

BMP 40: Vehicle Sediment Control

Description

This BMP describes measures to minimize track out of sediment from construction vehicles exiting the construction site onto off-site streets, other paved areas, and sidewalks. Sediment transported off site onto paved streets is a significant problem because it is difficult to effectively remove, and any sediment not removed ends up in the drainage system.

Temporary devices, such as a pad of coarse aggregate or a construction mat, should be installed at all exits from the construction site to a public roadway to stabilize the road and remove sediment (Figure 102). Additional controls to remove sediment from tires, such as wheel washing, rumble strips, and rattle plates, can also be used where necessary.

Applicability

Vehicle sediment control is appropriate for all construction sites in the following locations:

- Wherever vehicles are entering or leaving a construction site to or from a public right-of-way, street, alley, sidewalk or parking area.
- At any unpaved entrance/exit location where risk exists of transporting mud or sediment onto paved roads.

Vehicle sediment control is particularly important during wet weather periods when mud is easily tracked off site, during dry weather where dust is a concern, and when poorly drained, clayey soils are present on site.

Limitations

Vehicle sediment control using stabilized construction entrances are most effective when installed on level ground. If wheel washing is needed due to high sediment loads, washwater will need to be available and an additional sediment trap (BMP 66) may need to be installed.



Figure 102. Stabilized gravel construction entrance examples (EPA 2003).

| Primary BMP Functions and Controls | |
|--|--|
| <input checked="" type="checkbox"/> Construction | <input type="checkbox"/> Permanent |
| <input type="checkbox"/> Erosion Control | <input checked="" type="checkbox"/> Sediment Control |
| <input type="checkbox"/> Source Control | <input type="checkbox"/> Flood Control |
| <input type="checkbox"/> Filtration | <input type="checkbox"/> Infiltration |
| Typical Effectiveness for Targeted Pollutants | |
| <input checked="" type="radio"/> Sediment | |
| <input type="radio"/> Phosphorus | |
| <input type="radio"/> Metals | |
| <input type="radio"/> Bacteria | |
| <input type="radio"/> Hydrocarbons | |
| <input type="radio"/> Litter | |
| Other BMP Considerations | |
| Relative Cost | \$ |
| Maintenance Requirements | Medium |
| Ease of Installation | Medium |
| Freeze/Thaw Resistance | Good |
| Max. Tributary Drainage Area | N/A |
| Max. Slope | 15% |
| NRCS Soil Group | ABCD |
| Min. Ground Water Separation | N/A |
| Min. Bedrock Separation | N/A |

Design Basis

Vehicle sediment controls include aggregate pad construction entrances and turf mat construction entrances. Additional controls may be needed if the stabilized construction entrance does not remove sufficient amounts of sediment from vehicle and equipment tires. The following sections provide design information for these practices.

Access and exits should be limited to one route if possible or two for linear projects such as roadways where more than one access/exit is necessary. Construction entrances should avoid crossing existing sidewalks if possible. If they must cross a sidewalk, the full length of the sidewalk should be covered and protected from sediment leaving the site.

Construct entrances on a level surface, and if feasible, grade to drain towards the construction site to reduce off-site runoff. Runoff from a stabilized construction entrance should drain to a sediment trap or a sediment basin, and a culvert should be installed under the entrance to convey water along the ditch of the public road if necessary.

Aggregate Pad Construction Entrance

A coarse aggregate pad underlain with a geotextile fabric is a common technique for stabilizing construction entrances (Figure 103). The width should be at least 15 feet but not less than the full width of points where ingress or egress occurs. At sites where traffic volume is high, the entrance should be wide enough for two vehicles to pass safely. Flare the entrance where it meets the existing road to provide a sufficient turning radius.

The recommended minimum length should be 50 feet, although 100 feet is preferred. The aggregate should include 3- to 6-inch diameter rock. The placement depth should be 9 inches minimum or as recommended by a soils engineer based on the maximum expected vehicle loads. For entrances that will become permanent or for long-term installations during construction, two layers may be needed with a base layer of 2- to 8-inch diameter crushed stone and a top layer of 2 inch diameter or smaller stone.

Place geotextile filter fabric under the aggregate to prevent fine sediment from pumping up into the rock pad and to reduce maintenance and loss of aggregate. The geotextile should be a nonwoven fabric consisting only of continuous chain polymeric filaments or yarns of polyester. The geotextile should be inert to commonly encountered chemicals, hydrocarbons, and mildew and rot resistant.

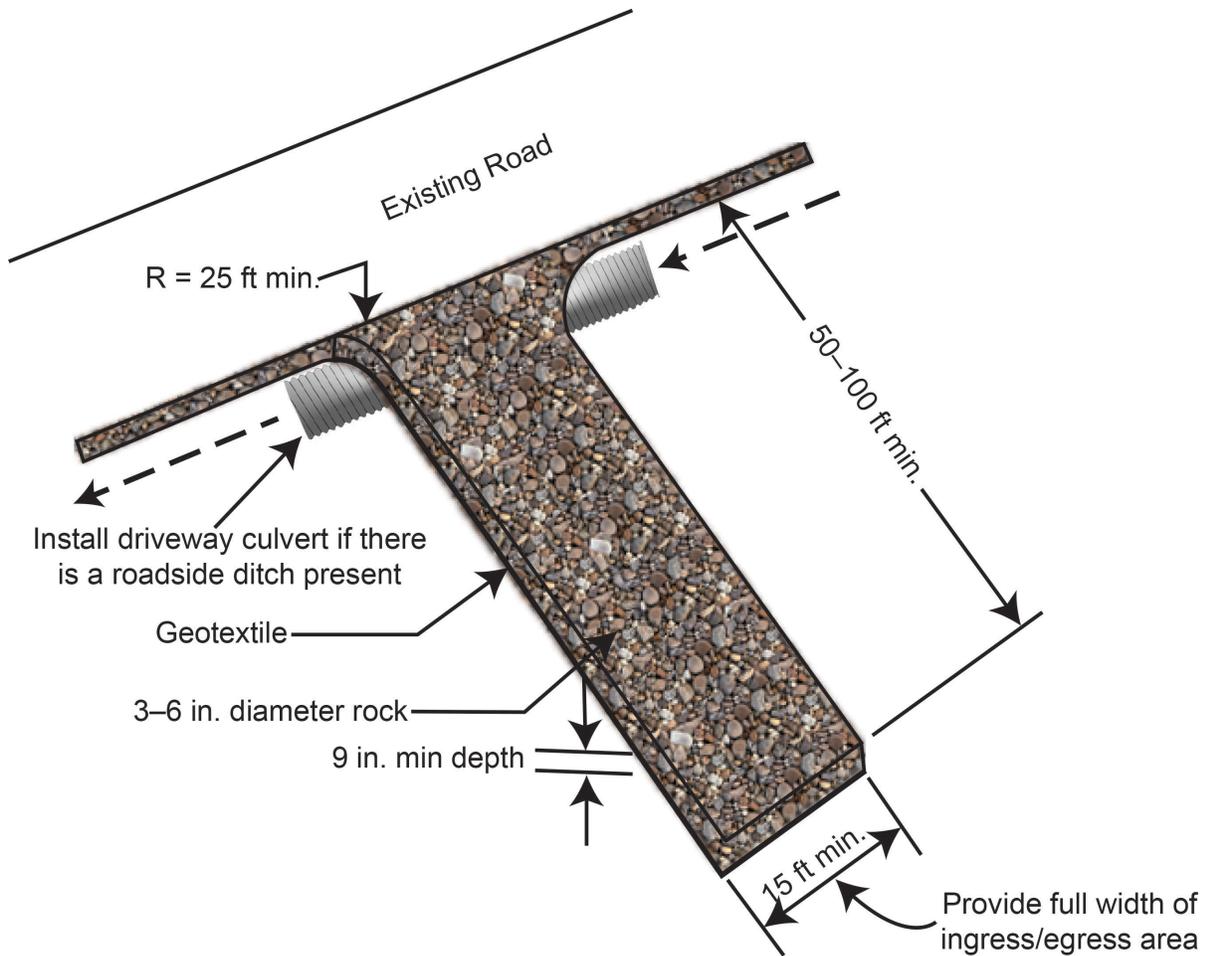


Figure 103. Aggregate pad construction entrance (adapted from King County 2009).

Construction Mat or Turf Reinforcement Mat

For small construction sites with low traffic volume, use a construction mat or turf reinforcement mat to stabilize the entrance (Figure 104 and Figure 105). The mats are made of steel, high-density polyethylene, timber, or a woven geotextile. Turf mats do not remove a significant amount of sediment from vehicles but do stabilize the entrance and prevent vehicles from causing rutting. These mats are especially suited for sites containing saturated soils, wetlands, or soft/poor subgrade as they provide immediate stabilization and some protection to existing vegetation. Some mats can be removed and reused on multiple sites.



Figure 104. Construction mat (*Matrax*).

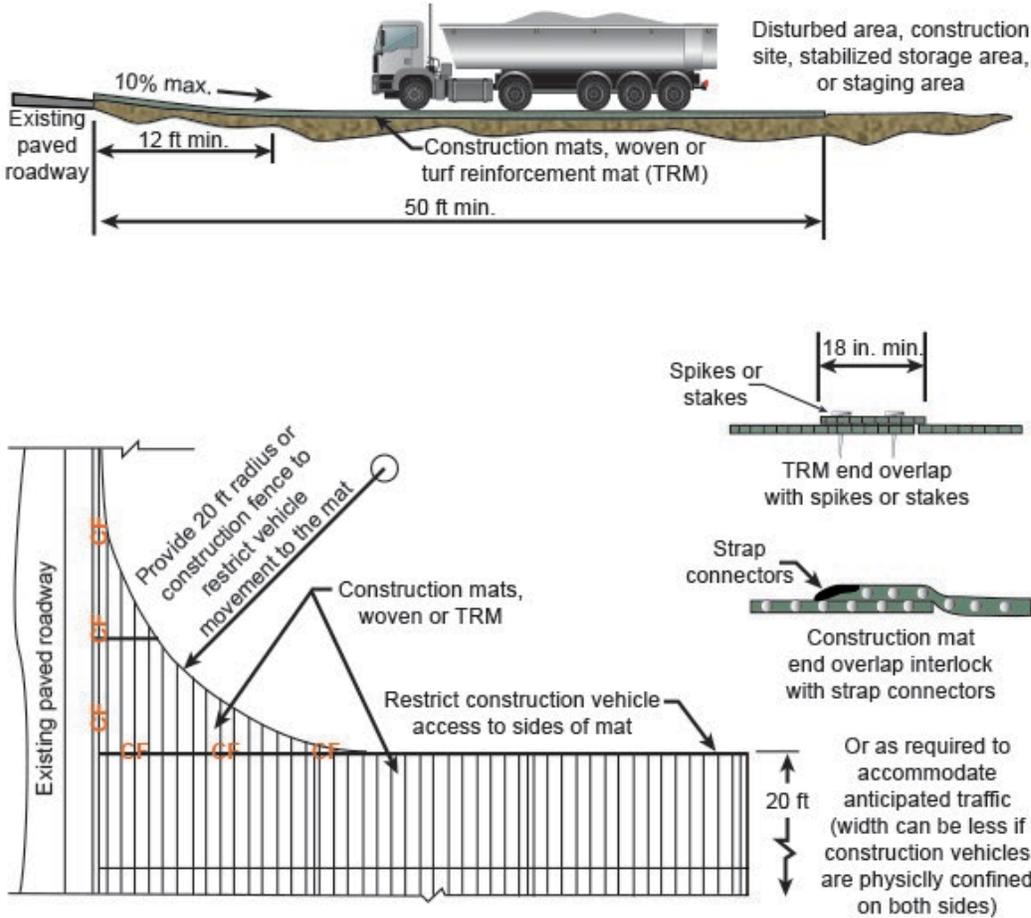


Figure 105. Vehicle-tracking control with construction mat or turf reinforcement mat (Colorado UDFCD 2010).

Additional Controls

If the stabilized construction entrance does not remove sufficient amounts of sediment from vehicle and equipment tires due to site conditions, additional controls may be required. Examples of additional controls include, but are not limited to, wheel washing, mountable berms, rumble strips, and rattle plates.

Wheel-washing facilities can be included within the stabilized construction entrance (Figure 106). It can be as simple as handheld power washing equipment to more advance systems. When washing is required, perform on an area stabilized with aggregate that drains into an approved sediment trap.

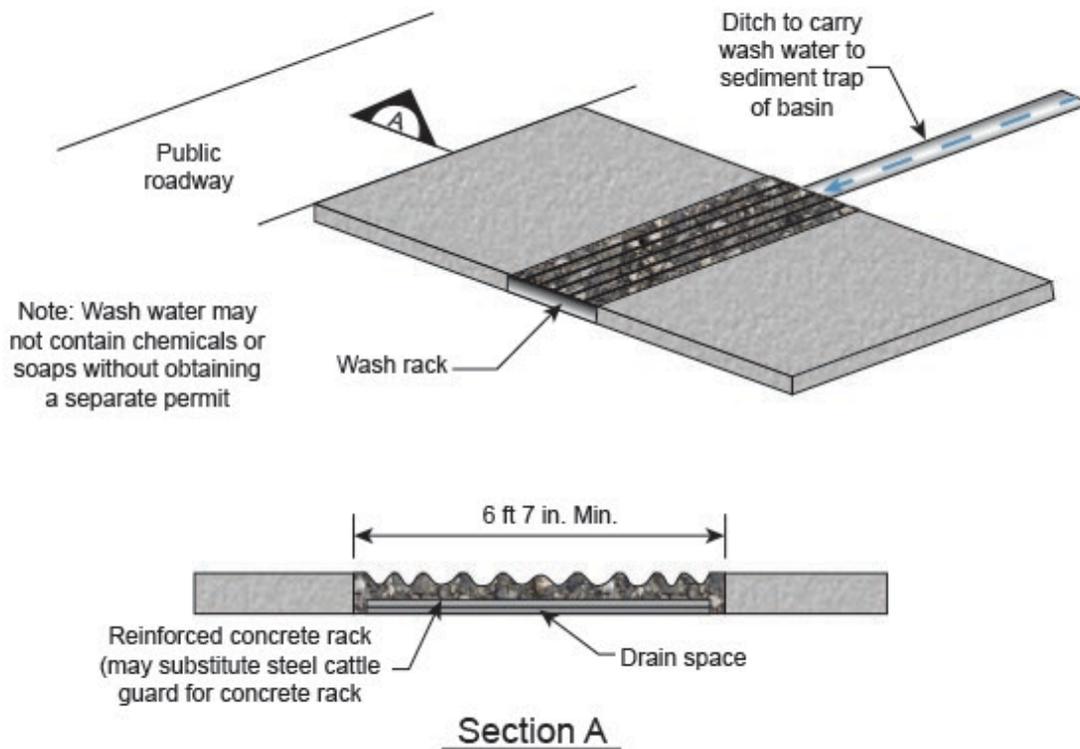


Figure 106. Aggregate vehicle-tracking control with wash rack (Colorado UDFCD 2010).

Mountable berms can be used in construction entrances to *bump* soil off of tires. These berms should be used when the entrance cannot be graded to flow away from the road. A mountable berm traps the pad water and keeps it from entering the adjacent road.

Rumble strips and rattle plates are constructed of steel panels with ridges or corrugations or pipes welded to a steel frame and can be installed within the construction entrance to remove additional sediment from vehicles. Rumble strips loosen and remove dirt and mud from vehicle tires as they pass over the construction entrance. Construct barriers around the sides of the rumble strips to ensure all construction vehicle and equipment tires travel over the rumble strips.

Rumble strip dimensions vary but typically are 8 feet long x 10 feet wide. Place rumble strip panels on a stable base and in the center of an aggregate entrance (Figure 107).



Figure 107. Rattle plates in construction entrance (*The Bag Lady*).

If sediment is tracked out of the construction site and onto off-site streets, sidewalks, or other paved areas, remove the sediment by sweeping, shoveling, or vacuuming. Complete cleanup by the end of the same work day when the track out occurs or by the end of the next work day if track out occurs on a nonwork day. Sediment should not be hosed or swept into an off-site storm water conveyance, storm drain inlet, or surface water.

Construction Guidelines

Stabilized construction entrances and any additional vehicle sediment controls should be installed as the first step in clearing and grading. Clear all vegetation, roots, and all other obstructions to prepare for grading, and ensure the entrance is properly graded and compacted before placing the geotextile fabric in the aggregate construction entrances.

All employees, subcontractors, and suppliers should be required to use the stabilized construction entrance. Place signage to direct construction traffic to the designated stabilized entrance, and use fencing where practical to restrict traffic to the stabilized construction entrance. Vehicle speeds should be limited to control dust (BMP 43: Dust Control). The stabilized construction entrance may be removed after final site stabilization is achieved or after the temporary BMPs are no longer needed. If stabilized entrances are located in a permanent site entrance, a geotechnical engineer should approve the subgrade after removal and before building the permanent entrance.

Maintenance

Inspect construction entrances and additional controls regularly and after storm events. Inspect local roads, sidewalks, and other paved surfaces adjacent to the site daily and sweep or vacuum accumulated sediment. Keep all temporary roadway ditches clear.

Construction entrances should be maintained in a condition that will prevent tracking or flow of mud onto public rights-of-way. Aggregate entrances may require periodic top dressing with additional 2 inches of stone (as conditions demand). If the aggregate pad is clogged with sediment, remove the aggregate and separate and dispose of the sediment. Rumble strips and rattle plates

must be kept clean to function properly. Sweep or scrape panels, and if water is used, discharge the washwater into a sediment trap adjacent to the rumble strips.

Additional Resources

Colorado UDFCD (Colorado Urban Drainage and Flood Control District). 2010. *Urban Storm Drainage Criteria Manual, Volume 3 Best Management Practices*. Denver, CO. <http://udfcd.org/wp-content/uploads/2014/07/Title-Page.pdf>

EPA (US Environmental Protection Agency). 2014. *Construction Entrances*. Water: Best Management Practices. <https://www.epa.gov/npdes/national-menu-best-management-practices-bmps-stormwater#constr>

King County (King County, Washington). 2009. *King County, Washington Surface Water Design Manual*. Seattle, WA: King County, Department of Natural Resources.