

TOWN OF SCITUATE



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Planning Board

**Stormwater Permit – 16 Mann Hill Road (Lot 6)
Decision: APPROVED with Conditions**

Owner: Chester and Susan Stone

Applicant: Susan Stone

Date: November 2, 2021

Location: 16 Mann Hill Road Lot 6

Assessor's Map Nos.: #27-7-9A (portion of)

Recording Info: Plymouth County Registry of Deeds Book 54881 Page 31

Plans: Plan entitled Stormwater Permit Plan Site Plan for 16 Mann Hill Road in Scituate, MA Sheet 1 of 4, Stormwater Permit Plan Site Details Sheet 2 of 4, Stormwater Permit Site Plan Erosion Control Site Plan Sheet 3 of 4, Stormwater Permit Plan Erosion Control Details Sheet 4 of 4 dated 6/4/2021 with revisions through 10/8/2021 by Ross Engineering Company Inc., Stormwater Report for Scituate Stormwater Permit Administrative Review by Ross Engineering Co., Inc. dated 6/4/2021 with revisions through 10/8/2021.

Members present for Public Hearing: Ann Burbine, Stephen Pritchard, Patricia Lambert, Benjamin Bornstein and Robert MacLean.

Background: A Stormwater Permit was requested by Ross Engineering Co., Inc. on behalf of Susan Stone for property located at 16 Mann Hill Road Lot 6. This property is currently shown as a portion of Assessor's Map/Block/Lot 27-7-9A. Gregory J. Tansey, P.E. of Ross Engineering Co., Inc. stamped the Stormwater Permit Plan Set Sheets 1-4 revised dated 10/8/2021. The Stormwater permit application includes a stormwater report and calculations and engineering certification signed by Gregory J. Tansey P.E. of Ross Engineering Co., Inc.

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The site consists of a lot of approximately 40,068 sq. ft. +/- of all undeveloped heavily vegetated upland. The property is in the R-2 Residential Zone on the easterly side of Mann Hill Road approximately 600 feet north of the intersection of Mann Hill Road and Tilden Road. A Form A was endorsed by the Board on 3/25/2021. The existing topography slopes from elevation 59 at the westerly side of the property down to elevation 49 at the northern portion of the property. The project consists of construction of a new single-family dwelling, access driveway, pool, grading, lawn and landscaping.

Under the Stormwater Bylaw, Section 32050 of the General Bylaws, all development and redevelopment projects that will disturb over 15,000 sq. ft. of land in a Residential zoning district, render 25% or more of an undeveloped lot impervious or increase impervious area of a developed lot by 25% or more, even if that disturbance is conducted over separate phases and/or by separate owners require a Stormwater Permit. Ross Engineering was notified that a public hearing would be required by the Planning Board as project is part of a larger development despite the land disturbance being approximately 28,450 sq. ft. according to the application. The proposed total impervious area for the site is 4,814 sq. ft. +/- from the existing of zero or approximately 12% of the total site. The proposed area of disturbance for re-grading or clearing is approximately 28,450 sq. ft. or approximately 71% of the site.

Mr. Tansey has certified that the drainage system can be expected to result in the post development runoff characteristics (including peak flow, total volume of runoff and water quality of runoff) being equal to or less than pre-development runoff characteristics. The peak discharge rate and volume are equal to or less than pre-development discharge rates for the 2, 10 and 100 year storms. Roof runoff from the proposed dwelling roof area and paved driveway will be directed overland where it will be picked up by a trench drain and piped to a bio-retention area to the rear of the dwelling. Additional soil testing has not been done at the bio-retention area to verify the infiltration rate used in the calculations. Some soil testing has been provided indicating that the estimated seasonal high groundwater (ESHGW) table is 34" to 50" below the surface. 80% TSS will be provided. Adequate recharge has been provided pending verification by soil testing of the bio-retention area.

Procedural Summary: A public hearing before the Planning Board was duly advertised and notices sent to abutters in accordance with the Stormwater Regulations. The hearing was opened on July 22, 2021 and continued until August 26, 2021, September 16, 2021 October 14, 2021 and October 28, 2021 when it was closed with the Planning Board approving the Stormwater Permit with conditions.

Hearing Summary: The hearing was opened on July 22, 2021 with Gregory J. Tansey, P.E. present for the applicant. Peter Palmieri of Merrill Engineers and Land Surveyors was present as the Board's Consulting Engineer. Mr. Tansey presented the house plan for 16 Mann Hill indicating it was part of a larger development area and a NPDES Permit has been filed. He indicated there would be three stormwater controls with a permeable paver driveway, permeable pavers around the pool and a natural stormwater lawn basin. He said the septic system would be in the front yard and it would have swales to bring the water to the basin and then down to the buffer area. Mr. Palmieri indicated soil testing has not been done, the slope of the driveway at 5% cannot handle storage for the whole length, temporary sediment basins need to maintain flows during construction and he questioned the permeable pavement for the driveway for a residential situation due to the slope and maintenance requirements. The Board questioned water runoff to the street, the permeable pavement, why rip rap was still being shown, grading on the adjacent lot without easements, the amount of fill that will be needed, a landscape buffer to the rear, and the design points. Mr. Tansey indicated that the post

development rate and volume of runoff are less than the pre-development rate as stormwater controls are used. The hearing was continued until August 26, 2021 to address concerns of abutters and the Board.

At the August 26, 2021 continued hearing, Mr. Tansey indicated that the house, pool and driveway had not changed and permeable paving is still proposed for the driveway. He addressed the peer review comments by clarifying the design points, putting in a liner by the foundation to prevent seepage from the permeable pavement, enlarging the sediment trap and providing a separate Operation and Maintenance Plan. He indicated a grading easement is being prepared and defended the use of permeable pavers as Mr. Palmieri indicated the maintenance is extensive for a residential lot and the TSS credit is only valid if the driveway is maintained. The Board requested more information on the groundwater depth, cleaning the permeable pavement, alternate options to the driveway permeable pavement, the design of the infiltration trench and the concentration of water toward Christopher Lane and the buffer. Mr. Tansey indicated stormwater calculations comply with the bylaw as rates and volume of runoff are reduced from the existing conditions.

At the September 16, 2021 hearing session, Mr. Tansey responded to the peer review comments by indicating the permeable paving in the driveway has been removed due to maintenance concerns. He said bituminous concrete will be used with the trench drain at the end of the driveway remaining. The water from the trench drain will go to a bio-retention area with a 6" pipe and there will be 90% TSS removal. The overflow from the bio-retention will go into the buffer strip. A temporary grading easement has been provided along with revised drainage calculations and a revised Operation and Maintenance Plan. It was indicated to the Board that the revised information had yet to be submitted. Mr. Palmieri indicated he has not seen the revised plans and opined the elimination of the permeable driveway pavers was good. He inquired if the additional soil testing had been completed and it has not been. The property owner, Susan Stone asked what needed to be completed. The Board indicated that the new plans would have to be submitted and peer reviewed. It was indicated that the lot will be clear cut except for the buffer strip. The Board asked about where the infiltration would occur now that it would not be in the permeable paver driveway. Mr. Tansey said it will be in the bio-retention area which will have the ability to infiltrate and retain water while providing TSS removal. He indicated it won't have the same infiltration as the driveway; but will infiltrate enough to meet the performance standards. The board asked for the variety and size of the plants in the bio-retention area to be indicated.

At the October 14, 2021 hearing session, Mr. Tansey indicated he submitted a revised plan and application correcting outstanding issues. He confirmed the fill was in cubic yards and not feet and over 3,000 cu yards of fill is required. The Board discussed the timing of the submittals and materials had not been received to comply with the deadline. Mr. Tansey indicated he responded as soon as he could. The temporary grading easement was questioned. Some members questioned why it was not permanent. Mr. Tansey opined it was not necessary to encumber #18 Mann Hill with a permanent easement as this fill is necessary for development on the lot. He said all stormwater for #16 stays on its own lot. It was confirmed that #16 is being cleared except for the buffer area in the back. The Board asked that the limit of clearing be placed on the #18 lot.

At the October 28, 2021 hearing session, the Board reviewed the revised plans and determined that stormwater requirements had been met and voted a stormwater permit and closed the public hearing.

Public Comment: Mr. Alan Wasserman of 12 Mann Hill asked how stormwater will be kept off his property with the increase in elevation, will water back up on his property. Mr. Tansey indicated water will be picked up by a swale and then water will travel northeast through the vegetated buffer. At the August 26, 2021 meeting session, Mr. Wasserman asked if the development will impede the flow of water across his property as it flows toward 16 Mann Hill. Mr. Tansey again indicated that the swale would direct water away from his property and prevent standing water.

At the September 16, 2021 hearing session, asked if the Terrell Estate extended the easement as she is concerned when happens with a new owner. Mr. Tansey confirmed it was the Terrell Estate and said the easement is temporary and goes away once everything is built on #16.

There was no public comment at either the October 14 or October 28 hearing sessions.

The Stormwater Permit Plan dated June 4, 2021 with revisions through 10/17/21 and Stormwater Report for the Scituate Stormwater Permit dated 6/4/21 with revisions through 10/8/21 are approved with the conditions noted below:

1. Construction shall comply with the Stormwater Permit Plan dated 6/4/21 with revisions through 10/17/21 and Stormwater Report for the Scituate Stormwater Permit dated 6/4/21 with revisions through 10/8/21 by Gregory J. Tansey, P.E. of Ross Engineering Co., Inc. and Long-Term Operation and Maintenance Plan for 16 Mann Hill Road latest revision 9/15/21 except as they may be modified to conform to the conditions below. Any or all owners of the property or site contractors for grading, site work, and installation of utilities, foundations, and/or driveways shall be advised of this approval and these conditions. A copy of the approved plan shall be kept on the site at all times during construction.
2. Any plan changes or changes from the proposed materials shall be submitted to the Planning Office to determine if the changes are insignificant or require a permit modification approved by the Town Planner or Planning Board. The stormwater management system including swales, bio-retention area, grading, dwelling and site amenity locations shall not be changed or expanded without the prior written approval of the issuing authority. Expansion includes additional pavement areas. Failure to obtain written approval is a violation of the Town of Scituate General Bylaw and subject to fines.
3. Copies of this approval and the approved Stormwater Permit plan shall be provided to subsequent owners who shall be advised of the need for periodic maintenance of the stormwater system and the need to retain the grading of the lot as approved. Prior to the transfer of the property, the owner shall provide to the subsequent owner and the Planning Office an inspection report certified by a Professional Engineer showing compliance with the Operation and Maintenance Plan. **The Planning Office must receive written notification at least one week prior to any change in the ownership of the property occurring during construction.**
4. Where this Stormwater Permit requires approval, permitting or licensing from any local, state or federal agency, such permitting or licensing is deemed a condition of this Stormwater Permit. All necessary permits and approvals must be received prior to

commencement of construction.

5. The Applicant shall consent to allow members and Town officials from the Planning Board and other persons acting under the Planning Board or its agents, to enter upon any lands and carry out such inspections as may be deemed necessary. The Applicant shall cooperate with the Planning Board and Town officials and assist them in their effort to verify that the layout, design and construction work for the Stormwater Permit are satisfactory and conform to Town specifications and requirements of the Board.
6. The NPDES Permit shall be provided to the Planning Office 48 hours prior to any site work. Stormwater Pollution Prevention Plan (SWPPP) inspection reports shall be provided to the Planning Office after **every half inch rain event and weekly**. Failure to comply with the NPDES Permit is a violation of this Stormwater Permit. The NPDES Permit shall list all the landowners.
7. This Stormwater Permit must be recorded at the Registry of Deeds with proof furnished to the Planning Office prior to construction. Failure to record the Stormwater Permit is a violation of the permit and subject to fines included in the Town of Scituate General Bylaws.
8. The Temporary Easement shall be recorded prior to construction with proof of recording furnished to the Planning Office prior to construction. The final as-built grade on the temporary easement is the basis for future development.
9. Additional soil testing shall be performed at the location of the proposed bio-retention area within 15 days of the Stormwater Permit approval. The test must be witnessed by the Planning Board's consulting engineer with costs to be borne by the applicant. Failure to comply shall deem the permit invalid. A new plan is required to be submitted prior to construction showing the location of the soil testing in the bio-retention area with the soil profile. If any change in the design is needed due to the conditions of the test pit not being the same as assumed, it shall be submitted to the Board prior to construction for review and approval.
10. The swales, trench drain, pipe and bioretention area shall be installed to have the bottom elevation a minimum of two feet above seasonal high groundwater elevations. Stormwater during construction as well as after construction is not allowed to increase in rate or volume to adjacent properties.
11. No clearing beyond the limit of work/limit of clearing/erosion control line as shown on the plan is allowed. The limit of clearing shall be staked in the field prior to construction commencing and shall be maintained throughout the construction phase.
12. Construction work shall not begin prior to 7:00 AM on weekdays and 8:00 AM on Saturdays and shall cease no later than 7:00 PM or sunset whichever is earlier. No construction shall take place on Sundays or legal state and/or federal holidays.

Construction work includes any operation of machinery and idling of vehicles. No truck idling on the site or on adjacent streets is allowed.

13. Bio-retention areas or swales must be retained and maintained as designed as they are components of the stormwater management system. Maintenance must be per the approved Operation and Maintenance Plan.
14. **A Stabilized construction entrance per the plan detail shall be installed prior to any work on the site and shall be maintained throughout construction.**
15. Prior to any land disturbance, erosion control shall be installed and inspected by the Town Planner or approved agent. At this time the site shall also be staked to show the house and drainage improvements. All stockpiles shall be surrounded by an erosion control barrier. Additional erosion control, such as silt fence, silt sock and/or haybales placed **prior** to a precipitation event, may be needed to prevent sediment from reaching the road or adjacent properties during construction. **All erosion control shall be installed per the plan and shall be maintained in good working condition throughout construction.** The Applicant is responsible for maintaining and managing stormwater on-site throughout the construction period and during the transition to fully functional operations and maintenance. Construction approval in no way relieves the Applicant from its obligation to ensure stormwater does not impact the abutting properties and the Applicant shall take all necessary steps to prevent such occurrences.
16. **The Town Planner shall be notified when installation of the construction entrance and erosion control are complete. If any permit inspection is being requested this notification shall occur 48 hours in advance of an inspection.**
17. **The sequence of construction shall be according to the plan. The proposed sediment trap must be in place prior to excavation of the foundation.**
18. No on-street parking or loading or unloading of construction equipment or vehicles shall be permitted during construction unless a police detail is provided if warranted as determined by the Police Department. Noise mitigation and proper dust controls shall be used.
19. A Landscape screening plan for the south corner of the property must be provided to the Planning Office for approval prior to installation. The screen shall consist of evergreen and deciduous plants and be designed to not interfere with the drainage swale. The minimum planting shown on the Stormwater permit Site Plan must occur.
20. All disturbed areas associated with this Stormwater permit shall be loamed and seeded with 6" of loam.
21. A pre-construction conference will be required on site to verify the contractor is aware of the

Stormwater Permit conditions and required inspections. Recording of the permit must occur prior to the pre-construction conference with proof of recording furnished to the Planning Office.

22. Construction inspections will be provided as follows:

- a. All inspections for the Town shall be performed by the **Town Planner or a designated representative of the Planning Department or Planning Board and by the record design engineer**. All inspections shall be documented with written reports that describe compliance with the approved plan(s) and supporting application documents and construction specifications. Any variations shall be noted.
- b. The Town Planner and record design engineering firm must be notified 48 hours prior to:
 - i. Installation of construction entrance and erosion control, and staking of corners of the dwelling, limit of work, driveway and the drainage improvements;
 - ii. Excavation of the proposed sediment trap;
 - iii. Excavation of bio-retention area;
 - iv. Installation of bio-retention area,
 - v. Rough grading of site including swales and driveway to verify grades are as designed including slope of the driveway;
 - vi. Finish grading of all swales and bio-retention area including the outlet elevation of the bio-retention area with the elevations submitted to the Town Planner and design engineer for verification;
 - vii. Inspection of site amenities including driveway, walk and pool and permeable paver patio, landscape screen and loamed & seeded areas;
 - viii. Inspection of final completion of site work including cleanup to determine compliance with the conditions prior to issuing a Certificate of Completion (COC).

Work shall be subject to removal if necessary inspections are not requested. If the property is sold prior to completion of the work, the Planning Board reserves the right to inform the buyer that the Stormwater Management System is incomplete. Spot grades shall be performed during rough grading and finish grading to insure any swales will drain and no standing water will be present.

23. The applicant will provide a construction and plan completion guarantee of \$5,000 prior to issuance of a building permit to guarantee that the Town will be notified when site inspections are required, the as-built plan will be provided and construction will be completed in accordance with the approved plan. A Certificate of Completion must be issued prior to return of the construction and plan completion guarantee.

24. The Property Owner shall be responsible for the proper maintenance and operation of the stormwater control system. A best management practices inspection schedule and maintenance checklist and plan is attached and shall serve as a guide for the proper maintenance of the system.

25. Construction of the proposed stormwater management system, site utilities, site amenities and grading shall be supervised by a registered professional engineer who shall certify to the Planning Board that the site was constructed according to the approved plans. The certification shall be accompanied by an As-Built Plan stamped by a registered surveyor and the registered professional engineer who designed the system and shall be submitted to the Planning Office within ten days of completion of the work. This plan shall include the construction conditions of the stormwater management system including top and bottom elevations and inverts, spot grades as necessary, grading, house, site amenities and driveways. Prior to application for a Certificate of Occupancy, an interim As-Built must be submitted to the Planning Office and Building Commissioner for verification that the stormwater management system and grading is following the design. The final As-Built Plan must be submitted prior to obtaining a Certificate of Completion for the Stormwater Permit and all work must be found in compliance with the approved permit. All grading and landscaping must be complete prior to the final as-built submittal.
26. Underground irrigation systems are prohibited from connecting to the town's water distribution system or in any manner using municipal water. All irrigation systems installed must be supplied by on-site sources at the expense of the property owner. Violations of this policy shall result in a fine to the property owner, with an equal fine levied on the installer of the system.

Very truly yours,



Ann Burbine
Chairman

AB:kaj
Encls

Cc: Robert Vogel, Building Commissioner (**As required by the General Bylaw**)
Susan Stone
Gregory J. Tansey and Paul Mirabito, Ross Engineering Company, Inc.
Peter Palmieri, Merrill Engineers and Land Surveyors
Ed and Kerri Johnson

**Long Term Operation and Maintenance
For
16 MannHill Road
Scituate, MA**

August 6, 2021
Rev. Sept. 15, 2021



Gregory J. Tansey

8.0 Long Term Operation and Maintenance

8.1 Definition of Standard

This standard requires proponents to prepare a plan designed to maintain the BMP control structures after construction of the project has been completed. Chapter 1 in Volume 1 of the Massachusetts Stormwater Handbook (page 23) Standard 9 is defined as follows:

A Long-Term Operation and Maintenance (O&M) Plan shall be developed and implemented to ensure that the stormwater management system function as designed.

The Long-term Operation and Maintenance Plan shall at a minimum include:

1. *Stormwater management system(s) owners;*
2. *The party or parties responsible for operation and maintenance, including how future property owners will be notified of the presence of the stormwater management system and the requirement for proper operation and maintenance;*
3. *The routine and non-routine maintenance tasks to be undertaken after construction is complete and a schedule for implementing those tasks;*
4. *A plan that is drawn to scale and shows the location of all stormwater BMP's in each treatment train along with the discharge point;*
5. *A description and delineation of public safety features; and*
6. *An estimated operations and maintenance budget.*

8.2 Explanation of Standard

The Goal of Standard 8 is to ensure all responsible parties and owners are aware of their maintenance obligations and all of the financial obligations associated with the maintenance. Another goal of Standard 8 is to alert the potential owner or responsible party of their maintenance obligations prior to becoming an owner or responsible party by a real estate purchase.

8.3 Long Term Operation and Maintenance Plan

8.4 Owners Identified

The owners of the Stormwater Management System are the record names of those individual(s) who currently appear on the deed for the real property identified at Scituate Assessor's Map 27, Block 07, Lot 9A or portion thereof. The property is more commonly known as 16 Mann Hill Road.

8.5 Responsible Parties Identified

The responsible parties of the Stormwater Management System for 16 Mann Hill Road in Scituate, MA are the record names of those individual(s) who currently appear on the deed for 16 Mann Hill Road in Scituate, MA. The owner or responsible party may delegate the maintenance responsibilities to a qualified company knowledgeable of landscape and maintenance matters involved with the BMP Structure present at 16 Mann Hill Road in Scituate, MA.

8.6 Maintenance Tasks

Lawns

The Owner(s) shall keep all lawn areas in a good healthy condition. Particular care shall be made to lawn areas amended with aeration and other good landscape practices. It is recommended that green space areas be maintained by a competent landscaper who will perform the following maintenance tasks as applicable to the season and lawn conditions:

Aerate the lawn areas	Cut heights of Lawns accordingly to drought conditions
Dethatch lawn areas	Proper and adequate irrigation of lawn areas
Fertilize lawn areas	Leaf removal of lawn areas
Reseeding of lawn areas	Pesticide treatments of lawn areas

Grass Swales

The Owner(s) shall keep the grass swales as shown on the plan of record in good condition. The swales shall be weed whacked or mowed as necessary to maintain a 4" thick grass cover.

It is recommended that the grass swales be maintained by a competent landscaper who will perform the following maintenance tasks as applicable to the season and lawn conditions:

- Keep grass swales clear of debris.
- Restore any areas subject to erosion.
- Mow on an as-needed basis to ensure a good 4" thick vegetative cover within the swales.
- Provide any required erosion controls that may be required to restore or protect the swales.

Driveway Trench Drain

The Owner(s) shall keep the Driveway Trench Drain in good condition. The Driveway Trench Drain shall be cleaned out to prevent sediments and debris from displacing the its volumetric capacity and ability to intercept, capture and convey stormwater to the outfall located in the southeast area of the rear lot. It is recommended that the Driveway Trench Drain be maintained by a competent landscaper who will perform the following maintenance tasks in the spring and fall:

- Visually inspect the trough of the Driveway Trench Drain.
- Remove the grate of the Driveway Trench Drain and extract any sediments and debris present.
- Flush out the Driveway Trench Drain with a hose if necessary.
- Restore Driveway Trench Drain grate.

6" SCH 40 PVC Drain line from driveway trench drain to Bio Retention System

The outfall of the 6" drain line should be visually inspected for signs of clogging once a month by either the homeowner or by the landscaper. If signs of sediment accumulations within the drain line are evident, it is to be flushed with a garden hose until sediments no longer are seen discharging into the forebay. If water is observed to back up into the driveway trench drain during the flushing operation, then the line is to be snaked through the trench drain or the inspection port.

Interceptor Trench Drain

The Owner(s) shall keep the Interceptor Trench Drain in good condition. The surface peas stone of Interceptor Trench Drain shall be kept clean of sediments, lawn clippings and debris that could impair it's capacity and ability to intercept, capture and convey stormwater to the Driveway Trench Drain. It is recommended that the Interceptor Trench Drain be maintained by a competent landscaper who will perform the following maintenance tasks in the spring and fall:

- Visually inspect the pea-stone surface of the Interceptor Trench Drain.
- Remove from and/or extract any sediments and debris on top of or within the pea-stone layer.
- Replace the pea-stone layer if necessary.

Bio-Retention System

The Owner(s) shall maintain the Bio-Retention System in a good operational condition at all times. The Bio-Retention System consists of two primary components, the forebay and the shallow basin containing the plantings set in a specified soil mix, herein referred to as the soil mix.

The forebay shall be maintained four times per year for scheduled maintenance and visually inspected monthly to ensure any needed interim maintenance is promptly performed.

Monthly visual inspections may be performed by the homeowner or the homeowner's landscaper.

Monthly inspections shall include taking note of the general functionality of the forebay and if immediate maintenance is required such as damages from a fallen tree, large branch, etc. Additionally, notations of any work required to be performed for the quarterly scheduled maintenance should be made to allow for prep work or any lead time need to properly schedule for performing the quarterly maintenance tasks.

Quarterly maintenance tasks shall be performed as needed and shall include the following:

- Removal of sediment accumulations exceeding depth of 3";
- Removal of tree and leaf litter and any other debris that may have accumulated in the forebay;
- Removal of any saplings or other vegetation growing up within the riprap area of the forebay;
- Restore any erosion issues associated with the exterior earthen berm portion of the forebay;
- Weed whack the excessive growth around the exterior earthen berm portion of the forebay;
- Restore any dislodged riprap, reset bottom of forebay to EL=54.0', and weir invert to EL=45.5'.

The Bio-Retention System shall be maintained four times per year for scheduled maintenance and visually inspected monthly to ensure any needed interim maintenance is promptly performed.

Monthly visual inspections may be performed by the homeowner or the homeowner's landscaper.

Monthly inspections shall include taking note of the general functionality of the Bio-Retention System and

if immediate maintenance is required such as damages from a fallen tree, large branch, etc. Additionally, notations of any work required to be performed for the quarterly scheduled maintenance should be made to allow for prep work or any lead time need to properly schedule for performing the quarterly maintenance tasks.

Quarterly maintenance tasks shall be performed as needed and shall include the following:

- Removal of sediment accumulations exceeding depth of 2" by raking or hand shoveling;
- Removal of tree and leaf litter and any other debris that may have accumulated in the Bio-Retention System;
- Removal of any vegetation growing up within the Bio-Retention System other than what was prescribed by the design;
- Restore any erosion issues associated with the exterior earthen berm portion of the Bio-Retention System;
- Weed whack the excessive growth around the exterior earthen berm portion of the Bio-Retention System;
- Replant any vegetation prescribed by design that has died, reset bottom of Bio-Retention System to EL=54.0', and weir invert to EL=45.3'.
- Keep grass weir mowed short and level.
- Re-seed bottom of Bio-Retention System with Switch grass when needed.
- Remove and replace soil mix if vegetation cannot be maintained.

Vegetation prescribed by design with Bio-Retention System shall include:

- A vegetated cover over the bottom of the Bio-Retention System with Switch grass.
- A cluster of three (3) Red Chokeberry shrubs.
- A cluster of three (3) Whitch-Hazel shrubs.
- A cluster of three (3) Arrow-wood shrubs.

The shrub clusters shall be located and arrayed within the bottom area of the Bio-retention system in such a manor to allow optimal sun exposure without adversely impacting the other shrub clusters.

8.7 BMP Treatment Structure Location Plan

The BMP structures described above may be seen on the Plan of record or the watershed plans located in Appendix C of this report.

8.8 Description and delineation of safety measures

All confined space entry work shall conform to the applicable OSHA standards. Safety goggles, safety vests, hard hats, etc. shall be worn at all times.

8.9 Cost to Maintain Budget Estimate

Estimated Annual Maintenance Budget

BMP STRUCTURE	EST. AVG. ANNUAL MAINTENANCE COST
Inspectional services	\$1000.00
Plowing Services	\$400.00
Bio-Retention System	\$300.00
BMP Grass Swales	\$100.00
Roof Gutters	\$100.00
Interceptor Trench	\$100.00
Driveway Trench Drain & 6" Pipe	\$100.00
Total	\$2100.00

8.10 Inspection Logs

Field Log for Inspections

16 Mann Hill Road Scituate, MA

Date: _____

Inspector: _____

Component	Functioning Properly	Debris removal required	Maintenance Needed	Comments
BMP Grass Swale				
Bio Retention System				
Driveway Trench Drain				
Lawn areas				
Roof Gutters				
Downspouts				
Interceptor Trench				