



# City of Stamford Stormwater Drainage Manual Training Session

June 25, 2020

# Introduction to Drainage Manual

---

# Manual Organization

**Chapter 1 – Introduction**

**Chapter 2 – Stormwater Management Standards**

**Chapter 3 – General Design Criteria**

**Chapter 4 – Design of Drainage Facilities**

**Chapter 5 – Stormwater Treatment Practices**

**Chapter 6 – Submittal Requirements**

**Appendices**

# Key Manual Concepts – Development Types

- **Development:** The modification of land to accommodate a new use or expansion of use, usually involving construction



**New Development**



**Redevelopment**



**Linear  
Development**

# Key Manual Concepts – DCIA

- **Directly Connected Impervious Area (DCIA):** The part of the total impervious area that is hydraulically connected to the City of Stamford's MS4
  - Does not include impervious areas where runoff is infiltrated prior to reaching MS4



# Examples – Not DCIA

- **Driveways, roofs, etc. that discharge to pervious areas and infiltrate into the ground**



# Key Manual Concepts – Water Quality

## Retention

- “Hold runoff on-site” (i.e. disconnection) for water quality event (1”)



## Treatment

- Removal of sediment, floatables, and nutrients
- Treated runoff enters MS4 system



# Key Manual Concepts – Site Factors

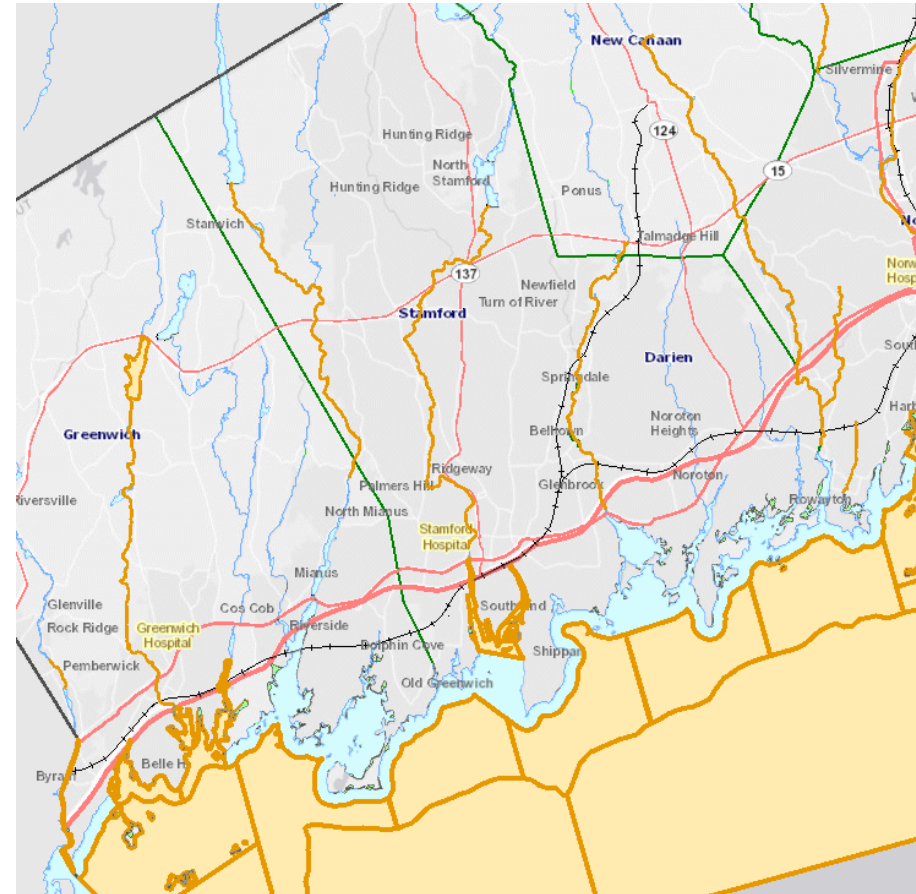
- Direct Waterfront Parcels
- Tidal Wetlands
- High Quality Waters
- Stormwater Impaired Waters

STATE OF CONNECTICUT  
DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION  
2016 INTEGRATED WATER QUALITY REPORT



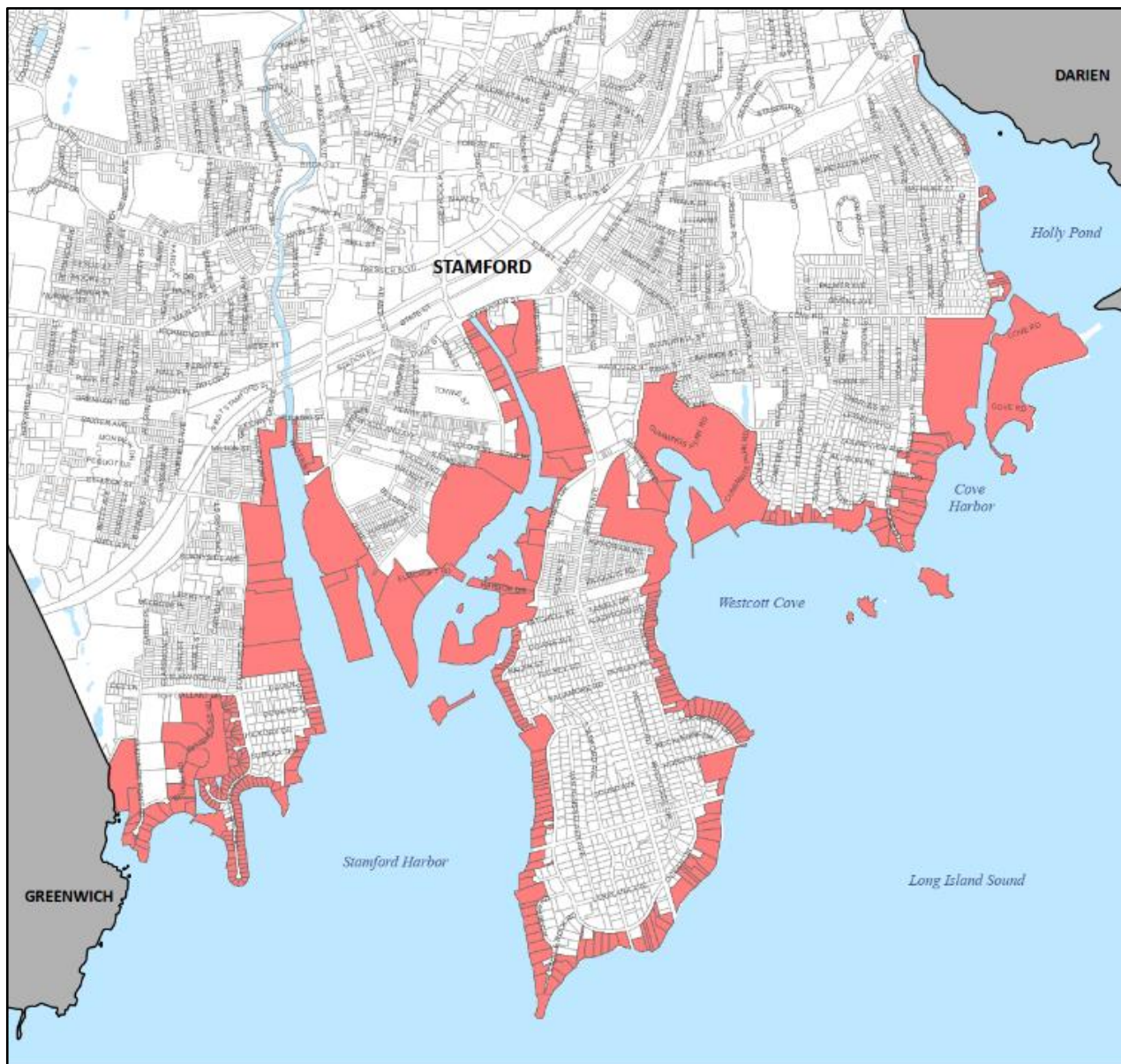
Draft – January 2017

This document has been established pursuant to the requirements of Sections 305(b) and 303(d) of the Federal Clean Water Act

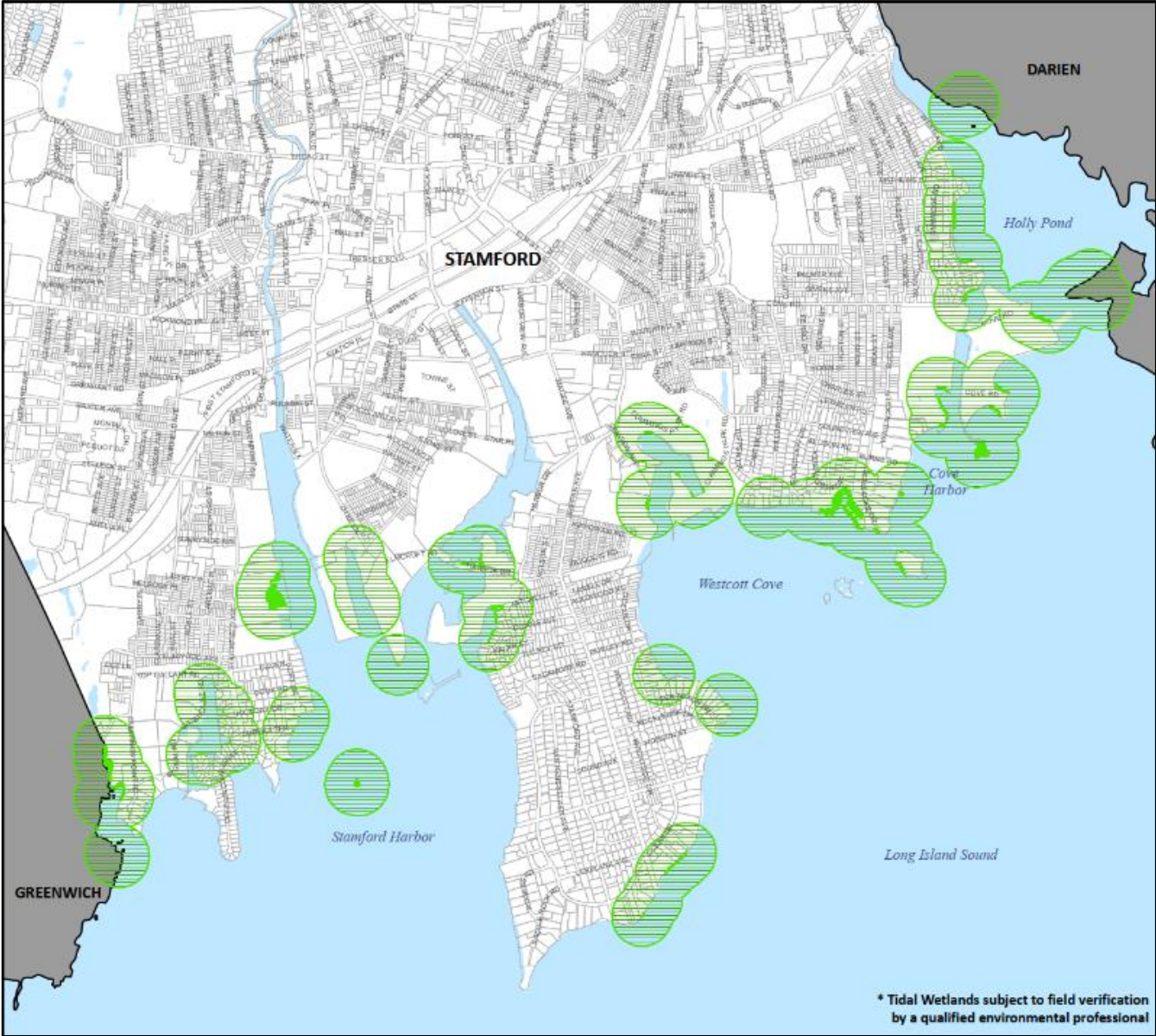




# Key Manual Concepts – Direct Waterfront



# Key Manual Concepts – Tidal Wetlands



# Applicability

- **The stormwater management standards apply to all new development, redevelopment, and other land disturbance activities, whether considered individually or collectively as part of a larger common plan, unless exempted**



# Exemptions

- **Projects creating less than 400 square feet of new impervious area**
  - Subject to 10-year cumulative review and residential “teardowns” may not claim exemption
  - Additional requirements:
    - *No adverse impact to adjacent or downstream properties*
    - *No proposed new or increased discharges to high quality waters, stormwater impaired waters, or to or within 500 feet of a tidal wetland, or on direct waterfront*
    - *Subject to submission and approval of exemption request form*
- **Utility construction that does not alter terrain, ground cover, or drainage patterns**



# Modification Requests

- **Must be made in writing and provide documentation to justify request**
- **Modifications to stormwater management standards need to be based on physical site or environmental factors**



- **Engineering Bureau may:**
  - **Grant the request in part or full**
  - **Deny the request**
  - **Refer request for third party review (cost paid by applicant)**

# Stormwater Management Standards

---

# Stormwater Management Standards



**Standard 1 – Runoff and Pollutant Reduction**



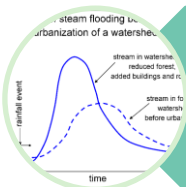
**Standard 2 – Peak Flow Control**



**Standard 3 – Construction Erosion and Sediment Control**



**Standard 4 – Operation and Maintenance**

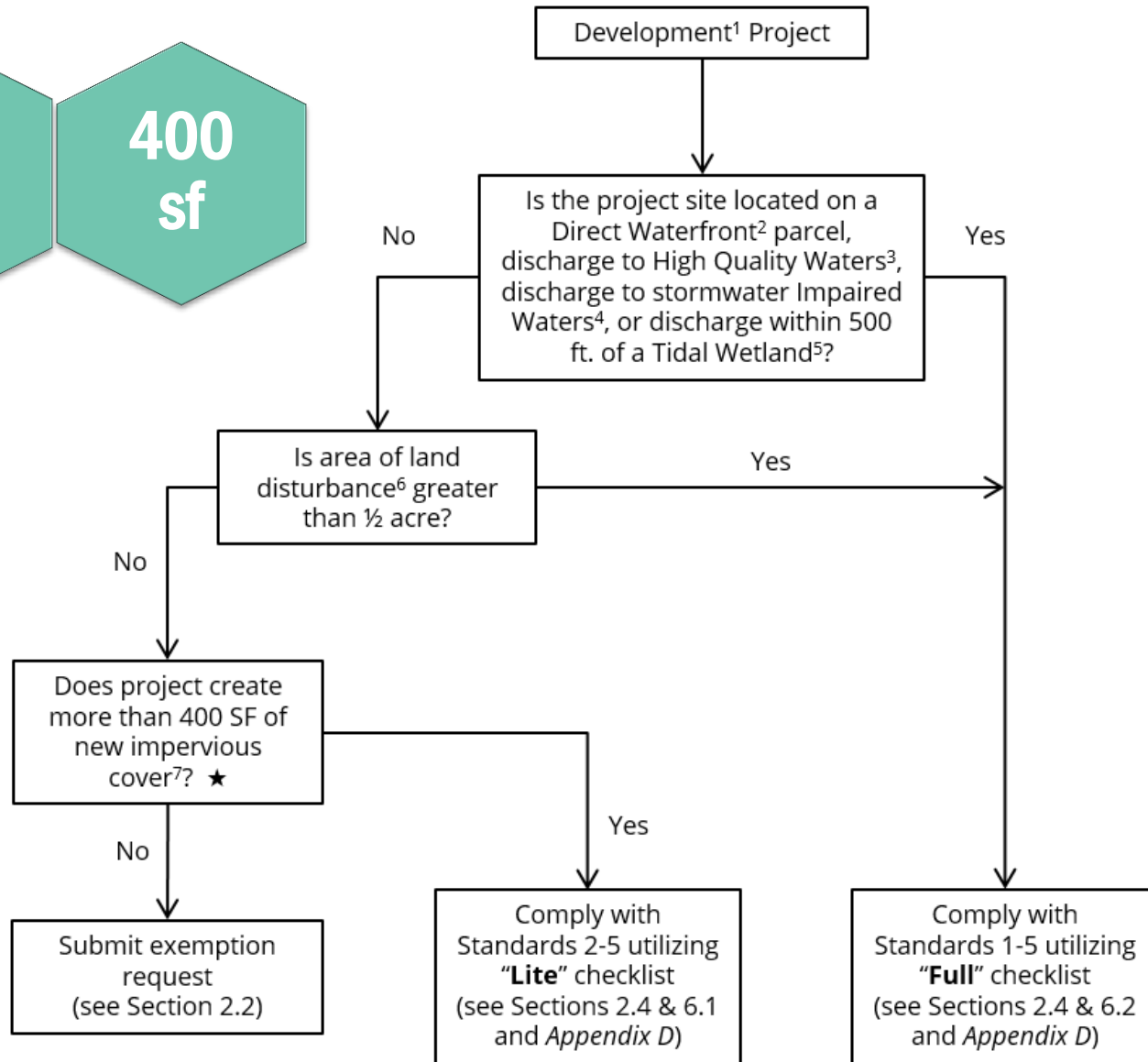


**Standard 5 – Stormwater Management Report**

# Standard Applicability Flowchart

1/2  
ac.

400  
sf





# Standard 1 – Runoff and Pollutant Reduction

- Volumetric standard (WQV) based on retention or treatment

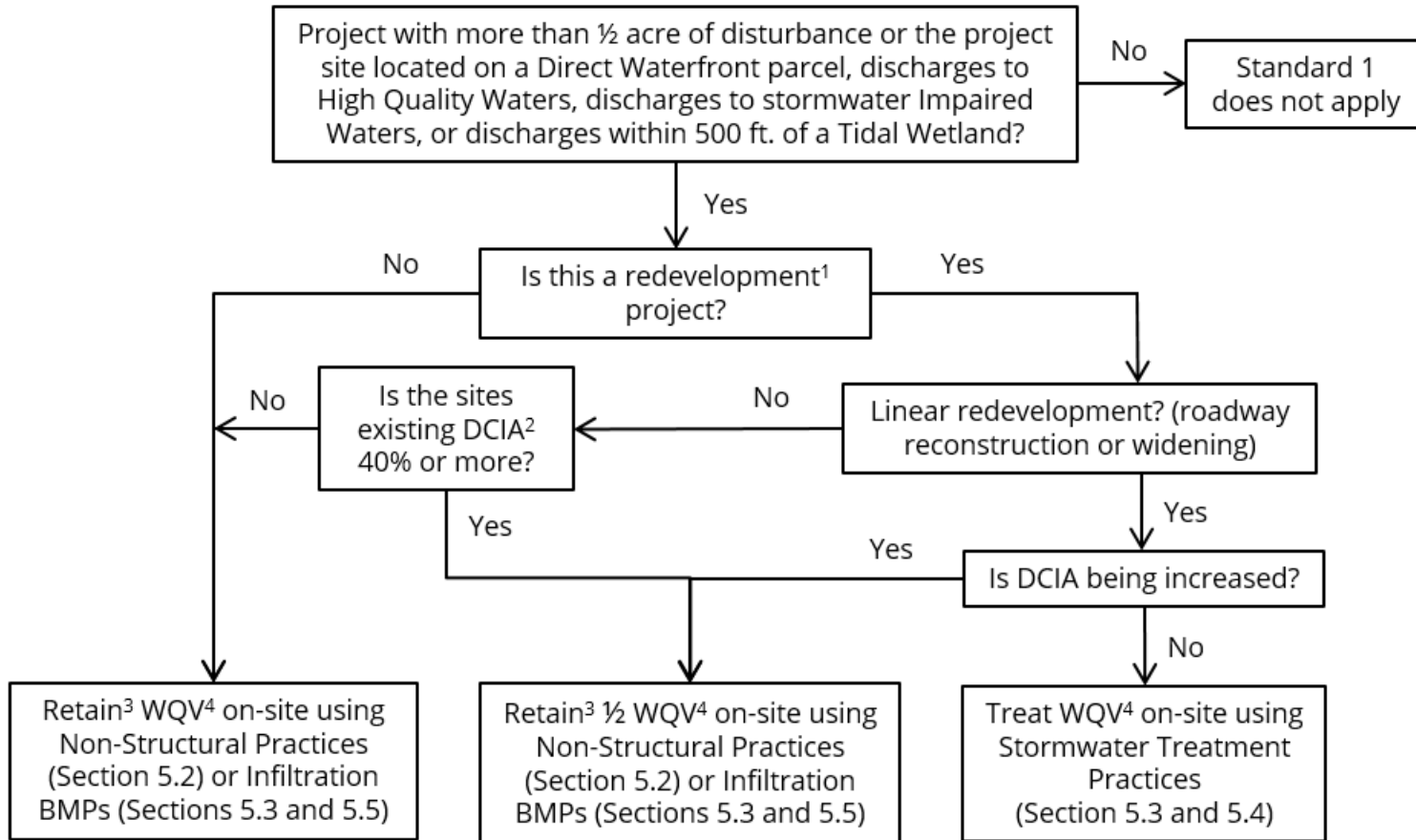
New Development/Redevelopment  
DCIA <40%  
Retain WQV

Redevelopment with  
DCIA  $\geq$  40%  
Retain  $\frac{1}{2}$  WQV

Linear Development  
Retain  $\frac{1}{2}$  WQV or Treat WQV



# Standard 1 Flow Chart



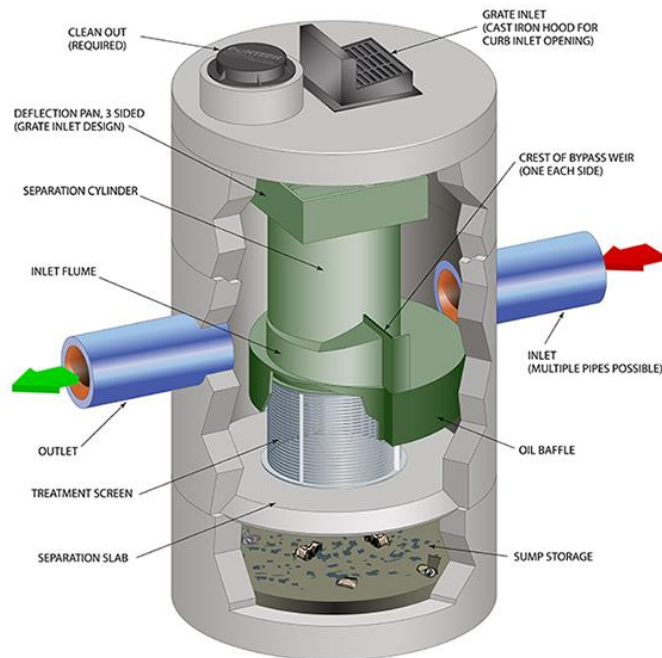
# Unable to Meet Standard 1?

- **Projects that are unable to meet the retention standard must provide retention to the “maximum extent achievable” and provide treatment for the remaining WQV**
- **Factors that might impede the projects ability to meet the retention standard include:**
  - **Brownfield sites**
  - **Capped landfills**
  - **High bedrock or ledge**
  - **High groundwater**
  - **Poor soils**
- **Applicant must submit written report detailing site specific limiting factors and what measures were taken to satisfy “maximum extent achievable”. Subject to approval by the Engineering Bureau.**



# Standard 1 – Parking

- Stormwater treatment is required for any new or improved parking lot with 6 or more spaces.
- Existing parking lots with 6 or more spaces must retrofit with stormwater treatment when seeking an approval or permit from the City



# Standard 2 – Peak Flow Control

- **Consistent with requirements from Connecticut Stormwater Quality Manual**
- **Stream channel protection**
  - **2-year post-development  $\leq$  50% of 2-year pre-development (or)**
  - **2-year post-development  $\leq$  1-year pre-development**



<b>Peak Flow Control</b>	<p><b>Stream Channel Protection</b> Control the 2-yr, 24-hour post-development peak flow rate to 50 percent of the 2-yr, 24-hr pre-development level or to the 1-yr, 24-hr pre-development level ("Two-Year Over-Control").</p> <p><b>Conveyance Protection</b> Design the conveyance system leading to, from, and through stormwater management facilities based on the 10-year, 24-hour storm.</p> <p><b>Peak Runoff Attenuation</b> Control the post-development peak discharge rates from the 10-, 25-, and 100-year storms to the corresponding pre-development peak discharge rates, as required by the local review authority.</p> <p><b>Emergency Outlet Sizing</b> Size the emergency outlet to safely pass the post-development peak runoff from, at a minimum, the 100-year storm in a controlled manner without eroding the outlet works and downstream drainages.</p>
--------------------------	--

# Standard 2 – Peak Flow Control

- **Peak Flow Control**
  - **Control the 1-year, 2-year, 5-year, 10-year, 25-year, and 50-year post-development flows**
  - **100-year storm at discretion of Engineering Bureau**



Source: WFSB

# Standards 3 & 4

## Standard 3 – Construction Erosion and Sediment Control

- Consistent with current City regulations
- Plan must be submitted with stormwater management plan



## Standard 4 – Operations and Maintenance

- Execute City Drainage Maintenance Agreement
- Construction plans must include required inspections, maintenance tasks, and schedule



# Standard 5 – Stormwater Management Report

- **Any project subject to drainage manual must submit a stormwater management report**
  - Document compliance with manual
  - Stamped by a PE licensed in Connecticut
  - Consistent with Section 6 of the Manual
- **Report content is based on standard applicability (checklists)**
  - “Lite”: Standards 2 – 5
  - “Full”: Additional documentation for Standard 1
- **Must include certification statement:**

“Based on the above information, the proposed improvements are designed in accordance with the City of Stamford Stormwater Drainage Manual and will not adversely impact adjacent or downstream properties or City-owned drainage facilities.”



# Certificate of Occupancy

- **After project completion, need the following to get CO:**
  - **Final Improvement Location Survey**
  - **Signed and Stamped Stormwater Management Certification Form**
  - **Signed and Certified DCIA Tracking Worksheet**
  - **City of Stamford Drainage Maintenance Agreement**
  - **Connection to City-owned storm drain requires Waiver Covering Storm Sewer Connection must be filed**
  - **Site Specific Requirements (if necessary)**
  - **Final Inspection by Engineering Bureau**