

CITY OF LAWRENCE STORMWATER MANAGEMENT REGULATIONS

1. Purposes

The purpose of these Regulations is to protect, maintain and enhance the public health, safety, environment, and general welfare by establishing minimum requirements and procedures to control the adverse effects of soil erosion and sedimentation, construction site runoff, increased post-development stormwater runoff, decreased groundwater recharge, and nonpoint source pollution associated with new development, redevelopment and other land alterations, as more specifically addressed in the Lawrence Municipal Code, Chapter 20.03, Stormwater Management & Erosion Control Ordinance (“Stormwater Management Ordinance”).

2. Definitions

The definitions contained in Chapter 20.03.030 of the Stormwater Management Ordinance and Appendix A of these Regulations apply to issuance of a Stormwater Management Permit established by the Stormwater Management Ordinance and implemented through these Regulations. Terms not defined in the Stormwater Management Ordinance or Appendix A shall be construed according to their customary and usual meaning unless the context indicates a special or technical meaning.

3. Authority

- A. The Rules and Regulations contained herein have been adopted by the Lawrence Board of Health in accordance with the Stormwater Management Ordinance.
- B. Nothing in the Stormwater Management Ordinance or these Regulations is intended to replace the requirements of the Lawrence Zoning Ordinance, Wetlands Ordinance, or any other City ordinance or rules and regulations adopted thereunder. Any activity subject to the provisions of the above-cited ordinances or rules and regulations must comply with the specifications of each.
- C. These Stormwater Regulations may be periodically amended by the Board of Health as provided for in the Stormwater Management Ordinance.
- D. Waivers

The Board of Health or its designated Reviewing Agent may waive strict compliance with any requirement of these Regulations where such action is:

- 1. Allowed by federal, state and local statutes and/or,
- 2. In the public interest, and
- 3. Consistent with the purpose and intent of the Stormwater Management Ordinance.

Any applicant may submit a written request to the Stormwater Authority to be granted such a

waiver. Such a request shall be accompanied by an explanation or documentation supporting the waiver request and demonstrating that strict application of these Regulations does not further the purposes or objectives of the Stormwater Management Ordinance and these Regulations.

4. Administration

The Board of Health shall serve as the Stormwater Authority and shall administer, implement, and enforce these Regulations in accordance with Section 20.03.070 of the Stormwater Management Ordinance. Any City employee, board or agent so designated by the Board of Health shall be defined as the “Reviewing Agent”. The “Reviewing Agent” shall be considered the Board of Health for the purposes of compliance with the Stormwater Management Ordinance.

If a project or activity is subject to Section 20.03.020 (Applicability) of the Stormwater Management Ordinance and is wholly within the specific jurisdiction of the Conservation Commission, then the Conservation Commission will be the designated Stormwater Authority for the project without further action needed by the Board of Health. The specific application submission requirements, public notices, and fee requirements of the Conservation Commission shall govern. The Board of Health reserves the right to retain review and approval authority for any application.

5. Applicability

These Stormwater Regulations apply to all activities subject to Section 20.03.020 (Applicability) of the Stormwater Management Ordinance. Projects and/or activities not specifically under the jurisdiction of any City boards, commissions, or departments but still within the jurisdiction of the Stormwater Management Ordinance must obtain a Stormwater Management Permit from the Stormwater Authority in accordance with the permit procedures and requirements defined these Regulations.

6. Permit Procedures for Stormwater Management Permits

A. Permit Required

1. Projects that meet the applicability provisions of 20.03.020 of the Stormwater Management Ordinance shall apply for a Stormwater Management Permit in accordance with these Regulations.
2. No site altering activity shall occur until a permit has been issued hereunder and conditions of approval have been met. For projects subject to the National Pollution Discharge Elimination System (NPDES) General Permit for Storm Water Discharges from Construction Activities, conditions of approval will include the following, at a minimum:
 - a. Submission of a Notice of Intent for coverage under the NPDES General Permit for Storm Water Discharges from Construction Activities to EPA;

- b. Development or modification of a Stormwater Pollution Prevention Plan (SWPPP), consistent with Section 7 of the NPDES General Permit, as applicable; and
 - c. Copy of Receipt of EPA Authorization letter and tracking number to City.
3. No landowner or land operator shall receive any of the building, clearing, grading or other land development permits required for land disturbance activities without first meeting the requirements of the Stormwater Management Ordinance and these Regulations prior to commencing the proposed activity.

B. Filing Application

1. Applications for a Stormwater Management Permit shall include the materials as specified in this section and must meet the stormwater management criteria as specified in Section 7 of these Regulations. The applicant shall file an original with the Reviewing Agent and ten (10) copies of a completed application package for a Stormwater Management Permit. Additional copies may be requested by the Reviewing Agent. The Reviewing Agent is responsible for distributing and coordinating the review of Stormwater Management Permit applications with the Land Use Planner, City Engineer, Conservation Commission or its agent, Inspectional Services Director, Director of Public Works, and the Fire and Police Departments, as applicable. The Stormwater Management Permit Application package shall include:
- a. A completed Application Form with original signatures of all owners as well as the Applicant signature if the Applicant is not a property owner;
 - b. Projection of date of commencement and completion of construction activities;
 - c. Payment of the application, review and other applicable fees;
 - d. Stormwater Management Plan (complete requirements listed in Section 7 of these Regulations);
 - e. Erosion and Sediment Control Plan (complete requirements listed in Section 7 of these Regulations);
 - f. Operation and Maintenance (O&M) Plan (complete requirements listed in Section 7 of these Regulations).
 - g. Projects subject to the National Pollution Discharge Elimination System (NPDES) General Permit for Storm Water Discharges from Construction Activities (“Construction General Permit”) shall also submit the following with their application unless otherwise waived under 40 CFR § 122.26(b)(15)(i):
 - (1) A copy of the Notice of Intent to comply with the Construction General Permit; and
 - (2) A copy of receipt of EPA Authorization letter and tracking number.

- h. A Surety Bond consistent with Section 9 of these Regulations.
- C. Entry. Filing an application for a permit grants the Stormwater Authority and the Reviewing Agent as specified per Section 4 of these Regulations, permission to enter the site throughout the term of the permit to verify the information in the application and to inspect for compliance with the approved permit.
- D. Fees. The Reviewing Agent shall obtain with each submission an Application Fee to cover expenses connected with the administration and review of the Stormwater Management Permit and an Engineering and Consultant Review Fee sufficient to cover professional review services for the project, if needed. Applicants must pay review fees before the review process may begin. Fees shall be as follows:
- 1. Application Fees
 - a. All projects subject to the Stormwater Management Ordinance: A non-refundable fee of the greater of \$500.00 or \$0.01 per square foot of the total land disturbance area to be permitted, up to a maximum of \$1,500.00 non-refundable.
 - b. Permit Extensions/Modifications: A non-refundable fee of \$100.00.
 - 2. Engineering and Consultant Reviews and Fees
 - a. In addition to the above fees, the Reviewing Agent is authorized to require an applicant to pay a fee for the reasonable costs and expenses for specific outside expert engineering and other consultant services deemed necessary by the Reviewing Agent to assist in the review of the Application.
 - b. Such fee shall be held in escrow, to be used to engage independent consultants should the Reviewing Agent determine this to be necessary, based on the characteristics or complexity of the issues raised by the application and/or construction. Such fee shall be governed and administered in accordance with G.L. c.44, § 53G or § 53E ½.
 - c. If prior to issuance of a Certificate of Completion, the Reviewing Agent finds that the initial deposit is not sufficient to cover actual costs incurred by the City during the review of the application, the applicant shall be required to submit forthwith such additional amount as is deemed necessary by the Reviewing Agent to cover such costs. The Reviewing Agent shall notify the applicant of such additional amount in writing by certified mail. Failure to submit such additional amount as required by the Board within fourteen (14) days of receipt of said notice shall be deemed sufficient and adequate reason by the Board to deny said application. If the actual cost incurred by the City 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 erosion and sediment control plans, hydrologic and drainage analysis, geotechnical analysis related to stormwater management design, stormwater quality and quantity

analysis, site inspections, as-built plan review, and construction site inspections.

- e. The Stormwater Authority reserves the right to waive or discount its fees at its discretion.
3. **Maintenance Fees for Municipally Operated Systems.** Any development subject to a Stormwater Management Permit which will require City maintenance, ownership or operation of the stormwater system shall be subject to a non-refundable charge based on an O&M Plan prepared in accordance with Massachusetts Stormwater Handbook standards and any specific conditions of a Stormwater Management Permit granted under the Stormwater Management Ordinance for a three-year period. The funds for maintenance shall be paid to the City for disbursement by the Board of Health to either the Department of Public Works, or to contracted services.
 4. **Fee-in-Lieu of Stormwater Management Facilities.** The Stormwater Authority may, at its discretion, permit redevelopment projects to pay a fee in lieu of on-site post-construction stormwater management in accordance with Section 7.B of these regulations.

The following fee schedule has been developed based on the probable cost to survey, design, permit, construct and maintain a stormwater management system in an urban environment. The fee will be computed in accordance with the following fee schedule:

- a. A non-refundable fee of \$4 per square foot of total post-construction impervious area on site that will not meet the pollutant load reduction requirements outlined in Section 7.A of these regulations. The calculation is subject to review and approval by the Reviewing Agent.
- b. Fees collected by the City under this provision shall be deposited into the water and sewer enterprise fund. The Lawrence Water and Sewer Department in conjunction with the Board of Health shall manage the fund and oversee projects undertaken with the funds. A potential list of projects shall be maintained by the Stormwater Authority as a part of the City of Lawrence, Stormwater Retrofit Plan (Plan). Expenditures from the fund shall be used for activities or projects included within the Plan, or may be used for other stormwater capital improvement projects that provide stormwater quality improvement. Expenditures shall be managed by the Lawrence Water and Sewer Department in accordance with the City's purchasing requirements including City Council approval when necessary.
- i) Funds, created through the fee-in-lieu, in the water and sewer enterprise fund may be used by the City for stormwater improvements that reduce combined sewer overflows, stormwater improvements that provide water quality and/or quantity treatment for existing unmanaged stormwater runoff, or capital improvement projects that reduce the potential for indirect illicit discharges or migration of illicit discharges into the City's stormwater drainage system. For redevelopment projects that disturb 1 acre or more of land or are part of a common plan that will disturb 1 acre or more of land, the City shall implement post-construction stormwater BMPs within the same HUC12 watershed to achieve the required stormwater pollutant removal that was not

provided on site.

ii) As part of these activities, the funds may be used for the following additional activities:

- (1) The planning of stormwater retrofit/mitigation activities including the survey of stormwater drainage systems, the establishment of priorities for protection, the preparation of plans and studies, site evaluations, preliminary engineering, legal services, and the design of stormwater retrofit/mitigation projects.
- (2) The acquisition of land or easements to be used for stormwater retrofit/mitigation activities including the cost of appraisals, commissions, legal fees, and similar acquisition costs.
- (3) The oversight and inspection of municipal stormwater retrofit/mitigation construction activities.
- (4) Up to the first three years of maintenance of that infrastructure that is constructed with fees from this Fund.

5. Revision of Fee Schedules and Regulations Governing Fees

- a. The Board of Health may review and revise its Regulations and fee schedules periodically as it sees fit, as outlined in the Stormwater Management Ordinance.
- b. All fee amendments shall be approved by the City Council.
- c. A copy of all fees and any amendments will be filed with the City Clerk within ten (10) days after final action is taken.
- d. The Reviewing Agent may waive or discount its fees at its discretion, particularly for minor projects that do not warrant significant additional review.

E. Actions. The Reviewing Agent's action, rendered in writing, shall consist of either:

1. Issuance of the Stormwater Management Permit based upon determination that the proposed plan meets the Standards in Section 7 of these Regulations and will adequately protect the water resources of the community and is in compliance with the requirements set forth in the Stormwater Management Ordinance and these Regulations;
2. Issuance of the Stormwater Management Permit subject to any conditions, modifications or restrictions required by the Reviewing Agent which will ensure that the project meets the Standards in Section 7 of these Regulations and adequately protects water resources, as set forth in the Stormwater Management Ordinance and these Regulations; or
3. Denial of the Stormwater Management Permit based upon a determination that the proposed plan, as submitted, does not meet the Standards in Section 7 of these Regulations to adequately protect water resources, as set forth in the Stormwater Management Ordinance and these Regulations.

F. Deadline for Action. Failure of the Reviewing Agent to take final action upon an application

within sixty (60) days of receipt of a complete application for a Stormwater Management Permit under the Stormwater Management Ordinance, shall be deemed to be approval of said application, unless extension of said deadline date is mutually agreed upon in writing by the Reviewing Agent and the applicant. Upon certification by the City Clerk that the allowed time has passed without Reviewing Agent action, the Reviewing Agent shall issue a Stormwater Management Permit.

Notwithstanding, whether the Conservation Commission is the designated Reviewing Agent, the time frame for issuance of a Stormwater Management Permit by the Conservation Commission shall be in accordance with the Lawrence Wetlands Protection Ordinance.

- G. Plan Changes. The permittee must notify the Reviewing Agent in writing of any change or alteration in the drainage system authorized in a Stormwater Management Permit before any change or alteration is made. If the Reviewing Agent determines that the change or alteration is significant, based on the Stormwater Management Standards in Section 7 of these Regulations and accepted construction practices, the Reviewing Agent may require that an amended application be filed and an amended permit be issued.
- H. Appeals of Actions of the Stormwater Authority. A final decision of the Stormwater Authority or its designated Reviewing Agent shall be reviewable by a court of competent jurisdiction in an action filed within sixty (60) days of the date of filing of the final decision of the Stormwater Authority or designated Reviewing Agent with the Lawrence City Clerk, in accordance with G.L. c. 249. § 4. An appeal of the Board of Health shall be separate and independent from any other appeals under the jurisdiction of other regulatory authority. An appeal from the decision of a board, commission or different department exercising concurrent jurisdiction will automatically revoke the decision of Board of Health pending the resolution of the appeal process.
- I. Project Delay. Should a land-disturbing activity associated with an approved plan in accordance with this Section not begin within 12 months following permit issuance, the Reviewing Agent may evaluate the existing stormwater management plan to determine whether the plan still satisfies local program requirements and to verify that all design factors are still valid. If the Reviewing Agent finds the previously filed plan to be inadequate, a modified plan shall be submitted and approved prior to the commencement of additional land-disturbing activities. If the project associated with an approved Stormwater Management Permit granted under the Stormwater Management Ordinance has not been substantially completed (fit for its intended purpose) within three (3) years of the issuance of the permit, a new permit or a permit extension will be required by the Reviewing Agent, and inclusive of fees outlined in Section D, at the sole discretion of the Reviewing Agent.
- J. Project Completion. At completion of the project the permittee shall request a Certificate of Completion from the Reviewing Agent pursuant to the requirements of Section 10 of these Regulations. The Reviewing Agent will issue a letter certifying completion upon review and approval of the final inspection reports and/or upon otherwise determining that all work of the permit has been satisfactorily completed in conformance with the Stormwater Management Ordinance and these Regulations.

7. Stormwater Management Permits Standards and Requirements

- A. Stormwater Management Plan. The application for a Stormwater Management Permit shall include the 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 mitigating adverse impacts from stormwater runoff. This plan shall be designed to meet the Massachusetts Stormwater Standards and additional criteria established in these Regulations and must be submitted with the stamp and signature of a Professional Engineer (PE) licensed to conduct such work in the Commonwealth of Massachusetts.
1. The Stormwater Management Plan shall fully describe the project in drawings, narrative, and calculations. Required contents of the Stormwater Management Plan are provided in Appendix B of the Regulations.
 2. Design and Performance Criteria: At a minimum all projects subject to a Stormwater Management Permit shall comply with the Stormwater Management Standards of the most recent version of the Massachusetts Stormwater Handbook, as well as the criteria contained herein. Where an inconsistency exists between the Massachusetts Stormwater Handbook and these regulations, the stricter requirement shall apply. The Massachusetts Stormwater Handbook contains information on acceptable stormwater management practices, with specific design and sizing criteria for each. The following criteria shall be used in the submittal of an application for a Stormwater Management Permit under the City of Lawrence Ordinances:
 - a. Evaluation and implementation of Low Impact Development (LID) practices is required unless infeasible. Guidance on these practices is provided in Appendix D and the Massachusetts Stormwater Handbook.
 - b. Hydrologic analyses using TR-55/TR-20 methodology shall be performed on the entire project site and include any off-site areas that drain to or through the project site.
 - c. The 24-hour rainfall amounts shall be based on the Northeast Regional Climate Center "Atlas of Precipitation Extremes for the Northeastern United States and Southeastern Canada" (rounded to the nearest one-tenth of an inch).
 - d. The same land area shall be used in the analysis for both pre- and post-development conditions to facilitate an accurate comparison of the two conditions.
 - e. The condition and capacity of any existing drainage infrastructure that will be connected to the proposed development shall be evaluated.
 - f. Infiltration systems shall not be permitted for use on industrial sites or sites with documented soil contamination as defined in Standard 3 of the Massachusetts Stormwater Handbook; if an infiltration system will be constructed near environmentally sensitive areas, such as public water supplies, it shall be designed to

- allow for shutdown and containment where appropriate to isolate the system in the event of an emergency spill or other unexpected event.
- g. The design of structural BMPs shall be optimized for the removal of phosphorus. Guidance on BMP phosphorus-removal performance may be found in the Massachusetts Small MS4 General Permit, Appendix F Attachment 3.
 - h. New development projects shall provide for removal of 90% of the average annual load of total suspended solids (TSS) and 60% of the average annual load of total phosphorus (TP) generated from the total post-construction impervious surface area on the site. Calculations of the proposed annual average load reductions of TSS and TP shall be completed using the Environmental Protection Agency (EPA) Region 1's BMP Accounting and Tracking Tool (2016), the Massachusetts NPDES MS4 Permit Appendix F Attachment 3 methodology, or other BMP performance evaluation tool provided by the Stormwater Authority.
 - (1) Required TSS and TP load reductions may be achieved by: 1) installing BMPs that meet the required pollutant removal percentages, or 2) 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 site, or 3) a combination of 1 and 2.
 - i. Redevelopment projects shall provide for removal of 80% of the average annual load of total suspended solids (TSS) and 50% of the average annual load of total phosphorus (TP) generated from the total post-construction impervious surface area on the site. Calculations of the proposed annual average load reductions of TSS and TP shall be completed using the Environmental Protection Agency (EPA) Region 1's BMP Accounting and Tracking Tool (2016), the Massachusetts NPDES MS4 Permit Appendix F Attachment 3 methodology, or other BMP performance evaluation tool provided by the Stormwater Authority.
 - (1) Required TSS and TP load reductions may be achieved by: 1) installing BMPs that meet the required pollutant removal percentages, or 2) retaining the volume of runoff equivalent to, or greater than, 0.8 inch multiplied by the total post-construction impervious surface area on the site, or 3) a combination of 1 and 2.
3. Discharges to Water Quality Impaired Waters

The Applicant must determine whether stormwater discharges from the proposed Site will contribute, either directly or indirectly, to the impairment of an impaired water body with or without approved total maximum daily load. The Massachusetts Integrated List of Waters is published every two years and shall be the reference for determination of water body impairment listings. Stormwater management facilities and non-structural stormwater BMPs shall be selected that will control the discharge of the pollutant(s) identified as causing the impairment, per the following

- a. 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.

- b. 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.

B. Fee-In-Lieu Alternative

1. The Stormwater Authority may, at its discretion, permit redevelopment projects to pay a fee in lieu when it is impracticable or infeasible to meet the TSS and TP load reduction requirements in Section 7.A. Standards 1, 8 and 10 of the Massachusetts Stormwater Handbook will continue to apply on site when a Fee-in-Lieu alternative is permitted.
2. Applicants seeking to pay a fee in lieu shall submit a written request and provide documentation to the Stormwater Authority demonstrating that the following criteria have been met:
 - a. The Applicant has made a complete evaluation of possible stormwater management measures that could be used on site and has made all reasonable efforts to meet the requirements of Section 7.A. on site.
 - b. The Applicant has evaluated and incorporated LID practices into the project. Measures such as, but not limited to, porous pavement, green roofs, rain gardens, bioretention areas, and rainwater harvesting and reuse have been considered.
 - c. The project incorporates appropriate measures to reduce stormwater runoff from the site through better site design practices, such as removing extraneous parking, reconfiguring required parking, minimizing the use of impervious materials, and providing enhanced vegetation.
 - d. The project incorporates appropriate measures to disconnect roof runoff and other paved areas from direct discharge to the drainage system.
 - e. Stormwater runoff from the site will not cause adverse impact, defined here as the potential of harm to human health, welfare, safety, or property;
 - f. There would be a negative, measurable environmental impact if the stormwater management facility (or facilities) were provided on the site; and
 - g. It is to the city's advantage to use the fee-in-lieu option, e.g., by contributing to a fund for stormwater capital improvements.

C. Erosion and Sediment Control Plan

1. An Erosion and Sediment Control Plan is required at the time of application for all projects and cannot be relieved by the fee-in-lieu alternative. Plan approval by the Reviewing Agent is required prior to any site altering activity. The plan shall be designed to ensure compliance with the Stormwater Management Permit, these Regulations, the Massachusetts Stormwater Handbook, 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.
2. If a project requires a Stormwater Pollution Prevention Plan (SWPPP) per the NPDES General Permit for Storm Water Discharges from Construction Activities, then the permittee is required to submit a complete copy of the SWPPP (including the signed Notice of Intent and approval letter) as part of its application for a Stormwater Management Permit. If the SWPPP meets the requirements of the NPDES General Permit for Storm Water Discharges from Construction Activities, it will be considered equivalent to the Erosion and Sediment Control Plan described in this Section.
3. The Erosion and Sediment Control Plan shall contain sufficient information to describe the nature and purpose of the proposed development, pertinent conditions of the site and the adjacent areas, and proposed erosion and sedimentation controls. The applicant shall submit such material as is necessary to show that the proposed development will comply with the design requirements listed below.
4. For larger developments where construction phasing occurs, the Erosion and Sediment Control Plan shall be updated as needed based on changing conditions at the site.
5. Required contents of the Erosion and Sediment Control Plan are provided in the Appendix C of these Regulations.
6. The Erosion and Sediment Control Plan shall be designed to meet the following criteria and guidelines:
 - a. Minimize the total area of disturbance and minimize unnecessary clearing and grading from all construction sites. Clearing and grading shall only be performed within areas needed to build the project, including structures, utilities, roads, recreational amenities, post-construction stormwater management facilities, and related infrastructure.
 - b. Prior to any land disturbance activities commencing on the site, the developer shall physically mark limits of no land disturbance on the site with tape, signs, or orange construction fence, so that workers can see the areas to be protected. The physical markers shall be inspected daily by the permittee.
 - c. Erosion and Sediment Control measures shall be installed and maintained in accordance with the manufacturer's specifications and good engineering practices to ensure they perform as intended.
 - d. Erosion and Sediment Control measures used shall be chosen based on the goal of

- minimizing site disturbance from installation of such measures.
- e. Keep Stormwater Runoff Velocities Low. The removal of existing vegetative cover during development and the resulting increase in impermeable surface area after development will increase both the volume and velocity of runoff. These increases must be taken into account when providing for erosion control.
 - f. Protect Disturbed Areas from Stormwater Runoff. Best management practices can be utilized to prevent water from entering and running over the disturbed area. Diversions and other control practices intercept runoff from higher watershed areas, store or divert it away from vulnerable areas, and direct it toward stabilized outlets.
 - g. Sediment trapping and settling devices shall be employed to trap and/or retain suspended sediments and allow time for them to settle out in cases where perimeter sediment controls (e.g., silt fence and hay bales) are deemed to be ineffective in trapping suspended sediments on-site. Sediment basins shall also be used to minimize peak rate of runoff in accordance with the Massachusetts Stormwater Standards.
 - h. Best Management Practices to be used for infiltration after construction shall not be used as Best Management Practices during construction unless otherwise approved by the Board. Many infiltration technologies are not designed to handle the high concentrations of sediments typically found in construction runoff, and thus must be protected from construction related sediment loadings.
 - i. Sediment shall be removed once the volume reaches $\frac{1}{4}$ to $\frac{1}{2}$ the height of a perimeter sediment control system. Sediment shall be removed from silt fence prior to reaching the load-bearing capacity of the silt fence which may be lower than $\frac{1}{4}$ to $\frac{1}{2}$ the height.
 - j. Sediment from sediment traps or sedimentation ponds shall be removed when design capacity has been reduced by 50 percent.
 - k. On and off-site material storage areas, including construction and waste materials, shall be properly protected and managed.
 - l. Soil stockpiles must be stabilized or covered at the end of each workday. Stockpile side slopes shall not be greater than 2:1. All stockpiles shall be surrounded by sediment controls.
 - m. Projects must 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 and debris control.
 - n. A tracking pad shall be constructed at all entrance/exist points of the site to reduce the amount of soil carried onto roadways and off the site.
 - o. Permanent seeding shall be undertaken in the spring from March through May, and in late summer and early fall from August to October 15. During the peak summer months and in the fall after October 15, when seeding is found to be impractical,

appropriate temporary mulch shall be applied. Permanent seeding may be undertaken during the summer if plans provide for adequate mulching and watering.

- p. Slopes (greater than 3:1) shall be protected from erosion by limiting clearing of these areas in the first place or, where grading is unavoidable, by providing special techniques to prevent upland runoff from flowing down a steep slope and through immediate stabilization to prevent gullying. Offsite runoff shall be diverted from highly erodible soils and steep slopes to stable areas.
- q. Interim and permanent stabilization measures shall be instituted on a disturbed area immediately after construction activity has temporarily or permanently ceased on that portion of the site. Two methods are available for stabilizing disturbed areas: mechanical (or structural) methods and vegetative methods. In some cases, both are combined in order to retard erosion.
- r. Temporary sediment trapping devices must not be removed until permanent stabilization is established in all contributory drainage areas.
- s. All temporary erosion and sediment control measures shall be removed after final site stabilization. Disturbed soil areas resulting from the removal of temporary measures shall be permanently stabilized within thirty (30) days of removal.
- t. Construction Waste Management: Trash, debris, and sanitary wastes shall be removed from the site on a regular basis. Dumpsters shall be covered at the end of every workday and before rain events. Concrete mixers shall be washed out only in designated areas with liners. Demolition debris, discarded building materials, concrete truck wash out, chemicals, litter, and sanitary wastes may not be discharged to the MS4 and shall be legally disposed of.

D. Operation and Maintenance Plan

1. An Operation and Maintenance Plan (O&M Plan) is required at the time of application for all projects with onsite stormwater management facilities. The O&M Plan shall be designed to ensure compliance with the Permit, the Stormwater Management Ordinance, these Regulations, and the Massachusetts Stormwater Handbook, 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 O&M Plan shall be a stand-alone document, and shall remain on file with the Board of Health or its designated Reviewing Agent and shall be an ongoing requirement. To ensure that all Best Management Practices continue to function as designed, a final O&M Plan shall be submitted prior to issuance of a Certificate of Completion and reflect any modifications made during the permitting process and the site-specific conditions.
2. The O&M Plan shall include, at a minimum:
 - a. The name(s) of the owner(s) for all components of the system.
 - b. The signature(s) of the owner(s).

- c. The names and addresses of the person(s) responsible for operation and maintenance; if responsibility is contracted to a third party, a copy of the maintenance agreement(s) must be provided.
 - d. A plan or map showing the location of the systems and facilities including easements, catch basins, manholes/access lids, main, and stormwater management facilities.
 - e. An Inspection and Maintenance Schedule for all stormwater management facilities including routine and non-routine maintenance tasks to be performed.
 - f. A list of easements with the purpose and location of each. Easements shall be recorded with the Northern Essex District Registry of Deeds prior to issuance of a Certificate of Completion by the Reviewing Agent.
 - g. Provisions for the Reviewing Agent to enter the property at reasonable times and in a reasonable manner for the purpose of inspection.
 - h. Any other information required by the Reviewing Agent.
- 3. O&M Plan shall apply to the entire project site, not just the construction site disturbance area.
 - 4. At a minimum, inspections shall occur during the first year of operation and in accordance with the O&M Plan in the approved stormwater management permit.
 - 5. The owner of the property shall maintain a log of all operation and maintenance activities, including without limitation, inspections, repairs, replacement, and disposal (for disposal, the log shall indicate the type of material and the disposal location). This log shall be made available to the Reviewing Agent upon request.
 - 6. The owner of the property shall retain a qualified inspector who shall submit an annual, written certification to the Reviewing Agent, documenting that work has been done to properly operate and maintain the stormwater management system.
 - 7. Inspection reports shall be submitted to and maintained by the Reviewing Agent for all stormwater management systems. Inspection reports for stormwater management systems shall include:
 - a. The date of inspection;
 - b. Name of inspector;
 - c. The condition of each Best Management Practice, including components such as:
 - (1) Pretreatment devices
 - (2) Vegetation or filter media
 - (3) Fences or other safety devices
 - (4) Spillways, valves, or other control structures

- (5) Embankments, slopes, and safety benches
 - (6) Reservoir or treatment areas
 - (7) Inlet and outlet channels and structures
 - (8) Underground drainage
 - (9) Sediment and debris accumulation in storage and forebay areas (including catch basins)
 - (10) Any nonstructural practices
 - (11) Any other item that could affect the proper function of the stormwater management system
- d. Description of the need for maintenance.
8. Changes to Ownership and Financial Responsibilities: The owner(s) of the stormwater management system must notify the Reviewing Agent of changes in ownership or assignment of financial responsibility and amend the original O&M Plan accordingly.
 9. The Reviewing Agent may require recordation of the O&M Plan depending on the complexity of the systems installed. All recording costs shall be the responsibility of the permittee. The applicant shall provide proof of the recording within thirty (30) days of recording to the Reviewing Agent.
 10. Parties responsible for the operation and maintenance of a stormwater management facility shall retain the records of the installation and of all maintenance and repairs for at least five years and shall provide records of all maintenance and repairs to the Reviewing Agent upon request.

8. Inspections

- A. Construction site inspections shall be conducted in accordance with approved Operations & Maintenance Plans and Erosion and Sediment Control Plans. Noncompliance issues discovered during inspections are the responsibility of the construction site operator to resolve in a timely manner.
- B. The person(s) inspecting the site must be knowledgeable in the principles and practice of erosion and sediment controls and pollution prevention and must possess the appropriate skills and training to assess conditions at the construction site that could impact stormwater quality and to assess the effectiveness of any stormwater controls selected and installed.
- C. Construction Commencement
 1. Pre-Construction Meeting. The Reviewing Agent may require a pre-construction meeting prior to the start of clearing, excavation, construction, or land disturbing activity by the permittee. The Applicant's technical representative, the general contractor, or any other person with authority to make changes to the project, shall meet with the Board or its representative to review construction sequencing and the permitted plans and their implementation.
 2. Notice of Construction Commencement. The applicant must notify the Reviewing Agent

two (2) days prior to the commencement of construction. In addition, the applicant must notify the Reviewing Agent two (2) days prior to construction of critical components, as defined in Section 8.D.4(c) and/or within the Stormwater Management Permit, of any stormwater management facility.

3. A copy of the approved and signed plans and permits for a Stormwater Management Permit, and documentation demonstrating that conditions of approval have been met, including a copy of the approved Erosion and Sediment Control Plan and EPA Authorization for a NPDES General Permit for Storm Water Discharges from Construction Activities, as applicable, shall be kept on the construction site at all times.
4. The Reviewing Agent shall be granted by the Owner and/or Applicant the right to enter the property at reasonable times and in a reasonable manner for the purpose of inspection. The Reviewing Agent shall have authority to enter upon privately owned land for the purpose of performing their duties under this Regulation and may make or cause to be made such examinations, surveys, or sampling as the Reviewing Agent deems necessary, subject to the constitutions and laws of the United States and the Commonwealth.

D. Erosion and Sediment Control Inspections

1. To ensure erosion control practices are in accordance with the filed Erosion and Sediment Control Plan, Erosion Control Inspections will be conducted by the construction site operator or an authorized representative at least once every seven (7) calendar days or once every 14 days and within 24 hours of the end of a storm event of 0.25 inches or greater, from the start of construction until the site is permanently stabilized. If a properly maintained rain gauge is not onsite, the National Oceanic and Atmospheric Administration (NOAA) shall be the authoritative reference for determining rainfall amounts and intensity. Inspection frequency may be reduced to at least once a month if the site is temporarily stabilized or if runoff is unlikely due to winter conditions (e.g., site is covered with snow, ice, or the ground is frozen). The permittee is required to notify the Reviewing Agent of any change in inspection frequency, including termination of inspections due to site stabilization.
2. A final inspection must be conducted near project completion to ensure temporary controls have been removed, stabilization is complete, and final conditions adhere to approved site plans.
3. Inspections must include all areas of the site disturbed by construction activity and areas used for storage of materials that are exposed to precipitation. Inspectors must look for evidence of, or the potential for, pollutants entering the storm water conveyance system. Sedimentation and erosion control measures identified in the Erosion and Sediment Control Plan must be observed to ensure proper operation. Discharge locations must be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to waters of the United States, where accessible. Where discharge locations are inaccessible, nearby downstream locations must be inspected to the extent that such inspections are practicable. Locations where vehicles enter or exit the site must be inspected for evidence of off-site sediment tracking.

4. For each inspection, an inspection report must be completed within 24 hours of the inspection by the construction site operator or an authorized representative consistent with construction inspection reporting outlined in the NPDES General Permit for Storm Water Discharges from Construction Activities (if applicable), or will include the following information, at a minimum:
 - a. The inspection date and location;
 - b. Names, titles, qualifications, and signatures of personnel making the inspection;
 - c. Weather information and a description of any discharges occurring at the time of the inspection;
 - d. Location(s) of discharges of sediment or other pollutants from the site;
 - e. Whether the built structures are in compliance with the approved stormwater management plan and any variations from the approved plans;
 - f. The conditions of each Best Management Practice;
 - g. Location(s) of Best Management Practices that need to be maintained and a description of the need for maintenance;
 - h. Location(s) of Best Management Practices that failed to operate as designed or proved inadequate for a particular location;
 - i. Location(s) where additional Best Management Practices are needed that did not exist at the time of inspection; and
 - j. Corrective action required including any changes to the Stormwater Pollution Prevention Plan or Erosion and Sediment Control Plan necessary and implementation dates.
5. If a project requires a Stormwater Pollution Prevention Plan per the NPDES General Permit for Storm Water Discharges from Construction Activities, then the permittee is required to submit all Inspection Reports to the designated Reviewing Agent upon request. If the Inspection Reports meet the requirements of the NPDES General Permit for Storm Water Discharges from Construction Activities, it will be considered equivalent to the Erosion and Sediment Control Inspection as described above.
6. A record of each inspection and of any actions taken must be retained for at least three (3) years from the date of completion of the project. The inspection reports must identify any incidents of non-compliance with the permit conditions. Where a report does not identify any incidents of non-compliance, the report must contain a certification that the construction project or site is in compliance with this permit.
7. All erosion and sediment control measures and other protective measures identified in the Erosion and Sediment Control Plan must be maintained in effective operating condition.

If site inspections identify Best Management Practices that are not operating effectively, maintenance must be performed as soon as possible and before the next storm event whenever practicable to maintain the continued effectiveness of storm water controls.

E. City Inspections

1. At its discretion, the Reviewing Agent may require periodic inspections of the stormwater management system construction by a professional engineer or other qualified inspector to ensure compliance with the conditions of the Stormwater Management Permit, or overall effectiveness and functioning of the system.
2. The Reviewing Agent reserves the right to require corrections or improvements to a stormwater management system after issuance of any Stormwater Management Permit based on the system's performance under actual storm conditions. If the system is found to be inadequate by virtue of physical evidence of operational defect and/or failure, even though it was built as called for in the Stormwater Management Plan, it shall be corrected by the applicant before the Certificate of Completion is released. If the applicant fails to act, the Department may use the surety bond to complete the work.
3. All inspections performed by the Applicant or their designee shall be documented and made available during City inspections.
4. The Reviewing Agent will coordinate inspections with the construction site operator listed in the Stormwater Pollution Prevention Plan and/or Stormwater Management Permit and will inspect the project site at the following stages, at a minimum:
 - a. Initial Site Inspection of erosion and sedimentation controls prior to any land disturbance to assess overall effectiveness and functioning to protect resources.
 - b. Opportunistic and Complaint-Driven Inspections: The City may conduct opportunistic inspections during other code enforcement activities and will respond to complaints about discharges within four (4) days of receipt.
 - c. Stormwater Management System Inspection: An inspection will be made of the completed stormwater management system, prior to backfilling of any underground drainage or stormwater conveyance structures.
 - d. Additional inspections may be conducted as needed if chronic deficiencies are identified.
 - e. Final Inspection:
 - (1) After the stormwater management system has been constructed and before the surety has been released, all applicants are required to submit actual "as built" plans for any stormwater management facilities or practices. The plans must be certified by a Massachusetts Registered Professional Engineer.
 - (2) 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 the Reviewing Agent which will issue a Certificate of Completion. "As built" plans shall be full size plans which reflect the "as built" conditions, including all final grades, prepared by a Massachusetts Registered Professional Engineer. All changes to project design should be recorded in red ink on plans to define changes made. All work deleted, corrections in elevations, and changes in materials, should be shown on the "as built" drawings.

9. Surety

- A. Stormwater Completion Surety. Before the start of land disturbance or construction activity, the Reviewing Agent may require the Applicant to post a bond to guarantee completion of the conditions of the approved Stormwater Management Permit. The form of the bond shall be approved by City Attorney, and be in an amount deemed sufficient by the Reviewing Agent to ensure that the work will be completed in accordance with the permit. If the project is phased, the Reviewing Agent may release part of the bond as each phase is completed in compliance with the permit, but the bond may not be fully released until the Reviewing Agent has received a final inspection report as required by Section 10 of these Regulations and issued a Certificate of Completion.
- B. Stormwater Maintenance Surety. The Reviewing Agent may also require the Applicant to secure the future maintenance of the stormwater system by a surety bond or by a deposit of money of an amount as determined by the Reviewing Agent. In the event that the Applicant does not follow maintenance procedures and programs as approved by the Reviewing Agent, the Reviewing Agent shall have the authority to expend any portion of said security to provide such maintenance for up to five (5) years after completion of the project.

10. Certificate of Completion

- A. Upon completion of the project, the applicant shall submit the following material to the Reviewing Agent demonstrating that the completed project is in accordance with the approved plans and specifications:
 - 1. Certification by a Massachusetts Registered Professional Engineer that the systems have been installed and are functioning according to the approved Stormwater Management Permit.
 - 2. As-built plan, stamped by a Massachusetts Registered Professional Engineer or Land Surveyor, and electronic copy, submitted no later than one (1) year after completion of construction, to include the following information:
 - a. Limit of work
 - b. Post-construction topography
 - c. Finished grades of all structures

- d. Post-construction structural and non-structural stormwater controls
 - e. Invert elevations of all stormwater structures
 - f. All structures, pavement, utilities
 - g. Off-site alterations
 - h. Electronic copy of the as-built plan
3. Documentation of compliance with all permit conditions.
 4. Maintenance surety has been submitted.
 5. All Inspection reports required during construction have been submitted.
 6. Final Operation & Maintenance Plan submitted.
 7. Maintenance contracts in place.
 8. Certified copy of the Stormwater Management Permit has been recorded at Registry of Deeds.
- B. The Reviewing Agent reserves the right to require corrections or improvements to a stormwater management system at any time after issuance of any Stormwater Management Permit based on the system's performance under actual storm conditions.
- C. If the system is found to be inadequate by virtue of physical evidence of operational defect and/or failure, even though it was built as called for in the Stormwater Management Plan, it shall be corrected by the applicant before the Certificate of Completion is released. If the applicant fails to act the Reviewing Agent may use the surety bond to complete the work.
- D. If the Reviewing Agent determines that there is a failure to comply with the plan, the property owner shall be notified in writing of the nature of the violation and the required corrective actions along with a timetable for their implementation. A Stop Work Order shall be issued until any violations are corrected and all work previously completed has received approval by the Reviewing Agent.
- E. If a responsible person fails or refuses to meet the requirements of the Operation & Maintenance Plan, the Reviewing Agent, after thirty (30) days written notice (except, that in the event the violation constitutes an immediate danger to public health or public safety, 24-hour notice shall be sufficient), may correct a violation of the design standards or maintenance requirements by performing the necessary work to place the facility or practice in proper working condition. The Reviewing Agent may assess the owner(s) of the facility for the cost of repair work, which shall be a lien on the property, as described in Section 11 of these Regulations.
- F. Upon receipt and approval of the final inspection and reports and/or upon otherwise

determining that all work of the permit has been satisfactorily completed in conformance with this Regulation, the Reviewing Agent shall issue a letter certifying completion in conformance with this Regulation.

11. Ongoing Inspection and Maintenance

- A. The owner of the property on which work has been done pursuant to these Regulations, or any other person or agent in control of such property, shall maintain in good condition and promptly repair and restore all stormwater management facilities. Such repairs or restoration and maintenance shall be in accordance with approved O&M plan.
- B. The City of Lawrence will not accept ownership of stormwater BMPs located outside of street rights of way, and the maintenance of such facilities shall remain the permanent responsibility of the Applicant or his successors and/or assigns. The owner of the property on which work has done pursuant to these regulations for private Stormwater Management Facilities, or any other person or agent in control of such property, shall maintain in good condition and promptly repair and restore all Stormwater Management Facilities in accordance with the O&M Plan and all other applicable approved plans, and all applicable laws.

1. Maintenance Inspections

- a. The property owner responsible for the operation and maintenance of stormwater management facilities shall retain a Qualified Inspector who shall submit, on an annual basis by January 1st of each year, a written certification to the Stormwater Agency documenting that work has been done to properly operate and maintain the stormwater management facilities consistent with the approved O&M plan. The property owner responsible for the operation and maintenance of a stormwater management system shall prepare records of all maintenance and repairs.
- b. Maintenance inspections shall include consideration of the condition of:
 - (1) Pretreatment devices;
 - (2) Vegetation or filter media;
 - (3) Fences or other safety devices;
 - (4) Spillways, valves, or other control structures;
 - (5) Embankments, slopes, and safety benches;
 - (6) Reservoir or treatment areas;
 - (7) Inlet and outlet channels and structures;
 - (8) Underground drainage;
 - (9) Sediment and debris accumulation in storage and fore bay areas (including catch basins);
 - (10) Any nonstructural practices; and
 - (11) Any other item that could affect the proper function of the stormwater management system.

2. Right-of-Entry for Inspection

The terms of the O&M Plan and any maintenance agreement for the implementation thereof shall provide for the Stormwater Authority or its designee to enter the property at reasonable times and in a reasonable manner for the purpose of inspection in accordance with Section 181-72(C) of these regulations.

3. Records of Inspections and Maintenance, Repair, Replacement and Disposal Activities

Property owners responsible for the operation and maintenance of stormwater management facilities shall prepare records of the installation and of all inspections, maintenance, repairs, replacement, and disposal activities, and shall retain the records for at least five years. These records shall be made available to the Stormwater Authority during inspection of the facility and upon request. For disposal, the record must indicate the type of material, quantity of material, and disposal location.

4. Failure to Maintain

After notification is provided to the signatories to the Maintenance Agreement of any deficiencies discovered from an inspection of a Stormwater Management System, the owner of the property shall have 30 days (which time may be extended by the Stormwater Authority) to correct the deficiency. The Stormwater Authority shall then conduct a subsequent inspection to ensure completion of repairs.

12. ENFORCEMENT

Enforcement powers of the Board of Health are granted in the Stormwater Management Ordinance, Section 20.03.120.

A. The Reviewing Agent or an authorized agent of the Board of Health shall enforce the Stormwater Management Ordinance, Regulations, orders, violation notices, and enforcement orders, and may pursue all civil, criminal, and non-criminal remedies for such violations.

B. Notices and Orders

1. The Reviewing Agent or an authorized agent of the Board of Health may issue a written notice of violation or enforcement order to enforce the provisions of the Stormwater Management Ordinance or the Regulations thereunder, which may include requirements to:

- a. Cease and desist from construction or land disturbing activity until there is compliance with the Stormwater Management Ordinance and the Stormwater Management Permit;
- b. Repair, maintain, or replace the stormwater management system or portions thereof in accordance with the operation and maintenance plan;
- c. Perform monitoring, analyses, and reporting; and
- d. Fix adverse impact resulting directly or indirectly from malfunction of the stormwater

management system.

2. If the Reviewing Agent or an authorized agent of the Board of Health determines that abatement or remediation of adverse impacts is required, the order may set forth a deadline by which such abatement or remediation must be completed. Said order may further advise that, should the violator or property owner fail to abate or perform remediation within the specified deadline, the City of Lawrence may, at its option, undertake such work, and the property owner shall reimburse the City of Lawrence for expenses incurred as described in the Stormwater Management Ordinance.
 3. Within thirty (30) days after completing all measures necessary to abate the violation or to perform remediation, the violator and the property owner shall be notified of the costs incurred by the City of Lawrence, including any administrative costs. The violator or property owner may file a written protest objecting to the amount or basis of costs with the Board of Health or an authorized agent of the Board of Health within thirty (30) days of receipt of the notification of the costs incurred. If the amount due is not received by the expiration of the time in which to file a protest or within thirty (30) days following a decision of the Board of Health or an authorized agent of the Board of Health affirming or reducing the costs, or from a final decision of a court of competent jurisdiction, the costs shall become a special assessment against the property owner and shall constitute a lien on the owner's property for the amount of said costs. Interest shall begin to accrue on any unpaid costs at the statutory rate provided in G.L. Ch. 59, § 57, after the thirty-first day at which the costs first become due.
- C. Any person who violates any provision of the City of Lawrence Stormwater Management Ordinance, or Regulations, order or permit issued thereunder, may be ordered to correct the violation and/or shall be punished by a fine of not more than \$200 per offense. Each day or part thereof that such violation occurs or continues shall constitute a separate offense.
- D. Non-Criminal Disposition. As an alternative to criminal prosecution or civil action, the City of Lawrence may elect to utilize the non- criminal disposition procedure set forth in G.L. Ch. 40, §21D. The penalty for the first violation shall be \$200. The penalty for the second violation shall be \$500. The penalty for the third and subsequent violations shall be \$1,000. Each day or part thereof that such violation occurs or continues shall constitute a separate offense.
- E. Remedies Not Exclusive. The remedies listed in the Stormwater Management Ordinance and these Regulations are not exclusive of any other remedies available under any applicable federal, state or local law.

13. SEVERABILITY

The invalidity of any section, provision, paragraph, sentence, or clause of these Regulations shall not invalidate any other section, provision, paragraph, sentence, or clause thereof, nor shall it invalidate any permit or determination that previously has been issued.

APPENDIX A: DEFINITIONS AS USED IN THESE REGULATIONS

ALTER: Any activity, which will measurably change the ability of a ground surface area to absorb water or will change existing surface drainage. Alter may be similarly represented as “alteration of drainage characteristics,” and “conducting land disturbance activities.”

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: A property owner or agent of a property owner who has filed an application for a Stormwater Management Permit.

BEST MANAGEMENT PRACTICE (BMP): Schedules of activities, practices (and prohibitions of practices), structures, vegetation, maintenance procedures, and other management practices 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. Structural, nonstructural, and managerial techniques will be utilized that are recognized to be most effective and practical means to prevent and/or reduce erosion, provide sediment control, increases in stormwater volumes and flows, reduce point source and nonpoint source pollution, and promote good stormwater quality and protection of the environment. "Structural" BMPs are devices that are engineered and constructed to provide permanent or temporary storage and treatment of stormwater runoff. "Nonstructural" BMPs use natural measures to reduce pollution levels, do not require extensive construction efforts, and/or promote pollutant reduction by eliminating the pollutant source. Nonstructural BMPs include managerial techniques that focus on the preservation and protection of natural features.

CERTIFICATE OF COMPLETION (COC): A document issued by the Board of Health after all construction activities have been completed which states that all conditions of an issued Stormwater Management Permit (STORMWATER MANAGEMENT PERMIT) have been met and that a project has been completed in compliance with the conditions set forth in a STORMWATER MANAGEMENT PERMIT.

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.

COMBINED SEWER: A combined sewer system is a sewer that accepts stormwater, sanitary water/sewage, and industrial wastewater in a single pipe system which is then transported to a publicly owned treatment works (POTW). During periods of heavy rainfall or snow melt, the wastewater volume in a combined sewer can exceed the capacity of the system. These discharges are called combined sewer overflows (CSOs).

COMBINED SEWER OVERFLOW: During periods of significant rainfall, the capacity of a

combined sewer, which conveys both sanitary sewage and stormwater in one piping system, may be exceeded and excess flow is discharged to natural waterways before it can be diverted to the wastewater treatment plant.

COMMON PLAN: Any announcement or piece of documentation (including a sign, public notice or hearing, advertisement, drawing, ANR plan, or permit application, etc.) or physical demarcation (including boundary signs, lot stakes, surveyor marking, etc.) indicating imminent or future construction activities to disturb earth regardless of how many phases or how long it will take to complete said plan. A Site will no longer be considered part of a Common Plan of Development if the following criteria are met:

- i. The original plan, including modifications, is substantially completed with less than one acre of the original common plan remaining (i.e., <1 acre of the common plan was not built out at the time); and
- ii. Work on said Site follows a clear, identifiable period of time of two (2) years or more where there is no construction on the property or other properties that would be part of the same Common Plan of Development, including final stabilization.

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. For example, if a developer buys a 20-acre lot and builds roads, installs pipes, and runs electricity with the intention of constructing homes or other structures sometime in the future, this would be considered a larger common plan of development or sale. If the land is parceled off or sold, and construction occurs on plots that are less than one acre by separate, independent builders, this activity still would be subject to stormwater permitting requirements if the smaller plots were included on the original site plan.

CONTROL MEASURE: Refers to any BMP or other method (including effluent limitations) used to prevent or reduce the discharge of pollutants to waters of the United States.

CONSTRUCTION SITE: The land or water area where construction activities will occur and where stormwater controls will be installed and maintained. The construction site includes construction support activities, which may be located at a different part of the property from where the primary construction activity will take place, or on a different piece of property altogether. The construction site is often a smaller subset of the lot or parcel within which the project is taking place.

CONSTRUCTION SITE OPERATOR: The party that has operational control over construction plans and specification, including the ability to make modifications to those plans and specifications, or the party that has day-to-day operational control of those activities at a project that are necessary to ensure compliance with the conditions set forth in a STORMWATER MANAGEMENT PERMIT.

CONSTRUCTION SUPPORT ACTIVITIES: A construction-related activity that specifically supports the construction activity and involves earth disturbance or pollutant-generating activities of its own, and can include activities associated with concrete or asphalt batch plants, equipment staging yards, materials storage areas, excavated material disposal areas, and borrow

areas.

CONSTRUCTION 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.

CONVEYANCE: Any structure or device, including pipes, drains, culverts, curb breaks, paved swales or swales of all types designed or utilized to move or direct stormwater runoff or existing water flow.

DISCHARGE OF A POLLUTANT: Any addition of any “pollutant” or combination of pollutants to “waters of the United States” from any “point source,” or any addition of any pollutant or combination of pollutants to the waters of the “contiguous zone” or the ocean from any point source other than a vessel or other floating craft which is being used as a means of transportation. This includes additions of pollutants into waters of the United States from surface runoff which is collected or channeled by man; or discharges through pipes, sewers, or other conveyances, leading into privately owned treatment works.

DISTURBANCE: Any action that causes a temporary or permanent change in the position, location, or arrangement of vegetation, soil, sand, rock, gravel, or similar earth material; such actions may include, but are not limited to, clearing, grading, site preparation (e.g., excavating, cutting, and filling), soil compaction, and movement and stockpiling of topsoils. See also "Alter."

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

EROSION AND SEDIMENT CONTROL PLAN: A Stormwater Pollution Prevention Plan as required by the EPA Construction General Permit, or the functional equivalent if a project is not subject to the EPA Construction General Permit.

ILLCIT DISCHARGE: Any discharge to a municipal separate storm sewer that is not composed entirely of stormwater except discharges pursuant to a NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer) and discharges resulting from firefighting activities.

IMPAIRED WATER: A water is impaired if it does not meet one or more of its designated use(s). Impaired waters refers to categories 4 and 5 of the five-part categorization approach used for classifying the water quality standards attainment status for water segments under the TMDL program. Impaired waters compilations are also sometimes referred to as “303(d) lists.” Category 5 waters are impaired because at least one designated use is not being supported or is threatened

and a TMDL is needed. Category 4 waters indicate that at least one designated use is not being supported but a TMDL is not needed (4a indicates that a TMDL has been approved or established by EPA; 4b indicates other required control measures are expected in result in the attainment of water quality standards in a reasonable period of time; and 4c indicates that the non-attainment of the water quality standard is the result of pollution (e.g., habitat) and is not caused by a pollutant).

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.

INDUSTRIAL ACTIVITY: The ten categories of industrial activities included in the definition of “stormwater discharges associated with industrial activity,” as defined in 40 CFR 122.26(b)(14)(i)-(ix) and (xi).

INDUSTRIAL STORMWATER: Stormwater runoff associated with the definition of “stormwater discharges associated with industrial activity.”

INFILTRATION: The act of conveying surface water into the ground to promote Groundwater Recharge and the reduction of stormwater runoff from a project Site.

LAND DISTURBANCE: Any action that causes a change in the position, location, or arrangement of soil, sand, rock, gravel, or similar earth material; involves clearing, grading, or excavating, including grubbing; or results in an alteration of drainage characteristics.

LAND USES WITH HIGHER POTENTIAL POLLUTANT LOADS (LUHPPL): LUHPPLs are defined in 310 CMR 10.04 and are listed in Appendix E.

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 (LID): A set of strategies that seek to maintain natural hydrologic systems both during and after the development process. This approach is implemented by engineering a Site so that the Post-Development hydrologic functions remain close to predevelopment conditions by using design techniques that infiltrate, filter, store, evaporate and detain stormwater Runoff close to its source. .

MASSACHUSETTS STORMWATER MANAGEMENT STANDARDS: The latest version, as may be amended from time to time, of the Stormwater Management Standards and accompanying Stormwater Handbook issued by the Department of Environmental Protection pursuant to its authority under the Wetlands Protection Act, M.G.L. c. 131, § 40, and the Massachusetts Clean Waters Act, M.G.L.c.21, §§ 26-53. The Stormwater Management Standards are incorporated in the Wetlands Protection Act Regulations, 310 CMR 10.05(6)(k) and the Water Quality Certification Regulations, 314 CMR 9.06(6)(a).

MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4), OR MUNICIPAL STORM DRAIN SYSTEM, OR MUNICIPAL DRAINAGE SYSTEM: A conveyance or a system of conveyances designed or used for collecting or conveying stormwater, including any road with a drainage system, street, gutter, curb, ditches, 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.

- (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to waters of the United States;
- (ii) Designed or used for collecting or conveying stormwater;
- (iii) Which is not a combined sewer; and
- (iv) Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2.

MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4): Means all separate storm sewers that are defined as “large” or “medium” or “small” municipal storm sewer systems pursuant to paragraphs 40 CFR 122.26 (b)(4) and (b)(7), or designated under paragraph 40 126.26(a) (1)(v). For the purposes of this permit “MS4” may also refer to the permittee with jurisdiction over the sewer system.

MASSACHUSETTS STORMWATER HANDBOOK (HANDBOOK): The Stormwater Handbook, as amended from time to time, produced by MassDEP and the Massachusetts Office of Coastal Zone Management to be used as guidance for controlling stormwater. Implementation of Stormwater Management Standards shall be in accordance with the Stormwater Handbook.

MASSACHUSETTS STORMWATER MANAGEMENT STANDARDS: The requirements described in the Massachusetts Stormwater Handbook, as they may be amended from time to time, that address water quality (pollutants) and water quantity (flooding, low base flow and Recharge) by establishing standards that require the implementation of a wide variety of stormwater management strategies. These strategies include environmentally sensitive Site design and LID techniques to minimize impervious surface and Land Disturbance, source control and pollution prevention, structural Best Management Practices, construction period erosion and Sedimentation control, and the long-term operation and maintenance of stormwater management systems. The Stormwater Management Standards have been incorporated in the Wetlands Protection Act Regulations, 310 CMR 10.05(6)(k) and the Water Quality Certification Regulations, 314 CMR 9.06(6)(a).

NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES): As authorized by the Federal Clean Water Act, the NPDES permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States.

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 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. (see part 2.3.6. of the permit).

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

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.

OWNER OR OPERATOR: The owner, operator, or a person with a legal or equitable interest in property of any “facility or activity” subject to regulation under the NPDES program.

PERMITTEE: The person who is issued a permit by the Stormwater Authority pursuant to these Regulations.

PERSON: An individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof.

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.

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.

POST-DEVELOPMENT: The conditions that reasonably may be expected or anticipated to exist after completion of the land development activity on a specific Site or tract of land. Post-Development refers to the phase of a new development or redevelopment project after completion and does not refer to the construction phase of a project. May also be called post-construction .

PRE-DEVELOPMENT: The conditions that exist at the time that plans for the land development of a tract of land are submitted to the Stormwater Authority with a Stormwater Management Permit Application. Where phased development or plan approval occurs (preliminary Grading,

roads and utilities, etc.), the existing conditions at the time prior to the first plan submission shall establish the Site's Pre-Development conditions.

QUALIFIED INSPECTOR: A person knowledgeable in the principles and practice of erosion and sediment controls and pollution prevention, who possesses the skills to assess conditions at the construction Site that could impact stormwater quality, and the skills to assess the effectiveness of any stormwater management facilities selected and installed to meet the requirements of this permit. The inspector must have a practical knowledge of stormwater hydrology and stormwater management techniques, including the maintenance requirements for stormwater management facilities; and the inspector must have the ability to determine if stormwater BMPS and facilities are performing as intended.

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

REDEVELOPMENT: Any construction, land alteration, 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 (see above).

RESOURCE AREA: Any area protected under including without limitation: the Massachusetts Wetlands Protection Act, Massachusetts Rivers Act, or City of Lawrence Wetlands Protection Ordinance.

REVIEWING AGENT: The Stormwater Authority, as defined in the Stormwater Management Ordinance, or any City employee, board, or agent appointed by the Stormwater Authority to assist in the administration, implementation, and enforcement of these Regulations or the Stormwater Management Ordinance. Applicants shall submit all Stormwater Management Permit application submittals in compliance with these Regulations to the Reviewing Agent.

RUNOFF: The water from rain, snowmelt, or irrigation that flows over the land surface that is not absorbed into the ground, instead flowing into streams or other surface waters or land depressions.

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 areal extent of land disturbance and construction activities, including but not limited to the creation of new impervious surface and improvement of existing impervious surface.

SLOPE: The incline of a ground surface expressed as a ratio of horizontal distance to vertical distance (e.g., a 4:1 slope). It can also be expressed as a percentage of the vertical rise divided by the horizontal distance (e.g., a twenty-five (25) percent slope).

SMALL MUNICIPAL SEPARATE STORM SEWER SYSTEM: All separate storm sewer systems that are (i) owned or operated by the United States, a State, city, town, borough, county,

parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district, or drainage district, or similar entity or an Indian tribe or an authorized Indian tribal organization or a designated and approved management agency under section 208 of the CWA that discharges to waters of the United States, and (ii) not defined as “large” or “medium” municipal separate storm sewer system pursuant to paragraphs 40 CFR 122.26 (b)(4) and (b)(7), or designated under paragraph 40 126.26(a) (1)(v). This term includes systems similar to separate storm sewer systems in municipalities, such as systems at military bases, large hospital or prison complexes, and highways and other thoroughfares. This term does not include separate storm sewers in very discrete areas, such as individual buildings.

SMALL MS4: Means a small municipal separate storm sewer system.

STOP WORK ORDER: An order issued which requires that all construction activity on a site be stopped.

STORMWATER: Stormwater runoff, snow melt runoff, and surface runoff and drainage. Water that accumulates on land because of storms and can include runoff from urban areas such as roads and roofs.

STORMWATER AUTHORITY: Board of Health or authorized agent(s) as defined in this chapter. The Board of Health or its agent(s) shall coordinate the review, approval, and permit process authorized by this chapter. For projects that, in their entirety, are required to obtain an Order of Conditions from the Lawrence Conservation Commission, the Conservation Commission is designated as the Stormwater Authority instead of the Board of Health.

STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY: A discharge of pollutants in stormwater runoff from areas where soil disturbing activities (e.g., clearing, grading, or excavating), construction materials, or equipment storage or maintenance (e.g., fill piles, borrow areas, concrete truck washout, fueling), or other industrial stormwater directly related to the construction process (e.g., concrete or asphalt batch plants) are located. (See 40 CFR 122.26(b)(14)(x) and 40 CFR 122.26(b)(15).

STORMWATER MANAGEMENT: The use of structural or nonstructural practices that are designed to reduce stormwater runoff pollutant loads, discharge volumes, and/or peak flow discharge rates. “Stormwater Management” includes the use of structural and nonstructural stormwater management practices.

STORMWATER MANAGEMENT FACILITY: A device engineered and constructed to provide permanent storage and/or treatment of stormwater runoff.

STORMWATER MANAGEMENT PERMIT (STORMWATER MANAGEMENT PERMIT): A permit issued by the Stormwater Authority, after review of an application, plans, calculations, and other supporting documents, which show that the proposed project is designed to protect the environment of the City from the adverse impact of uncontrolled and untreated stormwater runoff.

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.

TOTAL MAXIMUM DAILY LOADS (TMDLs): 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 is a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards, and an allocation of that amount to the pollutant's sources. A TMDL includes wasteload allocations (WLAs) for point source discharges, load allocations (LAs) for nonpoint sources and/or natural background, and must include a margin of safety (MOS) and account for seasonal variations. (See section 303(d) of the Clean Water Act and 40 CFR 130.2 and 130.7).

TOTAL PHOSPHORUS (TP): A measure of the total dissolved and particulate forms of phosphorus. Excessive phosphorus in stormwater runoff to surface waters can cause algal blooms and accelerated plant growth, which can lead to decreased dissolved oxygen availability and possibly fish kills.

Total Suspended Solids (TSS): TSS are solids in water that can be trapped by a filter. TSS may include a wide variety of material, such as sediments, decaying plant and animal matter and other particulates. It is typically reported in milligrams per liter.

WATER QUALITY STANDARDS: A water quality standard defines the water quality goals of a water body, or portion thereof, by designating the use or uses to be made of the water and by setting criteria necessary to protect the uses. States and EPA adopt WQS to protect public health or welfare, enhance the quality of water and serve the purposes of the Clean Water Act (See CWA sections 101(a)2 and 303(c)).

WATER QUALITY VOLUME (WQv): The Water Quality Volume is the total volume of runoff generated from a given area by a rainfall event of a particular depth. The Water Quality Volume required for treatment is defined by the most recent version of Massachusetts Stormwater Management Standards and accompanying Stormwater Management Handbook.

APPENDIX B: STORMWATER MANAGEMENT PLAN CONTENTS

The Stormwater Management Plan shall be consistent with the Massachusetts Stormwater Management Handbook and shall include, at a minimum:

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. Brief narrative description of the project and description of how and where stormwater will be controlled and whether runoff will discharge to the City's separate storm sewer system and/or combined sewer system;
3. A locus map;
4. Existing and Proposed Site Plans;
5. The existing zoning, and land use at the site and abutting properties;
6. The proposed land use;
7. The location(s) of existing and proposed easements;
8. The location of existing and proposed utilities;
9. The site's existing & proposed topography with contours at 2 foot intervals;
10. The existing site hydrology;
11. A description & delineation of existing stormwater conveyances, impoundments, wetlands, drinking water resource areas, swimming beaches or other critical environmental resource areas on or adjacent to the site or into which stormwater flows;
12. A delineation of 100-year flood plains, if applicable;
13. Estimated seasonal high groundwater elevation in areas to be used for stormwater retention, detention, or infiltration;
14. The existing and proposed vegetation and ground surfaces with runoff coefficients for each;
15. A drainage area map showing pre and post construction watershed boundaries, drainage area and stormwater flow paths, including municipal drainage system flows;
16. A description and drawings of all components of the proposed stormwater management system including:
 - a. Locations, cross sections, and profiles of all brooks, streams, drainage swales and their method of stabilization;

- b. Locations and details for all components of all measures for the conveyance, detention, retention, or infiltration of stormwater, and for the protection of water quality;
 - c. Notes on drawings specifying materials to be used, construction specifications, and expected hydrology with supporting calculations;
 - d. Proposed improvements including location of buildings or other structures and impervious surfaces, if applicable;
 - e. Any other information requested by the Reviewing Agent.
17. Hydrologic and hydraulic design calculations for the pre-development and post-development conditions for the design storms specified in this Regulation. Such calculations shall include:
- a. Description of the design storm frequency, intensity and duration;
 - b. Time of concentration;
 - c. Soil Runoff Curve Number (RCN) based on land use and soil hydrologic group;
 - d. Peak runoff rates and total runoff volumes for each watershed area;
 - e. Information on construction measures used to maintain the infiltration capacity of the soil where any kind of infiltration is proposed;
 - f. Infiltration rates, where applicable;
 - g. Culvert capacities;
 - h. Flow velocities;
 - i. Data on the increase in rate and volume of runoff for the specified design storms, and
 - j. Documentation of sources for all computation methods and field test results.
18. Calculations demonstrating compliance with the Massachusetts Stormwater Standards and these Regulations, including the proposed annual average load reductions of TSS and TP. Calculations shall be completed using the Environmental Protection Agency (EPA) Region 1's BMP Accounting and Tracking Tool (2016), the Massachusetts NPDES MS4 Permit Appendix F Attachment 3 methodology, or other BMP performance evaluation tool provided by the Stormwater Authority.
19. Post-Development downstream analysis if deemed necessary by the Reviewing Agent;
20. Soils Information from test pits performed at the location of proposed stormwater management facilities, including but not limited to soil descriptions, depth to seasonal high groundwater, depth to bedrock, and percolation rates. Soils information will be

based on site test pits logged by a Massachusetts Registered Soil Evaluator, or a Massachusetts Registered Professional Engineer;

21. Landscaping plan describing the woody and herbaceous vegetative stabilization and management techniques to be used within and adjacent to the stormwater practice.
22. Stamp and signature of a 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 Stormwater Management Ordinance and these Regulations.
23. Any other information required by the Reviewing Agent.

APPENDIX C: EROSION AND SEDIMENT CONTROL PLAN CONTENTS

The Erosion and Sediment Control Plan shall be consistent with requirements in the Construction General Permit, where applicable, and shall include, at a minimum:

1. A general location map (e.g., USGS quadrangle map, a portion of a city or county map, or other map) with enough detail to identify the location of the construction site and waters of the United States within one mile of the site.
2. A legible site map, showing the entire site, including at a minimum:
 - a. Existing and proposed grading plans;
 - b. Areas of soil disturbance;
 - c. Locations and details of all structural and nonstructural erosion and sediment control measures and Best Management Practices ;
 - d. Locations where stabilization practices are expected to occur;
 - e. Locations for storage of materials, waste, vehicles, equipment, soil, snow and other potential pollutants;
 - f. Locations of bodies of water, including wetlands;
 - g. Locations where stormwater discharges to a surface water (include all roads, drains and other structures that could carry stormwater to a wetland or other water body, on- or off-site);
 - h. Locations of any stormwater discharge associated with industrial activity;
 - i. Locations of construction vehicle wash-out; and
 - j. Locations of any proposed dewatering facilities.
 - k. Notes indicating that demolition debris, discarded building materials, concrete truck wash out, chemicals, litter, and sanitary wastes may not be discharged to the MS4 and must be legally disposed of.
3. Description of the following in narrative, calculations or drawings, as appropriate:
 - a. Estimates of the total area expected to be disturbed by excavation, grading, or other construction activities, including dedicated off-site borrow and fill areas;
 - b. Estimates of the total area of impervious surface, both new and existing, to be retained on site;
 - c. All pollution control measures (structural and non-structural Best Management Practices) that will be implemented as part of the construction activity to control

- pollutants in storm water discharges. Appropriate control measures must be identified for each major construction activity and the operator responsible for the implementation of each control measure must also be identified.
- d. The intended sequence and timing of activities that disturb soils at the site and the general sequence during the construction process in which the erosion and sediment control measures will be implemented;
 - e. Structural practices to divert flows from exposed soils, retain/detain flows or otherwise limit runoff and the discharge of pollutants from exposed areas of the site. Placement of structural practices in floodplains must be avoided to the degree practicable;
 - f. Interim and permanent stabilization practices for the site, including a schedule of when the practices will be implemented. Site plans should ensure that existing vegetation is preserved where possible and that disturbed portions of the site are stabilized. Use of impervious surfaces for stabilization should be avoided;
 - g. Construction and waste materials expected to be stored on-site with updates as appropriate, including descriptions of controls, and storage practices to minimize exposure of the materials to stormwater, and spill prevention and response practices;
 - h. Measures to minimize, to the extent practicable, off-site vehicle tracking of sediments onto paved surfaces and the generation of dust;
 - i. Measures to prevent the discharge of solid materials, including building materials, to waters of the United States, except as authorized by a permit issued under Section 404 of the CWA;
 - j. Pollutant sources from areas other than construction and a description of controls and measures that will be implemented at those sites to minimize pollutant discharges;
 - k. Proposed dewatering operations including proposed locations of discharge; and
 - l. A description of all necessary maintenance and inspection activities associated with the proposed erosion and sediment control measures.
4. An Operation and Maintenance Schedule for structural and non-structural measures, interim grading, and material stockpiling areas;
 5. Stamp and signature of a 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 Stormwater Management Ordinance and these Regulations.
 6. Any other information required by the Reviewing Agent.

APPENDIX D. LOW-IMPACT DEVELOPMENT PRACTICES

Low Impact Development (LID) strategies use careful site design and decentralized stormwater management based on natural hydrologic features to reduce the environmental footprint of new growth. This approach manages stormwater at the source to control the generation of stormwater, improve water quality, minimize the need for expensive pipe and complex stormwater BMP systems, and create more attractive developments. Cisterns and rain barrels can be used to harvest and store rainwater runoff from roofs, which can help reduce flooding and erosion caused by stormwater runoff; an added benefit is that the rainwater contains no salts or sediment, providing "soft" chemical-free water for garden or lawn irrigation, reducing water bills, and conserving municipal water supplies. The Massachusetts Stormwater Handbook contains additional information on specific LID alternatives.

Conservation Development

Like LID, Conservation Development tries to mitigate the effects of urbanization, but it places additional emphasis on protecting aquatic habitat and other natural resources. Conservation Development subdivisions are characterized by compact clustered lots surrounding a common open space. Conservation Development's goal is to disturb as little land area as possible while simultaneously allowing for the maximum number of residences permitted under zoning laws.

Prior to new construction, conservation developers evaluate natural topography, natural drainage patterns, soils and vegetation. They deploy stormwater best management practices to help prevent flooding and protect natural hydrology. By maintaining natural hydrological processes, Conservation Development creates conditions that slow, absorb, and filter stormwater runoff onsite.

Because future development threatens valuable natural features, Conservation Development provides specific provisions for long-term and permanent resource protection. Conservation easements, transfer of development rights, and other "in perpetuity" mechanisms ensure that protective measures are more than just temporary.

Better Site Design

The goals of Better Site Design are to reduce impervious cover, preserve natural lands, and capture stormwater onsite. To meet these goals, designers employ a variety of methods. To reduce impervious cover, they narrow streets and sidewalks, minimize cul-de-sacs, tighten parking spaces, and reduce the size of driveways and housing lots.

To reduce stormwater runoff, designers preserve natural lands, using them as buffer zones along streams, wetlands, and steep slopes. They employ landscaping techniques that flatten slopes and preserve native vegetation and clusters of trees. They create open channels and vegetated swales - to increase stormwater infiltration, helping to protect streams, lakes, and wetlands. Better Site Design is an integral component of Smart Growth management strategies, which emphasize the preservation of green space.