



**STORMWATER
AND EROSION
BMPs**



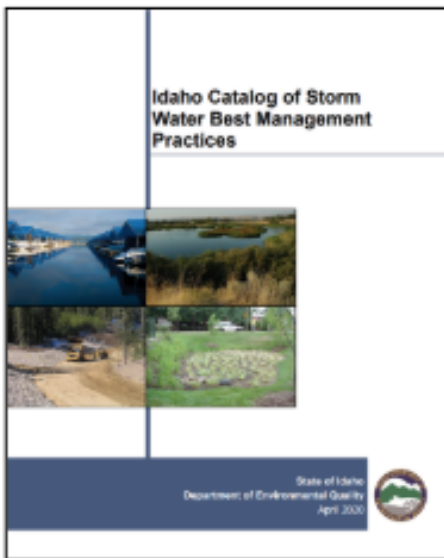
DISCLAIMER:

This guide is intended to help you minimize erosion and control sediments. It provides general information only. Additional erosion control methods may be used that are not covered. This guide is not meant to be a substitute for the assistance of an engineer or other erosion control professional. It is your responsibility to comply with ALL City, County, State, and Federal government agency requirements, which may differ from what is shown in this guide. Remember that YOU and/or ANY CONTRACTOR involved with a project can be held LEGALLY RESPONSIBLE for the results of your erosion and sediment control measures.

INSPECTION CRITERIA

Conduct inspections of site conditions and BMPs a minimum of once every 7 days or once every 14 days if inspected within 24 hours of a 0.5-inch or greater rain event. Document each inspection and all repairs or modifications. Repair or replace any damaged BMPs.

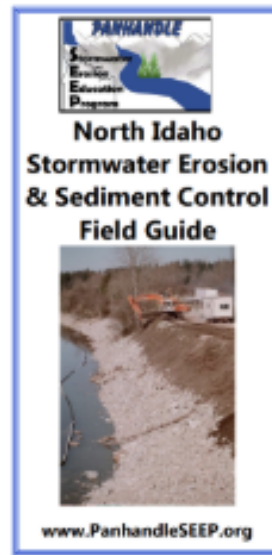
If a BMP is not effective, re-evaluated the situation and, if appropriate, install another more effective BMP. It may be prudent to consult a design professional if modifications are needed. For more information on the BMPs discussed in this booklet and others, please scan the QR codes or visit the website provided below.



Idaho Catalog of Storm Water Best Management Practices



deq.idaho.gov/stormwater



North Idaho Stormwater Erosion & Sediment Control Field Guide



SOURCE CONTROL

Store materials to reduce or eliminate air and stormwater pollution and reduce the risk of accidental exposure to contaminated materials.

- Locate stockpiles away from water flows.
- Protect stockpiles from run-off by using berms, dikes, sandbags, etc.
- Prevent wind erosion by wetting, while avoiding overwatering, and by covering stockpiles with tarps, straw, grass, etc.
- Place bagged materials on pallets, under cover.



YES



NO

CONSTRUCTION ENTRANCES/EXITS

Construction entrances/exits are used to minimize tracking onto public roadways. They consist of an aggregate pad with filter cloth underlay and are located at site access points. Inspect these areas daily and after each rainfall for gravel loss and sediment buildup. Maintenance will be needed as entrances/exits become hard packed or sediment fills the gaps in the aggregate material.

- Construct 6" to 12" deep with large angular rock over geotextile fabric.
- Vehicles should complete two tire rotations over angular rock.
- All vehicles must use entrances/exits.
- Sediment reaching the roadway must be collected and disposed of at an appropriate location (repository if required).
- Tire washes may be needed if tracking continues to be a problem.



NON-VISIBLE POLLUTANTS

Hazardous, non-visible pollutants are common on construction sites. Some of the more common pollutants include concrete, mortar, and paint. Lead contaminated soils are of additional concern to those working in the Silver Valley, the Coeur d'Alene Basin, and other locations known to contain lead contaminants. Avoid the spread of these materials using the following methods.

Reduce pollution from concrete wastes:

- Wash out wastes into a temporary pit where liquids can evaporate. Once slurry is dry, properly dispose of the remaining concrete waste.
- Avoid washing concrete dust into streets or storm drains. Collect and return sweepings to stockpiles or dispose of appropriately.



Reduce pollution from paint and other hazardous products:

- Use the entire product before disposing of the container with original product label intact.
- Use ground cloths and drip pans when using oil-based paints, stains, rust removers, masonry cleaners, and products with warning labels.
- Protect hazardous waste storage areas by storing the materials indoors or in outdoor storage areas with a roof, covering materials, and keeping containers off the ground.

Reduce pollution from contaminated soils by:

- Using appropriate dust control BMPs
- Disposing of contaminated soils at appropriate disposal locations
- Using washing stations at designated disposal locations when working within the Silver Valley or Coeur d'Alene Basin



DUST CONTROL

Prevention is the best method of dust control. To prevent dust issues:

- Limit the amount of bare soil exposed at one time.
- Fence off or mark areas that are not to be disturbed to prevent traffic or work in these areas.
- Avoid use of areas susceptible to wind erosion.
- Cover all haul trucks with a tarp.
- Drive 15 mph (maximum) when entering/leaving construction sites.

There are several methods used in dust prevention:

- **Vegetative Cover:** Seed or plant to specifications or leave existing vegetation in place to control dust.
- **Sprinkling:** Wet soil should not be saturated or muddy. Use to maintain air quality requirements and avoid site contamination.
- **Stone:** Apply a 2-inch (minimum) layer to access points, detours, haul roads, or temporary traffic routes through construction areas.
- **Surface Roughening:** Till or disk, leaving 6-inch (minimum) furrows, perpendicular to the prevailing wind direction.
- **Wind Barriers:** Install to protect soil downwind for a distance of 10x the height of the barrier.
- **Tackifiers:** Chemicals and organic compounds sprayed on loose soil to hold it in place.



MULCHING

Mulching is immediate, effective, and inexpensive. It controls dust and erosion, retains moisture, and requires no removal. Select materials based on soil type, season, and site conditions (see Idaho Catalog of Storm Water BMPs, pg. 339-343). Install additional surface controls prior to mulching.

- Tacking agents may be used anywhere but are best on very stony or rocky soils or small, steep slopes.
- Inspect all mulched areas regularly and repair damaged areas immediately.
- Straw mulch and other organic products do not need to be removed once vegetation becomes established.



SLOPE ROUGHENING

Roughened surfaces stabilize soils, reduce runoff velocity and increase filtration, encourage vegetation growth, and trap some sediments. Once final grade is reached, or as temporary erosion control, surface roughening should be completed. Roughening can be applied in the following ways:

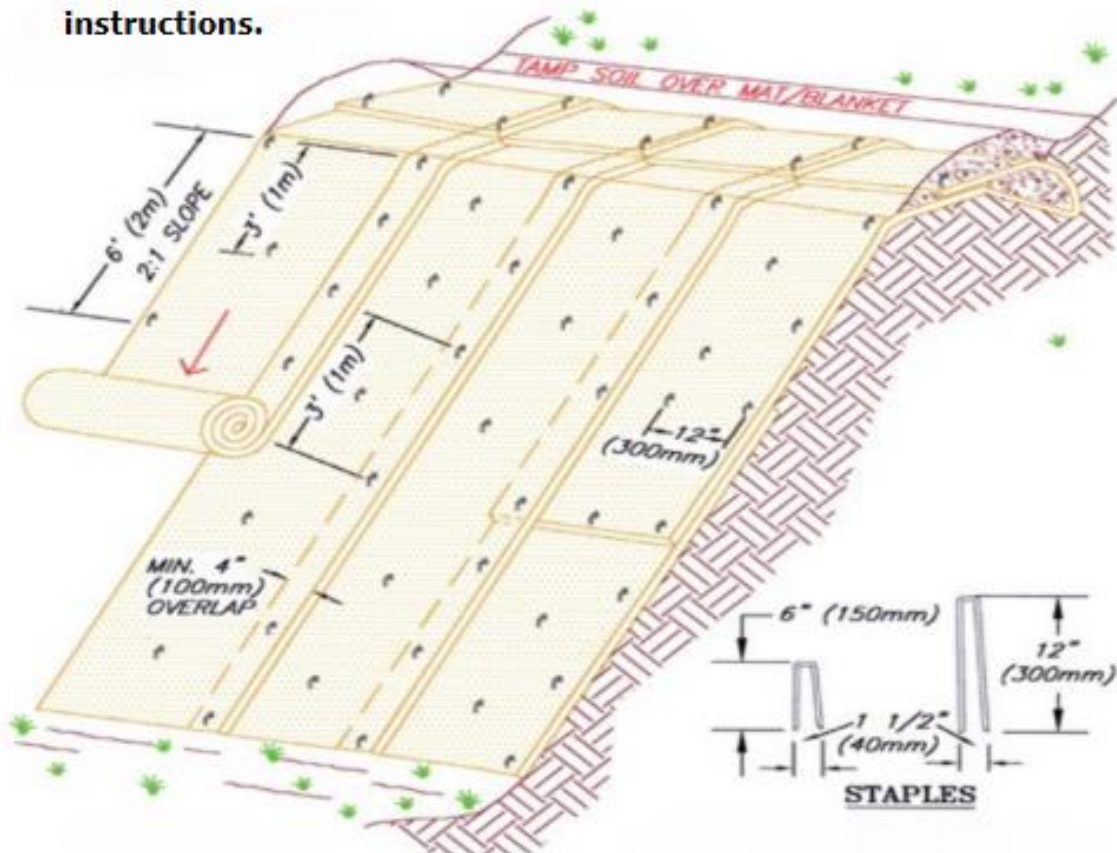
- Track perpendicular to slope direction
- Drive treaded equipment along slope direction
- Till surface (preferred)
- Best on 3:1 slopes; use terracing on 2:1 or steeper
- Add straw or mulch prior to roughening (preferred)



EROSION CONTROL BLANKETS

Blankets or matting are porous nets or fibrous sheets laid over the ground and used for slope stabilization and erosion control or to hold mulch in place and protect against wind or water damage. Remember the following when installing:

- Smooth all surfaces.
- Anchor blankets at the top of the slope.
- Backfill and tamp to anchor ends.
- Unroll from top to bottom.
- Do not stretch during installation.
- Overlap sides by 4 inches (minimum).
- Overlap uphill/downhill rolls by 3 ft (minimum).
- Secure staples per instructions.

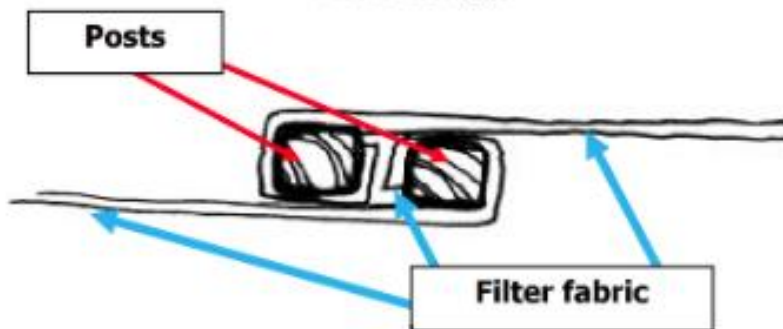


SILT FENCES

Silt fences are temporary and consist of filter fabric stretched and attached to supporting posts. They retain eroded soil and slow runoff velocity, allowing soil particles to settle. To install remember:

- Position the fence 6 ft (minimum) from toe of slope for maintenance.
- Install as close to the contour as possible and turn the last 6 ft uphill.
- The area below the fence should be undisturbed or stabilized.
- Bury (key-in) bottom 6 inches of fence, backfill, and compact.
- Space posts at 6 ft (maximum) for extra-strength filter fabric and 10 ft (maximum) for wire mesh support fence.
- Drive posts 16 inches (minimum) into the ground.
- Staple or wire fabric directly to the upslope side of the posts.
- **DO NOT** attach fabric to trees.
- Join fence sections by wrapping ends together (Illustration A).
- Inspect periodically for tears, weathering, and disrupted anchoring.
- Remove sediment when it reaches 1/3 the height of the silt fence.

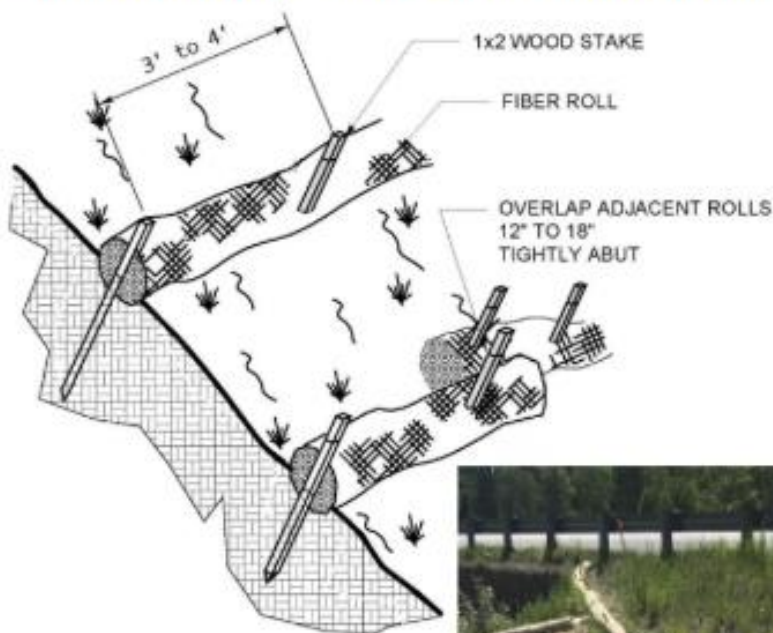
Illustration A



FIBER ROLLS AKA WATTLES

Fiber rolls/wattles/compost-filled socks consist of straw, flax, or other similar material bound into a biodegradable plastic or similar material. Place these at the toe and on the face of slopes to intercept runoff, reduce flow velocity, disperse runoff as sheet flow, and provide removal of sediment from runoff.

- Install rolls on contour, perpendicular to flow of water
- Trench rolls 3-4 inches into soil
- Stake ends and along rolls at 4 ft (maximum) on center
- Join ends by overlapping, not end-to-end
- Place at intervals of 10-20 ft (depending on slope steepness) with closer spacing being more effective
- Turn the final ends of rolls uphill to prevent runoff around end of roll
- Remove sediment if it reaches 1/2 the height of the roll or install additional rolls
- Inspect rolls prior to storms, daily during extended rain events, and after storms for breaches, tears, and undermining



INLET PROTECTION

Temporary devices are constructed to improve the water quality being discharged to dry wells, drop inlets, or catch basins by ponding sediments containing runoff and increasing settling time. Inlet protection is appropriate for small drainage areas only. Please consider:

- What type of inlet needs protection?
- How long will the inlet be used? What weather conditions exist on site? Gravel-filled sandbags are viable longer than fabric rolls.
- What vehicle and foot traffic can the damage inlet protection, making it ineffective?
- Will the device be reused multiple times?
- What space is needed to maintain, repair, and remove the inlet protection?

Remember the following:

- Inlet inserts need to be installed according to manufacturer's instructions.
- **DO NOT** install in streets, bicycle lanes, or pedestrian crosswalks.
- Inspect regularly and after every storm, making required repairs immediately.
- Remove accumulated sediment and restore traps to original dimensions when sediments reach half the depth of the trap, disposing of sediments appropriately (at a repository if needed).
- Remove all inserts after construction is complete or permanent vegetation is established.



TEMPORARY SWALES AND DIKES

Temporary swales and dikes are used to prevent runoff from entering disturbed areas by intercepting and diverting water into a stabilized outlet or sediment-trapping device.

- Design temporary swales to minimize erosion and reduce runoff velocity before discharging off site.
- Send runoff to a sediment-trapping device such as a sediment trap or basin until the drainage area above the swale is stabilized.
- On-site locations may need to be adjusted for field conditions to ensure the most stable outlet conditions.
- When swales are used to divert flows, a sediment-trapping device may not be needed.

Design criteria relevant to drainage areas served by swales:

Drainage Area	less than 5 acres	5 to 10 acres
Bottom Width	4 ft	6 ft
Depth of Flow (in Channel)	1 ft	1 ft
Channel Side Slopes	2:1 or flatter	2:1 or flatter
Grade	0.5% minimum 20% maximum	0.5% minimum 20% maximum



GROUND WATER CONTROLS

Contaminated water is created when excavating where both contaminated sediments and ground water exist. Special considerations must be taken to prevent the contamination of surrounding areas. If water is cloudy or turbid, solids must be filtered out prior to discharge and collected for proper disposal at an appropriate location such as a repository.

Dewatering is used to control and appropriately dispose of saturated soils and ground water. If containment of contaminated ground water is needed, it may be captured in one of the following ways prior to disposal:

- Buckets or dewatering filter bags
- Portable sediment tanks
- Temporary, lined or permanent sediment basins



Sediment tanks are compartmented containers where sediment-laden water is pumped and held until the sediment settles out by gravity.

- Locate tanks to maximize ease of clean out and sediment disposal.
- Discharge from tank should not cause downstream erosion. Stabilize outlet pipe with additional BMPs to prevent erosion and utilize a filter cloth to prevent accidental sediment discharge.

Sedimentation basins can be used to settle out coarse particulates. They are similar to ponds, and can be constructed of concrete, or other materials, to facilitate sediment removal. Consider the following when using a sedimentation basin for ground water control:

- Locate basins a minimum of 20 feet from any structure, property line, and any vegetative buffer
- If the basin allows for infiltration, ensure it is located 100 feet from any septic tank or drain field
- Place basin a minimum of 50 feet from any steep slope (greater than 15%)



TROUBLESHOOTING

Problem	Potential Solution	Pgs
Dust	<p>Limit the amount of bare soil exposed at one time.</p> <p>Avoid use of areas susceptible to wind erosion.</p> <p>Cover all haul trucks with a tarp.</p> <p>Drive 15 mph (maximum) when entering/leaving construction sites.</p> <p>Use dust control BMPs.</p>	4
Tracking on Roadways	<p>Verify correct entrance/exit installation.</p> <p>Ensure stabilized entrances/exits are used by all vehicles.</p> <p>Divert run-off from construction area to sediment trapping device.</p> <p>Utilize tire wash as needed.</p>	2
Run-off Leaving Site	<p>Assess current run-off controls and replace, repair, or modify as needed.</p>	10
Excessive Sediment Accumulation	<p>Assess erosion and run-off controls and install, replace, and repair as needed.</p> <p>Remove and properly dispose of sediment once 1/3 height on silt fences, and 1/2 height on waddles, inlet protections, and check dams.</p>	6-8
Inlet Protection Failing	<p>Determine if current inlet is working and replace as needed.</p> <p>If traffic is disturbing BMP, consider different type (internal insert).</p> <p>Assess run-off controls and repair, replace, or modify as needed.</p>	9
Ineffective BMPs	<p>Reassess site and BMP installations.</p> <p>Perform routine maintenance.</p> <p>Consult design professional as needed.</p>	all

FOR MORE INFORMATION

The Stormwater and Erosion Education Program (SEEP) serves the five northern Idaho counties and provides stormwater and erosion education through the University of Idaho.

SEEP is available to anyone in the construction industry and related disciplines who wants to improve their skill, understanding, and marketability in the stormwater and erosion control fields.

Much of the information presented in this booklet is supplied by and aligned with the SEEP educational curriculum and field guild. For more information, please visit the SEEP website at:

WWW.PANHANDLESEEP.ORG

