



Best Management Practice (BMP) Guidance Manual

INTRODUCTION

BMP examples in this guide provide ways to meet erosion and sediment control requirements. Best Management Practices are not limited to these examples; many other BMPs are acceptable. Reference tools at the end of the guide and manufacturer information to ensure BMPs are selected and installed properly.

Sediment Control BMPs

SILT FENCE



Silt fence is generally used as perimeter control to keep sediment on site. A silt fence slows runoff allowing water to flow through while filtering out sediment.

Silt fence is made of geotextile fabric and is machine sliced or trenched into the ground 8 to 12 inches, leaving 2 feet of fabric above ground. The trench is filled and soil compacted next to the fabric. Steel or wooden posts are attached to the fabric located on the downstream side of

water flow. Posts must be at least 5 feet long, embedded 2 feet into the ground, and secured with three zip ties in the upper 8 inches of fabric.

STRAW BIOROLL (Straw Wattle)

Straw biorolls can be used for perimeter control, ditch checks, and inlet protections. Straw biorolls slow runoff velocities allowing sediment to settle out and remain on site.

The straw is encased in a netting with a minimum 6 inch diameter. The bioroll must be slightly trenched into the ground and secured by wood stakes. The stakes should be driven through the back half of the log at a 45 degree angle with the top of the stake pointing upstream. Stakes are spaced one foot apart. When more than one log is used, overlap the ends 6 inches. The end sections of the log should be curled upslope or "J-hooked" to keep sediment on site.



WOOD FIBER BIOROLL



Wood fiber biorolls can be used for perimeter control, ditch checks and inlet protections. They slow runoff velocities to filter sediment, and are more effective filters in high flow areas than straw.

The wood fibers are encased in a netting with a minimum 6 inch diameter. The bioroll binds to flat soil and may not have to be trenched in. Wood stakes shall be driven through the back half of the log at a 45 degree angle with the top of the stake pointing upstream. Stakes are placed every foot.

When more than one log is used, overlap ends about 6". The end sections of the log should be curled upslope or "J hooked" to keep sediment on site.

COMPOST FILTER LOG

Compost logs can be used for perimeter control, ditch checks, and inlet protections. Compost logs slow water velocity and filter runoff.

The logs are made from a geotextile tube filled with shredded mulch or woodchips. They are easy to install and multiple logs should overlap about 6 inches so there are no gaps; no stakes are required. These logs are easily reused. Logs should form a smile shape to keep sediment on site.



ROCK LOG



Rock logs can be used for perimeter control, ditch checks, and inlet protections. Rock logs slow water velocity and filter sediment.

Typically used on paved surfaces, rock logs are installed by overlapping edges about 6" creating a smile shape. Due to their weight, rock logs are more difficult handle. However, if not damaged they can be reused multiple times.

BERMS

Berms are an effective perimeter control device as an alternative to other practices and a good reusable option. They are often used as a secondary BMP. Berms slow water velocity and allow for sediments to settle out on site. Berms can also be used to redirect water.

Berms can be made from shredded wood mulch, rock or compacted stabilized soil. To be effective, berms must be at least 1 foot tall and 2.5 feet wide. Berm material must be maintained and reapplied as necessary.



INLET PROTECTIONS



Inlet protections protect storm drain inlets by filtering out sediment while allowing water to pass through.

Some sit on top of the inlet or surround the inlet, while others are inside the inlet. Inlet protections come in many varieties such as prefabricated protections, various logs, and bags.

When choosing your inlet protection, it is important to know **one size does not fit all**. Different protections are designed for different inlets. When choosing your inlet protection consider installation and maintenance ease, safety, and effectiveness.

Install inlet protections to specifications provided and be sure there are no gaps, rips, or holes allowing water to be unfiltered. Inlet protections must be cleaned when 1/2 full of sediment. They must have an emergency overflow.

ENTRANCE BMPS

Entrance BMPs are used to limit the tracking of sediment from vehicle and equipment traffic onto paved surfaces and can act as perimeter controls. The most common is a rock entrance.

Rock entrances must be at least 50 feet long, 20 feet wide, **have a filter fabric underliner**, and be 6 inches thick with 1.5 to 3 inches of clean rock. Other prefabricated BMPs exist such as tracking pads and mats. Other BMPs like mulch or different aggregates may be used. Be creative and reuse products available (e.g. slash mulch from clearing & grubbing). Maintenance must occur as the BMP becomes ineffective or full of sediment.



BUFFERS



Grass buffers or existing vegetation around the perimeter and throughout the site can provide effective, inexpensive sediment control. Buffers should always be left when possible and utilized in conjunction with other sediment control BMPs.

Erosion Control BMPs

MULCH

Straw mulch is primarily used as temporary stabilization. It can also be used to establish permanent vegetation after seeding occurs. Mulch holds soil in place to reduce erosion. Temporary mulch can be placed on soils not ready for permanent seeding, and on exposed soils outside of seeding dates to meet temporary stabilization requirements.



There are two main types of mulch products: 1) straw or hay material; 2) wood material. Straw mulch should be applied evenly with 90% coverage (about 2 tons/ acre). Disc anchoring straw mulch will help hold it in place. Wood mulch can be produced on site from clearing and grubbing material and used to cover soils.

EROSION CONTROL BLANKETS



Erosion control blankets are commonly used where mulch is not appropriate including steeper slopes, and concentrated flow areas like ditch bottoms and narrow areas. Blanket can be used as a stand alone product to hold soil in place temporarily. It is most commonly used to reduce erosion until vegetation is established.

Erosion blankets can be made of straw, wood, or coconut fibers held together by netting or net less. There are many categories of blankets, each corresponding to different site conditions. Slope, length of time in place, and flow velocity dictate what type is used.

When installing blanket, the underlying soil should be smooth so the blanket can lay flat. Blanket should be laid parallel to the direction of water flow with the netting on top. Blanket must be stapled down appropriately with adjacent blankets overlapping at least 4 inches. Following the manufacturer's recommendations is critical.

HYDRAULIC SOIL STABILIZERS

Hydraulic soil stabilizers are hydraulically applied tackifiers (glues), or mulch material with a tackifier. These products are used for temporary soil stabilization or for erosion control to establish permanent vegetation. Typical uses are in areas with limited access, steep slopes, and stockpiles; **not to be used in concentrated flow areas.**

There are three types of tackifiers and five types of hydraulic matrix, all can be used with or without seed: 1) Natural tackifier; 2) Synthetic tackifier; 3) Polyacrylamide; 4) Hydraulic compost; 5) Hydraulic mulch; 6) Stabilized Fiber matrix; 7) Bonded Fiber matrix; 8) Fiber Reinforced matrix. Refer to MnDOT Specification for guidance.



TEMPORARY COVERING



Temporary cover BMPs are used to meet stockpile or slope stabilization requirements. Instead of using silt fence, mulch, or vegetation, a tarp can be pulled over a stockpile and anchored down. Geotextile or burlap are also great materials for temporary stabilization on slopes or piles.

Temporary covering is also a great BMP for challenging slopes until they are ready for final stabilization.

DITCH CHECKS

Ditch checks are used to slow water runoff velocities in a ditch or on steep slopes for reducing erosion. Ditch checks also trap sediment reducing stress on the final sediment BMP.

Common ditch checks are similar to sediment control products and installed in a similar manner: 1) silt fence; 2) straw bioroll; 3) wood bioroll; 4) compost & rock logs; 5) rock check dams.



TEMPORARY DIVERSIONS



Diversion BMPs such as extenders can direct runoff from roof gutters to paved or grassed areas until vegetation is established, reducing erosion potential. Temporary down drains can also be used to carry water down an un-vegetated slope.

EROSION STABILIZATION MATS (Turf Reinforcement Mats)

These mats are designed to reinforce vegetation, withstanding higher velocity flows than erosion control blankets. They can be used as an alternative to riprap. There are 5 classes of mats based on strength. Mats are composed of non-degradable synthetic fibers, filaments, netting, and wire mesh.

Other Important BMPs

CONCRETE/WASTE WASHOUT



Concrete and other waste materials must be disposed of in compliance with MN Pollution Control Agency regulations. These wastes must not cause contamination of the ground or surface waters prior to disposal. Liquids and slurry can be contained using compacted impermeable soils, impermeable plastics, or containers.

Washout areas must be marked with a sign and should be located on flat surfaces, away from waterways and storm drains, not in boulevards, and not on paved surfaces.

DEWATERING TECHNIQUES



Pumping and discharging water is a common occurrence during construction projects. Sediment is the main concern when dewatering, however, if other pollutants exist, alternative BMPs must be applied. Discharge water must not cause a nuisance in the receiving water and cannot create erosion.

BMPs to consider include: 1) Temporary pond; 2) Grass buffer; 3) Filtering with rock or wood chips; 4) Dewatering dumpster; 5) Floating pumps; 6) Dewatering bag; 7)

Flocculent - material used to bind and settle out sediment.

Multiple treatment methods may be needed depending on dirtiness & amount of water, and where it is being discharged. Discharges must be monitored to ensure BMPs are working properly. General rule: If you cannot see your hand through a clear sample bottle with the water inside, additional treatment is required.

Winter BMPs

Erosion and sediment control BMPs are required during winter construction; snowmelt is considered stormwater runoff and is required to be treated. To prevent pollutants from leaving the construction site during the winter season, it is recommended that the following are considered:

Stop land disturbing activities until warm weather returns. Sequence work so land disturbing activities occur prior to freeze.



Stabilize all exposed soil surfaces with vegetation, mulch, blankets, or other BMPs before the ground freezes. Remember, the City requires that all soils be stabilized if no land disturbing activity has occurred for 7 days, this includes the winter.

- Maintain construction entrance BMPs to limit tracking during snow melts.
- If new land disturbing activities occur, proper BMPs must be installed.
- Inlet protections may be removed after freeze as appropriate because they can pose problems in the winter (flooding, damage by plows). These BMPs must be installed prior to runoff and melting events. They may need to be installed/ removed daily, depending on the weather.
- Perimeter control devices may need to be moved or enhanced to avoid winter damage.

Links For Additional Information

Erosion and Sediment Control Pocketbook Guide (2017) - This is a useful reference about BMP types and installation. It can be purchased at:

<https://www.erosion.umn.edu/resource-links/pocketbook-guide>

Minnesota Stormwater Manual: A useful reference that is updated regularly throughout the year. https://stormwater.pca.state.mn.us/index.php/Main_Page

Mn/DOT Standard Specifications for Construction - Sections 3835-3973 contain most of the erosion/ sediment control and stormwater information, will assist with understanding products and installation www.dot.state.mn.us/pre-letting/spec/

Mn/DOT Approved/Qualified Product list - Erosion Control and Landscaping section provides quality BMP product examples.

<http://www.dot.state.mn.us/products/index.html>

MN Pollution Control Agency - Construction Stormwater - Lots of good BMP guidance and information. www.pca.state.mn.us/water/stormwater/stormwater