TEMPORARY EROSION AND SEDIMENT CONTROL PLAN Carlisle Crossing

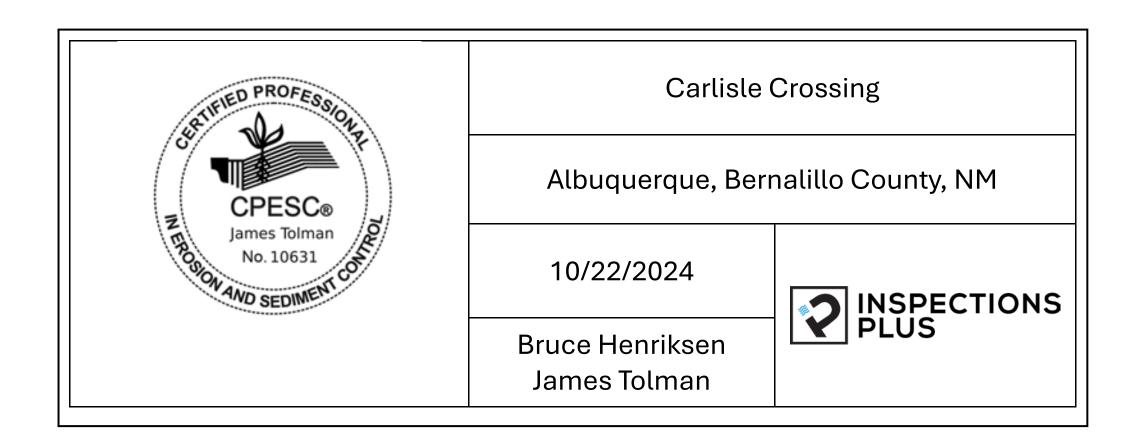
Indian School Rd. NE & Carlisle Blvd. NE, Albuquerque NM 87120

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ARIZON UADALURE CIBOLA LOS LUNES VALENCIA Estancia Clovis. Socorro CATRON SOCORRO Truth or Consequences Alamogordo Lovington LEA Silver City DONA OTERO Lordsburg TEXAS **NEW MEXICO**

LATITUDE: 35.104018 LONGITUDE: -106.603612

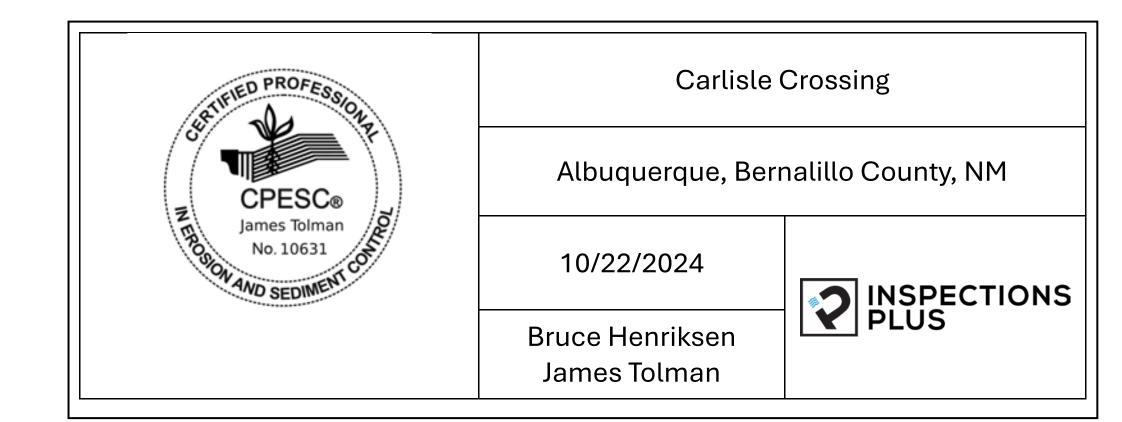


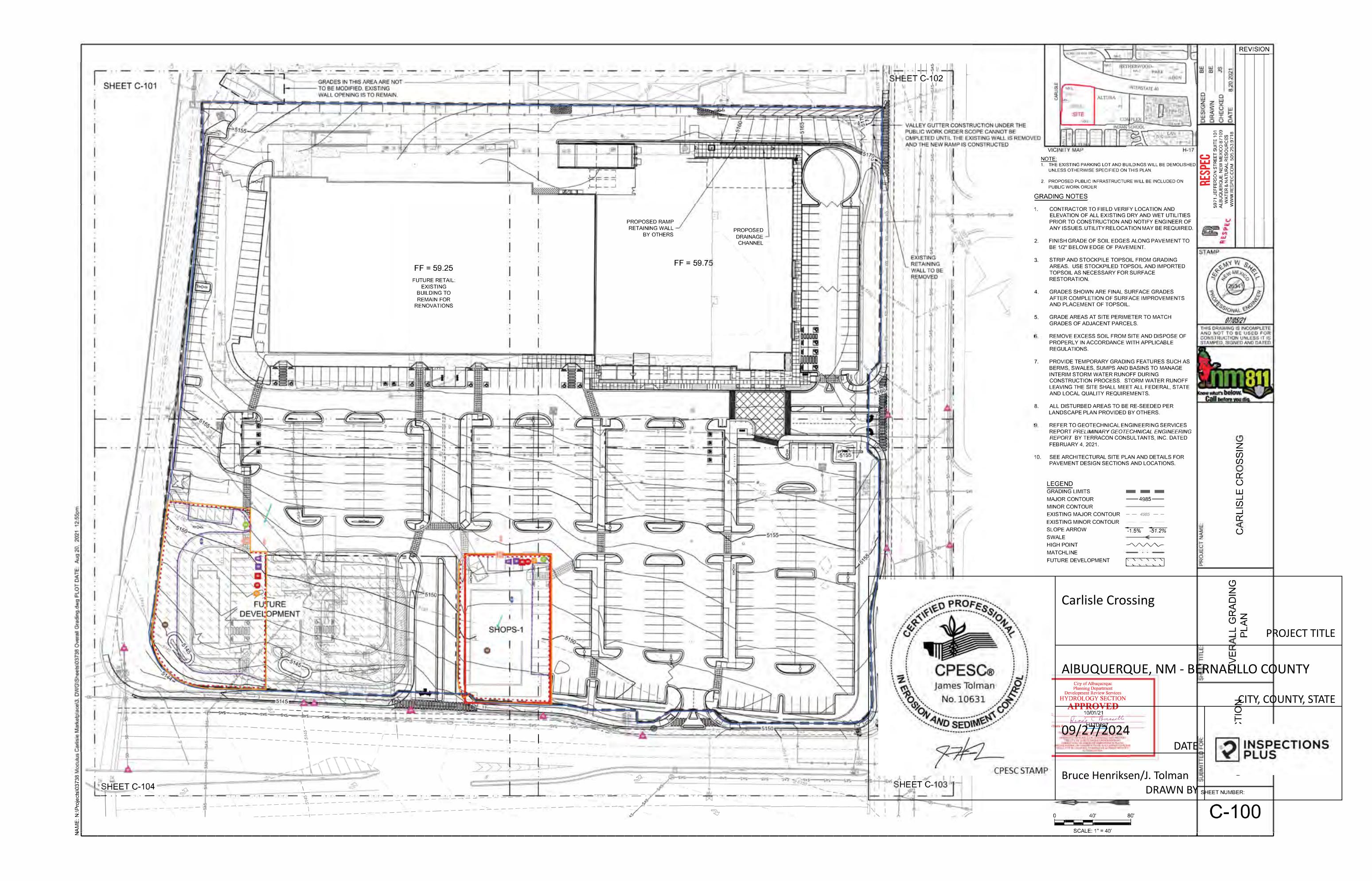
TEMPORARY EROSION AND SEDIMENT CONTROL PLAN

PERMIT NUMBER:	NMR
	NMR
OWNER NAME:	Carlisle Associates LP
OWNER POINT OF CONTACT:	Michael Falzarano
NOI PREPARED BY:	Inspections Plus
PROJECT/SITE NAME:	Carlisle Crossing
PROJECT/SITE ADDRESS:	Indian School Rd. NE & Carlisle Blvd. NE
LATITUDE	35.104018
LONGITUDE	-106.603612
ESTIMATED PROJECT START DATE	10/01/2024
ESTIMATED PROJECT COMPLETION DATE	10/31/2025
PROPERTY SIZE	16.00 acres
TOTAL AREA OF DISTURBANCE	0.83 acres
MAXIMUM AREA DISTURBED AT ONE TIME	0.83 acres
TYPE OF CONSTRUCTION	Commercial
DEMOLITION OF ANY STRUCTURES 10,000	N/A
SQ FT OR GREATER BUILT OR RENOVATED	
BEFORE JANUARY 1, 1980?	
WAS THE PREDEVELOPMENT LAND USED	N/A
FOR AGRICULTURE?	
COMMENCED EARTH DISTURBING	No
ACTIVITIES?	
DISCHARGE TO MS4? MS4 NAME	Yes – COA
SURFACE WATERS WITHIN 50 FT?	No Company of the state of the
RECEIVING WATER	Amafra North Diversion Channel
REC. WATER IMPAIRED? TIER	No
WHAT IMPAIREMENTS?	N/A
SWPPP CONTACT INFORMATION	Maichael Falzarano 516-281-1507 ichaelf@rosenmgmt.com
ENDANGERED SPECIES CRITERIA	Criterion "A", No Critical Habitats
HISTORICAL LOCATION CRITERIA	Preexisting Development

ESC Plan Stnadard Notes (2023-06-16)

- 1. All Erosion and Sediment Control (ESC) work on these plans, except as otherwise stated or provided hereon shall be permitted, constructed, inspected and maintained in accordance with:
 - a. The City Ordinance § 14-5-2-11, the ESC Ordinance,
 - b. The EPA's 2022 Construction General Permit (CGP), and
 - c. The City of Albuquerque Construction BMP Manual
- 2. All BMP's must be installed prior to beginning any earth moving activities except as specified hereon in the Phasing Plan. Construction of earthen BMP's such as sediment traps, sediment basins, and diversion berms shall be completed and inspected prior to any other construction or earthwork. Self-inspection is required after installation of the BMP's and prior to beginning construction.
- 3. Self-inspections In accordance with City Ordinance § 14-5-2-11(C)(1), "at a minimum a routine self-inspection is required to review the project for compliance with the Construction General Permit once every 14 days and after any precipitation event of ¼ inch or greater until the site construction has been completed and the site determined as stabilized by the city. Reports of these inspections shall be kept by the person or entity authorized to direct the construction activities on the site and made available upon request."
- 4. Corrective action reports must be kept by the person or entity authorized to direct the construction activities on the site and made available upon request.
- 5. Final stabilization and Notice of Termination (NOT) In accordance with City Ordinance § 14-5-2-11(C)(1), self-inspections must continue until the site is "determined as stabilized by the city." The property owner/operator is responsible for determining when the "Conditions for Terminating CGP Coverage" per CGP Part 8.2 are satisfied and then filing their Notice of Termination (NOT) with the EPA. Each operator may terminate the CGP coverage only if one or more of the conditions in Part 8.2.1, 8.2.2, or 8.2.3 has occurred. After filing the NOT with the EPA, the property owner is responsible for requesting a Determination of Stabilization from the City.
- 6. When doing work in the City right-of-way (e.g. sidewalk, drive pads, utilities, etc.) prevent dirt from getting into the street. If dirt is present in the street, the street should be swept daily or prior to a rain event or contractor induced water event (e.g. curb cut or water test).
- 7. When installing utilities behind the curb, the excavated dirt should not be placed in the street.
- 8. When cutting the street for utilities the dirt shall be placed on the uphill side of the street cut and the area swept after the work is complete. A wattle or mulch sock may be placed at the toe of the excavated dirt pile if the site constraints do not allow placing the excavated dirt on the uphill side of the street cut.
- 9. ESC Plans must show longitudinal street slope and street names. On streets where the longitudinal slope is steeper than 2.5%, wattles/mulch socks or j-hook silt fence shall be shown in the front yard swale or on the side of the street.





Carlisle Crossing Inspections Plus, LLC Commercial SWPPP Map-Final

LEGEND



- Property Boundary (1)
- Limit of Disturbance (2)
- • Silt Fence (3)
- Cutback Curb / Sidewalk (2)
- Pre & Post Construction Water Flow (2)
- Materials Storage (2)
- Stockpiles (2)
- Water Truck (2)
- Street Sweeping (2)
- Insert Inlet Protection (13)
- Portable Toilet with Secondary Containment (2)
- Dumpster (2)
- Spill Kit (2)
- SWPPP Sign (2)
- Portable Conctete Washout (2)
- Stabilized Construction Exit (2)

Bioretention Trash Best Management Practices (BMP) **Minimum Specifications**





Figure A: CA State University-Sacramento Bioretention BMP

Figure B. American Common Bio-Swale Detail

Bioretention BMPs, including bio-swales, remove pollutants from storm water runoff through physical filtration as storm water passes through media layers. The treatment area consists of: a ponding layer; vegetated, mulched, and engineered soil layer; and supporting bed layer of sand or gravel. Bioretention BMPs can be a variety of shapes and sizes. Storm water entering the treatment area evapotranspires or gradually passes through the mulch/soil/gravel layers where it then infiltrates into native soil or collects in an underdrain that conveys to a discharge point.

Performance and Design

The bioretention BMP must be designed to trap trash particles that are 5 mm or greater and prevent offsite migration, and the design must include:

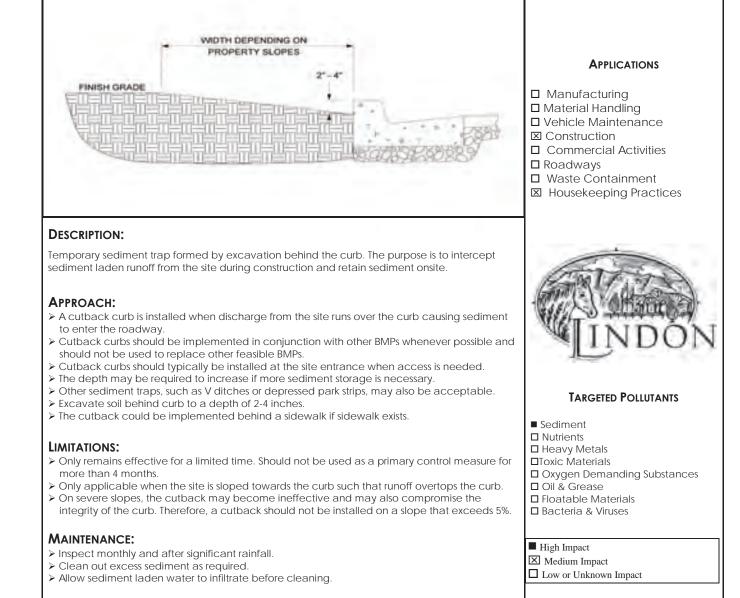
- 1. A screen¹ that prohibits the discharge of particles 5 mm or greater at the BMP overflow or bypass outlet; 2. A treatment capacity equal to or greater than the volume collected during the region specific one-year, one-hour storm event from the applicable drainage area; or a capacity to carry at least the same flows of the corresponding storm drain; and
- 3. Stamped and signed design plans by a registered California licensed professional civil engineer (see Bus. & Prof. Code Section 6700, et seq.).

Maintenance

BMP: Cutback Curb

Regular maintenance is required to maintain adequate trash capture capacity and to ensure that trapped trash does not migrate offsite. The owner should establish a maintenance schedule based on site-specific factors, including the size of the bioretention BMP trench, storm frequency, and characterization of upstream trash and vegetation accumulation. Trash capture and maintenance may be improved by addition of various forms of pretreatment, such as upstream swales or forebays.

¹Upon approval by the Regional Water Quality Control Board Executive Officer, an external design feature or upgradient structure designed to bypass flows exceeding the region specific one-year, one-hour, storm event does not require a 5 mm screen.



IMPLEMENTATION REQUIREMENTS

I High ⊠ Medium □ Low

□ Capital Costs

⊠Maintenance □ Training

☑ O&M Costs



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Construction Stormwater Best Management Practices

Wind Erosion Control

WEC-1 Dust Control

Dust control is a practice used to reduce the air transport of dust during construction activities by stabilizing exposed surfaces and minimizing activities that suspend or track dust particles.

Control dust so dust does not infiltrate into stormwater and does not cause discomfort or nuisance to occupants of the Project site or neighboring properties.

Conditions

Wind erosion control BMPs should be applied to all construction earth disturbing

activities, including the following construction activities: Where the Practice Applies • Construction vehicle traffic on unpaved surfaces.

- Drilling and blasting activities.
 - Sediment tracking onto paved roads.
 - Soils and debris storage piles.
 - Batch drop from front-end loaders.
 - Areas with unstabilized soil. • Final grading/site stabilization

Specifications:

<u>Preventive Measures:</u>

Design and • Schedule construction activities to minimize exposed area. Installation

- Quickly stabilize exposed soils.
- Identify and stabilize key access points prior to construction. • Minimize the impact of dust by anticipating the direction of prevailing winds.
- Direct most construction traffic to stabilized roadways within the Project site.
- Water should be applied by means of pressure-type distributors or pipelines equipped with a spray system or hoses and nozzles that will ensure even distribution.
- All distribution equipment should be equipped with a positive means of shutoff.
- Unless water is applied by means of pipelines, at least one mobile unit should be available at all times to apply water or dust palliative to the Project.
- Pave or chemically stabilize access points where unpaved traffic surfaces adjoin
- paved roads. • Provide covers for haul trucks transporting materials that contribute to dust.
- Provide for wet suppression or chemical stabilization of exposed soils.
- Provide for rapid clean up of sediments deposited on paved roads. Furnish stabilized construction road entrances.
- Stabilize inactive construction sites using BMPs such as vegetation.
- Limit the amount of areas disturbed by clearing and earth moving operations by scheduling these activities in phases.
- Cover stockpiles with plastics and make sure they are secure.

Sources include EPA, SWRCB, Caltrans, CASQA

OUTPAK CORRUGATED WASHOUT

GENERAL PART 1:

1.01 Description

- Work shall consist of furnishing and installing an OUPAK CORRUGATED CONCRETE WASHOUT in accordance with these specifications and in conformity with the plans.
- Work includes preparing foundation soil, furnishing and installing leveling pad, washout
- C. The washout may be used for concrete, sediment, paint, drywall, stucco, or mortar.

1.02 Submittals/Certification

- Contractor shall submit a Manufacturer's certification, prior to start of work, that the washout meets the requirements of this specification.
- The washout location should be shown on the Project specific Storm Water Pollution Plan (SWPPP) drawings or Erosion and Sediment Control Plan (ESCP) drawings.

1.03 Delivery, Storage and Handling

- Contractor shall check all materials upon delivery to assure that the size, type, and quantities have been received.
- Contractor shall protect all materials from damage due to jobsite conditions and in accordance with manufacturer's recommendations. Damaged materials shall not be incorporated into the work.

PART 2: PRODUCTS

2.01 Washout

- A. The Washout consists of a corrugated box and a 6-mm poly liner.
- The Outpak Corrugated Box is constructed of water resistant 350#VC# water-treated Kraft fiberboard

2.02 Base

Material shall consist of native or imported soil. May also be level asphalt or concrete

PART 3: **EXECUTION**

3.01 Prepare Level Surface

Locate level area to deploy. The washout should be located away from storm drains, gutters, or other stormwater conveyances as much as practical.

Outpak Corrugated Concrete Washout

Construction Stormwater Best Management Practices

Outpak Corrugated Concrete Washout

Clear area where washout is to be deployed of debris, rocks, other materials that may

Locate a level area to deploy the Washout and clear it of any debris that may cause

Cover the corrugated box with the enclosed 6-mm polyethylene liner.

Secure Liner into pinch points at top washout box perimeter.

OutPak's Slurry Solution to solidify wastewater.

washout and causing a discharge of wash water.

removed, cover protrusions with imported sand.

Unfold the corrugated box.

for easy transportation.

prevention documents.

3.02 Set Up Washout

3.03 Dispose Outpak Washout

3.04 Field Quality Control

puncture the corrugated board and 6-mm plastic liner. If rocks or other debris cannot be

Insert tie-down stakes if required (note tie-down stakes are not provided with corrugated

After the Washout has been filled with washout residue material, allow the wastewater to

evaporate leaving only solid concrete residue. Wastewater can be pumped form the

washout and disposed of a facility permitted to receive liquid waste. Alternatively, use

After residue has dried, load the hardened unit onto a flat-bed truck or dump truck with

Check washout unit for leaks. Ensure wash water is not leaking out of washout.

Washouts may be used for multiple washout events and concrete placement events.

Cover the Washout if precipitation is likely. Prevent stormwater from over-filling the

If the washout is moved, note the new location in the project stormwater pollution

Make sure that the washout has sufficient free space to hold the next planned washout

construction equipment such as a forklift or loader. Full, hardened units can be stacked

F. If a storm is imminent cover the Outpak washout with a tarp to prevent overflow of the

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- Maintenance & Inspect BMPs prior to forecast rain, daily during extended rain events, after rain
 - events, and weekly throughout the life of the Project. • Inspect and verify that activity-based BMPs are in place prior to the
 - commencement of associated activities.
 - Check areas protected to ensure coverage.
 - Most dust control measures require frequent, often daily, or multiple times per day

BMP: Employee Training

Construction

DESCRIPTION:

Employee training, like equipment maintenance, is a method by which to implement BMPs. Employee training should be used in conjunction with all other BMPs as part of the facility's

The specific employee training aspects of each of the source controls are highlighted in the individual information sheets. The focus of this information sheet is more general, and includes the overall objectives and approach for assuring employee training in stormwater pollution prevention. Accordingly, the organization of this information sheet differs somewhat from the other information sheets in this chapter.

OBJECTIVES:

Employee training should be based on four objectives:

- Promote a clear identification and understanding of the problem, including activities with the potential to pollute stormwater;
- Identify solutions (BMPs);
- Promote employee ownership of the problems and the solutions; and
- Integrate employee feedback into training and BMP implementation.

- Integrate training regarding stormwater quality management with existing training programs that may be required for your business by other regulations.
- Businesses that are not regulated in Federal, State, or local regulations, may use the information in this handbook to develop a training program to reduce their potential to pollute
- Employee training is a vital component of many of the individual source control BMPs included in this manual.

Sources include EPA, SWRCB, Caltrans, CASQA **Wind Erosion Control**

Wind Erosion Control Lindon City Storm Water Management Program—2015 WEC-1 WEC-2

Suitable Applications

Fiber rolls may be suitable:

- Along the toe, top, face, and at grade breaks of exposed and erodible slopes to shoten slope length and spread runoff as sheet flow
- At the end of a downward slope where it transitions to a steeper slope
- Along the perimeter of a project
- As check dams in unlined ditches
- Down-slope of exposed soil areas
- Around temporary stockpiles

Limitations

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Fiber rolls are not effective unless trenched

Construction 3-107 www .cabmphandbooks.com

Sediment Control TR Tracking Control

WE Wind Erosion Control Non-Stormwater Management Control

WM Waste Managementand

 $oldsymbol{0}$ Primary Objective

!K Secondary Objective

Targeted Constituents

Potential Alternatives

EC-3 Hydraulic Mulch

EC-5 SoilBinders

EC-6 Straw Mulch

EC-8 Wood Mulching

EC-7 Geotexties and Mats

Sediment

Nutrients

Trash

Metals

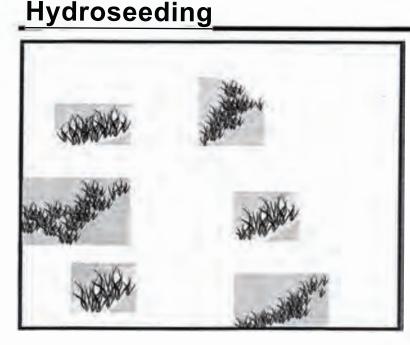
Bacteria

Organics

Oil and Grease

Materias Pollution Control

Objectives



Description and Purpose

Hydroseeding typically consists of applying a mixture of wood fiber, seed, fertilizer, and stabilizing emulsion with hydromulch equipment, to temporarily protect exposed soils from erosion by water and wind.

Suitable Applications

Hydroseeding is suitable for soil disturbed areas requiring temporary protection until permanent stabilization is established, and disturbed areas that will be re-disturbed following an extended period ofinactivity.

Limitations

3-15

- Hydro seeding may be used alone only when there is sufficient time in the season to ensure adequate vegetation establishment and coverage to provide adequate erosion control. Otherwise, hydroseeding must be used in conjunction with mulching (i.e., strawmulch).
- Steep slopes are difficult to protect with temporary seeding.
- Temporary seeding may not be appropriate in dry periods without supplemental irrigation.
- Temporary vegetation may have to be removed before permanent vegetation is applied.
- Temporary vegetation is not appropriate for short term inactivity.



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Objectives

Legend:

Sediment

Nutrients

Metals

Bacteria

Oil and Grease

SE-1 Silt Fence

SE-6 Gravel Bag Berm

SE-8 Sandbag Barrier

SE-9 Straw Bale Barrier

EC Erosion Control

SE Sediment Control TR Tracking Control WE Wind Erosion Control

Non-Stormwater

WM Waste Management and

O Primary Objective

!KI Secondary Objective

Targeted Constituents

Potential Alternatives

Management Control

Materials Pollution Control

 \mathbf{O}

- Fiber rolls at the toe of slopes greater than 5:1(H:V) should be a minimum of 20 in. diameter or installations achieving the same protection (i.e. stacked smaller diameter fiber
 - Difficult to move once saturated.

Utah RSI Manual

- If not properly staked and trenched in, fiber rolls could be transported by high flows.
- Fiber rolls have a very limited sediment capture zone.
- Fiber rolls should not be used on slopes subject to creep, slumping, or landslide.

mplementation

Fiber Roll Materials

Fiber rolls should be either prefabricated rolls or rolled tubes of erosion control blanket.

Assembly of Field Rolled Fiber Roll

- · Roll length of erosion control blanket into a tube of minimum 8 in. diameter.
- Bind roll at each end and every 4 ft along length of roll with jute-type twine.

- Locate fiber rolls on level contours spaced as follows:
 - Slope inclination of 4:1(H:V) or flatter: Fiber rolls should be placed at a maximum
 - Slope inclination between 4:1and 2:1(H:V): Fiber Rolls should be placed at a maximum interval of 5 ft. (a closer spacing is more effective).
- Slope inclination 2:1(H:V) or greater: Fiber Rolls should be placed at a maximum interval of toft. (a closer spacing is more effective).
- . Stake fiber rolls into a 2 to 4 in. deep trench with a width equal to the diameter of the fiber

. Turn the ends of the fiber roll up slope to prevent runoff from going around the roll

Drive stakes at the end of each fiber roll and spaced 4 ft maximum on center.

- Use wood stakes with a nominal classification of 0.75by 0.75 in. and minimum length of
- · If more than one fiber roll is placed in a row, the rolls should be overlapped, not abutted.

· Fiber rolls are typically left in place.

2 of 4.	California Stormwater BMP Handbook	January 2003
7.73	Construction	
3-108	www.cabmphandbooks.com	

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mplementation In order to select appropriate hydroseeding mixtures, an evaluation of site conditions shall be pe lformed with respect to:

Hydroseeding

Soil conditions	Maintenance requirements
Site topography	Sensitive adjacent areas
Season and climate	Water availability
Vegetation types	Plans for permanent vegetation

The local office of the U.S.D.A Natural Resources Conservation Service (NRCS) is an excellent source of information on appropriate seed mixes.

The following steps shall be followed for implementation:

- Avoid use of hydroseeding in areas where the BMP would be incompatible with future ea lthwork activities and would have to be removed.
- Hydroseeding can be accomplished using a multiple step or one step process. The multiple step process ensures maximum direct contact of the seeds to soil. When the one step process is used to apply the mixture of fiber, seed, etc., the seed rate shall be increased to compensate for all seeds not having direct contact with the soil.
- Prior to application, roughen the area to be seeded with the furrows trending along the
- Apply a straw mulch to keep seeds in place and to moderate soil moisture and temperature until the seeds germinate and grow.
- All seeds shall be in conformance with the California State Seed Law of the Depaltment of Agricultw-e. Each seed bag shall be delivered to the site sealed and clearly marked asto species, purity, percent germination, dealer's guarantee, and dates oftest. The container shall belabeled to clearly reflect the amount of PureLive Seed (PLS) contained. All legume seed shall be pellet inoculated. Inoculant sources shall be species specific and shall be applied at a rate of 2 lb of inoculant per 100lb seed.
- Commercial fe:tilizer shall conform to the requirements of the California Food and Agricultural Code. Felilizer shall be pelleted or granular form.
- Follow up applications shall be made as needed to cover weak spots and to maintain adequate soil protection.
- Avoid over spray onto roads, sidewalks, drainage channels, existing vegetation, etc.

Average cost for installation and maintenance may vary from as low as \$300 per acre for flat slopes and stable soils, to \$i600 per acre for moderate to steep slopes and/or erosive soils.

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SE-Fiber Rolls Fiber Rolls SE-5

• Iffiber rolls are removed, collect and dispose of sediment accumulation, and fill and compact holes, trenches, depressions or any other ground disturbance to blend with adjacent ground.

Material costs for fiber rolls range from \$20 - \$30 per 25 ft roll.

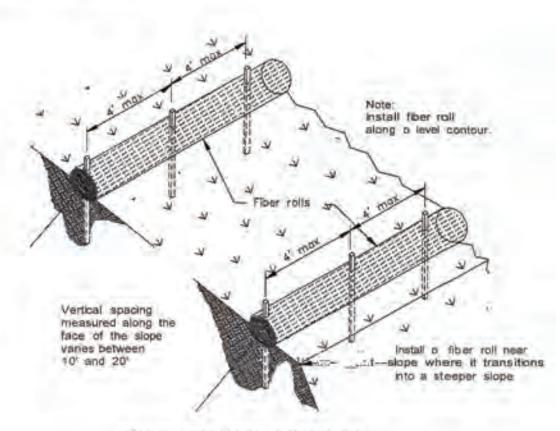
Inspection and Maintenance

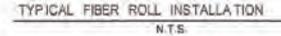
- Inspect BMPs prior to forecast rain, daily during extended rain events, after rain events, weekly during the rainy season, and at two-week intervals during the non-rainy season.
- Repair or replace split, torn, unraveling, or slumping fiber rolls.
- If the fiber roll is used as a sediment capture device, or as an erosion control device to maintain sheet flows, sediment that accumulates in the BMP must be periodically removed in order to maintain BMP effectiveness. Sediment should be removed when sediment accumulation reaches one-half the designated sediment storage depth, usually one-half the distance between the top of the fiber roll and the adjacent ground surface. Sediment removed during maintenance may be incorporated into earthwork on the site of disposed at an appropriate location.
- Iffiber rolls are used for erosion control, such as in a mini check dam, sediment removal should not be required as long as the system continues to control the grade. Sediment control BMPs will likely be required in conjunction with this type of application.

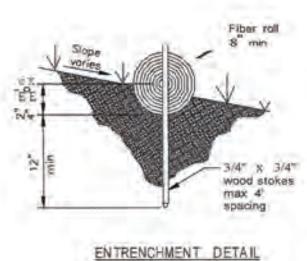
References

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

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Utah RSI Manual Hydroseeding

3-109

EC-4

	Hydroseeding	Installed CostperAcre
High Density	Ornamentals	\$400 - \$1600
	Tmf Species	\$350
	Bunch Grasses	\$300 - \$]300
East Carrie	Annual	\$350 - \$650
Fast Growing	Perennial	\$300-\$800
Non Commetine	Native	\$300-\$1600
Non-Competing	Non-Native	\$400-\$500
Sterile	Cereal Grain	\$500

Construction

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nspection and Maintenance

- Inspect BMPs prior to forecast rain, daily during extended rain events, after rain events, weekly during the rainy season, and at two-week intervals during the non-rainy season.
- Areas where erosion is evident shall be repaired and BMPs re-applied as soon as possible. Care should be exercised to minimize the damage to protected areas while making repairs, as any area damaged will require re-application of BMPs.
- Where seeds fail to germinate, or they germinate and die, the area must be re-seeded, fel:ilized, and mulched within the planting season, using not less than half the original application rates.
- Irrigation systems, if applicable, should be inspected daily while in use to identify system malfunctions and line breaks. When line breaks are detected, the system must be shut down immediately and breaks repaired before the system is put back into operation.
- Irrigation systems shall be inspected for complete coverage and adjusted as needed to maintain complete coverage.

References

3-17

Stormwater Quality Handbooks Construction Site Best Management Practices (BMPs) Manual, StateofCalifomiaDepaltrnentofTranspOltation (Caltrans), November 2000.

Guidance Document: Soil Stabilization for Temporary Slopes, State of California Department of Transpol:ation (Caltrans), November 1999.

Hydro-seed will be sprayed on the site to temporarily stabilize the site. The hydro-seed will also include tackifier to hold the seed to the soil and prevent erosion. Application rate is 1½ lbs per 1,000 Sq. ft. or about 60 lbs per acre.

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University of California, Santa Barbara Construction Stormwater Best Management Practices



Waste Management

Definition

Prevent, reduce, or eliminate the discharge of pollutants from material delivery and storage to the stormwater system or watercourses by minimizing the storage of hazardous materials onsite, storing materials in a designated area, installing secondary containment, conducting regular inspections, and training employees and subcontractors.

Minimize or eliminate the exposure of stormwater to construction materials to prevent pollution of the stormwater system.

Conditions Where the

These procedures are suitable for use at all construction sites with delivery and storage of the following materials:

- Practice Applies Soil stabilizers and binders
 - Pesticides and herbicides Fertilizers
 - Detergents Plaster
 - Petroleum products such as fuel, oil, and grease
 - Asphalt and concrete components
 - Hazardous chemicals such as acids, lime, glues, adhesives, paints, solvents, and
 - curing compounds
 - Concrete compounds
 - Other materials that may be detrimental if released to the environment

Specifications: Design and Installation

The following steps should be taken to minimize risk:

- Material Safety Data Sheets (MSDS) should be supplied for all materials stored. • Construction site areas should be designated for material delivery and storage.
- Temporary storage area should be located close to the entrance of the site but away from vehicular traffic to prevent accidents. Also locate storage areas away from the Project perimeter, waterways, and stormdrains.
- Avoid transport near drainage paths or waterways.
- Surround with earth berms.
- Material storage areas shall be covered. Store materials in secondary containment including non-reactive materials such as detergents, oil, grease, and
- Do not store chemicals, drums, or bagged materials directly on the ground. Place these items in secondary containment.
- Storage of reactive, ignitable, or flammable liquids must comply with the fire codes of your area. Contact the Fire Marshal at the UCSB Environmental Health & Safety department on campus to review site materials, quantities, and proposed storage area to determine specific requirements. See the Flammable Sources include EPA, SWRCB, Caltrans, CASQA **Waste Management**

WM-1

Management.

Material Delivery Practices

available.

Spill Cleanup

Waste Management

WM-1 Material Delivery and Storage

• Bagged and boxed materials should be stored on pallets and should not be allowed

• Stockpiles should be protected in accordance with WM - 5 Stockpile

Materials should be stored indoors within existing structures or sheds when

• An ample supply of appropriate spill clean up material should be kept near storage

• Keep an accurate, up-to-date inventory of material delivered and stored onsite.

present when dangerous materials or liquid chemicals are unloaded.

Maintenance & • Inspect and verify that activity-based BMPs are in place prior to the

• Keep an ample supply of spill cleanup materials near the storage area.

events, and weekly throughout the life of the Project.

supplies as appropriate for the materials being stored.

WM-3

Contain and clean up any and all spills immediately.

See BMP Contaminated Soil Management.

commencement of associated activities.

needed to maintain proper function.

• Arrange for employees trained in emergency spill cleanup procedures to be

Properly remove and dispose of any hazardous materials or contaminated soil if

• Inspect BMPs prior to forecast rain, daily during extended rain events, after rain

• Keep storage areas clean, well organized, and equipped with ample cleanup

• Repair or replace perimeter controls, containment structures, covers, and liners as

significant residual materials remain on the ground after construction is complete.

during non-working days and prior to and during rain events.

to accumulate on the ground. To provide protection from wind and rain

throughout the rainy season, bagged and boxed materials should be covered



Waste Management

WM-1 Material Delivery and Storage

Construction Stormwater Best Management Practices

and Combustible Liquid Code, NFPA30.

- Keep an up to date inventory of materials delivered and stored onsite.
- Hazardous materials storage onsite should be minimized.
- Hazardous materials should be handled as infrequently as possible.
- Chemicals should be kept in their original labeled containers.
- Employees and subcontractors should be trained on the proper material delivery and storage practices.
- Employees trained in emergency spill cleanup procedures must be present when dangerous materials or liquid chemicals are unloaded.
- If residual materials remain on the ground after construction is complete, properly remove materials and any contaminated soil. See WM - 8 Contaminated Soil Management. If the area is to be paved, pave as soon as materials are removed to stabilize the soil.

Material Storage Areas and Practices

- All temporary containment facilities and material storage areas shall be covered and have secondary containment.
- A temporary containment facility should provide for a spill containment volume able to contain precipitation from a 25 year storm event, plus the greater of 10% of the aggregate volume of all containers or 100% of the capacity of the largest container within its boundary, whichever is greater.
- A temporary containment facility should be impervious to the materials stored therein for a minimum contact time of 72 hours.
- A temporary containment facility should be maintained free of accumulated rainwater and spills. In the event of spills or leaks, accumulated rainwater and spills should be collected and placed into drums. These liquids should be handled as hazardous waste unless testing determines them to be non-hazardous. All collected liquids or non-hazardous liquids should be sent to an approved disposal
- Proper storage instructions should be posted at all times in an open and conspicuous location.
- Sufficient separation should be provided between stored containers to allow for spill cleanup and emergency response access.
- Incompatible materials, such as chlorine and ammonia, should not be stored in the same temporary containment facility.
- Materials should be stored in their original containers and the original product labels should be maintained in place in a legible condition. Damaged or otherwise
- illegible labels should be replaced immediately. • Liquids, petroleum products, and substances listed in 40 CFR Parts 110, 117, or 302 should be stored in approved containers and drums and should not be

overfilled. Containers and drums should be placed in temporary containment

Non-Stormwater Management

NSM-7 Paving and Grinding

• During chip seal application and sweeping operations, petroleum or petroleum

• Drainage inlet structures and manholes shall be covered with filter fabric during

• Seal coat, tack coat, slurry seal, or fog seal shall not be applied if rainfall is

• Leaks and spills from paving equipment can contain toxic levels of heavy metals

• Substances used to coat asphalt transport trucks, asphalt trucks, and asphalt

• Place plastic materials under asphaltic concrete (AC) paving equipment while not

Paving equipment parked onsite shall be parked over plastic to prevent soil

• Clean asphalt-coated equipment offsite whenever possible. When cleaning dry,

hardened asphalt from equipment, manage hardened asphalt debris as described in

WM – 2 Trash Containment. Any cleaning onsite shall follow NSM – 3 Vehicle

spreading equipment shall not contain soap and shall be non-foaming and non-

and oil and grease. Place drip pans or absorbent materials under paving

equipment when not in use. Clean up spills with absorbent materials rather than

burying. See NSM - Vehicle and Equipment Practices and WM - 6 Spill

application of seal coat, tack coat, slurry seal, and/or fog seal. Once these coats

are complete remove the filter fabric and install approved stormdrain inlet

Apply temporary perimeter controls until structure is stabilized.

predicted to occur during the application or curing period.

in use, to catch and/or contain drips and leaks.

covered aggregate must not be allowed to enter any stormdrain or water courses.

Sources include EPA, SWRCB, Caltrans, CASQA **Waste Management**

Construction Stormwater Best Management Practices

WM-2

University of California, Santa Barbara

Sources include EPA, SWRCB, Caltrans, CASQA

Construction Stormwater Best Management Practices

Waste Management

Non-Stormwater Management

NSM-7 Paving and Grinding

waste shall be disposed of properly.

Raised/Recessed Pavement Marker Application and Removal

- Do not transfer or load bituminous material near stormdrain inlets, the stormwater drainage system, or watercourses.
- Melting tanks shall be loaded with care and not filled to beyond six inches from the top to leave room for splashing when vehicle is deadheaded.
- When servicing or filling melting tanks, ensure all pressure is released before removing lids to avoid spills.
- On large scale Projects, use mechanical or manual methods to collect excess bituminous material from the roadway after removal of markers.
- Waste shall be disposed of properly.
- Maintenance & Inspect BMPs prior to forecast rain, daily during extended rain events, after rain events, and weekly throughout the life of the Project.
 - Inspect and maintain machinery regularly to minimize leaks and drips.
 - Ensure that employees and subcontractors are implementing appropriate measures

 - Keep ample supplies of drip pans or absorbent materials onsite.

NSM-17

and Equipment Practices. Thermoplastic Striping

University of California, Santa Barbara

Sealing Operations

protection.

Paving Equipment

Prevention and Control.

- All thermoplastic striper and pre-heater equipment shutoff valves shall be inspected to ensure that they are working properly to prevent leaking thermoplastic from entering the stormdrain inlets, the stormwater drainage
- The pre-heater shall be filled carefully to prevent splashing or spilling of hot thermoplastic. Leave six inches of space at the top of the pre-heater container when filling thermoplastic to allow room for material to move when the vehicle is
- Contractor shall not pre-heat, transfer, or load thermoplastic near stormdrain inlets
- Clean truck beds daily of loose debris and melted thermoplastic. Thermoplastic

NSM-16

Sources include EPA, SWRCB, Caltrans, CASQA **Non-Stormwater Management**

Sources include EPA, SWRCB, Caltrans, CASQA

Non-Stormwater Management

Construction Stormwater Best Management Practices

NSM-7 Paving and Grinding

Procedures and practices for conducting paving, saw cutting, and grinding operations to minimize the transport of pollutants to the stormdrain system and to the Project site perimeter.

Prevent the discharge of pollutants from paving operations, using measures to prevent runon and runoff pollution, properly disposing of wastes, and training employees and subcontractors.

Conditions These procedures are implemented where paving, surfacing, resurfacing, grinding, or Where the saw cutting, may pollute stormwater runoff or discharge to the stormdrain system or Practice Applies watercourses.

University of California, Santa Barbara

Specifications: Design and Installation

- Avoid paving during the wet season when feasible.
- Reschedule paving and grinding activities if rain is in the forecast.
- Train employees and subcontractors in pollution prevention and reduction.
- Store materials away from stormdrains and drainage courses to prevent stormwater runon, see WM – 1 Material Delivery and Storage.
- Protect drainage courses, particularly in areas with a grade, by employing BMPs to divert runoff or to trap and filter sediment.
- If paving involves an onsite mixing plant, follow the stormwater permitting
- requirements for industrial activities. • Stockpile material removed from roadways away from drain inlets, drainage ditches, and watercourses. These materials should be stored consistent with WM
- 5 Stockpile Management. • Disposal of PCC and AC waste should be in conformance with WM - 3
- Temporary Concrete Washout and Waste Management. • Do not wash sweepings from exposed aggregate concrete into a stormdrain system. Collect and return to aggregate base stockpile or dispose of properly.

Saw Cutting, Grinding, and Pavement Removal

- Shovel or vacuum saw-cut slurry and remove from site. Cover or barricade
- stormdrains during saw cutting to contain slurry.
- When paving involves AC, the following steps should be implemented to prevent the discharge of grinding residue, uncompacted or loose AC, task coats, equipment cleaners, or unrelated paving materials:
- Minimize sand and gravel from new asphalt from getting into stormdrains, streets, and creeks by sweeping.
- Old or spilled asphalt must be recycled or disposed as approved by the University's Representative.

Sources include EPA, SWRCB, Caltrans, CASQA **Non-Stormwater Management**

Construction Stormwater Best Management Practices

NSM-14

University of California, Santa Barbara

Waste Management

WM-4 Sanitary Waste Management

Definition

Practices and procedures such as providing convenient, well-maintained facilities, and arranging for regular service and disposal prevents the discharge of pollutants to stormwater from sanitary and septic waste.

Proper sanitary and septic waste management prevent the discharge of pollutants to

Purpose

Conditions

stormwater from sanitary and septic waste. Sanitary septic waste management practices are suitable for use at all construction

Where the Practice Applies Specifications:

Design and

Installation

Sanitary or septic wastes should be treated or disposed of in accordance with state and local requirements. In many cases, one contract with a local facility supplier will be all that it takes to make sure sanitary wastes are properly disposed.

sites that use temporary or portable sanitary and septic waste systems.

Storage and Disposal Procedures

- Temporary sanitary facilities should be located away from drainage facilities, watercourses, the Project perimeter, and from traffic circulation. When there is a risk of high winds, temporary sanitary facilities should be secured (staked down or tied to a sturdy structure) to prevent overturning.
- Temporary sanitary facilities should be located on a permeable surface at all times. If a temporary sanitary facility needs to be placed on an impermeable surface than it must be placed in an overflow pan or bin.
- Wastewater should not be discharged or buried within the Project site. • Only reputable, licensed sanitary and septic waste haulers should be used.
- Sanitary facilities should be located in a convenient location.
- Untreated raw wastewater should never be discharged or buried.

WM-10

- Temporary septic systems should treat wastes to appropriate levels before
- Sanitary and septic facilities should be maintained in good working order by a
- Regular waste collection by a licensed hauler should be arranged before facilities are full. Sanitary and septic facilities should never overflow.

- Educate employees, subcontractors, and suppliers on sanitary and septic waste storage and disposal procedures
- Educate employees, subcontractors, and suppliers of potential dangers to humans and the environment from sanitary and septic wastes.
- Instruct employees, subcontractors, and suppliers in identification of sanitary and

Sources include EPA, SWRCB, Caltrans, CASQA

Waste Management

Non-Stormwater Management

NSM-7 Paving and Grinding

- AC grindings, pieces, or chunks used in embankments or shoulder backing must not be allowed to enter any stormdrain or watercourses. Install an erosion control BMP until the structure is stabilized or permanent controls are
- Collect and remove all broken asphalt and recycle when practical; otherwise, dispose of properly.
- Any AC chunks and pieces used in embankments must be placed above the water table and covered by at least 1 foot of material.
- Do not allow saw-cut slurry to enter stormdrains or watercourses. Residue from grinding operations should be picked up by means of a vacuum attachment to the grinding machine, should not be allowed to flow across the pavement, and should not be left on the surface of the pavement. See also WM - 3 Temporary Concrete Washout and Waste Management.
- Dig out activities should not be conducted in the rain.
- Collect pavement dig out material by mechanical or manual methods. This material may be recycled if approved by the University's Representative for use as shoulder backing or base material at locations approved by the University's Representative.
- When approved by the University's Representative, stockpile material removed from roadways away from stormdrain inlets, drainage ditches, and watercourses and stored consistent with WM – 5 Stockpile Management.
- Disposal or use of AC grindings shall be approved by the University's Representative. See also WM – 3 Temporary Concrete Washout and Waste Management.

Asphalt Concrete Paving

- If paving involves asphaltic cement concrete, follow these steps:
- Do not allow sand or gravel placed over new asphalt to wash into stormdrains, streets, or watercourses. Vacuum or sweep loose sand and gravel and properly dispose of this waste by referring to WM – 2 Trash Containment.
- Old asphalt must be disposed of properly. Collect and remove all broken asphalt from the site and recycle whenever possible.

Portland Cement Concrete Paving

- Do not wash sweepings from exposed aggregate concrete into a stormdrain
- system. Collect and return to aggregate base stockpile or dispose of properly. • Allow aggregate rinse to settle. Then allow rinse water to dry in a temporary pit
- as described in WM 3 Temporary Concrete Washout and Waste Management. • Do not allow saw-cut Portland Concrete Cement (PCC) slurry to enter stormdrains or watercourses.

Construction Stormwater Best Management Practices

Sources include EPA, SWRCB, Caltrans, CASQA **Non-Stormwater Management** NSM-15

University of California, Santa Barbara



WM-4 Sanitary Waste Management

- Hold regular meetings to discuss and reinforce disposal procedures (incorporate
- into regular safety meetings).
- Establish a continuing education program to indoctrinate new employees.

Maintenance & • Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities.

• Inspect BMPs prior to forecast rain, daily during extended rain events, after rain

- events, and weekly throughout the life of the Project. Arrange for regular waste collection.
- If high winds are expected, portable sanitary facilities must be secured with spikes to prevent over turning.

Sources include EPA, SWRCB, Caltrans, CASQA Waste Management

Non-Stormwater Management

WM-11

Secondary Containment

Minimum Measure: Prevent accidental releases or spills

Subcategory: Fuels and Oils / Hazardous Materials



Secondary Containment

Secondary containment is a safeguard measure used to prevent accidental releases or spills of toxic or hazardous substances to the environment (water, soil & air). Secondary containment can be a structure that is chemically compatible to hold a release and remain liquid tight until clean up occurs. Secondary containment can also be an engineered means to redirect a spill away from water or other sensitive receptor to a temporary diversion system.

I. What is required?

Fuel tanks stored on site must have secondary containment and all other spill sources that may be a threat to human health or the environment must have secondary containment. The phrase "may be a threat" is subjective, and without prescriptive regulatory guidance, PEs and Ecology inspectors use professional judgment to determine the necessary and reasonable secondary containment requirements that fit each individual circumstance.

Permit or specification language does not have exemption language that allows projects to deviate from the requirements when secondary containment is impractical. However, PEs has the authority to modify Standard Specification requirements as reasonably necessary, whether to allow for deviations or to increase protection measures in high risk situations.

II. What needs secondary containment?

Secondary containment requirements are not straightforward and regulatory guidance is not black and white. This is a good thing, because secondary containment should be adjusted to match site specific conditions without unnecessarily increasing project costs.

The NPDES Permit requires secondary containment for:

- On-site fueling tanks (except double walled tanks) **NOTE**: Even though "Doubled-walled tanks do not require additional secondary containment," extra preventative measures may still be necessary with high risk construction activities in environmentally sensitive areas.
- 2. Chemicals, liquid products, petroleum products, and other materials that *have the potential* to pose a threat to human health or the environment. (This is a subjective **and left to interpretation** based on Other Factors described below).

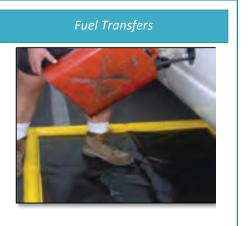
The 401 or HPA Permits may require more stringent secondary containment for in water or over water work activities.

Regulatory inspectors in the Northwest Region typically expect the following materials <u>and</u> work activities to always have secondary containment:

- Fuel tanks (single walled)
- Fuel transfer activities, for both mobile and stationary
- Volumes of stored or used liquid located adjacent/up gradient to water, where there is a reasonable potential of a worst case scenario spill could reach water. Examples
- Large volumes stored in drums and tanks
- Large volumes used in large generators and pumps, hydraulic power packs
- Moderate volumes located directly near water (within 5-10 ft) or unprotected drainage system that directly discharges to water
- Storage of material that may potentially pose a threat to







human health or the environment that is not in constant or regular daily use (i.e., general good housekeeping practices following Ecology's BMPs)

Other Factors

Multiple other factors must be considered when deciding what needs secondary containment. To assess spill risks, evaluate the project and the surrounding environment and consider worst case scenarios. Consider how things could fail and how to prevent or protect in event of a failure. Consider the location, type and quantity of stored materials or any risky construction activities (e.g., fueling) and take into account the topography (slope and gradient) and the proximity to water or other environmentally sensitive areas. Could a worst case scenario spill reach water?

Apply practicality and use common sense when enforcing secondary containment requirements. Use "worst case" to assess risk, but apply the knowledge listed below to establish reasonable means to manage the risk. Recognize that there is only so much energy, time, and money to expend to achieve full compliance on a project. Make a good faith effort to control pollution sources and require what is reasonable based on the project specific circumstances and environmental conditions.

Consider the following factors when making a judgment call pertaining to secondary containment:

- Surrounding environment
- 2. Timeframe in use
- Condition of equipment
- 4. Security and vandalism Weather
- 6. Available manpower
- 7. Equipment and materials

Surrounding Environment

- 1. Is the work located over water, or below the Ordinary High WaterLine?
- 2. Is the work or storage area located near environmentally sensitive areas, such as a) stormwater systems and ditches that discharge directly to water or wetlands?
- b) shallow groundwater or protected drinking water aquifers?
- 3. What is the distance of the nearest waterway or drainage system?
- 4. Will rain/stormwater come in contact with chemicals, fuels, or other hazardous materials used or stored on

Spill + Water = BIG/MULTIPLE FINE\$

If the project is near water or other sensitive receptor, you may need to apply increased protections. It is not only about secondary containment, because other measures like using pristine equipment, increased maintenance and inspection, enhanced security, and increased man power should also be considered in lieu of or together with varied levels of secondary containment needs.

Timeframe in Use

- 1. Will the spill source be on the project for a long period of time?
- 2. Would the containment structure become susceptible to wear and tear?

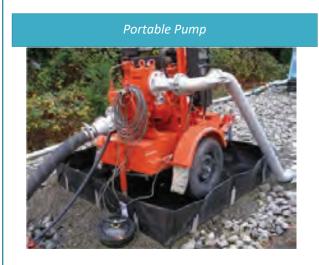
Long Term Project = Increased Risk

Depending on the project location, increased security of the project, storage and staging areas (i.e., fencing & lightening) may be needed. Don't forget the IFC requirements for fittings, devices and padlocks that prevent malicious tampering or siphoning.

Consider increasing the robustness of containment to increase the durability and resistance of wear and tear and exposure to weather elements over time. Or, ensure regular inspection, maintenance and replacement of containment throughout the entire project.

Condition of Equipment

- 1. Is equipment relatively new and/or in good condition?
- 2. Based on experience, is there a reasonable
- potential for equipment failure? 3. Does the equipment have unprotected high
- pressure hoses and valves? 4. Could high vibrations or friction cause increase
- wear and tear on containment structure?



Equipment Must Be Maintained

Secondary containment is not an option for leaking equipment. Equipment should always be inspected and maintained; otherwise it should be removed from the job site. Leaking equipment usually results in violations.

Many spills are a result of sprays from hydraulic hoses due to damage, chaffing, sharp bend points, broken fittings or maintenance /testing. Hoses should be protected from damage. Some hydraulic power packs have built in secondary containment.

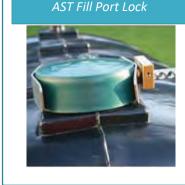
Inspections, tests, maintenance and repair are the first lines of defense against spills. If these are not performed appropriately, or the nature of the work is in environmentally sensitive areas, add or increase secondary containment protection measures. Otherwise, if the first lines of defense are faithfully carried out, secondary containment of equipment may not be necessary.

Security and Vandalism

- 1. Is the project located in an area easily accessible by
- 2. Is there a high rate of crime in the project area?
- 3. Does the project and designated areas have adequate fencing
- 4. Does equipment and storage tanks have protection measures,
- a) devices, such as Power Cord and Plug Locks, oil pump
- b) padlocks on pumps or hoses to secure to hanger
- c) anti-siphoning device
- d) self closing nozzles e) automatic shut off valves
- f) locks on drain or other valves















Weather

- 1. Is construction work occurring during the raining season?







How's the Weather?

2. Could extreme hot or cold temperatures cause plastic or structures to become brittle or fracture



Increase protection measures to prevent storm water from coming in contact with hazardous substances stored or used on the project. Otherwise, storm water polluted with chemicals must be diverted with drainage controls, contained, and sampled to determine proper disposal (See Ecology BMP C153, page 4-46). Ecology BMP C153, page 4-46 directs that during the wet weather season (Oct 1 –

April 30), each secondary containment

cause some plastics to crack or melt. If

facility shall be covered during non-

working days, prior to and during rain Areas with <u>increased rainfalls</u> (e.g., Quillayute & Quinault) must consider whether the 110% containment capacity can adequately hold a spill plus precipitation. A cover system may be a more effective means of protection. Extreme cold or hot temperatures may

unexpected extreme weather conditions occur, increase the frequency of inspections, maintenance, repair and replacement of plastic secondary containment systems. If extreme conditions are typical for the project area (i.e., summer months in Yakima or winter months in Spokane), then contact product manufactures for recommendations on materials that are capable of withstanding those conditions. Learn the minimum and maximum temperatures the material can tolerate.

1. Is there a commitment of man power to

conduct regular frequent inspections?

2. Is there staff on hand who are trained and experienced in spill response?

Trained staff on hand?

increased security.

Increase protective measures if there is a lack of staff or expertise to conduct inspections maintenance, documentation, and spill response actions. Consider stronger durability, increased capacity, fail safe diversions, cover, added spill kits, and

Equipment and Materials

Available Manpower

- 1. Is there an adequate supply of equipment and materials to quickly control and remove any quantity of
- 2. Is the equipment and materials located where they are immediately available?

Enough materials on hand?

Secondary containment methods must be added or enhanced to compensate for the lack of equipment or materials that are used to immediately control, contain, and/or remove spilled product and associated contaminated media.

Secondary containment should be appropriately constructed based on the surrounding environment and specific project circumstances. Sometimes, other preventative measures can be used in lieu of secondary containment, as approved by the PE. Following the same rational described in the IFC Section 3404.2.10, secondary containment can be altered or even waived based on site specific circumstances. For example, secondary containment can be avoided all together if materials are not stored on the project and only brought on site for immediate use on an as needed basis (e.g., mobile fuel trucks instead of temporary above ground tanks). On the other hand, although not required, secondary containment may be reasonable for double-walled fuel tanks, such as a tank located in a high construction traffic zone, with little or no security and placed immediately up gradient and adjacent to a water body.

PEs and inspectors must rely on their professional judgment and use their discretion to determine what is reasonable. HazMat Specialists are available to assess spill risks and provide recommendations. If the PE determines that secondary containment is not practical or necessary, the PE should be prepared to present a rational argument that demonstrates the PE is aware of the circumstance and has considered the predicted flow direction, rate of flow, and total quantity and whether the worst case scenario spill could reasonably be expected to reach a water body; And/or describe alternative measures that provide equivalent environmental protection.

Secondary Containment Page 10

III. How should secondary containment be built and maintained?

It isn't always easy to assess whether secondary containment is adequate. The proper method of secondary containment is a matter of good engineering practice, thus there is no approved specific method. A few pointers are provided to help evaluate a containment system's ability to effectively hold a spill for at least 72 hours. Types of secondary containment are driven by the following primary variables:

- Chemical Type
- 2. 72 Hour Spill Holding Timeframe Quantity
- 4. Surface Topography
- 5. Vibration Damage 6. Frequency of Inspection and Maintenance

Chemical Type

The type of chemical dictates what material is chemically compatible to hold a spill without disintegrating or breaking through, thus being considered "impervious." Vendors of spill response and containment equipment can help determine products that will properly contain various chemical substances.

Petroleum products (gasoline, diesel, hydraulic oil, etc.) are the primary chemicals stored or used on most projects. Typical products used to contain petroleum spills include temporary structures such as pop-up pools or materials like plastic sheeting used as a liner in containment systems.





Chemically Compatible?

Polyvinyl Chloride (PVC) plastic sheeting liners can be made to resist oils, alcohols, hydrocarbons, waste products and other corrosive liquids. PVC liners are lightweight, flexible and best used where soil conditions are stable with minimal amount of sharp rocks. PVC's flexibly allows for stretching to help prevent stress cracking, which may occur with High Density Polyethylene (HPDE). PVC has a wide range of thicknesses available, from 6 to 45 mils

or tears easily, but it may be effective for short

exposed to extreme hot or cold environments.

term durations, with little wear and tear and not

High Density Polyethylene (HDPE) essentially does the same as PVC, but is slightly stiffer which may provide increased durability and resistance

Secondary Containment Page 11

72-Hour Spill Holding Timeframe

revisions the proposed EPA 72 hour standard was

Ecology's BMP C153 requires that containment must hold a

spill for at least **72 hours** in order to be considered "sufficiently impervious." The 72 hour standard first came from EPA's attempt to define "sufficiently impervious" in 40 CFR Part 112 (Oil Pollution Prevention regulation). The rationale was that a containment system that is impervious to oil for 72 hours would allow time for discovery and

stored therein for a minimum contact time of 72 hours" removal of an oil discharge in most cases. In the 2002 rule

withdrawn; however Ecology continues to maintain the 72 hour standard per BMP C153. Ecology expects spill cleanup work to start immediately once a spill is discovered and in most cases be completely cleaned up within 72 hours.

For storage of large quantities of chemicals other than petroleum, consider asking the product supplier to specify in writing that the containment system meets Ecology's 72 hour impermeability standard. If there is a justifiable reason that clean up cannot feasibly occur within 72 hours of a spill (highly uncommon), provide additional protection measures (i.e., increased inspections, limit quantities stored, etc.) and then consider more robust products that exceed the 72 hour standard.

Quantity

The NPDES permit and amended Specification 1-07.15(1) requires the capacity to equal 110% of the volume contained in the largest tank (or container) within the containment structure. The extra 10% is intended to accommodate precipitation and a safeguard against miscalculations.

Ecology's Spill Prevention, Preparedness and Response Program began creating a new Excel tool to help calculate containment volumes. For more information or a copy of this calculation tool, contact the Ecology Spills Program at 360-407-6458. For area calculations, see EPA example at:

http://www.epa.gov/region6/6sf/sfsites/oil/samp pln.htm

BMP C153

"Secondary containment facilities

shall be impervious to the materials

Formula: (volume of single largest tank + 10%) x 0.1337 cubic

Question: What is the area of the minimum containment volume for a 25,000 gallon fuel tank?

Calculation:

EPA Example Calculation

feet/gallon

25,000 gal + 10% = 27,500 27,500 x 0.1337 = 3676.75

Secondary Containment

Surface Topography

Secondary containment should be as level as possible. If using plastic sheeting, the surface should be clear of rocks and debris that could puncture the material. If a containment structure must be placed on a slope, the downhill slide of the structure wall must be taller. Ecology's Excel tool (mentioned above) also helps calculate dimensions of secondary containment walls on slopes.



Vibration Damage

Increase protection if operating equipment is subject to vibration. Use thicker material, vibration dampening, and require more frequent inspections.



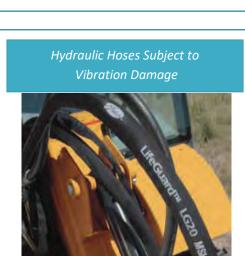
Frequency of Inspection and Maintenance The frequency of inspection and maintenance depends on several variables as described above. Inspection and maintenance should be regular, routine and documented as necessary

• Do not use in locations where ponded water may cause flooding.

elevation throughout, silt fences will create erosion.

Not effective unless trenched and keyed in.

Do not allow water depth to exceed 1.5 ft. at any point.





Page 13

Secondary Containment

Utah RSI Manual

collapsing.

Implementation

General

• Do not place fence on a slope, or across any contour line. Lf not installed at the same

• Filter fences will create a temporary sedimentation pond on the upstream side of the fence

and may cause temporary flooding. Fences not constructed on a level contour will be

• Improperly installed fences are subject to failure from undercutting, overlapping, or

Not intended for use as mid-slope protection on slopes greater than 4:1

A silt fence is a temporary sediment barrier consisting of filter fabric stretched across and

attached to supporting posts, entrenched, and, depending upon the strength of fabric used,

supported with plastic or wire mesh fence. Silt fences trap sediment by intercepting and

detaining small amounts of sediment-laden runoff from disturbed areas in order to promote

Silt fences are preferable to straw bale barriers in many cases. Laboratory work at the Virginia

Highway and Transportation Research Council has shown that silt fences can trap a much

been improperly installed. The following layout and installation guidance can improve

higher percentage of suspended sediments than can straw bales. While the failure rate of silt

fences is lower than that of straw bale barriers, there are many instances where silt fences have

oveliopped by concentrated flow resulting in failure of the filter fence.

IV. What encourages compliance?

Good communication is the best means to encourage compliance. When a regulatory inspector is assigned to a project, increase your chances of a positive outcome by clarifying gray areas in advance with respect to how the inspector might interpret the permit conditions. Ask for clarifications. Inspections are designed to help and the Contractor maintain legal compliance. Do not be afraid to ask for technical assistance, whether it be from Ecology or your HazMat Specialist. Working together is important and discussions to improve the situation are

To prevent the most common spill violations, projects should

- i) follow their Spill Prevention, Control and Countermeasures (SPCC) Plan,
- ii) give more attention to secondary containment needs, and
- iii) encourage better housekeeping practices.

Unfortunately sometimes, there is a lack of resources or commitment to comply with the requirements. Some projects lack the manpower, equipment and material to expeditiously follow the SPCC plan or permit requirements. When a contractor fails to comply with a PE's repeated attempts to correct a problem, here are a few suggestions.

- i) Remind staff and Contractors about the significant costs and fines associated with spills. In addition to construction delays and clean up costs, there are significant fines. Under water quality regulations, a spill to water is \$10,000 to \$100,000 per day per violation. Damage to habitat may also result in a Natural Resource Damage Assessment fine. For habitat protected under the Endangered Species Act, damage or "taking" of habitat may result in civil penalties up to \$25,000 per violation. There can by many violations in a single spill incident.
- ii) Call the HazMat Specialist to conduct an internal assessment, where the specialist works directly with the PE and then the PE uses the report to communicate and encourage compliance
- iii) Call local fire marshal, who enforces the International Fire Code
- iv) Call Ecology's spill prevention program to request an informal assessment
- v) Utilize some of the following Standard Specification "hammers" to contractually force
- vi) 1-05.1 Authority of the Engineer The Engineer and Project Engineer can suspend all or part of the Contract Work. can also use other resources to complete the Work.
- vii) 1-05.2 Authority of Assistants and Inspectors –Inspectors are not authorized to accept or approve any Work not meeting the intent of the Contract. Inspectors have the authority to reject defective material and suspend Work that is being done improperly, subject to the final decision of the PE.
- Compliance with environmental laws and regulations is part of the Contract.

Secondary Containment Page 14

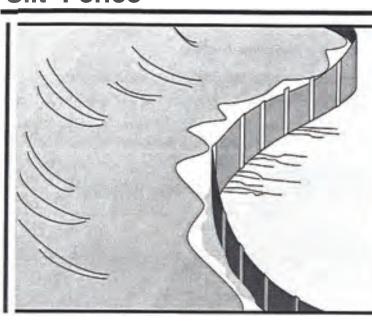
- viii) 1-05.6 Inspection of Work and Materials The Engineer can order the Contractor to remove and replace materials used without inspection. The Contractor shall correct any substandard Work or materials. The Engineer will reject unsuitable Work or materials or materials even though previously inspected or paid for.
- This condition allows to reject secondary containment structures, systems or BMPs that are not installed properly.
- ix) 1-05.7 Removal of Defective and Unauthorized Work will not pay for unauthorized or defective Work. This is anything that doesn't conform to the Contract, Work done beyond the lines and grades set by the Plans or Engineer, or extra Work and materials furnished without the Engineer's approval.
- This applies to improper secondary containment structures, systems or BMPs.
- x) 1-05.13 Superintendents, Labor, and Equipment of Contractor The Engineer can, with written statement, remove a superintendent from the project for failing repeatedly to follow the Engineers written or oral orders, directions, instructions, or determinations. This also applies to other employees of the Contractor.
- Poor environmental performance caused by the Contractor, whether chronic or acute, does not have to be tolerated.
- xi) **1-08.1 Subcontracting** Approval to subcontract shall not relieve the Contractor's responsibility to carry out the Contract or to relieve the Contractor of any obligation or liability under the Contract. In addition, the Engineer can request the Subcontractor to be removed from the project.
- xii) 1-08.6 Suspension of Work The Engineer may suspend all or any part of the Work if unsuitable weather prevents satisfactory and timely performance of the Work, if the Contractor does not comply with the Contract, or it is in the public

Suspending work is usually a last resort effort, but it does catch the Contractor's attention because they are responsible for any lost working days.

*Information obtained from Washington State Department of Transportation

Utah RSIManual

SE-Silt Fence



Description and Purpose

A silt fence is made of a filter fabric that has been entrenched, attached to supporting poles, and sometimes backed by a plastic or wire mesh for support. The silt fence detains sediment-laden water, promoting sedimentation behind the fence.

Suitable Applications

Silt fences are suitable for perimeter control, placed below areas where sheet flows discharge from the site. They should also be used as interior controls below disturbed areas where runoff may occur in the form of sheet and rill erosion. Silt fences are generally ineffective in locations where the flow is concentrated and are only applicable for sheet or overland flows. Silt fences are most effective when used in combination with erosion controls. Suitable applications include:

- Along the perimeter of a project.
- Below the toe or down slope of exposed and erodible
- Along streams and channels.
- Around temporary spoil areas and stockpiles.
- Below other small cleared areas.

Limitations

• Do not use in streams, channels, drain inlets, or anywhere flow is concentrated.

Silt. FenceSE-1

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Objectives

- SE Sediment Control TR Tracking Control
- WE Wind ErosionControl
- Non-Stormwater Management Control
- Material; Polluiton Control Le gend :

Waste Managementand

0 P r im a ry O b je c tiv e IKI Secondary Objective

Targeted Constituents

Sediment Nutrients Trash Metals Bacteria Oil and Grease Organics

Potential Alternatives

- SE-5 Fiber Rolls SE-6GravelBagBerm
- SE-8 Sandbag Barrier SE-9 Straw Bale Barrier
- Use principally in areas where sheet flow occurs.

performance and should be followed:

sedimentation behind the fence.

- Don't use in streams, channels, or anywhere flow is concentrated. Don't use silt fences to divert flow.
- Don't use below slopes subject to creep, slumping, or landslides.
- Select filter fabric that retains 85% of soil by weight, based on sieve analysis, but that is not finer than an equivalent opening size of 70.
- Install along a level contour, so water does not pond more than 1sft at any point along the

• The maximum length of slope draining to any point along the silt fence should be 200 ft or

• The maximum slope perpendicular to the fence line should be $_{1:1}$.

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Silt Fence

- Provide sufficient room for runoff to pond behind the fence and to allow sediment removal equipment to pass between the silt fence and toes of slopes or other obstructions. About 1200 ft2of ponding area should be provided for every acre draining to the fence.
- Turn the ends of the filter fence uphill to prevent stormwater from flowing around the fence.
- Leave an undisturbed or stabilized area immediately down slope from the fence where
- Silt fences should remain in place until the disturbed area is permanently stabilized.

Design and Layout

Selection of a filter fabric is based on soil conditions at the construction site (which affect the equivalent opening size (EOS) fabric specification) and characteristics of the supp0lt fence (which affect the choice of tensile strength). The designer should specify a filter fabric that retains the soil found on the construction site yet that it has openings large enough to permit drainage and prevent clogging. The following criteria is recommended for selection of the equivalent opening size:

- If 50 percent or less of the soil, by weight, will pass the U.S. Standard Sieve No. 200, select the EOS to retain 85% of the soil. The EOS should not be finer than
- For all other soil types, the EOS should be no larger than the openings in the U.S. Standard Sieve No. 70 except where direct discharge to a stream, lake, or wetland will occur, then the EOS should be no larger than Standard Sieve No. 100.

To reduce the chance of clogging, it is preferable to specify a fabric with openings as large as allowed by the criteria. No fabric should be specified with an EOS smaller than U.S. Standard. Sieve No. 100. If 85% or more of a soil, by weight, passes through the openings in a No. 200 sieve, filter fabric should not be used. Most of the particles in such a soil would not be retained if the EOS was too large and they would clog the fabric quickly if the EOS were small enough to

The fence should be supported by a plastic or wire mesh if the fabric selected does not have sufficient strength and bursting strength characteristics for the planned application (as recommended by the fabric manufacturer). Filter fabric material should contain ultraviolet inhibitors and stabilizers to provide a minimum of six months of expected usable construction life at a temperature range of o °F to 120 °F.

- Layout in accordance with attached figures.
- For slopes steeper than 2:1 (H:V) and that contain a high number of rocks or large dirt clods that tend to dislodge, it may be necessary to install additional protection immediately adjacent to the bottom of the slope, prior to installing silt fence. Additional protection may be a chain link fence or a cable fence.
- For slopes adjacent to sensitive receiving waters or Environmentally Sensitive Areas (ESAs), silt fence should be used in conjunction with erosion control BMPs.

Utah RSI Manual Silt Fence

SE-1

- Silt fence fabric should be woven polypropylene with a minimum width of 36in. and a minimum tensile strength of 100lb force. The fabric should conform to the requirements in ASTM designation D4632 and should have an integral reinforcement layer, The reinforcement layer should be a polypropylene, or equivalent, net provided by the manufacturer. The permittivity of the fabric should be between o.1sec-1 and 0.1sec-1 in conformance with the requirements in ASTM designation D449i.
- Wood stakes should be commercial quality lumber of the size and shape shown on the plans. Each stake should be free from decay, splits or cracks longer than the thickness of the stake or other defects that would weaken the stakes and cause the stakes to be structurally unsuitable.
- Staples used to fasten the fence fabric to the stakes should be not less than 1.75 in. long and should be fabricated from 15 gauge or heavier wire. The wire used to fasten the tops of the stakes together when joining two sections of fence should be 9 gauge or heavier wire. Galvanizing of the fastening wire will not be required.
- There are new products that may use prefabricated plastic holders for the silt fence and use bar reinforcement instead of wood stakes. If bar reinforcement is used in lieu of wood stakes, use number four or greater bar. Provide end-protection for any exposed bar reinforcement.

Installation Guidelines

Silt fences are to be constructed on a level contour. Sufficient area should exist behind the fence for ponding to occur without flooding or overtopping the fence.

- A trench should be excavated approximately 6 in. wide and 6 in. deep along the line the proposed silt fence.
- Bottom of the silt fence should be keyed-in a minimum of 12 in.
- Posts should be spaced a maximum of 6 ft. apart and driven securely into the ground a minimum of 18 in. or 12 in. below the bottom of the trench.
- When standard strength filter fabric is used, a plastic or wire mesh support fence should be fastened securely to the upslope side of posts using heavy-duty wire staples at least 1in. long. The mesh should extend into the trench. When extra-strength filter fabric and closer post spacing are used, the mesh support fence may be eliminated. Filter fabric should be purchased in a long roll, then cut to the length of the barrier. When joints are necessary, filter cloth should be spliced together only at a support post, with a minimum 6 in. overlap and both ends securely fastened to the post.
- The trench should be backfilled with compacted native material.
- Construct silt fences with a setback of at least 3 ft. from the toe of a slope. Where a silt fence is determined to be not practicable due to specific site conditions, the silt fence may be constructed at the toe of the slope, but should be constructed as far from the toe of the slope as practicable. Silt fences close to the toe of the slope will be less effective and difficult to maintain.

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Silt Fence SE-1

• Construct the length of each reach so that the change in base elevation along the reach does not exceed V3the height of the barrier; in no case should the reach exceed 500 ft.

• Average annual cost for installation and maintenance (assumes 6 month useful life): \$7 per lineal foot (\$850 per drainage acre). Range of cost is \$3.50 - \$9.10 per lineal foot.

Inspection and Maintenance

- Inspect-BMPs prior to forecast rain, daily during extended rain events, after rain events, weekly during the rainy season, and at two-week intervals during the non-rainy season.
- Repair undercut siltfences.
- Repair or replace split, torn, slumping, or weathered fabric. The lifespan of silt fence fabric is generally 5 to 8 months.
- Silt fences that are damaged and become unsuitable for the intended purpose should be removed from the site of work, disposed of, and replaced with new silt fence barriers.
- Sediment that accumulates in the BMP must be periodically removed in order to maintain BMP effectiveness. Sediment should be removed when the sediment accumulation reaches one-third of the barrier height. Sediment removed during maintenance may be incorporated into earthwork on the site or disposed at an appropriate location.
- Silt fences should be left in place until the upstream area is permanently stabilized. Until then, the silt fence must be inspected and maintained.
- Holes, depressions, or other ground disturbance caused by the removal of the silt fences should be backfilled and repaired.

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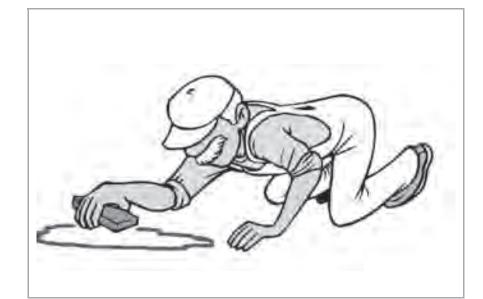
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Construction www.cabmphandbooks.com

BMP: Spill Clean-Up

SCU Construction



DESCRIPTION:

Practices to clean-up leakage/spillage of on-site materials that may be harmful to receiving waters.

APPLICATION: All sites

GENERAL:

- Store controlled materials within a storage area.
- Educate personnel on prevention and clean-up techniques.
- Designate an Emergency Coordinator responsible for employing preventative practices and for providing spill response.
- Maintain a supply of clean-up equipment on-site and post a list of local response agencies with phone numbers.

METHODS:

- Clean-up spills/leaks immediately and remediate cause.
- Use as little water as possible. NEVER HOSE DOWN OR BURY SPILL CONTAMINATED
- Use rags or absorbent material for clean-up. Excavate contaminated soils. Dispose of clean-up material and soil as hazardous waste.
- Document all spills with date, location, substance, volume, actions taken and other pertinent
- Contact the Salt Lake County Health Department (313-6700) for any spill of reportable quantity.

Utah RSI Manual

SE-1 Silt Fence

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Objectives

EC Erosion Control

SE Sediment Control

TC Tracking Control

WE Wind Erosion Control

Non-Stormwater

WM Waste Management and

Materials Pollution Control

NS Management Control

O Primary Objective

K Secondary Objective

Targeted Constituents

Potential Alternatives

Sediment

Nutrients

Trash

Metals

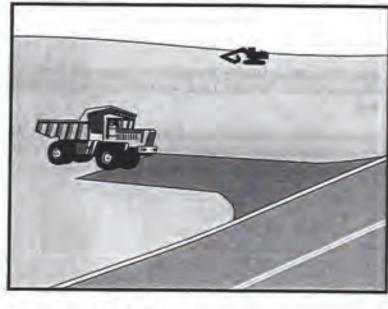
Bacteria

Organics

None

Oil and Grease

0



Description and Purpose A stabilized construction access is defined by a point of entrance/exit to a construction site that is stabilized to reduce the tracking of mud and dilt onto public roads by construction vehicles.

Suitable Applications Use at construction sites:

- · Where dit or mud can be tracked onto public roads.
- Adjacent to water bodies.
- Where poor soils are encountered.
- Where dust is a problem during dry weather conditions.

Limitations

- Entrances and exits require periodic top dressing with additional stones.
- This BMP should be used in conjunction with street sweeping on adjacent public right of way.
- · Entrances and exits should be constructed on level ground
- Stabilized construction entrances are rather expensive to construct and when a wash rack is included, a sediment trap of some kind must also be provided to collect wash water runoff.



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The lost 8'-O * of fence shall be turned up slope 3. Stake dimensions are normal. 4. Dimension may vary to fit field condition Stakes to overlap and fence fabric to fold around each stake one full turn. Secure fabric to stake with 4 staples. For end stake, fence fabric shall be folded around two stakes one full turn and secured With 4 staples. Cross barriers shall be a minimum of 1/3 and o maximum of 1/2 the heigh of the linear barrier. 11 Maintenance openings shall be constructed in a manner to ensure 12. Joining sections shall not be placed at sump locations SECTION C-C 13. Sandbag rows and byers shall be offset to eliminate gaps

SILT FENCE

Silt Fence

STAPLE DETAIL SECTION A-A (SEE NOTE 9) Silt fence fobrlc DETAIL A END DETAIL (SEE NOTE 11)

Utah RSI Manual

Stabilized Construction Entrance/Exit TC-1

Implementation

Utah RSI Manual

SE-1

A stabilized construction entrance is a pad of aggregate underlain with filter cloth located at any point where traffic will be entering or leaving a construction site to or from a public right of way. street, alley, sidewalk, or parking area. The purpose of a stabilized construction entrance is to reduce or eliminate the tracking of sediment onto public rights of way or streets. Reducing tracking of sediments and other pollutants onto paved roads helps prevent deposition of sediments into local storm drains and production of airborne dust.

Where traffic will be entering or leaving the construction site, a stabilized construction entrance should be used. NPDES permits require that appropriate measures be implemented to prevent tracking of sediments onto paved roadways, where a significant source of sediments is derived from mud and dirt carried out from unpaved roads and construction sites.

Stabilized construction entrances are moderately effective in removing sediment from equipment leaving a construction site. The entrance should be built on level ground. Advantages of the Stabilized Construction Entrance/Exit is that it does remove some sediment from equipment and serves to channel construction traffic in and out of the site at specified locations. Efficiency is greatly increased when a washing rack is included as part of a stabilized construction entrance/exit.

Design and Layout

- · Construct on level ground where possible.
- Select 3 to 6 in. diameter stones.
 - Use minimum depth of stones of D in. or as recommended by soils engineer.
 - · Construct length of 50 ft minimum, and 30 ft minimum width.
 - Rumble racks constructed of steel panels with ridges and installed in the stabilized entrance/exit will help remove additional sediment and to keep adjacent streets clean.
 - Provide ample turning radii as pait of the entrance.
 - · Limit the points of entrance/exit to the construction site.
 - Limit speed of vehicles to control dust.
 - Properly grade each construction entrance/exit to prevent runoff from leaving the
 - Route runoff from stabilized entrances/exits through a sediment trapping device before
 - Design stabilized entrance/exit to support heaviest vehicles and equipment that will use it.
 - Select construction access stabilization (aggregate, asphaltic concrete, concrete) based on longevity, required performance, and site conditions. Do not use asphalt concrete (AC) grindings for stabilized construction access/roadway.

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- If aggregate is selected, place cmshed aggregate over geotextile fabric to at least 12 in. depth. or place aggregate to a depth recommended by a geotechnical engineer. A cmshed aggregate greater than 3 in, but smaller than 6 in, should be used.
- Designate combination or single purpose entrances and exits to the construction site.
- · Require that all employees, subcontractors, and suppliers utilize the stabilized construction
- Implement SE-7. Street Sweeping and Vacuuming, as needed.
- · All exit locations intended to be used for more than a two-week period should have stabilized. construction entrance/exit BMPs.

hspection and Maintenance

- . Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMPs are under way, inspect weekly during the rainy season and of two-week intervals in the non-rainy season to verify continued BMP implementation.
- · Inspect local roads adjacent to the site daily. Sweep or vacuum to remove visible accumulated sediment.
- · Remove aggregate, separate and dispose of sediment if construction entrance/exit is clogged with sediment.
- Keep all temporary roadway ditches clear.
- · Check for damage and repair as needed.
- Replace gravel material when surface voids are visible.
- · Remove all sediment deposited on paved roadways within 24 hours.
- · Remove gravel and filter fabric at completion of construction

Average annual cost for installation and maintenance may vary from \$1,200 to \$4,800 each. averaging \$2,400 per entrance. Costs will increase with addition of washing rack, and sediment trap. With wash rack, costs range from \$1,200 - \$6,000 each, averaging \$3,600 per entrance.

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Virginia Erosion and Sedimentation Control Handbook, Virginia Department of Conservation and Recreation, Division of Soil and Water Conservation, 199i.

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Waste Management

Construction Stormwater Best Management Practices

WM-5 Stockpile Management

material at all times.

Stockpiles/Storage of Pressure Treated Wood with Copper, Chromium, and Arsenic or Ammonical, Copper, Zinc, and Arsenate

• Treated wood should be covered with plastic or comparable material at all times.

Protection of Active Stockpiles

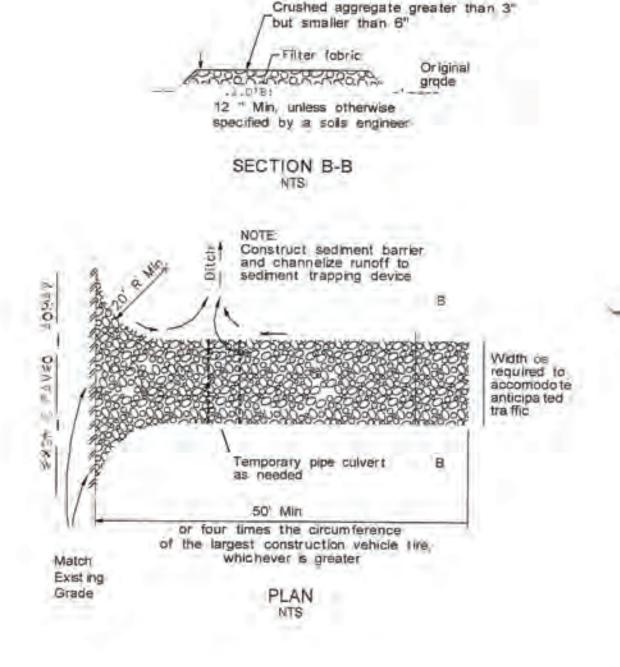
- All stockpiles should be covered and protected with a temporary linear sediment
- barrier prior to the onset of precipitation.
- Stockpiles of "cold mix" should be placed on and covered with plastic or comparable material prior to the onset of precipitation.

- Maintenance & Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities.
 - Inspect BMPs prior to forecast rain, daily during extended rain events, after rain events, and weekly throughout the life of the Project.
 - Repair and/or replace perimeter controls and covers as needed to keep them functioning properly. Ensure stockpiles are covered at all times and that the

covers are properly secured or weighted down.

Sources include EPA, SWRCB, Caltrans, CASQA Waste Management

Utah RSI Manual Stabilized Construction Entrance/Exit TC-1



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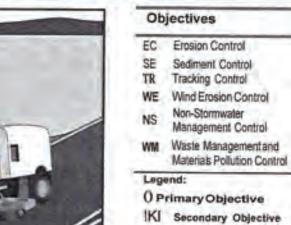
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Street Sweeping and Vacuuming

SE-7

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() Primary Objective KI Secondary Objective

Targeted Constituents

Nutrients

Trash

Metals

Bacteria

Organics

Oil and Grease

Description and Purpose

Street sweeping and vacuuming includes use of self-propelled and walk-behind equipment to remove sediment from streets and roadways, and to clean paved surfaces in preparation for final paving. Sweeping and vacuuming prevents sediment from the project site from entering storm drains or receiving waters.

Suitable Applications

Sweeping and vacuuming are suitable anywhere sediment is tracked from the project site onto public or private paved streets and roads, typically at points of egress. Sweeping and vacuuming are also applicable during preparation of paved surfaces for final paving.

Limitations

Sweeping and vacuuming may not be effective when sediment is wet or when tracked soil is caked (caked soil may need to be scraped loose).

mplementation

3-115

- · Controlling the number of points where vehicles can leave the site will allow sweeping and vacuuming effo ts to be focused, and perhaps save money.
- Inspect potential sediment tracking locations daily.
- Visible sediment tracking should be swept or vacuumed on a daily basis.

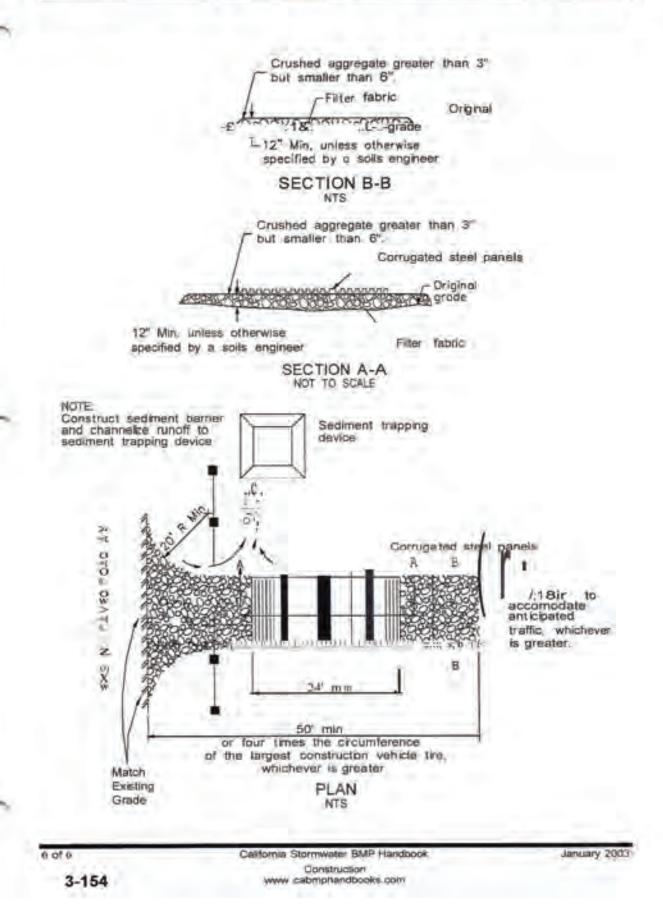


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Stabilized Construction Entrance/Exit TC-1



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Street Sweeping and Vacuuming

- . Do not use kick brooms or sweeper attachments. These tend to spread the dirt rather than
- . If not mixed with debris or trash, consider incorporating the removed sediment back into

Costs

Rental rates for self-propelled sweepers valy depending on hopper size and duration of rental. Expect rental rates from \$s8/hour (3 yd3 hopper) to \$88/hour (9 yd3 hopper), plus operator costs. Hourly production rates vary with the amount of area to be swept and amount of sediment. Match the hopper size to the area and expect sediment load to minimize time spent

Inspection and Maintenance

- · Inspect BMPs prior to forecast rain, daily during extended rain events, after rain events, weekly during the rainy season, and at two-week intervals during the non-rainy season.
- When actively in use, points of ingress and egress must be inspected daily.
- · When tracked or spilled sediment is observed outside the construction limits, it must be removed at least daily. More frequent removal, even continuous removal, may be required in some jurisdictions.
- . Be careful not to sweep up any unknown substance or any object that may be potentially
- · Adjust brooms frequently; maximize efficiency of sweeping operations.
- After sweeping is finished, properly dispose of sweeper wastes at an approved dumpsite.

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materials.

Construction Stormwater Best Management Practices



Waste Management

WM-5 Stockpile Management

Purpose

Stockpile Management procedures and practices are designed to reduce or eliminate air and stormwater pollution from stockpiles of soil, paving materials such as Portland Cement Concrete (PCC) rubble, Asphalt Concrete (AC), asphalt concrete rubble, aggregate base, aggregate sub base or pre-mixed aggregate, asphalt minder (so called "cold mix" asphalt), and pressure treated wood.

Conditions Implement in all Projects that stockpile soil and other materials.

Where the Practice Applies

Specifications: Design and

Installation

Protection of stockpiles is a year-round requirement. To properly manage stockpiles:

• Locate stockpiles a minimum of 50 feet away from concentrated flows of stormwater, stormdrain inlets, and the site perimeter.

To prevent air and stormwater pollution from stockpiles of various construction

- Protect all stockpiles from stormwater runon using a temporary perimeter sediment barrier such as gravel bags, fiber rolls, or cutback curb.
- Protect all stockpiles from stormwater and wind erosion by completely covering with some type of tarp or covering. Secure the tarp with stakes or gravel bags to ensure the tarp does not blow off or expose any portion of the stockpile. Stockpiles must be covered at all times.
- Implement wind erosion control practices as appropriate on all stockpiled
- material. For specific information, see WEC 1 Dust Control.
- Manage stockpiles of contaminated soil in accordance with WM 8 Contaminated Soil Management.
- Place bagged materials in the material storage area, in secondary containment, and under cover.

Protection of Non-Active Stockpiles

Soil Stockpiles

Non-active stockpiles of the identified materials should be protected further as follows:

• Soil stockpiles should be covered or protected with soil stabilization measures and a temporary perimeter sediment barrier at all times.

Stockpiles of Portland Cement Concrete Rubble, Asphalt Concrete, Asphalt Concrete Rubble, Aggregate Base, or Aggregate Sub Base

• The stockpiles should be covered or protected with soil stabilization measures and a temporary perimeter sediment barrier at all times. Stockpiles of "Cold Mix"

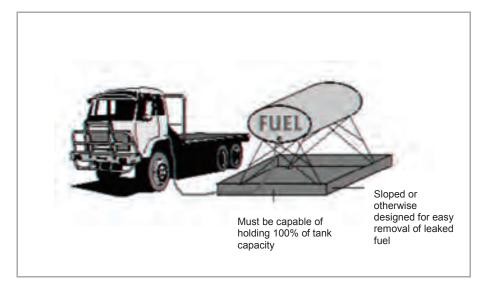
• Soil stockpiles should be placed on and covered with plastic or comparable

Sources include EPA, SWRCB, Caltrans, CASQA **Waste Management**

WM-12

BMP: Vehicle And Equipment Fueling

Construction



DESCRIPTION:

Prevent fuel spills and leaks, and reduce their impacts to storm water by using off-site facilities, fueling in designated areas only, enclosing or covering stored fuel, implementing spill controls, and training employees and subcontractors.

INSTALLATION/APPLICATION:

- Use off-site fueling stations as much as possible. Fueling vehicles and equipment outdoors or in areas where fuel may spill/leak onto paved surfaces or into drainage pathways can pollute storm water. If you fuel a large number of vehicles or pieces of equipment, consider using an off-site fueling station. These areas are better equipped to handle fuel and spills properly. Performing this work off-site can also be economical by eliminating the need for a separate fueling area at your site.
- If fueling must occur on-site, use designated areas, located away from drainage courses, to prevent the runon of storm water and the runoff of spills. Discourage topping-off of fuel tanks.
- Always use secondary containment, such as a drain pan or drop cloth, when fueling to catch spills/leaks. Place a stockpile of spill cleanup materials where it will be readily accessible. Use adsorbent materials on small spills rather than hosing down or burying the spill. Remove the adsorbent materials promptly and dispose of properly.
- Carry out all Federal and State requirements regarding stationary above ground storage tanks. (40 CF Sub. J) Avoid mobile fueling of mobile construction equipment around the site; rather, transport the equipment to designated fueling areas. With the exception of tracked equipment such as bulldozers and perhaps forklifts, most vehicles should be able to travel to a designated area with little lost time. Train employees and subcontractors in proper fueling and cleanup procedures.

Sending vehicles/equipment off-site should be done in conjunction with Stabilized Construction Entrance.

Keep ample supplies of spill cleanup materials on-site.

- Inspect fueling areas and storage tanks on a regular schedule.

Waste Management

Provide designated waste collection areas and containers, arranging for regular

disposal, and training employees and subcontractors.

Prevent or reduce the discharge of pollutants to stormwater from solid, leachable, or construction waste.

Conditions Where the Practice Applies

This BMP is suitable for construction sites where the following wastes are generated or stored:

- Solid waste generated from trees and shrubs removed during land clearing, demolition of existing structures (rubble), and building construction.
- Packaging materials including wood, paper, and plastic.
- Scrap or surplus building materials including scrap metals, rubber, plastic, glass pieces, and masonry products.
- Domestic wastes including food containers such as beverage cans, coffee cups, paper bags, plastic wrappers, and cigarettes.
- Construction wastes including brick, mortar, timber, steel and metal scraps, pipe and electrical cuttings, non-hazardous equipment parts, Styrofoam and other materials used to transport and package construction materials.
- Planting wastes, including vegetative material, plant containers, and packaging materials.

Specifications: Design and Installation

- The following steps will help keep a clean site and reduce stormwater pollution:
- Select designated waste collection areas onsite.
- Provide an adequate number of containers to prevent loss of wastes when it is windy.
- Plan for additional containers and more frequent pickup during the demolition phase of construction.
- Arrange for regular waste collection. Do not allow containers to overflow.
- Make sure that toxic liquid wastes (used oils, solvents, and paints) and chemicals (acids, pesticides,
- additives, curing compounds) are not disposed of in dumpsters designated for construction debris. • Trash receptacles should be provided in the Contractor's yard, field trailer areas, and at locations
- where workers congregate for lunch and break periods. • Dumpsters of sufficient size and number should be provided to contain the solid waste generated by the Project.

Sources include EPA, SWRCB, Caltrans, CASQA, University of California, Santa Barbara **Waste Management**

- Stormwater run-on should be prevented from contacting stored solid waste through the use of berms, dikes, or other temporary diversion structures or through the use of measures to elevate waste from site surfaces.
- Solid waste storage areas should be, where possible, located at least 50 feet from drainage facilities and watercourses and should not be located in areas prone to flooding or ponding.

- Have the Contractor's superintendent or representative oversee and enforce proper solid waste management procedures and practices.
- Instruct employees and subcontractors on identification of solid waste and hazardous waste. Hazardous waste must not be disposed of in dumpsters.
- Educate employees and subcontractors on solid waste storage and disposal procedures. Include bagging of blowable trash.
- Hold regular meetings to discuss and reinforce disposal procedures.
- Require that employees and subcontractors follow solid waste handling and storage procedures.
- Prohibit littering by employees, subcontractors, and visitors.
- Minimize production of solid waste materials whenever possible.

Collection, Storage, and Disposal

- Littering on the Project site is prohibited.
- To prevent clogging of the stormwater drainage system, litter and debris removal from drain gates, trash racks, and ditch lines should be a priority.
- Trash receptacles from work areas within the construction limits of the Project site should be collected, regardless of whether the litter was generated by the Contractor, the public, or others. Collected litter and debris shall not be placed in or next to storm drain inlets, stormwater drainage systems, watercourses, or near the site perimeter.
- Full dumpsters should be removed from the Project site and the contents should be disposed of properly by trash hauling contractor.
- Construction material visible to the public should be stored or stacked in an orderly manner.
- Dispose of planting waste in dumpsters.
- Segregate potentially hazardous waste from non-hazardous construction site waste.
- Make sure that toxic liquid wastes (used oils, solvents, and paints) and chemicals (acids, pesticides, additives, curing compounds) are NOT disposed of in dumpsters designated for construction debris.
- Make sure that demolition materials containing hazardous wastes are NOT disposed of in dumpsters designated for construction debris.
- For disposal of hazardous waste, have hazardous waste hauled to an appropriate disposal and/or recycling facility.
- Salvage or recycle useful vegetation debris, packaging and surplus building materials when

Sources include EPA, SWRCB, Caltrans, CASQA, University of California, Santa Barbara **Waste Management**

practical. For example, trees and shrubs from land clearing can be used as a brush barrier or converted into wood chips, then used as mulch on graded areas. Wood pallets, cardboard boxes, and construction scraps can also be recycled.

- Collect site trash daily and dispose in the dumpster, throughout the life of the Project, especially during the rainy and windy conditions.
- Make sure that construction waste is collected, removed, and disposed of only at authorized disposal areas.
- Remove solid waste promptly since erosion and sediment control devices tend to collect litter.
- Bag any waste that can leak out of the dumpster.
- Bag all blowable trash so that it is contained within the dumpster.
- Arrange for regular waste collection.

Maintenance & Inspection

- Inspect and verify that activity based BMPs are in place prior to the commencement of associated
- Inspect BMPs daily during extended rain events, after rain events, and weekly throughout the life of the Project.
- Inspect construction waste area regularly.
- Monitor employees, subcontractors, and visitors and ensure no littering.
- Check erosion and sediment controls for the accumulation of trash or debris.
- Inspect dumpsters to be sure that blowable trash is bagged.
- Inspect the dumpsters for leaks or signs of liquid waste in the dumpsters.
- Do not hose out dumpsters on the construction site. Leave dumpster cleaning to the trash hauling Contractor.
- Clean up immediately if a container does spill.

University of California, Santa Barbara **Waste Management**

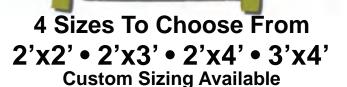
Sources include EPA, SWRCB, Caltrans, CASQA,

YellowJacket Drain Inlet Filter

Finally, a drain inlet filter that is affordable and simple to install and maintain. The yellow webbing secures the filter to the grate and doubles as lifting straps to quickly and easily remove the filter, grate and all, for simple cleaning.

YellowJackets are designed to accommodate rectangular inlets as well as square and round drains.





Quick Look Filter Bag

Water Flow Rate

High strength woven geotextile

- Weather resistant 2" polypropylene webbing Strapping
- Overflow 4 overflow portals built into each unit
- Flow Rate 200 gpm (gallons per minute)
- Dimensions
- 4 sizes available to fit many storm drains (custom sizing available) Remove with built-in lifting straps, clean filter and replace Maintenance

		9 1 -,	- 1				
YellowJacket Drain Inlet Filter Material Specifications							
PROPERTY	TEST METHOD	ENGLISH	METRIC				
ORIGIN OF MATERIALS	•						
% U.S. Manufactured Inputs		100%	100%				
% U.S. Manufactured		100%	100%				
MECHANICAL							
Tensile Strength (Grab)	ASTM D-4632	350 x 280 lbs	1557 x 1246 N				
Elongation	ASTM D-4632	20 x 15%	20 x 15%				
Trapezoidal Tear	ASTM D-4533	110 x 95 lbs	489 x 423 N				
CBR Puncture	ASTM D-4833	885 lbs	3937 N				
ENDURANCE							
V Resistance		000/	900/				
% Retained at 500 hrs	ASTM D-4355	80%	80%				
HYDRAULIC							
Apparent Opening Size (AOS)	ASTM D-4751	30 US Std. Sieve / .023 in	0.600 mm				
Permittivity	ASTM D-4491	1.50 sec ⁻¹	1.50 sec ⁻¹				
Percent Open Area	CW-02215 Mod4	17%	17%				

200 gm/ft²

Dispose of unit in accordance with applicable Federal, state and local environmental laws and regulations. The user is solely responsible for the compliance with maintenance and disposal laws and regulations.

ASTM D-4491

The manufacturer or seller assumes no responsibility for proper or improper maintenance or disposal.

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Phone (800) 808-1774 Fax (866) 990-1527

www.psibmp.com info@psibmp.com



8,149 lpm/m²

Drain Inlet Filter.

TEMPORARY EROSION AND SEDIMENT CONTROL PLAN

