

SEEDING REQUIREMENTS

Permanent Seeding	Dates for Seeding											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Tall Fescue	O	O	O	O	O	O	O	O	O	O	O	O
Smooth Bromes	O	O	O	O	O	O	O	O	O	O	O	O
Fescue & Bromes	O	O	O	O	O	O	O	O	O	O	O	O
Timothy, Ryegrass & Bluegrass	A	A	O	O	O	P	P	O	O	P	P	A

O = Optimum seeding dates
 A = Acceptable seeding dates
 P = Permitted seeding dates with reseeding 2 months later - ideally use 50% of seed and 75% of fertilizer. Rest of seed with additional 75% seed and maintain fertilizer.

Permanent Seeding	Minimum Fertilizer and Seeding Rates			
	Rate	Rate	Rate	Rate
Tall Fescue	300	7.0		
Smooth Bromes	200	4.0		
Mix #1	250	5.7		
Mix #2	250	4.8		

Mix #1 = Tall Fescue @ 150 pounds per acre and Bromes @ 100 pounds per acre.
 Mix #2 = Tall Fescue @ 100 pounds per acre, Perennial Ryegrass @ 100 pounds per acre, and Kentucky Bluegrass @ 16 pounds per acre.
 * Seeding rates for slopes in excess of 20% (2:1), shall be 10 pounds per 100 sq. ft.

Temporary Seeding	Minimum Fertilizer and Seeding Rates	
	Rate	Rate
Rye or Sudan	150	3.5
Oats	200	2.5

Fertilizer	Minimum Fertilizer and Seeding Rates	
	Rate	Rate
Nitrogen	45	30
Phosphate	65	30
Potassium	65	30
Lim. - ENM	600	600

ENM = Effective neutralizing material per state evaluation of quarried rock.

MULCH

PHYSICAL DESCRIPTION - A layer of organic material designed to protect exposed soil or freshly seeded areas from erosion by eliminating direct impact of precipitation and slowing overland flow rates. Mulch materials may include, but are not limited to, such things as grass, hay, straw, wood chips, wood fibers, and shredded bark.

- Type I Mulch-Vegetative (includes grass, hay, straw), 802-10.00.
- Type II Mulch-Vegetative with asphalt emulsion (includes grass, hay, straw), 802-20.00.
- Type III Mulch-Vegetative with overspray (includes grass, hay, straw), 802-30.00.
- Type IV Mulch-Hydro mulch (includes wood fiber, wood cellulose), 802-50.00.
- Shredded hardwood bark mulch, 802-60.00.
- Wood Chips (not recycled lumber), 802-60.92.

WHERE BMP IS TO BE INSTALLED - Typically installed on seeded areas for temporary use, and in landscaped areas for permanent use.

CONDITIONS FOR EFFECTIVE USE OF BMP:

Type of Flow: Sheet flow only.
 Slopes: See attached chart for types of mulch acceptable as a function of slope length and steepness.
 Mulching Rates: See attached table.

WHEN BMP IS TO BE INSTALLED - Immediately after grading landscaped areas or seeding other areas.

INSTALLATION/CONSTRUCTION PROCEDURES:

- Install upstream BMP's to protect area to be mulched.
- Rough grade area and remove all debris larger than 1 inch if area is to be vegetated and mowed in the future, larger than 2 inches if area is to be permanently mulched.
- If area is to be seeded, follow requirements of Seeding BMP.
- Spread mulch and anchor by punching it into the ground, using netting, peg and wire, or lacing with lead binder.
- For additional information see Section 802 of St. Louis County's Standard Specification for Highway Construction.

O&M PROCEDURES:

- Inspect every week and after every storm until adequate vegetation is established; annually for permanent mulch.
- Protect from vehicular and foot traffic.
- Repair damaged, degraded or eroded areas as needed and replace mulch.

SITE CONDITIONS FOR REMOVAL - Temporary mulch should be removed when adequate vegetation is established.

TYPICAL DETAILS - Type of mulch required for various slopes and application rates attached.

Additional erosion control measures may be required during construction that are not shown on these plans. Contractor is responsible for installing and maintaining temporary and/or interim erosion control measures during construction program or as required by the City of O'Fallon, St. Charles County and/or MDRN Inspector. Any changes/additions to the Storm Water Pollution Prevention Plan (SWPPP) shall be documented by the contractor and remain on file at the site.

SEEDING

PHYSICAL DESCRIPTION - Establishment of vegetation by spreading grass seed designed to protect exposed soil from erosion by eliminating direct impact of precipitation and slowing overland flow rates. Once established, the vegetative cover will also filter pollutants from the runoff.

WHERE BMP IS TO BE INSTALLED - Exposed soil after a phase of rough or finish grading has been completed, or areas where no activity will occur for 30 days.

CONDITIONS FOR EFFECTIVE USE OF BMP:

Type of Flow: Sheet flow.
 Slopes: 30 foot maximum for 3:1 slopes.
 100 foot maximum for slopes between 3:1 and 10:1.
 100 foot maximum for slopes under 10%.

Minimum Rates: See attached chart(s).
 Acceptable Dates: See attached chart.

WHEN BMP IS TO BE INSTALLED - Immediately after rough or finished grading is completed.

INSTALLATION/CONSTRUCTION PROCEDURES:

- Install upstream BMP's to protect area to be seeded.
- Rough grade area and remove all debris larger than 1 inch in diameter and concentrated areas of smaller debris.
- Install stabilization grids, if needed.
- Mix soil amendments (lime, fertilizer, etc.) into top 3"-8" of soil as needed.
- Plant seed 3/4 - 1/2 inch deep.
- Roll lightly to firm surface.
- Cover seeded area with mulch unless seeding completed during optimum spring and summer dates.
- Install additional stabilization (netting, bonded fiber matrix, etc.) as required.
- Water immediately enough to soak 4 inches into soil without causing runoff.

O&M PROCEDURES:

- Inspect every week and after every storm.
- Protect area from vehicular and foot traffic.
- Reed areas that have not sprouted within 21 days of planting.
- Repair damaged or eroded areas and reseed and stabilize as needed.
- Do not mow until 4 inches of growth occurs.
- During the first 4 months, mow no more than 1/3 of the grass height.
- Referitize during 2nd growing season.

SITE CONDITIONS FOR REMOVAL - Does not require removal, but temporary seeding can be removed immediately prior to work returning to an area.

TYPICAL DETAILS - Minimum seeding rates and acceptable dates for work attached.

NON-SEDIMENT POLLUTION CONTROL

PHYSICAL DESCRIPTION - Control measures designed to prohibit chemicals, hazardous materials, solid waste and construction debris from entering stormwater. Pollutants carried in solution or as surface films on runoff will be carried through most erosion control and sediment capture BMP's. Keeping substances like fuel, oil, asphalt, paint, solvents, fertilizer, soil additives, concrete wash water, solid waste and construction debris from polluting runoff can be accomplished to a large extent through good housekeeping on the site and following the manufacturer's recommendations for disposal.

WHERE BMP IS TO BE INSTALLED - Collection, storage and fueling areas should be located onsite in an area that does not receive a substantial amount of runoff from upland areas and does not drain directly to lakes, creeks, streams, rivers, sewers, groundwater, wetlands, or road ditches.

CONDITIONS FOR EFFECTIVE USE OF BMP:

- Reduction in pollutants depends heavily on how construction personnel perform their duties. An effective management system requires training and signage to promote proper storage, handling and disposal of materials. Follow up observations of actions and inspection of storage areas by management personnel is also required.
- Plans should contain notes clearly stating requirements for addressing potential pollutants.
- Fueling areas and storage sites for hazardous materials should be protected by berms or other means of catching leaks or spills.

WHEN BMP IS TO BE INSTALLED - Immediately following installation of construction entrance and wash station.

INSTALLATION/CONSTRUCTION PROCEDURES:

- Place waste receptacles near area of work.
- Construct protective berm or other devices around fueling and hazardous materials storage areas.
- Install appropriate signage.
- Post guidelines for proper handling, storage and disposal of materials, and emergency spill cleanup on site.

O&M PROCEDURES:

- Inspect storage areas and control devices at least every two weeks and after every storm.
- Make necessary corrections and repairs.

SITE CONDITIONS FOR REMOVAL - Maintain practices until all construction on the site has been completed.

TYPICAL DETAILS - General pollution prevention notes attached.

DUST CONTROL

PHYSICAL DESCRIPTION - Control measures designed to reduce the transport of dust, thereby preventing pollutants from infiltrating into stormwater. Examples for construction activities include vegetative cover, wind barriers, minimization of soil disturbance, spray on adhesives, tiling, chemical treatment and water sprays.

In St. Louis County the contractor / permittee is required by Missouri State Law (10 CSR 10-6.170) and County Ordinance (612.340) to control fugitive dust blown from the construction site, land disturbance site, signal installation, etc. Dust control, including saw-cut material etc., on the construction site shall be monitored for safety purposes and to prevent nuisances. The contractor / permittee shall apply reasonable measures to control dust and particulate matter (of any size or source) due to roadway / construction traffic, grading, clearing and grubbing, building demolition, wind erosion, saw-cutting etc., from migrating off the site of origin.

WHERE BMP IS TO BE INSTALLED - Critical in areas of exposed soil.

CONDITIONS FOR EFFECTIVE USE OF BMP - A combination of the following actions should be used to help reduce the dust and air pollution at a construction site.

- Minimize Concurrent Areas of Soil Disturbance - Phase work to the extent practical.
- Vegetative Cover - For areas not subjected to traffic, vegetation provides the most practical method of dust control and should be established as early as possible. Temporary vegetation should also be used. See Seeding and Sodding BMP's for additional information.
- Sprinkling - The site can be sprinkled with water until the surface is moist. This practice is effective for dust control on large areas, haul routes or other traffic routes, but constant repetition is required for effective control.
- Tiling - Roughen the surface and bring clods to the surface. This is an emergency measure that should be used before soil blowing starts. Begin tiling on windward side of the site. Chisel plows with shanks spaced about 12 inches to 16 inches apart and spring tines behind harrows are examples of equipment that may produce the desired effect. See Surface Roughening BMP for additional information.

Street Cleaning - Paved areas that have soil on them from construction sites should be cleaned continuously, at least daily, utilizing a street sweeper or bucket type end loader or scraper.

Mulching - This practice offers a fast and effective means of controlling dust when properly applied. Binders and tackifiers should be used on organic mulches. Mulching is not recommended for areas with heavy traffic. See Mulching BMP for additional information.

Wind Barriers - Solid board fences, snow fences, burlap fences, crate walls and similar materials can be used to control air currents and blowing soil. Barriers placed at right angles to prevailing wind currents at intervals of about 10 times their height are effective in controlling soil blowing.

NOTE: If calcium chloride or spray-on adhesives are used for dust control, a permit may be required from the Missouri Department of Natural Resources.

WHEN BMP IS TO BE INSTALLED - Routinely, especially in advance of and during periods of dry weather.

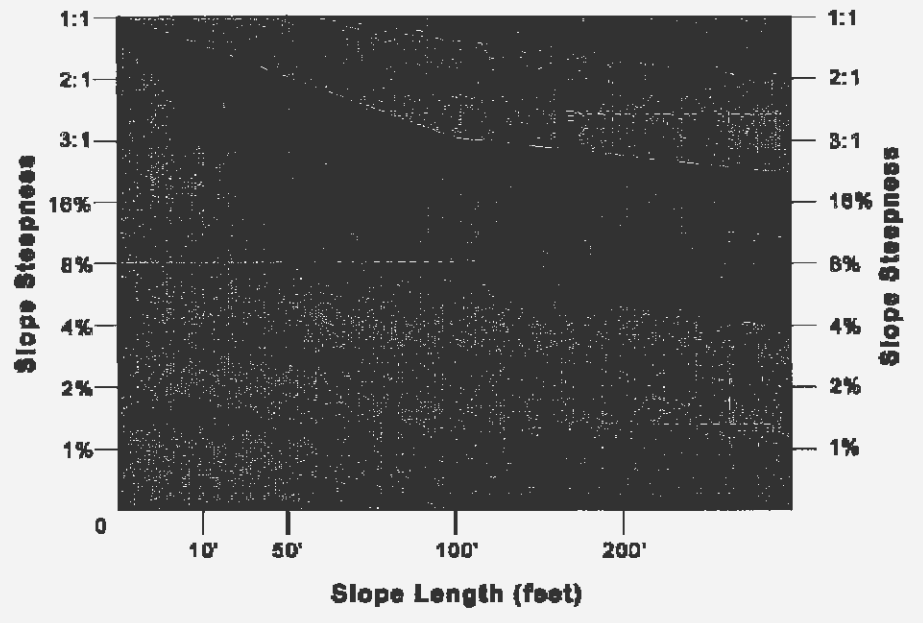
INSTALLATION / CONSTRUCTION PROCEDURES - See Conditions for Effective Use Above.

O&M PROCEDURES - Inspect daily and renew as needed.

SITE CONDITIONS FOR REMOVAL - Maintain practices until all disturbed areas are vegetated or paved and blowing soil is no longer a concern.

TYPICAL DETAILS - Not Applicable.

MULCH SELECTION AS A FUNCTION OF SLOPE



GENERAL MULCH RECOMMENDATIONS TO PROTECT FROM SPLASH AND SHEET FLOW

Mulch Type	Application Rate	Notes
Straw	2 to 2.5 tons	Use with hydro seeders; may be used to tack straw. Do not use in hot, dry weather.
Wood Fiber or Wood Cellulose	0.5 to 1 ton	Apply with blower, chip applicator, or by hand. Not for use in hot, dry weather.
Wood Chips	5 to 8 tons	Apply with blower, chip applicator, or by hand. Do not use asphalt base.
Bark	5 to 8 tons	Apply with blower, chip applicator, or by hand. Do not use asphalt base.

CONCRETE WASTE MANAGEMENT

DESCRIPTION - The purpose of this specification is to set forth procedures and practices designed to eliminate the discharge of concrete waste materials to storm drainage systems, drainage areas, streets or waterways, which shall be required of the contractor.

APPROPRIATE APPLICATION OF BMP - Concrete waste management procedures and practices will be implemented on construction projects as follows:

- Where concrete is used as a construction material or where concrete dust and debris result from demolition activities.
- Where slurries containing Portland cement concrete (PCC), asphaltic concrete (AC) or bituminous concrete (BC) are generated, such as from saw cutting, coring, grinding, grooving and hydro concrete demolition.
- Where concrete trucks and other concrete-coated equipment are washed on-site, when approved by the Resident Engineer or Construction Inspector.
- Where mortar mixing station exist.

AWARENESS / ENFORCEMENT

- Contractor's and / or permit holder's superintendent or representative shall oversee and enforce concrete waste management procedures.
 - Discuss the concrete management techniques described in this BMP (such as handling of concrete waste and washout) with the ready-mix concrete supplier before any deliveries are made.
- The site superintendent shall make drivers aware of the presence of the concrete waste management facilities. The site superintendent should post signage indicating the location and designated use of the concrete waste management areas, and provide careful oversight to inspect for evidence of improper dumping of concrete waste and wash water.

IMPLEMENTATION

- Contractors, private individuals, public agencies, etc. using concrete material shall incorporate requirements for concrete waste management into material supplier and subcontractor agreements. Include requirements in contracts with concrete delivery companies that drivers must use designated concrete washout facilities.
- Store dry and wet materials under cover, away from drainage areas.
- Avoid mixing excess amounts of fresh concrete.
- Do not allow excess concrete to be dumped on-site, except in designated areas.
- Cover the structures before predicted rainstorms to prevent overflow.
- Monitor on site concrete waste storage and disposal procedures at least weekly or as directed by the Resident Engineer or Construction Inspector.

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CONDITIONS FOR EFFECTIVE USE OF BMP:

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- Plans should contain notes clearly stating requirements for addressing potential pollutants.
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WHEN BMP IS TO BE INSTALLED - Immediately following installation of construction entrance and wash station.

INSTALLATION/CONSTRUCTION PROCEDURES:

- Place waste receptacles near area of work.
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- Install appropriate signage.
- Post guidelines for proper handling, storage and disposal of materials, and emergency spill cleanup on site.

O&M PROCEDURES:

- Inspect storage areas and control devices at least every two weeks and after every storm.
- Make necessary corrections and repairs.

SITE CONDITIONS FOR REMOVAL - Maintain practices until all construction on the site has been completed.

TYPICAL DETAILS - General pollution prevention notes attached.

DUST CONTROL

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Street Cleaning - Paved areas that have soil on them from construction sites should be cleaned continuously, at least daily, utilizing a street sweeper or bucket type end loader or scraper.

Mulching - This practice offers a fast and effective means of controlling dust when properly applied. Binders and tackifiers should be used on organic mulches. Mulching is not recommended for areas with heavy traffic. See Mulching BMP for additional information.

Wind Barriers - Solid board fences, snow fences, burlap fences, crate walls and similar materials can be used to control air currents and blowing soil. Barriers placed at right angles to prevailing wind currents at intervals of about 10 times their height are effective in controlling soil blowing.

NOTE: If calcium chloride or spray-on adhesives are used for dust control, a permit may be required from the Missouri Department of Natural Resources.

WHEN BMP IS TO BE INSTALLED - Routinely, especially in advance of and during periods of dry weather.

INSTALLATION / CONSTRUCTION PROCEDURES - See Conditions for Effective Use Above.

O&M PROCEDURES - Inspect daily and renew as needed.

SITE CONDITIONS FOR REMOVAL - Maintain practices until all disturbed areas are vegetated or paved and blowing soil is no longer a concern.

TYPICAL DETAILS - Not Applicable.

POLLUTION PREVENTION PROCEDURES

DESCRIPTION - Building materials and other construction site wastes must be properly managed and disposed of to reduce the risk of pollution from materials such as surplus or refuse building materials or hazardous wastes. Practices such as trash disposal, recycling, proper material handling, and spill prevention and cleanup measures can reduce the potential for storm water runoff to mobilize construction site wastes and contaminate surface or ground water.

APPROPRIATE APPLICATION OF BMP - The proper management and disposal of wastes should be practiced at every construction site to reduce contaminated storm water runoff. Use waste management practices to properly locate refuse piles, to cover materials that might be displaced by rainfall or storm water runoff, and to prevent spills and leaks from hazardous materials that were improperly stored.

Solid Wastes

- Designate a waste collection area on the site that does not receive a substantial amount of runoff from upland areas and does not drain directly to a water body.
- Ensure that containers have lids so they can be covered before periods of rain, and keep containers in a covered area whenever possible.
- Schedule waste collection to prevent the containers from overflowing.
- Clean up spills immediately. For hazardous materials, follow cleanup instructions on the package.
- During the demolition phase of construction, provide extra containers and schedule more frequent pickups.
- Called, remove, and dispose of all construction site wastes at authorized disposal areas. Contact a local environmental agency to identify these disposal sites.

Pesticides and Fertilizers

- Follow all federal, state, and local regulations that apply to the use, handling, or disposal of pesticides and fertilizers.
- Do not handle the materials any more than necessary.
- Store pesticides and fertilizers in a dry, covered area.
- Construct berms or dikes to contain stored pesticides and fertilizers in case of spillage.
- Follow the recommended application rates and methods.
- Have equipment and absorbent materials available in storage and application areas to immediately contain and clean up any spills that occur.

Detergents - Phosphorus and nitrogen containing detergents are used in wash water for cleaning vehicles. Excess of these nutrients can be a major source of water pollution. Use detergents only as recommended, and limit their use on the site. Do not dump wash water containing detergents into the storm drain system; direct it to a sanitary sewer or contain it so that it can be treated at a wastewater treatment plant.

1) HANDLING AND DISPOSAL OF HAZARDOUS MATERIALS

- Prevent spills
- Use products up
- Follow label directions for disposal
- Remove lids from empty bottles and cans when disposing in trash
- Recycle wastes whenever possible

DONT

- Don't pour wastes into sewers or waterways or on the ground
 - Don't pour waste down the sink, floor drain or septic tanks
 - Don't bury chemicals or containers, or dispose of them with construction debris
 - Don't burn chemicals or containers
 - Don't mix chemicals together
 - Don't remove the original product label from the container
- Containers shall be provided for collection of all waste material including construction debris, trash, petroleum products and any hazardous materials to be used onsite. All waste material shall be disposed of at facilities approved for that material.
 - No waste materials shall be buried on-site.
 - Mixing, pumping, transferring or otherwise handling construction chemicals such as fertilizer, lime, asphalt, concrete drying compounds, and all other potentially hazardous materials shall be performed in an area away from any water course, ditch or storm drain.
 - Equipment fueling and maintenance, oil changing, etc., shall be performed only in an area designated for that purpose. The designated area is equipped for recycling oil and catching spills.
 - Concrete wash water shall not be allowed to flow directly to storm sewers, streams, ditches, lakes, etc. without being treated. A sump or pit shall be constructed to contain concrete wash water. See additional requirements in the "Concrete Waste Management" section of this manual.
 - Substances such as oil, diesel fuel, hydraulic fluid, antifreeze, etc. are spilled, leaked, or released onto soil, the soil shall immediately be dug up and disposed of at a licensed sanitary landfill (not a construction / demolition debris landfill). Spills on pavement shall be immediately absorbed with sawdust, kitty litter or product designed for that purpose and disposed of at a licensed sanitary landfill. Hazardous or industrial wastes are the most toxic and persistent, and current laws and regulations require special handling. These materials will be removed from the site and recycled or disposed of in accordance with MoDRN requirements.
 - State law requires the party responsible for a petroleum product spill in excess of 50 gallons to report the spill to Missouri Department of Natural Resources (MoDRN) at (537) 634-2436, as soon as practical after discovery. Federal law requires the responsible party to report any release of oil if it reaches or threatens a sewer, lake, creek, stream, river, groundwater, wetland, or area, like a road ditch, that drains into one of the above.

O&M PROCEDURES - The only way to be sure that waste management practices are being followed is to be aware of worker habits and to inspect storage areas regularly. Extra management time may be required to ensure that all workers are following the proper procedures. Inspect storage and use areas and identify containers or equipment that could malfunction and cause leaks or spills. Check equipment and containers for leaks, corrosion, support or foundation failure, or other signs of deterioration, and test them for soundness. Immediately repair or replace failure that are found to be defective.

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