

**INSPECTION AND MAINTENANCE MANUAL  
FOR STORMWATER MANAGEMENT AND  
RELATED STORMWATER FACILITIES**

**WINDHAM PRIMARY SCHOOL SITE  
IMPROVEMENTS PROJECT  
WINDHAM, MAINE**

**PREPARED FOR:**

**RSU #14  
WINDHAM CENTER ROAD  
WINDHAM, MAINE 04062**

**PREPARED BY:**

**STANTEC CONSULTING SERVICES INC.  
482 PAYNE ROAD  
SCARBOROUGH, MAINE 04074  
(207) 883-3355**

**REVISED APRIL 2016**

## **TABLE OF CONTENTS**

<b><u>SECTION</u></b>	<b><u>DESCRIPTION</u></b>	<b><u>PAGE</u></b>
I.	<u>INTRODUCTION</u> .....	1
	A. Guidelines Overview.....	1
II.	<u>PROJECT OVERVIEW</u> .....	2
III.	<u>STANDARD INSPECTION/MAINTENANCE DESCRIPTIONS</u> .....	3
	A. Pond or Filter Overflow.....	3
	B. Control Structures.....	5
	C. Filter Berms .....	6
	D. Stormwater Inlets.....	7
	E. Tributary Drainage System.....	9
	F. Vegetated Swales.....	11
	G. Pond or Filter Lining .....	12
	H. Sorbent Booms.....	12
	I. Water Quality Filters .....	13
	J. Parking Lot Cleaning.....	15
	K. Litter .....	15
	L. Summary Checklist.....	15
IV.	<u>PROGRAM ADMINISTRATION</u> .....	15
	A. General.....	15
	B. Record Keeping .....	16
	C. Contract Services.....	16

## **APPENDICES**

Attachment A – Sample Inspection Logs

Attachment B – Permits for Project

Attachment C – Summary Checklist for Inspection and Maintenance

## I. INTRODUCTION

Relatively complex stormwater management facilities are commonly installed in development projects including school campuses, commercial facilities, and many other developments. The complexity and goals of these systems vary with the nature of the receiving water, as well as the type of development. Runoff from developed areas of the project, including rooftops, paved or lawn areas, may contain materials that can impact the receiving waters. Source control and the installation of wet ponds, infiltration galleries, green infrastructure and water quality units, often combined with pretreatment measures or followed by vegetated buffer strips and other best management practices, can significantly reduce the non-point pollution discharge from the developed area. These measures are particularly important to projects in the watersheds of sensitive water bodies, or projects with potential impacts to groundwater. With the increased cost of land and development, there is an increased tendency to construct portions of the stormwater management systems underground or to provide multifaceted management systems.

The effectiveness of water quality management provisions and other components of the stormwater management system are dependent on their design, upkeep, and maintenance to assure they meet their intended function over an extended period of years. It is critical that the stormwater management facilities are regularly inspected, and that maintenance is performed on an as-needed basis. It must also be recognized that the effectiveness of these facilities, and their maintenance requirements, are related to the stormwater drainage facilities that collect and transport the flow to the ponds or treatment measures. Thus, maintenance should be directed to the total system, not just the pond or primary stormwater management facility. The MeDEP Stormwater Permits now require a 5-year inspection report.

The purpose of this document is to define, in detail, the inspection and maintenance requirements deemed necessary to assure that the stormwater management facilities function as intended on a long-term basis. Subsequent sections identify individual maintenance items, give a brief commentary of the function and need for the item, a description of the work required, and a suggested frequency of accomplishment. While the suggested programs and schedules must be adapted to specific projects, the material presented should provide guidance for a successful long-term program.



### A. GUIDELINES OVERVIEW

A summary of the individual components of stormwater management facilities has been prepared. The format used in the summary is as follows:

Preface: A general description of what function/benefit the element is intended to provide. This is a short summary and not intended to provide the design basis which can be found in other sources.

Inspection: This section provides the inspection requirements for the individual component.

Maintenance: The section provides general information on the routine maintenance requirements of this element.

Frequency: This section outlines the best judgment of the designer on the system to the frequency of maintenance.

Comments: This section provides any particular comment on the site-specific features of this element. This is a summary only. The owner/operator should review the design drawings and documents carefully to understand the particular elements of the project. The end of this section should allow for the owner/operator to make notes on the specific program. This may include the selected maintenance procedure, cross-references to applicable design drawings, etc.

A list of the individual inspection/maintenance elements is provided in the table of contents. The guidelines are proposed for initial use with adjustments made as appropriate based upon specific project experience.

## **II. PROJECT OVERVIEW**

Key permits issued (or applied for) on the project include:

- MeDEP Site Location of Development Permit
- Town of Windham Site Plan Approvals

The permit applications for the project include the design information for the stormwater system.

A copy of the permits and Stormwater Management Report should be appended to this manual as Appendix B. The Owner/Operator of the stormwater management system should review these permits for a general description and background of the project, as well as any specific permit conditions or requirements of the project.

The applicant has retained Stantec Consulting Services Inc. (formerly DeLuca-Hoffman Associates, Inc.) for civil engineering for the proposed site improvements at the Windham Primary School. Stantec has prepared the design for the stormwater management facilities for this project and may be contacted at:

Stantec  
482 Payne Road  
Scarborough, Maine 04074  
(207) 883-3355

It is recommended any particular questions on the design intent or similar issues be directed to the designer of the system.

The applicable plans/design documents which apply to the project are:

1. Civil Site Plans/Permit Applications
2. The Erosion Control/Sedimentation Control Plan for the project.
3. The Stormwater Management Plan for the project.

4. O&M Stormwater Maintenance Drawing for the project.

A copy of these documents should be retained with the manual.

### **III. STANDARD INSPECTION/MAINTENANCE DESCRIPTIONS**

The following narratives describe the inspection/maintenance provisions for the Stormwater Management area. These O&M procedures will complement scheduled sweeping of the pavement areas anticipated to occur at least twice per year. The MeDEP will require the stormwater system be certified to meet the basis of design at five year increments. Proper O&M is necessary to make sure the system can be certified.

#### **A. POND OR FILTER OVERFLOW**

Preface: The stormwater water quality facilities proposed for the project include three above ground underdrained soil water quality filter systems. When storm events occur, the filter is saturated and begins to pond. As the storm continues, water in the filter is displaced by the entering flow with peak inflows attenuated. The filters include hydraulic control structures at the discharge which will be designed to attenuate flows which enter the filter and release it at a slower rate is provided. If the filter surcharges beyond the 25 year design stage, excess flow would be discharged to an emergency overflow spillway channel which will overtop the filter at the area designated as the emergency overflow channel.

Inspection: The outlet control structure has been designed to regulate the discharge from storm events. Therefore, flow is anticipated to be released during and after each storm event. The control structure will be designed to be inspected by removing the manhole covers and inspection of the orifice and channels. Debris should be removed whenever observed. Entry may require CONFINED SPACE ENTRY procedures and appropriately trained personnel.

The overflow channel (emergency spillway) will be designed to operate infrequently but it is important to assure that it is operable as intended. The channel will need to be inspected to assure the surface is stable and has not been eroded or damaged. The area should be inspected to note any larger brush or trees which could become established in the spillway channel and outlet pad.

Maintenance: Requirements for the spillway should be limited. Any brush or trees which become established near the spillway should be cut and kept in a cropped condition. Any debris which may accumulate in the channel should be removed.

Frequency: The spillway should be inspected on an annual basis, and after a high intensity rainfall event (in excess of 3 inches in a 24-hour period). Maintenance should be conducted on an as needed basis.

The outlet control structure should be inspected quarterly or if any unusually slow drawdown in the filter is observed.

Maintenance/Inspection Responsibility:

Inspection Personnel: The inspection is anticipated to be performed by maintenance personnel who will perform the minor maintenance/ inspection. Although the inspection will be recorded as made, any observations made/concerns, observations should be entered in the records maintained by the Owner. The spillways should be observed and debris removed during the annual inspection.

Special Services: Major repairs would need to be addressed on a case-by-case basis by contracted personnel.

Replacement Parts/Repairs: Material for repairs would be loam and seed or rip rap as appropriate for channels. No unusual parts are anticipated for the outlet manholes.

Comments: None.



**EMERGENCY OVERFLOW CHANNEL – FLOWS ARE CONVEYED  
VIA RIP RAP CHANNEL TO STABILIZED AREA OR STREAM**

Inspection: There are inspection ports that should be checked semi-annually to make sure that water is not ponded due to blockage.

Maintenance: The upstream measures are intended to reduce and presumably eliminate maintenance cleanings. Major cleaning would likely require excavation of the system although some success has been reported with fire flow flushing.

## B. CONTROL STRUCTURES

Preface: The proposed filters for the Windham Primary School site will also serve as a limited detention which is controlled by the outlet control structure.

Inspection: The outlet control structures must be inspected to assure they maintain their intended hydraulic characteristics. The inspection would note any debris or sediment which may accumulate in the structure and in the incoming and outlet pipes. It is noted that it does not take much debris or silt to alter the hydraulic characteristics of the discharge. The inlet should be inspected to assure it is not blocked or restricted or there is sediment to the extent that its flow characteristics may be altered.

Maintenance: Maintenance of the control structure will consist primarily of removing debris which may accumulate.

Frequency: The control structure should be inspected quarterly, and after a high intensity rainfall event (in excess of 3 inches in a 24-hour period). Debris and silt should be removed during each inspection.

### Maintenance/Inspection Responsibility:

Inspection Personnel: The Maintenance Personnel of the Windham Raymond RSU 14 School District will perform the scheduled maintenance/inspection.



**OUTLET CONTROL STRUCTURE – NOTE STRUCTURE (ABOVE CULVERT) HAS BEEN BACKFILLED TO ALLOW ACCESS, HOWEVER DOES NOT CREATE AN EYESORE OF A RAISED STRUCTURE.**

Dates of Inspections, maintenance performed, and any observed problems should be noted in the logs/records maintained by the Windham Raymond RSU 14 School District.

Outside Contract Services: The outlet structure should be opened/inspected by the Maintenance Personnel of the Auburn School Department on a quarterly basis. The logs and records of inspections and maintenance of the control structures should also be reviewed by the contract agent if the Department elects to retain an outside agent for assistance.

Replacement Parts/Repairs: No normal replacement parts are repaired. Inspection personnel should have a bucket to remove debris.

The outlet control structures will be designed with underwater inlets with bar racks. A sustained rise in water level would likely be due to a blockage of the orifice at the inlet from the underdrain pipes.

### C. **FILTER BERMS**

Preface: Many times filter construction will include installation of an earthen berm or dike to contain the water. The filter is formed with both excavated slopes and constructed berms. The maintenance and monitoring discussed here applies to both the side slopes of excavated filter areas and the constructed filter berms. All excavated slopes and constructed berms must maintain their integrity to contain water without catastrophic leakage. Erosion or piping could cause filter failure. It is critical that the integrity of the berm be maintained.

Inspection: The berm must be periodically inspected to note any sag, slope sloughing, erosion, cracking, or undesirable tree growth. Any defects in the berm must be noted and documented. It is noted that on larger ponds/filters muskrats can burrow into the sidewall to the extent that the wall's structural integrity can be diminished. Filters may have occasional problems with burrowing animals.

Any noted sags, or slope sloughing should be corrected after the causative factor has been identified and mitigated. If muskrat burrows become a problem, the muskrats should be trapped and removed from the site. This should be accomplished in cooperation with wildlife officials. Some situations have occurred where burrowing animals cause a significant problem with pond integrity. While this situation is generally rare, in certain instances it may warrant placement of a barrier. Chain link fence with shallow cover has been a successful deterrent in some cases.

Frequency: Berm inspections should be done semiannually. Grassed areas along the top of the berm should be mowed monthly during the growing season. Repair of any berm defects should be accomplished in a timely manner to limit further deterioration.

Maintenance/Inspection Responsibility:

Maintenance Personnel: The Maintenance Personnel will perform the mowing/ brush removal as part of the grounds maintenance. Minor slumping or washouts will also be repaired by maintenance personnel, but should be noted in the records to determine if the problem is reoccurring. The maintenance staff should perform the annual inspection and carefully walk/inspect all fill berms.

Repairs: Minor repairs will be performed by maintenance personnel. More significant problems would require outside services on an as needed basis. If burrowing animals were to become a problem, the Owner should consult with knowledgeable professionals on remedial actions.



**POND BERM – NOTE STABILIZATION HAS OCCURRED, VEGETATION HAS CAUGHT, SLOPES AND TOP HAVE BEEN MAINTAINED. PROPER MAINTENANCE HAS LED TO A STABILIZED FACILITY**

**D. STORMWATER INLETS**

Preface: The success of any stormwater facility relies on the ability to intercept stormwater runoff at the design locations. Stormwater inlets may include catch basins, open culverts, culverts with bar screens, and field inlets. Inlets exist throughout the system at the points of collection as well as at the outlet of many ponds. Bar racks are common on many inlet locations which intercept an open channel. This section is directed at maintenance of the actual inlet point. A later section addresses more substantive maintenance of the structures and conveyance facilities. The inlets contain sumps to retain sediment and avoid discharge to downgradient areas. Sumps will fill up over time and sediment should be removed annually.

Inspection: The inspection of inlet points will need to be coordinated with other maintenance items, these include:

- Roadway/parking lot maintenance areas
- Building maintenance areas
- Grounds maintenance

The key elements of the inspection are to assure the inlet entry point is clear of debris and will allow the intended water entry.

Maintenance: The key maintenance is the removal of any blockage which restricts the entry of stormwater to the inlet. The removed material should be taken out of the area of the inlet and placed where it will not reenter the runoff collection system. Snow should be removed from inlets in parking lots/roadway areas. Grass clippings and leaves should be bagged and removed particularly near the yard inlets near the building.



**POORLY STABILIZED INLET ALLOWS ENTRANCE OF DEBRIS AND REDUCED CAPACITY**

Frequency: All inlets should be inspected on a monthly basis, and after/during significant storm events. A windshield survey is suitable for most inlets but off road inlets and pond structures require more rigorous inspection.

Maintenance/Inspection Responsibility:

Maintenance Personnel: The maintenance personnel will perform the normal maintenance/inspections of the inlets and culvert crossings.

Comments: Maintenance of inlets is critical on this project.



## **STABILIZED INLETS REDUCE DEBRIS ACCUMULATION AND MAINTAIN DESIGN CAPACITY**

### **E. TRIBUTARY DRAINAGE SYSTEM**

Preface: Stormwater from most of the project will be directed through a conveyance system which transports the flow to water quality units and the underground detention units, exfiltration beds, or the open detention pond. This conveyance system will be principally overland flow discharging to piped drain systems. Most of the sediment carried by the drainage system is intended to be trapped in the catch basins or the catch basin inserts. Maintenance of this system can play a major role in the long-term maintenance costs and the effectiveness of the filter system.

Inspection: The tributary drainage system should be periodically inspected to assure that it is operating as intended, and that its carrying capacity has not been diminished by accumulations of debris and sediment or other hydraulic impediments. On piped systems the inlets must be inspected to ensure the rims are set at the proper elevation to optimize flow entry and are not clogged with leaves or other debris. The inlet basins are normally equipped with sumps which will remove large sediment particles from the flow stream with hooded outlets.

The level of sediment in the sumps should be checked to assure their effectiveness. Pipelines connecting the inlets should be checked to determine if siltation is occurring. This will be most critical on drain lines laid at minimal slopes. This can usually be accomplished by a light and mirror procedure.

In some projects most of the stormwater is carried in open swales, channels, or ditches. These conveyance channels may be rip rapped or vegetated, depending on the gradient and expected flow velocities. These facilities must be inspected to insure debris or sedimentation does not reduce their carrying capacity. Excess vegetative growth must also be noted. The surface protection for the channels, either stone or vegetation, must be inspected to insure its integrity. Any areas subject to erosion should be noted.

Maintenance: Maintenance of the storm drainage system must assure that it continues to serve its design function on a long term basis, and that its operation does not transport excessive sedimentation to any downstream detention pond, filters, or the receiving waters. Elevations on the rim of catch basins should be adjusted as needed to assure optimal water entry. Depending on the frost susceptibility of the soil, the rims may become elevated over time causing flow to circumvent the inlet. When the filter bag in an inlet restricts capacity and is coated with silt or other deleterious materials, the bag should be removed and Catch basin cleaning would normally be accomplished with vacuum trucks contracted as a maintenance service for the retail center. The removed material must be disposed of at an approved site for such materials.

If sediment in the pipeline exceeds 20% of the diameter of the pipe, it should be removed. This may be accomplished by hydraulic flushing, or by mechanical means. If hydraulic flushing is used the downstream conditions should be analyzed. In general a sump or sediment trap should be used where it can be flushed into the detention pond, since it will reduce pond volume and hasten the time when it must be cleaned.

Frequency: The piped drainage system should be inspected on an annual basis. Adjustment of inlet rim elevations should be on an as needed basis. Cleaning catch basin sumps and pipelines will depend on the rate of accumulation.

Typically, catch basin sumps should require little maintenance because of the filter bags. Pipeline cleaning schedules will be more variable

Maintenance/Inspection Responsibility:

Maintenance Personnel: Auburn School Department.

Special Services: The owner may elect to contract with an independent agent for cleaning or replacement of filter bags, catch basins, sumps, and pipelines. Remedial source control measures may be performed by the owner or an outside service depending upon the nature of the particular situation.



**A WELL STABILIZED VEGETATED SWALE SHOWS LITTLE SIGNS OF EROSION VELOCITIES OR FLOWS. THIS SWALE ALSO FUNCTIONS AS A POND SPILLWAY**

Comments:

Maintenance of inlets is critical on this project.

## **F. VEGETATED SWALES**

Preface: Vegetated swales are often used to convey stormwater. Swales can be intended to be:

1. Mowed and maintained
2. Reverted to wetlands
3. Naturalized

Inspection: Swales should be inspected for erosion and sedimentation.

Maintenance: Eroded or silted channels need to be repaired when discovered. If erosion is a problem, the swale design should be examined. Likewise, if situation is a continued problem, the upgradient conditions should be assumed.

Frequency: It is recommended vegetated swales be inspected quarterly until vegetation is established and a year after installation. Thereafter, if no problems have been noticed, the frequency can be increased to one year.

Design Guidelines: The vegetated swale should consider channel cover at the time of concentration as well as several years after construction.

Design computations should state the assumed channel of vegetation and provide the basis for the Manning's or other roughness coefficient and for design.

Applicability: The Windham Primary School will have several vegetated swales as well as open armored channel systems.



**VEGETATED SWALE UNDER CONSTRUCTION WITH HAY BALE CHECK DAM TO REDUCE VELOCITIES**



**A WELL STABILIZED VEGETATED SWALE SHOWS LITTLE SIGNS OF EROSION VELOCITIES OR FLOWS. THIS SWALE ALSO FUNCTIONS AS A POND SPILLWAY**

#### **G. POND OR FILTER LINING**

Preface: The pond or soil filters will have low permeability clay, soil/emulsion mix, or linear low density polyethylene liner intended to minimize or avoid exfiltration of the storm water to the underlying water resource. The liner is shown on the design drawings. The record drawings for the project will reflect the type of liner installed for the project.

Inspection: Observations of substantial water level variations could indicate pond leakage. Repairs could be made using a material called ESS 13 which is a vegetable emulsion that expanded during degradation and acts similar to a radiator sealant. Contact Stantec for more information.

Maintenance: Avoid excavation of original sidewall areas or pond bottom areas. Do not install new below water piping without proper watertight boots, ripley's dams, or seals.

#### **H. SORBENT BOOMS**

Preface: During construction, sorbent booms will be installed in the catch basins which have pavement areas. The intent of these is to absorb oil and runoff from new pavement surfaces. These will be removed and replaced when construction of the project is complete and should be inspected quarterly for the first year and annually thereafter.

Inspection: The sorbent boom should be raised out of the inlet, inspected, and replaced if necessary. Inspection should occur for the first year and annually thereafter concurrent with the catch basin cleaning.

Recommendation: It is recommended this project have additional sorbent booms or pillows onsite in the event of an unexpected spill or if oil sheen is observed frequently on any inlet.

Maintenance: The inspection and replacement should be conducted as part of a third party O&M contract and require disposal of used sorbent booms as “special wastes”.

## **I. WATER QUALITY FILTERS**

Preface: The soil filter is an underdrain system with multi-media aggregates. A typical section is in the site drawings for the project.

Inspection: The soil filter can be inspected visually. A good time for inspection is within one day of a substantial rain event.

### Maintenance:

#### *Inlets*

Inlets to each soil filter area should be kept open and in good working condition. This is particularly important around curb breaks and sidewalk culvert. These locations should be marked on the roadway at the completion of construction to allow for winter snow dam removal. All eroded areas should be repaired.

#### *Initial Turf Maintenance (when applicable)*

Grassed soil filters should be allowed to develop for one full growing season post-construction prior to their first mowing. This allows for natural reseeding of grass seed mixes and establishment of a healthy stand of grass.

#### *Long-Term Turf Maintenance (when applicable)*

It is preferable to only mow grassed soil filter two to three times per year. While grassed soil filters can be mown during routine lawn maintenance, excessive mowing reduces the viability of grasses and grass roots and can overcompact the surface layer of the soil filter media.

#### *Large Debris*

Large debris within the ponding area should be removed.

#### *Erosion in the Soil Filter Area*

Any eroded areas should be repaired as soon as practicable.

#### *Weeds in the Soil Filter Area*

Periodic weeding of the soil filter area may be necessary, particularly in the landscaped soil filters. Hand weeding is required as the use of herbicides is not recommended.

#### *Surface Mulch Layer (when applicable)*

Areas devoid of mulch should be remulched by hand. Every year, in the spring, a fresh layer of mulch should be added to the soil filter area.

### *Sedimentation (or Clogging) of Soil Filter Area*

If the soil filter area is holding water for a period longer than 48-72 hours, the soil mix has, more than likely, become clogged with sediment and/or the underdrains have clogged. To correct a standing water problem, the following remedial actions are recommended:

1. Evaluate the drainage area to the soil filter area to identify any potential sources of sediment, such as an erosive condition, that may be contributing to the clogging of the device. If a source is identified, it is recommended that that source be eliminated to the fullest extent practicable before proceeding with the remaining recommendations provided below.
2. Flush the underdrains. Use cleanouts to flush the underdrains. Sediment in the drains may be preventing the soil mix from draining. Make sure to provide a way to capture any flushed sediment before it enters the stream environment or storm drain system downstream of the device. If, after flushing the underdrains, the device continues to hold water, the soil mix may be contaminated. As such, following the guidelines provided below is recommended.
3. Gage the extent of soil contamination. To do this, it is recommended that one or more test pits be dug with a shovel and that the soil layer be evaluated for contamination. Once the levels of contamination have been determined (for example, the top 4" of soil appears to be contaminated), it is recommended that you proceed with the remaining remedial actions.
4. Harvest the plants (when applicable). Care should be taken in the removal and temporary storage of the plants so that as many as possible can be harvested for replanting in the soil filter area once the functioning of the device has been restored sufficiently.
5. Remove the mulch layer.
6. Remove the top few inches of contaminated soil plus an additional 2-inch of soil, and replace the removed soil with a clean soil mix in accordance with the soil mix specification applicable to the particular soil filter area.
7. Monitor the functioning of the soil filter area during the next two to three rain events. If the device appears to be draining as intended (e.g., there is no standing water 48-72 following a rain event), proceed with the remaining remedial actions. If the area continues to hold standing water, then the entire soil filter area soil mix and the underdrains may need to be removed and replaced. Reuse of any undamaged underdrains may be possible once they have been cleaned thoroughly.
8. Replant the harvested plants, and replace any plants that were rendered unusable during or following their removal from the soil filter area.
9. Replace the removed mulch layer with fresh mulch.
10. Water the plants in the soil filter for the next two or more weeks unless there is sufficient rainfall. This will help the plants to reestablish themselves.

Frequency: The water quality filters should be inspected 4 times per year.

Applicability: The Windham Primary School Campus has two filters. **Snow storage with the filter should be prohibited by Maintenance Personnel.**

**J. PARKING LOT CLEANING**

To protect the catch basin sediment bags, underground storage, and pretreatment, sweeping of the paved parking lot at mid winter and spring and that power washing with an appropriate vacuum/power wash vehicle be once a year is recommended.

Maintenance: It is recommended this service be done by maintenance staff or contract to an outside firm that has the equipment for sweeping and power washing.

**K. LITTER**

Litter should be removed as a matter of course by workers and a part of the grounds maintenance contract.

**L. SUMMARY CHECKLIST**

The above described inspection and maintenance items have been summarized on a checklist attached hereto as Attachment C.

**IV. PROGRAM ADMINISTRATION**

**A. GENERAL**

A reliable administrative structure must be established to assure implementation of the maintenance programs described in the foregoing section. Key factors that must be considered in establishing a responsive administrative structure include:

1. Administrative body must be responsible for long-term operation and maintenance of the facilities.
2. Administrative body must have the financial resources to accomplish the inspection and maintenance program over the life of the facility.
3. The administrative body must have a responsible administrator to manage the inspection and maintenance programs.
4. The administrative body must have the staff to accomplish the inspection and maintenance programs, or must have authority to contract for the required services.
5. The administrative body must have a management information system sufficient to file, retain, and retrieve all inspection and maintenance records associated with the inspection and maintenance programs.

If any of the above criteria cannot be met by the entity assigned inspection and maintenance responsibilities, it is likely that the system will fail to meet its water quality objectives at some point during its life. While each of the above criteria may be met by a variety of formats, it is critical to clearly establish the assigned administrative body in a responsible and sustainable manner.

**B. RECORD KEEPING**

Records of all inspections and maintenance work accomplished must be kept and maintained to document facility operations. These records should be filed and retained for a minimum 5-year time span. The filing system should be capable of ready retrieval of data for periodic reviews by appropriate regulatory bodies. Where possible, copies of such records should also be filed with the designated primary regulatory agency for their review for compliance with permit conditions. Typical inspection and maintenance record forms are attached hereto as Appendix B.

**C. CONTRACT SERVICES**

In some instances or at specific times, the Maintenance Personnel may not have the staff to conduct the required inspection and/or maintenance programs as outlined in this document. In such cases, the work should be accomplished on a contractual basis with a firm or organization that has the staff and equipment to accomplish the required work.

The service contract for inspection and maintenance should be formal, well written legal document which clearly defines the services to be provided, the contractual conditions that will apply, and detailed payment schedules. Liability insurance should be required in all contracts.

**ATTACHMENT A**

**Sample Inspection Logs**

*WINDHAM RAYMOND RSU 14 SCHOOL DISTRICT OR OTHER TOWN DEPARTMENTS*  
WINDHAM, MAINE

STORMWATER MANAGEMENT  
WATER QUALITY FILTER & DETENTION POND  
ANNUAL INSPECTION & MAINTENANCE LOG

**WINDHAM RAYMOND RSU 14 SCHOOL DISTRICT OR OTHER TOWN DEPARTMENTS**  
**WINDHAM, MAINE**

**STORMWATER MANAGEMENT**  
**WATER QUALITY FILTER & DETENTION POND**  
**MONTHLY INSPECTION & MAINTENANCE LOG**

FACILITY:	YEAR:					
LOCATION:	CONTRACTOR:					
FUNCTION:						
MONTH	DAY	INSPECTOR	WATER DEPTH			
			OVERFLOW	WEIR	WEIR CONDITION	
JANUARY				CLEAR	DEBRIS	
FEBRUARY						
MARCH						
APRIL						
MAY						
JUNE						
JULY						
AUGUST						
SEPTEMBER						
OCTOBER						
NOVEMBER						
DECEMBER						
LIST SPECIAL MAINTENANCE UNDERTAKEN:						

*WINDHAM RAYMOND RSU 14 SCHOOL DISTRICT OR OTHER TOWN DEPARTMENTS*  
WINDHAM, MAINE

STORMWATER MANAGEMENT  
WATER QUALITY FILTER & DETENTION POND  
SEMI-ANNUAL INSPECTION & MAINTENANCE LOG

<b>SEMI-ANNUAL INSPECT 1.2</b>		FACILITY:	
DATE:		LOCATION:	
INSPECTOR:		FUNCTION:	
WEIR CONDITION:			
OUTLET CONDITION			

FORE BAY SUMP	EST. DEPTH SED.	REMOVED? Y/N	EST. VOL. CY	WHERE DISPOSED OF	STRUCTURAL CONDITION

CONTROL STRUCTURE:
DESCRIBE CONDITIONS FOUND & MAINTENANCE ACCOMPLISHED:

**ATTACHMENT B**

**Permits for Project**

**(To be Added at a Subsequent Time)**

**ATTACHMENT C**

**Summary Checklist  
Inspection and Maintenance**

**Stormwater Management System**  
**Maintenance Program**  
**Summary Checklist**

<b>Item</b>	<b>Commentary</b>	<b>Frequency</b>				
		<b>Month</b>	<b>Quarterly</b>	<b>Semi-Annual</b>	<b>Annual</b>	<b>Long Term</b>
Pond Overflow	Inspect spillways and remove debris. Maintenance conducted on as needed basis.				X	
Control Structures	Inspect outlet control to assure it maintains its hydraulic characteristics. Inspect inlets for blockage.		X			
Filter Berms	Inspect berms for sags, sloughing, or erosion and undesirable tree growth. Mow berm slopes to control vegetation repair structure flaws upon identification.	Mow X Summer			X	
Vegetation in Ponds	Observe extent of vegetation in fall. Cut above ice level in winter - remove.				X	
Stormwater Inlets Series	Stormwater inlets allow flow entry from a surface swale to a piped system. Entry may or may not be equipped with a bar rack. Inspect entry for debris accumulation. Remove debris to allow unimpeded entry. Lawn clippings and leaves should be removed from yard areas.	X			X Clearing	
Tributary Drainage	Inspect to assure that the carrying capacity has not been diminished by debris, sediment or other hydraulic impediments.				X	
Vegetated Swales	Inspect for erosion and sedimentation; repair as discovered; check design and upgradient conditions as indicated by needed repairs.		X			
Pond or Filter Lining	Inspect for water level variations which could indicate pond leakage.	X (initial work)				
Sorbent Booms	Sorbent boom should be raised out of the inlet, inspected, and replaced if necessary.		X For 1 <sup>st</sup> 12 months		X After 1 <sup>st</sup> year	
Water Quality Filters	Inspect four times per year. Remove debris/mow.		X			
Parking Lot Cleaning	Parking lot be swept at mid winter and spring. Power washing with an appropriate vacuum/power wash vehicle be done once a year.			X	X	
Litter	Litter should be removed daily.					