

TEMPORARY EROSION AND SEDIMENT CONTROL PLAN

Carlisle Crossing

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

PAGE INDEX	
1	Title Page
2	SWPPP/TESCP Info & Notes
3	SWPPP Contacts / Nature of Construction
4-5	Temporary Erosion Control Map
6-14	BMP Specifications / Details



LATITUDE: 35.104018
LONGITUDE: -106.603612



	Carlisle Crossing	
	Albuquerque, Bernalillo County, NM	
	10/22/2024	
	Bruce Henriksen James Tolman	

TEMPORARY EROSION AND SEDIMENT CONTROL PLAN

PERMIT NUMBER:	NMR	ESC Plan Standard Notes (2023-06-16)
	NMR	
OWNER NAME:	Carlisle Associates LP	<div>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:<div>a. The City Ordinance § 14-5-2-11, the ESC Ordinance,</div>b. The EPA’s 2022 Construction General Permit (CGP), and</div> 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).

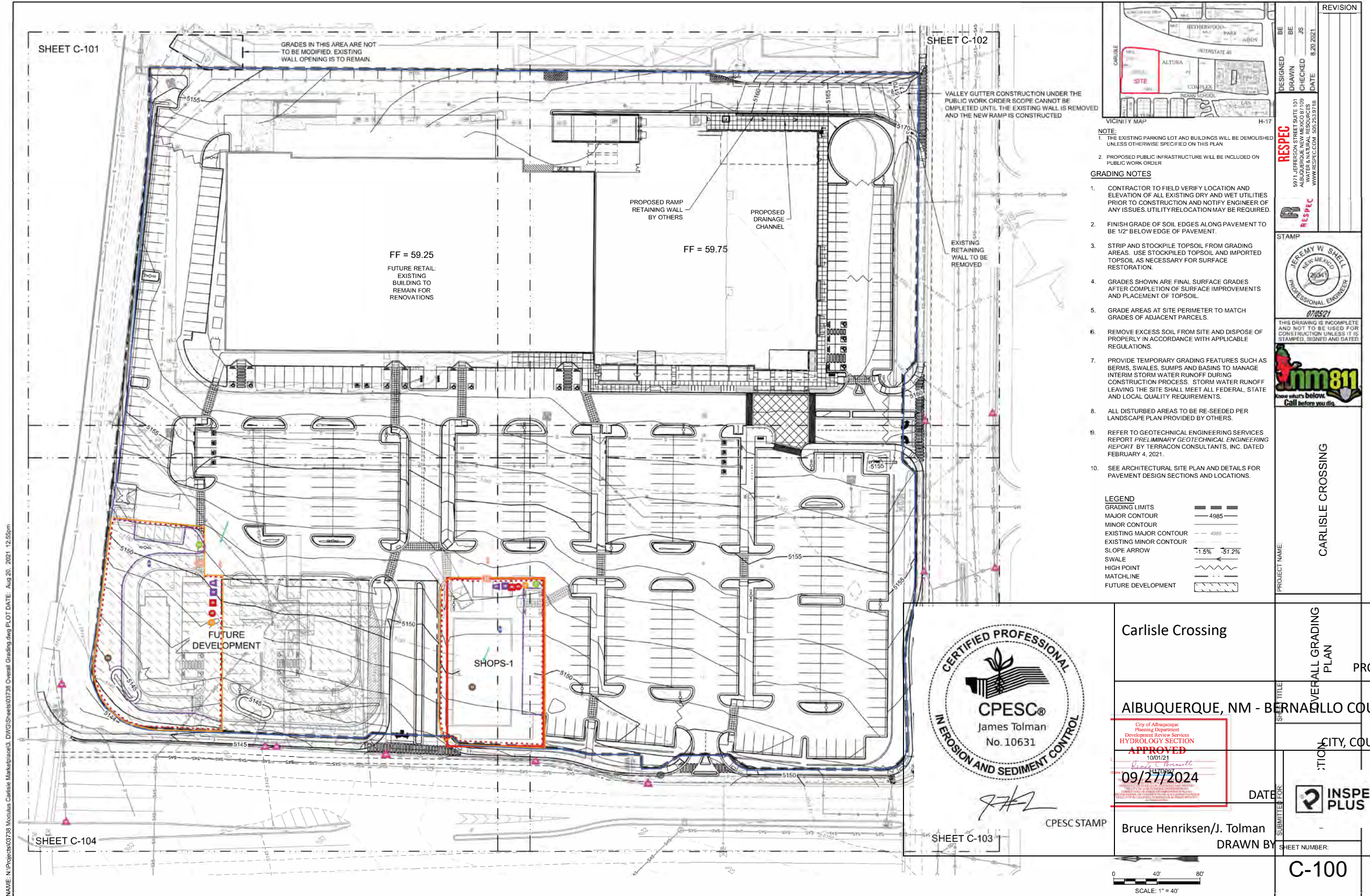
7. When installing utilities behind the curb, the excavated dirt should not be placed in the street.

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.

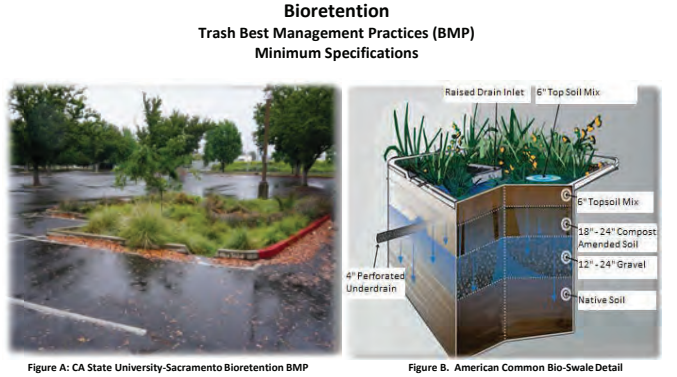
	Carlisle Crossing	
	Albuquerque, Bernalillo County, NM	
	10/22/2024	
	Bruce Henriksen James Tolman	

NAME: N:\Projects\03728 Modulus Carlisle Market\03728 Overall Grading.dwg PLOT DATE: Aug 20, 2021 12:55pm





-  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 Concrete Washout (2)
-  Stabilized Construction Exit (2)



Description
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
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.

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

Keeping Your Construction Projects Compliant

- Concrete, Paint, Dry Wall Mud, Stucco, Mortar
- Easy to Transport, Setup and Dispose of
- Eco-Friendly and BMP Compliant

Corrugated Washouts

Heavy-duty, water-treated Kraft fiberboard
Folds flat for easy transport and storage

30"x30"x14"
Capacity: 0.25 cu. yards/50 gallons
Part No: 945-123030

All-Weather Washouts

Woven poly propylene for the worst of climates

4"x4"x14" with Top
Capacity: 0.68 cu. yards/140 gallons
Includes 5 to 1 safe working load lifting straps
Part No: 950-12304AW

6"x6"x12" Bottom
Capacity: 1.33 cu. yards/260 gallons
1 to 1 safe safe working load lifting straps
Part No: 950-12306AW-Bot

6"x6"x11"
Capacity: 1.33 cu. yards/260 gallons
Part No: 945-123406

6"x6" Rainfly
For All-Weather and Corrugated Washouts
Part No: 950-12306AW-Top

outpak.com
208-376-6967 sales@outpak.com

- OUTPAK CORRUGATED WASHOUT**
- PART 1: GENERAL**
- 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 and removal of washout.
 - 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**
- The Washout consists of a corrugated box and a 6-mm poly liner.
 - The Outpak Corrugated Box is constructed of water resistant 350HV# water-treated Kraft fiberboard.
- 2.02 Base**
- Material shall consist of native or imported soil. May also be level asphalt or concrete surface.
- 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.

- Clear area where washout is to be deployed of debris, rocks, other materials that may puncture the corrugated board and 6-mm plastic liner. If rocks or other debris cannot be removed, cover protrusions with imported sand.
- 3.02 Set Up Washout**
- Locate a level area to deploy the Washout and clear it of any debris that may cause damage.
 - Unfold the corrugated box.
 - Cover the corrugated box with the enclosed 6-mm polyethylene liner.
 - Secure Liner into pinch points at top washout box perimeter.
 - Insert tie-down stakes if required (note tie-down stakes are not provided with corrugated washout).
 - If a storm is imminent cover the Outpak washout with a tarp to prevent overflow of the washout.
- 3.03 Dispose Outpak Washout**
- After the Washout has been filled with washout residue material, allow the wastewater to evaporate leaving only solid concrete residue. Wastewater can be pumped from the washout and disposed of a facility permitted to receive liquid waste. Alternatively, use OutPak's Slurry Solution to solidify wastewater.
 - After residue has dried, load the hardened unit onto a flat-bed truck or dump truck with construction equipment such as a forklift or loader. Full, hardened units can be stacked for easy transportation.
- 3.04 Field Quality Control**
- 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. Make sure that the washout has sufficient free space to hold the next planned washout event.
 - Cover the Washout if precipitation is likely. Prevent stormwater from over-filling the washout and causing a discharge of wash water.
 - If the washout is moved, note the new location in the project stormwater pollution prevention documents.

BMP: Cutback Curb

CC

APPLICATIONS

- ☐ Manufacturing
- ☐ Material Handling
- ☐ Vehicle Maintenance
- ☒ Construction
- ☐ Commercial Activities
- ☐ Roadways
- ☐ Waste Containment
- ☒ Housekeeping Practices

DESCRIPTION:
Temporary sediment trap formed by excavation behind the curb. The purpose is to intercept sediment laden runoff from the site during construction and retain sediment onsite.

APPROACH:

- A cutback curb is installed when discharge from the site runs over the curb causing sediment to enter the roadway.
- Cutback curbs should be implemented in conjunction with other BMPs whenever possible and should not be used to replace other feasible BMPs.
- Cutback curbs should typically be installed at the site entrance when access is needed.
- The depth may be required to increase if more sediment storage is necessary.
- Other sediment traps, such as V ditches or depressed park strips, may also be acceptable.
- Excavate soil behind curb to a depth of 2-4 inches.
- The cutback could be implemented behind a sidewalk if sidewalk exists.

LIMITATIONS:

- Only remains effective for a limited time. Should not be used as a primary control measure for more than 4 months.
- Only applicable when the site is sloped towards the curb such that runoff overtops the curb.
- On severe slopes, the cutback may become ineffective and may also compromise the integrity of the curb. Therefore, a cutback should not be installed on a slope that exceeds 5%.

MAINTENANCE:

- Inspect monthly and after significant rainfall.
- Clean out excess sediment as required.
- Allow sediment laden water to infiltrate before cleaning.

TARGETED POLLUTANTS

- ☒ Sediment
- ☐ Nutrients
- ☐ Heavy Metals
- ☐ Toxic Materials
- ☐ Oxygen Demanding Substances
- ☐ Oil & Grease
- ☐ Floatable Materials
- ☐ Bacteria & Viruses

IMPLEMENTATION REQUIREMENTS

- ☐ Capital Costs
- ☒ O&M Costs
- ☒ Maintenance
- ☐ Training

High Medium Low

University of California, Santa Barbara

Construction Stormwater Best Management Practices

Wind Erosion Control

WEC–1 Dust Control

Definition
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.

Purpose
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 Where the Practice Applies
Wind erosion control BMPs should be applied to all construction earth disturbing activities, including the following construction activities:

- 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: Design and Installation

Preventive Measures:

- Schedule construction activities to minimize exposed area.
- 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

Wind Erosion Control

WEC-1

University of California, Santa Barbara

Construction Stormwater Best Management Practices

Wind Erosion Control

WEC–1 Dust Control

Maintenance & Inspection

- 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 attention.

WEC-2

Sources include EPA, SWRCB, Caltrans, CASQA

Wind Erosion Control

BMP: Employee Training

ET 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 SWPPP.

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.

APPROACH:

- ♦ 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 stormwater.
- ♦ Employee training is a vital component of many of the individual source control BMPs included in this manual.

15



Description and Purpose

A fiber roll consists of straw, flax, or other similar materials bound into a tight tubular roll. When fiber rolls are placed at the toe and on the face of slopes, they intercept runoff, reduce its flow velocity, release the runoff as sheet flow, and provide removal of sediment from the runoff. By interrupting the length of a slope, fiber rolls can also reduce erosion.

Suitable Applications

Fiber rolls may be suitable:

- Along the toe, top, face, and at grade breaks of exposed and erodible slopes to shorten 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

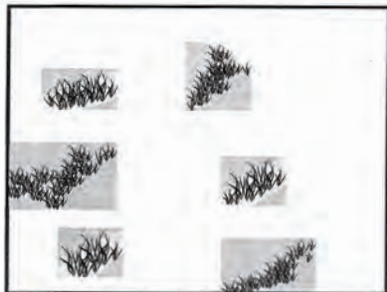
Limitations

- Fiber rolls are not effective unless trenched

Objectives		
EC	Erosion Control	IKI
SE	Sediment Control	O
TR	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	
Legend:		
O	Primary Objective	
IKI	Secondary Objective	

Targeted Constituents
Sediment
Nutrients
Trash
Metals
Bacteria
Oil and Grease
Organics

Potential Alternatives
SE-1 Silt Fence
SE-6 Gravel Bag Berm
SE-8 Sandbag Barrier
SE-9 Straw Bale Barrier



Description and Purpose

Hydroseeding typically consists of applying a mixture of wood fiber, seed, fertilizer, and stabilizing emulsion with hydro-mulch 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 of inactivity.

Limitations

- Hydroseeding 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., straw mulch).

- 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.

Objectives		
EC	Erosion Control	
SE	Sediment Control	
TR	Tracking Control	
WE	Wind Erosion Control	IKI
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	
Legend:		
O	Primary Objective	
IKI	Secondary Objective	

Targeted Constituents
Sediment
Nutrients
Trash
Metals
Bacteria
Oil and Grease
Organics

Potential Alternatives
EC-3 Hydraulic Mulch
EC-5 Soil Binders
EC-6 Straw Mulch
EC-7 Geotextiles and Mats
EC-8 Wood Mulching



- 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 rolls, etc.).
- Difficult to move once saturated.
- 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.

Implementation

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.

Installation

- 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 interval of 20 ft.

Slope inclination between 4:1 and 2:1(H:V): Fiber Rolls should be placed at a maximum interval of 15 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 10 ft. (a closer spacing is more effective).

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

- Stake fiber rolls into a 2 to 4 in. deep trench with a width equal to the diameter of the fiber 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 0.75 by 0.75 in. and minimum length of 24 in.

- If more than one fiber roll is placed in a row, the rolls should be overlapped, not abutted.

Removal

- Fiber rolls are typically left in place.

- If fiber 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.

Costs

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 or disposed at an appropriate location.

- If fiber 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.

	Hydroseeding		Installed Cost per Acre
	Ornamentals	Native	
High Density	Ornamentals		\$400 - \$1600
	Timber Species		\$350
	Bunch Grasses		\$300 - \$1300
Fast Growing	Annual		\$350 - \$650
	Perennial		\$300 - \$800
Non-Competing	Native		\$300 - \$1600
	Non-Native		\$400 - \$500
Sterile	Cereal Grain		\$500

Source: CalTrans Guidance for Soil Stabilization for Temporary Slopes, Nov. 1999

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.

- 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, fertilized, 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.

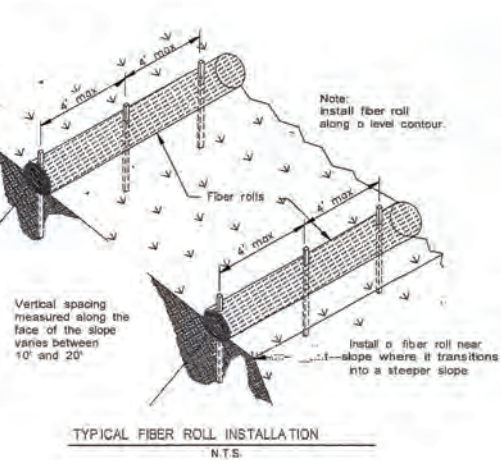
References

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

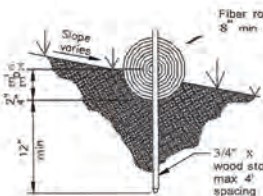
Guidance Document: Soil Stabilization for Temporary Slopes, State of California Department of Transportation (Caltrans), November 1999.

Additional Instructions:

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 1 1/2 lbs per 1,000 Sq. ft. or about 60 lbs per acre.



TYPICAL FIBER ROLL INSTALLATION
N.T.S.



ENTRENCHMENT DETAIL
N.T.S.



Waste Management

WM-1 Material Delivery and Storage

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.

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

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

- 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 paints.
- 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 Material Delivery and Storage

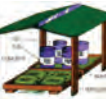
- and Combustible Liquid Code, NFPA30.
- Keep an up to date inventory of materials delivered and stored onsite.
- Hazardous materials storage onsite should be minimized.
- Hazardous materials should be handled as infrequently as possible.
- Chemicals should be kept in their original labeled containers.
- 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 site.
- 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

Sources include EPA, SWRCB, Caltrans, CASQA

WM-2

Waste Management

Waste Management

WM–1 Material Delivery and Storage

- facilities for storage.
- Bagged and boxed materials should be stored on pallets and should not be allowed to accumulate on the ground. To provide protection from wind and rain throughout the rainy season, bagged and boxed materials should be covered during non-working days and prior to and during rain events.
- Stockpiles should be protected in accordance with WM – 5 Stockpile Management.
- Materials should be stored indoors within existing structures or sheds when available.
- An ample supply of appropriate spill clean up material should be kept near storage areas.

Material Delivery Practices

- Keep an accurate, up-to-date inventory of material delivered and stored onsite.
- Arrange for employees trained in emergency spill cleanup procedures to be present when dangerous materials or liquid chemicals are unloaded.

Spill Cleanup

- Contain and clean up any and all spills immediately.
- Properly remove and dispose of any hazardous materials or contaminated soil if significant residual materials remain on the ground after construction is complete. See BMP Contaminated Soil Management.
- 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.
- Keep an ample supply of spill cleanup materials near the storage area.
- Keep storage areas clean, well organized, and equipped with ample cleanup supplies as appropriate for the materials being stored.
- Repair or replace perimeter controls, containment structures, covers, and liners as needed to maintain proper function.

Maintenance & Inspection

Sources include EPA, SWRCB, Caltrans, CASQA

WM-3

Waste Management

Non-Stormwater Management

NSM–7 Paving and Grinding

Sealing Operations

- During chip seal application and sweeping operations, petroleum or petroleum covered aggregate must not be allowed to enter any stormdrain or water courses. Apply temporary perimeter controls until structure is stabilized.
- Drainage inlet structures and manholes shall be covered with filter fabric during 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 protection.
- Seal coat, tack coat, slurry seal, or fog seal shall not be applied if rainfall is predicted to occur during the application or curing period.

Paving Equipment

- Leaks and spills from paving equipment can contain toxic levels of heavy metals 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 Prevention and Control.
- Substances used to coat asphalt transport trucks, asphalt trucks, and asphalt spreading equipment shall not contain soap and shall be non-foaming and non-toxic.
- Place plastic materials under asphaltic concrete (AC) paving equipment while not in use, to catch and/or contain drips and leaks.
- Paving equipment parked onsite shall be parked over plastic to prevent soil contamination.
- 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 and Equipment Practices.

Thermoplastic Striping

- 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 system, or watercourses.
- 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 deadheaded.
- Contractor shall not pre-heat, transfer, or load thermoplastic near stormdrain inlets or watercourses.
- Clean truck beds daily of loose debris and melted thermoplastic. Thermoplastic

Sources include EPA, SWRCB, Caltrans, CASQA

NSM-16

Non-Stormwater 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 & Inspection

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

Sources include EPA, SWRCB, Caltrans, CASQA

NSM-17

Non-Stormwater Management

Non-Stormwater Management

NSM–7 Paving and Grinding

Definition

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.

Purpose

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

Conditions

Where the Practice Applies

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

Specifications:
Design and Installation

General

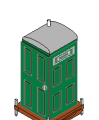
- Avoid paving during the wet season when feasible.
- Reschedule paving and grinding activities if rain is in the forecast.
- Train employees and subcontractors in pollution prevention and reduction.
- Store materials away from stormdrains and drainage courses to prevent stormwater runoff, see WM – 1 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

NSM-14

Non-Stormwater Management

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.

Purpose

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

Conditions

Where the Practice Applies

Sanitary septic waste management practices are suitable for use at all construction sites that use temporary or portable sanitary and septic waste systems.

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.

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

Education

- 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

WM-10

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 in place.
- 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.

Sources include EPA, SWRCB, Caltrans, CASQA

NSM-15

Non-Stormwater Management

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?

Requirements

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.
- 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 **and** work activities to always have secondary containment:

- Fuel tanks (single walled)
- Fuel transfer activities, for both mobile and stationary areas
- 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 such as:
 - 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

Single Walled Fuel Tanks



Material Storage



Fuel Transfers



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
- Timeframe in use
- Condition of equipment
- Security and vandalism
- Weather
- Available manpower
- Equipment and materials

Surrounding Environment

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

Spill + Water = BIG/MULTIPLE FINES

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

- Will the spill source be on the project for a long period of time?
- 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

- Is equipment relatively new and/or in good condition?
- Based on experience, is there a reasonable potential for equipment failure?
- Does the equipment have unprotected high pressure hoses and valves?
- 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.

Portable Pump



Security and Vandalism

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

Electrical Locks



AST Fill Port Lock



Alarm Systems



Cap Lock



Emergency Shut-Off Valve



Locking Container



Fencing



Weather

- Is construction work occurring during the raining season?
- Could extreme hot or cold temperatures cause plastic or structures to become brittle or fracture

Weathered Plastic



Plastic Cover



Cover with Containment Pallet



How’s the Weather?

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 facility shall be covered during non-working days, prior to and during rain events.

Areas with **increased rainfalls** (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 cause some plastics to crack or melt. If 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.

Available Manpower

- Is there a commitment of man power to conduct regular frequent inspections?
- Is there staff on hand who are trained and experienced in spill response?

Trained staff on hand?

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 increased security.

Equipment and Materials

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

Enough materials on hand?

Equipment available?
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.

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
- 72 Hour Spill Holding Timeframe
- Quantity
- Surface Topography
- Vibration Damage
- 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?

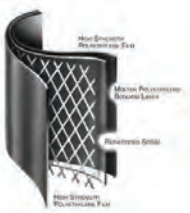


Plastic sheeting is made in various thicknesses. A thickness of 20-25 mil is recommended for temporary containment liners that is expected to last one to two years. A 6 mil thickness punctures or tears easily, but it may be effective for short term durations, with little wear and tear and not exposed to extreme hot or cold environments.

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 flexibility allows for stretching to help prevent stress cracking, which may occur with High Density Polyethylene (HDPE). PVC has a wide range of thicknesses available, from 6 to 45 mils or more.

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

Extra Heavy Duty Liner



- Construct the length of each reach so that the change in base elevation along the reach does not exceed 1/3 the height of the barrier; in no case should the reach exceed 500 ft.
- Costs**
- 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 silt fences.
- 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.

References

Manual of Standards of Erosion and Sediment Control Measures, Association of Bay Area Governments, May 1995.

National Management Measures to Control Nonpoint Source Pollution from Urban Areas, United States Environmental Protection Agency, 2002.

Proposed Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters, Work Group-Working Paper, USEPA, April 1992.

Sedimentation and Erosion Control Practices, and Inventory of Current Practices (Draft), UESPA, 1990.

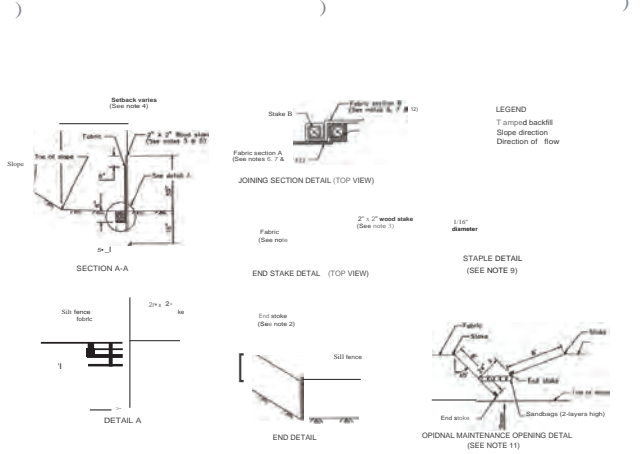
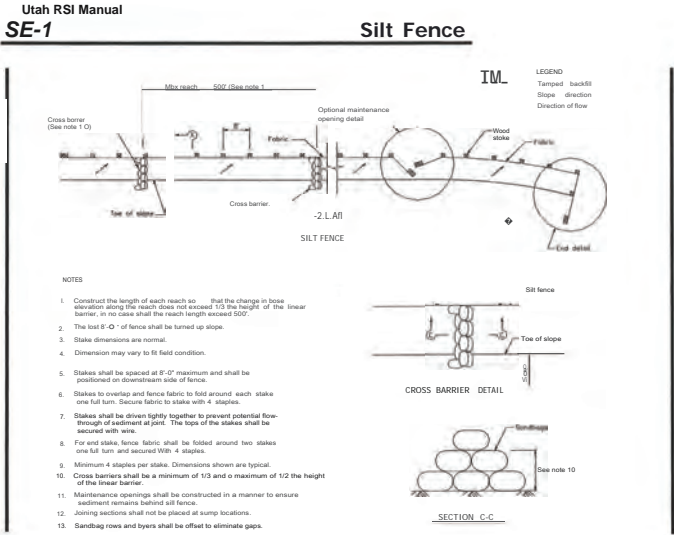
Southeastern Wisconsin Regional Planning Commission (SWRPC). Costs of Urban Nonpoint Source Water Pollution Control Measures. Technical Repo I No. 31. Southeastern Wisconsin Regional Planning Commission, Waukesha, WI. 1991

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

Stormwater Management Manual for The Puget Sound Basin, Washington State Department of Ecology, Public Review Draft, 1991.

U.S. Environmental Protection Agency (USEPA). Stormwater Management for Industrial Activities: Developing Pollution Prevention Plans and Best Management Practices. U.S. Environmental Protection Agency, Office of Water, Washington, DC, 1992.

Water Quality Management Plan for the Lake Tahoe Region, Volume II, Handbook of Management Practices, Tahoe Regional Planning Agency, November 1988.



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:

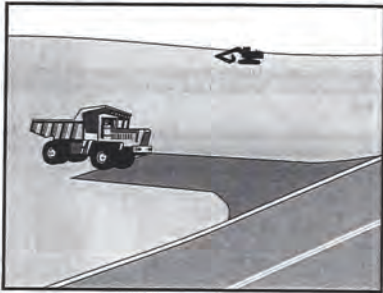
- Store controlled materials within a storage area.
- Educate personnel on prevention and clean-up techniques.
- Designate an Emergency Coordinator responsible for employing preventative practices and for providing spill response.
- Maintain a supply of clean-up equipment on-site and post a list of local 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 MATERIAL.
- 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 data.
- Contact the Salt Lake County Health Department (313-6700) for any spill of reportable quantity.

Utah RSI Manual

Stabilized Construction Entrance/Exit TC-1



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 dirt onto public roads by construction vehicles.

Suitable Applications
Use at construction sites:

- Where dirt 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 only.
- 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.

Objectives		
EC	Erosion Control	IKI
SE	Sediment Control	IKI
TC	Tracking Control	O
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	
Legend:		
O	Primary Objective	
IKI	Secondary Objective	

Targeted Constituents	
Sediment	
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives	
None	



Utah RSI Manual

Stabilized Construction Entrance/Exit TC-1

Implementation

General
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 12 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 part 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 construction site.
- Route runoff from stabilized entrances/exits through a sediment trapping device before discharge.
- 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.

Utah RSI Manual

Stabilized Construction Entrance/Exit TC-1

- If aggregate is selected, place crushed aggregate over geotextile fabric to at least 12 in. depth, or place aggregate to a depth recommended by a geotechnical engineer. A crushed 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 access.
 - 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.
- Inspection 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.

Costs
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.

References
Manual of Standards of Erosion and Sediment Control Measures, Association of Bay Area Governments, May 1995.

National Management Measures to Control Nonpoint Source Pollution from Urban Areas, USEPA Agency, 2002.

Proposed Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters, Work Group Working Paper, USEPA, April 1992.

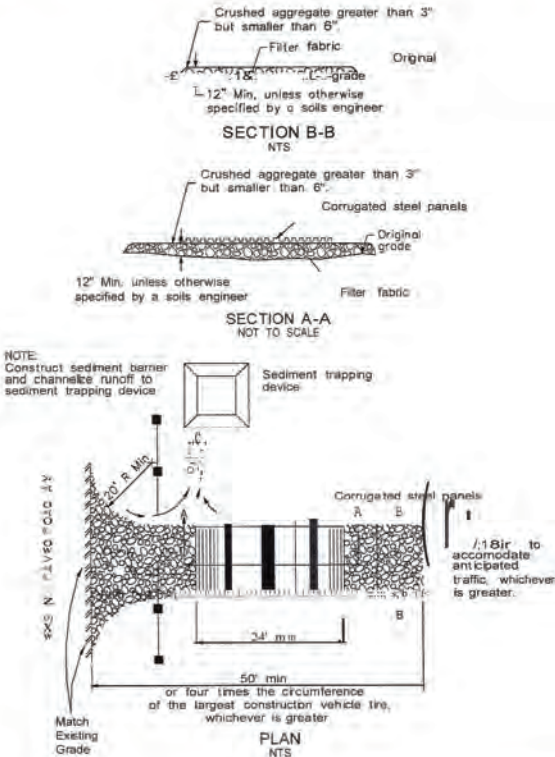
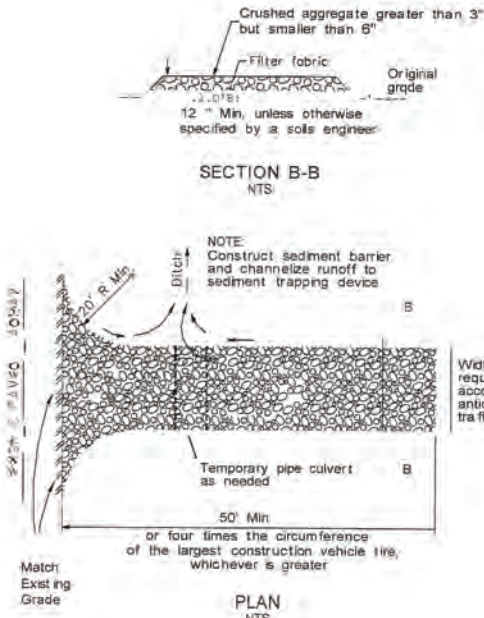
Stormwater Quality Handbooks Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Stormwater Management of the Puget Sound Basin, Technical Manual, Publication #91-75, Washington State Department of Ecology, February 1992.

Virginia Erosion and Sedimentation Control Handbook, Virginia Department of Conservation and Recreation, Division of Soil and Water Conservation, 1991.

Guidance Specifying Management Measures for Nonpoint Pollution in Coastal Waters, EPA 840-B-9-002, USEPA, Office of Water, Washington, DC, 1993.

Water Quality Management Plan for the Lake Tahoe Region, Volume II, Handbook of Management Practices, Tahoe Regional Planning Agency, November 1988.



Waste Management

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 & Inspection

- 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.



Objectives	
EC	Erosion Control
SE	Sediment Control
TR	Tracking Control
WE	Wind Erosion Control
NS	Non-Stormwater Management Control
WM	Waste Management and Materials Pollution Control
Legend:	
I	Primary Objective
K	Secondary Objective

Targeted Constituents
Sediment
Nutrients
Trash
Metals
Bacteria
Oil and Grease
Organics

Potential Alternatives
None

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).

Implementation

- Controlling the number of points where vehicles can leave the site will allow sweeping and vacuuming efforts 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.



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

Costs

Rental rates for self-propelled sweepers vary depending on hopper size and duration of rental. Expect rental rates from \$58/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 dumping.

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 hazardous.
- Adjust brooms frequently; maximize efficiency of sweeping operations.
- After sweeping is finished, properly dispose of sweeper wastes at an approved dumpsite.

References

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

Labor Surcharge and Equipment Rental Rates, State of California Department of Transportation (Caltrans), April 1, 2002 - March 31, 2003.



Waste Management

WM-5 Stockpile Management

Definition

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.

Purpose

To prevent air and stormwater pollution from stockpiles of various construction materials.

Conditions Where the Practice Applies

Implement in all Projects that stockpile soil and other materials.

- 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.
 - Protect all stockpiles from stormwater runoff 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

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

Soil Stockpiles

- 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

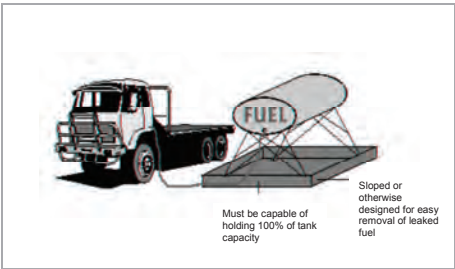
- The stockpiles should be covered or protected with soil stabilization measures and a temporary perimeter sediment barrier at all times.

Stockpiles of "Cold Mix"

- Soil stockpiles should be placed on and covered with plastic or comparable material at all times.
- Sources include EPA, SWRCB, Caltrans, CASQA

BMP: Vehicle And Equipment Fueling

VEF
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 runoff 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.

LIMITATIONS:

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

MAINTENANCE:

- Keep ample supplies of spill cleanup materials on-site.
- Inspect fueling areas and storage tanks on a regular schedule.

Waste Management

Definition	Provide designated waste collection areas and containers, arranging for regular disposal, and training employees and subcontractors.
Purpose	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.

Education

- 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 activities.
- 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.

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

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

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-4832	350 x 280 lbs	1557 x 1246 N
Elongation	ASTM D-4832	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			
UV Resistance % 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 Mod	17%	17%
Water Flow Rate	ASTM D-4491	200 gm/ft ²	8,149 lpm/m ²

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



Proudly made in the USA by:
Pollution Solution, Inc.

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

www.psbmp.com
info@psibmp.com



TEMPORARY EROSION AND SEDIMENT CONTROL PLAN

	Carlisle Crossing	
	Albuquerque, Bernalillo County, NM	
	10/22/2024	
	Bruce Henriksen James Tolman	