

LANDSLIDE MANAGEMENT PLAN

Landslide Management Activities and Best Management Practices

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1 INTRODUCTION

This Landslide Management Plan has been prepared by Caltrans to describe Division of Maintenance field crews activities and best management practices (BMPs) that are used to protect storm water quality from potential pollutant loading due to landslide (earth, rock or debris), debris flows, rock fall and wildfire events within the Department's right of way.

Submittal of this Landslide Management Plan complies with Caltrans' requirement under the *National Pollutant Discharge Elimination System (NPDES) Statewide Storm Water Permit Waste Discharge Requirements (WDRS) for State of California Department of Transportation* (Order No. 2012-0011-DWQ), issued by the California State Water Resources Control Board (SWRCB) on September 19, 2012 (SWRCB, 2012) (Caltrans NPDES Permit) and effective July 1, 2013. Provision E.2.h.3.d of the Caltrans NPDES Permit states the following.

"The Department shall develop a *LANDSLIDE MANAGEMENT PLAN* that includes BMPs for Department construction and maintenance work landslide-related activities (e.g., prevention, containment, clean up). The *Landslide Management Plan* shall address all forms of mass wasting such as slumps, mud flows, and rock falls, and shall include BMPs specifically for burn site management activities. The Department shall submit the *Landslide Management Plan* with the Year 1 Annual Report and implement the *Landslide Management Plan* for the remainder of the Permit term."

Future revisions to this document will be submitted with the revision year Annual Report. The activities and BMPs described in this plan are not intended to supersede efforts that may be required to ensure public safety or the preservation of the State's transportation system.



2 ACCOUNTABILITY FOR DECISION MAKING

Each year California is affected by storm damage events. These events can involve conditions that destabilize slopes (landslides, rock fall, debris flow, etc.) and cause damage to state highways and adjacent public or private property.

In response to these types of events, the Department of Transportation has in place emergency response policies whose purpose is to accomplish the following.

- Accurately assess damages and protect the public
- Minimize the loss of life and property
- Protect state operated facilities and the state highway system
- Maintain current damage and operations information
- Restore damaged state transportation system facilities as soon as possible.

The District Director is responsible to assess the potential damage from destabilized slopes, the impact to state facilities, and determine the appropriate course of action. On landslides, the decisions will be documented, including the risks identified, the potential impacts and the alternatives considered.

The District Director may delegate decision-making during a landslide event based on the following potential property damage.

- 1. Over \$5,000,000 no delegation allowed
- 2. \$1,000,000 and up to \$5,000,000 delegation allowed to a Deputy District Director
- 3. Less than \$1,000,000 the staff level of allowable delegation is discretionary to the District Director

The District Director remains accountable for the decisions made in a District, whether delegation for decision making has occurred or not.

The Headquarters Geotechnical Services Office of the Division of Engineering Services is to be contacted if additional assistance is needed in determining potential impacts or potential risks to a District from a landslide event.



3 LANDSLIDE MANAGEMENT ACTIVITIES

The Division of Maintenance staff and crews conduct prevention and response activities associated with erosion and slope failures which may result in landslides of earth, rock, and debris, debris flows and rock falls within the Department's right of way. These "Landslide Management" activities are funded under the Department's maintenance and capital improvement programs.

3.1 PREVENTION

Landslide prevention is initially addressed in project design. Unstable areas are avoided when possible and mitigation developed in the project design where potential landslide areas are unavoidable. The following prevention activities are conducted by Division of Maintenance staff to reduce the potential for erosion and slope failures and related damage, unsafe conditions and impacts to habitat and water quality.

3.1.1 Inspections

Maintenance Staff Roadway Observation

Maintenance staff routinely observe roadway conditions during their daily activities. Indicators of instability that may be observed include but are not limited to; cracks or settling of the road surface, buckling of the road surface, sagging of guardrail or barrier walls, increased rate of rockfall, cracks indicating shifting of the land surface, changes in hydrologic conditions. When these conditions are observed the site is referred to specialists as appropriate for further investigation.

Storm Patrol Activities

Storm activities include storm damage patrols. These are surveys conducted by Maintenance Supervisors during and after storm events to assess damage and repair needs in their designated State Highway Maintenance areas. During storms maintenance personnel patrol roadways to maintain drainage to prevent flooding and remove debris that may create on unsafe condition. Included in this activity designation are also patrols conducted subsequent to natural disasters and events such as floods, wildfires, earthquakes, and tidal waves. Maintenance Supervisors determine if resources are available for field crews to undertake necessary corrective actions or if major damage is present requiring contracted repair. For contracted work, Maintenance Supervisors or appropriate District staff determine necessary corrective actions and schedule.

Sand/Rock Patrol Inspections



Maintenance Supervisors conduct sand and rock patrol inspections to assess potential damage, actual damage and preventative and repair needs due to rockslides or sand drifts in their designated State Highway Maintenance areas. The Maintenance Supervisors are expected to be aware of the locations of rock slopes for which they are responsible to maintain. Since many major failures in rock slopes involve initial small rock block falls, rock slopes should be examined for the presence of loose blocks, and these should be removed and a determination if a stabilization of the rock face is necessary. Similar to storm patrols, Maintenance Supervisors make the determination if resources are available for field crews to undertake corrective actions or if emergency contracts are necessary to repair damage from a major rock slide event. For contracted work, Maintenance Supervisors or appropriate District staff determine necessary corrective actions and schedule.

Drainage and Culvert Inspections

Visual surface level inspections of drainage facilities are made by District Maintenance Supervisors to identify obvious defects, hazards or potential problems, and also to monitor known problems. These inspections should be made annually and during and after each major storm. When major defects or hazards are found, they shall be immediately reported to the District Culvert Inspection Program or the Maintenance Engineer. If an emergency condition exists, appropriate action shall be taken as soon as possible to ensure the safety of the traveling public and to prevent further damage from occurring, including restricting traffic on the roadway or closing it completely, installing temporary drainage or support systems or making temporary repairs.

Public Notification Inspections

Division of Maintenance Supervisors respond to Maintenance Service Requests (MSRs) to inspect areas for potential or actual earth and/or rock slide conditions. The Maintenance Service Requests can be submitted online at the Departments website: http://www.dot.ca.gov/hq/maint/msrsubmit/. The Department's District Offices also have phone numbers and email addresses for members of the public to notify of conditions they perceive as requiring a Division of Maintenance response. All MSRs are logged into a database and forwarded to the appropriate Area Supervisors to inspect and assess the locations. Maintenance Supervisors are required to record their initial inspection, assessment and recommended preventative or response activities, if required, into the Division's IMMS database.

3.1.2 Landslide Preventative Measures

Division of Maintenance staff performs the following landslide preventative activities.



Drain and Culvert Maintenance

Drain or culvert system diversion or plugging can create flooding, divert flow over cut or fill slopes and cause slope failure. Drain pipe and culvert ends should be checked annually or after major storms. Visible sections of existing drains, culverts and headwalls are to be inspected for erosion, stability and structural integrity. Debris that can divert water flow should be removed and eroded areas re-established with soil/aggregate mixtures and reseeded. Maintenance BMPs for Drain/Culvert are used to reduce sediment impacts (see section 4.1.2 for BMPs). Repairs requiring system reconstruction, significant site erosion, or erosion repairs exceeding Division of Maintenance allowable resources shall be reported to the District Maintenance Engineer. Additional measurers may need to be taken to reduce erosion, such as paving the channel in areas where erosion continues or adding rock slope protection. Provision E.2.h.3.c.i of the NPDES Permit also requires that,

"The Department shall inspect all urban drainage inlets and catch basins a minimum of once per year and shall remove all waste and debris from drainage inlets and catch basins when waste and debris have accumulated to a depth of 50 percent of the inlet or catch basin capacity".

Drainage Ditch and Channel Maintenance

Drainage ditches and channels are designed to route drainage in a stable fashion to avoid erosion, fill or cut undermining that can lead to instability. Drainage ditches and channels should be checked annually or after major storms for blockage, erosion, stability and structural integrity. These types of systems allow for visual inspection. Debris that can divert water flow should be removed and eroded areas repaired using soil stabilization and sediment control best management practices. Repairs requiring system reconstruction, significant site erosion, or erosion repairs exceeding Division of Maintenance allowable resources shall be reported to the District Maintenance Engineer.

Vegetation Maintenance

Vegetation provides surface stability and roots contribute to slope stability through reinforcement of soil and removal of water from transpiration. Vegetation can create safety hazards such as falling, blocking site distance or traffic control signage, therefore vegetation must be maintained. Division of Maintenance preserves natural existing and designated landscaped roadside vegetation areas to the maximum extent practicable. Planted groundcover improves the stability of roadside slopes providing a soil/root matrix and reducing erosion from rainfall. Grasses and weeds must be controlled to provide fire-risk management in accordance with annual District Vegetation Control Plans. Vegetation maintenance includes chemical, manual and mechanical/mowing controls, tree and shrub removal and ground cover preservation. Vegetation maintenance BMPs are used to prevent water quality impacts from vegetation maintenance activities (section 4.1.4 for BMPs).



Roadside Stabilization, Erosion and Sediment Control

When preventative work is needed for areas susceptible to landslides the Division of Maintenance implements roadside stabilization, rock and sediment controls as feasible.

Depending on the scope of the project stabilization work may be determined by the Maintenance Supervisor or directed by District Maintenance engineers, in consultation with the District NPDES Coordinator and/or landscape and geotechnical specialists.

As needed, field crews shall be trained and capable of implementing the following work.

- Maintenance crews in applicable areas shall be trained and capable of implementing soil sediment controls including: check dams, fiber rolls, sediment traps, sand/gravel bag barriers, silt fences and straw bale barriers.
- Maintenance crews in applicable areas shall be trained and capable of implementing soil stabilization including: compaction, geotextiles, mats/plastic covers, erosion control blankets, hydraulic mulch, hydroseeding, handseeding, rock slope protection, soil binders, straw mulch and wood mulch.
- Division of Maintenance field crews shall be trained and capable of implementing rock fall catchment devices such as rock fences/walls or K-rail rock catchments in locations to contain rock material where needed.

Specially trained Department or contracted crews may conduct rock scaling to remove loose or potentially unstable material that might dislodge from a highway slope and fall. In most cases, Maintenance Engineers will indicate areas that require scaling though there may be the need for multi-divisional geotechnical staff involvement in some instances. In all cases, scaling operations should be observed and carefully controlled to prevent the creation of unsupported or overly steep slope areas. As a stabilization or mitigation measure, scaling is typically effective for a period of two to ten years, depending on site conditions. It is not considered a permanent preventative measure.

3.1.3 Fire Prevention

Wildfires strip the soil of vegetation and soil cohesion, the absence of which may lead to mass debris and sediment landslides in subsequent major storm events. Fire prevention is an important element of the Department's preventative landslide management activities (see Appendix B).



Each district should identify at-risk areas and develop a Fire Prevention Plan in cooperation with local wild land fire prevention officials for Caltrans Right-of-Way adjacent to grass, brush, or forest covered lands. District Fire Prevention Plans should be developed annually in conjunction with District Vegetation Control Plans (example: designating fire strip areas). The Vegetation Control Plan must consider fire risk in sufficient detail to reflect changing vegetation types along highway edges differing adjacent land uses, highway configurations, and annual rainfall impacting expected vegetation growth which may increase/decrease fire risk, and urban interface. Additionally, the local California Department of Forestry and Fire Protection (Cal Fire) and Caltrans officials should meet at least annually in the spring to determine equipment and personnel resources available for the upcoming fire season as required in the Cal Fire - Caltrans Interagency Agreement.

A site specific annual Fire Risk Plan is to be prepared by the District Landscape Specialist for the Deputy District Director, Maintenance. This plan establishes specific fire control measures for road edges, while considering the likelihood of a fire occurring and the consequences of a fire to the roadside and to adjacent properties. The consequences of fire spreading to an adjacent forest may be more serious than fire spreading to desert, chaparral or grasslands.

Maintenance field staff is responsible for performing annual inspections of fire suppression equipment before the fire season to ensure suitability for roadside use in accordance with California Public Resources Code 4442. This also applies to rented equipment. Combustion equipment must meet spark arrestor requirements, and fire suppression equipment shall be available at work sites during any time of the year when burning permits are required.

• The minimum fire suppression equipment which must be at each work site when required are one serviceable round point shovel with a handle length not less than 46 inches and one backpack type water pump, not less than five gallons in capacity.

Cal Fire provides daily adjective ratings for high or extreme conditions by area. This information is available to supervisory personnel planning activities through the District Transportation Management Center or from the nearest Cal Fire Emergency Command Center. For HIGH or VERY HIGH adjective ratings the following are required for roadside work.

- A skid mounted or similar self-contained pump and tank unit mounted on a vehicle and capable of carrying and pumping 200 gallons located within one mile driving distance of work site.
- Personnel at each work location must be able to report fires or emergencies from the scene either by two-way radio or cellular phone.
- The entire area of any activity must be patrolled and directly monitored for 30 minutes following cessation of work operations. In extremely dry or windy



conditions, consideration should be given to extending patrol and monitoring times.

The Division of Maintenance has the following District Maps available online as additional fire prevention resources for supervisory personnel.

- Cal Fire Fire Threat Zones
- National Fire Rating Danger Zones
- Cal Fire State Responsibility Areas (federal, state and local)

(http://onramp.dot.ca.gov/hq/maint/roadway/gis/index.shtml)

When performing roadside activities during the fire season in grass, brush or forest covered lands, wind and humidity should be monitored using hand held measuring devices. Refer to the Attachment *Maintenance Fire Prevention Guidelines* for additional information and contacts.



3.2 RESPONSE

Response activities are conducted when landslides of earth, rock, and debris, debris flows and rock falls within the Department's right of way have occurred. The Division of Maintenance also conducts activities in responses to wildfires. These events may be minor or major resulting in a break in service where there is an imminent threat to traveler safety and/or the integrity of the highway system. Depending on the severity of a verified event, Maintenance Supervisors and appropriate field crews initiate work as a result of District inspections or notification by: the District Transportation Management Centers (TMCs), the Department's Emergency Operations Centers (EOCs), Maintenance Service Requests (MSRs), the California Highway Patrol (CHP), the California Emergency Management Agency (Cal-EMA), The California Department of Forestry and Fire Prevention (Cal Fire), other external agencies or entities.

3.2.1 Landslide and Burn Area Principal Response Activities

The following principal response activities are performed by maintenance field crews in mitigating landslide and burn areas. All of the activities may or may not be applicable to a specific response event depending on its severity.

- 1. Drainage system protection, repair and/or replacement
- 2. Stabilization and/or erosion control of slopes
- 3. Protection, restoration and/or removal of vegetation
- 4. Slide/slipout cleanup and repair
- 5. Structures and roadway surface damage replacements and/or repairs
- 6. Traffic safety management (lane closures and openings, traffic safety devices replacement and/or repairs to guard rail, signs, fences)
- 7. Maintenance of material storage/disposal areas

Landslides

The immediate concerns of maintenance crews in responding to a landslide occurrence are safety, emergency highway opening if needed, rock and sediment control and cleanup and site stabilization. This work can be labor intensive, involving an entire maintenance crew for traffic control, equipment operation, spotting for safety and truck hauling the material away to temporary waste disposal areas. Highway turnouts are commonly used for temporary material storage. The District Maintenance Storm Water Coordinator should assist in determining if a location chosen for clean up material is appropriate and ensure that proper BMPs are deployed.

Further cleanup typically includes follow up inspections, highway slide/slipout repair, hauling material from the temporary material storage areas to locations for recycling or permanent disposal, removing downed vegetation, stabilization and repair to drainage systems. When the needs posed by an event exceed the ability of maintenance crews to respond, contracted services are required.



Burn Areas

The immediate concerns of maintenance crews in responding to a burn area are assisting in traffic management, emergency site access, removal of fire debris, protecting the highway drainage systems, and mitigating the area against future runoff erosion and potential slides and slipouts. Depending on the severity of the event, damage to structures and pavement may occur requiring repairs and/or replacement. Temporary material storage areas may need to be established for fire debris collection for offsite disposal. District Maintenance Storm Water Coordinators should assist in establishing these locations. Maintenance Area Supervisors should assess potential drainage areas and inlets for the need to install debris racks, risers or other debris protection for the drainage system.

Where required, Maintenance personnel coordinate erosion control strategies with the District Landscape Architect staff. For multi-agency response situations, the Division of Maintenance may be called upon to assist in the implementation of a Burn Area Emergency Response (BAER) plan. This emergency stabilization document specifies treatments approved to implement post-wildfire emergency stabilization policies on an individual incident. This plan/report is prepared by an interdisciplinary team of specialists during or immediately after the containment of a wildfire. District Landscape Architect staff is the normal point of contact regarding BAER plan implementation. When the needs posed by an event exceed the ability of maintenance crews to respond, contracted services are required.

3.2.2 Inspection Assessments

Depending on the type and size of the landslide or wildfire event, a Supervisor and/or support staff are to conduct an initial location assessment. The assessment should gather information regarding Division of Maintenance resource needs for any or all of the required principal response activities.

A determination is made regarding available maintenance field resources and as to whether they are sufficient for required repairs, restoration and/or highway reopening. The Division of Maintenance may be the sole entity to mitigate the site or if Division resources are insufficient contracted services will be required. Where repairs or mitigation are conducted in Environmentally Sensitive Areas (ESAs) care should be taken to observe regulations governing the site. This includes permits and clearances from regional agencies if required. Landslides are common in coastal areas and watersheds that are already impaired with sediment.

In burn areas, assessment activities need to be closely coordinated with fire fighting activities to avoid conflicts between wildfire fighting efforts and maintenance response planning. For multi-agency responses, Division of Maintenance assessment activities must be coordinated with the designated Incident Commander.



3.2.3 Notification

If Division of Maintenance staff is the first responder to a landslide or wildfire location, the Maintenance Area Supervisor is required to notify appropriate personnel.

The District Major Damage Coordinator and the District Transportation Management Center (TMC) are to be notified if the total response and restoration required exceeds available field maintenance resources. For these types of events the District may implement the Department's Emergency Operations Plan (EOP) and contracted services will be required. The Division of Maintenance is not the lead in this situation and will assist as needed and as available resources allow. The District Major Damage Coordinator will initiate a Department multi-divisional response and external agency notification as required.

The EOP is available at: http://onramp.dot.ca.gov/hq/maint/em/eop/eop.htm

If response activities are to be conducted by Division of Maintenance field crews, the Maintenance Supervisor should contact: the District Major Damage Coordinator, the District Transportation Management Center (TMC), the District Maintenance Storm Water Coordinator and the District Maintenance Environmental Liaison if the incident requires highway closures and/or surface waters have or may be impacted. For smaller responses, the Maintenance Supervisor may contact the District Major Damage Coordinator prior to initiating site activities. Major damage is defined by the Division as exceeding \$1,000/site or \$15,000/mile for response and restoration work.

3.2.4 Mitigation

There are two phases to landslide and wildfire/burn area response: Emergency Opening (EO) and Permanent Restoration (PR).

Emergency Opening is first responder operations at the damage site taken to secure safety for travelers and workers, re-open closed facilities to at least partial service, establishment of detours, traffic control, and prevention of additional damage if there is an immediate threat. Permanent Restoration is repair work to restore the damaged facility to its pre-event condition. Improvements or betterments may be included as part of Permanent Restoration if the purpose of the improvement or betterment is to prevent recurring damage.

Strategies for responding and repairing damaged facilities include:

(1) **State Forces**. Maintenance crews perform all reopening and repair activities with State forces and State equipment. This may involve any or all principal response activities. This is commonly used for smaller damage sites where Division resources are sufficient.



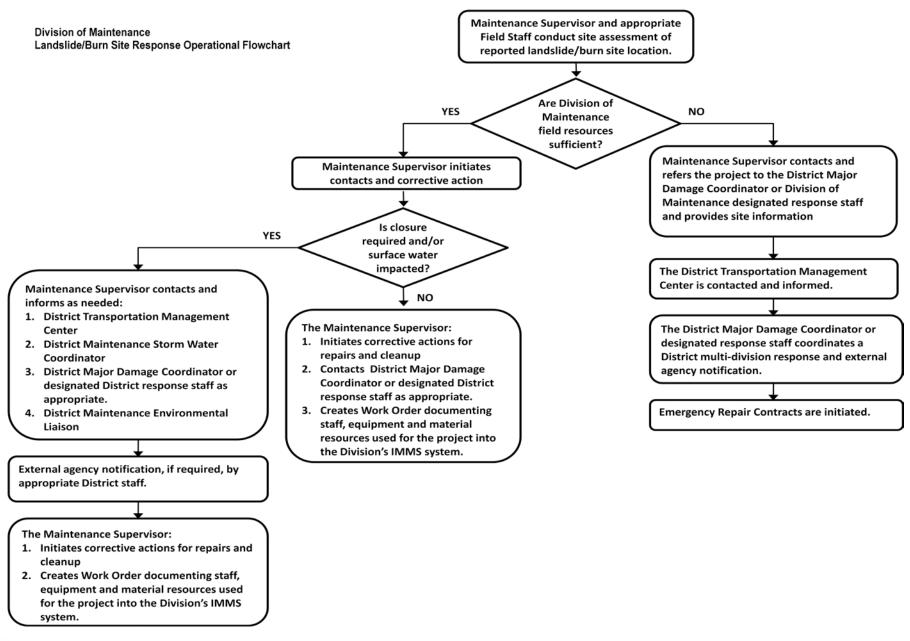
- (2) **Split Strategy**. The Maintenance crews perform EO activities to partially or fully reopen the facility. Once secured, the site is left unrepaired until a capital contractor completes the Permanent Restoration project at a later date. This is frequently used for larger damage locations.
- (3) **Combined Strategy**. The Maintenance crew(s) responds initially however, because the site is too large or costly, the EO is completed by a capital contractor (typically by Director's Order). The EO and PR are completed in one step by the same contractor. The combined strategy is only used when it is economically advantageous because there is no clear "break" between EO and PR. Example: a complete washout of the entire traveled way. Once the contractor restores subgrade it is usually more efficient to continue on to paving and striping, rather than trying to divide the work into a separate EO contract and PR contract.

The Department has the following mechanisms to fund major damage repairs by contract.

- (1) **Director's Orders**. Emergency contracts, approved by Headquarters, initiated by Maintenance but administered by Construction.
- (2) **Emergency Public Works Contracts** ("Minor B"). Emergency capital contracts below the cost threshold (currently \$270,000) for a Director's Order are delegated to the district.
- (3) **Emergency Equipment Rental Contracts** These contracts may or may not be capital funded on case-by-case basis. These contracts can only be used for debris removal, basin cleanout, culvert unplugging, or non-engineered excavation/backfill and may include dump fees. These contracts are not to exceed 60 days.
- (4) **Form 42 Emergency Materials Procurement**. Innovative procurement-in-place methods may be made available following declared disasters. A Governor's Executive Order is generally required.

The following flowchart illustrates the Division of Maintenance standard landslide/burn site response operational procedures.







4 BEST MANAGEMENT PRACTICES (BMPs)

In this section, BMP summary tables have been prepared for Landslide Management and Burn Site Management maintenance and construction activities. Personnel performing maintenance activities determine which BMPs should be applied for each activity by consulting these tables. The tables list potential BMPs for each section heading activity. For construction related activities the construction contracting/change order process and contract specifications are used to ensure that the appropriate BMPs are deployed.

For some activities, maintenance personnel may select from a variety of BMPs for storm water pollution prevention. For example, during cleanup or repair of slides and slip-outs, several sediment controls are available that may adequately contain sediment. Personnel may need to select one or a combination of the available control methods to address the sediment they encounter at the site.

Individual BMPs identified on the tables will not necessarily be applicable to all situations involving the activity. For example, not all sites will have on-site fueling operations, but those that do should be required to perform those operations in a manner consistent with the appropriate BMPs. The BMPs are listed alphabetically in each table. Several of the listed BMPs are also are also appropriate for deployment at burn sites.

Refer to Appendix A- *Description of BMPs* for details of the BMP titles listed in the tables. BMP detail includes; a description, appropriate application, implementation and maintenance requirements.

4.1 Landslide Management and Burn Site Activities BMPS

4.1.1 Inspections

The following BMP titles are applicable to inspection activities.

Illicit Spill Discharge Control
Illegal Connection Detection, Reporting and Removal
Slope Inspection
Vehicle and Equipment Operations:
Vehicle and Equipment Cleaning
Vehicle and Equipment Fueling
Vehicle and Equipment Maintenance

4.1.2 Drain/ Culvert and Drainage Ditch/Channel Maintenance The following BMP titles are applicable to drainage system maintenance.

Baseline Storm Water Drainage	Sediment Control:	Solid Waste Management
Facilities Inspection And Cleaning	Check Dam	
Clear-Water Diversion	Fiber Rolls	Stabilized Activity Entrance/Exit
Concrete Waste Management	Rock Fall Catchment	Stockpile Management
Contaminated Soil Management	Sand Bag or Gravel Bag Barrier	Storm Drain Inlet Protection
Enhanced Storm Drain Inlet Inspection and Cleaning Program	Sediment Trap Silt Fence Straw Bale Barrier Weighted Fiber Rolls	Tire Inspection and Sediment Removal
Illicit Spill Discharge Control Illegal Connection Detection, Reporting	Soil Stabilization: Compaction	Vehicle And Equipment Operations:
and Removal	Geotextiles, Mats/Plastic Covers and Erosion Control Blankets	Vehicle and Equipment Cleaning Vehicle and Equipment Fueling



	Hydraulic Mulch	Vehicle and Equipment
	Hydroseeding/Handseeding	Maintenance
Liquid Waste Management	Riprap (Rock Slope	Water Conservation Practices
Materials Handling:	Protection)	
Material Delivery and Storage	Soil Binders	
Material Use	Straw Mulch	
Material Loading and Unloading	Wood Mulch	
Preservation of Existing Vegetation		
Sanitary/Septic Waste Management		
Scheduling And Planning		



4.1.3 Roadside Stabilization and Erosion Control

The following BMP titles are applicable to soil stabilization and erosion control activities.

Illicit Spill Discharge Control	Sediment Control:	Spill Prevention and Control
Illegal Connection Detection, Reporting and Removal Material Handling: Material Delivery and Storage Material Use Material Loading and Unloading	Check Dam Fiber Rolls Rock Fall Catchment Sand Bag or Gravel Bag Barrier Sediment Trap Silt Fence Straw Bale Barrier Weighted Fiber Rolls	Stabilized Activity Entrance/Exit Stockpile Management Storm Drain Inlet Protection Sweeping And Vacuuming
Preservation of Existing Vegetation Safer Alternative Products Sanitary/Septic Waste Management Scheduling And Planning	Soil Stabilization: Compaction Geotextiles, Mats/Plastic Covers and Erosion Control Blankets Hydraulic Mulch Hydroseeding/Handseeding Riprap (Rock Slope Protection) Soil Binders Straw Mulch Wood Mulch	Tire Inspection and Sediment Removal Vegetated Slope Inspection Vehicle And Equipment Operations: Vehicle and Equipment Cleaning Vehicle and Equipment Fueling Vehicle and Equipment Maintenance Water Conservation Practices Wind Erosion Control

4.1.4 Vegetation Maintenance

The following BMP titles are applicable to implementing the Division's vegetation maintenance field activities.



Chemical Vegetation Control	Solid Waste Management
Illicit Spill Discharge Control	Spill Prevention and Control
Illegal Connection Detection, Reporting and Removal	Stockpile Management
Kemovai	Storm Drain Inlet Protection
Materials Handling	Vehicle and Equipment Operations
Material Delivery and Storage	Vehicle and Equipment Cleaning
Material Loading and Unloading	Vehicle and Equipment Fueling
Material Use	Vehicle and Equipment Maintenance
Preservation of Existing Vegetation	Water Conservation Practices
Safer Alternative Products	
Sanitary/Septic Waste Management	
Scheduling And Planning	



4.1.5 Slide/Slipout Cleanup and Repair

The following BMP titles are applicable during slide/slipout cleanup and repair work.

Ditches, Berms, Dikes and Swales	Solid Waste Management
Illicit Spill Discharge Control	Storm Drain Inlet Protection
Illegal Connection Detection, Reporting and	Stabilized Activity Entrance/Exit
Removal	Stockpile Management
Preservation of Existing Vegetation	Storm Drain Inlet Protection
Sediment Control:	Storm Water Dewatering Operation
Check Dam	Sweeping and Vacuuming
Fiber Rolls	Temporary Diversion Ditches
Rock Fall Catchment	Tire Inspection and Sediment Removal
Sand Bag or Gravel Bag Barrier	Vehicle and Equipment Operations:
Sediment Trap	Vehicle and equipment Cleaning
Silt Fence	Vehicle and Equipment Fueling
Straw Bale Barrier	Vehicle and Equipment Maintenance
Weighted Fiber Rolls	
Slope Inspection	Wind Erosion Control
Soil Stabilization:	Work in a Water Body
Compaction	
Geotextiles, Mats/Plastic Covers and	
Erosion Control Blankets	
Hydraulic Mulch	
Hydroseeding/Handseeding	
Riprap (Rock Slope Protection)	
Soil Binders	
Straw Mulch	



Wood Mulch	

4.1.6 Bridge and Structural Pavement Failure Repairs The following BMP titles are applicable to bridge and structural pavement failure repairs.

Concrete Waste Management	Scheduling And Planning
Hazardous Waste Management	Solid Waste Management
Illicit Spill Discharge Control	Spill Prevention and Control
Illegal Connection Detection, Reporting and Removal	Stockpile Management
Liquid Waste Management	Storm Drain Inlet Protection
Materials Handling	Sweeping And Vacuuming
Material Delivery and Storage	Vehicle and Equipment Operations
Material Loading and Unloading	Vehicle and Equipment Cleaning
Material Use	Vehicle and Equipment Fueling
Paving Operations Procedures	Vehicle and Equipment Maintenance
Safer Alternative Products	Water Conservation Practices
Sanitary/Septic Waste Management	

4.1.7 Guard Rail, Sign and Fence Repair and Replacement The following BMP titles are applicable to traffic safety guard rail and sign repair and replacement.

Compaction	Solid Waste Management
Concrete Waste Management	Stabilized Activity Entrance/Exit
Illicit Spill Discharge Control	Sweeping And Vacuuming
Illegal Connection Detection, Reporting and Removal	Tire Inspection and Sediment Removal
Materials Handling	Vehicle and Equipment Operations
Material Delivery and Storage	Vehicle and Equipment Cleaning
Material Loading and Unloading	Vehicle and Equipment Fueling
Material Use	Vehicle and Equipment Maintenance
Scheduling And Planning	Water Conservation Practices



4.1.8 Maintenance of Waste Disposal Areas

The following BMP titles are applicable to the maintenance of waste disposal areas.

Illegal Spill Discharge Control	Sediment Tracking Control
Maintenance Housekeeping Practices	Stabilized Activity Entrance/Exit
Material Handling:	Tire Inspection and Sediment Removal
Material Delivery and Storage	Stockpile Management
Material Loading and Unloading	Temporary Diversion Ditches
Preservation of Existing Vegetation	Sweeping And Vacuuming
Safer Alternative Products	Vehicle And Equipment Operations
Scheduling And Planning	Vehicle and Equipment Cleaning
Sediment Control:	Vehicle and Equipment Fueling
Check Dam	Vehicle and Equipment Maintenance
Fiber Rolls	Waste Management
Rock Fall Catchment	Concrete Waste Management
Sand Bag or Gravel Bag Barrier	Contaminated Soil Management
Sediment Trap	Solid Waste Management
Silt Fence	Spill Prevention and Control
Straw Bale Barrier	Wind Erosion Control
Weighted Fiber Rolls	



4.2 Burn Site Management Activities BMPS

Depending on the severity of the event, all or selected BMP titles from this table may be applicable to the activities required to manage a burn site.

Clear-Water Diversion	Soil Stabilization
Ditches, Berms, Dikes and Swales	Spill Prevention and Control
Illegal Connection Detection, Reporting and	Stabilized Activity Entrance/Exit
Removal	
Illicit Spill Discharge Control	Stockpile Management
Maintenance Housekeeping Practices	Storm Drain Inlet Protection
Materials Handling	Sweeping And Vacuuming
Paving Operations Procedures	Temporary Diversion Ditches
Preservation of Existing Vegetation	Tire Inspection and Sediment Removal
Safer Alternative Products	Vehicle And Equipment Operations Vehicle and Equipment Cleaning Vehicle and Equipment Fueling Vehicle and Equipment Maintenance
Scheduling And Planning	Waste Management
Sediment Control	Concrete Waste Management
Check Dam	Contaminated Soil Management
Fiber Rolls	Liquid Waste Management
Rock Fall Catchment	Sanitary/Septic Waste Management Solid Waste Management
Sand Bag or Gravel Bag Barrier	Solid waste Management
Sediment Trap Silt Fence	
Straw Bale Barrier	
Weighted Fiber Rolls	
Sediment Tracking Control	Water Conservation Practices
Slope Inspection	Wind Erosion Control
	Work In A Water Body



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APPENDIX A - DESCRIPTIONS OF BMPS



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Baseline Storm Water Drainage Facilities Inspection and Cleaning

Description:

Culverts, ditches, gutters, underdrains, horizontal drains and downdrains require inspection and cleaning to prevent flooding and to provide for sufficient hydraulic capacity.

Appropriate Applications:

These procedures are applicable to maintenance personnel who conduct storm water drainage system facilities inspection and cleaning. BMP implementation will depend on traffic, weather, available resources, safety conditions and access to storm water drainage systems.

Implementation:

- Inspect culverts, ditches, gutters, underdrains, horizontal drains, downdrains and outlets annually and as needed during the winter season to determine if cleaning is required or if damage has occurred.
- Caltrans will inspect storm drains annually during pre-rainy season periods and prioritize the cleaning of storm drains based on the following criteria:
 - Priority 1: Storm drains on highway segments in areas prone to erosion that are within Environmentally Sensitive Areas (ESAs)
 - Priority 2: Storm drains on highway segments in ESAs
 - Priority 3: Storm drains on highway segments in areas prone to erosion

Environmentally Sensitive Areas include:

- Areas that discharge to Areas of Special Biological Significance (ASBS)
- Areas that discharge to or are within 200 feet of a CWA Section 303(d) listed water bodies that are impaired for a pollutant that is known to be or likely to be discharged from Caltrans facilities or right of way
- Areas where discharges are subject to a TMDL for a pollutant that is known to be or likely to be discharged from Caltrans facilities or right of way
- Known "hot spot" areas of pollution accumulation as identified by Maintenance personnel, complaints and others.

District maps and databases have been developed identifying areas prone to erosion and Environmentally Sensitive Areas.

- Storm drains that do not meet one or more of the above criteria will be assigned lower priorities for cleaning than those drains that do meet one or more of the above criteria. Type of drainage facility (e.g., self-cleaning drop inlets, catch basins, trash screen, etc.) will also be considered when prioritizing a drain for cleaning.
- Inspect ditches and gutters to maintain sufficient hydraulic capacity. Schedule routine ditch-cleaning activities designed to maintain sufficient hydraulic capacity of ditches prior to the rainy season.



- When cleaning drainage ditches below cut slopes or steep slopes, avoid cutting the toe of the slope. This can also prevent damage to the ditch.
- Water used and the material generated during drainage facility cleaning should be collected and managed per the requirements of the BMPs Solid Waste Management and Liquid Waste Management.
- Where waterways are affected, coordinate maintenance activities with the appropriate regulatory agency.
- Temporary stockpiles of removed material should be managed per the requirements of the BMP Stockpile Management.
- The Maintenance Supervisors in charge of the activity will provide vacuum truck operators with written instructions identifying pre-approved decanting sites.
- Maintenance Supervisors will work with the District Maintenance Storm Water Coordinator in establishing approved decanting sites for vacuum truck waste.

Maintenance:

- District staff should observe culverts and drain inlets annually in the fall and throughout the winter as needed to determine if cleaning or repairs are required. Culverts will be cleaned when sediment adversely impacts culvert function.
- Ditches will be cleaned prior to the rainy season to maintain the hydraulic capacity of the ditch. Ditches and gutters will be sealed or repaired when structural integrity is endangered.
- Downdrains will be inspected annually and cleaned or repaired as necessary



Check Dam

Description:

A check dam is a small, temporary device constructed of rock, fiber rolls, gravel bags or sandbags placed across a natural or man-made channel or drainage ditch. Restricting the flow velocity in the ditch line reduces erosion of the drainage ditch. Check dams can be installed to slow and filter stormwater runoff (rock or permeable gravel bags) or to only slow stormwater (using sand bags, fiber rolls).

Appropriate Applications:

- Check dams shall not be installed in watercourses without required regulatory permits.
- Check dams are primarily considered for use during emergency situations (Minor Slides and Slipouts Cleanup/Repair).
- Check dams may be used when working in areas receiving concentrated flow (see Clear-Water Diversion BMP).
- Check dams may be installed in small open or steep channels.

Implementation:

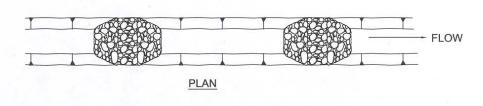
- Check dams should be placed at a distance and height to allow small pools to form behind them. They should follow up the side contours to reduce/eliminate scour.
- A conceptual rock, fiber roll, and gravel bag check dams are shown in the figures below. The notes on each figure provide guidance for the implementation of check dams.

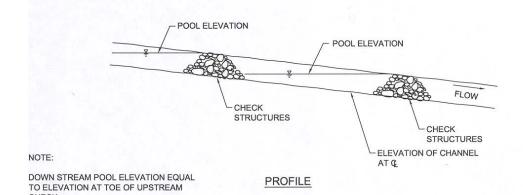
Maintenance:

- Remove sediment prior to accumulation reaching one-third of the check dam height and consider incorporating removed sediment into the maintenance activity site.
- Remove the check dam when no longer needed.

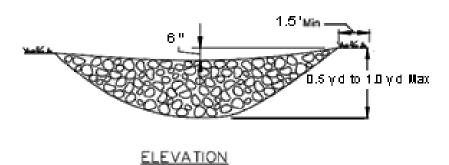


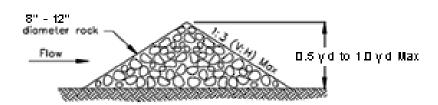
Temporary Check Dam





DOUBLE CHECK STRUCTURE N.T.S.

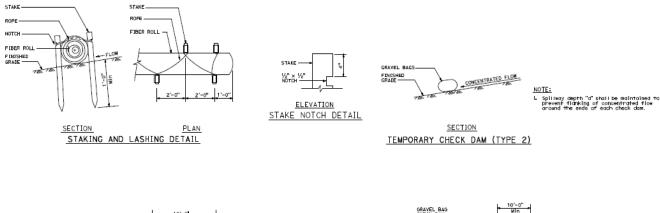


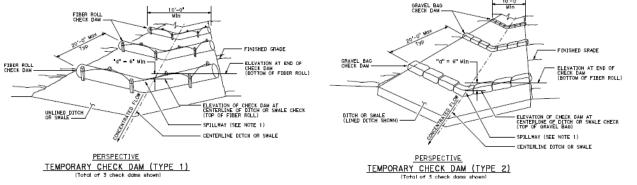


TYPICAL ROCK CHECK DAM SECTION



Temporary Check Dam







Clear-Water Diversion

Description:

Clear-water diversion consists of a system of structures and measures that intercept clear water, transport it around a maintenance activity site and discharge it downstream with minimal water quality degradation. Structures commonly used as part of this system include diversion ditches, berms, dikes, slope drains and drainage and interceptor swales.

Appropriate Applications:

- Clear-water diversions would most likely be implemented during Minor slides and slipouts cleanup repair.
- It is possible that a clear-water diversion may be implemented when working on a ditch line or channel.

Implementation:

- Clear-water diversions shall not be performed without prior approval and required regulatory permits.
- Stationary equipment (such as motors and pumps) located within or adjacent to a water body should be positioned over drip pans.
- When any artificial obstruction is being constructed, maintained or placed in operation, sufficient water shall at all times be allowed to pass downstream to maintain aquatic life downstream.
- Disturbance or removal of vegetation should not exceed the minimum necessary to complete operations.
- Remove diversions when the maintenance activity is completed.



Compaction

Description:

Soil may be compacted to reduce the potential for erosion and transport of sediment to drainage systems or watercourse.

Appropriate Applications:

- Compaction is not an alternative to restoring vegetation. Compaction is restricted to areas where vegetation is undesirable or is not sustainable.
- Compaction is appropriate for unpaved shoulder areas following shoulder grading activities, guard rail post installation and sign post installation.

Implementation:

- The effect of runoff from the compacted soil on nearby surface water should be considered.
- The area should be evenly graded or leveled prior to compaction.
- Compaction should not be performed while storm water runoff is observed.
- Compaction should be performed as soon as possible after grading or soil disturbance.
- Compaction may be combined with other BMPs Wood Mulch and Straw Mulch.

Maintenance:

• Compacted areas shall be inspected to identify any evidence of erosion upon the completion of maintenance activities.



Concrete Waste Management

Description:

Concrete waste management procedures and practices are designed to ensure that concrete wastes are properly handled and eliminate the discharge of concrete waste to storm water drainage systems or watercourses.

Appropriate Applications:

Concrete waste can be generated in various maintenance activities including Curb and Sidewalk Repair, Mudjacking and Drilling, Drain and Culvert Maintenance, Drainage Ditch and Channel Maintenance, Public Facilities, Sawcutting for Loop Installation, Sign Repair and Maintenance, Median Barrier and Guard Rail Repair, and Building and Grounds Maintenance.

- Contracts for concrete providers require contractors to appropriately manage any concrete waste and prohibit non-storm water discharges generated at the job site. The Department's *Standard Specifications Section 7-1.01G Water Pollution* requires compliance to applicable statutes relating to the prevention or abatement of water pollution.
- Portland cement concrete waste shall not be allowed to enter storm water drainage or watercourses.
- Concrete waste from grout pumping operations shall be contained.
- Concrete residue should be collected by vacuum or shovel for proper disposal. Concrete debris may be disposed of through on-site burial consistent with the requirements of Caltrans Standard Specification 15-3.02.
- Liquid waste can be contained in a bucket or drum with a tight-fitting lid for transport and approved off-site disposal. Plastic bags may be used if nothing else is available. Avoid breaking the bags by double-bagging and filling the bags to about one-fifth of their capacity. Allow solids to settle and recycle or dispose of in accordance with the Solid Waste Management BMP. The liquid waste may be evaporated. Decanted liquid waste shall be discharged to sanitary sewer only with the POTW's approval. Decanted liquid waste may also be removed for disposal as hazardous waste. Refer to the Hazardous Waste Management BMP.
- A temporary concrete washout facility may be constructed at the maintenance activity area. Below-grade concrete washout facilities are preferred. Above-grade facilities are used if excavation is not practical. Designated washout areas should be located at least 50 feet away from drainage facilities.
- Below-grade facilities consist of a pit excavated away from watercourses. Above-grade washout facilities should be bermed using sandbags or straw bales. Local



requirements and other environmental restrictions should be reviewed prior to placing concrete waste on the ground.

Maintenance:

The supervisor or the designee shall monitor the concrete working tasks, such as saw cutting, coring, grinding and grooving to ensure that concrete waste is collected and disposed of properly.



Contaminated Soil Management

Description:

These are procedures and practices to minimize or eliminate the discharges of pollutants from contaminated soil/sediment to storm water drainage systems or watercourses. Certain contaminated soil may be reused under specific conditions allowed the Department by agreements with regulatory agencies such as Cal-EPA Department of Toxic Substances Control (DTSC) variances for soil contaminated with aerially deposited lead (ADL).

Appropriate Applications:

Contaminated soil/sediment generated during emergency response or other maintenance activities should be collected and managed for reuse, treatment or disposal.

Implementation:

- The District HazMat Manager is the Maintenance Division lead for Maintenance HazMat activities. Maintenance staff shall contact the HazMat Manager immediately if wastes are generated or encountered within the Department's Right of Way requiring special HazMat handling procedures.
- Work with the local regulatory agencies to develop options for reuse, treatment, and/or disposal of contaminated soil. Any reuse, treatment and/or disposal of contaminated soils shall be in accordance with Department agreements with the appropriate regulatory agencies.
- Disposal of contaminated soil shall be in accordance with the Solid Waste Management BMP or Hazardous Waste Management BMP, depending on soil characteristics.
- Avoid stockpiling contaminated soils or hazardous material.
- Do not stockpile in or near storm water drainage systems or watercourses.
- If temporary stockpiling is necessary:
 - Cover the stockpile with plastic sheeting or tarps; and/or
 - Install a berm or barrier around the stockpile to prevent runoff from leaving the
- Take all necessary precautions and preventive measures to prevent the flow of water, including ground water, from mixing with hazardous substances.

Maintenance:

Temporary stockpiles of contaminated soil should be inspected regularly and controls shall be repaired as needed.



Ditches, Berms, Dikes and Swales

Description:

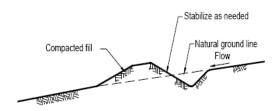
Ditches, berms, dikes and swales are temporary or permanent measures used to intercept and direct surface runoff to an overside/slope drain or stabilized watercourse.

Appropriate Applications:

Ditches, berms, dikes and swales may be implemented for the following purposes:

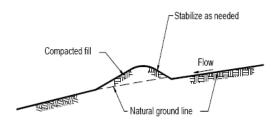
- To convey flow around maintenance activities;
- To divert flow away from maintenance stockpiles;
- At the top of slopes to divert run-on from adjacent slopes and areas;
- At bottom and mid-slope locations to intercept sheet flow and convey concentrated flows;
- At other locations to convey runoff to overside/drains, stabilized watercourses, storm water drainage system inlets (catch basins), pipes and channels;
- To intercept runoff from paved surfaces; and
- Along roadways and facilities subject to flood drainage.

- Evaluate risks due to erosion, overtopping, flow backups or washout.
- Consider outlet protection where localized scour is anticipated.
- Examine the site for run-on from off-site sources.
- Conveyances should be lined if high flow velocity is anticipated. Consider use of riprap, engineering fabric, asphalt concrete or concrete.
- Conceptual ditches, berms, dikes and swales are shown in figures below.



Conceptual Diversion Ditch/Drainage Swale

Not to Scale



Conceptual Diversion Dike/Berm
Not to Scale





Enhanced Storm Drain Inlet Inspection and Cleaning Program

Description:

In the metropolitan portions of Los Angeles, San Diego, Orange and Ventura Counties, the storm drain inlets will be inspected and cleaned annually prior to the rainy season. Those storm drain inlets that contain 12 inches or more of accumulated material will be cleaned. Inspection and cleaning activities will be reported annually by section of highway.

Appropriate Applications:

Within the target counties, an annual inspection and cleaning program should be implemented. This program will not address left shoulder, median or ramp inlets that require lane closures for access. Right shoulder inlets and other inlets that do not require lane closures should be inspected and the impact of litter and debris from these inlets should be assessed in the Monitoring and Research Program. Inspection and cleaning activities should be reported annually by county, route and post mile.

- Inspect drain inlets annually in the target counties to determine if cleaning is required or if damage has occurred.
- Clean inlets of accumulated material in accordance with regulatory mandates.
- Maintain records and a database of inspection and cleaning information.



Fiber Rolls

Description:

A fiber roll consists of wood excelsior, rice or wheat straw, or coconut fibers that is rolled or bound into tight tubular roll and placed on the toe and face of slopes to intercept runoff, reduce its flow velocity, release the runoff as sheet flow and provide some removal of sediment from the runoff. Fiber rolls are preferred at activity sites where the rolls may be left in place for assimilation into the site provide it is made of biodegradable netting. Fiber rolls are available commercially in diameters between 8 inches and 20 inches with 8 inch being most common.

Appropriate Applications:

- Fiber rolls may be used for minor slides and slipouts cleanup/repair.
- Fiber rolls may be used along the face and at grade breaks of exposed and erodible slopes to shorten slope length and spread runoff as sheet flow.
- Fiber rolls may also be used for inlet protection and as check dams under certain situations.
- Fiber rolls provide some sediment control.

- Fiber roll materials are either:
 - Prefabricated rolls: or
 - Rolled tubes of erosion control blanket.
- Assembly of field-rolled fiber roll:
 - Roll length of erosion control blanket into a tube.
 - Bind roll at each end (may be bound along length of roll with jute-type twine).
- Installation:
 - Install fiber rolls on level contours in a shallow trench.
 - Longer or additional stakes are needed where snow will accumulate behind roll. Drifting snow tends to pull rolls downhill.
 - For type-1 installation, place roll in shallow trench (2 to 4 inches deep). For type-2 installation, trench is not necessary.
 - Stake fiber rolls securely with maximum stake spacing of 4 feet through the center of roll for type-1 installation or every 2 feet on alternating sides of the roll for type-2 installation. Check to be sure the ground will hold stakes tight.



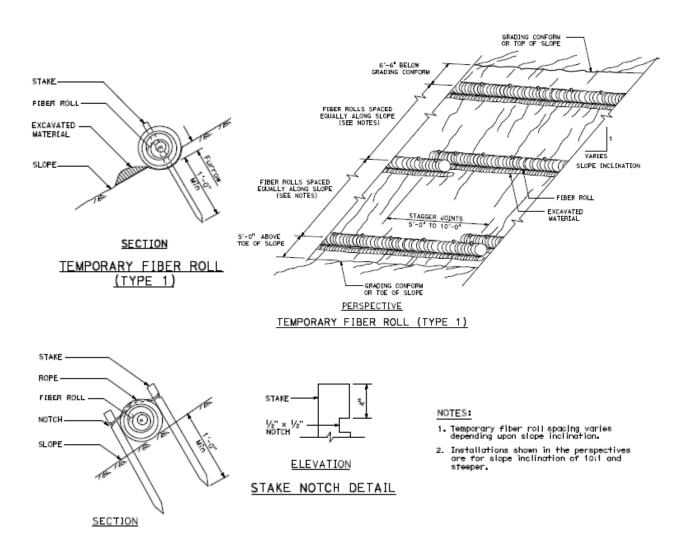
- Maintenance procedure is to secure adjacent rolls with a one foot overlap. A roll may be placed behind the adjacent roll and tied but not on top.
- Installation interval varies with the steepness of the slope:
 - Slope inclination of 1:4 or flatter: fiber rolls shall be placed on slopes 20 feet apart.
 - Slope inclination of 1:4 to 1:2: fiber rolls shall be placed on slopes 15 feet apart.
 - Slope inclination 1:2 or greater: fiber rolls shall be placed on slopes 10 feet apart.
- A conceptual fiber roll installation is shown in the figure below. The notes on the figure are useful guidance for the installation of fiber rolls.
- Fiber rolls are typically left in place.
- If fiber rolls are removed, collect and dispose of sediment accumulation, and fill and compact holes, trenches, depressions or any other ground disturbance to blend with adjacent ground.
- Where fiber rolls are installed on paved surfaces, gravel bag weights shall be placed on top at three-foot intervals or weighted fiber rolls used. Ensure fiber rolls fit tightly against the pavement and any concrete wall or edge to prevent gaps.

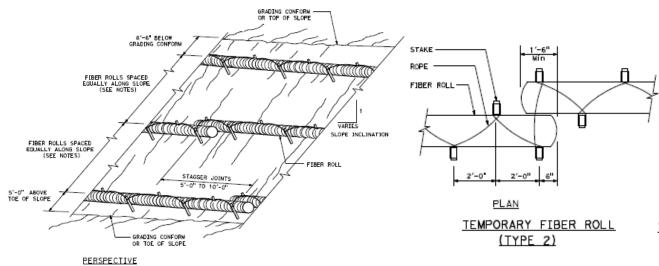
Maintenance:

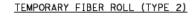
- Replace or repair split, torn, unraveling or slumping fiber rolls.
- Inspect fiber rolls when there is a forecast of rain. Inspect fiber rolls following rainfall events and a least daily during prolonged rainfall. Perform maintenance as needed.

Maintain fiber rolls to provide an adequate sediment holding capacity. Sediment shall be removed when the sediment accumulation reaches three quarters (3/4) of the barrier height. Normally, removed sediment may be disposed of in accordance with the Department's solid waste management practices. However, if the sediment exhibits characteristics such as odor, color and texture that are not similar to the surrounding native soil, an unknown material may be present, notify the District HazMat Manager immediately.











Geotextiles, Mats/Plastic Covers and Erosion Control Blankets

Description:

This BMP involves the placement of geotextiles, mats, chainlink fencing, plastic covers or alternative erosion control products to stabilize disturbed soil areas. These measures may be temporary or permanent.

Appropriate Applications:

• These measures are used where disturbed soils may be particularly difficult to stabilize, including steep slopes, slopes where erosion hazard is high and slopes where mulch must be anchored. They may be used for Slides and Slipouts Cleanup/Repair or Roadside Stabilization (see Slope Inspection BMP). Geotextiles, mats/plastic covers and erosion control blankets may also be used for disturbed soil areas where plants are slow to develop or where it is not the appropriate planting season. Geotextiles and mats/plastic covers may also be used in areas receiving concentrated flow.

Implementation:

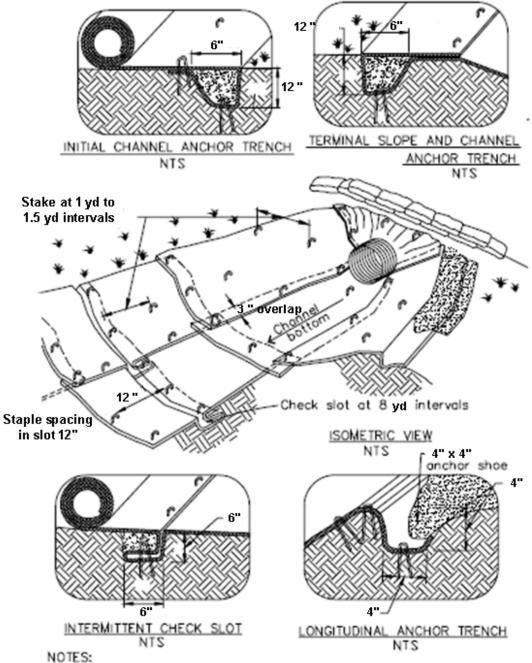
- These measures may be designed with input from geotechnical engineering or hydrology (especially if they are intended as permanent measures).
- Geotextiles, mats/plastic covers and erosion control blankets must be secured to the slope and installed in accordance with manufacturer's specifications.
- Illustrations of conceptual geotextiles, mats/plastic covers and erosion control blankets are shown in the figures below.
- Open edge sides should be keyed to prevent underflow.

Maintenance:

- Inspect for erosion and undermining. Ensure the controls are secured to the slope until permanent soil stabilization has been successfully attained.
- If washout or breaks occur, repair the damage to the slope or channel whenever possible and re-install the material.

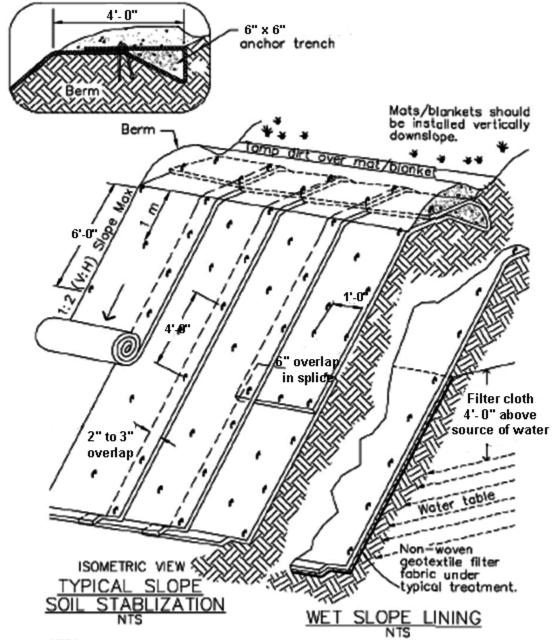


Conceptual Geotextiles, Mats/Plastic Covers and Erosion Control Blankets



- 1. Check slots to be constructed per manufacturers specifications.
- 2. Staking or stopling layout per manufacturers specifications.
- 3. Install per manufacturer's recommendations





Conceptual Geotextiles, Mats/Plastic Covers and Erosion Control Blankets

NOTES:

- Slope surface shall be free of rocks, clods, sticks and grass. Mats/blankets shall have good soil contact.
- Lay blankets loosely and stake or staple to maintain direct contact with the soil. Do not stretch.
- 3. Install per manufacturer's recommendations



Hazardous Waste Management

Description:

Hazardous waste management procedures and practices are designed to minimize or eliminate the discharge of pollutants at maintenance activity sites and maintenance facilities to storm water drainage systems or watercourses.

Appropriate Applications:

Hazardous waste management practices are implemented during maintenance activities and at maintenance facilities that generate or store hazardous waste from the use of petroleum products, asphalt products, concrete curing compounds, pesticides, acids, paints, solvents, wood preservatives, stains, roofing tar and any other materials considered a hazardous waste.

- The District HazMat Manager is the Maintenance Division lead for Maintenance HazMat activities. Maintenance staff shall contact the HazMat Manager immediately if wastes are generated or encountered within the Department's Right of Way requiring special HazMat handling procedures.
- Wastes shall be stored in sealed containers constructed of a suitable material and shall be labeled as required by Title 22 CCR, Division 4.5 and 49 CFR Parts 172,173, 178, and 179.
- All hazardous waste shall be stored, transported, and disposed as required in Title 22 CCR, Division 4.5 and 49 CFR 26-263.
- Waste containers shall be stored in temporary containment facilities that shall comply with the following requirements:
- Temporary containment facility shall provide for a spill containment volume able to contain precipitation from a 24-hour, 25 year storm event, plus the greater of 10% of the total volume of all containers or 100% of the capacity of the largest tank within its boundary, whichever is greater.
- All hazardous waste shall be stored, transported and disposed in accordance with federal, state and local regulations. Refer to the Department's <u>Maintenance</u> <u>Hazardous Waste Manual</u>. For example, the Hazardous Waste Manual includes the following: Chapter 2 Hazardous Waste Storage; Chapter 3 Disposal of Hazardous Waste; and Appendix E Section D5.07 Cleanup and Transport Requirements for Government Agencies.



- Waste shall be disposed of outside the highway right-of-way within 90 days of being generated. In no case shall hazardous waste storage exceed requirements in Title 22 CCR, Section 66262.34.
- Waste shall be disposed of by a licensed hazardous waste transporter at an authorized and licensed disposal facility or recycling facility utilizing properly completed Uniform Hazardous Waste Manifest forms.
- Make sure that toxic liquid wastes (e.g., used oils, solvents, and paints) and chemicals (e.g., acids, pesticides, additives, curing compounds) are not disposed of in dumpsters designated for solid waste maintenance debris.
- Properly dispose of rainwater in secondary containment that may have mixed with hazardous waste.
- Recycle any useful material such as used oil or water-based paint when practical.
- Maintenance staff are to follow label instructions regarding the proper handling, mixing and application of materials which could generate hazardous waste and a discharge to waterways.
- Maintenance staff shall implement good housekeeping procedures and exercise care
 and caution when handling hazardous materials capable of generating wastes that
 could create a contaminated water discharge. For example: Paint brushes and
 equipment for water- and oil-based paints shall be cleaned within a contained area
 and associated waste shall not be allowed to contaminate site soils, watercourses or
 storm water drainage systems; containers shall not be overfilled.
- At the Department's Maintenance Facilities, hazardous waste shall be stored in sealed containers constructed of a compatible material and shall be properly labeled in accordance with the Department's <u>Maintenance Hazardous Waste Manual</u>; Chapter 2 *Hazardous Waste Storage*. These types of materials require secondary containment.

Maintenance:

Periodically inspect the maintenance facility storage site to ensure all requirements are met and to review storage, disposal, and transport procedures.



Hydraulic Mulch

Description:

Hydraulic mulch is applied to disturbed soil areas that require protection. Hydraulic mulch consists of applying a mixture of natural or recycled fiber and a tackifier with hydro-mulching equipment. The mulch stabilizes the soil, reduces wind and water erosion and provides protection to seeds increasing survivability (see Hydroseeding/Handseeding BMP). It may be used as a temporary repair measure following maintenance activities to be followed by other soil stabilization BMPs.

Appropriate Applications:

- Hydraulic mulch may be applied to steeper slopes than wood mulch.
- Hydraulic mulch can be applied to areas that receive more concentrated flow where wood mulch would be washed away.
- Hydraulic mulch may be an appropriate measure for minor slides and slipouts cleanup repair.
- Hydraulic mulch may be used for stockpiled soil (see Stockpile Management BMP).

- Contact the District Landscape Specialist, District Erosion Control Specialist or Landscape Architect for the appropriate application rates. Use the recommended application rate.
- Hydro-mulching equipment is used to apply hydraulic mulch.
- Avoid mulch over-spray onto hardscaped areas.



Hydroseeding/Handseeding

Description:

Hydroseeding/Handseeding is a permanent soil stabilization method. Hydroseeding consists of applying a mixture of fiber, seed, fertilizer and stabilizing emulsion with hydro-mulching equipment. Other methods of seeding may also be used, including spreading by hand broadcasting or with a mechanical handspreader. Replacement planting is also covered under this BMP.

Appropriate Applications:

• Hydroseeding/handseeding may be used on erodible surfaces which require protection (e.g., Minor slides and slipouts cleanup repair).

Implementation:

- Hydroseeding can be accomplished using a multiple-step or one-step process.
- Avoid over-spray onto hardscaped areas.
- Seed should be uniformly applied.
- Seed should be "scratched in" or covered with straw or soil (Straw Mulch BMP).
- Contact the District Landscape Specialist or Landscape Architect for the appropriate seed type and application rate. The recommended seed type and application rate for the site conditions should be used.
- Temporary watering systems should be considered in critical areas. Consult a District Landscape Specialist for installation guidance.

Maintenance:

Seeded or planted areas should be inspected for failures and revegetated, fertilized or mulched.



Illicit Spill Discharge Control

Description:

This procedure calls for maintenance field staff who detect illegal dumping, discharges and spills of pollutants on Caltrans properties and facilities to report them.

This BMP is directed at incidents involving dumping, discharges or spills that affect storm water.

Appropriate Applications:

• Any spills or dumped materials that are observed by maintenance personnel shall be reported.

- Any illegal dumping or spilling of materials observed by field personnel, as part of
 their routine inspections and maintenance work, shall be reported to the District
 Stormwater Coordinator by their Maintenance Supervisor. The District Maintenance
 Storm Water Coordinator will forward these observations to the District NPDES
 Coordinator. A MTCE07 form is completed during the site investigation for the
 initial reporting information.
- If a Maintenance Supervisor suspects that the dumping of hazardous materials or hazardous waste has occurred, the supervisor shall report the incident to the District Hazardous Materials Manager.
- Spill cleanup shall be handled in accordance with the legal authority presented in Section 2 of the Statewide Storm Water Management Plan (SWMP).



Illegal Connection and Illicit Discharge Detection and Elimination (IC/ID)

Description:

Section 92 of the Streets and Highways Code states that the Department may do any act necessary, convenient or proper for the maintenance of all highways which are under its jurisdiction, possession or control. Section 27 of the Streets and Highways Code defines "maintenance" and includes maintenance or repair necessitated by unusual or unexpected damage to a roadway, structure or facility.

This management practice is directed at eliminating illicit discharges and continuous or recurring discharges through illegal connections to storm water drainage systems or as run-on from adjacent properties into Caltrans storm water drainage systems. .

An illicit discharge is a discharge onto Caltrans rights-of-way, Caltrans properties, facilities or from activities that is not composed entirely of storm water and is not authorized pursuant to Section B of the Department's NPDES Permit. Illicit discharges are considered "illicit" because Municipal Separate Storm Sewer Systems (MS4s) are not designed to accept, process, or discharge non-stormwater wastes.

Illegal connections are connections to Caltrans drainage systems that have not been approved by Caltrans. Illegal connections are encroachments as defined in Section 660 of the Streets and Highways Code. Illegal connections may carry unauthorized drainage, wastewater, or other illicit discharges to the Department's storm drain system from adjacent properties. These connections may carry pollutants into the storm drain system. Illegal connections may be intentional or may be unknown to the property owner.

The Department has authority over its property and investigates and resolves illegal connections and illicit discharges discovered within the right-of-way. Resolution may involve the elimination of the illegal connection and illicit discharge, proper permitting, or other appropriate actions including external enforcement and/or regulatory agencies involvement.

Appropriate Applications:

The detection and reporting of illegal connections and illicit discharges (IC/IDs) apply to all field activities performed by maintenance staff. If illegal connections and/or illicit discharges are discovered, they are to be reported and actions taken in accordance with the best management practices defined in this BMP.



Implementation:

DETECTION

- Where applicable, maintenance field personnel as part of their routine inspections and maintenance activities shall examine work areas for the existence of illegal connections and illicit discharges.
- Maintenance District Stormwater Coordinators, Supervisors or Supervisor designated staff shall investigate potential incidences of illegal connections and illicit discharges reported by the public, by phone, to District Public Information Offices or which have been reported through the Maintenance Service Request (MSR) process on-line.

INVESTIGATION

- Maintenance personnel shall complete the Division of Maintenance standardized form MTCE07 (Rev. 9/2011, see Appendix D) in conducting an IC/IDDE investigation at detected sites.
- The investigation should document, where possible, the minimum following information.
 - 1. The investigators name, title, reporting facility, cost center number and contact phone number
 - 2. Date, Time of the investigation
 - 3. Location address and the source of the discharge and/or illegal connection
 - 4. Description of source property (business or homeowner)
 - 5. Conversations with responsible party and or reporting party
 - 6. Contact names, addresses and phone numbers
 - 7. The type of substance discharged and the duration it has been discharging
 - 8. Physical and chemical characteristics of the discharge (color, smell)
 - 9. Plant and/or animal indicators present (plant discoloration, dead fish/rodents)
 - 10. Where the discharge flows to (drainage ditch, culvert, water body etc...)
 - 11. Photographic evidence

REPORTING

- The MTCE07 form completed during the site investigation contains the initial reporting information.
- Maintenance staff investigating sites should make copies of the MTCE07 form and
 forward a copy to the District Maintenance Stormwater Coordinator. If hazardous
 materials are known or suspected, the District Hazardous Materials Manager should
 be notified immediately and also forwarded a copy of the investigation report form.
 The form is available online at http://cefs.dot.ca.gov/forms/index.html and can be
 completed and distributed electronically.



- Maintenance field staff responding to a public report of an IC/ID should document the response on the MTCE07 form and follow Maintenance Service Request (MSR) policy.
- The Maintenance Stormwater Coordinator shall coordinate with the District NPDES coordinator and provide a copy of the investigative report form.
- The District NPDES Coordinator maintains the Department's database of illegal connections and illicit discharges information for regulatory tracking purposes.
- Maintenance field staff shall properly enter IC/ID activities completed into the Integrated Maintenance Management System (IMMS) Database for Division of Maintenance tracking.

CORRECTIVE ACTION

- In the event that illegal connections and illicit discharges to the Department's storm sewer system are used to intentionally introduce chemical, biological, radiological or other life threatening agents into the environment (an act of terrorism), corrective actions shall be in accordance with the Department's Emergency Operations Plan.
- When a highway spill (illicit discharge) causes an immediate threat to life, property or the environment and impacts the traveled way, such as a hazardous materials spill, actions taken shall be in accordance with Maintenance Policy Directive Number 0601 *Emergency Highway Spill Clean-up* and applicable sections of the Maintenance Manual Section D5. These are spills requiring a multi-agency response.
- Actions taken to remove illicit discharges due to illegal encampments shall be in accordance with Maintenance Policy Directive Number 1001 *Illegal Encampments*.
- In accordance with Section 721 of the Streets and Highways Code, the Department may immediately remove from any State highway any illicit discharge or illegal connection encroachment which:
 - o obstructs or prevents the use of such highway by the public;
 - o consists of refuse:
 - o is a non-approved, non-permitted advertising sign of any description.
- In accordance with Section 721 of the Streets and Highways Code, the Department may immediately remove from any State highway any encroachment, such as pipes or illegal connections, which is not removed, or the removal of which is not commenced and thereafter diligently prosecuted, prior to the expiration of five days from and after the service of a notice. The standard form TR0123 *Notice of Encroachment* (Red Tag) is to be used and is available on the forms website.



- District Maintenance staff removal of illicit discharges consisting of illegal dumping including animal carcasses shall be in accordance with the Maintenance Manual Section D1.
- District Division of Maintenance field staff may assist District Environmental staff
 and regulatory agencies, if requested to do so, in conducting IC/ID investigations of
 ongoing illegal connections and illicit discharges where the source is not immediately
 determined.

TRAINING

• Maintenance Supervisors should conduct a minimum of one IC/ID procedures review tailgate training meeting with their staff annually. A Division of Maintenance Stormwater Bulletin on Illegal Dumping and Spill Control is available to assist as a handout. A copy can be downloaded from this web location.

 $\frac{http://onramp.dot.ca.gov/hq/maint/roadside/storm_water/MaintenanceBulletins1998-2008.pdf$

• Formal refresher training is required for all field personnel at a minimum of once every four years and within the first year for new employees. This training includes a training module with more in-depth discussion and video aids on the Department's IC/ID policies and procedures.



Liquid Waste Management

Description:

Liquid waste management procedures and practices are designed to prevent the discharge of pollutants to storm water drainage systems or watercourses as a result of the creation, collection or disposal of nonhazardous materials that may be unauthorized non-storm water discharges.

Appropriate Applications:

- Liquid waste management is applicable to maintenance activities that generate any of the following non-hazardous byproducts, residuals, or wastes:
 - Drilling slurries and drilling fluids.
 - Grease-free and oil-free wastewater and rinse water.
 - Dredgings.
 - Other non-storm water liquid discharges not permitted by separate permits.
- Disposal of some liquid wastes may be subject to specific laws and regulations, or to requirements of other permits secured for the job (e.g., National Pollutant Discharge Elimination System [NPDES] permits, Army Corps permits, Coastal Commission permits, etc.).
- Does not apply to dewatering operations, solid waste management ,hazardous wastes , or concrete slurry residue.
- Does not apply to non-stormwater discharges permitted by any NPDES permit held by the pertinent Caltrans District, unless the discharge is determined by Caltrans to be a source of pollutants. Typical permitted non-stormwater discharges can include: water line flushing; landscape irrigation; diverted stream flows; rising ground waters; uncontaminated pumped ground water; discharges from potable water sources; foundation drains; irrigation water; springs; water from crawl space pumps; footing drains; lawn watering; flows from riparian habitats and wetlands; and, discharges or flows from emergency fire fighting activities.

- Non-stormwater discharges, unless specifically exempted by the Department's NPDES permit, to drainage paths, drain systems and watercourses are prohibited.
- Drilling and saw cutting fluids:
 - Stick-down berms may be used to improve containment.
 - Fluids may be collected by vacuum or other methods.
 - Collected fluids shall be contained and recycled, evaporated or discharged to the sanitary sewer system with approval from the publicly-owned treatment works (POTW).



- Fluids shall not be discharged to storm water drainage systems or watercourses.
- The supervisor shall oversee and enforce proper liquid waste management procedures and practices.
- Instruct maintenance personnel how to safely differentiate between non-hazardous liquid waste and potential or known hazardous liquid waste.
- Instruct maintenance personnel that it is unacceptable for any liquid waste to enter any storm drainage structure, waterway, or receiving water.
- Educate maintenance personnel on liquid waste generating activities, and liquid waste storage and disposal procedures.
- Hold regular meetings to discuss and reinforce disposal procedures (incorporate into regular tailgate meetings).
- Verify which non-stormwater discharges are permitted by the Caltrans Statewide NPDES permit; different regions might have different requirements not outlined in this permit. Some listed discharges may be prohibited if Caltrans determines the discharge to be a source of pollutants.
- Apply the Vehicle and Equipment Cleaning BMP for managing wash water and rinse water from vehicle and equipment cleaning operations

Vacuumed liquid wastes:

- A visual inspection of water drainage facilities shall be performed prior to cleaning. Caltrans operators are trained to visually inspect for petroleum products, odors, discoloration and other physical evidence of contamination. If chemical contamination is suspected, the operators will stop work and notify the Maintenance Supervisor. The Supervisor will follow existing Caltrans Hazardous Materials Spills procedures and coordinate removal of the contamination with the District Maintenance Hazardous Materials Coordinator.
- Liquid waste collected in the vacuum trucks may be evaporated or discharged to a
 Regional Water Quality Control Board approved temporary decanting location in
 the District. The Maintenance Supervisor shall ensure drain and culvert cleaning
 crews are aware of approved decanting procedures and the approved decanting
 location.

• Capturing, Containing, and Disposing Liquid Waste

- Capture all liquid wastes running off a surface, which has the potential to affect the storm drainage system, such as wash water and rinse water from cleaning walls or pavement.
- Do not allow liquid wastes to flow or discharge uncontrolled. Use temporary dikes or berms to intercept flows and direct them to a containment area or device for capture.



- If the liquid waste is sediment laden, use the Sediment Trap BMP for capturing and treating the liquid waste stream, or capture in a containment device and allow sediment to settle.
- Liquid wastes generated as part of an operational procedure, such as water laden material and mud, shall be contained and not allowed to flow into drainage channels or receiving waters prior to treatment.
- Contain liquid wastes in a controlled area, such as a holding pit, sediment basin, roll-off bin, or portable tank.
- Containment devices must be structurally sound and leak free.
- Containment devices must be of sufficient quantity or volume to completely contain the liquid wastes generated.
- Take precautions to avoid spills or accidental releases of contained liquid wastes.
 Apply the education measures and spill response procedures outlined in the Spill Prevention and Control BMP.
- Do not locate containment areas or devices where accidental release of the contained liquid can threaten health or safety, or discharge to water bodies, channels, or storm drains.
- Typical disposal of liquid waste method is to dewater the contained liquid waste, using procedures such as described in Storm Water Dewatering Operations BMP, Sediment Trap BMP and dispose of resulting solids per Solid Waste Management BMP.
- For off-site disposal the method of disposal for some liquid wastes may be prescribed in Waste Discharge Requirements, local agency discharge permits, etc., and may be defined elsewhere in state and federal regulations.
- Liquid wastes may require testing and certification whether it is hazardous or not before a disposal method can be determined.
- For disposal of hazardous waste, see Hazardous Waste Management BMP.
- If necessary, further treat liquid wastes prior to disposal. Treatment may include, though is not limited to, sedimentation, filtration, and chemical neutralization.

• Tunnel cleaning:

- Discharge to storm water drainage systems or watercourses from tunnel maintenance is prohibited.
- Storm drain inlets and systems shall be adequately protected from liquid waste discharges refer to the Storm Drain Inlet Protection BMP.
- Nonhazardous spent solvents shall be captured and reused, recycled or disposed in accordance with federal, state and local requirements.



- Refer to Material Delivery and Storage, Material Use and Material Loading and Unloading BMPs for appropriate handling and storage of liquids at maintenance activity sites.
- Refer to the Concrete Waste Management BMP for appropriate management of concrete waste.

Maintenance:

- Supervisors should review job sites to ensure appropriate practices are being employed.
- Remove deposited solids in containment areas and capturing devices as needed, and at the completion of the task. Dispose of any solids as described in the Solid Waste Management BMP.
- Inspect containment areas and capturing devices frequently for damage, and repair as needed.



Maintenance Housekeeping Practices

Description:

Daily activities occurring at maintenance facilities often involve the use of materials and products that are potentially harmful to the environment. Good housekeeping practices are intended to eliminate the potential for discharge of pollutants to drainage paths, storm water drainage systems or watercourses by promoting efficient and safe storage, use and cleanup of potentially harmful materials.

Appropriate Applications:

Proper housekeeping practices apply to all maintenance personnel who participate in activities that have a potential to generate pollutants that could discharge to storm water drainage systems or watercourses.

- Maintain clean, orderly material and equipment storage areas. Provide covers for materials as needed.
- Use the 'first in first out' policy for material storage and control. Avoid ordering more materials than can be stored properly or used in a reasonable timeframe.
- Properly reuse, recycle or dispose of empty containers, excess materials, equipment and parts that are not likely to be used. All solid wastes shall be managed per the requirements of the Solid Waste Management BMP.
- Maintain equipment and buildings to avoid peeling paint, rust and degradation. Request funding for major repairs.
- Sweep or vacuum maintenance facility floors and pavement.
- If mopping is used to clean floors or pavement, contain the mop water and dispose of it to the sanitary sewer system according to the following guidelines:
 - Do not dispose of mop water into the parking lot, street, gutter or drain inlet; and
 - If an oil/water separator is available, pour the mop water into the separator so that the wastewater is treated before being discharged to the sanitary sewer system.
- Secure and close lids on waste receptacles and bins when not in use.
- Clean up spills promptly. See the Spill Prevention and Control BMP.
- Use drip pans or absorbent material under leaking vehicles and equipment to capture fluids.
- If it is necessary to use a hose for cleaning, wash water shall not be discharged to the storm water drainage systems or watercourses.



- Minimize the possibility of storm water pollution from outdoor waste receptacles by doing at least one of the following:
 - Use only watertight waste receptacle(s) and keep the lid(s) closed;
 - Grade and pave the waste receptacle area to prevent run-on of storm water;
 - Install a roof over the waste receptacle area;
 - Install a low containment berm around the waste receptacle area; or
 - Use and maintain drip pans under waste receptacles.



Material Delivery and Storage

Description:

Material delivery and storage procedures and practices are designed for the proper handling and storage of materials at the maintenance facility. These procedures and practices minimize or eliminate the discharge of these materials to storm water drainage systems or watercourses.

Appropriate Applications:

- These procedures are implemented at maintenance facilities involved in the delivery and storage of aggregate, pesticides, fertilizers, detergents, plaster, petroleum products, asphalt and concrete components, concrete compounds or other materials that may be detrimental if released to storm water drainage systems or watercourses.
- Space limitation may preclude indoor storage. Storage sheds must meet building & fire code requirements.
- Refer to Material Use BMP and Stockpile Management BMP for procedures that apply to any materials that are assembled for use at a maintenance activity site.

- Containment facilities shall provide for proper spill containment.
- Containment facilities shall be impervious and compatible to the materials stored there.
- Containment facilities should be maintained free of rainwater and spills.
- Rainwater in containment facilities should be inspected prior to discharge. Drain valves should remain closed except to release clean rainwater.
- Personnel at maintenance facilities shall be trained to ensure that materials are properly handled and stored.
- Separation should be provided between stored containers and materials to allow for spill cleanup and emergency response cleanup.
- To provide protection from rain, bagged and boxed materials stored outdoors shall be stored on pallets throughout the rainy season and covered prior to rain events.
- Storage areas shall be kept clean, well organized and equipped with cleanup supplies for the materials being stored.
- Treated timber shall not be stored directly on the ground and shall be covered. Treated timber shall not be used to elevate storage of equipment and/or materials.



Maintenance:

- Storage areas shall be kept clean, well organized, and equipped with ample clean-up supplies as appropriate for the materials being stored.
- Perimeter controls, containment structures, covers, and liners shall be repaired or replaced as needed to maintain proper function.
- Inspect storage areas before and after rainfall events, and at least weekly where hazardous materials containers are stored. Collect and place into drums any spills or accumulated rainwater if contaminants are suspected.



Material Loading and Unloading

Description:

The loading/unloading of materials usually takes place outside on docks or terminals; therefore, materials spilled, leaked, or lost during loading/unloading may collect in the soil or on other surfaces and have the potential to be carried away by stormwater runoff or when the area is cleaned.

Appropriate Applications:

Loading and unloading of material may include package products, barrels, and bulk products. Implementation of the following protocols will prevent or reduce the discharge of pollutants to stormwater from outdoor loading/unloading of materials. Aside from materials, stormwater may wash pollutants from machinery used to unload or move materials.

- Develop an operations plan that describes procedures for loading and/or unloading.
- Do not conduct loading and unloading during wet weather, whenever possible.
- Designate loading/unloading area to prevent stormwater run-on which would include grading or berming the area, and positioning roof downspouts so they direct stormwater away from the loading/unloading areas.
- Cover designated loading/unloading areas to reduce exposure of materials to rain. A seal or door skirt between delivery vehicles and building can reduce or prevent exposure to rain.
- If feasible, load and unload all materials and equipment in covered areas such as building overhangs at loading docks. Load/unload only at designated loading areas.
- Use drip pans underneath hose and pipe connections and other leak-prone spots during liquid transfer operations, and when making and breaking connections. Several drip pans should be stored in a covered location near the liquid transfer area so that they are always available, yet protected from precipitation when not in use. Drip pans must be cleaned periodically, and drip collected materials must be disposed of properly.
- Pave loading areas with concrete instead of asphalt. Avoid placing storm drains in the area. Grade and/or berm the loading/ unloading area to a drain that is connected to a dead-end sump.



- Check loading and unloading equipment regularly for leaks, including valves, pumps, flanges and connections. Look for dust or fumes during loading or unloading operations.
- Train maintenance personnel on proper spill containment and cleanup. Personnel trained in spill containment and cleanup should be present during the loading/unloading. Train maintenance personnel in proper handling techniques during liquid transfers to avoid spills.
- Make sure equipment operators are properly trained on loading and unloading procedures.
- Have spill cleanup materials readily available and in a known location. Cleanup spills immediately and use dry methods if possible. Properly dispose of spill cleanup material.
- Space, material characteristics and/or time limitations may preclude all transfers from being performed indoors or under cover.

Maintenance:

- Conduct regular inspections and make repairs as necessary. The frequency of repairs will depend on the age of the facility.
- Check loading and unloading equipment regularly for leaks.
- Regular broom dry-sweeping of area.
- Conduct major clean-out of loading and unloading area and sump prior to October 1 of each year.



Material Use

Description:

Material use procedures and practices are used at maintenance facilities and maintenance activity sites to prevent the discharge of materials to storm water drainage systems or watercourses.

Appropriate Applications:

These procedures are implemented at maintenance facilities and at maintenance activity sites where pesticides, fertilizers, detergents, plaster, petroleum products, asphalt and concrete components, concrete compounds and other material that may be detrimental if released to the environment are used or prepared.

- Contract agreements with haulers who supply materials to maintenance activity sites should require them to supply materials in accordance with the requirements of this BMP.
- Latex paint and paint cans, used brushes, rags, absorbent materials and drop cloths shall be disposed of in accordance with federal, state and local requirements.
- Do not remove the original product label from a container as it contains important spill cleanup and disposal information. Make copies of the label information or material safety data sheet (MSDS) if needed. Use the entire product before disposing of the container. Appropriately label all secondary containers.
- Mix paint in a containment area. Do not clean paintbrushes or rinse paint containers
 where rinseate may discharge into a street, gutter, storm water drainage systems or
 watercourses. Rinseate from latex paint cleaning shall be disposed of properly.
 Empty paint cans shall be dry prior to disposal as solid waste. See the Liquid Waste
 Management BMP and the Hazardous Waste Management BMP.
- Paint should be loaded into spray equipment at a maintenance facility. Nearby drain inlets should be protected at maintenance facilities and at maintenance activity site.
- Use materials only where and when needed to complete the maintenance activity. Consider the use of safer alternative materials when possible. Reduce or eliminate use of hazardous materials on site when possible.
- Dispose of any paint thinners, residue and sludge(s), that cannot be recycled, as hazardous waste.
- For water-based paint, clean brushes to the extent practical, and rinse to a drain leading to a sanitary sewer where permitted, or into a concrete washout pit. For oil-



based paints, clean brushes to the extent practical and filter and reuse thinners and solvents.

- When loading and mixing pesticides, control water use to reduce potential for unpermitted non-stormwater discharges (e.g., provide a positive shutoff type of hose nozzle).
- Do not over-apply fertilizers and pesticides. Prepare only the amount needed. Strictly follow the recommended usage instructions. Apply surface dressings in smaller applications, as opposed to large applications, to allow time for it to work in and to avoid excess materials being carried off-site by runoff.
- Avoid exposing applied materials to rainfall and runoff unless sufficient time has been allowed for them to dry.
- Keep a supply of spill cleanup material near material use areas. Train employees in spill cleanup procedures.
- Secure loads and cover loose materials in open-bed trucks during hauling to activity sites.
- Truck beds should be inspected after the completion of material delivery to avoid depositing materials on the roadway.
- Use proper loading and unloading techniques to prevent spills.



Overside/Slope Drains

Description:

An overside/slope drain is a pipe used to intercept and direct surface runoff into a stabilized watercourse, a trapping device or a stabilized area. Overside/slope drains are typically used to intercept and direct surface flow away from slope areas to protect slopes. Overside/slope drains installed during maintenance efforts may be temporary. Maintenance staff may receive assistance from engineering for long-term installations or where installation is difficult.

Appropriate Applications:

- Slope drains may be used at sites where slopes have been eroded by surface runoff (Minor Slides and Slipouts Cleanup/Repair).
- Severe erosion may result if overside/slope drains fail. Overside/slope drains shall be inspected and maintained.

Implementation:

- When installing overside/slope drains:
 - Limit drainage area per pipe. For areas larger than 10 acres, use a lined channel or a series of pipes.
 - Use ditches, berms, dikes and swales to direct surface runoff into the overside/slope drain.
 - Secure the drain to the slope surface.
- Consider the following for installing overside/slope drains:
 - Install perpendicular to slope contours.
 - Protect area around inlet. Protect outlet with riprap or other energy dissipation device. For high-energy discharges, reinforce riprap with concrete or use reinforced concrete device.
 - Compact soil around and under entrance, outlet and along length of pipe.
 - Securely anchor and stabilize pipe and appurtenances into soil.

Maintenance:

- Regularly inspect overside/slope drains and maintain drains to ensure they are secured to the slope.
- Check outlet for erosion and downstream scour. If eroded, repair damage and install
 additional energy dissipation measures. If downstream scour is occurring, it may be
 necessary to reduce flows being discharged into the channel unless other preventive
 measures are implemented.
- Check slope drain for accumulation of debris and sediment. Clean drains to maintain their capacity.



Potable Water/Irrigation

Description:

In accordance with the Statewide SWMP, some non-storm water discharges are conditionally exempt by the Permit. The conditionally exempt non-storm water discharges include such discharges as irrigation water, potable water sources and water from line and hydrant flushing. This BMP is intended to reduce the possibility for the discharge of potential pollutants associated with conditionally exempt discharges from irrigation systems, planned and unplanned discharges from potable water sources and water line or hydrant flushing.

Appropriate Applications:

This BMP should be implemented on a site-specific basis whenever the above activities or discharges occur.

- When possible, flushed water should be applied for landscaping purposes.
- Shut off the water source to isolate a broken line, sprinkler or valve as soon as possible to minimize the loss of water.
- Repair broken water lines as soon as possible.
- Protect downstream storm water drainage systems and watercourses from water pumped or bailed from trenches excavated to repair water lines.
- Manage irrigation systems to ensure the appropriate amount of water is used and runoff is minimized.



Preservation of Existing Vegetation

Description:

Preservation of existing vegetation is the identification and protection of desirable vegetation that provides erosion and sediment control benefits. For activities involving the removal of vegetation, the limits of disturbance should be defined to minimize adverse effects on vegetation outside the working area. When removed vegetation shall be used as duff, the duff shall consist of a mixture of existing decomposed, chopped, broken or chipped plant material, leaves, grasses, weeds, and other plant material excavated from areas within the work area limits. Existing shrubs and other small plants shall be incorporated into the duff by dicing, or by other methods which will break or chop the material into particles not greater than 0.5 foot in greatest dimension.

Appropriate Applications:

- Vegetation should be preserved during the following activities:
 - Shoulder Grading;
 - Drain and Culvert Maintenance;
 - Drainage Ditch and Channel Maintenance;
 - Chemical Vegetation Control;
 - Manual Vegetation Control;
 - Mechanical Vegetation Control/Mowing;
 - Tree and Shrub Pruning, Brush Chipping, Tree and Shrub Removal;
 - Public Facilities;
 - Minor Slides and Slipouts Cleanup/Repair; and
 - Buildings and Grounds Maintenance.
- Preserve existing vegetation where no maintenance activity is planned or where activities will occur at a later date. Preserve existing vegetation to the maximum extent practicable.

Implementation:

The following general steps should be taken to preserve existing vegetation:

- Ensure that the limits of disturbance are identified. Vegetation disturbed outside these limits should be replaced if damaged (see Hydroseeding/Handseeding BMP).
- Minimize disturbed areas by locating temporary roadways to avoid stands of trees and shrubs. Follow existing contours to reduce cutting and filling.



- Minimize the number of access and egress points and locate them to reduce damage to existing vegetation.
- Maintenance materials and equipment storage and parking areas should be located where they will not cause root compaction.
- Keep equipment away from trees to prevent trunk damage and root damage.
- Consider the impact of grade changes to existing vegetation and the root zone.
- Avoid placing soil around trunks of trees.



Riprap (Rock Slope Protection)

Description:

Riprap is placed in locations that receive concentrated flows including ditches, channels, slides and slipouts to prevent scour or reduce the energy of storm water flows. Rock slope protection can also be used to stabilize slopes particularly when stabilization is needed immediately such as erodible slopes in sensitive areas with impending precipitation events.

Appropriate Applications:

- Riprap may be used as a temporary measure when working in channels (Drainage Ditch and Channel Maintenance).
- Riprap can be used as a temporary or permanent measure for Slides and Slipouts Cleanup/Repair.
- Riprap may be used as a velocity dissipation measure on slopes and near pipe outlets or on the banks of channels to reduce erosion.

Implementation:

- Install riprap or grouted riprap.
- Riprap may be used as a permanent measure to stabilize erodible slopes.
- When considering slope stabilization with riprap esthetics should be considered.

- Inspect riprap periodically and restore as necessary.
- Check for scour beneath riprap and repair damage as needed.
- Inspect for standing water.
- When installing riprap as a channel lining, the channel needs to be excavated adequately to maintain flow line with the thickness of riprap.
- Consult Maintenance Engineering for installation of geotextile fabric beneath riprap and appropriate rock size.



Rock Fall Catchment

Description:

These are facilities designed to control rock falls, such as rock fences/walls or K-rail rock catchments which are placed in locations to contain rock material. Rock fall catchments assist in protecting the State's highway system. Rock falls can damage highway drainage systems, divert surface flows and impact adjacent waterways.

Appropriate Applications:

- Rock fences/walls or K-rail may be used as permanent measures in segments of highway prone to rock fall activity.
- Rock fences/walls or K-rail may be used as temporary measures in segments of highway where rock scaling activities are being conducted.

Implementation:

- Maintenance Engineering should be consulted prior to the installation of rock fall catchments.
- Rock fences/walls or K-rail rock catchments are installed at the toe of slope to contain rock material. Additional rock fall catchments may be constructed on slopes that are benched to reduce the amount of material reaching the toe of slope.
- Materials used to construct rock fall catchments shall be in accordance with the Department's Standard Specifications.

- Rock fall catchment locations should be inspected prior to the District rainy season and during subsequent rock/sand patrols.
- Rock fall catchments should be checked for damage and repaired or replaced as needed.
- Periodic removal of collected material is required and may involve the removal and reinstallation of the rock fall catchment device.
- Consult Maintenance Engineering if increased quantities of material or size of material is noted during rock/sand patrol inspections.



Safer Alternative Products

Description:

A variety of products that may be harmful to the environment if they come into contact with surface waters are used in maintenance facilities and activities. In some cases, a less harmful product that serves the same purpose can replace a harmful product. The less harmful product is referred to as a safer alternative product. The primary purpose of using safer alternative products is to reduce the potential for the discharge of toxic products to drainage paths, storm water drainage systems or watercourses.

Appropriate Applications:

Safer alternative products should be considered for all maintenance activities. For example, when safer alternative products exist for cleaning products, paints, herbicides, automotive products and fertilizers, they should be used where practical and effective. Alternative products may not be available, effective or cost effective in every situation.

Implementation:

- Create awareness among employees regarding the benefits of safer alternative products. Safer alternative product awareness will be incorporated into the Maintenance Division storm water staff training program. For example the use of lower phosphate detergents where applicable at facilities and the use of water based cleaners versus halogenated solvents (cleaning fluids).
- The materials used on Maintenance activities shall conform to approved materials in the current *Standard Specifications* and special provisions. The Department's Translab has an established testing protocol for product review and testing before a material becoming a standard material for use. For example, the *Standard Specifications* include approved asphalt mixtures and thermoplastic striping materials.
- The use of a safer alternative product may still result in the discharge of harmful materials to drainage paths, storm water drainage systems or watercourses. All products are to be used in accordance with manufacturers' recommendations.



Sandbag or Gravel Bag Barrier

Description:

A sandbag or gravel bag barrier is a linear sediment barrier consisting of stacked sand- or gravel filled bags designed to intercept and slow the flow of sediment-laden sheet flow runoff. Sandbag and gravel bag barriers allow sediment to settle from runoff before water leaves a disturbed soil area. Sandbag or gravel bag barriers may also be used to divert the flow of water (see Ditches, Berms, Dikes and Swales BMP). Gravel bag barriers may be preferred because the gravel is easier to contain if the bag fails.

Appropriate Applications:

- Sandbag and gravel bag barriers are a temporary measure used to divert water and intercept sediment. They may be used during Drain and Culvert Maintenance, Drainage Ditch and Channel Maintenance, Irrigation Line Repairs, Roadside Stabilization, Sandblasting, Wet Blast with Sand Injection and Hydroblasting, Minor Slides and Slipouts Cleanup/Repair and Building and Grounds Maintenance. Other BMPs are preferred if the barrier is required for more than a few months.
- Sandbag and gravel bag barriers should be placed below the toe of slopes with exposed and erodible soil.
- Sandbag or gravel bag barriers may be placed around stockpiles at maintenance activity sites or maintenance facilities. It may be used to weigh down on fiber rolls installed around stockpiles located on flat paved surfaces. at three feet interval provided no gap exists for sediment or residuals to pass under the fiber rolls.
- They may also be used to protect drain inlets and ditch lines during maintenance activities at maintenance activity sites or maintenance facilities (see Storm Drain Inlet Protection BMP).
- Due to their density, sandbags are preferable to divert flows or to prevent flows from entering a storm water conveyance system or watercourse. Gravel bags are better suited for filtration purposes.
- Sandbag materials are sensitive to ultraviolet light resulting in a limited durability that may make them unsuitable for long-term activities. Sandbag barriers are labor intensive. Installation, removal, and maintenance costs should be evaluated when considering this BMP.
- Use permeable gravel bags as appropriate for settling and filtering sediment in ditch lines that only receive road runoff (low flow). Gravel placed in the permeable bags needs to be washed gravel or rock so that there are no fines in the material.



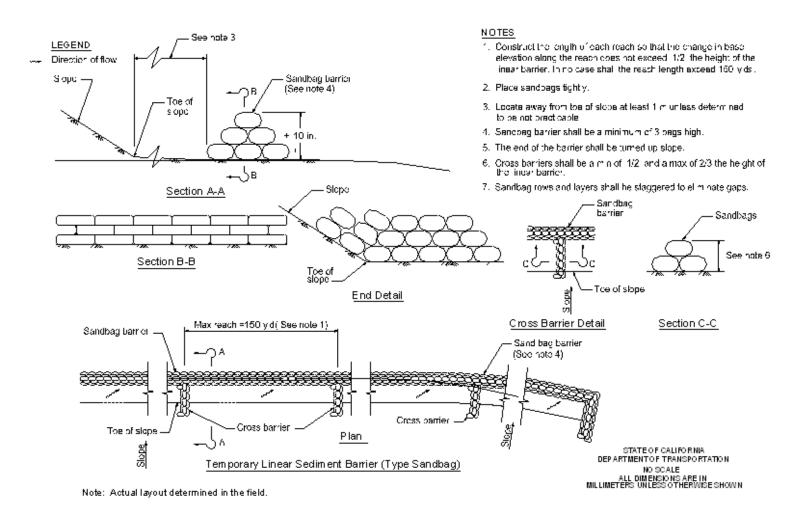
Implementation:

- Sandbag or gravel bag materials:
 - Bag material should be canvas, polypropylene, polyethylene, burlap or polyamide woven fabric. Sand bags should be made of non permeable or low permeability material while gravel bags should be made of permeable material.
 - Fill material should consist of clean coarse sand or gravel.
 - Fill material shall be ½ to 1 inch class 2 aggregate base that is clean and free from clay and undesirable materials.
 - For permeable gravel bags, gravel size shall be between 3/8 inch and 3/4 inch.
- A conceptual sandbag barrier is shown in the figure on the next page. Notes on the figure provide guidance for implementation.

- Inspect sandbags and gravel bags to ensure the sediment barrier is functioning properly.
- Reshape or replace sandbags and gravel bags as needed.
- Repair washouts or other damage as needed.
- Consideration should be given to incorporating removed sediment into the maintenance activity site.
- Remove sandbags and gravel bags when no longer needed. Remove sediment accumulation, clean the maintenance activity site of debris, re-grade if necessary and stabilize the area.



Conceptual Temporary Linear Sediment Barrier (Sandbag)



Sanitary/Septic Waste Management

Description:

Sanitary/septic waste management procedures and practices are designed to minimize or eliminate the discharge of sanitary/septic waste materials to storm drain systems or watercourses.

Appropriate Applications:

Sanitary/septic waste management practices are implemented for all maintenance activities that use portable sanitary/septic waste systems.

Implementation:

- Portable sanitary facilities shall be located at least 50 feet away from drainage facilities and watercourses. When subjected to risk of high winds, sanitary facilities shall be secured to prevent overturning.
- Wastewater shall not be discharged (unless the discharge is to a permitted leach field or pond) or buried within the highway right-of-way.

- Sanitary/septic waste should be discharged to a sanitary sewer or managed by a licensed hauler.
- Sanitary/septic waste storage and the disposal procedures should be managed to prevent non-storm water discharge.

Scheduling and Planning

Description:

This BMP provides recommended planning and scheduling implementation procedures for maintenance activities to minimize and/or eliminate potential water quality impacts. This BMP incorporates scheduling and planning of activities (at maintenance facilities or maintenance activity sites) in a manner that considers the use of all appropriate Division of Maintenance BMPs.

Planning is needed to reduce the exposure of potential pollutants to wind, rain, runoff and vehicle tracking and is important when working in the vicinity of a drainage system or water body. The Division of Maintenance has developed the following maps and databases to assist in scheduling appropriate activities, such as storm drain inspection and cleaning, erosion control and slope stabilization, to increase their water quality benefit.

- District maps and databases which delineate Environmentally Sensitive Areas (ESAs) on the California State Highway System. ESA's include such areas as 303d listed water bodies, areas of special biological significance (ASBS) and endangered species habitat.
- District maps and databases which delineate Areas Prone to Erosion on the California State Highway System. The Division of Maintenance has defined areas prone to erosion on the California State Highway System as route segments requiring major and/or minor erosion repair activities for three consecutive years.
- District maps and databases which delineate Areas Prone to Erosion within Environmentally Sensitive Areas on the California State Highway System. These are route segments with special significance in the scheduling of erosion control activities and storm drain inlet inspections and cleanings.

Hard copies of the information may be requested from the Headquarters Division of Maintenance Office of Roadside or electronic files downloaded from the Division of Maintenance Stormwater website at the following address.

http://onramp.dot.ca.gov/hq/maint/roadside/storm water/watqual.htm

Appropriate Applications:

Scheduling and planning to eliminate and/or minimize the impacts to water quality apply to all field activities performed by Maintenance staff.



Maintenance activities should be scheduled to minimize land disturbance during the rainy season.

Except for emergency conditions, the following activities shall not be performed during rain events or when storms are predicted:

- Asphalt cement crack and joint grinding/sealing;
- Asphalt paving;
- Structural pavement failure (digouts) pavement grinding and paving;
- Sealing operations;
- Portland cement crack and joint sealing;
- Mudjacking and drilling;
- Shoulder grading (should not be performed if runoff is visible);
- Non-landscaped chemical vegetation control;
- Curb and sidewalk repair;
- Chemical vegetation control (not pre-emergent);
- Painting;
- Thermoplastic striping and marking;
- Paint striping and marking;
- Raised/recessed pavement marker application and removal; and
- Outdoor vehicle and equipment maintenance and repair.

General Implementation:

- During the rainy season and prior to forecast storm events, avoid scheduling maintenance activities that could adversely affect storm water quality.
- Planning should include a review of appropriate BMPs specific to an activity to ensure that proper procedures are implemented and that all materials necessary are brought to the activity site.
- Planning should include a tailgate meeting for the specific activity if needed.

Additional EPA Administrative Order Implementation:

The Environmental Protection Agency Findings of Violation and Order for Compliance Docket No. CWA-09-2011-0001 (EPA Order) Section III.B.4 requires the California Department of Transportation (the Department) to



- 1. Develop a maintenance schedule for storm drain inlets that pose a significant threat to water quality based on, among other factors, the CWA 303(d) list of impaired water bodies for pollutants likely to be discharged from Caltrans facilities and rights-of-way, applicable Total Maximum Daily Loads (TMDLs), and known "hot spot" areas for pollutant accumulation as identified by Maintenance personnel, complainants, and others.
- 2. Develop an inventory of road segments prone to erosion and the discharge of sediment. Caltrans shall include a schedule for the stabilization of erosion prone slopes with priority given first to slopes discharging to water bodies on the CWA 303(d) list or where other data shows that water quality standards are not being met.
 - Maintenance Supervisors in determining the schedule for drain inspection cleaning, and the stabilization of erosion prone slopes activities shall prioritize their work order scheduling found in Baseline Stormwater Drainage Facilities, Inspection and Cleaning BMP, and Slope Inspection BMP.

District maps and databases defining route limits have been developed to assist in the implementation of this mandated best management practice.

This BMP is not intended to supersede actions required by a Maintenance Supervisor in determining activity priority required for public safety or transportation system preservation.



Sediment Trap

Description:

A sediment trap is a basin formed by excavating or constructing an earthen embankment across a ditch line or low drainage area (see Figure C-6). A sediment trap is appropriate for long-term application at a maintenance activity.

Appropriate Applications:

- Sediment traps may be used where the contributing drainage area is less than 5 acres. Traps should be placed where sediment-laden storm water may enter a storm water drainage system or watercourse.
- Sediment traps may be used for Minor slides and slipouts cleanup repair.
- Sediment traps shall not to be located in waterways.

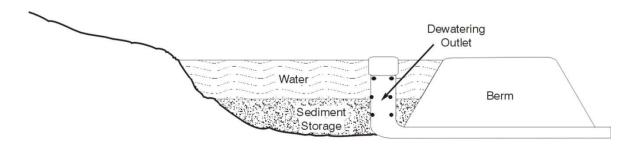
Implementation:

- Traps should be situated according to the following criteria: (1) by excavating a suitable area, such as a low embankment constructed across a swale; (2) where failure would not cause loss of life or property damage; and (3) to provide access for maintenance, including sediment removal and temporary storage of sediment in a protected area.
- Sediment traps should be adequately sized to allow settling of sediment.
- Trap inlets should be located to maximize the travel distance to the trap outlet. Rock or vegetation may be used to protect the trap outlets against erosion (see Section C.7.8 Riprap [Rock Slope Protection] BMP).
- To dewater the trap, the outlet may be constructed in one of the following ways: (1) use a small diameter riser pipe with dewatering holes encased in gravel; (2) construct a crushed stone outlet section of the embankment at the low point of the trap; or (3) use a skimmer device.

- Check sediment trap for groundwater seepage and embankment erosion.
- Check outlet structure and spillway for any damage or obstructions. Repair damages and remove obstructions as needed.
- Check outlet area for erosion and stabilize if required.
- Remove sediment prior to accumulating one-third the volume of the trap.
- If captured runoff has not completely infiltrated within 72 hours then drain the sediment trap.



- Properly dispose of sediment and debris removed from the trap as follows:
 - Dispose of debris in accordance with the Solid Waste Management BMP.
 - Incorporate sediment into the maintenance activity site or manage in accordance with the Solid Waste Management BMP.



Conceptual Sediment Trap Note: Actual layout determined in the field



Silt Fence

Description:

A silt fence is a linear sediment barrier of permeable fabric designed to intercept and slow the flow of sediment-laden sheet flow runoff. Silt fences allow sediment to settle from runoff before water leaves a disturbed soil area. Silt fences are more difficult to construct and maintain than most other sediment control options. This limits their use for short-term maintenance activities.

Appropriate Applications:

- Silt fences may be used for temporary stockpiles.
- For cleanup/repair of minor slides and slipouts, silt fences may be placed below the toe of exposed and erodible slopes or down slope of exposed soil areas to address long-term erosion concerns.
- Silt fences may be used as a temporary measure during roadside stabilization activities.
- Silt fences may also be considered when performing work in the vicinity of sensitive water bodies.
- Silt fences cannot be used under extremely muddy or rocky conditions where the fence cannot be properly anchored.
- Do not install silt fence across intermittent or permanent streams, channels, or any location where concentrated flow is anticipated.
- Silt fences filter fabric deteriorate faster when used in open, windy areas.

Implementation:

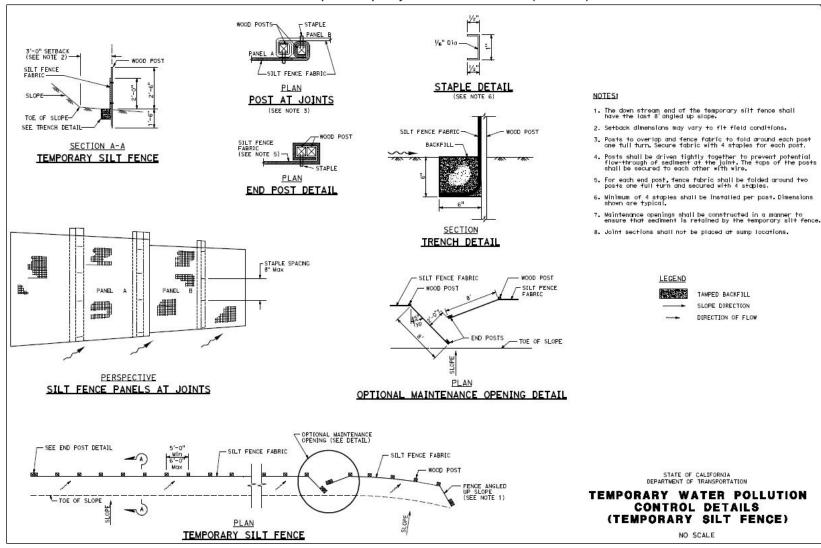
- Silt fences should be constructed with a setback of at least 3 feet from the toe of a slope or stockpile. Where a silt fence cannot have a 3 feet setback due to specific site conditions, the silt fence may be constructed as far from the toe of the slope as practicable.
- A conceptual silt fence is shown in the figure below. The notes on the figure provide guidance for the proper installation of silt fences.
- Fence posts shall be spaced at 8 feet maximum and shall be positioned on downstream side of fence.
- Silt fence should be placed on level contour. If placement on contour is not possible cross barriers are necessary.



- Inspect silt fences to ensure they are functioning properly.
- Repair undercut silt fences. Repair or replace split, torn, slumping or weathered fabric.
- Remove sediment prior to accumulation reaching one-third of the fence height. Consideration should be given to incorporating removed sediment into the maintenance activity site.
- Remove a silt fence when it is no longer needed. Fill postholes and anchorage trench and remove sediment accumulation to conform to existing grade.



Conceptual Temporary Linear Sediment Barrier (Silt Fence)





Slope Inspection

Description:

Districts have established patrols and Maintenance Inspection/Slope Stabilization Teams to review roadside slopes. The program will identify problematic slopes for repair to reduce erosion.

Appropriate Application:

Slope inspections are conducted during storm patrols, rock and sand patrols and along all roadsides at least once during an established NPDES required 5-year schedule as a preventative measure. Slope inspections are conducted in response to landslides, rock fall slides and burn areas as part of damage assessment..

Implementation:

- Minor slides and slipouts requiring a Maintenance Division response shall be inspected and evaluated at the time of response field activities. Roadsides found to be of significant concern will be inspected on a more frequent basis depending on site conditions. In addition, all newly completed slopes resulting from construction projects are inspected on a more frequent basis up to one year after project completion.
- Areas with recurring problems should be inspected at least once annually during the NPDES inspection program and by Maintenance Supervisory staff on an as-needed basis.
- Slope repairs that are within the abilities of the Maintenance Inspection/Slope Stabilization Team should be repaired by that team. The Districts will prioritize stabilization efforts for those slopes most prone to erosion based on the following criteria:
 - Priority 1: Storm drains on highway segments in areas prone to erosion that are within Environmentally Sensitive Areas (ESAs)
 - Priority 2: Storm drains on highway segments in ESAs
 - Priority 3: Storm drains on highway segments in areas prone to erosion

Areas prone to erosion are areas where major and/or minor repairs were required for three consecutive years.

- Road segments that do not meet one or more of the above criteria will be assigned lower priorities for slope stabilization than those segments that do meet one or more of the above criteria.
- Each District will establish a multi-disciplinary team to review problem slopes. Problem slopes with erosion concerns that cannot be repaired by the Maintenance Inspection/Slope Stabilization Team should be reported to the multi-disciplinary



- team. These projects should be forwarded to the State Highway Operation and Protection Program for possible funding and repair.
- Caltrans uses a standard reporting form for recording inspection findings and identifying recommended repairs. Slides and slip-outs encountered during routine surveillance and inspections are evaluated for repair. Recommendations are developed for site-specific remedial measures to maintain slope and soil stability. Remedial measures can range from minor grading or seeding to installation of major slope stabilization systems.
- A standard Maintenance Division reporting format for scheduling, inspection findings and repairs has been developed for the program. *The Preliminary Maintenance Slope Inspection Form* (CT-MAINT-NPDES-005) is to be used. The form is available from the Department Headquarters Maintenance Division Stormwater Quality website. (http://onramp.dot.ca.gov/hq/maint/roadside/storm_water/watqual.htm).
- A summary of the inspections conducted by each District is submitted with the Annual Report.



Soil Binders

Description:

Soil binders consist of applying and maintaining polymeric or lignin sulfonate soil stabilizers or emulsions.

Appropriate Applications:

Soil binders may be applied to disturbed soil areas or soil stockpiles requiring short-term protection.

A variety of soil binders are available for use. Prior to use, the manufacturers' specifications should be reviewed and compared to the site-specific conditions. In selecting a soil binder, the following criteria should be considered:

- Availability of product;
- Ease of cleanup;
- Degradability (how the product degrades and what its by-products are);
- Length of drying time;
- Erosion control effectiveness;
- Longevity;
- Mode of application and availability of application equipment; and
- Water quality impact.

Implementation:

- Apply soil binders per manufacturer's specifications.
- Soil binders shall be nontoxic to plant and animal life.
- Soil binders shall not be applied to frozen soil or areas with standing water.
- Soil binders should not be applied during or immediately before rainfall.
- Avoid over-spray onto hardscaped areas.

Maintenance:

Check protected areas to ensure proper coverage and re-apply soil binder as needed, or implement additional BMPs.



Solid Waste Management

Description:

Solid waste management procedures and practices are designed to minimize or eliminate the discharge of pollutants to drainage systems or watercourses associated with the stockpiling or removal of maintenance activity wastes. Certain solid wastes may be reused under specific conditions allowed by the Department such as asphalt concrete grindings under the Department of Fish and Game interagency MOU.

Appropriate Applications:

Solid waste management practices are implemented during maintenance activities that generate solid wastes. These solid wastes include, but are not limited to:

- Maintenance wastes, including sweeper waste, drain cleaning waste, brick, mortar, asphalt concrete, Portland cement, concrete, timber, steel and metal scraps, pipe and electrical cuttings, nonhazardous equipment parts, styrofoam, grindings, sandblast grit and other materials used to transport and package maintenance materials;
- Highway planting wastes, including vegetative material, plant containers and packaging materials; and
- Litter and debris, including food containers, beverage cans, coffee cups, paper bags and plastic wrappers.

Implementation:

- Recycle, reuse or properly dispose of solid waste. Salvage or recycle useful
 vegetation debris, packaging and/or surplus building materials when practical. For
 example, trees and shrubs from land clearing can be converted into wood chips, and
 then used as mulch on graded areas. Wood pallets, cardboard boxes, and maintenance
 scraps can also be recycled.
- Use dry cleanup techniques (e.g., vacuuming, sweeping, dry rags) to remove solid waste from the maintenance activity site when practicable. Use another technique only when dry cleanup techniques are not practicable, such as having to wet for dust control for safety or air quality reasons.
- Storm water run-on shall be prevented from contacting stored solid waste through the use of ditches, berms, dikes and swales or through the use of measures to keep waste off surface water.
- To prevent clogging of the storm drainage system litter and debris removal from drainage grates, trash racks, and ditch lines shall be a priority under safe conditions.



- Littering on the facility site shall be prohibited. Keep the site clean of litter and debris. Covered trash receptacles shall be provided in the facility yard, and at locations where workers congregate for lunch and break periods.
- Dumpsters of sufficient size and number shall be provided to contain and properly service the solid waste generated by the activity or facility and serviced properly.
- Material waste shall be stored in a designated area approved by the supervisor. Waste
 material visible to the public shall be stored or stacked in an orderly manner to the
 satisfaction of the supervisor.
- Solid waste storage areas at maintenance facilities and in field sites should be located
 at least 50 feet away from drain inlets, storm water drainage systems or watercourses.
 and shall not be located in areas prone to flooding or ponding. Except during fair
 weather, maintenance and highway planting waste not stored in watertight waste
 storage shall be securely covered from wind and rain by covering the waste with tarps
 or plastic sheeting or protected.
- Litter stored in collection areas and containers shall be handled and disposed of by trash hauling contractors if not disposed of by maintenance staff.
- Decomposable waste shall not be allowed to remain on site for more than seven days. Construction, demolition, and other non-hazardous solid waste materials shall be removed from the work site and the contents shall be disposed of outside the highway right-of-way in conformance with the local agency regulations.
- For disposal of hazardous waste, refer to the Hazardous Waste Management. BMP. Have hazardous waste hauled to an appropriate disposal and/or recycling facility.
- Make sure that toxic liquid wastes (e.g., used oils, solvents, and paints) and chemicals (e.g., acids, pesticides, additives, curing compounds) are not disposed of in storage designated for debris. Waste storage washout on the job site is not allowed.

- Periodically inspect the solid waste storage areas and review the disposal procedures.
- Repair or replace damaged or missing BMPs.



Spill Prevention and Control

Description:

Spill prevention and control procedures and practices are implemented to prevent and control spills in a manner that minimizes or prevents discharge to storm water drainage systems or watercourses at maintenance activity sites and maintenance facilities. Refer to Material Delivery and Storage, Material Loading and Unloading and material Use BMPs for additional materials handling procedures.

Appropriate Applications:

- These controls apply at maintenance activity sites and at maintenance facilities.
- Spill prevention and control procedures are implemented wherever non-hazardous chemicals and/or hazardous substances are stored or used. Substances may include, but are not limited to, soil stabilizers, dust palliatives, pesticides, growth inhibitors, fertilizers, paints, de-icing chemicals, fuels, lubricants and other petroleum distillates.
- To the extent that the cleanup work can be accomplished safely, spills shall be contained and cleaned up immediately.

Implementation:

- Contain spread of the spill. For spills that enter or have the potential to enter water conveyance systems, the supervisor shall notify the Maintenance Stormwater Coordinator.
- To the extent that it does not compromise safety or cleanup activities, spills shall be covered and protected from storm water run-on during rainfall. If the spill occurs during rain, cover spill with tarps or other material to prevent contaminating runoff and provide drainage protection.
- Spills shall not be buried. Used clean up materials, contaminated materials, and recovered spill material that is no longer suitable for the intended purpose shall be stored and disposed of in conformance with local agency regulations.
- If the spill occurs in dirt areas, immediately contain the spill by constructing an earthen dike. Excavate and properly dispose of contaminated soil.
- If the spill occurs on paved or impermeable surfaces, clean up using "dry" methods (absorbent materials, cat litter and/or rags). Contain the spill by encircling with absorbent materials and do not let the spill spread widely.
- Water used for cleaning and decontamination shall not be allowed to enter storm drains or watercourses and shall be collected and disposed of in accordance with Liquid Waste Management BMP.



- Waste storage areas shall be kept clean, well organized and equipped with ample clean-up supplies as appropriate for the materials being stored.
- Perimeter controls, containment structures, covers and liners shall be repaired or replaced as needed to maintain proper function.
- Refer to the District Hazardous Spill Contingency Plan for guidelines on spill requirements. The purpose of the Spill Prevention and Control BMP is to prevent water contamination to the maximum extent practicable from spills and cleanup activities.
- To contain significant or hazardous spills of substances on highway rights of way
 Caltrans will take action to contain spilled material, to remove it or to have it
 removed by the spiller or by a qualified contractor, and to ensure it is disposed of
 properly after proper identification and hazard assessment. Guidelines are outlined in
 Maintenance Manual Volume 1, Chapter D5 Spills of Substances on Highway
 Rights of Way.

- Verify that spill control cleanup materials are located near material storage, unloading and use areas. Spill kits shall be clearly identified at facilities.
- Update spill prevention and control plans and stock appropriate cleanup materials whenever changes occur in the types of chemicals stored on site.



Stabilized Activity Entrance/Exit

Description:

This temporary control practice is a defined point of entrance/exit to a maintenance site that is stabilized to reduce the tracking of mud and soil onto public roads by maintenance vehicles.

Appropriate Applications:

• Use at maintenance activity sites where sediment may be tracked by maintenance vehicles as pose a potential pollutant loading to the environment.

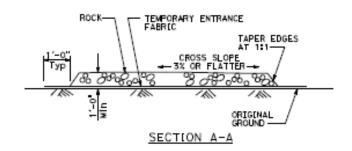
Implementation:

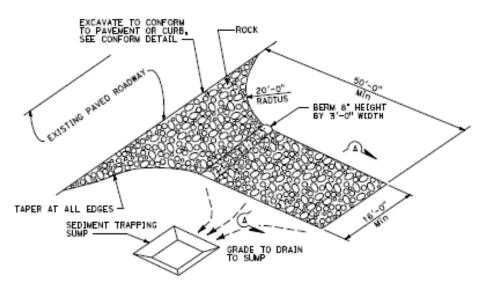
- Limit the points of entrance/exit to the maintenance activity site.
- Stabilize entrance/exits with wood chips, straw, rock aggregate, commercially available manufactured steel-ribbed plate or other suitable material. Refer to following figures.

- Inspect entrance/exit for functionality.
- Replace or supplement rock aggregate as needed.
- Periodically clean steel-ribbed plates.
- Incorporate removed sediment or soil back into the maintenance activity site.

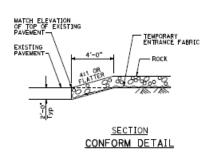


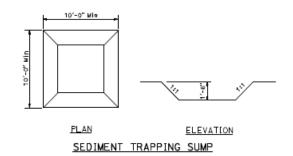
Stabilized Contraction Entrance/Exit Type 1



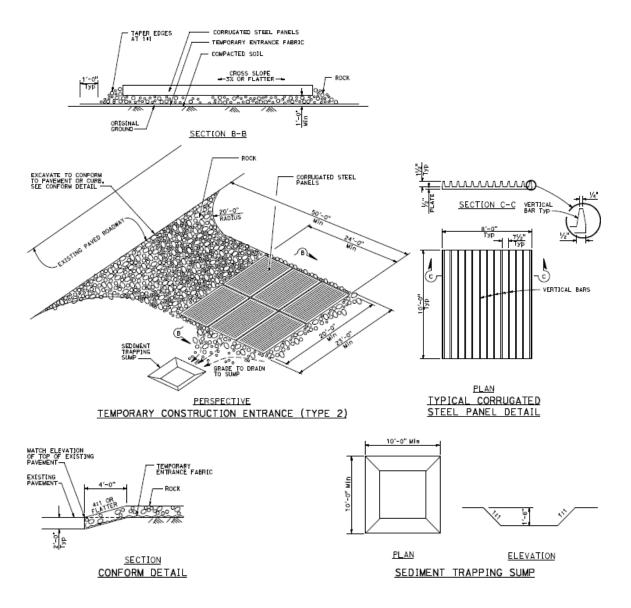


PERSPECTIVE TEMPORARY CONSTRUCTION ENTRANCE (TYPE 1)





Stabilized Contraction Entrance/Exit Type 2





Stockpile Management

Description:

Stockpile management procedures and practices are designed to reduce or eliminate pollution of storm water from stockpiles of various types of materials.

Appropriate Applications:

Stockpile management procedures are used for stockpiles of the following materials:

- contaminated and uncontaminated soil
- vegetative waste and paving materials
- materials removed from drains, ditches and culverts
- waste piles
- any other material or waste that could impact storm water quality (e.g., snow haul in the Lahontan Region)

Implementation:

- Locate stockpiles a minimum of 50 feet away from concentrated flows of storm water, drainage systems, inlets or watercourses.
- Divert storm water run-on away from stockpiles. See Section Ditches, Berms, Dikes and Swales BMP.
- Wind erosion control practices shall be implemented on stockpile material. See Wind Erosion Control BMP.
- Manage stockpiles of contaminated soil in accordance with the Contaminated Soil Management BMP.
- Minor slides/slipouts usually occur during major storms. Stockpiles should be removed as soon as practicable and materials should be placed so that waterways are not impacted (see Sediment Control BMP).
- During rain events, stockpiles of "cold mix" asphalt (i.e., pre-mixed aggregate and asphalt binder) shall be covered. Any deviation from this BMP for "cold mix" shall be coordinated with the RWQCB.
- During rain events, soil stockpiles shall be covered or protected with soil stabilization measures and a temporary perimeter sediment barrier.
- During rain events, stockpiles of Portland cement concrete rubble, asphalt concrete, asphalt concrete rubble, aggregate base or aggregate subbase shall be covered or protected with a temporary perimeter sediment barrier. Bagged materials should be placed on pallets and under cover.
- Protection of Non-Active Stockpiles. Stockpile of materials from activities that have ceased for 21 days or longer shall be protected further as follows:



Soil stockpiles:

- During the rainy seasons, soil stockpiles shall be covered or protected with soil stabilization measures and a temporary perimeter sediment barrier at all times.
- During the non-rainy season, soil stockpiles shall be covered and protected with a temporary perimeter sediment barrier prior to the onset of precipitation.

Stockpiles of portland cement concrete rubble, asphalt concrete, asphalt concrete rubble, aggregate base, or aggregate subbase:

- During the rainy season, the stockpiles shall be covered or protected with a temporary perimeter sediment barrier at all times.
- During the non-rainy season, the stockpiles shall be covered or protected with a temporary perimeter sediment barrier prior to the onset of precipitation.

Stockpiles of "cold mix":

- During the rainy season, cold mix stockpiles shall be placed on and covered with plastic or comparable material at all times.
- During the non-rainy season, cold mix stockpiles shall be placed on and covered with plastic or comparable material prior to the onset of precipitation.

Storage of pressure treated wood with copper, chromium, and arsenic or ammonia, copper, zinc, and arsenate placed on pallets at all times:

- During the rainy season, treated wood shall be under a covered structure or protected from stormwater with plastic or comparable material at all times.
- During the non-rainy season treated wood shall be covered with plastic or comparable material prior to the onset of precipitation.
- Protection of Active Stockpiles. Active stockpiles of the identified materials shall be protected further as follows:
 - All stockpiles shall be covered, stabilized, or protected with a temporary linear sediment barrier prior to the onset of precipitation.
 - Stockpiles of "cold mix" shall be placed on and covered with plastic or comparable material prior to the onset of precipitation.

Maintenance:

Repair and/or replace perimeter controls and covers as necessary to keep them functioning properly. Sediment shall be removed when sediment accumulation reaches one-third (1/3) of the barrier height.



Storm Drain Inlet Protection

Description:

This control practice is used in two ways: (1) to detain and/or to filter sediment-laden storm water runoff and (2) to prevent unpermitted non-storm water discharges into storm water drainage systems or watercourses.

Appropriate Applications:

This BMP may be implemented during the following activities:

- Flexible Pavement (A Family);
- Rigid Pavement (B Family);
- Slope/Drains/Vegetation (C Family);
- Traction Sand Trap Devices (F Family);
- Public Facilities (G Family);
- Welding or Grinding (H Family);
- Sawcutting for Loop Installation (K Family);
- Paint Striping/Marking (M Family);
- Minor Slides and Slipouts Cleanup/Repair (S Family);
- Vehicle and Equipment Maintenance and Repair (if required in the field) (T Family); and
- Aboveground and Underground Tank Leak and Spill Control (T Family).
- Storm drain inlet protection should be considered for activities where sediment-laden storm water may enter a drain inlet.
- Use this BMP only where ponding of water will not encroach into highway traffic or onto erodible surfaces or slopes.

Implementation:

- Impermeable covers should be used to prevent the unauthorized discharge of nonstorm water.
- Storm drain inlets may be temporarily covered with spill pads and/or mats during maintenance activities.
- Storm drain inlets may also be protected by surrounding an inlet with one or a combination of the following:
 - Silt fence (stormwater only);
 - Fiber rolls (stormwater only);



- Straw bale barrier (stormwater only);
- Polyurethane barrier (storm water or non-storm water);
- Rubber barrier (storm water or non-storm water);
- Sandbag or gravel bag barrier (gravel or aggregate preferred for storm water only); or
- Excavated culvert inlet sediment trap (storm water only).

- Make sure silt fence stakes are securely driven into the ground. Replace damaged stakes.
- Repair fabric as needed. Replace or clean fabric prior to fabric becoming clogged with sediment.
- Check sandbags for proper installation. Replace damaged bags as needed.
- Remove sediment prior to accumulation reaching one-third of the fence height or before the volume of the basin has been reduced by one-half. Sediment removed shall be disposed of in accordance with the Solid Waste Management BMP or incorporated in the maintenance activity site.
- Remove all inlet protection when no longer needed.



Stormwater Dewatering Operations

Description:

These practices are implemented where storm water is pumped. This BMP addresses discharge from portable pumps used by maintenance personnel during repairs and to prevent damage to the highway.

Appropriate Applications:

These practices are implemented where storm water is pumped as part of a maintenance activity. Note that per the NPDES Permit, some discharges are exempt or conditionally exempt.

Implementation:

- Ensure that dewatering discharges do not cause erosion, scour or sedimentary deposits at the discharge point and surface.
- Pumping systems should be equipped with screens on the intake.
- Intakes should be located to reduce the pumping of sediment. Pumping areas near the storm water surface often contain less sediment than areas near the bottom.
- Sediment Control BMPs may be installed at intake or outlet locations to trap excessive sediment. Refer to the Silt Fences BMP, Sandbag or Gravel Bag Barriers BMP and Straw Bale Barriers BMP, Fiber Rolls BMP, Check Dams BMP, Sediment Trap BMP and. Weighted Fiber Rolls BMP.
- Do not discharge stormwater or non-stormwater that has an odor, discoloration other than sediment, an oily sheen, or foam on the surface. Notify your supervisor immediately upon discovering any such condition.

- Inspect all BMPs implemented frequently and repair or replace to ensure the BMPs function as designed.
- Accumulated sediment removed during the maintenance of a dewatering device may be incorporated in the maintenance activity site or disposed in accordance with the Solid Waste Management BMP.
- Accumulated sediment that is commingled with other pollutants must be disposed of in accordance with the Solid Waste Management BMP.



Straw Bale Barrier

Description:

A straw bale barrier is a linear sediment barrier consisting of straw bales designed to intercept and slow the flow of sediment-laden sheet flow runoff. Straw bale barriers allow sediment to settle from runoff before water leaves a disturbed soil area. Straw bale barriers are readily available and suitable for many short-term applications in maintenance activities. Straw bale barriers have the disadvantages of being bulky and heavy when wet.

Appropriate Applications:

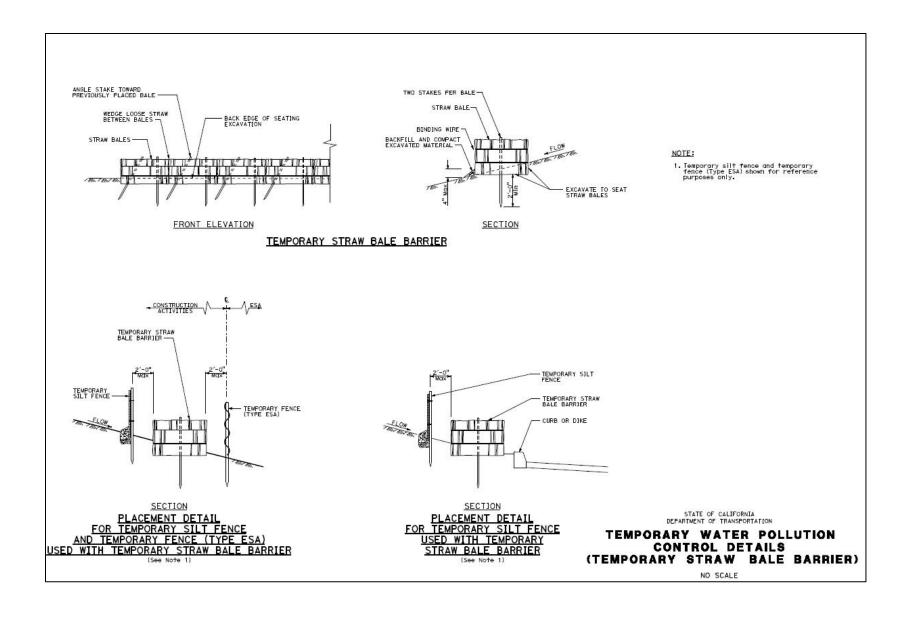
- Straw bale barriers are best suited for short-term applications and should not be placed into areas receiving concentrated flow.
- Straw bale barriers are typically placed below the toe of exposed and erodible slopes, down slope of disturbed soil areas (e.g., Minor Slides and Slipouts Cleanup/Repair).
- Straw bale barriers may be placed around stockpiles at maintenance activity sites or at maintenance facilities.
- Straw bale barriers may also be used to protect drain inlets (see Storm Drain Inlet Protection BMP) at maintenance activity sites or maintenance facilities during maintenance activities
- Straw bale barriers should be considered impermeable. Very little water flows through the bales. Water will flow around or under them often causing erosion and more sediment than would have occurred without them.

Implementation:

• A conceptual straw bale barrier is shown in figure on the next page. The notes on the figure are useful guidance for the placement and anchoring of larger barriers.

- Repair or replace damaged straw bales as needed.
- Repair washouts or other damage as needed.
- Consideration should be given to incorporating removed sediment into the maintenance activity site.
- Remove straw bales when no longer needed. Remove or redistribute accumulated sediment to grade and stabilize the area.







Straw Mulch

Description:

The application of straw mulch consists of placing of a uniform layer of straw. It may be attached by wetting, with an organic tackifier or by mechanical means. It is effective for short-term applications and may be combined with other BMPs (e.g., Hydroseeding/Handseeding BMP).

Appropriate Applications:

- Straw mulch may be an appropriate temporary measure for responding to Minor slides and slipouts cleanup repair.
- Straw mulch may be applied as a short-term measure to disturbed soil areas. It can be used in this manner for Building and Grounds Maintenance.
- Straw mulch may be used for roadside stabilization (see Slope Inspection BMP).
- Straw mulch may also be used in combination with permanent seeding strategies (Hydroseeding/Handseeding BMP) to enhance plant establishment.
- Straw mulch can be applied to steeper slopes than wood mulch.

Implementation:

- Straw mulch should be derived from native grass, oat, wheat, rice or barley.
- Straw mulch with organic tackifier should not be applied during or immediately before rainfall.
- Avoid placing straw mulch onto hardscaped areas.

Maintenance:

• Straw mulch should be periodically inspected and maintained until permanent stabilization measures or repairs are successful.

Sweeping and Vacuuming

Description:

Sweeping and vacuuming are performed to remove litter, debris and de-icing abrasives from paved roads and shoulders. Sweeping to reduce track-out generally involves manual sweeping or use of small equipment, but does not exclude the use of sweepers should the need arise (e.g., for slides and slipouts).

Appropriate Applications:

- Sweeping and vacuuming operations are appropriate for removing de-icing abrasives, material from small slides, litter and debris.
- Sweeping and vacuuming may be implemented anywhere sediment is tracked from off-road maintenance activity sites onto public or private paved roads typically at the points of egress (see Stabilized Activity Entrance/Exit BMP).

Implementation:

- Highway Sweeping:
 - Do not sweep up any unknown substance that may be potentially hazardous. If a substance is known to be hazardous, suspected of being hazardous or cannot be identified, notify the District Maintenance HazMat Manager immediately. If an illegally dumped substance within the Department's Right of Way has the potential of entering a municipal drain system, the immediate supervisor and the District Storm Water Coordinator must be notified so that the downstream municipality can be contacted.
 - Adjust brooms to maximize the efficiency of sweeping operations.
 - Do not load hoppers beyond their capacity.
 - Dispose of waste to a landfill or approved site in accordance with local regulations and the Solid Waste Management BMP. There is to be no dumping on site, especially during the rainy season or during unseasonal storm events to abate wash out. Clean materials may be incorporated into the maintenance activity area.

• Tracking Control:

- Substantially visible sediment shall be swept or vacuumed from the maintenance activity site.
- If not mixed with debris or trash, consider incorporating the removed sediment back into the maintenance activity site.



- Washing and rinsing of equipment shall be performed in designated areas and in accordance with the Vehicle and Equipment Cleaning BMP.



Temporary Diversion Ditches

Description:

These are temporary measures used to intercept and direct surface runoff to an overside (or slope) drain or stabilized watercourse.

Appropriate Applications:

Temporary diversion ditches may be implemented for one or more of the following purposes:

- To convey flow around maintenance activities (most commonly during Minor slides and slipouts cleanup repair);
- To divert flow away from maintenance stockpiles;
- At the top of slopes to divert run-on from adjacent slopes and areas;
- At bottom and mid-slope locations to intercept sheet flow and convey concentrated flows;
- At other locations to convey runoff to overside drains, stabilized watercourses, storm water drainage system inlets (catch basins), pipes and channels; and
- To intercept runoff from paved surfaces.

- Evaluate risks due to erosion, overtopping, flow backups or washout.
- Consider protection where localized scour is anticipated.
- Examine the site for run-on from off-site sources.
- Conveyances should be lined if high flow velocity is anticipated. Consider use of riprap, engineering fabric, asphalt concrete or concrete.



Tire Inspection and Sediment Removal

\Description:

Tires are inspected and sediment is removed to reduce tracking of sediment onto public roads or the highway.

Appropriate Actions:

• Tires should be inspected after the completion of off-road activities. Sediment should be removed as needed.

- Inspect tires prior to entering the roadway after off-road work.
- Use dry cleanup techniques to remove rock and sediment from tires prior to leaving the worksite.



Vehicle and Equipment Cleaning

Description:

Discharges to storm water drainage systems or watercourses from vehicle and equipment cleaning are prohibited. Vehicle and equipment cleaning procedures and practices are used to eliminate the discharge of pollutants from vehicle and equipment cleaning operations to storm water drainage systems or watercourses.

Appropriate Applications:

- These procedures apply whenever vehicle and equipment cleaning is performed.
- Waste generated during concrete washout must be managed in accordance with the Concrete Waste Management BMP. Non-storm water discharges of concrete washout are prohibited.

- Contractual provisions require contractors to use cleaning practices consistent
 with the requirements of this BMP when working at maintenance activity
 sites.
- When using solvents for cleaning vehicles and equipment, used solvents and by-products shall be captured and reused, recycled or disposed of according to the requirements of the Liquid Waste Management BMP or Hazardous Waste Management BMP, depending on waste characteristics. Minimize use of solvents.
- When possible, truck beds should be cleaned using a dry cleanup technique (sweep up or shovel out).
- Vehicle and equipment rinsing and/or washing shall occur only at designated areas.
 - When rinsing areas at a maintenance facility, or in the field, vehicle and equipment rinse water should be discharged to a sanitary sewer. If no connection to the sanitary sewer is available, water should be contained for percolation (if preapproved by the RWQCB) or evaporative drying away from storm drain inlets or watercourses.
 - Designated equipment wash areas should discharge to a sanitary sewer, recycle system or other approved discharge system.
 - Concrete washout areas are described under the Concrete Waste Management BMP.
- Minimize water use to reduce potential for unpermitted non-storm water discharges (e.g., provide a positive shutoff type of hose nozzle).



• Post signs for rinsing and wash areas that identify the allowable cleaning methods for the location and discharge prohibitions.

Maintenance:

• Regularly inspect and maintain the designated rinsing areas, facility wash racks, designated cleaning areas, wash pads, clarifiers, oil-water separators, sumps and sediment traps. Follow manufacturer's instructions including regular cleaning and repair by contract.



Vehicle and Equipment Fueling

Description:

Vehicle and equipment fueling procedures and practices are designed to minimize or eliminate the discharge of fuel spills and leaks into storm water drainage systems or watercourses during equipment fueling and the bulk delivery of fuel.

Appropriate Applications:

These procedures apply at all maintenance sites where vehicle and equipment fueling occurs.

Implementation:

Bulk Fuel Delivery

- All aboveground and underground storage tanks shall be equipped with automatic overfill shutoff valves.
- Implement the Spill Prevention and Control BMP to prevent spillage.
- Implement the Storm Drain Inlet Protection BMP to prevent non-storm water discharges to the storm water drainage systems and watercourses.

Fueling Area Maintenance

- Label drains at fuel dispensing areas to indicate if they discharge to the storm drain or to the sewer.
- Storm drain inlets may be temporarily covered with spill pads and/or mats during fueling operations.
- Absorbent spill cleanup materials or drip pans shall be stored in fueling and maintenance areas and used materials shall be disposed in accordance with the Hazardous Waste Management BMP.
- Immediately clean up leaks and drips.
- Hosing off the fueling area is prohibited. Dry shop clean up practices should be used.
- Manage wastes to reduce adverse impacts on storm water quality (see the Solid Waste Management BMP and Hazardous Waste Management BMP).
 Fueling areas should be kept free of litter and debris that might become contaminated with petroleum products.
- Maintain and implement a current spill response plan for fueling operations.



Refueling Practices

- Nozzles used at dedicated fueling areas shall be equipped with an automatic shut-off.
- Warnings against "topping off" fuel tanks should be posted at fuel dispensers.
- Fueling operations shall not be left unattended.
- Fueling in the field shall not be performed near unprotected drainage facilities or watercourses. See the Spill Prevention and Control BMP and Storm Drain Inlet Protection BMP for pollution prevention and response requirements.

Maintenance:

- Inspect fueling facilities daily and correct deficiencies.
- Keep a supply of spill cleanup materials on site.



Vehicle and Equipment Maintenance

Description:

Vehicle and equipment maintenance procedures and practices are designed to minimize or eliminate the discharge of pollutants to storm water drainage systems or watercourses from vehicle and equipment maintenance.

Appropriate Applications:

- These procedures are applied where equipment and vehicles are stored or repaired.
- These procedures should be implemented to avoid prohibited discharges to the storm water drainage system of fuel, oil, hydraulic fluid, brake fluid, antifreeze and wiper fluid.

Implementation:

Indoor Maintenance

 Maintenance should be performed in covered or indoor maintenance areas where potential pollutants cannot be introduced into storm water drainage systems.

Field or Outdoor Maintenance

- Drip pans or absorbent materials shall be used during vehicle and equipment maintenance work that involves fluids.
- The Spill Prevention and Control BMP for pollution prevention and response measures shall be implemented if needed.
- The Contaminated Soil Management BMP should be used to address any contaminated soil resulting from vehicle or equipment repair.
- Use dry methods (e.g., dry rags, vacuuming or sweeping) for cleaning associated with maintenance in outdoor areas.

General Maintenance (in the field or in the yard)

- Vehicles and equipment shall be inspected for leaks on each day of use. Leaks should be repaired immediately; problematic vehicles or equipment shall be removed from the maintenance activity site.
- All parts washing should be performed in designated areas. Do not wash parts
 where wash waste cannot be captured. Use self-contained sinks or tanks when
 working with solvents.



- Non-storm water discharges into storm water drainage systems or watercourses are prohibited.
- Wastes should be collected and reused, recycled, removed or disposed of in accordance with the Hazardous Waste Management BMP.

Maintenance:

- Inspect areas following vehicle and equipment maintenance activities to ensure there is no residual contamination that might impact storm water quality. Clean areas as needed using dry methods, (e.g., sweeping or vacuuming).
- Maintain waste fluid containers in leak-proof condition.
- Inspect equipment for damaged hoses and leaky gaskets. Repair or replace as necessary.



Water Conservation Practices

Description:

Water conservation practices minimize water use during a maintenance activity to avoid causing erosion and/or the transport of pollutants into the drainage system and watercourses. Non-storm water discharges to storm water drainage systems and watercourses are prohibited unless the discharge is authorized by a separate National Pollutant Discharge Elimination System (NPDES) permit, exempted or conditionally exempt as provided in the Caltrans Statewide Storm Water Permit.

Appropriate Applications:

- All maintenance activities should practice water conservation.
- Unpermitted non-storm water discharges are prohibited.

Implementation:

- Keep water application equipment in good working condition.
- Avoid using water to clean maintenance areas. Use dry cleanup methods where practical. Sweep paved areas.
- Use the minimum amount of water needed to complete each maintenance activity.
- In periods of drought, the Caltrans contingency plan should be followed:

<u>Phase 1 (Moderate).</u> Local or regional water storage has fallen to a level 30 percent below historical average for time of year.

- Reduce water applications a minimum of 10 percent (plant materials, except ground cover, should not be subjected to stress).
- Consider increasing the use of night watering.
- Check and repair all leaks and other malfunctions in irrigation systems.
- Adjust all sprinklers for more efficient coverage.

Phase 2 (Serious). Storage levels are 50 percent below normal.

- Reduce watering an additional 40 percent (ground cover and shrubs may be subjected to stress; trees should not be subjected to stress where independent irrigation systems exist).
- Night watering is now mandatory except in hazardous situations.
- Discontinue washing maintenance vehicles except for chemical spray rigs or other equipment requiring post-operational maintenance.

<u>Phase 3 (Critical).</u> Storage levels are 70 percent below normal. Reduce watering as follows:

- Ground cover - discontinue watering.



- Shrubs and vines water only when independent or individual irrigation is available. Shrubs will be in a stressed condition and many may die. (No overhead watering allowed).
- Trees (no independent irrigation) water established trees (ten years or older) once monthly to sustain life. Temporary independent irrigation systems or tank truck watering may be necessary.
- -Trees (with independent irrigation) –Water as often as necessary regardless of age to sustain life in a non-stressed condition. Trees should not be stressed unless unavoidable. Stressed trees become susceptible to airborne diseases and pest infestations.

Maintenance:

• Repair water supply and distribution equipment to minimize the loss of water.



Weighted Fiber Rolls

Description:

A weighted fiber roll consists of crushed walnut shells, wood shavings/chips, or other natural materials that are rolled or bound into a tubular roll and netted in mesh, with handles at both ends for ease of handling. Weighted fiber rolls should weigh between four to eight pounds per linear foot. Weighted fiber rolls may replace straw fiber rolls, silt fences, straw bales, earth berms, willow fiber rolls, sand or gravel bags, and earth water-bars. Weighted fiber rolls filter stormwater runoff and trap sediment to prevent erosion by slowing and spreading water flow, thus diminishing stormwater runoff pollution. They provide long lasting sediment control along with filtering runoff water and can be cleaned and reused.

Appropriate Applications:

- Weighted fiber rolls may be used along the slope to prevent erosion by reducing slope length and slowing and spreading water flow and prevent rill and gully development.
- Weighted fiber rolls may be used along the edge of berms or sidewalks to keep soil in place and prevent it from washing out onto pavement or asphalt.
- Weighted fiber rolls may be used around drain inlets to slow water flow and capture soil and sediments to diminish runoff pollution.
- Weighted fiber rolls may be used as check dams to prevent rills and gullies from developing.
- Weighted fiber rolls may be placed around material stockpiles or storage areas to contain sediment

- Installation:
 - Install weighted fiber rolls on a level contours end-to-end in shallow trench; there is no need to stake (the weight will keep it in place).
 - Install weighted fiber rolls along berms or sidewalks end-to-end. Multiple weighted fiber rolls can be used in series or placed downstream from each other. Overlap the ends by 1½ feet.
 - Install weighted fiber rolls around drain inlet in a circle end-to-end or forming a "U" shape upstream of inlet
 - Install on paved surfaces around stockpiles or material storage areas. Make sure no gaps exist where sediment may pass.



Maintenance:

- Replace or repair split, torn, unraveling weighted fiber rolls
- Weighted fiber rolls should be inspected for sediment accumulation that can render the weighted fiber roll ineffective. Normally, removed sediment may be disposed of in accordance with the Solid Waste Management BMP. However, if the sediment exhibits characteristics such as odor, color and texture that are not similar to the surrounding native soil, an unknown material may be present. Notify the District HazMat Manager immediately.



Wind Erosion Control

Description:

Wind erosion control consists of applying water or other dust palliatives as necessary to prevent or alleviate dust nuisances. Covering of small stockpiles is an alternative to applying water or other dust palliatives.

Appropriate Applications:

- Wind erosion controls should be implemented for stockpiles of loose materials.
- This practice is also implemented during work involving disturbed soils subject to wind erosion such as Shoulder Grading, Roadside Stabilization and Minor Slides and Slipouts Cleanup/Repair.

Implementation:

- Evaluate suspending work under windy conditions when loose materials are prone to erosion.
- All distribution equipment shall be equipped with a positive means of shutoff.
- At least one mobile unit should be available to apply water or dust palliative to the maintenance activity site.
- Only potable and non-potable (uncontaminated) water shall be used. Reclaimed wastewater or otherwise contaminated water shall not be used.
- Materials applied as temporary soil stabilizer BMPs may also provide wind erosion control benefits including Compaction; Wood Mulch; Hydraulic Mulch; Hydroseeding/Handseeding; Soil Binders; Straw Mulch; Geotextiles, Mats/Plastic Covers and Erosion Control Blankets; and Riprap (Rock Slope Protection).
- Do not apply excess water. Non-storm water discharges are prohibited.

Maintenance:

Inspect protected areas to ensure proper coverage.



Wood Mulch

Description:

Wood mulch consists of applying chipped material or commercially available wood mulch products to reduce the potential for eroding the underlying soil. Wood mulch is readily available and has an attractive appearance. Wood mulch may be chosen over other stabilization measures to reduce germination of noxious weeds and the need for vegetation control measures. Wood mulch meeting Caltrans specifications is recommended for best performance.

Appropriate Applications:

- Wood mulch is appropriate for landscaping applications such as building and grounds maintenance.
- Wood mulch may be considered as an option for roadside stabilization work. (See Slope Inspection BMP).
- Wood mulch may also be considered as an option during irrigation line repairs.
- Wood mulch should not be applied to steep slopes or placed into drainage paths that could receive concentrated flow. Wood mulch is prone to displacement under these conditions.

Implementation:

- Contact the District Landscape Specialist, District Erosion Control Specialist or Landscape Architect for the appropriate application rates. Use the recommended application rate.
- Wood mulch may be applied by hand, with blowers or with chippers.
- Avoid application onto hardscaped areas.

Maintenance

• Periodically inspect areas where mulch has been applied.



Work in a Water Body

Description:

Maintenance activities occasionally require equipment or personnel to enter a stream, river, channel or other water body. This BMP describes measures that are required for maintenance activities in water bodies.

Appropriate Applications:

• Although working in a water body is not routine, Minor Slides and Slipouts Cleanup/Repair, Drainage Ditch and Channel Maintenance, Bridge Repairs and Draw Bridge Maintenance could require work in a water body.

- Maintenance equipment shall not enter a water body without the required regulatory permits (e.g., Army Corps of Engineers Clean Water Act Section 404 permit, California Department of Fish and Game Code Section 1602 Agreement, SWRCB Clean Water Act Section 401 Water Quality Certification and ESA Section 7). The Maintenance Storm Water Coordinator should be contacted to identify the appropriate permits.
- Evaluate alternatives to performing work in the water body.
- Tires shall be cleaned before entering a water body.
- Heavy equipment driven into a water body to accomplish work should be clean of petroleum residue.
- Water levels should be below the gear boxes of the equipment in use, or equipment lubricants and fuels should be sealed such that inundation by water shall not result in leaks.



APPENDIX B - MAINTENANCE FIRE PREVENTION GUIDELINES



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State of California
DEPARTMENT OF TRANSPORTATION

Business, Transportation and Housing Agency

Memorandum

Flex your power! Be energy efficient!

To: DEPUTY DISTRICT DIRECTORS MAINTENANCE REGION MANAGERS MAINTENANCE Date: June 4, 2012

From: TONY TAVARES

Chief

Division of Maintenance

Subject: Division of Maintenance Fire Prevention Guidelines

As we prepare for another fire season, it is imperative that we keep the safety of the traveling public, and our employees foremost when planning roadside activities. The attached Fire Prevention Guidelines represent the standards necessary to reduce the potential risk of fires. All Maintenance employees who perform roadside activities should be thoroughly familiar with them. The guidelines detail the inspection and use of equipment, mitigation measures based on weather conditions, and other information valuable to the work planning process.

These guidelines are applicable to Caltrans Right-of-Way adjacent to grass, brush, or forest-covered-lands. Each district should identify at-risk areas and develop a Fire Prevention Plan in cooperation with local wild land fire prevention officials.

As stated in the guidelines under <u>Operational Procedures and Mitigation Chart</u> up to date information will be sent out to Caltrans personnel to safely plan their work.

- Caltrans Sacramento Headquarters Communications Center will be forwarding to the districts the predictive adjective ratings on a daily basis.
- CAL EMA weather report (Daily Weather Outlook) for seasonal readiness will be distributed
 at 0545 hours on a daily basis through the summer months. Please visit www.weather.gov
 for the most current information.

Below are the links for maps on the Maintenance GIS website.

- State Responsibility Area http://onramp.dot.ca.gov/hq/maint/roadway/gis/cdf_sra.shtml
- Fire Danger Rating Zones http://onramp.dot.ca.gov/hq/maint/roadway/gis/nfdrz_fire_danger_rating_zones.shtml

Please contact Herby Lissade, Office of Emergency Management, at (916) 417-6994 or e-mail kerby_lissade@dot.ca.gov, with any questions or for more information.

Attachments

c Steve Takigawa, Deputy Director, Maintenance and Operations Herby Lissade, Chief, Office of Emergency Management

"Caltrans improves mobility across California"



DIVISION OF MAINTENANCE OFFICE OF EMERGENCY MANAGEMENT FIRE PREVENTION GUIDELINES

The goal of the Fire Prevention Guidelines (FPG) is to provide for the safety of the employees of the California Department of Transportation (Caltrans) and the citizens of the State of California. These guidelines represent expected standards that are necessary to reduce the risk of fire and provide compliance with the California Public Resources Code section 700-716 (PRC).

This document establishes operating guidelines for Caltrans crews who perform roadside maintenance. These activities are conducted during any time of the year when burning permits are required in an area, pursuant to PRC section 4423. This document is only applicable in a State responsibility area as defined in PRC sections 4126, 4127, and 4128. The standards are minimum guidelines. Actual conditions may indicate a need for more stringent mitigation measures. All personnel who may perform roadside activities should be thoroughly familiar with these guidelines.

The FPG are applicable to Caltrans Right-Of-Way (ROW) that is contiguous to grass, brush, or forest-covered lands. These areas generally represent a small portion of the total ROW, but are at risk for generating large and damaging fires. Specific "at-risk" areas are typically described in each local Caltrans Fire Prevention Plan (see Maintenance Manual, Volume I, Chapter C2 Section I C206.2 Fire Risk Plan) which should be developed annually in conjunction with Vegetation Control (VegCon) plans. Additionally, the local California Department of Forestry and Fire Protection (Cal Fire) and Caltrans officials should meet at least annually in the spring to determine equipment and personnel resources available for the upcoming fire season as required in the Cal Fire – Caltrans Interagency Agreement 7CA00123 Exhibit A, Scope of Work, effective, October 28, 2008 through August 31, 2012.

Chapter C2 Section I C2.06 Annual Plans:

C2.06.2 Fire Risk

A site specific Fire Risk Plan is prepared by the District Landscape Specialist for the Deputy District Director, Maintenance. This plan establishes specific fire control measures for road edges, while considering the likelihood of a fire occurring and the consequences of a fire to the roadside and to adjacent properties. Fire potential varies with the type of roadside vegetation and the configuration of the pavement edge. For example, grasses on a cut slope with a dike at its base are less likely to be ignited by a cigarette or spark than grasses on a flat traversable roadside. Similarly, perennial or low growing annual grasses present fewer fire risks than tall annual grasses, and the chance and consequences of a fire escaping vary widely with conditions. The consequences of fire spreading to an adjacent forest may be more serious than fire spreading to desert, chaparral or grasslands. Likewise, the consequences of a roadside fire where there is a containment barrier such as a frontage road or sound wall, is less than if the fire can spread unimpeded into adjacent terrain.

The VegCon Plan must consider fire risk in sufficient detail to reflect changing vegetation types along highway edges differing adjacent land uses, highway configurations, and annual rainfall impacting expected vegetation growth which may increase/decrease fire risk, and urban interface. Refer to District VegCon Plan in the Integrated Maintenance Management System.





GUIDELINES

Pre-operation inspection of equipment:

- Caltrans will perform an annual inspection of fire suppression equipment before fire season to
 ensure suitability for roadside use.
- Caltrans will perform a pre-operation inspection of tools, equipment, and related machinery to
 ensure its compliance with Section 4442 of the PRC.
- Rented or contracted private equipment must meet the requirements of Section 4442 of the PRC. Caltrans is responsible for the inspection and determining the suitability of this equipment.
- Combustion equipment must meet spark arrestor requirements, and fire suppression equipment shall be available at the site.

Minimum equipment required:

- During any time of the year when burning permits are required in an area by PRC sections 4126, 4127, and 4128, the following minimum fire suppression equipment must be immediately available at each job site as per PRC Section 4427 (b).
- One serviceable round point shovel with a handle length not less than 46 inches at the site.
- One backpack type water pump, not less than five gallons in capacity.

Operational Procedures and Mitigation Chart:

Cal Fire supplies daily predictive adjective ratings for very high and extreme conditions by area to the Caltrans Sacramento Headquarters Communications Center, (916-653-3442), which then forwards this information to the District Transportation Management Centers. The Cal Fire Emergency Command Centers will also provide the daily predicted adjective rating. Caltrans personnel planning activities should contact the nearest Cal Fire Emergency Command Center (see page 5) for up-to-date fire weather information. Refer also to the Caltrans Code of Safe Operating Practices for information on specific activities.

Before commencing work:

Review the Caltrans Code of Safe Operating Practices for information on requirements as they relate to fire prevention.



RED

UTILIZE THE CHART BELOW TO DETERMINE PERMITTED OPERATIONS AND REQUIRED ACTION, OR MITIGATION WHEN CONDITIONS CHANGE

	CAL FIRE	PREDICTED ADJ	ECTIVE RATING	
	LOW (GREEN)	MODERATE (BLUE)	HIGH (YELLOW)	VERY HIGH (ORANGE)
WEATHER SAMPLING	None	2 hours	1 hour	1 hour
PERMITTED ACTIVITY	All	All	All	All
REQUIRED MITIGATION	Meet Public Resource Code Section 4442 (see item 2, page 2)	Next level of mitigation is required if: Wind > 15 mph or Relative Humidity < 30%	*200 gal pumper **Communications ***Patrol Next level mitigation if: Wind > 10 mph or Relative Humidity < 25%	*200 gal water pumper **Communications ***Patrol Next level mitigation required if: Wind > 10 mph or Relative Humidity < 20%

3



MITIGATION MEASURES DESCRIBED

200-gallon capacity water pump:

A skid mounted or similar self-contained pump and tank unit mounted on a vehicle and capable of carrying and pumping 200 gallons. The tank and pump unit must be located within one mile driving distance of the work being performed as long as the operator has an unobstructed view to the location where activities are being performed.

Communications:

Personnel at each work location must be able to report fires or emergencies from the scene either by two-way radio or cellular phone.

Patrol:

The entire area of any activity must be patrolled and directly monitored for 30 minutes following cessation of work operations. In extremely dry or windy conditions, consideration should be given to extending patrol and monitoring times.

NOTE: WHEN PERFORMING ROADSIDE ACTIVITIES IN GRASS, BRUSH, OR FOREST-COVERED LANDS, WEATHER CONDITIONS (WIND & HUMIDITY) AT THE WORK SITE SHOULD BE MONITORED USING HAND HELD MEASURING DEVICES.

WEB RESOURCES

(For daily fire weather, wind speed, direction, and humidity)

Southern California

Geographic Area Coordination Center, Riverside, CA http://gacc.nifc.gov/oscc/predictive/weather/index.htm
Mouse over regional map to see 7 day prediction for fire potential in your area or click non then PSA (Predictive Service Area) Map for a specific day.

Northern California

Geographic Area Coordination Center, Redding, CA http://gacc.nifc.gov/oncc/predictive/weather/index.htm Click on: Northern Ops Daily Weather Outlook

These sites should be bookmarked for easy access during Fire Season.



CAL FIRE EMERGENCY COMMAND CENTERS

CA NORTH REGION

Sanders, Justin			CA NORTH REGION	
Borelli, Mike	Sanders, Justin	Justin.Sanders@fire.ca.gov	AEU - Amador-El Dorado	(530) 647-5223
Hull- Humboldt Del Norte Charles.Hanes@fire.ca.gov Hull- Humboldt Del Norte C707) 729-1209	Weber, Mike	Mike.Weber@fire.ca.gov	BTU - Butte	(530) 538-6460
Ewing, Eric Eric.Ewing@fire.ca.gov LMU - Lassen-Modoc (530) 257-5576 Wink, Mike Mike,Wink@fire.ca.gov LNU - Sonoma-Lake-Napa (707) 963-4112 Steward, Mark Mark. Steward@fire.ca.gov MEU - Mendocino (707) 459-7403 Weber, Jason Jweber@co.marin.ca.us MRN - Marin (415) 499-6717 Webb, Tom Tom.Webb@fire.ca.gov NEU - Nevada-Yuba-Placer (530) 477-0641 Crawford, Jim Jim.Crawford@fire.gov.ca SCU - Santa Clara (408) 201-0490 Zulliger, J.T. Johnathan.zulliger@fire.ca.gov SHU - Shasta (530) 225-2411 Anzo, Phillip Phillip.Anzo@fire.ca.gov SKU - Siskiyou (530) 842-7066 Rosales, Mike Mike.Rosales@fire.ca.gov TGU - Tahama-Glen (530) 529-8542 CA SOUTH REGION Sweeney, Mike Mike.Sweeney@fire.ca.gov BDU - San Bernardino (909) 883-1112 Agenbroad, Jerry Jerry Agenbroad@fire.ca.gov FKU - Fresno-Kings (559) 281-4309 Hunley, Melinda Dustin.Hail@fire.ca.gov FKU - Fresno-Kings (559) 281-6430 Douty, Dean ddouty@fire.lacounty.gov LAC - Los Angele	Borelli, Mike	Michael.Borelli@fire.ca.gov	CZU - San Mateo-Santa Cruz	(831) 335-6719
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