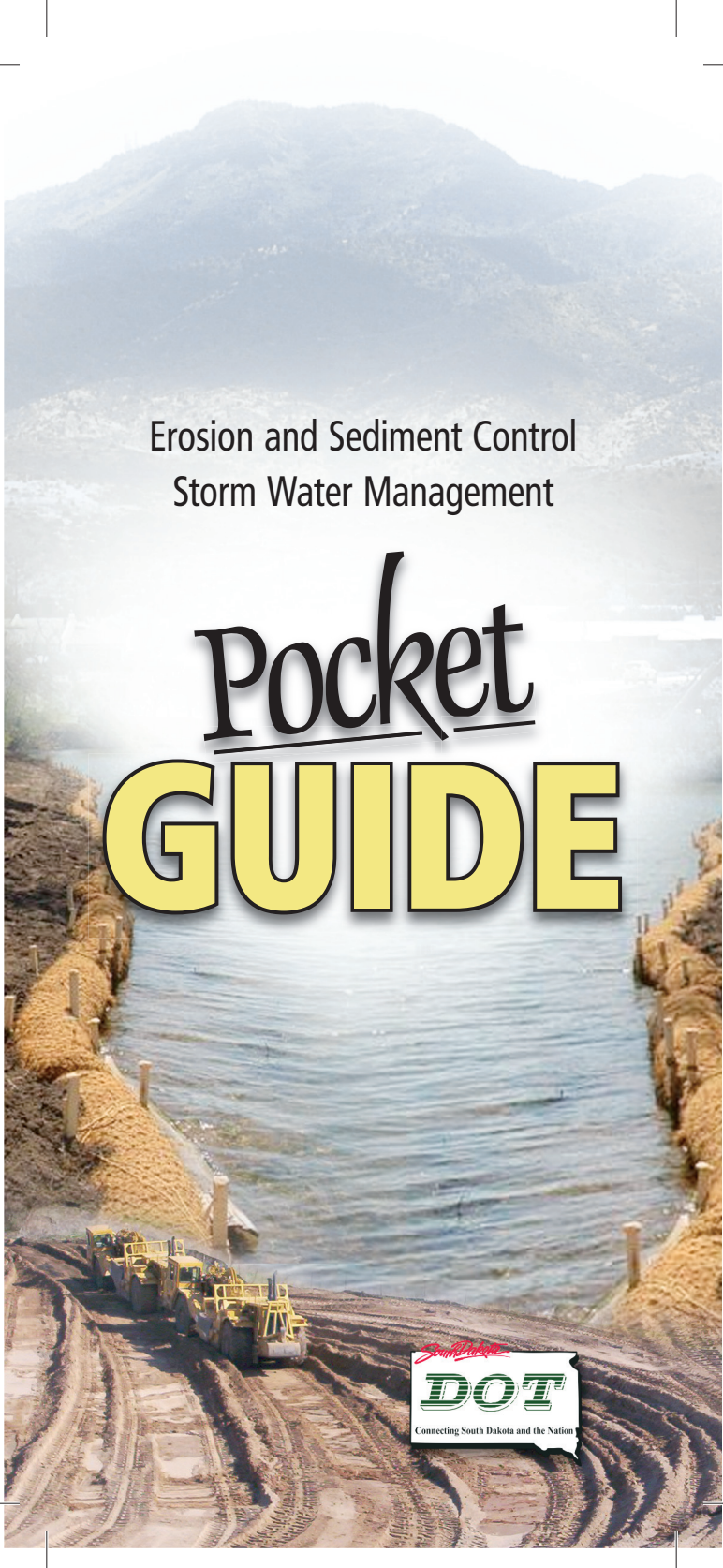
Erosion and Sediment Control
Storm Water Management

Pocket GUIDE



South Dakota DOT
Connecting South Dakota and the Nation

PREFACE

The South Dakota Department of Transportation has approved this field guide as part of its' Water Quality Enhancement Program. Environmental regulations are continually changing as are methods of complying with regulations in the field. SDDOT believes this field guide will act as a resource tool on site to respond to those changing conditions.

The purpose of this guide is to assist field personnel with establishing and maintaining construction site compliance with the **2004 South Dakota Standard Spec Book – Div. II** and the **General Permit for Storm Water Discharges Associated with Construction Activities.**

It is assumed that most design decisions have been made prior to needing the information contained in this field guide. Therefore, this document contains information intended to assist in decisions involving construction practices, maintenance, inspection, and record keeping. Refer to the **SD DOT Erosion and Sediment Control Design Manual** for issues on design, planning or training.

NOTE:

Completely review the Plans and Specifications so you are familiar with the requirements of the project.

The sequence of priority concerning Specifications is:

- Special Provisions
- Plan Notes
- Supplemental Specifications
- Standard Specifications

1. Special Provisions govern over the Plan Notes, Supplemental Specifications, and Standard Specifications.
2. Plan Notes govern over Supplemental Specifications and Standard Specifications.
3. Supplemental Specifications govern over the Standard Specifications.

SDDOT is dedicated to protecting and preserving the valuable resources of the State of South Dakota for generations to come.

PROJECT PREPARATION

There are several steps to keeping your job site in compliance. Some of those steps begin before one spec of dirt is moved.

- Become familiar with the SWPPP for the project
- Take pictures of pre-land disturbance conditions and add them to the project files
- Identify potential discharge points
- Pre-Land Disturbance Meeting, discuss with subcontractors the importance of stormwater management
- Identify Erosion Control Supervisor
- Make sure an emergency contact procedure has been created
- Install onsite signage
- Review SWPPP phasing and detail maps and hang them in the job trailer

TABLE OF CONTENTS

TABLE OF CONTENTS CONT.

Additional Resources

PRINCIPLES AND PRACTICES OF EROSION AND SEDIMENT CONTROL

Erosion and Sediment Control Types

The terms erosion and sediment control (ESC) are often used interchangeably. However, erosion and sediment control are quite different. Sediment is a product of erosion.

Erosion control is any practice that protects the soil surface and minimizes the amount of soil particles detached and transported by rainfall or wind. One method of good erosion control is minimizing the length of time areas are exposed. Erosion control is implemented as a source control. Soil is a natural resource that has a significant value, especially in the structural integrity of a highway system.

Sediment control is any practice that traps the soil particles after they have been detached and transported. Sediment control begins with erosion control by minimizing the potential sources of sediment. The emphasis should be placed on minimizing length of time areas are exposed, providing a protective cover on the soil surface, diverting runoff so that it does not flow across disturbed areas, and preserving existing vegetation.

FACTORS AFFECTING EROSION

Types of Erosion

Splash – Energy from the raindrop dislodges soil particles and initiates the erosion process.

Sheet – Uniform removal of particles across a slope.

Rill – Long, narrow incisions in the soil caused by increased runoff velocities and channelized flow.

Gully – Deep, wide incisions caused by concentrated flow.

Streambank – Bank sloughing, toe cutting in a natural drainage pattern.

Soil Type

The primary soil property that affects erosiveness is the cohesiveness of the soil. While there are other factors, this is the most dominant factor when considering temporary erosion controls. The generalized soil triangle shows the break between soils that can be considered cohesive or non-cohesive soils. This rule of thumb has to be applied with good professional judgment.

Vegetation

Vegetation is the primary permanent erosion control for unpaved surfaces along the roadside. Anytime the existing vegetation is removed, there is immediate potential for wind and water erosion. Therefore, any un-vegetated surface should be treated with an appropriate best management practice (BMP) to prevent surface erosion. The appropriate BMP depends on the other factors affecting erosion.

ADDITIONAL FACTORS AFFECTING EROSION

Climate

The key climatic factors affecting erosion are rainfall intensity, duration, and return frequency, which in turn determine the energy level of storms. Other climatic properties, such as temperature and growing season, are key to reestablishing permanent erosion controls.

Topography

The gradient and length of slope have a direct influence on the transport of dislodged sediment and soil particles down slope. Even very erosive soils on flat slopes will not produce large amounts of sediment because there is not sufficient potential gravitational force to accelerate surface runoff. As slopes become steeper, the velocity of flow of surface runoff increases with a subsequent increase in sediment loads.

SITE INSPECTIONS

South Dakota DOT in combination with the contractor's Erosion Control Supervisor are responsible for maintaining Erosion and Sediment Control compliance. Inspections must be conducted by personnel who are familiar with permit conditions, as well as the proper installation and operation of pollution prevention measures.

Inspections should be performed at least once every seven (7) calendar days and within 24 hours of the end of a storm that is 0.5 inches or greater, or a snow melt event that causes surface erosion. Where runoff is unlikely due to winter conditions, inspections should be conducted at least once per month.

inspections should include:

- Disturbed areas of the construction site that have not been finally stabilized (achieved 70% of vegetative cover)
- Areas used for storage of materials
- Structural control measures
- Locations where vehicles enter or exit the site
- Inlets and other pollution sources

These areas must be inspected for evidence of, or the potential for, pollutants entering the drainage system, and erosion and sediment control measures identified in the plan shall be observed to ensure that they are operating correctly and sediment is not tracked offsite.

INSPECTION PRACTICES

- Silt fence will be inspected for depth of sediment and for tears. Also ensure the fabric is securely attached to the posts and that the posts are well anchored. Sediment buildup will be removed from the silt fence when it reaches 1/3 of the height of the silt fence
- Sediment basins and traps must be checked. Sediment will be removed when depth reaches approximately 50 percent of the structure's capacity, and at the conclusion of the construction
- Check dams will be inspected for stability. Sediment will be removed when depth reaches ½ the height of the dam
- All seeded areas will be checked for bare spots, washouts, and vigorous growth free of significant weed infestations
- Inspection and maintenance reports will be prepared on form DOT 298 for each site inspection, this form will also be used to document changes to the SWPPP. A copy of the completed inspection form will be filed with the SWPPP documents
- The SDDOT Project Engineer and contractor's site superintendent are responsible for inspections. Maintenance, repair activities are the responsibility of the contractor. The SDDOT Project Engineer will complete the inspection and maintenance reports and distribute copies per the distribution instructions on DOT 298

12 WAYS TO INSPECT YOUR SITE*

- Inspect discharge points, downstream, and off-site areas for signs of sediment & erosion
- Inspect all perimeter controls & maintain them as necessary
- Inspect projects for vehicle tracking offsite and schedule cleaning as appropriate
- Inspect disturbed areas with final stabilization for erosion and condition of vegetative cover
- Inspect good housekeeping throughout the project
- Inspect inlets, stockpiles, and concrete washout areas
- Update and ensure SWPPP is consistent with all implemented practices
- Ensure BMPs are consistent and adequate for site conditions
- Ensure records and inspection logs are up-to-date
- Ensure photo documentation of ESC to serve as evidence of effort, if necessary
- Ensure that contractors, subcontractors, and DOT are notified as appropriate. Convey reasonable timelines for completing any corrective action
- Ensure enforcement agency is notified if there is a sediment release or spill

** Adapted from the Wisconsin Stormwater Basics Field Guide*

REPORTS AND RECORDS

Inspection Reports

After every inspection, an inspection report should be completed and include:

- Summary of the areas inspected
- The name(s) and title(s) of personnel making the inspection
- The date(s) of the inspection
- Major observations
- Corrective actions taken
- Any incidents of non-compliance

Based on the results of the inspection, the plan shall be revised and implemented in a timely matter, but in no case more than seven (7) calendar days following the inspection. Where an inspection does not identify any incidents of non-compliance, the report shall contain a certification that the site is in compliance with the plan and the permit.

The report shall be signed in accordance with the signatory requirements of the General Permit 6.7 2.a.

Retention of Records

Inspection reports shall be retained as part of the plan for at least three (3) years after the site has reached final stabilization and coverage under the permit has been terminated.

A copy of the SWPPP and SD DENR's letter granting coverage under the permit from the date of project initiation to the date of final stabilization should also be retained on site, or made readily available.

SWPPP AMENDMENTS

When changes are made to the construction project that will require alterations in the temporary erosion controls of the site, the Storm Water Pollution Prevention Plan (SWPPP) must be amended to provide appropriate protection to disturbed areas, all storm water structures, and adjacent waters.

The SDDOT Project Engineer will modify the SWPPP plan (DOT 298) and drawings to reflect the needed changes. Copies of changes will be routed per DOT 298. Copies of forms and the SWPPP will be retained in a designated place for review over the course of the project.

The modifications should be made on the plan. The plan then should be posted and/or made available for all people involved in the project.

TOPSOIL

Contractor Furnished Topsoil – If a larger volume of topsoil is required for the new grade than can be salvaged from the existing grade, the Contractor will be required to furnish and place 4 inches of topsoil

- Topsoil placement must be 4 inches thick in ROW
- 6 inches thick on temporary easements
- Expectable topsoil should have fine grained material to maintain adequate moisture and nutrients
- After soil installation is completed, depth should be verified and seeding operations can be initiated

Remember

- Vegetation cannot be successfully without making sure topsoil requirements are met before permanent seeding takes place
- If soil testing is required, make sure soil tests are completed per plans and specifications
- Salvage topsoil from initial site disturbances
- Topsoil berms are a good perimitter control device

Notes:

Refer to Standard Specification 120.3.A.2 and/or 230

SURFACE ROUGHENING

A technique to create horizontal grooves, or depressions, which run parallel to the slope contours. These grooves will decrease runoff velocities, trap sediment, and increase water infiltration rate of the soil.

- Shall be done after topsoil placement and before permanent seeding
- Shall be done on slopes 3:1 and greater and on slopes deemed necessary by the Engineer
- Surface Roughening helps in areas of high compaction by ripping the soil and increasing pore space available to soil
- Surface Roughening should be done in conjunction with additional erosion prevention practices

Remember

- Keep equipment off the areas that have recently be worked, this will decrease the chance for recompaction those areas

Notes:

Refer to Standard Plate 734.25 for details.

SEEDING EQUIPMENT

The Standard Specifications call for using a press drill for seeding. However, other drills may be used if they are equipped with packer wheels that follow directly behind double disk furrow openers and provide the same compaction obtained by a press drill.

In addition to the drills specified in Section 730 of the Standard Specifications, other types of no-till drills will be allowed as long as the seed is planted at a depth of 1/4 inch to 1/2 inch.

- The drill should be equipped with a metering device which measures the area covered by the drill (usually in acres)
- There are no speed requirements for the seed drill. However, experience shows that 5 mph should be the maximum
- Calibration is necessary to ensure the seed is applied at the designated seed rate on the plans
- All permanent seed shall be planted in topsoil 1/4 inch to 1/2 inch deep
- All broadcast seed must be raked or dragged into the top 1/4 inch to 1/2 inch of topsoil

SEED AND FERTILIZATION

Seed Mixtures

SD Native grown seed is an acceptable alternative to any of the following varieties - they must conform to the same specification and requirements.

- Type A mixture is typically used West of the Missouri River
- Type B mixture is used East of the Missouri River
- Type C mixture is used on projects with less than 5 acres of disturbed ground
- Type D mixture is a lawn seed mixture
- Type E mixture is used where there is US Forest Serice, National Forest Service, or Game, Fish, and Parks lands adjacent to the highway
- Type F mixture can be used as a substitute for Type A where there are steep grades, long backslopes, or erosive soils
- Type G mixture can be used as a substitute for Type B where there are steep grades, long backslopes, or erosive soils
- Special Permanent Seed Mixtures 1, 2, etc. are seed mixtures other than Types A, B, C, D, and E. These are special because of the type of project, location of project, or by request of an adjacent landowner

Fertilizing

- Native Grasses will not require fertilizer
- Special Seed Mixtures shall have a commercial grade 18-46-0, 11-52-0, 13-13-13 or alternate approved fertilizer
- 11-52-00 shall be used for Sod, or approved alternate; it shall be incorporated 2 inches into the soil; application rate shall be 3 lbs/1000 sq. ft.

Refer to Standard Specification 730, 731, and Plan Notes for your specifics.

DRY MULCHING

Grass Hay or Straw

- Bales with noxious weed contamination must be rejected
- The Contractor will be required to remove the contaminated bales.
- Prior to seeding and mulching, the soil should be loosened to a depth of 3 inches
- Bromegrass is not an acceptable mulch
- Mulch shall be uniformly over the seeded area at 4000 lbs/acre
- Approximately 10% of the soil should be visible through the mulch
- The mulch shall be punched immediately after application
- The contractor must reapply on areas skipped or are not uniform

Remember

- Mulch shall be placed as soon as possible, or within 48 hours of seeding
- Traffic (foot, equipment, vehicle) shall be avoided over seeded/mulched areas
- Any areas with displaced mulch will need to be remulched

Refer to Standard Specification 732 for complete details

HYDRO MULCHING

Fiber Mulching

- Shall be applied in a separate operation following seeding
- The product must be premixed with 2% guar gum or synthetic tackifier
- The application rate shall be 2000 lbs/ acre
- It shall cure a minimum of 18 hours prior to watering or a storm event
- Must have total and uniform ground coverage
- See APL for type and sources

Bonded Fiber Matrix

- Shall be hydraulically applied at a rate of 3900 lbs/acre
- Product shall be 100% biodegradable
- Has to be applied in two applications from two directions to achieve 100% ground coverage
- It shall be composed of 90% wood fiber, 9% natural binder, and 1% organic/mineral activators (All by weight.)
- It shall consist of 50 lbs BFM to 125 gallons of water

Inspection Tip

Make sure application is uniform and the correct coverage is applied.

SODDING

- Sod shall be placed as specified in the plans
- It shall be dense, well rooted Kentucky Bluegrass or other specified grass
- Sod must be laid within 36 hours of cutting
- Dry, crumbling, tearing, or breaking sod rolls will not be accepted
- Sod will be 3/4" or more thick; 2-3" long grass; free of weeds, undesirable grasses, or foreign material
- Soils shall be tilled to a fine texture an inch or more deep
- The soil will be watered to a depth of 1" prior to placing sod
- Sod will be hand laid, from the bottoms of slopes to the top
- In waterways, the sod strips shall be laid parallel to the flow with two staples in the upper end of each sod strip
- The sod shall be watered after laying to provide a moist condition throughout the sod and well into the soil

Water Source

- Permits may be requied to draw water from ponds, lakes, streams, rivers, wells

Remember

- Sodded areas shall be watered for 4 weeks after sodding
- Sod cannot be laid from June 1 to August 1

Refer to Section 733 and Plan Notes for anchoring specifics.

TURF REINFORCING MAT

Turf Reinforcement Mats (TRMs) are used as a permanent, cost effective and environmentally friendly alternative to rip rap or hard armor. They are designed to add reinforcement to the soils. The combination of seed and soil are held in place within the matrix. As the vegetation matures, roots and stems inter-twine with the matrix and enhance the soils ability to with stand higher sheer stress.

- Shall be installed as noted in the Plans, locations in the table, and at locations determined by the Engineer
- The Contractor shall install the mat according to manufacturer's installation instructions
- TRM's are typically used on slope areas with concentrated flow or in channels
- See the APL for vendors.

Tips

- Make sure TRM is installed per manufactures specifications
- Proper amount of staples are needed to insure that effectiveness of the product
- Make sure large rocks and other debris are not under the blanket because they can cause tenting

EROSION CONTROL BLANKET

These products are designed to dissipate the energy of rain-drop impact or flow depths and help keep soil particles from being detached and transported.

- All blankets should be selected from the APL
- Slopes - Product choice depends on slope steepness and soil type

Examples of erosion control blanket materials include the following:

- Straw or hay
- Coconut and related fibers
- Wood excelsior
- Jute
- Polypropylene
- Nylon

Common Problems

- The first blanket must have the upgrade edge buried and stapled in a check slot
- Stapling must be completed per manufactures specifications
- Make sure large rocks and other debris are not under the blanket because they can cause tenting
- Make sure water is flowing on top of blankets and not below

Refer to Standard Plate 734.01 and Standard Specification 734

RIPRAP

Riprap is a layer of large rock placed on a slope for erosion protection. It is used when water velocities are greater than what the erosion control blanket or sod can withstand. It also is used where there is a continual wave action against a slope and to protect bridge berms. Occasionally it is used around inlets and outlets of pipe, and smaller drainage channels.

The material used for riprap can be either quarry rock or fieldstone, depending on the class of riprap. It must be hard and durable so it won't disintegrate when exposed to water and weather. There are several gradation specifications for the various classes of riprap depending on its use.

RIPRAP CLASS	ROCK SIZE IN FEET	RIPRAP CLASS	ROCK SIZE IN FEET
A	.40 – 1.3	D	1.8 – 2.85
B	.40 – 1.8	E	2.25 – 3.6
C	.95 – 2.25	F	2.85 – 4.5

Tips

- Used to dissipate water energy where vegetation will not withstand the predicted flow velocities
- It should be keyed in to match the ground line. It should not be laid on top of soil
- Rock should be a fractured rock so it locks together
- Rock should be large enough to withstand predicted high flows, use larger rock if in doubt

Refer to SDDOT Standard Specification 700.1. Riprap shall conform to SDDOT Standard Specification 830.

EROSION BALES

Erosion bales are a temporary sediment control device. The bales will generally last 3-6 months.

They are entrenched and anchored with wood stakes, two stakes per bale, so they remain securely in place. It is important that water be able to flow through the bales and that a dam effect is not created.

- Do not use in high volume, high flows
- Do not use in streams or channels
- Maintenance required because bales disintegrate
- Cannot be used on paved surfaces because requires trenching
- Use as perimeter control
- Use for small drainage areas only
- Bales with noxious weed contamination will be rejected
- The Contractor will be required to remove the contaminated bales

Refer to Standard Plate 734.02 and Standard Specification 734

EROSION CONTROL WATTLE

A wattle is a mesh casing (biodegradable or synthetic) filled with biodegradable fibers such as straw, excelsior, coir, compost or shredded wood. Wattles reduce the velocity of the runoff, retain the sediment-laden water and allow for sedimentation and discharge of less sediment-laden storm water.

- See the APL for approved types

Common Problems

- Installed without low point in center, narrower than channel and/or not high enough on sides
- Result-water goes around the check dam and creates scour at edges
- Not large enough diameter wattle for application and is ineffective
- When used at mid-slope, wattle is not placed on contour or perpendicular to slope and water bypasses BMP

Ditch Installation		Cut or Fill Slope Installation	
Grade	Spacing (Ft)	Slope	Spacing (Ft)
2%	150	1:1	10
3%	100	2:1	20
4%	75	3:1	30
5%	50	4:1	40

Refer to Standard Plate 734.06 for details.

SILT FENCE

Silt fence consists of a temporary vertical barrier of geotextile fabric (filter fabric) attached to and supported by woven wire and wood or steel posts. The bottom of the silt fence material must be entrenched 6-8 inches into the ground.

Silt fence is placed before earth disturbing activities have begun and left in place until vegetation is established. Exceptions are at those locations where it is impractical to do so because of interference with construction activities.

Silt fence reduces the velocity of the runoff, retains the sediment-laden water and allows for sedimentation and discharge of less sediment laden storm water.

- Place silt fence away from toe of slope to allow for sediment deposition
- Do not use in high volume, high velocity flows
- Do not use in live streams
- Silt fence will need to be removed when site reaches final stabilization
- Post spacing should be 4 – 6 feet.
- Install J – Hooks appropriately for long runs.

Common Problems

- Placed in high velocity flows
- Not entrenched at bottom therefore water passes under fence
- Not placed on contour or slope and water bypasses fence
- Lack of maintenance
- Silt fence placed adjacent to bottom of slope which creates quick build up of sediment

Refer to Standard Plates 734.04, 734.05 and Standard Specification 734 for details.

CHECK DAMS

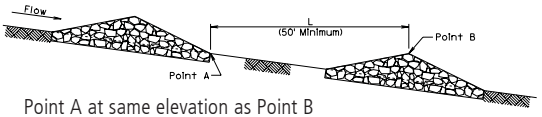
Check dams constructed across a swale or drainage ditch, and are used for the purpose of reducing the velocity of concentrated flows. Check dams are generally placed in areas where the steepness of slope is 6% or greater combined with a large drainage area and/or where rocky soil conditions prevent the installation of other erosion or sediment control devices.

Types of Check Dams

- Rock Check Dam
- Rock Weeper
- Triangular Silt Dike
  - Shall be placed at locations noted in the table and those determined by the Engineer

Tips

- Make sure the center of each check dam is 6" lower than its outer edges
- Remove sediment once it reaches 1/3 the height of the check dam
- Can be used as temporary or permanent controls



Point A at same elevation as Point B

Refer to Standard Plate 734.03

INLET, MANHOLE, JUNCTION BOX PROTECTION

Storm drain inlets must be protected with sediment capture devices prior to soil disturbing activities that would result in sediment laden runoff entering the inlet.

- Products used shall be from the APL
- Leave a minimum of 1' between the silt fence installation and the inlet. Fill space completely to a 2" depth of 2" minus or smaller aggregate
- The top elevation of the silt fence must allow a 12" horizontal flap of silt fence remains at the bottom
- The base of the silt fence should conform to the natural ground profile but trenching is not necessary
- The extra 12" of material may be cut to lie flat upon the subgrade
- Place Sediment Filter Bags shall be placed on the 12" flap around the perimeter of the installation.
- The Sediment Filter Bags shall overlap 6" at the ends and be placed tightly together
- Sediment Filter Bags shall be filled with clean aggregate 2" minus or smaller

Tips

- Inlet protection is to be maintained during the life of the project
- Inlet protection devices must be inspected and cleaned out regularly
- All devices should have an emergency overflow feature to prevent flooding if it is full

Refer to Standard Plates 734.05, 734.10, 734.11 and Standard Specification 670 and 671 for details.

INLET PROTECTION

Drop inlet or storm drain inlet protection can successfully use an assortment of BMPs. Inlet protection measures provide a temporary area for sedimentation.

Some BMPs are designed to filter, but most rely upon the detention of sediment-laden storm water to allow for the soil particles to drop from suspension and the cleaner water to enter the conveyance system.

Storm drain inlets must be protected with sediment capture devices prior to soil disturbing activities that would result in sediment laden runoff entering the inlet.

- Adequate area is necessary to provide for excavated area for settling without interfering with traffic or equipment movement
- Excavated drop inlet stilling basins are appropriate where heavier flows are anticipated, and overflow capability is needed
- Inlet protection devices must be inspected and cleaned out regularly
- Sediment removal may be difficult in high flow conditions or if runoff is heavily sediment laden
- If high flow conditions are expected, use other onsite sediment trapping techniques in conjunction with inlet protection
- If drainage area is greater than 1 acre, sediment-laden water should be diverted to a sediment control device such as a sediment trap or basin
- Inlet protection must be maintained during the life of the project
- All devices should have an emergency overflow feature to prevent flooding if it is full

Refer to Standard Plates 734.10, 734.11 and Standard Specification 670 for details.

STABILIZED CONSTRUCTION ACCESS

The Contractor shall install an entrance/exit shown on the Construction Entrance Detail at the location where there is an approach from a site to a public roadway.

- The access shall be regularly inspected and maintained
- Tracking and sediment flow will not enter the roadway
- Granular material may need to be removed when dirty and replaced with new
- Granular material shall conform to the gradation in the Plans
- Geotextile below the granular material should conform to Section 831 of the Standard Specifications
- Geotextile will be kept as taut as possible prior to placing material
- Equipment shall not be allowed on geotextile until the first lift of material is in place
- Seams must overlap two feet and be shingled
- Granular material shall be placed in 6 inch lifts

Inspection Tips:

- Inspect exit for excessive sediment build up
- Remove sediment and rebuild the exit as necessary to retain effectiveness and prevent off-site tracking
- Additional street cleaning may be required if unable to retain sediment on site
- BMP examples: Rock bed, cattle guard, log/timber, vehicle tire washoff

STREET SWEEPING

When construction exits are not keeping construction site sediment from the roadway, other forms of sediment removal must be employed. Street sweeping is often overlooked, but should be considered an effective BMP.

- Street sweeping is effective at cleaning construction entrances and exits, shoulders, and maintenance yards
- Depending on the desired level of sediment removal, street sweeping should occur on a regular basis and may warrant daily sweeping if the site is located in a highly erosive area
- Street sweeping frequency should increase just prior to wet seasons to remove sediment accumulated during dry periods
- Street Sweeping is a NPDES requirement to be done within 24 hours of discovery of off-site sediment tracking
- Sweeping and vacuuming may not be effective when soil is wet or muddy.

STOCKPILE MANAGEMENT

Stock pile management consists of procedures and practices designed to minimize or eliminate the discharge of stock-piled material (soil, topsoil, base material, rubble) from entering drainage systems or water courses.

- Locate stockpiles away from concentrated storm water flow, drainage paths, and inlets
- Protect all stockpiles from storm water runoff using perimeter barriers such as silt fences, berms, sandbags, or dikes
- Stockpiles should be protected with temporary soil stabilization measures ranging from seed/vegetation to tarps, which should be repaired or replaced as needed
- Temporally seed the stockpile if it remains for one month or more
- Silt fence may not be adequate protection, jersey barriers may be required

Typical Stockpile Protection Methods

- Tarps/Fabric
- Hydromulch
- Temporary Seed
- Straw Mulch

DEWATERING AND SEDIMENT COLLECTING

The Contractor can treat the water trapped within the project limits (See Plans) OR transport sediment laden water off the project.

Dewatering of sediment laden water is a specific NPDES Permit requirement. Sediment laden water can be a common occurrence when constructing bridges, retaining walls, pipe jacking, and culvert installations.

If sediment laden water is hauled off site:

- No additional payment is made for loading, unloading, transporting, or labor costs
- It shall be disposed of in an area where it can not enter a waterway
- The disposal site must be approved by the Project Engineer

Tips

- Check discharge point for scouring or nuisance conditions
- Check Turbidity at discharge point, make sure you are discharging at an expectable rate or additional dewatering BMPs will be needed

Typical Methods	
Extended Detention	Mechanical Filtration
Floating Head Pump	Flocculants
Natural Filtration	Dewatering Dumpster

TEMPORARY SLOPE DRAIN

A pipe slope drain or down spout is designed to keep surface flow from going down the face of a slope. Runoff is diverted into a pipe at the top of a slope and carried to the bottom of the slope within the pipe thereby protecting the surface of the slope.

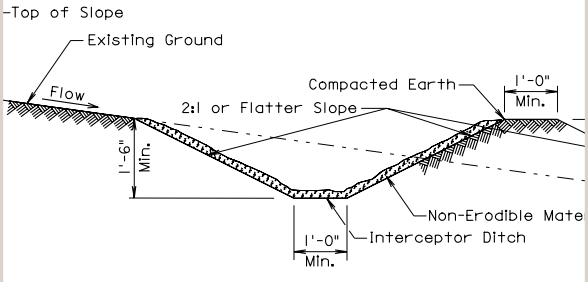
- The size of the pipe should vary with the size of the drainage area contributing to the slope drain
- Diversion berms should be constructed at the height of the pipe at least twice the height of the pipe

Tips

- Install prior to surrounding land disturbance activity beginning
- Inspect weekly and after each rainfall event. Make sure repairs are completed immediately upon discovery

2 – Year Drainage Area (Acres)	24 – Hour Pipe Diameter (Inches)
1	9
2	12
3	14
4	16

Refer to Standard Plate 734.16 for details.



TEMPORARY DIVERSION CHANNEL

These shall be used to divert stream or drainage away from a construction area to provide a dry work area for construction.

Cut Interceptor Ditch

An interceptor ditch or swale is use to collect water above cut or fill slopes where there is considerable drainage being collected above the slope and divert it to the bottom of the grade so it does not create erosion on the slope.

- The Contractor shall cut interceptor ditches at the locations noted in the table and at locations

Notes:

Refer to Standard Plate 734.15 and 734.30 for details.

GABIONS

Gabions are wire mesh baskets filled with a specific gradation and size of rock. They are used to dissipate water energy where structural strength for erosion control is necessary, usually at high volume and high velocity discharge points. Gabions are made from precut pieces to form a single unit. The top, sides, ends and bottom are generally attached at delivery.

- Little maintenance is required
- Gabions can remain as permanent structures after construction phases are complete
- They are keyed in, locked together, filled with appropriate rock, and wired closed
- The number and pattern are specified in the Standard Specifications or Plan

Tips

- Inspect regularly and after storm events
- Inspect for undercutting and other signs of stability
- Inspect wire baskets and mattresses for signs of degradation, rust and breakage

Gabions must conform to SDDOT Standard Specification 1030.

FLOATING SILT CURTAIN

Floating silt curtains are designed specifically to contain and control the dispersion of turbidity and silt in a water body related to site work, marine construction, pile-driving, and dredging activities.

THE CONTRACTOR SHALL:

- Determine water depth
- Determine waterway characteristics
- Order and install the correct type for the individual sites
- Install silt curtains at locations noted in the table and locations determined by the Engineer
- Install silt curtains according to manufacturer's instructions or as directed by engineer
- Monitor and maintain for the duration of the project
- Install parallel to the flow of the waterbody
- Do not install across water way
- Do not install across culverts
- Install as close to shore as possible

Tips

- Silt Curtain should be inspected daily for effectiveness.
- Silt Curtain should be repaired when necessary for the life of the construction project
- Remove only after the water clarity is the same on both the containment and protection sides of the curtain

Refer to Standard Specification 734.3.B.4

SITE MANAGEMENT

Solid waste management consists of procedures and practices designed to minimize and prevent solid waste (plastic, fabrics, Styrofoam, general litter) associated with construction activities from entering storm drains and water courses.

- Waste collection sites must be provided on the site
- These receptacles must be emptied and cleaned out on a regular basis to avoid overflow
- Trash will be hauled to an approved disposal site or licensed landfill
- Receptacles may not be washed out on site
- Sediment barriers such as berms and dikes should be used to prevent storm water from contacting collected waste
- The Contractor is responsible for following waste disposal procedures

Hazardous Waste

- All hazardous waste materials will be disposed of in a manner specified by State, Local, or Manufacturer regulations
- Personnel will be instructed in these practices
- The Contractor will see the practices are followed

Sanitary Waste

- Portable facilities will be provided on all construction sites
- Sanitary waste will be collected from portable units in a timely manner by a Waste Management Contractor or as required by any local regulations

MATERIALS MANAGEMENT

Materials Inventory

Have a list of materials/ substances and thier storage locations that will be present during construction.

Housekeeping

- Only needed products will be stored onsite by the contractor
- Except for bulk materials the contractor will store all materials under cover and in appropriate containers
- Products must be stored in original containers and labeled
- Material mixing will be conducted in accordance with the manufacturer's recommendations
- When possible, all products will be completely used before properly disposing of the container off site
- The manufacturer's directions for disposal of materials and containers will be followed
- The contractor's site superintendent will inspect materials storage areas regularly to ensure proper use and disposal
- Dust generated will be controlled in an environmentally safe manner
- Vegetation areas not essential to the construction project will be preserved and maintained as noted on the plans

MATERIALS MANAGEMENT

Hazardous Materials

- Products will be kept in original containers unless the container is not resealable
- Original labels and material safety data sheets will be retained in a safe place to relay important product information
- If surplus product must be disposed of, manufacturer's label directions for disposal will be followed
- Maintenance and repair of all equipment and vehicles involving oil changes, hydraulic system drain down, de-greasing operations, fuel tank drain down and removal, and other activities which may result in the accidental release of contaminants will be conducted on an impervious surface and under cover during wet weather to prevent the release of contaminants onto the ground
- Berms, sandbags, or other barriers should be used around the perimeter of the maintenance area to prevent storm water contamination. Maintenance areas should be clearly designated

MATERIALS MANAGEMENT

Hazardous Materials cont.

- Wheel wash water will be collected and allowed to settle out suspended solids prior to discharge. Wheel wash water will not be discharged directly into any storm water system or storm water treatment system
- Potential pH-modifying materials such as: bulk cement, cement kiln dust, fly ash, new concrete washings, concrete pumping, and mixer washout waters will be collected on site and managed to prevent contamination of storm water runoff
- Regularly inspect all on-site equipment, as well as those entering and exiting the site
- Secondary containment (capable of handling 110% of material) must be provided for all fluids greater than 55 gallons

Product Specific Practices

- Petroleum Products - All on-site vehicles will be monitored for leaks and receive regular preventive maintenance to reduce the chance of leakage. Petroleum products will be stored in tightly sealed containers which are clearly labeled
- Fertilizers - Fertilizers will be applied only in the amounts specified by the SDDOT. Once applied, fertilizers will be worked into the soil to limit the exposure to storm water. Fertilizers will be stored in an enclosed area. The contents of partially used fertilizer bags will be transferred to sealable containers to avoid spills

CONCRETE WASTE MANAGEMENT

Temporary concrete washout areas must be constructed and maintained to contain all water and concrete waste generated by washout operations.

- A sign should be placed at the washout site to inform concrete equipment operators of the facility location
- These washout areas should be placed a minimum of 50 feet from any storm drain inlet, water course, or drainage facility
- They must be located in an area with easy access for the concrete equipment and away from traffic
- Existing facilities must be cleaned or replaced when they reach 75% capacity

Notes:

SPILL PREVENTION/RESPONSE

Spill prevention and material handling procedures and practices are designed to help prevent spilled materials from entering drainage system or water course.

- Stop the source of the spill
- Be sure the contractor contains and cleans up the spill using absorbent materials rather than hosing down or redistributing the spilled material. If spilled on soil, construct earth dikes to prevent spreading
- Poperly dispose of spilled material and clean up materials
- All waste fluids must be in leak-proof containers
- Be prepared! Don't wait until there is a problem. Be sure the contractor has a plan in place and has educated employees and subcontractors

Spill Control Practices

In addition to the previous housekeeping and management practices, the following practices will be followed for spill prevention and cleanup if needed.

- For all hazardous materials stored on site, the manufacturer's recommended methods for spill clean up will be clearly posted. Site personnel will be made aware of the procedures and the locations of the information and cleanup supplies

SPILL PREVENTION/RESPONSE

- Appropriate cleanup materials and equipment will be maintained by the contractor in the materials storage area on-site. As appropriate, equipment and materials may include items such as brooms, dust pans, mops, rags, gloves, goggles, kitty litter, sand, sawdust, and plastic and metal trash containers specifically for clean up purposes
- All spills will be cleaned immediately after discovery and the materials disposed of properly
- The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contact with a hazardous substance
- After a spill a report will be prepared describing the spill, what caused it, and the cleanup measures taken. The spill prevention plan will be adjusted to include measures to prevent this type of spill from reoccurring, as well as clean up instructions in the event of reoccurrences
- The contractor's site superintendent, responsible for day-to-day operations, will be the spill prevention and cleanup coordinator. The contractor is responsible for ensuring that the site superintendent has had appropriate training for hazardous materials handling, spill management, and cleanup

Spill Response

The primary objective in responding to a spill is to quickly contain the material(s) and prevent or minimize migration into storm water runoff and conveyance systems. If the release has impacted on-site storm water, it is critical to contain the released materials onsite and prevent their release into receiving waters. If a spill of pollutants threatens storm water or surface water at the site, the spill response procedures outlined below must be implemented in a timely manner to prevent the release of pollutants.

- The contractor's site superintendent will be notified immediately when a spill or the threat of a spill is observed. The superintendent will assess the situation and determine the appropriate response
- If spills represent an imminent threat of escaping erosion and sediment controls and entering receiving waters, personnel will be directed to respond immediately to contain the release and notify the superintendent after the situation has been stabilized

SPILL PREVENTION/RESPONSE

- Spill kits containing appropriate materials and equipment for spill response and cleanup will be maintained by the contractor at the site
- If oil sheen is observed on surface water (e.g. settling ponds, detention ponds, swales), action will be taken immediately to remove the material causing the sheen. The contractor will use appropriate materials to contain and absorb the spill. The source of the oil sheen will also be identified and removed or repaired as necessary to prevent further releases
- If a spill occurs the superintendent or the superintendent's designee will be responsible for completing the spill reporting form and for reporting the spill to SD DENR
- Personnel with primary responsibility for spill response and clean up will receive training by the contractor's site superintendent or designee. The training must include identifying the location of the spill kits and other spill response equipment and the use of spill response materials
- Spill response equipment will be inspected and maintained as necessary to replace any materials used in spill response activities

DUST CONTROL

Dust control procedures and practices are designed to suppress dust on a construction site during the construction process. Temperature, humidity, wind velocity and direction will determine amount and frequency of applications.

The best method of controlling dust is to prevent dust production. This can best be accomplished by limiting the amount of bare soil exposed at one time.

Remember Dust Control:

- Reduces vehicle accidents and human injuries due to poor visibility and road conditions
- Lessens the impact on fish and aquatic life, vegetation, agricultural crops, and water quality due to turbidity and sediments

Refer to SDDOT Standard Specification 205.

CHECKLISTS

Four check lists are available to be used at different points in the project development and construction process. The most important for construction activities are the Mobilization, Site Inspection, and Final Inspection. Each of these documents focuses on specific areas that need to be checked to ensure NPDES compliance.

SWPPP Checklist Description

The SWPPP checklist ensures that all SWPPP requirements are complete. The following information should be recorded on the checklist:

- Site Description
- Site Maps
- Erosion and Sediment Controls
- Other Controls
- Maintenance
- Signature and Plan Review

Mobilization Checklist Description

The mobilization checklist aids the inspection of your site and covers the following areas of mobilization:

- General Permit Documentation (SWPPP & NOI)
- Deployment of Erosion & Sediment Control BMPs
- Waste Disposal & Spill Management

SWPPP Site Inspection Form Description

The SWPPP site inspection form records required site inspections during a construction project, including the following:

- Project Information
- Inspection Findings

Final Inspection Checklist Description

The final inspection checklist aids in the preparation and filing of the NOI by documenting the following:

- Removal of Structural Erosion & Sediment Control BMPs
- Waste Disposal and Spill Management

SITE INSPECTION CHECKLIST

Y	N	N/A	General Documentation Checklist
			Is the SWPPP being implemented?
			Are SWPPP revisions initialed & dated?
			Does the SWPPP reflect current site conditions?
			Are EROSION Control BMP's installed per SWPPP, ESC plan, and are they functioning properly?
			Are SEDIMENT Control BMP's installed per SWPPP, ESC plan, and are they functioning properly?
			Do any of the permanent or temporary BMP's need maintenance?
			Does the project need additional control measures due to changes in site conditions?
			Is all travel in/out of the project site directed to specific entrances/exits designed to prevent sediment tracking offsite?
			Is the construction entrance functioning properly?
			Is there off-site tracking from vehicles leaving the site?
			Are soil stockpiles protected?
			Has the contractor made provisions for wind erosion and dust control?
			Is there any place on site that must be temporarily or permanently seeded?
			Has sediment left the construction site since the last inspection? Has it been removed or scheduled to be removed?
			Have you documented all recent rainfall events?
			Are containers in place for the storage & disposal of wastes and properly marked?
			Are hazardous material spill kits in place & adequate for potential incidences?
			Are materials & equipment in place to manage chemical or petroleum spills?
			Are hazardous materials protected to withstand a 25-year, 24-hour storm event?

INSPECTION CHECKLIST

Y	N	N/A	Seeding (730.1)
			Is cover crop seeding needed?
			Is permanent seeding needed?
			Materials (730.2) Is the seed from an approved vendor?
			Seedbed Preparations (730.3 E) Has the seedbed been properly prepped? Seed bed should be worked to a depth of 3 in.
Y	**N**	**N/A**	**Fertilizer (731.1)**
			Fertilizing (Spec.731.1) Has fertilizer been provided for seeded or sodded areas?
			Materials (731.2) Is fertilizer from an approved vendor, complying with South Dakota Fertilizer Law?
			Construction Requirements (731.3) Fertilizer shall not be applied more than 48 hours prior to seeding.
			(731.3) Was fertilizer applied by one of the approved methods?
Y	**N**	**N/A**	**Mulching (Spec. 732.1)**
			Has mulch been placed on slopes or designated areas following seeding and fertilizing operations?
			Materials (732.2) Has the specified mulch material been applied?
			(732.2 A) Grass Hay or Straw Mulch free of noxious weed seeds and objectionable foreign matter.
			Is mulch placed evenly over seeded areas?
			Is mulch applied at a rate of 4000 lbs/acre?
			Has mulch been properly punched into the soil approximately 3 inches?
			(732.2 B) Fiber Mulch applied at 2,000lbs per acre and per manufactures specifications?
			(732.3 C) BFM applied at the rate of 3900lbs per acre and per manufactures specifications?

INSPECTION CHECKLIST

Y	N	N/A	Sodding (Spec. 733.3)
			Materials (733.2) Is sod well rooted, Kentucky bluegrass or other approved native grass?
			Construction Requirements (733.3) Has sod been machine cut and laid within 36 hours of being cut?
Y	**N**	**N/A**	**Sodding (Spec. 733.3)**
			(733.3 B) Has the surface been properly prepped?
			(733.3 C) Sod laid horizontally on slopes beginning at the bottom and working up?
			(733.3 D) Has Sod been fertilized properly after installation of sod?
			(733.3 E) Are slopes steeper than 6:1? Anchoring is needed.
Y	**N**	**N/A**	**Sodding (Spec. 733.3)**
			(733.3 F) Is sod being watered and kept moist throughout the entire depth?
			(733.3 G) Is rolling needed?
Y	**N**	**N/A**	**Erosion Control and Water Pollution Control (Spec. 734.1)**
			Temporary Erosion Control (734.2 B) Is silt fence installed per plans and specifications?
			(734.2 B) Are Erosion bales anchored as detailed in the plans?
			Permanent Erosion Control (734.2 C) Are Erosion Control Blankets installed in accordance with the plan?
			Water Pollution control (734.3 A) Are water pollution control measures installed in the sequence and manner outline in the contract?
			Are Temporary structures installed and working? (berms, dikes, basins, slope drains, mulches, mats or seeding)
			Are equipment yards and service areas contained with berms or perimeter controls?

INSPECTION CHECKLIST

Y	N	N/A	FINAL INSPECTIONS
			Have all erosion controls shown on the revised SWPPP and plan sheets been removed?
			Has any additional disturbance caused by the removal pf BMPs been reseeded or repaired so that no discharge of sediment will occur?
			Have all slide slopes and embankments achieved a vegetative cover equivalent to 70% of adjacent vegetation?
			Are there no large bare spots or erosion areas present?
Y	**N**	**N/A**	**FINAL INSPECTIONS**
			Have all entrances and exits been restored by either permanent paved surfaces or have been re-vegetated to the 70% cover standard.
			Is there no evidence of any residual contamination from spills?
			Is there no evidence of petroleum residue or spills left in areas used for equipment or material storage and all surfaces are properly restored.

Notes:

MOBILIZATION CHECKLIST

Y	N	GENERAL DOCUMENTATION
		Has an NOI been submitted to DENR / EPA at least 15 days prior to disturbance?
		Is the LOA, NOI and permit posted on-site and accessible to the general public?
		Is the SWPPP located on-site & accessible?
		Does the SWPPP contain the contact information of the Contractor & ESCS?
		Is the ESCS's certification valid & up-to-date?
		Has the Contractor & ESCS been informed of inspection, record keeping and other SWPPP requirements?
		Has the Contractor submitted a Site Plan?
		Has the contractor secured permit coverage for all offsite facilities: batching plants, staging areas, borrow, etc., as necessary.
Y	**N**	**EROSION & SEDIMENT CONTROLS**
		Are the temporary ESCs needed for initial phase of work in place and properly installed as per the SWPPP?
		Do the installed ESCs appear to cover all areas with the potential for erosion?
		Are sediment controls installed for all disturbed side slopes and down slopes?
		Is all travel in/out of the project site directed to specific entrances/exits designed to prevent sediment tracking offsite?
		Has the contractor made provisions for wind erosion and dust control?

Notes:

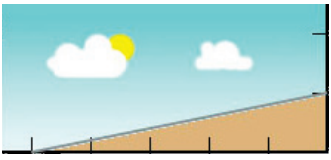
SWPPP REVISIONS

Date	Revisions Needed	Implement By

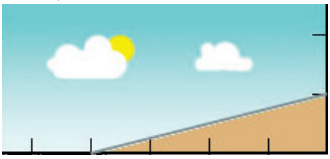
REFERENCE TABLES

Slope Gradient

5:1 Slope Gradient

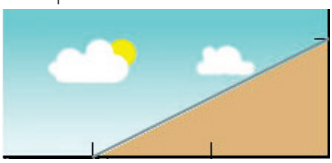


4:1 Slope Gradient



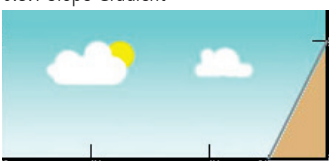
3:1 Slope Gradient

2:1 Slope Gradient



1:1 Slope Gradient

0.5:1 Slope Gradient



MATERIAL SELECTION/ APPLICATION TABLE

	Erosion Control Slopes 3:1 or flatter	Erosion Control Slopes 2:1 or steeper	Sediment Control Slopes	Velocity Reduction Channels	Surface Protection Channels	Perimeter Protection	Inlet Protection	Outlet Protection
BFM		●						
Rock Check Dams				●				
Compost	●							
Compost Berms			●			●		
Continuous Berm			●			●		
Crimped Straw	●							
Cover Crop Seeding	●							
ECB	●	●						

	Erosion Control Slopes 3:1 or flatter	Erosion Control Slopes 2:1 or steeper	Sediment Control Slopes	Velocity Reduction Channels	Surface Protection Channels	Perimeter Protection	Inlet Protection	Outlet Protection
Erosion Bales				●		●	●	
Fiber Roving	●							
Floating Silt Curtain						●		
Gabions					●			●
Hydraulic Mulch	●							
Interceptor Swale			●					
Pipe Slope Drain	●	●						
Riprap					●			●
Sand/Gravel bags				●		●	●	

MATERIAL SELECTION/ APPLICATION TABLE

	Erosion Control Slopes 3:1 or flatter	Erosion Control Slopes 2:1 or steeper	Sediment Control Slopes	Velocity Reduction Channels	Surface Protection Channels	Perimeter Protection	Inlet Protection	Outlet Protection
Silt Fence						●	●	
Slope Roughening	●	●						
Sodding	●							
Street Sweeping						●	●	
Triangular Silt Dike			●	●		●	●	
TRM					●			
Vegetated Buffer Strip			●			●		
Wattles			●	●		●		

SLOPE MEASUREMENTS

Rise:Run	% Grade	Degree of Slope
1 : 1	100	45
1.25 : 1	80	38.7
1.50 : 1	66.7	33.7
1.75 : 1	57	29.7
2 : 1	50	26.6
2.25 : 1	44.4	24
2.50 : 1	40	21.8
2.75 : 1	36.4	20
3 : 1	33.3	18.4
3.50 : 1	28.6	15.9
4 : 1	25	14
5 : 1	20	11.3

Run = horizontal change in slope

Rise = vertical change in slope

% Grade = percentage difference between the run and the rise. w

Degree of Slope = Angle of slope at the toe of slope.

Conversion Tables (cont.)

Length

Known	Multiply by	Results
Inches	2.54	Centimeters
Feet	0.304	Meters
Yards	.914	Meters
Mile	1.161	Kilometers
Centimeters	0.394	Inches
Meters	3.28	Feet
Meters	1.09	Yards
Kilometers	.621	Mile

SLOPE MEASUREMENTS

Area

Known	Multiply by	Results
Sq. In.	6.45	Sq. Cm.
Sq. Ft.	.093	Sq. M.
Sq. Yd.	0.836	Sq. M.
Acres	4,840	Sq. Yd.
Acres	0.40	Hectares
Sq. Cm.	.155	Sq. In.
Sq. M.	10.8	Sq. Ft.
Sq. M.	1.20	Sq. Yd.
Hectares	2.47	Acres

Weight

Known	Multiply by	Results
Ounce	28.4	Gram
Pound	0.45	Kilogram
Ton	.907	Metric Ton
Gram	.035	Ounce
Kilogram	2.20	Pound
Metric Ton	1.10	Ton

ACRONYMS

APL – Approved Products List
BOP – Bureau of Personnel
BMP – Best Management Practices
CWA – Clean Water Act
CWO – Concrete Wash Out
DENR – Department of Environment & Natural Resources
DOT – Department of Transportation
EA – Environmental Assessment
EFF – Effectiveness
EIS – Environmental Impact Statement
EPA – Environmental Protection Agency
ESC – Erosion and Sediment Control
ESCS – Erosion and Sediment Control Supervisor
FWPCA – Federal Water Pollution Control Act
FWS – Fish and Wildlife Service
HSS – Hydraulic Soil Stabilizers
LOA – Letter of Authorization
LGU – Local Government Unit
MS4 – Municipal Separate Storm Sewer System
MUSLE – Modified Universal Soil Loss Equation
NOI – Notice of Intent
NOT – Notice of Termination
NPDES – National Pollutant Discharge Elimination System
NRCS – Natural Resource Conservation Service
NRDC – Natural Resources Defense Council
NURP – Nationwide Urban Runoff Program
PG – Performance Goal
PLS – Pure Live Seed
RECP – Rolled Erosion Control Product
ROW – Right of Way
RUSLE – Revised Universal Soil Loss Equation
SDR – Sediment Delivery Ratio
SWM – Storm Water Management
SWPPP- Storm Water Pollution Prevention Plan
TMDL – Total Maximum Daily Load
TRM – Turf Reinforcement Mat
TSS – Total Suspended Solids
USEPA – United States Environmental Protection Agency
USGS – US Geological Survey
USLE – Universal Soil Loss Equation

CONTACTS

DOT

- Central Office . . . . . (605) 773-3268
  - » Terry Keller
    Environmental Supervisor
  - » Joan Bortnem Clarke
    Storm Water Coordinator

Region / Area Offices

- Aberdeen . . . . . (605) 626-2244
- Huron . . . . . (605) 353-7140
- Watertown . . . . . (605) 882-5166
- Mitchell . . . . . (605) 995-8120
- Sioux Falls . . . . . (605) 367-5680
- Yankton . . . . . (605) 668-2929
- Pierre . . . . . (605) 773-3464
- Mobridge . . . . . (605) 845-3844
- Winner . . . . . (605) 842-0810
- Rapid City . . . . . (605) 394-2244
- Belle Fourche . . . . . (605) 892-2872
- Custer . . . . . (605) 673-4948

DENR

- Storm Water Hotline 800-SDSTORM
- Surface Water Quality Program . . . . . (605) 773-3351

INTERNET RESOURCES

DOT

- *Department*
  http://www.sddot.com
- *SDDOT Environmental Program*
  http://www.sddot.com/pe/projdev/environment.asp
- *Storm Water Program*
  http://www.sddot.com/pe/projdev/environment_stormwater.asp
- *ESC / SWM Training*
  http://www.sddot.com/pe/projdev/environment_stormwater_training.asp

Bureau Of Personnel

- *Training*
  http://bop.sd.gov/training/dot/home.aspx

DENR

- *Storm Water Program*
  http://denr.sd.gov/des/sw/stormwater.aspx
- *Construction General Permit*
  http://denr.sd.gov/des/sw/StormWaterandConstruction.aspx
- *Industrial General Permit*
  http://denr.sd.gov/des/sw/StormWaterandIndustry.aspx
- *MS4 General Permit*
  http://denr.sd.gov/des/sw/StormWaterPermitforMunicipalStormSewerSystems.aspx
- *Water Quality Standards*
  http://denr.sd.gov/des/sw/swqstandards.aspx

EPA

- *Storm Water Program*
  http://cfpub.epa.gov/npdes/home.cfm?program_id=6
- *Construction General Permit*
  http://cfpub.epa.gov/npdes/stormwater/cgp.cfm#final2008cgp
- *Electronic Notice of Intent (eNOI) System*
  http://cfpub.epa.gov/npdes/stormwater/enoi.cfm
- *Region VIII – Denver*
  http://www.epa.gov/region8/stormwater/

ILLICIT DISCHARGES/ PUBLIC REPORTING

To report a problem or issue a complaint over a potential storm water pollution activity from construction, illegal dumping or discharges, please contact any of the followings.

DOT

- Storm Water Coordinator . . . . . (605) 773-3268
  . . . . . *joan.bortnemclarke@state.sd.us*

DENR

- Storm Water Hotline 1-800-SDSTORM

MS4 Programs

- City of Aberdeen . . . . . (605) 626-7010
- City of Brookings . . . . . (605) 692-6629
- City of Pierre . . . . . (605) 773-3066
- City of Huron . . . . . (605) 353-8510
- City of Mitchell . . . . . (605) 995-8433
- City of North Sioux City . . . . . (605) 232-4276
- City of Rapid City . . . . . (605) 394-4154
- City of Sioux Falls . . . . . (605) 367-8276
- City of Spearfish . . . . . (605) 642-1333
- City of Sturgis . . . . . (605) 347-3916
- City of Vermillion . . . . . (605) 677-7084
- City of Watertown . . . . . (605) 882-6201
- City of Yankton . . . . . (605) 668-5253
- Pennington County . . . . . (605) 394-2166

EPA

- *http://www.epa.gov/region8/stormwater/contacts.html*

SD-DOT STORM WATER MS4 CONSTRUCTION PROGRAM SUMMARY

Applies to all construction projects one acre or greater; applies to projects of any size adjacent to sensitive areas suck as creeks, streams, lakes, and wetlands. Program developed in coordination with SDDENR Stormwater Construction Permit requirements.

Project Design

- Interim (temporary) BMPs
- Permanent (final) BMPs
- Specifications, Supplemental Specifications, Plan Notes and Special Provisions in bid packet
- Storm Water Pollution Prevention Plan (SWPPP)
- Site Construction Plan Inspections
- SDDOT 298 inspection forms completed within 24 hours after every ½" of rain
- SDDOT 298 inspection forms completed every 7 days during construction
- SDDOT 298 inspection forms completed monthly during winter months
- Major inspections conducted jointly by DOT personnel and contractor
- Contractors encouraged to conduct daily inspections

Training & Certification

- Program implemented 2003
- Training required for DOT personnel (environmental, designers, project managers, field inspectors, maintenance), consultants, contractors, & utilities
- Certification required for DOT personnel (environmental, designers, project managers, field inspectors), consultants, contractors, & utilities beginning 2008 construction season
- Certification required for constructing 2008 projects
- Certification is good for 4 years; training required every 8 years
- Re-certification classes available
- Refresher courses added as needed

Permit Administration

- Notices of Intent filed by Environmental Office
- Notices of Termination filed by Area Office
- Letters Of Authorization kept by Environmental Office electronic & paper files, Area Offices
- NOT acknowledgements kept by Environmental Office electronic & paper files, Area Offices
- Inspections kept as part of construction diary
- Inspections entered into database
- Paperwork kept for three years after filing NOT

EROSION CONTROL SUPERVISOR

Supplemental Specifications Section 734.3

Existing:

Section 734.3 – Page 423 – Add the following paragraph before the first paragraph:

The Contractor shall designate an employee as Erosion Control Supervisor whose responsibility is the construction and maintenance of erosion and sediment control. This person shall be available to be reached by phone 24 hours a day, 7 days a week, and must be able to respond to emergency situations at the job site within 12 hours. The person so designated must have training and be certified by the South Dakota Department of Transportation in the area of erosion and sediment control. The name, phone number, and location of the person shall be provided to the Department at the preconstruction meeting.

Proposed revision to incorporate QA/QC:

The Contractor shall designate an employee as Erosion Control Supervisor whose responsibility is the construction and maintenance of erosion and sediment control and to oversee the quality control program for storm water permit compliance. This person shall be available to be reached by phone 24 hours a day, 7 days a week, and must be able to respond to emergency situations at the job site within 12 hours. The person so designated must have training and be certified by the South Dakota Department of Transportation in the area of erosion and sediment control and storm water management. The name, phone number, and location of the person shall be provided to the Department at the preconstruction meeting.

EROSION CONTROL SUPERVISOR JOB DUTIES

- Retain DOT certification in Erosion and Sediment Control / Storm Water Management (ESC/SWM) by:
  - » Attending SDDOT training
  - » Successfully pass class exam
  - » Re-testing every 4 years (voluntary refresher classes available)
  - » Attending training every 8 years

OR

- Retain certification credentials in:
  - » Certified Professional in Erosion & Sediment Control (CPESC)
  - » Certified Professional in Storm Water Management (CPSWM), or
  - » Certified Erosion, Sediment & Storm Water Inspector (CESSWI).
- Be available by phone to project personnel 24 hours/day, seven days/week.
- Be available to be at the project site within 12 hours.
- Oversee contractor's ESC/SWM quality assurance / quality control (QA/QC) program.
- Ensure implementation of the Storm Water Pollution Prevention Plan (SWPPP).
- Coordinate work of subcontractors.
- Prepare weekly erosion control schedules.
- Attend all weekly construction meetings.
- Prepare the ESC site plans.
- Provide for ESC for contractor's temporary work.
- Ensure that permits are acquired and in compliance with for borrow pits, dewatering, sensitive sites (biological and cultural), temporary works in rivers, streams, etc.
- Conduct contractor inspections and maintain contractor inspection log.
- Maintain all paperwork related to the permit in an orderly manner.
- Have paperwork available for inspectors (DOT, DENR, or EPA).
- Ensure that the SWPPP reflects actual conditions as practices are revised.
- Ensure ESC work is initiated and completed in a timely manner and meets permit requirements.
- Ensure project is stabile prior to suspension of the work – temporary or permanent.
- Coordinate with state and federal agencies.
- Ensure prevention and proper cleanup from vehicle tracking on paved surfaces, spills, trash, etc.
- Ensure proper cleanup if sediment leaves the work limits or right-of-way.
- Ensure proper cleanup from spills.

NOTES

NOTES


Bonestroo