

STORMWATER MANAGEMENT RULES AND REGULATIONS FOR CONSTRUCTION AND POST-CONSTRUCTION ACTIVITIES

Boxborough Planning Board

Adopted: August 1, 2022

1.0 Purpose

The purpose of these rules and regulations is to establish Stormwater Management Rules and Regulations for the Town of Boxborough Stormwater Bylaw – Construction and Post-Construction. The Goals are to establish the procedures and requirements for construction and post-construction activities to 1) minimize damage to public and private property and infrastructure, 2) safeguard the public health, safety, environment and general welfare, 3) protect aquatic resources and wildlife habitat, 4) protect the quality and health of water resources, 5) conserve groundwater supplies, and, 6) foster climate change resiliency.

2.0 Authority

The Boxborough Planning Board, under the authority of the General Bylaws of the Town of Boxborough, and after holding a duly called Public Hearing on August 1, 2022, adopts these Stormwater Management Rules and Regulations. Discharges to Storm Drains, including prohibition of illicit connections and discharges to storm drains, are regulated by the Board of Health under a General Bylaw. .

3.0 Definitions

3.1. For the purposes of these rules and regulations, the following shall mean:

- (1) **ABUTTER:** The owner(s) of land abutting the site on which the activity occurs.
- (2) **APPLICANT:** Any person, individual, partnership, association, firm, company, corporation, trust, authority, agency, department, or political subdivision, of the Commonwealth of Massachusetts or the federal government to the extent permitted by law requesting a Stormwater Management Permit for proposed Disturbance of Land activity.
- (3) **ASSESSOR:** Town of Boxborough Town Assessor's office and/or Assessor.
- (4) **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.

- (5) **CERTIFICATE OF COMPLETION:** Document issued by the Planning Board or its Reviewing Agent upon receipt of a final inspection report and acknowledgement that all conditions of the Stormwater Management Permit have been satisfactorily completed.
- (6) **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.
- (7) **CERTIFIED VERNAL POOLS:** Temporary bodies of freshwater that provide critical habitat for a number of vertebrate and invertebrate wildlife species, certified by the Massachusetts Natural Heritage and Endangered Species Program (NHESP).
- (8) **CLEARING:** Any activity that removes vegetative surface cover.
- (9) **CONSERVATION COMMISSION:** Town of Boxborough.
- (10) **CONSTRUCTION WASTE AND 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.
- (11) **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 of Massachusetts from any source.
- (12) **DISTURBANCE OF LAND:** Action to alter the existing vegetation and/or underlying soil of a site, such as clearing, grading, site preparation (e.g., excavating, cutting, and filling), soil compaction, and movement and stockpiling of top soils.
- (13) **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.
- (14) **EROSION AND SEDIMENT CONTROL PLAN:** A document containing narrative, drawings, and details developed by a licensed professional engineer (P.E.) or CPESC, which includes BMPs, or equivalent measures designed to control surface runoff, erosion, and sedimentation during pre-construction and construction-related Disturbance of Land activities.
- (15) **ESTIMATED HABITAT OF RARE WILDLIFE:** Habitats delineated by the NHESP for state-protected rare wildlife and certified vernal pools for use with the Wetlands Protection Act Regulations (310 CMR 10.00) and the Forest Cutting Practices Act Regulations (304 CMR 11.00).

- (16) **GRADING:** Changing the level or shape of the ground surface.
- (17) **GROUNDWATER:** Water beneath the surface of the ground including confined or unconfined aquifers.
- (18) **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 non porous material; buildings, rooftops, structures, artificial turf and compacted gravel or soil.
- (19) **INFEASIBLE:** means not technologically possible, or not economically practicable and achievable in light of best industry practices.
- (20) **LOW IMPACT DEVELOPMENT (LID):** An approach to land development design and stormwater management that attempts to mimic the natural hydrology of the site by avoiding, reducing, and mitigating impacts with natural, non-structural and structural measures.
- (21) **MASSACHUSETTS ENDANGERED SPECIES ACT (MESA):** (G.L. c. 131A) and its implementing regulations at (321 CMR 10.00). This Act prohibits the "taking" of any rare plant or animal species listed as "Endangered", "Threatened", or of "Special Concern".
- (22) **MASSACHUSETTS STORMWATER MANAGEMENT STANDARDS (the STANDARDS):** The Stormwater Management Standards promulgated by the Massachusetts Department of Environmental Protection (DEP) 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, and further described in the Wetlands Protection Act Regulations (310 CMR 10.00) and the 401 Water Quality Certification Regulations (314 CMR 9.00). The Stormwater Management Standards address stormwater impacts through implementation of performance standards to reduce or prevent pollutants from reaching water bodies and to control the quantity of runoff from a site.
- (23) **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 the Town of Boxborough.
- (24) **NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) STORMWATER DISCHARGE PERMIT:** A permit issued by the United States Environmental Protection Agency (EPA) or jointly with the Commonwealth of

- Massachusetts that authorizes the discharge of stormwater to waters of the United States.
- (25) **NEW DEVELOPMENT:** Any construction activities or Disturbance of Land resulting in total earth disturbances greater than 1 acre (or activities that are part of a larger common plan of development disturbing greater than 1 acre) on an area that has not previously been developed to include impervious cover.
 - (26) **NATURAL HERITAGE AND ENDANGERED SPECIES PROGRAM (NHESP):** The Commonwealth of Massachusetts' program for implementing MESA requirements, administered by the Massachusetts Division of Fisheries and Wildlife (MassWildlife).
 - (27) **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 ensure that it continues to function as designed.
 - (28) **OUTFALL:** The point where stormwater flows out from a point source which is a discernible, confined and discrete conveyance into Waters of the Commonwealth of Massachusetts.
 - (29) **OWNER:** A person with a legal or equitable interest in property.
 - (30) **PERSON:** An individual, partnership, association, firm, company, trust, corporation, agency, authority, department or political subdivision of the Commonwealth of Massachusetts or the federal government, to the extent permitted by law, and any officer, employee, or agent of such person.
 - (31) **PLANNING BOARD:** Town of Boxborough Planning Board.
 - (32) **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. This term does not include return flows from irrigated agriculture or agricultural stormwater runoff.
 - (33) **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, and industrial, municipal and agricultural waste discharged into water.
 - (34) **PRE-CONSTRUCTION:** All activity in preparation for construction.

- (35) **PRIORITY HABITAT OF RARE SPECIES:** Habitats delineated for rare plant and animal populations protected pursuant to the MESA and its regulations.
- (36) **RECHARGE:** The process by which groundwater is replenished by precipitation through the percolation of runoff and surface water through soil.
- (37) **REDEVELOPMENT:** Any construction, Disturbance of Land, or improvement of impervious surfaces resulting in total earth disturbances greater than 1 acre (or activities that are part of a larger common plan of development disturbing greater than 1 acre) that does not meet the definition of New Development.
- (38) **REVIEWING AGENT:** The Boxborough Town Planner, other town employee, or third-party consultant designated by the Planning Board for the purposes of administering and enforcing these rules and regulations
- (39) **RUNOFF:** Rainfall, snowmelt, or irrigation water flowing over the ground surface.
- (40) **SEDIMENT:** Mineral or organic soil material that is transported by wind or water, from its origin to another location; the product of erosion processes.
- (41) **SEDIMENTATION:** The process or act of deposition of sediment.
- (42) **SITE:** The area extent of construction activities, including but not limited to the creation of new impervious cover and improvement of existing impervious cover.
- (43) **SLOPE:** The incline of a ground surface expressed as a ratio of horizontal distance to vertical distance.
- (44) **SOIL:** Any earth, sand, rock, gravel, or similar material.
- (45) **STABILIZATION:** The use, singly or in combination, of mechanical, structural, or vegetative methods, to prevent or minimize erosion.
- (46) **STORMWATER:** Stormwater, snow melt, and surface water runoff and drainage.
- (47) **STORMWATER MANAGEMENT PERMIT:** The written approval issued by the Planning Board to undertake a construction activity pursuant to a Stormwater Management Permit Application. A valid Stormwater Management Permit must be signed by a majority of the Planning Board participating at a duly noted public hearing, and such permit must be recorded at the Middlesex Registry of Deeds, prior to the start of any work.
- (48) **STORMWATER MANAGEMENT PLAN:** A plan required as part of the application for a Stormwater Management Permit.
- (49) **TOTAL SUSPENDED SOLIDS (TSS):** Sediment being carried in stormwater.

- (50) WATERCOURSE: A natural or man-made channel through which water flows or a stream of water, including a river, brook, or underground stream.
- (51) WATERS OF THE COMMONWEALTH OF MASSACHUSETTS: All waters within the jurisdiction of the Commonwealth of Massachusetts, including, without limitation, rivers, streams, lakes, ponds, springs, impoundments, estuaries, wetlands, coastal waters, groundwaters, and vernal pools.
- (52) WETLAND RESOURCE AREAS: Areas specified in the Massachusetts Wetlands Protection Act Regulations, 310 CMR 10.00, as amended, and in the Town of Boxborough Wetland Bylaw, as amended.

4.0 Amendments

The Planning Board may adopt, and periodically amend, these Stormwater Management Rules and Regulations by majority vote of the Planning Board, after conducting a minimum of one (1) advertised public hearing to receive comments on any proposed revisions. The hearing shall be duly advertised in a paper of general circulation in the Town of Boxborough no less than fourteen (14) days prior to the date of the public hearing.

5.0 Applicability

These rules and regulations apply to all projects meeting the applicability criteria of the Stormwater Bylaw – Construction and Post Construction. New Development and Redevelopment projects must comply with the rules and regulations contained herein unless expressly waived by the Planning Board.

The Planning Board reserves the right to waive certain requirements of these rules and regulations for minimally invasive projects. These projects may include, but not be limited to, individual single-family dwellings, projects that add minimal impervious area, and/or projects limited only to clearing and construction access with no further phases to be completed at a later date, provided that an alternative or equivalent approach to meeting these rules and regulations is provided to the Planning Board. Applicants of these projects are encouraged to contact the Planning Board prior to filing an application to discuss the proposed project. Compliance with the Stormwater Standards as outlined in Section 7.3 or Section 11.2 is not eligible for a waiver.

6.0 Permit Procedures and Requirements

6.1. No construction, Disturbance of Land, or improvement of impervious surfaces resulting in total Disturbance of Land greater than 1 acre shall commence prior to issuance of the Stormwater Management Permit Application by the Planning Board.

6.2. Filing Application.

- (1) The site Owner(s) or his/her agent shall file with the Reviewing Agent, three (3) copies of a completed Stormwater Management Permit Application package as outlined below. Permit issuance is required prior to any applicable site-altering activity. While the Applicant can be a representative, the permittee must be the Owner(s) of the site.
- (2) Proposed projects at individual single-family or duplex residences.
 - (a) Completed Application Form with original signatures of all Owners;
 - (b) Three (3) copies of the Stormwater Management Plan for Single-Family or Duplex Residences as specified in Section 11.0; and
 - (c) Payment of any application and review fees.
- (3) All other types and/or locations of proposed projects:
 - (a) Completed Application Form with original signatures of all Owners;
 - (b) List of abutters, certified by the Assessors' Office;
 - (c) Three (3) copies of the Stormwater Management Plan as specified in Section 7.0;
 - (d) Three (3) copies of the Erosion Control Plan as specified in Section 8.0;
 - (e) Three (3) copies of the Operation and Maintenance Plan as specified in Section 9.0;
 - (f) An acknowledgement of the Site Inspections and Final Reports requirements as specified in Section 10.0
 - (g) Payment of any application and review fees.

6.3. Fee Structure.

- (1) The Reviewing Agent shall obtain with each submission an Application Fee payable to the Town of Boxborough. Applicants shall pay review fees as listed below to cover any expenses connected with the public hearing and review of the Stormwater Management Permit Application before the review process commences. The Planning Board or Reviewing Agent may, at the Applicant's expense, retain a licensed P.E. or other professional consultant to advise the Reviewing Agent on any or all aspects of these plans.
 - (a) Application fee for single family residential or duplex only\$100
 - (b) Application fee for projects from 1 to 2 acres\$200
 - (c) Application fee for projects from 3 to 10 acres\$300
 - (d) Application fee for projects greater than 10 acres\$500
 - (e) Application fee for a resubmittal / amendment.....\$100
 - (f) Fees for a professional peer reviewInitial fee of up to \$2,500, see 6.3(2) below
- (2) In addition to the above fee, the Planning Board or its Reviewing Agent is authorized to require an Applicant to pay an initial fee of up to \$2,500 for the reasonable costs and expenses associated with retaining specific expert engineering and other consultant to provide professional peer review services deemed necessary to reach a final decision on the application. Payment may be required at any point during the review process prior to a final decision. The Reviewing Agent shall notify the Applicant of such amount in writing. Failure

to submit such amount within 14 days of receipt of said notice shall be deemed sufficient reason by the Reviewing Agent to deny said application.

- (a) If, prior to final action on the plan, the Reviewing Agent finds that \$2,500 is insufficient to cover the costs and expenses associated with professional peer review services necessary for review of the application, the Reviewing Agent may require the Applicant to submit any additional funding required to fund peer review services required for the Reviewing Agent's review of the pending application. The Reviewing Agent shall notify the Applicant of any additional funding required in writing. Failure to submit such additional amount of funds to the Reviewing Agent within 14 days of receipt of said notice shall be deemed reason by the Reviewing Agent to deny said application.
- (b) Such fee shall be held in escrow, to be used to provide independent professional peer review services, should the Reviewing Agent determine this to be necessary, based on the characteristics or complexity of the issues raised by the application. Such fee shall be governed and administered in accordance with G.L c. 44, § 53G or § 53E 1/2.
- (c) If the actual cost incurred by the Town for review of said application is less than the amount on deposit as specified above, the Reviewing Agent shall authorize that such excess amount be refunded to the Applicant concurrently with final action on said application.
- (d) The services for which a fee may be utilized include, but are not limited to, review of wetland survey and delineation, hydrologic and drainage analysis, wildlife evaluation, stormwater quality analysis, site inspections, as-built plan review, and analysis of legal issues.

6.4. Information Requests. The Applicant shall submit all additional information requested by the Planning Board or Reviewing Agent to issue a decision on the application within 30 days of the request for additional information.

6.5. Actions. The Planning Board's action, issued in writing, shall consist of either:

- (1) "Approval" of the Stormwater Management Permit Application based upon determination that the proposed Stormwater Management Plan meets the Standards and will adequately protect the water resources of the community and is in compliance with the requirements set forth in these rules and regulations;
- (2) "Approval with Conditions" of the Stormwater Management Permit Application subject to any conditions, modifications, or restrictions that will ensure the proposed Stormwater Management Plan meets the Standards (Standards) as set forth in Section 7.3 or Section 11.2, as applicable, and will adequately protect the water resources of the community and is in compliance with the requirements set forth in these rules and regulations;
- (3) "Disapproval" of the Stormwater Management Permit Application based upon determination that the proposed Stormwater Management Plan, as submitted, does not meet the Standards or will not adequately protect the water resources of the community and is not in compliance with the requirements set forth in these rules and regulations.

- 6.6. Appeals. The Applicant may appeal the decision in accordance with M.G.L. c. 249, § 4.
- 6.7. Access Permission. To the extent permitted by Massachusetts law, the Reviewing Agent and third-party inspector may enter upon privately owned property for the purpose of performing their duties under these rules and regulations and may make or cause to be made such examinations, surveys or sampling as the Planning Board or Reviewing Agent deems reasonably necessary to determine compliance with the Stormwater Management Permit.
- 6.8. Plan Changes. The Applicant must notify the Reviewing Agent in writing of any drainage change or alteration in the system authorized in the Stormwater Management Permit before any change or alteration is made. If the Planning Board or Reviewing Agent determines that the change or alteration is significant, based on the Standards, the requirements set forth in these rules and regulations, or accepted construction practices, the Planning Board may require that an amended application be filed. If any change or alteration from the Stormwater Management Permit occurs during any Disturbance of Land activities, the Planning Board may require the installation of interim erosion and sedimentation control measures before approving the change or alteration.

7.0 Stormwater Management Plan

- 7.1. The Stormwater Management Permit Application shall consist of a submittal of a Stormwater Management Plan to the Reviewing Agent. This Stormwater Management Plan shall contain sufficient information to evaluate the environmental impact, effectiveness, and acceptability of the measures proposed by the Applicant for reducing adverse impacts from stormwater. The Stormwater Management Plan shall be designed to meet the Standards, as set forth in Section 7.3, and the Massachusetts DEP Stormwater Handbook Volumes 1, 2, and 3, as amended.
- 7.2. The Stormwater Management Plan shall fully describe the project in drawings and narrative. It shall include, as a minimum, the following:
 - (1) Names, addresses, and telephone numbers of the Owner(s), Applicant, and person(s) or firm(s) preparing the plan;
 - (2) Project narrative containing relevant information related to stormwater requirements;
 - (3) Locus map of the site;
 - (4) Description of existing and proposed conditions;
 - (5) Existing and proposed zoning and land use at the site;
 - (6) Existing and proposed easements and utilities at the site;
 - (7) Existing and proposed topography (1-foot or 2-foot interval contours with additional spot grades as needed to depict detailed drainage patterns) at the site;
 - (8) Existing and proposed hydrology, watershed name, watershed boundaries, drainage area, and stormwater flow paths;

- (9) Existing and proposed stormwater conveyances, impoundments, and wetlands into which stormwater flows at and adjacent to the site;
 - (10) Existing and proposed 100-year flood plain, if applicable;
 - (11) Estimated high groundwater elevation (November to April) as determined via completion of representative test pits or other geological investigations in areas to be used for stormwater retention, detention, or infiltration;
 - (12) Description of subsurface conditions in areas to be used for stormwater retention, detention, or infiltration;
 - (13) Plans, drawings, and descriptions of proposed drainage system and all components including:
 - (a) Locations, cross sections, and profiles of all stormwater conveyances such as drainage swales and their method of stabilization;
 - (b) All measures for the detention, retention, and/or infiltration of stormwater;
 - (c) All measures for the protection of water quality;
 - (d) The structural details and sizing for all components of the proposed drainage systems and stormwater management facilities;
 - (e) Notes on drawings specifying materials to be used, construction specifications, and typical details and cross-sections;
 - (f) Analysis of existing and proposed hydrology with supporting calculations;
 - (g) Calculations supporting the estimate of stormwater treatment performance;
 - (h) Calculations supporting the design of infiltration practices, including design infiltration rates, estimated dewatering times, and mounding analyses, where applicable;
 - (14) Stormwater runoff shall be calculated using latest Northeast Regional Climate Center (NRCC) extreme precipitation amounts for recurrence intervals (storm events) 2-, 10-, 25-, 50- and 100-year frequencies;
 - (15) An Erosion and Sediment Control Plan as detailed in Section 8.0;
 - (16) An Operation and Maintenance Plan as detailed in Section 9.0;
 - (17) Documents must be stamped and certified by a qualified licensed P.E.; and,
 - (18) Any other information requested by the Reviewing Agent.
- 7.3. Stormwater Management Standards. Projects shall meet the following standards:
- (1) No new stormwater conveyances (e.g., outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or Waters of the Commonwealth of Massachusetts.
 - (2) Low Impact Development (LID) site planning and design strategies must be implemented unless infeasible in order to reduce the discharge of stormwater from development sites;
 - (3) Stormwater management system design shall be consistent with, or more stringent than, the requirements of the 2008, or most current version, of the Massachusetts Stormwater Handbook;
 - (4) 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 post-construction impervious surface area on the site.

- (a) Average annual pollutant removal requirements in 7.3.(4) are achieved through one of the following methods:
 - i. 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
 - ii. Retaining the volume of runoff equivalent to, or greater than, 1.0 inch multiplied by the total post-construction impervious surface area on the new development site; or
 - iii. Meeting a combination of retention and treatment that achieves the above standards; or
 - iv. Utilizing offsite mitigation that meets the above standards within the same USGS Hydrologic Unit Code (HUC)12 as the new development site.
- (5) Stormwater management systems on redevelopment sites shall be designed to meet an average annual pollutant removal equivalent to 80% of the average annual post-construction load of TSS related to the total post-construction impervious area on the site AND 50% of the average annual load of TP related to the total post-construction impervious surface area on the site.
 - (a) Average annual pollutant removal requirements in 7.3.(5) are achieved through one of the following methods:
 - i. 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
 - ii. Retaining the volume of runoff equivalent to, or greater than, 0.8 inches multiplied by the total post-construction impervious surface area on the redevelopment site; or
 - iii. Meeting a combination of retention and treatment that achieves the above standards; or
 - iv. Utilizing offsite mitigation that meets the above standards within the same USGS HUC12 as the redevelopment site.
- (6) Redevelopment activities that are exclusively limited to maintenance and improvement of existing roadways, (including widening less than a single lane,

adding shoulders, correcting substandard intersections, improving existing drainage systems, and repaving projects) shall improve existing conditions where feasible and are exempt from part Section 7.3.(5). Roadway widening or improvements that increase the amount of impervious area on the redevelopment site by greater than or equal to a single lane width shall meet the requirements of Section 7.3.(5).

8.0 Erosion and Sediment Control Plan

8.1. The Stormwater Management Permit Application shall include submittal of an Erosion and Sediment Control Plan to the Reviewing Agent. This Erosion and Sediment Control Plan shall contain sufficient information about the nature and purpose of the proposed development, pertinent conditions of the site and adjacent areas, proposed erosion and sedimentation controls, and proposed control for other wastes on construction sites such as demolition debris, litter, and sanitary wastes to ensure they are not discharged to the MS4, drainage system, or waters of the United States or Commonwealth of Massachusetts. The Applicant shall submit such material as is necessary to show that the proposed development will comply with the design requirements as follows:

- (1) Minimize total area of disturbance;
- (2) Sequence activities to minimize simultaneous areas of disturbance;
- (3) Installing erosion and sediment controls prior to the commencement of any construction activity;
- (4) Minimize soil erosion and control sedimentation during construction, provided that prevention of erosion is preferred over sedimentation control;
- (5) Divert uncontaminated water around disturbed areas;
- (6) Maximize infiltration and groundwater recharge;
- (7) Install, inspect, and maintain all Erosion and Sediment Control measures in accordance with the manufacturer's specifications and good engineering practices;
- (8) Prevent off-site transport of sediment and wastes;
- (9) Protect all storm drain inlets and armor all newly constructed outlets;
- (10) 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);
- (11) 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;
- (12) Institute interim and permanent stabilization measures, which shall be instituted on a disturbed area as soon as practicable but no more than fourteen (14) days after construction activity has temporarily or permanently ceased on that portion of the site;
- (13) Properly manage on-site construction waste and materials;
- (14) Stabilize construction site entrances and exits and prevent off-site vehicle tracking of sediments; and,

- (15) Ensure that any stormwater BMP (for post-construction stormwater management) installed during construction will be protected from compaction, siltation, and erosion or will be restored or replaced such that the BMP will be capable of functioning as designed in accordance with these stormwater regulations.
- 8.2. The content of the Erosion and Sediment Control Plan shall contain the following information:
- (1) Names, addresses, and telephone numbers of the Owner, Applicant, and person(s) or firm(s) preparing this 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 qualified P.E. 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 one (1) foot 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;
 - (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;
 - (11) Location and description of and implementation schedule for temporary and permanent seeding, vegetative controls, and other stabilization measures;
 - (12) 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;

- (13) A description of provisions for phasing the project where one acre of area or greater is to be altered or disturbed;
- (14) A description of how the project Owner(s) will inspect the site during the course of construction to monitor the management of stormwater in accordance with applicable town, state, and federal regulations;
- (15) Plans must be stamped and certified by a qualified licensed P.E. or a CPESC; and,
- (16) Such other information as is required by the Reviewing Agent.

9.0 Operation and Maintenance Plan

9.1. The Stormwater Management Permit Application shall include a submittal of Operation and Maintenance Plan (O&M Plan) to the Reviewing Agent. This O&M Plan shall be designed to ensure compliance with the Stormwater Management Permit, these rules and regulations, and that the Massachusetts Surface Water Quality Standards, 314 CMR 4.00, are met in all seasons and throughout the life of the system. The Planning Board shall make the final decision of what maintenance option is appropriate in a given situation. The Reviewing Agent will consider natural features, proximity of the site to MS4 infrastructure, proximity of the site to waterbodies and wetlands, extent of impervious surfaces, size of the site, the types of stormwater management structures, and potential need for ongoing maintenance activities when making this decision. The O&M Plan shall remain on file with the Reviewing Agent and shall be an ongoing requirement. The O&M Plan shall include:

- (1) Names, addresses, and telephone numbers of the Owner(s) of all components of the system;
- (2) Maintenance agreements that specify:
 - (a) The names and addresses of the person(s) responsible for operation and maintenance
 - (b) The person(s) responsible for financing maintenance and emergency repairs.
 - (c) A Maintenance Schedule that includes routine inspection along with routine and non-routine maintenance tasks for each BMP.
 - (d) A list of easements, if applicable, with the purpose and location of each.
 - (e) The signature(s) of the Owner(s).
 - (f) Estimated operation and maintenance budget.
 - (g) The responsible party shall:
 - i. Maintain a log of all operation and maintenance activities for the last three years including inspections, repair, replacement, and disposal (the log shall indicate the type of material and the disposal location);
 - ii. Make this log available to the Reviewing Agent and the Commonwealth of Massachusetts upon request; and,
 - iii. Allow the Reviewing Agent to inspect each BMP to determine whether the responsible party is implementing the Operation and Maintenance Plan.

- (3) 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 regular cleanout.
 - (b) The purpose of each easement shall be specified in the maintenance agreement signed by the property Owner(s).
 - (c) Stormwater management easements are required for all areas used for off-site stormwater control, unless a waiver is granted by the Planning Board.
 - (d) Easements shall be recorded by the Owner(s) with the Middlesex County Registry of Deeds or Land Registration Office (for registered land) prior to issuance of a Certificate of Completion.
 - (4) Changes to Operation and Maintenance Plans.
 - (a) The Owner(s) of the stormwater management system must notify the Reviewing Agent of changes in ownership or assignment of financial responsibility.
 - (b) The maintenance schedule in the Maintenance Agreement may be amended to achieve the purposes of these rules and regulations by mutual agreement of the Reviewing Agent 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 responsibility during future years.
- 9.2. Stormwater infrastructure shall be privately owned, inspected and maintained per the Operation and Maintenance procedures approved for the project. Inspection and maintenance logs shall be provided to the Reviewing Agent on a yearly basis by June 30 for the Town to use in preparation of its annual report to the US EPA as part of the NPDES MS4 Permit requirements.
- 9.3. The landowner or responsible party shall provide the Reviewing Agent an annual report prepared and stamped by a licensed P.E. documenting and certifying performance of required maintenance and providing an assessment of overall system performance.
- 9.4. The O&M Plan shall include procedures for using dedicated funds, establishing an escrow account, and/or developing a maintenance contract, if determined appropriate to ensure adequate long-term maintenance.
- 9.5. Stormwater Management operation and maintenance duties shall be recorded with the deed for each lot in a subdivision. The Applicant may elect to setup a Homeowner's

Association (HOA) or other means to ensure all BMPs are inspected and maintained as required.

10.0 Site Inspections and Final Reports

- 10.1. Pre-Construction Meeting. Prior to the commencement of any clearing, excavation, construction, or Disturbance of Land, the Applicant, the Applicant's technical representative, the general contractor, or any other person with authority to make changes to the project, shall meet with the Reviewing Agent to review the permitted Stormwater Management, Erosion and Sediment Control, and Operation and Maintenance Plans and their implementation.
- 10.2. Erosion and Sediment Control Inspections. The Applicant or responsible party shall conduct and document inspections of all erosion and sediment control measures no less than weekly or as specified in the Stormwater Management Permit, and prior to and following anticipated storm events. The purpose of such inspections is to determine the overall effectiveness of the erosion and sediment control plan, and the need for maintenance or additional control measures. The Applicant or responsible party shall submit monthly erosion and sediment control reports to the Reviewing Agent in a format approved by the Reviewing Agent.
- 10.3. Routine Inspections. Routine inspections shall be performed as follows:
- (1) Initial Site Inspection: prior to approval of any permit/plan;
 - (2) Erosion and Sediment Control Inspection: to ensure erosion and sediment control measures are in place and stabilized, and to ensure erosion control practices are in accordance with the filed plan.
 - (3) Site Clearing has been substantially completed;
 - (4) Rough Grading has been substantially completed;
 - (5) Final Grading has been substantially completed;
 - (6) Bury Inspections: prior to backfilling of any underground drainage or stormwater structures.
 - (7) Close of the Construction Season;
 - (8) Landscaping (permanent stabilization); and,
 - (9) Final Inspection. After the stormwater management system has been constructed, and before any surety is released, the Applicant must submit a record as-built plan detailing the actual stormwater management system as installed. Such plans shall show compliance with the final approved plans by the Reviewing Agent. The Reviewing Agent shall inspect the system to confirm its "as-built" features. This inspector shall also evaluate the effectiveness of the system in an actual storm. If the inspector finds the system to be adequate, he/she shall so report to Planning Board which will issue a Certificate of Completion.
- 10.4. Inspector Qualifications. Inspections shall be performed by an independent third-party licensed P.E. or CPESC. Alternatively, inspections shall be performed by a qualified employee of the Town of Boxborough.

10.5. Final Reports. Upon completion of the work, the Applicant shall submit a report (including certified as-built construction plans) from a P.E.. As-built drawings shall be submitted no later than one year after completion of construction projects. 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). The report shall certify that all permitted construction, plans, and approved changes and modifications, were completed in accordance with the conditions of the issued Stormwater Management Permit. Any discrepancies should be noted in the report.

If the system is found to be inadequate by virtue of physical evidence of operational failure, even though it was built as called for in the Stormwater Management Plan, it shall be corrected before the performance guarantee is released. If the Applicant fails to act the Town of Boxborough may use the surety bond to complete the work. Examples of inadequacy include but are not limited to: errors in the infiltrative capability, errors in the maximum groundwater elevation, failure to properly define or construct flow paths, or erosive discharges from basins or other structural BMPs.

11.0 Stormwater Management Plan for Single-Family or Duplex Residences Application

11.1. The Stormwater Management Plan for Single-Family or Duplex Residences Application shall consist of a submittal of a Stormwater Management Plan to the Reviewing Agent. This Stormwater Management Plan shall contain sufficient information for the Reviewing Agent to evaluate the environmental impact, effectiveness, and acceptability of the measures proposed by the Applicant for reducing adverse impacts from stormwater. The Stormwater Management Plan shall fully describe the project in drawings and narrative. It shall include, as a minimum, the following:

- (1) Names, addresses, and telephone numbers of the Owner(s), Applicant, and person(s) or firm(s) preparing the plan;
- (2) Project narrative of existing and proposed conditions as relevant to stormwater;
- (3) Existing and proposed easements and utilities at the site;
- (4) Existing and proposed topography (approximate 1-foot or 2-foot interval contours with additional spot grades as needed to depict detailed drainage patterns) at the site;
- (5) Existing and proposed drainage area, and stormwater flow paths;
- (6) Existing and proposed stormwater conveyances and wetlands into which stormwater flows at and adjacent to the site;
- (7) Existing and proposed 100-year flood plain, if applicable;
- (8) Estimated high groundwater elevation (November to April) in areas to be used for stormwater retention, detention, or infiltration;
- (9) Plans, drawings, and descriptions of proposed drainage system and all components including:
 - (a) Locations of all stormwater conveyances such as drainage swales and their method of stabilization;

- (b) The structural details and sizing for all components of the proposed drainage systems and stormwater management facilities;
 - (c) Notes on drawings specifying materials to be used, construction specifications, and typical details and cross-sections;
 - (d) Calculations supporting the estimate of stormwater treatment performance and design of infiltration practices;
- (10) An Erosion and Sediment Control Plan as detailed below;
 - (11) An Operation and Maintenance Plan as detailed below; and
 - (12) Any other information requested by the Reviewing Agent.

11.2. Stormwater Management Standards. Projects shall meet the Massachusetts DEP Stormwater Management Standards as follows:

- (1) No new stormwater conveyances (e.g., outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or Waters of the Commonwealth of Massachusetts.
- (2) The design of treatment and infiltration practices should follow the guidance in Volume 2 of the Massachusetts Stormwater Handbook, as amended, or other federally or State approved BMP design guidance.
- (3) Stormwater management systems on new development sites shall be designed to:
 - (a) Not allow new stormwater conveyances to discharge untreated stormwater in accordance with Massachusetts Stormwater Handbook Standard 1;
 - (b) Control peak runoff rates in accordance with Massachusetts Stormwater Handbook Standard 2;
 - (c) Recharge groundwater in accordance with Massachusetts Stormwater Handbook Standard 3;
 - (d) Eliminate or reduce the discharge of pollutants from land uses with higher pollutant loads as defined in the Massachusetts Stormwater Handbook in accordance with Massachusetts Stormwater Handbook Standard 5;
 - (e) Protect Zone II or Interim Wellhead Protection Areas of public water supplies in accordance with Massachusetts Stormwater Handbook Standard 6;
 - (f) Implement long term maintenance practices in accordance with Massachusetts Stormwater Handbook Standard 9;
 - (g) Optimize stormwater BMPs for nitrogen and phosphorus removal to the maximum extent practicable; and
 - (h) Require that all stormwater management systems be designed to:
 - i. Retain the volume of runoff equivalent to, or greater than, one (1.0) inch multiplied by the total post-construction impervious surface area on the site AND/OR
 - ii. Remove 90% of the average annual load of Total Suspended Solids (TSS) generated from the total post-construction impervious area AND 60% of the average annual load of Total Phosphorus (TP) generated from the total post-construction impervious surface area on the site. Pollutant removal shall be calculated consistent with EPA Region 1's BMP Performance Extrapolation Tool 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 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.

- (4) Stormwater management systems on redevelopment sites shall be designed to:
 - (a) Not allow new stormwater conveyances to discharge untreated stormwater in accordance with Massachusetts Stormwater Handbook Standard 1;
 - (b) Control peak runoff rates in accordance with Massachusetts Stormwater Handbook Standard 2;
 - (c) Recharge groundwater in accordance with Massachusetts Stormwater Handbook Standard 3;
 - (d) Meet the pretreatment and structural best management practices requirements of Massachusetts Stormwater Standards 5 and 6;
 - (e) Optimize stormwater BMPs for nitrogen and phosphorus removal to the maximum extent practicable; and
 - (f) Require:
 - i. Retaining the volume of runoff equivalent to, or greater than, 0.80 inch multiplied by the total post-construction impervious surface area on the site AND/OR
 - ii. Removing 80% of the average annual post-construction load of Total Suspended Solids (TSS) generated from the total post-construction impervious area on the site AND 50% of the average annual load of Total Phosphorus (TP) generated from the total post-construction impervious surface area on the site. Pollutant removal shall be calculated consistent with EPA Region 1's BMP Performance Extrapolation Tool 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 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.

11.3. The Stormwater Management Permit Application shall include submittal of an Erosion and Sediment Control Plan to the Reviewing Agent. The content of the Erosion and Sediment Control Plan shall contain the following information:

- (1) Names, addresses, and telephone numbers of the Owner(s), Applicant, and person(s) or firm(s) preparing this plan;
- (2) Title, date, north arrow, scale, legend, and locus map;
- (3) 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;
- (4) 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;

- (5) Lines of existing abutting streets showing drainage and driveway locations and curb cuts;
- (6) Existing soils, volume and nature of imported soil materials;
- (7) Topographical features including existing and proposed contours at intervals no greater than one (1) feet with spot elevations provided when needed;
- (8) Approximate property lines, 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;
- (9) Surveyed property lines, if determined necessary by the Reviewing Agent;
- (10) Drainage patterns and approximate slopes anticipated after major grading activities;
- (11) 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; and
- (12) Such other information as is required by the Reviewing Agent.

11.4. Operation and Maintenance Plan. The Stormwater Management Permit Application shall include a submittal of Operation and Maintenance Plan (O&M Plan) to the Reviewing Agent. The Reviewing Agent shall make the final decision of what maintenance option is appropriate in a given situation. The Reviewing Agent will consider natural features, proximity of the site to MS4 infrastructure, proximity of the site to waterbodies and wetlands, extent of impervious surfaces, size of the site, the types of stormwater management structures, and potential need for ongoing maintenance activities when making this decision. The O&M Plan shall include:

- (1) The name(s) of the Owner(s) of all components of the system;
- (2) A Maintenance Schedule that includes routine inspection along with routine and non-routine maintenance tasks for each BMP.

11.5. Ongoing Maintenance. The property Owner(s) shall provide the Reviewing Agent an annual report documenting and certifying performance of required maintenance and providing an assessment of overall system performance Stormwater Management operation and maintenance. Duties shall be recorded with the deed for each lot in a subdivision. Maintenance requirements shall be required by all future Owner(s) in the event of lot transfer.

11.6. Site Inspections and Final Reports. The responsible party shall provide a description and schedule of how and when the project Owner(s) or authorized additional party will inspect the site during the course of construction to monitor the management of stormwater in accordance with applicable town, state, and federal regulations.

11.7. Erosion and Sediment Control Inspections. The schedule shall be subject to approval by the Reviewing Agent, however may include documenting inspections of all erosion and sediment control measures no less than weekly, and prior to and following anticipated events:

- (1) Initial Site Inspection: prior to approval or issuance of any permit/plan;

- (2) Erosion and Sediment Control Inspection: to ensure erosion and sediment control measures are in place and stabilized, and to ensure erosion control practices are in accordance with the filed plan.
- (3) Site Clearing has been substantially completed;
- (4) Rough and Final Grading has been substantially completed;

11.8. Inspector Qualifications. Inspections shall be performed by the homeowner or an independent third-party licensed P.E. or CPESC. Alternatively, inspections shall be performed by a qualified employee of the Town of Boxborough. If done by the homeowner, the homeowner is responsible for ensuring that inspections are conducted and that any repairs needed are conducted promptly and adequately to meet these Regulations. Failure to do so may subject the homeowner to the enforcement actions outlined under the Stormwater Bylaw – Construction and Post-Construction.

11.9. Final Reports. Upon completion of the work, the Applicant shall submit as-built construction plans no later than one year after completion of construction projects. 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). The report shall certify that all permitted construction, plans, and approved changes and modifications, were completed in accordance with the conditions of the issued Stormwater Management Permit. Any discrepancies should be noted in the report.

12.0 Certification of Completion

The Planning Board or its Reviewing Agent will issue a letter certifying completion of the project upon receipt and approval of the final inspection reports from the Applicant and/or upon otherwise determining that all work of the Stormwater Management Permit has been satisfactorily completed in conformance with these rules and regulations. The Planning Board or Reviewing Agent may, in addition to certifying satisfactory completion of the project, require ongoing maintenance procedures as outlined O&M Plan and/or work deemed necessary by the Planning Board or Reviewing Agent.