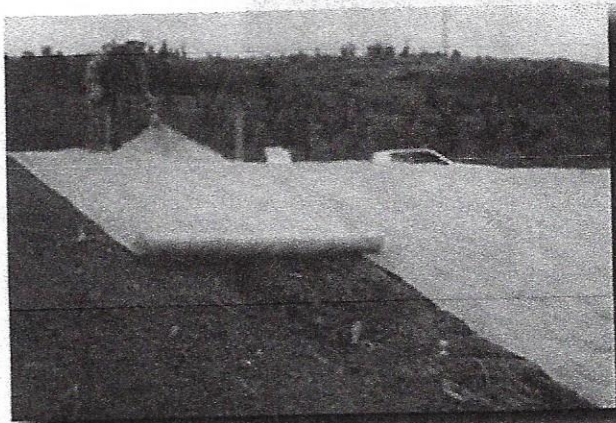
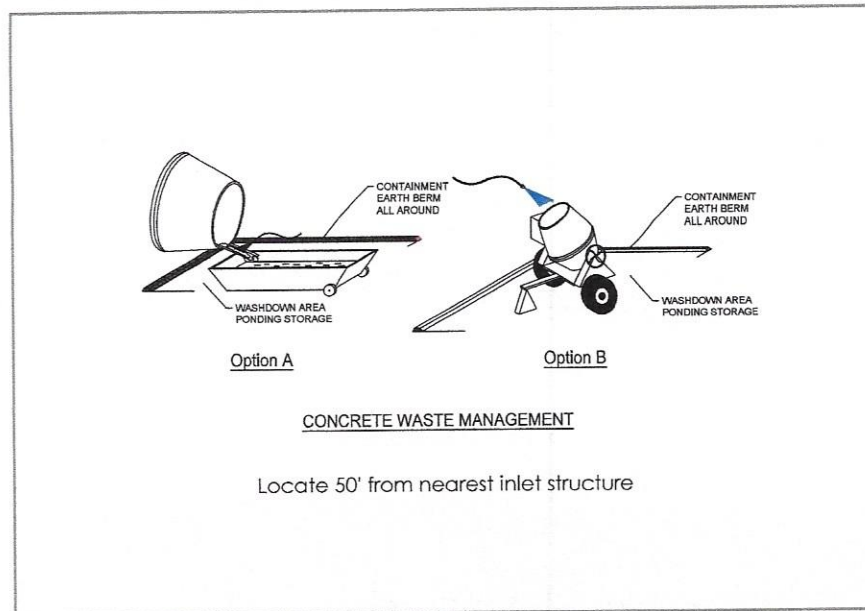


BEST MANAGEMENT PRACTICES FOR CONSTRUCTION ACTIVITIES



**DESCRIPTION:**

Prevent or reduce the discharge of pollutants to storm water from concrete waste by conducting washout off-site, performing on-site washout in a designated area, and training employees and subcontractors.

APPLICATION:

This technique is applicable to all types of sites.

INSTALLATION/APPLICATION CRITERIA:

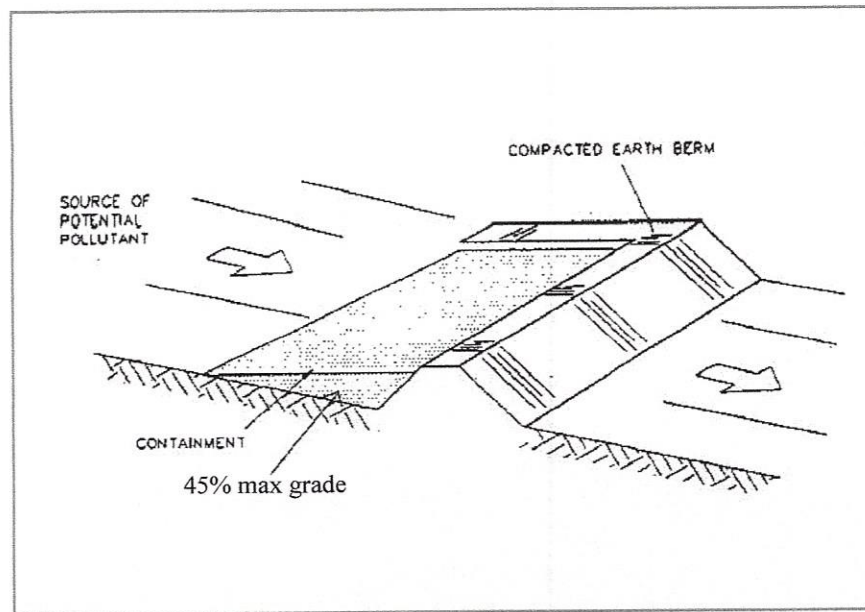
- ◆ Store dry materials under cover, away from drainage areas.
- ◆ Minimize excess mixing of fresh concrete, mortar or cement on-site.
- ◆ Perform washout of concrete trucks off-site or in designated areas only.
- ◆ Do not wash out concrete trucks into storm drains, open ditches, streets, or streams.
- ◆ Do not allow excess concrete to be dumped on-site, except in designated areas.
- ◆ When washing concrete to remove fine particles and expose the aggregate, avoid creating runoff by draining the water within a bermed or level area. (6" tall by 6" wide).
- ◆ Train employees and subcontractors in proper concrete waste management.

LIMITATIONS:

- ◆ Off-site washout of concrete wastes may not always be possible.

MAINTENANCE:

- ◆ Inspect subcontractors to ensure that concrete wastes are being properly managed.
- ◆ If using a temporary pit, dispose hardened concrete on a regular basis.

**DESCRIPTION:**

A temporary containment control constructed of compacted soil.

APPLICATION:

- ◆ Construct around waste and materials storage area.
- ◆ Construct around staging and maintenance areas.
- ◆ Construct around vehicle parking and servicing areas.

INSTALLATION/APPLICATION CRITERIA:

- ◆ Construct an earthen berm down hill of the area to be controlled. The berm should surround fueling facilities and maintenance areas on three sides to provide containment.
- ◆ Berm needs to be a minimum of 1 foot tall by 1 foot wide and be compacted by earth moving equipment.

LIMITATIONS:

- ◆ Not effective on steep slopes.
- ◆ Limits access to controlled area.
- ◆ Personnel need to quickly respond to spills with remedial actions.

MAINTENANCE:

- ◆ Observe daily for any non-stormwater discharge.
- ◆ Look for runoff bypassing ends of berms or undercutting berms.
- ◆ Repair or replace damaged areas of the berm and remove accumulated sediment.
- ◆ Recompect soil around berm as necessary to prevent piping.

**DESCRIPTION:**

Land grading involves reshaping the ground surface to planned grades as determined by an engineering survey, evaluation, and layout. Land grading provides more suitable topography for buildings, facilities, and other land uses and helps to control surface runoff, soil erosion, and sedimentation during and after construction.

APPLICATIONS:

Land grading is applicable to sites with uneven or steep topography or easily erodible soils, because it stabilizes slopes and decreases runoff velocity. Grading activities should maintain existing drainage patterns as much as possible.

INSTALLATION/APPLICATION CRITERIA:

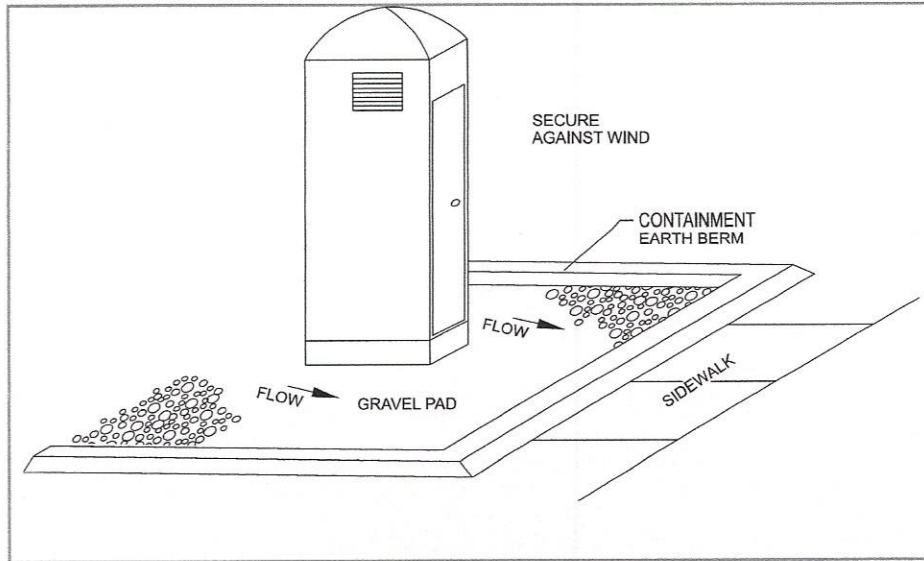
Before grading activities begin, a construction site operator must make decisions regarding the steepness of cut-and-fill slopes and how the slopes will be: Protected from runoff, stabilized and maintained.

LIMITATIONS:

Improper grading practices that disrupt natural stormwater patterns might lead to poor drainage, high-runoff velocities, and increased peak flows during storm events. Clearing and grading the entire site without vegetated buffers promotes offsite transport of sediments and other pollutants. Design the grading plan with erosion and sediment control and stormwater management goals in mind; to ensure that the plan is implemented as intended, carefully supervise grading crews.

MAINTENANCE:

- ◆ Check all graded areas and supporting erosion and sediment control practices periodically, especially after heavy rainfalls.
- ◆ Promptly remove all sediment from diversions or other stormwater conveyances, and if washouts or breaks occur, repair them immediately.
- ◆ To prevent small-scale eroded areas from becoming significant gullies, maintain them promptly.



DESCRIPTION:

Temporary on-site sanitary facilities for construction personnel.

APPLICATION:

All sites with no permanent sanitary facilities or where permanent facility is too far from activities.

INSTALLATION/APPLICATION CRITERIA:

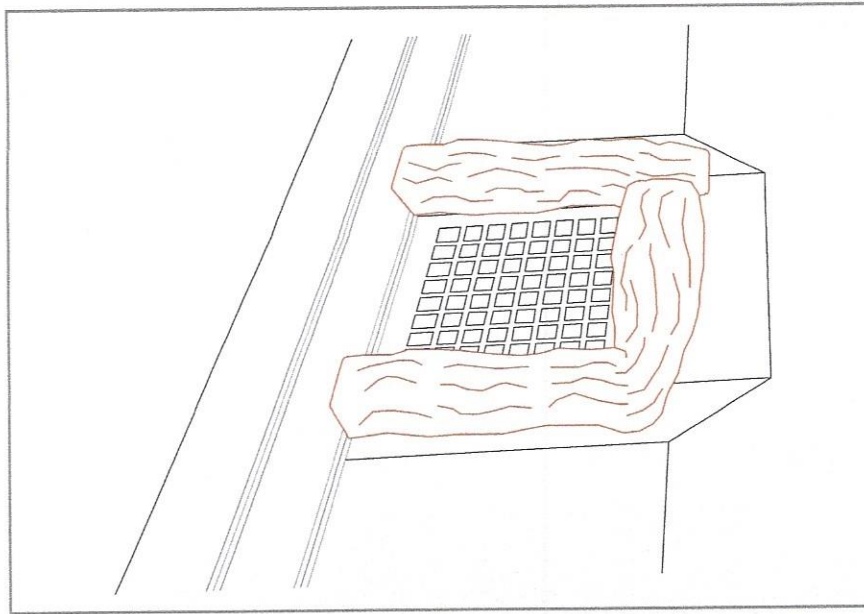
- ◆ Locate portable toilets in convenient locations throughout the site.
- ◆ Prepare level, gravel surface and provide clear access to the toilets for servicing and for on-site personnel.
- ◆ Construct earth berm perimeter (6" tall by 6" wide), control for spill/protection leak.

LIMITATIONS:

- ◆ No limitations.

MAINTENANCE:

- ◆ Portable toilets should be maintained in good working order by licensed service with daily observation for leak detection.
- ◆ Regular waste collection should be arranged with licensed service.
- ◆ All waste should be deposited in sanitary sewer system for treatment with appropriate agency approval.

**DESCRIPTION:**

Sediment barrier erected around storm drain inlet.

APPLICATION:

Construct at storm drainage inlets located down-gradient of areas to be disturbed by construction.

INSTALLATION/APPLICATION CRITERIA:

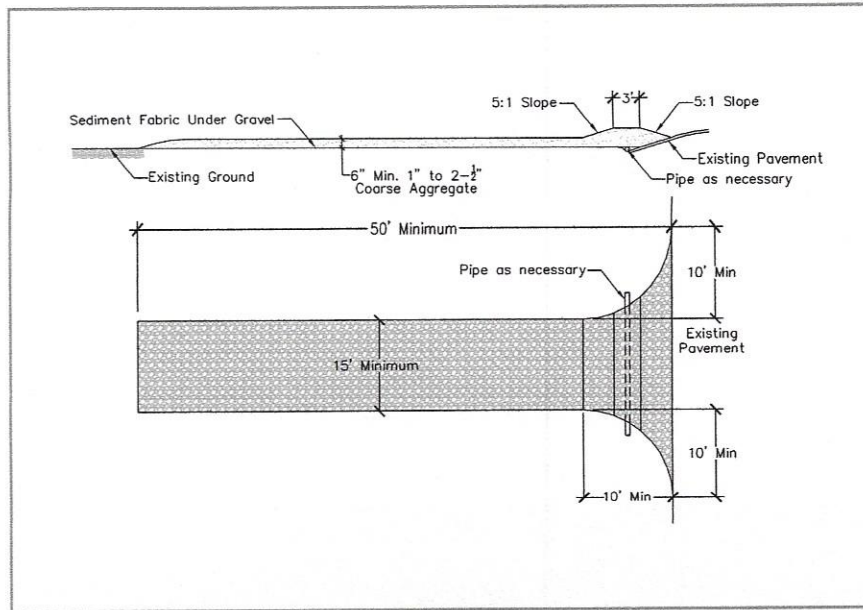
- ◆ Provide up-gradient sediment controls, such as silt fence during construction of inlet
- ◆ When construction of curb and gutter and roadways is complete, install gravel filled wattles around perimeter of inlet

LIMITATIONS:

- ◆ Recommended maximum contributing drainage area of one acre
- ◆ Requires shallow slopes adjacent to inlet

MAINTENANCE:

- ◆ Inspect inlet protection following storm event and at a minimum of once every 14 days.
- ◆ Remove accumulated sediment when it reaches 4 inches in depth.
- ◆ Look for bypassing or undercutting and repair or realign as needed.



DESCRIPTION:

A stabilized pad of crushed stone located where construction traffic enters or leaves the site from or to paved surface.

APPLICATION:

At any point of ingress or egress at a construction site where adjacent traveled way is paved. Generally applies to sites over 2 acres unless special conditions exist.

INSTALLATION/APPLICATION CRITERIA:

- ◆ Clear and grub area and grade to provide maximum slope of 2%.
- ◆ Compact subgrade and place filter fabric if desired (recommended for entrances to remain for more than 3 months).
- ◆ Place coarse aggregate, 1 to 2-1/2 inches in size, to a minimum depth of 8 inches.

LIMITATIONS:

- ◆ Requires periodic top dressing with additional stones.
- ◆ Should be used in conjunction with street sweeping on adjacent public right-of-way.

MAINTENANCE:

- ◆ Inspect daily for loss of gravel or sediment buildup.
- ◆ Inspect adjacent roadway for sediment deposit and clean by sweeping or shoveling.
- ◆ Repair entrance and replace gravel as required to maintain control in good working condition.
- ◆ Expand stabilized area as required to accommodate traffic and prevent erosion at driveways.

**DESCRIPTION:**

Reduce the discharges of pollutants to stormwater from street surfaces by conducting street cleaning on a regular basis.

APPROACH:

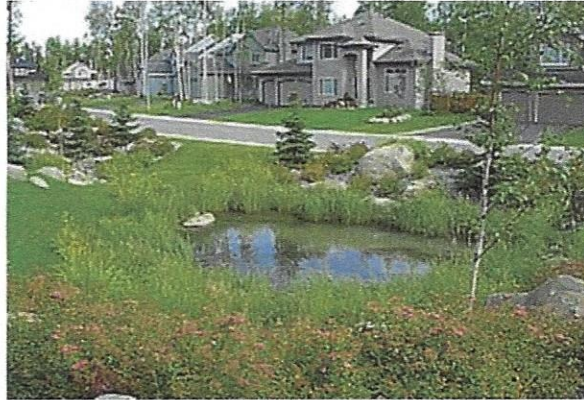
- ◆ Prioritize cleaning to use the most sophisticated sweepers, at the highest frequency, and in areas with the highest pollutant loading.
- ◆ Restrict street parking prior to and during sweeping.
- ◆ Increase sweeping frequency just before the rainy season.
- ◆ Proper maintenance and operation of sweepers greatly increase their efficiency.
- ◆ Keep accurate operation logs to track programs.
- ◆ Sweepers effective at removing smaller particles (less than 10 microns) may generate dust that would lead to concerns over worker and public safety.
- ◆ Equipment selection can be key for this particular BMP. There are two types used, the mechanical broom sweepers (more effective at picking up large debris and cleaning wet streets), and the vacuum sweepers (more effective at removing fine particles and associated heavy metals). Many communities find it useful to have a compliment of both types in their fleet.

LIMITATIONS:

- ◆ Conventional sweepers are not able to remove oil and grease.
- ◆ Mechanical sweepers are not effective at removing finer sediments.
- ◆ Effectiveness may also be limited by street conditions, traffic congestion, presence of construction projects, climatic conditions and condition of curbs.

MAINTENANCE:

- ◆ Replace worn parts as necessary.
- ◆ Install main and gutter brooms of the appropriate weight.

**DESCRIPTION:**

Vegetated buffers are areas of natural or established vegetation maintained to protect the water quality of neighboring areas. Buffer zones slow stormwater runoff, provide an area where runoff can permeate the soil, contribute to ground water recharge, and filter sediment. Slowing runoff also helps to prevent soil erosion and streambank collapse.

APPLICATIONS:

Vegetated buffers can be used in any area able to support vegetation. They are most effective and beneficial on floodplains, near wetlands, along streambanks, and on unstable slopes.

INSTALLATION/APPLICATION CRITERIA:

To establish an effective vegetative buffer, follow these guidelines:

- ◆ Make sure soils are not compacted.
- ◆ Make sure slopes are less than 5 percent unless temporary erosion control mats are also used.
- ◆ Determine buffer widths after carefully considering slope, vegetation, soils, depth to impermeable layers, runoff sediment characteristics, type and amount of pollutants, and annual rainfall.
- ◆ Make sure buffer widths increase as slope increases.
- ◆ Intermix zones of vegetation (native vegetation in particular), including grasses, deciduous and evergreen shrubs, and understory and overstory trees.
- ◆ In areas where flows are concentrated and fast, combine buffer zones with other practices such as level spreaders, infiltration areas, or diversions to prevent erosion and rilling.

LIMITATIONS:

Adequate land must be available for a vegetated buffer. If land cost is high, buffer zones might not be cost-effective. In addition, adequate vegetative cover must be maintained in the buffer to keep it effective. Vegetated buffers work well with sheet flows, but they are not appropriate for mitigating concentrated stormwater flows.

MAINTENANCE:

Keeping vegetation healthy in vegetated buffers requires routine maintenance. Depending on species, soil types, and climatic conditions, maintenance can include weed and pest control, mowing, fertilizing, liming, irrigating, and pruning.