

SOP PL-1: EROSION AND SEDIMENTATION CONTROL

Erosion and sedimentation from land-disturbing human activities can be a significant source of stormwater pollution. This Standard Operating Procedure describes methods for reducing or eliminating pollutant loading from such activities.

Controlling Erosion and Sediment through Design and Planning

Prevention of erosion and sedimentation is preferable to installing treatment devices. Consistent application and implementation of the following guidelines during the Planning Board design and review phases can prevent erosion and sedimentation:

1. Avoid sensitive areas, steep slopes, and highly erodible soils to the maximum extent possible when developing site plans.
2. Identify potential problem areas before the site plan is finalized and approved.
3. Plan to use sediment barriers along contour lines, with a focus on areas where short-circuiting (i.e., flow around the barrier) may occur.
4. Use berms at the top of a steep slopes to divert runoff away from the slope's edge.
5. Design trapezoidal or parabolic vegetated drainage channels, not triangular.
6. Use vegetated channels with rip rap check dams, instead of impervious pavement or concrete, to reduce the water velocity of the conveyance system.
7. Design a check dam or sediment forebay with level spreader at the exit of outfalls to reduce water velocity of the discharge and collect sediment.
8. Use turf reinforcement matting to stabilize vegetated channels, encourage vegetation establishment, and withstand flow velocities without scouring the base of the channel.
9. Plan open channels to follow land contours so natural drainage is not disrupted.
10. Use organic matting for temporary slope stabilization and synthetic matting for permanent stabilization.
11. Provide a stable channel, flume, or slope drain where it is necessary to carry water down slopes.

Controlling Erosion and Sediment on Construction Sites

During the construction phase, it is important to inspect active sites regularly to ensure that practices are consistent with approved site plans and the site's Stormwater Pollution Prevention Plan (SWPPP) or other document, as required by the municipality's legal authority. The following guidelines apply:

1. Erosion and sediment control features should be constructed before initiating activities that remove vegetated cover or otherwise disturb the site. These shall be installed consistent with the approved site plans and with manufacturer's instructions.
2. Erosion and sediment control devices shall be inspected by the contractor regularly and maintained as needed to ensure function.
3. In the SWPPP or other document, the contractor shall clearly identify the party responsible for maintaining erosion and sediment control devices.
4. An inspection should be completed of active construction sites every month, at a minimum, to check the status of erosion and sedimentation controls. Refer to SOP PL-2, "Construction Site Inspection", for construction site stormwater inspection procedures.
5. Existing vegetation should be maintained on site as long as possible.
6. Construction should proceed progressively on the site in order to minimize exposed soil, and disturbed areas should be restored as soon as possible after work has been completed.
7. Stockpiles shall be stabilized by seeding or mulching if they are to remain for more than two weeks.
8. Disturbed areas shall be protected from stormwater runoff by using protective Best Management Practices (BMPs).
9. Clean water shall be diverted away from disturbed areas on construction sites to prevent erosion and sedimentation.
10. Sediment traps and sediment barriers should be cleaned out regularly to reduce clogging and maintain design function.
11. Vegetated and wooded buffers shall be protected.
12. Soils shall be stabilized by mulching and/or seeding when they would be exposed for more than one week during the dry season, or more than two days during the rainy season.
13. Vegetation shall be allowed to establish before introducing flows to channels.
14. Regular light watering shall be used for dust control, as this is more effective than infrequent heavy watering.
15. Excessive soil compaction with heavy machinery shall be avoided, to the extent possible.
16. Construction activities during months with higher runoff rates shall be limited, to the extent possible.

Controlling Erosion and Sediment by Proper Maintenance of Permanent BMPs

Many construction phase BMPs can be integrated into the final site design, but ongoing inspection and maintenance are required to ensure long-term function of any permanent BMP. Refer to SOP PL-3, "Inspection of Constructed Best Management Practices", for more information.

The following guidelines summarize the requirements for long-term maintenance of permanent BMPs.

1. Responsibility for maintaining erosion and sediment control devices shall be clearly identified.
2. Erosion and sediment control devices shall be inspected following heavy rainfall events to ensure they are working properly.
3. Erosion control blankets shall be utilized when seeding slopes.
4. Vegetated and wooded buffers shall be protected and left undisturbed to the extent possible.
5. Runoff shall not be diverted into a sensitive area unless this has been specifically approved.
6. Sedimentation basins shall be cleaned out once sediment reaches 50% of the basin's design capacity.
7. Snow shall not be plowed into, or stored within, retention basins, rain gardens, or other BMPs.
8. Easements and service routes shall be maintained, to enable maintenance equipment to access BMPs for regular cleaning.

Attachments

1. SOP PL-1 Erosion and Sedimentation Control Inspection Report

Related Standard Operating Procedures

1. SOP PL-2 Construction Site Inspection
2. SOP PL-3 Inspection of Constructed Best Management Practices

Governing Laws

Approval Date: June 30, 2019

Source: *Central Massachusetts Regional Stormwater Coalition*

Erosion and Sediment Control (ESC) on Construction Sites

Document any of the following issues found on the construction site, and the corrective action(s) required for each.

Issue	Status	Corrective Action Needed
Have all ESC features been constructed before initiating other construction activities?	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Is the contractor inspecting and maintaining ESC devices regularly?	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Is existing vegetation maintained on the site as long as possible?	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Is construction staged so as to minimize exposed soil and disturbed areas?	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Are disturbed areas restored as soon as possible after work is completed?	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Is clean water being diverted away from the construction site?	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Are sediment traps and sediment barriers cleaned regularly?	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Are vegetated and wooded buffers protected and left undisturbed?	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Are soils stabilized by mulching and/or seeding when they are exposed for a long time?	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Has vegetation been allowed to establish itself before flows are introduced to channels?	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Is regular, light watering used for dust control?	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Is excessive soil compaction with heavy machinery avoided, to the extent possible?	Yes <input type="checkbox"/> No <input type="checkbox"/>	

(continued)

Issue	Status	Corrective Action Needed
Are erosion control blankets used when seeding slopes?	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Are trees and vegetation that are to be retained during construction adequately protected?	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Are areas designated as off-limits to construction equipment flagged or easily distinguishable?	Yes <input type="checkbox"/> No <input type="checkbox"/>	
If excavated topsoil has been salvaged and stockpiled for later use on the project, are stockpiles adequately protected?	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Are temporary slope drains or chutes used to transport water down steep slopes?	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Do all entrances to the storm sewer system have adequate protection?	Yes <input type="checkbox"/> No <input type="checkbox"/>	

Non-Compliance Actions

The municipality shall provide the site operator with a copy of this report, and notice of the corrective action(s) to be taken. The site operator shall have thirty days from the receipt of the notice to commence curative action of the violation.

Source: *Central Massachusetts Regional Stormwater Coalition*

June 2019

SOP PL-2: CONSTRUCTION SITE INSPECTION

Construction sites that lack adequate stormwater controls can contribute a significant amount of sediment to nearby bodies of water. This Standard Operating Procedure describes the major components of a municipal Stormwater Construction Inspection Plan, as well as procedures for evaluating compliance of stormwater controls at construction sites.

Stormwater Construction Inspection Plan

A stormwater Construction Site Inspection program is a program developed by municipalities to track, inspect, and enforce local stormwater requirements at construction sites.

This SOP assumes that the municipality has legal authority (i.e., a bylaw or ordinance) in place, per the requirements of the 2003 New Hampshire MS4 Permit, to require sediment and erosion control at construction sites. This legal authority must require construction site operators “to implement a sediment and erosion control program which includes [Best Management Practices] that are appropriate for the conditions at the construction site, including efforts to minimize the area of the land disturbance.” The legal authority must also give inspectors the authority to enter the site.

A municipal stormwater Construction Site Inspection program should include or address the following:

1. Construction Site Inventory
 - A tracking system to inventory projects and identify sites for inspection.
 - Track the results of inspection and prioritize sites based on factors such as proximity to waterways, size, slope, and history of past violations.
2. Construction Requirements and BMPs
 - Municipalities provide contractors with guidance on the appropriate selection and design of stormwater BMPs.
3. Plan Review Procedures
 - Submitted plans must be reviewed to ensure they address state and local requirements and protect water quality.
4. Public Input
 - Per the 2003 New Hampshire MS4 Permit, a program must allow the public to provide comment on inspection procedures and must consider information provided by the public.

5. Construction Site Inspections
 - Identify an inspection frequency for each site.
 - See more detailed information below.
6. Enforcement Procedures
 - A written progressive enforcement policy for the inspection program.
 - Sanctions, both monetary and non-monetary, should be implemented to ensure compliance with the program
7. Training and Education
 - While professional inspectors will typically be utilized, and municipal staff conducting inspections should receive training on regulatory requirements, BMPs, inspections, and enforcement.

Conducting Stormwater Inspections at Construction Sites

The role of the construction inspector is to ensure that site operations match the approved site plans and the Stormwater Pollution Prevention Plan (SWPPP) for the project, and that all precautions are taken to prevent pollutants and sediment from the construction site from impacting local waterways. The inspector is also expected to determine the adequacy of construction site stormwater quality control measures.

The attached Construction Site Stormwater Inspection Report shall be used by the inspector during site visits. Construction site inspectors should abide by the following guidelines:

1. Inspections to monitor stormwater compliance should be performed at least once per month at each active construction site, with priority placed on sites that require coverage under the USEPA 2012 Construction General Permit (i.e., that disturb one or more acres), and sites that are located in the watershed of any 303(d) water bodies.
2. The inspection shall begin at a low point and work uphill, observing all discharge points and any off-site support activities.
3. Written and photographic records shall be maintained for each site visit.
4. During the inspection, the inspector should ask questions of the contractor. Understanding the selection, implementation, and maintenance of BMPs is an important goal of the inspection process and requires site-specific input.
5. The inspector should not recommend or endorse solutions or products. The inspector may offer appropriate advice, but all decisions must be made by the contractor.
6. The inspector shall always wear personal protective equipment appropriate for the site.

7. The inspector shall abide by the contractor's site-specific safety requirements.
8. The inspector has legal authority to enter the site. However, if denied permission to enter the site, the inspector should never force entry but instead should notify the Planning Director.

Prior to planning a site visit, the inspector shall determine if the project is subject to USEPA's 2012 Construction General Permit, which is true if the the project disturbs one or more acres, total. The 2012 Construction General Permit replaces the 2008 Construction General Permit, which expired on February 15, 2012. Operators of sites that required coverage under the USEPA's 2008 Construction General Permit but continue to be active should have submitted a new Notice of Intent (NOI) under the 2012 Permit.

If the site requires this coverage, the inspector shall visit the USEPA Region 1 eNOI website (<http://cfpub.epa.gov/npdes/stormwater/cgpenoi.cfm> or <http://cfpub.epa.gov/npdes/stormwater/noi/noisearch.cfm>) to determine if the contractor filed for coverage under the 2012 and/or 2008 Construction General Permits, respectively. Print a copy of the project's NOI.

If the project disturbs one or more acres and is under construction, but does not show up in either database, the project is in violation of the Construction General Permit. Call the contractor to determine if the NOI process has been started. If not, notify the contractor verbally of this requirement and the violation. Work cannot proceed on the site until a Notice of Intent (NOI) for coverage under the 2012 Construction General Permit has been approved by USEPA. The inspector may choose to print instructions on how to file an NOI and meet with the contractor to review these. Issue a written Stop Work Order until the NOI has been approved by USEPA.

Once it has been determined that the site is in compliance with the 2012 Construction General Permit, the site inspection process can continue. The Construction Site Inspection process shall include the following:

1. Plan the inspection before visiting the construction site
 - a. Obtain and review permits, site plans, previous inspection reports, and any other applicable information.
 - b. Print the approved NOI from the USEPA 2012 Construction General Permit NOI website, listed previously.
 - c. Inform the contractor of the planned site visit.

2. Meet with the contractor
 - a. Review the Construction SWPPP (if the site includes over one acre of disturbance) or other document, as required by the municipality's legal authority. Compare BMPs in the approved site plans with those shown in the SWPPP.
 - b. Review the project's approved NOI and confirm that information shown continues to be accurate.
 - c. Get a general overview of the project from the contractor.
 - d. Review inspections done by the contractor.
 - e. Review the status of any issues or corrective actions noted in previous inspection reports.
 - f. Discuss any complaints or incidents since the last meeting.
3. Inspect perimeter controls
 - a. Examine perimeter controls to determine if they are adequate, properly installed, and properly maintained.
 - b. For each structural BMP, check structural integrity to determine if any portion of the BMP needs to be replaced or requires maintenance.
4. Inspect slopes and temporary stockpiles
 - a. Determine if sediment and erosion controls are effective.
 - b. Look for slumps, rills, and tracking of stockpiled materials around the site.
5. Compare BMPs in the site plan with the construction site conditions
 - a. Determine whether BMPs are in place as specified in the site plan, and if the BMPs have been adequately installed and maintained.
 - b. Note any areas where additional BMPs may be needed which are not specified in the site plans.
6. Inspect site entrances/exits
 - a. Determine if there has been excessive tracking of sediment from the site.
 - b. Look for evidence of additional entrances/exits which are not on the site plan and are not properly stabilized.
7. Inspect sediment basins
 - a. Look for signs that sediment has accumulated beyond 50% of the original capacity of the basin.

8. Inspect pollution prevention and good housekeeping practices
 - a. Inspect trash areas and material storage/staging areas to ensure that materials are properly maintained and that pollutant sources are not exposed to rainfall or runoff.
 - b. Inspect vehicle/equipment fueling and maintenance areas for the presence of spill control measures and for evidence of leaks or spills.
9. Inspect discharge points and downstream, off-site areas
 - a. Walk down the street and/or in other directions off-site to determine if erosion and sedimentation control measures are effective in preventing off-site impacts.
 - b. Inspect down-slope catch basins to determine if they are protected and identify whether sediment buildup has occurred.
10. Meet with the contractor again prior to leaving
 - a. Discuss the effectiveness of current controls and whether modifications are needed.
 - b. Discuss possible violations or concerns noted during the site inspection, including discrepancies between approved site plans, the SWPPP, and/or the implementation of stormwater controls.
 - c. Agree on a schedule for addressing all discrepancies and schedule a follow-up inspection.
11. Provide a written copy of the inspection report to the contractor.
12. Follow up, as determined, and provide copy of subsequent inspection to the contractor.
13. Use Stop Work orders, as needed, until compliance with the 2012 Construction General Permit and/or other document, as required by the municipality's legal authority, can be achieved.

Attachments

1. SOP PL-3 Constructed BMPs Inspection Forms

Related Standard Operating Procedures

1. SOP PL-3 Inspection of Constructed Best Management Practices

Governing Laws

Approval Date: June 30, 2019

Source: *Central Massachusetts Regional Stormwater Coalition*

SOP PL-3: INSPECTION OF CONSTRUCTED BEST MANAGEMENT PRACTICES

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 eight common constructed BMPs, including:

1. Bioretention Areas and Rain Gardens
2. Constructed Stormwater Wetlands
3. Extended Dry Detention Basins
4. Proprietary Media Filters
5. Sand and Organic Filters
6. Wet Basins
7. Dry Wells
8. Infiltration Basins

Bioretention Areas and Rain Gardens

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	Annually
Inspect for invasive species and remove if present	Year round	Annually
Remove trash	Year round	As Needed
Mulch Void Areas	Spring	Annually
Remove dead vegetation	Fall and Spring	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.

Constructed Stormwater Wetlands

Constructed stormwater wetlands maximize the pollutant removal from stormwater using wetland vegetation uptake, retention and settling. Constructed stormwater wetlands must be used in conjunction with other BMPs, such as sediment forebays. As of June 2019, no constructed Stormwater Wetlands exist in Pelham, but this SOP is established in case they are ever established.

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, Constructed Stormwater Wetlands: Years 0-3

Activity	Time of Year	Frequency
Inspect for invasive species and remove if present	Year round	Annually
Record and Map:	Year round	Annually
Types and distribution of dominant wetland plants	Year round	Annually
Presence and distribution of planted wetland species	Spring	Annually
Presence and distribution of invasive species	Fall and Spring	Annually
Indications other species are replacing planted wetland species	Spring	Annually
Percent of standing water that is not vegetated	Spring or Fall	Annually
Replace all media and vegetation	Late Spring/Early Summer	As Needed
Stability of original depth zones and micro-topographic features		As Needed
Accumulation of sediment in the forebay and micropool and survival rate of plants		As Needed

Maintenance Schedule, Constructed Stormwater Wetlands: Years 4-Lifetime

Activity	Time of Year	Frequency
Inspect for invasive species and remove if present	Year round	Annually
Clean forebays	Year round	Annually
Clean sediment in basin/wetland system	Year round	Once every 10 years
Mulch Void Areas	Spring	Annually
Remove dead vegetation	Fall and Spring	As Needed
Replace dead vegetation	Spring	As Needed
Prune	Spring or Fall	As Needed
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 constructed stormwater wetland. This would prevent required water quality treatment and the recharge of groundwater.

Extended Dry Detention Basins

Extended dry detention basins are designed to control both stormwater quantity and quality. These BMPs are designed to hold stormwater for at least 24 hours, allowing solids to settle and to reduce local and downstream flooding. Pretreatment is required to reduce the potential for overflow clogging. The outflow may be designed as either fixed or adjustable. Additional nutrient removal may be achieved by a micropool or shallow marsh.

Inspection & Maintenance

Annual inspection of extended dry detention basins is required to ensure that the basins are operating properly. Potential problems include erosion within the basin and banks, tree growth on the embankment, damage to the emergency spillway and sediment accumulation around the outlet. Should any of these problems be encountered, necessary repairs should be made immediately.

Maintenance Schedule: Extended Dry Detention Basins

Activity	Time of Year	Frequency
Inspect basins	Spring	Annually
Examine outlet structure for clogging or high outflow release velocities	Spring	Annually
Mow upper stage, side slopes, embankment and emergency spillway	Spring through Fall	As Needed
Remove trash and debris	Spring	As Needed
Remove sediment from basin	Year round	As Needed

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 sorbed 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	Annually
Remove trash and debris	N/A	As Needed
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

Sand and Organic Filters

Sand and organic filters, also known as filtration basins, are intended for quality control rather than quantity control. These filters improve water quality by removing pollutants through a filtering media and settling pollutants on top of the sand bed and/or in a pretreatment basin. Pretreatment is required to prevent filter media from clogging. Runoff from the filters is typically discharged to another BMP for additional treatment.

Inspection & Maintenance

If properly maintained, sand and organic filters have a long design life. Maintenance requirements include raking the sand and removing sediment, trash and debris from the surface of the BMP. Over time, fine sediments will penetrate deep into the sand requiring replacement of several

inches or the entire sand layer. Discolored sand is an indicator of the presence of fine sediments, suggesting that replacement of the sand should be completed.

Maintenance Schedule: Proprietary Media Filters

Activity	Frequency
Inspect filters and remove debris	After every major storm for the first 3 months after construction completion. Annually thereafter.

Wet Basins

Wet basins are intended to treat stormwater quality through the removal of sediments and soluble pollutants. A permanent pool of water allows sediments to settle and removes the soluble pollutants, including some metals and nutrients. Additional dry storage is required to control peak discharges during large storm events, and if properly designed and maintained wet basins can add fire protection, wildlife habitat and aesthetic values to a property.

Inspection & Maintenance

To ensure proper operation, wet basin outfalls should be inspected for evidence of clogging or excessive outfall releases. Potential problems to investigate include erosion within the basin and banks, damage to the emergency spillway, tree growth on the embankment, sediment accumulation around the outlet and the emergence of invasive species. Should any of these problems be encountered, perform repairs immediately. An on-site sediment disposal area will reduce sediment removal costs.

Maintenance Schedule: Wet Basins

Activity	Time of Year	Frequency
Inspect wet basins	Spring and/or Fall	Annually
Mow upper stage, side slopes, embankment and emergency spillway	Spring through Fall	Annually
Remove sediment, trash and debris	Spring through Fall	Annually
Remove sediment from basin	Year round	As required, but at least once every 10 years

Dry Wells

Dry wells are used to infiltrate uncontaminated runoff. These BMPs should never be used to infiltrate stormwater or runoff that has the potential to be contaminated with sediment and other pollutants. Dry wells provide groundwater recharge and can reduce the size and cost required of downstream BMPs or storm drains. However, they are only applicable in drainage areas of less than one acre and may experience high failure rates due to clogging.

Inspection & Maintenance

Proper dry well function depends on regular inspection. Clogging has the potential to cause high failure rates. The water depth in the observation well should be measured at 24- and 48-hour intervals after a storm and the clearance rate calculated. The clearance rate is calculated by dividing the drop-in water level (inches) by the time elapsed (hours).

Maintenance Schedule: Dry Wells

Activity	Frequency
Inspect dry wells	After every major storm for the first 3 months after construction completion. Annually thereafter.

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.

Maintenance Schedule: Infiltration Basins

Activity	Time of Year	Frequency
Preventative maintenance	Spring through Fall	Annually
Inspection	Spring through Fall	After every major storm for the first 3 months after construction completion. Bi-annually thereafter and discharges through the high outlet orifice.
Mow/rake buffer area, side slopes and basin bottom	Spring through Fall	Bi-Annually
Remove trash, debris and organic matter	Spring through Fall	Bi-Annually

Attachments

1. SOP PL-3 Constructed BMP Inspection Forms

Related Standard Operating Procedures

1. SOP PL-2 Construction Site Inspection

Governing Laws

Approval Date: June 30, 2019

Source: Central Massachusetts Regional Stormwater Coalition

This SOP is based on the Massachusetts Stormwater Handbook even though Pelham is a New Hampshire municipality. This SOP is not intended to replace that document, rather to inform Pelham SOPs based on the sound model provided in that handbook. In some cases, these SOPs have been modified to meet Pelham’s needs.

INSPECTION OF BIORETENTION AREAS / RAIN GARDENS

General Information

BMP Description	Bioretention Area / Rain Garden		
BMP Location			
Inspector's Name			
Date of Inspection		Date of Last Inspection	
Start Time		End Time	
Type of Inspection: Regular <input type="checkbox"/> Pre-Storm Event <input type="checkbox"/> During Storm Event <input type="checkbox"/> Post-Storm Event <input type="checkbox"/>			
Describe the weather conditions at time of inspection			

Specific Information

Maintenance Activity	Maintenance Frequency	Is Status of BMP Satisfactory?	Corrective Action Needed
Inspect for soil erosion and repair	Annually	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Inspect for invasive species and remove if present	Annually	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Remove trash	As Needed	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Mulch void areas	As Needed	Yes <input type="checkbox"/> No <input type="checkbox"/>	

Remove dead vegetation	Annually	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Replace dead vegetation	Annually	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Prune	Annually	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Replace all media and vegetation	As Needed	Yes <input type="checkbox"/> No <input type="checkbox"/>	

INSPECTION OF CONSTRUCTED STORMWATER WETLANDS
Years 0-3 of Operation

General Information

BMP Description	Constructed Stormwater Wetland		
BMP Location			
Inspector's Name			
Date of Inspection		Date of Last Inspection	
Start Time		End Time	
Type of Inspection: Regular <input type="checkbox"/> Pre-Storm Event <input type="checkbox"/> During Storm Event <input type="checkbox"/> Post-Storm Event <input type="checkbox"/>			
Describe the weather conditions at time of inspection			

Specific Information

Maintenance Activity	Maintenance Frequency	Is Status of BMP Satisfactory?	Corrective Action Needed
Inspect for invasive species and remove if present	Annually	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Replace all media and vegetation	As Needed	Yes <input type="checkbox"/> No <input type="checkbox"/>	

In addition, the following information should be recorded and mapped at least once per year:

- Types and distribution of dominant wetland plants
- Presence and distribution of planted wetland species
- Presence and distribution of invasive species
- Indications other species are replacing planted wetland species
- Percent of standing water that is not vegetated
- Replace all media and vegetation
- Stability of original depth zones and micro-topographic features
- Accumulation of sediment in the forebay and micropool and survival rate of plants

INSPECTION OF CONSTRUCTED STORMWATER WETLANDS
Year 4 - Lifetime of Operation

General Information

BMP Description	Constructed Stormwater Wetland		
BMP Location			
Inspector's Name			
Date of Inspection		Date of Last Inspection	
Start Time		End Time	
Type of Inspection: Regular <input type="checkbox"/> Pre-Storm Event <input type="checkbox"/> During Storm Event <input type="checkbox"/> Post-Storm Event <input type="checkbox"/>			
Describe the weather conditions at time of inspection			

Specific Information

Maintenance Activity	Maintenance Frequency	Is Status of BMP Satisfactory?	Corrective Action Needed
Inspect for invasive species and remove if present	Annually	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Clean forebays	Annually	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Clean sediment in basin/wetland system	Once every 10 years	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Mulch void areas	Annually	Yes <input type="checkbox"/> No <input type="checkbox"/>	

Remove dead vegetation	As Needed	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Replace dead vegetation	As Needed	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Prune	As Needed	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Replace all media and vegetation	As Needed	Yes <input type="checkbox"/> No <input type="checkbox"/>	

INSPECTION OF EXTENDED DRY DETENTION BASINS

Inspections should be conducted bi-annually, and during and after major storm events.

General Information

BMP Description	Extended Dry Detention Basin		
BMP Location			
Inspector's Name			
Date of Inspection		Date of Last Inspection	
Start Time		End Time	
Type of Inspection: Regular <input type="checkbox"/> Pre-Storm Event <input type="checkbox"/> During Storm Event <input type="checkbox"/> Post-Storm Event <input type="checkbox"/>			
Describe the weather conditions at time of inspection			

Specific Information

Maintenance Activity	Maintenance Frequency	Is Status of BMP Satisfactory?	Corrective Action Needed
Examine outlet structure for clogging or high outflow release velocities	Annually	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Mow upper stage, side slopes, embankment and emergency spillway	Annually	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Remove trash and debris	Annually	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Remove sediment from basin	At least once every 10 years	Yes <input type="checkbox"/> No <input type="checkbox"/>	

INSPECTION OF PROPRIETARY MEDIA FILTERS

General Information

BMP Description	Media Filter		
BMP Location			
Media Type			
Inspector's Name			
Date of Inspection		Date of Last Inspection	
Start Time		End Time	
Type of Inspection: Regular <input type="checkbox"/> Pre-Storm Event <input type="checkbox"/> During Storm Event <input type="checkbox"/> Post-Storm Event <input type="checkbox"/>			
Describe the weather conditions at time of inspection			

Specific Information

Maintenance Activity	Maintenance Frequency	Is Status of BMP Satisfactory?	Corrective Action Needed
Inspect for standing water, trash, sediment and clogging	Annually	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Remove trash and debris	As Needed	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Examine to determine if system drains in 72 hours	Annually	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Inspect filtering media for clogging	Per manufacturer's schedule	Yes <input type="checkbox"/> No <input type="checkbox"/>	

INSPECTION OF SAND AND ORGANIC FILTERS

Inspections should be conducted after every major storm event for the first 3 months following completion, then every 6 months thereafter.

General Information

BMP Description	Sand/Organic Filter		
BMP Location			
Media Type			
Inspector's Name			
Date of Inspection		Date of Last Inspection	
Start Time		End Time	
Type of Inspection: Regular <input type="checkbox"/> Pre-Storm Event <input type="checkbox"/> During Storm Event <input type="checkbox"/> Post-Storm Event <input type="checkbox"/>			
Describe the weather conditions at time of inspection			

Specific Information

Maintenance Activity	Maintenance Frequency	Is Status of BMP Satisfactory?	Corrective Action Needed
Remove sediment, trash, and debris	Annually	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Rake sand	Annually	Yes <input type="checkbox"/> No <input type="checkbox"/>	

INSPECTION OF DRY WELLS

Regular inspections should be conducted after every major storm event for the first 3 months following completion, then annually thereafter.

General Information

BMP Description	Dry Well		
BMP Location			
Inspector's Name			
Date of Inspection		Date of Last Inspection	
Start Time		End Time	
Type of Inspection: Regular <input type="checkbox"/> Pre-Storm Event <input type="checkbox"/> During Storm Event <input type="checkbox"/> Post-Storm Event <input type="checkbox"/>			
Describe the weather conditions at time of inspection			
Describe condition of dry well at time of inspection			

After a major storm event, the water depth in the observation well should be measured at 24 and 48 hour intervals and the clearance rate calculated.

INSPECTION OF WET BASINS

Inspections should be conducted after every major storm event for the first 3 months following completion, then biannually thereafter.

General Information

BMP Description	Wet Basin		
BMP Location			
Inspector's Name			
Date of Inspection		Date of Last Inspection	
Start Time		End Time	
Type of Inspection: Regular <input type="checkbox"/> Pre-Storm Event <input type="checkbox"/> During Storm Event <input type="checkbox"/> Post-Storm Event <input type="checkbox"/>			
Describe the weather conditions at time of inspection			
Describe condition of wet basin at time of inspection			

Specific Information

Maintenance Activity	Maintenance Frequency	Is Status of BMP Satisfactory?	Corrective Action Needed
Preventative maintenance	Annually	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Mow/rake buffer area, side slopes and basin bottom	Annually	Yes <input type="checkbox"/> No <input type="checkbox"/>	

Remove trash, debris and organic matter	Annually	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Inspect and clean pretreatment devices	As Needed	Yes <input type="checkbox"/> No <input type="checkbox"/>	

INSPECTION OF OTHER BMP

General Information

BMP Description			
BMP Location			
Inspector's Name			
Date of Inspection		Date of Last Inspection	
Start Time		End Time	
Type of Inspection: Regular <input type="checkbox"/> Pre-Storm Event <input type="checkbox"/> During Storm Event <input type="checkbox"/> Post-Storm Event <input type="checkbox"/>			
Describe the weather conditions at time of inspection			

Specific Information

Maintenance Activity	Maintenance Frequency	Is Status of BMP Satisfactory?	Corrective Action Needed
		Yes <input type="checkbox"/> No <input type="checkbox"/>	
		Yes <input type="checkbox"/> No <input type="checkbox"/>	
		Yes <input type="checkbox"/> No <input type="checkbox"/>	
		Yes <input type="checkbox"/> No <input type="checkbox"/>	
		Yes <input type="checkbox"/> No <input type="checkbox"/>	

		Yes <input type="checkbox"/>	
		No <input type="checkbox"/>	
		Yes <input type="checkbox"/>	
		No <input type="checkbox"/>	

SOP PL-4: PRIVATE DRAINAGE CONNECTION INSPECTION

The 2003 New Hampshire MS4 Permit described a number of non-stormwater discharges to the engineered storm drain system that are considered “allowable”, as long as an individual community has not prohibited the discharge. Allowable non-stormwater discharges to the storm drain system can include the following:

- Diverted stream flows;
- Uncontaminated groundwater infiltration (as defined at 40 CFR 35.2005(20));
- Uncontaminated pumped groundwater;
- Foundation drains;
- Water from crawl space pumps;
- Footing drains; and
- Flows from riparian habitats and wetlands.

When inspecting private drainage connections to the storm drain system, this form shall be used by the inspector to ensure that the connection remains in compliance with the current SOP. The inspector has the right to enter and inspect the premises where the private drainage connection is located, including any tanks, storage areas, or rooms that may discharge or be caused to discharge to the connection. The inspector also has the right to sample or monitor any substances or parameters at any location for purposes of assuring compliance with the Private Drainage Connection Agreement or as otherwise authorized by the Clean Water Act. In addition, the inspector has the right to have access to and copy any records required to be kept under the terms and conditions of the Agreement.

General Information

Address of Connection			
Private Drainage Description			
Inspector’s Name			
Date of Inspection		Date of Last Inspection	
Start Time		End Time	

Compliance Review

Each of the following conditions should be evaluated as “True” during the on-site inspection to demonstrate compliance. If any of the following conditions, as recorded during the inspection, are not satisfied (i.e., if the evaluation is “False”), the drainage connection shall be considered to be in violation of the original connection Agreement.

Prior to the Inspection

The inspector shall review the following questions prior to completing the on-site inspection.

Condition	Evaluation	Comment
A covenant for the property to reflect the drainage connection has been recorded at the Registry of Deeds	True <input type="checkbox"/> False <input type="checkbox"/>	
Record drawings documenting the location of the discharge were supplied to the municipality after construction.	True <input type="checkbox"/> False <input type="checkbox"/>	
If property has an oil/water separator: evidence of annual maintenance of oil/water separator was provided to municipality in previous period	True <input type="checkbox"/> False <input type="checkbox"/>	
If property was required to complete analytical monitoring: results of analytical testing of discharge provided to municipality in previous period.	True <input type="checkbox"/> False <input type="checkbox"/>	
Other:		

During the On-Site Inspection

The inspector shall make the following observations during the on-site inspection and note the results in the table.

Condition	Evaluation	Comment
The drainage connection is used for the discharge of stormwater only	True <input type="checkbox"/> False <input type="checkbox"/>	
The discharge is visibly free of oil or other pollutants.	True <input type="checkbox"/> False <input type="checkbox"/>	
Grey water/black water is not visibly present in the discharge	True <input type="checkbox"/> False <input type="checkbox"/>	
Sediment-laden surface water is not visibly present in the discharge	True <input type="checkbox"/> False <input type="checkbox"/>	
Flow from the connection does not exceed approved flow	True <input type="checkbox"/> False <input type="checkbox"/>	
No prohibited fixtures are connected to the municipal system from the property	True <input type="checkbox"/> False <input type="checkbox"/>	
If a pump has been approved: the pump presently utilized is the same as the pump approved by the municipality.	True <input type="checkbox"/> False <input type="checkbox"/>	
If required in original Application: backflow preventer, cleanout, and shutoff device remain operational and easily accessible to municipality	True <input type="checkbox"/> False <input type="checkbox"/>	
Other:		

Review of Compliance with Private Drainage Connection Policy

If any of the following conditions is applicable, as recorded during the inspection, the municipality shall have the right to revoke approval of the private drainage connection.

<input type="checkbox"/>	There is inadequate capacity of the drainage system to manage flow from the connection.
<input type="checkbox"/>	The private drainage includes flow from municipal users or sources.
<input type="checkbox"/>	The stormwater outfall managing the property flow discharges to a water body identified as impaired in the most current of the Integrated List of Waters (303(d) list) or is subject to stringent local controls.
<input type="checkbox"/>	The connection is located within 100 linear feet of a subsurface wastewater disposal system, such as a septic system.
<input type="checkbox"/>	The connection is located within a public drinking water Zone I.
<input type="checkbox"/>	The connection is located in a public drinking water supply Zone II, and the water department or district has not approved of the connection in writing.
<input type="checkbox"/>	Flow conveyed to the discharge creates a safety hazard such as ponding or freezing to vehicular, pedestrian, bicycle, or other transportation, or creates erosion or the potential for erosion.
<input type="checkbox"/>	The connection jeopardizes public health, safety, or natural resources.
<input type="checkbox"/>	The connection fails to meet the terms and conditions of the SOP.

Non-Compliance Actions

The municipality shall provide the property owner with written notice of the violation with corrective action to be taken. The property owner shall have thirty days from the receipt of the notice to commence curative action of the violation.

Attachments

1. SOP PL-3 Constructed BMP Inspection Forms

Related Standard Operating Procedures

2. SOP PL-2 Construction Site Inspection
3. SOP PL-3 Inspection of Constructed Best Management Practices

Governing Laws

Approval Date: June 30, 2019

Source: *Central Massachusetts Regional Stormwater Coalition*

SOP HW-1: 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 an 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; and/or
- optical enhancers, fluorescent dye added to laundry detergent.

Each catch basin should be cleaned and inspected annually at a minimum, and at any time when the structure has reached 50% of capacity. 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) including the depth of sediment

and the full depth of the sump to help identify problematic structures that may require more frequent cleaning.

Catch basin inspection and cleaning procedures include the following:

1. Work upstream to downstream within each system.
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. Remove material with clam shovel truck.
7. If contamination is suspected, chemical analysis will be required to determine if the materials comply with the New Hampshire Department of Environmental Services (NHDES) Hazardous Waste Regulations, RSA 147-A (<http://www.gencourt.state.nh.us/rsa/html/NHTOC/NHTOC-X-147-A.htm>). 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 ID-3: Addressing Illicit Discharges").
11. At the end of each day, document location and number of catch basins cleaned, volume of waste collected, and disposal method for all screenings.
12. Report additional maintenance or repair needs to the appropriate department.

Storage of Screenings

Screenings from catch basin cleaning are to be stored in a manner so as not to allow resuspension of the screenings in stormwater or flow into the local stormwater system or surface waters, including roadside ditches and swales.

Disposal of Screenings

The Town has a local lab perform grit analysis on catch basin cleanings from stormwater drainage systems before material is hauled to E.S.M.I. in Loudon, NH to be incinerated. NHDES 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.

Screenings may need to be placed in a drying bed to allow water to evaporate before proper disposal and reduce tipping fees. In this case, ensure that the screenings are managed to prevent pollution.

Attachments

1. SOP HW-1 Catch Basin Inspection Form

Related Standard Operating Procedures

1. SOP ID-3 Addressing Illicit Discharges
2. SOP ID-4 Water Quality Screening in the Field
3. SOP HW-2 Street Sweeping Procedures

Governing Laws

40 CFR 122.26

2017 NH Small MS4 Permit Part 2.3.7.1.d.ii && iv

Approval Date: June 30, 2019

Source: Central Massachusetts Regional Stormwater Coalition

**Town of Pelham, New Hampshire
Highway Department**

Job No.: _____ Town: _____
 Inspector: _____ Date: _____

SOP HW-1 CATCH BASIN INSPECTION FORM

Catch Basin I.D.		Final Discharge from Structure? Yes <input type="checkbox"/> No <input type="checkbox"/> If Yes, Discharge to Outfall No: _____
Catch Basin Label:	Stencil <input type="checkbox"/> Ground Inset <input type="checkbox"/> Sign <input type="checkbox"/> None <input type="checkbox"/> Other _____	
Basin Material:	Concrete <input type="checkbox"/> Corrugated metal <input type="checkbox"/> Stone <input type="checkbox"/> Brick <input type="checkbox"/> Other: _____ <input type="checkbox"/>	Catch Basin Condition: Good <input type="checkbox"/> Poor <input type="checkbox"/> Fair <input type="checkbox"/> Crumbling <input type="checkbox"/>
Pipe Material:	Concrete <input type="checkbox"/> HDPE <input type="checkbox"/> PVC <input type="checkbox"/> Clay Tile <input type="checkbox"/> Other: _____ <input type="checkbox"/>	Pipe Measurements: Inlet Dia. (in): d= ____ Outlet Dia. (in): D= ____

Required Maintenance/ Problems (check all that apply): <input type="checkbox"/> Tree Work Required <input type="checkbox"/> New Grate is Required <input type="checkbox"/> Pipe is Blocked <input type="checkbox"/> Frame Maintenance is Required <input type="checkbox"/> Remove Accumulated Sediment <input type="checkbox"/> Pipe Maintenance is Required <input type="checkbox"/> Basin Undermined or Bypassed	<input type="checkbox"/> Cannot Remove Cover <input type="checkbox"/> Ditch Work <input type="checkbox"/> Corrosion at Structure <input type="checkbox"/> Erosion Around Structure <input type="checkbox"/> Remove Trash & Debris <input type="checkbox"/> Need Cement Around Grate Other: _____
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Catch Basin Grate Type: Bar: <input type="checkbox"/> Cascade: <input type="checkbox"/> Other: _____ Properly Aligned: Yes <input type="checkbox"/> No <input type="checkbox"/>	Sediment Buildup Depth: 0-6 (in): _____ 6-12 (in): _____ 12-18 (in): _____ 18-24 (in): _____ 24 + (in): _____	Description of Flow: Heavy <input type="checkbox"/> Moderate <input type="checkbox"/> Slight <input type="checkbox"/> Trickling <input type="checkbox"/> <input type="checkbox"/>	Street Name/ Structure Location:
---	---	---	---

*If the outlet is submerged check yes and indicate approximate height of water above the outlet invert. h above invert (in):_____			Yes <input type="checkbox"/>	No <input type="checkbox"/>
<input type="checkbox"/> Flow <input type="checkbox"/> Standing Water (check one or both)	Observations:		Circle those present:	
	Color:		Foam	Oil Sheen
	Odor:		Sanitary Waste	Bacterial Sheen
Weather Conditions:		Dry > 24 hours <input type="checkbox"/>	Wet <input type="checkbox"/>	Orange Staining
Sample of Screenings Collected for Analysis?		Yes <input type="checkbox"/>	No <input type="checkbox"/>	Excessive sediment
Comments:		Other:_____		

SOP HW-2: Street Sweeping Procedures

Introduction

Street sweeping is necessary for vehicle and pedestrian safety, street maintenance, surface water quality and environmental concerns. The Town will provide such service in a cost-effective manner, keeping in mind safety, budget, personnel, and environmental concerns. The Town will use Town employees and equipment and private contractors (if applicable) to provide this service. Completion dates are dependent on weather conditions, personnel, and equipment availability. The Highway Agent or his/her designee will be responsible for scheduling.

Operations

the Town of Pelham uses private contractors for street sweeping. Street sweeping will begin when streets are significantly clear of snow and ice, usually in April, after the significant risk of later snowfall and freezing of the water from the sweepers has passed. Street sweeping operations generally take about 170 hours over 40 days, collect roughly 305 cubic yards of material, and is typically completed by June.

Priorities

- **Stormwater Management:** Priority will be given to areas draining into the higher priority water bodies as determined by the Town's Stormwater Management Program. These areas will be swept on a priority basis throughout the year to comply with the EPA National Pollutant Discharge Elimination System (NPDES) Phase II New Hampshire Small Municipal Separate Storm Sewer System (MS4) General Permit.
- **Downtown:** The core of the downtown and municipal parking lots inclusive in this area are swept once per year. Areas within the Long Pond MS4 area must be swept at least twice per year, once in the spring following winter maintenance activities, and once in the fall after leaf drop is over.
- **Arterial Streets:** The streets in the remainder of the town outside of the downtown district are swept once per year. This takes several months and concludes approximately at the end of July to beginning of August. Second sweeps are conducted if severe weather events require or the Highway Agent or his/her designee determines it is necessary.
- **School Parking Lots:** School parking lots are swept by private contractor during the spring break in April.
- **Citizens Request:** Citizens requests for sweeping will be evaluated and the Highway Agent will determine the necessity and priority.

- **Construction Debris:** Erosion/siltation dirt and debris cleanup from construction projects is the responsibility of the developer, contractor, or property owner. Except in cases of emergency the streets shall be cleaned and swept by the developer, contractor, or property owner within twenty-four (24) hours of notification. If the streets are not swept within the specified time allowed, or in the case of an emergency, then the Town may sweep the street and the responsible party will reimburse the Town for all associated costs.
- **Porous sidewalks** must be swept twice per year in the spring and fall.
- **Sidewalks:** The Town identifies sidewalks in the downtown and arterial streets requiring sweeping and sweeps once after the risk of snow has passed, and they are cleared of snow and ice or on an as-needed basis.

Procedures

Sweeping is a slow process with average gutter line speeds for the first sweeping in spring that can be as slow as 2 to 3 miles per hour. The Town utilizes private contractors. Normally center lines are swept after gutter lines are cleaned. Equipment may include mechanical, vacuum, or regenerative air sweepers.

Sweeping operations will be conducted when weather conditions permit. Factors that may delay sweeping operations include: temperatures below 32-degrees Fahrenheit, wind, rain, snow and frozen gutter lines.

Sweeping operations are performed in conjunction with and can be impacted by other maintenance operations. Sweeping operations will normally be conducted Monday through Friday, from 7:00 a.m. to 3:00p.m. Extended workdays and shift changes may be utilized for spring cleanup or emergency sweeping to provide maximum efficiency.

Storage of Screenings

Screenings from street sweeping are to be stored in a manner so as not to allow resuspension of the screenings in stormwater or flow into the local stormwater system or surface waters, including roadside ditches and swales.

Disposal of Screenings

Screenings from street sweeping may be disposed at any landfill that is permitted by NHDES to accept solid waste or may be used a road base or for other uses allowed by NHDES. NHDES does not routinely require street sweeping cleanings to be tested before disposal, unless there is evidence that they have been contaminated by a spill or some other means.

Screenings from street sweeping may be reused provided that there is no visual evidence of litter, animal waste, or petroleum contamination.

Screenings may need to be placed in a drying bed to allow water to evaporate before proper disposal and reduce tipping fees. In this case, ensure that the screenings are managed to prevent pollution.

Catch Basins and Surface Waters

Street sweeping may not be purposefully swept into or directed toward catch basins or surface waters. Cleaning of catch basins should follow local street sweeping operations.

Yard Waste

It is the responsibility of residents to keep their neighborhood streets free of excessive yard waste and other debris. The Town does not provide street sweeping of leaves left in the gutter. Residents are not to sweep their leaves to the gutter in the expectation of the sweepers collecting them. Leaving yard waste and other debris in the street can clog the storm water system during heavy rains, degrade water quality, cause flooding problems, and possibly damage homes.

Attachments

Related Standard Operating Procedures

1. SOP HW-1 *Catch Basin Inspection and Cleaning*
2. SOP HW-3 *Winter Maintenance Procedures – Snow Removal and Ice Control*

Governing Laws

2017 NH Small MS4 Permit Part 2.3.7.1.d.iii & iv

Approval Date: June 30, 2019

Sources: *Town of Andover [MA], Street Sweeping Standard Operating Procedure, 2009*

Guidelines and Standard Operating Procedures, Illicit Discharge Detection and Pollution Prevention/Elimination and Good Housekeeping for Stormwater Phase II Communities in New Hampshire. New Hampshire Estuaries Project, November 2006.

SOP HW-3: Winter Maintenance Procedures – Snow Removal and Ice Control

Introduction

It is the goal and intent of the Town of Pelham to provide timely, efficient, and cost-effective winter maintenance, snow removal, and ice control on the roadways of the municipality for the safety and benefit of the town's residents and the general motoring public.

Procedure

The objective stated above will be achieved by implementation and execution of the procedures and tasks outlined in the Town of Pelham Winter Operations Snow Removal and Ice Control Procedures. Due to the many variables that are inherent in New England weather, each storm and/or weather event will require slightly different effort and/or emphasis on any number of maintenance tasks, which together, determine the overall winter maintenance, snow removal or ice control strategy.

Level of Service

It is not possible to maintain a snow and ice-free black road or sidewalk during a storm. It is the intention of the Town of Pelham to provide practical, safe access to homes, business and municipal facilities during winter storms within the confines of physical and budget limitations.

It is our policy to start snow removal operations upon accumulation of 1-inch of snowfall. The Highway Agent or his designee may, at his discretion, based on weather information reports, elect to not remove snow until a greater or lesser accumulation.

Pre-treatment and ice control may be addressed prior to the actual snow beginning, during the actual storms as seen effective, and after the storm. It should be noted that salt has a much slower effect on melting snow and ice at temperatures below 25-degrees Fahrenheit and may not be applied without additives until it is warmer.

Sidewalk snow clearance will be conducted as soon as possible during winter storms. Personnel availability and the needs to maintain roadways will take priority.

Command

Direction of all winter maintenance activities for the Town of Pelham is vested with the Highway Agent, the Lead Foreman, or their designee.

Execution

The policy outlined above is intended to serve as the normal operation procedures for winter maintenance, snow removal and/or ice control for the Town of Pelham. One or more of the

following, which may delay or prevent the implementation of this policy, may affect all or any part of this policy.

1. Equipment Breakdown
2. Snow accumulation in excess of 1-inch per hour
3. Traffic Congestion
4. Emergencies
5. Personnel illness
6. Extensive long drawn out storm, with an exhausted crew

Equipment

The Highway Department utilizes all the assets needed to address snow emergencies. A list of the current rolling stock assets is available from the Highway Department.

Routes

Currently, the town is divided into 10 to 12 plow routes. The town owns five 6-wheel dump trucks with wings, one 10-wheel dump trucks with wings, and two 1-ton dump trucks, all with mounted power sanders and front plows. Three town pickups, specialty equipment, and hired equipment when necessary complete the snow and ice fighting equipment.

Manpower

The town has nine full-time and one part-time employees assigned to its winter maintenance operations. In addition, private contractors are also used to plow town roads and parking lots.

Materials

In an average winter, the department, uses approximately 3,000 tons of salt and 1,900 tons of sand each season. The sand is used as an abrasive for dirt roads and is applied to improve the public's motor vehicle traction. On paved roads sand is mixed with salt and tightly spread as close to the middle of the road as traffic allows, creating liquid super salt brine. The Department employs salt and calcium chloride as de-icing and anti-icing agents. In "no salt zones" sand is directly sprayed onto the road. Our sand supply is bid each year and is trucked to our storage area following bid requirements throughout the winter season. Rock salt is purchased from a supplier as needed and our storage facility can store approximately 600 tons of salt and 600 tons of salt/sand mix. All salt and sand (and mixed material) is stored inside a building under cover.

Unless weather conditions require a different approach, winter maintenance routes are usually treated with salt or a mixture of sand and salt. The mixture is maintained at minimum of one-part salt to three-parts sand. The mixture is applied as close to the center of the roadway where traffic can work the mix traveling either way. The mixture, in conjunction with traffic action, creates a watery brine melting snow and/or ice, and resisting snow and ice packing on the roadway. The

road crown further assists with the spreading of the mixture brine. Sand/salt is only effective to approximately 20-degrees Fahrenheit.

LOW SALT USE: The Town has established certain roadways or portions of roadways as low-salt use areas to protect drinking water resources or other natural resources. A low salt area is one in which the municipality has determined it will use a lower concentrate of salt as part of its ice control efforts for winter maintenance. The Town posts such areas to warn traveling motorists that they are in a low-salt area.

SALT FREE AREAS: The Town has established certain roadways or portions of roadways as "salt-free" areas to protect drinking water resources or other natural resources which is believed to have been damaged in the past due to roadway salt. A "salt-free" area is one in which the municipality has determined it will not use salt as part of its ice control efforts for winter maintenance. The Town posts such areas to warn traveling motorists that they are in a "salt-free" area. Gravel roads will not be treated with salt at any time. (This is to prevent the frozen gravel from melting).

Communications

The Highway Department rolling stock is equipped with two-way radios capable of transmitting and receiving. Each vehicle is assigned a unique call number. Most private contractors working for the town, communicate with Highway Department using cell phones. The Highway Department maintains communications both from our garage and Pelham Communications during winter emergencies.

Snow Emergencies

Snow emergency may be instituted by the Town Administrator in consultation with the Highway Agent and concurrence of the Police Chief in the event of a predicted or on-going severe winter snowstorm.

1. Contact Police Chief for concurrence with implementing the emergency.
2. Notify the Town Administrator.
3. Draft News Release on public works stationary.
4. Call or email details to:

Pelham Public Access TV *jgreenwood@pelhamweb.com*

Town Web Site Manager *bdemurs@pelhamweb.com*

Police Department *Call Dispatch 603-635-2411 (select Option 1)*

Sample News Release

NEWS RELEASE - DATE

The Town of Pelham has instituted a SNOW EMERGENCY and PARKING BAN, which will begin 9:00pm on Friday January 3rd and remain in effect until 9:00 am Saturday, January 4th. Vehicles parked on or alongside town streets during this period will be towed at the owner's expense.

Schools

The school district manages snow removal and winter surface treatments directly using private contractors. The school superintendent or designated official representative along with the school bus company's representative confers with the Highway Department to discuss the condition of the municipality's roads in order to determine the safety of students using buses, this is done prior to 5:30AM. The school representative shall make the decision to cancel or delay school opening for the day.

Parking

The town has enacted a winter parking ban effective from November 1st to April 1st of each year. This ban prohibits parking in or on the town's roads or right of way. The Town has the right to tow at the owner expense. The purpose of the winter parking ban is to allow winter maintenance crews unobstructed snow removal and ice control routes, as much as possible, to maintain the maximum effectiveness of their efforts.

Plow Route Priorities

With a total of approximately 105 miles of town roads from which to remove snow and ice and 20 pieces of equipment to handle this responsibility. The Highway Department has to assign priorities for winter maintenance route activity in order to maximize the effectiveness of their efforts for the motoring public.

School bus routes will be given the first priority during school days. Each plow route will ensure that the best possible snow clearance will be completed within one half hour of bus route time.

Public parking areas at the Town Office, Town Hall, Library, Police Station, and both Fire Stations will be maintained by plowing during the winter storm. The application of slip resistant materials will be applied after the storm as determined by the Highway Department or his designee.

Roads and Other Areas Not Receiving Winter Maintenance

The Town of Pelham does not maintain a number of roadways and other areas as part of the ongoing winter maintenance activities. The areas not maintained by the Town include:

- A. Town roads classified as Class VI roads.
- B. Private Roads

Transfer Station / Recycling Center

Transfer Station personnel may be required to assist with the town's general winter maintenance operations. If the facility is open during the snow or ice storm, personnel will plow this area prior to opening for public use. Public areas shall be kept as clear as possible to provide as safe access as is reasonably possible. Sand and other slip resistant materials shall be used in public areas.

Snow Storage (Banks and/or Piles)

Snow shall not be piled or plowed into surface water or stormwater devices (swales, detention ponds, etc.). To the maximum extent practical, snow storage areas should not be located on impervious surfaces, in vegetated buffers, or adjacent to surface waters.

The following guidelines should be overserved relative to the storing and/or banking of removed/plowed. No snow should be stored or banked within:

- 25-feet of a surface water;
- 75-feet of a private water supply;
- 200-feet from community water supply; and
- 400-feet from municipal wells.

Snow storage areas should be kept free of trash and debris. At a minimum, trash and debris should be removed from planned snow storage areas prior to the winter season and following snow melt in the spring.

Damage to Private Property

It should be noted that the municipality isn't held responsible for damage to private property that is located within the public right-of-way. The right of way (ROW) is often 50-feet wide and is often confused by property owners as their own property. In most cases, the ROW extends 10- to 20-feet on either side of paved or gravel roads. Homeowners cultivate extensions of their lawns, place mailboxes, erect fences or stonewalls in these areas, and is obstructive to a good maintenance needed to be conducted on the roadway.

Homeowners should not put bark mulch, crushed rock, stone walls, fences (visible and invisible), irrigation systems, trees or lawns in the town right-of-way. The town is not liable for damage that may occur to property in its right-of-way. Many items interfere with heavy equipment and become

a hazard for vehicles and pedestrians. They can also cause drainage failures, and thereby road deterioration.

Location of Mailboxes

Mail and newspaper boxes are allowed, at the owner's risk, within the right-of-way for the purposes of convenience. United States Postal bulletin 22102 states; *"The Postal Service suggests using a semi-arch or extended arm support which allows snowplows to sweep near or under mailboxes without damaging supports and provides easy access to the mailboxes by carriers and customers"*. Please refer to the town's recommended policy on mailbox placement.

The following suggestions are for reducing the possibility of damage and liability:

- whenever possible, mailboxes should be installed at least 3-feet from the edge of pavement; and
- installation should be sufficiently sturdy to withstand the weight of heavy snow resulting from plowing operations.

Parking Ban

Pursuant to the provisions of RSA 41:11 and RSA 47:17, the following regulation has been adopted by the Town of Pelham. It shall be unlawful for any vehicle to be parked upon or adjacent to the street of the Town of Pelham so as to obstruct snow plowing and or snow removal operations between November 1 and the following April 1. Any vehicle obstructing such snow plowing and/or snow removal operations may be towed by the Town of Pelham without notice to the owner, and at the expense of the vehicle owner, unless exempt by the Pelham Highway Department.

Post Storm Operations

As determined by the Highway Agent or his designee, the snowbanks resulting from previous accumulations shall be pushed back, or shelved, using the plow and wings of dump trucks, grader, or other suitable equipment to make space for future snowstorms.

Sidewalk Snow Removal

Sidewalk snow plowing will be done as soon as possible within the limitations of manpower, equipment, and storm size. If there are insufficient personnel available to conduct sidewalk snow removal operations, as well as street and road clearance, the streets and roads shall take priority. The sidewalks will be treated with salt or sand as quickly as possible after the storm. Sidewalks are generally plowed in one sweep taking one day for typical snow events.

Obstructing Roads and Sidewalks

This is prohibited by law and can cause a serious hazard. No person, firm, or corporation engaged in the operation of snow plowing, blowing, or removing shall allow or cause any accumulation of

snow to obstruct or impair any town-maintained street, roadway, sidewalk, parking lot or right-of way, unless such operations are approved by the Highway Agent.

Enforcement

Any person who violates the provisions of this will be guilty of a violation, subject to a \$100.00 fine. Subsequent offenses shall be subject to a fine of up to \$500.00.

Attachments

Related Standard Operating Procedures

1. SOP HW-X, *Salt Use Reduction Plan* (to be completed Year 2)

Governing Laws

RSA 41:11, RSA 47:17, RSA 231:92-a, and RSA 507-B:2-b
2017 NH Small MS4 Permit Part 2.3.7.1.d.v

Approval Date: June 30, 2019

Sources: *Snow Removal and Ice Control – Standard Operating Procedure, Town of Amherst, New Hampshire, 2017*
Snow Plowing and Snow Removal, Standard Operating Procedures, Exeter New Hampshire, 2011
Standard Operating Procedures, Weare, New Hampshire, Snow Removal and Ice Control, 2004
Guidelines and Standard Operating Procedures, Illicit Discharge Detection and Pollution Prevention/Elimination and Good Housekeeping for Stormwater Phase II Communities in New Hampshire. New Hampshire Estuaries Project, November 2006.

APPENDIX A

Definitions

In an effort to avoid confusion, the following standardized terminology is established. When directed to do so, operators will perform winter maintenance tasks in accordance with these definitions.

Across Town Roads: Pushing snow from one side to the other where snow would be deposited within the Right of Way of any road.

Cleanup: Clean-up and push back all roads. Clean-up intersections; turn arounds, Route and cul de sacs. Some areas may require more than one pass.

Drags: May be requested to do side streets.

Open: Keeping the center of roads open; not spending a lot of time clearing route intersections or turn arounds. This normally will be requested while snow is falling and there is a need to finish the drivers' routes in as short a time as possible. (One inch per hour would result in three to four inches of snow at the beginning of routes before a truck gets back to it.)

Open Full: Making extra passes at Routes/intersections to allow vehicle traffic to flow better. This is also aimed at getting the whole route done in as short a time as possible.

Push/Back: After several large storms it may be necessary to send a truck or the grader out to shelf or back snow win rows. A loader will normally go along to clean up driveways and intersections.

Sand Roads: Roads will be spread with "straight" sand over the travel width of a gravel road. It may be necessary to spread in both directions to get a complete coverage.

Slush Off: Scrape off any snow/ice that has loosened up from treating with salt. Normally it will require one pass each way unless advised to slush off and clean up.

Traveled Portion: Any part of the roadway in which vehicles would travel or within the shoulders of said roadway.

Treat Mains: The treating of just the high traffic volume roads. Depending on conditions, drivers

Treat Roads: Roads spread with salt and or a mixture of sand and salt. The proportion of the sand/salt mixture will be determined by the Road Agent or his or her designee. Mixture will be spread along the centerline of the roadway in a width of two to four feet.

Treat Route: The spreading of salt and or a sand/salt mix on all roads, in such a manner that one backtracks as little as possible.