

Model Stormwater Standards, 2025 update

Prepared by the
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Rockingham Planning Commission
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POST CONSTRUCTION STORMWATER MANAGEMENT STANDARDS FOR SITE PLAN REVIEW REGULATIONS

ELEMENT A: Purpose and Goals

1. Purpose and Goals. The purpose of post-construction stormwater management standards is to provide reasonable guidance for the regulation of stormwater runoff to protect local natural resources from degradation and prevent adverse impacts to adjacent and downstream land, property, facilities, and infrastructure. These standards regulate discharges from stormwater and runoff from land development projects and other construction activities to control and minimize increases in stormwater runoff rates and volumes, soil erosion, stream channel erosion, and nonpoint source pollution associated with stormwater runoff.

The goal of these standards is to establish minimum stormwater management requirements and controls to protect and safeguard the general health, safety, and welfare of the public in the Town of { your jurisdiction }. This regulation seeks to meet that goal through the following objectives:

- a. Preserving the natural watershed functions of sites (or in instances of redevelopment seeking to restore natural watershed functions), through carefully designed development and stormwater management to minimize impacts to natural hydrology, groundwater recharge, and drainage patterns.
- b. Preventing increases in stormwater runoff, nonpoint source pollution, or the total volume of runoff that flows from any specific site during and following development so as not to exceed the pre-development hydrologic conditions, as allowable by site conditions.
- c. Protecting the quality of groundwater resources, surface water bodies, and wetlands.
- d. Ensuring to the maximum extent practicable (MEP) that development and redevelopment activities minimize erosion and sediment loss and preserve native soils and vegetation.
- e. Ensuring that stormwater control measures (SCMs) are appropriately managed, maintained, and monitored through the lifetime of the development.

ELEMENT B: Minimum Thresholds for Applicability

Insert the following Sections #1 and #2 for SITE PLAN REVIEW REGULATIONS:

1. The post-construction stormwater management standards apply to any development or redevelopment project that is subject to Site Plan Review and disturbs more than 5,000 square feet or more than 2,500 square feet within 100 feet of a surface water body.
2. The Planning Board may grant a waiver from these regulations upon appropriate demonstration by the applicant as to why these regulations should not apply.
3. The following activities are considered exempt from these regulations:
 - i. Agricultural and forestry practices located outside wetlands and surface water setbacks and/or buffers.
 - ii. Resurfacing and routine maintenance of roads and parking lots.
 - iii. Interior and exterior building renovation that does not exceed conditions in E.1.b.

Insert the following Sections #1 and #2 for SUBDIVISION REGULATIONS:

1. The Post-Construction Stormwater Management Standards apply to subdivisions that result in the creation of a private road or a road intended for adoption as a public road. All stormwater runoff generated from the proposed private or public roadway(s) and any other stormwater runoff contributing to the roadway stormwater management system(s) shall be managed and treated in full compliance with these standards.
2. For subdivisions comprising lots with frontage on existing private or public roadways, roadside drainage and any other stormwater runoff from the new lots discharging to the roadside drainage system must be managed for: stormwater runoff quantity/volume; and water quality treatment if stormwater is discharged to the municipality's drainage system subject to the EPA MS4 permit.

ELEMENT C: Stormwater Management for New Development

1. All new development sites shall meet the following standards for site design:
 - a. Stormwater management and erosion and sediment control practices shall be located outside any specified buffer zones unless otherwise approved by the Planning Board. Alternatives to stream and wetland crossings that eliminate or minimize environmental impacts shall be considered whenever possible.
 - b. Low Impact Development (LID) site planning and design strategies shall be used to reduce stormwater runoff volumes, protect water quality, and maintain predevelopment site hydrology. Low Impact Development (LID) techniques that preserve existing vegetation, reduce the development footprint, minimize or disconnect impervious area, and use enhanced stormwater SCMs (such as raingardens, bioretention systems, tree box filters, and similar stormwater management landscaping techniques) shall be incorporated into landscaped areas. Capture and reuse of stormwater is strongly encouraged. If LID strategies are not used to manage stormwater, the applicant must provide written documentation explaining why they weren't used.
 - c. Whenever practicable, native site vegetation shall be retained, protected, or supplemented. Any stripping of vegetation shall be done in a manner that minimizes soil erosion. All stormwater treatment areas shall be planted with native plantings appropriate for the site conditions: trees, grasses, shrubs and/or other native plants in sufficient numbers and density to prevent soil erosion and to achieve the water quality treatment requirements of this section.
 - e. Salt source control (through Green SnowPro) should be required. Snow storage areas should be designed to be 75 ft from any private wells, 200 ft from any community supply wells, and 400 ft from municipal wells. Snow storage areas should not be located near SCMs. Deicer storage areas shall be fully covered with permanent or semi-permanent measures, and loading/offloading areas shall be located and designed so as not to drain directly to receiving waters and maintained with good housekeeping measures in accordance with NH DES published guidance. Runoff from snow and deicer storage areas shall enter treatment areas before being discharged to receiving waters or allowed to infiltrate into the groundwater. See NH DES published guidance fact sheets on road salt and water quality, and snow disposal at <https://www.des.nh.gov/land/roads/road-salt-reduction>.
2. All new development sites shall meet the following standards for water quality:
 - a. The site shall be designed to meet the Watershed Protection Standard (WPS) to the Maximum Extent Practicable (MEP) as specified in the latest New Hampshire Stormwater Manual. That is, with infiltration and filtration SCMs (Tier 1 SCMs) such that there is no expected increase in nutrient discharge. This is equivalent to sizing SCMs with a Design Storage Volume (DSV)

- that provides onsite retention of the first 1-inch of rainfall based on hydrologic soil group (HSG). The University of New Hampshire's Stormwater Center (UNSHC) has developed a tool to standardize the sizing of SCMs for retention, which is accessible at <https://scholars.unh.edu/stormwater/114/>. If the WPS cannot be met due to site constraints, the applicant must document in writing why this is impracticable. Failing the WPS, runoff from impervious surfaces shall be treated to achieve at least 90% removal of Total Suspended Solids, and at least 60% removal of total nitrogen and total phosphorus using appropriate treatment measures, as specified in the New Hampshire Stormwater Manual as amended.
- b. Where practical, the use of natural, vegetated filtration and/or infiltration practices or subsurface gravel wetlands for water quality treatment is preferred, given its relatively high nitrogen removal efficiency. All new impervious areas draining to surface waters impaired by nitrogen, phosphorus, or nutrients shall be treated with stormwater SCMs designed to optimize pollutant removal efficiencies based on design standards and performance data published by the UNH Stormwater Center and/or included in the latest version of the New Hampshire Stormwater Manual.
 - c. Measures shall be taken to control the post-development peak runoff rate so that it does not exceed the pre-development runoff rate for the 10-year and 50-year 24-hour storms for all discharges leaving the site. Drainage analyses shall include calculations comparing pre- and post-development stormwater runoff rates (cubic feet/second) and volumes (cubic feet) for the 1-inch rainstorm and the 2-year, 10-year, 25-year, and 50-year 24-hour storm events. Similar measures shall be taken to control the post-development runoff volume to infiltrate the groundwater recharge volume (GR_v) in accordance with the latest NH DES requirements. For sites where infiltration is limited or not practicable, the applicant must demonstrate that the project will not create or contribute to water quality impairment. For sites in the 100-year floodplain, supporting documentation should demonstrate that there is no impact to properties as a result of development.
 - d. The design of stormwater drainage systems shall provide for the disposal of stormwater without flooding or functional impairment to streets, adjacent properties, downstream properties, soils, or vegetation and shall also account for existing site hydrology, including flows originating offsite.

ELEMENT D: Submission Requirements for Stormwater Management Report and Plans.

- a. All applications shall include a comprehensive Stormwater Management Plan (SMP). The SMP shall include a narrative description and an Existing Conditions Site Plan showing all pre-development impervious surfaces, buildings and structures; surface water bodies and wetlands; drainage patterns, sub-catchment and watershed boundaries; building setbacks and buffers, locations of various hydrologic group soil types, mature vegetation, land topographic contours with minimum 2-foot intervals and spot grades where necessary for sites that are flat.
- b. The SMP shall include a narrative description and a Proposed Conditions Site Plan showing all post-development proposed impervious surfaces, buildings and structures; temporary and permanent stormwater management elements and SCMs, including SCM GIS coordinates and GIS files; important hydrologic features created or preserved the site; drainage patterns, sub-catchment and watershed boundaries; building setbacks and buffers; proposed tree clearing and topographic contours with minimum 2-foot intervals. The plans shall provide calculations and identification of the total area of disturbance proposed on the site (and off-site if applicable) and total area of new impervious surface created. A summary of the drainage analysis showing a

comparison of the estimated peak flow and volumes for various design storms (see Table 1. Stormwater Infrastructure Design Criteria) at each outlet location shall be included.

- c. The SMP shall describe the general approach and strategies implemented, and the facts relied upon, to meet the goals of Element A and Element C. The SMP shall include design plans and/or graphical sketches of all proposed above-ground LID practices.
- d. The SMP shall include calculations of the change in impervious area, pollution loading and removal volumes for each SCM, retention, and groundwater recharge, as well as GIS files containing the coordinates of all stormwater infrastructure elements (e.g. catch basins, swales, detention/bioretention areas, piping).
- e. The SMP shall include a description and a proposed Site Plan showing proposed erosion and sediment control measures, limits of disturbance, temporary and permanent soil stabilization measures in accordance with the NH Stormwater Handbook (most recent version) as well as a construction site inspection plan including phased installation of best management practices and final inspection upon completion of construction.
- f. The SMP shall include a long-term SCM inspection and maintenance plan (see Element F) that describes the responsible parties and contact information for the qualified individuals who will perform future SCM inspections. The inspection frequency, maintenance and reporting protocols shall be included.
- g. The SMP shall describe and identify locations of any proposed deicing chemical and/or snow storage areas. SMP will describe how deicing chemical use will be minimized or used most efficiently.
- h. In urbanized areas that are subject to the EPA MS4 Stormwater Permit and will drain to chloride-impaired waters, any new developments and redevelopment projects shall submit a description of measures that will be used to minimize salt usage.

2. General Performance Criteria for Stormwater Management Plans.

- a. All applications shall apply site design practices to reduce the generation of stormwater in the post-developed condition, reduce overall impervious surface coverage, seek opportunities to capture, infiltrate, reuse and minimize and discharge of stormwater to the municipal stormwater management system.
- b. Water Quality Protection.
 - i. No stormwater runoff generated from new development or redevelopment shall be discharged directly into a jurisdictional wetland or surface water body without adequate treatment.
 - ii. All developments shall provide adequate management of stormwater runoff and prevent discharge of stormwater runoff from creating or contributing to water quality impairment.
- c. Groundwater resources shall be protected by minimizing the loss of groundwater recharge from development. Sites that meet the WPS for water quality shall be assumed to have met groundwater recharge requirements. Sites that fail to meet the WPS shall provide for infiltration of the Groundwater Recharge Volume (GRV) as detailed in Table 1 below unless this is contraindicated due to site conditions that constrain the use of infiltration such as contaminated soils or inappropriate soil conditions, as detailed in the New Hampshire Stormwater Manual.
- d. Stormwater system design, performance standards, and protection criteria shall be provided as prescribed in Table 1 below. Calculations shall include sizing all structures and SCMs, including

emergency overflow structures, based on assessment of the 100-year 24-hour frequency storm discharge rate.

- e. The sizing and design of stormwater management practices shall utilize new precipitation data from the Northeast Region Climate Center (NRCC) or the most recent precipitation atlas published by the National Oceanic and Atmospheric Administration (NOAA) for the sizing and design of all stormwater management practices. See the NRCC website at <http://precip.eas.cornell.edu/>.
- f. All stormwater management practices involving bioretention and vegetative cover as a key functional component must have a landscaping plan detailing both the type and quantities of plants and vegetation to be used in the practice and how and who will manage and maintain this vegetation. The use of native plantings appropriate for site conditions is strongly encouraged for these types of stormwater treatment areas. The landscape plan must be prepared by a licensed landscape architect, soil conservation district office, or another qualified professional.

3. Spill Prevention, Control and Countermeasure (SPCC) Plan.

Any existing or otherwise permitted use or activity having regulated substances in amounts greater than five gallons, shall submit to the local official such as Fire Chief, Emergency Response Official a SPCC plan for review and approval. The Plan will include the following elements:

- a. Disclosure statements describing the types, quantities, and storage locations of all regulated substances that will be part of the proposed use or activity.
- b. Owner and spill response manager's contact information.
- c. Location of all surface waters and drainage patterns.
- d. A narrative describing the spill prevention practices to be employed when normally using regulated substances.
- e. Containment controls, both structural and non-structural.
- f. Spill reporting procedures, including a list of municipal personnel or agencies that will be contacted to assist in containing the spill, and the amount of a spill requiring outside assistance and response.
- g. Name of a contractor available to assist in spill response, contaminant, and cleanup.
- h. The list of available clean-up equipment with instructions available for use on-site and the names of employees with adequate training to implement containment and clean up response.

ELEMENT E: Stormwater Management for Redevelopment

1. Redevelopment (as applicable to this stormwater regulation) means:

- a. Any construction, alteration, or improvement that disturbs existing impervious area (including demolition and removal of road/parking lot materials down to the erodible subbase) or expands existing impervious cover by any amount, where the existing land use is commercial, industrial, institutional, governmental, recreational, or multifamily residential.
- b. Any redevelopment activity that results in improvements with no increase in impervious area shall be considered redevelopment activity under this regulation if the capital cost of improvements is greater than 30% of the appraised property value.
- c. Any new impervious area over portions of a site that are currently pervious.

The following activities are not considered redevelopment:

- Interior and exterior building renovation that do not exceed conditions in E.1.b.
 - Resurfacing of an existing paved surface (e.g. parking lot, walkway or roadway).
 - Pavement excavation and patching that is incidental to the primary project purpose, such as replacement of a collapsed storm drain.
 - Landscaping installation and maintenance.
2. Redevelopment applications shall comply with the requirements of Sections D.2 Submission Requirements for Stormwater Management Report and Plans, D.3 General Performance Criteria for Stormwater Management Plans, and D.4 Spill Prevention, Control and Countermeasure (SPCC) Plan.
 3. For sites meeting the definition of a redevelopment project and having less than 60% existing impervious surface coverage, the stormwater management requirements will be the same as other new development projects. The applicant must satisfactorily demonstrate that impervious area is minimized, and LID practices have been implemented on-site to the maximum extent practicable.
 4. For sites meeting the definition of a redevelopment project and having more than 60% existing impervious surface area, stormwater shall be managed for water quality in accordance with one or more of the following techniques, listed in order of preference:
 - a. Implement measures onsite that result in disconnection or treatment of 100% of the additional proposed impervious surface area and at least 30% of the existing impervious area and pavement areas, preferably using filtration and/or infiltration practices.
 - b. If resulting in greater overall water quality improvement on the site, implement LID practices to the maximum extent practicable to provide treatment of runoff generated from at least 60% of the entire developed site area.
 5. Runoff from impervious surfaces shall be treated to achieve at least 90% removal of Total Suspended Solids, at least 60% removal of total phosphorus and 50% removal of total nitrogen via appropriate treatment measures, as specified in the New Hampshire Stormwater Manual, as amended or other equivalent means. All new impervious area draining to surface waters impaired by nitrogen, phosphorus or nutrients shall be treated with stormwater SCM's designed to optimize pollutant removal efficiencies based on design standards and performance data published by the UNH Stormwater Center and/or included in the latest version of the New Hampshire Stormwater Manual. Treatment meeting the WPS shall be assumed to have met these pollutant removal requirements.

Option to Allow for Off-Site Mitigation:

1. In cases where the applicant demonstrates, to the satisfaction of the planning board, that on-site treatment has been implemented to the maximum extent possible or is not feasible, off-site mitigation will be an acceptable alternative if implemented within the same USGS HUC12 as the development site.
2. Off-site mitigation shall be equivalent to no less than the total area of impervious cover NOT treated on-site. Treatment of the impervious area shall comply with all standards of this regulation.
3. An approved off-site location must be identified, the specific management measures identified, and if not owned by the applicant, with a written agreement with the property owner(s) and an implementation and maintenance schedule developed in accordance with planning board review. The applicant must also demonstrate that there is no downstream drainage or flooding impacts that would result from not providing on-site management for large storm events.

ELEMENT F: Stormwater Management Plan and Site Inspections

1. The applicant shall provide that all stormwater management and treatment practices have an inspection and maintenance plan in place and agreement to ensure the system will continue to function as designed. This agreement will include all maintenance easements required to access and inspect the stormwater treatment practices, and to perform routine maintenance as necessary to ensure proper functioning of the stormwater system. The operations and maintenance plan shall specify the parties responsible for the proper maintenance of all stormwater treatment practices. The operations and maintenance shall be provided to the Planning Board as part of the application prior to issuance of any local permits for land disturbance and construction activities.
2. The applicant shall provide legally binding documents for filing with the registry of deeds which demonstrate that the obligation for maintenance of stormwater best management practices and infrastructure runs with the land and that the Town has legal access to inspect the property to ensure their proper function or maintain onsite stormwater infrastructure when necessary to address emergency situations or conditions.
3. The property owner shall bear responsibility for the installation, construction, inspection, and maintenance of all stormwater management and erosion control measures required by the provisions of these regulations and as approved by the Planning Board, including emergency repairs completed by the town.

ELEMENT G: Stormwater Management Plan Recordation

1. Stormwater management and sediment and erosion control plans shall be incorporated as part of any approved site plan. A Notice of Decision acknowledging the Planning Board approval of these plans shall be recorded at the Registry of Deeds. The Notice of Decision shall be referenced to the property deed (title/book/page number) and apply to all persons that may acquire any property subject to the approved stormwater management and sediment control plans. The Notice of Decision shall reference the requirements for maintenance pursuant to the stormwater management and erosion and sediment control plans as approved by the Planning Board.
2. The applicant shall submit as-built drawings of the constructed stormwater management system following construction.
3. Easements: Where a development is traversed by or requires the construction of a watercourse or a drainage way, an easement to the Town of adequate size to enable construction, reconstruction and required maintenance shall be provided for such purpose. Easements to the Town shall also be provided for the purpose of periodic inspection of drainage facilities and SCMs should such inspections by the Town become necessary. All easements shall be recorded at the County Registry of Deeds. Where stormwater management or treatment facilities are constructed outside of public rights of way, a permanent easement to the town shall be recorded to allow construction, maintenance or inspection of the facility, as well as flowage rights.

ELEMENT H: Inspection and Maintenance Responsibility

1. Municipal staff or their designated agent shall be granted site access to complete routine inspections to ensure compliance with the approved stormwater management and sediment and erosion control plans. Such inspections shall be performed at a time agreed upon with the landowner.

- a. If permission to inspect is denied by the landowner, municipal staff or their designated agent shall secure an administrative inspection warrant from the district or superior court. Expenses associated with inspections shall be the responsibility of the applicant/property owner.
 - b. If violations or non-compliance with a condition(s) of approval are found on the site during routine inspections, the inspector shall provide a report to the Planning Board documenting these violations or non-compliance including recommend corrective actions. The Planning Board may notify the property owner in writing of these violations or non-compliance and corrective actions necessary to bring the property into full compliance. The Planning Board, at their discretion, may recommend to the Board of Selectmen to issue a stop work order if corrective actions are not completed within 10 days.
 - c. If corrective actions are not completed within the designated period of the Board notification, the Planning Board may exercise their jurisdiction to revoke approval.
2. The applicant shall bear final responsibility for the installation, construction, inspection, and disposition of all stormwater management and erosion control measures required by the Planning Board. Site development shall not begin before the Stormwater Management Plan receives written approval by the Planning Board.
3. The municipality retains the right, though accepts no responsibility, to repair or maintain stormwater infrastructure if: a property is abandoned or becomes vacant; and in the event a property owner refuses to repair infrastructure that is damaged or is not functioning properly.
4. Landowners subject to an approved Stormwater Management Plan shall be responsible for submitting an annual report to the Planning Board or other designated responsible municipal entity by September 1 each year by a qualified professional that all stormwater management and erosion control measures are functioning per the approved stormwater management plan. The annual report shall note if any stormwater infrastructure has needed any repairs and the results of those repairs and also routine maintenance activities performed. If the stormwater infrastructure is not functioning per the approved stormwater management plan the landowner shall report on the malfunction in their annual report and include detail regarding when the infrastructure shall be repaired and functioning as approved.

If no report is filed by September 1, municipal staff or their designated agent shall be granted site access to complete routine inspections to ensure compliance with the approved stormwater management and sediment and erosion control plans. Such inspections shall be performed at a time agreed upon with the landowner.

For reference:

Table 1. Stormwater Infrastructure Design Criteria

Design Criteria	Description
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Water Quality Volume (WQV)	$WQV = (P)(R_v)(A)$ $P = 1$ inch of rainfall R_v = unitless runoff coefficient, $R_v = 0.05 + 0.9(I)$ I = percent impervious cover draining to the structure converted to decimal form A = total site area draining to the structure
Water Quality Flow (WQF)	$WQF = (q_u)(WQV)$ WQV = water quality volume calculated as noted above q_u = unit peak discharge from TR-55 exhibits 4-II and 4-III Variables needed for exhibits 4-II and 4-III: I_a = the initial abstraction = 0.2S S = potential maximum retention in inches = $(1000/CN) - 10$ CN = water quality depth curve number $= 1000 / (10 + 5P + 10Q - 10[Q^2 + 1.25(Q)(P)]^{0.5})$ P = 1 inch of rainfall Q = the water quality depth in inches = WQV/A A = total area draining to the design structure
Groundwater Recharge Volume (GRV)	$GRV = (A_i)(R_d)$ A_i = the total area of effective impervious surfaces that will exist on the site after development R_d = the groundwater recharge depth based on the USDA/NRCS hydrologic soil group, as follows: Hydrologic Group R_d (inches) A 0.40 B 0.25 C 0.10 D 0.00
Channel Protection Volume (CPV)	If the 2-year, 24-hour post-development storm volume <u>does not increase</u> due to development then: control the 2-year, 24-hour post-development peak flow rate to the 2-year, 24-hour predevelopment level. If the 2-year, 24-hour post-development storm volume <u>does increase</u> due to development then: control the 2-year, 24-hour post-development peak flow rate to ½ of the 2-year, 24-hour pre-development level or to the 1-year, 24-hour pre-development level.
Peak Control	Post-development peak discharge rates shall not exceed pre-development peak discharge rates for the 10-year and 50-year, 24-hour storms
EIC and UDC	$\%EIC$ = area of effective impervious cover/total drainage areas within a project area x 100 $\%UDC$ = area of undisturbed cover/total drainage area within a project area x 100

[After: NH DES Stormwater Manual: Volume2 Post-Construction Best Management Practices Selection & Design (December 2008)]

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