Subcontractor Awareness Seminar

Education & Training Certification Requirements for Persons Involved in Land Disturbing Activities

Sponsored By

GSWCC

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- Construction Checklist of BMPs

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Subcontractor Awareness

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EROSION & SEDIMENT CONTROL AWARENESS

Subcontractor Awareness Seminar

Effective August 2018

GSWCC

1

Overview

- Introduction to Erosion & Sedimentation
  - Definitions & Basic Processes
- Impacts of Erosion & Sedimentation
  - Environmental vs Economic
- Best Management Practices (BMPs)
  - Structural vs. Vegetative
- Laws Governing Erosion & Sedimentation
  - GESA & NPDES

2

Introduction to E&S

- Definitions
  Factors
  Stages

3

Erosion

- The process by which the land surface is worn away by the action of water, wind, ice and gravity

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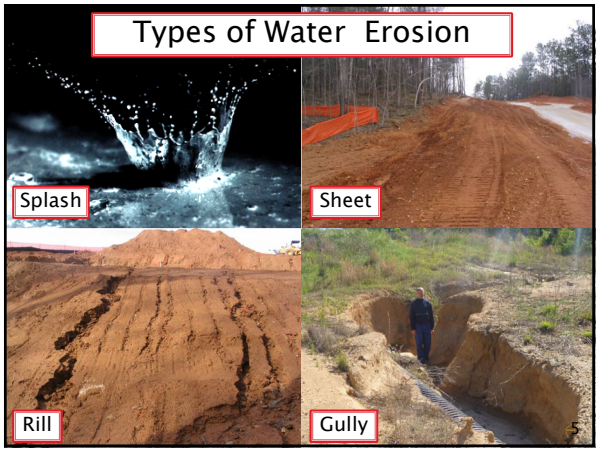

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Types of Water Erosion

- Splash Erosion
  - The spattering of small soil particles caused by the impact of raindrops on bare soil
- Sheet Erosion
  - The removal of a uniform layer of soil by water flowing in a thin layer over the surface
- Rill Erosion
  - The development of numerous small channels, only several inches deep, on recently disturbed soils
- Gully Erosion
  - The process whereby water accumulates in narrow channels and, over short periods, removes the soil from this area

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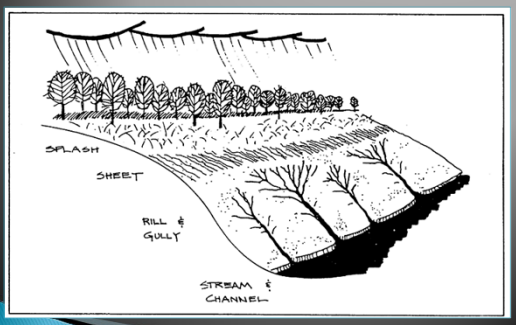
Water Erosion



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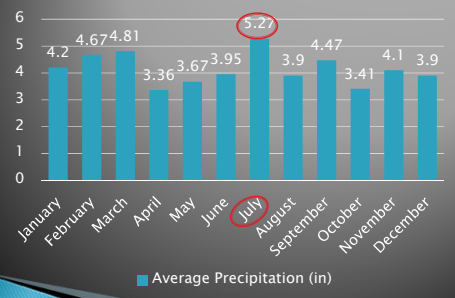
Factors Influencing Erosion

- Climate
  - The frequency, intensity and duration of rainfall and temperature extremes are principle factors influencing the volume of runoff
- Topography
  - The size, shape, and slope characteristics of a watershed influence the amount and duration of runoff

8

30-yr Average Rainfall Data - ATL



www.srh.noaa.gov

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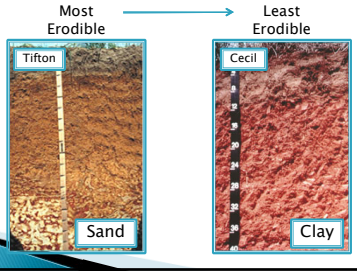
Factors Influencing Erosion

- Soils
  - The soil type will determine its vulnerability to erosion



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Factors Influencing Erosion

- Vegetative Cover
  - Extremely important factor in reducing erosion
  - It will:
    - Absorb energy of rain drops
    - Bind soil particles
    - Slow velocity of runoff
    - Increase ability to absorb water
    - Remove subsurface water between rainfalls

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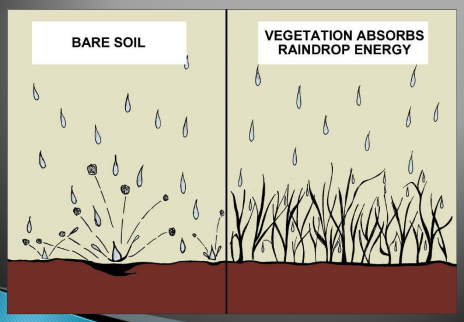
Absorb Energy of Rain Drops



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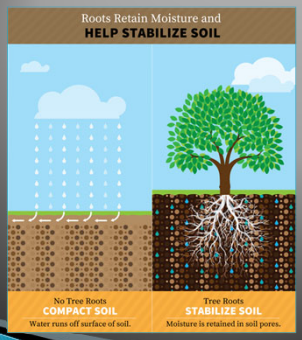
Bind Soil Particles



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Slow Velocity of Runoff

Slows the flow of water, reducing erosion, & trapping sediment

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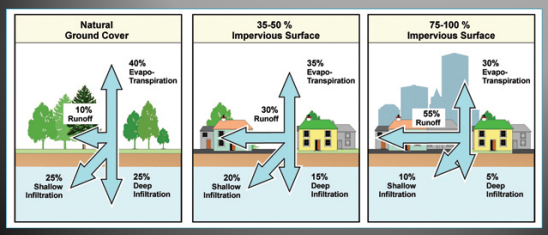
Increase Absorption



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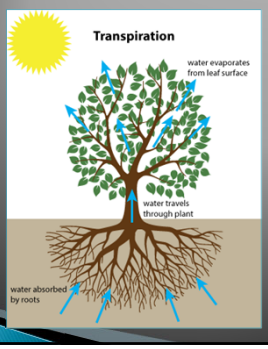
Remove Subsurface Water



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Sedimentation

- The process by which the eroded material is transported and deposited by water, wind, ice, and gravity

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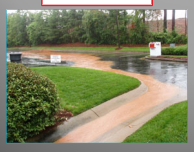
3 Step Process

Detachment

Transport



Deposition

1 → 2 → 3

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Impacts of Erosion & Sedimentation

- Everyday
  Environmental
  Economic

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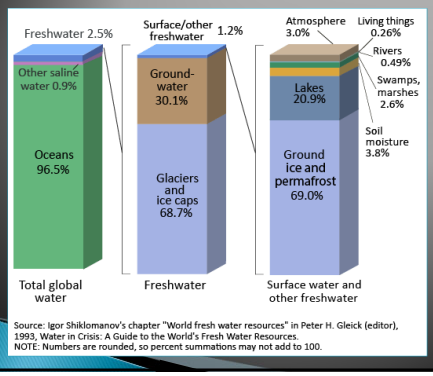
Where is Earth's Water?



Source: Igor Shiklomanov's chapter "World fresh water resources" in Peter H. Gleick (editor), 1993, Water in Crisis: A Guide to the World's Fresh Water Resources.
NOTE: Numbers are rounded, so percent summations may not add to 100.

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Deterioration of Water Quality

- Sediment is the #1 non-point source pollutant

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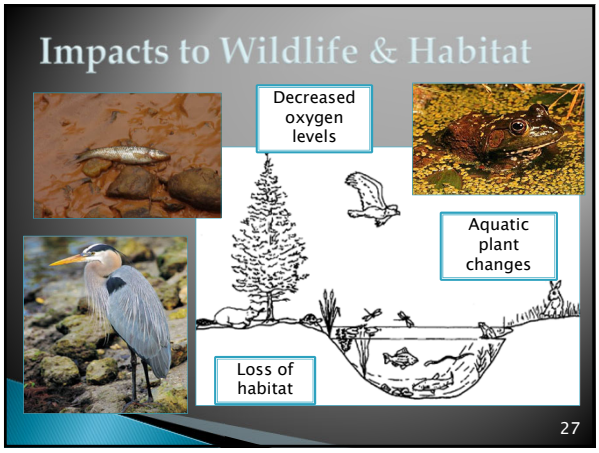
Deterioration of Water Quality
Before Construction
After Construction
22

Increased Likelihood of Flooding
23

Loss of Soil Productivity
24

Decreased Recreational Value
LAKE CLOSED
TO FISHING
& SWIMMING
Potential impacts to revenue in the State
25

Increased Costs & Maintenance
As structures begin to fill with sediment, the flood control storage volume decreases
26


Impacts to Wildlife & Habitat
Decreased oxygen levels
Aquatic plant changes
Loss of habitat
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Best Management Practices

- 3 Keys
  Vegetative
  Structural

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Best Management Practices

- Required on all Land-disturbing sites in Georgia
- 3 Keys to BMPs
  - Proper Design, Installation & Maintenance
- Vegetative Practices
  - Prevent Erosion
- Structural Practices
  - Control Sedimentation

MANUAL FOR
EROSION AND SEDIMENT CONTROL
IN GEORGIA
2016 Edition

GSWCC

Georgia Soil and Water Conservation Commission

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Athens, GA 30605
706-552-4470
706-552-4486 fax
https://gswcc.georgia.gov/

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Vegetative BMPs

Bf	Buffer Zone
Cs	Coastal Dune Stabilization
Ds1	Disturbed Area Stabilization (With Mulching Only)
Ds2	Disturbed Area Stabilization (With Temporary Seeding)
Ds3	Disturbed Area Stabilization (With Permanent Vegetation)
Ds4	Disturbed Area Stabilization (With Sodding)
Du	Dust Control on Disturbed Area
Fl-Co	Flocculants and Coagulants
Sb	Streambank Stabilization (With Permanent Vegetation)
Ss	Slope Stabilization
Tac	Tackifiers

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Vegetative Benefits

- Intercepts raindrops
  - Reduces detachment of soil particles
  - Results in less soil erosion
- Slows & Cleans runoff
  - Increases water infiltration
  - Increased soil moisture aids plant growth
- Protects structures, rivers, streams, and ponds
- Reduces maintenance of structural measures
  - Reduced deposition in sediment basins
- Improves aesthetics, soil quality, and wildlife habitat

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Vegetative Benefits

It's cheaper to prevent Erosion…

…than to deal with Sedimentation

32

Buffer Zone

Bf

- Definition
  - A strip of undisturbed, original vegetation, enhanced or restored vegetation or the re-establishment of vegetation surrounding an area of disturbance or bordering streams, ponds, wetlands, lakes and coastal waters

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Functions of Buffers

- Reduce storm water runoff
- Act as a screen for "visual pollution"
- Reduce construction noise
- Improve aesthetics
- Filtering and infiltrating runoff
- Providing shade, food, and cover for wildlife and aquatic organisms
- Flood protection
- Protect channel banks from scour and erosion

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Coastal Dune Stabilization Cs

- Definition
  - The planting of vegetation on dunes that are denuded, artificially constructed, or re-nourished
- Purpose
  - Allow the development of dunes in areas where they have been damaged or destroyed
  - Stabilize soil on dunes allowing them to become more resistant to wind and waves
- Permits must be requested and granted by all appropriate jurisdictions, including all Federal, State, and local agencies, before work is performed

35

Coastal Dune Stabilization Cs

Sand Fence

Helps build higher dunes by trapping sand

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Disturbed Area Stabilization (With Mulching Only)

Ds1

- Definition
  - The application of plant residue or other suitable material, produced on site if possible, to the soil surface
- Purpose
  - Reduce runoff
  - Conserve moisture
  - Prevent surface compaction or crusting
  - Control undesirable vegetation
  - Modify soil temperature
  - Increase biological activity

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Disturbed Area Stabilization (With Mulching Only)

Ds1

- Mulch or temporary grassing shall be applied to all exposed areas within 14 days of disturbance
- Apply at the appropriate depth
- Maintain at least 90% cover
- Must be anchored
- Can be used alone for up to 6 months

Table 1. Mulching Application Requirements

Material	Rate	Depth
Straw or hay	-	2" to 4"
Wood waste, chips, sawdust, bark	-	2" to 3"
Polyethylene film	Secure with soil, anchors, weights	-
Geotextiles, jute matting, netting, etc.	See manufac-turer's recom-mentations	-

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Poor Ds1 Stabilization

Ds1

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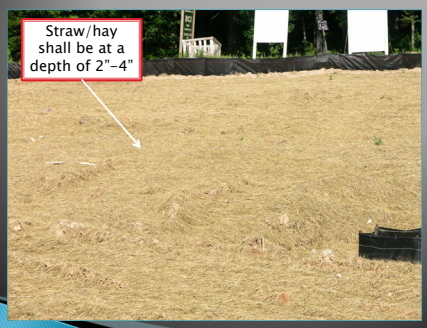
Good Ds1 Stabilization

Ds1



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Disturbed Area Stabilization (With Temporary Seeding)

Ds2

- Definition
  - The establishment of temporary vegetative cover with fast growing species for seasonal protection on disturbed or denuded areas
- Purpose
  - Reduce runoff and sediment damage of downstream resources
  - Protect the soil surface from erosion
  - Improve wildlife habitat
  - Improve aesthetics
  - Improve tilth, infiltration, aeration, and organic matter

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Disturbed Area Stabilization (With Temporary Seeding)

Ds2

- Temporary grassing shall be applied to all exposed areas within 14 days of disturbance
- Maintain at least 90% cover
- If an area is expected to be undisturbed for longer than 6 months, permanent perennial vegetation shall be used

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Poor Ds2 Stabilization

Ds2

43

Good Ds2 Stabilization

Ds2

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Disturbed Area Stabilization (With Permanent Vegetation)

Ds3

- Definition
  - The planting of perennial vegetation such as trees, shrubs, vines, grasses, or legumes on exposed areas for final permanent stabilization
- Final Stabilization
  - All of the soil disturbing activities at the site have been completed, and that for unpaved areas and areas not covered by permanent structures, 100% of the soil surface is uniformly covered in permanent vegetation with a density of 70% or greater, or landscaped according to the ES&PC plan (uniformly covered with landscaping materials in planned landscaped areas)

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Disturbed Area Stabilization (With Permanent Vegetation)

Ds3

- This practice shall be applied immediately to rough graded areas that will be undisturbed for **longer than 6 months**
- Purpose
  - Protect the soil surface from erosion
  - Reduce damage to downstream areas
  - Improve wildlife habitat and visual resources
  - Improve aesthetics

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Poor Ds3 Stabilization

Ds3

47

Good Ds3 Stabilization

Ds3

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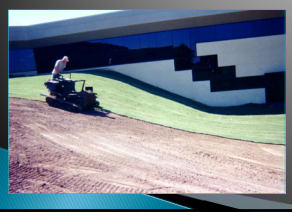
Disturbed Area Stabilization (With Sodding)

Ds4

- Definition
  - A permanent vegetative cover using sod on highly erodible or critically eroded lands



- Purpose
  - Immediate ground cover
  - Reduce runoff and erosion
  - Improve aesthetics
  - Reduce dust
  - Stabilize waterways
  - Filter sediment
  - Reduce downstream complaints
  - Reduce likelihood of stop work order

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Dust Control

Du

- Definition
  - The control of surface and air movement of dust on construction, roads, and demolition sites

- Methods
  - Mulches
  - Cover
  - Irrigation
  - Tillage
  - Spray-On Adhesives

50

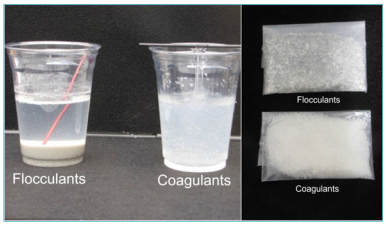
Flocculants & Coagulants

Fl-Co

- Definition
  - Formulated to assist in the solids/liquids separation of suspended particles in solution. Only anionic forms shall be used

This practice is not intended for application to surface waters of the state

It is intended for application within constructed storm water ditches that feed into constructed ponds or basins



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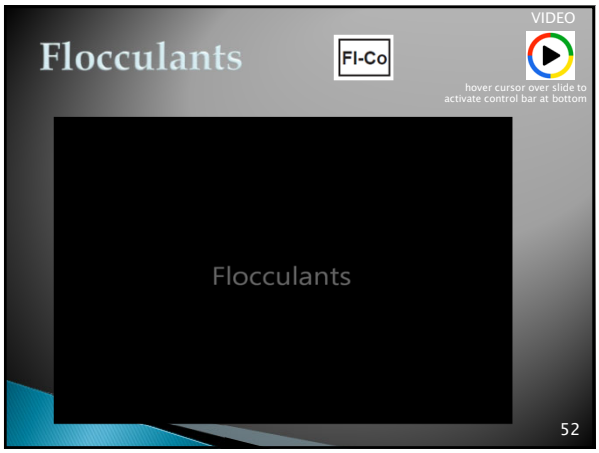

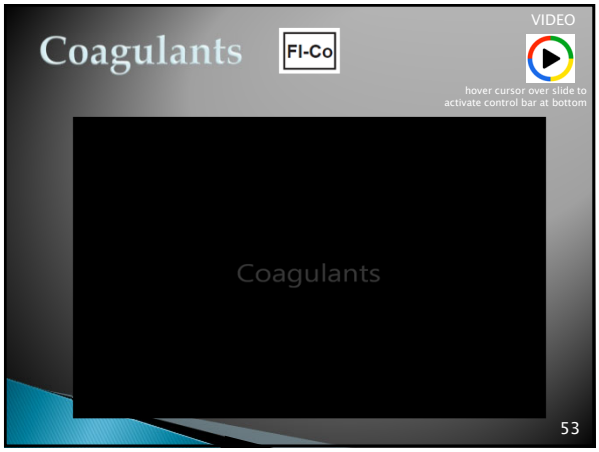

Streambank Stabilization Using Permanent Vegetation

Sb

- Definition
  - The use of readily available native plant materials to maintain and enhance streambanks
- Purpose
  - Prevent small streambank erosion problems
  - Form a root mat to stabilize and reinforce the soil on the streambank
  - Enhance the appearance of the stream
  - Enhance water quality and wildlife habitat

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Streambank Stabilization

Sb

- Preferred Practices
  - Live Staking
  - Live Fascines
  - Branchpacking
  - Vegetated Geo-grid
  - Brushmattress
  - Coconut Fiber Roll
  - Dormant Post Plantings (live posts)
- Acceptable Practices
  - Joint Planting
  - Live Cribwall
  - Vegetated Gabion Baskets
  - Tree Revetments
  - Log, Rootwad & Boulder Revetments

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Slope Stabilization

Ss

Definition

- A protective covering used to prevent erosion and establish temporary or permanent vegetation on steep slopes, shore lines, or channels
- Two types of Ss products: Rolled Erosion Control Products (RECP) & Hydraulic Erosion Control Product (HECP)

56

Tackifiers

Tac

- Definition
  - A tie-down for soil, compost, seed, straw, hay or mulch
  - Hydrate in water and readily blend with other slurry materials to form a homogenous slurry

Only anionic forms of PAM shall be used

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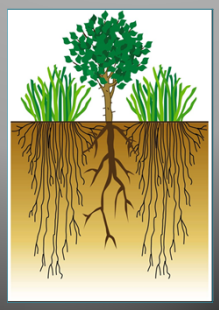
Summary

- Vegetation is the 1st step in reducing erosion
- A site-specific plan is required to achieve maximum impact
- The vegetative plan and maintenance requirements should encompass the entire year



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Structural BMPs

Cd	Check Dam	Gr	Grade Stabilization Structure	SpB	Seep Berm
Ch	Channel Stabilization	Lv	Level Spreader	Sr	Temporary Stream Crossing
Co	Construction Exit	Rd	Rock Filter Dam	St	Storm Drain Outlet Protection
Cr	Construction Road Stabilization	Re	Retaining Wall	Su	Surface Roughening
Dc	Stream Diversion Channel	Rt	Retrofit	Tc	Turbidity Curtain
Di	Diversion	Sd1	Sediment Barrier	Tp	Topsoiling
Dn1	Temporary Downdrain Structure	Sd2	Inlet Sediment Trap	Tr	Tree Protection
Dn2	Permanent Downdrain Structure	Sd3	Temporary Sediment Basin		
Fr	Filter Ring	Sd4	Temporary Sediment Trap		
Ga	Gabion	Sk	Floating Surface Skimmer		
Wt	Vegetated Waterway or Stormwater Conveyance Channel				

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Check Dam

Cd

- Definition
  - A temporary grade control structure, or dam constructed across a swale, drainage ditch, or area of concentrated flow.

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Cd-S Proper Installation

Cd

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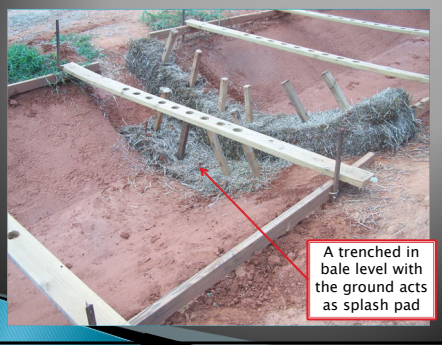
Cd-Hb Proper Installation

Cd



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Cd Maintenance

Cd

63

Cd Improper Installation

Cd

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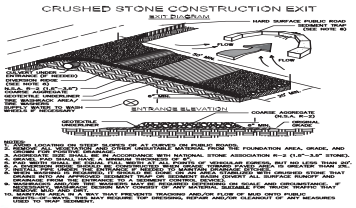
Construction Exit

Co

- Definition
  - A stone stabilized pad located at any point where traffic will be leaving a construction site to a public right-of-way, street, alley, sidewalk or parking area.



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Co Proper Installation

Co

66

Co Maintenance

Co

67

Co Improper Installation

Co

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Sediment Barrier

Sd1

- Definition
  - A temporary structure made of a porous material typically supported by steel or wood posts
- Types
  - Silt Fence
  - Brush Piles
  - Mulch Berms
  - Compost Filter Sock

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Sediment Barrier

Sd1

- Along all state waters and other sensitive areas, 2 rows of Type S sediment barrier shall be used. The 2 rows of Type S should be placed a minimum of 36" apart.

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Sd1 Proper Installation

Sd1

71

Sd1 Maintenance

Sd1

72

Sd1 Improper Installation

Sd1

73

Sd1 Improper Installation

Sd1

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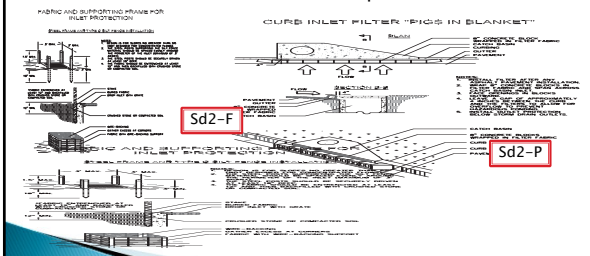
Inlet Sediment Trap

Sd2

- Definition
  - A temporary protective device formed at or around an inlet to a storm drain to trap sediment



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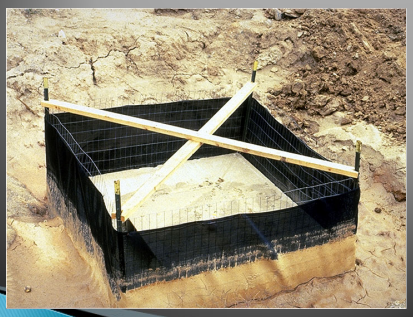
Sd2-F Proper Installation

Sd2



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Sd2-F Maintenance

Sd2

77

Sd2-P Proper Installation

Sd2

78

Sd2-P Maintenance

Sd2

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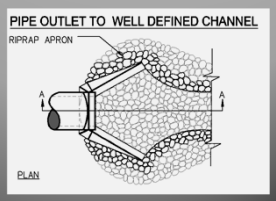
Storm Drain Outlet Protection

St

- Definition
  - A paved and/or riprap channel section placed below storm drain outlets
- Purpose
  - To reduce velocity of flow before entering a receiving water



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St Proper Installation

St

81

St Maintenance

St

82

St Improper Installation

St

83

St Improper Installation

St

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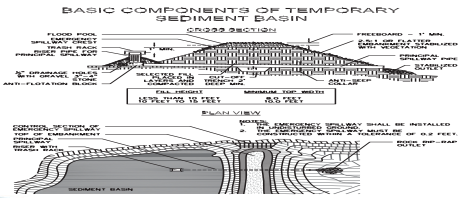
Temporary Sediment Basin

Sd3

- Definition
  - A basin created by the construction of a barrier or dam across a concentrated flow area, or by excavating a basin, or by a combination of both.



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Sd3 Proper Installation

Sd3

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Sd3 Maintenance

Sd3

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Sd3 Improper Installation

Sd3

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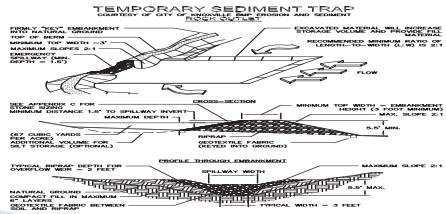
Temporary Sediment Trap

Sd4

- Definition
  - A small temporary pond that drains a disturbed area so that sediment can settle out



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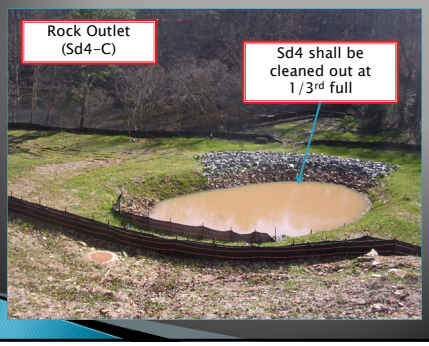
Sd4 Proper Installation

Sd4



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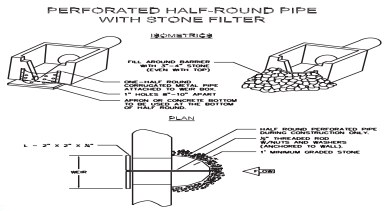
Retrofit

Rt

- Definition
  - A device or structure placed in front of a permanent storm water detention pond outlet or roadway drainage structure to serve as a temporary filter



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Rt Proper Installation

Rt

92

Rt Maintenance

Rt

93

Rt Improper Installation

Rt

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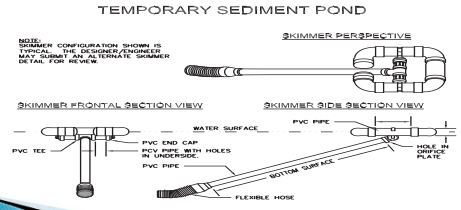
Floating Surface Skimmer

Sk

- Definition
  - A buoyant device that releases/drains water from the surface of sediment ponds, traps, or basins at a controlled rate of flow



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Sk Proper Installation

Sk

96

Sk Maintenance

Sk

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Clean-out Elevations

- One-Half Full (1/2)
  - Silt Fence
  - Check Dam
  - Rock Filter Dam
  - Inlet Sediment Trap
- One-Third Full (1/3)
  - Temporary Sediment Basin
  - Retrofit
  - Temporary Sediment Trap
  - Seep Berm

98

Summary

- Structural BMPs control sedimentation after erosion has happened
- Maintenance requirements are important for each BMP to maintain efficient working measures
- Structural BMPs are typically the last line of defense on site

99

Laws Governing E&S

- GESA
- NPDES
- Local Ordinances
- DNR Rules & Regulations

100

GESA

GA Erosion & Sedimentation Act

- Erosion in Georgia is the result of several activities including construction, agriculture, forestry, etc.… that convert land from one use to another
- Land disturbing activities are governed on the federal, state, and local level
- GESA is the State Law that may be incorporated into a local ordinance and enforced by a county or municipality
- Sometimes referred to as the "E&S Act"

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Participating Agencies

- Local Issuing Authorities (LIA)
- Soil & Water Conservation Districts (SWCD)
- Georgia Soil & Water Conservation Commission (GSWCC)
- Georgia Environment Protection Division (GA EPD)
- Natural Resources Conservation Service (NRCS)

Contact information for each agency can be found in the "Resource Information" section

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"Land-Disturbing Activity"

- Any activity which may result in soil erosion from water or wind and the movement of sediments into state water or onto lands within the state, including, but not limited to:
  - Clearing
  - Dredging
  - Grading
  - Excavating
  - Transporting
  - Filling of land

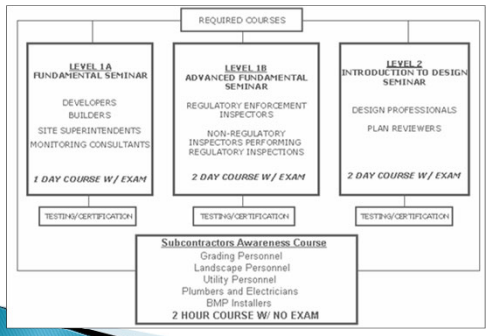
103

Intent of GESA

- To strengthen and extend the present erosion and sediment control activities and programs of this state
- To provide for the establishment and implementation of a state-wide comprehensive soil erosion and sediment control program
- To conserve and protect the land, water, air, and other resources of the state

104

Education & Training Requirements



105

Subcontractor Certification

- Required for individuals involved in land disturbing activities that are working in a subcontractor capacity for a primary, secondary or tertiary permittee
- Certified Subcontractor status **DOES NOT** certify an individual to perform the duties of a "certified" person/personnel

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Certified Personnel

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Subcontractor Examples

- Included but not limited to
  - Grading Personnel
  - Plumbers & Electricians
  - Landscape Personnel
  - Utility Personnel
  - Waste Water Personnel
  - BMP Installers
  - Other subcontractors conducting land-disturbing activities

108

NPDES

National Pollutant Discharge Elimination System

Created by the Federal Clean Water Act to control water pollution by regulating the discharge of pollutants to surface waters

The GA EPD has been "authorized" by the U.S. EPA to issue NPDES General Permits within the State

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General Permits

GAR100001 – Stand Alone
GAR100002 – Infrastructure
GAR100003 – Common Development

- The Permits became effective on August 1, 2018
  - Valid for 5 years (Expires July 31, 2023)
- Permits are available at:
  - www.epd.georgia.gov
  - www.gaswcc.georgia.gov

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Permittees

- "Permittee"
  - Any entity that has submitted a Notice of Intent (NOI) and obtained permit coverage
- "Primary Permittee"
  - The Owner or Operator or both of a tract of land for a construction site subject to the permit
- "Secondary Permittee"
  - An owner, individual builder, utility company, or utility contractor that conducts a construction activity within a common development with an existing primary permittee
- "Tertiary Permittee"
  - The Owner or Operator of remaining lot(s) within a common development conducting a construction activity where the primary permittee and all secondary permittees have submitted a Notice of Termination or where a primary permittee does not exist

Part I.B.

111

Permittee Inspections

Daily

- Petroleum storage areas
- Locations where vehicles enter and exit the site
- Measure & record rainfall within disturbed areas that have not met final stabilization every 24 hours except any non-working Saturday, Sunday and Federal Holiday. (*N/A for Secondary Permittee*)

Weekly & After ≥½" Rainfall

- Disturbed areas
- Areas used for storage of materials that are exposed to precipitation
- Structural control measures (BMPs)
- Discharge points

For Infrastructure Construction projects, these inspections are required every 14 days and after ≥½ rainfall

Monthly

- Areas of the site that have undergone "final stabilization"
- Discharge Points

Part IV.D.4.a–c.(1–6)

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Permittee Inspection Results

- If BMP deficiencies are identified during an inspection, the BMP deficiencies should be documented and corrected as soon as practical
  - If corrective action requires a revision to the Plan, the Plan must be revised within 7 calendar days of the inspection.
  - Any Plan revisions must be implemented within 7 calendar days of the inspection.

Part IV.D.4.a–c.(5)

113

Permittee Inspection Results

- If BMP deficiencies are identified during a Secondary Permittee inspection, the Secondary Permittee must notify the Primary Permittee of any suspected BMP design deficiencies within 24 hours
  - Primary Permittee must evaluate any suspected BMP design deficiencies within 48 hours of notice.
  - If corrective action requires a revision to the Plan, the Plan must be revised within 7 calendar days of notification.
  - Any Plan revisions affecting their site(s) must be implemented by the Secondary Permittee within 48 hours of notice by the Primary Permittee.

Part IV.D.4.a–c.(5)

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Local Ordinance

- The GA EPD may certify a county or municipality as a Local Issuing Authority if the county or municipality enacts an ordinance which meets or exceeds the standards, requirements, and provisions of GESA and the State General Permit

O.C.G.A. 12-7-8(a)(3)

115

Regulatory Enforcement Options

- Notice of Violation
- Issuance of Stop Work Order
- Suspension of LDA Permit
- Denial of future LDA Permit applications
- Imposition of civil penalties
- Forfeiture of bonding

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Notice of Violation

- First & Second Violation
  - A written warning is issued to the permittee
  - The permittee shall have five (5) days to correct the violation
  - If the violation is not corrected within five (5) days, an immediate stop work shall be issued
- Third Violation
  - An immediate stop work order shall be issued

O.C.G.A. 12-7-12(c)

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Stop Work Order

- Immediate Issuance
  - 3rd violation
  - Imminent threat to public health
  - Land disturbance without a permit
  - Failure to maintain stream buffer
  - Significant amounts of sediment discharged into state waters
  - Where BMPs have not been properly designed, installed, and maintained
- All Stop Work Orders
  - Effective immediately upon issuance
  - In effect until corrective action or mitigation has occurred
  - Apply to all land-disturbing activity on the site with the exception of the installation and maintenance of all erosion and sediment controls
  - Can be issued with a NOV

O.C.G.A. 12-7-12(d)

118

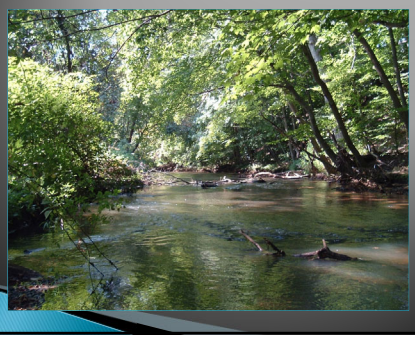
"State Waters"

Includes any and all rivers, streams, creeks, branches, lakes, reservoirs, ponds, drainage systems, springs, wells, and other bodies of surface or subsurface water, natural or artificial, lying within or forming a part of the boundaries of the state, which are not entirely confined and retained completely upon the property of a single individual, partnership, or corporation.

O.C.G.A. 12-7-3(16)

119

"State Waters"



120

"Buffer"

- *The area of land immediately adjacent to the banks of State Waters in its natural state of vegetation, which facilitates, when properly vegetated, the protection of water quality and aquatic habitat*
- The State-mandated stream buffers are measured horizontally from the point where vegetation has been wrested by "normal stream flow" or "wave action"

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"Buffer"

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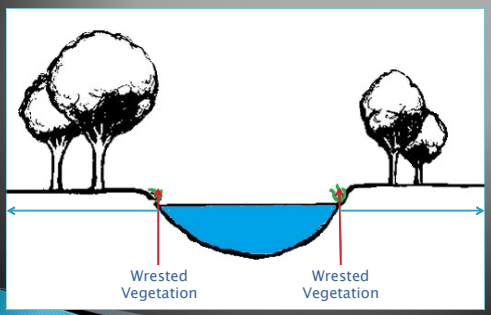
Wrested Vegetation



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Stream Buffer Requirements

Non-trout	Trout
Warm water perennial and intermittent streams: ◦ 25-ft buffer	Cold water perennial, intermittent and ephemeral streams: ◦ 50-ft buffer

- Local Issuing Authorities may require additional buffers in the local ordinance!

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Summary

- Erosion & Sedimentation is a serious problem associated with active construction sites
- Land-disturbing activities are governed on the Federal, State, & Local level
- By implementing a series of sound BMPs that are properly designed, installed, and maintained is the most effective way to prevent problems
- Any violations associated with Erosion & Sedimentation must be properly documented and corrected

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Questions?

GSWCC
Urban Program
4310 Lexington Road
Athens, GA 30605
(706) 552-4474

GSWCC

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Insert Tab 2

Field Manual

Back of Tab

VEGETATIVE BEST MANAGEMENT PRACTICES

Bf	Buffer Zone
Cs	Coastal Dune Stabilization
Ds1	Disturbed Area Stabilization (With Mulching Only)
Ds2	Disturbed Area Stabilization (With Temporary Seeding)
Ds3	Disturbed Area Stabilization (With Permanent Vegetation)
Ds4	Disturbed Area Stabilization (With Sodding)
Du	Dust Control on Disturbed Area
Fl-Co	Flocculants and Coagulants
Sb	Streambank Stabilization (With Permanent Vegetation)
Ss	Slope Stabilization
Tac	Tackifiers

The products and practices presented in this Field Manual show the standard installation methods for each conventional BMP. New products and practices may not necessarily meet the requirements for each conventional BMP. Please see the Equivalent Best Management Practice List for specific manufacturer guidelines and specifications.

Bf

BUFFER ZONE

DEFINITION

A strip of undisturbed, original vegetation, enhanced or restored existing vegetation or the re-establishment of vegetation surrounding an area of disturbance or bordering streams, ponds, wetlands, lakes, and coastal waters

PURPOSE

- Reduce storm runoff velocities
- Act as screen for “visual pollution”
- Reduce construction noise
- Improve aesthetics
- Filtering and infiltrating runoff
- Cooling rivers and streams by creating shade
- Provide food and cover for wildlife and aquatic organisms
- Flood protection
- Protect channel banks from erosion

INSTALLATION

- Important factors, such as slope, hydrology, width, and structure shall be considered.
- The GA EPD enforces a 25 ft minimum undisturbed stream buffer requirement for warm water fisheries and a 50 ft minimum undisturbed stream buffer requirement for cold water fisheries.

- If any land-disturbing activity, exempt or non-exempt, occurs within a mandated stream buffer, all cut and fills shall be stabilized with appropriate slope stabilization.

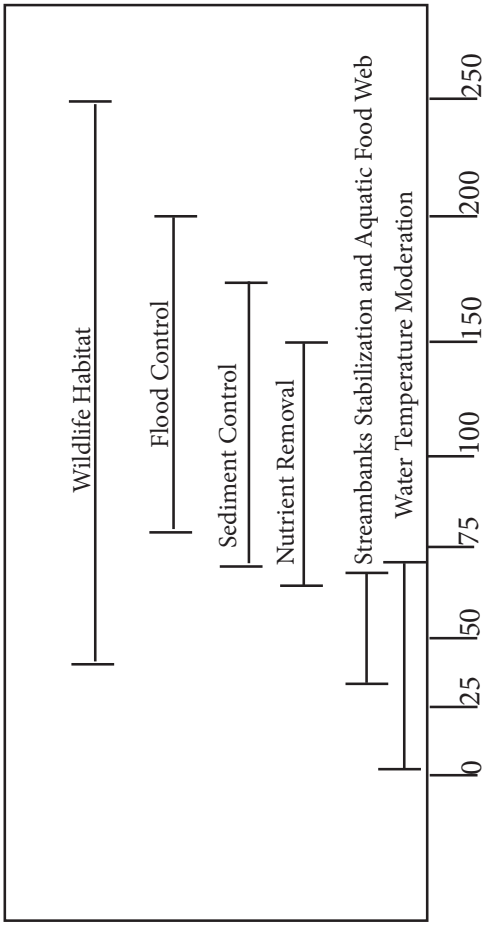

Figure 1. Range of Minimum Width (ft.) for Meeting Specific Buffer Objectives (Palone & Todd, draft)

Types of Buffers

General Buffer

- A strip of undisturbed, original land surrounding the disturbed site.
- A width should be selected to permit the zone to serve the purpose(s) listed above.

Vegetated Stream Buffer

- A vegetated stream buffer of 50 ft or greater can protect waters from excess sedimentation.

- The size of the stream and topography of the area must be considered to determine the appropriate width.
- The buffer should be increased 2 ft in width for every 1% slope.

Planting Techniques

- Plantings for buffer re-establishment and enhancement can consist of bare root seedlings, container-grown seedlings, container-grown plants, and balled and burlapped plants.
- Standard erosion control grasses and legumes may be used in denuded areas for quick stabilization.
- Refer to Tables 6-1.1 & 6-1.2 in the Manual for Erosion & Sediment Control in Georgia for complete listing of all Native Plants & Unrooted Hardwood Cuttings.
- Streambank stabilization techniques may be required if steep slopes and hydrologic patterns deem it necessary.
- Soil preparation and maintenance are essential for the establishment of planted vegetation.

Table 1. Effectiveness of Vegetative Buffer Strips

Purpose	Grass	Shrub	Tree
Filter Sediment	High	Low	Low
Filter Chemicals	Medium	Low	Low
Stabilize Stream Banks	Low	High	High
Improve Aesthetics	Low	Medium	High
Improve Habitat	Low	Medium	High
Reduce Noise	Low	Medium	High

Bf

MAINTENANCE

- Areas closet to the stream should be maintained with minimal impact.
- During periods of drought, water as necessary in all buffer areas planted for enhancement.
- Remove weeds by hand or with careful spraying.
- Monitor to determine if plant material needs to be replaced.
- Fertilizer is unnecessary if the appropriate vegetation is chosen.

REFERENCES

Ds1	Disturbed Area Stabilization (With Mulching Only)
Ds2	Disturbed Area Stabilization (With Temporary Seeding)
Ds3	Disturbed Area Stabilization (With Permanent Vegetation)
Sb	Streambank Stabilization (With Permanent Vegetation)

Cs

COASTAL DUNE STABILIZATION (WITH VEGETATION)

DEFINITION

Planting vegetation on dunes that are denuded, artificially constructed, or renourished.

PURPOSE

- Stabilize soil on dunes allowing them to become more resistant to wind and waves.
- Allow development of dunes in areas where they have been damaged or destroyed.

INSTALLATION

- Install in accordance with the approved plan.
- Install in accordance with all Federal, State and local regulations.
- Protect dunes from vehicular and human traffic.
- Provide crosswalks or crossover structures to allow for beach access.
- Irrigate during the first growing season in order to obtain good survival.
- Native plants commercially available that may be planted are included in Table 1.

Cs

Table 1. Planting Requirements for Native Plants

Species	Stock	Date	Depth
Marshay Cordgrass (Spartina patens)	Plants	Spring	4”-5”
Bitter Panicum (Panicum amarum)	Rhizomes	Spring	~4”
Coastal Panigrass (Panicum amarum v. amaralum	Seeds or Plants	Spring	1”-3”

Figure 1. Sand Fence and Native Plants

Sand Fence

- Install according to approved plan.
- Use posts made of Black Locust, Red or White Cedar, or similarly durable wood.
- Use posts with minimum length of 7 ft and minimum diameter of 3”.
- Space posts at a maximum of 10 ft.
- Entrench posts a minimum of 3 ft.
- Fasten fence to posts with four 12-gauge galvanized wires.
- Vegetation must be established immediately following development of the dunes.
- Use standard commercial 4-ft high snow fence that consists of wooden slats wired together with 1-1/4” spaces between the slats (See Figure 2)

Cs

Barrier Dune Construction

- Install sand fence a minimum of 100 ft from the mean high tide line.
- Space 2 or more parallel fences 30-40 ft apart.
- Locate fences as close to perpendicular with the prevailing winds, but as near parallel to the water line as possible
- When the winds are generally parallel to the water line, construct a single line of fence at least 140 ft from the mean high tide line with a shorter 30 ft section perpendicular to the original fence.
- Place these fences opposite the water side and space these fences about 40 ft apart.

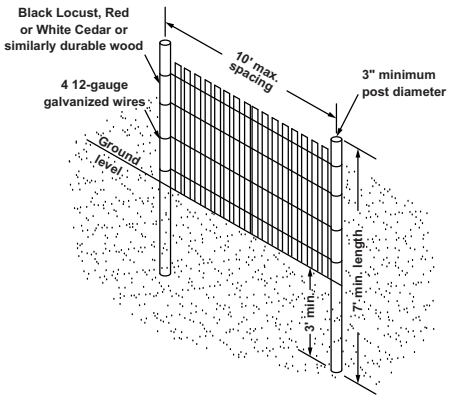

Figure 2. Sand Fence Installation Requirements

MAINTENANCE

- Repair any blowouts, wash pits, or other natural or man-made damage quickly.
- Maintain fences and erect additional fences if needed until the eroding area is replenished.
- Replant lost or destroyed vegetation.
- Apply 50 lbs of nitrogen/acre/year.
- Protect dunes from traffic by using elevated walks, semi-permanent paved paths, and portable roll-up walkways .

Cs

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Ds1

DISTURBED AREA STABILIZATION
(WITH MULCHING ONLY)

DEFINITION

A temporary cover of plant residues or other suitable materials, produced on site if possible, applied to the soil surface.

PURPOSE

- Reduce runoff and erosion
- Modify soil temperature
- Conserve moisture
- Prevent surface compaction and crusting
- Control undesirable vegetation
- Increase biological activity in the soil

INSTALLATION

- Apply mulch or temporary grassing to all exposed areas within 14 days of disturbance.
- Applicable to graded or cleared areas where seedings may not have a suitable growing season to produce an erosion retardant cover.
- Mulch can be used as a singular erosion control device for up to 6 months.
- Apply at the appropriate depth. Refer to Table 1 for specific materials.

Site Preparation

- Grade to permit the use of equipment for applying and anchoring mulch

- Install needed erosion control measures such as dikes, berms, and sediment barriers.
- Loosen compacted soil to a minimum depth of 3”.

Applying Mulch

- Apply dry straw or hay and wood chips uniformly by hand or by mechanical equipment.
- Apply 20-30 lbs of nitrogen/acre if the area will eventually be covered with perennial vegetation.
- Apply polyethylene film on exposed areas.

Anchoring Mulch

- Press straw or hay into the soil with a disk harrow immediately after application. Tackifiers may be used when spreading mulch with blower-type equipment.
- Anchor wood waste using the appropriate size netting
- Trench polyethylene at the top as well as incrementally as necessary.

Table 1. Mulching Application Requirements

Material	Rate	Depth
Straw or hay	-	2” to 4”
Wood waste, chips, sawdust, bark	-	2” to 3”
Polyethylene film	Secure with soil, anchors, weights	-
Geotextiles, jute matting, netting, etc.	See manufac-turer’s recom-mentations	-

MAINTENANCE

- The appropriate depth and 90% cover shall be maintained at all times.

REFERENCES

Tac Tackifiers

DISTURBED AREA STABILIZATION

(WITH TEMPORARY SEEDING)

DEFINITION

The establishment of temporary vegetative cover with fast growing seedings for seasonal protection on disturbed or denuded areas.

PURPOSE

- Reduce runoff and sediment damage of down stream resources
- Protect the soil surface from erosion
- Improve wildlife habitat
- Improve aesthetics
- Improve tilth, infiltration, and aeration as well as organic matter for permanent plantings

INSTALLATION

- Apply mulch or temporary grassing to all exposed areas within 14 days of disturbance.
- Applicable to rough graded areas that will be exposed for less than 6 months.
- Coordinate with permanent measures to ensure economical and effective stabilization.
- Take note of which species are not appropriate for companion crop plantings.
- When the soil has been sealed by rainfall or consists of smooth cut slopes, scarify the soil in order to provide a place for the seed to lodge and germinate.

- Apply agricultural lime at the rate determined by soil test pH.
- Apply lime before land preparation and incorporate with a disk, ripper, or chisel.
- On steep slopes, apply fertilizer hydraulically.
- Select grass or grass-legume mixtures based on the area and season of the year.
- Apply seed uniformly by hand, cyclone seeder, drill, culti-packer-seeder, or hydraulic seeder.
- The appropriate depth of planting is 10x the seed diameter.
- Apply irrigation at a rate that will not cause runoff and erosion. Thoroughly wet the soil to insure germination of the seed.

MAINTENANCE

- Re-seed areas where an adequate stand of temporary vegetation fails to emerge.
- If optimum conditions for temporary vegetation is lacking, mulch can be used a singular erosion control device.

REFERENCES

Ds1	Disturbed Area Stabilization (With Mulching Only)
Tac	Tackifiers

Figure 2. Browntop Millet

Figure 3. Ryegrass

Figure 3. Rye

Table 1. Some Temporary Plant Species, Seeding Rates and Planting Dates

Species	Rates Per 1,000 sq. ft.	Rates per Acre	Planting Dates by Region		
			M-L	P	C
Barley Alone Barley in Mixtures	3.3 lbs. .6 lbs.	3 bu. .5 bu.	9/1-10/31	9/15-11/15	10/1-12/31
Lespedeza, Annual Lespedeza in Mixtures	0.9 lbs. 0.2 lbs.	40 lbs. 10 lbs.	3/1-3/31	3/1-3/31	2/1-2/28
Lovegrass, Weeping Lovegrass in Mixtures	0.1 lbs. .05 lbs.	4lbs. 2 lbs.	4/1-5/31	4/1-5/31	3/1-5/31
Millet, Browntop Millet in Mixtures	.9 lbs. .2 lbs.	40 lbs. 10 lbs.	4/15-6/15	4/15-6/30	4/15- 6/30
Millet, Pearl	1.1 lbs.	50 lbs.	5/15-7/15	5/1-7/31	4/15-8/15
Oats Alone Oats in Mixtures	2.99 lbs. .7 lbs.	4 bu. 1 bu.	9/15 -11/15	9/15-11/15	9/15-11/15

Ds2

Table 1. Some Temporary Plant Species, Seeding Rates and Planting Dates (continued)

Ds2

Species	Rates Per 1,000 sq. ft.	Rates per Acre	Planting Dates by Region		
			M-L	P	C
Rye (Grain) Alone Rye in Mixtures	3.9 lbs. .6 lbs.	3 bu. .5 bu.	8/15-10/31	9/15/-11/30	10/1-12/31
Ryegrass	0.9 lbs.	40 lbs.	8/15-11/15	9/1-12/15	9/15-12/31
Sudangrass	1.4 lbs.	60 lbs.	5/1-7/31	5/1-7/31	4/1-7/31
Triticale Alone Triticale in Mixtures	3.3 lbs. .6 lbs	3 bu. .5 bu.	NA	NA	10/15-11/30
Wheat Alone Wheat in Mixtures	4.1 lbs. .7 lbs.	3 bu. .5 bu.	9/15 -11/30	10/1-12/15	10/15-12/31

1. Unusual site conditions may require heavier seeding rates.
2. Seeding dates may need to be altered to fit temperature variations and local conditions.
3. For Major Land Resource Areas (MLRAs), see page 60.
4. Seeding rates are based on pure live seed (PLS).

Table 2. Fertilizer Requirements for Temporary Vegetation

Types of Species	Planting Year	Fertilizer (N-P-K)	Rate (lbs./acre)	N Top Dressing Rate (lbs./acre)
Cool season grasses	First Second Maintenance	6-12-12 6-12-12 10-10-10	1500 1000 400	50-100 --- 30
Cool seasn grasses & legumes	First Second Maintenance	6-12-12 0-10-10 0-10-10	1500 1000 400	0-50 --- ---
Temporary cover crops seeded alone	First	10-10-10	500	30
Warm season grasses	First Second Maintenance	6-12-12 6-12-12 10-10-10	1500 800 400	50-100 50-100 30

Ds3

DISTURBED AREA STABILIZATION

(WITH PERMANENT SEEDING)

DEFINITION

The planting of perennial vegetation such as trees, shrubs, vines, grasses, or legumes on exposed areas for final permanent stabilization.

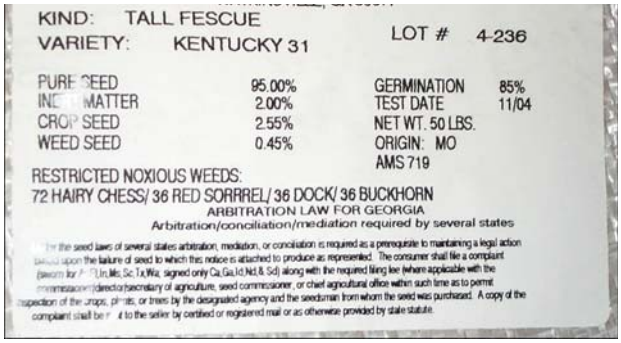
PURPOSE

- Protect the soil surface from erosion
- Reduce damage from sediment and runoff to down-stream areas
- Improve wildlife habitat and visual resources
- Improve aesthetics

INSTALLATION

- Use conventional planting methods where possible.
- Final Stabilization means that 100% of the soil surface is uniformly covered in permanent vegetation with a density of 70% or greater, or landscaped according to the plan (uniformly covered landscaping materials in planned lanscaped areas), or equivalent permanent stabilization measures.
- Select plants species based on site and soil conditions, planned use and maintenance of the area, time of year, method of planting, and the needs of the land user. (Refer to Table 1)

- Apply agricultural lime at a rate of 1-2 tons/acre unless soil tests indicate otherwise. Please refer to Table 2 for initial fertilization, nitrogen, topdressing, and maintenance fertilizer requirements for each species.
- Apply seed hydraulically. If using conventional methods, use a culti-packer seeder, drill, rotary seeder, or by hand.
- Cover the seed lightly with 1/8”-1/4” of soil for small seed and 1/2”-1” of soil for large seed when using a cultipacker.
- Check seed tags for % germination & % purity in order to calculate Pure Live Seed (PLS), which is the percentage of the seeds that are pure and will germinate.
- Mulch is required for all permanent vegetation applications. Please refer to **Ds1** for application rates and anchoring methods for different materials.
- Irrigate when the soil is dry and at a rate that will not cause runoff.



KIND: TALL FESCUE
VARIETY: KENTUCKY 31
LOT # 4-236

PURE SEED	95.00%	GERMINATION	85%
INERT MATTER	2.00%	TEST DATE	11/04
CROP SEED	2.55%	NET WT. 50 LBS.	
WEED SEED	0.45%	ORIGIN: MO	
		AMS 719	

RESTRICTED NOXIOUS WEEDS:
72 HAIRY CHESS/ 36 RED SORRREL/ 36 DOCK/ 36 BUCKHORN
ARBITRATION LAW FOR GEORGIA
Arbitration/conciliation/mediation required by several states

Figure 1. Typical Tag on a Bag of Seed

PLS Example

Tall Fescue

85% germination & 95% purity

PLS = 0.85 germination x 0.95 purity

PLS = 80.75%

$$\frac{\text{Seeding rate}}{\text{PLS}} = \frac{\text{50 lbs. PLS/acre}}{\text{80.75\% PLS}} = \text{61.92 lbs/acre}$$

Table 1. Some Permanent Plant Species, Seeding Rates, and Planting Dates

Species	Rates per Acre	Rates per 1,000 sq. ft	Planting Dates by Region			Remarks
			M- L	P	C	
Bahia, Pensacola Alone or with temporary cover With other perennials	60 lbs. 30 lbs.	1.4 lbs. 0.7 lb.	---	4/1 -5/31	3/1-5/31	Low growing; sod producing; will spread into Bermuda lawns.
Bahia, Wilmington Alone or with temporary cover With other perennials	60 lbs. 30 lbs.	1.4 lbs. 0.7 lb.	3/15-5/31	3/1-5/31	__	Same as above
Bermuda, Common (Hulled seed) Alone With other perenials	10 lbs. 6 lbs.	0.2 lb. 0.1 lb.	---	4/1-5/31	3/15-5/31	Quick cover; low growing; sod forming; needs full sun.
Bermuda, Common (Unhulled seed) With temporary cover With other perennials	10 lbs. 6 lbs.	0.2 lb. 0.1 lb	---	10/1-2/28	11/1-1/31	Plant with Winter annuals. Plant with Tall Fescue

Table 1. Some Permanent Plant Species, Seeding Rates, and Planting Dates (continued)

Species	Rates per Acre	Rates per 1,000 sq. ft	Planting Dates by Region			Remarks
			M- L	P	C	
Bermuda Springs Common lawn and forage hybrids	40 cu. ft.	0.9 cu.ft.	4/15-6/15	4/1-6/15	4/1-5/31	1 cu. ft. = 650 sprigs 1 bu. = 1.25 cu. ft. or 800 sprigs
	Sod plugs 3' x3'					
Centipede	Blcok Sod Only	Block Sod Only	---	11/1-5/31	11/1-5/31	Drought tolerant. Full sun or partial shade.
Crown Vetch With winter annuals or cool season grasses	15 lbs.	0.3 lb.	9/1-10/15	9/1-10/15	--	Mix with 30 lbs. Tall Fescue or 15 lbs. Rye; inoculate seed; plant only North of Atlanta.
Fescue, Tall Alone With other perennials	50 lbs. 30 lbs.	1.1 lbs. 0.7 lb.	3/1-4/15 or 8/15-10/15	9/1-10/15	---	Can be mixed with perennial Lespedezas or Crown Vetch; not for droughty soils or heavy use areas

Table 1. Some Permanent Plant Species, Seeding Rates, and Planting Dates (continued)

Species	Rates per Acre	Rates per 1,000 sq. ft	Planting Dates by Region			Remarks
			M- L	P	C	
Lespedeza, Sericea						Widely adapted and low maintenance; takes 2-3 years to establish; inoculate seed with EL inoculant; mix with Weeping lovegrass, Common Bermuda, Bahia or Tall Fescue.
Scarified	60 lbs.	1.4 lbs.	4/1-5/31	3/15-5/31	3/1-5/15	
Unscarified	75 lbs.	1.7 lbs.	9/1-2/28	9/1-2/28	9/1-2/28	Mix with Tall Fescue or winter annuals.
Seed-bearing hay	3 tons	138 lbs.	10/1-2/28	10/1-1/31	10/15-1/15	Cut when seed is mature but before it shatters. Add Tall Fescue or winter annuals.

Table 1. Some Permanent Plant Species, Seeding Rates, and Planting Dates (continued)

Species	Rates per Acre	Rates per 1,000 sq. ft	Planting Dates by Region			Remarks
			M- L	P	C	
Lespedeza Ambro Virgata or Appalow						Spreading growth with height of 18”-24”; good in urban areas; slow to develop good stands; mix with Weeping Lovegrass, Common Bermuda, Bahia Tall Fescue or winter annuals; do not mix with Sericea Lespededeza; inoculate seed with EL inoculant.
Scarified	60 lbs.	1.4 lbs.	4/1-5/31	3/15-5/31	3/1-5/15	
Unscarified	75 lbs.	1.7 lbs.	9/1-2/28	9/1-2/28	9/1-2/28	
Lespedeza, Shrub (Lespedeza Bicolor or Lespedeza Thumbergii) Plants	3’ x 3’ spacing		10/1-3/31	11/1-3/15	11/15-2/28	Plant in small clumps for wildlife food and cover.

Ds3

Table 1. Some Permanent Plant Species, Seeding Rates, and Planting Dates (continued)

Species	Rates per Acre	Rates per 1,000 sq. ft	Planting Dates by Region			Remarks
			M- L	P	C	
Lovegrass, weeping Alone With other perennials	4 lbs. 2 lbs.	0.1 lb. 0.05 lb.	4/1-5/31	3/15-5/31	3/1-5/31	Quick cover; drought tolerant; grows well with Sericea Lespedeza on road-banks and other steep slopes; short lived.
Maidencane sprigs	2' x 3' spacing		2/1-3/31	2/1-3/31	2/1-3/31	For very wet sites such as river banks and shorelines. Dig sprigs locally.
Panicgrass, Altantic Coastal	20 lbs.	0.5 lb.	---	3/1-4/30	3/1-4/30	Grows well on coastal sand dunes; mix with Sericea Lespedeza but not on sand dune.
Red Canary Grass With other perennials	50 lbs. 30 lbs.	1.1 lbs. 0.7 lb.	8/15-10/15	9/1-10/15	——	Grows similar to Tall Fescue; for wet sites

Table 1. Some Permanent Plant Species, Seeding Rates, and Planting Dates (continued)

Species	Rates per Acre	Rates per 1,000 sq. ft	Planting Dates by Region			Remarks
			M- L	P	C	
Sunflower, Aztec Maximillian	10 lbs.	0.2 lb.	4/15-5/31	4/15-5/31	4/1-5/31	Mix with Weeping Lovegrass or other low growing grasses or legumes.

1. Rates are for broadcasted seed. If a seed drill is used, reduce the rates by one-half.
2. PLS is an abbreviation for Pure Live Seed. Refer to Glossary for an explanation of this term.
3. The resource areas are defined in the Glossary. See page 60 for Resource Area.
4. Seeding rates are based on pure live seeds (PLS).

Table 2. Fertilizer Requirements for Permanent Vegetation

Types of Species	Planting Year	Fertilizer (N-P-K)	Rate (lbs./ acre)	N Top Dressing Rate (lbs./acre)
Cool season grasses	First Second Maintenance	6-12-12 6-12-12 10-10-10	1500 1000 400	50-100 --- 30
Cool grasses and legumes	First Second Maintenance	6-12-12 0-10-10 0-10-10	1500 1000 400	0-50 --- ---
Warm season grasses	First Second Maintenance	6-12-12 6-12-12 10-10-10	1500 800 400	50-100 50-100 30
Warm season grasses and legumes	First Second Maintenance	6-12-12 0-10-10 0-10-10	1500 1000 400	50 --- ---

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Figure 2. Weeping Lovegrass

Figure 3. Sericea Lespedeza

Figure 4. Common Bermuda

MAINTENANCE

- Re-seed areas where an adequate stand of vegetation fails to emerge or where a poor stand exists.
- Maintain at least 6” of top growth under any use and management.
- Exclude traffic until the plants are well established.
- Please refer to Table 2 for second year and maintenance fertilizer rates.
- Apply one ton of agricultural lime every 4-6 years or as indicated by soil tests.
- Mow Bermudagrass, Bahiagrass, and Tall Fescue as desired.
- Mow Sericea Lespedeza only after frost to ensure that the seeds are mature.

REFERENCES

Ds1 Disturbed Area Stabilization (With Mulching Only)

Ds2 Disturbed Area Stabilization (With Temporary Seeding)

Ss Slope Stabilization

Ds4

DISTURBED AREA STABILIZATION
(WITH SODDING)

DEFINITION

A permanent vegetative cover using sods on highly erodible or critically eroded lands.

PURPOSE

- Establish immediate ground cover
- Reduce runoff and erosion
- Improve aesthetics and land value
- Reduce dust and sediments
- Stabilize waterways and critical areas
- Filter sediments, nutrients and bugs
- Reduce downstream complaints
- Reduce likelihood of legal action
- Reduce likelihood of work stoppage due to legal action
- Increase “good neighbor” benefits

INSTALLATION

- Bring soil surface to final grade. Clear surface of trash, woody debris, stones and clods larger than 1”. Apply sod to soil surfaces only and not frozen surfaces, or gravel type soils.

- Topsoil properly applied will help guarantee a stand. Don’t use topsoil recently treated with herbicides or soil sterilants.
- Mix fertilizer into soil surface. Fertilize based on soil tests or Table 1. For fall planting of warm season species, half the fertilizer should be applied at planting and the other half in the spring.
- Agricultural lime should be applied based on soil tests or at a rate of 1-2 tons/acre.
- Lay sod with tight joints and in straight lines. Don’t overlap joints. Stagger joints and do not stretch sod.

Table 1. Fertilizer Requirements for Soil Surface Application

Fertilizer Type (lbs./acre)	Fertilizer Rate (lbs./sq.ft.)	Fertilizer Rate	Season
10-10-10	1000	.025	Fall

- On slopes steeper than 3:1, sod should be anchored with pins or other approved methods.
- Installed sod should be rolled or tamped to provide good contact between sod and soil.
- Irrigate sod and soil to a depth of 4” immediately after installation.
- Sod should not be cut or spread in extremely wet or dry weather.
- Irrigation should be used to supplement rainfall for a minimum of 2-3 weeks.

MATERIALS

- Sod selected should be certified. Sod grown in the general area of the project is desirable.
- Sod should be machine cut and contain 3/4” (+ or - 1/4”) of soil, not including shoots or thatch.

- Sod should be cut to the desired size within ±5%. Torn or uneven pads should be rejected.
- Sod should be cut and installed within 36 hours of digging.
- Avoid planting when subject to frost heave or hot weather, if irrigation is not available.
- The sod type should be shown on the plans or installed according to Table 2. See page 60 for your Resource Area.

Table 2. Sod Planting Requirements

Grass	Varieties	Resource Area	Growing Season
Bermudagrass	Common Tifway Tifgreen Tiflawn	M-L, P,C P,C P,C P,C	Warm weather
Bahiagrass	Pensacola	P,C	Warm weather
Centipede	___	P,C	Warm weather
St. Augustine	Common Bitterblue Raleigh	C	Warm weather
Zoysia	Emerald Myer	P,C	Warm weather
Tall Fescue	Kentucky 31	M-L, P	Cool weather

MAINTENANCE

- Re-sod areas where an adequate stand of sod is not obtained.
- New sod should be mowed sparingly. Grass height should not be cut less than 2”-3” or as specified.
- Apply one ton of agricultural lime as indicated by soil test or every 4-6 years.

- Fertilize grasses in accordance with soil tests or Table 3.

Table 3. Fertilizer Requirements for Sod

Types of Species	Planting Year	Fertilizer (N-P-K)	Rate (lbs./acre)	Nitrogen Top Dressing Rate (lbs./acre)
Cool season grasses	First Second Maintenance	6-12-12 6-12-12 10-10-10	1500 1000 400	50-100 --- 30
Warm season grassed	First Second Maintenance	6-12-12 6-12-12 10-10-10	1500 800 400	50-100 50-100 30

REFERENCES

Ds1 Disturbed Area Stabilization (With Mulching Only)

Ds2 Disturbed Area Stabilization (With Temporary Seeding)

Ds3 Disturbed Area Stabilization (With Permanent Vegetation)

Ss Slope Stabilization

Du

DUST CONTROL ON DISTURBED AREAS

DEFINITION

Controlling surface and air movement of dust on construction sites, roads, and demolition sites.

PURPOSE

- Prevent surface and air movement of dust from exposed soil surfaces.
- Reduce the presence of airborne substances that may be harmful or injurious to human health, welfare, or safety, or to animals or plant life.

MATERIALS

Temporary Methods

- Mulches - See **Ds1 - Disturbed Area Stabilization** (with Mulching only). Refer to specification **Tac - Tackifiers** for the use of synthetic resin to bind mulch material.
- Vegetative Cover - See **Ds2 - Disturbed Area Stabilization** (with Temporary Seeding).
- Spray-on Adhesives - For use on mineral soils, not muck soils. Refer to specification **Tac - Tackifiers**.

- Tillage - Designed to roughen and bring clods to the soil surface. Begin plowing on windward side of site. Use chisel-type plows, spring-toothed harrows, or similar plows to achieve desired effect. This is an emergency measure to be used before wind erosion starts.
- Irrigation - Sprinkle the site with water until the surface is wet. Repeat as needed.
- Barriers - Use solid board fence, snow fence, burlap fence, crate walls, bales of hay, or similar material to control air currents and soil blowing. Place barriers at right angles at intervals of 15x their height to control wind erosion.
- Calcium Chloride - Apply at a rate to keep the surface moist.

Permanent Methods

- Permanent Vegetation - See **Ds3 - Disturbed Area Stabilization** (with Permanent seeding). Existing trees and large shrubs may afford valuable protection if left in place.
- Topsoiling - See specification **Tp - Topsoiling**.
- Stone - Cover surface with crushed stone or coarse gravel. See specification **Cr - Construction Road Stabilization**.

MAINTENANCE

- Prohibit traffic on surface after spraying.
- Supplement surface covering as needed.

REFERENCES

Ds1	Disturbed Area Stabilization (With Mulching Only)
Ds2	Disturbed Area Stabilization (With Temporary Seeding)
Ds3	Disturbed Area Stabilization (With Permanent Vegetation)
Ds4	Disturbed Area Stabilization (With Sodding)
Tac	Tackifiers
Cr	Construction Road Stabilization
Tp	Topsoiling

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Fl-Co

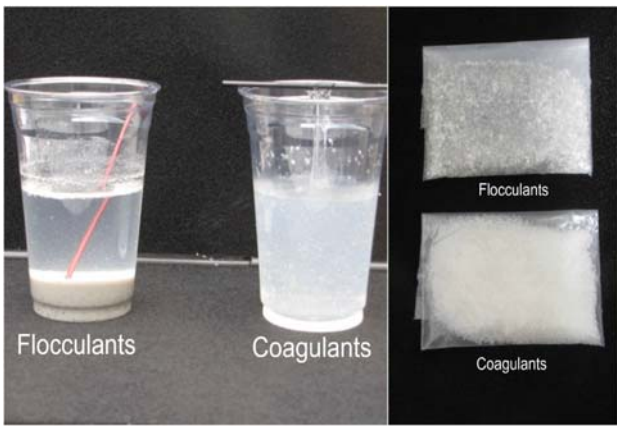
FLOCCULANTS & COAGULANTS

DEFINITION

Formulated to assist in the solids/liquid separation of suspended particles in solution.

Coagulant - Required to help give body to the water. A coagulant neutralizes the repulsive electrical charges surrounding particles allowing them to “stick together” creating clumps or flocs that form a small to mid-size particle.

Flocculent - Facilitate the agglomeration or aggreation of the coagulated particles to form larger floccules and act as a net where it gathers up the smaller coagulated particles making a larger particle. This larger particle will slowly drop out of suspension.



PURPOSE

- Settle suspended sediment, heavy metals and hydrocarbons (TSS) in runoff water from construction sites for water clarification.

INSTALLATION

- Application shall conform to manufacturer’s instructions and guidelines. Fl-Co applications shall comply with all federal and local laws.
- Only anionic forms of Fl-Co shall be used.

- This practice is not intended for application to surface waters of the state. It is intended for application within construction storm water ditches and storm drainage systems that feed into pre-constructed ponds or basins.

MAINTENANCE

- Maintenance shall consist of reapplying Fl-Co via the measures above when turbidity levels are no longer met or the Fl-Co is used up. Bricks, blocks, socks,logs and bags shall be maintained when sediment accumulates on the products.

Sb

STREAMBANK STABILIZATION

(USING PERMANENT VEGETATION)

DEFINITION

The use of readily available native plant materials to maintain and enhance streambanks, or to prevent, or restore and repair small streambank erosion problems.

PURPOSE

- Lessen the impact of rain directly on the soil.
- Trap sediment from adjacent land.
- Form a root mat to stabilize and reinforce the soil on the streambank.
- Provide wildlife habitat.
- Enhance the appearance of the stream.
- Lower summertime water temperatures for a healthy aquatic population.

NOTE: Careful thought, planning and execution is required to assure that the streambank stabilization project is done efficiently and correctly. Please refer to GSWCC's Guidelines for Streambank Restoration for more detailed information.

SELECTED PRACTICES

- Revegetation includes seeding and sodding of grasses, seeding in combination with erosion control fabrics, and the planting of woody vegetation (shrubs and trees).
- Use jute mesh and other geotextiles to aid in soil stabilization and revegetation.

Live Stake

- Fresh, alive woody plant cuttings tamped into the ground as stakes, intended to root and grow into mature shrubs that will stabilize soils and restore the riparian zone habitats.
- Willow species work best.
- Provides no immediate streambank stabilization.

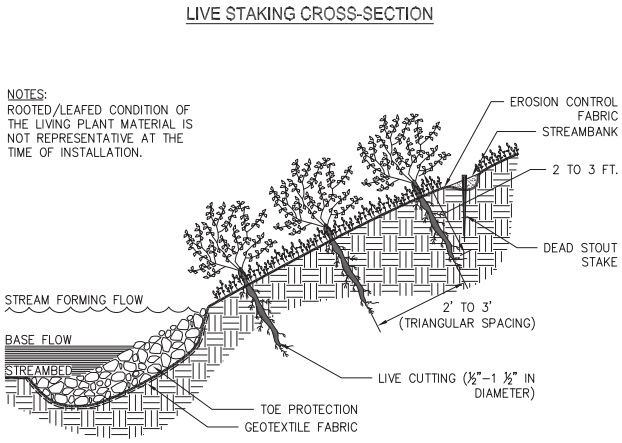


Figure 1. Illustration of a Live Stake

Joint Planting

- Installation of live willow stakes between rock previously placed along the streambank.
- Rock needs to be loosely dumped or hand placed and no thicker than 2 ft.
- Enables a bank previously installed with conventional rip-rap to become naturalized.

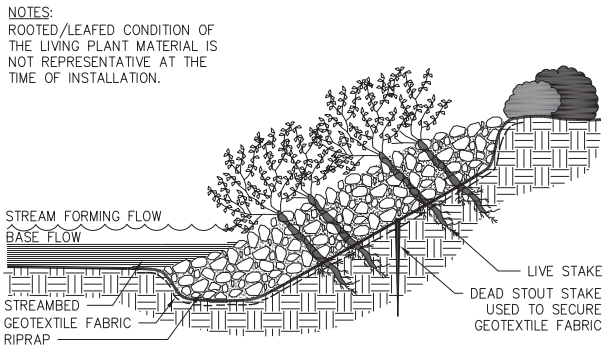


Figure 2. Illustration of Joint Planting

Live Fascine

- Sausage-like bundles of live cut branches placed into trenches along the streambank.
- Willow species work best.
- Provides immediate protection from erosion when properly used and installed.
- Creates very little site disturbance as compared to other systems.
- Works especially well when combined with surface covers such as jute mesh or coir fabrics.

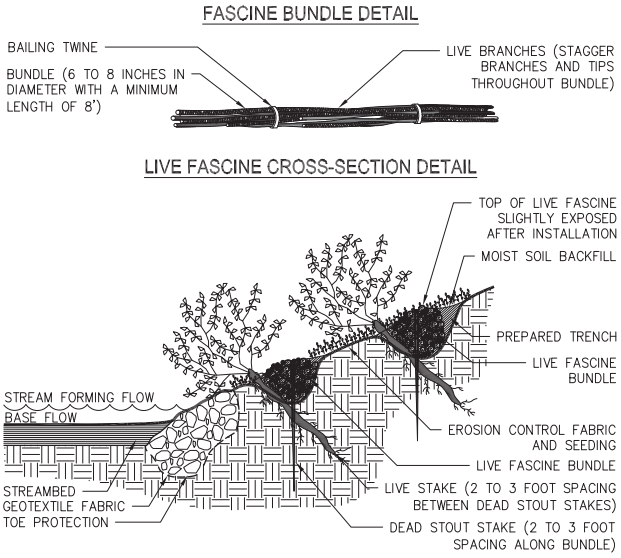


Figure 3. Illustration of a Live Fascine

Brushmattress

- Combination of living units that form an immediate protective surface cover over the streambank.
- Living units used include live stakes, live fascines, and a mattress branch cover (long, flexible branches placed against the bank surface).
- Requires a great deal of live material.
- Complicated and expensive to evaluate, design, and install.
- Captures sediment during flood conditions.
- Produces habitat rapidly, and quickly develops a healthy riparian zone.

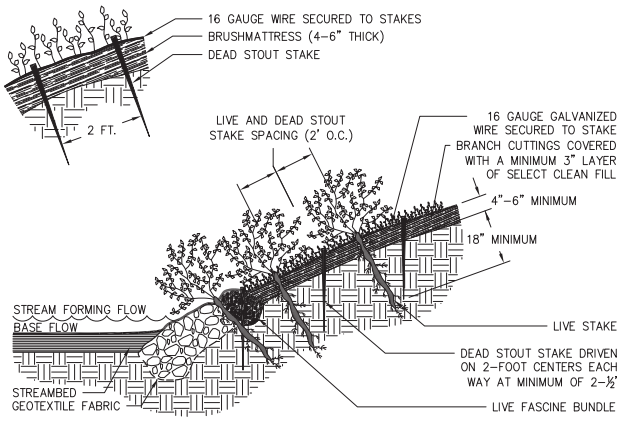


Figure 4. Illustration of a Brushmattress

Live Cribwall

- A rectangular framework of logs or timbers, rock, and woody cuttings.
- Requires a great deal of assessment and understanding of stream behavior.
- Can be complicated and expensive if a supply of wood and some volunteer help is not available.
- Develops a natural streambank or upland slope appearance after it has begun to grow.

- Provides excellent habitat for a variety of fish, birds, and animals.
- Very useful where space is limited on small, narrow stream corridors.

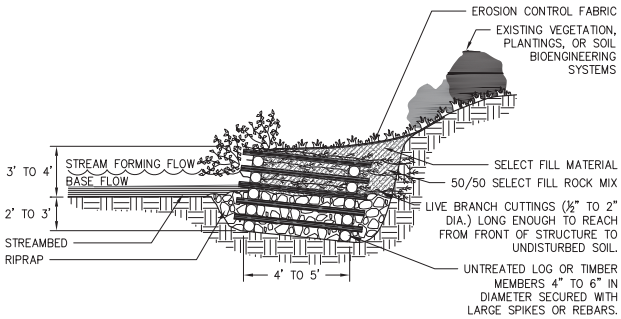


Figure 5. Illustration of a Live Cribwall

Branchpacking

- Process of alternating layers of live branches and soil, incorporated into a hole, gully, or slumped-out area in a slope or streambank.
- Moderate to complex level of difficulty for construction.
- Produces an immediate filter barrier, reducing scouring conditions, repairing gully erosion, and providing habitat cover and bank reinforcement.

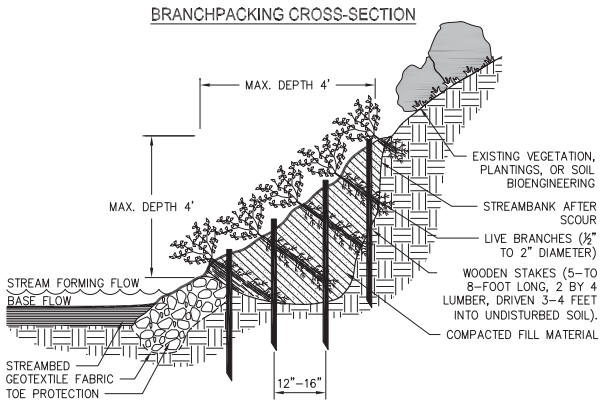


Figure 6. Illustration of Branchpacking

- One of the most effective and inexpensive methods for repairing holes in earthen embankments along small stream sites.

Table 1. Streambank Erosion Protection Measures Relative Costs Complexity		
Measure	Relative Cost	Relative Complexity
Live stake	Low	Simple
Joint planting	Low*	Simple*
Live fascine	Moderate	Moderate
Brushmattress	Moderate	Moderate to Complex
Live cribwall	High	Complex
Branchpacking	Moderate	Moderate to Complex
Conventional vegetation	Low to Moderate	Simple to Moderate
Conventional bank armoring (riprap)	Moderate to High	Moderate to Complex

*Assumes rock is in place

MAINTENANCE

- Check banks after every high-water event, fixing gaps in the vegetative cover at once with structural materials or new plants, and mulching if necessary.
- Fresh cuttings from other plants may be used for repairs.
- When fertilizer is applied on the surface, it is best to apply about one-half at planting, one-fourth when new growth is about 2” tall, and one-fourth about six weeks later.

REFERENCES

Ds1 Disturbed Area Stabilization (With Mulching Only)

Ds2 Disturbed Area Stabilization (With Temporary Seeding)

Ds3 Disturbed Area Stabilization (With Permanent Vegetation)

Ds4 Disturbed Area Stabilization (With Sodding)

Ss Slope Stabilization

Guidelines for Streambank Restoration, Georgia Soil and Water Conservation Commission

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Ss

SLOPE STABILIZATION

DEFINITION

A protective covering used to prevent erosion and establish temporary or permanent vegetation on steep slopes, shore lines, or channels.

Rolled Erosion Control Products (RECP)

- A natural fiber blanket with single or double photodegradable or biodegradable nets.

Hydraulic Erosion Control Products (HECP)

- HECP shall utilize straw, cotton, wood or other natural based fibers held together by a soil binding agent which works to stabilize soil particles. Paper mulch should not be used for erosion control.

PURPOSE

- Provide a cover layer that stabilizes the soil and acts as a rain drop impact dissipater while providing a microclimate which protects young vegetation and promotes its establishment.

INSTALLATION

- Installation and stapling of RECPs and application rates for the HECPs shall conform to manufacturer's guidelines for application.
- Hydraulic erosion control products shall be prepackaged from the manufacturer. Field mixing of performance enhancing additives will not be allowed. Fibrous components should be all natural or biodegradable.

Figure 1. Hydroseeding on disturbed areas

MAINTENANCE

- Inspect all erosion control blankets and matting periodically after installation. Inspect immediately after rainstorms to check for erosion and undermining.
- Repair all dislocations and failures immediately.
- Re-install all materials after washouts or breakage occurs. Repair damage to the slope or ditch first.
- Monitor all areas until they are permanently stabilized.

Figure 2. Installation of Jute Matting

Ss

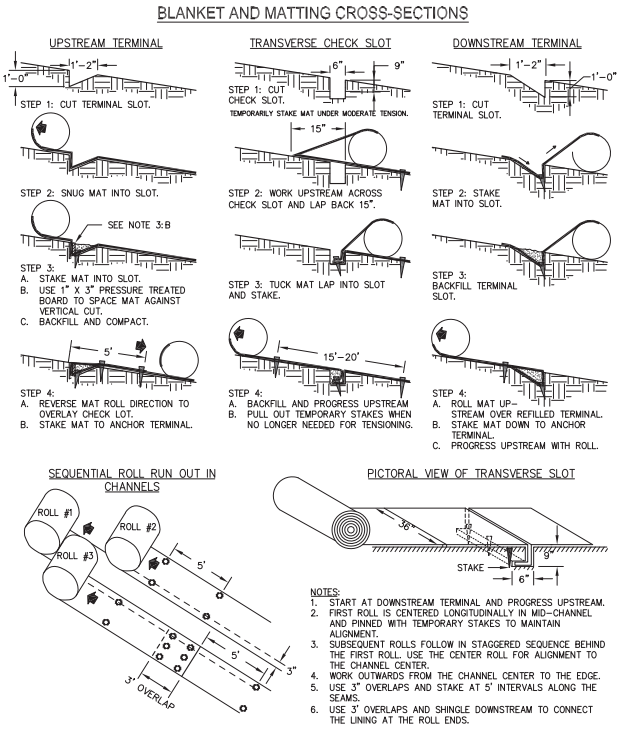

Figure 2. Typical Installation Guidelines for RECP

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Tac

TACKIFIERS

DEFINITION

A substance used as tie-down for soil, compost, seed, straw, hay or mulch. They hydrate in water and readily blend with other slurry materials to form a homogenous slurry.

PURPOSE

The purpose of tackifiers are to reduce soil erosion from wind and water on construction sites. It also increases the performance of the mulching material, so that it can:

- Increase infiltration.
- Increase soil fertility
- Control undesirable vegetation.
- Reduce runoff stormwater turbidity and loss of topsoil.
- Modify soil temperature.
- Increase soil cohesion and stabilization.
- Enhance seed germination

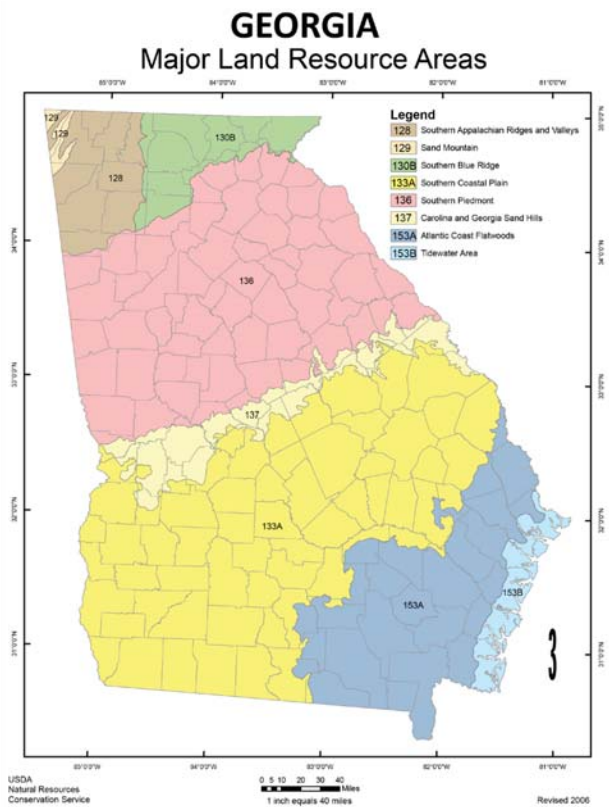
CONDITIONS

This practice is intended for direct soil surface application to sites where the timely establishment of vegetation may not be feasible or where vegetative cover is absent or inadequate.

Tac

CRITERIA

- All organic mulching materials shall be anchored by tackifiers/binders or matting/netting. Tackifiers and binders are used to anchor wood cellulose, wood pulp fiber, and other mulch materials applied with hydroseeding equipment.
- Only anionic forms of PAM shall be used. Not harmful to plants, animals, and aquatic life.
- Application rates shall conform to manufacturer's guidelines for application.
- Shall not reduce infiltration rates.
- All organic tackifiers must be derived from natural plant sources.
- Contain no growth or germination inhibiting materials.
- Synthetic fibers shall be of nylon or polyester blends.
- There are 5 types of tackifiers:
  - **Tac-1** Synthetic Polymers
  - **Tac-2** Organic Polymers
  - **Tac-3** Synthetic/Organic Blends
  - **Tac-4** Organic Polymers w/ Synthetic Fibers
  - **Tac-5** Synthetic/Organic Blends w/ Synthetic Fibers



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Insert Yellow Sheet

Back of Yellow Sheet

STRUCTURAL BEST MANAGEMENT PRACTICES

- **Cd** Check Dam
- **Ch** Channel Stabilization
- **Co** Construction Exit
- **Cr** Construction Road Stabilization
- **Dc** Stream Diversion Channel
- **Di** Diversion
- **Dn1** Temporary Downdrain Structure
- **Dn2** Permanent Downdrain Structure
- **Fr** Filter Ring
- **Ga** Gabion
- **Gr** Grade Stabilization Structure
- **Lv** Level Spreader
- **Rd** Rock Filter Dam
- **Re** Retaining Wall
- **Rt** Retrofit
- **Sd1** Sediment Barrier
- **Sd2** Inlet Sediment Trap
- **Sd3** Temporary Sediment Basin
- **Sd4** Temporary Sediment Trap
- **Sk** Floating Surface Skimmer
- **SpB** Seep Berm
- **Sr** Temporary Stream Crossing

- **St** Storm Drain Outlet Protection
- **Su** Surface Roughening
- **Tc** Turbidity Curtain
- **Tp** Topsoiling
- **Tr** Tree Protection
- **Wt** Vegetated Waterway or Stormwater Conveyance Channel

The products and practices presented in this Field Manual show the standard installation methods for each conventional BMP. New products and practices may not necessarily meet the requirements for each conventional BMP. Please see the Equivalent Best Management Practice List for specific manufacturer guidelines and specifications.

Cd CHECK DAM

DEFINITION

A small temporary barrier constructed across a swale, drainage ditch, or area of concentrated flow.

PURPOSE

- Reduce velocity.
- Filter sediment.
- Stabilize grade.

INSTALLATION

- Install according to the approved plan.
- Place in small, open channels, <u>not in live streams</u>.
- Construct center at least 9” lower than outer edges.
- Extend across entire width of ditch or swale.
- Make side slopes 2:1 or flatter.
- Toe of the upstream dam should be at the same elevation as the top of the downstream dam.
- Seed and mulch area beneath the dam after its removal.
- Check dams may be used in conjunction with other BMPs for any flows exceeding 2.0 cfs.

Stone Check Dams **Cd-S**

- Drainage area not to exceed 2 acres.
- Constructed of graded size 2”-10” stone.
- The center of the check dam should be at least 9” lower than the outer edges.
- The dam height should be a maximum of 2 ft from the center to the rim edge.
- Place a suitable geotextile between the graded stone and the soil base and abutments.

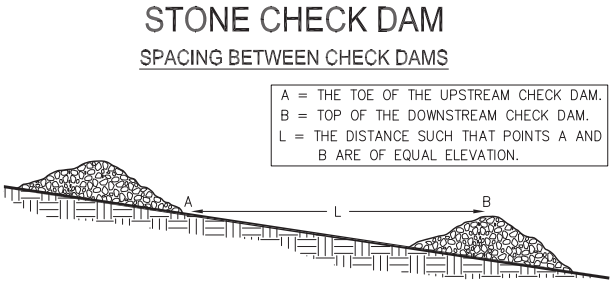
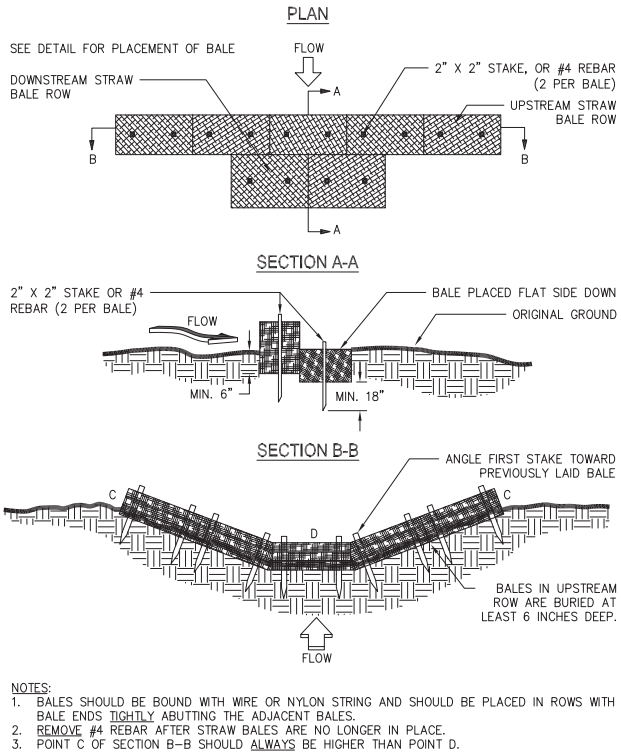


Figure 1. Stone Check Dam Spacing Requirements

Straw Bale Check Dams **Cd-Hb**

- Drainage area not to exceed 1 acre.
- Bales should be bound with wire or nylon string.
- Bales should be placed in rows with bale ends tightly abutting the adjacent bales.
- A trench shall be dug across the channel deep enough that the wide side of the 2nd bale is level with the ground.
- Drive the standard 2x2 stakes or #4 rebar through the bales into the ground 18”-24” for anchorage. The first stake in each bale should be driven toward a previsouly laid bale in order to force bales together.

Cd



NOTES:
1. BALES SHOULD BE BOUND WITH WIRE OR NYLON STRING AND SHOULD BE PLACED IN ROWS WITH BALE ENDS TIGHTLY ABUTTING THE ADJACENT BALES.
2. REMOVE #4 REBAR AFTER STRAW BALES ARE NO LONGER IN PLACE.
3. POINT C OF SECTION B-B SHOULD ALWAYS BE HIGHER THAN POINT D.

Figure 1. Straw Bale Check Dam Installation Requirements

Compost Filter Sock **Cd-Fs**

- Drainage area not to exceed 1 acre.
- Place one stake in the filter sock at the center of the ditch/ channel.
- Place stakes at the bed/bank junction and at the end of the device not spaced more than 2 ft apart.
- Compost filter sock to be at least 18" in diameter
- Minimum staking depth is 18".
- Can be seeded at the time of installation.

Cd

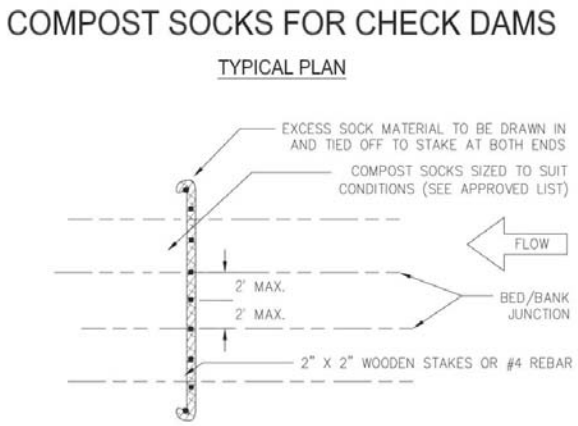


Figure 1. Compost Filter Sock Installation Requirements

MAINTENANCE

- Periodically inspect and maintain all structures.
- Remove sediment when it reaches a depth of one-half the original dam height.
- May remain in place permanently.

REFERENCES

Ds1 Disturbed Area Stabilization (With Mulching Only)

Ds2 Disturbed Area Stabilization (With Temporary Seeding)

Ds3 Disturbed Area Stabilization (With Permanent Vegetation)

Ds4 Disturbed Area Stabilization (With Sodding)

Ch

CHANNEL STABILIZATION

DEFINITION

Improving, constructing, or stabilizing an open channel or waterway.

PURPOSE

- Prevent erosion and sediment deposition.
- Provide adequate capacity for flood water, drainage, or other water management practices.

INSTALLATION

- Install according to the approved plan.
- Drainage area not to exceed one square mile.
- This applies only to channels conveying intermittent flow, not to channels conveying a continuous, live stream.

Category 1 (≤ 5 ft/sec) Ch-1

Vegetative Lining

- Temporary erosion control blankets or sod shall be used to aid in the establishment of the vegetated lining.
- Hydraulic Erosion Control Products are not intended to be applied in channels, swales, or other areas where concentrated flows are anticipated.

Category 2 (≥ 5 ft/sec to < 10 ft/sec) Ch-2

Turf Reinforcement Matting (TRM)

- Permanent geosynthetic erosion control matting that is used in channels to stabilize the soil while permanent vegetation is rooting.

Rock Riprap Lining

- Slopes should be 1.5:1 or less.
- Place a filter blanket, at least 6 inches thick, of sand, gravel, and/or geotextile material between the riprap and the base material.

Category 3 (≥ 10 ft/sec) Ch-3

Concrete Lining

- A separation geotextile should be placed under concrete linings to prevent undermining.
- Provide adequate outlet protection for discharge point.

Grade Stabilization Structure

- Constructed of concrete, rock, masonry, steel, aluminum or treated wood.
- Provide adequate outlet for discharge.
- Do not compromise the environmental integrity of the area.
- Vegetate all disturbed areas immediately.

Figure 1. Concrete Lining

Ch

MAINTENANCE

- Periodically inspect and maintain all structures.

REFERENCES

Gr	Grade Stabilization Structure
St	Storm Drain Outlet Protection
Ds1	Disturbed Area Stabilization (With Mulching Only)
Ds2	Disturbed Area Stabilization (With Temporary Seeding)
Ds3	Disturbed Area Stabilization (With Permanent Vegetation)
Ds4	Disturbed Area Stabilization (With Sodding)

Ch

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Co

CONSTRUCTION EXIT

DEFINITION

A stone-stabilized pad located at any point where traffic will be leaving a construction site to a public right-of-way, street, alley, sidewalk, or parking area.

PURPOSE

- Reduce or eliminate the transport of mud from the construction area onto public right-of-ways.

INSTALLATION

- Install according to the approved plan.
- Use 1.5”-3.5” stone.
- Minimum pad thickness of 6”.
- Minimum pad width of 20 ft.
- Minimum pad length of 50 ft.
- When the construction is less than 50 ft from the paved access, the length shall be from the edge of the existing pavement to the permitted building being constructed.
- When washing is required, conduct on an area stabilized with crushed stone and route runoff to an approved sediment trap or sediment basin.
- Place the geotextile liner the full length and width of the entrance.

Co

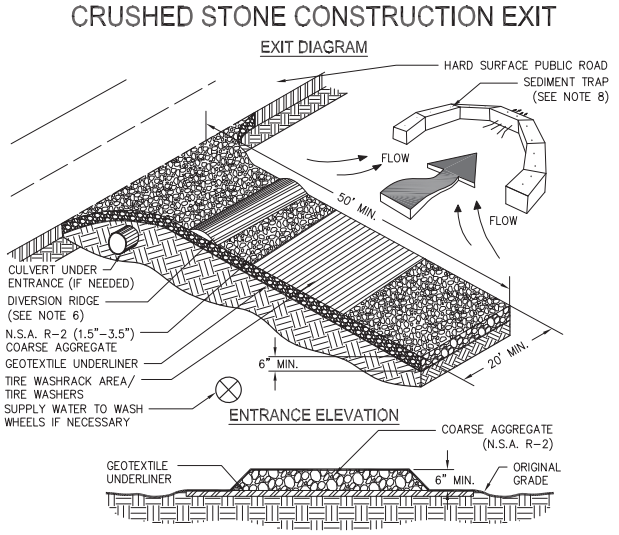

Figure 1. Crushed Stone Construction Exit Installation Requirements

Figure 2. Geotextile Underliner

MAINTENANCE

- Periodically dress with 1.5”-3.5” stone.
- Maintain in a condition that will prevent tracking or flow of mud onto public rights-of way.
- Immediately remove mud and debris tracked or spilled onto roadways.

Cr

CONSTRUCTION ROAD STABILIZATION

DEFINITION

A travel way constructed as part of a construction plan including access roads, subdivision roads, parking areas, and other on-site vehicle transportation routes.

PURPOSE

- Provide a fixed route of travel for construction traffic.
- Reduce erosion and subsequent regrading of permanent roadbeds between time of initial grading and final stabilization.

INSTALLATION

- Install according to the approved plan.
- Temporary roads shall follow the contours of the natural terrain to minimize disturbance of drainage patterns.
- If a temporary road must cross a stream, the crossing must be designed, installed and maintained according to specification **Sr - Temporary Stream Crossing**.
- Grades for temporary roads should not exceed 10% except for short lengths but maximum grades of 20% or more may be used for special uses.

- Temporary roadbeds shall be at least 14 ft wide for one-way traffic, 20 ft wide for two-way traffic. The width for two-way traffic shall be increased approximately 4 ft for trailer traffic.
- Provide a minimum shoulder width of 2 ft on each side.
- All cut and fills shall be 2:1 or flatter. Side slopes shall be no steeper than 3:1 if mowing
- Drainage channels shall be designed to be on stable grades or protected with structures or linings for stability.
- Apply geotextile to the roadbed for additional stability according to the design manual specifications.
- Apply a 6” layer of coarse aggregate immediately after grading. For “heavy-duty” traffic situations, place stone at a depth of 8”-10”.
- Stabilize all roadside ditches, cuts, fills, and other disturbed areas adjacent to parking areas and roads with appropriate temporary or permanent vegetation

MAINTENANCE

- Periodically top dress roads and parking areas with gravel to maintain the gravel depth at 6”.
- Check vegetated areas periodically to ensure a good stand of vegetation is maintained.
- Remove any silt or other debris causing clogging of roadside.

REFERENCES

Ds2	Disturbed Area Stabilization (With Temporary Seeding)
Ds3	Disturbed Area Stabilization (With Permanent Vegetation)
Sr	Temporary Stream Crossing

Dc STREAM DIVERSION CHANNEL

DEFINITION

A temporary channel constructed to convey flow around a construction site while a permanent structure is being constructed in the stream channel.

PURPOSE

- Protect the streambed from erosion and allow work “in the dry”.

INSTALLATION

- Install according to the approved plan.
- Drainage area shall not exceed one square mile (640 acres).
- The bottom width of the stream diversion shall be a minimum of six feet or equal to the bottom width of the existing streambed, whichever is greater.
- Side slopes of the stream diversion channel shall be no steeper than 2:1.
- Depth and grade of the channel shall be sufficient to ensure continuous flow of water in the diversion.
- The channel shall be lined to prevent erosion of the channel and sedimentation in the stream.
- The lining is selected based upon the expected velocity of bankfull flow. Please refer to Table 1.

Table 1. Stream Diversion Channel Linings

Lining Materials	Symbol	Acceptable Velocity Range
Geotextile, poly-ethylene film, or sod	Dc-A	0-2.5 fps
Geotextile alone	Dc-B	2.5-9.0 fps
Class I RipRap & Geotextile	Dc-C	9.0-13.0 fps

STREAM DIVERSION CHANNEL

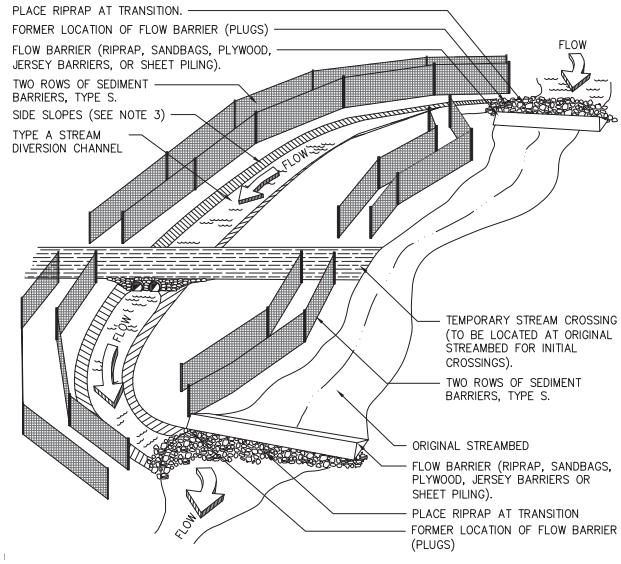

Figure 1. Stream Diversion Channel (Perspective View)

- The channel shall be excavated, constructing plugs at both ends.
- Sediment barriers or berms shall be placed along the sides of the channel to prevent unfiltered runoff from entering the stream.
- The channel surface shall be smooth (to prevent tearing of the liner) and lined with the material specified in the plans.
- The plugs are removed when the liner installation is complete, removing the downstream plug first.
- As soon as construction in the streambed is complete, the diversion shall be replugged and backfilled.
- Upon removal of the lining, the stream shall immediately be restored and properly stabilized.
- A Stream Buffer Variance from the GA EPD may be required and all other appropriate agencies, including the U.S. Army Corps of Engineers, must be contacted to ensure compliance with other laws.

MAINTENANCE

- Inspect the stream diversion channel at the end of each day to make sure that the construction materials are positioned securely.
- Ensure that the work area stays dry and that no construction materials float downstream.
- All repairs shall be made immediately.

REFERENCES

Ss Slope Stabilization

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Di DIVERSION

DEFINITION

A ridge of compacted soil, constructed above, across, or below a slope.

PURPOSE

- Reduce slope lengths.
- Intercept and divert storm runoff to a stable outlet at a non-erosive velocity.

INSTALLATION

- Install according to the approved plan.
- Remove trees, brush, stumps and other objectionable material.
- Compact all fills.
- Channel cross-section should be trapezoidal or parabolic in shape.
- Side slopes should be 2:1 or flatter.
- Excavate narrow, deep channels on steep slopes and broad, shallow channels on gentle slopes.
- Adequate outlet must be present.
- Stabilize channel and outlet with vegetation (mulch required for all seeded or sprigged channels), riprap, or concrete.
- Dispose of and/or stabilize unneeded excavated material.

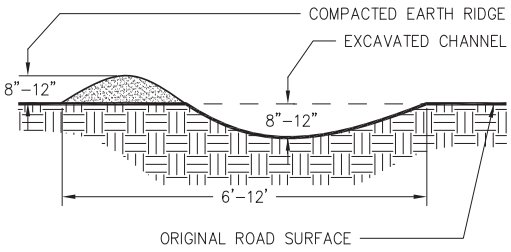


Figure 1. Typical Diversion Across Road

MAINTENANCE

- Inspect frequently and after each rainfall and make necessary repairs.

REFERENCES

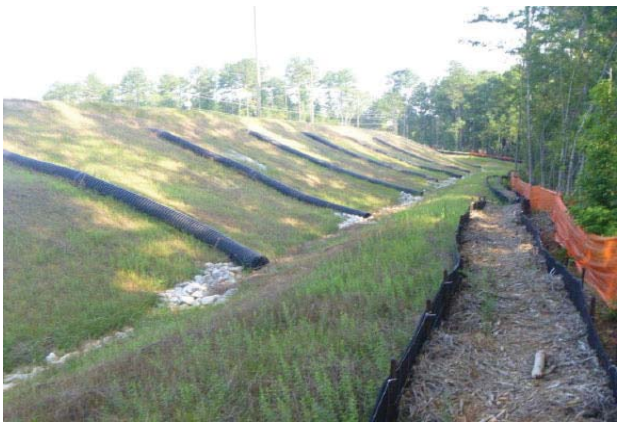
Ds1	Disturbed Area Stabilization (With Mulching Only)
Ds2	Disturbed Area Stabilization (With Temporary Seeding)
Ds3	Disturbed Area Stabilization (With Permanent Vegetation)
Ds4	Disturbed Area Stabilization (With Sodding)
Ch	Channel Stabilization

Dn1

TEMPORARY DOWNDRAIN STRUCTURE

DEFINITION

A temporary structure used to convey storm water down the face of cut or fill slopes.



PURPOSE

- Transport storm runoff from one elevation to another.
- Reduce slope erosion.

INSTALLATION

- Install according to the approved plan.
- Install heavy-duty, flexible materials such as non-perforated, corrugated plastic pipe, or specifically designed flexible tubing.
- Place on undisturbed soil or well-compacted fill.
- Slightly slope the section of pipe under the dike toward its outlet.
- Install Tee, “L” or flared end section inlet at the top of the slope.
- Slope the entrance 1/2” per foot toward outlet.
- Compact a dike ridge no less than 1 ft above the top of the pipe.
- Use reinforced, hold-down grommets or stakes to anchor the pipe at intervals not to exceed 10 ft.

Table 1. Pipe Diameter for Temporary Downdrain

Maximum Drainage Area per Pipe (acres)	Pipe Diameter (inches)
0.3	10
0.5	12
1.0	18

- Ensure that fill over the drain at the top of the slope meets the minimum dimensions.
- Ensure connections are watertight.
- Extend pipe beyond the toe of the slope.
- For steep slopes, drains should be placed diagonally across the slope.
- Curve the outlet uphill.
- Stabilize outlet with rock riprap. A Tee outlet, flared end section, or other suitable device may be used for additional protection.
- Direct all flows into a sediment trap if drains convey sediment-laden runoff.
- Stabilize all disturbed areas immediately.

MAINTENANCE

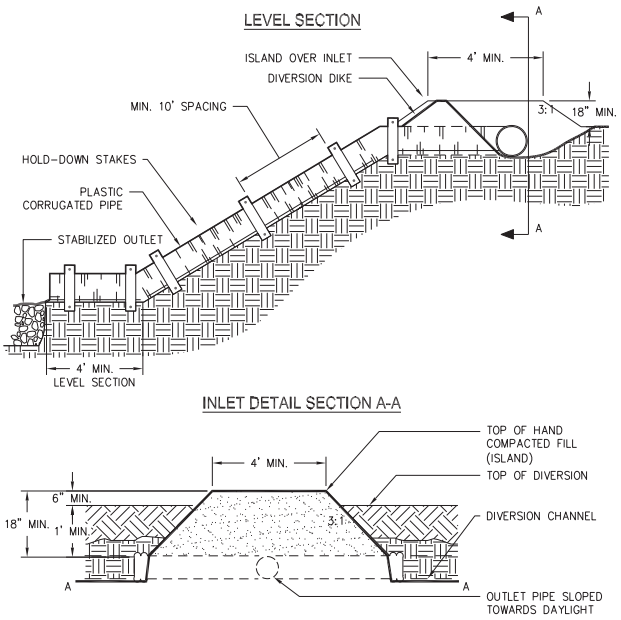
- Inspect drain and diversion after every rainfall and promptly make necessary repairs.
- Remove once the protected area has been stabilized and the permanent water disposal system is fully functional.

REFERENCES

St Storm Drain Outlet Protection

Dn1

DOWNDRAIN PIPE AND INLET DETAIL



MAKE ALL PIPE CONNECTIONS WATERTIGHT AND SECURE SO THAT THE JOINTS WILL NOT SEPARATE IN USE.

Figure 1. Temporary Downdrain and Inlet Detail

Figure 2. Diagonally Placed Downdrain

Dn1

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Dn2

PERMANENT DOWNDRAIN STRUCTURE

DEFINITION

A permanent structure to safely convey surface runoff from the top of a slope to the bottom of the slope.

PURPOSE

- Convey storm runoff safely down cut or fill slopes to minimize erosion.

INSTALLATION

- Install according to the approved plan.
- Slopes must have sufficient grade to prevent sediment deposition.
- Stabilize outlet according to plan.
- Vegetate all disturbed areas immediately.

Types of Structures

- Paved flume - parabolic, rectangular, or trapezoidal cross section.
- Pipe - steel, plastic, etc.
- Sectional - a prefabricated sectional conduit of half-round or third-round pipe.

MAINTENANCE

- Inspect periodically and maintain structure after each rainfall.

REFERENCES

Ds1	Disturbed Area Stabilization (With Mulching Only)
Ds2	Disturbed Area Stabilization (With Temporary Seeding)
Ds3	Disturbed Area Stabilization (With Permanent Vegetation)
Ds4	Disturbed Area Stabilization (With Sodding)
St	Storm Drain Outlet Protection

Fr

FILTER RING

DEFINITION

A temporary stone barrier constructed at storm drain inlets and pond outlets.

PURPOSE

- Reduce flow velocity.
- Prevent the failure of other sediment control devices.
- Prevent sediment from leaving the site or entering drainage systems.

INSTALLATION

- Install according to the approved plan.
- Use in conjunction with other sediment control measures, except where other practices defined in this Manual are not appropriate.
- Surround all sides of the structure receiving runoff from disturbed areas.
- Place the ring a minimum of 4 ft from the structure.
- If the ring is utilized above a retrofit structure, place a minimum of 8-10 ft from the retrofit.
- When utilized at inlets with diameters less than 12”, the filter ring shall be constructed of stone no smaller than 3”-5” (15-30 lbs).

- When utilized at pipes with diameters greater than 12”, the filter ring shall be constructed of stone no smaller than 10”-15” (50-100 lbs).
- Construct the ring at a height no less than 2 ft above grade.
- Mechanically or hand place the stone uniformly around the structure.

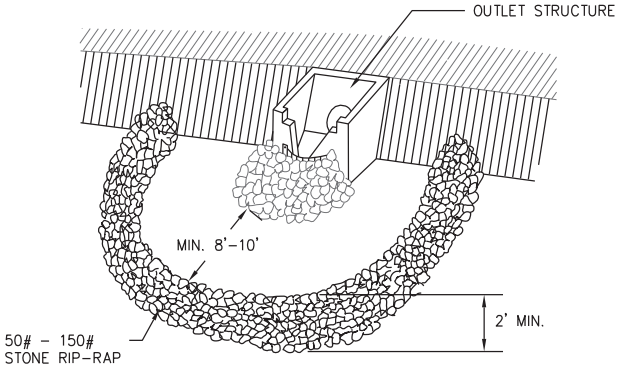

Figure 1. Filter Ring Placement

MAINTENANCE

- Keep clear of trash and debris.
- Continuously monitor and maintain the structure.
- Remove sediment when it reaches <u>one-half</u> full.
- Remove structure when the project has reached final stabilization.

REFERENCES

Rt Retrofit

Sd3 Temporary Sediment Basin

St Storm Drain Outlet Protection

Ga

GABION

DEFINITION

Large, multi-celled, welded wire or rectangular wire mesh boxes, used in channel revetments, retaining walls, abutments, check dams, etc.

PURPOSE

- Construction of erosion control structures.
- Stabilize steep or highly erosive slopes.

INSTALLATION

- Install according to the approved plan.
- Foundations must be smooth and level.
- Use only galvanized or PVC coated wire. For highly corrosive conditions, the PVC coating must be used over the galvanizing.
- Set individual baskets into place, wire them together in courses, and fill with rock to form flexible monolithic building blocks.
- Rock should be durable and adequately sized (typically 4”-8”) to be retained in the baskets.
- Hand-pack the basket in order to completely fill.
- “Key” structure securely into foundations and abutment surfaces.
- Geotextiles should be used behind all gabion structures.

Ga

MAINTENANCE

- Periodically inspect for signs of undercutting or excessive erosion at transition areas.
- Make any necessary repairs immediately.

Gr

GRADE STABILIZATION STRUCTURE

DEFINITION

A structure to stabilize the grade in natural or artificial channels.

PURPOSE

- Stabilize the grade in natural or artificial channels.
- Prevent the formation or advancement of gullies.
- Reduce erosion and sediment pollution.

INSTALLATION

- Install according to the approved plan.
- Construct with concrete, rock, masonry, steel, aluminum, or treated wood or by soil bioengineering methods.
- Dewater excavations prior to filling.
- Construct embankment with a minimum top width of 10 ft and side slopes of 3:1 or flatter.
- Construct materials in 6”-8” horizontal lifts
- Place structure on compacted earth-fill. Compact fill to approximately 95% of standard density.
- Construct keyway 8 or more ft wide and 2 ft deep along centerline of the structure and embankment.
- Provide adequate outlet for discharge.

- Place geotextile, such as revetment mats and riprap, under stabilization structure.
- Apply protective cover immediately after completion of the structure.
- Vegetate all disturbed areas immediately.
- All appropriate agencies, including the GAEPD & U.S. Army Corps of Engineers, must be contacted to ensure compliance with other Laws.

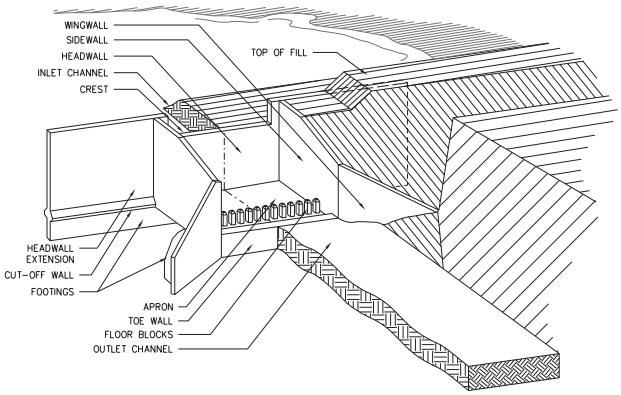

Figure 1. Straight Drop Spillway Structure

MAINTENANCE

- Periodically inspect and maintain all structures.

REFERENCES

St	Storm Drain Outlet Protection
Ds1	Disturbed Area Stabilization (With Mulching Only)
Ds2	Disturbed Area Stabilization (With Temporary Seeding)
Ds3	Disturbed Area Stabilization (With Permanent Vegetation)
Ds4	Disturbed Area Stabilization (With Sodding)

Lv

LEVEL SPREADER

DEFINITION

A storm flow outlet device constructed at zero grade across the slope whereby concentrated runoff may be discharged at non-erosive velocities onto undisturbed areas stabilized by existing vegetation.

PURPOSE

- Dissipate storm flow energy at the outlet.
- Convert storm runoff into sheet flow.
- Discharge storm runoff onto areas stabilized by existing vegetation.

INSTALLATION

- Install according to the approved plan.
- Grade the channel no greater than 1% for the last 15 ft of the dike or diversion.
- Construct on undisturbed soil that is stabilized with vegetation.
- Minimum width of 6 ft.
- The depth of the level spreader from the lip shall be a minimum of 6”.
- The depth shall be uniform across the entire length.

- Construct level lip at 0% grade.
- Discharge converted sheet flow onto undisturbed stabilized areas.
- Provide a smooth outlet.
- Prevent water from concentrating below point of discharge.
- Vegetate all disturbed areas immediately.

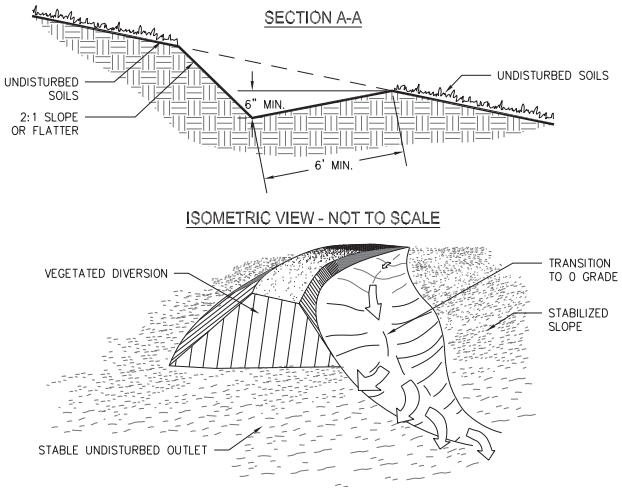

Figure 1. Level Spreader Installation Requirements

MAINTENANCE

- Periodically inspect and maintain all structures.

REFERENCES

Ds1	Disturbed Area Stabilization (With Mulching Only)
Ds2	Disturbed Area Stabilization (With Temporary Seeding)
Ds3	Disturbed Area Stabilization (With Permanent Vegetation)
Ds4	Disturbed Area Stabilization (With Sodding)

Rd

ROCK FILTER DAM

DEFINITION

A temporary stone filter dam installed across drainageways or in conjunction with a temporary sediment trap.

PURPOSE

- Serve as a sediment filtering device.
- Reduce velocity of stormwater flow through a channel.
- Not intended to substantially impound water.

INSTALLATION

- Install according to the approved plan.
- The drainage area shall not exceed 50 acres.
- Must be used in conjunction with other appropriate sediment control measures.
- The dam should be located as close to the source of sediment as possible.
- The dam should not be higher than the channel banks or exceed the elevation of the upstream property line.
- The center of the dam should be at least 9” lower than the outer edges of the dam at the channel banks.

- Side slopes should be 2:1 or flatter.
- The width across the top should be 6 ft. or greater.
- Refer to plan for stone size.
- Geotextiles should be used as a separator between the graded stone, soil base, and abutments.
- Extend completely across the channel and securely tie into both channel banks.
- All other appropriate agencies, including the GAEPD & U.S. Army Corps of Engineers, must be contacted to ensure compliance with other Laws.

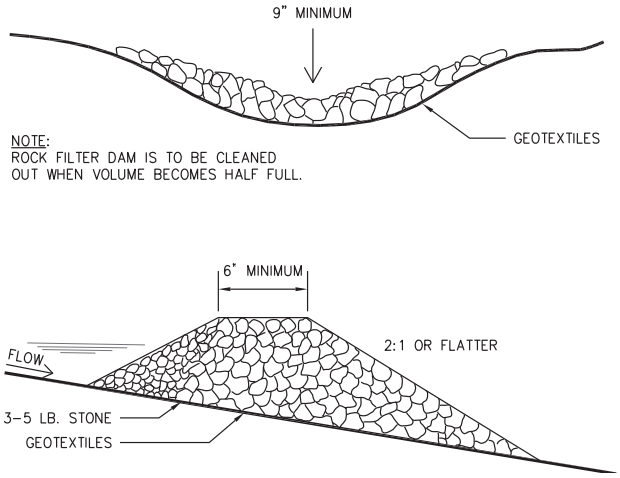

Figure 1. Rock Filter Dam Installation Requirements

MAINTENANCE

- Periodically inspect and maintain all structures.
- Remove sediment when it reaches a depth of <u>one-half</u> of the original height of the dam.
- Remove once disturbed areas have been stabilized.

Re

RETAINING WALL

DEFINITION

A constructed wall of one or more of the following: concrete masonry, reinforced concrete cribbing, treated timbers, steel pilings, gabions, stone drywall, rock riprap, etc.

PURPOSE

- Assist in stabilizing cut or fill slopes where stable slopes are not obtainable without the use of a wall.

INSTALLATION

- Retaining walls require a specific design that is within the capabilities of the design professional.
- Many factors must be taken into account during the design process.
- Close supervision is required to ensure proper installation.
- Depending on the Local Issuing Authority's ordinance, a design professional certificate may be required prior to construction.

Re

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Rt

RETROFIT

DEFINITION

A device or structure placed in front of a permanent stormwater detention pond outlet or roadway drainage structure to serve as a temporary sediment filter.

PURPOSE

- Allows a permanent stormwater detention basin structure to function as a temporary sediment retention basins.
- Allows a roadway drainage structure to be used for temporary sediment storage.

INSTALLATION

- Install according to the approved plan.
- Prohibited in basins on live streams.
- The height of the retrofit should be approximately one-half the height of structure.

Rt-P

Perforated Half-Round Pipe with Stone Filter

- Drainage area shall not exceed 30 acres.
- Never use on exposed pipe end or winged headwall.
- Diameter of half-round pipe should be 1.5x the diameter of the principal pipe outlet or wider than the greatest width of the concrete weir.

Rt

- Shall be affixed by means to the concrete outlet structure.

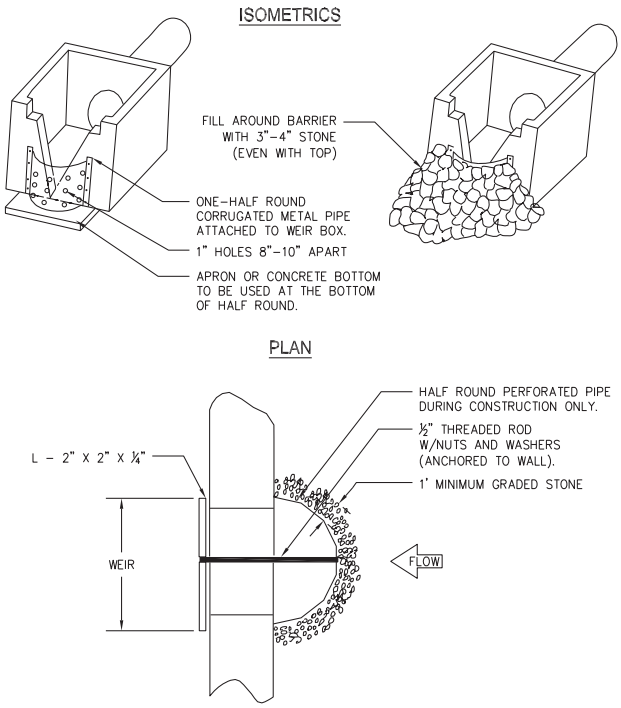

Figure 1. Perforated Half-Round Pipe Retrofit with Stone Filter.

Figure 2. Affixed to Concrete Structure

Figure 3. Slotted Board Dam

Slotted Board Dam with Stone **Rt-B**

- For use in detention ponds with drainage areas up to 100 acres and on roadway drainage structures with a drainage area of 30 acres or less.
- Can be used with open end pipe outlets, winged headwalls, or concrete weir outlets.
- Install with minimum 4x4” posts.
- Install boards with a 0.5”-1.0” space between them.
- Install a minimum of 3”-4” stone or approved filter fabric around the upstream side of the board dam.

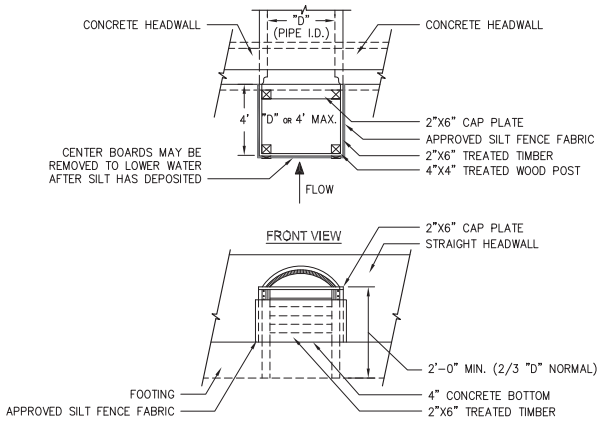

Figure 3. Slotted Board Dam Installation Requirements

Silt Control Gate **Rt-Sg**

- Use only on roadway drainage structures with the following structures: winged headwalls, tapered headwalls, straight headwalls, open end pipes, flared end sections.
- Drainage area shall not exceed 50 acres and the disturbed area of the basin shall not exceed 5 acres.
- Use 4”x4” treated posts & 2”x6” treated face boards with no spacing between the boards.
- Fasten an approved silt fence fabric to the front of the structure with staples or nails.

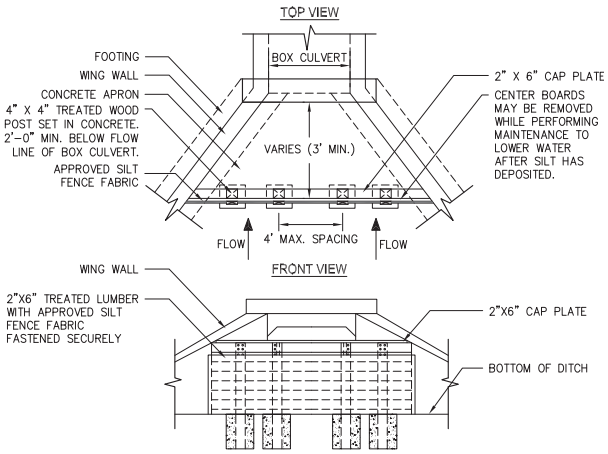

Figure 3. Silt Control Gate Installation Requirements

MAINTENANCE

- Clean-out when <u>one-third</u> sediment storage capacity is lost. Indicate this elevation with a mark on the outlet structure or a post inserted in the pond.
- Remove all trash and debris.
- Remove retrofit and accumulated sediment when the project is completed.
- Stabilize all disturbed areas immediately with permanent vegetation.

Sd1

SEDIMENT BARRIER

DEFINITION

A temporary structure made up of porous material typically supported by steel or wood posts. Types include silt fence, brush piles, mulch berms, compost filter socks or other filtering material.

PURPOSE

- Minimize and prevent sediment carried by sheet flow from leaving the site.
- Retain the sediment on the disturbed area.
- Filter sediment from runoff.

INSTALLATION

- Install according to the approved plan.
- Do not install across streams, ditches, waterways, or other concentrated flow areas.
- The type of sediment barrier depends on whether the area is sensitive or non-sensitive.
- For silt fence, Type C will be classified as sensitive and Type A & B will be classified as non-sensitive.
- Install along the contour.
- Along all state waters and other sensitive areas, 2 rows of Type S shall be used. The 2 rows should be placed a minimum of 36” apart.

- Overlap barriers 18” when using multiple types of sediment barriers in a single run on a site.
- When storing runoff behind the sediment barrier, the maximum continuous slope length behind the sediment barrier shall not exceed those found in Table 1.
- Provide a riprap spalsh pad or other protection device at any point where flow may overtop the sediment barrier.

Installation Methods

Static Slicing Method

- Using a machine, pull a narrow blade through the ground to create a 12” deep slit, and simultaneously insert the silt fence fabric into the slit behind the blade.
- Roll a tractor wheel along both sides of the slit in the ground 2-4 times to achieve compaction
- Drive posts 18” into ground and attach fabric.

Figure 1. Static Slicing Machine

Trenching Method

- Dig a 2”-6” wide trench with a 6” excavation.
- Drive posts 18” into ground and attach fabric.
- The best trenching method typically requires triple the time and effort to achieve results comparable to the static slicing method.

Sensitive Areas Sd1-S

Sediment barriers being used as Type S shall have a support spacing of no greater than 4 ft on center, with each being driven into the ground a minimum of 18”.

Type C Silt Fence

- 36” wide with wire reinforcement or equivalent backing
- To be used where runoff velocities are particularly high or where slopes exceed a vertical height of 10 ft.

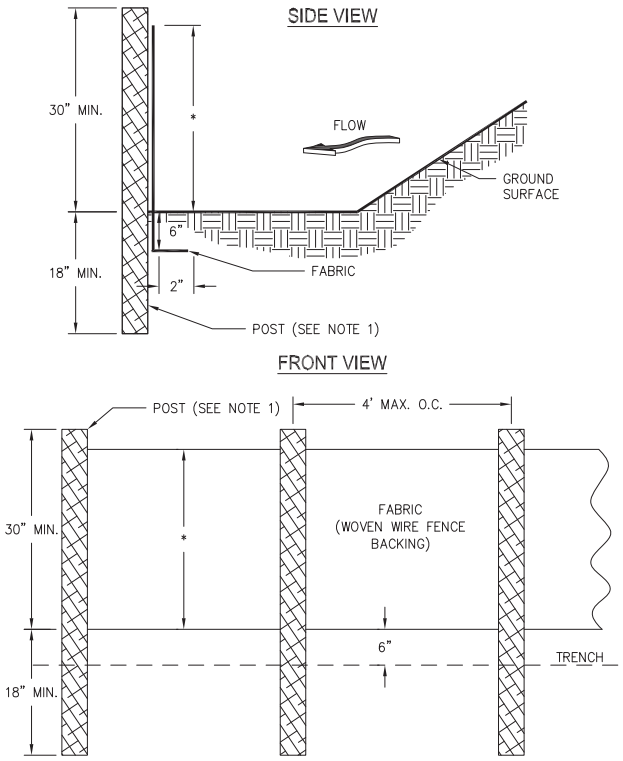

Figure 1. Type “C” Silt Fence

Sd1-NS Non-Sensitive Areas

Sediment barriers being used as Type NS shall have a support spacing of no greater than 6 ft on center, with each being driven into the ground a minimum of 18”.

Type A Silt Fence

- 36” wide fabric
- To be used where the life of the project is greater than or equal to 6 months.

Type B Silt Fence

- 22” wide fabric
- Limit to use on minor projects, such as residential home sites or small commercial developments where permanent stabilization will be achieved in less than 6 months.
- Same flow rate as Type A.

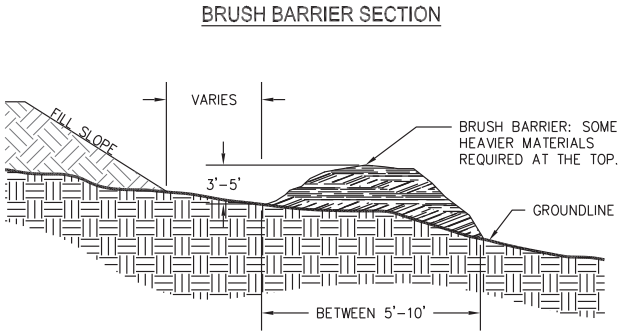

Figure 1. Brush Barrier (Sd1-BB)

Brush Barrier (only during timber clearing)

- Intermingle brush so as not to form a solid dam.
- Should be wind-rowed on the contour as nearly as possible.
- Minimum base width is 5 ft and should be no wider than 10 ft.
- The height should be between 3-5 ft.

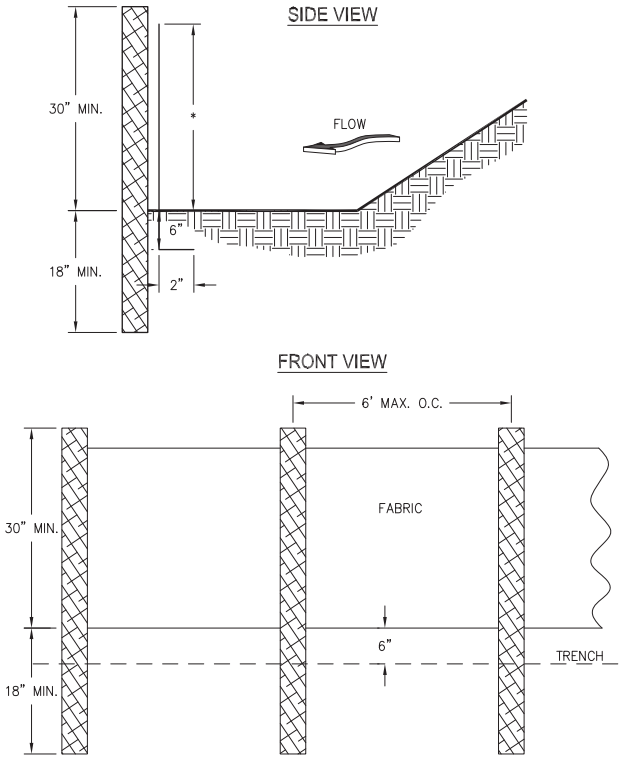

Figure 2. Type “A” & “B” Silt Fence

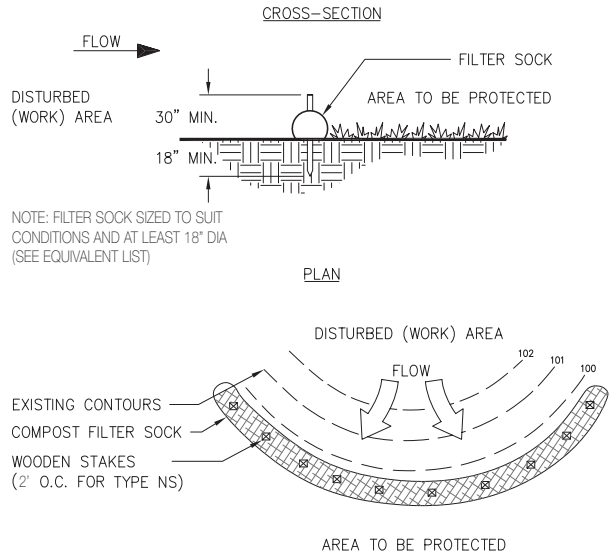

Figure 3. Compost Filter Sock - Type “B”

Table 1. Criteria for Sediment Barrier Placement

Land Slope (%)	Maximum Slope Length Behind Fence (ft)
<2	100
2-5	75
5-10	50
10-20	25
>20	15

MAINTENANCE

- Remove the sediment once it has accumulated to one-half the original height of the barrier.
- Replace barrier whenever it has deteriorated to such an extent that the effectiveness of the product is reduced (~ 6 months) or the height of the product is not maintaining 80% of its properly installed height.
- Remove and dispose of all accumulated sediment at the barrier before it is removed.
- Leave in place until all disturbed areas are permanently stabilized.

Table 2. Post Size

Type	Min. Length	Type of Post	Size of Post
NS	4’	Oak Steel Soft Wood	1.5”x1.5” 1.15lb/ft min 3” or 2”x4”
S	4’	Oak Steel	2”x2” 1.15lb/ft. min

Figure 1. Thomas Carpenter, CPESC, Carpenter Erosion Control.

Sd2

INLET SEDIMENT TRAP

DEFINITION

A temporary protective device formed at or around an inlet to a storm drain to trap sediment.

PURPOSE

- Prevent sediment from entering a storm drainage system prior to permanent stabilization of the disturbed area draining to the inlet.

INSTALLATION

- Install according to the approved plan.
- Do not install on paved surfaces where safety is a concern.
- Sediment traps must be self-draining unless otherwise protected.
- Install at or around all storm drain drop inlets that receive runoff from disturbed areas.
- Construct on natural ground surface, excavated surface, or on machine compacted fill.

Excavated Sediment Traps

- An excavation created around the inlet to provide additional sediment storage.
- Provide a minimum depth of 1.5 ft for sediment storage.
- The side slopes shall not be steeper than 2:1.
- The drainage area entering the trap shall be no greater than 1 acre.

Filter Fabric with Supporting Frame Sd2-F

- Applicable where the inlet drains a relatively flat area (<5% slope).
- Use Type S steel posts.
- Space stakes evenly around perimeter at a maximum of 3 ft apart.
- Drive stakes into the ground ~18” deep.
- The fabric shall be 36” tall and entrenched at least 12” and backfill with crushed stone or compacted soil.
- Securely fasten the fabric and wire to the posts.

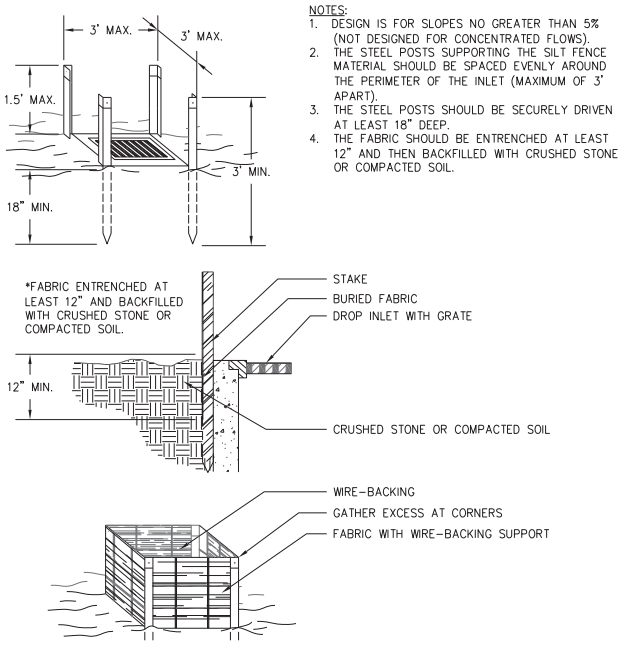

Figure 1. Filter Fabric with Supporting Frame Installation Requirements (Sd2-F)

Block and Gravel Drop Inlet Protection Sd2-Bg

- Applicable where heavy flows are expected and a overflow capacity is necessary to prevent excessive ponding.

- Excavate foundation at least 2” below the crest of the storm drain.
- On each side of the structure, place one block in the bottom row on its side to allow pool drainage.
- Place the bottom row of blocks against the edge of the storm drain.
- Add support by placing 2”x4” wood studs through block openings.
- Fit hardware cloth or wire mesh with 1/2” openings over all block openings to hold gravel in place.
- Place clean gravel 2” below the top of the block on a 2:1 or flatter slope and smooth it to an even grade.
- GADOT #57 stone is recommended.

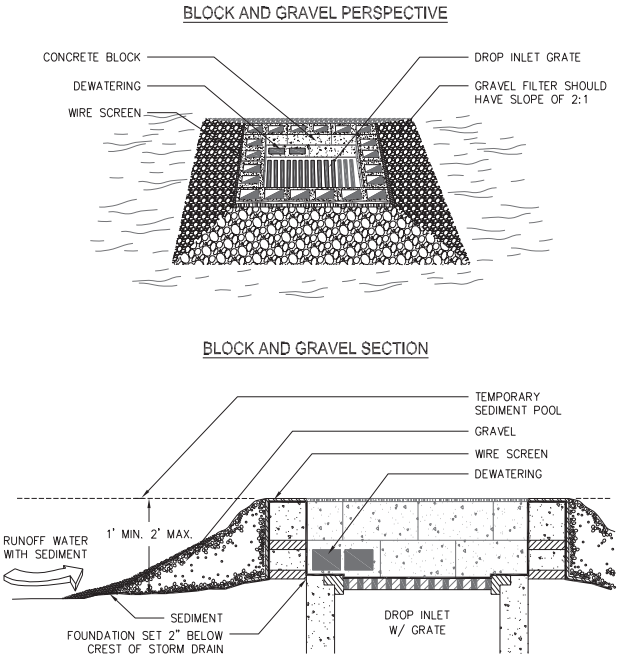

Figure 2. Block and Gravel Drop Inlet Protection Installation Requirements (Sd2-Bg)

Baffle Box **Sd2-B**

- Applicable for inlets receiving a higher volume or velocity.
- Construct 2”x4” boards spaced a maximum of 1” apart OR of plywood with weep holes 2” in diameter.
- Place weep holes ~6” on center vertically or horizontally.
- Place gravel outside of the box and around the inlet at a depth of 2-4”.
- Wrap entire box in Type C filter fabric and entrench at a depth of 12”.

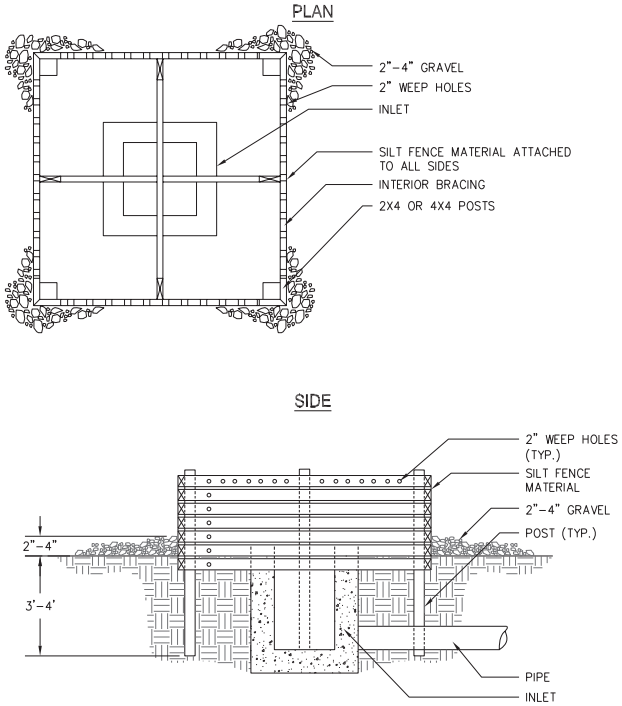

Figure 3. Baffle Box Installation Requirements (Sd2-B)

Gravel Drop Inlet Protection **Sd2-G**

- Applicable where heavy concentrated flows are expected.
- 3:1 or flatter slope toward the inlet.

- Leave a minimum 1 ft wide level stone area between the structure and the inlet to prevent gravel from entering the inlet.
- Place stone 3” in diameter or larger on the slope toward the inlet.
- Place 1/2” to 3/4” gravel on the slope away from the inlet at a minimum thickness of 1 foot.

Sod Inlet Protection **Sd2-S**

- Applicable only at the time of permanent seeding in order to protect the inlet from sediment and mulch material.
- Place the sod to form a turf mat covering the soil for a distance of 4 ft from each side of the inlet.
- Stagger sod strips so that adjacent ends are not aligned.

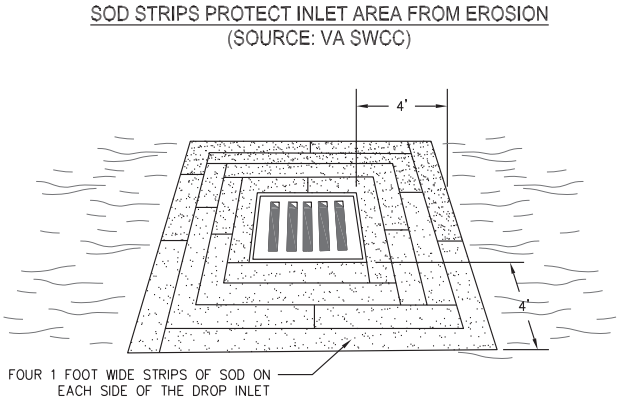

Figure 4. Sod Inlet Protection Installation Requirements (Sd2-S)

Curb Inlet Protection **Sd2-P**

- Applicable once pavement has been installed.
- The method of inlet protection shall be removed if a safety hazard is created.

- For the “pigs-in-a-blanket” method, wrap 8” concrete blocks in filter fabric and span across catch basin inlet.
- Face openings in blocks outward.
- Leave a gap of ~4” between the inlet filter and the inlet to allow for overflow and prevent hazardous ponding in the roadway.
- Another method uses gravel bags constructed by wrapping GADOT #57 stone with filter fabric, wire, plastic mesh, or equivalent material.

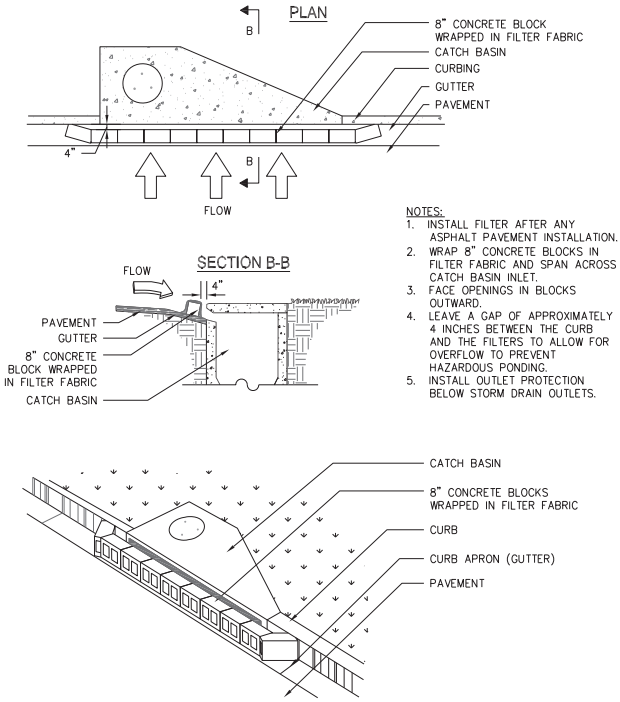

Figure 5. Curb Inlet Protection Installation Requirements (Sd2-P)

MAINTENANCE

- Inspect, clear, and/or repair trap at the end of each working day.
- Do not remove inlet protection and wash sediment into the inlet.
- Remove sediment when accumulation has reached one-half the height of the trap.
- Remove sediment from curb inlet protection immediately.
- Remove all materials and any sediment once the contributing drainage area has been permanently stabilized.
- Appropriately stabilize all disturbed areas around the inlet.

REFERENCES

Ds4 Disturbed Area Stabilization (With Sodding)

Sd1 Sediment Barrier

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Sd3

TEMPORARY SEDIMENT BASIN

DEFINITION

A basin created by the construction of a barrier or dam across a concentrated flow area, or by excavating a basin, or by a combination of both.

PURPOSE

- Detain runoff waters and trap sediment from erodible areas.
- Protect properties and drainage ways below the installation from damage by excessive sedimentation and debris.

INSTALLATION

- Construct all basins according to the approved plan unless modified by the design professional.
- Remove all trees, vegetation, roots, and other objectionable material.

Location

- Never place basin in a live stream.
- Storm drains should discharge into the basin.
- Install on sites where (1) failure will not result in loss of life or interruption of use or service of public utilities and (2) the drainage area does not exceed 150 acres.

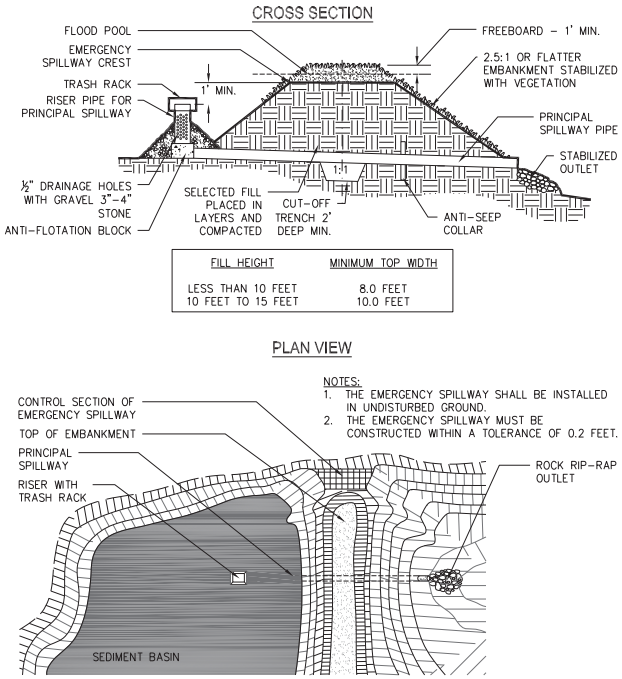


Figure 1. Components of a Typical Temporary Sediment Basin

Shape

- Length to width ratio shall be greater than 2:1
- The basin should be wedge shaped with the inlet at the narrow end.
- Install baffles and diversions when necessary.

Principal Spillway

- Join vertical pipe or box type riser to a pipe that extends through the embankment and exits beyond the downstream toe of the fill.
- The crest elevation of the riser should be 1 ft below the elevation of the control section of the emergency spillway.
- The riser and all pipe connections shall be completely watertight.
- Install pipe with a minimum diameter of 8”.

- If using the conventional method for dewatering a sediment basin, Perforate lower half of riser with 1/2” holes spaced approximately 3”, and cover with 2 ft of 3”-4” stone.
- If constructing the basin with a skimmer outlet, please refer to the specification **Sk - Floating Surface Skimmer.**
- Install a trash rack and anti-vortex device securely on top of the riser.
- Attach riser to the base with a watertight connection. Embed riser 9” into an 18” thick concrete base.
- Provide an adequte outlet that allows discharge in an erosion free manner.
- Place the fill material around the the pipe spillway in 4” layers and compact to at least the same density as the adjacent embankment.
- A minimum depth of 2 ft of hand compacted backfil shall be placed over the pipe spillway before crossing it with construction equipment.

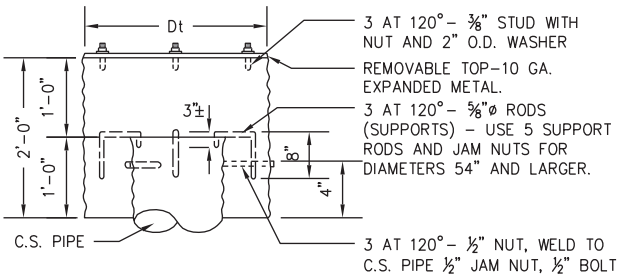


Figure 2. Typical Sediment Basin Trash Rack

Emergency Spillway

- Construct on undisturbed ground (not fill).
- Excavate a trapezoidal channel with minimum bottom width of 8 ft.

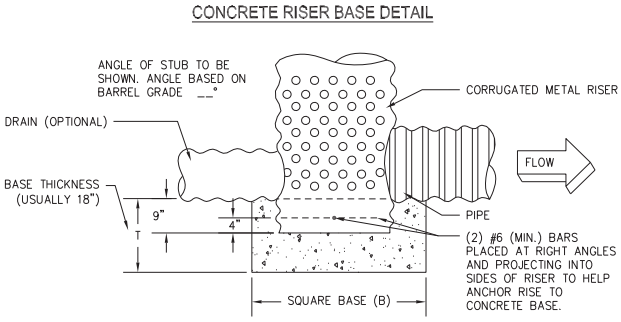
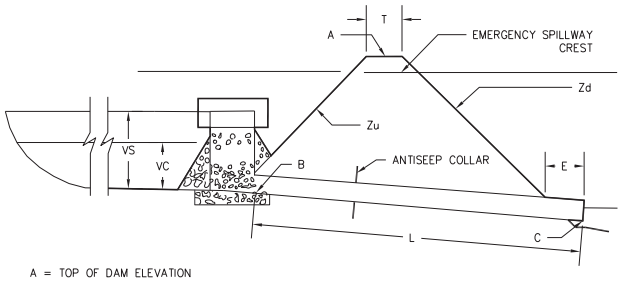


Figure 3. Concrete Riser Base Detail

- Construct a channel with a straight control section of at least 20 ft in length and a straight outlet section that is at least 25 ft in length.
- Stabilize with vegetation, asphalt, riprap or concrete.

Entrance of Runoff into Basin

- Install dikes, swales, or other water control devices to direct runoff into the basin.
- Locate points of entry as far away from the riser as possible.



A = TOP OF DAM ELEVATION

B = LOWEST ELEVATION OF PIPE AT RISER

C = LOWEST ELEVATION OF PIPE AT OUTLET

E = EXTENDED LENGTH OF PIPE BEYOND TOE OF DAM

L = TOTAL LENGTH OF PIPE, FT.

$L = [A - (B + C) /2] [ZU + ZD] + T + E$

T = TOP WIDTH OF DAM, FT.

Zu = UPSTREAM SIDE SLOPE

Zd = DOWNSTREAM SIDE SLOPE

Figure 4. Principle Spillway

- Stabilize the embankment and all other disturbed areas in accordance with the appropriate permanent vegetative measure, Ds3, immediately following construction.

Figure 5. Clean-out marker

Cut-off Trench

- Excavate a cut-off trench with a minimum depth of 2 ft along the center-line of the earth-fill embankment.
- Extend both abutments up to the riser crest with a minimum bottom width of 4 ft in order to permit operation of compaction equipment.
- Side slopes shall be no steeper than 1:1

Embankment

- Place fill material in 6”-8” thick continous layers over entire length of fill.
- Construct the embankment to an elevation 5% higher than the design height to allow for settlement.
- Fill material shall be free of rocks, woody vegetation, oversized stones, rocks, etc.

Table 1. Dam Width Requirements

Fill Height (ft)	Minimum Top Width (ft)
<10	8
10-15	10

MAINTENANCE

- Repair all damages caused by soil erosion or construction equipment at or before the end of each working day.
- Remove sediment from the basin when one-third of the storage volume has been lost to accumulation.
- Do not allow sediment to enter adjacent streams or drainage ways during the sediment removal process.
- Do not deposit sediment downstream from the embankment, adjacent to a stream or floodplain.
- Dispose of all temporary structures when they have served their intended purpose and the contributing drainage basin has been properly stabilized.

REFERENCES

Ds1	Disturbed Area Stabilization (With Mulching Only)
Ds2	Disturbed Area Stabilization (With Temporary Seeding)
Ds3	Disturbed Area Stabilization (With Permanent Vegetation)
Ds4	Disturbed Area Stabilization (With Sodding)
Ch	Channel Stabilization
Sk	Floating Surface Skimmer
St	Storm Drain Outlet Protection

Sd4

TEMPORARY SEDIMENT TRAP

DEFINITION

A small temporary pond that drains a disturbed area so that sediment can settle out.

PURPOSE

- Collect and store sediment from uphill sites cleared and/or graded during construction.
- For use on small tributary areas with no unusual drainage features.

INSTALLATION

- Install according to the approved plan.
- Sediment traps are effective against coarse sediment, but not against silt or clay particles.
- The maximum drainage area is 5 acres depending on the type of installation.
- The maximum depth of a trap is 4 ft as measured from the bottom of the trap to the invert of the emergency spillway.
- Ensure the length to width ratio is great than 2:1.
- The height of the embankment shall not exceed 5.5 ft from the downstream toe to the top of the berm. The top width shall be at least 3 ft.
- Slopes shall not exceed 2:1.

- Construct side slopes 3:1 or flatter to allow people and equipment to enter the trap.

Methods

Overflow Outlet Sd4-A

- Limited to small drainage areas less than 1 acre with gentle slopes(1-2%).
- The maximum life span is 6 months.
- Silt fence, straw bale barriers or grass filter strips are used to “polish” the overflow water as it leaves the sediment trap.

Combination Outlet Sd4-B

- A combination of straw bales and silt fence are used to dewater the trap.
- Properly install and stake the straw bales and ensure the silt fence has a wire backing so that the materials can resist 1 ft or more of ponded water.
- The maximum drainage area is 1 acre.
- The life span is less than 1 year.
- Requires frequent maintenance and adjustments.

Rock Outlet Sd4-C

- This type relies on filtering through layers of aggregate, rock or riprap material to dewater the sediment trap.
- This is the sturdiest design of the three and requires less maintenance.
- The maximum drainage area is 5 acres.
- The life span is typically 1 year.

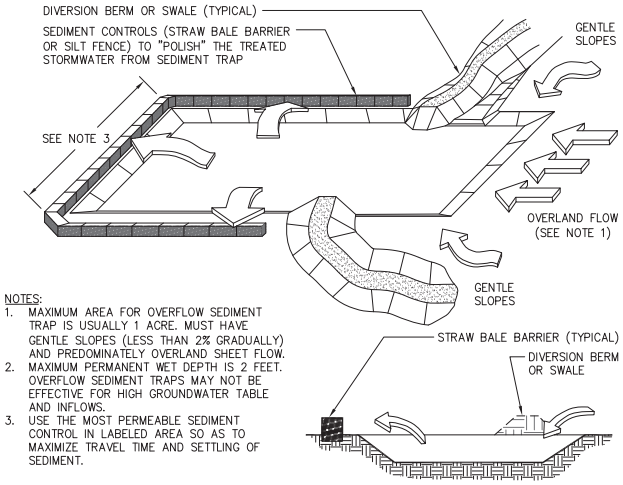


Figure 1. Overflow Outlet

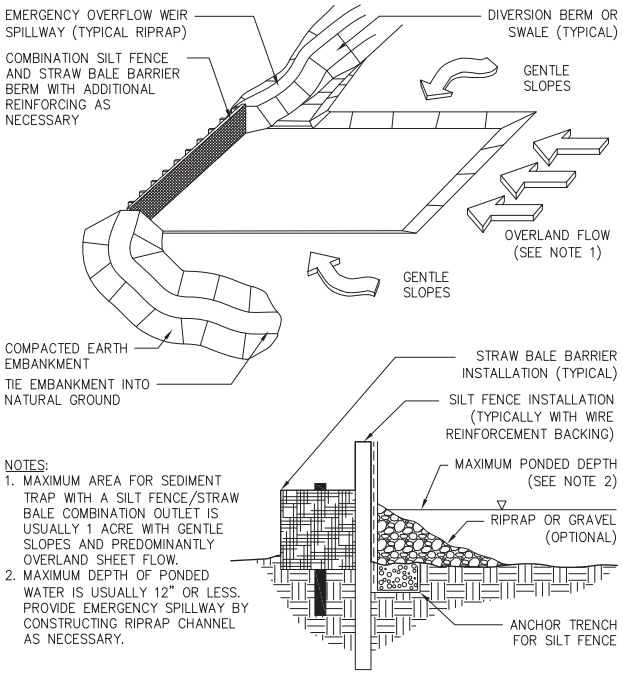


Figure 2. Combination Outlet

Emergency Spillway

- Stabilize with rock, geotextile, vegetation, or another suitable material that is resistent to erosion.
- Must be able to convey the 10-year storm event.

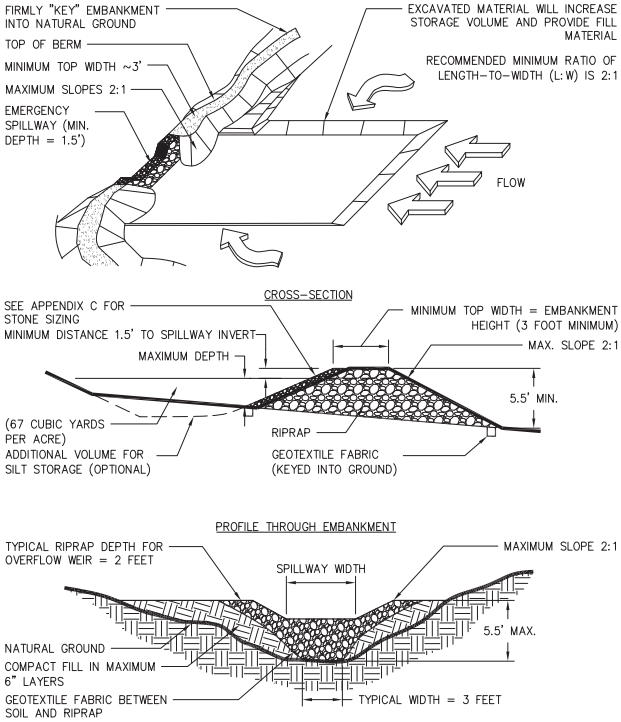


Figure 3. Rock Outlet

MAINTENANCE

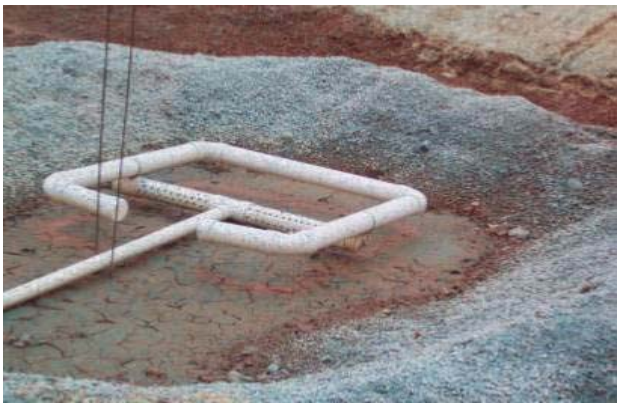
- Repair all damages caused by soil erosion or construction equipment at or before the end of each working day.
- The cleanout volume for a temporary sediment trap is <u>one-third</u> of the total storage volume.

Sk

FLOATING SURFACE SKIMMER

DEFINITION

A buoyant device that releases/drains water from the surface of sediment ponds, traps, or basins at a controlled rate of flow.



PURPOSE

- Discharge clearer water from the surface of a sediment pond, trap, or basin at relatively uniform rate.
- Reduce the retention time associated with meeting a desired water quality standard for discharge from a sediment pond, trap or basin.

INSTALLATION

- Install according to the approved plan.
- It can replace the riser pipe as the principal spillway, but does **not** replace the emergency spillway.
- A portion of the skimmer must be visible above the water surface at all times.
- Excavate a pit filled with riprap under the floating surface skimmer to account for sediment accumulation around the device.
- At a minimum, the pit has dimensions of 4x4 ft with a minimum depth of 2 ft.

- Ensure the pit is lower than the invert of the outlet barrel from the riser.
- Use floating surface skimmers constructed of PVC (Schedule 40 or greater) or other appropriate materials.
- Install the device according to the approved plan and manufacturer's instructions.

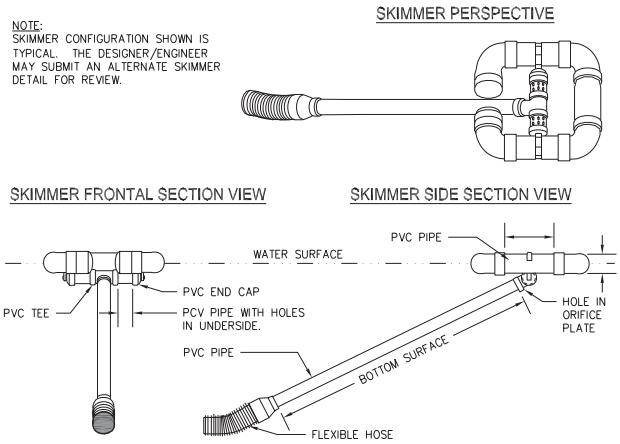


Figure 1. "Typical" Skimmer Design

MAINTENANCE

- Inspect Floating Surface Skimmers together with the Sediment Basin (Sd3) inspections.
- Inspect for any structural damage, clogging, or excessive sediment accumulation.
- Install trash guard to prevent larger debris from entering the skimmer and cause internal blocking.
- Use a floatable maintenance rope to remove trash and debris that accumluates on the outside of the trash guard.
- Free the skimmer from being stuck in the mud at the bottom of the basin to allow for normal operation.

SpB

SEEP BERM

DEFINITION

A linear control device constructed as a diversion perpendicular to the direction of runoff to enhance dissipation and infiltration, while creating multiple sedimentation chambers with the employment of intermediate dikes.

PURPOSE

- Allows the 2 year, 24-hour storm to seep out while allowing larger flows to be diverted to a sediment storage area.

INSTALLATION

- Install according to the approved plan.
- Install where runoff can be stored behind the seep berm without damaging the berm or submerged area behind the intermediate dike points.
- Do not use above fill slopes that have not achieved permanent stabilization.
- Do not install across streams, ditches, or waterways.
- The top of the berm shall have a minimum width of 12” and a height of 4 ft.

- Maximum spacing between the dikes should be such that the toe of the upstream dike is at the same elevation as the top of the downstream dike.
- Install clean out markers at each intermediate dike using a sediment storage calculation.
- Compact the earthen berm by using a skid-loader with a full bucket, tracking with a dozer and applying pressure with the bucket, or rubber tired backhoe.
- Compaction must meet a minimum of 90% standard proctor density test.
- Apply seed at 70% germination or better prior to other land disturbing activities taking place.

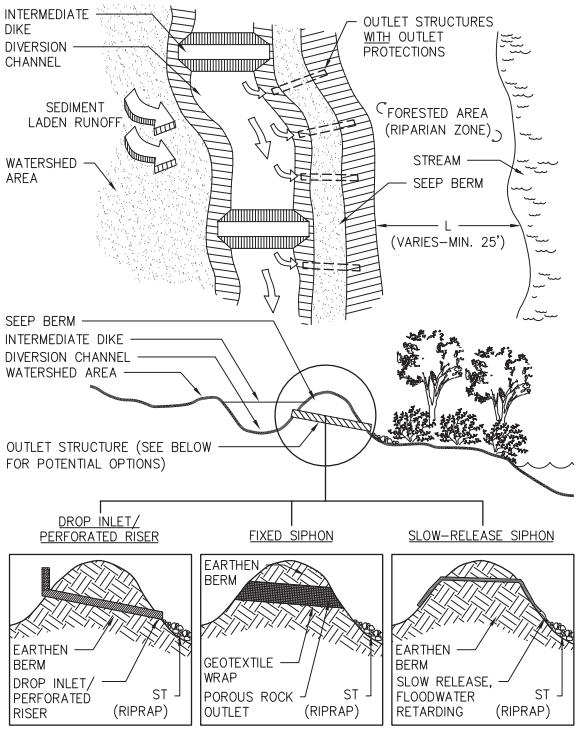


Figure 1. “Typical” Seep Berm System

SpB

- Seeps can be placed 3 different ways:
  - During the construction of the berm,
  - After construction has been completed, excavate at the location of the seeps, place in the trench and back-fill. Compact the berm to finalize,
  - After construction has been completed, using a steel pipe with a conical end, insert pipes through the berm.

MAINTENANCE

- Inspect the dam from the seep and supporting berm after every 1/2” or greater rainfall.
- Make any repairs promptly.
- Remove sediment when it has accumulated to <u>one-third</u> the height of the intermediate dike.

SpB

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Sr

TEMPORARY STREAM CROSSING

DEFINITION

A temporary structure installed across a flowing stream or watercourse for use by construction equipment.

PURPOSE

- Provide a means for construction vehicles to cross streams or watercourses without moving sediment into streams, damaging the streambed or channel, or causing flooding.

INSTALLATION

- Install according to the approved plan.
- The drainage area is not to exceed one square mile, unless specifically designed to accomodate the additional drainage area by the design professional.
- Structures include bridges, round pipes, or pipe arches.
- Do not allow for use by the general public.
- Install perpendicular to the stream. The crossing may vary 15° from the perpendicular.
- Divert all surface water from the construction site onto undisturbed areas adjoining the stream.

- Convey full bank flow of stream without appreciably altering the stream flow characteristics.
- Washout protection may include elevation of bridges above adjacent flood plain lands, crowning of fills over pipes, or the use of diversions, dikes or island type structures.
- A Stream Buffer Variance from the GA EPD may be required and all other appropriate agencies, including the U.S. Army Corps of Engineers, must be contacted to ensure compliance with other laws.

Types of Stream Crossings

Temporary Bridge Crossing Sr-B

- This method causes the least amount of erosion of the stream channel.
- Provides the least obstruction to flow and fish migration.
- Construct at or above the bank elevation to prevent entrapment of floating materials.
- Place abutments parallel to and on stable banks.
- Construct the bridge to span the entire channel. Install a footing, pier, or bridge support if the span exceeds 8 ft.
- Securely anchor the bridge at one end with a steel cable or chain, large trees, large boulders, or driven steel anchors.

Temporary Culvert Crossing Sr-C

- The most common stream crossing design.
- Can be easily constructed and enables heavy equipment loads to be used.
- Creates the greatest obstruction to stream flows and are subject to blockages.

- Install the invert elevation of the culvert on the natural streambed grade.
- Extend the culvert(s) a minimum of 1 ft beyond the upstream and downstream toe of the aggregate placed around the culvert.
- Do not exceed 40 ft in length of the culvert.
- Cover the culvert(s) with a minimum of 1 ft of aggregate.
- If using multiple culverts, separate them with compacted aggregate fill by a minimum of 12 in.

Table 1. Pipe Diameters for Stream Crossings (in)

Drainage		Average Slope of Watershed		
Acres	**1%**	**4%**	**8%**	**16%**
1-25	24	24	30	30
26-50	24	30	36	36
51-100	30	36	42	48
101-150	30	42	48	48
151-200	36	42	48	54
201-250	36	48	54	54
251-300	36	48	54	60
301-350	42	48	60	60
351-400	42	54	60	60
401-450	42	54	60	72
451-500	42	54	60	72
501-550	48	60	60	72
551-600	48	60	60	72
601-640	48	60	72	72

MAINTENANCE

- Inspect structure after every rainfall and at least once a week.
- Repair all damages immediately.
- Remove the structure immediately after construction is finished.
- Stabilize the streambed and banks.

REFERENCES

Ds1 Disturbed Area Stabilization (With Mulching Only)

Ds2 Disturbed Area Stabilization (With Temporary Seeding)

Ds3 Disturbed Area Stabilization (With Permanent Vegetation)

Ds4 Disturbed Area Stabilization (With Sodding)

Bf Buffer Zone

St

STORM DRAIN OUTLET PROTECTION

DEFINITION

Paved and/or riprapped channel sections placed below storm drain outlets.

PURPOSE

- Reduce the velocity of flow before entering receiving channels below storm drain outlets.

INSTALLATION

- Install according to the approved plan.
- The apron may be lined with riprap, grouted riprap, or concrete.
- Compact any fill required in the subgrade to the density of the surrounding undisturbed material.
- Ensure that the riprap and gravel filter conform to the specified grading limits on the plan.
- Install geotextile between the riprap and the soil base.
- Protect the geotextile from punching or tears during installation. Overlap connecting joints a minimum of 1 ft.
- The minimum thickness of the riprap should be 1.5x the maximum stone diameter.
- Place riprap by hand or equipment. Be careful to avoid damaging the filter fabric.

St

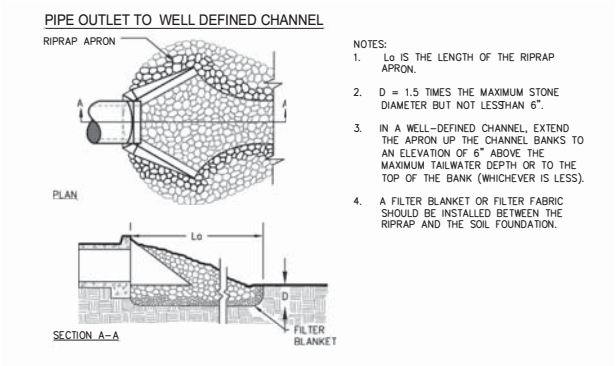

Figure 1. Outlet Protection for a Well-Defined Channel

- Construct the apron on zero grade with no overfall at the end. Ensure the top of the riprap at the downstream end is level with the receiving area or slightly below it.
- Place any necessary curves in the upper section of the apron.
- Ensure the apron is properly aligned and preferably straight throughout its length.
- Stabilize all distubed areas after construction.

Apron Width for a Well-Defined Channel

- Side slopes of the channel shall be no steeper than 2:1.
- Extend the apron across the channel bottom.
- Extend the apron up the channel banks to an elevation one foot above the maximum tailwater depth or to the top of the bank (whichever is less).

Apron Width for a Flat Area

- The upstream end of the apron shall have a width 3x the diameter of the outlet pipe.
- For a Minimum Tailwater Condition, the downstream end of the apron shall have a width equal to the pipe diameter plus the length of the apron.

- For a Maximum Tailwater Condition, the downstream end shall have a width equal to the pipe diameter plus 0.4x the length of the apron.

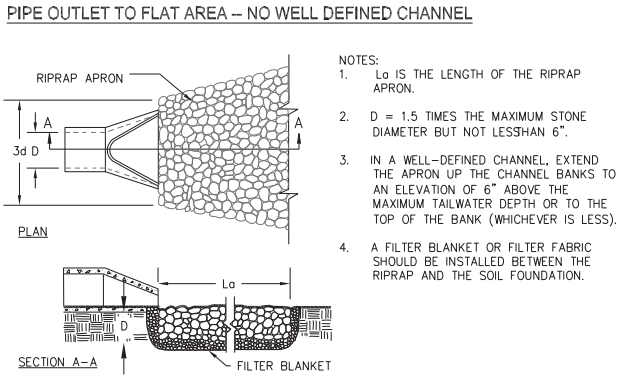

Figure 2. Outlet Protection for a Flat Area

MAINTENANCE

- Inspect riprap outlet structures after heavy rain events to see if any erosion has taken place around or below the riprap.
- Make all needed repairs immediately to prevent further damage.

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Su

SURFACE ROUGHENING

DEFINITION

Providing a rough soil surface with horizontal depressions created by operating a tillage or other suitable implement on the contour.

PURPOSE

- Aid in the establishment of vegetative cover with seed.
- Reduce runoff velocity and increase infiltration.
- Reduce erosion and provide for sediment trapping.

INSTALLATION

- Conduct according to the approved plan.
- Required on all slopes steeper than 3:1 if they are to be stabilized with vegetation.
- If slope is to be stabilized with matting and blankets, the surface should not be roughened.
- Not required on slopes with a stable rock face.
- Lightly roughen and loosen soil to a depth of 2”-4” on slopes 3:1 or flatter.
- Areas that will be mowed should have slopes less than 3:1.
- Groove or maintain roughness of fill slopes steeper than 3:1.

- Stair-step grade or groove cut slopes steeper than 3:1.

Roughening Methods

Stair-Step Grading

- May be carried out on any material soft enough to be ripped with a bulldozer.
- Particularly good for slopes with soft rock and some subsoil.
- The ratio of the vertical cut distance to the horizontal distance shall be less than 1:1.
- Horizontal portion of the “step” shall slope toward the vertical wall.

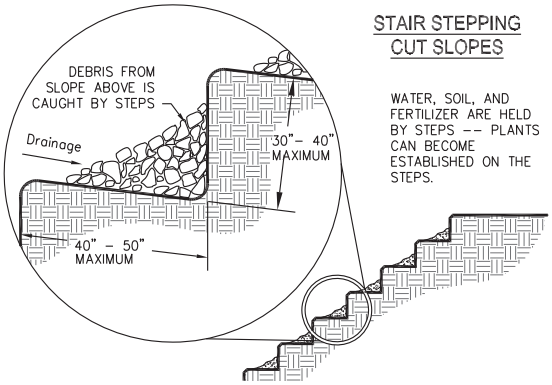

Figure 1. Stair-Stepping Cut Slopes

- Individual vertical cuts are not to exceed 30” on soft materials and not more than 40” in rocky materials.

Grooving

- Use discs, tillers, spring harrows, or the teeth on a front-end loader.
- On un-mowed slopes, minimum groove depth of 3” and maximum groove spacing of 15”.
- On mowed slopes, minimum depth of 1” and maximum groove spacing of 12”.

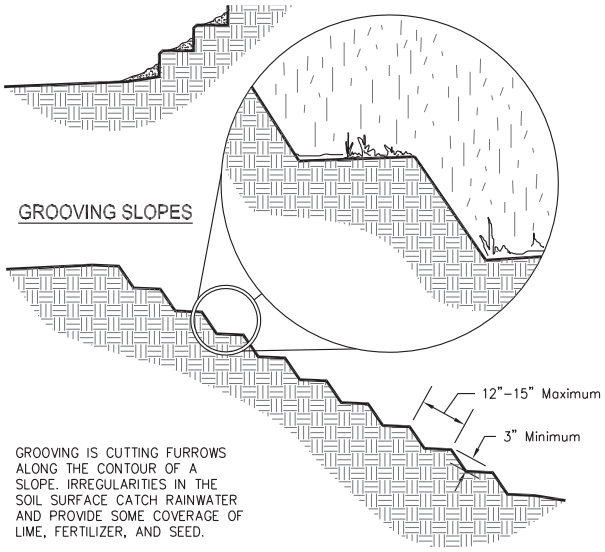

Figure 2. Grooving Slopes

Tracking

- Not recommended on clayed soils unless no alternatives are available.
- Sandy soils may be tracked because they do not compact severely.
- Minimize machine passes to minimize compaction.
- Roughened areas shall be seeded and mulched as soon as possible to obtain optimum seed germination and growth.

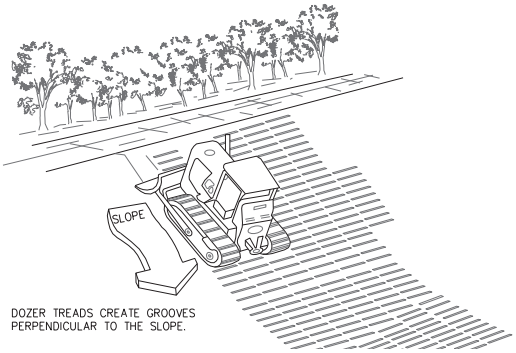

Figure 3. Tracking

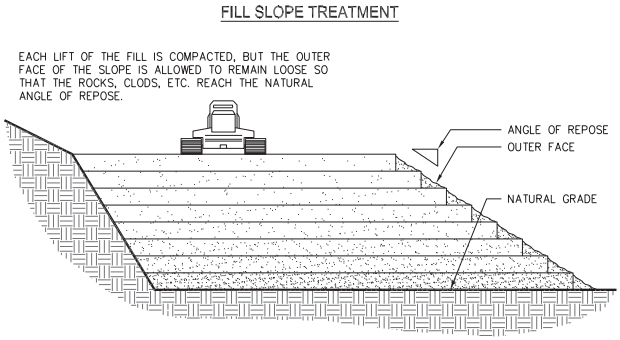

Figure 4. Fill Slope Treatment

REFERENCES

Ds1 Disturbed Area Stabilization (With Mulching Only)

Ds2 Disturbed Area Stabilization (With Temporary Seeding)

Ds3 Disturbed Area Stabilization (With Permanent Vegetation)

Ds4 Disturbed Area Stabilization (With Sodding)

Tc

TURBIDITY CURTAIN

DEFINITION

A floating or staked barrier installed within the water.

PURPOSE

- Minimize turbidity and silt migration from work occurring within the water or as a supplement to perimeter control BMPs at the water's edge.
- Allow suspended particles to drop out of the water column over time.

INSTALLATION

- Install according to the approved plan.
- This practice is only allowed as a primary device when required permitting has been obtained for the site that approves the filling of State or U.S. waters.
- A Stream Buffer Variance from the GA EPD may be required and all other appropriate agencies, including the U.S. Army Corps of Engineers, must be contacted to ensure compliance with other laws.
- Not to be used as sediment storage.

Tc

- The installation of a turbidity curtain as a supplemental BMP is allowed provided the stream or other water "body" is not altered in any manner by the installation.
- Place barrier approximately 25 ft outside of the affected construction area for large water bodies.
- Place barrier parallel to flow whenever there is significant velocity or current in the body of water.
- Never allow the silt dispersion to exceed the allowances the filling permit has authorized.
- Installation dimensions and methods shall be fitted to the conditions, permitted activity, and construction methods.

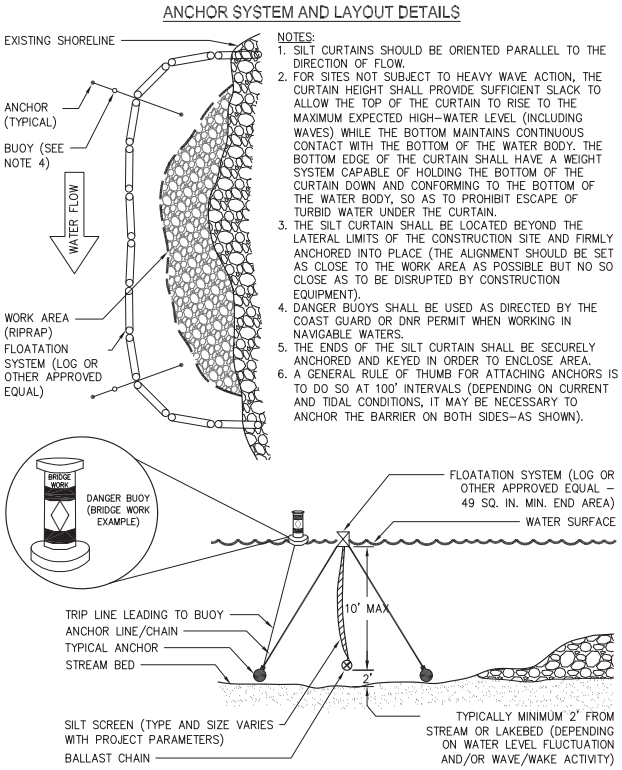

Figure 1. Turbidity Curtain System

Installation Types

Floating Turbidity Curtain **Tc-F**

- Typical installation include large bodies of water such as rivers and lakes.
- Extend curtain to a depth of 5 ft from the bottom of the water body.

Staked Turbidity Curtain **Tc-S**

- Typical installations include shallow inundations where construction is required.
- Extend the barrier to the bottom of the streambed.
- Limit the height to 5 ft whenever possible and extend 2 ft above the normal water elevation.

MAINTENANCE

- Remove the curtain when it is no longer required.
- Carefully remove any sediment that exceeds the allowance of the filling permit.
- If using Tc as a supplemental BMP, it should be removed once the contributing drainage area reaches final stabilization and perimeter control removal has occurred.

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Tp

TOPSOILING

DEFINITION

The stripping off of the fertile topsoil, storing it, then spreading it over the disturbed area after the completion of construction activities.

PURPOSE

- Provide a suitable soil medium for vegetative growth on areas where other measures will not produce or maintain a desirable stand.

SPECIFICATIONS

- Recommended for sites with slopes 2:1 or flatter where:
  - (1) the texture of the exposed subsoil or parent material is not suitable to produce adequate vegetative growth.
  - (2) the soil material is so shallow that the rooting zone is not deep enough to support plants with continuing supplies of moisture and food.
  - (3) the soil to be vegetated contains material toxic to plant growth.
- Topsoil should be friable and loamy, free of debris, objectionable weed and stones, and contain no toxic substance that may be harmful to plant growth.

- A stripping depth of 4”-6” is common and should be confined to the immediate construction area.
- Stockpiles should not obstruct natural drainage or cause off-site environmental damage.
- Stockpiles shall be contained by sediment barriers and stabilized with temporary vegetative measures.
- Where the pH of the subsoil is 5.0 or less or composed of heavy clays, agricultural lime shall be spread at a rate of 100lbs/1000 sq.ft.
- Subsoil shall be loosened by discing or scarifying to a minimum depth of 3” to permit bonding of the topsoil to the subsoil. Tracking by a bulldozer is also adequate.
- Topsoil should be applied at a uniform depth of 5” (unsettled), but may be adjusted at the discretion of the design professional.
- Topsoil should be handled only when dry in order to prevent damaging the soil structure.

Table 1. Cubic Yards of Topsoil Required for Application to Various Depths

Depth (in.)	Per 1,000 Sq. Ft.	Per Acre
1	3.1	134
2	6.2	268
3	9.3	403
4	12.4	537
5	15.5	672
6	18.6	806

Tr

TREE PROTECTION

DEFINITION

The protection of desirable trees from injury during construction activity.

PURPOSE

- Ensure the survival of desirable trees where they will be effective for erosion and sediment control, watershed protection, landscape beautification, dust and pollution control, noise reduction, shade and other environmental benefits while the land is being converted.

SPECIFICATIONS

- Contact the local government to obtain information regarding tree ordinances BEFORE ES&PC plans are designed.

Tree Protection Zones

(1) Measure the diameter of the tree trunk in inches 4.5 ft from the ground. This is the Diameter Breast Height (DBH).

(2) Multiply this value by 1.5. This result is the radius of the root protection zone in ft Also considered the critical rooting distance.

Tr

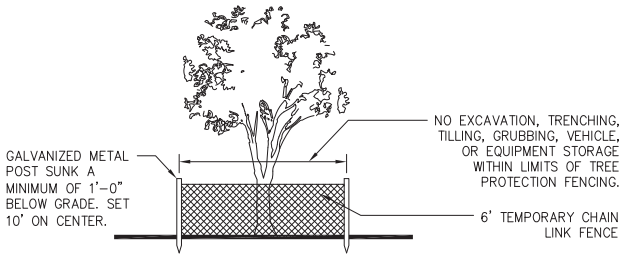


Figure 1. Chain Link Fence Installation

Tree Protection Zone Fencing

Tree protection zone fencing may be one of the following:

- For areas of large remnant forest to be protected, use 4 ft high orange plastic fabric fencing stapled in 3 locations to 2x4 treated wood stakes. Set stakes 6 ft on center. Do not use rebar as stakes.
- For single family homes use a treated wood fencing. It may have orange fabric attached to it.
- For all other developments use 6 ft high chain link fencing attached to galvanized metal post.

*Please refer to the American National Standard(ANSI) or the International Society of Arborculture for more information regarding standards for adequate tree protection.

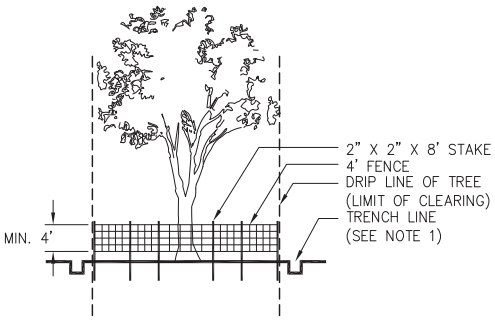


Figure 2. "Snow" Fence Installation

Wt

VEGETATED WATERWAY OR STORMWATER CONVEYANCE CHANNEL

DEFINITION

A natural or constructed channel that is shaped or graded to required dimensions and established in suitable vegetation for the stable conveyance of runoff.

PURPOSE

- Dispose of runoff without causing damage either by erosion or flooding.

INSTALLATION

- Install according to the approved plan.
- Remove all trees, brush, stumps, obstructions and other objectionable material so as not to interfere with the proper functioning of the waterway.
- Ensure the channel is free of bank projections or other irregularities that will impede normal flow.
- Compact fills as needed to prevent unequal settlement.
- Dispose of all excess earth fill so that it will not interfere with waterway functioning.
- Stabilize the channel in accordane with applicable vegetative standards.

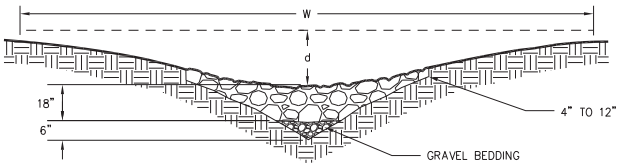
- Channel shape may be parabolic, trapezoidal, or triangular.
- The bottom width shall not exceed 50 ft unless multiple or divided waterways or other means are provided to control meandering of low flows within this limit.
- Please refer to Table 1 for design velocities of the grassed waterways.

Table 1. Permissible Velocities for Vegetated and Rock-Lined Waterways

Vegetative Cover	Maximum Permissible Velocity (fps)
Bermuda	5
Bahia	4
Tall Fescue	4
Sericea Lespedeza Weeping Lovegrass	3
Stone Center	Design Required

- Tile or other subsurface drainage measure shall be provided for sites having high water tables or seepage problems. Where there is base flow, a stone center or lined channel will be required.
- Mulching is required for all seeded or sprigged channels.
- Geotextiles should be used as an erosion control measure beneath the riprap center.
- If conditions permit, water should be temporarily diverted from the channel, or otherwise disposed of, during the establishment of vegetation.

WATERWAY WITH STONE CENTER DRAIN AND
V–SECTION SHAPED BY MOTOR GRADER



WATERWAY WITH STONE CENTER DRAIN AND
ROUNDED SECTION SHAPED BY BULLDOZER

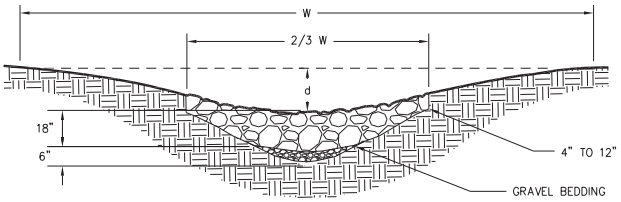


Figure 1. Stone Center Waterway

REFERENCES

Ds1	Disturbed Area Stabilization (With Mulching Only)
Ds2	Disturbed Area Stabilization (With Temporary Seeding)
Ds3	Disturbed Area Stabilization (With Permanent Vegetation)
Ds4	Disturbed Area Stabilization (With Sodding)
Ss	Slope Stabilization

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Insert Tab 3

Resource Information

Back of Tab

Important Links for E&S in Georgia

These documents can be found at http://gaswcc.georgia.gov/

Under "Documents List"

O.C.G.A. 12-7-1 (GESA)

http://gaswcc.georgia.gov/sites/gaswcc.georgia.gov/files/related_files/document/OCGANov2018.pdf

NPDES Permit Fact Sheet

https://gaswcc.georgia.gov/sites/gaswcc.georgia.gov/files/imported/SWCC/Files/Factsheet-NPDES-Construction-General-Permits-May-2018.pdf

NPDES Permit for Stand Alone Construction Projects (GAR100001)

https://gaswcc.georgia.gov/sites/gaswcc.georgia.gov/files/imported/SWCC/Files/GAR100001-Stand-Alone-May-2018-Final.pdf

NPDES Permit for Infrastructure Construction Projects (GAR100002)

http://gaswcc.georgia.gov/sites/gaswcc.georgia.gov/files/imported/SWCC/Files/GAR100002-Infrastructure-May-2018-Final.pdf

NPDES Permit for Common Development Construction Projects (GAR100003)

http://gaswcc.georgia.gov/sites/gaswcc.georgia.gov/files/imported/SWCC/Files/GAR100003-Common-Development-May-2018-Final.pdf

2016 Manual for Erosion & Sediment Control in Georgia

http://gaswcc.georgia.gov/sites/gaswcc.georgia.gov/files/related_files/site_page/GSWCC-2016-Manual-As-Approved-by-Overview-Council.pdf

2016 Field Manual for Erosion & Sediment Control in Georgia

https://gaswcc.georgia.gov/sites/gaswcc.georgia.gov/files/imported/SWCC/Files/2016%20Field%20Manual%20for%20Erosion%20%26%20Sediment%20Control.pdf

Model Ordinance 2016

http://gaswcc.georgia.gov/sites/gaswcc.georgia.gov/files/related_files/document/Model_Ordinance_June_2016.doc

2019 ES&PC Plan Review Checklists

https://gaswcc.georgia.gov/sites/gaswcc.georgia.gov/files/imported/SWCC/Files/2019-ESPC-Plan-Review-Checklists-final-UPDATE-JULY-2018.xlsx

https://gaswcc.georgia.gov/sites/gaswcc.georgia.gov/files/imported/SWCC/Files/2019-ESPC-Plan-Review-Checklists-final%20-UPDATE-JULY-2018.pdf

Sample Inspection & Record Keeping Forms

http://gaswcc.georgia.gov/sites/gaswcc.georgia.gov/files/Sample_FormsF.zip

Equivalent Best Management Practice List

https://gaswcc.georgia.gov/sites/gaswcc.georgia.gov/files/related_files/document/Equivalent-BMP-List.pdf

Impaired Streams Map Viewer

http://www.gaswcc.org/maps/

Commonly Used Acronyms

BMP: Best Management Practices

CPESC: Certified Professional in Erosion & Sediment Control

CWA: Clean Water Act

DNR: Department of Natural Resources

EMC: Electric Membership Corporation

EPA: Environmental Protection Agency

EPD: Environmental Protection Division

ES&PC: Erosion, Sedimentation & Pollution Control

FEMA: Federal Emergency Management Agency

FERC: Federal Energy Regulatory Commission

GACD: Georgia Association of Conservation Districts

GDOT: Georgia Department of Transportation

GESA: Georgia Erosion & Sediment Control Act

GEOS: Georgia EPD Online System

GFC: Georgia Forestry Commission

GSWCC: Georgia Soil & Water Conservation Commission

LDA: Land Disturbing Activity

LIA: Local Issuing Authority

MLRA: Major Land Resource Area

MOA: Memorandum of Agreement

NOI: Notice of Intent

NOT: Notice of Termination

NOV: Notice of Violation

NPDES: National Pollutant Discharge Elimination System

NRCS: Natural Resource Conservation Service

NTU: Nephelometric Turbidity Unit

O.C.G.A.: Official Code of Georgia Annotated

RO: Responsible Official

PSC: Public Service Commission

SWCD: Soil & Water Conservation District

TMDL: Total Maximum Daily Load

USACE: United States Army Corps of Engineers

USDA: United States Department of Agriculture

Glossary

Accelerated Erosion – alteration of the land surface that is intensified by human activities

Agricultural Lime – a soil amendment consisting principally of calcium carbonate ($CaCO_3$)

Base Flow – the discharge that enters the stream channel through the soil

Best Management Practices – schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent and minimize erosion and resultant sedimentation, which are consistent with, and no less stringent than, those practices contained in the "Manual for Erosion & Sediment Control in Georgia" (Manual) published by the State Soil & Water Conservation Commission as of January 1 of the year in which the land-disturbing activity was permitted to prevent or reduce the pollution of waters of Georgia

Buffer – an area of land immediately adjacent to the banks of State waters in its natural state of vegetation, which facilitates the protection of water quality and aquatic habitat

Certified Personnel – a person who has successfully completed the appropriate certification course approved by GSWCC

Channel Stabilization – improving, constructing or stabilizing an open channel for water conveyance

Check Dam – a temporary grade control structure, or dam constructed across a swale, drainage ditch, or area of concentrated flow

Climate – the statistics of weather. It is measured, usually over a 30-year period, by assessing the patterns of variation in temperature, humidity, atmospheric pressure or precipitation

Coagulant – neutralizes the repulsive electrical charge surrounding a particle allowing it to stick together with other particles to form a clump or floc

Coastal Dune Stabilization – the planting of vegetation on dunes that are denuded, artificially constructed, or re-nourished

Common Development – a contiguous area where multiple, separate, and distinct construction activities will be taking place at different times on different schedules under one plan of development on or after August 1, 2000

Conservation – the protection, improvement and use of natural resources according to principles that will assure their highest economic or social benefit

Construction Activity – the disturbance of soils associated with clearing, grading, excavating, filling of land, or other similar activities

Construction Exit – a stone stabilized pad located at any point where traffic will be leaving a construction site to a public right-of-way, street, alley, sidewalk or parking area

Construction Road Stabilization – a travel-way constructed as part of a construction plan including access roads, subdivision roads, parking areas, and other on-site vehicle transportation routes

Cut-and-Fill – the process of earth moving by excavating part of an area and using the excavated material for adjacent embankments or fill areas

Design Professional – a professional licensed by the State of Georgia in the field of engineering, architecture, landscape architecture, forestry, geology, or land surveying; or a person that is a Certified Professional in Erosion & Sediment Control with a current certification by EnviroCert International Inc.

Direct Runoff – the water entering stream channels promptly after rainfalls or snow melts

Disturbed Area Stabilization (with mulching) – the application of plant residue or other suitable material, produced on site if possible, to the soil surface

Disturbed Area Stabilization (with temporary vegetation) – the establishment of temporary vegetative cover with fast growing species for seasonal protection on disturbed or denuded areas

Disturbed Area Stabilization (with permanent vegetation) – the planting of perennial vegetation such as trees, shrubs, vines, grasses, or legumes on exposed areas for final permanent stabilization

Disturbed Area Stabilization (with sodding) – a permanent vegetative cover using sod on highly erodible or critically eroded lands

Diversion – a ridge of compacted soil, constructed above, across, or below a slope

Drainage Structure – a device composed of a virtually non-erodible material such as concrete, steel, plastic or other such material that conveys water from one place to another by intercepting the flow and carrying it to a release point for storm water management, drainage control, or flood control purposes

Dust Control – the control of surface and air movement of dust on construction, roads, and demolition sites

Ephemeral Stream – a stream that flows only in direct response to precipitation

Erosion – the process by which the land surface is worn away by the action of water, wind, ice and gravity

ES&PC Plan – an Erosion, Sediment & Pollution Control Plan for the control of soil erosion and sediment resulting from a land-disturbing activity

Filling – the placement of any soil or solid material either organic or inorganic on a natural ground surface or an excavation

Filter Ring – a temporary stone barrier constructed at storm drain inlets and pond outlets

Final Stabilization – all soil disturbing activities at the site have been completed, and that for unpaved areas and areas not covered by permanent structures and areas located outside the waste disposal limits of a landfill cell that has been certified by EPD for waste disposal, 100% of the soil surface is uniformly covered in permanent vegetation with a density of 70% or greater, or landscaped according to the Plan (uniformly covered with landscaping materials in planned landscaped areas), or equivalent permanent stabilization measures as defined in the Manual (excluding a crop of annual vegetation and a seeding of target crop perennials appropriate for the region)

Floating Surface Skimmer – a buoyant device that releases/drains water from the surface of sediment ponds, traps, or basins at a controlled rate of flow

Flocculant – facilitates the agglomeration or aggregation of coagulated particles to form larger floccules that slowly drop out of suspension

Gabion – a large, multi-celled, welded wire or rectangular wire mesh box used to stabilize highly erosive slopes

Grade Stabilization Structure – a structure used to stabilize the grade in a natural or artificial channel

Grade – the slope of a road, channel, or natural ground

Gradient – the number of horizontal units per vertical units

GEOS – Georgia EPD Online System; the mandatory electronic submittal system for permit applications

Geologic Erosion – the natural erosion caused by geologic processes acting over long geologic periods

Geotextile – a term used to describe woven or non-woven fabric materials used to reinforce or separate soil and other materials

Hydric Soils – soils that were developed in conditions where soil oxygen is limited by the presence of saturated soil for long periods during the growing season

Hydrophytic Vegetation – a plant that grows partially or fully submerged in water

Infrastructure Construction – construction activities that are not part of a common development that include the construction, installation, and maintenance of roadway and railway projects and conduits, pipes, pipelines, substations, cables, wires, trenches, vaults, manholes, and similar or related structures for the conveyance of natural gas, liquid petroleum products, electricity, telecommunications, water, storm water, or sewage

Inlet Sediment Trap – a temporary protective device formed at or around an inlet to a storm drain to trap sediment

Intermittent Stream – a stream, or portion of a stream, that flows only in direct response to precipitation

Interstate Commerce – as had, presently has, or potential to have interstate commerce

Land-Disturbing Activity – any activity which may result in soil erosion from water or wind and the movement of sediments into state water or onto state lands, including, but not limited to clearing, dredging, grading, excavating, transporting, and filling of land

Level Spreader – a storm flow outlet device constructed at zero grade across the slope

Local Issuing Authority – the governing authority of any county or municipality which is certified pursuant to subsection (a) of Code Section 12-7-8

Marshlands – any marshland intertidal area, mud flat, tidal water bottom, or salt marsh in the State within the estuarine area of the state, whether or not the tidewaters reach the littoral areas through natural or artificial watercourses

Mass Grading – the movement of earth by mechanical means to alter the gross topographic features (elevations, slopes, etc.) in order to prepare a site for final grading and the construction of facilities (buildings, roads, parking, etc.)

Manual – the Manual for Erosion & Sediment Control in Georgia is the published guidance of the GSWCC governing the design and practices to be utilized in the protection of the state's natural resources from erosion and sedimentation

Navigable Waters – waters subject to the ebb and flow of the tide and has a connection to the transportation of interstate commerce

Nephelometric Turbidity Unit – a numerical unit of measure based upon photometric analytical techniques for measuring the light scattered by fine particles of a substance in suspension.

Normal Business Hours – Monday thru Friday, 8:00 AM to 5:00 PM, excluding any non-working Saturday, non-working Sunday and non-working Federal holiday.

Normal Stream Flow – any stream flow that consists solely of base flow or consists of both base flow and direct runoff during any period of the year

Outfall – the location where storm water, in a discernible, confined and discrete conveyance, leaves a facility or construction site or, if there is a receiving water on site, becomes a point source discharging into that receiving water

Perennial Stream – a stream with base flow that maintains stream flow throughout the year under normal circumstances

Permanent Downdrain – a permanent structure used to safely convey surface runoff from the top of a slope to the bottom of the slope

pH – a numerical measure of the acidity or hydrogen ion activity

Preparer – someone assigned by a Responsible Official to create and prepare applications for their facility

Primary Permittee – the owner or operator or both of a tract of land for a construction project subject to the permit

Primary Trout Waters – any stream supporting a self-sustaining population of Rainbow, Brown, or Brook Trout

Receiving Water(s) – all perennial and intermittent waters of the State into which the runoff of storm water from a construction activity will actually discharge, either directly or indirectly

Responsible Official - a duly authorized representative for a facility who can certify and submit applications in GEOS.

Retaining Wall – a wall constructed of one or more of the following: concrete masonry, reinforced concrete, cribbing, treated timbers, steel pilings, gabions, stone drywall, rock riprap, etc….

Retrofit – a device or structure placed in front of a permanent storm water detention pond outlet or roadway drainage structure to serve as a temporary filter

Rill Erosion – an erosion process in which numerous small channels, only several inches deep, occur mainly on recently disturbed and exposed soils

Riprap – broken rocks, cobbles, or boulders placed

Roadway Drainage Structure – a device such as a bridge, culvert, or ditch, composed of a virtually non-erodible material such as concrete, steel, plastic, or other such material that conveys water under a roadway by intercepting the flow on one side of a traveled roadway consisting of one or more defined lanes, with or without shoulder areas, and carrying water to a release point on the other side

Rock Filter Dam – a temporary stone filter dam installed across a drainage way or in conjunction with a temporary sediment trap

Secondary Permittee – an owner, individual builder, utility company, or utility contractor that conducts a construction activity within a common development with an existing primary permittee

Secondary Trout Waters – streams with no evidence of natural trout reproduction but capable of supporting trout throughout the year

Sediment – solid material, both organic and inorganic, that is in suspension, is being transported, or has been moved from its site of origin by, wind, water, ice, or gravity as a product of erosion

Sediment Barrier – a temporary structure made of a porous material typically supported by steel or wood posts

Sedimentation – the process by which eroded material is transported and deposited by water, wind, ice and gravity

Seep Berm – a linear control device constructed as a diversion perpendicular to the direction of runoff to enhance dissipation and infiltration of the runoff, while creating multiple sedimentation chambers with the employment of intermediate dikes

Sheetflow – runoff which flows over the ground surface as a thin, even layer, not concentrated in a channel

Sheet Erosion – the removal of a fairly uniform layer of soil from the land surface by runoff water

Slope Stabilization – a protective covering used to prevent erosion and establish temporary or permanent vegetation on steep slopes, shorelines, or channels

Soil – the unconsolidated mineral and organic material on the immediate surface of the Earth that serves as natural medium for the growth of land plants

Splash Erosion – the spattering of small soil particles caused by the impact of raindrops on wet soils

Stand Alone Construction – construction activities that are not part of a common development where the primary permittee chooses not to use secondary permittees

State Waters – includes any and all rivers, streams, creeks, branches, lakes, reservoirs, ponds, drainage systems, springs, wells, and other bodies of surface or subsurface water, natural or artificial, lying within or forming a part of the boundaries of the state, which are not entirely confined and retained completely upon the property of a single individual, partnership, or corporation

Storm Drain Outlet Protection – a paved and/or riprap channel section placed below storm drain outlets

Storm Water – storm water runoff, snow melt runoff, and surface runoff and drainage

Stream Diversion Channel – a temporary channel constructed to convey flow around a construction site while a permanent structure is being constructed in the stream channel

Streambank Stabilization – the use of readily available native plant materials to maintain and enhance streambanks

Sub-contractor – an entity employed or retained by the permittee to conduct any type of construction activity (as defined in this permit) at a stand alone construction site

Surface Roughening – providing a rough soil surface with horizontal depressions created by operating a tillage or other suitable implement on the contour

Tackifier – a tie-down for soil, compost, seed, straw, hay or mulch

Temporary Downdrain – a temporary structure used to convey concentrated storm water runoff down the face of cut or fill slopes

Temporary Sediment Basin – a basin created by the construction of a barrier or dam across a concentrated flow area, or by excavating a basin, or by a combination of both

Temporary Sediment Trap – a small temporary pond that drains a disturbed area so that sediment can settle out

Temporary Stream Crossing – a temporary structure installed across a flowing stream or watercourse for use by construction equipment

Tertiary Permittee – the owner or operator of remaining lot(s) within a common development conducting a construction activity where the primary permittee and all secondary permittees have submitted a Notice of Termination or where a primary permittee no longer exists

Topography – the arrangement of the natural or artificial physical features of an area

Topsoiling – the stripping off of the more fertile top soil, storing it, and then spreading it over the disturbed area after completion of construction activities

Tree Protection – protection for desirable trees from injury during construction activity

Turbidity Curtain – a floating or staked barrier installed within the water column

Turf Reinforcement Matting – a permanent geo-synthetic matting that is used to stabilize the soil while permanent vegetation is taking root

Vegetated Waterway – a natural or constructed channel that is shaped and graded to the required dimensions and established in suitable vegetation

Wetland – those areas inundated or saturated by surface or ground water at a frequency and duration to support, and that under normal circumstances do support a prevalence of vegetation adapted for life in saturated soil conditions

Wrested Vegetation – the point where vegetation has been wrested away by normal stream flow or wave action

Georgia Soil and Water Conservation Commission

4310 Lexington Road, Athens, Georgia 30605
Phone (706) 552-4474 Fax (706) 552-4486

Commission Members
Commission Board appointed by the Governor on April 15, 2015

Harold Fallin	Bob Martin	Jason Winters	Drew Echols	Kerry Moore
Chairman	Vice Chairman	Member	Member	Member
Thomaston, Georgia	*Ocilla, Georgia*	*Lyerly, Georgia*	*Alto, Georgia*	*West Green, Georgia*

Staff
Mitch Attaway – Executive Director: mitch.attaway@gaswcc.ga.gov
Robert Amos – Conservation Manager: robert.amos@gaswcc.ga.gov
Jonathan Rutland – Resource Specialist: jonathan.rutland@gaswcc.ga.gov
Kari Kleist – Administrative Assistant: kari.kleist@gaswcc.ga.gov

Urban Lands Erosion & Sediment Control Program
Ben Ruzowicz – Program Manager: ben.ruzowicz@gaswcc.ga.gov
Jennifer Howell – Technical Specialist: jennifer.howell@gaswcc.ga.gov
Susan Castle – E&SC Specialist: susan.castle@gaswcc.ga.gov
Guerry Thomas – E&SC Specialist: guerry.thomas@gaswcc.ga.gov
Greg Walker – E&SC Specialist: greg.walker@gaswcc.ga.gov
Josh Jackwood – E&SC Specialist: josh.jackwood@gaswcc.ga.gov
Jennifer Standridge – Data Entry Specialist: jennifer.standridge@gaswcc.ga.gov
Melanie Hill – Administrative Assistant: melanie.hill@gaswcc.ga.gov

Rural Water Resources & Watersheds Program
Jessica Mimbs – Program Manager: jessica.mimbs@gaswcc.ga.gov
Ben Hyer – 319 Water Quality Projects: ben.hyer@gaswcc.ga.gov

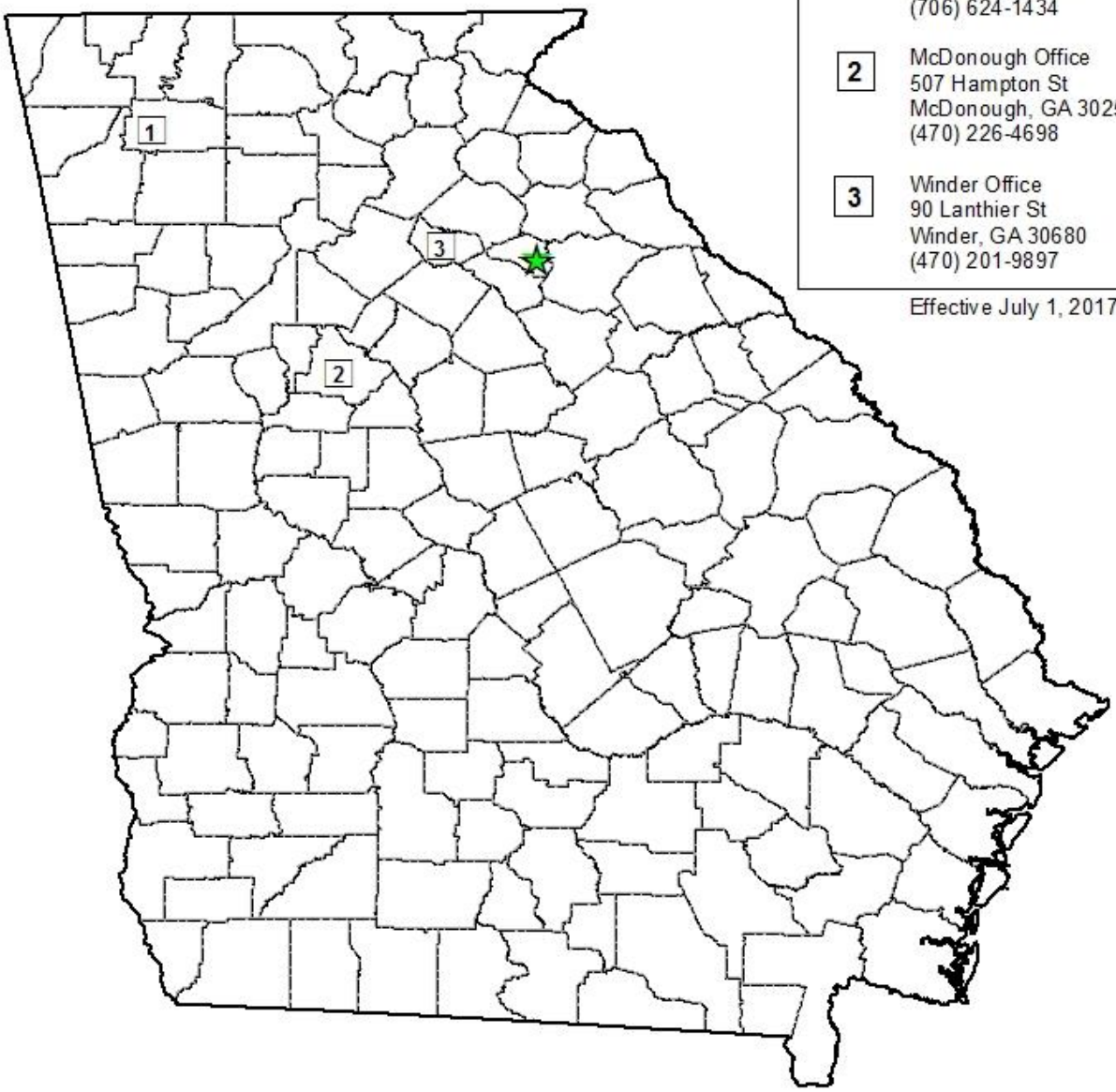
Financial Personnel
Karen Bruce – Office Manager: karen.bruce@gaswcc.ga.gov
Andy Pope – Personnel Representative: andy.pope@gaswcc.ga.gov

Information Technology
Erik McCutcheon – IT Director: erik.mccutcheon@gaswcc.ga.gov
Ernell Babb – IT Project Specialist: ernie.babb@gaswcc.ga.gov

Georgia Soil and Water Conservation Commmission

gaswcc.georgia.gov

GSWCC



Headquarters
4310 Lexington Rd
Athens, GA 30605
(706) 552-4470

1 Calhoun Office
1282 SR 53 Spur SW Ste 300
Calhoun, GA 30701
(706) 624-1434

2 McDonough Office
507 Hampton St
McDonough, GA 30253
(470) 226-4698

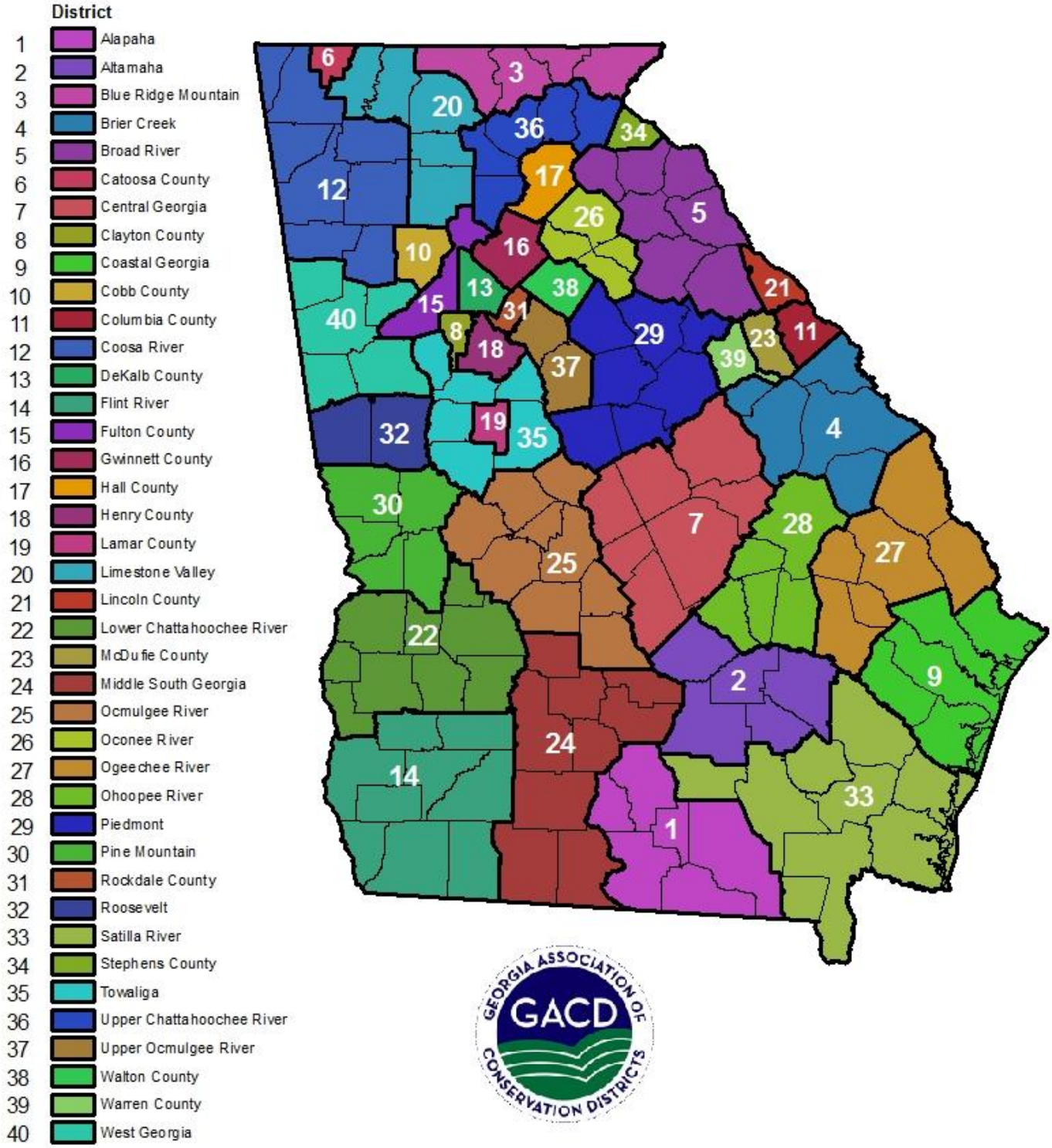
3 Winder Office
90 Lanthier St
Winder, GA 30680
(470) 201-9897

Effective July 1, 2017

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Georgia Soil and Water Conservation Districts

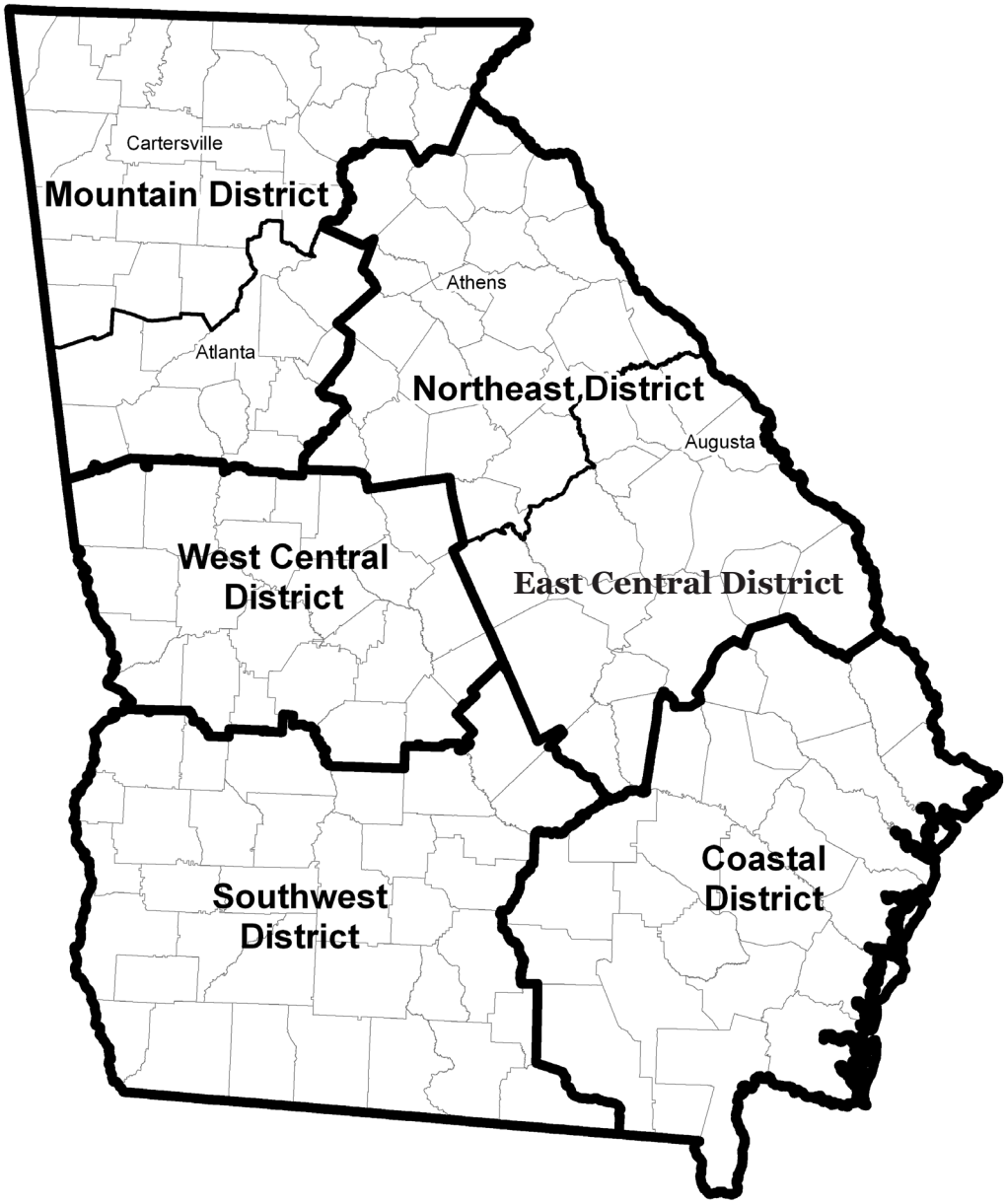
www.gacd.us



GA DNR
Environmental Protection Division

epd.georgia.gov

GEORGIA
DEPARTMENT OF NATURAL RESOURCES



West Central District
2640 Shurling Drive
Macon, GA 31211
(478) 751-6612

Mountain District (Atlanta)
4244 International Parkway
Atlanta, GA 30354
(404) 362-2671

Northeast District
745 Gaines School Road
Athens, GA 30605
(706) 369-6376

Mountain District (Cartersville)
P.O. Box 3250
16 Center Road
Cartersville, GA 30120
(770) 387-4900

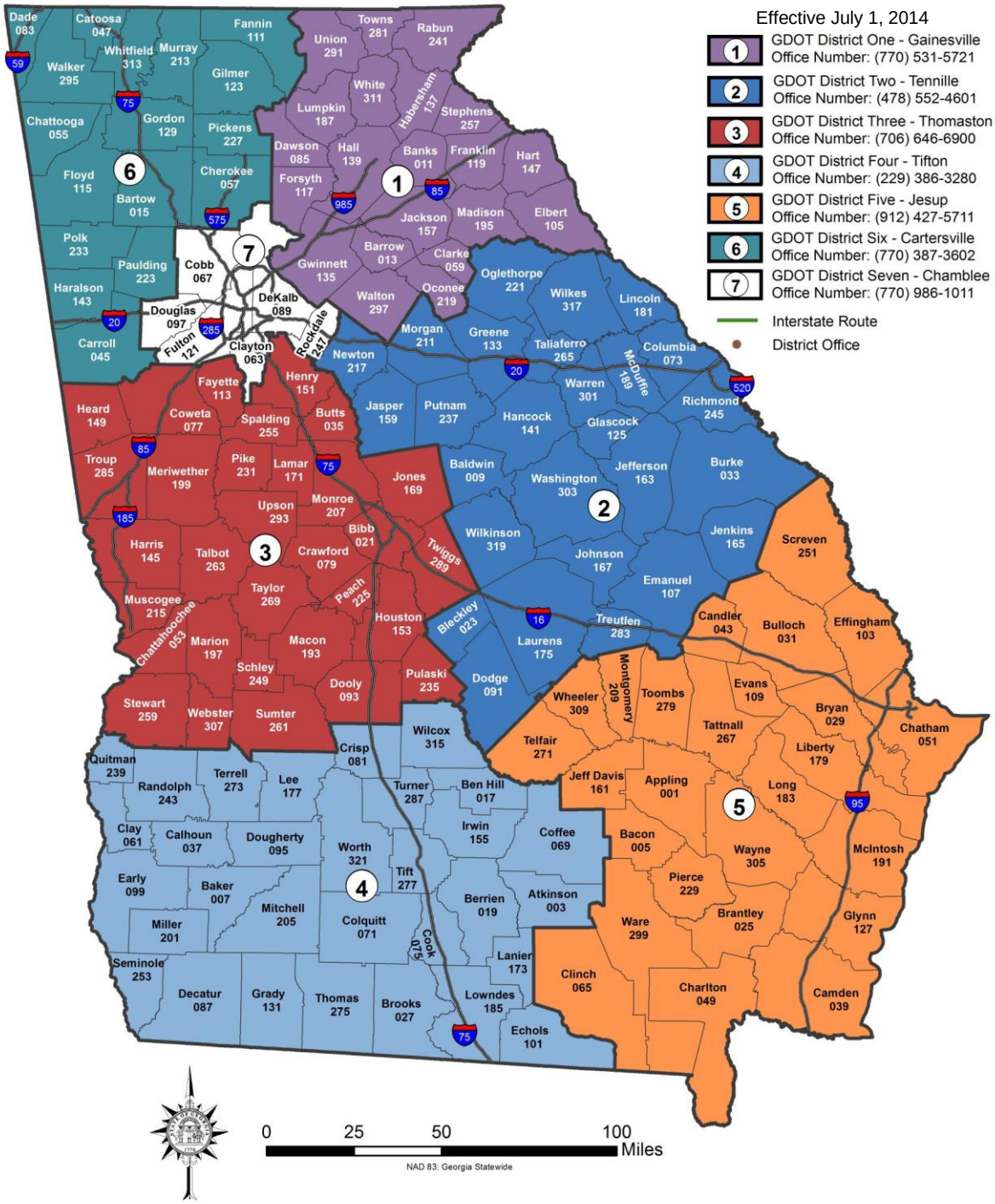
Southwest District
2024 Newton Road
Albany, GA 31701
(229) 430-4144

Coastal District
400 Commerce Center Dr.
Brunswick, GA 31523
(912) 264-7284

East Central District
3525 Walton Way Ext.
Augusta, GA 30909
(706) 667-4343

Georgia Department of Transportation

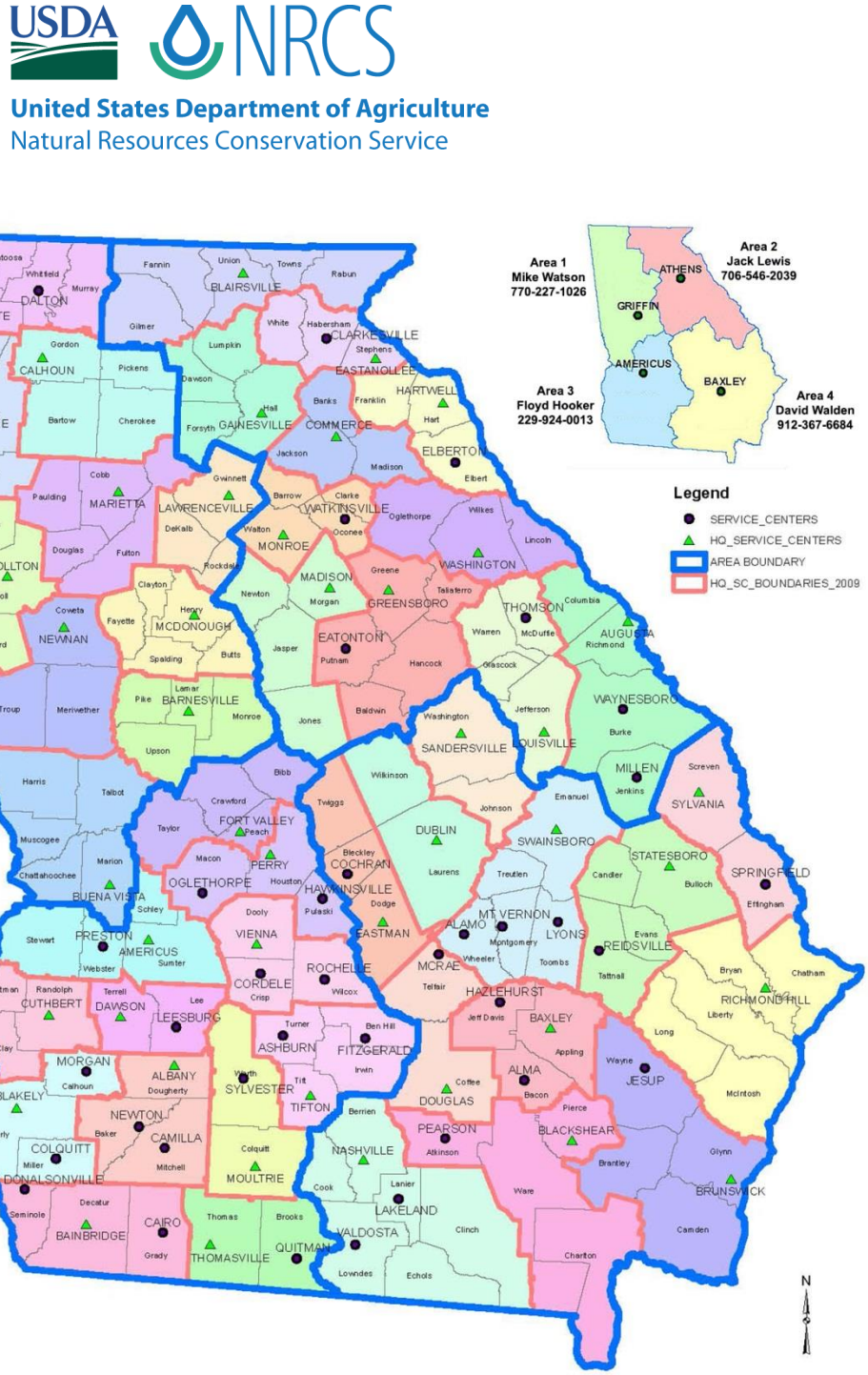
www.dot.ga.gov



Georgia Department of Transportation

Natural Resources Conservations Service

www.nrcs.usda.gov



Area 1 Griffin
201 W Solomon St
Griffin, GA 30223

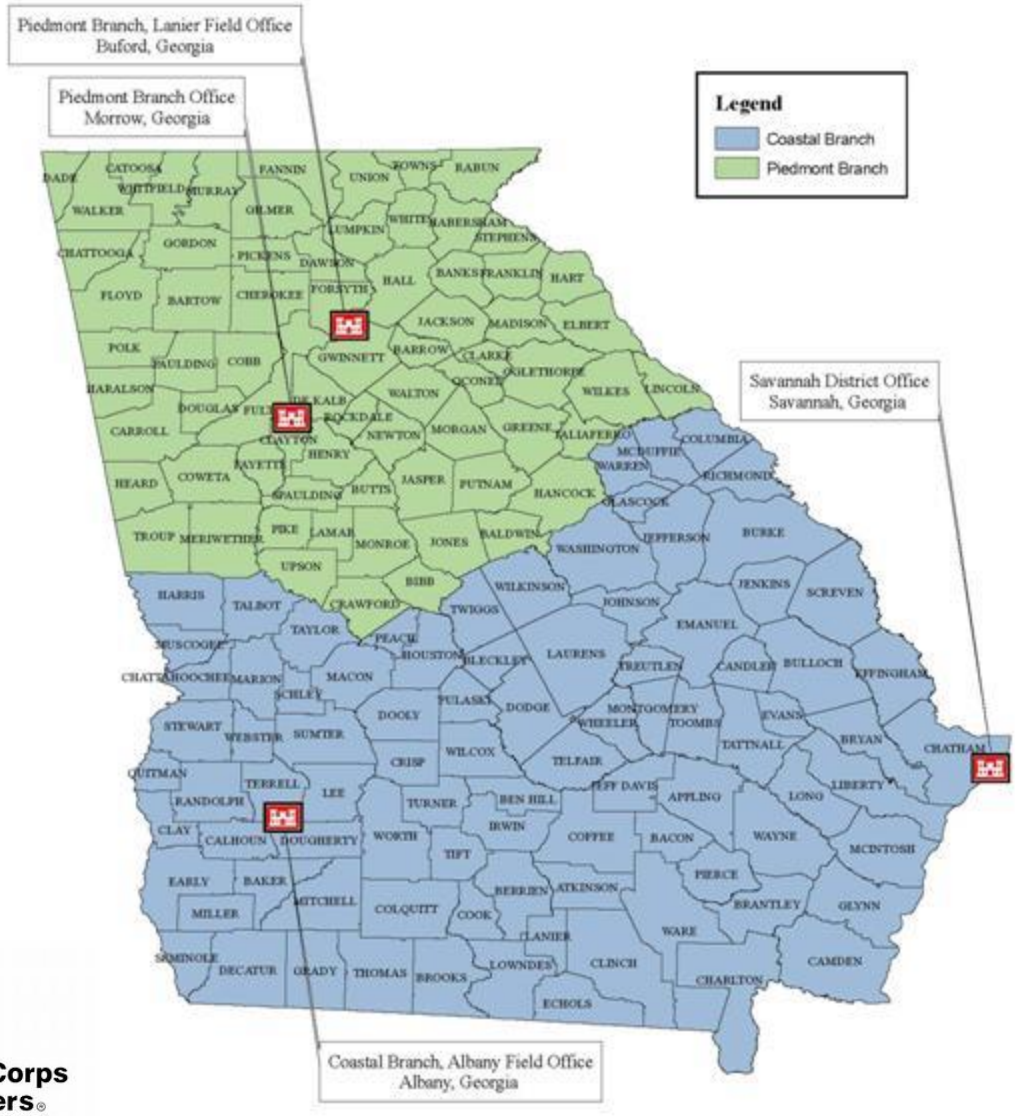
Area 2 Athens
355 E Hancock Ave
Athens, GA 30601

Area 3 Americus
295 Morris Dr
Americus, GA 31719

Area 4 Baxley
239 NE Park Ave
Baxley, GA 31513

State Office
355 E Hancock Ave
Athens, GA 30601

US ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT, REGULATORY DIVISION
OFFICE LOCATION MAP



US Army Corps of Engineers®
Savannah District

Savannah District
Regulatory Division
U.S. Army Corps of Engineers
ATTN: CESAS-RD
100 West Oglethorpe Avenue
Savannah, Georgia 31401-3604

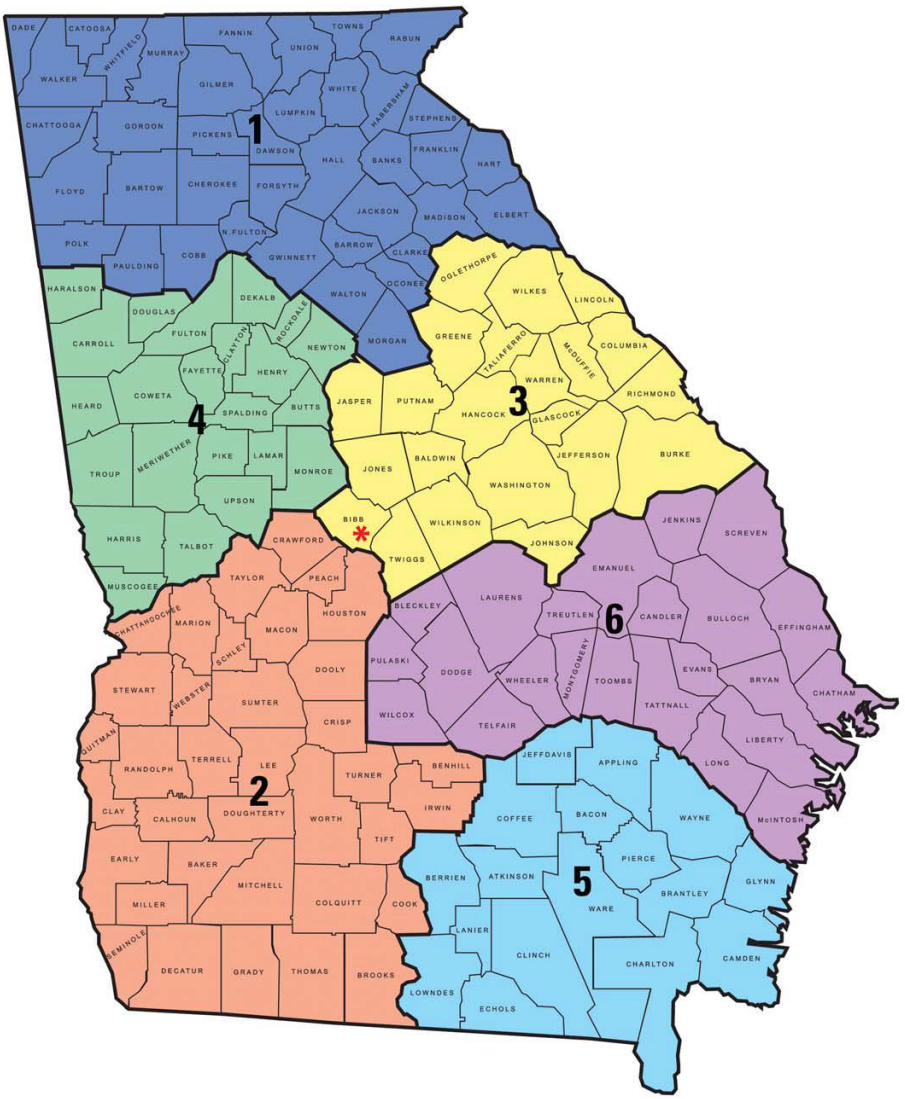
Piedmont Branch
U.S Army Corps of Engineers
1590 Adamson Parkway
The Plaza, Suite 200
Morrow, GA 30260-1777

Coastal Branch
U.S. Army Corps of Engineers
ATTN: CESAS-RD-C
100 West Oglethorpe Avenue
Savannah, Georgia 31401-3604

Georgia Forestry Commission

www.gfc.state.ga.us

5645 Riggins Mill Road
Dry Branch, GA 31020
1-800-GA-TREES (428-7337)
GaTrees.org



Coosa District (1)
Gainesville Office
3005 Atlanta Hwy
Gainesville, GA 30507
(770) 531-6043/6048

Rome Office
3086 Martha Berry Hwy NE
Rome, GA 30165
(706) 295-6021/6022

Flint District (2)
Camilla Office
3561 Hwy 112
Camilla, GA 31730
(229) 522-3580/3581

Americus Office
243 US Hwy 19 North
Americus, GA 31719
(229) 931-2436/2437

Oconee District (3)
Milledgeville Office
119 Hwy 49
Milledgeville, GA 31061
(478) 445-5164/5548

Washington Office
1465 Tignall Road
Washington, GA 30673
(706) 678-2015

Chattahoochee District (4)
Newnan Office
187 Corinth Rd
Newnan, GA 30263
(770) 254-7218

Satilla District (5)
Waycross Office
5003 Jacksonville Hwy
Waycross, GA 31503
(912) 287-4915

Ogeechee District (6)
McRae Office
Route 1 Box 67
Helena, GA 31037
(229) 868-3385

Local Issuing Authority Information

Effective December 2018

County	LIA Name	Active LIA	SWCD
Appling	Baxley	Yes	Altamaha
Atkinson	Pearson	Yes	Satilla River
Baldwin	Baldwin County	Yes	Piedmont
Baldwin	Milledgeville	Yes	Piedmont
Banks	Banks County	Yes	Broad River
Banks	Homer	Yes	Broad River
Banks	Maysville	Yes	Broad River
Barrow	Auburn	Yes	Oconee River
Barrow	Barrow County	Yes	Oconee River
Bartow	Adairsville	Yes	Coosa River
Bartow	Emerson	Yes	Coosa River
Bartow	Euharlee	Yes	Coosa River
Bartow	White	Yes	Coosa River
Ben Hill	Ben Hill County	Yes	Middle South Georgia
Ben Hill	Fitzgerald	Yes	Middle South Georgia
Berrien	Berrien County	Yes	Alapaha
Berrien	Nashville	Yes	Alapaha
Bryan	Bryan County	Yes	Coastal
Bryan	Pembroke	Yes	Coastal
Bryan	Richmond Hill	Yes	Coastal
Bulloch	Bulloch County	Yes	Ogeechee River
Bulloch	Statesboro	Yes	Ogeechee River
Butts	Butts County	Yes	Towaliga
Butts	Jackson	Yes	Towaliga
Camden	Camden County	Yes	Satilla River
Camden	Kingsland	Yes	Satilla River
Camden	St. Marys	Yes	Satilla River
Candler	Candler County	Yes	Ogeechee River
Candler	Metter	Yes	Ogeechee River
Carroll	Mt. Zion	Yes	West Georgia
Carroll	Villa Rica	Yes	West Georgia
Catoosa	Catoosa County	Yes	Catoosa
Catoosa	Ft. Oglethorpe	Yes	Catoosa
Catoosa	Ringgold	Yes	Catoosa

Charlton	Charlton County	Yes	Satilla River
Charlton	Folkston	Yes	Satilla River
Charlton	Homeland	Yes	Satilla River
Chatham	Bloomingdale	Yes	Coastal
Chatham	Chatham County	Yes	Coastal
Chatham	Garden City	Yes	Coastal
Chatham	Pooler	Yes	Coastal
Chatham	Savannah	Yes	Coastal
Chatham	Tybee Island	Yes	Coastal
Chattooga	Chattooga County	Yes	Coosa River
Cherokee	Canton	Yes	Limestone Valley
Cherokee	Cherokee County	Yes	Limestone Valley
Clayton	Clayton County	Yes	Clayton County
Clayton	Lovejoy	Yes	Clayton County
Clayton	Morrow	Yes	Clayton County
Clinch	Homerville	Yes	Alapaha
Cobb	Austell	Yes	Cobb County
Cobb	Marietta	Yes	Cobb County
Cobb	Powder Springs	Yes	Cobb County
Coffee	Coffee County	Yes	Altamaha
Coffee	Douglas	Yes	Altamaha
Colquitt	Colquitt County	Yes	Middle South Georgia
Colquitt	Doerun	Yes	Middle South Georgia
Colquitt	Moultrie	Yes	Middle South Georgia
Colquitt	Norman Park	Yes	Middle South Georgia
Columbia	Grovetown	Yes	Columbia County
Columbia	Harlem	Yes	Columbia County
Cook	Adel	Yes	Alapaha
Cook	Cook County	Yes	Alapaha
Cook	Sparks	Yes	Alapaha
Coweta	Sharpsburg	Yes	West Georgia
Crisp	Cordele	Yes	Middle South Georgia
Crisp	Crisp County	Yes	Middle South Georgia
Dade	Dade County	Yes	Coosa River

Dawson	Dawson County	Yes	Upper Chatthoochee River
Dawson	Dawsonville	Yes	Upper Chatthoochee River
Decatur	Bainbridge	Yes	Flint River
DeKalb	Avondale Estates	Yes	Dekalb County
DeKalb	Brookhaven	Yes	Dekalb County
DeKalb	City of Brookhaven	Yes	Dekalb County
DeKalb	Clarkston	Yes	Dekalb County
DeKalb	Decatur	Yes	Dekalb County
DeKalb	Doraville	Yes	Dekalb County
DeKalb	Dunwoody	Yes	Dekalb County
DeKalb	Stone Mountain	Yes	Dekalb County
DeKalb	Stonecrest	Yes	Dekalb County
DeKalb	Tucker	Yes	Dekalb County
Dodge	Eastman	Yes	Central Georgia
Dooly	Dooly County	Yes	Ocmulgee River
Dooly	Unadilla	Yes	Ocmulgee River
Early	Blakely	Yes	Flint River
Effingham	Effingham County	Yes	Ogeechee River
Effingham	Rincon	Yes	Ogeechee River
Elbert	Elbert County	Yes	Broad River
Elbert	Elberton	Yes	Broad River
Evans	Claxton	Yes	Ogeechee River
Fannin	Blue Ridge	Yes	Blue Ridge Mountain
Fannin	Fannin County	Yes	Blue Ridge Mountain
Fayette	Brooks	Yes	Towaliga
Fayette	Woosley	Yes	Towaliga
Forsyth	Cumming	Yes	Upper Chatthoochee River
Forsyth	Forsyth County	Yes	Upper Chatthoochee River
Fulton	College Park	Yes	Fulton County
Fulton	East Point	Yes	Fulton County
Fulton	Fulton County	Yes	Fulton County
Fulton	Hapeville	Yes	Fulton County
Fulton	Mountain Park	Yes	Fulton County
Fulton	Palmetto	Yes	Fulton County
Fulton	Union City	Yes	Fulton County

Gilmer	East Ellijay	Yes	Limestone Valley
Gilmer	Ellijay	Yes	Limestone Valley
Gilmer	Gilmer County	Yes	Limestone Valley
Glascock	Glascock County	Yes	Brier Creek
Glynn	Glynn County	Yes	Satilla River
Gordon	Calhoun	Yes	Coosa River
Gordon	Fairmount	Yes	Coosa River
Gordon	Gordon County	Yes	Coosa River
Grady	Cairo	Yes	Flint River
Grady	Grady County	Yes	Flint River
Greene	Greensboro	Yes	Piedmont
Greene	Union Point	Yes	Piedmont
Gwinnett	Berkeley Lake	Yes	Gwinnett County
Gwinnett	Dacula	Yes	Gwinnett County
Gwinnett	Grayson	Yes	Gwinnett County
Gwinnett	Lawrenceville	Yes	Gwinnett County
Gwinnett	Loganville Gwinnett	Yes	Gwinnett County
Gwinnett	Norcross	Yes	Gwinnett County
Gwinnett	Suwanee	Yes	Gwinnett County
Habersham	Alto	Yes	Upper Chatthoochee River
Habersham	Cornelia	Yes	Upper Chatthoochee River
Habersham	Habersham County	Yes	Upper Chatthoochee River
Hall	Flowery Branch	Yes	Hall County
Hall	Gainesville	Yes	Hall County
Hall	Hall County	Yes	Hall County
Hall	Lula	Yes	Hall County
Hall	Oakwood	Yes	Hall County
Hancock	Hancock County	Yes	Piedmont
Haralson	Bremen	Yes	West Georgia
Haralson	Haralson County	Yes	West Georgia
Harris	Hamilton	Yes	Pine Mountain
Harris	Harris County	Yes	Pine Mountain
Harris	Pine Mountain	Yes	Pine Mountain
Henry	Hampton	Yes	Henry County
Henry	Stockbridge	Yes	Henry County

Houston	Centerville	Yes	Ocmulgee River
Houston	Perry	Yes	Ocmulgee River
Irwin	Irwin County	Yes	Middle South Georgia
Irwin	Ocilla	Yes	Middle South Georgia
Jackson	Arcade	Yes	Oconee River
Jackson	Braselton	Yes	Oconee River
Jackson	Commerce	Yes	Oconee River
Jackson	Jackson County	Yes	Oconee River
Jackson	Jefferson	Yes	Oconee River
Jackson	Pendergrass	Yes	Oconee River
Jackson	Talmo	Yes	Oconee River
Jasper	Jasper County	Yes	Upper Ocmulgee River
Jasper	Monticello	Yes	Upper Ocmulgee River
Jefferson	Jefferson County	Yes	Brier Creek
Jefferson	Louisville	Yes	Brier Creek
Jefferson	Wrens	Yes	Brier Creek
Jones	Gray	Yes	Piedmont
Jones	Jones County	Yes	Piedmont
Lamar	Barnesville	Yes	Lamar County
Lamar	Lamar County	Yes	Lamar County
Lanier	Lakeland	Yes	Alapaha
Lanier	Lanier County	Yes	Alapaha
Laurens	Dublin	Yes	Central Georgia
Laurens	Laurens County	Yes	Central Georgia
Lee	Lee County	Yes	Lower Chattahoochee River
Lee	Leesburg	Yes	Lower Chattahoochee River
Liberty	Allenhurst	Yes	Coastal
Liberty	Flemington	Yes	Coastal
Liberty	Gum Branch	Yes	Coastal
Liberty	Hinesville	Yes	Coastal
Liberty	Liberty County	Yes	Coastal
Liberty	Midway	Yes	Coastal
Liberty	Riceboro	Yes	Coastal
Liberty	Walthourville	Yes	Coastal
Lincoln	Lincoln County	Yes	Lincoln County
Lincoln	Lincolnton	Yes	Lincoln County
Long	Long County	Yes	Coastal

Lowndes	Hahira	Yes	Alapaha
Lowndes	Lake Park	Yes	Alapaha
Lumpkin	Dahlonega	Yes	Upper Chatthoochee River
Lumpkin	Lumpkin County	Yes	Upper Chatthoochee River
Madison	Ila	Yes	Broad River
McDuffie	McDuffie County	Yes	McDuffie County
McDuffie	Thomson	Yes	McDuffie County
Meriwether	Manchester	Yes	Roosevelt
Meriwether	Meriweather County	Yes	Roosevelt
Mitchell	Camilla	Yes	Flint River
Monroe	Forsyth	Yes	Towaliga
Monroe	Monroe County	Yes	Towaliga
Morgan	Madison	Yes	Piedmont
Morgan	Morgan County	Yes	Piedmont
Murray	Chatsworth	Yes	Limestone Valley
Murray	Eton	Yes	Limestone Valley
Murray	Murray County	Yes	Limestone Valley
Newton	Newton County	Yes	Upper Ocmulgee River
Oconee	Oconee County	Yes	Oconee River
Oconee	Watkinsville	Yes	Oconee River
Peach	Byron	Yes	Ocmulgee River
Peach	Peach County	Yes	Ocmulgee River
Pickens	Jasper	Yes	Limestone Valley
Pickens	Nelson	Yes	Limestone Valley
Pickens	Pickens County	Yes	Limestone Valley
Pierce	Blackshear	Yes	Satilla River
Pierce	Patterson	Yes	Satilla River
Pierce	Pierce County	Yes	Satilla River
Pike	Pike County	Yes	Towaliga
Polk	Cedartown	Yes	Coosa River
Polk	Rockmart	Yes	Coosa River
Pulaski	Hawkinsville	Yes	Ocmulgee River

Putnam	Eatonton	Yes	Piedmont
Putnam	Putnam County	Yes	Piedmont

Rabun	Clayton	Yes	Blue Ridge Mountain
Rabun	Rabun County	Yes	Blue Ridge Mountain
Rabun	Sky Valley	Yes	Blue Ridge Mountain
Screven	Screven County	Yes	Ogeechee River
Screven	Sylvania	Yes	Ogeechee River
Seminole	Seminole County	Yes	Flint River
Spalding	Griffin	Yes	Towaliga
Spalding	Spalding County	Yes	Towaliga
Stephens	Toccoa	Yes	Stephens County
Stewart	Stewart County	Yes	Lower Chattahoochee River
Sumter	Americus	Yes	Lower Chattahoochee River
Sumter	Plains	Yes	Lower Chattahoochee River
Sumter	Sumter County	Yes	Lower Chattahoochee River
Tattnall	Glennville	Yes	Ogeechee River
Telfair	McRae	Yes	Altamaha
Telfair	Telfair County	Yes	Altamaha
Thomas	Thomasville	Yes	Middle South Georgia
Tift	Omega	Yes	Middle South Georgia
Tift	Tift County	Yes	Middle South Georgia
Tift	Tifton	Yes	Middle South Georgia
Toombs	Toombs County	Yes	Ohoopee River
Toombs	Vidalia	Yes	Ohoopee River
Towns	Young Harris	Yes	Blue Ridge Mountain
Troup	Hogansville	Yes	Roosevelt
Troup	West Point	Yes	Roosevelt
Union	Blairsville	Yes	Blue Ridge Mountain
Union	Union County	Yes	Blue Ridge Mountain
Upson	Thomaston	Yes	Towaliga
Upson	Upson County	Yes	Towaliga

Local Issuing Authority Information

Effective December 2018

Walker	Chickamauga	Yes	Coosa River
Walker	Rossville	Yes	Coosa River
Walker	Walker County	Yes	Coosa River
Walton	Between	Yes	Walton County
Walton	Good Hope	Yes	Walton County
Walton	Loganville Walton County	Yes	Walton County
Walton	Monroe	Yes	Walton County
Walton	Walnut Grove	Yes	Walton County
Walton	Walton County	Yes	Walton County
Ware	Ware County	Yes	Satilla River
Warren	Warren County	Yes	Warren County
Warren	Warrenton	Yes	Warren County
Washington	Sandersville	Yes	Central Georgia
Washington	Tennille	Yes	Central Georgia
White	Cleveland	Yes	Upper Chatthoochee River
White	White County	Yes	Upper Chatthoochee River
Wilkes	Washington	Yes	Broad River
Wilkes	Wilkes County	Yes	Broad River
Worth	Sylvester	Yes	Middle South Georgia

Local Issuing Authorities with a Memorandum of Agreement (MOA)

Effective December 2018

County	LIA Name	Active MOA	SWCD
Bartow	Bartow County	Yes	Coosa River
Bartow	Cartersville	Yes	Coosa River
Bibb	Macon-Bibb County	Yes	Ocmulgee River
Carroll	Carroll County	Yes	West Georgia
Carroll	Carrollton	Yes	West Georgia
Cherokee	Holly Springs	Yes	Limestone Valley
Cherokee	Woodstock	Yes	Limestone Valley
Clarke	Athens-Clarke County	Yes	Oconee River
Clayton	Forest Park	Yes	Clayton County
Clayton	Jonesboro	Yes	Clayton County
Cobb	Acworth	Yes	Cobb County
Cobb	Cobb County	Yes	Cobb County
Cobb	Kennesaw	Yes	Cobb County
Cobb	Smyrna	Yes	Cobb County
Columbia	Columbia County	Yes	Columbia County
Coweta	Coweta County	Yes	West Georgia
Coweta	Newnan	Yes	West Georgia
DeKalb	Chamblee	Yes	Dekalb County
DeKalb	Dekalb County	Yes	Dekalb County
DeKalb	Pine Lake	Yes	Dekalb County
Dougherty	Albany	Yes	Flint River
Dougherty	Dougherty County	Yes	Flint River
Douglas	Douglas County	Yes	West Georgia
Douglas	Douglasville	Yes	West Georgia
Fayette	Fayette County	Yes	Towaliga
Fayette	Fayetteville	Yes	Towaliga
Fayette	Peachtree City	Yes	Towaliga
Fayette	Tyrone	Yes	Towaliga
Floyd	Floyd County	Yes	Coosa River
Floyd	Rome	Yes	Coosa River

Local Issuing Authorities with a Memorandum of Agreement (MOA)

Effective December 2018

County	LIA Name	Active MOA	SWCD
Fulton	Alpharetta	Yes	Fulton County
Fulton	Atlanta	Yes	Fulton County
Fulton	Fairburn	Yes	Fulton County
Fulton	Johns Creek	Yes	Fulton County
Fulton	Milton	Yes	Fulton County
Fulton	Roswell	Yes	Fulton County
Fulton	Sandy Springs	Yes	Fulton County
Greene	Greene County	Yes	Piedmont
Gwinnett	Buford	Yes	Gwinnett County
Gwinnett	Duluth	Yes	Gwinnett County
Gwinnett	Gwinnett County	Yes	Gwinnett County
Gwinnett	Lilburn	Yes	Gwinnett County
Gwinnett	Peachtree Corners	Yes	Gwinnett County
Gwinnett	Snellville	Yes	Gwinnett County
Gwinnett	Sugar Hill	Yes	Gwinnett County
Henry	Henry County	Yes	Henry County
Henry	McDonough	Yes	Henry County
Houston	Houston County	Yes	Ocmulgee River
Houston	Warner Robins	Yes	Ocmulgee River
Lowndes	Lowndes County	Yes	Alapaha
Lowndes	Valdosta	Yes	Alapaha
Muscogee	Columbus-Muscogee County	Yes	Pine Mountain
Newton	Covington	Yes	Upper Ocmulgee River
Paulding	Paulding County	Yes	Coosa River
Richmond	Augusta-Richmond County	Yes	Brier Creek
Rockdale	Rockdale County	Yes	Rockdale County
Troup	LaGrange	Yes	Roosevelt
Troup	Troup County	Yes	Roosevelt
Ware	Waycross	Yes	Satilla River
Whitfield	Dalton	Yes	Limestone Valley
Whitfield	Tunnell Hill	Yes	Limestone Valley
Whitfield	Varnell	Yes	Limestone Valley
Whitfield	Whitfield County	Yes	Limestone Valley

Insert Tab 4

Sample Forms

Back of Tab

Site Inspection Report

Erosion and Sedimentation Inspection Report

Maintain Reports on-site

Site:	**Date:**	**Time:**
Inspector:	**Accompanied By:**	
Stage of Construction:		
Site:		
Observation:		
Recommendations:		
Contractors's Corrective Action (and Date):		
Site:		
Observation:		
Recommendations:		
Contractors's Corrective Action (and Date):		

B.M.P Inspection Report

Project: _____ Inspection Date: _____ Time: _____

Type of Inspection: Routine _____ Re-Inspection _____

Stage of Construction: BMP Installation/Clearing Grading Curb/Gutter Building Other _____

Weather/Soil Condition: Raining/Wet Light Rain/Medium Clear/Dry

Erosion Device Inspected	Status
Bf: Buffer Zone	Passed Failed Comment
Ds1: Soil Stabilization: mulch only 6" to 10"	Passed Failed Comment
Ds2: Soil Stabilization: (temp. seeding)	Passed Failed Comment
Ds3: Soil Stabilization: (permanent vegetation)	Passed Failed Comment
Ds4: Soil Stabilization: (soding)	Passed Failed Comment
Ga: Gablon	Passed Failed Comment
Du: Dust Control	Passed Failed Comment
Cd: Check Dams: rock/other	Passed Failed Comment
Cb: Channel Stabilization: (rip rap or vegetation)	Passed Failed Comment
Co: Construction Exit Pad	Passed Failed Comment
Mb: Geotextiles	Passed Failed Comment
Rd: Rock Filter Dam	Passed Failed Comment
Rt: Retrofit: Detention/Sediment Pond	Passed Failed Comment
Sd1: Sediment Barrier	Passed Failed Comment
Sd2: Inlet Sediment Trap	Passed Failed Comment
Sd3: Temporary Sediment Basin	Passed Failed Comment
Sr: Temporary Stream Crossing	Passed Failed Comment
St: Storm Drain Outlet Protection	Passed Failed Comment
Dn1: Temporary Down Drain Structure	Passed Failed Comment
Sb: Stream Bank Stabilization	Passed Failed Comment
Wt: Veg. Waterway or St/Water Conv. Channel	Passed Failed Comment
Tree Preservation Fencing	Passed Failed Comment
Trash	Passed Failed Comment

1. What action(s) was taken for any failed activities listed above? Verbal Notification:_____
   Written Notification:_____ Stop Work Order:_____ Citation #:_____
2. What time frame was given to comply with the above violation: Days:____ Other:_____
3. Have any complaints or violations been issued on this project previously? Yes:_____ No:_____
4. If yes, explain violations/fines:_____
   _____
5. Are there state waters present? Yes:_____ No:_____
6. Were all permits posted? Yes:_____ No:_____
7. Is an approved E&S plan on site? Yes:_____ No:_____

Comments:

Inspected By:_____

Storm Water Discharge Data

Site:_____ LDA No._____

Date	Rainfall (in.)	Location	Reading (NTU)	Comments

Daily Rainfall Log

Project Name: _____

Project Location: _____

Month: _____ **Year:** _____

Type of Device Used to Measure Rainfall: _____

Device Location: _____

Daily Rainfall Monitoring Data

Date	Rainfall Amount, Inches	Time	Reported By

Stormwater Monitoring Records

Month:_____ Year: _____ **Sheet ___ of___**

Submit to EPD by 15th of Following Month

Project Name: _____ **Project Location: _____**

Date Sampled	Rainfall Amount, Inches	Exact Location of Samples	Time Sampled	Sampling Technique Manual or Automatic	Sampled By	Date of Analysis	Time of Analysis	Analyzed By	Analytical Method	Results (NTU)

_____ _____

Signature Date

Inspection Summary

Site:_____ **LDA No.**_____

Map Site	Violation	First Date	Date Corrected

Daily Inspection Report

Inspection performed by certified personnel each day construction activity occurs on-site

Project Information	
Date:	Project Name:
Project Location:	
Inspection Observations	
Rainfall within past 24 hours (inches):	Is rainfall greater than 0.5”? Inspection Required ☐
Inspection Observations	
Petroleum Product Storage Areas: Are all of the temporary and permanent controls contained in Plan in place? ☐ Yes ☐ No If no, describe the location(s) of deficiencies and corrective actions that must be taken.	
Vehicle Entrances and Exits: Is there tracking of sediment from locations where vehicles enter and leave the project? ☐ Yes ☐ No If yes, describe the location(s) and the corrective actions that must be taken.	
Other Observations	
Is an Erosion, Sedimentation and Pollution Control Plan revision required? ☐ Yes ☐ No Date of revision:	
Corrective Actions and Date:	

Signature of Certified Personnel

Printed Name of Certified Personnel

Weekly Inspection Report

Inspection performed by certified personnel at least once every seven calendar days and within 24 hours of the end of a storm that is 0.5 inches or greater

Project Information	
Date:	Project Name:
Project Location:	
Name of Inspector:	
Inspection Event	
Regular weekly inspection: ☐	Inspection within 24 hours of 0.5" storm event ☐

Inspection Observations

Disturbed areas that have not undergone final stabilization:

Are all of the temporary and permanent controls contained in Plan in place and properly maintained? ☐ Yes ☐ No

If no, describe the location(s) of deficiencies and corrective actions that must be taken.

Corrective Action Taken and Date:

Material storage areas exposed to precipitation:

Are all of the temporary and permanent controls contained in Plan in place and properly maintained? ☐ Yes ☐ No

If no, describe the location(s) of deficiencies and corrective actions that must be taken.

Corrective Action Taken and Date:

Discharge locations or points.

Are erosion control measures preventing impacts to receiving waters? ☐ Yes ☐ No

If no, describe observations:

Structural control measures:

Are all of the temporary and permanent controls contained in Plan in place and properly maintained? ☐ Yes ☐ No

If no, describe the location(s) of deficiencies and corrective actions that must be taken.

Control Measures	Location	Deficiency	Date Corrected

Other observations:

Is an Erosion, Sedimentation and Pollution Control Plan revision required? ☐ Yes ☐ No Date of revision:

Signature of Certified Personnel

Printed Name of Certified Personnel

Monthly Inspection Report

Inspection performed by certified personnel at least once per month

Project Information	
Date:	Project Name:
Project Location:	
Inspection Observations	
Rainfall within past 24 hours (inches):	Is rainfall greater than 0.5”? Inspection Required ☐
Inspection Observations	
Areas that have undergone final stabilization: Are all permanent stabilization controls contained in Plan in place? ☐ Yes ☐ No If no, describe the location(s) of deficiencies and corrective actions that must be taken.	
Other observations: Are pollutants entering the drainage system or receiving waters? ☐ Yes ☐ No If yes, describe the location(s) and the corrective actions that must be taken. Are all erosion and sediment control measures operating properly? ☐ Yes ☐ No If no, describe the location(s) and the corrective actions that must be taken.	
Other Observations	
Is an Erosion, Sedimentation and Pollution Control Plan revision required? ☐ Yes ☐ No Date of revision:	
Corrective Actions and Date:	

Signature of Certified Personnel

Printed Name of Certified Personnel

Construction Checklist of BMPs And Minimum Requirements

Project Name & File No._____

Inspection Date:_____

Time:_____

Inspected by:_____

Stage of Construction

___Pre-Construction Phase

___Construction Phase

___Building Phase

___Final Stabilization

CHECK DAM (Cd)		
Minimum Requirement	Passed	Failed
Center: 9" lower than outer edges.		
Side Slopes: 2:1 or flatter		
Spacing: Toe of upstream dam is at the same elevation as the top of the downstream dam.		
Geotextile: Placed between the rock and its soil foundation.		
Maintenance: Sediment removed when depth reaches 1/2 the original dam height. Dam removed and area stabilized when useful life has expired.		

CHANNEL STABILIZATION (Ch)		
Minimum Requirement	Passed	Failed
Installation: Channel lining installed immediately after grading and vegetate all bare areas.		
Riprap Lining: Graded to 1.5:1 or less. A filter blanket, at least 6" thick, of sand, gravel, and/or geotextile material should be between soil and riprap.		
Outlet: Adequate outlet for free flow of water from flood plains into channel.		
Clearing: Objectionable materials removed from the channel. As many trees preserved, as possible.		
Buffers: Preserved by clearing for soil placement on one side of channel only. Buffers re-established with appropriate vegetation.		
Maintenance: Inspected periodically and necessary repairs made immediately.		

CONSTRUCTION EXIT (Co)		
Minimum Requirement	Passed	Failed
Aggregate Size: 1.5"-3.5"		
Pad Thickness: 6" minimum		
Pad Width: 20 ft minimum		
Pad Length: 50 ft minimum		
Location: At all exit points.		
Geotextile: Placed the full length and width of the exit.		
Maintenance: Peiodic top dressing with 1.5"-3.5" stone as conditions demand.		

CONSTRUCTION ROAD STABILIZATION (Cr)		
Minimum Requirement	Passed	Failed
Aggregate Size: 1.5"-3.5"		
Pad Thickness: 8"-10"		
Pad Width: 14 ft minimum.		
Maintenance: Peiodic top dressing with 1.5"-3.5" stone as conditions demand.		

STREAM DIVERSION CHANNEL (Dc)		
Minimum Requirement	Passed	Failed
Size: Channel width should be a minimum of 6 ft with side slopes flatter than 2:1.		
Lining: The liner should consist of geotextile or class I riprap.		
Maintenance: Inspected daily for construction material positioning.		

DIVERSION (Di)		
Minimum Requirement	Passed	Failed
Site Preparation: Trees, brush, stumps, and other objectionable material have been removed.		
Fills: All fills have been compacted. All un-needed excavated material has been disposed of and stabilized. Ridge should be at least 10 ft wide. Add 10% height for settlement.		
Stabilization: Channel outlets have adequate vegetation, riprap, and/or concrete.		
Maintenance: Inspected frequently and after each rainfall. Necessary repairs made immediately.		

(Dn1) DOWNDRAIN STRUCTURE (Dn2)		
Minimum Requirement	Passed	Failed
Location: On un-disturbed soil or well-compacted fill.		
Outlet: Stabilized with rock riprap.		
Pipe: Heavy duty, flexible tubing staked at 10 ft intervals for temporary structure. Joints are well-connected and watertight.		
Maintenance: Check after every rainfall. Necessary repairs made promptly. Temporary strucuture removed after useful life. Exposed areas stabilized		

FILTER RING (Fr)		
Minimum Requirement	Passed	Failed
Size: At inlets with a diameter less than 12”, the stone size should be 3”-5”		
Size: At inlets with a diameter greater than 12”, the stone size should be 10”-15”		
Height: The filter ring should have a minimum height of 2 ft from grade.		
Maintenance: The ring should be kept clear of trash and debris, and the sediment should be removed at 1/2 full		

GABION (Ga)		
Minimum Requirement	Passed	Failed
Design: Designed and installed by a professional familiar with the use of gabions		
Maintenance: Periodically inspected for signs of undercutting or excessive erosion		

GRADE STABILIZATION STRUCTURE (Gr)		
Minimum Requirement	Passed	Failed
Materials: Constructed of concrete, rock, masonry, steel, aluminum, or treated wood.		
Outlet: Adequate, stable outlet for discharge.		
Vegetation: On all disturbed areas.		
Maintenance: Periodically inspected for signs of undercutting or periodic erosion.		

LEVEL SPREADER (Lv)		
Minimum Requirement	Passed	Failed
Grade: No greater than 1% for the last 15 ft of the dike or diversion.		
Length: Determined by the design professional from estimated storm flow.		
Outlet: Discharges onto an undisturbed stabilized area to create uniform sheet flow.		
Maintenance: No blockages at point of discharge.		

ROCK FILTER DAM (Rd)		
Minimum Requirement	Passed	Failed
Height: The dam center shall be 9" lower than the outer edge and not higher than the channel banks.		
Side Slopes: 2:1 or flatter		
Location: Located so that it will not cause flooding of upstream property.		
Rock Size: Determined by the design criteria set forth in Appendix C of the Manual		
Top Width: 6 ft or greater		
Maintenance: Sediment removed when it reaches a depth of 1/2 the original height of the dam. Remove dam at the end of its useful life.		

RETAINING WALL (Re)		
Minimum Requirement	Passed	Failed
Design: Designed and installed by a professional familiar with the use of retaining walls.		
Maintenance: Periodically inspected for signs of undercutting or excessive erosion.		

RETROFIT (Rt)		
Minimum Requirement	Passed	Failed
Height: 1/2 the height of the outlet control structure		
Half-Round Pipe: Diameter should be 1.5x the principal pipe outlet diameter.		
Slotted Board Dam: Minimum posts size of 4"x4". The spacing between shall be 0.5"-1.0"		
Stone Size: 3-4" stone		
Pond Inlet: Sediment entry point should be at opposite end of basin from outlet. If not, baffles shall be installed		
Maintenance: Trash and debris hindering drainage shall be removed. Sediment removed when structure is 1/3 full. Structure removed when final stabilization achieved.		

SEDIMENT BARRIER (Sd1)		
Minimum Requirement	Passed	Failed
Location: Intended for areas where sheet flow occurs. Installed along the contour. Where state waters are present, 2 rows of Type "S" is installed.		
Brush Barrier: Wind-rowed on the contour. Width should be between 5-10 ft and height should be between 3-5 ft.		
Silt Fence: Verify fabric type and support spacing for each application. Entreched to a depth of 6". Verify post size.		
Maintenance: Sediment removed at 1/2 the original height of the barrier. Product replaced when it cannot maintain 80% of properly installed height. Removed once final stabilization has occurred		

INLET SEDIMENT TRAP (Sd2)		
Minimum Requirement	Passed	Failed
Excavated: A minimum depth of 1.5 ft is provided. Side slopes sohuld be 2:1 or flatter.		
Fabric & Frame: Steel posts are used. Fabric is entrenched at least 12" and fabric is securely fastened to the posts.		
Curb Inlet: 8" concrete blocks wrapped in filter fabric or gravel bags consisting of #57 stone wrapped in filter fabric or equivalen material.		
Gravel: 3" in diameter or larger stone placed on slope toward the inlet. 1/2"-3/4" gravel placed on slope away from inlet.		
Maintenance: Sediment removed when accumulation has reached 1/2 the height of the trap. Remove once contributing drainage basin has been stabilized		

TEMPORARY SEDIMENT BASIN (Sd3)		
Minimum Requirement	Passed	Failed
Location: Not placed in a live stream		
Principal Spillway: Vertical pipe should extend through the embankment and exit beyond the downstream toe of the fill. All pipe and riser connections should be watertight. Pipe should be a minimum of 8" in diameter		
Riser: 1/2" perforations spaced 3" apart covered with 2 ft of 3"-4" stone. Embedded 9" into an 18" thick concrete base.		
Emergency Spillway: Constructed on undisturbed ground. Minimum bottom width of 8 ft. Stabilized with vegetation, riprap, or concrete.		
Maintenance: All damages caused by erosion or equipment repaired before the end of each day. Sediment removed when 1/3 of the storage volume has been lost.		

TEMPORARY SEDIMENT TRAP (Sd4)		
Minimum Requirement	Passed	Failed
Depth: Maximum depth is 4 ft		
Overflow: The maximum permanent wet depth is 2 ft. Slopes are less than 2%.		
Combination: The maximum depth of ponded water is 12".		
Rock: Height of the embankment is not greater than 5.5 ft. The top width is at least 3 ft. Slopes do not exceed 2:1.		
Maintenance: All damages caused by erosion or equipment repaired before the end of each day. Sediment removed when 1/3 of the storage volume has been lost.		

FLOATING SURFACE SKIMMER (Sk)		
Minimum Requirement	Passed	Failed
Excavation Pit: 4 x 4 x 2 ft pit filled with riprap under the skimmer. Must be lower than the invert of the outlet barrel of the riser.		
Apparatus: Schedule 40 or greater PVC or other appropriate materials		
Maintenance: Use a floatable rope to remove trash and debris that accumulates on the outside of guard. Free skimmer from being stuck in the mud.		

SEEP BERM (SpB)		
Minimum Requirement	Passed	Failed
Location: Not located above fill slopes that have not achieved permanent stabilization. Not located across streams, ditches, or waterways.		
Berm: Minimum width of 12” and height of 4 ft. Compacted by mechanical equipment.		
Vegetation: Planted with seed that has 70% or better germination		
Spacing: The toe of the upstream dike is at the same elevation as the top of downstream dike.		
Maintenance: Inspect after every 1/2” rainfall or greater. Remove sediment when accumulation is 1/3 the height of the intermediate dike		

TEMPORARY STREAM CROSSING (Sr)		
Minimum Requirement	Passed	Failed
Size: Large enough to convey full bank flow without appreciably altering the stream flow characteristics.		
Location: Installed perpendicular to the stream.		
Overflow Protection: Elevated crossings, crown fills over pipes, or diversions and dikes.		
Maintenance: Inspect after every rainfall and at least once a week.		

STORM DRAIN OUTLET PROTECTION (St)		
Minimum Requirement	Passed	Failed
Alignment: The apron is properly aligned and preferably straight throughout its length		
Grade: Constructed at 0% grade with no overfall at the end. The top of the riprap at the downstream end is level with the receiving channel. Compacted any required fill.		
Filter Fabric: Gravel filter or Geotextile installed between the riprap and subgrade. Fabric is free of any punching or tears. Gravel filter is properly graded and installed according to the manufacturer’s recommendation		
Riprap Thickness - 1.5x the maximum stone diameter Upstream Width - 3x the diameter of the outlet pipe Length of Apron - Refer to Plan		
Maintenance: Inspect riprap outlet structures after heavy rain events. Make repairs immediately.		

SURFACE ROUGHENING (Su)		
Minimum Requirement	Passed	Failed
Steeper than 3:1: Roughened by either Stair-Step Grading, Grooving, or Tracking		
Flatter than 3:1: Soils loosened to a depth of 2”-4”		
Stair-Step Grading: Maximum depth of 30”-40” Maximum width of 40”-50”		
Grooving: Un-Mowed slopes with a minimum depth of 3” and maximum spacing of 15”. Mowed slopes with a minimum depth of 1” and maximum spacing of 12”		
Tracking: Not recommended on clay soils. Sandy soils may be tracked.		
Vegetation: Roughened areas are seeded and mulched immediately after roughening		

TURBIDITY CURTAIN		Tc
Minimum Requirement	Passed	Failed
Location: Barrier placed 25 ft outside of the construction area where possible. Curtain placed parallel to flow.		
Water Body: Not altered by the installation of the curtain.		
Filling: Required permits and variances have been obtained and allowable limits have not been exceeded.		
Maintenance: Removed when no longer needed. Excess sediment carefully removed.		

TOPSOILING		Tp
Minimum Requirement	Passed	Failed
Stripping: Confined to the immediate construction area with a typical depth of 4”-6.” Topsoil is friable, loamy, and free of debris and objectionable rock.		
Stockpile: Located where natural drainage is not obstructed and contained by a sediment barrier. Stabilized with temporary vegetative measures		
Spreading: Applied at a uniform depth of 5”. Subsoil has been loosened and agricultural lime added as required		

TREE PROTECTION		Tr
Minimum Requirement	Passed	Failed
Fence: Orange plastic fabric stapled to 2x4 treated wood stakes. Treated wood fencing with orange fabric attached used for single family homes		
Protection Zone: Local government contacted regarding tree ordinances and critical rooting distance		

VEGETATED WATERWAY		Wt
Minimum Requirement	Passed	Failed
Channel: Free of all trees, bank projections, and other objectionable material that will impeded normal flow. Shaped to desired cross section and stabilized in accordance vegetative standards.		
Fill: Compacted as needed. Excess fill disposed of in an appropriate manner		

BUFFER ZONE		Bf
Minimum Requirement	Passed	Failed
Width: For warm water fisheries, a minimum of 25 ft from the point of wrested vegetation shall be protected. For cold water fisheries, a minimum of 50 ft from the point of wrested vegetation shall be protected.		
Maintenance: Area closet to the stream is maintained at all times with minimal impact from equipment.		
Variance: A variance is required for any work inside State mandatad buffers		

COASTAL DUNE STABILIZATION		Cs
Minimum Requirement	Passed	Failed
Location: 100-140 ft depending on wind conditions from the mean high tide line.		
Posts: Minimum length of 7 ft with a minimum diameter of 3". Spacing should be 10 ft apart and entrenched to a depth of 3 ft.		
Snow Fence: Standard commercial 4 ft high snow fence with a slat spacing of 1-1/4". Fencing should be spaced 30-40 ft apart.		
Placement: Placed perpendicular to the prevailing winds. When winds are parallel to water, an additional 30 ft section should be placed perpendicular to the original fence.		
Vegetation: Established immediately following dune development. Irrigate is necessary.		
Preservation: Dunes protected from human and vehicular traffic. Crosswalks provided for beach access.		

DISTURBED AREA STABILIZATION (WITH MULCHING ONLY)		Ds1
Minimum Requirement	Passed	Failed
Preparation: Soil loosened to a minimum depth of 3"		
Application: Applied by hand or mechanical equipment.		
Anchoring: Anchored with a disk harrow or tackifier. Polyethylene film entrenched at the top		
Materials & Related Depths Straw or Hay - 2" to 4" Wood waste/chips - 2" to 3"		

DISTURBED AREA STABILIZATION (WITH TEMPORARY SEEDING)		Ds2
Minimum Requirement	Passed	Failed
Preparation: Soil should be loose and friable. Soil should be scarified when sealed by rainfall.		
Lime & Fertilizer: Applied at a rate determined by the soil pH.		
Seeding: Plant species selected based on site and soil conditions, area, and time of year.		
Irrigation: Applied at a rate that will not cause runoff and erosion.		
Mulch: Placed after seeding to retain moisture.		

DISTURBED AREA STABILIZATION (WITH PERMANENT SEEDING)		Ds3
Minimum Requirement	Passed	Failed
Preparation: Soil should be loose and friable. Soil should be scarified when sealed by rainfall.		
Lime & Fertilizer: Applied at a rate of 1-2 tons/acre unless soil tests indicate otherwise. Refer to Manual for 2nd & 3rd year fertilizer rates.		
Seeding: Plant species selected based on site and soil conditions, area, and time of year.		
Mulch: Applied in accordance with Ds1 specifications		
Irrigation: Applied at a rate that will not cause runoff and erosion.		
Mowing: 6" of top growth maintained at all times		

DISTURBED AREA STABILIZATION (WITH SODDING)		Ds4
Minimum Requirement	Passed	Failed
Surface: Soil surface is brought to final grade and clear of any trash, debris, and clods larger than 1".		
Installation: Sod applied to soil surface only (not to frozen or gravel type soils). Cut and installed within 36 hours of digging.		
Lime & Fertilizer: Applied based on soil tests or at a rate of 1-2 tons/acre.		
Anchoring: Sod should be anchored with pins on slopes steeper than 3:1.		
Irrigation: Used as a supplement to rainfall for a minimum of 2-3 weeks.		
Mowing: Grass height should not be cut less than 2"-3".		

DUST CONTROL		Du
Minimum Requirement	Passed	Failed
Methods: Mulch, vegetation, tackifiers, or irrigation used to prevent surface and air movement of dust.		

FLOCCULANTS & COAGULANTS		Fl-Co
Minimum Requirement	Passed	Failed
Application: Conforms to manufactuurer's guidelines.		
Type: Only anionic forms shall be used.		
Location: Intended for use in construction storm water ditches that feed ponds or basins. Not intended for use to surface waters of the state.		

STREAMBANK STABILIZATION (WITH PERMANENT VEGETATION)		Sb
Minimum Requirement	Passed	Failed
Design: Designed and installed by a professional familiar with the process.		
Materials: None used that could be poisonous to fish or aquatic life.		
Runoff: Diverted away from the area being treated.		
Side Slope: Should be 2:1 or flatter.		
Work Sequence: Work started at an upstream stable point along the bank.		
Stake Health: Cut with a saw. Planted the same day as prepared. Buds upward. Split, stripped, and mushroomed cuttings replaced.		
Stake Installation: Begins at water's edge and works up the bank.		
Vegetation: Native trees and shrubs.		
Inspection: Checked regularly for wash-outs, undercutting, unhealthy vegetation, especially after heavy rains. Make necessary repairs immediately.		
Maintenance: All failures fixed with structural materials, new plants, and mulch immediately.		

SLOPE STABILIZATION		Ss
Minimum Requirement	Passed	Failed
Installation: Conforms to manufacturer's guidelines for installation of HECPs & RECPs		
Maintenance: Inspected periodically after installation. All materials reinstalled after washouts or breakage.		

TACKIFIERS		Tac
Minimum Requirement	Passed	Failed
Specifications: Used as tie-down for soil, compost, seed, straw, hay, or mulch. Only anionic forms shall be used.		
Installation: Installed according to the manufacturer's guidelines.		

ACTIONS TAKEN

___ Verbal Warning Issued Date: _____

___ Stop Work Order Issued Date: _____

___ Citation Issued Date: _____

Comments: _____

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