

Northern Middlesex Stormwater Collaborative

Model Stormwater Regulations August 2020

The Northern Middlesex Stormwater Collaborative (NMSC) has developed a model stormwater bylaw and regulation to assist communities within the watershed effectively manage stormwater pollution and comply with the most recent Small MS4 General Permit (MS4) and 2020 Small MS4 General Permit revisions.¹ The model bylaw and regulations are largely based on those developed by the Neponset River Watershed Association (NepRWA) in 2019². The model is annotated to highlight decision points for communities to consider as they tailor the model to suit their unique needs and goals.

The goals of this model are to provide language that addresses:

- New requirements for Construction Site Stormwater Runoff Control per Section 2.3.5 of the 2016 Massachusetts Small MS4 General Permit
- Requirements for submittals and calculations that will facilitate improved data management with regard to record keeping for waterbodies required by Appendices F and H of the 2016 Massachusetts Small MS4 General Permit
- Requirements to address regional pollutants of concern in TMDL and impaired watersheds in accordance with Appendices F and H, respectively, of the 2016 Massachusetts Small MS4 General Permit
- Gaps in stormwater code relative to the requirements of the 2016 Massachusetts Small MS4 General Permit as identified by Northern Middlesex Stormwater Collaborative Communities as part of the Northern Middlesex Capacity Building for Local Oversight of Development & Redevelopment project
- Optional design criteria and requirements to address regional issues

This model is intended to serve as an example and be adaptable, and should be modified to fit with existing local bylaws and other relevant law. Each community is different, and the models are not intended to be a one-size-fits-all approach, but rather a template on which to build so municipalities do not have to begin from scratch.

Any municipality considering implementing stormwater regulations should consult with its legal counsel for consistency with applicable laws and regulations of the Commonwealth of Massachusetts.

¹ <https://www3.epa.gov/region1/npdes/stormwater/ma/ma-small-ms4-2020-mods.pdf>

² <http://yourcleanwater.org/wp-content/uploads/2019/06/NSP-Model-Stormwater-Regulations-May-2019.docx>

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Town of XXXXXXXXX

Stormwater Management Regulations

Table of Contents

- Section 1. Purpose
- Section 2. Definitions
- Section 3. Authority and Administration
- Section 4. Applicability
- Section 5. Waivers
- Section 6. Administrative Land Disturbance Approval Review Procedures and Standards
- Section 7. Land Disturbance Permit and Procedure
- Section 8. Fees
- Section 9. Stormwater Management Plan for Permit Applications
- Section 10. Erosion and Sedimentation Control Plan for Permit Applications
- Section 11. Operation and Maintenance Plan for Permit Applications
- Section 12. Inspection and Site Supervision for Permit Applicants
- Section 13. Surety for Projects Requiring Permits
- Section 14. Final Reports for Projects Requiring Permits
- Section 15. Certificate of Completion for Projects Requiring Permits

Section 1. Purpose

The purpose of these Stormwater Regulations is to protect, maintain and enhance public health, safety, environment, and general welfare by establishing minimum requirements and procedures to control the adverse effects of increased runoff, decreased ground water recharge, erosion and sedimentation, and nonpoint source pollution associated with new development and redevelopment of land, pursuant to the **[Town Stormwater Management Bylaw]**.

Development of land including loss of vegetative cover to create impervious surfaces, regrading, and other land use changes, permanently alter the hydrologic system of local watersheds by decreasing transpiration and infiltration, and increasing stormwater runoff rates and volumes, causing an increase in flooding, stream channel erosion, and sediment transport and deposition, and water quality degradation. This additional runoff contributes to increased nonpoint source pollution and degradation of receiving waters.

Stormwater management systems that are properly designed utilizing low impact design (LID) and green infrastructure (GI) techniques and appropriate best management practices (BMPs) can better simulate the natural hydrologic condition and reduce adverse impacts.

During the construction process, soil is often exposed for periods of time and most vulnerable to erosion by wind and water. The eroded soil endangers water resources by reducing water quality, and causing the siltation of valuable wetland resources including swamps, streams, rivers, lakes and aquatic habitat for fish and other desirable species.

The impacts of construction and post-development stormwater runoff quantity and quality can adversely affect public safety, public and private property, surface water drinking water supplies, groundwater resources including drinking water supplies, recreation, aquatic habitats, fish and other aquatic life, property values and other uses of lands and waters.

These Stormwater Regulations (Regulations) have been developed to provide reasonable guidance for the regulation of project design, construction and post-development stormwater runoff for the purpose of protecting local water resources from degradation. It is in the public interest to regulate construction and post-development stormwater runoff discharges in order to control and minimize increases in stormwater runoff rates and volumes, soil erosion and sedimentation, stream channel erosion, and nonpoint source pollution associated with construction site and post-development stormwater runoff.

Section 2. Definitions

ABUTTER: The owner(s) of land adjacent to regulated activity.

ADMINISTRATIVE LAND DISTURBANCE APPROVAL: Review and approval by the Stormwater Authority of a land disturbance activity that does not require a Land Disturbance Permit because of its size and/or scope.

ALTERATION OF DRAINAGE CHARACTERISTICS: Any activity on an area of land that changes the water quality, force, direction, timing or location of runoff flowing from the area. Such changes include: change from distributed runoff to confined or discrete discharge, change in the volume of runoff from the area; change in the peak rate of runoff from the area; and change in the recharge to groundwater on the area.

APPLICANT: Any person, individual, partnership, association, firm, company, corporation, trust, authority, agency, department, or political subdivision, of the Commonwealth or the Federal government, to the extent permitted by law, requesting a Land Disturbance Permit or Administrative Land Disturbance Approval.

AS-BUILT DRAWING: Drawings that completely record and document applicable aspects and features of conditions of a project following construction using Stormwater Management Plans derived from a Land Disturbance Permit.

BEST MANAGEMENT PRACTICE (BMP): schedules of activities, practices (and prohibitions of practices), structures, vegetation, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants to Waters of the United States. BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

CERTIFICATE OF COMPLETION (COC): A document issued by the Stormwater Authority after all construction activities have been completed, which states that all conditions of an issued Land Disturbance Permit have been met and that a project has been completed in compliance with the conditions set forth in the permit.

CERTIFIED PROFESSIONAL IN EROSION AND SEDIMENT CONTROL (CPESC): A certified specialist in soil erosion and sediment control. This certification program, sponsored by the Soil and Water Conservation Society in cooperation with the American Society of Agronomy, provides the public with evidence of professional qualifications.

CLEAN WATER ACT: The Federal Water Pollution Control Act (33 U.S.C. § 1251 et seq.) as hereafter amended.

CLEARING: Any activity that removes the vegetative surface cover.

COMMON PLAN OF DEVELOPMENT: - A "larger common plan of development or sale" is a contiguous area where multiple separate and distinct construction activities may be taking place at different times on different schedules under one plan.

CONSTRUCTION AND WASTE MATERIALS: Excess or discarded building or site materials, including but not limited to concrete truck washout, chemicals, litter and sanitary waste at a construction site that may adversely impact water quality.

DISCHARGE OF POLLUTANTS: The addition from any source of any pollutant or combination of pollutants into the municipal storm drain system or into the Waters of the United States or Commonwealth from any source.

DRAINAGE EASEMENT: A legal right granted by a landowner to a grantee allowing the use of private land for stormwater management purposes.

EROSION: The wearing away of the land surface by natural or artificial forces such as wind, water, ice, gravity, or vehicle traffic and the subsequent detachment and transportation of soil particles.

EROSION AND SEDIMENTATION CONTROL PLAN: A document containing narrative, drawings and details developed by a registered Professional Engineer (PE) or a Certified Professional in Erosion and Sedimentation Control (CPESC), which includes best management practices, or equivalent measures designed to control surface runoff, erosion and sedimentation

during pre-construction and construction related land disturbing activities.

EROSION CONTROL: The prevention or reduction of the movement of soil particles or rock fragments due to stormwater runoff.

ESTIMATED HABITAT OF RARE WILDLIFE AND CERTIFIED VERNAL POOLS: Habitats delineated for state-protected rare wildlife and certified vernal pools under the Wetlands Protection Act Regulations (310 CMR 10.00) and the Forest Cutting Practices Act Regulations (304 CMR 11.00).

GRADING: Changing the level or shape of the ground surface.

GROUNDWATER: Water beneath the surface of the ground.

GRUBBING: The act of clearing land surface by digging up roots and stumps.

HAZARDOUS MATERIAL: Any material which, because of its quantity, concentration, chemical, corrosive, flammable, reactive, toxic, infectious or radioactive characteristics, either separately or in combination with any substance or substances, constitutes a present or potential threat to human health, safety, welfare, or to the environment. Toxic or hazardous materials include any synthetic organic chemical, petroleum product, heavy metal, radioactive or infectious waste, acid and alkali, and any substance defined as "toxic" or "hazardous" under MGL c. 21C and c. 21E, and the regulations at 310 CMR 30.000 and 310 CMR 40.0000.

ILLCIT DISCHARGE: Direct or indirect discharge to the municipal storm drain system that is not composed entirely of stormwater, except as exempted in **Article II, § 2D** of the **[Town Stormwater Management Bylaw]**. The term does not include a discharge in compliance with an NPDES stormwater discharge permit or resulting from fire-fighting activities and other activities exempted pursuant to **Article II, § 2(D)(1)** of the **[Town Stormwater Management Bylaw]**.

IMPERVIOUS SURFACE: Any surface that prevents or significantly impedes the infiltration of water into the underlying soil. This can include but is not limited to: roads, driveways, parking areas and other areas created using nonporous material; buildings, rooftops, structures, artificial turf and compacted gravel or soil.

IMPOUNDMENT: A stormwater pond created by either constructing an embankment or excavating a pit which retains a permanent pool of water.

INFILTRATION: The act of conveying surface water into the ground to permit groundwater recharge and the reduction of stormwater runoff from a project site.

LAND DISTURBANCE PERMIT: A permit issued by the Stormwater Authority pursuant to the **[Town Stormwater Management Bylaw]** prior to commencement of Land Disturbing Activity or Redevelopment.

LAND DISTURBING ACTIVITY: Any activity that causes a change in the position or location of soil, sand, rock, gravel, or similar earth material; results in an increased amount of runoff or pollutants; measurably changes the ability of a ground surface to absorb waters; involves clearing, grading, or excavating, including grubbing; or results in an alteration of drainage characteristics.

LAND USE WITH HIGHER POTENTIAL POLLUTANT LOAD (LUHPPL): Land uses such as auto salvage yards, auto fueling facilities, exterior fleet storage yards, vehicle service and equipment cleaning areas, commercial parking lots with high intensity use, road salt storage areas, outdoor storage and loading areas of hazardous substances, confined disposal facilities and disposal sites, marinas, boat yards or other uses as identified by the Massachusetts Stormwater Handbook.

LOT: An individual tract of land as shown on the current Assessor's Map for which an individual tax assessment is made. For the purposes of these regulations, a lot also refers to an area of a leasehold on a larger parcel of land, as defined in the lease agreement and shown by approximation on the Assessor's Map.

LOW IMPACT DEVELOPMENT or LID: site planning and design strategies that use or mimic natural processes that result in the infiltration, evapotranspiration or use of stormwater in order to protect water quality and associated aquatic habitat. LID employs principles such as preserving and recreating natural landscape features, minimizing effective imperviousness to create functional and appealing site drainage that treat stormwater as a resource rather than a waste product. LID practices include but are not limited to bioretention facilities, rain gardens, vegetated rooftops, rain barrels and permeable pavements.

MASSACHUSETTS STORMWATER MANAGEMENT STANDARDS: The performance standards as further defined by the Massachusetts Stormwater Handbook, issued by the Department of Environmental Protection, and as amended, that coordinate the requirements prescribed by state regulations promulgated under the authority of the Massachusetts Wetlands Protection Act G.L. c. 131 §. 40 and Massachusetts Clean Waters Act G.L. c. 21, §. 23-56 to prevent or reduce pollutants from reaching water bodies and control the quantity of runoff from a site.

MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) or MUNICIPAL STORM DRAIN SYSTEM: The system of conveyances designed or used for collecting or conveying stormwater, including any road with a drainage system, street, gutter, curb, inlet, piped storm drain, pumping facility, retention or detention basin, natural or man-made or altered drainage channel, reservoir, and other drainage structure that together comprise the storm drainage system owned or operated by **[Town]**.

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

STORMWATER DISCHARGE PERMIT: A permit issued by the EPA that authorizes the discharge of pollutants to Waters of the United States.

NEW DEVELOPMENT: any construction activities or land alteration on an area that has not previously been developed to include impervious cover.

NONPOINT SOURCE POLLUTION: Pollution from many diffuse sources caused by rainfall or snowmelt moving over and through the ground. As the runoff moves, it picks up and carries away natural and man-made pollutants finally depositing them into a water resource area.

OFF-SITE COMPLIANCE: an approach whereby pollutant removal practices are implemented at redevelopment or retrofit sites at another location in the same HUC12 watershed, as approved by the Stormwater Authority.

Note: The 2016 Massachusetts Small MS4 General Permit redline revisions allow for off-site compliance to be offered as a compliance strategy for both new and redevelopment projects, but Towns and Cities are not required to include off-site compliance in their stormwater program. Modify this definition as appropriate to reflect whether it is being offered as an approach for redevelopment sites or both new and redevelopment sites.

Also note that the redline revisions to the 2016 Massachusetts Small MS4 General Permit reduce the watershed size in which the offsite mitigation can occur from HUC10 to HUC 12, which is reflected in this definition.

OPERATION AND MAINTENANCE PLAN: A plan setting up the functional, financial and organizational mechanisms for the ongoing operation and maintenance of a stormwater management system to insure that it continues to function as designed.

OUTFALL: The point at which stormwater flows out from a point source discernible, confined and discrete conveyance into Waters of the Commonwealth.

OWNER: A person with a legal or equitable interest in property.

PERSON: An individual, partnership, association, firm, company, trust, corporation, agency, authority, department or political subdivision of the Commonwealth or the federal government, to the extent permitted by law, and any officer, employee, or agent of such person.

POINT SOURCE: Any discernible, confined, and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel, or other floating craft from which pollutants are or may be discharged.

PRE-CONSTRUCTION: All activity in preparation for construction.

POLLUTANT: dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, construction wastes and residues including discarded building materials, concrete truck wash out, chemicals, litter, and sanitary wastes and industrial, municipal and agricultural waste discharged into water.

PRIORITY HABITAT OF RARE SPECIES: Habitats delineated for rare plant and animal populations protected pursuant to the Massachusetts Endangered Species Act (M.G.L. c. 131A) and its regulations.

RECHARGE: The process by which groundwater is replenished by precipitation through the percolation of runoff and surface water through the soil.

REDEVELOPMENT: Development, rehabilitation, expansion, demolition, construction, land alteration, or phased projects that disturb the ground surface, including impervious surfaces, on previously developed sites.

RUNOFF: Rainfall, snowmelt, or irrigation water flowing over the ground surface.

SEDIMENT: Mineral or organic soil material that is transported by wind or water, from its origin to another location; the product of erosion processes.

SEDIMENTATION: The process or act of deposition of sediment.

SITE: The area extent of construction activities, including but not limited to the creation of new impervious cover and improvement of existing impervious cover.

SLOPE: The incline of a ground surface expressed as a ratio of horizontal distance to vertical distance.

SOIL: Any earth, sand, rock, gravel, or similar material.

STABILIZATION: The use, singly or in combination, of mechanical, structural, or vegetative methods, to prevent or retard erosion.

STORMWATER AUTHORITY: **[Town] Conservation Commission** or its authorized agent(s).

STORMWATER: Stormwater runoff, snow melt runoff, and surface runoff and drainage.

STORMWATER MANAGEMENT PLAN: A document containing narrative, drawings, details and reporting requirements developed by a registered Professional Engineer (PE), which describes structural and non-structural best management practices designed to control the discharge of pollutants from impervious surfaces and onsite activities as well as the volume and peak rate of surface runoff from a site on an ongoing basis after construction has been completed.

STRIP: Any activity which removes the vegetative ground surface cover, including tree removal, clearing, grubbing, and storage or removal of topsoil.

TIME PERIODS: All time periods of ten days or less specified in the **[Stormwater Bylaw or Ordinance]** and these Stormwater Regulations shall be computed using business days only. In the case of a permit or approval, such period shall commence on the first day after the date of issuance and shall end at the close of business on the tenth business day thereafter. All other time periods specified in **[Stormwater Bylaw or Ordinance]** and these Stormwater Regulations shall be computed on the basis of calendar days, unless the last day falls on a Saturday, Sunday or legal holiday, in which case the last day shall be the next business day following.

TOTAL MAXIMUM DAILY LOAD or TMDL: Section 303(d) of the Clean Water Act authorizes the EPA to assist states, territories and authorized tribes in listing impaired waters and developing Total Maximum Daily Loads (TMDLs) for these waterbodies. A TMDL establishes the maximum amount of a pollutant that a water body can accept and still meet water quality standards for protecting public health and maintaining the designated beneficial uses of those waters for drinking, swimming, recreation, and fishing. A TMDL includes Waste Load Allocations for point source discharges, Load Allocations for nonpoint sources and/or natural background, and must include a margin of safety and account for seasonal variations.

TOTAL SUSPENDED SOLIDS or TSS: Undissolved organic or inorganic particles in water.

VERNAL POOLS: Temporary bodies of freshwater which provide critical habitat for a number of vertebrate and invertebrate wildlife species.

WATERCOURSE: A natural or man-made channel through which water flows or a stream of water, including a river, brook or underground stream.

WATERS OF THE COMMONWEALTH: All waters within the jurisdiction of the Commonwealth, including, without limitation, rivers, streams, lakes, ponds, springs, impoundments, estuaries, wetlands, coastal waters, and groundwater and Waters of the United States as defined under the Federal Clean Water Act (33 U.S.C. § 1251, et seq.) as hereafter amended.

WETLAND RESOURCE AREA: Areas specified in the Massachusetts Wetlands Protection Act G.L. c. 131, § 40 and in the **[relevant local law]**.

WETLANDS: Tidal and non-tidal areas characterized by saturated or nearly saturated soils most of the year that are located between terrestrial (land-based) and aquatic (water-based) environments, including freshwater marshes around ponds and channels (rivers and streams), brackish and salt marshes; common names include marshes, swamps and bogs.

Section 3. Authority and Administration

- A. The **[Conservation Commission]** is designated as the Stormwater Authority under the **[Town Stormwater Management Bylaw]**. These Stormwater Regulations have been adopted by the Stormwater Authority in accordance with the **[Town Stormwater Management Bylaw]**. The **[Conservation Commission]** shall administer, implement and enforce these Regulations. Any powers granted to or duties imposed upon the Stormwater Authority may be delegated in writing by the Stormwater Authority to its employees or agents.

Note: As noted in the model bylaw, the designated Stormwater Authority may vary by Town or City and references will need to be updated accordingly.

- B. The Stormwater Authority may periodically amend these regulations pursuant to **Article I, Section 6 of the Stormwater Bylaw**.
- C. Nothing in these Regulations is intended to replace or be in derogation of the requirements of any other **[Town]** bylaw.

Section 4. Waivers

- A. The Stormwater Authority, or its authorized agent, may waive strict compliance with any requirement of this bylaw or the rules and regulations promulgated hereunder, where such action is:
- (1) allowed by federal, state and local statutes and/or regulations and the MS4 Permit; and
 - (2) in the public interest; and
 - (3) not inconsistent with the purpose and intent of this bylaw.
- B. Any person seeking a waiver must submit a written waiver request. Such a request shall be accompanied by an explanation or documentation supporting the waiver request and demonstrating that strict application of the bylaw does not further the purposes or objectives of this bylaw.

C. All waiver requests shall require a public hearing.

Note: It is recommended but not required that waiver requests be discussed at a public hearing of the Stormwater Authority.

- D. If in the opinion of the Stormwater Authority or its authorized agent, additional time or information is required for review of a waiver request, the Stormwater Authority may continue a hearing to a date certain announced at the meeting. In the event the applicant objects to a continuance, or fails to provide requested information, the waiver request shall be denied.

Section 6. Administrative Land Disturbance Approval Review Procedure and Standards

Note: As noted in the model bylaw, the model regulations set-up a two-tier permitting system intended for an overall threshold lower than EPA's requirement (land disturbance of 1 acre or more). The following section describes application filing requirements and performance standards for lower-tier threshold projects.

- A. Administrative Review and Approval Required. Administrative Land Disturbance Approval must be obtained prior to the commencement of land disturbing activity disturbing **between 5,000 square feet and one-half acre (21,780 square feet) of land.**
- B. Application. A completed application for an Administrative Land Disturbance Approval shall be filed with Stormwater Authority. The Administrative Land Disturbance Approval Application package shall include:
- (1) A completed Application Form with original signatures of all property owners;
 - (2) Narrative describing the proposed work including existing and proposed site conditions (including structures, vegetation, and drainage), measures to mitigate any stormwater impacts, and anticipated maintenance requirements;
 - (3) A completed Checklist for Stormwater Report from the latest edition of the Massachusetts Stormwater Handbook to document compliance with applicable stormwater standards;
 - (4) An operation and maintenance plan to inspect, properly maintain and repair installed best management practices (BMPs) after project completion to ensure that they are functioning according to manufacturer or design specifications for the life of the BMP;
 - (5) **Three (3) copies of plans** that include:
 - (a) Existing site features including structures, pavement, plantings, and stormwater management systems etc.;
 - (b) Proposed work including proposed stormwater management systems and limits of disturbance; and

- (c) Basic erosion and sedimentation controls.
 - (6) Payment of the application fee. Each application must be accompanied by the appropriate application fee as established by the Stormwater Authority. Applicants shall also pay review fees as determined by the Stormwater Authority sufficient to cover any expenses connected with the review of the Administrative Land Disturbance Approval Application before the review process commences. The Stormwater Authority is authorized to retain a registered Professional Engineer (PE) or other professional consultant to advise the Stormwater Authority on any or all aspects of the Application. Additional fee information is provided in Section 8.
- C. Performance Standards
- (1) To the extent that the project will discharge, directly or indirectly, to a water body subject to one or more pollutant-specific Total Maximum Daily Loads (TMDLs), implement structural and non-structural stormwater best management practices (BMPs) that are consistent with each such TMDL.
 - (2) To the extent the project will discharge, directly or indirectly, to an impaired water body not subject to a TMDL, implement structural and non-structural stormwater BMPs optimized to remove the pollutant or pollutants responsible for the impairment.
 - (3) Avoid disturbance of areas susceptible to erosion and sediment loss.
 - (4) Use Low Impact Development (LID) techniques where adequate soil, groundwater and topographic conditions allow. These may include but not be limited to reduction in impervious surfaces, disconnection of impervious surfaces, bioretention (rain gardens), and infiltration systems.
- D. Consent to Entry onto Property. An applicant consents to entry of the Stormwater Authority or its authorized agents in or on site to verify the information in the application and to inspect for compliance with permit conditions.
- E. Information requests. The applicant shall submit all additional information requested by the Stormwater Authority to issue a decision on the application.
- F. Action by the Stormwater Authority. The Stormwater Authority may:
- (1) Approve the Administrative Land Disturbance Approval Application if it finds that the proposed plan meets the performance standards set forth herein;
 - (2) Approve the Administrative Land Disturbance Approval Application with conditions, modifications or restrictions that the Stormwater Authority determines are required to meet the performance standards set forth herein; or
 - (3) Require submission of a Land Disturbance Permit Application if the project will disturb land beyond administrative review thresholds or in the opinion of the Stormwater Authority requires more extensive review.

- G. Project Changes. The Applicant, or their agent, must notify the Stormwater Authority in writing of any change or alteration of a land-disturbing activity authorized in an Administrative Land Disturbance Approval before any change or alteration occurs. If the Stormwater Authority determines that the change or alteration is significant, based on the design requirements listed in Section 9(E) and accepted construction practices, the Stormwater Authority may require a Land Disturbance Permit application be filed. If any change or alteration from the Administrative Land Disturbance Approval occurs during any land disturbing activities, the Stormwater Authority may require the installation of interim erosion and sedimentation control measures before approving the change or alteration.
- H. As-Built Drawings. Applicants shall submit as-built drawings upon project completion, no later than two (2) years after completion of construction.

Section 7. Land Disturbance Permit and Procedure

- A. Application. A completed application for a Land Disturbance Permit shall be filed with the Stormwater Authority. The Land Disturbance Permit Application package shall include:
 - (1) A completed Application Form with original signatures of all property owners;
 - (2) A list of abutters within 300 feet of the property, certified by the [Town] Assessors Office;
- (3) [Three (3)] copies each of the
 - (a) Stormwater Management Plan;
 - (b) Erosion and Sediment Control Plan; and
 - (c) Operation and Maintenance Plan.
- (4) Payment of the initial application fee (see below for further information about fees).
- C. Information Requests. The applicant shall submit all additional information requested by the Stormwater Authority to issue a decision on the application.
- D. Determination of Completeness: The Stormwater Authority shall make a determination as to the completeness of the application and adequacy of the materials submitted. No review shall take place until the application is determined complete.
- E. Fees. Each application must be accompanied by the appropriate application fee as established by the Stormwater Authority. Applicants shall also pay review fees as determined by the Stormwater Authority sufficient to cover any expenses connected with the public hearing and review of the Land Disturbance Permit

Note: Notification of abutters is not required by the 2016 Massachusetts Small MS4 General Permit, but is recommended.

Application before the review process commences. The Stormwater Authority is authorized to retain a registered Professional Engineer (PE) or other professional consultant to advise the Stormwater Authority on any or all aspects of the Application. Additional fee information is provided in Section 8.

- F. Entry. Filing an application for a permit grants the Stormwater Authority or its agent, permission to enter the site to verify the information in the application and to inspect for compliance with permit conditions.
- G. Other Boards. The Stormwater Authority shall notify the Town Clerk of receipt of the application, and shall provide one copy of the application package to the **[relevant Town administrative boards or commissions, such as the Planning Board or Department of Public Works]**

Note: Revise this section as needed to reflect internal procedures for number of copies to be provided and other Boards/Departments that will be involved in permit review. This section may need to be modified if an electronic permitting system will be used.

- H. **Public Hearing.** The Stormwater Authority shall hold a public hearing **within 21 days** from the receipt of a complete application and may continue the hearing as necessary for complete review. The Stormwater Authority shall take final action within thirty (30) days from the time of the submission of all required information unless such time is extended by agreement between the applicant and Stormwater Authority. Notice of the public hearing shall be by publication, posting and by first-class mailings to abutters at least seven (7) days prior to the hearing. The Stormwater Authority shall make the application available for inspection by the public during business hours.

Note: Holding a public hearing is not required by the 2016 Massachusetts Small MS4 General Permit, but is recommended.

- I. Action by the Stormwater Authority. The Stormwater Authority may:
 - (1) Approve the Land Disturbance Permit Application and issue a permit if it finds that the performance standards and requirements set forth herein have been met;
 - (2) Approve the Land Disturbance Permit Application and issue a permit with conditions, modifications or restrictions that Stormwater Authority determines are required to ensure that the performance standards and requirements set forth herein are met;
 - (3) Disapprove the Land Disturbance Permit Application and deny the permit if it finds that the performance standards and requirements set forth herein have not been met; or
 - (4) Disapprove the Land Disturbance Permit Application “without prejudice” where an applicant fails to provide requested additional information or review fees that in the Stormwater Authority’s opinion are needed to adequately describe or review the proposed project.

- J. Final Approval. Final approval, if granted, shall be endorsed on the Land Disturbance Permit **by the signature of the majority of the Stormwater Authority** (or by the signature of the person officially authorized by the Stormwater Authority).

Note: Remove highlighted sentence as necessary based on who is designated as the Stormwater Authority in your community.

- K. Project Changes. The permittee, or their agent, must notify the Stormwater Authority in writing of any change or alteration of a land-disturbing activity authorized in a Land Disturbance Permit before any change or alteration occurs. If the Stormwater Authority determines that the change or alteration is significant, based on the design requirements listed in Section 9(E) and accepted construction practices, the Stormwater Authority may require that an amended Land Disturbance Permit application be filed and a public hearing held. If any change or alteration from the Land Disturbance Permit occurs during any land disturbing activities, Stormwater Authority may require the installation of interim erosion and sedimentation control measures before approving the change or alteration.
- L. As-Built Drawings. Applicants shall submit as-built drawings upon project completion, no later than two (2) years after completion of construction. The as-built drawings must depict all on-site controls, both structural and non-structural, designed to manage stormwater associated with the completed site.

Section 8. Fees

- A. Initial application fees shall be as follows:
- (1) Administrative Land Disturbance Approval: \$_____.
 - (2) Land Disturbance Permit: \$_____.

Note: Fees must be reasonably related to the costs incurred by the Town to administer the program. They may vary by project type, project size, or any other rational criteria.

- B. Consultant Fees

Note: The provisions of this section are required by c. 44, §53G.

- (1) Purpose. As provided by G.L. Ch. 44 §53G and the **[Town Stormwater Bylaw]**, the Stormwater Authority may impose reasonable fees for the employment of outside consultants, engaged by the Stormwater Authority, for specific expert services to assist the Stormwater Authority in its review of applications for Administrative Land Disturbance Approval and Land Disturbance Permits and oversight of permit compliance.
- (2) Special Account. Funds received pursuant to these rules shall be deposited with the municipal treasurer who shall establish a special account for this purpose. Expenditures from this special account may be

made at the direction of the Stormwater Authority without further appropriation as provided in G.L. Ch. 44 §53G. Expenditures from this account shall be made only in connection with a specific project or projects for which a consultant fee has been collected from the applicant. Expenditures of accrued interest may also be made for these purposes.

- (3) Consultant Services. Specific consultant services may include but are not limited to technical or legal review of the permit application and associated information, on-site monitoring during construction, or other services related to the project deemed necessary by the Stormwater Authority. The consultant shall be chosen by, and report only to, the Stormwater Authority or its staff.
- (4) Notice. The Stormwater Authority shall give written notice to the applicant of the selection of an outside consultant. Such notice shall state the identity of the consultant, the amount of the fee to be charged to the applicant, and a request for payment of said fee in its entirety. Such notice shall be deemed to have been given on the date it is mailed or delivered. No such costs or expenses shall be incurred by the applicant if the application or request is withdrawn within five days of the date notice is given.
- (5) Payment of Fee. The fee must be received prior to the initiation of consulting services. The Stormwater Authority may request additional consultant fees if necessary review requires a larger expenditure than originally anticipated or new information requires additional consultant services. Failure by the applicant to pay the consultant fee specified by the Commission within ten (10) business days of the request for payment, or refusal of payment, shall be cause for the Stormwater Authority to deny the application based on lack of sufficient information to evaluate whether the project meets applicable performance standards. An appeal stops the clock on the above deadline; the countdown resumes on the first business day after the appeal is either denied or upheld.
- (6) Appeals. The applicant may appeal the selection of the outside consultant to the Board of Selectmen, who may only disqualify the outside consultant selected on the grounds that the consultant has a conflict of interest or does not possess the minimum required qualifications. The minimum qualifications shall consist of either an educational degree or three or more years of practice in the field at issue or a related field. Such an appeal must be in writing and received by the Board of Selectmen and a copy received by the Stormwater Authority, so as to be received within ten (10) days of the date consultant fees were requested by the Stormwater Authority. The required time limits for action upon the application shall be extended by the duration of the administrative appeal.
- (7) Return of Unspent Fees. When the Stormwater Authority's review of a permit application and oversight of the permitted project is complete, any balance in the special account attributable to that project shall be returned

within 30 days. The excess amount, including interest, shall be repaid to the applicant or the applicant's successor in interest. For the purpose of this regulation, any person or entity claiming to be an applicant's successor in interest shall provide the Stormwater Authority with appropriate documentation. A final report of said account shall be made available to the applicant or applicant's successor in interest.

Section 9. Stormwater Management Plan for Permit Applications

- A. The application for a Land Disturbance Permit shall include a Stormwater Management Plan. The Stormwater Management Plan shall contain sufficient information for the Stormwater Authority to evaluate the environmental impact, effectiveness, and acceptability of the site planning process and the measures proposed by the applicant to reduce adverse impacts from stormwater runoff during construction, and post-construction in the long-term.
- B. The Stormwater Management Plan shall fully describe the project in narrative, drawings, and calculations. It shall at a minimum include:
 - (1) Contact Information. The name, address, and telephone number of all persons having a legal interest in the property and the tax reference number and parcel number of the property or properties affected;
 - (2) Narrative describing:
 - (a) Purpose;
 - (b) Methodologies and assumptions;
 - (c) Existing and proposed uses and conditions;
 - (d) Project impacts and mitigation techniques including:
 - i. Summary of proposed land area to be cleared, existing and proposed impervious area, work within proximity of regulated wetland resources, aquifer protection zones, earthwork within 4 feet of seasonal high groundwater elevations, and other sensitive environmental areas;
 - ii. LID techniques considered for this project and an explanation as to why they were included or excluded from the project;
 - iii. Proposed best management practices;
 - iv. Identifying the watershed basin that the project is located in and the immediate down gradient waterbody(s) that stormwater runoff from the project site discharges to, EPA's watershed and waterbody assessment and TMDL and/or impairment status of the watershed and waterbody(s), and the LIDs and BMPs included in the project to address the pollutant(s) of concern;

- (e) Summary of pre- and post-development peak rates and volumes of stormwater runoff demonstrating no adverse impacts to down-gradient properties, stormwater management systems and wetland resources; and
 - (f) Summary of how project meets stormwater management criteria.
- (3) Plans
- (a) Portion of the USGS Map indicating the site locus and properties within a minimum of 500 feet of project property line;
 - (b) Existing conditions and proposed design plans showing:
 - i. Buildings and/or structures including materials, approximate height;
 - ii. Utilities including size, material and invert data; and
 - iii. Regulated wetland resource areas within proximity of the site
 - (c) Stormwater management design plan(s) and details showing:
 - i. Location, size, material, inverts data and details for all existing and proposed stormwater management system components including structures, pipes, swales, detention, retention, and infiltration systems and any other LID techniques or BMPs;
 - ii. Profiles of drainage trunk lines; and
 - iii. Drainage easements;
 - (d) Separate Pre- and Post- Condition Watershed Plans indicating:
 - i. Structures, pavements, surface vegetation and other ground cover materials;
 - ii. Topography sufficient to delineate watershed areas;
 - iii. Point(s) of analysis;
 - iv. Watershed areas including upgradient areas that contribute stormwater flow onto the project site, labeled to be easily identified in calculations. Total pre and post watershed areas should be equivalent;
 - v. Breakdown summary of various surface conditions by soil hydrologic group rating; and
 - vi. Flow path for time of concentration (Tc) calculation.
- (4) Calculations
- (a) Hydrologic calculation to determine pre and post peak rates and volumes of stormwater runoff for 2, 10, 25 and 100 year 24 hour storm events;

- (b) Groundwater recharge calculations and BMP drawdown (time to empty);
 - (c) Water quality calculations including (if applicable):
 - i. TSS removal calculation for each watershed;
 - ii. Specific BMPs utilized in critical areas;
 - iii. Specific BMPs utilized for land uses of higher potential pollutant loads (LUHPPL); and
 - iv. Specific treatment for pollutant causing impairment of down-gradient waterbody identified by U.S. Environmental Protection Agency and Massachusetts Department of Environmental Protection.
 - (d) Hydraulic calculations to size drainage pipes, swales and culverts; and
 - (e) Supplemental calculations for sizing LID and BMPs and addressing impairments to water bodies.
 - (5) Soil mapping and test data;
 - (6) Massachusetts Department of Environmental Protection Checklist for Stormwater Report completed, stamped and signed by a registered Professional Engineer (PE) licensed in the Commonwealth of Massachusetts to certify that the Stormwater Management Plan is in accordance with the criteria established in the Massachusetts Stormwater Management Standards, [Town] Stormwater Management bylaw and these regulations; and
 - (7) Any other information requested by the Stormwater Authority.
- C. General Performance Standards for All Sites.
- (1) LID site planning and design strategies must be utilized to the maximum extent feasible.

Note: The use of LID to the maximum extent feasible is required by section 2.3.6 of the 2016 Small MS4 General Permit. Note that the term LID is inclusive of green infrastructure and site design strategies such as preservation of natural features of a site, minimization of the creation of impervious area, and managing stormwater in a decentralized fashion (for example, through disconnection of rooftop drains to pervious areas for infiltration).

- (2) The selection, design and construction of all pre-treatment, treatment and infiltration BMPs shall be in accordance with Massachusetts Stormwater Handbook and shall be consistent with all elements of the Massachusetts Stormwater Standards including but not limited to those regarding new stormwater conveyances, peak runoff rates, recharge, land uses with higher potential pollutant loads, discharges to Zone II or interim wellhead protection areas, sediment and erosion control, and illicit discharges.

Note: The performance standards in (3), (4) and (5) below are related to optional design criteria for emerging best practices related to protecting tree canopy, preserving riparian buffers, and mitigating thermal impacts of stormwater runoff.

- (3) **Tree Protection and Preservation.** Trees can be an important tool for retention and detention of stormwater runoff. Trees provide additional benefits, including cleaner air, reduction of heat island effects, carbon sequestration, reduced noise pollution, reduced pavement maintenance needs, and cooler cars in shaded parking lots. The [Town] therefore deems that the preservation and protection of certain trees on private property, the requirement to replant trees to replace those removed, and the collection of financial contributions to support the [Town's] tree planting and maintenance efforts are public purposes that protect the public health, welfare, environment and aesthetics.

Note: The following Tree Protection and Preservation regulations are based upon the Town of Wellesley Tree Protection & Preservation Bylaw. Please refer to that bylaw for additional language regarding the Tree Fund and additional applicability language.

- (a) Existing trees with a Diameter at Breast Height (DBH) of 10 inches or greater on sites for which a Land Disturbance Permit application is submitted shall be considered to be Protected Trees. Each Protected Tree to be retained on property planned for demolition and/or construction activity shall be protected by the establishment of a Tree Save Area. The Tree Save Area shall be delineated within the submitted Erosion and Sedimentation Plan and described in the Land Disturbance Permit, shall be installed prior to the issuance of applicable permits, and shall remain in place until work is completed on the property. The applicant shall submit written documentation, prepared, stamped, dated and signed by a Certified Arborist, to the Building Department confirming that the required Tree Save Area identified in the Erosion and Sedimentation Plan has been installed.
- i. Critical Root Zone (CRZ) - The minimum area beneath the canopy of a tree which must be left undisturbed in order to preserve a sufficient root mass to give a tree a reasonable chance of survival. The CRZ is represented by a concentric circle centering on the tree's trunk and extending outward towards the tree's drip-line. The minimum area of the CRZ shall be dependent on the required minimum radius of the CRZ; the required minimum radius of the CRZ shall be determined by multiplying a tree's DBH (in inches) by eighteen (18) inches, with the resulting product constituting the minimum radius of the CRZ.

- ii. Drip-Line - The area surrounding the tree from the trunk to the outermost branches. This area is distinguished from, and not to be confused with Critical Root Zone.
 - iii. Tree Save Area - The area surrounding a tree which includes at a minimum the Critical Root Zone (“CRZ”) and Drip-Line of all Protected Trees, unless otherwise authorized herein. The Tree Save Area must be enclosed within a fence and remain undisturbed so as to prevent damage to the tree.
- (b) Trees that are hazardous or subject to an immediate and/or probable risk of disease or insect infestation as determined and confirmed in writing by a Certified Arborist will not be considered to be Protected Trees.
 - (c) The removal of a Protected Tree from a property shall require mitigation through replanting or contribution to the [Town] Tree Bank. Mitigation measures shall be identified in the Land Disturbance Permit application.
 - (d) Replanting of Trees: For each inch of DBH of the tree(s) removed no less than one-half (0.5) inch of caliper of new tree(s) shall be replanted in accordance with the following:
 - i. Each new tree must have a minimum caliper of two (2) inches;
 - ii. Such replanting, either on the applicant’s land or on land abutting the applicant’s land with the express written approval of the owner of such abutting land, shall occur prior to Final Inspection, or be otherwise assured at such time to the satisfaction of the [Town];
 - iii. Invasive tree species, as determined by the Massachusetts Division of Fisheries and Wildlife, shall not be replanted to mitigate the removal of a Protected Tree.
 - (e) Contribution to the Tree Bank: In lieu of replanting, if applicable, the owner of the property shall submit any required contribution to the Tree Bank as mitigation for the removal of a protected tree. [The Town] shall establish a Tree Bank contribution schedule, such schedule to be based on the DBH of Protected Tree(s) to be removed. The schedule may take into account the aggregate DBH of Protected Trees to be removed. The applicant shall make such contribution to the Tree Bank for the removal of a Protected Tree not already mitigated for through replanting.
 - (f) Each Protected Tree retained shall be maintained in good health for a period of no less than twenty-four (24) months from the date of Final Inspection, or issuance of a Certificate of Completion if applicable. Should such tree die within this twenty-four (24) month

period, the owner of the property shall be required to provide mitigation consistent with the requirements for the removal of a Protected Tree as contained herein within nine (9) months from the death of the original tree.

- (g) All new trees replanted to mitigate the removal of Protected Tree(s) shall be maintained in good health for a period of no less than twenty-four (24) months from the date of planting. Should such tree die within this twenty-four (24) month period, the owner of the property shall be responsible for replacing the tree with a tree equal to or greater than the size of the original replacement tree at the time of planting; such tree shall be planted within nine (9) months of the death of the original replacement tree.

Note: If your community has a stormwater utility in place, you may wish to consider instead offering a stormwater performance-based Tree Credit as described by the Center for Watershed Protection in the *Stormwater Performance-Based Credit Overview* and *Stormwater Performance-Based Credit Calculator*. The calculator determines the credit amount for use of tree planting for meeting stormwater management requirements for runoff, nutrient, and sediment reduction, and suggests requiring certain conditions be met (maintenance agreement and plan in place, consultation with a tree professional, curbside leaf pick-up program in place for trees planted over impervious cover in urban areas) for use of the full credit.

- (4) **Protection of Riparian Buffers.** Riparian buffers, also known as a vegetated buffer or forest buffers, are vegetated areas along a stream, usually forested, which helps shade and partially protect a stream from the impact of adjacent land uses. Where possible, establish and protect a naturally vegetated buffer system along all perennial streams and other water features that encompass critical environmental features such as the 100-year floodplain, steep slopes (in excess of 15%), lake shorelands, and wetlands.

Riparian stream buffers should be preserved or restored with native vegetation. Buffers are most effective when maintained in an undisturbed condition, mowing and brush hogging should not take place within a buffer.

Note: If additional performance standards on protection/preservation of forested buffers is desired, please refer to section 5.1 of the New York State Stormwater Manual.

- (5) **Mitigation of Thermal Impacts of Stormwater Runoff.** Stormwater BMPs must mitigate potential temperature impacts of development and land use conversions to Cold Water Fisheries. Elevated temperatures are caused by reduced shading in developed riparian areas, warming of stormwater as it runs over hot roofs and pavement, and heating of water stored in stormwater management ponds. Traditional peak reduction outlet

structures and simple spillway outlets do nothing to cool the water before discharge. Cold Water Fisheries located in the [Town of] include, but are not limited to, [name]. The [Town DPW or Engineering Department] has current maps of [Town]'s watersheds and the locations of Cold Water Fisheries. Land Disturbance Permit sites located near Cold Water Fisheries shall address the following additional design considerations.

- (a) To mitigate thermal impacts to Cold Water Fisheries from stormwater, alternative BMPs to stormwater ponds, such as buffers, infiltration or under-drained filters should be used, or, if ponds are required, under-drained outlet structures can provide effective cooling.
- (b) Equally important to maintaining cool stream temperature is preservation and/or restoration of riparian trees and shrubs to provide shade. To the maximum extent feasible, trees and other existing vegetation shall be conserved. To the extent that existing vegetation cannot be conserved, new natural areas shall be established by planting additional vegetation, establishing no-mow zones, clustering tree areas, and using native plants in revegetation.

Note: The Urban Waterways article *Stormwater BMPs for trout waters : coldwater stream design guidance for stormwater wetlands, wet ponds, and bioretention* authored by the NC State University and d State University Cooperative Extensive provides specific design criteria for stormwater BMPs discharged to cold water habitats.

D. Performance Standards for New Development.

Note: The performance standards in the following sections use the minimum requirements from the redline revisions to the 2016 Massachusetts Small MS4 General Permit.

- (1) Stormwater management systems on new development shall be designed to meet an average annual pollutant removal equivalent to 90% of the average annual load of Total Suspended Solids (TSS) related to the total post-construction impervious area on the site AND 60% of the average annual load of Total Phosphorus (TP) related to the total postconstruction impervious surface area on the site. Average annual pollutant removal requirements shall be achieved through one of the following methods:
 - (a) installing stormwater BMPs that meet the pollutant removal percentages required in 9.D.(1) based on calculations developed consistent with EPA Region 1's BMP Accounting and Tracking Tool (2016) or other BMP performance evaluation tool provided by EPA Region 1, where available. If EPA Region 1 tools do not address the planned or installed BMP performance, then any federally or State-approved BMP design guidance or performance standards (e.g., State stormwater handbooks and design guidance manuals) may be used to calculate BMP performance; or

- (b) retaining the volume of runoff equivalent to, or greater than, one (1.0) inch multiplied by the total post-construction impervious surface area on the new development site; or
- (c) meeting a combination of retention and treatment that achieves the above standards.

Note: The redline revisions to the 2016 Massachusetts Small MS4 General Permit allow for the use of off-site mitigation for new development projects, but based on conversations with NMSC communities, the use of off-site mitigation for new development is not a preferred option, so it has not been included in the model.

E. Performance Standards for Redevelopment Sites.

- (1) Stormwater management systems on redevelopment sites shall be designed to meet an average annual pollutant removal equivalent to 80% of the average annual postconstruction load of Total Suspended Solids (TSS) related to the total post-construction impervious area on the site AND 50% of the average annual load of Total Phosphorus (TP) related to the total post-construction impervious surface area on the site. Average annual pollutant removal requirements shall be achieved through one of the following methods:
 - (a) installing BMPs that meet the pollutant removal percentages based on calculations developed consistent with EPA Region 1's BMP Accounting and Tracking Tool (2016) or other BMP performance evaluation tool provided by EPA Region 1, where available. If EPA Region 1 tools do not address the planned or installed BMP performance, then any federally or State-approved BMP design guidance or performance standards (e.g., State stormwater handbooks and design guidance manuals) may be used to calculate BMP performance; or
 - (b) retaining the volume of runoff equivalent to, or greater than, 0.8 inch multiplied by the total post-construction impervious surface area on the redeveloped site; or
 - (c) meeting a combination of retention and treatment that achieves the above standards; or
 - (d) **utilizing off-site mitigation** that meets the above standards within the same USGS HUC12 as the redevelopment site.

Note: (d) above allows the use of off-site mitigation for redevelopment projects, and the below section provides optional criteria related to off-site mitigation project applications.

F. **Performance Standards for Redevelopment Projects Offsite Mitigation.**

Note: The following section includes some recommendations for requirements related to off-site mitigation for redevelopment projects based on the Neponset model stormwater regulations. Allowing the use of off-site mitigation is not required, but if the Town/City determines that it would be beneficial to allow the use of off-site mitigation, additional considerations may be required. Please refer to the 2018 Center for Watershed Protection document, *Guidance for Developing an Off-site Stormwater Compliance Program for Redevelopment Projects in Massachusetts* for additional information.

- (a) For Redevelopment projects where the Applicant proposes to utilize off-site mitigation to meet the average annual pollutant removal requirements of 9.E.(1), the Applicant will describe in writing why it is not technically feasible to meet the average annual pollutant removal requirements on-site, including which on-site treatment BMPs were considered and why they were deemed not feasible.
- (b) Off-site mitigation shall be located within [Town] and the same tributary to the maximum extent feasible. Under no circumstances will off-site mitigation be located outside the same USGS HUC12.
- (d) The off-site mitigation project shall be designed and constructed in a manner consistent with the requirements of the [Town Stormwater Management Bylaw] and related regulations.
- (e) The [Stormwater Authority] shall, at its discretion, identify priority areas within the [watershed] in which offsite mitigation may be completed.

Note: This provision gives the Town the option to develop a list of priority projects within its watersheds for projects to complete as their offsite mitigation.

- (g) Offsite mitigation provided at a site not owned by [Town], requires a separate Land Disturbance Permit covering the off-site mitigation project, the terms and conditions of which, including ongoing operations and maintenance requirements, shall run with the land where the off-site mitigation is located.

Note: (g) requires applicants to submit separate applications – one for the redevelopment project and site, and one for the offsite mitigation project and site.

- (h) Construction of the off-site mitigation project shall commence within 12 months of Land Disturbance Permit issuance and be completed within 12 months of commencement.

G. Stormwater Management Design Standards

- (1) Projects must be designed to collect and dispose of stormwater runoff from the project site in accordance with Massachusetts Stormwater Management Standards, the Small MS4 General Permit, [Town]

Department of Public Works **[requirements, including those for subdivisions]**, recognized engineering methodologies and these regulations with an emphasis on including LID techniques in the design.

- (2) Projects must manage surface runoff so that no proposed flows are conducted over public ways, nor over land not owned or controlled by the Applicant unless a drainage easement in proper form is obtained permitting such discharge.
- (3) Projects must use LID techniques where adequate soil, groundwater and topographic conditions allow. These may include but not be limited to reduction in impervious surfaces, disconnection of impervious surfaces, bioretention (rain gardens) and infiltration systems.

Note: The 2016 Massachusetts Small MS4 permit requires the use of LID to the maximum extent feasible. The following language offers potential credits for the use of LID measures based on the method for calculating credits in the Massachusetts Stormwater Handbook.

The use of one or more LID site design measures by the applicant may allow for a reduction in the water quality treatment volume required by these regulations. The applicant may, if approved by the Stormwater Authority, take credit for the use of stormwater LID measures to reduce some of the requirements specified in these regulations. The site design practices that qualify for these credits and procedures for applying and calculating credits are identified in the Massachusetts Stormwater Handbook **[or local LID Credit bylaw]**.

- (4) Projects must use TR-55 and TR-20 methodologies to calculate peak rate and volume of runoff from pre-development to post-development conditions.
- (5) Stormwater management systems shall be designed to avoid disturbance of areas susceptible to erosion and sediment loss, avoiding, to the greatest extent practicable: the damaging of large forest stands; building on steep slopes (15% or greater); and disturbing land in wetland buffer zones and floodplains.

Note: The avoidance measures described in (5) above are not required by the 2016 Massachusetts Small MS4 General Permit but are recommended best practices.

- (6) Watershed area for hydrologic analysis and BMP sizing calculations must include at a minimum the site area and all upgradient areas from which stormwater runoff flows onto the site.
- (7) For purposes of computing runoff, all pervious lands in the site are assumed prior to Development to be in “good hydrologic condition” regardless of the conditions existing at the time of the computation.
- (8) Length of sheet flow used for times of concentration is to be no more than 50 feet.

- (9) Utilize the 24 hour rainfall data taken from the most recent version of the **Precipitation-Frequency Atlas** of the United States, Northeastern states.

Note: Some communities are opting to require projects to utilize the more conservative NRCC Extreme Precipitation in New York & New England rainfall data.

- (10) Soils tests to be conducted by a Registered Professional Engineer or Massachusetts Soil Evaluator, performed at the location of all proposed LID techniques and BMPs, to identify soil descriptions, depth to estimated seasonal high groundwater, depth to bedrock, and soil texture.
- (11) The design infiltration rate shall be determined from the on-site soil texture and Rawls rates as published in the Massachusetts Stormwater Handbook or saturated hydraulic conductivity tests.
- (12) Size drainage pipes to accommodate the 25 year storm event and maintain velocities between 2.5 and 10 feet per second, and provide calculations using the Mannings Equation.

Note: We recommend not specifying the method for (12), but requiring the engineer to provide calculations using the Mannings equation, as using the Rational Method conflicts with using TR-20/TR-55 for hydrologic analysis.

- (13) Size drainage swales to accommodate the 25 year storm event and velocities below 4 feet per second.
- (14) Size culverts to accommodate the 50 year storm event and design adequate erosion protection. Design stream crossing culverts in accordance with the latest addition of the Massachusetts Stream Crossing Handbook.
- (15) Size stormwater basins to accommodate the 100-year storm event with a minimum of one foot of freeboard.
- (16) All drainage structures are to be able to accommodate HS-20 loading.
- (17) Catch basins structures are to be constructed as required by **[Town Department of Public Works or other local law]** and spaced a maximum of 250 feet apart in roadways.
- (18) Catch basins adjacent to curbing are to be built with a granite curb inlet as required by **[Town Department of Public Works or other local law]**.
- (19) Catch basins in low points of road and on roads with profile grades greater than 5 percent are to be fitted with double grates (parallel with curb) as required by **[Town Department of Public Works or other local law]**.
- (20) All drainpipes are to be reinforced concrete pipe or High Density Polyethylene (HDPE) pipe and have a minimum diameter of 12 inches.
- (21) Outfalls are to be designed to prevent erosion of soils, and pipes 24 inches or larger are to be fitted with grates or bars to prevent ingress.

- (22) Drainage easements are to provide sufficient access for maintenance and repairs of system components and be at least 20 feet wide.
- (23) Minimize permanently dewatering soils by:
 - (a) Limiting grading within 4 feet of seasonal high groundwater elevation (SHGWE);
 - (b) Raising roadways to keep roadway section above SHGWE; and
 - (c) Setting bottom floor elevation of building(s) a minimum of 2 feet above SHGWE.

Section 10. Erosion and Sedimentation Control Plan of Permit Applications

- A. The Erosion and Sediment Control Plan shall be designed to ensure compliance with these regulations, the MS4, and if applicable, the NPDES General Permit for Storm Water Discharges From Construction Activities. In addition, the plan shall ensure that the Massachusetts Surface Water Quality Standards (314 CMR 4.00) are met in all seasons.
- B. If a project requires a Stormwater Pollution Prevention Plan (SWPPP) per the NPDES General Permit for Storm Water Discharges From Construction Activities (and as amended), then the applicant is required to submit a complete copy of the SWPPP and the signed Notice of Intent. If the SWPPP meets the requirements of the General Permit, it will be considered equivalent to the Erosion and Sediment Control Plan described in this section.
- C. The Erosion and Sediment Control Plan shall remain on file with the Stormwater Authority. Refer to the latest version of the Massachusetts Erosion and Sediment Control Guidelines for Urban & Suburban Areas for detailed guidance.
- D. Erosion and Sedimentation Control Plan Content. The Plan shall contain the following information:
 - (1) Names, addresses, and telephone numbers of the owner, applicant, and person(s) or firm(s) preparing the plan;
 - (2) Title, date, north arrow, names of abutters, scale, legend, and locus map;
 - (3) Location and description of natural features including:
 - (a) Watercourses and water bodies, wetland resource areas and all floodplain information, including the 100-year flood elevation based upon the most recent Flood Insurance Rate Map, or as calculated by a registered Professional Engineer (PE) for areas not assessed on these maps;
 - (b) Existing vegetation including tree lines, canopy layer, shrub layer, and ground cover, and trees with a caliper twelve (12) inches or larger, noting specimen trees and forest communities; and
 - (c) Habitats mapped by the Massachusetts Natural Heritage & Endangered Species Program as Endangered, Threatened or of Special Concern, Estimated Habitats of Rare Wildlife and Certified

Vernal Pools, and Priority Habitats of Rare Species within five hundred (500) feet of any construction activity.

- (4) Lines of existing abutting streets showing drainage and driveway locations and curb cuts;
- (5) Existing soils, volume and nature of imported soil materials;
- (6) Topographical features including existing and proposed contours at intervals no greater than two (2) feet with spot elevations provided when needed;
- (7) Surveyed property lines showing distances and monument locations, all existing and proposed easements, rights-of-way, and other encumbrances, the size of the entire parcel, and the delineation and number of square feet of the land area to be disturbed;
- (8) Drainage patterns and approximate slopes anticipated after major grading activities (Construction Phase Grading Plans);
- (9) Location and details of erosion and sediment control measures with a narrative of the construction sequence/phasing of the project, including both operation and maintenance for structural and non-structural measures, interim grading, and material stockpiling areas;
- (10) Path and mechanism to divert uncontaminated water around disturbed areas, to the maximum extent practicable. When determining whether the requirements have been met, the Stormwater Authority shall consider all stormwater management practices available and capable of being implemented after taking into consideration costs, existing technology, proposed use, and logistics in light of overall project purposes. Project purposes shall be defined generally (*e.g.*, single family home or expansion of a commercial development).;
- (11) Location and description of industrial discharges, including stormwater discharges from dedicated asphalt plants and dedicated concrete plants, which are covered by this permit;
- (12) Stormwater runoff calculations in accordance with the Massachusetts Department of Environmental Protection's Stormwater Management Handbook and Stormwater Standards;
- (13) Location and description of and implementation schedule for temporary and permanent seeding, vegetative controls, and other stabilization measures;
- (14) A description of construction and waste materials expected to be stored on-site. The Plan shall include a description of controls to reduce pollutants from these materials, including storage practices to minimize exposure of the materials to stormwater, and spill prevention and response;

- (15) A description of provisions for phasing the project where one acre of area or greater is to be altered or disturbed;
 - (16) Plans must be stamped and certified by a qualified Professional Engineer registered in Massachusetts or a Certified Professional in Erosion and Sediment Control; and
 - (17) Such other information as is required by the Stormwater Authority.
- E. Erosion Controls Design Standards. The Sediment and Erosion Control Plan shall be developed to comply with the Small MS4 General Permit and shall meet the following standards:
- (1) Minimize total area of disturbance;
 - (2) Sequence activities to minimize simultaneous areas of disturbance;
 - (3) Minimize peak rate of runoff in accordance with the Massachusetts Department of Environmental Protection Stormwater Standards;
 - (4) Minimize soil erosion and control sedimentation during construction;
 - (5) Divert uncontaminated water around disturbed areas;
 - (6) Maximize groundwater recharge;
 - (7) Install and maintain all Erosion and Sediment Control measures in accordance with the Massachusetts Erosion and Sedimentation Control Guidelines for Urban and Suburban Areas, manufacturers specifications and good engineering practices;
 - (8) Prevent off-site transport of sediment;
 - (9) Protect and manage on and off-site material storage areas (overburden and stockpiles of dirt, borrow areas, or other areas used solely by the permitted project are considered a part of the project);
 - (10) Comply with applicable Federal, State and local laws and regulations including waste disposal, sanitary sewer or septic system regulations, and air quality requirements, including dust control;
 - (11) Protect natural resources and prevent significant alteration of habitats mapped by the Massachusetts Natural Heritage & Endangered Species Program as Endangered, Threatened or Of Special Concern, Estimated Habitats of Rare Wildlife and Certified Vernal Pools, and Priority Habitats of Rare Species from the proposed activities;
 - (12) Institute interim and permanent stabilization measures, which shall be instituted on a disturbed area as soon as practicable but no more than 14 days after construction activity has temporarily or permanently ceased on that portion of the site;
 - (13) Properly manage on-site construction and waste materials, including truck washing and cement concrete washout facilities;
 - (14) Prevent off-site vehicle tracking of sediments; and

- (15) Incorporate appropriate BMPs designed to comply with the Massachusetts Stormwater Handbook.

Section 11. Operation and Maintenance Plan for Permit Applications

- A. A stand-alone Operation and Maintenance Plan is required at the time of application for all projects that include structural and non-structural stormwater BMPs. The Operation and Maintenance Plan shall be designed to ensure compliance with the Permit and these regulations for the life of the system. The Operation and Maintenance Plan shall remain on file with the Stormwater Authority and shall be an ongoing requirement. The Applicant shall provide copies of the Operation and Maintenance Plan to all persons responsible for maintenance and repairs.
- B. The Operation and Maintenance Plan shall include:
 - (1) The name(s) of the owner(s) for all components of the system;
 - (2) A map showing the location of the systems and facilities including all structural and nonstructural stormwater best management practices (BMPs), catch basins, manholes/access lids, pipes, and other stormwater devices. The plan showing such systems and facilities to be privately maintained, including associated easements shall be recorded with the **[County]** Registry of Deeds prior to issuance of a Certificate of Compliance by the Stormwater Authority pursuant to Section 15.
 - (3) Maintenance Agreement that specifies:
 - (a) The names and addresses of the person(s) responsible for operation and maintenance;
 - (b) The person(s) financially responsible for maintenance and emergency repairs;
 - (c) An Inspection and Maintenance Schedule for all stormwater management facilities including routine and non-routine maintenance tasks to be performed. Where applicable, this schedule shall refer to the Maintenance Criteria provided in the Stormwater Handbook or the EPA National Menu of Stormwater Best Management Practices or equivalent;
 - (d) Instructions for routine and long-term operation and maintenance shall have sufficient detail for responsible parties to perform necessary maintenance activities and prevent actions that may adversely affect the performance of each structural and/or nonstructural stormwater BMP.
 - (e) A list of easements with the purpose and location of each; and
 - (f) The signature(s) of the owner(s) and all persons responsible for operation and maintenance, financing, and emergency repairs, as defined in the Maintenance Agreement, if maintenance is to be performed by an entity other than the owner.

- (4) Stormwater Management Easement(s)
- (a) Stormwater Management easements shall be provided by the property owner(s) as necessary for:
 - i. Access for facility inspections and maintenance;
 - ii. Preservation of stormwater runoff conveyance, infiltration, and detention areas and facilities, including flood routes for the 100-year storm event; and
 - iii. Direct maintenance access by heavy equipment to structures requiring maintenance.
 - (b) The purpose of each easement shall be specified in the Maintenance Agreement signed by the property owner.
 - (c) Stormwater Management easements are required for all areas used for permanent stormwater control, unless a waiver is granted by the Stormwater Authority pursuant to Section 4(B).
 - (d) Easements shall be recorded with the **[County]** Registry of Deeds prior to issuance of a Certificate of Compliance by the Stormwater Authority pursuant to Section 15.
- (5) Changes to Operation and Maintenance Plans
- (a) The owner(s) of record of the Stormwater Management system must notify the Stormwater Authority of changes in ownership, assignment of Operation and Maintenance responsibilities, or assignment of financial responsibility within 30 days of the change in ownership. The owner of record shall be responsible for Operation and Maintenance activities until a copy of the updated Operation and Maintenance Plan has been furnished to the Stormwater Authority signed by the new owner or any new responsible person.
 - (b) The maintenance schedule in the Maintenance Agreement may be amended to achieve the purposes of the **[Stormwater Management bylaw]** by mutual agreement of the Stormwater Authority and the Responsible Parties. Amendments must be in writing and signed by all Responsible Parties. Responsible Parties shall include owner(s), persons with financial responsibility, and persons with operational and/or maintenance responsibility.
- (6) Enforcement. To ensure adequate long-term operation and maintenance of stormwater management practices, applicants are required to implement one or more of the following procedures, as directed by the Stormwater Authority:

Note: The following section describes options for ensuring long-term operations and maintenance of stormwater BMPs per the 2016 Massachusetts Small MS4 General Permit. Municipalities should revise this section if there are procedures that they do not wish to include as options for applicants.

- (a) Filing by the applicant of an annual Operation and Maintenance Report with the Stormwater Authority on a form specified by the Stormwater Authority, accompanied by an annual filing fee established by the Stormwater Authority for administration and enforcement of the Operation and Maintenance plan.

Note: Establishing an annual filing fee for annual inspection reports and utilizing a standard annual reporting form would reduce the administrative burden of receiving and tracking annual inspections.

- (b) Establishment by the applicant of a dedicated fund or escrow account in the form of a Bond, Insurance Policy or similar instrumentality, to be maintained for a number of years and for an amount specified by the Stormwater Authority. Such fund or account may be used by the applicant to perform its operation and maintenance responsibilities or, if the Stormwater Authority finds that the applicant has failed to comply with the Plan, by the Stormwater Authority to perform or cause to be performed the required operation and maintenance tasks;
- (c) Payment by the applicant to the Stormwater Authority of an amount specified by that Authority in compensation for its acceptance of ownership of all privately-constructed BMPs;
- (d) A maintenance contract between the applicant and the Stormwater Authority in an amount specified by the Stormwater Authority whereby the Stormwater Authority will perform or cause to be performed the required operation and maintenance tasks;
- (e) Submission by the applicant of an annual certification documenting the work that has been done over the last 12 months to properly operate and maintain the stormwater control measures. The certification shall be signed by the person(s) or authorized agent of the person(s) named in the permit as being responsible for ongoing operation and management;
- (f) Recording of Operation and Maintenance Plans at the appropriate Registry of Deeds or Land Court.

Section 13. Inspection and Site Supervision for Permit Applicants.

- A. Pre-construction Meeting. Prior to starting the clearing, excavation, construction, Redevelopment or land disturbing activity, the applicant, the applicant's technical representative, the general contractor or any other person with authority to make changes to the project, may be required to meet with the Stormwater Authority, to review the approved plans and their proposed implementation. The need for a pre-construction meeting shall be determined by the Stormwater Authority based on the project scope.
- B. Construction may not commence until the applicant has submitted EPA's approval of the Construction General Permit Notice of Intent to the Stormwater Authority and the final SWPPP is posted at the site.

Note: The above language should be a standard condition in permit approvals.

- B. Stormwater Authority Inspections. The Stormwater Authority or its designated agent shall make inspections as herein required and shall either approve that portion of the work completed or shall notify the applicant wherein the work fails to comply with the Erosion and Sedimentation Control Plan or the Stormwater Management Plan as approved.
 - (1) Inspections will be conducted by a "qualified person" from the Stormwater Authority or a third party hired to conduct such inspections. A "qualified person" is a person knowledgeable in the principles and practice of erosion and sediment controls and pollution prevention, who possesses the appropriate skills and training to assess conditions at the construction site that could impact stormwater quality, and the appropriate skills and training to assess the effectiveness of any stormwater controls selected and installed to meet the requirements of these Regulations.
 - (2) The approved Erosion and Sedimentation Control Plan and associated plans for grading, stripping, excavating, and filling work, bearing the signature of approval of the Stormwater Authority, shall be maintained at the site during the progress of the work.
 - (3) In order to obtain inspections, the applicant shall notify the Stormwater Authority at least two (2) working days before each of the following events:
 - (a) Erosion and sedimentation control measures are in place and stabilized;
 - (b) Site Clearing has been substantially completed;
 - (c) Rough Grading has been substantially completed;
 - (d) Final Grading has been substantially completed;
 - (e) Close of the Construction Season; and,
 - (f) Final Landscaping (permanent stabilization) and project final completion.

- C. Applicant Inspections. The applicant or his/her agent shall conduct and document inspections of all control measures no less than weekly or as specified in the permit, and prior to and following anticipated storm events. The purpose of such inspections will be to determine the overall effectiveness of the Erosion and Sedimentation Control Plan, and the need for maintenance or additional control measures as well as verifying compliance with the Stormwater Management Plan. The applicant or his/her agent shall submit monthly reports to the Stormwater Authority or designated agent in a format approved by the Stormwater Authority.

Section 14. Surety for projects requiring permits.

Note: This section will need to be significantly revised if the municipality opts to use the procedure in M.G.L. c. 44, §53G½. See the note on the model bylaw.

The Stormwater Authority may require the permittee to post before the start of land disturbance activity, a surety bond, irrevocable letter of credit, cash, or other acceptable security. The form of the security shall be approved by Town Counsel and the Stormwater Authority, and shall be in an amount deemed sufficient by the Stormwater Authority to ensure that the work will be completed in accordance with the permit. If the project is phased, the Stormwater Authority may release part of the security as each phase is completed in compliance with the permit, but the security may not be fully released until the Stormwater Authority has received the final report as required by Section 14 and issued a certificate of completion pursuant to Section 15. If the permittee defaults on any obligations imposed by the Land Disturbance Permit, the Stormwater Authority may (after notification of the permittee) inform the holder of the security (and the municipal treasurer if the treasurer is not holding the funds) of the default, in which event the Town shall be entitled to the security funds.

Section 15. Final Reports for projects requiring permits

Upon completion of the work, but no later than two (2) years after completion of construction projects, the permittee shall submit a report (including certified as-built construction plans) from a registered Professional Engineer (PE), surveyor, or Certified Professional in Erosion and Sediment Control (CPESC), certifying that all erosion and sediment control devices, and approved changes and modifications, have been completed in accordance with the conditions of the approved permit. The as-built drawings must depict all on site controls, both structural and non-structural, designed to manage the stormwater associated with the completed site (post construction stormwater management). Any discrepancies should be noted in the cover letter.

Section 16. Certificate of Completion for projects requiring permits.

The Stormwater Authority shall issue a letter certifying completion upon receipt and approval of the final reports and/or upon otherwise determining that all work has been conducted in conformance with these regulations and the Stormwater Management Permit conditions.