



RIDOT's Stepwise Approach for Integrating Stormwater Mitigation into Capital Improvement Projects

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Presentation Overview

- 1. Background
- 2. Objectives & Overview
- 3. Study & Development of Stormwater Management
- 4. Final Design
- 5. Questions?







Background

Stormwater Design – Rhode Island

RUNOFF \implies TREATMENT (RI SW RULES) \implies WATERBODY





USEPA & RIDOT Consent Decree

CONSENT DECREE

STORMWATER CONTROL PLANS (SCPs)

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UNITED STATES OF AMERICA)	
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STUs (BMPs)





RIDOT's Approach

• Include stormwater mitigation as part of transportation projects vs. constructing independent water quality retrofit projects





RI Stormwater Rules & Consent Decree

RI SW RULES

CONSENT DECREE



Maximum Extent Practicable

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Plaintiff, v. CIVIL ACTION NO PRODE ISLAND DEPARTMENT OF TRANSPORTATION, Defendant.	UNITED STATES OF AMERICA,	
v. (CIVIL ACTION NO TRANSPORTATION, Defendant.	Plaintiff,	Ś
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RI Stormwater Rules vs. Consent Decree

RI STORMWATER RULES



CONSENT DECREE





BMP Selection





RIDOT Work Breakdown Structure (WBS)

WBS Code	WBS Description
1	Study & Development
1.01	Project Management
1.02	Preparation of Base Mapping
1.03	Analysis of Existing Conditions
1.04	Traffic and Safety Analysis
1.05	Site Contamination Assessments (Non-Analytical)
1.06	Cultural Resources Section
1.07	Landscape Architecture
1.08	Conceptual Highway Plans
1.09	Bridge Evaluation and Report
1.10	NEPA Documentation
1.11	Wetland & Water Quality Pre-Permitting Coordination
1.12	Preliminary Right-of-Way (ROW)
1.13	Preliminary Subsurface Exploration
1.14	Storm Water Management
1.15	Bridge Type Study Report
1.16	Design Study Report
1.17	Highway/Traffic Plans & Profiles (Selected Alternative)
1.18	Bridge Plans of Selected Alternative
1.19	Utilities
1.20	Value Analysis



Objectives & Overview

Objectives of the RIDOT Linear SW Manual

- 1. Provide a clear, predictable & repeatable approach
- 2. Simplify relationship between RIDOT work breakdown structure & stormwater design
- 3. Standardize stormwater infrastructure & maintenance
- 4. Resolve differing requirements between Consent Decree & RI Stormwater Rules
- 5. Define stormwater treatment goals



Timeline





Stakeholders



REGULATORY AGENCIES US Environmental Protection Agency (USEPA) RI Dept. of Environmental Management (RIDEM) Coastal Management Resources Council (CRMC)











Study & Development of Stormwater Management

Identify Pavement Reduction Opportunities & Disconnected Areas





• Utilize Worksheet A to identify the treatment goal for each Waterbody ID.

WATERBODY INFORMATION

PRE & POST IMPERVIOUS SURFACE AREAS

TREATMENT GOAL

Treatment Goal					
			dor		
ocation: Mun	icipality:				
aded boxes.					
Project Information	Stormw	ater Treatment Inform	nation		
ep 5.1(b), Enter waterbody ID (WBID) per me DEM GIS Map Room.					
ep 3.1(b): Enter waterbody name per the DEM GIS Map Room.					
ep 3.1(c): Is the WBID impaired per the DEM 303(d) List of Impaired Waters?					
concern. Enter N/A if none.					
ep 3.1(d) is there an SCP for the WBID?					
the Waterbody (ft ²) btal Disturbed ⁸ Existing Impervious Area Contributin					
the Waterbody (ft ²)					
and/or Reclamation Area (ft ²)					
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Pre-Release Version: February 2019







- Identify Site Conditions
- Identify Soil Conditions
- Identify Potential Locations for BMPs



RHODE ISLAND GEOGRAPHIC INFORMATION SYSTEM





fUSS&O'NEILL

• Can the treatment goal be met with Filter Strips?







• Can the treatment goal be met with upgrading existing BMPs?







• Tier 1 & Tier 2 BMPs



<image>

LINER & UNDERDRAIN

SECTION A-A

TIER 2

FUSS & O'NEILL

INFILTRATION

• Can the treatment goal be met with Tier 1 BMPs inside the project limits?







• Can the treatment goal be met with Tier 1 BMPs outside the project limits and/or Tier 2 STUs inside the project limits?







Documentation

• Utilize Worksheet B to document compliance with the treatment goal.



dor

WATERBODY ID

TREATMENT GOAL

BMP TREATMENT VOLUMES



roject ID: Location:						
in u	nshaded boxes.					
	Project Information	Stormwater Treatment Information				
А	Waterbody ID (WBID)					
в	Total Stormwater Treatment Goal (ft ³)	0	0	0		
с	Step 4.1: Total Volume to Filter Strips (ft ³)					
D	Step 4.2: Total Volume of Stormwater Treated by Upgrading Existing STUs (ft ³)					
E	Step 4.3: Total Volume of Stormwater Treated by Tier 1 STUs Inside the Project Limits (ft ³)					
F	Step 4.4: Total Volume of Stormwater Treated by Tier 2 STUs Inside the Project Limits (ft ³)					
G	Step 4.4: Total Volume of Stormwater Treated by Tier 1 STUs Outside the Project Limits (ft ³)					
н	Total Volume of Stormwater Treated (ft ³) = Sum of Items in Step 2	0	0	0		
Т	Total Volume ⁴ of Remaining Stormwater Requiring Treatment (fi ³) = (B) - (H)	0	0	ò		
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PART 2 (treatment deficit only)

Worksheet B: Treatment Provided by STUs

Prepared By:

Date

Attach justification to this worksheet for treatment deficit. Utilize the STU Selection Tool as a basis for this justification. This tool is available on the RIDOT Stormwater Page.

Pre-Release Version: February 2019



Documentation

• Utilize STU Selection Tool to justify treatment goal cannot be met.



STUs (BMPs)

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No Fermentero ho Prict de 11 x 17 landscape		Infiluation Resin & Tranch (Tier 1 STU)	Bioretention Resin, Carb Inlet Planter & Swale (Tier 1STU)	Tree Filter & Tree Filter with Storage (Tier 1STU)	Filter Strip (Tier 1 STU)	Sand Filter [Tire 1 STU]	Porcus Persenant with Storage (Tier 1 STU)	Underground Infiltration, Infiltration Gutter & Leaching Resin (Tier 2 STU)	Bioretentinii Perking Lane Adjacent & Curb Patencian Pleater (Tier 2 STU)	Gravel Wetland (WVTS) (The 2 STU)	Perous Pavement (Taw 2 STU)	Intentionally Left Blank	Intentionally Left Blar
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Documentation

• Utilize STU Selection Tool to justify treatment goal cannot be met.



		Infiltration Basin & Trench (Tier 1 STU)	Bioretention Basin, Curb Inlet Planter & Swale (Tier 1 STU)	Tree Filter & Tree Filter with Storage (Tier 1 STU)
Practicability Constraints	Response			*1
LUHPPL - Will run-on include discharge from a LUHPPL?	● Yes ○ No	Not Practicable	Available as Tier 2 with Liner & Underdrain	Available as Tier 2 with Liner & Underdrain
Contamination - Is the STU site regulated by RIDEM's Office of Waste Management?	● Yes ○ No	Available with RIDEM OWM Approval	Available with RIDEM OWM Approval or as Tier 2 with Liner & Underdrain	Available with RIDEM OWM Approval or as Tier 2 with Liner & Underdrain
Limited Access - Does the site fail to meet the maintenance access requirements specified in the Linear Manual?	● Yes ○ No	Not Practicable	Not Practicable	Not Practicable



Objectives of the RIDOT Linear SW Manual

- Provide a clear, predictable & repeatable approach
- Simplify relationship between RIDOT work breakdown structure & stormwater design
- Standardize stormwater infrastructure & maintenance
- Resolve differing requirements between
 Consent Decree & RI Stormwater Rules
- ✓ Define stormwater treatment goals



Final Design

Design Sections

- Pretreatment*
- Inlet & Outlet Controls*
- BMPs*
- Maintenance
- Upgrading BMPs
- Vegetation
- Utility Management



BMP Design Sections





Maintenance

Underground Infiltration







Questions?

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