Stormwater Quality Manuals
Construction Site Best Management Practices (BMPs) Manual

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Nevada Department of Transportation

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Nevada Department of Transportation

NDOT's Stormwater Quality Manuals

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Notice

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Acronyms

AASHTO	American Association of Highway and Transportation Officials
AC	Asphalt Concrete
ASCA	American Society of Consulting Arborists
ASTM	American Society for Testing and Materials
BFM	Bonded Fiber Matrices
BMP	Best Management Practices
BMPP	Best Management Practices Plan
BWPC	Bureau of Water Pollution Control
CCS	Cellular Confinement System
CSROCP	Construction Site Runoff Control Program
CFR	Code of Federal Regulations
CGP	Construction General Permit
DAQEM	Department of Air Quality and Environmental Management (Clark County)
DI	Drain (Drop) Inlet
DSA	Disturbed Soil Area
EPA	United States Environmental Protection Agency (see USEPA)
ESA	Environmentally Sensitive Area
FHWA	Federal Highway Administration
FPPP	Facility Pollution Prevention Plans
HCM	Hydraulic Compost Matrices
HDPE	High Density Polyethylene
HEC	Hydraulic Engineering Circular
HM	Hydraulic Matrices
HMMP	Hazardous Materials Management Plan
H:V	The Ratio of the Horizontal to the Vertical (i.e. slope)
IDDE	Illicit Discharge Detection and Elimination
MBFM	Mechanically Bonded Fiber Matrices

MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NDEP	Nevada Division of Environmental Protection
NDOT	Nevada Department of Transportation
NDOW	Nevada Division of Wildlife
NOI	Notice of Intent (NDEP Permitting)
NOT	Notice of Termination (NDEP Permitting)
NPDES	National Pollutant Discharge Elimination System
NRS	Nevada Revised Statutes
OSHA	Occupational Safety and Health Administration
PAM	Polyacrylamide
PCC	Portland Cement Concrete
PE	Professional Engineer
PPCBR	Portable Precast Concrete Barrier Rail
QPL	Qualified Products List
RCP	Reinforced Concrete Pipe
RCRA	Resource Conservation and Recovery Act
RE	Resident Engineer
RECP	Rolled Erosion Control Product
ROW	Right-of-Way
SBP	Soil Bioengineering Practices
SDS	Safety Data Sheets
SDWA	Safe Drinking Water Act
SFM	Stabilized Fiber Matrices
SM	Standard Hydraulic Mulch
SPCC	Spill Prevention, Control and Countermeasures
SWDA	Solid Waste Disposal Act
SWPPP	Stormwater Pollution Prevention Plan
TRM	Turf Reinforcement Mat

TRPA	Tahoe Regional Planning Agency
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
WPCM	Water Pollution Control Manager
WPCP	Water Pollution Control Plan

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Section 1 – Introduction and Permitting

The Nevada Department of Transportation (NDOT) has developed a Construction Site Best Management Practices (BMS) Program to minimize water quality impacts to receiving waterways from construction activities.

A key component of this program is the implementation of stormwater pollution control best management practices (BMPs) during construction. There may be several approaches and a variety of BMPs appropriate for a given stormwater pollution control scenario encountered on a construction site. However, the BMPs presented in this manual are considered by NDOT as the **minimum,** largely temporary, pollution control standards for construction activities performed within NDOT's right-of-way.

Contractors may implement BMPs not identified in this manual, provided the BMPs are utilized appropriately, provide an equal or better level of pollution prevention than the BMPs presented in this manual, and receive prior approval by the project Engineer. Supporting documentation, e.g. product description, appropriate use, installation details, maintenance requirements, etc., shall be provided to the Engineer as appropriate.

Site conditions may warrant the modification of a particular BMP presented in this manual. These adjustments shall receive approval from the project Engineer prior to implementation. Upon acceptance, the modifications shall be noted in the construction operator's stormwater pollution prevention plan (SWPPP) or runoff control plan, as appropriate.

While this manual is intended to serve as a beneficial guide for assisting with the selection and implementation of construction site stormwater BMPs, it is ultimately the responsibility of the construction site operator to ensure their respective construction site maintains regulatory and NDOT compliance. Additionally, the implementation of structural BMPs within the NDOT right-of-way "clear zone" shall conform to current NDOT safety standards as appropriate.

This manual is subject to revision. The current version of the manual is available for download on NDOT's Stormwater Program website at www.nevadadot.com.

1.0 Overview

Construction activities have the potential to cause pollutants to become entrained in stormwater runoff and be discharged to receiving waterways either directly or via municipal separate storm sewer systems (MS4). The potential for pollutants to be discharged can be influenced by many factors such as:

- Nature of the construction activities
- Size of the construction project
- Duration of the construction project
- Site topography
- Soil type
- Type of construction materials and products used
- Use and type of construction equipment
- Weather conditions

Common pollutants generated by construction activities include sediment, chemicals, metals, waste products, and debris. When sediments are transported off-site, they can destroy aquatic habitat (via siltation) and be a source of nutrients to algae and aquatic plants. Because of their chemical and physical properties, sediments can bind with chemical pollutants and carry them into nearby waterways. Examples of chemical pollutants include oils, fuels, nutrients (e.g. nitrogen and phosphorus), concrete products (cement, admixtures, etc.), pesticides, paints, and solvents. Construction materials are often potential sources of heavy metal pollutants that can be toxic to aquatic life. Trash and debris not properly contained are often transported off-site by wind and water and can adversely affect wildlife, aesthetics, and aquatic habitat.

Because of the increased potential for construction site stormwater runoff to contain pollutants, it is important that BMPs be incorporated into all aspects of a construction project, from initial planning to final stabilization.

Presented in this manual are BMPs recommended for use on construction sites within NDOT's right-of-way with the goal of preventing or minimizing to the maximum extent practicable (MEP) the discharge of pollutants associated from construction activities. Each BMP write-up includes the following elements, as appropriate:

- A description of the practice
- Application
- Limitations of the BMP
- Guidance on the design and implementation
- Inspection and maintenance needs

Unless otherwise noted in the contract documentation, permit requirements, etc., all BMPs shall be designed and installed to withstand and treat stormwater runoff resulting from a 2-year, 24-hour design event, at minimum.

1.1 Purpose and Organization of the Manual

This BMP Manual was developed to provide construction contractors and NDOT staff with a resource document that provides information and guidance on:

- Understanding stormwater regulations and NDOT requirements applicable to construction activities within the State of Nevada
- Identifying potentially applicable stormwater permits
- Selecting and implementing construction site BMPs
- Listing, identifying and referencing practices to be included in contractor prepared Stormwater Pollution Prevention Plans (SWPPPs)

Field conditions can vary significantly and this BMP Manual does not provide guidance for every site condition. Accordingly, this Manual is intended to establish a uniform benchmark for the selection and implementation of construction site BMPs that can be referred to by NDOT staff and construction contractors.

This BMP Manual is organized into five sections and one appendix as follows:

- Section 1 introduces the Clean Water Act and describes the applicability and requirements of NDOT's Standard Specification Section 637, the Nevada Division of Environmental Protection's (NDEP's) Construction General Stormwater Permit (CGP) (NVR100000), and other commonly required construction site permits
- Section 2 offers guidance on preparing SWPPPs
- Section 3 provides a discussion of stormwater BMP considerations when preparing the site SWPPP document
- Section 4 offers an introduction to the BMP fact sheets included in this document. The main body of this section consists of 42 BMP fact sheets
- Section 5 includes a reference listing of the documents used in preparing this manual
- Appendix A provides a copy of the current (2015) NDEP issued CGP

1.2 How to Use this Manual

Before a project commences, the construction contractor must develop a thorough understanding of the project, site specific details and constraints, project phasing, and the project's potential impacts to stormwater quality. With this information, this BMP Manual can then be consulted as follows:

- Review Section 1 and identify potential permit coverage requirements and other construction related permits that may be required for the project
- Follow the Section 2 guidance on preparing a SWPPP

- Review the BMP considerations described in Section 3
- Utilize the Section 4 BMP fact sheets to assist with developing a SWPPP. The SWPPP diagram should incorporate the mapping symbol provided with each BMP fact sheet
- Implement the BMPs using the guidance presented in the BMP fact sheets

1.3 Water Quality Regulations and Requirements

NDOT construction activities must comply with Federal, State, and local regulations regarding the protection of water quality. Compliance includes securing the appropriate permits required for construction activities. In addition, NDOT requires that its construction contractors adhere to all contract specifications. Temporary pollution control is addressed in NDOT's Standard Specifications (notably Specification Section 637). The following sections provide a general overview of the pertinent water quality regulations and permitting requirements related to construction activities.

1.3.1 United States Clean Water Act

The federal Clean Water Act (CWA) established the National Pollutant Discharge Elimination System (NPDES) requiring all facilities that discharge pollutants from any point source into Waters of the United States (WOUS) to obtain a discharge permit. Permits may be issued as individual permits or as general permits.

An *individual permit* is a permit issued to an individual facility. Once a facility submits the appropriate application(s), the permitting authority develops a permit for that particular facility based on the information contained in the permit application (e.g., type of activity, nature of discharge, receiving water quality, etc.). The authority issues the permit to the facility for a specific time period (not to exceed five years) with a requirement to reapply prior to the expiration date. For example, NDOT was issued individual NPDES MS4 permit authorizing stormwater (and select non-stormwater) discharges from its roadways and maintenance facilities statewide.

A *general permit* covers multiple, unrelated, facilities within a specific category (e.g., industrial, construction, pesticide application, etc.). A general permit is written by the authorized agency and covers categories of point sources having common elements such as stormwater discharges. The authorized agency is the holder of the permit and can grant approved applicant coverage under the general permit provided the applicant meets the permit requirements. Applying for coverage under a general permit may offer a cost-effective option because the application process is greatly simplified to address categorical activities, such as construction activities. For example, the NDEP allows stormwater discharges from construction activities under the CGP, when the applicant meets certain conditions.

1.3.2 NDEP Primacy

Federal law authorizes the Environmental Protection Agency (EPA) to implement the NPDES Program. The EPA, however, may authorize States, Territories, or Tribes to implement all or parts of the NPDES program. If the state, territory, or tribe has partial authority, the EPA will implement the remaining parts of the program.

NDEP has been delegated authority by the EPA to administer the NPDES program throughout Nevada, except on Tribal Lands. NPDES permits for discharges on Tribal Lands within Nevada must be acquired through EPA Region IX (San Francisco, CA).

1.4 Construction Stormwater Discharge Permitting

Listed in this section are the three primary stormwater specific permits that may be required for an NDOT related construction project. Other environmental permits that might be required for an NDOT construction project are described in Section 1.6. When permit coverage is required, it is the responsibility of the construction contractor to obtain the permit, pay all fees, and fully implement all permit requirements.

1.4.1 NDEP Stormwater General Permit for Construction Sites

To address stormwater discharges from construction activities, NDEP may authorize coverage under the CGP on a project-by-project basis. This general permit authorizes the discharge of stormwater associated with construction activities and related industrial activities (e.g. temporary asphalt mixing or concrete mixing plants), provided the operator complies with all the requirements of the permit and submits a Notice of Intent ("NOI"), prepares a SWPPP, and pays the associated fees.

Coverage under the CGP is required when construction activities disturb one (1) acre or more of total land area, or will disturb less than one (1) acre but are part of a larger common plan that will ultimately disturb one (1) or more acres, and discharges to waters of the United States. Projects less than one (1) acre in size, but will impact receiving waters or its tributaries within a 1/4-mile radius of the project, as determined by NDEP, may also require permit coverage.

NDEP permitting authority does not extend onto Tribal Lands. Projects on these lands must apply for permit coverage from the EPA (see Section 1.4.2).

For all NDOT construction projects, a SWPPP must be prepared regardless of whether or not coverage under the CGP is required (see Section 1.5.1).

1.4.2 EPA Stormwater General Permit for Construction Sites

The EPA retains the stormwater related permitting authority for construction activities on Tribal Lands in Nevada. Contractors performing construction activities on Tribal Lands

that requires a permit must apply to the EPA Region IX for coverage under the EPA's Construction General Permit (CGP) (NVR12000I). Similar to NDEP requirements, the EPA requires an NOI application, and preparation and implementation of a SWPPP. The applicant is to contact the appropriate tribal authority to determine if additional permits and approvals are required.

An EPA issued CGP is required for projects that disturb one (1) acre or more of total land area, or will disturb less than one (1) acre but are part of a larger common plan that will ultimately disturb one (1) or more acres. EPA may issue CGP waivers for construction sites between 1 and 5 acres based on erosivity calculations, total maximum daily load (TMDL) analysis, or other factors. Per NDOT Standard Specifications Section 637 (see Section 1.5.1), a SWPPP must be prepared regardless of whether or not coverage under the EPA's CGP is required for NDOT construction projects.

1.4.3 TRPA Construction Permit

Within the Lake Tahoe basin, the Tahoe Regional Planning Agency (TRPA) issues permits for roadway related construction projects. These permits are in addition to the contractor's requirement for obtaining project coverage under the Nevada CGP. Construction permits issued by TRPA include the usual standard conditions of approval and often special conditions for many Basin location specific projects.

TRPA permits typically include requirements for both permanent and temporary erosion control BMPs. Generally, TRPA permit conditions include:

- Compliance with all conditions of the TRPA permit and the NDEP CGP
- The contractor's engineer must attend a pre-grading meeting with TRPA and the TRPA Contract Compliance Officer to identify BMPs required for the project
- TRPA required BMPs are to be included in the contractor's SWPPP

Additionally, local permitting authorities within the Lake Tahoe Basin (Washoe County, Carson City, or Douglas County) may have additional permitting requirements.

1.5 NDOT Construction Contractor Stormwater Requirements

NDOT construction site stormwater requirements and contractor expectations are dynamic. Text presented in this subsection should be considered as guidance related to general policy. Contractors are required to establish and document contact with NDOT and NDEP representatives (or the EPA for projects on Tribal Lands) for the latest stormwater guidance and regulatory requirements.

1.5.1 NDOT Standard Specification Section 637

Section 637 requires the contractor to install and maintain temporary pollution control BMPs intended to provide prevention, control, and abatement of water and air pollution during the construction project. In some cases, requirements and instructions to the contractor listed in Section 637 may be more stringent than requirements of the EPA, NDEP, or other regulatory agencies.

1.5.2 NDOT's Water Pollution Control Manager (WPCM) Requirement

Section 637 requires that contractors designate a Water Pollution Control Manager (WPCM) to oversee the implementation of stormwater pollution control measures. The designated WPCM is required to successfully complete the two-day (16 hour) "Water Pollution Control Manager" training class provided by the Associated General Contractors/Nevada Contractors Association. The WPCM must be knowledgeable in the principles and practices of construction site water pollution control and possess the skills to assess conditions at the site that could impact stormwater quality, including the identification of illicit discharges and illicit connections to the storm sewer system. The WPCM must also be capable of identifying existing conditions and predictable effects of the contractor's operations, and have complete authority to direct the contractor's personnel and equipment to implement the requirements described in Section 637.

1.5.3 Contractor Stormwater BMP Non-Compliance (BMP Escalation Process)

NDOT has developed policy and procedure to address contractor BMP non-compliance on construction sites, which includes language in the current Standard Specifications (notably Section 637) as well as internal guidance documents. In summary, when BMP deficiencies are noted on construction projects, the contractor shall correct the deficiencies with 7 calendar days, or prior to the next anticipated storm event (whichever occurs first). Should the contractor fail to address the noted BMP deficiencies, liquidated damages will be assessed. The Engineer will schedule a mandatory meeting with the contractor's Project Manager and WPCM, as well as NDOT's District Engineer, to determine the appropriate course of action.

1.6 Other Environmental Related Permits Applicable to Construction

In addition to the stormwater related permits and contract requirements noted above, other activities may occur at construction sites requiring the contractor to obtain permits and implement BMPs to meet permit conditions. Such activities may include working in a waterway, site grading, or site dewatering. The following sections provide additional information on when such permits may be necessary and where to apply for coverage.

This BMP Manual provides only an introduction to some of the permit considerations for NDOT construction projects from a stormwater and water quality perspective. Do not use this guidance exclusively in obtaining permits. Work closely with NDOT, NDEP, and other appropriate local authorities prior to construction activity.

1.6.1 Temporary Working in Waters Permit

The Temporary Working in Waterways Permit authorizes the use of equipment within a Waters of the State. This permit is issued to contractors on an individual project basis and not for frequent or ongoing maintenance activities. An application for permit coverage is made online through NDEP's website. This permit does not authorize discharges to the waters, only equipment access.

When an NDOT project requires coverage under this permit, the construction contractor will be responsible for obtaining the permit, implementing all requirements, developing all plans, and paying the associated permit fee. The permit is valid for up to 180 days from the date of issuance.

1.6.2 General Permit for Routine Maintenance Activities

This permit is typically issued to agencies, entities, and/or jurisdictions authorizing the use of construction equipment to accommodate routine maintenance activities in a Waters of the State. This permit does not authorize discharges to the waters, only equipment access. A construction contractor would likely not be issued this permit.

1.6.3 De Minimis Discharge Permit

A De Minimis General Permit (NVG201000) covers small discharges resulting from specific activities such construction dewatering, well development, fire hydrant flushing, etc., into a WOUS.

De Minimis discharges fall into one or more of the following below listed categories. NDEP regulations, described on the NDEP website, establish an NOI requirement, water quality limitations, prohibitions, and management practices for the following five discharge categories. For each discharge, a separate permit is required. The categories are:

- Category 1 – Public water system (NRS 445A.235) emergency discharges
- Category 2 – Existing public water system supply discharges
- Category 3 – Well development, testing & maintenance / aquifer testing / water quality testing
- Category 4 – Subsurface water discharges

- Category 5 – Utility vault water discharges

Requirements may also include the need for water quality monitoring. When an NDOT construction project requires this type of permit, the contractor is responsible for obtaining the permit, implementing all requirements, and paying the associated annual fee. De Minimis General Permits are valid until the expiration date on the permit. The permittee is required to submit an annual review and service fee in accordance with NAC 445A.268 on or before July 1st of every year.

1.6.4 Temporary Discharge to Waters of the State Permit

The Temporary Discharge to Waters of the State permit covers discharges to state waters from well pump testing, aquifer drawdown testing, construction dewatering and other discharges of a temporary nature. This permit would only be issued if discharges were not covered under a stormwater general permit or De Minimis Discharge permit. An application for a Temporary Discharge to Waters of the State permit is submitted online through NDEP's website.

When an NDOT construction project requires this permit, the construction contractor is responsible for obtaining the permit, implementing all requirements, and paying the associated permit fee. The permit is valid for up to 180 days from the date of issuance.

1.6.5 Air Quality Permits (Dust Control)

Air quality and associated dust control activities can play a role in protecting water quality during construction. Dust control permits, issued through a variety of agencies, specify measures to be implemented before, during, and after dust generating activities. Not all construction projects require air quality/dust control permits. Washoe and Clark Counties each have an air quality management division (or similar) that regulates local air quality. In the remainder of the state, NDEP regulates air quality.

The contractor is encouraged to contact the below listed agencies for the most recent requirements and minimum thresholds of land disturbance pertaining to permit coverage.

- Clark County Department of Air Quality and Environmental Management
- Washoe County District Board of Health
- NDEP Bureau of Air Pollution

When an NDOT project requires an air quality permit, the contractor is responsible for obtaining the permit, implementing all requirements, and paying the associated permit fee. The length that the permit is valid depends on the issuing agency.

Section 2 – Preparing SWPPPs

Provided in this section is an introduction to the preparation of SWPPPs, NDOT minimum stormwater BMP requirements and BMP inspection expectations. NDOT's contractors are required to utilize NDOT's SWPPP template for the preparation of project SWPPPs. A copy of the template is available on NDOT's Stormwater Program website at www.nevadadot.com.

2.1 Stormwater Pollution Prevention Plans

The construction contractor is required by NDOT Standard Specification Section 637 to prepare a SWPPP for every project, regardless of whether or not coverage under NDEP's or EPA's CGP is required. The SWPPP is used to describe the construction project and the stormwater BMPs utilized to minimize the potential to discharge pollutants to the MEP. When preparing a SWPPP, the construction contractor is to address the unique circumstances and conditions of the construction project. All BMPs are to be implemented as described in the SWPPP document.

The SWPPP shall be prepared in accordance with "Good Engineering Practices" and satisfy the requirements of Section 637 and any other permit conditions and requirements. The SWPPP is a "living" document and shall be modified as needed to address changing site conditions, altered construction activities or to address deficiencies in stormwater pollution prevention measures.

Key elements of a SWPPP are as follows:

- Known project information (owner, operator, project location, description of soil disturbing activities, anticipated project phasing and duration, calculated land areas, existing soils information, water quality information, etc.)
- Contact information (include 24-hour emergency contact information for the WPCM, and key subcontractors)
- Detailed project site maps (describe and show land coverages of permeable and non-permeable areas, drainage patterns, discharge locations, disturbed areas, BMPs, special or designated use areas, etc.)
- Receiving waters (describe and locate receiving waters and water quality impairments, including any 303(d) listed impaired water bodies or TMDL listed waters as referenced in Section 3.9 of NDEP's CGP)

- Best management practices (itemize each location and type of BMP's to be used on the project, including post-construction and non-stormwater discharge management)
- Inspection and maintenance procedures (describe frequencies and processes for corrective actions)
- Signed Contractor Certification Statement (in the event CGP coverage was procured)
- Records of inspection and corrective actions (on an on-going basis, include all inspection reports, logs, maintenance activities, corrective actions, paperwork and reporting, etc.)

The EPA and NDEP have numerous resources available to assist stormwater professionals with the development of SWPPPs. However, NDOT's construction contractors are required to utilize NDOT's SWPPP template, which is available for download on NDOT's website (www.nevadadot.com).

2.2 BMP Inspection

At a minimum, construction site stormwater inspections are to be performed at the frequencies specified in the CGP. It should be noted that contract documents may require construction site stormwater inspections to be performed at frequencies more stringent than the CGP. Inspections are to be documented and note BMPs that are inadequate or otherwise not properly operated and/or maintained.

Section 3 – BMP Considerations

In the development of a SWPPP and the selection of stormwater BMPs, it is necessary to anticipate construction site activities, when and where they will occur, and understand their potential to impact stormwater quality. As a guide, Sections 3.1 through 3.11 below provide discussions of various project elements and considerations for SWPPP development and BMP implementation. This list of considerations is not exhaustive and the contractor should understand that other site-specific circumstances may arise that need to be addressed given project specifics.

3.1 Disturbed Soil Areas (DSAs)

Disturbed soil areas (DSAs) are areas within the limits of a construction project that have been disturbed by construction activities and rendered exposed and erodible. In general, DSAs do not include:

- Roadways, construction and access roads, or contractor yards that have been stabilized by the placement of compacted aggregate base or paved surfacing; and,
- Areas where construction activities are completed and final stabilization has been achieved.

3.2 Temporary and Final Stabilization

Soil stabilization is required whenever soil disturbing activities are either temporarily or permanently ceased.

Temporary stabilization may need to remain in place until final stabilization measures become established. Final stabilization must be established prior to filing the CGP Notice of Termination (NOT). Refer to NDEP's or EPA's CGP (as appropriate) for further information on temporary and permanent stabilization requirements.

All temporary sediment control BMPs treating stormwater discharges from areas that have achieved final stabilization per the respective CGP must be removed prior to project closeout and relief of maintenance. Conversely, temporary sediment control BMPs treating stormwater discharges from areas that have not achieved final stabilization must remain in place and maintained accordingly until such areas have met the CGP final stabilization requirements, regardless of relief of maintenance status.

3.3 Time of Year

It is important to consider the time of year the construction activities will occur. Some BMPs cannot be properly deployed in freezing conditions or when snow is on the ground. Furthermore, construction activities occurring during intense precipitation events or periods of prolonged precipitation may require additional or enhanced BMPs. Where possible, land disturbing activities should be scheduled during dry weather periods to minimize the potential for sediment discharges.

3.4 Site Soils and Moisture Conditions

Soils and associated site moisture conditions can play a significant role in erosion, erodibility and off-site migration of sediments during construction. Some soils and surface types are more susceptible to erosion than others. Soils with a higher proportion of silt and clay are typically less susceptible to erosion than soils with a higher proportion of sand. Soils having a high infiltration capacity often require much higher precipitation rates to produce runoff.

High soil moisture conditions can exacerbate off-site sediment movement and vehicle sediment tracking. Dry soils may require additional dust control measures in heavily used areas.

3.5 Project Schedule

Review the project schedule and determine when a BMP is required, and how long a specified BMP will need to be in place, maintained and fully functional. Some BMPs may be necessary for only a short duration while others may be needed for a long period of time. Also consider if and how the construction project will be phased. Will an area require repeated disturbance, requiring repair or replacement of soil stabilization BMPs? Will different BMPs be required in certain areas as the project progresses?

3.6 Slope

There are three key factors to consider when specifying BMPs for sloped DSAs: inclination (slope steepness), length, and soil type. DSAs with steep long slopes and having erodible soils are more susceptible to erosion and require more or enhanced protection in the form of erosion prevention and sediment control BMPs.

3.7 Temporary Batch Plants

Temporary batch plants dedicated to a construction project are covered under the CGP. These plants may require their own specific BMPs. Batch plant BMPs and implementation is to be addressed in the project SWPPP.

3.8 BMP Implementation Time

Some BMPs may take time to become effective or require advance coordination for installation. For example, it may take a week or more to coordinate with a contractor to spray a DSA with a tackifier or mulch. Once applied, it may take a day for the applied material to set and become effective. Seeded areas may require months for the seeds to sprout, grow, and become effective. In contrast, rolled erosion control products (such as geotextile fabrics) are effective immediately.

3.9 Unintended BMP Effects

Some BMPs can have unanticipated negative effects on the project. For example, straw mulch applied to an area that will later receive structural fill may need to be removed because it might interfere with site compaction requirements. When selecting a BMP, it is important to consider how that BMP might affect the overall site activities or how it will be incorporated into the site at the completion of the project.

3.10 Identification of Waterways

The nearest waterway with potential to receive runoff from the project site must be identified in the SWPPP (this is a requirement of both the NDEP and EPA CGPs). Because runoff can be carried several miles by the stormwater drainage system, it may require an investigative effort to determine the receiving waterway. Once the receiving waterway(s) have been identified, check the current Nevada Integrated Report to determine if it is listed as an Impaired Water (303(d) List) or has an established TMDL. The Nevada Integrated Report can be found at NDEP's Bureau of Water Quality Planning website.

If construction site runoff has the potential to discharge into a waterbody on the 303(d) list, the WPCM shall investigate whether discharges from the construction site will contribute to the listing (i.e., violations the water quality standards). If violations are possible, appropriate BMPs shall be implemented to ensure construction site discharges do not cause or contribute to an exceedance of an applicable water quality standard.

If construction site runoff has the potential to flow into a waterbody with an established TMDL, requirements of the TMDL shall be complied with, and the SWPPP shall include a section describing the condition for which the TMDL was established. Appropriate BMPs are to be identified in the SWPPP and specific to the TMDL constituent. The SWPPP must describe how the selected BMPs will prevent site discharges from causing exceedances of the applicable water quality standard(s).

3.11 Tribal Considerations

When EPA CGP coverage is required (i.e. construction activities within Tribal Lands), review and understand the requirements and conditions pertaining to specific Tribes.

Construction activities may occur on both Tribal and non-Tribal Lands for a given project; consequentially simultaneous coverage under the NDEP and EPA CGP may be required.

Section 4 – BMP Fact Sheets

BMPs described in this manual pertain to commonly anticipated construction activities and, when properly selected and implemented, are expected to minimize the discharge of pollutants to the MEP. The BMP fact sheets presented provide the user with the following information (as appropriate):

- A description of the BMP
- Information on the appropriate use of the BMPs (application)
- Limitations of the BMP
- Guidance on the construction and/or installation of the BMP
- Inspection and maintenance needs
- A mapping symbol for use on the SWPPP map

BMPs described in this section are grouped into five primary categories.

1. Construction Operations (CO)
2. Erosion Control (EC)
3. Materials Management (MM)
4. Sediment Controls (SC)
5. Tracking Controls (TC)

While the BMPs listed in this manual address many construction activities, there may be unique or unusual construction practices or site conditions for which an appropriate BMP is not adequately described or included in this manual. In these instances, the SWPPP developer should look to other resources for an appropriate BMP or modify a BMP provided herein and adapt it to the specific needs of the construction site.

Additional construction site stormwater BMP resources include:

- Nevada Contractors Field Guide for Construction Site Best Management Practices (available for download from NDOT's website)
- U.S. EPA Construction Site Stormwater Runoff Control webpage
- American Association of State Highway and Transportation Officials (AASHTO) Construction Stormwater Field Guide (available for purchase from the AASHTO Bookstore website, or viewing from AASHTO's Center for Environmental Excellence website).

Refer to NDOT's Qualified Products List (QPL) for a listing of approved products for certain BMPs. A copy of the current QPL can be downloaded from NDOT's website (www.nevadadot.com).

A summary of the BMPs presented in this manual is provided below in Table 4.1.

Table 4.1
Construction Site Stormwater BMP Fact Sheets Listed in this Manual

Table 4.1 Construction Site Stormwater BMP Fact Sheets Listed in this Manual		
SC-04	Check Dams	160
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Construction Operations (CO)

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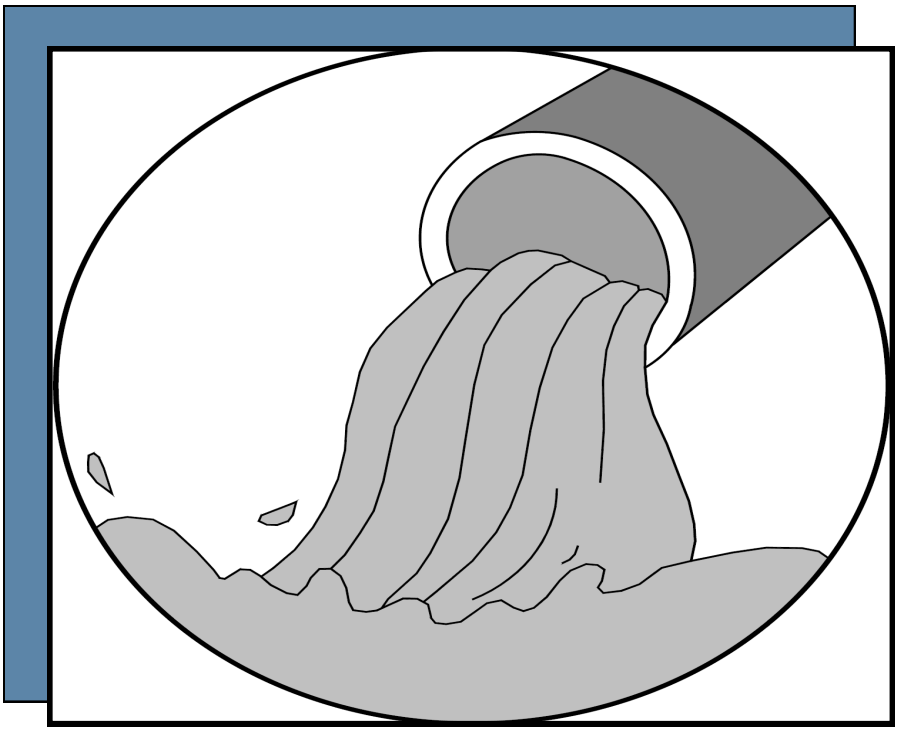
Illicit Discharge Detection and Elimination, and Spill Reporting

CO-01



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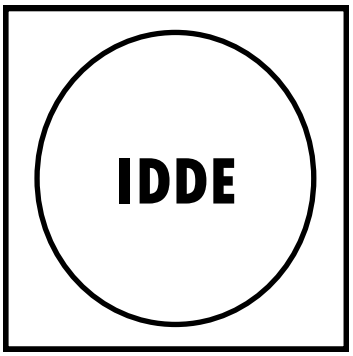

Description: Illicit discharges refer to the discharge or dumping into the storm drain system or waterway any material other than stormwater. This BMP outlines the guidelines and typical practices for preventing, recognizing, and eliminating illicit discharges at a construction site. This BMP also provides guidance on reporting and cleanup should an illicit discharge incident occur. Further information regarding illicit discharge detection can be found in NDOT's Field Guide for Illicit Discharge Detection and Elimination.

Application:

- Illicit discharge detection and elimination (IDDE), and spill reporting is applicable at every construction site.

Limitations:

- Contractor shall use extreme caution and immediately notify the Engineer when illicit discharges are discovered.
- Not all illicit discharges and/or their sources are readily identifiable.
- Assistance from other municipalities or jurisdictions may be necessary to identify and/or eliminate illicit discharges or connections entering the right-of-way.

Design and Implementation:

Planning

- Inspect the site before beginning the job for evidence of illicit discharges or dumping.
- Inspect the site regularly, specifically stormwater inlets and outfalls, during project execution

for evidence of illicit discharges.

- Unlabeled or non-identifiable material shall be assumed to be hazardous and immediately removed and disposed of properly.
- Observe site perimeter for evidence of illicitly discharged materials that may enter the job site.

Identification of Illicit Discharges

- Solids - Look for debris, powders, or rubbish piles. Solid waste dumping often occurs on roadways with light traffic loads or in areas not easily visible from the traveled way.
- Liquids - signs of illegal liquid dumping or discharge can include:
  - ◊ Evidence of a sanitary sewer discharge.
  - ◊ Visible signs of staining or unusual colors to the pavement or surrounding adjacent soils.
  - ◊ Pungent or unpleasant odors coming from the drainage systems.
  - ◊ Discoloration or oily substances in the water or stains and residues detained within ditches, channels or drain boxes.
  - ◊ Abnormal water flow during the dry weather season.
- Illicit Connections - Evidence of illicit connections and discharges is typically detected at storm drain outfall locations or at manholes. Signs of an illicit connection or discharge may include:
  - ◊ Abnormal water flow during the dry weather season.
  - ◊ Unusual flows in subdrain systems used for dewatering.
  - ◊ Pungent odors coming from the drainage systems.
  - ◊ Discoloration or oily substances in the water or stains and residues detained within ditches, channels or drain boxes.
  - ◊ Excessive sediment deposits, particularly adjacent to or near active off-site construction projects.
- Additional information on identifying illicit discharges can be found on NDOT's Stormwater Program website.

Reporting a Suspected Illicit Discharge

- When an illicit discharge is suspected at a construction site, the Engineer as well as a representative of NDOT's Stormwater Division shall be contacted. Illicit discharges can be reported to the Stormwater Division via the following:
  - ◊ Stormwater Program Website: www.nevadadot.com
  - ◊ Phone #: 775-888-7771
- NDOT's Stormwater Division will initiate an illicit discharge investigation within 24 hours of the incident being reported.

When you call the Stormwater Division, the following are typical of the questions you will be asked:

- What is the location of the discharge? (The more detail the better, i.e. roadway number, milepost, intersection, etc.)

- What is the description of the discharge? (Dumped solids, a dry weather flow, odor, color, foam, etc.)
- What is the discharge frequency? (One time dump or an on-going issue)
- What is the source of the discharge? (Do you have an idea of where the potential illicit discharge may be coming from?)
- Is the illicit substance in, or discharging to, a waterway or the storm sewer system?

This information will be used to document and initiate the investigation. All illicit discharges entering NDOTs MS4 that discharge into a waters of the U.S. must be reported to NDEP via the Spill Reporting Hotline listed below.

NDEP Spill Reporting Hotline (1-888-331-6337)

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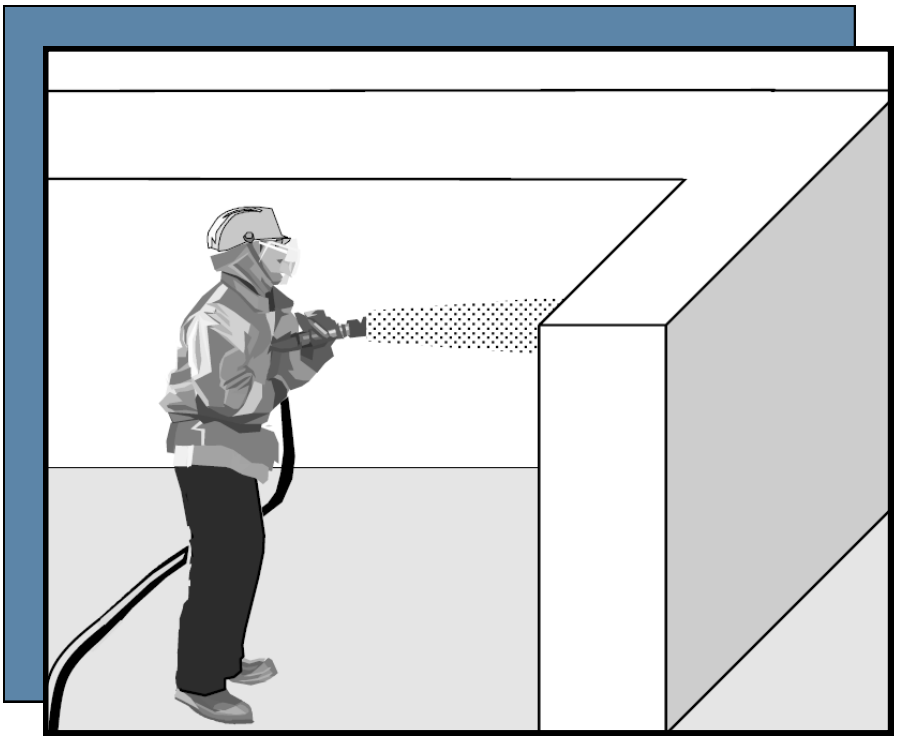
Paving and Concrete Operations

CO-02



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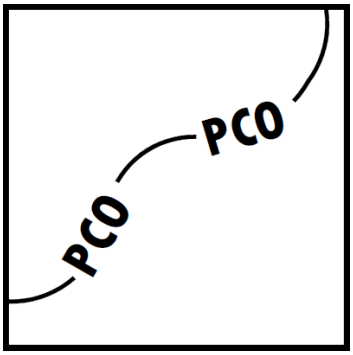

Description: Most construction sites involve the use of pavement and/or concrete to accomplish the work. Inherently, paving, saw cutting, grinding, sand/shot blasting, pressure water blasting, curing, deck rehabilitation, paint removal, surface preparation, and finishing operations often involve the use of materials containing chemicals, concrete, asphalt, curing compounds, or other potentially hazardous substances, and can also generate fine particles that should not be allowed to enter waterways.

Application:

- These guidelines shall be implemented where paving, surfacing, resurfacing, grinding, or saw cutting may generate pollutants that could enter storm drain system or watercourses.
- All concrete elements of a structure (i.e., footings, columns, abutments, stems, soffit, and deck) and concrete pavements are subject to curing requirements in accordance with Standard Specifications Section 501. This BMP shall be implemented on any project with curing activities.
- These guidelines apply to construction sites where concrete finishing and pavement sealing operations are performed.

Limitations:

- Finer solids are not effectively removed by conventional sedimentation systems.
- High winds could blow cutting and grinding dust away before it can be captured.
- Specific requirements may be included in the contract documents for certain concrete finishing operations.

Design and Implementation:

Pavement and Grinding Operations

- Release agents used to coat asphalt transport trucks and asphalt spreading equipment shall adhere to Standard Specifications Section 401 and shall be non-foaming and non-toxic.
- Place plastic materials or other containment measures under asphaltic concrete (AC) paving equipment while not in use to catch and/or contain drips and leaks. See also BMP MM-04 Spill Prevention and Control.
- When paving involves AC, the following steps should be implemented to prevent the discharge of grinding residue, un-compacted or loose AC, tack coats, or other paving materials:
  - ◊ Prevent sand and gravel from new asphalt from getting into storm drains, streets, and waterways.
  - ◊ Old or spilled asphalt must be recycled or disposed of in accordance with Standard Specifications Section 404 or 107, respectively.
  - ◊ AC grindings, pieces, or chunks used in embankments or shoulder material must not be allowed to enter any storm drains or watercourses. Install appropriate perimeter control and/or inlet protection measures until structure is stabilized or permanent controls are in place.
  - ◊ Collect and remove all broken asphalt and recycle when practical; otherwise, dispose in accordance with Standard Specification Section 107.
  - ◊ Petroleum, petroleum-covered aggregate, or fine particulates generated from chip seal and sweeping operations must not be allowed to enter any storm drains or watercourses. Apply temporary perimeter and/or inlet controls until all chip seal materials are completely cured and sweeping of excess material is complete.
- Use care during application of seal coat, tack coat, slurry seal, and/or fog seal near drainage inlet structures and manholes. To avoid introduction of these materials into the storm drain system or sewer, apply these materials by hand sprayer or brush when working adjacent to inlets or cover and seal the structures and manholes with plastic.
- Seal coat, tack coat, slurry seal or fog seal shall not be applied if rain is predicted during the application or curing period.
- Paving equipment parked on-site shall be parked over plastic or with other appropriate fluid containment measures to prevent leaks and drips from contaminating the surface.
- Clean asphalt coated equipment off-site whenever possible. Any cleaning on-site shall follow BMP CO-05 Vehicle and Equipment Cleaning. All dry, hardened asphalt from equipment shall be recycled or disposed of in accordance with Standard Specifications Section 404 or 107, respectively.
- When cleaning dry, hardened asphalt from equipment, manage hardened asphalt debris as described in BMP MM-05 Construction Debris and Litter Management. Do not wash sweepings or grindings from exposed aggregate concrete into a storm drain system. Collect and return to aggregate base stockpile or dispose of per Standard Specification 107.
- If aggregate is washed on-site, allow the rinse water to settle and prevent discharges into waterways. Then, either dry in a temporary pit as (see BMP MM-06 Concrete Waste Management), or dispose in accordance with Standard Specifications Section 202.
- Do not allow saw-cut Portland Concrete Cement (PCC) slurry to enter storm drains or watercourses. Contractors shall clean up slurry before it has the opportunity to enter any nearby storm drains or watercourses.

- Avoid performing paving, saw cutting, and grinding operations during wet weather to minimize the potential of pollutants migrating into waterways.

Pavement Grinding or Removal

- Implement preventative measures to minimize the potential for residue from grinding operations to discharge into waterways. See also BMP MM-06 Concrete Waste Management, and BMP MM-08 Hazardous Material Management.
- Collect pavement dig-out material (the aggregate base and backfill directly below the pavement section) by mechanical or manual methods. This material may be recycled or, if allowed in the contract documents, used as shoulder material or base material at locations approved by the Engineer.
- If dig-out material cannot be recycled, dispose of in accordance with Standard Specifications Section 107.
- Avoid performing dig-out activities during runoff generating precipitation events.
- Stockpile any materials removed from roadways away from drain inlets, drainage ditches, and watercourses, and store consistent with BMP MM-03 Stockpile Management.
- Disposal or use of AC grindings shall be in accordance with Standard Specification Section 107 & 202, respectively and per the Engineer. See also BMP MM-06 Concrete Waste Management.

Raised/Recessed Pavement Marker Application and Removal

- Do not transfer or load bituminous material near storm drain inlets, drainage ditches or watercourses.
- Melting tanks shall be loaded with care and not filled to beyond six inches from the top to leave room for splashing.
- When servicing or filling melting tanks, ensure all pressure is released before removing lids to avoid spills.
- Collect excess bituminous material from the roadway after removal of markers.
- Waste shall be disposed of in accordance with Standard Specifications Section 107 and 202.

Chemical Curing

- Avoid over-spray of curing compounds.
- Minimize the drift of chemical curing agents as much as possible by applying the curing compound close to the concrete surface. Apply an amount of compound that covers the surface, but does not allow any runoff of the agent.
- Use proper storage and handling techniques for curing compounds. Refer to BMP MM-01 Material Handling and Storage.
- Protect drain inlets and adjacent waterways prior to the application of curing compounds. Refer to BMP SC-08 Storm Drain Inlet Protection.
- Refer to BMP MM-04 Spill Prevention and Control.

Water Curing for Concrete Bridge Decks, Retaining Walls, and other Structures

- Prevent any runoff of cure water to the greatest extent possible.
- In the event runoff occurs, direct cure water away from inlets and watercourses to collection areas for proper disposal in accordance with all applicable permits.
- When possible, utilize wet blankets or a similar method that maintains moisture while minimizing the use and possible discharge of water.

Concrete Finishing

- Prevent, collect and properly dispose of water and solid waste from high pressure blasting operations.
- Direct water from blasting operations away from inlets and watercourses to sumps for proper collection and disposal.
- Protect inlets during sandblasting operations. Refer to BMP SC-08 Storm Drain Inlet Protection.
- Minimize the drift of dust and blast material as much as possible by keeping the blasting nozzle close to the surface.
- Avoid over-spray (allowing it to become airborne) of blast residue.
- When blast residue contains potentially hazardous materials, refer to Standard Specification Section 107.

Maintenance and Inspection:

- Inspect and maintain machinery regularly to minimize leaks and drips.
- Ensure that employees and subcontractors are implementing appropriate BMP measures during paving operations.
- Ensure that employees and subcontractors implement appropriate BMP measures for storage, handling, and use of curing compounds.
- Inspect any temporary diversion devices, lined channels, or swales for washouts, erosion, or debris. Replace lining and remove debris as necessary.
- Inspect cure containers and spraying equipment for leaks.
- Follow inspection procedures as required in the contract documents.
- At a minimum, inspect containment structures prior to use each day and prior to the onset of rain.
- At the end of each work shift, remove and dispose the liquid and solid wastes from containment structures and from the general work area.

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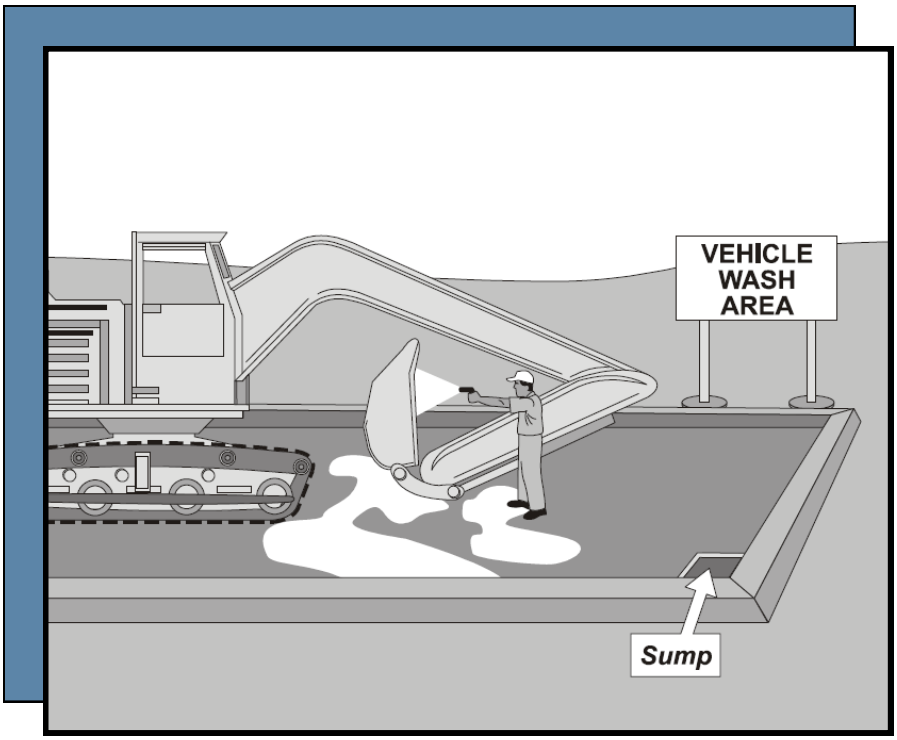
Vehicle and Equipment Cleaning/ Maintenance

CO-03



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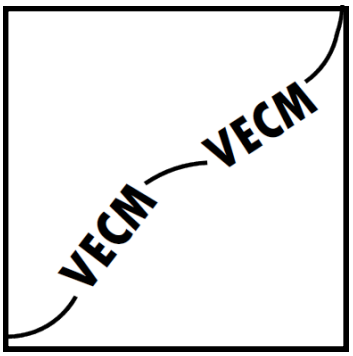

Description: The majority of construction work requires the use of vehicles and equipment to accomplish the work. Inherently, the vehicles and equipment used at construction sites require frequent cleaning and maintenance to keep them operating at optimum levels. Consequently these activities can generate a variety of waste streams.

Application: These procedures are applicable where vehicle and equipment cleaning is performed on-site.

Limitations: Indoor or covered areas may not be available on-site.

Design and Implementation:

Vehicle Wash Areas

- On-site vehicle and equipment washing shall only be performed within designated contained areas.
- Cleaning of vehicles and equipment with detergents, solvents or steam shall not occur on the project site unless the Engineer has been notified in advance and the resulting wash water and waste are fully contained in a lined facility and disposed of in conformance with the provisions in Standard Specifications Section 107.
- Wash water containing hazardous substances shall be containerized and disposed of in accordance with Standard Specifications Section 107. Water containing hazardous materials must not be contained in unlined ponds.

- When vehicle/equipment washing/cleaning must occur on-site, and the operation cannot be located within a structure or building equipped with appropriate disposal facilities, the outside cleaning area shall have the following characteristics:
    - ◊ Located away from storm drain inlets, drainage facilities, or watercourses
    - ◊ Paved with concrete or asphalt and bermed with an impermeable material to contain wash waters and to prevent run-on and runoff
    - ◊ Configured with a sump to allow collection and disposal of wash water
    - ◊ Wash waters shall not be discharged to storm drains or watercourses
    - ◊ Used only when necessary
- When cleaning vehicles/equipment with water:
    - ◊ Use as little water as possible.
    - ◊ Use a shutoff valve to minimize overall water usage.
    - ◊ Facility wash racks shall discharge to a sanitary sewer, recycle system or other approved discharge system and shall not discharge to the storm drainage system or watercourses. Discharges to a sanitary sewer system require written approval from the appropriate municipal authority.

Vehicle Maintenance Areas

- Contractor shall clearly establish dedicated areas for vehicle and equipment maintenance, repair, and storage. Areas shall be located at least 100 feet from drainage facilities and watercourses and be protected from run-on.
- Drip pans, absorbent, or other appropriate containment measures pads shall be used during vehicle and equipment maintenance work that involves fluids.
- Absorbent spill clean-up materials shall be available and clearly identified in maintenance areas. Waste materials shall be properly disposed of.
- Use off-site maintenance facilities whenever possible.
- Consider installing roofs or portable tents over on-site maintenance areas.
- Properly dispose of (or recycle as appropriate) any tires, batteries, petroleum products, and spill cleanup materials.
- Upon discovery of a leak, immediately place adsorbent pads, drip pans, or other appropriate containment measures under the vehicle or equipment and make arrangements to have the leak repaired immediately.
- Provide impermeable spill containment dikes or secondary containment around stored oil and chemical drums. Refer to BMPs MM-04 Spill Prevention and Control and MM-08 Hazardous Material Management for more information on material storage.

Maintenance and Inspection:

- Vehicle and equipment maintenance, storage, and cleaning areas shall be inspected daily, including waste collection and treatment areas.
- Waste from vehicle and equipment cleaning and maintenance areas shall be disposed of in accordance with Standard Specification Section 107.
- Monitor and train employees and subcontractors throughout the duration of the construction

project to ensure appropriate practices are being implemented.

- Leaking vehicles and equipment are to be repaired immediately. Leaking vehicles and equipment may be removed from the project area at the Engineer's discretion.

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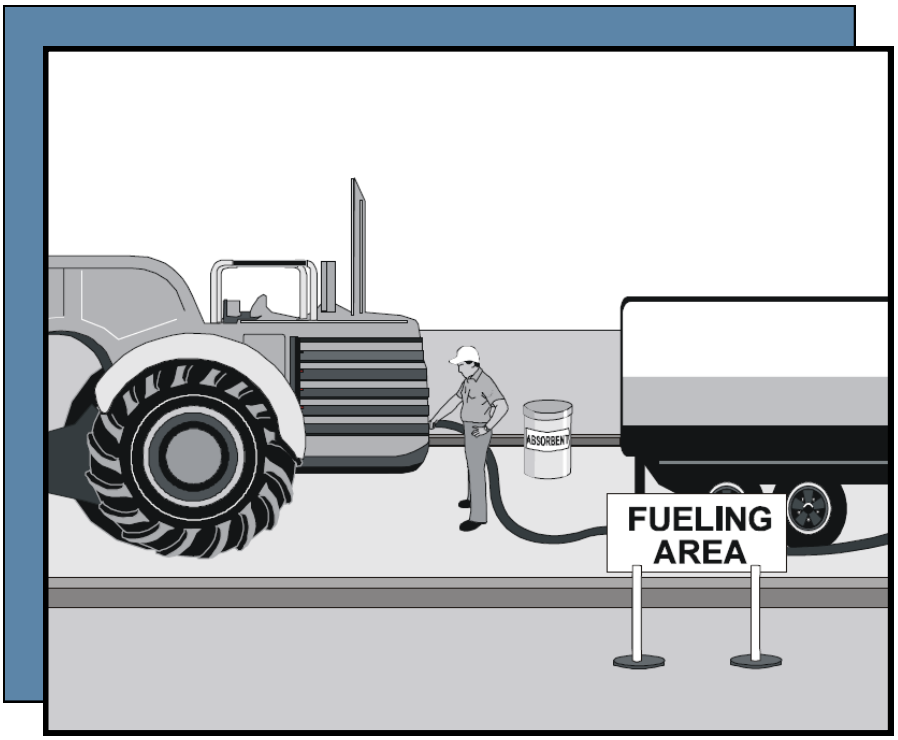
Vehicle and Equipment Fueling

CO-04



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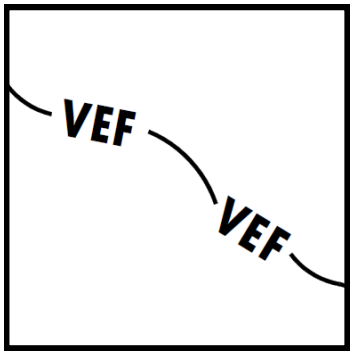

Description: The majority of construction work requires the use of vehicles and equipment to accomplish the work and therefore may require onsite fueling areas. This BMP provides guidelines for vehicle and equipment fueling practices to prevent fuel spills and leaks from impacting stormwater and to minimize the discharge of pollutants to the storm drain system or nearby watercourses.

Application: These guidelines are to be applied on all construction sites where vehicle and equipment fueling occurs. Guidelines also apply to mobile fueling operations as appropriate.

Limitations: Permits may dictate fueling area and fuel storage requirements.

Design and Implementation:

- On-site vehicle and equipment fueling shall only be used where it is impractical to send vehicles and equipment off-site for fueling.
- For permanent fueling sites, select and designate a dedicated fueling area and restrict all fueling activities to that location.
- Dedicated fueling areas must be located on level ground.
- Dedicated fueling areas shall be protected from stormwater run-on and runoff, and shall be located at least 100 feet (when possible) from drainage facilities and watercourses. Note that water quality permits may dictate the minimal distance from watercourses.
- Spill containment and clean-up kits shall be staged at each fueling area.

- Comply with spill prevention, control, and countermeasure (SPCC) plan requirements when appropriate.
- Fueling storage areas shall have appropriate secondary containment, which includes an impervious floor surface, and sufficient volume to contain 100% of the aggregate volume of all fuel storage containers plus a minimum of 4 inches of free-board, or in accordance with SPCC plan requirements.
- Spills and leaks shall be cleaned using adsorbents. Never wash down a spill to a storm drain. Used spill containment and clean up materials shall be properly disposed in accordance with Standard Specifications Section 107.
- Drip pans or absorbent pads shall be placed on the ground under the vehicle or equipment during fueling, unless the fueling is performed over an impermeable containment area.
- Fueling nozzles shall be equipped with an automatic shut-off to reduce drips.
- Train employees and subcontractors in proper fueling procedures (stay with vehicles during fueling, proper use of pumps, emergency shutoff valves, etc.). (EPA, 2007).
- Use vapor recovery nozzles to help control drips as well as air pollution where required by air quality permits and regulations. Ensure the nozzle is secured upright when not in use.
- Fuel tanks shall not be "topped-off."
- Fueling operations shall not be left unattended.
- Fueling equipment shall be inspected each day for leaks. Drip pans, absorbent pads, or other suitable containment measures shall be placed under leaking fueling equipment.
- Stormwater that collects within the fueling areas such as the secondary containment area, drip pans, etc., shall be containerized and disposed of in accordance with Standard Specifications Section 107. These areas shall be maintained to provide adequate spill containment capacity.
- Fuel saturated soil shall be containerized and disposed of in accordance with Standard Specifications Section 107.
- All federal, state, and local requirements must be observed for any fueling facility and stationary above ground storage tanks.
- When possible, provide overhead cover for stationary fueling stations to prevent/minimize exposure to precipitation.
- When possible, protect fueling areas with barriers or bollards to prevent inadvertent damage from vehicles or equipment.
- Fire extinguishers should be accessible within 30 feet of any fuel tank.

Maintenance and Inspection:

- Fueling areas and storage tanks shall be inspected daily.
- Maintain an ample supply of spill containment and clean-up materials on the site.
- Maintain an ample supply of adsorbent pads, drip pans, or other appropriate containment measures on the site.
- Immediately clean up spills and properly dispose of contaminated soil and cleanup materials.
- Inspect the secondary containment area for breaches.
- Ensure all fueling hoses are kept entirely within the secondary containment area.

- Materials, pans, drums, fuel containers, etc. are not to be placed on the side or edge of the secondary containment area.

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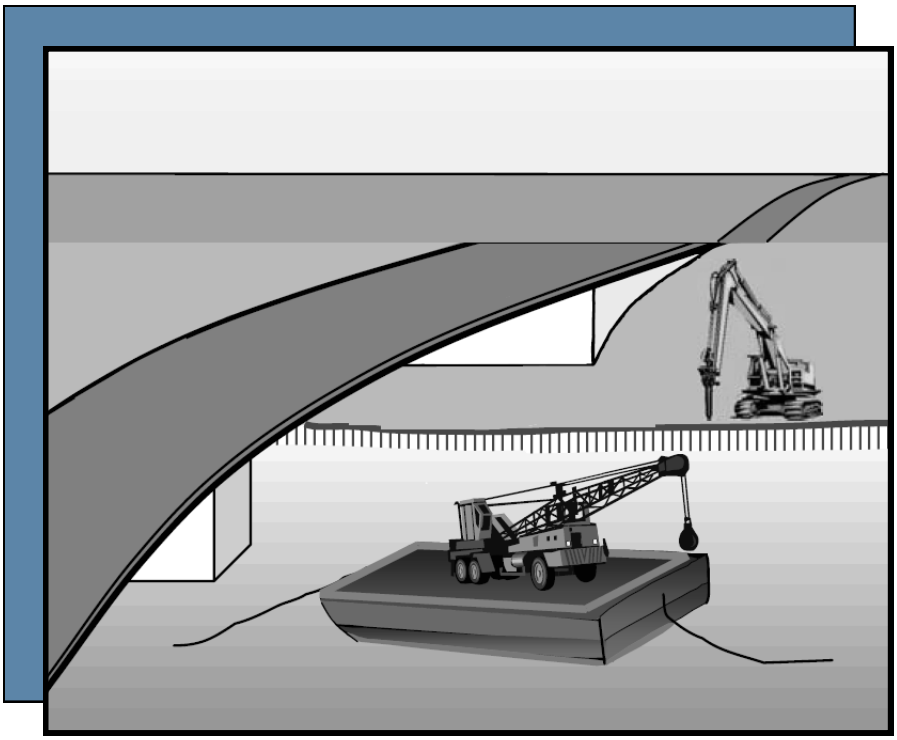
Construction Activity Over or Adjacent to Water

CO-05



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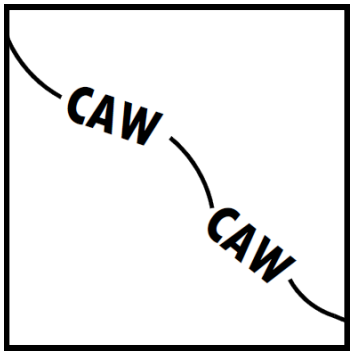

Description: Some projects may require work over or directly adjacent to water. When this work occurs there is an elevated potential that the associated water body could be negatively impacted by the construction activity. Consequently, it is critical that all contractors follow the guidelines for proper use, storage, and disposal of materials and equipment on barges, boats, temporary construction pads, or similar locations to minimize or eliminate the discharge of potential pollutants to the watercourse.

Application: This practice is applicable to construction that occur over (or adjacent to) watercourses. This may include bridge demolition (full or partial removal), bridge widening, concrete channel removal, or when equipment such as barges, boats, docks, and any other platforms are used.

Limitations:

- Specific requirements may be included in the contract documents and/or permits.
- Structural design by a professional engineer licensed in the State of Nevada may be required.

Design and Implementation:

- Contractors are responsible for reporting any discharges to a waterway immediately upon discovery to the project Engineer. If determined necessary by NDOT, written notification from the Contractor describing the discharge and subsequent mitigation measures to prevent and/or control potential future discharges may also be required.
- Use attachments on construction equipment such as backhoes to catch debris from small demolition operations.

- Use covers or platforms to collect debris.
- Provide watertight curbs or toe boards to contain spills and prevent materials, tools, and debris from leaving any barge, platform, dock, etc.
- For structures containing hazardous materials, (i.e., lead paint or asbestos) refer to Standard Specifications Section 107.
- Use appropriate spill containment and cleanup measures for leaky equipment and vehicles and ensure that an adequate supply of spill cleanup materials are available.
- Drip pans or other appropriate spill containment measures shall be placed under all vehicles and equipment placed on docks, barges, or other structures over water bodies when the vehicle or equipment is expected to be idle for more than one hour.
- Secure all materials to prevent discharges to receiving waters via wind.
- Ensure staff is trained regarding the deployment of spill control and clean up.
- Ensure the timely and proper removal of accumulated wastes.
- Refer to BMPs MM-01 Material Handling and Storage and MM-04 Spill Prevention and Control, and review the project's
- Stockpile accumulated debris and waste generated during demolition away from watercourses and in accordance with BMP MM-03 Stockpile Management.
- Refer to BMP MM-05 Construction Debris and Litter Management (non-hazardous) and Standard Specifications Section 107.
- Maintain equipment in accordance with BMP CO-03 Vehicle and Equipment Cleaning and Maintenance. If a leaking line cannot be repaired, immediately remove the equipment from over or near the waterway.
- Comply with all necessary permits required for construction within or near the watercourse.

Maintenance and Inspection:

- Contractor shall inspect demolition areas over or near adjacent watercourses on a daily basis.
- Any debris-catching devices shall be emptied regularly and at a frequency sufficient to prevent accumulated debris from spilling over. Collected debris shall be removed and stored away from the watercourse and protected from run-on and runoff.
- All debris shall be disposed in accordance with all local, state, and federal laws and regulations.
- Inspect equipment for leaks and spills on a daily basis, and immediately make necessary repairs.
- Verify employees and subcontractors are implementing appropriate measures for storage and use of materials and equipment.
- Inspect and maintain all associated BMPs and perimeter controls to ensure continuous protection of the watercourse.

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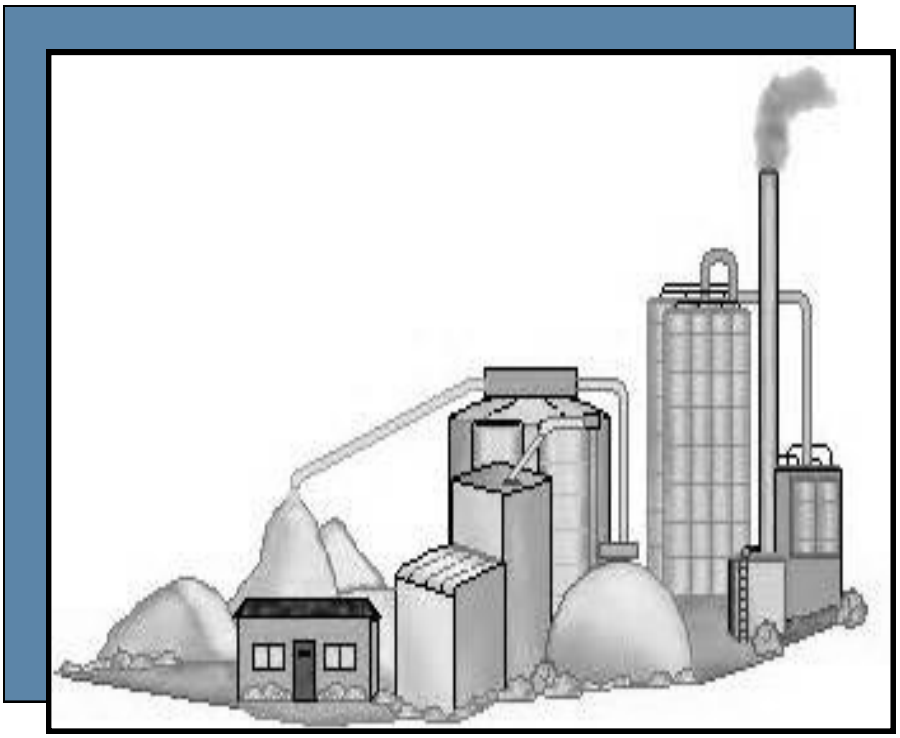
Temporary Batch Plants

CO-06



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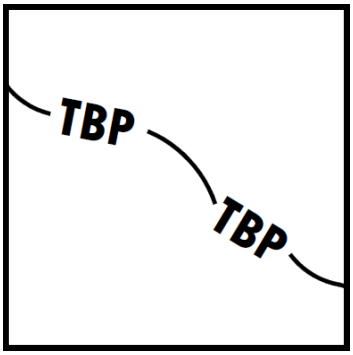

Description: The construction of roads, bridges and retaining walls often requires temporary batch plant facilities to crush rock, and manufacture asphalt concrete (AC) or Portland cement concrete (PCC) near construction projects. Temporary batch plant facilities typically consist of silos containing fly ash, lime and cement; sand and gravel material storage areas; a mixing plant/equipment; above ground storage tanks containing concrete additives and water; and designated areas for sand and gravel truck unloading, concrete truck loading, and concrete truck washout. Proper control and use of equipment, materials, and waste products from temporary batch plant facilities will reduce the discharge of potential pollutants to the storm drain system or watercourses, reduce air emissions, and mitigate noise impacts.

If the plant or operation is dedicated solely to a specific CCP covered construction project, the plant is also covered under the project's CGP. Pollution control measures associated with a temporary batch plant are to be addressed in the project SWPPP.

Application: These guidelines apply to construction sites where temporary batch plant facilities are utilized.

Limitations:

- Specific permit requirements by Clark and Washoe Counties, NDEP and local noise ordinances, may dictate control/measures.

Design and Implementation:

Layout and Design

- Construct temporary batch plants down-wind of existing developments whenever possible.

- The location of access roads should be planned to minimize water and air quality impacts. Temporary batch plants should be located and designed to minimize water quality impacts to receiving water bodies. Batch plants should be located away from watercourses, drainage courses, and drain inlets.
- Batch plants should be designed to minimize the potential for stormwater run-on to the site.
- Temporary batch plant facilities (including associated stationary equipment and stockpiles) should be located at least 300 feet from any recreational area, school, residence, or other structure not associated with the construction project.
- Continuous interior AC or PCC berms around batch plant equipment (mixing equipment, silos, concrete drop points, conveyor belts, admixture tanks, etc.) facilitate proper containment and cleanup of releases. Rolled curb or dikes should be placed at ingress and egress points, and loading areas.
- Direct stormwater and non-stormwater runoff from the batch plant facility to catchment ponds or treatment tanks.

Operational Guidelines

- Washout of concrete trucks shall be conducted in a designated area in accordance with BMP MM-06 Concrete Waste Management.
- Do not dispose of concrete into drain inlets, the stormwater drainage system or watercourses.
- Washing of equipment, tools, or vehicles to remove PCC shall be conducted in accordance with BMPs CO-03 Vehicle and Equipment Cleaning and Maintenance and MM-06 Concrete Waste Management.

Tracking Control

- Plant roads (batch truck and material delivery truck roads) and areas between stockpiles and conveyor hoppers should be stabilized, watered, treated with dust-palliative, or paved with a cohesive hard surface that can be repeatedly swept, washed, and maintained intact and cleaned as necessary to control dust emissions.
- Trucks should not track PCC from plants onto the NDOT right-of-way or other public roads. Use appropriate BMPs (see BMP TC-01 Stabilized Construction Approaches) to prevent tracking sediments off-site.

Materials Storage

- BMP MM-01 Material Handling and Storage should be implemented at all batch plants using concrete components or compounds. An effective strategy is to cover and contain.
- BMP MM-02 Material Use should be implemented to minimize or eliminate the discharge of materials to storm drain system or watercourse.
- Minimize dispersion of finer materials into the air during operations, such as unloading cement delivery trucks.
- Where possible, stockpiles should be covered and enclosed with perimeter sediment barriers per BMP MM-03 Stockpile Management. Use care to avoid over-applying water and causing runoff.
- Store bagged and boxed materials on pallets and cover on non-working days or prior to rain.

- Provide secondary containment for liquid materials (see BMPs MM-01 through MM-08). Secondary containment shall provide sufficient volume to contain 100% of the aggregate volume of all containers plus a minimum of 4 inches of free-board, or per SPCC plan requirements as appropriate.
- Properly manage solid and liquid wastes in accordance with BMPs MM-01 through MM-08. Dispose of or recycle waste materials as frequently as possible to minimize the amount of waste stored on-site.
- Immediately clean up spilled materials (e.g. cement, fly ash, etc.) and contain or dampen so that dust or emissions from wind erosion or vehicle traffic are minimized.

Equipment Maintenance

- Equipment should be maintained to prevent fluid leaks and spills per BMPs CO-03 Vehicle and Equipment Cleaning and Maintenance and CO-04 Vehicle and Equipment Fueling.
- Maintain adequate supplies of spill cleanup materials and train staff to respond to spills per BMP MM-04 Spill Prevention and Control.
- Incorporate other BMPs such as MM-05 Construction Debris and Litter Management and MM-08 Hazardous Material Management.

Maintenance and Inspection:

- Inspect batch plant components daily during batch plant construction and operation.
- Inspect and repair equipment (for damaged hoses, fittings, and gaskets) daily.
- Inspect secondary containment areas for breaches.

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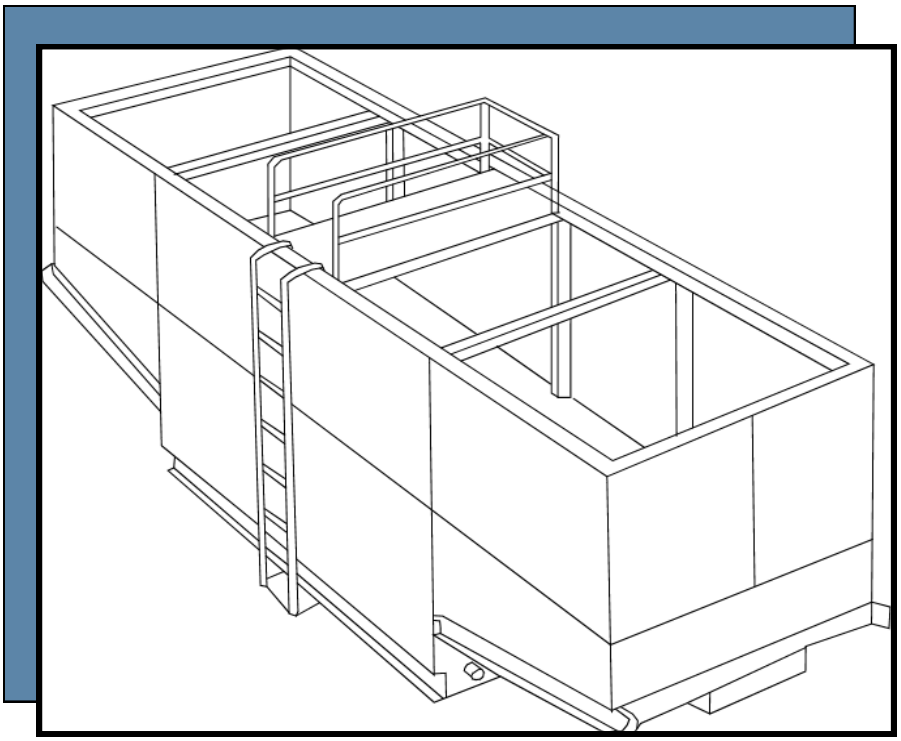
Dewatering Operations

CO-07



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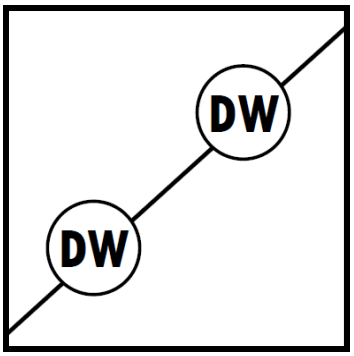

Description: Construction activities often occur in areas where non-stormwater and/or accumulated precipitation (stormwater) must be removed from a project site so that construction work may be accomplished. This BMP provides guidelines for dewatering operations to manage these flows while so minimizing the discharge of pollutants. A permit from NDEP is required to discharge such waters on to the ground or to a waterway. The discharged water must be managed in a manner that minimizes the discharge of pollutants from the site and in accordance with the appropriate permit requirements.

Application: These practices are for the treatment of construction site discharges of non-stormwater and stormwater (accumulated rain water). Non-stormwater sources include, but are not limited to, groundwater, water from cofferdams, de-watering of piles, water diversions, and waters used during construction activities that must be removed from the work area.

Limitations:

- Dewatering operations may require permits above and beyond coverage under NDEP's Construction Stormwater General Permit.
- Site conditions will dictate design, appropriate use, and best practice for dewatering operations.
- All dewatering activities will need to be included in the project SWPPP, detailing the location of dewatering activities, equipment, anticipated volume, water quality, and the discharge point.
- Implement appropriate pollution controls as required by NDOT contract documents, applicable permits, State, Federal, and Local regulations.
- The discharge of accumulated precipitation (strictly un-contaminated stormwater) to a waterbody or storm drain is subject to the requirements of the CGP and applicable MS4 permits.

Sediment control and other appropriate BMPs shall be employed when this water is discharged.

- Additional permits or permissions from other agencies may be required for dewatering operations. These permits may dictate pollution control measures.

Design and Implementation:

- Dewatering discharges must not cause erosion at the discharge point. Install velocity dissipation measures as necessary.
- Dewatering records shall be maintained for the time period specified in the applicable permits.
- Minimize dewatering discharges when possible by using the water for dust control. Apply to vegetated upland areas or treat by evaporation where appropriate. It should be noted that this practice is an option for uncontaminated water only and shall be approved by the Engineer prior to application.
- If the quality of water to be removed by dewatering is not identified as polluted in the contract documents, but is later determined by observation or testing to be polluted, notify the Engineer and comply with Standard Specifications Section 107.

Methods

Depending on the dewatering application and the level of treatment required, there are four general dewatering methods that could potentially be implemented at a construction site.

- **Constructed Settling:** Examples include sediment basins and sediment traps that can be used to contain sediment laden runoff and provide sufficient detention time for the sediment to settle before discharge of the water.
- **Mobile Settling:** Examples include weir tanks and dewatering tanks that can be used for sediment treatment of dewatering operations.
- **Basic Filtration:** An example includes gravity bag filters that retain sand, silt, and fines.
- **Advanced Filtration:** Examples include sand media particulate filters, pressurized bag filters, and cartridge filters that can be placed in series or as pre-treatment for other methods.

Maintenance and Inspection:

- Repair or replace components as needed to ensure effective treatment.
- Accumulated sediment removed during the maintenance of a dewatering device may be either spread on-site and stabilized (if not contaminated), or disposed of at an appropriate off-site facility (as approved by the Engineer).
- Accumulated sediment that is commingled with other pollutants must be disposed of in accordance with all applicable laws and regulations and as approved by the Engineer.

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Erosion Control (EC)

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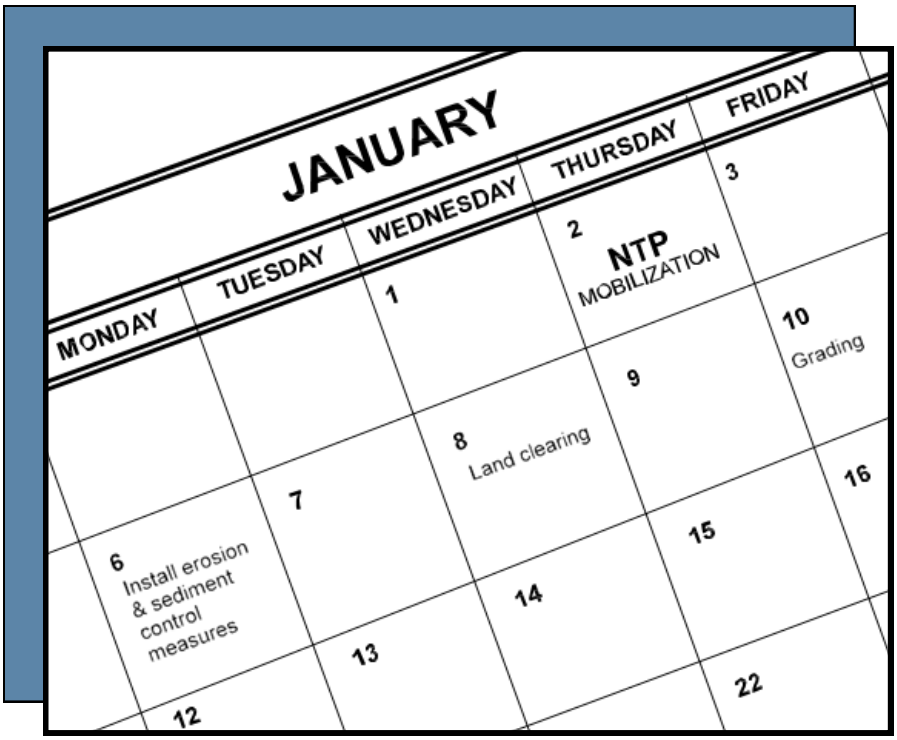
Scheduling

EC-01



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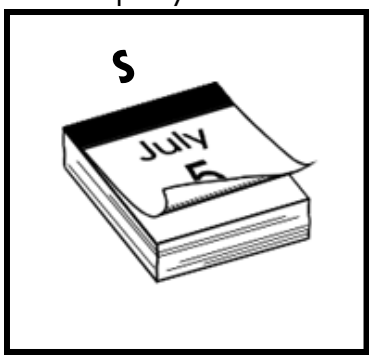

Description: Developing a project schedule results in a better understanding of construction sequencing and phasing. Scheduling not only facilitates an understanding of the logistics of the project, but can be an effective BMP for stormwater pollution control. Scheduling can assist with reducing the amount and duration of soil exposure at any one time, help predict stormwater pollution control needs, and help ensure that structural stormwater BMPs are installed within designated timeframes.

Application: This BMP can be applied to any construction site.

Limitations: Permit and contract documents requirements may dictate components of the project schedule.

Implementation:

- Develop a project schedule and site layout for the construction activities (refer to Standard Specifications Section 108). The schedule shall include dates and time frames for significant long-term operations and activities, and describe how the rainy season relates to soil-disturbing and re-stabilization activities. The construction schedule shall be incorporated into the SWPPP.
- The construction schedule should also include dates and time frames for significant long-term operations or activities.
- Schedule major grading operations for the non-rainy season when practical.
- Monitor the weather forecast to optimize or modify the near-term scheduling of activities.
- When precipitation is predicted, adjust the construction schedule to allow the implementation of

erosion and sediment controls on all disturbed areas prior to the onset of precipitation.

- Be prepared year-round to deploy erosion and sediment controls. Keep the site stabilized year-round.
- Limit the extent of land disturbing activities.
- Apply permanent erosion control to areas deemed substantially complete as soon as possible.
- Account for construct revegetation schedules and seeding windows in the construction schedule. Unless directed otherwise, seeding shall take place in the fall to promote spring germination.

Maintenance and Inspection:

- Evaluate construction progress and update the schedule as necessary.

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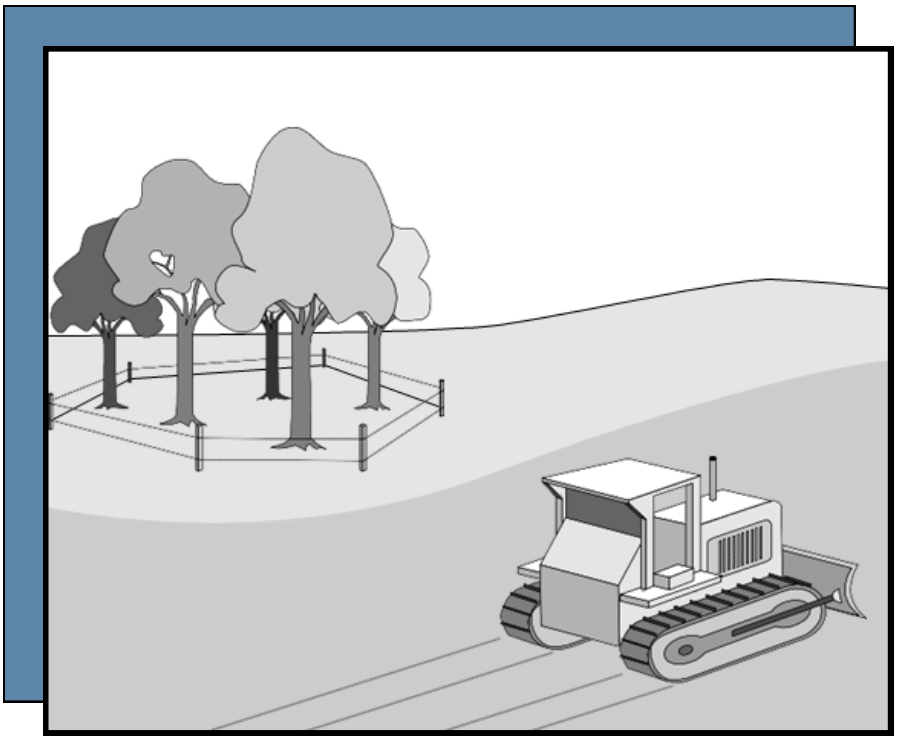
Preservation of Existing Vegetation

EC-02



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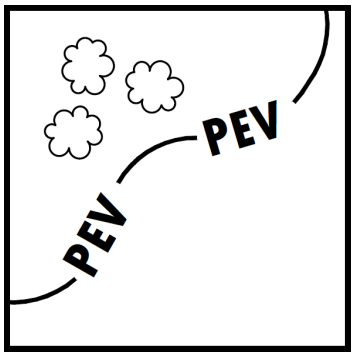

Description: Construction activity may involve the removal of soils and the clearing of vegetation which generally results in increased runoff and potential for erosion. To minimize the effects of disturbed construction surfaces, existing vegetation should be preserved when ever possible. Preservation of existing vegetation consists of the carefully planned protection of in-place, established trees and vegetation within the construction site project limits. Benefits of this BMP include reducing soil disturbance, minimizing site runoff, and reducing the need for other erosion control BMPs.

Application:

- This BMP shall be implemented on all construction sites.
- Sites where buffers or aesthetic values are to be maintained.

Limitations: Protection of existing vegetation requires planning, and may limit the area available for construction activities. Local agencies may dictate tree protection and mitigation measures.

Design and Implementation:

Timing

- Preservation of existing vegetation shall occur year-round. Temporary fencing should be utilized prior to the start of clearing and grubbing operations or other soil-disturbing activities in areas where construction activity is not planned or will occur at a later date.
- Preservation of existing vegetation shall conform to scheduling requirements set forth in the permits and contract documents.

Design and Layout

- The preservation of vegetation for the purpose of creating natural buffer areas for CGP compliance shall be clearly demarcated.
- Utilize temporary flagging or fencing that is fluorescent in color and resistant to ultraviolet light.
- In general, the temporary fencing shall be at least 3 feet tall and shall have openings not larger than 2 inches by 2 inches.
- Specifications for preservation of existing vegetation can be found in the Standard Specifications - Sections 106 and 107, project plans or the contract special provisions.
- Minimize the disturbed areas by locating temporary roadways to avoid established vegetation and to follow existing contours to reduce cutting and filling.
- Consider the impact of grade changes to existing vegetation and the root zone.
- Vegetation removal above and beyond what is depicted in the plan sheets shall be prevented or minimized to the extent necessary to perform work.
- Plans should provide site specific design and layout diagrams with respect to vegetation and land disturbance.
- Vegetation protection shall be provided prior to the commencement of clearing and grubbing operations or other soil disturbing activities.
- Land disturbance shall not occur in areas identified on the plans to be preserved or designated as avoidance areas.

Installation

- When possible, construction materials, equipment storage, and parking areas shall be located where they will not cause root compaction.
- Maintain any existing irrigation systems.
- When heavy equipment is to be working directly adjacent to trees, provide 2 foot x 4 foot tree wraps.
- Employees and subcontractors shall be instructed to honor protective devices.
- No heavy equipment, vehicular traffic, or storage piles of any construction materials shall be permitted within the drip line of retained trees.
- Removed trees shall not be felled, pushed, or pulled into retained trees.
- Fires shall not be permitted within 100 feet of the drip line of retained trees.
- Avoid storing construction materials containing liquids within 50 feet of the drip line of retained trees.
- Do not dispose of any waste materials in a manner that would injure vegetation.
- Washout areas are not allowed within 50 feet of the drip line of retained trees or vegetation preservation areas.

Trenching and Tunneling

- When possible, trenching shall be performed away from retained tree trunks and drip lines.
- Curve trenches around trees to avoid large roots or root concentrations.
- If roots are encountered, consider tunneling under them.

- When trenching and/or tunneling near or under trees to be retained, tunnels should be at least 18 inches below the ground surface, and not below the tree center to minimize impact on the roots.
- Tree roots should be covered with soil, protected, and kept moistened with wet burlap or peat moss until the tunnel and/or trench is completed.
- Trenches and tunnels should be filled as soon as possible. Careful filling and tamping will eliminate air spaces in the soil, which can damage roots.
- Temporary protective fences and barriers are to be removed only after all other work is completed.

Tree Protection

During construction, the limits of disturbance shall remain clearly marked at all times. Irrigation or maintenance of existing vegetation shall conform to the requirements in the landscaping plan. If damage to protected trees still occurs, guidelines described below shall be followed:

- Any damage to the crown, trunk, or root system of a retained tree should be evaluated and repaired per the recommendations of an American Society of Consulting Arborists (ASCA) representative.
- Consult with representatives from the appropriate land management agency, e.g. Bureau of Land Management, Forest Service, Tahoe Regional Planning Agency, etc., should damage be sustained to retained trees on their respective properties.
- Assist with aerating compacted soils over a tree's root zone by punching holes 12 inches deep with water injection soil probes at a spacing of 18 inches apart beneath the drip line, or per the recommendations of an ASCA representative.
- Should fertilizer be used to aid in the recovery of damaged trees, apply to the soil over the root system in accordance with manufacturer recommended application instructions. Do not apply fertilizer within 3 feet of the tree trunk.

Maintenance and Inspection:

- Inspect the limits of disturbance and maintain clear markings, flagging and protective fencing on a daily basis.
- Note any violations or incursions into protected areas to the project Engineer

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References:

- ADOT, 2012. Arizona Department of Transportation. Erosion and Pollution Control Manual for Highway Design and Construction. December 2012.
- Caltrans, 2003b. State of California Department of Transportation. Storm Water Quality Handbooks, Construction Site Best Management Practices (BMPs) Manual. March 2003.
- NDOT, 2006b. Nevada Department of Transportation. Stormwater Quality Handbooks: Construction Site BMPs Manual. Carson City, Nevada. January 2006.
- NDOT, 2014. Nevada Department of Transportation. Standard Specifications for Road and Bridge Construction. (Silver Book). Carson City, Nevada. 2014.

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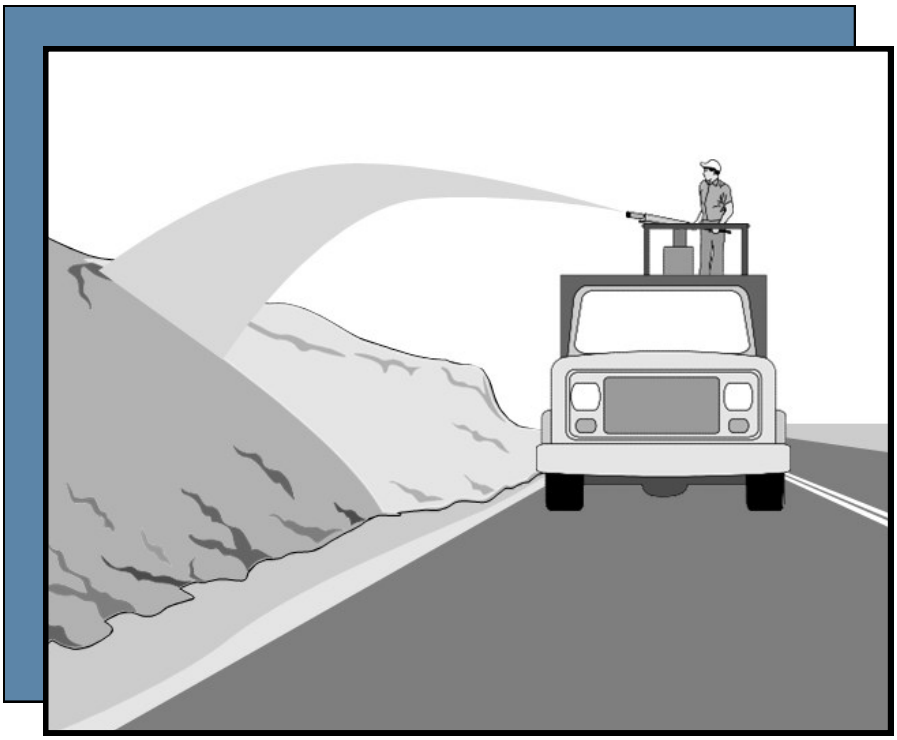
Hydraulic Wood Fiber Mulch

EC-03



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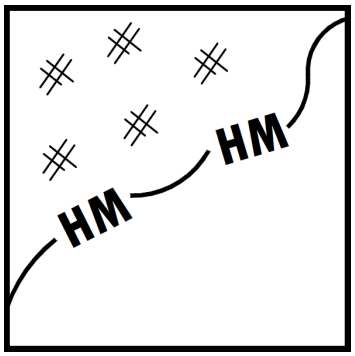

Description: Hydraulic mulch consists of applying a mixture of cut or shaved wood fiber, cellulose fiber, blended fiber, or a bonded fiber matrix, and a stabilizing emulsion or tackifier with hydro-mulching equipment. Mulching provides temporary erosion protection, increased infiltration, dust protection, and fosters growth of vegetation.

Application: Hydraulic mulch is a temporary, stand alone, erosion control BMP suitable for disturbed areas that require temporary protection from wind and water erosion until permanent soil stabilization activities commence.

Limitations:

- Wood fiber hydraulic mulches require a curing (or drying) period to be fully effective. Refer to product specifications.
- Application is limited to calm weather conditions with sustained wind speeds of 15 mph or less.
- Polyacrylamide (PAM) utilized with hydraulic mulch shall be water based, anionic in form, contain less than 0.05% residual monomer, and suited to the specific soil type being treated. The use of cationic-based polymers within NDOT's right-of-way is prohibited.

Design and Implementation:

- The application procedures and materials used for hydraulic mulches shall conform to Standard Specifications Section 211 and 726, respectively. If application rates are not included in the contract documents, apply per manufacturer recommended rates.
- Products are limited to those approved for use on the current QPL.
- Unless specified otherwise, prior to application, roughen embankment and fill areas.

- Avoid mulch over-spray onto areas not designated for treatment, e.g. travel ways, sidewalks, drainage channels, waterways, and existing vegetation.
- Unless specified otherwise, hydraulic mulches are to be applied per manufacturer's recommended rates.
- Mulches are to be uniformly applied across the soil surface.
- Never apply hydraulic mulch within 24 hours of a forecasted precipitation event, unless approved by the project Engineer.

Categories of Hydraulic Mulches:

Standard Hydraulic Mulch (SM)

- Standard hydraulic mulches are generally applied at a rate of 2,000 pounds per acre and are manufactured containing around 5% tackifier (i.e. soil binder), usually a plant-derived guar or psyllium type. Most standard mulches are dyed green in color derived using food color based dye.

Hydraulic Matrices (HM) and Stabilized Fiber Matrices (SFM)

- Hydraulic matrices and stabilized fiber matrices are slurries which contain increased levels of tackifiers and/or other binders. HMs and SFMs have improved performance compared to a standard hydraulic mulch (SM) because of the additional tackifier (10%) and because of their higher application rates, typically 2,500 – 4,000 pounds per acre. Hydraulic matrices can include a mixture of fibers, for example, a 50/50 blend of paper and wood fiber.

Bonded Fiber Matrices (BFM)

- Bonded fiber matrices (BFMs) are hydraulically-applied slurries of fibers and adhesives (typically guar based). Upon drying, the slurry forms an erosion-resistant blanket that prevents soil erosion and promotes vegetation establishment. The adhesive in the BFM should be biodegradable and should not dissolve or disperse upon re-wetting. BFMs are typically applied at rates from 3,000 to 4,000 lbs/acre based on the manufacturer's recommendation. BFMs should not be applied immediately before, during, or immediately after rainfall when the soil is saturated. Depending on the product, BFMs typically require 12 to 24 hours to dry and become effective.

Mechanically-Bonded Fiber Matrices (MBFM)

- Mechanically-bonded fiber matrices (MBFMs) are hydraulically applied systems similar to BFM that use crimped synthetic fibers and PAM. MBFMs are typically applied to a slope at a higher application rate than a standard BFM.

Hydraulic Compost Matrices (HCM)

- Hydraulic compost matrix (HCM) is a field-derived practice whereby finely graded or sifted compost is introduced into the hydraulic mulch slurry. A guar-type tackifier can be added for steeper slope applications as well as any specified seed mixtures. A HCM can help to accelerate seed germination and growth. HCMs are particularly useful as an in-fill for three dimensional re-vegetation geo-composites, such as turf reinforcement mats.

If product selection and application rates are not provided in project specifications, consult an erosion control professional to assist with the selection of the appropriate product for the specific application.

Maintenance and Inspections:

- Inspect mulch areas for proper application and uniform coverage.
- Inspect mulched areas weekly for indications of erosion.
- Maintain any unbroken, mulched ground cover throughout the period of construction when the soils are not being reworked. Repair any damaged mulch areas and re-mulch exposed areas as needed. Maintain as required to prevent soil loss.
- Inspect mulched areas after rain events.

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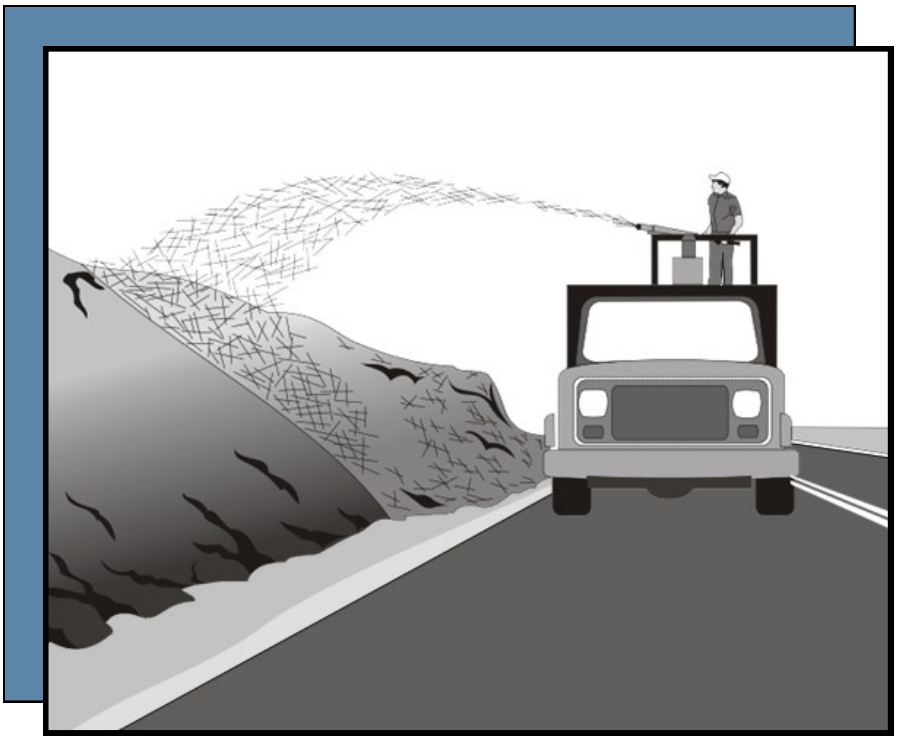
Straw Mulch

EC-04



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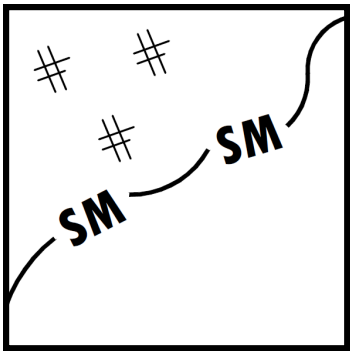

Description: Straw mulch consists of placing a uniform layer of straw and incorporating it into the soil, typically with a studded roller, and anchoring it with a tackifier stabilizing emulsion. As a BMP, straw mulching can be easily applied to DSA's (by spraying, blowing or placed by hand), is widely available, and easy to work-in to the soil surface.

Application:

- Used as temporary erosion control for disturbed soil areas.
- Used in combination with temporary and/or permanent seeding strategies to enhance plant establishment.
- Viable option where construction water is limited.

Limitations:

- There is a potential for the introduction of weeds and unwanted plant seeds into the job site.
- When straw blowers are used to apply straw mulch, the treatment areas must be within the equipment throwing distance (150 feet of a road or surface capable of supporting trucks is typical).
- Application is limited to calm wind conditions (with sustained wind speeds <13 mph typical guideline) to prevent the blowing of straw mulch material.
- Straw mulch lacks density, therefore it can easily be blown away or washed away during rain if not integrated into the soil (physically) or bound using a tackifier.
- Straw mulch can be a wildlife attractant.

Design and Implementation:

- Straw mulch is generally applied at 4,000 lb/acre; however, refer to Section 211 of the Standard Specifications regarding specifics to the application of the straw mulch. If application rates are not included in the contract documents, apply per manufacturer recommend rates.
- Products are limited to those approved for use as listed in NDOT's current QPL.
- Tackifier and hydraulically applied straw mulch drying (or curing) time is product specific. Refer to product specifications.
- Straw shall be derived from wheat, rice, or barley. The use of rye or oat straw is not permissible.
- Straw shall be certified weed-free.
- The use of a tackifier is the preferred method for anchoring straw mulch to soil on slopes.
- Crimping, punch rollers, or track-walking is recommended for mechanically incorporating straw mulch into the soil. Use tack-walking where other methods are impractical upon Engineer approval.
    - ◊ For small areas, or areas inaccessible to equipment, a spade or shovel can be used to crimp the straw into the soil.
    - ◊ On small areas and/or steep slopes, straw can also be held in place using jute netting. The netting shall be held in place using 11 gauge wire staples, geotextile pins or wooden stakes as described in BMP EC-09 Geotextiles/Erosion Control Blankets.
- Avoid applying straw onto areas not designated for treatment, e.g. travel ways, sidewalks, drainage channels, waterways, and existing vegetation.
- In general, simple straw mulch is capable of stabilizing a slope of 2:1, but with advanced technologies such as "cross-linked insoluble hydro-colloidal tackifiers, and reinforcing natural or synthetic fibers", sprayed-on mulches may be capable of stabilizing slopes approaching 2:5 (NC State 2014).
- Straw mulch should be evenly distributed on the soil surfaces.
- Do not apply hydraulic straw mulch and tackifier within 24 hours of a forecasted precipitation event, unless approved by the project Engineer.
- Apply loose straw either by machine or by hand distribution. If a stabilizing emulsion will be used to anchor the straw mulch (in lieu of mechanical soil incorporation), roughen the embankment or fill before placing the straw mulch.

Maintenance and Inspections:

- Inspect mulched areas for indications of erosion.
- Maintain an unbroken, temporary mulched ground cover while disturbed soil areas are non-active. Repair any damaged ground cover and re-mulch exposed areas.
- Reapply straw mulch as needed to maintain effective soil stabilization over disturbed areas and slopes.
- Inspect straw mulched areas before and after rain events. Repair any damaged ground cover and re-mulch areas of exposed bare soil.
- Inspect mulched areas for proper application and uniform coverage.

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Wood Mulching

EC-05

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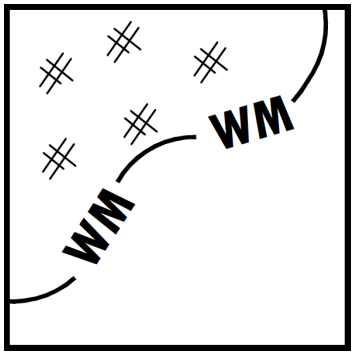

Description: Wood mulching consists of applying a mixture of chipped or cut wood mulch (per Standard Specification Section 726), bark, or compost. Wood mulching is considered a temporary soil stabilization, erosion control alternative. Wood mulch can reduce rainfall impact, decrease the velocity of sheet flow increase infiltration and protect the soil from wind erosion.

Application: Wood mulch is typically utilized with landscape projects. Wood mulch can be used as a stand-alone temporary surface cover or as a tool to facilitate the establishment of vegetation and ground cover.

Limitations:

- Wood mulch may introduce weeds.
- Chipped or cut wood does not withstand concentrated flows and is prone to washout.
- Light weight (dry) wood mulch is easily blown or transported by rain and may require additional maintenance or reapplication.
- Wood mulch can be blown away if applied in windy areas and should not be applied during high winds.
- Wood mulch can be difficult to secure if the effective size is large (>1 inch).
- Use of wood mulch may require approval from appropriate land management agencies, e.g. Forest Service, Bureau of Land Management, etc.

Design and Implementation:

Mulch Selection

There are many types of wood mulches and selection of the appropriate type must be based on the product selected and site conditions. Selection of wood mulches by the Contractor shall comply with Standard Specifications Sections 726 and 211. NDOT's Landscape Architect shall approve all wood mulch products prior to use.

Application Procedures

The common wood mulches are:

- **Green Material**: This type of mulch is produced by recycling of vegetation trimmings such as chipped or cut shrubs and trees. Methods of application are generally by hand, although pneumatic methods are available. Materials composted must naturally existing—there shall be no compost of noxious weeds. Green material must conform to Standard Specification Section 726.
    - ◊ It can be used as a temporary ground cover with or without seeding.
    - ◊ The green material shall be evenly distributed on-site to a depth of not more than 2 inches.
- **Chipped or Cut Wood per Standard Specification Section 726**: Suitable for ground cover in ornamental or revegetated plantings.
    - ◊ Chipped or cut wood/bark per Standard Specification Section 726 is conditionally suitable; see note under limitations.
    - ◊ Shall be distributed by hand or another method approved by the RE.
    - ◊ The mulch shall be evenly distributed across the soil surface to a depth of 3 inches.

General

- Avoid mulch placement onto areas not designated for treatment, e.g. travel ways, sidewalks, drainage channels, waterways, existing vegetation, etc.).
- Typically, wood mulch material must be removed prior to re-starting work on the slopes. In some cases, wood mulch may be incorporated into the soil if approved by the Engineer.
- Mulch material should come from naturally existing plants only.
- Chips and bark are not recommended for use with sandy or decomposed granite soils on slopes steeper than 3:1.

Maintenance and Inspection:

- Inspect and maintain mulched areas for proper application and uniform coverage.
- Where vegetation is not the ultimate cover, such as ornamental and landscape applications of bark or wood chips, inspection and maintenance shall focus on longevity and integrity of the mulch.
- Maintain any unbroken, temporary mulched ground cover while DSAs are non-active. Repair any damaged ground cover and re-mulch exposed areas.
- Reapply wood mulch as needed to maintain effective soil stabilization over disturbed areas.

- Observe any wood mulched areas after storm events and look for wash-outs. Repair any damaged ground cover and re-mulch exposed areas. Remove any migrated material as required.

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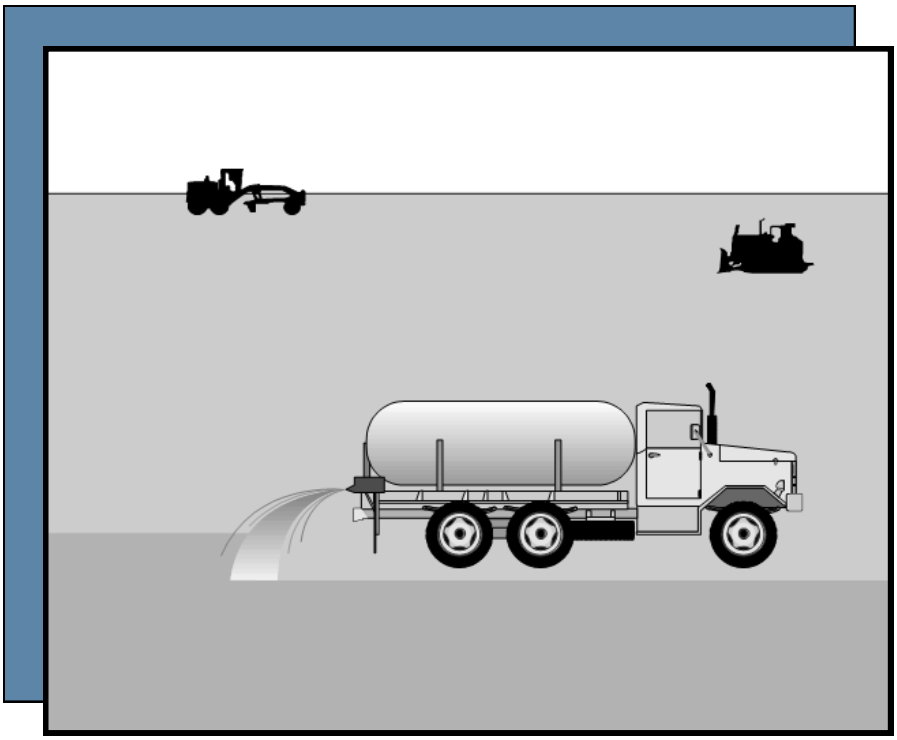
Wind Erosion Control

EC-06



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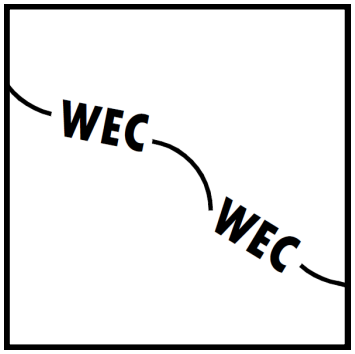

Description: Soil erosion can be caused by the abrasive action of wind and water. Dust control measures must be implemented at construction sites to minimize wind erosion and control airborne emissions. Best practices to control dust may include the application of water, soil stabilizers, dust palliatives, blankets, mats, mulches or other soil stabilization BMPs as necessary to comply with state and local air quality permit regulations.

Application: This practice is to be implemented on temporary haul roads and other exposed soils subject to wind erosion.

Limitations:

- Dust control measures are temporary and require reapplication.
- Overwatering may lead to runoff issues.
- Effectiveness depends on soil, temperature, humidity and wind velocity.
- The use of reclaimed water, wastewater, soaps, solvents, detergents, oils, grease, fuels, or cationic treatment chemicals shall not be utilized for dust control within NDOT's right-of-way.

Design and Implementation:

- Unless otherwise specified, apply chemical soil stabilizers per manufacturer's recommendations.
- From a BMP perspective, the application of water alone to control dust is not considered a form of temporary site stabilization (temporary stabilization usually includes temporary seeding, geotextiles,

palliatives, mulches, and other techniques to reduce or eliminate erosion until either final stabilization can be achieved or until further construction activities take place to re-disturb the area.

- Construction activities may require an air quality permit. Dust control and air quality can play a role in protecting water quality during construction. Washoe and Clark Counties each have an air quality management division (or similar) that regulates local air quality. In the remainder of the state, NDEP regulates air quality.
- When an NDOT project requires an air quality permit, the contractor is responsible for obtaining the permit, implementing all requirements, and paying the associated permit fee.
- Additional wind erosion control measures may be required depending on agency jurisdiction. Refer to governing agencies' standard practices manuals, BMP handbooks, and/or construction regulations for supplemental guidance.
- Limit soil disturbance activities on windy days
- Unless water is applied by means of pipelines, at least one mobile unit shall be available at all times to apply water or dust palliative to the DSAs.
- Water can be applied by means of pressure-type distributors or pipelines equipped with a spray system or hoses and nozzles that will ensure even distribution. Water spray distribution equipment must be equipped with an emergency shutoff valve.
- Maintain existing vegetation as wind breaks whenever feasible to minimize erosion.
- PAM utilized for dust control shall be water based, anionic in form, contain less than 0.05% residual monomer, and suited to the specific soil type being treated.

Maintenance and Inspection:

- Routinely inspect disturbed or wind prone areas to ensure that the area is protected.
- Inspect and repair any spray equipment before its use is needed.
- Daily inspections shall occur for areas experiencing excessive winds, vehicle traffic, or rains.
- Implement requirements of the Standard Specifications Section 107 and 637.

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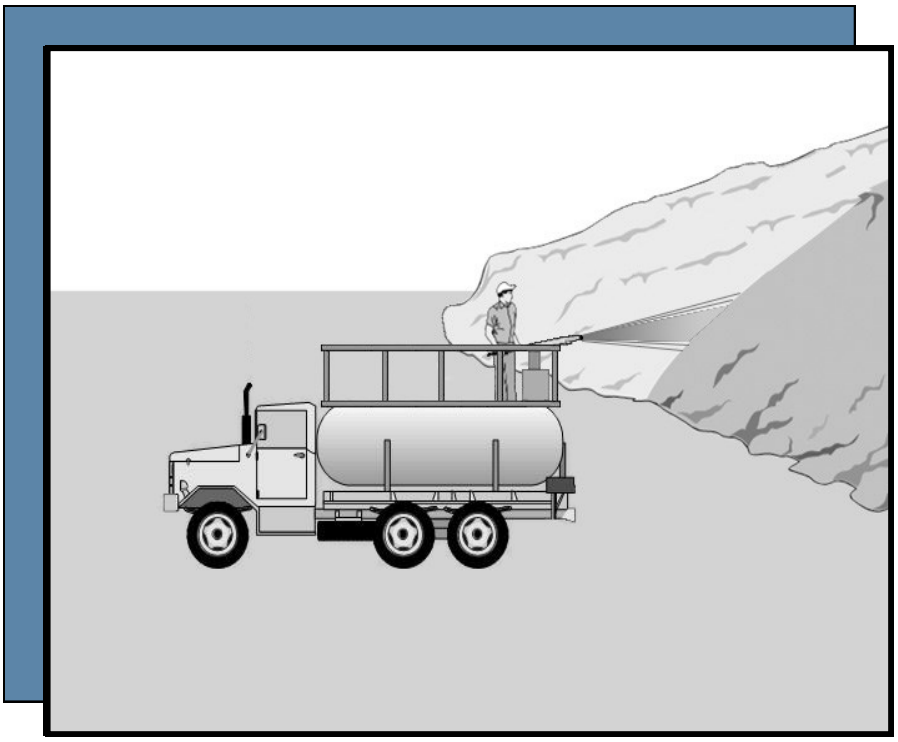
Soil Stabilizers/Dust Palliatives

EC-07



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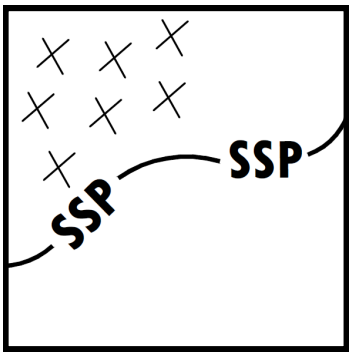

Description: Soil stabilizers and dust palliatives are typically water soluble substances that are mixed with water to create a solution that is sprayed on disturbed soils to establish a solid sub-base to reduce air pollution at constructions sites. There are numerous commercial soil stabilizers and dust palliatives available depending on the application. Examples include: powder, water absorbing products, fiber reinforcement, polymer products, organic nonpetroleum based products, enzymes, and clay additive products.

Application:

- Soil stabilizers and dust palliatives are applied to exposed or disturbed soil (including material stockpiles) to temporarily reduce wind and water erosion.
- Dust palliatives are used during construction to reduce dust emissions due to mechanical and wind forces, and typically do not have the longevity of soil stabilizers.

Limitations:

- Soil stabilizers and dust palliatives require a minimum curing time until fully effective, as prescribed by the manufacturer, which may be 24 hours or longer. They may need reapplication after a storm or strong wind event.
- The use of these compounds may limit infiltration and inhibit plant growth.
- Soil stabilizers and dust palliatives may not penetrate soil surfaces made up primarily of silt and clay, particularly when compacted.
- Some soil stabilizers and dust palliatives may not perform well with low relative humidity. Refer to manufacturers' literature for humidity limitations.

- Under rainy conditions, some agents may become slippery or leach out from the soil.
- May not cure if low temperatures occur within 24 hours of application. Refer to manufacturers' literature for temperature limitations.
- The use of reclaimed water, wastewater, soaps, solvents, detergents, oils, grease, fuels, or cationic treatment chemicals shall not be utilized for soil stabilization or dust control within NDOT's right-of-way.

Design and Construction:

General Considerations

- Site-specific soil types will dictate appropriate soil stabilizers or dust palliatives to be used.
- Soil stabilizers and dust palliatives must be environmentally benign (non-toxic to plant and animal life), easy to apply, easy to maintain, economical, and shall not stain paved or painted surfaces. Refer to Standard Specifications Section 211 and 637.
- Products may not be compatible with existing vegetation.
- Performance of soil stabilizers and dust palliatives depends on temperature, humidity, and traffic across treated areas.
- Avoid over-spray onto areas not designed for treatment the travel ways, sidewalks, drainage channels, waterways, and existing vegetation.
- PAM utilized for soil stabilization or dust control shall be water based, anionic in form, contain less than 0.05% residual monomer, and suited to the specific soil type being treated.

Selecting a Soil Stabilizer or Dust Palliative

- Consider where the product will be applied, if it needs a high resistance to leaching or abrasion, and whether it needs to be compatible with any existing vegetation.
- Determine the length of time stabilization will be needed, and if the product will be placed in an area where it will degrade rapidly.
- Soil types and surface materials - Consider a soil stabilizer or dust palliative's ability to penetrate, likelihood of leaching, and ability to form a surface crust on the surface materials based on soil properties, e.g., texture and moisture content.
- Frequency of application - The frequency of application can be affected by subgrade conditions, surface type, climate, and maintenance schedule.
- Application frequency may be minimized if the dust palliative has good penetration, low evaporation, and good longevity.

Applying Soil Stabilizers and Dust Palliatives

After selecting an appropriate product, the untreated soil surface must be prepared before applying the soil stabilizer. The untreated soil surface must contain sufficient moisture to assist the agent in achieving uniform distribution. In general, the following steps shall be followed:

- Follow manufacturer's recommendations for application rates and pre-wetting of application area.
- Prior to application, roughen or roll embankment and fill areas. Track walking should only be used where rolling is impractical.

- Consider the drying time for the selected product and apply with sufficient time before anticipated rainfall. Generally, soil stabilizers and dust palliatives require a minimum curing time of 24 hours before they are fully effective. Refer to manufacturer's instructions for specific cure times. Soil stabilizers and dust palliatives shall not be applied during or immediately before rainfall.
- Soil stabilizers and dust palliatives shall not be applied to frozen soil, areas with standing water, under freezing or rainy conditions, or when the air temperature is below 40° F during the curing period.
- For liquid agents:
    - ◊ Crown or slope ground to avoid ponding.
    - ◊ Uniformly pre-wet ground at 0.03 to 0.3 gal/yd^2 or according to manufacturer's recommendations.
    - ◊ Apply solution under pressure and overlap solution 6 to 12 inches (typical).
    - ◊ Allow treated area to cure for the time recommended by the manufacturer; typically, at least 24 hours.
    - ◊ In low humidity, reactivate chemicals by re-wetting with water at 0.1 to 0.2 gal/yd^2.

Maintenance and Inspection:

- Inspect treated areas for proper application and uniform coverage.
- Regularly inspect areas for erosion and fugitive dust.
- Reapplying the selected soil binder as needed to maintain BMP effectiveness.

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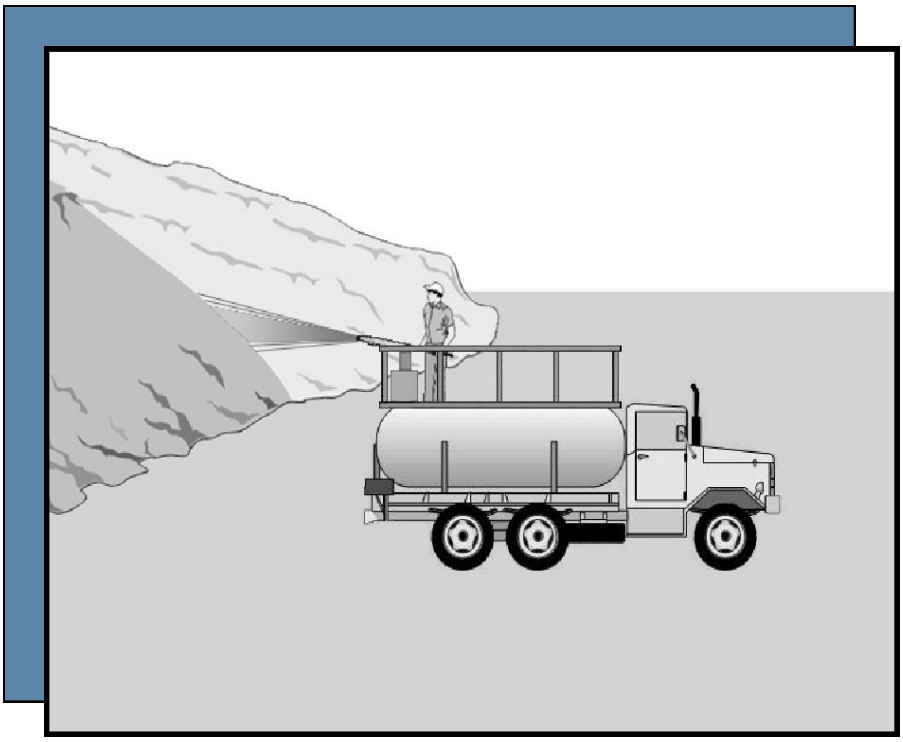
Hydroseeding

EC-08



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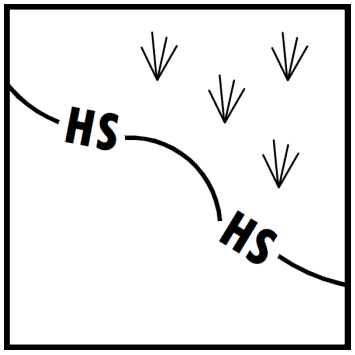

Description: During construction it is often necessary to stabilize exposed soils and slopes from raindrop impact and erosion, wind erosion, conserve soil moisture, decrease runoff, and increase infiltration utilizing the process of hydroseeding. Hydroseeding typically consists of applying a mixture of wood fiber or mulch, seed mix, and tackifier with hydro-mulch equipment to achieve soil stabilization and erosion control.

Application:

- Applicable to disturbed areas requiring erosion control as well as areas that must be re-disturbed following an extended period of inactivity.
- Temporary protection for disturbed areas until vegetation is established.

Limitations:

- Hydroseeding shall not occur during periods of strong winds or freezing weather.

Design and Implementation:

- All hydroseeding activities shall comply with the Standard Specifications 211 and 726.
- NDOT's Landscape Architecture Section shall approve all seed mixes.
- Avoid hydroseed over-spray onto areas not designated for treatment, e.g. travel ways, drainage channels, waterways, existing vegetation, etc..
- Apply hydroseed uniformly and ensure complete coverage over treatment area.

- Unless otherwise specified, apply hydroseed slurry components, e.g. mulch, tackifier, etc., per manufacturer's recommendations.
- Hydroseeding can be accomplished using a multiple-step process; refer to the Special Provisions for specified processes.
- Prior to application, roughen the slope, fill area, or area to be seeded. Ensure furrows are parallel to slope contours. Refer to Standard Specifications Section 211.
- Commercial fertilizer shall conform to the requirements of the Nevada Food and Agricultural Code.
- In the Lake Tahoe Basin, seed mixes shall be approved by TRPA.
- Re-application of hydroseed slurry may be required to cover thin spots, and to maintain adequate soil protection.
- Soil testing may be necessary to determine the need to add soil inoculants or other amendments to the hydroseed slurry.
- For additional guidance on seeding and revegetation in Nevada, refer to the publication *Mapping Ecosystems Along Nevada Highways and the Development of Specifications for Vegetation Remediation* (UNR, 2002).

Maintenance and Inspection:

- All seeded areas shall be inspected for proper application and uniform coverage.
- All seeded areas shall be inspected for failures and re-seeded as necessary.

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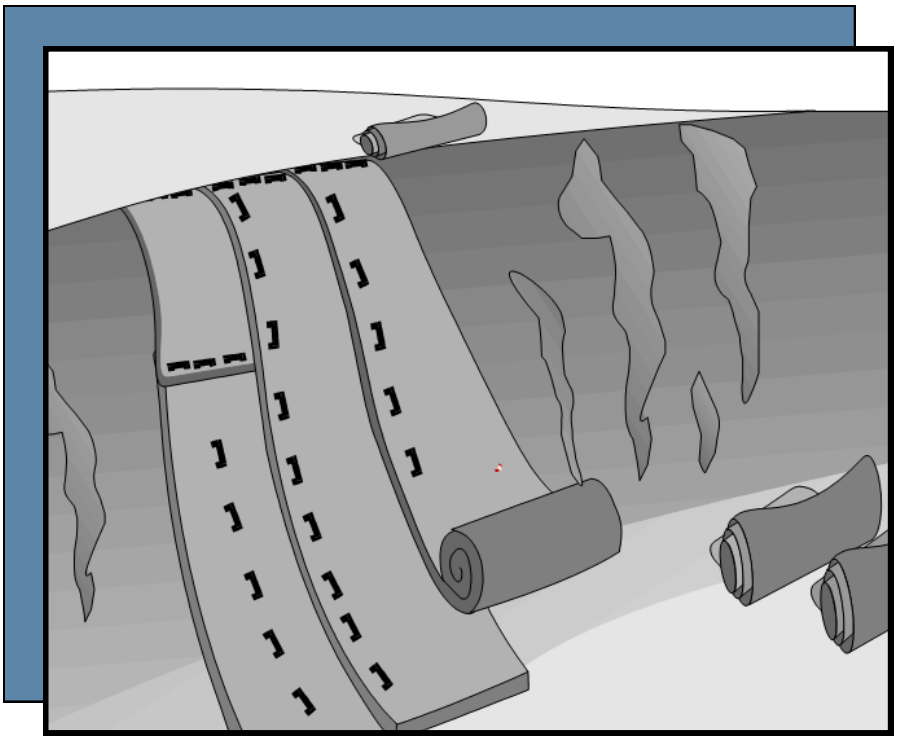
Geotextiles/Erosion Control Blankets

EC-09



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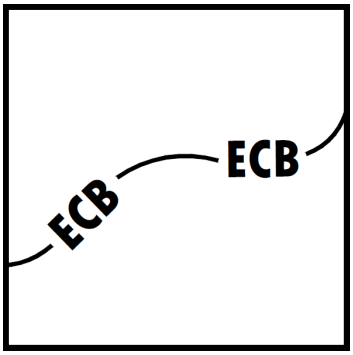

Description: Geotextiles, mats, or erosion control blankets are used to temporarily stabilize disturbed soil areas and protect soils from erosion by wind or water. Geotextiles and erosion control blankets reduce rainfall impact, improve infiltration, promote seed establishment, protect bare soil from wind and rain, and hold mulch, seeds and fertilizer in place.

Application: Geotextiles and erosion control blankets can be applied almost anywhere the soil has been disturbed but are most effective in difficult to stabilize areas including:

- Steep slopes, generally steeper than 3:1
- Slopes with loose soils or non-cohesive sandy and/or silty material
- Slopes and disturbed soils where mulch must be anchored
- Disturbed areas where plants are slow to develop
- Water course channels with velocities exceeding 3 ft/s (feet per second)
- Water course channels to be vegetated
- Stockpiles
- Slopes adjacent to water bodies of environmentally sensitive areas (ESAs)

Limitations:

- Blankets and mats are generally not suitable for excessively rocky sites or areas where the final vegetation will be mowed (since staples and netting can catch in mowers).

- Non-degradable fabrics are to be removed when permanent stabilization measures are ready to be installed.

Design and Construction:

Material Selection

Selection of the appropriate type shall be based on the specific type of application and site conditions. Certification of compliance shall be in accordance with Standard Specifications Sections 211 and 726. General selection guidance is as follows:

Geotextiles

A wide variety of geotextiles are available and intended uses range from separation of different materials (such as road bedding and underlying soils) to lining ponds and landfills. For temporary erosion control, geotextile fabrics typically consist of woven or non-woven fabrics that are used to line channels or slopes and are usually used in combination with rock or other mulches or riprap.

Geomembranes are more impervious type of geotextile and can be used to cover stockpiles or bare soil areas, where a more durable material (as compared to plastic sheeting) is desired.

- Geotextiles should be secured in place with wire staples and by keying into tops of slopes and edges to prevent infiltration of surface waters under the geotextile. Staples shall be made of 0.12 inch steel wire and shall be U-shaped with 8 inch legs and 2 inch crown.
- Geotextiles may be reused if, they meet performance requirements and are suitable for the use intended.

Erosion Control Blankets/Mats

- Biodegradable rolled erosion control products (RECPs) are typically composed of jute fibers, curled wood fibers, straw, coconut fiber, or a combination of these materials. In order for an RECP to be considered 100% biodegradable, the netting, sewing or adhesive system that holds the biodegradable mulch fibers together must also be biodegradable. Below are several examples of RECPs:
    - ◊ **Jute** is a natural fiber that is made into a yarn that is loosely woven into a biodegradable mesh.
    - ◊ **Excelsior (curled wood fiber)** blanket material shall consist of machine-produced mats of curled wood excelsior with 80 percent of the fiber 6 inches (Caltrans, 2003b) or longer.
    - ◊ **Straw blankets** are machine-produced mats of straw with a lightweight biodegradable netting top layer.
    - ◊ **Wood fiber blanket** is composed of biodegradable fiber mulch with extruded plastic netting held together with adhesives.
    - ◊ **Coconut fiber blankets** are machine-produced mats of 100 percent coconut fiber with biodegradable netting on the top and bottom.
    - ◊ **Coconut fiber mesh** is a thin permeable membrane made from coconut or corn fiber that is spun into a yarn and woven into a biodegradable mat.
    - ◊ **Straw coconut fiber blankets** are machine-produced mats of 70 percent straw and 30 percent coconut fiber with a biodegradable netting top layer and a biodegradable bottom net.
- Non-biodegradable RECPs are typically composed of polyethylene, polypropylene, nylon or

other synthetic fibers. In some cases, a combination of biodegradable and synthetic fibers is used to construct the RECP. Netting used to hold these fibers together is typically non-biodegradable as well. Below are several examples of non-biodegradable RECPs:

- ◊ **Plastic netting** is a lightweight biaxially-oriented netting designed for securing loose mulches like straw or paper to soil surfaces to establish vegetation.
- ◊ **Plastic mesh** is an open-weave geotextile that is composed of an extruded synthetic fiber woven into a mesh with an opening size of less than 2 inches.
- ◊ **Synthetic fiber with netting** is a mat that is composed of durable synthetic fibers treated to resist chemicals and ultraviolet light.
- ◊ **Bonded synthetic fibers** consist of a three-dimensional geomatrix nylon (or other synthetic) matting.
- ◊ **Combination synthetic and biodegradable RECPs** consist of biodegradable fibers, such as wood fiber or coconut fiber, with a heavy polypropylene net stitched to the top and a high-strength continuous-filament geomatrix or net stitched to the bottom.

Site Preparation

- Ensure complete contact of the blanket or matting with the soil.
- Grade and shape the area of installation.
- Remove all rocks, clods, vegetation or other obstructions so that the installed blankets or mats will have complete, direct contact with the soil.
- Prepare seedbed by loosening 2 inches to 3 inches of topsoil. When using a fabric or mat that is designed to be used in conjunction with seeding or re-vegetation follow the contract specifications for proper seedbed for proper seedbed preparation, seed application, and/or planting. If contract specifications are unavailable, follow the manufacturer's guidelines.

Seeding

Seed the area before blanket installation for erosion control and re-vegetation. Seeding after mat installation is only specified for turf reinforcement applications. When seeding prior to blanket installation, check all slots and other areas disturbed during installation as these areas must be re-seeded. Where soil filling is specified, seed the matting and the entire disturbed area after installation and prior to filling the mat with soil.

Anchoring

Anchoring shall be in accordance with the manufacturer's recommendations and Section 211 of the Standard Specifications. In general, use the following guidance:

- U-shaped wire staples, metal geotextile stake pins or triangular wooden stakes can be used to anchor mats and blankets to the ground surface.
- Staples shall be made of 0.12 inch steel wire and shall be U-shaped with 8 inch legs and 2 inch crown. Wire staples shall be a minimum of 11 gauge.
- Metal stake pins shall be 0.188 inch diameter steel with a 1.5 inch steel washer at the head of the pin.
- Wire staples and metal stakes shall be driven flush to the soil surface.
- All anchors shall be a minimum of 6 inches long and have sufficient penetration to resist pullout. Longer anchors may be required for loose soils or based on manufacturer's installation guidelines.

Installation on Slopes

Installation shall be in accordance with the manufacturer's recommendations and Section 211 of the Standard Specifications. In general, use the following guidance:

- Begin at the top of the slope and anchor the blanket in a 6 inch deep by 6 inch wide trench. Backfill trench and tamp earth firmly.
- Unroll blanket down slope in the direction of water flow.
- Overlap the edges of adjacent parallel rolls 6 inches and staple every 3 feet.
- When blankets must be spliced, place blankets end over end (shingle style) with 6 inch overlap. Staple through overlapped area, approximately 12 inches apart.
- Lay blankets loosely and maintain direct contact with the soil. Do not stretch.

Installation in Channels

Installation shall be in accordance with the manufacturer's recommendations and approved by a Nevada PE. General installation guidelines are as follows:

- Dig initial anchor trench 12 inches deep and 6 inches wide across the channel at the lower end of the project area.
- Excavate intermittent check slots, 6 inches deep and 6 inches wide across the channel at 25 to 30 foot intervals along the channels.
- Cut longitudinal channel anchor slots 4 inches deep and 4 inches wide along each side of the installation to bury edges of matting, whenever possible extend matting 2 inches to 3 inches above the crest of the channel side slopes.
- Beginning at the downstream end and in the center of the channel, place the initial end of the first roll in the anchor trench and secure with fastening devices at 12 inch intervals. Note: matting will initially be upside down in anchor trench.
- In the same manner, position adjacent rolls in anchor trench, overlapping the preceding roll a minimum of 6 inches.
- Secure these initial ends of mats with anchors at 12 inch intervals, backfill and compact soil.
- Unroll center strip of matting upstream. Stop at next check slot or terminal anchor trench. Unroll adjacent mats upstream in similar fashion, maintaining a 6 inch overlap.
- Fold and secure all rolls of matting snugly into all transverse check slots. Lay mat in the bottom of the slot then fold back against itself. Anchor through both layers of mat at 12 inch intervals, then backfill and compact soil. Continue rolling all mat widths upstream to the next check slot or terminal anchor trench.
- Shingle lap ends by overlapping uphill on top of downhill fabric a minimum of 12 inches to prevent water from flowing underneath fabric at splice locations.
- Place edges of outside mats in previously excavated longitudinal slots, anchor using prescribed staple pattern, backfill and compact soil.
- Anchor, fill, and compact upstream end of mat in a 6 inch by 12 inch terminal trench.
- Secure mat to ground surface using U-shaped wire staples, geotextile pins, or wooden stakes.
- Seed and fill turf reinforcement matting with soil, if specified.

Soil Filling (if specified for turf reinforcement)

- Always consult the manufacturer's recommendations for installation.

- Do not drive tracked or heavy equipment over mat.
- Avoid any traffic over matting if loose or wet soil conditions exist.
- Use shovels, rakes or brooms for fine grading and touch up.

Blanket Removal

- When no longer required for work, non-degradable temporary blankets shall be removed from the site and disposed of in conformance with NDOT Standard Specifications Section 107.

Maintenance and Inspection: Areas treated with temporary geotextiles, mats, blankets and other covers shall be maintained to provide adequate erosion control. Temporary geotextiles, mats, blankets and other covers shall be reapplied or replaced on exposed soils when greater than 10% of the previously treated area becomes exposed or exhibits visible erosion or as determined by the Engineer.

- All blankets and mats shall be inspected at least weekly after installation.
- Inspected after all rainstorms to check for erosion and undermining. Any failures shall be repaired immediately.
- If washout or breakage occurs, re-install the material after repairing the damage to the slope or channel.
- Inspections shall conform to all permit and contract requirements.

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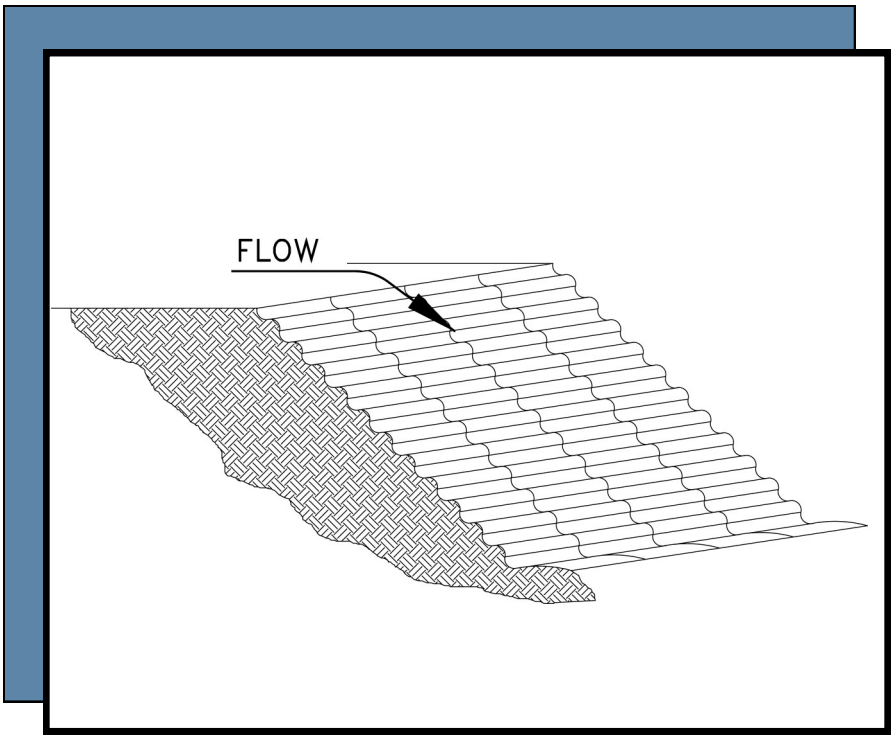
Slope Terracing & Surface Roughening EC-10



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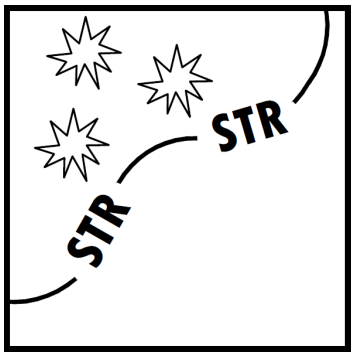

Description: Slope Terracing involves constructing a permanent berm and channel arrangement either built along the face of a slope at regular intervals or constructed as a continuous series of horizontal steps on the face of a slope. Surface roughening is a technique used for creating unevenness on bare soil by use of horizontal grooves, furrows, depressions, or steps running parallel to the slope contour over the entire face of a slope. The primary objective of both of these techniques is to reduce erosion potential by decreasing runoff velocities, trapping sediment, and increasing infiltration of water into the soil.

Application: Terracing and roughening can be used on any disturbed slope, but is most effective when used on steep slopes, slopes with highly erodible soil, slopes with varying topography, and slopes to be re-vegetated and stabilized at a later date. Terracing and roughening can be used on slopes near waterways, wetlands and other sensitive areas.

Limitations:

- Over compaction could impair vegetation establishment and growth.
- Surface roughening may not be effective in granitic, sandy soils, or other non-cohesive soils.

Implementation:

The following items should be considered when implementing slope terracing or surface roughening:

- Impact to drainage patterns
- Project starting and ending dates (project scheduling)
- Permanent soil stabilization measures

- Grade, length, slope, soil type and the area to be treated
- How/where any excess soil will be disposed

General: Slope Terracing and Surface Roughening

Typically, slopes steeper than 3:1 (H:V) are candidates for terracing. Confirm the soil properties will support terracing. Terraces should direct runoff to protected ditches or allowed to sheet flow over the edge. Terraces should not concentrate runoff onto unprotected surfaces where it would cause gully erosion. Terraces are to be installed perpendicular to the fall of the slope. Surface roughening can be achieved by one of the following methods:

- Disking
- Furrowing
- Raking
- Tracking (imprinting using tracked equipment)

When tracking to roughen the surface, the equipment travels up and down the slope to leave imprints that are perpendicular to the fall of the slope.

Maintenance and Inspection:

- Inspect terraced or roughened areas following a storm event for evidence of rill or gully erosion.
- Immediately repair areas and implement appropriate control measures where rill or gully erosion is beginning to show.

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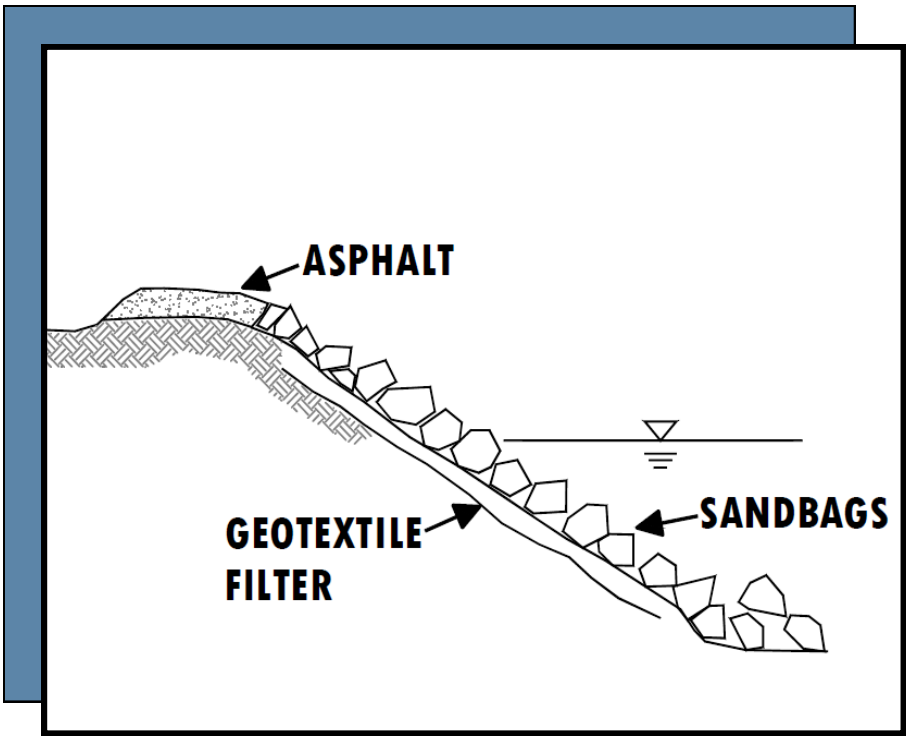
Streambank Stabilization

EC-11



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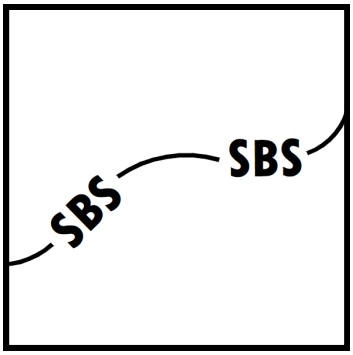

Description: Streambank stabilization includes a wide variety of protection techniques to armor streambanks, alter the flow regime and minimize bank and channel erosion. Streambank stabilization can range from simple as gravel bag placements along the high water mark to extensively engineered concrete walls. During the design and contracting phase of the project, NDOT may identify and prescribe the required streambank stabilization BMPs in the contracting documents. However, the Contractor retains responsibility for compliance with the site CGP requirements. Additionally, working in or near waters will likely require additional regulatory permits not specifically discussed in this fact sheet.

Application: This BMP is specifically applicable to contractor efforts to protect stream channel integrity through the use of stormwater BMPs, flow modification, flow channelization, flow energy dissipation, and the protection of stream hydro-modification through in-stream and bank protection methods. Flood bank stabilization should be a contractor consideration, though likely not specifically described here.

Incorporate streambank stabilization BMPs when the construction project has the potential of site runoff reaching or increasing the flow in a nearby stream (ephemeral or perennial).

Streambank stabilization stormwater BMPs may apply to construction sites in which some working in waters are required, significant hydro-modification occurs, when the DSAs are immediately adjacent to streams, or when site drainage is channeled to the stream.

Limitations:

- The services of a Nevada registered PE may be required.
- May require additional NDEP or United States Army Corps of Engineers (USACE) permits.

Design, Implementation, and Construction: Proper planning, design, and construction techniques can

minimize impacts normally associated with proper functioning streams. Planning should take into account scheduling, avoidance of high flow periods, avoidance of in-stream construction, minimizing disturbance area and construction time period, using pre-disturbed areas, selecting crossing location, and selecting equipment. Retaining flow on-site is particularly important to reduce off-site flows and the transport of sediments from DSAs.

In the application of streambank stabilization BMPs, care must be taken to avoid simply transferring the erosion problem to another location. This requires the understanding and the causes of streambank erosion and any interplay between natural and structural stabilization controls. Common streambank stabilization techniques are listed below. Much of the information listed here was adapted from the *Streambank Protection and Erosion Damage Mitigation Manual*, McKinney, Texas (McKinney, 2016). However, NDOT's Planning and Design Guide, Drainage Manual, Road Design Guide, and Standard Specifications shall be utilized as appropriate.

Channel Bank Armoring

- Concrete-Lined Channels

  Concrete lined channels can be placed in a narrow right-of-way and enable the use of steep side slopes in the presence of swiftly running water and may help minimize maintenance. Concrete-lined channels are expensive to build and remove. They should only be used where existing channel right-of-way is restricted or as transition culverts and bridges.

- Rock Riprap

  Riprap is a commonly used for streambank stabilization and is less expensive than reinforced concrete channel liners. Riprap is loose stone or rock placed along the channel, sometimes placed using grout and mortar. The most common mistake in riprap stabilization applications is the use of rock that is too small with respect to the water forces. Consult NDOT Standard Specifications for use and application of rock riprap.

- Vegetative Stabilization

  Existing or planted vegetation, like deeply rooted grasses, ground covers, shrubs and trees, can effectively protect the streambank. Any vegetation selected for the bank and terrace zones should be tolerant of summer drought and periodic flooding. Grass lined channels are effective for channel stabilization in many locations. Soil retention blankets made for natural or synthetic materials can be used to hold seed and soil in place and greatly assist in the vegetative establishment on channel banks (likely with the assist of irrigation). For perennial and intermittent stream banks, if it is critical that the roots of riparian trees and shrubs are planted within the saturated zone of the soil.

- Articulated and Interlocking Concrete Blocks

  Concrete blocks glued to fabric liner or tied by cables can form a flexible and porous stabilized slope that allows grasses and other plants to grow through the openings. Block mats are appropriate for mild slopes and moderate velocities, but can be undermined by high or turbulent flows. Effectiveness is dependent on the block mass and their ability to resist being dislocated and transported by flowing water.

- Sand- Cement Bag Revetments

  Many configurations, including several into which mortar, gravel or concrete are pumped into fabric liners are available. Installation and maintenance complexity are minimal since vegetation does not often grow through the bag fabric during the lifetime of the

construction project. Proper installation must include adequate foundations and anchoring of the bags. In general, application of these stabilization techniques are limited in terms of their height, steepness of slope and may require engineering services.

- Poured-In-Place Concrete Grid Mats

  Poured-in-place concrete grid mats are capable of stabilizing both channels and slopes. Many different flexible grid mats are available and capable of supporting vehicular and pedestrian traffic. The contractor should consult a commercial product specialist for product use, application and maintenance.

Walls

On occasions, walls are constructed to function as channel banks in areas of limited right-of-way. Walls can be constructed out of reinforced concrete, gabions, steel pilings or stone. Wall construction generally requires a structural analysis prepared by a licensed engineer.

- Reinforced Earth

  Typical systems consists of layers of reinforcing strips attached to a precast reinforced concrete facing. Reinforcing strips extend into the backfill behind the wall. The system is backfilled in lifts separating the strips. The installation requires a large area at the back of the wall and may not be practical in areas where space is limited. Design must be specified by a licensed and qualified engineer.

- Bulkhead

  A bulkhead is a vertical wall used to support a slope and/or protect it from erosion. As such, it must be designed to resist the forces of overturning, bending and sliding. Bulkheads can be constructed out of sheet pile or sheet metal.

- Precast Retaining Wall Systems

  Precast retaining wall systems typically consist of a gravity retaining wall that utilizes precast, interlocking, or reinforced concrete modules. Typically, these walls are backfilled and compacted. These systems must be installed as per manufacturer's recommendations.

Control Structures

In contrast to the above techniques that improve a channel's ability to resist erosion, control structures reduce the erosive power of the water. Control, or energy dissipating structures slow the water and reduce channel erosion.

- Check Dams

  Check dams consist of small dams, placed at regular intervals, across a ditch or channel to reduce flow velocities and scour potential (see SC-04, Check Dams). Check dams pond the water and increases the cross-sectional area of the flow and hence, reduces the velocity.

- Drop Structures

  Channel drop structures like stills and weirs are manmade structures made to control and dissipate the water's energy through passage. Like check dams, drop structures reduce water velocity and dissipate energy.

- Stilling Basins

Stilling basins located at the discharge of control structures like check dams and other drop-type structures can further dissipate energy and prevent erosion. A number of velocity-reducing components can be incorporated into stilling basin design, like baffle blocks, wing walls, or surface boils.

- Durable Obstructions

  Baffles, chute blocks and other kinds of durable obstructions increase the turbulence and are useful in dissipating the energy of low flows. These are often incorporated into stilling basin design and at storm drain outfalls.

Other

Diversion channels and high water swales can increase the stream cross-sectional area and thereby lower velocities and assist in bank stabilization.

- Diversion Channel

  Construction of a diversion channel can eliminate the need for total rehabilitation of the natural creek bed. The diversion channel becomes the primary conveyance; only the amount of flow necessary to prevent stagnation is permitted in the natural channel.

- High Water Swales

  High-water swales are shallow channels excavated parallel to the natural channel. During low-flow conditions, the swale will remain dry and all the water will flow through the natural course. During high-flow conditions flood water will be conveyed via the swale. This reduces the amount and frequency of bankfull flows in the natural channel.

Streambank Bioengineering Practices

The practice of soil bioengineering (SBP) is gaining recognition as a viable tool for controlling erosion and stabilizing slopes. In soil bioengineering, plants provide both a living component and a structural component (roots and stems) in a slope protection system. Using common cuttings, such as willows, the treatment attempts to provide sufficient stability until native vegetation can be established. Advantages include:

- Economy - SBPs are often less expensive to install than conventional methods.
- Environmental compatibility - SBPs offer benefits of habitat improvement, aesthetic value, ecological utility, and use of native and natural materials.
- Maintenance - Once established, SBPs typically require minimal maintenance and can be self-repairing.
- Improved strength over time - Growth of the vegetative components of SBPs increases structural stability.
- Access - Access is often critical to the installation of conventional erosion control and stabilization techniques. Many SBPs require minimal equipment usage and are not restricted by access considerations.

Limitations to streambank bioengineering should be emphasized and can impact their usefulness by design professionals:

- Installation season - SBPs are most effective when installed during the dormant season of late fall through early spring, depending on the plant material. This season may coincide with poor weather conditions which may discourage or prohibit the use of SBPs.

- Availability of plant material - Sufficient quantities of locally adapted plant species may be difficult to obtain.

Inspection and Maintenance: Inspection and maintenance needs vary widely with the methods and techniques employed for streambank stabilization. In general:

- If erosion or a breach in structural integrity is observed, identify the cause or source and implements corrective measures immediately.
- Assess the suitability of the stabilization BMP(s) used and evaluate if additional or different BMPs are necessary on a weekly basis.
- Report any stabilization problems to the project Engineer immediately.
- Consult the project contract documents for specific inspection and maintenance requirements (if any).
- Remove debris as required to retain BMP effectiveness
- Streambank areas shall be completely restored and stabilized prior to project closeout/relief of maintenance.

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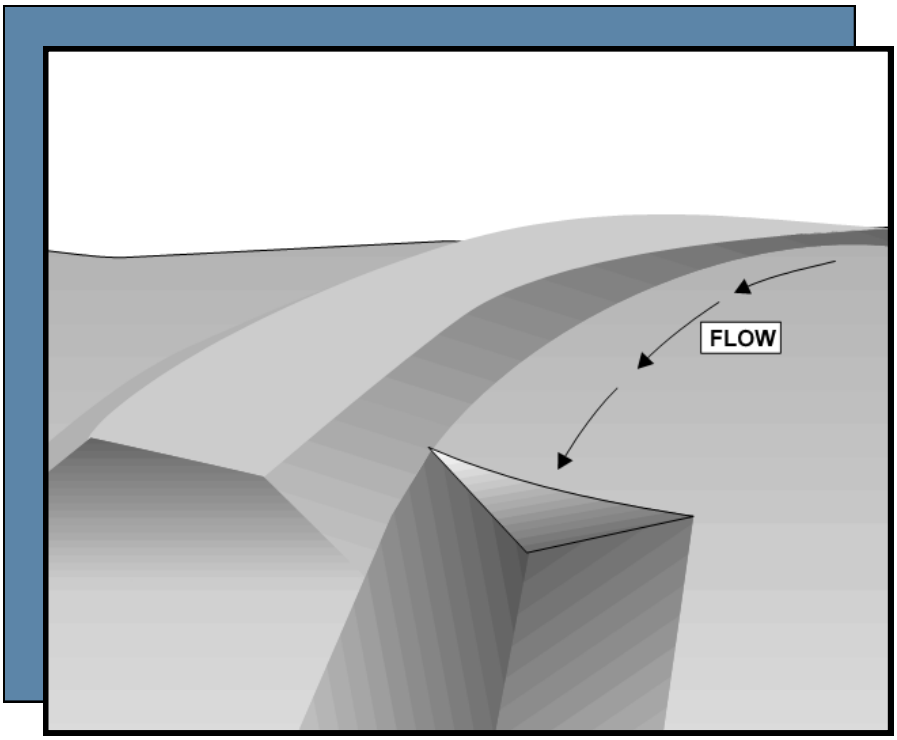
Drainage Swales and Earth Dikes

EC-12



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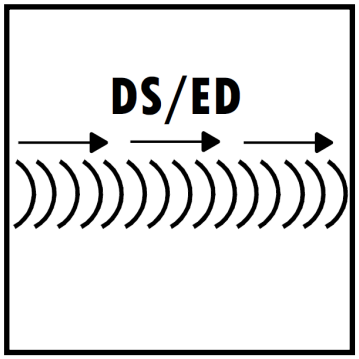

Description: A drainage swale is a shaped and sloped depression in the soil surface used to convey runoff to a desired location. An earth dike is a temporary berm or ridge of compacted soil used to divert runoff or channel water to a desired location. From a construction site perspective, these BMPs are structures that intercept, divert and convey surface flows (often sheet flow) away from DSAs or slopes to prevent erosion.

Application: Drainage swales and earth dikes are suitable for the following uses:

- Provide perimeter control to intercept and divert runoff and run-on to avoid sheet flow over sloped surfaces or other areas of concern.
- Divert and direct runoff towards a stabilized watercourse, drainage pipe, or channel.
- Intercept runoff from paved surfaces.
- At the top of slopes to divert run-on from adjacent or undisturbed slopes.
- At bottom and mid-slope locations to intercept sheet flow and convey concentrated flows.

Limitations: Swales and dikes should not be used for drainage areas greater than 10 acres or along slopes greater than 10 percent. For larger areas, more permanent drainage structures should be built. All drainage structures should be built in compliance with local requirements.

- Drainage swales and earth dikes are not suitable as sediment trapping devices. Consequently, appropriate sediment control measures shall be implemented at all discharge points.
- Must conform to local floodplain management regulations and shall not adversely impact upstream or downstream properties.

- Sediment accumulation, scour depressions, standing water, and vegetation in the bottom of these structures can pose vector problems.

Design and Construction: The temporary earth dike is a berm or ridge of compacted soil, located in such a manner as to divert stormwater to a sediment trapping device or a stabilized outlet, thereby reducing the potential for erosion and offsite sedimentation. Earth dikes can also be used to divert runoff from off-site and from undisturbed areas away from DSAs and to divert sheet flows away from unprotected slopes.

An earth dike does not itself control erosion or remove sediment from runoff. A dike prevents erosion by directing runoff to an erosion control device such as a sediment trap or directing runoff away from an erodible area. Temporary diversion dikes should not adversely impact adjacent properties and must conform to local floodplain management regulations, and should not be used in areas with slopes steeper than 10%.

Slopes that are formed during cut and fill operations should be protected from erosion by runoff. A combination of a temporary drainage swale and an earth dike at the top of a slope can divert runoff to a location where it can be brought to the bottom of the slope (see EC-14 Slope Drains). A combination dike and swale is easily constructed by a single pass of a bulldozer or grader and compacted by a second pass of the tracks or wheels over the ridge. Diversion structures should be installed when the site is initially graded and remain in place until post construction BMPs are installed and the slopes are stabilized.

Diversion practices concentrate surface runoff, increasing its velocity and erosive force. Thus, the flow out of the drain or swale must be directed onto a stabilized area or into a grade stabilization structure. If significant erosion will occur, a swale should be stabilized using vegetation, rock rip-rap, matting, or other physical means of stabilization. Any drain or swale that conveys sediment laden runoff must be diverted into a sediment basin or trap before it is discharged from the site.

General

- Care must be applied to correctly size and locate drainage dikes and drainage swales. Excessively steep, unlined dikes, and swales are subject to erosion and gully formation.
- Conveyances should be stabilized.
- Compact all dikes, berms, and fills per Standard Specification 207 for culvert backfill to prevent unequal settlement.
- Use NDOT's Drainage Manual as a guideline to determine if a ditch needs to be lined.
- Do not divert runoff onto other property without securing written authorization from the property owner and the discharge is in compliance with the CGP.
- When possible, install and utilize permanent swales, dikes, and ditches early in the construction process.
- Provide stabilized outlets.
- Stormwater is not to discharge into a storm sewer or receiving water without appropriate sediment control measures being implemented.

Drainage Swales

Swales are more effective than dikes because they tend to be more stable. The combination of a swale with a dike on the downhill side is the most cost effective diversion. Standard engineering design criteria for small open channel and closed conveyance systems shall be used. Unless NDOT'S drainage design criteria state otherwise, drainage swales should be designed as follows:

- No more than 5 acres may drain to a temporary drainage swale.
- Place drainage swales above or below, not on, a cut or fill slope.
- Swale bottom width should be at least 2 feet.
- Depth of the swale should be at least 18 inches.
- Side slopes should be 2:1 or flatter.
- Drainage gradients should be at least 1% but not greater than 15%. Ensure continuous, positive grade along dike to prevent ponding of runoff.
- The swale must not be overtopped by the peak discharge from a 10-year storm, irrespective of the design criteria stated above.

Earth Dikes

Temporary earth dikes are a practical, inexpensive BMP used to divert stormwater runoff. Temporary diversion dikes should be installed in the following manner:

- All dikes should be compacted by earth moving equipment.
- All dikes should have positive drainage to an outlet.
- All dikes should have 2:1 or flatter side slopes, 18 in. minimum height, and a minimum top width of 24 in. Wide top widths and flat slopes are usually needed at crossings for construction traffic.
- The outlet from the earth dike must function with a minimum of erosion. Runoff should be conveyed to a sediment trapping device such as SC-02 Temporary Sediment Basins or SC-03 Sediment Traps when either the dike channel or the drainage area above the dike are not adequately stabilized.
- The stone riprap, recycled concrete, etc. used for stabilization should be pressed into the soil with construction equipment.
- Dikes exhibiting significant sediment loss should be covered with filter cloth or similar material.
- Construction activity on the earth dike should be kept to a minimum.

Maintenance and Inspection:

- Inspect ditches and berms for washouts. Replace lost riprap or linings as needed.
- Inspect channel linings, embankments, and beds of ditches and berms for erosion and accumulation of debris and sediment. Remove debris and sediment.
- Temporary conveyances shall be completely removed as soon as the surrounding drainage area has been stabilized, or at the completion of construction/relief of maintenance.

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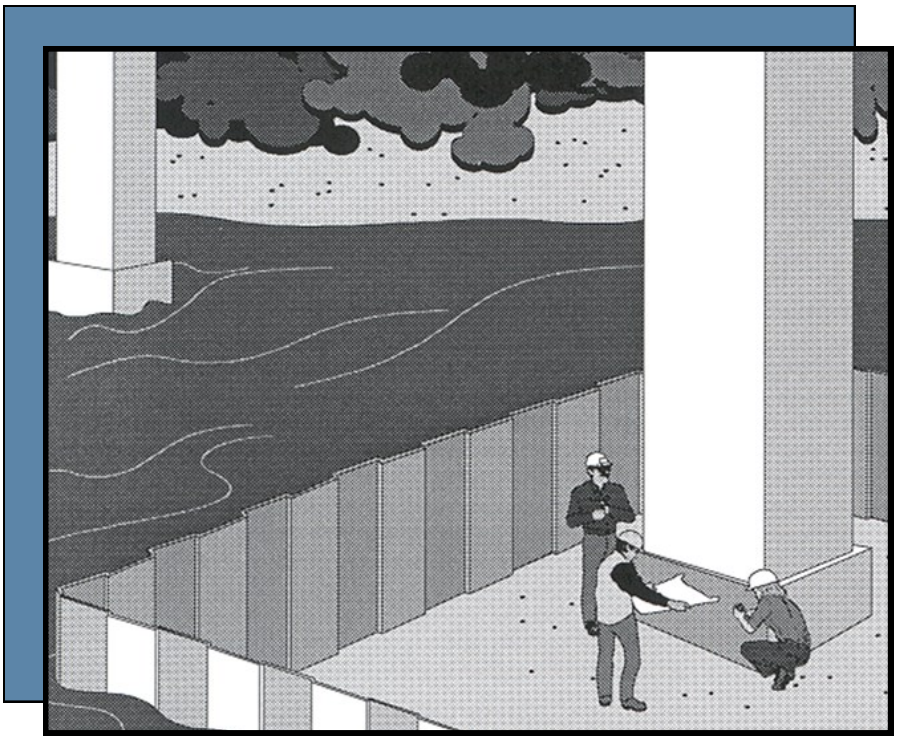
Clear Water Diversion

EC-13



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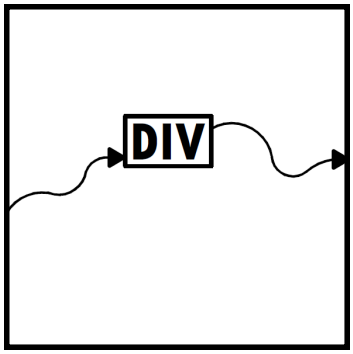

Description: Clear water diversions consists of various structures and measures that redirect water around a construction site with minimal water quality degradation by either the project construction operations or the construction of the diversion. Clear water diversions can be used in or adjacent to a waterway to provide a dry construction area and reduce sediment pollution caused by the construction work. Structures commonly used to create clear water diversions include ditches, berms, dikes, slope drains, rock, gravel bags, wood, aqua barriers, cofferdams, sheet piles, silt fencing, drainage and interceptor swales, pipes, or flumes.

Application:

- A clear water diversion is implemented where appropriate USACE, NDEP, and other local permits have been secured and work must be performed below the waterline of a stream or water body.
- Clear water diversions are appropriate for isolating construction activities occurring within or near a water body such as streambank stabilization; or culvert, bridge, pier or abutment installation. They may also be used in combination with other methods such as clear water bypasses and/or pumps.
- Pumped diversions are suitable for intermittent and low flow streams. Excavation of a temporary bypass channel or passing the flow through a flume is appropriate for the diversion of streams less than 20 feet wide, with flow rates less than 100 ft^3/sec.

Limitations:

- Diversion/encroachment activities may temporarily constrict the waterway, which can obstruct flows and cause flooding or washouts.
- Diversion or isolation activities should not completely dam stream flow.

- All clear water divisions shall be designed and stamped by a Professional Engineer that is registered in the State of Nevada.
- Specific permit requirements and/or mitigation measures may be required from regulatory agencies, such as the USACE, U.S. Fish and Wildlife Service (USFWS), NDEP, etc.

Design and Implementation: Clear water diversions are unique to each project site and waterway. Below are a few common techniques that are used to construct clear water divisions.

Turbidity Curtain Isolation

- A turbidity curtain is a relatively impervious fabric barrier used to trap sediment in water bodies. The curtain is a floating barrier, and thus does not prevent water from entering the isolated area; rather, it prevents suspended sediment from getting out. This method can be effective in isolating fine as well as coarse sediment.
- Turbidity curtains should be used where sediment discharge to a stream is unavoidable. They are used when construction activities adjoin relative still waters, such as lakes, ponds, lagoons, bays, and slow flowing rivers. The curtains are designed to deflect and contain sediment within a limited area and provide sufficient retention time so that the soil particles will fall out of suspension.

Portable Precast Concrete Barrier Rail (PPCBR) River Isolation

- This is a temporary sediment control/stream isolation method that uses PPCBR to form the sediment deposition area to isolate the in-stream or near-bank construction area.
- Barriers are placed end-to-end in a pre-designed configuration and gravel-filled bags are used at the toe of the barrier and also at their abutting ends to seal and prevent movement of sediment beneath or through the barrier walls.
- The PPCBR isolation can be used in streams with higher water velocities than many other isolation techniques.

Stream Diversions

- Stream diversions consist of a system of structures and measures that intercept an existing stream upstream of the project, transport it around the work area, and discharge it downstream. The selection of which stream diversion technique to use depends upon the type of work involved, physical characteristics of the site, and the volume of water flowing through the project.
- Pumped diversions are appropriate in areas where de-watering is necessary.
- Dam-type diversion may serve as temporary access to the site.
- Used where work areas require isolations from flows.

Maintenance and Inspection:

- Ensure permit related discharge requirements are being met.
- Inspect diversions on a daily basis and within 24 hours of a rainfall event for damage and proper function. Repair as needed.
- Pumped diversions may require frequent or continuous monitoring of the pumps.
- Inspect the pump discharge point daily for erosion.

- Inspect embankments and diversion channels for damage to the linings, accumulating debris, sediment buildup, and adequacy of the slope protection. Remove debris and repair linings and slope protection as required. Repair holes, gaps, or areas of scour.
- Upon completion of work, the diversion or isolation structure shall be removed and flow should be re-directed through the new culvert or back into the original stream channel. Recycle or re-use if applicable.
- Stabilize areas disturbed by BMP removal if needed.

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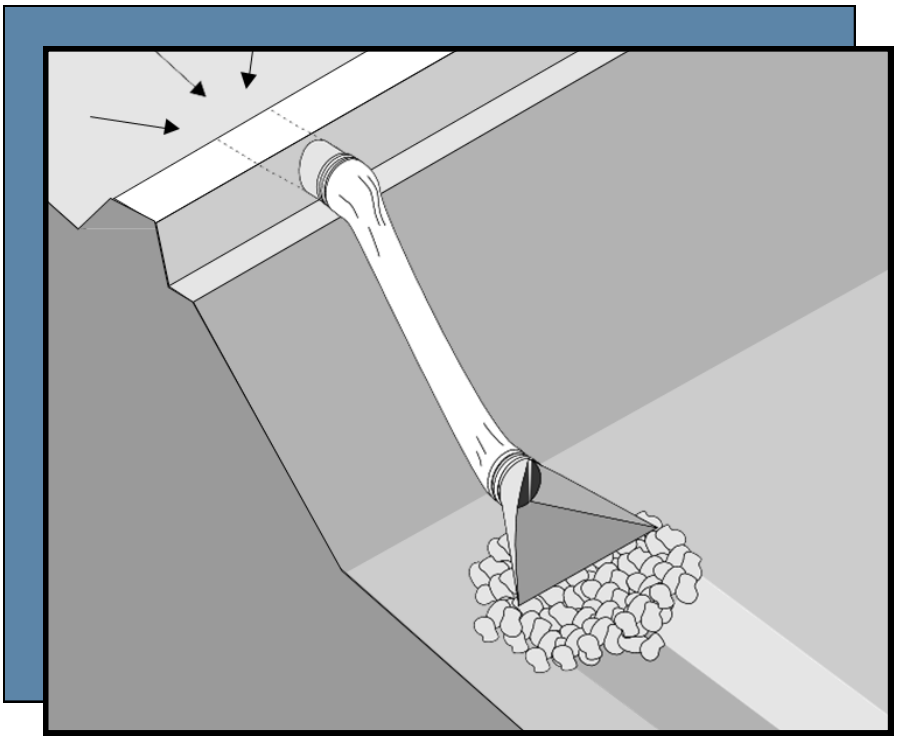
Slope Drains

EC-14



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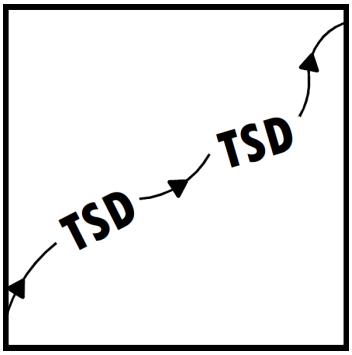

Description: A slope drain is a pipe used to intercept and direct surface runoff or groundwater into a stabilized watercourse, trapping device, or stabilized area. Slope drains are used with lined ditches to intercept and direct surface flow away from slope areas to protect cut or fill slopes.

Application: Slope drains are generally pertinent to long, un-stabilized steep slopes. More specifically they are used in the following cases:

- Where slopes may be eroded by surface runoff.
- On construction sites with large berms and grade changes.
- Used in combination with temporary and/or permanent seeding strategies to enhance plant establishment.

Limitations:

- Severe erosion may result when slope drains fail by overtopping, pipe separation, or energy dissipaters fail.
- Slope drains must be designed by a Professional Engineer registered in the State of Nevada.

Design and Construction:

- When using slope drains, limit drainage area to 10 acres per pipe. For larger areas, use a rock-lined channel or a series of pipes.
- Maximum slope is generally limited to 2:1 (H:V), as energy dissipation below steeper slopes is difficult.

- Direct surface runoff to slope drains with interceptor dikes. See BMP EC-12 Drainage Swales and Earth Dikes.
- Slope drains can be placed on or buried underneath the slope surface.
- Allowable materials are corrugated steel, aluminum or polyethylene per Standard Specifications Section 608.
- When installing slope drains:
  - ◊ Install slope drains perpendicular to slope contours.
  - ◊ Compact soil around and under entrance, outlet, and along length of pipe.
  - ◊ Securely anchor and stabilize pipe and appurtenances into soil.
  - ◊ Check to ensure that pipe connections are watertight.
  - ◊ Protect area around inlet with filter cloth. Protect outlet area with riprap sized to minimize movement, slow the flow, and prevent erosion. The Contractor or his/her engineer must ensure that excessive velocities/energy are not created at the outlet of the drain.
  - ◊ Protect inlet and outlet of slope drains using standard flared end sections for pipe slope drains 12 inches in diameter and larger.
  - ◊ Slope drains should not exceed 18 inches in diameter. Use parallel pipes if necessary to convey design flows.
  - ◊ In the Lake Tahoe Basin, size slope drains to convey the 20-year/1-hour storm event. For the remainder of Nevada the 2-year/24-hour storm event shall be used to size temporary slope drains.
  - ◊ Also refer to the current NDOT Drainage Manual for further guidance if necessary.

Maintenance and Inspection:

- Inspect outlet structures 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 until other preventative measures can be implemented.
- Inspect slope drainage for accumulations of debris and sediment.
- Remove built-up sediment from entrances and outlets as required. Flush drains if necessary; capture and settle out any sediments generated from the cleaning effort.
- Ensure water does not pond onto inappropriate areas (e.g., active traffic lanes, material storage areas, etc.).

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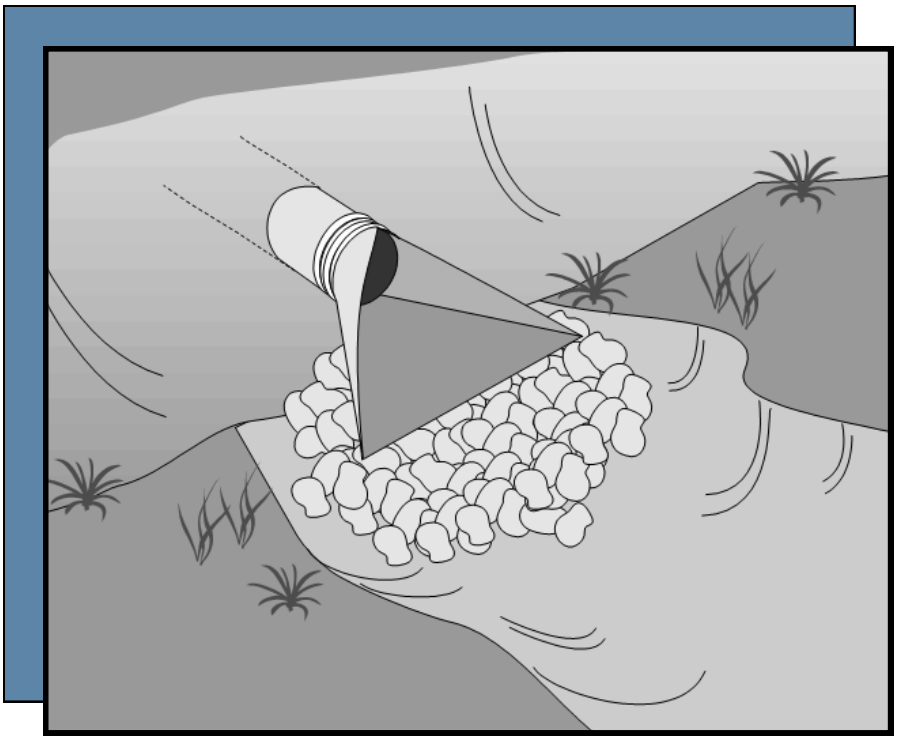
Outlet Protection/Velocity Dissipation Devices

EC-15



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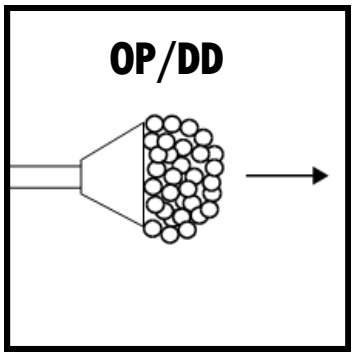

Description: Outlet protection/velocity dissipation devices are placed at pipe/culvert outlets to prevent scour and reduce the velocity and energy of exiting stormwater flows. This fact sheet provides guidance for their use as a temporary BMP. Permanent outlet protection will be specified in the construction plans.

Application: In general, outlet protection/velocity dissipation devices are structures that protect soil surfaces from the rapidly flowing water at the outlet of a pipe. These devices are applicable to the following locations:

- Outlets of pipes, drains, culverts, slope drains, diversion ditches, swales, conveyances or channels.
- Outlets located at the bottom of mild to steep slopes.
- Discharge outlets that carry continuous flows of water.
- Outlets subject to short, intense flows of water such as flash floods.
- Points where lined conveyances discharge to unlined conveyances.

Limitations:

- Undersized riprap may flush away during high flows. Ensure riprap (size, volume and length) is properly sized and designed for the application.
- These devices can contribute to erosion if not properly installed.
- For this application (construction sites), these devices are temporary in nature and need to be removed prior to project closeout.

Design and Construction: Guidance on the sizing and the use of outlet protection may be found in the current NDOT Drainage Manual or in the FHWA HEC-14 circular (FHWA, 2006).

- Install riprap at selected outlet in conjunction with filter and fabric riprap bedding.
- Carefully place riprap to avoid damaging the filter fabric in accordance with Standard Specifications Section 610.
- For proper operation of apron:
  - ◊ Align apron with receiving stream and keep straight throughout its length. If a curve is needed to fit site conditions, place it in upper section of apron.
  - ◊ Protect the underlying erosion control fabric with the corresponding class of riprap bedding per Standard Specification Section 219.
- Outlets on slopes steeper than 10 percent shall have additional protection per the guidelines in the current NDOT Drainage Manual.

Maintenance and Inspection:

- Inspect apron for displacement of the riprap and/or damage to the underlying fabric. Repair fabric and replace riprap that has washed away.
- Temporary devices shall be completely removed as soon as the contributing drainage area has been stabilized.

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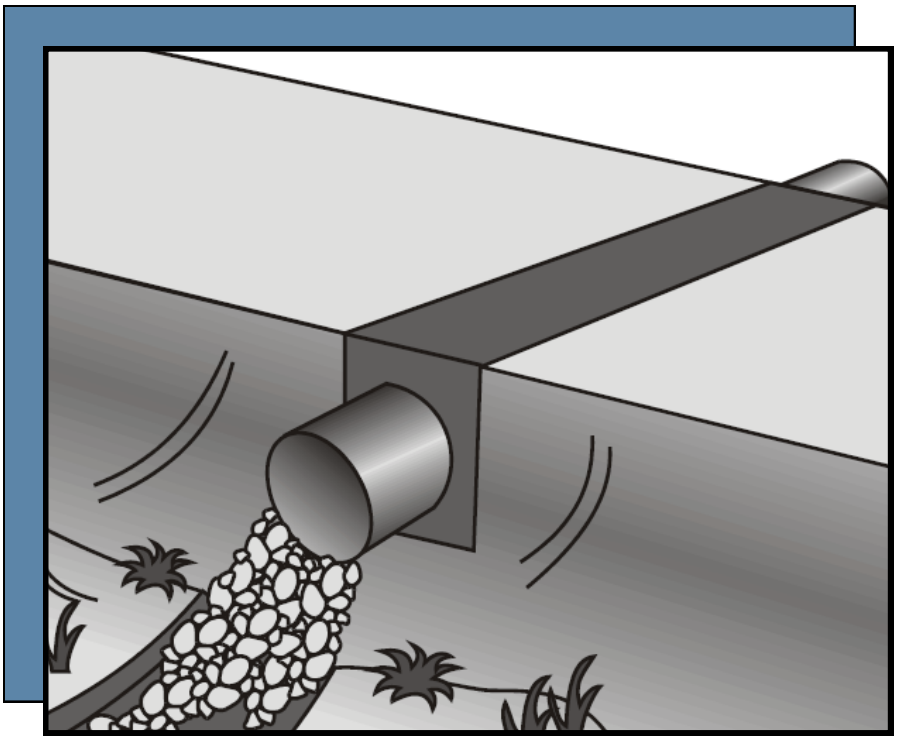
Temporary Stream Crossing

EC-16



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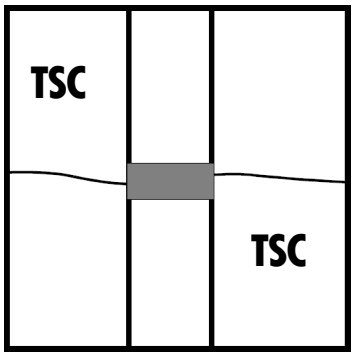

Description: A temporary stream crossing is a structure placed across a waterway that allows vehicles and equipment to cross the waterway during construction and minimizes erosion potentially caused by the vehicles and equipment. Temporary crossings also keep vehicles and equipment from contacting the water, which may wash sediments or chemicals from the vehicles and equipment into the waterway.

Application: Temporary stream crossings are typically installed for the following circumstances:

- Where construction equipment or vehicles need to frequently cross a small waterway.
- When alternate access routes are infeasible or impose significant constraints.
- When the crossing of perennial streams or waterways causes erosion.
- At sites where duration of construction activities will not exceed one year.

Limitations:

- Will usually disturb the waterway during installation and removal.
- Permitting from NDEP and the USACE may be required.
- Installation may require dewatering or temporary diversion of the stream. See BMP CO-07 Dewatering Operations and BMP EC-13 Clear Water Diversions.
- Channel constrictions can obstruct flood flow and cause flow backups, washouts, and/or scouring.
- Temporary stream crossings shall not be installed during high water flows.
- Must be removed at the end of the project.

Design and Implementation:

General Considerations

Location of the temporary stream crossing shall:

- Be selected from areas with the lowest erosion potential.
- Be in areas where highway runoff will not flow on to the side slopes of the crossing.

The following types of temporary stream crossings shall be considered:

- Culverts - Used on perennial and intermittent streams.
- Fords - Appropriate during the dry season in arid areas. Used on dry washes and ephemeral streams.
- Bridges - Appropriate for streams with high flow velocities, steep gradients and/or where temporary restrictions in the channel are not allowed.

Design and installation requires knowledge of stream flows and soil strength. Designs shall be prepared under the direction of a Professional Engineer registered in Nevada. Both hydraulic and construction loading requirements shall be considered along with the following:

- Compliance with the requirements for culvert and bridge crossings, as contained in the NDOT's Drainage Manual and Bridge Manual, particularly if the temporary stream crossing will remain through the rainy season.
- Stability in the crossing and adjacent areas to withstand the design flow shall be provided. The design flow and safety factor shall be selected based on careful evaluation of the risks due to over topping, flow backups, or washout.

Construction Considerations

- Stabilize construction roadways, adjacent work areas, and stream bottom to protect from erosion.
- Construct during dry periods (or low flow periods) to minimize stream disturbance.
- Construct at or near the natural elevation of the streambed to prevent potential flooding upstream of the crossing.
- Install temporary sediment control BMPs as needed to minimize erosion of the embankment.
- Vehicles and equipment shall not be driven, operated, fueled, cleaned, maintained, or stored in a water body where wetland vegetation, riparian vegetation, or aquatic organisms may be destroyed, except as authorized by the Engineer as necessary to complete the work.
- Temporary water body crossings and encroachments shall be constructed to minimize scour.
- Rock used for temporary water body crossings or encroachments shall be clean, rounded river rock that is free of sediment and debris.
- The exterior of vehicles and equipment that will encroach on the water body, within the project, shall be maintained free of grease, oil, fuel, and residues . Steam clean equipment prior to entering waterbodies per BMP CO-03 Vehicle and Equipment Cleaning and Maintenance.
- Disturbance or removal of vegetation shall be minimized to complete operations. Precautions shall be taken to avoid damage to vegetation by people or equipment. Disturbed vegetation shall be replaced with the appropriate soil stabilization measures.
- Riparian vegetation, unless complete removal is required, shall be cut off no lower than ground level to promote rapid regrowth.

- Access roads and work areas built over riparian vegetation shall be covered by a sufficient layer of clean river run cobble to prevent damage to the underlying soil and root structure. The rock shall be removed upon completion of project activities in a manner that minimizes impacts to underlying soil and root structure.
- Remove temporary crossing promptly when it is no longer needed.
- After removing the crossing structure, restore stream channel to its original grade and condition.

Specific Considerations

- Culverts are relatively easy to construct and able to support heavy equipment loads, depending upon installation, but do have maximum load limits.
- Temporary fords are not appropriate if construction will continue through rainy season, if thunderstorms are likely, or if the stream is perennial or intermittent.

Maintenance and Inspection:

- Replace lost protective aggregate from inlets and outlets of culverts.
- Check for blockage in the channel, debris buildup in culverts or behind fords, and under bridges. Service as necessary to retain proper functioning.
- Check for erosion of abutments, channel scour, riprap displacement, or piping in the soil.
- Check for structural weakening of the temporary crossing, such as cracks, and undermining of foundations and abutments.
- Inspect crossings on a daily basis and within 24 hours of a rainfall event for damage and proper function. Repair as needed.

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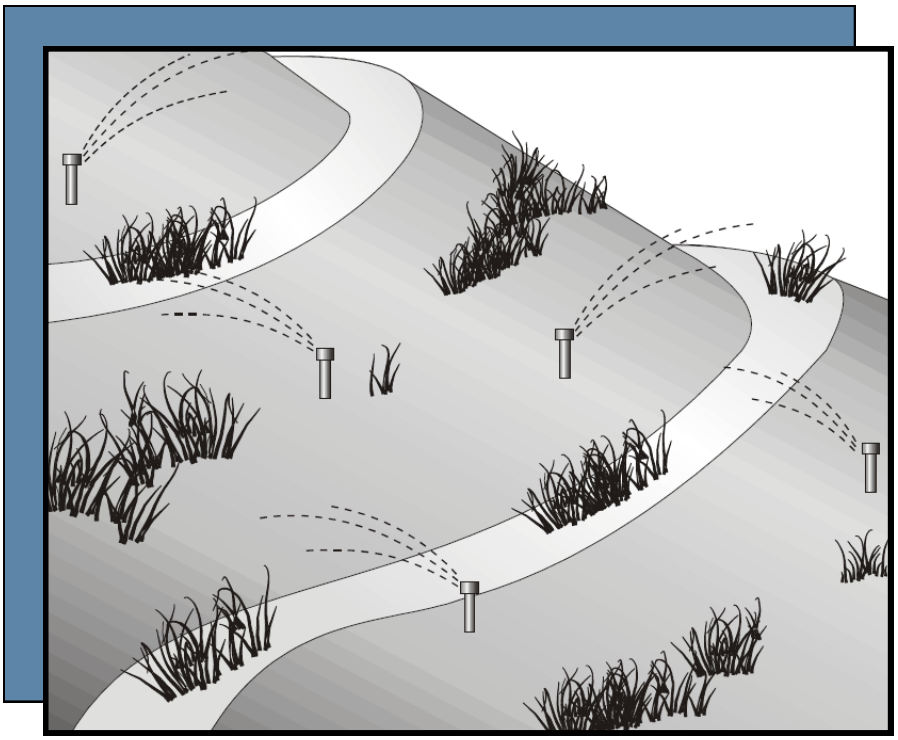
Landscape Irrigation

EC-17



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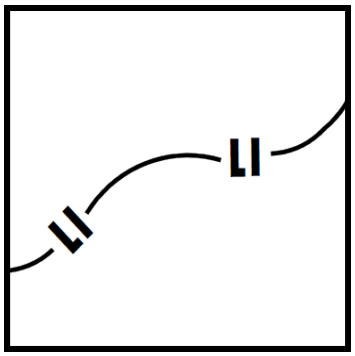

Description: Temporary irrigation may be necessary when the vegetation or landscaped plants require supplemental water to grow and become established. Typical construction site irrigation systems may consist of pressurized temporary piping and spray heads, stationary water tanks and drip emitters, or truck plant watering using spray or hand hose water applications. Regardless of the irrigation system, it is important that water applied stays where it is intended to be applied and does not pond, wash or migrate unwanted materials off-site and potentially into waterways.

Application: Implement this BMP whenever the construction site requires plant irrigation for revegetation and/or landscape growth.

Limitations:

- Professional revegetation services may be needed to determine the proper water application locations, rates and frequencies.
- Irrigation may be required for a contract specified plant establishment period.

Design and Implementation:

- Consult a landscape professional and/or the contract documents to determine the type of irrigation system needed, its placement, operation and constraints.
- To be effective in establishing vegetation in most parts of Nevada, irrigation systems need to be carefully designed, maintained and operated.
- Consult a landscape professional to address factors such as soil structure, grade, time of year, and type of vegetation when determining proper watering rates.

- Where possible, design buffers or containment areas for over-spray or excess application of irrigation waters.
- Before working on a pressurized irrigation system, be sure the system has been turned off, de-pressured, and properly drained.
- Carefully test and adjust irrigation water application to keep the water where it is intended to be.
- Understand the intent of the system and maintain accordingly.
- Turn off and winterize the system as needed.
- Do not use wastewater or reclaimed water for irrigation unless approved by NDEP.

Maintenance and Inspection:

- Inspect the system for leaks, overspray, and application effectiveness (i.e., plants or areas that are too wet or dry). Maintain accordingly.
- Inspect irrigated areas within and just outside of the project limits for evidence of over watering (e.g., irrigation runoff flowing into adjacent drains or ditches).
- Where possible, shut-off the system during rain events.
- Adjust the water application as needed by season.
- Shut off the water source to broken lines, sprinklers, or valves as soon as possible to prevent excess water flow and repair broken water lines as soon as possible.
- Inspect irrigated areas regularly for signs of erosion and/or discharge.

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Materials Management (MM)

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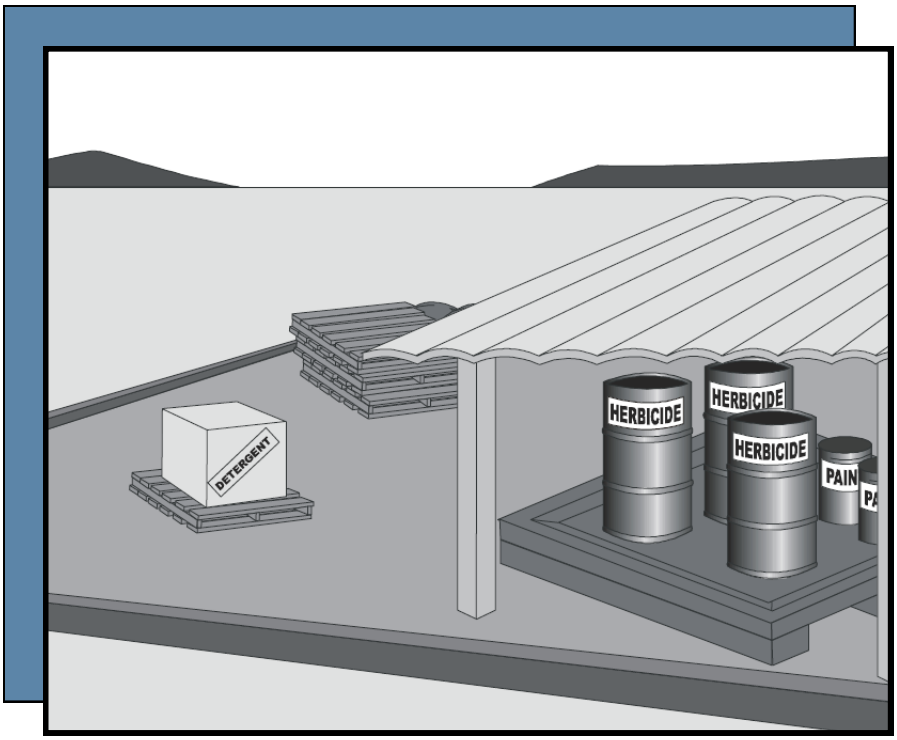
Material Storage

MM-01



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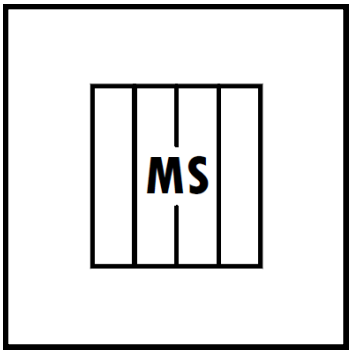

Description: Construction sites may stockpile toxic and/or hazardous materials and products for use during the construction process. This BMP outlines general practices designed to effectively prevent environmental contamination and human health hazards through the use of proper storage of materials in a manner that minimizes or eliminates the discharge of potential pollutants to the storm drain system, watercourses, or drainage channels.

Application: At a minimum, this BMP should be implemented at all construction sites that store any of the following (or similar) materials:

- Herbicides, pesticides or fertilizers
- Soil stabilizers and binders, polymers, amendments, and conditioners,
- Deicers, salts or other similar agents
- Detergents and cleaners
- Paints
- Petroleum products such as fuel, oil, grease or other lubricants
- Asphalt and concrete related compounds
- Solid or liquid materials that may contain hazardous substances
- Other materials that may contain potential pollutants
- Sand, soil or other stockpiled materials
- New or scrap metals

Limitations:

- Storage sheds may need to meet building & fire code requirements.

Design and Implementation:

General

- Secure storage areas with fencing, locked sheds, or trailers to prevent unwarranted access.
- Storage areas should be located away from vehicular traffic.
- Materials storage areas shall be designated and must comply with all federal, state, and local regulations.
- Safety Data Sheets (SDS) shall be available on-site for all stored materials.
- Contractors shall train employees and subcontractors on proper material handling and storage practices.
- Comply with SPCC plan requirements when appropriate.

Material Storage Areas and Practices

- Liquids, petroleum products, and substances listed in 40 CFR Parts 110, 117, or 302 shall be stored in appropriate containers and drums and not be overfilled. Containers and drums shall be placed in designated storage areas with appropriate secondary containment.
- Secondary containment shall provide sufficient volume to contain 100% of the aggregate volume of all containers plus a minimum of 4 inches of free-board, or in accordance with SPCC plan requirements.
- Appropriate measures shall be implemented to prevent stormwater run-on into designated storage areas.
- Secondary containment facilities shall be impervious to the materials stored therein for a minimum contact time of 72 hours.
- Secondary containment facilities shall be maintained free of accumulated rainwater and spills. In the event of spills or leaks, accumulated rainwater and spills shall be collected and placed into DOT approved drums and labeled accordingly. Handle and dispose of these liquids in accordance with applicable federal, state, or local laws.
- Allow access in storage areas for spill cleanup and emergency response access.
- Incompatible materials shall not be stored in the same temporary containment facility.
- Materials shall be stored in their original containers and the original product labels shall be maintained in place in a legible condition. Damaged or otherwise illegible labels shall be replaced immediately.
- Bagged and boxed materials shall be stored on pallets off of the ground and covered to provide protection from wind and rain.
- Stockpiles shall be protected in accordance with BMP MM-03 Stockpile Management.
- Store materials indoors or under cover whenever possible. A storage facility having a solid cover and sides is preferred to a temporary tarp. Storage facilities shall be equipped with proper ventilation.
- Have proper storage instructions posted at all times in an open and conspicuous location.

- Do not store chemicals, drums, or bagged materials directly on the ground. When not in use, store these items on a pallet, under cover, and with secondary containment provisions.
- Appropriate spill clean up material shall be readily identified and placed near storage areas.

Material Handling Practices

- Keep an accurate, up-to-date inventory of material delivered and stored on-site.
- Personnel appropriately trained in emergency spill clean-up procedures shall be present when solid or liquid-hazardous materials are unloaded.
- All material handling shall be done in accordance with BMP MM-02 Material Handling.

Spill Clean-Up

- Spill Prevention, Control and Countermeasures (SPCC) Plans (if required) shall be included in the SWPPP.
- See BMP MM-04 Spill Prevention and Control, for spills of chemicals and/or hazardous materials.
- Contain and clean up any spilled immediately.
- Properly remove and dispose of any spilled hazardous materials in accordance with federal, state, or local laws.

Maintenance and Inspection:

- Storage areas shall be kept clean, well organized, and equipped with sufficient clean-up supplies as appropriate for the materials being stored.
- Perimeter controls, containment structures, covers, and liners shall be inspected, repaired or replaced as needed to maintain proper function.
- Inspect storage areas before and within 24 hours of rainfall events. Inspect material storage areas weekly for evidence of leaks, spills, and proper storage practices.
- Routinely inspect and clean inlet protection BMPs.
- Secondary containment facilities shall be maintained free of accumulated rainwater and spills.
- Secondary containment areas shall be inspected daily for evidence of leaks and containment breaches.

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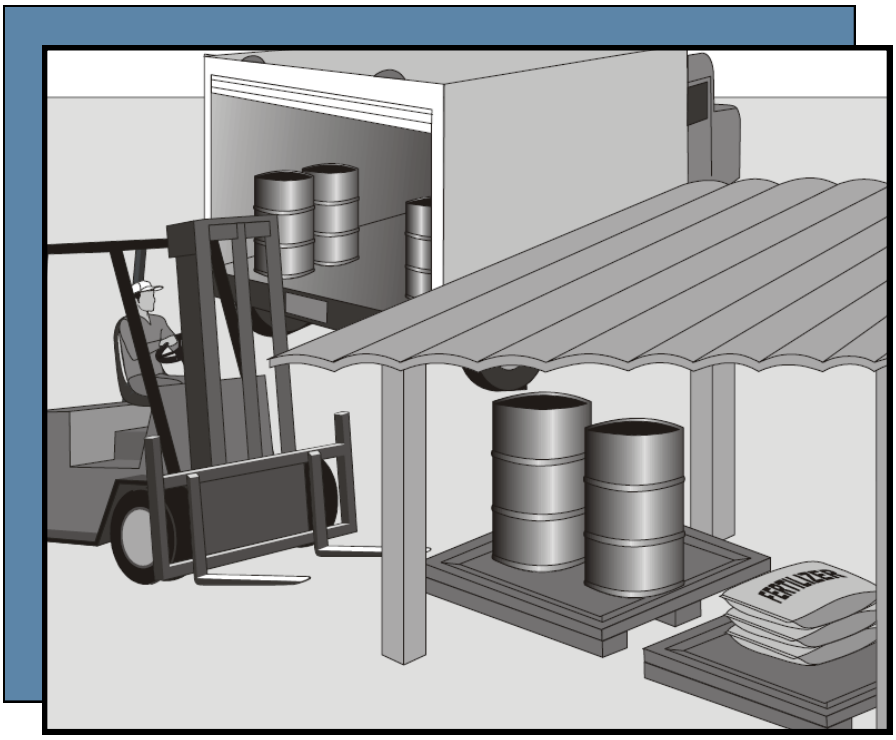
Material Handling

MM-02



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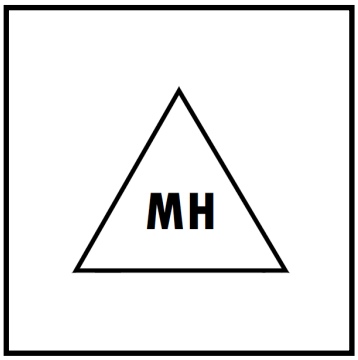

Description: Construction sites often utilize many different materials in order to accomplish the work. Many of these materials pose a hazard if released into the environment. Proper handling of materials on-site is critical to minimizes the discharge of potential pollutants to the storm drain system, watercourses or drainage channels.

Application: These procedures apply to all construction sites when materials like petroleum products, pesticides, fertilizers, asphalt, concrete, paints, etc. are used and handled on-site.

Limitations:

- Project space may limit proper designated use areas.

Design and Implementation:

- Train employees on the proper use, storage and handling of materials used or stored on-site.
- Where possible, designate a single area on the construction site for the loading and unloading of potentially environmentally sensitive materials.
- Situate the designated loading and unloading area away from waterways, berm the perimeter, and slope towards a containment area.
- Where possible, use, handle, store, load and unload materials on an impermeable surface.
- Designated material handling areas should be level and stable, capable of supporting forklifts, cranes and truck traffic.
- Safety Data Sheets (SDS) for all materials shall be readily available on-site.

- Have cleanup supplies, materials and devices at the ready.
- Immediately cleanup any spilled materials.
- Use only "dry" cleanup methods. Do not cleanup spilled materials using water.
- Do not remove the original product label as it contains important safety and disposal information.

Handling Considerations

- Handle materials in designated areas only
- Use extreme caution when loading, unloading or filling transfer trucks with liquid products.
- For oils, paints, etc.— Do not dispose of partially full containers into the garbage. Where possible, use up the entire product before discarding. Discard the container in accordance with the manufacturer's recommendations.
- Latex paint and paint cans, used brushes, rags, absorbent materials, and drop clothes, when thoroughly dry may be disposed of with other construction debris.
- Mix paint indoors, or inside a containment area. Never clean paintbrushes or rinse paint containers into a street, gutter, storm drain or watercourse. Dispose of any paint thinners, residue and sludge that cannot be recycled, in accordance with applicable laws, regulations, and Standard Specifications Section 107.
- 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 or other appropriate containment area. For oil-based paints, clean brushes to the extent practical and filter and reuse thinners and solvents.
- Use recycled and alternative products free of hazardous materials (source reduction) when practical. Recycle residual paints, solvents, non-treated lumber, and other materials (waste minimization).
- Use materials only where and when needed to complete the construction activity. Use safer alternative materials as much as possible. Reduce or eliminate use of hazardous materials on-site when practical.
- Fertilizers and pesticides (e.g. herbicides and insecticides) shall be applied per manufacturer's instructions and in compliance with any applicable laws.
- Application of pesticides shall be performed by a State of Nevada licensed applicator.
- Allow sufficient drying or application time to avoid exposing uncured applied materials to rainfall and runoff.
- Monitor employees and subcontractors to ensure that proper practices are being implemented.
- Do not apply hazardous chemicals during wet or windy conditions.

Maintenance and Inspections:

- Inspect material handling areas for evidence of spilled materials.
- Monitor materials handling and on-site material disposal practices
- Inspect and verify that activity based BMPs (fueling, training, etc.) are in place prior to the commencement of material handling activities.

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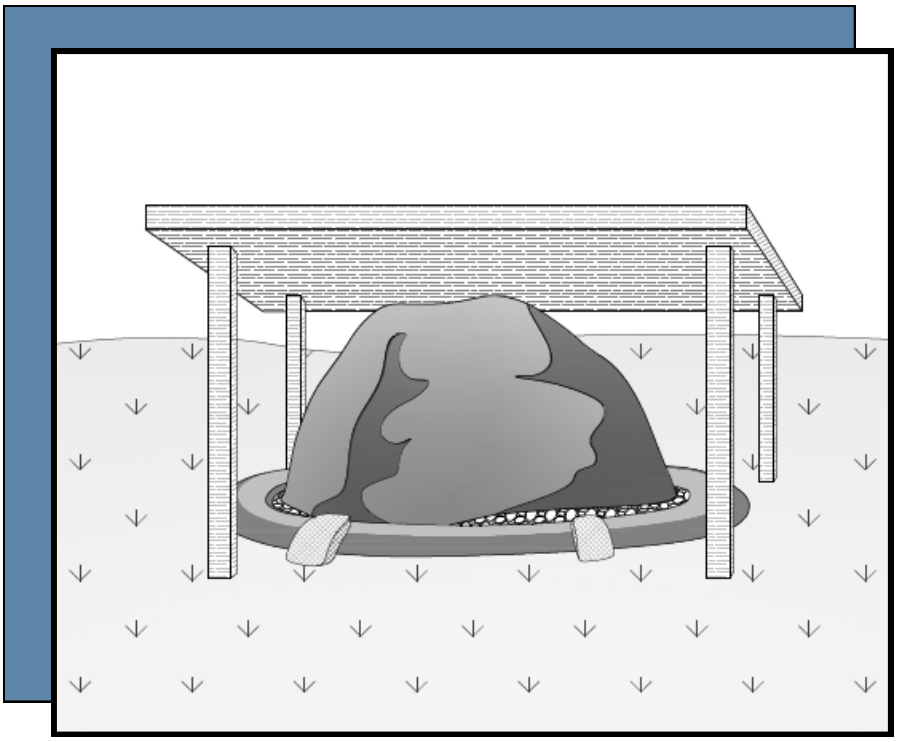
Stockpile Management

MM-03



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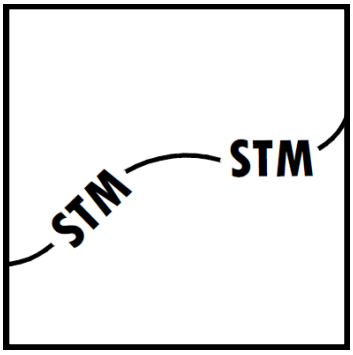

Description: Numerous different types of bulk materials can be stockpiled and temporarily stored on construction sites. Examples of stockpiled materials include sand, aggregate base, asphalt mix, spoils, etc. Proper storage and management practices will reduce the potential for these materials to discharge into waterways.

Application: Construction sites with stockpiled material.

Limitations:

- Proper stockpile management requires space, materials, equipment, training and effort.

Design and Implementation:

- Situate stockpiles a minimum of 100 feet away from waterways, drainages, and stormwater conveyances.
- Abide by CGP and air quality permit requirements for managing material stockpiles and minimizing dust generation.
- Locate stockpiles on impermeable surfaces where possible.
- Do not stockpile materials in areas subject to ponding or standing water.
- Use perimeter control barriers such as berms, dikes, sediment logs, gravel bags, etc. (as appropriate) to protect stockpiles from stormwater run-on and to minimize potential sediment discharges.

- Silt fence and sediment logs utilized for perimeter control are to be installed and maintained per SC-01 and SC-05, respectively.
- There should be no gaps in perimeter control measures surrounding the stockpile. If concrete blocks or K-rails are used, the gaps and edges should be sealed with gravel bags, plastic liner, or other suitable material.
- Stormwater flow shall be diverted around stockpiles when possible.
- Maintain stockpile protection when not in use.
- Use appropriate perimeter controls to deter foot and vehicle traffic that may inadvertently encroach upon or spread the stockpiled material.
- Water soluble materials (e.g., salt or lime) must not be stockpiled uncovered. Soluble chemicals must be stored in indoors, covered, or at minimum fully covered with plastic sheeting, tarps or other suitable protection at all times preventing contact with precipitation and stormwater runoff.
- Treated wood stockpiles shall be stored off the ground surface and covered, minimizing exposure to precipitation and stormwater runoff.
- Do not hose down or sweep fugitive or waste stockpile materials into any waterway or stormwater conveyance system.
- Remove construction stock/spoil piles from the construction site as soon as possible.
- Limit quantities of materials stockpiled onsite at any given time. Material should be staged and ordered in quantities that minimize, to the extent practical, the amount stored onsite.
- Use care to minimize material spillage when loading spreader trucks, during material deliveries, and during mixing operations.
- Sweep up any material that migrates outside of the containment area or spilled during loading/ mixing operations and return to its respective stockpile (if possible).

Maintenance and Inspections:

- Inspect and verify that stockpile protection is in place following material use.
- Monitor the weather forecast to assist in the determination for the need to cover stockpiled materials. Unexpected thunderstorms during summer months can cause substantial runoff and cause stock/spoil pile erosion.
- Check all stockpile area sites before and after storm events for perimeter protection integrity and any evidence of off-site migration.
- Main, change or replace perimeter controls and covers as needed to keep them functioning properly.

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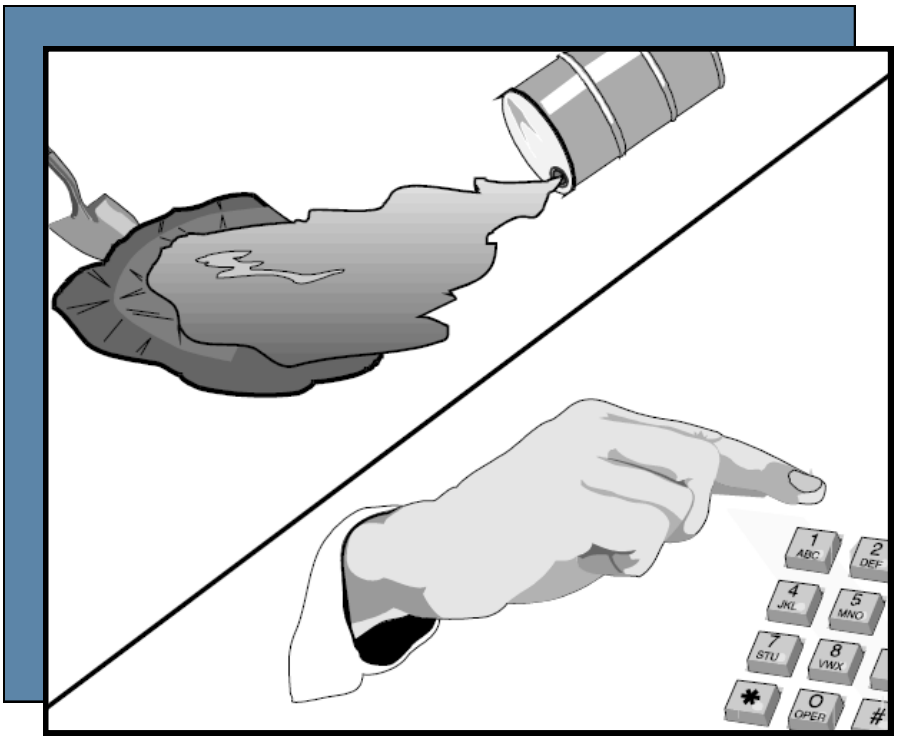
Spill Prevention and Control

MM-04



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Description: Spill prevention, detection, and response procedures must be implemented at each construction site to prevent and contain spills of fuels, lubricants, paints, and other products that might result in a discharge of contaminants to the storm drain system and watercourses.

Application: This practice apples to all construction sites where materials like fuels, oils, pesticides, paints, solvents, etc. are used, stored and handled on-site.

To the extent that the work can be accomplished safely; spills of oil, petroleum products, substances listed under 40 CFR (Code of Federal Regulations) parts 110, 117, and 302, and sanitary and septic wastes shall be contained and cleaned up immediately either by on-site personnel (dependent on level of training), local agencies (e.g. fire department), or by engaging a private emergency response company, as necessary and determined herein.

Limitations: Procedures and practices presented in this BMP are general. The Contractor must identify appropriate practices for the specific materials used or stored on-site and comply with all federal, state, and local regulations.

Design and Implementation:

- To the extent that it does not compromise clean up activities, spills shall be covered and protected from stormwater run-on and precipitation.
- Spills shall not be buried or washed with water unless as part of emergency response activities.

- Used clean-up materials, materials impacted from the effect of a spill, and recovered product that is no longer suitable for the intended purpose shall be stored and disposed of in conformance with applicable laws, regulations, and Standard Specifications Section 107.
- 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 BMP MM-08 Hazardous Material Management.
- Proper storage, clean-up and spill reporting instruction for hazardous materials stored or used on the project site shall be posted near the materials.
- 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 inspected daily and repaired or replaced as needed to maintain proper function.
- Efforts to contain and clean spills shall be made immediately upon discovery.

Education

- Educate employees and subcontractors on what a "Reportable Spill" is for each material they use and the appropriate responses for "Reportable" and "non-reportable" spills.
- Educate employees and subcontractors on potential dangers to humans and the environment from spills and leaks.
- Hold regular meetings to discuss and reinforce appropriate disposal procedures (incorporate into regular safety meetings).
- Establish a continuing education program to train new employees on spill prevention and control measures.

Spill Classification, Reportable, and Non-Reportable Spills

A spill can be described as any pollutant, hazardous waste or contaminate that has been spilled, leaked, pumped, poured, emitted, emptied, discharged, injected, escaped, leached, dumped, or disposed into the environment. The reportable quantity for petroleum products such as oil, diesel, gasoline, and hydraulic fluid is 25 gallons or 3 cubic yards of impacted material, or the presence on or in groundwater. The reportable quantity for hazardous waste is based upon Federal EPA guidelines established under Title III List of Lists (40CFR Part 302). A spill of any quantity that affects a waterway within the State of Nevada must be reported, regardless of the quantity. Contact NDEP at 1-888-331-NDEP (6337) to report a Reportable Spill and NDOT's Environmental Services Division at (775) 888-7013 and NDOT's Stormwater Division at (775) 888-7771 as soon as possible but no later than the end of the first working day of the release.

Spill Clean Up and Storage Procedures

- Non-Reportable Spills
    - ◊ Use absorbent materials on small spills. Never hose down a spill to a storm drain or waterway, bury a spill.
    - ◊ Remove the absorbent materials promptly and dispose of properly in accordance with applicable laws and regulations and Standard Specifications Section 107.
    - ◊ The practice commonly followed for a non-reportable spill is:
        1. Contain the spread of the spill.
        2. Recover spilled materials.

3. Clean the impacted area and/or properly dispose of affected materials.

- Petroleum Product Reportable Spills
  - ◊ For petroleum product Reportable Spills, the following steps shall be taken:
    1. Contain spread of the spill.
    2. If the spill occurs on paved or impermeable surfaces, clean up using "dry" methods (absorbent materials, floor dry and/or rags). Contain the spill by encircling with absorbent materials and do not let the spill spread widely.
    3. If the spill occurs in dirt areas, immediately contain the spill by constructing an earthen dike.
    4. If the spill occurs during rain, cover spill with tarps or other material to prevent impacting runoff.
    5. Notify the Engineer immediately and follow up with a written report documenting the incident and cleanup measures.
    6. Notify NDEP and contact NDOT Environmental Services and Stormwater Divisions.
- Hazardous Material Reportable Spills
  - ◊ For hazardous Material Reportable Spills that cannot be controlled by appropriately trained personnel in the immediate vicinity, the following steps shall be taken:
    1. Notify the local emergency response by dialing 911, as necessary. In addition to 911, the contractor will notify the Engineer, NDOT Environmental Services and Stormwater Divisions, the NDEP and the appropriate federal agencies. It is the contractor's responsibility to have all emergency phone numbers at the construction site.
    2. The services of a spills contractor or HazMat team shall be obtained immediately by the contractor. Construction personnel shall not attempt to clean up the spill.
    3. Other agencies which may need to be consulted include, but are not limited to, the Fire Department, the Public Works Department, the Highway Patrol, the City/County Police Department, Department of Toxic Substances, Nevada Division of Oil and Gas, OSHA, etc.

Maintenance and Inspection:

- Verify weekly that spill control clean up materials are properly identified and are located near material storage, unloading, and use areas.
- Frequently inspect areas having a higher likelihood of spills (e.g. petroleum product and chemical storage areas) for threats, defective equipment, and spill cleanup supplies.
- Update spill prevention and control plans, and stock appropriate clean-up materials for the types of chemicals on-site.
- Ensure all incidents of significant spills and Reportable Spills are documented accordingly per the CGP.

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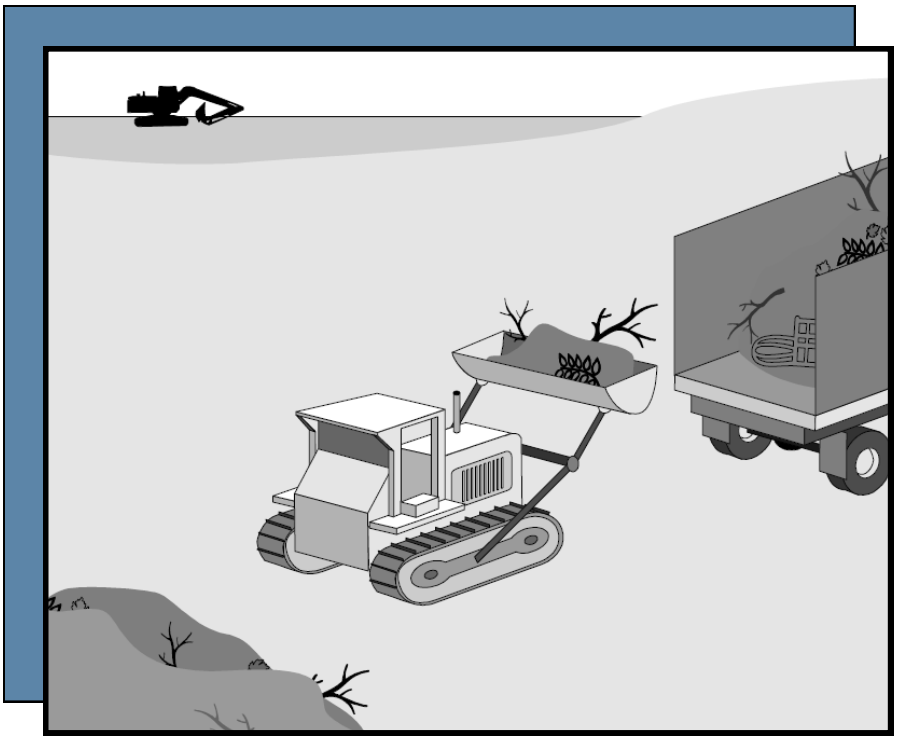
Construction Debris and Litter Management

MM-05



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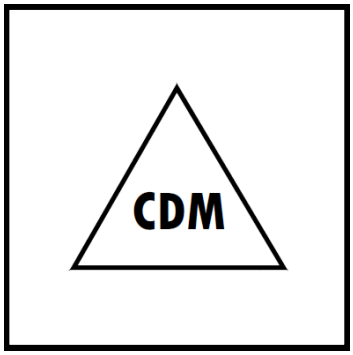

Description: Most construction sites generate construction debris and trash during normal operations. Construction debris and litter management guidelines and practices are designed to minimize or eliminate the discharge of these waste materials from the site before they can reach storm drains or waterways.

Application: Construction debris and litter management guidelines and practices should be implemented on all construction projects that generate solid wastes. All disposal practices shall conform to the requirements of the Solid Waste Disposal Act (SWDA) as amended by the Resource Conservation and Recovery Act (RCRA). Solid wastes include but are not limited to:

- Construction wastes including brick, mortar, timber, steel and metal scraps, sawdust, pipe and electrical cuttings, non-hazardous equipment parts, styrofoam and other materials used to transport and package construction materials.
- Highway planting wastes, including vegetative material, plant containers, and packaging materials.
- Litter, including food containers, beverage cans, coffee cups, paper bags, plastic wrappers, and smoking materials.

This BMP is not intended to address hazardous or toxic materials.

Limitations:

- Some construction waste may be hazardous; consequently some of the recommended practices in this BMP may not be appropriate for the management of the wastes.

Design and Implementation:

Education

- Instruct employees and subcontractors on solid waste handling, storage, and disposal requirements and the difference with managing a hazardous vs. non-hazardous waste.
- Hold regular meetings to discuss and reinforce disposal procedures (incorporate into regular safety meetings).
- Ensure all employees, subcontractors, and visitors follow solid waste handling, storage, and disposal procedures.

Collection, Storage, and Disposal

- Wherever possible, minimize production of solid waste materials.
- Littering on or off of the project site is prohibited by Nevada State law.
- To prevent clogging of the storm drainage system, litter and debris shall be removed from drainage grates, trash racks, and ditch lines promptly.
- Construction debris and litter from work areas within the construction limits of the project site shall be collected and placed in covered trash bins (aka Dumpsters®) daily regardless of whether the litter was generated by the Contractor, the public, or others. Collected litter and debris shall not be placed in or next to storm drain inlets, drainage systems, or watercourses.
- Covered trash bins of sufficient size and number shall be provided to contain the solid waste generated by the project and properly serviced.
- Full trash bins shall be removed from the project site and the contents properly disposed of in conformance with applicable laws and regulations and the provisions of Standard Specifications Section 107.
- Construction debris and waste shall be removed from the site biweekly or as appropriate.
- Construction material visible to the public shall be stored or stacked in an orderly manner to the satisfaction of the Engineer.
- Stormwater run-on shall be prevented from contacting stored solid waste through the use of berms, dikes, or other temporary diversion structures or through the use of measures to elevate waste from site surfaces.
- Solid waste storage areas shall be located at least 50 feet from drainage facilities and watercourses and shall not be located in areas prone to flooding or ponding.
- Construction and highway planting waste not stored in containers shall be securely covered from wind and rain by covering the top with tarps or plastic sheeting or other appropriate protection.
- Trash bins may not be washed at the project site.
- Waste generation is dynamic and is dependent upon factors such as construction activity and phasing. Plan accordingly.
- Construction waste shall be stored in designated areas.
- Segregate potentially hazardous waste from non-hazardous construction site waste.
- Keep the site clean of litter debris.
- Do not dispose liquid wastes, especially potentially hazardous liquid wastes (used oils, solvents, paints, acids, pesticides, additives, curing compounds), in bins designated for construction debris.

- 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 construction scraps can also be recycled.

Maintenance and Inspection:

- Inspect waste storage areas for proper containment.
- Inspect the construction site for litter and other improperly contained wastes. Collect, contain, and dispose of as appropriate.
- Arrange for regularly scheduled waste collection and disposal.

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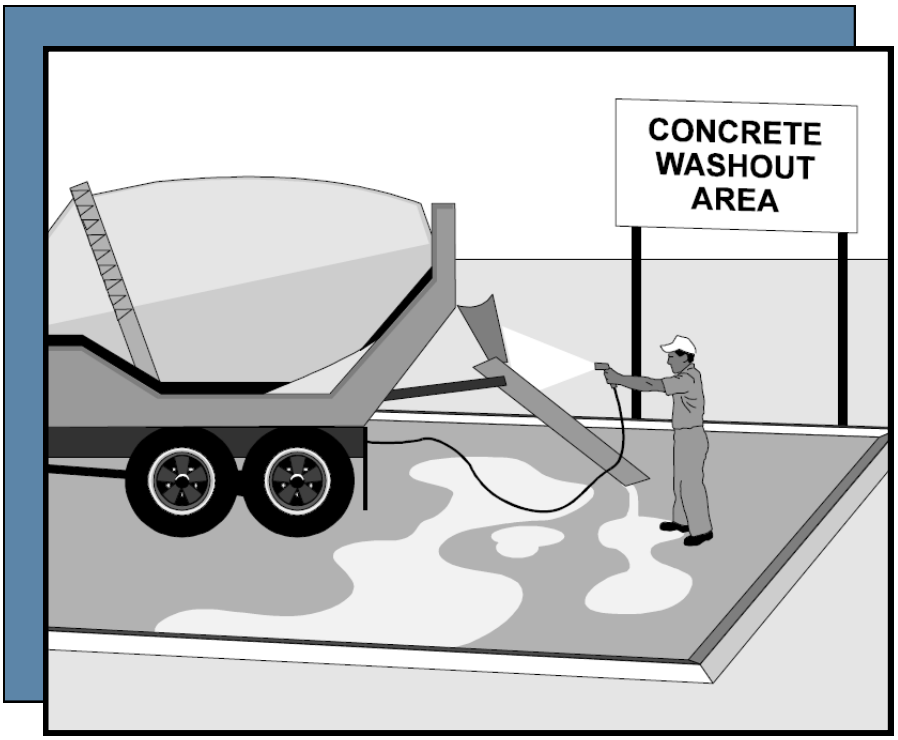
Concrete Waste Management

MM-06



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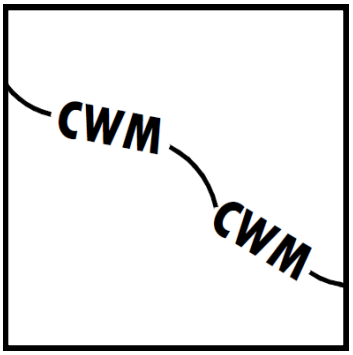

Description: Concrete work, especially concrete wash-out activities generate water and slurry containing fine particles often having a high pH (caustic), which is detrimental to stormwater quality as well as any aquatic life nearby. The discharge of concrete washout waters are classified as a "Prohibited Discharge" under the CGP unless managed by an appropriate control. The concrete waste management guidelines and practices provided in this BMP are intended to minimize or eliminate the discharge of concrete wastes into the storm drain system and waterways.

Application:

- Concrete waste management guidelines and practices are to be implemented on all construction projects where concrete or mortar is used, where concrete dust and debris result from demolition activities and concrete truck washout occurs.
- Where slurries containing Portland cement concrete (PCC) or asphalt concrete (AC) are generated, such as from saw cutting, coring, grinding, grooving, and hydro-concrete demolition.
- Where concrete trucks and other concrete-handling equipment (e.g., pumper trucks) are emptied and/or washed on-site.

Limitations:

- Multiple washouts may be needed to assume adequate capacity and to allow for evaporation.

Design and Implementation: The following procedures and techniques will assist in mitigating stormwater pollution from concrete wastes:

- Educate employees, subcontractors, and suppliers on the concrete waste management techniques described herein.
- PCC and AC waste shall not be allowed to enter storm drains or waterways.
- PCC and AC waste shall be collected and properly disposed of in conformance with Standard Specifications Section 107.
- Collect slurry residue and place in a temporary containment facility and allow slurry to dry. Dried slurries shall be properly disposed before project completion.
- Temporary concrete washout facilities shall be located a minimum of 100 feet, where practical, from storm drain inlets, open drainage facilities, and watercourses, unless determined infeasible by the Engineer. Each facility shall be located away from construction traffic or access areas to prevent disturbance or tracking.
- A sign shall be installed adjacent to each washout facility advising concrete equipment operators on the location of the washouts and their proper use. The sign shall be in conformance with the provisions in Standard Specifications Section 625.
- Temporary concrete washout facilities shall be constructed above grade or below grade at the option of the contractor. Temporary concrete washout facilities shall be constructed and maintained in sufficient quantity and size to contain all liquid and concrete waste generated by washout operations.
- Temporary washout facilities shall have a temporary pit or bermed area of sufficient volume to completely contain all liquid and waste concrete materials generated during washout procedures.
- Wash concrete only from mixer truck chutes into approved designated concrete wash out facility.
- Hardened concrete waste in washout facilities shall be broken up, removed, and disposed of per BMP MM-05 Construction Debris and Litter Management. Hardened concrete can be broken up and incorporated into fill as approved by the Engineer.
- Below-grade concrete washout facilities shall be lined material. Plastic lining material shall be a minimum of 40-mil polyethylene sheeting and shall be free of holes, tears or other defects that compromise the impermeability of the material.
- The soil base shall be prepared free of rocks or other debris that may cause tears or holes in the plastic lining material.

Maintenance and Inspection:

- Monitor on-site concrete waste storage and disposal procedures at least weekly.
- Temporary concrete washout facilities shall be maintained to provide adequate holding capacity with a minimum freeboard of 4 inches for above grade facilities and 12 inches for below grade facilities. Maintaining temporary concrete washout facilities shall include removing and disposing of hardened concrete, maintaining liners, and returning the facilities to a functional condition.
- When the washout is 75% full (not including freeboard), it must be cleaned or a new washout constructed.
- Ensure signage is properly maintained at all onsite temporary washout facilities.

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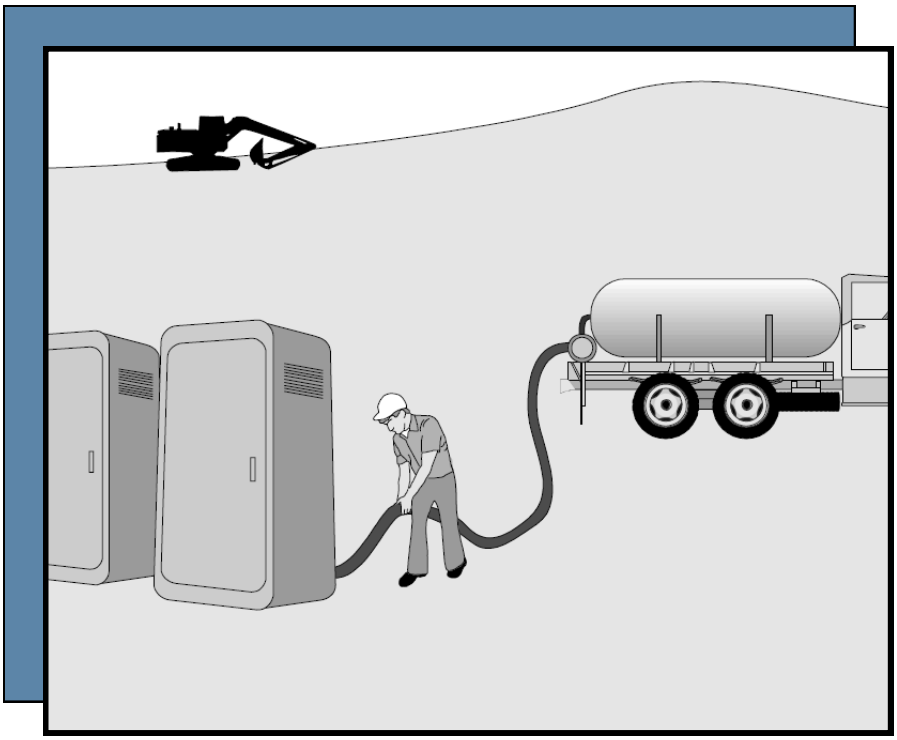
Sanitary/Septage Waste Management MM-07



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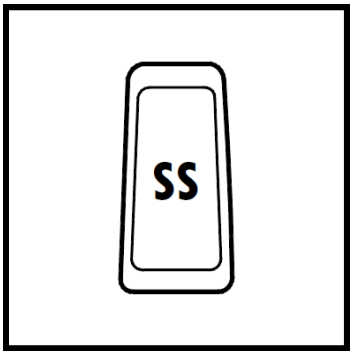

Description: The majority of construction work requires temporary or portable sanitary/septage facilities to be provided on-site for employees and staff. This BMP provides guidelines and practices to minimize the likelihood of sanitary/septage waste from portable toilets reaching the storm drain system or watercourses.

Application: Construction sites that utilize portable toilets.

Limitations:

- Contracts are required for on-site servicing of portable toilets, consequently oversight of vendor servicing activities may be necessary.

Design and Implementation:

Education

- The contractor should educate employees, subcontractors, and suppliers on sanitary/ septage waste storage and disposal procedures.
- The contractor should educate employees, subcontractors, and suppliers of potential dangers to humans and the environment from sanitary/septage wastes.

Application Practices

- Temporary sanitary facilities shall be located away from waterways and drainage facilities (outside of stormwater flow areas).

- All portable toilets must be firmly secured to prevent overturning. Stake toilets to the ground surface (all four corners) or use trailer mounted units.
- Wastewater shall be properly disposed and never discharged or buried.
- Ensure that sanitary/septic facilities are maintained in good working order by a licensed service provider.
- Use only licensed sanitary/septage waste haulers to clean and pump out the units.
- Place toilets at convenient locations to encourage use.
- Locate toilets in secure areas of the construction site to avoid vandalism.
- Do not situate portable toilets in areas where they may be knocked over by equipment of vehicles.
- Report all discharges of portable toilets to the Engineer immediately.

Maintenance and Inspection:

- Maintain, clean, repair and service portable toilets as required.
- Inspect for leaks or other issues at least weekly.
- Arrange a regular maintenance schedule for cleaning and emptying.

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Hazardous Material Management

MM-08

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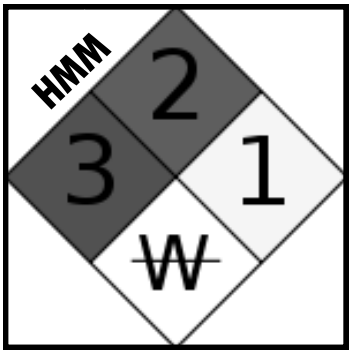

Description: Potentially hazardous materials may be used, stored, generated, or encountered at a construction site. Proper handling, storage, and disposal practices are necessary to minimize the potential for the release of these materials to the environment.

Application: Any time potentially hazardous materials are on a construction site, the practices described herein are to be implemented. Hazardous materials may include, but are not limited to:

- Fuels, lubricants, and oils
- Solvents
- Paints, stains, and wood preservatives
- Contaminated soil
- Vehicle fluids (e.g., antifreeze)
- Herbicides and pesticides
- Asphalt and concrete products
- Acids and caustics
- Construction wastes (e.g., lead paint, asbestos products, treated lumber)

Limitations:

- Does not address preexisting contamination or site assessments.
- Hazardous waste releases require the services of a Certified Environmental Manager to oversee response, cleanup, and remediation efforts.

- Contractor is required to follow all federal, state and local laws regarding handling, storing, and transporting waste materials.

Implementation:

- Comply with SPCC plan requirements when appropriate.
- Hazardous waste shall be kept separate from construction and domestic waste. Do not mix waste products.
- Waste shall be stored in sealed containers constructed of suitable materials, and provided cover or secondary containment to prevent spills from being discharged. Store materials in temporary storage facilities with roofs and secondary containment. Secondary containment shall provide sufficient volume to contain 100% of the aggregate volume of all containers plus a minimum of 4 inches of free-board, or in accordance with SPCC plan requirements.
- Locate storage areas away from storm drains, gutters, ditches, and waterways.
- Store materials that might be incompatible (chemically reactive) separately.
- Store materials in an appropriate type of container.
- All containers shall be labeled in accordance with applicable Resource Conservation and Recovery Act (RCRA) requirements and other applicable federal, state and local requirements. Labels should identify, the material, health hazards, environmental hazards, and collection date.
- Waste shall be disposed of in accordance with the manufacturer's recommendations and federal, state and local requirements.
- Maintain Safety Data Sheets on-site for all materials at the site.
- Provide sufficient space between stored materials to allow access and minimize the need for excess handling.
- Implement good housekeeping practices.
- Properly dispose of stormwater collected in the secondary containment — assume it is contaminated unless proven otherwise.
- Do not dispose of liquid wastes in waste bins or other solid waste containers.
- Promptly clean all spills. Never wash spills down a storm drain.
- Recycle materials when possible.
- Train employees in proper material handling, storage, and disposal practices.
- Disposal per Section 107, and all local, state, federal laws.

Maintenance and Inspection:

- Ensure materials and wastes are properly stored and labeled.
- Ensure the secondary containment is functioning, and determine if containment facilities require servicing.
- Inspect all pumps, hoses, and other equipment that has been used in conjunction with hazardous materials. Replace or repair those that are found to be defective.
- Inspect the construction site weekly for evidence of spills and releases.
- Verify spill containment and cleanup supplies are stocked and available.

- Immediately repair storage areas or containment structures as needed.
- Schedule disposal of waste products before the collection containers are full.
- Verify and maintain records of proper waste disposal.
- If a spill of any kind is discovered, the reporting procedures in BMP MM-04 Spill Prevention and Control shall be followed.

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Sediment Controls (SC)

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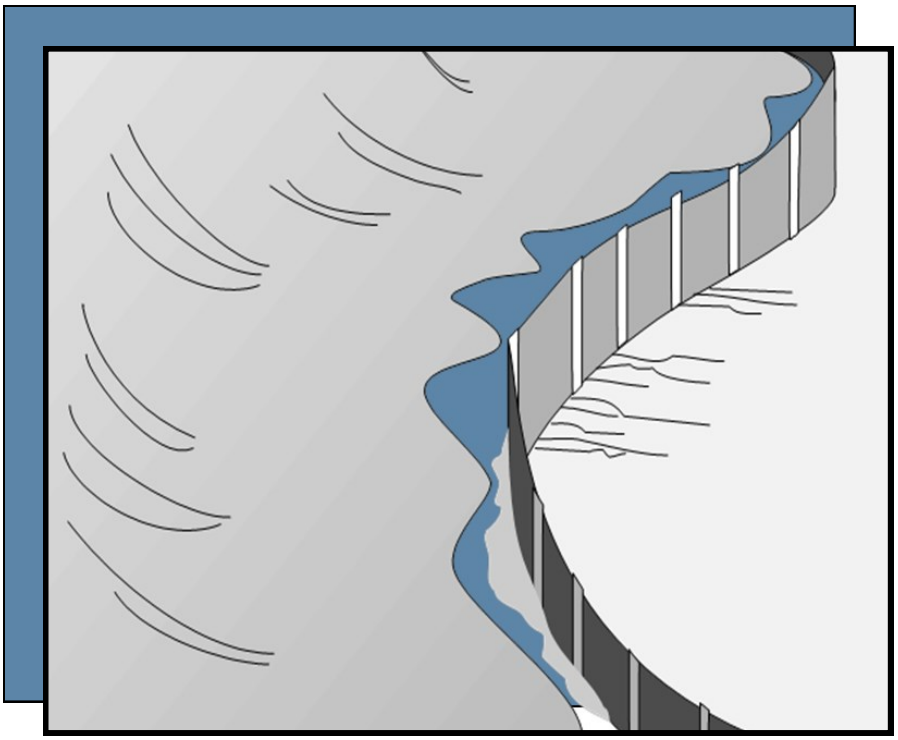
Silt Fence

SC-01



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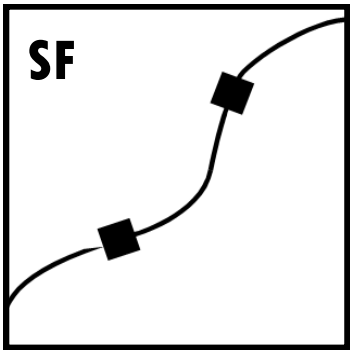

Description: Through the construction process, disturbed soils and sediments have the potential to migrate due to erosion. A silt fence is a temporary linear sediment control barrier used to intercept and detain sediment while decreasing the velocity of runoff. Silt fences consist of a geotextile filter fabric or other permeable fabric that has been staked, entrenched and anchored into the soil. Silt fences allow larger sediment particles to settle from the runoff as it passes through the permeable fabric.

Application: Silt fences are placed:

- Along the perimeter of a project.
- At the toe of exposed and erodible slopes.
- Along the contour of slopes.
- Down-slope of exposed soil areas.
- Around temporary stockpiles and disturbed areas.
- Along streams and channels.
- Can be used to define project boundary, work areas, or equipment exclusion areas.

Limitations:

- Typically the maximum length of slope draining to any point along the silt fence is 200 feet.
- Limit to locations suitable for temporary ponding and deposition of sediment.
- Do not use below slopes subject to creep, slumping, or landslides.

- Do not use in streams, channels, or anywhere flow is concentrated.
- Do not use silt fences to divert or redirect flow.
- Subject to wind damage.
- Not recommended for use in rocky areas due to potential difficulties with proper installation.

Design and Implementation:

Types and Specifications

- **Type 1 (standard silt fence):** Silt fence shall be constructed of silt fence fabric and wood posts at 6 foot maximum spacing. This installation typically is only suitable for up to two-week duration, especially in wind prone areas. Longer duration installations typically require significant maintenance as posts fail easily and the fabric quickly becomes unsuitable.
- **Type 2 (wire back silt fence):** Silt fence shall be constructed of silt fence fabric, wire mesh backing, and steel T-posts at 8 foot maximum spacing. This installation is intended for construction activities of two weeks duration or longer.
- Not intended for use as mid-slope protection on slopes steeper than 4:1.
- For slopes steeper than 2:1 and that contain a high number of rocks or large dirt clods that might dislodge, it may be necessary to install additional protection fencing immediately adjacent to the bottom of the slope, prior to installing silt fence.
- For slopes adjacent to water bodies or Environmentally Sensitive Areas (ESAs), additional temporary soil stabilization may be necessary.

Materials

- Silt fence fabric shall be woven polypropylene with a minimum width of 35 inches and a minimum tensile strength of 100 pounds. The fabric shall conform to the requirements in ASTM designation D4632 and shall have an integral reinforcement layer. The reinforcement layer shall be a polypropylene, or equivalent, net provided by the manufacturer. The permittivity of the fabric shall be between 0.1 sec^{-1} and 0.15 sec^{-1} in conformance with the requirements in ASTM designation D4491. The contractor must submit certificate of compliance in accordance with the project's specifications.
- Wood posts shall be commercial quality lumber of nominal dimensions 2 inches x 2 inches x 5 feet. Each post shall be free from decay, splits or cracks longer than the thickness of the post or other defects that would weaken the posts and cause the posts to be structurally unsuitable.
- Steel T-posts shall be 5 feet tall and conform to Standard Specifications Section 724.03.02.
- Wire mesh shall be 2 inches x 2 inches x 14-gauge wire.
- Fabric shall be fastened to the posts in accordance with manufacturer's recommendations.

Installation

- Trenches shall not be excavated wider and deeper than necessary for proper installation of the temporary linear sediment barriers. Excavation of the trenches shall be performed immediately before installation of the temporary linear sediment barriers.
- The bottom of the silt fence shall be keyed-in the soil a minimum of 6 inches and form a "J" or an "L" up gradient below the soil surface.

- Construct silt fences with a setback of at least 10 feet from the toe of a slope. Where setback is not practical, the silt fence shall be constructed as far from the toe of the slope as practical to allow for equipment access for removal of accumulated sediment.
- Silt fence end posts shall be turned uphill to prevent stormwater from flowing around the edges.
- Attached silt fence fabric on the upslope side of the posts to withstand potential surface runoff and trap sediment.

Maintenance and Inspection:

Inspection

- Inspect for the depth of accumulated sediment.
- Inspect fabric for rips and tears.
- Inspect for areas of strained fabric.
- Verify that the fabric remains attached to the posts.
- Inspect for post stability.
- Inspect for signs of undercutting and confirm the fabric is keyed-in along the entire length.

Maintenance

- Repair undercut silt fences and re-key as needed.
- Repair or replace ripped, torn, slumping, or weathered fabric.
- Maintain silt fences to provide adequate sediment holding capacity. Sediment shall be removed when the sediment accumulation reaches one-half (1/2) of the fabric height. Sediment removal should occur more frequently if accumulated sediment is creating noticeable strain on the fabric and there is the possibility of the fence failing from a sudden storm event. Removed sediment can be utilized to repair slopes, or shall be incorporated in the project at locations designated by the Engineer or disposed of outside the highway right-of-way in conformance with NDOT Standard Specifications.
- Silt fences that are damaged and become unsuitable for the intended purpose shall be removed from the site, disposed of outside the highway right-of-way in conformance with NDOT Standard Specifications, and replaced with new silt fence barriers.
- Holes, depressions or other ground disturbance caused by the removal of temporary silt fences shall be backfilled and repaired in conformance with NDOT Standard Specifications.
- Remove silt fence when no longer needed. Fill and compact postholes and anchoring trench, remove sediment accumulation, as appropriate, and grade fence alignment to blend with adjacent ground.

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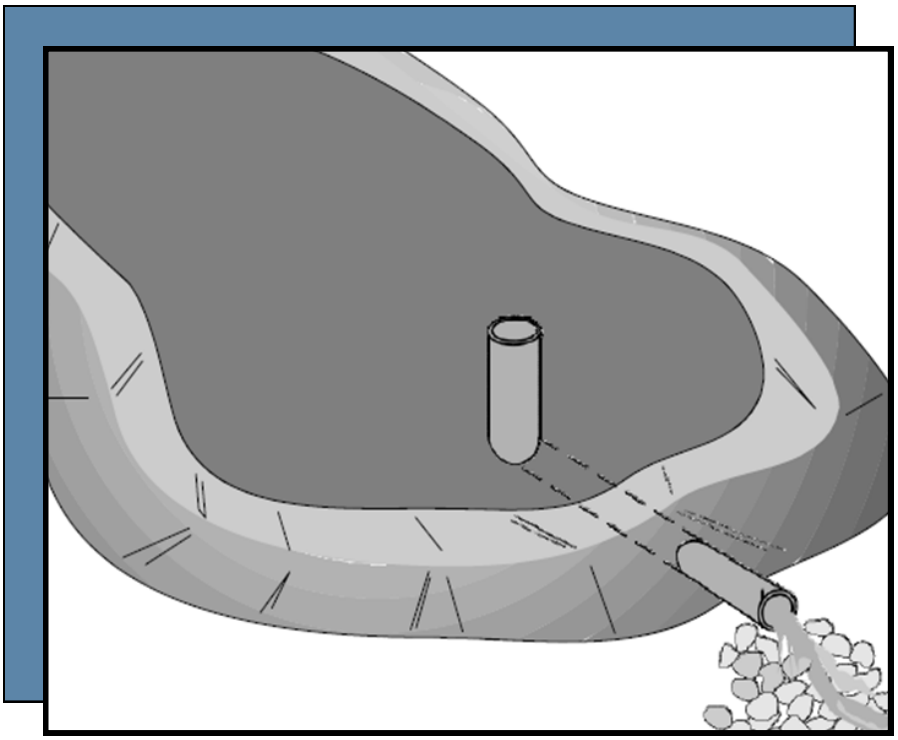
Temporary Sediment Basins

SC-02



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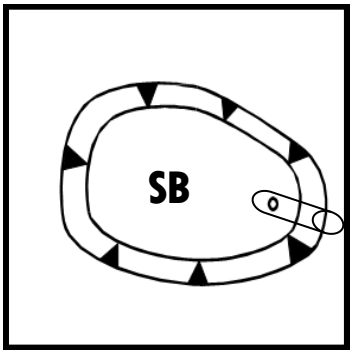

Description: Disturbed soils and sediments have an increased potential to migrate with stormwater runoff. A temporary sediment basin is formed by excavation and/or construction of an embankment to detain sediment -laden runoff under quiescent conditions and promote sedimentation prior to discharging the runoff. This practice does not include permanent detention basins that may be a part of the larger construction project itself. Note that temporary sedimentation basins are different from sediment traps, as described in BMP SC-03.

Application: Temporary sediment basins may be used:

- Used to intercept and treat sediment-laden stormwater from large drainage areas prior to discharge.

Limitations:

- Size may be limited by availability of right-of-way.
- Not to be located where failure will result in loss of life, damage to buildings/structures or roadway or utilities impairment.
- Use of mosquito abatement / vector control may be required.
- It is recommended to size basins for a drainage area of 5-10 acres; however, basins may be designed for drainage areas with an absolute maximum of 75 acres. For drainage areas greater than 75 acres it may be necessary to construct more than one sediment basin.
- Not to be located in dry stream beds or washes.
- Proper basin design may need to be performed by a licensed professional engineer.

- Basins need to be sized based on flowrate and sediment loading in order to be effective and in compliance with permits.

Design and Implementation:

- Temporary sediment basins are an excellent tool for use to remove sediments and protect water quality. Contractors need not be discouraged by permit regulations and the potential need for engineering support. Most erosion control specialists understand the implication, benefits and requirements related to temporary sediment basins.
- Contractors should note that sediment basins must be designed in accordance with Section 4.2 of the NV CGP, text below:

  "4.2.1 If sediment basins are installed the operator shall comply with the following design and maintenance requirements:

  4.2.1.1 Provide storage for either the calculated volume of runoff from a 2-year, 24-hour storm event for each disturbed acre drained, or 3600 cubic feet per acre drained;

  4.2.1.2 When discharging from the sediment basin, utilize outlet structures that withdraw water from the surface in order to minimize the discharge of pollutants, unless infeasible. If it is determined to be infeasible, support documentation shall be provided in the SWPPP.

  4.2.1.3 Prevent erosion of (1) the sediment basin using stabilization controls (e.g., rip-rap or erosion control blankets), and (2) the inlet and outlet using erosion controls and velocity dissipation devices;

  4.2.1.4 Sediment basins shall be situated outside of surface waters and any natural buffers established under Part 3.5.1; and

  4.2.1.5 Basins shall be maintained in effective operating condition and removal of accumulated sediment shall be conducted when design capacity has been reduced by 50%."

- Note that basins within the Lake Tahoe Basin may have a different sizing criteria (e.g, a 20-year/1-hour storm event).
- Limit the contributing area to the sediment basin to only the runoff from the disturbed soil areas. Use temporary concentrated flow conveyance controls to divert runoff from undisturbed areas away from the sediment basin.
- Sediment basins should be used in combination with appropriate soil stabilization controls (refer to EC BMP Fact Sheets).
- The length of the basin shall be more than twice the width of the basin. Length shall be determined by measuring the distance between the inlet and the outlet.
- It is recommended that the depth be no less than 3 feet and not greater than 5 feet.
- Embankments shall be constructed to be maintained and improved using materials such as clay, geomembranes, grout or cement.
- Basins with an impounding levee greater than 5 feet tall, measured from the lowest point of the impounding area to the highest point of the levee, and basins capable of impounding more than 36,000 ft^3, shall be designed by a professional Civil Engineer registered with the State of Nevada. The design shall include maintenance requirements, including sediment and vegetation removal, to ensure continuous function of the basin outlet and bypass structures.

- A Nevada Division of Water Resources permit is required to construct, reconstruct, or alter a dam that has a crest height 20 feet or higher, as measured from the downstream toe to the crest, or has a crest height less than 20 feet but will impound 20 acre-feet or more of movable material.
- Design and locate sediment basins so that they can be maintained. The basins shall be cleaned out when 50% of the storage capacity is occluded (filled). This means that a backhoe or excavator may need access to the basin. The design must take maintenance need in consideration.
- Construct sediment basins prior to the rainy season and soil disturbing activities.
- Sediment basins, regardless of size and storage volume, must include features to accommodate overflow or bypass flows that exceed the design storm event.
- In general, basins should be designed to drain within 72 hours following storm events. This consideration is based on vector and mosquito abatement for standing water. Design for appropriate local percolation rates or historical events.
- Adhere to local vector control design considerations where appropriate.
- The outflow from the sediment basin shall be provided with outlet protection to prevent erosion and scouring of the embankment and channel. Refer to BMP EC-15 Outlet Protection/Velocity Dissipation Devices.
- Basins shall be located: (1) by excavating a suitable area or where a low embankment can be constructed across a swale, (2) where post-construction (permanent) detention basins will be constructed, (3) where failure would not cause loss of life or property damage, and (4) where the basins can be maintained on a year-round basis.
- Areas under embankments, structural works, and sediment basin must be cleared and stripped of vegetation in accordance with Standard Specifications Section 201 Clearing and Grubbing.
- Earthwork shall be in accordance with Standard Specifications Section 203 Excavation and Embankment.
- Rock or vegetation should be used to protect the basin inlet and slopes from erosion.
- Large basins should have a "forebay" - a pre-settling basin or plunge pool constructed at the inlet of the basin to facilitate the removal (via sedimentation) of debris and larger particles.
- The principal outlet shall consist of a corrugated metal, high density polyethylene (HDPE), or reinforced concrete riser pipe with dewatering holes and an anti-vortex device and trash rack attached to the top of the riser, to prevent floating debris from flowing out of the basin or obstructing the system. This principal structure shall be designed to accommodate the design storm inflow.
- Outlet structure shall be placed on a firm, smooth foundation with the base securely anchored with concrete or other means to prevent floatation.
- Attach riser pipe (watertight connection) to a horizontal pipe (barrel) that extends through the embankment to toe of fill. Provide anti-seep collars on the barrel.
- Provide anti-seep collars on the barrel that are designed to increase the effective length along the outside of the barrel by 10%. Collars should project a minimum of 1.5 feet radially outward from the outside of the pipe. Ensure that adequate cover is provided for the anti-seep collars. Cleanout level shall be clearly marked on the riser pipe.
- Temporary construction site sedimentation basins are typically unlined basins and largely function as infiltration or evaporation basins when not overflowing. Be mindful of this. Direct only natural, disturbed soil surface flow to these basins. Do not direct flows from potentially hazardous material storage areas or fueling areas to unlined temporary sedimentation basins. Use secondary containment procedures for materials locations.

- Standing water can be an "attractive nuisance" and attract public activity like swimming. Unless otherwise directed by NDOT's Engineer, barbed wire and public postings (e.g. like "No Trespassing" or "Swimming Not Allowed") must be provided around each sediment basin to prevent unauthorized entry. Fencing may be required in accordance with NDOT Standard Specifications Sections 616 "Fencing and 724 Fence Materials".

Maintenance and Inspection:

- Inspect temporary sediment basins after rainfall events and maintain as appropriate.
- Examine basin banks for seepage and structural soundness.
- Check inlet and outlet structures and spillway for any damage or obstructions. Repair damage and remove obstructions as needed.
- Check inlet and outlet area for erosion and stabilize if required.
- Frequently examine the basin for any design deficiencies, such as short circuiting and preferential (visible) flow, bank erosion, inlet or outlet scouring, overflow surcharges, high or low flow inadequacies, sediment accumulations, etc.
- Remove accumulated sediment when the designed basin storage volume reaches one-half (1/2) the volume. Properly dispose of sediment and debris removed from the trap in accordance with NDOT Standard Specification Section 107.
- Check the perimeter fencing for damage and repair as needed.
- Follow any applicable Nevada design and safety regulations where applicable (consult a Nevada licensed Civil Engineer-do not defer to NDOT or NDEP as implicit acceptance of any design elements of the SWPPP).
- Design parameters shall be consistent with the American Association of State Highway and Transportation Officials (AASHTO) Drainage Manual (current edition); exceptions require approval from NDOT's Hydraulics Section or Stormwater Division.

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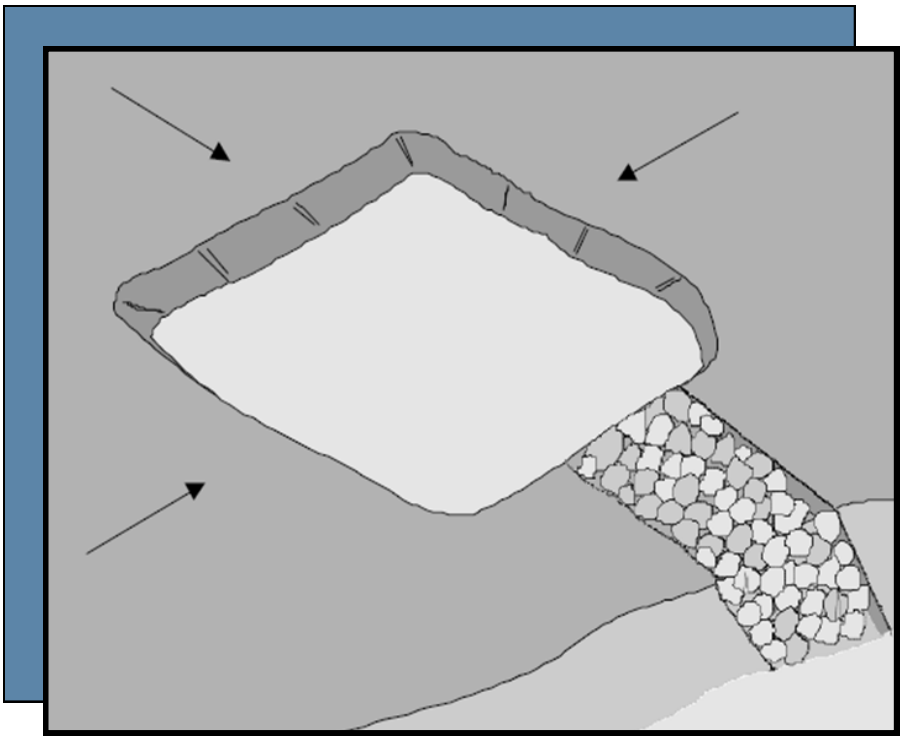
Sediment Trap

SC-03



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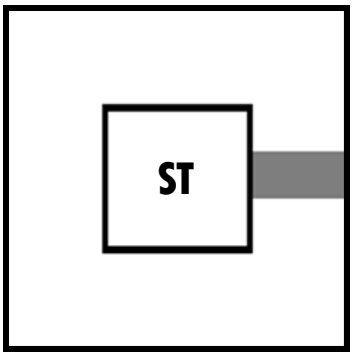

Description: Through the construction process, disturbed soils and sediments have the potential to migrate due to erosion and/or runoff. A sediment trap provides temporary runoff containment that facilitates sedimentation and infiltration before the runoff is discharged through a stabilized spillway. Sediment traps are formed by excavating a temporary depression or hole where runoff can be directed and settled.

Application:

- Used to intercept and treat sediment-laden stormwater from small drainage areas prior to discharge.

Limitations:

- Appropriate for drainage areas 5 acres or less.
- Typically, only removes large and medium sized particles.
- Sediment traps shall not be located in streams.
- Size may be limited by availability of right-of-way.
- May create a mosquito habitat.

Design and Construction:

- Construct sediment traps prior to soil disturbing activities and during dry weather.

- Traps shall be sized to accommodate a settling zone and sediment storage zone. The 2-year/24-hour rain event shall be used for temporary sediment trap sizing, unless working in the Lake Tahoe Basin, where the 20-year/1-hour event shall be used.
- The minimum recommended volumes for settling and sediment storage are 67 yd^3/acre and 33 yd^3/acre of contributing drainage area, respectively. These minimum volumes are based on 0.5 inches over a 24-hour period. Multiple traps and/or additional volume may be required to accommodate site-specific rainfall and soil conditions.
- Earthwork shall be in accordance with Standard Specifications Section 203 Excavation and Embankment. Side slopes shall not be steeper than 2:1.
- Areas under embankments, structural works, and sediment traps shall be cleared and stripped of vegetation in accordance with Standard Specifications Section 201 Clearing and Grubbing.
- Fencing, in accordance with Standard Specifications Section 616 Fencing, shall be provided to prevent unauthorized entry.
- The outflow from the sediment basin shall be provided with outlet protection to prevent erosion and scouring of the embankment and channel. Refer to BMP EC-15 Outlet Projection/Velocity Dissipation Devices.
- Must be removed and the area restored at the completion of the project.
- To limit vector disease issues (April—September), the sediment trap shall drain within 72 hours. If captured runoff has not completely infiltrated with 72 hours, the sediment trap should be dewatered.
- Adhere to local vector control design considerations where appropriate.

Maintenance and Inspection:

- Maintain the depth of the spillway to ensure it is a minimum of 1.5 feet below the low point of the embankment.
- Inspect outlet structure and spillway for any damage, erosion, or obstructions. Repair damage eroded areas and remove obstructions as needed.
- Inspect outlet area for erosion and stabilize if required.
- Remove accumulated sediment when the volume has reached one-half the original trap volume or designed storage volume.
- Properly dispose of sediment and debris removed from the trap according to Standard Specifications Section 107.
- Inspect fencing for damage and repair as needed.

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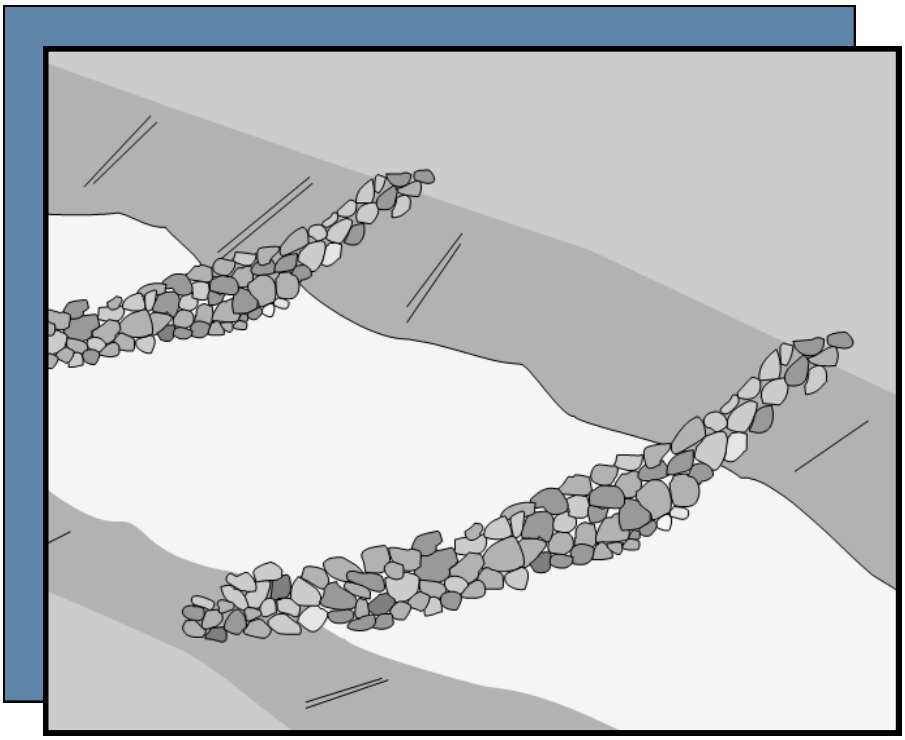
Check Dams

SC-04



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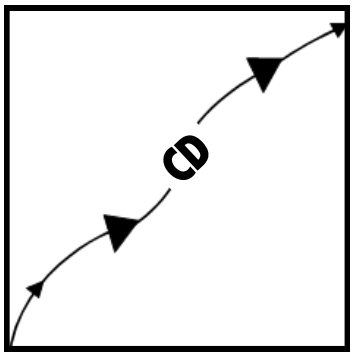

Description: Check dams consist of small dams, placed at regular intervals, across a ditch or channel to reduce flow velocities and scour potential. Check dams promote sediment deposition and are typically constructed of rock, gravel bags, or sediment logs.

Application:

- Check dams are intended for use in low to moderate stormwater flow channels.
- Check dams may be installed in the following:
  - ◊ Small open channels that drain 10 acres or less.
  - ◊ Channels constructed in erosive soils.
  - ◊ During the establishment of grass linings in drainage ditches or channels.
  - ◊ Temporary ditches where the short length of service does not warrant establishment of erosion-resistant linings.
- Sediment logs are suitable as check dams for channels with very low flow rates. Gravel bags or rock material are more appropriate in moderate flow channels.

Limitations:

- Not to be used in streams or washes.
- Not appropriate in channels that drain areas greater than 10 acres.
- Not to be placed in channels that are already grass or vegetation lined unless erosion is expected (installation may damage existing vegetation).

Design and Implementation:

- Check dams shall be placed at a distance and height to allow small pools to form. Install the first check dam approximately 16 feet downstream of the outfall to the channel and at regular intervals based on slope gradient and soil type.
- Check dams shall be constructed with adequate spillway dissipator aprons, and with adequate tie-ins to the channel banks, and in a manner that protects the channel and structure during times of peak flow. It is recommended that spillways be 1/3 lower in elevation than the sides to prevent scouring along the channel.
- For multiple check dam installation, backwater from downstream check dam shall reach the toe of the upstream dam. Typically the base of the upstream dam is the same elevation as the top of the next downstream dam.
- At a minimum, check dams shall be designed to treat the 2-year/24-hour storm event without an increase in upstream flooding or damage to the check dam.
- Where grass is used to line ditches, check dams shall be removed when grass has matured sufficiently to protect the ditch or swale.
- Rock shall be installed in a manner that achieves complete ditch or swale coverage.
- Not to be constructed from a silt fence.
- Riprap material and placement shall conform to Standard Specifications Sections 610 and 719 (Riprap).

Materials

- **Sediment Logs:** Sediment log materials shall conform to BMP SC-05 Sediment Logs.
- **Gravel Bags:** Gravel bags and fill material shall conform to BMP SC-06 Gravel Bag Berm.
- **Rock Size for Check Dams:** Rock gradation shall conform to the table below, or be designed by a Nevada registered Professional Engineer . "Slope" in the table is to be the average channel slope in the vicinity of the check dam. Check dams with rock selected from this table shall not exceed 2 feet in height. Check dams higher than 2 feet or with depth times slope greater than 0.032 foot/foot shall be designed by a Nevada registered Professional Engineer.

Rock Designation	D50	Max Flow Depth (ft) x Slope (ft/ft)
Riprap Bedding	3"	up to 0.016
150 Riprap	6"	0.017 to 0.032

Installation

- Sediment logs shall be installed per BMP SC-05 Sediment Logs.
- Gravel gags shall be installed per to BMP SC-06 Gravel Bag Berm.
- Tightly abut bags and stack according to the detail below. Gravel bags shall not be stacked higher than 3 feet.
- For long-term rock check dams, installations (over one year), key the rock into the channel banks and extend it beyond the abutments a minimum of 18 inches to prevent flow around the dam.

- Install along a level contour.

Maintenance and Inspection:

- Repair damage to the check dam as needed.
- Remove sediments when depth reaches 50% of the check dam height. Removed sediment shall be incorporated in the project at locations designated by the Engineer or disposed of outside the highway right-of-way in conformance with the Standard Specifications Section 107.
- Check for erosion around the edges of the check dam and at the spillways. Adjust the dimensions of the check dam as needed and repair all eroded areas.
- Maintain sediment logs per BMP SC-05 Sediment Logs.
- Maintain gravel bags per BMP SC-06 Gravel Bag Berm.

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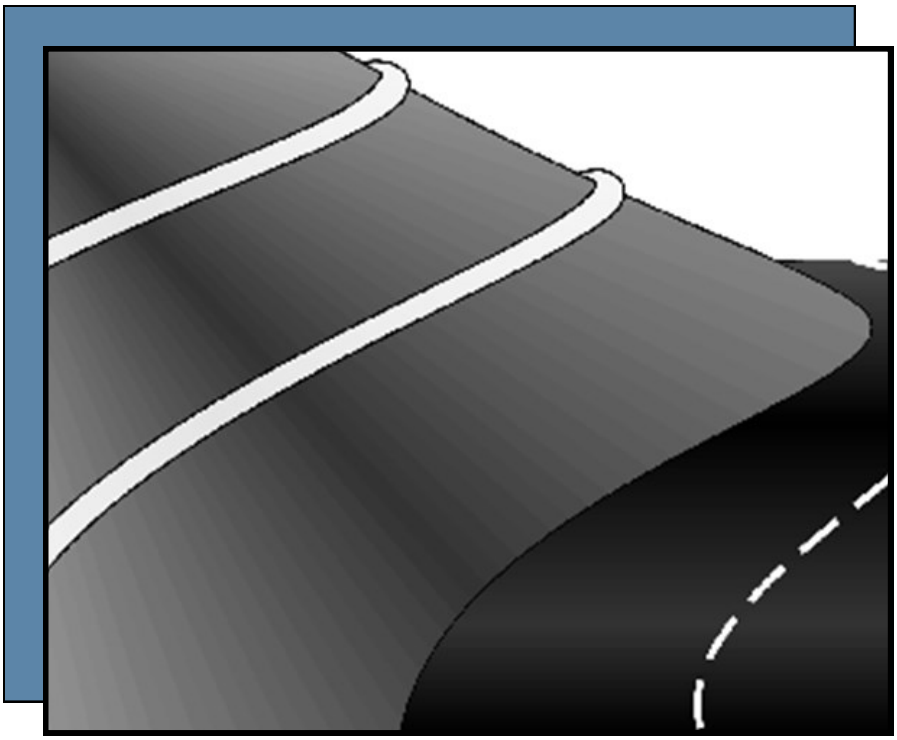
Sediment Logs

SC-05



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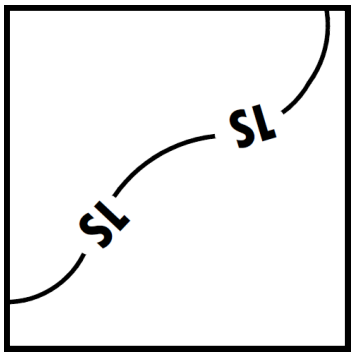

Description: Sediment logs consists of wood excelsior, rice straw, wheat straw, or coconut fibers that are rolled or bound into a tight roll and placed on the toe or the face of slopes to intercept runoff, reduce its velocity, release the runoff to sheet flow, and provide removal of sediment from the runoff. Sediment Logs are also alternatively known as: straw wattles, fiber rolls, fiber roll barriers, coir rolls or coir logs.

Application:

- Along the perimeter of a site or work area.
- Along the toe, top, face, and at grade breaks of exposed and erodible slopes to shorten slope length and maintain sheet flow conditions.
- To minimize the concentration of flow that might cause rill erosion.
- Below the toe of exposed and erodible slopes.
- Used as check dams in unlined ditches.
- Down-slope of exposed soil areas.
- Around temporary stockpiles.

Limitations:

- Do not use sediment logs on slopes subject to creep, slumping, or landslide.
- Not suitable for applications where "ground-log" contact is insufficient.

Design and Implementation:

Sediment Log Materials

- Sediment logs shall be either:
  - ◊ Prefabricated rolls; or,
  - ◊ Rolled tubes of erosion control blanket.
- Plant-derived materials shall be certified weed free.
- Sediment logs shall be bound with 100% biodegradable natural fiber netting.

Assembly of Field Rolled Sediment Log

- Erosion control blanket shall be rolled into a tube with a minimum diameter of 8 inches..
- Bind roll at each end and every 4 feet along length of roll with jute-type twine or other 100% biodegradable natural fiber.

Installation

- Slope inclination of 4:1 or flatter: place sediment logs no more than 20 feet apart.
- Slope inclination of 4:1to 2:1: place sediment logs no more than 15 feet apart.
- Slope inclination greater than 2:1: place sediment logs no more than 10 feet apart.
- Sediment logs at the toe of slopes greater than 5:1 shall be a minimum of 20 inches in diameter.
- Key sediment logs into the ground a minimum of one-third their diameter.
- Anchor sediment logs with stakes at the ends and every 4 feet or less.
- Sediment logs placed on impervious surfaces for inlet protection must be adequately weighted down to prevent runoff from passing beneath the roll.
- Use wood stakes with a nominal classification of 3/4 inches by 3/4 inches, and minimum length of 24 inches (Type 1 installation), and 1 by 1 ½ inches by minimum length of 24 inches (Type 2 installation).
- If more than one sediment log is placed in a row, the rolls shall be overlapped, not abutted.
- Install along level slope contour and perpendicular to water flow.
- Turn the terminal ends of the fiber roll upslope to prevent runoff from flowing around the roll.
- In areas designated for revegetation, sediment logs shall remain in place during reseeding efforts.

Removal

- When used in reseeded areas, sediment logs are to remain and biodegrade in place.
- If sediment logs 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.

Maintenance and Inspection:

- Inspect for split, torn, unraveling, or slumping sediment logs. Repair or replace as necessary.
- Maintain sediment logs to provide an adequate sediment holding capacity. Sediment shall be removed when the sediment capacity reaches 50% of the non-keyed in portion of the sediment log.

- Removed sediment shall be incorporated in the project or disposed of outside the highway right-of-way in conformance with the Standard Specifications Section 107.

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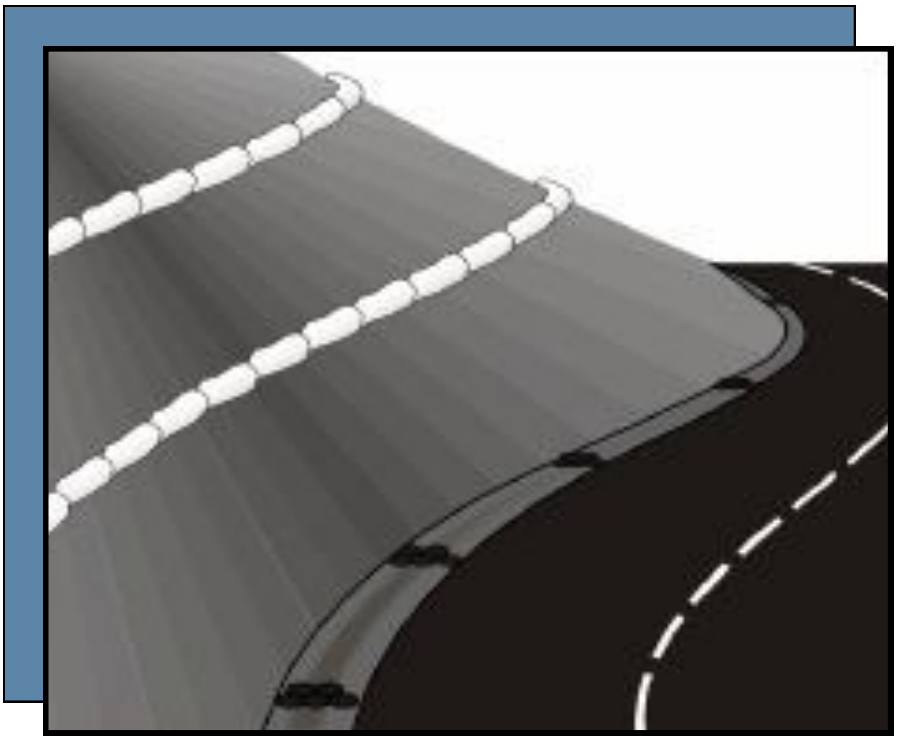
Gravel Bag Berm

SC-06



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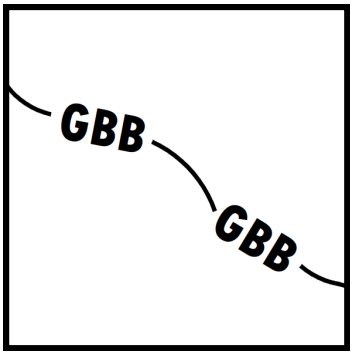

Description: Gravel bag berms form a barrier to intercept runoff, reduce water velocity and provide sediment removal. Gravel bags are stackable and unlike sediment logs, do not need to be staked, weighted or keyed-in.

Application:

- Along the perimeter of a site.
- Along streams and channels.
- At the toe of exposed and erodible slopes.
- Across the slope of exposed soil areas.
- Around stockpiles.
- Where flows are moderately concentrated, such as ditches, swales, and storm drain inlets.
- Across channels in constructing check dams or temporary diversions.
- Parallel to a roadway to keep sediment off paved areas.
- At the top of slopes to divert runoff away from disturbed slopes.
- To divert or direct flow or create a temporary sediment basin.
- When conditions require a more durable product than sediment logs.
- When site conditions or construction sequencing require adjustments or relocation of the barrier to meet changing field conditions.

- At grade breaks of exposed and erodible slopes to shorten slope length and spread runoff as sheet flow.

Limitations:

- Gravel bags can be subject to ripping and tearing.

Design and Implementation:

Materials

- **Bag Material:** Bags shall be woven polypropylene, polyethylene or polyamide fabric or burlap, minimum unit weight 4 ounces/yd^2, Mullen burst strength exceeding 300 psi in conformance with the requirements in ASTM designation D3786, and ultraviolet stability exceeding 70 percent in conformance with the requirements in ASTM designation D4355. (Caltrans, 2003b).
- **Bag Size:** Each gravel-filled bag shall have a length of 18 inches, width of 12 inches, thickness of 3 inches, and mass of approximately 33 pounds. Bag dimensions are nominal, and may vary based on locally available materials. It should be noted that burlap bags tend to deteriorate and are less durable than woven polyethylene.
- **Fill Material:** Fill material shall be 1 inch minus washed and well graded gravel or crushed rock with less than five percent fines, such as Class 150 Riprap Bedding.

Installation

- When used as a linear control for sediment removal:
  - ◊ Install along the contour of a slope at a constant elevation.
  - ◊ Turn ends of gravel bag row up slope to prevent runoff from escaping around the ends.
- When used for concentrated flows:
  - ◊ Stack gravel bags to a maximum height of 3 feet and maximum side slopes of 1:1, using a pyramid approach.
  - ◊ Upper rows of gravel bags shall overlap joints in lower rows.
- Construct gravel bag barriers with a setback of at least 3 feet from the toe of a slope. Where it is not practical due to specific site conditions, the gravel bag barrier may be constructed at the toe of the slope, but shall be constructed as far from the toe of the slope as practical to allow for maintenance access.
- Trenching or keying-in of bags is generally not necessary since the bags are heavy and flexible enough to prevent underflow.

Maintenance and Inspection:

- Reshape or replace gravel bags as needed.
- Repair washouts or other damages as needed.
- Inspect gravel bag berms for sediment accumulations and remove when sediment accumulation reaches one-half (1/2) of the berm height. Removed sediment shall be incorporated in the project

at locations designated by the Engineer or disposed of outside the highway right-of-way in conformance with the Standard Specifications Section 107.

- Remove and properly dispose of gravel bags when no longer needed. Remove sediment accumulations, and clean, re-grade, and stabilize the area.

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Street Sweeping and Vacuuming

SC-07

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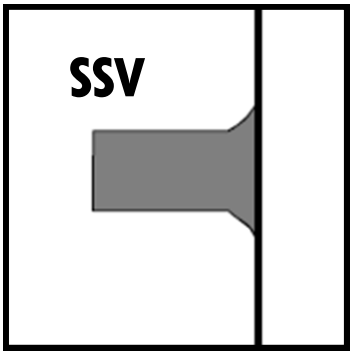

Description: Throughout construction, sediment can be tracked out from the project area and onto paved areas or adjacent streets. Street sweeping and vacuuming removes the accumulations of sediment from the pavement before it can enter a storm drain or waterway.

Application: Implement at locations, e.g. ingress/egress locations, where sediment or other materials can migrate from the project area onto adjacent paved surfaces.

Limitations:

- Not a practical BMP for non-paved areas.
- May not be effective when the deposits are excessive or wet.
- Dust emissions from sweeping can pose a visibility problem.
- Local air quality regulations may dictate sweeping implementation.

Implementation:

- Develop and implement a schedule for regular sweeping activities. The need for sweeping should be assessed daily.
- Regularity inspect paved surfaces for any buildup of soil or sediments. Adjust the sweeping schedule and frequency where necessary.
- Adjust sweeping needs based on-site related activities as necessary.

- Consider the need for a different type of sweeper (i.e., mechanical broom, regenerative air, pure vacuum, waterless and water dust control regenerative, etc.) if the pavement cleanup is not effective.
- Store any captured sweepings on-site in a contained area and covered in the event of wind or rain.
- Minimize the time that sweeping piles are on-site. Haul sweepings frequently off-site for proper disposal.
- The use of water may be necessary to limit dust emissions from the use of dry rotary brushes.
- When wash water is used to aid in sweeping, any water must be captured (e.g., vacuum sweeper) and properly disposed of.
- Do no not sweep up unknown substances or any object or material that may be potentially hazardous.

Maintenance and Inspection:

- Inspect construction access points daily and clean up track out in accordance with Standard Specifications Section 107.
- Adjust brooms frequently to maintain proper contact with the ground and maximize efficiency of sweeping operations.
- All inlet protection BMPs shall be inspected and maintained after street sweeping activities to correct any that were displaced.
- After sweeping is finished, properly dispose of sweeper wastes in conformance with the provisions in Standard Specifications Section 107.

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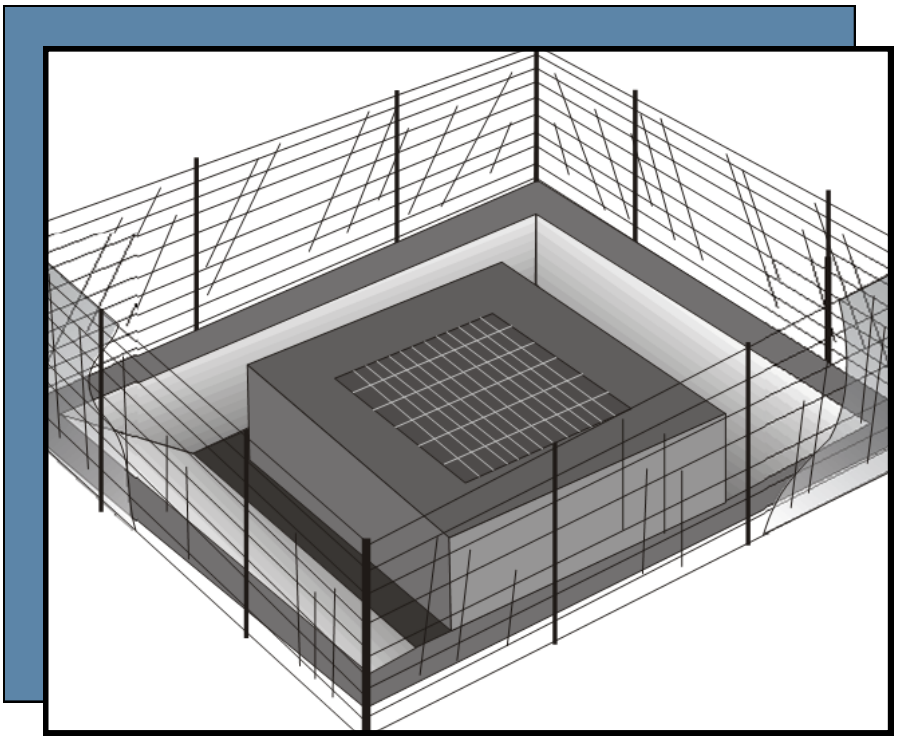
Storm Drain Inlet Protection

SC-08



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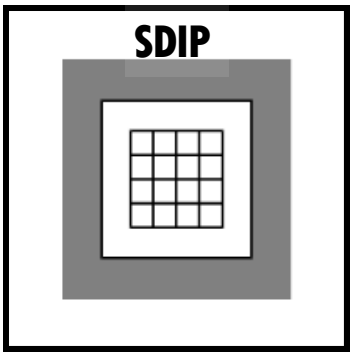

Description: BMPs must be implemented when working near inlets to minimize the potential for site generated debris or sediments to enter the storm drain system. There are numerous techniques, devices and methods used to protect storm drain inlets, ranging from gravel bags, inlet filter sacks, pads, and silt fencing. Inlet protection is a temporary BMP intended to keep sediment and debris from entering the storm sewer system until construction activities are complete. Inlet protection is the last line of defense to preventing sediment and debris from entering the storm sewer system; therefore it is necessary to implement appropriate erosion and sediment control measures within inlet drainage areas as appropriate.

Application: This practice is to be implemented where there is an inlet to the storm sewer system that has the potential to receive sediment or other debris from a construction site. An inlet is typically in the form of a standard drop inlet (DI) , but may include curb cuts, grates, drainage and overflow structures.

Limitations:

- Inlet protection measures can result in ponded water on the roadway. Poorly drained roadways and standing water may present a hazard to drivers. Inlet protect should be pulled during larger events to minimize this risk.
- Should upstream erosion and/or sediment controls be inadequate, inlet protection measures may become overwhelmed with sediment and debris.
- Local regulations may dictate the use of inlet protection measures.

Design and Construction: Identify storm drain inlets with potential to receive stormwater runoff. Determine if storm drain inlet protection is needed, and which type of device to install.

- For drainage areas larger than 1 acre, runoff shall be routed to a sediment-trapping device designed for larger flows.
- Filter fabric fence inlet protection is appropriate in open areas subject to sheet flow and for flows less than 0.5 ft^3/s.
- Gravel bag barriers for DI protection are recommended. Sediment logs should not be used for DI protection unless effectively weighted/anchored down to provide sufficient contact with the underlying surface.
- Excavated drop inlet sediment traps are appropriate where relatively heavy flows are expected and overflow capability is needed. This method shall be used for drain inlets requiring protection in areas where finished grade is established.

Common Inlet Protection Applications

- **Silt Fence Inlet Protection:** Silt fencing can be used to protect inlets in applications where the surrounding area is unpaved. Install silt fencing around the perimeter of the inlet allowing for slope and toe constraints listed in BMP SC-01 Silt Fence. Do not use silt fencing as filter fabric underneath the inlet grate itself.
- **Excavated DI Sediment Traps:** An excavated drop inlet sediment trap is a dug basin or sediment trap surrounding an inlet and applicable to areas within the construction site that are unpaved. Size the excavated trap to provide a minimum storage capacity calculated at the rate of 67 yd^3/acre of drainage area.
- **Gravel Bag DI Barriers:** Grave bag barriers are recommended common roadway DI protection. The objective of this BMP is to slow the flow and allow simple sedimentation behind the gravel bags (see BMP SC-06, Gravel Bag Berms). Gravel bags should be placed in a manner that slows and detains most small stormwater events with no short circuiting.
- **Vendor Products:** Many proprietary devices and products are available for storm drain inlet protection. If used, these products shall be installed and maintained per the manufacturer's recommendations.

Requirements:

- Inlet protect shall be implemented in a manner that avoids ponding and encroachment upon highway traffic or adjacent property.
- Inlet protection measures may need to be remove during high runoff events.
- Remove and properly dispose of all inlet protection devices after the site is stabilized, or when inlet protection is no longer needed.
- Bring the disturbed area to final grade, and smooth and compact the area in accordance with the construction drawings. Stabilize, as appropriate, all disturbed areas around the inlet.
- Removed sediment shall be incorporated in the project or disposed of outside the highway right-of-way in conformance with Standard Specification Section 107.

Maintenance and Inspection:

- Inspect areas for adequate drainage.
- Ensure inlet protection measures are not impacting motorist traffic.
- Accumulated sediment and debris is removed and disposed of accordingly.
- Maintain silt fence per BMP SC-01 Silt Fence.

- Maintain gravel bags per BMP SC-06 Gravel Bag Berm.
- Maintain vendor products per manufacturer's recommendations.
- Remove sediment from the excavated drop inlet sediment trap when the volume of the trap has been reduced by one-half (1/2).

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Tracking Controls (TC)

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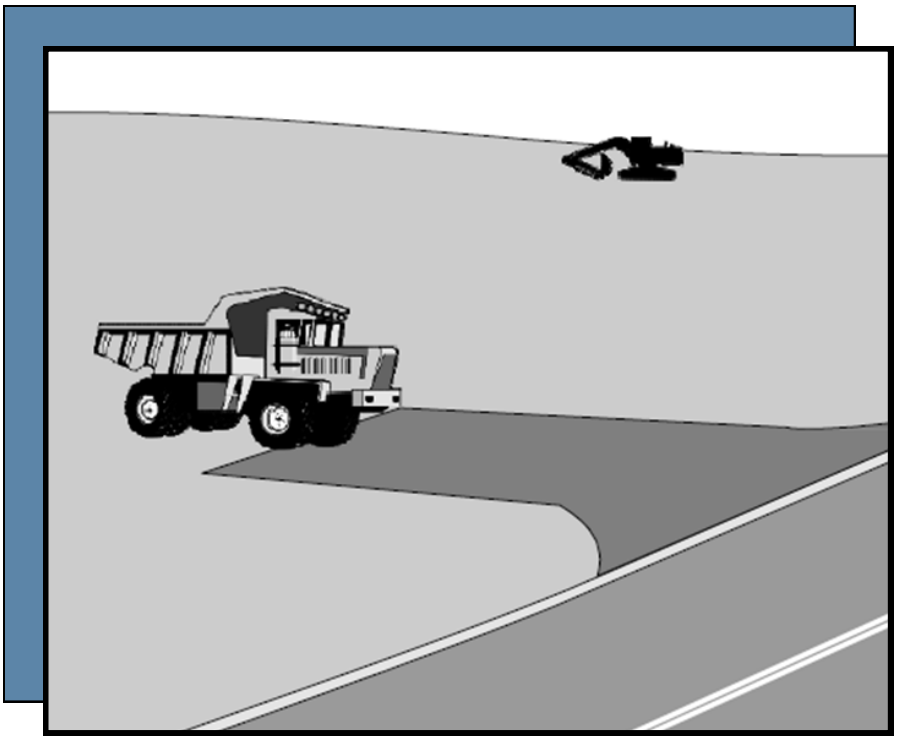
Stabilized Construction Approaches

TC-01



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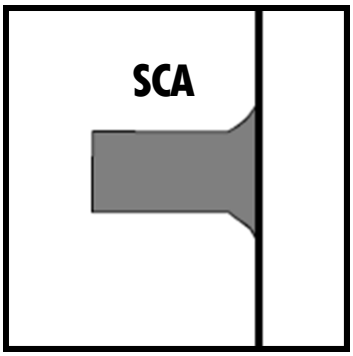

Description: A stabilized construction approach is a defined point of access to enter or exit a construction site that is stabilized to reduce the tracking of mud and dirt onto adjacent roads by construction vehicles and equipment. Examples include: aggregate pads, steel plates with ribs (i.e. wheel shakers), and wash racks.

Application: Construction projects where sediment and other materials have the potential to be tracked off-site.

Limitations: Site conditions will dictate the actual design.

Design and Construction:

- Designate dedicated entrances and exits, and require all construction traffic to use these points of access.
- Install signs directing traffic to the designated approaches.
- Limit vehicle speeds on all unpaved routes and parking areas to limit dust generation.
- Properly grade construction entrances and exits to prevent runoff from flowing onto paved roads.
- Avoid siting exits at dips, low spots, and areas that remain wet after precipitation.
- Route runoff from stabilized approach to designated areas and retain the runoff on-site.
- Design stabilized approaches to support the heaviest anticipated vehicles and equipment.
- Stabilized approaches should be a minimum of 15 feet wide by 50 feet long (or the length of the longest haul truck, whichever is greater). Aggregate material shall be 6 inches deep and consist of Class 150 riprap bedding (larger size class riprap bedding may be used as necessary). Riprap

bedding shall be in conformance with Standard Specification Section 719. Geotextile shall be placed under the aggregate material.

- Install wheel shakers consisting of constructed/manufactured steel plates with ribs. Ribbed or corrugated steel plates must be manufactured to support all expected vehicle/equipment loads.
- Wheel shakers with less than 4 inches of soil storage space below the top of the rack should be installed over 6 inches of coarse aggregate.
- Refer to BMP TC-03 Entrance/Outlet Tire Wash) for guidance pertaining to wheel washers.

Maintenance and Inspection:

- Inspect daily for damage and to assess BMP effectiveness.
- Remove aggregate, separate, and dispose of sediment if aggregate becomes laden with sediment. Add additional aggregate when needed.
- Maintain wheel washers per BMP TC-03 Entrance/Outlet Tire Wash.
- Inspect roadways for tracked materials daily and remove/dispose in accordance with Standard Specification Section 107.

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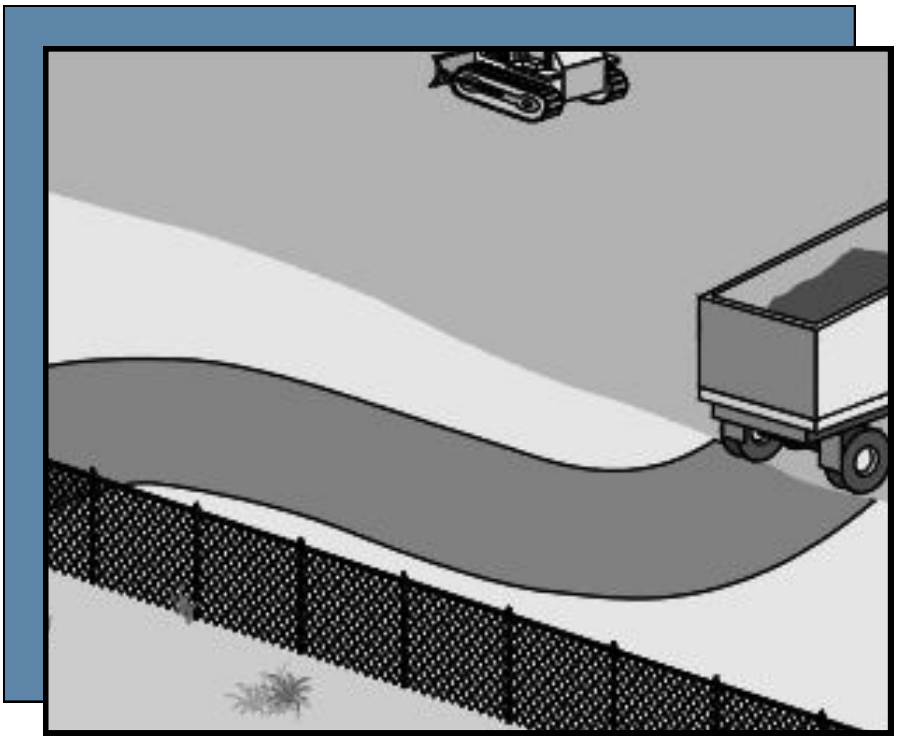
Stabilized Construction Roadway

TC-02



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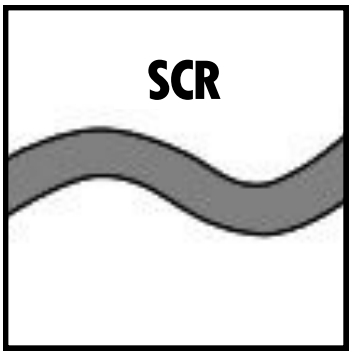

Description: Construction sites may require temporary roadways to facilitate the movement of materials and equipment. Temporary construction roadways shall be designed, used, and stabilized to minimize erosion and the off-site migration of sediments.

Application: Temporary construction and short-term roadways must be stabilized when:

- Wet weather is anticipated.
- Dust is a problem during dry weather.
- Adjacent to a nearby waterway, or the potential to discharge into a waterway.
- Silt and/or clay content is high, causing roadways to become slick with small amounts of moisture.
- Instances where additional traction is needed (e.g. steep grades).

Limitations:

- Dust Control and/or construction stormwater discharge permits may dictate implementation.
- Soil physical properties, i.e. texture, will dictate the type of chemical stabilizer used.

Design and Implementation: The following criteria should be considered when constructing temporary construction roadways:

- Roadway should be graded to effectively direct runoff away from the roadway; however, runoff should be prevented from leaving the construction site.

- Runoff is to be directed through appropriate sediment control measures prior to discharging offsite.
- Design stabilized construction roadways to support the heaviest vehicles and equipment that will use it.
- Stabilize roadways using water, dust palliative, aggregate, asphalt concrete, or concrete; based on required longevity, performance, and site conditions.
- Chemical stabilizers shall be appropriate for the soil type and texture. The use of cationic treatment chemicals is prohibited on NDOT projects and within NDOT's right-of-way.
- If aggregate is selected, use clean, well-graded gravel or crushed rock in conformance with Class 150 riprap base (larger size class riprap base may be used as necessary). Recommended dimensions are 15 feet wide by 6 inches deep, or as needed to accommodate the roadway footprint and the types of vehicles that will use the road.
- Limit vehicles speeds on all unpaved routes and parking areas to limit dust generation. The use of bumps or dips for speed control is encouraged.
- Apply bituminous or concrete paving as soon as possible to all permanent roadway or parking areas.
- Adhere to dust control permit requirements.
- When no longer required, remove stabilized construction roadway and re-grade and restore areas to match site conditions, or restore to pre-construction conditions as appropriate and/or as directed.

Maintenance and Inspection:

- Inspect daily for damage and repair as needed.
- Maintain the stabilized roadway (replace gravel/crushed rock, re-grade to correct drainage problems, etc.) as needed.
- Keep all temporary roadway ditches clear and functional.

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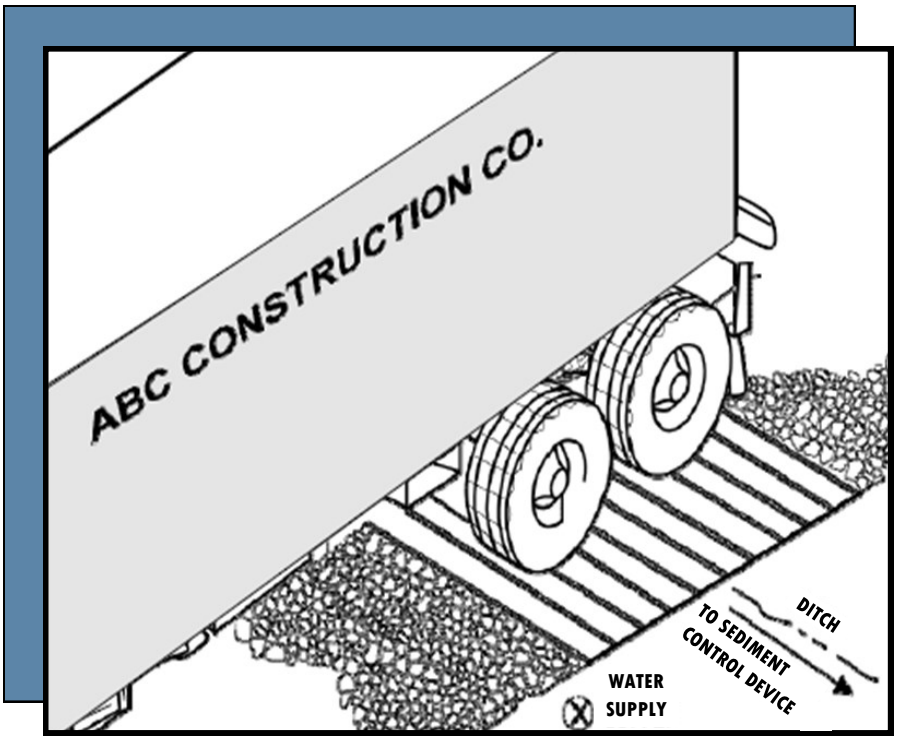
Entrance/Outlet Tire Wash

TC-03



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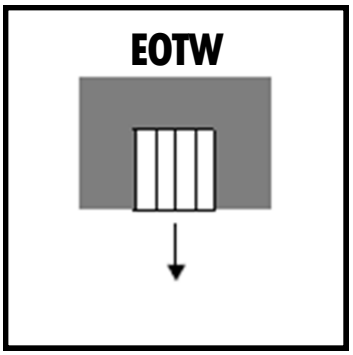

Description: Tire wash stations are installed at construction approaches to remove sediment from tires and under-carriages, reducing the potential for track-out.

Application:

- Tire washes may be used on construction sites where dirt and mud tracking onto paved areas by construction vehicles may occur.
- This BMP may be appropriate when there is insufficient space for appropriately designed stabilized construction approaches BMPs or for sites with mud that will adhere to the tires or equipment body.
- Tire and vehicle washing may also be required to prevent the spread of noxious weeds. Refer to the contract documents to verify compliance with noxious weed requirements.

Limitations:

- Requires a supply of wash water. Potential sources include existing water service connections if available, fire hydrants, or temporary water storage tanks. The contractor shall obtain approval from the water purveyor or agency prior to using water from a public water system. Always obtain approval from the fire department or water purveyor before using a fire hydrant.
- Requires a turnout or doublewide exit to avoid having entering vehicles drive through the wash area.
- The discharge of wash water containing reclaimed or other wastewater, soaps, detergents, solvents, oils, grease, or fuels is prohibited.

Design and Implementation:

- Utilize this BMP in conjunction with BMP TC-01 Stabilized Construction Approaches.
- Construct on level ground when possible, on a pad of coarse aggregate. A geotextile fabric shall be placed below the aggregate.
- Design the tire wash area for anticipated traffic loads.
- Provide a drainage ditch that will convey the runoff from the wash area to a sediment-trapping device (See BMP SC-03 Sediment Trap). The drainage ditch shall be of sufficient grade, width, and depth and adequately stabilized to safely carry the wash runoff.
- The tire wash area should be graded to properly contain the wash water within the tire wash station.
- Be sure the tire wash station is far enough from the road to allow washing of the rear wheels without the front end of the vehicle impeding traffic in the road.
- Require all employees, subcontractors, and others to use the wash facility as appropriate.
- Tire wash water shall be contained and not allowed to discharge off-site.

Maintenance and Inspection:

- Remove accumulated sediment in the tire wash area and/or sediment trap to maintain system performance and dispose of sediments in accordance with Standard Specifications Section 107.
- Inspect daily for damage and repair as needed.
- Inspect roadways for tracked materials and remove in accordance with Standard Specifications Section 107.

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Section 5 – References

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Appendix A

NDEP's 2015 Stormwater Construction General Permit (NVR100000)

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NVR100000

STATE OF NEVADA
DIVISION OF ENVIRONMENTAL PROTECTION

PERMIT FOR
STORMWATER DISCHARGES ASSOCIATED WITH LARGE CONSTRUCTION ACTIVITY, SMALL CONSTRUCTION ACTIVITY AND INDUSTRIAL ACTIVITY FROM TEMPORARY CONCRETE, ASPHALT AND MATERIAL PLANTS OR OPERATIONS DEDICATED TO THE PERMITTED CONSTRUCTION PROJECT

AUTHORIZATION TO DISCHARGE

In compliance with the provisions of the federal Water Pollution Control Act as amended (33 U.S.C. 1251 et seq: the "Act") and Chapter 445A of the Nevada Revised Statutes (NRS), eligible dischargers have submitted: 1) a Notice of Intent and filing fee in accordance with Nevada Administrative Code (NAC) 445A.268.

In accordance with the terms and conditions set forth hereof;

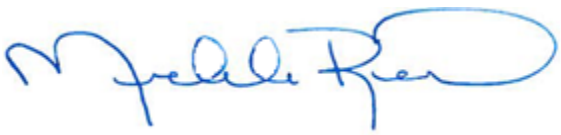
Site Number: CSW- XXXXX **NOI Approval Date: mm/dd/yyyy**

Facility Information	
Site Name	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
Site Address	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
Owner Name	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
Operator Name	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

This permit shall become effective on: **January 5, 2015**

This permit and the authorization to discharge shall expire at midnight **January 4, 2020.**

Signed this **18th** day of **December 2014.**



Michele R. Reid
Staff Engineer I
Bureau of Water Pollution Control

ndep
NEVADA DIVISION OF ENVIRONMENTAL PROTECTION
protecting the future for generations

Table of Contents

1.0 Coverage under this General Permit

1.1 Eligibility

1.1.1 The objective of this permit is to control and reduce pollution to Waters of the State of Nevada that meet the definition of Waters of the United States from: Stormwater Discharges Associated with Construction Activity and Stormwater Discharges Associated with Industrial Activity from temporary plants or operations set up to produce concrete, asphalt or other materials exclusively for the permitted construction project, through the use of Best Management Practices (BMPs).

1.1.2 This General Permit authorizes stormwater discharges associated with large construction activity, small construction activity and associated industrial activity, provided the operator complies with all the requirements of this general permit and submits a Notice of Intent (NOI) in accordance with Part 2.3 of this general permit. A waiver from coverage under this permit is not offered.

1.1.3 This permit is not authorized for use by operators with stormwater discharges associated with construction activities on any Tribal Lands in Nevada. USEPA Region 9 is the permitting authority for Tribal Lands in Nevada.

1.1.4 Any discharges that do not comply with the eligibility conditions of this permit are not authorized by the permit. A person shall either apply for a separate National Pollutant Discharge Elimination System (NPDES) permit to cover the ineligible discharge(s), cease the discharge(s), or take necessary steps to make the discharge(s) eligible for coverage under this permit.

1.2 Authorized Discharges

1.2.1 Allowable Stormwater Discharges. Subject to compliance with the terms and conditions of this permit, the following is a list of discharges that are allowed under the permit provided that appropriate stormwater controls are designed, installed and maintained:

1.2.1.1 Stormwater runoff associated with construction activities;

1.2.1.2 Stormwater discharges from construction support activities (e.g. concrete or asphalt batch plants, equipment staging yards, material storage yards, excavated material disposal areas, borrow areas) provided:

1.2.1.2.1 The support activity is directly related to a construction site that is required to have NPDES permit coverage for discharges of stormwater associated with construction activity;

1.2.1.2.2 The support activity is not a commercial operation (serving multiple unrelated construction projects by different operators) and does not operate beyond the completion of the construction activity at the last construction project it supports; and

1.2.1.2.3 Appropriate controls and measures covering the discharges from the support activity areas are identified in a stormwater pollution prevention plan (SWPPP).

1.2.2 Allowable Non-Stormwater Discharges. The operator shall reduce or eliminate discharges of non-stormwater from construction sites to the maximum extent practicable.

1.2.2.1 The following are non-stormwater discharges allowed under this permit, provided they are not a significant source of pollutants and appropriate control measures are in place to assure compliance with Parts 3.0 and 3.8 of this permit:

1.2.2.1.1 Discharges from emergency fire-fighting activities;

1.2.2.1.2 Water used to rinse/wash vehicles and equipment, provided that reclaimed water or other wastewater is not used and no soaps, solvents, detergents, oils, grease, or fuels are present in the rinse/wash water;

1.2.2.1.3 Water used to control dust, provided reclaimed water or other wastewaters are not used;

1.2.2.1.4 Routine external building wash-down where detergents are not used;

1.2.2.1.5 Pavement wash waters where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled material has been removed) and where detergents are not used. Directing pavement wash waters directly into any surface water, storm drain inlet, or stormwater conveyance without the appropriate pollution control measures in place is prohibited;

1.2.2.1.6 Uncontaminated air conditioning or compressor condensate;

1.2.2.1.7 Dewatering of accumulated stormwater where flows are not contaminated (see Part 3.8 Dewatering Practices); and

1.2.2.1.8 Water used for compacting soil, provided reclaimed water or other wastewaters are not used.

1.2.3 Allowable Non-Stormwater DeMinimus Discharges

1.2.3.1 The following are non-stormwater deminimis discharges allowed under this permit, provided they are not a significant source of pollutants and appropriate control measures are in place to assure compliance with Parts 3.0 and 3.8 of this permit:

1.2.3.1.1 Uncontaminated, non-turbid groundwater or spring water;

1.2.3.1.2 Foundation or footing drains where flows are not contaminated with process materials such as solvents or contaminated groundwater;

1.2.3.1.3 Potable water sources including uncontaminated water line flushing; and

1.2.3.1.4 Uncontaminated, non-turbid potable water well flushing where the receiving waters are ephemeral.

1.2.3.2 DeMinimis Discharges are limited to one discharge outfall per permitted site. The discharge flow is limited to 250 gallons per minute (gpm) or less for 30 days or less. DeMinimis discharges that exceed these conditions must apply for permit coverage under the General Permit for DeMinimis Discharges NVG201000 at http://ndep.nv.gov/bwpc/diminimis.htm

1.3 Prohibited Discharges

1.3.1 The operator shall not allow any non-stormwater discharges from the site except as provided in Part 1.2.2, 1.2.3 or Part 3.8 Dewatering Practices. All other non-stormwater discharges shall be eliminated or authorized under a separate permit as determined by NDEP. The prohibited discharges include but are not limited to:

1.3.1.1 Wastewater from washout of concrete, unless managed by an appropriate control described in Part 3.7.2.2;

1.3.1.2 Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds and other construction materials. See Part 3.7.2.3;

1.3.1.3 Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance. See Part 3.7.2.4;

1.3.1.4 Soaps or solvents used in vehicle and equipment washing; and

1.3.1.5 Toxic or hazardous substance from a spill or other release.

1.3.2 Stormwater discharges that are mixed with non-stormwater, other than the allowable non-stormwater discharges listed in Part 1.2.2, are not eligible for coverage under this permit.

1.4 Limitations of Coverage

1.4.1 Post Construction Discharges. This general permit does not authorize stormwater discharges that originate from the site after construction activities have been completed and the site, including any temporary support activity site, has achieved final stabilization and a Notice of Termination (NOT) has been filed. Post construction stormwater discharges from industrial sites may need to be covered by a separate NPDES permit.

1.4.2 Discharges Covered by Another NPDES Permit. This general permit does not authorize discharges associated with construction activities that have been covered under an individual permit or another applicable general permit. Construction discharges at mining operations are covered under the Mining General Permit NVR300000.

1.4.3 Discharges Threatening Water Quality. This general permit does not authorize discharges that will cause or contribute to non-attainment of water quality standards or the beneficial uses of receiving waters as defined in NAC 445A.121 and NAC 445A.122 respectively. The operator shall design and implement BMPs sufficient to meet these requirements.

1.4.4 Discharges to Water Quality Impaired Waters. A discharge to a surface water contained in the current 303(d) *Impaired Water Body* listing issued by NDEP Bureau of Water Quality Planning (BWQP), that is impaired for (1) sediment or a sediment-related parameter, such as total suspended solids (TSS) or turbidity, and/or (2) nutrients, including impairments for nitrogen and/or phosphorus shall make one of the following demonstrations and retain such data and technical information on site with the Stormwater Pollution Prevention Plan (SWPPP):

1.4.4.1 That the site will employ measures to prevent the discharge of stormwater pollutant(s) for which the waterbody is impaired; or

1.4.4.2 That the discharge from the site has no potential to contain the pollutants causing impairment; or

1.4.4.3 That the discharge is not expected to cause or contribute to an exceedence of an applicable water quality standard.

1.4.5 Discharges to Water Bodies with Established Total Maximum Daily Load (TMDL). The Permittee shall comply with all applicable TMDL requirements. TMDL information can be found on the NDEP website: http://ndep.nv.gov/bwqp/303dlist2012.htm

1.4.6 Exempt Discharges. Persons performing the following activities are not required to seek coverage under this permit:

1.4.6.1 Construction projects that disturb less than 1 acre, unless part of a larger common plan of development or sale (e.g., subdivisions or commercial development areas) or unless required as a condition of Part 1.6.1;

1.4.6.2 Routine maintenance that disturbs less than 5 acres that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of a facility or structure; or

1.4.7 Use of Cationic Treatment Chemicals. The use of cationic treatment chemicals (as defined in Appendix A), are ineligible for coverage under this permit, unless the Permittee notifies NDEP in advance and the Administrator authorizes the coverage under this permit. The Permittee must include appropriate controls and implementation procedures designed to ensure that any approved use of cationic treatment chemicals will not lead to a violation of water quality standards.

1.4.8 Oil and Gas Operations. Construction activities associated with the oil and gas exploration, production, processing, or treatment operations or transmission facilities (e.g. drilling site preparation, crude oil pipelines, etc.) are addressed in NDEP's Stormwater General Permit NVR050000 for Stormwater Associated with Industrial Activity.

1.5 Requirement for Individual Permit

1.5.1 NDEP may require the holder of a general stormwater permit to apply for and obtain an individual permit in accordance with NAC 445A.269.

1.6 Requirement for a Stormwater Permit for Projects Less Than 1 Acre

1.6.1 If NDEP determines that a project less than 1 acre in size will impact receiving waters or their tributaries within a 1/4-mile radius of the project, the owner of the project may be required to obtain a stormwater permit and abide by the terms of this permit.

2.0 Authorization Under this General Permit

2.1 Owner/Operator Responsibility

2.1.1 *All Operators*. All operators are required to obtain coverage for stormwater discharges associated with construction activity under this permit. In some cases, an operator may be

the owner or the developer, in other cases the operator may be the general contractor. In the event of a default by the "Operator" submitted on the NOI, NDEP will consider the "Owner" submitted on the NOI as the responsible "Operator". For the purpose of this permit, an "Operator" is any person associated with the construction project who meets the following criteria:

2.1.1.1 The person has operational control over the construction plans and specifications, including the ability to make modifications to those plans and specifications; or

2.1.1.2 The person has day-to-day operational control of those activities at a project that are necessary to ensure compliance with the permit conditions (e.g., they are authorized to direct workers at a site to carry out activities required by the permit).

2.1.2 *Multiple Operators*. Where there are multiple operators associated with the same project, each operator is required to file an NOI for permit coverage. The following applies in these situations:

2.1.2.1 If one operator has control over plans and specifications and a different operator has control over activities at the project site, they may divide responsibility for compliance with the terms of this permit and jointly develop a common SWPPP, which documents which operator has responsibility for each requirement of the permit.

2.1.2.2 If an operator only has operational control over a portion of a larger project (e.g. one of the four homebuilders in a subdivision), the operator is responsible for compliance with applicable effluent limits, terms and conditions of this permit as it relates to their activities on their portion of the construction site, and implementation of control measures described in the SWPPP in the areas under their control.

2.1.2.3 Operators shall ensure, either directly or through coordination with other operators, that their activities do not render another operator's pollutant discharge controls ineffective.

2.2 Application for Coverage

2.2.1 Prior to submission of a Notice of Intent (NOI), an applicant seeking authorization to discharge under this general permit shall:

2.2.1.1 Ensure that the facility is not located on Tribal lands;

2.2.1.2 Ensure the facility meets the eligibility requirements under Part 1.1; and

2.2.1.3 Develop and implement a SWPPP that meets the requirements of Part 6.0 of this permit and that covers either the entire site or all portions of the site for which the Permittee is an operator.

2.2.1.3.1 The SWPPP shall be prepared prior to submission of the NOI and shall be implemented prior to the start of construction.

2.2.1.3.2 It is not necessary to submit a copy of the SWPPP to NDEP. The SWPPP, including any updates, shall be retained and made available in accordance with Part 6.7.1.

2.2.1.4 An operator shall submit separate NOIs to NDEP for each project that disturbs one or more acres of land. The operator of a common plan of development or sale that will ultimately disturb one or more acres shall also submit an NOI in accordance with Part 2.3.

2.3 NOI Electronic Application Requirements

2.3.1 NOIs must be submitted using NDEP's electronic NOI system. Submission of the NOI demonstrates the owner's/operator's intent to be covered by this permit; it is not a determination by NDEP that the owner/operator has met the eligibility requirements for the permit.

2.3.2 *New Dischargers* seeking authorization for stormwater discharges under this general permit shall submit a Notice of Intent (NOI) and filing fee with NDEP no later than 14 days prior to the start of the permitted activity. The NOI application may be accessed via the NDEP website at: **https://genpermits.ndep.nv.gov/**

2.3.3 *Existing Dischargers* seeking authorization for stormwater discharges under this general permit shall submit a **RENEWAL** Notice of Intent (NOI) within 60 days (**by March 6, 2015**) of the effective date of this permit. **NO FEE IS REQUIRED FOR A RENEWAL NOI**. The Renewal NOI application may be accessed via the NDEP website at: **https://genpermits.ndep.nv.gov/**

2.3.4 The minimum information required for an approved NOI consists of:

2.3.4.1 Project Owner and Operator (Applicant) Information – Name, Address, City, State, Zip Code, Phone Number(s) and Tax Identification Number for both the owner and operator;

2.3.4.2 Project/Site Information – Project Name, Project Address/Location, City, County, State, Zip Code, Latitude, Longitude, and at least one Assessor's Parcel Number (APN) associated with the project;

2.3.4.3 Name of the receiving water;

2.3.4.4 Whether any part of the site is located on Tribal lands;

2.3.4.5 Estimated start date;

2.3.4.6 Estimated completion date;

2.3.4.7 Estimate of area to be disturbed (to nearest acre);

2.3.4.8 Estimate for likelihood of discharge;

2.3.4.9 Address for location of SWPPP for viewing – City, State, Zip Code and Phone Number(s); and

2.3.4.10 NOI Certification page signed and dated by appropriate authority (see Part 7.23) and mailed with the application fee to NDEP at the address indicated on the form and in Part 7.26 of this permit.

2.3.5 If the contact information or addresses on the NOI filed for permit coverage change during

the permit coverage, the Permittee shall, within 15 days of the change, submit a letter on official letterhead indicating the updated information.

2.4 Effective Date of Permit Coverage

2.4.1 *New Discharger* – Following receipt of the NOI Certification Page and applicable Application Fee, NDEP will determine if the NOI is complete and confirm coverage by providing an Approval Letter with a site authorization number.

2.4.2 If NDEP determines the NOI is incomplete, coverage may not be "approved" until a completed NOI is submitted. NDEP will notify an applicant of an incomplete application within 7 days of receipt of the NOI Certification Page in the Bureau of Water Pollution Control.

2.4.2.1 In accordance with NAC 445A.268 (4), a discharger will not be covered under a general permit until the discharger has been notified by the Director.

2.4.3 *Existing Discharger* – For operators of construction projects ongoing as of the effective date of this permit who received authorization to discharge for these projects under the expired 2007 Construction General Permit (NVR100000), the Operator shall submit a Renewal NOI within 60 days of the effective date of this permit (**by March 6, 2015**). NDEP will determine if the NOI is complete and confirm coverage by providing a Renewal Approval Letter. Following receipt of the renewal approval letter the operator shall comply with the following terms:

2.4.3.1 Within 120 days of the effective date of this permit (**by May 5, 2015**), the Permittee shall update the SWPPP as necessary to comply with the requirements of Part 6.0 of this permit.

2.4.3.2 The Permittee shall continue to comply with the terms and conditions of the expired 2007 Construction General Permit NVR100000 until the SWPPP is updated.

2.4.4 *Change of Owner/Operator* – For construction projects where the owner/operator changes, including instances where an operator is added after an NOI has been submitted, the following shall apply:

2.4.4.1 **Current operator** shall notify the succeeding owner/operator of the existence of this permit by letter, a copy of which shall be forwarded to NDEP for file record;

2.4.4.2 **New operator** shall update SWPPP documents as needed or develop and implement a new SWPPP to comply with permit requirements in Part 6.0; and submit an NOI **within 14 calendar days** of taking over operational control of the site; and

2.4.4.3 **Current operator** shall submit a Notice of Termination (NOT) **within 30 calendar** days after the new owner/operator assumes responsibility for the site.

2.5 Authorization of Emergency-Related Construction Activities

2.5.1 Emergency-related construction activities are automatically authorized provided that;

2.5.1.1 An operator is conducting earth-disturbing activities in response to a public

emergency (e.g., natural disaster, widespread disruption in essential public services), and the related work requires immediate authorization to avoid imminent endangerment to human health, public safety, or the environment, or to reestablish essential public services;

2.5.1.2 If the activity continues past 30 calendar days of commencing construction activities, the operator shall prepare a SWPPP and submit an NOI in accordance with Parts 2.2 and 2.3 of this permit;

2.5.1.3 The operator provides documentation in the SWPPP to substantiate the occurrence of the public emergency; and

2.5.1.4 The operator complies with all other applicable requirements in the permit regarding discharges associated with the construction activities.

2.5.2 Operators of emergency-related construction activities are considered provisionally covered under the terms and conditions of this permit immediately, and fully covered within 14 calendar days after NDEP receives a complete NOI and application fee in accordance with Part 2.3 above.

2.6 Continuation of this Permit

2.6.1 If this permit is not reissued or replaced prior to the expiration date, it will be administratively continued and remain in force and effect. If the operator is authorized to discharge under this permit prior to the expiration date, any discharges authorized under this permit will automatically remain covered by this permit until:

2.6.1.1 The owner/operator submits an NOI requesting authorization to discharge under a renewal or revision of the permit and NDEP issues an Approval Letter; or

2.6.1.2 The owner/operator submits a NOT; or

2.6.1.3 A formal permit decision is made by NDEP not to reissue this general permit, at which time NDEP will identify a reasonable time period for covered dischargers to seek coverage under an alternative general permit or an individual permit. Coverage under this permit will cease at the end of this time period.

2.7 Requirement to Post a Notice of Permit Coverage

2.7.1 The Permittee shall post a sign or other notice conspicuously at a safe, publicly accessible location in close proximity to the project site. At a minimum, the notice shall include the Permit site ID (CSW-xxxxx) and a contact name and telephone number.

2.7.2 The notice shall be located so that it is visible from the public road that is nearest to the active part of the construction site, and it shall use a font large enough to be readily viewed from a public right-of-way. For linear projects, the site authorization number(s) shall be posted near the entrance where most of the construction activity is occurring.

2.8 Terminating Coverage

2.8.1 To terminate coverage, the Permittee shall submit a completed hard-copy Notice of

Termination (NOT) form, available at **http://ndep.nv.gov/bwpc/forms.htm,** to the address listed on the form and in Part 7.26 of this permit. The submitted form shall include a wet signature; copies will not be accepted. The facility's authorization to discharge will expire at midnight of the day that a complete NOT form is received by NDEP. The permittee is responsible for meeting the terms and conditions of this permit until the facility's authorization to discharge are terminated.

2.8.1.1 Should an electronic NOT version become available during the term of this permit a link for this electronic reporting requirement will be provided on the NDEP Stormwater page at http://ndep.nv.gov/bwpc/storm_cont03.htm

2.8.2 All Notice of Termination (NOT) forms shall be signed in accordance with the signatory requirements of Part 7.23.

2.8.3 The Permittee may submit an NOT form to NDEP after any of the following conditions have been met:

2.8.3.1 The Permittee has established final stabilization on all portions of the site for which the operator is responsible, in accordance with Part 3.6.3; or

2.8.3.2 Another operator, who has a valid NOI and site number under this general permit or an individual NPDES permit, has assumed control over all areas of the site that have not been finally stabilized; or

2.8.3.3 For residential construction only, temporary stabilization has been completed and the residence has been transferred to the homeowner in accordance with Part 3.6.3.2 of this permit; or

2.8.3.4 The planned construction activity identified on the original NOI was never initiated (i.e., no grading or earthwork was ever started and plans for construction have been permanently abandoned or indefinitely postponed); or

2.8.3.5 The operator has obtained coverage for the site under another NPDES permit.

2.8.4 The minimum information required on a NOT consists of:

2.8.4.1 Site specific identification number (i.e., CSW-xxxxx);

2.8.4.2 Owner/Operator (Applicant) Information – name, address, city, state, Zip Code and phone number(s);

2.8.4.3 Project/Site Information – project name, project address/location, city, county, state, Zip Code, latitude, longitude or APN, and phone number(s); and

2.8.4.4 Certification signed and dated by the appropriate authority (see Parts 8.23 and 8.25).

3.0 Effluent Limitations Applicable to All Discharges from Construction Sites

3.1 Provisions for Existing Construction Projects

3.1.1 If a project is an "existing project" as defined in Appendix A, or if a person is a new operator of an existing project, and it is infeasible for the operator to comply with a specific requirement in Part 3.0 because (1) the requirement was not part of the permit the project was previously covered under (i.e. the 2007 CGP NVR100000) and (2) the operator is prevented from compliance due to the nature or location of earth disturbances at the site, or the operator is unable to comply with the requirement due to the manner in which the stormwater controls have already been installed or were already designed prior to **January 5, 2015**, the project is waived from complying with that requirement as long as the operator documents this fact in the SWPPP. This provision only applies to those portions of a project that have already commenced earth-disturbing activities or where stormwater controls implemented in compliance with the previous permit have already been installed.

3.2 Non-numeric Effluent Limitations and Associated Control Measures

3.2.1 The stormwater control requirements in this Part are technology-based, effluent limitations that, where applicable, apply to all discharges from construction sites eligible for coverage under this permit. These requirements apply the national effluent limitations guidelines and new source performance standards found at 40 CFR Part 450. The Permittee shall comply with the stormwater control requirements included in Part 3.0 through site planning and through designing, installing, and maintaining stormwater controls.

3.2.2 Whenever applicable, the operator shall design, install and maintain the following control measures at construction sites:

3.2.2.1 Erosion and sediment control (Part 3.4 and Part 3.5);

3.2.2.2 Site Stabilization (Part 3.6); and

3.2.2.3 Pollution Prevention (Part 3.7);

3.3 General Maintenance Requirements

3.3.1 The operator shall ensure that all control measures required in this Part remain in effective operating condition during permit coverage and are protected from activities that would reduce their effectiveness.

3.3.2 The operator shall inspect all control measures in accordance with the inspection requirements in Part 5.0. The operator shall document the findings in accordance with Part 5.4. When controls need to be replaced, repaired or maintained, the operator shall make the necessary repairs or modifications in compliance with the following schedule:

3.3.2.1 Initiate work to correct the problem immediately after discovery, and complete such work by the close of the next work day, if feasible and the problem does not require significant maintenance, repair or replacement.

3.3.2.2 If existing control measures need significant repair or modification, or if additional control measures are necessary, implementation shall be completed within 7 calendar days or before the next storm event (whichever is sooner). If implementation before the next storm event is impracticable, the reason(s) for the delay shall be documented in the SWPPP and alternative control measures shall be implemented as soon as possible. Additionally, the following maintenance activities

shall be implemented:

3.3.2.2.1 Remove accumulated sediment when it reaches a maximum of one-half the height of the silt fence or one-half the height of the fiber roll.

3.3.2.2.2 Sediment shall be removed from temporary and permanent sedimentation basins, ponds and traps when the depth of the sediment collected in the basin reaches 50% of the storage capacity.

3.2.2.2.3 Construction site egress location(s) shall be inspected for evidence of off-site tracking of sediment, debris, and other pollutants onto paved surfaces. Removal of sediment, debris, and other pollutants from all off-site paved areas shall be completed as soon as practicable, or as otherwise required by Federal, State, and local requirements.

3.2.2.2.4 Accumulations of sediment, debris, and other pollutants observed in off-site surface waters, drainage ways, catch basins, and other drainage features shall be removed in a manner and at a frequency sufficient to minimize impacts and to ensure no adverse effects on water quality.

3.4 Erosion and Sediment Controls

3.4.1 The Operator shall design, install, and maintain erosion and sediment controls that minimize the discharge of pollutants from earth-disturbing activities. The operator shall minimize the amount of soil exposed during construction activities and control stormwater volume and velocity to minimize soil erosion. The operator is also subject to the deadlines for temporarily and/or permanently stabilizing exposed portions of the site in accordance with Part 3.6.

3.4.2 *Design Requirements* – The operator shall account for the following factors in designing stormwater controls:

3.4.2.1 The expected amount, frequency, intensity, and duration of a 2-year, 24-hour precipitation event;

3.4.2.2 The nature of stormwater runoff and run-on at the site, including factors such as expected flow from impervious surfaces, slopes, and site drainage features. If any stormwater flow will be channelized at the site, stormwater control measures shall be designed to control both peak flow rates and total stormwater volume to minimize channel and stream bank erosion and scour in the immediate vicinity of discharge points:

3.4.2.3 The range of soil particle sizes expected to be present on the site.

3.4.3 The operator shall direct discharges from stormwater controls to vegetated areas of the site to increase sediment removal and maximize stormwater infiltration, including any natural buffers established under Part 3.5.1, unless infeasible. Use velocity dissipation devices if necessary to prevent erosion when directing stormwater to vegetated areas.

3.4.4 *Installation Requirements*

3.4.4.1 Complete installation of stormwater controls by the time each phase of the earth disturbance has begun. By the time construction activities in any given portion of the

site have begun, unless infeasible, the operator shall install and make operational any down-gradient sediment controls (e.g., buffers, or equivalent sediment controls, perimeter controls, exit point controls, storm drain inlet protection) that control discharges from the initial site clearing, grading, excavating, and other land-disturbing activities.

3.4.4.2 Following the installation of these initial controls, all other stormwater controls planned for this portion of the site and described in the SWPPP shall be installed and made operational as soon as site conditions allow. The requirement to install stormwater controls prior to earth disturbance for each phase of the project does not apply to the earth disturbance associated with the actual installation of these controls.

3.4.4.3 The operator shall install all stormwater controls in accordance with good engineering practices, including applicable design specifications. Design specifications may be found in manufacturer specifications and/or in applicable erosion and sediment control manuals or local ordinances. Any departures from such specifications shall reflect good engineering practice and shall be explained in the SWPPP.

3.4.5 The operator shall control stormwater discharges, including both peak flow rates and total stormwater volume, to minimize channel and stream bank erosion and scour in the immediate vicinity of the discharge points.

3.4.5.1 *Culvert Stabilization* – If culverts are present on the site, the SWPPP shall include measures to sufficiently minimize the threat of erosion at culvert location to prevent the formation of rills and gullies during construction; and

3.4.5.2 *Velocity Dissipation Devices* – The operator shall place velocity dissipation devices at locations where discharges leave the construction site as necessary to provide a non-erosive flow velocity.

3.5 Erosion and Sediment Controls Required by All Sites

3.5.1 ***Maintain Natural Buffers*** adjacent to surface waters of the State that meet the definition of Waters of the U.S., and direct stormwater to vegetated areas to maximize stormwater infiltration and reduce pollutant discharges, unless infeasible. The operator is not required to enhance the quality of the vegetation that already exists in the buffer, or provide vegetation if none exists. Areas not owned or that are otherwise outside the operational control of the Permittee may be considered areas of undisturbed natural buffer for purposes of compliance with this Part.

3.5.1.1 *Provide Natural Buffers or Equivalent Sediment Controls* – these requirements only apply when surface water is located within 50 feet of the project's earth disturbances.

3.5.1.1.1 The operator shall ensure that any discharges to surface waters through the area between the disturbed portions of the property and any surface waters located within 50 feet of the site are treated by an area of undisturbed natural buffer and/or additional erosion and sediment controls in order to achieve a reduction in sediment load estimated to be equivalent to that achieved by a 50-foot natural buffer. Appendix G of EPA's Construction General Permit may help in providing guidance in determine estimated equivalents.

http://water.epa.gov/polwaste/npdes/stormwater/upload/cgp2012_appendixg.pdf

3.5.1.2 *Alternatives to Natural Buffers* – In areas where it is infeasible to maintain the 50 foot buffer the operator shall:

3.5.1.2.1 Document in the SWPPP the reasons why the 50-foot buffer cannot be maintained, and identify the additional erosion and sediment controls selected;

3.5.1.2.2 Preserve as much buffer as possible and design, implement and maintain additional erosion and sediment controls (such as berms, diversion dikes, sediment basins, etc.);

3.5.1.2.3 Ensure that all discharges from the area of the earth disturbance to the natural buffer are first treated by the site's erosion and sediment controls, and use velocity dissipation devices if necessary to prevent erosion caused by stormwater within the buffer;

3.5.1.2.4 Document in the SWPPP the natural buffer width retained on the property, and show the buffer boundary on the site plan;

3.5.1.2.5 Delineate, and clearly mark off with flags, tape or other similar marking device, all natural buffer areas; and

3.5.1.2.6 Follow the additional stabilization requirements described in Part 3.6.2.

3.5.1.3 *Exceptions* –

3.5.1.3.1 If there is no discharge of stormwater to perennial waters through the area between the site and any perennial waters located within 50 feet of the site, the operator is not required to comply with the requirements of this Part. This includes situations where control measures, such as a berm or other barrier that will prevent such discharges, have been implemented.

3.5.1.3.2 Where no natural buffer exists due to pre-existing development disturbances (e.g., structures, impervious surfaces) that occurred prior to the initiation of planning for the current development of the site, operators are not required to comply with the requirements in this Part, unless portions of the pre-existing development are removed.

3.5.1.3.3 Where some natural buffer exists but portions of the area within 50 feet of the perennial water are occupied by preexisting development disturbances, operators are required to comply with the requirements in this Part. For the purposes of calculating the sediment load reduction, an operator is not expected to compensate for the reduction in buffer function from the area covered by these pre-existing disturbances.

3.5.1.3.4 If any portion of a pre-existing area will be disturbed during the project, the area disturbed will be deducted from the area treated as natural buffer.

3.5.1.3.5 Linear construction projects are not required to comply with the requirements in this Part if site constraints (e.g., limited right-of-way) prevent the operator

from meeting any of the compliance alternatives in Part 3.5.1.2, provided that, to the extent practicable, the operator limits disturbances within 50 feet of the surface water and/or provides supplemental erosion and sediment controls to treat stormwater discharges from earth disturbances within 50 feet of the surface water. The operator shall also document in the SWPPP the rationale for why it is infeasible to comply with the requirements in Part 3.5.1.2, and describe any buffer width retained and/or supplemental erosion and sediment controls installed.

3.5.1.3.6 "Small residential lot" construction (i.e., a lot being developed for residential purposes that will disturb less than 1 acre of land, but is part of a larger residential project that will ultimately disturb greater than or equal to 1 acre) is exempt from buffer requirements provided that the operator minimizes the discharge of pollutants and complies with the requirements of Part 3.4.

3.5.1.3.7 The following disturbances within 50 feet of surface water are exempt from the requirements in this Part but shall be documented in the SWPPP and on the site map:

3.5.1.3.7.1 Construction approved under a CWA Section 404 permit; or

3.5.1.3.7.2 Construction of a water-dependent structure or water access area (e.g., pier, boat ramp, trail).

3.5.2 ***Install Perimeter Controls*** –

3.5.2.1 The operator shall install appropriate control measures (e.g., fiber rolls, berms, silt fences, vegetative buffer strips, sediment traps, or equivalent approved sediment controls) along those perimeter areas of the site that will receive stormwater from earth-disturbing activities.

3.5.2.2 For linear projects with rights-of-way that restrict or prevent the use of such perimeter controls, the operator shall maximize the use of perimeter controls where practicable and document in the SWPPP why it is impracticable in other areas of the project.

3.5.3 ***Minimize Sediment Track-Out*** – The operator shall implement effective control measures (e.g., stone/rip rap pad, concrete or steel wash racks, or other NDEP approved systems) to minimize tracking of sediments, debris and other pollutants from vehicles and equipment leaving the site. To comply with this requirement the operator shall:

3.5.3.1 Restrict vehicle use to properly designated exit points;

3.5.3.2 Use appropriate stabilization techniques at all points that exit onto paved roads so that sediment removal occurs prior to vehicle exit;

3.5.3.3 Where necessary, use additional controls to remove sediment from vehicle tires prior to exit; and

3.5.3.4 Where sediment has been tracked-out from the site onto the surface of off-site streets, other paved areas, and sidewalks, the deposited sediment shall be removed by the end of the same work day in which the track-out occurs or by the end of the next work day if the track-out occurs on a non-work day. Track-out shall be removed by sweeping, shoveling, or vacuuming these surfaces, or by using other similarly

effective means of sediment removal. Hosing or sweeping tracked-out sediment into any stormwater conveyance, without appropriate control measures in place, is strictly prohibited.

3.5.3.5 If site conditions make it infeasible to install structural controls to prevent track-out (e.g., linear project along a paved right-of-way), the operator shall explain in the SWPPP why such controls cannot be installed and what alternative measures will be used to prevent, monitor and remove track-out sediment from paved roadways.

3.5.4 ***Control Discharges from Stockpiled Sediment or Soil –*** As necessary, implement the following measures for any stockpiled or land clearing debris composed, in whole or in part, of sediment or soil:

3.5.4.1 Place stockpiles away from stormwater conveyances, such as curb and gutter systems, and streets leading to such conveyances. If placement is infeasible, install appropriate sediment controls and document the reasons in the SWPPP;

3.5.4.2 Locate the piles outside of any buffers implemented in accordance with Part 3.5.1;

3.5.4.3 Protect piles from contact with stormwater (including run-on) using a temporary sediment barrier or other protective means;

3.5.4.4 Do not hose down or sweep soil or sediment accumulated on pavement or other impervious surfaces into any stormwater conveyance, storm drain inlet, or surface water leading to a Water of the State Nevada that meets the definition of Waters of the United States; and

3.5.4.5 Unless infeasible, contain and securely protect from wind.

3.5.5 ***Discharge of Sediments during Dry Weather –*** The operator shall implement effective control measures that minimize the discharge of sediment from construction activities to any water body, including dry washes, during dry weather.

3.5.6 ***Minimize the Disturbance of Steep Slopes –*** Where practicable, implement standard erosion and sediment control practices, such as phasing disturbances to these areas and using stabilization practices designed to be used on steep grades.

3.5.7 ***Minimize Soil Compaction and Preserve Topsoil –*** The operator shall minimize soil compaction and, unless infeasible, preserve topsoil for re-vegetation.

3.5.7.1 In areas of the site where final vegetative stabilization will occur or where infiltration practices will be installed, the operator shall either:

3.5.7.1.1 Restrict vehicle and equipment use in these locations to avoid soil compaction; or

3.5.7.1.2 Prior to seeding or planting areas of exposed soils that have been compacted, use techniques that condition the soils to support vegetative growth, if necessary and feasible.

3.5.7.2 Minimizing soil compaction is not required where the intended function of a specific area of the site dictates that it be compacted.

3.5.7.3 Preserving topsoil is not required where the intended function of a specific area of

the site dictates that the topsoil be disturbed or removed.

3.5.8 ***Storm Drain Inlet Protection –*** For discharge to any storm drain inlet that carries stormwater flow from the site directly to surface water (and it is not first directed to a sediment basin, sediment trap, or similarly effective control), ***where the operator has authority to access the storm drain inlet***, the operator shall:

3.5.8.1 Install inlet protection measures that remove sediment from the discharge prior to entry into the storm drain inlet; and

3.5.8.2 Clean, or remove and replace, the protection measures as sediment accumulates, the filter becomes clogged, and/or performance is compromised.

3.5.8.3 *Public Safety* – Inlet protection measures can be removed in the event of flooding conditions or to prevent erosion.

3.5.9 ***Preserve Natural Vegetation –*** Where practicable, existing vegetation should be preserved. If natural vegetation can be preserved, the operator shall clearly mark vegetation before clearing activities begin. Locations of trees and boundaries of environmentally sensitive areas and buffer zones to be preserved shall be identified on the SWPPP site map.

3.6 Site Stabilization Requirements, Schedules and Deadlines

3.6.1 The operator shall, at a minimum, initiate soil stabilization measures immediately whenever any clearing, grading, excavating, or other earth disturbing activities have permanently ceased on any portion of the site, or temporarily ceased on any portion of the site and will not resume for a period exceeding 14 calendar days.

3.6.2 *Temporary Stabilization* – The operator shall provide temporary stabilization, or initiate permanent stabilization, of disturbed areas within 14 calendar days of the most recent land disturbance in areas where construction or support activities have been temporarily suspended or have permanently ceased, except as follows:

3.6.2.1 Where stabilization by the 14th day is precluded by snow cover or frozen ground conditions, stabilization measures shall be initiated as soon as practicable;

3.6.2.2 Where disturbed areas are awaiting vegetative stabilization for periods greater than 14 calendar days, non-vegetative methods of stabilization shall be employed. These methods shall be described in the SWPPP.

3.6.2.3 In arid areas (areas with an average annual precipitation of 0-10 inches), semi-arid areas (areas with an average annual precipitation of 10-20 inches), and areas experiencing drought, where initiating vegetative stabilization measures immediately is infeasible, alternative stabilization measures shall be employed and vegetative or final stabilization measures shall be initiated as soon as practicable.

3.6.3 *Final Stabilization* – Final stabilization means the operator has achieved one of the following conditions:

3.6.3.1 All soil disturbing activities at the site have been completed; all construction materials, waste and temporary erosion and sediment control measures (including any sediment that was being retained by temporary erosion and sediment control

measures) have been removed and properly disposed of; and

3.6.3.1.1 A uniform (i.e., evenly distributed, without large bare areas) annual and/or perennial vegetative cover with a density of 70% of the native background vegetative cover for the area is in place on all unpaved areas and areas not covered by permanent structure, or

3.6.3.1.2 Equivalent permanent stabilization measures (such as the use of riprap, gabions, gravel, geotextiles, or other NDEP approved methods) have been employed.

Note: When preconstruction native background vegetation covered less than 100% of the ground (i.e., arid areas, beaches), the 70% coverage criteria is adjusted as follows: if the native vegetation covered 50% of the ground, 70% of 50% (.70 x .50 =.35) or 35% cover density would be required.

3.6.3.2 For individual lots in residential construction, final stabilization means that the homebuilder:

3.6.3.2.1 Has completed final stabilization as specified in Part 3.6.3 above; or

3.6.3.2.2 Has established temporary stabilization, including perimeter controls, for an individual lot prior to occupation of the home by the homeowner and has informed the homeowner of the need for, and benefits of, final stabilization.

3.6.3.3 For construction projects on land used for agricultural purposes (e.g., pipelines across crop or range land), final stabilization may be accomplished by returning the disturbed land to its preconstruction agricultural use. Areas disturbed that were not previously used for agricultural activities, such as buffer strips immediately adjacent to waters of the U.S., and areas that are not being returned to their preconstruction agricultural use shall meet the final stabilization criteria in Part 3.6.3 above.

3.7 Pollution Prevention Requirements

3.7.1 These requirements apply to all areas of the construction site and any support activities covered by this permit. The operator shall design, install, implement, and maintain effective pollution prevention measures to minimize the discharge of pollutants. To meet this requirement, the operator shall comply with all of the following:

3.7.1.1 Eliminate certain pollutant discharges from the site (see Part 1.3 Prohibited Discharges);

3.7.1.2 Properly maintain all pollution prevention controls (see Part 3.3 General Maintenance Requirements); and

3.7.1.3 Comply with pollution prevention measures for pollutant generating activities that occur at the site (See Parts 3.7.2 and 3.7.3).

3.7.2 ***Minimize the Discharge of Pollutants*** – The operator shall minimize the discharge of pollutants from equipment and vehicle washing, wheel washing and other wash waters.

3.7.2.1 *Equipment/Vehicle Washing* – The operator shall minimize the discharge of

pollutants from equipment and vehicle washing and wheel wash water.

3.7.2.1.1 Wash waters shall be treated in a sediment basin or an alternative control that provides equivalent or better treatment prior to discharge.

3.7.2.2 *Concrete Washout* – The operator shall provide an effective means of eliminating the discharge of water from the washout of concrete.

3.7.2.2.1 Where possible, concrete suppliers should conduct washout activities at their own plants or dispatch facilities.

3.7.2.2.2 If washout is conducted at the construction site, the operator shall employ control measures (e.g., lined pits or portable washouts) to contain and manage on-site concrete washout to prevent discharge.

3.7.2.2.3 The pit or container shall be designed so that no overflows can occur due to inadequate sizing or precipitation.

3.7.2.2.4 Hardened concrete shall be removed and disposed of consistent with handling of other construction waste materials.

3.7.2.3 *Washing of Applicators and Containers used for paint or other materials* – The operator shall provide an effective means of eliminating the discharge of wash water from the washout and cleanout of stucco, paint, form release oils, curing compounds and other construction materials.

3.7.2.3.1 All wash water shall be directed into a leak-proof container or leak-proof pit. The container or pit shall be designed so that no overflows can occur due to inadequate sizing or precipitation.

3.7.2.3.2 Any washout or cleanout activities shall be located as far away as possible from surface water and stormwater inlets or conveyances, and, to the extent practicable, areas designated to be used for these activities.

3.7.2.3.3 Liquid waste shall be disposed of in accordance with local and state regulations.

3.7.2.4 *Fueling and Maintenance of Equipment or Vehicles* – An operator that conducts fueling and/or maintenance of equipment or vehicles at the site shall provide an effective means of eliminating the discharge of spilled or leaked chemicals, including fuel, from the area where these activities take place.

3.7.2.4.1 Adequate supplies shall be available at all times to handle spills, leaks and disposal of used liquids.

3.7.2.4.2 Drip pans, absorbents or other approved methods shall be used under or around leaky vehicles and equipment.

3.7.2.4.3 Oil and oily wastes shall be disposed of or recycled in accordance with other federal, state, or local requirements.

3.7.2.4.4 Spills shall be cleaned up immediately and the source of the spill eliminated to prevent further discharge.

3.7.2.4.5 If applicable, the Spill Prevention Control and Countermeasures (SPCC) requirements in 40 CFR 112 and Section 311 of the CWA shall be complied with.

3.7.3 ***Building Materials, Chemicals, Products and Waste*** – The operator shall minimize the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste and other materials present on the site to precipitation and to stormwater. Minimization of exposure is not required in cases where the exposure to precipitation and to stormwater will not result in a discharge of pollutants, or where exposure of a specific material or product poses little risk of stormwater contamination (such as final products and materials intended for outdoor use).

3.7.3.1 *Storage, Handling, and Disposal of Construction Products, Wastes and Material* – The operator shall minimize the exposure to stormwater of any of the products, materials, or wastes specified below in this Part. These requirements do not apply to those products or materials that are designed to be exposed to precipitation and stormwater.

3.7.3.1.1 Building product storage areas shall provide either (1) cover (e.g., plastic sheeting or temporary roofs) to prevent products from coming in contact with rainwater, or (2) a similarly effective means designed to prevent the discharge of pollutants from these areas.

3.7.3.1.2 Pesticides, herbicides, insecticides, fertilizers, and landscape materials shall (1) be covered (i.e. plastic sheeting or temporary roofs) to prevent these chemicals from coming into contact with rainwater, or (2) be provided a similarly effective means to prevent discharge of pollutants from these areas. Application and disposal requirements shall be in accordance with the products registered label.

3.7.3.1.3 Diesel fuel, oil, hydraulic fluids and other petroleum products and chemicals shall be stored in water-tight containers and (1) provided cover (e.g. plastic sheeting or temporary roofs) to prevent containers from coming into contact with rainwater or (2) provide similarly effective means designed to prevent the discharge of pollutants from these areas (e.g. spill kits) or provide secondary containment (e.g., spill berms, decks, spill containment pallets).

3.7.3.1.4 Hazardous or toxic waste shall be kept separate from construction and domestic waste. Waste shall be stored in sealed containers constructed of suitable materials, and provided cover or secondary containment to prevent spills from being discharged. All containers shall be labeled in accordance with applicable Resource Conservation and Recovery Act (RCRA) requirements and other applicable federal, state and local requirements. Additionally, hazardous or toxic wastes shall be disposed of in accordance with the manufacturer's recommendations and federal, state and local requirements.

3.7.3.1.5 Waste containers (e.g. dumpsters or trash receptacles) of sufficient size and number shall be provided for construction and domestic waste.

3.7.3.1.6 Portable toilets for sanitary waste shall be positioned outside stormwater flow areas and secured to ensure they will not tip over.

3.8 Dewatering Practices

3.8.1 ***Accumulated stormwater*** to be removed from excavations, trenches, foundations, vaults or other similar spaces may be discharged if effectively managed by appropriate controls. Dewatering of accumulated stormwater shall meet the following requirements:

3.8.1.1 A flow of 250 gallons per minute (gpm) or less for no more than 30 days;

3.8.1.2 Only uncontaminated non-turbid waters may be discharged without being routed through a control;

3.8.1.3 An oil-water separator or other suitable filtration device that is designed to remove oil, grease or other products shall be used if dewatering water is found to contain these materials;

3.8.1.4 To the extent feasible, vegetated, upland areas of the site shall be utilized to infiltrate dewatering water before discharge. In no case will surface water be considered part of the treatment area; and

3.8.1.5 At all points where dewatering water is discharged, the velocity dissipation requirements of Part 3.4.5.2 shall be complied with.

3.8.2 ***Allowable DeMinimis Discharges***, identified in Part 1.2.3, may be discharged if they are effectively managed by appropriate controls and meet the following requirements:

3.8.2.1 The discharge occurs only from a single outfall per permitted site;

3.8.2.2 A flow of 250 gallons per minute (gpm) or less for no more than 30 days;

3.8.2.3 Within 24 hours of commencement of the discharge a sample shall be taken, for the parameters listed in Appendix B of this permit, to ensure the discharge does not contribute to an exceedence of the discharge limits indicated in the table;

3.8.2.4.1 The sample shall be collected *after* any control measures, including BMPs, and *prior* to discharge into the receiving water or MS4.

3.8.2.4.1 If the sample analyses indicate an exceedence of the discharge limits indicated in the Appendix B table, the Permittee shall cease the discharge and contact NDEP for additional permitting options.

3.8.2.5 The following DeMinimis discharge information shall be recorded and maintained in the SWPPP to demonstrate compliance with this permit.

3.8.2.5.1 A description of the discharge;

3.8.2.5.2 The beginning and ending dates of the discharge, and

3.8.2.5.3 A copy of the sampling results,

3.9 Water Quality Standards

3.9.1 The Permittee shall control discharges to surface waters, impaired for common construction

related pollutants such as sediment, sediment-related parameters and nutrients (including nitrogen and phosphorus), from the facility as necessary to not cause or contribute to an exceedence of an applicable water quality standard. If at any time the Permittee becomes aware, or NDEP determines, that the facility's discharge causes or contributes to an exceedence of an applicable water quality standard, the Permittee shall take corrective action and report to NDEP as required.

3.9.1.1 When discharges are proposed to water quality-impaired waters that are contained in the current 303(d) Impaired Water Body listing issued by the NDEP Bureau of Water Quality Planning, the permittee shall investigate whether discharges from the Permittee's site will contribute to any 303(d) listing. Information for 303(d) listed waters can be found on the following NDEP website: http://ndep.nv.gov/bwqp/303dlist2012.htm

3.9.1.2 If a site discharges into a waterbody with an established Total Maximum Daily Load (TMDL), the Permittee shall comply with all applicable TMDL requirements.

3.9.1.3 If a TMDL has not been established as described in Part 3.9.1.2 above, the Permittee shall include a section in the SWPPP describing the condition for which the water has been listed. The SWPPP shall also include a demonstration that the BMPs that are selected for implementation will be sufficient to ensure that the discharges will not cause or contribute to an exceedance of an applicable State water quality standard.

4.0 Effluent Limitations Applicable to Sites Using Constructed Stormwater Conveyance Channels or Sediment Basins.

4.1 Constructed Stormwater Conveyance Channels

4.1.1 Stormwater conveyance channels shall be designed to avoid un-stabilized areas on the site and to reduce erosion, unless infeasible. Operators shall minimize erosion of channels and their embankments, outlets, adjacent stream banks, slopes, and downstream waters during discharge conditions through the use of erosion controls and velocity dissipation devices within and along the length of any constructed stormwater conveyance channel, and at any outlet to provide a non-erosive flow velocity.

4.2 Sediment Basins

4.2.1 If sediment basins are installed the operator shall comply with the following design and maintenance requirements:

4.2.1.1 Provide storage for either the calculated volume of runoff from a 2-year, 24-hour storm event for each disturbed acre drained, or 3600 cubic feet per acre drained;

4.2.1.2 When discharging from the sediment basin, utilize outlet structures that withdraw water from the surface in order to minimize the discharge of pollutants, unless infeasible. If it is determined to be infeasible, support documentation shall be provided in the SWPPP.

4.2.1.3 Prevent erosion of (1) the sediment basin using stabilization controls (e.g., rip-rap or

erosion control blankets), and (2) the inlet and outlet using erosion controls and velocity dissipation devices;

4.2.1.4 Sediment basins shall be situated outside of surface waters and any natural buffers established under Part 3.5.1; and

4.2.1.5 Basins shall be maintained in effective operating condition and removal of accumulated sediment shall be conducted when design capacity has been reduced by 50%.

5.0 Inspections

5.1 Inspector Qualifications

5.1.1 The operator shall provide qualified personnel to perform inspections according to the schedules outlined below. "Qualified Personnel" means a person knowledgeable in the principles and practice of erosion and sediment controls and who possesses the skills to assess conditions at the site that could impact stormwater quality and effectiveness of the control measures selected to manage the quality of the stormwater discharges.

5.2 Routine Site Inspection Procedures

5.2.1 Implementation and functioning of the SWPPP shall be verified by inspections. If, during any routine site inspection or any other time, the facility's control measures are found to be inadequate or otherwise not properly operated and/or maintained, the Permittee shall review selection, design, installation, and implementation of the control measures to determine if maintenance and/or modifications are necessary. Modifications shall be documented in the SWPPP and implemented within 7 days following the inspection results or prior to the next storm event, whichever is sooner.

5.2.2 The Permittee shall conduct, at a minimum, a routine site inspection once every 7 days and within 24 hours of the end of a 0.5 inch or greater storm event, that includes all areas of the site where construction materials and/or activities are exposed to stormwater discharges authorized by this permit. Routine inspections shall incorporate the following:

5.2.2.1 Disturbed areas and areas used for storage of materials that are exposed to precipitation shall be inspected for evidence of, or potential for, pollutants entering the drainage system;

5.2.2.2 Sediment and erosion control measures identified in the SWPPP shall be observed to ensure that they are operating correctly;

5.2.2.3 Where discharge locations or points are accessible, they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters;

5.2.2.4 Where discharge locations are inaccessible, nearby downstream locations shall be inspected to the extent that such inspections are practicable;

5.2.2.5 Locations where vehicles enter or exit the site shall be inspected for evidence of

offsite sediment tracking;

5.2.2.6 The effectiveness of non-structural stormwater controls and practices (such as good housekeeping practices and pollution prevention measures) shall be evaluated;

5.2.2.7 Site conditions shall be inspected for evidence of, or the potential for, pollutants entering the municipal separate storm sewer; and

5.2.2.8 All locations where temporary stabilization measures have been implemented shall be inspected.

5.3 Reduced Inspection Schedule

5.3.1 The operator may reduce inspection frequency if the following conditions are met:

5.3.1.1 Land disturbance activities have been suspended and discharges are unlikely based on seasonal rainfall patterns; and

5.3.1.2 The disturbed areas of the site have been temporarily stabilized as described in Part 3.6.2; or

5.3.1.3 Runoff is unlikely due to winter conditions (e.g., site is covered with snow, ice; or frozen ground exists).

5.3.2 During a reduced inspection schedule, the operator shall inspect the site at least once every 30 days and within 24 hours of the end of each storm event of 0.5 inch or greater during a 24 hour period. The reduced schedule shall be documented in the SWPPP and the beginning and ending dates of the period noted.

5.3.3 For sites where snow cover or frozen ground exists, the site shall be waived from inspection requirements until one month before thawing conditions are expected to result in a discharge if all of the following requirements are met:

5.3.3.1 The project is located in an area where frozen conditions are anticipated to continue for extended periods of time (i.e., greater than 30 days);

5.3.3.2 Land disturbance activities have been suspended; and

5.3.3.3 The beginning and ending dates of the reduced inspection schedule are documented in the SWPPP.

5.4 Routine Facility Inspection Documentation

5.4.1 The Permittee shall document the findings of each routine site inspection performed and maintain this documentation onsite with the SWPPP. At a minimum, the documentation for each routine facility inspection shall include:

5.4.1.1 The inspection date and time;

5.4.1.2 The name(s) and signatures(s) of the inspector(s);

5.4.1.3 Weather information for the period since the last inspection and a description of any

discharges occurring at the time of the inspection;

5.4.1.4 Location(s) of discharges of sediment or other pollutants from the site;

5.4.1.5 Any control measures needing maintenance or repairs;

5.4.1.6 Any control measures that failed to operate as designed or proved inadequate for a particular location;

5.4.1.7 Discussion describing the reason(s) for any failed control measure;

5.4.1.8 Any observations of deviations from the permit or SWPPP; and

5.4.1.9 Locations where additional control measures are needed to comply with the permit requirements;

5.5 Inspection Results

5.5.1 Actions taken based on inspection results shall be recorded and retained as part of the SWPPP. Such reports shall identify any incidents of noncompliance. Where a report does not identify any incidents of noncompliance, the report shall contain a certification that the facility is in compliance with the SWPPP. The report shall be signed in accordance with Part 7.23 of this permit.

5.5.2 Inspection reports shall be retained as part of the SWPPP for at least three years from the date that permit coverage is terminated or the site is finally stabilized.

5.6 Inspection Follow-up

5.6.1 Based on the findings and observations of the inspection, including the visual assessment, the operator shall implement the changes necessary to comply with the conditions of this permit. The SWPPP shall be updated and modified as needed in accordance with Part 6.4. The changes shall be implemented in accordance with the schedule described in Part 3.3 “General Maintenance Requirements”.

5.6.2 Based on the scope of the inspection conducted in accordance with 5.0, the operator shall determine and implement appropriate corrective actions, and meet the applicable deadlines and in accordance with the permit.

6.0 Stormwater Pollution Prevention Plan (SWPPP)

6.1 General SWPPP Information

6.1.1 The Permittee shall prepare a SWPPP for the site before submitting a Notice of Intent (NOI) for permit coverage. If the Permittee prepared a SWPPP for coverage under the previous NPDES permit, they shall review and update the SWPPP to implement all provisions of this permit within 120 days of the General Permit NVR100000 issuance date. The SWPPP documentation requirements are intended to guide the identification of stormwater pollution sources and the reduction of their impacts, and otherwise lead to compliance with the

conditions of this permit.

6.1.2 The SWPPP shall be prepared and implemented in accordance with good engineering practices and shall:

6.1.2.1 Identify all potential sources of pollution that may reasonably be expected to affect the quality of stormwater discharges from the construction site;

6.1.2.2 Identify, describe, and ensure implementation of control measures that will be used to reduce pollutants in stormwater discharges from the construction site;

6.1.2.3 Ensure compliance with the terms and conditions of this permit; and

6.1.2.4 Be consistent with applicable State and/or local waste disposal, sanitary sewer, or septic system regulations to the extent these are located within the permitted area.

6.1.3 All operator(s) shall sign and certify the SWPPP in accordance with the signatory requirements Part 7.23.

6.1.4 The operator shall implement the SWPPP from initial commencement of the construction activity until final stabilization is complete and a Notice of Termination (NOT) is filed, or an NOT transferring the site to a new operator is received by NDEP.

6.1.5 SWPPPs that do not meet all the provisions of this permit are considered incomplete. Operating under an incomplete or inadequate SWPPP is a violation of this permit.

6.2 SWPPP Contents

6.2.1 *Identification of Operator(s)* – The SWPPP shall identify (by name, title, and contact number) the operator(s) for the project site. If there is more than one operator the SWPPP shall identify the areas and phases over which each operator has control.

6.2.2 *Stormwater Team* – Each operator or group of operators shall assemble a “stormwater team”, which is responsible for overseeing the development of the SWPPP, any modifications to the SWPPP, and compliance with the requirements of this permit. The SWPPP shall identify the team members by name, title and individual responsibilities. The team may include members who are not employed by the operator (i.e., third party consultants)

6.2.3 *Nature of Construction Activities* – The SWPPP shall describe the nature of the construction activities, including the size of the property (in acres) and the total area expected to be disturbed by the construction activities (in acres), construction support activity areas covered by this permit (see Part 1.2.1.3), and the maximum area expected to be disturbed at any one time.

6.2.3.1 *Emergency Related Construction Activities* – For earth-disturbing activities in response to a public emergency (see Part 2.5), the Permittee must document the cause of the public emergency (e.g., natural disaster, extreme flooding conditions, etc.), information substantiating its occurrence (e.g., state disaster declaration or similar state or local declaration), and a description of the construction necessary to reestablish effected public services.

6.2.4 *Sequence and Estimated Dates of Construction Activities* – The SWPPP shall include a

description of the intended sequence of construction activities, including a schedule of the estimated start dates and the duration of the activity for the following activities:

6.2.4.1 Installation of stormwater control measures, and when they will be made operational, including an explanation of sequence and schedule for installation of stormwater control measures;

6.2.4.2 Commencement and duration of construction activities, including clearing and grubbing, grading, site preparation (i.e., excavating, cutting, and filling), final grading, and creation of soil and vegetation stockpiles requiring stabilization;

6.2.4.3 Cessation, temporarily or permanently, of construction activities on the site, or in designated portions of the site;

6.2.4.4 Final or temporary stabilization of areas of exposed soil. The dates for stabilization shall reflect the applicable deadlines in Part 3.6; and

6.2.4.6 When departures from initial projections are necessary, this shall be documented in the SWPPP itself or in associated records, as appropriate.

6.2.5 *Site Description* – The SWPPP shall describe the construction site, including:

6.2.5.1 The project name and location including address, city, county and at least one APN associated with the project;

6.2.5.2 A description of the site and its intended use after the NOT is filed (e.g., low density residential, shopping mall, highway, etc.);

6.2.5.3 The total area of the site, and estimate of the total area of the site expected to be disturbed by construction activities, including off-site supporting activities, borrow and fill areas, staging and equipment storage areas;

6.2.5.4 The percentage of the site that is impervious before and after construction;

6.2.5.5 A description of soils at the site including the potential for erosion;

6.2.5.6 For areas where it is infeasible to maintain a 50-foot buffer in accordance with Part 3.5.1, a description of which alternative was selected for the site, and any additional required documentation;

6.2.5.7 Identification and description of all material storage areas (on-site and off-site) including overburden, stockpiles of dirt, borrow areas, etc.; and

6.2.5.8 A general location map (e.g., USGS quadrangle map, a portion of a city or county map or other map) with enough detail to identify the following:

6.2.5.8.1 The location of the construction site and one-mile radius; and

6.2.5.8.2 The waters of the State of Nevada including tributaries within a one-mile radius of the site.

6.2.6 *Site Map(s)* – The SWPPP shall contain a legible site map or series of maps completed to scale showing the entire site that identifies all of the following:

6.2.6.1 Topography of the site, existing types of cover (e.g., forest, pasture, pavement, structures), and drainage pattern(s) of flow onto, over, and from the site both before and after major grading activities;

6.2.6.2 Areas of soil disturbance and areas that will not be disturbed. Boundaries of the property and locations where construction activities will occur, including:

6.2.6.2.1 Locations where construction activities will occur, noting any phasing;

6.2.6.2.2 Locations where sediment or soil will be stockpiled;

6.2.6.2.3 Locations of any crossings of surface waters;

6.2.6.2.4 Designated points on the site where vehicles will exit onto paved road; and

6.2.6.2.5 Locations of construction support activity areas covered by this permit;

6.2.6.3 Locations of temporary and permanent stormwater control measures identified in the SWPPP;

6.2.6.4 Locations where stabilization control measures are expected to occur;

6.2.6.5 Areas protected by buffers (i.e., either the 50-foot buffer or other buffer areas retained on site when within 50 feet of perennial water) consistent with Part 3.5.1. The site map shall show the boundary line of all such buffers;

6.2.6.6 Locations of on-site material, waste, borrow areas or equipment storage areas, and other supporting activities (per Part 1.2.1.3);

6.2.6.7 Locations of all potential pollutant-generating activities identified in Part 6.2.9;

6.2.6.8 Locations of all surface waters and any impaired waters within ¼ mile of the site;

6.2.6.9 Stormwater discharge location(s), using arrows to indicate discharge direction(s) that include the following:

6.2.6.9.1 Location(s) where stormwater and/or allowable non-stormwater discharges are discharged to a Water of the U.S.; and

6.2.6.9.2 Location(s) of any discharges to municipal separate storm sewer systems (MS4s) from the construction site.

6.2.6.9.3 Areas where final stabilization has been accomplished and no further construction permit requirements apply; and

6.2.6.9.4 Location of trees and boundaries of environmentally sensitive areas and buffer zones to be preserved.

6.2.7 *Receiving Waters* – the SWPPP shall identify the name of the receiving water(s) and the areal extent and description of wetland or other special aquatic sites at or near the site which will be disturbed or which will receive discharges from disturbed areas of the construction site.

6.2.7.1 If any discharge point from the construction site is within ¼ mile of impaired water,

the SWPPP shall identify any common construction related pollutants such as sediment, sediment-related parameters and nutrients (including nitrogen and phosphorus) listed on the 303(d) list that may potentially be discharged from the construction site and describe additional or enhanced control measures to minimize discharges of these pollutants.

6.2.8 *Stormwater Control Measures to be used During Construction Activity* – The SWPPP shall describe all control measures as required in Part 3.0 that will be implemented and maintained as part of the construction project to control pollutants in discharges. The SWPPP shall clearly describe for each major activity identified:

6.2.8.1 The appropriate control measures and the general timing (or sequence) during the construction process that the measure will be implemented; and

6.2.8.2 Which operator is responsible for implementation of the control measures.

6.2.9 *Summary of Potential Pollutant Sources* – The SWPPP shall identify the location of and describe any pollutant sources, including any non-stormwater discharges expected to be associated with the project, from areas other than construction (i.e., support activities including stormwater discharges from dedicated asphalt or concrete plants and any other non-construction pollutant sources such as fueling and maintenance operations, materials stored on-site, waste piles, equipment staging yards, etc.)

6.2.10 *Spill Prevention and Response Procedures* – The SWPPP shall describe procedures to prevent and respond to spills, leaks, and other releases including:

6.2.10.1 Procedures for plainly labeling containers (e.g., “Used Oil”, “Pesticides”, etc.) that could be susceptible to spillage or leakage to encourage proper handling and facilitate rapid response as spills or leaks occur;

6.2.10.2 Preventative measures such as barriers between material storage and traffic areas, secondary containment provisions, and procedures for material storage and handling;

6.2.10.3 Procedures for expeditiously stopping, containing, and cleaning up spills, leaks, and other releases. Identify the name or position of the employee(s) responsible for detection and response of spills or leaks; and

6.2.10.4 Procedures for notification of appropriate facility personnel, emergency response agencies, and regulatory agencies where a leak, spill, or other release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity established under either 40 CFR Part 110, 40 CFR Part 117, or 40 CFR Part 302, occurs during a 24-hour period. Contact information shall be in locations that are readily accessible and available;

6.2.10.5 The operator may reference the existence of other plans, such as the Spill Prevention Control and Countermeasure (SPCC) plans developed for the construction activity under Part 311 of the CWA, or spill control programs otherwise required by NDEP permits for the construction activity, provided that a copy of that other plan is kept with the SWPPP onsite. If an SPCC or other spill prevention plan already exists, the operator may use such plans and incorporate them by reference in the SWPPP.

6.2.11 *Waste Management Procedures* – The SWPPP shall describe procedures for handling and

disposing of all wastes generated at the site, including, but not limited to, clearing and demolition debris, sediment removed from the site, construction and domestic waste, hazardous or toxic waste, and sanitary waste.

6.3 Documentation Requirements including Permit Related Records

6.3.1 The Permittee shall keep the following inspection, monitoring, and certification records complete and up-to-date. Retaining these records with the SWPPP (unless otherwise specified below) is necessary to demonstrate compliance with the conditions of this permit.

6.3.1.1 A copy of the signed electronic NOI certification page submitted to NDEP;

6.3.1.2 A copy of the approval letter received from NDEP;

6.3.1.3 A copy of this permit;

6.3.1.4 Descriptions and dates of any incidences of significant spills, leaks, or other releases that resulted in discharges of pollutants in stormwater to a regulated MS4 or waters of the State of Nevada that meet the definition of Waters of the U.S., the circumstances leading to the release and actions taken in response to the release and measures taken to prevent recurrence of such releases;

6.3.1.5 Documentation of repairs of structural control measures, including the date(s) of discovery of areas in need of repair/replacement, date(s) that the structural control measure(s) returned to full function, and the justification for any extended repair schedules;

6.3.1.6 All inspection reports including post storm event inspections;

6.3.1.7 Description of any corrective action taken at the site, including events and dates when problems were discovered and modification occurred;

6.3.1.8 Buffer documentation if the sites disturbance area is located within 50 feet of perennial water;

6.3.1.9 Records of employee training, including the date training was received; and

6.3.1.10 The SWPPP may incorporate by reference the appropriate elements of plans required by other agencies. A copy of the requirements incorporated by reference shall be included as an attachment to the SWPPP.

6.3.1.11 For DeMinimis discharges, a description of the discharge, the beginning and end dates of the discharge, and a copy of the sampling analyses report.

6.3.2 *Post Construction Stormwater Management* – The SWPPP shall include the following documentation:

6.3.2.1 A description of stormwater management control measures that will be installed during the construction process to control pollutants in stormwater discharges after construction has been completed.

6.4 SWPPP Updates and Modification Requirements

6.4.1 *Maintaining an Updated SWPPP* – The SWPPP shall be revised as necessary during permit coverage to reflect current conditions and to maintain accuracy. The operator shall make any required amendments to the SWPPP within 7 calendar days whenever:

6.4.1.1 There is a change in design, construction, operations, or maintenance at the construction site that may have a significant effect on the discharge of pollutants to the waters of the state of Nevada that meet the definition of waters of the U.S. that has not been previously addressed in the SWPPP; or

6.4.1.2 During inspections, monitoring if required, or investigations by the operator or by local, state, MS4 or federal officials, it is determined the discharges are causing or contributing to water quality exceedences or the SWPPP is ineffective in eliminating or significantly minimizing pollutants in stormwater discharges from the construction site; or

6.4.1.3 There is a change to the stormwater team.

6.4.2 *Conditions Requiring SWPPP Modification* – The operator shall complete required revisions to the SWPPP within 7 calendar days following the occurrence of any of the conditions listed below. The operator shall modify the SWPPP, including the site map(s), in response to any of the following conditions:

6.4.2.1 Whenever new operators become active in construction activities on the site, or changes are made to construction plans, stormwater control measures, pollution prevention measures, or other activities at the site that are no longer accurately reflected in the SWPPP. This includes changes made in response to corrective actions;

6.4.2.2 To reflect areas on the site map where operational control has been transferred (and the date of transfer) since initiating permit coverage;

6.4.2.3 If inspections or investigation by site staff, or by local, state or federal officials, determine that SWPPP modifications are necessary for compliance with this permit;

6.4.2.4 Where NDEP determines it is necessary to impose additional requirements on the discharge, the following shall be included in the SWPPP:

6.4.2.4.1 A copy of any correspondence describing such requirements; and

6.4.2.4.2 A description of the stormwater control measures that will be used to meet such requirements.

6.4.2.5 To reflect any revisions to applicable federal, state, tribal, or local requirements that affect the stormwater control measures implemented at the site.

6.5 Deficiencies in the SWPPP

6.5.1 NDEP may notify the permittee at any time that the SWPPP does not meet one or more requirements of this section. The notification shall identify the parts of this permit that are not being met and parts of the SWPPP that require modification. Within fifteen (15) calendar days of receipt of the written notification from NDEP, the operator shall make the

required changes to the SWPPP and submit to NDEP a written certification that the requested changes have been made. NDEP may request a copy of the SWPPP to confirm that all deficiencies have been adequately addressed. NDEP may also take appropriate enforcement action for the period of time the permittee was operating under a plan that did not meet minimum requirements of this permit.

6.6 Procedures for Inspection, Maintenance, and Corrective Action

6.6.1 The SWPPP shall describe the procedures operators will follow for maintaining their stormwater control measures, conducting site inspections, and, where necessary, taking corrective actions, in accordance with Parts 3.0, 4.0, and 5.0, of this permit. The following information shall also be included in the SWPPP:

6.6.1.1 Personnel responsible for conducting inspections;

6.6.1.2 The inspection schedule that will be followed based on whether the site is subject to Part 5.2 or whether the site qualifies for the reduced inspection frequency in Part 5.3;

6.6.1.3 If reducing the inspection frequency in accordance with Part 5.3, the beginning and ending dates of the reduced inspection period; and

6.6.1.4 Any inspection or maintenance checklists or other forms that will be used.

6.6.1.5 The operator shall ensure that all qualified personnel (see Appendix A) review the requirements of this permit. Qualified personnel are responsible for:

6.6.1.5.1 The design, installation, maintenance, and/or repair of stormwater controls (including pollution prevention measures); and

6.6.1.5.2 Conducting inspections as required in Part 5.0.

6.7 SWPPP Review and Making SWPPPS Available

6.7.1 The operator shall retain a copy of the current SWPPP at the site or at an easily accessible location so that it can be made available to NDEP, EPA, or another Federal, State or local agency having stormwater program authority, or the operator of a regulated MS4 receiving discharges from the facility (where applicable), at the time of an onsite inspection or upon request.

7.0 General Permit Conditions

7.1 Annual Fee

7.1.1 In accordance with NAC 445A.268, a discharger who is covered under a general permit shall pay to the Director the applicable nonrefundable annual fee not later than July 1 of each year that the discharger is covered under that permit.

7.1.2 If application/fee for the permit occurs prior to July 1, the permittee shall also submit the

annual renewal fee due on or before July 1 of the same year.

7.2 General Permit Re-issuance for Ongoing Projects

7.2.1 The Permittee will be included in the reissued general permit after this general permit expires, or will be informed of other permitting requirements. The Permittee will receive public notice if NDEP determines to reissue the general permit.

7.3 Facilities Operation

7.3.1 The Permittee shall at all times maintain in good working order and operate as efficiently as possible all equipment and ancillary BMPs used by the Permittee to achieve compliance with the terms and conditions of this general permit.

7.4 Need to Halt or Reduce Activity Not a Defense

7.4.1 It shall not be a defense for the Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity, under the Permittee's control, in order to maintain compliance with the conditions of this permit.

7.5 Noncompliance, Unauthorized Discharge, Bypass, and Upset

7.5.1 Any diversion, bypass, spill, overflow, upset or discharge of treated or untreated stormwater from stormwater treatment or conveyance facilities under the control of the Permittee is prohibited except as authorized by this permit. In the event the Permittee has knowledge that a diversion, bypass, spill, overflow, upset or discharge not authorized by this permit is imminent, the permittee shall notify NDEP immediately.

7.5.1.1 ***Bypass*****:** means the intentional diversion of stormwater from any portion of a control measure.

7.5.1.1.1 Bypass is prohibited, and NDEP may take enforcement action against the Permittee for bypass, unless:

7.5.1.1.1.1 Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

7.5.1.1.1.2 There were no feasible alternatives to the bypass. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventative maintenance; and

7.5.1.1.1.3 The Permittee submitted prior notice at least 10 days before the date of the bypass.

7.5.1.1.2 NDEP may approve an anticipated bypass, after considering its adverse effects, if NDEP determines that it will meet the three conditions listed in Part 7.5.1.1.1 above.

7.5.1.2 ***Upset*:** means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed control measures, inadequate control measures, lack of preventive maintenance, or careless or improper operation.

7.5.1.2.1 An upset constitutes an affirmative defense to an action brought for non-compliance with such technology-based permit effluent limitations if the requirements of Part 7.5.1.2.2 below are met.

7.5.1.2.2 A Permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs or other relevant evidence, that:

7.5.1.2.2.1 An upset occurred and that the Permittee can identify the cause(s) of the upset;

7.5.1.2.2.2 The permitted site was at the time being properly operated;

7.5.1.2.2.3 The Permittee submitted notice of the upset as required under this section; and

7.5.1.2.2.4 The Permittee complied with any remedial measures required under Part 7.0.

7.5.1.2.3 In selecting the appropriate enforcement option, NDEP shall consider whether or not the noncompliance was the result of an upset. The burden of proof is on the Permittee to establish that an upset occurred.

7.5.1.3 There shall be no discharge of substances to Waters of the State that would cause a violation of water quality standards of the State of Nevada.

7.6 Sampling and Analysis

If any samples or measurements are taken pursuant to this permit they shall be representative of the volume and nature of the discharge. Laboratory analyses shall be performed by a State of Nevada certified lab. Results from this lab shall be provided to NDEP.

7.7 Test Procedures

Test procedures for analyses of pollutants shall conform to regulations (40 CFR § 136) published pursuant to Section 304(h) of the Act, under which such procedures may be required, unless other procedures are approved by NDEP.

7.8 Recording the Results

If any measurement or sample is taken pursuant to this permit, the permittee shall record the following information:

7.8.1 The exact place, date, and time of sampling;

7.8.2 The dates the analyses were performed;

7.8.3 The person(s) who performed the analyses;

7.8.4 The analytical techniques or methods used; and

7.8.5 The results of all required analyses.

7.9 Odors

7.9.1 There shall be no objectionable odors resulting from activities authorized by this general permit.

7.10 Removed Substances

7.10.1 Solids or other pollutants removed in the course of treatment or control of stormwater shall be disposed of in a manner such as to prevent pollution from such materials from entering any surface water.

7.11 Changes in Discharge

7.11.1 All discharges authorized herein shall be consistent with the terms and conditions of this general permit. Any anticipated new discharges at the site which will result in new, different, or increased discharges of pollutants shall be reported to NDEP. Pursuant to NAC 445A.263, the general permit may be modified to specify and limit any pollutants not previously limited.

7.12 Adverse Impact

7.12.1 The Permittee shall take all reasonable steps to minimize, to the extent practicable, any adverse impact to receiving waters resulting from noncompliance with this general permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the non-complying discharge. The Permittee shall carry out such measures, as reasonable, to prevent significant adverse impacts on human health or the environment.

7.13 Right of Entry

7.13.1 The Permittee shall allow the Administrator and/or his authorized representatives, upon the presentation of credentials:

7.13.1.1 To enter upon the Permittee's premises where a discharge is or could be located or in which any records are required to be kept under the terms and conditions of the general permit; and

7.13.1.2 At reasonable times, to have access to and copy any records required to be kept under the terms and conditions of this general permit; to inspect any monitoring equipment or monitoring method required in this general permit; and to perform any necessary sampling to determine compliance with the general permit or to sample any discharge.

7.14 Transfer of Ownership or Control

7.14.1 In the event of any change in control or ownership of facilities from which the authorized discharge emanates, the Permittee shall notify the succeeding owner/operator of the existence of this permit by letter, a copy of which shall be forwarded to NDEP. Completion of transfer requires the following actions:

7.14.1.1 Transfer of coverage from one owner/operator to a different owner/operator (e.g., facility sold to a new company): the new owner/operator shall complete and file a Notice of Intent in accordance with Part 2.3, at least 14 days prior to taking over operational control of the facility. The current owner/operator shall file a Notice of Termination within thirty (30) days after the new owner/operator has assumed responsibility for the facility.

7.14.1.2 Name changes for the Permittee (e.g., Company "A" changes name to "BCD, Inc.") may be done by submitting to NDEP a request letter on company letterhead, indicating the facility's assigned permit number and requesting the name change.

7.15 Availability of Reports

7.15.1 Except for data determined to be confidential under NRS 445A.665, all reports prepared in accordance with the terms of this general permit shall be available for public inspection at the office of NDEP. As required by the Act, effluent data shall not be considered confidential. Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provided for in NRS 445A.710.

7.16 Furnishing False Information and Tampering with Monitoring Devices

7.16.1 Any person who knowingly makes any false statement, representation, or certification in any application, record, report, plan or other document filed or required to be maintained by the provisions of NRS 445A.300 to 445A.730, inclusive, or by any general permit, rule, regulation or order issued pursuant thereto, or who falsifies, tampers with or knowingly renders inaccurate any monitoring device or method required to be maintained under the provisions of NRS 445A.300 to 445A.730 inclusive, or by any general permit, rule, regulation or order issued pursuant thereto, is guilty of a gross misdemeanor and shall be punished by a fine of not more than $10,000 or by imprisonment. This penalty is in addition to any other penalties, civil or criminal, provided pursuant to NRS 445A.300 to 445A.730 inclusive.

7.17 Penalty for Violation of General Permit Conditions

7.17.1 The Permittee shall comply with all conditions of this permit. Any permit non-compliance constitutes a violation of the CWA and is grounds for enforcement action, permit termination, revocation and re-issuance, modification, or denial of a permit renewal application. NRS 445A.675 provides that any person who violates a general permit condition is subject to administrative and judicial sanctions as outlined in NRS 445A.690 through 445A.705.

7.18 General Permit Modification, Suspension or Revocation

7.18.1 After notice and opportunity for a hearing, this general permit may be modified, suspended, or revoked in whole or in part during its term for cause including, but not limited to, the following:

7.18.1.1 Violation of any terms or conditions of this general permit;

7.18.1.2 Obtaining this general permit by misrepresentation or failure to disclose fully all relevant facts; or

7.18.1.3 A change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge.

7.19 Liability

7.19.1 Nothing in this general permit shall be construed to preclude the institution of any legal action or relieve the Permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable Federal, State or local laws, regulations, or ordinances.

7.20 Property Rights

7.20.1 The issuance of this general permit does not convey any property rights, in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

7.21 Records Retention

7.21.1 All records and information resulting from activities performed pursuant to this permit shall be retained for a minimum of three years, or longer if required by NDEP.

7.22 Severability

7.22.1 The provisions of this general permit are severable, and if any provisions of this general permit, or the application of any provisions of this general permit to any circumstance is held invalid, the application of such provision to other circumstances, and the remainder of the general permit, shall not be affected thereby.

7.23 Signature Requirements

7.23.1 All Notices of Intent, Notices of Termination, SWPPPs, reporting forms and document submissions shall be signed by one of the following:

7.23.1.1 A principal executive officer of the corporation (of at least the level of vice president) or his authorized representative who is responsible for the overall operation of the facility for which the discharge described in the application or reporting form originates; or

7.23.1.2 A general partner of the partnership; or

7.23.1.3 The proprietor of the sole proprietorship; or

7.23.1.4 A principal executive officer, ranking elected official or other authorized employee of the municipal, state or other public facility.

7.23.1.5 A duly authorized representative only if:

7.23.1.5.1 The authorization is made in writing by a person described above in Part 7.23.1.1;

7.23.1.5.2 The authorization specifies either an individual or a position within the organization; and

7.23.1.5.3 The written authorization is submitted to the Director.

7.24 Changes to Authorization

7.24.1 If an authorization under Part 7.23 is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of Part 7.23 shall be submitted to NDEP prior to or together with any reports, information, or application to be signed by an authorized representative.

7.25 Certification Requirements

7.25.1 Signatures, Certification Required on Application and Reporting Forms: All applications, reports, or information submitted to the Administrator shall be signed and certified by making the following certification. “I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.”

7.26 Address for Fee Payment, NOI Certification Page, and Notice of Termination Form

7.26.1 NOI Certification pages and NOT applications shall be signed and dated in accordance with Parts 2.3.3.10, 2.8.2, and 8.23 and submitted to NDEP at the address below. Application fees, Annual Fees, and any required reporting documentation shall likewise be sent to the address in Part 7.26.2.

7.26.2 **Nevada Division of Environmental Protection**
Bureau of Water Pollution Control
901 South Stewart Street, Suite 4001
Carson City, Nevada 89701

Appendix A
Definitions, Abbreviations and Acronyms

A.1 Definitions

24-hour period – any consecutive 24-hour period

Administrator – means the executive head of the Division (NRS 445A.315).

Anticipated Storm Event – for the purpose of this permit, means any storm event with at least a 30% chance of precipitation as predicted by the National Weather Service for the area local to the construction site.

Best Management Practices (BMPs) – schedules of activities, practices (and prohibitions of practices), structures, vegetation, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants to Waters of the State of Nevada that meet the definition of Waters of the United States. BMPs also include treatment requirements, operating procedures, and practices to control site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. See 40 CFR 122.2. In addition, the term shall include erosion and sediment controls, conveyance, stormwater diversion and treatment structures, and any procedure or facility used to minimize, to the extent practicable, the exposure of pollutants to stormwater or remove pollutants from stormwater.

Borrow Areas – the areas where materials are dug or stored for use as fill, either onsite or off-site.

Cationic Treatment Chemical – polymers, flocculants, or other chemicals that contain an overall positive charge. Among other things they are used to reduce turbidity in stormwater discharges by chemically bonding to the overall negative charge of suspended silts and other soil materials and causing them to bind together and settle out. Common examples of cationic treatment chemcials are chitosan and cationic PAM.

Clean Water Act (CWA) – Formerly referred to as the Federal Water Pollution Control Act or Federal Water Pollution Control Act Amendments of 1972, Public Law 92-500, as amended by Public Law 92-217, Public Law 95-576, Public Law 96-483 and Public Law 97-117, 33 U.S.C.1251 et seq. CWA and regulations means the Clean Water Act (CWA) and applicable regulation promulgated thereunder. In the case of an approved State program, it includes State program requirements.

Commencement of construction activities – the initial disturbance of soils (or “breaking ground”) associated with clearing, grading, excavating, or stockpiling of fill material activities or other construction related activities.

Common Plan of Development – a contiguous area where multiple separate and distinct land disturbing activities may be taking place at different times, on different schedules, but under one plan. A ‘plan’ is broadly defined to include design, permit application, advertisement or physical demarcation indicating that land disturbing activities may occur.

Construction Activity – includes clearing, grading excavating, stockpiling of fill material and other similar activities. This definition encompasses both large construction activities defined in 40 CFR 122.26(b)(14)(x) and small construction activities in 40 CFR 122.26(b)(15)(i) and include construction support activities.

Construction and Development Effluent Limitations and New Source Performance

Standards (C&D Rule) – as published in 40 CFR § 450 is the regulation requiring effluent limitations guidelines (ELGs) and new source performance standards (NSPS) for controlling the discharge of pollutants from construction sites.

Construction Site (or site) – means the land or water area where construction activities will occur, including construction support activities, and where stormwater controls will be installed and maintained. The construction support activities may be located at a different part of the property from where the primary construction activity will take place, or on a different piece of property altogether.

Construction Support Activity – means a construction related activity that exclusively supports the construction activity and involves earth disturbance or pollutant-generating activities of its own, and can include activities associated with concrete or asphalt batch plants, equipment staging yards, material storage areas, excavated material disposal areas, and borrow areas.

Construction Waste – refers to discarded material (such as packaging materials, scrap construction materials, masonry products, timber, steel, pipe, and electrical cuttings, plastics and Styrofoam).

Control Measure – refers to any BMP or other method (including effluent limitations) used to prevent or reduce the discharge of pollutants to Waters of the State of Nevada that meet the definition of Waters of the United States.

Conveyance Channel – means a temporary or permanent waterway designed and installed to safely convey stormwater flow within and out of a construction site.

Corrective Action – for the purpose of this permit, any action taken to (1) modify or replace any stormwater control used at the site; (2) clean up and dispose of spills, releases, or other deposits found on the site; or (3) remedy a permit violation.

Department - means the State Department of Conservation and Natural Resources (NRS 445A.330).

Director – means the Director of the Nevada Division of Environmental Protection or an authorized representative (NRS 445A.340).

Discharge – means any addition of a pollutant or pollutants to Waters of the State of Nevada that meet the definition of Waters of the United States or to a MS4 from any point source.

Discharge of a pollutant – any addition of any “pollutant” or combination of pollutants to “waters of the United States” from any “point source,” or any addition of any pollutant or combination of pollutants to the waters of the “contiguous zone” or the ocean from any point source other than a vessel or other floating craft which is being used as a means of transportation. This includes additions of pollutants into waters of the United States from surface runoff which is collected or channeled by man. See 40 CFR 122.2.

Discharge Point – is, for the purpose of this permit, the location where stormwater flows exit the construction site.

Discharge to an Impaired Water – for the purposes of this permit, a discharge to an impaired water occurs if the first water of the U.S. to which you discharge is identified by NDEP, pursuant to section 303(d) of the Clean Water Act, as not meeting an applicable water quality standard. For

discharges that enter a storm drain system prior to discharge, the first surface water to which you discharge is the water body that receives the stormwater discharge from the storm drain system.

Division – means the Division of Environmental Protection of the Department (NRS 445A.350)

Domestic Waste – for the purpose of this permit means typical household trash, garbage or rubbish items generated by construction activities.

Emergency-related Construction Activity – means an activity initiated in response to an emergency (e.g., natural disaster, disruption in essential public services), for which the related work requires immediate authorization to avoid imminent endangerment to human health or the environment, or to reestablish essential public services.

Ephemeral Water – means a surface water that has a channel that is at all times above the water table, and that flows only in direct response to precipitation.

Erosion Control – means temporary or permanent measures to prevent soil particles from detaching and being transported in stormwater.

Existing Discharger – an operator applying for coverage under this permit for discharges authorized previously under an NPDES general or individual permit.

Existing Project – means a construction project that commenced construction activities prior to ADD DATE PERMIT BECOMES EFFECTIVE

Exit points – are any points of egress from the construction site to be used by vehicles and equipment during construction activities.

General Permit – means a permit issued by the Department pursuant to NRS 445A.475 (NRS445A.360).

Impaired Water – waters that have been assessed by NDEP, under the CWA, Section 303(d), as not attaining a water quality standard for at least one designated use, and are listed in Nevada's 2006 303(d) Impaired Waters List. **http://ndep.nv.gov/bwqp/303dlist2012.htm**

Industrial Activity – means temporary concrete, asphalt and material plants which are dedicated exclusively to the permitted construction activity.

Infeasible – means not technologically possible, or not economically practicable and achievable in light of best industry practices.

Large Construction Activity – includes clearing, grading and excavation that results in the disturbance of five acres or more of total land area.

Linear Project – includes the construction of roads, bridges, conduits, substructures, pipelines, sewer lines, towers, poles, cables, wires, connectors, switching, regulating and transforming equipment and associated ancillary facilities in a long, narrow area.

Minimize – to reduce and/or eliminate to the extent achievable using stormwater controls that are technologically available and economically practicable and achievable in light of best industry practices.

Municipal Separate Storm Sewer (MS4) – a conveyance or system of conveyances (including

roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains);

1. Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to waters of the United States;
2. Designed or used for the collecting or conveying stormwater;
3. Which is not a combined sewer; and
4. Is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR122.2. See 40 CFR 122.26(b)(4) and (b)(7).

Notice of Intent (NOI) – the application to operate under this general permit.

Notice of Termination (NOT) – the application to terminate coverage under this general permit.

Operator – any entity with a stormwater discharge associated with construction activity that meets either of the following two criteria:

1. The person has operational control over the construction plans and specifications, including the ability to make modifications to those plans and specifications; or

2. The person has day-to-day operational control of those activities at a project that are necessary to ensure compliance with the permit conditions (e.g., they are authorized to direct workers at a site to carry out activities required by the permit).

Person – "Person" includes the United States, to the extent authorized by federal law, the State or any agency or institution thereof, any municipality or other political subdivision of this State or any interstate body (NRS 445A.390)

Pollutant – (NRS 445A.400)

1. Means dredged soil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal and agricultural waste discharged into water.

2. Does not mean water, gas or other material which is injected into a well to facilitate production of oil or gas, or water derived in association with oil or gas production and disposed of in a well, if the well is used either for facilitating production or for disposal purposes and if the Department determines that such injection or disposal will not result in the degradation of ground or surface water resources.

3. Does not mean water, gas or other material injected into a well or used to stimulate a reservoir of geothermal resources if the Department determines that the injection or stimulation will not result in the degradation of ground or surface water resources.

Pollution Prevention Measures – refers to stormwater controls designed to reduce or eliminate the addition of pollutants to construction site discharges through analysis of pollutant sources, implementation of proper handling/disposal practices, employee education, and other actions.

Qualified Person or Qualified Personnel – Qualified personnel are those (either the Operator's employees or outside consultants) who are knowledgeable in the principles and practice of erosion and sediment controls and pollution prevention, who possess the skills to assess conditions at the

construction site that could impact stormwater quality, and the skills to assess the effectiveness of any stormwater controls selected to control the quality of stormwater discharges from the construction activity.

Point Source – means any discernible, confined and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural stormwater runoff.

Pollution Prevention Measures – means stormwater controls designed to reduce or eliminate the addition of pollutants to construction site discharges through analysis of pollutant sources, implementation of proper handling/disposal practices, employee education, and other actions.

Run-on – means stormwater that drains from land located upslope or upstream from the regulated site in question.

Sediment Control – refers to measures designed to intercept and settle out soil particles that have become detached and transported by water.

Small Construction Activity – includes the disturbance of less than one acre of total land area that is part of a larger common plan of development or sale if the larger common plan will ultimately disturb equal to or greater than one acre. Small construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of the facility.

Stabilization – means covering or maintaining an existing cover over soil that reduces and minimizes erosion. The use of vegetative and/or non-vegetative cover to prevent erosion and sediment loss in areas exposed through the construction process.

Storm Event – as used in this permit is defined as a precipitation event that results in a measureable amount of precipitation.

Stormwater – means stormwater runoff, snow melt runoff, and surface runoff and drainage. See 40 CFR 122.26(b)(13).

Stormwater Discharges Associated with Construction Activity – refers to a discharge of pollutants in stormwater runoff from areas where soil disturbing activities (e.g., clearing, grading, or excavating), construction materials or equipment storage or maintenance (e.g., fill piles, borrow areas, concrete truck washout, fueling), or other industrial stormwater directly related to the construction process (e.g., concrete or asphalt batch plats) are located. See 40 CFR 122.26(b)(14)(x) and 40 CFR 122.26(b)(15).

Stormwater Pollution Prevention Plan (SWPPP) – a site-specific, written document that, among other things: (1) identifies potential sources of stormwater pollution at the construction site; (2) describes stormwater control measures to reduce or eliminate pollutants in stormwater discharges from the construction site; and (3) identifies procedures the operator will implement to comply with the terms and conditions of the general permit.

Stormwater Team – refers to an individual or group of individuals responsible for oversight of the development and modification of the SWPPP, and oversight of compliance with the permit requirements.

Temporary Stabilization – means a condition where exposed soils or disturbed areas are provided a temporary vegetative and/or non-vegetative protective cover to prevent erosion and sediment loss. Temporary stabilization may include temporary seeding, geotextiles, palliatives, mulches, and other techniques to reduce or eliminate erosion until either final stabilization can be achieved or until further construction activities take place to re-disturb the area. The application of water alone to control dust is not considered a form of temporary stabilization.

Waters of the United States or waters of the U.S. – is defined at 40 CFR §122.2. Discharges to storm drain systems that in turn discharge to Waters of the United States are considered to be discharges to Waters of the United States.

Water Quality Standards – A water quality standard defines the water quality goals of a water body, or portion thereof, by designating the use or uses to be made of the water and by setting criteria necessary to protect the uses. States and EPA adopt water quality standards to protect public health or welfare, enhance the quality of water and serve the purposes of the Clean Water Act.

A.2 Abbreviations and Acronyms

BMP – Best Management Practice

BWPC – Bureau of Water Pollution Control

CFR – Code of Federal Regulations

CWA – Clean Water Act (or Federal Water Pollution Control Act, 33 U.S.C. §1251 et seq)

EPA – Federal Environmental Protection Agency

MS4 – Municipal Separate Storm Sewer System

NDEP – Nevada Division of Environmental Protection

NOI – Notice of Intent

NOT – Notice of Termination

NPDES – National Pollutant Discharge Elimination System

SWPPP – Stormwater Pollution Prevention Plan

USGS – United States Geological Survey

WOUS – Waters of the United States

Appendix B
DeMinimis Discharge Sampling and Limitations

B.1 DeMinimis Discharge Sampling and Limitations Table

Parameters	Discharge Limit - Daily Max	Sample Type
Flow - gallons per minute (gpm)	250	Meter
Total Residual Chlorine - mg/L	0.10	Discrete
Total Dissolved Solids (TDS) - mg/L	Monitor & Record in SWPPP	Discrete
Total Suspended Solids (TSS) - mg/L	Monitor & Record in SWPPP	Discrete
Total Petroleum Hydrocarbon (TPH) (C6 - C40) mg/L[1]	1.0	Discrete
Methyl tert-Butyl Ether (MTBE) - µg/L	20.0	Discrete
Total Nitrogen as N - mg/L	10.0	Discrete
Total Phosphorus as P	Monitor & Record in SWPPP	Discrete
Trichloroethylene (TCE) - µg/L	5.0	Discrete
Tetrachloroethylene (PCE) - µg/L	5.0	Discrete
Benzene - µg/L	5.0	Discrete
Ethyl Benzene - µg/L	100.0	Discrete
Toluene - µg/L	100.0	Discrete
Xylene - µg/L	200.0	Discrete
pH - SU	6.5 - 9.0	Discrete
Turbidity - NTU[2]	Monitor & Record in SWPPP	Discrete
Barium - mg/L	2.0	Discrete
Fluoride - mg/L	Monitor & Record in SWPPP	Discrete
Iron - mg/L	1.0	Discrete
Sulfate - mg/L	Monitor & Record in SWPPP	Discrete
Dissolved Oxygen	Monitor & Record in SWPPP	Discrete
Molybdenum - mg/L	6.16	Discrete
Antimony	Monitor & Record in SWPPP	Discrete
Arsenic	Monitor & Record in SWPPP	Discrete
Beryllium	Monitor & Record in SWPPP	Discrete
Boron	Monitor & Record in SWPPP	Discrete
Cadmium	Monitor & Record in SWPPP	Discrete
Calcium	Monitor & Record in SWPPP	Discrete
Copper	Monitor & Record in SWPPP	Discrete
Lead	Monitor & Record in SWPPP	Discrete
Magnesium	Monitor & Record in SWPPP	Discrete
Manganese	Monitor & Record in SWPPP	Discrete
Mercury	Monitor & Record in SWPPP	Discrete
Nickel	Monitor & Record in SWPPP	Discrete
Selenium	Monitor & Record in SWPPP	Discrete

Silver	Monitor & Record in SWPPP	Discrete
Sulfur	Monitor & Record in SWPPP	Discrete
Thallium	Monitor & Record in SWPPP	Discrete
Zinc – total recoverable	Monitor & Record in SWPPP	Discrete
Fecal Coliform - MPN/100 mL	Monitor & Record in SWPPP	Discrete
E Coli - MPN/100 mL	Monitor & Record in SWPPP	Discrete
Hardness (expressed as $CACO_3$) – mg/L	Monitor & Record in SWPPP	Discrete

1. EPA Method 8015B and EPA Method 8260B, extractable and purgeable, C6-C40. Summation must meet permit limit.
2. Turbidity shall be less than or equal to 10 Nephelometric Turbidity Units (NTUs) over the background value of the receiving water.

Nevada Department
of Transportation