



## Description

Training programs that address the proper installation and maintenance of construction best management practices (BMPs), along with State of Hawaii Department of Transportation, Highways Division's (DOT-HWYS) policies, rules, and procedures regarding construction storm water.

### TRAINING OBJECTIVES

Provide the necessary information for personnel to identify potential pollutant sources on DOT-HWYS construction projects and implement practicable solutions.

### SEE ALSO

- MS4 NPDES Permit No. HI S000001 (Oahu District)
- MS4 NPDES Permit No. HI15KE674 (Maui District)
- Hawaii Administrative Rules, Title 11, Chapter 55, and all appendices as applicable
- *2005 Hawaii Standard Specifications for Road and Bridge Construction*, Standard Specifications & Special Provisions Section 209
- *City & County of Honolulu Rules Relating to Water Quality*
- Stormwaterhawaii.com
- Stormwatermaui.com
- Youtube.com/user/stormwaterhawaii

## Applications

- Personnel with construction storm water responsibilities, including but not limited to designers, construction engineers, construction and maintenance inspectors, plan reviewers, contractors, and sub-contractors are responsible, as applicable, for the following:
  - Designing, installing, maintaining, and/or repairing storm water controls/BMPs (including pollution prevention measures).
  - Applying and storing chemicals.
  - Vehicle/equipment storage, maintenance, and refueling.
  - Conducting inspections.
  - Taking and documenting corrective actions.

## Implementation Requirements

- Provide training to DOT-HWYS staff with construction storm water responsibilities, including construction engineers, construction and maintenance inspectors, and plan reviewers. Per MS4 NPDES Permit No. HI S000001, as in effect, training shall be specific to DOT-HWYS activities (including the proper installation and maintenance of accepted BMPs), policies, rules, and procedures.
- Provide relevant educational materials to project applicants, contractors, developers, property owners, and other responsible parties, per MS4 NPDES Permit No. HI S000001, as in effect.
- Provide construction BMP training to contractors and sub-contractors responsible for development of the *Storm Water Pollution Prevention Plan (SWPPP)* and implementation of site-specific BMPs on DOT-HWYS contract construction projects. The contractor shall keep training logs updated and readily available, per *2005 Hawaii Standard Specifications for Road and Bridge Construction*, Standard Specifications & Special Provisions Section 209.03(G), as in effect.
  - Prior to commencement of earth-disturbing activities or pollutant-generating activities, whichever occurs first, at a minimum, personnel must be trained to understand the scope of their job duties, as applicable, as follows:
    - Location of all storm water controls on the site, and how they are to be maintained.



Training should be specific to DOT-HWYS activities, policies, rules, and procedures.

## Implementation Requirements *(continued)*

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- Proper procedures to follow with respect to the project's pollution prevention requirements.
- When and how to conduct inspections, record applicable findings, and take corrective actions.
- Provide storm water training through field office trainings, product demonstrations, an annual storm water conference, videos, newsletters, and/or field demonstrations.



Product demonstrations provide hands-on training opportunities for BMP installation.

## Considerations

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- Availability of personnel with storm water responsibilities to attend trainings.
- Motivation and incentive for personnel to learn about erosion and sediment controls.

## Training Frequency

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- DOT-HWYS provides annual training to staff with construction storm water responsibilities.
- When needed, as new technology, permits, and regulations are created.
- Prior to the commencement of earth-disturbing activities or pollutant-generating activities.
- Provide training to new hires prior to them performing responsibilities related to compliance with applicable permits.
- Site-specific training may be necessary for new construction projects.



## Description

Practices and procedures to promote proper handling, storage, and use of construction materials in a manner that minimizes or eliminates storm water pollution, groundwater pollution, soil contamination, and injury to workers or visitors.

## Applications

Properly store and handle materials on construction sites based on the general requirements for the materials listed in Table SM-2.1, as applicable:

- Designate a material storage area.
- Locate stored materials away from inlets, concentrated flows, and open waterbodies.
- Provide a cover for stored material.
- Cover with an impermeable material to prevent contact with storm water if materials must be stored in an uncovered area.

## SEE ALSO

- Hawaii Administrative Rules, Title 11, Chapter 55, Appendix C (February 9, 2019)
- *2005 Hawaii Standard Specifications for Road and Bridge Construction*, Standard Specifications & Special Provisions Section 209
- 40 CFR 355, Appendix A & B – The List of Extremely Hazardous Substances and Their Threshold Planning Quantities
- 29 CFR Part 1910, Subpart H – Hazardous Materials



# Material Storage and Handling

Table SM-2.1 Proper storage and handling of materials commonly found on construction sites

Materials Commonly Found on Construction Sites	Proper Material Storage and Handling
<ul style="list-style-type: none"> <li>• Soil</li> <li>• Fill</li> <li>• Aggregate</li> </ul>	<ul style="list-style-type: none"> <li>• Designate a material storage area.</li> <li>• Locate stored materials away from inlets, concentrated flows and open waterbodies.</li> <li>• Cover stored materials containing fines with an impermeable material to prevent erosion caused by storm water and wind.</li> <li>• Place a compost filter sock, silt fence, or similar sediment barrier device at the base of material stockpiles.</li> <li>• <i>See</i> section SM-3 Stockpile Management.</li> </ul>
<ul style="list-style-type: none"> <li>• Soil stabilizers and binders</li> <li>• Fertilizers</li> <li>• Pesticides and herbicides</li> <li>• Detergents</li> <li>• Plasters</li> </ul>	<ul style="list-style-type: none"> <li>• Designate a material storage area.</li> <li>• Locate stored materials away from inlets, concentrated flows and open waterbodies.</li> <li>• Store materials on proper dunnage, pallet, or similar materials to elevate off the ground.</li> <li>• Cover stored materials with an impermeable material to prevent contact with storm water.</li> <li>• Tightly seal container lids when not in use.</li> <li>• Do not apply fertilizer or herbicides during or just before a rain event.</li> <li>• Materials shall be in sealed and properly labeled bags or containers.</li> <li>• All liquid materials shall be stored with an appropriately sized secondary containment.</li> </ul>
<ul style="list-style-type: none"> <li>• All metals, including galvanized metal</li> <li>• Rebar</li> </ul>	<ul style="list-style-type: none"> <li>• Rack materials off the ground on proper dunnage, pallet, or similar materials to elevate off the ground.</li> <li>• Cover all metal materials, including galvanized metals and rebar, with an impermeable material to prevent contact with storm water.</li> </ul>



# Material Storage and Handling

Table SM-2.1 Proper storage and handling of materials commonly found on construction sites (continued)

Materials Commonly Found on Construction Sites	Proper Material Storage and Handling
<ul style="list-style-type: none"> <li>• Asphalt</li> <li>• Asphalt products (i.e., cold patch, tack coat, etc.)</li> <li>• Concrete products (i.e., cold curing compound, form release agents, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>• Designate a material storage area.</li> <li>• Locate stored materials away from inlets, concentrated flows and open waterbodies.</li> <li>• Store materials on proper dunnage, pallet, or similar materials to elevate off the ground.</li> <li>• Cover asphalt and concrete products with an impermeable material to prevent contact with storm water.</li> <li>• Seal in a properly labeled container with a secure lid when not in use.</li> <li>• Provide appropriately sized secondary containment for asphalt and concrete products.</li> </ul>
<ul style="list-style-type: none"> <li>• Hazardous materials: acids, lime, glues, paints, solvents, curing compounds, etc.</li> <li>• Petroleum products: fuel, oil, hydraulic fluid, and grease</li> <li>• Creosote-soaked materials</li> </ul>	<ul style="list-style-type: none"> <li>• Designate a material storage area.</li> <li>• Locate stored materials away from concentrated flows, inlets, and open waterbodies.</li> <li>• Cover stored materials with an impermeable material to prevent contact with storm water.</li> <li>• Hazardous materials shall be labeled and stored in the original containers.</li> <li>• Provide appropriately sized secondary containment.</li> <li>• Properly dispose of containers only after all of the product has been used.</li> <li>• <i>See</i> section SM-9 Hazardous Materials and Waste Management.</li> </ul>

## Installation and Implementation Requirements

Ensure proper material storage and handling practices are implemented on construction sites.

### MATERIAL STORAGE

- Materials with the potential to contaminate runoff must be stored under some type of impermeable cover and racked off of the ground to prevent contact with storm water. This BMP will greatly decrease the potential of pollutants originating from storage areas.
- Designate an on-site material storage area. This area shall be located away from concentrated flows, inlets, and open waterbodies.
- Maintain accurate and up-to-date records of materials delivered and stored on-site.
- Minimize on-site inventory.
- Retain a complete set of Safety Data Sheets (SDS) on-site.
- Do not store chemicals, drums, and bagged materials directly on the ground. Metal drums or containers must be covered with 10 mil plastic sheeting to prevent contact with rainwater if stored in an uncovered area.
- Secondary containment must be designed, installed, and operated to prevent any migration of wastes or accumulated liquid out of the containment system to the soil, groundwater, or surface water.
- Secondary containment must be able to retain 100% of the volume of the largest container or 10% of the aggregate total of all the containers being stored within the secondary containment, whichever is greater.
- Hazardous chemicals shall be stored in their original containers with manufacturer's labels and placed in secondary containment.
- All product containers are required to have Globally Harmonized System (GHS) Labels.
- All containers are required to be labeled as to their contents.
- Do not stack more than 2 containers on top of each other to avoid tipping over. Containers may be stacked higher (no more than 3) provided they are secured from tipping over through such methods of shrink wrap or other supportive means. There must be enough room in the containment area to contain any tipped containers.



Secondary containment reduces the risk of spills and leaks from getting into storm water runoff, contaminating soil, and injuring workers or visitors.

## Installation and Implementation Requirements *(continued)*

- Fuel containers shall have secondary containment for nozzles/hoses.
- Store soaps, detergents, and solvents under cover or other means to prevent contact with rainwater.
- Materials should not be stored in locations that hinder the effectiveness of other BMPs.
- Do not store materials on erosion and sediment control devices.
- Comply with building and fire code requirements when storing materials.
- Provide appropriate training to all new employees responsible for material storage and handling prior to the commencement of work.



Stacked containers, higher than 2, must be secured from tipping over and under adequate cover.

## MATERIAL HANDLING

- Use the appropriate amount of materials necessary to complete the construction activity.
- All personnel shall be trained in accordance with hazardous communication standards. Refer to the Occupational Safety and Health Administration (OSHA), Occupational Safety and Health Standards 29 CFR Section 1910.1200 for more information.
- Minimize the use of hazardous materials. *See* section SM-9 Hazardous Materials and Waste Management for more information.
- Do not remove the original label. Comply with manufacturer's labels, which include product information regarding uses, protective equipment, flammability, ventilation, mixing of chemicals, and proper disposal.
- Use the entire product before disposing of the container in accordance with all federal, state, and local regulations.
- Restrict amount of herbicide prepared to the quantity necessary for the current application. Comply with the recommended usage instructions. Do not apply fertilizers or herbicides during or just before a rain event.
- Comply with building and fire code requirements when storing materials.
- Maintain an ample supply of cleanup materials that are readily accessible for spills.





## Description

Stockpile protection measures to reduce the potential for air and water pollution originating from stockpiles of construction materials and spoil piles. Stockpiled materials may include soil, Portland cement concrete (PCC), asphalt concrete, cold mix asphalt, and aggregate. Spoil piles may include materials excavated from a trench, tunnel, shaft or other excavation activity.

## Applications

- Provide proper protection of stockpiles on construction sites. Table SM-3.1 provides a list of materials commonly stockpiled on construction sites and examples of BMPs for stockpile protection, depending on what material is being stored and the associated risk it poses.

Table SM-3.1 Common stockpiled materials and example BMPs

Common Stockpile Material	Examples of BMPs
<ul style="list-style-type: none"> <li>• Soil</li> <li>• Topsoil</li> <li>• Excavated material</li> <li>• Imported material</li> <li>• Spoil piles</li> </ul>	<ul style="list-style-type: none"> <li>• Cover stockpile with either:               <ul style="list-style-type: none"> <li>– 10 mil plastic sheeting or comparable impermeable material.</li> <li>– soil stabilization measures (i.e., hydromulch, tackifier).</li> </ul> </li> <li>• Protect stockpile with a temporary perimeter sediment barrier.</li> </ul>



# Stockpile Management

Table SM-3.1 Common stockpiled materials and example BMPs (continued)

Common Stockpile Material	Examples of BMPs
<ul style="list-style-type: none"> <li>• PCC               <ul style="list-style-type: none"> <li>– Rubble</li> <li>– Crushed</li> <li>– Hardened</li> <li>– Saw cut</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Cover with 10 mil plastic sheeting or comparable impermeable material (applicable if fines are present).</li> <li>• Protect stockpile with a temporary perimeter sediment barrier.</li> </ul>
<ul style="list-style-type: none"> <li>• Asphalt               <ul style="list-style-type: none"> <li>– Hot mix asphalt</li> <li>– Asphalt cement (cold mix)</li> <li>– Rubble</li> <li>– Reclaimed asphalt pavement</li> <li>– Cold planed material</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Cover with 10 mil plastic sheeting or comparable impermeable material.</li> <li>• Protect stockpile with a temporary perimeter sediment barrier.</li> <li>• Asphalt (cold mix and hot mix) must be stored on an impervious material.</li> </ul>
<ul style="list-style-type: none"> <li>• Aggregate               <ul style="list-style-type: none"> <li>– Base</li> <li>– Sub-base</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Cover with 10 mil plastic sheeting or comparable impermeable material.</li> <li>• Protect stockpile with a temporary perimeter sediment barrier.</li> </ul>
<ul style="list-style-type: none"> <li>• Treated wood               <ul style="list-style-type: none"> <li>– Creosote telephone poles</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Cover with 10 mil plastic sheeting or comparable impermeable material at all times.</li> <li>• Rack materials off the ground or place on top of impermeable material.</li> </ul>

## Installation and Implementation Requirements

- Locate stockpiles a minimum of 50 feet, or as far as practicable, from concentrated runoff, waterbodies, and inlets. If impracticable, additional precautions should be taken to protect storm drain inlets, open drainage facilities, and waterbodies.
- Place bagged materials on pallets and under cover.
- Provide physical diversion to protect stockpiles from concentrated runoff.
- Cover stockpiles with 10 mil plastic sheeting or comparable impermeable material.
- Cover may be removed while adding to or removing from the stockpile. Replace the cover when not in use.
- Cover should be weighted down to prevent it from blowing off.

## Installation and Implementation Requirements *(continued)*

- Geotextile filter fabric is an acceptable cover for mulch stockpiles or other heat producing materials.
- Stockpiles of paving materials must not be placed directly on the ground. Place on 10 mil plastic sheeting or similar impermeable material or dispose of it properly off-site at the end of the day.
- Soil stabilization measures may be used if soil stockpiles will be inactive for an extended amount of time. Hydroseeding, hydromulching, and tackifiers may be accepted as adequate soil stabilization measures. *See* sections EC-13 Hydroseeding, EC-15 Hydromulching, and EC-16 Soil Binders for more information.
- Place silt fence, compost filter socks, or other accepted perimeter controls approximately 1 to 2 feet from the base of the stockpile.
- Stockpiles consisting of aggregate may need to be covered depending on the amount of fines present.
- Stockpiling topsoil for extended periods of time can reduce the biotic benefits of the existing soil. Topsoil stockpiles should be stored for as little time as possible.
- Stockpiles must be covered at the end of each work day and before each anticipated rain event.
- Minimize compaction of soil stockpiles.
- Ensure stockpile heights can be managed and should be no taller than surrounding structures.



Cover stockpiles with 10 mil plastic sheeting or comparable impermeable material and place perimeter controls 1 to 2 feet from the base of the stockpile.

## Considerations

- Stockpiles are only applicable for temporary storage of material.
- Perimeter controls for the project limits are not considered stockpile protection.
- Stockpiles cannot be located in any natural buffer area.

## What to Inspect

- Are stockpiles completely covered?
- Is perimeter control installed at the base of the stockpile?

## What to Inspect *(continued)*

- Are there tears/rips in the stockpile cover?
- Is there evidence of water or wind erosion?
- Are stockpiles located away from concentrated flows, open waterbodies, and inlets?
- Does the stockpiled material have fines and need to be covered?
- Is the stockpile taller than surrounding structures?



Damaged covers and gaps in perimeter protection increase the chance of water or wind erosion from the contents of the stockpile.

## Maintenance

- Replace/repair damaged stockpile cover, as needed.
- Ensure the plastic cover is in contact with the ground around the entire pile and properly anchored.
- Replace/repair damaged temporary perimeter sediment barrier.
- Stockpiles removed from the project site shall be disposed of at an approved solid waste permitted facility. Stockpiles shall not be taken to an intermediary site such as a contractor's baseyard (for storage) unless the contractor's baseyard has been issued the appropriate permit from the Department of Health.
- Revegetate any disturbed areas under removed stockpiles, if applicable.
- Reapply temporary stabilization (i.e., hydromulch, tackifier, etc.), if needed.



Cold patch spoil piles or waste asphalt piles must be placed on and covered with impervious material, as well as have full perimeter control around the base of the stockpile.

## What to Inspect

- Are storage areas clean, organized, and equipped with an adequate supply of cleanup materials?
- Are secondary containment measures being used and are they appropriately sized?
- Do containers have proper labeling?
- Do containers show signs of corrosion and/or evidence of leaks?
- Are materials properly stored and disposed of?
- Are storage areas located away from drainage structures, concentrated flows and open waterbodies?

## Maintenance

- Storage areas shall be clean and well organized.
- Maintain an adequate supply of spill cleanup materials on-site and readily available.
- Any significant residual materials remaining on the ground shall be removed and properly disposed of immediately. If the residual materials contaminate the soil, then the contaminated soil shall also be removed and disposed of properly.
- Maintain covers on any materials that should not come into contact with storm water. All containers must have proper GHS Labels and, if practicable, be in secondary containment.
- Provide periodic training to all employees responsible for material storage and handling.



Galvanized metal and rebar must be racked off the ground and covered with impermeable material.



## Description

Practices and procedures to reduce the discharge of pollutants from construction and demolition (C&D) waste from entering the drainage system or adjacent waterbodies.

## Applications

- Construction projects generating non-hazardous solid wastes from C&D activities. These wastes include C&D waste, inert fill material, litter and recycle/reuse material.
  - C&D wastes include materials originating from the construction, demolition, and repair of roads, buildings, or other structures.
  - Inert fill materials are defined as earth, soils, rocks, rock-like material, such as cured asphalt, brick, and clean concrete less than 8 inches in diameter, except as specified by a licensed Engineer with no exposed steel reinforced rod. The inert fill material shall not contain vegetation, organic material, or other solid waste. It shall not be contaminated with asbestos or lead-based paint. In addition, inert fill materials do not decompose or produce leachate or products harmful to the environment.

## Installation and Implementation Requirements

- Separate contaminated cleanup materials from C&D wastes. Contamination may be from hazardous substances, friable asbestos, waste paint, solvents, sealers, or adhesives.

## Installation and Implementation Requirements *(continued)*

- Dispose of waste in designated waste containers.
- Solid waste bins must be watertight and placed away from drainage facilities and open bodies of water.
- Most C&D wastes can be reused or salvaged for recycling. Inert fill materials shall not be mixed with other C&D waste.
- Solid waste is generally any material that leaves a project that is no longer usable on the project. If any material is intended to be characterized as inert fill or soil for reuse, the material shall be tested and determined clean.
- Ensure inert fill material does not contain vegetation, organic material, or other solid waste.
- The Department of Health, Hazard Evaluation and Emergency Response Office (HEER) refers to *Guidance for Soil Stockpile Characterization and Evaluation of Imported and Exported Fill Material*, to define "acceptable fill material" as:
  - Natural materials consisting of soil, clay, sand, volcanic cinder and ash, and rock; or a mixture/combination of such materials.
  - C&D materials exclusive of soil that are known or tested to be free of hazardous substances.
- The fill determination process, defined by HEER, is to determine if proposed fill material meets the definition of acceptable fill material. Options to complete the fill determination process include:
  - An environmental due diligence review of the fill source property that concludes there is no evidence of past releases that could pose an environmental hazard or contain chemical contaminants above applicable State of Hawaii Department of Health (DOH) Tier 1 Environmental Action Levels (EALs).
  - A fill material characterization report that summarizes representative analytical data for the proposed fill material from the fill source operator, fill importer, or fill exporter.
- The contractor shall obtain approval from the Engineer to take any material off-site from an HDOT construction site.
- Provide waste containers of sufficient size and number to contain construction and domestic waste. Dumpsters must be watertight and securely lidded. Roll off containers must be watertight and have a cover to keep rain out and prevent loss of waste during windy conditions.



Waste containers must be covered with an impermeable material at the end of the day and when it is not in use.

## Installation and Implementation Requirements *(continued)*

- Waste containers may be covered with 10 mil plastic sheeting/Visqueen, tarpaulin, manufactured lid, or other impermeable material.
- Waste containers shall meet all local and state solid waste management regulations.
- Littering on-site is prohibited.
- Ensure construction waste is collected, removed, and disposed of only at authorized disposal areas. Any site not contiguous with the project site may need a permit to receive solid waste. This includes any site or facility that receives solid waste, landowners who want to accept and process solid waste, and contractors who have to take solid waste to their Baseyard.
- The contractor's supervisory personnel shall be instructed regarding the correct practices for waste disposal. Post notices detailing these practices in the office trailer. The contractor shall ensure that these practices are followed.
- Follow all contract requirements regarding handling and disposal of solid waste.
- Fill out the *Solid Waste Disclosure Form for Construction Sites* at <https://health.hawaii.gov/shwb/sw-permits/>. Inform HDOT of disposal destinations and obtain all permits/approvals relating to stockpiling and disposal of material.
- Do not allow containers to overflow. Plan for waste and recyclable materials to be collected weekly or when containers are two-thirds full, whichever is sooner.
- Minimize production of solid waste materials wherever possible.
- It is highly recommended to reuse C&D waste when possible. For criteria for reuse, refer to DOH Tier 1 EALs for unrestricted land use. Refer to DOH *Evaluation of Environmental Hazards at Sites with Contaminated Soil and Groundwater* for more information on EALs.
- Consideration of soil that exceeds Tier 1 EALs for unrestricted land use, but meets the DOH environmental action levels for commercial use (Refer to DOH *Evaluation of Environmental Hazards at Sites with Contaminated Soil and Groundwater*, Appendix 1, Table I-2) for off-site reuse at such sites must be approved by HEER in consultation with the State of Hawaii Department of Health, Solid and Hazardous Waste Branch (SHWB).
- Notify the Resident/Construction Engineer of any illegal connections, illicit discharges, or illegal dumping not generated by the contractor. Fill out the *Report a Violation Form* at website – <https://www.stormwaterhawaii.com/report-a-violation/> at the time of discovery.



Water is able to get into uncovered waste containers, potentially leading to leaking. Windy conditions may also cause loss of waste from waste containers.



## Considerations

- Must sort waste material accordingly.
- Some types of solid waste can easily be washed away by storm water if not properly disposed of.
- The Engineer may reject imported fill from sources known to contain hazardous material.
- The import of fill material from a source that has not been evaluated could inadvertently recontaminate a remediated property, and may be considered illegal dumping. Contaminated fill material can also pose direct exposure hazards to workers and the public.
- Understanding the source of the fill material and the potential for contamination is very important.
- Construction vehicles may be necessary to put C&D waste in the correct bin.
- Construction personnel should not hose out containers on-site. Leave dumpster cleaning to the trash hauling contractor.

## What to Inspect

- Are waste containers properly covered?
- Do waste containers exceed two-thirds capacity?
- Is there evidence of leaks or spills around waste containers?
- Is site neat and free of litter?
- Is waste being separated and placed in the appropriate bin?
- Are waste bins located away from drainage facilities, inlets, and open bodies of water?
- Is there evidence of illegal dumping on-site?
- Is trash removed regularly?



Solid waste should be removed regularly so waste containers do not exceed two-thirds capacity.

## Maintenance

- Schedule solid waste collection regularly.
- Empty waste containers when they are two-thirds full.
- Schedule recycling activities based on construction/demolition phases.
- Do not allow containers to overflow.



# Solid Waste Management

## Maintenance (*continued*)

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- Repair/replace leaking or damaged dumpsters.
- Clean up site and dispose of waste in designated waste containers by the end of each work day.
- Keep disposal receipts and provide a copy to HDOT to document that the waste is disposed of at the facility permitted on the *Solid Waste Disclosure Form for Construction Sites*.
- Solid waste shall be taken directly from the project site to the facility permitted on the *Solid Waste Disclosure Form for Construction Sites*.



## Description

Practices and procedures to reduce or prevent the discharge of sanitary wastes from construction sites into the storm drain system or adjacent waterbodies.

## Applications

- Construction sites containing temporary or portable sanitary waste systems.

## Installation and Implementation Requirements

- Locate sanitary facilities in a convenient place away from drainage facilities.
- Wastewater shall not be discharged to the ground and open waterbodies, or buried.
- Position sanitary facilities where they are secured and will not be tipped over or knocked down.
- Use of straps, rebar stakes, or similar devices to secure sanitary facilities are required.
- Sanitary systems discharging to the sanitary sewer shall comply with the local wastewater treatment plant requirements.



Stakes can be used to secure sanitary facilities to ensure they will not be tipped over or knocked down.

## Installation and Implementation Requirements *(continued)*

- A licensed service provider shall maintain sanitary facilities in good working order.
- Schedule regular waste collection by a licensed transporter at least once a week or as required.
- If a spill occurs, immediately contain and determine if contents have reached an inlet or open waterbody. The area shall be properly disinfected after cleanup of the spill has been completed.
- All spills regardless of size must be reported to the Emergency Spill Response Coordinator and the State of Hawaii Department of Transportation (HDOT) Construction Resident Engineer/Project Engineer/Construction Inspector. *See section SM-10 Spill Prevention and Control for more information.*



Portable toilets must be located away from drainage systems and waterbodies.

## What to Inspect

- Are portable toilets secured from tipping over?
- Are contents leaking from septic facility?
- Are portable toilets located away from the drainage systems, concentrated flows and waterbodies?

## Maintenance

- Maintain facilities regularly.
- Schedule regular waste collection by a licensed transporter at least once a week or as required.
- Prevent illicit discharges.
- Resecure portable toilets, if needed.

# Hazardous Materials and Waste Management



## Description

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Practices and procedures to prevent hazardous material and waste from discharging into the storm drain system or adjacent waterbodies.

## Applications

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Handling and storing procedures on construction sites involving the following hazardous materials and waste:

### TYPICAL HAZARDOUS MATERIALS AND WASTES FROM COMMERCIAL CONSTRUCTION AND DEMOLITION (C&D) JOBS

- Oil-based paint, stains, and varnishes
- Acids and bases (e.g., muriatic acid, etc.)
- Ignitable waste (gasoline and diesel)
- Used batteries
- Waste vehicle lubricants (e.g., used motor oil, etc.)
- Latex paint with mercury
- Thinners and painting solvents
- Spent sand blast material from paint removal operations
- Weatherproofing/insulation solvents
- Finishing and flooring adhesives and sealants
- Mechanical/electrical waste
- Absorbent materials used to clean up spills



# Hazardous Materials and Waste Management

## Applications *(continued)*

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- All petroleum-based products
- Concrete curing/repair compounds and related concrete work products
- Contaminated rags
- Waste mercury or acrylic mercury paint
- Non-empty aerosol cans

## TYPICAL HAZARDOUS MATERIALS AND WASTE FROM EXISTING STRUCTURES

- Sandblasted material such as grit or chips containing lead, cadmium, or chromium-based paints
- Asbestos
- Polychlorinated Biphenyls (PCBs)
  - Older transformers are a common source of PCBs.

## Installation and Implementation Requirements

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### POTENTIALLY HAZARDOUS WASTE RECOGNITION

- Review product label and shipping papers.
- Identify key words such as flammable or ignitable (able to catch fire); carcinogenic (causes cancer); toxic or poisonous (injures or harms people or animals); and hazardous, danger, caustic or corrosive (burns through chemical action). Hawaii Administrative Rules (HAR) Title 11, Chapter 261 includes a list of hazardous waste and criteria. Review Safety Data Sheets (SDS) from the manufacturer and supplier of the product.

### HAZARDOUS MATERIALS HANDLING AND STORAGE

- Hazardous material should remain in the original container. Do not transfer material into another storing device unless it is considered waste.
- Keep the original product label on the container because it includes important safety and disposal information. Keep all SDS at a designated location. Inform all personnel of the location of the SDS.
- Restrict amount of herbicide and fertilizer prepared to the quantity necessary for the current application. Comply with the recommended usage instructions. Do not apply herbicides and fertilizers during or just before a rain event.

# Hazardous Materials and Waste Management

## Installation and Implementation Requirements *(continued)*

- It is preferred to store hazardous material under a covered facility. If a covered facility is not applicable, materials must be placed in secondary containment and covered with impermeable material to prevent storm water from coming in contact with materials.
- Secondary containment must be able to retain 100% of the volume of the largest container or 10% of the aggregate total of all the containers being stored within the secondary containment, whichever is greater.
- Metal containers shall be covered by an impermeable material so they are not exposed to rainwater, which can cause rusting and potential leaks.
- Secondary containment is required for storing hazardous materials and must be impervious to the materials stored.
- All spills, free products, or storm water captured in a secondary containment shall be immediately removed and properly disposed of.
- Incompatible materials, such as chlorine and ammonia, shall not be stored in the same temporary containment facility.
- Immediately clean up hazardous waste that spills or leaks on the ground. Do not hose down or bury spills.



Hazardous materials stored under a covered facility and in secondary containment prevents storm water from coming into contact with materials.

## DISPOSAL OF HAZARDOUS WASTE FROM CONSTRUCTION ACTIVITIES

- It is required to ensure the site has adequate space for hazardous waste storage volume.
- Waste storage areas must be located away from drain inlets, watercourses, and moving vehicles.
- Minimize hazardous waste stored on-site.
- Waste shall not be mixed and drums used for waste shall not be overfilled.
- Label all waste containers with the type of waste being stored and the date of accumulation.

# Hazardous Materials and Waste Management

## Installation and Implementation Requirements *(continued)*

- Store hazardous waste separate from non-hazardous waste to prevent mixing in case of a spill. Do not mix wastes.
- Remove as much paint from brushes on painted surface. Do not clean or rinse water-based paint brushes in soil, streets, gutters, storm drains, or streams. Rinse from water-based paints shall be discharged into the sanitary sewer system. Filter and reuse solvents and thinners.
- Dispose of oil-based paints and residue as a hazardous waste.
- Place hazardous waste in a sealable container suitable for the material.
- Rainwater that mixes with hazardous waste due to spills or leaks shall be treated as hazardous waste and must be placed in drums.
- Dispose of container only after all of the product has been used in accordance with federal, state, and local regulations.
- Hazardous waste that will not be recycled/reused must be disposed of off-site within 90 days of being generated, or as directed by the Resident/Construction Engineer.
- Maintain an ample supply of cleanup materials that are readily accessible for spills. All employees shall be informed of the location of the cleanup material and trained in their proper use.
- Hazardous waste must not accumulate on the ground.
- A licensed hazardous waste transporter shall dispose of hazardous waste at an authorized disposal facility. For more information regarding licensed transporters, refer to the State of Hawaii Department of Health (DOH) Hazardous Waste Section at website – <http://health.hawaii.gov/shwb/hazwaste/>.



Metal containers must be covered by an impermeable material or under a covered facility to prevent contact with rainwater, which can cause rusting and potential leaks.

## WASTE RECYCLING AND DISPOSAL OF HAZARDOUS WASTE

- Designate areas for collection of hazardous wastes.
- Store hazardous materials and wastes in covered containers and label according to applicable Resource Conservation and Recovery Act (RCRA) requirements.
- Provide secondary containment for hazardous waste containers to prevent contact with storm water runoff.
- Keep wastes separate to prevent chemical reactions which make recycling and disposal difficult.
- Recycle useful materials such as oil- or water-based paint.



# Hazardous Materials and Waste Management

## Installation and Implementation Requirements *(continued)*

- Do not dispose of toxic liquid wastes (solvents, used oils, and paints) or chemicals (additives, acids, and curing compounds) in dumpsters allocated for construction debris.
- Schedule periodic waste collection to prevent overflow of containers.
- Ensure collection, removal, and disposal of hazardous waste complies with regulations.
- Clean up spills immediately. Do not clean spills or surfaces by hosing the area down. Use the appropriate tools in the spill prevention kit to mitigate spills from leaching into the receiving waters or entering a storm drainage system.
- Eliminate the source of the spill to prevent a discharge or a continuation of an ongoing discharge.

## Considerations

- Hazardous waste that cannot be reused or recycled shall be disposed of by a licensed hazardous waste hauler.
- Nothing in this section relieves the contractor's responsibility of compliance with federal and state laws.

## What to Inspect

- Is hazardous material in secondary containment and covered with an impermeable material?
- Are containers completely empty before being thrown into the waste bin?
- Is plastic cover ripped or torn?
- Are metal containers containing hazardous material rusting or leaking?
- Are original labels on all containers containing hazardous material?
- Are containers completely sealed?
- Is hazardous material in its original container?
- Is there evidence of leaks or spills on ground?
- Is hazardous waste being stored properly and regularly disposed of by a licensed transporter?



Hazardous materials not stored in a covered facility must be placed in secondary containment and under an impermeable cover.



# Hazardous Materials and Waste Management

## What to Inspect *(continued)*

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- Is there an ample supply of cleanup material readily accessible?
- Is hazardous waste being mixed?

## Maintenance

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- Schedule regular hazardous waste collection.
- Replace/repair secondary containment if there are signs of leaking.
- Replace plastic cover that has rips and tears.
- Immediately clean up spills of hazardous material and dispose of waste properly.
- Maintain areas where hazardous material and waste must be kept clean and well organized.



## Description

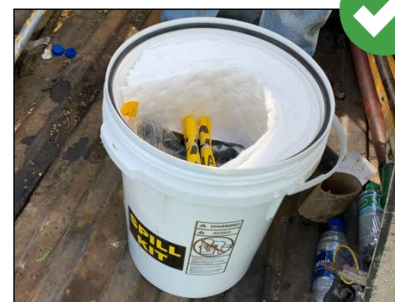
Proper spill prevention practices and procedures to aid in preventing spills and leaks from discharging into the storm drain system or adjacent waterbodies.

## Applications

- Construction projects involving the storage and use of chemicals or hazardous substances.

## Installation and Implementation Requirements

- Maintain an ample supply of cleanup materials that are readily accessible for spills.
- Train employees on proper spill prevention and cleanup.
- Review spill response requirements at all applicable work sites.
- Install perimeter control, such as a dike or berm, around areas of concern to prevent spills or leaks from exiting the contained area.
- Eliminate the source of the spill to prevent a discharge or a furtherance of an ongoing discharge.



Spill kits containing cleanup materials can be used to clean up potential leaks and spills.



# Spill Prevention and Control

## Installation and Implementation Requirements *(continued)*

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### CLEANUP REQUIREMENTS AND PROCEDURES

- Immediately clean up leaks and spills.
- Use minimal water to clean up spills on paved surfaces. For small spills, use a rag. For general cleanup, use a damp mop. For larger spills, use absorbent materials.
- Properly dispose of materials used to clean up hazardous materials.
- Do not hose down or bury dry material spills.
- Ensure all personnel who are affected by the spill or will be responsible for its cleanup have all appropriate personal protective equipment (PPE).
- If possible, prevent or minimize the amount of the spill that may discharge into the drainage system.

### SMALL SPILLS

- Small spills must be taken care of immediately by the first responder.
- Use a rag or any type of absorbent material to soak up the chemical spill. Do not hose down or bury the spill.
- Use a broom or shovel to clean up dry chemical spills.
- Prompt and effective response is the best way to prevent pollutants from coming into contact with storm water.
- Notify the Engineer.

### MEDIUM-SIZED SPILLS

- Semi-significant/medium-sized spills can be cleaned up by the first responder with help from construction personnel on-site, but the spill will be too large to soak up with a rag.
- Isolate and contain the chemical spill with the appropriate BMPs and use materials in the spill prevention kit to immediately clean up the spill. Do not let the chemical liquid spread into drainage systems or state waterways.
- Immediately notify the Resident/Construction Engineer.

### SIGNIFICANT HAZARDOUS SPILL OCCURRENCE THAT CANNOT BE CLEANED UP/HANDLED BY PERSONNEL ON-SITE

- Immediately notify the Resident/Construction Engineer followed by completing a written report of the incident.
- Immediately stop work in the vicinity of the spill. Remove and keep all non-essential employees away from the spill. Never subject yourself or other personnel to unreasonable risk of illness or injury.



# Spill Prevention and Control

## Installation and Implementation Requirements *(continued)*

- Call 911 immediately for spills that pose an immediate threat or danger to the public or property.

### REPORTING ON-SITE SPILL OCCURENCE

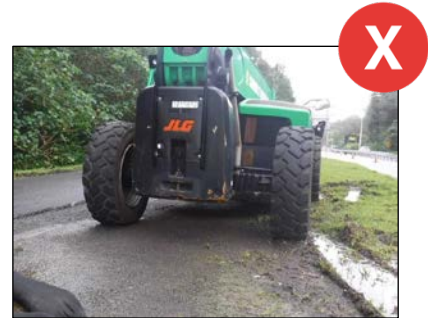
- Where a leak, spill, or other release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity established under either 40 CFR Part 110, 40 CFR Part 117, or 40 CFR Part 302 occurs during a 24-hour period, the permittee shall notify:
  - U.S. Coast Guard National Response Center (NRC) at 800-424-8802,
  - The State of Hawaii Department of Health, Clean Water Branch (CWB) during regular business hours,
  - The Hawaii State Hospital Operator during non-business hours at 247-2191, and
  - The CWB via email at [cleanwaterbranch@doh.hawaii.gov](mailto:cleanwaterbranch@doh.hawaii.gov) during non-business hours as soon as the permittee has knowledge of the discharge.
- To report a spill to the State of Hawaii Department of Health Hazard Evaluation and Emergency Response (HEER) office outside of normal business hours, call (808) 236-8200.
- It is expected that HEER is notified via telephone or in-person within 20 minutes of discovery of the release. A follow-up written notification form will also need to be completed and post-marked to HEER no later than 30 days after the initial discovery of a release. (The notification form can be found at <https://health.hawaii.gov/heer/how-to-report-a-release-spill/>).
- Immediately report spills that are 25 gallons or more of petroleum product, such as oil and gasoline, or any spill of any volume that is not contained and remediated within 72 hours to HEER.
- The contractor shall provide to the Engineer, within 7 calendar days of knowledge of the release, the circumstances leading to the release, and the date of the release. The Engineer shall provide this information the CWB.
- For any spills that discharge into the drain system or receiving state waters, immediately notify the CWB. Within 7 calendar days of discovering the occurrence of discharge into the drain system or receiving state waters, submit a discharge report of the following to the CWB:
  - Any follow-up actions taken to review the design, installation, and maintenance of storm water controls, including the dates such actions occurred.
  - A summary of storm water control modifications taken or to be taken, including a schedule of activities necessary to implement changes, and the date the modifications are completed or expected to be completed.

## Installation and Implementation Requirements *(continued)*

- Notice of whether *Storm Water Pollution Prevention Plan (SWPPP)* modifications are required as a result of the condition identified or corrective action.

### VEHICLE AND EQUIPMENT MAINTENANCE ACTIVITIES

- Use off-site repair and maintenance shops as much as possible. These repair and maintenance shops are better equipped to handle vehicle fluids and spills properly.
- If on-site repair is necessary, use a designated area and/or secondary containment for on-site repair or maintenance activities. These areas shall be located away from drainage courses, inlets, and open waterbodies.
- Conduct regular inspections of on-site vehicles and equipment, including delivery trucks and employee vehicles, for leaks. Do not allow vehicles or equipment with leaks on-site.
- Secondary containment devices such as drop cloths and drain pans shall be used to catch leaks or spills while staging or changing fluids from vehicles or equipment.
- Drip pans can be used to catch potential leaks from idle vehicles and equipment.
- Place drip protection/pads with absorbent and impermeable materials under all vehicles and equipment with the potential to leak/spill when not in use.
- Use absorbent materials on small spills. Do not hose down or bury spills. Remove and properly dispose of cleanup materials.
- Minimize the movement of drums and containers filled with hazardous material.
- Immediately transfer used fluids to the appropriate waste or recycling containers. Avoid leaving drip pans and open containers with hazardous material on-site. Large-diameter funnels must be used to transfer liquids into drums.
- Drain excess oil from oil filters prior to disposal by placing filter in a funnel over a waste oil recycling drum. Recycle oil filters if this service is available.
- Store all cracked batteries in a non-leaking secondary container even if the acid appears to have drained out. Handle dropped batteries as cracked batteries until assured it is not leaking.



Drip protection or pads with absorbent and impermeable material must be placed under construction vehicles and equipment when not in use.

### VEHICLE AND EQUIPMENT FUELING ACTIVITIES

- Use off-site fueling stations as much as possible.
- If on-site fueling is necessary, use designated areas for required on-site fueling. Fueling areas shall be located away from drainage courses, inlets, and waterbodies.

## Installation and Implementation Requirements *(continued)*

- Avoid “topping off” of fuel tanks.
- Use secondary containment devices such as drain pans to catch spills or leaks while fueling.

## Considerations

- Use of a private spill cleanup company may be necessary.
- This BMP only applies to spills caused on-site by the contractor, sub-contractors, and their vendors.
- Only respond to spills if you can do so safely.

## What to Inspect

- Are drip pans and/or absorbent material placed under construction vehicles and equipment?
- Is there an ample amount of spill cleanup material on-site and easily accessible?
- Are spills/leaks evident around construction vehicles, equipment, stored materials, drain inlets or open bodies of water?
- Are there tears/rips in plastic sheeting or geotextile covers?
- Is plastic cover or other impermeable material overlapped and secured (duct tape is applicable)?
- Are perimeter controls in good condition and able to operate properly, in case of a spill?
- Are facilities away from waterbodies and drainage systems?
- Do facilities have sufficient spill containment areas?
- Are facilities located on impervious surfaces?
- Does sufficient containment volume exist?
- Do locations for storing hazardous materials and chemicals exist?
- Are hazardous material drums/containers properly labeled?
- Are hazardous and chemical materials/waste stored in secondary containment?
- Are hazardous and chemical materials/waste covered by an impermeable material?



Cleanup procedures must be followed when leaks from vehicles, equipment, and stored materials are evident.



# Spill Prevention and Control

## Maintenance

- Update spill prevention and control plans and stock necessary cleanup materials as the chemicals used or stored on-site change.
- Locate an ample supply of materials for spill control and cleanup on-site near maintenance and material storage or unloading areas.
- Replace/repair impermeable material/plastic covers that have rips or tears.
- Realign perimeter control devices, when necessary, to ensure proper function.
- Immediately clean up spills.

Table SM-10.1 Useful phone numbers for emergency spill contacts.

Emergency Spill Contacts	Phone Number
Honolulu Fire Department; Honolulu Police Department	911
State of Hawaii Department of Health, Hazard Evaluation and Emergency Response Office	(808) 586-4249 or (808) 236-8200 during non-business hours
State of Hawaii Department of Health, Clean Water Branch – Oahu	(808) 586-4309 or (808) 247-2191 during non-business hours
State of Hawaii Department of Health, Clean Water Branch – Maui	(808) 873-3556
State of Hawaii Department of Health, Clean Water Branch – Hilo	(808) 933-0401
State of Hawaii Department of Health, Clean Water Branch – Kona	(808) 322-1967
State of Hawaii Department of Health, Clean Water Branch – Kauai	(808) 241-3322
Honolulu Local Emergency Planning Committee	(808) 723-8960
Maui Local Emergency Planning Committee	(808) 870-7404
Hawaii Local Emergency Planning Committee	(808) 936-8181





# Spill Prevention and Control

Table SM-10.1 Useful phone numbers for emergency spill contacts (continued)

Emergency Spill Contacts	Phone Number
Kauai Local Emergency Planning Committee	(808) 241-1800
U.S. Coast Guard	(808) 842-2970
Hawaii National Guard	(808) 733-4228
State of Hawaii Department of Transportation, Highways Division, Oahu District	(808) 831-6700
State of Hawaii Department of Transportation, Highways Division, Maui District	(808) 873-3538
State of Hawaii Department of Transportation, Highways Division, Hawaii District	(808) 933-8866
State of Hawaii Department of Transportation, Highways Division, Kauai District	(808) 241-3000
State of Hawaii Department of Health, Solid Waste & Hazardous Waste Branch	(808) 586-4226
U.S. Coast Guard National Response Center	(800) 424-8802 (24 hour)
State of Hawaii Department of Labor & Industrial Relations, Hawaii Occupational Safety and Health Administration	(808) 586-9116



## Description

Practices and procedures to prevent the discharge of pollutants from equipment and vehicle cleaning activities from entering the drainage system or adjacent waterbodies.

## Applications

- Construction or maintenance activities involving cleaning of vehicles and equipment.

## Installation and Implementation Requirements

- Use off-site vehicle wash racks or commercial washing facilities when practical. Off-site cleaning facilities may be better equipped to properly handle and dispose of wash waters.
- If on-site cleaning is necessary, designate a paved surface and bermed wash area for cleaning activities. The wash area may be sloped to facilitate collection of wash water and evaporative drying. Water must be contained in the bermed wash area.
- Use a positive shutoff valve when cleaning vehicles and equipment to minimize water usage.



Use of a designated paved surface and bermed wash area helps prevent the discharge of pollutants from equipment and vehicle cleaning from entering drainage systems and waterbodies.

## Installation and Implementation Requirements *(continued)*

- Removal of sediment or soil from vehicles and equipment, except for contaminated media, can be done on pervious areas as long as they are cleaned through dry cleanup measures (e.g., tire sweeping, vacuuming, etc.) only.
- Do not allow wash water to enter the storm drainage system or open waterbodies.
- Minimize the amount of water being used to clean vehicles and equipment.
- Vehicle and equipment cleaning using soaps, solvents, or detergents are only allowed in an impervious area where water can be captured and either treated (i.e., oil/water separator) or disposed of properly (off-site).
- Properly store soaps, detergents, and solvents. *See* section SM-2 Material Storage and Handling for more information.
- Only use phosphate-free, biodegradable soaps.
- Do not discharge wash water directly into the storm drainage system or open waterbodies.
- Minimize water use to avoid the need for erosion and sediment controls for the wash area.
- If vehicles and equipment are cleaned off in the field, ensure waste is collected and disposed of properly.
- Do not store hazardous material in the wash area.
- Cover the wash area when it is not in use to prevent contact with storm water.
- Train employees on pollution prevention measures.
- Do not wash personal vehicles on-site.
- Steam cleaning shall not occur in uncontained areas. Significant pollutant concentrations may be generated from steam cleaning.
- Remove the wash area and stabilize disturbed areas once the project is complete.



Vehicle and equipment cleaning using soaps, solvents, or detergents are only allowed in an impervious area where water will be captured and either treated or disposed of properly.

## What to Inspect

- Are pollution prevention controls (i.e., berms, sumps, oil/water separators, etc.) properly functioning?
- Are soaps, detergents, and solvents properly stored?



# Vehicle and Equipment Cleaning

## What to Inspect *(continued)*

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- Are there traces of soap and solvents in pervious wash areas?
- Is there a presence of pollutants (i.e., concrete, oils, etc.) observed in the wash area?
- Are all wash areas located in impervious areas?
- Is wash water being captured?
- Is there evidence of prohibited discharge?

## Maintenance

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- Any sediment or other potential pollutants removed from vehicles and equipment during cleaning activities should be managed and/or disposed of appropriately.
- Repair/replace pollution prevention controls (i.e., berm, sump, etc.) if not operating per design.
- Wash water containing soaps, detergents, and solvents should be routinely disposed of.



## Description

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Practices and procedures to prevent or reduce the discharge of pollutants from vehicle and equipment maintenance. When vehicles and equipment need maintenance, the best option is to perform these activities off-site to avoid spills and leaks on-site. If on-site maintenance activities are necessary, they should be conducted in an approved designated area.

## Applications

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- Construction sites with vehicle and equipment maintenance areas.
- Construction sites where vehicle and equipment are stored when not in use.
- Construction sites where vehicle and equipment are idle, but intermittent use is occurring.

## Installation and Implementation Requirements

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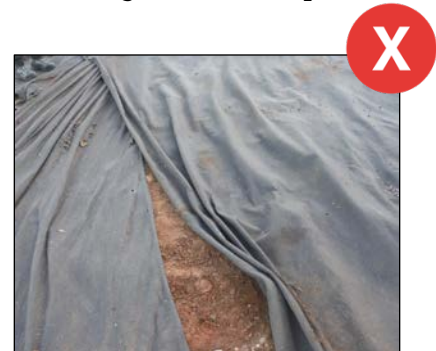
- Prevent excessive accumulation of oil and grease by keeping vehicles and equipment clean.
- Use off-site repair and maintenance facilities where practical.
- Repair oil and fluid leaks immediately.
- Immediately place a drip pan or drip pad under the vehicle once a leak is observed until repairs can be made.

## Installation and Implementation Requirements *(continued)*

- Designate a leveled maintenance area away from drainage courses and inlets to prevent pollutants from entering the drainage system.
- Store vehicles and equipment that need maintenance on a layer of geotextile filter fabric on top of 10 mil plastic sheeting before conducting maintenance activities. Perimeter controls must be placed along the perimeter of the maintenance area and underneath the impermeable material, to create a berm able to contain any possible spills and/or leaks.
- Have an ample supply of readily accessible spill cleanup materials on-site, at all times.
- Use absorbent materials on small spills. Promptly remove and properly dispose of absorbent materials. Do not hose down or bury small spills. *See* section SM-10 Spill Prevention and Control for more information.
- Check vehicles and equipment regularly for leaks. Leaking vehicles and equipment shall not be allowed on-site.
- Keep maintenance areas clean and orderly to minimize oil and grease buildup.
- Segregate and recycle wastes from vehicle/equipment maintenance activities such as used oil, oil filters, greases, hydraulic and transmission fluids, cleaning solutions, antifreeze, and automotive batteries.
- Oil, fuels, fluids and lubricants should be recycled whenever possible. Do not dump on the ground or pour into storm drains.
- Properly dispose of wastes generated by vehicle/equipment maintenance activities.
- Provide employee training on proper maintenance and spill cleanup practices and procedures.



If a leak is observed, immediately place a drip pan or drip pad under the vehicle until repairs can be made.



Geotextile filter fabric must have 10 mil plastic sheeting underneath it to contain leaks and spills.

## Considerations

- Off-site maintenance facility may not be easily accessible.
- Vehicle and equipment maintenance should only be used when off-site maintenance is impractical.



# Vehicle and Equipment Maintenance

## What to Inspect

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- Are leaks and/or spills coming from vehicles and/or equipment?
- Is there evidence of oil, grease, fluids, lubricants, etc. on the ground?
- Are spill cleanup materials available on-site?
- Are vehicles and equipment properly stored on a layer of geotextile filter fabric on top of 10 mil plastic sheeting?
- Are berms properly aligned along the perimeter of the maintenance area?
- Is the maintenance area on leveled ground away from drainage courses?
- Are maintenance areas kept clean and orderly?
- Are vehicles being taken off-site for maintenance?

## Maintenance

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- Maintain an adequate supply of spill cleanup materials on-site.
- Remove used oils, antifreeze, grease, lubricants, etc. routinely.
- Do not allow used oils to accumulate on-site.
- Maintain adequate supplies of spill cleanup materials on-site.
- Leaking vehicles and equipment shall be repaired promptly.
- Leaks and spills shall be cleaned up immediately.
- Maintain impermeable material/plastic sheeting, geotextile filter fabric, and perimeter control to ensure proper effectiveness.



## Description

Practices and procedures to prevent or reduce the discharge of pollutants to storm water from vehicle and equipment fuel leaks or spills.

## Applications

- Construction or maintenance activities involving fueling of vehicles or equipment.

## Installation and Implementation Requirements

- Use off-site fueling sites when practical. Off-site fueling sites may be better equipped to service and handle spills due to multiple vehicles or pieces of equipment.
- If on-site fueling is necessary, locate designated fuel areas away from storm water run-on and runoff, and locate fueling areas at least 50 feet, or as far as practicable, from downstream drainage facilities and watercourses to prevent contamination of storm water. If impracticable, consider implementing additional BMPs or secondary containment when fueling.
- Avoid “topping-off” of fuel tanks.
- Drip pans or absorbent pads shall be used to absorb leaks or spills during fueling.



Protect on-site fueling areas with berms and dikes to prevent run-on, runoff, and to contain spills.



## Installation and Implementation Requirements *(continued)*

- Fueling must be performed on a leveled area.
- Protect fueling areas with berms and dikes to prevent run-on, runoff, and to contain spills.
- Have absorbent spill cleanup materials located in fueling areas.
- Use absorbent materials on small spills. Do not hose down or bury the spill. Promptly remove and properly dispose the absorbent materials. *See* section SM-10 Spill Prevention and Control for more information.
- Clean up spills or contaminated surfaces immediately, using dry cleanup measures where possible, and eliminate the source of the spill to prevent a discharge or a furtherance of an ongoing discharge. Store hazardous materials and fluids under cover and in secondary containment. *See* section SM-9 Hazardous Materials and Waste Management for more information.
- Minimize mobile fueling of construction equipment by transporting equipment to designated areas for fueling.
- Train employees on proper fueling and cleanup procedures.
- Put fuel pods and hoses in secondary containment to prevent hoses/nozzles from leaking.
- Store diesel fuel, oil, hydraulic fluid, or other petroleum products or other chemicals in watertight containers and provide cover or secondary containment. If container is metal, cover is required.
- Containers shall be properly labeled.
- Comply with federal and state requirements regarding stationary, above ground storage tanks.
- Comply with the Spill Prevention Control Countermeasures (SPCC) requirements in 40 CFR 112 and section 311 of the Clean Water Act (CWA).



There must be drip protection under vehicles and equipment that are being refueled on-site.

## What to Inspect

- Is there evidence of fuel spills or leaks on the ground?
- Are any vehicles and/or equipment leaking fuel?
- Are hoses/nozzles in secondary containment?
- Are berms and absorbent pads well-maintained and effective?

## What to Inspect *(continued)*

- Is there an ample amount of spill cleanup materials on-site?
- Are hazardous fluids properly stored?

## Maintenance

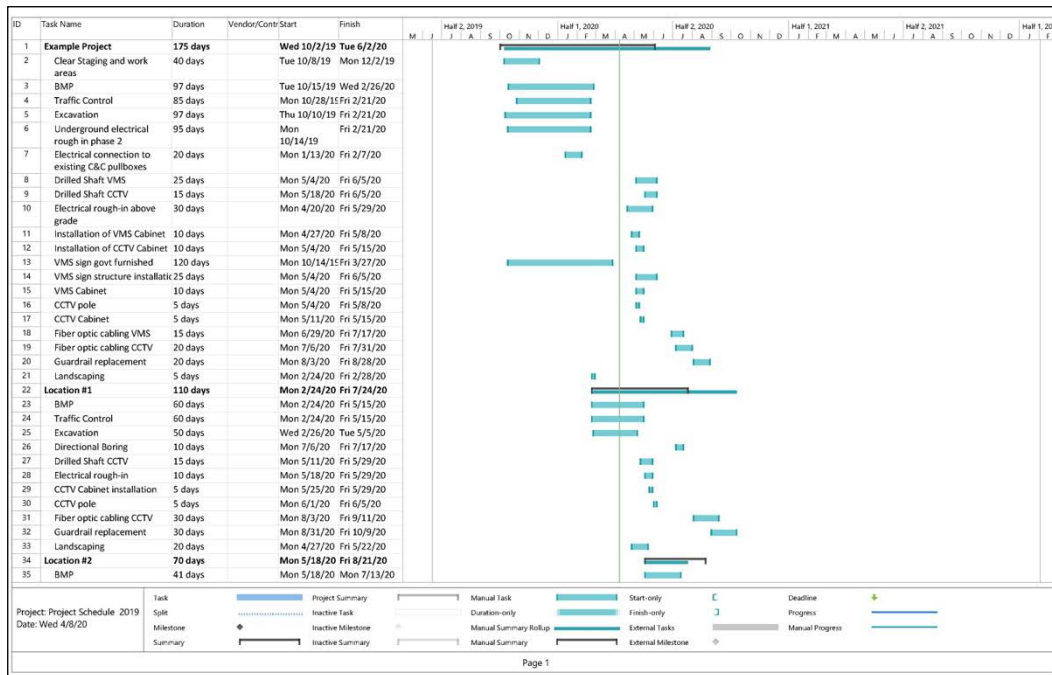
- Keep an ample supply of materials for fuel spill control and cleanup located on-site near fueling areas available at all times.
- Properly dispose of absorbent pads, hazardous material and contaminated soil.



Ensure that drip protection is adequate enough to capture any potential vehicle or equipment leaks.



# Scheduling



## Description

Developing a schedule that includes sequencing of construction activities with the implementation of construction site BMPs to reduce the amount and duration of soil exposed to erosion by wind, rain, runoff, and vehicle tracking as well as ensure construction activities and control practices are performed in accordance with the planned schedule.

## Applications

- Proper scheduling shall be used on all projects.

## Installation and Implementation Requirements

- The *Storm Water Pollution Prevention Plan (SWPPP)* must 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:
  - Installation of storm water control measures, and when they will be operational, including an explanation of the sequence and schedule for installation of storm water control measures.



# Scheduling

## Installation and Implementation Requirements *(continued)*

- Commencement and duration of earth-disturbing activities, including clearing and grubbing, mass grading, site preparation (i.e., excavating, cutting, and filling), final grading, and creation of soil and vegetation stockpiles requiring stabilization.
- Cessation, temporarily or permanently, of construction activities on-site, or in designated portions of the site.
- The dates for final or temporary stabilization of areas of exposed soil.
- Removal of temporary storm water conveyances/channels and other storm water control measures, removal of construction equipment and vehicles, and cessation of any pollutant generating activities.
- Minimize the area of active construction. Limit maximum surface area of earth material exposed at any time to 300,000 square feet. Do not expose or disturb surface area of earth material until BMP measures are installed and accepted in writing by the Engineer.
- Inspect the site prior to initiation of ground-disturbing activities to verify BMPs, as required by the approved *BMP Plan* and/or other documents, have been installed correctly per the manufacturer's specifications and in the correct location.
- Date and sign the *Site-Specific BMP Plan (SSBMP)* or *SWPPP*, keeping an approved copy of the plan on-site or at an accessible location so that it can be made available at the time of an on-site inspection or upon request by the Engineer, per *2005 Hawaii Standard Specifications for Road and Bridge Construction*, Special Provisions Section 209.03(A)(h).
- After the *SSBMP Plan* or *SWPPP* is accepted in writing, schedule a water pollution, dust, and erosion control meeting with the Engineer a minimum of 7 calendar days prior to the start work date.
- Minimize work involving soil-disturbing activities during rain and forecasted events.
- Schedule disturbed areas to be stabilized prior to additional grading of other areas.
- Minimize duration of time trenches remain open. Schedule trenching activities to ensure trenches are closed prior to excavating new trenches.
- Periodically review the schedule for upcoming tasks. Prior to any new activity or new area opened for work, review the *SWPPP* to ensure BMP measures are appropriate to the site and/or means and methods of work. If not, a *SWPPP* amendment should be proposed by the Contractor and certified by HDOT prior to any change to the *SWPPP*. An approved/signed amendment must be in place prior to the start of work.
- Immediately initiate stabilization of exposed soil areas upon completion of earth-disturbing activities for areas permanently or temporarily ceased on any portion of the site. Stabilization must be completed no later than 14 calendar days after the initiation of stabilization measures.



# Scheduling

## Installation and Implementation Requirements *(continued)*

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- All BMPs must be in place at the start of construction unless stipulated otherwise in the *SWPPP*.
- Refer to Hawaii Administrative Rules (HAR) Title 11, Chapter 55, Appendix C or project specifications for information on inspection and maintenance scheduling requirements.

## Considerations

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- Adherence to schedule.

## What to Inspect

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- Does the schedule reflect actual construction activities?
- Is there new work starting on-site?
- Does the *SWPPP* need to be amended?
- Are amendments approved prior to the start of work?

## Maintenance

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- Monitor progress of construction activities relative to construction schedule. Implement remedial measures if progress deviates from schedule.
- Revise the schedule, as necessary.

# Location of Potential Sources of Sediment



## Description

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Practices and procedures to identify potential sources of sediment to reduce sediment discharge from construction sites.

## Applications

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- Any potential source of sediment on all projects.

## Installation and Implementation Requirements

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- Configure construction site to ensure vegetated areas buffer haul roads, stockpiles, and adjacent waterbodies. Vegetation provides an effective means of reducing sediment and pollutants discharged off-site.
- Place stockpiles away from waterways, drains and low spots.
- Direct off-site runoff away from bare ground.
- Maintain vegetation in swales and natural drainage ways.
- Designate naturally level areas for parking and equipment staging during construction.
- Inspect the construction site during or immediately following a rain event to identify the storm water's natural path to locate where sediment leaves the site. This will assist in *Storm Water Pollution Prevention Plan (SWPPP)* design and BMP placement.



# Location of Potential Sources of Sediment

## What to Inspect

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- Where are the exposed areas on the construction site?
- Is there evidence of run-on and/or runoff?

## Maintenance

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- Install, repair, or replace BMPs to cover exposed areas or redirect off-site runoff.



## Description

An approved location, designated in the *Storm Water Pollution Prevention Plan (SWPPP)*, where construction equipment, vehicles, materials, and other construction-related materials are stored. Staging areas can be a significant point source for pollution, so BMPs are necessary to ensure no contaminated storm water exits the site.

## Applications

- Flat areas with ample space for equipment and materials to be stored.
- Paved areas and/or land already disturbed within project boundaries.

## Installation and Implementation Requirements

- Staging areas must be defined in the plans of the project's *SWPPP* and approved prior to using the area. The approved locations and layout/detailing of the staging area must be included in the *SWPPP* or included by amendment process. In the case of roadside staging areas for paving equipment, a generic layout may be provided for multiple roadside identified locations. The approved staging area plan shall designate the locations of the equipment/material to be stored within the staging area, as well as, any BMPs to be implemented for the staging area.
- BMPs must be in place prior to using the staging area.
- Drip pans can be used to catch potential leaks from idle vehicles and equipment.
- Place drip protection/pads with absorbent and impermeable materials under all vehicles and equipment with the potential to leak/spill when not in use.



## Installation and Implementation Requirements *(continued)*

- Perimeter controls must be placed along the perimeter of the staging area and underneath the impermeable material, to create a berm able to contain any possible spills and/or leaks.
- Perimeter control devices installed along the perimeter of the staging area diverts storm water run-on and runoff. For sloping areas where storm water can run onto the project site, consider installing a diversion to prevent off-site storm water from entering the project site.
- Do not store materials or equipment on perimeter controls. Material and equipment must be stored away from the perimeter controls to allow access for inspection and maintenance of the controls.
  - Commonly used BMPs include:
    - Silt fences
    - Compost filter socks or berms
    - Berms
- Consider phasing construction staging areas to minimize the duration of exposed soil. Dust control must be used on all exposed soils or any construction activity generating soil. *See section SM-19 Dust Control for more information.*
- When a phase of the project is complete and the staging area for the site is no longer required, immediately initiate stabilization at the disturbed areas. Once the area is deemed stabilized, the BMP devices can be removed. *See section EC-12 Seeding and Planting for more information.*
- Install a stabilized construction entrance/exit at the entrance of the staging area to prevent tracking onto adjacent paved roads and sidewalks. *See section SC-11 Stabilized Construction Entrance/Exit for more information.*
- All storm drain inlets that may intercept sediment-laden runoff from staging areas must be protected. *See section SC-1 Storm Drain Inlet Protection for more information.*
- Place drip pans or drop cloths under vehicles and equipment to absorb spills or leaks. *See sections SM-10 Spill Prevention and Control and SM-12 Vehicle and Equipment Maintenance for more information.*
- Store paving equipment and vehicles that are idle in a designated staging area on a layer of geotextile filter fabric on top of 10 mil plastic sheeting. Place drip pads/pans under paving equipment to contain leaks and spills. Drip protection is required under asphalt hopper and roller assembly. *See section SM-20 Paving Operations for more information.*



Aerial view of a construction staging area.

## Installation and Implementation Requirements *(continued)*

- Ensure that construction vehicles and equipment are not stored under tree drip lines or on top of existing tree roots. *See* section SM-17 Preservation of Existing Vegetation for more information.
- Metal (galvanized and ungalvanized) and rebar must be stored off of the ground on proper dunnage, pallet, or similar material and covered with 10 mil plastic sheeting to prevent material from coming into contact with storm water. *See* section SM-2 Material Storage and Handling for more information.
- Locate stockpiles a minimum of 50 feet, or as far as practicable, from concentrated runoff, drainage systems, or open waterbodies. Stockpiles must be entirely covered with an impermeable material and surrounded by a perimeter control device installed around the base of the pile. Staging area perimeter protection cannot be used as perimeter protection for stock/spoil piles. *See* section SM-3 Stockpile Management for more information.
- Sanitary facilities must be secured and located away from drainage systems and open waterbodies. *See* section SM-7 Sanitary Waste Management for more information.
- Waste bins must be covered by the end of each work day and emptied when they reach two-thirds capacity. *See* section SM-6 Solid Waste Management for more information.
- Hazardous materials and waste such as: creosote pipes, waste asphalt, contaminated soil and transite pipes must be properly stored and covered. *See* section SM-9 Hazardous Materials and Waste Management for more information.
- Concrete wash areas must be lined with an impervious material and disposed of in compliance with federal, state, and local standards. *See* section SM-4 Concrete Wash and Waste Management for more information.
- For shared staging areas, responsibilities must be clearly defined. If the staging area is divided by well-defined boundaries for each project, each area can be covered under its respective Notice of General Permit Coverage (NGPC)/National Pollutant Discharge Elimination System (NPDES) permit. If a staging area is shared in its entirety, a separate NGPC/NPDES permit may be obtained for the staging area.
  - All areas within a shared staging area must be accounted for and there should be no overlapping areas for which responsibilities are shared by more than 1 contractor. Consult with the Engineer for review/approval.



Store vehicles and equipment on a layer of geotextile filter fabric on top of 10 mil plastic sheeting when not being used.



# Staging Area

## Installation and Implementation Requirements *(continued)*

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- Off-site staging areas need to be included in the project's *SWPPP* and are subject to NPDES requirements.

## Considerations

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- Staging area may have a limited amount of space to store vehicles and equipment due to local traffic and existing vegetation.
- Storm water run-on from a point source upgradient becomes the contractor's responsibility to manage if it enters the staging area.
- Contractor may need to implement dust control measures if staging area is not stabilized.
- Runoff flows increase on paved and graded areas. Special attention will be needed during heavier rain events. Staging areas need to be secured prior to a severe storm event.
- Staging areas must be approved before storing materials and equipment in the area.
- Additional staging areas added to the project, outside of the project limits, may require a separate NPDES permit.

## What to Inspect

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- Are approved staging areas identified in the project's *SWPPP*?
- Are BMPs installed prior to vehicles and equipment being stored in the staging area?
- Are there leaks and/or spills evident around construction vehicles, equipment or materials?
- Is the correct size aggregate being used in staging area for construction roads and entrances?
- Are waste bins covered when not in use?
- Are portable toilets secured to prevent tipping or knocking over?
- Is rebar and steel under cover/covered with 10 mil plastic sheeting and properly stored on dunnage, pallet, or similar material?
- Are construction vehicles stored under existing tree drip lines or on top of tree roots?
- Are vehicles tracking sediment onto public roads?
- Are there traces of run-on or runoff around the perimeter of the staging area?
- Has the contractor initiated stabilization in disturbed areas no longer required for staging?



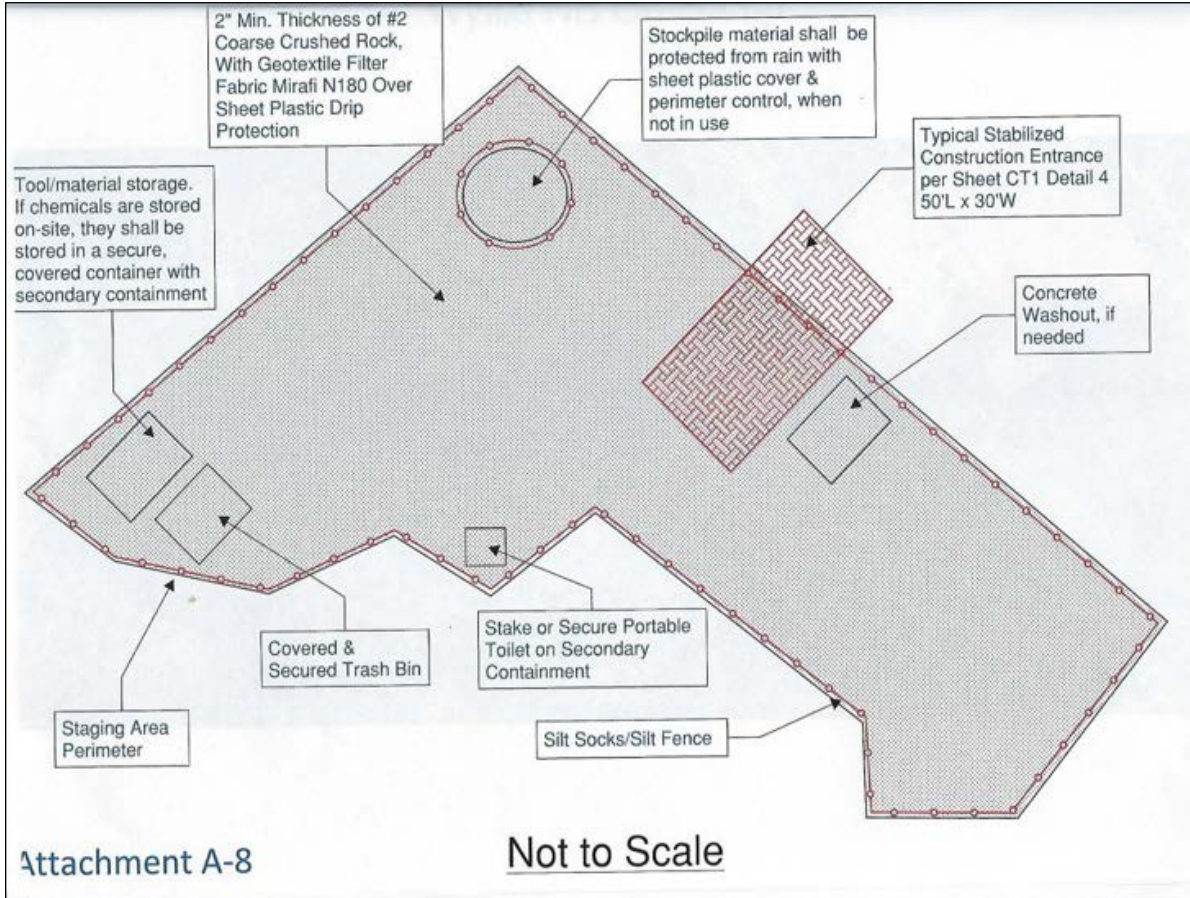
# Staging Area

## Maintenance

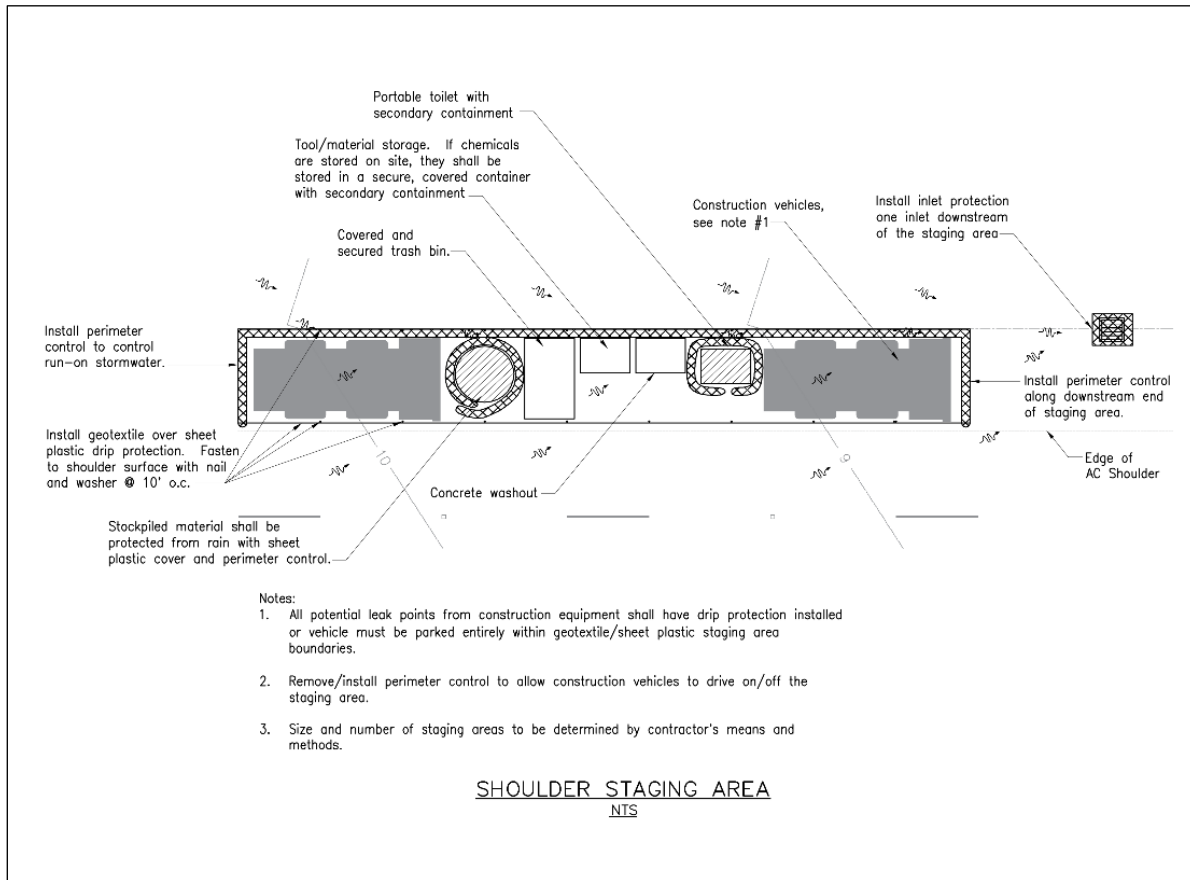
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- Immediately clean up spills using dry cleanup methods where possible, and dispose of used materials properly.
- Clean up leaks and spills with an absorbent material. Do not clean surfaces or spills by hosing the area down.
- Provide an ample supply of readily available spill cleanup materials.
- Repair/replace plastic sheeting and/or geotextile filter fabric when torn or ripped.
- Replenish surface and construction entrance aggregate periodically.
- Repair/replace perimeter control devices that are tampered with and not functioning as designed.
- Place drip pans under idle construction vehicles.
- Adjust, repair, and/or reinstall inlet protection devices that are damaged, out of position, or not fully functional according to manufacturer's specifications.
- Regularly dispose of garbage and waste material.
- Amend the project's *SWPPP* when additional staging areas are needed or existing staging areas are no longer required.

# Staging Area



Example of a typical staging area.



Example of a typical shoulder staging area.



## Description

Practices and procedures to provide erosion and sediment control to preserve existing vegetation on a site with future land-disturbing activities.

## Applications

- Areas on-site where no construction activity occurs or will occur at a later date.
- Areas where the existing vegetation should be preserved such as steep slopes, watercourses, and building sites in wooded areas.
- Natural resources or environmental protection areas requiring preservation by federal, state, and local governments such as wetlands and marshes.

## Installation and Implementation Requirements

- Incorporate existing vegetation into landscaping plans when possible. Proper care of this vegetation before and after construction is required.
- Consider aesthetic and environmental values, tree/plant health, life span, sun exposure limitations, and space requirements when determining which vegetation to preserve.
- Avoid using vegetation which competes with the existing vegetation when preparing the landscaping plans.
- Phase construction activity to minimize the total amount of disturbed area to preserve existing vegetation.

## Installation and Implementation Requirements *(continued)*

- Clearly identify land to be disturbed to avoid damaging existing vegetation that is not meant to be disturbed.
- Establish setback distances defined by devices such as berms, fencing, or signs. Setback distances are based on vegetation species, location, size, and age. Consider the type of construction activity in the vicinity of the vegetation. Construction activities are not permitted within the setback.
- Protect existing vegetation using the following methods:
  - Mark, flag, or fence areas of vegetation to be preserved.
  - Designate limits of root system (tree drip line).
  - Identify tree wells and retaining walls which are large enough to protect the root system.
  - Limit grading to within 1 foot of the tree drip lines, if grading under the tree is necessary.
  - Locate construction traffic routes, spoil piles, etc. away from existing vegetation.
- Consult with a licensed arborist to develop a plan if it is not possible, due to construction requirements, to provide a setback to the limits of the root system (tree drip line). This plan should include setback limits and other mitigation methods to provide protection for the subject tree or other vegetation.
- Do not park equipment on tree roots or near endangered species of vegetation.
- Consult with the appropriate agencies to approve any setbacks established if endangered species of vegetation are found within or adjacent to the project limits.



Steel plates were installed under the tree drip line to protect the root system after consultation with a licensed arborist.

## Considerations

- Requires advanced planning and coordination among the owner/developer, contractor, and designer.
- Limited use if final site design does not incorporate existing vegetation.
- Diverse site topography may result in additional expenses to satisfy vegetation preservation and the grading required for the site improvements.
- Limited space for construction activity makes it difficult to preserve existing vegetation.



## What to Inspect

- Are any endangered species identified within the projects limits and protected prior to the start of construction?
- Is there construction equipment, materials, personal vehicles or spoil piles stored on a tree's root system?
- Is construction activity occurring within vegetation setback limits?



Construction equipment and materials, personal vehicles, and spoil piles must not be stored on a tree's root system.

## Maintenance

- Immediately repair or replace damaged protection measures.
- Damage to existing trees should be examined and attended to by an arborist.



## Description

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Measures to minimize erosion and reduce the amount of dust generated by construction activities.

## Applications

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Dust control shall be used on all exposed soils or any construction activity generating dust. Dust control shall apply to the following:

- Clearing, grubbing, and grading
- Construction vehicular travel on unpaved roads
- Drilling and blasting
- Soil and debris stockpiles
- Excavation and handling of soil or aggregate from excavators, loaders, and backhoes
- Unstable soil areas
- Sawcutting, jack hammering and grinding
- Sifting operations

## Installation and Implementation Requirements

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- Minimize exposed areas through the schedule of construction activities.
- Anticipate the prevailing wind direction to determine BMP placement in order to minimize the amount of dust generated.

## Installation and Implementation Requirements *(continued)*

- Identify and stabilize primary entrances/exits prior to commencement of construction to prevent tracking and dust generation.
- Direct construction vehicular traffic to stabilized roadways.
- Maintain dust screens until permanent ground cover has been established.
- Use methods to mitigate or eliminate the amount of dust produced, such as spraying water from water truck, using misters, chemical dust controlling agents, or combination thereof; hydromulching, keeping soil moist, and grassing.
- Light spray of water or use of vacuum can minimize dust when drilling, sawcutting, jack hammering or grinding.
- Do not overspray water for dust control purposes, which will result in runoff from the area.
- Prevent water from wetting vehicles, pedestrians, and existing pavements.
- Washing down of debris or dirt into drainage, sewage systems, or state waters is not allowed.
- Chemicals used as soil stabilizers for dust control must be approved by the Engineer before use.
- Large areas and stockpiles can be hydromulched with a tackifier (with or without seed) to prevent wind erosion/dust. *See* section SM-3 Stockpile Management for more information.
- Geobinders with surfacants may be used to minimize water consumption.
- Cover exposed surface of materials completely with tarpaulin or similar device when transporting aggregate, soil, excavated material or material that may be sources of fugitive dust.
- Utilize vegetation, mulching, sprinkling, and stone/gravel layering to quickly stabilize exposed soil.
- Comply with the *2005 Hawaii Standard Specifications for Road and Bridge Construction*, Standard Specifications & Special Provisions Sections 209 and 619, as in effect.



Spraying water on exposed areas and when drilling, sawcutting, jack hammering, or grinding helps mitigate the amount of dust produced on a construction site.



Not using dust control measures can result in excessive dust being generated by construction activities.

## Considerations

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- Daily or more frequent applications of water may be necessary since water is a short-term dust preventative.
- Erosion may result from overwatering.
- Oil may not be used for dust control since the oil may discharge into a drainageway or seep into soil.
- Some dust suppression chemicals may cause soil to become water repellent resulting in increased runoff.

## What to Inspect

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- Is there evidence of off-site runoff?
- Is dust being suppressed during construction activity?
- Are dust screens properly maintained?
- Is dust from the construction site impeding public safety or health?
- Is water being oversprayed?

## Maintenance

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- Install, repair, or replace BMPs to cover bare ground or redirect off-site runoff.
- Apply water as conditions require.
- Repair water truck leaks immediately.



Dust screens must be maintained until permanent ground cover has been established.