
**Field Guide
For
Erosion and Sediment Control
On Construction Sites
In
Alabama**

**Alabama Soil and Water
Conservation Committee
and
Partners**

Second Edition, June 2015

Preface

This Field Guide was prepared to provide a quick, handy guide for persons involved in land disturbing activities. This includes homebuilders, general contractors, road builders, installers of best management practices, erosion and sediment control planners and designers, plan reviewers and inspectors.

The basis for the Field Guide is Volume II of the Alabama Handbook for Erosion Control, Sediment Control and Stormwater Management on Construction Sites and Urban Areas, September 2014.

The Field Guide covers the most commonly used erosion and sediment control practices contained in the Alabama Handbook. Some details and most pictures of the practices were omitted to maintain a small format.

Consult the Alabama Handbook Volumes I and II for details on planning, design, construction and inspections. It may be viewed at the Alabama Soil and Water Conservation homepage (<http://www.swcc.state.al.us>) under the “Programs” tab and it may be purchased from the Alabama Chapter of the Soil and Water Conservation Society (order form is at the same web location mentioned above).

This Field Guide may be obtained from the various project partners (see Acknowledgements section).

Acknowledgements

This Field Guide is a product of a partnership coordinated by the Alabama Soil and Water Conservation Committee. The partnering organizations are listed below.

Alabama Soil and Water Conservation Committee
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Alabama Department of Environmental Management
Alabama Department of Transportation
Associated General Contractors of Alabama
Auburn University
Alabama Cooperative Extension System
Home Builders Association of Alabama
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Chapter 1

Introduction

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Introduction

Use of the Field Guide

This Field Guide provides general guidance (descriptions and illustrations) for installing and maintaining many of the erosion and sediment control practices that are referred to as Best Management Practices (BMPs).

Detailed design plans/drawings are the basis for meeting requirements on most sites and the **plan design requirements take precedence over details in the Field Guide.**

Also, the Field Guide is **not intended to be used for specifications in instances where a design is not available. A professional should always be consulted.**

Benefits of Erosion and Sediment Control

The benefits of effective erosion and sediment control are important to the environment, to contractors and the general public. Keeping sediment out of small conveyances, channels, streams, lakes and rivers contributes to clean water, protection of wetlands and reduced maintenance costs associated with culverts, road ditches and drainage channels. The biological integrity of streams and lakes is protected with effective erosion and sediment control. Contractor construction costs should be minimized with a well-executed erosion and sediment control program. Obviously, the general public benefits as the environment is protected and construction costs are minimized.

These benefits are accomplished most effectively with proper installation and maintenance of BMPs.

Principles of Erosion and Sediment Control

- Emphasize erosion control to minimize soil detachment and sediment production.
- Minimize the periods of bare ground by shortening construction periods and staging a project (dividing the project into sectors that will be done independently of other sectors) when possible. Install practices in a sequence that supports shortened construction periods and permits the use of temporary and permanent seeding when the practices can be most effective.
- Use perimeter and interior sediment control and erosion control measures that minimize erosive velocities and minimize sediment transport off of the disturbed site.
- Prevent sediment from leaving the construction site at entrance/exits during muddy periods.
- Use practices that minimize turbid water from leaving the construction site.
- Give special attention to cut-and-fill slopes because they are difficult to stabilize.
- Give special attention to sites that are transected by streams or are in close proximity to streams and wetlands because close proximity to these areas increases the importance of effective erosion and sediment control.

- Maintain practices to ensure their effectiveness. This includes regular inspections of the practices, the site, adjacent off-site areas and receiving streams.
- A schedule or regular inspections should be set forth to ensure that repairs and maintenance receive appropriate attention and is accomplished.

Alabama 811 (call before you dig)

Determine exact location of underground utilities before beginning earthmoving or excavations. If you don't call and lines are cut, you may be billed for the repair. The number to call in Alabama is 811 or 1-800-292-8525. Check out www.al811.com for more information.

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Chapter 2

Site Preparation

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Construction Exit Pad (CEP)

Description

A stone base pad that removes mud and caked soil from the tires of construction vehicles. It is located where traffic will be leaving a construction site and moving directly onto a public road or street.

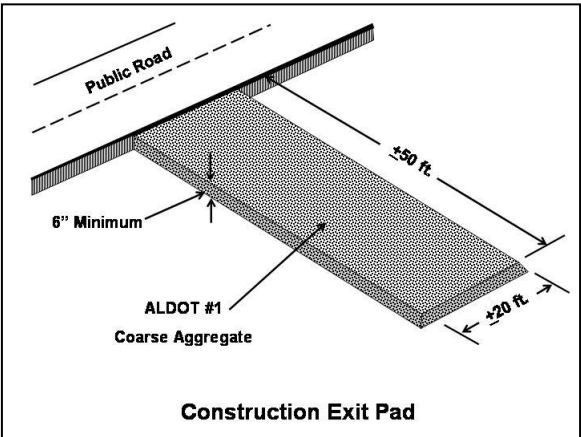
Installation

- Begin by removing all vegetation and other unsuitable material from the foundation area.
- Grade and crown the area for positive drainage.
- Utilize a diversion to direct any surface flow away from the construction exit pad.
- Install pipe under the pad if needed to maintain drainage ditches along public roads.
- Divert all construction exit pad runoff and drainage to a sediment trap or basin.
- If wet conditions or soft soils are anticipated, place non-woven geotextile filter fabric on the graded foundation before placing the aggregate.
- Place specified stone size to lines and grade shown on plans. Leave smooth and sloped for drainage. If stone size is not specified, use ALDOT Coarse Aggregate No. 1 (most of the aggregate should be 2.5" – 3.5").
- If dimensions are not specified, pads are generally 50' x 20'. Adjustments in size should be made to accommodate site conditions.

Maintenance

- Remove large chunks of mud or caked soil from construction exit pad daily.

- Inspect stone pad and sediment disposal area weekly and after storm events or heavy use.
- Reshape pad as needed for drainage and runoff control.
- Top-dress with clean specified stone as needed to maintain effectiveness.
- Immediately remove mud or sediment tracked or washed onto public road by sweeping.
- Remove unneeded exit pad materials from areas where permanent vegetation will be established.



Topsoiling (TSG)

Description

The removal of the desirable soil surface at a site prior to construction and using it on areas to be vegetated. Topsoiling a site usually improves the quality of the plant growth medium at the site and increases the likelihood of successful plant establishment and performance.

Installation

- Begin by identifying on the design plan the area to be stripped, the depth of soil to be removed, the storage area and the areas to utilize topsoil. If a plan is not available, obtain the aid of a qualified design professional.
- Schedule stripping to precede or be done concurrently with land grading.
- Install silt fence or other sediment barrier where necessary to minimize sediment movement from stockpile site.
- Remove and dispose of stumps, roots, trash, noxious weeds, and soils containing toxic chemicals according to locally accepted procedures and regulations.
- Stockpile topsoil at the site(s) identified in the plan or by the design professional.
- In the absence of plan details, locate the stockpile so that natural drainage is not obstructed and avoid stockpiling on steep slopes or near waterbodies, wetlands, or storm drain inlets.

- Side slopes of the stockpile should not exceed 2:1.
- Protect stockpile as specified in the design plan. In the absence of details in the plan, use temporary seeding as soon as possible and not more than 13 working days after formation of stockpile (see Temporary Seeding practice).
- Mulching may be substituted for temporary seeding on stockpiles that will be used within 2 months (see Mulching practice).
- If stockpiles will not be used within 12 months, they should be stabilized by permanent vegetation to control erosion and weed growth (see Permanent Seeding practice).
- Immediately prior to spreading topsoil for reuse, adjust the pH of the subsoil with lime if needed and loosen the subgrade of the site to receive the topsoil by disking or scarifying to a depth of at least 2” to ensure bonding of the topsoil and subsoil.
- Uniformly spread topsoil to the depth specified in the design plan, as specified by a qualified professional or to a minimum of 4”. For long-term growth of vegetation without irrigation, minimum soil depth (subsoil and topsoil) should be 8” to 12” over loose sand or rock fragments. Soil depth of 24” is needed over bedrock.
- Maintain grades shown in the construction plan.

Maintenance

- Inspect areas that received topsoil after rainstorms until vegetation is established.
- Repair eroded or damaged areas and revegetate.
- Repair sloughing on steep slopes by removing

the topsoil, roughening the subgrade and resspreading topsoil.

- Consult with a qualified design professional if drainage (wetness caused by seepage) or shallowness to bedrock (less than 24”) is involved.



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Chapter 3

Surface Stabilization

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Chemical Stabilization (CHS)

Description

The application of chemical products typically during temporary seeding or mulching operations to control erosion caused by water and wind. Water-soluble polyacrylamide (PAM) is often used for this.

Installation

- Prepare application site according to plans and specifications.
- Obtain toxicity reports and OSHA Safety Data Sheets (SDSs) from the supplier before using products on site.
- Conduct site soil testing for products to verify performance with site soils before use.
- All products should be mixed, applied, and equipment cleaned according to OSHA SDSs, and the manufacturer's recommendation. Rinse residue should be applied to soil areas needing stabilization.
- This practice along with other BMPs is needed to contain/control runoff from the application area.
- Runoff from the treated area should not be allowed to drain directly into storm drains or offsite prior to additional treatment options.
- Check for compliance with all manufacturers' recommendations and safety requirements during application.

Maintenance

- Reapply products if treated areas are disturbed or tilled.
- Maintain application equipment to ensure uniform applications.
- Remove downgradient sediment deposits as needed.
- Inspect monthly and after rain events.



Photo courtesy of Sunshine Supplies, Inc.

Dust Control

Description

Controlling dust during land disturbing activities to minimize on-site and off-site damages and hazards.

Installation

- Sequence construction to minimize the amount of disturbed area at any one time.
- Leave undisturbed vegetative buffers between disturbed areas, if possible.
- Install planned surface stabilization measures immediately after completing grading.
 - Vegetative Cover – Apply according to plans and specifications.
 - Mulch – Apply according to plans and specifications.
- Sprinkling – Sprinkle disturbed areas with water until surface is moist. Repeat as often as needed to maintain moisture. Be careful not to overwater as to cause or contribute to stormwater runoff.
- Barriers – Install fences perpendicular to prevailing wind at intervals of 15 times the fence height.
- Calcium Chloride – Apply according to plans and specifications using a mechanical spreader.
- Spray-on Adhesives – Apply according to plans and specifications or the following table if not specified.

- Stone – Place proper gradation to the specified width and thickness.

Table DC-1 Application Rates for Spray-on Adhesives Used in Dust Control

Adhesive	Water Dilution (water: adhesive)	Type of Nozzle	Application Rate (gallons/acre)
Anionic Asphalt Emulsion	7:1	Coarse	1200
Latex Emulsion	12.5:1	Fine	235
Resin in Water	4:1	Fine	300

Source: Virginia Erosion and Sediment Control Handbook, 1993

Consult with a qualified design professional if spray-on adhesives are specified. A permit may be needed.

Maintenance

- Prohibit traffic on treated surfaces until curing is complete.
- Check site during windy conditions to monitor measure effectiveness.
- Maintain dust control measures continuously throughout dry weather periods, until all disturbed areas have been stabilized.
- Insure that any run off water is diverted to a BMP practice to be treated before discharge.

Erosion Control Blanket (ECB)

Description

Protective cover made of straw, jute, wood or other plant fibers; plastic, nylon, paper or cotton. Erosion control blanket is used on areas with high erosion potential such as steep slopes and channels to protect soil from raindrop impact and erosive velocities while facilitating vegetative growth.

Installation

- Grade the site to a smooth uniform surface, free of debris.
- Incorporate soil amendments and seed according to plans and specifications.
- Install erosion control blankets according to manufacturer's recommendations, especially concerning check slots and stapling patterns (lack of adequate stapling is often a cause of blanket failure).
- Anchor blanket so that continuous, firm contact (no tenting) is maintained with the soil surface.
- Check materials used for compliance with specifications and suitability for application.
- Check finished grade and dimensions for compliance with specifications.
- Check staple installation for compliance with recommendations.

Maintenance

- After storm events, check for erosion and undermining beneath blankets. Repair as

needed, by filling eroded area with soil, seeding, and replacing damaged blanket.

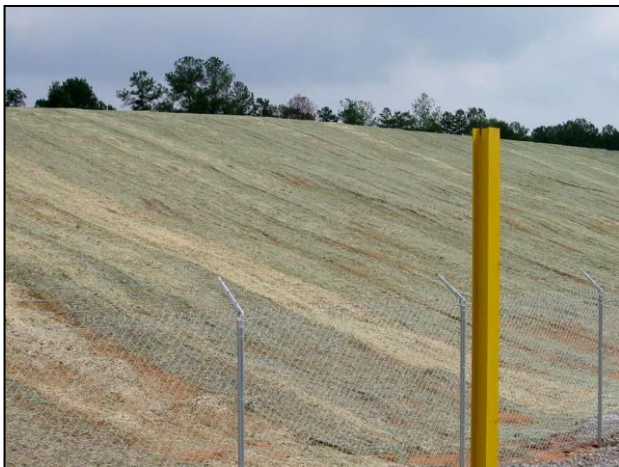


Photo courtesy of Environmental Plans and Review Section,
Development Department, DeKalb County, GA

Groundskeeping (GK)

Description

Activities, measures, and BMPs that are essential during construction for the protection of environmental quality.

Spill Prevention and Material Management

- All construction sites with temporary or permanent fuel or chemical storage must have a Spill Prevention Control and Counter Measures (SPCC) Plan.
- Monitor all vehicles on-site for leaks.
- Secondary containment is required for storage of petroleum products when tanks greater than 55 gallons have a cumulative storage capacity that exceeds 1,320 gallons.
- All petroleum products and chemicals must be stored in labeled tightly sealed containers. Stored the containers in a neat orderly manner and under roof when possible.
- No fueling, servicing, maintenance, or repair of equipment should occur within 50 feet of a stream or within 100 feet of Public Water Supply, Outstanding Alabama Water, Outstanding National Resource Water, or a sinkhole.
- All construction traffic should use the designated construction entrance/exit.
- Mud and soil tracked onto streets and roads should be removed on a daily basis.

- Concrete trucks should only be allowed to wash out at designated locations where the discharge is appropriately treated according to regulations.
- Locate portable toilets so that accidental spills will not discharge into a storm sewer or concentrated flow area.
- No hazardous materials of any kind can be disposed of on the site.
- All solid waste should be collected in a dumpster or other approved collection facility and be disposed of in accordance with state law.
- Water used to pressure test sanitary sewers, flush water lines, etc., should be discharged only in approved locations. Discharge of chlorinated water may require permitting.

Spill Controls

- Materials to contain and clean-up fuel and chemical spills should be readily available on-site.
- In the event of a spill that has the potential to impact surface or groundwater, immediately call the National Response Center at 1-800-424-8802 and the Alabama Emergency Management Agency at 1-800-843-0699.
- ALL SPILLS should be cleaned up immediately, properly contained, and handled according to the Safety Data Sheet (SDS). DO NOT Bury spilled materials.

Management of Hazardous Products

- Keep all products in original containers whenever possible. Make sure all containers are properly marked and labeled.

- Original labels and SDSs should be on-site until the product(s) is no longer used.
- Surplus product and empty containers should be disposed of only according to ADEM regulations.

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Mulching (MU)

Description

Applying straw or other suitable materials to cover the soil surface to protect against erosion. Mulching with seeding helps establish plant cover. It can be used on unseeded areas (not concentrated flow areas) to protect against erosion until final grading and shaping can be accomplished.

Installation

- Remove stumps, roots and other debris from the site before seeding and/or mulching.
- Grade area, if needed, to permit the use of equipment for seeding, mulching and maintenance.
- Shape area so that it is relatively smooth.
- If seeding, follow seeding specifications and apply mulch immediately after seeding.
- Spread straw uniformly over the area with a power blower, hydroseeder or by hand at rates recommended for either seeded areas or without seeding. When mulching with seeding, about 25% of the ground surface should be visible after mulching is applied. When mulching without seeding, 100% of the soil surface should be covered.
- Apply at the rates shown in the plan or in Table MU-1 if there is not a plan.
- Hydraulic Erosion Control Products (HECPs) as defined by the Erosion Control Technology Council (ECTC) that is used as mulch should be applied at the specified rates and methods.

Table MU-1 Mulching Materials and Application Rates

Material	Rate Per Acre and (Per 1000 ft.²)	Notes
Straw (with Seed)	1 ½ - 2 tons (70 lbs – 90 lbs)	Spread by hand or machine; anchor when subject to blowing.
Straw Alone (no seed)	2 ½ - 3 tons (115 lbs - 140 lbs)	Spread by hand or machine; anchor when subject to blowing.
Wood Chips	5-6 tons (225 lbs - 275 lbs)	Treat with 12 lbs. nitrogen/ton.
Bark	35 cubic yards (0.8 cubic yard)	Can apply with mulch blower.
Pine Straw	1-2 tons (45 lbs – 90 lbs)	Spread by hand or machine; will not blow like straw.
Peanut Hulls	10-20 tons (450 lbs - 900 lbs)	Will wash off slopes. Treat with 12 lbs. nitrogen/ton.
HECPs	0.75 - 2.25 tons (35 lbs – 103 lbs)	Refer to ECTC or Manufacturer's Specifications.

Anchor straw or wood cellulose mulch by one of the following methods:

- Crimp with a mulch anchoring tool (crimper), as near to the contour as practical, to punch the straw into the soil.
- Tack with a liquid tackifier designed to hold mulch in place. Use suitable spray equipment and follow manufacturer's recommendations.
- In more erosive areas, cover mulch with netting, using a degradable natural or synthetic mesh and anchor according to manufacturer's specifications (see Erosion Control Blanket practice).
- On steep slopes and other areas needing a higher degree of protection, use heavy natural nets without additional mulch, synthetic netting with additional mulch or erosion control blanket (don't place erosion control blanket over mulch). These areas include grassed waterways, swales and diversion channels.
- Install netting and blankets according to manufacturer's specifications making sure materials are properly anchored (see Erosion Control Blankets).

Maintenance

- Inspect all mulched areas periodically and after rainstorms for erosion and damage to the mulch.
- Make repairs promptly and restore to original condition.
- Continue inspections of seeded areas until vegetation is well established.
- Keep mower height high if plastic netting or blanket is used to prevent material from being entangled in mower blades.



Permanent Seeding (PS)

Description

Establishing a permanent vegetative cover for soil stabilization and long-term erosion control by seeding disturbed areas.

Installation

- Make plantings during the specified planting period if possible.
- Spread topsoil if required (see Topsoiling practice).
- Apply lime and fertilizer according to the plans or soil test recommendations.
- If a design plan or soil test is not available, use 2 tons/acre of ground agricultural lime on clayey soils (about 90 lbs/1000 ft²) and 1 ton/acre on sandy soils (about 45 lbs/1000 ft²). For grass only, apply 8-24-24 or equivalent – 400 lbs/acre (about 9 lbs/1000 ft²) before planting and 30 lbs/acre of nitrogen fertilizer (about 0.8 lbs/1000 ft²) when vegetation has emerged to a stand. For grass-legume mixtures, apply 5-10-10 or equivalent - 800 – 1200 lbs/acre (about 18 – 27 lbs/1000 ft²) at planting. For legume alone apply 0-20-20 or equivalent – 400 – 600 lbs/acre (about 9 - 14 lbs/1000 ft²) at planting.
- On gentle slopes (3:1 and flatter) and immediately after spreading lime and fertilizer, prepare the seedbed by loosening soil surfaces to a depth of 6” to 8” with appropriate tillage equipment and incorporate lime and fertilizer.

- Grade and loosen the soil to a smooth firm surface except for no-till drilling and hydroseeding. Break up large clods and loosen compacted, hard or crusted soil surfaces with a disk, ripper, chisel, harrow or other tillage equipment.
- Avoid preparing the seedbed under excessively wet conditions.
- On slopes steeper than 3:1, lime and fertilizer may be applied to the surface without incorporation.
- Lime and fertilizer may be applied through hydroseeding equipment (usually on steep slopes). Lime may be applied with seed, but fertilizer should not be added to the seed mixture during hydroseeding because fertilizer salts may damage the seed.
- Plant the species specified. In the absence of plans and specifications, plant species and seeding rates may be selected from Figure PS-1 and Table PS-1 by qualified persons.



Figure PS-1 Geographical Areas for Species Adaptation

Table PS-1 Commonly used Plants for Permanent Cover with Seeding

Species	Seeding Rates/Ac PLS*	North AL	Central AL	South AL
Seeding Dates				
Bahiagrass, Pensacola	40 lbs	--	Mar 1- July 1	Feb 1- Nov 1
Bermudagrass, Common	10 lbs	Apr 1- July 1	Mar 15- July 15	Mar 1- July 15
Bahiagrass, Pensacola	30 lbs	--	Mar 1- July 1	Mar 1- July 15
Bermudagrass, Common	5 lbs			
Bermudagrass, Hybrid (Lawn Types)	Solid Sod	Anytime	Anytime	Anytime
Bermudagrass, Hybrid (Lawn Types)	Sprigs 1/sq ft	Mar 1- Aug 1	Mar 1- Aug 1	Feb 15 - Sep 1
Fescue, Tall	40-50 lbs	Sep 1- Nov 1	Sep 1- Nov 1	--
Sericea	40-60 lbs	Mar 15- July 15	Mar 1- July 15	Feb 15 - July 15
Sericea & Common Bermudagrass	40 lbs 10 lbs	Mar 15- July 15	Mar 1- July 15	Feb 15- July 15
Switchgrass, Alamo	4 lbs	Apr 1- Jun 15	Mar 15- Jun 15	Mar 15- Jun 15

* PLS means pure live seed and is used to adjust seeding rates. For example, to plant 10 lbs. PLS of a species with germination of 80% and purity of 90%, $PLS = 0.8 \times 0.9 = 72\%$. 10 lbs. PLS = $10 / 0.72 = 13.9$ lbs. of the species to be planted.

- Plant grasses and legume seed ¼” to ½” deep and small grains about 1” deep.

- When planting by methods other than a drill seeder or hydroseeder, cover the seed and then firm the soil lightly with a roller.
- If planting a legume, use the correct inoculant and follow recommendations on the label. For hydroseeding, increase the inoculant used to 4 times the rate recommended on the label for other seeding methods.
- Cover about 75% of the surface with the specified mulch materials. (See Mulching practice for more details).

Maintenance

- Generally, a stand of vegetation cannot be determined to be fully established until vegetative cover has been maintained for 1 year from planting and has reached 100% coverage and 85% density.
- Inspect seedings weekly until a stand has germinated and, thereafter, at least monthly for stand survival and vigor.
- Bare and eroded areas should be repaired by filling and/or smoothing, and reapplication of lime, fertilizer, seed and mulch. A qualified design professional should be consulted for advice on remedial actions.
- If vegetation fails to grow, identify the cause of the failure (plant materials, lime/fertilizer quantities, poor seedbed preparation or weather) and take corrective action including having the soil tested to determine whether pH is in the correct range or a nutrient deficiency is the problem.

- Mow vegetation on structural practices such as embankments and grass-lined channels to prevent woody plants from invading.
- Other areas should be mowed to compliment the use of the site.
- Fescue should not be mowed close during the summer. Sericea should not be mowed close in late summer.
- Bermudagrass and bahiagrass can be mowed often and close, if so desired, during their growing season.
- Control weed infestations a needed.

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Sodding (SOD)

Description

Establishing vegetative cover with sod to provide immediate erosion control on bare soil.

Installation

- Begin by clearing the area of clods, rocks, etc.
- Grade and loosen the soil to a smooth firm surface.
- Loosen compacted, hard or crusted soil surfaces to 6" to 8" with appropriate tillage equipment and incorporate the lime and fertilizer.
- Where topsoiling is specified or needed, follow steps in the design plan or, if not available, apply according to the Topsoiling practice. Lime subsoil first if lime is needed.
- Apply lime and fertilizer according to the plan or by soil test recommendations. In the absence of a plan or soil test recommendations apply agricultural limestone at the rate of 2 tons per acre (90 lbs. per 1000 sq. ft.) if the pH is under 6.0 and apply 10-10-10 fertilizer at the rate of 1000 lbs. per acre (25 lbs per 1000 sq. ft.). Incorporate amendments to depth of 4" to 6".
- Rake or harrow to achieve a smooth, loose, debris-free final grade on which to lay the sod.
- Avoid preparing the seedbed when conditions are too wet.
- Use plants specified in the plan. If not specified, select a variety using Figure SOD-1 and Tables SOD-1 and SOD-2.



Figure SOD-1 Geographical Areas for Species Adaptation in Alabama

Table SOD-1 Grasses Adapted for Sodding in Alabama

Warm Season Species	Variety	Area Adapted
Bermudagrass	Tifway, TifSport, Celebration, TifGrand, Common	North, Central, South
Bahiagrass	Pensacola	Central, South
Centipede	Common, TifBlair	Central, South
St. Augustine	Common, and commercial varieties	South
Zoysia	Any selection available in AL, Zenith is seeded.	Central, South
Cool Season Species		
Tall Fescue	Kentucky 31, Rebel (turf type)	North

Table SOD-2 Adaptation and Maintenance of Grasses Used for Sodding

Species	Tolerance Ratings					Maintenance	
	Shade	Heat	Cold	Drought	Wear	Mowing Hght.	Mowing Frequency
Bermuda-grass	P	G	P	E	E	1"	H
Bahiagrass	F	G	P	E	G	2-3"	H
Centipede	F	G	P	G	P	1½"	L
Tall Fescue	G	F	G	G	G	3"	H
St. Augustine	G	G	P	P	P	2-3"	M
Zoysia	F	G	F	E	G	1"	H

E=Excellent, G=Good, F=Fair, P=Poor, H=High, M=Medium, L=Low

- During high temperatures, moisten the soil immediately prior to laying sod.
- Lay the first row of sod in a straight line with subsequent rows placed parallel to and butting tightly against each other. Stagger joints to create a brick-like pattern.
- Ensure that sod is not stretched or overlapped and that all joints are butted tight.
- Wherever concentrated flow may be a problem, install sod with the length perpendicular to the water flow (see Figure SOD-2) and secure by stapling firmly at the corners and middle of each strip. Jute or synthetic netting may be pegged over the sod for further protection during establishment.
- Immediately after laying the sod, roll or tamp it to provide firm contact between roots and soil.

- Irrigate sod deeply so that the underside of the sod pad and the soil 6” below the sod is wet.
- Until a good root system develops, water sod during dry periods as often as necessary to maintain moist soil to a depth of at least 4”.

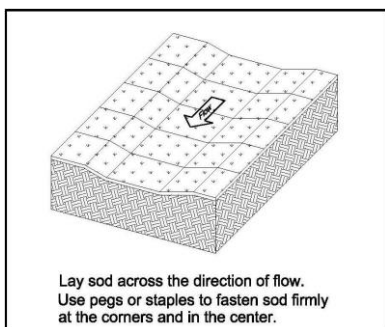


Figure SOD-2 Installation of Sod in Waterways

Maintenance

- Mow to a height of 2” to 3” after sod is well rooted. Do not remove more than $\frac{1}{3}$ of the leaf blade in any mowing.
- Permanent, fine turf areas require yearly fertilization. Fertilize warm-season grass in late spring to early summer; cool-season grass in early fall and late winter.

Temporary Seeding (TS)

Description

Establishing a temporary fast-growing annual grass or legume on disturbed areas where vegetation can be established before final grading or in a season not suitable for planting the desired permanent species. Temporary seeding reduces erosion and the amount of sediment moving off the site. Apply to any portion of the site where work has temporarily ceased and will not resume for a period exceeding 13 calendar days.

Installation

- Make plantings during the specified planting period if possible.
- Loosen compacted, hard or crusted soil surfaces to a depth of 6" with appropriate tillage equipment for all methods of seeding except hydroseeding on slopes steeper than 3:1.
- Leave a smooth firm seedbed except for no-till drilling and hydroseeding.
- Avoid preparing the seedbed under excessively wet conditions.
- Incorporate lime during seedbed preparation. If a design plan or soil test is not available, use 2 tons/acre of ground agricultural lime on clayey soils (approximately 90 lbs/1000 ft²) and 1 ton/acre on sandy soils (approximately 45 lbs/1000 ft²).
- Apply fertilizer during seedbed preparation. If a design plan or soil test is not available, apply

8-24-24 or equivalent – 400 lbs/acre (approximately 9 lbs/1000 ft²) at planting.

- Apply topdressing of 30 to 40 lbs/acre of nitrogen fertilizer (approx. 0.8 lbs/1000 ft²) when vegetation has emerged to a stand.
- Incorporate lime and fertilizer to a depth of 6” with a disk or rotary tiller on slopes of up to 3:1.
- On steeper slopes, lime and fertilizer may be applied to the surface without incorporation.
- Lime and fertilizer may be applied through hydroseeding equipment. Lime may be applied with the seed mixture, but fertilizer should not be added to the seed mixture during hydroseeding because fertilizer salts may damage the seed.
- Plant the species specified. In the absence of plans and specifications, plant species and seeding rates may be selected by qualified persons from Table TS-1 and Figure TS-1.



Figure TS-1 Geographical Areas for Species Adaptation in Alabama

Table TS-1 Plants for Temporary Cover

Species	Seeding Rate/Ac PLS*	North AL	Central AL	South AL
Seeding Dates				
Millet, Browntop or German	40 lbs	May 1- Aug 1	Apr 1- Aug 15	Apr 1- Aug 15
Rye	3 bu	Sept 1- Nov 15	Sept 15- Nov 15	Sept 15- Nov 15
Ryegrass	30 lbs	Aug 1- Sept 15	Sept 1- Oct 15	Sept 1 - Oct 15
Sorghum-Sudan Hybrids	40 lbs	May 1- Aug 1	Apr 15- Aug 1	Apr 1- Aug 15
Sudangrass	40 lbs	May 1- Aug 1	Apr 15- Aug 1	Apr 1- Aug 15
Wheat Common	3 bu	Sept 1- Nov 1	Sept 15- Nov 15	Sept 15- Nov 15
Common Bermudagrass	10 lbs	Apr 1- July 1	Mar 15- July 15	Mar 1- July 15
Crimson Clover	10 lbs	Sept 1- Nov 1	Sept 1- Nov 1	Sept 1- Nov 1

*PLS means pure live seed. For example, to plant 10 lbs PLS with germination of 80% and purity of 90%, $PLS = 0.8 \times 0.9 = 72\%$. 10 lbs. PLS = $10/0.72 = 13.9$ lbs. of seed.

- Ryegrass is highly competitive and should not be used when a temporary cover is added to the Permanent Seeding mixture.
- Plant small grains about 1" deep and grasses and legume seed 1/4" to 1/2" deep.
- When planting by methods other than a drill seeder or hydroseeder, cover the seed and then firm the soil lightly with a roller.
- If planting a legume, use the correct inoculant and follow use recommendations on the label. For hydroseeding, increase the inoculant used to

4 times the recommended rate for other seeding methods.

- Cover 75% of the surface with the specified mulch materials. (See Mulching practice for more details).

Maintenance

- Inspect seedings weekly until a stand is established and thereafter at least monthly for stand survival and vigor.
- Bare and eroded areas should be addressed appropriately by filling and/or smoothing, and reapplication of lime, fertilizer, seed and mulch. A qualified design professional should be consulted for advice on remedial actions.
- If vegetation fails to grow, identify the cause of the failure (plant materials, lime/fertilizer quantities, poor seedbed preparation or weather) and take corrective action including having the soil tested to determine whether pH is in the correct range or a nutrient deficiency is the problem.
- Millet, sorghum-sudan hybrids, sudangrass, rye and wheat may be mowed, but no lower than 6" (closer moving may damage the stand).
- Ryegrass is tolerant of most mowing regimes and may be mowed often and as close as 4" to 6" if this regime is started before it attains tall growth (over 8").

Tree Planting On Disturbed Areas (TP)

Description

Planting desirable trees on construction sites or other disturbed areas to stabilize the soil.

Installation

- Planting should be done in accordance with the design plan. If a detailed plan is not available, obtain the assistance of a qualified professional to select long-lived and non-invasive or nuisance trees that are suitable for growing on the disturbed site.
- Prepare the site for seedling type to permit adequate root development and proper tree growth.
- Bare-root seedlings should be planted between December 1 and March 15 when the soil is neither too dry nor too wet. Freezing weather should be avoided.
- Seedlings from a nursery should be kept moist and cool at all times. Do not expose seedlings to sun, wind, artificial heat, drying or freezing before they are planted.
- Balled seedlings may be kept up to 3 weeks if they are properly stacked, watered, and kept in a cool place.
- When planting is delayed longer than 3 weeks, roots should be covered with moist soil (heeled-in) or the seedlings should be put in cold storage.

- During planting, keep roots of seedlings moist.
- At the end of each day, loose seedlings should be either repacked in wet moss or heeled-in.
- If planting is being done on sloping land by equipment, the planting should be made on the contour.
- Most bare-root seedlings should be planted deeper than they grew in the nursery: small stock 1" deeper and medium to large stock ½" deeper.
- Bare root longleaf pine seedlings should be planted ¼" deeper than they grew in the nursery (never any deeper!). Containerized longleaf should be planted slightly higher than the depth grown in the nursery.
- Plant roots straight down and not twisted, balled, or U-shaped.
- Soil should be packed firmly around the planted seedlings.
- Mulching may be necessary on sloping land to reduce erosion. Mulch with wood chips, bark, pine needles, peanut hulls etc., to a depth of no more than 3". Mulch should not be placed against the trunk of the tree.
- Seedlings that are balled and burlapped or container-grown may be planted any time of the year, if watering is available during dry periods.
- Prepare hole to allow proper placement of the root ball. (See Figure TP-1).
- Depth of planting must be close to the original depth. Do not set the tree lower than it grew before.

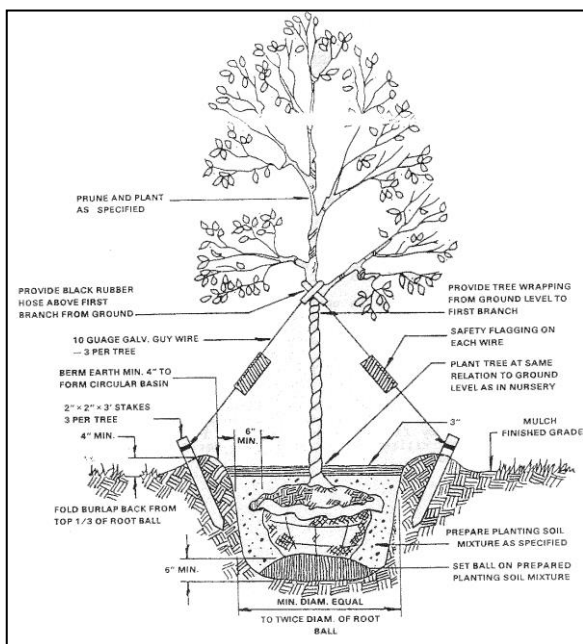


Figure TP-1 Tree Planting Diagram

- Set the tree in the hole and, if the tree is balled and burlapped, loosen the burlap and remove completely (if practical) without breaking the soil of the root ball.
- Fill the hole with soil halfway and add water to settle the soil and eliminate air pockets.
- When the water has drained off, fill the hole the remainder of the way.
- Use extra soil to form a shallow basin around the tree to help retain water.
- If needed, provide support with stakes and guy wires (see Figure TP-1). Guy wires should be

loose enough to allow some movement of the tree.

- Mulch with wood chips, bark, pine needles, peanut hulls etc. to a depth of no more than 3". Mulch should not be placed against the trunk of the tree.

Maintenance

- Periodic fertilization may be beneficial on poor sites to maintain good tree growth.
- Transplanted trees should be fertilized 1 year or more after planting in the late fall or early spring before leaves emerge.
- Determine what nutrients are needed with a soil test or 10-8-6 or 10-6-4 can be used in the absence of a soil test.
- About 2 lbs. of fertilizer should be used for each inch of tree diameter measured at 4.5 feet above the ground – simply broadcast it within the drip line of the tree.
- Replant dead trees where needed to maintain adequate cover for erosion control.
- Remove guy wires from a tree after the tree has developed a root system that will support the tree.

Chapter 5

Sediment Control

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Inlet Protection

Block and Gravel Inlet Protection (BIP)

Fabric Drop Inlet Protection (FIP)

Description

A small basin, barrier, or device used around a storm drain inlet to temporarily pond runoff water, allowing suspended soil particles to settle out; thereby minimizing sediment entering storm drains during construction. Inlet protection is used with the following practices:

- Block and Gravel Inlet Protection
- Fabric Drop Inlet Protection

Installation

- Ensure that each inlet protection practice has no more than 1 acre of drainage area and the approaches to the inlet are 1% or flatter.
- Install the inlet protection according to the plans and/or manufacturer's instructions.
- Fabric Drop Inlet Protection structures shall be installed with a structural frame to withstand soil and hydrostatic loads without buckling, sagging, or undermining.
- Shape or construct the storage area as necessary to obtain the volume of storage required in the plans.
- Ensure that excess runoff water will go over the inlet protection practice and into the storm drain.

Maintenance

- Inspect each inlet protection practice after rainfall events and make repairs as needed.
- Remove sediment from the pool area before its capacity is reduced by 50%.
- When the contributing drainage area has been adequately stabilized, remove all materials and sediment and dispose of properly. Fill the disturbed area to the grade of the drop inlet. Stabilize disturbed areas in accordance with the plans.

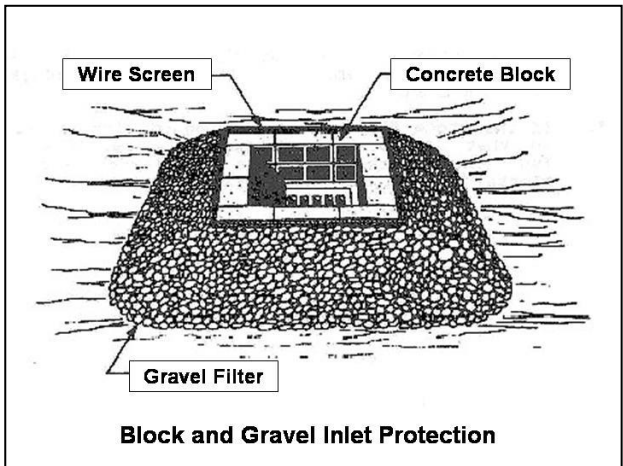


Figure BIP-1 Typical Details of Block and Gravel Inlet Protection

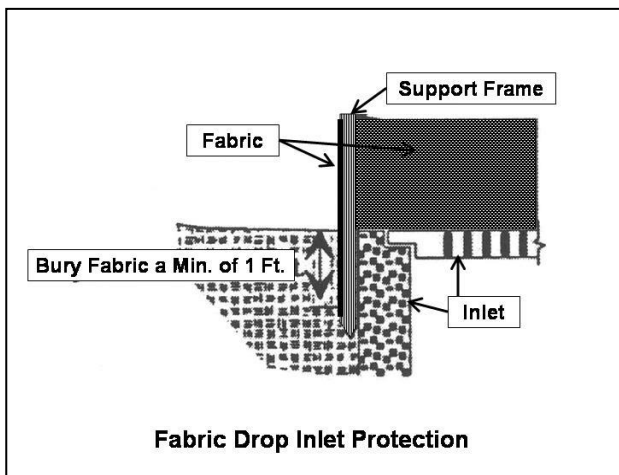


Figure FIP-1 Fabric Drop Inlet Framing Details



Photo courtesy of ALDOT



Brush / Fabric Barrier (BFB)

Description

A dam-like structure constructed from woody residue and faced with a non-woven geotextile fabric to provide a temporary sediment basin. This practice is applicable on sites with a small drainage area of 2 acres or less.

Installation

- Ensure the detention area for the structure is adequate.
- Smooth the foundation area for the brush/fabric barrier.
- Use woody debris from on-site to construct the barrier on a constant elevation with each end upturned to ensure that stormwater flow goes over the barrier and not around.
- Tightly pack the woody debris to form a dam that is 3-to-6 feet tall and at least 5 feet wide at the base. Align the stems with the length of the barrier.
- Trim limbs from the front side of the barrier.
- Face the front of the barrier with geotextile fabric utilizing the minimum pieces of fabric (one single piece is best to avoid splicing). The minimum vertical splice overlap should be 3 ft. and secured to avoid flows through the splice.
- Anchor the bottom of the fabric in an excavated trench that is at least 6" deep in front of the barrier. Stakes should be placed every 3 ft. in the trench. Tie the top of the

fabric securely with twine to stakes behind the dam.

Maintenance

- Inspect the brush/fabric barrier after rainfall events for flows around or under the structure and repair as needed.
- Remove and properly dispose of sediment before it reaches $\frac{1}{2}$ the height of the barrier.
- Check for gully erosion behind the dam after large rainfall events and repair as needed.
- Remove the brush/fabric dam when the structure is no longer needed, properly disposing of geotextile, woody debris and sediment.
- Stabilize the area with vegetation.

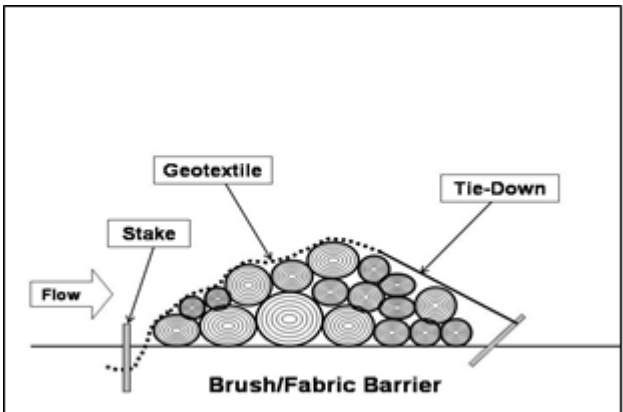


Figure BFB-1 Brush/Fabric Barrier

Flocculant (FL)

Description

A product that causes small suspended soil particles to be drawn together creating “flocs” that settle out of stormwater runoff from construction sites to help minimize turbidity.

Installation

- The application of flocculants should be designed by a qualified design professional.
- The application of flocculants should conform to the design and specifications in the plans.
- Only the approved flocculants for the job can be used and only at the dosage rates and application methods approved.
- A Safety Data Sheet (SDS) for the approved flocculant should be available on the job site.
- Only mix and apply flocculants according to the Occupational Safety and Health Administration (OSHA) SDS requirements.
- Solid form flocculant (logs) should often be installed at a location that maintains hydration and shade. Do not place logs in sediment, but in areas of turbulent flow.
- Dry form flocculant can be applied by hand or mechanical spreader. Small applications can be spread by hand.
- Do not apply flocculants directly to streams, wetlands, or other waters of the state.
- All flocculant applications must drain into a sediment basin or other BMP that promotes

settling for final flocculation prior to discharge from the site.

Maintenance

- Reapply flocculants at specified intervals or when turbidity control is no longer effective.
- Inspect flocculant logs to ensure they are properly located and hydrated.
- Deposition of sediment in basins or other BMPs may require periodic sediment removal.

Rock Filter Dam (RD)

Description

A stone embankment constructed across natural drainageways with drainage areas of 10 acres or less used to capture sediment from disturbed areas. This practice can also be used as a forebay to a sediment basin.

Installation

- Clear and grub the area under the dam, removing roots, brush and other debris.
- Divert runoff from undisturbed areas away from the rock dam and basin.
- Smooth the dam foundation.
- If specified, cover the foundation with filter fabric, overlapping the downstream strips 1 foot with the upstream strips. Trench the upstream edge of the fabric 1 foot deep into the foundation.
- Construct the dam to the planned dimensions using rock of the specified size and quality.
- Line the face of the dam with gravel of the specified size and thickness.
- After the dam is constructed, clear the basin area.
- Set a marker at the elevation equivalent to 50% of the sediment volume to indicate the clean-out level.
- Stabilize disturbed areas with vegetation when construction is complete.

- Check finished grades and dimensions for compliance with specifications.
- Check materials for compliance with specifications.

Maintenance

- Check the dam after each storm event for rock displacement and erosion at the abutments and the toe of the dam. Repair and replace rock as needed.
- Remove sediment from the basin when it accumulates to the marked clean-out elevation.
- Replace gravel filter on the dam face if it becomes clogged with sediment.
- After stabilization of the construction site, remove the dam and sediment in the basin, smooth the area and stabilize using vegetation.

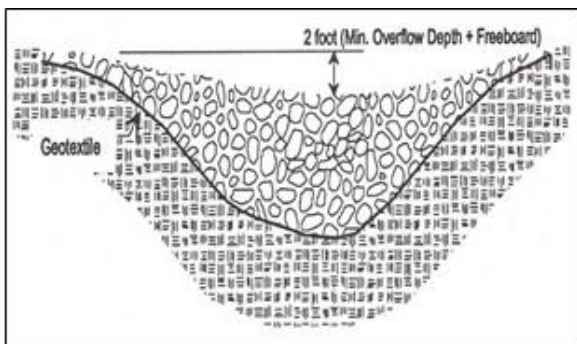


Figure RD-1 Typical Front View of Rock Filter Dam

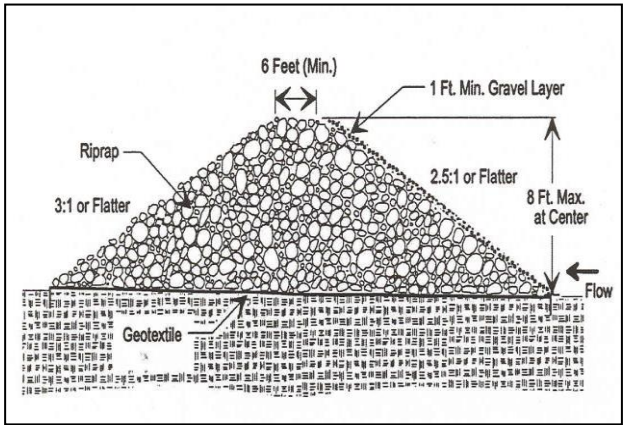


Figure RD-2 Typical Section of Rock Filter Dam



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Sediment Barrier (SB)

Description

A temporary structure across a disturbed landscape, mostly on the contour, that ponds runoff water and reduces the quantity of sediment moving downslope. Sediment barriers include silt fence, sand bags, wattles and various man-made materials. Sediment barriers are used where sheet flow can be ponded to allow sediment to settle out of the water and stay on the construction site.

Installation

Silt fence is the only barrier installation covered in this edition of the Field Guide.

- Begin by determining the exact location of underground utilities so that locations for placement of stakes can be selected where utilities will not be damaged.
- Locate the fence mostly on the contour so that sheet flow from disturbed areas must pond and pass through the fence. The ends of the fence are turned uphill to provide temporary storage of runoff and sediment.
- Generally, silt fence should not be placed across concentrated flow areas such as channels or waterways unless specifically designed by a professional and used as a Check Dam or Inlet Protection.
- Smooth the construction zone to provide a broad, nearly level area wide enough to provide storage of runoff and sediment behind the fence.

- If placed near the toe of a slope, the fence should be installed far enough from the slope toe to provide a broad flat area for adequate storage capacity for runoff and sediment.
- Dig trench along the fence alignment. Trench depth for Type A & B fences should be at least 6" deep and at least 4" deep for Type C fences.
- Drive posts into the ground to the specified depth on the downslope side of the trench. Space posts a maximum of 10 feet if fence is supported by woven wire, or 6 feet if high strength fabric and no woven wire support fence is used.
- Fasten support wire fence for Types A fence to upslope side of posts and 6" into the trench.
- Attach continuous length of fabric to upslope side of fence posts. Minimize the number of joints. If joints are necessary, fasten fence securely to support posts and overlap to the next post. Avoid joints at low points along the line.
- For Types A & B silt fence, place the bottom 12" of fabric in the 6" deep (minimum) trench, lapping toward the upslope side.
- For Type C fabric place the bottom 6" in the 4" deep (minimum) trench lapping toward the upslope side.
- Backfill the trench with compacted earth.
- Provide good access in areas of predicted heavy sedimentation for clean out and maintenance.
- Stabilize disturbed areas with temporary or permanent vegetation. If no vegetation plan

exists, select planting and mulching information from either the Permanent Seeding or Temporary Seeding and the Mulching practice.

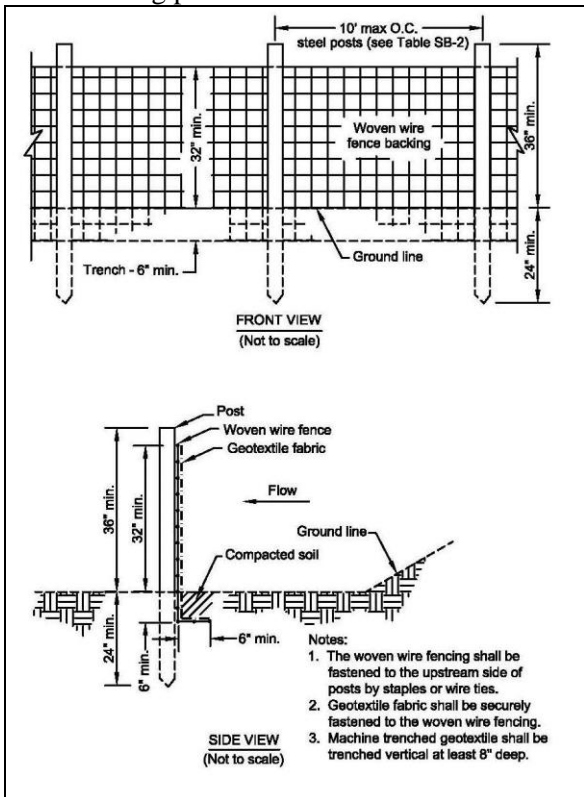


Figure SB-1 Detail of Type A Silt Fence
(see the Handbook for details of Type B and C fences.)

Maintenance

- Inspect sediment fences at least weekly and after each significant rain event and make required repairs immediately.

- Should the fabric of silt fence collapse, tear, decompose or become ineffective, replace it promptly.
- Remove sediment deposits before they reach a depth of $\frac{1}{2}$ the height of the fence.
- After the contributing drainage area has been stabilized, remove all barrier materials and unstable sediment deposits, bring the area to grade and stabilize it with vegetation.



Sediment Trap (ST)

Description

A temporary catch basin used to intercept sediment laden runoff and detain small amounts of sediment. Various materials may be used for sediment traps including straw bales, sand bags, wattles, and various man-made materials and devices.

Installation

Straw Bale Sediment Trap is the only Sediment Trap covered in this edition of the Field Guide.

- Smooth the construction area to provide a broad level area for bale installation.
- Excavate a trench to the dimensions shown on the drawings. Make the trench long enough to ensure end bales are upslope of the sediment pool so that excess flows do not bypass the trap.
- Place bales end to end in the trench with the bindings around the sides not top to bottom.
- Anchor the bales by driving 2 – 36 inch long 2” x 2” stakes through each bale and 18” into the ground.
- Wedge loose straw into any gaps to slow water movement through the bales.
- Backfill with compacted soil to ground level on the downstream side and 4” above ground level on the upstream side of the bales.
- Stabilize disturbed areas with vegetation.

- Check finished grade and dimensions of straw bale trap.

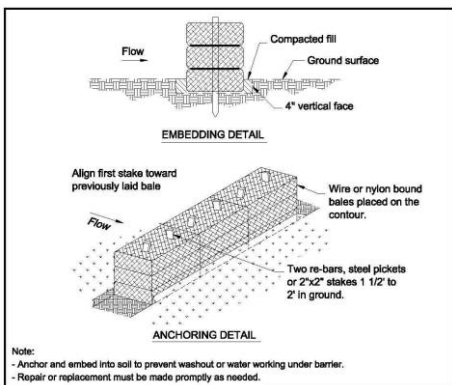


Figure ST-1 Placement of Straw Bales

Maintenance

- Inspect straw bale barriers after each storm event and remove sediment deposits promptly after it has accumulated to $\frac{1}{2}$ of the original capacity.
- Replace deteriorated and damaged bales promptly.
- After contributing area is stabilized, remove straw bales and sediment and stabilize the area using vegetation.



Chapter 5

Sediment Control

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Inlet Protection

Block and Gravel Inlet Protection (BIP)

Fabric Drop Inlet Protection (FIP)

Description

A small basin, barrier, or device used around a storm drain inlet to temporarily pond runoff water, allowing suspended soil particles to settle out; thereby minimizing sediment entering storm drains during construction. Inlet protection is used with the following practices:

- Block and Gravel Inlet Protection
- Fabric Drop Inlet Protection

Installation

- Ensure that each inlet protection practice has no more than 1 acre of drainage area and the approaches to the inlet are 1% or flatter.
- Install the inlet protection according to the plans and/or manufacturer's instructions.
- Fabric Drop Inlet Protection structures shall be installed with a structural frame to withstand soil and hydrostatic loads without buckling, sagging, or undermining.
- Shape or construct the storage area as necessary to obtain the volume of storage required in the plans.
- Ensure that excess runoff water will go over the inlet protection practice and into the storm drain.

Maintenance

- Inspect each inlet protection practice after rainfall events and make repairs as needed.
- Remove sediment from the pool area before its capacity is reduced by 50%.
- When the contributing drainage area has been adequately stabilized, remove all materials and sediment and dispose of properly. Fill the disturbed area to the grade of the drop inlet. Stabilize disturbed areas in accordance with the plans.

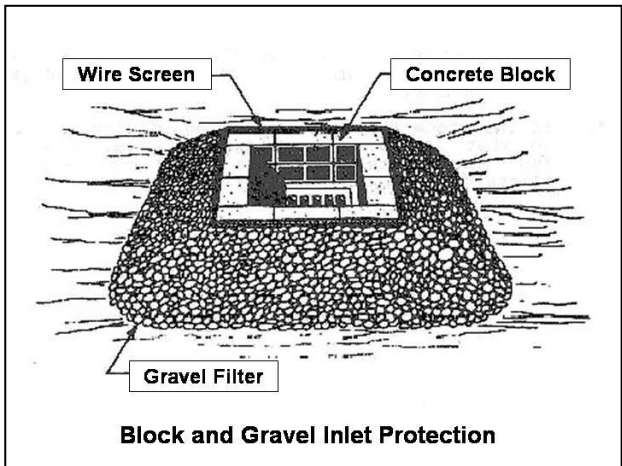


Figure BIP-1 Typical Details of Block and Gravel Inlet Protection

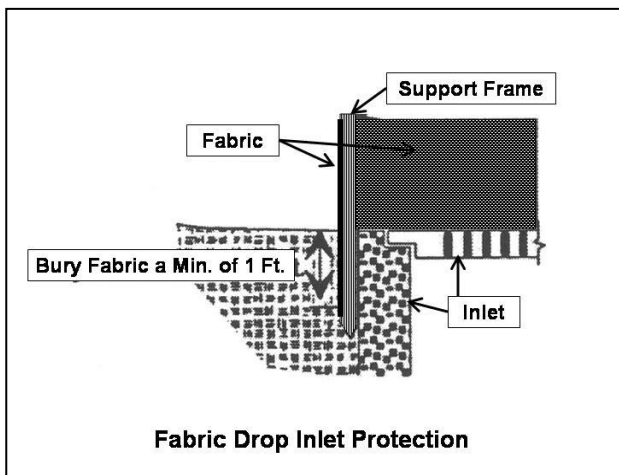


Figure FIP-1 Fabric Drop Inlet Framing Details



Photo courtesy of ALDOT



Brush / Fabric Barrier (BFB)

Description

A dam-like structure constructed from woody residue and faced with a non-woven geotextile fabric to provide a temporary sediment basin. This practice is applicable on sites with a small drainage area of 2 acres or less.

Installation

- Ensure the detention area for the structure is adequate.
- Smooth the foundation area for the brush/fabric barrier.
- Use woody debris from on-site to construct the barrier on a constant elevation with each end upturned to ensure that stormwater flow goes over the barrier and not around.
- Tightly pack the woody debris to form a dam that is 3-to-6 feet tall and at least 5 feet wide at the base. Align the stems with the length of the barrier.
- Trim limbs from the front side of the barrier.
- Face the front of the barrier with geotextile fabric utilizing the minimum pieces of fabric (one single piece is best to avoid splicing). The minimum vertical splice overlap should be 3 ft. and secured to avoid flows through the splice.
- Anchor the bottom of the fabric in an excavated trench that is at least 6" deep in front of the barrier. Stakes should be placed every 3 ft. in the trench. Tie the top of the

fabric securely with twine to stakes behind the dam.

Maintenance

- Inspect the brush/fabric barrier after rainfall events for flows around or under the structure and repair as needed.
- Remove and properly dispose of sediment before it reaches $\frac{1}{2}$ the height of the barrier.
- Check for gully erosion behind the dam after large rainfall events and repair as needed.
- Remove the brush/fabric dam when the structure is no longer needed, properly disposing of geotextile, woody debris and sediment.
- Stabilize the area with vegetation.

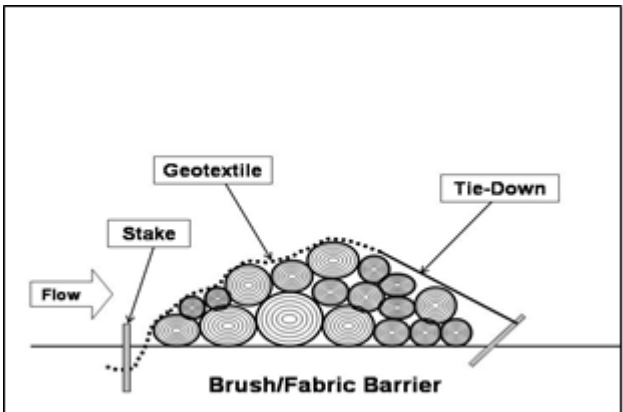


Figure BFB-1 Brush/Fabric Barrier

Flocculant (FL)

Description

A product that causes small suspended soil particles to be drawn together creating “flocs” that settle out of stormwater runoff from construction sites to help minimize turbidity.

Installation

- The application of flocculants should be designed by a qualified design professional.
- The application of flocculants should conform to the design and specifications in the plans.
- Only the approved flocculants for the job can be used and only at the dosage rates and application methods approved.
- A Safety Data Sheet (SDS) for the approved flocculant should be available on the job site.
- Only mix and apply flocculants according to the Occupational Safety and Health Administration (OSHA) SDS requirements.
- Solid form flocculant (logs) should often be installed at a location that maintains hydration and shade. Do not place logs in sediment, but in areas of turbulent flow.
- Dry form flocculant can be applied by hand or mechanical spreader. Small applications can be spread by hand.
- Do not apply flocculants directly to streams, wetlands, or other waters of the state.
- All flocculant applications must drain into a sediment basin or other BMP that promotes

settling for final flocculation prior to discharge from the site.

Maintenance

- Reapply flocculants at specified intervals or when turbidity control is no longer effective.
- Inspect flocculant logs to ensure they are properly located and hydrated.
- Deposition of sediment in basins or other BMPs may require periodic sediment removal.

Rock Filter Dam (RD)

Description

A stone embankment constructed across natural drainageways with drainage areas of 10 acres or less used to capture sediment from disturbed areas. This practice can also be used as a forebay to a sediment basin.

Installation

- Clear and grub the area under the dam, removing roots, brush and other debris.
- Divert runoff from undisturbed areas away from the rock dam and basin.
- Smooth the dam foundation.
- If specified, cover the foundation with filter fabric, overlapping the downstream strips 1 foot with the upstream strips. Trench the upstream edge of the fabric 1 foot deep into the foundation.
- Construct the dam to the planned dimensions using rock of the specified size and quality.
- Line the face of the dam with gravel of the specified size and thickness.
- After the dam is constructed, clear the basin area.
- Set a marker at the elevation equivalent to 50% of the sediment volume to indicate the clean-out level.
- Stabilize disturbed areas with vegetation when construction is complete.

- Check finished grades and dimensions for compliance with specifications.
- Check materials for compliance with specifications.

Maintenance

- Check the dam after each storm event for rock displacement and erosion at the abutments and the toe of the dam. Repair and replace rock as needed.
- Remove sediment from the basin when it accumulates to the marked clean-out elevation.
- Replace gravel filter on the dam face if it becomes clogged with sediment.
- After stabilization of the construction site, remove the dam and sediment in the basin, smooth the area and stabilize using vegetation.

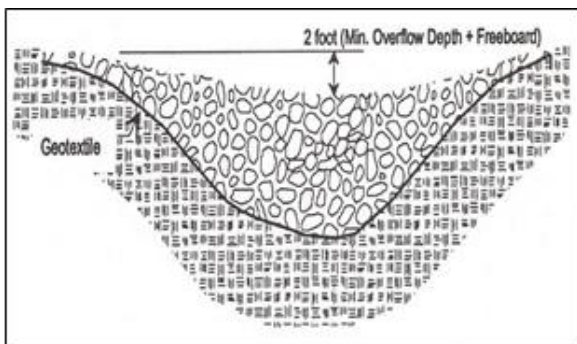


Figure RD-1 Typical Front View of Rock Filter Dam

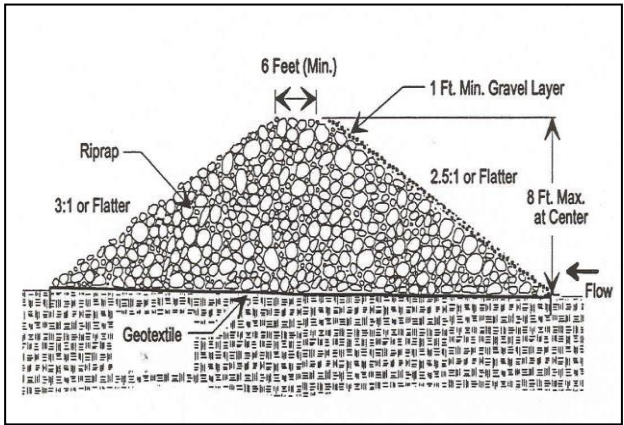


Figure RD-2 Typical Section of Rock Filter Dam



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Sediment Barrier (SB)

Description

A temporary structure across a disturbed landscape, mostly on the contour, that ponds runoff water and reduces the quantity of sediment moving downslope. Sediment barriers include silt fence, sand bags, wattles and various man-made materials. Sediment barriers are used where sheet flow can be ponded to allow sediment to settle out of the water and stay on the construction site.

Installation

Silt fence is the only barrier installation covered in this edition of the Field Guide.

- Begin by determining the exact location of underground utilities so that locations for placement of stakes can be selected where utilities will not be damaged.
- Locate the fence mostly on the contour so that sheet flow from disturbed areas must pond and pass through the fence. The ends of the fence are turned uphill to provide temporary storage of runoff and sediment.
- Generally, silt fence should not be placed across concentrated flow areas such as channels or waterways unless specifically designed by a professional and used as a Check Dam or Inlet Protection.
- Smooth the construction zone to provide a broad, nearly level area wide enough to provide storage of runoff and sediment behind the fence.

- If placed near the toe of a slope, the fence should be installed far enough from the slope toe to provide a broad flat area for adequate storage capacity for runoff and sediment.
- Dig trench along the fence alignment. Trench depth for Type A & B fences should be at least 6” deep and at least 4” deep for Type C fences.
- Drive posts into the ground to the specified depth on the downslope side of the trench. Space posts a maximum of 10 feet if fence is supported by woven wire, or 6 feet if high strength fabric and no woven wire support fence is used.
- Fasten support wire fence for Types A fence to upslope side of posts and 6” into the trench.
- Attach continuous length of fabric to upslope side of fence posts. Minimize the number of joints. If joints are necessary, fasten fence securely to support posts and overlap to the next post. Avoid joints at low points along the line.
- For Types A & B silt fence, place the bottom 12” of fabric in the 6” deep (minimum) trench, lapping toward the upslope side.
- For Type C fabric place the bottom 6” in the 4” deep (minimum) trench lapping toward the upslope side.
- Backfill the trench with compacted earth.
- Provide good access in areas of predicted heavy sedimentation for clean out and maintenance.
- Stabilize disturbed areas with temporary or permanent vegetation. If no vegetation plan

exists, select planting and mulching information from either the Permanent Seeding or Temporary Seeding and the Mulching practice.

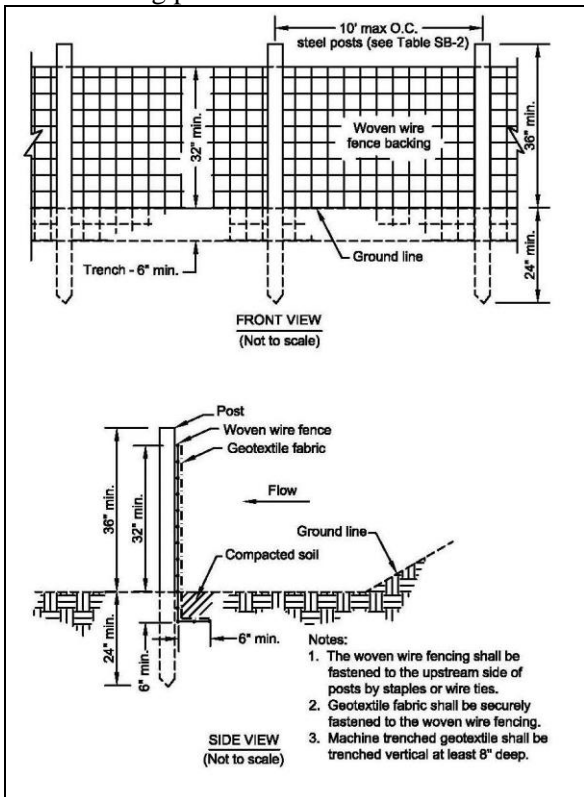


Figure SB-1 Detail of Type A Silt Fence
(see the Handbook for details of Type B and C fences.)

Maintenance

- Inspect sediment fences at least weekly and after each significant rain event and make required repairs immediately.

- Should the fabric of silt fence collapse, tear, decompose or become ineffective, replace it promptly.
- Remove sediment deposits before they reach a depth of $\frac{1}{2}$ the height of the fence.
- After the contributing drainage area has been stabilized, remove all barrier materials and unstable sediment deposits, bring the area to grade and stabilize it with vegetation.



Sediment Trap (ST)

Description

A temporary catch basin used to intercept sediment laden runoff and detain small amounts of sediment. Various materials may be used for sediment traps including straw bales, sand bags, wattles, and various man-made materials and devices.

Installation

Straw Bale Sediment Trap is the only Sediment Trap covered in this edition of the Field Guide.

- Smooth the construction area to provide a broad level area for bale installation.
- Excavate a trench to the dimensions shown on the drawings. Make the trench long enough to ensure end bales are upslope of the sediment pool so that excess flows do not bypass the trap.
- Place bales end to end in the trench with the bindings around the sides not top to bottom.
- Anchor the bales by driving 2 – 36 inch long 2” x 2” stakes through each bale and 18” into the ground.
- Wedge loose straw into any gaps to slow water movement through the bales.
- Backfill with compacted soil to ground level on the downstream side and 4” above ground level on the upstream side of the bales.
- Stabilize disturbed areas with vegetation.

- Check finished grade and dimensions of straw bale trap.

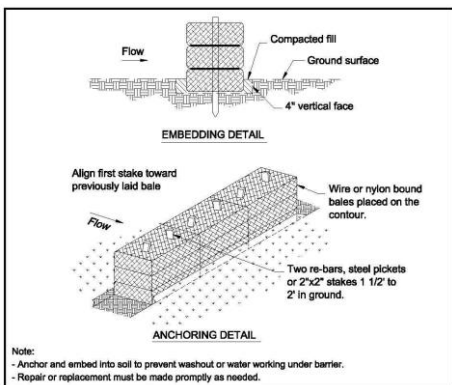


Figure ST-1 Placement of Straw Bales

Maintenance

- Inspect straw bale barriers after each storm event and remove sediment deposits promptly after it has accumulated to $\frac{1}{2}$ of the original capacity.
- Replace deteriorated and damaged bales promptly.
- After contributing area is stabilized, remove straw bales and sediment and stabilize the area using vegetation.



Chapter 6

Stream Protection

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Temporary Stream Crossing (TSC)

Description

A bridge, culvert, or low water crossing (ford), constructed over a stream on a construction site to prevent turbidity and streambed disturbance caused by construction traffic. Stream crossings are generally applicable to flowing streams with drainage areas less than 1 square mile.

Installation

- Temporary Stream Crossings may require approvals from ADEM or the USCOE.
- Keep the number of stream crossings to a minimum and try to install the stream crossing during dry periods and relatively low flows.
- To minimize environmental damage, the order of preference for crossings is:
 - (1) bridge
 - (2) culvert
 - (3) ford
- Ensure that equipment used near the stream is leak free.

Bridge Crossing

- Bridges are specialized engineered structures.
- Install the bridge according to plans and specifications.
- Anchor or cable the bridge so it won't be moved by a flood.

Culvert Crossing

- Ensure the culvert has a firm foundation.
- Use pipe or pipes of the size and materials specified in the plans.
- The pipe should be long enough to extend at least 2 ft. past side slopes (3:1) of the earth fill.
- Manually compact the soil around the pipe in 4" – 6" lifts.
- Extend the fill to at least 2 ft. over the pipe.
- Grade the road so that flood flows go around the crossing and not over the pipe.
- Place ALDOT No. 1 stone on the road surface over the pipe.
- Place outlet protection riprap as specified or needed.

Low Water Crossing (Ford)

- Select a location so the crossing is perpendicular to the stream flow.
- Excavate foundation according to plans to ensure the final surface is "at grade" with the stream bed (no waterfall).
- Ensure the entrance and exit slopes are gentle (5:1 or flatter).
- Place geotextile, riprap, and wearing surface as specified.

Maintenance

- Always store construction materials away from the stream.
- Inspect the crossing after rainfall events and repair erosion or damage as necessary.

- Remove debris, trash, and other materials that restrict flow from the culvert or bridge.
- Crossings are temporary structures and generally removed after no longer needed. After removal, restore the stream to its original conditions and establish permanent vegetation.

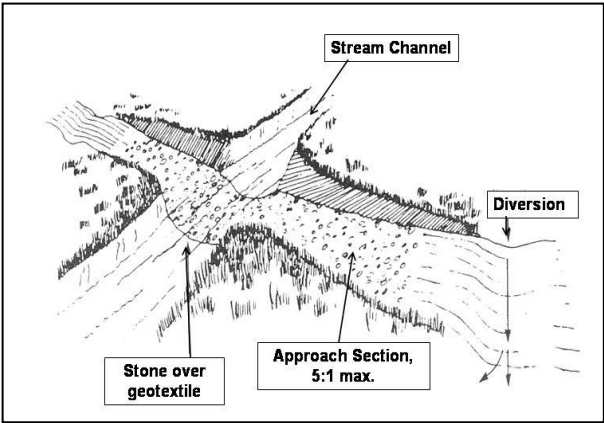


Figure TSC-1 Ford Stream Crossing

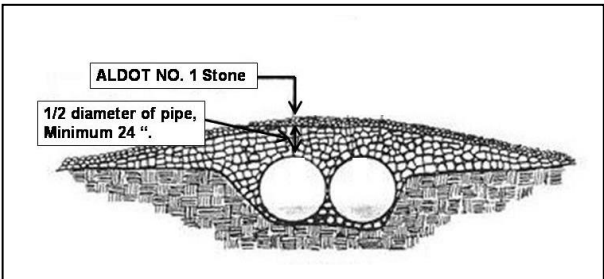


Figure TSC-2 Culvert Stream Crossing

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Chapter 7

Earthen Dam Structures

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Earth Dam Structures

Drop Structure (DS)

Sediment Basin (SBN)

Stormwater Detention Basin (SDB)

Description

An earthen barrier across a drainage way usually constructed with a pipe system through the embankment and/or an emergency spillway bypass. Earth Dam Structures are used with the following practices:

- Drop Structure
- Sediment Basin
- Stormwater Detention Basin

Basins created by the earth dam can be used to convey runoff water without causing erosion, trap sediment, and reduce stormwater peak flows.

Installation

- Divert runoff from undisturbed areas away from the earth dam practice if allowable.
- Clear and prepare the foundation for the dam removing all objectionable material.
- Stockpile surface soil for use in top soiling and vegetation establishment.
- Excavate a keyway trench with 8 ft. bottom and 1.5:1 side slopes across the dam foundation according to the plans, at least 2 feet deep, and to an adequate foundation.

- Compact earth fill in the keyway trench with good clay material in thin lifts (6" – 9" uncompact) back up to ground elevation.
- Install pipe system according to plans and elevations with anti-seep collars, anti-flotation block, trash rack, and outlet protection.
- Manually compact moist clayey earth fill around pipe (4"- 6" uncompact lifts) and anti-seep collars (or drainage diaphragm) within 2 ft. of pipe and to an elevation 2 ft. over the pipe.
- Construct earth dam in 6" – 9" uncompact lifts (compact to 4" - 6") to form the embankment to the planned elevation with a top width of at least 8 ft. and side slopes of 3:1 or flatter. Use most clayey material in the core of the dam with more permeable materials in the shell of the dam. Overbuild the dam at least 10% for settlement. Maintain moisture and compaction requirements according to the plans and specifications.
- Construct emergency spillway according to plans and elevation installing geotextile and riprap if specified.
- Make sure stormwater enters the far end of the pool to maximize trap efficiency.
- Spread stockpiled top soil and establish vegetation.

Maintenance

- Inspect the earth dam and basin after each storm event.
- Remove and properly dispose of sediment that has accumulated to ½ the design volume.

- Remove trash from pipe system or emergency spillway.
- Check for any erosion, settlement, seepage, or slumping and make repairs as needed.
- If the basin is temporary, properly remove the structure and stabilize the area.



Sediment Basin

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Contacts

1. *For information regarding registration for construction sites* contact the Alabama Department of Environmental Management (ADEM) Water Division, Stormwater Management Branch (334) 271-7823; Fax (334) 279-3051, or the nearest ADEM Field Operations Division office:

Birmingham Branch

(205) 942-6168; Fax (205) 941-1603

Decatur Branch

(256) 353-1713; Fax (256) 340-9359

Mobile Branch

(251) 450-3400; Fax (251) 479-2593

Mobile Branch, Coastal Program

(251) 304-1176; Fax (251) 304-1189

Office of Field Services, Montgomery Office

(334) 394-4311; Fax (334) 394-4326

ADEM webpage: www.adem.alabama.gov

2. *If your project is within the coastal zone of Alabama* contact the ADEM Mobile Coastal Field Office for certification requirements.

3. *For information about wetland regulations or if your project could cause fill to be placed in federal waters or could interfere with navigation* contact the U. S. Army Corps of Engineers.

Mobile District

251-690-3776

Nashville District (TVA service area)

615-736-7161

Birmingham Regulatory Office
205-290-9096
Montgomery Regulatory Office
344-953-2172

4. *For information about the proper management/disposal of solid or hazardous waste from a construction/demolition site, contact the ADEM Land Division, Solid Waste Branch at (334) 271-7730.*

5. *For information on requirements for above-ground petroleum tanks and spill prevention contact the ADEM Land Division, Groundwater Branch, at (334) 270-5655 or the ADEM Field Operations Division Office listed under item #1.*

6. *To report oil or chemical spills with the potential to impact groundwater or surface waters of the State, or after becoming aware of a visible oil sheen on waters of the State, immediately call the National Response Center at 1-800-424-8802 and the Alabama Emergency Management Agency at 1 (205) 280-2200. The caller should be prepared to report the name, address and telephone number of person reporting spill, the exact location of the spill, the company name and location, the material spilled, the estimated quantity, the source of the spill, the cause of the spill, the nearest downstream water with the potential to receive the spill, and the actions taken for containment and cleanup.*

7. *To make a complaint about pollution by sediment and other pollutants from a construction site* contact an ADEM Field Operations Division Office or submit a complaint online at www.app.adem.alabama.gov/complaints listed under item #1.

8. *For information about historical or culturally significant sites* contact the Alabama Historical Commission (334) 242-3184.

9. *If conducting onsite or offsite non-coal mining or borrow operations (dirt, clay, chert, sand & gravel, etc.)* contact the ADEM Water Division, Stormwater Management Branch at (334) 271-7823; Fax (334) 279-3051. Alabama Department of Industrial Relations (ADIR) permit coverage may also be needed. Contact ADIR at (334) 242-8265.

10. If you have a question regarding fugitive dust emissions and offsite dust control related to your construction/demolition site, contact the ADEM Air Division at (334) 271-7861

11. *If your project has the potential to impact potential threatened/endangered species* contact the US Fish & Wildlife Service (USFW) at (251) 441-5181 and/or the Alabama Department of Conservation and Natural Resources (ADCNR) at (334) 242-3465.

12. *For basic information about soils* contact the local soil and water conservation district office (usually listed under county, i.e. ____ County Soil and Water Conservation District), or the Web Soil Survey, <http://websoilsurvey.nrcs.usda.gov>.

13. *For additional information on seedings* contact the local Natural Resources Conservation Service or Alabama Cooperative Extension System office.

14. *For additional copies of this Field Guide* contact the local soil and water conservation district office.

15. *To view the Alabama Handbook for Erosion Control, Sediment Control and Stormwater Management on Construction Sites and Urban Areas* visit the Alabama Soil and Water Conservation Committee webpage: www.swcc.state.al.us (under “Programs” tab).

16. *To purchase the Alabama Handbook for Erosion Control, Sediment Control and Stormwater Management on Construction Sites and Urban Areas* obtain an order form from the Alabama Soil and Water Conservation Committee webpage: www.swcc.state.al.us (under “Programs” tab).

17. *To view the Alabama Low Impact Development Handbook* visit the Alabama Cooperative Extension System website at: www.aces.edu/lid/.

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