Alaska Department of Transportation and Public Facilities

Alaska Storm Water Pollution Prevention Plan Guide

Table of Contents

1. Introduction

1.1. Purpose of Guide

The Alaska Department of Transportation and Public Facilities (DOT&PF) prepared this guide to help contractors, consultants, and the public understand and comply with the requirements of the Storm Water Construction General Permit (CGP) for small and large construction sites as well as the DOT&PF Clean Water Act Consent Decree. Specifically this guide focuses on the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP) required for coverage under the CGP and compliance with the Consent Decree. Any reference to "you" or "the contractor" in this guide refers to the contractor or contractor's designee.

Construction activities may disturb the earth and allow soil particles (sediment) to easily wash away during a storm. A SWPPP is a document describing the nature and extent of a construction activity and the measures used to minimize sediment and other pollutants are not carried into the storm water discharges from the construction site. To control these pollutants, the contractor can use a variety of control measures referred to as Best Management Practices (BMPs). The BMPs form the basis of the SWPPP, and the contractor must select them based on the conditions at the construction location. For a SWPPP to be effective, the contractor must properly design, construct, and maintain the BMPs during the life of the project. See Section 2.2.3 of this guide for types of BMPs and their applications.

1.2. Summary of Applicable Water Quality Laws and Regulations

The federal and state governments have passed numerous laws to minimize environmental harm from storm water discharge at construction sites. Some of these laws and subsequent regulations require the implementation of erosion and sediment control measures while others mandate that construction activities maintain water quality. The two most important water quality related laws and regulations are the Federal Clean Water Act and the State of Alaska Water Quality Standards, as defined in the Alaska Administrative Code (18 AAC 70).

1.2.1 Clean Water Act

The purpose of the Clean Water Act is to restore and maintain the chemical, physical and biological integrity of the Nation's waters. The three sections relevant to construction storm water regulation are described below. Most of the Act is implemented by the U.S. Environmental Protection Agency (EPA).

Section 401. This section authorizes states to comment on any federal permit when it has the potential to affect water quality. The State (DEC) can add conditions that become part of the federal permit. These conditions are in the "401 Certification". When the CGP was a federal permit, DEC added Alaska-specific conditions through Section 401, but now that the permit is written by DEC that is no longer done.

Section 402. This section authorizes the National Pollutant Discharge Elimination System (NPDES), which is a waste water discharge program managed by EPA. Storm water regulation is included in this program. Most states have been delegated the authority to manage the NPDES. The Alaska Legislature initiated Alaska's delegation with a bill that passed in 2002. DEC then applied to gain authorization from EPA to manage the NPDES. EPA approved the transfer in 2008 and DEC is phasing in the transition. DEC renamed the system to the Alaska Pollutant Discharge Elimination System (APDES) and the APDES statute is at AS 46.03 and the regulations are at 18 AAC 83. DEC became the regulator of the storm water part of NPDES on October 31, 2009.

The DEC now issues the CGP. For complete regulatory information on the Storm Water General Permit for Large and Small Construction Activities, visit the following website: http://www.dec.state.ak.us/water/wnpspc/stormwater/Index.htm

Section 404. This section authorizes the Army Corps of Engineers to issue permits for dredged or fill material to be placed in waters of the United States. Waters of the U.S. are defined to include rivers, streams, lakes, ponds, tidelands and wetlands. Section 404 also directs the EPA to produce guidelines for the permitting criteria.

1.2.2 Water Quality Standards

The DEC develops water quality standards, which are published in 18 AAC 70. These regulations set the standards based on the use of the waterbody. The use categories are: water supply, recreation, fish propagation and growth. The standards may differ between fresh and marine water. The CGP requires that erosion, sediment and pollution control measures are selected so that pollutant discharges are minimized as necessary to meet the applicable water quality standards.

Other federal and state laws and regulations applicable to storm water discharges from construction activities are in the next sections.

1.2.3 The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA)

Section 1057 of this act requires the U.S. Department of Transportation to develop erosion control guidelines for the construction of all federally funded highway projects. To satisfy the provisions of Section 1057, the Federal Highway Administration (FHWA) has adopted the American Association of State Highway and Transportation Officials' (AASHTO) "Highway Drainage Guidelines" to address erosion and sediment control. Every state highway agency must comply with these AASHTO guidelines for projects that use federal highway funds.

Chapter 16 of the Alaska Highway Drainage Manual describes DOT&PF's adoption of the AASHTO guidelines. The Alaska Aviation Preconstruction Manual references this chapter, making it applicable to aviation as well as highway projects. Chapter 16 requires a SWPPP for all projects that disturb earth, regardless of project size. However, the detail needed in a SWPPP for small (<1 acre) projects needs to be commensurate with the complexity and water quality risk of the project. Water quality standards must be met at all sizes of projects.

1.2.4 The Coastal Zone Act Reauthorization Amendments of 1990

This act requires every state participating in the federal coastal management program to use erosion and sediment control management measures. Alaska's Coastal Management Program (ACMP) requires the management of estuaries, wetlands, tide flats, lagoons, rivers, streams, and lakes to protect natural vegetation, water quality, important fish and wildlife habitat, and natural water flow. The ACMP states in part that contractors for projects within the coastal zone must use "all feasible and prudent steps to maximize conformance" with this requirement. State and federal resource agencies that issue permits often require erosion control measures to ensure that a project will be consistent with the ACMP.

1.2.5 Alaska Statutes 16.05.841 and 16.05.871, Fish Passage and Anadromous Fishes

The Alaska Department of Fish and Game (ADF&G) regulates construction and other activities in specified streams that are important for the spawning, rearing or migration of anadromous fish or that block fish passage in streams with resident fish. A fish habitat permit may be required for any activity that either (1) involves a dam or obstruction in water bodies containing resident fish, or (2) equipment use or construction activities that would disturb the natural flow of specified streams. This includes crossing of anadromous streams by vehicles. Title 16 generally does not apply to activities in a marine environment. However, if a project will affect the mouth of a stream, defined by a line drawn between the seaward extremities of the exposed tideland banks at MLLW, a fish habitat permit is needed.

1.3. Clean Water Act Consent Decree

The United States Department of Justice (USDOJ) lodged a complaint in the U.S. District Court alleging the DOT&PF was in violation of the CGP. A court-ordered Consent Decree (CD) is a result of the enforcement settlement between the state of Alaska and USDOJ. The CD requires DOT&PF to complete new tasks, designates specific formats for existing tasks under the CGP and provides stipulated penalties for non-compliance. The CD became effective on September 21, 2010. The DOT&PF must be in compliance with the CD conditions for three years and meet other conditions before DOT&PF can request CD termination. The CD is available on the DOT&PF's website at: http://www.dot.state.ak.us/stwddes/desenviron/assets/pdf/swppp/consent_decree_060210.pdf

2. SWPPP Process and Plan Requirements

2.1. Introduction

Figure 1 is a flow chart of the storm water permitting process for DOT&PF projects. This chapter describes the planning process for projects that disturb one or more acres of land or smaller parcels that are part of a larger plan of development and that drain to waters of the United States.

The Storm Water Pollution Prevention Plan (SWPPP) is an important part of this process. The SWPPP is a site-specific written storm water management plan to demonstrate compliance with the CGP by minimizing or eliminating the pollutants in the storm water discharges from construction activities. The SWPPP must include how the applicant intends to comply with each of the requirements of the CGP. The CGP requires the preparation of a SWPPP before submitting a Notice of Intent for permit coverage (see part 2.2.5 below).

Federal and state laws, regulations, and water quality standards require that any DOT&PF earth-disturbing construction activities (highway, airport, ferry terminal, or building) address erosion and sediment control measures. Earth-disturbing activities are defined as clearing, grubbing, excavating, filling, or stockpiling that disturbs the ground surface and results in the potential for erosion from precipitation, snow melt runoff or wind.

For projects requiring CGP coverage, DOT&PF requires that the SWPPP preparer use the EPA's SWPPP template for Authorized States that is published in Appendix A of "Developing Your Stormwater Pollution Prevention Plan, A Guide for Construction Sites." The EPA SWPPP template is available in WORD format at www.epa.gov/npdes/swpppguide. This template will be replaced by the DEC SWPPP Template. However, additional information may need to be added, as these templates may not address all requirements outlined in the DOT&PF specifications.

The requirement to use a template ensures completeness as SWPPPs are prepared in a consistent order and format. However, you are cautioned to start every SWPPP with a blank template rather than one that was completed for a different project in order to avoid errors of mixing projects.

Information about Alaskan and cold climate design considerations and temporary and permanent BMPs are found in DEC's Alaska Storm Water Guide, available at: http://www.dec.state.ak.us/water/wnpspc/stormwater/index.htm

The SWPPP preparer should use the SWPPP Checklist in Appendix A of this Guide to review the draft SWPPP and ensure all requirements are met.

All SWPPP related forms mentioned in this Guide are found in Appendix C and at http://www.dot.state.ak.us/stwddes/dcsconst/pop_constforms.shtml

2.2. General Process

The success of a SWPPP requires a cooperative effort between DOT&PF and the contractor. Both parties have responsibilities during the process to ensure that the SWPPP is effective. The contractor and the DOT&PF are co-permittees as both meet the definition of operator on a DOT&PF construction project. The process of developing and implementing a SWPPP for construction activities is outlined in the EPA guidance document "Developing Your Stormwater Pollution Prevention Plan, A Guide for Construction Sites" and consists of the following steps:

1. Site assessment and planning
2. Selecting erosion and sediment control and good housekeeping BMPs
3. Inspections, Maintenance and Recordkeeping
4. Certification and Notification
5. SWPPP Implementation
6. Final Stabilization and Permit Termination

The EPA SWPPP Guide is available at www.epa.gov/npdes/swpppguide.

2.2.1 Site Assessment and Planning

Gather information regarding resources at the site such as impaired water bodies, critical habitat, and historic sites. Much of this information will be contained in the DOT&PF documents. Then, the

contractor's SWPPP preparer needs to conduct a visit to assess the existing site conditions, and identify storm water systems, receiving waters, pollutant sources, and non-storm water discharges. The SWPPP needs to describe the construction project as well as the permanent storm water controls and contain site maps. During project design, DOT&PF develops an Erosion and Sediment Control Plan (ESCP) for all earth-disturbing projects for inclusion in the Plans, Specifications, and Estimate (PS&E) package. An ESCP explains site conditions and illustrates measures to control erosion and pollution. It provides a workable plan while giving the contractor enough latitude to develop a sequence of operations based on season, site conditions, personnel, and equipment. The ESCP gives bidders a basis for estimating cost and ultimately provides the contractor information and guidance for developing an acceptable SWPPP.

After contract award , the contractor reviews the ESCP for its suitability with the contractor's proposed construction plan, schedule, and equipment. Using the information provided in the ESCP and their own construction sequence, the contractor provides a SWPPP to the project engineer at least 21 calendar days before the planned start of construction activities. The SWPPP must address all sections of the SWPPP template, with careful attention to the sequence of major earth-disturbing activities and the sequence of installation of all controls specified for the project. Note that a typical project schedule does not contain enough detail about the erosion and control measures to meet this SWPPP requirement. The SWPPP must also describe the planned stabilization (both interim and permanent) measures that will be used while performing excavation and embankment construction.

The DOT&PF requires documentation of a preconstruction site visit on DOT&PF Form 25D-106. If the preconstruction site visit was conducted prior to writing the SWPPP, which is preferable, then the form needs to document that the following were identified and will be included in the SWPPP:

(1) the opportunities to phase construction (to minimize exposed ground and erosion potential);

(2) the appropriate BMPs and BMP sequencing and

(3) the sediment controls that must be installed prior to starting earth-disturbing work.

In some cases, the SWPPP might be prepared when the ground is snow-covered and if so, the site visit can be postponed and conducted after the SWPPP is written. In this situation, the visit is needed to verify that the three considerations listed above are adequately addressed in the SWPPP and if not, amend the SWPPP accordingly.

The SWPPP must be completed, approved and certified by the contractor and DOT&PF prior to seeking coverage under the CGP. After approval by the DOT&PF, the document becomes the project's SWPPP of record.

2.2.2 Plan Contents

For projects disturbing one acre or more of land, the contractor includes the following information, as required by the CGP. **Note**: **As part of the ESCP, DOT&PF will typically supply information for items followed by an asterisk (*).**

Site Description

1. * Describe the construction activity including the nature and extent of all new construction and/or reconstruction earth-disturbing activities for buildings, airport runways or taxiways, highways (including shoulders), bridges, curb and gutter, sidewalks, utilities, and drainage systems.

2. Identify all potential sources of pollution that might affect the quality of storm water from the site and name the pollutant of concern (usually sediment and others).

3. Describe the intended sequence of major activities that disturb soils on major portions of the site within the project including grubbing, excavation, and grading.

4. Estimate to the nearest quarter acre both the sum of areas likely to be disturbed by excavation, grading, or other earth moving or stockpiling activities and the total area of the project. For project areas, include the area of any off-site disturbed areas supplied as stockpile sites, disposal sites, staging areas and borrow/quarry sites. List the off-site areas separately when there are different permittees (* The DOT&PF's estimate will include project area and state-designated material sources and disposal sites).

5. * Include a general area location map and a site map indicating

a. * Drainage patterns and approximate slopes anticipated after major grading activities
b. * On the general location map, the construction site and names (if known) and locations of Waters of the United States within one mile of the site
c. * On the site map, names (if known) and locations of all Waters of the United States including wetlands
d. * Locations of structural and nonstructural controls identified in the plan (the contractor may modify the DOT&PF's proposed temporary controls)
e. * Areas to be disturbed and those not disturbed
f. * Locations where stabilization activities are expected to occur (the contractor may modify the DOT&PF's proposed locations)
g. Locations of off-site material, waste, borrow, equipment and material storage areas
h. The location and description of any discharge associated with industrial activity other than construction, including asphalt and concrete plants dedicated solely to the project. Do not include commercial plants and sources (i.e., those pre-established plants and sources that serve other projects and remain in place after the project is completed)

6. * Indicate the locations where storm water flows to a surface water or a municipal storm system that enters into any Waters of the U.S.

7. * Indicate the location of any impaired waters.

8. * Indicate the location of any waters with approved and final Total Maximum Daily Loads (TMDLs) for Alaska.

9. Review and the documentation obtained by the DOT&PF on endangered and threatened species (as defined by the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS). The SWPPP must evaluate whether storm water discharges will affect listed species. Use the DOT&PF information for the DOT&PF-supplied areas to avoid any duplication of effort. In the case of contractor-supplied support areas (such as material sources, staging yards and disposal areas) or contractor expansion of footprint of DOT&PF-supplied areas, consult either the USFWS website at http://endangered.fws.gov or http://alaska.fws.gov/fisheries/endangered/index.htm or the NMFS website at http://www.fakr.noaa.gov/protectedresources/default.htm, or one of their field offices listed in Appendix D. If endangered species are not present, check criterion A on the *Notice of Intent Form*. If endangered species are present in areas you must meet the permit eligibility requirements by checking the appropriate criterion box or boxes on the *Notice of Intent Form*. Consult with the project engineer and regional environmental analyst to fill out this section of the form.

10. Review the documentation and agreements with SHPO (if any) obtained by the DOT&PF on historic sites. The SWPPP must evaluate whether storm water discharges will affect any properties listed on the National Register of Historic Places (NRHP). Use the DOT&PF information for DOT&PF-supplied areas to avoid any duplication of effort. In the case of contractor-supplied support areas or contractor expansion of DOT&PF supplied areas, consult with SHPO. If you find historic or archeological resources at any of your proposed support area, notify the project engineer and consult with the SHPO. Section 106 processing could take from one to six months. If an historic or archaeological resource is eligible for the NRHP, you must use an alternative material or disposal site if practical.

Control Measures

Describe the appropriate control measures (BMPs) you will implement at the construction site and the off-site areas. Include erosion control BMPs, sediment control BMPs, storm water management measures and good housekeeping practices, . Both erosion control and sediment control measures are required. An effective erosion (source) control program will reduce the expense and maintenance of the sediment control program.

The CGP requires temporary or permanent sediment basins for projects that have a common drainage area of 10 or more disturbed acres where practicable. The SWPPP must show the calculations used for determining the size of the basin.

In addition, the permit requires the use of velocity dissipation devices at discharge locations and along outfall channels to provide non-erosive flow and

protect the physical and biological characteristics of the receiving waters.

If there are any identified discharges into a water body with an EPA approved or established TMDL, review the TMDL and incorporate control measures into the SWPPP to ensure discharges of pollutants from construction activities are consistent with the TMDL's provisions.

Describe the installation schedule for all identified BMPs to be implemented at the construction site and the off-site areas where the DOT&PF is a co-permittee. The narrative should describe the installation in relation to the intended sequence of major activities that disturb soils (excavating, grading, filling). Do not provide dates in the narrative, but tie the installation to the earth disturbing activity; for example, use language such as "installation will occur prior to…" or "…will occur concurrent with…" or "…will occur upon completion of…" The sequencing must minimize the amount of soil exposed at any one time.

2.2.3 Selecting Erosion and Sediment BMPs

There are a variety of control measures (BMPs) that can be used on a construction project.

All selected BMPs must be described in the SWPPP, including their design and installation. See Appendix B of this guide for a list of some commonly used BMPs along with application, design, construction, inspection, maintenance, and removal guidelines. Appendix B is a limited set of BMPs, and SWPPP preparers are encouraged to use other sources of information. The manual(s) or publication(s) used to select and/or design BMPs described in the SWPPP must be referenced in the SWPPP. Include the author's name, title of the publication, publisher, and date of publication in the citation. However, in the instance that a BMP was selected and designed for a project specific situation and no published source was used, then it must be stated that "No published BMP manual was used for this design". The following websites provide current BMP information:

- *Alaska Storm Water Guide* by DEC at http://www.dec.state.ak.us/water/wnpspc/stormwater/index.htm
- *National Menu of Storm Water Best Management Practices* by EPA at www.epa.gov/npdes/stormwater/menuofbmps
- International Erosion Control Association at www.ieca.org/Resources/Resources.asp
- Construction Industry Compliance Assistance Center at www.CICAcenter.org/bmps.html

The SWPPP must include a description and location of the BMPs to be implemented at the construction site as well as the contractor, subcontractor, utility company, etc. responsible for implementing each BMP.

Types of BMPs

The first step is to ensure existing vegetation is preserved wherever possible. The second step is to minimize the amount of disturbed land at any one time. The sooner stabilization can be achieved in areas where work has stopped, the less disturbed ground there will be.

There are four primary types of BMPs. There are stabilization (erosion control) BMPs for disturbed areas to control erosion at the source. There are sediment control measures to trap, filter and/or remove sediment before it leaves the site. There are storm water management BMPs that divert water around a site or manage water within the site. And there are pollution prevention BMPs, known as "good housekeeping" that deal with chemicals, sanitary wastes, fuels and other pollutants. There can also be BMPs that consist of an administrative action, practice or procedure, such as scheduling or training.

The contractor bases the selection of a BMP on the soil properties, terrain characteristics, intensity and duration of rainfall, volume and characteristics of the storm water flow at the location and the duration that the BMP is required to function. The next section presents a brief description of the types of BMPs and examples of each.

Erosion Control BMPs are measures to prevent or minimize the loss of soil from land surfaces. Initiate stabilization measures as soon as practicable after temporarily or permanently ceasing construction activity on that portion of the site. The CGP sets the maximum number of days allowed before initiating stabilization .

Erosion control examples are as follows:

- Temporary or permanent seeding with mulch
- Mulching
- Applying tackifier
- Installing rolled erosion control products
- Applying compost blanket

- Preserving existing grass, trees, or other vegetation
- Compost blanket

While temporary or permanent seeding and surface roughening are erosion controls, neither of these BMPs will be considered sufficient when implemented alone. In order to be effective at preventing or minimizing erosion, these measures must be implemented in conjunction with other compatible stabilization BMPs.

Erosion control devices such as mulches or Rolled Erosion Control Products (ie. RECP's or blankets) are rated for longevity. Whether the BMP will be require to last days or months dictates product selection. Multiyear projects and over wintering projects are required to stabilize sites in the fall in a manner that will minimize pollution during spring thaw.
For more information about seeding methods and species, see "A Revegetation Manual for Alaska" and "Alaska Coastal Revegetation and Erosion Control Guide", both at
http://www.plants.alaska.gov/

Sediment Control BMPs are temporary measures used to minimize the amount of sediment that travels in runoff and discharges from the project. If sediment controls fill up quickly with sediment, it is an indication that the erosion controls are not functioning adequately. Sediment control examples include:

- Check dam
- Temporary sediment trap
- Brush barrier
- Fiber rolls
- Silt fence
- Tracking control at exits and entrances
- Drain inlet protection
- Temporary Sediment Traps, Ponds and Basins

Storm water management BMPs are installed to handle the storm water in a way that avoids or minimizes erosion. The storm water that would enter a project site can be diverted around the project in order to decrease the runoff and thus, erosion potential. Water within the project can be carried so that it doesn't come in contact with the disturbed ground. Storm water management BMPs include:

- Velocity control
- Interception /diversion ditch
- Slope drain
- Storm water conveyance channel

Good Housekeeping BMPs address potential pollutants other than sediment. They are also called Pollution Prevention BMPs. Examples include:

- Ensuring proper disposal of construction site waste materials
- Preventing exposure of construction site materials, debris, and chemicals to storm water so these materials do not become pollutant sources (enclosed storage)
- Treating or disposing of sanitary wastes that are generated on-site, in accordance with state or local requirements
- Designating contained concrete washout areas
- Fueling and maintaining vehicles without polluting
- Developing spill prevention and response practices

Some of the CGP required SWPPP elements are contained in the DOT&PF-required Hazardous Material Control Plan (HMCP). Therefore, the HMCP must be incorporated into the SWPPP in an appendix.

Release of Reportable Quantities of Oil or Hazardous Substances

Because construction personnel may handle oil and certain hazardous substances, spills in amounts that reach Reportable Quantity (RQ) levels are possible. If a spill of oil reaches any surface waters or a certain hazardous substances spill exceeds the RQ level, the contractor must notify the project engineer, the National Response Center, and the DEC. A spill of any amount of certain hazardous substances or of 1 gallon or more of oil to land requires the contractor to notify the project engineer and the DEC. See Appendix E of this guide for reporting requirements.

Non-Storm Water Discharges

The CGP allows a limited number of non-storm water discharges. Identify, in the SWPPP, any allowable sources of non-storm water that will be combined with storm water discharges from the construction activity, except for flows from fire-fighting activities.

Examples:

- A water truck that is used to control dust at the construction site
- Water from uncontaminated water line flushings
- Water used to wash vehicles and equipment (no detergents permitted)
- Pavement wash waters (where no spills or leaks of toxic or hazardous materials have occurred and no detergents used)
- Water from uncontaminated excavation dewatering activities
- Landscape irrigation

Identify and implement pollution prevention measures for the allowable non-storm water discharges and eliminate or reduce them to the extent feasible. Also describe prevention efforts for non-storm water discharges not allowed by the CGP for release to Waters of the United States.

2.2.4 Permanent Storm Water Management Practices

The DOT&PF project design will include measures to control pollutants in storm water after construction is completed. These permanent controls must be discussed in the SWPPP and the SWPPP must describe how they will be protected during the construction phase. Some examples are:

- Retention pond
- Detention pond
- Infiltration measures
- Vegetated swales
- Natural depressions

2.2.5 Certification and Notification

The contractor and DOT&PF must receive coverage under the CGP as co-permittees. To receive coverage, both must submit an electronic Notice of Intent (eNOI) form to the DEC. For a copy of the form, complete instructions on filing and to file the eNOI online, go to http://www.dec.state.ak.us/water/wnpspc/stormwater/APDESeNOI.html.

The eNOI form requires the following information:

1. Applicable permit number for which you are requesting coverage (the permit number is AKR100000).
2. Operator name, address, telephone number, and Employer Identification Number (EIN) as established by the Internal Revenue Service
3. Project/site name, address, and latitude/longitude
4. Whether it is located in Indian country, which in Alaska is only Metlakatla.
5. Whether the SWPPP precedes the filing of the eNOI (required by the permit), and location for viewing the applicable SWPPP
6. Name of the water(s) of the U.S. into which your site discharges (see NOI instructions for further explanation)
7. Whether the discharge is consistent with the assumptions and requirements of applicable EPA approved or established TMDLs.
8. Estimated dates of commencement of construction activity and final stabilization (i.e., project start and completion dates)
9. Total acreage (to the nearest quarter acre) to be disturbed for which you are requesting coverage
10. Whether any federally-listed threatened and endangered species or federally-designated critical habitat are in the project area to be covered by the permit and the basis for eligibility of permit coverage based on instruction in the CGP
11. A certifying statement signed and dated by both a corporate officer including name and title (as defined by the Standard Permit Conditions of the CGP) and the DOT&PF regional director

DEC established the use of the eNOI to avoid the delay involved in mailed paper NOIs .

To use the eNOI system, the corporate officer must have a myAlaska account or create one. The eNOI requires the same information as the standard NOI. Staff should prepare a hardcopy NOI for the certifying official's use in submitting the eNOI. The corporate officer should sign the hardcopy NOI and place it in the SWPPP. The DEC requires that only one of the co-permittees pay the required NOI fee. DOT&PF contracts require that the contractor pay the fee.

Use of the eNOI requires close coordination between the contractor and DOT&PF so both eNOIs are submitted as close as possible to the same time.

Construction activities cannot begin until the DEC activates both eNOIs. The CGP definition of construction activities relates to land disturbance. For example, mobilizing equipment may disturb land if moved over unstable soils, but would not disturb land if moved over paved areas. Clearing may disturb land if displacing tree roots, using vehicles, or removing trees. Clearing would not likely disturb land if done on frozen ground without disturbance of the vegetative mat.

The contractor must certify the SWPPP on DOT&PF Form 25D-111. The DOT&PF also certifies the SWPPP. Certification of the SWPPP must be completed prior to submission of the Notice of Intent (NOI). Unlike the eNOI certification, the SWPPP certification can be signed by a representative of the corporate officer. For the DOT&PF, the regional director delegates signature authority to the position of project engineer (delegation to a position rather than an individual allows another person to sign in the case of changes of personnel during vacation or turnover). DOT&PF requires the contractor's corporate officer to delegate signature authority for the SWPPP certification to the Superintendent, using DOT&PF Form 25D-108. Either the contractor's corporate officer or the Superintendent can certify the SWPPP.

The contractor compiles and retains the following records with the SWPPP:

1. SWPPP Certification, original copies, one for each operator
2. Delegation of Signature Authority, original copies, one for each operator
3. The DOT&PF requires that the contractor have each sub-contractor sign a different certification, stating they have read, understood and will comply with the SWPPP. This is DOT&PF Form 25D-105.

eNOI

Include the signed and certified eNOI forms that were submitted to DEC. Include both DOT&PF's and the contractor's eNOIs. Upon receipt, also include a copy of the e-mail message from DEC, which notifies you of their receiving your administratively completed eNOI and gives the date it becomes active.

Alaska Department of Environmental Conservation and Local Requirements

For all projects disturbing five acres or more of ground outside the area of a MS4 permit (current MS4 permitted municipalities in Alaska include Anchorage, Fairbanks and North Pole), the contractor must submit the SWPPP certified by DOT&PF and the contractor to DEC at the same time the eNOI is filed using the address below.

Alaska Department of Environmental Conservation
Wastewater Discharge Authorization Program
Storm Water
555 Cordova Street
Anchorage, AK 99501

For projects that disturb one acre or more (or in some locations, 10,000 square feet for more) and are within the MS4, the SWPPP must be submitted to the appropriate MS4 entity *prior* to filing the eNOI. However, the MS4 SWPPP review requirements vary by permit and municipality, so the contractor will need to identify the requirements specific to the MS4 permit for that project location.

Local governments may have ordinances regarding storm water and your SWPPP should demonstrate its compliance with applicable local requirements.

Post a Notice

Post the following in a publicly accessible, noticeable location near the construction site's main entrance:

- APDES permit numbers and copies of the eNOIs
- Name and phone number of contractor's local contact (if different from the eNOI)
- Location of the SWPPP for viewing (if different from the eNOI)

2.2.6 SWPPP Implementation (Modifications, Inspections, Maintenance and Recordkeeping)

The SWPPP is a dynamic document, and the contractor is responsible for modifying it as conditions dictate (i.e., changes in design, construction, site conditions, or BMPs).

During construction, the contractor must inspect and maintain the storm water controls and management practices. The SWPPP describes the inspection procedures and frequency.

Based on these inspections, the contractor may need to amend the SWPPP if there are any changes in the construction or if the plan is ineffective in controlling pollutants. The CGP requires that SWPPP amendments must be completed within seven calendar days of the day a problem was identified.

Erosion and sediment control measures require maintenance to remain effective.

Routine maintenance is an activity that is described and expected in the SWPPP. Therefore, routine maintenance does not require a SWPPP Amendment. SWPPP Records are legal documents and need to be prepared and kept with care. When a regulatory inspector (could be local government, DEC, or EPA) visits a site, the contractor's SWPPP is the SWPPP of Record that will be examined.

SWPPP Modifications

SWPPP Amendments

For a construction activity to comply fully with the storm water CGP and the SWPPP to be effective, the plan must accurately reflect current site features and operations. When it does not, amend the plan. The contractor must complete a SWPPP amendment within seven calendar days of the inspection that identified the need for a change in the plan.

The following actions require amendments to the SWPPP:

- Addition of a structural BMP not shown on the original SWPPP
- Deletion of a structural BMP that is shown on the original SWPPP
- Addition of different manufactured BMP
- Change in named personnel (SWPPP Manager, Superintendent)
- Change in inspection frequency
- Addition of support facility site

Amendments may be done by adding new pages of text or drawings, or by markups in the margins of text or on the plan sheets. However, the DOT&PF consent decree requires that every amendment must be dated, easy-to-read, approved by an AK-CESCL (or equivalently) certified individual, and listed in the SWPPP Amendment Log (DOT&PF Form 25D-114). The AK-CESCL who approves a SWPPP Amendment could be either a contractor or DOT&PF employee.

To signify approval of a SWPPP Amendment, the AK-CESCL can sign the Amendment Log and/or the actual page that the amendment is on. The certification number and expiration date of the approving individual must also be included in the SWPPP.

SWPPP Updates

In addition to Amendments, the SWPPP is modified with updated information, such as the installation or removal date of BMPs. These notes are typically hand-drawn on the plan sheets, with each entry dated and signed or initialed. These types of notes are not SWPPP Amendments, because they are simply recording actions that were planned for in the SWPPP, not changing the SWPPP. When a plan sheet becomes too full to be read easily, fold and date it, transfer the current conditions to a new sheet and continue to document amendments and the new sheet. Place the new page after the old page in the SWPPP binder.

In addition, the permit and DOT&PF contract require continually recording updates on logs, such as the rainfall, grading and stabilization activities and corrective actions.

Plan Location

You must keep a copy of the SWPPP at the construction site from the time construction begins until final stabilization. The contractor's copy will be the project's SWPPP.

Inspections

The permit and consent decree require inspectors be qualified in the field of erosion and sediment control and storm water quality protection. For DOT&PF projects, inspectors meet both requirements if they hold a current Alaska Certified Erosion and Sediment Control Lead (AK-CESCL) certification. This certification is obtained by attending a two-day training, passing a written exam, and recertifying at least every three years. There are two other certifications that meet the decree requirement and that is the Certified Professional in Erosion and Sediment Control (CPESC) and Certified Inspector of Sediment and Erosion Control (CISEC). These certifications require having experience that meets the pre-qualifications and passing a written exam.

The inspector's certification type, number and expiration date must be provided on the Inspection Report (Form 25D-100) and copies of the certifications are also placed in an appendix of the SWPPP.

Describe the plan and frequency for inspection of the project's BMPs in accordance with the CGP and contract. When planning inspections, be sure the scope of the inspection is thorough enough to meet the CGP requirements.

Inspections must include

- all project areas disturbed by construction activities
- observation of all of the discharge points (where collected and concentrated storm water exits the project, such as a drain inlet, ditch, stream, gully, swale, etc.)
- all of the installed control measures (BMPs)
- areas where temporary stabilization measures have been placed
- areas where permanent stabilization measures have been initiated but not yet reached "final stabilization"
- locations where vehicles enter and exit
- locations where vehicles are stored, fueled or maintained to check for leaks or spills
- locations where materials are stored and exposed to precipitation.

Identify the personnel responsible for these inspections and describe their qualifications. In addition, the inspection must be performed as a collaborative effort between the contractor and the DOT&PF, with representatives of each entity participating.

If the site is eligible for reduced inspection frequency or waiver, indicate why it is eligible and provide the beginning and ending dates.

Use the inspection report form 25D-100 Parts 1 and 2 provided in Appendix A of this guide and in WORD format on the DOT&PF Construction Forms website. This form requires you to list your BMPs. It is advisable to list them by location grouping, so that when the inspector walks the site, the BMPs on the report form are in a logical order.

Some BMPs can be grouped on the form, such as a series of ditch check dams. However, only group BMPs when it makes sense and can be easily understood by someone else. For example, a common sense place to separate silt fence into separate BMPs would be when there is a break in a continuous fence line. If needed, expand the form to list additional BMPs on the continuation sheets (Part 2 of the form).

When an inspector observes a problem, such as a new BMP is needed, one needs to be fixed or maintained, or a leak needs to be fixed and cleaned up, then the action needed must be described on the report form and the date it will be done entered as the "Complete-by-Date". Each of these action items must also be transferred to the Corrective Action Log (DOT&PF From 25D-112). The Corrective Action Log is where the contractor documents that the action was completed before or on the "Complete by Date."

A duly authorized representative from DOT&PF and the primary contractor must certify the inspection reports. For DOT&PF, this would be the project engineer. For the contractor, this would be the Superintendent. Both certifying representatives are required to have current AK-CESCL (or an approved equivalent) certification.

Maintenance

Describe the procedures that you will use to maintain the vegetation, the erosion and sediment control measures, and other protective measures. Such practices may include removing sediment from structural controls (such as sediment ponds/traps, silt fences, or check dams), reinforcing and repairing silt fences or wattles, or reseeding areas as needed. For sediment control BMPs, the permit requires maintenance when accumulation reaches 50% of design capacity. Maintenance procedures for other BMPs should be described in the SWPPP and may be specified in the contract.

If control measures are not working effectively, take immediate action if water quality is threatened. Make all other repairs and modifications as soon as possible and before the next storm whenever practicable. Describe in the SWPPP winter shutdown maintenance procedures to ensure all control measures will remain functional during that time. It is particularly important for the control measures to be effective at the time of spring thaw.

Recordkeeping

Include a copy of the CGP that is current at the time the NOI is filed in the SWPPP.

Also keep all of the forms that are included in Appendix A of this Guide in the SWPPP and keep the forms up to date on preferably a daily basis but at least on a weekly basis.

Other records to keep with the SWPPP include

- A copy of the signed Notice of Intent from every permittee (usually the contractor and the DOT&PF, but there could be others)
- Copies of the DEC acknowledgement of receipt of each eNOI
- Correspondence related to storm water with regulatory authorities
- Records of non-storm water discharges
- Documentation of the SWPPP Preparer's Storm Water Inspector's, Superintendent's and Project Engineer's erosion and sediment control certification(s). Be careful to update these records anytime there is either personnel turnover or someone goes on leave and is replaced with a temporary "acting." In the latter case, include in the SWPPP a memo that delegates the position responsibilities and gives the dates.
- Copy of the DOT&PF Letter of Non-Objection from DEC regarding the permanent storm water management (when it is required)

Retention of Records

Retain the following for three years after filing the NOT or until one year after the termination of the consent decree, whichever is longer. Note that the consent decree may continue for an unknown number of years beyond three.

1. A copy of the SWPPP
2. Inspection records detailing dates of earth-disturbing activities, BMP corrective action dates, end of construction, and stabilization dates
3. A copy of the eNOI and eNOT

2.2.7 Contractor and Subcontractor

The SWPPP needs to describe the roles and responsibilities of the various entities that are active at a project. Identify the personnel of the prime contractor (and subcontractor, if applicable) responsible for implementing the SWPPP. List all contractors (prime or sub) who perform earth-disturbing activities or install and maintain erosion and sediment control measures. If applicable, include a description of the utility company's role and responsibilities unless they have developed their own SWPPP (in which case, your SWPPP must reference theirs). If the contractor has provided support activities, such as disposal or material sites, that are covered in a separate SWPPP, then the project SWPPP must reference the other plans.

2.2.8 Final Stabilization and Permit Termination

The SWPPP remains in effect until the completion of construction activities and stabilization of disturbed areas occur to prevent further erosion of the soil. Final stabilization means all earth-disturbing activities at the project site are complete and all disturbed land is stabilized through mechanical or vegetative means.

Mechanical stabilization includes

- Paving
- Riprap
- Retaining structures
- Clean gravel
- Any naturally non-erodible surfaces such as bedrock and porous parent material

Vegetative stabilization means planting a uniform perennial vegetative cover with a density of 70 percent of the native background cover. In arid and semi-arid areas, temporary erosion control measures (e.g. degradable rolled erosion control product) should be selected, installed and designed to provide erosion control for at least three years without active maintenance, and establish 70 percent vegetative cover within those 3 years. When background cover is less than 100 percent (such as beaches or arid areas), the stabilization requirement is adjusted (see the Definitions of the CGP).

The project engineer will verify final stabilization. Even if less than one acre remains in the disturbed area, an operator cannot file for termination of permit coverage until there is stabilization for all disturbed areas and the removal of all temporary BMPs.

If the contractor or subcontractor's responsibility for final stabilization is complete or another subcontractor or DOT&PF has assumed responsibility for all areas of the site for final stabilization, submit an electronic Notice of Termination (eNOT) to the DEC. The NOT must be submitted within 30 days of the Engineer confirming final stabilization.

The eNOT must include

1. The APDES tracking number
2. The basis for submitting the eNOT (e.g., completed final stabilization or permittee no longer has responsibility over the site)

3. Your name, address, telephone number, and organization Employer Identification Number (EIN)
4. Name of project, address, and location
5. A certification statement signed and dated by the corporate officer.

Submit eNOTs to DEC in the same manner as the eNOI (see 2.2.5). Provide a copy of the eNOT to the DOT&PF project engineer. For a stabilized project, the DOT&PF regional director will submit an eNOT, terminating the DOT&PF's coverage under the CGP.

Provide a complete and true copy of the contractor's SWPPP and all associated records to the DOT&PF when the eNOTs are filed.

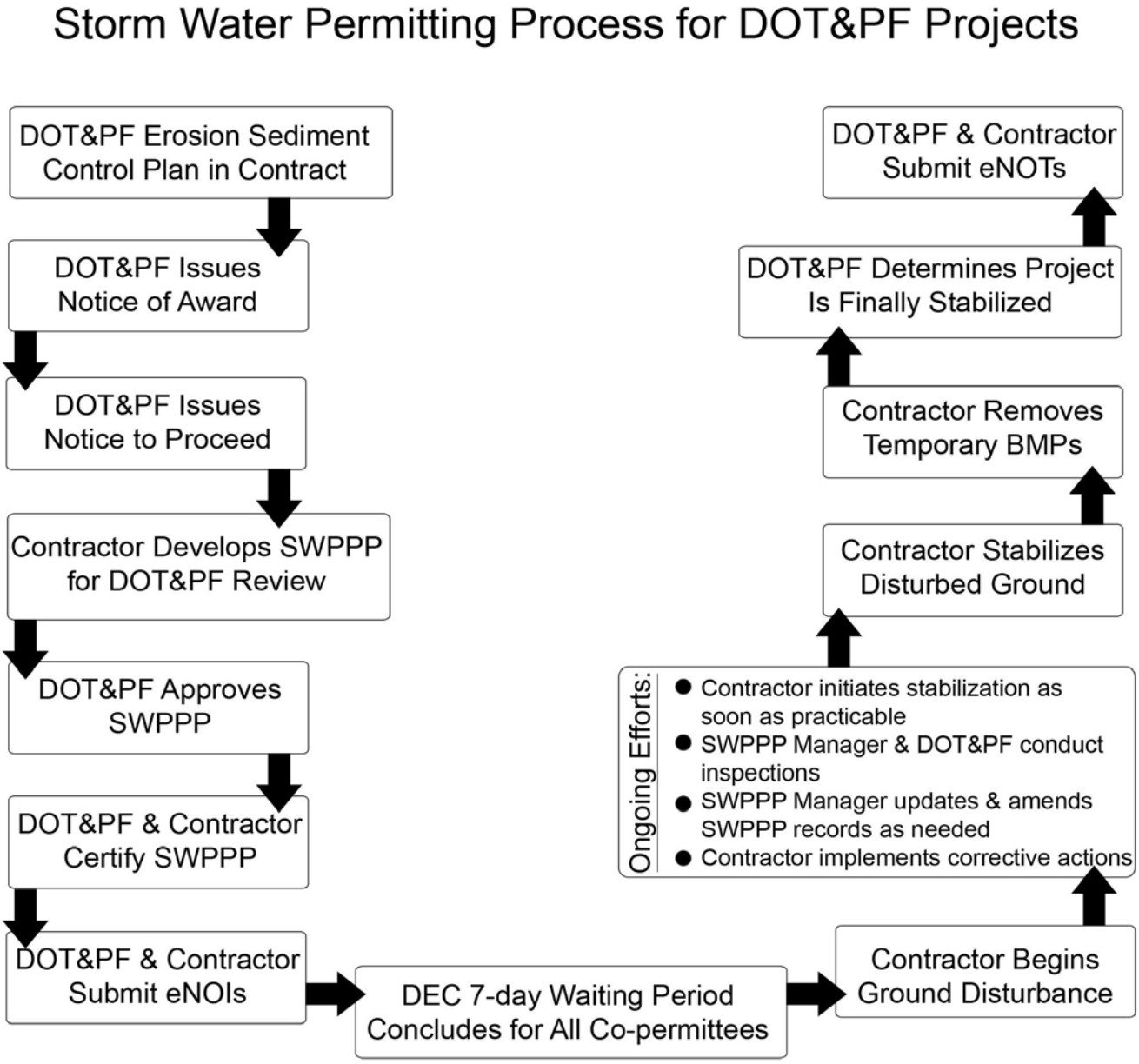

Storm Water Permitting Process for DOT&PF Projects
DOT&PF Erosion Sediment Control Plan in Contract
DOT&PF Issues Notice of Award
DOT&PF Issues Notice to Proceed
Contractor Develops SWPPP for DOT&PF Review
DOT&PF Approves SWPPP
DOT&PF & Contractor Certify SWPPP
DOT&PF & Contractor Submit eNOIs
DEC 7-day Waiting Period Concludes for All Co-permittees
Contractor Begins Ground Disturbance
Ongoing Efforts:
Contractor initiates stabilization as soon as practicable
SWPPP Manager & DOT&PF conduct inspections
SWPPP Manager updates & amends SWPPP records as needed
Contractor implements corrective actions
Contractor Stabilizes Disturbed Ground
Contractor Removes Temporary BMPs
DOT&PF Determines Project Is Finally Stabilized
DOT&PF & Contractor Submit eNOTs

Figure 1

State of Alaska Department of Transportation & Public Facilities
Statewide Design & Engineering Services

STORM WATER POLLUTION PREVENTION PLAN REVIEW CHECKLIST

Project Name:
Project Number:
Date SWPPP Submitted to DOT&PF:
Date of Review:
Reviewer:
SWPPP Approved? ☐ No ☐ Yes

Use this checklist when reviewing a Storm Water Pollution Prevention Plan (SWPPP) that has been submitted by a contractor. The purpose of this checklist is to ensure that the SWPPP includes the Alaska Department of Environmental Conservation (ADEC) requirements in the 2010 CGP, the September 21, 2010 Clean Water Act Consent Decree, and the DOT&PF specification requirements. This checklist follows the topic order of the Sept. 2007 EPA SWPPP template. Check the "Done" box to indicate that each requirement has been met, and note the location in the contractor's SWPPP.

1.0 SITE EVALUATION, ASSESSMENT, AND PLANNING

Item #	Requirement	Location in SWPPP	Addressed?	Deficiencies	Requiring Document(s)
1.1 Project/Site Information					
1	Does the SWPPP provide the project location?		☐ No ☐ Yes		
2	Does the SWPPP provide the project latitude and longitude?		☐ No ☐ Yes		
1.2 Contact Information/Responsible Parties					
3	Does the SWPPP identify all operators at the site, and the areas over which each operator has control?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 5.2.1 DOT&PF Spec: 641-2.01
4	Does the SWPPP state which operator(s) is responsible for the implementation of control measures?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 5.3.1 DOT&PF Spec: 641-2.01
5	Does the SWPPP show the lines of authority and contact information for the Superintendent, SWPPP Manager, Subcontractor SWPPP Coordinators and Utility SWPPP Coordinators?		☐ No ☐ Yes, but deficient ☐ Yes		DOT&PF Spec: 641-2.01

Item #	Requirement	Location in SWPPP	Addressed?	Deficiencies	Requiring Document(s)
1.2 Contact Information/Responsible Parties, cont.					
6	Is the name of the preparer(s) of the SWPPP provided?		☐ No ☐ Yes		Consent Decree: 6a(1) DOT&PF Spec: 641-2.01
7	Is the SWPPP preparer's qualifications provided?		☐ No ☐ Yes, but deficient ☐ Yes		DOT&PF Spec: 641-1.04 & 2.01
1.3 Nature and Sequence of Construction Activity					
8	Is the scope and function of the construction project described?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 5.2.2.1
9	Are the nature and sequence of construction activities that disturb soils described?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 5.2.2.2 DOT&PF Spec: 641-2.01
1.4 Soils, Slopes, Vegetation and Current Drainage Patterns					
10	Has the contractor described the soil types, slopes, drainage patterns, and vegetation (current and after grading and fill)?		☐ No ☐ Yes, but deficient ☐ Yes		
1.5 Construction Site Estimates					
11	Is the total site area (in acres) expected to be disturbed provided (including off-site staging, borrow, and waste areas)?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 5.2.2.3
1.6 Receiving Waters					
12	Does the SWPPP list all the water bodies that would receive storm water from the site (including wetlands)?		☐ No ☐ Yes, but deficient ☐ Yes		
13	Does the project affect an impaired water body? ☐ No; *If no,* skip to Item 14. ☐ Yes; *If yes,* address 13a.				
13a	Does the SWPPP indicate the location of discharges into such impaired water bodies?		☐ No ☐ Yes, but deficient ☐ Yes		

Item #	Requirement	Location in SWPPP	Addressed?	Deficiencies	Requiring Document(s)
1.6 Receiving Waters, cont.					
14	Does the project affect a water body with an approved or established total maximum daily load (TMDL)? ☐ No; *If no*, skip to Item 15. ☐ Yes; *If yes*, address 14a – d.				
14a	Does the SWPPP indicate the locations of discharges into water bodies with a TMDL?		☐ No ☐ Yes, but deficient ☐ Yes		
14b	Does the SWPPP state whether the discharge is identified in the TMDL or whether there are allocations, requirements or assumptions identified for the discharge?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 3.5 & 5.6.1
14c	Does the SWPPP identify measures to ensure that discharges will be consistent with the assumptions and requirements of the TMDL including any specific wasteload allocation that would apply to the discharge?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 5.6.3
14d	Does the SWPPP summarize or document consultation with ADEC on the consistency of SWPPP conditions with the TMDL?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP 5.6.2
1.7 Site Features and Sensitive Areas to be Protected					
15	Does the SWPPP describe unique resources (such as historic property, stream buffers) that are to be preserved?		☐ No ☐ Yes, but deficient ☐ Yes		
16	Does the SWPPP describe how natural features that are identified will be protected during construction activity?		☐ No ☐ Yes, but deficient ☐ Yes		

Item #	Requirement	Location in SWPPP	Addressed?	Deficiencies	Requiring Document(s)
1.8 Potential Sources of Pollution					
17	Does the SWPPP identify all potential sources of pollution including those not directly from the site's construction that might affect the quality of storm water discharges from the site?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 5.1.2.1
18	Is sediment included as a potential pollutant?		☐ No ☐ Yes		
19	Does the project include dedicated asphalt and/or concrete plants? (note: if there are none, the SWPPP must state this) ☐ No; *If no*, skip to Item 20. ☐ Yes: *If yes*, address 19a.				
19a	Does the SWPPP describe measures to minimize pollutant discharges from present dedicated asphalt and/or concrete plant(s)?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 5.2.5
1.9 Endangered Species Certification					
20	Does the SWPPP indicate the procedures in CGP Appendix C were followed to assess the potential effects of the project's storm water on endangered species and critical habitat?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 3.3 and 5.5 DOT&PF Spec: 641-2.01
21	Was the project found to affect an endangered species and/or critical habitat? ☐ No; *If no*, skip to Item 22. ☐ Yes; *If yes*, address 21a.				
21a	Does the SWPPP list measures for the protection of endangered species and/or critical habitat?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 3.3 & 5.5
1.10 Historic Preservation					
22	Does the SWPPP include documentation of consultation with the State Historic Preservation Officer (SHPO) regarding the project?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 1.3.3.7 DOT&PF Spec: 641-2.01

Item #	Requirement	Location in SWPPP	Addressed?	Deficiencies	Requiring Document(s)
1.10 Historic Preservation, cont.					
23	Was the project found to affect historic properties/resources? ☐ No; *If no*, skip to Item 24. ☐ Yes; *If yes*, address 23a.				
23a	Does the SWPPP list measures for the protection of historic properties/resources?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP 1.3.3.7
1.11 Applicable Federal, Tribal, State or Local Programs					
24	Does the SWPPP describe the project's compliance with any applicable state, local, or tribal requirements for soil and erosion control and storm water management?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 3.8
1.12 Site Maps (Also to be included in Appendices A and B)					
25	Does the SWPPP include a map identifying the general location of the site and, if known, the names and locations of any waters of the U.S. (including wetlands) within one mile of the site?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 5.2.2.4 & 5.2.3.6
26	Does the SWPPP include a legible site map of the entire site?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 5.2.3
27	Does map of the site indicate areas to be disturbed and areas that will not be disturbed?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 5.2.3.2
28	Does the site map indicate the natural features that are to be preserved, if any?		☐ No ☐ Yes, but deficient ☐ Yes		
29	Does the site map show locations of major structural and non-structural erosion and sedimentation controls?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 5.2.3.3
30	Does the site map show locations where stabilization practices are expected to occur?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 5.2.3.4

Item #	Requirement	Location in SWPPP	Addressed?	Deficiencies	Requiring Document(s)
1.12 Site Maps, cont. (Also to be included in Appendices A and B)					
31	Does the site map show the locations of off-site material, waste, borrow, and equipment storage areas used solely for the project?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 5.2.3.5
32	Does the site map show the location of any described industrial activities and associated storm water discharges other than construction at the site (such as dedicated asphalt or concrete plants)?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 5.2.5
33	Does the site map show the direction of storm water flow and appropriate slopes before and after major grading activities?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 5.2.3.1
34	Does the site map show locations of storm water discharges to surface water or to a municipal storm sewer system?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 5.2.3.7

2.0 EROSION AND SEDIMENT CONTROL BMPS

Item #	Requirement	Location in SWPPP	Addressed?	Deficiencies	Requiring Document(s)
Throughout Section 2.0					
35	Are BMPs listed under the appropriate subsection? (erosion control vs. sediment control)		☐ No ☐ Yes, but deficient ☐ Yes		
36	Does the SWPPP properly select controls in accordance with manufacturer specifications and good engineering practices?		☐ No ☐ Yes, but deficient ☐ Yes		
37	For each major activity identified in the project description, does the SWPPP describe all control measures?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 5.3.1 DOT&PF Spec: 641-2.01

Item #	Requirement	Location in SWPPP	Addressed?	Deficiencies	Requiring Document(s)
Throughout Section 2.0, cont.					
38	Does the SWPPP reference the BMP manual or publication used as a source for each BMP described?		☐ No ☐ Yes, but deficient ☐ Yes		Consent Decree: 6b DOT&PF Spec: 641-2.01
39	If no BMP manual or publication was used to select or design a given BMP, then does the SWPPP state so and include a description of the design and placement of the BMP?		☐ No ☐ Yes, but deficient ☐ Yes		Consent Decree: 6b DOT&PF Spec: 641-2.01
40	Does the SWPPP describe the implementation and maintenance of control measures to minimize pollutants in discharges as necessary to meet applicable water quality standards?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 3.4 DOT&PF Spec: 641-3.01
41	Does the SWPPP discuss routine maintenance of identified control measures, including performing maintenance before next storm event whenever practicable?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 3.6.1 Consent Decree: 8a DOT&PF Spec: 641- 3.01
42	Does the SWPPP discuss maintenance of controls when site inspections identify they are not working effectively? (Can refer to the Corrective Action Log, Section 5.3)		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 3.6.2 Consent Decree: 8a DOT&PF Spec: 641-3.01
43	In stabilizing the site, does the SWPPP discuss avoiding use of impervious surfaces?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 3.1.8.1
2.1 Minimize Disturbed Areas and Protect Natural Features and Soil					
44	Does the SWPPP describe how natural features identified in Section 1.7 will be protected during construction activity?		☐ No ☐ Yes, but deficient ☐ Yes		

Item #	Requirement	Location in SWPPP	Addressed?	Deficiencies	Requiring Document(s)
2.1 Minimize Disturbed Areas and Protect Natural Features and Soil, cont.					
45	Does the SWPPP proposed to preserve existing vegetation where possible?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 3.1.8.1
2.2 Phased Construction Activity					
46	Does the SWPPP describe how sequencing and phasing will minimize the amount of disturbed soil that is unstabilized at any one time?		☐ No ☐ Yes, but deficient ☐ Yes		DOT&PF Spec: 641-3.01
47	Does the SWPPP describe the timing during the construction when control measures will be installed?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 5.3.1 DOT&PF Spec: 641- 2.01
48	If applicable, does the SWPPP describe how the site will be stabilized prior to seasonal thaw?		☐ N/A ☐ No ☐ Yes, but deficient ☐ Yes		Consent Decree: 6c DOT&PF Spec: 641 -2.01
2.3 Control Storm Water Flowing Onto and Through the Project					
49	Does the SWPPP describe any structural practices used to divert flows from exposed soils, retain/detain flows, or otherwise limit runoff/pollutants from exposed areas?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 3.1.3
2.4 Stabilize Slopes					
50	Does the SWPPP state disturbed areas will be stabilized as soon as practicable and within 14 days where construction activity is permanently or temporarily ceased?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 3.1.8.2 DOT&PF Spec: 641-3.01
51	Does the SWPPP describe all temporary and permanent stabilization practices, including installation schedules?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 5.3.2 DOT&PF Spec: 641-3.01
52	Does the SWPPP describe how wind erosion will be minimized?		☐ No ☐ Yes, but deficient ☐ Yes		DOT&PF Spec: 641- 2.01

Item #	Requirement	Location in SWPPP	Addressed?	Deficiencies	Requiring Document(s)
2.5 Protect Slopes					
53	Does the SWPPP describe how slopes will be protected including the design specifications and details?		☐ No ☐ Yes, but deficient ☐ Yes		
2.6 Protect Storm Drain Inlets					
54	Are storm drains present at the site? ☐ No; *if no*, skip to Item 55 ☐ Yes; *if* yes, address 54a.				
54a	Does the SWPPP describe how storm drain inlets will be protected?		☐ No ☐ Yes, but deficient ☐ Yes		
2.7 Establish Perimeter Controls and Sediment Barriers					
55	Does the SWPPP discuss BMPs to filter and trap sediment before it leaves the site (e.g. silt fence or fiber rolls)?		☐ No ☐ Yes, but deficient ☐ Yes		
56	Does the SWPPP discuss removing sediment from silt fences before deposits reach 50% of above ground height?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 3.6.4 DOT&PF Spec: 641-3.01
57	Does the contractor discuss removal of sediment from other BMPs as appropriate?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP 3.6.1
2.8 Retain Sediment On-site and Control Dewatering Practices					
58	Does the SWPPP discuss BMPs to trap sediment on-site?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP 3.1.1
59	Does the disturbed area exceed 10 acres in a common drainage? ☐ No; *If no*, skip to Item 60. ☐ Yes; *If yes*, address 59a.				
59a	Does the SWPPP propose the use of sediment basins? ☐ No; *If no*, address 59b. ☐ Yes; *If yes*, address 59c.				2010 CGP: 3.1.1.1
59b	Does the SWPPP describe why a sediment basin is not attainable and provide for equivalent measures?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP 3.1.1.2
59c	Does the sediment basin meet the minimum required storage capacity?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP 3.1.1.1

Item #	Requirement	Location in SWPPP	Addressed?	Deficiencies	Requiring Document(s)
2.8 Retain Sediment On-site and Control Dewatering Practices, cont.					
59d	Are the factors considered for the sediment basin discussed (design specification and design details)?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP 3.1.1.1
60	Does the SWPPP propose the use of sediment traps or ponds? ☐ No; *If no*, skip to Item 62. ☐ Yes; *If yes*, address 61a.				
60a	Does the SWPPP discuss removal of sediment from sediment traps or sedimentation ponds when design capacity has been reduced by 50 percent?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 3.6.3 DOT&PF Spec: 641-3.01
2.9 Establish Stabilized Construction Exits					
61	Are all construction exits gravel to gravel surfaces? ☐ Yes; if yes, skip to Item 63. ☐ No; if no, address 62a.				
61a	Does the SWPPP describe measures to minimize off-site tracking of sediments to paved surfaces?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 3.1.2
62	Does the SWPPP discuss removal of off-site accumulations of sediment to minimize off-site impacts?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 3.1.2
63	Does the SWPPP describe measures to minimize generation of dust?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 3.1.2
2.10 Any Additional BMPS					
64	Does the SWPPP specify velocity dissipation devices at discharge locations and along outfall channels to provide non-erosive flow?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 3.1.4 DOT&PF Spec: 641-2.01

3.0 GOOD HOUSEKEEPING BMPS

Item #	Requirement	Location in SWPPP	Addressed?	Deficiencies	Requiring Document(s)
Throughout Section 3.0					
65	For each major activity identified in the project description, does the SWPPP describe all control measures?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 5.3.1 DOT&PF Spec: 641 -2.02
66	Does the SWPPP or Hazardous Materials Control Plan (HMCP) address the prevention of exposure to storm water of construction litter, debris and chemicals to water?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 3.1.6.2 & 3.1.6.3 DOT&PF Spec: 641- 2.02
3.1 Material Handling and Waste Management					
67	Does the SWPPP describe any waste or construction materials that may be handled?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 5.2.4
68	Does the SWPPP describe all waste disposal practices and material handling procedures to prevent and/or minimize discharge of solid material, including building materials, to waters of the U.S.?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 3.1.6.1 & 3.1.6.2
69	Is compliance with any applicable state, local, or tribal requirements regarding material handling and waste management documented?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 3.8
3.2 Establish Proper Building Material Staging Areas					
70	Will any waste or construction materials to be stored on-site? ☐ No; *If no*, skip to Item 71. ☐ Yes; *If yes*, address 70a.				
70a	Does the SWPPP describe how exposure to storm water of any waste or construction materials stored on-site will be minimized?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP 5.2.4

Item #	Requirement	Location in SWPPP	Addressed?	Deficiencies	Requiring Document(s)
3.3 Designate Washout Areas					
71	Does the project include concrete or paint washout areas? (note: if there are none, the SWPPP must state this) ☐ No; *If no*, skip to Item 72. ☐ Yes: *If yes*, address 71a.				
71a	Does the SWPPP describe the concrete/paint washout areas and their locations?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 3.1.6.2 & 3.1.6.3
3.4 Establish Proper Equipment/Vehicle Fueling and Maintenance Practices					
72	Does the SWPPP or HMCP establish vehicle fueling and maintenance practices that will prevent storm water pollution?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 3.1.6. DOT&PF Spec: 641-2.02
3.5 Control Equipment/Vehicle Washing					
73	Does the SWPPP describe vehicle and equipment washing practices to ensure compliance and prevent storm water pollution? (e.g. no detergent)		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP 1.3.2.3. DOT&PF Spec: 641-2.02
3.6 Spill Prevention and Control Plan					
74	Does the SWPPP or HMCP describe all spill prevention and response practices?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 3.1.9 DOT&PF Spec: 641-2.02

Item #	Requirement	Location in SWPPP	Addressed?	Deficiencies	Requiring Document(s)
3.6 Spill Prevention and Control Plan, cont.					
75	Does the SWPPP or HMCP describe procedures for giving notice of a reportable release of oil or other hazardous substance and implementing measures to prevent future releases?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 3.1.9
3.7 Any Additional BMPs					
76	Does the SWPPP described controls to minimize pollutants from sources other than construction (such as dedicated asphalt or concrete plants)?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 3.1.7
3.8 Allowable Non-Storm Water Discharge Management					
77	Does the project include allowable non-storm water discharges? (note: if there are none, the SWPPP must state this) ☐ No; *If no*, skip to Item 78. ☐ Yes; *If yes*, address 77a – c.				
77a	Does the SWPPP identify all allowable sources of non-storm water discharges?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 5.4
77b	Does the SWPPP discuss how non-storm water discharges will be minimized?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP 3.2 and 5.4
77c	Does the SWPPP describe pollution prevention measures for any allowable non-storm water discharges?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP 5.4
78	Does the project require Notice for use of ADEC Excavation Dewatering Permit for dewatering (250,000 gallons or more within one mile of a contaminated site)? ☐ No; *If no*, skip to Item 79. ☐ Yes; *If yes*, address 78a.				
78a	Is the Notice and DEC's response included in the SWPPP?		☐ No ☐ Yes, but deficient ☐ Yes		DEC 2009DB0003 General Permit

4.0 SELECTING POST CONSTRUCTION BMPS

Item #	Requirement	Location in SWPPP	Addressed?	Deficiencies	Requiring Document(s)
79	Does the SWPPP describe the post-construction storm water management controls to be installed at the site?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP 3.1.5
80	Is compliance with any applicable state, local, or tribal requirements regarding design and installation of post-construction measures documented?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 3.1.5
81	Is the DEC nondomestic wastewater (18AAC72.600) plan review of post-construction stormwater management documentation provided in the SWPPP?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 5.13.6

5.0 INSPECTIONS

Item #	Requirement	Location in SWPPP	Addressed?	Deficiencies	Requiring Document(s)
5.1 Inspections					
82	Does the SWPPP state which of the two permit options for inspection frequency the contractor will use?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 4.1 Consent Decree: 7b DOT&PF Spec: 641-2.01
83	Does the SWPPP outline procedures for conducting inspections during winter or during seasonal suspension of work as applicable?		☐ No ☐ Yes, but deficient ☐ Yes		DOT&PF Spec: 641-3.03
84	Is the site eligible for reduced inspection frequency and/or inspection waiver? ☐ Yes; *If yes*, address 84a & b. ☐ No; *If no*, skip to 85.				

Item #	Requirement	Location in SWPPP	Addressed?	Deficiencies	Requiring Document(s)
5.1 Inspections, cont.					
84a	Does the SWPPP indicate why the project is eligible for a reduced frequency and/or waiver?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP 4.1 & 4.2; Consent Decree 7b
84b	Does the SWPPP state the beginning and ending dates of the waiver period?		☐ No ☐ Yes		2010 CGP 4.3.3 Consent Decree 7b DOT&PF Spec 641-3.03
85	Is a preconstruction inspection required? ☐ No; *If no*, skip to Item 86. ☐ Yes; *If yes*, address 85a. Note: the Decree requires Pre-construction Inspections for the following: Northern and Southeast Regions: any project ≥ five acres Central Region (road accessible from Anchorage): any project ≥ one acre Central Region (all other areas): any project ≥ five acres				Consent Decree: 6a(1) & 7a DOT&PF Spec: 641-2.01 3.01
85a	Was a pre-construction inspection conducted? ☐ No; *If no*, answer Items 85b and 85c and then skip to Item 86. ☐ Yes; *If yes*, skip 85b and 85c and address 85d .				
85b	Does the SWPPP state that a preconstruction site visit will be conducted prior to the start of construction activities?		☐ No ☐ Yes, but deficient ☐ Yes		
85c	Does the SWPPP establish a protocol and time period for modifying the SWPPP following a preconstruction inspection (if written prior to this inspection)?		☐ No ☐ Yes, but deficient ☐ Yes		Consent Decree: 7a DOT&PF Spec: 641-3.03
85d	Does the SWPPP include a completed Preconstruction Site Visit Form (Form 25D-106)?		☐ No ☐ Yes, but deficient ☐ Yes		Consent Decree 7a
86	Does the SWPPP identify the individuals responsible for conducting inspections and reference the appendix containing copies of their AK-CESCL certification cards?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 4.4 Consent Decree: 7b DOT&PF Spec: 641-1.04

Item #	Requirement	Location in SWPPP	Addressed?	Deficiencies	Requiring Document(s)
5.1 Inspections, cont.					
87	Does the SWPPP state that the inspections will be conducted jointly with the DOT&PF, unless impracticable?		☐ No ☐ Yes, but deficient ☐ Yes		Consent Decree: 7b DOT&PF Spec: 641-3.03
88	Does the SWPPP outline procedures for delivering the Inspection Reports to the absent party when a joint inspection is not practicable?		☐ No ☐ Yes, but deficient ☐ Yes		Consent Decree: 7b
89	Is there reference to Appendix E where a blank Inspection Report (Form 25D-100) must be included?		☐ No ☐ Yes		Consent Decree: 7c DOT&PF Spec: 641-3.03
90	Does the SWPPP state that the inspector will enter a Complete by Date in the Report for any BMP maintenance or modifications and that the date must be before the next storm, whenever practicable, and such that water quality will be protected?		☐ No ☐ Yes, but deficient ☐ Yes		Consent Decree: 8a DOT&PF Spec: 641-3.01
5.2 Delegation of Authority					
91	Does the SWPPP describe which corporate officer has delegated signature authority to the Superintendent and reference Appendix K where the actual completed delegation form (Form 25D-108) must be included?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP Appendix F, Part 12 DOT&PF Spec: 641-1.05 & 641-2.04

Item #	Requirement	Location in SWPPP	Addressed?	Deficiencies	Requiring Document(s)
5.3 Corrective Action Log/Delayed Action Items					
92	Does the SWPPP describe the procedures for completing the Corrective Action Log and include a reference to Appendix F where a blank Corrective Action Log (Form 25D-112) must be included?		☐ No ☐ Yes, but deficient ☐ Yes		DOT&PF 641 Spec: 3.03

6.0 **RECORD KEEPING AND TRAINING**

Item #	Requirement	Location in SWPPP	Addressed?	Deficiencies	Requiring Document(s)
6.1 Recordkeeping					
93	Does the SWPPP describe how it will be kept up to date with required recordkeeping?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 5.3.3 DOT&PF Spec 641-2.01 and 641-3.03
94	Does the SWPPP contain the Grading and Stabilization Log (Form 25D – 110)?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 5.3.3 DOT&PF Spec: 641-3.03
95	Does the SWPPP state how it will be retained at the construction site and that it will be made available upon request to the EPA, state, tribal, local agency, inspectors, etc.		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 5.11.1 and 5.11.3 Consent Decree: 6a(4) DOT&PF Spec 641-3.02
96	Does the SWPPP describe how and where it will be retained after completion of the project?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 5.11.1 Consent Decree 33 DOT&PF Specification 641-3.02
6.2 Log of Changes to the SWPPP					
97	Does the SWPPP establish a protocol and time period for modifying the SWPPP when there is		☐ No ☐ Yes, but deficient		2010 CGP: 5.10.1 DOT&PF Spec: 641-

	a change in design, construction, operation, or maintenance at the site?		☐ Yes		3.03
98	Does the SWPPP establish a protocol and time period for modifying the SWPPP to reflect any revisions in federal, state, tribal and local requirements?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 5.8
99	Does the SWPPP establish a protocol and time period for modifying the SWPPP within 7 days following a site staff or regulatory official inspection noting additional or modified BMPs are needed?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 5.10.3 DOT&PF Spec: 641-3.03
100	Does the SWPPP establish a protocol and time period for modifying the SWPPP if it is determined during inspections or investigations that it is ineffective in minimizing pollutants in the discharges from the site?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 5.10.2 DOT&PF Spec: 641-3.03
101	Does the SWPPP establish that amendments will be dated and approved in writing by an AK-CESCL (or equivalent) certified individual? Is this individual's name and AK-CESCL certification number and expiration date provided?		☐ No ☐ Yes, but deficient ☐ Yes		Consent Decree: 6a(3) DOT&PF Spec: 641-3.03
102	Does the SWPPP reference Appendix G, where the SWPPP Amendment Log (Form 25D-114) will be kept?		☐ No ☐ Yes, but deficient ☐ Yes		DOT&PF Spec: 641-3.03

Item #	Requirement	Location in SWPPP	Addressed?	Deficiencies	Requiring Document(s)
6.3 Training					
103	Does the SWPPP describe how employees and subcontractors will be trained for BMP awareness and procedures and reference Appendix J where the training records will be kept?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 3.7 DOT&PF Spec: 641-3.01
104	Does the SWPPP document that the Superintendent and SWPPP Manager are AK-CESCL, or equivalently, certified as outlined in the Consent Decree?		☐ No ☐ Yes, but deficient ☐ Yes		Consent Decree: 5b & 5d DOT&PF Spec: 641-1.04
105	Does the SWPPP document that DOT&PF Project Engineer and Stormwater Inspector are AK-CESCL, or equivalently, certified as outlined in the Consent Decree?		☐ No ☐ Yes, but deficient ☐ Yes		Consent Decree 5a and 5d DOT&PF Spec: 641-2.01

6.0 FINAL STABILIZATION

Item #	Requirement	Location in SWPPP	Addressed?	Deficiencies	Requiring Document(s)
106	Does the SWPPP describe procedures for final stabilization?		☐ No ☐ Yes, but deficient ☐ Yes		DOT&PF Spec: 641-3.01

SWPPP APPENDICES

Item #	Requirement	Location in SWPPP	Addressed?	Deficiencies	Requiring Document(s)
107	App. A: a general location map identifying site location and the names, if known, and locations of any waters of the U.S. within one mile of the site?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 5.2.2.4

Item #	Requirement	Location in SWPPP	Addressed?	Deficiencies	Requiring Document(s)
108	App. B: are the site maps included in Appendix B and do they contain all the information asked for on the checklist under SWPPP template Section 1.12?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 5.2.3
109	App. C: includes a copy of the permit (current CGP) with the SWPPP		☐ No ☐ Yes	2010 CGP 5.7 DOT&PF spec 641-2.01	
110	App. D: where all the applicable eNOIs and acknowledgement letters from ADEC can be placed once the SWPPP is approved and they are filed		☐ No ☐ Yes	2010 CGP 5.7	
111	App. E: includes a blank SWPPP inspection report (Form 25D-100 Parts 1 and 2)		☐ No ☐ Yes		2010 CGP: 5.9
112	App. F: includes blank Corrective Action Log (Form 25D-112)		☐ No ☐ Yes		DOT&PF Spec 641-2.01
113	App. G: includes blank SWPPP Amendment Log (Form 25D-114)		☐ No ☐ Yes		DOT&PF Spec 641-2.01
114	App. I: includes blank Grading and Stabilization Log (Form 25D-110)		☐ No ☐ Yes		2010 CGP: 5.3.3 DOT&PF spec 641-2.01
115	App. J: includes blank training log form (Form 25D-125)		☐ No ☐ Yes		2010 CGP: 3.7 DOT&PF Spec 641-2.01
116	App. K: includes the original copy of the contractor's (Form 25D-108) properly signed delegation letter		☐ No ☐ Yes		DOT&PF 641 Spec: 1.05
117	App. M: includes the required documentation with regard to endangered species		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 3.3 & 5.5 DOT&PF 641 Spec: 2.01

118	App. M: includes the required documentation with regard to historic sites		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 1.3.3.7 DOT&PF 641 Spec: 2.01
119	App. N: includes the HMCP that includes the lines of authority and contact information		☐ No ☐ Yes, but deficient ☐ Yes		DOT&PF Spec 641-2.02
120	App. O: includes all BMP descriptions		☐ No ☐ Yes, but deficient ☐ Yes		DOT&PF Spec 641-2.01
121	App. P: includes the Preconstruction Site Visit form (Form 25D-106)		☐ No ☐ Yes		DOT&PF Spec 641-2.01
122	App. Q: includes copies of current AK-CESCL (or equivalent) certifications for the Superintendent, SWPPP Manager, DOT&PF Project Engineer and DOT&PF Stormwater Inspector)		☐ No ☐ Yes, but deficient ☐ Yes		DOT&PF Spec 641-1.04 and 2.01
123	App. R: includes a blank Form 25D-115, SWPPP Daily Record of Rainfall in the SWPPP		☐ No ☐ Yes		DOT&PF Spec 641-2.01
124	App. S: Includes the DOT&PF-acquired project permits		☐ No ☐ Yes, but deficient ☐ Yes		DOT&PF Spec: 641-2.01
125	App. T: includes, if required, the ADEC delivery receipt confirmation of the SWPPP submittal and ADEC Non-domestic Wastewater Plan Review or No Objection Letter?		☐ No ☐ Yes		DOT&PF Spec 641-2.01
126	App. U: includes a blank or unsigned NOT form		☐ No ☐ Yes		DOT&PF Spec 641-2.01

TO CHECK AFTER DOT&PF APPROVAL OF THE SWPPP

8.0 CERTIFICATION AND NOTIFICATION

Item #	Requirement	Location in SWPPP	Addressed?	Deficiencies	Requiring Document(s)
127	Has the contractor's Superintendent signed and certified the SWPPP (Form 25D-111)?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 5.11.4 DOT&PF 641 Spec: 2.04
128	Has the DOT&PF Project Engineer signed and certified the SWPPP (Form 25D-109)?		☐ No ☐ Yes, but deficient ☐ Yes		2010 CGP: 5.11.4 Consent Decree: 6a(2)
129	Has the Subcontractor(s) signed and certified that they have read and will adhere to the conditions outlined in the SWPPP (Form 25D-105)?		☐ No ☐ Yes, but deficient ☐ Yes		DOT&PF Spec: 641-1.05

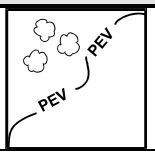
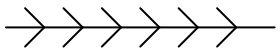
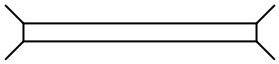
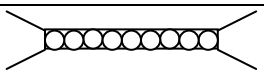
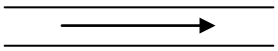
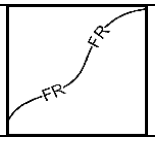
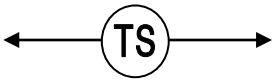
Appendix B. Examples of Best Management Practices

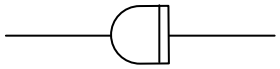
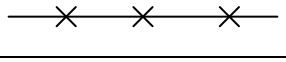
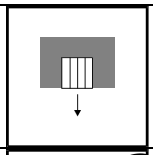
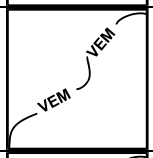
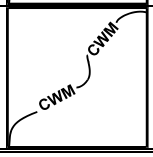
Introduction

Appendix B is a discussion of the more commonly used erosion and sediment control practices. Objectives and applications are outlined for each practice. Use considerations, common failures, alternate measures, and relationship with other erosion and sediment control practices are described. Finally, design, materials, installation, inspection, maintenance, and removal are described for each measure. The measures described here are by no means all-inclusive. There are many variations to these practices according to site-specific conditions, and in addition there may be manufactured products available that will satisfy a particular need for erosion and sediment control. Table B-1 lists a matrix of uses for selected erosion control practices, and suggested symbology to be used on plans.

It is crucial to the success of erosion and sediment control at construction sites that individual measures be designed, constructed, and maintained with regard to the site, to other measures, and construction methods being used. Revegetation, either temporary or permanent, is integral to the process. SWPPP Preparers for DOT&PF projects can select between these BMPs, those found in the Alaska Storm Water Guide, or select from another state's BMP Manual. The SWPPP Preparer is required to cite the published source that is used.

Table B-1
Matrix of Uses and Suggested Drawing Symbols

Erosion and Sediment Control Measures	Pg.	Structural Measures		Erosion Control	Pollution Prevention	Temporary/ Permanent	Symbol
		Velocity Control	Sediment Control				
Preservation of Existing Vegetation (BMP AK-1)	B-4			X		P	
Interception/ Diversion Ditch (BMP AK-2)	B-6	X				T, P	
Slope Drain (BMP AK-3)	B-9	X				T	
Rock Flume (BMP AK-4)	B-12	X				T, P	
Outlet Protection (BMP AK-5)	B-14	X				T, P	
Stormwater Conveyance Channel (BMP AK-6)	B-17	X				T, P	
Check Dam (BMP AK-7)	B-21	X				T, P	
Fiber Rolls (BMP AK-8)	B-24	X	X	X		T, P	
Mulching (BMP AK-9)	B-26			X		T	
Temporary Seeding (BMP AK-10)	B-28			X		T	
Seeding Around Culverts (BMP AK-11)	B-30			X		T,P	
Surface Roughening and Terracing (BMP AK-12)	B-32			X		T	
Compost Blankets (BMP AK-13)	B-37			X		T,P	
Rolled Erosion Control Products (BMP AK-14)	B-39			X		T, P	

Temporary Sediment Trap (BMP AK-15)	B-43		X			T	
Vegetative Buffer Strip (BMP AK-16)	B-46		X			T, P	
Filter Berm (BMP AK-17)	B-49		X			T	
Silt Fence (BMP AK-18)	B-50		X			T	
Inlet Protection (BMP AK-19)	B-54		X			T	
Brush Barrier (BMP AK-20)	B-59		X			T	
Vehicle Tracking Entrance/Exit (BMP AK-21)	B-61		X			T	
Tire Wash (BMP AK-22)	B-63		X			T	
Vehicle and Equipment Maintenance (BMP AK-23)	B-64				X	T	
Concrete Washout (BMP AK-24)	B-65				X	T	

BMP AK-1
Preservation of Existing Vegetation

Purpose and Description

- The purpose of preserving existing vegetation is to limit site disturbance and to minimize soil erosion by identifying and protecting pre-existing vegetation on the construction site.[1]

Applicability

- Natural vegetation must be preserved in all areas where no construction is planned or will occur at a later date.
- Clear only land that is needed for building activities or vehicle traffic.[2]
- This BMP is not to supersede existing guidelines, restrictions or law, preserve vegetation as required by local governments (such as stream buffers).
- The preservation of existing vegetation is an applicable practice in all regions and climates in Alaska.

Design and Installation

- Before any clearing begins, vegetation selected for preservation must be clearly marked with established barriers.[3] These barriers must be about 1 meter in height, must be highly visible and be anchored by wood or metal fence posts at spacing and depth that will adequately support the fence for the entirety of the project.[1]
- A site map must be prepared clearly outlining all areas of vegetation that is to be preserved.[2]
- Vehicle traffic, equipment storage and parking shall be kept away from these areas to prevent soil and root compaction.[1]
- Ground disturbance must be kept from these areas at least as far out as the leaf drip line.[3]
- Maintain pre-existing irrigation systems that may supply water to vegetation selected for preservation.[1]
- To increase chances of survival it is best to limit grade changes in these areas and areas within the drip line.[3]

Maintenance and Inspection

- Repair or replace damaged vegetation immediately.[2]
- Inspect preservation areas regularly, if barrier has been removed or visibility reduced repair or replace barrier so that visibility is restored.[3]
- If roots are exposed or damaged, prune ends just above damage with pruning shears or loppers and recover with native soil.[3]

References

[1]Caltrans Storm Water Quality Handbooks, March 2003, Construction Site Best Management Practices Manual, SS-2 Preservation of Existing Vegetation, Uhttp://www.dot.ca.gov/hq/construc/stormwater/CSBMPM_303_Final.pdf

(Continued on next page)

[2]USEPA (United States Environmental Protection Agency), October 2000, National Menu of Best Management Practices, Preserving Natural Vegetation, http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=browse&Rbutton=detail&bmp=34&minmeasure=4

[3]Washington State Department of Ecology, February 2005, Storm Water Management Manual for Western Washington, Construction Storm Water Pollution Prevention, BMP C101: Preserving Natural Vegetation, http://www.ecy.wa.gov/pubs/0510030.pdf

BMP AK-2
Interception/Diversion Ditch

Objectives and Applications

An interception/diversion ditch, berm or excavated channel, or combination berm and channel constructed across a slope that functions to intercept runoff and divert it to a stabilized area where it can be safely discharged.

This measure should be used in construction areas where runoff can be diverted and disposed of properly to control erosion, sedimentation, or flood damage. Specific locations and conditions include above disturbed existing slopes, and above cut or fill slopes to prevent runoff over the slope; across unprotected slopes, as slope breaks, to reduce slope length; below slopes to divert excess runoff to stabilized outlets; where needed to divert sediment laden water to sediment traps; at or near the perimeter of the construction area to prevent sediment from leaving the site; above disturbed areas before stabilization to prevent erosion and maintain acceptable working conditions; around buildings or areas that are subject to damage from runoff, and during culvert installations where water must be temporarily diverted around the construction area. Diversions may be either temporary or permanent.

Common Failures - Generally due to faulty installation or maintenance.

- Berm not properly compacted during construction, resulting in uneven settling.
- Sediment accumulation against berm/channel not removed periodically, resulting in berm not functioning properly.

Other Considerations

- Berms to intercept and divert runoff should not be used where the drainage area exceeds 10 ac.
- Interception/diversion ditches should be carefully designed where longitudinal ditch slopes are steeper than 10 per cent.

Diversions are preferable to other types of man-made storm water conveyance systems because they more closely simulate natural flow patterns and characteristics, and flow velocities are generally kept to a minimum.

Relationship to Other ESC Measures

Diverted runoff should outlet to a stabilized area such as a sediment basin, detention or retention basin, or stabilized outlet, which should be established prior to introducing runoff from the diversion.

Alternate Sediment Control Measures

Slope Drain (can be used in association with this measure).

Other Names

Interceptor Ditch, Crown Ditch

Design

Location: *Should be determined by considering outlet conditions, topography, land use, soil type, and length of slope.*

Capacity: *permanent: 10 year peak runoff storm. temporary: 2 year peak runoff storm.*

Berm

Berm Top Width: *minimum 2 ft.*
Berm Base Width: *minimum 4.5 ft.*
Berm Height: *minimum 18 in.*
Berm Side Slopes: *2:1 or flatter*

Ditch

Channel Freeboard: *minimum 6 in.*
Channel Side Slopes: *2:1 or flatter*

Materials

Compacted soil or coarse aggregate, riprap, filter fabric, plastic lining, seed and mulch, sandbags

Installation

Interception Ditch
Remove and properly dispose of all trees, brush, stumps, or other objectionable material. Fill and compact all ditches, swales, or gullies that that will be crossed to natural ground level. Excavate, shape, and stabilize the diversion to line, grade, and cross section as required in the plans. Compact the berm to prevent unequal settlement and to provide stability against seepage. Stabilize the diversion with vegetation after installation.

Diversions for Culvert Installations

Excavate the diversion channel to the specified dimensions, leaving temporary plugs at both ends. Place channel lining and stabilize with riprap or sandbags. Remove plugs at both ends (down-stream first) and divert water into the diversion with sandbags. After installation of the culvert is complete, replug the diversion, salvage the diversion lining, and backfill in the channel.

Inspection

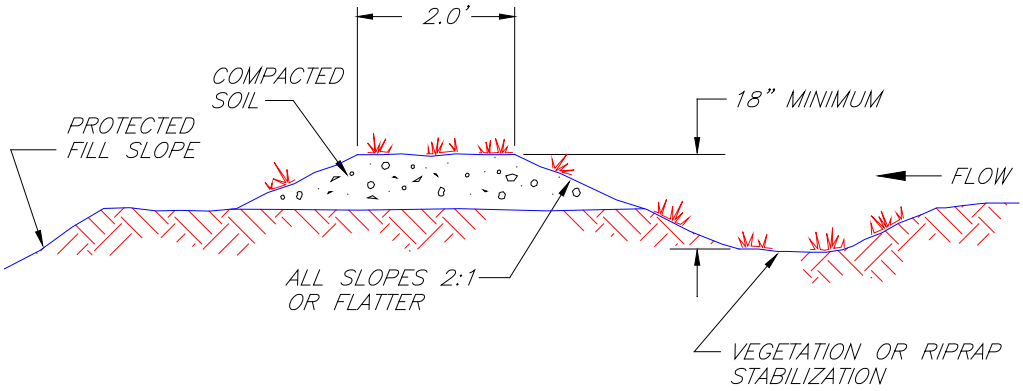
Inspect the diversion every week and after each rainfall during construction operations.

Maintenance

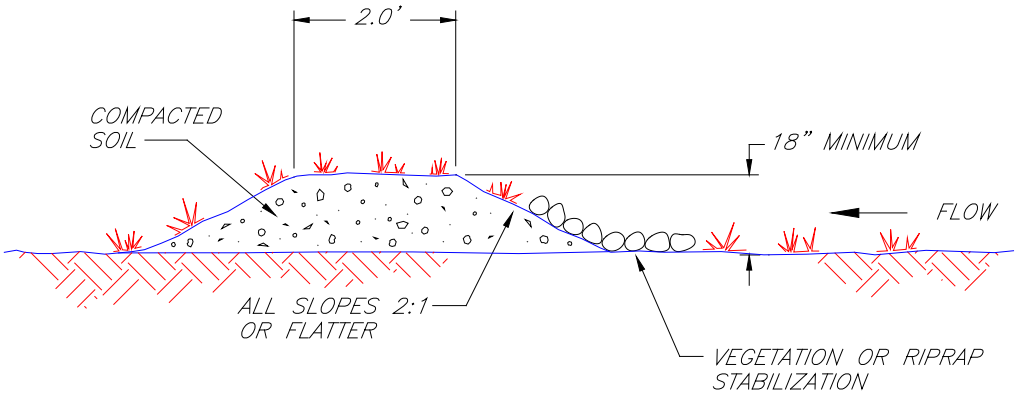
Remove any sediment or other obstructions from the diversion channel. Check outlets and make repairs as necessary. Reseed areas that fail to establish a vegetative cover.

Removal

Temporary installations – Restore to existing or constructed grade. Seed and mulch.



TYPICAL FILL DIVERSION



TYPICAL TEMPORARY DIVERSION DIKE

NOTES:
1. THE CHANNEL BEHIND THE DIKE SHALL HAVE POSITIVE GRADE TO A STABILIZED OUTLET.
2. THE DIKE SHALL BE ADEQUATELY COMPACTED TO PREVENT FAILURE.
3. THE DIKE SHALL BE STABLILIZED WITH TEMPORARY OR PERMANENT SEEDING OR RIPRAP.

FILE: TEMPDIKE

INTERCEPTION/DIVERSION DITCH

BMP AK-3
Slope Drain

Objectives and Applications

A slope drain is a flexible tubing or conduit extending temporarily from the top to the bottom of a cut or fill slope.

The purpose of a slope drain is to temporarily conduct concentrated storm water runoff safely down the face of a cut or fill slope without causing erosion on or below the slope. These are temporary measures that are used during grading operations, until the permanent drainage structures are installed, and until the slopes are permanently stabilized. The pipe material is typically corrugated plastic or flexible tubing, and is used in conjunction with temporary diversion dikes along the top edge of newly constructed slopes, that function to direct storm water runoff into the slope drain.

Common Failures - Generally due to faulty installation or maintenance.

- Slope drain sections not securely fastened together; fittings not water tight, resulting in leakage.
- Slope drain sections not securely anchored to the slope, resulting in displacement of the structure.
- Materials placed on, or construction traffic across slope drain, resulting in damage to the structure.

Other Considerations

- Provide both inlet and outlet protection to minimize erosion at these locations.
- Slope drains should be used in conjunction with diversion dikes to convey runoff from the drainage area.
- The entrance section must be securely entrenched, all connections must be watertight, and the conduit must be securely staked.

Relationship to Other ESC Measures

Slope drains are used with temporary diversion dikes to facilitate channeling of runoff into the structure. Inlet and outlet protection are required to minimize erosion and scour.

Alternate Sediment Control Measures

Diversion

Other Names

Downdrain; Drop Pipe

Design

Design life: *1 season (6 months) or less*

Contributing flow drainage area*: should not exceed 5 acres per slope drain. If contributing drainage area exceeds this amount, consider using a more permanent installation such as a rock-lined flume, etc.*

Capacity: *2 year peak runoff or the design discharge of the water conveyance structure, whichever is greater*

Slope drain size (minimum)	
Drainage area (Acres)	**Pipe diameter (Inches)**
0.5 ac.	12 in.
1.5 ac.	18 in.
3.5 ac.	24 in.
5.0 ac.	30 in.

Flexible conduit: *heavy duty flexible material, such as corrugated plastic pipe or plastic tubing*

Inlet section: *standard flared end section for metal pipe culverts, or geotextile, for inlet protection*

Diversion dike height: *minimum 12 in. higher than the top of the drain pipe*

Island over inlet height: *minimum 18 in. higher than the top of the drain pipe*

Outlet section: *riprap or geotextile, for outlet protection*

Materials

Flexible corrugated plastic pipe or specially designed plastic tubing; grommets or stakes (for fastening); riprap, geotextile

Installation

Place slope drains on undisturbed ground or well-compacted fill at locations specified on the plans. Place the entrance of the drain in a 6 in. sump at the top of the slope. Hand tamp the soil under and around the entrance in 6 in. lifts. Ensure that fill over the top of the drain has minimum dimensions of 18 in. height, 4 ft. top width, and 3:1 side slopes. Install inlet protection using end section for pipes or geotextile. Use watertight fittings at all slope drain connections. Securely fasten the exposed section of the pipe with grommets or stakes at 10 ft. spacings. Extend the drain beyond the toe of the slope and provide riprap or geotextile outlet protection. Construct the diversion dike 12 in. above the top of the pipe entrance. Compact and stabilize the dike.

Inspection

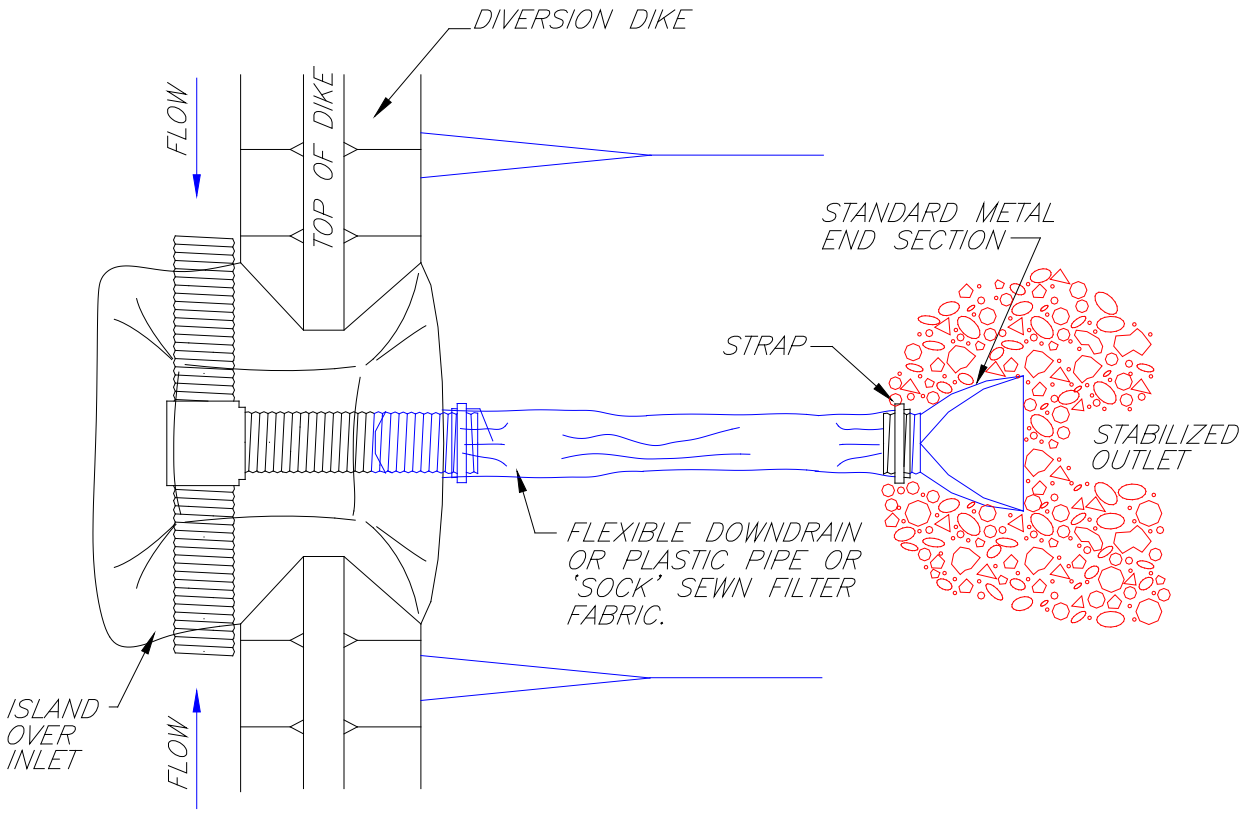
Inspect slope drains weekly and immediately after each rainfall that produces runoff for erosion around the inlet and outlet that could result in undercutting or bypassing. Inspect the pipe for breaks or clogs.

Maintenance

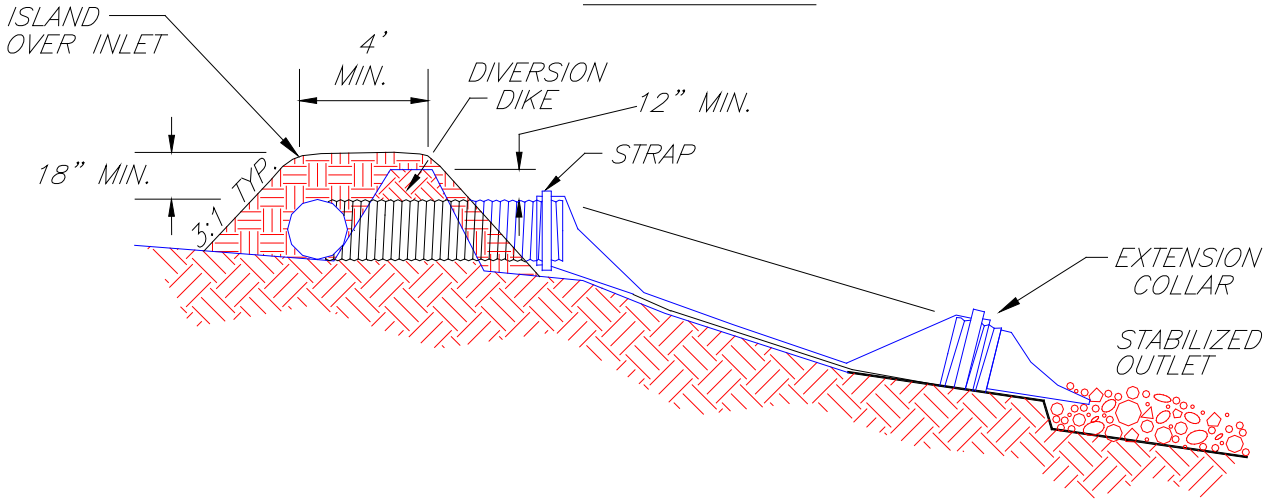
Immediately repair any erosion around the inlet or outlet; install a headwall, riprap, or sandbags if necessary. Promptly repair any breaks in the pipe and clear any clogs that reduce flow through the structure.

Removal

After the slope has been permanently stabilized and the permanent drainage system has been installed, remove the slope drains and stabilize the remaining disturbed areas.



PLAN VIEW



SECTION

SLOPE DRAIN

BMP AK-4

Rock Flume

Objectives and Applications

A rock flume is a riprap-lined channel to convey water down a relatively steep slope without causing erosion problems on or below the slope.

Flumes serve as stable, permanent elements of a storm water system receiving drainage from above a relatively steep slope, typically conveyed by diversions, channels, or natural drainageways. Drainage will flow down the rock culvert and into a stabilized outlet, sediment trap, or other conveyance measure.

Common Failures - Generally due to faulty installation or maintenance.

- Stone size too small or backslope too steep, resulting in stone displacement.
- Sediment accumulation in flume channel, resulting in reduced capacity.
- Channel width too narrow, resulting in over topping and erosion.

Other Considerations

- Provide both inlet and outlet protection to minimize erosion at these locations.
- Rock flumes should be used in conjunction with diversion dikes to convey runoff from the drainage area.
- When planning rock flumes, consider flow entrance conditions, soil stability, outlet energy dissipation, and downstream stability.

Relationship to Other ESC Measures

Rock flumes assist in the second, conveyance, stage of a BMP system. Rock flumes are used with diversion dikes to facilitate channeling of runoff into the structure

Alternate Sediment Control Measures

Storm water conveyance channel

Other Names

Rock chute, rock downdrain

Design

Contributing flow drainage area*: not to exceed 10 acres per rock flume.*

Capacity*: 10 year peak runoff or the design discharge of the water conveyance structure, whichever is greater.*

Flume Channel Lining	
Drainage Area (Acres)	Riprap Sizes (Class)
5.0 ac	Class I
10.0 ac	Class II

Slope: *not to exceed 1.5:1 (67 %)*

Depth: *minimum 1 ft.*

Alignment: *straight*

Inlet section: *riprap and geotextile, or flared metal end section for inlet protection*

Outlet section*: riprap and geotextile, for outlet protection*

Materials

Riprap, geotextile, flared metal end section

Installation

Remove all unsuitable material, such as trees, brush, roots, or other obstructions prior to installation. Shape the channel to proper grade and cross-section as shown in the plans, with no abrupt deviations from design grade or horizontal alignment. Compact all fills to prevent unequal settlement. Place geotextile prior to placement of riprap.

Inspection

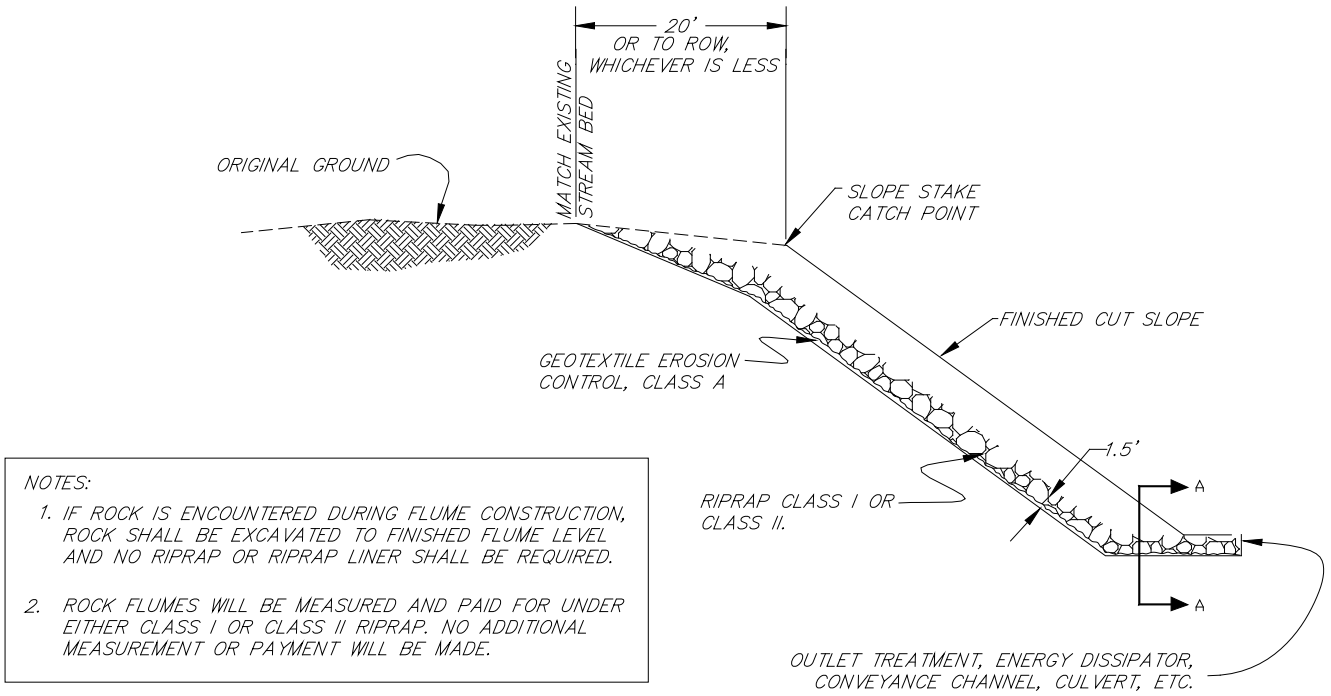
Inspect flume channels at regular intervals as well as after major rains for sediment accumulation, material displacement, bank failures, and scour at inlet and outlet sections.

Maintenance

Rock flume channels should be checked periodically to ensure that scouring is not occurring beneath the fabric underlying the riprap layer, or that the stones have not been displaced by the flow. Sediment should be removed from the riprap lined channel if it reduces the capacity of the channel.

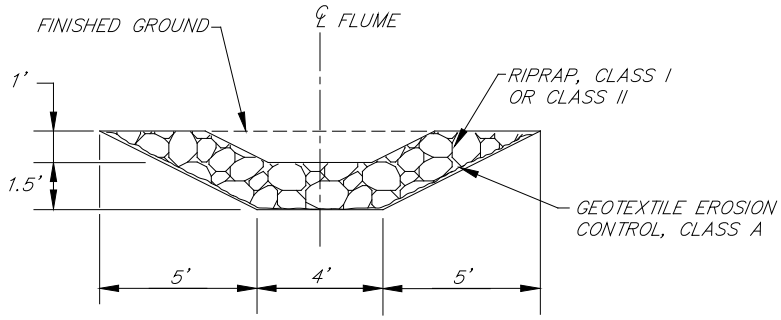
Removal

Rock flumes will normally be left in place after construction is completed.



NOTES:

1. IF ROCK IS ENCOUNTERED DURING FLUME CONSTRUCTION, ROCK SHALL BE EXCAVATED TO FINISHED FLUME LEVEL AND NO RIPRAP OR RIPRAP LINER SHALL BE REQUIRED.
2. ROCK FLUMES WILL BE MEASURED AND PAID FOR UNDER EITHER CLASS I OR CLASS II RIPRAP. NO ADDITIONAL MEASUREMENT OR PAYMENT WILL BE MADE.



SECTION A–A

ROCK FLUME DETAIL

Rock Flume

BMP AK-5
Outlet Protection

Objectives and Applications

An outlet protection is a structure designed to control erosion at the outlet of a pipe by reducing flow velocity and dissipating flow energy.

This measure should be used where the discharge velocity of a pipe exceeds the tolerances of the receiving channel or disposal area. To prevent scour and undermining, an outlet protection structure is needed to absorb the impact of the flow and reduce the velocity to non-erosive levels. A riprap lined apron is the most commonly used practice for this purpose because of its low cost and ease of installation. Designs will vary based on discharge specifics and receiving stream conditions. Outlet Protection may be temporary or permanent.

***Common Failure**s - Generally due to faulty design, installation or maintenance.*

- Inadequate apron length, resulting in scouring
- Riprap rock that is too small for runoff velocities

Other Considerations

- The riprap apron should be extended downstream until stable conditions are reached even though this may exceed the length calculated for design velocity control
- If the pipe discharges into a well defined channel, the side slopes of the channel shall not be steeper than 1:2 (horizontal:vertical)
- Riprap stilling basins or plunge pools should be considered in lieu of aprons where pipe outlets are perched or where high flows would require excessive apron length. Design guidelines for stilling basins can be found in Hydraulic Design of Energy Dissipators for Culverts and Channels, Hydraulic Engineering Circular No. 14, USDOT, FHWA (1983).

Relationship to Other ESC Measures

Outlet protection may be installed at the discharge points of grassed waterways or swales, storm water conveyance channels, sediment basins, and wet ponds.

Alternate Sediment Control Measures

Other structural energy dissipators, such as riprap stilling basins, baffle wall basins or T-fitting on the end of corrugated metal pipe.

Other Names

Stabilized Outlet.

Design

Capacity: *2 year peak runoff or the design discharge of the water conveyance structure, whichever is greater. Determine the maximum allowable velocity for the receiving stream, and design the riprap apron to reduce the flow to this velocity*

Apron Length: *The apron length shall be six times the diameter of the outlet pipe.*

Apron Width: *The apron width shall be four times the diameter of the outlet pipe.*

Materials: *The apron should be lined with riprap. The riprap should consist of a well-graded mixture of stone, with larger stones predominating. The diameter of the largest stone shall be no greater than the 1.5 times the median stone size. Geotextile filter cloth shall be placed between the riprap and the underlying soil.*

Grade: *The apron shall be less than or equa*l *to the receiving channel grade, preferably a flat (0%) slope. Steeper grades may require alternative measures such as riprap stilling basins, or other energy dissipators.*

Alignment: *The apron shall be straight throughout the entire length.*

Additional Design Guidelines: *Hydraulic Design of Energy Dissipators for Culverts and Channels, Hydraulic Engineering Circular No. 14, USDOT.*

Materials

Rock riprap; geotextile filter cloth.

Installation

Ensure that the subgrade for the filter and riprap follows the required lines and grades shown in the plan.

Compact any fill required in the subgrade to the density of the surrounding undisturbed material. The riprap must conform to the specified grading limits shown on the plan. Filter cloth must meet the design requirements and be properly protected from punching or tearing during installation.

Riprap may be placed by equipment, but take care not to damage the filter cloth. Ensure that the riprap consists of a well-graded mixture of stones. The diameter of the largest stone should be no greater than 1.5 times the median stone size. The minimum thickness of the riprap apron should be 1.5 times the maximum stone diameter. Riprap may be field stone or rough quarry stone, and should be hard, angular, weather resistant, and well graded. Make the top of the riprap at the downstream end level with the receiving area or slightly below it. Ensure that the apron is properly aligned with the receiving stream and preferably straight throughout its length. If a curve is needed to fit site conditions, place it in the upper section of the apron. Stabilize all disturbed areas with vegetation immediately after construction.

Inspection

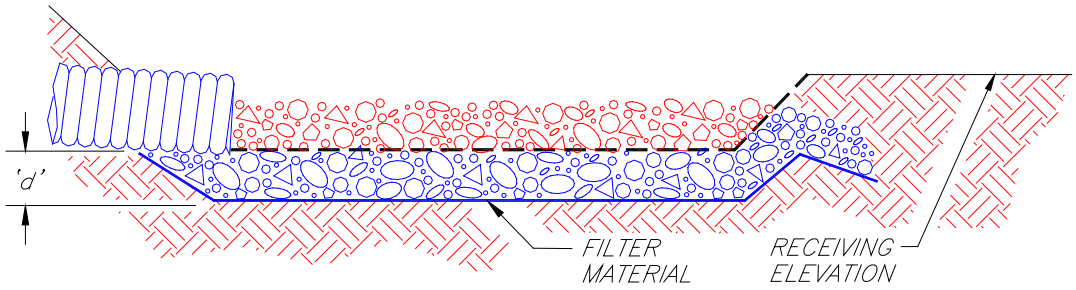
Inspect outlet protection weekly and after heavy rains to look for erosion around or below the riprap, dislodged stones, and scouring. Outlet protection should also be monitored for sediment accumulation filling the voids between rocks.

Maintenance

Make immediate repairs if any conditions noted under inspection are found. Sediment should be removed when it fills the voids between rocks.

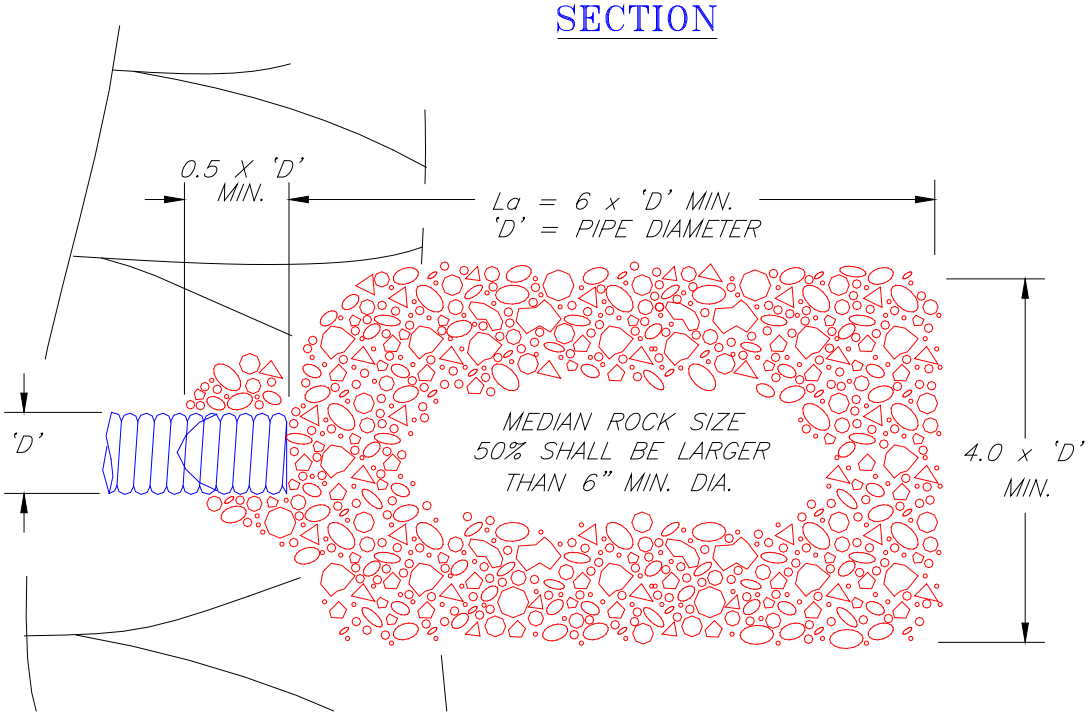
Removal

Restore ground to existing or constructed grade. Revegetated measures may be left in place only if specifications specifically allow it.



THICKNESS ('d') = 1.5 x MAX. ROCK DIAMETER – 6" MIN.

SECTION



PLAN

NOTES:

1. 'La' = LENGTH OF APRON. DISTANCE 'La' SHALL BE OF SUFFICIENT LENGTH TO DISSIPATE ENERGY.
2. FILTER MATERIAL SHALL BE FILTER FABRIC OR 6" THICK MINIMUM GRADED GRAVEL LAYER.

FILE: ENRGYDIS

OUTLET PROTECTION

BMP AK-6
Storm Water Conveyance Channel

Objectives and Applications

A storm water conveyance is a channel lined with vegetation, riprap, or other flexible material designed for the conveyance and safe disposal of concentrated surface runoff to a receiving system without damage from erosion.

The main design considerations are the volume and velocity of the water expected in the channel. All conveyance channels should be designed to carry at least the appropriate peak flow. Other factors to be considered include availability of land, aesthetics, safety, maintenance requirements, and soil characteristics. There are two types of cross sections for channel linings, trapezoidal and triangular ("V" shaped). All channels should discharge through a stabilized outlet that should be designed to handle the expected runoff velocities and volumes from the channel without resulting in scouring.

Channel linings function to protect drainage channels against erosion through the use of flexible linings (vegetation, riprap, gravel, or flexible, porous mats), and may be used as either a temporary or a permanent sediment control measure. The selection of a type of lining should be based upon the design flow velocities.

Common Failures *- Generally due to faulty maintenance.*

- Sediment accumulation – channel capacity is reduced, resulting in over topping and erosion
- Failure of lining

Other Considerations

- Channels should be located to conform with and use the natural drainage system.
- Grass lined channels should not be subject to sedimentation from disturbed areas.
- Grass-lined channels may be unsuitable if channel slopes over 5% predominate, continuous or prolonged flows occur, potential exists for damage from traffic (people or vehicles), or soils are erodible.
- Channel side slopes should be 2:1 or flatter in the case of rock-riprap lining. Vegetated channel side slopes should be 4:1 or flatter.
- When using riprap as a liner, a geotextile filter blanket or one or more layers of granular filter should be placed before placing the riprap. The thickness and gradation of the granular filter, or specifications for the geotextile, should be included in the plans.
- Vegetation in grass lined channels should be established before flows are introduced.

Relationship to Other ESC Measures

All channels should discharge through a stabilized outlet. The outlet should be designed so that it will handle the expected runoff velocities and volumes without scouring. An energy dissipator may be needed if flow velocities exceed the allowable velocity of the receiving channel.

Alternate Sediment Control Measures

Grass Lined Swale

Other Names

Channel Stabilization

Design

The following information is needed to design channel linings.

- *Expected runoff peak flow*
  Temporary: 2-year frequency storm
  Permanent: 10-year frequency storm
- *Desired channel capacity*
- *Slope of the channel*
- *The type of cross-sectional design of channel*
- *The type of lining*
- *Design depth or design cross sectional area*

Design Guidelines – *Design procedures should be consistent with steps outlined in chapter 8.6.3.1 of the Alaska Highway Drainage Manual. Basic steps will include:*

1. *Establish a roadside plan*
2. *Obtain or establish cross section data*
3. *Determine initial channel grades*
4. *Check flow capacities and adjust as necessary*
5. *Determine channel lining/protection needed (following procedures in FHWA Hydraulic Engineering Circular No. 15, "Design of Roadside Channels with Flexible Linings")*
6. *Analyze outlet points and downstream effects*

Materials

Filter blanket or geotextiles, flexible, porous mats (fiberglass, plastic, or jute), staples, riprap, gravel, seed, fertilizer, mulch.

Installation

Remove all unsuitable material, such as trees, brush, roots, or other obstructions prior to installation. Shape the channel to proper grade and cross-section as shown in the plans, with no abrupt deviations from design grade or horizontal alignment. Compact all fills to prevent unequal settlement. Remove any excess soil and dispose of properly.

Grass lined channels – Seed, fertilize and mulch.

Riprap lined channels – Place a geotextile filter blanket or a granular filter, prior to placement of riprap.

Mat lined Channels –Seed and fertilize. Apply the matting from the upper end of the channel and continue downgrade. Secure the top end of the matting by excavating a 6 in. trench, followed by back-filling and compacting. Overlap rolls of matting at least 6 in. And use a double row of staples. Staple securely on 6 in. centers, using minimum 6 in. long staples, then backfill and compact. Roll channel lining with a heavy roller after seeding, mat placement, and stapling are complete.

Inspection

Inspect channels weekly as well as after major rains for sediment accumulation, material displacement, bank failures, and scour at inlet and outlet sections.

Maintenance

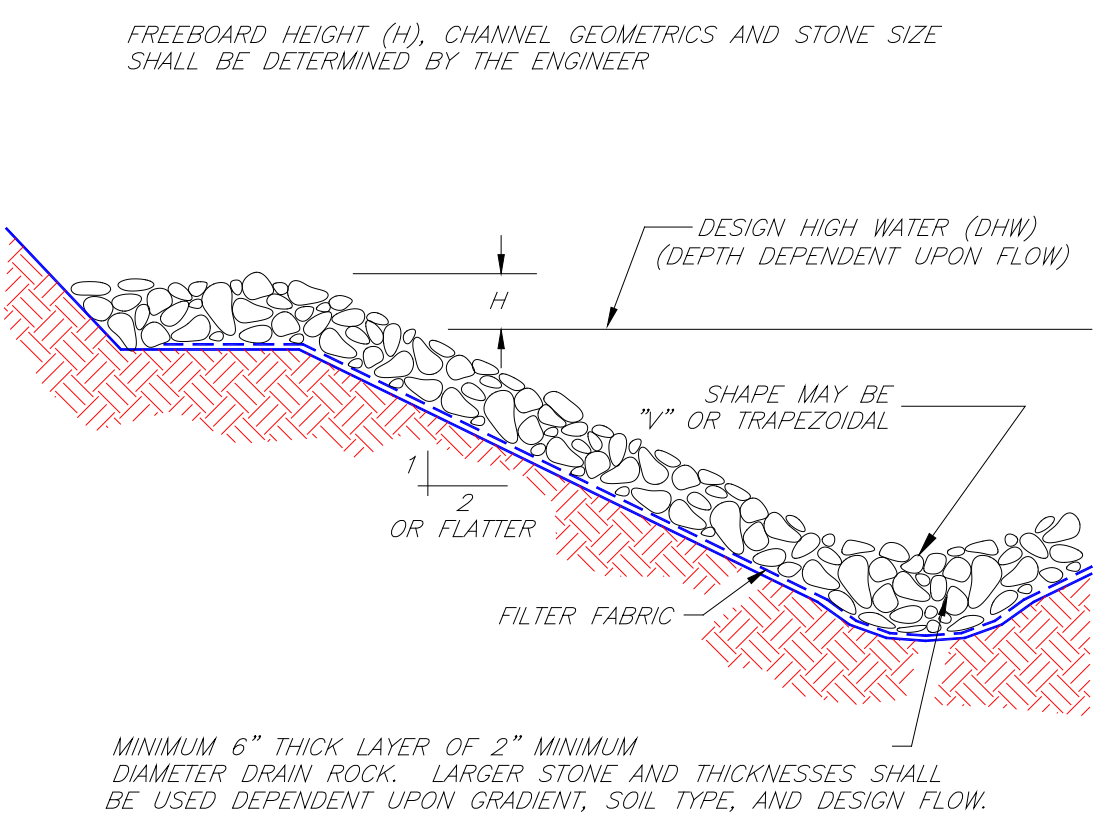
Grass Lined Channels – During the initial establishment, grass lined channels should be repaired immediately and grass re-established if necessary. After grass has become established, the channel should be checked periodically to determine if the grass is withstanding the flow velocities without damage. The channel should be repaired if scour is found to be present, and any debris or sediment accumulation should be removed.

Riprap Lined Channels – Riprap lined channels should be checked periodically to ensure that scouring is not occurring beneath the fabric underlying the riprap layer, or that the stones have not been displaced by the flow. Sediment should be removed from the riprap lined channel if it reduces the capacity of the channel.

Mat Lined Channels – Inspect channel linings following each major storm or snowmelt event and repair as necessary. If the desired grass has not become established through a mat, replace the matting, taking care not to disturb any areas of established grass.

Removal

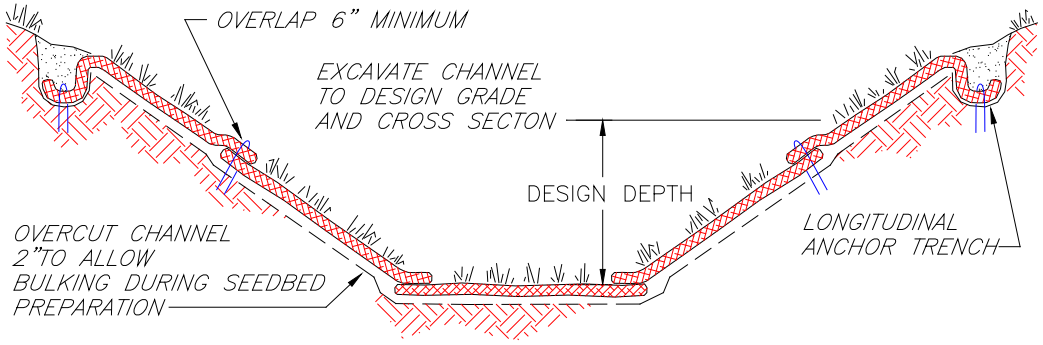
Temporary channels - Provide and compact fill to existing or constructed grade. Seed and mulch.



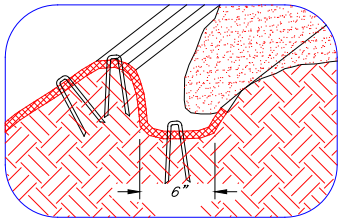
TYPICAL SECTION

FILE: RCKCHNEL

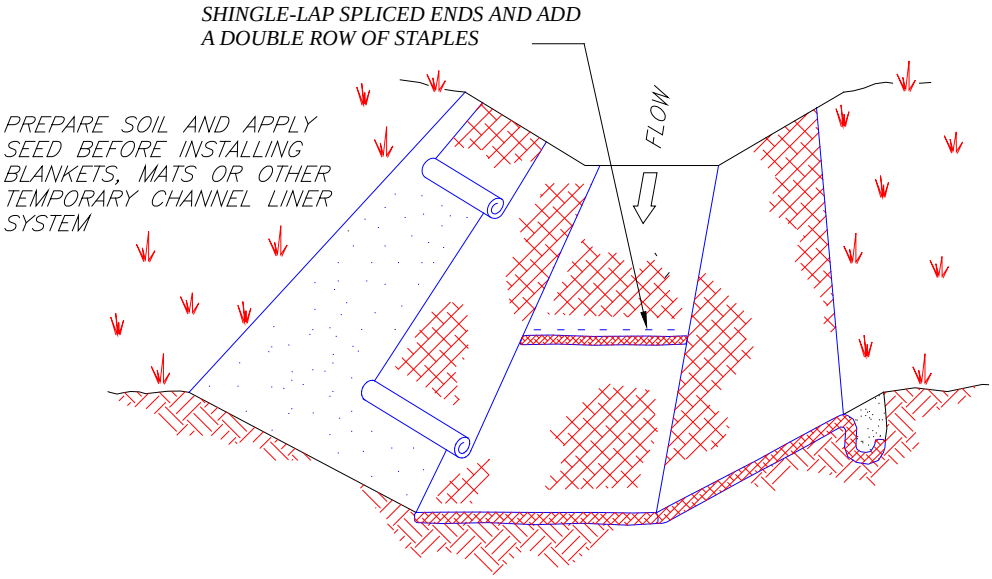
STORM WATER CONVEYANCE CHANNEL, RIPRAP



TYPICAL INSTALLATION
WITH EROSION CONTROL
BLANKETS OR TURF
REINFORCEMENT MATS



LONGITUDINAL ANCHOR TRENCH



NOT TO SCALE

NOTES:
1. DESIGN VELOCITIES EXCEEDING 2.0 FT/SEC REQUIRE TEMPORARY BLANKETS, MATS OR SIMILAR LINERS TO PROTECT SEED AND SOIL UNTIL VEGETATION BECOMES ESTABLISHED.
2. GRASS-LINED CHANNELS WITH DESIGN VELOCITIES EXCEEDING 6.0 FT/SEC SHOULD INCLUDE TURF REINFORCEMENT MATS.

FILE: GRSSINST

BMP AK-7
Check Dam

Objectives and Applications

A check dam is an expedient (or emergency) temporary measure to protect narrow erosion-susceptible waterways and/or reduce the sediment loads in channeled flows. Check dams may also be used as permanent measures. Rock or a triangular silt dike may be used.

Temporary check dams are placed in series in ditches, swales, gullies, or other minor drainageways intended to be filled or stabilized at a later time. They are used to slow stormwater velocities and direct scouring flows away from channel surfaces. The dam configuration supports sediment settling from silted waters pooled behind the weir. When rock is used, small sediment particles become lodged in the dam's interior.

Permanent check dams may be used as gradient control structures in ditches adjacent to elevated roadway sections.

Common Failures - Check dams are vulnerable to failure from concentrated flow.

- Undercut/washout of channel banks beside the structure due to improper installation (e.g. dam not built high enough onto the banks).
- Increased bank erosion (e.g. at channel bends) or inadequate protection of channel surfaces due to improper location or installation of check dams.
- Water backup and bank overflow due to overly tall dam structure.
- When rock is used, rocks washed downstream may clog culverts, misdirect flow, etc.
- Check dams installed in grass lined structures may kill the vegetative lining if siltation is excessive or the dam remains submerged for extended periods of time.

Other Considerations

- Check dams are used in narrow ditches and gullies.
- Check dam rocks interfere with the establishment of vegetation.
- Check dams left as permanent structures interfere with grass mowing (maintenance).
- Steep channel slopes reduce effectiveness.
- Coupling check dams with a small adjacent upstream sump improves velocity slowing and sediment trapping ability.
- The area downstream from the last dam should be stabilized or flow diverted.

Relationship to Other ESC Measures

As part of the perimeter control ESC network, check dams are used for channel protection prior to establishment of permanent or stabilized erosion controls. Although check dams do some sediment filtering, they are not intended to replace filters or sediment basins. A depression in the bottom of the channel at the upstream edge of a check dam augments velocity slowing and sediment removal. Digging a sump through stabilized in-channel protection (e.g. grassed lining) should be avoided, however. Check dams interfere with localized vegetative channel protection. Rocks prohibit establishment of in-situ vegetation and the protective lining is subject to disturbance/ destruction during check dam removal.

Alternate Sediment Control Measures

- Drainage diversion during channel stabilization.
- Protective channel linings (e.g. grassed waterway, concrete or rock-lined ditch, erosion control blankets or mattings), , sediment settling ponds, permanent ditch blocks, brush barriers or combinations or these measures.

Other Names

In Stream/Channel Energy Dissipator

Design

The design of rock check dams (high at channel banks, lower in the middle) directs overtopping flows centrally to avert scouring of channel surfaces. The dam is keyed into channel slopes to prevent bank undercut and erosion.

Spacing between dams is based on waterway grade, height of adjacent check dams and desired length of backwater effect. The distance shown in the table below has been calculated for the protection of channel banks between successive structures. Placement of check dams at abrupt bends should be avoided since erosive waters could be misdirected by the check dam into channel banks.

Check dam structures are sized to stay in place during peak flow and should pass 2-year storm runoff without overtopping the roadway or ditch side-slopes. Generally, dams are not constructed higher than recommended as follows since excessive weir depth seriously impacts the flow characteristics of the ditch.

The following dimensions may be modified for site-specific applications:

Standard Check Dam

Maximum drainage area: *not to exceed 10 acres*

Normal flow velocity*: no greater than* 6 ft/sec.

Maximum height at dam center*: not greater than 2 ft. or one half the channel depth*

Minimum height difference between center and (bank) sides*: 6 in.*

Structure slope*: 1:2*

Maximum spacing between standard (2 ft. high) check dams: *align top of check dam level with toe elevation of the upstream dam*

Channel Slope (%)				
2	*3*	*4*	*5*	*6*
Spacing (ft.)				
100	*67*	*50*	*40*	*33*

.

Materials

Rock. Clean hard angular (e.g. crushed, shot) rock graded according to expected flows. Two- to three-inch stone is usually adequate.
Alternate materials: logs, brush and twigs, sandbags partially filled with pea gravel. Use only clean materials. Avoid introduction of fines.

Tirangular Silt Dike. These are foam encased in geotextile, with extra fabric to make an apron. They are usually 10 to 14" high at the center and 20 to 28" at the base.

Installation

Install dams as soon as drainage routes are established. Place rock by hand or mechanical means, distributing smaller rocks to the upstream side to prevent transport. Attach the leading edge of the triangular silt dike with rocks, sandbags or staples and a key slot. Check structures key into a trench that spans the complete width of the channel. Extend dams high onto the channel banks (above anticipated high water level) to prevent localized undermining and erosion. In unlined channels, a small sump dug at the upstream side of the dam facilitates sediment collection and removal.

Inspection

Observe dam function during/after each rainfall event that produces runoff and note conditions of channel surfaces. Visually compare upstream and downstream flows to determine relative turbidity levels and effectiveness of velocity checks. Inspect channel banks for evidence of undermining and erosion. Look for dam deterioration and for migration of structural components downstream. Observe level of sediment buildup behind dam. It should not exceed ½ dam height. Observe ESC effectiveness during flows to determine if adjunct measures are needed. The dam should be stable and appropriately sized to withstand high velocity events.

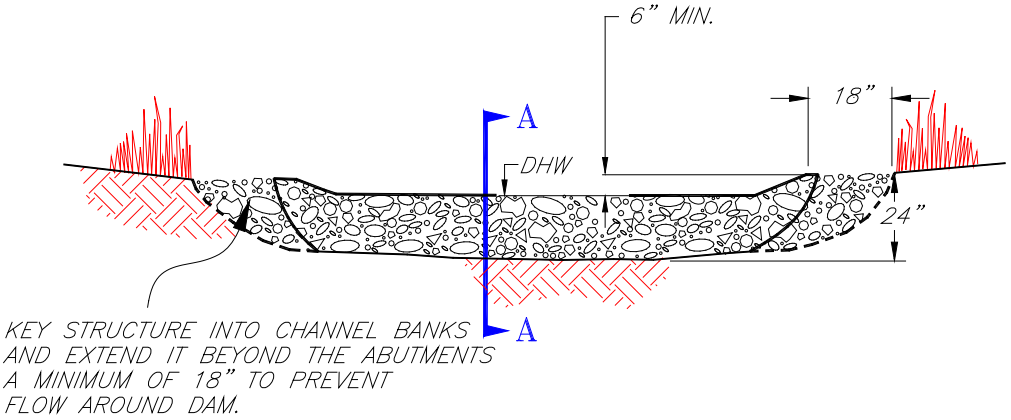
Maintenance

Rock. Repair check dam voids and bank undercuts. Fortify disintegrating dams and install additional dams or other ESC measures as needed. Correct undesirable effects of rock migration (e.g. clogged culvert, flow construction). Periodically remove sediment deposits.

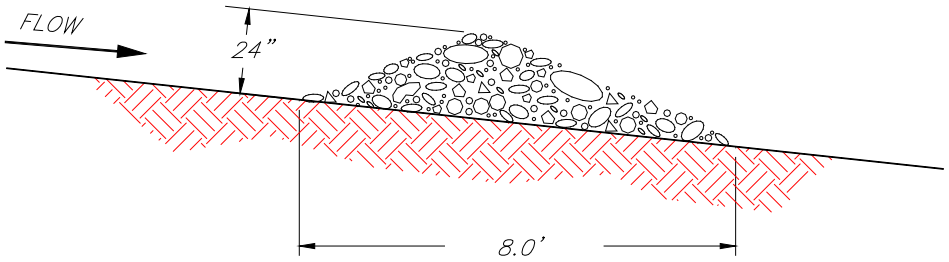
Triangular Silt Dike. Remove accumulated sediment when it reaches half the height of the dam. Repair right away if there is any undercutting or flow around the edges.

Removal

Care should be taken since the waterway surfaces are susceptible to damage during check dam removal. Damaged or unprotected areas should be seeded immediately or other forms of protection provided as warranted. Some check dams are left as a permanent control measure. Removal may be indicated because of unsightliness or interference with maintenance activities.

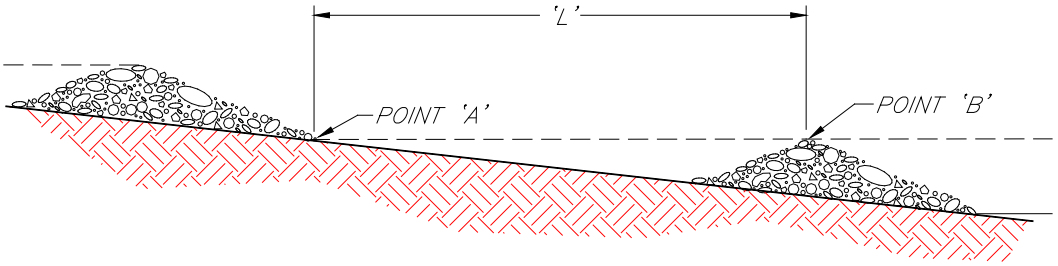


VIEW LOOKING UPSTREAM



SECTION A – A

'L' = THE DISTANCE SUCH THAT POINTS 'A' AND 'B' ARE OF EQUAL ELEVATION.



SPACING BETWEEN CHECK DAMS

NOT TO SCALE

FILE: RCKCHKDM

ROCK CHECK DAM

BMP AK-8

Fiber Roll

Objectives and Applications

Fiber rolls are long rolls of material such as straw, flax, rice, coconut or compost wrapped in plastic or biodegradable netting. They are placed and staked along the contour of disturbed slopes.

The purpose of a fiber roll is to shorten the slope and help to slow, filter and spread overland flows. They capture organic matter and seeds that might otherwise be washed downslope.

Fiber rolls can be applied to steep or long slopes and slopes that are susceptible to freeze/thaw activity, sheet and rill erosion or dry ravel. They can be placed along the toe, top, face and at grade-breaks on disturbed slopes. They can be placed at the perimeter of a project and around temporary stockpiles. They can be used as check dams in unlined ditches

Common Failures - Generally due to faulty installation or maintenance.

- Without being placed in a trench, runoff can flow underneath the roll and cause failure.
- Water can flow between rolls is they are not abutted tightly together.
- Rolls must be placed perpendicular to flow (parallel to the slope contour).
- Rolls will not work if the slope is slumping, creeping or sliding.

Other Considerations

- Use in areas of low shear stress.
- Avoid use on slopes that could build up ice.
- They are effective for one to two seasons.
- Fiber rolls can be stakes to the ground using willow cuttings to increase the revegetation. Since the fiber roll will retain moisture, it will provide a good site for the willow.
- Rolls will be difficult to move once they are saturated.
- The quantity of sediment that a roll can capture is limited. They are typically about 8 inches in diameter.

Relationship to Other ESC Measures

Fiber rolls are best used in combination with seeding, mulch and/or erosion control blankets. They can be used to stabilize slopes until the permanent vegetation becomes established.

Alternate Sediment Control Measures

Silt fence -- the advantage of fiber rolls over silt fence is that installation is much easier, they do not have to be removed and hydroseeding can be done after their installation.

Other Names

Straw Wattle, Straw Roll

Design

Design life: *1 or 2 seasons*

Contributing flow drainage area*:*

Diameter: 8 to 10 inches up to 20 inches

Length: 20 to 30 feet

Materials

Fiber rolls: The netting may be UV-degradable polypropylene, biodegradable burlap, jute or coir. The filling may be straw, flax, rice, coconut-fiber or compost.

Stakes: 1”x1” wooden stakes 24” long (18” if soils are rocky) or 3/8” rebar or ¾” to 1 ½” diameter live willow cuttings

Installation

Dig trenches across the slope (on the contour) to a depth of 3 to 5 inches. If the slope is steep or there is high rainfall, make trenches 5 to 7 inches deep. Add a slight downward angle to the trench at the ends to avoid ponding in the middle of the slope.

Start installation downslope. Determine the spacing of the rolls based on the slope gradient and soil type. Typically, place rolls 10 feet apart on 1:1 slopes, 20 feet apart on 2:1 slopes, 30 feet apart on 3:1 slopes. Space rolls closer in softer soils, farther in rocky soils.

Place the rolls in the trenches. Where two rolls meet, place the ends abutted tightly, not overlapped. At the end of the roll, turn the end upslope to prevent runoff from going around the roll end.

Stake the roll every four feet. Leave 3 inches of the stake above the roll. It may be easier to make a pilot hole through the roll and into the soil first. Fiber rolls around storm drains and inlets must be staked into the ground

Inspection

Ensure that the roll ends remain abutted tightly. Ensure that the rolls are in contact with the soil and thoroughly entrenched. Rolls need to be inspected after a significant rainfall. Look for scouring underneath the rolls.

Maintenance

Equipment cannot drive over the installed fiber rolls. If inspections reveal crushed, torn, slumping or split rolls, the damaged sections must be replaced.

Remove sediment accumulated upslope of the roll when it reaches one-half the distance between the top of the fiber roll and the ground surface.

Removal

Usually fiber rolls are left in place. If they are removed, the accumulated sediment must first be collected and disposed. After removal, the trenches and stake holes should be filled to blend with the slope and revegetated

BMP AK-9
Mulching

Objectives and Applications

Mulching is the application of a uniform protective layer of straw, wood fiber, wood chips, or other acceptable material on or incorporated into the soil surface of a seeded area to allow for the immediate protection of the seed bed.

The purpose of mulching is to protect the soil surface from the forces of raindrop impact and overland flow, foster the growth of vegetation, increase infiltration, reduce evaporation, insulate the soil, and suppress weed growth. Mulching also helps hold fertilizer, seed, and topsoil in place in the presence of wind, rain, and runoff, and reduces the need for watering. Mulching may be utilized in areas that have been seeded either for temporary or permanent cover.

Mulches include straw, hay, wood fiber, paper fiber, wood/ paper fiber blends, peat moss, wood chips, bark chips, shredded bark, manure, compost and corn stalks. This type of mulch is usually spread by hand or by machine (mulch blower) after seed, water, and fertilizer have been applied. Soil binders or tackifiers, composed of a variety of synthetic and organic materials, including emulsions or dispersions of vinyl compounds, rubber, asphalt, or plastics mixed with water are often added to commercial mulch products. Tackifiers aid in the stabilization process, and are not used as a mulch alone, except in cases where temporary dust and erosion control is required. Hydroseeding, sometimes referred to as hydromulching, consists of mixing a tackifier, specified organic mulch, seed, water, and fertilizer together in a hydroslurry and spraying a layer of the mixture onto a surface or slope with hydraulic application equipment. The choice of materials for mulching should be based on soil conditions, season, type of vegetation, and the size of the area.

Common Failures - Generally due to faulty installation or maintenance.

- Mulches are not properly watered after application, resulting in drying out and possible blowing or washing away of materials.
- Depth of mulching material is either insufficient or excessive, resulting in low seed germination rates.
- Hydroseeding slurry not applied uniformly, resulting in spotty germination and inadequate ground cover.

Other Considerations

- Mulch should be applied immediately after seeding to improve seed germination.
- Hydroseeding can be performed in one step, and is effective provided that materials are properly mixed and equipment is in good working order.
- Depth of the applied mulch should be not less than 1 in. and not more than 2 in.
- Chemical soil stabilizers or soil binders, when used alone, are less effective than other types of mulches. These products are primarily useful for tacking organic mulches.
- A tackifier should be used in conjunction with seeding, fertilizing, and mulching or hydro-seeding on any slopes steeper than 3:1.
- Check labels on chemical mulches and binders for environmental concerns. Take precautions to avoid damage to fish, wildlife, and water resources.
- Some materials such as wood chips may absorb nutrients necessary for plant growth.

Relationship to Other ESC Measures

Mulching may be performed in conjunction with seeding, fertilizing, surface roughening, and grading practices. Concentrated flows of runoff should be directed away from mulched areas.

Alternate Sediment Control Measures

Erosion Control Blankets; Sodding

Other Names

Hydromulching; Chemical Stabilization

Design

Design life: *1 season (6 months) or less*

Site applicability: *Areas which have been disturbed and require temporary or permanent cover*

Materials and application rates: *as per Section 619 and Section 727 of Alaska Standard Specifications for Highway Construction, and Special Provisions for project*

Materials

Most Commonly Specified Mulches – Wood Fiber, Paper Fiber, Wood/Paper Fiber Combination Blends, Peat Moss

Other Mulches – Straw, Hay, Wood Chips, Bark Chips, Shredded Bark, Corn Stalks, Compost, Manure

Tackifiers – Vinyl Compounds, Rubber, Asphalt, or Plastics mixed with water

Installation

Complete the required grading as shown on the plans and ensure that erosion control measures intended to minimize runoff over the area to be mulched are in place. Apply mulch at the rates specified in the special provisions either by hand or by machinery immediately after the seed and fertilizer have been applied (two step method), or as part of the hydroslurry incorporating seed, fertilizer, mulch, and water (one step method). Apply specified tackifier if not already incorporated into the mulch matrix or hydroslurry. Provide additional watering as specified to ensure optimal seed germination conditions.

Inspection

Inspect all mulches weekly, and after each rainstorm to check for rill erosion, dislocation, or failure.

Maintenance

Replace mulch that has been loosened or dislodged. In addition, reseed areas if necessary. Water mulched areas periodically to ensure that moisture content will be maintained and seed germination and grass growth will continue.

Removal

Mulching is usually left in place to naturally decompose and become part of the soil structure.

BMP AK-10
Temporary Seeding

Objectives and Applications

To establish a temporary vegetative cover on disturbed areas by seeding with appropriate and rapid growing annual grasses, usually annual ryegrass.

The purpose of temporary seeding is to eventually stabilize the soil once the vegetation is established and reduce damage from wind and/or water until permanent stabilization is accomplished. By itself, temporary seeding is not soil stabilization, because the seeds aren't effective until they sprout and grow. Seeding is applicable to areas that are exposed and subject to erosion and not being actively worked. It is usually accompanied by surface preparation, fertilizer, and mulch. Temporary seeding may be accomplished by hand or mechanical methods, or by hydraulic application (hydroseeding), which incorporates seed, water, fertilizer, and mulch into a homogeneous mixture (slurry) that is sprayed onto the soil.

Common Failures - Generally due to faulty installation or maintenance.

- Seed is not properly watered after application, resulting in drying out and low germination rates.
- Depth of mulching material is either insufficient or excessive, resulting in low seed germination rates.
  Hydroseeding slurry is not applied uniformly, resulting in spotty germination and inadequate ground cover.

Other Considerations

- Proper seedbed preparation and the use of high quality seed are essential to the success of this practice.
- Temporary seeding should take place as soon as practicable after the last ground-disturbing activities in an area.
- Once seeded, protect the area from foot and equipment traffic.
- Temporary seeding is not recommended if permanent seeding will be completed in the same growing season. Other temporary stabilization measures should be considered.

Relationship to Other ESC Measures

Seeding should be performed in conjunction with mulching, fertilizing, surface roughening, and grading practices. Concentrated flows of runoff should be directed away from seeded areas using diversions.

Alternate Sediment Control Measures

Erosion Control Matting, Plastic Sheeting

Other Names

Temporary Stabilization

Design

Seed Selection: *Annual Ryegrass (Lolium multiflorum)*

Seed Application Rate: *60 lbs/acre (average rate, site specific conditions may require more or less)*

Fertilizer Application Rate: *600 lbs/acre 20-20-10 (nitrogen-phosphorous-potassium [average rate, site specific conditions may require more or less])*

Materials

Seed, water, fertilizer, mulch

Installation

Grade as needed where it's feasible to permit the use of equipment for seedbed preparation. Prepare the seedbed by using surface roughening if soil has been compacted by machinery or heavy foot traffic. If using hand or mechanical methods, apply fertilizer in order to optimize growing conditions, followed by seed, mulch, and water. If using hydroseeding, mix seed, mulch, fertilizer, and water as per the manufacturer's recommendations. Apply slurry as per the manufacturer's recommendations.

Inspection

Inspect newly seeded areas on a regular basis and after each storm event to check for areas where protective measures (mulch) have failed or where plant growth is not proceeding at the desired rate.

Maintenance

Water seeded areas daily until initial ground cover is established if rainfall does not provide moisture for seed germination. Reseed areas where growth is absent or inadequate. Provide additional fertilizer if needed.

Removal

Removal of temporary vegetation is usually not necessary. Continue inspections and remedial action until the site is stabilized by permanent vegetation.

BMP AK-11
Seeding Around Culverts

Objectives and Applications

To establish a temporary vegetative cover on disturbed areas around culverts by seeding with appropriate and rapid growing annual grasses, usually annual ryegrass.

The purpose of seeding around culverts is to minimize the erosion potential in an area of concentrated flows of storm water.

Common Failures - Generally due to faulty installation or maintenance.

- Seed is not properly watered after application, resulting in drying out and low germination rates.
- Depth of mulching material is either insufficient or excessive, resulting in low seed germination rates.
- Hydroseeding slurry is not applied uniformly, resulting in spotty germination and inadequate ground cover.

Other Considerations

- Proper seedbed preparation and the use of high quality seed are essential to the success of this practice
- Temporary seeding should take place within 24 hours after culvert installation, or maintenance, is complete.
- Seed 25 feet from the end of the pipe, or the disturbed area, whichever is larger.
- Once seeded, protect the area from foot and equipment traffic.
- Protect temporary seeding, if seed has not fully developed into 70% of background vegetation, prior to anticipated storm events in order to minimize erosion potential with a concentrated flow of storm water.

Relationship to Other ESC Measures

Seeding should be performed in conjunction with mulching, fertilizing, surface roughening, and grading practices.

Alternate Sediment Control Measures

- Rolled Erosion Control Products
- Rock Drains
- Geotextile Armoring

Other Names

Temporary Seeding

Design

Seed Selection: Annual Ryegrass (Lolium multiflorum)

Seed Application Rate: 1/2 lb/1000 sq.ft. (average rate, site specific conditions may require more or less, steep slopes require more but do not exceed 1 ½ lb/1000 sq.ft.)

Fertilizer Application Rate: 10 lb/1000 sq.ft. 20-20-10 (nitrogen-phosphorous-potassium [average rate, site specific conditions may require more or less])

Materials

Seed, Water, Fertilizer, Mulch

Installation

Prepare the seedbed by using surface roughening. If using hand or mechanical methods, apply fertilizer in order to optimize growing conditions, followed by seed, mulch, and water. If using hydroseeding, mix seed, mulch, fertilizer, and water as per the manufacturer's recommendations. Apply slurry as per the manufacturer's recommendations.

Inspection

Inspect newly seeded areas on a regular basis and after each storm event to check for areas where protective measures (mulch) have failed or where plant growth is not proceeding at the desired rate.

Maintenance

Water seeded areas daily until initial ground cover is established if rainfall does not provide moisture for seed germination. Reseed areas where growth is absent or inadequate. Provide additional fertilizer if needed.

Removal

Removal of temporary vegetation is usually not necessary. Continue inspections and remedial action until the site is stabilized by permanent vegetation

BMP AK-12
Surface Roughening and Terracing

Objectives and Applications

Surface roughening and terracing includes establishing a rough soil surface by creating horizontal grooves, furrows, depressions, steps, or terraces running parallel to the slope contour over the entire face of the slope.

These measures are intended to aid in the establishment of vegetative cover from seed, to reduce runoff velocity and increase infiltration, and to reduce erosion and provide for sediment trapping. By themselves, surface roughening measures are not soil stabilization. They provide simple, inexpensive and immediate short-term erosion control for bare soil where vegetative cover is not yet established. A rough, loose soil surface gives a mulching effect that provides more favorable moisture conditions than hard, smooth surfaces and that aids in seed germination. The measure chosen to achieve these goals depends on the grade of the slope, the type of slope (cut or fill), soil and rock characteristics, future mowing and maintenance requirements, and type of equipment available. The most common measures utilized include:

Tracking – This is done by running machinery (such as bulldozers) up and down slopes to leave horizontal depressions in the soil, and is generally limited to sandy soils in order to avoid undue compaction of the soil surface.

Groove Cutting – This is done by cutting serrations along the contour with a blade attached to a dozer or other equipment.

Contour Furrows – This is done by cutting furrows (a series of ridges and depressions) along the contour of a slope, and is applicable to any area that will safely accommodate disks, tillers, spring harrow, or the teeth of a front end loader.

Stair Step Grading – This is done by cutting "steps" along the contour of a slope, and is applicable to slopes with a gradient greater than 3:1 which have material soft enough to be bulldozed and which will not be mowed.

Gradient Terracing – This is done by constructing earth embankments or ridges and channels along the face of a slope at regular intervals to intercept surface runoff and conduct it to a stable outlet. This measure is applicable to long, steep slopes where water erosion is a problem, and should not be constructed in areas with sandy or rocky soils.

Common Failures - Generally due to faulty installation or maintenance.

- Roughening washed away by heavy rain, necessitating reroughening and reseeding.
- Failure of upslope control measures (diversions), resulting in excessive flows over area and erosion of soil.

Other Considerations

- These measures are of limited effectiveness in anything more than a moderate storm.
- These measures may not be suitable for noncohesive or highly erodible soils.
- All fills should be compacted to reduce erosion, slippage, settlement, subsidence, and other related problems.
- The finished cut and fill slopes to be vegetated should not exceed 2:1.
- Use slope breaks, such as diversions, benches, or contour furrows to reduce the length of cut and fill slopes to limit sheet and rill erosion.

Relationship to Other ESC Measures

Diversions at the upper perimeter of the area function to prevent runoff from causing erosion on the exposed soil. Silt fences and sediment basins at the lower perimeter of the area function to prevent off site sedimentation.

Alternate Sediment Control Measures

Erosion Control Blankets

Other Names

Contour Grading, Serration

Design

Measure Applicability: *Construction slopes greater than 5 vertical feet.*

Measure Selection: *Should be determined by slope grade, soil type, mowing requirements, and slope type (cut or fill).*

Materials

Construction equipment (bulldozer, front end loader, crawler tractor).

Installation

Cut Slope Roughening (Areas Not To Be Mowed)
Stair step grade or groove cut slopes that are steeper than 3:1. Use stair step grading on any erodible material soft enough to be ripped with a bulldozer. Slopes consisting of soft rock with some subsoil are particularly suited to stair step grading. Make the vertical cut distance less than the horizontal distance, and slightly slope the horizontal position of the "step" in toward the vertical wall. Do not make individual vertical cuts more than 2 ft. high in soft materials or more than 3 ft. high in rocky materials. Groove the slope using machinery to create a series of ridges and depressions that run across the slope, on the contour.

Fill Slope Roughening (Areas Not To Be Mowed)
For slopes greater than 3:1, ensure that the face of the slope consists of loose, uncompacted fill 4 in. – 8 in. deep. Use contour furrows or tracking to roughen the face of the slope, if necessary. Do not blade or scrape the final slope face.

Cuts, Fills, And Graded Areas (To Be Mowed)
Make mowed slopes no steeper than 3:1. Roughen these areas with shallow grooves by using tilling, disking, or harrowing implements. Make grooves close together, less than 12 in., and not less than 1 in. deep. Avoid excessive roughness on areas to be mowed.

Roughening With Tracked Machinery
Limit roughening with tracked machinery to sandy soils in order to avoid undue compaction of the soil surface. Operate machinery up and down the slope to leave horizontal depressions in the soil. Do not back blade during the final grading operation.

Inspection

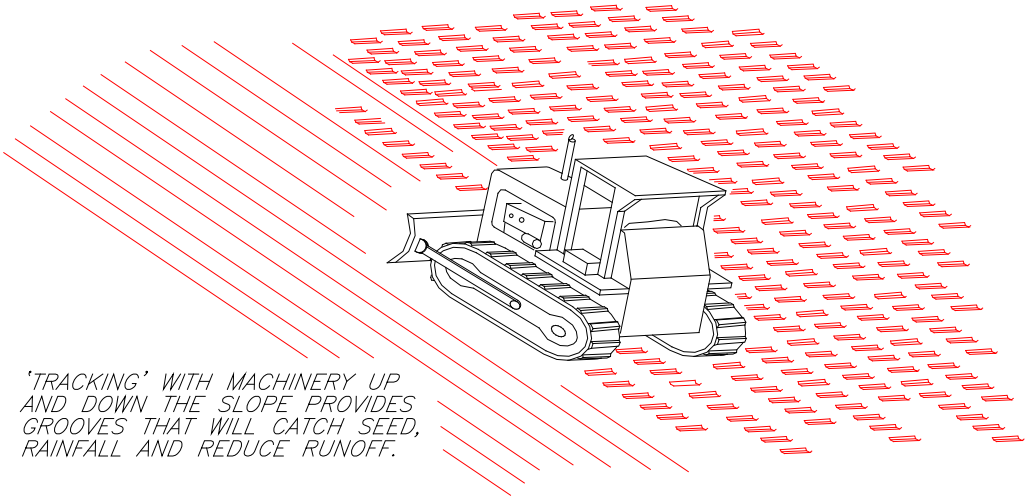
Inspect the areas every week and after each rainfall that produces runoff during construction operations.

Maintenance

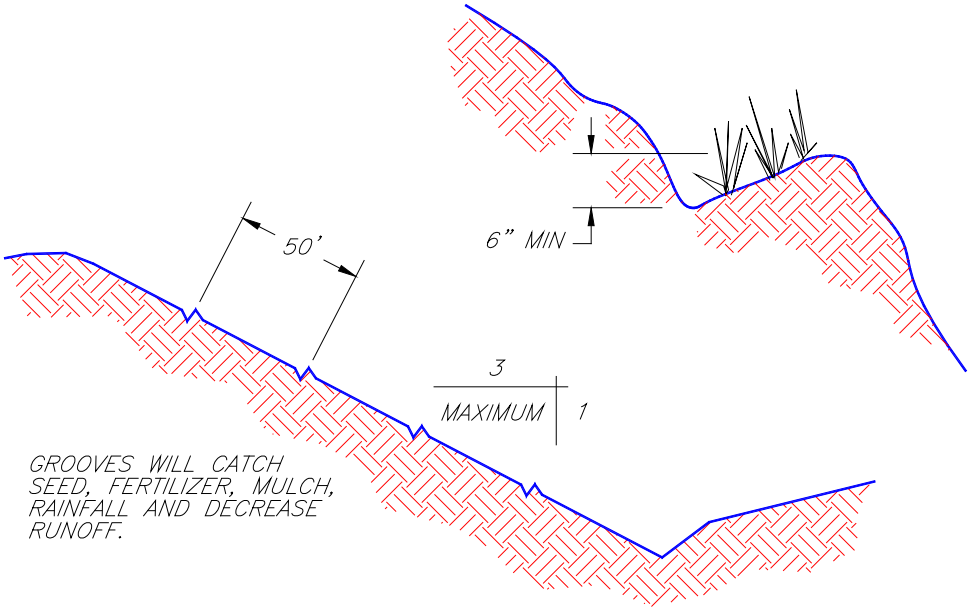
Seed, fertilize, and mulch areas which are graded as quickly as possible. Regrade and reseed immediately if rills appear.

Removal

Surface roughening and gradient terracing will remain an integral part of the slope after final stabilization with vegetation.



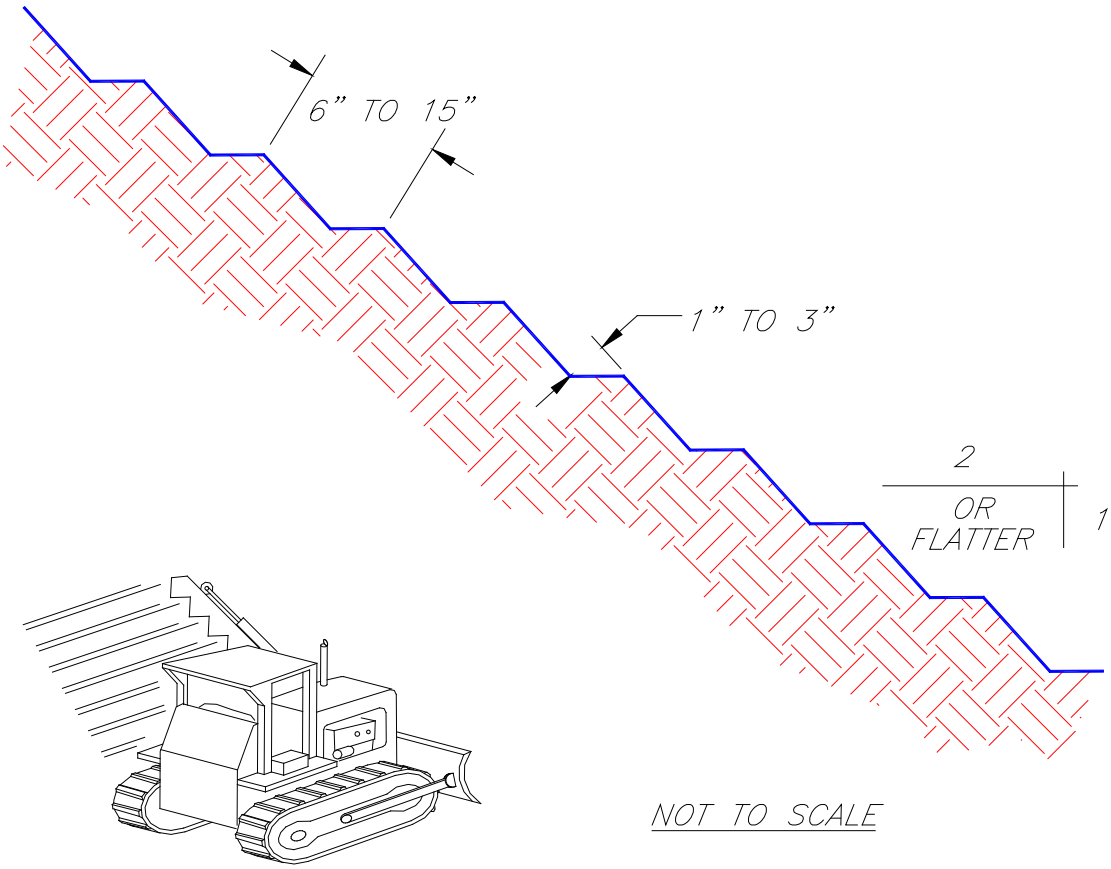
TRACKING



CONTOUR FURROWS

FILE: SRFROUGH

SURFACE ROUGHENING AND TERRACING

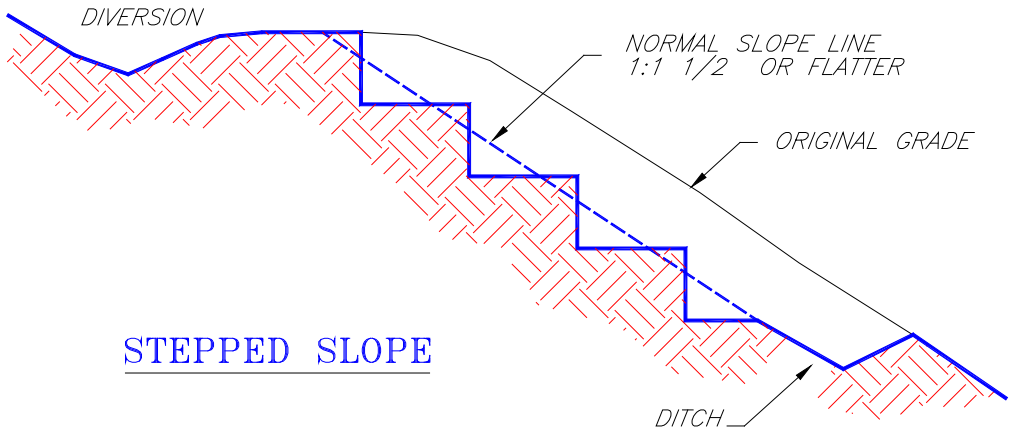


NOTE:

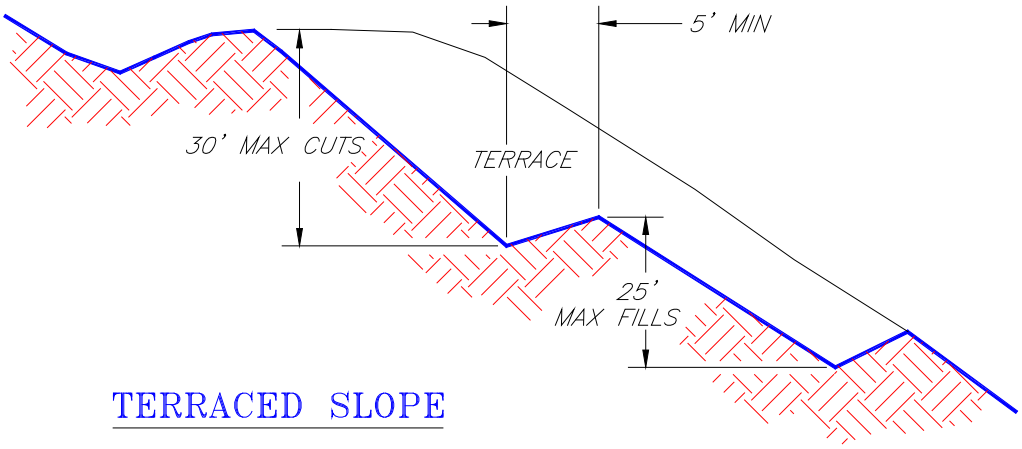
GROOVE BY CUTTING SERRATIONS ALONG THE CONTOUR. IRREGULARITIES IN THE SOIL SURFACE CATCH RAINWATER, SEED, MULCH AND FERTILIZER.

FILE: SERSLOPE

SURFACE ROUGHENING AND TERRACING



STEPPED SLOPE



TERRACED SLOPE

NOT TO SCALE

NOTES:
1. VERTICAL CUT DISTANCE SHALL BE LESS THAN HORIZONTAL DISTANCE.
2. VERTICAL CUT SHALL NOT EXCEED
2 FT IN SOFT MATERIAL AND
3 FT IN ROCKY MATERIAL.

FILE: STPSLOPE

SURFACE ROUGHENING AND TERRACING

BMP AK-13
Compost Blankets

Purpose and Description

- A compost blanket is a layer of compost or composted material applied loosely to the surface of disturbed slopes or other erodible areas.
- It is used to control erosion and retain sediment resulting from sheet flow.[1]
- Can be used in place of mulch, rolled erosion control products, soil binders or other sediment and erosion control tools.[1]
- A compost blanket helps limit erosion by:
    - Promoting growth of vegetation.[1]
    - Filling in rills and ridges to eliminate channelized flow in the slope.[1]
    - Providing a permeable surface for infiltration of sheet flow.[1]
    - Protects slope from destructive and soil compacting forces of rainfall.

Applicability

- Compost blankets can be applied to any soil surface (rocky, frozen, flat, steep, etc…) and are therefore applicable to all regions of Alaska.[1]
- Not applicable in locations of concentrated flow.[1]
- Most effective when applied to slopes between 4:1 and 1:1.[1]
- On slopes greater than 2:1 other BMP's such as RECP's should be considered to be used in conjunction with compost blanket. [1]
- It is also necessary to establish vegetation on slopes greater than 2:1 as soon as possible. [1]
- Pedestrian and vehicular traffic must be eliminated on slopes greater than 2:1.[1]

Design and Installation

- Mature, sanitized compost that meets all local, state and federal regulations must be used.[1]
- Compost must be compatible with pH and nutrient requirements of the vegetation that will be used for stabilization.
- Compost must be applied to the surface in a uniform thickness of 1-4 inches depending on annual rainfall and presence of vegetation on the site (see table 2).[1]
- Compost may be spread using a pneumatic blower, spreader unit (bulldozer, manure spreader, etc), or by hand using a shovel.[1]
- Compost Blanket must extend at least 3 feet over the shoulder of the slope to ensure that storm water does not flow underneath the blanket.[1]
- Seed can be spread over the blanket after it is installed or incorporated into the compost before application (suggested).[1]
- Compost blankets may provide better sediment and erosion control when used in conjunction with other best management practices.

Table 2. Example Compost Blanket Depths for Various Rainfall Rates [1]

Annual Rainfall / Flow Rate	Total Precipitation (Rainfall Erosivity Index)	Compost Blanket Depth (Vegetated Surface)	Compost Blanket Depth (Unvegetated Surface)
Low	1 – 25 in. (20 – 90)	½ – ¾ in. (12.5 – 19 mm)	1 in. – 1½ in. (25 – 37.5 mm)
Average	26 – 50 in. (91 – 200)	¾ – 1 in. (19 – 25 mm)	1½ in – 2 in. (37 – 50 mm)
High	>51 in. (>201)	1 – 2 in. (25 – 50 mm)	2 – 4 in. (50 – 100 mm)

Maintenance and Inspection

- Compost Blanket should be inspected regularly and particularly following heavy rainfall or storm events.[1]
- Compost should be reapplied to areas where the compost has washed out.

References

1. [1]*USEPA (United States Environmental Protection Agency), October 2000, National Menu of Best Management Practices, Compost Blankets,* *http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=browse&Rbutton=detail&bmp=118&minmeasure=4*

BMP AK-14
Rolled Erosion Control Products

Objectives and Applications

Rolled erosion control products (RECPs) are manufactured long sheets or coverings that can be unrolled onto unvegetated cut or fill slopes where erosion control or soil stabilization is needed. They are used where temporary seeding and mulching alone are inadequate, or where mulch must be anchored and other methods such as crimping or tackifying are unfeasible. There are many types of RECPs—and an ever-changing array of new products and manufacturers' claims. Applications range from coverings for temporarily inactive construction sites to long term protection of steep slopes.

Common RECP categories include:

Temporary RECP *designed for short term use--e.g. up to 1 year.*

Degradable (generally preferred and more prevalent) *made from naturally decomposing materials*. Different fibers yield different characteristics and breakdown patterns. RECPs are either:
photodegradable—broken down by sunlight exposure or
biodegradable—deteriorated by action of biological organisms.

Erosion control blanket(ECB): matrix of long-fibered mulch held by netting on one or both sides or sewn though the filler. Common ECB mulches are straw, wood shavings (excelsior), flax, coconut fiber (coir) and jute.

Jute matting: woven jute fiber mesh.

Netting: fixative mesh cover to keep mulch in place. Made of cotton, jute, coir or photodegradable plastics. Opening sizes vary by design purpose.

Non-degradable *does not decompose with exposure to the elements*

Plastic sheeting: occasionally used for urgent, short-term protective treatment or for overwintering disturbed slopes.

Semi-permanent RECP *lasts 4-8 years--commonly made from coir products*

Permanent RECP *does not decompose for 10 years or more*

Synthetic Turf Protection Mat: mechanically, structurally or chemically bound continuous mesh of processed or polymeric fibers. Mats are thick, heavy, long lasting. Some are designed to structurally support vegetation.

Common Failures - Generally due to faulty installation or maintenance.

- Seed washout/soil erosion due to water flow beneath poorly secured RECPs.
- Failed/inhibited growth of vegetative cover.
- Unintended RECP destruction by equipment, the elements, wildlife etc.

Other Considerations

- Expensive RECPs aren't necessarily more effective than lower cost RECPs.
- Installation requirements, surface features & preparation, installer experience.
- RECP features; suitability constraints, strength, durability, degradation rate.
- Vegetation viability practices including: soil, temperature, insulation and sunlight requirements for plant species; site suitability including topsoil adequacy; fertilizer/growth-enhancer needs; moisture and timing requirements for germination and plant growth; over-saturation; destructive moisture levels cause seed/plant mold/mildew/rot.
- RECP seasonal durability; e.g. overwintering plastic sheeting tears.
- Ease of RECP puncture (desirable for bio-remedial shoot penetrations).
- Slope length and steepness relative to vegetative support & blanket saturation, weight and durability.
- Runoff velocities, volumes, moisture infiltration rates.
- Compatibility and interaction with other on-site erosion measures. E.g. plastic netting and mattings don't retain moisture or heat useful for germination enhancement; plan means to disperse snow accumulations or high runoff volumes at the toe of plastic covered slopes.
- Visual impact, including public's perception of erosion protection needs and available

levels/sophistication of erosion technologies.
- Compatibility with land use (e.g. urban or well-populated sites).
- Interactions with wildlife: habitat, susceptibility to foraging, grazing, nesting

Relationship To Other ESC Measures

RECPs can complement seeding and revegetation. Byproducts of RECP decomposition add mulch benefits and soil enhancement. RECPs can be used in conjunction with benching or other runoff velocity slowing or redirecting measures. RECPs aid dust control.

Alternate Sediment Control Measures

Stabilization measures for vegetation preservation. Crimped, tracked or tackified mulches. Benching, terracing, diversions or other means to reduce slope steepness, length and runoff velocity and volume.

Other Names

Terms used interchangeably: e.g. matting, blanket, sheet. Specified names e.g. Erosion Control Geotextile, ECB, Straw blanket, Mulch Mat

Design

Consult product distributors for recommendations or use the Product Selection Tool on the Erosion Control Technology Council website (http://www.ectc.org) regarding RECP selection and performance criteria suitable for site-specific parameters. Evaluate:

- *Duration of need--Temporary (e.g. 2 mo., 6 mo., 1 yr.) vs. Permanent (2-10 yrs.)*
- *Slope length*
- *Slope gradient (e.g. less than 1:1, 2:1, 3:1 or steeper)*
- *Soil type & erodibility*
- *Seasonal temperature & weather patterns; regional precipitation distribution*
- *Vegetation needs, especially where germination conditions are not optimal*

Blankets: on grades > 2:1 are subject to high stresses.

Synthetic turf protection mat: distribute loads across (saturated) fill slopes and reinforce root systems. Use where slope protection is needed at least 2 years. Use on highly erodible slopes (>3:1), for steep slide rehabilitation, for heavy/high velocity runoff, landfill or high elevation reclamations, drought areas, long cut/fill slopes, bridge abutments etc.

Plastic sheeting: 6 mil or thicker. Not recommended as cover for seeded slopes.

Wood fiber mat: drawbacks: bulky, difficult to place, 10–20% less effective erosion control than other mat types. May need to replace soil nitrogens leached by degrading wood.

Netting: Plastic netting doesn't hold heat or moisture, may require increased thickness of netted straw mulch 25%. Plastic netting and wood fiber mulches alone should not be used where runoff water flow exceeds 7 ft./sec.

Jute matting: Apply alone for seed germination enhancement or dust control, but not where runoff is significant.

Materials

Matting: Burlap, Jute Mesh Fabric, Woven Paper or Sisal Mesh Netting, Knitted Straw Mat, Woven/ Curled Wood Blanket.

Anchors: U-shaped wire staples, triangular wooden stakes, willow stakes.

Staples: U-shaped steel wire (normally 8 in. long, 1 in. wide, 11 gage or heavier, a 12-in. length, 9 gage or heavier).

Installation

RECPs -Excavate a 6" X 6" check slot trench at a level area well behind the slope crest or slopetop berm. Backfill and tamp over RECP roll end, leaving no gaps to allow under-blanket runoff invasion. Unroll sheeting downslope, parallel to grade and runoff path. Midslope splicings overlap successive sheets in the direction of flow so that upslope ends extend past the trench 16" anchoring the next downslope section. Stagger adjacent splicings. Anchor RECP terminal ends in slope toe key trenches and repeat the entire process until the entire slope has continuous coverage.

Lay RECPs to follow ground contours closely but do not stretch taut across surface depressions. Staple RECPs to maintain firm contact with underlying

surfaces. Staple patterns vary depending upon slope length, grade, soil type and runoff rates. Staple blanket perimeters at no less than 12 in. intervals across the top and 3 ft. spacings along RECP sides and bottom. Staple intervals should be sufficient to prevent runoff flows beneath the blanket. Staple through 5 in. adjacent overlaps strips and staple every 3 ft. down sheet centerlines. Adjacent staple lines should stagger.

Plastic Sheeting - Anchor in slopetop trench (as above) to seal from runoff flow beneath sheeting. Duct tape 18 in. overlap seams to seal against wind and rain. Cover the entire exposed area. Hold sheets close to slope by suspending weights (tires, sandbags etc.) from ropes affixed to uphill anchors set no more than 10 ft. apart. Secure so wind doesn't lift the cover, expose slopes or tear plastic.

Inspection

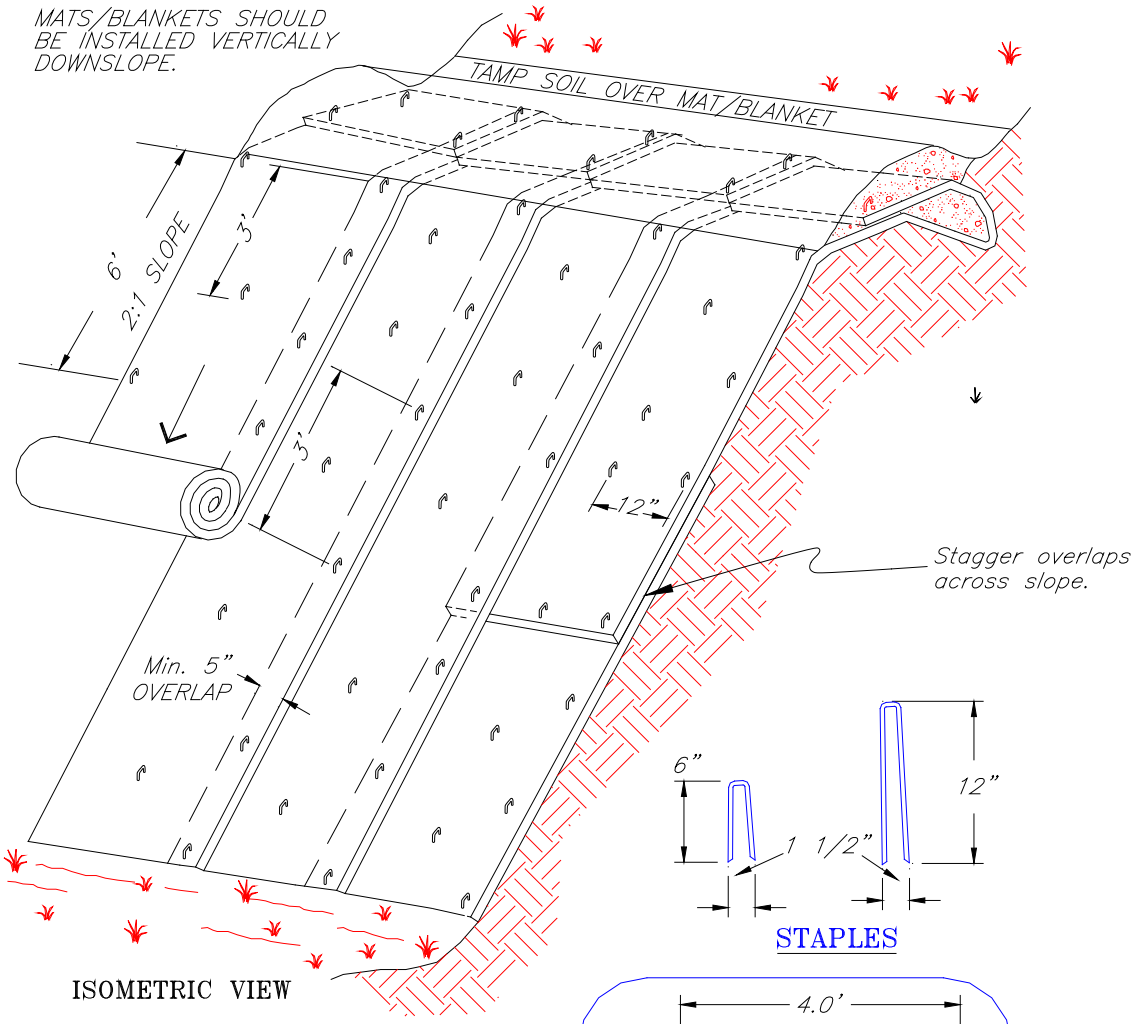
Check that surfaces adhere, fasteners remain secure and covering is in tight contact with soil surface beneath. Look for damaged areas and exposed soil surfaces. Pay special attention to seams and uphill edges.

Maintenance

Repair, re-anchor, reinstall or replace matting. Re-seed where needed. It is especially important to protect overwintering plastic covered slopes, since the saturated soils may be easily erodible upon thaw.

Removal

Non-degradable RECPS must be removed manually when no longer useful and disposed at an offsite landfill or by other approved methods. Degradable RECPs naturally deteriorate over time and can add soil enrichment.



TYPICAL SLOPE SOIL STABLIZATION

NOTES:

1. SLOPE SURFACE SHALL BE FREE OF ROCKS, CLODS, STICKS AND GRASS. MATS/ BLANKETS SHALL HAVE GOOD SOIL CONTACT.
2. APPLY PERMANENT SEEDING BEFORE PLACING BLANKETS.
3. LAY BLANKETS LOOSELY AND STAKE OR STAPLE TO MAINTAIN DIRECT CONTACT WITH THE SOIL. DO NOT STRETCH.

NOT TO SCALE

FILE: BLNKTSLP

ROLLED EROSION CONTROL PRODUCTS

BMP AK-15
Temporary Sediment Trap

Objectives and Applications

A temporary sediment trap is a small temporary ponding area, with a rock outlet, formed by excavating below grade and/or by constructing an earth embankment.

A sediment trap is a temporary structure that is used to detain runoff from small drainage areas so that sediment can settle out. Sediment traps generally are used for drainage areas less than five acres, and should be located in areas where access can be maintained for sediment removal and proper disposal. A sediment trap can be created by excavating a basin, utilizing an existing depression, or constructing a dam on a slight slope downward from a project area. Sediment laden runoff from the disturbed site is conveyed to the trap via ditches, slope drains, or diversion dikes. After being treated, the flow from the structure is controlled by a rock spillway. The trap is a temporary measure, with a design life of approximately six months, and is to be maintained until the site is permanently protected against erosion by vegetation and/or structures.

Common Failures - Generally due to faulty installation or maintenance

- Inadequate spillway size; this results in overtopping of dam, poor trap efficiency, and possible failure of the structure.
- Low point in embankment caused by inadequate compaction and settling; this can result in overtopping and possible failure.
- Outlet not extended to stable grade; this can result in erosion below the dam.
- Spillway stone size too small or backslope too steep; this may result in stone displacement.
- Inadequate storage capacity; the sediment is not removed from basin frequently enough.

Other Considerations

- The location of sediment traps should be determined based on the existing and proposed topography of the site.
- As a perimeter control, locate the trap where up to 5 disturbed acres drain to one location. Choose a location where maximum storage can be obtained from natural topography. This will minimize excavation.
- Locations should be selected where interference with construction activities will be minimized and will allow the trap to remain in service until the site is stabilized.
- The site must be accessible for future clean-out of the trap.
- Sediment traps are most effective at removing sand particles and are less effective at removing fine silt and clay particles. Longer retention times using engineered structures such as sediment basins or retention ponds may be necessary to remove these smaller particles.

Relationship to Other ESC Measures

Sediment traps are usually located at the outlets of diversions, channels, slope drains, or other runoff conveyances that discharge sediment laden water.

Alternate Sediment Control Measures

A sediment basin should be considered if the drainage area exceeds five acres. Sediment basins may be either temporary or permanent, and due to additional and more complex design and construction considerations, should be designed by a registered engineer.

Other Names

Catch Basin

Design

Design life: *1 season (6 months) or less*

Contributing flow drainage area: *not to exceed 5 acres*

Storage volume: *minimum 134 cubic yards per acre*

Wet storage area depth: *minimum 2 ft.- 3 ft., maximum 4 ft.*

Ideal shape: *rectangular and shallow trap, with a length to width ratio of 2:1 or greater*

Berm: *compacted earth, maximum height 5 ft.*
Slopes (cut and fill): *2:1 or flatter*

Outlet*: rock spillway, crest of spillway* 1.0 ft. below top of embankment.

Spillway weir length (minimum)	
Drainage area (Acres)	**Weir length (Feet)**
1 ac.	4 ft.
2 ac.	5 ft
3 ac.	6 ft.
4 ac.	10 ft.
5 ac.	12 ft.

Stone size: *construct outlet using well graded stones with a median stone size of 9 in. and a maximum stone size of 14 inches. A 12-in. thick layer of ½ to ¾ in. aggregate should be placed on the inside face to reduce seepage flow rate.*

Materials

Filter fabric, coarse aggregate or riprap 2 inches to 14 inches in diameter; washed gravel 1/2 inch to 3/4 inch in diameter, seed and mulch for stabilization.

Installation

Clear, grub, and strip the area under the berm of any vegetation and root mat. Clear the pool area to reduce debris buildup and facilitate cleanout. Excavate as required in the plan to obtain the necessary storage volume. Use fill material for the berm that is free of roots, other woody vegetation, organic materials, and large stones. Make all cut and fill slopes 2:1 or flatter. Compact the berm in 8 in. layers by traversing with construction equipment. Construct the rock spillway to the dimensions shown on the plan, placing filter fabric beneath the rock. Provide temporary or permanent stabilization (seed and mulch) on the berm immediately after the construction.

Inspection

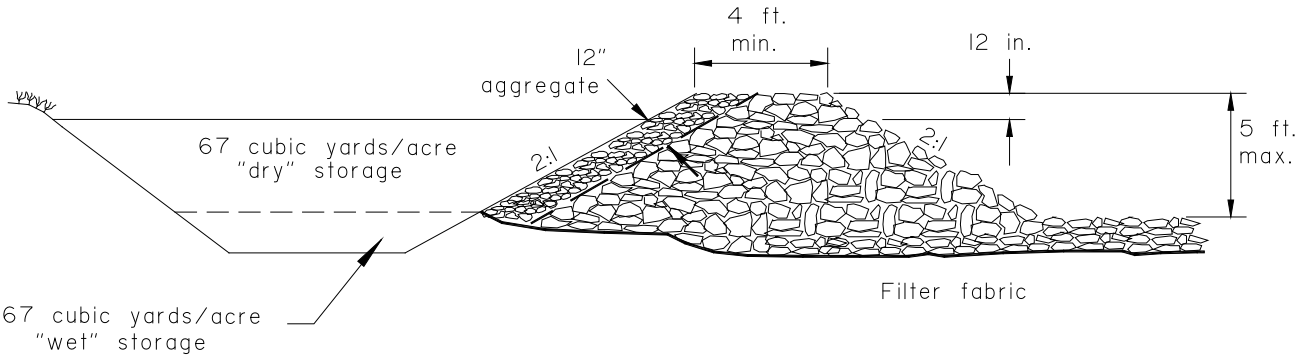
Inspect temporary sediment traps weekly and after each period of significant rainfall. Check the structure for damage from erosion, and check rocks in the outlet for clogging with sediment. Check the height of the stone outlet to ensure that the crest is at least 12 in. below the top of the berm.

Maintenance

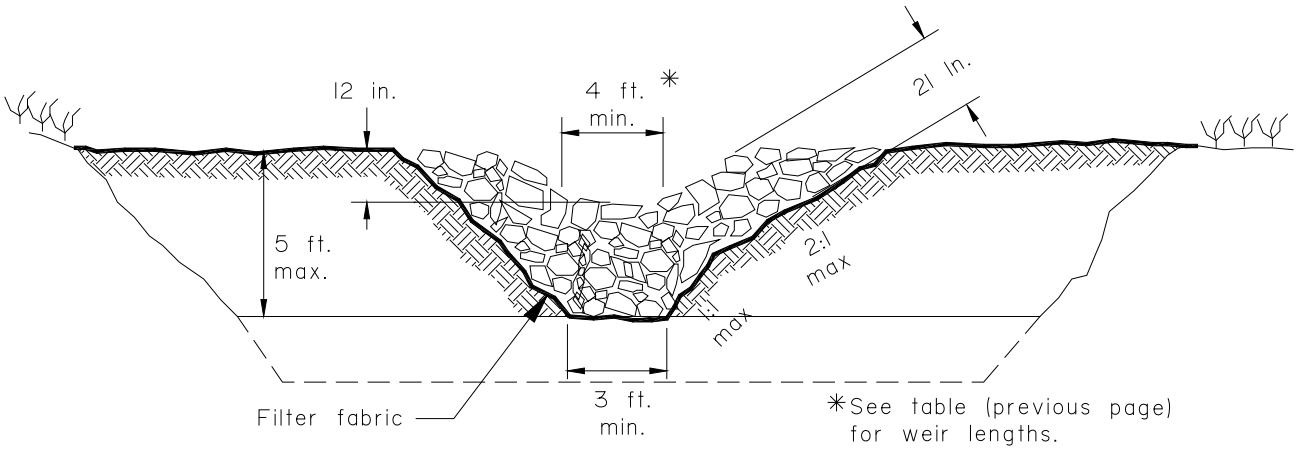
Remove sediment and restore trap to its original dimensions when the sediment has accumulated to one-half the design depth of the trap. Deposit sediment removed from the basin in a suitable area and in such a manner that it will not erode and cause sedimentation problems. Clean or replace the filter stone in the outlet structure if clogged with sediment. Adjust the height of the stone outlet if the crest is not at least 12 in. below the top of the berm.

Removal

Remove sediment traps after the contributing drainage area is stabilized. Grade and stabilize the site of the sediment trap after removal as shown in the plans.



CROSS SECTION



ELEVATION

TEMPORARY SEDIMENT TRAP

BMP AK-16
Vegetative Buffer Strip

Objectives and Applications

A vegetative buffer strip is an undisturbed area or strip of natural vegetation, or an established suitable planting that will provide a living filter to reduce soil erosion and runoff velocities.

Buffer strips act as living sediment filters that intercept and detain storm water runoff. They reduce the flow and velocity of surface runoff, promote infiltration, and reduce pollutant discharge by capturing and holding sediments and other pollutants in the runoff water. They may be natural, undeveloped land, or may be graded and planted with grass or other vegetation; and may be placed at many locations between the source of sediment (road surface, side slopes) and a natural or constructed waterway or other drainage area that could be impacted by deposits of sediment. Buffer strips may be used at any site that can support vegetation, but are best suited where soils are well drained and where the bedrock and water table are well below the surface. Buffer strips are particularly effective on flood plains, along stream banks, and at the top and bottom of a slope. Buffer strips may be either temporary or permanent.

Common Failures - Generally due to faulty installation or maintenance.

- Excessive sediment or oil and grease loads resulting in clogging.
- Introduction of storm water flows onto buffer strip before vegetation is established.

Other Considerations

- Not effective for filtering high velocity flows from large, paved areas, steep slopes, or hilly areas.
- May be more viable than silt fence where silt fence installation and removal will cause more harm than good.
- Avoid flow concentration
- Buffer strips generally only trap coarse sediments. Depending upon vegetative type, clay and fine silt particles will generally pass through a buffer strip during periods of heavy rain.
- Preserve natural vegetation in clumps, blocks or strips where possible, particularly in areas adjacent to waterways.
- Do not use planted or seeded ground as a buffer strip for sediment trapping until the vegetation is established.
- Extensive constructed buffers may increase development costs.

Relationship to Other ESC Measures

Buffer strips are used in conjunction with diversion measures such as earth dikes, diversions, and slope drains for slope protection. Silt fences placed upslope may prevent sediment overloading.

Alternate Sediment Control Measures

Diversion; Slope Drain

Other Names

Buffer Zone, Vegetated Filter Strip.

Design

Location: *Should be determined by considering slope, soil type, anticipated flow, and vegetation type.*

Capacity: *2 year peak runoff storm*

Width: *18 ft. - 60 ft., depending on type of vegetation and length of slope*

Grading: *smooth and uniform*

Permitting: *Wetland use as a vegetative buffer strip requires approval from the Corps of Engineers.*

Flow Distribution: *evenly distributed; avoid flow concentration*

Materials

Natural vegetation, seed or sod; fertilizer, mulch, water; fencing or flagging

Installation

Natural Vegetation

Delineate undisturbed natural areas of vegetation that have been identified on the plans with flagging prior to the start of construction activities. Ensure that other sediment control measures to be used in conjunction with the buffer strip are in place and functioning properly. Minimize construction activities and traffic in the buffer strip and immediate surrounding areas.

New Buffer Strip

Ensure that sediment control measures such as silt fence and diversions are in place to protect waterways or drainage areas until the buffer strip is established. Clear and grade the land according to the plans and specifications. Establish vegetation using specified seeding, mulching, watering, and fertilizer.

Inspection

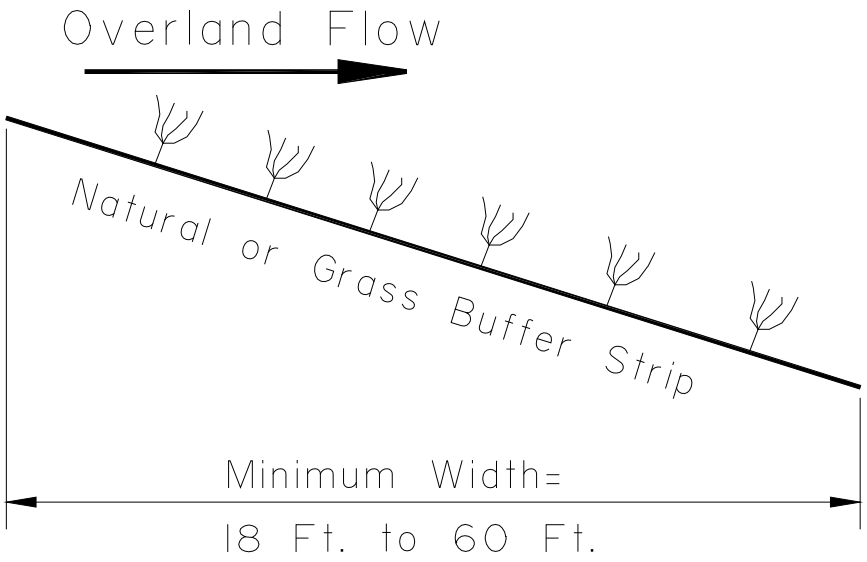
Inspect natural vegetation buffer strip areas at regular intervals to ensure that the fencing or flagging used to delineate non-disturbance areas are in place. Check for damage by equipment and vehicles. Inspect new buffer strip areas for the progress of germination and plant growth. Ensure that water flowing through the area is not forming ponds, rills, or gullies due to erosion within the buffer strip.

Maintenance

Replace or repair fencing or flagging as necessary. Repair any damage by equipment or vehicles. Provide additional seed, fertilizer, and water to ensure adequate establishment of vegetation. Repair and reseed areas damaged by erosion or ponding of water.

Removal

Temporary buffer strips - Provide and compact fill to existing or specified grade. Seed and mulch.



VEGETATIVE BUFFER STRIP

BMP AK-17
Filter Berm

Purpose and Description

- Can be made of loose gravel or crushed rock.[1]
- Designed to slow, filter sediment from, and divert flow of stormwater.[1]

Applicability

- When temporary measures are necessary to retain sediment on construction sites.

Design and Installation

- Use washed well-graded gravel or crushed rock ranging from about ¾in (~2cm) to 3in (~7.5cm) in diameter containing less than 6% fines.
- Berms must be at least 1ft in height.[2]
- Berms must have side-slopes of 3:1.[2]
- Space Berms:
    - Every 300ft on slopes less than 5%.[2]
    - Every 200ft on slopes between 5 and 10%.[2]
    - Every 100ft on slopes greater than 10%.[2]

Maintenance and Inspection

- Inspect berms regularly and after rainfall.
- It is important to make repairs to berms at the first sign of deterioration.[2]
- Remove and either dispose of or reincorporate into the project any sediment buildup and replace filter material when necessary.[1]

References

[1]USEPA (United States Environmental Protection Agency), October 2000, National Menu of Best Mangement Practices, Filter Berms http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=browse&Rbutton=detail&bmp=37&minmeasure=4

[2]Washington State Department of Ecology, February 2005, Storm Water Management Manual for Western Washington, Construction Storm Water Pollution Prevention, BMP C232: Gravel Filter Berm, http://www.ecy.wa.gov/pubs/0510030.pdf

BMP AK-18

Silt Fence

Objectives and Applications

A silt fence is a perimeter control geotextile fence to prevent sediment in silt-laden sheet flow from entering sensitive receiving waters.

Silt fencing downslope from erosion-susceptible terrain traps sheet flow runoff before the drainage exits the project site. Intercepted drainage pools along the uphill side of the fence and standing water promote sediment settling out of suspension. Drainage in contact with the fence is to some degree filtered by the geotextile—the fabric's small pores not only block larger-sized eroded particles but also severely restrict water exfiltration rates.

Barrier locations are informally chosen based on site features and conditions (e.g. soil types, climate, terrain features, sensitive areas, etc.), design plans, existing and anticipated drainage courses, and other available erosion and sediment controls. Typical barrier sites are catchpoints beyond the toe of fill or on sideslopes above waterways or drainage channels. Silt fences are not recommended for wide low-flow, low-velocity drainageways, for concentrated flows, in continuous flow streams, for flow diversion, or as check dams. Use at drop or curb inlets is not appropriate for high volumes of stormwater.

Common Failures - Generally due to faulty installation or maintenance.

- Posts installed on uphill side of trench (instead of downhill side) or fabric attached to downhill side of posts (rather than uphill side).
- Soil is not tamped next to fence after backfilling trench, allowing water to flow underneath.
  - Slope erosion occurs below the fenceline due to drainage that bypasses the barrier end or water build-up that "blows out" a poorly secured fence bottom.
- Fence function impairment due to sediment build-up, maintenance neglect etc.
- Fence topples due to poor installation and/or high levels of impounded back-up water or sediment.
- Inappropriate for intended function (e.g. used for check dam, flow diversion, etc.).
- Uneven distribution of pooled drainage along non-level fenceline ground reduces efficiency.
  - End of fence is not "J-hooked" upslope allowing water to run around the end.
- Poor support system (e.g. soil too rocky to secure posts, fabric stapled to trees, etc.).

Other Considerations

Use of sediment control measures and the level of effort should be commensurate to the potential problem. ***Silt fence is not to be used solely as a project delineator****. (Use barriers, flagging, etc. instead.)*

- Use of a silt fence sediment control measure is usually more complex, expensive and maintenance-prone than other slope stabilization measures.
- Slope stabilization should occur at the earliest possible time.
- Fenceline proximity to sensitive areas needing protection during fence installation, maintenance, removal, etc. (e.g. avoid equipment encroachment on wetlands).
- Undesirable effects of fence placement (e.g. a trench in ground that won't readily "heal" after fence removal; undesirable effects of water back-up, ditch overflow, etc.).
- Equipment access route/space required for fence installation, maintenance and removal.

Relationship to Other ESC Measures

Sediment control measures are secondary to erosion prevention or soil stabilizing measures. Silt fences may be used as part of a sequential system with other temporary or permanent measures such as vegetation, check dams, settling ponds, etc. Occasional flow velocity increases may be offset using corrective measures such as rock berms or other redirecting energy absorbers.

Alternate Sediment Control Measures

Fiber rolls. Brush bundles to filter small amounts of sediment in shallow gullies or ditches. Temporary settlement basin. Gravel berm. Triangular sediment filter dike (stand-alone wire mesh structure covered with filter fabric on uphill side [labor intensive to construct and maintain]).

Other Names

Geotextile for Sediment Control (sect 633 specifications), Filter Fence, Sediment Fence.

Design

Design life: *1 season (6 months) or less*

Contributing sheet flow drainage area: *not to exceed 0.25 acres/ 100 ft. of fence*

Maximum Slope Length for Silt Fence

Slope (%)	18 in. Fence	30 in. Fence
2 (or less)	250 ft.	500 ft.
5	100 ft.	250 ft.
10	50 ft.	150 ft.
15	35 ft.	100 ft.
20	25 ft.	70 ft.
25	20 ft.	55 ft.
30	15 ft.	45 ft.
35	15 ft.	40 ft.
40	15 ft.	35 ft.
45	10 ft.	30 ft.

Undisturbed buffer zone: *At least 3.5 ft. from fence to downstream sensitive area*

Support posts: *at least 18 in. in the ground. Minimum trench size (x-section): 6"x 6"*

Buried fabric: *18 in. (3 sides of trench, if fabric is not pre-attached to posts)*

M**aximum spacing between posts**: *6 ft.*

Maximum fence height: *3 ft. above ground*

Fabric joint overlap: *minimum 6 in. at post not allowed in pooled drainage areas*

Maximum height of ponding water: *18 in.*

Maximum allowable depth of sediment accumulation against fence: *50% of accumulation capacity*

Materials

Geotextile fabric sect 729-2.04 specification (AASHTO M 288 for Temporary Silt Fence except that minimum permittivity is .05/sec)

Support posts wood, steel or synthetic, adequate to support fence under field conditions, available attached to fabric in some products

Staples or other means to attach fabric to posts

Wire-backed (or polymeric backed) silt fence - for use where a longer duration of use is expected or where undermining forces, such as wind, are expected

Installation

Install fences before excavation/ fill work. Erect fenceline downslope along a level contour and perpendicular to anticipated sheet flow drainage path(s). Orient end sections uphill slightly and install sufficient length to keep drainage from spilling around barrier ends. Where ground surfaces are uneven, install shorter fences following contours (rather than install one long, contour-crossing fence that directs drainage to accumulate in low spots). Locate fence 3-10 ft. beyond toe of fill to leave room for a broad, shallow sedimentation pool and for equipment access during fence maintenance and removal. Leave buffers between fencing and sensitive receiving areas. Compacting the soil next to the fence is critical. If using the front wheel of a tractor or roller, it is best to compact the upstream side first, then each side twice (a total of four trips).

Installation can be completed using the trench method or the "slicing" method. The trench method is a manual, labor-intensive method. The "slicing" method is a mechanical method. Both methods are effective when correctly followed.

Trench method: Drive support posts into the ground, excavate a trench on the uphill side along the line of the stakes, attach geotextile, and bury fence bottom. Soil backfill trench and compact to secure fence bottom. (Compacted soil is preferred to gravel fill. Using sandbags or cement blocks to anchor the fence bottom is undesirable because of the tendency for undermining). Keep fence fabric taut. Do not field-sew seams. Overlap joints at support posts but do not place overlapped joints across pooled drainage areas.

Slicing method: This method requires the "Tommy" silt fence machine or equivalent. The machine utilizes a blade that plows or slices the fabric directly into the soil. Though this minimizes soil disturbance, soil crumbs created by the blade can be manually backfilled into the slice and the tractor can then be used to mechanically compact the soil. Check the

installation prior to compaction and use a flat-bladed shovel, if necessary, to tuck fabric deeper into the ground. Support posts are then installed along the length of the fence following similar procedures for the trench method.

For wire-backed silt fence, extend the wire into the trench a minimum of three inches and post spacing may be lengthened to 8'.

Inspection

A properly installed fence intercepts sheet drainage, contains sediment on site and does not permit spillover or bypass. Inspect as needed daily, weekly, or during/ following major rainfall events.

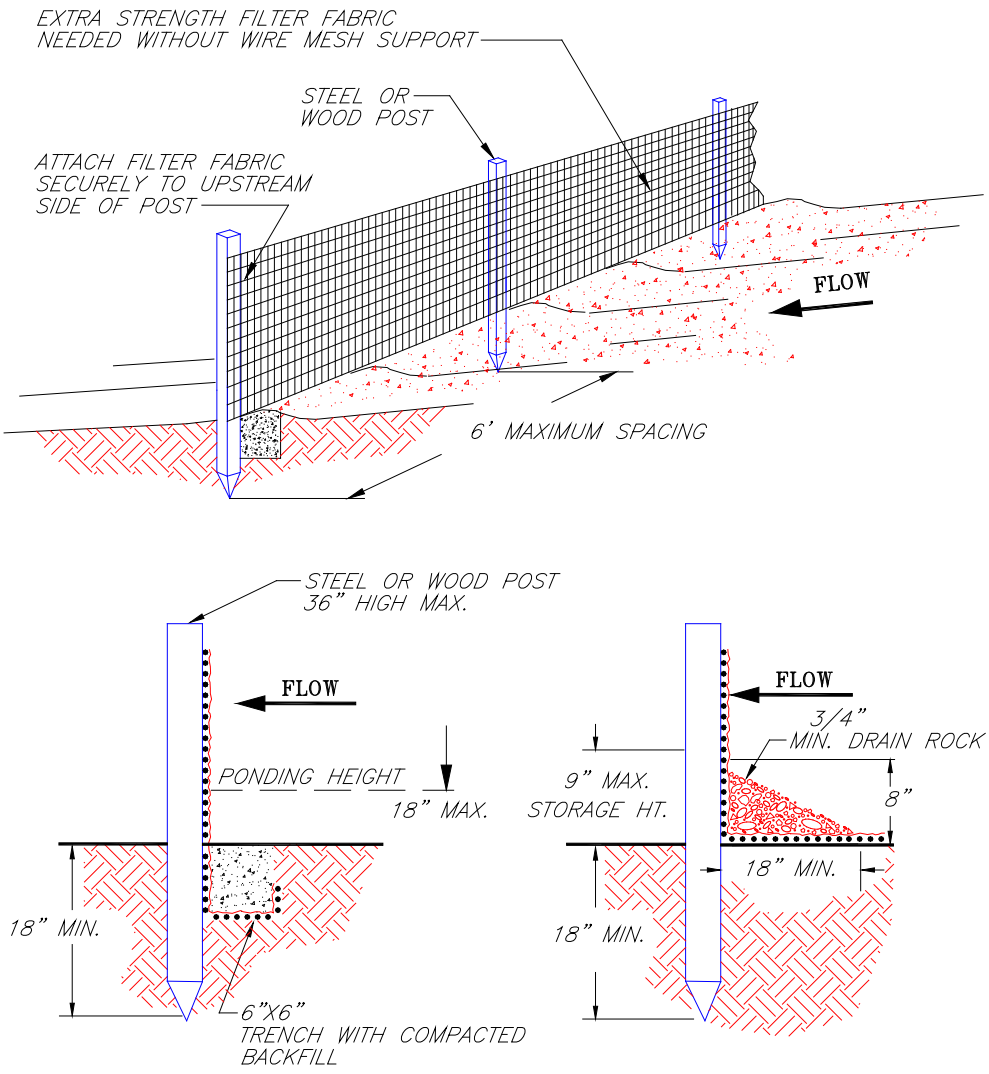
Observe for fenceline continuity. Inspect fences for collapse, damage, undermined areas, compromised integrity, or other installation or functional inadequacies. To ensure the fence is keyed in usually requires close inspection (not looking from a distance upslope). Look for evidence of sediment or erosion flow leading off the downhill edge of the fence. (This may be an indicator of drainage bypass or fence undermine.) Note depth of sediment build up at the fence. Look for signs of inadequate protection of off-site sensitive areas. Observe turbidity levels of protected waterways and determine sources of sediment/siltation.

Maintenance

Repair functional deficiencies immediately. Reinforce fenceline as needed to prevent undesirable sedimentation of sensitive areas. Replace torn or punctured fabric. Remedy fence sags as needed. Periodically remove accumulated sediment and dispose of silt waste in approved manner/location (typically in a non-erosion area).

Removal

Do not remove until the disturbed area is permanently stabilized or sediment protection is no longer needed. Unless directed otherwise, cut fabric at ground level, remove supports and spread sediment. Seed bare ground immediately. Discard filter fence as directed. Avoid damage to sensitive (e.g. wetland or surface water) areas. Stabilize areas.



TRENCH DETAIL

INSTALLATION WITHOUT TRENCHING

NOTES:

1. SILT FENCE FOLLOWS SLOPE CONTOURS TO MAXIMIZE PONDING EFFICIENCY.
2. INSPECT AND REPAIR FENCE AFTER EACH STORM EVENT AND REMOVE SEDIMENT WHEN NECESSARY. 9" MAXIMUM SEDIMENT ACCUMULATION.
3. REMOVED SEDIMENT SHALL BE DEPOSITED TO AN AREA THAT WILL NOT CONTRIBUTE SEDIMENT AND CAN BE PERMANENTLY STABILIZED.

NOT TO SCALE

FILE: SILTFENC

SILT FENCE

BMP AK-19
Inlet Protection

Objectives and Applications

Inlet protection is a temporary filtering measure placed around a drop inlet or curb inlet to trap sediment and prevent the sediment from entering the storm drain system.

This measure is employed where storm drain inlets are to be made operational before permanent stabilization of the disturbed area, where a permanent storm drain structure is being constructed on site and there is potential for sediment accumulating in an inlet, and where ponding of storm water around the inlet structure could be a problem to the traffic on site. There are several types of sediment filters applicable for different conditions keeping in mind whether traffic will be present;some of these are:

Catchbasin insert: a "sock" or "witches hat" that fits inside the structure and filters sediment

Triangular Silt Dike: may be used to protect a drop inlet

Sand bag barrier: can be used around a curb inlet, or at a minimum, upstream of a curb inlet where traffic won't drive on them

Filter fabric fence : applicable to drop inlets with flows 0.5 cfs or less, and flat grades (5 % or less).

Block and gravel filter : applicable to drop and curb inlets with flows 0.5 cfs or more, flat grades (5 % or less), where no construction traffic will cross over the inlet.

Gravel and wire mesh filter : applicable to drop and curb inlets with flows 0.5cfs or more, flat grades (5 % or less), where construction traffic will cross over the inlet.

Common Failures - Generally due to faulty installation or maintenance.

- Sediment accumulation – filtering capacity is reduced, resulting in ponding of water
- Improper installation, resulting in sediment bypassing filter and entering storm drain
- Tearing, undermining, or collapsing of filter fabric, resulting in sediment entering storm drain

Other Considerations

Inlet protection should be constructed in a manner that will facilitate cleanout and disposal of trapped sediment.

- Inlet protection should be constructed in a manner that will minimize ponding of storm water around the structure.
- Straw bale barriers should not be used for inlet protection because they are not effective.

Relationship to Other ESC Measures

Inlet protection is installed as a secondary measure to remove residual sediment that was not removed by other measures, such as check dams, grassed swales, and sediment traps. Erosion control must be in place to minimize the amount of sediment that must be treated at inlets.

Alternate Sediment Control Measures

Runoff from areas exceeding 1.0 acre or where grade is greater than 5% may require routing through a temporary sediment trap or sediment pond.

Other Names

Storm Drain Inlet Protection, Filter Inlet

Design

Drainage Area: *Not to exceed 1.0 acre*

Slope Gradient: *Not to exceed 5 %. For filter fabric fence designs, the area immediately surrounding the inlet should not exceed 1%. Gravel filters may be more appropriate for steeper slopes.*

Sediment Trapping Sump: *Where possible, a sump 12 in. – 20 in. measured from the crest of the inlet should be excavated. Side slopes should be 2:1. The recommended volume of excavation is 35 cubic yards/acre of disturbed ground.*

Orientation: *The longest dimension of the basin should be oriented toward the longest inflow area.*

Materials

Catch basin insert: should be designed by the manufacturer for use at construction sites

Triangular Silt Dike -- is a geotextile encased urethane foam, with an apron; use staples according

to the manufacturer recommendations

Sand bag barrier – bags should be about 2/3 full

Filter fabric fence – filter fabric (extra strength, filtering capacity 75 % minimum, meeting AASHTO Specification M 288 For Temporary Silt Fence); wooden stakes 2 in. x 4 in. – minimum length 3 ft.; heavy duty wire staples 1/2 in. long; washed gravel 3/4 in. – 1 ¼ in., with less than 5% fines.

Gravel and wire mesh filter - hardware cloth or wire mesh with 1/2 in. openings; filter fabric (AASHTO M 288); washed gravel 3/4 in. – 4 in. in diameter.

Installation

Catch basin insert: the filter is inserted just below the grating; manufacturer's have different design details

Triangular silt dike -- can be used on soil with wire staples or on pavement with adhesive

Sand bag barrier – place the bags in a horseshoe shape around the curb inlet or in sets of two or more upstream in the flow line to result in ponding (bag must be lower than the top of the curb)

Filter fabric fence – Place a stake at each corner of the inlet no more than 3 ft. apart. Drive stakes into the ground a minimum of 12 inches. For stability, install a frame of 2 in. x 4 in. wood strips around the top of the overflow area. Excavate a trench 8 in. wide x-12 in. deep around the outside perimeter of the stakes. If a sediment trapping sump is being provided, then the excavation may be as deep as 20 inches. Staple the filter fabric to the wooden stakes with heavy duty staples; ensure that 32 in. of filter fabric extends at the bottom so it can be formed into the trench. Place the bottom of the fabric into the trench - backfill with washed gravel all the way around.

Block and gravel filter – Secure the inlet grate to prevent seepage. Place wire mesh over the inlet so that it extends 12 in. - 20 in. beyond the inlet structure. Place filter fabric (optional) over the mesh and extend it 20 in. beyond the inlet structure. Place concrete blocks over the wire mesh or filter fabric in a single row lengthwise on their sides, with the open ends of the blocks facing outward, not upward; ensure that adjacent ends of blocks abut. For curb inlet applications, cut a 2 in. x 4 in. wood stud the length of the curb inlet plus the width of the two end blocks and place the stud through the outer hole of the end blocks to keep the blocks in place. Place wire mesh over the outside of the vertical face (open end) of the blocks to prevent gravel from being washed through the blocks. Place gravel against the wire mesh to the top of the blocks.

Gravel and wire mesh filter – Secure the inlet grate. Place wire mesh over the inlet so that the mesh extends 12 in. beyond each side of the inlet structure. Place filter fabric over the mesh, extending it 20 in. beyond the inlet structure. Place washed gravel over the fabric/wire mesh to a depth of 12 inches.

Inspection

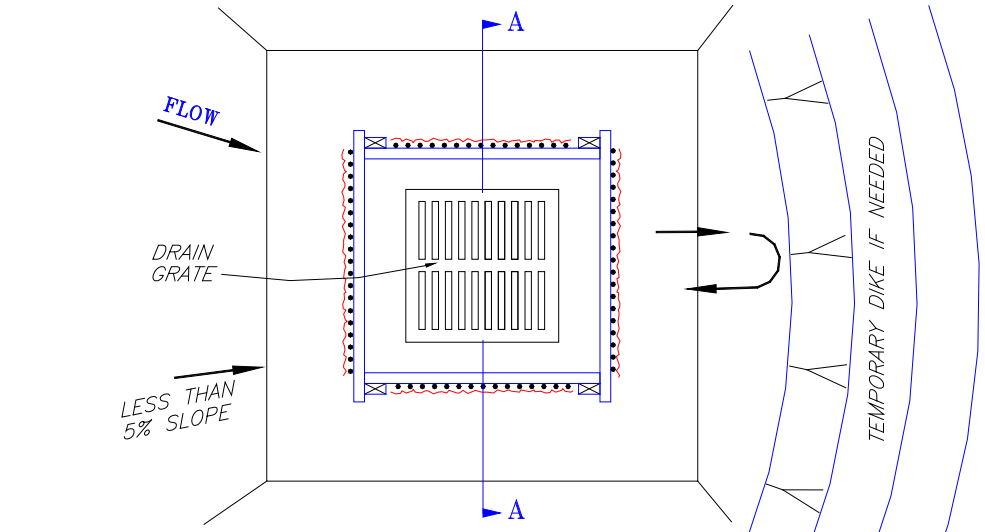
Inspect inlet protection regularly and after every storm to look for sediment accumulation and structural damage. All of the methods described are prone to plugging.

Maintenance

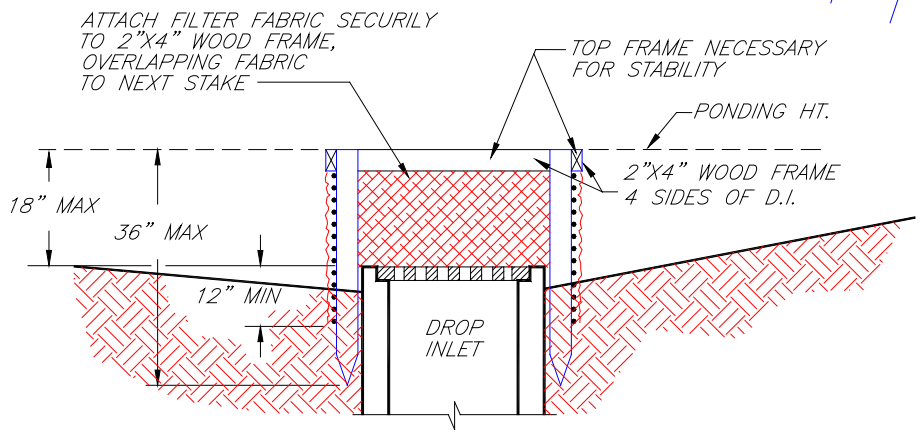
All of the methods described are maintenance-intensive. For inserts, carefully remove the insert to avoid spilling sediment, clean away from any drainages and replace it. For above-ground structures, remove sediment and restore structure to its original dimensions when sediment has accumulated to ½ the design depth. On gravel and mesh designs, clean (it is easier to remove and replace) the gravel filter or filter fabric if it becomes clogged. Repair any structural damage immediately.

Removal

Remove the filter material and support structures after the drainage areas have been completely stabilized. Remove or stabilize trapped sediment. Stabilize disturbed soil areas resulting from removal.



PLAN VIEW



SECTION A–A

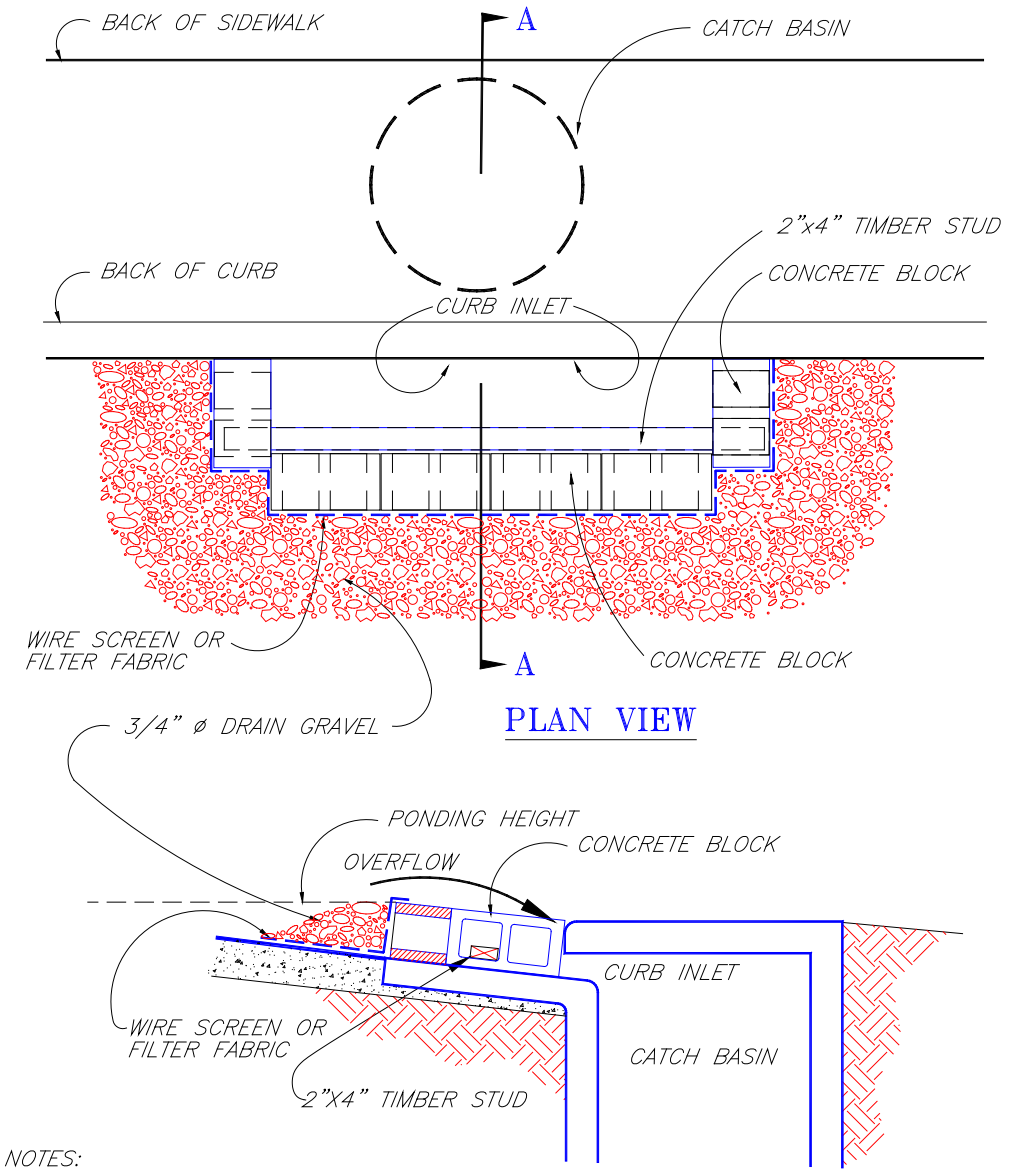
NOTES:

1. DROP INLET SEDIMENT BARRIERS ARE TO BE USED FOR SMALL, NEARLY LEVEL DRAINAGE AREAS. (LESS THAN 5%)
2. USE 2"X4" WOOD OR EQUIVALENT METAL STAKES, 3' MINIMUM LENGTH.
3. INSTALL 2"X4" WOOD TOP FRAME TO INSURE STABILITY.
4. THE TOP OF THE FRAME (PONDING HEIGHT) MUST BE WELL BELOW THE GROUND ELEVATION DOWNSLOPE TO PREVENT RUNOFF FROM BY–PASSING THE INLET. A TEMPORARY DIKE MAY BE NECESSARY ON THE DOWNSLOPE SIDE OF THE STRUCTURE.

NOT TO SCALE

FILE: SILTFDIB

INLET PROTECTION

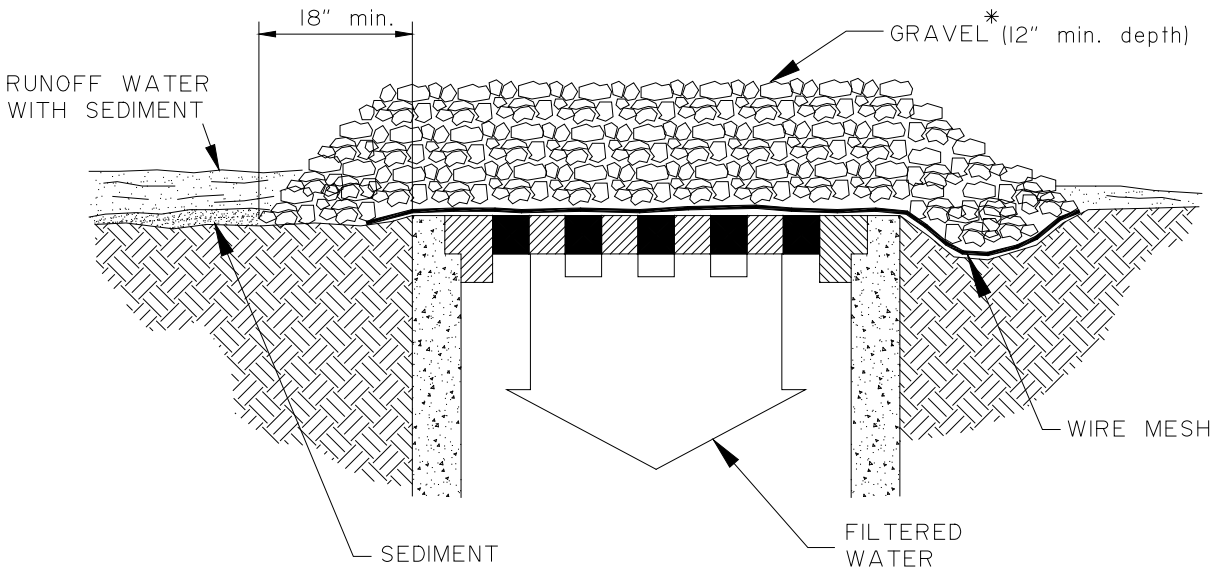


NOTES:

1. USE BLOCK AND GRAVEL TYPE SEDIMENT BARRIER WHEN CURB INLET IS LOCATED IN GENTLY SLOPING STREET SEGMENT, WHERE WATER CAN POND AND ALLOW SEDIMENT TO SEPARATE FROM RUNOFF.
2. BARRIER SHALL ALLOW FOR OVERFLOW FROM SEVERE STORM EVENT.
3. INSPECT BARRIERS AND REMOVE SEDIMENT AFTER EACH STORM EVENT. SEDIMENT AND GRAVEL MUST BE REMOVED FROM THE TRAVELED WAY IMMEDIATELY.

FILE: BLCKCURB

INLET PROTECTION



SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE HEAVY CONCENTRATED FLOWS ARE EXPECTED, BUT NOT WHERE PONDING AROUND THE STRUCTURE MIGHT CAUSE EXCESSIVE INCONVENIENCE OR DAMAGE TO ADJACENT STRUCTURES AND UNPROTECTED AREAS.

INLET PROTECTION

BMP AK-20

Brush Barrier

Objectives and Applications

A brush barrier is a temporary sediment barrier constructed at the perimeter of a disturbed site from the residual materials available from clearing and grubbing the site.

The purpose of a brush barrier is to intercept and retain sediment laden storm water runoff from disturbed areas of limited extent, preventing sediment from leaving the site. The barrier is constructed of tree limbs, weeds, vines, root mat, soil, rock, or other cleared materials piled together to form a berm, and located across or at the toe of a slope susceptible to sheet and rill erosion.

Common Failures - Generally due to faulty installation or maintenance.

- Materials that are too large are used, creating voids where sediment can easily pass through.
- Barrier constructed too loosely, allowing water and sediment to easily pass through.
- Sediment accumulation, resulting in loss of filtering capacity.

Other Considerations

- Enough residual material should be available on site for barrier construction.
- Material larger than 6 inches in diameter should not be used since it tends to create large voids.
- Barrier should be used only in areas of sheet or very low flow.
- Barrier should not be constructed where the maximum upslope gradient exceeds 2:1.
- Brush barriers should act as a filter, not a dam. If it is impermeable, then water will flow around it and outlet treatment will be required.

Relationship to Other ESC Measures

Brush barriers are utilized to retain sediment that would otherwise be deposited in other downslope sediment control measures, such as sediment traps and sediment ponds.

Alternate Sediment Control Measures

Silt Fence

Other Names

Brush Berm, Brush Bundle

Design

Design life: *1 season (6 months) or less*

Contributing flow drainage area*: not to exceed 0.25 acres*

Height: *3 ft. minimum to 5 ft. maximum*

Width: **(at base)** *5 ft. minimum to 15 ft. maximum*

Materials

Residual on site materials from clearing and grubbing activities – brush, tree limbs, root mat, weeds, vines, rock, or other cleared materials; nylon or polypropylene rope, rebar stakes; geotextile fabric (optional) meeting AASHTO specification M 288 for temporary silt fence.

Installation

Construct the barrier to the specified height and width by piling brush, stone, root mat and other material from the clearing and grubbing process into a mounded row on the contour. Ensure that barrier structure is uniform and that no significant voids are present. Cover with geotextile fabric (optional). Anchor into the ground using 1/4 in. polypropylene or nylon rope tied across the berm in a crisscross fashion and secured to 18 in. long x 3/8 in. diameter rebar stakes.

Inspection

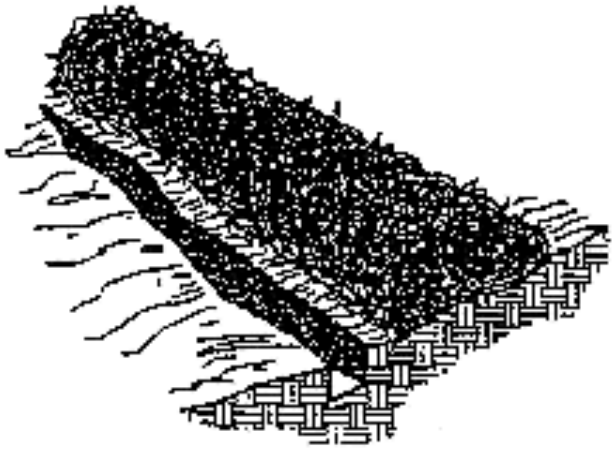
Inspect barrier weekly and after heavy rains to look for sediment accumulation.

Maintenance

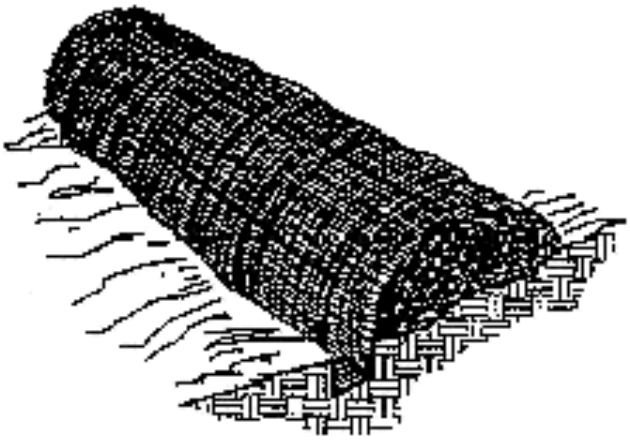
Sediment deposits should be removed when they reach approximately one-third the height of the uphill edge of the barrier.

Removal

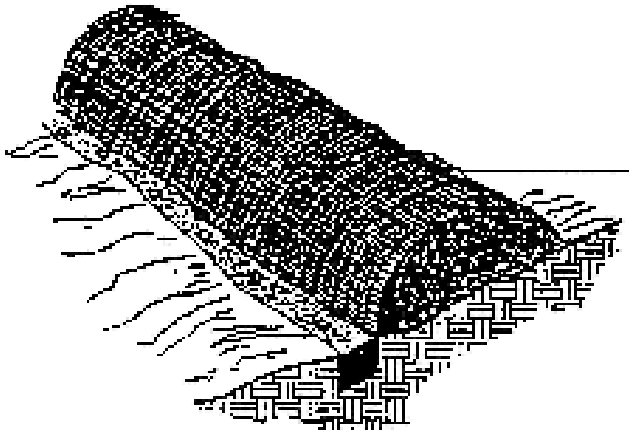
Brush barriers should be removed after they have served their usefulness, but not before the upslope areas have been permanently stabilized. Remove and stabilize trapped sediment. Stabilize disturbed soil areas resulting from removal. Brush barriers should only be left in-place if specifically allowed in the contract documents.



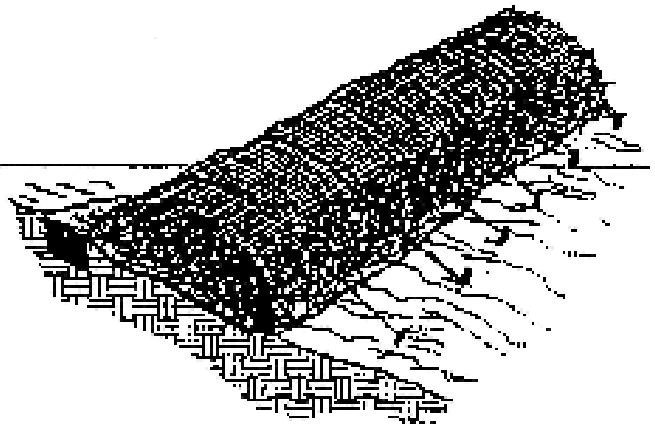
Excavate a 4" X 4" trench along the uphill edge of the Brush Barrier.



Drape a geotextile over the barrier and into the trench. The geotextile should be secured in the trench with stakes set approximately 36" on center.



Backfill and compact the excavated soil.



Set stakes along the downhill edge of the barrier, and anchor by tying twine from the geotextile to the stakes.

BRUSH BARRIER

BMP AK-21
Vehicle Tracking Entrance/Exit

Objectives and Applications

A vehicle tracking entrance/exit provides a stabilized gravel area or pad underlined with a geotextile and located where traffic enters or exits the construction site.

This measure establishes a buffer area for vehicles to deposit their mud and sediment, and minimize the amounts transported onto public roadways. Mud on a road can create a safety hazard as well as a sediment problem. This measure may be used with or without washdown, depending upon severity of problem.

Common Failures - Generally due to faulty installation or maintenance.

- Inadequate depth and length of gravel.
- Failure to periodically "top dress" (provide additional gravel) when sediment accumulates on the surface.
- Failure to repair and/or clean out any structures used to trap sediment.

Other Considerations

- Avoid entrances/exits which have steep grades or which are located where sight distance may be a problem.
- Provide drainage to carry water to sediment trap or other suitable outlet.

Design

Gravel Size*: 2 in.-3 in.*

Pad Thickness*: minimum 6 in.*

Pad Width: *minimum 12 ft.*

Pad Length: *minimum 50 ft.*

Materials

Gravel, geotextile

Installation

Clear the entrance and exit area of all vegetation, roots, and other material and properly grade it. Place geotextile prior to placement of gravel. Place the gravel to the specific grade shown on the plans, and smooth it. Provide drainage to carry water to a sediment trap or other outlet.

Inspection

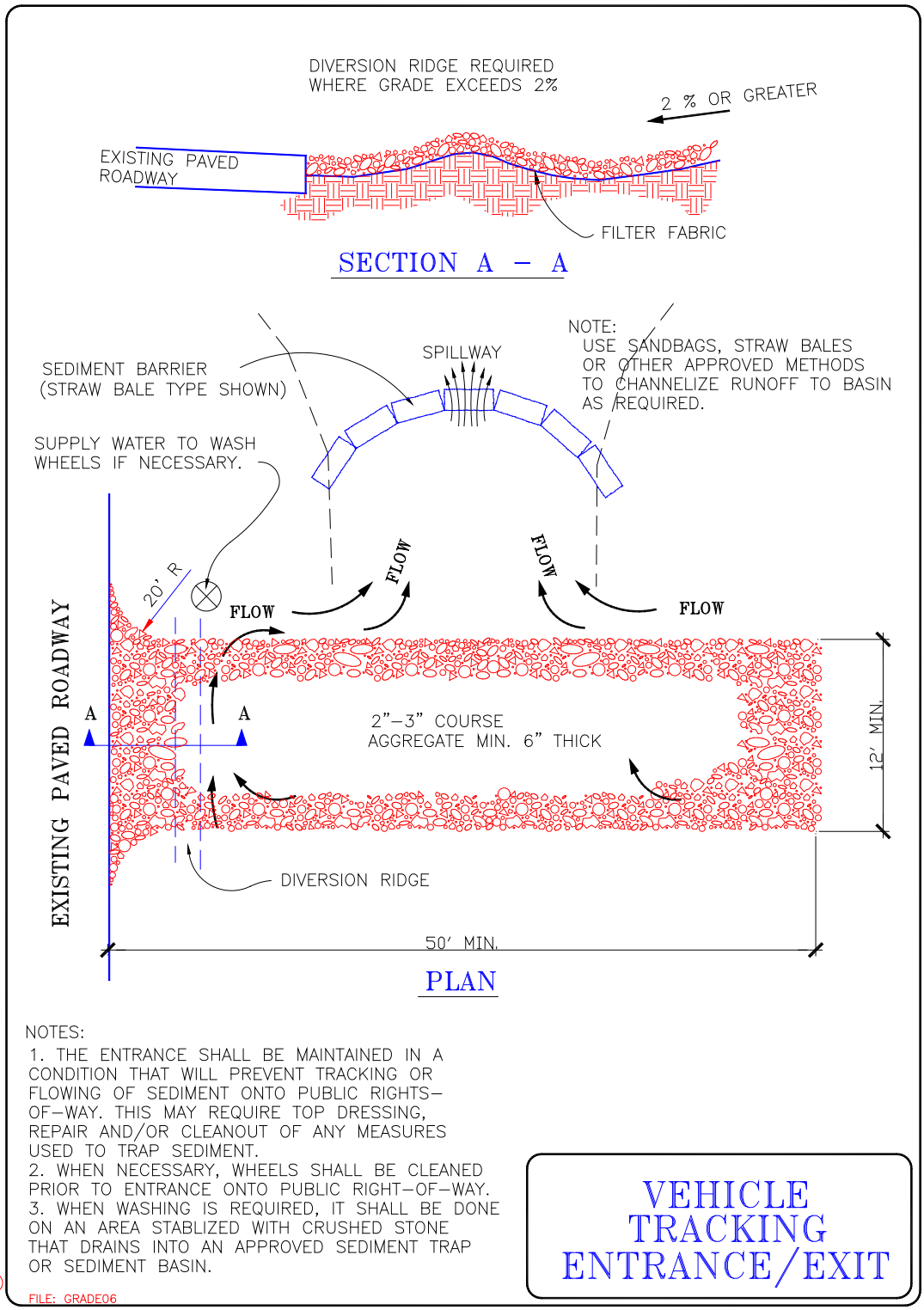
Inspect pads and sediment trapping structures daily for sediment accumulation and material displacement.

Maintenance

Maintain each entrance in a condition that will prevent tracking of mud or sediment onto public rights-of-way. Replace gravel material when surface voids are visible. Top dress with 2 in. gravel when pad becomes laden with sediment. Repair and/or clean out any structures used to trap sediment. Remove all mud and sediment deposited on paved roadways within 24 hours.

Removal

Remove pad and any sediment trapping structures after they are no longer needed, or within 30 days after final site stabilization. Remove and stabilize trapped sediment on site.



Vehicle Tracking Entrance/Exit

BMP AK-22
Tire Wash

Purpose and Description

- A tire wash (located at vehicle tracking entrance/exit) is designed to remove sediment from the tires and undercarriage of construction vehicles and equipment so that it is not tracked on to public roads or highways.

Applicability

- A tire wash must be used when a vehicle tracking entrance/exit is not preventing sediment from being tracked onto public roads or highways.[2]
- Requires a water supply.

Design and Installation

- Incorporated into vehicle tracking entrance/exit BMP.
- Construct on level ground when possible on a pad of coarse gravel that is about 2 to 3 inches in size
- Underline gravel with geotextile.
- Wash rack shall be designed and constructed/manufactured for anticipated traffic loads.[1]
- A drainage ditch must be constructed that will drain the runoff into a sediment trapping device.[1]
- Require all vehicles with mud or sediment on their tires to use tire wash when leaving the site.

Maintenance and Inspection

- Wash rack and sediment trapping device must be inspected routinely.
- Accumulated sediment must be removed to ensure quality performance.
- Repair Damage as needed.

References

[1]Caltrans Storm Water Quality Handbooks, March 2003, Construction Site Best Management Practices Manual, TC-3 Tire Wash, http://www.dot.ca.gov/hq/construc/stormwater/CSBMPM_303_Final.pdf

[2]Washington State Department of Ecology, February 2005, Storm Water Management Manual for Western Washington, Construction Storm Water Pollution Prevention, BMP C106: Wheel Wash, http://www.ecy.wa.gov/pubs/0510030.pdf

BMP AK-23
Vehicle and Equipment Maintenance

Purpose and Description

- Vehicle and equipment cleaning areas, procedures and practices are designed to minimize or prevent discharge of pollutants and hazardous wastes into water courses and/or storm drain systems.[1]

Applicability

- Procedures and practices are used everywhere that onsite maintenance and washing takes place.

- When practical, maintenance must be done offsite.

Design and Installation

- When vehicle and equipment maintenance cannot be done offsite or within a structure equipped with proper containment and disposal facilities[1] it must be done at an onsite maintenance area with the following characteristics:
    - Located at least 50ft from any downstream drainages or waterbodies.
    - Protected from storm water run-on and run-off by diversion dikes or berms which are configured to contain spills and pollutants.
    - Have drip pans, absorbent pads and spill kits on site.
    - Absorbent pads, contaminated soil, or any other waste product produced by vehicle or equipment maintenance operations must be disposed of properly.
    - Fuels and lubricants must not be dumped on the ground.[1]
    - Tires must not be buried.[1]
    - Batteries must be disposed up properly or recycled.[1]
    - No liquids (oil, fuel, anti-freeze, etc…) will be poured or otherwise go into a storm drain system. They must be disposed of per manufacturer's instructions.[2]
    - Secondary containment is required when storing oil, fuel and chemicals in drums onsite.[1]

Maintenance an Inspection

- Any vessel used to store waste fluids must be inspected regularly and maintained in a leak-proof condition.[1]

- Inspect construction vehicles and equipment daily and immediately fix any leaks or remove problem vehicle(s) and/or equipment from the site.[2]

- Maintenance area and secondary containment must be inspected regularly.

References

[1]Caltrans Storm Water Quality Handbooks, March 2003, Construction Site Best Management Practices Manual, NS-10 Vehicle and Equipment Maintenance, http://www.dot.ca.gov/hq/construc/stormwater/CSBMPM_303_Final.pdf

[2]USEPA (United States Environmental Protection Agency), October 2000, National Menu of Best Management Practices, Vehicle Maintenance and Washing Areas at Construction Sites, http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=browse&Rbutton=detail&bmp=34&minmeasure=4

BMP AK-24
Concrete Washout

Objectives and Applications
The purpose of a concrete washout facility is to contain concrete and fluids from the chutes of concrete mixers and hoppers of concrete pumps when they are rinsed out after delivery. Washout facilities allow for easier disposal of consolidated solids and prevent pollution from run-off. Washout facility can consist of a pre-fabricated container or self-installed containment area, which can be above or below ground. Concrete washout facilities can be used on projects where concrete, stucco, mortar, grout, and cement are used as a construction material.

Common Failures - Generally due to faulty installation or maintenance.

- Overflow and discharge of waste when the facility is not covered prior to anticipated rainfall and/or when accumulated liquid wastes have not been removed.
- Leaking resulting from torn or damaged liners going unnoticed or not being replaced.
- Compromised structural integrity due to miscalculated capacity and installation, particularly for self-installed above-ground facilities.

Other Considerations

Operator education: Use of concrete washout areas as a BMP is only successful if concrete truck operators utilize them. Operators need to be made aware of the presence of these facilities. All concrete truck operators, including those of subcontractors, should be educated on the importance of managing concrete waste and washout procedures.

Spill response: Even with washout facilities present, there is still potential for accidental release of concrete materials including wash water and waste. It is important to have items in the spill kit that are capable of capturing, containing, or treating accidental discharge of concrete materials.

Pre-fabricated washout containers: A growing number of companies offer prefabricated containers specifically for concrete washout. However, prefabricated facilities can be any water tight unit that can contain all liquids and solid waste generated by washout operations. When available, prefabricated containers are delivered to the site and minimize installation efforts. They are also resistant to damage and protect against spills and leaks. Some companies will also offer complete service with their product that could include providing maintenance and regular disposal of waste materials. Such full-service options could relieve the superintendent of these responsibilities. However, when selecting a company that provides such an option, ensure that they are properly disposing of materials and give preference to companies that recycle collected materials.

Below-ground facilities: Use of below-ground containment area helps prevent breaches and reduces the likelihood of run-off. This option is recommended for projects expecting extensive concrete work. However, this option is not recommended for areas with high water tables or shallow groundwater such as near natural drainages, springs or wetlands.

Above-ground facilities: Above-ground containment areas must be sized and installed correctly, and diligently maintained in order to be effective. However, this option, particularly if a prefabricated container is unavailable, is better suited in areas with potentially high water tables to prevent leaching of wastewater into groundwater or in areas where excavation is not practical.

Design

Location: Do not place concrete washout facilities within 50 feet of storm drains, open ditches, or waterbodies. Concrete washout facilities should be placed in a location that provides convenient access for concrete trucks, preferably near the area where the concrete is being poured. Larger sites with extensive

concrete work should have concrete washout facilities at multiple locations for ease of use.

Capacity: Concrete washout facilities should be in sufficient quantity and size to handle the expected volume of solids, wash water, and rainfall to prevent overflow. To estimate capacity, Concrete Washout Systems, Inc., (2006) estimates that 7 gallons of wash water are used to wash one truck chute and 50 gallons are used to wash out the hopper of a concrete pump truck.

Containment area: The containment area of the washout facility can consist of a pre-fabricated container or a self-installed containment area. The prefabricated container selected should be of a sufficient size and capacity to contain the expected volume of generated waste from washout operations. Self-installed containment areas can either be installed above- or below-ground, and should be constructed to dimensions that provide sufficient capacity to contain the expected volume of generated waste from washout operations. For larger sites, it is recommended that self-installed containment (both above and below ground) areas be 10 feet wide by 10 feet long, with a depth to provide the sufficient capacity. However, above-ground self-installed containment areas shall not exceed a size and capacity in which the selected outside barrier becomes structurally unsound when filled with waste materials.

Cover: A temporary cover should be used as necessary to prevent rain or other precipitation from filling the facility and causing wash water to discharge into the environment. The cover should be secure, non-collapsing, non-water collecting cover.

Materials

Pre-fabricated washout containers: Prefabricated containers are usually made of sturdy materials such as plastic or metal.

Self-Installed facilities: Self-installed washout facilities can be made of a variety of materials depending on availability and site needs.

Barrier/Sidewalls: The sidewalls of an above-ground containment area can be made from staked straw bales, earthen berms, barrier walls and wood planks to name a few.

Liner: The liner should be an impermeable plastic sheeting of at least 10-mil thickness, and should be free of holes, tears, and other defects that may compromise the impermeability of the material. Because they are more prone to leaks, it is recommended that above-ground facilities use sheeting of at least 30-mil thickness or double or triple line the containment area if using the 10-mil thick sheeting.

Anchors: Anchors are used to secure the liner and certain sidewall materials for self-installed above ground containment areas. Types of anchors that may be used include, but are not limited to, sand bags, 6” wire staples, and wood or metal stakes.

Installation

Site considerations: The number and size of facilities provided should depend on the expected demand for storage capacity. Locate each facility at a location as described above.

Each facility on-site should have highly visible signage to indicate washout locations. It is recommended that signs be at least 48” by 24” and have 6” black letters on white background, and be placed at a height of 3 feet above ground level and within 30 feet of the facility.

If the washout facility is located on undeveloped property or off-pavement, stabilized access should be provided to prevent tracking (see Vehicle Tracking Entrance/Exit BMP).

Prefabricated washout containers: Installation of these containers is minimal. These containers are usually delivered to the site and would only need to be placed in the appropriate location. Some pre-fabricated models may involve assembly of the container and/or its accessories.

Self-Installed facilities:

Above-ground washout:
Construct the sidewalls to the desired size and capacity for the containment area. If not using an earthen berm for this purpose, ensure that the sidewall material is secure and each unit is butted tightly end to end. For use of straw bales in construction of the sidewall, it is required/recommended that the sidewall construction conform to the installation instructions provided below to ensure structural integrity. Line the entire area with the lining material, bringing the sheeting up over the sidewalls and securing the ends with sandbags, staples or other appropriate anchor.

Straw bales:
Excavate a trench the width of the bale and the length of the proposed barrier to a minimum depth of 4 in. Place the bales in a single row, lengthwise, with ends of the adjacent bales tightly abutting one another. Ensure that all bales are wire-bound or string tied. Install bales so that the bindings are oriented around the sides, rather than along the tops and the bottoms of the bales, in order to prevent deterioration of the bindings. Place and anchor each bale with at least two wood stakes, minimum dimensions, 2 in. x 2 in. x 36 in., or with # 4 reinforcing bars, driving the first stake toward the previously placed bale to force the bales together. Drive the stakes or reinforcing bars a minimum of 12 in. into the ground. Fill any gaps between bales with tightly wedged straw.

Below-ground washout:
Excavate a flat, subsurface pit to the desired size and capacity for the containment area. The resulting sidewall should not exceed 3:1 slopes. The base of the pit should be free of rocks and debris that may cause damage to the liner. It is recommended that the excavated material be used to create a berm along three sides of the pit, leaving the side providing access relatively flat. It is recommended that the berm be at least one foot high. Line the entire area with the lining material, bringing the sheeting up over the sidewalls and berm, and securing the ends with sandbags or other appropriate anchor.

Identify the washout pit with lath and flagging on three sides, leaving the approach unflagged.

Inspection
Check all concrete washout facilities frequently to determine if they have been filled to 70 percent capacity, which is when the materials need to be removed.

For any self-installed facility, inspect the plastic liner to ensure it's securely anchored and intact. Inspect the sidewalls for leaks and to ensure they have not been damaged by construction activities. For any prefabricated facility, inspect the unit for leaks and potential damage.

Check to ensure that each facility sign is still secure and visible.

Note whether facilities are being used regularly and whether operators have washed their chutes or hoppers in other locations. This helps to determine if additional facilities need to be placed, perhaps in more convenient locations, if additional signs or new signs need to be installed, or if operator education is needed.

Maintenance
Existing facilities must be cleaned once the washout is two-thirds full.

Concrete washouts are designed to promote evaporation where feasible. However, if stored liquids are not evaporating and are reaching capacity, vacuum and dispose of liquids in an approved manner (check with the local sanitary sewer authority to determine if there are special disposal requirements for concrete wash water).

Remove hardened solids whole or break them up first depending on the type of equipment available. Then re-use the solids on-site or haul them away for recycling or disposal. When removing materials from a self-installed washout, either construct another facility for use during cleaning or, if the existing structure is still intact, it can be re-used.

Before relining the structure, inspect it for signs of weakening or damage and make any necessary repairs. Then line the structure with

new plastic sheeting, checking that it is free of holes, tears and other damage. It is important that new plastic be used after every cleaning as equipment can damage the existing liner.

Any damaged facilities should be repaired promptly. If necessary, a new facility may be required until the existing facility is operational. Contain any spill or discharge of concrete waste materials

Replace or display new signage as needed.

Removal

An operational concrete washout facility should remain in place until all concrete for the project (or phase of the project) is poured. When the concrete facility is no longer needed, the hardened concrete should be removed and properly disposed of. Materials used to construct any above-ground containment area should be removed from the site and properly disposed of.

Holes, depressions or other ground disturbance caused by the creation or removal of the facility should be backfilled and stabilized with an approved stabilization BMP.

Appendix C. DOT&PF SWPPP Forms

This is a listing of all forms currently associated with SWPPP documentation. The latest versions and updates can be found online at http://www.dot.state.ak.us/stwddes/dcsconst/pop_constforms.shtml.

Form Number	Form Name
25D-114	SWPPP Amendment Log
25D-111	SWPPP Contractor Certification
25D-109	SWPPP DOT&PF Certification
25D-100	SWPPP Construction Inspection Report Form
25D-100 (Part 2)	SWPPP Inspection Report Form Part 2 (continuation sheets)
25D-115	SWPPP Daily Record of Rainfall
25D-113	SWPPP Delayed Action Item Report
25D-108	SWPPP Contractor Delegation of Signature for CGP Documents
25D-107	SWPPP DOT&PF Delegation of Signature for CGP Documents
25D-110	SWPPP Grading & Stabilization Activities Log
25D-112	SWPPP Corrective Action Log
25D-126	SWPPP Liquidated Damages Table
25D-106	SWPPP Preconstruction Site Visit
25D-105	SWPPP Subcontractor Certification
25D-125	SWPPP Training Log

Appendix D. Endangered or Threatened Species, Critical Habitat, and Historic Landmark Contacts

Regional Endangered Species Coordinator
Region 7 – Alaska
U.S. Fish and Wildlife Service
1011 E. Tudor Road
Anchorage, AK 99503-6199

Field Supervisor
U.S. Fish and Wildlife Service
Ecological Services
3000 Vintage Blvd., Suite 201
Juneau, AK. 99801

Field Supervisor
U.S. Fish and Wildlife Service
Ecological Services
605 West 4th Avenue, Room G-61
Anchorage, AK. 99501

Field Supervisor
U.S. Fish and Wildlife Service
Ecological Services
101 12th Avenue, Room 110
Fairbanks, AK. 99701

National Marine Fisheries Service
Protected Resources Division
222 W. 7th Avenue, #43
Anchorage, AK 99513-7577

National Marine Fisheries Service
Protected Resources Division
PO Box 21668
Juneau, AK 99802-1668

Office of History & Archaeology
Department of Natural Resources
State Historic Preservation Officer
550 West 7th Ave., Suite 1310
Anchorage AK 99501-3565

Appendix E. Oil and Hazardous Materials Reporting Requirements

Reporting Timeline

Oil/Petroleum Releases:

To water: any release of oil to water must be reported as soon as the person has knowledge of the discharge

To land:

- Any release of oil in ***excess of 55 gallons*** must be reported as soon as the person has knowledge of the discharge.

- Any release of oil in ***excess of 10 gallons but less than 55 gallons*** must be reported within 48 hours after the person has knowledge of the discharge.

- A person in charge of a facility or operation shall maintain, and provide to the Department on a monthly basis, a written record of any releases of oil ***from 1 to 10 gallons***.

To impermeable secondary containment areas: Any release of oil in ***excess of 55 gallons*** must be reported within 48 hours after the person has knowledge of the discharge.

Hazardous Substance Release: Any release of a hazardous substance must be reported as soon as the person has knowledge of the discharge.

Either Oil or Hazardous Substance, when the release endangers health or the environment:
Must be orally reported to DEC and EPA as required by the CGP Standard Permit Conditions and the consent decree, respectively, within 24 hours of discovery. A written report must follow within 5 days. See the contract and the CGP for details on what must be included in each of the reports and how the DEC report must be certified.

DEC Noncompliance Reporting
(877) 569-4114
dec-wqreporting@alaska.gov

EPA Noncompliance Reporting
(206) 553-0290
karlson.kristine@epa.gov

Reporting and Documentation Procedure

In the event of a release of oil that reaches any surface waters, or a release on land of certain hazardous substances (listed on the following pages) exceeding the Reportable Quantity (RQ) level, the Contractor must take the following steps:

1. Notify the Project Engineer
2. Notify the Alaska Department of Environmental Conservation (ADEC) at one of the following telephone numbers, depending on project location:
   - Central (Anchorage) 907-269-3063
   - Northern (Fairbanks) 907-451-2121
   - Southeast (Juneau) 907-465-5340
   - Outside normal business hours, call:1-800-478-9300

During telephone notification to ADEC, they will assist you in completing an Oil and Hazardous Substances Spill Notification Form. Submit it to ADEC after telephone notification (A copy of the form appears after the list of hazardous substances below.)

3. Notify the National Response Center in Washington, D.C., immediately at (800) 424-8802 or 202-267-2675 if you do not have 800 access. There is also an online reporting tool available at http://www.nrc.uscg.mil/nrchp.html
4. Update the SWPPP describing the release, all actions taken and any revisions made to the SWPPP (additions or deletions).
5. Within 14 days, submit a written description of the release to the Environmental Protection Agency (EPA) regional office providing the date and circumstances of the release and the steps to be taken to prevent another release
   U.S. Environmental Protection Agency
   1200 Sixth Avenue
   Seattle, WA 98101

In the event of a release of any amount of certain hazardous substances (listed on the following pages), or a spill of 1 gallon or more of oil on land the Contractor must:

Take steps 1, 2 and 4 above

Note: "oil" means oil of any kind and in any form, whether crude, refined, or a petroleum by-product, including but not limited to petroleum, fuel oil, gasoline, lubricating oils, oily sludge, oil refuse, oil mixed with other wastes, crude oils, liquefied natural gas, propane, butane, or other liquid hydrocarbons regardless of specific gravity.

Table 117.3
Reportable Quantities of Hazardous Substances Designated Pursuant to Section 311 of the Clean Water Act

Material	Category	RQ in pounds (kilograms)
Acetaldehyde	C	1,000 (454)
Acetic acid	D	5,000 (2,270)
Acetic anhydride	D	5,000 (2,270)
Acetone cyanohydrin	A	10 (4.54)
Acetyl bromide	D	5,000 (2,270)
Acetyl chloride	D	5,000 (2,270)
Acrolein	X	1 (0.454)
Acrylonitrile	B	100 (45.4)
Adipic acid	D	5,000 (2,270)
Aldrin	X	1 (0.454)
Allyl alcohol	B	100 (45.4)
Allyl chloride	C	1,000 (454)
Aluminum sulfate	D	5,000 (2,270)
Ammonia	B	100 (45.4)
Ammonium acetate	D	5,000 (2,270)
Ammonium benzoate	D	5,000 (2,270)
Ammonium bicarbonate	D	5,000 (2,270)
Ammonium bichromate	A	10 (4.54)
Ammonium bifluoride	B	100 (45.4)
Ammonium bisulfite	D	5,000 (2,270)
Ammonium carbamate	D	5,000 (2,270)
Ammonium carbonate	D	5,000 (2,270)
Ammonium chloride	D	5,000 (2,270)
Ammonium chromate	A	10 (4.54)
Ammonium citrate dibasic	D	5,000 (2,270)
Ammonium fluoborate	D	5,000 (2,270)
Ammonium fluoride	B	100 (45.4)
Ammonium hydroxide	C	1,000 (454)
Ammonium oxalate	D	5,000 (2,270)
Ammonium silicofluoride	C	1,000 (454)
Ammonium sulfamate	D	5,000 (2,270)
Ammonium sulfide	B	100 (45.4)
Ammonium sulfite	D	5,000 (2,270)
Ammonium tartrate	D	5,000 (2,270)
Ammonium thiocyanate	D	5,000 (2,270)
Amyl acetate	D	5,000 (2,270)
Aniline	D	5,000 (2,270)
Antimony pentachloride	C	1,000 (454)
Antimony potassium tartrate	B	100 (45.4)
Antimony tribromide	C	1,000 (454)
Antimony trichloride	C	1,000 (454)
Antimony trifluoride	C	1,000 (454)
Antimony trioxide	C	1,000 (454)
Arsenic disulfide	X	1 (0.454)
Arsenic pentoxide	X	1 (0.454)
Arsenic trichloride	X	1 (0.454)

Material	Category	RQ in pounds (kilograms)
Arsenic trioxide	X	1 (0.454)
Arsenic trisulfide	X	1 (0.454)
Barium cyanide	A	10 (4.54)
Benzene	A	10 (4.54)
Benzoic acid	D	5,000 (2,270)
Benzonitrile	D	5,000 (2,270)
Benzoyl chloride	C	1,000 (454)
Benzyl chloride	B	100 (45.4)
Beryllium chloride	X	1 (0.454)
Beryllium fluoride	X	1 (0.454)
Beryllium nitrate	X	1 (0.454)
Butyl acetate	D	5,000 (2,270)
Butylamine	C	1,000 (454)
n-Butyl phthalate	A	10 (4.54)
Butyric acid	D	5,000 (2,270)
Cadmium acetate	A	10 (4.54)
Cadmium bromide	A	10 (4.54)
Cadmium chloride	A	10 (4.54)
Calcium arsenate	X	1 (0.454)
Calcium arsenite	X	1 (0.454)
Calcium carbide	A	10 (4.54)
Calcium chromate	A	10 (4.54)
Calcium cyanide	A	10 (4.54)
Calcium dodecylbenzenesulfonate	C	1,000 (454)
Calcium hypochlorite	A	10 (4.54)
Captan	A	10 (4.54)
Carbaryl	B	100 (45.4)
Carbofuran	A	10 (4.54)
Carbon disulfide	B	100 (45.4)
Carbon tetrachloride	A	10 (4.54)
Chlordane	X	1 (0.454)
Chlorine	A	10 (4.54)
Chlorobenzene	B	100 (45.4)
Chloroform	A	10 (4.54)
Chlorosulfonic acid	C	1,000 (454)
Chlorpyrifos	X	1 (0.454)
Chromic acetate	C	1,000 (454)
Chromic acid	A	10 (4.54)
Chromic sulfate	C	1,000 (454)
Chromous chloride	C	1,000 (454)
Cobaltous bromide	C	1,000 (454)
Cobaltous formate	C	1,000 (454)
Cobaltous sulfamate	C	1,000 (454)
Coumaphos	A	10 (4.54)
Cresol	B	100 (45.4)
Crotonaldehyde	B	100 (45.4)
Cupric acetate	B	100 (45.4)
Cupric acetoarsenite	X	1 (0.454)
Cupric chloride	A	10 (4.54)
Cupric nitrate	B	100 (45.4)
Cupric oxalate	B	100 (45.4)

Material	Category	RQ in pounds (kilograms)
Cupric sulfate	A	10 (4.54)
Cupric sulfate, ammoniated	B	100 (45.4)
Cupric tartrate	B	100 (45.4)
Cyanogen chloride	A	10 (4.54)
Cyclohexane	C	1,000 (454)
2,4-D Acid	B	100 (45.4)
2,4-D Esters	B	100 (45.4)
DDT	X	1 (0.454)
Diazinon	X	1 (0.454)
Dicamba	C	1,000 (454)
Dichlobenil	B	100 (45.4)
Dichlone	X	1 (0.454)
Dichlorobenzene	B	100 (45.4)
Dichloropropane	C	1,000 (454)
Dichloropropene	B	100 (45.4)
Dichloropropene-Dichloropropane (mixture)	B	100 (45.4)
2,2-Dichloropropionic acid	D	5,000 (2,270)
Dichlorvos	A	10 (4.54)
Dicofol	A	10 (4.54)
Dieldrin	X	1 (0.454)
Diethylamine	B	100 (45.4)
Dimethylamine	C	1,000 (454)
Dinitrobenzene (mixed)	B	100 (45.4)
Dinitrophenol	A	10 (45.4)
Dinitrotoluene	A	10 (4.54)
Diquat	C	1,000 (454)
Disulfoton	X	1 (0.454)
Diuron	B	100 (45.4)
Dodecylbenzenesulfonic acid	C	1,000 (454)
Endosulfan	X	1 (0.454)
Endrin	X	1 (0.454)
Epichlorohydrin	B	100 (45.4)
Ethion	A	10 (4.54)
Ethylbenzene	C	1,000 (454)
Ethylenediamine	D	5,000 (2,270)
Ethylenediamine-tetraacetic acid (EDTA)	D	5,000 (2,270)
Ethylene dibromide	X	1 (0.454)
Ethylene dichloride	B	100 (45.4)
Ferric ammonium citrate	C	1,000 (454)
Ferric ammonium oxalate	C	1,000 (454)
Ferric chloride	C	1,000 (454)
Ferric fluoride	B	100 (45.4)
Ferric nitrate	C	1,000 (454)
Ferric sulfate	C	1,000 (454)
Ferrous ammonium sulfate	C	1,000 (454)
Ferrous chloride	B	100 (45.4)
Ferrous sulfate	C	1,000 (454)
Formaldehyde	B	100 (45.4)

Material	Category	RQ in pounds (kilograms)
Formic acid	D	5,000 (2,270)
Fumaric acid	D	5,000 (2,270)
Furfural	D	5,000 (2,270)
Guthion	X	1 (0.454)
Heptachlor	X	1 (0.454)
Hexachlorocyclopentadiene	A	10 (4.54)
Hydrochloric acid	D	5,000 (2,270)
Hydrofluoric acid	B	100 (45.4)
Hydrogen cyanide	A	10 (4.54)
Hydrogen sulfide	B	100 (45.4)
Isoprene	B	100 (45.4)
Isopropanolamine dodecylbenzenesulfonate	C	1,000 (454)
Kepone	X	1 (0.454)
Lead acetate	A	10 (4.54)
Lead arsenate	X	1 (0.454)
Lead chloride	A	10 (4.54)
Lead fluoborate	A	10 (4.54)
Lead fluoride	A	10 (4.54)
Lead iodide	A	10 (4.54)
Lead nitrate	A	10 (4.54)
Lead stearate	A	10 (4.54)
Lead sulfate	A	10 (4.54)
Lead sulfide	A	10 (4.54)
Lead thiocyanate	A	10 (4.54)
Lindane	X	1 (0.454)
Lithium chromate	A	10 (4.54)
Malathion	B	100 (45.4)
Maleic acid	D	5,000 (2,270)
Maleic anhydride	D	5,000 (2,270)
Mercaptodimethur	A	10 (4.54)
Mercuric cyanide	X	1 (0.454)
Mercuric nitrate	A	10 (4.54)
Mercuric sulfate	A	10 (4.54)
Mercuric thiocyanate	A	10 (4.54)
Mercurous nitrate	A	10 (4.54)
Methoxychlor	X	1 (0.454)
Methyl mercaptan	B	100 (45.4)
Methyl methacrylate	C	1,000 (454)
Methyl parathion	B	100 (45.4)
Mevinphos	A	10 (4.54)
Mexacarbate	C	1,000 (454)
Monoethylamine	B	100 (45.4)
Monomethylamine	B	100 (45.4)
Naled	A	10 (4.54)
Naphthalene	B	100 (45.4)
Naphthenic acid	B	100 (45.4)

Material	Category	RQ in pounds (kilograms)
Nickel ammonium sulfate	B	100 (45.4)
Nickel chloride	B	100 (45.4)
Nickel hydroxide	A	10 (4.54)
Nickel nitrate	B	100 (45.4)
Nickel sulfate	B	100 (45.4)
Nitric acid	C	1,000 (454)
Nitrobenzene	C	1,000 (454)
Nitrogen dioxide	A	10 (4.54)
Nitrophenol (mixed)	B	100 (45.4)
Nitrotoluene	C	1,000 (454)
Paraformaldehyde	C	1,000 (454)
Parathion	A	10 (4.54)
Pentachlorophenol	A	10 (4.54)
Phenol	C	1,000 (454)
Phosgene	A	10 (4.54)
Phosphoric acid	D	5,000 (2,270)
Phosphorus	X	1 (0.454)
Phosphorus oxychloride	C	1,000 (454)
Phosphorus pentasulfide	B	100 (45.4)
Phosphorus trichloride	C	1,000 (454)
Polychlorinated biphenyls	X	1 (0.454)
Potassium arsenate	X	1 (0.454)
Potassium arsenite	X	1 (0.454)
Potassium bichromate	A	10 (4.54)
Potassium chromate	A	10 (4.54)
Potassium cyanide	A	10 (4.54)
Potassium hydroxide	C	1,000 (454)
Potassium permanganate	B	100 (45.4)
Propargite	A	10 (4.54)
Propionic Acid	D	5,000 (2,270)
Propionic anhydride	D	5,000 (2,270)
Propylene oxide	B	100 (45.4)
Pyrethrins	X	1 (0.454)
Quinoline	D	5,000 (2,270)
Resorcinol	D	5,000 (2,270)
Selenium oxide	A	10 (4.54)
Silver nitrate	X	1 (0.454)
Sodium	A	10 (4.54)
Sodium arsenate	X	1 (0.454)
Sodium arsenite	X	1 (0.454)
Sodium bichromate	A	10 (4.54)
Sodium bifluoride	B	100 (45.4)
Sodium bisulfite	D	5,000 (2,270)
Sodium chromate	A	10 (4.54)
Sodium cyanide	A	10 (4.54)
Sodium dodecylbenzenesulfonate	C	1,000 (454)
Sodium fluoride	C	1,000 (454)
Sodium hydrosulfide	D	5,000 (2,270)
Sodium hydroxide	C	1,000 (454)

Material	Category	RQ in pounds (kilograms)
Sodium hypochlorite	B	100 (45.4)
Sodium methylate	C	1,000 (454)
Sodium nitrite	B	100 (45.4)
Sodium phosphate, dibasic	D	5,000 (2,270)
Sodium phosphate, tribasic	D	5,000 (2,270)
Sodium selenite	B	100 (45.4)
Strontium chromate	A	10 (4.54)
Strychnine	A	10 (4.54)
Styrene	C	1,000 (454)
Sulfuric acid	C	1,000 (454)
Sulfur monochloride	C	1,000 (454)
2,4,5-T acid	C	1,000 (454)
2,4,5-T amines	D	5,000 (2,270)
2,4,5-T esters	C	1,000 (454)
2,4,5-T salts	C	1,000 (454)
TDE	X	1 (0.454)
2,4,5-TP acid	B	100 (45.4)
2,4,5-TP acid esters	B	100 (45.4)
Tetraethyl lead	A	10 (4.54)
Tetraethyl pyrophosphate	A	10 (4.54)
Thallium sulfate	B	100 (45.4)
Toluene	C	1,000 (454)
Toxaphene	X	1 (0.454)
Trichlorfon	B	100 (45.4)
Trichloroethylene	B	100 (45.4)
Trichlorophenol	A	10 (4.54)
Triethanolamine dodecylbenzenesulfonate	C	1,000 (454)
Triethylamine	D	5,000 (2,270)
Trimethylamine	B	100 (45.4)
Uranyl acetate	B	100 (45.4)
Uranyl nitrate	B	100 (45.4)
Vanadium pentoxide	C	1,000 (454)
Vanadyl sulfate	C	1,000 (454)
Vinyl acetate	D	5,000 (2,270)
Vinylidene chloride	B	100 (45.4)
Xylene (mixed)	B	100 (45.4)
Xylenol	C	1,000 (454)
Zinc acetate	C	1,000 (454)
Zinc ammonium chloride	C	1,000 (454)
Zinc borate	C	1,000 (454)
Zinc bromide	C	1,000 (454)
Zinc carbonate	C	1,000 (454)
Zinc chloride	C	1,000 (454)
Zinc cyanide	A	10 (4.54)
Zinc fluoride	C	1,000 (454)
Zinc formate	C	1,000 (454)
Zinc hydrosulfite	C	1,000 (454)
Zinc nitrate	C	1,000 (454)

Material	Category	RQ in pounds (kilograms)
Zinc phenolsulfonate	D	5,000 (2,270)
Zinc phosphide	B	100 (45.4)
Zinc silicofluoride	D	5,000 (2,270)
Zinc sulfate	C	1,000 (454)
Zirconium nitrate	D	5,000 (2,270)
Zirconium potassium fluoride	C	1,000 (454)
Zirconium sulfate	D	5,000 (2,270)
Zirconium tetrachloride	D	5,000 (2,270)

[50 FR 13513, Apr. 4, 1985, as amended at 51 FR 34547, Sept. 29, 1986; 54 FR 33482, Aug. 14, 1989; 58 FR 35327, June 30, 1993; 60 FR 30937, June 12, 1995]

ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION

OIL & HAZARDOUS SUBSTANCES SPILL NOTIFICATION FORM

ADEC USE ONLY

ADEC SPILL #:	ADEC FILE #:	ADEC LC:

PERSON REPORTING:	PHONE NUMBER:	REPORTED HOW? (ADEC USE ONLY) ☐ Phone ☐ Fax ☐ Troopers
DATE/TIME OF SPILL:	DATE/TIME DISCOVERED:	DATE/TIME REPORTED:
INCIDENT LOCATION/ADDRESS:	DATUM: ☐ NAD27 ☐ NAD83 ☐ WGS84 ☐ Other LAT. LONG.	PRODUCT SPILLED:

QUANTITY SPILLED: ☐ gallons ☐ pounds	QUANTITY CONTAINED: ☐ gallons ☐ pounds	QUANTITY RECOVERED: ☐ gallons ☐ pounds	QUANTITY DISPOSED: ☐ gallons ☐ pounds

	POTENTIAL RESPONSIBLE PARTY:	OTHER PRP, IF ANY:	VESSEL NAME:
Name/Business:			
Mailing Address:			VESSEL NUMBER:
Contact Name:			> 400 GROSS TON VESSEL: ☐ Yes ☐ No
Contact Number:			

SOURCE OF SPILL:	CAUSE CLASSIFICATION:
CAUSE OF SPILL: ☐ Under Investigation	☐ Accident ☐ Human Factors ☐ Structural/Mechanical ☐ Other

CLEANUP ACTIONS:

DISPOSAL METHODS AND LOCATION:

AFFECTED AREA SIZE:	SURFACE TYPE: *(gravel, asphalt, name of river etc.)*	RESOURCES AFFECTED/THREATENED: *(Water sources, wildlife, wells, etc.)*

COMMENTS:

ADEC USE ONLY

SPILL NAME:	NAME OF DEC STAFF RESPONDING:	C-PLAN MGR NOTIFIED? ☐ Yes ☐ No

DEC RESPONSE: ☐ Phone follow-up ☐ Field visit ☐ Took Report	CASELOAD CODE: ☐ First and Final ☐ Open/No LC ☐ LC Assigned	CLEANUP CLOSURE ACTION: ☐ NFA ☐ Monitoring ☐ Transferred to CS or STP
COMMENTS:	**Status of Case: ☐ Open ☐ Closed**	**DATE CASE CLOSED:**
REPORT PREPARED BY:		DATE:

Revised 2/2008

Appendix F. Web Links for SWPPP Resources

Alaska Endangered Species Information
- http://alaska.fws.gov/fisheries/endangered/index.htm

Alaska Coastal Revegetation and Erosion Control Guide
- http://www.plants.alaska.gov/

Consent Decree
- http://www.dot.state.ak.us/stwddes/desenviron/assets/pdf/swppp/consent_decree_060210.pdf

Construction Industry Compliance Assistance Center
- http://www.CICAcenter.org/bmps.html

DEC Alaska Storm Water Guide
- http://www.dec.state.ak.us/water/wnpspc/stormwater/index.htm

EPA SWPPP template
- http://www.epa.gov/npdes/swpppguide

EPA SWPPP Guide
- http://www.epa.gov/npdes/swpppguide

Erosion Control Technology Council
- http://www.ectc.org/index.asp

International Erosion Control Association
- http://www.ieca.org/Resources/Resources.asp

National Marine Fisheries Service (NMFS)
- http://www.fakr.noaa.gov/protectedresources/default.htm

National Menu of Storm Water Best Management Practices
- http://www.epa.gov/npdes/stormwater/menuofbmps

Notice of Intent (eNOI) form
- http://www.dec.state.ak.us/water/wnpspc/stormwater/APDESeNOI.html

A Revegetation Manual for Alaska
- http://www.plants.alaska.gov/

Storm Water General Permit for Large and Small Construction Activities
- http://www.dec.state.ak.us/water/wnpspc/stormwater/Index.htm

SWPPP Related Forms
- http://www.dot.state.ak.us/stwddes/dcsconst/pop_constforms.shtml

U.S. Fish and Wildlife Service (USFWS)
- http://endangered.fws.gov