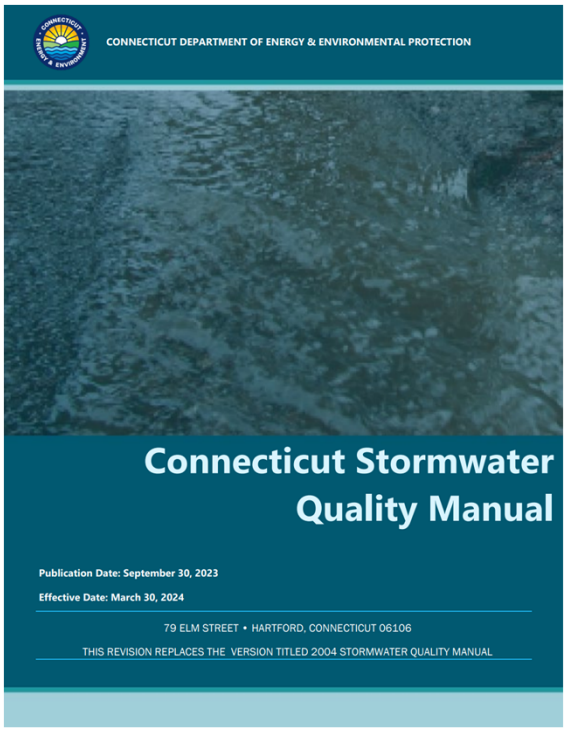
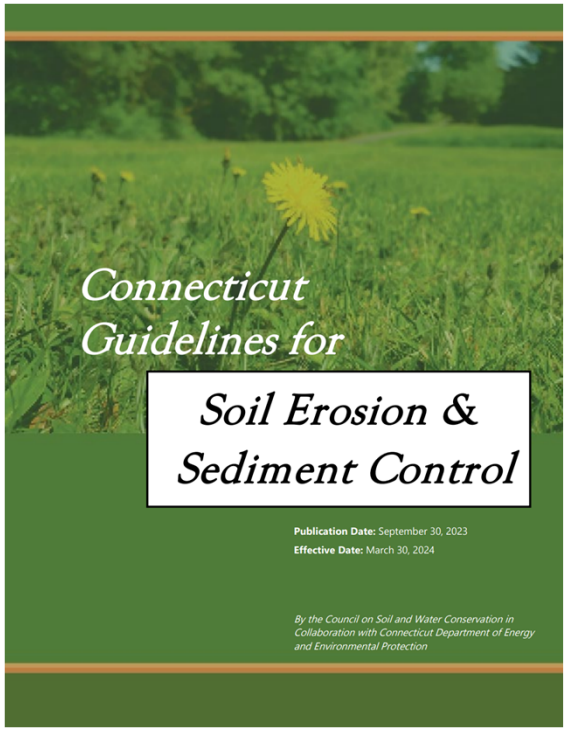




Connecticut's New Stormwater Manuals

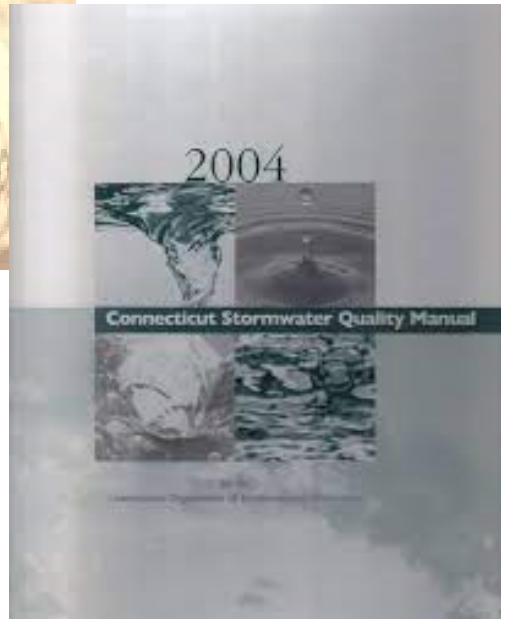
CAFM 2023 Annual Conference - November 1, 2023

Erik Mas, P.E., Fuss & O'Neill

FUSS & O'NEILL

Why Update the Manuals?

2002 Connecticut Guidelines for Soil Erosion and Sediment Control



2004 Connecticut Stormwater Quality Manual

- Evolution in understanding of stormwater management and erosion and sediment control
- Changes in federal & state regulations

Objectives

- Update technical information
- Improve consistency between both manuals
- Improve consistency with CT DEEP stormwater general permits
- Incorporate climate resiliency considerations
- Enhance usability

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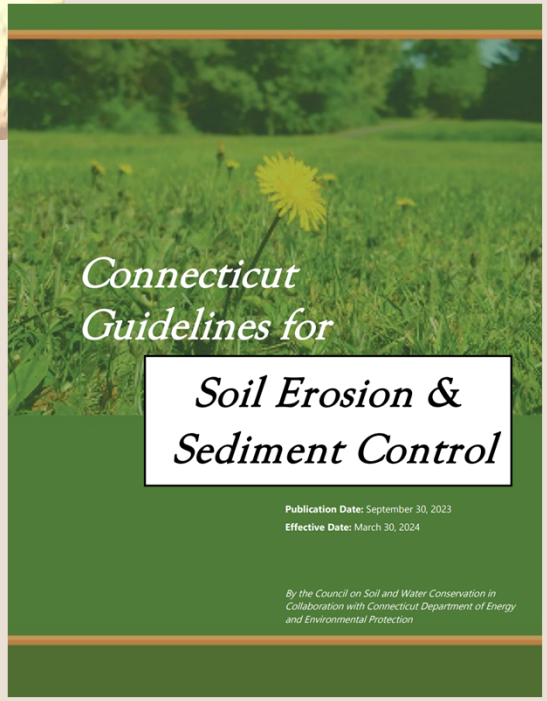
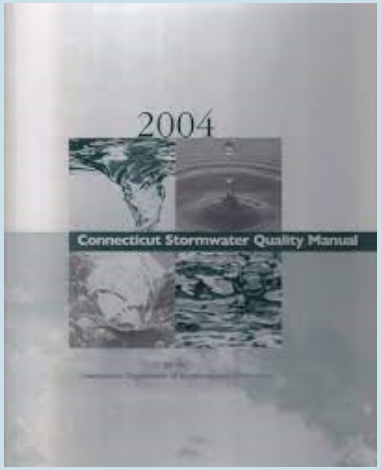
History of the Manuals

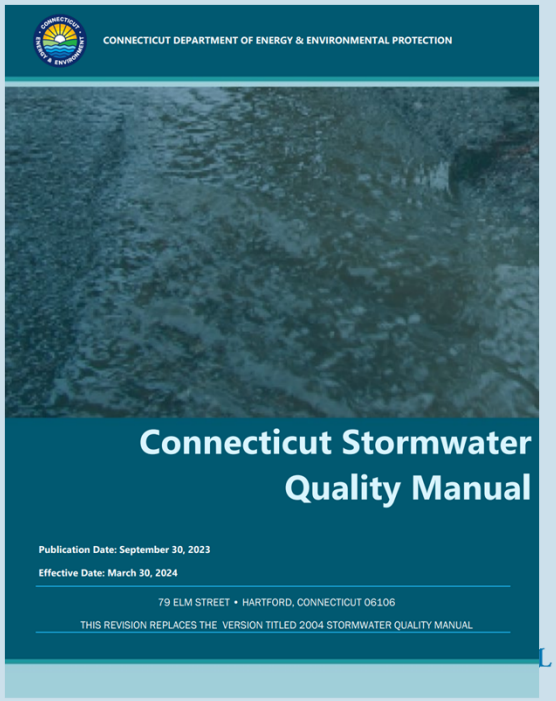
- 2002 Guidelines
- 2023 Draft Revision



- Public Comment Period ended March 1
- Release Date: September 30, 2023
- Effective Date: March 2024



- 2004 Manual
- 2011 Low Impact Development (LID) Appendix
- 2023 Draft Revision

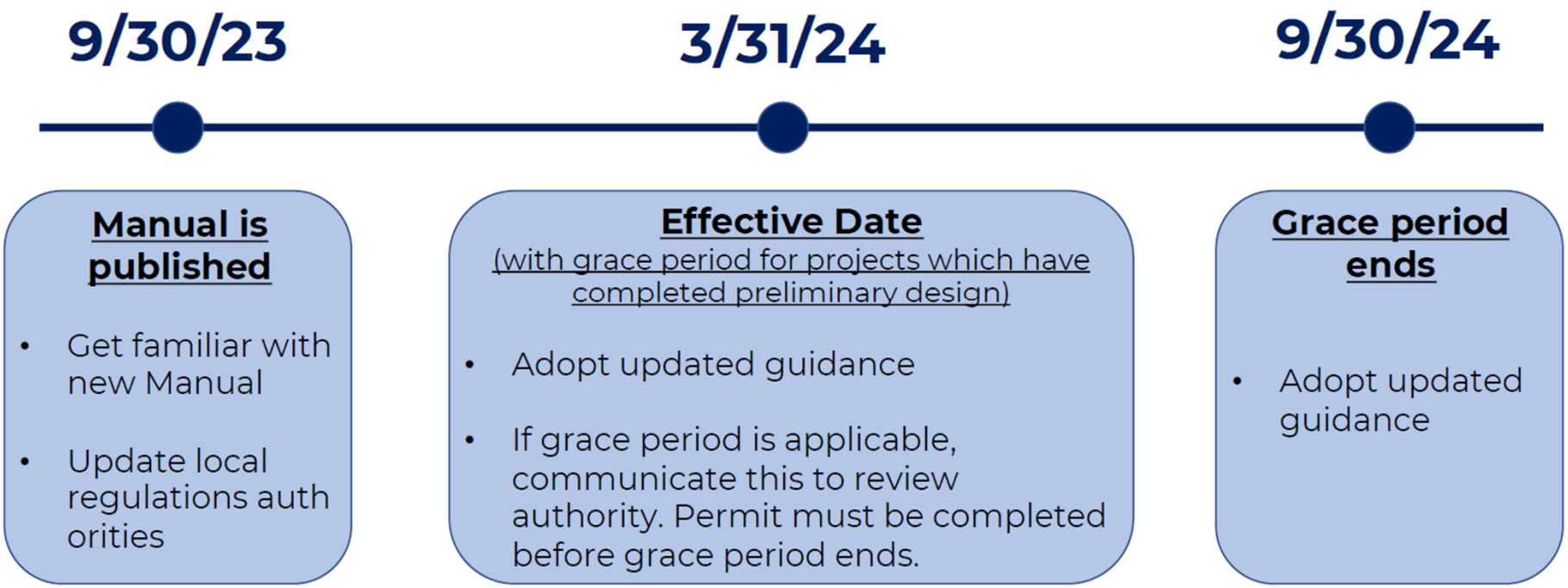


Manuals Update Process

Workgroup

- CT DEEP
- Council on Soil and Water Conservation
- Conservation Districts
- Save the Sound
- UCONN, CLEAR
- Town of Mansfield, City of Milford
- CT NRCS/USDA
- CTDOT
- Fuss & O'Neill

Timeline for Adoption of New Manuals



Source: UCONN, CLEAR

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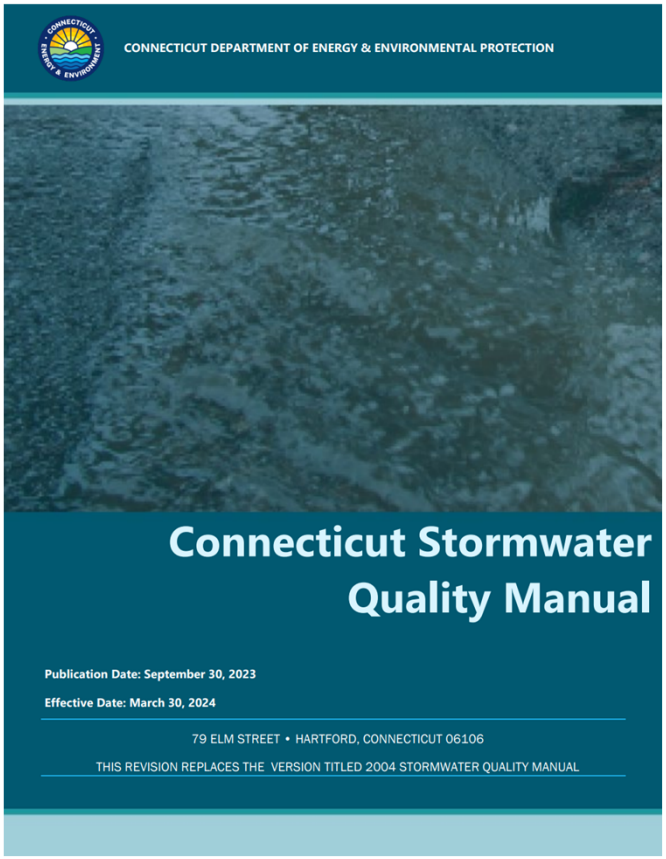
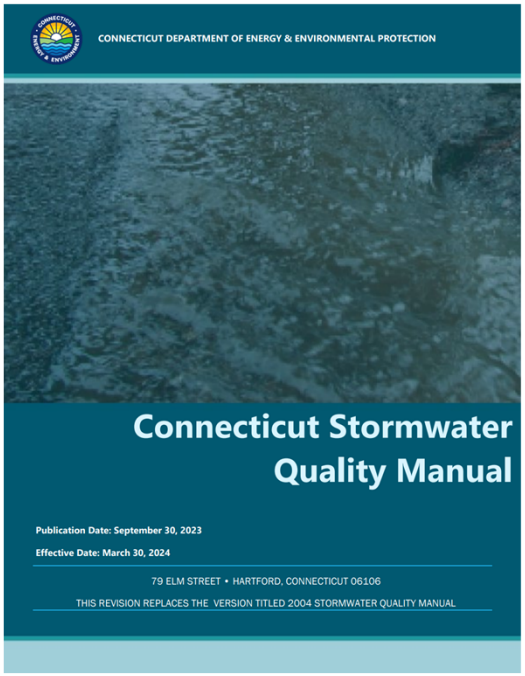
Connecticut Stormwater Quality Manual



Major Changes ("Overhaul")

- **Chapter 4: Stormwater Management Standards and Performance Criteria**
  - Retention standard
  - Water Quality Storm/Volume Change
- **Chapter 5: LID Site Planning and Design Strategies**
  - Replaces the 2011 LID Appendix
- **Chapter 9: Stormwater Retrofits**
  - Updated chapter, integrates performance curves
- **Chapter 10: General Design Guidance for Stormwater Infiltration**
  - New chapter
- **Chapter 13: Structural Stormwater BMP Design Guidance**
  - Overhaul of design guidance for specific BMPs

Connecticut Stormwater Quality Manual



Organization of the Manual

BACKGROUND

- Ch. 1: Introduction
- Ch. 2: Stormwater Impacts
- Ch. 3: Preventing and Mitigating Stormwater Impacts

DESIGN & IMPLEMENT

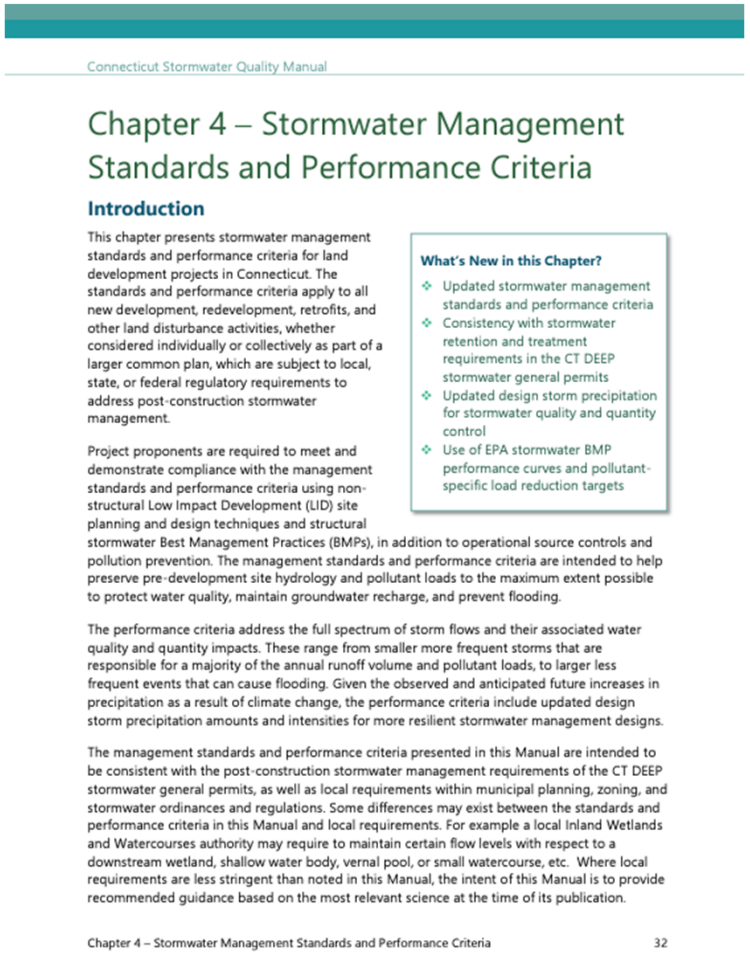
- Ch. 4: Stormwater Management Standards and Performance Criteria
- Ch. 5: Low Impact Development Site Planning and Design Strategies
- Ch. 6: Source Control Practices and Pollution Prevention
- Ch. 7: Overview of Structural Stormwater Best Management Practices
- Ch. 8: Selection Considerations for Stormwater BMPs
- Ch. 9: Stormwater Retrofits
- Ch. 10: General Design Guidance for Stormwater Infiltration Systems
- Ch. 11: Proprietary Stormwater BMPs
- Ch. 12: Stormwater Management Plan
- Ch. 13: Structural Stormwater BMP Design Guidance

Source: UCONN, CLEAR

EILL

Stormwater Management Standards & Performance Criteria (Chapter 4)

- Consistency with post-construction stormwater management requirements of CT DEEP stormwater general permits and municipal stormwater regulations
- Emphasis on non-structural LID and stormwater retention
- Retention/infiltration replaces previous groundwater recharge requirement
- Updated design storm precipitation
- EPA stormwater BMP performance curves



Connecticut Stormwater Quality Manual

Chapter 4 – Stormwater Management Standards and Performance Criteria

Introduction

This chapter presents stormwater management standards and performance criteria for land development projects in Connecticut. The standards and performance criteria apply to all new development, redevelopment, retrofits, and other land disturbance activities, whether considered individually or collectively as part of a larger common plan, which are subject to local, state, or federal regulatory requirements to address post-construction stormwater management.

What's New in this Chapter?

- Updated stormwater management standards and performance criteria
- Consistency with stormwater retention and treatment requirements in the CT DEEP stormwater general permits
- Updated design storm precipitation for stormwater quality and quantity control
- Use of EPA stormwater BMP performance curves and pollutant-specific load reduction targets

Project proponents are required to meet and demonstrate compliance with the management standards and performance criteria using non-structural Low Impact Development (LID) site planning and design techniques and structural stormwater Best Management Practices (BMPs), in addition to operational source controls and pollution prevention. The management standards and performance criteria are intended to help preserve pre-development site hydrology and pollutant loads to the maximum extent possible to protect water quality, maintain groundwater recharge, and prevent flooding.

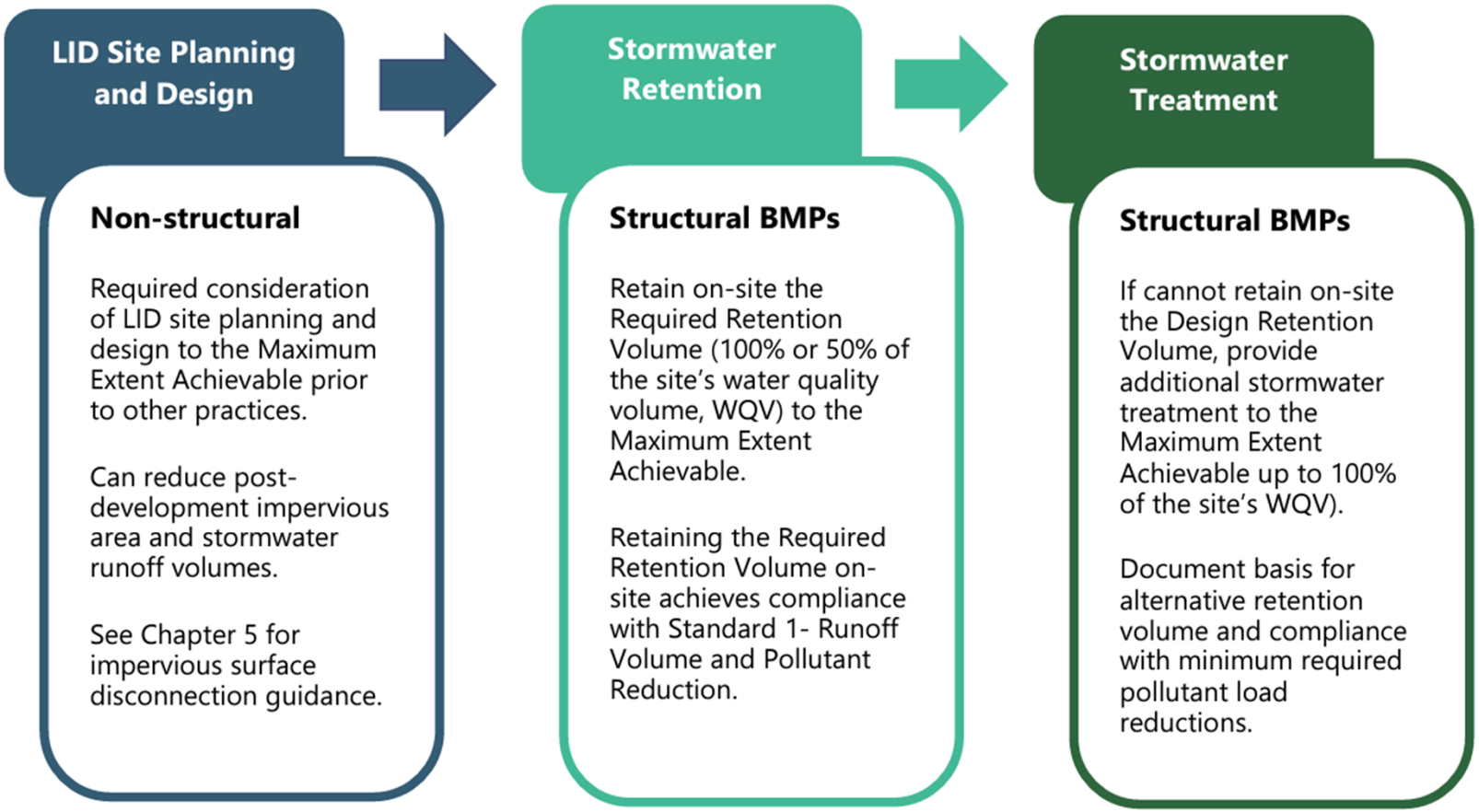
The performance criteria address the full spectrum of storm flows and their associated water quality and quantity impacts. These range from smaller more frequent storms that are responsible for a majority of the annual runoff volume and pollutant loads, to larger less frequent events that can cause flooding. Given the observed and anticipated future increases in precipitation as a result of climate change, the performance criteria include updated design storm precipitation amounts and intensities for more resilient stormwater management designs.

The management standards and performance criteria presented in this Manual are intended to be consistent with the post-construction stormwater management requirements of the CT DEEP stormwater general permits, as well as local requirements within municipal planning, zoning, and stormwater ordinances and regulations. Some differences may exist between the standards and performance criteria in this Manual and local requirements. For example a local Inland Wetlands and Watercourses authority may require to maintain certain flow levels with respect to a downstream wetland, shallow water body, vernal pool, or small watercourse, etc. Where local requirements are less stringent than noted in this Manual, the intent of this Manual is to provide recommended guidance based on the most relevant science at the time of its publication.

Chapter 4 – Stormwater Management Standards and Performance Criteria 32

Standard 1. Runoff Volume & Pollutant Reduction

Figure 4-1. Runoff Volume and Pollutant Reduction (Standard 1) Elements and Process



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Standard 1. Runoff Volume & Pollutant Reduction

LID Site Planning and Design

- Consider non-structural LID site planning and design strategies to the **Maximum Extent Achievable** prior to the consideration of structural stormwater BMPs
- Reduce and disconnect impervious area
- Chapter 5 – LID Site Planning and Design Strategies

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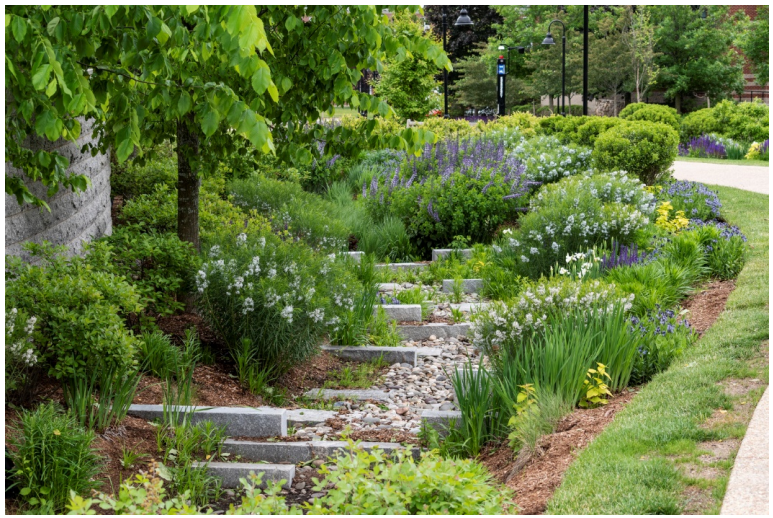
Standard 1. Runoff Volume & Pollutant Reduction

Stormwater Retention

- Retain on-site the **Required Retention Volume (RRV)** to the **Maximum Extent Achievable**
- DRV = 100% or 50% of the Water Quality Volume (WQV)
- **Hold post-development runoff on-site** using structural stormwater BMPs (no discharge up to RRV)
- See **Table 8-1** for BMPs suitable for stormwater retention



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Standard 1. Runoff Volume & Pollutant Reduction

Stormwater Treatment

- If cannot retain on-site the full RRV, **provide treatment without retention** for remainder of RRV up to 100% WQV to the **Maximum Extent Achievable**
- Use **stormwater BMP performance curves** to demonstrate adequate pollutant reduction
- See **Table 8-1** for BMPs suitable for providing treatment without retention
- Multiple BMPs in series (treatment train) typically required

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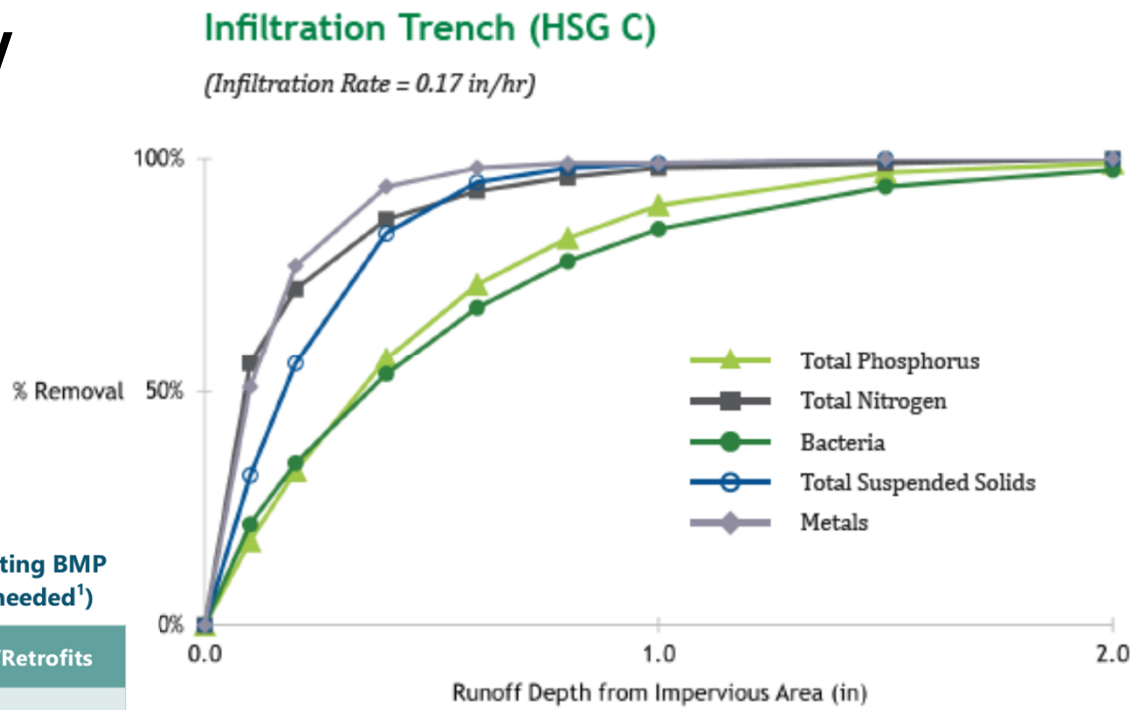
Stormwater BMP Performance Curves

- **Document adequate pollutant removal when RRV cannot be fully retained on-site**
- EPA Region 1, long-term pollutant removal
- Design storage volume (Appendix C)

Table 4. 3 Minimum Average Annual Pollutant Load Reductions When Evaluating BMP Selection and Sizing (Only needed when additional stormwater treatment is needed[1])

Water Quality Parameter	New Development	Redevelopment/Retrofits
Total Suspended Solids (TSS)	90%	80%
Total Phosphorus (TP)	60%	50%
Total Nitrogen (TN)	40%	30%

[1] Pollutant load reduction percentages are calculated based on average annual loading and not based on any individual storm event. Load reductions based on post-construction stormwater management standards contained in the EPA Massachusetts MS4 General Permit.



Source: New England Stormwater Retrofit Manual, VHB, UNH Stormwater Center, and SNEP Network.

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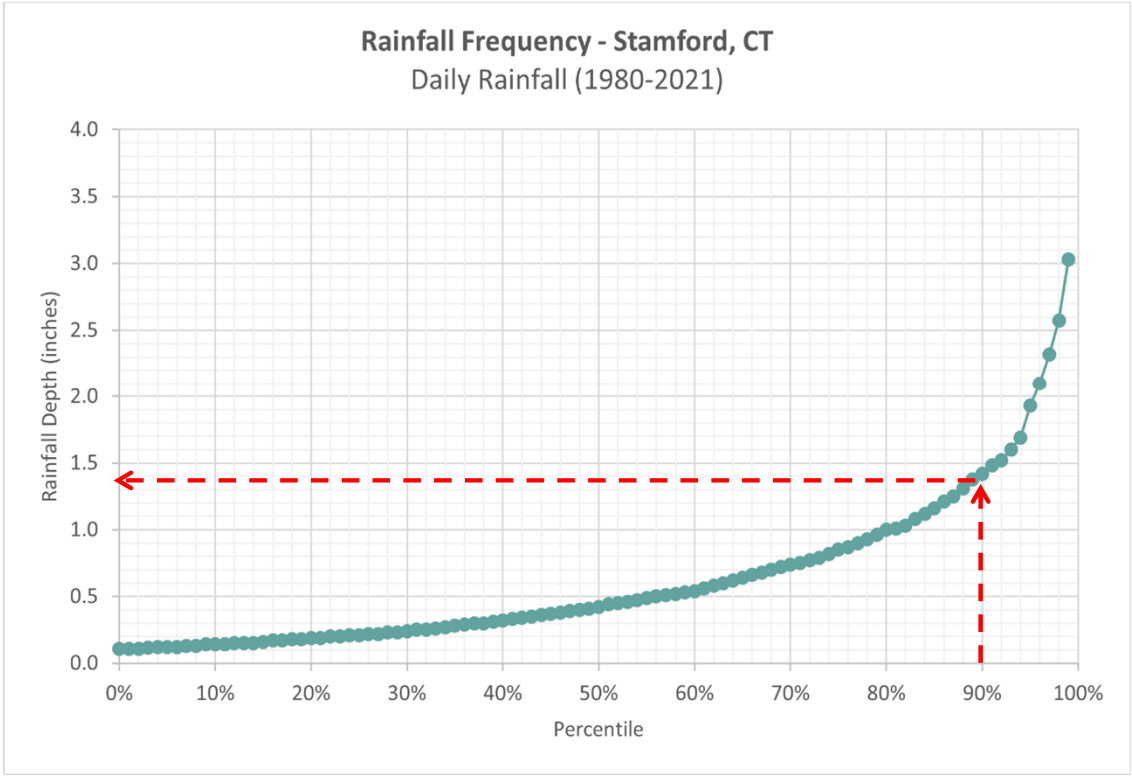
Updated Water Quality Storm

- First flush principle, majority of pollutant load
- Used in Water Quality Volume equation
- Updated 90th percentile rainfall event (amount that should be managed on-site to restore and maintain pre-development hydrology)
- **Increased water quality storm from 1.0” to 1.3”**
- **No change to WQV equation**



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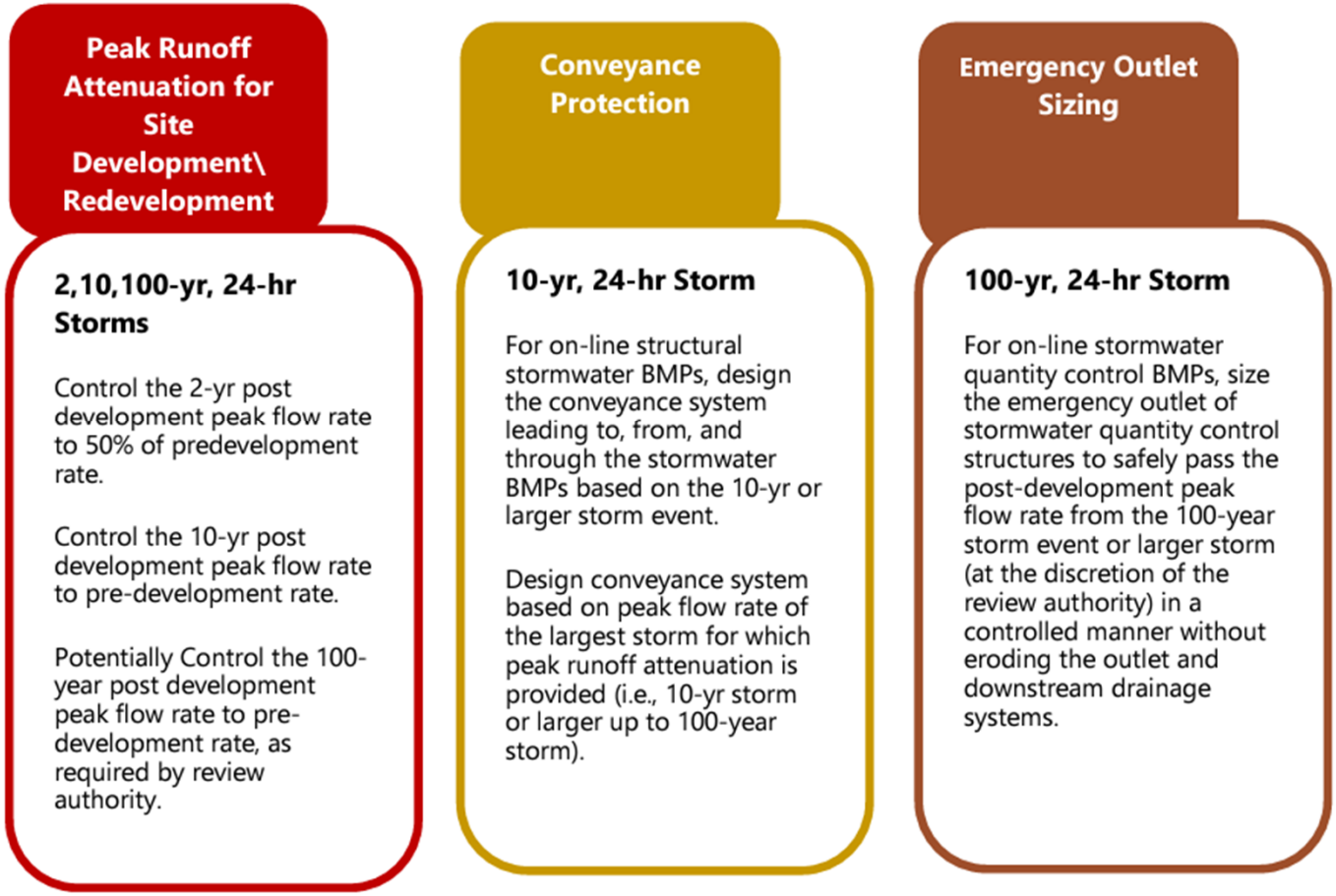
Standard 2. Stormwater Runoff Quantity Control

Figure 4- 3 Stormwater Runoff Quantity Control (Standard 2) Elements



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Updated Stormwater Quantity Control Design Storm Rainfall

Parameter	2004 Stormwater Quality Manual	2023 Stormwater Quality Manual
24-hour Rainfall Depth	TP-40	NOAA Atlas 14 (and subsequent generations)
Rainfall Distribution	NRCS Type III	NRCS NOAA_D

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Climate Change Considerations

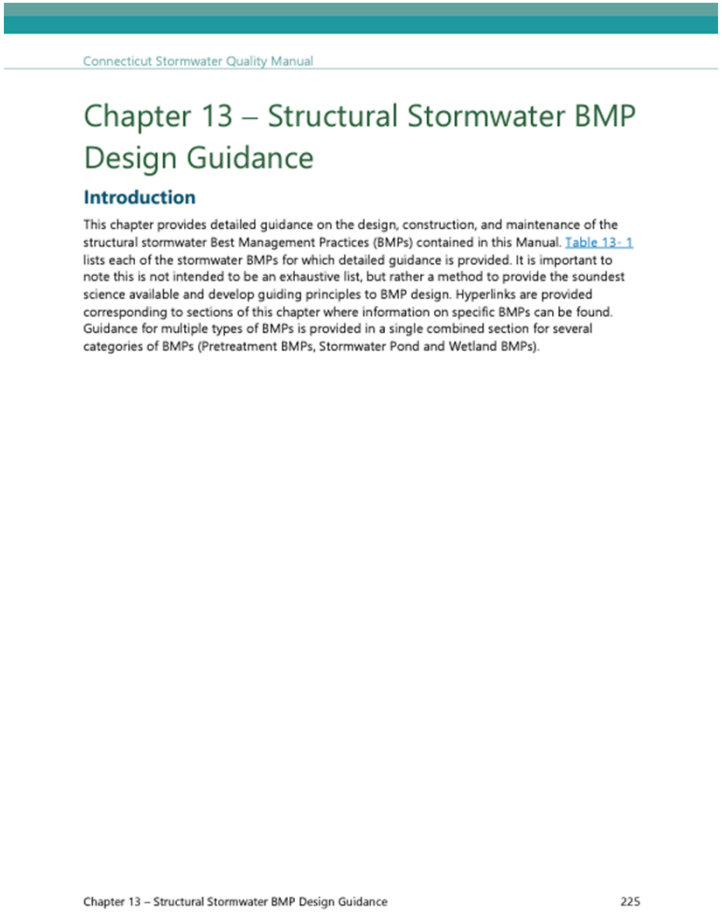
Resilient Design Elements (Appendix G)

- Emphasis on non-structural LID
- Updated design storm precipitation
  - Adopt future generations of NOAA Atlas 14 precipitation products
  - Projected future rainfall due to climate change, NOAA Atlas 15
- Coastal considerations (sea level rise)
- Mitigating impacts to stream temperatures and nutrient loads

Structural Stormwater BMP Design Guidance

Updated Technical Guidance (Chapter 13)

- Detailed technical design guidance for each type of structural stormwater BMP
- Selection, design, construction, and maintenance
- Advantages & limitations
- Drawings & photos



Connecticut Stormwater Quality Manual

Chapter 13 – Structural Stormwater BMP Design Guidance

Introduction

This chapter provides detailed guidance on the design, construction, and maintenance of the structural stormwater Best Management Practices (BMPs) contained in this Manual. Table 13- 1 lists each of the stormwater BMPs for which detailed guidance is provided. It is important to note this is not intended to be an exhaustive list, but rather a method to provide the soundest science available and develop guiding principles to BMP design. Hyperlinks are provided corresponding to sections of this chapter where information on specific BMPs can be found. Guidance for multiple types of BMPs is provided in a single combined section for several categories of BMPs (Pretreatment BMPs, Stormwater Pond and Wetland BMPs).

Chapter 13 – Structural Stormwater BMP Design Guidance 225

Structural Stormwater BMP Design Guidance

Functional Classification

Pretreatment BMPs

Infiltration BMPs

Filtering BMPs

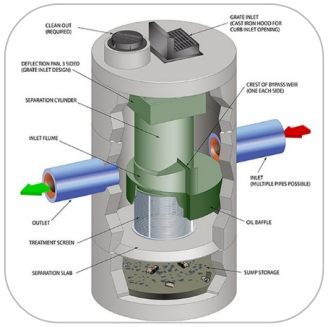
Stormwater Pond BMPs

Stormwater Wetland BMPs

Water Quality Conveyance BMPs

Stormwater Reuse BMPs

Proprietary BMPs



Other BMPs and Accessories

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Structural Stormwater BMP Design Guidance

Table 13- 1 Structural Stormwater BMPs Addressed in Chapter 13

BMP Category	BMP Type
Pretreatment BMPs	Pretreatment BMPs Sediment Forebay Pretreatment Vegetated Filter Strip Pretreatment Swale Deep Sump Hooded Catch Basin Oil Grit Separator Proprietary Pretreatment Device
Infiltration BMPs	Infiltration Trench Underground Infiltration System Infiltration Basin Dry Well & Infiltrating Catch Basin Permeable Pavement
Filtering BMPs	Bioretention Tree Filter Sand Filter
Stormwater Pond and Wetland BMPs	Stormwater Pond Wet Pond Micropool Extended Detention Pond Wet Extended Detention Pond Multiple Pond System Stormwater Wetland Subsurface Gravel Wetland Shallow Wetland Extended Detention Shallow Wetland Pond/Wetland System
Water Quality Conveyance BMPs	Dry Water Quality Swale Wet Water Quality Swale
Stormwater Reuse BMPs	Rain Barrel and Cistern Rain Barrel Cistern
Other BMPs and BMP Accessories	Green Roof Dry Extended Detention Basin Underground Detention (no infiltration) Inlet and Outlet Controls

Table 13- 3 Suitability of Pretreatment BMPs Based on Type of Primary Stormwater BMP

BMP Category	BMP Type	Sediment Forebay	Pretreatment Vegetated Filter Strip	Pretreatment Swale	Deep Sump Hooded Catch Basin (1)	Oil Grit Separator (2)	Proprietary Pretreatment Device (3)
Infiltration BMPs	Infiltration Trench	♦	♦	♦	♦	♦	♦
	Underground Infiltration System				♦	♦	♦
	Infiltration Basin	♦	♦	♦	♦	♦	♦
	Dry Well	Pretreatment Not Required					
	Infiltrating Catch Basin (4)				♦	♦	♦
	Permeable Pavement	Pretreatment Not Required					
Filtering BMPs	Bioretention	♦	♦	♦	♦	♦	♦
	Surface Sand Filter	♦	♦	♦	♦	♦	♦
	Tree Filter				♦	♦	♦
Stormwater Pond BMPs	Wet Pond	♦	♦	♦		♦	♦
	Micro pool Extended Detention Pond	♦	♦	♦		♦	♦
	Wet Extended Detention Pond	♦	♦	♦		♦	♦
	Multiple Pond System	♦	♦	♦		♦	♦
Stormwater Wetland BMPs	Subsurface Gravel Wetland	♦	♦	♦		♦	♦
	Shallow Wetland	♦	♦	♦		♦	♦
	Extended Detention Shallow Wetland	♦	♦	♦		♦	♦
	Pond/Wetland System	♦	♦	♦		♦	♦

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Structural Stormwater BMP Design Guidance

Bioretention

Stormwater BMP Type

Pretreatment BMP	□
Infiltration BMP	□
Filtering BMP	■
Stormwater Pond BMP	□
Stormwater Wetland BMP	□
Water Quality Conveyance BMP	□
Stormwater Reuse BMP	□
Proprietary BMP	□
Other BMPs and Accessories	□

Stormwater Management Suitability

Retention	■
Treatment	■
Pretreatment	□
Peak Runoff Attenuation	■

Pollutant Removal

Sediment*	**High**
Phosphorus	**Moderate**
Nitrogen	**Low**
Bacteria	**High**

*Includes sediment-bound pollutants and floatables (with pretreatment)

Implementation

Capital Cost	**Medium**
Maintenance Burden	**Medium**
Land Requirement	**Varies**

Description

Bioretention systems are shallow, vegetated depressions that capture, temporarily store, and filter stormwater runoff. Bioretention systems have an engineered soil[86] media below the surface of the system that facilitates stormwater filtration and vegetative growth. Bioretention systems are frequently designed to infiltrate, commonly referred to as "infiltration" or "exfiltration" bioretention systems but can be designed with an underdrain to capture filtered water and assist with drainage from the system, typically referred to as "flow-through" bioretention systems. In certain situations, bioretention systems can also be designed with impermeable liners to prevent infiltration into the underlying soil.

Bioretention systems remove pollutants through a variety of physical, chemical, and biological processes including filtration, pollutant uptake, and adsorption. Vegetation in the soil bed provides uptake of pollutants and runoff, and the root system helps maintain the infiltration rate in the soil bed. If not designed with an impermeable liner, bioretention systems can provide retention of stormwater and reduce runoff volumes through infiltration and groundwater recharge. Bioretention systems may also be used to provide stormwater quantity control when designed as on-line facilities.

Bioretention systems can be implemented on most sites as part of the urban, suburban, or rural landscape. Given their versatility, many design variants of bioretention systems exist, including bioretention basins, stormwater planters, bioswales, tree filters (see Tree Filter section), and

[86] **Engineered** soil is a manufactured soil consisting of specified ratios of sand, silt, clay, and organic amendments such as compost and designed for a specific application.

other systems that vary based on shape, location, and configuration. The following photographs are examples of common types of bioretention systems.

Bioretention basin at the edge of a parking lot.

Rain garden on a residential lot.

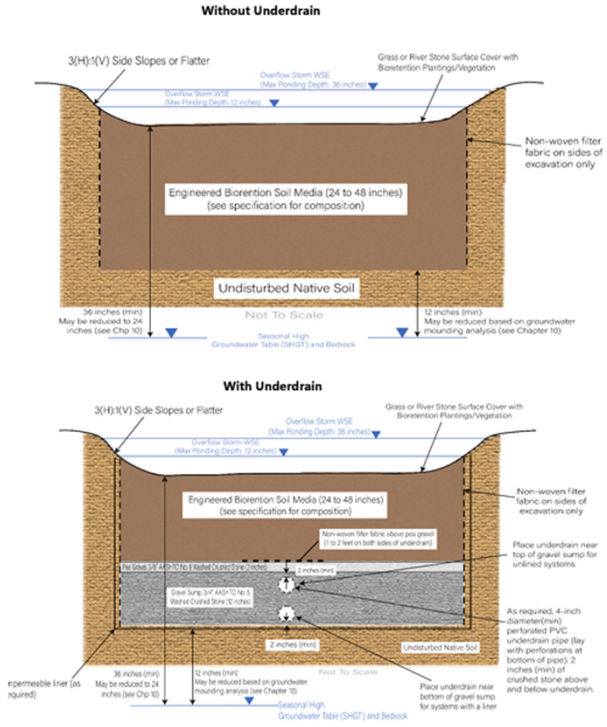
Roadside bioswale in urban residential setting.

Bioretention planter in urban downtown setting.

Advantages

- Applicable to small drainage areas.
- Can be applied to most sites due to relatively few constraints and many design variations (i.e., highly versatile).
- Ideal for stormwater retrofits and highly developed sites.
- High pollutant removal efficiency and water quality benefits.
- Can provide stormwater retention, runoff volume reduction, and groundwater recharge if designed for infiltration.
- Vegetation can also provide aesthetic, ecological, and other green infrastructure benefits, like cooling the urban heat island effect.

Figure 13-17. Bioretention System without and with Underdrain Schematic



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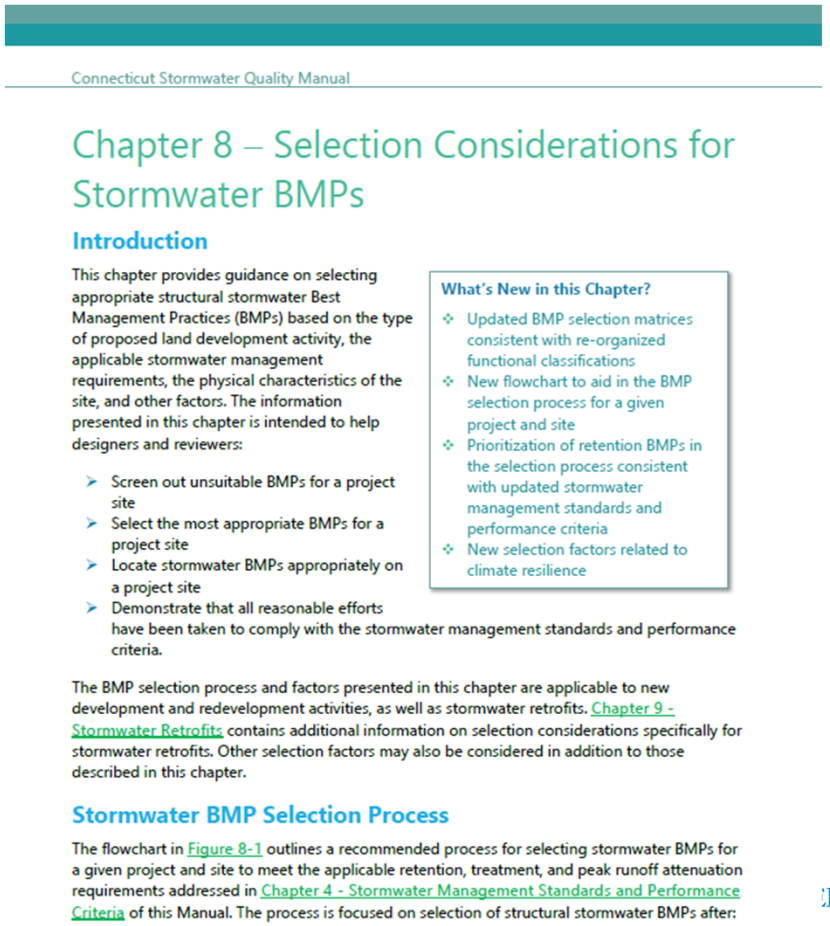
Structural Stormwater BMP Design Guidance

BMP Selection Considerations (Chapter 8)

- New BMP selection flowchart
- Prioritization of retention BMPs
- Updated BMP selection matrices



Connecticut Stormwater Quality Manual

Chapter 8 – Selection Considerations for Stormwater BMPs

Introduction

This chapter provides guidance on selecting appropriate structural stormwater Best Management Practices (BMPs) based on the type of proposed land development activity, the applicable stormwater management requirements, the physical characteristics of the site, and other factors. The information presented in this chapter is intended to help designers and reviewers:

- Screen out unsuitable BMPs for a project site
- Select the most appropriate BMPs for a project site
- Locate stormwater BMPs appropriately on a project site
- Demonstrate that all reasonable efforts have been taken to comply with the stormwater management standards and performance criteria.

What's New in this Chapter?

- Updated BMP selection matrices consistent with re-organized functional classifications
- New flowchart to aid in the BMP selection process for a given project and site
- Prioritization of retention BMPs in the selection process consistent with updated stormwater management standards and performance criteria
- New selection factors related to climate resilience

The BMP selection process and factors presented in this chapter are applicable to new development and redevelopment activities, as well as stormwater retrofits. Chapter 9 - Stormwater Retrofits contains additional information on selection considerations specifically for stormwater retrofits. Other selection factors may also be considered in addition to those described in this chapter.

Stormwater BMP Selection Process

The flowchart in Figure 8-1 outlines a recommended process for selecting stormwater BMPs for a given project and site to meet the applicable retention, treatment, and peak runoff attenuation requirements addressed in Chapter 4 - Stormwater Management Standards and Performance Criteria of this Manual. The process is focused on selection of structural stormwater BMPs after:

Structural Stormwater BMP Design Guidance

Physical Feasibility Factors

- Drainage Area
- Site Slope
- Soil Infiltration Capacity
- Depth to Seasonal High Groundwater
- Depth to Bedrock

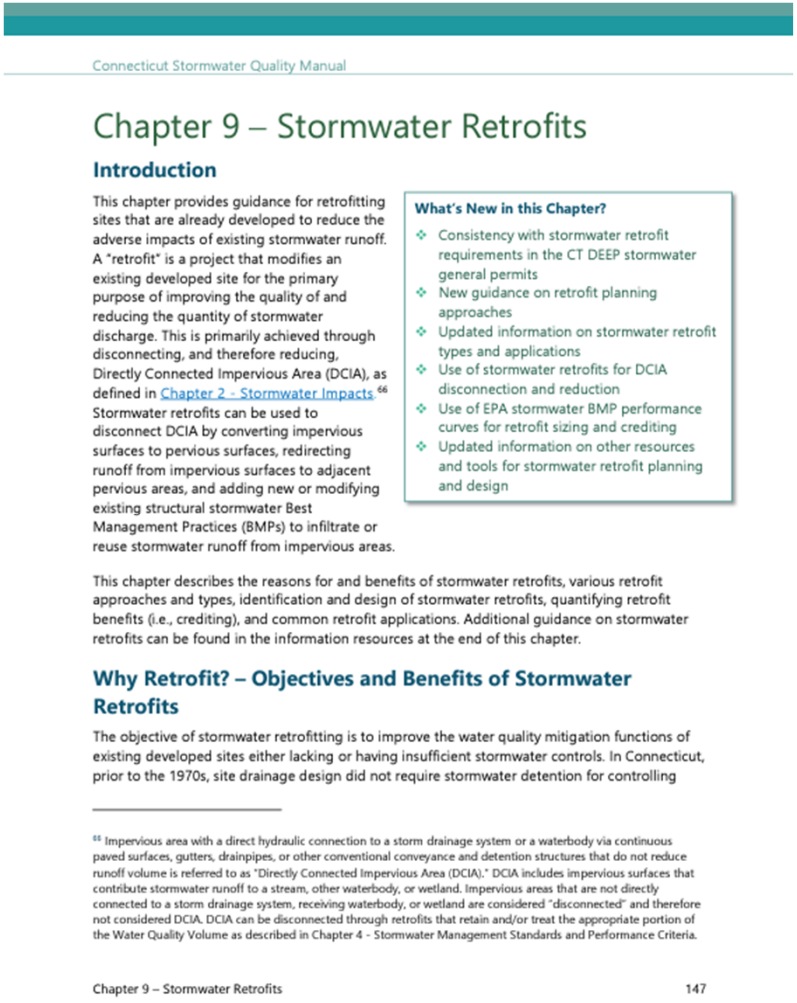
Table 8-5. Physical Feasibility – Depth to Seasonal High Groundwater Table and Bedrock

BMP Category	BMP Type	Depth to Seasonal High Groundwater Table (1)				Depth to Bedrock		
		< 1 ft	1 – 2 ft	2 – 3 ft	> 3 ft	< 2 ft	2 – 3 ft	> 3 ft
Infiltration BMPs	Infiltration Trench			(2)	💧		(2)	💧
	Underground Infiltration System			(2)	💧		(2)	💧
	Infiltration Basin			(2)	💧		(2)	💧
	Dry Well			(2)	💧		(2)	💧
	Infiltrating Catch Basin			(2)	💧		(2)	💧
	Porous Asphalt			(2)	💧		(2)	💧
	Pervious Concrete			(2)	💧		(2)	💧
	Permeable Concrete Interlocking Pavers			(2)	💧		(2)	💧
Filtering BMPs	Bioretention		(3)	(2)	💧	(3)	(2)	💧
	Sand Filter		(3)	(2)	💧	(3)	(2)	💧
	Tree Filter		(3)	(2)	💧	(3)	(2)	💧
Stormwater Pond BMPs	Wet Pond	💧	💧	(4)		💧	💧	💧
	Micropool Extended Detention Pond	💧	💧	(4)		💧	💧	💧
	Wet Extended Detention Pond	💧	💧	(4)		💧	💧	💧
	Multiple Pond System	💧	💧	(4)		💧	💧	💧
Stormwater Wetland BMPs	Subsurface Gravel Wetland	💧	💧	(4)		💧	💧	💧
	Shallow Wetland	💧	💧	(4)		💧	💧	💧
	Extended Detention Shallow Wetland	💧	💧	(4)		💧	💧	💧
	Pond/Wetland System	💧	💧	(4)		💧	💧	💧

Structural Stormwater BMP Design Guidance

Stormwater Retrofits (Chapter 9)

- Guidance on retrofitting to reduce & disconnect DCIA (MS4 Permits)
- Retrofit planning
- Updated information on retrofit types & applications
- EPA BMP performance curves for sizing and crediting
- References New England Stormwater Retrofit Manual (2022)



Connecticut Stormwater Quality Manual

Chapter 9 – Stormwater Retrofits

Introduction

This chapter provides guidance for retrofitting sites that are already developed to reduce the adverse impacts of existing stormwater runoff. A "retrofit" is a project that modifies an existing developed site for the primary purpose of improving the quality of and reducing the quantity of stormwater discharge. This is primarily achieved through disconnecting, and therefore reducing, Directly Connected Impervious Area (DCIA), as defined in Chapter 2 - Stormwater Impacts.[66] Stormwater retrofits can be used to disconnect DCIA by converting impervious surfaces to pervious surfaces, redirecting runoff from impervious surfaces to adjacent pervious areas, and adding new or modifying existing structural stormwater Best Management Practices (BMPs) to infiltrate or reuse stormwater runoff from impervious areas.

What's New in this Chapter?

- Consistency with stormwater retrofit requirements in the CT DEEP stormwater general permits
- New guidance on retrofit planning approaches
- Updated information on stormwater retrofit types and applications
- Use of stormwater retrofits for DCIA disconnection and reduction
- Use of EPA stormwater BMP performance curves for retrofit sizing and crediting
- Updated information on other resources and tools for stormwater retrofit planning and design

This chapter describes the reasons for and benefits of stormwater retrofits, various retrofit approaches and types, identification and design of stormwater retrofits, quantifying retrofit benefits (i.e., crediting), and common retrofit applications. Additional guidance on stormwater retrofits can be found in the information resources at the end of this chapter.

Why Retrofit? – Objectives and Benefits of Stormwater Retrofits

The objective of stormwater retrofitting is to improve the water quality mitigation functions of existing developed sites either lacking or having insufficient stormwater controls. In Connecticut, prior to the 1970s, site drainage design did not require stormwater detention for controlling

[66] Impervious area with a direct hydraulic connection to a storm drainage system or a waterbody via continuous paved surfaces, gutters, drainpipes, or other conventional conveyance and detention structures that do not reduce runoff volume is referred to as "Directly Connected Impervious Area (DCIA)." DCIA includes impervious surfaces that contribute stormwater runoff to a stream, other waterbody, or wetland. Impervious areas that are not directly connected to a storm drainage system, receiving waterbody, or wetland are considered "disconnected" and therefore not considered DCIA. DCIA can be disconnected through retrofits that retain and/or treat the appropriate portion of the Water Quality Volume as described in Chapter 4 - Stormwater Management Standards and Performance Criteria.

Chapter 9 – Stormwater Retrofits 147

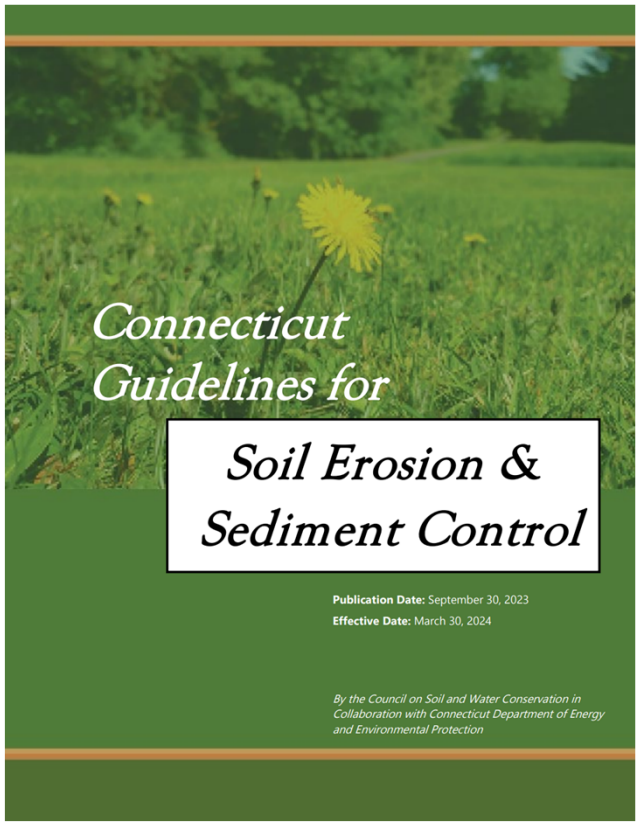
Accessing and Using the 2023 CT SWQM

Website and PDF Versions

- Web Version
  - Developed by UCONN CLEAR
  - Organized by chapter and usage
- UCONN CLEAR Webinars
- Website:

https://ctstormwatermanual.nemo.uconn.edu/

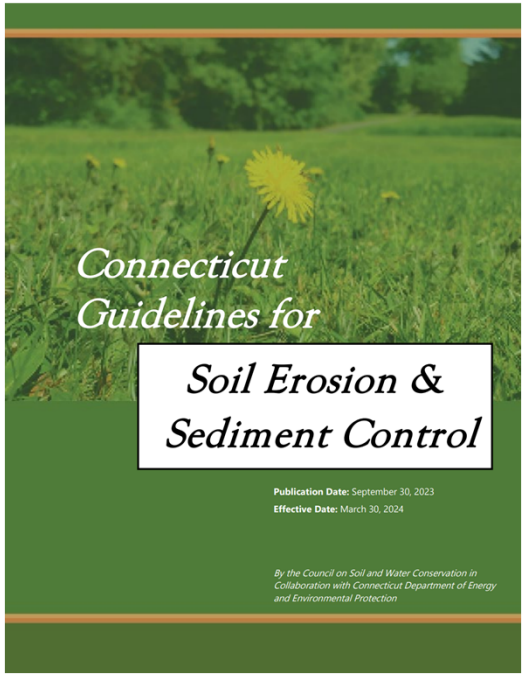
Soil Erosion & Sediment Control Guidelines



Changes ("Refresh")

- Format changes (appendices, hyperlinks)
- References CT SWQM for post-construction stormwater management
- Incorporates LID site planning and design
- Updated section on E&S Control Plans
- Updated design storm precipitation and climate change considerations
- Added, updated, and removed some control measures

Soil Erosion & Sediment Control Guidelines



Organization of the Guidelines

BACKGROUND

- **Chapter 1: Purpose and Functions of the Guidelines**
- **Chapter 2: The Erosion and Sedimentation Control Process**

DESIGN & IMPLEMENT

- **Chapter 3: Erosion and Sediment Control Plans**
- **Chapter 4: Construction Phasing and Sequencing and Special Treatments**
- **Chapter 5: The Functional Groups and Measures**

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E&S Controls for Specialized Applications

- Several new types of projects
  - Solar Array Construction Projects
  - Soil Bioengineering
  - Projects in Coastal Shoreline Environments

Bioengineering Fiber Rolls

Coastal Bank Protection

Chapter 4 – Construction Phasing and Sequencing, and Special Treatments

This chapter provides guidance on construction phasing and sequencing, with sample construction sequences provided for large or potentially high-impact construction project types that involve difficult soil erosion and sediment control challenges. This chapter also addresses the integrated use of combinations of erosion and sediment control measures for specialized applications (i.e., special treatments). These types of construction activities have higher potential for adverse impacts and therefore require careful phasing and sequencing, and/or the use of multiple erosion and sediment control measures.

The measures described in this chapter should be implemented in conjunction with the guidance provided in Chapter 3 (Erosion and Sediment Control Plans) and Chapter 5 (Functional Groups and Measures), as well as the requirements of the CT DEEP Construction General Permit and other applicable local, state, and federal permits or approvals

Part I – Construction Phasing and Sequencing

Construction phasing and sequencing are closely related and equally important concepts for soil erosion and sediment control.

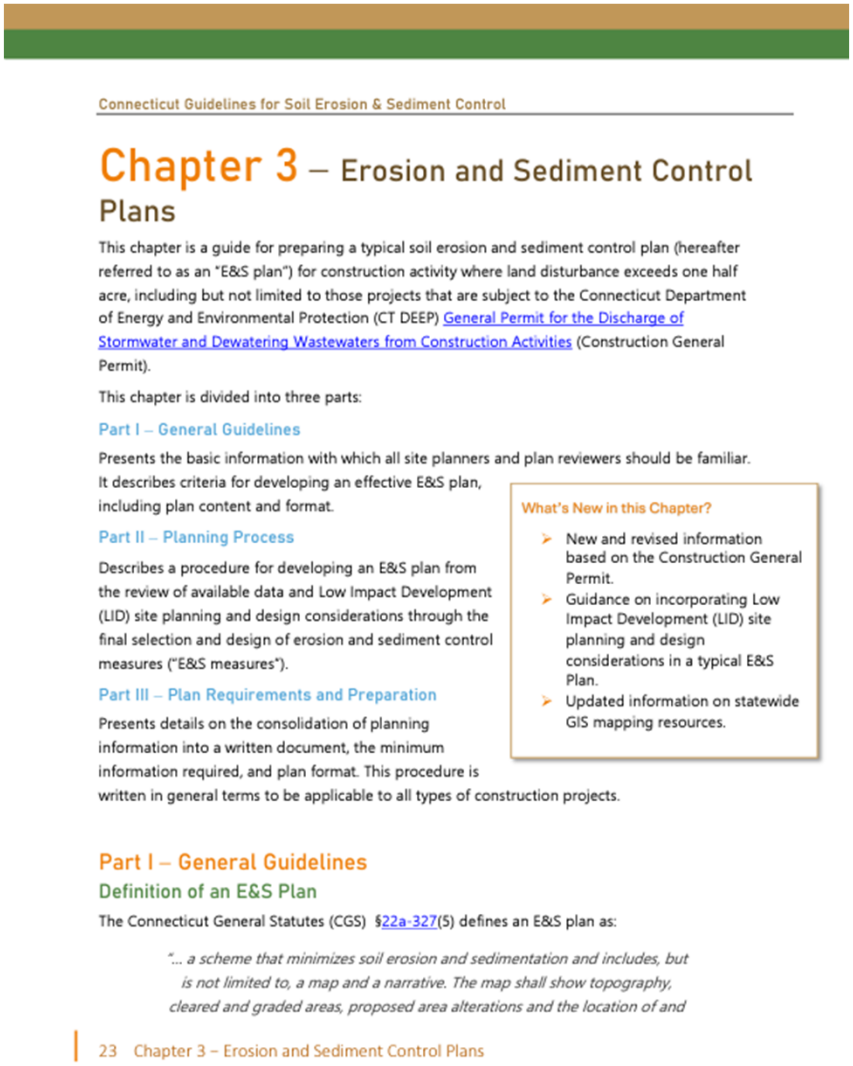
- Construction phasing divides a construction project into multiple phases, which are distinct and complete sets of activities that have a specific functional goal wherein the work to be completed in one phase is not dependent upon the execution of work in a later phase in order to make it functional. Phasing involves disturbing only a part of a site at any given time to minimize the amount of area that is exposed and subject to erosion. Earth-disturbing activities and construction are completed, and soils are effectively stabilized on one part of the site before work begins on another part of the site.

- Construction sequencing is a site-specific work schedule that coordinates the timing of site development related land-disturbance activities and the implementation of temporary and permanent erosion and sediment control measures during any particular phase to minimize soil erosion and sedimentation.

Proper construction sequencing is required for all construction projects regardless of size. Wherever practicable, site construction activities shall be phased, with each phase having its own construction sequence and erosion and sediment control measures, to avoid the disturbance of over 5 acres at one time or 3 acres for sites that discharge directly to impaired waters consistent with the requirements of the CT DEEP Construction General Permit. Phasing and construction sequence are particularly important for large construction projects, which are defined as projects with a total land disturbance of 5 acres or greater, and projects that discharge directly to impaired waters. Large construction projects typically involve major construction activities (e.g.,

E&S Control Plans

- Greater consistency with E&S Plan requirements of Construction General Permit
- Guidance on incorporating LID site planning and design considerations
- Updated information on statewide GIS resources



Connecticut Guidelines for Soil Erosion & Sediment Control

Chapter 3 – Erosion and Sediment Control Plans

This chapter is a guide for preparing a typical soil erosion and sediment control plan (hereafter referred to as an "E&S plan") for construction activity where land disturbance exceeds one half acre, including but not limited to those projects that are subject to the Connecticut Department of Energy and Environmental Protection (CT DEEP) General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities (Construction General Permit).

This chapter is divided into three parts:

Part I – General Guidelines

Presents the basic information with which all site planners and plan reviewers should be familiar. It describes criteria for developing an effective E&S plan, including plan content and format.

Part II – Planning Process

Describes a procedure for developing an E&S plan from the review of available data and Low Impact Development (LID) site planning and design considerations through the final selection and design of erosion and sediment control measures ("E&S measures").

Part III – Plan Requirements and Preparation

Presents details on the consolidation of planning information into a written document, the minimum information required, and plan format. This procedure is written in general terms to be applicable to all types of construction projects.

What's New in this Chapter?

- New and revised information based on the Construction General Permit.
- Guidance on incorporating Low Impact Development (LID) site planning and design considerations in a typical E&S Plan.
- Updated information on statewide GIS mapping resources.

Part I – General Guidelines

Definition of an E&S Plan

The Connecticut General Statutes (CGS) §22a-327(5) defines an E&S plan as:

> *"... a scheme that minimizes soil erosion and sedimentation and includes, but is not limited to, a map and a narrative. The map shall show topography, cleared and graded areas, proposed area alterations and the location of and*

Erosion & Sediment Controls Technical Guidance

Functional Groups and Measures (Chapter 5)

Protect Vegetation

Preserve & Conserve Soil

Vegetative Soil Cover

Non-Living Soil Protection

Stabilization Structures

Drainageways & Watercourses

Diversions

Subsurface Drains

Energy Dissipators

Sediment Impoundments, Barriers & Filters

Tire Tracked Soils

Dewatering

Erosion & Sediment Controls Technical Guidance

New Control Measures Added (Chapter 5)

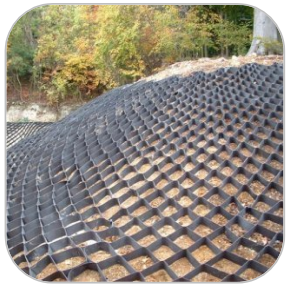
Fiber Roll

Filter Sock

Inlet Protection

Pumping Settling Basin

Cellular Confinement System



Articulating Concrete Block

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Erosion & Sediment Controls Technical Guidance

Updated or Eliminated Control Measures (Chapter 5)

Hay Bale Barrier (Replaced with Straw Bales)

Dust Control (Non-Asphalt Tackifiers)

Level Spreader

Permanent Detention Basin (refer to SWQM)

Stone Check Dam

Temporary Sediment Basin

Stone Slope Protection

FUSS & O'NEILL

Accessing and Using the 2023 Guidelines

CT DEEP and UCONN CLEAR Websites

- Same phased adoption as SWQM
- Available in PDF format
- No web version yet

- Website:

https://portal.ct.gov/DEEP/Water/Soil-Erosion-and-Sediment-Control-Guidelines/Guidelines-for-Soil-Erosion-and-Sediment-Control

Questions?

Thank you!

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