



Using the Updated *RI Soil Erosion and Sediment Control Handbook*

**The Introductory Workshop for RIDEM/CRMC Staff
January 23, 2015**



THE
UNIVERSITY
OF RHODE ISLAND
COOPERATIVE
EXTENSION
RI NEMO





URI Cooperative Extension NEMO



URI Cooperative Extension NEMO



White Oak, estimated age 100-150 yrs. Photo: David Schwartz 1996



David Schwartz,



David Schwartz,



David Schwartz,



David Schwartz,



Photos: Jim Turenne



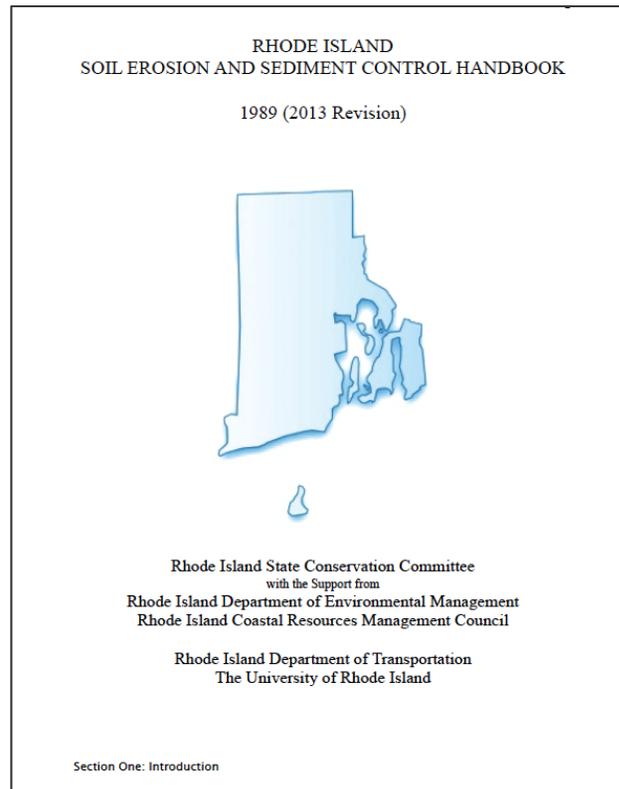
Residential lot < 1 acre,
drain discharging to Bay,
class A waters. 2011





Photos: URI Cooperative Extension NEMO

Storm drains clogged with sediment from construction activity ~ 2009



URI Cooperative Extension is assisting in the development of this training thanks to funding provided by DOT under the Storm Water Phase II Education Project.



New Handbook Features

Lorraine Joubert
URI Cooperative Extension, NEMO



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Handbook Table of Contents

SECTION ONE: INTRODUCTION

SECTION TWO: SITE PLANNING AND MANAGEMENT



SECTION THREE: POLLUTION PREVENTION AND GOOD HOUSEKEEPING



SECTION FOUR: EROSION CONTROL MEASURES

SECTION FIVE: RUNOFF CONTROL MEASURES

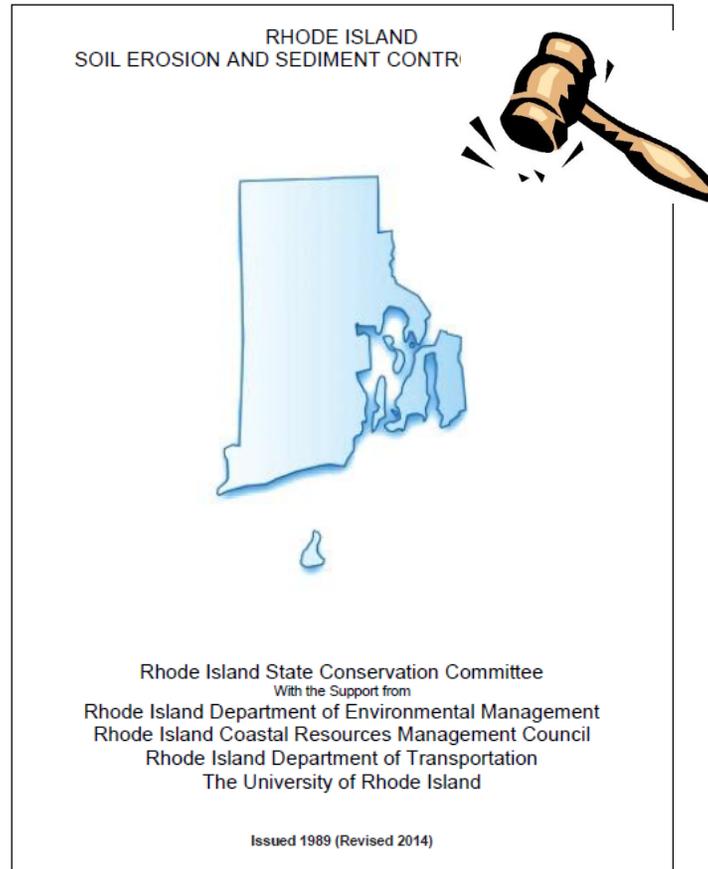
SECTION SIX: SEDIMENT CONTROL MEASURES

Many new or updated measures, organized by process

SECTION SEVEN: APPENDICES

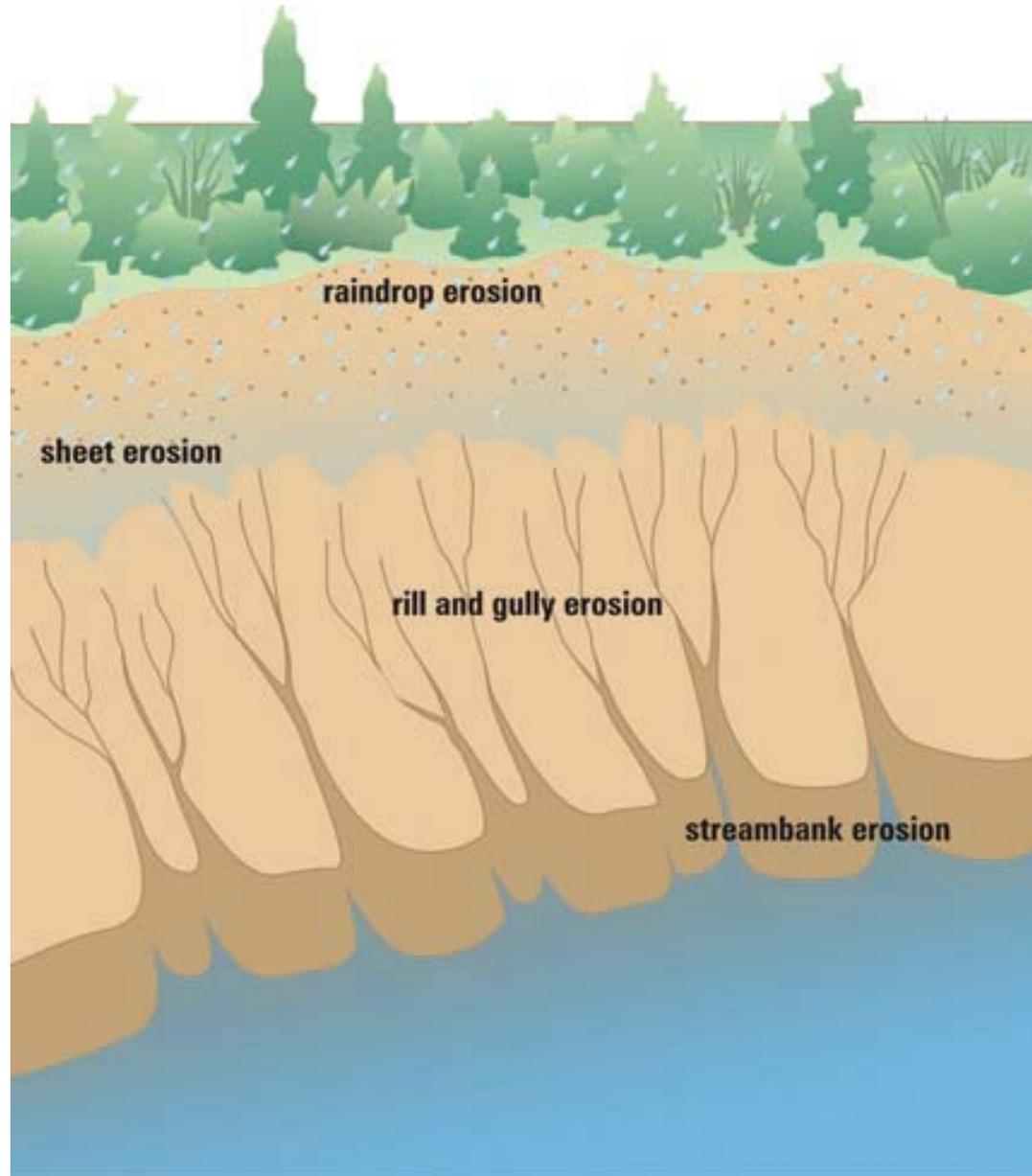
Section One: Introduction

Part A. About This Handbook



Section One: Introduction

Part B. Erosion and Sediment Pollution

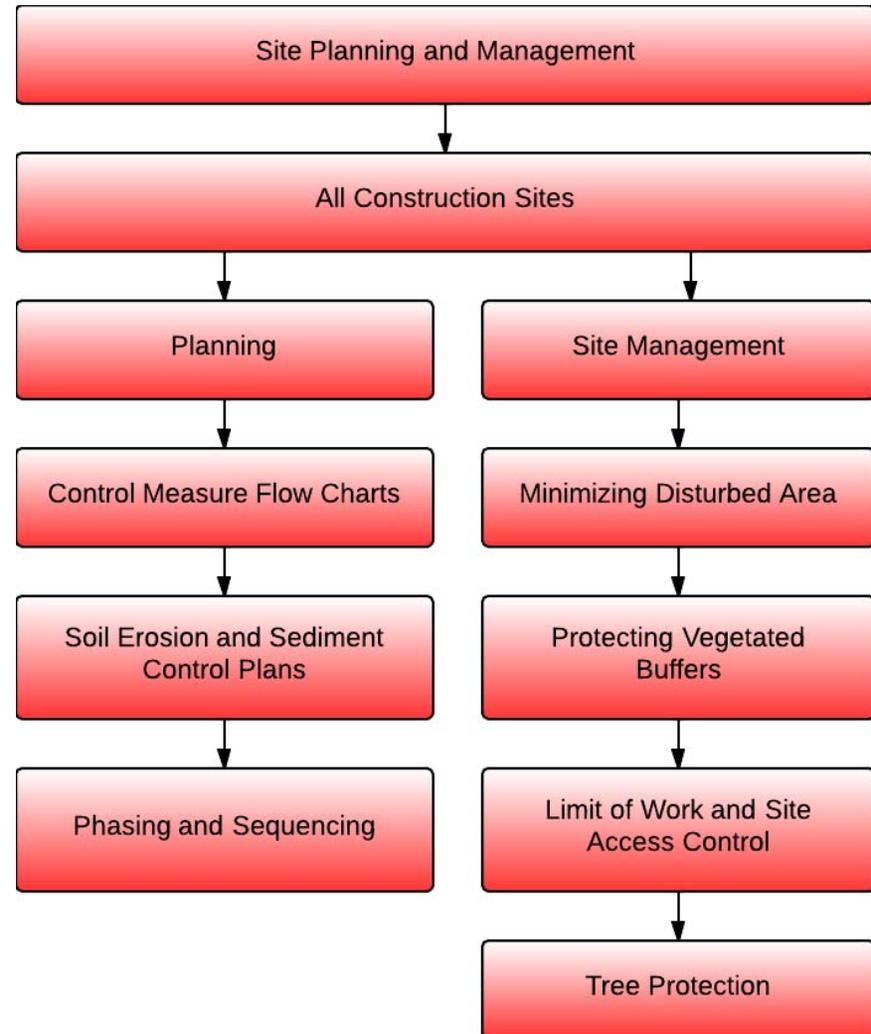


Section Two: Site Planning and Management

Part C. Control Measures

Part D. Soil Erosion and Sediment Control Plan Criteria

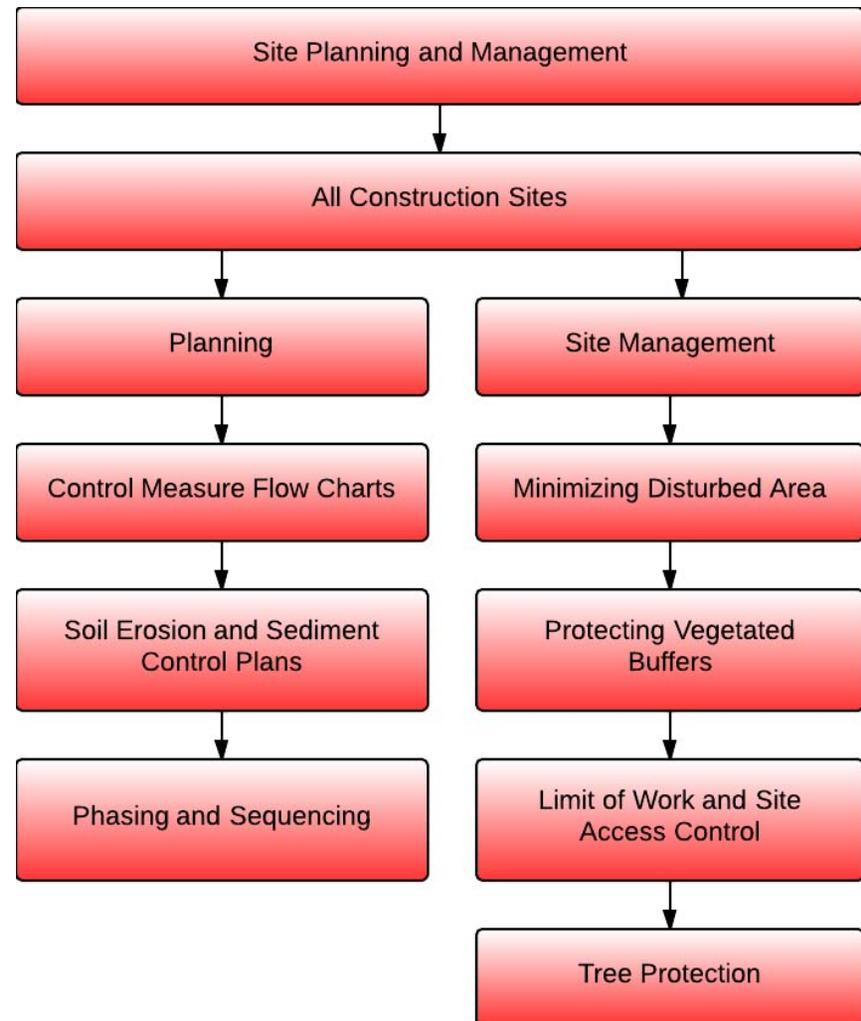
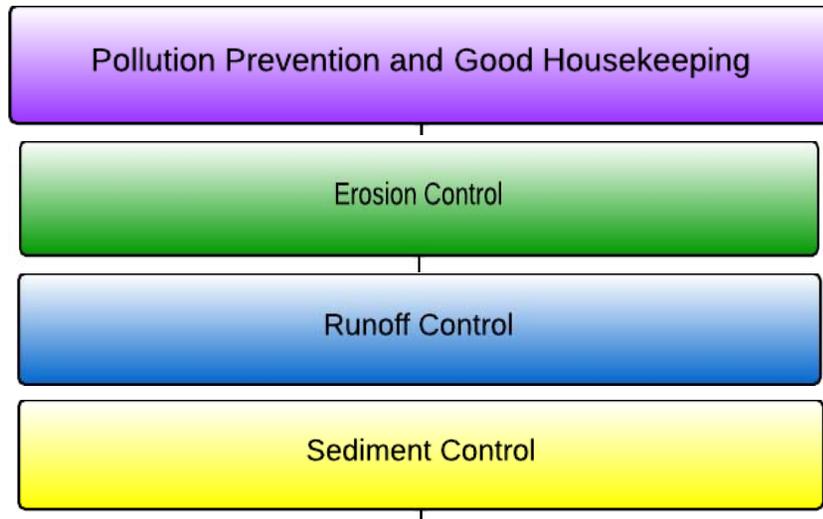
Part E. Construction Phasing and Sequencing



Section Two: Site Planning and Management

Part C. Control Measures Selection Guide

Includes 5 decision charts, one for each handbook section.



Section Two: Site Planning and Management

Part D. Soil Erosion and Sediment Control Plans

- Establishes 15 Performance Criteria for SESC plans.



- Required under Stormwater Manual Minimum Standard 10

1. Avoid and Protect Sensitive Areas and Natural Features
2. Minimize Area of Disturbance
3. Minimize the Disturbance of Steep Slopes
4. Preserve Topsoil
5. Stabilize Soils
6. Protect Storm Drain Inlets
7. Protect Storm Drain Outlets
8. Establish Temporary Controls for the Protection of Post-Construction Stormwater Treatment Practices
9. Establish Perimeter Controls and Sediment Barriers
10. Divert or Manage Run-on from Up-gradient Areas.....11, 13, 14,

Section Two: Site Planning and Management

Part E. Construction Phasing and Sequencing

Phasing is used to reduce the amount of soil disturbed at one time.

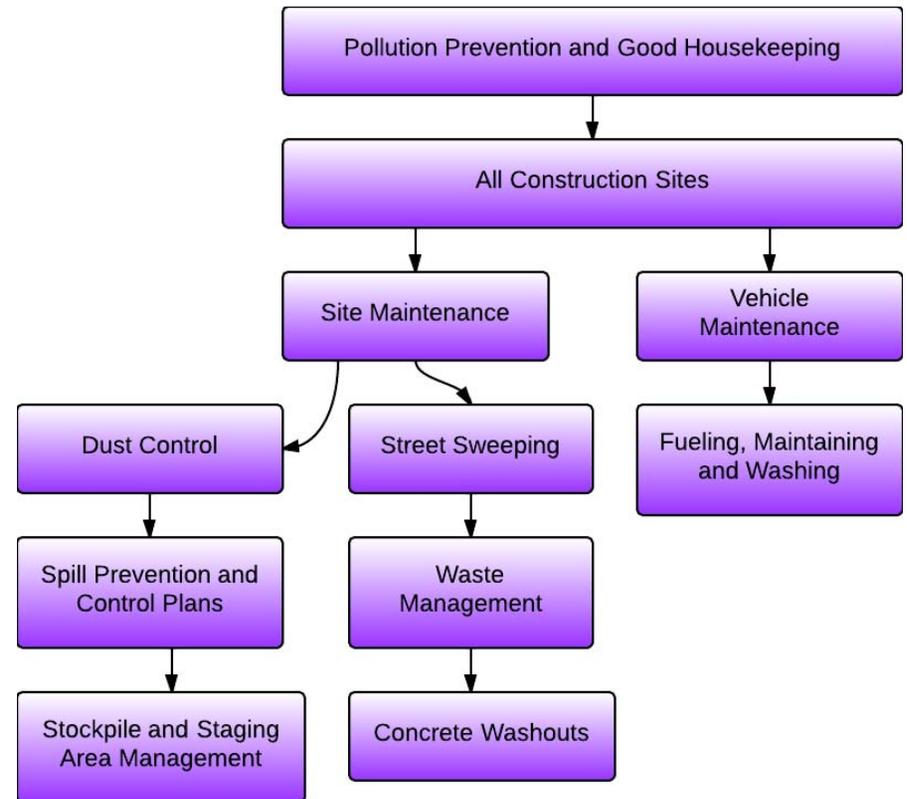
Construction is completed and soils are stabilized on one part of the site before grading and construction commence at another part.



(Photo Credit: Douglas County, CO)

Section Three: Pollution Prevention and Good Housekeeping

- **Minimizing Disturbed Area: Preserving Soils & Vegetation**
- **Protecting Vegetated Buffers**
- **Limit of Work and Site Access Control**
- **Tree Protection**
- **Dust Control**
- **Spill Prevention and Control Plan**
- **Stockpile and Staging Area Management**
- **Street Sweeping**
- **Waste Management**
- **Concrete Washout**
- **Vehicle Fueling, Maintenance and Washing**

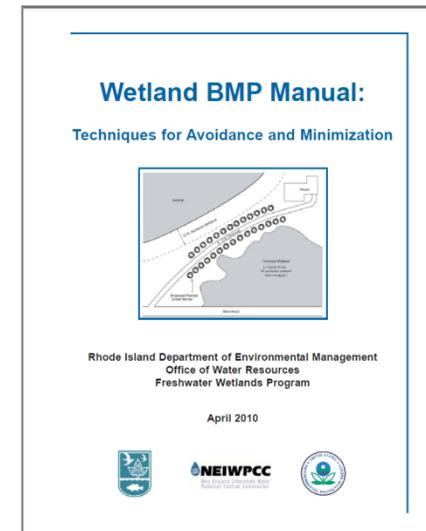


Section Three: Pollution Prevention and Good Housekeeping

- **Minimizing Disturbed Area: Preserving Soils & Vegetation**
- **Protecting Vegetated Buffers**
- **Limit of Work and Site Access Control**
- **Tree Protection**

LID Site Management measures to **Avoid and Minimize** Impacts

- **Dust Control**
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Section Three: Pollution Prevention and Good Housekeeping

- **Dust Control**
- **Spill Prevention and Control Plan**
- **Stockpile and Staging Area Management**
- **Street Sweeping**
- **Waste Management**
- **Concrete Washout**
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Section Four: Erosion Control Measures

- Mulching
- **Soil Preparation and Topsoiling**
- Seeding for Temporary Vegetative Cover

- Seeding for Permanent Vegetative Cover
- Sodding

- Landscape Planting

- **Land Grading**

- Retaining Walls

- Slope Protection

- Surface Roughening

- **Branch Packing**

- **Brush Layering**

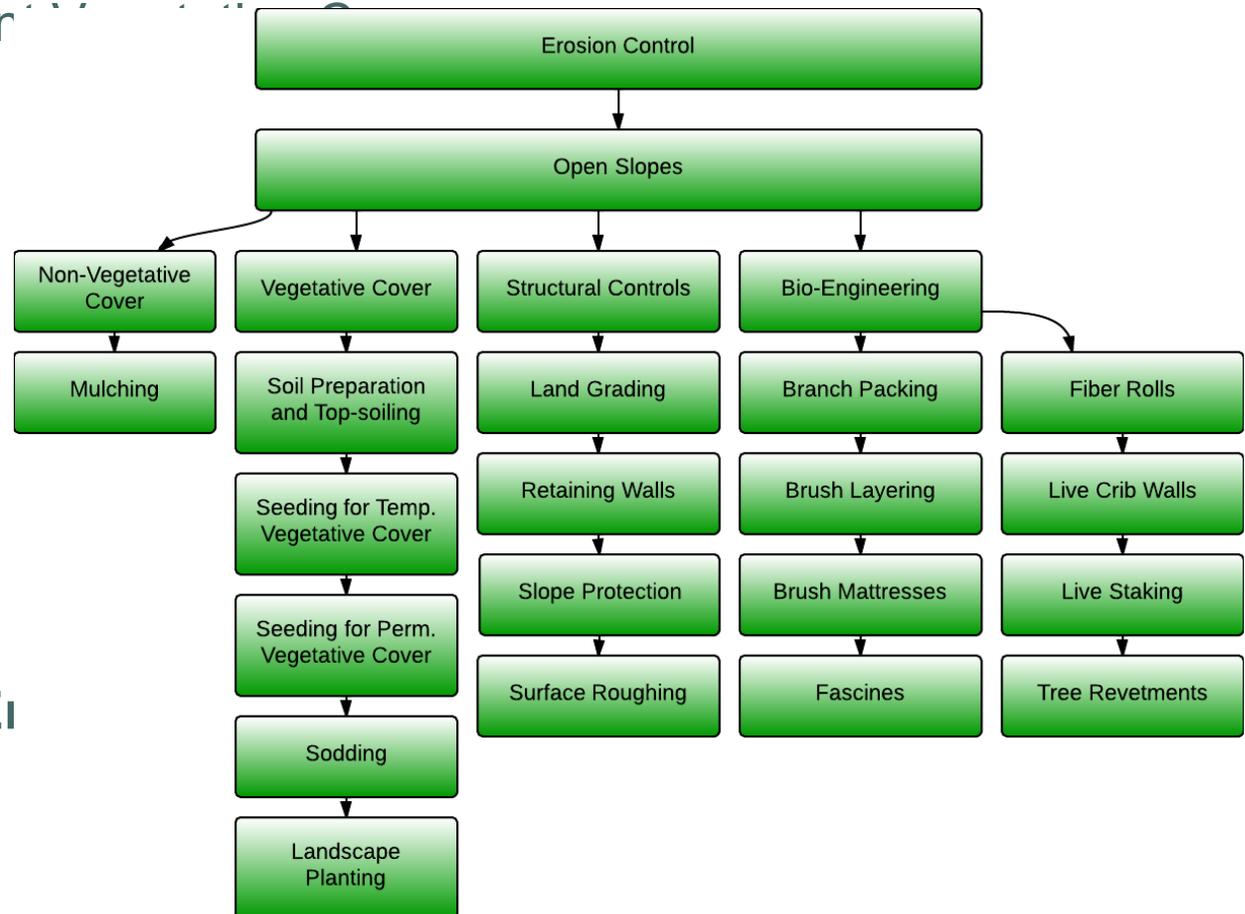
- **Brush Mattresses**

- **Fascines**

- **Fiber Rolls for Bio-Er**

- **Live Crib Walls**

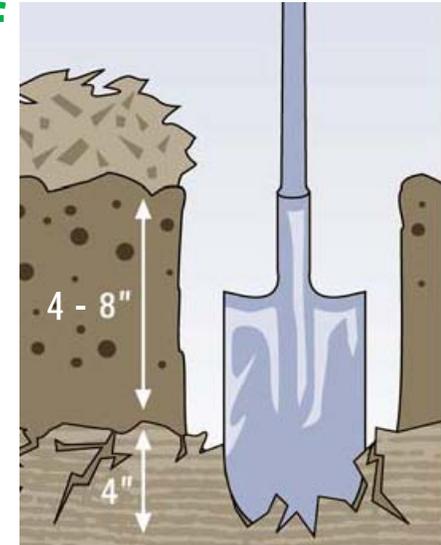
- **Live Staking**



Section Four: Erosion Control Measures

- Mulching
- **Soil Preparation and Topsoiling** →
- Seeding for Temporary Vegetative Cover
- Seeding for Permanent Vegetative Cover
- Sodding
- Landscape Planting
- **Land Grading**
- Retaining Walls
- Slope Protection
- Surface Roughening
- **Branch Packing**
- **Brush Layering**
- **Brush Mattresses**
- **Fascines**
- **Fiber Rolls for Bio-Engineering**
- **Live Crib Walls**
- **Live Staking**

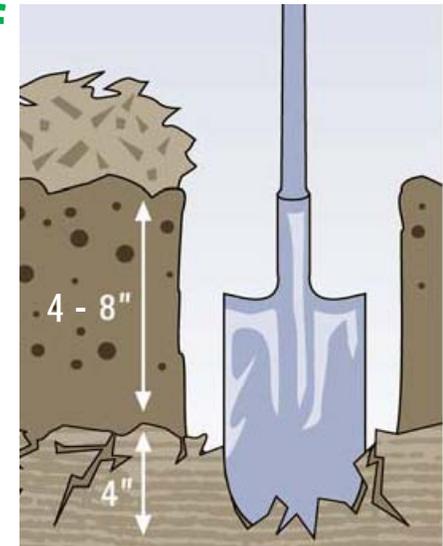
Restore compacted soils. Provide adequate depth and quality of



Section Four: Erosion Control Measures

- Mulching
- **Soil Preparation and Topsoiling** →
- Seeding for Temporary Vegetative Cover
- Seeding for Permanent Vegetative Cover
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- **Live Staking**

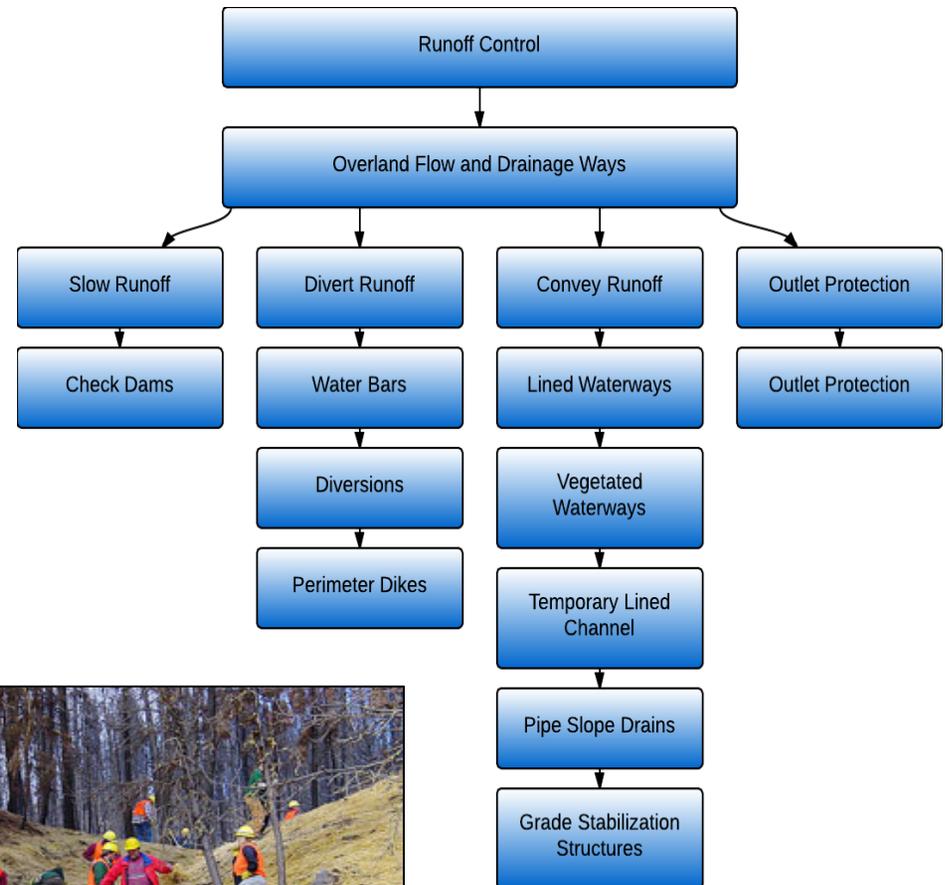
Restore compacted soils. Provide adequate depth and quality of



Bioengineering for stream restoration

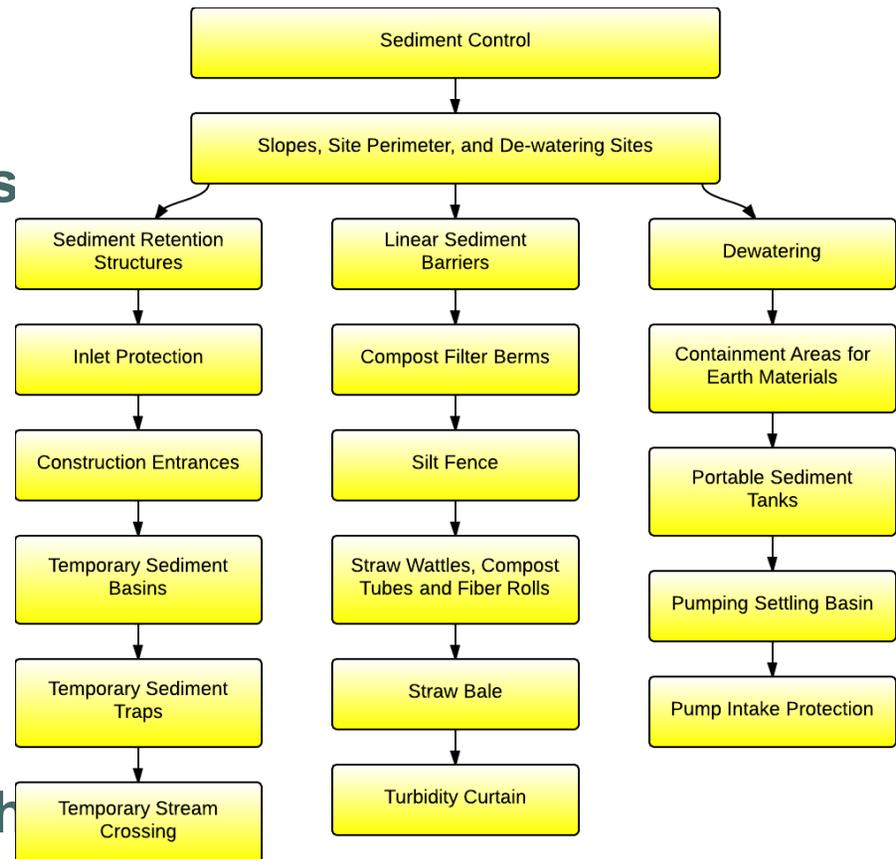
Section Five: Runoff Control Measures

- Check Dams
- **Water Bars**
- Diversions
- **Perimeter Dikes**
- Lined Waterways
- Vegetated Waterways
- **Temporary Lined Channel**
- **Pipe Slope Drains**
- Grade Stabilization Structures
- Outlet Protection



Section Six: Sediment Control Measures

- **Inlet Protection**
- Construction Entrances
- **Temporary Sediment Basins**
- **Temporary Sediment Traps**
- Temporary Stream Crossings
- **Compost Filter Berms**
- Silt Fence
- **Straw Wattles, Compost Tubes and Fiber Rolls**
- **Straw Bale**
- Turbidity Curtains
- **Containment Areas for Earth Materials**
- **Portable Sediment Tanks and Bags**
- **Pumping Settling Basins**
- **Pump Intake Protection**



Section Six: Sediment Control Measures

- **Inlet Protection**
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- **Temporary Sediment Basins**
- **Temporary Sediment Traps**
- Temporary Stream Crossings
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- Silt Fence
- **Straw Wattles, Compost Tubes and Fiber Rolls**
- **Straw Bale – limited application**
- Turbidity Curtains
- **Containment Areas for Earth Materials**
- **Portable Sediment Tanks and Bags**
- **Pumping Settling Basins**



Hay Bale

Appendices

- Appendix A. Glossary
- Appendix B. Model Ordinance: Erosion and Sediment Control
- **Appendix C. Request Form to Submit Updates to the Handbook**
- **Appendix D. Subscription for Updates and other Notices for the Handbook**
- **Appendix E. Model SESC Plan Templates**
- Appendix F. Site Constraint Maps
- **Appendix G. Spill Prevention, Control and Countermeasures Plans (SPCCP)**
- Appendix H. Soil Classification Systems
- Appendix I. Revised Universal Soil Loss Equation -- RUSLE2
- **Appendix J. Chemical Treatment for Erosion and Sediment Control**
- **Appendix K. Turf Reinforcement Mats**
- **Appendix L. Riprap**
- **Appendix M. Gabions**
- **Appendix N. Erosion Control Blankets (ECBs)**
- **Appendix O. Earth Fill**

Soil Erosion and Sediment Control Plan				
For:				
Project Name				
Project Site Location/Address				
City, State, Zip Code				
Assessor's Plat and Lot Number				
<hr/>				
Owner:	Louis Allen D'Agostino 37 Sanderson Rd. Smithfield, RI 02917 (401) 949-3271			
	<table border="1"><tr><td style="text-align: center;">Environmental Management</td></tr><tr><td style="text-align: center;">OCT 31 2014</td></tr><tr><td style="text-align: center;">Office of Water Resources</td></tr></table>	Environmental Management	OCT 31 2014	Office of Water Resources
Environmental Management				
OCT 31 2014				
Office of Water Resources				
<hr/>				
Operator:	John Rocchio 20 Lark Industrial Parkway Smithfield, RI 02928 401-949-5920			
<hr/>				
Estimated Project Dates:	Start Date: Start Date			
	Completion Date: End Date			
<hr/>				
SESC Plan Prepared By:	Hudson Place Associates Civil and Environmental Engineering 91 Carriage Dr. Warwick, RI 02886 Attention: Peter Alviti Jr., P.E. 401-821-6600 info@hudsonplaceassociates.com			
<hr/>				
SESC Plan Preparation Date:	September 2014			
<hr/>				
Revision Date: 01/09/2014				

Appendices

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- Appendix M. Gabions
- Appendix N. Erosion Control Blankets (ECBs)
- Appendix O. Earth Fill

**Next steps –
Update! Use
Appendix C and
Send your
comments to
Beverly Migliore
DEM Water
Resources.**





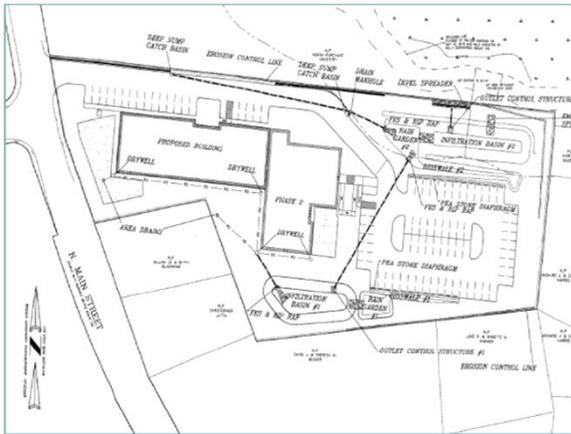
Clear, Consistent, & Predictable Rules
Unifying State Regulations and Local Ordinances for Better Outcomes

Eric Beck
Supervisor, RIDEM RIPDES Permitting Program



Who Should Use the Handbook?

Designers



Municipal Officials



Property Owners



Regulatory Reviewers

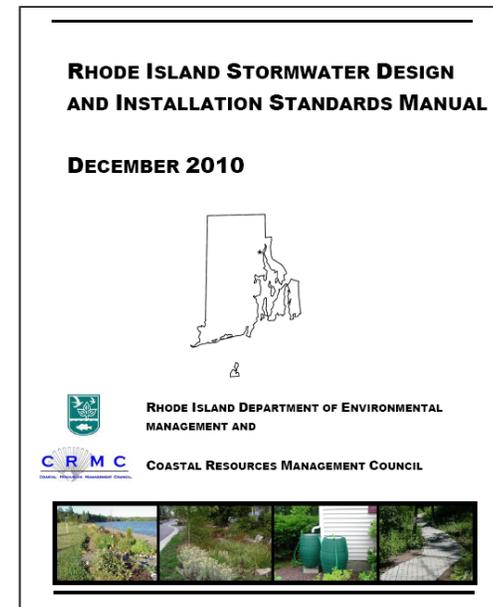


Enabling Legislation for State Regulations and Local Ordinances

- Rhode Island General Law, Section 45, Chapter 61.2, entitled “The Smart Development for a Cleaner Bay Act of 2007” required DEM and CRMC to amend the 1993 Stormwater Design and Installation Standards Manual.
- *RIGL 45-61.2-2(b) passed in the 2012 allows communities to adopt the stormwater manual as local requirements: ordinances may require compliance with the Rhode Island Stormwater Design and Installation Standards Manual for any development, redevelopment, or land disturbance.
- In accordance with the RIPDES MS4 General Permit , Ms4s have adopted a local ordinances that references the RISDISM and RI SESC Handbook(as amended)

The Stormwater Manual Established Eleven (11) Stormwater Management Design Standards

1. LID Site Planning and Design
2. Groundwater Recharge
3. Water Quality
4. Conveyance and Channel Protection
5. Overbank Protection
6. Redevelopment Projects
7. Pollution Prevention
8. LUHPPLs
9. Illicit Discharges
- 10. Construction Erosion and Sedimentation Control**
11. Operation and Maintenance



Stormwater Management Plan

```
graph TD; A[Stormwater Management Plan] --> B(Stormwater Site Planning, Analysis, and Design (SW Manual)); A --> C(Soil Erosion, Runoff, and Sediment Control (SW Manual Standard 10, & RISESC Handbook Part D)); A --> D(Post Construction Operation and Maintenance (SW Manual));
```

**Stormwater Site
Planning, Analysis, and
Design**
(SW Manual)

**Soil Erosion, Runoff,
and Sediment Control**
(SW Manual Standard
10, & RISESC Handbook
Part D)

**Post Construction
Operation and
Maintenance**
(SW Manual)

Stormwater Management Plan

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graph TD; A[Stormwater Management Plan] --> B(Stormwater Site Planning, Analysis, and Design (SW Manual)); A --> C(Soil Erosion, Runoff, and Sediment Control (SW Manual Standard 10, & RISESC Handbook Part D)); A --> D(Post Construction Operation and Maintenance (SW Manual));
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**Stormwater Site
Planning, Analysis, and
Design**
(SW Manual)

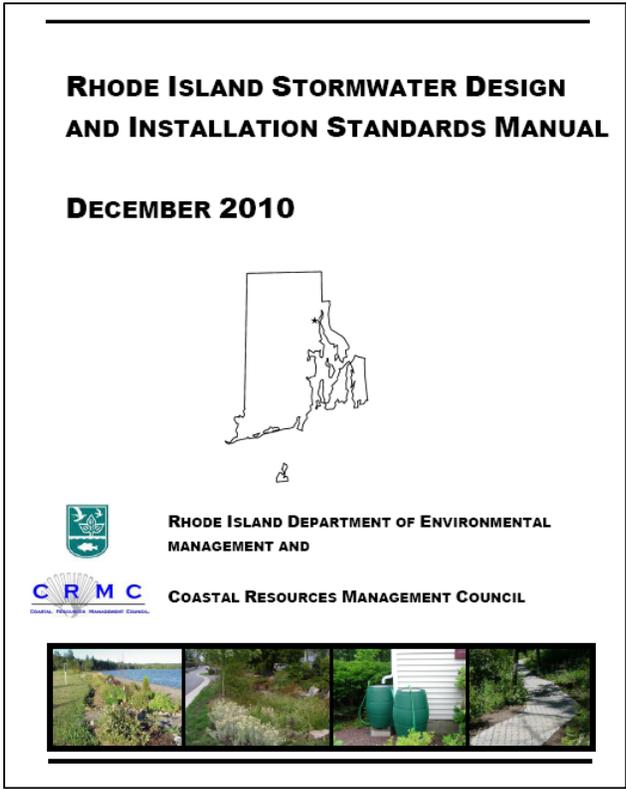
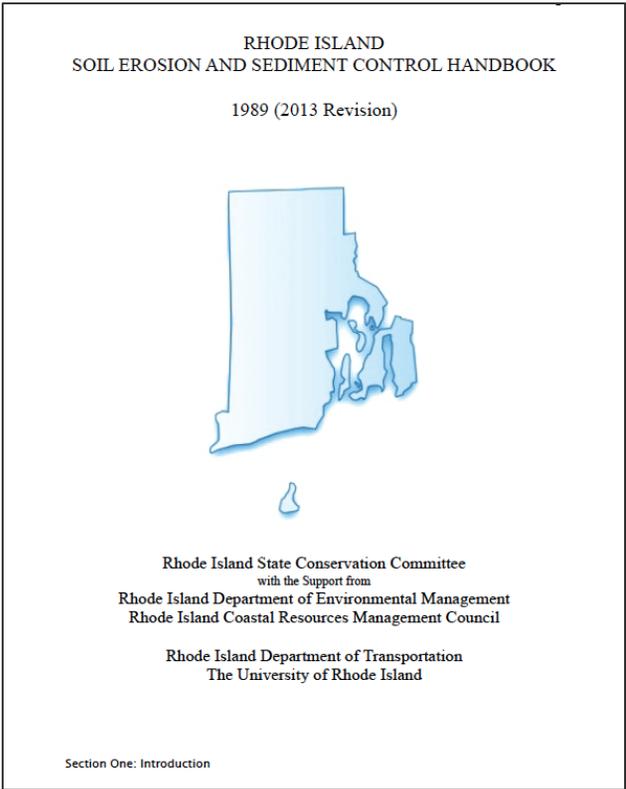
**Soil Erosion, Runoff,
and Sediment Control**
(SW Manual Standard
10, & RISESC Handbook
Part D)

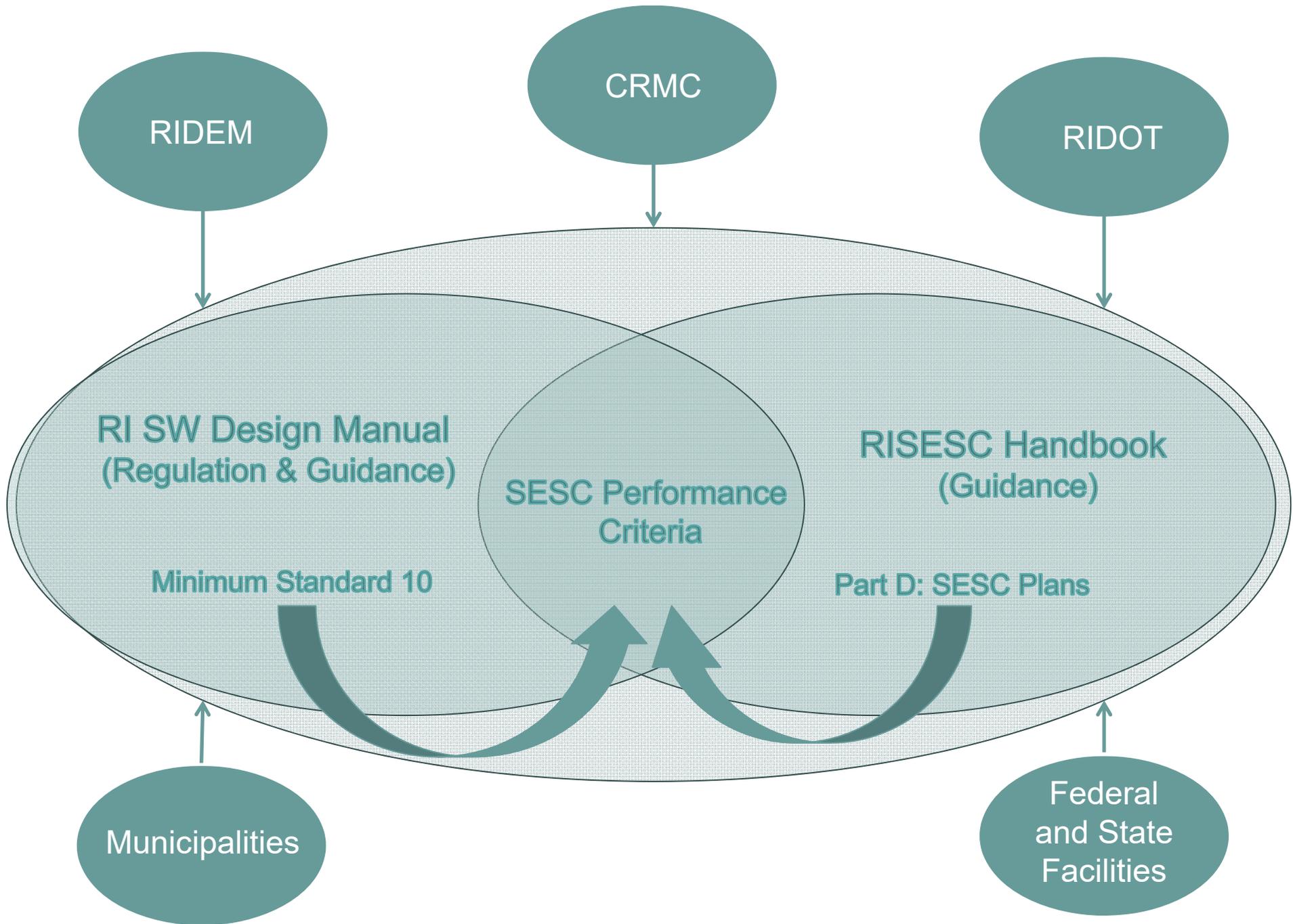
**Post Construction
Operation and
Maintenance**
(SW Manual)

Soil Erosion and Sediment Control Performance Criteria Are Now Aligned

Part D – SESC Plans

Minimum Standard 10 - SESC





RIDEM

CRMC

RIDOT

RI SW Design Manual
(Regulation & Guidance)

SESC Performance
Criteria

RISESC Handbook
(Guidance)

Minimum Standard 10

Part D: SESC Plans

Municipalities

Federal and State
Facilities



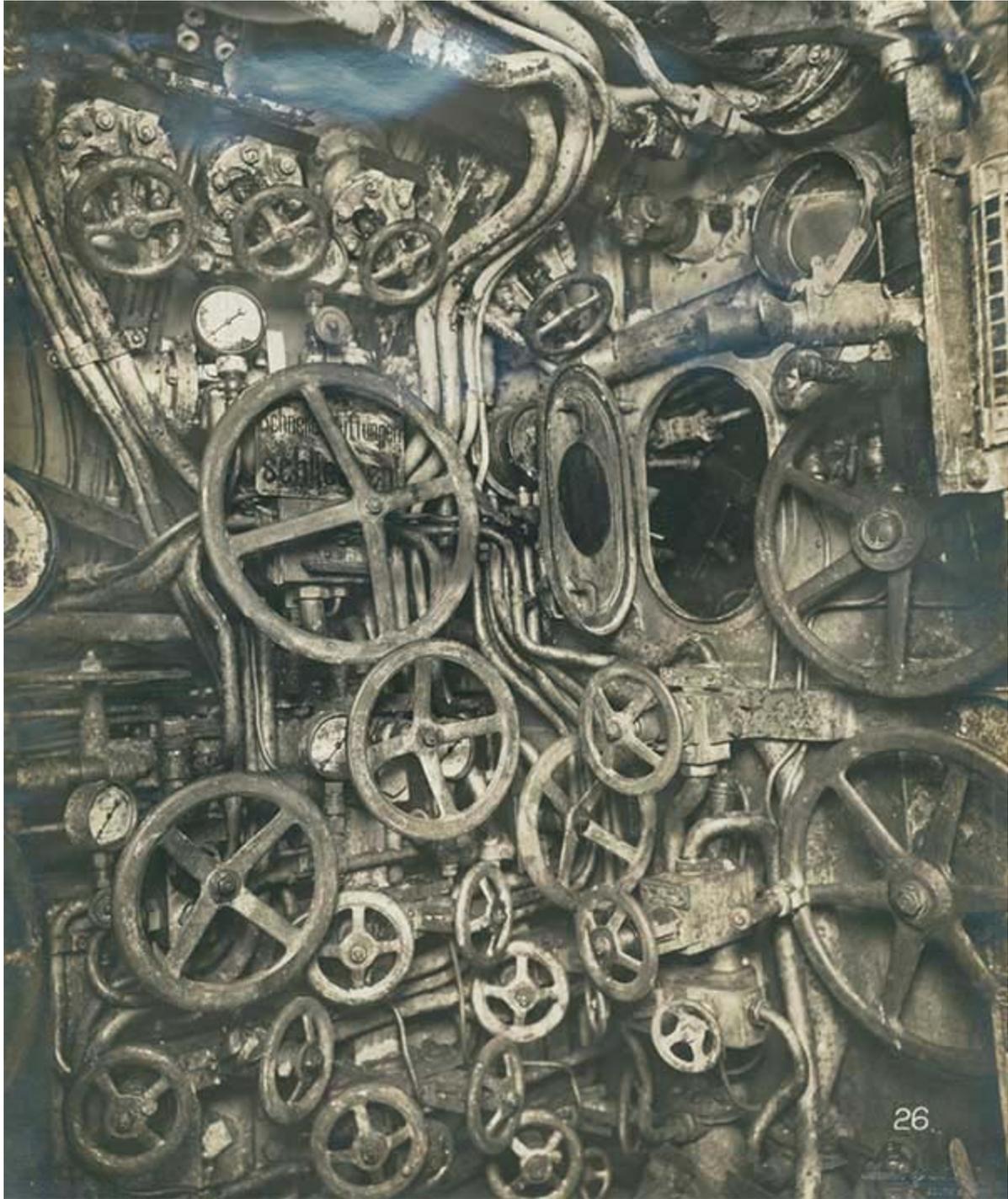
Soil Erosion and Sediment Control Plan Performance Criteria

Brian Lafaille
RIDEM RIPDES Permitting Program

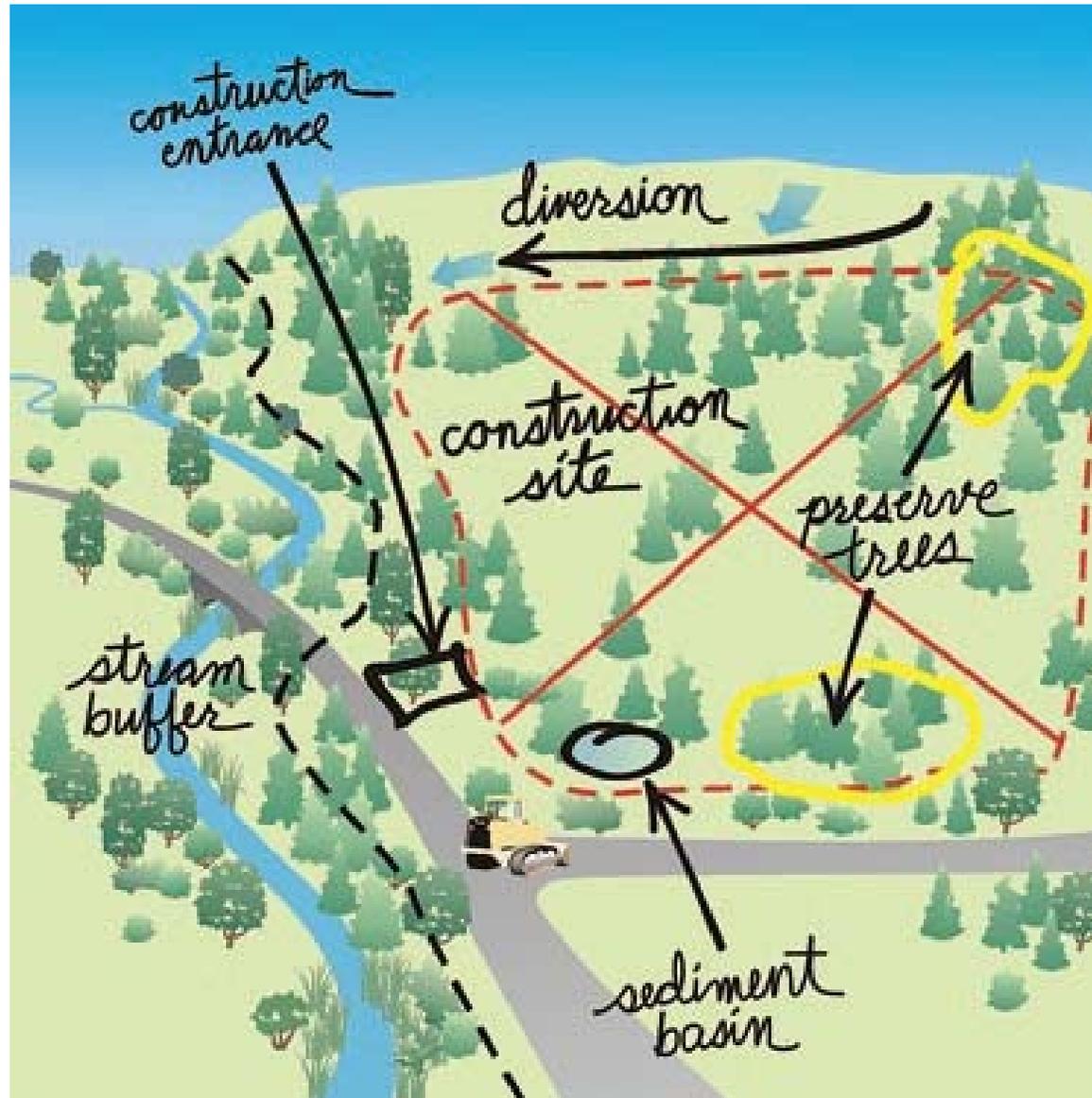


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EXTENSION
RI NEMO





Soil Erosion and Sediment Control Plan



Soil Erosion and Sediment Control Plan Format

Narrative (Written Document)

Soil Erosion and Sediment Control Plan

For:
Project Name

Project Site Location/Address
City, State, Zip Code
Assessor's Plat and Lot Number

Owner: Louis Allen D'Agostino
37 Sanderson Rd.
Smithfield, RI 02917
(401) 949-3271

Environmental Management
 OCT 31 2014
 Office of Water Resources

Operator: John Rocchio
20 Lark Industrial Parkway
Smithfield, RI 02828
401-949-5620

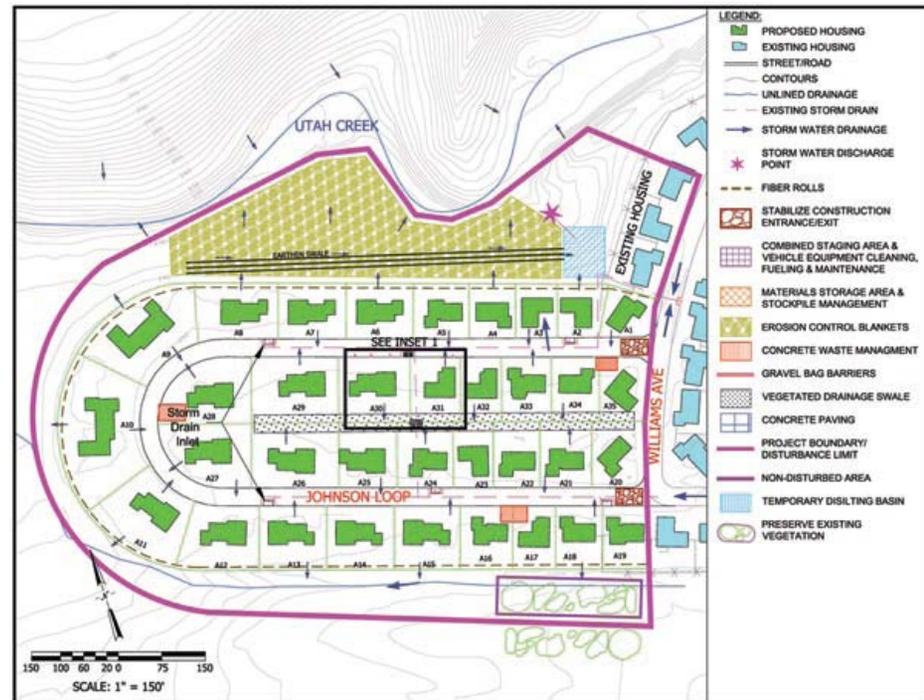
Estimated Project Dates: Start Date: Start Date
Completion Date: End Date

SESC Plan Prepared By: Hudson Place Associates
Civil and Environmental Engineering
91 Carriage Dr.
Warwick, RI 02886
Attention: Peter Alviti Jr., P.E.
401-821-6600
info@hudsonplaceassociates.com

SESC Plan Preparation Date: September 2014

Revision Date: 01/09/2014

Site Plans (Construction Drawings)





Soil Erosion and Sediment Control Performance Criteria

1. **Avoid and Protect Sensitive Areas and Natural Features**
2. **Minimize Area of Disturbance**
3. **Minimize the Disturbance of Steep Slopes**
4. **Preserve Topsoil**
5. **Stabilize Soils**
6. **Protect Storm Drain Inlets**
7. **Protect Storm Drain Outlets**
8. **Establish Temporary Controls for the Protection of Post-Construction Stormwater Treatment Practices**
9. **Establish Perimeter Controls and Sediment Barriers**
10. **Divert or Manage Run-on from Up-gradient Areas**
11. **Properly Design Construction Stormwater Conveyance Channels**
12. **Retain Sediment Onsite**
13. **Control Temporary Increases in Stormwater Velocity, Volume, and Peak Flows**
14. **Construction Activity Pollution Prevention Control Measures**
15. **Control Measure Installation, Inspections, Maintenance, and Corrective Actions**

Avoid and Protect Sensitive Areas and Natural Features

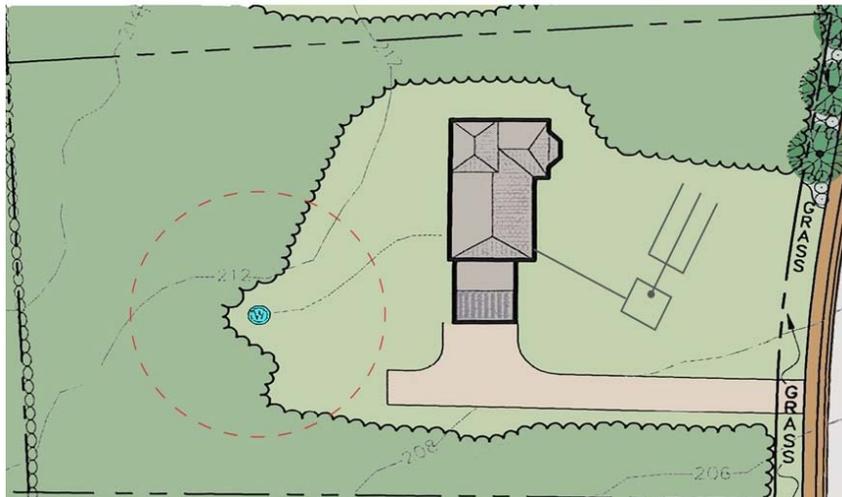


Example signage and fencing protecting wetland buffers and forest.
Source: RI LID Site Planning and Design Guidance Manual

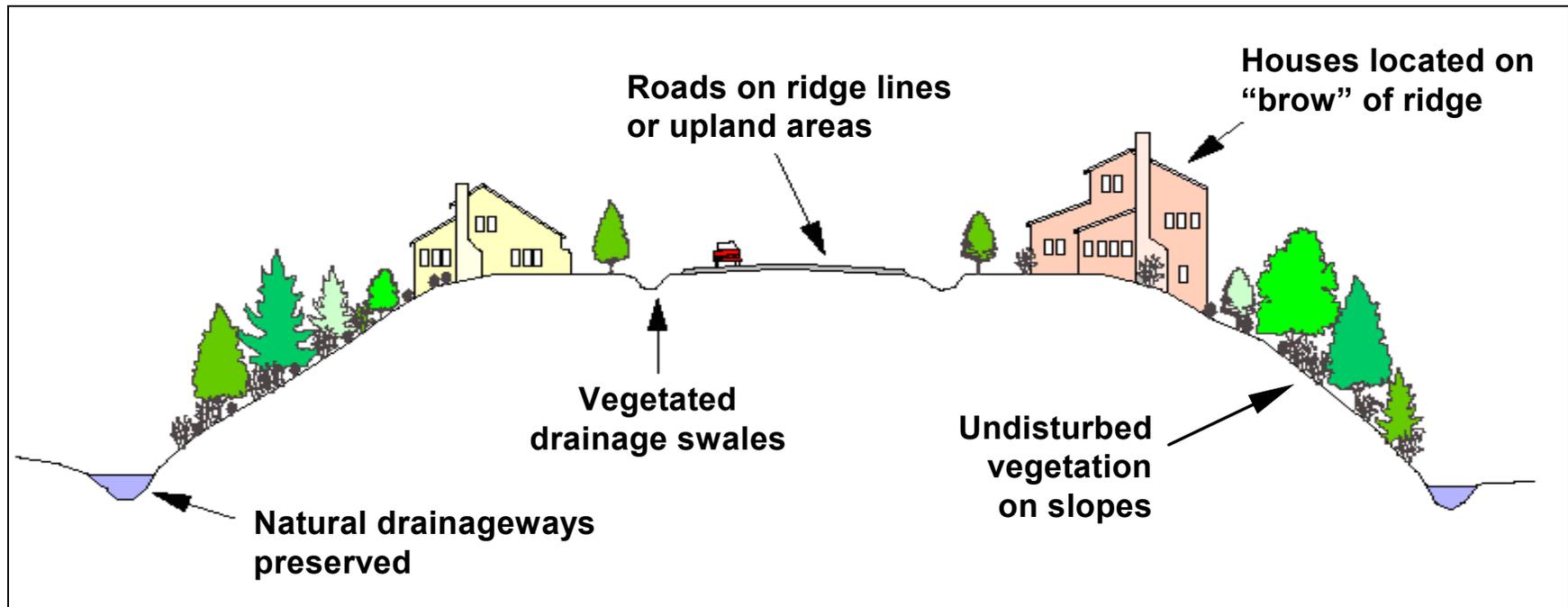
Minimize Area of Disturbance



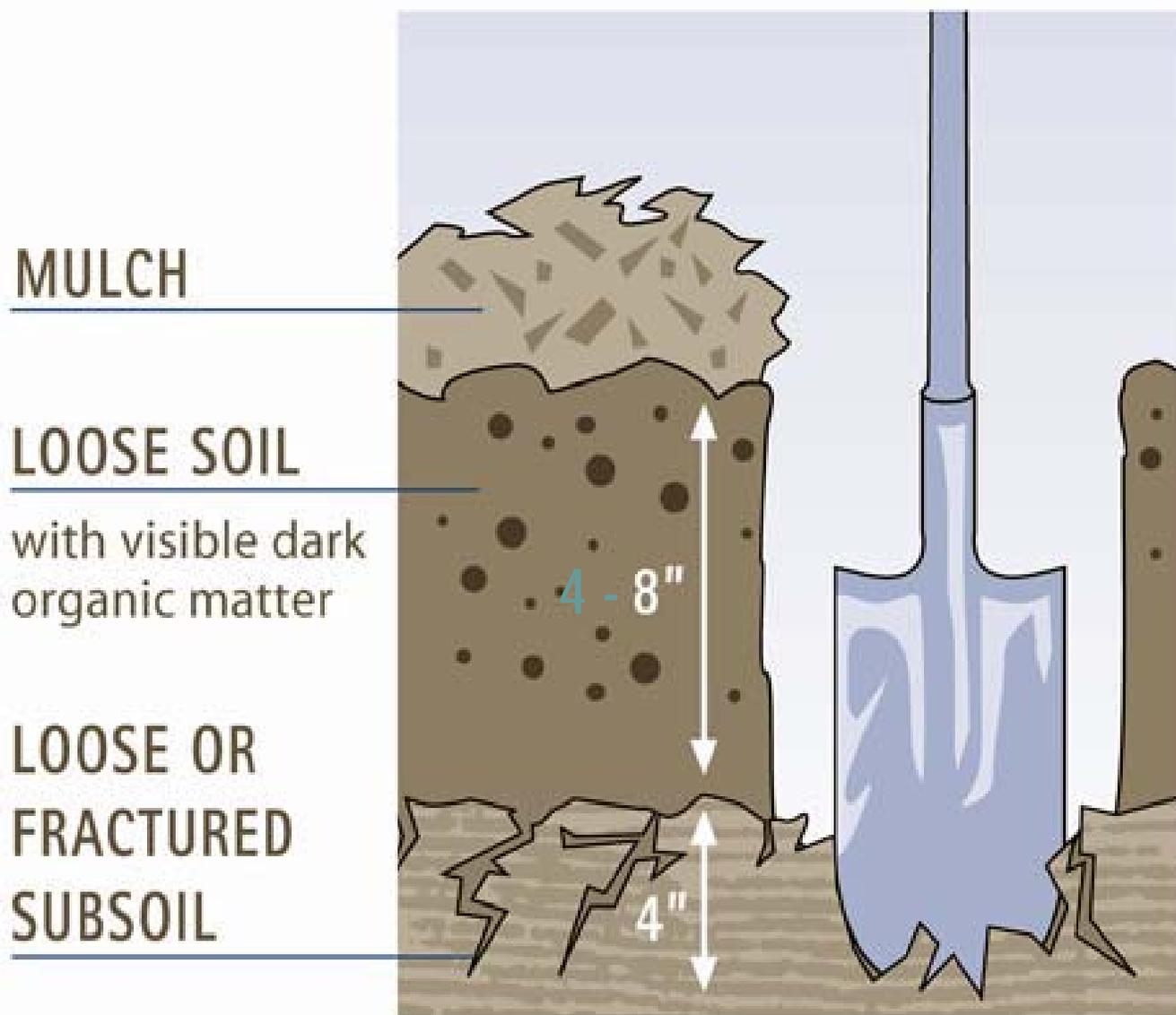
Figure 15. Sign posted at construction site informs workers of forest protection area.



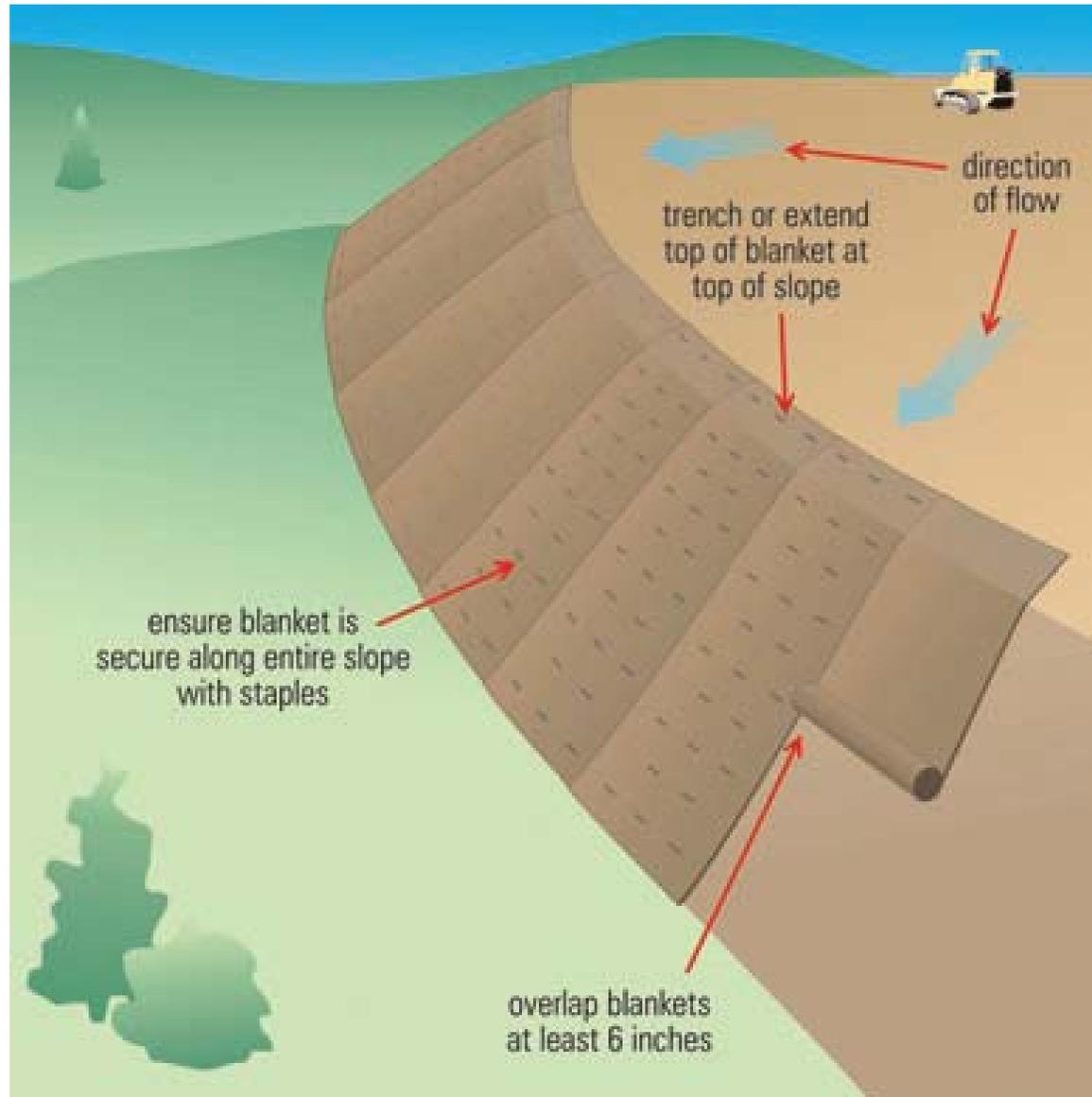
Minimize Disturbance of Steep Slopes



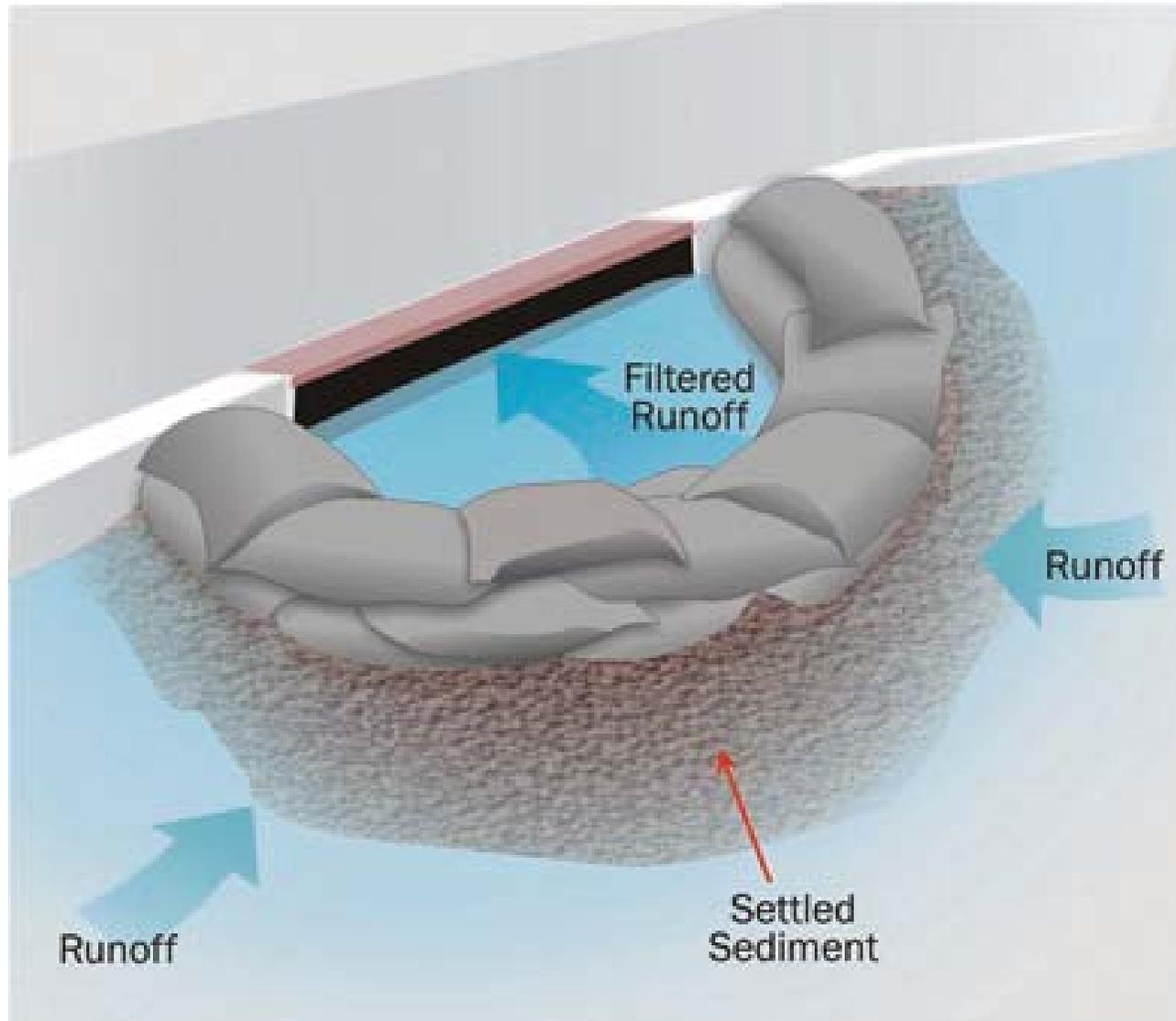
Preserve Topsoil



Stabilize Soils



Protect Storm Drain Inlets



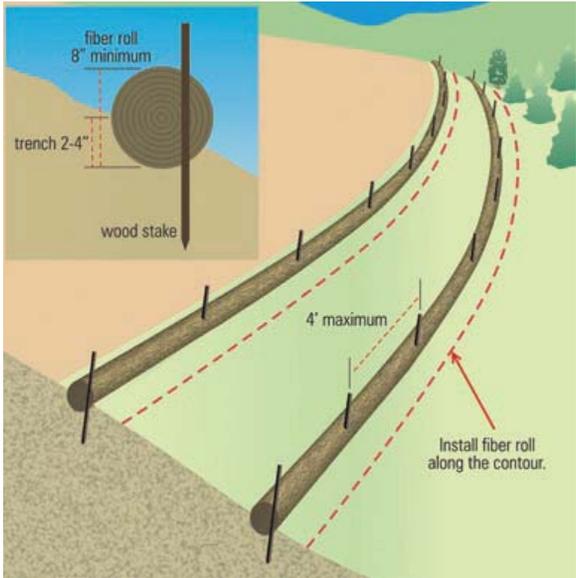
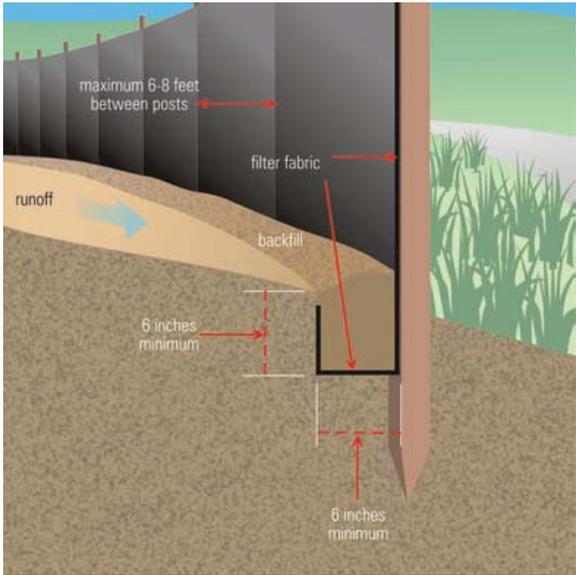
Protect Storm Drain Outlets



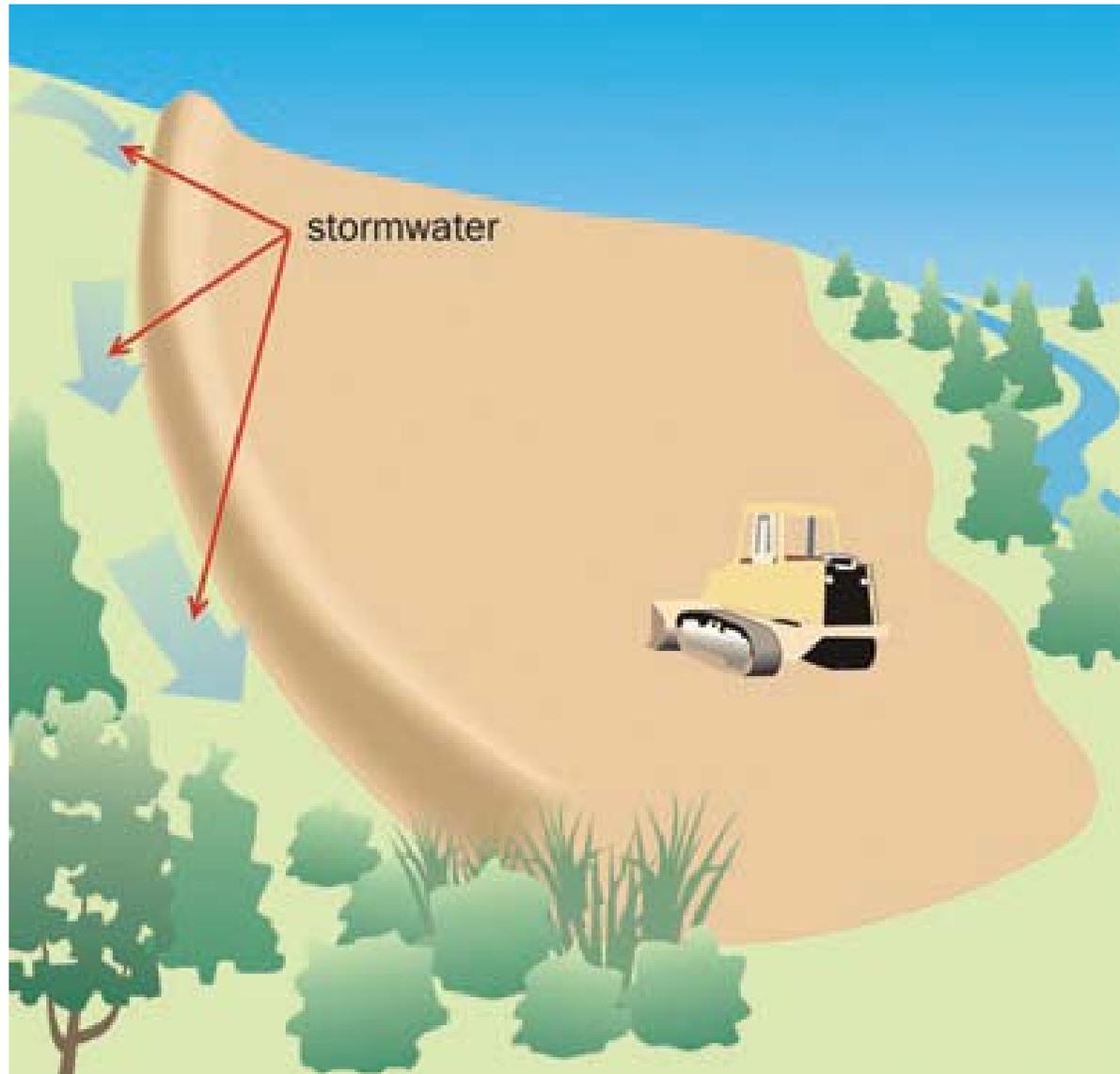
Establish Temporary Controls for the Protection of Post-Construction Stormwater Treatment Practices



Establish Perimeter Controls and Sediment Barriers



Divert or Manage Run-on from Up-gradient Areas



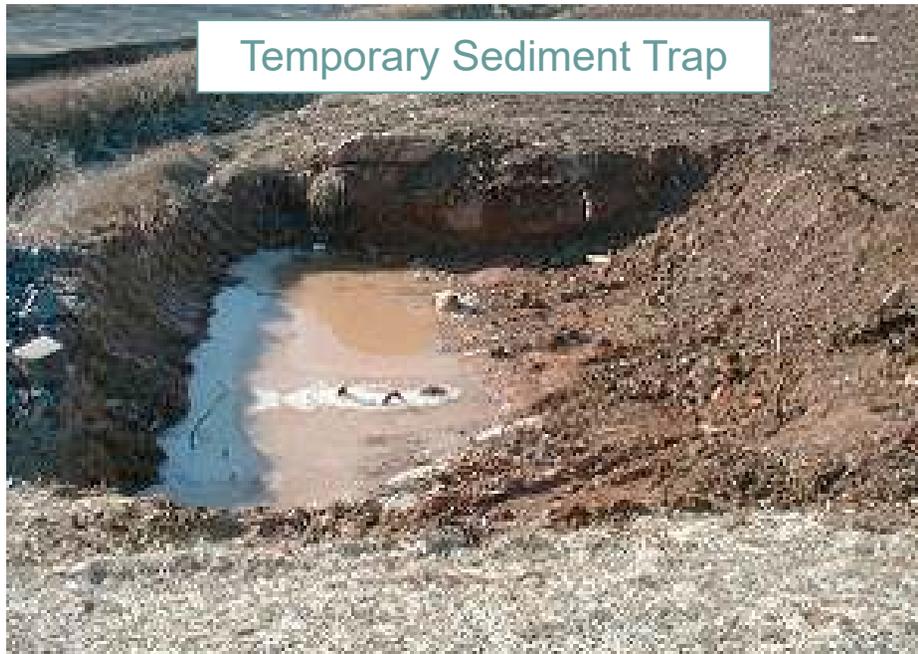
Source: USEPA-833-R-06-004 May 2007

Properly Design Construction Stormwater Conveyance Channels



Temporary Conveyance Channels must be designed to handle the 10 Year, 24 Hour Type III Design Storm

Retain Sediment Onsite



Sediment Traps are Mandatory for Common Drainage Locations Where 1-5 Acres of Land Will Be Disturbed

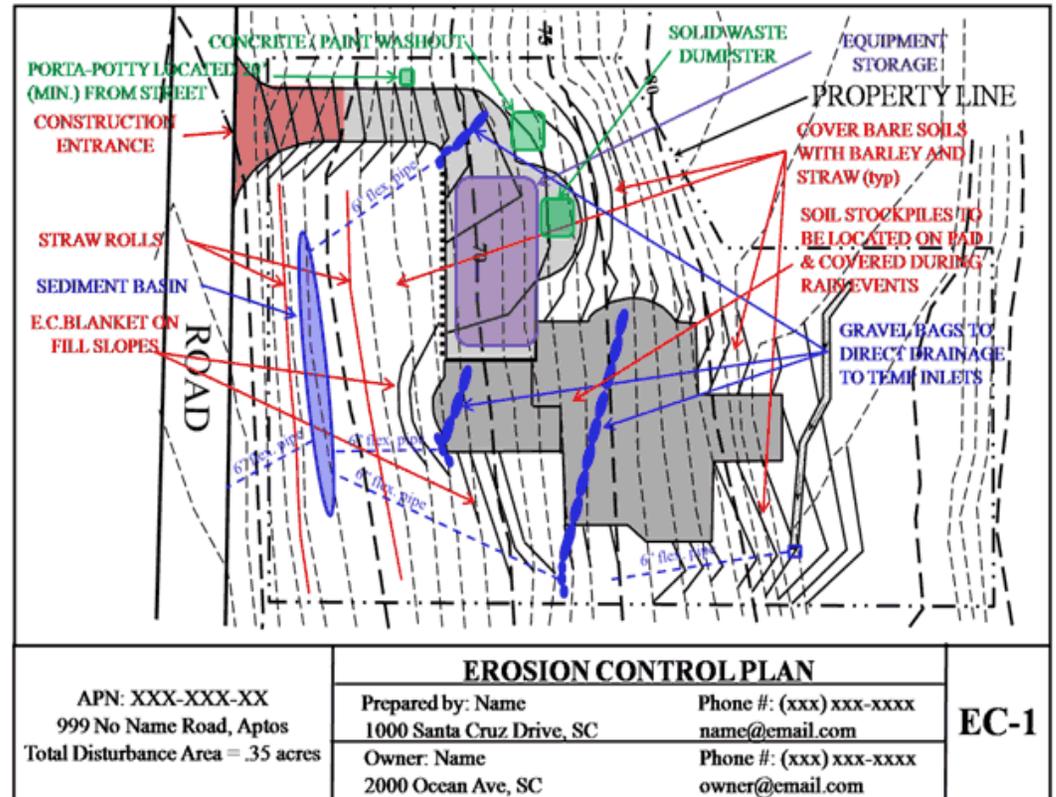


Sediment Basins are Mandatory for Common Drainage Locations Where >5 Acres of Land Will Be Disturbed

Control Temporary Increases in Stormwater Velocity, Volume, and Peak Flows

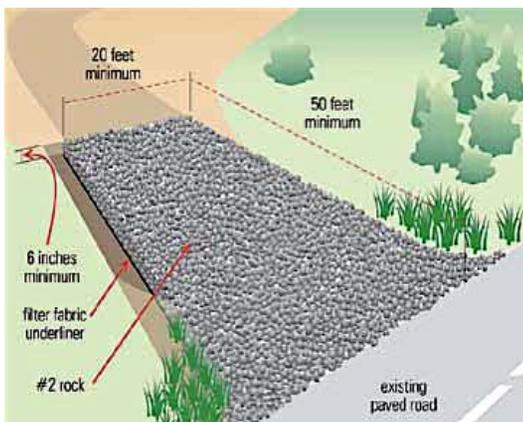
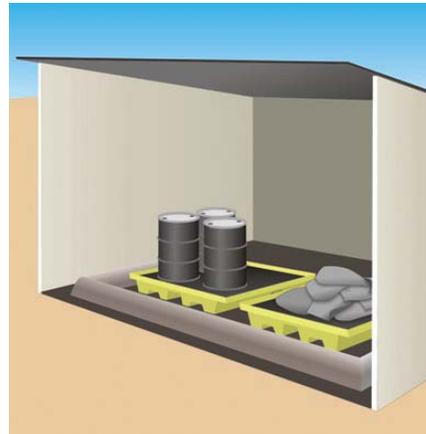
Goal: Protect Downstream Receiving Waters, Conveyances, and Drainage Systems During Construction.

- In most cases the combination of all other performance criteria will be adequate.
- SESC Plan Preparer must evaluate the need for additional velocity, peak, and volume controls.



EC-1

Construction Activity Pollution Prevention Control Measures



Control Measure Installation, Inspections, Maintenance, and Corrective Actions



