a clogged under drain or clogged filter media)
- Physical damage to box or inlet
- Cast iron grate damaged or missing
- Downstream bypass catch basin blocked
- Plant replacement required
- Plant pruning required
- Unusual pollutant loading conditions (heavy sand or silt, dumping)

Step 2: Remove Trash, Sediment and Mulch

Remove metal grates for access into tree box.

- Dig/rake out trash, sand, silt and old mulch layer, a bucket may be helpful in removing debris from the box.
- Remember to remove mulch and litter from areas under the concrete lid.
- Do NOT remove filter media (sandy soil below mulch layer)
- Note volume of material removed (number of buckets or other unit of measure)

Step 3: Evaluate and Recharge Filter Media

After removal of mulch and debris, measure distance from the top of the Filterra engineered media soil to the bottom of the top slab. If this distance is greater than 12”, add Filterra media (not top soil or other) to recharge to a 9” distance. Note the following on maintenance data sheet:

- Distance from top of filter media (without mulch) to bottom of top slab (inches)
- Buckets of media added

Step 4: Prune or Replace Tree

Replace or prune plant as needed and note any actions taken on data sheet.

Step 5: Replace Mulch and Close Unit

- Add shredded hardwood mulch across the entire unit to a depth of 3”.
- Ensure correct position of erosion control stones by the curb inlet.
- Put cast iron grates back into position.

Step 6: Sweep Area and Dispose of Refuse Appropriately

Step 7: Update Maintenance Records

- Check maintenance datasheet for completeness.
- Print photographs (if any) and attach to datasheet.
- Deliver completed datasheets to supervisor for filing.

Tree Box Maintenance Record

BMP number: _____ Location Description: _____
Date: _____ Time start: _____ Time end: _____
Name(s): _____

Step 1: Inspection

Standing water: Y N Remarks (including photo #, if any):
Box damage: Y N
Grate damage: Y N
Plant dead: Y N
Pruning needed: Y N
Unusual pollutants: Y N

Step 2: Waste Removal

Silt or clay in box: Y N Remarks:
Leaves in box: Y N
Dumping in box: Y N
Volume removed: _____

Step 3: Evaluate and Recharge Filter Media

Inches from top of media (below mulch) to bottom of concrete lid: _____
Buckets of new media added: _____

Step 4: Prune or Replace Tree

Tree replaced: Y N
Tree pruned: Y N

Step 5: Replace mulch and close unit
Step 6: Sweep area and dispose of refuse appropriately
Step 7: Update maintenance records

Make additional notes on back if needed

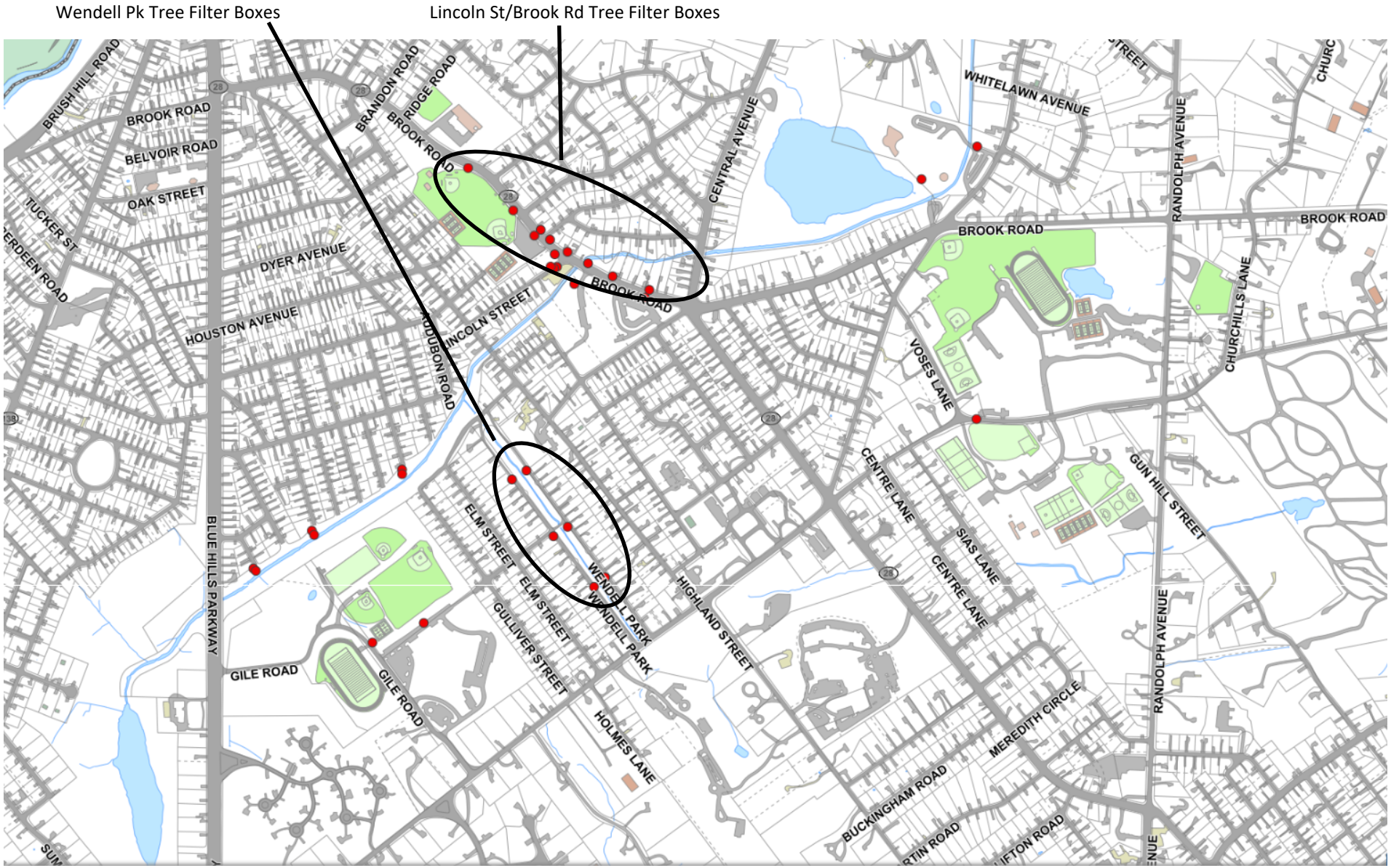


Image from Milton's online stormwater BMP mapper. Tree filter boxes are circled as groups and labeled. Other red circles indicate stormwater BMPs that are not tree filter boxes.

Tree Filter Box Maintenance Photos

Step 2: Opening cover

Step 2: Removing old mulch and litter

Step 2: Removing leaves at rear

Step 5: Adding fresh mulch

RUSTLEWOOD RD

MARILYN RD

MATCH LINE

PINE TREE BROOK

BROOK RD

LINCOLN ST

9

3

360

366

374

400

408

412

418

422

424

DMH

4' x 6' FILTER BOX
DRAINAGE AREA – 5100 SF
CB INVERT – 3'10"

4' x 6' FILTER BOX AT LOW POINT
DRAINAGE AREA – 6400 SF
CB INVERT – 3'10"

4' x 6' FILTER BOX
DRAINAGE AREA – 6000 SF
CB INVERT – 4'1"

4' x 6' FILTER BOX
DRAINAGE AREA – 7700 SF
CB INVERT – 4'9"

4' x 6' FILTER BOX
DRAINAGE AREA – 9700 SF
CB INVERT – 1'10"

THE SCHOOL BUILDING PROJECT WILL INCLUDE A CB THAT INTERCEPTS MOST OF THIS BASIN'S FLOW

SEE PAGE 2

4' x 6' FILTER BOX
DRAINAGE AREA – 6800 SF
CB INVERT – 3'7"

INSTALL APPX. 40' OF 6"x18" GRANITE CURBING ON EACH SIDE OF LINCOLN ST FROM CORNER TO BEYOND PROP. TREE BOXES

INSTALL 4' x 6' FILTER BOX
DRAINAGE AREA – 5700 SF
CB INVERT – 3'9"

INSTALL TWO 4' x 6' FILTER BOXES
DRAINAGE AREA – 5500 SF EACH SIDE
CB INVERT – 3'8"

PIERCE MIDDLE SCHOOL

LEGEND

- EXISTING DRAIN MANHOLE
- EXISTING CATCH BASIN
- EXISTING SUBSURFACE DRAIN
- PROPOSED FILTERA CHAMBER

SCALE: 1" = 30'

0' 15' 30' 60' 90'

NOTE: ALL INVERT DEPTHS ARE GIVEN AS MEASURED FROM THE CATCH BASIN RIMS. CURB ELEVATIONS ARE GENERALLY 4–6" ABOVE RIM ELEVATIONS

NO. | DATE | REVISIONS | MADE BY | CHECKED BY

PROJECT TITLE: Drainage Improvements
Brook Rd. at Pine Tree Brook

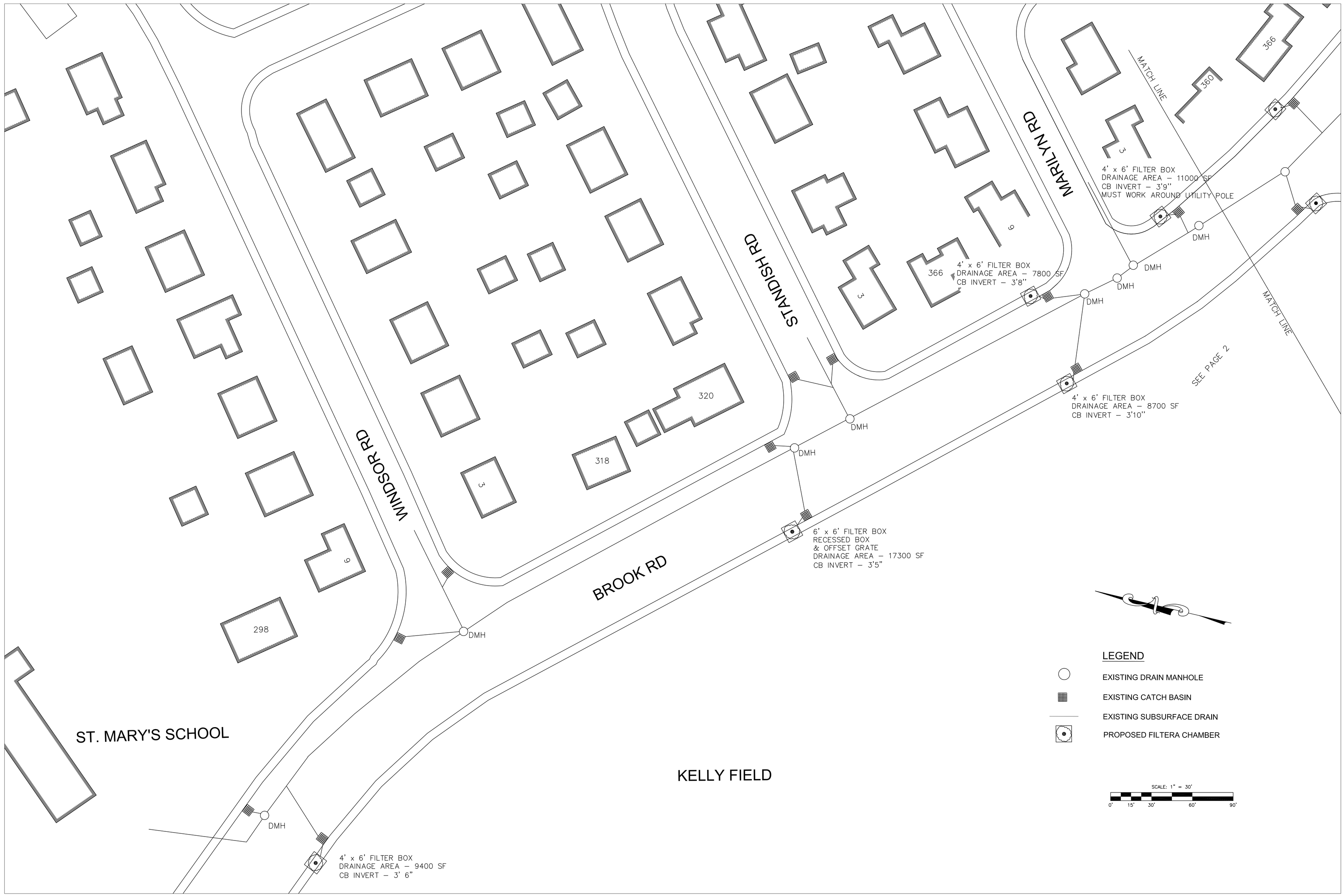
SCALE: 1" = 30'
PROJECT NO.
FILE NO.

SHEET TITLE: Proposed Tree Filter Boxes

DRAWN BY: S.D.D.
CHECKED BY: J.P.T.
APPROVED BY: W.P.H.
DATE: 07/02/07

TOWN OF MILTON
DEPARTMENT OF PUBLIC WORKS
525 CANTON AVENUE MILTON, MASS.
TEL: (617) 898-4868 FAX: (617) 698-6741

1



NO. | DATE | REVISIONS | MADE BY | CHECKED BY

PROJECT TITLE
Drainage Improvements
Brook Rd. at Pine Tree Brook

SCALE: 1" = 30'
PROJECT NO.
FILE NO.

SHEET TITLE
Proposed Tree Filter Boxes

DRAWN BY: S.D.D.
CHECKED BY: J.P.T.
APPROVED BY: W.P.H.
DATE: 07/02/07

TOWN OF MILTON
DEPARTMENT OF PUBLIC WORKS
525 CANTON AVENUE MILTON, MASS.
TEL: (617) 898-4868 FAX: (617) 698-6741

2

INSTALL CB01
RIM: 69.87 SUMP: 62.87
INV OUT: 66.87 (8" HDPE PIPE)

INSTALL GUTTER INLETS AT CATCH BASIN GRATES (TYP.)

EXISTING 8" RCP BYPASS PIPE #1.
INVERT IN ELEV. = 69.00.
INVERT OUT ELEV. 63.83
REMOVE AND REPLACE EXISTING PIPE AS NECESSARY TO MEET NEW INVERTS.
CONNECT TO EXISTING 8" PIPE . SEE NOTE 2.

INSTALL 4'X6' FILTERRA UNIT #1
ESTIMATED DRAINAGE AREA = 0.30 ACRES
TOP = 69.20
INVERT IN = 68.70
INVERT OUT = 66.20 (6" HDPE PIPE)

INSTALL 20FT GRANITE CURB AT EACH TREE FILTER BOX LOCATION. SEE DETAIL (TYP.)

INSTALL 6" HDPE PIPE AS NECESSARY TO CONNECT TO EXISTING 8" RCP PIPE

WENDELL PARK

INSTALL 8X8X6 WYE CONNECTION (TYP)

EXISTING 8" RCP BYPASS PIPE #6.
INVERT IN ELEV. = 69.30.
INVERT OUT ELEV. 63.00
REMOVE AND REPLACE EXISTING PIPE AS NECESSARY TO MEET NEW INVERTS. CONNECT TO EXISTING 8" PIPE . SEE NOTE 2.

INSTALL GUTTER INLETS AT CATCH BASIN GRATES (TYP.)

INSTALL CB06
RIM: 69.50 SUMP: 62.50
INV OUT: 66.50 (8" HDPE PIPE)

INSTALL 20FT GRANITE CURB AT EACH TREE FILTER BOX LOCATION. SEE DETAIL (TYP.)

INSTALL 6" HDPE PIPE AS NECESSARY TO CONNECT TO EXISTING 8" RCP PIPE

INSTALL 4'X6' FILTERRA UNIT #6
ESTIMATED DRAINAGE AREA = 0.36 ACRES
TOP = 70.00
INVERT IN = 69.50
INVERT OUT = 69.50 (6" HDPE PIPE)

WENDELL PARK

EXISTING 8" RCP BY-PASS PIPE TO BE CAPPED AND ABANDONED (TYP - 15 LOCATIONS) - SEE NOTE 1

NOTES:
1. ALL EXISTING BYPASS PIPES NOT BEING CONNECTED TO NEW STRUCTURES SHALL BE MECHANICALLY CAPPED AT THE OUTLET AND FILLED WITH CONCRETE.
2. ALL STRUCTURES SHALL BE CONNECTED TO EXISTING BYPASS PIPES USING NEW PIPES AT A LENGTH NECESSARY TO ACHIEVE A 2% MINIMUM SLOPE. CONNECTIONS TO BYPASS PIPE SHALL BE A MINIMUM OF 5' AWAY FROM RETAINING WALLS OR EDGE OF STREAM AND THE EXISTING INVERT SHALL BE MAINTAINED.

LIMITS OF CLEARING AND GRUBBING

CANTON AVENUE

MATCHLINE SEE BELOW

1" = 30'

INSTALL CB03
RIM: 47.69 SUMP: 40.69
INV OUT: 44.69 (8" HDPE PIPE)

INSTALL GUTTER INLETS AT CATCH BASIN GRATES (TYP.)

EXISTING 8" RCP BYPASS PIPE #3.
INVERT IN ELEV. = 47.00
INVERT OUT ELEV. 41.67
REMOVE AND REPLACE EXISTING PIPE AS NECESSARY TO MEET NEW INVERTS.
CONNECT TO EXISTING 8" PIPE . SEE NOTE 2.

INSTALL 4'X6' FILTERRA UNIT #3
ESTIMATED DRAINAGE AREA = 0.26 ACRES
TOP = 48.00
INVERT IN = 47.50
INVERT OUT = 44.50 (6" HDPE PIPE)

INSTALL 20FT GRANITE CURB AT EACH TREE FILTER BOX LOCATION. SEE DETAIL (TYP.)

INSTALL 6" HDPE PIPE AS NECESSARY TO CONNECT TO EXISTING 8" RCP PIPE

INSTALL 8X8X6 WYE CONNECTION (TYP)

LIMITS OF CLEARING AND GRUBBING

EXISTING 8" RCP BYPASS PIPE #4.
INVERT IN ELEV. = 45.80
INVERT OUT ELEV. = 42.50
REMOVE AND REPLACE EXISTING PIPE AS NECESSARY TO MEET NEW INVERTS.
CONNECT TO EXISTING 8" PIPE . SEE NOTE 2.

INSTALL GUTTER INLETS AT CATCH BASIN GRATES (TYP.)

INSTALL CB04
RIM: 46.81 SUMP: 39.81
INV OUT: 43.81 (8" HDPE PIPE)

INSTALL 20FT GRANITE CURB AT EACH TREE FILTER BOX LOCATION. SEE DETAIL (TYP.)

INSTALL. 6" HDPE PIPE AS NECESSARY TO CONNECT TO EXISTING 8" RCP PIPE

INSTALL 4'X6' FILTERRA UNIT #4
ESTIMATED DRAINAGE AREA = 0.31 ACRES
TOP = 46.50
INVERT IN = 46.00
INVERT OUT = 43.00 (6" HDPE PIPE)

WENDELL PARK

INSTALL CB02
RIM: 64.65 SUMP: 57.65
INV OUT: 61.65 (8" HDPE PIPE)

INSTALL GUTTER INLETS AT CATCH BASIN GRATES (TYP.)

EXISTING 8" RCP BYPASS PIPE #2.
INVERT IN ELEV. = 63.80.
INVERT OUT ELEV. 61.75
REMOVE AND REPLACE EXISTING PIPE AS NECESSARY TO MEET NEW INVERTS.
CONNECT TO EXISTING 8" PIPE . SEE NOTE 2.

INSTALL 4'X6' FILTERRA UNIT #2
ESTIMATED DRAINAGE AREA = 0.20 ACRES
TOP = 65.50
INVERT IN = 65.00
INVERT OUT = 62.00 (6" HDPE PIPE)

INSTALL 20FT GRANITE CURB AT EACH TREE FILTER BOX LOCATION. SEE DETAIL (TYP.)

INSTALL 6" HDPE PIPE AS NECESSARY TO CONNECT TO EXISTING 8" RCP PIPE

INSTALL 8X8X6 WYE CONNECTION (TYP)

WENDELL PARK

EXISTING 8" RCP BYPASS PIPE #5.
INVERT IN ELEV. = 63.80.
INVERT OUT ELEV. 61.75
REMOVE AND REPLACE EXISTING PIPE AS NECESSARY TO MEET NEW INVERTS.
CONNECT TO EXISTING 8" PIPE . SEE NOTE 2.

INSTALL GUTTER INLETS AT CATCH BASIN GRATES (TYP.)

INSTALL CB05
RIM: 64.66 SUMP: 57.66
INV OUT: 61.66 (8" HDPE PIPE)

INSTALL 20FT GRANITE CURB AT EACH TREE FILTER BOX LOCATION. SEE DETAIL (TYP.)

INSTALL 6" HDPE PIPE AS NECESSARY TO CONNECT TO EXISTING 8" PIPE

INSTALL 4'X6' FILTERRA UNIT #5
ESTIMATED DRAINAGE AREA = 0.22 ACRES
TOP = 65.50
INVERT IN = 65.00
INVERT OUT = 62.00 (6" HDPE PIPE)

CHANNING STREET

MATCHLINE SEE ABOVE

REVISIONS

NO.	DATE

SHEET TITLE: SITE PLAN AS-BUILT

D18-1
WENDELL PARK STORMWATER IMPROVEMENTS

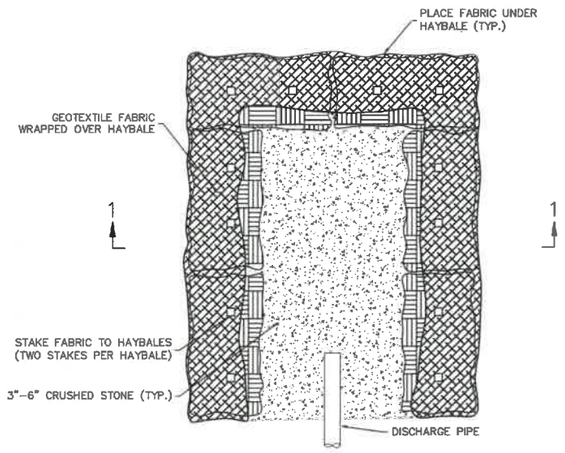
DRAWN BY:	DESIGNED BY:	APPROVED BY:
CRT	CRT	JPT

DATE: 1/22/16

TOWN OF MILTON
DEPARTMENT OF PUBLIC WORKS
629 RANDOLPH AVENUE, MILTON, MA
TEL: (617) 898-4900 FAX: (617) 698-1290

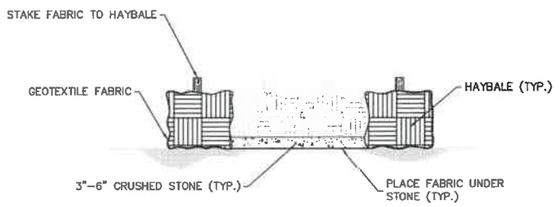
1

DEWATERING BASIN DETAIL
1" = 1.5'

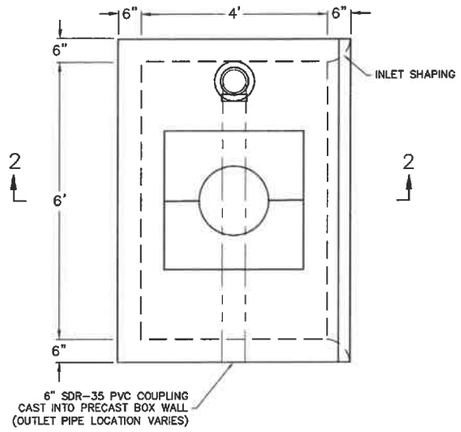


NOTE: DEWATERING BASIN TO BE USED IN EVERY INSTANCE WHEN GROUNDWATER MUST BE PUMPED OUT OF AN EXCAVATION.

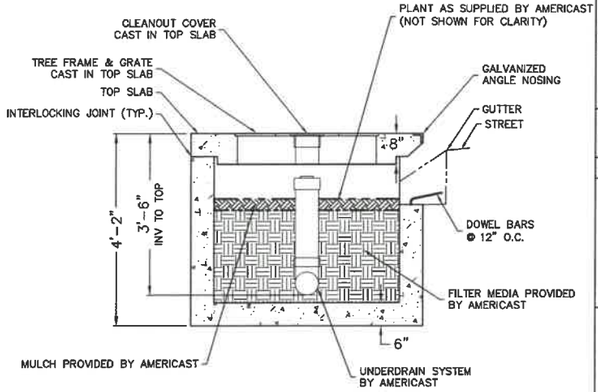
SECTION 1–1
1" = 1.5'



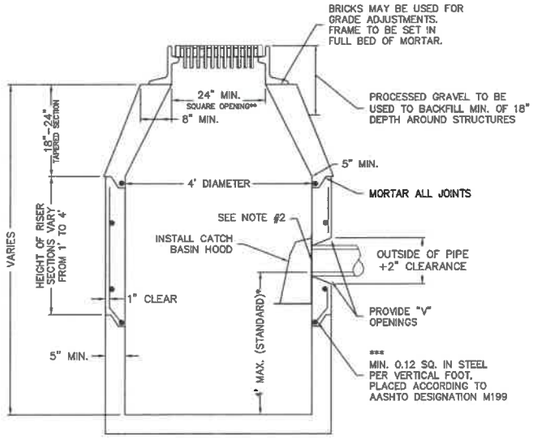
FILTERRA TREE FILTER BOX DETAIL
1" = 1.5'



SECTION 2–2
1" = 1.5'



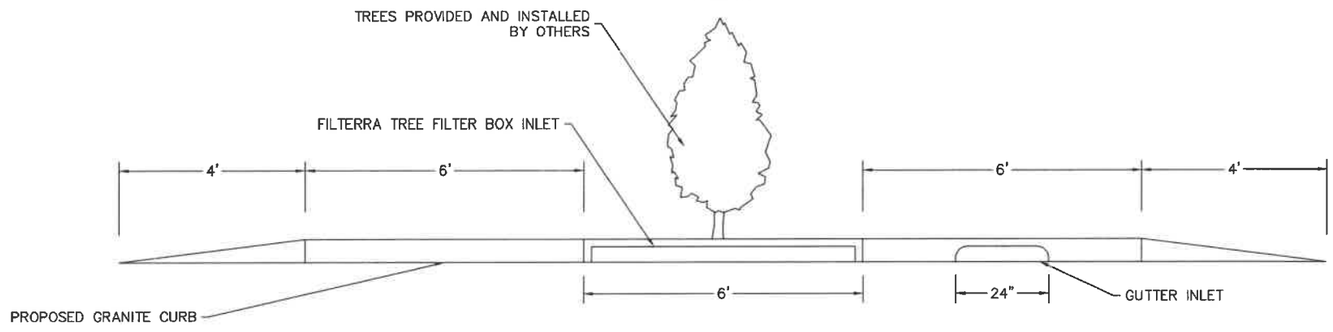
CATCH BASIN DETAIL
1" = 1.5'



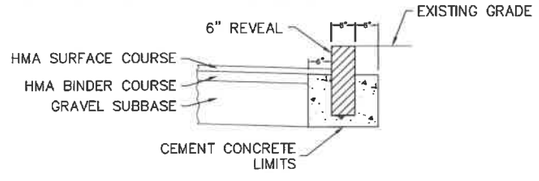
* MINIMUM DEPTH OF SUMP TO BE 4 FT
** WHEN A CURB INLET IS INSTALLED, THE OPENING IS TO BE 24"±1" X 27"±1"
*** REINFORCING STEEL BASED ON A WALL THICKNESS OF 5"

NOTES:
1. DETAILS NOT INDICATED ABOVE ARE TO BE SIMILAR TO THOSE SHOWN ON MASSDOT CONSTRUCTION DETAIL DRAWING E 201.3.0
2. FACE OF PIPE FLUSH OR NOT TO PROJECT MORE THAN 4" FROM FACE OF WALL ALONG CENTERLINE OF PIPE
3. FOR DESCRIPTION, MATERIALS, AND CONSTRUCTION METHODS, SEE MASS HIGHWAY STANDARD SPECIFICATIONS
4. ALL CONCRETE TO BE AIR ENTRAINED

GRANITE CURB AT INLETS DETAIL
1" = 1.5'



GRANITE CURB DETAIL
1" = 1.5'



REVISIONS

NO.	DATE

AS-BUILT

SHEET TITLE: **DRAINAGE IMPROVEMENT DETAILS**

D18-1
WENDELL PARK STORMWATER IMPROVEMENTS

DESIGNED BY: CRT
DRAWN BY: CRT
APPROVED BY: JPT
DATE: 1/22/18

TOWN OF MILTON
DEPARTMENT OF PUBLIC WORKS
629 RANDOLPH AVENUE MILTON, MA
TEL: (617) 898-4900 FAX: (617) 698-1290

2

Bioretention Cell BMPs Operation and Maintenance Plan

Includes Pine Tree Brook BMPs and Police Station BMPs

BMP Description

The Pine Tree Brook BMPs are three sets of two bioretention cells at the end of Parkway Crescent, Meagher Avenue, and Grove Street. Each pair is set on either side of the walking path on the north bank of Pine Tree Brook. The structures are not connected.

The Milton Police Station parking lot contains a system of stormwater BMPs. At the front of the parking lot (south side near entrance) there is a 1,040 SF rain garden. At the back of the parking lot at the northeast end of the property, there is a 1,310 SF infiltration basin. Connecting the two larger structures is a vegetated swale on the southeast edge of the lot.

Plans for both of these groups of BMPs are included at the end of this document.

Plantings at these BMPs includes small trees and shrubs, as well as perennials and grasses for ground cover. Species include:

TREES	• NYSSA SYLVATICA (BLACK GUM) • QUERCUS BICOLOR (SWAMPE WHITE OAK) • ACER RUBRUM (RED OAK)	• MAGNOLIA VIRGINIANA (SWEETBAY MAGNOLIA • BETULA NIGRA (RIVER BIRCH)
SHRUBS	• ARONIA ARUBUTIFLIA (RED CHOKEBERRY) • CLETHRA ALNIFOLIA (SUMMERSWEET) • VIBURNUM DENATAUM (ARROWHEAD)	• ILEX VERICALLATA (WINTERBERRY HOLLY • LINDERA BENZOIN (SPICEBUSH) • CORNUS AMOMUM (SILKY DOG WOOD)
PERENNIALS	• EUPATORIUM FISTULOSUM (JOE PIE WEED) • HEMEROCALLIS SPP. (DAYLILLY) • MNOARDA DIDYMA (BEE BALM)	• TAXUS X MEDIA ‘HICKSII’ (HICKS YEW) • YUCCA FILAMENTOSA (YUCCA) • VINCA MINOR (PERIWINKLE)
GRASS	• ANDROPOGON GERARDII (BIG BLUESTEM) • ANDROPGON VIRGINICUS (BROOMSEDGE) • LOTUS CORNICULATUS (BIRDSFOOD TREFOIL)	• DESCHAMPA CAESPITOSA (TUFTED HAIRGRASS) • HELICTOTRICHON SEMPERVIRENS (BLUE OATS)

All the BMPs at Pine Tree Brook Path and the Police Station are owned by the Town of Milton, which will be responsible for maintenance.

Inspection and Maintenance Schedule and Procedures

The following schedule indicates when certain maintenance procedures, such as pruning or sediment removal, should be conducted. Brief descriptions of each procedure follow.

Activity	**Time of Year**	**Frequency**
Initial inspections/watering	6 months post-construction	After storm events that exceed 0.5in of rainfall
Regular inspections, including inspection for clogging or ponding water	Year-round	Monthly
Good housekeeping	Year-round	During all activities and management
Remove dead vegetation	Spring	Annually
Replace dead vegetation	Spring	Annually
Prune trees and shrubs	Late fall	Annually
Mow grass strips	At least 4x per year	Annually
Repair broken equipment	As needed	As needed
Remove sediment	As needed	Every 2-3 years
Replace the mulch layer	As needed	As needed, with full replacement every 2-3 years

Initial inspections/watering

Following construction, the BMPs should be inspected frequently for the first six months, including after each storm event that exceeds 0.5 inches in rainfall. The rain garden/infiltration basin BMPs should be watered every 2 weeks to ensure healthy vegetative growth. Inspector will make notes on whether any reseeding, erosion control, or planting may be necessary. Inspector will work through attached Inspection Form. Key areas to inspect include:

- Drainage area
- Inlets and outlets
- Bioretention ponding area
- Vegetation

These BMPs are already constructed, but this post-construction information remains in the Operation and Maintenance Program for clarity.

Regular inspections

These monthly inspections should always occur to ensure any other urgent need for maintenance is documented and fulfilled. At least one monthly inspection per quarter should be during or immediately

after wet weather. During this wet-weather inspection, procedure “Inspect for clogging or ponding water” should also be conducted. Inspector will remove any trash, weeds, and debris from the area as necessary.

During regular inspections, Inspector will work through the BMP Inspection Form at the end of this document. Key areas to inspect include:

- Drainage area
- Inlets and outlets
- Bioretention ponding area
- Vegetation

Good housekeeping

Because the BMPs are sited near a municipal building and parking lots, the Town is solely responsible for maintenance of the building, lots, and BMPs. Care should be taken to ensure the best possible performance of BMPs. “Good housekeeping” practices help keep unintended pollutants out of BMPs and reduce potential risks for water pollution and BMP failure.

The Department of Public Works, Consolidated Facilities, and the Police Department implement the following procedures to ensure good performance of the stormwater BMPs:

Onsite structures:

- The dumpster on site will be moved to a more appropriate location on the parking lot in order to minimize pollution of runoff with liquid wastes or other garbage.
- The dumpster cover remains closed unless the container is being loaded or unloaded.

Snow removal:

- DPW and Consolidated Facilities minimize the use and optimize the application of sodium chloride, sand, and salt for the purpose of snow and ice melt.
- Deicing products are always stored under cover at the DPW salt shed. Piles of salt are not maintained in other lots or locations.
- Snow should never be plowed into the BMP structures, nor should it be allowed to obstruct runoff from entering the bioretention cells or swale.
- The town adheres to all state and federal requirements related to dumping of snow. The MS4 Permit prohibits snow disposal into waters of the United States. Snow disposal activities, including selection of appropriate snow disposal sites, will adhere to the Massachusetts Department of Environmental Protection Snow Disposal Guidance, located at http://www.mass.gov/eea/agencies/massdep/water/regulations/snow-disposal-guidance.html . The Town provides training on snow disposal and winter roadway and lot maintenance.

Spill and pollution prevention:

- Vehicles in need of leaks or repairs should be parked under cover or at a Town maintenance garage. Drip pans may also be used to prevent leaks onto pavement.
- K9 Officers must ensure dog waste is promptly picked up and disposed.
- Respond appropriately to chemical or petroleum spills: make any necessary phone calls to Milton Fire, DPW, MassDEP; clean with dry materials (booms, socks, Speedy Dry, etc.). Do not rinse spilled materials into stormwater structures.

- Do not wash or rinse vehicles in the parking lot. Soap and dirt can damage BMP performance.
- Maintain trash receptacles on site and empty often to prevent overflow. Do not allow trash to accumulate in or near BMPs.

Inspect for clogging or ponding water

Water should infiltrate through the structures in a timely manner. Ponding should not occur for more than 12-24 hours following wet weather. At least quarterly, inspections should take place following wet weather to check infiltration of structures.

If ponding greatly exceeds the design drainage time, sediment removal may be necessary or the soil layer may need replacement.

Remove and replace dead vegetation

Inspector will remove any vegetation that is dead and prepare the site for new plantings. Vegetation will be replaced in the spring when plants' chances of survival are greatest. New plantings should be watered frequently.

Invasive species should be removed when identified.

Prune trees and shrubs

Annual pruning of trees and shrubs will be conducted in late fall. This maintenance is mostly aesthetic, but care should be taken to ensure good plant health and prevent growth of invasive species.

Mow grass strips

Grass strips that are part of the BMP should be mowed a minimum of four times annually. Weeds and invasive species should be removed.

Repair broken equipment

Pipes or underdrains that are part of the BMP system may need occasional repair or replacement. This should be done on an as-needed basis.

Remove sediment

Sediment in the BMP system can cause unintended clogging or accumulation in the inlets or outlets of the system. During regular inspection, inspector will remove any observed sediment in inlets or outlets.

Sediment in the filter structure will require regular removal. Accumulated material should be removed with a vactor truck, and may also require getting the sediment to loosen it. Accumulated material will be sampled and tested as hazardous/non-hazardous (same as done for catch basins). All sediment shall be disposed according to regular Department of Public Works best practices (same as done for catch basins/street sweepings). DPW regularly contracts vendors for sediment disposal in compliance with MA state law.

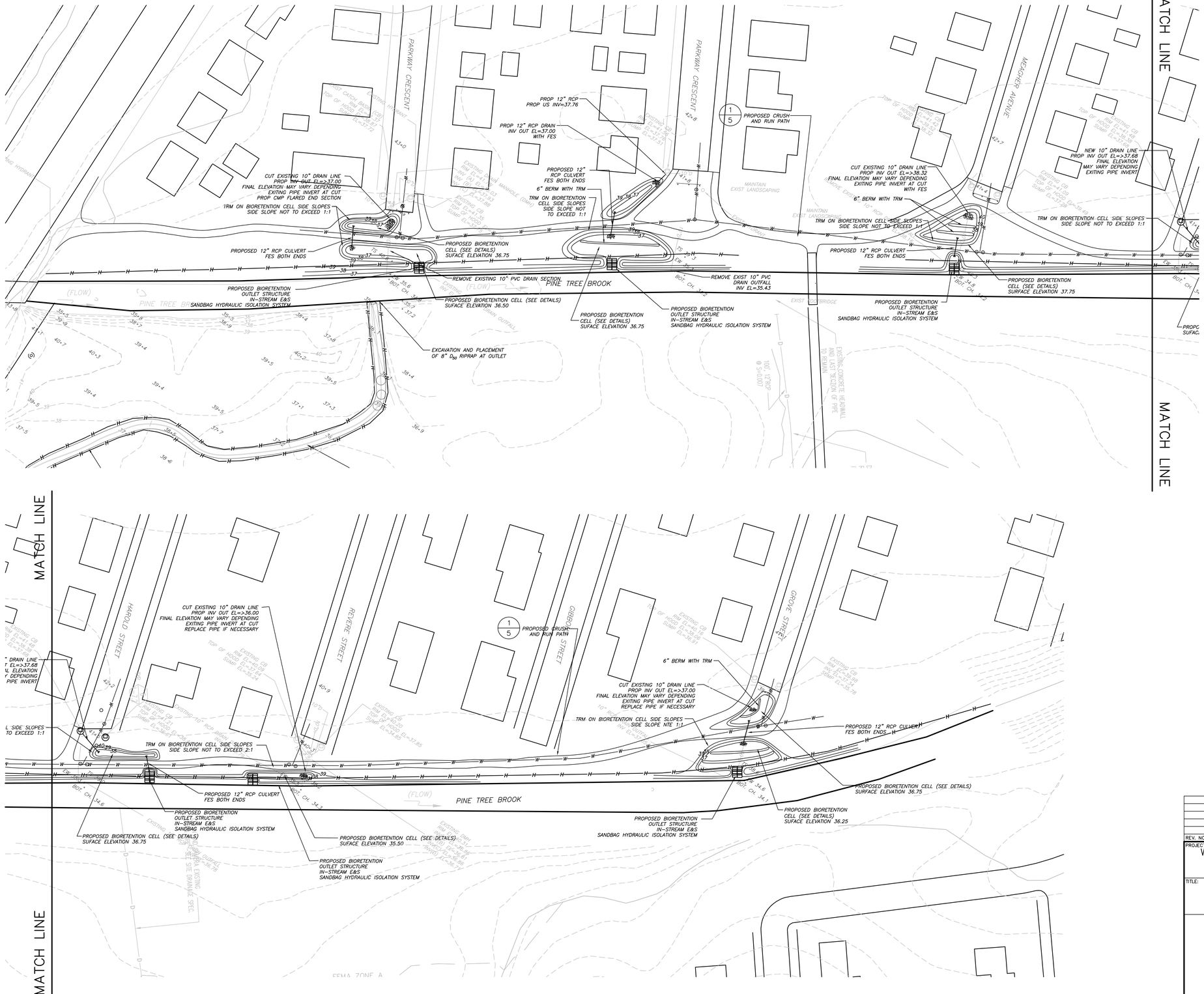
Replace the mulch layer

Mulch helps vegetated bioretention systems by providing a source of organic matter and nutrients to the soil. As mulch decomposes, it will occasionally need replacement or renewal. In the first few years of the BMPs' establishment, mulch should provide cover to the soil layer of the BMPs.

Inspector should note any areas where plant cover does not protect soil and renew mulch in those areas. Renewal of mulch in the entire infiltration basin and rain garden should occur two or three times after establishment, after which plant cover and material should suffice to provide organic matter to the soil.

Infiltration Basin/Cell Inspection Form

System component	Inspection	Yes	No	If "Yes" checked, describe steps taken to remediate or additional maintenance required
Structure	Are trash, excessive leaves, grass clippings, or other debris present?	☐	☐	
	Is snow being plowed into BMP areas?	☐	☐	
	Are there any other good housekeeping concerns (dumpster, kennel, etc.)	☐	☐	
Drainage area	Is there excessive sediment accumulation?	☐	☐	
Inlets and Outlets	Is there sediment accumulation in the inlet or outlet?	☐	☐	
	Is there soil or sediment washing into the inlet from the drainage area or filter strips?	☐	☐	
	Is anything blocking or clogging the inlet or outlet?	☐	☐	
	Is there evidence of erosion near the inlet or outlet?	☐	☐	
Bioretention ponding area	Is there sediment accumulation?	☐	☐	
	Is there standing water 48 or more hours after a rainfall?	☐	☐	
Vegetation	Are weeds or invasive plants present?	☐	☐	
	Are there areas of bare soil or erosion?	☐	☐	
	Is mulch layer uneven or missing in some areas?	☐	☐	



PLAN NOTES

1. ELEVATIONS ARE IN FEET AND REFER TO THE TOWN OF MILTON DATUM (TMD). TMD DATUM IS 5.65' BELOW U.S.C. AND G.S. MEAN SEA LEVEL OF 1929.
2. HORIZONTAL COORDINATE VALUES ARE ASSUMED. SURVEY WAS APPROXIMATELY ALIGNED TO MASSGIS ORTHO IMAGE #237886 (NAD83 US FEET).
3. THIS PLAN WAS DEVELOPED FROM AN ON-THE-GROUND TOPOGRAPHIC SURVEY PERFORMED BY GREEN INTERNATIONAL AFFILIATES, INC. BETWEEN NOVEMBER 24, 2003 AND DECEMBER 05, 2003.

BENCHMARK

1. CHISEL SQUARE SET ON CONCRETE RAILING POST ON TOP OF EXISTING PINE TREE BROOK CULVERT, EL=46.96

LEGEND (EXISTING)

	TREE
	CATCH BASIN
	DRAIN MANHOLE
42+2	EXISTING SPOT GRADE
D	STORM DRAIN
	EDGE OF BROOK LINE
EW	EDGE OF WATER
TS	TOP OF SLOPE
BOT. CH.	BOTTOM OF CHANNEL
45	CONTOUR MAJOR
41	CONTOUR MINOR
H	SILT FENCE AND HAY BALES
	PROPOSED DRAIN PIPE WITH FLARED END SECTIONS (FES)

REV. NO.	DATE	DESCRIPTION	DES. BY	DR. BY	CHK. BY	RVW. BY	APP. BY
	8/13/04	INITIAL ISSUE	MQ	BFT	BFT	MQ	MQ

PROJECT:
WATER QUALITY AND RESOURCE IMPROVEMENT PROJECT
PINE TREE BROOK
DOWNSTREAM OF BLUE HILLS PARKWAY, MILTON, MASSACHUSETTS

TITLE:
PINE TREE BROOK GREENWAY GRADING AND DRAINAGE DESIGN

Owner:
TOWN OF MILTON
PUBLIC WORKS DEPARTMENT
525 CANTON AVENUE
MILTON, MASSACHUSETTS, 02186

Consultant/Engineer:
GEOSYNTEC CONSULTANTS
289 GREAT ROAD, SUITE 105
ACTON, MASSACHUSETTS 01720 USA
TEL: 978-263-9588 FAX: 978-263-9594

DATE: AUGUST 2004
SCALE: 1" = 40'
PROJECT NO.: BW0035
FILE NO.: BW0035-002
SHEET NO.: 2 OF 6

DRAFT NOT FOR CONSTRUCTION

STONE OVERFLOW WEIR

45 LF 8" HDPE PIPE OVERFLOW WITH FLARED END. CONNECT TO OCS

OCS W/24" BEEHIVE GRATE RIM=69.25 INV=68.00

MAHW INTERMITTENT STREAM/BVW ALONG STREAM

WATER QUALITY SWALE

CAPE COD BERM

EXISTING SHEDS

8" CMP OPEN PIPE OVERFLOW OUTLET

BIORENTENTION BASIN 2
AREA=1,308±SF
WQ VOLUME=2,105± CF (PEAK ELEV. 69.31)
100-YR PEAK ELEV.=68.85

24" CONCRETE FLARED END (TYP)

MILTON POLICE STATION
40 HIGHLAND STREET

8" CMP DRAIN

3
2

EXISTING PARKING ISLAND

BIORENTENTION BASIN 1
AREA=1,039±SF
WQ VOLUME=430± CF (PEAK ELEV. 75.80)
100-YR PEAK ELEV.=76.70

EMERGENCY DRAINAGE OVERFLOW AREA DRAIN

24" PERFORATED HDPE SUB-DRAIN W/ STONE CURTAIN DRAIN

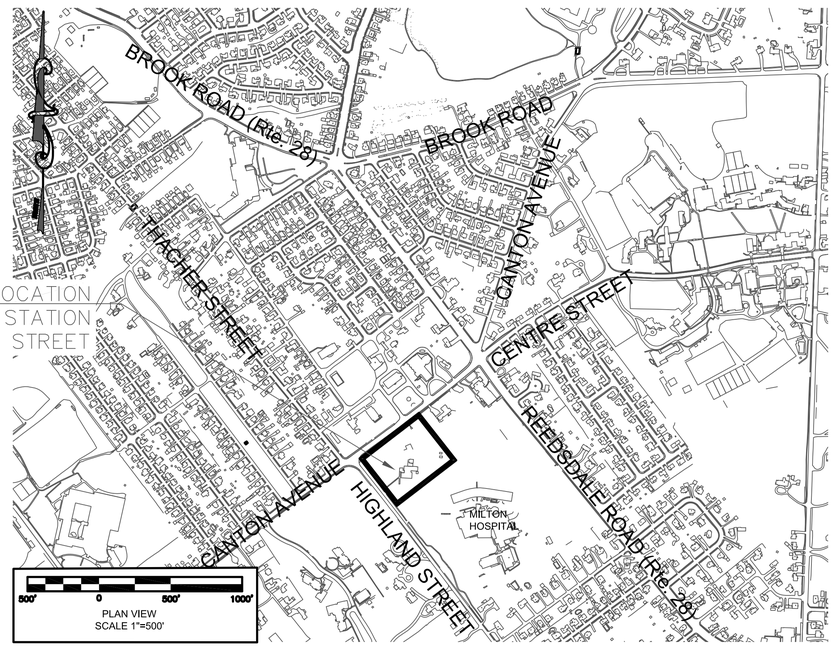
BIOSWALE.
SEE TYPICAL SECTION.

RADIO COMMUNICATIONS TOWER

HIGHLAND STREET

20' 0 20' 40'
PLAN VIEW
SCALE 1"=20'

PROJECT LOCATION
MILTON POLICE STATION
40 HIGHLAND STREET



REVISIONS

NO. | DATE

SHEET TITLE: SITE PLAN - AS BUILT

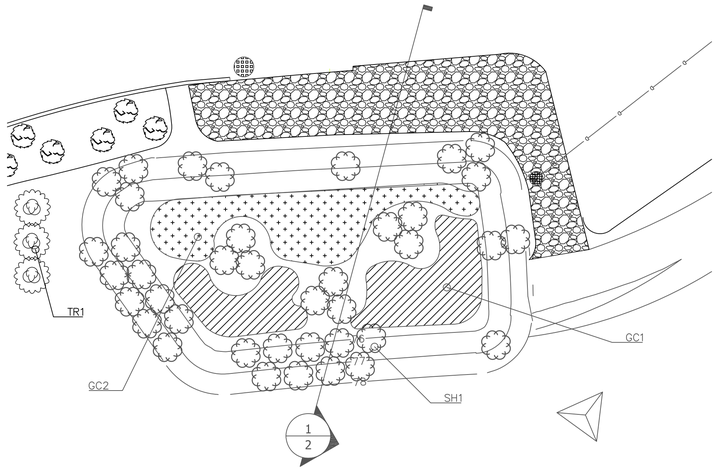
POLICE STATION STORMWATER IMPROVEMENTS PROJECT

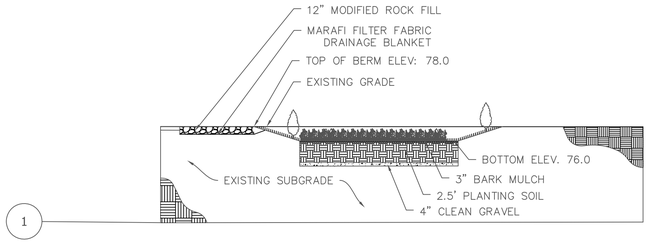
DRAWN BY: C.R.T | DESIGNED BY: C.R.T./J.P.T. | APPROVED BY: J.P.T.

DATE: 6/21/19

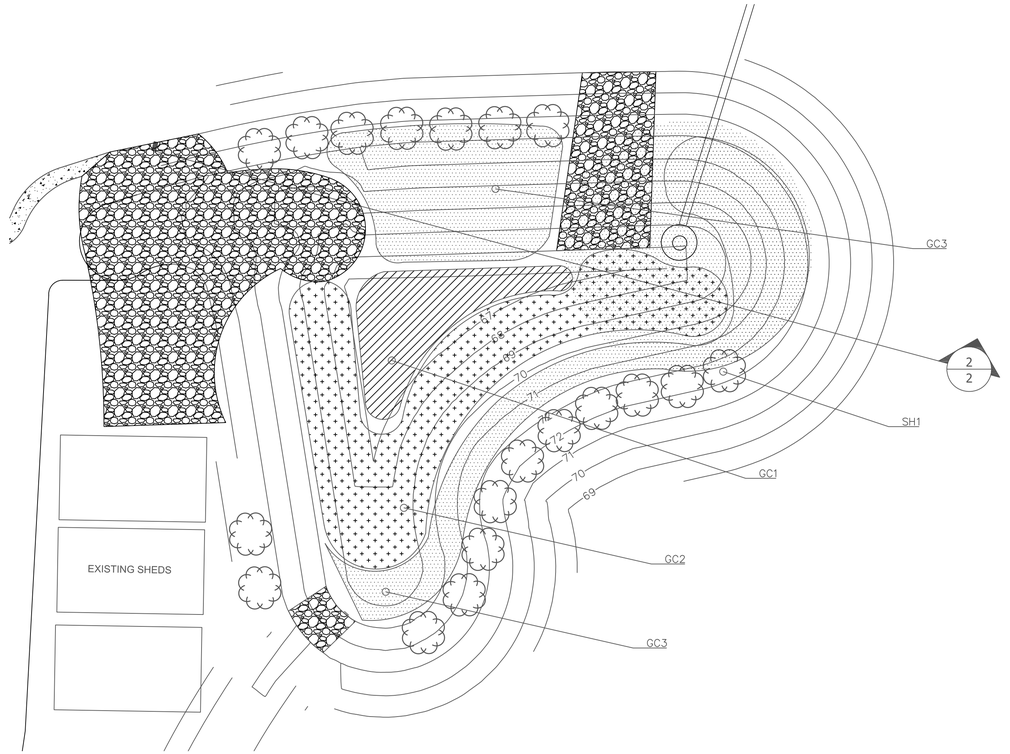
TOWN OF MILTON
DEPARTMENT OF PUBLIC WORKS
525 CANTON AVENUE MILTON, MA
TEL: (617) 898-4900 FAX: (617) 698-1290

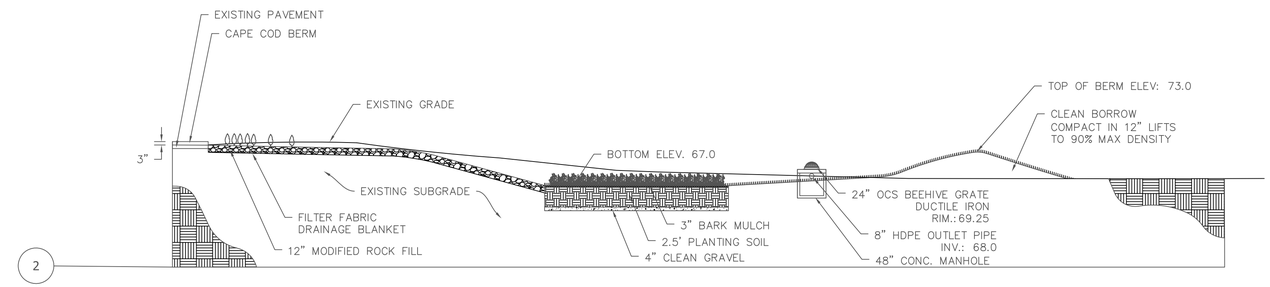
1





BIORETENTION BASIN 1
1"=10'





BIORETENTION BASIN 2
1"=10'

KEY	SYMBOL	DESCRIPTION
		SMALL TREES (1-2 PER 1000 SF OF FACILITY)
TR(ID) #	○	SPECIES: TR1: BETULA NIGRA (RIVER BIRCH)
		SHRUBS (2 PER 100 SF OF FACILITY)
SH(ID) #	✿	SPECIES: SH1: CLETHRA ALNIFOLIA (SUMMERSWEET)
		GROUND COVER/PERENNIALS/GRASSES (10 PER 100 SF OF FACILITY)
GC(ID) #	▨ ⁘	PERENNIAL AND GROUNDCOVER SPECIES: GC1: HEMEROCALLIS SPP. (DAYLILY) GRASS SPECIES: GC2: ANDROPOGON GERARDII (BIG BLUESTEM) GC3: HYDROSEED

REVISIONS

NO.	DATE

SHEET TITLE: LANDSCAPE PLAN - AS BUILT

APPROVED BY: J.P.T.

DESIGNED BY: C.R.T./J.P.T.

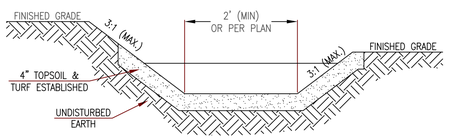
DRAWN BY: C.R.T

DATE: 6/20/19

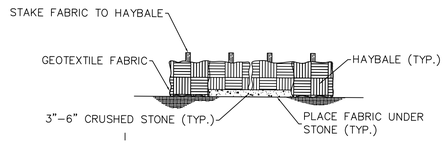
POLICE STATION STORMWATER
IMPROVEMENTS PROJECT

TOWN OF MILTON
DEPARTMENT OF PUBLIC WORKS
525 CANTON AVENUE MILTON, MA
TEL: (617) 898-4900 FAX: (617) 698-1290

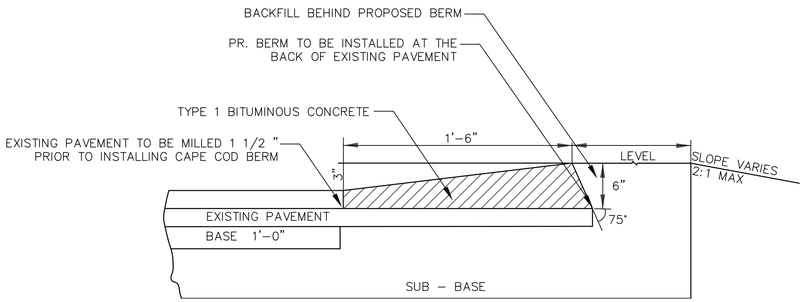
2



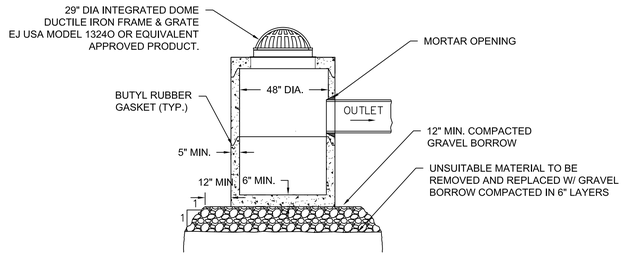
WATER QUALITY SWALE
NTS



HAYBALES FOR EROSION CONTROL
NTS



CAPE COD BERM
NTS



DRAIN MANHOLE (OCS)
NTS

GENERAL NOTES:

1. THE PROJECT SITE IS UNDER THE GOVERNANCE AND JURISDICTION OF THE TOWN OF MILTON CONSERVATION COMMISSION AND HAS BEEN PERMITTED AS SHOWN AND ON THE BASIS THAT ALL WORK IS PERFORMED IN COMPLIANCE WITH THE ORDER OF CONDITIONS SET FORTH BY THE CONSERVATION COMMISSION WHICH ARE INCLUDED AS AN APPENDIX TO THE PROJECT DOCUMENTS. THE CONTRACTOR IS EXPECTED TO BE FAMILIAR WITH THE ORDER OF CONDITIONS PRIOR TO STARTING THE PROJECT AND TO ADHERE TO ALL CONDITIONS SET FORTH THEREIN.
2. INSTALL ALL TEMPORARY EROSION CONTROL MEASURES PRIOR TO THE START OF ANY CONSTRUCTION OPERATION THAT MAY CAUSE ANY SEDIMENTATION OR SILTATION AT THE SITE.
3. INSTALL STORM DRAIN INLET PROTECTION TO PREVENT CLOGGING OF THE STORM SEWER AND SEDIMENT LOADS TO DOWNSTREAM STORM WATER FACILITIES OR WATERBODIES.
4. GRADING OF THE BIORETENTION BASIN SHALL BE ACCOMPLISHED USING LOW-IMPACT EARTH-MOVING EQUIPMENT TO PREVENT COMPACTION OF THE UNDERLYING SOILS. SMALL TRACKED DOZERS AND BOBCATS WITH RUNNER TRACKS ARE RECOMMENDED.
5. EXCAVATE THE BIORETENTION BASIN TO THE SPECIFIED DEPTH (ELEVATION). IT IS RECOMMENDED THAT ALL SUB MATERIAL BELOW THE SPECIFIED ELEVATION SHALL BE LEFT UNDISTURBED, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
6. GRADE TO THE DEPTH (ELEVATION) SPECIFIED IN THE CONSTRUCTION DOCUMENTS UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
7. SILT FENCES ARE TO BE INSTALLED ALONG THE PERIMETER OF THE BOTTOM OF THE PROPOSED BASINS ONCE THE BASIN HAS BEEN EXCAVATED AND MUST REMAIN IN PLACE UNTIL THE SIDE SLOPES ESTABLISH VEGETATION.
8. IN THE EVENT THAT SEDIMENT IS INTRODUCED INTO THE BMP DURING OR IMMEDIATELY FOLLOWING EXCAVATION, THIS MATERIAL WILL NEED TO BE REMOVED FROM THE BASIN PRIOR TO INITIATING THE NEXT STEP IN THE CONSTRUCTION PROCESS. SEDIMENT THAT HAS BEEN WASHED INTO THE BASIN DURING THE EXCAVATION PROCESS CAN SEAL THE PERMEABLE MATERIAL, SIGNIFICANTLY REDUCING THE INFILTRATION CAPACITY OF THE SOILS.
9. BIORETENTION AREA SHALL BE STAKED OFF DURING CONSTRUCTION TO RESTRICT HEAVY EQUIPMENT TRAFFIC FROM COMPACTING NATIVE SOILS.

REVISIONS | NO. | DATE

SHEET TITLE: DETAILS - AS BUILT

POLICE STATION STORMWATER IMPROVEMENTS PROJECT

DRAWN BY: C.R.T
DESIGNED BY: C.R.T./J.P.T.
APPROVED BY: J.P.T.
DATE: 3/6/19

TOWN OF MILTON
DEPARTMENT OF PUBLIC WORKS
525 CANTON AVENUE MILTON, MA
TEL: (617) 898-4900 FAX: (617) 698-1290

3

APPENDIX A: Stormwater Management Structures Inventory

This inventory is a list of only Town-owned and managed structures. Other stormwater management structures exist in town, but the Town is not responsible for their maintenance or inspection.

ID #	Approx. date of construction (if known)	Type	Location	Dept. Responsible for Maintenance
SBMP-001	2017	Tree Filter Box (FilTerra)	South side of Brook Rd across from #422	DPW
SBMP-002	2017	Tree Filter Box (FilTerra)	North side of Brook Rd in front of #422	DPW
SBMP-003	2017	Tree Filter Box (FilTerra)	North side of Brook Rd in front of #400	DPW
SBMP-004	2017	Tree Filter Box (FilTerra)	North side of Brook Rd south of PTB bank	DPW
SBMP-005	2017	Tree Filter Box (FilTerra)	North side of Brook Rd in front of #366	DPW
SBMP-006	2017	Tree Filter Box (FilTerra)	South side of Lincoln St East 1/2	DPW
SBMP-007	2017	Tree Filter Box (FilTerra)	South side of Lincoln St West 1/2	DPW
SBMP-008	2017	Tree Filter Box (FilTerra)	North side of Lincoln St	DPW
SBMP-009	2017	Tree Filter Box (FilTerra)	South side of Brook Rd across from #360	DPW
SBMP-010	2017	Tree Filter Box (FilTerra)	NE side of Brook Rd adjacent to #3 Marilyn	DPW
SBMP-011	2017	Tree Filter Box (FilTerra)	NE side of Brook Rd adjacent to #6 Marilyn	DPW
SBMP-012	2017	Tree Filter Box (FilTerra)	SW side of Brook Rd adjacent to parking lot	DPW
SBMP-013	2017	Tree Filter Box (FilTerra)	SW side of Brook Rd across from #320	DPW
SBMP-014	2017	Tree Filter Box (FilTerra)	South side of Brook Rd across from #298	DPW
SBMP-015		Hydrodynamic Separator (Vortechs)	Glover School NW corner of Canton Ave parking lot near tree line	Consolidated Facilities
SBMP-016		Hydrodynamic Separator (Vortechs)	Glover School South corner of school grounds near a utility pole 2 manholes	Consolidated Facilities
SBMP-017		Hydrodynamic Separator (Vortechs)	Milton High School Grass between football field and basketball courts (basketball courts side) 2 manholes	Consolidated Facilities

SBMP-018		Hydrodynamic Separator (Vortechs)	Milton High School Parking lot, near northwest corner of building 3 manholes in a parking space	Consolidated Facilities
SBMP-019		Underground detention vault with baffle	Pierce Middle School Northwest yard, near south bank of PTB	Consolidated Facilities
SBMP-020		Detention/ retention basin	Patricia Dr. behind #99 (drainage easement)	DPW
SBMP-021	2003	Infiltration basin	Pine Tree Brook Path off Parkway Crescent west North side of path	DPW
SBMP-022	2003	Infiltration basin	Pine Tree Brook Path off Parkway Crescent West South side of path	DPW
SBMP-023	2003	Infiltration basin	Pine Tree Brook Path off Meagher Ave. North side of path	DPW
SBMP-024	2003	Infiltration basin	Pine Tree Brook Path off Meagher Ave. South side of path	DPW
SBMP-025	2003	Infiltration basin	Pine Tree Brook Path off Grove St North side of path	DPW
SBMP-026	2003	Infiltration basin	Pine Tree Brook Path off Grove St South side of path	DPW
SBMP-027	2018	Tree Filter Box (FilTerra)	Wendell Park, northeast side near #41	DPW
SBMP-028	2018	Tree Filter Box (FilTerra)	Wendell Park, northeast side near footpath	DPW
SBMP-029	2018	Tree Filter Box (FilTerra)	Wendell Park, northeast side at end of paved road	DPW
SBMP-030	2018	Tree Filter Box (FilTerra)	Wendell Park, southwest side near #42	DPW
SBMP-031	2018	Tree Filter Box (FilTerra)	Wendell Park, southwest side near footpath	DPW
SBMP-032	2018	Tree Filter Box (FilTerra)	Wendell Park, southwest side	DPW
SBMP-033	2019	Infiltration basin	Police Station, front parking lot	DPW
SBMP-034	2019	Infiltration basin	Police Station, back of parking lot	DPW
SBMP-035	2019	Bioswale	Police Station connecting SBMPs 033 and 034	DPW
SBMP-036	2019	Infiltration basin	DPW Yard northwest corner	DPW