



Vermont Stormwater Program Overview

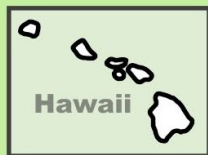
ACWA Stormwater Roundtable

October 19, 2022

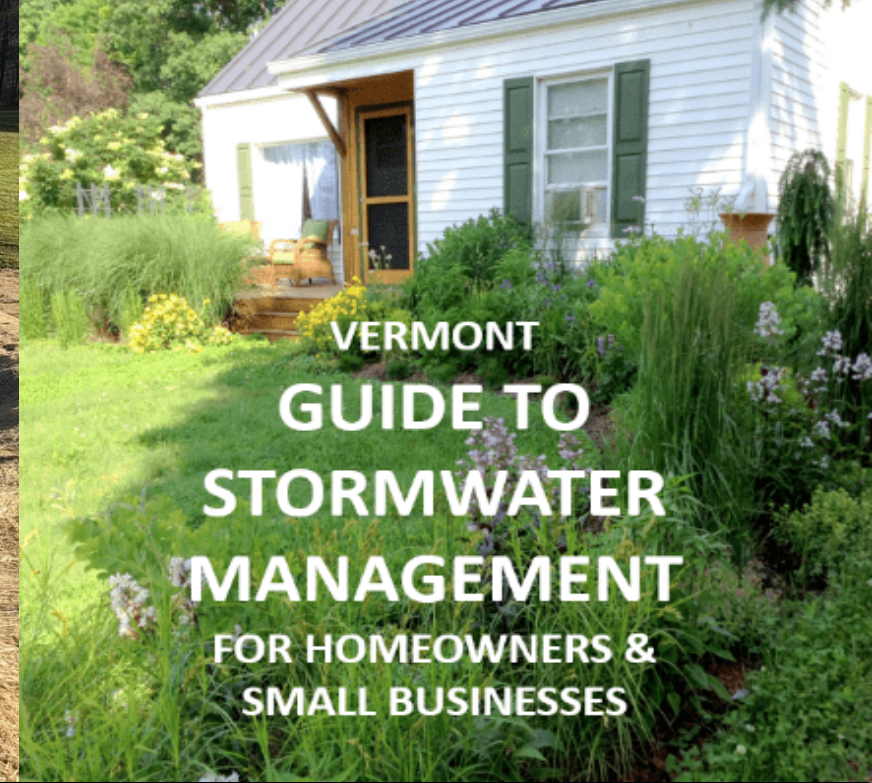
Boston MA

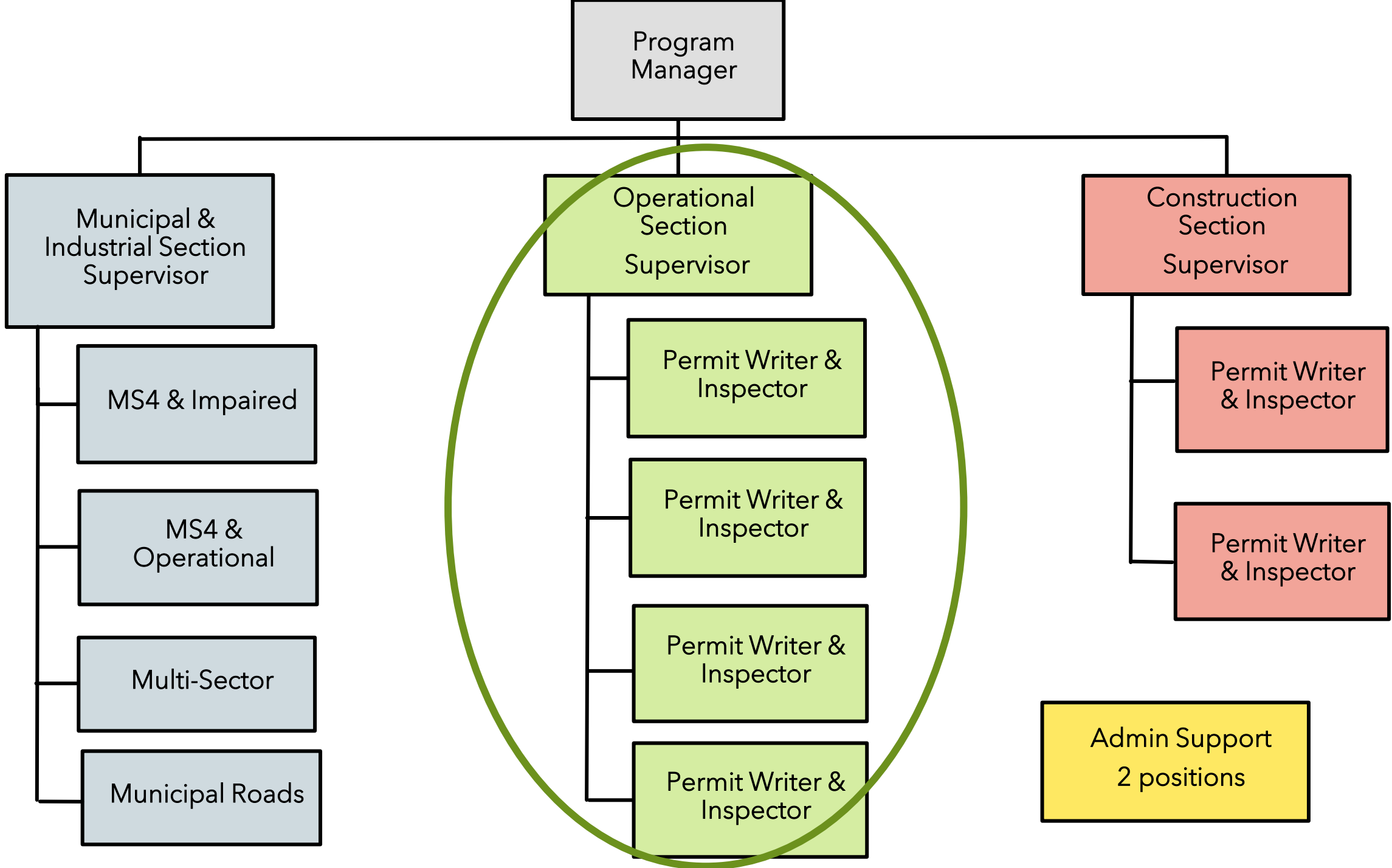
Chip Gianfagna

Stormwater Program Manager
VT Department of Environmental
Conservation









What is an Operational Permit?

- ▶ State Permit
- ▶ Post-construction runoff treatment and management
- ▶ Required for impervious surfaces than exceed threshold
- ▶ Vermont Stormwater Management Manual (VSMM)
- ▶ O&M
- ▶ Public Notice



The site plan illustrates the proposed new office building and its integration with the historic core. The new building, labeled "NEW OFFICE BUILDING", is a large, brown, multi-winged structure. The historic core, labeled "HISTORIC CORE", is a smaller, brown, multi-winged structure. The plan includes labels for various buildings, parking lots, and green spaces. Red lines and arrows indicate the proposed building footprint and its relationship to the historic core. The new building is a large, brown, multi-winged structure. The historic core is a smaller, brown, multi-winged structure. The plan also shows the front lawn, parking lots, and surrounding streets.

- ▶ ½-ac of New Impervious
- ▶ ½-ac of Redevelopment
- ▶ Expansions resulting in
 > 1-ac
- ▶ 3-ac sites
- ▶ Exemptions
 - ▶ Farms
 - ▶ Logging
 - ▶ Direct Discharges

New Development Vs Redevelopment

New Development

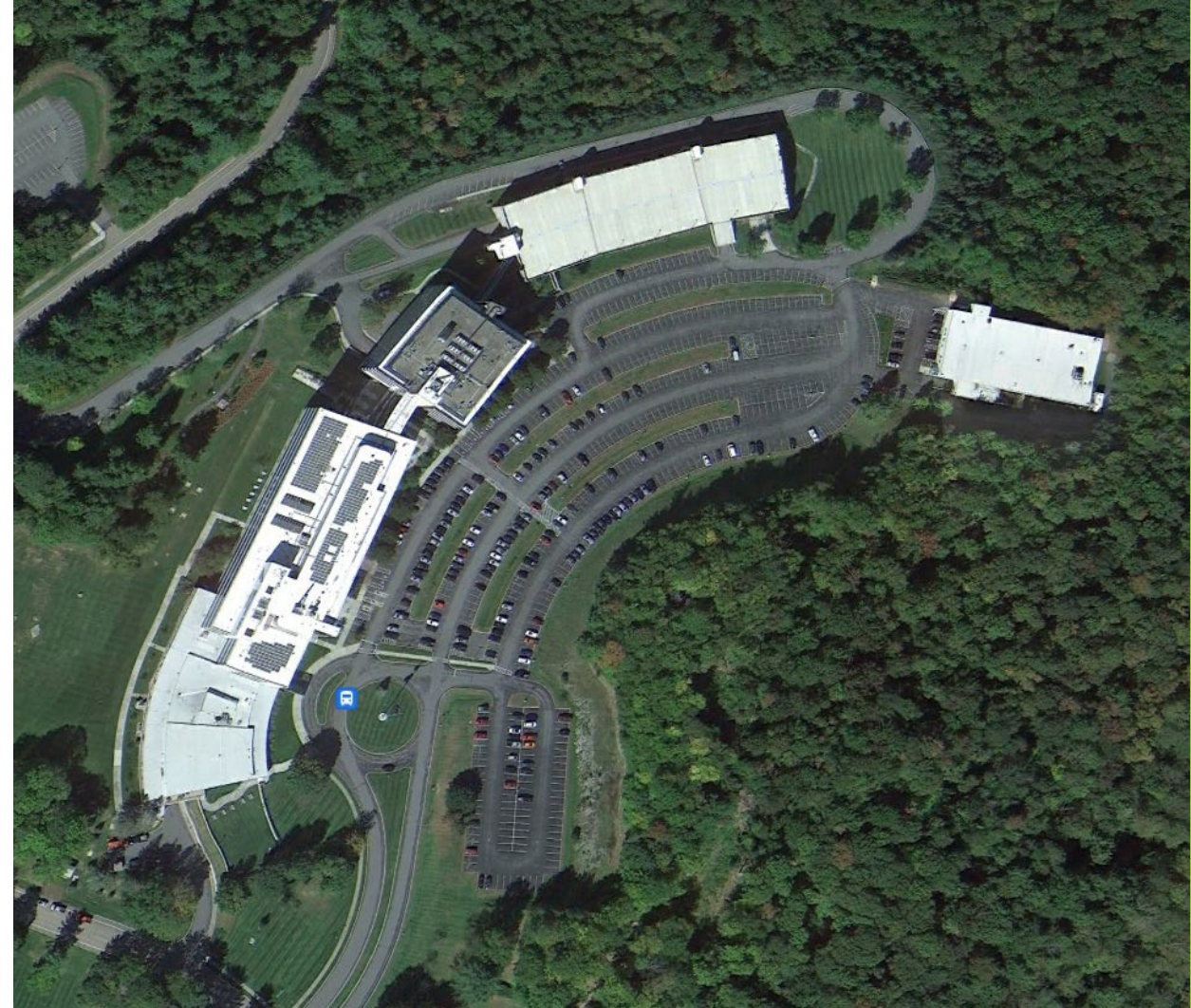
- ▶ New impervious surfaces/greenfield development
- ▶ Meet all applicable standards

Redevelopment

- ▶ Construction of an impervious surface where one already exists
 - ▶ Parking lot → Building
- ▶ Treat 50% WQv

Three-Acre Sites

- ▶ Retrofit sites
- ▶ Standards depend on receiving water status
- ▶ Engineering Feasibility Analysis
- ▶ 5 years to construct system once approved
- ▶ Champlain, Memphremagog, SW-impaired waters: 1/1/2023
- ▶ Rest of the State: 10/1/2033



Application Materials Needed for a Permit



Notice of
Intent



Narrative



Modeling



Worksheets



Plans



Engineering
Feasibility
Analysis
(3-ac)

Vermont Stormwater Management Manual (VSMM)

Treatment Standards:

1. Water Quality Treatment Standard
2. Groundwater Recharge Treatment Standard
3. Channel Protection Treatment Standard (1-yr)
4. Overbank Flood Protection Treatment Standard (10-yr)
5. Extreme Flood Protection Treatment Standard (100-yr)
6. Post-Construction Soil Depth and Quality Standard

Water Quality Treatment Standard

- ▶ Capture and treat water quality volume (WQv)
 - ▶ First inch of rainfall
- ▶ Remove at least 80% of TSS and 50% of TP
- ▶ Use highest performing practice feasible



Tier 1 Practices¹

Infiltration Basins, Trenches, Chambers

Bioretention (designed for infiltration)

Dry Swales (designed for infiltration)

Filtering Systems (designed for infiltration)

Simple Disconnection

Disconnection to Filter Strips and Vegetated Buffers

¹ These STPs generally exceed 80% TP removal and generally achieve 98% TSS removal, and the T_v credit equivalent to volume infiltrated. (USEPA BMP Performance Curves, National Stormwater Database, International Stormwater Database)

Tier 2 Practices²

Bioretention (not designed for infiltration)

Gravel Wetlands

² These STPs generally meet 60-80% TP removal and generally achieve 80-97% TSS removal, and the T_v credit equivalent to volume stored below the sump/underdrain. (USEPA BMP Performance Curves, National Stormwater Database, International Stormwater Database)

STP Selection Matrix

Project Name: _____

Version 5/8/2017

Discharge Point: _____

Step 1: Is the Water Quality Treatment Standard entirely managed with one or more of the following Tier 1 practices?

Infiltration Basins/ Trenches/ Chambers	Simple Disconnection
Drywells	Disconnection to Filter Strips and Vegetated Buffers
Bioretention (designed to infiltrate)	Dry Swales (designed to infiltrate)
Filters (designed to infiltrate)	Permeable Pavement ¹
Reforestation ¹	

☐ Yes ☒ No

Proceed to Step 2

¹ These practices do not require specific justification due to feasibility limitations

Step 2: Assess the feasibility of using Tier 1 Practices

Complete the matrix below in its entirety for each drainage area.

Tier 1 Practices are available to meet the Water Quality Treatment Standard. If using one of these practices, stop here. If additional site constraints exist other than those listed here, proceed to Step 3.		Infiltration Basin/ Trench/ Chamber	Drywell	Bioretention (infiltrating)	Simple Disconnection	Disconnection to Filter Strips or Vegetated Buffer	Dry Swales (infiltrating)	Filters (infiltrating)
Practice Availability for Water Quality Treatment:		Not Feasible	Not Feasible	Not Feasible	Yes	Yes	Not Feasible	Not Feasible
Feasibility Restriction	Response	Practice Availability Based on Restrictions						
Do underlying soils have an infiltration rate of less than 0.2 inches per hour, as confirmed by field geotechnical tests or are classified as Hydrologic Soil Group D according to the NRCS	<input checked="" type="radio"/> Yes <input type="radio"/> No	Not Feasible	Not Feasible	Not Feasible	n/a	n/a	Not Feasible	Not Feasible
Will runoff to the practice include discharge from a hotspot landuse or activity?	<input type="radio"/> Yes <input checked="" type="radio"/> No	Available	Available	Available	Available	Available	Available	Available
Is the site a brownfield or contaminated site where infiltration is restricted or where infiltration would increase the threat of pollution migration, as confirmed in writing by the Department's Waste Management and Prevention Division?	<input type="radio"/> Yes <input checked="" type="radio"/> No	Available	Available	Available	Available	Available	Available	Available
Is the slope of the vegetated buffer greater than 15%	<input type="radio"/> Yes <input checked="" type="radio"/> No	n/a	n/a	n/a	Available	Available	n/a	n/a

Tier 3 Practices³

Dry Swales (not designed for infiltration)

Filtering Systems (not designed for infiltration)

Wet Ponds

Shallow Surface Wetlands

³ These STPs generally meet 50-60% TP removal and achieve 80% TSS removal, and the T_v credit is equivalent to volume stored below the sump/underdrain, if applicable. (USEPA BMP Performance Curves, National Stormwater Database, International Stormwater Database)

Step 3: Other feasibility constraints for remaining Tier 1 and Tier 2 practices

If, following completion of Step 2 of the STP Selection Tool, there are no Tier 1 practices available for use on the project site, Tier 2 practices shall be utilized for treatment of the Water Quality Treatment Standard.

Is the Water Quality Treatment Standard entirely managed with Tier 2 Practices? ☐ Yes ☒ No

Provide site specific justification below. Tier 3 Practices may be used to meet the Water Quality Treatment Standard.

If the use of a Tier 1 or Tier 2 Practice is infeasible for reasons beyond those listed in Step 2 of the STP Selection Matrix, a designer may submit site specific detailed justification and certification that such practices are not feasible. Only after evaluation of the STP Selection Matrix and certification that Tier 1 and Tier 2 Practices are infeasible shall a designer consider Tier 3 Practices for meeting the Water Quality Treatment Standard (WQTS) on the project site.

Provide justification here or list attachments

Groundwater Recharge Standard

- ▶ Maintain existing water table elevations
- ▶ Infiltrate a specified volume or disconnect a specified area
 - ▶ Dependent on soil type (HSG)



Channel Protection Standard

- ▶ Protect channels from degradation by the 1-yr storm
 - ▶ Hydrologic Condition Method
 - ▶ Extended Detention Method



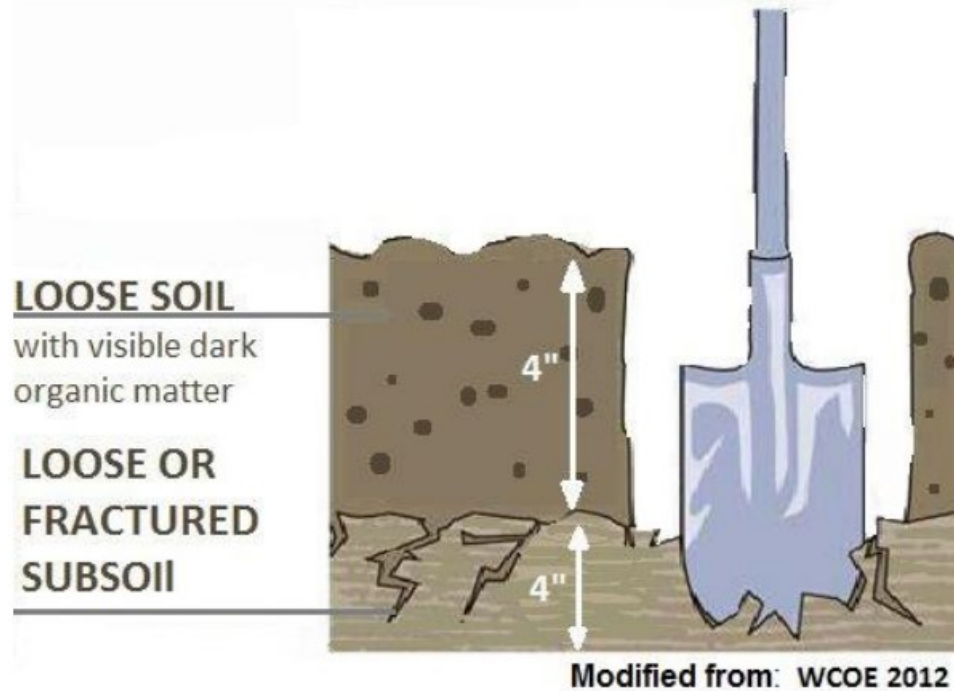
Overbank and Extreme Flood Protection Standards

- Prevent flooding from the 10-yr and 100-yr rain events

$$Q_{p10_{\text{post}}} \leq Q_{p10_{\text{pre}}}$$
$$Q_{p100_{\text{post}}} \leq Q_{p100_{\text{pre}}}$$

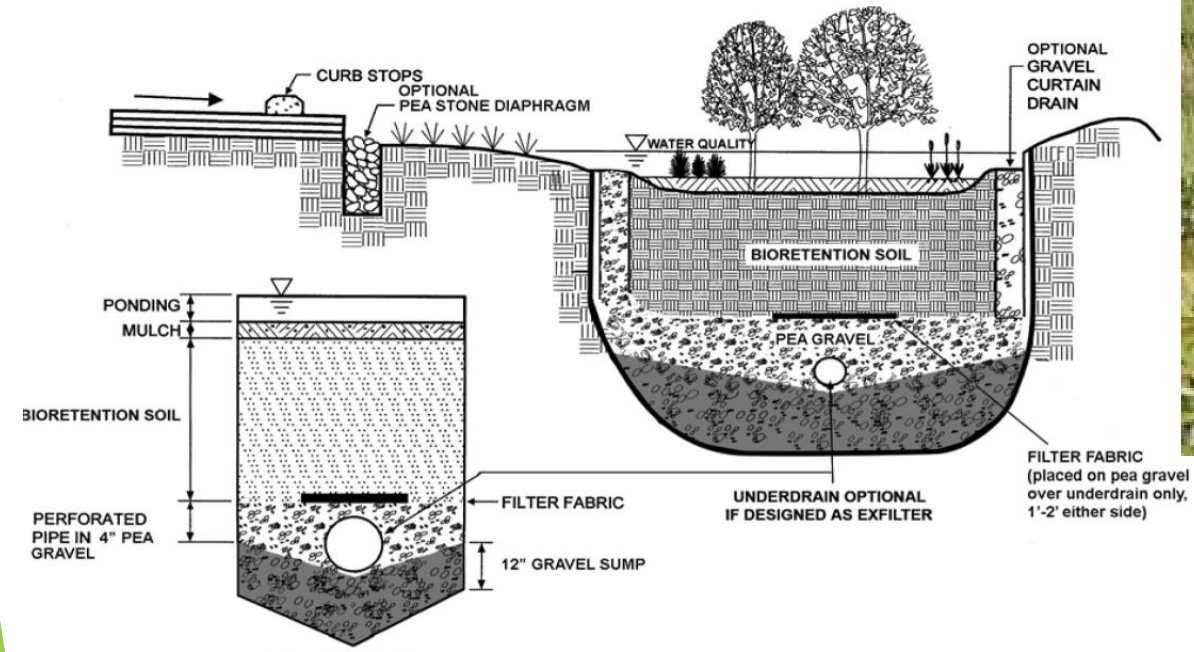
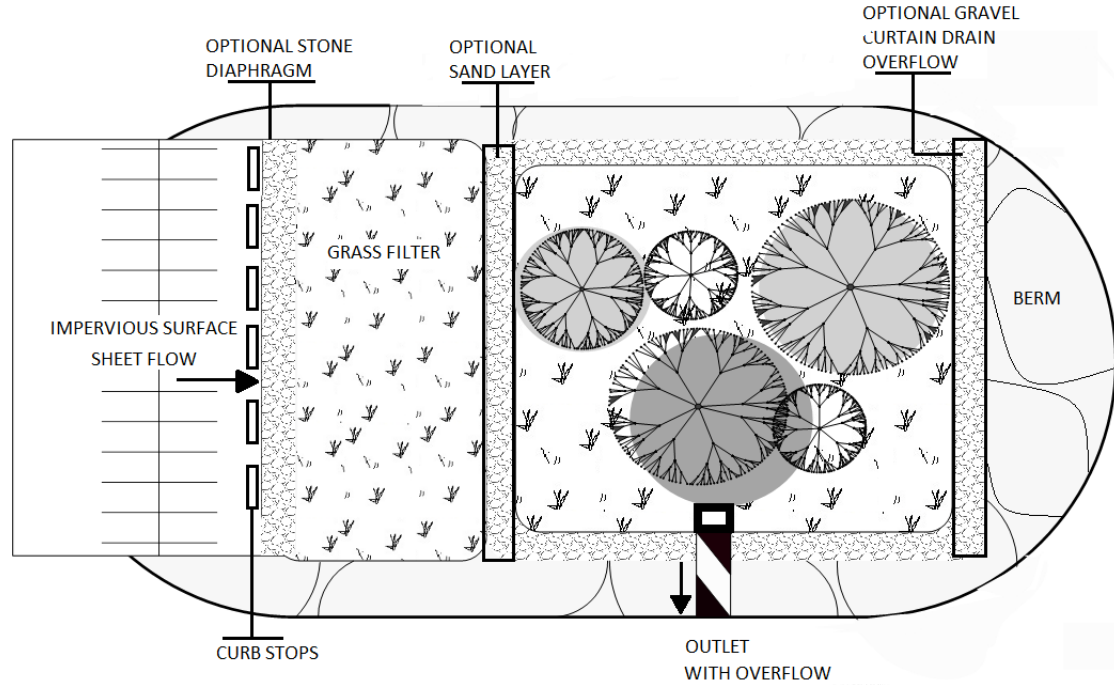


Post-Construction Soil Depth and Quality

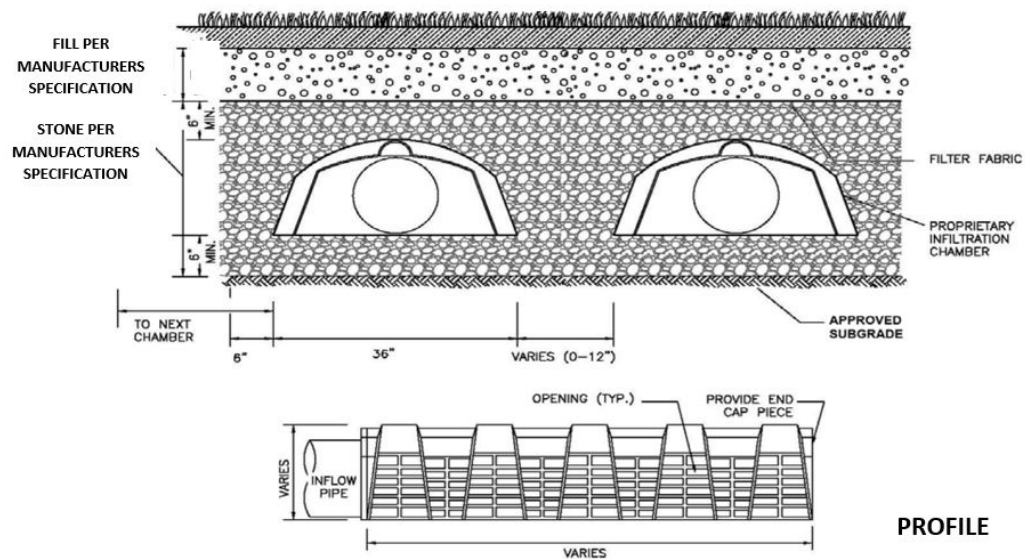
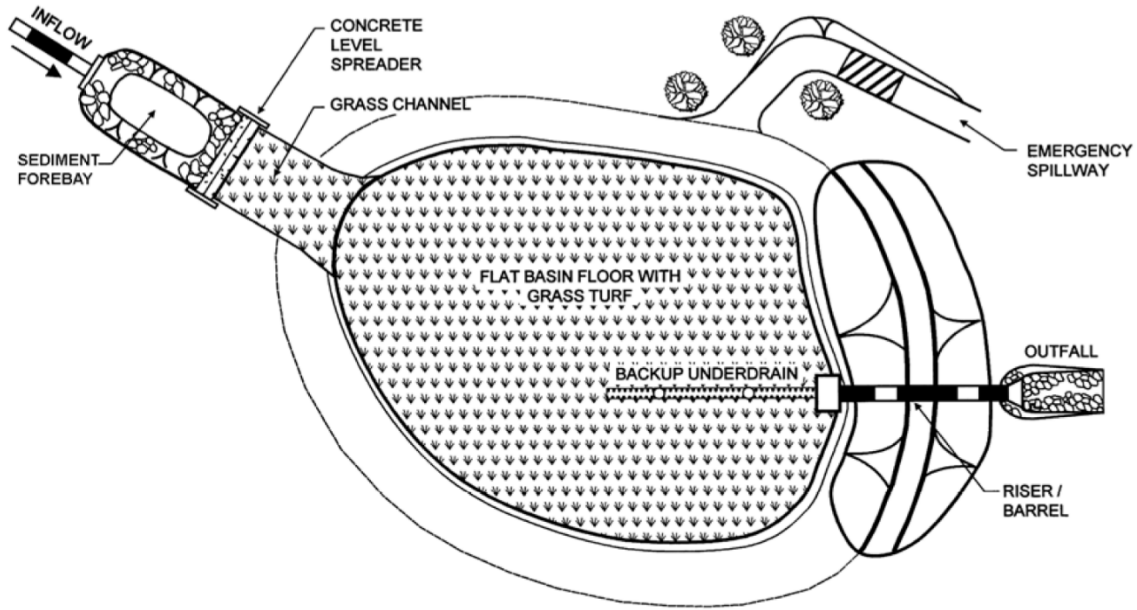


- ▶ 4" Topsoil
- ▶ 4" Scarified Subsoil
- ▶ 4% Organic Matter
- ▶ Exemptions
 - ▶ Steep Slopes
 - ▶ Impervious Surfaces
 - ▶ Treatment Practices
 - ▶ Structural Fill

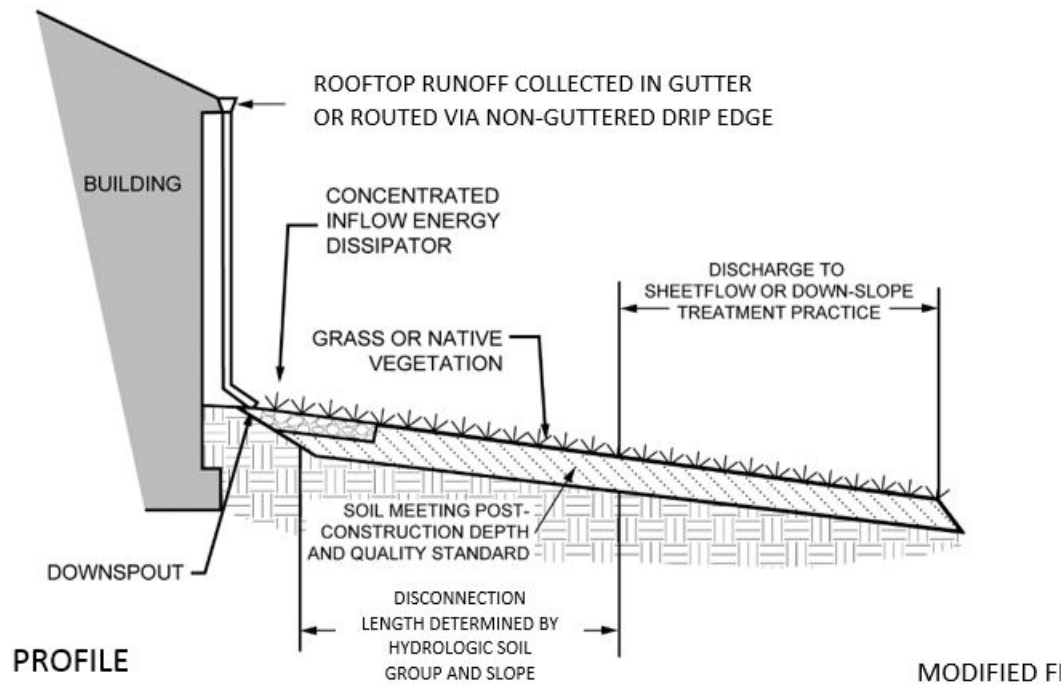
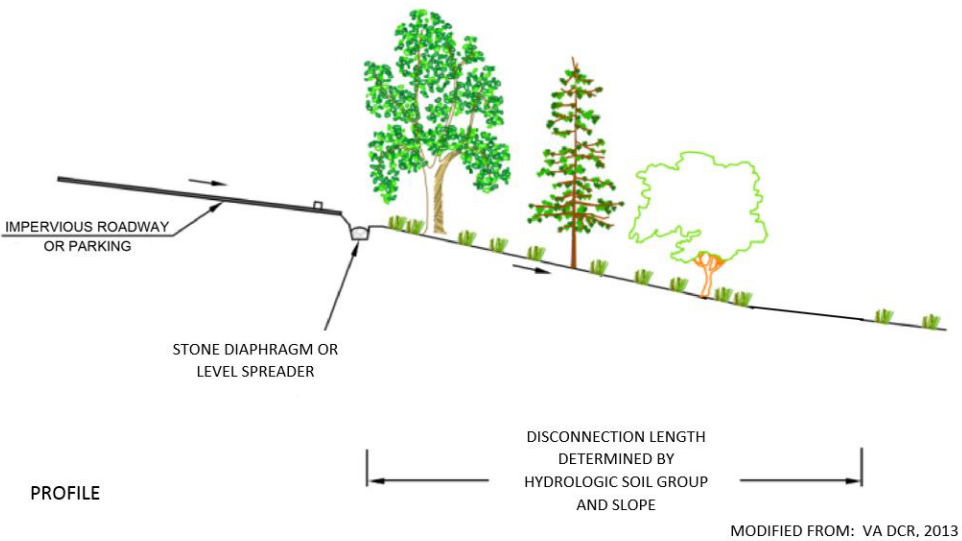
Bioretention - Tier 1



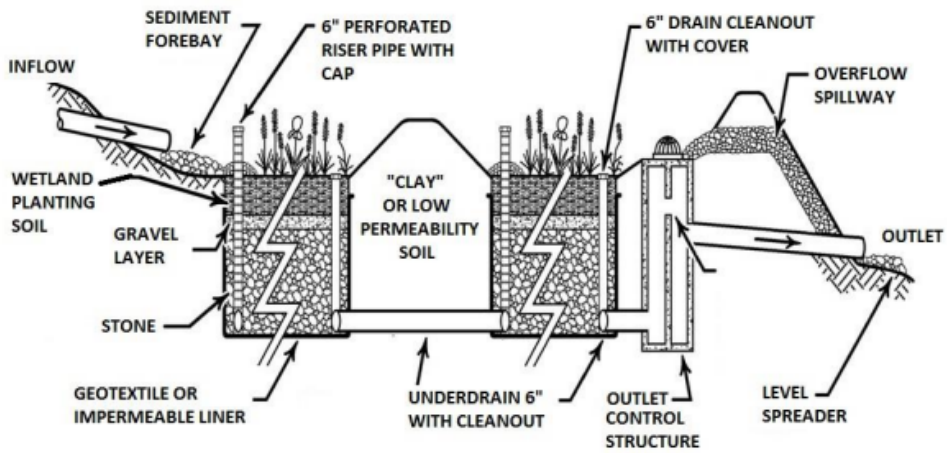
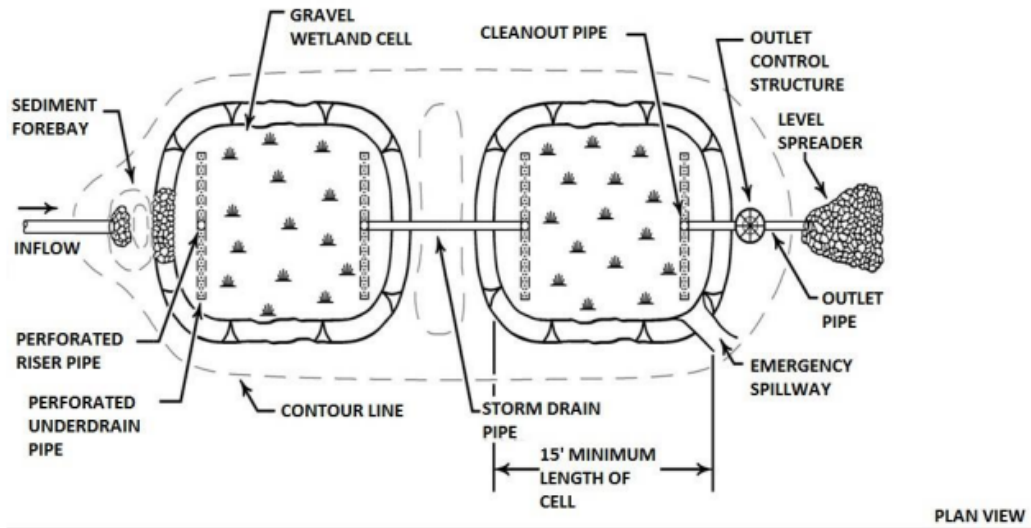
Infiltration Basin - Tier 1



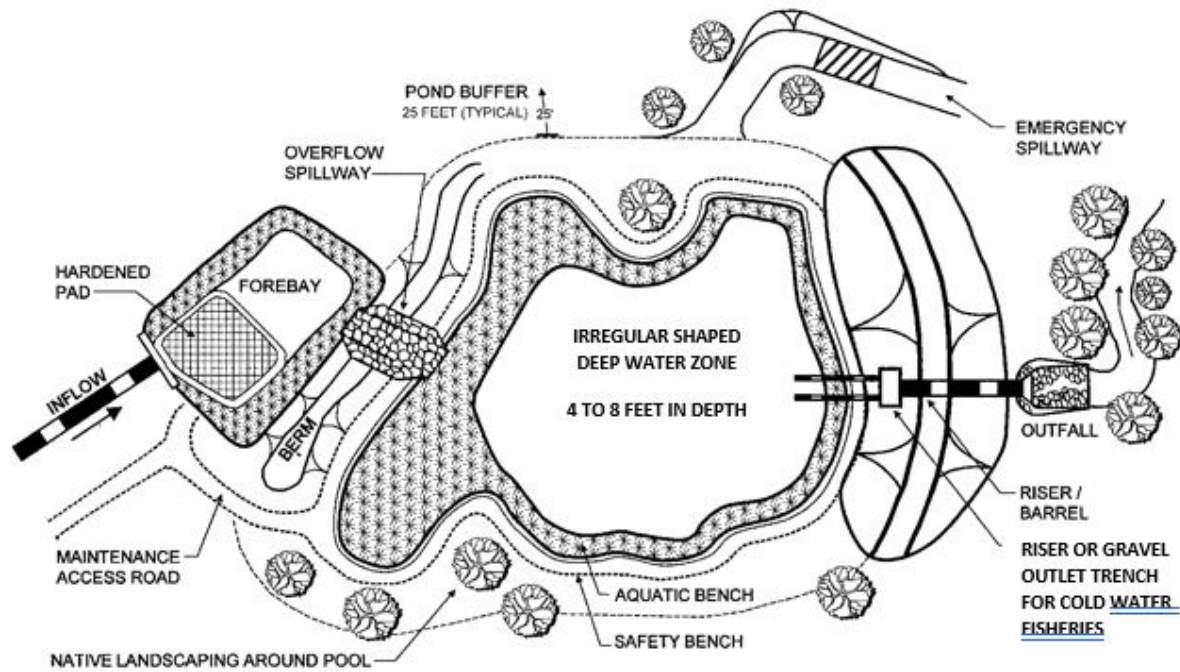
Disconnection - Tier 1



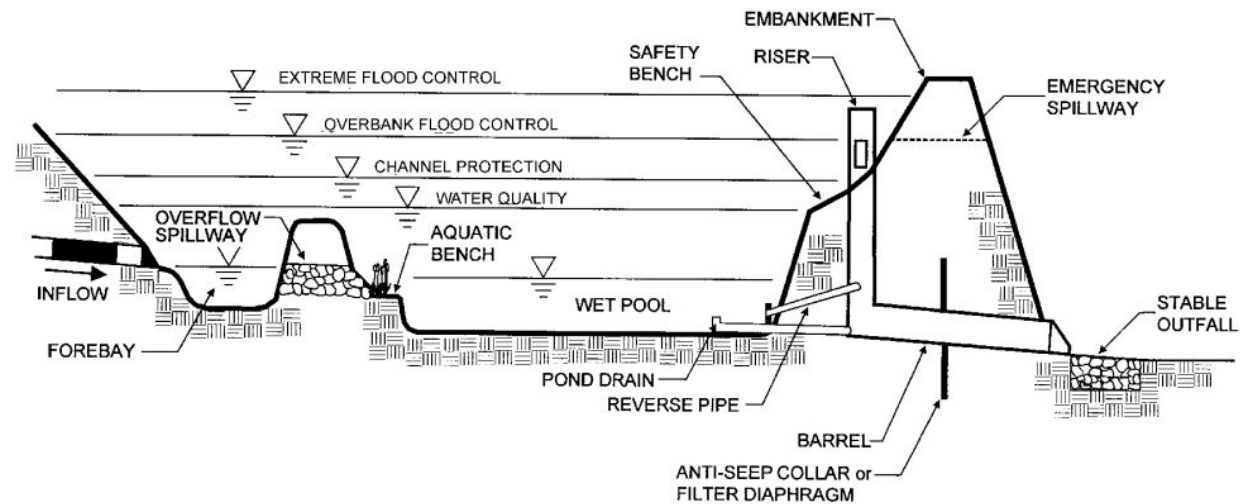
Gravel Wetland - Tier 2



Wet Ponds - Tier 3



PLAN VIEW



You Have Your Permit, Now What?

- ▶ Post Issuance Requirements for Permittees
 - ▶ Initial Statement of Compliance
 - ▶ Annual Inspections
 - ▶ Operating Fees
 - ▶ Restatement of Compliance
 - ▶ Maintenance, Maintenance, Maintenance

