

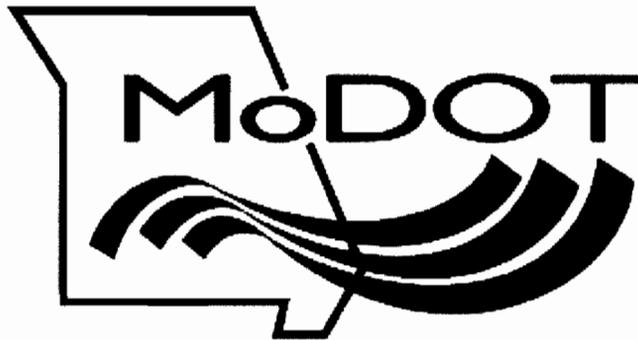
# Storm Water Management Plan

Missouri Department of Transportation

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OCT 16 2015

Water Protection Program



Permit covers: 2013-2018

Submitted by: Eric Schroeter, State Design Engineer  
Revised October 15, 2015

## INTRODUCTION

The Missouri Department of Transportation (MoDOT) developed its first Storm Water Management Plan (SWMP) in July 2006.

The SWMP summarizes MoDOT's intentions to reduce the amount of pollution in storm water runoff from MoDOT's road system by addressing the six categories of concern listed in the MS4 General permit. These categories are as follows:

*Public Education and Outreach*

*Public Involvement and Participation*

*Illicit Discharge Detection and Elimination*

*Construction Site Runoff Control*

*Post-Construction Site Runoff Control*

*Pollution Prevention/Good House Keeping*

As circumstances change, new solutions may be necessary to better control pollution in storm water that flows onto or away from MoDOT's road system. This plan is a continuation in which new and innovative ideas and solutions can be developed in the years to come to protect the water quality of the state's waterways.

MoDOT is unique as an MS4 and is better identified as a TS4, or Transportation Separate Storm Sewer System, for a number of reasons. First, unlike a municipality, MoDOT does not have enforcement capability for measures like illicit discharge detection and elimination. Second, unlike a municipality, MoDOT does not have ordinances, only policies. These are just a few examples of why MoDOT's linear transportation system does not fit well with the requirements of the MS4 permit.

MoDOT's TS4 coverage area is a combination of Phase I MS4s, Phase II MS4s, County MS4s, TMDLs where MoDOT has been identified with a waste load allocation, and Outstanding State and National Resource Waterways (Exhibit 1).

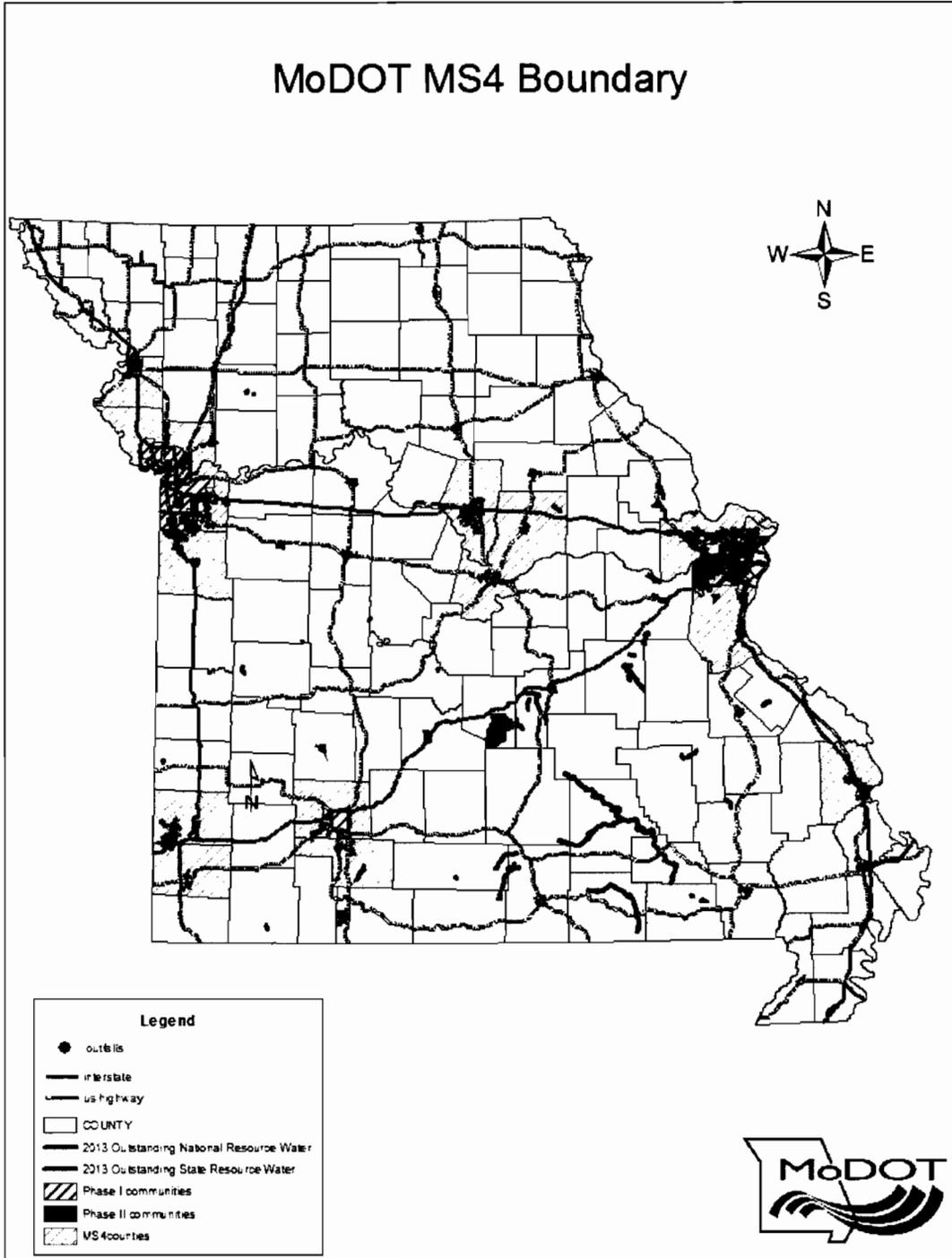
Included in this stormwater management plan are actions with measurable goals to be implemented to control stormwater runoff. This is an iterative process of developing a plan, implementing the plan, and evaluating the plan and the process is dynamic, helping MoDOT achieve the goals of the SWMP.

## MODOT INFORMATION

<b>Name of Responsible Public Entity:</b>	Missouri Department of Transportation
<b>Name of Person Responsible for the SWMP:</b>	Melissa Scheperle
<b>MS4 coverage area:</b>	In regulated MS4 areas as defined by MDNR, in established or approved TMDLs, in Outstanding State and National Resource Waters.

MoDOT is identified as the continuing authority within MoDOT right of way and properties owned by MoDOT.

# MoDOT MS4 Boundary



**Exhibit 1: Map showing state of Missouri, MS4 area, and major highways.**

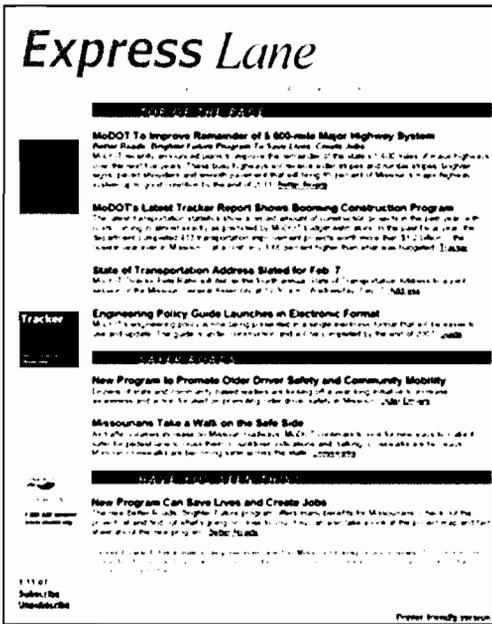
## PUBLIC EDUCATION AND OUTREACH

Through the planning and design phase of its projects, MoDOT holds hundreds of public meetings and hearings around the state each year. While they are primarily held to solicit public opinion on a specific project, those meetings also serve as an excellent way for MoDOT officials to personally respond, one-on-one, to citizen concerns. Surveys have shown that nearly 82 percent of those who attend are satisfied with how their questions/comments were handled.

MoDOT officials also make numerous public appearances, speaking to civic groups, schools, clubs and appearing at other public events. On the Services webpage of the MoDOT home webpage, anyone can request a public speaker by topic or region (<http://www.modot.org/requestaspeaker>).

MoDOT also makes extensive use of the media to communicate with the public. These contacts include news releases, twitter, facebook, radio, e-mail, telephone and written correspondence. MoDOT has also made strides toward communicating directly with the public through a bi-monthly electronic newsletter, *ExpressLane*. The distribution list for the newsletter, which debuted in October 2005, has climbed to over 38,000 subscribers.

### Sign up for Express Lane!



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Twice a month you'll receive this e-newsletter that's sent conveniently to your e-mail address. It contains all the highlights of Missouri's transportation news. Want to know what your Department of Transportation is doing? Get in the Express Lane today!

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Figure 1: *ExpressLane* bi-monthly publication.

MoDOT has also made a commitment to making its Web site – [www.modot.mo.gov](http://www.modot.mo.gov) – an outreach tool and information repository for its customers. Approximately 180,000 persons per month visit the site, with 20 percent of those customers returning more than once. The percentage of repeat visitors has been climbing steadily since MoDOT began tracking the activity in January of 2005 and added interactive features like the Traveler Information map.

**Action:** MoDOT will educate the public on storm water issues as it relates to operation and maintenance of the state's highway system through public meetings, public events, website and use of media.

**Measurable Goal -** MoDOT will continue the same level of effort to reach as many persons as in the previous year through all of the above mechanisms, and will use some of these outreach tools to explain storm water quality issues.



Figure 2: MoDOT "Programs and Services" webpage.

**Action:** MoDOT will use outreach through its website and other media.

- **Measurable Goal -** MoDOT will track how many visitors have used our storm water webpage each year and continually update the page with the best available information on MoDOT's role as an MS4.
- **Measurable Goal -** MoDOT will report yearly how many visitors have used/submitted the Report a Stormwater Concern form and how many of those were related to MoDOT right-of-way.

**Action:** Create materials to disseminate at public events and public meetings.

- **Measurable Goal -** In 2013, MoDOT's Stormwater Brochure was available at public meetings and events. MoDOT will track how many are disseminated each year.
- **Measurable Goal -** In 2013, MoDOT's Stormwater tattoo was available at Earth Day and the State Fair. MoDOT will track how many are distributed each year.

- **Measurable Goal** - MoDOT will continue to participate in events such as Earth Day and the State Fair. MoDOT will track participation in these events.

## **PUBLIC INVOLVEMENT AND PARTICIPATION**

MoDOT is committed to involving the public, local officials, transportation stakeholders and other interested parties in the process of evaluating needs, selecting projects and defining the work to be done. The department goes beyond federal guidelines to create a transportation system that is safe, efficient and enjoyable. A transparent planning process helps minimize the impact a project could otherwise have on the natural, social and economic environments.

MoDOT's commitment to involving the public in the transportation decision-making process and to reaching out to its customers about its programs and projects is in keeping with the department's mission: "...to provide a world-class transportation experience that delights our customers and promotes a prosperous Missouri."

Public involvement and outreach also support MoDOT's values that are measured through a series of tangible results that are the key component of *The Tracker*, MoDOT's performance-based system that is documented quarterly. *Tracker* is focused on the customer and measures MoDOT's performance in giving customers what they want, such as "provide outstanding customer service;" and "use resources wisely," just to name a few.

Some of those values are:

MoDOT will ...

- Be Safe,
- Be Accountable,
- Be Respectful,
- Be Inclusive,
- Be Bold,
- Be Better, and
- Be One Team

So we can be a great organization.

To reach out to the public, and to be responsive to its needs, MoDOT uses many tools and techniques. Each of these is implemented on statewide and local levels through the department's community relations offices at the Central Office in Jefferson City and the department's 7 district offices. A customer service center is also maintained at each location.

MoDOT tracks the number of customers who contact MoDOT via email, telephone or letter.

**Action:** Through the above mechanisms, MoDOT will collect and respond to public comments on water quality issues related to storm water management as it relates to expansion or operation and maintenance of the state's highway system.

**Action:** MoDOT will continue a program to facilitate the public reporting of illicit discharges, including dumping, by providing a venue for the public to submit concerns to MoDOT.

**Measurable Goals:** MoDOT will report yearly how many visitors have submitted the Report a Stormwater Concern form and how many of those were related to MoDOT right-of-way or facilities from the website.

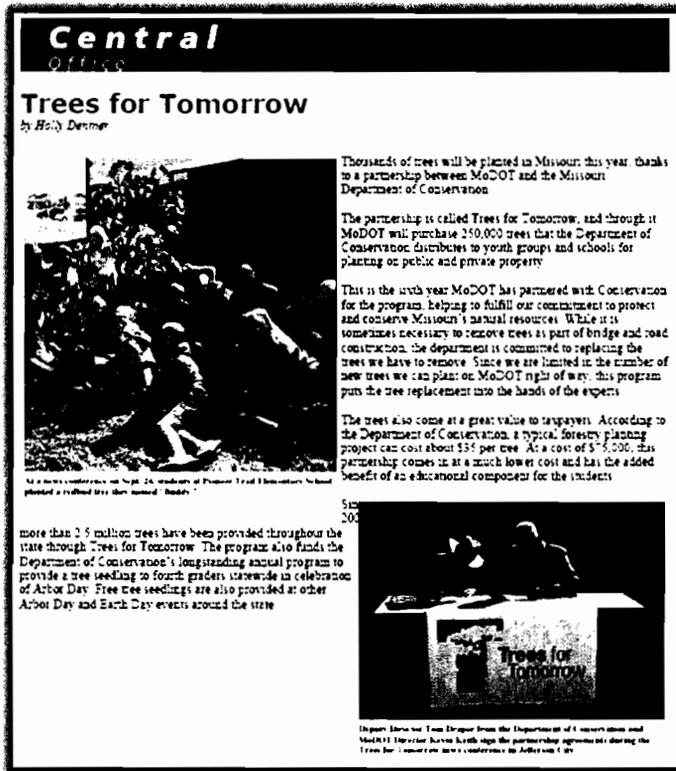


Figure 3: October 4, 2012 *Connections* publication for Central Office.

**Action:** MoDOT will continue to promote public awareness campaigns including the No More Trash Bash, Trees for Tomorrow, adopt a highway and sponsor a highway programs.

**Measurable Goal - MoDOT** will report annually how many of these types of events were carried out.

**Action:** MoDOT will continue to participate in watershed activities when appropriate including the Hinkson Creek Collaborative Adaptive Meeting Team and others as requested.

**Measurable Goal - MoDOT** will report annually how many events were participated in.

## **ILLCIT DISCHARGE DETECTION AND ELIMINATION (IDDE)**

MoDOT has a program to educate MoDOT employees regarding proper management and disposal of toxic materials discovered on the right of way.

### **Outfalls**

Nearly every MoDOT highway includes one or two drainage ditches that carry runoff water to the nearest down gradient water body at the location of a crossroad culvert or bridge. In some cases the parallel MoDOT ditch may discharge to a drainage swale that simply flows away from the right of way in the direction of a nearby water body. If a typical one-mile section of a MoDOT highway involves three hydrologic conveyance structures (pipe or bridge), then the average number of "storm water outfalls" (points where storm water is flowing from a parallel road ditch into a pipe or water feature that flows under a bridge) would be approximately 12 per mile. Thus MoDOT's Municipal Separate Storm Sewer System (MS4) would include approximately 400,000 outfalls. While MS4s are usually required to identify and map "storm water outfalls," such a task would be daunting and resource exhaustive or of questionable value for a DOT.

MoDOT has used resources available, GIS data, to provide a UTM point at every intersection of MoDOT's roadway layer and the streams and rivers layers statewide. This GIS effort has provided over 25,791 data points statewide. For each data point, it can be assumed that there are 4 outfalls bringing the total to over 103,000 outfalls (Exhibit 2). This is an approximate estimation using best available tools and does not constitute all outfalls. UTM locations of these can be provided upon request.

# MoDOT MS4 Boundary and Major Watersheds

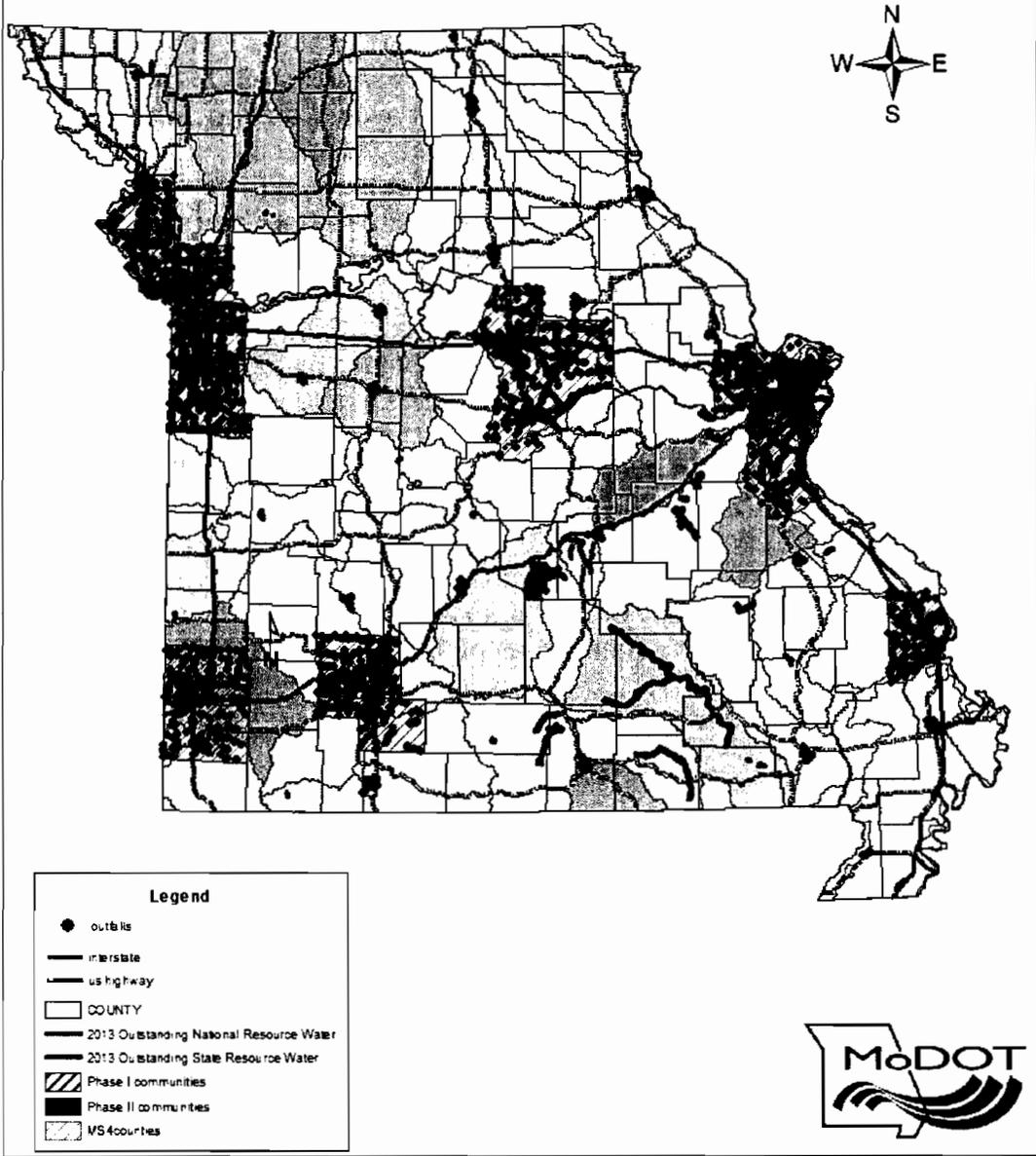


Exhibit 2: MoDOT Outfalls using GIS data.

For new construction, all project plans show the location of these outfalls. Persons who are interested in the locations of specific storm water outfalls may request individual project plans from the appropriate district office or from MoDOT's Central office in Jefferson City. "As-constructed" plans for existing facilities, many of which may be on microfilm, may also be obtained from district offices or the MoDOT Central office.

**Discovery of IDDE's**

MoDOT currently has a process in place to detect and eliminate illicit discharges but does not possess the legal authority under state law to prevent illicit discharges and improper disposal of waste or wastewater. Case law has, in fact, established precedent in this area. Unpermitted discharges are referred to the appropriate regulatory authority for follow-up. MoDOT will perform a preliminary investigation of any illicit discharges, to the extent allowed by MoDOT's authority, prior to notifying the existing regulatory authority.

<p><b>127.25.8.3.1 Industrial and Domestic Waste Waters on Right of Way</b></p> <p>Sewage and waste shall be disposed of by discharging into a sewer system regulated pursuant to chapter 644, RSMo, or shall be disposed of by discharging into an on-site sewage disposal system operated as defined by rules promulgated pursuant to sections 701.025 to 701.059, RSMo. Any person installing on-site sewage disposal systems shall be registered to do so by the Missouri Department of Health and Senior Services.</p> <p>Private homeowners are regulated by the Missouri Department of Health and Senior Services. The Missouri Department of Health and Senior Services is to be contacted when wastewater discharge from private homeowners is found on right of way. If a property owner requires assistance in containing effluent, they should be directed to the Department of Health for assistance.</p> <p>Commercial businesses and industries are regulated by MDNR. When wastewater discharge from a regulated entity is discovered on MoDOT right of way, the Environmental Specialist will contact MDNR to determine if the commercial business or industry has a valid operating permit issued by MDNR to discharge effluent.</p> <p>The Environmental Specialist will request MDNR to take whatever legal action necessary concerning any business or industry that does not have a valid permit from MDNR to discharge effluent to the highway right of way.</p> <p>For additional information see EPG 127.25.3.1 Rest Area Lagoon, EPG 127.25.8.3 Sewage Disposal System, and EPG 127.25.8.3.2 System Attachments by Others.</p> <p><b>Reason for Policy:</b> RSMo 701</p> <p><b>Effective Dates:</b> 6/1/99</p> <p><b>Revision Dates:</b> 12/27/12</p> <p><b>127.25.8.3.2 System Attachments by Others</b></p>	<p>MoDOT's policy, under the Engineering Policy Guide (EPG) <u>127.25.8.3.1 (See attached)</u>, outlines how discoveries of illegal effluents will be handled. MoDOT typically contacts the local departments of health when the presence of wastewater from single-family residences appears to be a health or water quality concern deserving regulatory</p>
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Figure 4: Engineering Policy Guide 127.25.8.3.1.

intervention.

Public reporting of the presence of illicit discharges or water quality impacts associated with storm water discharges is possible by contacting any of MoDOT's Customer Service Centers, Central Office, or MoDOT's website including the Report a Stormwater Concern form.

**Trash as an IDDE**

MoDOT has an Adopt-A-Highway program, where volunteer groups periodically pick up the trash and debris along the sides of state highways. See MCM 2, Public Involvement and Participation, for details.



Figure 5: Street sweeping and bridge washing.

### **Other Occasional, Non-Stormwater Discharges**

Bridge washing, cleaning and flushing is a relatively common non-stormwater discharge that occurs when necessary for construction and maintenance activities. Preventative maintenance can extend the life of a bridge by retarding the rate of deterioration of bridge components. Spraying of water on bridges is also used to remove inactive bird nests. MoDOT is currently working on guidance for this activity in

regards to spread of zebra mussels and rock snot. All state and federal requirements are met when accomplishing this task (EPG: 771.2 Bridge Cleaning and Flushing)(See attached).

**Action:** MoDOT will continue a program to facilitate the public reporting of illicit discharges, including dumping, by providing a venue for the public to submit concerns to MoDOT. Hazardous material spills will be reported within 24 hours upon discovery. Reporting will be made to the Missouri Department of Natural Resources (MDNR) Environmental Emergency Response (EER) – 573-634-2436 – in accordance with MoDOT procedures and Missouri RSMo 260.500 through 260.555.

**Measurable Goal:** Illicit discharge reports will be tracked and mapped using information obtained through the website reporting form and by MoDOT staff.

**Action:** MoDOT will educate and cross-train maintenance staff to assist with identification of illicit discharges that discharge into the MoDOT drainage system on MoDOT right of way.

**Measurable Goal:** MoDOT will educate staff on identification of illicit discharges that discharge into the MoDOT drainage system at least once annually.

**Measurable Goal:** MoDOT will continue to update the EPG to define illicit discharge and identify the process of elimination.

**Measurable Goal:** Develop a statewide online training module for MoDOT personnel that explains illicit discharges and the proper sequence of reporting illicit discharges by the end of the permit cycle.

**Action:** MoDOT is working with the Bridge Division and Maintenance Division to come up with an inspection schedule that coincides with biannual bridge inspections, annual mowing inspections, and frequent culvert and ditch inspections after rain events.

**Measurable Goal:** Develop aspects of the existing system to proactively inspect for illicit discharges.

**Measurable Goal:** Develop maps based on existing bridges and multi-cell box culverts for the inspection schedule.

**Action:** MoDOT plans to better align with other state DOTs in changing the coverage area from statewide to occurring where there are other MS4s. This is consistent with the intent of the permit as being a “municipal” permit.

**Measurable Goal:** Continue to work with MDNR to modify our permit coverage area.

**Measurable Goal:** Focus on other areas that are MS4s for compliance with MCM.

## **CONSTRUCTION SITE RUNOFF CONTROL**

### **Storm water Permits**

Provisions of the federal Clean Water Act and related state rules and regulations require storm water permits where construction activities disturb greater than one acre over the life of a project as part of a common plan or sale. MoDOT has a general permit, obtained from the Missouri Department of Natural Resources (MDNR), which allows road construction activities and the associated land disturbance. The permit stipulates that MoDOT will follow certain erosion and sediment control guidelines and install temporary erosion control measures. Locally sponsored federal aid projects that are performed on MoDOT right of way and are using MoDOT’s land disturbance permit are required to comply with MoDOT Standard Specifications, and therefore, must follow the Storm Water Pollution Prevention Plan (SWPPP). Cities, counties and other government entities may already possess their own National Pollutant Discharge Elimination System (NPDES) permit and, in that case, must comply with their own SWPPP.

### **Design Considerations**

MoDOT has provided a few guidelines for the development of erosion and sediment control plans. First the designer is responsible for the plans and

therefore should develop the plan during the design phase. The designer shall also study and inspect the future construction site and plans to determine what areas have potential erosion hazards. Once this information has been reviewed and all necessary data is obtained, the following recommended guidelines should be followed:

- Determine limits of clearing and grading.
- Divide the site into drainage areas.
- Divert clean runoff around the construction area.
- Erosion and sediment control shall be used whenever possible to reduce erosion at the site and prevent offsite damage.

As part of the storm water control measures, the contractor shall take certain management measures into consideration when preparing a work schedule. Such contractor measures include, but are not limited to:

- Install appropriate perimeter erosion control measures prior to grading.
- Sequence and stage construction so that no area remains exposed for unnecessarily long periods of time, and disturbed areas should be stabilized before other areas are disturbed.
- Stabilization Best Management Practices (BMPs) should be implemented as soon as practical after grading.
- Develop and carry out a regular maintenance schedule for erosion and sediment control practices.
- Utilize spill prevention and containment measures at storage sites.
- Develop and follow a plan for regular collection and disposal of waste material as well as designate a site for disposal.
- Designate the responsibility for implementing and maintaining the erosion and sediment control measures to one person.

Erosion, sediment and pollution control and storm water management will be a priority discussion point at all appropriate project pre-construction conferences. Monitoring and inspection of the features of the erosion control plans will be carried out and documented by the resident engineer and contractor for the construction project. Any items of concern regarding BMPs should be brought to the attention of the contractor for immediate correction.

### **Construction Requirements**

The engineer will limit the surface area of erodible earth material exposed by clearing and grubbing, or excavation, borrow and fill operations, and may direct the contractor to provide immediate permanent or temporary erosion control measures to prevent contamination of adjacent streams or other watercourses, wetlands, lakes, ponds and other water impoundments.

The contractor shall be required to incorporate all permanent erosion control measures into the project at the earliest practicable time. Temporary erosion

control measures shall be used to correct conditions that develop during construction which were not foreseen during the design stage. Temporary erosion control shall also be used when needed prior to installation of permanent erosion control measures or when needed temporarily to control erosion that develops during normal construction practices, but are not associated with permanent control measures on the project.

Clearing and grubbing operations shall be scheduled and performed so that grading operations and temporary and permanent erosion control measures will follow immediately thereafter. The surface area of erodible earth material exposed at one time by clearing and grubbing, by excavating, by fill or by borrow, shall be minimized to prevent runoff. The engineer may limit the total acreage of erodible earth material to be exposed at one time as determined by an analysis of project conditions. In such cases the engineer will identify specific BMPs and controls that have been, or will be installed in order to exceed the specified maximum disturbed acreage threshold.

Unless otherwise approved, construction operations in rivers, streams, wetlands and impoundments shall be restricted to those areas which must be entered for the construction of temporary or permanent structures. Rivers, streams, wetlands and impoundments shall be promptly cleared of all false work, piling, debris or other obstructions placed therein or caused by the construction operations. Frequent fording of live streams or wetlands with construction equipment is not permitted.

Site-specific erosion and sediment controls above and beyond MoDOT standard specifications shall be discussed with the contractor at a preconstruction conference. Special conditions may be developed which can include limitations on the amount of surface area that can remain unprotected at one time or special water quality or stream protection requirements.

In the event of a conflict between these requirements and pollution control laws, rules, or regulations of other federal, state or local agencies, the more restrictive laws, rules or regulations shall apply.

### **Control Measures (SWPPP)**

MoDOT has prepared a Storm Water Pollution Prevention Plan (SWPPP) that has been provided to all construction offices as part of each construction contract. The SWPPP describes several BMPs that may be used to control runoff from land disturbance activities of one acre or more. The following BMPs may be used together or separately in order to ensure that contaminants do not leave MoDOT right of way.

## **Temporary Controls**

Temporary water pollution control measures are required on all contracts awarded by MoDOT. The contractor shall exercise best management practices throughout the project to ensure that contaminants do not leave MoDOT right-of-way. Construction of permanent drainage facilities and other activities, which may contribute to the control of siltation, shall be accomplished at the earliest practicable time. This work shall consist of furnishing, installing, maintaining and removing temporary control measures as shown on erosion control plans or as ordered by the engineer. The control of water pollutants will be accomplished through the use of berms, slope drains, ditch checks, sediment basins, seeding and mulching, straw bales, silt fences and other erosion control devices or methods. Pollutants such as chemicals, fuels, lubricants, bitumens, raw sewage or other harmful materials shall not be discharged from the project. No work shall be started until the erosion control timetable and methods of operation have been approved.

Temporary erosion and sediment control measures shall be coordinated with permanent erosion control measures to assure economical, effective and continuous erosion control. Temporary erosion and sediment controls shall be kept in place and maintained until revegetation has occurred to an extent sufficient to prohibit the formation of gullies by runoff. The engineer shall routinely inspect the condition of erosion controls and shall notify the contractor immediately if any controls are found to be in disrepair or are not functioning at the desired level of effectiveness. Inspection records and directives to the contractor shall be noted in the inspector's Project Records, which shall be available for review by Missouri Department of Natural Resources (MDNR) upon request. Temporary Measures include:

- Temporary Berms (Type A, Type B, Type C)
- Temporary Slope Drains
- Ditch Checks (Type 1, Type 2)
- Sediment Traps
- Temporary Seeding
- Temporary Mulching
- Straw Bales
- Silt Fence
- Surface Roughening
- Mulching and Crimping
- Brush Piles
- Sediment Basins

## **Permanent Controls**

The contractor shall be required to incorporate all permanent erosion control measures into the project at the earliest practicable time. Permanent Measures include:

- Sediment Basins
- Sediment traps
- Permanent Seed and Mulch
- Type C Berms
- Rock Blanket
- Rock Ditch Checks

## **Erosion and Sediment Containment Inspections**

Erosion Control Inspection Records and an inspection report log are required for projects with one acre or more of total land disturbance. All disturbed areas and installed Best Management Practice items (BMPs) are inspected for proper location, installation, operation and maintenance. Points of storm water egress are inspected for evidence of erosion or sedimentation.

Reports are required within seven calendar days of a previous inspection or within 48 hours of any reportable precipitation event (1/2" over 24 hours).

The report is to be signed by the MoDOT representative who performed the inspection. Information required on the form includes:

- 1) Contract/Job identification number;
- 2) County and Route location;
- 3) Name of MoDOT inspector completing report;
- 4) Date of inspection;
- 5) Areas requiring installation of new BMPs;
- 6) Existing BMPs requiring corrective action;
- 7) Corrective actions taken on previously listed deficiencies;
- 8) Areas where land disturbance operations have temporarily or permanently ceased.

The inspection report is signed by the resident engineer or by the person performing the inspection if authorized to do so. The contractor's Erosion Control Supervisor receives a copy of each week's report for prompt corrective action, if necessary.

## **Audits and Training**

MoDOT has assigned one employee the responsibility of performing statewide audits of construction sites to ensure that SWPPPs are being followed to the

extent that off-site contamination does not occur. The individual usually will visit every construction site at least once per year and meet with MoDOT resident engineers, inspectors or contractors to evaluate the land disturbance elements of the project.

MoDOT shall continue to require training for construction inspectors, resident engineers and other personnel. It is anticipated that such training shall continue through the annual Environmental Compliance class, currently held routinely at each of the seven MoDOT districts. The Environmental Compliance class has also been delivered and is available to contractors and other private or public organizations as requested. Training may also occur on a less formal basis as deemed necessary by MoDOT.

### **Contractor Compliance**

MoDOT has the authority to stop work on any construction job when the contractor does not perform work in compliance with contract provisions. In cases where the contractor is causing water quality problems, or creates conditions with the potential to contaminate waters of the state, the engineer will take appropriate disciplinary action to ensure proper control measures are in place. Actions possible include: issuance of an Order Record (this is a non-compliance notification that negatively affects a contractor's performance rating; a poor rating could result in removal from the list of MoDOT approved contractors), suspension of payments to the contractor, or suspension of work on the project.

Contractors are evaluated on project performance each year. One of the elements of the Performance Rating system involves erosion control compliance. Low ratings may cause disciplinary action to be taken against poorly performing contractors. Disciplinary actions range from being placed in a probationary status to disqualification from bidding on MoDOT construction contracts for a period of three years.

### **Protection of Streams, Lakes, Ponds, and Reservoirs**

In compliance with the Missouri Clean Water Law (Section 644.051), neither MoDOT nor MoDOT's contractors shall pollute any waters of the state, or place, cause, or permit to be placed any water contaminant in a location where it is reasonably certain to cause pollution of any waters of the state. Also, they shall not discharge water contaminants into any waters of the state, which reduce the quality of these waters below the state's water quality standards. These water quality standards include the following (MO10 CSR 20-7):

*(a) Waters shall be free from substances in sufficient amounts to cause the formation of putrescent, unsightly or harmful bottom deposits or prevent full maintenance of beneficial uses.*

*(b) Waters shall be free from oil, scum and floating debris in sufficient amounts to be unsightly or prevent full maintenance of beneficial uses.*

*(c) Waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or prevent full maintenance of beneficial uses.*

*(d) Waters shall be free from substances or conditions in sufficient amounts to result in toxicity to human, animal or aquatic life.*

*(e) Waters shall be free from physical, chemical or hydrologic changes that would impair the natural biological community.*

*(f) Waters shall be free from used tires, car bodies, appliances, demolition debris, used vehicles or equipment and solid waste as defined in Missouri's Solid Waste Law, section 260.200, RSMo, except as the use of such materials is specifically permitted pursuant to section 260.200–260.247.*

MoDOT personnel or contractors performing work for MoDOT shall comply with these and any other federal, state and local laws and regulations that serve to control pollution of the environment. To ensure that these general criteria are met, the following guidelines will be observed:

*1) Machinery shall be kept out of the waterway as much as possible.*

*2) Fuel, lubricants, debris and other water contaminants shall not be stored in areas that are subject to flooding or contact with water (such as adjacent to stream banks) or where contaminated runoff from the storage areas can enter waters of the state.*

*3) Refueling and maintenance (e.g., oil changing) of machinery shall not take place in, or directly alongside, any water body.*

*4) Clearing of vegetation/trees shall be kept to the minimum required to accomplish the activity.*

*5) Riparian areas and banks shall be restored to a stable condition through recontouring and revegetation of the area, as necessary, as soon as possible (normally within three working days of final contouring).*

*6) Work shall be conducted during periods of low flow whenever possible.*

*7) Wetland areas shall be avoided to the greatest extent practical.*

*8) Work shall conform to all conditions that are part of the United States Army Corps of Engineers (USACOE) Section 404 permit and the ancillary MDNR Section 401 Water Quality Certification.*

**Action:** Continue to comply with provisions of NPDES “land disturbance” permit.

**Action:** Continue training of MoDOT personnel through an annual Environmental Compliance class.

**Action:** Conduct classes and train MoDOT employees who deal with construction erosion annually.

**Measurable Goal:** Report how many MoDOT employees and how many non-MoDOT employees have taken the training.

**Action:** Perform statewide audits of construction sites to ensure that specifications and SWPPP are being followed.

**Measurable Goal:** Evaluate erosion control elements of 90% of all land disturbance sites that involve 1 acre or more of land disturbance.

**Action:** Continue Contractor Performance Rating System for project to measure or recognize contractors’ outstanding performance as well as those being disciplined for less than satisfactory performance. Disciplinary action results from unacceptable rating in the categories of quality, prosecution & progress, contract compliance, and overall. The contractor performance questionnaire (see attached) includes a section of six questions related to Section 800, Roadside Development to rate the contractor on items such as seeding, erosion inspection reports, correction of deficiencies within the 7-day requirement, etc. For more information refer to EPG 102.2 (See attached).

**Measurable Goal:** Utilize the existing performance rating system to notify contractors when erosion control elements of the project are less than desirable as determined by elements of the SWPPP yearly per project.

## **POST-CONSTRUCTION SITE RUNOFF CONTROL**

Developers are informed that if their project will involve disturbance of one acre or more of ground surface, then they will most likely require an NPDES permit from MDNR. Before MoDOT issues an entry or access permit to perform work on MoDOT right of way, the developer must provide proof that they have obtained the appropriate permit from MDNR, or some type of proof that the activity is exempt from MDNR’s NPDES requirements.

MoDOT will consider additional New Development and Redevelopment Program requirements as MoDOT projects are initiated. The evaluation shall consider comprehensive planning procedures and controls to reduce the discharge of pollutants after construction is complete, from areas of new highway

development and significant redevelopment and associated drainages. The program will consider non-highway facilities that would prevent or minimize water quality impacts. This program does not apply to maintenance activities that do not change storm water impacts to state waters.

MoDOT shall continue to implement a program that ensures that new highway projects and significant highway modifications are reviewed for the need to include permanent storm water BMPs, and the results from that review implemented. As part of the program, MoDOT will define as "significant," highway modifications that disturb greater than or equal to one acre of existing vegetation.

MoDOT shall select and implement BMPs whenever applicable for those projects that have the potential to discharge storm water conveying pollutants of concern into sensitive waters. "Sensitive waters" primarily include those waters that are listed on MDNR's most recent 303(d) list or a total maximum daily load (TMDL) has been developed that limits the amount of the specified pollutant that is likely to be present in discharges from MoDOT.



Figure 6: Permanent detention basin on Route 54 expressway.

MoDOT is working toward a formal program for incorporation of water quality elements into developments or significant redevelopments. No statewide policy exists regarding permanent water quality structural and source controls. Water quality facilities associated with new highway development and redevelopment are incorporated into the design upon request of the resource agencies and MoDOT.

There are no policies, procedures or regulations that address water quality impacts from operating highways. Compliance with any physically connected city's New Development criteria will be done on a courtesy basis if possible considering budget, timing, and statutory constraints.

MoDOT will evaluate existing mechanisms that ensure long-term maintenance and operation of permanent BMPs and determine whether a need exists to improve the current mechanisms. If it is determined that changes are needed to MoDOT's existing policies that ensure long-term maintenance and operation of permanent BMPs, MoDOT will identify and consider alternatives for improving the existing practices and/or developing additional mechanisms. If necessary,

MoDOT will select and implement the preferred alternative mechanism to ensure the long-term maintenance and operation of permanent water quality BMPs.

Under EPG 748.1.2 Hydraulic Impacts of Roadway, MoDOT mimics pre-construction runoff quality in all new development and to the MEP in

#### 748.1.2 Hydrologic Impacts of Roadway

Development such as a highway project can affect the hydrologic characteristics of a watershed. Such development typically increases the amount of impervious area within the watershed, and may also decrease the time of concentration of the watershed. Both of these effects tend to increase both the volume and peak rate of runoff from the watershed. The magnitude of this increase is generally dependent on the ratio of the developed area (pavement and right of way in the case of highway projects) to the total watershed drainage area. When the developed area is a large percentage of the total drainage area, the impacts can be significant. The degree of hydrologic impact shall be subjectively evaluated for all highway projects; when the impacts are estimated to be of concern, a detailed analysis shall be performed. Significant increases in peak flow rates shall be mitigated through the use of detention storage or other appropriate measures.

Figure 7: EPG 748.1.2

redevelopment projects by evaluating how significant an increase is for a project regarding peak flows and therefore mitigation through detention storage or other various measures.

**Action:** Create a Stormwater Team to develop policy regarding post-construction bmps.

**Measurable Goal:** Team created with personnel from Design, Maintenance, and Construction.

**Action:** Consider post-construction BMPs where needed and report the number constructed.

**Measurable Goal:** The number of post-construction bmps should increase as the number of new construction projects increase. Reported annually.

**Action:** MoDOT will develop a feasibility checklist or flow chart to evaluate the needs of post-construction bmps on projects.

**Measurable Goal:** By permit year 3 MoDOT will develop a process to evaluate the needs and feasibility of post-construction bmps.

**Measurable Goal:** By permit year 4 MoDOT will develop a policy in the EPG that address post-construction bmps.

### **Pollution Prevention/Good House Keeping**

Roadway maintenance activities conducted by district maintenance forces, that impact storm water quality include: snow and ice control on state and interstate

highways, roadway surface maintenance, roadside facility maintenance, roadway appearance, miscellaneous MoDOT facilities, and tunnel maintenance.

Cities and counties perform the maintenance work on some state roadways for MoDOT. This is accomplished through a formal maintenance agreement signed by the Missouri Highways and Transportation Commission and the city or county. The maintenance agreements contain standard requirements that the city or county maintain the facilities in accordance with Commission-approved standards.

The following manuals are to be used for maintenance of roadway facilities. Most manuals can be found in the Engineering Policy Guide:

1. Maintenance Division Policy Manual – EPG 171: Maintenance Policy and Operations.
2. Roadside Vegetation Management Manual – EPG 171.6.4: Vegetation Management.
3. Herbicide Manual – EPG 821: Herbicides and Roadsides.
4. Maintenance Function Planning Guidelines – EPG 822: Maintenance Planning Guidelines for Mowing Operations.
5. Preventive Maintenance Guidelines for Bridges – EPG 171.7 Bridge Maintenance.
6. Operator's Guide for Anti-Icing – EPG 133: Snow and Ice Control.
7. Missouri Standard Specifications for Highway Construction.

### **Structure Maintenance**

MODOT drainage facilities such as detention ponds, storm drains, inlets and catch basins are inspected on an as-needed basis. In all areas a close inspection of problematic storm drain inlets (selected inlets known to flood) occurs during rainstorms or if complaints are received to ensure proper operation. Documentation pertaining to the inspections is limited and may normally contain only the date and time of the inspection. Each district currently inspects water drainage facilities (retention ponds and other structures) on an as-needed basis to ensure that the facility operates as designed. The frequency of inspection can vary depending on the design of the structures.

Currently, MODOT has not located all of its structural controls. Location of major structural controls (primarily large detention basins) will be stored in a database and may be identified in a GIS system as part of the implementation of the permit.

The District Maintenance Engineer (or his designee) or the State Bridge Maintenance Engineer approves improvements to channels, and any addition of riprap immediately adjacent to the roadway or structure. All work to improve

channels that requires additional environmental clearance must be cleared with the Design Division Environmental Unit and the proper permits obtained.

### **Ditches**

All open ditches are to be maintained to preserve their full depth and cross section. Surplus material from ditch cleaning is used in other tasks such as widening shoulders and fills, repairing erosion and filling wash outs. Where appropriate or necessary, maintenance occurs on ditches and waterways as needed.

### **Street Sweeping**

Mechanical sweeping of sand, dirt and debris from paved surfaces, shoulders, curbs and gutters and median barriers is performed to assure roadway drainage. Sweeping maintains the environmental and aesthetic quality of the roadway, and is accomplished for safety concerns. Sweeping is MoDOT's responsibility on Interstate Highways, National Highway System Routes and Commission-owned roadways within the state highway system unless covered by a maintenance agreement (EPG 127.25.1.4 See attached).

### **Snow and Ice Control**

One of MoDOT's high priorities is the removal of snow from state highways. Anti-icing operations to prevent the formation or development of packed and bonded snow or bonded ice to the pavement surface is the first priority on continuous treatment routes during a winter weather event. Snow and ice control operations begin as soon as weather conditions warrant and continue on a 24-hour-per-day basis until all major highways and all minor highways are returned to a wet or dry condition and all minor highways are open to two-way traffic. The removal of snow and ice from the roadway and the application of abrasives or de-icing products take precedence over all other maintenance work. MoDOT's Operator's Guide For Anti-icing (EPG 133.5) and the snow-and-ice section of the Maintenance Policy Manual are both used to clarify the department's official procedure (EPG 133: Snow and Ice Control)(See attached).

All abrasives and de-icers are to be applied in accordance with the Operator's Guide For Anti-icing and the snow-and-ice section of the Maintenance Policy Manual. These directives include the following:

- Chemicals and stockpiles of treated abrasives are to be stored in a manner to prevent loss of material and minimize damage to state or private property.
- All bulk salt shall be stored inside covered storage structures.
- Asphalt pads are installed under and in front of storage facilities.

- Mixed materials shall be covered when not in use and between storm events.

Required maintenance practices which have a side benefit to water quality include:

- Application of only the amount of salt or salt/abrasive mix material necessary to provide safe driving.
- Use of clean snow and ice control abrasives (sand or 3/8 crushed aggregate) that contain only 0-10 percent passing a No. 10 sieve.
- Use of snow and ice control chips only when needed to provide traction.
- Sweeping or flushing of the bridges as soon as possible after a storm event.

MoDOT uses a database to track information on how much winter abrasives, calcium chloride, or sodium chloride was applied in the different maintenance areas during a snowfall event. This information is contained in the Winter Events Database Report.

### **Roadside Management**

MoDOT's roadside management program keeps the roadsides safe and attractive. The program establishes and maintains appropriate vegetation to control erosion and limits undesirable vegetation. Specific guidance updated in 2012 is provided in the Roadside Vegetation Management Manual ([http://epg.modot.org/files/a/ae/822\\_2012.pdf](http://epg.modot.org/files/a/ae/822_2012.pdf))(See attached). This includes herbicides, fertilization, mowing, brush control and litter removal.

### **Mowing Operations**

Mechanical and chemical vegetation management is done to maintain sight distance, improve aesthetics and control undesirable vegetation. At a minimum, mowing occurs to a distance of at least one mower width from the edge of the traveled way per the guidance contained in the Roadside Vegetation Manual.

### **Roadside Facilities**

Drainage facilities within the rights of way owned by MoDOT include cattle passes, collection ditches, shoulder drains, side ditches, under drains, outlet ditches, contour ditches and culverts (includes structures that span 20 feet or less). These facilities are maintained to be able to handle runoff from rainfall events. Maintenance includes removing trash, debris and sediment that has collected in the facility. All drainage facilities statewide are inspected periodically; minor defects are repaired as necessary; and major defects are reported to the Maintenance Superintendent responsible for that geographic area. Natural watercourses and streams that pass within the right of way are kept clean so water can flow freely.

Any slope associated with roadside facilities is maintained to keep erosion to a minimum. The only required modification to this program is the review of the Federal Highway Administration's document dealing with bridge runoff, for potential additions to MoDOT's Preventive Maintenance Guidelines for Bridges (EPG 171.7.1 Bridge Maintenance)(See attached).

### **Herbicide Program**

MoDOT uses a variety of techniques to manage roadside vegetation. Herbicides provide effective and efficient vegetation control. Specific guidance for herbicide use is provided in MoDOT's Herbicide Manual. Operators and their supervisors are required to read and follow the label. Only non-restricted herbicides are used. Employees are encouraged to obtain and maintain a public operator's license certified by the Missouri Department of Agriculture. Detailed recordkeeping is required. Spray equipment is clean, in good operating order and properly maintained. Operators are instructed to not apply herbicides to standing, running or open water. Only approved aquatic herbicides are used to control undesirable vegetation in or near water. Care is taken to avoid drift, run-off, leaching and spills.

### **Procedures to Prevent, Contain and Respond to Spills**

Procedures to prevent, contain and respond to spills are found in MoDOT's Guide to Hazardous Material Spill Response on State Highways. All vehicles carrying hazardous materials must be identified by the distinct diamond shaped symbol. The following are guidelines taken from MoDOT's Guide to Hazardous Material Spill Response on State Highways:

- Avoid contact with and breathing vapors of the spilled material.
- No smoking allowed in the spill area.
- If a state waterway is involved in the spill the Missouri Department of Natural Resources must be contacted along with the MoDOT District Hazardous Materials Spill Coordinator.
- Obtain facts and information on the spill for the emergency team and maintenance supervisor.
- Call the Missouri State Highway Patrol for help and notify the maintenance supervisor.
- Coordinate with emergency response personnel.
- An "Incident Commander" should coordinate with other agencies and handle direct reporting of the spill.
- Use appropriate traffic control to isolate the spill area from public contact.
- Wait for instructions and do not clean up the spill or contaminated area.
- If private property or waterways are threatened, containment of spill should be coordinated with Missouri Department of Natural Resources, Missouri State Highway Patrol and the appropriate maintenance supervisor.

## **Spill Prevention and Response Procedures at Maintenance Facilities**

MoDOT has implemented Spill Prevention Control and Countermeasure (SPCC) plans at maintenance facilities to prevent oil spills from occurring, and to perform safe, efficient and timely response in the event of a spill or leak. In accordance with United States Environmental Protection Agency (EPA) regulations (40 CFR 112), MoDOT must prepare and implement an SPCC plan for facilities that could reasonably be expected to discharge petroleum or hazardous material into or upon navigable waters or adjoining shorelines; that meet one of the following conditions:

Above-ground oil storage capacity exceeds 1,320 gallons; or

Underground oil storage capacity exceeds 42,000 gallons, unless the underground tanks are subject to all of the technical requirements of 40 CFR 280 or a state program approved under 40 CFR 281. (Missouri's approved program is 319.100 – 319.139, RSMo and 10 CSR26-1 thru 10 CSR26-5 Rules for Underground Storage Facilities.)

As defined by 40 CFR Part 112, oil includes all grades of motor oil, hydraulic oil, lube oil, fuel oil, gasoline and diesel, automatic transmission fluid (ATF), used oil and transformer mineral oil. The definition also includes non-petroleum oils such as animal or vegetable oils and synthetic oils.

**Action:** Continue to educate maintenance staff and MoDOT general staff on SPCC and NEPA. Evaluate the effectiveness of housekeeping activities and identify those processes and/or procedures that are impacting waters of the state using semi-annual inspections of all MoDOT facilities to assess compliance.

**Measurable Goal:** SPCC training and NEPA training every other year.

**Action:** Continue dialogue with the Environmental Steering Committee (ESC) to evaluate the effectiveness of housekeeping processes and procedures.

**Measurable Goal:** Document how many times and what topics regarding the MS4 are discussed at the quarterly ESC meetings.

**Action:** Develop and test new housekeeping processes and procedures to add to current available resources and techniques.

**Measurable Goal:** Report any new processes' or procedures that are adopted.

**Action:** MoDOT will work to develop online training modules.

**Measurable Goal:** MoDOT will develop modules in year 5 of permit cycle.

**Action:** MoDOT will develop and maintain a guidance document listing BMPs utilized to minimize the spread of zebra mussels and rock snot.

**Measurable Goal:** MoDOT will develop the document by year 5 of the permit cycle.

**Action:** Bridge cleaning and flushing are used to remove de-icing chemicals from the bridge deck, drains, expansion device drains, piers, abutments, and lower truss chords; thereby prolonging the life of the structure. Bridge cleaning activities use dry methods and equipment (scraping, sweeping, and vacuuming), to prevent debris, sediment, and other substances from entering waters of the State. Bridge flushing and cleaning shall adhere to the process and procedures outlined in the EPG 771.2 and the beneficial use requirements outlined in EPG 127.25.1.4 (See attached). Bridge inspections are not considered a bridge flushing or cleaning activity.

**Measurable Goal:** MoDOT will ensure the appropriate BMPs are being implemented prior to and during such activities and report approximately how many bridges are flushed/cleaned in a reporting cycle.

# 102.2 Contractor Performance Rating System

## From Engineering Policy Guide

### Contents

- 1
- 2 102.2.1 Evaluation
- 3 102.2.2 Evaluation Categories
- 4 102.2.3 Evaluation Completion
- 5 102.2.4 Evaluation Determination
- 6 102.2.5 Contractor Recognition
- 7 102.2.6 Contractor Discipline
- 8 102.2.7 Performance Discussion

### Forms

Contractor Performance Evaluation Example  
Form for 2014

Contractor Performance Evaluation System  
(<http://p0004/ContractorRating/displayLogin.do>)

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Water Protection Program

The Missouri Code of State Regulations (<http://www.sos.mo.gov/adrules/csr/current/7csr/7c10-10.pdf>) governs the Contractor Performance Rating System. While this system is not mentioned in the specifications, changes in specifications and areas of emphasis warrant periodic changes to the evaluation process and the administrative rules are routinely changed to improve the system.

The Construction and Materials Division is charged with tracking contractor performance. The Commission is informed of contractors being recognized for outstanding performance as well as those being disciplined for less than satisfactory performance after the State Construction and Materials Engineer completes reviews and the Chief Engineer gives approval.

The project performance evaluation is provided at the project preconstruction conference and at the start of each year. Project performance measurements are known at the beginning of each evaluation period.

### 102.2.1 Evaluation

The reporting period for the annual performance project evaluation is the calendar year, January 1 through December 31 with the report for each active project due on February 1 of the following year. Final reports on projects completed during the calendar year are due 30 days after project acceptance.

An Interim Report is completed on all contractors with a disciplinary status and may also be completed at any time, at the discretion of the engineer, for any contractor when a

serious concern regarding contractor performance on the project exists. Interim reports are performed at mid-season; either when the work on the project for the year is approximately fifty percent (50%) completed or by September 1, whichever comes first. The interim report provides the contractor an opportunity to improve their ratings before the end of year annual evaluation. The interim report is for informational purposes only.

### **102.2.2 Evaluation Categories**

The evaluation is divided into sections corresponding to the Missouri Standard Specifications for Highway Construction. Point values are assigned to each question and each question is assigned to one of four categories: Quality, Prosecution and Progress, Contract Compliance, and Contract Administration.

Contract Compliance is further divided into 3 subcategories:

- contract requirements,
- erosion control, and
- traffic control.

### **102.2.3 Evaluation Completion**

The project inspection staff is responsible for completing the individual project performance evaluation and, after a review by the resident engineer, it is provided to the contractor for review and comment.

When completing an evaluation, every question begins with a 100% compliant response. Documentation is required to reduce any response rating. Stepped communications for infractions are encouraged. Minor infractions should be initially verbally communicated (no effect on ratings). If the infraction continues, documentation should begin (rating is effected). Order Records (Notices of Violations) create negative point assessments for "Contract Compliance". Letters or documentation records do not, but provides a basis for reducing the contractor's performance evaluation.

### **102.2.4 Evaluation Determination**

Contractors receive individual project evaluations in each of the four categories and an Overall annual rating. Category performance ratings are determined by dividing the total point values of applicable questions answered by the total possible category point value. Questions included in the evaluation are contract requirements. Routine project records and documentation support the responses. Not all questions included in the evaluation are applicable on a project.

The project Quality rating is weighted by the dollar value of work completed during the rated construction season for each section of the evaluation. (Example: if bridge items comprise 75% of the completed work performed on a project, then 75% of the project Quality of Work rating will be obtained



- from the Section 700 questions). The effect of subcontractors' work on the prime contractor's rating can be determined.

The category of Prosecution and Progress is evaluated based on the dollar value of the contract. Some considerations in determining the contractor's rating are: status of project progress, project scheduling, subcontractor / supplier coordination, adequacy of equipment, adequacy of work force, and project supervision.

To keep from penalizing contractors for delays beyond their control, adjustments in the contract completion must be made as allowed by Sec 108 ([http://www.modot.mo.gov/business/standards\\_and\\_specs/Sec0108.pdf](http://www.modot.mo.gov/business/standards_and_specs/Sec0108.pdf)) (see appropriate subsections Secs 108.6, 108.7.1, 108.7.2, 108.8 or 108.14). It will be necessary to change order justifiable time extensions for additional authorized work, utility or other excusable or noncompensable delays affecting the contractor's schedule.

Complete change orders to adjust project completions prior to submitting the evaluation to the contractor to minimize disputes. The review period for the evaluation is tight and it is not to the advantage of the state nor the contractor to utilize the review period for challenging contract delays.

The Contract Compliance rating is based on dollar value of work completed during the rated year. The subcategories of the category are: traffic control, erosion control and contract provision requirements.

The Contract Administration category evaluation is also based on the dollar value of the contract. The category rates required documentation submittals for the project, such as: list of suppliers, subcontract requests, payrolls, trainee reports, material invoices / certifications and final project documentation.

The project Overall rating is the average of the categories rated.

The contractor's annual performance summary is the weighted average of the individual project's overall and category ratings, i.e., \$10 M of completed work on one project will carry twice the weight of \$5 M of completed work on a second project.

Statistical analysis is used to identify the system's performance levels:

- Outstanding
- Above Average
- Average
- Below Average
- Unacceptable

The mean (average) and standard deviation of all ratings are calculated for each of the categories and overall ratings. Ratings falling below the mean minus two standard deviations define unacceptable performance. Ratings between the mean minus one and two standard deviations establishes below average performance. Rating values between the mean plus and minus one standard deviation identifies average performance. Ratings between the mean plus one and two standard deviations signifies above average performance. Outstanding performance is recognized as having a rating above the mean plus two standard deviations.

## 102.2.5 Contractor Recognition

For purposes of performance recognition, contractors are divided into 4 groups.

**Specialty Contractors** are defined as contractors performing 85% of their total work in a single work element. Specialty contractors typically complete 2 to 4% of the total dollar volume.

**Heavy Volume Contractors** are the top ten contractors who complete the largest volume of work and typically complete 45 to 50% of the total dollar volume.

**Medium Volume Contractors** are the top 1/2 remaining contractors and typically complete 45 to 50% of total dollar volume.

**Low Volume Contractors** are the remaining contractors. They typically complete 3 to 5% of total dollar volume.

Contractors eligible for recognition must complete greater than 2% of Low Volume Contractor group total dollar volume and have an overall rating of above average. Group Overall Top Achievers are recognized by a plaque displayed in MoDOT's Central Office Lobby and with a plaque presented at Annual MoDOT / Associated General Contractor (AGC) Meeting routinely held each fall. Group "Category" Top Achievers receive a certificate of recognition at the annual MoDOT/AGC COOP meeting.

## 102.2.6 Contractor Discipline

Disciplinary action results from unacceptable ratings in the categories:

- Quality
- Prosecution & Progress
- Contract Compliance
- Overall

An unacceptable Contract Administration rating will not by itself bring disciplinary actions unless the category rating results in an unacceptable Overall rating.

The system is designed to encourage communication on the project and provide information to the contractor to help identify operational areas where greatest improvement can be realized. Continued unacceptable performance imposes progressive disciplinary actions. Disciplinary actions may extend to affiliates of the contractor.

An initial unacceptable performance rating will place the contractor on probation.

After a second unacceptable performance rating the contractor will be declared nonresponsible and suspended from bidding any additional work for a period of one year. At the conclusion of the suspension period, the contractor will be permitted to bid on department projects on a probationary status.

A third subsequent unacceptable rating will disqualify a contractor from bidding for a period of three years.

A contractor will be declared nonresponsible and will be prohibited from bidding for a period a three years if the company is in probationary status after return from a previous suspended or disbarred status. After the three year debarment, the contractor will be allowed to bid work on a renewed probationary status.

Contractors with a disciplinary status can return to good standing after achieving average annual summary ratings.

### **102.2.7 Performance Discussion**

The resident engineer must discuss performance with the contractor. If performance deficiencies exist, the contractor needs the time during the remainder of the season to provide the opportunity to improve their ratings for the year. The department does not want a contractor disciplined at the end of a construction season without assurances efforts were made to timely communicate any poor performance. It is not MoDOT's intent or desire to disqualify contractors but it must insist on quality construction and timely completion of projects.

Retrieved from "[http://epg.modot.mo.gov/index.php?title=102.2\\_Contractor\\_Performance\\_Rating\\_System](http://epg.modot.mo.gov/index.php?title=102.2_Contractor_Performance_Rating_System)"  
Category: [102 Bidding Requirements and Conditions](#)

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- This page was last modified on 2 July 2014, at 12:09.





# 2014 CONTRACTOR PERFORMANCE QUESTIONNAIRE

Job No. \_\_\_\_\_ Route: \_\_\_\_\_ County: \_\_\_\_\_

<b>Section 100 - General Provisions</b>				
This section shall be completed on all projects.				
1	How many order records were written this construction season for Section 100 contract document violations? <i>(Contract Compliance)</i>			# _____ -6n%
(RE instructions: The actual number of order records written for violations. Do not include order records for documentation or rescission. Contract documents are defined as Notice to Contractors, Plans, Bidding Document, Contract Bond, Contract Agreement, Acknowledgment, Contractor Questionnaire, Job Special Provisions, Standard Specifications, General Special Provisions, Notice to Proceed, and all Supplemental Contracts and Change Orders. - Spec 105.4)				
2	Did the contractor provide the engineer with letters of approval, from the appropriate regulating agencies, prior to commencing any blasting operations? <i>(Contract Administration)</i>	N/A	NO (- 2%)	YES (No deduct)
(RE instructions: Discuss this item at the preconstruction conference. - Spec # 107.7.1)				
3	How many DNR Notices of Violation were issued this construction season for Clean Water Act violations? <i>(Contract Compliance - Environmental)</i>			# _____ -(3n+3 <sup>nth</sup> )%
(RE instructions: The actual number of Notices of Violations written for Clean Water Act violations.)				
4	Were the contractor's proposed primary sources of materials identified at or before the preconstruction conference? <i>(Contract Administration)</i>	N/A	NO (- 2%)	YES (No deduct)
(RE instructions: Notice that the proposed source of materials is to be provided at the preconstruction conference is made by letter when the prejob is scheduled)				
5	Were paid invoices for material allowances received within the time limit specified in the contract? <i>(Contract Administration)</i>	N/A	<50% (-2%)	50-99% (-1%)
100% (No deduct)				
(RE instructions: Section 109.7.2 of the Standard Specifications states, "Receipted invoices for all material payments previously allowed on the estimate shall be submitted to the engineer within 42 days of the date of the estimate on which material allowance was made or such material allowance will be deducted from future payments." This question should be calculated (number of material allowance invoices received on time / total number of material allowances - Spec # 109.7.2).				
6	Did the contractor submit certified copies of payrolls within one week of the limit specified in the contract? <i>(Contract Administration)</i>	N/A	<90% (-2%)	90-99% (-1%)
100% (No deduct)				
(RE instructions: Item for discussion at pre-job - Number of certified copies of payrolls submitted one week from end of payroll period / total number of payrolls required. - Spec # 110.3.2)				
7	Did employee wage interviews indicate that the contractor was in compliance with prevailing wage requirements? <i>(Contract Compliance)</i>	N/A	<90% (-2%)	90-99% (-1%)
100% (No deduct)				
(RE instructions: Check when employees receive paystub. Do not penalize contractors if employees don't know their wage. Number of wage rate interviews taken in compliance / total number of wage rate interviews - Spec # 110.1)				
8	Were contractor payrolls correct? <i>(Contract Administration)</i>	N/A	<90% (-2%)	90-99% (-1%)
100% (No deduct)				
(RE instructions: Number of correct payrolls / total number of payrolls. - Spec. 110.1)				
9	Did the contractor expediently correct errors on payrolls when notified? <i>(Contract Administration)</i>	N/A	<90% (-2%)	90-99% (-1%)
100% (No deduct)				
(RE instructions: This question would be N/A if Question 8 was answered 100% - Number of times the contractor voluntarily correct errors on payrolls / total number of times the contractor was contacted to correct payrolls.)				
10	Was a proper bulletin board installed prior to the beginning of work and maintained during the course of the project? <i>(Contract Compliance)</i>		NO (- 2%)	YES (No deduct)
(RE instructions: The material for the bulletin board, a description of what the Resident Engineer expects, and a time frame should be presented at the pre-construction conference.)				
11	Did the contractor submit signed and / or revised subcontractor requests prior to the subcontracted work being performed? <i>(Contract Administration)</i>	N/A	NO (- 2%)	YES (No deduct)
(RE instructions: Were approved subcontract requests on file? Spec 108.1.3)				
12	Did the DBE subcontractors perform the work as identified in the contract? <i>(Completed for Final Report Only) (Contract Compliance - DBE)</i>	N/A	NO (- 2%)	YES (No deduct)
(RE instructions: If the response is "no", MoDOT's External Civil Rights Unit of Construction & Materials in Jefferson City shall be notified.)				
13	Did the contractor meet the requirements for trainees? <i>(Completed for Final Report Only) (Contract Compliance - DBE)</i>	N/A	NO (- 2%)	YES (No deduct)
(RE instructions: If the response is "no", MoDOT's External Civil Rights Unit of Construction & Materials in Jefferson City shall be notified.)				

## 2014 CONTRACTOR PERFORMANCE QUESTIONNAIRE

Job No. \_\_\_\_\_ Route: \_\_\_\_\_ County: \_\_\_\_\_

14	Were the required trainee reports submitted accurately and within the time limit for all approved trainees on the job? <i>(Contract Administration)</i>	N/A	<90% (-2%)	90-99% (-1%)	100% (No deduct)	
(RE instructions: Number of trainee reports submitted on time and accurately / total number of trainee reports submitted- Job Special Provisions)						
15	Was wetland mitigation areas constructed as designated in the contract? <i>(Contract Compliance – Environmental)</i>	N/A	NO (- 2%)	YES (No deduct)		
(RE Instructions: Compare work to features required in the mitigation construction plan. Failure to adhere to any provision is failure to meet Clean Water Act Section 404 requirements. - Contract document requirements)						
16	Were temporary stream crossings / workpads built and removed in compliance with the Clean Water Act. <i>(Contract Compliance – Environmental)</i>	N/A	NO (- 2%)	YES (No deduct)		
(RE Instructions: Compare work to condition required by the contract. Failure to adhere in any provision is failure to meet Clean Water Act - Section 404 permit, Section 401 certification, Spec.806.100)						
17	Did the contractor keep equipment out of areas (streams, wetlands) designated not to be disturbed? <i>(Contract Compliance – Environmental)</i>	N/A	NO (- 2%)	YES (No deduct)		
(RE Instructions: Failure to adhere to any provision is failure to meet Clean Water Act Section 404 requirements. Check plans for designated areas or permit verification needed to enter water bodies- JSP, 404 Permit, plans)						
18	Did the contractor contact the resident engineer 4 weeks prior to work in streams or wetland which will exceed the Section 404 permit, stream or wetland, condition limits? <i>(Contract Compliance – Environmental)</i>	N/A	NO (- 2%)	YES (No deduct)		
(RE Instructions: Failure to have 404 permit or verification that activity can proceed at time of work in stream or wetland would be a failure to meet Clean Water Act - Section 404 permit requirements)						
19	Progress Schedule: Was the progress schedule submitted prior to or at the preconstruction conference? <i>(Initial Report Only) (Prosecution &amp; Progress)</i>	N/A	NO (- 2%)	YES (No deduct)		
(RE instructions: The initial schedule should be submitted prior to or at the pre-construction conference. For multiple year contracts, rate only the first year. Subsequent years should be rated as not applicable. Spec # 108.4.2)						
20	Progress Schedule: Does the contractor’s progress schedule show project completion within the specified number of working days, calendar days or other increments as set forth in the contract with the major item of work and the duration for each construction activity identified? <i>(Prosecution &amp; Progress)</i>	N/A	NO (- 5%)	YES (No deduct)		
(RE instructions: Overlay and minor scope projects may be N/A) Spec # 108.4, 108.4.2.1)						
21	Did the contractor clearly outline the intended maintenance of traffic, work phasing provided by the contract and such other information as required by the contract? <i>(Prosecution &amp; Progress)</i>	N/A	NO (- 2%)	YES (No deduct)		
(RE instructions: This information could be submitted in a traffic management plan. JSP/ Spec # 108.4.1.)						
22	Did the contractor provide a final or an acceptable revised progress schedule within 7 days when required or requested? <i>(Prosecution &amp; Progress)</i>	N/A	NO (- 2%)	YES (No deduct)		
(RE instructions: Was a revised schedule submitted within 7 days when requested or required because it was apparent that the project will not be completed in the time provided in the contract. If a schedule was not requested or required, the score given should be “N/A” Spec # 108.4.2.2)						
23	Was an authorized representative readily available throughout the life of the project? <i>(Prosecution &amp; Progress)</i>	N/A	0-74% (- 4%)	75-84% (- 3%).	85-94% (- 2%)	
95-99% (- 1%) 100% - (No deduct). (RE instructions: Number of days authorized representative was present / total number of days worked. Days an authorized representative wasn't present must be documented like all other ratings- Spec # 105.5.2)						
24	Did the contractor exercise caution around construction stakes installed by MoDOT? <i>(Contract Compliance)</i>	N/A	<90% (-2%)	90-99% (-1%)	100% (No deduct)	
(RE instructions: Total number of working or calendar days - number of days survey crew re-staked / total number of working or calendar days. - Spec # 105.8.1)						
25	Did the contractor provide a list of personnel readily available for non-working hour emergencies? <i>(Contract Administration)</i>				NO (- 2%)	YES (No deduct)
(RE instructions. This information should be requested in the pre-construction conference notice. This information should be received before any work is completed on the project.)						
26	Did the contractor satisfactorily remove, maintain, and relocate signs and markers? <i>(Contract Compliance)</i>	N/A	<90% (-2%)	90-99% (-1%)	100% (No deduct)	
(RE instructions: The contractor must remove and take the necessary precautions for signs, and markers. Items preserved in good condition / total items handled. - Spec 104.10)						

## 2014 CONTRACTOR PERFORMANCE QUESTIONNAIRE

Job No. \_\_\_\_\_ Route: \_\_\_\_\_ County: \_\_\_\_\_

27	Did the contractor provide the effort to resolve substantiated complaints in a positive, prompt and professional manner? <i>(Prosecution &amp; Progress)</i> <small>(RE instructions: This should reflect the contractor's philosophy on handling complaints and not individual circumstances.)</small>	N/A	<90% (-2%)	90-99% (-1%)	100% (No deduct)	
<b>COMPLETION BY WORKING DAYS: Final Report Only:</b>						
a) How many total working days, including adjustments, were allowed for the completion of the project? <i>(Prosecution &amp; Progress)</i>						
<small>(RE instructions: # of Contract Working Days plus time extensions granted- Spec. 108.7.2)</small>						
b) How many working days were used to complete the project? <i>(Prosecution &amp; Progress)</i>						
<small>RE instructions: Final # of Working Days Charged: This quantity is the total number of days charged. - Spec.108.7.2</small>						
<small>Deduct: - 1% per each % late</small>						
<b>COMPLETION BY CALENDAR DATE, Final Report Only:</b>						
a) What was the contract or adjusted completion date? <i>(Prosecution &amp; Progress)</i>						
<small>(RE instructions: Contract Completion Date plus time adjustments granted - Spec. 108.7.1)</small>						
b) What date was the Final Inspection made? <i>(Prosecution &amp; Progress)</i>						
<small>Deduct: - 1% per each % late.</small>						
<b>PROJECT COMPLETION, Annual Report Only:</b>						
<b>If the Notice to Proceed is after October 1 of the year the project is let or if the project is less than 25% complete, make b = c * a.</b>						
Is the contractor on schedule?					Yes	No
If the answer is "NO", complete one or the other of the following.						
<b>COMPLETION BY WORKING DAYS: Annual Report Only:</b>						
a) How many total working days, including adjustments, were allowed for the completion of the project? <i>(Prosecution &amp; Progress)</i>						
<small>(RE instructions: # of Contract Working Days plus time extensions granted- Spec. 108.7.2)</small>						
b) How many working days were charged effective December 31? <i>(Prosecution &amp; Progress)</i>						
<small>RE instructions: This quantity is the total number of days charged. - Spec.108.7.2)</small>						
c) What percentage of the project is completed?						
<small>Deduct: - 1% per each % late</small>						
<b>COMPLETION BY CALENDAR DATE, Annual Report Only:</b>						
Project Notice to Proceed: _____ Contract / Scheduled Completion Date: _____						
<small>(RE instructions: For projects &gt;25% complete, make all necessary time adjustments to the completion / schedule prior to completing. Use the total points from the weighted timetable from the notice to proceed to the contract completion date (with any adjustments if applicable).</small>						
a) Using the weighted timetable, how many total points are allowed for the project? <i>(Prosecution &amp; Progress)</i>						
b) What are the total weighted time table points used? <i>(Prosecution &amp; Progress)</i>						
<small>(RE instructions: Use the total points from the weighted timetable from the project notice to proceed date to December 31 of the rated year.)</small>						
c) What percentage of the project is completed?						
<small>(RE instructions: Use the project percent complete as of December 31 of the rated year. Deduct: - 1% per each % late</small>						
<b>Were there Disincentive / Milestone damages charged on the project?</b>					Yes	No
<b>If Yes, answer the following:</b>						
a) \$ Disincentive/Liquidated Damages for failing to meet contract milestone dates. <i>Prosecution &amp; Progress)</i>					\$ _____	
<small>(RE instructions: Total disincentive and/or liquidated damages for missing milestone dates. Enter as positive number. Rating: deduct based on \$ deduction / \$ original contract expressed as percentage.</small>						

# 2014 CONTRACTOR PERFORMANCE QUESTIONNAIRE

Job No. \_\_\_\_\_ Route: \_\_\_\_\_ County: \_\_\_\_\_

<b>Section 200 - Earthwork</b>												
Complete Section 200 if the contract has any Section 200 contract pay items. Indicate N/A at section heading if project(s) had no Section 200 pay items or if no work was performed in this section during this evaluation period.												
<b>Total Dollars of Section 200 Items Completed This Rating Year: \$ _____</b> (If the contract includes combination projects, the total is to include all Section 200 items from all projects.)										N/A		
1	How many order records were written this construction season for Section 200 Quality specification violations? <i>(Quality)</i> (RE instructions: The actual number of order records written for violations. Do not include order records for documentation or rescission.									# _____ -6n%		
2	Did the contractor give proper notice to the engineer and the Missouri Department of Natural Resources prior to demolishing a building, removing asbestos, underground storage tank or plugging/closure of a well or septic tank? <i>(Contract Compliance - Environmental)</i> (RE Instructions: Note: MDNR requires a 10 working day notice before building or asbestos removal commences. A 30-day notice is required for removal of underground storage tanks. - # notifications given / # notifications required. Spec.# 202.10.2, 202.20.2)							N/A	NO (- 2%)	YES (No deduct)		
3	Did the contractor properly dispose of project waste and provide necessary documentation? <i>(Contract Compliance – Environmental)</i> (RE Instructions: quantity waste properly disposed / Total quantity of project waste generated - 202.2.1, 202.3, 202.40.4.9, 202.40, 202.50.3)							N/A	NO (- 2%)	YES (No deduct)		
4	Did the contractor's operations produce the required embankment/subgrade density? <i>(Quality)</i> (RE Instructions: Consider the number of failed test and the total number of test on the project or total % of rock fill properly placed. (Spec # 203.5, 203.6, 214.3)											
	N/A	<50% (-50%)	50 - 60% (-45%)	61 - 70% (-40%)	71 - 76% (-35%)	77 - 83% (-30%)	84 - 90% (-25%)	91 - 94% (-20%)	95 - 96% (-15%)	97 - 98% (-10%)	99% (-5%)	100% No deduct
5	Did the contractor use proper lift thicknesses and benching procedures in the construction of embankments? <i>(Quality)</i> (RE Instructions: Consider the number of incidents vs. the total number of days grading was active. - Spec # 203.4.11, 203.4.16, 203.4.17)											
	N/A	<50% (-30%)	50 - 60% (-27%)	61 - 70% (-24%)	71 - 76% (-21%)	77 - 83% (-18%)	84 - 90% (-15%)	91 - 94% (-12%)	95 - 96% (-9%)	97 - 98% (-6%)	99% (-3%)	100% No deduct
6	Did the contractor make an effort to identify and locate utility services prior to excavation? <i>(Contract Compliance)</i> (RE Instructions: Spec # 105.7.1)							N/A	NO (- 2%)	YES (No deduct)		
7	Did the contractor submit a complete blasting plan at least 14 days before rock-drilling operations began? <i>(Contract Administration)</i> (RE instructions: Did the blasting plan provide all the information required by specifications - Spec 107.7, 203.4.4.1.1)							N/A	NO (- 2%)	YES (No deduct)		
8	Did the contractor perform blasting operations in a manner to avoid damage to public or private property? <i>(Contract Compliance)</i> (RE instructions: # blasting occurrences - # blasting incidents / # blasting occurrences. An incident would be damage resulting from the contractor's blasting operations or situations where blasts produce excessive fly rock creating the possibility of property damage. - (Spec 107.7.3)							N/A	<90% (-10%)	90 - 99% (-5%)	100% No deduct	
9	Did the contractor furnish copies of all blasting logs, and seismic monitoring data? <i>(Contract Administration)</i> (RE instructions: # individual blast documentation provided / # of blasts conducted. - Spec 107.7.1)							N/A	NO (- 2%)	YES (No deduct)		

## 2014 CONTRACTOR PERFORMANCE QUESTIONNAIRE

Job No. \_\_\_\_\_ Route: \_\_\_\_\_ County: \_\_\_\_\_

<b>Section 300 - Bases and Aggregate Surfaces</b>												
Complete Section 300 if the contract has any Section 300 contract pay items. Indicate N/A at section heading if project(s) had no Section 300 pay items or if no work was performed in this section during this evaluation period.												
<b>Total Dollars of Section 300 Items Completed This Rating Year: \$</b> <small>(If the contract includes combination projects, the total is to include all Section 300 items from all projects.)</small>											N/A	
1	How many order records were written this construction season for Section 300 Quality specification violations? <i>(Quality)</i>										# _____ -6n%	
<small>(RE instructions: The actual number of order records written for violations. Do not include order records for documentation or rescission.)</small>												
2	Were the results of density tests on aggregate/ rock /stabilized permeable bases within specification limits? <i>(Quality)</i>											
	N/A	<50% (-50 %)	50 - 60% (-45%)	61 - 70% (-40%)	71 - 76% (-35%)	77 - 83% (-30%)	84 - 90% (-25%)	91 - 94% (-20%)	95 - 96% (-15%)	97 - 98% (-10%)	99% (-5%)	100% No deduct
<small>(RE instructions: # tests w/in spec. / total # of tests performed. - Spec # 302, 304.3.4)</small>												
3	Did the 2" capping material for rock base comply with the specifications? <i>(Quality)</i>											
	N/A	<75% -25%	75 - 79% -22.5%	80 - 8 2% -20%	83 - 86% -17.5%	87 - 89% -15%	90 - 92% 12.5%	93 - 94% -10%	95 - 96% -7.5%	97 -98% -5%	99 -2.5%	100% No deduct
<small>(RE instructions: # checks w/in spec. / total # of checks performed. - Spec # 303.3.5)</small>												
4	Were the final grades of the rock/aggregate base in conformance with the specifications? <i>(Quality)</i>											
	N/A	<75% -15%	75 - 79% -13.5%	80 - 8 2% -12%	83 - 86% -10.5%	87 - 89% -9%	90 - 92% (-7.5%)	93 - 94% -6%	95 - 96% -4.5%	97 - 98 % -3%	99 -1.5%	100% No deduct
<small>(RE instructions: # checks w/in spec. / total # of checks performed. - Spec # 303.3.6)</small>												
5	Was cement stabilized base cured in conformance with the specifications? <i>(Quality)</i>							N/A	<90% (-10%)	90 - 99% (-5%).	100% No deduct	
<small>(RE instructions: Total SY correctly cured / Total SY Placed - Spec # 302.3.4)</small>												
6	Did QC/QA results compare favorably? <i>(Quality)</i>											
	N/A	<50% (-25 %)	50 - 60% (-22.5%)	61 - 70% (-20%)	71 - 76% (-17.5%)	77 - 83% (-15%)	84 - 90% (-12.5%)	91 - 94% (-10%)	95 - 96% (-7.5%)	97 - 98% (-5%)	99% (-2.5%)	100% No deduct
<small>(RE Instructions: Number of QA test comparing favorably with QC results / Total Number of test compared. - Spec 304.4)</small>												
7	Was Section 300 material stored and handled in such a way to maintain its' quality? <i>(Quality)</i>							N/A	<90% (-10%)	90 - 99% (-5%).	100% No deduct	
<small>(RE instructions: MoDOT has the option to reject material that does not meet specification at the time of use. After an initial material acceptance, materials can be adversely affected by environmental exposure or rendered unacceptable by improper storage and handling. Spec # 106.5, 106.6)</small>												

<b>Section 400 - Flexible Pavements</b>								
Complete Section 400 if the contract has any Section 400 contract pay items. Indicate N/A at section heading if project(s) had no Section 400 pay items or if no work was performed in this section during this evaluation period.								
<b>Total Dollars of Section 400 Items Completed This Rating Year: \$</b> <small>(If the contract includes combination projects, the total is to include all Section 400 items from all projects.)</small>					N/A			
<b>(Allow override for Alternate Pavement bids)</b>								
1	How many order records were written this construction season for Section 400 specification violations? <i>(Quality)</i>				# _____ -6n%			
<small>(RE instructions: The actual number of order records written for violations. Do not include order records for documentation or rescission.)</small>								
2	Were samples of compacted bituminous mixtures delivered to the engineer in accordance with the specifications or as agreed to by the engineer? <i>(Contract Compliance)</i>				N/A	<90% (-6%)	90 - 99% (-3%).	100% No deduct
<small>(RE instructions: amount of AC w/i spec / amount of AC used - Spec # 403.22.4)</small>								

# 2014 CONTRACTOR PERFORMANCE QUESTIONNAIRE

Job No. \_\_\_\_\_ Route: \_\_\_\_\_ County: \_\_\_\_\_

3	Were acceptable profilograms, evaluations and reports furnished to the engineer in accordance with the specifications or as agreed to by the engineer? ( <i>Contract Compliance</i> )	N/A	<90% (-8%)	90 - 99% (-4%).	100% No deduct								
<small>(RE instructions: # traces provided w/in specifications / # traces required. - Spec # 403.20.2, 502.8)</small>													
4	Were contractor supplied material certifications for Section 400 items provided prior to the material being incorporated into the work? ( <i>Contract Administration</i> )	N/A	<90% (-6%)	90 - 99% (-3%).	100% No deduct								
<small>(RE instructions: This item is for certification required of the contractor, not for department inspected material items. When the contractor fails to provide material certification, a notice shall be given for any particular shipment, per item code. Spec. #106.11)</small>													
<b>All SuperPave Projects:</b>					<b>N/A</b>								
5	Did QC/QA results compare favorably? ( <i>Quality</i> )	N/A	<50% (-25 %)	50 - 60% (-22.5%)	61 - 70% (-20%)	71 - 76% (-17.5%)	77 - 83% (-15%)	84 - 90% (-12.5%)	91 - 94% (-10%)	95 - 96% (-7.5%)	97 - 98% (-5%)	99% (-2.5%)	100% No deduct
<small>(RE Instructions: Number of QA test comparing favorably with QC results / Total Number of test compared. Spec 403.17)</small>													
6	a. \$ SuperPave deductions this construction season b. \$ SuperPave bonuses this construction season c. \$ Contract Value of SuperPave asphalt this construction season										a. \$ _____ b. \$ _____ c. \$ _____		
<small>RE Instructions: Include all contract deductions for Superpave asphalt placed this construction season. Include deducts made for deficiencies or asphalt accepted at reduced cost. Spec. 403.23.4, 502.15; <b>-(10 a / e)% Consider changing deduct to balance sections, std deviations</b></small>													
Value of Bituminous Mixes Other than SuperPave: \$ _____												<b>N/A</b>	
7	What percentage of density / compaction tests met specification requirements? ( <i>Quality</i> )	N/A	<75% -25%	75 - 79% -22.5%	80 - 82% -20%	83 - 86% -17.5%	87 - 89% -15%	90 - 92% 12.5%	93 - 94% -10%	95 - 96% -7.5%	97-98 % -5%	99 -2.5%	100% No deduct
<small>(RE instructions: Total tonnage w/in specifications vs. Total tonnage laid. - Spec #401.7.8, 402)</small>													
8	Was the asphalt cement content within specification limits? ( <i>Quality</i> )	N/A	<90% (-8%)	90 - 99% (-4%).									
<small>(RE instructions: tons of mix w/in spec / total tons of asphalt mix -Spec #401, 402, include all QC/QA test results)</small>													
9	Was the gradation of the combined aggregates, prior to mixing with asphalt cement, within specification limits? ( <i>Quality</i> )	N/A	<90% (-6%)	90 - 95% (-4%)	96 - 99% (-2%).								
<small>(RE instructions: tons of mix w/in spec /s total tons of asphalt mix - Spec #401.8, 402.5, include all QC/QA test results)</small>													
<b>Section 500 - Rigid Pavements</b>													
Complete Section 500 if the contract has any Section 500 contract pay items. Indicate N/A at section heading if project(s) had no Section 500 pay items or if no work was performed in this section during this evaluation period.													
<b>Total Dollars of Section 500 Items Completed This Rating Year: \$ _____</b> <small>(If the contract includes combination projects, the total is to include all Section 400 items from all projects.)</small> (Allow override for Alternate Pavement bids)												<b>N/A</b>	
1	How many order records were written this construction season for Section 500 specification violations? ( <i>Quality</i> )												# _____ -6n%
<small>(RE instructions: The actual number of order records written for violations. Do not include order records for documentation or rescission..)</small>													
2	Did concrete for Section 500 items meet the specifications when it arrived at the jobsite? ( <i>Quality</i> )	N/A	<90% (-9%)	90 - 95% (-6%)	96 - 99% (-3%).								
<small>(RE instructions: # tests w/in specifications / Total # of test - Spec # 501.5,501.10.2)</small>													

## 2014 CONTRACTOR PERFORMANCE QUESTIONNAIRE

Job No. \_\_\_\_\_ Route: \_\_\_\_\_ County: \_\_\_\_\_

3	Were acceptable profilograms, evaluations and reports furnished to the engineer in accordance with the specifications or within the timeline agreed by the engineer? ( <i>Contract Compliance</i> )	N/A	<90% (-8%)	90 - 99% (-4%)	100% No deduct							
<small>(RE instructions: # traces provided w/in specifications / # traces required. - Spec # 502.8)</small>												
4	Were joints sawed before uncontrolled shrinkage cracking took place? ( <i>Quality</i> )	N/A	<90% (-12.5%)	90 - 94% (-10%)	95 - 96% (-7.5%)	97 - 98% (-5%)	99% (-2.5%)	100% No deduct				
<small>(RE instructions: total # joints - # uncontrolled shrinkage cracks / # total joints - Spec # 502.5)</small>												
5	Was the contractor persistent in adding unauthorized moisture to finish the concrete pavement surface? ( <i>Quality</i> )					# _____ -2n%						
<small>(RE instructions: - # documented notices, other than order records - Spec # 502.4.8.2)</small>												
6	Were contractor supplied material certifications and / or correct and complete PAL tags for Section 500 items provided prior to the material being incorporated into the work? ( <i>Contract Administration</i> )	N/A	<90% (-6%)	90 - 99% (-3%)	100% No deduct							
<small>(RE instructions: This item is for certification required of the contractor, not for department inspected material items. When the contractor fails to provide material certification or fails to provide all required information for PAL, a notice shall be given for any particular shipment, per item code. Spec. #106.11, 106.12)</small>												
7	a. \$ PCCP deductions this construction season b. \$ PCCP bonuses this construction season c. \$ Contract Value of PCCP this construction season					a. \$ _____ b. \$ _____ c. \$ _____						
<small>RE Instructions: Include all contract deductions for Superpave asphalt placed this construction season. Include deducts made for deficiencies or asphalt accepted at reduced cost. Spec. 403.23.4, 502.15; - (10 a / c) %</small>												
<b>All QC/QA Projects:</b>					<b>N/A</b>							
8	Did QC/QA results compare favorably? ( <i>Quality</i> )											
	N/A	<50% (-25%)	50 - 60% (-)	61 - 70% (-20%)	71 - 76% (-)	77 - 83% (-15%)	84 - 90% (-)	91 - 94% (-10%)	95 - 96% (-7.5%)	97 - 98% (-5%)	99% (-2.5%)	100% No deduct
<small>(RE Instructions: Number of QA test comparing favorably with QC results / Total Number of test compared. Spec 502.10)</small>												
9	Were control charts maintained on a daily basis? <i>Contract Compliance</i>	N/A	<90% (-12.5%)	90 - 94% (-10%)	95 - 96% (-7.5%)	97 - 98% (-5%)	99% (-2.5%)	100% No deduct				
<small>(RE Instructions: Number of days charts were maintained / Number of days paving was active. Spec. 502.11.3)</small>												

### Section 600 - Incidental Construction

Complete Section 600 if the contract has any Section 600 contract pay.  
Indicate N/A at section heading if project(s) had no Section 600 pay items  
or if no work was performed in this section during this evaluation period.

<b>Total Dollars of Section 600 Work Items Completed This Rating Year: \$ _____</b> Do not include Mobilization (618-1000) <small>(If the contract includes combination projects, the totals are to include all Section 600 work items from all projects)</small>	N/A
<b>Total Dollars of Mobilization (Item No. 618-10.00) Paid this Year: \$ _____</b>	
<b>Total Dollars of Temporary Traffic Control Items Completed This Rating Year: \$ _____</b> <small>(If the contract includes combination projects, the total is to include temporary traffic control items from all projects.)</small>	
1 How many order records were written this construction season for Section 600 Quality specification violations? ( <i>Quality</i> )	# _____ -6n%
<small>(RE instructions: The actual number of order records written for violations. Do not include order records for documentation or rescission.)</small>	

# 2014 CONTRACTOR PERFORMANCE QUESTIONNAIRE

Job No. \_\_\_\_\_ Route: \_\_\_\_\_ County: \_\_\_\_\_

2	How many order records were written for traffic control? <i>(Contract Compliance – Traffic Control)</i>	# _____	-3n%					
	<small>(RE instructions: The actual number of order records written for violations. Do not include order records for documentation or rescission. Spec # 616)</small>							
3	How many order records were written for pavement grinding environmental violations? <i>(Contract Compliance – Environmental)</i>	# _____	-3n%					
	<small>(RE instructions: The actual number of order records written for violations. Do not include order records for documentation or rescission. Spec # 622)</small>							
4	Was pavement edge treatment properly provided and constructed in accordance with plans and specifications? <i>(Contract Compliance - Traffic Control)</i>	N/A	<90% (-10%)	90 - 99% (-5%).	100% No deduct			
	<small>(RE instructions: % of edge treatment in compliance. L.F. provided vs. L.F. required. If contractors operations eliminated need, edge treatment was provided. - Spec # 619)</small>							
5	Was pavement marking installed within the time limits specified in the contract? <i>(Contract Compliance - Traffic Control)</i>	N/A	<90% (-10%)	90 - 99% (-5%).	100% No deduct			
	<small>(RE instructions: % of pavement marking installed within 5 days. Sta. installed w/in specifications / Sta. required. - Spec #620.2.2)</small>							
6	a. \$ Pavement Marking paid this construction season b. \$ Contract Value of Pavement Marking this construction season.	a. \$ _____ b. \$ _____						
	<small>RE instructions: Include all contract deductions for pavement marking place this construction season. Include deducts made for deficiencies or marking accepted at reduced costs. Spec 620 (a / b) (%) – 100%</small>							
7	Were traffic control devices installed and maintained in accordance with plans and specifications? <i>(Contract Compliance - Traffic Control)</i>	N/A	<90% (-9%)	90 – 95% (-6%)	96 - 99% (-3%).	100% No deduct		
	<small>(RE instructions: % of traffic control devices properly installed. # Proper installations / total # devices installed. - Spec # 616)</small>							
8	Did the contractor provide well trained, equipped, and properly attired flag persons when required? <i>(Contract Compliance - Traffic Control)</i>	N/A	<90% (-9%)	90 – 95% (-6%)	96 - 99% (-3%).	100% No deduct		
	<small>(RE instructions: % of days contractor provided proper flagging. # days flagging required minus # documented improper flagging / # days flagging required. - Spec # 616.4.3)</small>							
9	Were signs covered, set aside, turned, removed, or relocated as work progressed or was completed and their necessity ceased to exist? <i>(Contract Compliance - Traffic Control)</i>	# _____				-2n%		
	<small>(RE instructions: # of documented notices. Contractor should be given a reasonable designated time to make corrections. - Spec # 616.4)</small>							
10	Did concrete for Section 600 items meet the specifications when it arrived at the jobsite? <i>(Quality)</i>	N/A	<90% (-10%)	90 - 94% (-8%)	95 - 96% (-6%)	97 - 98% (-4%)	99% (-2%)	100% No deduct
	<small>(RE instructions: % of tests in compliance when delivered to project. # tests w/in specifications / Total # of test - Spec # 5015, 501.10.2)</small>							
11	Quality Assurance: What was the percentage of contractor staking checked acceptable? <i>(Quality)</i>	N/A	<95% - 4 %	95 – 99% - 2 %	100% No deduct.			
	<small>(RE instructions: 10% of contractor staking requires verification, Measure is % of contractor staking acceptable when checked - Spec # 627)</small>							
12	Did the contractor provide the necessary notification and documentation required for design errors, benchmark and control point errors and structure staking? <i>(Contract Administration)</i>	N/A	<90% (-3%)	90 – 95% (-2%)	96 - 99% (-1%).	100% No deduct		
	<small>(RE instructions: Notifications and documentation provided / notifications and documentation required as percentage. Spec.627.2.2, 627.2.4, 627.2.7, 627.2.8.1, 627.2.8.2, 627.2.9 )</small>							
13	Were contractor supplied material certifications and / or correct and complete PAL tags for Section 600 items provided prior to the material being incorporated into the work? <i>(Contract Administration)</i>	N/A	<90% (-6%)	90 - 99% (-3%).	100% No deduct			
	<small>(RE instructions: This item is for certification required of the contractor, not for department inspected material items. When the contractor fails to provide material certification or fails to provide all required information for PAL, a notice shall be given for any particular shipment, per item code. Spec. #106.11, 106.12)</small>							
14	Was Section 600 material stored and handled in such a way to maintain its' quality? <i>(Quality)</i>	N/A	<90% (-10%)	90 - 99% (-5%).	100% No deduct			

# 2014 CONTRACTOR PERFORMANCE QUESTIONNAIRE

Job No. \_\_\_\_\_ Route: \_\_\_\_\_ County: \_\_\_\_\_

(RE instructions: MoDOT has the option to reject material that does not meet specification at the time of use. After an initial material acceptance, materials can be adversely affected by environmental exposure or rendered unacceptable by improper storage and handling. Sec # 106.5, 106.6)

## Section 700 – Structures

Complete Section 700 if the contract has any Section 700 contract pay items.  
Indicate N/A at section heading if project(s) had no Section 700 pay items  
Or if no work was performed in this section during this evaluation period.

<b>Total Dollars of Section 700 Items Completed This Rating Year: \$</b>						N/A
(If the contract includes combination projects, the total is to include all Section 700 items from all projects.)						
1	How many order records were written this construction season for Section 700 Quality specification violations? <i>(Quality)</i>					# _____ -6n%
(RE instructions: The actual number of order records written for violations. Do not include order records for documentation or rescission.)						
2	How many order records were written for Section 700 environmental violations? <i>(Contract Compliance – Environmental)</i>					# _____ -(3n)%
(RE instructions: The actual number of order records written for violations. Do not include order records for documentation or rescission. Examples are lead containment, stream contamination, stream crossing, work pads, Sec 404 permit issues, etc.)						
3	Were exposed concrete surfaces properly cured? <i>(Quality)</i>					# _____ -2n%
(RE instructions: Information should be documented in routine reports and diary entries. - Spec #703.3.6, 703.3.10.2)						
4	Was reinforcing steel properly aligned and tied in conformance with the plans and specifications when the contractor requested inspection? <i>(Quality)</i>	N/A	<90% (-6%)	90 – 95% (-4%)	96 - 99% (-2%).	100% No deduct
(RE instructions: Wt of properly placed re steel / Total wt of steel - (Spec # 706.3, 710.3.2.1.)						
5	Was a detailed installation plan for construction of drilled shafts submitted at least 30 days prior to construction? <i>(Contract Compliance)</i>		N/A		No -5%	Yes
(RE Instructions: Spec. 701.2)						
6	Were forms properly aligned and graded when the contractor requested inspection? <i>(Quality)</i>	N/A	<90% (-6%)	90 – 95% (-4%)	96 - 99% (-2%).	100% No deduct
(RE instructions: S.Y. properly formed / Total S.Y. of deck - Spec # 703.3.2)						
7	Did concrete for Section 700 items meet the specifications when it arrived at the jobsite? <i>(Quality)</i>	N/A	<90% (-6%)	90 – 95% (-4%)	96 - 99% (-2%).	100% No deduct
(RE instructions: # tests w/in specifications / Total # of test - Spec # 501.4, 501.5, 501.10.2, 501.8)						
8	Was the contractor persistent in adding unauthorized moisture to finish the bridge deck surface? <i>(Quality)</i>					# _____ 2n%
(RE instructions: # documented orders to cease. Documentation can be by order record, written notice, or diary entry. - Spec # 502.4.8.2)						
9	Did the contractor provide adequate protection for property (to include the structure) and traffic during bridge, including painting, operations? <i>(Contract Compliance)</i>					# _____ 2n%
(RE instructions: # documented orders. Documentation can be by written notice, or diary entry. - Spec. # 107.5)						
10	Did the contractor's concrete removal practices minimize damage to existing reinforcing and structural steel that was to be used in place? <i>(Quality)</i>	N/A	<90% (-9%)	90 – 95% (-6%)	96 - 99% (-3%).	100% No deduct
(RE instructions: # days w/o incident / total days concrete removal was active. Documentation can be by order record, written notice, or diary entry. - Spec 704.4.1.5, 704.4.1.6, 704.4.1.7)						
11	Were drainage pipes and structures constructed in accordance with the plans and specifications? <i>(Quality)</i>	N/A	<90% (-9%)	90 – 95% (-6%)	96 - 99% (-3%).	100% No deduct
RE Instructions: LF pipe properly installed / LF plan length. Spec 725.4, 725.5, 725.6, 726.4, 728.3.5, 730.3.5						
12	Were contractor supplied material certifications and / or correct and complete PAL tags for Section 700 items provided prior to the material being incorporated into the work? <i>(Contract Administration)</i>		N/A	<90% (-6%)	90 - 99% (-3%).	100% No deduct

# 2014 CONTRACTOR PERFORMANCE QUESTIONNAIRE

Job No. \_\_\_\_\_ Route: \_\_\_\_\_ County: \_\_\_\_\_

(RE instructions: This item is for certification required of the contractor, not for department inspected material items. When the contractor fails to provide material certification or fails to provide all required information for PAL, a notice shall be given for any particular shipment, per item code. Spec. #106.11, 106.12)					
13	Was Section 700 material stored and handled in such a way to maintain its' quality? ( <i>Quality</i> )	N/A	<90% (-10%)	90 - 99% (-5%).	100% No deduct
(RE instructions: MoDOT has the option to reject material that does not meet specification at the time of use. After an initial material acceptance, materials can be adversely affected by environmental exposure or rendered unacceptable by improper storage and handling. Sec # 106.5, 106.6)					

## Section 800 - Roadside Development

Complete Section 800 if the contract has any Section 800 contract pay items.  
Indicate N/A at section heading if project(s) had no Section 800 pay items  
or if no work was performed in this section during this evaluation period.

<b>Total Dollars of Section 800 Items Completed This Rating Year: \$</b>		N/A											
(If the contract includes combination projects, the total is to include all Section 800 items from all projects.)													
1	How many order records were written this construction season for Section 800 Quality specification violations? ( <i>Quality</i> )	# _____ -6n%											
(RE instructions: The actual number of order records written for violations. Do not include order records for documentation or rescission..)													
2	How many order records were written this construction season for SWPP deficiency violations? ( <i>Contract Compliance - Environmental</i> )	# _____ -3n%											
(RE instructions: The actual number of order records written for violations. Do not include order records for documentation or rescission. , Spec # 107.10, 806)													
3	Was seeding and/or sodding completed before the slopes became eroded? ( <i>Contract Compliance - Environmental</i> )	N/A	<90% (-15%)	90 - 95% (-10%)	96 - 99% (-5%).	100% No deduct							
(RE Instructions: % of competed grade seeded/sodded before erosion occurs. Spec 805.3.1, 806.4)													
4	What percentage of the performed erosion inspection reports have no deficiencies or have deficiencies corrected within the 7-day requirement? ( <i>Contract Compliance - Environmental</i> )	N/A	<75% -25%	75 - 79% -22.5%	80 - 82% -20%	83 - 86% -17.5%	87 - 89% -15%	90 - 92% 12.5%	93 - 94% -10%	95 - 96% -7.5%	97 % -5%	99 -2.5%	100% No deduct
(RE instructions: Deficiencies include unauthorized acreage opened, required BMPs not installed, existing BMPs requiring maintenance. # inspections with deficiencies extending beyond 7 days / Total # of erosion inspections performed General Storm Water Permit, Storm Water Pollution Prevention Plan, Section 806).													
5	Was Section 800 material stored and handled in such a way to maintain its' quality? ( <i>Quality</i> )	N/A	<90% (-10%)	90 - 99% (-5%).	100% No deduct								
(RE instructions: MoDOT has the option to reject material that does not meet specification at the time of use. After an initial material acceptance, materials can be adversely affected by environmental exposure or rendered unacceptable by improper storage and handling. Sec # 106.5, 106.6)													
6	Were contractor supplied material certifications and / or correct and complete PAL tags for Section 800 items provided prior to the material being incorporated into the work? ( <i>Contract Administration</i> )	N/A	<90% (-6%)	90 - 99% (-3%).	100% No deduct								
(RE instructions: This item is for certification required of the contractor, not for department inspected material items. When the contractor fails to provide material certification or fails to provide all required information for PAL, a notice shall be given for any particular shipment, per item code. Spec. #106.11, 106.12)													

## 2014 CONTRACTOR PERFORMANCE QUESTIONNAIRE

Job No. \_\_\_\_\_ Route: \_\_\_\_\_ County: \_\_\_\_\_

<b>Section 900 - Traffic Control Facilities</b>										
Complete Section 900 if the contract has any Section 900 contract pay items. Indicate N/A at section heading if project(s) had no Section 900 pay items or if no work was performed in this section during this evaluation period.										
<b>Total Dollars of Section 900 Items Completed This Rating ear: \$</b> <small>(If the contract includes combination projects, the total is to include all Section 900 items from all projects.)</small>						N/A				
1	How many order records were written this construction season for Section 900 Quality specification violations? ( <i>Quality</i> )						# _____ -6n%			
<small>(RE instructions: The actual number of order records written for violations. Do not include order records for documentation or rescission.)</small>										
2	Did the contractor provide material that was listed on the approved list of equipment and materials? ( <i>Contract Administration</i> )				N/A	<90% (-6%)	90 - 99% (-3%).	100% No deduct		
<small>(RE instructions: # items approved / # items required. Prior approval of a replacement item does not constitute failure to provide equipment on the approved list. - Spec # 901.4)</small>										
3	Did the contractor provide the necessary certifications, manufacturers instructions, wiring diagrams, and parts lists, as required by the specifications? ( <i>Contract Administration</i> )				N/A	<90% (-6%)	90 - 99% (-3%).	100% No deduct		
<small>(RE instructions: # provided / # required - Spec # 901.6, 902.4, 902.4, 903.3)</small>										
4	Did concrete for Section 900 items meet the specifications when it arrived at the jobsite? ( <i>Quality</i> )			N/A	<90% (-10%)	90 - 94% (-8%)	95 - 96% (-6%)	97 - 98% (-4%)	99% (-2%)	100% No deduct
<small>(RE instructions: # tests w/in specifications / Total # of test - Spec # 501.5, 501.10.2)</small>										
5	Was Section 900 material stored and handled in such a way to maintain its' quality? ( <i>Quality</i> )				N/A	<90% (-6%)	90 - 99% (-3%).	100% No deduct		
<small>(RE instructions: MoDOT has the option to reject material that does not meet specification at the time of use. After an initial material acceptance, materials can be adversely affected by environmental exposure or rendered unacceptable by improper storage and handling. Sec # 106.5, 106.6)</small>										

# 2014 CONTRACTOR PERFORMANCE QUESTIONNAIRE

Job No. \_\_\_\_\_ Route: \_\_\_\_\_ County: \_\_\_\_\_

Total Dollars of Miscellaneous Payments Paid this Year: \$ \_\_\_\_\_

Payments made for miscellaneous items, principally leftover material. ALL bonus payments (smoothness, payment factors, are to be shown in the appropriate section totals. Bonus payments in section totals provide an increased weighted average benefit to the contractor.

Total Dollars of Deductions Charged this Year: \$ \_\_\_\_\_

ALL Deductions should be shown here, such as deductions made for liquidated damages, disincentives, penalties. Deductions shown in section totals would reduce the weighted average effect for poor performance.

## Questionnaire Completion

**7 CSR 10-10.050 "Each Contractor Performance Report shall be completed on all projects that were active during the rated year and will be completed within thirty (30) days after final project acceptance, but shall be completed no later than January 15, whichever comes first. ...."**

**".... A copy of the questionnaire shall be furnished to the contractor by the resident engineer via certified mail, return receipt requested.. If the contractor's representative does not return a signed questionnaire to the resident engineer within two (2) weeks after it has been mailed, the questionnaire shall be final, with no further comment to be considered by the contractor's representative. If the contractor disagrees with any particular rating on the questionnaire, s/he may request in writing that the district engineer review the matter. Such request must be made to the district engineer within twenty-eight (28) days from the date of the mailing of the questionnaire from to the contractor. However, the contractor's representative shall first have discussed the discrepancy with the resident engineer in order to resolve the dispute. Upon receiving the contractor's written request to review the particular area of discrepancy on the questionnaire, the district engineer shall review the matter and provide the contractor with a written response regarding the particular area of dispute between the contractor and the resident engineer...."**

Documentation for evaluating contractor performance is vital, however, it is not necessary or desirable to document every minor infraction. Excessive documentation creates a burdensome task for inspectors and may ultimately break down inspector/contractor communications and create a hostile atmosphere on the project. Infrequent minor infractions should be discussed and handled in a professional manner that builds a project partnering team.

Documentation must be made for serious infractions or for violations that continually reoccur. Notices of infractions must be communicated with the contractor. It is recommended that documentation for infractions be handled by a staged or stepped notification process. Initially the minor violation should be discussed with the contractor's project representative. A second instance should be discussed and documented by a diary entry. An order record should document subsequent infractions of the same specification.

Before mailing the evaluation to the contractor the resident engineer must review the evaluation to ensure the ratings are consistent with the contractor's actual performance. An obviously low rating in any category or work element requires a rational review as to the reason for the score. Shortly after mailing the questionnaire (by certified mail, return receipt requested) the resident engineer or an authorized representative must contact the contractor to provide an opportunity to meet and discuss the evaluation. The date of the discussion, the name of contractor's representative and their response must be noted.

This rating system is designed to encourage improved contractor performance. However, continued unacceptable performance by a contractor will lead to his suspension or disqualification. This system should facilitate communications on the project and provide an impetus for improvement. Performance improvement on a project should result in a better project work atmosphere for both project office staff and the contractor.



# 127.25 Maintenance Environmental Policies

## From Engineering Policy Guide

### Contents

- 1 127.25.1 Solid Waste
  - 1.1 127.25.1.1 Asbestos
  - 1.2 127.25.1.2 Solid Waste
  - 1.3 127.25.1.3 Tire Management
  - 1.4 127.25.1.4 Street Sweepings
  - 1.5 127.25.1.5 Antifreeze
  - 1.6 127.25.1.6 Battery Management
  - 1.7 127.25.1.7 Disposal of Animal Carcasses
- 2 127.25.2 Hazardous Material Spills
  - 2.1 127.25.2.1 Hazardous Material Spills (Roadway) by Others
  - 2.2 127.25.2.2 MoDOT Hazardous Material Spills
- 3 127.25.3 Rest Areas
  - 3.1 127.25.3.1 Rest Area Lagoon
  - 3.2 127.25.3.2 Rest Area Drinking Water
    - 3.2.1 127.25.3.2.1 Well Drilling
- 4 127.25.4 Water Management
  - 4.1 127.25.4.1 Storm Water Regulations
  - 4.2 127.25.4.2 Maintenance Operations in Streams
  - 4.3 127.25.4.3 Well Closures
- 5 127.25.5 Containers
  - 5.1 127.25.5.1 Fuel Storage Tanks
    - 5.1.1 127.25.5.1.1 Fuel Pump Calibration
    - 5.1.2 127.25.5.1.2 Fuel
  - 5.2 127.25.5.2 Herbicide Containers
  - 5.3 127.25.5.3 Empty Drums and Containers
- 6 127.25.6 Environmental Compliance
  - 6.1 127.25.6.1 Threatened or Endangered Species
  - 6.2 127.25.6.2 Tier II Reporting
- 7 127.25.7 Hazardous Waste
  - 7.1 127.25.7.1 Hazardous Waste Compliance
  - 7.2 127.25.7.2 When a Product Becomes a Waste
  - 7.3 127.25.7.3 Lead Based Paint Abatement
  - 7.4 127.25.7.4 Equipment Cleaning Fluids
  - 7.5 127.25.7.5 Used Oil
  - 7.6 127.25.7.6 Hazardous Waste Reporting
- 8 127.25.8 General
  - 8.1 127.25.8.1 Open Burning
  - 8.2 127.25.8.2 Lead Mining Chat
    - 8.2.1 127.25.8.2.1 Abrasives
  - 8.3 127.25.8.3 Sewage Disposal System
    - 8.3.1 127.25.8.3.1 Industrial and Domestic Waste Waters

#### Forms

Deer Death Report  
Form and Map (Excel)

#### Additional Information

Top Ten Spill  
Prevention Items

- on Right of Way
- 8.3.2 127.25.8.3.2 System Attachments by Others
- 8.4 127.25.8.4 Vehicle Placarding
- 8.5 127.25.8.5 Fugitive Dust
- 8.6 127.25.8.6 Vehicle Painting
- 8.7 127.25.8.7 Environment Site Assessment
- 8.8 127.25.8.8 Salt Runoff
  - 8.8.1 127.25.8.8.1 Storage

## 127.25.1 Solid Waste

### 127.25.1.1 Asbestos

Asbestos or possible asbestos containing material that is to be removed during remodeling, repair or demolition shall be sampled by a MoDOT Asbestos Inspector. Material that tests positive for asbestos must be removed by a permitted removal contractor and overseen by a MoDOT Asbestos Contractor Supervisor. All asbestos containing materials shall be handled according to local, state and federal regulations. Asbestos containing materials that do not have to be removed or disturbed shall be left in place. Materials found to have been damaged or become friable (crumbles easily) will be repaired or removed and replaced with non asbestos containing material. All asbestos work must be done by qualified personnel. There are two types of notifications required by MDNR in regard to asbestos abatement and demolition. Asbestos abatement notification must be provided to MDNR at least 10 working days prior to the start of the project. Demolition or major renovation notification must be provided to MDNR at least 10 working days prior to the start of that project. The demolition notice is required even if there is no asbestos identified in the project.

**Reason for Policy:** 10 CSR 10-6, Air Pollution Control Program

RSMo 643.225 - 643.620 Air Conservation

**Effective Date:** 6/1/99

**Revision Dates:**

### 127.25.1.2 Solid Waste

The department shall dispose of garbage, refuse and other discarded material in a permitted sanitary landfill. Materials such as whole tires, batteries, appliances, used oil and hazardous wastes are prohibited from being disposed of in a sanitary landfill and shall be recycled as regulations dictate.

**Reason for Policy:** RSMo 260.200 - 260.345  
Environmental Control

**Effective Date:** 6/1/99



**Revision Dates:****127.25.1.3 Tire Management**

Waste tires unsuitable for sale or recapping shall be disposed of under state contract. Contact an Environmental Specialist for current contract information. Burning tires or tire pieces is prohibited. Tires and tire pieces shall be stored in a manner that avoids providing a mosquito-breeding site. Twenty-five or more whole tires stored at any one site must be covered. Maintain an inventory of less than 500 whole tires at any one site, at any one time, unless they are loaded on a truck for disposal.

**Reason for Policy:** 10 CSR 80-8.010 - 80-8.040 Solid Waste Management

**Effective Date:** 6/1/99

**Revision Dates:****127.25.1.4 Street Sweepings**

Street sweepings are considered solid waste by the Missouri Department of Natural Resources (MDNR). The sweepings must be disposed of in a permitted sanitary landfill. An exception from disposal in a landfill has been granted by MDNR. To qualify for the exemption, the street sweepings must meet the beneficial use requirements as established by MDNR.

To qualify for the beneficial use exception, the sweepings must be composed of grit and dirt from the roadway surface and only minor amounts of trash, litter or automotive parts can be present in the sweepings. The sweepings can contain asphaltic concrete materials as clarified in the April 2010 MDNR approval letter.

Street sweepings need to be processed or screened to remove trash, litter and other debris. If the screenings still contain excessive amounts of trash, litter or other debris, additional processing will be required; or the materials will need to be disposed in a landfill. All of the trash, litter and other debris removed by the screening process shall be disposed of in a sanitary landfill.

Sampling and testing of the screened grit and dirt material is required by MDNR. At least one sample must be collected for every 500 cubic yards of screened material created. The guidance in the sampling protocol must be followed. This includes proper sample collection, preservation and analysis by MoDOT's chemical laboratory. Questions regarding the sampling protocol should be directed to Environmental section of the Design Division.

A copy of the sample results must be kept on file at the Maintenance building where the screenings were processed and a copy of the sample results needs to be provided to the Environment section of the Design Division.

**Reason for Policy:** 10 CSR 80 Solid Waste Management Regulations, RSMo 644 Missouri Clean Water Law, and 10 CSR 20-6 regulations.

**MDNR Approval Letters and  
Street Sweeping Sampling  
Information**

Street Sweep MDNR 2007 letter  
Street Sweep MDNR 2010 letter  
Street Sweep Guidance/Beneficial  
Use Approval  
Street Sweep Sampling Protocol

**Effective Date:** 6/1/99

**Revision Dates:**

### **127.25.1.5 Antifreeze**

Used antifreeze from vehicle maintenance activities shall be collected and processed through a MoDOT antifreeze recycler for reuse in the vehicle. Antifreeze not recycled in the vehicle must be sent to a recycler that accepts antifreeze. Antifreeze may never be discharged to storm sewers, septic systems, streams or on the ground.

**Reason for Policy:** 10 CSR 25-5.262, Hazardous Waste Management Program. Antifreeze is considered a solid waste. Reduce antifreeze cost and disposal cost.

**Effective Date:** 6/1/99

**Revision Dates:**

### **127.25.1.6 Battery Management**

All non-rechargeable batteries shall be managed as a solid waste. All rechargeable batteries shall be recycled with an approved recycler. Place cracked lead acid batteries in an acid safe container and contact your battery recycler or Environmental Specialist for specific information. All lead acid batteries should be inside secondary containment.

**Reason for Policy:** 10 CSR 80 Solid Waste Management Program. Non rechargeable batteries are considered to be a solid waste. 10 CSR 25, Hazardous Waste Management Regulations. Rechargeable batteries contain specific hazardous components such as nickel, cadmium, mercury, lead and sulfuric acid that cause the batteries to be a hazardous waste unless they are sent to a recycler.

**Effective Date:** 6/1/99

**Revision Dates:**

### **127.25.1.7 Disposal of Animal Carcasses**

Animal carcasses found on MoDOT right of way shall be disposed of properly. Options for disposal are listed below under Accepted Disposal Practices. It is the supervisor's responsibility to choose the option that best suits the needs of their particular area. Disposal practices other than the accepted practices listed below will require State Maintenance Engineer approval.

Since the distribution of a 1987 letter of agreement, MoDOT has reported all deer killed on its right of way to the Missouri Department of Conservation (MDC). Each deer found on MoDOT right of way is to be reported to the district office and the information logged on the Deer Death Report Form and Map (Excel). The monthly log sheets are to be forwarded to the Maintenance Operations Functional Unit at General Headquarters by the 15th of the following month. The information will be forwarded to the MDC.

### Accepted Disposal Practices

- Option 1 - Bury the carcass on highway right of way, provided it is not prohibited by local ordinances, and not in a waterway. The carcass should be buried at a minimum depth of 30 inches. Call 800-DIG-RITE (800-344-7483) prior to digging.
- Option 2 - Dispose of the animal carcass at a state-approved sanitary landfill, with the landfill operator's approval. There will likely be a fee associated with this option.
- Option 3 - Dispose of the carcass in an animal compost bin, which can be built at a maintenance facility. The compost bin and disposal procedures shall meet the guidelines established by the University of Missouri.
- Option 4 - Dispose of the carcass at a site and in a manner pre-approved by the MDC. Written approval from MDC is required.
- Option 5 - Where available, the carcass may be taken to a city or county animal control facility equipped to dispose of animal carcasses.
- Option 6 - Missouri law allows an individual who has struck and killed a deer with their vehicle to claim the deer carcass if written authorization to possess the deer is granted by a MDC Agent.
- Option 7 - Disposal of domestic animal carcasses by the owner is allowed provided the owner can be identified in a timely manner. If there are any identifying marks on the carcass, department personnel shall attempt to notify the owner.

**Reason for Policy:** RSMo 269 Environmental Control 40 CFR 30 Federal Endangered Species Act, DNR Solid Waste Program and Water Pollution Control Program, MoDOT liability.

**Effective Date:** 12/12/01

**Revision Date:**

## 127.25.2 Hazardous Material Spills

### 127.25.2.1 Hazardous Material Spills (Roadway) by Others

MoDOT may become responsible for abandoned drums and containers, illegal dumped chemicals and accidental releases of hazardous materials on Department property. When hazardous material spills and incidents are discovered on department property, MoDOT personnel shall follow the department's *Hazardous Materials Materials Response Plan* to assure the material is handled properly. Reporting will be made to the Missouri Department of Natural Resources (MDNR) Environmental Emergency Response (EER) (573) 634-2436 in accordance with MoDOT procedures and Missouri RSMo 260.500 through 260.550.

**Note:** All unknown materials and containers will be treated as hazardous waste until proven

otherwise. When an unknown material or a known hazardous material is discovered on the department's property, the District Hazardous Material Coordinator (DHMC) will be notified. The DHMC contact list can be accessed via SharePoint. The DHMC will call the MoDOT Environmental Section, (573) 526-4778, and the MDNR ERR 24 hour hotline number, (573) 634-2436, and report all information available to both. It will then be the responsibility of the MDNR ERR to determine if the material is hazardous. If DNR makes the declaration of a "hazardous substance emergency", they will (1) respond with their own resources, or (2) contact the contractor to respond to the incident. In either case, either party will conduct the initial containerization and remove the material from the ROW to the nearest available storage facility, while any additional waste stream profile analysis is performed. MoDOT staff will arrange for any required shipment, disposal and reporting once waste stream profiling is complete.

In the event the abandoned container is neither leaking nor bulging, but is located within the clear zone, then the same contact protocol would apply as specified above. The only exception would be if MDNR were unable to respond immediately to the incident (due to lack of personnel availability, etc.), then MoDOT shall contact the appropriate emergency response contractor as specified in our Hazardous Substance Cleanup & Disposal Services OA contract to ensure a timely response.

If a responsible party cannot be identified, then the response, characterization and disposal costs would become the responsibility of MoDOT (for either hazardous or non-hazardous substance responses). In those instances where an owner (responsible party) can be identified, MoDOT will seek cost recovery from the owner. If there has been a release, it will be necessary to coordinate with district Traffic personnel to write a permit to the responsible party or the emergency response contractor to allow cleanup on department property.

**Note:** Discovery of suspect mobile meth labs shall follow a variation of this process, as outlined in "Publication for Dealing with Mobile Meth Labs", due to the law enforcement aspect associated with this material.

**Reason for Policy:** RSMo 260.500 - 260.550 Environmental Control 40 CFR 260 - 261, MoDOT liability

**Effective Date:** 6/1/99

**Revision Dates:**

### 127.25.2.2 MoDOT Hazardous Material Spills

Refer to MoDOT's Hazardous Materials Reporting Procedures Training for guidance to reporting spills discovered along the highway. Hazardous material spills, and spills of other materials that leave MoDOT and enter waters of the state from MoDOT operations are the responsibility of the Department and will be reported to the MDNR ERR 24 hour hot line number immediately by the first Department employee to discover the spill. That employee will also notify their supervisor and the DHMC. An environmental specialist will also be notified of the spill. MoDOT employees will take immediate action to contain the release and clean up spilled material. Reporting will be made to the Missouri Department of Natural Resources (MDNR) Environmental Emergency Response (ERR) 573-634-2436 in accordance with MoDOT procedures and Missouri RSMo 260.500 through 260.550. If any of the material spilled comes in contact

**Top Ten Spill  
Prevention Items**

with waters of the state (creeks, springs, rivers, groundwater or ponds) the incident shall also immediately be reported to the National Response Center (NRC) at 800-424-8802. Incidents during the normal working day should be reported to the district as soon as possible. The District office should report to the Maintenance division as soon as possible. Should an incident occur after normal working hours, information should be telephoned to available maintenance personnel and contact an Environmental Specialist, Design Division at the contact numbers in the SPCC plan.

**Reason for Policy:** RSMo 260.500 - 260.550 Environmental Control

**Effective Date:** 6/1/99

**Revision Dates:**

## 127.25.3 Rest Areas

### 127.25.3.1 Rest Area Lagoon

All rest area lagoons shall have a current National Pollution Discharge Elimination System (NPDES) permit. These permits require the department to submit discharge samples results on a regular basis to the Missouri Department of Natural Resources. The department will comply with all requirements of the (NPDES) permits. Application for renewal shall be submitted to MDNR every five years at least 180 days prior to the expiration date of the permit. All NPDES permits must be kept current. The NPDES permit describes the limits and requirements for each specific site. These requirements include the discharge limits, frequency of sampling, location of sampling and where sample results are to be submitted. All reporting requirements and sample collection will be in compliance with the NPDES permit. A copy of the permit shall be readily available to the person who conducts sampling and report submittal.

**Reason for Policy:** RSMo 644 Water Pollution, Federal Water Pollution Control Act, Public Law 92-500, 92nd Congress

**Effective Date:** 6/1/99

**Revision Dates:**

### 127.25.3.2 Rest Area Drinking Water

All rest areas that are using on-site wells as the source of drinking water shall have a valid operating permit issued by the Missouri Department of Natural Resources (MDNR) Public Drinking Water Program (PDWP). Operation and maintenance of these wells shall be in accordance with the MDNR-PDWP rules and regulations pertaining to drinking water supplies. Rest areas that are served by a municipal or public water supply shall adhere to specific rules and regulations established by the water supplier concerning operation and maintenance of the water distribution system. For additional information see EPG 127.25.4.3 Well Closures and EPG 127.25.3.2.1 Well Drilling.

**Reason for Policy:** 10 CSR 60-1.010 Public Drinking Water

**Effective Date:** 6/1/99

**Revision Dates:**

### 127.25.3.2.1 Well Drilling

The following procedures are established for well drilling:

- The district office shall request the Department of Natural Resources (DNR), Research and Technical Information Division, Rolla, Mo., to advise the district office concerning the expected depth of the proposed well and the estimated casing depth.
- The district office will use the "Standard Bid Form - Well Drilling" to receive bids for the work from only licensed well drillers.
- The district shall appoint an employee who is familiar with well drilling to make regular inspections of the work in progress.

For additional information see EPG 127.25.3.2 Rest Area Drinking Water and EPG 127.25.4.3 Well Closures.

**Reason for Policy:** RSMo 256.000-256.640

**Effective Date:** 6/1/99

**Revision Dates:**

## 127.25.4 Water Management

### 127.25.4.1 Storm Water Regulations

MoDOT activities disturbing one acre or more of total land area require storm water permit authorization from the Missouri Department of Natural Resources (MDNR). This includes many construction and maintenance grading operations. The "MoDOT Operating Permit for Land Disturbance" from the MDNR authorizes these MoDOT grading activities so long as a site-specific storm water pollution prevention plan (SWPPP)

has been developed for the activity prior to commencing land disturbance. Some minimal impact activities, such as narrow linear, strip or ribbon construction or maintenance activities such as cleaning or routine maintenance of roadside ditches are exempt from the storm water permit requirements. Contact the MoDOT Environmental and Historic Preservation Section if you have questions.

**Additional Form Available**  
Missouri State Operating Permit for  
Land Disturbance  
**Additional Information**  
June 2012 Changes in the MO State  
Operating Permit for Land Disturbance

Note: The MDNR defines storm water as storm water runoff, snow melt runoff, surface runoff and drainage.

**Reason for Policy**

10 CSR 20-6.200 Missouri Department of Natural Resources, Water Pollution Control Program

**Effective Date:** 6/1/99

**Revision Dates:**

### **127.25.4.2 Maintenance Operations in Streams**

Activities in most streams are regulated by the U.S. Army Corps of Engineers (COE) and require 404 Permits. Districts shall contact the local COE Office or their wetland specialist prior to beginning any work in streams. The necessary permits for removal or placement of materials in the stream shall be obtained from the COE prior to conducting the work, unless emergency authorization has been given by the COE to do the work. Technical assistance can be obtained from the Design Division's Environmental Section in applying for a COE 404 permit. (Use the Request for Environmental Services Form for STIP jobs or contact your wetland specialist for typical maintenance projects.)

For additional information see - EPG 127.25.4.1 Storm Water Regulations.

#### **Reason for Policy**

The specific regulatory authority for the COE is based on the following laws: Rivers and Harbors Act of 1899 - Section 10; Clean Water Act - Section 404; Marine Protection Research and Sanctuaries Act of 1972 (amended) - Section 10333; and CFR 320 - 330 (Code of Federal Regulations) Water Quality Certification.

**Effective Date:** 6/1/99

**Revision Dates:**

### **127.25.4.3 Well Closures**

The proper abandonment of water wells is imperative to the protection of ground water. All wells not in use or planned to be used shall be properly closed to comply with the Water Drillers Act. A permitted water well, pump installer, monitoring well or heat pump installer shall oversee the closures. Contact an environmental specialist for guidance in well closures. See - EPG 127.25.3.2 Rest Area Drinking Water and EPG 127.25.3.2.1 Well Drilling.

**Reason for Policy:** RSMo 256.000 - 256.637 Geology, Water Resources and Geodetic survey 10 CSR 23-3.110

**Effective Date:** 6/1/99

**Revision Dates:**

## **127.25.5 Containers**

### **127.25.5.1 Fuel Storage Tanks**

Underground fuel storage tanks and their piping are required to have operational, approved leak,

corrosion and overflow protection and when necessary, vapor controls. A tank registration form shall be submitted to the Missouri Department of Natural Resources within 30 days of bringing a tank into use and when a change is made to the tank or ancillary equipment.

All above ground tanks shall be labeled as to their contents. Any facility that has any kind of oil storage capacity (55 gallons or larger containers) that totals 1320 gallons aggregate, is required to have a SPCC plan. All containers of oil are required to have secondary containment with sufficient capacity to hold the largest container plus the maximum expected rainfall. The plan must be made available to an EPA inspector if requested during an on-site inspection.

Tanks that exceed the minimum reportable quantity of hazardous material require an NFPA 704 Hazard Communication sign. For additional information see EPG 127.25.5.1.1 Fuel Pump Calibration and EPG 127.25.5.1.2 Fuel.

**Reason for Policy:** 40 CFR 112

**Effective Date:** 6/1/99

**Revision Dates:**

#### **127.25.5.1.1 Fuel Pump Calibration**

Fuel pumps shall be calibrated annually except for those that have a history of reporting errors, or when normal tracking of petroleum usage indicates that there is a problem. Those pumps that are showing unacceptable variances should be calibrated as needed and corrections made until the problem is solved or the pump is replaced.

For additional information see EPG 127.25.5.1 Fuel Storage Tanks.

**Reason for Policy:** MoDOT inventory requirement to eliminate petroleum theft.

**Effective Date:** 6/1/99

**Revision Dates:**

#### **127.25.5.1.2 Fuel**

The department and the Highway Patrol (MSHP) shall work together at selected maintenance locations to reduce the duplicate investment in fuel storage and dispensing equipment. This cooperative effort shall be accomplished in two ways:

- The MSHP tank will be removed and they will fuel from MoDOT's tank.
- The Patrol may fuel from their above ground tank with MoDOT taking over the responsibility of the tank as if it were their own. This would include ordering fuel for this tank as well as for the maintenance tank.

The first option will be used for any new installation of above ground setups. The second option will be used where the Patrol already has an approved above ground system.

MoDOT will not provide gasoline for those locations where that product is not otherwise needed by the department. Other state agencies, authorized by Business and Benefits, will be allowed to receive gasoline and/or diesel fuel at maintenance lots.

For additional information see EPG 127.25.5.1 Fuel Storage Tanks.

**Reason for Policy:** Reduce cost of operation. Assist MSHP with their operations in accordance with an agreement between MoDOT and MSHP.

**Effective Date:** 6/1/99

**Revision Dates:**

### **127.25.5.2 Herbicide Containers**

Instructions on container labels shall be followed for storage, use and disposal of containers and their contents. Empty herbicide containers shall be triple rinsed with water and the rinsate reused in mixing operations. The container shall be returned to the supplier or disposed of in a permitted sanitary landfill or sent to a recycler. To dispose of containers containing some herbicide material or an out of specification herbicide, contact an environmental specialist for assistance.

**Reason for Policy:** RSMo 260 Environmental Control, RSMo 281 Pesticides

**Effective Date:** 6/1/99

**Revision Dates:**

### **127.25.5.3 Empty Drums and Containers**

All empty (less than an inch of product remaining) containers, including 55 gallon drums, shall have all openings closed with containers stored on their sides to prevent rainwater from mixing with product residues.

**Reason for Policy:** 40 CFR 260 – 261; 10 CSR 25. Prevent the formation of large quantities of used products that require complying with Hazardous Waste Regulation

**Effective Date:** 6/1/99

**Revision Dates:**

## **127.25.6 Environmental Compliance**

### **127.25.6.1 Threatened or Endangered Species**

All MoDOT Maintenance activities shall be conducted in a manner that does not impact any Federally or State listed threatened or endangered species or their critical habitat. If an activity will impact a listed species, MoDOT must conduct formal consultation with the U.S. Fish and Wildlife Service and obtain a

Biological Opinion prior to conducting the activity.

Prior to starting any new activities (mowing, spraying, etc.) or changing methods for conducting established activities maintenance personnel should contact Alan Leary at (573) 526-6678 or Bree McMurray at (573) 526-0606 to determine if the activity will impact any rare species or critical habitat.

**Reason for Policy:** 50 CFR 17 Endangered Species Act, 3 CSR 10-4.111, State Endangered Species Rule

**Effective Date:** 6/1/99

**Revision Dates:**

### **127.25.6.2 Tier II Reporting**

A copy of the Tier II Reporting form shall be clearly posted on a bulletin board in each maintenance building. Tier II refers to state and federal Emergency Planning Community Right-to-Know Act (EPCRA).

**Reason for Policy:** RSMo 292.606 Missouri Emergency Planning and Community Right-to-Know Act

**Effective Date:** 6/1/99

**Revision Dates:**

## **127.25.7 Hazardous Waste**

### **127.25.7.1 Hazardous Waste Compliance**

The department shall comply with all Federal (RCRA) and State (MDNR) regulations regarding waste materials. This includes the generation, transportation, storage, and disposal of hazardous waste. If you have reason to think your site or location is producing a hazardous waste you should contact the district Hazardous Material Spill Coordinator or an environmental specialist in the Design Division.

**Reason for Policy:** 10 CSR 25-1.010 and 10 CSR 25-14.010, Missouri Hazardous Waste Management Regulations, RSMo. 260, 40 CFR 260 - 265.

**Effective Date:** 6/1/99

**Revision Dates:**

### **127.25.7.2 When a Product Becomes a Waste**

Generators must use products for their intended purpose. A product can become a waste if a facility does not properly store the material or the product is beyond its shelf life. If a generator is no longer using the product, it must be properly disposed and not abandoned or stored. A facility storing a material that is a hazardous waste must comply with Missouri's hazardous waste regulations.

Missouri Department of Natural Resources has produced the Waste or Product Determination Guidance to provide criteria to consider when a product becomes a waste.

**Reason for Policy:** 10 CSR 25-1.010 and 10 CSR 25-14.010, Missouri Hazardous Waste Management Regulations, RSMo. 260, 40 CFR 260 - 265.

### **127.25.7.3 Lead Based Paint Abatement**

The following activities involving lead paint abatement currently require licensing of personnel and project notification to the Department of Health & Senior Services (DHSS):

- 1) any testing or identification of lead-based paint on the surface of structures,
- 2) determinations of whether a painted structure is a lead hazard because of deteriorated paint, and
- 3) performance of lead abatement activities.

MoDOT has entered into a Memorandum of Understanding (MOU) with the DHSS that stipulates the above requirements will be followed for all MoDOT-let lead abatement projects. Specific requirements include:

- 1) all contractors and subcontractors performing lead abatement activities must be licensed as Missouri lead abatement contractors. Additionally, employees of the contractors performing lead abatement activities are required to be licensed as Missouri lead abatement supervisor(s) and/or workers,
- 2) the MoDOT Resident Engineer (RE) shall provide notification to DHSS through the submittal of a lead abatement project funding agency notification form which is required to be submitted 10 days prior to the onset of lead abatement projects, and
- 3) the contractor shall also provide notification to DHSS through the submittal of a lead abatement project notification form which is required to be submitted 10 days prior to the onset of lead abatement projects.

Information on both the MOU and contractor information for lead work activities is available.

Lead based paint removed from any surface is considered a hazardous waste. Lead based paint removed from steel structures or buildings shall be containerized, labeled and disposed of at an approved hazardous waste facility. In some instances the lead paint and blast material may be recycled and exempted as a hazardous waste. Contact an Environmental Specialist for assistance or additional information.

**Reason for Policy:** 40 CFR 260 – 265 and 40 CFR 268, RSMo 260, 10 CSR 25-4.010, Hazardous Waste Management.

701.300-701.332, RSMo and 19 CSR 30-70.600(19)

Lead Abatement and Assessment Licensing, Training Accreditation.

**Effective Date:** 6/1/99

**Revision Dates:**

### 127.25.7.4 Equipment Cleaning Fluids

The department shall make every effort to purchase fluids that do not exhibit any characteristics of hazardous materials which would result in the generation of a hazardous waste when used. These characteristics include the following:

- A flash point of 140 degrees Fahrenheit or less
- Corrosive, a pH of equal to or less than 2 or equal to or greater than 12.5
- Reacts violently with water
- Listed as a toxic hazardous waste
- Product must be on MREP products list

An example of exceptions to this policy are cleaners for electronic equipment because adequate non hazardous alternatives are not available.

**Reason for Policy:** Clean Water Act, Solid Waste Law, Hazardous Waste Law. MoDOT desires to produce as few hazardous wastes as possible. Chlorinated solvents pose a health risk to employees .

**Effective Date:** 6/1/99

**Revision Dates:**

### 127.25.7.5 Used Oil

The department shall store used oil, prior to shipment off-site, in containers that are in good condition, void of leaks and labeled with the words used oil. All containers of oil are required to be included in the SPCC plan and have secondary containment with sufficient capacity to hold the largest container plus the maximum expected rainfall.

**NOTE:** Used petroleum fluids such as gear lube, transmission oil and hydraulic oil are defined as used oils. Mixing of small amounts of other solvents may be possible with prior approval from the contractor. **Never put antifreeze in a used oil container.** Records of contracts, shipper name and identification number, dates of shipment, quantity and type of oil and the processor's name and permit number shall be kept on file.

**Reason for Policy:** 10 CSR 25-11, Hazardous Waste Program.

**Effective Date:** 6/1/99

**Revision Dates:**

### 127.25.7.6 Hazardous Waste Reporting

The department must file a quarterly summary report for all MoDOT hazardous waste shipments from the large quantity generator sites with the Missouri Department of Natural Resources (MDNR). Annual reports are required for small quantity and one-time shipment sites. A copy of the hazardous waste manifest document shall be forwarded to the district hazardous materials spill coordinator, after it is received from the hazardous waste facility, and sent to the support center. If the hazardous waste

manifest is not received from the hazardous waste facility within 45 days, an exception report must be filed with MDNR.

**Reason for Policy:** 10 CSR 25-5.262 Missouri Hazardous Waste Management Regulations.

**Effective Date:** 6/1/99

**Revision Dates:**

## 127.25.8 General

### 127.25.8.1 Open Burning

There shall be no open burning of trade waste or refuse generated by the department at any of its facilities except for open burning of tree trunks, limbs and vegetation at the point of generation, unless permitted. Restrictions concerning open burning:

- 10 CSR 10-2.100 Kansas City Metropolitan Area
- 10 CSR 10-3.030 Out State Missouri
- 10 CSR 10-4.090 Springfield Green County Area
- 10 CSR 10-5.070 St. Louis Metropolitan Area

Contact individual county planning and zoning offices for areas requiring compliance. Trade wastes are defined as solid, liquid, or gaseous material resulting from construction or the prosecution of any business, trade or industry or any demolition operations including, but not limited to cardboard, plastics, cartons, grease, oil, chemicals or cinders. Trade wastes include scrap lumber and wooden shipping pallets. Refuse is defined as garbage, rubbish, trade waste, leaves, salvageable material, agricultural wastes or other wastes.

**Reason for Policy:** Comply with State Regulations Air Pollution Control Law and Regulations 10 CSR 10-6, Air Pollution Control Program RSMo 643.

**Effective Date:** 6/1/99

**Revision Dates:**

### 127.25.8.2 Lead Mining Chat

Lead mining chat encapsulated in asphalt or concrete, may be used for highway construction. Refer to Missouri Standard Specifications for Highway Construction 1001.12. For additional information see EPG 127.25.8.2.1 Abrasives

**Reason for Policy:** MDH Health Study established to protect the health of workers and persons living along roadways. Air Pollution Control Law and Regulations 10 CSR 10-6, Air Pollution Control Program, RSMo 643, 40 CFR 260 – 265 and 268; RSMo 260, 10 CSR 25-4.010, Hazardous Waste Management.

**Effective Date:** 6/1/99

**Revision Dates:****127.25.8.2.1 Abrasives**

The maximum aggregate size for abrasives shall not exceed 3/8 inch. Lead mining chat (within established limits) may be used for general maintenance purposes. See Missouri Standard Specifications for Highway Construction Sec 1001.12 for established lead limits in mining by-product aggregates.

For additional information see EPG 127.25.8.2 Lead Mining Chat.

**Reason for Policy:** Experience has shown that an aggregate size larger than 3/8 in. is ineffective and contributes to broken windshields. Mine tailings may contain environmentally unsafe materials.

**Effective Date:** 6/1/99

**Revision Dates:** 6/17/03

**127.25.8.3 Sewage Disposal System**

Where a sewage system at a present maintenance site is being modified or when a sewage system is being designed for a new facility, the department shall consider the feasibility of connecting onto a publicly owned waste water treatment plant (POTW). If it is not economically feasible to connect to a POTW, an on-site sewage treatment system shall be considered. The required construction permit shall be obtained from the Missouri Department of Health or the Missouri Department of Natural Resources, Water Pollution Control Program, prior to construction. For additional information see EPG 127.25.8.3.1 Industrial and Domestic Waste Waters on Right of Way

**Reason for Policy:** RSMo 701.025 - 701.059 State Standards, RSMo 644 Water Pollution Control Program, Federal Clean Water Act 33 U.S.C. §§ 1251-1387

**Effective Date:** 6/1/99

**Revision Dates:**

**127.25.8.3.1 Industrial and Domestic Waste Waters on Right of Way**

Sewage and waste shall be disposed of by discharging into a sewer system regulated pursuant to chapter 644, RSMo, or shall be disposed of by discharging into an on-site sewage disposal system operated as defined by rules promulgated pursuant to sections 701.025 to 701.059, RSMo. Any person installing on-site sewage disposal systems shall be registered to do so by the Missouri Department of Health and Senior Services.

Private homeowners are regulated by the Missouri Department of Health and Senior Services. The Missouri Department of Health and Senior Services is to be contacted when wastewater discharge from private homeowners is found on right of way. If a property owner requires assistance in containing effluent, they should be directed to the Department of Health for assistance.

Commercial businesses and industries are regulated by MDNR. When wastewater discharge from a

- regulated entity is discovered on MoDOT right of way, the Environmental Specialist will contact MDNR to determine if the commercial business or industry has a valid operating permit issued by MDNR to discharge effluent.

The Environmental Specialist will request MDNR to take whatever legal action necessary concerning any business or industry that does not have a valid permit from MDNR to discharge effluent to the highway right of way.

For additional information see EPG 127.25.3.1 Rest Area Lagoon, EPG 127.25.8.3 Sewage Disposal System, and EPG 127.25.8.3.2 System Attachments by Others.

**Reason for Policy:** RSMo. 701

**Effective Dates:** 6/1/99

**Revision Dates:** 12/27/12

#### **127.25.8.3.2 System Attachments by Others**

Piped connections to the drainage system are prohibited unless approved by the district engineer. In situations where connections are permitted, plans and specifications are required and they must meet MoDOT specifications. If approved, the work shall be done under an approved permit and/or a Missouri Highway and Transportation Commission Agreement. Attachments to bridges and large box culverts that qualify as bridges should be referred to the Bridge Division for review.

For additional information see EPG 127.25.8.3.1 Industrial and Domestic Waste Waters on Right of Way.

**Reason for Policy:** Protect MoDOT from possible litigation. Protect the current drainage system.

**Effective Date:** 6/1/99

**Revision Dates:** 12/27/12

#### **127.25.8.4 Vehicle Placarding**

Department vehicles transporting regulated quantities of hazardous waste shall be placarded. MoDOT is exempt from placarding asphalt distributors and product shipments.

**Reason for Policy:** 49 CFR 105-177 U.S.DOT, 10 CSR 25-6.010, Missouri Hazardous Waste Regulations

**Effective Date:** 6/1/99

**Revision Dates:**

#### **127.25.8.5 Fugitive Dust**

The department shall operate in a manner that minimizes and/or prevents fugitive dust from going

beyond MoDOT property lines or off right of way. Dust from operations such as concrete sawing, crack and joint repair, street sweeping and roadway rotomilling shall be contained on department property.

**Reason for Policy:** 10 CSR 10-6.170, Air Pollution Control Program. Provide driving conditions free from dust obstructions.

**Effective Date:** 6/1/99

**Revision Dates:**

### **127.25.8.6 Vehicle Painting**

A permit may be required for vehicle painting using power spray operations at maintenance buildings. When required, such permits shall be acquired prior to initiation of painting operations. Painting with a brush or touch up painting with an aerosol can does not required a permit.

**Reason for Policy:** 10 CSR 10-6.020, Air Pollution Control Program

**Effective Date:** 6/1/99

**Revision Dates:**

### **127.25.8.7 Environment Site Assessment**

All properties to be disposed of or purchased shall have an environmental review conducted prior to selling or purchasing. Environmental reviews are conducted for the benefit of the department to identify existing or potential environmental liability that could be connected with a particular piece of property. Environmental reviews shall be conducted by an environmental specialist from the Support Center.

**Reason for Policy:** Reduce MoDOT liability.

**Effective Date:** 6/1/99

**Revision Dates:**

### **127.25.8.8 Salt Runoff**

Measures shall be implemented that will eliminate damage to adjacent property from maintenance lot salt runoff. Salt and salt mix shall be placed under waterproof cover while it is stored. For additional information see EPG 127.25.8.8.1 Storage

**Reason for Policy:** RSMo 644 Water Pollution, Federal Clean Water Act 33 U.S.C. §§ 1251-1387. There have been a number of incidents in which salt, salt brine, and liquid calcium chloride runoff or spillage from the storage of salt has caused environmental damage. Storm water runoff from salt piles, brine and calcium storage tanks and mixing areas has proven to be detrimental to aquatic life and vegetation.

**Effective Date:** 6/1/99

**Revision Dates:****127.25.8.8.1 Storage**

Chemicals and stockpiles of treated abrasives are to be stored in a manner to prevent loss of material and prevent damage to State or private property. All bulk salt shall be stored inside covered storage structures. Asphalt pads are to be constructed under and in front of all storage facilities. Mixed materials shall be covered when not in use and between storm events.

For additional information see EPG 127.25.8.8 Salt Runoff.

**Reason for Policy:** Prevent loss of material and drainage to private property. Most salt runoff damage comes from mixed piles.

**Effective Date:** 6/1/99

**Revision Dates:** 6/17/03

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Category: 127 MoDOT and the Environment

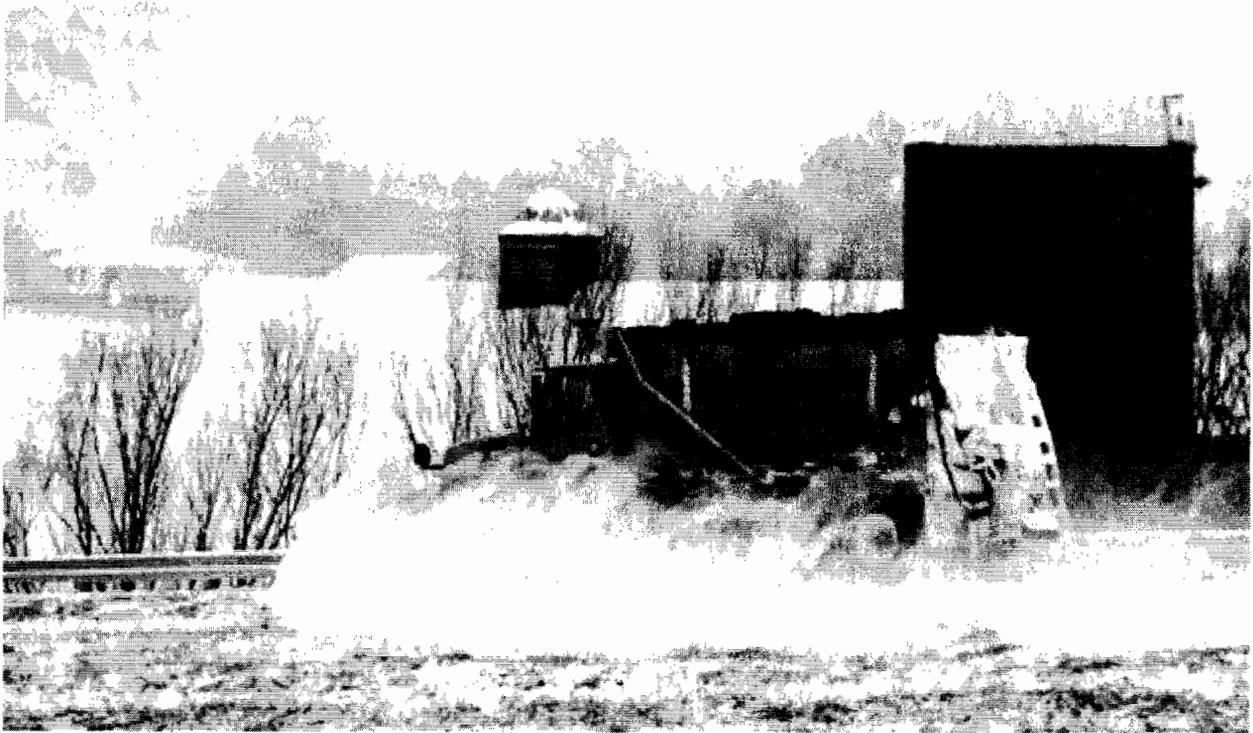
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- This page was last modified on 2 September 2014, at 12:11.



# Category:133 Snow and Ice Control

## From Engineering Policy Guide



This article is to be used by Maintenance and other MoDOT personnel to execute daily assignments and deal with external customers. Materials and equipment used in snow and ice control are addressed in this article. Districts may use any safety sensitive personnel designated by the district engineer in emergency situations and as indicated by the particular emergency. Snow and ice control operations as well as the Operator's Guide for Anti-Icing are included in this article.

### Contents

- 1 Anti-Icing
- 2 Operational Closure
- 3 Intent
- 4 Winter Operations Communication Plan

### Related Information

Incident Response Plan and Emergency Response Management  
 MoDOT Snow Academy Official Guide, Participant's Manual and Snow Academy Website

### Snow Plowing Practices

Summary 2009

**See also:** Innovation Library

## Anti-Icing

Anti-icing is the snow and ice control practice of preventing snow or ice from bonding to the pavement. Anti-icing forms the basis of MoDOT's snow and ice control program. De-icing will be practiced if and

when weather conditions render anti-icing activities ineffective.

Reason for policy: National research shows anti-icing to be the most cost effective snow and ice control program.

Effective Date: 6/1/99  
Revision Dates: 6/17/03

## Operational Closure

In the event a storm reaches an intensity that the continuation of operations would prove ineffective or would pose an undue safety risk for MoDOT personnel and/or the traveling public, snow and ice control activities should be shut down until weather conditions have improved. The district engineer or designee is responsible for making a closure decision. The MoDOT Emergency Operation Center (EOC) is to be notified of any such closure decision.

Reason for policy: Reserve department resources for when they can be used more effectively

Effective Date: 6/1/99  
Revision Dates: 6/17/03, 10/14/05

## Intent

Snow and ice control operations should begin as soon as weather conditions warrant and continue on a 24-hour per day basis until all objectives outlined in this policy are met and sustained. Refer to EPG 133.4 Snow and Ice Control Operations.

Reasons for policy: Meet customer needs and set statewide performance standards.

Effective Date: 6/1/99  
Revision Dates: 6/17/03, 10/14/05, 12/01/06, 8/16/07, 9/01/10

## Winter Operations Communication Plan

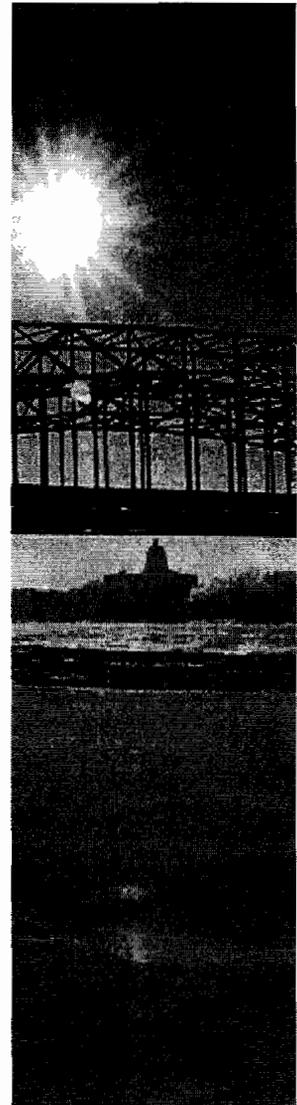
Communication is critical to enhancing situational awareness during winter weather events. Communication between maintenance buildings, maintenance areas, districts and the central office is necessary to understand where the greatest needs are for resources during any particular event, but more so during major winter storms that affect a good portion of the state. Each district shall have a communication plan in place to disseminate information between the buildings, areas and district office.

The following guidelines shall be used to facilitate communication between districts and between districts and the central office before and during winter events.

- As storms begin in a district, that district shall contact the neighboring district in the direction that the storm is moving to inform them of the timing and intensity of the storm.
- Contact with neighboring districts after normal working hours, prior to the other district activating their EOC, can be made using the snowstorm contacts and phone numbers. Refer

to [http://wwwi/intranet/tr/emerg\\_response.htm](http://wwwi/intranet/tr/emerg_response.htm) for links to the Emergency Contact List, which is part of the Incident Response Plan.

- During a storm, contact can be made using the other district's Emergency Operation Center (EOC) phone number or by contacting the neighboring Maintenance personnel directly.
- Each Maintenance manager (from Maintenance Supervisor on up) shall have a list of cell phone numbers and radio call numbers for all surrounding Maintenance managers, including those in neighboring districts, to coordinate continuity of route treatments between areas and districts.
- Each Maintenance manager whose area borders other states shall have a contact list for their counterparts in those bordering states to share storm information and, if possible, coordinate continuity of route treatments.
- Each district shall call the central office EOC phone number to announce activation and deactivation of the district EOC, and to notify the central office EOC of any incidents with statewide significance.
- Central office EOC will send updates to appropriate email distribution list(s) with district EOC activation/deactivation information, as well as any major incident information.
- Conference calls will be scheduled for all districts and the Central Office EOC at times designated by the Asst. Chief Engineer, State Maintenance Engineer and/or State Traffic Engineer.



## Articles in "133 Snow and Ice Control"

The following 5 pages are in this category, out of 5 total.

1

- 133.1 Materials for Snow and Ice Control
- 133.2 Equipment for Snow and Ice Control
- 133.3 Snow and Ice Control Personnel
- 133.4 Snow and Ice Control Operations
- 133.5 Operator's Guide for Anti-Icing

Retrieved from "[http://epg.modot.org/index.php?title=Category:133\\_Snow\\_and\\_Ice\\_Control](http://epg.modot.org/index.php?title=Category:133_Snow_and_Ice_Control)"

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# 133.5 Operator's Guide for Anti-Icing

## From Engineering Policy Guide



Anti-icing is the snow and ice control practice of preventing the development of a bond between snow and/or ice and the pavement surface with the timely application of salt. Applying the right amount of salt at the right time will make snow removal operations more efficient and

produce safer driving conditions during winter storms.

This article provides guidelines for the application of salt to the roadway for a variety of winter storm conditions. The timing and application rates were developed under the SHRP/FHWA Research Program, in which MoDOT participated. Many Maintenance personnel who have tested these procedures have found them to be valuable in their winter maintenance operations. The statewide implementation of this technology will help produce safer driving conditions on MoDOT's continuous operations routes during winter months.

### Contents

- 1 133.5.1 Operations Guide for Maintenance Field Personnel
- 2 133.5.2 Glossary
- 3 133.5.3 Tables
  - 3.1 Table 133.5.3.1 How to Use Liquid Anti-Icers
  - 3.2 Table 133.5.3.2 Equivalent Salt Spread Rates
  - 3.3 Table 133.5.3.3 Pure salt concentration and corresponding specific gravity (measured by a hydrometer) at 59° F
  - 3.4 Table 133.5.3.4 Gradation of salt specified by ASTM D 632 & MoDOT
  - 3.5 Table 133.5.3.5 Proportions for preparing sodium chloride solution from commercial grade salt (i.e., up to 5 percent impurities)
  - 3.6 133.5.3.6 Tables for Continuous Operations Routes
    - 3.6.1 Table 133.5.3.6.1 Type 5 Winter Event: Frost, Flurries, Freezing Fog, Blowing Snow and Refreeze
    - 3.6.2 Table 133.5.3.6.2 Type 4 Winter Event: Dusting to 1 in. of snow, sleet, or other frozen precipitation
    - 3.6.3 Table 133.5.3.6.3 Type 3 Winter Event: 1 – 6 in. of snow/frozen precipitation in 24 hours OR a trace to 1/2 in. of ice
    - 3.6.4 Table 133.5.3.6.4 Type 2 Winter Event: 6 – 12 in. of snow in 24 hours OR 1/2 to 3/4 in. of ice
    - 3.6.5 Table 133.5.3.6.5 Type 1 Winter Event: More than 12 inches of snow in 24 hours OR more than 3/4 inch of ice

Tables	Printable pdf files
How to Use Liquid Anti-Icers	How to Use Liquid Anti-Icers
Equivalent Salt Spread Rates	Equivalent Salt Spread Rates
Pure salt concentration and corresponding specific gravity (measured by a hydrometer) at 59° F	Pure salt concentration and corresponding specific gravity (measured by a hydrometer) at 59° F
Gradation of salt specified by ASTM D 632 and MoDOT	Gradation of salt specified by ASTM D 632 and MoDOT
Proportions for preparing sodium chloride solution from commercial grade salt (i.e., up to 5 percent impurities)	Proportions for preparing sodium chloride solution from commercial grade salt (i.e., up to 5 percent impurities)
Type 5 Winter Event: Frost, Flurries, Freezing Fog, Blowing Snow and Refreeze	Type 5 Winter Event
Type 4 Winter Event: Dusting to 1 in. of snow, sleet, or other frozen precipitation	Type 4 Winter Event
Type 3 Winter Event: 1 – 6 in. of snow/frozen precipitation in 24 hours OR a trace to 1/2 in. of ice	Type 3 Winter Event
Type 2 Winter Event: 6 – 12 in. of snow in 24 hours OR 1/2 to 3/4 in. of ice	Type 2 Winter Event
Type 1 Winter Event: More than 12 inches of snow in 24 hours OR more than 3/4 inch of ice	Type 1 Winter Event

## 133.5.1 Operations Guide for Maintenance Field Personnel

This is a guide to highway anti-icing operations for Maintenance field personnel. Its purpose is to recommend maintenance actions for *preventing* the formation or development of packed and bonded snow or bonded ice on the **continuous operations routes** during a variety of winter weather events. It is intended to complement the decision-making and management practices of a systematic anti-icing program so that **continuous operations routes** can be efficiently maintained in the best possible condition.

These guidelines are based on the results of four years of anti-icing field testing conducted by 15 state DOTs, including MoDOT, and is supported by the Strategic Highway Research Program (SHRP) and the Federal Highway Administration (FHWA). Since then, it has been augmented with many additional years of anti-icing experience in different parts of our state.

Guidance for anti-icing operations during five winter weather events is available. The five events are:

- Type 5 Winter Event: Frost, flurries, freezing fog, blowing snow & refreeze
- Type 4 Winter Event: Dusting to 1 in. of snow, sleet or other frozen precipitation
- Type 3 Winter Event: 1 – 6 in. of snow/frozen precipitation in 24 hours OR a trace to ½ in. of ice
- Type 2 Winter Event: 6 – 12 in. of snow in 24 hours OR ½ to ¾ in. of ice
- Type 1 Winter Event: More than 12 in. of snow in 24 hours OR more than ¾ in. of ice

The tables suggest the appropriate maintenance action to take during initial and follow-up anti-icing operations for a given precipitation or icing event. Each action is defined for a range of pavement temperatures and an associated temperature trend. For some events the operation is dependent not only on the pavement temperature and trend, but also upon the pavement surface or the traffic condition at the time of the action. Many of the maintenance actions involve the application of salt in either a dry solid, pre-wetted or brine (liquid) form. Pre-wetted solid and brine are the two primary forms on which we need to concentrate. Application rates are given for each form where appropriate. **These are suggested rates and should be adjusted, if necessary, to achieve the effectiveness for local conditions.**

#### Related Information

MoDOT Snow Academy Official Guide,  
Participant's Manual and Snow Academy  
Website

Comments and notes are given in each table where appropriate to further guide field maintenance personnel for their anti-icing operations.

## 133.5.2 Glossary

**Black ice.** Popular term for a very thin coating of clear, bubble-free, homogenous ice which forms on a pavement with a temperature at or slightly above 32° F when the temperature of the air in contact with the ground is below the freezing-point of water and small slightly supercooled water droplets deposit on the surface and coalesce (flow together) before freezing.

**Brine.** Water saturated with common salt (NaCl), also liquid salt or liquid chemical.

**Continuous Operations Routes.** This system includes all major highways, minor highways with traffic volumes of 2,500 ADT or greater and other urban and community routes designated by the district in consultation with the Maintenance Division. This also includes all designated incident bypass routes.

These routes will receive plowing and application of snow and ice control treatments on an as needed basis, throughout the storm until all lanes are restored to a near normal condition.

**Dew Point.** The temperature that a vapor begins to condense.

**Freezing rain.** Super-cooled droplets of liquid precipitation falling on a surface whose temperature is below or slightly above freezing, resulting in a hard, slick, generally thick coating of ice commonly called glaze or clear ice. Non-super-cooled raindrops falling on a surface whose temperature is well below freezing will also result in glaze.



Preparing for winter weather in  
Butler County

**Frost.** Also called hoarfrost. Ice crystals in the form of scales, needles, feathers or fans deposited on surfaces cooled by radiation or by other processes. The deposit may be composed of drops of dew frozen after deposition and of ice formed directly from water vapor at a temperature below 0° C (32° F) (sublimation).

**Light Snow.** Snow falling at the rate of less than 1/2 in. per hour; visibility is not affected adversely.

**Moderate or heavy snow.** Snow falling at a rate of 1/2 in. per hour or greater; visibility may be reduced.

**Pre-treatment.** This is the practice of applying salt brine at 44 gallons per lane mile to dry pavement prior to the winter event, or the application of pre-wetted salt to the surface prior to snow and ice bonding to the pavement.

**Pre-wetting.** Pre-wetting is the practice of applying salt brine to dry salt before it is placed on the pavement, and should be done at 10 to 15 gallons per ton. Liquid calcium chloride may be used for pre-wetting salt at temperatures below 15° F.

**Sleet.** A mixture of rain and of snow that has been partially melted by falling through an atmosphere with a temperature slightly above freezing.

**Slush.** Accumulation of snow that lies on an impervious base and is saturated with water in excess of its freely drained capacity. It will not support any weight when stepped or driven on but will "squish" until the base support is reached.

**Spread Rate.** The salt application rate in either the solid or liquid form. For solid applications it is simply the weight of the salt applied per lane mile. For liquid applications it is the volume (gallons) of brine applied per lane mile.

### 133.5.3 Tables

**Table 133.5.3.1 How to Use Liquid Anti-Icers**

*Pounds of Ice Melted per Pound of Salt*

Temperature, ° F	One Pound of Salt (sodium chloride)
30	46.3 lbs. of ice
25	14.4 lbs. of ice
20	8.6 lbs. of ice
15	6.3 lbs. of ice
10	4.9 lbs. of ice
5	4.1 lbs. of ice
0	3.7 lbs. of ice

Printable pdf of "Equivalent Salt Spread Rates"

**Table 133.5.3.2 Equivalent Salt Spread Rates**

Solid or Pre-wetted Solid (lbs./lane-mile)	Salt Brine, 23% Concentration NaCL (gallon/lane-mile)
25	11
50	22
75	33
100	44
125	55
150	65
200	87

Printable pdf of "Pure salt"

**Table 133.5.3.3 Pure salt concentration and corresponding specific gravity (measured by a hydrometer) at 59° F**

concentration and corresponding specific gravity (measured by a hydrometer) at 59° F"

Percent salt	Specific gravity at 59° F	Percent of saturation	Weight <sup>1</sup> of salt, lb/gal
0	1.000	0	0
5	1.035	20	0.43
6	1.043	24	0.52
7	1.050	28	0.61
8	1.057	32	0.71
9	1.065	36	0.80
10	1.072	40	0.90
11	1.080	44	0.99
12	1.087	48	1.00
13	1.095	52	1.10
14	1.103	56	1.29
15	1.111	60	1.39
16	1.118	63	1.49
17	1.126	67	1.60
18	1.134	71	1.71
19	1.142	75	1.81
20	1.150	79	1.92
21	1.158	83	2.03
22	1.166	87	2.14
23	1.175	91	2.26
24	1.183	95	2.37
25	1.191	99	2.45
25.2	1.200	100	

<sup>1</sup>Note: Weight of commercial salt required = (weight of pure NaCl from table) ÷ (purity in percent)

Printable pdf of "Gradation of salt specified by ASTM D 632 and MoDOT"

**Table 133.5.3.4 Gradation of salt specified by ASTM D 632 & MoDOT**

Sieve size	Weight % passing		
	ASTM Gr. 1	ASTM Gr. 2	MoDOT
3/4 in.	-	100	-
1/2 in.	100	-	100
3/8 in.	95-100	-	95-100
No. 4	20-90	29-100	15-95
No. 8	10-60	10-60	5-65
No. 30	0-15	0-15	0-15

Note: ASTM Gr. 1 is the most commonly used gradation in the U.S.

**Table 133.5.3.5 Proportions for preparing sodium chloride solution from commercial grade salt (i.e., up to 5 percent impurities)**

Printable pdf of "Proportions for preparing sodium chloride solution from commercial grade salt"

Actual % NaCl	Weight NaCl		Crystallization temperature, ° F	Weight per unit volume of solution, lb/gal
	per volume solution, lb/gal	per volume water, lb/gal		
10	0.9	0.8	20	8.95
15	1.4	1.3	12	9.28
20	1.9	1.7	0	9.6
23 <sup>1</sup>	2.3	1.9	-6	9.76
25	2.5	2.1	-16	10.3

<sup>1</sup> Note: This is the approximate eutectic composition, i.e., the composition that results in the lowest temperature at which a solution can exist while remaining completely liquid.

**133.5.3.6 Tables for Continuous Operations Routes**

**Table 133.5.3.6.1 Type 5 Winter Event: Frost, Flurries, Freezing Fog, Blowing Snow and Refreeze**

Printable file for "Type 5 Winter Event"

*Continuous Operations Routes*

Pavement Temperature Range and Trend	Traffic Condition	Initial Operation			Subsequent Operations			Comments
		Maintenance Action	Spread Rates		Maintenance Action	Spread Rates		
			Pre-wetted solid salt (lb/lane-mile)	Brine (gal/lane-mile)		Pre-wetted solid salt (lb/lane-mile)	Brine (gal/lane-mile)	
Above 32° F, steady or rising	Any level	None, see comments	-	-	None, see comments	-	-	1) Monitor pavement temperature closely; begin treatment if starts to fall to 32°F and below and is at or below dew point.
28° F to 32° F, remaining in range or falling to 32° F or below, and equal to or below dew point	Traffic rate less than 100 vehicles per hr	Apply brine or pre-wetted solid salt	25-65	11-28	Reapply pre-wetted solid salt as needed	25-65	-	1) Monitor pavement closely; if pavement becomes wet or if thin ice forms, reapply salt at higher indicated rate.
	Traffic rate greater than 100 vehicles per hr	Apply brine or pre-wetted solid salt	25-65	11-28	Reapply brine pre-wetted solid salt as needed	25-65	11-28	2) Do not apply brine on ice so thick that the pavement cannot be seen.
								1) Monitor pavement closely; if thin ice forms, reapply salt at higher indicated rate. 2) Applications will need

20 to 28° F, remaining in range and equal to or below dew point	Any level	Apply brine or pre-wetted solid salt	65-130	28-57	Reapply brine pre-wetted solid salt as needed	65-130	28-57	to be more frequent at higher levels of condensation; if traffic volumes are not enough to disperse condensation, it may be necessary to increase frequency.  3) It is not advisable to apply a brine at the indicated spread rate when the pavement temperature drops below 20°F.
10° to 20° F, remaining in range and equal to or below dew point	Any level	Apply pre-wetted solid salt	130-200	-	Reapply pre-wetted solid salt as needed	130-200	-	1) Monitor pavement closely; if thin ice forms, reapply salt at higher indicated rate.  2) Applications will need to be more frequent at higher levels of condensation; if traffic volumes are not enough to disperse condensation, it may be necessary to increase frequency.
Below 0° F, steady or falling	Any level	Apply abrasives	-	-	Apply abrasives as needed	-	-	1) Monitor pavement closely, salt will have limited melting power in this temperature range.  2) Liquid calcium chloride may be used for pre-wetting salt/abrasive mix at colder temperatures.
<p><b>Notes: TIMING.</b> 1) Conduct initial operation in advance of freezing. Apply brine up to 3 hr in advance. Use longer advance times in this range to effect drying when traffic volume is low. Apply pre-wetted solid salt 1 to 2 hr in advance. 2) In the absence of precipitation, brine at 33 gal/lane-mi has been successful in preventing bridge deck icing when placed up to 4 days before freezing on higher volume roads and 7 days before on lower volume roads.</p>								

Table 133.5.3.6.2 Type 4 Winter Event: Dusting to 1 in. of snow, sleet, or other frozen precipitation

Printable file for "Type 4 Winter Event"

Continuous Operations Routes

Pavement Temperature Range and Trend	Initial Operation				Subsequent Operations			Comments
	Pavement surface at time of initial operation	Maintenance action	Salt spread rates		Maintenance action	Salt spread rates		
			Pre-wetted solid salt (lb/lane-mile)	Brine (gal/lane-mile)		Pre-wetted solid salt (lb/lane-mile)	Brine (gal/lane-mile)	
								1) Monitor pavement temperature closely for

Above 32° F, steady or rising	Dry, wet, slush or light snow cover	None, see comments	-	-	None, see comments	-	-	drops toward 32° F and below.  2) Treat icy patches if needed with pre-wetted solid salt at 100 lb/lanemile; plow if needed.
Above 32° F, 32° F or below is imminent; ALSO 15 to 32° F, remaining in range	Dry	Apply brine or pre-wetted salt	100	44	Plow as needed, reapply liquid or solid chemical when needed	100	44	1) Applications will need to be more frequent at lower temperatures and higher snowfall rates  2) It is not advisable to apply a straight brine at the indicated spread rate when the pavement temperature drops below 20°F  3) Do not apply brine onto heavy snow accumulation or packed snow
	Wet, slush, or light snow cover	Apply liquid or solid salt	100	44				
0 to 15° F, remaining in range	Dry, wet, slush or light snow cover	Apply pre-wetted solid chemical	200	-	Plow as needed, reapply pre-wetted solid chemical when needed	200	-	1) Abrasives may be added to the salt to enhance traction at colder temperatures  2) Liquid calcium chloride may be used for pre-wetting solid salt at colder temperatures
Below 0° F, steady or falling	Dry or light snow cover	Plow as needed	-	-	Plow and apply salt/abrasive mix as needed	-	-	1) If pavement becomes slick apply salt/abrasive mix to enhance traction. Salt will have limited melting power in this temperature range.  2) Pre-wet salt/abrasive mix with liquid calcium chloride.
<p><b>Notes: SALT APPLICATIONS.</b> 1) Time initial and subsequent chemical applications to prevent deteriorating conditions or development of packed and bonded snow. 2) Apply salt ahead of traffic rush periods occurring during storm.</p> <p><b>PLOWING.</b> If needed, <i>plow before salt applications</i> so that excess snow, slush, or ice is removed and pavement is wet, slushy, or lightly snow covered when treated.</p>								

Table 133.5.3.6.3 Type 3 Winter Event: 1 – 6 in. of snow/frozen precipitation in 24 hours OR a trace to 1/2 in. of ice

Printable file for "Type 3 Winter Event"

Continuous Operations Routes

Pavement	Initial Operation			Subsequent Operations		
	Pavement	Salt spread rates		Pavement	Salt spread rates	
		Pre-			Pre-wetted	Brine

Temperature Range and Trend	surface at time of initial operation	Maintenance action	wetted solid salt (lb/lane-mile)	Brine (gal/lane-mile)	Maintenance action	solid salt (lb/lane-mile)		(gal/lane-mile)		Comments
						Light snow	Heavier snow	Light snow	Heavier snow	
Above 32° F, steady or rising	Dry, wet, slush or light snow cover	None, see comments	-	-	None, see comments	-	-	-	-	<p>1) Monitor pavement temperature closely for drops toward 32° F and below.</p> <p>2) Treat slick patches if needed with pre-wetted salt at 100 lb/lane-mile or brine 44 gal/lane-mile; plow if needed.</p>
Above 32° F, 32° F or below is imminent; ALSO 20 to 32° F, remaining in range	Dry	Apply brine or pre-wetted salt	100	44	Plow as needed, reapply brine or pre-wetted solid salt when needed	100	200	44	88	<p>1) Applications will need to be more frequent at lower temperatures and higher snowfall rates.</p> <p>2) Do not apply brine onto heavy snow accumulation or packed snow. 3) After heavier snow periods and during light snowfall, reduce salt rate to 100 lb./lane-mile or 44 gal./lane-mile brine; continue to plow and apply salt as needed</p>
	Wet, slush, or light snow cover	Apply brine or pre-wetted salt	100	44						
										1) Reduce salt rate to 200

10 to 20° F, remaining in range	Dry, wet, slush or light snow cover	Apply pre-wetted salt	200	-	Plow as needed, reapply pre-wetted solid salt when needed	200	250	-	-	lb./lane-mile after heavier snow periods and during light snowfall; continue to plow and apply salt as needed.  2) Liquid calcium chloride may be used for pre-wetted salt at colder temperatures
Below 10° F, steady or falling	Dry or light snow cover	Plow as needed	-	-	Plow and apply salt/abrasive mix as needed	-	-	-	-	As pavement becomes slick, apply salt/abrasive mix to enhance traction. Salt will have limited melting power at these temperatures.
<p><b>Notes: SALT APPLICATIONS.</b> 1) Time initial and subsequent chemical applications to <i>prevent</i> deteriorating conditions or development of packed and bonded snow. 2) <b>Anticipate increases in snowfall intensity. Apply higher rate treatments prior to or at the beginning of heavier snowfall periods to prevent development of packed and bonded snow.</b> 3) Apply salt ahead of traffic rush periods occurring during storm.</p> <p><b>PLOWING.</b> If needed, <i>plow before salt applications</i> so that excess snow, slush or ice is removed and pavement is wet, slushy or lightly snow-covered when treated.</p>										

Table 133.5.3.6.4 Type 2 Winter Event: 6 – 12 in. of snow in 24 hours OR ½ to ¾ in. of ice

Printable file for "Type 2 Winter Event"

Continuous Operations Routes

Pavement Temperature Range and Trend	Initial Operation				Subsequent Operations			Comments
	Pavement surface at time of initial operation	Maintenance action	Salt spread rates		Maintenance action	Salt spread rates		
			Pre-wetted solid salt (lb/lane-mile)	Brine (gal/lane-mile)		Pre-wetted solid salt (lb/lane-mile)	Brine (gal/lane-mile)	
Above 32° F,	Dry, wet, slush or	None, see			None, see			1) Monitor pavement temperature closely for drops toward 32° F and below.

steady or rising	light snow cover	comments	-	-	comments	-	-	2) Treat slick patches if needed with pre-wetted solid salt at 100 lb/lane-mile or with brine at 44 gal/lane-mile; plow if needed.
Above 32° F, 32° F or below is imminent; ALSO 30 to 32° F, remaining in range	Dry	Apply brine or pre-wetted solid salt	100	44	Plow accumulation and reapply brine or solid salt as needed	100	44	1) If the desired plowing/treatment frequency cannot be maintained, the spread rate can be increased to 200 lb/lane-mile to accommodate longer operational cycles.  2) Do not apply brine onto heavy snow accumulation or packed snow.
	Wet, slush or light snow cover	Apply brine or pre-wetted solid salt	100	44				
20 to 30° F, remaining in range	Dry	Apply brine or pre-wetted solid salt	150-200	65-87	Plow accumulation and reapply brine or solid salt as needed	200	87	1) If the desired plowing/treatment frequency cannot be maintained, the spread rate can be increased to 400 lb/lane-mile to accommodate longer operational cycles.  2) Do not apply brine onto heavy snow accumulation or packed snow.
	Wet, slush or light snow cover	Apply brine or pre-wetted solid salt	150-200	65-87				
10 to 20° F, remaining in range	Dry, wet, slush or light snow cover	Apply pre-wetted solid salt	200	-	Plow accumulation and reapply brine or solid salt as needed	250	-	1) If the desired plowing/treatment frequency cannot be maintained, the spread rate can be increased to 500 lb/lane-mile to accommodate longer operational cycles.  2) Liquid calcium chloride may be used for pre-wetting salt at colder temperatures.
Below 10° F, steady or falling	Dry or light snow cover	Plow as needed	-	-	Plow accumulation as needed	250	-	As pavement becomes slick, apply salt/abrasive mix to enhance traction. Salt will have limited melting power in this temperature range.

**Notes. SALT APPLICATIONS.** 1) Time initial and subsequent salt applications to *prevent* deteriorating conditions or development of packed and bonded snow – **timing and frequency of applications will be determined primarily by plowing requirements.** 2) Apply salt ahead of traffic rush periods occurring during storm.

**PLOWING.** *Plow before chemical applications* so that excess snow, slush or ice is removed and pavement is wet, slushy, or lightly snow-covered when treated.

**Table 133.5.3.6.5 Type 1 Winter Event: More than 12 inches of snow in 24 hours OR more than ¼ inch of ice**

Printable file for "Type 1 Winter Event"

*Continuous Operations Routes*

Pavement Temperature Range and Trend	Initial Operation				Subsequent Operations			Comments
	Pavement surface at time of initial operation	Maintenance action	Salt spread rates		Maintenance action	Salt spread rates		
			Pre-wetted solid salt (lb/lane-mile)	Brine (gal/lane-mile)		Pre-wetted solid salt (lb/lane-mile)	Brine (gal/lane-mile)	
Above 32° F, steady or rising	Dry, wet slush or light snow cover	None, see comments	-	-	None, see comments	-	-	1) Monitor pavement temperature closely for drops toward 32° F and below 2) Treat slick patches if needed with pre-wetted salt at 100 lb/lane-mi or with brine at 44 gal/lane-mi; plow if needed.
Above 32° F, 32° F or below is imminent; ALSO 30 to 32° F, remaining in range	Dry	Apply brine or pre-wetted solid salt	100	44	Plow accumulation and reapply brine or solid salt as needed	100	44	1) If the desired plowing/treatment frequency cannot be maintained, the spread rate can be increased to 200 lb/lane-mi to accommodate longer operational cycles. 2) Do not apply brine onto heavy snow accumulation or packed snow.
	Wet, slush, or light snow cover	Apply brine or pre-wetted solid salt	100	44				
20 to 30° F, remaining in range	Dry	Apply brine or pre-wetted solid salt	150-200	65-87	Plow accumulation and reapply brine or solid salt as needed	200	87	1) If the desired plowing/treatment frequency cannot be maintained, the spread rate can be increased to 400 lb/lane-mi to accommodate longer operational cycles. 2) Do not apply brine onto heavy snow accumulation or packed snow.
	Wet, slush, or light snow cover	Apply brine or pre-wetted solid salt	150-200	65-87				
10 to 20° F, remaining in range	Dry, wet, slush, or light snow cover	Apply pre-wetted solid salt	200	-	Plow accumulation and reapply brine or solid	250	-	1) If the desired plowing/treatment frequency cannot be maintained, the spread rate can be increased to 500 lb/lane-mi to accommodate longer operational cycles.

					salt as needed			2) Liquid calcium chloride may be used for pre-wetting salt at colder temperatures
<b>Below 10° F,</b> steady or falling	Dry or light snow cover	Plow as needed	-	-	Plow accumulation as needed	250	-	As pavement becomes slick apply salt/abrasive mix to enhance traction. Salt will have limited melting power in this temperature range.
<p><b>Notes: SALT APPLICATIONS.</b> 1) Time initial and subsequent salt applications to prevent deteriorating conditions or development of packed and bonded snow--<i>timing and frequency of subsequent applications will be determined primarily by plowing requirements.</i> 2) Apply salt ahead of traffic rush periods occurring during storm.</p> <p><b>PLOWING.</b> <i>Plow before chemical applications</i> so that excess snow, slush or ice is removed and pavement is wet, slushy or lightly snow covered when treated.</p>								

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 Category: 133 Snow and Ice Control

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## 771.2 Bridge Cleaning and Flushing

### From Engineering Policy Guide

Bridge cleaning and flushing is done to remove dirt and debris to allow proper drainage and drying of the deck. The dirt and debris holds moisture and chlorides that cause deterioration. Deck flushing should be done throughout the winter months when needed and temperatures safely permit. Thorough cleaning of entire bridge should be accomplished in the spring following snow season and again in the fall prior to snow season. This cleaning should include deck, piers, abutments, and lower chords of truss bridges.

Code: R329

### Procedures

1. Set up proper traffic control.
2. Remove all dirt and debris and ensure that all curb outlets and pipe drains are clean.
3. Heavy buildup of dirt and debris may require removal prior to flushing. Sweeping or brooming is beneficial to supplement flushing.
4. Adequate water supply and pressure is needed for effective flushing.
5. Spring and fall flushing should include all bridge items, drain system, drain basins, and under expansion devices.

### Safety

Run off from flushing needs to be controlled to prevent property damage.

### Instructions



Set up proper traffic control. Remove all dirt and debris and ensure that all curb outlets and pipe drains are clean. Heavy buildup of dirt and debris may require removal prior to flushing. Sweeping or brooming is beneficial to supplement flushing.



**Adequate water supply and pressure is needed for effective flushing.**



**Spring and fall flushing should include all bridge items, drains system, drain basins, and under expansion devices.**

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Category: 771 Bridge Preventative Maintenance Guidelines

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# 171.7 Bridge Maintenance

## From Engineering Policy Guide

### Contents

- 1 BRG(A1) Utility Attachments to Bridges
- 2 BRG(A2) Levees
- 3 BRG(A3) High Water Marks
- 4 BRG(A4) Navigation Lights/Light Tenders
- 5 BRG(A5) Corps of Engineers Regulations
- 6 BRG(A6) Cathodic Protection
- 7 BRG(A7) Bridge Repairs Near, On or Over Railroad Right of Way
- 8 171.7.1 Bridge Maintenance
  - 8.1 BRG(B1) Bridge Inspections (Span Type and Culvert Type)
  - 8.2 BRG(B2) Bridge Maintenance (District)
  - 8.3 BRG(B3) Bridge Maintenance (Division)
- 9 171.7.2 Restriction
  - 9.1 BRG(C1) Posted Bridge Load Limits
  - 9.2 BRG(C2) Vertical Clearance
  - 9.3 BRG(C3) Temporary Clearances or Restrictions
  - 9.4 BRG(C4) Permits (Overdimension/Overweight)

### **BRG(A1) Utility Attachments to Bridges**

Refer to EPG 643.3 Policy, Standards and Regulations concerning issuance of permits for utilities and EPG 643.3.16 General Guidelines for Bridge Attachments concerning the attachment of utilities to bridges. Failure of a utility to maintain the attachment to the bridge shall be reported to the District Utility Engineer.

### **BRG(A2) Levees**

See DRN(B1) Levee Attachments and DRN(B2) Levee Fees and Taxes.

### **BRG(A3) High Water Marks**

refer to EPG 748.2 Roadway Overtopping, High Water Marks concerning the requirements for marking high water marks during flood situations.

### **BRG(A4) Navigation Lights/Light Tenders**

Refer to EPG 770.4 Navigation Lights/Light Tenders concerning navigation light maintenance and inspection.

### **BRG(A5) Corps of Engineers Regulations**

Refer to DRN(C2) 404 Permits.

### **BRG(A6) Cathodic Protection**

Refer to EPG 774.4 Maintenance Procedures concerning the maintenance of bridge deck with cathodic protection.

### **BRG(A7) Bridge Repairs Near, On or Over Railroad Right of Way**

Refer to EPG 643.4.4.1 Railroad Crossing Safety concerning safety and notification requirements associated with bridge maintenance activities over or within 25 horizontal ft. of the centerline of an active railroad track.

## **171.7.1 Bridge Maintenance**

### **BRG(B1) Bridge Inspections (Span Type and Culvert Type)**

Refer to EPG 772 Bridge Inspections concerning the types of bridges to be inspected and the frequency of the inspections.

### **BRG(B2) Bridge Maintenance (District)**

Refer to EPG 770.1 District Routine Maintenance and Special Crew Responsibilities for the Bridge Maintenance tasks district Maintenance personnel are responsible.

### **BRG(B3) Bridge Maintenance (Division)**

Refer to EPG 770.2 Regional and Central Office Bridge Maintenance Crew Responsibilities for examples of bridge maintenance items the respective crews are responsible to perform.

## **171.7.2 Restriction**

### **BRG(C1) Posted Bridge Load Limits**

Refer to EPG 770.5 Posting of Bridge Limits for how load carrying capacities of bridges are to be posted.

### **BRG(C2) Vertical Clearance**

Refer to EPG 760.4 Vertical Clearance concerning the legal height limits for vehicles and the responsibility for measuring and reporting vertical height clearances for roadway structures.

### **BRG(C3) Temporary Clearances or Restrictions**

Refer to EPG 760.4.3 Measurement Requirements concerning the measurement, input and notification

of other divisions regarding temporary vertical clearances and lane width restrictions due to construction or maintenance work.

### **BRG(C4) Permits (Overdimension/Overweight)**

Rules and regulations on the movement of overdimension and/or overweight loads are established by the Commission and Chief Engineer based on State Statute and are on file with the Secretary of State. Permits for this movement may be obtained at Motor Carrier Services, by phone at 800-877-8499. Permits for overdimension loads and non-commercial building movement shall be issued by district office staff for local customers. Permits for all other movement may be obtained at the district by allowing walk-in customers to fax Motor Carrier Services. A permit agent will issue the permit and fax it to the customer at the district office.

District staff should observe the movement of large overdimension and/or extra heavy overweight loads that may cause damage to MoDOT facilities or have a significant impact on traffic movement. Motor Carrier Services will provide copies of all permits issued to the district(s) involved for loads over 16 ft. 6 in. tall, 17 ft. 0 in. wide or 240,000 pounds. District staff should determine which loads are most critical for observance, based on the permitted route. If the permitted move is not made according to the provisions of the permit or any MoDOT facilities are damaged, a report shall be made to Motor Carrier Services.

When permitted loads are moved across more than one district, the original district should notify the next district of problems (if any) encountered with the movement in their area. If the movement was proper and no problems were encountered, it may not be necessary to observe that load in other districts. As part of the quality assurance program, it is recommended that at least 10 percent of the permits issued for larger dimensions and weights (listed above) be observed by district staff.

Reason for policy:

- RSMo 304.170 - 304.210 (State Laws), Traffic Regulations as to width, height and length of vehicles - exceptions.

Effective Date: 6/1/99

Revision Dates:

Retrieved from "[http://epg.modot.org/index.php?title=171.7\\_Bridge\\_Maintenance](http://epg.modot.org/index.php?title=171.7_Bridge_Maintenance)"

Category: 171 Maintenance Policy and Operations

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- This page was last modified on 21 June 2012, at 08:46.



# 748.1 Evaluation of Project Impacts

## From Engineering Policy Guide

### Contents

- 1 748.1.1 Evaluation of Risk
  - 1.1 748.1.1.1 Risk Assessment
  - 1.2 748.1.1.2 Risk Analysis
- 2 748.1.2 Hydrologic Impacts of Roadway
- 3 748.1.3 Hydraulic Impacts of Bridges and Drainage Structures
- 4 748.1.4 Common Drainage Complaints



## 748.1.1 Evaluation of Risk

The design of all hydraulic structures should include an evaluation of the potential for hydrologic and hydraulic impacts to the roadway and surrounding properties. The evaluation of risk is a two-stage process:

### 748.1.1.1 Risk Assessment

The initial step, identified as risk assessment, is a qualitative analysis of the potential risk involved with the drainage structure. This evaluation should include particular attention to the following risks:

- lack of a practicable detour
- hazard to people
- hazard to surrounding property

### 748.1.1.2 Risk Analysis

If the evaluation of potential hydrologic or hydraulic impacts indicates a potential exists for "unreasonable" damage to occur, a risk analysis should be performed. The risk analysis will consider

damage to the roadway structures and embankments, damage to surrounding properties and traffic related losses, and will determine an appropriate balance between increasing the cost of the project and decreasing the risk of hydraulic impacts. Procedures for conducting a risk analysis are included in the FHWA HEC-17 publication Design of Encroachments on Floodplains Using Risk Analysis. Contact GHQ Design for additional guidance in performing a risk analysis. The evaluation of potential hydrologic and hydraulic impacts, as well as the risk analysis, if one is performed, shall be retained with the project file.

### **748.1.2 Hydrologic Impacts of Roadway**

Development such as a highway project can affect the hydrologic characteristics of a watershed. Such development typically increases the amount of impervious area within the watershed, and may also decrease the time of concentration of the watershed. Both of these effects tend to increase both the volume and peak rate of runoff from the watershed. The magnitude of this increase is generally dependent on the ratio of the developed area (pavement and right of way in the case of highway projects) to the total watershed drainage area. When the developed area is a large percentage of the total drainage area, the impacts can be significant. The degree of hydrologic impact shall be subjectively evaluated for all highway projects; when the impacts are estimated to be of concern, a detailed analysis shall be performed. Significant increases in peak flow rates shall be mitigated through the use of detention storage or other appropriate measures.

### **748.1.3 Hydraulic Impacts of Bridges and Drainage Structures**

For each drainage structure, an evaluation should be performed to compare the general hydraulic conditions of the area before and after the proposed improvement is made. This evaluation should consider increases in peak flow rates, flow velocities and water surface elevations as well as changes in drainage patterns before and after the proposed improvement is made. With the results of this evaluation, a determination can be made concerning the flood damage potential to adjacent properties as a result of the proposed improvement.

Evaluation of the consequences of risk associated with a stream crossing considers capital cost, traffic service, environmental and property impacts and hazards to human life. The risk assessment should consider damage to structures, embankments, and surrounding property, traffic related losses, and scour or stream channel change.

### **748.1.4 Common Drainage Complaints**

Listed below are several common causes for drainage complaints by landowners. Consideration should be given to minimizing or eliminating, to the extent practical, these causes for complaint:

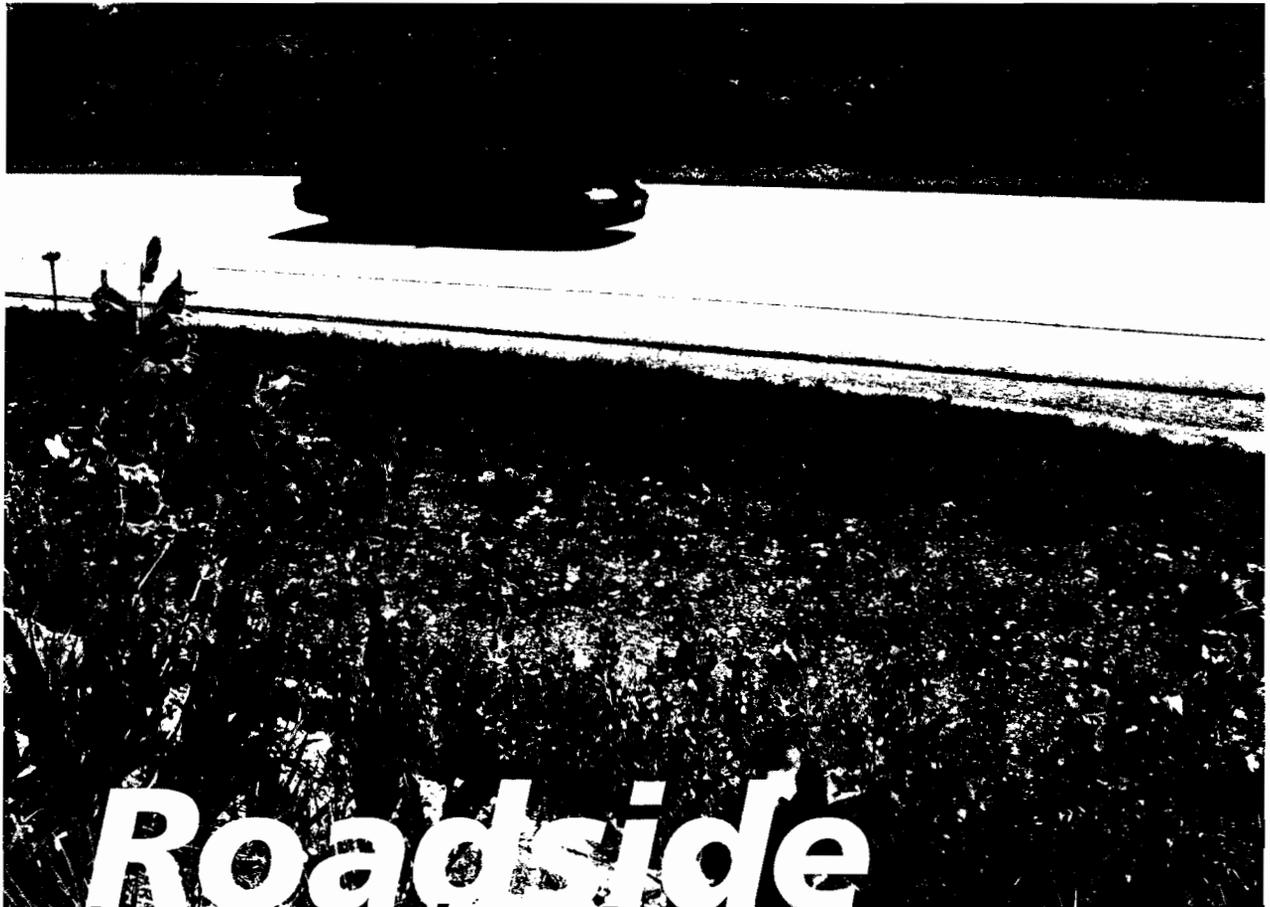
- Diversion of flow from one watercourse to another
- Collection and concentration of surface waters
- Augmentation of flow peaks or volumes
- Obstruction of flows resulting in increased backwater
- Erosion and sedimentation
- Groundwater interference

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Category: 748 Hydraulics and Drainage

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- This page was last modified on 5 May 2008, at 10:12.





# **Roadside** *Vegetation Management*



May 2012

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Missouri Department of Transportation



## **Index**

	<b>page</b>
Roadside Vegetation Management	3
Roadside Vegetation Management Policy	3
Major Roads – Vegetation Management Guidelines	4
Minor Roads – Vegetation Management Guidelines	5
High-Profile Areas – Vegetation Management Guidelines	5
Best Practices	6-7
Recommended Practices	8-9
Definitions	10-12

## **Figures**

	<b>figure no.</b>
Major Roads with Medians Less Than 60'	1
Major Roads with Medians Over 60'	2
Minor Roads	3
Interchanges	4
Mowing and Spraying Strip Widths	5
Native Vegetation Preventing Snow Drifts	6
Ditch Cut (Mowing Backside of a V-Ditch)	7
Wildflowers and Native Grasses	8
Naturalized Area	9

# Roadside Vegetation Management

The Missouri Department of Transportation's (MoDOT) roadside management philosophy is to preserve, enhance and diversify the roadsides of Missouri's transportation system. Our roadside management program helps keep Missouri roadsides safe and attractive. This program establishes and maintains desirable roadside vegetation to control erosion.

This is accomplished through several methods, including an effective herbicide program, fertilization, mowing, brush control and litter removal. Wildflower and native grass plantings, landscaping and naturalized vegetation are also part of maintaining and improving safety and roadside appearance. Combining different management practices, such as these, form an Integrated Roadside Vegetation Management (IRVM) program.

The sharing of best practices among districts results in greater efficiency and effectiveness and helps meet the need to operate better, faster and cheaper. Money is saved on labor and mobilization by making mowing a focused priority during scheduled times. Consistency is also improved.

## Roadside Vegetation Management Policy

Vegetation in sight distance areas shall be controlled as necessary on all routes.

Equipment shall not be used on slopes steeper than 3 to 1 unless designed for that purpose. Reliable, manufactured slope indicators shall be used on all mowing equipment.

New trees or hardscape features shall not be permitted within 30 feet from the nearest traveled way. This distance is extended to 40 feet on routes with 65-70 mph speed limits. Exceptions may be permitted if behind barriers or if other special circumstances exist.

Vegetation shall be removed that interferes with the visibility of MoDOT signs.

Traffic control shall be performed according to the most recent edition of MoDOT's Traffic Control for Field Operations manual.

Noxious weed control shall be done on all routes, as required by federal, state and county laws and regulations. Noxious weed control shall be by either chemical or biological means.

Vegetation management practices shall not conflict with efforts to protect state and federally designated endangered species. Refer to Heritage Database Information. Contact the Design Division's Environmental Section at 573.751.2876 for assistance.

Required mowing on major roads shall be completed before Memorial Day and mid-July. The final mowing shall begin in mid-September.

Final mowing shall be completed by November 30.

## ***Major Roads***

# **Vegetation Management Guidelines**

Mow all major roads within two weeks prior to Memorial Day and mid-July a minimum 15 feet from the edge of the paved or aggregate shoulders or where the grass begins unless physically obstructed. Beginning mid-September, a final mowing of up to 30 feet shall be completed every year. Minimum mowing height is six inches.

Consistency is expected on major corridors. Coordination of mowing within areas and between districts is needed to ensure this.

Slopes steeper than 3 to 1 and areas not required to be mowed should be planted to wildflowers and native grasses, encouraged to naturalize or landscaped.

Do not leave a narrow strip (less than 30 feet) between the main roadway and outer roads. Areas between the main roadway and the outer roads 30 feet wide or less should be mowed the entire width with each cycle. Areas wider than 30 feet may be mowed 15 feet in each direction each cycle.

An urban area is where the surrounding land is dominated by housing developments and commercial properties. There are no large gaps of areas without housing or commercial development. Each urban area should be evaluated to determine the extent of mowing needed. Urban areas may be mowed more often and wider but the intent is to reduce the total acres mowed and number of mowing cycles.

Community mowing may be done for special events, festivals and fairs. This mowing is not limited to one pass. All mowing must be part of the planning process to avoid unnecessary mowing.

PGRs may be used to reduce trimming around guardrails, guard cables, sign posts and sight distance areas. Selectively applying herbicides to control brush up to 50 feet from the roadway is permitted.

An additional mowing cycle may be added and coordinated statewide if growing conditions require it.

## **Main Roadway**

Within two weeks prior to Memorial Day, and mid-July, mow all major roads up to 15 feet from the edge of the paved or aggregate shoulders or where the grass begins unless physically obstructed. Beginning mid-September, mow all major roads up to 30 feet from the edge of the paved or aggregate shoulders or where the grass begins unless physically obstructed. Selectively applying herbicides to control brush up to 50 feet is permitted.

## **Medians (Figures 1 and 2)**

Medians less than 60 feet wide shall be mowed entirely each mowing cycle. Medians wider than 60 feet may be mowed 15 feet in each direction and, if less than 100 feet wide, should be mowed entirely for the final mowing. Medians over 100 feet in width should be mowed up to 30 feet in each direction from the edge of the paved or aggregate shoulders or where the grass begins for the final mowing.

## **Interchanges (Figure 4)**

Mowing interchanges requires a large resource commitment. Each interchange should be evaluated as to the extent of mowing needed. Interchanges on major roads shall be mowed 15 feet from the edge of the paved or aggregate shoulders or where the grass begins unless physically obstructed, two weeks prior to Memorial Day, and mid-July and beginning in mid-September. Mowing may be done on the interior of interchanges, if necessary, where slopes are 3 to 1 or flatter.

## **Minor Roads (Figure 3) Vegetation Management Guidelines**

The height of minor road vegetation should be maintained between six and 18 inches. Mowing should begin when 50 percent of the vegetation reaches 18 inches in height.

Vegetation may be maintained by using PGRs or by mowing. The area for vegetation control is six to 15 feet unless physically obstructed. This is intended to be one pass with the type of equipment used.

A final mowing may be done if the slopes are 3 to 1 or flatter. It should not begin until the chance of significant regrowth is minimal. The final mowing area may extend up to 30 feet from the edge of the pavement each odd numbered year. The final mowing area may extend up to 15 feet each even numbered year.

Areas within 30 feet of the roadway with heavy brush should be treated with selective herbicides to control brush.

Slopes steeper than 3 to 1 and areas not requiring mowing should be planted to wildflowers and native grasses, encouraged to naturalize or landscaped.

<b>Final Mowing Distance on Minor Routes</b>	
Odd numbered year (2011, 2013, etc.)	Mow up to 30'
Even numbered year (2012, 2014, etc)	Mow up to 15'

## **High-Profile Areas Vegetation Management Guidelines**

These areas include raised medians, islands, roadside parks, commuter parking lots and high-profile areas with considerable pedestrian traffic. These locations require the highest level of vegetation management and cleanliness. Vegetation should be maintained in a turf-type manner with vegetation height maintained between four and eight inches.

Typically, this turf should be mowed with walk-behind mowers, lawn-type mowers and line trimmers.

## Best Practices

The sharing of best practices among districts results in greater efficiency and effectiveness. This trend should continue as the department is faced with greater need to operate better, faster and cheaper.

Personnel engaged in mowing should be trained in the operation of mowers and must be familiar with the applicable safety guidelines as set forth in MoDOT's [Safety Policies, Rules and Regulations Employee Handbook](#).

## Fleet

1. The department is moving away from leasing tractors due to the higher costs associated with leases.
2. Fleet composition should be examined and comprised of tractors and mowing attachments that are optimal for the terrain and obstacles that are present in specific areas.
3. Accurately enter and maintain mower attachments inventory in FASTER. Stagger equipment inspections according to season. This allows for equipment to be properly inspected and all repairs made prior to the beginning of season.

## Materials

1. The Herbicide Manual should be used as a guideline for herbicide programs. The Herbicide Manual is at: [http://epg.modot.org/index.php?title=Category:821\\_Herbicides\\_and\\_Roadsides](http://epg.modot.org/index.php?title=Category:821_Herbicides_and_Roadsides).
2. A pre-season meeting to discuss herbicide treatments should be held in early- to mid-February each year.

## Communication

1. Implement monthly statewide conference calls to discuss mowing plans. This should increase consistency between districts. This is also recommended on a district level to improve consistency between areas.
2. Develop a district specific vegetation management plan, including herbicides and mowing, and submit to Central Office by March 1st each year. The plan should also be communicated and readily accessible to maintenance personnel.
3. When a major route corridor spans district lines, the districts should work together to present a coordinated plan for the route. Provide speaking points for customer service representatives and other district personnel to consistently answer questions from the public regarding mowing practices.
4. Collaborate with district community relations personnel to create public information pieces to inform our customers on work that will be completed. Examples of successful public relations pieces are news releases, brochures, maps and information posted on the website.
5. Communicate herbicide and PGR plans (recently completed and upcoming) to mowing personnel.

## Labor

1. Analyze the area with the purpose of mapping out a circular route to increase efficiency by eliminating or significantly reducing deadheading.

2. Actively monitor working hours and overtime of personnel by flexing work schedules during the work week once an employee reaches 40 hours.
3. Encourage short mowing cycles with all mowers operating, and make mowing a focused priority during scheduled mowing times. This will help save money on labor and mobilization.

## **Operations**

1. Encourage the expansion of the Adopt-A-Highway program for mowing.
2. Develop and encourage areas of native vegetation.
3. The mowing operations team will remain intact and will meet after the mowing season to review the effectiveness of the operations direction.

## **Trimming**

1. Trimming should be evaluated for need at each mowing cycle, according to height limitations in this manual.
2. The use of total vegetation control (bareground) should be limited to a 30" radius around signs to limit erosion problems.

# Recommended Practices

## Safety

1. Tractor tires should be set at the appropriate width and inflation that provides optimum stability. Always consult the operator's manual before making any adjustments to the tractor tires.
2. For safety concerns and appearance purposes, a cut should not be made on top of rock cuts or down from the top of an unmowed slope.
3. Dead trees and limbs, fallen or standing, which may create a hazard, should be promptly removed. Trees on the roadway should be removed as soon as possible, suspending other lower priority work if necessary.

## Appearance

1. Mowing cycles and litter pickup on major roads should be planned to provide a desirable appearance at all times.
2. Coordination of the mowing effort is important not only between areas but between districts to ensure that similar routes will present the same appearance at the same time.
3. The transition between mowing widths and patterns will vary and should be gradual to give a natural and pleasing appearance.
4. All required trimming should be completed with each mowing cycle. PGRs plus a broadleaf herbicide applied in the spring prior to seedhead development will help control vegetation height and reduce the need for trimming. Total vegetation control may be used around objects with care.
5. Visible litter should be removed prior to and after each mowing cycle.
6. Landowners should be allowed to mow the right-of-way adjacent to their property if they feel it will enhance the appearance of their property.

## Herbicides

1. Only herbicides in the Herbicide Manual are approved for use. Other herbicides must be approved by Central Office Roadsides.
2. Undesirable weeds should be controlled by either chemical or biological means.
3. An effective herbicide program is a strong part of a properly managed roadside.
4. Herbicides may be used to keep sidewalks, paved slopes, paved islands, paved shoulders, commuter parking lots, drains, pavement joints, barriers, curb lines, paved ditches, etc. free of vegetation. If growth does occur in these areas, the vegetation should be removed.
5. Invasive plant species should be controlled that are considered mutually undesirable by MoDOT and adjacent landowners.

## **Cultural Practices**

1. Erosion control measures may be necessary if there is not adequate vegetation to prevent erosion or if operations require removal of vegetation and there is a possibility that silt will leave the right-of-way.
2. Fertilization and/or reseeding should be considered where difficulty in establishing vegetation is encountered.
3. Mowing height is the actual height of cut.
4. Do not mow when turf and soil conditions are wet to the point that turf damage or ruts will occur.
5. Native vegetation should be left standing and encouraged in areas that are prone to drifting snow. (Figure 6)
6. Desirable trees and shrubs should be pruned to promote proper growth habit.
7. Delayed mowing allows for seed production which may result in healthier stands of turf.

## **Miscellaneous**

1. Refer to your district roadside representative for assistance.
2. When mowing to the ditch line, it is acceptable to make a five to eight foot cut on the back side of a V-ditch to help maintain drainage if it can be accomplished without placing the tractor on a slope steeper than 3 to 1. However, for appearance purposes, a cut on the backside of the ditch should not be made. A preferred alternative would be the selective use of herbicides (Figure 7).
3. Areas of wildflower, native grass and tree plantings may be signed to indicate what is being accomplished at these locations.
4. Areas around and under bridges should be kept clear of brush.
5. Culverts should be kept clear of brush.

# Definitions

**Biological Control:**

Usually involves the use of insects and disease-causing agents that attack certain weed species. An example is the control of musk thistle with the thistle head weevil. For effective biological control, the insect or disease must affect only the weed requiring control and the insects must have few natural enemies that interfere with their activity.

**Brush:** Coarse, woody vegetation growing in an undesirable location.

**Chemical Control:** The use of herbicides to control vegetation. Refer to Herbicide Manual.

**Ditch Line:** Ditch lines are considered to be to the back of a flat bottom ditch and to the bottom of a "V" ditch for roadside vegetation management purposes.

**Divided Highway:** Highway with physical separation of traffic in the opposite direction.

**Endangered Species:** Plants or animals considered by the state or federal government to be in danger of extinction or require protection to maintain their existence.

**Hardscape Features:** Landscape materials such as timbers, segmental block retaining walls and boulders that could create an obstacle if they are in an unprotected path of the clear zone.

**Herbicide Program:** Utilize appropriate equipment, herbicides and trained personnel for the application of products as specified in the Herbicide Manual. The objective is to control noxious and undesirable plant species, as well as manage plant growth by applications of plant growth regulators and side trimming.

**Heritage Database Information:** Location maps and specific species information about endangered species located within the state of Missouri. Refer to maps available in the districts. See the Maintenance Policy Manual, Section RDS(A4).

**High-Profile Areas:** Areas with high traffic counts which may be subjected to idle viewing by the motorist and/or have considerable pedestrian traffic.

**Integrated Roadside Vegetation Management (IRVM):** A decision-making and quality management process for maintaining roadside vegetation that integrates the following:

- needs of the local communities and highway users;
- knowledge of plant ecology, design, construction and maintenance considerations;
- monitoring and evaluation procedures;
- government statutes and regulations and
- technology.

IRVM uses cultural, biological, mechanical and chemical pest control methods to economically manage roadsides for safety plus environmental and visual quality.

**Invasive Plant Species:** An aggressive plant species which tends to spread. This includes noxious weeds.

**Islands:** Areas surrounded by driving lanes, turn lanes or ramps, etc. They may be vegetated or paved. They may be at-grade or raised.

**Major Roads:** The major highway system is all routes functionally classified as principal arterials. The principal arterial system provides for statewide or interstate movement of traffic. In urban areas, principal arterials carry traffic entering or leaving the urban area and serve for movement of vehicles between central business districts and suburban residential areas. The major roads in Missouri total approximately 5,573 centerline miles.

**May:** Permitted.

**Median Width:** Distance measured between the edge of traveled ways on a divided highway. The median width measurement includes the width of the inside shoulders.

**Minor Roads:** The minor highway system is all routes functionally classified as minor arterials or collectors. These routes mainly serve local transportation needs and include highways commonly referred to as lettered routes, such as Route A, Route C and Route DD. The minor roads in Missouri total approximately 27,000 centerline miles.

**Mowing Cycle:** The amount of time to mow and trim an area or route from start to finish is one cycle.

**Native Grasses:** Grasses which occur naturally or were known to exist prior to European settlement. (Figure 8)

**Naturalized Areas:** Areas that have been allowed to flourish with native or non-invasive plant growth. These areas may have a random mix of what has established on its own or have selected vegetation management practices used to promote optimum desirable growth. (Figure 9)

**Noxious Weeds:** A plant which is troublesome and undesirable, and declared so by state law. Noxious weeds are: Canada thistle, Scotch thistle, musk thistle, purple loosestrife, marijuana, Johnsongrass, multiflora rose, kudzu, cutleaf teasel, common teasel, field bindweed and spotted knapweed. MoDOT is thereby required by law to control these plants on right-of-way. The Johnsongrass law is subject to county option. Regardless of county option, the department shall make an effort to control this plant on right-of-way. Methods of control are specific to individual plants and MoDOT's Herbicide Manual shall be followed in developing control practices. Control efforts should be documented.

**Noxious Weed Control:** Documented efforts to reduce and possibly eradicate an undesirable or noxious weed. Efforts include both chemical and biological methods.

**Plant Growth Regulators (PGR):** A chemical which suppresses the top growth and seedhead production of a plant.

**Raised Medians:** Areas between driving lanes that may be grass or paved (or a combination) and are elevated.

**Right-of-Way Line:** MoDOT's property line between MoDOT and adjacent property owner.

**Shall:** Mandatory.

**Should:** Strongly recommended.

**Sight Distance:** All vegetation should be maintained at intersections and curves along state rights-of-way to maximize drivers' visibility. Most sight distances can be maintained by a clear view unobstructed by vegetation, along the main roadway approximately six to 10 feet from the edge of the traveled way. At intersections created by cross roads and gore points, the sight distance may need to be extended if necessary.

**Slope Indicators:** A mechanical device that operates on the same basis as a (bubble) level by indicating the degree of slope.

**Total Vegetation Control (TVC):** A chemical(s) to eliminate all vegetation to reduce trimming around signs, guardrails and other objects. Application should not extend more than 24 inches from the object to reduce the risk of erosion.

**Traveled Way:** Portion of the roadway intended for movement of motorized traffic. The white line strip on the edge of the road surface would typically designate this.

**Trimming:** Vegetation control to eliminate unsightly growth remaining after the mowing is complete. Includes line trimming, pulling and other manual means. Vegetation control under or around fixed objects within the mowed area. To manage vegetation in such a manner that keeps it consistent with the surrounding vegetation.

**Undesirables:** Vegetation which chokes out, shades out or competes with the intended vegetation at the given location. This includes any plant in the wrong place. Undesirables include but are not limited to chicory, giant ragweed, phragmites, and others. Noxious weeds are included in this category. Several are listed in the Herbicide Manual.

**Undivided Highway:** Highway with no physical separation of traffic in the opposite direction.

**Urban Areas:** Fully-developed areas where the surrounding land is dominated by housing developments and commercial properties. There are no large gaps of areas without housing or commercial development.

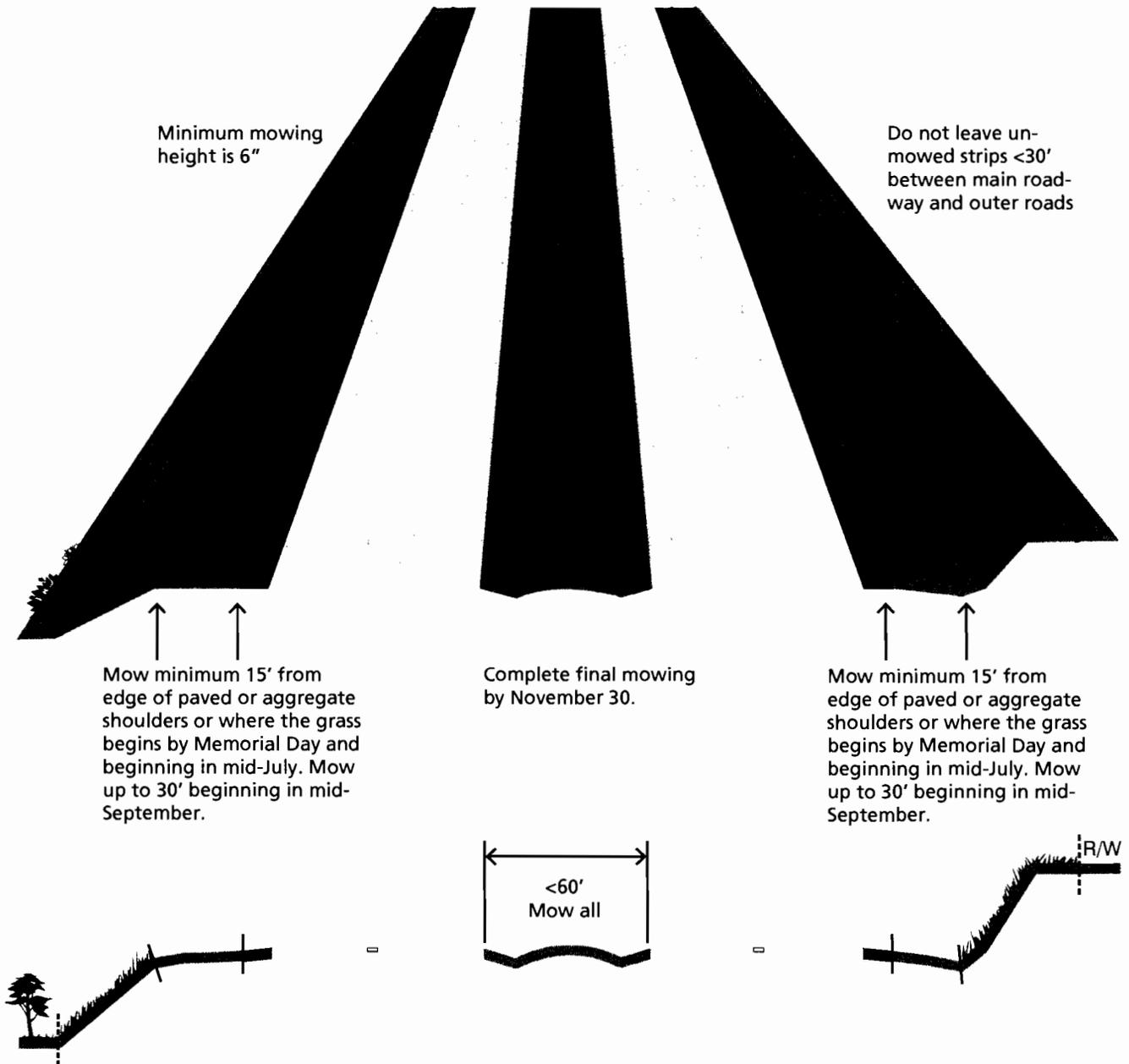
**Visible Litter:** Trash in a size or quantity noticeable to roadway travelers.

**V-Ditch:** Ditch with little or no flat bottom.

**Wildflowers:** Reoccurring broadleaf flowering plant in a naturalized area. (Figure 8)

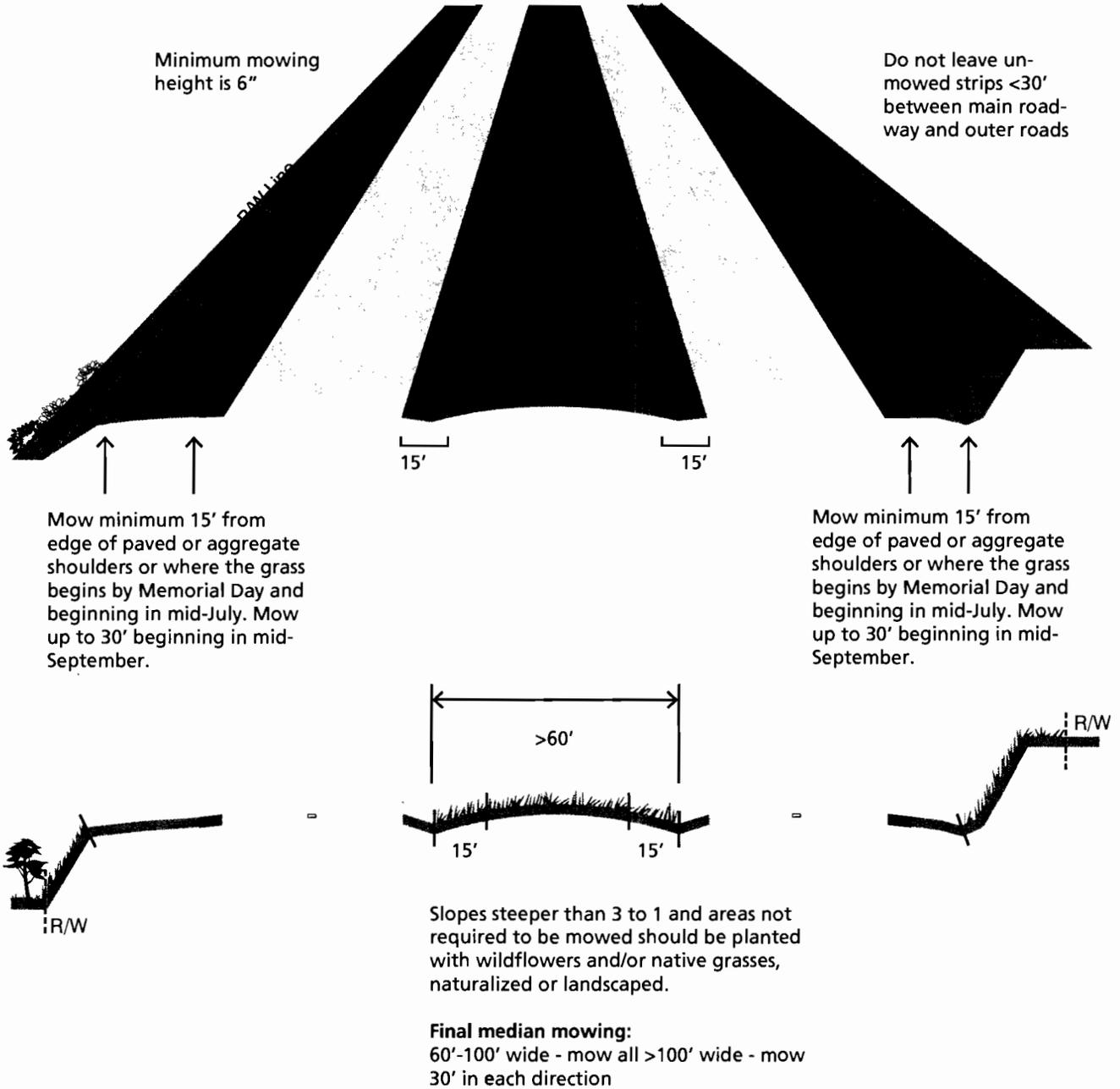
**Major Roads  
Vegetation Management Guidelines  
Medians Less Than 60' Wide**

**Figure 1**



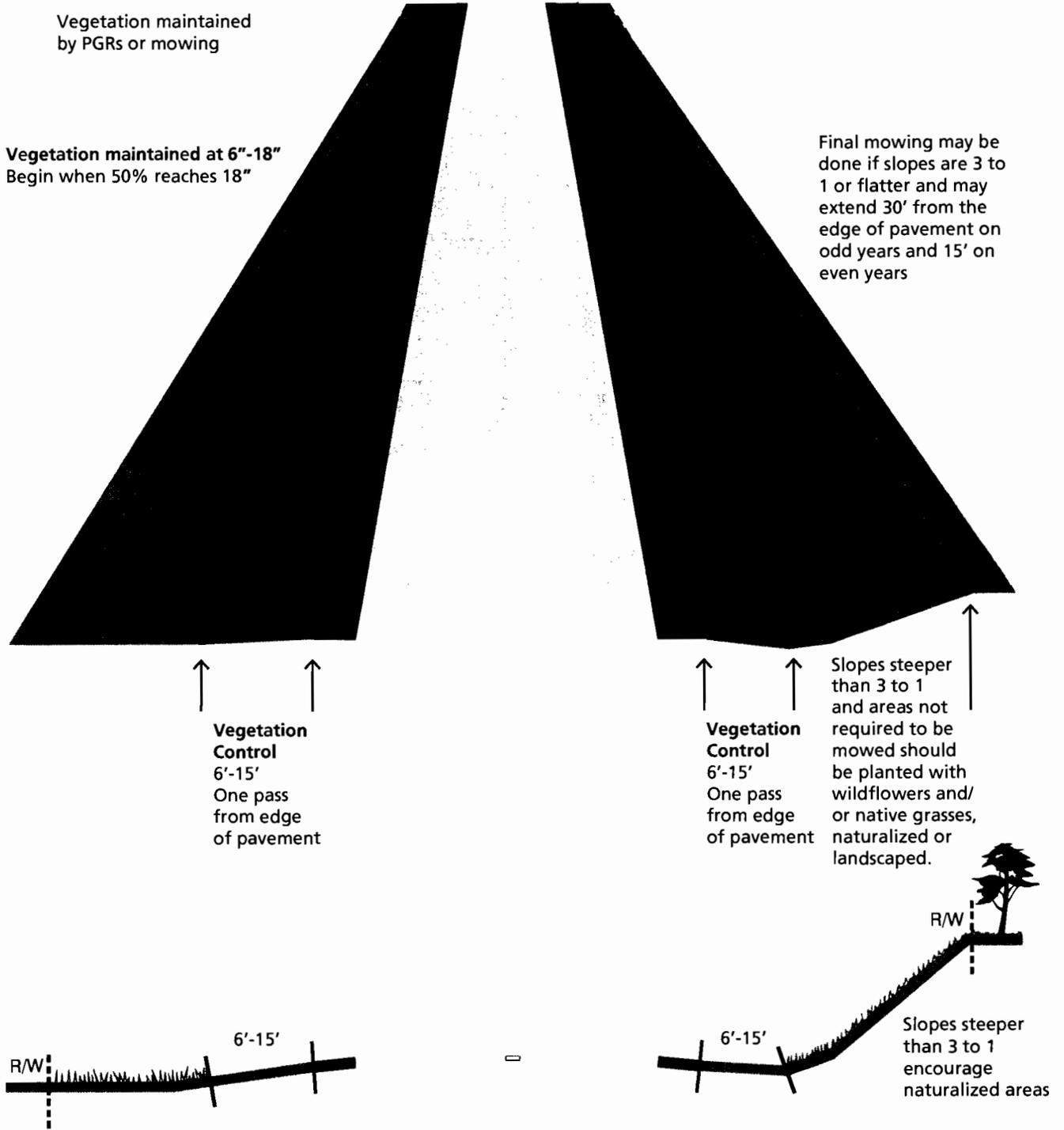
**Major Roads  
Vegetation Management Guidelines  
Medians Over 60' Wide**

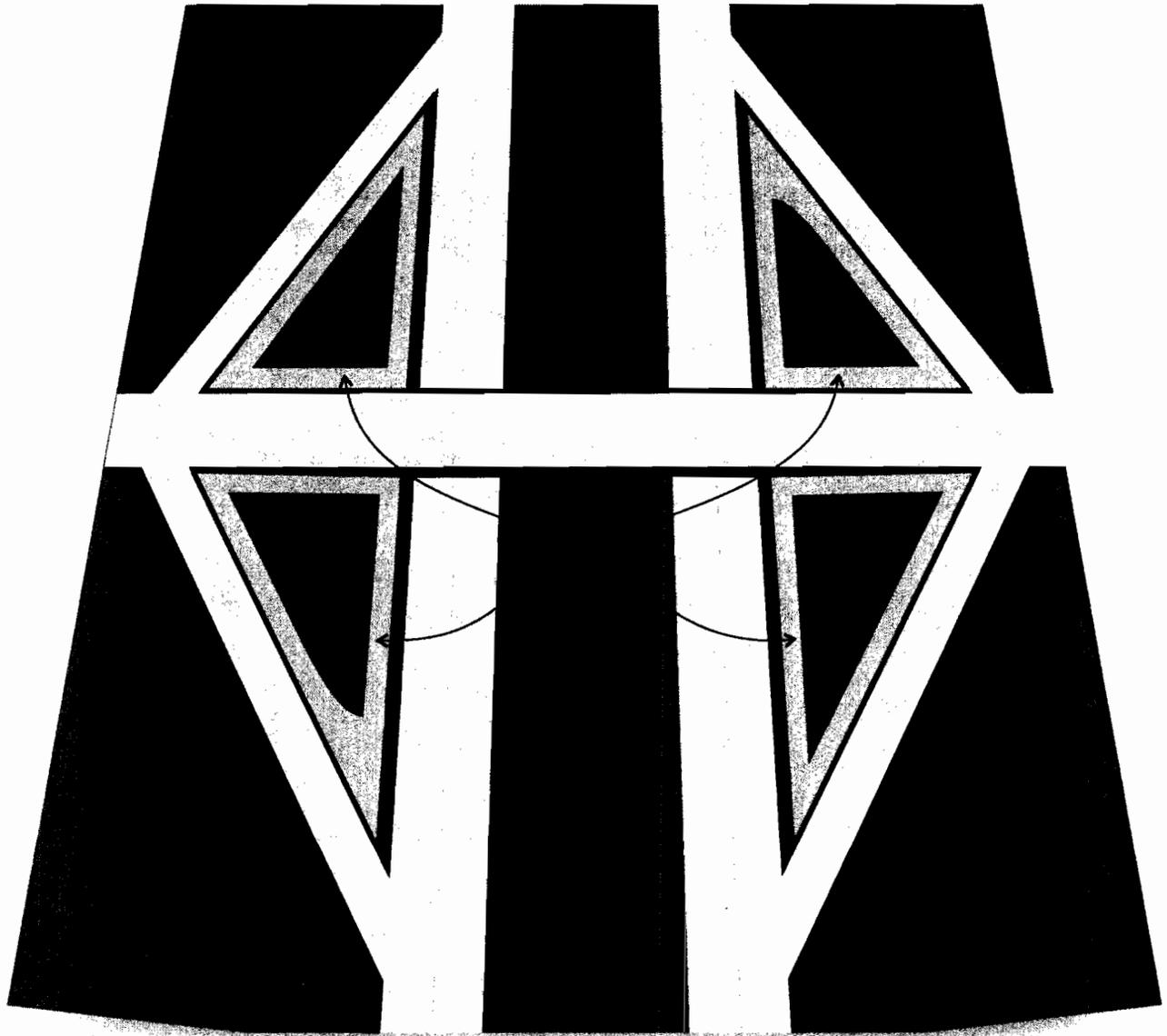
**Figure 2**



# Minor Roads Vegetation Management Guidelines

Figure 3





Evaluate each interchange to determine extent of mowing needed.

## Mowing and Spraying Strip Widths

Figure 5

<b>Mowing and Spraying Strip Widths</b>					
<b>Strip Width (Feet)</b>	<b>Approximate acreage in one mile</b>	<b>Miles traveled to equal one acre</b>	<b>Strip Width (Feet)</b>	<b>Approximate acreage in one mile</b>	<b>Miles traveled to equal one acre</b>
<b>1.0</b>	0.12	8.25	<b>8.0</b>	0.97	1.03
<b>2.0</b>	0.24	4.13	<b>9.0</b>	1.09	0.92
<b>3.0</b>	0.36	2.75	<b>10.0</b>	1.21	0.83
<b>4.0</b>	0.48	2.06	<b>11.0</b>	1.33	0.75
<b>5.0</b>	0.61	1.65	<b>12.0</b>	1.45	0.69
<b>6.0</b>	0.73	1.38	<b>14.0</b>	1.70	0.59
<b>7.0</b>	0.85	1.18	<b>16.5</b>	2.00	0.50

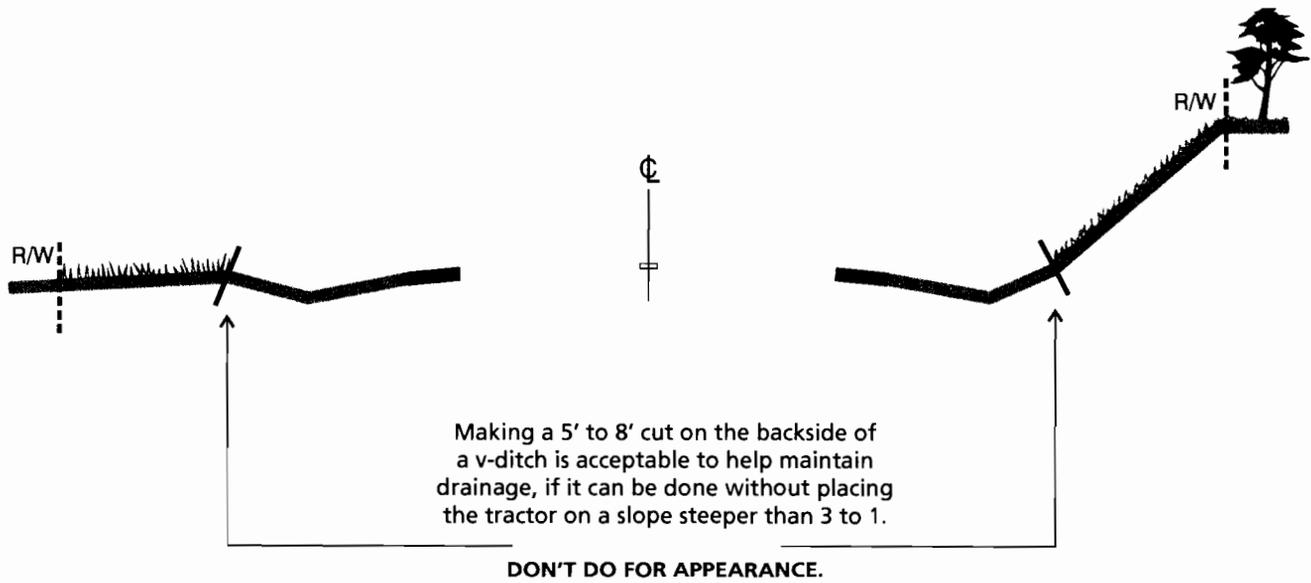
Native Vegetation Preventing Snow Drifts

Figure 6



# Ditch Cut (Mowing Backside of a V-Ditch)

Figure 7



Wildflower and Native Grasses

Figure 8



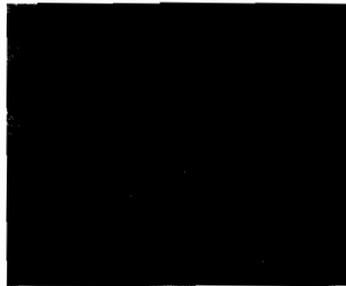
Yellow & purple coneflower, purple beardtongue & ox-eye daisy



Big bluestem



Indian paintbrush & betony



Rudbeckia



Coreopsis



Big bluestem & rudbeckia



Indiangrass

Naturalized Area

Figure 9

