

Construction Stormwater BMP

10 Keys to succeed

- Minimize soil disturbance and protect natural features
- Phase construction activity in a manner that minimizes impacts to resources
- Control Stormwater quantity and velocity flowing onto and through the project
- Stabilize soils and protect slopes
- Protect storm drain inlets
- Establish perimeter controls
- Detain runoff, before it is discharged, to provide time for sediment to settle out of suspension.
- Establish stable construction exits
- Inspect and maintain all pollution control measures
- Keep chemicals away from traffic and out of environmentally sensitive areas

Mulching

- Mulch cover must be uniform and should be applied within 24 hours after an area is seeded
- Apply mulch between 1 and 2 inch depths
- Hay at 2 tons per acre is preferred to straw
- Anchor mulch by mechanically crimping, or straight disking, hay/straw approximately six inches into the soil surface
- A tackifier may be used if needed to keep mulch in place for longer periods of time
- Mulch should not be applied during windy conditions that can hamper an even distribution
- Mulch can be kept on-site for quick stabilization of slopes prior to a rain event



Berms and Diversions

- Repair and inspect often for breaches
- Berm heights should not exceed a height of 5 feet. The desirable top width is 4 feet and the side slopes should be 3:1 or flatter
- Berms should not be used in high traffic areas where they can be damaged by vehicles
- Direct runoff down slopes in a non-erosive manner and protect outlets to prevent washouts
- Stabilize soil berms and ditches with vegetation after installation



Top Soil

- Compacted topsoil can be used as a temporary barrier around the construction site and then re-applied during final grading. Topsoil barriers must be stabilized if they will be left undisturbed for more than 14 days.

Pictured: Topsoil can be used as a perimeter control during construction and reapplied as a growth medium during final grading.



Mulch (slash)

- Trees removed for construction may be ground up into slash mulch consisting of coarse pieces ranging in size from 3 to 24 inches. The mulch can be used in place of, or in addition to, using a silt fence by piling the mulch into a triangle dike, approximately 3 feet high and 6 feet wide at the base.
 - Consider using slash mulch in combination with silt fence to reduce the risk of Stormwater undercutting the silt fence.

Pictured: Good example of slash mulch installation.



Silt Fence

- Silt fence is a geotextile product used for temporary sediment control on construction sites where soil will be disturbed and sheet flow is expected. This material provides an effective barrier to flow when it is trenched into the soil and reinforced by attaching steel posts on the down slope side of the product. Silt fence is used to create small containment areas that detain Stormwater on the construction site. Sediment settles out of Stormwater runoff and is deposited behind the silt fence, allowing cleaner water to discharge from the construction site.
 - Silt fence should be installed prior to any grubbing or grading activity
 - Install along contours to avoid concentrated flows
 - Inspect silt fence regularly for sediment accumulation, tears, undermining, and separation from posts.
 - Silt fence should be installed approximately 6 feet away from the toe of the fill, when feasible, for ease of maintenance.
 - Sediment should be removed when it accumulates to one-half of the exposed fabric height and be disposed of properly
 - Maximum drainage area is one-quarter acre per 100 feet of silt fence length
 - Silt fence should be removed once it has served its purpose and the area has been stabilized
 - Reinforce silt fence material with steel posts that are spaced no wider than 6 feet apart
 - Do not excavate silt fence trenches wider or deeper than necessary for installation and compact soil around the toe of the material.

Pictured: Good example of silt fence installation using a silt fence plow on a tractor.



Pictured: Poor example of silt fence installation. The silt fence was not trenched into the soil.



Pictured: Good silt fence installation. Accumulated sediment has been removed from the fence and the area has been mulched.

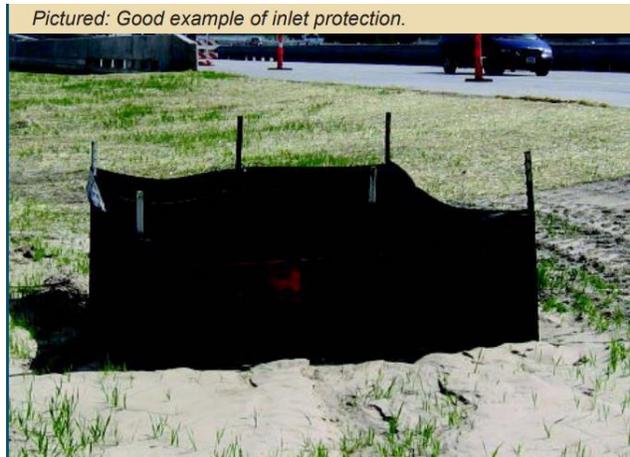
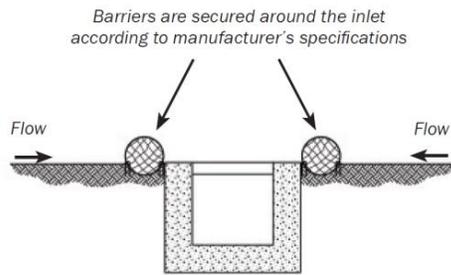


Culverts and ditches are designed to carry moderate to large amounts of Stormwater. They also can carry sediment to streams, rivers, wetlands, lakes, and sensitive areas if they are not properly protected. Culvert and swale outlets can become severely eroded if Stormwater flows are not controlled.

Inlet protection

- Storm drain inlet protection measures prevent sediment and debris from entering the inlets. Inlet protection is installed at existing inlets prior to construction. New inlets are protected as they are installed and brought on-line. Inlets can be protected with silt fence, silt checks, straw bales, or other sediment control devices.

Figure: Section view of median inlet protection using silt checks.



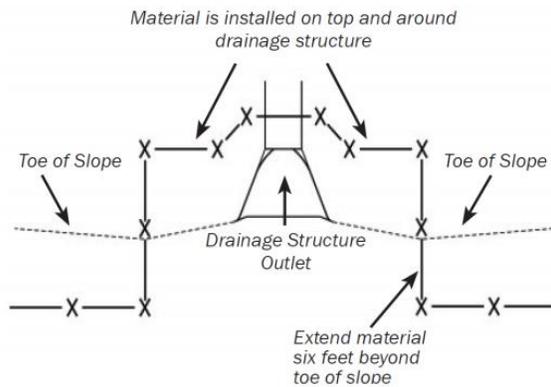
Curb inlet protection

- Temporary measure used to block sediment from entering storm drain inlets. Some methods used to provide curb inlet protection may include rock filled mesh bags (rock socks) and other synthetic proprietary products. Curb inlet protection is most effective appropriate erosion control measures are used to minimize sediment migration toward inlets.
 - For new inlets, install inlet protection as soon as storm drain inlets are constructed. For existing inlets, install inlet protection before land-disturbance activities begin.
 - Check inlet protection during rain events to make sure they are not creating a flooding hazard
 - Clean-up and dispose of accumulated sediment
 - Replace or repair the damaged inlet protection
 - Sweep street, sidewalks, and other paved areas regularly

Outlet protection

- Outlet protection prevents scour and erosion at the outlet of a channel or conduit by reducing the velocity of Stormwater. Outlet protection is generally comprised of geotextile and riprap or Turf Reinforcement mat placed at the outlet point. For use with sediment basins, a plunge pool may be necessary.
 - Prepare outlet areas with proper top soil dressing to assist establishment of a vegetation cover
 - Prevent soil from falling into the outlet by installing appropriate soil barriers until final stabilization is established.

Figure: Use silt fence or silt checks around the outlet, as shown, until the surrounding area is stabilized with vegetation.



Pictured: Outlet is protected with riprap and adjacent areas are mulched and seeded to prevent erosion. Additional barriers around outlet could prevent sediment from getting into the channel until final stabilization is established.



Good Housekeeping

Construction staging and phasing

- Contractors should preserve vegetated buffers as a temporary BMP during the construction project. Preserve areas that are already vegetated for as long as possible to provide an inexpensive sediment and erosion control BMP.
 - Mark off vegetated buffer areas before construction begins using appropriate perimeter controls
 - Limit disturbed areas to only those necessary for construction of the project
 - Supplement buffer areas for waterways and wetlands with construction barrier fence, silt fence and/or wattles
 - Educate equipment operators or use signs to warn vehicle traffic to avoid preservation areas. Keep preservation areas clear of construction materials.

Perimeter control

Construction Safety barrier fencing

- Safety barrier fencing (orange fencing) creates a visual obstruction that can notify people operating equipment on-site to stay clear of certain areas. Fence material does not provide erosion or sediment control, but this BMP can be installed near wetlands and other areas where soils are not to be disturbed so that erosion is prevented

Pictured: Construction safety barrier fencing (orange fencing) can be used to protect wetlands, other sensitive areas and areas to remain undisturbed from construction traffic.



Dust control

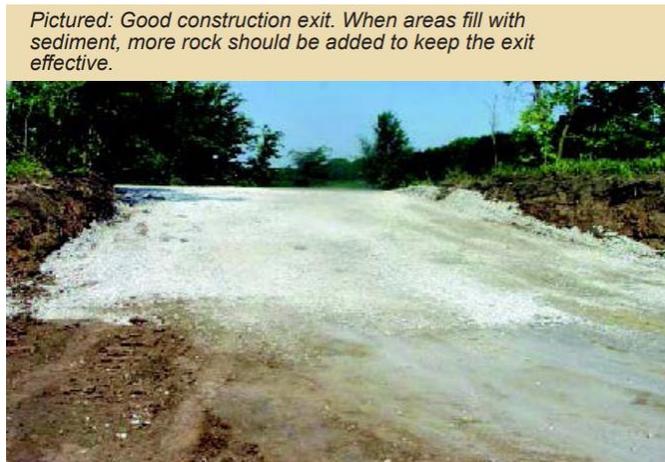
- For disturbed areas not subject to traffic, vegetation provides the most practical method of dust control
- When properly applied, mulch offers a fast, effective means of controlling dust
- The site may be watered until the surface is wet. Water is especially effective for dust control on haul roads and other traffic routes when a soil binder is added.
- Stone used to stabilize construction roads; can also be effective for dust control

Pictured: Water, with a soil binder added, can be a useful tool for controlling dust on haul roads and other traffic routes.



Stabilized construction exits

- When vehicles and equipment drive off of a construction site, mud and sediment can be tracked onto paved surfaces unless the exit area is stabilized. Stabilized exits made of crushed rock or other approved materials provide an area for vehicles to drive over before leaving the construction area. Driving over these areas will vibrate the vehicle, knocking the sediment loose from the tires. Exits should be installed in strategic locations to encourage operators to use them as much as possible. When a stabilized construction exit is specified, geotextile is used to separate the stabilizing material from the soil below.
 - Ensure material does not get tracked onto nearby roads or travel routes. Clean roads throughout the day to maintain safety.
 - Encourage all vehicles to use the stabilized construction exits
 - Replace and/or add material as needed to maintain the effectiveness of the BMP



Stockpiles

- Topsoil/embankment stockpiles should be sprayed with soil tackifier, a hydraulically applied mulch or have cover crop tackifier applied to prevent wind erosion
- Provide temporary stabilization where work on stockpiles is paused at least 14 days
- The toe of erodible stockpiles must be protected with silt fence or other applicable BMPs
- Do not place stockpiles in drainage wats or near state waters

Pictured: Good installation of silt fence around stockpile. The fence is placed at least 6 feet from the toe of the slope to provide a catchment area and easy clean out. Stockpiles must be stabilized if left undisturbed for more than 14 days.



Concrete washout

- It is recommended that facilities be cleaned out once they are three-fourths full, or new facilities should be constructed to provide additional concrete waste storage
- Allow concrete washout to harden material for disposal
- Do not place concrete washouts in areas prone to flooding, ditches, or adjacent to state waters
- Permanent disposal of concrete washout should be done according to project specifications
- Concrete washout must be lined with plastic sheeting that has no holes or tears to prevent leaching of liquids into the ground

Pictured: Good installation of a concrete wash-out facility. Be sure the location is visible and easily accessible.

