MAINE STORMWATER MANAGEMENT DESIGN MANUAL

Technical Design Manual
Volume III

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MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION
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MAINE STORMWATER MANAGEMENT MANUAL

VOLUME III – Technical Design Manual

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This manual was produced by the Maine Department of Environmental Protection (DEP). This May 2016 edition supersedes these manuals:

- Stormwater Management for Maine: Best Management Practices, November 1995, and
- Stormwater Management for Maine, January 2006

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DISCLAIMER:

This manual is intended to be a guidance document for the design and implementation of sound technical stormwater management systems and to assist developers and the regulated community in complying with existing state laws and regulations. The information outlined in this guidance manual supplement the requirements stated in the Maine Department of Environmental Protection Stormwater Management Rules, Chapter 500 and cannot overrule regulatory requirements.

The Department reserves the right and discretion to vary from this guidance and approve, on a case-by-case basis, other systems or designs that are warranted by site conditions or are based on new techniques or procedures if the proposed system or design meets the requirements of Chapter 500 for pollutant removal, cooling, channel protection or flood control.

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Chapter 1 - Introduction

Maine's stormwater Best Management Practices (BMPs) are focused on meeting four major water quality objectives:

- **Effective pollutant removal:** BMPs must effectively remove the fine particles that carry much of the nutrient and heavy metal load, as well as dissolved pollutants, and hydrocarbons.
- **Cooling:** BMPs discharging within a river, stream, or brook watershed must effectively cool down (22°C or cooler) stormwater runoff before its discharge to protect aquatic life. This may also be accomplished through measures that avoid heating the stormwater.
- **Channel protection:** BMPs discharging within a river, stream, or brook watershed must slowly release the discharge to avoid the destabilization and resulting sedimentation of receiving stream channels. This can also be accomplished through site planning and operation that minimizes the volume and rate of discharge of stormwater by minimizing impervious area, maximizing infiltration and evapotranspiration, and maximizing time of concentration of storm flows.
- **Flood control:** Traditional flood control detention for large, infrequent storms will be necessary for some large sites to avoid the flooding of downstream infrastructure.

NOTE:
The traditional stormwater management systems that have been applied to developments in the past are either inadequate or may actually be causing problems in the resources to which they drain. Maine's stormwater management program is now built around ensuring that stormwater management systems for new developments should always provide pollutant removal. More information on this philosophy can be found in Volume I of this manual.

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DEP recommends four types of BMPs that will provide effective pollutant removal, cooling and channel protection; and, some may also provide flood control benefits without the need for a pond structure. The BMPs covered in this manual are outlined below.

BMPs to Meet Water Quality Objectives: These four BMPs are recommended to meet the BMP standards for discharges to river, stream and brook watersheds and can also be used to meet phosphorus standards for lakes. Water quality BMPs are discussed in the following chapters of this Volume III:

- Chapter 4: Wet Ponds
- Chapter 5: Buffers
- Chapter 6: Infiltration BMPs
- Chapter 7: Filtration BMPs

BMPs to Control Flooding: These BMPs can be used to control peak flows from a development. Peak control BMPs are discussed in Chapter 3, Detention Basins for Flooding Control.

Conveyance and Distribution BMPs: These BMPs (vegetated swales, flow splitters, level spreaders, or others) can be used to convey and control flows entering one of the four water quality BMPs. Conveyance and distribution BMPs are discussed in Chapter 8, Conveyance and Distribution Systems.

Separator BMPs: Separator BMPs (water quality inlets, oil/grit and oil/water separators or proprietary systems) are primarily used as pretreatment devices to remove sediment, oil and grease from runoff before it is discharged into one of the four water quality BMPs. Separator BMPs are discussed in Chapter 9, Separator BMPs.

Low Impact Development (LID) BMPs: LID can be used to minimize the impacts of development and minimize the need for structural BMPs. It is important to limit the size of an area draining to a LID BMP and to treat runoff at its source. LID BMPs are discussed in Chapter 10, LID Practices and Techniques.

Operation and Maintenance: Operation and maintenance is crucial to the performance of any BMP. This needs to be incorporated into the design of any water quality BMP to be most effective. Operation and maintenance criteria are discussed in Chapter 11, Operation and Maintenance.

The following table summarizes the applicability of each BMP. Alternative stormwater management systems to the four proposed by DEP may be used if they will provide equivalent pollutant removal, cooling and channel protection. DEP also strongly encourages the incorporation of low impact development site planning concepts within any development.

BEST MANAGEMENT PRACTICE SELECTION MATRIX

BMP Type	Best Management Practice	Drainage Area (acres)			Soil Hydrologic Group				Depth to High Water Table or Bedrock		Applicability					Design Restrictions and Setbacks (feet)				
		0-5	5-10	>10	A	B	C	D	<3 ft	>3ft	Flooding	WQ	Pretreatment	Conveyance	Distribution	Drinking Water Wells	Property Lines	Natural Resources	Building Setbacks	Slopes (>3:1)
Detention Basin	Detention Basin	●		●	●	●	●	●	●	●	●					100	25	75	20	50
Wet Pond	Wetpond			●		●	●	●	●	●	●	●				300	25	75	20	50
Buffers	Buffer with Level Spreader	●			●	●	●	●	●	●	●	●								
	Downhill of Road	●			●	●	●	●	●	●	●	●								
	Ditch Turnout	●			●	●	●	●	●	●	●	●								
	Adjacent to Large Impervious Area	●			●	●	●	●	●	●	●	●								
	Adjacent to Residential	●			●	●	●	●	●	●	●	●								
Infiltration	Drywell	●			●	●	●			●		●				300	25	75	10	
	Infiltration Trench	●	●		●	●	●			●		●				300	25	75	20	
	Infiltration Basin		●	●	●	●	●			●	●	●				300	25	75	20	
Filtration	Vegetated Soil Filter		●		●	●	●	●	●	●		●				100	25	75	20	25
	Bioretention Cell	●			●	●	●	●	●	●		●				100	25	75	20	25
	Subsurface Sand Filter				●	●	●	●	●	●						100	25	75	20	
Conveyance and Distribution	Vegetated Swales				●	●	●	●	●	●			●	●	●					
	Flow Splitter	●	●	●	●	●	●	●	●	●				●	●					
	Level Spreader	●			●	●	●	●	●	●				●	●					
Separator BMPs	Water Quality Inlet	●			●	●	●	●	●	●			●	●	●					
	Oil/Grit or Oil/Water Separator	●			●	●	●	●	●	●			●	●	●					
	Proprietary Systems	●			●	●	●	●	●	●			●	●	●					
LID	LID	●	●	●	●	●	●	●	●	●		●		●	●					