AI : 80553

Rec'd via hard copy: 10/23/2023

MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY

INDUSTRIAL STORMWATER NOTICE OF INTENT (ISNOI)

Coverage #: MSR002520

FOR COVERAGE UNDER THE INDUSTRIAL STORMWATER GENERAL NPDES PERMIT MSR00 2520

(NUMBER TO BE ASSIGNED BY STATE)

INSTRUCTIONS

Applicant must be the owner or operator (i.e., legal entity that controls the facility's operation, or the plant/site manager, not the environmental consultant). The owner or operator that receives coverage is responsible for permit compliance. File at least 60 days prior to the commencement of the regulated industrial activity.

Submittals with this ISNOI must include a Storm Water Pollution Prevention Plan (SWPPP) with the minimum components found in ACTs 5-8 of the Industrial Stormwater General Permit. In addition, a United States Geological Survey (USGS) quadrangle map (or a copy) showing site location and extending at least 1/2 mile beyond the site's property boundary is required. If a copy is submitted, provide the name of the quadrangle map that is found in the upper right hand corner. Maps can be obtained from the MDEQ, Office of Geology at 601-961-5523.

ALL FORM BLANKS MUST BE COMPLETED (enter "NA" if not applicable)

THE APPLICANT IS: ☒ OWNER ■ OPERATOR (PLEASE CHECK ONE OR BOTH)

OWNER INFORMATION

Owner Contact Name: Greg Prine Position: Owner

Owner Company Name: MC Environmental, LLC

Owner Street (P.O. Box): 60 Dyess Circle

Owner City: Columbia State: MS Zip: 39429

Owner Phone Number: (601) 441-6245 Owner Email: gregprine@bellsouth.net

OPERATOR INFORMATION (if different than owner)

Operator Contact Name: _____ Position: _____

Operator Company Name: _____

Operator Street (P.O. Box): _____

Operator City: _____ State: _____ Zip: _____

Operator Phone Number: (___)_____ Operator Email: _____

FACILITY INFORMATION

Facility Name: MC Environmental, LLC

Nature of Business (Include 4-digit Standard Industrial Classification Code (SIC) and description):

SIC Code: 4953 Refuse Systems

Receiving Stream: Upper Little Creek

Is receiving stream on MDEQ's 303(d) List? ☒ Yes ☐ No

Has a TMDL been established for the receiving stream segment? ☒ Yes ☐ No

Physical Site Address:

Street: Columbia-Purvis Road at Loftin Road City: Columbia

County: Marion Zip: 39429

Latitude: 31 degrees 12 minutes 52 seconds Longitude: 89 degrees 44 minutes 39 seconds

Method Used to Determine Lat & Long (GPS of plant entrance) or Map Interpolation): Map Interpolation

Attach a copy of any existing laboratory data for each storm water outfall. If multiple sampling has been performed, provide a summary for each parameter, including sampling dates and the minimum, average and maximum values.

Is this a SARA Title III, Section 313 facility utilizing water priority chemicals at threshold amounts? ☐ Yes ☒ No
If yes, please attach a list of water priority chemicals present at the facility.

DOCUMENTATION OF COMPLIANCE WITH OTHER REGULATIONS/REQUIREMENTS

Is this notice for a facility that will require other permits? ☑ Yes ☐ No

If yes, check which one(s): ☐ Air, ☐ Hazardous Waste, ☐ Pretreatment, ☐ Water State Operating, ☐ Individual NPDES, or list Other(s):

CLASS II RUBBISH DISPOSAL SITE

How will sanitary sewage be collected and treated? N/A

Indicate any local storm water ordinance with which the facility must comply and submit any documentation of approval.

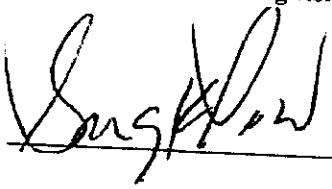
N/A

Is treatment of storm water provided at any outfall? ☐ Yes ☑ No

If yes, please describe: _____

CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



10-13-2023
Date Signed

Greg Prine
Printed Name[1]

Owner
Title

[1]This application shall be signed according to the General Permit, ACT 16, T-9, as follows:

- For a corporation, by a responsible corporate officer.
- For a partnership, by a general partner.
- For a sole proprietorship, by the proprietor.
- For a municipal, state or other public facility, by principal executive officer, the mayor, or ranking elected official.

After signing please mail to:

Chief, Environmental Permits Division
MS Department of Environmental Quality, Office of Pollution Control
P.O. Box 2261
Jackson, MS 39225

ENVIRONMENTAL MANAGEMENT SERVICES, INC.

RECEIVED
OCT 23 2023
Dept. of Environmental Quality

October 17, 2023

Chief, Storm Water Permitting
Mississippi Department of Environmental Quality
Office of Pollution Control, General Permits/Storm Water
515 East Amite Street
Jackson, MS 39201

Re: Storm Water NOI and SWPPP
MC Environmental, LLC Class II Rubbish Site Application, Marion County, Mississippi
MDEQ AI ID No. 80553

Dear Storm Water Permit Chief,

On behalf of MC Environmental, LLC, Environmental Management Services, Inc. is pleased to submit the enclosed Notice of Intent and storm water pollution prevention plan (SWPPP) for the MC Environmental, LLC Class II Rubbish Facility to be constructed in Marion County, Mississippi.

Please let me know if you have any questions about the application. I can be reached at (601) 992-8233 or by email at kruckstuhl@env-mgt.com.

Sincerely,
Environmental Management Services, Inc.

Kenneth D. Ruckstuhl, RPG
Senior Geologist, Project Manager

c: Greg Prine, *MC Environmental, LLC, Columbia, MS*
Christopher Johnson, PE, PS, *EMS Hattiesburg office*
Steven Utroska, PE, RPG, *EMS Jackson area office*

Enclosures – NOI and SWPPP

File: PRI0-23-001

1929 Spillway Road, Suite B, Brandon MS 39047
Phone (601) 992-8233 Fax (601) 919-2674
www.env-mgt.com
P. O. Box 15369, Hattiesburg, MS 39404
Phone (601) 544-3674 Fax (601) 544-0504

STORM WATER POLLUTION PREVENTION PLAN

(SWPPP)

Prepared for:

MC ENVIRONMENTAL, LLC
Class II Rubbish Facility
Columbia-Purvis Road
Columbia, MS

Prepared by:

ENVIRONMENTAL MANAGEMENT SERVICES, INC.

P.O. Box 15369
Hattiesburg, MS 39404
(601) 544-3674

1929 Spillway Road, Suite B
Brandon, MS 39047
(601) 992-8233

EMS PROJECT NO. PRI1-23-001

October 4, 2023

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FIGURES

APPENDICES

Worksheets

CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. To the best of my knowledge this SWPPP was prepared in accordance with sound engineering practices and identifies potential sources of pollution, which are reasonably expected to affect the quality of storm water discharges associated with industrial activity from the facility. The SWPPP describes and ensures the implementation of best management practices which reduce pollutants in storm water discharges and assure compliance with the terms and conditions of the permit. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Signature: _____

Greg Prine

Title: Owner

Company: MC Environmental, LLC

Certification Date: 10-13-2023

1.0 GENERAL INFORMATION

1.1 INTRODUCTION

This Storm Water Pollution Prevention Plan (SWPPP) has been developed by Environmental Management Services, Inc. (EMS) for MC Environmental, LLC in order to discharge storm water under the Mississippi Department of Environmental Quality's (MDEQ's) Industrial Storm Water General Permit for Industrial Activities (MSR00). The facility is a Class II Rubbish Site which accepts rubbish waste such as tree limbs, concrete, brick, and similar waste materials specifically approved by MDEQ for disposal. The purpose of this SWPPP is to develop and implement a system of management practices which identifies potential storm water pollution sources, reduces contaminant levels, and ultimately improves the quality of storm water discharges from this facility.

The two major objectives for the plan are: to identify potential pollution sources that may impact the quality of storm water discharged from the facility; and to describe and outline the implementation of practices to minimize and control potential pollutants in storm water discharges. Implementation and continuation of these practices are ongoing. A summary of the content included in this SWPPP is also included in the Worksheets section of this report.

The development of the plan involves:

- Formation of a Pollution Prevention Team of qualified personnel;
- Assessment of potential storm water pollution sources;
- Selection and implementation of appropriate management practices and controls; and
- Periodic evaluation of the plan's effectiveness.

The SWPPP shall be implemented and a copy of the SWPPP retained at the facility at all times. Failure to implement the SWPPP is a violation of permit requirements. A copy of the SWPPP must be made available to the MDEQ inspectors for review at the time of an on-site inspection. All records, reports and information resulting from activities required by the permit shall be retained by the coverage recipient, on-site with the SWPPP, for a minimum of at least three years from the date of generation.

1.2 SITE DESCRIPTION

MC Environmental, LLC facility is located on Columbia-Purvis Road at Loftin Road in Columbia, Marion County, Mississippi. The site's location is depicted in Figure 1. The facility receives Class II rubbish waste such as tree limbs, concrete, brick, and similar waste materials specifically approved by MDEQ for disposal.

The topography consists of moderately sloped terrain. Storm water on site drains to the

southwest to a sediment basin with Outfall 1 as shown on Figure 2.

1.3 RECEIVING WATERS

Storm water discharged from the site flows northward into Upper Little Creek. Upper Little Creek then flows into the Pearl River. The Upper Little Creek was first found on Mississippi's 2006 Section 303(d) List of Impaired Waterbodies for which a Pathogen TMDL report was completed utilizing Fecal Coliform as the indicator organism for pathogenic bacteria. A source assessment was conducted in the watershed which revealed nonpoint sources including wildlife, livestock, and urban development (failing septic systems) were the primary source of contaminants as the dominant land use within the watershed is listed as forest. The Upper Little Creek was included in the latest Draft Final 2020 303d Mississippi List of Impaired Water Bodies (August 2020) with an impaired use for aquatic life use support with the primary pollutant as biological impairment.

1.4 FACILTY ENTRANCE AND OUTFALL COORDINATES

Approximate facility entrance and outfall coordinates are shown below in Table 1.

Table 1

Location	Coordinate
Facility Entrance	31°12'57"N, 089°44'39"W
Outfall 1	31°12'57.42"N, 89°44'57.51"W

1.5 EMERGENCY/IMPORTANT CONTACTS

Table 2 is a compilation of important/emergency contacts to be used in the event of a spill, release, or other circumstance that may potentially impact storm water/environmental quality at the site.

Table 2

Mississippi Department of Environmental Quality	601-961-5171
Mississippi Emergency Management Agency	601-352-9100
National Response Center	1-800-424-8802
Greg Prine (Owner)	(office) 601-736-2199

Marion County Fire Coordinator	911 or (601) 736-9627
Emergency Medical Service	911

1.6 TYPE OF MANUFACTURER

The facility accepts rubbish waste such as tree limbs, concrete, brick, and similar waste materials specifically approved by MDEQ for disposal. Waste entering the site will be visually inspected prior to unloading. Any unauthorized waste will be rejected by the facility attendant. The driver may be allowed to remove minor quantities of unauthorized materials from the waste load prior to dumping. Larger quantities of unauthorized waste will be rejected at the gate, and the driver will be required to leave the site with the entire load. Incidental waste that is observed after unloading will be removed by facility employees and placed in onsite waste containers for proper disposal off site.

1.7 SIC CODES

SIC (Standard Industrial Classification) code for the facility is listed below.

4953-Refuse Systems

1.8 OPERATING SCHEDULE

The rubbish site will have an attendant present during any time that the facility is operating. Standard hours of operation are expected to be 7:00 a.m. to 5:00 p.m., Monday through Friday (or adjusted seasonally as daylight allows), and 8:00 a.m. to 12:00 p.m. on Saturday. If a client needs to deliver waste outside of these times, arrangements will be made on an as-needed basis.

1.9 EXISTING ENVIRONMENTAL PERMITS

This facility requires a Class II Rubbish Disposal Permit.

MC Environmental, LLC operates a permitted Class I rubbish site co-located on land owned by Prine Properties, LLC. Prine Properties, LLC also operates a permitted surface mining operation on the property.

2.0 STORM WATER POLLUTION PREVENTION PLAN

2.1 POLLUTION PREVENTION TEAM

MC Environmental, LLC pollution prevention team is composed of supervisory personnel who are responsible for:

- Defining the goals of the storm water management program;
- Implementing all general permit and pollution plan requirements;
- Evaluating the plan's effectiveness and implementing necessary changes resulting from changes in facility operations; and,
- Maintaining clear lines of communication.

The members of the Pollution Prevention Team and their responsibilities are provided below.

(1) Greg Prine, Owner Office Phone: 601-736-2199

Responsibilities: Signatory authority, coordination, and implementation of SWPPP procedures and practices.

(2) Shane Thornhill, Operator Office Phone: 601-736-2199

Responsibilities: Team member, coordination, and implementation of SWPPP procedures and practices.

2.2 RISK IDENTIFICATION AND ASSESSMENT/MATERIAL INVENTORY

MC Environmental, LLC stores all rubbish waste within the confines of the facility. All process rubbish waste storage and disposal areas are well maintained. The industrial activities and potential pollution sources of storm water contaminants are summarized below. Planned actions for addressing potential sources and pollutants of concern are presented in Section 2.3.

2.2.1 Industrial Activities Exposed to Storm Water

Listed below are industrial activities occurring on the site that are exposed to storm water.

- Rubbish waste delivered to the site
- Rubbish waste processing (moving the waste to various areas on the site for disposal)

2.2.2 Potential Pollutant Sources

Worksheet #2a contains an inventory of the industrial activities and the associated potential pollutants and sources onsite that were exposed to storm water during the past 3 years. The inventory includes the following information:

- Name of the Material
- Period of Exposure
- Quantity Exposed
- Location (as indicated on Figure 2)
- Method of Storage or Disposal
- Description of Material Management Practice
- Description of Any Treatment Storm Water Receives

2.2.3 Significant Spills and Leaks of Toxic or Hazardous Pollutants

Worksheet #2b is included to maintain a list of significant spills and significant leaks that have occurred, or may occur, at the facility. Currently there have been no significant spills at the site; however, if any spills occur, this list will be updated. Should a significant spill or significant leak occur, the following information shall be recorded on Worksheet #2b:

- Date
- Determination of Spill or Leak
- Location (as indicated on Figure 2)
- Type of Material
- Amount of Material Recovered

- Determination if Material has been Exposed to Storm Water
- Preventative Measures Taken

2.2.4 Storm Water Sampling

Appendix A contains previous storm water sampling documentation that has taken place on the site. Section 2.3.10 details non-storm water discharge evaluation procedures and sections. Sections 2.4.1 and 2.4.2 describe routine and annually site evaluation procedures for the facility. Any new storm water sampling data shall be submitted to MDEQ within 90 days of sampling.

2.2.5 SARA Title III, Section 313 Chemicals

Chemicals listed in 40 CFR 372.65 are not presently stored or used at the site.

2.3 CONTROLS AND PRACTICES

The facility has initiated Best Management Practices (BMPs) that are intended to substantially reduce the potential for the introduction of pollutants into the environment, to reduce waste, and to enhance the overall efficiency and safety of the operation. A summary of BMPs implemented at the facility is included in Worksheet #3a with design specifications provided in Appendix H. The following subsections describe the BMPs which are associated with the facility's storm water pollution prevention plan. the following information was considered when selecting and designing control measures:

- preventing storm water from contacting with polluting materials is generally more effective, and less costly, than trying to remove pollutants from storm water;
- the use of control measures in combination rather than in isolation is more effective for
- minimizing pollutants in storm water discharges;
- assessing the type and quantity of pollutants, including their potential to impact receiving water quality, is critical to designing effective control measures that will achieve the limits in this permit;
- minimizing impervious areas at the facility and infiltrating runoff onsite (including bioretention cells, green roofs, and pervious pavement, among other approaches) can reduce runoff and improve groundwater recharge and stream base flows in local streams, although care must be taken to avoid ground water contamination;
- attenuating flow using open vegetated swales and natural depressions can reduce in-stream impacts of erosive flows;
- conserving and/or restoring riparian buffers will help protect streams from storm water runoff and improve water quality; and

- using treatment interceptors (e.g., swirl separators and sand filters) may be appropriate in some instances to minimize the discharge of pollutants.

The following subsections describe the BMPs which are associated with the facility's storm water pollution prevention plan which includes practices which minimize exposure such as:

- use grading, berming, or curbing to prevent runoff of contaminated flows and divert run-on away from these areas;
- locate materials, equipment, and activities so that leaks are contained in existing containment and diversion systems (confine the storage of leaky or leak-prone vehicles and equipment awaiting maintenance to protected areas);
- clean up spills and leaks promptly using dry methods (e.g., absorbents) to prevent the discharge of pollutants;
- use drip pans and absorbents under or around leaky vehicles and equipment or store indoors where feasible;
- use spill/overflow protection equipment;
- drain fluids from equipment and vehicles prior to on-site storage or disposal;
- perform all cleaning operations indoors, under cover, or in bermed areas that prevent runoff and run-on and also that capture any overspray; and
- ensure that all wash water drains to a proper collection system (i.e., not the storm water drainage system).

2.3.1 Sediment and Erosion Control

The site is moderately sloped with large portions of the undisturbed site being grassed, reducing the potential for soil erosion. The exposed areas are stabilized and runoff is contained using structural and/or non-structural control measures in order to minimize on-site erosion and sedimentation. The flow velocity of runoff is dissipated using proper BMPs placed at discharge locations and within outfall channels where necessary to reduce erosion and/or settlement of pollutants. Polymers may be used, as needed, as a part of the erosion and sediment control program. All controls are designed, installed, and maintained in accordance with the standards set forth in the most recent edition of Mississippi's "Erosion Control, Sediment Control and Storm water Management on Construction Sites and Urban Areas (Three Volumes)," or other recognized manuals for storm water controls design, or provided a design that has been certified by a Mississippi registered professional engineer.

Site-specific controls appropriate for the facility activities as well as the procedures for

implementing such controls are found in Worksheet #3a with design specifications provided in Appendix H. All controls are designed, installed, and maintained to retain sediment on-site and to minimize the discharge of pollutants. Temporary stabilization (e.g. temporary seeding, mulching, and placing geotextiles on the inactive portions of stockpiles) are also found in Worksheet #3a for the following in order to minimize discharges of pollutants in storm water:

- materials stockpiled for intermediate, and final cover; inactive areas of the landfill or open dump;
- landfills or open dump areas that have gotten final covers but where vegetation has yet to be established itself; and
- land application sites where waste application has been completed but final vegetation has not yet been established.

All temporary BMPs are designed, installed, and maintained in order to:

- Control storm water volume and velocity within the site to minimize soil erosion;
- Control storm water discharges, including both peak flow rates and total storm water volume, to minimize erosion at outlets and to minimize downstream channel and stream bank erosion;
- Minimize the amount of soil exposed during the facility's activity;
- Minimize the disturbance of steep slopes;
- Minimize sediment discharges from the site. The design, installation and maintenance of erosion and sediment controls must address factors such as the amount, frequency, intensity and duration of precipitation, the nature of resulting storm water runoff, and soil characteristics, including the range of soil particle sizes expected to be present on the site;
- Provide and maintain natural buffers around surface waters, direct storm water to vegetated areas to increase sediment removal and maximize storm water infiltration, unless infeasible;
- Minimize soil compaction and, unless infeasible, preserve topsoil;
- Direct storm water to vegetated areas, brush barriers, silt fences, hay bales, etc. to aid in the filtration, infiltration, velocity reduction and diffusion of the discharge;
- Transport runoff down steep slopes through lined channels or piping;
- Minimize off-site vehicle tracking of sediments.

All BMPs shall be implemented during facility construction and subsequent facility cell construction (e.g. clearing and grubbing) as necessary to mitigate erosion and adverse impacts to

offsite areas and receiving streams. During facility operations, vegetative and structural practices shall be maintained as set forth in this SWPPP and as described in Appendix H.

All brush/fabric barrier BMPs should be inspected at least weekly for short-circuiting of water or flow around the ends of the barrier and after each significant rainfall event (½ inch or greater). Sediment deposits should be removed when they reach ½ the height of the barrier or fence as installed, to provide adequate storage volume for the next rain event and to reduce pressure on the fence. If the area behind the barrier fills with sediment, there is a greater likelihood that water will flow around the end of the barrier and cause the practice to fail. Large rainfall events that overtop the structure can result in gully erosion behind the barrier which should be repaired as needed. Should the fabric of silt fence collapse, tear, decompose, or become ineffective, it should be replaced promptly. Brush/fabric barriers are temporary structures and should be removed when their useful life has been completed. After the contributing drainage area has been properly stabilized, all barrier materials and unstable sediment deposits should be removed, the area should be brought to grade, and stabilized by being seeded or mulched immediately, unless a different treatment is prescribed by the engineer.

Any sediment basin or bermed area should be inspected at least weekly and after each significant storm event (½ inch or greater). Sediment should be removed when it accumulates to ½ the design volume. Any trash and other debris should be removed from the sediment basin or bermed area. The embankment, emergency spillway, and outlet should be periodically checked for erosion damage, piping, settling, seepage, or slumping along the toe or around the barrel and repaired immediately if discovered. The sediment basin or bermed area may be removed only after the drainage area has been permanently stabilized, inspected, and approved. The sediment basin or bermed area may be removed by draining any water, removing the sediment to a designated disposal area, and smoothing the site to blend with the surrounding area; then stabilized in a manner determined by the engineer.

No construction entrances/exits will be required as no traffic leaving the site will move directly onto a paved public road. Vehicles entering and exiting the site traverse an approximately 0.25 mile privately maintained gravel road before traveling on a paved public road.

Vegetative practices at the site are designed to preserve existing native vegetation whenever possible and all areas should be re-vegetated as soon as practical after clearing, grading, excavating, or other land disturbing activities.

In order to address the biological impairments of Upper Little Creek as indicated in the TMDL and 303d list, and to ensure that facility operations do not further impact the creek with pathogenic bacteria, the facility shall ensure that no sources of pathogenic bacteria or other biological pollutants (other than those naturally occurring from wildlife) are allowed to enter discharged waters from the site. Although no current or planned septic tanks are on site, if a

septic tank is installed on site at any time in the future, the tank must always remain in proper operating condition to prevent pathogenic bacteria from entering Upper Little Creek. If site conditions exacerbate wildlife occupation of the site (bird occupation or other) beyond what wildlife occupation was prior to the initial site operations, best management practices should be utilized to deter wildlife occupation on site.

2.3.2 Implementation Sequence and Final Stabilization

The rubbish disposal cell is constructed on a naturally occurring strata. The facility does not propose to install alternate bottom or sidewall liners at this time. Storm water within the cell will be managed by earthen berms and/or diversion ditches located topographically upgradient and downgradient of the proposed waste disposal cells. Berm/ditch construction will be designed to divert water away from the current disposal area and toward the sedimentation basin. The base of each cell will be graded to prevent standing water in the current disposal area and direct water toward the sedimentation basin. If ponding is observed in a portion of the current disposal area, the area will be regraded to drain the water. Any area where ponding occurs will be closed to disposal until regrading can be accomplished. On a twice-monthly basis, the active working face is to be covered with a minimum of six inches of native earthen soil. The twice monthly cover is typically conducted on the first and third Friday of the month, weather permitting.

Within 30 days of final completion of a disposal cell, at least two feet of a low permeable earthen cover shall be applied as final cover. Following final cover soil placement, suitable vegetation shall be promptly established and maintained. Any erosion occurring on a final completed area shall be promptly repaired. Any area containing rubbish waste materials, which has not received wastes in the past twelve months, shall also be covered with soil in accordance with this final closure condition. Permanent vegetation should be established utilizing methods described in Appendix H. Final stabilization of the site should include vegetative or structural stabilization of any exposed soils.

A final closure plan should be submitted to MDEQ no later than 30 days prior to ceasing the regulated industrial activities. The plan should include how all machinery and/or equipment will be removed from the site and how all potential storm water pollutants discharging from the site will be eliminated.

2.3.3 Wetlands Protection

Special considerations and additional BMPs will be utilized to ensure the protection of the potential jurisdictional wetlands located on the property adjoining the facility to the south from being impacted by stormwater runoff or sediment discharge from the facility. Disposal activities associated with the facility shall not extend beyond the facility's design perimeter and all disposal activities shall remain at a distance greater than 15 feet from any potential jurisdictional wetlands. An earthen berm perimeter with a silt fence at the southern toe of the berm shall be

placed and maintained between the disposal cell and the potential jurisdictional wetlands on the southern adjoining property to prevent stormwater runoff or sediment discharge from the facility, in order to provide additional protections for the potential jurisdiction wetlands.

2.3.4 Preventive Maintenance

The preventive maintenance program includes:

- Timely and appropriate maintenance of facility equipment and systems.
- Regular visual inspections of operation, rubbish waste storage, and rubbish waste handling areas.
- Implementation of a written record system to record inspections and preventive maintenance operations. Records will indicate when the inspection occurred, the person conducting the inspection, and all relevant findings. (See sections 2.4.1 and 2.4.2)

2.3.5 Good Housekeeping

The following practices are implemented by the facility if applicable to adhere to MDEQ requirements, as written in MSR00, to maintain a clean and orderly work environment.

- *Designate areas for equipment maintenance and repair;*
- *Waste receptacles at convenient locations (outdoor waste receptacles must be covered).*
- *Regular collection of waste;*
- *Protected storage areas for chemicals, paints, solvents, fertilizers, and other potentially toxic materials;*
- *Adequately maintained sanitary facilities;*
- *Secondary containment around any on-site single fuel or chemical container with a capacity greater than 660 gallons or any combination of containers which has an above ground bulk storage capacity of more than 1,320 gallons; and*
- *Secondary containment for raw material stockpiles (if required to prevent material from entering waters of the State).*

2.3.6 Spill Prevention and Response Procedures

Based upon the information presented the following high risk potential spill areas have been identified.

- Rubbish waste handling area
- Rubbish waste disposal cells

Equipment utilized in the rubbish waste handling area may occasionally be exposed to storm water; however, should a spill occur, the team will quickly determine the number and types of personnel and equipment that will be required to contain the release and whether additional specialty personnel (firemen, hazardous waste response teams, ambulance) may be required. Safety of team personnel, fellow employees, and neighbors will be of highest priority. All personnel must be equipped with the appropriate level of personal protection prior to entering the spill area. Rubbish waste itself rarely includes pollutants that could be exposed to storm water because the facility requires that materials brought into the site be free from wastes other than rubbish waste specifically approved by MDEQ. Examples of potential exposure would be from non-accepted waste containing chemical products that are mixed in the rubbish waste brought on to the site. When discovered, the non-accepted waste will be rejected for acceptance by the site attendant(s) and the owner of the waste will be required to retain the non-accepted waste for disposal in the appropriate manner off site.

Minor Drips and Spills

Minor Drips and spills will generally be contained in drip pans that are positioned to catch the escaping fluids. These drip pans will be placed in areas of higher spill occurrence and will be utilized during normal maintenance events on fluid filled lines, pumps, etc.

Unplanned minor drips and spills may be contained with temporary drip pans, small soil berms or absorbent materials. The team should evaluate whether process equipment should be shut down until the spill is contained and the area cleaned up. Absorbent materials may be utilized to clean up the spill once containment has been achieved. All spill contaminated material should be disposed of properly.

Large Spills

Large spills often result from human error (opening/closing wrong valve, failure to shut off pumps, etc.) or catastrophic failure of vessels, tanks, piping or transfer equipment. To minimize the frequency of spills all operators must be competent and properly trained. Preventative maintenance should be conducted on all process equipment at regular intervals.

In the event of a spill, all process equipment should be shut down. If it can be done safely, the source of the leak should be secured. Sand or other material may be utilized as an absorbent for oily materials. Contaminated soils and absorbent materials should be protected from storm water by berms, plastic sheeting covers or other means until the spill contaminated material can be containerized and properly disposed.

If a pollutant or contaminant that may endanger human health or the environment is released from the site and reaches waters of the state or crosses a property boundary, it should be reported **immediately**. Applicable telephone numbers are provided below:

Mississippi Department of Environmental Quality	**601-961-5171**
National Response Center	**800-424-8802**

Spill Response Personnel and Equipment

As indicated in Section 2.1, Greg Prine is the onsite spill response coordinator.

On-site spill response equipment includes:

- absorbent pads/material
- drums
- plastic sheeting (for covering contaminated soil)

Spill team members are responsible for immediately stopping the source of the leak or spill, and to prevent the spilled material from contacting storm water. Employees will be trained to notify the spill response coordinator, who will determine the appropriate response and if the spill needs to be reported to others. A listing of telephone numbers is provided in Section 1.5 of this plan. A monthly spill and leak log sheet is provided in Appendix B to be kept in order to record any spills that occur on site during the calendar month. If no spills have occurred, the inspector should indicate that no spills have occurred during the month on the monthly spill and leak log sheet.

2.3.7 Employee Training

Employee training programs are instituted at the facility to inform the employees of the components and goals of the storm water pollution prevention plan. Storm water pollution prevention is discussed during new employee orientation/training and annually thereafter. As required in MSR00 the facility's training program addresses the following areas mentioned in greater detail in the prescribed sections:

- *SWPPP goals and plan components*
- *Housekeeping and pollution prevention requirements* (Section 2.3.4)
- *Spill prevention and response procedures,* (Section 2.3.5)
- *Identification and elimination of non-allowable, non-storm water discharges,* (Section 2.3.10)
- *Installation, maintenance and inspection of erosion and sediment controls for construction activities,* (Section 2.3.1)

- *Installation, maintenance and inspection of Best Management Practices (BMPs) for industrial storm water and/or post-construction storm water,* (Section 2.2.1)
- *Procedures for monitoring compliance with non-numeric limitations described in MSR00,*
- *Recordkeeping, reporting, and record retention requirements,*
- *Release reporting and non-compliance notification requirements, and*
- *Applicable standard requirements contained in ACT15 of the Industrial Storm water General Permit.*

A summary of the employee training program implemented at the facility is included in Worksheet #3b. The employee training program includes:

- *Training Topics*
- *Description of Scheduled Training Program/Materials*
- *Proposed Frequency of Training*
- *Who will Attend*

An Employee Training Log is provided in Appendix C to document all employees training.

2.3.8 Illicit Connection-Testing and Certification

Storm water discharges are to be evaluated for the presence of non-allowable, non-storm water discharges at least every five (5) years (as required by MSR00). Certification of the evaluation is included in Worksheet #2c.

2.3.9 Daily Visual Site Inspections

Rubbish waste handling, disposal cells, site boundary areas and equipment as well as other potential sources of pollution will be visually inspected daily during operational hours for evidence of actual or potential pollutant discharges to the drainage system. These daily inspections are part of normal operations at the facility and are not documented.

Qualified personnel will conduct routine inspections and a comprehensive annual site inspection to (1) confirm the accuracy of the description of potential pollutant sources contained in the storm water pollution prevention plan; (2) determine the effectiveness of the plan; and (3) assess compliance with the terms and conditions of the storm water permit. Routine and annual inspections are described in greater detail in Section 2.4

2.3.10 Storm Water Management

Storm water runoff is diverted into the sediment basin(s) using berms or other approved methods. The sediment basin will provide capacity for the 17.7-acre disposal area plus an

additional 2.1 acres of area outside of the disposal area that drains into the sediment basin. The sediment basin is 0.31 acres in size with six feet of working depth and two foot of freeboard. This design provides approximately 81,000 CF of capacity; 10,000 CF greater than the required capacity of 71,000 CF.

Appropriate control measures and BMPs for erosion and sediment control are implemented on site to reduce run off. Petroleum products including fuel, lubricants, or oil are not stored onsite. No discharge of floating solids, visible foam (except in trace amounts), oily or oily materials in visible sheen or stains is allowed on site. All solid waste, garbage, and floatable debris is collected and properly disposed prior allowing it to discharge to receiving waters.

2.3.11 Non-Storm Water Discharge Management

The following are potential non-storm water discharges allowed by MSR00:

- Water used to control dust
- Uncontaminated air conditioning or compressor condensate (the amount would likely be insignificant and would not discharge from the site)
- Uncontaminated ground water or spring water
- Uncontaminated excavation dewatering

These allowable non-storm water discharges will occur only if necessary and may not result in a discharge off site. All non-storm water discharges will be reduced or eliminated to the extent feasible.

2.4 ACTION/SUBMITTAL REQUIREMENTS

2.4.1 Routine Site Inspections

As required by MSR00 Monthly site inspections shall

"...be performed at a minimum of once per month to ensure the effectiveness of the SWPPP's design and implementation by an authorized authority listed in the Employee Training Log... If feasible, the inspections should be conducted during or after storm events. All areas contributing to storm water discharges associated with industrial activity (including, but not limited to, ground storage piles, tanks, hoppers, silos, dust containment/collection systems, cleaning and maintenance areas) must be visually inspected as often as needed, but no less than once monthly. The inspection must evaluate whether the SWPPP adequately minimizes pollutant loadings and is properly implemented in accordance with the terms of this permit or whether additional control measures are needed. This includes observing storm water discharges for obvious industrial storm water pollution such as color, lack of clarity, floating solids, settled solids, suspended solids, foam, odor, and oil sheens. The results of all monthly site inspections shall be documented on the Industrial Storm water Monthly Inspection Report Form..."

The MSR00 monthly site inspections further require that *"As part of inspections conducted during or after storm events, a representative sample of storm water should be collected at each outfall in a clean, clear jar and examined in a well-lit area. Should any of the objectionable characteristics described above be observed, coverage recipient shall investigate upstream from the sample location to identify the potential sources of pollution and implement corrective action. The results of all jar test inspections shall be documented on the Monthly Visual Jar Test Inspection Form"*

Based on the results of each inspection, any poorly functioning erosion controls or sediment controls, non-compliant discharges, or any other deficiencies observed shall be corrected as soon as possible, but not to exceed 24 hours of the inspection unless prevented by unsafe weather conditions as documented on the inspection form. Permanent corrective measures shall be implemented within five (5) days of the inspection. In addition to the weekly inspection, all storm water and erosion controls and outfalls/discharge points shall be inspected after each rain event that produces a discharge. Any spill or leaks should be documented on the Monthly Spill and Leak Log Sheet and corrected within 14 days unless it immediately threated Storm water in which case it should be corrected as soon as possible. The description of newly identified potential pollutant sources, measures and controls will be revised (if appropriate) as soon as possible. Changes in the measures and controls will be implemented on the site in a timely manner after the completion of the inspection. In addition, if the inspection report lists changes at the facility that have a significant effect on the potential of the discharge of pollutants to surface waters, the storm water pollution prevention plan will be amended.

A copy of the Industrial Storm Water Monthly Inspection Report Form is included in Appendix D, although this shall be completed weekly. A copy of the Monthly Visual Jar Test Inspection Form is included in Appendix E. All completed forms shall be filed on-site with the SWPPP and made available to MDEQ personnel for inspection upon request.

2.4.2 Annual Comprehensive SWPPP Evaluation

As required by MSR00 Annual Comprehensive SWPPP Evaluation *"Coverage recipients shall conduct a comprehensive evaluation of the facility's SWPPP by December 31st of each calendar year. The evaluation shall assess the effectiveness and accuracy of the SWPPP and ensure that the SWPPP is current, up to date, and meets all the requirements of ACT5, T-1 through T-9. Should the SWPPP need to be amended based on the findings of any evaluation, a copy of the amended SWPPP must be submitted to MDEQ..."*

The results of all annual SWPPP evaluations shall be documented on the Annual Comprehensive SWPPP Evaluation Form, filed on-site with the SWPPP, and made available to MDEQ personnel for inspection upon request. The Annual Comprehensive SWPPP Evaluation Form is provided in Appendix F.

The Permit Board must be notified of any expansion and/or modification by submittal of an appropriate form at least 30 days before:

(1) Any planned change in industrial processes that may affect storm water quality,

(2) Any change in the area of the footprint of the facility identified the original submittal,

(3) Any planned changes of ownership or,

(4) Any changes in information previously submitted in the ISNOI.

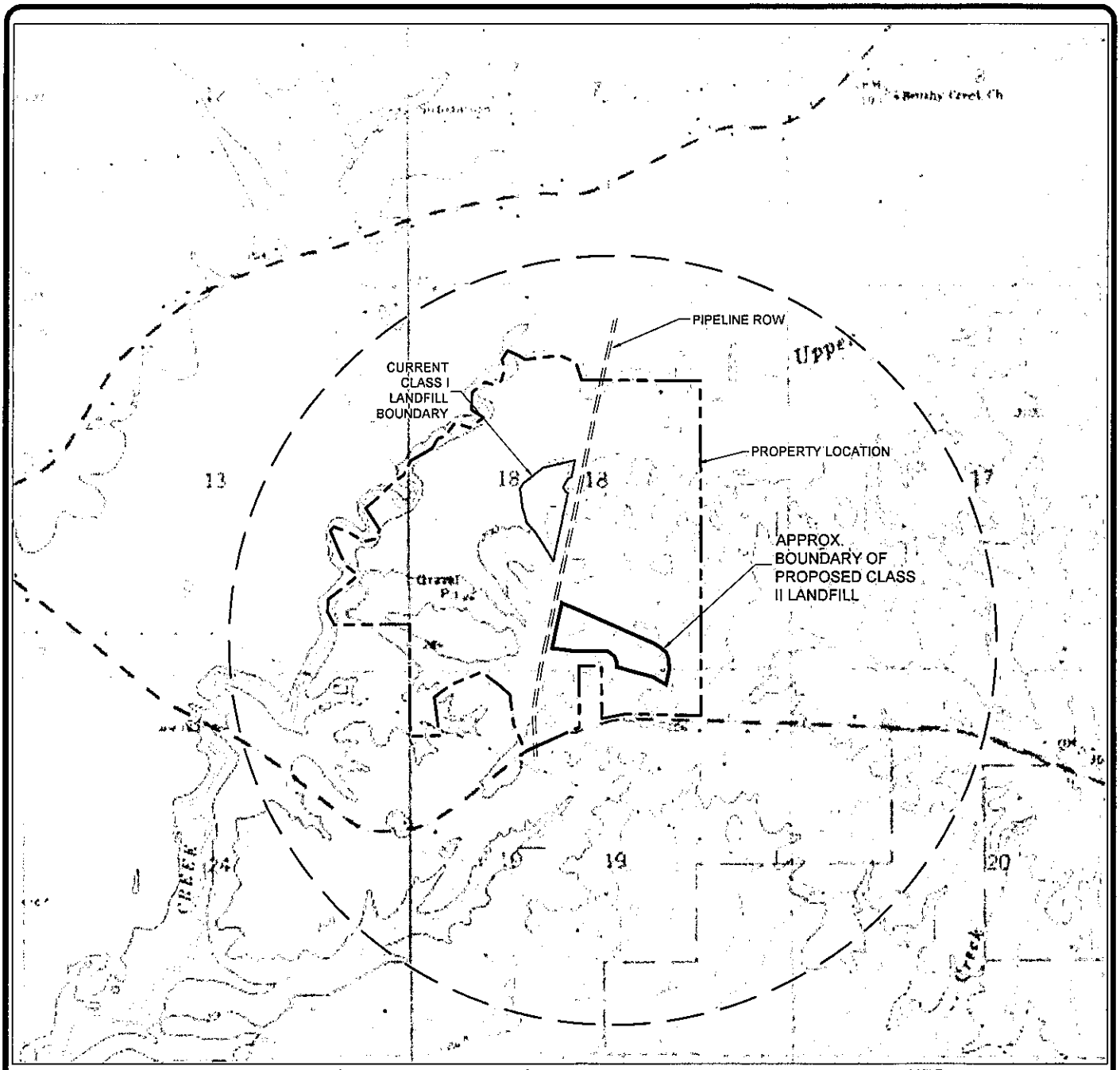
Submittal

Annual storm water evaluation reports will be maintained on file as required by this plan and need not be submitted to MDEQ unless specifically request by MDEQ. An amended SWPPP or requested Annual Reports shall be sent to the address listed below.

Chief, Environmental Permits Division
Mississippi Department of Environmental Quality
Office of Pollution Control
P.O. Box 2261
Jackson, Mississippi 39225

Correspondence from MDEQ pertaining to SWPPP components may be included in Appendix G.

FIGURES



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LEGEND

APPROX. PROPERTY BOUNDARY

REFERENCE: U.S.G.S. 7.5 MINUTE TOPOGRAPHIC QUAD SHEETS
COLUMBIA SOUTH, MISS AND PINBUR, MISS

USGS QUAD MAP

PROPOSED MC ENVIRONMENTAL CLASS II RUBBISH FACILITY

MC ENVIRONMENTAL, LLC
60 DYESS CIRCLE
COLUMBIA, MS 39429

DATE: 08/25/2023	APPROVED: BY: S. Utroska DATE: 08/25/2023	DRAWN BY: KRK/LMM
SCALE: AS SHOWN		CAD NO. PRI1-21-001

ENVIRONMENTAL MANAGEMENT SERVICES, INC.

FIGURE 1

APPENDIX A

Previous Storm Water Sampling

No Previous Storm Water Sampling Data at this Time

APPENDIX B

Monthly Spill & Leak Log Sheet

Facility Name _____

Physical Address _____

Monthly Spill & Leak Log Sheet

Month/Year _____

Coverage Number _____

Instructions: A list of spills and leaks of toxic or hazardous pollutants that have occurred at the facility shall be documented on the Monthly Spill and Leak Log Sheet that is provided in the Industrial Stormwater Forms Package. A separate form shall be completed for each month that the facility is covered under this general permit. If no spills have occurred, the form shall be completed by checking the available box and signing it as indicated. Coverage recipients may use an alternate form to record this information, so long as it includes all of the information on the above referenced form and it is updated monthly. The completed forms shall be filed on-site with the SWPPP and made available to MDEQ personnel for inspection upon request. [Industrial Stormwater General Permit ACT5 T-3 (4)]

Date of Spill	Material Spilled	Quantity Spilled (specify units)	Area that Spill Occurred	Did the Spill Result in a Discharge?	Injury / Property Damage?	Person(s) Involved In Clean-up	Date Reported to MDEQ (If significant)
Corrective Action(s) Taken							
Date of Spill	Material Spilled	Quantity Spilled (specify units)	Area that Spill Occurred	Did the Spill Result in a Discharge?	Injury / Property Damage?	Person(s) Involved In Clean-up	Date Reported to MDEQ (If significant)
Corrective Action(s) Taken							
Date of Spill	Material Spilled	Quantity Spilled (specify units)	Area that Spill Occurred	Did the Spill Result in a Discharge?	Injury / Property Damage?	Person(s) Involved In Clean-up	Date Reported to MDEQ (If significant)
Corrective Action(s) Taken							
☐ No spills have occurred this month.	*"I certify under penalty of law that this report is true, accurate, and complete, to the best of my knowledge and belief."*						
	Inspector's Name - Printed			Inspector's Signature			Date

APPENDIX C

Employee Training Log

Employee Training Log

MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY

Instructions: Newly hired employees responsible for implementing and/or complying with the requirements of the permit shall receive initial training prior to performing such responsibilities. Employees shall receive refresher training at a minimum of every twelve (12) months, thereafter. Proper documentation of employee training must be maintained. Include copies of the training agenda and certificates of training when applicable. All training records shall be maintained for at least three years from the date of training. [Industrial Stormwater General Permit ACT14 S-1]

Facility Name:	Physical Address:
Coverage Number:	Training Date:
Training Topic:	
Training Description:	

Employee Name (printed)	Employee Signature	Worker ID Number	Initial/Refresher

"I certify under penalty of law that this report is true, accurate, and complete, to the best of my knowledge and belief."

Trainer Name (printed)	Trainer Signature	Date

APPENDIX D

Industrial Storm Water Monthly Inspection Report Form

MC ENVIRONMENTAL, LLC, Columbia-Purvis Road, Columbia, MS 39429
Storm Water Permit Coverage No. MSR00____
Monthly Storm Water Inspection Report

Inspection Date _____

Inspection Time _____

Weather Condtions: _____

Days since last rainfall event:_____ Was there water flow in any outfalls? Yes ☐ No ☐

(If yes , conduct a Jar Test at each storm water outfall and attach Monthly Visual Jar Test Inspection Form)

I. POTENTIAL POLLUTANT SOURCE AREA INSPECTION AND BMP EVALUATION

(NOTE: For any findings of non-compliance or deficient BMP's, provide corrective action description in Section II.)

I.A. SWPPP AND SITE MAP:

Is the site map current and accurate?	Yes	☐	No	☐	N/A	☐
Is the SWPPP inventory of industrial activities, materials, and products current?	Yes	☐	No	☐	N/A	☐

I.B. VEHICLE/EQUIPMENT AREAS

Equipment Fueling - No equipment fueling other than propane for fork lifts, and gasoline for lawn maintenance equipment is performed onsite. Confirmed?	Yes	☐	No	☐	N/A	☐
Is lawn maintenace equipment re-fueled on a paved area?	Yes	☐	No	☐	N/A	☐
Are maintenance tools, equipment and materials stored under shelter, elevated and covered?	Yes	☐	No	☐	N/A	☐
Are all drums and containers of fluids stored with proper cover or containment indoors?	Yes	☐	No	☐	N/A	☐
Are vehicles and/or equipment free from leaking fluids? (Identify leaking equipment.)	Yes	☐	No	☐	N/A	☐
Have traffic areas been free from vehicle leaks or spills since last inspection? (Identify and address.)	Yes	☐	No	☐		
Are materials, equipment, and activities located so that leaks are contained in existing containment and diversion systems?	Yes	☐	No	☐		
Any additional equipment BMP needs?	Yes	☐	No	☐		

If yes above, describe: _____

I.C. GOOD HOUSEKEEPING BMPS:

1. Are paved surfaces free of accumulated dust/sediment and debris?	Yes	☐	No	☐	N/A	☐
Date of last vacuum/sweep _____					N/A	☐
Are areas of erosion or sediment/dust sources kept away from storm drains?	Yes	☐	No	☐	N/A	☐
2. Are any waste receptacles located outdoors (example dumpsters)? If yes:	Yes	☐	No	☐	N/A	☐
-In good condition?	Yes	☐	No	☐	N/A	☐
-Not leaking contaminants?	Yes	☐	No	☐	N/A	☐
-Closed when not being accessed?	Yes	☐	No	☐	N/A	☐
-External surfaces and area free of excessive contaminant buildup?	Yes	☐	No	☐	N/A	☐
3. Are the following areas free of accumulated dust/sediment, debris, contaminants, and/or spills/leaks of fluids?						
-External dock areas	Yes	☐	No	☐	N/A	☐
-Pallet, bin, tote, and drum storage areas	Yes	☐	No	☐	N/A	☐
-Maintenance shop(s)	Yes	☐	No	☐	N/A	☐
-Equipment staging areas (loaders, tractors, trailers, forklifts, etc.)	Yes	☐	No	☐	N/A	☐
-Bone yard	Yes	☐	No	☐	N/A	☐
-Trash compactor	Yes	☐	No	☐	N/A	☐
-Other areas of industrial activity: _____	Yes	☐	No	☐	N/A	☐

I.D. SPILL RESPONSE AND EQUIPMENT:

1.Are spill kits available, in the following locations?						
-Fueling areas	Yes	☐	No	☐	N/A	☐
-Product transfer areas	Yes	☐	No	☐	N/A	☐
-Vehicle and equipment maintenance areas	Yes	☐	No	☐	N/A	☐
-Process / product formulation areas	Yes	☐	No	☐	N/A	☐

2.Do the spill kits contain all the appropriate necessary items such as:

-Oil absorbents (clay, boom, and mats), shovel, dust pan, and gloves.	Yes	☐	No	☐	N/A	☐
-A storm drain plug or cover kit?	Yes	☐	No	☐	N/A	☐
-Other additional items: _____	Yes	☐	No	☐	N/A	☐
3. Are contaminated absorbent materials properly disposed?	Yes	☐	No	☐		

I.E. GENERAL MATERIAL STORAGE AREAS:

Are damaged/scrap, powder, or dusty materials stored inside a building or under roof?	Yes	☐	No	☐	N/A	☐
Are all uncontained materials stored in a manner that minimizes the discharge of impacted storm water?	Yes	☐	No	☐	N/A	☐
Do all outdoor containers have closed lids or covers?	Yes	☐	No	☐	N/A	☐

I.F. STORM WATER BMPS AND TREATMENT STRUCTURES:

(Visually inspect all storm water BMPs, treatment structures / devices, discharge areas, infiltration, and outfalls shown on the Site Map).

Are BMPs and treatment structures in good repair and operational?	Yes	☐	No	☐	N/A	☐
Are BMPs and treatment structures free from debris buildup that may impair function?	Yes	☐	No	☐	N/A	☐
Are berms, curbing or other methods used to divert and direct discharges adequate and in good condition?	Yes	☐	No	☐	N/A	☐

I.G. OBSERVATION OF STORM WATER DISCHARGES:

Is the discharge free of floating materials, visible oil sheen, discoloration, turbidity, odor, foam or any other signs of contamination?	Yes	☐	No	☐	N/A	☐
Is process water prevented from comingling with storm water or entering storm drains? (Vehicle washing with detergent, pressure washing, process water).	Yes	☐	No	☐	N/A	☐
Based on the inspection, is the facility free from illicit discharges? (*Illicit discharges include domestic wastewater, noncontact cooling water, or process wastewater, or leachate.)*	Yes	☐	No	☐	N/A	☐

I.H. MISCELLANEOUS AREAS / ITEMS OF CONCERN:

Evaluations of any matters that are not contained within another section but are covered in the SWPPP [i.e. industrial areas; housekeeping measures; unique BMPs; observations, etc.] should be noted here.

_____

_____

_____

II. CORRECTIVE ACTION AND SWPPP MODIFICATION DESCRIPTIONS:

Additional space to describe inspection findings and corrective actions if needed. Provide brief explanation of the general location and the rationale for the additional or different BMPs.

_____

_____

III. CERTIFICATION STATEMENTS AND SIGNATURES:

Inspector - Certification: This section must be completed by the person who conducted the site inspection prior to submitting this form to the person with signature authority or a duly authorized representative of that person.

"I certify that this report is true, accurate, and complete, to the best of my knowledge and belief."

_____

Inspector's Name - Printed **Inspector's Signature** **Inspector's Title** **Date**

APPENDIX E

Monthly Visual Jar Test Inspection Form

Monthly Visual Jar Test Inspection Form

Instructions: As part of inspections conducted during or after storm events, a representative sample of storm water should be collected at each outfall in a clean, clear jar and examined in a well-lit area. Should any of the objectionable characteristics described in the form below be observed, coverage recipient shall investigate upstream from the sample location to identify the potential sources of pollution, implement corrective action, and describe the corrective action in the space provided below. [Industrial Stormwater General Permit ACT10 R-1]

Facility Name:	Physical Address:
Date:	Coverage Number:
Time collected:	Person collecting/examining sample (Print):
Outfall Number/Location sample was collected:	
Was the sample collected during or immediately after a rain event? **Yes or No**	

Parameter	Parameter Description	Description of Sample
Color	Is the water sample colored? **Yes or No**	If yes, describe the color:
Clarity	Is the water sample clear and transparent? **Yes or No**	If no, describe the clarity:
Floating Solids	Are there solids floating at the top of the sample? **Yes or No**	If yes, describe the floating solids:
Settled Solids	Are there solids settled out in the bottom of the sample? **Yes or No**	If yes, describe the settled solids:
Suspended Solids	Are there solids suspended in the water column of the sample? **Yes or No**	If yes, describe the suspended solids:
Foam	Is there foam forming at the top of the sample? **Yes or No**	If yes, describe the foam:
Odor	Does the sample have an odor? **Yes or No**	If yes, describe the odor:
Oil Sheens	Does the sample have an oil sheen? **Yes or No**	If yes, describe the oil sheen:

Detail any concerns noted in the visual jar sample and describe the corrective actions taken:

"I certify under penalty of law that this report is true, accurate, and complete, to the best of my knowledge and belief."

Inspector's Name - Printed	Inspector's Signature	Date

APPENDIX F

Annual Comprehensive SWPPP Evaluation Report Form

INDUSTRIAL STORM WATER GENERAL PERMIT
COVERAGE NUMBER (MSR__ __ __ __ __ __)
ANNUAL COMPREHENSIVE SWPPP EVALUATION FORM

MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY

Coverage recipients shall conduct a comprehensive evaluation of the facility's SWPPP by December 31, 2021, and annually thereafter by December 31st of each year. The evaluation shall assess the effectiveness and accuracy of the SWPPP and ensure that the SWPPP is current, up to date, and meets all the requirements of ACT5 T-1 through T-9. Should the SWPPP need to be amended based on the findings of any evaluation, a copy of the amended SWPPP must be submitted to MDEQ in accordance with ACT9 S-1 (4).

FACILITY NAME:	EVALUATION DATE:
PHYSICAL ADDRESS:	

I. DESCRIPTION OF POTENTIAL POLLUTANT SOURCES

INDUSTRIAL ACTIVITIES	Yes	No	Findings & Remedial Action Documentation
• Does the SWPPP have a list of Industrial Activities exposed to storm water?	○	○	
• Has the facility added any Industrial Activities that are exposed to storm water since the previous Annual SWPPP Evaluation?	○	○	
MATERIALS AND POLLUTANTS			
• Does the SWPPP have a list of materials and pollutants exposed to storm water?	○	○	
• Does the SWPPP have a narrative description of the materials and pollultants?	○	○	
• If so, does the narrative contain the following information?			
o Method of storage and disposal.	○	○	
o Management practices employed to minimize contact with storm water.	○	○	
o Structural and non-structural control measures to reduce pollutants in storm runoff.	○	○	
o Any treatment the storm water receives.	○	○	
SPILLS AND LEAKS			
• Does the SWPPP contain a monthly updated list of spills and leaks?	○	○	
• Does the SWPPP contain an updated summary of all storm water samplaing data including a description of associated pollutants?	○	○	

I. DESCRIPTION OF POTENTIAL POLLUTANT SOURCES (CONTINUED)			
SITE MAP	Yes	No	Findings & Remedial Action Documentation
• Does the SWPPP have a site map showing the property layout with site boundaries?	○	○	
• If so, does the site map indicate the following features?			
o Surface water bodies.	○	○	
o Drainage area of each storm outfall by number.	○	○	
o Direction of flow for each drainage area.	○	○	
o Location and description of existing structural and non-structural control measures to reduce the pollutants in storm runoff.	○	○	
o Location of any storm water treatment activities.	○	○	
o Location of any storm drain inlets.	○	○	
o Location of industrial activities, such as:	○	○	
a) Fuel storage and dispensing locations. b) Vehicle/equipment repair, maintenance, and cleaning areas. c) Materials storage and handling areas. d) Loading/unloading areas. e) Process or manufacturing areas.			
o Location of housekeeping practices.	○	○	
o Storm water conveyances (ditches, pipes, & swales).	○	○	
II. DESCRIPTION OF STORM WATER MANAGEMENT CONTROLS			
POLLUTION PREVENTION MANAGER/COMMITTEE			
• Does the SWPPP specify individual(s) responsible for developing the SWPPP and assisting the facility manager in its implementation, maintenance, and revision?	○	○	
• If so, have there been any changes in the personnel listed since the previous Annual SWPPP Evaluation?	○	○	
RISK IDENTIFICATION AND MATERIAL INVENTORY			
• Does the SWPPP assess the pollution potential of various sources at the facility including loading and unloading operations; outdoor storage, manufacturing or processing activities; significant dust or particulate generating processes and on-site disposal practices?	○	○	
• If so, have there been any changes in operations or sources of potential pollutants since the previous Annual SWPPP Evaluation.?	○	○	

II. DESCRIPTION OF STORM WATER MANAGEMENT CONTROLS (CONTINUED)			
SEDIMENT AND EROSION PREVENTION	Yes	No	Findings & Remedial Action Documentation
• Does the SWPPP identify areas with a high potential for soil erosion, and specify prevention measures to limit erosion?	○	○	
• If so, have there been any changes to the facility which would increase the potential for soil erosion since the previous Annual SWPPP Evaluation?	○	○	
PREVENTIVE MAINTENANCE			
• Does the SWPPP contain a preventive maintenance program to insure the inspection and maintenance of storm water management devices?	○	○	
• If so, does the program specify protocol for inspecting and testing of equipment to preclude breakdowns or failures that may cause pollution?	○	○	
GOOD HOUSEKEEPING			
• Does the SWPPP describe and list practices appropriate to prevent pollutants from entering storm water from industrial activities due to poor housekeeping?	○	○	
• If so, do the practices describe or list the following:			
○ Designated areas for equipment maintenance and repair.	○	○	
○ Provisions for waste receptacles at convenient locations.	○	○	
○ Provisions for regular collection of waste.	○	○	
○ Adequately maintained sanitary facilities.	○	○	
○ Secondary containment around any on-site fuel or chemical container with a capacity greater than 660 gallons or any combination of containers which have an aboveground storage capacity of more than 1,320 gallons.	○	○	
○ Secondary containment for raw material stockpiles.	○	○	
SPILL PREVENTION AND RESPONSE PROCEDURES			
• Does the SWPPP identify potential spill areas and their drainage points?	○	○	
• Does the SWPPP specify material handling procedures and storage requirements?	○	○	
• Does the SWPPP have procedures for cleaning up spills?	○	○	
• Have there been any changes at the facility in potential spill areas and/or their drainage points since the previous Annual SWPPP Evaluation?	○	○	
EMPLOYEE TRAINING			
• Does the SWPPP specify periodic training for personnel that are responsible for implementing and/or complying with the requirements of the SWPPP? (see ACT14)	○	○	

II. DESCRIPTION OF STORM WATER MANAGEMENT CONTROLS (CONTINUED)			
ILLICIT CONNECTIONS EVALUATION AND CERTIFICATION	Yes	No	Findings & Remedial Action Documentation
• Does the SWPPP contain an illicit connection certification?	○	○	
• If so, was the certification evaluation and certification completed within the last 5 years?	○	○	
• Does the certification include the following?: o Method of evaluation, date(s), observation point(s), and result(s).	○	○	
ROUTINE VISUAL SITE INSPECTIONS			
• Does the SWPPP describe the policy and procedures for routine visual inspections, including frequencies and areas to be inspected?	○	○	
• Does the SWPPP inspection policy describe procedures for collecting storm water if the inspection is conducted during or after a storm event?	○	○	
• If so, does the SWPPP inspection policy outline procedures consistent with the requirements of ACT10 R-1 to investigate, correct, and document instances in which visible pollutants are observed?	○	○	
STORM WATER MANAGEMENT			
• Does the SWPPP provide for the management of storm water volume through its diversion, infiltration, storage or re-use?	○	○	
III. NON-STORM WATER DISCHARGE MANAGEMENT			
NON-STORM WATER MANAGEMENT			
• Does the SWPPP identify any allowable non-storm water discharges identified in ACT2 T-3?	○	○	
• Does the SWPPP identify and ensure the implementation of appropriate Best Management Practices (BMPs) for the non-storm water component of any discharge?	○	○	
• Have there been any changes or additions to the allowable non-storm water discharges since the previous Annual SWPPP Evaluation?	○	○	
IV. FACILITY CHANGES			
SWPPP AMENDMENT			
• Has there been a change in design, construction, operation, or maintenance, which may increase the discharge of pollutants to waters of the State or has the SWPPP been ineffective in controlling storm water pollutants? **If so, amend the SWPPP and submit it to the MDEQ within 30 days of amendment. (ACT9 S-1 (4))**	○	○	

V. MONTHLY INSPECTION SUMMARY (Previous 12 months)

DATE (mm/dd/yy)	TIME	ANY DEFICIENCIES? YES	ANY DEFICIENCIES? NO	IF YES, WERE CORRECTIVE ACTIONS TAKEN? YES	IF YES, WERE CORRECTIVE ACTIONS TAKEN? NO	INSPECTOR(S)

SWPPP EVALUATION CERTIFICATION STATEMENT AND SIGNATURE:

SWPPP Evaluation and Certification: This section must be completed by the person who conducted the SWPPP evaluation prior to submitting this form to the person with signature authority or a duly authorized representative.

"I certify that this report is true, accurate, and complete to the best of my knowledge and belief."

Name-Printed	Signature	Title	Date

RO/DAR CERTIFICATION AND SIGNATURE

Permittee-Certification:

☐ The SWPPP is in compliance with the terms and conditions of the Baseline Industrial Storm Water General Permit.

☐ The SWPPP is out of compliance with the terms and conditions of the Baseline Industrial Storm Water General Permit. The SWPPP will be amended and submitted to MDEQ within 30 days of amendment.

"I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Printed Name of person with Signature Authority or a Duly Authorized Representative[1]	Signature of person with Signature Authority or a Duly Authorized Representative[1]	Date

[1]A person is a Duly Authorized Representative only if 1) the authorization is made in writing and submitted to the permit board by a person described in ACT 16 T-9 [*"Signatory Requirements"*], and 2) the authorization specifies either an individual or a position having responsibility for the overall operation of the regulated activity, such as: manager, operator of a well or well field, superintendent, person of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company.

APPENDIX G

Correspondence to/from State

Place final signed NOI and any correspondence to/from state here.

APPENDIX H

Sediment Control Best Management Practice Designs

Brush/Fabric Barrier (BFB)

Practice Description

A brush/fabric barrier is a dam-like structure constructed from woody residue and faced with a geotextile fabric to provide a temporary sediment basin. This practice is applicable on sites with a small drainage area where brush and other woody debris are available from a clearing and grubbing operation.

Planning Considerations

This practice is intended to be a temporary sediment basin with a limited life span and applicable only for small drainage areas.

The barrier should be located downslope from areas with potential sheet and rill erosion, with adequate storage volume in front of the barrier, and with no more than 2 acres of drainage area.

Adequate woody material from clearing and grubbing required on the site must be available for the construction of the barrier.

The practice should be located and designed so that adequate storage volume and detention time can be obtained, and failure of the barrier will not result in hazard to the public or damage to work on either on-site or off-site property.

Design Criteria and Construction

Prior to start of construction, a qualified design professional should determine the location and storage for the barrier. Typically, brush/fabric barriers are constructed where materials are readily available and at a location with adequate storage characteristics.

Drainage Area

Brush/fabric barriers should be designed with no more than 2 acres of drainage area. A sediment basin should be considered for larger drainage areas (see *Sediment Basin Practice*).

Structure Life

The design life of the structure should be 1 year or less. The barrier should be removed, and sediment accumulations properly stabilized prior to completion of the construction project.

Sediment Storage

The barrier should be designed to provide 67 cubic yards of sediment storage per acre of disturbed drainage area. Sediment should be removed and properly utilized on-site when half of the sediment storage volume has been filled.

Site Location and Preparation

The site for the barrier should be located so that a basin capable of providing the sediment storage required can be obtained or created. The site for the barrier should be smoothed prior to placement of the brush.

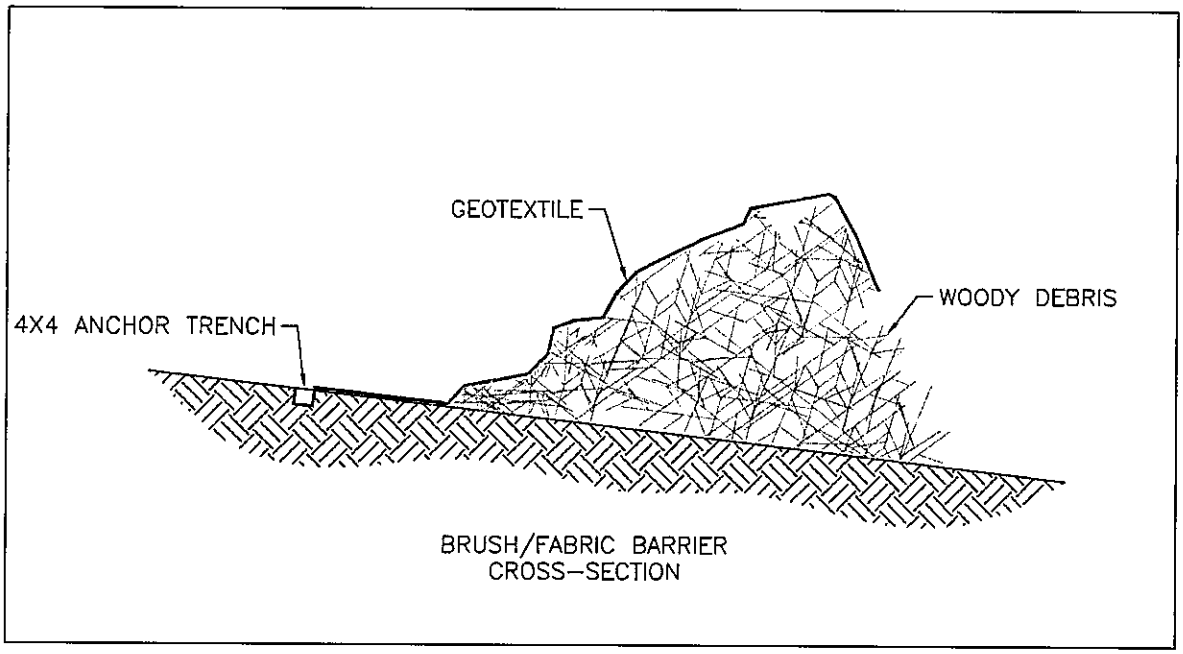

Figure BFB-1 Typical Installation

Materials Installation

Place the cleared and grubbed material in a densely compacted row, mostly on the contour, with each end upturned so that excessive flows will go over the top of the barrier and not around the ends of the barrier. Figure BFB–1 shows the typical installation.

Densely packed material should be placed so that the main stems of the woody debris are aligned with the length of the barrier. Small stems and limbs protruding from the bundle that could damage the fabric should be trimmed.

Generally, the barrier should be at least 3 feet tall, but no more than 6 feet tall. The width of the barrier perpendicular to the direction of flow should be at least 5 feet at its base.

Geotextile filter fabric consistent with the fabric used for silt fencing can be used to cover the face of the barrier. It is best to use wide and long rolls of the fabric so that splicing is minimized or eliminated. The fabric used to face the upstream surface of the brush should be non-woven geotextile equivalent to Class II fabric (see Table BFB-1).

The fabric should be securely buried at the bottom of an excavated trench that is at least 6" deep in front of the barrier. Prior to backfilling the trench, the fabric should be securely staked at 3-foot centers with minimum 18" long wooden stakes.

The fabric to be used should be supplied in lengths and widths to minimize vertical splices and eliminate horizontal splices. Avoid longitudinal splices of the fabric. Vertical splices must be securely fastened to each other so that flows will not short-circuit through the splice. The minimum vertical splice overlap should be 3 feet. Vertical splices must be securely fastened to each other so that flows will not short-circuit through the splice.

The top edge of the fabric should be secured so that it will not sag below the designed storage elevation. The upper edge can be anchored with twine fastened to the fabric and secured to stakes behind the barrier.

Table BFB-1 Requirements for Nonwoven Geotextile

Property	Test method	Class I	Class II	Class III	Class IV [1]
Tensile strength (lb) [2]	ASTM D 4632 grab test	180 minimum	120 minimum	90 minimum	115 minimum
Elongation at failure (%) [2]	ASTM D 4632	≥50	≥50	≥50	≥50
Puncture (pounds)	ASTM D 4833	80 minimum	60 minimum	40 minimum	40 minimum
Ultraviolet light (% residual tensile strength)	ASTM D 4355 150-hr exposure	70 minimum	70 minimum	70 minimum	70 minimum
Apparent opening size (AOS)	ASTM D 4751	As specified max. no. 40 [3]	As specified max. no. 40 [3]	As specified max. no. 40 [3]	As specified max. no. 40 [2]
Permittivity sec^{-1}	ASTM D 4491	0.70 minimum	0.70 minimum	0.70 minimum	0.10 minimum

Table copied from NRCS Material Specification 592.

1 Heat-bonded or resin-bonded geotextiles may be used for Classes III and IV. They are particularly well suited to Class IV. Needle-punched geotextile is required for all other classes.
2 Minimum average roll value (weakest principal direction).
3 U.S. standard sieve size.

Construction Verification

Check finished size, elevation, storage, and shape for compliance with standard drawings and materials list. (Check for compliance with specifications if included in contract specifications.)

Common Problems

Consult with a qualified design professional if any of the following occurs:

Variations in topography on-site indicate brush/fabric barrier will not function as intended. Change in design plan will be needed.

There is not adequate cleared, woody material to construct the barrier.

Materials specified in the plan are not available.

Maintenance

Inspect the barrier for short-circuiting of water or flow around the ends of the barrier after each significant rainfall event.

Sediment should be removed if it reaches a depth half of the original fabric height. If the area behind the barrier fills with sediment, there is a greater likelihood that water will flow around the end of the barrier and cause the practice to fail.

Large rainfall events that overtop the structure can result in gully erosion behind the barrier. This should be repaired as needed.

Brush/fabric barriers are temporary structures and should be removed when their useful life has been completed. All accumulated sediment should be properly stabilized. and the area where the barrier was located should be seeded and mulched immediately unless a different treatment is prescribed.

References

BMPs from Volume 1

Chapter 4

Sediment Basin (SBN) 4-298

MDOT Drawing ECD-2

Details of Sediment Barrier Applications 4-259

MDOT Drawing TEC-1

Typical Temporary Erosion Control Measures 4-260

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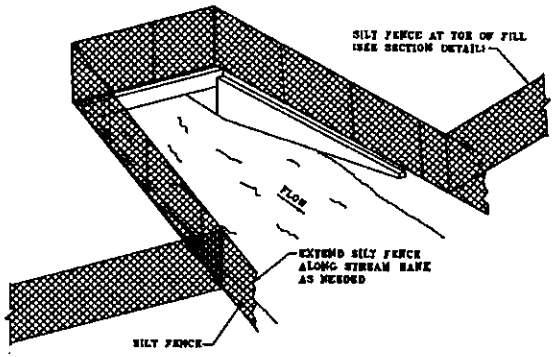
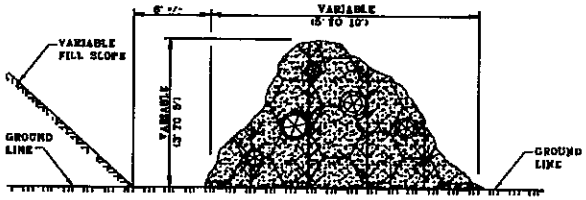


SEDIMENT BARRIER AT CROSS DRAIN

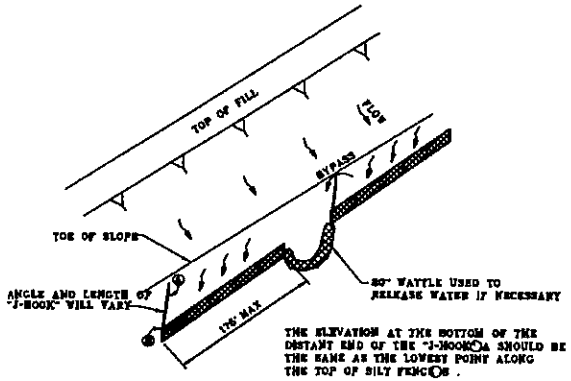
FRONT ELEVATION



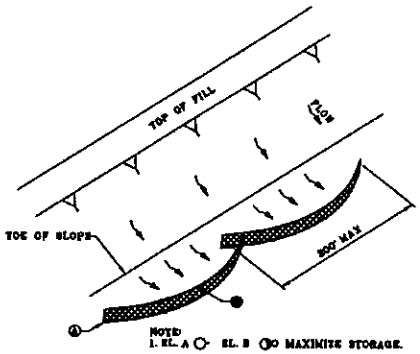
SIDE ELEVATION

TEMPORARY BRUSH BARRIER

NOTES:
1. BRUSH BARRIER MAY BE USED WHERE NATURAL GROUND IS LEVEL OR SLOPING AWAY FROM PROJECT.
2. PLACE BRUSH, LOG AND TREE LAPS APPROXIMATELY PARALLEL TO TOE OF FILL SLOPE WITH SOME OF THE HEAVIER MATERIALS BEING PLACED ON TOP TO PROPERLY SECURE THE BARRIER AS DETAILED AT LOCATIONS SHOWN ON PLANS OR AS DIRECTED OR PERMITTED BY THE ENGINEER.
3. TO ALLOW WATER TO SEEP THROUGH BRUSH BARRIER, INTERMINGLE THE BRUSH, LOG AND TREE LAPS SO AS NOT TO FORM A SOLID DAM.
4. THE BRUSH BARRIER MAY BE CHOKED WITH FILTER FABRIC.
5. TEMPORARY BRUSH BARRIER WILL NOT BE MEASURED FOR SEPERATE PAYMENT

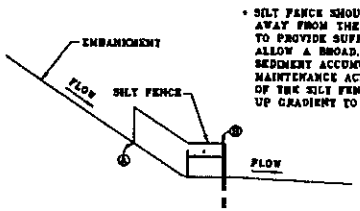


"J-HOOK" SILT FENCE APPLICATION



"SMILE-CONFIGURATION" SILT FENCE APPLICATION

NOTE
1. ANCHOR AND INSTALL SILT FENCE PER DETAILS SHOWN ON ECD-3



* SILT FENCE SHOULD BE LOCATED AWAY FROM THE TOE OF THE SLOPE TO PROVIDE SUFFICIENT SPACE TO ALLOW A BROAD, FLAT AREA FOR SEDIMENT ACCUMULATION AND MAINTENANCE ACTIVITIES. THE ENDS OF THE SILT FENCE SHOULD BE TURNED UP GRADIENT TO MAXIMIZE STORAGE.

SILT FENCE SECTION AT TOE OF FILL

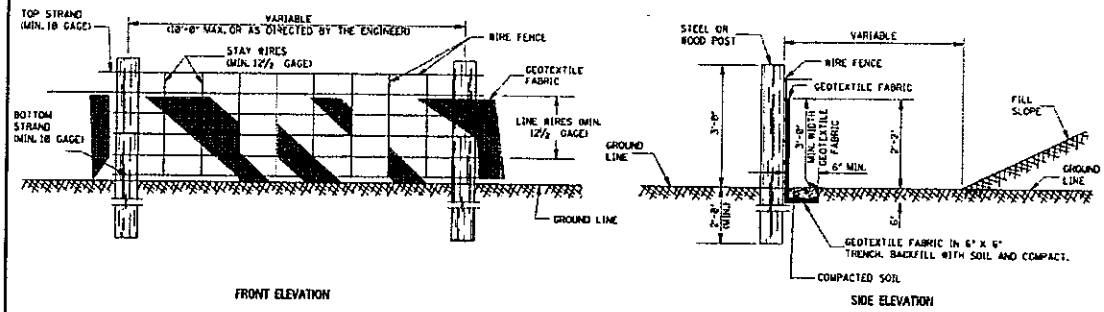
MISSISSIPPI DEPARTMENT OF TRANSPORTATION

DETAILS OF SEDIMENT BARRIER APPLICATIONS

WORKING NUMBER ECD-2

SHEET NUMBER

FILENAME: EROSION CONTROL\ECD-2.DGN



TEMPORARY SILT FENCE

NOTES:

1. WIRE SHALL BE MINIMUM OF 32" IN WIDTH AND SHALL HAVE A MINIMUM OF 6 LINE WIRES WITH 12" STAY SPACING.
2. GEOTEXTILE FABRIC SHALL BE A MINIMUM OF 36" IN WIDTH AND SHALL BE FASTENED ADEQUATELY TO THE WIRE AS DIRECTED BY THE ENGINEER.
3. STEEL POST SHALL BE 5'-0" IN HEIGHT AND OF THE SELF-FASTENER ANGLE STEEL TYPE. WOOD POST SHALL BE A MINIMUM OF 5'-0" IN HEIGHT AND 3" OR MORE IN DIAMETER. WIRE FENCE SHALL BE FASTENED TO WOODEN POST WITH NOT LESS THAN 9 GAGE WIRE STAPLES 1" LONG.
4. GEOTEXTILE FABRIC MEETING THE TYPE II MATERIAL REQUIREMENTS AND INSTALLED ACCORDING TO SPECIFICATIONS MAY BE USED WITHOUT WIRE FENCE.

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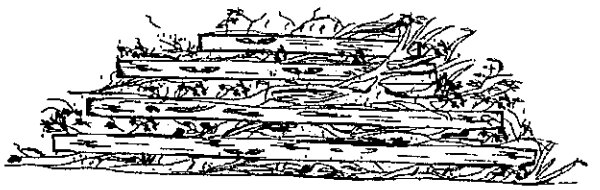
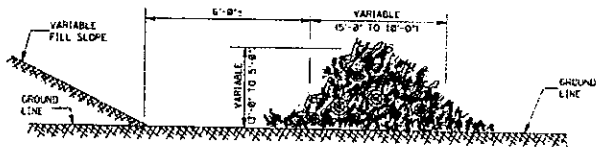


FRONT ELEVATION

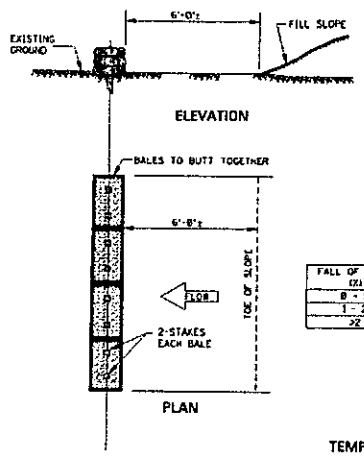


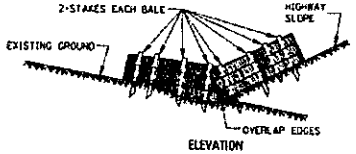
SIDE ELEVATION

TEMPORARY BRUSH BARRIER

NOTES:

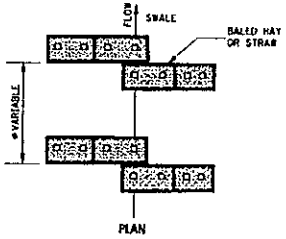
1. BRUSH BARRIER TO BE USED WHERE NATURAL GROUND IS LEVEL OR SLOPING AWAY FROM PROJECT.
2. PLACE BRUSH, LOG AND TREE LAPS APPROXIMATELY PARALLEL TO TOE OF FILL SLOPE WITH SOME OF THE HEAVIER MATERIALS BEING PLACED ON TOP TO PROPERLY SECURE THE BARRIER AS DETAILED AT LOCATIONS SHOWN ON PLANS OR AS DIRECTED BY THE ENGINEER.
3. TO ALLOW WATER TO FLOW THROUGH BRUSH BARRIER, INTERMINGLE THE BRUSH, LOG AND TREE LAPS SO AS NOT TO FORM A SOLID DAM.

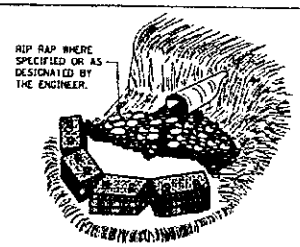




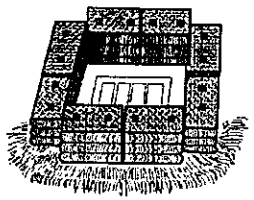
NOTE: SIMILAR TREATMENT TO BE USED IN DITCHES.

FALL OF DITCH (X)	DISTANCE (Y)
0 - 1	100'
1 - 2	50'
>2	25'





CULVERT



DROP INLET

TEMPORARY EROSION CHECKS USING HAY OR STRAW BALES

NOTE: EMBED ALL BALES 3" MINIMUM INTO GROUND AND STAKE 12" X 2" X 36" SECURELY.

GENERAL NOTES:

1. THE CONTRACTOR SHALL BE REQUIRED TO FURNISH ALL MATERIALS AND PERFORM ALL WORK FOR THE PROPER INSTALLATION, MAINTENANCE AND REMOVAL OF TEMPORARY EROSION CONTROL MEASURES NECESSARY TO CONTROL SILTATION.
2. TEMPORARY BRUSH BARRIERS SHALL BE USED AS REQUIRED BUT WILL NOT BE MEASURED FOR SEPARATE PAYMENT.
3. THE USE OF TEMPORARY EROSION CONTROL MEASURES OTHER THAN TEMPORARY BRUSH BARRIERS WILL ONLY BE REQUIRED AND MEASURED FOR SEPARATE PAYMENT WHEN APPROPRIATE PAY ITEM(S) IS INCLUDED IN THE BID SCHEDULE OF THE PROPOSAL.

BY | DATE | REVISION

MISSISSIPPI DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN DIVISION
STANDARD PLAN

TYPICAL TEMPORARY EROSION CONTROL MEASURES
(SILT FENCE, HAY BALES & BRUSH BARRIER)

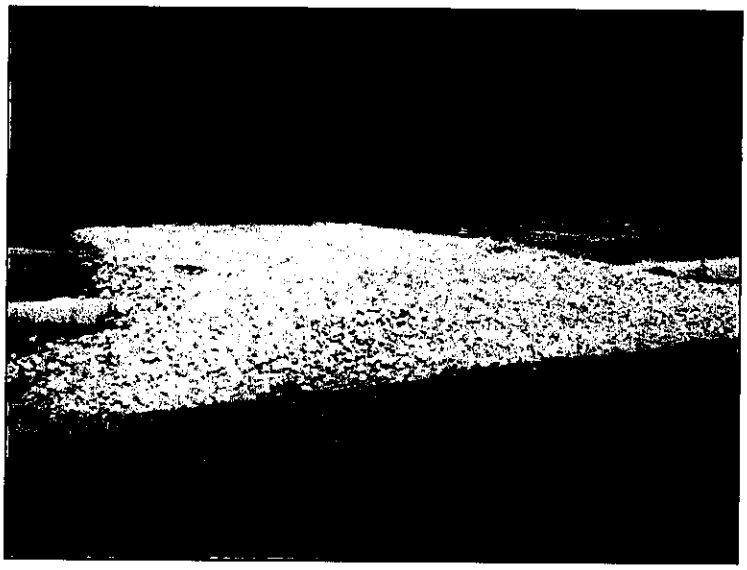
ENGLISH

WORKING NUMBER: TEC-1

ISSUE DATE: OCTOBER 1, 1998

SHEET NUMBER: 142

Construction-Exit Pad (CEP)



Practice Description

A construction-exit pad is a stone-base pad designed to provide a buffer area where mud- and caked-soil can be removed from the tires of construction vehicles to avoid transporting it onto public roads. This practice applies anywhere traffic will be leaving a construction site and moving directly onto a public road or street.

Planning Considerations

Roads and streets adjacent to construction sites should be kept clean for the general safety and welfare of the public. A construction-exit pad (Figure CEP-1) should be provided where mud can be removed from construction vehicle tires before they enter a public road.

If the action of the vehicle traveling over the gravel pad does not sufficiently remove the mud, or if the site is in a particularly sensitive area, a washing facility should be included with the pad (Figure CEP-2). When a washing facility is required, all wash water shall be diverted into a sediment trap or basin.

If the construction-exit pad is located in an area with soils that will not support traffic when wet, a geotextile liner located beneath the aggregate will be required to provide stability to the pad.

Construction of stabilized roads throughout the development site should be considered to lessen the amount of mud transported by vehicular traffic. The construction-exit pad

should be located to provide for maximum use by construction vehicles. Consideration should be given to limiting construction vehicles to only one ingress and egress point. Measures may be necessary to make existing traffic use the construction-exit pad.

Design Criteria and Construction

Site Preparation

Remove all vegetation and other unsuitable material from the foundation area.

Grading

Grade and crown the area for positive drainage. Utilize a diversion to direct any surface flow away from the construction-exit pad. Any runoff from the pad should be diverted into a sediment trap or basin. Install a pipe under the pad, if needed, to maintain drainage ditches along public roads.

Aggregate Size

Aggregate should be Mississippi Department of Transportation Size 1 Stabilizer. Aggregate surface shall be left smooth and sloped for drainage.

Pad Dimensions

The exit pad shall have a minimum aggregate thickness of 6". The exit pad must be a minimum of 50 feet long and shall provide for entering and parking the longest construction vehicles anticipated. MDOT Drawing ECD-15 provides an example of a stabilized construction entrance. The exit pad shall have a typical width of 20 feet, but may be narrower or wider to equal the full width of the vehicular egress.

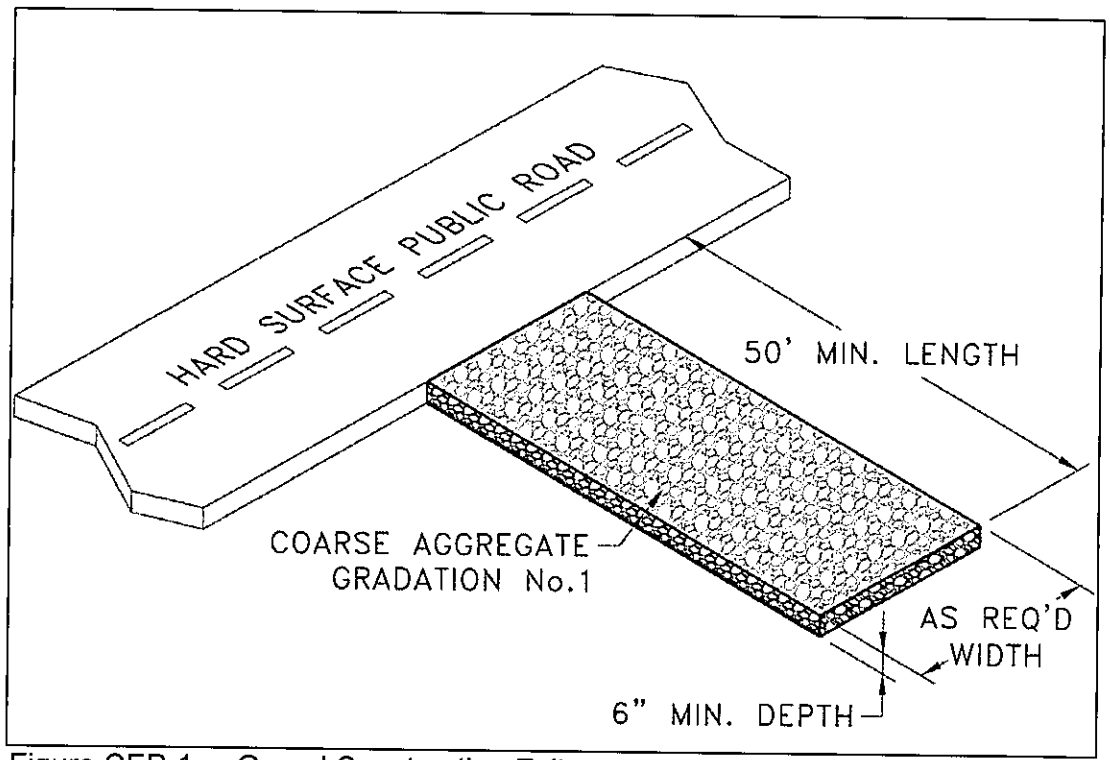


Figure CEP-1 Gravel Construction Exit

Geotextiles

A non-woven geotextile meeting the requirements shown in the table below for Class IV geotextiles should be used under the rock when the subgrade is soft or the blow count is less than 10.

Table CEP-1 Requirements for Nonwoven Geotextile

Property	Test method	Class I	Class II	Class III	Class IV [1]
Tensile strength (lb) [2]	ASTM D 4632 grab test	180 minimum	120 minimum	90 minimum	115 minimum
Elongation at failure (%) [2]	ASTM D 4632	≥ 50	≥ 50	≥ 50	≥ 50
Puncture (pounds)	ASTM D 4833	80 minimum	60 minimum	40 minimum	40 minimum
Ultraviolet light (% residual tensile strength)	ASTM D 4355 150-hr exposure	70 minimum	70 minimum	70 minimum	70 minimum
Apparent opening size (AOS)	ASTM D 4751	As specified max. #40 [3]	As specified max. #40 [3]	As specified max. #40 [3]	As specified max. #40 [3]
Permittivity sec^{-1}	ASTM D 4491	0.70 minimum	0.70 minimum	0.70 minimum	0.10 minimum

Table copied from NRCS Material Specification 592.

1 Heat-bonded or resin-bonded geotextile may be used for classes III and IV. They are particularly well suited to class IV. Needle-punched geotextile required for all other classes.

2 Minimum average roll value (weakest principal direction).

3 U.S. standard sieve size.

Washing

A washing facility shall be provided, if necessary, to prevent mud- and caked-soil from being transported to public streets and highways. It shall be constructed of concrete, stone, and/or other durable materials. Provisions shall be provided for the mud and other material to be carried away from the washing facility into a sediment trap or basin to allow for settlement of the sediment from the runoff before it is released from the site.

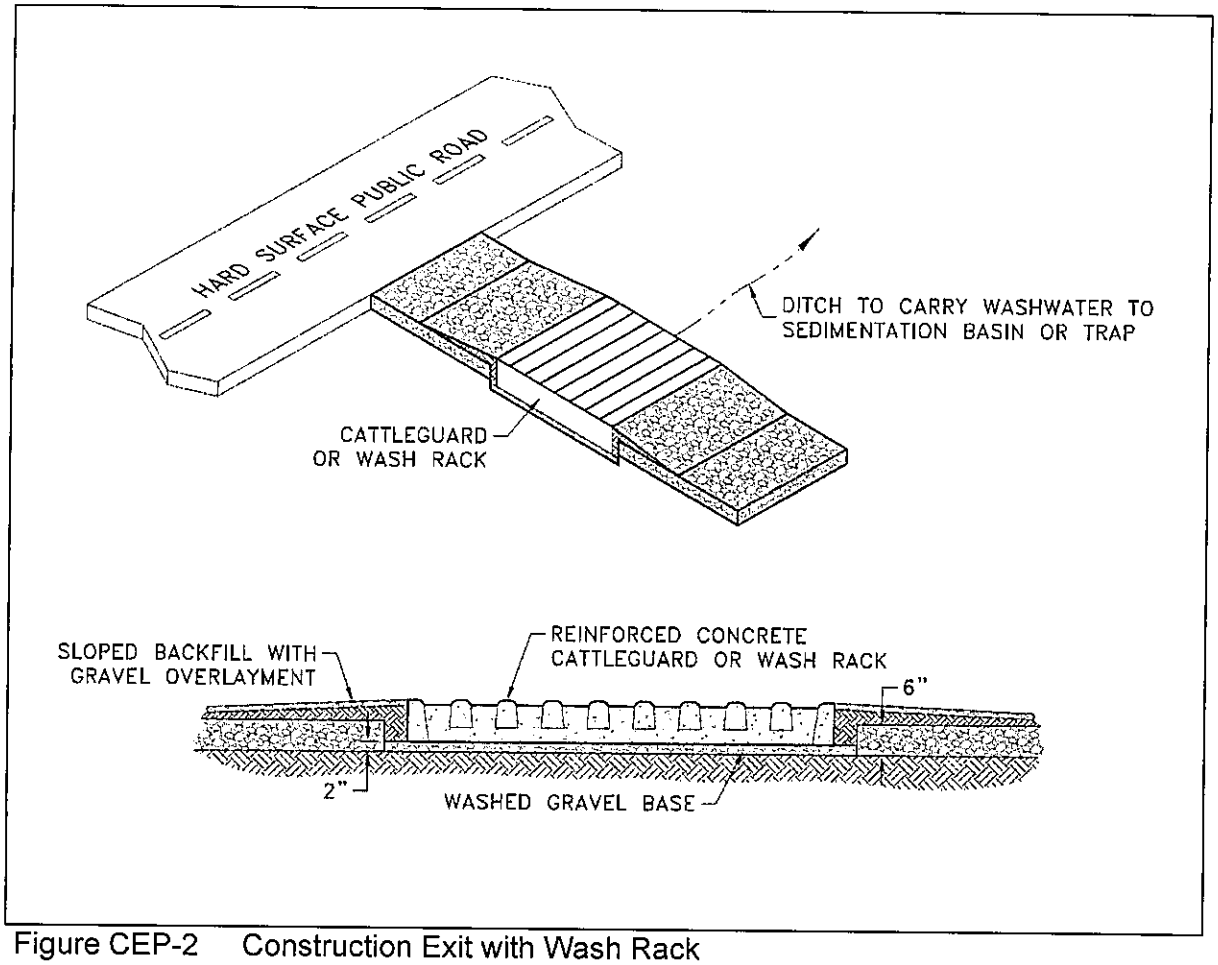


Figure CEP-2 Construction Exit with Wash Rack

Common Problems

Consult with a qualified design professional if any of the following occur:

Inadequate runoff control and sediment washes onto public road: install diversions or other runoff-control measures.

Ruts and muddy conditions develop as stone are pressed into soil: increase stone size or pad thickness, or add geotextile fabric.

Pad too short for heavy-construction traffic: consult design professional about extending pad to the necessary length

Maintenance

Remove large chunks of mud- or caked-soil from construction-exit pad daily to minimize sediment buildup.

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 of the practice.

Immediately remove mud or sediment tracked or washed onto public road.

Repair any broken-road pavement immediately.

Remove unneeded exit-pad materials from areas where permanent vegetation will be established.

References

BMPs from Volume 1

Chapter 4

MDOT Drawings Referenced

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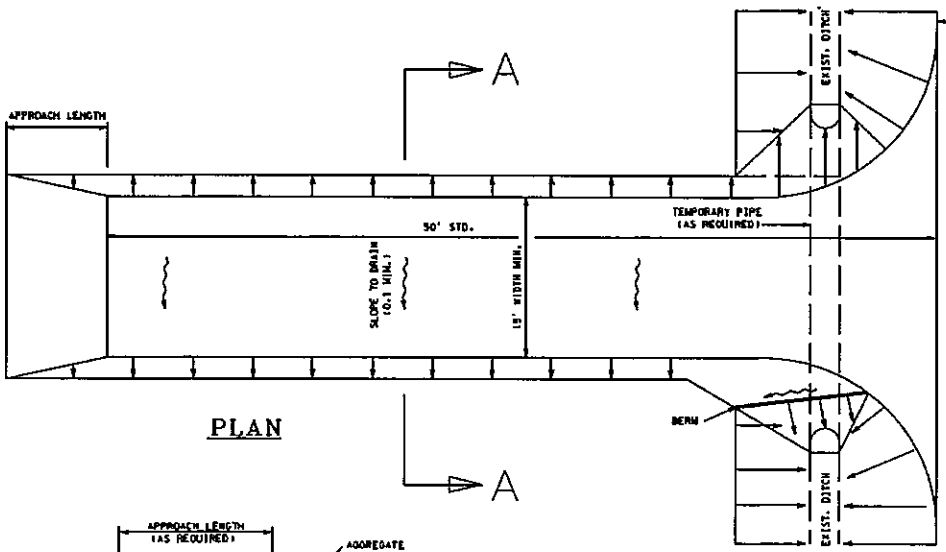


PLAN

NOTES:

1. A STABILIZED CONSTRUCTION ENTRANCE SHALL BE CONSTRUCTED AT POINTS OF EGRESS FROM UNSTABILIZED AREAS OF THE PROJECT TO PUBLIC ROADS WHERE OFFSITE TRACKING OF MUD COULD OCCUR. TRAFFIC FROM UNSTABILIZED AREAS OF THE PROJECT SHALL BE DIRECTED THRU THE STABILIZED ENTRANCE. BARRIERS, FLAGGING, OR OTHER POSITIVE MEANS SHALL BE USED AS REQUIRED TO LIMIT AND DIRECT VEHICULAR EGRESS ACROSS THE STABILIZED ENTRANCE.

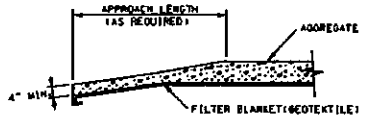
2. THE CONTRACTOR MAY PROPOSE AN ALTERNATIVE TECHNIQUE TO MINIMIZE OFFSITE TRACKING OF SEDIMENT. THE ALTERNATIVE MUST BE REVIEWED AND APPROVED BY THE ENGINEER PRIOR TO IT'S USE.

3. ALL MATERIALS SPILLED, DROPPED, OR TRACKED INTO PUBLIC ROADS (INCLUDING THE STABILIZED CONSTRUCTION ENTRANCE AGGREGATE AND CONSTRUCTION MUD) SHALL BE REMOVED DAILY, OR MORE FREQUENTLY IF SO DIRECTED BY THE ENGINEER.

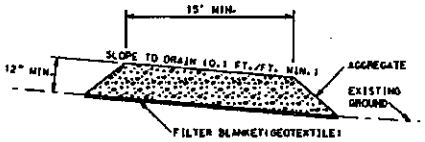
4. SIZE 1 STABILIZER AGGREGATE SHALL BE USED

5. THE STABILIZED CONSTRUCTION ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL ALLOW IT TO PERFORM IT'S FUNCTION TO PREVENT OFFSITE TRACKING. THE STABILIZED CONSTRUCTION ENTRANCE SHALL BE RINSED WHEN NECESSARY TO MOVE ACCUMULATED MUD DOWNWARD THRU THE STONE. ADDITIONAL STABILIZATION OF THE VEHICULAR ROUTE LEADING TO THE STABILIZED ENTRANCE MAY BE REQUIRED TO LIMIT THE MUD TRACKED.

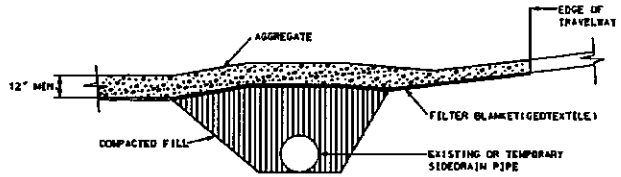
6. THE NOMINAL SIZE OF A STANDARD STABILIZED CONSTRUCTION ENTRANCE IS 15' X 50' UNLESS OTHERWISE SHOWN IN THE EROSION CONTROL PLAN



TRANSITION DETAIL



SECTION A-A



RURAL CONNECTION DETAIL

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

STABILIZED CONSTRUCTION ENTRANCE

WORKING NUMBER
ECD-15
SHEET NUMBER

FILENAME: EROSION CONTROL\ECD-15.DGN

Dust Control (DC)

Practice Description

Dust control includes a wide range of techniques that prevent or reduce movement of wind-borne soil particles (dust) during land disturbing activities. This practice applies to construction routes and other disturbed areas where on-site and off-site damage or hazards may occur if dust is not controlled.

Planning Considerations

Construction activities that disturb soil can be a significant source of air pollution. Large quantities of dust can be generated, especially in "heavy" construction activities such as land grading for road construction and commercial, industrial, or subdivision development.

The scheduling of construction operations so that the least amount of area is disturbed at one time is important in planning for dust control.

The greatest dust problems occur during dry periods. Therefore, to the extent practicable, do not expose large areas of bare soil during drought conditions.

Where wind erosion is a potential cause of dust problems, preserving vegetation should be considered as a passive measure. Leave undisturbed buffer areas between graded areas wherever possible.

Installing temporary- or permanent- surface stabilization measures immediately after completing land grading will minimize dust problems.

Design Criteria and Construction

Dust-control requirements should be designed by a qualified design professional and plans and specifications should be made available to field personnel prior to start of construction. Whenever possible, leave vegetated-buffer areas undisturbed between graded areas.

Scheduling

Schedule construction operations so that the smallest area is disturbed at any one time.

Permanent Methods

Vegetative Cover

For disturbed areas not subject to traffic, vegetation provides the most practical method of dust control. Establish vegetative cover according to the *Permanent Seeding* or *Temporary Seeding Practice.*

Topsoiling

This entails covering the surface with less erosive soil material. See *Topsoiling Practice* for guidance.

Stone

Stone used to stabilize construction roads can also be effective for dust control. Stone should be spread a minimum of 6″ thick over construction roads in the disturbed area. For heavily traveled roads or roads subjected to heavy loads, the stone thickness should be 8″ to 10″. A non-woven geotextile meeting the requirements shown in the Table DC-1 for Class IV geotextiles should be used under the rock when the subgrade is soft or the blow count is less than 10.

Temporary Methods

Mulches

Mulch offers a fast, effective means of controlling dust when properly applied. See *Mulching Practice* for guidelines on planning and installing the practice.

Temporary Vegetative Cover

For disturbed areas where no activity is anticipated for 14 days or longer, temporary seeding can effectively control dust. Establish vegetative cover according to *Temporary Seeding Practice* guidelines.

Calcium Chloride

Calcium chloride may be applied by mechanical spreader as loose, dry granules or flakes at a rate that keeps the surface moist, but not so high as to cause water pollution or plant damage. Sites may need to be retreated because the product degrades over time.

Table DC-1 Requirements for Nonwoven Geotextile

Property	Test method	Class I	Class II	Class III	Class IV [1]
Tensile strength (lb) [2]	ASTM D 4632 grab test	180 minimum	120 minimum	90 minimum	115 minimum
Elongation at failure (%) [2]	ASTM D 4632	≥ 50	≥ 50	≥ 50	≥ 50
Puncture (pounds)	ASTM D 4833	80 minimum	60 minimum	40 minimum	40 minimum
Ultraviolet light (% residual tensile strength)	ASTM D 4355 150-hr exposure	70 minimum	70 minimum	70 minimum	70 minimum
Apparent opening size (AOS)	ASTM D 4751	As specified max. no.40 [3]	As specified max. no.40 [3]	As specified max. no.40 [3]	As specified max. no.40 [3]
Permittivity sec–1	ASTM D 4491	0.70 minimum	0.70 minimum	0.70 minimum	0.10 minimum

Table copied from NRCS Material Specification 592.

[1] Heat-bonded or resin-bonded geotextile may be used for classes III and IV. They are particularly well suited to class IV. Needle-punched geotextile are required for all other classes.
[2] Minimum average roll value (weakest principal direction).
[3] U.S. standard sieve size.

Spray-on Adhesives

Spray-on adhesives may be used on mineral soils for dust control. Traffic must be kept off treated areas to prevent the product from becoming ineffective. Examples of spray-on adhesives for use in dust control are listed in Table DC-2.

Table DC-2 Spray-on Adhesives for Dust Control on Mineral Soil

Material	Water Dilution	Type of Nozzle	Apply Gal/Ac
Latex Emulsion	12.5:1	Fine Spray	235
Resin In Water	4:1	Fine Spray	300

Chemical Stabilization (CHS)

PAM may be used on mineral soils for dust control. Traffic must be kept off treated areas to prevent the product from becoming ineffective. The manufacturer or supplier shall provide written application methods for PAM and PAM mixtures. The application method shall ensure uniform coverage to the target and avoid drift to non-target areas including waters of the State. The manufacturer or supplier shall also provide written instructions to ensure proper safety, storage, and mixing of the product. Refer to the *Planning Considerations for Chemical Stabilization (PAM) Practice* for planning considerations before deciding to use this product.

Sprinkling or Irrigation

Sprinkling is especially effective for dust control on haul roads and other traffic routes. Sprinkle the site until the surface is wet. Repeat as needed. Also, bare areas may be kept wet with irrigation to control dust as an emergency treatment.

Tillage

Tillage is used to roughen the site and bring clods and moist soil to the surface. This is a temporary emergency measure that can be used on large, open, disturbed areas as soon as soil blowing starts. Begin tilling on the windward edge of the site. The depth of tillage is determined by the depth to moist soil and the amount of moist soil desired at the surface. In sandy soils, the depth to moist soil may make tillage impractical.

Barriers

A board fence, wind fence, sediment fence, hay bales, or similar barriers can control air currents and blowing soil. Place barriers perpendicular to prevailing air currents at intervals about 15 times the barrier height.

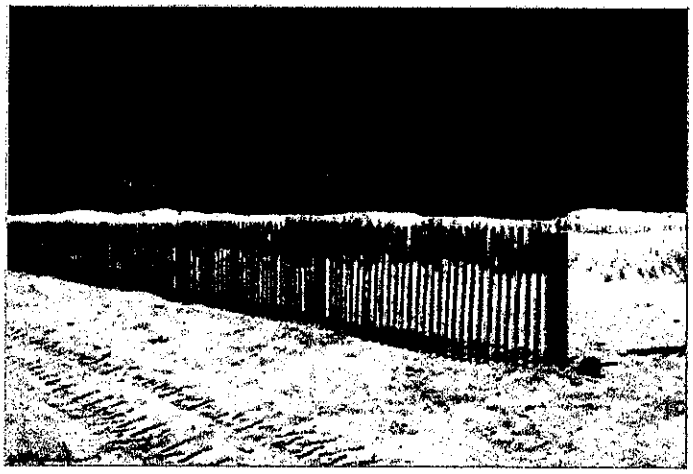


Figure 1 Sand Fence (http://www.gulfmex.org/erp/7004/fence.jpg)

Street Cleaning

Use a street sweeper to remove the source materials.

Maintenance

Check construction site during vehicular traffic or windy conditions to see if measures are working adequately. Maintain dust-control measures continuously throughout dry-weather periods, until all disturbed areas have been stabilized.

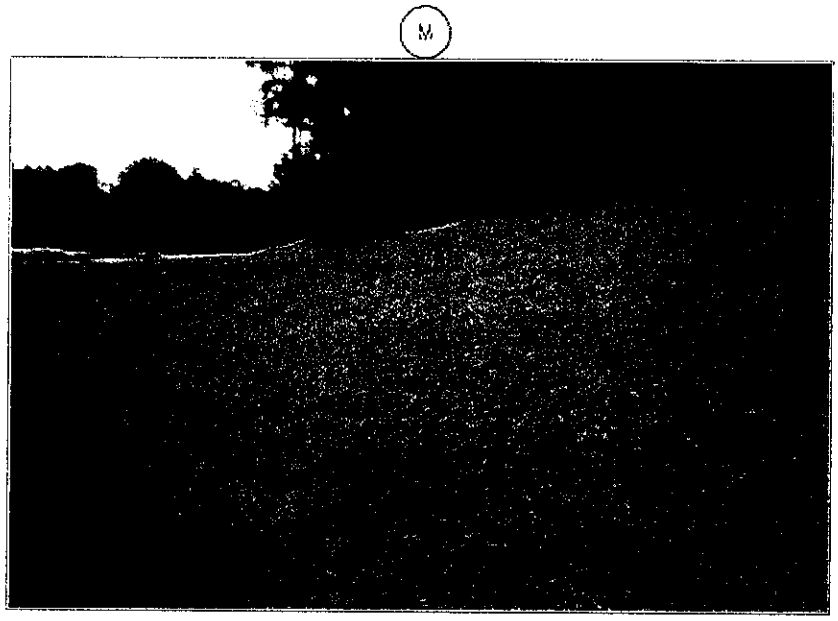
References

BMPs from Volume 1

Chapter 4

Topsoiling (TSG)	4-20
Chemical Stabilization (CHS)	4-25
Mulching (MU)	4-48
Permanent Seeding (PS)	4-53
Temporary Seeding (TS)	4-103

Mulching (MU)



Practice Description

Mulching is the application of plant residues such as straw or other suitable materials to the soil surface. Mulch protects the soil surface from the erosive force of raindrop impact and reduces the velocity of overland flow. It helps seedlings germinate and grow by conserving moisture, protecting against temperature extremes and controlling weeds. Mulch also maintains the infiltration capacity of the soil. Mulch can be applied to seeded areas to help establish plant cover. It can also be used in unseeded areas to protect against erosion over the winter or until final grading and shaping can be accomplished except in areas with concentrated flow.

Planning Considerations

Surface mulch is the most effective, practical means of controlling runoff and erosion on disturbed land prior to vegetation establishment. Mulch absorbs the energy associated with raindrops and thereby minimizes soil-particle detachment, which is the initiation step of erosion.

Mulch also reduces soil moisture loss by evaporation, prevents crusting and sealing of the soil surface, moderates soil temperatures, and provides a suitable microclimate for seed germination.

Organic mulches such as straw, wood chips and shredded bark have been found to be very effective mulch materials. Materials containing weed and grass seeds that may compete with establishing vegetation should not be used. Also, decomposition of some wood products can tie up significant amounts of soil nitrogen, making it necessary to modify fertilization rates or add fertilizer with the mulch.

A variety of erosion-control blankets have been developed in recent years for use as mulch, particularly in critical areas such as waterways and channels. Various types of netting materials are also available to anchor organic mulches.

The choice of materials for mulching should be based on soil conditions, season, type of vegetation to establish, and size of the area. Properly applied and tacked mulch is always beneficial. Mulching is especially important when conditions of germination are not optimum, such as midsummer and early winter, and on difficult sites with cut slopes, or fill slopes and droughty soils.

Straw is the most commonly used material in conjunction with seeding. Wheat straw is the mostly commonly used straw, and can be spread by hand or with a mulch blower. If the site is susceptible to blowing wind, the straw should be tacked down with a tackifier, a crimper, or a disk to prevent loss. Some site developers always require that straw mulch be tacked by an approved method.

Wood chips are suitable for areas that will not be closely mowed, and around ornamental plantings. Chips do not require tacking. Because they decompose slowly, they must be treated with 12 pounds of nitrogen per ton to prevent nutrient deficiency in plants. They can be an inexpensive mulch if the chips are obtained from trees cleared on the site.

Wood fiber refers to short cellulose fibers applied as a slurry in hydroseeding operations. Wood-fiber hydroseeder slurries may be used to tack straw mulch on steep slopes, critical areas, and where harsh climatic conditions exist.

Compost, peanut hulls, and pine straw are organic materials that potentially make excellent mulches but may only be available locally or seasonally. Creative use of these materials may reduce costs.

Jute mesh or the various types of netting is very effective in holding mulch in place on waterways and slopes before grasses become established.

Erosion-control blankets promote seedling growth in the same way as organic mulches and are suited for use in areas with concentrated flows (see *Erosion-Control Blanket Practice*).

Design Criteria and Installation

Mulching should be designed by a qualified design professional and plans and specifications should be made available to field personnel prior to start of construction.

Site Preparation

Divert runoff water from areas above the site that will be mulched.

Remove stumps, roots, and other debris from the construction area.

Grade area as needed to permit the use of equipment for seeding, mulching, and maintenance. Shape area so that it is relatively smooth.

If the area will be seeded, follow seeding specifications in the design plan and apply mulch immediately after seeding.

Spreading the Mulch

Select a mulch material based on the site and practice requirements, availability of material, and availability of labor and equipment. Table MU-1 lists commonly used mulches.

Uniformly spread organic mulches by hand or with a mulch blower at a rate which provides about 75% ground cover. When spreading straw mulch by hand, divide the area to be mulched into sections of approximately 1000 sq. ft. and place 70-90 pounds of straw (1 ½ to 2 bales) in each section to facilitate uniform distribution. Caution, an over-application of wheat straw will reduce stand success – do not over-apply wheat straw when mulching a seeding application!

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

- Crimp with a weighted, straight, notched disc or a mulch-anchoring tool 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 with netting, using a degradable natural or synthetic mesh. The netting should be anchored according to manufacturer's specifications (see *Erosion-Control Blanket Practice*).

- On steep slopes and other areas needing a higher degree of protection, use one of the following: 1) heavy natural nets without additional mulch; 2) synthetic netting with additional mulch or; 3) erosion control mats/blankets. These areas include grassed waterways, swales and diversion channels.

- Install netting and mats/blankets according to manufacturer's specifications making sure materials are properly anchored (see *Erosion-Control Blanket Practice*).

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 to attain 75% groundcover; anchor when subject to blowing.
Straw Alone (no seed)	2 ½-3 tons (115 lbs-160 lbs)	Spread by hand or machine; anchor when subject to blowing.
Wood Chips	5-6 tons (225 lbs-270 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.

Liquid-mulch binders can also be used to tack mulch subject to being blown away by wind. Applications of liquid-mulch binders and tackifiers should be heaviest at the edges of areas and at crests of ridges and banks, to resist wind. Binders should be applied uniformly to the rest of the area. Binders may be applied after mulch is spread or may be sprayed into the mulch as it is being blown onto the soil. Applying straw and binder together is the most effective method. Liquid binders include an array of commercially available synthetic binders.

Straw mulch may also be anchored with lightweight plastic, cotton, jute, wire or paper netting which is stapled over the mulch. The manufacturer's recommendations on stapling netting should be followed.

Verification of Installation

Check materials and installation for compliance with specifications.

Common Problems

Consult with qualified design professional if either of the following occurs:

Variations in topography on site indicate the mulching materials will not function as intended; changes in plan may be needed.

Design specifications for mulching materials or seeding requirements cannot be met; substitution may be required. Unapproved substitutions could result in erosion or seeding failure.

Problems that require remedial actions:

Erosion, washout and poor plant establishment; repair eroded surface, reseed, re-mulch and anchor mulch.

Mulch is lost to wind or stormwater runoff; reapply mulch and anchor appropriately by crimping, netting or tacking.

Maintenance

Inspect all mulched areas periodically and after rainstorms for erosion and damage to the mulch. Repair promptly and restore to original condition. Continue inspections until vegetation is well established. Keep mower height high if plastic netting is used to prevent netting from wrapping around mower blades or shaft.

References

BMPs from Volume 1

Chapter 4

Erosion-Control Blanket (ECB)	4-33
Permanent Seeding (PS)	4-53
Temporary Seeding (TS)	4-103

Permanent Seeding (PS)

(PS)

Practice Description

Permanent seeding is the establishment of perennial vegetation on disturbed areas from seed. Permanent vegetation provides economical long-term erosion control and helps prevent sediment from leaving the site. This practice is used when vegetation is desired and appropriate to permanently stabilize the soil.

Planning Considerations

The advantages of seeding over other means of establishing plants include the smaller initial cost, lower labor input, and greater flexibility of method.

Disadvantages of seeding include potential for erosion during the establishment stage, seasonal limitations on suitable seeding dates, and weather-related problems such as droughts.

The probability of successful plant establishment can be maximized through good planning. The selection of plants for permanent vegetation must be site specific. Factors that should be considered are types of soils, climate, establishment rate, and management requirements of the vegetation. Other factors that may be important are wear, mowing tolerance, and salt tolerance of vegetation.

Plant selection for permanent vegetation should be based on plant characteristics, site and soil conditions, time of year of planting, method of planting, and the intended use of the vegetated area. Climate factors can vary widely in Mississippi. Important plant attributes are discussed in *Vegetation Establishment for Erosion and Sediment Control* in Chapter 2.

Plant selection may include companion plants to provide quick cover on difficult sites, late seedings, or where the desired permanent cover may be slow to establish. Annuals are usually used for companion plants and should be selected carefully to prevent using a species that provide so much competition that it prevents the establishment of the desired species.

Seeding properly carried out within the optimum dates has a higher probability of success. It is also possible to have satisfactory establishment when seeding outside these dates. However, as plantings are deviated from the optimum dates, the probability of failure increases rapidly. Seeding dates should be taken into account in scheduling land-disturbing activities.

Site quality impacts both short-term and long-term plant success. Sites that have compacted soils, soils that are shallow to rock, or have textures that are too clayey or too sandy should be modified whenever practical to improve the potential for plant growth and long-term cover success.

The operation of equipment is restricted on slopes steeper than 3:1, severely limiting the quality of the seedbed that can be prepared. Provisions for establishment of vegetation on steep slopes can be made during final grading. In construction of fill slopes, for example, the last 4-6″ might not be compacted. A loose, rough seedbed with irregularities that hold seeds and lime and fertilizer is essential for hydroseeding. Cut slopes should be roughened (see *Land Grading Practice*).

Proper mulching is critical to protect against erosion on steep slopes. When using straw, anchor with netting. On slopes steeper than 2:1, jute, excelsior, or synthetic matting may be required.

The use of irrigation (temporary or permanent) will greatly improve the success of vegetation establishment.

Design Criteria and Installation

Prior to start of construction, plant materials, seeding rates and planting dates should be specified by a qualified design professional. Plans and specifications should be referred to by field personnel throughout the installation process.

Permanent seeding should be done during the specified planting period whenever possible. When sites are only available for planting outside of the recommended planting period, either an out-of-season permanent seeding, a temporary seeding, mulching or chemical stabilization will be more appropriate than leaving the surface bare for an extended period. If lime and fertilizer application rates are not specified, take soil samples during final grading from the top 6″ in each area to be seeded. Submit samples to a soil testing laboratory for lime and fertilizer recommendations.

Scheduling

The schedule for work at the site should consider the recommended planting period and whenever practical, the site work should accommodate seeding during the recommended planting period.

Plant Selection

Select plants that can be expected to meet planting objectives. To simplify plant selection, use Figure PS-1 Geographical Areas for Species Adaptation and Table PS-1, Commonly Used Plants for Permanent Cover. Mixtures commonly specified by the Mississippi Department of Transportation are an appropriate alternative for plantings on rights-of-ways. Additional information related to plantings in Mississippi is found in Chapter 2 under the section *Vegetation for Erosion and Sediment Control.*

The plants used for temporary vegetation may be used for companion plants provided the seeding rate is reduced by one half. See the *Temporary Seeding Practice* for additional information on establishing temporary vegetation. **Ryegrass or other highly competitive plants should not be used as a companion plant.**

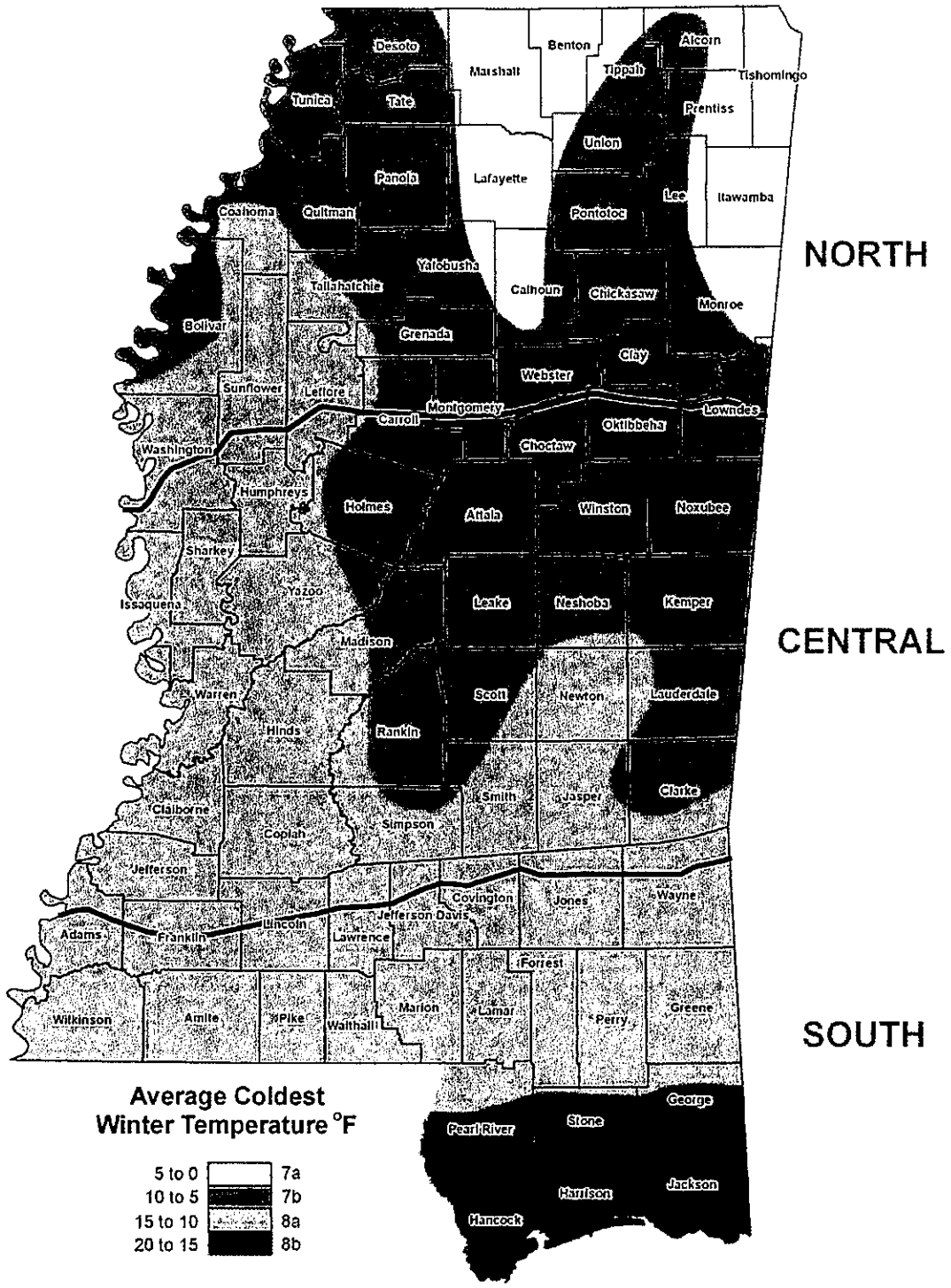


Figure PS-2 Geographical Areas for Species Adaptation

Table PS-1 Commonly Used Plants for Permanent Cover with Seeding Rates and Dates

Species	Seeding Rates/Ac	Planting Time	Desired pH Range	Fertilization Rate/Acre	Method of Establish-ment	Zone of Adaptability	Native / Introduced
Common Bermuda	15 lbs. alone 10lbs. mix	3/1 – 7/15 9/1 – 11/30	6.0 – 7.0	600 lbs. 13-13-13	Seed or sod	All	Introduced * Potential for Invasive-ness
Bahia	40 lbs. alone 30 lbs. mix	3/1 – 7/15 9/1 – 11/30	6.0 – 7.0	600 lbs. 13-13-13	Seed	Central and South	Introduced
Fescue	40 lbs. alone 30 lbs. mix	9/1 – 11/30	6.0 – 7.0	600 lbs. 13-13-13	Seed	North and Central	Native
Saint Augustine	--	3/1 – 7/15	6.0 – 7.0	600 lbs. 13-13-13	Sod only	Central and South	Native
Centipede	4 lbs. alone 2.5 lbs mix	3/1 – 715	6.0 – 7.0	600 lbs. 13-13-13	Seed or sod	All	Introduced
Carpet Grass	15 lbs. alone 10 lbs. mix	3/1 – 7/15	6.0 – 7.0	600 lbs. 13-13-13	Seed or sod	All	Native
Zoysia Grass	--	3/1 – 7/15	6.0 – 7.0	600 lbs. 13-13-13	Sod only	All	Introduced
Creeping Red Fescue	30 lbs. alone 22.5 lbs. mix	9/1 – 11/30	6.0 – 7.0	600 lbs. 13-13-13	Seed	All	Native
Weeping Lovegrass	10 lbs. alone 5 lbs. mix	3/1 – 7/15	6.0 – 7.0	600 lbs. 13-13-13	Seed	All	Introduced
***Wheat**	90 lbs. alone	9/1 – 11/30	6.0 – 7.0	600 lbs 13-13-13	Seed	All	Native
***Ryegrass**	30 lbs.	9/1 – 11/30	6.0 – 7.0	600 lbs 13-13-13	Seed	All	Native
***White Clover**	5 lbs.	9/1 – 11/30	6.0 – 7.0	400 lbs 6-24-24	Seed	All	Introduced
***Crimson Clover**	15 lbs.	9/1 – 11/30	6.0 – 7.0	400 lbs 6-24-24	Seed	All	Introduced
Sericea Lespedeza	40 lbs.	3/1 – 7/15 9/1 – 11/30	6.0 – 7.0	400 lbs. 13-13-13	Seed	All	Introduced
***Hairy Vetch**	30 lbs.	9/1 – 11/30	6.0 – 7.0	400 lbs 6-24-24	Seed	All	Introduced
***Browntop Millet**	40 lbs. alone 15 lbs. mix	4/1 – 8/30	6.0 – 7.0	600 lbs 13-13-13	Seed	All	Introduced

* Note on Annuals: For permanent seeding, annuals can only be used in a mixture with perennials.

Seedbed Requirements

Establishment of vegetation should not be attempted on sites that are unsuitable due to compaction or inappropriate soil texture, poor drainage, concentrated overland flow, or steepness of slope until measures have been completed to correct these problems. To maintain a good stand of vegetation, the soil must meet certain minimum requirements as a growth medium. A good growth medium should have these attributes:

- Sufficient pore space to permit root penetration.
- Enough fine-grained soil material (silt and clay) to maintain adequate moisture and nutrient supply.
- Sufficient depth of soil to provide an adequate root zone. The depth to rock or impermeable layers such as hardpans should be 12" or more, except on slopes steeper than 2:1 where topsoiling is not feasible.
- A favorable pH range for plant growth, usually 6.0-6.5.
- Sufficient nutrients (nitrogen, phosphorus and potassium) for initial plant establishment.
- Freedom from large roots, branches, stones, or large clods. Clods and stones may be left on slopes steeper than 3:1 if they are to be hydroseeded.

If any of the above attributes are not met; i.e., if the existing soil is too dense, coarse, shallow or acidic to foster vegetation – chiseling, topsoil, or special amendments should be used to improve soil conditions. The soil conditioners described below may be beneficial or topsoil may be applied (for guidance on topsoiling see *Topsoiling Practice*). These amendments should only be necessary where soils have limitations that make them poor for plant growth or for turf establishment.

- Peat-appropriate types are sphagnum moss peat, reed-sedge peat, or peat humus, all from fresh-water sources. Peat should be shredded and conditioned in storage piles for at least 6 months after excavation.
- Sand-should be clean and free of toxic materials.
- Vermiculite-use horticultural grade.
- Rotted manure-use stable or cattle manure not containing undue amounts of straw or other bedding materials.
- Thoroughly rotted sawdust-should be free of stones and debris. Add 6 lbs of nitrogen to each cubic yard.

Soil Amendments

Liming Materials

Lime (Agricultural limestone) should have a neutralizing value of not less than 90 percent calcium carbonate equivalent and 90 percent will pass through a 10-mesh sieve and 50 percent will pass through a 60-mesh sieve.

Selma chalk should have a neutralizing value of not less than 80-percent calcium carbonate equivalent and 90 percent will pass through a 10-mesh sieve.

Other liming materials that may be selected should be provided in amounts that provide equal value to the criteria listed for agricultural lime or be used in combination with agricultural limestone or Selma chalk to provide equivalent values to agricultural limestone.

Plant Nutrients

Commercial grade fertilizers that comply with current Mississippi Fertilizer Laws should be used to supply nutrients required to establish vegetation.

Rates of Soil Amendments

Lime and fertilizer needs should be determined by soil tests. Soil testing is performed by the Mississippi State University Extension Service Soil Testing Laboratory and provides recommendations based on field tests on Mississippi soils. The local county Cooperative Extension Service can provide information on obtaining soil tests. Commercial laboratories that make recommendations based on soil analysis may be used.

When soil tests are not available, use the following rates for application of soil amendments.

Lime (Agricultural Limestone or Equivalent – see Liming Materials)

Sandy soils: Use 1 ton/acre (exception on sandy soils – if the cover will be tall fescue and clover use 2 tons/acre).

Clayey soils: 2 tons/acre.
(Do not apply lime to alkaline soils).

Fertilizer

Grasses alone: Use 400 lbs/acre of 8-24-24 or the equivalent. Apply 30 lbs of additional nitrogen when grass has emerged and begun growth (approximately 0.8lbs/1000 ft^2).

Grass-legume mixtures: Use 800 to 1200 lbs/acre of 5-10-10 or the equivalent.

Legumes Alone: Use 800 to 1200 lbs/acre of 0-10-10 or the equivalent.

Note: Fertilizer can be blended to meet exact fertilizer recommendations. Take soil test recommendations to local fertilizer dealer for bulk fertilizer blends. This may be more economical than bagged fertilizer.

Application of Soil Amendments

Apply lime and fertilizer evenly and incorporate into the top 6" of soil by disking, chiseling, or other suitable means during seedbed preparation. Operate machinery on the contour.

Seedbed Preparation

Install necessary sediment-control practices before seedbed preparation and complete grading according to the approved plan.

Grade and loosen the soil to a smooth, firm surface to enhance rooting of seedlings and reducing rill erosion. 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. Operate the equipment on the contour.

For broadcast seeding and drilling, tillage, as a minimum, should adequately loosen the soil to a depth of at least 6", alleviate compaction, and smooth and firm the soil for the proper placement of seed.

For no-till drilling, the soil surface does not need to be loosened unless the site has surface compaction.

Incorporate lime and fertilizer to a depth of at least 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; however, fertilizer should not be added to the seed mixture during hydroseeding. Lime may be added with the seed mixture.

Planting Methods

Seeding

Use certified seed for permanent seeding whenever possible. Certified seed is inspected by the Mississippi Crop Improvement Association to meet high quality standards and will be tagged with a "Certified Seed" tag. (Note: all seed sold in Mississippi is required by law to be tagged to identify seed purity, germination, and presence of weed seeds. Seed must meet state standards for content of noxious weeds.)

Seeding dates are determined using Figure PS-1 and Table PS-1.

Inoculate legume seed with the *Rhizobium* bacteria appropriate to the species of legume. Details of legume inoculation are located in Chapter 2 in the part on *Vegetation for Erosion and Sediment Control* under Inoculation of Legumes.

Seed should be uniformly planted with a cyclone seeder, a drill seeder, a cultipacker seeder, or by hand on a fresh, firm, friable seedbed. If the seedbed has been sealed by rainfall, it should be disked so the seed will be sown into a freshly prepared seedbed.

When using broadcast-seeding methods, subdivide the area into workable sections and determine the amount of seed needed for each section. Apply one-half the seed while moving back and forth across the area, making a uniform pattern; then apply the second half in the same way, but moving at right angles to the first pass.

Cover broadcast seed by raking or chain dragging; then firm the surface with a roller or cultipacker to provide good seed contact. Small grains should be planted no more than 1" deep and grasses and legume seed no more than ½" deep.

Hydroseeding

Surface roughening is particularly important when hydroseeding, as a roughened slope will provide some natural coverage for lime, fertilizer, and seed. The surface should not be compacted or smooth. Fine seedbed preparation is not necessary for hydroseeding operations; large clods, stones, and irregularities provide cavities in which seeds can lodge.

Mix seed, inoculant if required, and a seed carrier with water and apply as a slurry uniformly over the area to be treated. The seed carrier should be a cellulose fiber, natural wood fiber or other approved fiber mulch material which is dyed an appropriate color to

facilitate uniform application of seed. Use the correct legume inoculant at 4 times the recommended rate when adding inoculant to a hydroseeder slurry. The mixture should be applied within one hour after mixing to reduce damage to seed.

Fertilizer should not be mixed with the seed-inoculant mixture because fertilizer salts may damage seed and reduce germination and seedling vigor.

Fertilizer may be applied with a hydroseeder as a separate operation after seedlings are established.

Agricultural lime is usually applied as a separate operation and spread in dry form. It is not normally applied with a hydraulic seeder because it is abrasive and, also, may clog the system. On the other hand, liquid lime is applied with a hydraulic seeder but because of cost is used primarily to provide quick action for benefit of plants during their seedling stage with the bulk of liming needs to be provided by agricultural lime. Dry lime may be applied with the fertilizer mixture.

Sprigging

Hybrid Bermuda grass cannot be grown from seed and must be planted vegetatively. Vegetative methods of establishing common and hybrid Bermuda grass, centipede grass and zoysia include sodding, plugging and sprigging (see *Sodding Practice*).

When sprigs are planted with a sprigging machine, furrows should be 4-6" deep and 2 feet apart. Place sprigs no farther than 2 feet apart in the row and so that at least one rooting node is in the furrow.

Broadcasting of sprigs is not recommended as the practice requires additional vegetative material and is an unreliable method of planting. Hand planting of sprigs is recommended instead with furrows 4-6" deep and 2 feet apart. Place sprigs no farther than 2 feet apart in the row and so that at least one rooting node is in the furrow.

Mulching

The use of mulch provides instant cover and helps ensure establishment of vegetation under normal conditions and is essential to seeding success under harsh site conditions (see *Mulching Practice*). Harsh site conditions include slopes steeper than 3:1 and adverse soils (shallow, rocky, or high in clay or sand). Areas with concentrated flow should be treated differently and require sod, a hydromulch formulated for channels or an appropriate erosion control blanket.

Irrigation

Moisture is essential for seed germination and vegetation establishment. Supplemental irrigation can be very helpful in assuring adequate stands in dry seasons or to speed development of full cover. It is a requirement for establishment of vegetation from sod and sprigs and should be used elsewhere when feasible. However, irrigation is rarely critical for low-maintenance vegetation planted at the appropriate time of the year.

Water application rates must be carefully controlled to prevent runoff. Inadequate or excessive amounts of water can be more harmful than no supplemental water.

Installation Verification

Check materials and installation for compliance with specifications during installation of products.

Common Problems

Consult with a qualified design professional if the following occurs:

Design specifications for seed variety, seeding dates or mulching cannot be met; substitutions may be required. Unapproved substitutions could lead to failure.

Seeding at the wrong time of the year results in an inadequate stand. Reseed according to specifications of a qualified design professional (see recommendations under *Maintenance*)

Inadequate mulching results in an inadequate stand, bare spots or eroded areas-prepare seedbed, reseed, cover seed evenly and tack or tie down mulch, especially on slopes, ridges and in channels (see recommendations under *Maintenance*).

Maintenance

Generally, a stand of vegetation cannot be determined to be fully established until vegetative cover has been maintained for 1 year from planting.

Reseeding

Inspect seedlings monthly for stand survival and vigor. Also, inspect the site for erosion.

If stand is inadequate identify the cause of failure (choice of plant materials, lime and fertilizer quantities, poor seedbed preparation or weather) and take corrective action. If vegetation fails to grow, have the soil tested to determine whether pH is in the correct range or nutrient deficiency is a problem.

Stand conditions, particularly the coverage, will determine the extent of remedial actions such as seedbed preparation and reseeding. A qualified design professional should be consulted to advise on remedial actions. Consider drill seeding where possible.

Eroded areas should be addressed appropriately by filling and/or smoothing, and reapplication of lime, fertilizer, seed and mulch.

Fertilizing

Satisfactory establishment may require refertilizing the stand in the second growing season. Follow soil test recommendations or the specifications provided to establish and maintain the planting.

Mowing

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.

Certain species can be weakened by mowing regimes that significantly reduce their food reserves stored for the next growing season: fescue should not be mowed close during the summer; sericea should not be mowed close in late summer.

Bermuda grass is tolerant of most mowing regimes and can be mowed often and close, if so desired, during its growing season.

References

Volume 1

Chapter 2

Vegetation for Erosion and Sediment Control 2-10

Chapter 4

Land Grading (LG) 4-16
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Temporary Seeding (TS) 4-103

Appendices Volume

Appendix G

MDOT Vegetation Schedule G-1

Sediment Basin (SBN)

Practice Description

A sediment basin is an earthen embankment suitably located to capture runoff, with an emergency spillway lined to prevent spillway erosion, interior porous baffles to reduce turbulence and evenly distribute flows, and equipped with a floating skimmer for dewatering. Sediment basins are designed to provide an area for runoff to pool and settle out a portion of the sediment. Old technology utilized a perforated riser for dewatering, which allowed water to leave the basin from all depths. One way to improve the sediment capture rate is to have an outlet that dewaters the basin from the top of the water column where the water is cleanest. A skimmer is probably the most common method to dewater a sediment basin from the surface. The basic concept is that the skimmer does not dewater the basin as fast as runoff enters it but, instead, allows the basin to fill and then slowly drain over multiple days. This process has two effects. First, the sediment in the runoff has more time to settle out prior to discharge. Second, a pool of water forms early in a storm event, which increases sedimentation rates in the basin and reduces turbidity. Many of the storms will produce more volume than the typical sediment basin capacity and flow rates in excess of the skimmer capability, resulting in flow over the emergency spillway. This water is also coming from the top of the water column and has thereby been "treated" to remove sediment as much as possible (adapted from *Soil Facts: Dewatering Sediment Basins Using Surface Outlets*, N. C. State University, Soil Science Department).

Planning Considerations

Sediment basins are needed where drainage areas are too large for other sediment-control practices.

Select locations for basins during initial site evaluation. Locate basin so that sudden failure should not cause loss of life or serious property damage. Install sediment basins before any site grading takes place within the drainage area.

Select sediment basin sites to capture sediment from all areas that are not treated adequately by other sediment-control measures. Always consider access for cleanout and disposal of the trapped sediment. Locations where a pond can be formed by constructing a low dam across a natural swale are generally preferred to sites that require excavation. Where practical, divert sediment-free runoff away from the basin.

Because the emergency spillway is actually used relatively frequently, it is generally stabilized using geotextile and riprap that can withstand the expected flows without erosive velocities. The spillway should be placed as far from the inlet of the basin as possible to maximize sedimentation before discharge. The spillway should be located in natural ground (not over the embankment) to the greatest extent possible.

As discussed in the *Chemical Stabilization Practice,* the proper introduction of polyacrylamides (PAM) into the turbid runoff water at the inlet of the basin and/or at the first baffle should be considered to help polish the discharge from the basin for decreasing the turbidity. See the *Flocculants and Polymers Practice.*

Where heavy loads of coarse sediment are expected, a forebay or sump area prior to the basin should be considered for capture of heavier particles.

Baffles

Porous baffles effectively spread the flow across the entire width of a sediment basin, or trap and cause increased deposition within the basin. Water flows through the baffle material, but is slowed sufficiently to back up the flow, causing it to spread across the entire width of the baffle (Figure SBN-1). Spreading the flow in this manner utilizes the full cross section of the basin and reduces turbulence, which shortens the time required for sediment to be deposited.

The installation of baffles should be similar to a silt fence (Figure SBN-2) utilizing posts and wire backing. The most proven material for a baffle is 700-900 g/m^2 coir erosion blanket (Figure SBN-3). Other materials proven by research to be equivalent in this application may be used. A support wire or rope across the top will help prevent excessive sagging if the material is attached to it with appropriate ties. Another option is to use a sawhorse type of support with the legs stabilized with rebar inserted into the basin floor. These structures work well and can be prefabricated off-site and quickly installed.

Baffles need to be installed correctly to fully provide their benefits. Refer to Figure SBN-2 and the following key points:

- The baffle material needs to be secured at the bottom and sides by staking, trenching, or securing horizontally to the bottom. Flow should not be allowed under the baffle.

- Most of the sediment will accumulate in the first bay, so this should be readily accessible for maintenance.

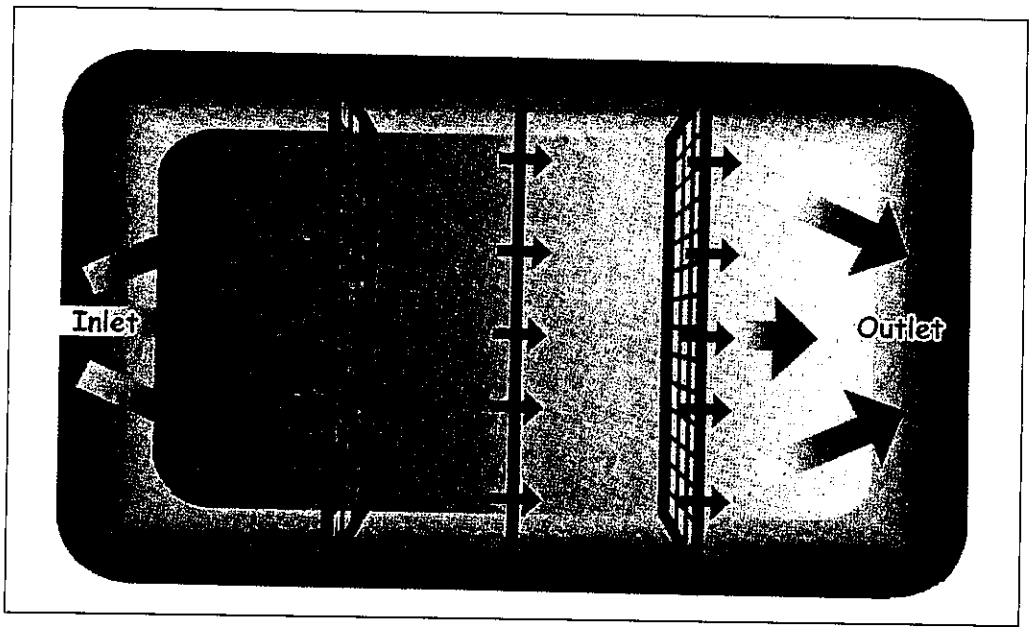


Figure SBN-1 Porous baffle in a sediment basin
(from North Carolina Erosion and Sediment Control Planning and Design Manual)

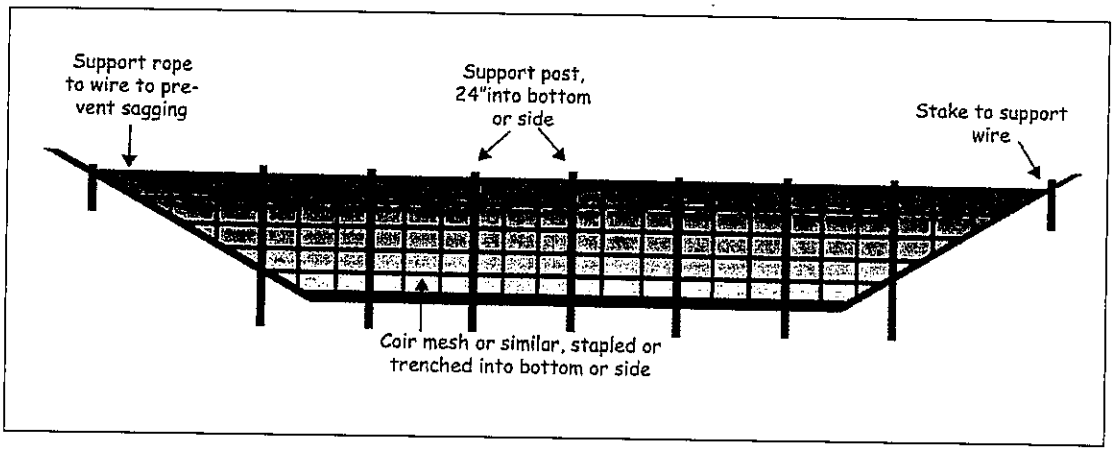


Figure SBN-2 Cross section of a porous baffle in a sediment basin
(Note: there is no weir because the water flows through the baffle material)
(from North Carolina Erosion and Sediment Control Planning and Design Manual)

Figure SBN-3 Example of porous baffle made of 700 g/m^2 coir erosion blanket as viewed from the inlet

Skimmer Option

A skimmer is a sediment basin dewatering-control device that withdraws water from the basin's water surface, thus removing the highest quality water for delivery to the uncontrolled environment. A skimmer is shown in Figure SBN-4. By properly sizing the skimmer's control orifice, the skimmer can be made to dewater a design hydrologic event in a prescribed period.

The costs of using a skimmer system are similar, or occasionally less, than a conventional rock outlet or perforated riser. However, the basin is more efficient in removing sediment when a skimmer is used. Another advantage of the skimmer is that it can be reused on future projects. Skimmers are generally maintenance free, but may require occasional maintenance to remove debris from the orifice.

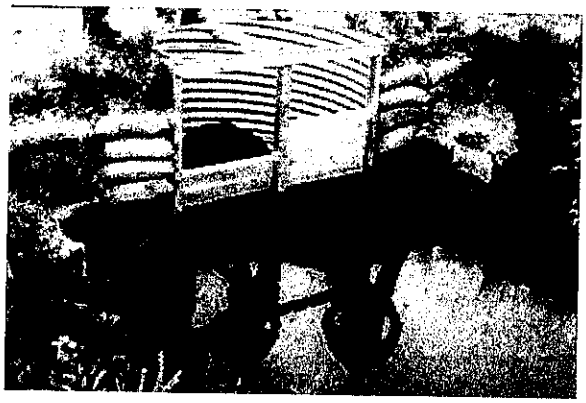
A skimmer must dewater the basin from the top of the water surface. The rate of dewatering must be controlled. A dewatering time of 48 to 120 hours (2 to 5 days) is required for the basin to function properly.

Perforated Riser

The perforated risers are a common dewatering device in basins that will be retained for stormwater detention post-construction. These devices dewater the basin quickly by drawing water from the entire water column.

Flashboard Riser Option

A flashboard riser forces the basin to fill to a given level before the water tops the riser and is then drained. As with the skimmer option, removing water from the top improves sediment capture, as the top of the water column is often where the least amount of sediment resides. The benefit of the flashboard riser is that water level can be controlled by removed (or adding) "stop logs" to adjust the water level.



Flashboard Riser (Source: NRCS)

Solid Riser Option

A solid riser option is another that is commonly used when the sediment basin will be used for post-construction stormwater control. A solid riser manages stormwater by forcing water to drain over the top of the riser pipe. The disadvantage to the solid riser option is that the only way to fully dewater the basin (for sediment removal) is through a pump system.

Design Criteria and Construction

Summary:	Temporary Sediment Trap
Emergency Spillway:	Trapezoidal spillway with non-erosive lining. 10-year, 24-hour rainfall event
Maximum Drainage Area:	10 acres
Minimum Volume:	3,600 cubic feet per acre of drainage area
Minimum L/W Ratio:	2:1
Minimum Depth:	2 feet
Dewatering Mechanism:	Skimmer(s) attached at bottom of barrel pipe
Dewatering Time:	2 – 5 days
Baffles Required:	3

Compliance with Laws and Regulations

Design and construction should comply with state and local laws, ordinances, rules, and regulations.

Design Basin Life

Structures intended for more than 3 years of use should be designed as permanent structures. Procedures outlined in this section do not apply to permanent structures. See *Volume 2: Stormwater Runoff Management* for permanent stormwater control methods.

Dam Height

Maximum height should be 10 feet, measured from the designed (settled) top elevation of the dam to the lowest point of the original ground surface.

Basin Locations

Select areas that

- Are not intermittent or perennial streams;
- Allow a maximum amount of construction runoff to be brought into the structure;
- Provide capacity for storage of sediment from as much of the planned disturbed area as practical;
- Exclude runoff from undisturbed areas where practical;
- Provide access for sediment removal throughout the life of the project; and
- Interfere minimally with construction activities.

Basin Shape

Ensure that the flow-length to basin-width ratio is 2:1 or larger to improve trapping efficiency. Length is measured at the elevation associated with the minimum storage volume. Generally, the bottom of the basin should be level to ensure that the baffles function properly. The area between the inlet and first baffle (forebay) can be designed with reverse grade to improve the trapping efficiency.

Storage Volume

Ensure that the sediment-storage volume of the basin is at least 3,600 cubic feet per acre for the area draining into the basin. Volume is measured below the emergency spillway crest. Remove sediment from the basin when approximately one-half of the storage volume has been filled.

Baffles

Space the baffles to create equal zones of volume within the basin.

The top of the baffle should be the same elevation as the maximum water depth flowing through the emergency spillway.

Baffles should be designed to go up the sides of the basin banks so water does not flow around the baffles. Most of the sediment will be captured in the inlet zone. Smaller particle size sediments are captured in the latter cells.

The design life of the fabric can be up to 3 years, but it may need to be replaced more often if damaged or clogged.

Spillway Capacity

The emergency spillway system must carry the peak runoff from the 10-year 24-hour storm with a minimum 1 foot of freeboard (distance between the surface of the water with the spillway flowing full and the top of the embankment). Base runoff computations on the most severe soil cover conditions expected in the drainage area during the effective life of the structure.

Sediment Cleanout Elevation

Determine the elevation at which the invert of the basin would be half-full. This elevation should also be marked in the field with a permanent stake set at this ground elevation (not the top of the stake).

Basin Dewatering

Basin dewatering discussion will be limited to the skimmer options. Additional dewatering options are discussed in "Planning Considerations" (earlier in this practice). The basin should be provided with a surface outlet. A floating skimmer should be attached to a Schedule 40 PVC barrel pipe of the same diameter as the skimmer arm. The skimmer apparatus will control the rate of dewatering. The skimmer should be sized to dewater the basin in 48 to 120 hours (2–5 days). The barrel pipe should be located under the embankment with at least one anti-seep collar at the center of the embankment projecting a minimum of 1.5 ft in all directions from the pipe. The barrel-pipe outlet must be stable and not cause erosion.

Skimmer Orifice Diameter

Faircloth Skimmer Selection Procedure

The skimmer performance charts (Table SBN-1) are recommended for use in selecting Faircloth Skimmers for use in dewatering sediment control basins. Always verify performance with the manufacturer's information.

Required input data:
Basin volume = _____ ft^3
Desired dewatering time = _____ days

Procedure:

1. First use the basin volume (ft^3) and the desired dewatering time (days) and determine the required skimmer outflow rate in cubic feet per day (ft^3/d) from the following equation

$$Q = \frac{V}{t_d}$$

2. Scan the skimmer performance charts (Table SBN-1) and select the (a) skimmer size and (b) the skimmer orifice diameter (in inches) if desired.

Table SBN-1 Faircloth Skimmer Selection Charts

1.5-inch skimmer (H = 0.125 ft)

Orifice (in.)	Outflow Rate (ft^3/d)
None	2,079
1.0	809
0.5	193

2-inch skimmer (H = 0.167 ft)

Orifice (in.)	Outflow Rate (ft^3/d)
None	5,429
1.0	924
0.5	231

2.5-inch skimmer (H = 0.167 ft)

Orifice (in.)	Outflow Rate (ft^3/d)
None	9,548
1.0	1,039
0.5	250

3-inch skimmer (H = 0.25 ft)

Orifice (in.)	Outflow Rate (ft^3/d)
None	10,588
1.5	2,541
1.0	1,136
0.5	289

4-inch skimmer (H = 0.333 ft)

Orifice (in.)	Outflow Rate (ft^3/d)
None	16,863
2.5	8,181
2.0	5,236
1.5	2,945
1.0	1,309
0.5	327

5-inch skimmer (H = 0.333 ft)

Orifice (in.)	Outflow Rate (ft^3/d)
None	26,276
3.5	16,035
3.0	11,781
2.5	8,181
2.0	5,236
1.5	3,715
1.0	1,309
0.5	327

6-inch skimmer (H = 0.417 ft)

Orifice (in.)	Outflow Rate (ft^3/d)
None	44,371
4.5	29,645
4.0	23,427
3.5	17,941
3.0	13,186
2.5	9,144
2.0	5,852
1.5	3,292
1.0	1,463
0.5	366

8-inch skimmer (H = 0.5 ft)

Orifice (in.)	Outflow Rate (ft^3/d)
None	127,416
5.5	48,510
5.0	40,098
4.5	32,475
4.0	25,660
3.5	19,654
3.0	14,438
2.5	10,029
2.0	6,410
1.5	3,619
1.0	1,598
0.5	404

Example: Select a skimmer that will dewater a 20,000-ft^3 sediment basin in 3 days.

Solution: First, compute the required outflow rate as

$$Q = \frac{V}{t_d} = \frac{20000\,ft^3}{3d} = 6670\,ft^3/d$$

Now, go the Selection Charts (Table SBN-1) and select an appropriate skimmer. If the 2-inch skimmer with no orifice is chosen, the outflow rate will be 5,429 ft^3/d, which will require about 3.5 days to dewater the basin. An alternative might be to use a 4-inch skimmer with a 2.5-inch-diameter orifice, which will have an outflow rate of 8,181 ft^3/d and dewater the basin in about 2.5 days.

Example: A More Precise Alternative: Each skimmer comes with a plastic plug that

can be drilled forming a hole that will limit the skimmer's outflow to any desired rate. Thus, for a specific skimmer, the orifice that will dewater a basin in a more precisely chosen time can be determined. The flow through an orifice can be computed as

$$Q = CA\sqrt{2gH}$$

where C is the orifice coefficient (usually taken to be 0.6), A is the orifice cross-sectional area in ft^2, g is the acceleration of gravity (32.2 ft/sec^2), and H is the driving head on the orifice center in feet. The orifice equation can be simplified to yield the orifice flow in gpm using the diameter, D (in inches), and the head, in feet, as

$$Q = 12D^2\sqrt{H}\ .$$

Or, the orifice flow in ft^3/d using the diameter, D (in inches), and the head, in feet, as

$$Q = 2310D^2\sqrt{H}\ .$$

If we solve the orifice equation for the orifice diameter using the desired outflow rate (6670 ft^3/d) and the head driving water through the skimmer (0.333 ft for a 4-inch skimmer) as

$$D = \sqrt{\frac{Q}{2310\sqrt{H}}} = \sqrt{\frac{6670}{2310\sqrt{0.333}}} = 2.24 inches$$

We see that if the plastic plug were drilled to a diameter of 2.24 inches and placed in a 4-inch skimmer, the dewater rate would be 6,670 ft^3/d and the 20,000-ft^3 basin would dewater in 3 days.

Outlet Protection

Provide outlet protection to ensure erosion does not occur at the pipe outlet.

Basin Emergency Spillway

The emergency spillway should carry the peak runoff from a 10-year storm. The spillway should have a minimum 10-foot bottom width, 0.5-foot flow depth, and 1-foot freeboard above the design water surface.

Construct the entire flow area of the spillway in undisturbed soil to the greatest extent possible. The cross section should be trapezoidal, with side slopes 3:1 (horizontal: vertical) or flatter for grass spillways (Figure SBN-5) and 2:1 (horizontal: vertical) for riprap. Select vegetated lining to meet flow requirements and site conditions.

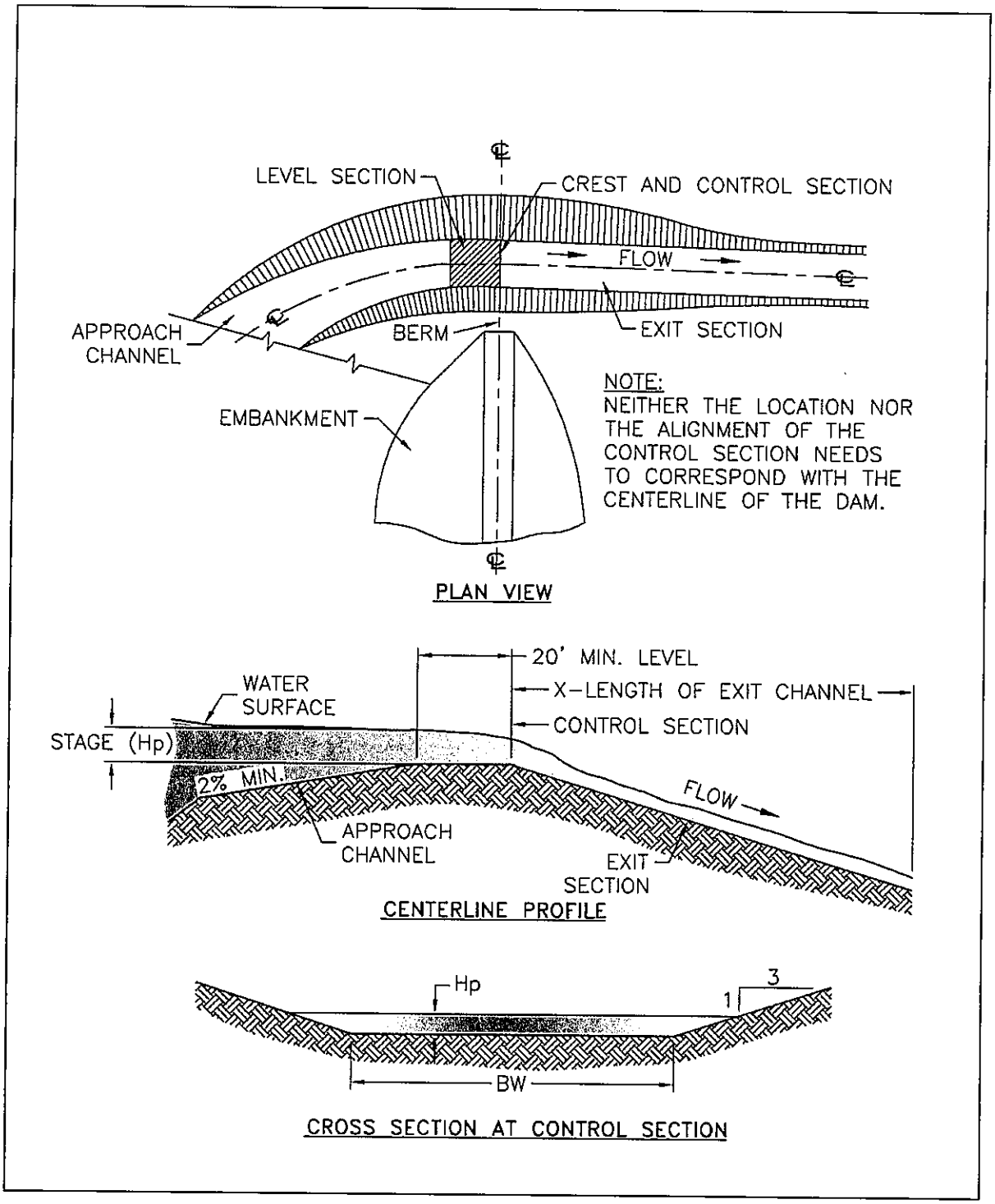


Figure SBN-5 Excavated grass spillway views

Inlet Section

Ensure that the approach section has a slope toward the impoundment area of not less than 2% and is flared at its entrance, gradually reducing to the design width of the control section. The inlet portion of the spillway may be curved to improve alignment.

The Control Section

The control section of the spillway should be level and straight and at least 20 feet long for grass spillways and 10 feet for riprap. Determine the width and depth for the required capacity and site conditions. Wide, shallow spillways are preferred because they reduce outlet velocities.

The Outlet Section

The outlet section of the spillway should be straight, aligned, and sloped to ensure supercritical flow with exit velocities not exceeding values acceptable for site conditions.

Outlet Velocity

Ensure that the velocity of flow from the basin is nonerosive for existing site conditions. It may be necessary to stabilize the downstream areas or the receiving channels.

Embankment

Embankments should not exceed 10 feet in height, measured at the center line from the original ground surface to the designed (settled) top elevation of the embankment. Keep a minimum of 1 foot between the designed (settled) top of the dam and the design water level in the emergency spillway. Additional freeboard may be added to the embankment height, which allows flow through a designated bypass location. Construct embankments with a minimum top width of 8 feet and side slopes of 2.5:1 (horizontal: vertical) or flatter.

There should be a cutoff trench in stable soil material under the dam at the centerline. The trench should be at least 2 feet deep with 1.5:1 (horizontal: vertical) side slopes, and sufficiently wide (at least 8 feet) to allow compaction by machine.

Embankment material should be a stable mineral soil, free of roots, woody vegetation, rocks, or other objectionable materials, with adequate moisture for compaction. Place fill in 9-inch layers through the length of dam and compact by routing construction hauling equipment over it. Maintain moisture and compaction requirements according to the plans and specifications. Hauling or compaction equipment must traverse each layer so that the entire surface has been compacted by at least one pass of the equipment wheels or tracks.

Excavation

Where sediment pools are formed or enlarged by excavation, keep side slopes at 2:1 (horizontal: vertical) or flatter for safety.

Erosion Protection

Minimize the area disturbed during construction. Divert surface water from disturbed areas. When possible, delay clearing the sediment impoundment area until the dam is in place. Keep the remaining temporary pool area undisturbed. Stabilize the spillway, embankment, and all disturbed areas with permanent vegetation. The basin bottom should also be established to a vegetative cover as this promotes sediment deposition.

Trap Efficiency

Improve sediment basin trapping efficiency by employing the following considerations in the basin design:

- Surface area—In the design of the settling pond, allow the largest surface area possible. The shallower the pool, the better.
- Length—Maximize the length-to-width ratio of the basin to provide the longest flow path possible.
- Baffles—Provide a minimum of three porous baffles to evenly distribute flow across the basin and reduce turbulence.
- Inlets—Area between the sediment inlets and the basin bottom should be stabilized by geotextile material, riprap with geotextile, a pipe drop, or other similar methods (Figure SBN-6 shows the area with rocks). Inlets to basin should be located the greatest possible distance away from the spillway.
- Dewatering—Allow the maximum reasonable detention period before the basin is completely dewatered (at least 48 hours).
- Inflow rate—Reduce the inflow velocity to nonerosive rates, and divert all sediment-free runoff.
- Establish permanent vegetation in the bottom and side slopes of the basin.
- Introduce the appropriate PAM material either at the turbulent entrance of the runoff water into the basin and/or apply to the first baffle. Apply the PAM according to manufacturer's recommendations.

Safety

Avoid steep side slopes. Fence basins properly and mark them with warning signs if trespassing is likely. Follow all state and local safety requirements.

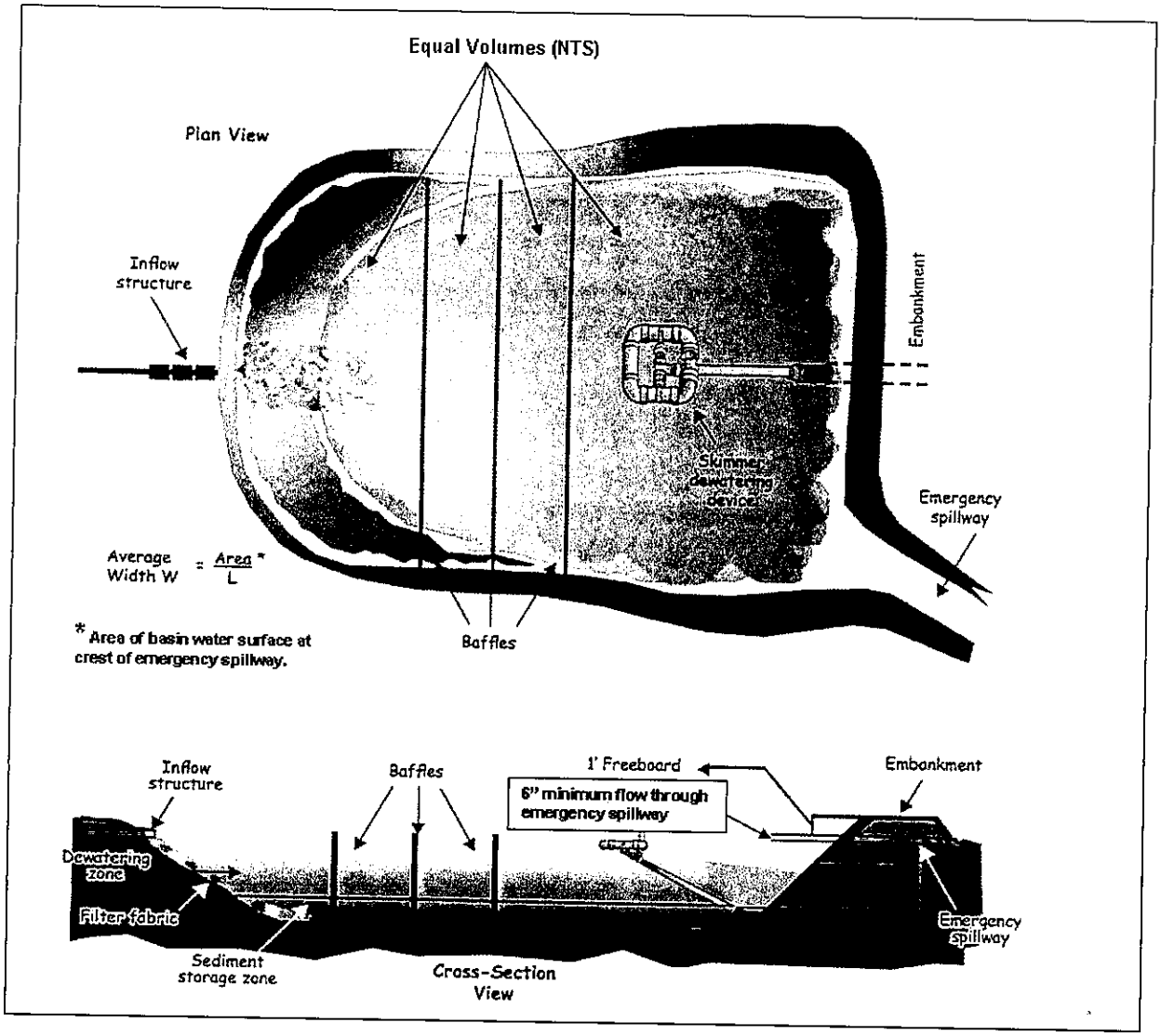


Figure SBN-6 Example of a sediment basin with a skimmer outlet and emergency spillway
(modified from Pennsylvania Erosion and Sediment Control Manual, March 2000)

Design Procedure

Step 1. Determine peak flow, Q_{10}, for the basin drainage area utilizing the NRCS runoff curve number method (see *Appendix A: Erosion and Stormwater Runoff Calculations*).

Step 2. Determine any site limitations for the sediment pool elevation, emergency spillway, or top of the dam.

Step 3. Determine basin volumes:

- Compute minimum volume required (3,600 ft^3/acre of drainage area).
- Specify sediment cleanout level to be clearly marked (one-half the design volume). Specify that the basin area is to be cleared after the dam is built.

Step 4. Determine area of basin, shape of basin, and baffles:

- Check length/width ratio (should be 2:1 or larger).
- Ensure the bottom of the basin is level.
- Design and locate a minimum of three coir baffles. The baffle spacing should produce equal volumes of storage within the basin when the basin is full. The top elevation of the baffles will be set in Step 7.

Step 5. Size the skimmer, skimmer orifice, and barrel pipe.

Use Table SBN-1 or the precise alternative design to size the orifice. Generally, a Schedule 40 PVC barrel pipe the same size as the skimmer arm is used under the embankment.

Step 6. Design the anti-seep collar.

Ensure that anti-seep collar is no closer than 2 feet from a pipe joint and as close to the center of the embankment as possible. Collar must project at least 1.5 feet from the pipe and be watertight.

Step 7. Determine the emergency spillway dimensions.

Size the spillway bottom width and flow depth to handle the Q_{10} peak flow. Tables SBN 2 and SBN-3 can be used for the design process for grassed emergency spillways. Use appropriate design procedures for spillways with other surfaces. Set top of baffles at the elevation of the designed maximum flow depth of the emergency spillway.

Step 8. Spillway approach section.

Adjust the spillway alignment so that the control section and outlet section are straight. The entrance width should be 1.5 times the width of the control section with a smooth transition to the width of the control section. The approach channel should slope toward the reservoir no less than 2%.

Step 9. Spillway control section.

- Locate the control section in natural ground to the greatest extent possible.
- Keep a level area to extend at least 20 feet (grass) or 10 feet (riprap) upstream from the outlet end of the control section to ensure a straight alignment.
- Side slopes should be 3:1 (grass) or 2:1 (riprap).

Step 10. Design spillway exit section.

- Spillway exit should align with the control section and have the same bottom width and side slopes.
- Slope should be sufficient to maintain supercritical flow, but make sure it does not create erosive velocities for site conditions. (Stay within slope ranges in appropriate design tables.)
- Extend the exit channel to a point where the water may be released without damage.

Step 11. Size the embankment.

- Set the design elevation of the top of the dam a minimum of 1 foot above the water surface for the design flow in the emergency spillway.
- Constructed height should be 10% greater than the design to allow for settlement.
- Set side slopes 2.5:1 or flatter.
- Determine depth of cutoff trench from site borings. It should extend to a stable, tight soil layer (a minimum of 2 ft deep).
- Select borrow site remembering that the spillway cut may provide a significant amount of fill.

Step 12. Erosion control

- Select surface-stabilization measures to control erosion.
- Select groundcover for emergency spillway to provide protection for design flow velocity and site conditions. Riprap stone over geotextile fabric may be required in erodible soils or when the spillway is not in undisturbed soils.
- Establish all disturbed areas, including the basin bottom and side slopes, to vegetation.

Step 13. Safety.

- Construct a fence and install warning signs as needed.

Table SBN-2 Design Table for Vegetated Spillways Excavated in Erosion-Resistant Soils (side slopes 3 horizontal: 1 vertical)

Discharge Q CFS	Slope Range		Bottom Width Feet	Stage Feet
	Minimum Percent	Maximum Percent		
15	3.3	12.2	8	.83
	3.5	18.2	12	.69
20	3.1	8.9	8	.97
	3.2	13.0	12	.81
	3.3	17.3	16	.70
25	2.9	7.1	8	1.09
	3.2	9.9	12	.91
	3.3	13.2	16	.79
	3.3	17.2	20	.70
30	2.9	6.0	8	1.20
	3.0	8.2	12	1.01
	3.0	10.7	16	.88
	3.3	13.8	20	.78
35	2.8	5.1	8	1.30
	2.9	6.9	12	1.10
	3.1	9.0	16	.94
	3.1	11.3	20	.85
	3.2	14.1	24	.77
40	2.7	4.5	8	1.40
	2.9	6.0	12	1.18
	2.9	7.6	16	1.03
	3.1	9.7	20	.91
	3.1	11.9	24	.83
45	2.6	4.1	8	1.49
	2.8	5.3	12	1.25
	2.9	6.7	16	1.09
	3.0	8.4	20	.98
	3.0	10.4	24	.89
50	2.7	3.7	8	1.57
	2.8	4.7	12	1.33
	2.8	6.0	16	1.16
	2.9	7.3	20	1.03
	3.1	9.0	24	.94
60	2.6	3.1	8	1.73
	2.7	3.9	12	1.47
	2.7	4.8	16	1.28
	2.9	5.9	20	1.15
	2.9	7.3	24	1.05
	3.0	8.6	28	.97
70	2.5	2.8	8	1.88
	2.6	3.3	12	1.60
	2.6	4.1	16	1.40
	2.7	5.0	20	1.26
	2.8	6.1	24	1.15
	2.9	7.0	28	1.05
80	2.5	2.9	12	1.72
	2.6	3.6	16	1.51
	2.7	4.3	20	1.35

Discharge Q CFS	Slope Range		Bottom Width Feet	Stage Feet
	Minimum Percent	Maximum Percent		
80	2.8	5.2	24	1.24
	2.8	5.9	28	1.14
	2.9	7.0	32	1.06
90	2.5	2.6	12	1.84
	2.5	3.1	16	1.61
	2.6	3.8	20	1.45
	2.7	4.5	24	1.32
	2.8	5.3	28	1.22
	2.8	6.1	32	1.14
100	2.5	2.8	16	1.71
	2.6	3.3	20	1.54
	2.6	4.0	24	1.41
	2.7	4.8	28	1.30
	2.7	5.3	32	1.21
	2.8	6.1	36	1.13
120	2.5	2.8	20	1.71
	2.6	3.2	24	1.56
	2.7	3.8	28	1.44
	2.7	4.2	32	1.34
	2.7	4.8	36	1.26
140	2.5	2.7	24	1.71
	2.5	3.2	28	1.58
	2.6	3.6	32	1.47
	2.6	4.0	36	1.38
	2.7	4.5	40	1.30
160	2.5	2.7	28	1.70
	2.5	3.1	32	1.58
	2.6	3.4	36	1.49
	2.6	3.8	40	1.40
	2.7	4.3	44	1.33
180	2.4	2.7	32	1.72
	2.4	3.0	36	1.60
	2.5	3.4	40	1.51
	2.6	3.7	44	1.43
200	2.5	2.7	36	1.70
	2.5	2.9	40	1.60
	2.5	3.3	44	1.52
	2.6	3.6	48	1.45
220	2.4	2.6	40	1.70
	2.5	2.9	44	1.61
	2.5	3.2	48	1.53
240	2.5	2.6	44	1.70
	2.5	2.9	48	1.62
	2.6	3.2	52	1.54
260	2.4	2.6	48	1.70
	2.5	2.9	52	1.62
280	2.4	2.6	52	1.70
300	2.5	2.6	56	1.69

Example of Table Use:

Given: Discharge, Q_{10} = 87 cfs, Spillway slope (exit section) = 4%.

Find: Bottom Width and Stage in Spillway.

Procedure: Using a discharge of 90 cfs, note that the spillway (exit section) slope falls within slope ranges corresponding to bottom widths of 24, 28, and 32 ft. Use bottom width of 32 ft, to minimize velocity. Stage in the spillway is 1.14 ft.

Note: Computations are based on: Roughness coefficient, n = 0.40, and a maximum velocity of 5.50 ft per sec.

Table SBN-3 Design Table for Vegetated Spillways Excavated in Very Erodible Soils (side slopes 3 horizontal: 1 vertical)

Discharge Q CFS	Slope Range		Bottom Width Feet	Stage Feet
	Minimum Percent	Maximum Percent		
10	3.5	4.7	8	.68
15	3.4	4.4	12	.69
	3.4	5.9	16	.60
20	3.3	3.3	12	.80
	3.3	4.1	16	.70
	3.5	5.3	20	.62
25	3.3	3.3	16	.79
	3.3	4.0	20	.70
	3.5	4.9	24	.64
30	3.3	3.3	20	.78
	3.3	4.0	24	.71
	3.4	4.7	28	.65
	3.4	5.5	32	.61
35	3.2	3.2	24	.77
	3.3	3.9	28	.71
	3.5	4.6	32	.66
	3.5	5.2	36	.62
40	3.3	3.3	28	.76
	3.4	3.8	32	.71
	3.4	4.4	36	.67
	3.4	5.0	40	.64
45	3.3	3.3	32	.76
	3.4	3.8	36	.71
	3.4	4.3	40	.67
	3.4	4.8	44	.64
50	3.3	3.3	36	.75
	3.3	3.8	40	.71
	3.3	4.3	44	.68
60	3.2	3.2	44	.75
	3.2	3.7	48	.72
70	3.3	3.3	52	.75
80	3.1	3.1	56	.78

Example of Table Use:

Given: Discharge, Q_{10} = 38 cfs, Spillway slope (exit section) = 4%.

Find: Bottom Width and Stage in Spillway.

Procedure: Using a discharge of 40 cfs, note that the spillway (exit section) slope falls within slope ranges corresponding to bottom widths of 36 and 40 ft. Use bottom width of 40 ft, to minimize velocity. Stage in the spillway is 0.64 ft.

Note: Computations are based on: Roughness coefficient, n = 0.40 and a maximum velocity of 3.50 ft per sec.

Construction

Prior to the start of construction, sediment basins should be designed by a qualified design professional.

Plans and specifications should be referred to by field personnel throughout the construction process. The sediment basin should be built according to planned grades and dimensions. Follow all federal, state and local requirements on impoundments.

Consider the following guidance as construction proceeds.

Site Preparation

Locate all utilities at the site to ensure avoidance.

Clear, grub, and strip the dam foundation and emergency spillway area, removing all woody vegetation, rocks, and other objectionable material. Dispose of trees, limbs, logs, and other debris in designated disposal areas.

Stockpile surface soil for use later during topsoiling.

Delay clearing the pool area until the dam is complete and then remove brush, trees, and other objectionable materials to facilitate sediment cleanout.

Keyway Trench

Excavate the keyway trench along the centerline of the planned embankment to a depth determined by the qualified design professional (at least 2 feet). The trench bottom elevation should extend up both abutments to the riser crest elevation and should have a bottom width of at least 8 feet and side slopes no steeper than 1.5:1 (horizontal: vertical). Compaction requirements will be the same as those for the embankment.

Skimmer

Prevent the skimming device from settling into the mud by excavating a shallow pit under the skimmer or providing a low support under the skimmer of stone or timber (Figure SBN-1).

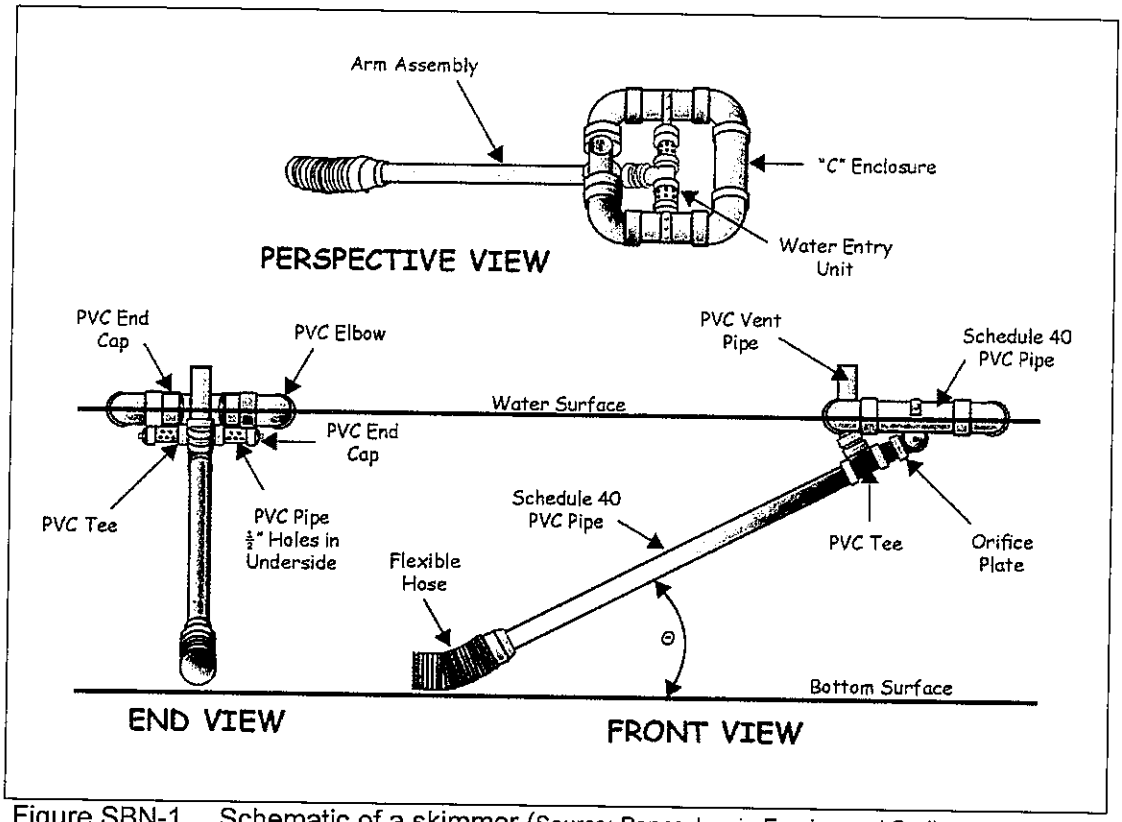


Figure SBN-1 Schematic of a skimmer (Source: Pennsylvania Erosion and Sediment Pollution Control Manual, March 2000)

Place the barrel pipe (typically the same size as the skimmer arm) on a firm, smooth foundation of impervious soil. Do not use pervious material such as sand, gravel, or crushed stone as backfill around the pipe. Place the fill material around the pipe in 4-inch layers and manually compact it under and around the pipe to at least the same density as the adjacent embankment. Care must be taken not to raise the pipe from the firm contact with its foundation when compacting under the pipe haunches.

Construct the anti-seep collar(s), if shown on the plans.

Place a minimum depth of 2 feet of compacted backfill over the pipe before crossing it with construction equipment. In no case should the pipe conduit be installed by cutting a trench through the dam after the embankment is complete.

Assemble the skimmer following the manufacturer's instructions, or as designed.

Lay the assembled skimmer on the bottom of the basin with the flexible joint at the inlet of the barrel pipe. Attach the flexible joint to the barrel pipe and position the skimmer over the excavated pit or support. Be sure to attach a rope to the skimmer and anchor it to the side of the basin. This will be used to pull the skimmer to the side for maintenance.

Install outlet protection as specified.

Embankment

Scarify the foundation of the dam before placing fill.

Use fill from predetermined borrow areas. It should be clean, stable soil free of roots, woody vegetation, rocks, and other debris; and must be wet enough to form a ball without crumbling, yet not so wet that water can be squeezed out.

Place the most permeable soil in the downstream toe and the least permeable in the center portion of the dam.

Place the fill material in 6" to 9" continuous uncompacted layers over the length of the dam. Fill should then be compacted to a 4" to 6" thick continuous layer (for example, routing construction equipment over the dam so that each layer is traversed by at least four passes of the equipment).

Protect the spillway barrel with 2 feet of fill that has been compacted with hand tampers before traversing over the pipe with equipment.

Construct and compact the dam to an elevation 10% above the design height to allow for settling. The embankment should have a minimum 8-foot top width and 2.5:1 side slopes, but the design may specify additional width and gentler side slopes.

Place a reference stake at the sediment clean-out elevation shown on the plans (50% of design storage volume).

Emergency Spillway

Construct the spillway at the site located by a qualified design professional according to the plan design (in undisturbed soil around one end of the embankment, and so that any flow will return to the receiving channel without damaging the embankment).

Basin and Baffles

Ensure the basin has a length-to-width ratio of at least 2:1 or more as specified. Grade the basin so that the bottom is level front-to-back and side-to-side. Discharge water into the basin in a manner to prevent erosion. Use diversions with outlet protection to divert sediment-laden water to the upper end of the pool area to improve basin trap efficiency.

Install porous coir baffles as specified to ensure water does not flow under or around the baffles (Figure SBN-2).

Install posts or sawhorses across the width of the sediment trap.

Steel posts should be driven to a depth of 24 inches, spaced a maximum of 4 feet apart, and installed up the sides of the basin as well. The top of the fabric should be at least the height of the required storage volume elevation.

Install at least three rows of baffles between the inlet and outlet discharge point and at the locations specified in the plans.

When using posts, add a support wire or rope across the top to prevent sagging.

Wrap porous coir material (700–900 g/m^2) over a sawhorse or the top wire. Hammer rebar into the sawhorse legs for anchoring. Attach fabric to a rope and a support structure with zip ties, wire, or staples.

The bottom and sides of the fabric should be anchored in a trench or pinned with 8-inch erosion-control matting staples.

Do not splice the fabric, but use a continuous piece across the basin.

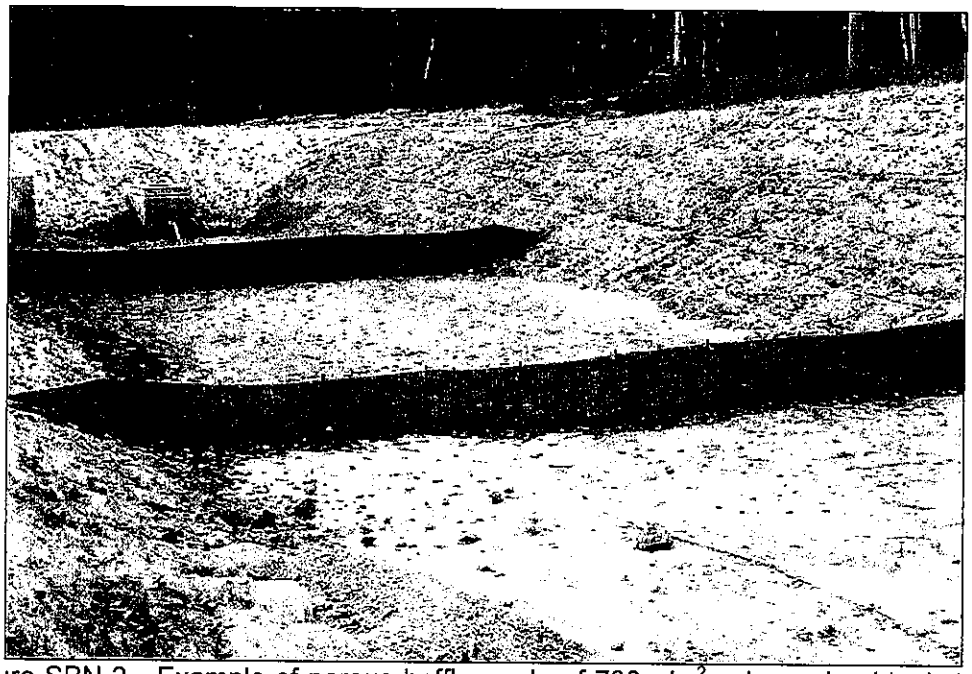


Figure SBN-2 Example of porous baffle made of 700-g/m^2 coir erosion blanket as viewed from the inlet (Source: North Carolina Erosion and Sediment Control Planning and Design Manual)

Erosion Control

Minimize the size of all disturbed areas.

Divert runoff from undisturbed areas away from the basin.

Use temporary diversions to prevent surface water from running onto disturbed areas.

Divert sediment-laden water to the upper end of the sediment pool to improve trap effectiveness.

Vegetate and stabilize the embankment, the emergency spillway, and all disturbed areas including the basin bottom and side slopes.

Safety

Because sediment basins that impound water are hazardous, the following precautions should be taken:

- Fence the area and post warning signs if trespassing is likely.
- Ensure that the basin does not exceed design heights.

Construction Verification

Check the finished grades and configurations for all earthworks. Check elevations and dimensions of all pipes and structures.

Common Problems

Consult with a registered design professional if any of the following occurs:

Variations in topography on-site indicate sediment basin will not function as intended.

Seepage is encountered during construction; it may be necessary to install drains.

Design specifications for fill, pipe, seed variety, or seeding dates cannot be met; substitutions may be required. Unapproved substitutions could lead to failure.

Maintenance

Inspect the sediment basin at least weekly and after each significant storm event (½ inch or greater).

Remove and properly dispose of sediment when it accumulates to ½ the design volume.

Remove trash and other debris from the skimmer, emergency spillway, and pool area.

Periodically check the embankment, emergency spillway, and outlet for erosion damage, piping, settling, seepage, or slumping along the toe or around the barrel and repair immediately.

Remove the basin after the drainage area has been permanently stabilized, inspected and approved. Do so by draining any water, removing the sediment to a designated disposal area, and smoothing the site to blend with the surrounding area; then stabilize.

References

Volume 1

Chapter 2

Vegetation for Erosion and Sediment Control 2-10

Chapter 4

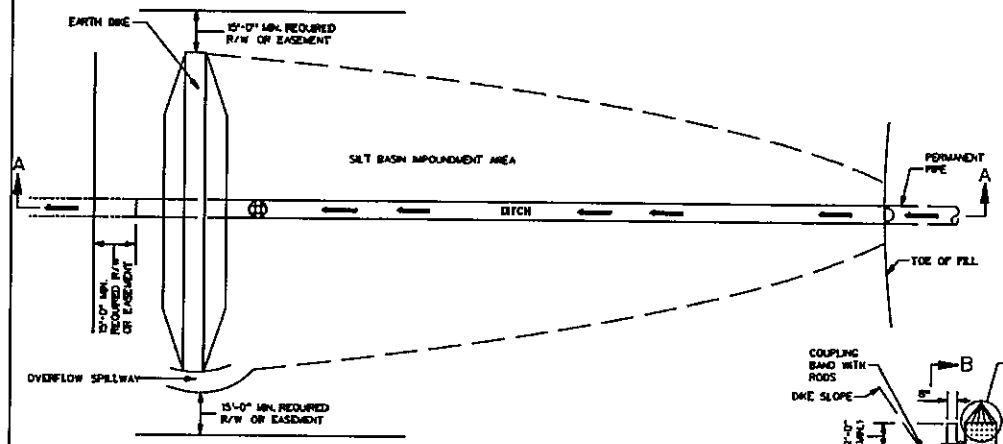
Permanent Seeding (PS) 4-53

Flocculants and Polymers (FLC) 4-328

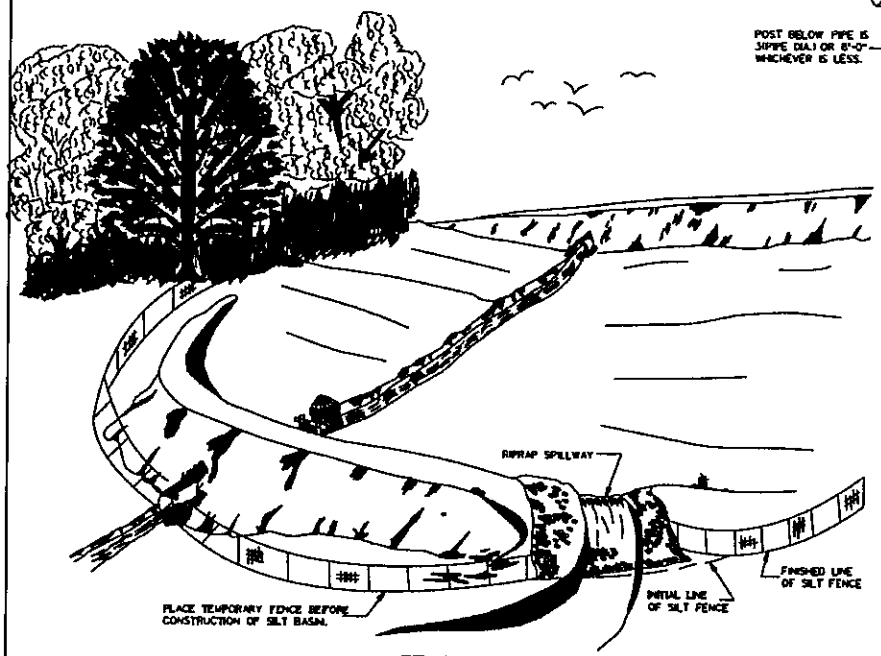
MDOT Drawing TEC-3

Appendix G (Available in Appendices Volume)

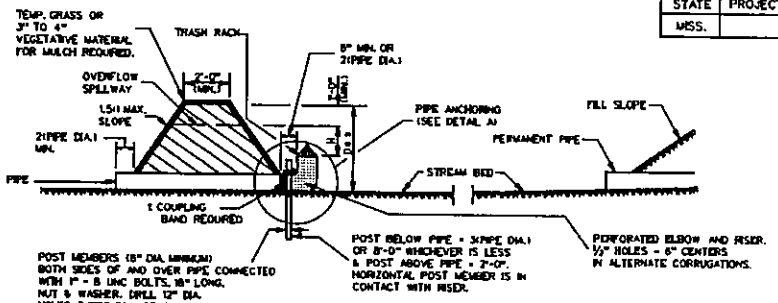
STATE	PROJECT NO.
MISS.	



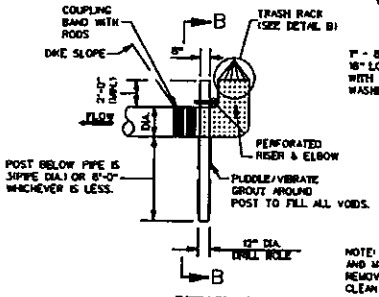
PLAN



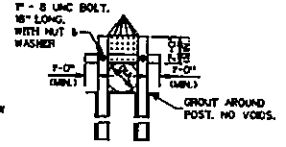
TEMPORARY SILT BASIN (TYPE B)



SECTION A-A



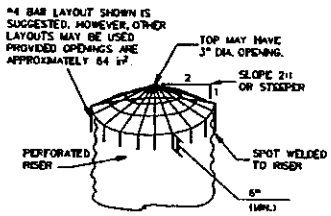
DETAIL A



SECTION B-B

NOTE: POST MEMBERS MAY BE GREEN TIMBER AND MAY BE CUT OFF AT NATURAL GROUND REMOVAL. POST MUST BE 8" MINIMUM CLEAN DIAMETER.

PIPE ANCHORAGE



DETAIL B
TRASH RACK INSTALLATION

GENERAL NOTES:

1. PROVIDE OVERFLOW SPILLWAY IN NATURAL GROUND AT A MINIMUM OF 1'-0" BELOW TOP OF DIKE. CROSS-SECTIONAL AREA OF SPILLWAY IS EQUAL TO 1.5 TIMES THE AREA OF THE OUTLET PIPE MINIMUM. RIPRAP SHALL BE REQUIRED AT THE SPILLWAY. AFTER THE PURPOSE OF THE SILT BASIN HAS BEEN SERVED, THE DIKE AND RIPRAP MAY REMAIN IN PLACE AT THE DISCRETION OF THE ENGINEER, BUT THE DRAIN PIPE WITH RISER SHALL BE REMOVED AND THE NEWLY DISTURBED AREA REVEGETATED.
2. BASIN AND DIKE DIMENSIONS DO NOT REQUIRE CONSTRUCTION TO NEAT LINES.
3. THE SILT BASIN MAY BE CONSTRUCTED IN ANY SHAPE WITH THE DIKE EXTENDING ALONG ONE OR MORE SIDES AS LONG AS THE LENGTH MEASURED IN THE DIRECTION OF FLOW IS APPROXIMATELY TWICE THE WIDTH AND THE IMPOUNDMENT AREA AND DEPTH AT LEAST AS LARGE AS INDICATED.
4. MINIMUM DIMENSIONS FOR SILT BASIN (TYPE B) ARE AS FOLLOWS:

MIN. DIMENSIONS OF SILT BASIN (TYPE B)				‡ COUPLING BAND	
PIPE	W x D (ft-in)	H (ft-in)	± AREA (ft²)	LENGTH (in)	COUPLING RODS/SIDE
15"	4'-0"	1'-0"	310	12"	2 & 2
18"	5'-0"	1'-0"	550	12"	2 & 2
24"	5'-0"	1'-0"	1100	12"	2 & 2
30"	6'-0"	1'-6"	1850	24"	3 & 3
36"	6'-0"	1'-6"	2800	24"	3 & 3
42"	7'-0"	2'-0"	4200	24"	3 & 3
48"	8'-0"	2'-0"	6200	24"	3 & 3

NOTES:
± 1. IMPOUNDMENT SURFACE AREAS ARE MEASURED AT ELEVATION OF TOP OF ELBOW RISER.
± ± 2. RISER REQUIRED WHERE MINIMUM "D" DIMENSION IS EXCEEDED. LENGTH OF RISER IS EQUAL TO THE AMOUNT THAT MINIMUM "D" DIMENSION IS EXCEEDED.
‡ 3. COUPLING RODS TO BE ½" DIAMETER MINIMUM WITH LUGS.

5. IN SELECTING BASIN SIZE, CONSIDERATION MUST BE GIVEN TO THE AREA DISCHARGING INTO THE BASIN OTHER THAN THAT WHICH COMES THROUGH THE PIPE UNDER THE ROADWAY. THIS WILL AT TIMES NECESSITATE A LARGER BASIN AND OUTLET PIPE SECTION.
6. THE DIKE SHALL BE CONSTRUCTED OF A MATERIAL SUITABLE FOR ROADWAY EMBANKMENT.
7. SILT BASIN (TYPE B) REQUIRED AT LOCATION(S) INDICATED ON PLANS.
8. THE CONTRACTOR SHALL BE REQUIRED TO FURNISH ALL MATERIALS AND PERFORM ALL WORK FOR THE PROPER INSTALLATION, MAINTENANCE AND REMOVAL OF TEMPORARY EROSION CONTROL MEASURES NECESSARY TO CONTROL SILTATION.
9. THE USE OF THE TEMPORARY EROSION CONTROL MEASURE SHOWN ON THIS SHEET WILL ONLY BE REQUIRED AND MEASURED FOR SEPARATE PAYMENT WHEN AN APPROPRIATE PAY ITEM IS INCLUDED IN THE BID SCHEDULE OF THE PROPOSAL.
10. RIPRAP AND TEMPORARY SILT FENCE, USED IN CONJUNCTION WITH TYPE B SILT BASINS AS SHOWN BY THE DETAILS ON THIS SHEET, WILL NOT BE MEASURED FOR SEPARATE PAYMENT. THEIR COST SHALL BE INCLUDED IN THE PRICE BID FOR TYPE B SILT BASIN.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN DIVISION
STANDARD PLAN

TYPICAL TEMPORARY EROSION CONTROL MEASURES
(TYPE B SILT BASIN)

BY	DATE

ISSUE DATE: OCTOBER 1, 1998

ROADWAY NUMBER: TEC-3

SHEET NUMBER: 144

Sediment Barrier (SB)

SILT FENCE
STRAW BALE BARRIER

Practice Description

Silt fencing is a temporary sediment barrier used across a landscape to reduce the quantity of sediment that is moving farther downslope. Commonly used barriers include silt fence (a geotextile fabric that is trenched into the ground and attached to supporting posts) or hay bales trenched into the ground. Other barrier materials include sand bags, brush piles, and various man-made materials and devices that can be used in a similar manner as silt fence and hay bales.

This practice applies where sheet and rill erosion occurs on small disturbed areas. Barriers intercept runoff from upslope to form ponds that temporarily store runoff and allow sediment to settle out of the water and stay on the construction site.

Planning Considerations

Sediment barriers may be used on developing sites. They should be installed on the contour so that flow will not concentrate and cause bypassing by runoff going around the end of the barrier or overtopping because of lack of storage capacity.

The most commonly used sediment barriers are silt fences, manufactured sediment logs (several names other than "logs" are used), and hay bales. Silt fences and manufactured sediment logs are preferable to hay bales because they are more likely to be installed correctly. The design and installation of a hay bale sediment barrier is the same as for *Straw Bale Sediment Traps*. Manufactured sediment logs should be installed according to manufacturer's recommendations.

The silt fence is the only sediment barrier covered in this manual.

The success of silt fences depends on a proper installation that causes the fence to develop maximum efficiency of sediment trapping. Silt fences should be carefully installed to meet the intended purpose.

A silt fence is specifically designed to retain sediment transported by sheet flow from disturbed areas, while allowing water to pass through the fence. Silt fences should be installed to be stable under the flows expected from the site. Silt fences should not be installed across streams, ditches, waterways, or other concentrated flow areas.

Silt fences are composed of woven geotextile supported between steel or wooden posts. Silt fences are commercially available with geotextile attached to the post, and can be rolled out and installed by driving the post into the ground. This type of silt fence is simple to install, but more expensive than some other installations. Silt fences must be trenched in at the bottom to prevent runoff from undermining the fence and developing rills under the fence. Locations with high runoff flows or velocities should use wire reinforcement.

Design Criteria

Silt fence installations are normally limited to situations in which only sheet- or overland-flow is expected because they normally cannot pass the volumes of water generated by channel flows. Silt fences are normally constructed of synthetic fabric (woven geotextile), and the life is expected to be the duration of most construction projects. Silt fence fabric should conform to the requirements of Table SB-1.

The drainage area behind the silt fence should not exceed ¼ acre per 100 linear feet of silt fence for non-reinforced fence and ½ acre per 100 linear feet of wire-reinforced fence. When all runoff from the drainage area is to be stored behind the fence (i.e. no stormwater disposal system is in place), the maximum slope length behind the fence should not exceed the value shown in Table SB-2.

Type A Silt Fence

The Type A fence is 36" wide with wire reinforcement and is used on sites needing the highest degree of protection by a silt fence. The wire reinforcement is necessary because the Type A silt fence is used for the highest flow situations and has almost 3 times the flow rate as the Type B silt fence. Type A silt fence should be used where runoff flows or velocities are particularly high or where slopes exceed a vertical height of 10 feet.

Provide a riprap splash pad or other outlet protection device for any point where flow may overtop the sediment fence. Ensure that the maximum height of the fence at a protected, reinforced outlet does not exceed 1 foot and that support post spacing does not exceed 4 feet.

This silt fence should be installed as shown in Figure SB-1. Materials for posts and fasteners are shown in Tables SB-3 and SB-4. Details for overlap of the silt fence and fastener placement are shown in Figure SB-4.

Table SB-1 Specifications for Silt Fence

Specifications	Type A	Type B	Type C
Tensile Strength (Lbs. Min.)[1] (ASTM D-4632)	Warp – 260 Fill – 100	Warp – 120 Fill – 100	Warp – 120 Fill – 100
Elongation (% Max.) (ASTM D-4632)	40	40	40
AOS (Apparent Opening Size) (Max. Sieve Size) (ASTM D-4751)	No. 30	No. 30	No. 30
Flow Rate (Gal/Min/Sq. Ft.) (GDT-87)	70	25	25
Ultraviolet Stability[2] (ASTM D-4632 after 300 hours weathering in accordance with ASTM D-4355)	80	80	80
Bursting Strength (PSI Min.) (ASTM D-3786 Diaphragm Bursting Strength Tester)	175	175	175
Minimum Fabric Width (Inches)	36	36	22

[1] Minimum roll average of five specimens.
[2] Percent of required initial minimum tensile strength.

Table SB-2 Slope Limitations for Silt Fence

Land Slope (Percent)	Maximum Slope Length Above Fence (Feet)
<2	100
2 to 5	75
5 to 10	50
10 to 20*	25
>20	15

*In areas where the slope is greater than 10%, a flat area length of 10 feet between the toe of the slope to the fence should be provided.

Type B Silt Fence

This 36" wide filter fabric should be used on developments where the life of the project is greater than or equal to 6 months.

This silt fence should be installed as shown in Figure SB-2. Materials for posts and fasteners are shown in Tables SB-3 and SB-4. Details for overlap of the silt fence and fastener placement are shown in Figure SB-4.

Type C Silt Fence

Though only 22" wide, this filter fabric allows the same flow rate as Type B silt fence. Type C silt fence should be limited to use on relatively minor projects, such as residential

home sites or small commercial developments where permanent stabilization will be achieved in less than 6 months.

This silt fence should be installed as shown in Figure SB-3. Materials for posts and fasteners are shown in Tables SB-3 and SB-4. Details for overlap of the silt fence and fastener placement are shown in Figure SB-4.

Table SB-3 Post Size for Silt Fence

	Minimum Length	Type of Post	Size of Post
Type A	4'	Steel	1.3 lb./ft. min.
Type B	4'	Soft Wood Oak Steel	3" diameter or 2 X 4 1.5" X 1.5" 1.3 lb./ft. min.
Type C	3'	Soft Wood Oak Steel	2" diameter or 2 X 2 1" X 1" 0.75 lb./ft. min.

Table SB-4 Wood Post Fasteners for Silt Fence

	Gauge	Crown	Legs	Staples/Post
Wire Staples	17 min.	¾" wide	½" long	5 min.
	Gauge	Length	Button Heads	Nail/Post
Nails	14 min.	1"	¾" long	4 min.

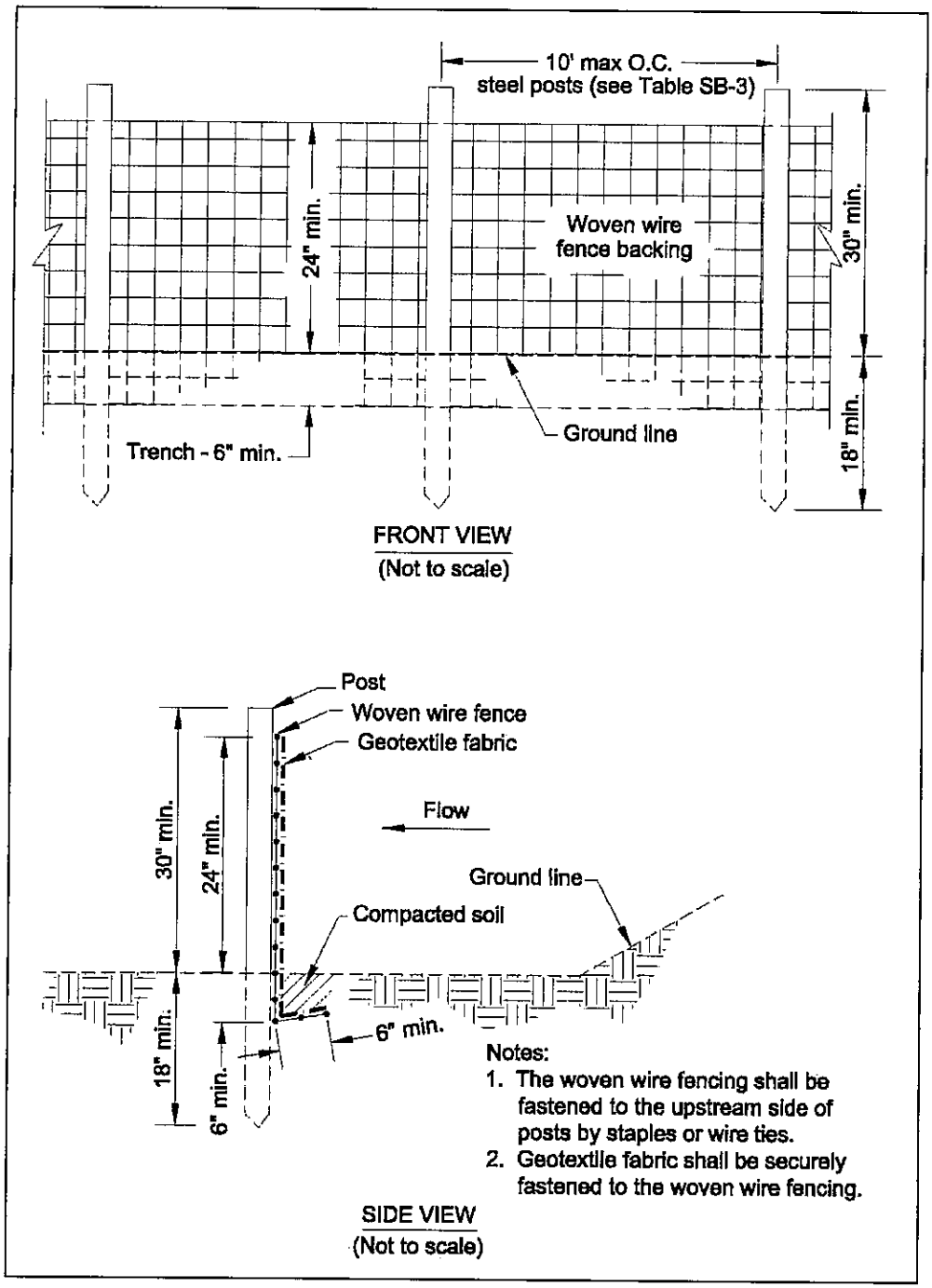


Figure SB-1 Silt Fence-Type A

(1) For fabric material requirements see Table SB-1
(2) For post material requirements see Tables SB-3 and SB-4

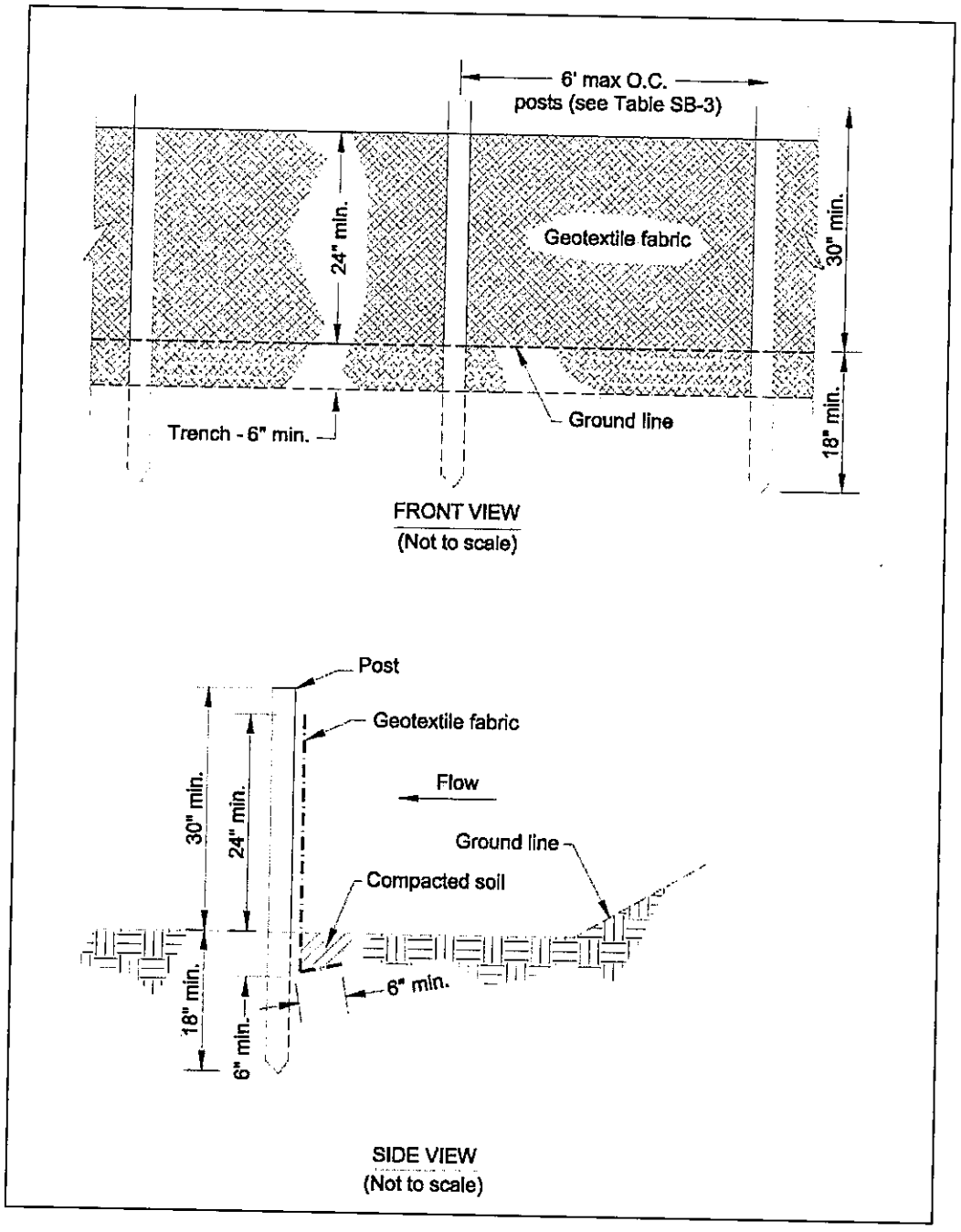


Figure SB-2 Silt Fence - Type B

(1) For fabric material requirements see Table SB-1
(2) For post material requirements see Tables SB-3 and SB-4

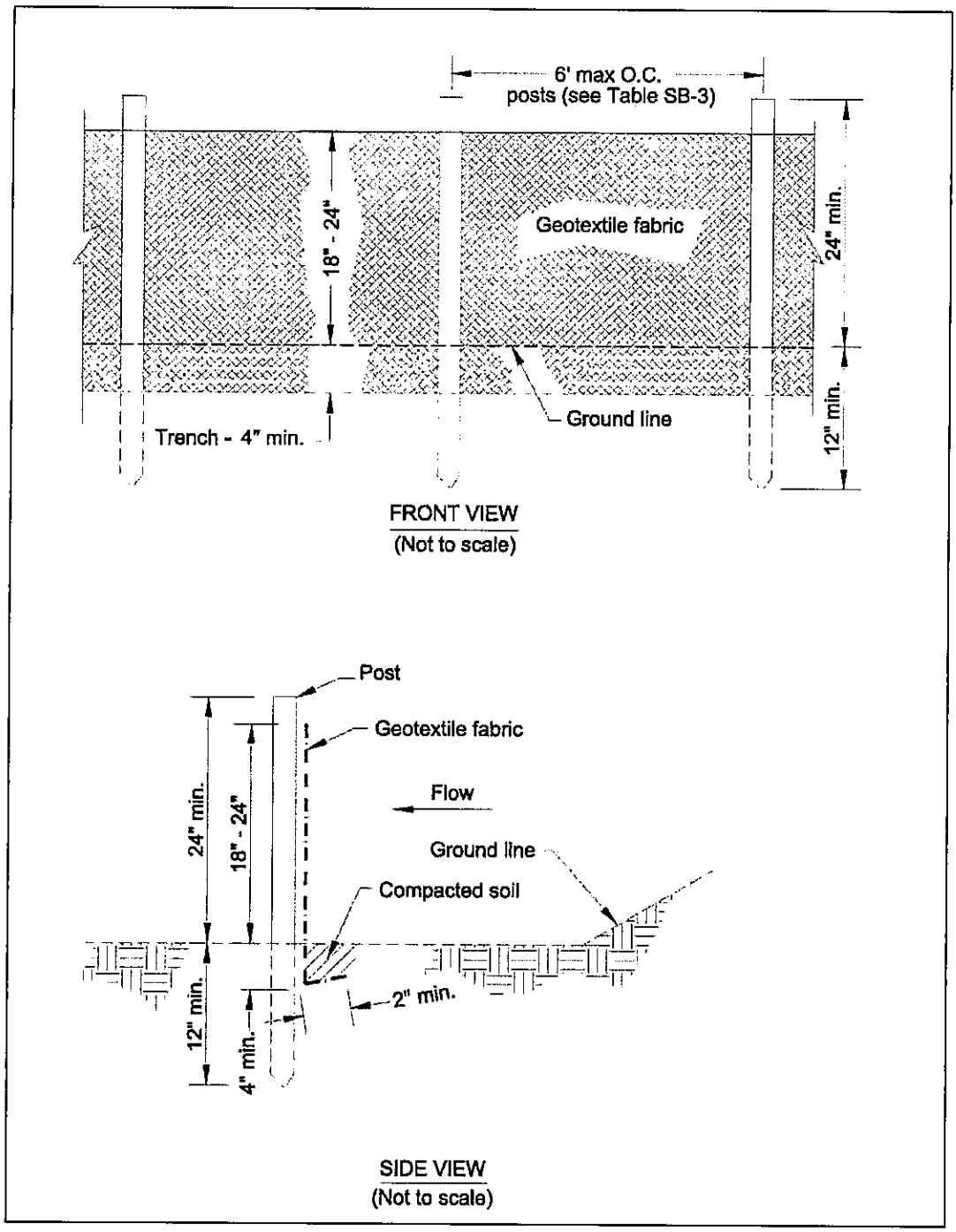


Figure SB-3 Silt Fence – Type C

(1) For fabric material requirements see Table SB-1
(2) For post material requirements see Tables SB-3 and SB-4

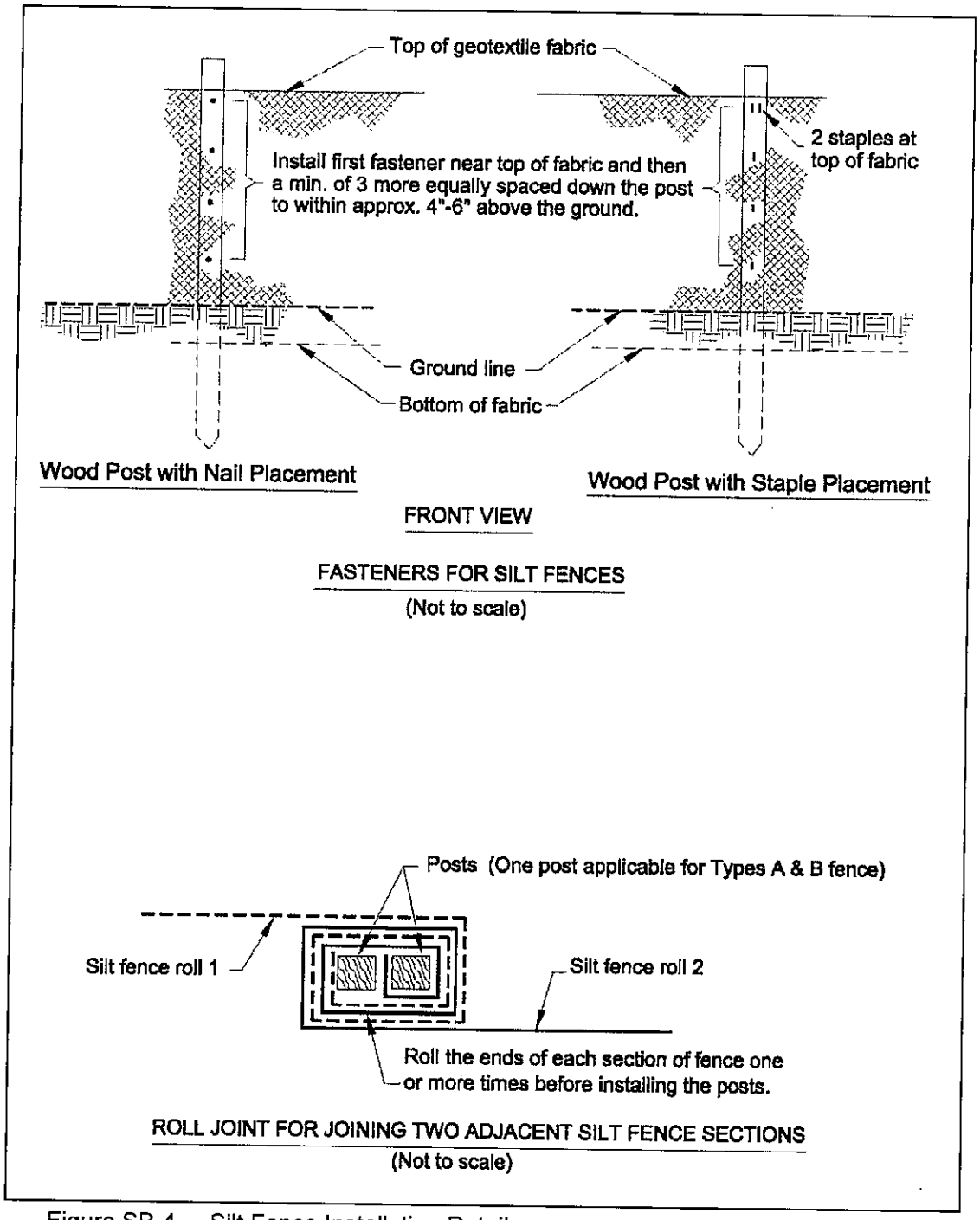


Figure SB-4 Silt Fence Installation Details

Construction

Prior to start of construction, sediment barriers should be designed by a qualified professional. Plans and specifications should be referred to by field personnel throughout the construction process.

Note: Silt fence is the only barrier installation being covered in this handbook.

Site Preparation

Determine exact location of underground utilities so that locations for digging or placement of stakes can be selected where utilities will not be damaged.

Smooth the construction zone to provide a broad, nearly level area for the fence. The area should be wide enough throughout the length of the fence to provide storage of runoff and sediment behind the fence.

Silt Fence Installation

Silt fence should be installed on the contour, so that runoff can be intercepted as sheet flow; ends should be flared uphill to provide temporary storage of water. Silt fence should be placed so that runoff from disturbed areas must pass through the fence. Silt fence should not be placed across concentrated flow areas such as channels or waterways. When 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 sediment. Dig a trench at least 6″ deep along the fence alignment as shown in Figures SB-1 and SB-2 for Types A & B fences. Type C fences require only a 4″ deep trench as shown in Figure SB-3. **Please note that installation with a silt fence installation machine may permit different depths if performance is equal.**

Drive posts at least 18″ into the ground 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 support fence is used.

Fasten support wire fence to upslope side of posts, extending 6″ into the trench, as shown in the appropriate figure for the type fence (see Figure SB-1, SB-2 or SB-3).

Attach a continuous length of fabric to the upslope side of fence posts. Minimize the number of joints and, when necessary to join rolls, they should be joined by rolling the ends together using the "roll joint" method illustrated in Figure SB-4. Avoid joints at low points in the fence line.

For Types A and 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 or gravel as shown in Figures SB-1 – SB-3.

Provide good access in areas of heavy sedimentation for cleanout and maintenance.

Erosion Control

Stabilize disturbed areas in accordance with the vegetation plan. If no vegetation plan exists, consider planting and mulching as a part of barrier installation, and select planting information from the appropriate planting practice (*Permanent Seeding* or *Temporary Seeding*). Select mulching information from the *Mulching Practice*.

Construction Verification

Check finished grades and dimensions of the sediment fence. Check materials for compliance with specifications.

Common Problems

Consult with a qualified design professional if any of the following occurs:

Variations in topography on site indicate sediment fence will not function as intended, or alignment is not on contour, or fence crosses concentrated flow areas; changes in plan may be needed.

Design specifications for filter fabric, support posts, support fence, gravel, or riprap cannot be met; substitutions may be required. Unapproved substitutions could lead to failure.

Drainage area appears to exceed ¼ acre for 100 feet of non-reinforced silt fence and ½ acre for 100 feet for reinforced fence. Additional sediment-control BMPs may be required.

Maintenance

Inspect sediment fences at least once a week and after each significant rain event.

Make required repairs immediately.

Should the fabric of silt fence collapse, tear, decompose, or become ineffective, replace it promptly.

Remove sediment deposits when they reach a depth of 15″ or ½ the height of the fence as installed, to provide adequate storage volume for the next rain event and to reduce pressure on the fence.

After the contributing drainage area has been properly stabilized, remove all barrier materials and unstable sediment deposits, bring the area to grade, and stabilize it with vegetation.

References

BMPs from Volume I

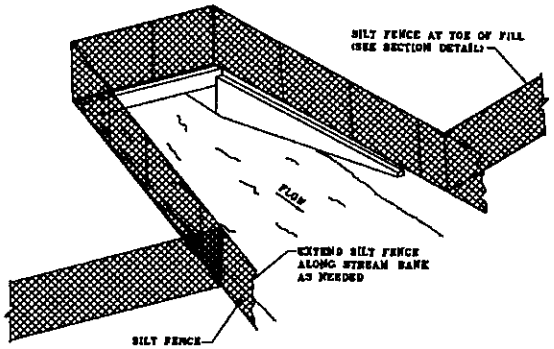
Chapter 4

MDOT Drawing ECD-2

MDOT Drawing ECD-3

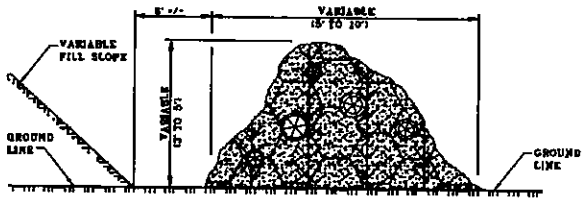
MDOT Drawing SSF-1

STATE	PROJECT NO.
MISS.	



SEDIMENT BARRIER AT CROSS DRAIN

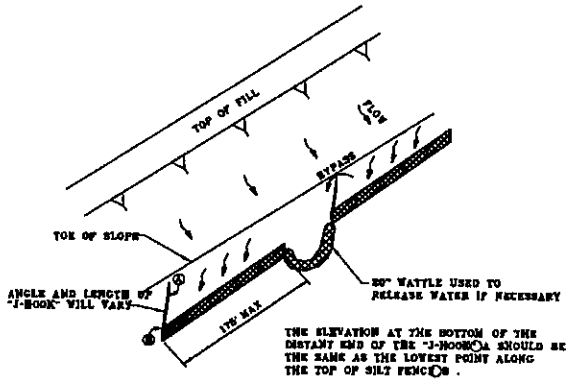
FRONT ELEVATION



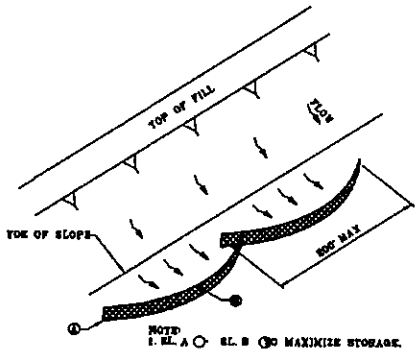
SIDE ELEVATION

TEMPORARY BRUSH BARRIER

NOTES:
1. BRUSH BARRIER MAY BE USED WHERE NATURAL GROUND IS LEVEL OR SLOPING AWAY FROM PROJECT.
2. PLACE BRUSH, LOG AND TREE LAPS APPROXIMATELY PARALLEL TO TOE OF FILL SLOPE WITH SOME OF THE HEAVIER MATERIALS BEING PLACED ON TOP TO PROPERLY SECURE THE BARRIER AS DETAILED AT LOCATIONS SHOWN ON PLANS OR AS DIRECTED OR PERMITTED BY THE ENGINEER.
3. TO ALLOW WATER TO SEEP THROUGH BRUSH BARRIER, INTERMINGLE THE BRUSH, LOG AND TREE LAPS SO AS NOT TO FORM A SOLID DAM.
4. THE BRUSH BARRIER MAY BE CHOKED WITH FILTER FABRIC.
5. TEMPORARY BRUSH BARRIER WILL NOT BE MEASURED FOR SEPERATE PAYMENT

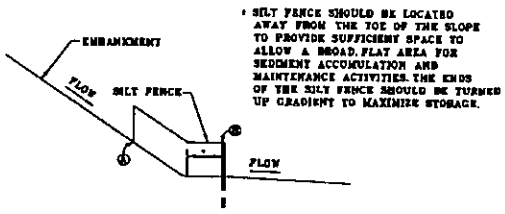


"J-HOOK" SILT FENCE APPLICATION



"SMILE-CONFIGURATION" SILT FENCE APPLICATION

NOTE
1. ANCHOR AND INSTALL SILT FENCE PER DETAILS SHOWN ON ECD-3



* SILT FENCE SHOULD BE LOCATED AWAY FROM THE TOE OF THE SLOPE TO PROVIDE SUFFICIENT SPACE TO ALLOW A BROAD, FLAT AREA FOR SEDIMENT ACCUMULATION AND MAINTENANCE ACTIVITIES. THE ENDS OF THE SILT FENCE SHOULD BE TURNED UP GRADIENT TO MAXIMIZE STORAGE.

SILT FENCE SECTION AT TOE OF FILL

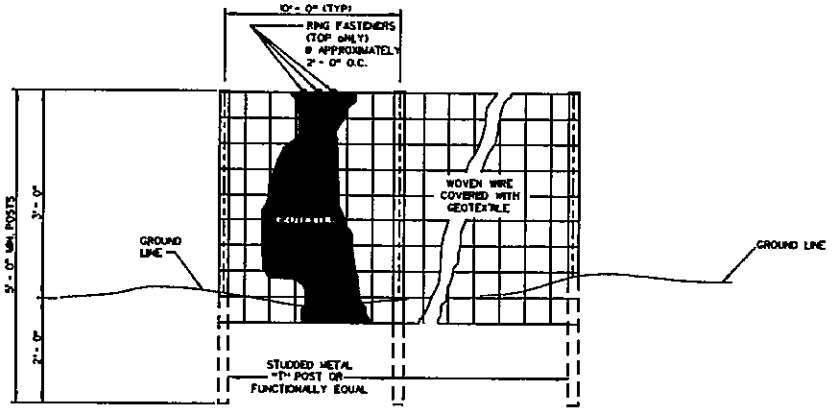
MISSISSIPPI DEPARTMENT OF TRANSPORTATION

DETAILS OF SEDIMENT BARRIER APPLICATIONS

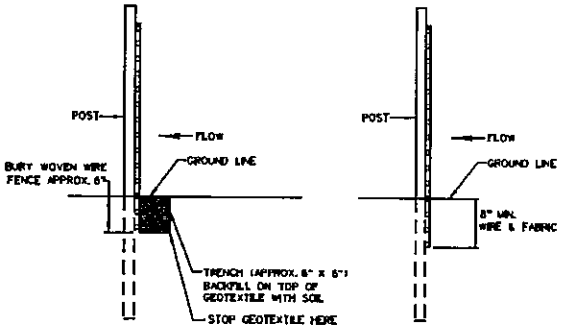
DRAWING NUMBER ECD-2
SHEET NUMBER

FILENAME: EROSION CONTROL\ECD-2.DGN

STATE	PROJECT NO.
MISS.	



ELEVATION VIEW

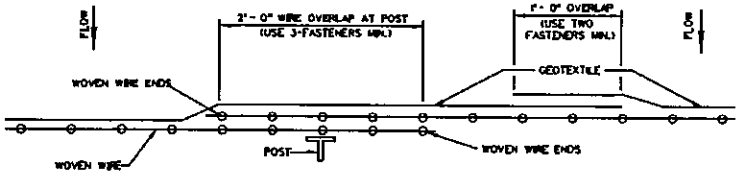


METHOD I

METHOD II
MECHANICAL INSTALLATION

SIDE VIEW

NOTES:
1. SILT FENCES SHALL BE USED IN AREAS WHERE FLOW IS NOT SEVERE.
2. SILT FENCES ARE TEMPORARY SEDIMENT CONTROL ITEMS THAT SHALL BE ERECTED OPPOSITE ERODIBLE AREAS SUCH AS NEWLY GRADED FILL SLOPES AND ADJACENT TO STREAMS AND CHANNELS.
3. SILT FENCE SHOULD BE PLACED WELL INSIDE RIGHT-OF-WAY AND ALONG EDGE OF CLEARING LIMITS. THIS WILL ALLOW ROOM FOR A BACK-UP FENCE IF FIRST FENCE BECOMES FULL.
4. WHEREVER POSSIBLE SILT FENCE SHALL BE CONSTRUCTED ACROSS A LEVEL AREA IN THE SHAPE OF A SMILE. THIS AIDS IN PONDING OF RUNOFF AND FACILITATES SEDIMENTATION.
5. THE CONTRACTOR MAY ELECT TO USE EITHER METHOD I OR METHOD II. COST TO BE LINEAR FEET OF SILT FENCE.
6. METHOD II INSTALLATION SHALL BE ACCOMPLISHED USING AN IMPLEMENT THAT IS MANUFACTURED FOR THE APPLICATION AND PROVIDES A CONFIGURATION MEETING THE REQUIREMENTS OF THE DETAIL.
7. WIRE SHALL BE MINIMUM OF 32" IN WIDTH AND SHALL HAVE A MINIMUM OF 6 LINE WIRES WITH 12" STAY SPACING.
8. GEOTEXTILE FABRIC MEETING THE TYPE I MATERIAL REQUIREMENTS AND INSTALLED ACCORDING TO SPECIFICATION MAY BE USED WITHOUT WIRE FENCE.



PLAN VIEW

REQUIRED LAPPING

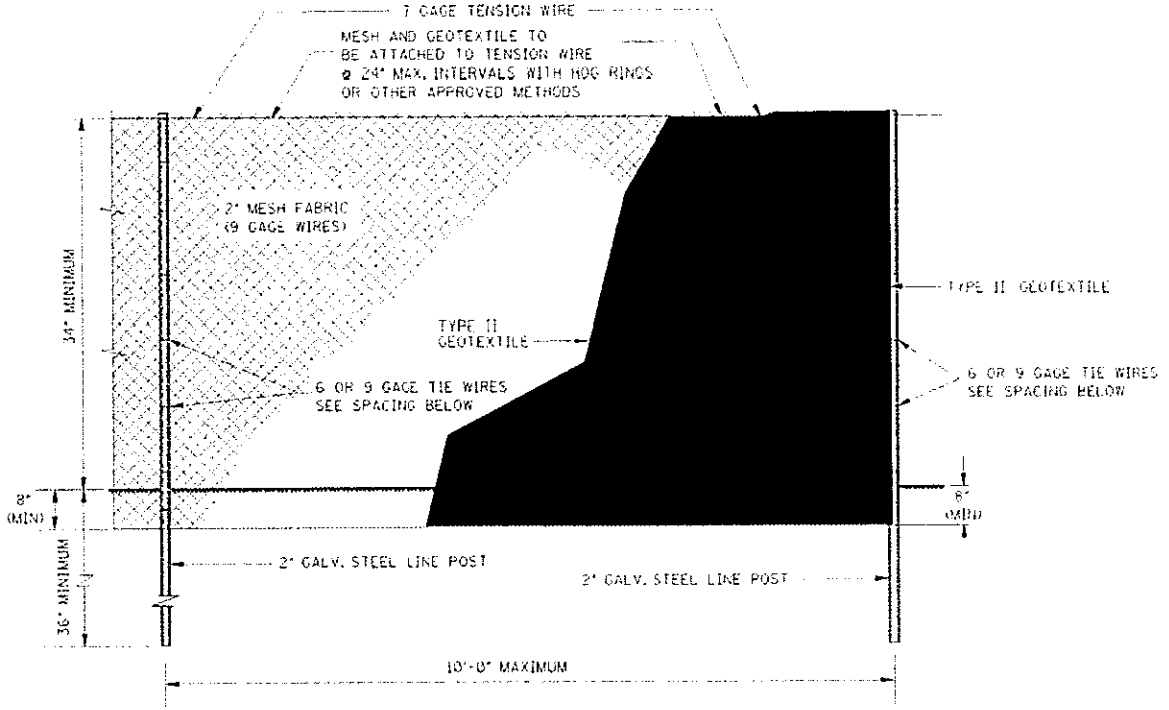
MISSISSIPPI DEPARTMENT OF TRANSPORTATION

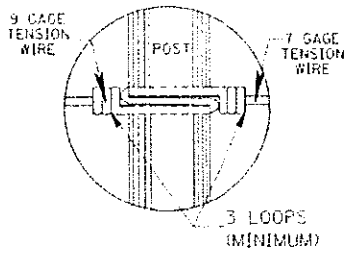
DETAILS OF SILT FENCE INSTALLATION

WORKING NUMBER ECD-3

SHEET NUMBER

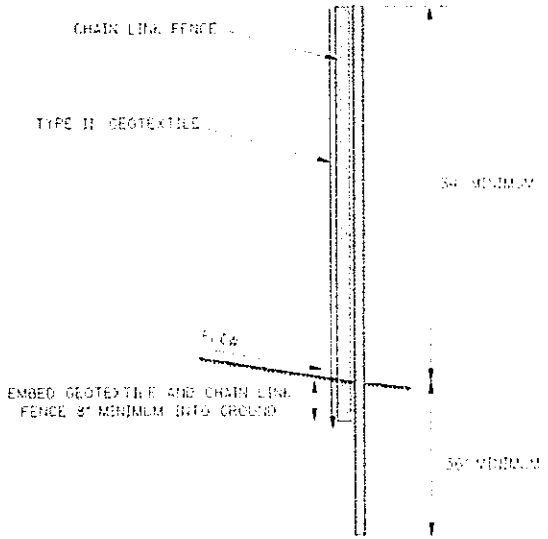
FILENAME: EROSION CONTROL\ECD-3.DGN





TENSION WIRE TIE DETAILS

6 OR 9 GAGE TIE WIRE SPACING	
TOTAL TEST LOAD (lbs)	TIE WIRE SPACING (C-C)
518	12"
475-517	11"
430-474	10"
387-429	9"
344-386	8"
301-343	7"
258-300	6"

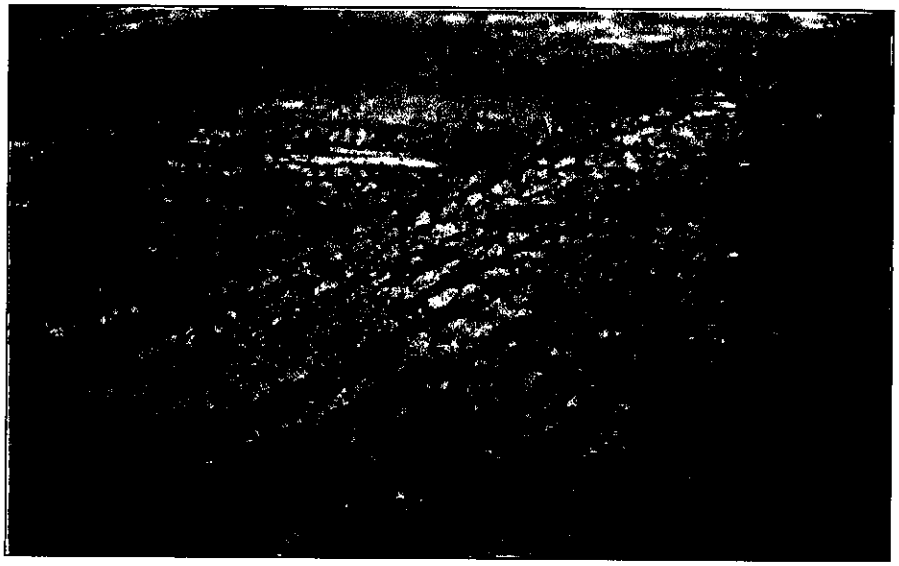


MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SUPER SILT FENCE

SSF-1

Surface Roughening (SR)



Practice Description

Roughening a sloping bare soil surface with horizontal depressions helps control erosion by aiding the establishment of vegetative cover with seed, reducing runoff velocity, and increasing infiltration. The depressions also trap sediment on the face of the slope. This practice is especially appropriate for soils that are frequently disturbed and on piles of excavated soils.

Roughening methods include stair-step grading, grooving and tracking. Equipment such as bulldozers with rippers or tractors with disks may be used. The final face of the slopes should not be bladed or scraped to give a smooth hard finish.

Planning Considerations

Surface roughening should be considered for all slopes. The amount of roughening required depends on the steepness of the slope and the type of soil. Stable sloping rocky faces may not require roughening or stabilization, while erodible slopes steeper than 3:1 require special surface roughening.

Design Criteria and Installation

Surface roughening is to be done only after cuts and fill are to final grade and shape.

Cut Slope Roughening (Areas not to be mowed)

Use stair-step grades or groove cut slopes with a gradient steeper than 3:1. Use stair-step grading on any erodible material soft enough to be ripped with a bulldozer. Do not make

individual vertical cuts more than 2 feet in soft materials or more than 3 feet in rocky materials.

Grooving

Grooving uses machinery to create a series of ridges and depressions that run across the slope (on the contour). Groove using any appropriate implement that can be safely operated on the slope, such as disks, tillers, spring harrows, or the teeth on a front-end loader bucket. Do not make such grooves less than 3 inches deep nor more than 15 inches apart.

Fill Slope Roughening (Areas not to be mowed)

Place fill slopes with a gradient steeper than 3:1 in lifts not to exceed 9 inches, and make sure each lift is properly compacted. Insure that the face of the slope consists of loose, uncompacted fill 4 to 6 inches deep. Use grooving, as described above, to roughen the face of the slopes, if necessary. Do not blade or scrape the final slopes face.

Cuts, Fills, and Graded Areas That Will Be Mowed

Make mowed slopes no steeper than 3:1. Roughen these areas to shallow grooves by normal tilling, dishing, harrowing, or use of cultipacker-seeder. Make the final pass of any such tillage implement on the contour. Make grooves formed by such implements close together (less than 10 inches) and not less than 1 inch deep. Excessive roughness is undesirable where moving is planned.

Roughening with Tracked Machinery

Limit roughening with tracked machinery to sandy soils to avoid undue compacting of the soil surface. Tracking is generally not as effective as other roughening methods described. Operate tracked machinery up and down the slopes to leave horizontal depressions in the soil. Do not back-blade during the final grading operation.

Seeding

Immediately seed and mulch roughened areas to obtain optimum seed germination and growth.

Common Problems

Tracking in the wrong direction, perpendicular to the slope, can accelerate rill erosion.

Figure 3 Rill Erosion

Maintenance

Inspect roughened areas after storms to see if re-roughening is needed. Regular inspection should indicate where additional erosion and

sediment-control measures are needed. If rills appear, fill, regrade, and reseed them immediately. Use proper *Dust Control* methods.

References

BMPs from Volume 1

Temporary Seeding (TS)

TS

Practice Description

Temporary seeding is the establishment of fast-growing annual vegetation from seed on disturbed areas. Temporary vegetation provides economical erosion control for up to a year and reduces the amount of sediment moving off the site.

This practice applies where short-lived vegetation can be established before final grading or in a season not suitable for planting the desired permanent species. It helps prevent costly maintenance operations on other practices such as sediment basins and sediment barriers. In addition, it reduces problems of mud and dust production from bare soil surfaces during construction. Temporary or permanent seeding is necessary to protect earthen structures such as dikes, diversions, grass-lined channels and the banks and dams of sediment basins.

Planning Considerations

Temporary vegetative cover can provide significant short-term erosion and sediment reduction before establishing perennial vegetation.

Temporary vegetation will reduce the amount of maintenance associated with sediment basins.

Temporary vegetation is used to provide cover for no more than 1 year. Permanent vegetation should be established at the proper planting time for permanent vegetative cover.

Certain plants species used for temporary vegetation will produce large quantities of residue which can provide mulch for establishment of the permanent vegetation.

Proper seedbed preparation and selection of appropriate species are important with this practice. Failure to follow establishment guidelines and recommendations carefully may result in an inadequate or short-lived stand of vegetation that will not control erosion.

The selection of plants for temporary vegetation must be site specific. Factors that should be considered are types of soils, climate, establishment rates, and management requirements of the vegetation. Other factors that may be important are wear, mowing tolerance, and salt tolerance of vegetation.

Seeding properly carried out within the optimum dates has a higher probability of success. It is also possible to have satisfactory establishment when seeding outside these dates. However, as plantings are deviated from the optimum dates, the probability of failure increases rapidly. Seeding dates should be taken into account in scheduling land-disturbing activities.

Site quality impacts both short-term and long-term plant success. Sites that have compacted soils should be modified whenever practical to improve the potential for plant growth.

The operation of equipment is restricted on slopes steeper than 3:1, severely limiting the quality of the seedbed that can be prepared. Provisions for establishment of vegetation on steep slopes can be made during final grading. In construction of fill slopes, for example, the last 4-6″ might not be compacted. A loose, rough seedbed with irregularities that hold seeds and fertilizer is essential for hydroseeding. Cut slopes should be roughened (see practice *Land Grading*).

Good mulching practices are critical to protect against erosion on steep slopes. When using straw, anchor with netting or asphalt. On slopes steeper than 2:1, jute, excelsior, or synthetic matting may be required to protect the slope.

The use of irrigation (temporary or permanent) will greatly improve the success of vegetation establishment.

Design Criteria and Installation

Prior to start of installation, plant materials, seeding rates and planting dates should be specified by a qualified design professional. Plans and specifications should be referred to by field personnel throughout the installation process.

Scheduling

Plantings should be made during the specified planting period if possible. When sites become available to plant outside of the recommended planting period, either temporary seeding, mulching or chemical stabilization will be more appropriate than leaving the surface bare for an extended period. If lime and fertilizer application rates are not specified, take soil samples during the final grading operation from the top 6″ in each area to be seeded. Submit samples to a soil testing laboratory for lime and fertilizer recommendations.

Plant Selection

Select plants that can be expected to meet planting objectives. To simplify plant selection, use Table TS-1, *Commonly Used Plants for Temporary Cover* and Figure TS-1, *Geographical Areas for Species Adaptation and Seeding Dates*. Seeding mixtures commonly specified by the Mississippi Department of Transportation are an appropriate alternative for plantings on rights-of-ways. Additional information related to plantings in Mississippi is found in Chapter 2 in the section *Non-woody Vegetation for Erosion and Sediment Control*.

Table TS-I Commonly Used Plants for Temporary Cover

Species	Seeding Rates/Ac	Planting Time	Desired pH Range	Fertilization Rate/Acre	Method of Establishment	Zone of Adaptability
Wheat	90 lbs. alone	9/1 – 11/30	6.0 – 7.0	600 lbs. 13-13-13	Seed	All
Ryegrass	30 lbs.	9/1 – 11/30	6.0 – 7.0	600 lbs. 13-13-13	Seed	All
White Clover	5 lbs	9/1 – 11/30	6.0 – 7.0	400 lbs. 13-13-13	Seed	All
Crimson Clover	25 lbs. alone 15 lbs. mix	9/1 – 11/30	6.0 – 7.0	400 lbs. 13-13-13	Seed	All
Hairy Vetch	30 lbs.	9/1 – 11/30	6.0 – 7.0	400 lbs. 13-13-13	Seed	All
Browntop Millet	40 lbs. alone 15 lbs. mix	4/1 – 8/30	6.0 – 7.0	600 lbs. 13-13-13	Seed	All

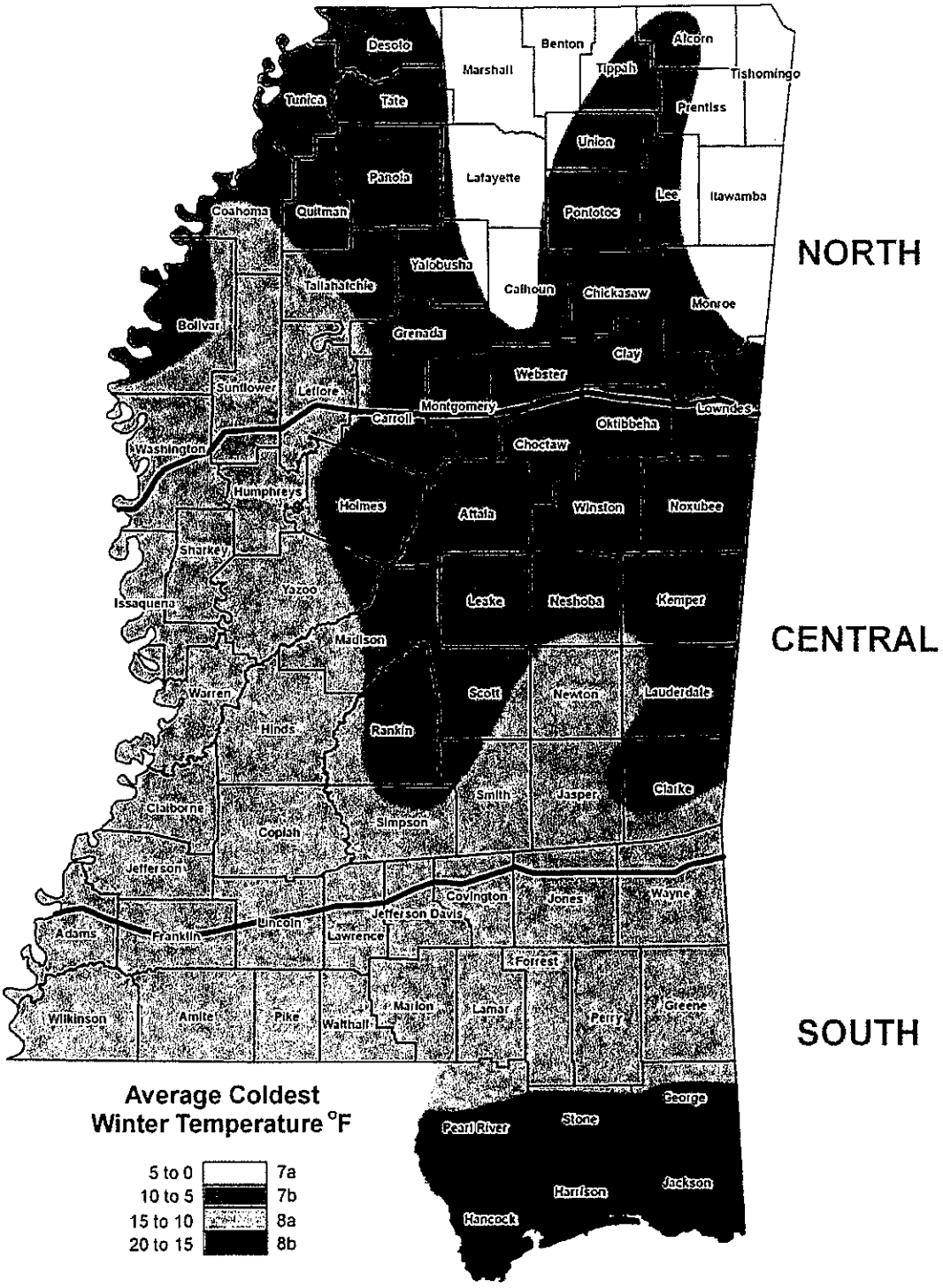


Figure TS- 1 Geographical Areas for Species Adaptation

Site Preparation and Soil Amendments

Complete grading and shaping before applying soil amendments, if needed, to provide a surface on which equipment can safely and efficiently be used to apply soil amendments and accomplish seedbed preparation and seeding. Incorporate lime and fertilizer into the top 6" of soil during seedbed preparation.

Lime

Apply lime according to soil-test recommendations. If a soil test is not available, use 1 ton of agricultural limestone or equivalent per acre on coarse-textured soils and 2 tons per acre on fine textured soils. Do not apply lime to alkaline soils or to areas that have been limed during the preceding 2 years. Other liming materials that may be selected should be provided in amounts that provide equal value to the criteria listed for agricultural lime or be used in combination with agricultural limestone or Selma chalk to provide equivalent values to agricultural limestone.

Fertilizer

Apply fertilizer according to soil-test results. If a soil test is not available, apply 8-24-24 fertilizer.

When vegetation has emerged in a stand and is growing, 30 to 40 lbs/acre (approximately 0.8 lbs/1000 ft^2) of additional nitrogen fertilizer should be applied.

Note: Fertilizer can be blended to meet exact fertilizer recommendations. Take soil-test recommendations to local fertilizer dealer for bulk-fertilizer blends. This may be more economical than bagged fertilizer.

Seedbed Preparation

Good seedbed preparation is essential to successful plant establishment. A good seedbed is well pulverized, loose, and smooth. If soils become compacted during grading, loosen them to a depth of 6" to 8" using a ripper or chisel plow.

If rainfall has caused the surface to become sealed or crusted, loosen it just prior to seeding by disking, raking, harrowing, or other suitable methods. When hydroseeding methods are used, the surface should be left with a more irregular surface of clods.

Planting Methods

Seeding

Evenly apply seed using a cyclone seeder (broadcast), drill seeder, cultipacker seeder, or hydroseeder. Broadcast seeding and hydroseeding are appropriate for steep slopes where equipment cannot operate safely. Small grains should be planted no more than 1" deep, and grasses and legumes no more than ½" deep. Seed that are broadcast must be covered by raking or chain dragging, and then lightly firmed with a roller or cultipacker.

Hydroseeding

Surface roughening is particularly important when hydroseeding, as a roughened slope will provide some natural coverage for lime, fertilizer, and seed. The surface should not be compacted or left smooth. Fine seedbed preparation is not necessary

for hydroseeding operations; large clods, stones, and irregularities provide cavities in which seeds can lodge.

Mix seed, use an inoculant if required, and mix a seed carrier with water and apply as slurry uniformly over the area to be treated. The seed carrier should be a cellulose fiber, natural-wood fiber or other approved fiber-mulch material which is dyed an appropriate color to facilitate uniform application of seed. Use the correct legume inoculant at 4 times the recommended rate when adding inoculant to a hydroseeder slurry. The mixture should be applied within one hour after mixing to reduce damage to seed.

Fertilizer should not be mixed with the seed-inoculant mixture because fertilizer salts may damage seed and reduce germination and seedling vigor. Fertilizer may be applied with a hydroseeder as a separate operation after seedlings are established.

Mulching

The use of an appropriate mulch provides instant cover and helps ensure establishment of vegetative cover under normal conditions and is essential to seeding success under harsh site conditions (see the *Mulching Practice* for guidance). Harsh site conditions include the following: slopes steeper than 3:1 and adverse soils (soils that are shallow to rock, rocky, or high in clay or sand). Areas with concentrated flow should be treated differently and require a hydromulch formulated for channels or use of an appropriate erosion control blanket.

Verification of Installation

Check materials and installation for compliance with specifications during installation of products.

Common Problems

Consult with a qualified design professional if the following occurs:

Design specifications for seed variety, seeding dates or mulching cannot be met; substitutions may be required. Unapproved substitutions could lead to failure.

Seeding outside of the recommendations results in an inadequate stand. Reseed according to specifications of a qualified design professional (see recommendations under Maintenance).

Maintenance

Reseeding

Inspect seedings weekly until a stand is established and at least monthly thereafter for stand survival and vigor. Also, inspect the site for erosion.

Eroded areas should be addressed appropriately by filling and/or smoothing, and a reapplication of lime, fertilizer, seed and mulch.

A stand should be uniform and dense for best results. Stand conditions, particularly the vegetative coverage, will determine the extent of remedial actions, such as seedbed preparation and reseeding. A qualified design professional should be consulted to advise on remedial actions. Consider no-till planting.

Fertilizing

If vegetation fails to grow, have the soil tested to determine whether its pH is in the correct range or whether nutrient deficiency is a problem.

Satisfactory establishment may require refertilizing the stand, especially if the planting is made early in the planting season. Follow soil-test recommendations or the specifications provided to establish the planting.

Mowing

Temporary plantings may be mowed and baled or simply mowed to complement the use of the site.

Millet, rye, and wheat may be mowed, but no lower than 6" (closer mowing 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").

Bermuda grass is tolerant of most mowing regimes and can be mowed often and close, if so desired, during its growing season.

References

Volume 1

Chapter 2

Vegetation for Erosion and Sediment Control 2-10

Chapter 4

Land Grading (LG) 4-16
Topsoiling (TSG) 4-20
Mulching (MU) 4-48
Permanent Seeding (PS) 4-53

Appendices Volume

Appendix G

MDOT Vegetation Schedule G-1

WORKSHEETS

Worksheet #1
Cover Sheet

STORM WATER POLLUTION PREVENTION PLAN (SWPPP)

For: MC Environmental LLC, Class II Rubbish Facility

Facility Name

Columbia-Purvis Road at Loftin Road, Columbia, Marion County, MS

Facility Location

Under Mississippi's

Industrial **Storm Water General NPDES Permit**

(Type of Permit: Industrial, Wood Treater, etc.)

Coverage No. MSR 0 0 _ _ _ _

SWPPP Manager: Greg Prine

Title: Owner **Telephone #:** 601-736-2199

SWPPP Committee Members (list), if applicable:

I certify under penalty of law that the information submitted is, to the best of my knowledge, true, accurate and complete.

Signature | **Date Signed** 10-13-2023

GREG PRINE | PRESIDENT

Printed Name | **Title**

DESCRIPTION OF POTENTIAL POLLUTANT SOURCES

Worksheet #2a

Instructions: Describe potential pollutant sources that were exposed to storm water during the past three years and/or are currently exposed.

Description of Exposed Significant Material	Period of Exposure	Quantity Exposed (units)	Location (as indicated on the site map)	Method of Storage or Disposal (e.g., pile, drum, tank)	Description of Material Management Practice and/or Any Treatment Storm Water Receives (e.g., pile covered, drum sealed)
Rubbish Waste	Year Round	0 – 500 Tons	Disposal Cell	Pile	All rubbish waste will be contained in the disposal cells and all storm water runoff from the cell will be diverted using berms or ditches and retained in the sediment basin.
Exposed soils	Year Round	1 – 4 acres	Disposal Cell	Pile	During digging of disposal cells, sediment may be exposed. All storm water runoff from the cell construction will be diverted using berms or ditches and retained in the sediment basin.

LIST OF SIGNIFICANT SPILLS AND LEAKS

Worksheet #2b

Directions: Record below all significant spills and significant leaks of toxic or hazardous pollutants that have occurred at the facility as of July 14, 1992 (See page 5 of the guidance manual).

Date (Month/day/Year)	Spill or Leak (S/L)	Location (as indicated on site map)	Description	Response Procedure		Preventive Measures Taken (Add additional sheets if necessary)
			Type of Material	Amount of Material Recovered	Material Exposed to Storm Water (Y/N)	

NON-STORM WATER DISCHARGE EVALUATION AND CERTIFICATION

Worksheet #2c

Outfall No.	Date of Evaluation	Method Used to Test or Evaluate Discharge	If Evaluation is Impossible Give Reason	Is Non-Storm Water Being Discharged? (Yes/No)	List Likely Sources of Non-Storm Water Discharges	Person(s) Who Conducted the Test or Evaluation

CERTIFICATION

I certify under penalty of law that is, to the best of my knowledge and belief, true, accurate, and complete (see permit Part V.G.).

A. Name & Official Title (type or print)	B. Area Code and Telephone No.
C. Signature	D. Date Signed

EXISTING AND PROPOSED BMPs

Worksheet #3a

Instructions: **List all identified actual and potential storm water pollution sources and describe existing management practices and proposed BMPs with implementation schedule.**

Potential Pollution Sources	Existing BMPs	Proposed BMPs	Implementation Schedule
1. Rubbish Waste Handling Areas	Spill containment and control practices (i.e. spill training for personnel, spill kits, temporary berms constructed as needed, sediment basin).	NA	Exiting BMPs are currently implemented. Future potential BMPs are at the discretion of the certifying engineer.
2. Rubbish Waste Disposal Cell Perimeter	Structural practices to divert flow from exposed soils in and along the perimeter of the disposal cells included native vegetation outside of the perimeter and berms to divert stormwater to the sediment basins. Vegetative practices may include temporary seeding, permanent seeding, mulching, and surface roughing.	Silt fences along the active disposal cell perimeter may be required if evidence of sediment load in stormwater is present.	Daily visual inspections will indicate when or if silt fences along the disposal cell perimeter is required.
3. Rubbish Waste Disposal Cells	Stormwater within the disposal cells is managed by earthen berms and/or diversion ditches. Berm/ditch construction is designed to divert water away from the current disposal area and toward the sediment basin.	The base of each cell will be graded to prevent standing water in the current disposal area and direct water toward the sediment basin. If ponding is observed in a portion of the current disposal area, the area will be regraded to drain the water. Any area where ponding occurs will be closed to disposal until regrading can be accomplished.	Berms and/or diversion ditches will be constructed as determined by the site stormwater manager as cells are constructed.

EMPLOYEE TRAINING

Worksheet #3b

Instructions: **Describe the employee training program for your facility below. The program should, at a minimum, address spill prevention and response, good housekeeping, and material management practices. Provide a schedule for the training program and list the employees who attend training sessions.**

Training Topics	Brief Description of Scheduled Training Program/Materials (e.g., film, seminar, staff meeting)	Proposed Frequency of Training (e.g., once per quarter)	Who will attend?
Spill Prevention And Response	Safety meeting	Once per year	Staff responsible for storm water pollution prevention
Good Housekeeping	Safety meeting	Once per year	Staff responsible for storm water pollution prevention
Material Management Practices	Safety meeting	Once per year	Staff responsible for storm water pollution prevention
Other Topics			

(Make additional copies of this form as needed)