

Honoapiilani Highway at Olowalu Shoreline Embankment Site Specific Best Management Practices (BMPs)

March 2013

The purpose of the site specific best management practices (BMPs) is to isolate and confine pollutants, thereby preventing pollutants from entering ocean waters outside the project area. Two types of BMPs will be implemented during construction:

- Gravel bag barrier and diversion
- General BMPs and erosion control plan for landside construction activity

Gravel Bag Barrier and Diversion

The gravel bag barrier and diversion system described below is intended to protect the work area from breaking wave activity at the shoreline and to provide temporary containment and filtering of sediments from return flows. The attached figures show the approximate gravel bag locations and detail.

1. Where working areas encroach on nearshore waters, barriers adequate to mitigate breaking wave energy from eroding exposed areas and filter sediments from return flows will be constructed and maintained.
2. Encroachment into the water will not exceed the minimum necessary to complete the removal work.
3. For construction of the shoreline revetment, the gravel bag barrier will be installed in phases that are approximately 200 feet in length and corresponding to the section under construction (see Erosion Control Plan 1). They will be designed to accommodate fluctuations in water depth (maintain a minimum 12" freeboard) or flow volume due to tides, etc.
4. For construction of the new drainline, the gravel bag diversion will be positioned to isolate the worksite around the drainline and outlet (see Erosion Control Plan 2).
5. Gravel bags will be filled with clean, washed gravel; approximately 0.4 to 0.8 inch in diameter; and be free from clay, organic matter, and other deleterious materials.
6. The gravel bag system will use high strength geotextile bags filled with gravel. These bags will consist of an inner bag made of woven poly (Super sack or similar) and an outer bag made of a high strength non-woven permeable material

(Elcomax or similar). The gravel bags will be heavy enough to prevent movement or damage to the integrity of the barrier when subjected to breaking waves.

7. Mechanical equipment will not be operated or parked in the water or below the Mean Higher High Water (MHHW) line.
8. Dewatering will be conducted in accordance with State of Hawaii, Department of Health, Clean Water Branch policies and guidelines.
9. When possible, avoid or minimize diversion/encroachment impacts by scheduling construction during periods of low tide.
10. Construct diversion structures with materials free of potential pollutants, such as soil, silt, sand, clay, grease, or oil.
11. Trenching will not exceed the minimum necessary to complete operations.
12. Stabilize exposed slopes as soon as practical.

Photos of Gravel-filled Bags Intended for BMPs at Laniupoko
(a similar system is proposed at Olowalu)



High strength geotextile bags filled with clean gravel off-site



Filled gravel bags mechanically lowered into place



Gravel bags to be lined up to form barrier

General BMPs and Erosion Control

A. General

1. See Section 209 - Water Pollution and Erosion Control (attached). Section 209 describes but is not limited to: submittal requirements; scheduling of a water pollution and erosion control conference with the Engineer; construction requirements; method of measurement; and basis of payment.
2. Effective October 1, 2008, follow the guidelines in the "Construction Best Management Practices Field Manual", dated January 2008 in developing, installing and maintaining the Best Management Practices (BMP) for the project.
3. Follow the guidelines in the Honolulu's City & County "Rules Relating to Soil Erosion Standards and Guidelines" along with applicable Soil Erosion Guidelines for projects on Maui, Molokai, Kauai, and Hawaii.
4. The Engineer may assess liquidated damages of up to \$27,500 for non-compliance of each BMP requirement and each requirement stated in Section 209, for every day of non-compliance. There is no maximum limit on the amount assessed per day.
5. The Engineer will deduct the cost from the progress payment for all citations received by the Department for non-compliance, or the Contractor shall reimburse the State for the full amount of the outstanding cost incurred by the State.
6. For projects that require an NPDES Permit from the Department of Health, install a rain gage prior to any field work including the installation of any site-specific best management practices. The rain gage shall have a tolerance of at least 0.05 inches of rainfall, and have an opening of at least one-inch in diameter. Install the rain gage on the project site in an area that will not deter rainfall from entering the gage opening. The rain gage installation shall be stable and plumbed. Do not begin field work until the rain gage is installed and site-specific best management practices are in-place.

B. Waste Disposal

1. Waste Materials

Collect and store all waste materials in a securely lidded metal dumpster. The dumpster shall meet all local and State solid waste management regulations. Deposit all trash and construction debris from the site in the dumpster. Empty the dumpster a minimum of twice per week or as often as is deemed necessary. Do not bury construction waste materials onsite. The Contractor's supervisory personnel shall be instructed regarding the correct procedure for waste disposal. Post notices stating these practices in the office trailer and the Contractor shall be responsible for seeing that these procedures are followed.

2. Hazardous Waste

Dispose all hazardous waste materials in the manner specified by local or State regulations and by the manufacturer. The Contractor's site personnel shall be instructed in these practices and shall be responsible for seeing that these practices are followed.

3. Sanitary Waste

Collect all sanitary waste from the portable units a minimum of once per week, or as required.

4. Solid Waste

The Contractor shall develop and submit to the Engineer a Solid Waste Management Plan for the disposal of cleared and grubbed material from the project site during construction. Contractor shall coordinate with the Central Maui Landfill supervisor at 270-6153 regarding suitability of this material as landfill cover.

C. Erosion and Sediment Control Inspection and Maintenance Practices

1. Inspect all control measures at least once each week and within 24 hours of any rainfall event of 0.5 inches or greater.
2. Maintain all measures in good working order. If repair is necessary, it shall be initiated within 24 hours after the inspection.
3. Remove built-up sediment from silt fence when it has reached one-third the height of the fence.
4. Inspect silt screen or fence for depth of sediment, tears, to verify that the fabric is securely attached to the fence posts or concrete slab and to verify that the fence posts are firmly in the ground. Inspect and verify the bottom of the silt screen is buried a minimum of 6 inches below the existing ground. As the project progresses, HDOT or his representative shall determine if additional silt fence, not specified by the BMP plans, shall be required to control soil and sediment migration.
5. Inspect temporary and permanent seeding and planting for bare spots, washouts and healthy growth.
6. Make a maintenance inspection report promptly after each inspection. Submit a copy to the Engineer no later than one week from the date of the inspection.
7. Provide a stabilized construction entrance to reduce vehicle tracking of sediments. Include stabilized construction entrance in the Water Pollution, Dust, and Erosion Control submittals. Minimum length should be 50 feet. Minimum width should be 30 feet. Minimum depth should be 6 inches and underlain with geo-textile fabric. Clean the paved street adjacent to the site entrance daily or as required to

remove any excess mud, cold planed materials, dirt or rock tracked from the site. Cover dump trucks hauling material from the construction site with a tarpaulin.

8. Include designated Concrete Washout Area(s) in the Water Pollution, Dust, and Erosion Control submittals.
9. Submit the name of a specific individual designated responsible for inspections, maintenance and repair activities and filling out the inspection and maintenance report.
10. Personnel selected for the inspection and maintenance responsibilities shall receive training from the Contractor. They shall be trained in all the inspection and maintenance practices necessary for keeping the erosion and sediment controls used onsite in good working order.
11. Contain, remove, and dispose slurry generated from saw cutting of pavement in accordance with approved BMP practices. Payment for confinement, removal, and disposal of slurry shall be considered incidental to the various contract items.

D. Good Housekeeping Best Management Practices

1. Materials Pollution Prevention Plan

- a. Applicable materials or substances listed below are expected to be present onsite during construction. Other materials and substances not listed below shall be added to the inventory.

Concrete	Fertilizers
Detergents	Petroleum Based Products
Paints (enamel and latex)	Cleaning Solvents
Metal studs	Wood
Tar	Masonry Block

- b. Use Material Management Practices to reduce the risk of spills or other accidental exposure of materials and substances to storm water runoff. Make an effort to store only enough product as is required to do the job.
- c. Store all materials stored onsite in a neat, orderly manner in their appropriate containers and if possible under a roof or other enclosure.
- d. Keep products in their original containers with the original manufacturer's label.
- e. Do not mix substances with one another unless recommended by the manufacturer.
- f. Whenever possible, use a product up completely before disposing of the container.

- g. Follow manufacturer's recommendations for proper use and disposal.
 - h. Conduct a daily inspection to ensure proper use and disposal of materials onsite.
2. Hazardous Material Pollution Prevention Plan
- a. Keep products in original containers unless they are not re-sealable.
 - b. Retain original labels and material safety data sheets (MSDS).
 - c. Dispose of surplus products according to manufacturer's instructions and local and State regulations.
3. Onsite and Offsite Product Specific Plan
- The following product specific practices shall be followed onsite:
- a. Petroleum Based Products: Monitor all onsite vehicles for leaks and perform regular preventive maintenance to reduce the chance of leakage. Store petroleum products in tightly sealed containers which are clearly labeled. Apply asphalt substances used onsite according to the manufacturer's recommendation.
 - b. Fertilizers: Apply fertilizers used only in the minimum amounts recommended by the manufacturer. Once applied, work fertilizer into the soil to limit exposure to storm water. Storage shall be in a covered shed. Transfer the contents of any partially used bags of fertilizer to a sealable plastic bin to avoid spills.
 - c. Paints: Seal and store all containers when not required for use. Do not discharge excess paint to the highway drainage system. Dispose properly according to manufacturers' instructions or State and local regulations.
 - d. Concrete Trucks: Wash out or discharge concrete truck drum wash water only at a designated site. Do not discharge water in the highway drainage system or waters of the United States. Contact Drinking Water Branch, Department of Health at 586-4258 to receive permission to designate a disposal site. Clean disposal site as required or as requested by the Owner's representative.
4. Spill Prevention Plan
- a. Post a spill prevention plan to include measures to prevent and clean up each spill.
 - b. The Contractor shall be the spill prevention and cleanup coordinator. Designate at least three site personnel who shall receive spill prevention and cleanup training. These individuals shall each become responsible for a particular phase of prevention and cleanup. Post the names of responsible spill personnel in the material storage area and in the office trailer onsite.

- c. Clearly post manufacturers' recommended methods for spill cleanup. Make site personnel aware of the procedures and the location of the information and cleanup supplies.
- d. Keep materials and equipment necessary for spill cleanup in the material storage area onsite.
- e. Clean up spills immediately after discovery.
- f. Keep the spill area well ventilated. Personnel shall wear appropriate protective clothing to prevent injury from contact with a hazardous substance.
- g. Report spills of toxic hazardous material to the appropriate State or local government agency, regardless of the size.

E. Permit Requirements

- 1. A Section 404 (DA) permit and Section 401 WQC have been submitted for this Project. The Contractor shall prepare his bid accordingly to allow adherence to all of the conditions and BMP's. Copies of the permits are available for review upon request.
- 2. If the Contractor's staging area increases the project area to greater than one acre or more, then he shall prepare and process a National Pollutant Discharge Elimination System (NPDES) Permit for Construction Activities and submit to the Engineer six sets of the Water Pollution and Erosion Control Submittals as detailed in Subsection 209.03 of the specifications.
- 3. Obtainment of an NPDES Permit for Construction Dewatering is not anticipated, however if the Contractor's means and methods requires such permits then he shall be responsible to obtain the Permit from the Department of Health, Clean Water Branch.
- 4. Comply with all other applicable State and Federal permit conditions.

BMPs for Drainline Removal below Mean Higher High Water (MHHW) Line

- 1. Encroachment into the ocean shall not exceed the minimum necessary to complete the removal work.
- 2. Gravel bag diversion must be adequately designed to accommodate fluctuations in water depth (maintain a minimum 12" freeboard) or flow volume due to tides, storms, flash floods, etc. Mechanical equipment shall not be operated or parked in the water or below the Mean Higher High Water (MHHW).
- 3. Disturbance or removal of vegetation shall not exceed the minimum necessary 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.

4. Where possible, avoid construction during period of high surf (breaking waves of 2' or more) to minimize diversion and encroachment impacts.
5. Construct diversion structures with materials free of potential pollutants such as soil, silt, sand, clay, grease, or oil.
6. Trenching shall not exceed the minimum necessary to complete operations.
7. Stabilize exposed slopes as soon as practical.

Best Management Practices—Notes

1. Best Management Practices (BMP) presented on the BMP Plan are for suggestion only. The purpose of BMPs is to prevent the discharge of pollutants, resulting from sediment laden storm water runoff, into receiving water. Soil particles resulting from land disturbing activities, shall be prevented from entering any water of Hawaii. For this reason, the Contractor shall develop a Site-Specific Best Management Practices Plan for the project and obtain its approval by both DOH and the HDOT or his representative prior to the commencement of construction activities. Erosion and Sediment Control shall be in compliance with all provisions described in Section 209 - Water Pollution and Erosion Control, and the "Construction Best Management Practices Field Manual", dated January 2008.
2. The Contractor shall obtain any additional required land use permits prior to construction work. A separate permit shall be acquired if the Contractor's Staging Area is located outside the project site.
3. The Contractor shall avoid conducting work during coral spawning season (April through August).
4. The Contractor shall install silt fences, diversion berms, gravel bag barrier, drain inlet protection/catch basin filters, stabilized construction ingress/egress features, and other methods as required as soon as practicable prior to commencement of construction work for sediment runoff control. The Contractor shall maintain these erosion control measures as required to ensure their effectiveness.
5. Storm drain inlet protection must be used throughout the jobsite and areas outside the jobsite where construction activity may track sediment onto paved areas. Storm drain inlet protection must be placed at storm drains, drop inlets, curb inlets or wherever runoff may occur. As the project progresses, inlet protection may have to be added as determined by HDOT or his representative.
6. The Contractor shall adjust distances as necessary to ensure effectiveness of gravel bag barriers and silt fence.
7. The Contractor shall provide silt fence and stabilized construction entrance for each ingress/egress point unless authorized otherwise by the HDOT or his representative. Should the Contractor require ingress or egress other than that

shown in detail on the plan sheet, the Contractor shall be responsible to obtain all necessary approvals.

8. Measures to control erosion and other pollutants shall be in place before any earthwork or demolition is initiated.
9. Slope and exposed area shall be watered, mulched, sodded or planted as soon as backfill and final grading has been established in order to control dust, erosion and sedimentation. Planting shall not be delayed until all backfilling and final grading has been completed. Backfilling shall be continuous and any area within which work has been interrupted or delayed shall be stabilized. Unless indicated otherwise on the plans or in the specifications, payment for planting or grassing required under this item (other than that specified for landscaping) shall not be paid for directly but shall be considered incidental to and included in the price bid for excavation and embankment or other relevant bid item.
10. At the end of earthwork operations, existing inlets and manholes surrounding the project site shall be inspected and any accumulated sediment and debris found in the structures shall be removed. Flushing into the inlets and manholes is not permitted.
11. Temporary BMPs shall not be removed until all permanent erosion controls are in place and established.
12. Any backfilled area which will be left idle for thirty (30) calendar days or more shall be mulched.
13. Washing down of construction equipment and vehicles and wash out of concrete truck drums on site is prohibited. Wash water from wash downs shall not be discharged into drainage systems nor water courses.
14. Should the Contractor choose to have an on-site maintenance/storage/stockpile area, the Contractor shall install proper secondary containment structures, such as diversion berms and silt fences, around the designated area to prevent storm water carrying contaminants into drainage systems or water courses. If material is left onsite during non-working hours, the stockpile shall be covered with a tarp or sheet to prevent runoff in an event of rainfall. The rainwater accumulating within the designated area shall be naturally evaporated or infiltrated into the ground. There shall be one main material storage area located on the mauka side of Honoapiilani Highway.
15. The Contractor shall provide required information to the HDOT or his representative and DOH for discharges of storm water associated with construction activity within thirty (30) days before the commencement of construction.
16. The Contractor shall use the appropriate BMPs, as required or shown on the erosion control plan sheet and described in the Construction Best Management

Practices Field Manual for runoff control, to the approval of the HDOT or his representative and DOH.

17. The Contractor shall be responsible for any precaution for the health and safety of his/her employees at the project where contaminated water or other hazardous materials are present at the project site.
18. Within the erosion and sediment control plan the Contractor shall establish an approved monitoring plan to verify this requirement. The site-specific BMP plan should be referred to frequently during project work and revised when site conditions or information changes. Site housecleaning to prevent indiscriminate storage of construction materials or waste is a requirement tasked or charged to the Contractor.
19. Mechanized equipment and construction materials shall be clean, uncontaminated, and free of deleterious substances, including toxic chemicals and clay-coated material.
20. An Oil Spill Response Plan (OSRP) shall be in place for landside platforms and all in-mechanized equipment which are associated with the installation of the revetment. The OSRP shall detail procedures for managing the accidental release of petroleum products to the aquatic environment during construction. No contamination of the marine environment shall result from the permitted activities. No petroleum products, trash, or other debris shall enter nearshore waters. When such material is found within the operating area, the Construction Contractor POC or its designated agent shall collect and dispose of the material at an approved upland disposal site.
21. Preventive measures to avoid and minimize interactions with green sea and hawksbill turtles and other protected species in active, mechanized equipment areas of operation shall incorporate the following site-specific avoidance and minimization measures:
 - a. Surveys shall be made prior to the start of work each day and prior to resumption of work following any break of more than one half hour. Periodic additional surveys throughout the work day are strongly recommended.
 - b. All in-water work shall be postponed or halted when Endangered Species Act (ESA) listed marine species are within 50 yards of the proposed work and shall only begin/resume after the animals have voluntarily departed the area. If ESA-listed marine species are noticed after work has already begun, that work may continue only after the animals have voluntarily departed the area.
 - c. If approached by a marine mammal or turtle, the equipment operator shall put the engine in neutral and allow the animal to pass.
 - d. Marine mammals and sea turtles shall not be encircled or trapped between multiple mechanized equipment or between mechanized equipment and the shore.

- e. Do not attempt to feed, touch, ride, or otherwise intentionally interact with any ESA-listed marine species.
22. While in-water construction operations are on-going, no contamination of the marine environment should result from project related activities.
- a. Prepare a contingency plan to control toxic materials.
 - b. Store at the work site and have readily available appropriate materials to contain and clean potential spills.
 - c. All project related materials and equipment to be placed in the water shall be cleaned and free of pollutants prior to use. The Contractor shall see that daily pre-work equipment inspections for cleanliness and leaks are performed. The Contractor shall also have a spill containment kit on-site to insure the spill in the ocean caused by the leak will be contained and cleaned up. All heavy equipment operations will be postponed or halted should a leak be detected and will not proceed until the leak is repaired and equipment is cleaned or the equipment is removed from the project site.
 - d. Fueling of land-based vehicles and equipment should take place at least 50 feet away from the water, preferably over an impervious surface. Fueling of vessels should be done at approved fueling facilities.
 - e. Turbidity and siltation from project related work should be minimized and contained through the appropriate use of effective silt containment devices and by the curtailment of work during adverse tidal and weather conditions.
 - f. Develop and maintain a plan to prevent debris and other wastes from entering or remaining in the marine environment during construction operations.
23. The Contractor shall be responsible for coordination of removal and disposal activities of hazardous waste in accordance with all federal, state and local regulations.
24. Weekly sweeps shall be conducted at all construction entrances and exits. However, if sediment build up is heavy, daily sweeps shall be conducted. Residual asphalt or concrete produced during the job shall be immediately swept, contained and managed.
25. Concrete washouts shall be generated in the staging areas of the jobsite. Washout areas shall be lined with geotextile fabric or plastic sheeting or contained in approved washout bins.
26. Saw cutting waste shall be vacuumed with a shop vacuum.
27. Water trucks shall be circulated throughout the jobsite.
28. Fueling trucks shall be used to refuel vehicles and heavy equipment at the project location. Fueling trucks shall also store and dispense other required lubricants and

- fuels. In an event the fueling truck remains at the project site, the truck shall be positioned in a safe environment clear from vehicular and operational traffic.
29. If necessary, absorbent pads and drip pans shall be placed under the equipment.
 30. Litter shall be picked up and disposed of on a daily basis.
 31. Portable toilets shall be placed throughout the jobsite.

Construction Sequence

- Install roadway BMPs
- Construct shoreline revetment by increment
 - Install ocean BMPs for the section to be constructed (200 feet ±)
 - Remove existing fill (excavate)
 - Place geotextile fabric
 - Place quarry run material (6-12 in stone underlayer)
 - Place armor stone (1.5-2.5 ton boulders)
 - Remove ocean BMPs for the constructed section and install ocean BMPs for the next increment
- Extend the existing 30" drainline
- Grade and compact roadway base
- Repair road pavement
- Install guardrails
- Install signage and striping
- Remove all temporary BMPs

Overall contract time is estimated at 52 weeks, of which the duration for in-water construction is estimated at 32 weeks.