



Falmouth Conservation Commission
59 Town Hall Square
Falmouth, MA 02540

TO:

Understanding the Falmouth Wetland Bylaw Stormwater Control Regulations: Guidance for Developers



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Why is stormwater regulated by the Town of Falmouth Wetland Regulations?

Like the Massachusetts Wetlands Protection Act regulations, the Falmouth Wetlands Regulations (FWR) have sections requiring the management and treatment of stormwater. The goals of the stormwater management regulations are the same as the bylaw as a whole: to protect public and private water supplies, groundwater quality, fisheries, shellfish, wildlife habitat, to prevent and manage pollution, flooding, erosion and sediment runoff, and storm damage, and to preserve agriculture, aesthetics, recreation, and aquaculture values. More specifically, the stormwater regulations minimize or prevent impacts to the above resources, or impacts on abutting properties from changes in stormwater *volume, quality, or rate*.

Do these regulations affect all applicants to the Conservation Commission?

No. The regulations typically apply to larger development projects. Small projects, like the construction of a typical home and driveway are exempt from the stormwater regulations. The specific criteria for exemptions to the regulations are defined in FWR 2.05.

Why are the Falmouth Stormwater Regulations different from the State regulations?

Like the Falmouth Wetland Regulations (FWR) as a whole, the local stormwater regulations were designed to meet the needs and conditions in Falmouth. For example, most of Falmouth has fast draining sandy soils. The Falmouth stormwater regulations take advantage of these conditions and require large storage capacity of stormwater so that a maximum volume of stormwater can be treated through infiltration. Because of this focus on infiltration, the Falmouth regulations also require better pre-treatment than required under the state regulations. For example, the Falmouth regulations require the removal of 80% of the suspended solids before discharge to infiltration basins to ensure these infiltration structures will last many years without clogging.



A stormwater detention pond serving a Falmouth shopping area parking lot.

Because Falmouth has been plagued by increasing shellfish bed closures caused largely by untreated or inadequately treated stormwater, other more stringent requirements have been incorporated in the Falmouth regulations. For example, both the state and Falmouth regulations require treatment of the “first flush” of stormwater because this initial discharge contains the highest level of pollutants. However, the state regulations define first flush as the first inch of rainfall, whereas the Falmouth regulations define first flush as the first 1.25 inches. Other differences of the Town regulations from the state regulations are described in the sections below.

If Falmouth has its own stormwater regulations, do the state stormwater regulations still apply?

Yes. Conservation Commissions must specifically approve or deny a project under the state regulations, and approve or deny a project under local regulations. However, local regulations cannot weaken or conflict with state minimum requirements. The Falmouth regulations exceed or equal state regulations, so in a practical sense, if engineers develop stormwater designs that meet the Falmouth regulations, they will automatically comply with the state regulations.

If the Planning Board has already approved a stormwater design, why are these designs not automatically acceptable to Conservation Commission?

The Falmouth Wetland Regulations were developed to protect wetland resources, groundwater, and many

other values of interest to the residents of Falmouth. The Planning Board regulations do not include the same detailed performance standards or goals as those of the Conservation Commission. Moreover the Planning Board regulations address only stormwater rates, and do not have criteria for stormwater quality or volume. It is the responsibility of the applicant to develop stormwater designs that meet the most stringent set of regulations that may apply to a project.

What sections of the Falmouth Wetland Regulations describe stormwater management requirements?

The section titled “Stormwater Management”, FWR 10.16(3), spells out the overall requirements and goals for stormwater management under the Falmouth Wetland Regulations. The section directs the reader to FWR 2.00, “Stormwater Control Regulations,” which provides detailed guidance to engineers developing stormwater management plans.

What are the principal performance standards in the Falmouth Wetland Bylaw Stormwater Regulations?

The stormwater water quality treatment and design performance standards vary with the location of the discharge. For example, downstream flooding is an issue in streams, but not an issue if the discharge is to coastal waters or an isolated kettle hole. For new development, the volume performance standards will be the most challenging requirement. For retrofits, such as the reconstruction of a road, the first flush requirement will often be the most challenging requirement. The principal performance standards in the stormwater regulations (and how they are typically addressed) are summarized below.

1) The rate of discharge from the site after development from the 2, 5, 10, 25, and 100-year storm cannot exceed pre-existing conditions.

Typical Solution: Underground storage chambers or surface basins are installed with control structures to limit rate of discharge.

2) The total volume of post-development runoff shall not exceed the pre-development runoff volume for the 10-year, 24-hour design storm. The stormwater control system must store the volume difference between pre-existing and post construction conditions for a 10 year 24 hour storm (4.85 inches in Falmouth).

Typical Solution: All excess water volume must be infiltrated into the ground.

3) The first flush (defined as the first 1.25 inches on impervious) must be treated for water quality.

Typical Solution: Infiltration (with appropriate pre-treatment) of most of the stormwater, but may be accomplished in wet ponds in high groundwater areas.

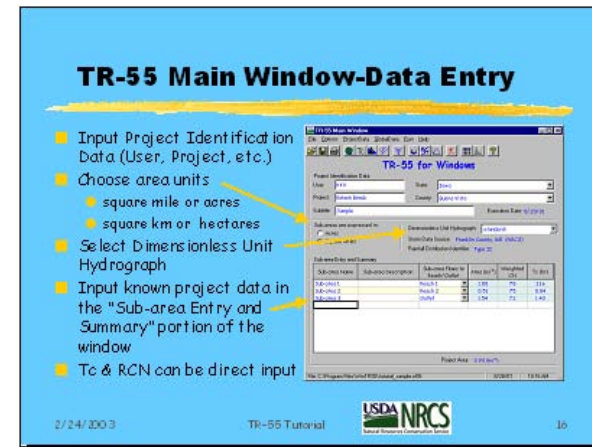
Important Guidance for Engineers

All the above calculations must be derived from the use of the TR-55 software program (available free at www.USDA.gov), or equivalent commercial software. The Falmouth regulations (like the state regulations), explicitly prohibit the use of “Rational Method” ($Q=CIA$) or its derivatives for calculating stormwater volumes for sizing treatment systems. The Rational Method (based on peak rainfall rates), is appropriate for sizing pipe diameter but not appropriate for calculating either storage capacity or rainfall volumes.

When designing stormwater controls, special consideration should be given to the fact that the Falmouth regulations do not allow a credit for infiltration when calculating storage volumes (the Rhode Island method). Thus, volume storage chambers or basins must be sized to account for the full volume of rain in the first flush, or the 10-year 24-hour stormwater volume increase from pre-existing conditions. The reason for this is that all infiltration basins eventually clog, or have greatly reduced infiltration capacity over many years, and this extra storage capacity will help prevent flooding, or the discharge of untreated stormwater in overflow pipes.

In contrast to the state regulations, the Falmouth Stormwater Regulations require removal of 80% of the total suspended solids (TSS) before discharge to infiltration devices. This requirement is to maximize the longevity of the infiltration structure without failure. Simple settling tanks do not provide the required TSS removal, and swirl separators are generally recommended.

Both explicitly, and by reference, the Falmouth stormwater regulations adopt the state of Rhode Island stormwater BMP design standards (the “Rhode Island Method”). The most important of these, besides the lack of credit for infiltration of stormwater in calculating volumes, are the setback requirements for infiltra-



Stormwater Plans must include summary calculations from TR-55 or comparable stormwater rate and volume software.

tion basins. These setbacks include a four-foot separation to groundwater from the base of the water quality infiltration structure (like a septic system leach field) for components designed to meet water quality requirements, a 100 foot separation to the nearest septic system for water quality structures (to prevent hydraulic failure of the septic system), and 100 foot separation to any public or private well.

Test pits must be excavated at the location of each stormwater water quality infiltration structure, and excavated to four feet below the base of the infiltration structure. The Health Agent must observe these test pits. Monitoring wells must be also installed to document water table levels and adjusted to estimate seasonal maximum groundwater elevations.

What the applicant must submit

If a project is not exempt from the stormwater section of the regulations, then the applicant must submit a Stormwater Management Plan including engineering designs showing all the information described in section FWR 2.04. Plans must include all required pre-development features, and show 1-foot contours: All pertinent post-development features must also be included. The Stormwater Management Plan must also include soil logs for BMPs, groundwater elevation data, calculation of the first flush (1.25”) pollution control, and stormwater volumes for pre and post development conditions for the 10-year storm and stormwater rates for the 2, 5, 10, 25, and 100-year 24-hour storm.

It is strongly recommended that the applicant include in their Stormwater Management Plan form 2.13, the applicant’s submission requirement checklist. The form will help the applicant and the Conservation Commission identify any omitted materials, and help avoid delays. The applicant must also submit form 2.15, the “Stormwater Management Summary Form” with pre- and post development conditions. For parcels with complex watersheds, a separate form 2.15 may be submitted for each subwatershed area on the parcel. The stormwater management plan should include summary reports from TR-55 or comparable software to facilitate design review. The regulations allow the Conservation Commission to charge a consultant fee to hire an engineer to review stormwater management plans.

Wetland permit forms and information are available at the Conservation Commission office, and are available online at the Town of Falmouth website, www.town.falmouth.ma.us. Click on the Conservation Commission link. When developing stormwater designs, engineers should consider low impact development (LID) strategies to minimize impervious surfaces, and to infiltrate stormwater before it is captured in stormwater conveyance systems.



The Conservation Commission staff will be happy to assist you.



This fact sheet was prepared by the Buzzards Bay Project National Estuary Program at the request of the Falmouth Conservation Commission. More information about Town of Falmouth regulations can be obtained at:

www.town.falmouth.ma.us and
www.buzzardsbay.org/falmouth.htm.

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